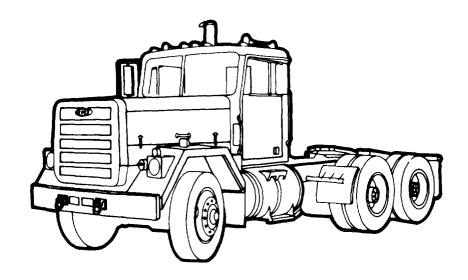
TECHNICAL MANUAL

ORGANIZATIONAL MAINTENANCE

TRUCK TRACTOR, LINE HAUL,
50,000 GVWR, 6 X 4, M915 (NSN 2320-01-028-4395)
TRUCK TRACTOR, LIGHT EQUIPMENT TRANSPORTER
(LET), 56,000 GVWR, 6 X 6, W/WINCH
M916 (NSN 2320-01-028-4396)
TRUCK TRACTOR, MEDIUM EQUIPMENT TRANSPORTER
(MET), 75,000 GVWR, 8 X 6, W/WINCH
M920 (NSN 2320-01-028-4397)



TRUCK CHASSIS, 75,000 GVWR, 8 X 6,
FOR 20-TON DUMP TRUCK,
M917 (NSN 3805-01-028-4389)
TRUCK CHASSIS, 56,000 GVWR, 6 X 6,
FOR BITUMINOUS DISTRIBUTOR TRUCK,
M918 (NSN 3895-01-028-4390)
TRUCK CHASSIS, 75,000 GVWR, 8 X 6,
FOR CONCRETE-MOBILE® MIXER TRUCK,
M919 (NSN 3895-01-028-4391)

AM GENERAL CORPORATION

TA 075632

HEADQUARTERS, DEPARTMENT OF THE ARMY

NOVEMBER 1980

This copy is a reprint which includes current pages from Changes 1 through 4.

This manual may include copyrighted technical data of one or more of the following subcontractors of AM General Corporation:

© 1975 © 1973, 1978	Alinabal, Division of MPB Corporation Anchorlock, Division of Royal Industries
© 1971	Bostrom, Division of Universal Oil Products Company
© 1976	The Budd Company
© 1965, 1967, 1973, 1977	Cole-Hersee Company
© 1971, 1972, 1974, 1975	Chelsea Power Equipment, Division of Dana Corporation
© 1970	Cross Manufacturing, Incorporated
© 1977, 1978, 1979	Cummins Engine Company, Incorporated
© 1977	Dayco Corporation
© 1976	Eberhard Manufacturing Company, Division of the Eastern Company
© 1973	Firestone Steel Products Company,
	Division of the Firestone Tire and Rubber Company
© 1976	Grote Manufacturing Company
© 1975, 1975, 1977	Owatonna Tool Company, Tools and Equipment Division
© 1975	Holland Hitch Company
© 1972, 1973, 1976	Long Manufacturing, Division of Borg-Warner Corporation
© 1960	Mercury Metal Products
© 1976	Nelson Muffler, Division of Nelson Industries, Incorporated
© 1977	Phillips, Division of Budd
© 1976	Parker-Hannifin Corporation
© 1970, 1975, 1976, 1977,	
© 1978, 1979	Rockwell International
© 1976, 1977	Ross Gear, Division of TRW, Incorporated
© 1978	Snap-On Tools Corporation

AM General has written permission from any and all such subcontractors holding copyrights to grant the United States Government a royalty free, nonexclusive and irrevocable license throughout the world for Governmental purposes to publish, translate, reproduce, deliver, perform, dispose of, and to authorize others so to do, all tecnnical data now or hereafter covered by copyright. Any use other than that authorized above must be made with the express permission of AM General or the subcontractor whose copyrighted material is being used. This notice must be reproduced on all copies or portions thereof.

WARNING

CARBON MONOXIDE POISONING CAN BE DEADLY

Carbon monoxide is a colorless, odorless, poisonous gas, which, when breathed, deprives the body of oxygen and causes suffocation. Exposure to air contaminated with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, apparent drowsiness, or coma. Permanent brain damage or death can result from severe exposure.

Carbon monoxide occurs in the exhaust fumes of fuel-burning internal combustion engines and can become dangerous under conditions of inadequate ventilation. The following precautions must be observed to insure the safety of personnel:

- A. DO NOT operate the engine of a vehicle in an enclosed area unless it is ADEQUATELY VENTILATED.
- B. DO NOT idle the engine for long periods without maintaining ADEQUATE VENTILATION in the personnel compartments.
- C. DO NOT drive any vehicle with inspection plates, cover plates, or engine compartment doors removed unless it is necessary for maintenance purposes.
- D. BE ALERT at all times during vehicle operation for exhaust odors, and exposure symptoms. If either are present, IMMEDIATELY VENTILATE the personnel compartments. If symptoms persist, remove affected personnel from the vehicle and treat as follows:
 - (1) Exposure to fresh air.
 - (2) Keep warm.
 - (3) DO NOT PERMIT EXERCISE.
 - (4) If necessary, administer artificial respiration (see FM 21-11).

THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS ADEQUATE VENTILATION.

COMPRESSED AIR

Compressed air used for cleaning purposes will not exceed 30 psi. Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc.).

WINCH HYDRAULIC RESERVOIR (M916 AND M920)

Do not remove fill cap when hydraulic fluid is hot. The hydraulic tank is pressurized to 5 psi. Remove the fill cap slowly.

WARNING

COOLING FAN

When working in the engine compartment with the engine running, stay clear of the cooling fan. The fan may engage automatically at any time and could cause serious injury.

PUSHER AXLE (M917, M919, AND M920)

When the pusher axle is in the up position it freewheels. DO NOT USE THE PUSHER AXLE AS A STEP. You can fall and be injured. Always lower the pusher axle when the vehicle is parked.

FILLING THE RADIATOR

Let the radiator cool before removing cap. Remove radiator cap in two steps. First, place a thick cloth over the cap and slowly rotate cap left to its first stop; pause, and let pressure escape from cooling system. Then rotate cap farther left until you can remove it. Failure to follow this procedure can result in serious burns.

LIFTING THE TRUCK

Improper use of lifting equipment and attachment of cables to the truck can result in serious personnel injury and equipment damage. OBSERVE ALL STANDARD RULES OF SAFETY.

HOOD SAFETY LATCH

After raising hood, insert the S-shaped safety hook through two matching holes in the prop channels to prevent the hood from falling accidentally.

EXHAUST PIPE AND MUFFLER

During normal operation the exhaust pipe and muffler can become very hot. Be careful not to touch these components with your bare hands. Do not allow your body to come in contact with the pipe or muffler. Exhaust system components may be hot enough to cause serious burns.

Change

No. 5

HEADQUARTERS, DEPARTMENT OF THE ARMY WASHINGTON, DC, 30 December 2005

TECHNCIAL MANUAL

ORGANIZATIONAL MAINTENANCE

TRUCK TRACTOR, LINE HAUL, 50,000 GVWR, 6x4, M915 (NSN 2320-01-028-4395)

TRUCK TRACTOR, LIGHT EQUIPMENT TRANSPORTER (LET), 56,000 GVWR, 6x6, W/WINCH M916 (NSN 2320-01-028-4396)

TRUCK TRACTOR, MEDIUM EQUIPMENT TRANSPORTER (MET), 75,000 GVWR, 8x6, W/Winch M920 (NSN 2320-01-028-4397)

TRUCK CHASSIS, 75,000 GVWR, 8x6, FOR 20-TON DUMP TRUCK M917 (NSN 3805-01-028-4389)

TRUCK CHASSIS, 56,000 GVWR, 6x6, FOR BITUMINOUS DISTRIBUTOR TRUCK, M918 (NSN 3895-01-028-4390)

TRUCK CHASSIS, 75,000 GVWR, 8x6, FOR CONCRETE- MOBILE MIXER TRUCK M919 (NSN 3895-01-028-4391)

DISTRIBUTION STATEMENT A- Approved for public release; distribution is unlimited.

TM 9-2320-273-20, 28 November 1980, is changed as follows:

1. Remove old pages and insert new pages as indicated below.

Remove Pages Insert Pages

B-1 through B-20 B-1 through B-20.2

Sample and DA Forms 2028 Sample and DA Forms 2028

2. File this changed sheet in the front of the publication for information purposes.

This change implements Army Maintenance Transformation and changes the Maintenance Allocation Chart (MAC) to support Field and Sustainment Maintenance.

By Order of the Secretary of the Army:

PETER J. SCHOOMAKER General, United States Army Chief of Staff

Official:

SANDRA R. RILEY
Administrative Assistant to the
Secretary of the Army

0517806

DISTRIBUTION: To be distributed in accordance with the initial distribution (IDN) 380298 requirements for TM 9-2320-273-20.

CHANGE

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., 20 April 1993

No. 4

ORGANIZATIONAL MAINTENANCE

TRUCK TRACTOR, LINE HAUL, 50,000 GVWR, 6X4, M915 (NSN 2320-01-028-4395)

TRUCK TRACTOR, LIGHT EQUIPMENT TRANSPORTER (LET), 56,000 GVWR, 6X6, W/WINCH M916 (NSN 2320-01-028-4396)

TRUCK TRACTOR, MEDIUM EQUIPMENT TRANSPORTER (MET), 75,000 GVWR, 8X6, W/WINCH M920 (NSN 2320-01-028-4397)

TRUCK CHASSIS, 75,000 GVWR, 8X6 FOR 30 TON DUMP TRUCK M917 (NSN 3805-01-028-4389)

TRUCK CHASSIS, 56,000 GVWR, 6X6 FOR BITUMINOUS DISTRIBUTOR TRUCK, M918 (NSN 3895-01-028-4390)

TRUCK CHASSIS, 75,000 GVWR, 6X6 FOR CONCRETE MOBILE MIXER TRUCK, M919 (NSN 3895-01-028-4391)

TM 9-2320-273-20, 28 November 1980, is changed as follows:

- 1. Remove old pages and insert new pages as indicated below.
- 2. The Preventive Maintenance Checks and Services have been completely replaced; no change bars or pointing hands will appear on pages 3-3 through 3-10.30.

Remove Pages

Insert Pages

3-3 through 3-10

3-3 through 3-10.30

3. File this change sheet in the front of the publication for information purposes.

By Order of the Secretary of the Army:

GORDON R. SULLIVAN General, United States Army Chief of Staff

Official:

MILTON H. HAMILTON Administrative Assistant to the Secretary of the Army

With H. Samultan

Distribution:

To be distributed in accordance with DA Form 12-38-E, Block 0298, requirements for TM 9-2320-273-20.

Approved for public release; distribution is unlimited.

CHANGE

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington D.C., 26 June 1992

No. 3

ORGANIZATIONAL MAINTENANCE

TRUCK TRACTOR, LINE HAUL, 50,000 GVWR, 6 X 4, M915 (NSN 2320-01-028-4395)

TRUCK TRACTOR, LIGHT EQUIPMENT TRANSPORTER (LET), 56,000 GVWR, 6 X 6, W/WINCH M916 (NSN 2320-01-028-4396)

TRUCK TRACTOR, MEDIUM EQUIPMENT TRANSPORTER (MET), 75,000 GVWR, 8 X 6, W/WINCH M920 (NSN 2320-01-028-4397)

TRUCK CHASSIS, 75,000 GVWR, 8 X 6 FOR 30 TON DUMP TRUCK, M917 (NSN 3805-01-028-4389)

TRUCK CHASSIS, 56,000 GVWR, 6 X 6 FOR BITUMINOUS DISTRIBUTOR TRUCK, M918 (NSN 3895-01-028-4390)

TRUCK CHASSIS, 75,000 GVWR, 6 X 6 FOR CONCRETE MOBILE MIXER TRUCK, M919 (NSN 3895-01-028-4391)

TM 9-2320-273-20,28 November 1980 is changed as follows:

- 1. Remove old pages and insert new pages as indicated below.
- 2. New or changed material is indicated by a vertical bar in the margin of the page.
- 3. Added or revised illustrations are indicated by a vertical bar adjacent to the illustration.

Remove Pages Insert Pages

3-3 and 3-4 10-85 and 10-86 3-3 and 3-4 10-84.1 thru 10-86

Index 11 and Index 12 Index 11 thru Index 12.1/(index 12.2

blank)

4. File this change sheet in front of the publication for reference purposes.

By Order of the Secretary of the Army:

GORDON R. SULLIVAN General, United States Army Chief of Staff

Official:

MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army

Mitter St. Samuelles

0198

Distribution:

To be distributed in accordance with DA Form 12-38-E (Block 0298) Unit Maintenance requirements for TM9-2320-273-20.

Approved for public release; distribution is uniimited.

NO. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 18 June 1987

ORGANIZATIONAL MAINTENANCE MANUAL

TRUCK TRACTOR, LINE HAUL, 50,000 GVWR, 6 X 4, M915 (NSN 2320-01-028-4395)

TRUCK TRACTOR, LIGHT EQUIPMENT TRANSPORTER (LET), 56,000 GVWR, 6 X 6, W/WINCH M916 (NSN 2320-01-028-4396)

TRUCK TRACTOR, MEDIUM EQUIPMENT TRANSPORTER (MET), 75,000 GVWR, 8 X 6, W/WINCH M920 (NSN 2320-01-028-4397)

TRUCK CHASSIS, 75,000 GVWR, 8 X 6, FOR 20-TON DUMP TRUCK, M917 (NSN 3805-01-028-4389)

TRUCK CHASSIS, 56,000 GVWR, 6 X 6, FOR BITUMINOUS DISTRIBUTOR TRUCK, M918 (NSN 3895-01-028-4390)

TRUCK CHASSIS, 75,000 GVWR, 8 X 6, FOR CONCRETE MOBILE MIXER TRUCK, M919 (NSN 3895-01-028-4391)

TM 9-2320-273-20, 28 November 1980 is changed as follows:

- 1. Remove old pages and insert new pages as indicated below.
- 2. New or changed material is indicated by a vertical bar in the margin of the page.
- 3. Added or revised illustrations are indicated by a vertical bar adjacent to the illustration identification number

Remove Pages	Insert Pages	Remove Pages	Insert Pages
c and d	c and d	9-28 thru 9-34	9-28 thru 9-34.8
1-15 and 1-16	1-15 and 1-16	9-53 and 9-54	9-53 thru 9-54.4
2-5/2-6 (blank)	2-5/2-6 (blank)	9-175 thru 9-178	9-175 thru 9-178
2-23 and 2-24	2-23 and 2-24	10-39 thru 10 66	10-39 thru 10 66
2-65 thru 2-68	2-65 thru 2-68	11-27 thru 11-32	11-27 thru 11-32
2-75 thru 2-82	2-75 thru 2-82	12-49/12-50 (blank)	12-49 thru 12-52
3-1 thru 3-10	3-1 thru 3-10	A-1 and A-2	A-1 and A-2
4-7 and 4-8	4-7 and 4-8	B-13 and B-14	B-13 and B-14
4-25 and 4-26	4-25 thru 4-26.2	B-17 and B-18	B-17 and B-18
5-31 thru 5-34	5-31 thru 5-34	B-21 and B-22	B-21 and B-22
5-91 and 5-92	5-91 thru 5-92.4	C-3 and C-4	C-3 and C4
6-11 and 6-12	6-11 thru 6-12.2	Index-1 thru Index-6	Index-1 thru Index-6
9-5 and 9-6	9-5 and 9-6	Index-9 and Index-10	Index-9 and Index-10
9-11 thru 9-18	9-11 thru 9-18	Index-13 thru Index-15/16 (blank) FO-2 thru FO-15	Index-13 thru Index-15/16 (blank) FO-2 thru FO-15

^{4.} File this change sheet in front of the publication for reference purposes.

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR. General, United States Army Chief of Staff

Official:

R.L. DILWORTH

Brigadier General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-38, Organizational Maintenance requirements for M915, M916, M920 Trucks and Truck chassis for M917, M918, and M919.

CHANGE NO. 1 HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC. 18 February 1983

ORGANIZATIONAL MAINTENANCE MANUAL

TRUCK TRACTOR, LINE HAUL, 50,000 GVWR, 6 X 4, M915 (NSN 2320-01-028-4395)

TRUCK TRACTOR, LIGHT EQUIPMENT TRANSPORTER (LET), 56,000 GVWR, 6 X 6, W/WINCH M916 (NSN 2320-01-028-4396)

TRUCK TRACTOR, MEDIUM EQUIPMENT TRANSPORTER (MET), 75,000 GVWR, 8 X 6, W/WINCH M920 (NSN 2320-01-028-4397)

TRUCK CHASSIS, 75,000 GVWR, 8 X 6, FOR 20-TON DUMP TRUCK, M917 (NSN 3805-01-028-4389)

TRUCK CHASSIS, 56,000 GVWR, 6 X 6, FOR BITUMINOUS DISTRIBUTOR TRUCK, M918 (NSN 3895-01-028-4390)

TRUCK CHASSIS, 75,000 GVWR, 8 X 6, FOR CONCRETE MOBILE MIXER TRUCK, M919 (NSN 3895-01-028-4391)

TM 9-2320-273-20, 28 November 1980 is changed as follows:

Remove old pages and insert new Pages as indicated below. Now or changed material
is indicated by a vertical bar in the margin of the page. Added or revised illustrations
are indicated by a vertical bar adjacent to the identification number.

Remove Pages	Insert Pages	Remove Pages	Insert Pages
i 3-3 through 3-10 4-141 through 4-146 5-157 through 5-160 6-13 through 6-16	i 3-3 through 3-10 4-141 through 4-146 5-157 through 5-160 6-13 through 6-14.2, 6-15 and 6-16	9-135 and 9-136 9-165 and 9-166 10-3 and 10-4 10-9 and 10-10 11-89 through 11-94 B-11 and B-12	9-135 and 9-136 9-165 and 9-166 10-3 and 10-4 10-9 and 10-10 11-89 through 11-94 B-11 and B-12, B-12.1

2. File this change sheet in front of the publication for reference purposes.

By Order of the Secretary of the Army:

E.C. MEYERGeneral, United States Army
Chief of Staff

Official:

ROBERT M. JOYCE Major General, United States Army The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-38, organizational maintenance requirements for M915, M916, M920 trucks and truck chassis for M917, M918, and M919.

LIST OF EFFECTIVE PAGES

Dates of issue for original and change pages are:

Original 28 November 1980 Change 3 . . . 26 June 1992

Change 2 18 June 1987 Change 5 30 December 2005

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 1504 CONSISTING OF THE FOLLOWING:

Page No.	*Change No.
Cover (Back Blank)	0
A/B	5
a/b blank	0
c and d	2
i and ii	1
iii through 2-4	0
2-5/2-6 blank	2
2-7 though 2-22	0
2-23 and 2-24	1
2-25 through 2-64	0
2-67 and 2-68	2
2-69 through 2-74	0
2-75 through 2-82	2
2-83 through 2-93/2-94 (Blank)	0
3-1 and 3-2	2
3-3 through 3-10.30	4
3-11 through 4-6	0
4-7 and 4-8	2
4-9 through 4-24	0
4-25 through 4-26.2	2
4-27 through 4-140	0
4-141 through 4-146	1
4-147 through 5-30	0
5-31 through 5-34	2
5-35 through 5-90	0
5-91 through 5-92.2	2
5-92.3 (blank)/5-92.4 through 5-156	0
5-157 through 5-160	1
5-161 through 6-10	0
6-11 through 6-12.1/6-12.2 blank	2
6-13 through 6-16	1
6-17 through 9-4	0

Page No.	*Change No.
9-5 and 9-6	2
9-7 through 9-10	0
9-11 through 9-16	
9-17 and 9-18	2 2 2
9-19 through 9-34.8	2
9-35 through 9-58	0
9-53.1 through 9-54.2	2
9-54.3 (blank)/9-54.4 through 9-164	$\overset{2}{0}$
9-165 and 9-166	1
9-167 through 9-174	0
9-175 through 9-178	2
9-179 through 9-192	$\overset{2}{0}$
9-177 tillough 9-172	2
9-177 9-178 through 10-4	0
10-3 and 10-4	1
10-5 through 10-8	0
10-9 and 10-10	1
10-11 through 10-38	0
10-39 through 10-66	2
10-67 through 10-84	0
10-84.1/(10-84.2 blank) through	O
10-84.14	3
10-85 and 10-86	0
10-87 through 11-26	0
11-27 through 11-32	2
11-33 through 11-88	0
11-89 through 11-94	1
11-95 through 12-48	0
12-49 through 12-52	2
A1 and A-2	2
A-3/A-4 (Blank)	0
B-1 through B-4	5
B-5 through B-20	5
B-21 through E-6	0
Index 1 through Index 6	2
Index 7 and Index 8	0
Index 9 and Index 10	
Index 11 and Index 12	3
Index 13 and Index 14	2 3 2
Index 15/16 (blank)	0
Authentication Page	0
Sample 2028	0
DA Form 2028	0
Metric Chart/Back Cover	5
	,

^{*} Zero in this column indicates an original page or work package.

Technical Manual

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 28 November 1980

No. 9-2320-273-20

ORGANIZATIONAL MAINTENANCE MANUAL

TRUCK TRACTOR, LINE HAUL, 50,000 GVWR, 6 X 4, M915 (NSN 2320-01-028-4395)

TRUCK TRACTOR, LIGHT EQUIPMENT TRANSPORTER (LET), 56,000 GVWR, 6 X 6, W/WINCH M916 (NSN 2320-01-028-4396)

TRUCK TRACTOR, MEDIUM EQUIPMENT TRANSPORTER (MET), 75,000 GVWR, 8 X 6, W/WINCH M920 (NSN 2320-01-028-4397)

TRUCK CHASSIS, 75,000 GVWR, 8 X 6, FOR 20-TON DUMP TRUCK, M917 (NSN 3805-01-028-4389)

TRUCK CHASSIS, 56,000 GVWR, 6 X 6, FOR BITUMINOUS DISTRIBUTOR TRUCK, M918 (NSN 3895-01-028-4390)

TRUCK CHASSIS, 75,000 GVWR, 8 X 6, FOR CONCRETE MOBILE MIXER TRUCK, M919 (NSN 3895-01-028-4391)

REPORTING OF ERRORS

You can help improve this publication. If you find any mistakes, or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publication and blank forms), or DA Form 2028-2 located in back of this Publication direct to: US Army Tank-Automotive Command, ATTN: DRSTA-MBP, Warren MI 48090. A reply will be furnished to you.

	HOW TO USE THIS MANUAL	age v
CHAPTER 1	INTRODUCTION	
Section I	Chapter Overview	1

^{*}This manual supersedes DRAFT TM 9-2320-273-20, 30 August 1979.

TABLE OF CONTENTS (Continued)

		TABLE OF CONTENTS (Continuou)	Page
CHAPTER	2	PRINCIPLES OF OPERATION	2-1
		Chapter Overview	2-1
Section		Truck/Tractor Chassis	2-2
	II	Engine	2-4
	III	Engine Controls	2-7 2-10
	IV	Transmission and Controls	2-10 2-12
	V	Power Transfer Case and Rear Axle Differential Lockup	2-12 2-14
	VI	Pusher Axle and Controls	2-14 2-15
	VII	Front Axle and Suspension	2-13 2-17
	VIII	Rear Axle	2-17 2-19
	IX	Fuel and Air Intake System	2-19
	X	Engine Oil System	2-23
	XI	Exhaust System	2-30
	XII	Cooling System	2-33
	XIII	Relays, Circuit Breakers, and Wire Identification	2-33
	XIV XV	Starting and Starting Control System	2-40
	XVI	Ether Quick-Start	2-42
	XVII		2-44
		Service Lighting System	2-58
	XVIII XIX	Instrumentation	2-60
	XX	Electric Horn.	2-61
		Cab Heating and Ventilating Systems	2-62
	XXI	Compressed Air System	2-66
	XXIII	Brake System	2-68
	XXIV	Auxiliary Air-Powered Systems	2-82
	XXV	Steering System	2-86
	XXVI	Power Takeoff	2-89
	XXVII	Winch	
	XXVIII	Winterization Kit	2-90 2-92
CHAPTER	3	INTERGRATED SYSTEMS MAINTENANCE	3-1
		Chanter Overrieus	3-1
Coation	ı	Chapter Overview	3-1
Section	 	Repair Parts, Special Tools, TMDE, and Support Equipment Service Upon Receipt	3-1
	III	Preventive Maintenance Checks and Services	3-3
	IV	Troubleshooting Symptom Index	3-11
	V	Torque instructions	3-17
CHAPTER	4	ENGINE AND ENGINE SYSTEMS MAINTENANCE	4-1
		Chapter Overview	4-1
Section	ı	Repair Parts, Special Tools, TMDE, and Support Equipment	4-1
Codion		Troubleshooting	4-1
	 III	Maintenance Procedures	4-7
	•••	Maintenance i recodules	

TABLE OF CONTENTS (Continued)

		Page
CHAPTER 5	ELECTRICAL AND INSTRUMENTATION SYSTEMS MAINTENANCE	5-1
Section I II III	Chapter Overview	5-1 5-1 5-2 5-65
CHAPTER 6	TRANSMISSION MAINTENANCE	6-1
Section I II III	Chapter Overview	6-1 6-1 6-2 6-7
CHAPTER 7	POWER TRANSFER CASE MAINTENANCE	7-1
Section I II III	Chapter Overview	7-1 7-1 7-1 7-5
CHAPTER 8	PROPEL LERSHAFTS AND AXLE MAINTENANCE	8-1
Section I II III	Chapter Overview	8-1 8-1 8-2 8-5
CHAPTER 9	COMPRESSED AIR AND BRAKE SYSTEMS	9-1
Section I II III	Chapter Overview	9-1 9-1 9-2 9-17
CHAPTER 10	WHEELS, STEERING, AND SUSPENSION SYSTEMS MAINTENANCE	10-1
Section I II III	Chapter Overview	10-1 10-1 10-2 10-12

TABLE OF CONTENTS (Continued)

		Page
CHAPTER 11	FRAME, BODY AND CAB MAINTENANCE	11-1
Section I II III	Chapter Overview	11-1 11-1 11-2 11-5
CHAPTER 12	WINCH AND POWER TAKEOFF LINKAGE MAINTENANCE	12-1
Section I II III	Chapter Overview	12-1 12-1 12-1 12-2
APPENDIX A	REFERENCES	. A-1
APPENDIX B	MAINTENANCE ALLOCATION CHART	. B-1
Section I II	Introduction	B-1 B-4 B-20
APPENDIX C	EXPENDABLE SUPPLIES AND MATERIALS LIST	. C-1
Section I	Introduction	C-1 C-2
APPENDIX D	SCHEMATIC DIAGRAMS	. D-1
Section I	Introduction	. D-1
APPENDIX E	ILLUSTRATED LIST OF MANUFACTURED ITEMS	E-1
Secton I	Introduction	
	ALPHABETICAL INDEX	. Index-

HOW TO USE THIS MANUAL

This manual contains the following information to help you understand how the truck/tractor works, how to service it, and how to make authorized repairs.

WHAT THIS MANUAL CONTAINS

This manual is divided into chapters which provide the following information:

CHAPTER 1 - INTRODUCTION

This chapter contains general information on different truck/tractor models covered in this manual. Included are illustrations showing the inside and outside of the vehicle.

CHAPTER 2 - PRINCIPALS OF OPERATION

This chapter contains information on how the vehicle works. It is divided into sections by function: fuel system, oil system, etc. (see Table of Contents for complete listing).

CHAPTER 3 - TRUCK/TRACTOR MAINTENANCE

This is the integrated maintenance chapter. It includes information that applies to all the maintenance chapters that follow (chapter 4 thru 11), including the following important information:

- a. When to inspect, test, and service the vehicle. (Preventive Maintenance Checks and Services.)
- b. How to find the best troubleshooting procedures for a specific problem. (Troubleshooting Symptom Index.)

CHAPTERS 4 THRU 12 - INDIVIDUAL MAINTENANCE CHAPTERS (See Table of Contents).

These chapters give you the following information:

- a. How to find out what's causing a problem. (Troubleshooting Procedures.)
- b. A list of authorized maintenance procedures. (Maintenance Task Summaries.)
- c. Detailed procedures for replacing and servicing component parts (Task Procedures). Procedures include a list of special tools that you'll need (if any), materials required and references to other manuals, if needed.

This listing includes the nomenclature cross reference list and the list of abbreviations used in this manual.

A. NOMENCLATURE CROSS REFERENCE LIST

Common Name

Air Cooler, Intercooler

Drive Shaft

Power Steering Cylinder

Dual Control Valve, Treadle Valve

Crankcase Breather

Antifreeze, Ethylene Glycol Mixture

Power Transfer/Differential Lockup Control

Cold Start System

Tail Pipe Float Switch

Power Steering Pump, Power Steering Reservoir

Ratio Valve

Differential Lockout Engaged Switch

Splash Shields
Intermediate Pipe
Brake Control Valve

PTO Propeller Shaft U-Joint

Jacobs Brake Cover, Valve Cover,

Cylinder Head Cover

Stowage Box Cross Tube

Hand Control Valve for Trailer

Exhaust Pipe

Official Nomenclature

Aftercooler Propeller Shaft

Auxiliary Assist Cylinder

Dual Brake Valve Breather Tube

Coolant

Differential Lockup Control Ether Quick-Start System

Exhaust Stack

Fuel Level Sending Unit

Hydraulic Pump and Reservoir Assembly

Limiting Valve
Lockout Switch

Mud Flaps

Muffler Inlet Pipe Park Brake Valve

PTO-to-Pump Coupling

Rocker Arm Housing Cover Seat Risers and Tool Box

Tie Rod

Trailer Brake Valve Turbo Outlet Pipe

B. LIST OF ABBREVIATIONS

amp ampere

approx approximate

attn attention cm centimeter

cu ft cubic foot/cubic feet

cu m cubic meter cu yd cubic yard

DA Department of the Army

dia diameter desc description figure

GVWR gross vehicle weight rating

gnd ground in. inch

kph kilometers per hour

m meter MI Michigan

mph miles per hour

MTOE Modified Table of Organization & Equipment

No. number

NSN National Stock Number

para paragraph

PMCS Preventive Maintenance Checks & Services

P/N part number

psi pounds per square inch

PTO Power Takeoff

qt quart reference

TM technical manual

TMDE Test, Measurement & Diagnostic Equipment

vert vertical

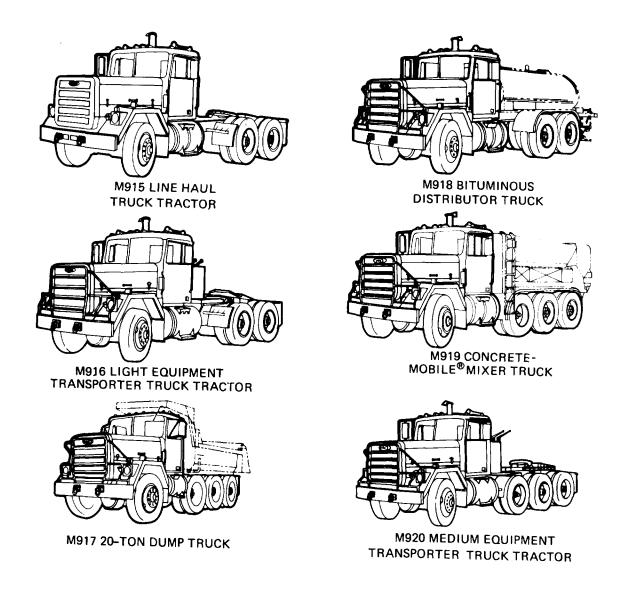
Reporting Equipment Improvement Recommendations (EIR's).

EIR's can and must be submitted by anyone who is aware of an unsatisfactory condition with the equipment design or use. It is not necessary to show a new design or list a better way to perform a procedure, just simply tell why the design is unfavorable or why a procedure is difficult. See TM 38-750. Mail EIR's directly to Commander, U.S. Army Tank Automotive Materiel Readiness Command, ATTN: DRSTA-MTC, Warren, Michigan, 48090. A reply will be furnished to you.

Equipment Improvement Report and Maintenance Digest (EIR MD) and Equipment Improvement Report and Maintenance Summary (EIR MS).

The quarterly Equipment Improvement Report and Maintenance Digest, TB 43-0001-39 series, contains valuable field information on the equipment covered in this manual. The information in the TB 43-0001-39 series is compiled from some of the Equipment Improvement Reports that you prepared on the vehicles covered in this manual. Many of these articles result from comments, suggestions. and improvement recommendations that you submitted to the EIR program. The TB 43-0001-39 series contains information on equipment improvements, minor alterations, proposed Modification Work Orders (MWO'S), warranties (if applicable), actions taken on some of your DA Form 2028's (Recommended Changes to Publications), and advance information on proposed changes that may affect this manual. In addition, the more maintenance significant articles, including minor alterations, field-fixes, etc., that have a more permanent and continuing need in the field are republished in the Equipment Improvement Report and Maintenance Summary (EIR MS) for TARCOM Equipment (TM 43-0143). Refer to both of these publications (TB 43-0001-39 series and TM 43-0143) periodically, especially the TB 43-0001-39 series, for the most current and authoritative information on your equipment. The information will help you in doing your job better and will help in keeping you advised of the latest changes to this manual. Also refer to DA Pam 310-4, Index of Technical Publications, and Appendix A, References, of this manual.

This page intentionally left blank.



TA 074553

Figure 1-1. M915 Series Vehicles

CHAPTER 1

INTRODUCTION

1-1. OVERVIEW.

This chapter provides you with the following information:

- a. Forms and record data required for maintenance.
- b. Physical description of each truck model and major equipment components.

Section I GENERAL INFORMATION

1-2. SCOPE.

Type of Manual: Organizational Maintenance.

Model Numbers and Equipment Names (fig. 1-1):

- a. M915 Line Haul Truck Tractor
- b. M916 Light Equipment Transporter Truck Tractor
- c. M917 20-Ton Dump Truck
- d. M918 Bituminous Distributor Truck
- e. M919 Concrete Mobile Mixer Truck
- f. M920 Medium Equipment Transporter Truck Tractor

Chassis Designations:

- a. Type I Model M915
- b. Type II Models M916 and M918
- c. Type III Models M917, M919, and M920

1-3. MAINTENANCE FORMS, RECORDS, AND REPORTS.

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-250, The Army Maintenance Management System.

1-4. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE.

Requirements and procedures for destruction of Army materiel to prevent enemy use are given in TM 750-244-6.

1-5. ADMINISTRATIVE STORAGE.

Storage information is given in TM 740-90-1, Administrative Storage.

Section II EQUIPMENT DESCRIPTION AND DATA

1-6. PURPOSE OF EQUIPMENT.

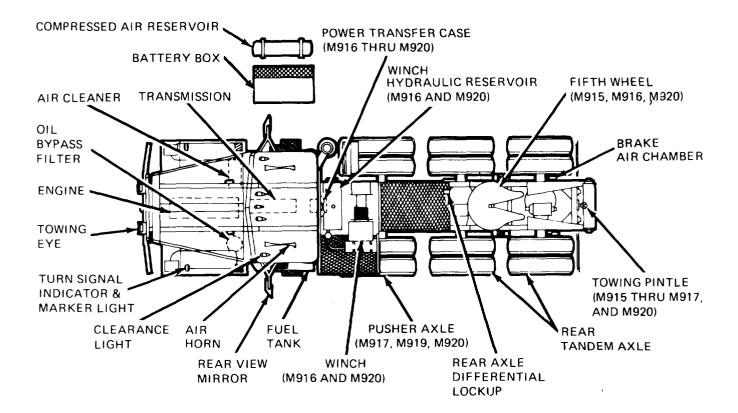
- Model M915. Used for on-road line hauling of loads up to a gross vehicle weight rating of 50,000 lbs (22,680 Kg), 30,000 lbs (13,608 Kg) on fifth wheel.
- Model M916. Used for transporting light equipment, both on and off the road, up to a gross vehicle weight rating of 56,000 lbs (25,402 Kg), 28,000 lbs (12,700 Kg) on fifth wheel.
- Model M917. A heavy-duty, 20-ton dump truck used to haul aggregate and similar materials. Capable of operating both on and off the road, up to a gross vehicle weight rating of 75,000 lbs. Hauls 15.2 cu yds (11.62 cu m) heaped, and 19.6 cu yds (14.98 cu m) with 12 inch sideboards.
- Model M918. Used with a mounted bituminous distributor to spread 375 gallons (1,419.52 liters) of bitumen per minute at a road speed of 1.5 miles per hour (2.41 K/H).
- Model M919. Used with a mounted concrete mixer to mix and spread concrete at a maximum rate of 40 cu ft per minute. Can transport sufficient cement, sand, coarse aggregate and water to mix 8 cu yds (6.12 cu m) on-site.
- Model M920. Used to transport medium equipment both on and off the road, up to a gross vehicle rating of 75,000 lbs (34,020 Kg), 40,000 lbs (18,144 Kg) on fifth wheel.

1-7. CAPABILITIES AND FEATURES.

- a. Interchangeable frame components (Exception: Frames for Types II and III chassis have an added 3/8-inch outer channel.)
- Commercial-type replacement parts for entire vehicle, available through national network of dealers and vendors.
- c. Commercial operating components that require no special maintenance procedures and a minimum of special tools:
 - (1) Six-cylinder, in-line, four-stroke, four-cycle turbocharged diesel engine.
 - (2) Semi-automatic, centrifugal clutch transmission with 16 forward and 2 reverse speeds.
 - (3) Transfer case for front wheel drive (M916 thru M920).
 - (4) Pusher axle for weight distribution (M917, M919, and M920).
 - (5) Rear tandem axle.
 - (6) Power Takeoff (PTO) for power to drive accessories (M916 thru M920).
 - (7) Winch (M916 and M920).

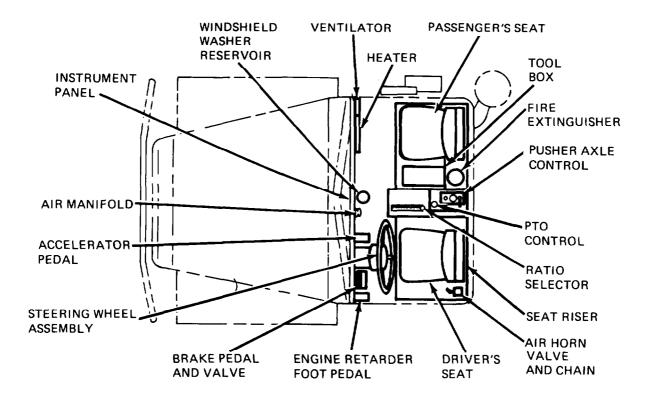
1-8. LOCATION OF MAJOR EXTERIOR COMPONENTS.

The illustration below identifies the major exterior components located on one or more models of M915 thru M920 vehicles. See table 1-1, Differences Between Models for model configuration differences and a reference to detailed information. Also see the Operator's Manual TM 9-2320-273-10.



1-9. LOCATION OF MAJOR INTERIOR COMPONENTS.

The illustration below identifies the major interior components located on the M915 thru M920 vehicles. No identification plates, instruction plates, warranty plates, modification plates or stencils are applicable to organizational maintenance.



1-10. DIFFERENCES BETWEEN MODELS.

The major equipment and functional differences between models are given in table 1-1. For illustrations and descriptions, refer to the following:

- a. Illustration of each model (fig. 1-1).
- b. Purpose of each model (para 1-6).
- c. Differences between models (table 1-1).

Table 1-1. Differences Between Models.

Table 1-1. Differences Between Models. VEHICLE MODEL							
EQUIPMENT/FUNCTION	M915	M916	M917	M918	M919	M920	DESC/REF (PARA)
Type I Chassis.	Х						1-2
Type I I Chassis.		Х		l x			1-2
Type III Chassis.			X		X	Х	1-2
Transfer Case.		Х	X	l x	X	X	2-14
Pusher Axle.			X		X	X	2-16
Driving Front Axle.		Х	X	l x	X	X	2-19
Spare Tire and Wheel							
Assembly.	Х	Х					10-11,10-12
Hoist for Spare.	X	X				X	-
Towing Pintle.	X	X	l x			X	_
Fifth Wheel.	X	X	^			X	11-13
Spacer Kit for Fifth	,						11-13
Wheel.		Х				Х	
Winch.		X				X	2-80
Work Lamps – Stationary.		X				X	2-48
Work Lamps - Portable.	Х	X				X	5-54
Power Takeoff (PTO).		X	X	l x	l x	X	2-78
Hose Tender and Cable		_ ^	^	^	^		2-70
Support.	Х	Х				X	_
Backup Alarm.	^	X	X	l x	X	X	_
Double Rail Frame.		X	X	l ^	X	X	_
Front Shock Absorbers.	Х	^	^	^	^	_ ^	
No-Spin Differential (1)	X						
(2)	^	Х	l x	l x	l x	X	
Tires:		_ ^	^	^	^	^	
Highway.	Х						
On/Off Road.	^	Х	l _x	l x	l x	X	
Special Bodies:		_ ^	^	^	^	^	
Dump Body.			X				
Bituminous Distributor.			^	l x			
Concrete-Mobile [®] Mixer.				^	X		
Auxiliary Power Steering					^		
Cylinder.		Х	X	l x	l x	X	
Sliding Rear Window.		X	l ^	^	^	X	
Front and Rear Air		^				^	
Connections.	x	X				X	
Tail Roller.	^	^					
	x	X	X			X	
24V Receptacle.	^	^	^			Х	

MODEL M915 TRUCK T	RACIOR	
VERALL CHARACTERISTICS:	ENGLISH	METRIC
ational Stock Number:	2320-01-028-4395	
urb Weight:	19,630 lbs	8781 Kg
xle Loads (Empty):	0.000 !!	4.500.1/~
Front Axle:	9,920 lbs	4,500 Kg
Rear Axle:	9,710 lbs	4,405 Kg
xle Loads (with 30,000 lbs (13,608 Kg) 5th Wheel Load):	44.055 lba	E 04E 1/a
Front Axle:	11,055 lbs	5,015 Kg
Rear Tandem:	37,660 lbs	17,083 Kg
Gross Vehicle Weight:	48,715 lbs	22,097 Kg
Gross Axle Weight Rating:	12 000 lbs	5 112 Ka
Front Axle:	12,000 lbs	5,443 Kg 17,236 Kg
Rear Tandem:	38,000 lbs 55,000 lbs	24,941 Kg
Gross Vehicle Weight Rating:	55,000 IDS 86,170 Ibs	24,941 Kg 39,121 Kg
owed Load (M872 Trailer – 30,000 lb (13,608 Kg) on the King Pin):	86,170 lbs 105,000 lbs	47,627 Kg
ross Combination Weight Rating:	100,000 105	41,021 NY
IMENSIONAL DATA:		
Overall Length (Less Pintle Hook and Litting Shackle):	268.50 in.	6.82 m
Overall Width (Body):	96.75 in.	2.46 m
leight (Over Horns – Empty):	114.63 in.	2.91 m
verall Height (Over Stack-Empty):	134.63 in.	3.42 m
ab to Axle:	86 in.	2.18 m
umper to Back of Cab:	119 in.	3.02 m
umper to Front Axle:	37.5 in.	.95 m
/heel Base:	168.25 in.	4.30 m
Chipping Cube, Minimum:	1,674 cu ft	47.40 cu m
andem Axle Spacing:	52 in.	1.32 m
read Width:	70.40	4.00
Front:	78.40 in.	1.99 m
Rear:	71.57 in.	1.82 m .35 m
Oual Tire Spacing:	13.75 in.	.33 III .20 m
ifth Wheel to Rear Tandem:	8 in. 54.92 ft	.20 III 16.74 m
Overall Length with M-872 Trailer:	34.92 it	38°
ingle of Approach (Loaded):	53.50 ft	16.31 m
Ainimum Turning diameter, Curb to Curb:	10.25 in.	.26 m
Minimum Ground Clearance (Under Rear Walking Beam Bracket, Empty): fording Depth, Maximum:	20 in.	.51 m
PERFORMANCE:		40- 404
Maximum Speed Forward (At 2,100 rpm - 16th Gear):	66.60 mph	107.16 kph
peed on 3.9% Grade:	25 mph	40.22 kph
Maximum Grade (At GCWR):	17%	17%
/inimum Sustained Speed (At 1,300 rpm):	2.31 mph	3.72 kph
Maximum Drawbar Pull @ 0.7 Coefficient:	25,028 lbs	11,262 Kg
Maximum Side Slope (W/Adequate Tractive Surface):	10%	10%

1-11. EQUIPMENT DATA (Continued).					
MODEL M916 TRUCK TRACTOR					
OVERALL CHARACTERISTICS:	ENGLISH	METRIC			
National Stock Number:	2320-01028-4396				
Curb Weight:	27,500 lbs	12,474 Kg			
Axle Loads (Empty):	40.070 lb -	0.005 1/-			
Front Axle : Rear Axle:	13,370 lbs 14,130 lbs	6,065 Kg 6,409 Kg			
Axle Loads (with 25,588 lbs (11,606 Kg) 5th Wheel Load):	14,130 lb5	0,409 Kg			
Front Axle:	14,570 lbs	6,609 Kg			
Rear Tandem:	40,930 lbs	18,566 Kg			
Gross Vehicle Weight:	55,500 lbs	25,174 Kg			
Gross Axle Weight Rating:					
Front Axle:	14,860 lbs	6,740 Kg			
Rear Tandem:	52,160 lbs	23,659 Kg			
Gross Vehicle Weight Rating: Towed Load (M172A1 Trailer – 25,588 lbs (11,606 Kg) on the King Pin):	56,000 lbs 78,500 lbs	25,402 Kg 35,639 Kg			
Gross Combination Weight Rating:	106,000 lbs	48,082 Kg			
DIMENSIONAL DATA:					
Overall Length (Less Pintle Hook and Lifting Shackle):	294.30 in.	7.48 m			
Overall Width (Body):	96.75 in.	2.46 m			
Height (Over Horns – Empty):	128.00 in.	3.25 m			
Overall Height (Over Stack – Empty):	142.00 in.	3.61 m			
Cab to Axle: Bumper to Back of Cab:	105 in. 124 in.	2.67 m 3.15 m			
Bumper to Front Axle:	43 in.	1.09 m			
Wheel Base:	186 in.	4.72 m			
Shipping Cube, Minimum:	2,212 cu ft	62.64 cu m			
Tandem Axle Spacing:	56 in.	1.42 m			
Tread Width:					
Front:	77.90 in.	1.98 m			
Rear: Dual Tire Spacing:	72.70 in. 13.75 in.	1.85 m .349 m			
Fifth Wheel to Rear Tandem:	8 in.	.349 m			
Overall Length with M172A1 Trailer:	58.66 ft	17.88 m			
Angle of Approach (Loaded):	42°	42°			
Minimum Turning Diameter, Curb to Curb:	80 ft	24.40 m			
Minimum Ground Clearance (Under Rear Walking Beam Bracket, Empty):	11.62 in.	.29 m			
Fording Depth, Maximum:	20 in.	.51 m			
PERFORMANCE:					
Maximum Speed (Forward (At 2100 rpm - 16th Gear):	59 mph	94.93 kph			
Speed on 3.9% Grade:	25 mph	40.22 kph			
Maximum Grade (At GCWR):	25%	25%			
Minimum Sustained Speed (At 1300 rpm): Maximum Drawbar Pull @ 0.7 Coefficient:	2.23 mph	3.59 kph			
Maximum Side Slope (W/Adequate Tractive Surfaces):	47,725 lbs 10%	20,576 Kg 10%			
maximam side clope (minacquate mattire cumaces).	I U /0	I U /0			

MODEL M917 DUMP	TRUCK CHASSIS	
VERALL CHARACTERISTICS:	ENGLISH	METRIC
ational Stock Number:	3805-01-028-4389	
urb Weight:	34,080 lbs	15,459 Kg
xle Loads (Empty):	. ,	-, J
Front Axle:	18,670 lbs	8,469 Kg
Rear Axle:	15,360 lbs	6,967 Kg
kle Loads (with 40,000 lbs (18,144 kg) Payload):	,	
Front Axle:	10,980 lbs	4,890 Kg
Rear Tandam:	44,200 lbs	20,049 Kg
Pusher Axle:	20,000 lbs	9,072 Kg
Gross Vehicle Weight:	74,980 lbs	34,011 Kg
Gross Axle Weight Rating:		, ,
Front Axle:	14,860 lbs	6,740 Kg
Rear Tandem:	52,160 lbs	23,659 Kg
Pusher:	20,000 lbs	9,072 Kg
Gross Vehicle Weight Rating:	75,000 lbs	34,019 Kg
IMENSIONAL DATA:		
verall Length (Less Pintle Hook and Lifting Shackle):	350.60 in.	8.90 m
verall Width (Body):,	96.75 in.	2.46 m
		3.60 m
verall Height (Over Cab Protector):	141 in.	
ab to Axle:	130 in. 124 in.	3.30 m
umper to Back of Cab:		3.15 m
umper to Front Axle:	43 in.	1.09 m
heel Base:	211 in.	5.36 m
hipping Cube, Minimum:	2,804 cu ft	79.40 cu m
andem Axle Spacing:	56 in.	1.42 m
read Width:	77 00 i-	4.00
Front:	77.90 in.	1.98 m
Pusher:	72.70 in.	1.95 m
Rear:	72.70 in.	1.85 m
usher Axle to Rear Tandem Forward Axle:	54 in.	1.37 m
ual Tire Spacing (6.88 in. (.17 m) between each dual):	13.75 in.	.35 m 42°
ngle of Approach (Loaded):	42°	
inimum Turning Diameter, Curb to Curb:	89.50 ft	27.30 m
linimum Ground Clearance (Under Rear Walking Beam Bracket, Emp	• •	.30 m
ording Depth, Maximum:	20 in.	.51 m
ERFORMANCE:		
aximum Speed Forward (At 2100 rpm - 16th Gear):	59 mph	94.93 kph
peed on 3.9% Grade:	25 mph	40.22 kph
laximum Grade (At GCWR):	25%	25%
linimum Sustained Speed (At 1300 rpm):	2.23 mph	3.59 kph
aximum Side Slope (W/Adequate Tractive Surface):	10%	10%
, , , , , , , , , , , , , , , , , , , ,		

1-11. EQUIPMENT DATA (Continued).		
MODEL M918 BITUMINOUS DISTRIB	UTOR TRUCK CHASSIS	
OVERALL CHARACTERISTICS:	ENGLISH	METRIC
National Stock Number:	3895-01-028-4390	
Curb Weight:	30,280 lbs	13,735 Kg
Axle Loads (Empty):	44.0004.1	5 40444
Front Axle:	11,9801 bs	5,434 Kg
Rear Axle:	19,300 lbs	8,754 Kg
Axle Loads (with 13,483 lbs (6,116 Kg) Payload):	40 500 lb -	F 070 I/-
Front Axle:	12,520 lbs	5,679 Kg
Rear Tandem:	30,760 lbs	13,953 Kg
Gross Vehicle Weight:	43,280 lbs	19,632 Kg
Gross Axle Weight Rating: Front Axle:	14,860 lbs	6,740 Kg
Rear Tandam:	52,160 lbs	23,659 Kg
Gross Vehicle Weight Rating:	56,000 lbs	25,402 Kg
Gloss vehicle weight Nating.	30,000 103	20,402 Ng
DIMENSIONAL DATA:		
Overall Length:	350.60 in.	8.90 m
Overall Width (Body):	96.75 in.	2.46 m
Height (Over Horns – Empty):	128 in.	3.25 m
Overall Height (Over Stack – Empty):	142.0 in.	3.61 m
Cab to Axle:	105 in.	2.67 m
Bumper to Back of Cab:	124 in.	3.15 m
Bumper to Front Axle:	43 in.	1.09 m
Wheel Base:	186 in.	4.72 m
Shipping Cube, Minimum:	2,544 cu ft	72.04 cu m
Tandem Axle Spacing:	56 in.	1.42 m
Thread Width:	77.00 in	4 00 m
Front:	77.90 in. 72.70 in.	1.98 m 1.85 m
Rear: Dual Tire Spacing:	72.70 in. 13.75 in.	
Angle of Approach (Loaded):	42°	.35 m 42°
Minimum Turning Diameter, Curb to Curb:	80 ft	24.40 m
Minimum Ground Clearance (Under Rear Walking Beam Bracket, Empty):	11.62 in.	.29 m
Fording Depth, Maximum:	20 in.	.51 m
PERFORMANCE:		
Maximum Speed Forward (At 2100 rpm – 16th Gear):	59 mph	94.93 kph
Speed on 3.9% Grade:	25 mph	40.22 kph
Maximum Grade (At GCWR)	25%	25%
Minimum Sustained Speed (At 1300 rpm):	2.23 mph	3.59 kph
Maximum Side Slope (W/Adequate Tractive Surface):	10%	10%
	. 0,0	1070

1-11. EQUIPMENT DATA (Continued).		
MODEL M919 CONCRETE MOBILE M	IIXER TRUCK CHASSIS	
OVERALL CHARACTERISTICS:	ENGLISH	METRIC
National Stock Number:	3895-01-028-4391	
Curb Weight:	37,540 lbs	17,028 Kg
Axle Loads (Empty): Front Axle:	14 200 lba	C 477 1/a
Rear Axle:	14,280 lbs 23,260 lbs	6,477 Kg 10,551 Kg
Axle Loads (with 36,500 lbs (16,556 Kg) Payload):	20,200 103	10,331 Ng
Front Axle:	9,210 lbs	4,178 Kg
Rear Tandem:	43,880 lbs	19,904 Kg
Pusher Axle:	20,000 lbs	9,072 Kg
Gross Vehicle Weight:	73,090 lbs	33,154 Kg
Gross Axle Weight Rating:	44.000 lba	C 740 1/a
Front Axle: Rear Tandem:	14,860 lbs 52,160 lbs	6,740 Kg 23,659 Kg
Pusher:	20,000 lbs	9,072 Kg
Gross Vehicle Weight Rating:	75,000 lbs	34,019 Kg
DIMENSIONAL DATA:		
Overall Length:	374.40 in.	9.51 m
Overall width (Body):	96.75 in.	2.46 m
Height (Over Horns – Empty):	128 in.	3.25 m
Overall Height (Over Stack - Empty):	142.0 in.	3.61 m
Cab to Axle:	130 in.	3.30 m
Bumper to Back of Cab:	124 in.	3.15 m
Bumper to Front Axle:	43 in. 211 in.	1.09 m 5.36 m
Wheel Base: Shipping Cube, Minimum:	2,716 cu ft	76.91 cu m
Tandem Axle Spacing:	56 in.	1.42 m
Tread Width:		
Front:	77.90 in.	1.98 m
Pusher:	72.70 in.	1.85 m
Rear:	72.70 in.	1.85 m
Pusher Axle to Rear Tandem Forward Axle:	54 in.	1.37 m
Dual Tire Spacking (6.88 in. (.17 m) between each dual): Angle of Approach (Loaded):	13.75 in. 42°	.35 m 42°
Minimum Turning Diameter, Curb to Curb:	89.50 ft	27.30 m
Minimum Ground Clearance (Under Rear Walking Beam Bracket, Empty):	12 in.	.30 m
Fording Depth, Maximum:	20 in.	.51 m
PERFORMANCE:		
Maximum Speed Forward (At 2100 rpm - 16th Gear):	59 mph	94.93 kph
Speed of 3.9% Grade:	25 mph	40.22 kph
Maximum Grade (At GCWR):	25%	25%
Minimum Sustained Speed (At 1300 rpm):	2.23 mph 10%	3.59 kph 10%
Maximum Side Slope (W/Adequate Tractive Surface):	I U /0	10 /0

1-11. EQUIPMENT DATA (Continued).		
MODEL M920 TRUCK 1	TRACTOR	
OVERALL CHARACTERISTICS:	ENGLISH	METRIC
National Stock Number:	2320-01-028-4397	
Curb Weight:	30,270 lbs	13,730 Kg
Axle Loads (Empty): Front Axle:	14,700 lbs	6 660 Va
Rear Axle:	14,700 lbs 15,570 lbs	6,668 Kg 7,063 Kg
Axle Loads (with 40,000 lbs (18,144 Kg) 5th Wheel Load):	10,010 100	7,000 Ng
Front Axle:	8,870 lbs	4,023 Kg
Rear Tandem:	46,010 lbs	20,870 Kg
Pusher Axle:	30,000 lbs	9,072 Kg
Gross Vehicle Weight:	74,880 lbs	33,965 Kg
Gross Axle Weight Rating: Front Axle:	14,860 lbs	6,740 Kg
Rear Tandem:	52,160 lbs	23,659 Kg
Pusher:	20,000 lbs	9,072 Kg
Gross Vehicle Weight Rating:	75,000 lbs	34,019 Kg
Towed Load (M-870 Trailer – 40,000 lbs (18,144 Kg) on the King Pin):	99,730 lbs	45,277 Kg
Gross Combination Weight Rating:	130,000 lbs	58,968 Kg
DIMENSIONAL DATA:		
Overall Length:	319,30 in.	8.11 m
Overall Width (Body):	96.75 in.	2.46 m
Height (Over Horns – Empty):	128 in. 142 in.	3.25 m
Overall Height (Over Stack – Empty): Cab to Axle:	142 iii. 130 in.	3.61 m 3.30 m
Bumper to Back of Cab:	130 iii. 124 in.	3.15 m
Bumper to Front Axle:	43 in.	1.09 m
Wheel Base:	211 in.	5.36 m
Shipping Cube, Minimum:	2,317 cu ft	65.61 cu m
Tandem Axle Spacing:	56 in.	1.42 m
Tread Width: Front:	77.90 in.	1.98 m
Pusher:	77.90 iii. 72.70 in.	1.85 m
Rear:	72.70 in.	1.85 m
Pusher Axle to Rear Tandem Forward Axle:	54 in.	1.37 m
Dual Tire Spacing (6.88 in. (.17 m) Between each Dual):	13.75 in.	.35 m
Fifth Wheel to Rear Tandem:	8 in.	.20 m
Overall Length with M-870 Trailer:	60.75 ft 42°	18.52 m 42°
Angle of Approach (Loaded): Minimum Turning Diameter, Curb to Curb:	89.50 ft	27.30 m
Minimum Ground Clearance (Under Rear Walking Beam Bracket, Empty):	11.62 in.	.29 m
Fording Depth, Maximum:	20 in.	.51 m
PERFORMANCE:		
Maximum Speed Forward (At 2100 rpm - 16th Gear):	59 mph	94.93 kph
Maximum Speed on 3.9% Grade:	25 mph	40.22 kph
Maximum Grade (At GCWR):	25%	25%
Minimum Sustained Speed (At 1300 rpm):	2.23 mph	3.59 kph
Maximum Drawbar Pull @ 0.7 Coefficient:	47,403 lbs	21,501 Kg
Maximum Side Slope (W/Adequate Tractive Surface):	10%	10%
l .		

Make: Type: ENGINE (ALL Make/Model/Type: Displacement: Compression Ratio: Horsepower – Gross:	Cummins Diesel/NTC-400/6 -cylinder, 4 cycle. 855 cu in. (14 liters).
Make/Model/Type: Displacement: Compression Ratio: Horsepower – Gross:	Cummins Diesel/NTC-400/6 -cylinder, 4 cycle. 855 cu in. (14 liters).
Displacement: Compression Ratio: Horsepower – Gross:	855 cu in. (14 liters).
Torque - Gross: Lube Capacity: Coolant Capacity: Governed Speed: Retarder (Integral with Engine): Make/Model:	13.5:1. 400 @ 2100 rpm (298 Kw @ 2100 RPM). 1150 lb-ft @ 1500 RPM (1559 N•m @ 1500 RPM). 46 qts (43.5 liters). 17.25 gal (65.3 liters). 2100 rpm. Jacobs/130
TRANSMISSION (A	ALL MODELS)
Make/Model/Type:	Caterpillar/D7155/Semi-Automatic
Number of Gears:	16 Forward, 2 Reverse.
Ratios: 1st	14.77
2nd	12.21
3rd	10.07
4th	8.33
5th	6.89
6th	5.70
7th	4.70
8th	3.89
9th	3.14
10th	2.60
11th	2.14
12th	1.77 1.47
13th 14th	1.47
15th	1.00
16th	.83
Reverse	14.77
Reverse	8.33
Shift: Remote – Air Control – Power Shift	
Lube Capacity:	5.5 gal (20.8 liters).
Weight, Net Dry (Approx) Including Control:	1,090 lbs (494.86 Kg).

TRANSFER CASE (MODELS M916 THROUGH M920)

Make/Model:

Ratio:

Torque Capacity:

Torque Proportioning – Front/Rear:

Lock-Up - Front Axle:

Lube Capacity:

Oshkosh/1,800 series F-U29.

1:1.

15,155 lb-ft (20,550 NŽm).

1:1 When Engaged.

Air Operated.

5 qts (4.48 liters).

AXLES (MODEL M915)

Front:

Make/Model/Type:

Rated Capacity:

Steer Angle:

Rear Tandem:

Make/Model:

Ratio:

Rated Capacity (Tandem):

Inter-Axle Differential:

Lock-Up:

Axle Differential – Forward/Rear Make/Type:

Rear/Rear Make/Type:

Lubrication:

Lube Capacity - Forward/Rear:

Rockwell/F-F931/l-Beam.

12,000 lbs (5448 Kg).

32°.

Rockwell/SQHP.

4.44:1.

38,000 lbs (17,252 Kg).

Bevel Gear.

Air Control.

Detroit Automotive/No-Spin.

Rockwell/Bevel Gear.

Pressure.

40/36 pts (19/17 liters).

AXLES (MODELS M916 AND M918)

Front:

Make/Model/Type:

Ratio:

Rated Capacity:

Steer Angle:

Rear Tandem:

Make/Type:

Ratio:

Rated Capacity (Tandem):

Inter-Axle Differential:

Lock-Up:

Axle Differential Make/Type:

Lubrication:

Lube Capacity – Forward/Rear:

Rockwell/FDS/1807/Hypoid.

6.17:1.

20,000 lbs (9,080 Kg).

28°.

Rockwell/SUHD

6.17:1.

58,000 lbs (26,332 Kg).

Bevel Gear. Air Operated.

Detroit Automotive/No-Spin.

Pressure.

34/28 pts (16/13.2 liters).

AXLES (MODELS M917, M919, AND M920)		
AXLES (MODELS MS	117, M919, AND M920)	
Front: Make/Type/Model: Ratio: Rated Capacity: Steer Angle: Pusher: Type: Rated Capacity: Singles/Duals: Rear Tandem: Make/Model: Ratio: Rated Capacity (Tandem): Inter-Axle Differential: Lock-Up: Axle Differential Make/Type: Lubrication: Lube Capacity – Forward/Rear:	Rockwell/Hypoid FDS-1807. 6.17:1. 20,000 lbs (9,080 Kg). 28 degrees. Rockwell/Granning. 20,000 lbs (9,080 Kg). Duals. Rockwell/SUHD. 6.17:1. 58,000 lbs (26,332 Kg). Bevel Gear. Air Operated. Detroit Automotive/No-Spin. Pressure. 34/28 pts (16.08/13.25 liters).	
Lube Capacity – Forward/Rear:	34/28 pts (16.08/13.25 liters).	
SUSPENSION	(MODEL M915)	
Front: Make/Type: Rate: Static Deflection: Rear Tandem: Make/Model/Type: Static Deflection:	Rockwell/Asymmetrical Leaf Pin & Shackle. 1,861 lbs/in. (332.3 Kg/cm). 2.73 in. (6.93 cm). Hendrickson/RTE 380/Walking Beam-Steel Leaf97 in. (2.46 cm).	
SUSPENSION	(MODEL M916)	
Front: Make/Type: Rate: Static Deflection: Rear Tandem: Make/Model/Type: Static Deflection:	Rockwell/Asymmetrical Leaf Pin & Shackle. 3,245 lbs/in. (580 Kg/cm). 1.94 in. (4.93 cm). Hendrickson/RT 450/Walking Beam-Steel Leaf. 2.85 in. (7.24 cm).	

SUSPENSION	(MODEL M917)
Front: Make/Type: Rate: Static Deflection: Pusher: Make/Model/Type: Raising System: Rear Tandem: Make/Model/Type: Static Deflection:	Rockwell/Asymmetrical Leaf Pin & Shackle. 3,245 lbs/in. (580 Kg/cm). 2.11 in. (5.36 cm). Granning/T-500 AP/Trailing Arm Non-Linear (503 lbs/in.) (85.2 Kg/cm). External Positive Pneumatic. Hendrickson/RT 450/Walking Beam-Steel Leaf. 2.38 in. (6.04 cm).
SUSPENSION	(MODEL M918)
Front: Make/Type: Rata: Static Deflection: Rear Tandem: Make/Model/Type: Static Deflection:	Rockwell/Asymmetrical Leaf Pin & Shackle. 3,245 lbs/in. (580 Kg/cm). 2.26 in. (5.74 cm). Hendrickson/RT 450/Walking Beam-Steal Leaf. 4.6 in. (11.68 cm).
SUSPENSION (MODE	ELS M919 AND M920)
Front: Make/Type: Rate: Static Deflection: Pusher: Make/Model/Type: Raising System: Rear Tandem: Make/Model/Type: Static Deflection:	Rockwell/Asymmetrical Leaf Pin & Shackle. 3,245 lbs/in. (980 Kg/cm). 2.11 in. (5.36 cm). Granning/T-500 AP/Trailing Arm Non-Linear (503 lbs/in.) (85.2 Kg/cm). External Positive Pneumatic. Hendrickson/RT 450/Walking Beam-Steal Leaf. 2.00 in. (5.08 cm).
WHEELS (N	IODEL M915)
All Positions - Make/Model: Size - Dia x Rim Width: Number of Studs/Bolt Circle: Stud Size: Offset/Dual Spacing: Rated Capacity:	Budd/47890-3. 20.00 x 8 in. (508 x 203 mm). 10/11.25 in. (10/28.6 cm). 1.125 in. Grade 8 (2.86 cm). 6.88/13.75 in. (17.5/35 cm). 7,280 lbs (3,305 Kg).

WHEELS (MODELS M916 AND M918) All Positions - Make/Model: Budd/R49210. Size - Dia x Rim Width: 24.00 x 8 in. (610 x 203 mm). Number of Studs/Bolt Circle: 10/11.25 in. (10/28.6 cm). Stud Size: 1.125 in. Grade 8 (2.86 cm). Offset/Dual Spacing: 6.88/13.75 in. (17.5/35 cm). Rated Capacity: 7,430 lbs (3.373 Kg). WHEELS (MODELS M917, M919 AND M920) All Positions - Make/Model: Budd/R49210. Size - Dia x Rim Width: 24.00 x 8 in. (610 x 203 mm). Number of Studs/Bolt Circle: 10/11.25 in. (10/28.6 cm). Stud Size: 1.125 in. Grade 8 (2.86 cm). Offset/Dual Spacing: 6.88/13.75 in. (17.5/35 cm). Rated Capacity: 7,430 lbs (3.373 Kg). **TIRES (MODEL M915)** All Positions - Make/Model: Size: 10.00 x 20 in. (254 x 508 mm). Bias Ply - On-Highway. Type: Load Range/Ply Rating: G/14. Static Loaded Radius: 19.6 in. (49.8 cm). Rated Capacity – Single/Dual: 6,040/5,300 lbs (2742/2406 Kg). TIRES (MODELS M916 THROUGH M920) All Positions - Make/Model: Size: 11.00 x 24 in. (279 x 610 cm). Type: Bias Ply - On/Off Highway. Load Range/Ply Rating: G/14. Static Loaded Radius: 22.5 in. (57.1 cm). 7,430/6,520 lbs (3,373/2,9360 Kg). Rated Capacity - Single/Dual:

BRAKES (MODEL	LS M917, M918, AND M920)
Service: Front Axle: Dia x Width: Pusher Axle: Dia x Width: Rear Tandem: Dia x Width: Parking: Type: Location: Actuation:	Rockwell – Air Actuated 16 sq in. (Actuator) – Wedge 17 x 6 in. (48.18 x 15.24 cm). 36 sq in. (Actuator) – "S" Cam 16.5 x 7 in. (47.72 x 17.78 cm). 30 sq in. (Actuator) – "S" Cam 16.5 x 7 in. (41.91 x 17.78 cm) Spring Chamber Rear Tandems Air Exhaust
FIFTH WH	EEL (MODEL M915)
Make/Model: Type: Rated Capacity: King Pin Size: Pitch — Forward/Aft:	Holland/3600-102-LH 36 in. (91.4 cm) Dia – Single Oscillating 40,000 lbs (18,160 Kg) Vert 150,000 lbs (68,100 Kg) Drawbar 2.0 in. (5.08 cm) 15/10°
FIFTH WHEEL (N	MODELS M916 AND M920)
Make/Model: Type: Rated Capacity: King Pin Size: Pitch – Forward/Aft:	Holland/FW-70-0-15 36 in. (91.4 cm) Dia – Single Oscillating 70,000 lbs (31,780 Kg) Vert 200,000 lbs (90,800 Kg) Drawbar 3.5 in. (8.9 cm) 15/19°
PINTLE (MODELS N	1915, M916, M917 AND M920)
Make/Type: Rated Capacity:	Holland/NO. 760 30 ton (27.2 metric ton)

STEERING (MODELS M915 THROUGH M920)

Gear - Make/Type:

Model: Ratio:

Auxiliary Cylinder Make/Model:

Piston Diameter:

Wheel:

Diameter: Pump Make/Type:

Model: Flow Rates:

Ross/Integral Power

HFB-70033 23.4:1

Ross/C44538 2.80 in. (7.1 1 cm) Sheller Globe 20 in. (50.8 cm)

Eaton/Gear Driven ERS-15867-1

3.35 GPM (12.68 liters min) @ 600 RPM + 1200 psi 7.0/8.0 GPM (26.49/30.28 liters) @ 3000 RPM

+ 50 psi

BRAKES (MODEL M915)

Make/Type:

Service: Front Axle:

Dia x Width: Rear Tandem: Dia x Width:

Parking:
Make/Type:
Location:

Actuation:

Rockwell – Air Actuated 9 sq in. (Actuator) – Wedge 15 x 5 in. (38.1 x 12.7 cm) 30 sq in. (Actuator) - "S" Cam 16.5 x 7 in. (41.9 x 17.8 cm)

Anchorlock - Spring Chamber

Rear Tandems Air Exhaust

BRAKES (MODELS M916 AND M918)

Service:

Front Axle:

Dia x Width:

Rear Tandem: Dia x Width:

Parking:

Make/Model: Location:

Actuation:

Rockwell – Air Actuated 16 sq in. (Actuator) – Wedge 17 x 6 in. (43.2 x 15.2 cm)

30 sq in. (Actuator) – "S" Cam 16.5 x 7 in. (41.9 x 17.8 cm)

Anchorlock Spring Chamber

Rear Tandems Air Exhaust

FRAME ((MODEL M915)
Type: Channel Section: Section Modulus: Overall Width:	Steel-Heat Treat-Bolted- 110,000 psi (758,450 kPa) 10,625 in. x 3.25 in. x .38 in. (28.99 cm x 8.25 cm x .7 cm) 17.7 cu in. (290 cm³) 34 in. (86.4 cm)
FRAME (MODELS	M916 THROUGH M920)
Type: Channel Section: Auxiliary Section (Wrapper): Section Modulus: Overall Width:	Steel-Heat Treated-Bolted- 110,000 psi (758,450 kPa) 10.625 in. x 3.25 in, x .38 in. (28.99 cm x 8.25 cm x .7 cm) 11.50 in. x 3.625 in. x .38 in. 38.04 cu in. (623.36 cm³) 34 in. (86.4 cm)
WINCH (MODE	ELS M916 AND M920)
Make/Model: Type: Capacity:	DPMFG/4045 Hydraulic Planetary 45,000 lbs (20411.64 Kg)
ELECTRICAL SY	YSTEM (ALL MODELS)
Type: Batteries Make/Model/Type: Number/Volts: Alternator Make/Model: Volts/Amps: Starter: Make/Model: Volts:	Basic 12V-w/24V Starting Delco Remy/1200 Series/ Maintenance Free 4/12V Leece-Neville/2500JB 12/24V/85 Amps Leece-Neville/7406 MA Series 24V

CHAPTER 2

PRINCIPLES OF OPERATION

2-1. OVERVIEW.

This chapter explains the functioning of chassis components you will be maintaining at the Organizational level, and how these components relate to each other. The explanation is broken down into the following sections:

- a. Truck/Tractor Chassis (para 2-2 thru 2-5).
- b. Engine (para 2-6, 2-7).
- c. Engine Controls (para 2-8 thru 2-10).
- d. Transmission and Controls (para 2-11, 2-12).
- e. Power Transfer Case and Rear Axle Differential Lockup (para 2-13, 2-14).
- f. Pusher Axle and Controls (para 2-15, 2-16).
- g. Front Axle and Suspension (para 2-17 thru 2-19).
- h. Rear Axle (para 2-20 thru 2-22).
- j, Fuel and Air Intake System (para 2-23 thru 2-25).
- j. Engine Oil System (para 2-26 thru 2-28).
- k. Exhaust System (para 2-29, 2-30).
- I. Cooling System (para 2-31 thru 2-33).
- m. Relays, Circuit Breakers, and Wire Identification (para 2-34 thru 2-36).
- n. Starting and Starting Control System (para 2-37, 2-38).
- o. Ether Quick-Start (para 2-39, 2-40).
- p. Batteries and Power Generating System (para 2-41, 2-42).
- q. Service Lighting System (para 2-43 thru 2-49).
- r. Blackout Lighting System (para 2-50, 2-51).
- s. Instrumentation (para 2-52).
- t. Electric Horn (para 2-53, 2-54).
- u. Cab Heating and Ventilating Systems (para 2-55 thru 2-58).
- v. Compressed Air System (para 2-59, 2-60).
- w. Brake System (para 2-61 thru 2-70).
- x. Auxiliary Air-Powered Systems (para 2-71 thru 2-74).
- y. Steering System (para 2-75, 2-76).
- z. Power Takeoff (para 2-77, 2-78).
- aa. Winch (para 2-79, 2-80).
- bb. Winterization Kit (para 2-81, 2-82).

2-1. OVERVIEW (Continued).

You can find other basic information about the M915, M916, and M920 Truck Tractors and Chassis for the M917, M918, and M919 in:

- a. Chapter 5, section II (Circuit Descriptions).
- b. Appendix D (Schematic Diagrams).
- c. TM 9-2320-273-10 (Operating Instructions for the M915, M916, and M920 Truck Tractors and Chassis for the M917, M918, and M919).

Section I TRUCK/TRACTOR CHASSIS

2-2. INTRODUCTION.

Following is a description of the basic chassis and cab and illustrations of the power train. You will find detailed descriptions of the major components shown in subsequent sections in this chapter.

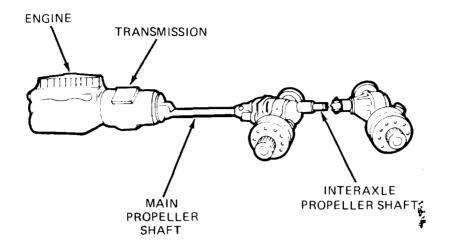
2-3. BASIC CHASSIS AND CAB.

The basic chassis and cab for all M915 thru M920 vehicles is the Crane Carrier Corporation Centaur Model T3824. Three frame types are used, each designated by its corresponding chassis.

- a. Type I for Model M915 (6 x 4 tractor).
- b. Type II for Model M916 (6 x 6 tractor).
- c. Type II for Model M918 (6 x 6 bituminous distributor).
- d. Type III for Model M917 (8 x 6 dump truck).
- e. Type III for Model M919 (8 x 6 Concrete-Mobile® mixer).
- f. Type III for Model M920 (8 x 6 tractor).

The same basic frame is used for each type design. Type II and Type III frames differ from Type I frame by the addition of a 3/8-inch outer channel. The designations given above (6 x 4, 6 x 6 and 8 x 6) refer to the number of wheel positions on the vehicle (first digit) and number of drive wheel positions (second digit). For example: 6 x 4 indicates six wheel positions (inside wheels on rear axles are not counted), and four driving wheel positions.

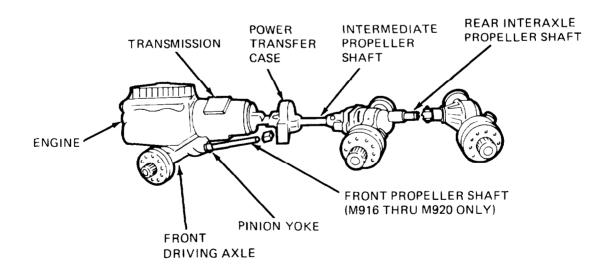
2-4. POWER TRAIN M915.



2-5. POWER TRAIN - M916 thru M920.

NOTE

Pusher Axle (not shown) on Models M917, M919, and M920 is non-driving unit.

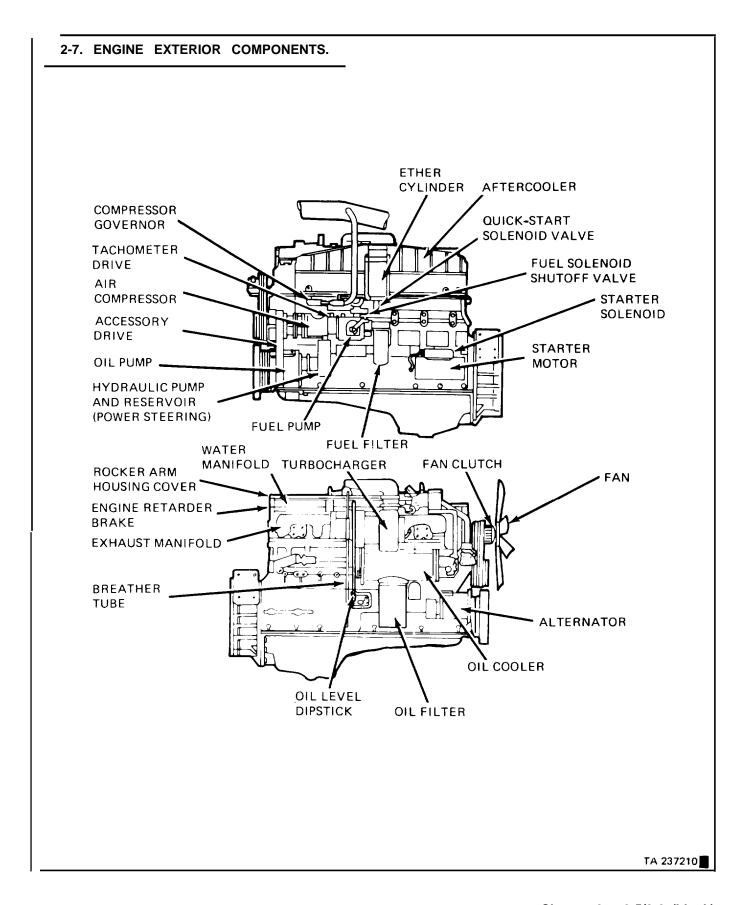


Section II ENGINE

2-6. INTRODUCTION.

The Cummins NTC-400 Engine is used on all M915 thru M920 vehicles. It is an inline, six-cylinder, four-stroke, four-cycle, turbocharged diesel engine. The engine is common to other production truck diesel engines, without special operating or maintenance requirements. This section provides you with illustrations that identify major exterior components. See one of the following associated engine systems in this chapter for details:

- a. Engine Controls (section III).
- b. Fuel and Air Intake System (section IX).
- c. Engine Oil System (section X).
- d. Exhaust System (section XI).
- e. Cooling System (section XII).
- f. Starting and Starting Control System (section XIV).
- g. Ether Quick-Start System (section XV).
- h. Batteries and Power Generating System (section XVI).



Section III ENGINE CONTROLS

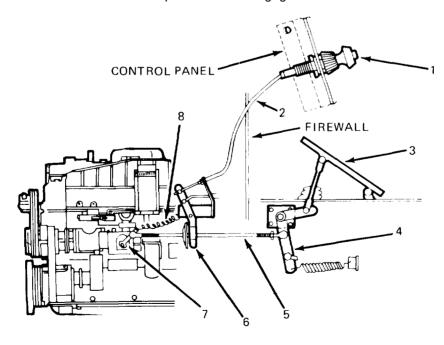
2.8. INTRODUCTION.

Cab engine controls for all M915 thru M920 vehicles are identical. Special body engine speed controls for models M917, M918, and M919 are described in the following manuals:

- a. M917 Dump Truck TM 5-3805-274-24 & P.
- b. M918 Bituminous Distributor TM 5-3895-371-24 & P.
- c. M919 Concrete Mobil®Mixer TM 5-3895-372-20.

2-9. ENGINE SPEED CONTROLS.

- 1. HAND THROTTLE. Allows manual control of engine rpm. Throttle motion is transferred by cable to engine mounted pivot lever (6).
- 2. THROTTLE CABLE. Flex cable from hand throttle to engine mounted pivot lever (6).
- 3. ACCELERATOR PEDAL. Connected by mechanical linkage to under cab pivot lever (4).
- 4. PIVOT LEVER. Mechanical linkage that connects accelerator pedal to accelerator rod.
- 5. ACCELERATOR ROD. Connects accelerator pedal and throttle linkage to accelerator lever on fuel pump.
- 6. ENGINE MOUNTED PIVOT LEVER. This lever connects the under dash hand throttle cable (ALL) and the winch throttle cable (M916 and M920) to the accelerator rod.
- 7. ACCELERATOR LEVER. This lever *controls the flow of fuel* through the *fuel pump* thus setting *engine speed*.
- 8. FUEL CONTROL RETURN SPRING. Return accelerator lever to normal position when hand throttle and accelerator pedal are not engaged.



2-10. ENGINE RETARDER BRAKE CONTROLS.

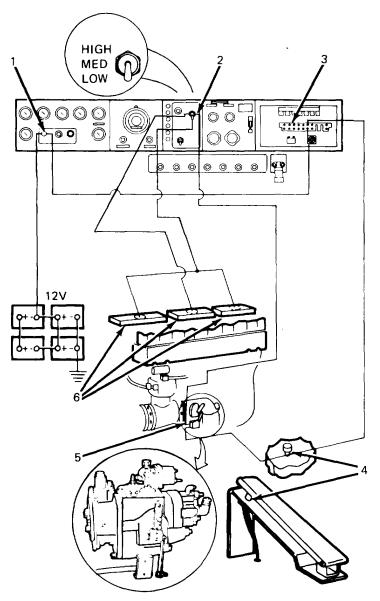
NOTE

In reading the following descriptions make sure that the throttle switch is in its normally-closed position.

- 1. ENGINE RUN SWITCH. Energizes the 12-volt electrical system, including engine retarder brake circuit.
- 2. ENGINE RETARDER SWITCH. Three-position switch allows driver to select engine braking for two cylinders (LOW), four cylinders (MED), or six cylinders (HIGH). Depressing foot pedal actuated switch completes 12-volt power circuit to energize one, two, or three solenoids.

2-10. ENGINE RETARDER BRAKE CONTROLS (Continued).

- 3. CIRCUIT BREAKER (CB-6). Protects electrical components of engine retarder brake circuit by opening when load exceeds 20 amps. Automatically recycles until the overload is removed.
- 4. FLOOR PEDAL SWITCH. Allows driver to activate engine brake circuit with his left foot. When depressed, switch supplies 12-volt power through CB-6, throttle switch, engine retarder switch, to energize the selected solenoid valve.
- 5. THROTTLE SWITCH. Open switch prevents activation of engine retarder brake if hand throttle is pulled out or accelerator pedal is pressed down. Activating arm on fuel pump lever closes switch when hand throttle and accelerator are both disengaged.
- 6. SOLENOID VALVES. When valves are activated, they operate engine braking mechanism.



Section IV TRANSMISSION AND CONTROLS

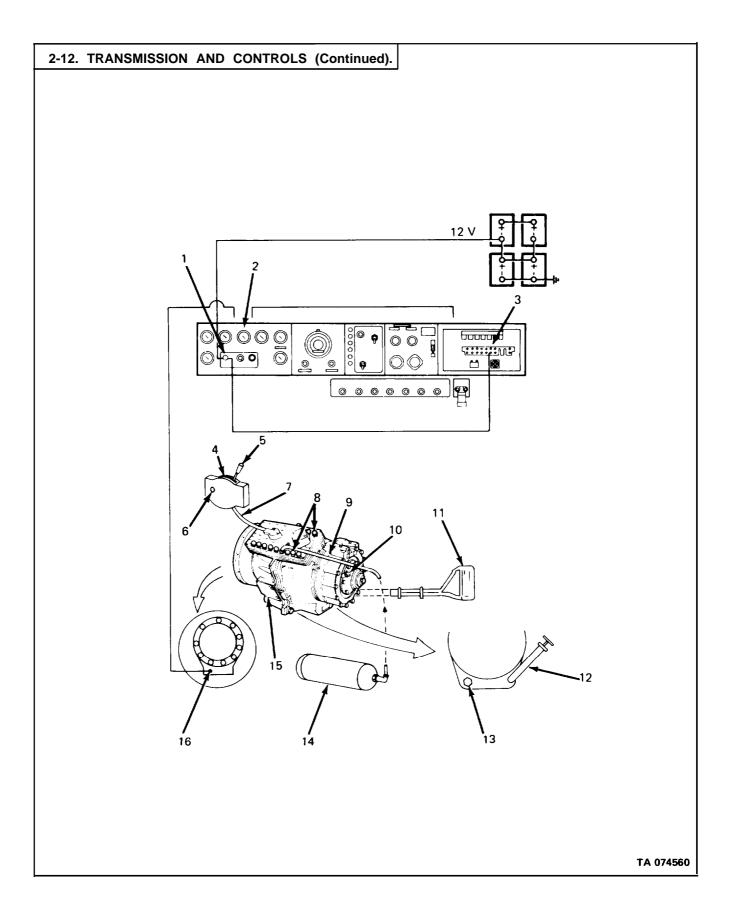
2-11. INTRODUCTION.

The Caterpillar D7155 transmission is used on all M915 thru M920 trucks. It is a mechanical drive unit with 16 forward speeds and 2 reverse speeds. The transmission is bolted directly to engine flywheel housing.

2-12. TRANSMISSION AND CONTROLS.

- 1. ENGINE RUN SWITCH. Energizes the 12-volt electrical system, including the transmission oil temperature gage circuit.
- 2. TRANSMISSION OIL TEMPERATURE GAGE. Signal from sending unit actuates pointer gage showing transmission oil temperature.
- 3. CIRCUIT BREAKER (CB-6). Protects electrical components of transmission oil temperature circuit when load exceeds 20 amps. Automatically recycles until the overload is removed.
- 4, RATIO SELECTOR UNIT. Floor-mounted, houses transmission controls.
- 5. GEAR SELECTOR. Allows operator to select desired gear.
- 6. TRANSMISSION AIR CHARGING VALVE. Used to charge control line when starting up.
- 7. CONTROL LINE. Carries pneumatic pressure which controls pressure from supply line.

 Normal air pressure is 90-120 psi (transmission is disengaged if air pressure drops below 60 psi).
- 8. BREATHERS. Prevent air pressure buildup in case.
- 9. SUPPLY LINE. Pneumatic pressure, controlled by line from ratio selector and sets transmission to selected gear. Normal air pressure is 90-120 psi (transmission is disengaged if air pressure drops below 60 psi).
- 10. SPEEDOMETER CABLE. Provides engine speed input to tachograph.
- 11. TRANSMISSION OIL COOLER. Two hydraulic lines carry warm oil from the transmission to an oil cooler mounted in front of radiator. Once cooled, the oil is returned to the transmission.
- 12. DIPSTICK AND OIL FILL PORT. Used to inspect and replenish oil supply. Normal capacity: at oil change 5.5 gallons (21 liters) of engine oil.
- 13. DRAIN PLUG. Provides access for draining oil. Has magnetic base to attract foreign particles in the oil and warn of unusual wear of the internal parts.
- 14. SUPPLY RESERVOIR. Provides air supply line. Normal air pressure is 90-120 psi (transmission is disengaged if air pressure drops below 60 psi).
- 15. ACCESS PLATE. Provides opening for access to oil pump suction line screen, There is an identical plate on the opposite side of the transmission.
- 16. TRANSMISSION OIL TEMPERATURE SENDING UNIT. Provides electrical signal to temperature gage for indicating transmission oil temperature.



Section V POWER TRANSFER CASE AND REAR AXLE DIFFERENTIAL LOCKUP

2-13. INTRODUCTION.

The power transfer cases on M916 thru M920 trucks provide a means of engaging or disengaging front wheel drive. The instrument panel control for this feature also allows the driver to lock up the rear inter-axle differential so that all differentials on rear axle tandem turn the same speed. (The instrument panel control engages or disengages the front propeller shaft to the front driving axle (M916 thru M920) and the inter-axle differential located in all the forward rear tandem axles.) On M916 and M920 models only, an oil cooler is used to keep the transfer case lubricant within the proper temperature range during warm weather operation. It is disconnected in cold weather to prevent cooler damage (see para 7-9).

The M915 is a 6 x 4, activating the differential lockout control locks the inter-axle differential thereby connecting the transmission to front tandem and rear tandem axles solidly together.

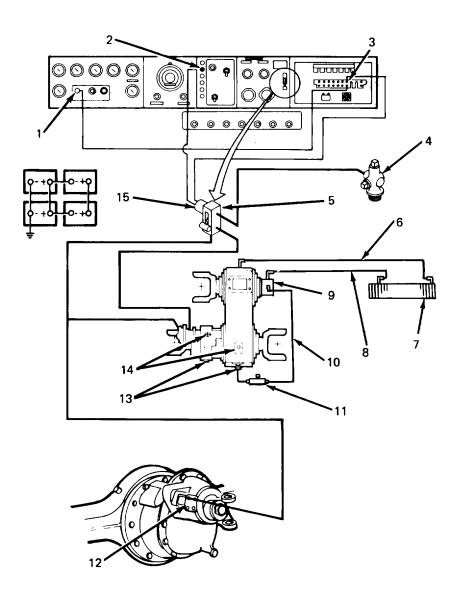
The forward rear tandem axle is equipped with a no-spin differential which automatically locks, eliminating differential action independent of the manual control, at least three wheels on the rear tandem must turn when the inter-axle differential lock is engaged.

2-14. POWER TRANSFER CASE.

- 1. ENGINE RUN SWITCH. Energizes 12-volt electrical system, including differential lockup indicator circuit,
- 2. LOCKUP INDICATOR. Illuminates when lockup switch is closed.
- 3. CIRCUIT BREAKER (CB-6). Protects electrical components of differential lockup circuit by opening when load exceeds 20 amps, Automatically recycles until overload is removed.
- 4. AIR MANIFOLD. Routes air from reservoir to control valve.
- 5. CONTROL VALVE. Provides control to engage or disengage front wheel drive on M916 thru M920. When front wheel drive is engaged, air pressure is applied to lockup rear axle differential. When front wheel drive is disengaged, air pressure is vented through lockup valve. On M915, this control locks up the rear differential only.
- 6. OIL COOLER LINE. Carries cooled oil to top of power transfer case. (M916 and M920 only).
- OIL COOLER. By means of fresh air flow thru fins and tubing, cools warm oil from power transfer case (M916 and M920 only); suspended under winch platform.
- 8. OIL COOLER LINE. Brings warm oil from power transfer case to oil cooler (M916 and M920 only).
- 9. OIL PUMP. Driven from upper shaft of power transfer case, draws warm oil from bottom of case, pumps thru cooler, and returns to top of case (M916 and M920 only).
- OIL PUMP LINE. Carries warm oil from bottom of case to pump (M916 and M920 only).
- 11. TEE. Replaces drain plug (plug is reinserted in end of tee; provides connection for line (10). (M916 and M920 only).

2-14. POWER TRANSFER CASE (Continued).

- 12. LOCKUP CHAMBER. When air pressure is applied to the chamber, it mechanically locks the rear axle differential in place so that drive is applied to both rear axles. Without air pressure, the differential applies drive to the axle that offers the least resistance.
- 13. DRAIN PLUGS. Allow draining oil during service intervals. Has magnetic base to attract foreign particles and warn of unusual wear of internal parts.
- 14. FILLER PLUGS. Provide means of checking and replenishing oil supply.
- 15. LOCKUP SWITCH. Normally open; closed by 60 psi air pressure to activate lockup indicator circuit.



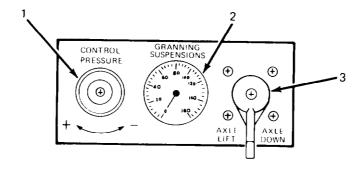
Section VI PUSHER AXLE AND CONTROLS

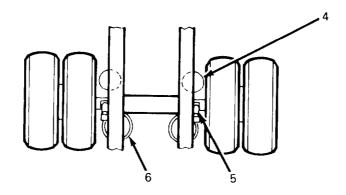
2-15. INTRODUCTION.

A pusher axle is provided on M917, M919, and M920 vehicles.

2-16. PUSHER AXLE.

- 1. PRESSURE REGULATOR VALVE. Allows operators to regulate air pressure to air bags.
- 2. PRESSURE GAGE. Air-actuated gage indicates pressure in lines to air bags.
- 3. UP-DOWN SELECTOR VALVE. In DOWN position, directs air pressure to air bags which lower axle. In UP position, directs pressure to air cylinders which raise axle.
- 4. AIR CYLINDERS. Provide force to raise axle to stowed position.
- 5. SHOCK ABSORBERS. Stabilize fluctuations in air bags caused by road surface variations.
- 6. AIR BAGS. Provide force to lower axle to road position.





TA 0745 62

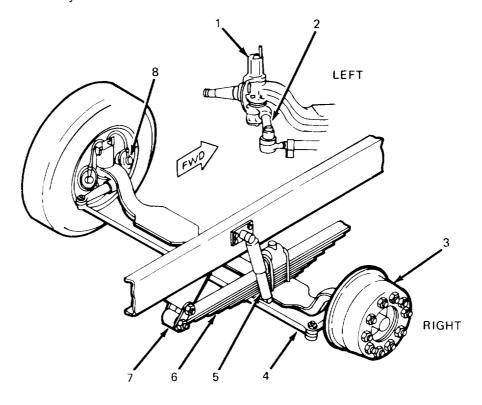
Section VII FRONT AXLE AND SUSPENSION

2-17. INTRODUCTION.

The Model M915 is equipped with a non-driving front axle; the Models M916 thru M920 have a driving front axle. (See power train illustrations in paragraphs 2-4 and 2-5.) Shock absorbers are used only on the Model M915.

2-18. NON-DRIVING FRONT AXLE (M915).

- 1. KNUCKLE AND KINGPIN ASSEMBLY (Shown with drum removed). Movable joint between the wheel and axle l-beam.
- 2. STEERING ARM. Connects to power steering drag link (see para 2-76).
- 3. DRUM. Houses the wheel brakes. Serves as mount for front wheels.
- 4. TIE ROD ASSEMBLY. Connects left and right knuckles for synchronized movement of both wheels.
- 5. SHOCK ABSORBERS (M915). Supplement spring and stabilize spring fluctuations caused by road surface variations.
- 6. LEAF SPRINGS. Absorb and minimize the amount of road shock transmitted to the vehicle frame.
- 7. SHACKLE. Swinging support that permits the leaf spring to vary in length as it is deflected.
- 8. BRAKE AI R CHAMBER. When pressure is supplied to the chambers from the air system, they mechanically activate the brake mechanism.

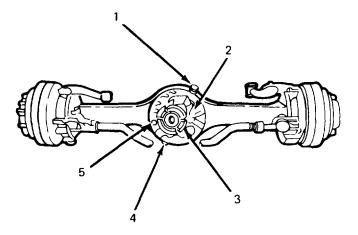


2-19. DRIVING FRONT AXLE (M916 THRU M920).

NOTE

See illustration in para 2-18 for identification and description of common components.

- 1. BREATHER. Allows fumes from hot oil to escape.
- 2. CARRIER. Houses differential drive and driven gears.
- 3. PINION YOKE. Attaches to transfer case propeller shaft universal. (See illustration in para 2-5.)
- 4. DRAIN PLUG. Allows draining oil at service intervals.
- 5. FILLER PLUG. Provides access for checking oil level and replenishing oil supply.



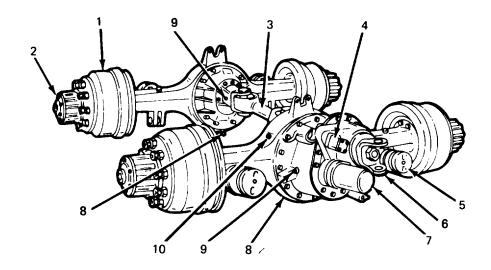
Section VIII REAR AXLE

2-20. INTRODUCTION.

Two similar rear axle assemblies are used in the M915 thru M920 vehicles. The Model M915 uses one type; the Models M916 thru M920 use a different assembly. (Specifications for both axles are given in para 1-11.)

2-21. REAR AXLE (M915).

- 1. HUB AND DRUM ASSEMBLY. Serves as mount for rear wheels. Houses the brake shoe assemblies which can be mechanically forced against it to slow or stop the vehicle.
- 2. AXLE SHAFT. Transmits power from the differential gear assembly to the hub assembly inside of axle housing.
- 3. INTER-AXLE PROPELLER SHAFT. Transmits power to rear axle.
- 4. DIFFERENTIAL LOCKUP CHAMBER. Air actuated by lockup switch located in cab interior. (Refer to para 2-14 for description.)
- 5. BRAKE AIR CHAMBER. (Refer to para 2-64 for description.)
- 6. PINION YOKE. Connects to propeller shaft from transmission.
- 7. OIL FILTER. Oil filter (under cover) removes impurities from oil in forward rear axle. Filter is replaceable, automobile-type unit (Refer to LO 9-2320-273-12.)
- 8. DRAIN PLUG. Allows draining oil at service intervals.
- 9. FILLER PLUG. Used to inspect oil level and replenish oil supply.
- 10. BREATHER. Allows fumes from hot oil to escape.

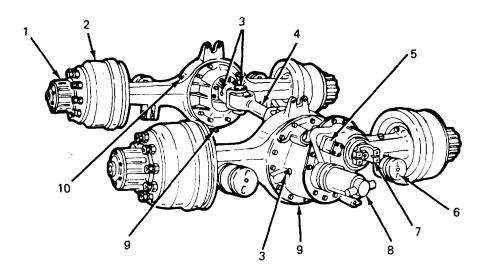


2-22. REAR AXLE (M916 THRU M920).

NOTE

See illustration in paragraph 2-21 for identification and description of common components. For organizational maintenance purposes, the basic difference between the axles shown in paragraphs 2-21 and 2-22 is that the axle shown below does not have an oil filter. Quantity and placement of fill and drain plugs also differ from one configuration to the other.

- 1. AXLE SHAFT. Transmits power from the differential gear assembly to the hub assembly inside of axle housing.
- 2. HUB AND DRUM ASSEMBLY. Serves as mount for rear wheels. Houses the brake shoe assemblies which can be mechanically forced against it to slow or stop the vehicle.
- 3. FILLER PLUG. A plug used to gain access for inspecting oil level and replenishing oil supply.
- 4. INTER-AXLE PROPELLER SHAFT. Transmits power for forward-rear to rear-rear axle.
- 5. DIFFERENTIAL LOCKUP CHAMBER. Air actuated by lockup switch located in cab interior. (Refer to para 2-14 for description.)
- 6. BRAKE AIR CHAMBER. (Refer to para 2-64 for description.)
- PINION YOKE. Connects to propeller shaft from power transfer case.
- 8. DIFFERENTIAL INTERNAL LUBRICATION PUMP. Circulates gear lubricant under pressure thru differential gears.
- 9. DRAIN PLUG. A magnetic plug which allows draining oil at service intervals. Also, draws metallic particles from the oil.
- 10. BREATHER. Allows fumes from hot oil to escape.



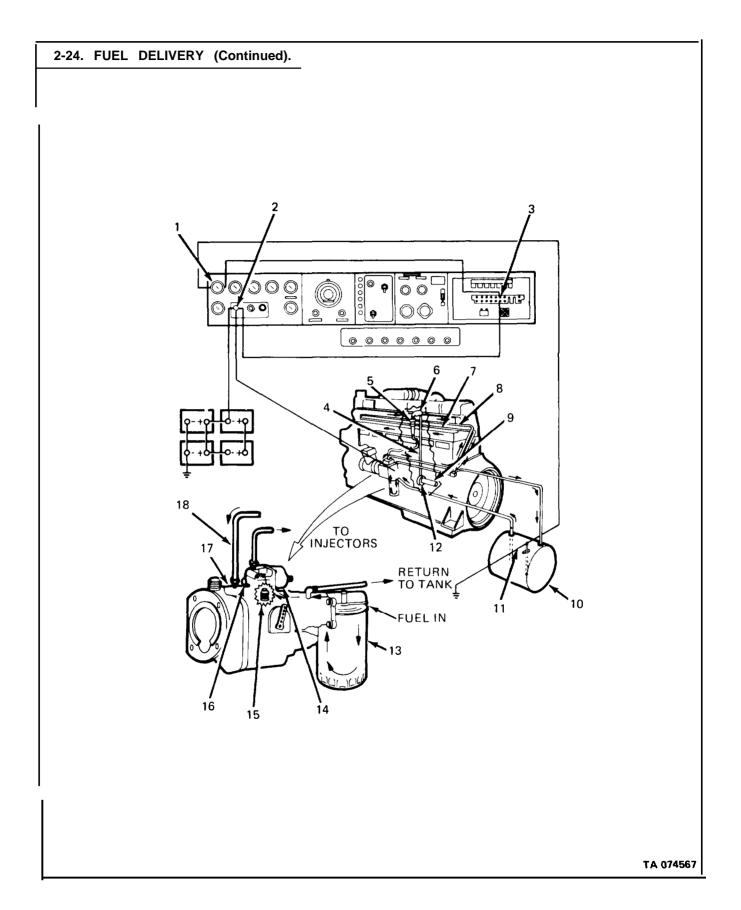
Section IX FUEL AND AIR INTAKE SYSTEM

2-23. INTRODUCTION.

This system is comprised of two basic subsystems: fuel delivery and air intake. The systems are identical in all M915 thru M920 vehicles.

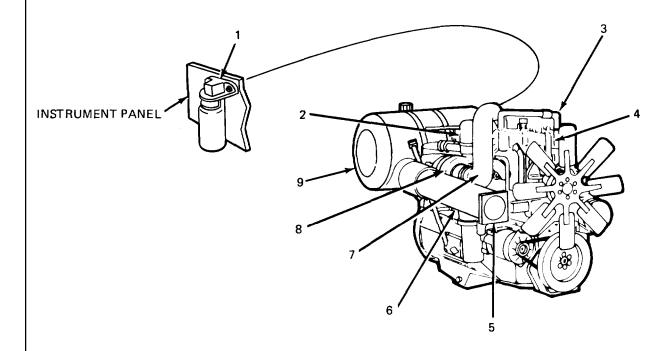
2-24. FUEL DELIVERY.

- FUEL GAGE. Needle actuated by electrical signal from sending unit which shows level of fuel in tank.
- 2. ENGINE RUN SWITCH. Energizes 12-volt electrical system, including circuits to solenoid shutoff valve and fuel level sending unit.
- 3. CIRCUIT BREAKER (CB-6). Protects electrical components of fuel system by opening circuit when load exceeds 20 amps. Automatically recycles until overload is removed.
- 4. PUSH TUBE. Transmits motion from cam follower to rocker arm assembly.
- 5. INJECTOR. Cam timed to meter and inject fuel into each cylinder.
- 6. ROCKER ARM. Transmits directional movement from push tube to injector.
- 7. FUEL DELIVERY LINE. Carries fuel under pressure from fuel pump to fuel manifold.
- 8. BYPASS LINE. Carries excess fuel from manifold back to tank.
- 9. CAMSHAFT. Determines valve and injector timing.
- 10. TANK. 118-gallon (446.63 liters) capacity (110-gallon (416.35 liters) draw).
- 11. FUEL LEVEL SENDING UNIT. Provides electrical signal to fuel gage for indicating fuel quantity in tank.
- 12. CAM FOLLOWER. Mechanical lever transmits cam lobe movement from cam shaft to push tube.
- 13. FILTER. Throwaway filter removes impurities from fuel. Petcock in bottom allows operator to drain off water filtered from fuel.
- 14. SOLENOID SHUTOFF VALVE. Normally closed, shutting off fuel supply to engine. Open when engine run switch is ON.
- 15. SCREEN FILTER. Located in fuel pump. Provides additional filtration for fuel prior to entering engine.
- 16. MANUAL OVERRIDE FOR FUEL SHUTOFF SOLENOID. Normally closed, can be screwed open to allow operation of engine when solenoid is not working.
- 17. FUEL PUMP. Gear driven from compressor drive. Built-in governor meters fuel through screen filter, solenoid shutoff valve, and into injectors. Excess fuel from pump is returned to the tank, The tachometer drive is located on the pump housing.
- 18. AIR ACTUATING LINE. Carries pressurized air from intake manifold to fuel pump. Pressure from line opens valve in pump and allows full fuel flow.



2-25. AIR INTAKE.

- 1. AIR RESTRICTION INDICATOR. Mounted on instrument panel. A red signal shows on indicator housing when air cleaner needs servicing. A tube connects the indicator to the air cleaner outlet. When air flow through the cleaner is restricted, the red signal becomes visible. The unit is factory set to signal at a specific filter restriction. Resetting is accomplished by pushing a button which is recessed in the bottom.
- 2. CROSSOVER TUBE. Directs compressed air from turbocharger, through aftercooler, to intake manifold.
- 3. AFTER COOLER. Cools air entering intake manifold from turbocharger. Water flow from engine cooling system absorbs heat. (See illustration of cooling system in paragraph 2-32.)
- 4. ENGINE INTAKE MANIFOLD. Directs compressed air charge to each cylinder after it has been cooled by aftercooler.
- 5. PLENUM. Directs outside air to the air intake tube.
- 6. AIR INTAKE TUBE. Draws outside air through grille mounted plenum and into air cleaner.
- 7. INLET TUBE. Directs air from air cleaner to turbocharger.
- 8. TURBOCHARGER. Driven by exhaust gases (para 2-30). Compresses air in the intake manifold to increase engine power.
- 9. AIR CLEANER. Mounted on fire wall. Removes impurities from air entering turbocharger. Has replaceable dry, two-stage element.

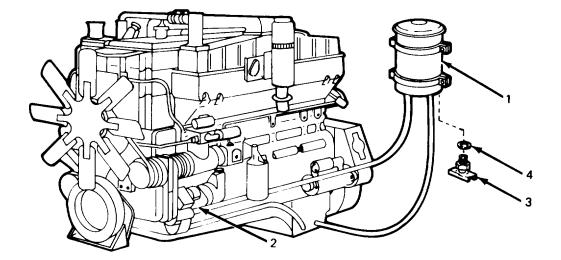


Section X ENGINE OIL SYSTEM

2-20. INTRODUCTION.
The engine oil system is identical on all M915 thru M920 vehicles. The system provides lubricating oil for moving internal engine parts and the turbocharger. In addition, engine oil is used by the Jacobs® brake (engine retarder).

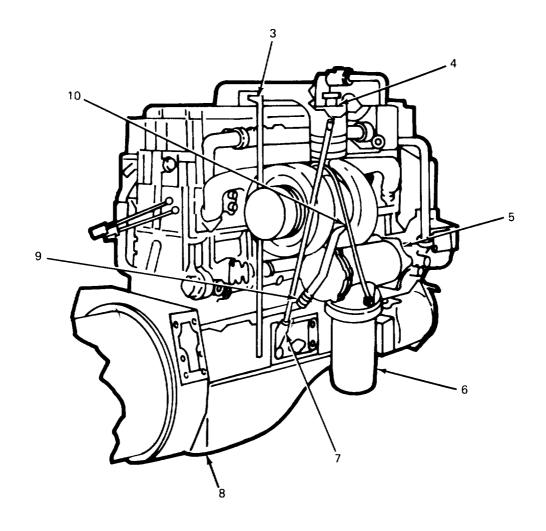
2-27. COMPONENTS AND PIPING ARRANGEMENT.

- 1. OIL BYPASS FILTER. Provides additional filtration, allowing a longer period between oil changes. Oil from pump circulates through the filter, then to the sump.
- 2. OIL PUMP. Circulates oil through engine to provide cooling and lubrication.
- 3. DRAINCOCK. Provide passage for draining oil.
- 4. FLATWASHER. Provides seal between draincock and oil bypass filter.



2-27. COMPONENTS AND PIPING ARRANGEMENT (Continued).

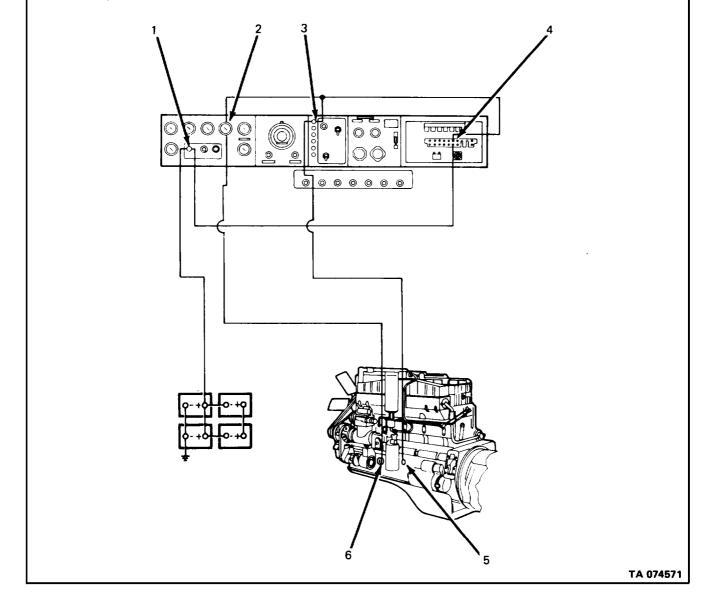
- 3. BREATHER TUBE. Allow fumes from hot oil to escape.
- 4. OIL FILLER. Located in engine cover. Used for replenishing engine oil supply.
- 5. OIL COOLER. Coolant circulates through internal tubes of oil cooler and carries away heat from engine oil.
- 6. PRIMARY OIL FILTER. Throwaway filter removes dirt and foreign particles from oil.
- 7. DIPSTICK. Engine oil level indicator.
- 8. DRAIN PLUG. Located in bottom of engine oil pan, Used to drain oil from engine.
- 9. OIL RETURN LINE. Carries return oil from turbocharger to engine block.
- 10. OIL SUPPLY LINE. Carries oil under pressure to cool and lubricate turbocharger.



TA 074570

2-28. OIL MONITORING SYSTEM.

- 1. ENGINE RUN SWITCH. Energizes 12-volt electrical system, including oil pressure gage and warning light circuits.
- 2. OIL PRESSURE GAGE. Needle activated by electrical signal from oil pressure sending unit indicates engine oil pressure.
- 3. OIL WARNING LIGHT. Indicator light is activated by 12-volt power from pressure switch when engine oil pressure drops below 5 psi (34 kPa).
- 4. CIRCUIT BREAKER (CB-6). Protects electrical components of oil system by opening circuit when load exceeds 20 amps. Automatically recycles until overload is removed.
- 5. PRESSURE SWITCH. Closes when oil pressure drops below 5 psi (34 kPa) and supplies 12-volt power to oil warning indicator.
- 6. OIL PRESSURE SENDING UNIT. Provides electrical signal to oil pressure gage to indicate oil pressure.

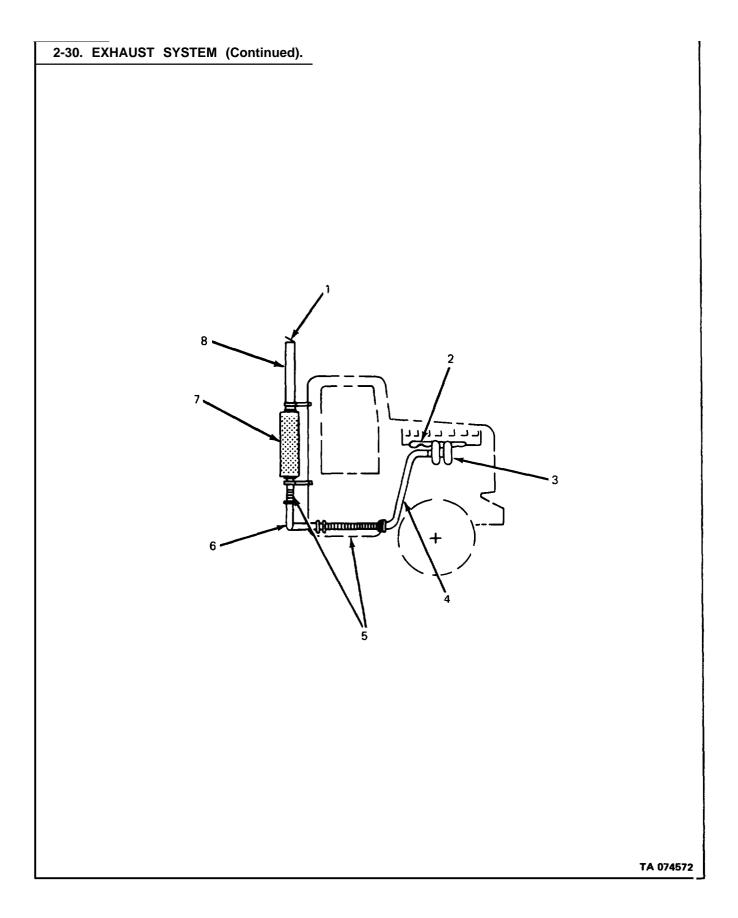


Section XI EXHAUST SYSTEM

2-29. INTRODUCTION.
The exhaust system is identical in all M915 thru M920 vehicles, except for minor variations in arrangement.

2-30. EXHAUST SYSTEM.

- 1. RAIN CAP. Prevents entry of rain and dirt into exhaust pipes when engine is not in use.
- 2. EXHAUST MANIFOLD. Bolted to exhaust ports on cylinder heads. Collects exhaust from ports and directs it to turbocharger.
- 3. TURBOCHARGER. See illustration and description in paragraph 2-25.
- 4. TURBO OUTLET PIPE. Carries hot exhaust away from turbocharger.
- 5. FLEX PIPE(S). Connect turbo outlet pipe, muffler inlet pipe, and muffler. Pipes are flexible to allow for vibrations and expansion in system.
- 6. MUFFLER INLET PIPE. Connects flex pipes.
- 7. MUFFLER. Directs exhaust through baffles to deaden noise.
- 8. EXHAUST STACK. Directs exhaust from muffler.



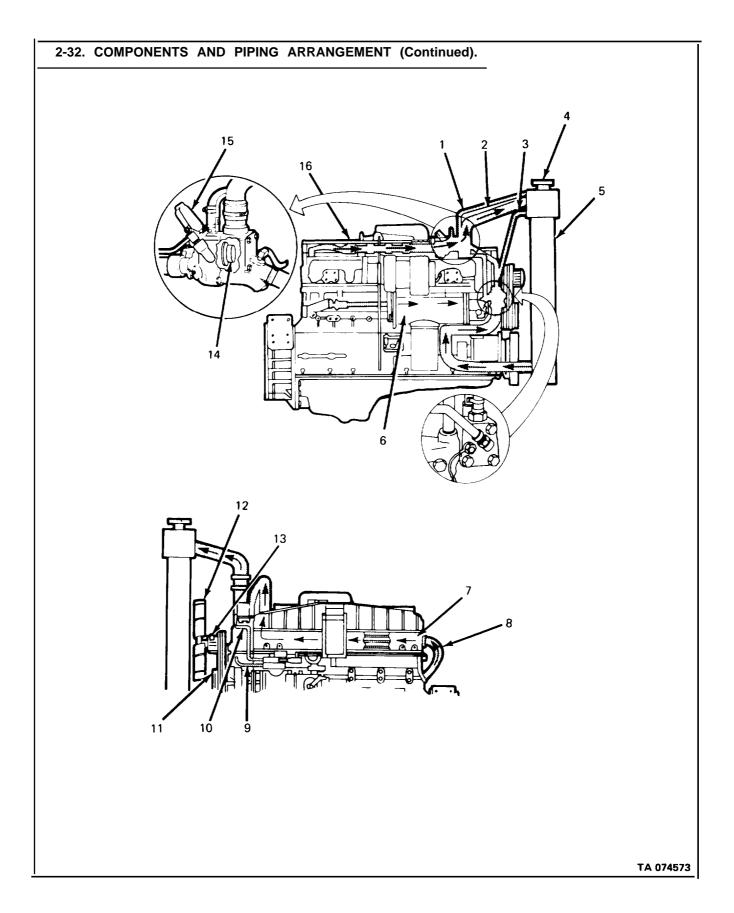
Section XII COOLING SYSTEM

2-31. INTRODUCTION.

The cooling system is identical in all M915 thru M920 vehicles, The system provides coolant for the engine block, oil cooler, aftercooler, fuel injectors, and air compressor.

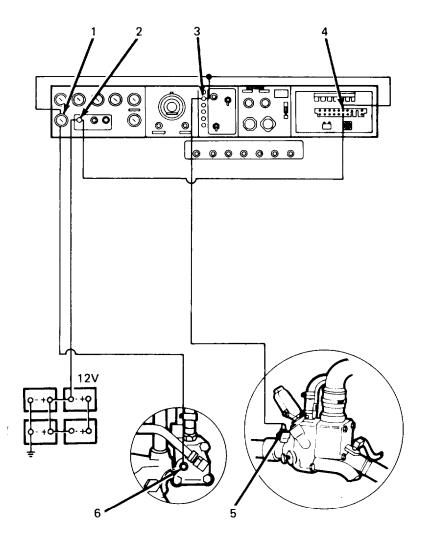
2-32. COMPONENTS AND PIPING ARRANGEMENT.

- 1. THERMOSTAT DEAERATION LINE. Escape route for air trapped in radiator top or thermostat housing.
- RADIATOR IN LET HOSE. Channels hot coolant into radiator when thermostat is open.
- 3. ENGINE SHUNT LINE. Allow air bubbles from coolant in pump to escape into radiator, to prevent pump cavitation.
- RADIATOR CAP. Closes off filler opening and keeps system under pressure up to a maximum of 10 psi.
- 5. RADIATOR. Coolant is circulated through a series of fins and baffles so that outside air flow can dissipate heat.
- 6. OIL COOLER. Engine coolant circulates through internal tubes of cooler and carries away heat from engine.
- AFTERCOOLER. Coolant flowing through core cools hot air entering intake manifold ports from turbocharger.
- 8. WATER LINE. Carries water under pressure from block to aftercooler.
- 9. WATER LINE. Carries hot water from air compressor to thermostat housing.
- 10. WATER LINE. Carries coolant from water pump to air compressor.
- 11. ACCESSORY DRIVE. Powers the fan and water pump.
- 12. FAN. Forces air through radiator to control coolant temperature.
- 13. FAN CLUTCH. Air pressure from actuator engages fan when coolant temperature rises above 190°F (88°C).
- 14. THERMOSTAT. Shuts off coolant flow to radiator until temperature reaches 185°F (85°C). Coolant is then directed through radiator inlet hose to the radiator.
- 15. FAN CLUTCH ACTUATOR. When coolant temperature rises above 190°F (88°C), actuator directs compressed air into fan clutch causing fan to engage.
- 16. WATER MANIFOLD. Collects coolant from cylinder heads and directs it to thermostat housing.



2-33. COOLANT TEMPERATURE MONITORING SYSTEM.

- 1. WATER TEMPERATURE GAGE. Shows coolant temperature actuated by electrical signal from water temperature sending unit.
- 2. ENGINE RUN SWITCH. Energizes 12-volt electrical system, including temperature gage and temperature indicator light circuits.
- 3. ENGINE COOLANT TEMPERATURE WARNING LIGHT. Activated by 12-volt power from water temperature switch when engine temperature exceeds 225°F (107°C).
- CIRCUIT BREAKER (CB-6). Protects electrical components and wiring of coolant system by opening circuit when load exceeds 20 amps. Automatically recycles until overload is removed.
- 5. WATER TEMPERATURE SWITCH. Normally open, closes to activate indicator light when coolant temperature exceeds 225°F (107°C).
- 6. WATER TEMPERATURE SENDING UNIT. Provides electrical signal to temperature gage.



TA 073922

Section XIII RELAYS, CIRCUIT BREAKERS, AND WIRE IDENTIFICATION

2-34. INTRODUCTION.

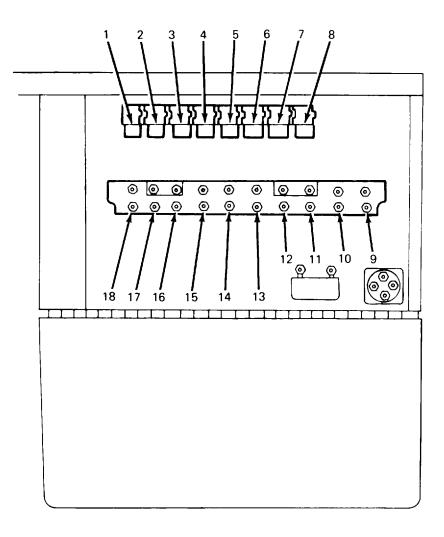
- a. The electrical relays are identical in all M915 thru M920 vehicles, except for minor variations in arrangement. The M917, M918, and M919 use two relays, the M915 use seven relays; while the M916 and M920 use eight.
- b. The circuit breakers are identical in the M915 thru M920 vehicles, except for minor variations in arrangement. The M917, M918, and M919 use six circuit breakers to protect their electrical systems, the M915 uses eight; while the M916 and M920 use nine. These circuit breakers are rated at 20 amps continuous load. If an overload does occur, the circuit breaker automatically recycles (opens and closes) until the overload is removed.

2-35. RELAYS AND CIRCUIT BREAKERS.

- 1. RELAY (K1). (M915 thru M920) Normally open contacts: Provides 12-volt power to the electric horn when energized.
- 2. RELAY (K2). (M915, M916, and M920) Normally open contacts: Provides 24-volt power to trailer left turn signal light when energized.
 - RELAY (K2). (M918 and M919) Normally closed contacts: Provides 12-volt power to the backup alarm when energized.
 - RELAY (K2). (M917) Normally closed contacts: Disconnects 12-volt power from tractor backup lights when the Operation switch is in BLACKOUT position,
- 3. RELAY (K3). (M915, M916, and M920) Normally open contacts: Provides 24-volt power to trailer right turn signal light when energized.
- 4. RELAY (K4). (M915, M916, and M920) Normally open contacts: Provides 24-volt power to trailer blackout stop lights when energized.
- 5. RELAY (K5). (M915, M916, and M920) Normally open contacts: Provides 24-volt power to trailer blackout tail lights when energized.
- 6. RELAY (K6). (M915, M916, and M920) Normally open contacts: Provides 24-volt power to trailer marker and tail lights when energized.
- 7. RELAY (K7). (M915, M916, and M920) Normally closed contacts: Disconnects 12-volt power from tractor backup lights when operation switch is in BLACKOUT position.
- 8. RELAY (K8). (M916 and M920) Normally closed contacts: Provides 12-volt power to work lamps when WORK LAMPS switch is ON.
- 9. ENGINE TEMPERATURE DIODE. Provides a circuit to illuminate engine temperature indicator when engine is cranking, and prevents engagement of the starter by feedback voltage in the event the water temperature switch closes.
- 10. CIRCUIT BREAKER (CB-9). Protects the 12-volt work lamps circuit in the M916 and M920 vehicles.
- 11. CIRCUIT BREAKER (CB-8). Protects the 24-volt blackout stop, marker, and tail light circuits for trailers used with the M915, M916, and M920 vehicles.
- 12. CIRCUIT BREAKER (CB-7). Protects the 24-volt left and right turn signals and blackout tail light circuits for trailers used with the M915, M916, and M920 vehicles.
- 13. CIRCUIT BREAKER (CB-6). Protects the 12-volt engine retarder brake, instrument gages, low air, park brake, and differential lockout circuits in the M915 thru M920 vehicles.
- 14. CIRCUIT BREAKER (CB-5). Protects the 12-volt backup lights and ether start circuits in the M915 thru M920 vehicles.
- 15. CIRCUIT BREAKER (CB4). Protects the 12-volt heater fan motor circuit in the M915 thru M920 vehicles.
- 16. CIRCUIT BREAKER (CB-3). Protects the 12-volt cigar lighter and dome light circuits in the M915 thru M920 vehicles.
 - CIRCUIT BREAKER (CB-3). Protects the 12-volt utility outlets on the M915, M916, and M920 vehicles.

2-35. RELAYS AND CIRCUIT BREAKERS (Continued).

- 17. CIRCUIT BREAKER (CB-2). Protects the 12-volt electric horn and turn signal flasher circuits in the M915 thru M920 vehicles.
- 18. CIRCUIT BREAKER (CB-1). Protects the 12-volt stop light, operation switch, turn signal, and instrument lighting circuits in the M915 thru M920 vehicles.



2-36. WIRE IDENTIFICATION.

The electrical wiring on the M915 thru M920 vehicles is contained in braided or loomed harness assemblies. The wires are permanently hot-stamped with individual circuit numbers. The circuit numbers appear two inches from each termination end and every six inches throughout the length. Refer to Appendix D for wiring harness drawings and electrical system diagrams, for circuit numbers and terminations.

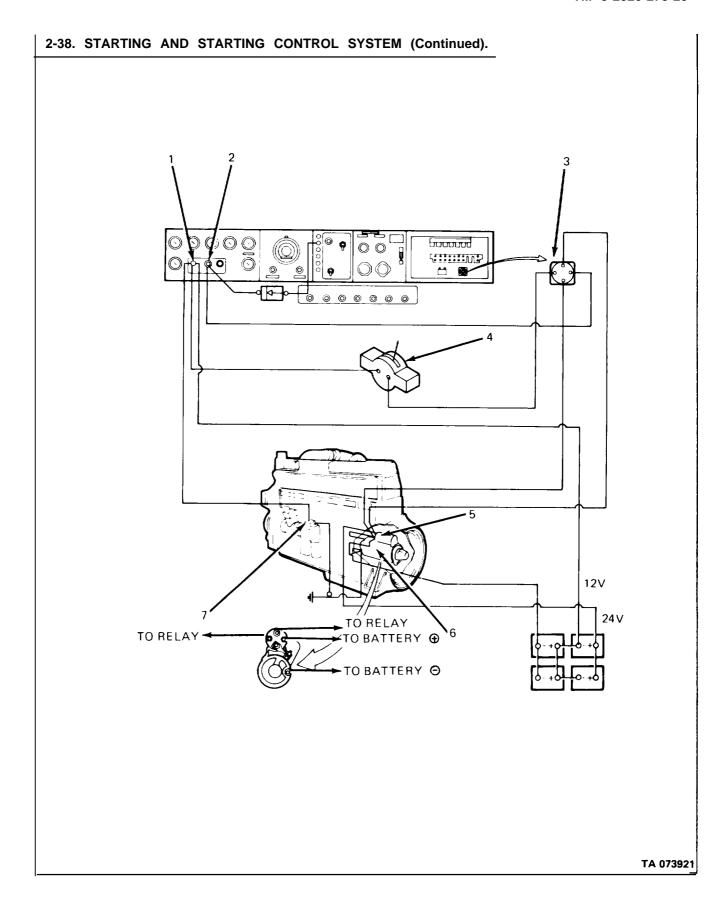
Section XIV STARTING AND STARTING CONTROL SYSTEM

2-37. INTRODUCTION.

The starting and starting control system is identical in all M915 thru M920 vehicles.

2-38. STARTING AND STARTING CONTROL SYSTEM.

- ENGINE RUN SWITCH. Directly controls fuel solenoid shutoff valve and allows remainder of starting circuit to be placed into operation when the start button is depressed.
- 2. ENGINE START BUTTON. Activates starting circuit by energizing the starter relay.
- STARTER RELAY. With ENGINE RUN switch on, transmission ratio selector lever in neutral, and ENGINE START button depressed, the relay energizes and closes the starter solenoid circuit.
- 4. NEUTRAL SAFETY SWITCH. Switch is normally open. Starting circuit cannot be activated when ratio selector lever is in any position other than neutral.
- 5. STARTER SOLENOID. 12-volt power is applied to the starter solenoid when starter relay is energized. The solenoid closes and supplies 24-volt power, which energizes the starter motor.
- 6. STARTER MOTOR. When energized, the motor engages the flywheel to start the engine.
- 7. FUEL SOLENOID SHUTOFF VALVE. When the ENGINE RUN switch is turned on, valve is energized and opens to allow fuel to pass to the injectors. (See paragraph 2-24 for description of fuel system.)



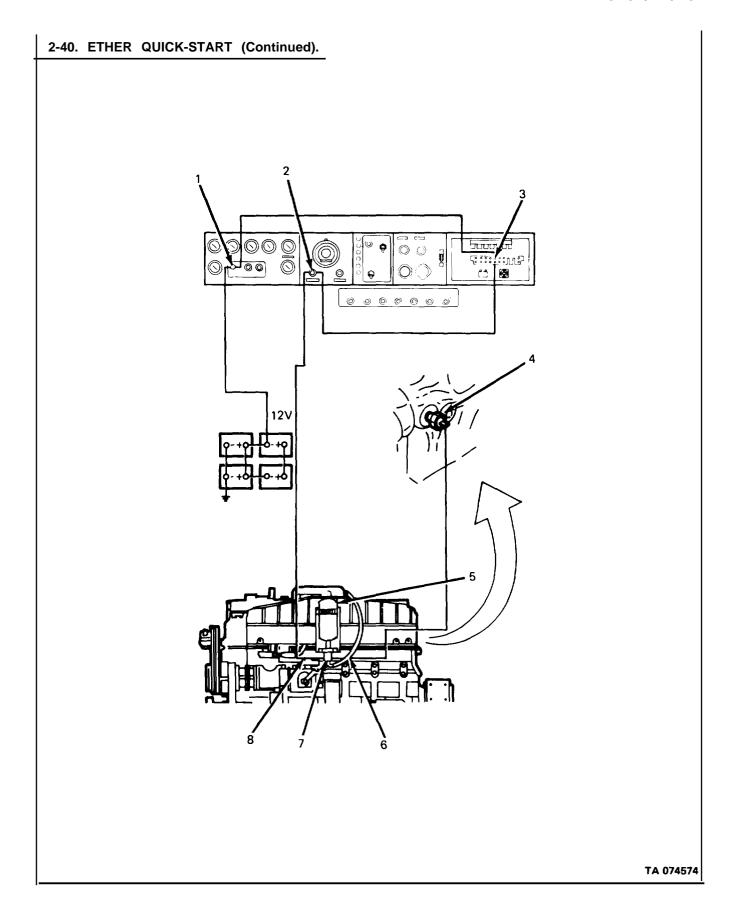
Section XV ETHER QUICK-START

2-39. INTRODUCTION.

The quick-start system is identical in all M915 thru M920 vehicles.

2-40. ETHER QUICK-START.

- 1. ENGINE RUN SWITCH. Energizes 12-volt electrical system, including quick-start solenoid valve circuit.
- 2. ETHER BUTTON. Activates solenoid valve. Will not work if thermal switch is open.
- 3. CIRCUIT BREAKER (CB-5). Protects electrical components and wiring of quickstart system by opening circuit when load exceeds 20 amps. Automatically recycles until overload is removed.
- 4. THERMAL SWITCH. Opens when coolant temperature is above 50°F (10°C), and prevents solenoid valve from activating.
- 5. ETHER CYLINDER. Replaceable 18-02 (710 cc) ether container.
- 6. ETHER TUBE. Carries ether from solenoid valve thru atomizer to engine air intake manifold.
- 7. ATOMIZER. Sprays fine ether mist into intake manifold.
- 8. SOLENOID VALVE. Controls release of ether from cylinder. When solenoid is energized, ether flows to atomizer.



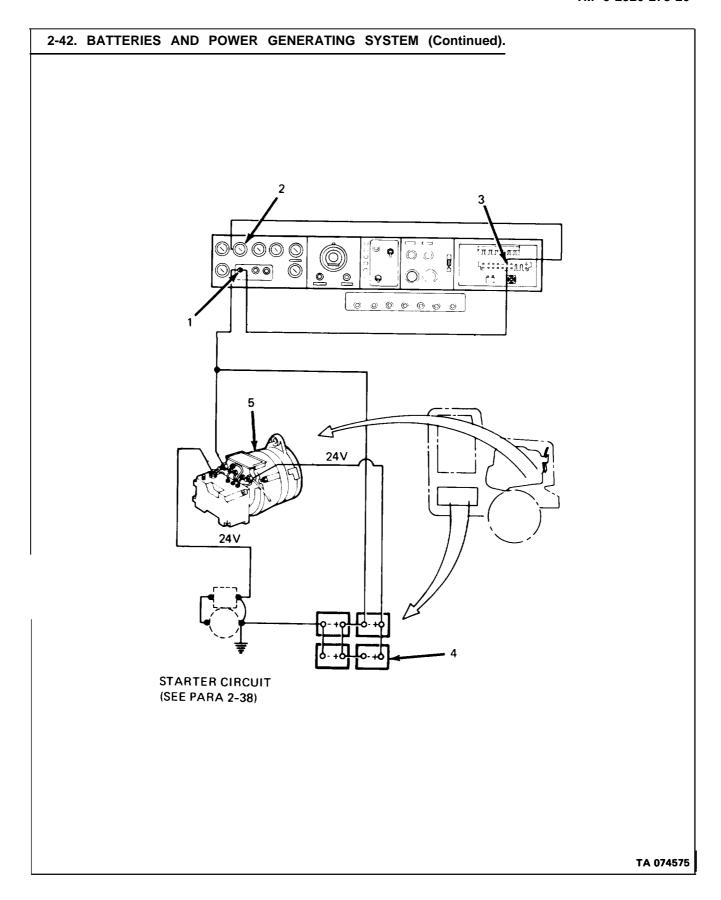
Section XVI BATTERIES AND POWER GENERATING SYSTEM

2-41. INTRODUCTION.

The battery and generating system provides 12- and 24-volt power to electrical systems in M915 thru M920 vehicles. The power generating system is identical for all vehicles.

2-42. BATTERIES AND POWER GENERATING SYSTEM.

- 1. ENGINE RUN SWITCH. Supplies 12-volt power from batteries through switch, circuit breaker, to voltmeter.
- 2. VOLTMETER. 10- to 16-volt gage indicates voltage provided by battery pack, and alternator.
- 3. CIRCUIT BREAKER (CB-6). Protects electrical components of volt meter circuit by opening when load exceeds 20 amps. Automatically recycles until overload is removed.
- 4. BATTERY PACK. Comprised of four 12-volt, maintenance-free batteries. Two batteries wired in parallel in each set. Each set connected in series for 24-volt output. Battery pack is used for both 1.2- and 24-volt output.
- AC GENERATOR (ALTERNATOR). Generates voltage for recharging battery pack.
 Has external 24-volt transformer rectifier.



Section XVII SERVICE LIGHTING SYSTEM

2-43. INTRODUCTION.

The service lighting system provides illumination required while operating the vehicles. This system is comprised of the following subsystems:

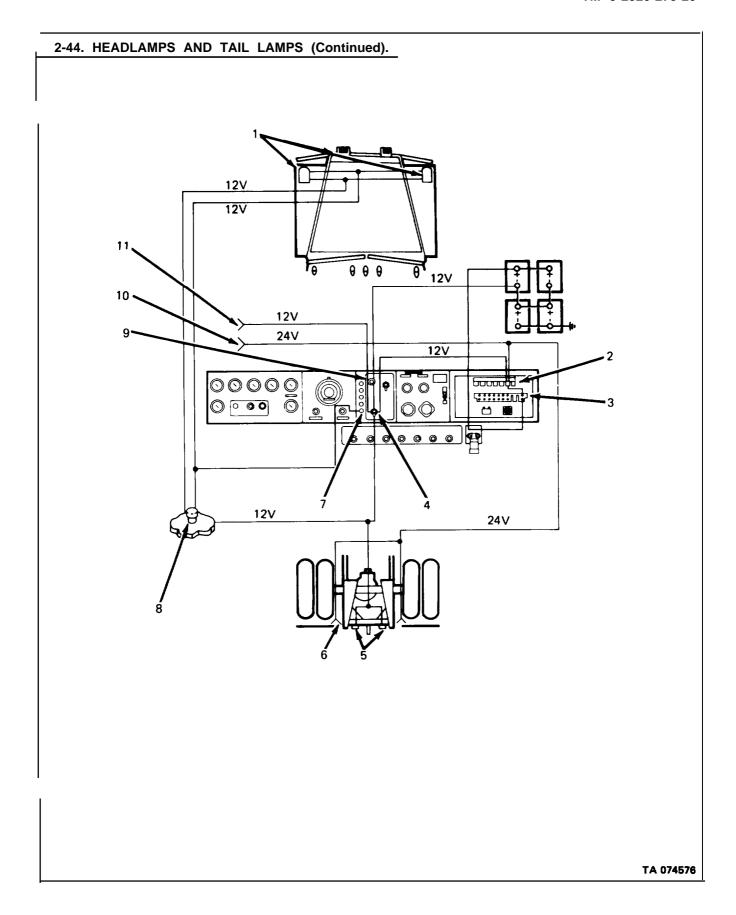
- a. Headlamps and Tail Lamps (para 2-44).
- b. Marker and Clearance Lamps (para 2-45),
- c. Turn Signals and Hazard Warning Lamps (para 2-46).
- d. Backup Lamps (para 2-47).
- e. Work Lamps (para 2-48).
- f. Instrument and Cab Dome Lamps (para 2-49).
- g Stop Lamps (See brake switches and indicators (para 2-63)).

Individual circuit descriptions, except stop lamps, follow in this section. You can find a complete electrical schematic diagram and wiring harness diagrams in Appendix D.

2-44. HEADLAMPS AND TAIL LAMPS.

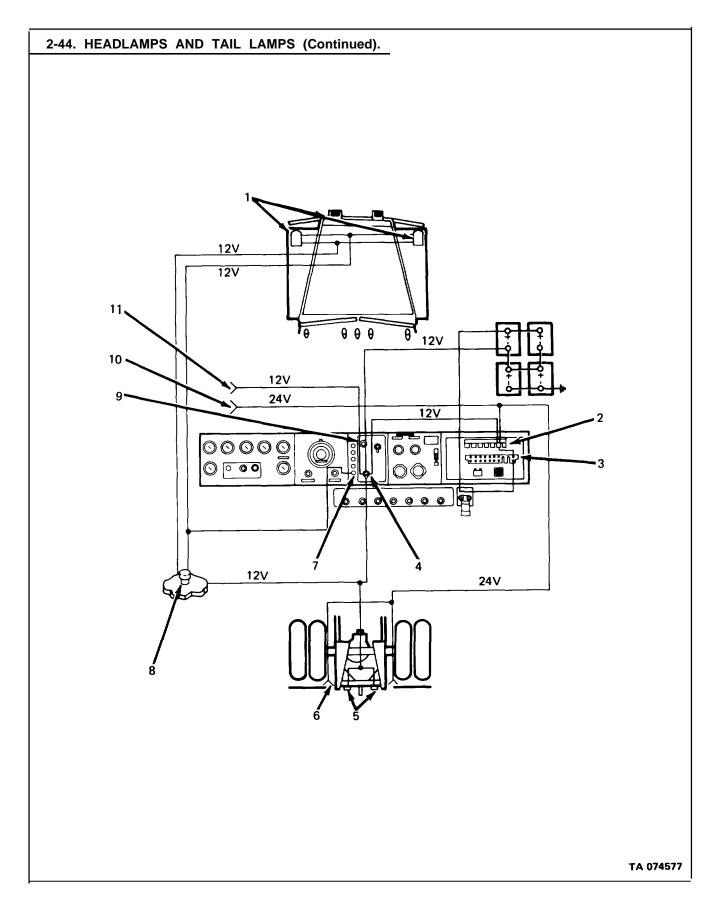
When headlamp switch is on, and operation lamp switch is in NORMAL, battery power is supplied to illuminate the headlamps and tail lamps as well as the trailer tail lamps on the M915, M916, M917, and M920. The trailer tail lamps are powered through tractor chassis receptacles.

- 1. HEADLAMPS. Each assembly has two filaments in a sealed unit, a high beam and a low beam. Selection of high or low beam is controlled by the dimmer switch.
- 2. RELAY (K6). Normally open contacts; energized by 12-volt power from operation lamp switch when in NORMAL and headlamp switch is in on position. When relay is closed, 24-volt power is applied to trailer tail lamps, through circuit breaker and tractor receptacles.
- 3. CIRCUIT BREAKER (CB-8). Protects electrical components of 24-volt relay circuit by opening when load exceeds 20 amps. Automatically recycles until overload is removed.
- 4. OPERATION LAMP SWITCH. Two-position safety switch for NORMAL and BLACKOUT modes of operation. To select mode, switch is pulled out and placed to either position. Set to NORMAL, 12-volt power from the lamp switch passes through operation lamp switch contacts to energize; tail lamps, headlamps (through dimmer switch), and coil of relay. Set to BLACKOUT, 12-volt power is removed from regular service lamps, electric horn, and backup alarm, while 12-volt power from the lamp switch is supplied through the switch to blackout tail lamps, marker lamps, and headlamp.
- 5. TAIL LAMPS. Each assembly contains two bulbs: A double-element bulb provides tail lamp, turn signal lamp, and stop lamp. A separate bulb is used for the backup lamp. The tail lamp circuit is energized through the operation lamp switch when headlamp switch is in either ON position. (The circuits for turn signals, stop lamps, and backup lamps are described in paragraph 2-46 and 2-47).



2-44. HEADLAMPS AND TAIL LAMPS (Continued).

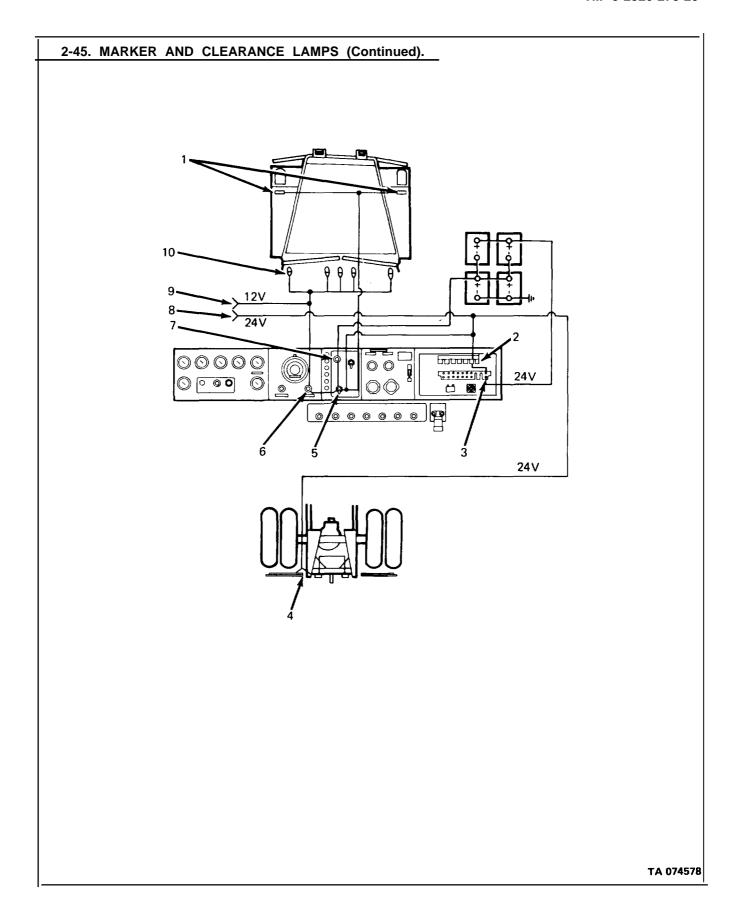
- 6. 24-VOLT TRAILER RECEPTACLE (M915, M916, M917, and M920). Tractor chassis mounted 12-pin connector to provide power to lunette-towed vehicles. (This receptacle is 12-volts on the M917).
- 7. HIGH-BEAM INDICATOR. When power is supplied to each high-beam filament in the headlamps, the high-beam indicator is illuminated via the same circuit.
- 8. DIMMER SWITCH. Two-position, floor-mounted switch. The switch is always closed in one of two positions to energize either the low-beam or high-beam filament.
- 9. HEADLAMP SWITCH. Three-position with one OFF position and two ON positions, When the switch is pulled out to the second detented ON position, 12-volt power is supplied to the lighting systems through operation lamp switch. (The first detented position on the switch energizes the circuit for tail lamps, but not the headlamps.) The switch has an integral circuit breaker that opens to protect the complete circuit in the event of a "short" or faulty wiring. The circuit breaker is a recycling type; that is, it opens when the circuit is overloaded and cycles until the fault is removed.
- 10. 24-VOLT TRAILER RECEPTACLE (M915, M916, and M920). Tractor chassis mounted 12-pin connector, provides 24 volts to trailer for lighting and tail lamps.
- 11. 12-VOLT TRAILER RECEPTACLE (M915, M916, and M920. Tractor mounted sevenpin connector provides 12 volts to trailer for lighting.



2-45. MARKER AND CLEARANCE LAMPS.

When headlamp switch is in either ON position, the operation lamp switch is in NORMAL position, 12-volt power is supplied to illuminate clearance lamps and front marker lamps as well as the trailer marker lamps on M915, M916, M917, and M920 vehicles. The trailer marker lamps receive power through receptacles mounted on the tractor chassis.

- 1. MARKER LAMP ASSEMBLY. Each assembly has two bulbs that illuminate whenever headlamp switch is ON and operation lamp switch is in NORMAL. One bulb is used as a marker lamp, and the other is for turn signals (para 2-46).
- RELAY (K6). Normally open contacts; 12-volt power energizes relay when operation light switch is in NORMAL and headlamp switch is ON. When contacts of relay close, 24 volts from circuit breaker CB-8 is supplied to tractor chassis receptacles.
- CIRCUIT BREAKER (CB-8). Protects electrical components for 24-volt tractor receptacle circuits by opening when load exceeds 20 amps, Automatically recycles until overload is removed.
- 24-VOLT TRAILER RECEPTACLE (M915, M916, M917, and M920). 12-pin connector for 24-volt power used for lunette-towed vehicles. (This receptacle is 12-volts on the M917).
- 5. OPERATION LAMP SWITCH. With the switch set to NORMAL and the headlamp switch ON, 12-volt power is supplied to marker lamps, clearance lamps, and 12-volt tractor receptacle.
- CLEARANCE LAMP SWITCH. Provides the capability of flashing the clearance lamps on the cab and the 12 volt supplied to the tractor receptacle, when switch is depressed and released. 12-volt power is supplied to the switch when headlamp switch is ON and operation switch is in NORMAL.
- 7. HEAD LAMP SWITCH. Supplies 12-volt power, when in either ON position, through operation lamp switch in NORMAL, to clearance lamps, marker lamps, and 12-volt tractor receptacle.
- 8. 24-VOLT TRAILER RECEPTACLE (M915, M916, and M920). 12-pin connector containing 24-volt circuit for trailer marker lamps.
- 9. 12-VOLT TRAILER RECEPTACLE (M915, M916, and M920). Seven-pin connector containing 12-volt circuit for trailer clearance and marker lamps.
- 10. CLEARANCE LAMPS. Each unit has a replaceable single-element bulb that illuminates when headlight switch is in either ON position, and operation lamp switch is in NORMAL. The clearance lamps will flash when clearance lamp switch is depressed and released.



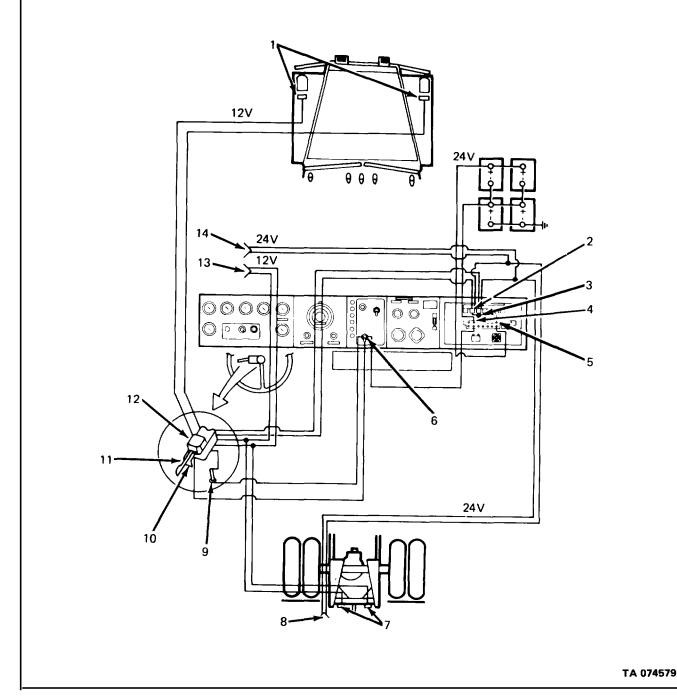
2-46. TURN SIGNAL AND HAZARD WARNING LAMPS.

When the operation lamp switch is in NORMAL position, battery power is applied to the turn signal control to illuminate right or left: front turn signals, rear turn signals as well as trailer turn signals on M915, M916, M917, and M920 vehicles through tractor-mounted receptacles. Also, the turn signal control contains a hazard warning switch, that allows the operator to flash all lamps in the turn signal system simultaneously.

- 1. MARKER AND TURN SIGNAL LAMP ASSEMBLY. Each assembly has a replaceable single filament bulb that flashes when turn signal control or hazard warning switch is on.
- 2. RELAY (K2). Normally open contacts; closed by 12 volts from left turn signal control or hazard warning switch. When relay is energized, 24 volts is applied to tractor mounted receptacles for trailer left turn signals.
- 3. RELAY (K3). Normally open contacts; closed by 12 volts from right turn signal control or hazard warning switch. When relay is energized, 24 volts are applied to tractor mounted receptacles for trailer right turn signals.
- 4. CIRCUIT BREAKER (CB-2). Protects electrical components of flasher, turn signal control, and hazard warning switch circuits by opening when load exceeds 20 amps. Automatically recycles until overload is removed.
- 5. CIRCUIT BREAKER (CB-7). Protects electrical components of 24-volt relay and circuits by opening when load exceeds 20 amps. Automatically recycles until overload is removed.
- 6. OPERATION LAMP SWITCH. Two-position switch for normal and blackout modes of operation. When set to NORMAL, 12-volt battery power from circuit breaker (CB-2) passes through switch contacts to turn signal control, flasher unit, and hazard warning switch.
- 7. REAR TAIL LAMPS. Each assembly contains two bulbs; the tail lamp turn signal and stop lamp circuits all use the same bulb. When either the turn signal control or hazard warning switch are on, the turn signal and stop lamp filaments flash. When the turn signal control is activated, only the bulb on the side selected flashes. If the brakes are engaged at the same time that the hazard warning switch is on, both bulbs flash. When the brakes are engaged and the turn signal control is activated, one bulb will flash and the other bulbs will remain on constantly.
- 8. 24-VOLT TRAILER RECEPTACLE (M915, M916, M917, and M920). Tractor mounted 12-pin connector provides 24 volts power to lunette-towed vehicles. This receptacle is 12-volts on the M917.
- 9. FLASHER UNIT. This unit receives 12-volt power from operation lamp switch in NORMAL position and supplies this power alternately on and off to turn signal control or hazard warning switch when either one is engaged.
- 10. HAZARD WARNING SWITCH. When this switch is engaged, it receives 12-volt power from the operation lamp switch and energizes all components in the turn signal circuits simultaneously.
- 11. TURN SIGNAL CONTROL. When this control is engaged, it receives 12-volt power from flasher unit. (The flasher unit receives 12-volt power through operation lamp switch and circuit breaker CB-2.) Power is then supplied to:
 - a. Front left or right turn signals.
 - b. Rear left or right turn signals.
 - c. 12-volt Trailer Receptacle.
 - d. Relays K2 and K3 (To energize relay and supply power to both tractor mounted 24-volt receptacles for trailer turn signals.)

2-46. TURN SIGNAL AND HAZARD WARNING LAMPS (Continued).

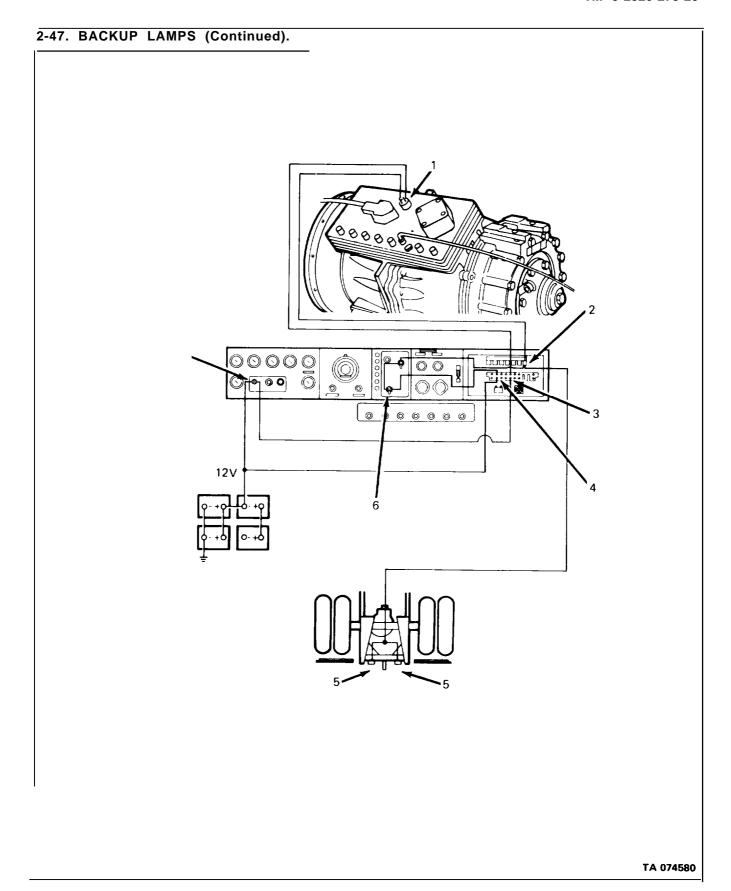
- 12. INDICATOR LAMPS. Three bulbs to indicate left turn (green), right turn (green), or hazard (red). The bulbs are energized, by selection, with 12-volt power from the flasher unit.
- 13. 12-VOLT TRAILER RECEPTACLE (M915, M916, and M920). Tractor mounted seven-pin connector provides 12-volt power to the trailer turn signal lamps.
- 14. 24-VOLT TRAILER Receptacle (M915, M916, and M920). Tractor mounted 12-pin connector provides 24-volts power to the trailer turn signal lamps.



2-47. BACKUP LAMPS.

When the operator places the gear ratio selector lever in reverse position (R1 or R2), air pressure within the transmission closes backup switch. When operation lamp switch in NORMAL position and engine run switch ON, the circuit is energized to illuminate each backup bulb in tail lamp assembly.

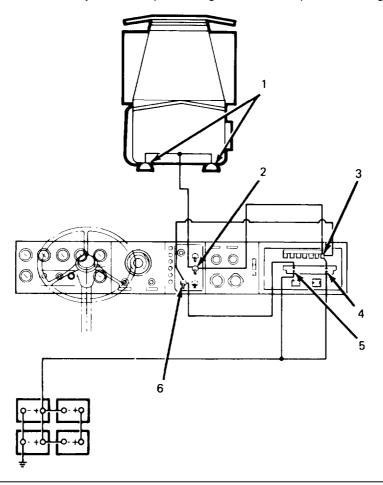
- 1. BACKUP SWITCH. The switch is normally open. When closed, it receives 12-volt battery power through circuit breaker CB-5 and supplies power through normally closed contacts of relay K7 to energize backup lamps in tail lamp assemblies.
- 2. RELAY (K7). The relay is normally closed. When the operation lamp switch is placed to BLACKOUT position, 12-volt power is supplied to coil of K7, energizing the relay, and opens the contacts. This prevents the backup lamps from coming on whenever the operation lamp switch is in BLACKOUT mode.
- 3. CIRCUIT BREAKER (CB-5). Protects electrical components of backup switch circuit by opening when load exceeds 20 amps. Automatically recycles until overload is removed.
- 4. CIRCUIT BRAKER (CB-2). Protects electrical components of relay K7 circuits by opening when load exceeds 20 amps. Automatically recycles until overload is removed.
- 5. TAIL LAMP. Each assembly contains two bulbs: A tail, turn signal, and stop lamp bulb which contain two filaments and backup bulb which contains one filament. When the backup switch closes, the backup lamp illuminates.
- 6. OPERATION LAMP SWITCH. Two-position switch for NORMAL AND BLACKOUT modes of operation. In this circuit, the switch is used to prevent operation of the backup lamp. In BLACKOUT position, 12-volt power from circuit breaker CB-2 passes through the switch and energizes coil of relay K7, thus preventing the backup lamps from possibly coming on.
- 7. ENGINE RUN SWITCH. This switch controls 12-volt power to the backup switch through circuit breaker CB-5. When the switch is off the backup lamp circuit is de-energized.



2-48. WORK LAMPS (M916 AND M920).

When the operation switch is in NORMAL position, and the operator places the work lamps switch to ON, 12-volt power is supplied to the work lamps on the M916 and M920 vehicles.

- 1. WORK LAMPS. Each assembly contains a single filament sealed beam unit. When the operation switch is in NORMAL and the work lamps switch is ON, the work lamps come on.
- 2. WORK LAMPS SWITCH. Two-position switch for ON and OFF mode of operation. When the switch is ON, 12-volt power is supplied through CB-2, normally closed contacts of relay K8, to the work lamps.
- 3. RELAY (K8). The relay is normally closed. When the operation switch is placed to BLACK-OUT, 12-volt power is supplied to coil of K8, energizing the relay, and opens the contacts. This prevents the work lamps from coming on whenever the operation switch is in the BLACKOUT mode.
- 4. CIRCUIT BREAKER (CB-9), Protects electrical components of work lamps circuit by opening when load exceeds 20 amps. Automatically recycles until overload is removed.
- 5. CIRCUIT BREAKER (CB-2). Protects electrical components of relay K8 circuits by opening when load exceeds 20 amps. Automatically recycles until overload is removed.
- 6. OPERATION SWITCH. Two-position switch for NORMAL and BLACKOUT modes of operation. In this circuit, the switch is used to prevent operation of the work lamps. In BLACKOUT position, 12-volt power from circuit breaker CB-2 passes through the switch and energizes coil of relay K8, thus preventing the work lamps from being turned on.



TA 074581

This page intentionally left blank.

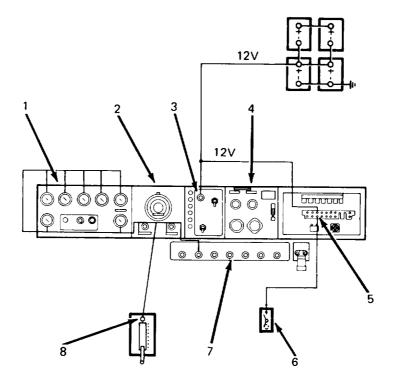
2-49. INSTRUMENT AND CAB DOME LAMPS.

- a. With the headlamp switch in either ON position, the instrument lamps illuminate. The dome lamp illuminates whenever the dome lamp switch is ON.
- b. The low air pressure warning lamp on left-hand cluster, clearance lamp on center cluster and six indicator lamps on the right-hand cluster are described with their respective circuits in this chapter, That is, the high engine temperature warning indicator is described with the cooling system; low oil pressure warning indicator with the oil system, etc., (see table of contents).
- 1. LEFT HAND INSTRUMENT CLUSTER, The instrument gage lamps on this panel receive 12-volt power from headlamp switch when it is in either ON position, Each gage contains its own illumination bulb.
- 2. CENTER INSTRUMENT CLUSTER. The center cluster contains the tachograph which is illuminated when the headlamp switch is in either ON position.
- 3. HEADLAMP SWITCH. Three-position switch with one OFF position and two ON positions, In either ON position, 12-volt battery power passes through the switch to energize the following lamp in this circuit:
 - a. Instrument lamps on left-hand instrument cluster.
 - b. Clearance switch and tachograph illumination lamps on center cluster.
 - c. Switch and functional indicators on right-hand instrument cluster.
 - d. Illumination lamps on heater panel.
 - e. Illumination lamps on ratio selector.

The headlamp switch has a variable rheostat that allows the operator to adjust the brightness of all lamps in this circuit by turning the switch knob.

- 4. RIGHT-HAND INSTRUMENT CLUSTER. The instrument lamps on this cluster receive 12-volt power from the headlamp switch and illuminate the windshield wiper, and windshield washer indicator.
- 5. CIRCUIT BREAKER (CB-3). Protects electrical components of dome lamp circuit by opening when load exceeds 20 amps. Automatically recycles until overload is removed.
- 6. DOME LAMP AND SWITCH ASSEMBLY. When the assembly integral switch is ON, the lamp is energized by 12-volt battery power through circuit breaker (CB-3).
- 7. HEATER PANEL LAMPS. When the headlamp switch is in either ON position, the lamps are energized by 12-volt battery power and illuminates the heater control panel.
- 8. GEAR RATIO SELECTOR LAMP. When the headlamp switch is in either ON position, the lamp is energized by 12-volt battery power and illuminates the gear ratio selector.

2-49. INSTRUMENT AND CAB DOME LAMPS (Continued).



TA 074582

Section XVIII BLACKOUT LIGHTING SYSTEM

2-50. INTRODUCTION.

The blackout lighting system prevents operation of the horn, backup alarm, and all service lighting (para 2-43), except instrument lamps, and dome lamp. The system provides the following intensity lighting for blackout operation on all M915 series vehicles:

- a. One headlamp.
- b. Two front marker lamps.
- c. Two tail and stop lamps.
- d. Trailer tail, stop, and marker lamps on M915, M916, M917, and M920 at the 12-pin trailer receptacles.

2-51. BLACKOUT LIGHTING SYSTEM.

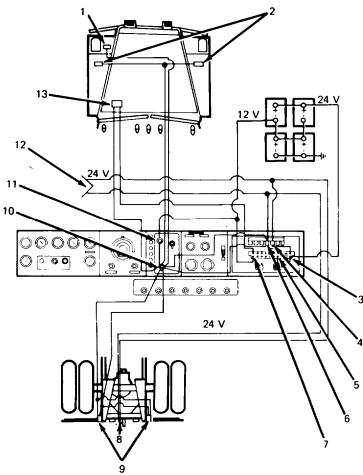
NOTE

In reading the following component description you should remember that the OPERATION switch is in BLACKOUT position.

- 1. BLACKOUT HEADLAMP. The lamp consists of a single, replaceable sealed beam unit. With the headlamp switch in the ON position, the blackout headlamp is energized by a 12-volt battery power.
- 2. BLACKOUT MARKER LAMPS. Each lamp consists of a replaceable bulb which is energized by 12-volt battery power when the headlamp switch is in either ON position.
- CIRCUIT BREAKER (CB-8). Protects electrical components for 24-volt blackout stop lamp relay circuit by opening when load exceeds 20 amps. Automatically recycles until overload is removed.
- 4. RELAY (K5). Normanlly open contacts: Closed by 12-volt power when the operation switch is in BLACKOUT. When relay is energized, 24-volt power is supplied from circuit breaker CB-7 through 24-volt trailer receptacle for blackout tail lamps.
- CIRCUIT BREAKER (C B-7). Protects electrical components for 24-volt blackout tail lamp relay circuit by opening when load exceeds 20 amps. Automatically recycles until overload is removed.
- 6. RELAY (K4). Normanlly open contacts: Closed by 12-volt power when the operation switch is in BLACKOUT. When relay is energized, 24-volt power is supplied from circuit breaker CB-8 through 24-volt trailer receptacle.
- 7. CIRCUIT BREAKER (CB-1). Protects electrical components for stop switch circuit by opening when load exceeds 20 amps. Automatically recycles until overload is removed.
- 8. 24-VOLT TRAILER RECEPTACLE (M915, M916, M917, and M920). Tractor mounted 12-pin connector to provide 24-volt battery power to lunette towed trailers for blackout tail and stop lamps. This receptacle is 12-volts on M917.

2-51. BLACKOUT LIGHTING SYSTEM (Continued).

- REAR BLACKOUT LAMPS. Contains the bulbs for blackout tail and stop lamps. The blackout tail lamp is energized when the operation switch is in BLACKOUT and the headlamp switch is in either ON position. The stop lamps are energized when the stop lamp switch is actuated.
- OPERATION LAMP SWITCH. Two-position switch for NORMAL and BLACKOUT modes
 of operation. With this switch in the BLACKOUT position, 12-volt battery power is available from the headlamp switch to energize: blackout headlamp, marker lamps, tail lamps,
 and relay K4 and K5.
- 11. HEADLAMP SWITCH, Three-position switch with one OFF position and two ON positions. The switch supplies 12-volt battery power to the OPERATION lamp switch.
- 12. 24-VOLT TRAILER RECEPTACLE (M915, M916, and M920). Tractor mounted 12-pin connector to provide 24-volt battery power to trailer blackout tail and stop lamps.
- 13. STOP LAMP SWITCH. The stop lamp switch is part of the brake system and is shown and described in paragraph 2-63. In this circuit, the switch receives 12-volt battery power from circuit breaker CB-1. When the brakes are engaged, the switch closes and supplies 12-volt power through the operation lamp switch to energize relay K4. With this relay closed, 24-volt battery power is supplied through circuit breaker CB-8 to the 24-volt tractor mounted trailer receptacles.



TA 074583

Section XIX INSTRUMENTATION

2-52. INTRODUCTION.

Table 2-1 lists the instruments and major input connections for all M915 thru M920 vehicles. Connections for instrument gage lamps have been omitted. (See wiring diagram in Appendix D.) You will find an illustration or schematic diagram for each listed instrument by using the Reference/ Illustration column of the table.

Table 2-1. Instruments.

Instrument	Input Connections	Reference Illustration (Para)
TACHOGRAPH	Tachometer cable from fuel pump on engine provides engine speed input.	2-7
	Speed cable from transmission provides vehicle speed input.	2-12
	GRAY/RED (ILLUMINATION)	
	BROWN-GND BROWN/BLACK-	
	BLACK (POWER)	
FRONT WHEEL BRAKE AIR PRESSURE GAGE	Pneumatic line from front brake system.	2-62
REAR WHEEL BRAKE AIR PRESSURE GAGE	Pneumatic line from rear brake system.	2-62
PUSHER AXLE AIR PRESSURE GAGE (M917, M919, M920)	Pneumatic line from air bag pressure system.	2-16
VOLTMETER	Power wire from circuit breaker.	2-42
FUEL GAGE	Signal wire from sending unit in fuel tank.	2-24
	Power wire from circuit breaker.	
OIL PRESSURE GAGE	Signal wire from sending unit on engine.	2-28
	Power wire from circuit breaker.	
WATER TEMPERA- TURE GAGE	Signal wire from temperature transmitter on engine.	2-33
	Power wire from circuit breaker.	
TRANSMISSION	Signal wire from sending unit on transmission.	2-12
OIL TEMPERATURE	Power wire from circuit breaker.	

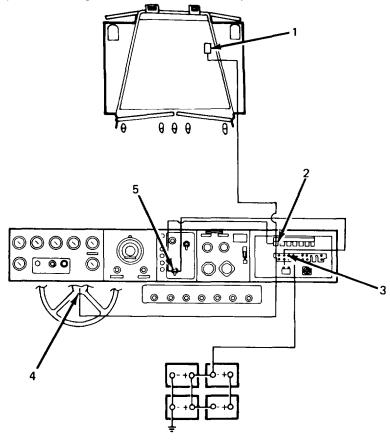
Section XX ELECTRIC HORN

2-53. INTRODUCTION.

The electric horn circuit is identical on all M915 thru M920 vehicles.

2-54. ELECTRIC HORN

- 1. ELECTRIC HORN. The horn is energized by 12-volt battery power when horn button is depressed and operation lamp switch is in NORMAL position.
- 2. RELAY (K1). When horn button is depressed, coil of relay is energized by 12-volt battery power from circuit breaker. With relay de-energized, 12 volts are supplied from a second lead from circuit breaker, through operation lamp switch, through contacts of relay to horn.
- 3. CIRCUIT BREAKER (CB-2) Protects electrical components of horn circuit by opening when load exceeds 20 amps. Automatically recycles until overload is removed.
- 4. HORN BUTTON. Pushing this button activates the horn circuit and energizes the horn.
- 5. OPERATION LAMP SWITCH. Two-position switch for normal and blackout modes of operation. With switch set to NORMAL and horn button depressed, 12-volt battery power from circuit breaker passes through switch contacts to relay.



Section XXI CAB HEATING AND VENTILATING SYSTEMS

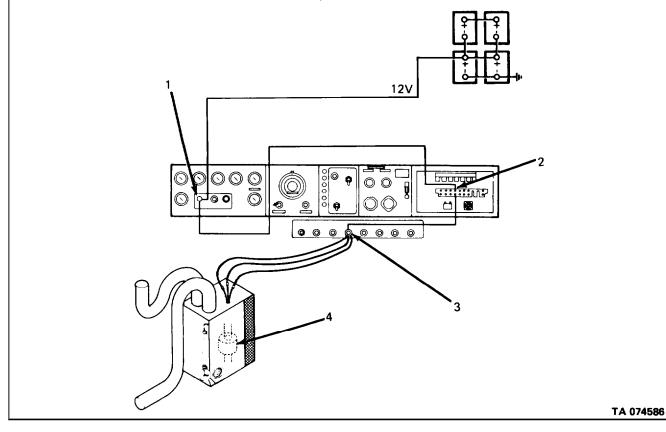
2-55. INTRODUCTION.

The cab heating and ventilating system are identical in all M915 thru M920 vehicles. This system is comprised of:

- a. Heater Electrical Control
- b. Heater Water Controls
- c. Ventilating System

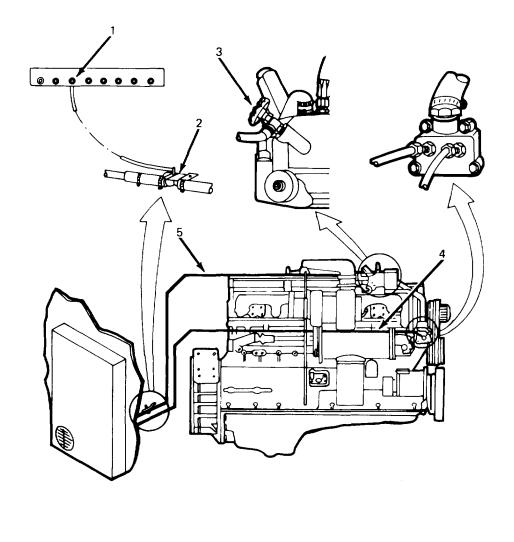
2-56. HEATER ELECTRICAL CONTROLS.

- 1. ENGINE RUN SWITCH. Controls 12-volt battery power to heater fan switch. When switch is OFF, fan cannot be actuated.
- 2. CIRCUIT BREAKER (CB-4). Protects electrical components of heater fan switch by opening when load exceeds 20 amps. Automatically recycles until overload is removed.
- FAN SWITCH. Four-position switch with three ON positions. Supplies 12-volt battery power through circuit breaker (CB-4) to motor. Current flow increases as switch is moved from LOW to MEDIUM to HIGH.
- 4. MOTOR. Powers heater fan. Actuated by current from heater fan switch.



2-57. HEATER WATER CONTROLS.

- 1. HEATER KNOB. Allows operator to regulate flow of coolant through control valve.
- 2. CONTROL VALVE. Controls heater temperature by regulating flow of hot water to heater core. Cable from heater knob in cab opens valve as knob is pulled out. Valve is spring-loaded to close as knob is pushed in. Some water passes through this valve even when it is fully closed.
- 3. HEATER SHUTOFF VALVE. Supplies coolant to control valve. Manual shutoff handle allows complete cutoff of coolant flow to heater.
- 4. HEATER RETURN TUBE. Carries coolant from heater to water pump.
- 5. HEATER SUPPLY TUBE. Carries coolant from control valve to heater.



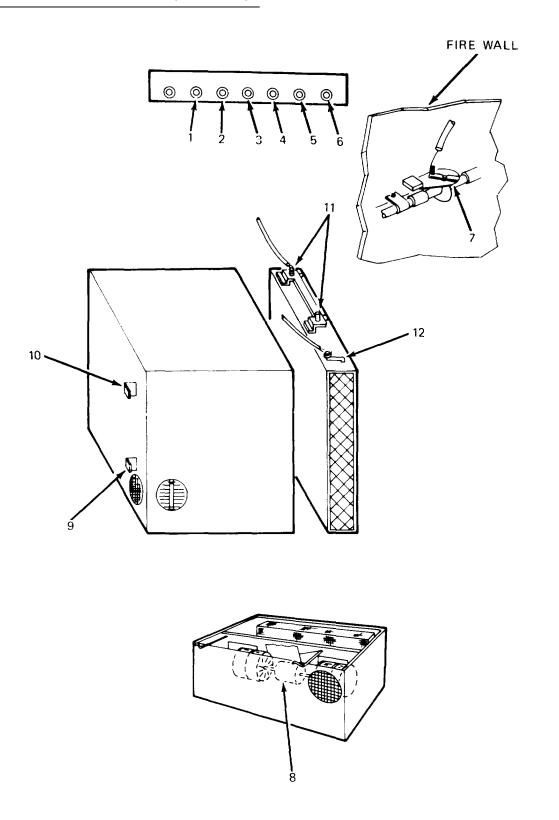
2-58. VENTILATING SYSTEM.

NOTE

The driver's fresh air vent is a manually operated unit mounted in the lower cowl side of the cab. It is not serviced at the organizational level.

- HEAT CONTROL KNOB. Allows driver to heat cab, Connected by cable to water control
 valve.
- 2. FAN CONTROL SWITCH. Allows driver to control amount of heat in cab. Connected by electrical wires to heater motor.
- 3. DRIVER HEAT KNOB. Allows driver to open or close heat vent for his side of cab. Connected by cable to heat control lever.
- 4. PASSENGER HEAT KNOB. Allows passenger to open or close heat vent for his side of cab. Connected by cable to heat control lever.
- 5. FRESH VENT CONTROL KNOB. Allows driver to control fresh air vent on passenger side. Connected by cable to vent control lever.
- 6. RECIRCULATION VENT CONTROL KNOB. Allows driver to recirculate cab air through heater. Connected by cable to recirculation control lever.
- 7. WATER CONTROL VALVE. Allows flow of water through heater core. Actuated by cable from heat control knob.
- 8. HEATER MOTOR. Drives fan for distributing heat. Actuated by fan control switch.
- 9. HEAT CONTROL LEVER. Actuates flap at heat vent for passenger. Connected by cable to passenger pull knob.
- 10. HEAT CONTROL LEVER. Actuates flap at heat vent for driver. Connected by cable to driver pull knob.
- 11. RECIRCULATION CONTROL LEVER. Actuates shutter inside heater. Connected by cable to recirculation vent control knob.
- 12. FRESH VENT CONTROL LEVER. Actuates shutters at fresh air vent. Connected by cable to fresh vent control knob.

2-58. VENTILATING SYSTEM (Continued).



Section XXII COMPRESSED AIR SYSTEM

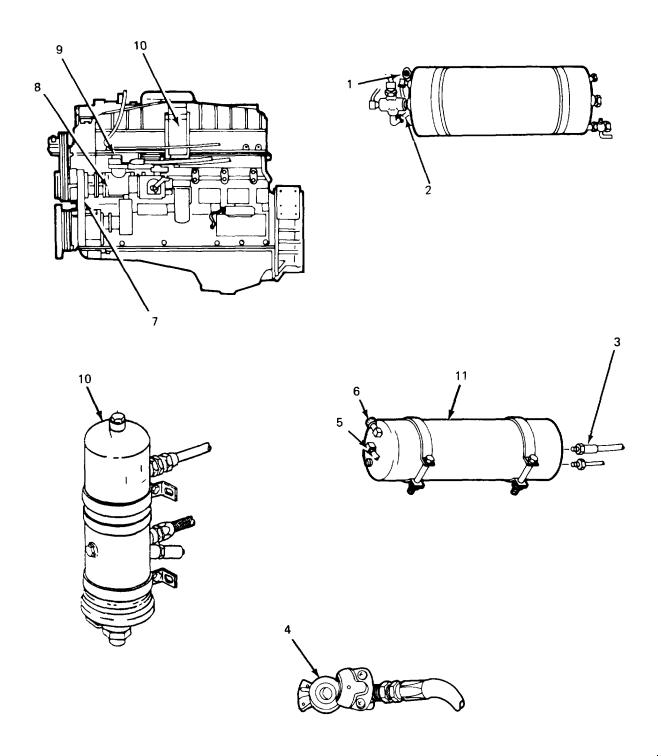
2-59. INTRODUCTION.

The compressed air supply system is the same in all M915 thru M920 vehicles.

2-60. COMPRESSED AIR SYSTEM.

- 1. SAFETY VALVE. Vents air when pressure in supply tank rises above 150 psi (1,034 kPa).
- 2. TRANSMISSION CONTROL LINE. Air supply to ratio selector valve in cab. (see para 2-12).
- 3. CHECK VALVE. One-way valve prevents air from flowing out of supply air reservoir back to compressor.
- 4. EXTERNAL AIR COUPLINGS. Tractor to trailer couplings are provided on M915, M916, and M920 models. All models are equipped with front external air couplings for brake use when the vehicle must be towed, Rear external air couplings are provided on M915, M916, M917 and M920 for brake actuation of a disabled vehicle being towed.
- 5. PRIMARY RESERVOIR LINE. Carries air from primary tank to supply reservoir.
- 6. TIRE INFLATION AIR HOSE FITTING. Used in conjunction with the tire inflation air hose and chuck.
- 7. ACCESSORY DRIVE. Provides power to operate compressor.
- 8. COMPRESSOR. Draws air from cleaner, compresses it, and directs it to supply air reservoir.
- 9. COMPRESSOR GOVERNOR. Opens unloading valve to vent air before compression when pressure in supply tank is above 105-125 psi (724-826 kPa).
- 10. AIR DRYER. Air from compressor is dried and contaminants are removed before entering the system.
- 11. SUPPLY AIR RESERVOIR. Receives compressed air from compressor.

2-60. COMPRESSED AIR SYSTEM (Continued).



Section XXIII BRAKE SYSTEM

2-61. INTRODUCTION.

The brakes on all M915 thru M920 vehicles are actuated by the compressed air system (para 2-60).

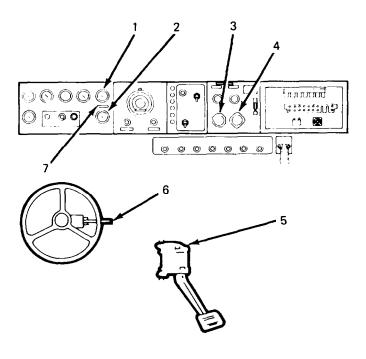
The system is comprised basically of valves and controls for dual air brakes (service and emergency). "S"- type cam brakes with two air chambers are used in the rear on all models and on the pusher axle (Models M917, M919 and M920). Wedge-type brakes with one air chamber (M916 thru M920) or two air chambers (M915 only), are used in the front. (See illustration and description of each type of brake in paragraphs 2-65 thru 2-70).

(Refer to section XXIV for description of auxiliary air powered systems.)

This section is divided into three parts: controls, switches and indicators, and system components. Since the number of air reservoirs and the arrangement of valves and lines differs with each vehicle model, a separate arrangement drawing is provided for each in paragraphs 2-65 thru 2-70. (See Appendix D for a piping schematic diagram of each vehicle model.)

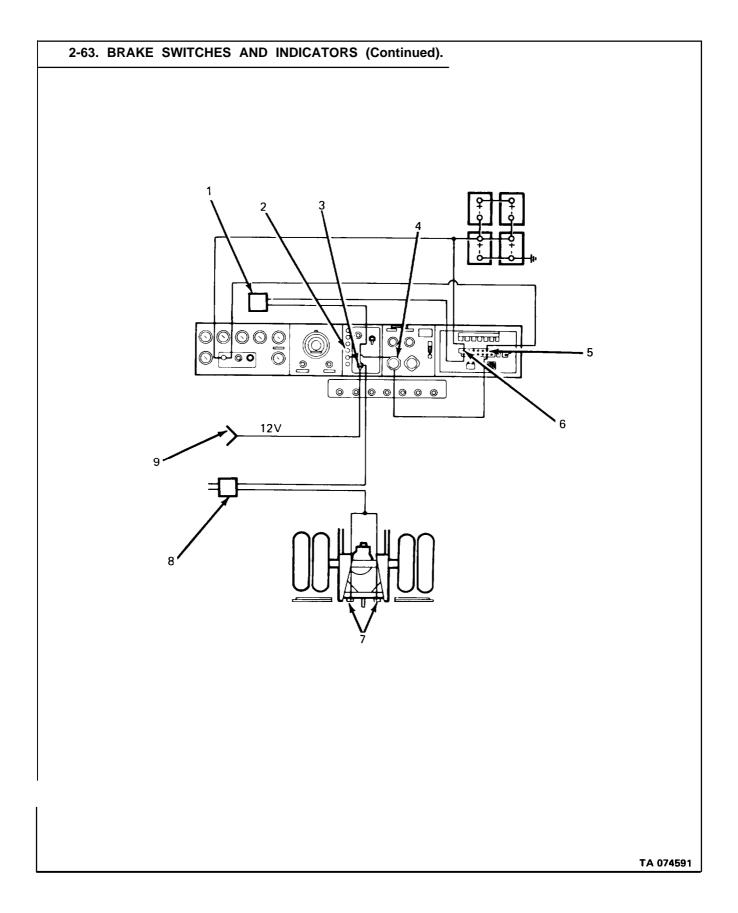
2-62. CONTROLS.

- REAR AIR PRESSURE GAGE. Direct pressure gage indicates air pressure in rear service reservoir.
- 2. FRONT AIR PRESSURE GAGE. Direct pressure gage indicates air pressure in front service reservoir.
- 3. TRAILER EMERGENCY BRAKE VALVE. In applied position, supplies pressure to trailer service and emergency air lines.
- 4. PARKING BRAKE VALVE. Normally supplies pressure holding spring brakes in compressed position. When knob is pulled out, valve exhausts air pressure, allowing spring brakes to apply.
- 5. DUAL BRAKE VALVE. Applies front and rear service brakes at the same time when brake pedal is pushed.
- 6. TRAILER BRAKE HAND CONTROL (M915, M916 and M920). Applies trailer brakes only. Opens connection between air supply reservoir and trailer service brake lines as it is turned clockwise.
- 7. LOW AIR PRESSURE WARNING INDICATOR (12-volt). Circuit normally held open, by air pressure. Closes to activate control panel indicator when pressure drops below 70 psi.



2-63. BRAKE SWITCHES AND INDICATORS.

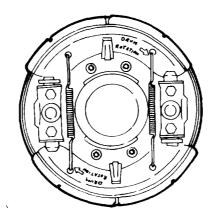
- STOP LAMP SWITCH. Normally open air actuated switch, which closes when brakes are
 actuated. The switch receives 12-volt battery power from circuit breaker CB-1 and supplies
 this power through the operation switch in NORMAL position, turn signal control to the
 tractor tail stop lamps. Also, with switch closed, 12-volt battery power is routed through
 the operation switch to the 12-volt trailer receptacle.
- PARK BRAKE INDICATOR. Illuminates when the park brakes are applied. Indicator receives 12-volt battery power through engine run switch in ON position, circuit breaker CB-6, and actuated parking brake switch.
- 3. OPERATION LAMP SWITCH. Two-position switch for NORMAL and BLACKOUT modes of operation. With the switch set to NORMAL, 12-volt battery power is received from closed stop lamp switch, and circuit breaker CB-1. This 12-volt power is supplied through the turn signal control to the tractor tail stop lamp. 12-volt power is also supplied to the 12-volt trailer receptacle.
- 4. PARK BRAKE SWITCH. Normally open, air actuated switch on parking brake (para 2-62). Closes to energize park brake indicator when parking brakes are actuated.
- 5. CIRCUIT BREAKER (CB-6). Protects electrical components of parking brake circuit by opening when load exceeds 20 amps. Automatically recycles until overload is removed.
- 6. CIRCUIT BREAKER (CB-1), Protects electrical components of stop lamp circuit by opening when load exceeds 20 amps. Automatically recycles until overload is removed.
- 7. STOP TAIL LAMPS. Unit contains two bulbs, a single-filament bulb for backup, and a two-filament bulb for tail, turn signal, and stop lamps. The stop lamps receive 12-volt power through circuit breaker CB-1, closed stop lamp switch, closed contacts of operation switch, and the turn signal control.
- 8. CIRCUIT BREAKER (CB-6). Protects electrical components of parking brake circuit by opening when load exceeds 20 amps. Automatically recycles until overload is removed.
- 9. 12-VOLT TRAILER RECEPTACLE. When the stop lamp switch is closed and the operation switch is in NORMAL, 12-volt battery power is supplied to the tractor mounted receptacle for trailer stop lamps.



2-64. SYSTEM COMPONENTS.

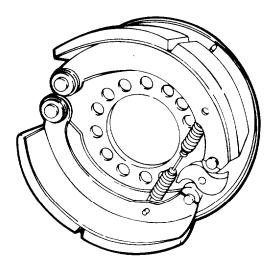
This paragraph describes and illustrates the major components that comprise the brake system in the M915 series vehicles.

- a. Wedge Brakes.
- b. "S"- Type Cam Brake.
- c. Air Chambers.
- d. Reserve Air Reservoir. (Supply reservoir is described in compressed air system, para 2-60).
- e. Relay Valve.
- f. Double-Check Valve.
- g. Quick-Release Valve.
- h. Limiting Valve.
- A. WEDGE BRAKES. Used on front wheels of all six vehicle models.

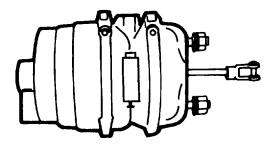


2-64. SYSTEM COMPONENTS (Continued).

B. "S"- TYPE CAM BRAKE. Used on rear tandem axle inside wheels on all six models and pusher axle wheel on M917, M919 and M920.

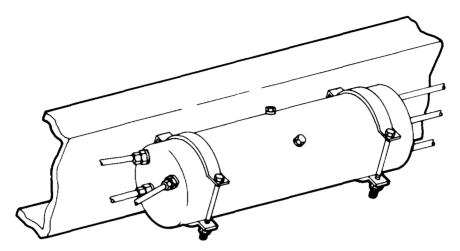


- C. AIR CHAMBER. Two used on each rear tandem axle of all vehicle models. Spring loaded brake applies when air pressure drops due to:
 - 1. compressed air system failure.
 - 2. engine shutdown.
 - 3. application of park brakes.

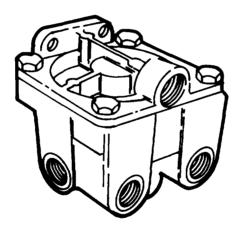


2-64. SYSTEM COMPONENTS (Continued).

D. RESERVE AIR RESERVOIR. Two reserve air reservoirs are used on M915, M916, and M918; three on M917, M919, and M920. (See illustrations in para 2-65 thru 2-70.)

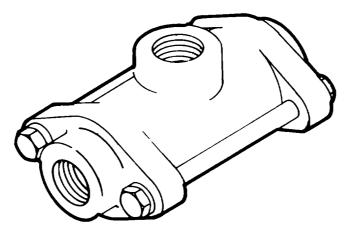


E. RELAY VALVE. Pressure from cab brake valves control flow of air from brake reservoirs to rear axle brake chambers. Applies rear brakes faster and more firmly than if they were actuated directly by air pressure in control lines from cab.

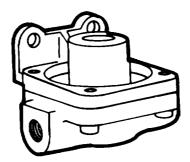


2-64. SYSTEM COMPONENTS (Continued).

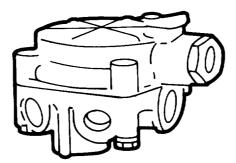
F. DOUBLE-CHECK VALVE. Directs air flow from either of two inlet lines into a single outlet line.

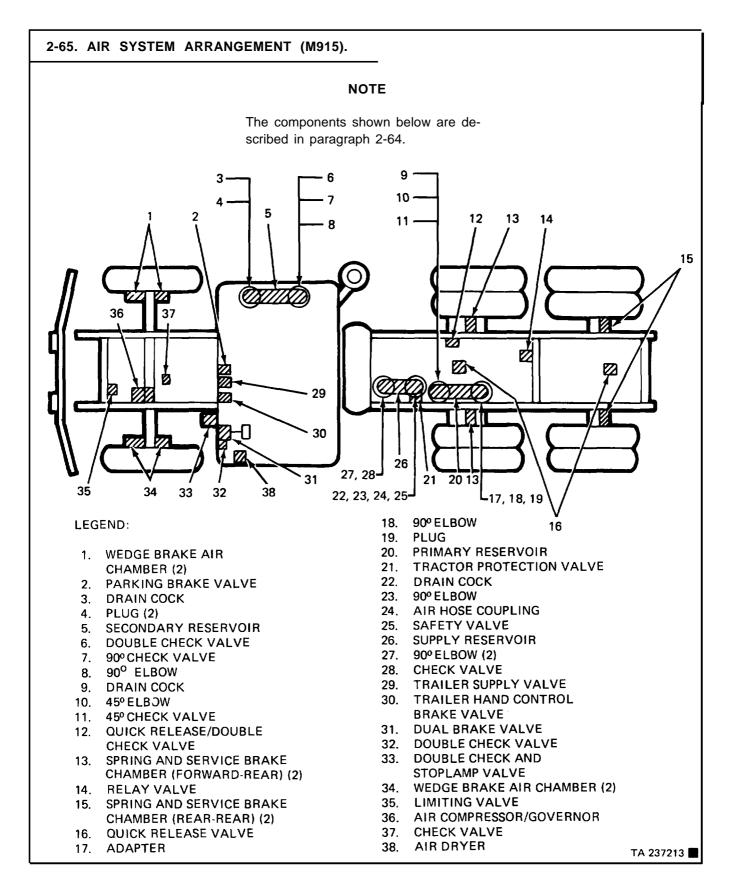


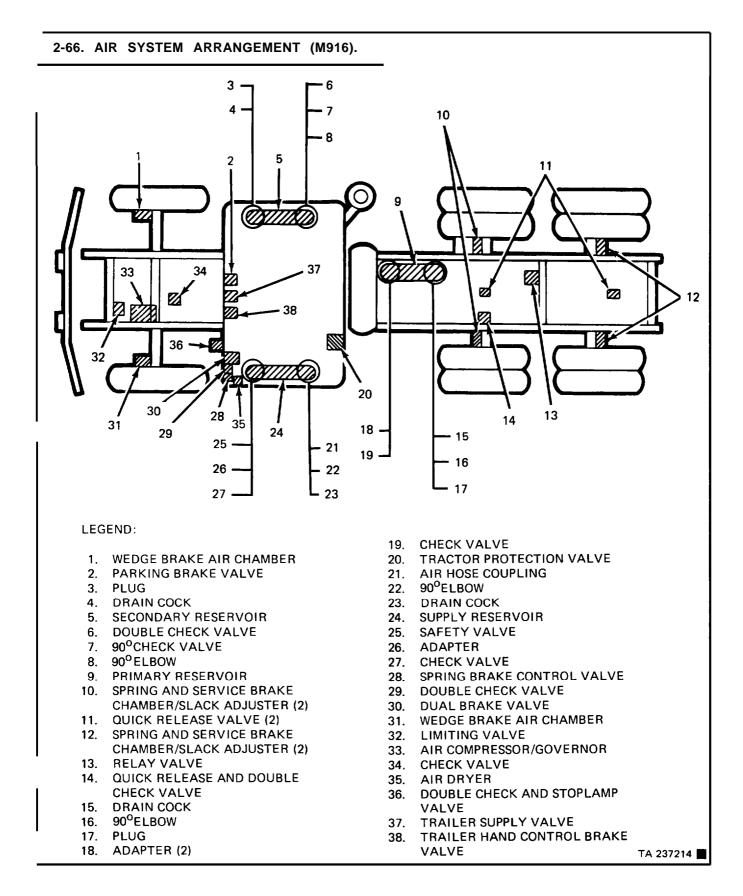
G. QUICK-RELEASE VALVE. Vents air from rear brake system when operator releases brake.



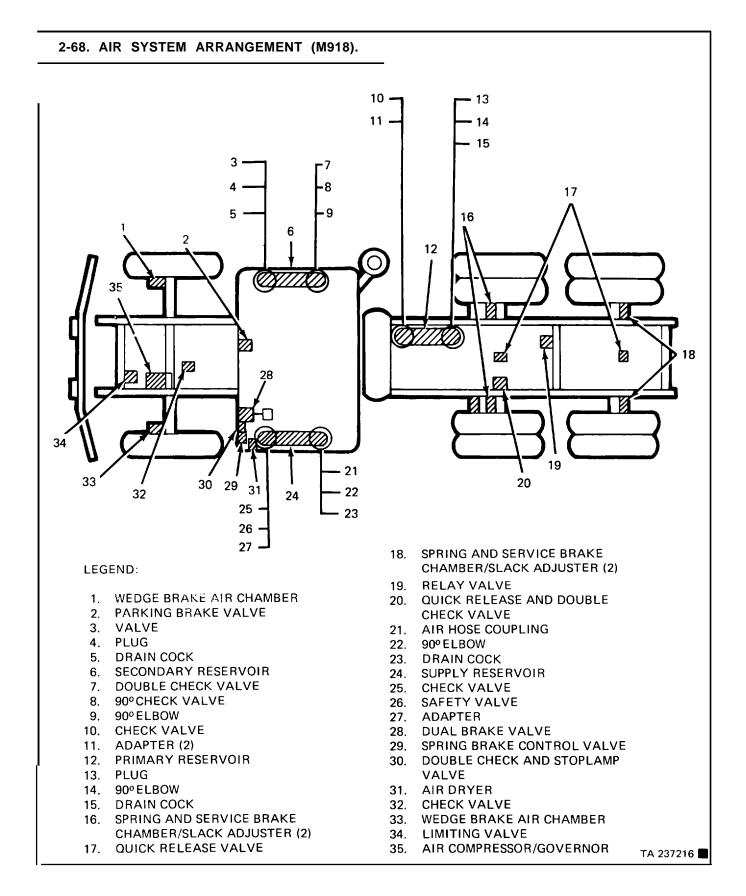
H. LIMITING VALVE. Directs air pressure from a single incoming line to brakes on both sides of truck.

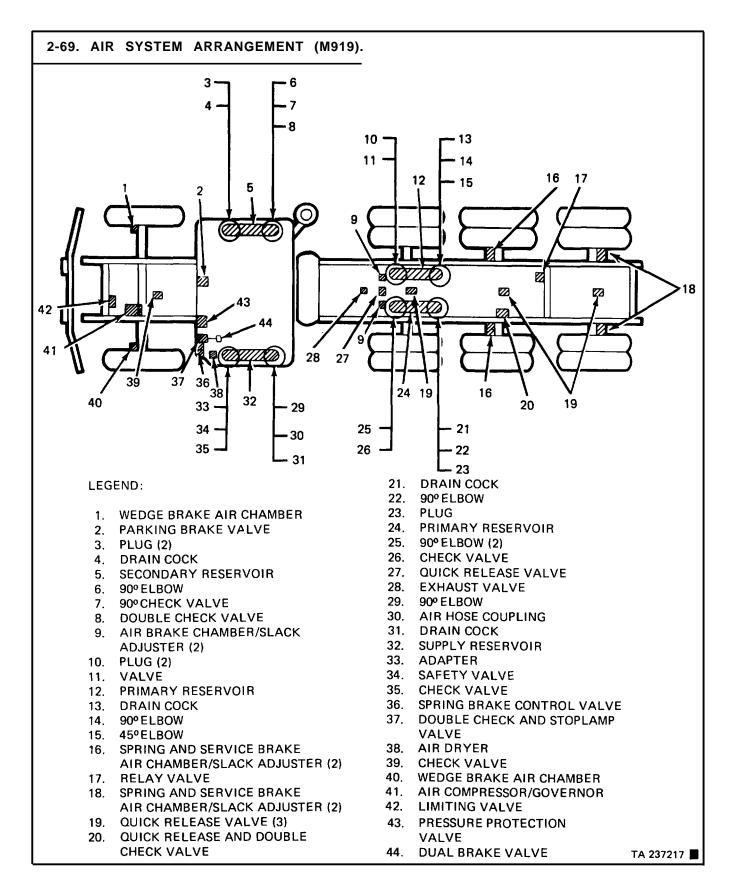


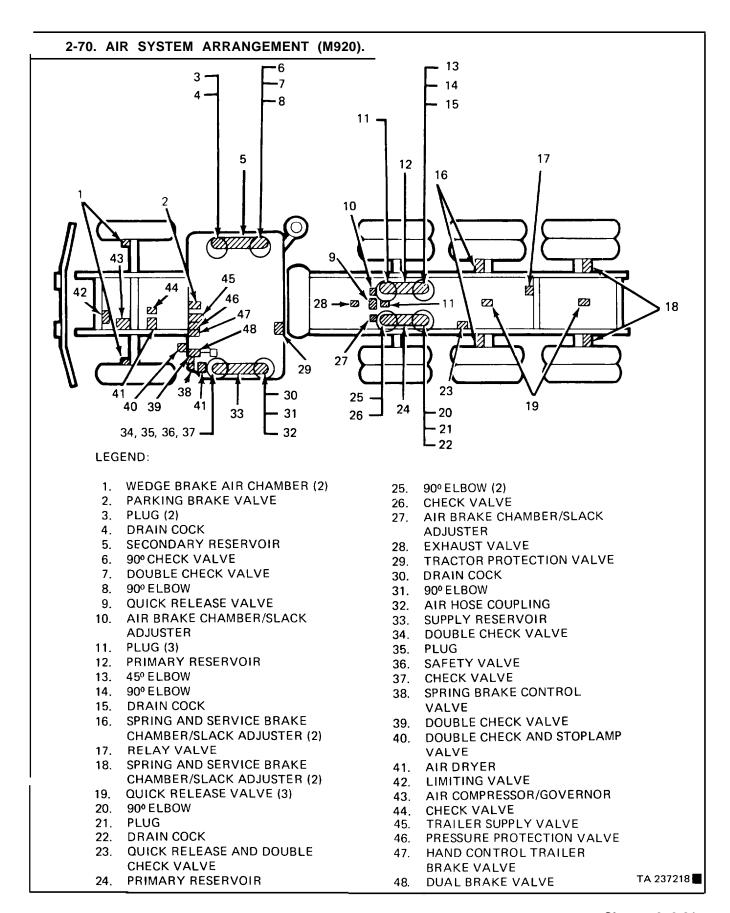




2-67. AIR SYSTEM ARRANGEMENT (M917). 6 12 10 13 8 14 11 15 5 9 41 43 25 → 22 16 26 9 38 37 27 22 18 35 36 17 31 46 19 23 -28 32 • 20 33 • 29 - 21 24 -34 30 LEGEND: 22. PRIMARY RESERVOIR 23. CHECK VALVE 1. WEDGE BRAKE AIR CHAMBER 24. 90° ELBOW (2) 2. PARKING BRAKE VALVE 25. **EXHAUST VALVE** 3. PLUG (2) 26. QUICK RELEASE VALVE 4. DRAIN COCK 27. TRACTOR PROTECTION VALVE 5. SECONDARY RESERVOIR 28. DRAIN COCK 6. DOUBLE CHECK VALVE 29. 90º ELBOW 7. 90° CHECK VALVE 30. AIR HOSE COUPLING 90° ELBOW 31. SUPPLY RESERVOIR 9. AIR BRAKE CHAMBER/SLACK 32. CHECK VALVE ADJUSTER (2) 33. ADAPTER 10. PLUG (3) 34. SAFETY VALVE 11. PRIMARY RESERVOIR 35. SPRING BRAKE CONTROL VALVE 12. 45° ELBOW (2) 36. DOUBLE CHECK VALVE 13. DRAIN COCK 37. **DUAL BRAKE VALVE** 14. SPRING AND SERVICE BRAKE 38. DOUBLE CHECK AND STOPLAMP CHAMBER/SLACK ADJUSTER (2) VALVE 15. RELAY VALVE 39. WEDGE BRAKE AIR CHAMBER SPRING AND SERVICE BRAKE 40. LIMITING VALVE CHAMBER/SLACK ADJUSTER (2) 41. AIR COMPRESSOR/GOVERNOR 17. QUICK RELEASE VALVE (3) 42. CHECK VALVE 18. QUICK RELEASE AND 43. TRAILER SUPPLY VALVE TRAILER HAND CONTROL BRAKE DOUBLE CHECK VALVE DRAIN COCK VALVE 20. PLUG 45. PRESSURE PROTECTION VALVE 21. 45° ELBOW 46. AIR DRYER TA 237215







Section XXIV AUXILIARY AIR-POWERED SYSTEMS

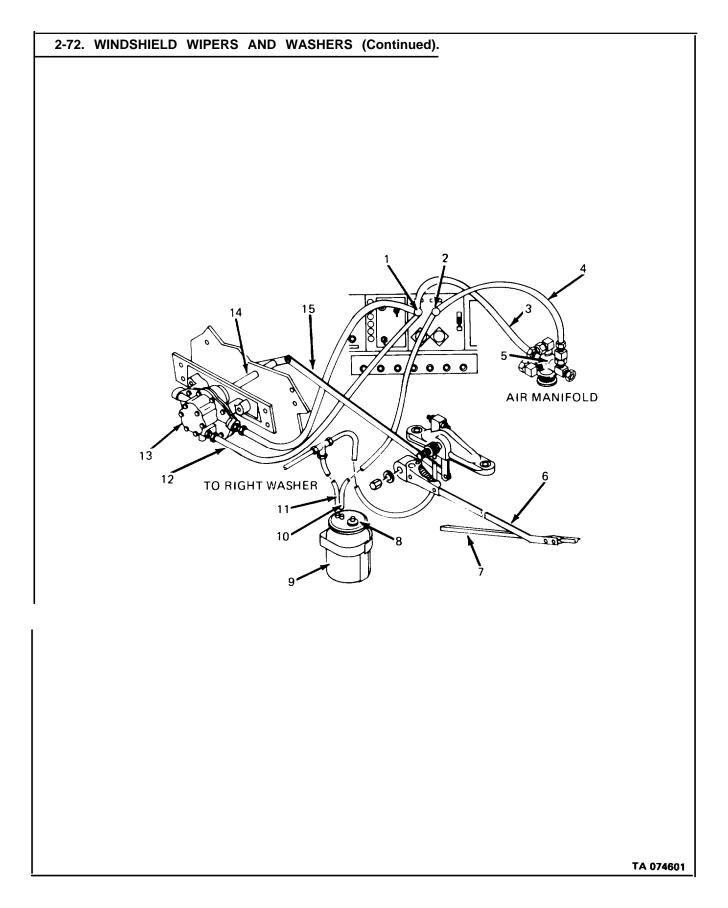
2-71. INTRODUCTION.

Air pressure from the compressed air system is used for the following: (Brakes are covered in section XXIII.)

- a. Transmission and Controls (para 2-12).
- b. Power Transfer Case (para 2-14).
- c. Pusher Axle (para 2-16).
- d. Windshield Wipers (para 2-72).
- e. Air Horn (para 2-73).
- f. Fan Clutch Control (para 2-74).

2-72. WINDSHIELD WIPERS AND WASHERS.

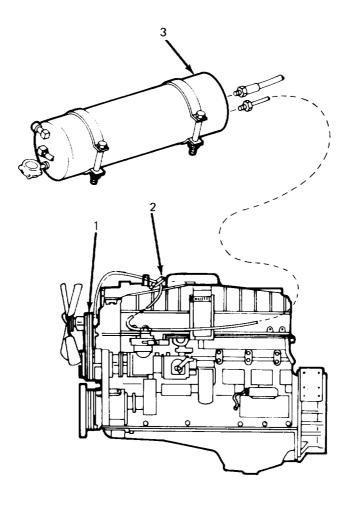
- 1. WIPER CONTROL KNOB. In OFF position, knob directs air from supply line to park line. When pulled out, it diverts air to wiper line. By turning clockwise (LOW) or counterclockwise (HIGH), desired speed is selected. Return to center and push in to park wipers.
- 2. WASHER BUTTON. When button is pushed, air flows from manifold to reservoir.
- 3. WIPER KNOB SUPPLY LINE. Carries air for wiper system from manifold to control knob.
- 4. WASHER AIR SUPPLY LINE. Carries air from manifold to control button.
- 5. COMPRESSED AIR SUPPLY MANIFOLD. Supplies compressed air to washer and wiper through supply lines.
- 6. WIPER ARM. Connect wiper blade to linkage blade. Moved by motor.
- 7. WIPER BLADE. Replaceable blade wipes windshield.
- 8. RESERVOIR FILLER CAP. Filter underneath cap prevents dirt from entering system. Cap closes firmly to maintain pressure in system.
- 9. WASHER FLUID RESERVOIR. Holds supply of washer fluid.
- 10. RESERVOIR AIR LINE. Carries pressurized air from button to reservoir where pressure forces fluid into washer hose,
- 11. WASHER FLUID HOSE. Carries washer fluid from reservoir onto windshield
- 12. PARK AIR LINE. When knob is pushed into PARK position, air flows through park line to motor causing wiper blades to move down to REST position.
- 13. WIPER MOTOR. Air-powered motor turns wipers back and forth when air comes from wiper line or moves them down windshield to PARK position when air comes through park line.
- 14. WIPER AIR LINE. When knob is in WIPE position, air flows through wiper line to motor which starts wiper blades in motion.
- 15. WIPER LINKAGE. Linkage from motor actuates two wiper arms.



 AIR HORNS. Air-powered signaling devices. CONTROL VALVE. Allows compressed air to flow to horns when lever is pulled downward. LEVER. Actuates control valve when pulled downward by chain in cab. 	2-73.	AIR HORNS.
2. CONTROL VALVE. Allows compressed air to flow to horns when lever is pulled downward.	1.	AIR HORNS Air-powered signaling devices
·		
11		
11		
11		
TA 074602]

2-74. FAN CLUTCH CONTROLS.

- 1. FAN CLUTCH. When actuator opens, compressed air from supply reservoir engages clutch to actuate fan.
- 2. FAN CLUTCH ACTUATOR. Opens air connection between supply reservoir and fan clutch when coolant temperature rises above 190°F (88°C).
- 3. PRIMARY RESERVOIR. Supplies air pressure to engage clutch and rotate fan when actuator opens air connection.



Section XXV STEERING SYSTEM

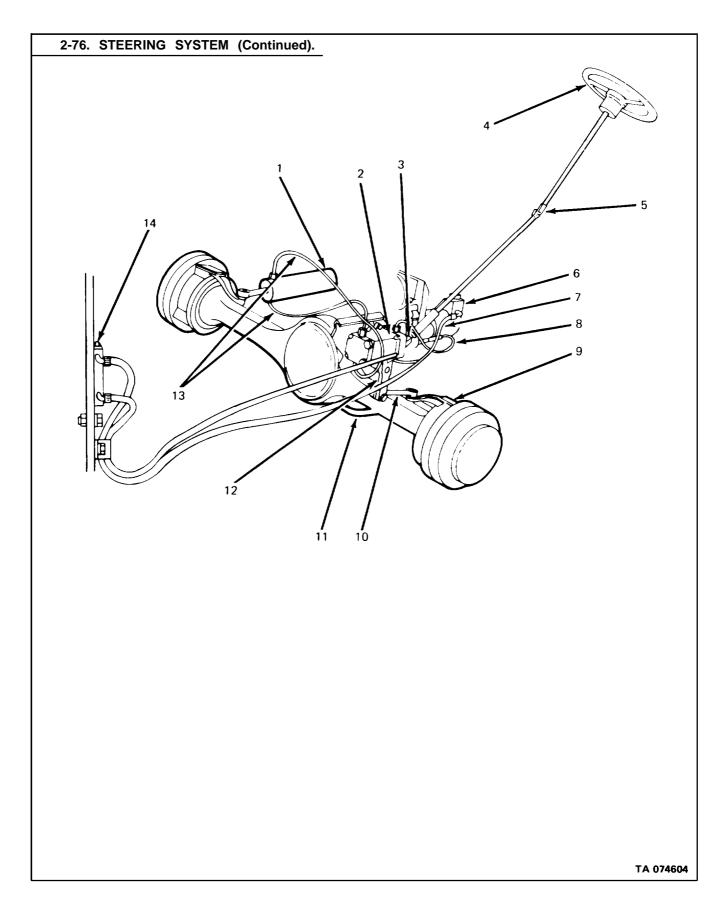
2-75. INTRODUCTION.

Two power steering systems are used for the M915 thru M920 vehicles: one for the M915 and one for the M916 thru M920. The systems are identical, except for the following:

Auxiliary power cylinder and associated hydraulic lines - used on the M916 thru M920 only.

2-76. STEERING SYSTEM.

- 1. AUXILIARY ASSIST CYLINDER. Piston moved back and forth by pressure from lines. Connects to right wheel steering arm through auxiliary drag link. (M916 thru M920 ONLY.)
- 2. POWER STEERING GEAR. Hydraulically multiplies input torque from steering column and transmits it to Pitman arm.
- 3. UNIVERSAL. Changes angle of torque from steering wheel and applies it to input shaft of power steering gear.
- 4. STEERING WHEEL. Provides rotational torque to steering shaft, actuating steering system.
- 5. UNIVERSAL. Changes angle of steering torque.
- 6. HYDRAULIC PUMP AND RESERVOIR. Pump supplies hydraulic pressure to power steering system. Reservoir provides a supply of oil to assure complete filling of hydraulic system.
- 7. STEERING GEAR RETURN LINE. Carries hydraulic fluid from steering gear back to reservoir.
- 8. STEERING GEAR SUPPLY LINE. Carries hydraulic fluid under pressure from pump to steering gear.
- 9. STEERING ARM. Transmits fore and aft movement from drag link to knuckle assembly.
- 10. DRAG LINK. Transfers motion of Pitman arm to steering arm and tie rod.
- 11. TIE ROD ASSEMBLY. Connects steering arms so that wheels turn together.
- 12. PITMAN ARM. Transfers steering torque (boosted by power steering gear to drag link).
- 13. AUXILIARY CYLINDER HYDRAULIC LINES. Carry fluid under pressure from the steering gear to operate auxiliary cylinder.
- 14. POWER STEERING COOLER. Cools power steering fluid by means of finned unit on vehicle grille, exposed to outside air. After the fluid is cooled, it is returned to the power steering system.



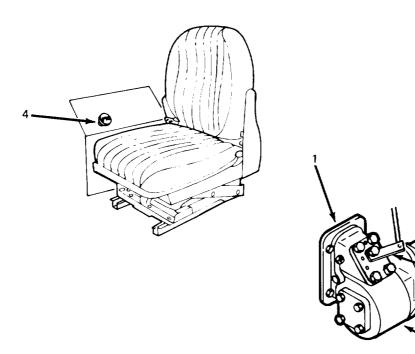
Section XXVI POWER TAKEOFF

2-77. INTRODUCTION.

The power takeoff is installed on M916 thru M920. It supplies power from the engine to auxiliary equipment.

2-78. POWER TAKEOFF.

- 1. PTO ADAPTER. Mounts on transmission and mates to transmission drive gear.
- 2. PTO. Gear driven from adapter. Provides drive for:
 - a. Winch hydraulic pump on the M916 and M920 (para 2-80).
 - b. Hoist cylinder hydraulic pump on the M917 (TM 5-3805-274-24 & P).
 - c. Hydraulic power pump on the M918 (TM 5-3895-371-24 & P).
 - d. Power train jack screw for conveyor drive on the M919 (TM 5-3895-372-20).
- 3. CONTROL LEVER. Engages or disengages PTO. Actuated by pulling control knob in cab.
- 4. PTO CONTROL KNOB. Allows movement of control lever from cab. Pulling knob out engages PTO. Pushing knob in disengages PTO.



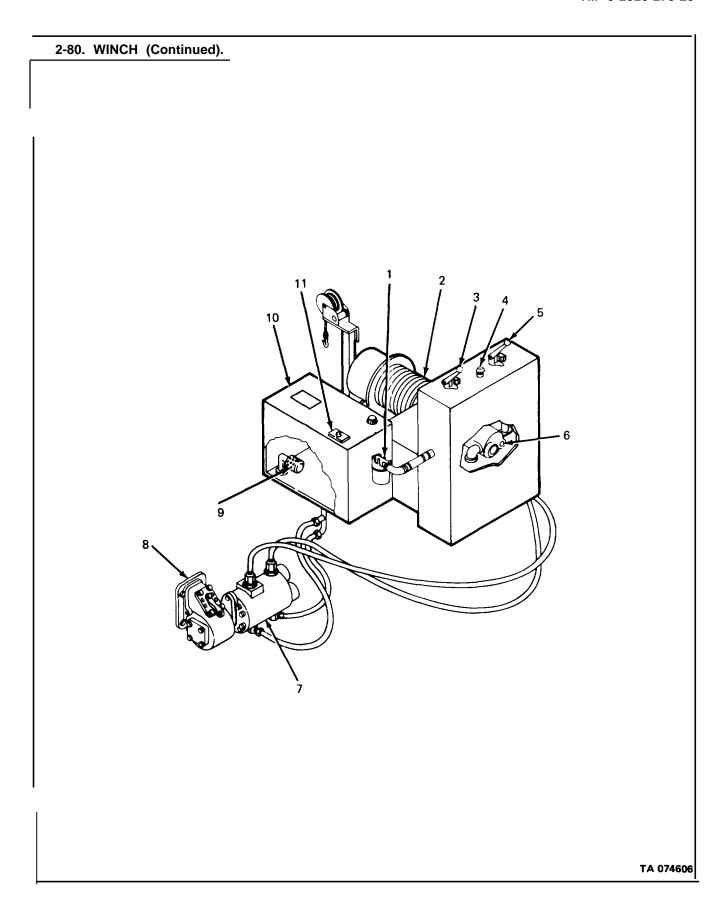
Section XXVII WINCH

2-79. INTRODUCTION.

The winch is installed on M916 and M920. The assembly is located behind the cab with all operating controls.

2-80. WINCH.

- INLINE RETURN FILTER. Throwaway filter removes water and dirt from oil returning to reservoir.
- 2. WINCH CABLE. 7/8 inch (22.2 mm) diameter wire rope, 150 feet (46 m) long. Rated at 75,000 lbs (33,600 N) minimum breaking strength.
- 3. CONTROL VALVE. Detented "up" position supplies pressure to outlet for auxiliary hydraulic system. Down position provides high speed winch operation.
- 4. AUXILIARY THROTTLE. Adjusts power input to PTO by altering engine speed.
- 5. DIRECTIONAL CONTROL VALVE. Controls winch direction. Spring-loaded valve returns to middle position when released, causing winch brakes to apply.
- HYDRAULIC MOTOR. Turns winch to pay out or haul in cable. Powered by oil under pressure from pump.
- 7. DUAL PUMP. 22 gpm/gear; total of 44 gpm @ 2200 engine rpm gear type pump powered by PTO supplies 2350 psi (14,800 kPa) hydraulic pressure to motor through hydraulic valves.
- 8. POWER TAKEOFF. Drives dual pump. (See paragraph 2-78 for functional description.)
- 9. INLET STRAINER. Removes large particles from oil going to dual pump.
- 10. HYDRAULIC RESERVOIR. Supplies oil to dual pump and receives oil returning from system.
- 11. COVE R PLATE. When removed allows access to interior of reservoir to service interal strainer and for general clean out.



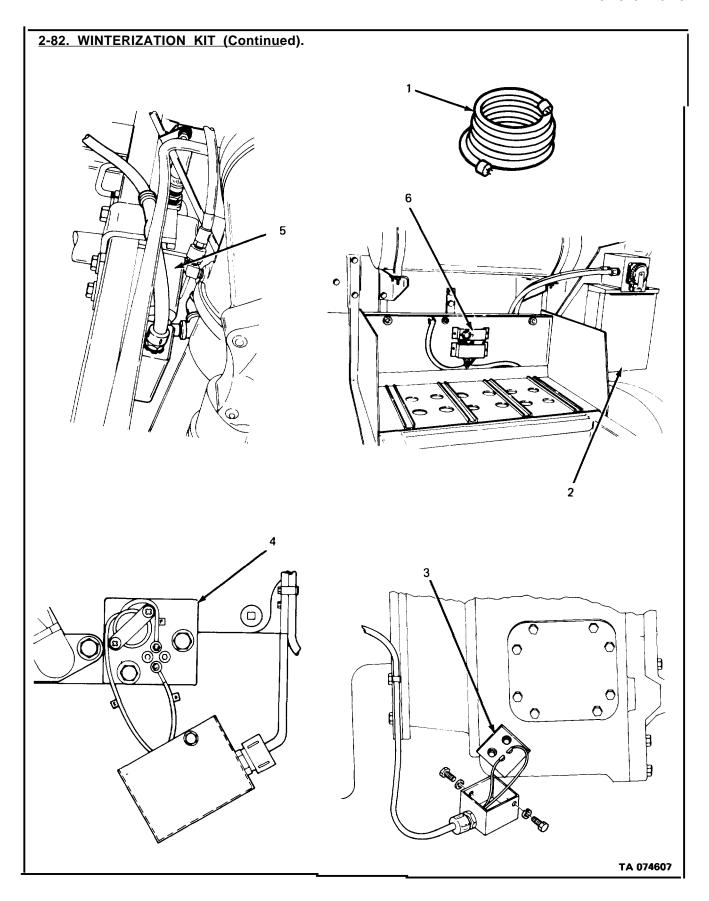
Section XXVIII WINTERIZATION KIT

2-81. INTRODUCTION.

The Winterization Kit is an available option on all M915 thru M920 vehicles. This kit facilitates vehicle start-up at temperatures down to -50°F (-46°C.). The components of this kit are described below.

2-82. WINTERIZATION KIT.

- 110 VAC POWER CORD. This twenty-five foot power cord is used to connect a suitable 110/115 V exterior power supply to the power receptacle mounted on top of the vehicle circuit breaker box.
- 2. CIRCUIT BREAKER BOX. Mounted to the vehicle right side behind the front fender and in front of the battery box, this control center channels incoming 110 VAC electrical power to any of four separate heaters. Each of the heaters is controlled and protected by an individual circuit breaker.
- 3. TRANSMISSION OIL HEATER. Located on the forward, lower, left side of the transmission, this immersion heater supplies 375 watts. No thermostat is used due to the relatively low wattage. When the 110 VAC power cord is plugged in, this heater can be operated by the circuit breaker so marked. The breaker is a 15 ampere.
- 4. ENGINE OIL HEATER. Also an immersion type heater, the unit is mounted thru the aft, lower, left side of the engine oil pan with a capacity of 750 watts, which is controlled by a thermostat set at 170°F. The thermostat mounts to a plate outside the oil pan and is protected by an insulated waterproof cover. When the 110 VAC power cord is plugged in, this heater can be operated by the circuit breaker so marked. The breaker is a 15 ampere.
- 5. ENGINE COOLANT HEATER. This thermo-syplon type requires no circulating pump and has a capacity of 2700 to 2800 watts. The heating unit integral with a thermostat set at 190° F, is mounted to the main right hand frame rail below the turbocharger. The heated coolant is piped to the top of the engine into the rear water manifold. The hot coolant flows down thru the engine as the cold coolant returns to the heater. When the 110 VAC power cord is plugged in, this heater can be operated by the circuit breaker so marked. The breaker is a 30 ampere.
- 6. BATTERY BOX HEATER. The battery box is insulated and heated by a coil, under the battery support, with a capacity of 550 watts. A thermostat mounted on the inside back wall of the box closes at +35°F and opens at +55°F. When the 110 VAC power cord is plugged in, this heater can be operated by the circuit breaker so marked. The breaker is a 15 ampere.



CHAPTER 3

INTEGRATED SYSTEMS MAINTENANCE

3-1. OVERVIEW.

This chapter provides you with the following information related to overall truck tractor/truck chassis maintenance:

- a. Tools and Equipment.
- b. Service Upon Receipt.
- c. Preventive Maintenance Checks and Services (PMCS).
- d. Composite Troubleshooting Index.

Section I REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

3-2. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

3-3. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.

There are no special tools, TM DE and support equipment required for the procedures in this chapter.

3-4. SPARES AND REPAIR PARTS.

Spares and repair parts are listed and illustrated in the Repair Parts and Special Tools List covering Organizational Maintenance for this equipment (TM 9-2320-273-20P).

Section II SERVICE UPON RECEIPT

3-5. CHECKING UNPACKED EQUIPMENT.

- a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on SF Form 364, Report of Discrepancy (ROD).
- b. Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA PAM 738-750.

3-6. SERVICE UPON RECEIPT CHECKLIST M915 THRU M920 VEHICLES.

LOCATION/ITEM	ACTION	REMARKS				
Protective wrappings.	Remove.					
Engine, tires, glass panels, instruments.	Check for missing parts or shipping damage.					
3. Separately packaged kits.	Inspect for damage.					
4. Brakes and brake shoes.	Check to be sure brake shoes do not stick to brake drums.	See para 2-64 thru 2-70 for locations.				
 Breather tube, air intake, exhaust stack, transmission, alternator, brakes. 	Remove all tape and wrapping.	See paras 2-12, 2-25,2-27, 2-30, 2-42, and 2-64 thru 2-70 for locations.				
Water pump and alter- nator belts.	Check tension and adjust if necessary.	See para 4-51 and 4-53.				
Cooling system, fuel system, transmission, and differentials.	Check fluid levels.	TM 9-2320-273-10.				
hoses. T rubber, a	to come in contact with seals or flexible hoses. These cleaners cause leather, rubber, and synthetic materials to dry out, rot, and lose pliability					
rubber, a	rubber, and synthetic materials to dry					
8. Machined surfaces	Remove wrappings. Clean with SD-2 dry cleaning solvent.					
 a. Key switch, engine retarder switch, worklamps, clearance lamps, headlamp switch, cigar lighter. 	Make sure all electrical switches are OFF.	See TM 9-2320-273-10 for locations.				
b. Battery cables.	Connect.	See para 5-37.				
10. Oil system.	If truck is due for an oil change, drain crankcase, replace filters, and refill to operating level.	See para 4-14.				
11. Entire vehicle.	 a. Lubricate. b. Inspect for: Leaks. Loose or broken hoses and lines. Other damage. 	See LO 9-2320-273-12.				

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

- **3-7. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) INTRODUCTION.** This section contains Unit PMCS requirements for the M915 vehicle. The PMCS tables contain checks and services necessary to ensure the vehicle is ready for operation. Using the PMCS tables, perform maintenance at the specified intervals. Preventive Maintenance Checks and Services in TM 9-2320-273-10 must be completed before doing Unit preventive maintenance.
- **3-8. MAINTENANCE FORMS AND RECORDS.** Every mission begins and ends with paperwork. There is not much of it, but it must be kept up. The filled out forms and records have several uses. They area record of the services, repairs, and modifications made on the vehicle; they are reports to unit maintenance and to the Commander; and they serve as a checklist to find out what is wrong with the vehicle after its last use, and whether those faults have been fixed. For information needed on forms and records, see DA PAM 738-750.

3-9. GENERAL MAINTENANCE PROCEDURES.

WARNING

Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from fire and use in well-ventilated area. If adhesive, solvents, or sealing compound get on skin or clothing, wash immediately with soap and water.

- a. CLEANLINESS. Dirt, grease, oil and debris only get in the way and may cover up a serious problem. Use dry cleaning solvent on metal surfaces and soapy water on rubber.
- b. BOLTS, NUTS, AND SCREWS. Check bolts, nuts, and screws for obvious looseness, missing, bent, or broken condition and tighten or replace as necessary. They cannot all be checked with a tool, of course, but look for chipped paint, bare metal, or rust around bolt heads.
- c. WELDS. Look for loose or chipped paint, rust, or gaps where parts are welded together. If a bad weld is found, have it repaired.
- d. ELECTRIC WIRES AND CONNECTORS. Look for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors and make sure the wires are in good shape.
- e. HYDRAULIC LINES AND FITTINGS. Look for wear, damage, leaks, and make sure clamps and fittings are tight. Wet spots show leaks, of course, but a stain around a fitting or connector may indicate a leak. If a connector or fitting is loose, tighten it. If something is broken or worn out, repair or replace per applicable procedure.
- 3-10. FLUID LEAKAGE. It is necessary to know how fluid leakage affects the status of fuel, oil, coolant, and the hydraulic systems. The following are definitions of types/classes of leakage necessary to know in order to determine the status of the vehicle.

CAUTION

Equipment operation is allowable with minor leakages (Class I or II). Of course, consideration must be given to the field capacity in the item/system being checked/inspected. When in doubt, notify the supervisor. When operating with Class I or II leaks, continue to check fluid levels as required in the PMCS. Class III leaks should be repaired per applicable procedure.

a. Class 1. Seepage or fluid as indicated by wetness or discoloration not great enough to form drops.

TM 9-2320-273-20

- b. Class II. Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected.
- c. Class III. Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

3-11. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) TABLES.

- a. Do the (S) PREVENTIVE MAINTENANCE once every six months and/or every 3000 miles (4,827 KM) whichever comes first.
- b. Do the (A) PREVENTIVE MAINTENANCE once each year and/or every 6,000 miles (9,654 KM) whichever comes first.
- c. Do the (B) PREVENTIVE MAINTENANCE once each year and/or every 12,000 miles (19,308 KM) whichever comes first.
- d. Always do the PREVENTIVE MAINTENANCE in the same order until it gets to be a habit. Once practiced, it will be easy to spot anything wrong in a hurry.
- e. If something does not work, troubleshoot with instructions in Chapter 2.
- f. If anything looks wrong and is not fixed, write a DA Form 2404.
- g. When doing preventive maintenance, take along the tools and supplies needed to make all the checks. Always take a clean cloth or two.

Table 3-1. Unit Level Preventive Maintenance Checks and Services M915-M920

Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
1	Semi- Annual	Pre- Service Checks	PRIOR TO ROAD TEST Ensure Operator/Crew has performed -10 PMCS listed in TM 9-2320-273-10. ROAD TEST Maintenance personnel will be with vehicle operator to assist in performing -10 PMCS checks and verify pre-service checks. NOTE The following will be performed during the road test. These inspections must be performed before any -20 level PMCS regardless of interval. For road test, vehicle will be driven at least five miles over different ground to give enough time to detect any malfunctions. a. Notice if starter engages smoothly and turns the engine at normal cranking speed. b. Listen for unusual engine noise at idle, at operating speeds, and under acceleration. Be alert for excessive vibration and the smell of oil, fuel and exhaust.	a. Starter inoperative or makes excessive grinding sound. b. Engine knocks, rattles or smokes excessively.

Table 3-1. Unit Level Preventive Maintenance Checks And Services M915-M920

Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
1	Semi-Annual	Pre- Service Checks Continued	c. Check for transmission response to shifting and for smoothness of operation in all speed ranges. Be alert for unusual noises and difficulty in shifting in any speed range. d. Check for transfer response to shifting and for smoothness of operation in all gear ranges. Be alert for unusual noises and difficulty in shifting in any gear range. e. Test for response to accelerator feed. Observe for sticking pedal. f. With vehicle speed approximately 5 mph (8 kph) turn steering wheel to left, then right, to detect steering backlash, shimmy or freeplay is more than 1-1/2 inches (38 mm) if either direction. Vehicle should respond instantly. With vehicle moving on straight, level terrain, lightly hold steering wheel to check for pull and wandering. g. Apply brake pedal with steady force. Vehicle should slow down and stop without pulling to one side or jerking. Release brake pedal. The brakes should release immediately and without difficulty. h. Observe vehicle response to road shocks, side sway or continuous bouncing indicates a malfunction.	c. Transmission shifts improperly, does not shift or makes excessive noises. d. Transfer jumps out of gear or makes excessive noises. e. Pedal sticking or binding. f. Steering binds, grabs, wanders or freeplay is more than 1-1/2 inch (38 mm) in either direction. g. Brakes chatter, pull to one side or in- operative. Brakes will not release. h. Handling is unsta- ble.

Table 3-1. Unit Level Preventive Maintenance Checks and Services M915-M920

		l		1
Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
1	Semi- Annual	Pre- Service Checks Continued	AFTER ROAD TEST a. Make sure the vehicle has been cleaned of mud, gravel, etc., from the underbody, outside and crew compartment area. CAUTION Do not hold steering wheel at full left or	
			right position for longer than 10 seconds. Oil overheating and pump damage can result.	
			b. With vehicle stopped, turn steering wheel to extreme left, then to the extreme right to check for hard steering.	b. Hard steering is evident.
			c. Check engine operation at all speeds. Insure that engine does not go over engine governed speed - 600-2100 rpm.	c. Engine governed speed - no load is be- low 600 rpm or ex- ceeds 2100 rpm.
2	Semi- Annual	Fuel Sys- tem	Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from fire and use in well-ventilated area. If adhesive, solvents, or sealing compound get on skin or clothing, wash immediately with soap and water. a. Clean fuel transfer pump screen by soaking in a carbon dissolving agent, or clean the carear in fivel all and dry with	a. Screen is worn or damaged.
			clean the screen in fuel oil and dry with compressed air. Visually inspect screen for holes or embedded metal particles in mesh.	

Table 3-1. Unit Level Preventive Maintenance Checks And Services M915-M920

Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
2	Semi- Annual	Fuel System Continued	 b. Purge and clean fuel tank (TB 43-0212), if required. c. Inspect fuel injection pump, nozzle lines, and fittings for leaks and damage. d. Inspect all fuel lines for loose connections, splits, cracks, and kinks that could leak. 	c. Rubber cap missing or torn on return line. Any nozzle loose or damaged. d. Any Class III leak.
3	Semi- Annual	Engine Accessory Drive Belt	 a. Check for missing, broken, cracked and frayed drivebelts. Check alternator and fan belts 1/2 inch or less adjustment for looseness, dry rot, excessive fraying and cracks. b. Check fan belt (paragraph 4-45D) and alternator belt (paragraph 4-55C) for adjustment. 	a. Any drivebelt is missing or broken. Belt fiber has more than one crack (1/8 inch in depth or 50% of belt thickness) or has frays more than 2 inches long. b. Belts are loose.

Table 3-1. Unit Level Preventive Maintenance Checks and Services M915-M920

Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
4	Semi- Annual	Fan, Alternator, and Water Pump	a. Inspect the pulleys for alignment. b. Inspect the water pump for leaks and fan shrouds to see if they are securely mounted.	
5	Semi- Annual	Alternator Wiring and Engine Mount	a. Check for loose wiring connections or worn insulation.b. Inspect for cracked or loose engine mounts.	a. Loose connections or worn insulation. b. Cracked or loose engine mounts.
6	Semi- Annual	Air Intake System	a. Inspect air cleaner, hoses, and tubing for proper installation, cracks, breaks, or loose connections that could let unfiltered air get into air intake system. WARNING Compressed air used for cleaning purposes will not exceed 30 psi. Use only with effective chip guarding and personal protective equipment (goggles/shield, gloves, etc.). NOTE Outside element can be washed up to five times or blown clean with air an indefinite number of times. This outside element is costly and should be reused. Handle and clean carefully. Inside safety filter should not be washed or blown clean and should be replaced every 10,000 miles. b. Remove air filters and service (paragraph 4-24 B). After servicing, reinstall (paragraph 4-24C).	b. Air filters have holes or damaged seal.

Table 3-1. Unit Level Preventive Maintenance Checks And Services M915-M920

	10010		ver Preventive Maintenance Checks And Service	I I I I I I I I I I I I I I I I I I I
Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
7	Semi- Annual	Engine Crank- case	NOTE COLD TEMPERATURE OPERATION For operation of equipment in expected continuous temperatures below 0° F (-18° C), remove lubricants prescribed in the key for temperature above 0° F (-18° C). Re-lubricate with lubricant specified in the key for temperatures 0° F to -50° F (-18° C to -46° C). NOTE Engine Oil Filter. After installing new filter element, fill crankcase, operate engine 5 minutes, and check housing for leaks. Shut down engine, check crankcase oil level and bring to full mark.	
			NOTE If AOAP laboratory is not available, drain and refill engine crankcase with OE/HDO every 3,000 miles (4,800 km) or semi-annually, whichever comes first.	"Do not operate" re- ceived from AOAP laboratory.
			a. Drain and refill crankcase with OE/ HDO.	h ()! (!! h
			b. Replace engine oil filter.c. Check and clean crankcase breather and attaching hoses.	b. Oil filter has Class III leak.
			d. Check all oil lines and hoses for cracks and wear that could cause leaks.	d. Cracks, frays, leaks, and wear are evident.
			e. Check oil filter housing and oil pan drain plug for looseness. Make sure all oil pan bolts are tight.	e. Drain plugs and oil pan bolts are loose.
			f. Check rocker housing covers for evidence of leaks.	f. Class III leaks evident.

Table 3-1. Unit Level Preventive Maintenance Checks and Services M915-M920

Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
8	Semi- Annual	Cab, En gine, Front/ Rear Light Wiring Harness	Check all wiring harnesses for frays, splits, missing insulation or poor connections. Replace any worn wiring.	Insulation missing. Frays, splits, poor connections evi- dent.
9	Semi- Annual	Alternator and En gine Mount	Inspect alternator mounting for looseness. Inspect bracket and attaching hardware for cracks, bends, and loose mounting.	Loose mounting, cracks, or bends evi- dent.
10	Semi- Annual	Battery Electrical System	NOTE Refer to TM 9-61 40-200-14for more specific details on battery maintenance. a. Inspect battery box for corrosion and debris. b. Clean slave receptacle and coat with corrosion preventive compound. c. Check and record specific gravity of each cell. d. Inspect battery cables for frays, splits, and looseness.	 a. Corrosion that has made holes in metal battery box. b. Terminals corroded. c. If cell is below 1.225 specific gravity. d. Cables frayed, split, or loose.

Table 3-1. Unit Level Preventive Maintenance Checks And Services M915-M920

	1 0010	1	rei Preventive Maintenance Checks And Service	
Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
11	Semi- Annual	Power Steering Pump and Filter	 a. Inspect power steering pump for leaks, cracks, and damage. b. Check steering stops for proper adjustment (paragraph 10-21.2). c. Check steering gear poppet valve for proper adjustment (paragraph 10-21.3). d. Change filter when fluid is contaminated. 	a. Cracks, damage, or Class III leaks.b. Steering stops out of adjustment.c. Steering gear poppet valve is out of adjustment.d. Fluid is contaminated.
12	Semi- Annual	Com- pressed Air System	NOTE In areas where more than approximately 30° range of temperature is common, small amounts of water can accumulate in the air brake system due to condensation. The presence of small amounts of water due to condensation is normal. a. Drain air tanks. If any moisture is forced out, inspect air dryer and replace filter (paragraph 9-10). If moisture is milky, blue or green, serious internal malfunctions are indicated. b. Inspect air reservoirs, attaching valves, lines and connections for mounting looseness, bends, dents, and cracks that could cause leaks.	a. Moisture is milky, blue or green. b. Bends, dents, cracks, loose air lines or air leaks evident.

Table 3-1. Unit Level Preventive Maintenance Checks and Services M915-M920

		,	er Freventive Maintenance Checks and Servic	
Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
13	Semi- Annual	Brake Pedal	Lubricate brake pedal with OE/HDO.	
14	Semi- Annual	Accelera- tor Pedal and Link- age	Lubricate accelerator pedal and linkage with OE/HDO.	
	LUBI	LUBE	FIREWALL	

Table 3-1. Unit Level Preventive Maintenance Checks And Services M915-M920

	Table	3-1. Unit Le	vel Preventive Maintenance Checks And Services	M915-M920
Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
15	Semi-Annual BE LUBE	Auxiliary Throttle (All models in cat M916 and M920 on Hydraulic Winch)	NOTE Do not oil control wire. The wire case has teflon paste in it for wire lubrication. Oil the body of the assembly with OE/HDO and place a drop of oil (OE/HDO) under the plunger cap.	

Table 3-1. Unit Level Preventive Maintenance Checks and Services M915-M920

Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
16	Semi- Annual	Cooling System	WARNING If vehicle has been operating, use extreme care to avoid being burned when removing cooling system radiator cap. Use heavy rags or gloves to protect hands. Turn radiator cap only one-half turn counterclockwise and allow pressure to be relieved before fully removing cap. NOTE Coolant level is correct when sight glass is full (TM 9-2320-273-10). Use MIL-A-46153 in temperatures above 0°F (18° C) and MIL-A-11755 in temperatures below 0°F (-18° C). a. Check coolant condition. Test coolant to see if draining is necessary (TB 750-651). b. Check all hoses for looseness, splits, wear, and cracks that would cause leaks. c. Inspect hose clamps for wear and serviceability.	 a. Coolant condition/testing shows draining is required. b. Class III leakage evident. Hoses are loose or have splits or cracks. c. Hose clamps are worn or unserviceable.

Table 3-1. Unit Level Preventive Maintenance Checks And Service M915-M920

	ı abie	3-1. OIIIL E	vei Preventive Maintenance Checks and Service	W1915-W1920
Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
17	Semi- Annual	Tires	CAUTION Do not mix radial and bias tires on the same vehicle. Make sure tires are cold when you check pressure.	
			a. Inspect tires for unusual wear, penetrating objects, and improper matching.	a. Tires improperly match.
			b. Make sure all wheel lugnuts are installed and tightened to correct torque value 450 lb-ft (610 N.m).	b. Any lugnut miss- ing and/or improp- erly torqued.
18	Semi- Annual	Wheel Alignment	Check toe-in and adjust as necessary. Toe-in should be 1/8 inch (3.2 mm).	Toe-in out of adjust- ment.
19	Semi- Annual	Parking Brake	Inspect spring brake control valve, lines and double air brake chambers for leaks and damaged fittings.	Air leaks or dam- aged fittings.
20	Semi- Annual	Trans- mission	a. Check transmission to bellhousing bolts for gaps and torques. b. If any bolt shows a gap or is loose, remove bolt and apply loctite; reinstall bolt with flat washer and torque to 55 lb-ft + or -5 lb-ft (74.6 N.m + or -6.8 Nm); then proceed to check all the remaining bolts as follows: Torque each bolt to 50 lb-ft (67.8 N.m). If bolt turns or has a gap, remove and' apply loctite, reinstall bolt and flat washer and torque 55 lb-ft + or - 5 lb-ft (74.6 N.m + or -6.8 N.m).	

Table 3-1. Unit Level Preventive Maintenance Checks and Services M915-M920

Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
20	Semi- Annual	Trans- mission Continued	 c. Check transmission for cracks, loose bolts, leaks, and obvious damage. d. Inspect transmission output shaft seal for damage and leaks. e. Drain and refill transmission oil every 6,000 miles (9,654 km) or annually, whichever comes first. f. Replace transmission filter. 	c. Cracks, loose bolts, or Class III leaks evident. d. Damage or Class III leaks evident. e. "Do not operate" received from AOAP lab.
21	Semi- Annual	Exhaust System	WARNING The exhaust pipe and muffler can become very hot during vehicle operation. Be careful not to touch these parts with bare hands, or allow body to come in contact with pipe or muffler. Exhaust system parts can become hot enough to cause serious burns. a. Inspect exhaust manifold, exhaust pipes, muffler, and tailpipe for corrosion, carbon deposits which may indicate leaks. b. Inspect for damaged pipes, loose clamps and leaking gaskets or seals. c. Inspect raincap to make sure it operates freely.	 a. Evidence of corrosion or carbon deposits evident. b. Pipes damaged, clamps loose, gaskets or seals leaking. c. Raincap does not operate freely, does not close when engine is off, or missing.

Table 3-1. Unit Level Preventive Maintenance Checks And Services M915-M920

		· · · · · · · · · · · · · · · · · · ·	vei Preventive Maintenance Checks And Service	
Item No.	Interval	Item To BE Inspected	Procedure	Not Mission Capable If:
22	Semi- Annual	Rear Axles	NOTE COLD TEMPERATURE OPERATION For operation of equipment in expected continuous temperatures below 0° F (-18° C), remove lubricants prescribed in the key for temperatures above 0° F (-18° C). Relubricate with lubricants specified in the key for temperatures 0° F to -50° F (-18° C to -46° C). NOTE Pressure gun should be held on fittings until new grease appears. This will assure that all the old contaminated grease has been forced out. Take weight off suspension walking beam during lubrication to ensure uniform application of grease into the trunnion bushing.	
		Rear Axle Spring and Walking Beam	a. Lubricate with GAA the Axle Spring and Walking Beam.	a. Fitting will not purge old lubricant out of component.
		Axle Dif- ferentials (M916/M 920) Front Driving and all Rear	b. Check and refill all axle differential with GO as required. WARNING Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from fire and use in well-ventilated area. If adhesive, solvents, or sealing compound get on skin or clothing, wash immediately with soap and water.	
		Axle Hous ing Vent Plug	c. Remove vent plug from axle housing. Wash vent plug in solvent and allow to air dry.d. Coat threads with pipe thread sealing compound and install axle housing breather.	c. Axle vent plug missing or cannot be cleaned.
			2.23.000	

Table 3-1. Unit Level Preventive Maintenance Checks and Services M915-M920

Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
23	Semi- Annual	Front Axles Drag Link, Front Axle Spring Steering Shaft Universals	NOTE COLD TEMPERATURE OPERATION For operation of equipment in expected continuous temperatures below 0° F (-18° C), remove lubricants prescribed in the key for temperatures above 0° F (-18° C). Relubricate with lubricants specified in the key for temperatures 0° F to -50° F (-18° C to -46° C). NOTE Pressure gun should be held on fittings until new grease appears. This will assure that all the old contaminated grease has been forced out. Take weight off suspension walking beam during lubrication to ensure uniform application of grease into the trunnion bushing. a. Lubricate with GAA the Drag link, front axle spring. b. Inspect suspension/spring hanger brackets and pins for wear or damage. Inspect steering shaft for looseness and lubricate with GAA.	 a. Fitting will not purge old lubricant out of component. b. Spring hanger brackets bent or broken. Fitting will not purge old lubricant out of component.

Table 1-1. Unit Level Preventive Maintenance Checks And Service M915-M920

Item No Interval Interval Inspected Item To Be Inspected Procedure Not Mission Capable If:	Table		Table 1-1. Unit Le	evel Preventive Maintenance Checks And Service	M915-M920
				Procedure	
Universal Joint, Slip Yokes and Splines Diagram		23	Annual Axles Continued Drive Line Universal Joint, Slip Yokes and	Apply grease until purging takes place at the air hole in the end slip yoke. a. Lubricate drive line universal joint with GAA and check for looseness or side play. b. Lubricate slip yokes and spline with GAA and check for looseness or side play. PURGE LUBE PURGE LUBE PURGE	a. Fitting will not purge old lubricant out of component, loose or side play. b. Fitting will not purge old lubricant out of component, loose or side play.

Table 3-1. Unit Level Preventive Maintenance Checks and Services M915-M920

Itern No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
24	Semi-Annual	M916 and M920 Front Axle Only	NOTE COLD TEMPERATURE OPERATION For operating of equipment in expected continuous temperatures above 0° F (-18° C), remove lubricants prescribed in the key for temperatures above 0° F (-18° C). Relubricate with lubricants specified in the key for temperatures 0° F to -50° F (-18° C to -46° C). NOTE Change lubricant in new or rebuilt axles within 1000 miles (1600 km) but no sooner than 500 miles (800 km). Following initial drain, change lubricant every 24,000 miles (18,000 km) or 2 years of service, whichever comes first. During all lubricant changes, remove metal particles from magnetic drain and filler plugs. NOTE Fill front differential to bottom of CHECK and FILL plug hole. a. Check lubricant level of axle differential. Fill as necessary with GO.	

Table 3-1. Unit Level Preventive Maintenance Checks And Service M915-M920

				Г
Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
25	Semi- Annual	Auxiliary Power Steering Cylinder	NOTE Pressure gun should be held on fittings until new grease appears. This will assure that all the old contaminated grease has been forced out.	
			Lubricate the auxiliary power steering cylinder with GAA.	Fitting will not purge old lubricant out of component.
			LUBE FITTING	FITTING
26	Semi- Annual	Pusher Ax- le Lift Link- age (M920 Only)	NOTE Pressure gun should be held on fittings until new grease appears. This will assure that all the old contaminated grease has been forced out.	
			Lubricate the pusher axle linkage with GAA.	Fitting will not purge old lubricant out of component.

Table 3-1. Unit Level Preventive Maintenance Checks and Services M915-M920

Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
27	Semi- Annual	Hydraulic Steering Lines	WARNING Do not start engine or move vehicle when anyone is under vehicle. Severe injury or death could result. Follow routing of all hydraulic steering lines, hoses, and tubes to inspect for loose fitting, rubbing, chafing, cracks, bends, breaks, and leaks. Tighten if loose and replace hoses that are damaged.	Class III leaks evident.
28	Semi- Annual	Springs and Shocks	 a. Check spring leaves for cracks and breaks. b. Check spring clips, saddles, saddle caps and spring hangers for presence, looseness, cracks, and visible damage. c. Check for missing or broken retaining hardware, bolts or parts of suspension system. d. Check all shock absorbers. Look for oil leaks and damage. e. Check rubber bushings for cracks, damage, and looseness. 	a. Cracks or breaks evident. b. Missing, loose, cracks, or visible damage evident. c. Any retaining hardware, bolts or parts are missing or broken. d. Class III oil leaks or damage is present. e. Rubber bushings are cracked, damaged or loose.

Table 3-1. Unit Level Preventive Maintenance Checks And Services M915-M920

	Table	J-1. Utilit Le	Vel Preventive Maintenance Checks And Service	
Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
29	Semi- Annual	Frame and Cross- members	a. Inspect frame side rails for cracks, breaks, bends, wear deterioration and missing and loose fasteners.b. Inspect crossmembers for cracks, breaks, bends, wear deterioration and missing and loose fasteners.	a. Cracks, bends, or breaks in frame. Any loose or missing fasteners. b. Cracks, bends, or breaks in crossmembers. Any loose or missing fasteners.
30	Semi- Annual	Torque Rods	a. Check torque rods for damage.b. Check mounting brackets for cracks, breaks, rust, and loose mounting hardware on frame.	a. Damage is evident. b. Cracks, breaks, or loose mounting hardware.
31	Semi- Annual	Propeller Shafts and Uni- versal Joints	WARNING Do not start engine or move vehicle when anyone is under vehicle. Severe injury or death could result. NOTE When using a grease gun, apply lubricant to the fitting until clean lubricant squeezes out of the part being lubricated. NOTE Use the proper lubricant to purge all four bearing seals of each universal joint. This flushes abrasive contaminates from each bearing and assures all four bearings are filled properly. NOTE When vehicle is operating under severe conditions, lubricate propeller shafts and universal joints every 500 hours. a. Lubricate using GAA all axle propeller shafts and universal joints.	a. Fitting will not purge old lubricant out of component.

Table 3-1. Unit Level Preventive Maintenance Checks and Services M915-M920

Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
31	Semi- Annual	Propeller Shafts and Uni- versal Joints Continued	b. Lubricate using GAA transmission to transfer case propeller shaft and universal joints. PURGE	a. Damage is evident. b. Cracks, breaks, or loose mounting hardware.
		Continued	LUBE	JRGE
			PURGE LUBE	
			c. Inspect all propeller shafts for bends and cracks.d. Inspect U-joints for wear, play, broken or missing lubrication fittings and secure. There should be no free play at U-joint.	c. Bends or cracks evident.d. Lubrication fittings or screws are broken or missing. Wear and play evident.
32	Semi- Annual	M916/ M920 Tie Rod	NOTE Pressure gun should be held on fittings until new grease appears. This will assure that all the old contaminated grease has been forced out. Take weight off suspension walking beam during lubrication to ensure uniform application of grease into the trunnion bushing.	
			a. Lubricate tie rod ends with GAA.	 a. Fitting will not purge old lubricant out of component, loose or side play.
			b. Check tie rod drag links for proper torque. Tighten nuts-to 120 lb-ft (163 N.m).	b. Improper torque value.

Table 3-1. Unit Level Preventive Maintenance Checks And Services M915-M920

	labie	J-1. Offic Lev	vel Preventive Maintenance Checks And Service	Jes 101913-101920
Item No.	Interval	Item To Be inspected	Procedure	Not Mission Capable If:
33	Semi- Annual	Winch (M916 and M920 only)	 a. Check for damage and proper operation of winch assembly. b. Check and fill gearbox with OE/HDO to proper level. c. Check for proper braking. d. Inspect winch cables for damage, kinks, frayed strands, and excessive wear. 	a. Improper control response. b. Class III leak evident.
34	Semi- Annual	Winch Control Panel	a. Check control panel cylinders and hoses for hydraulic leaks.b. Check and fill hydraulic fluid reservoir with OE/HDO to proper level.	
35	Semi- Annual	5th Wheel Assem- blies	Inspect and test the operation of the locking mechanism. Adjust as necessary (paragraph 11-13).	
36	Semi- Annual	Winteriza- tion Kit	NOTE Never operate a heater without fluid in the oil pan, transmission, or engine cooling system. a. Plug in 110 VAC power cord to power source and to receptacle on vehicle circuit breaker box with vehicle exposed to +35° F (+1.6° C) or lower. b. Turn on all four circuit breakers to the "ON" position. NOTE Allow at least 15 minutes, then check for appropriate heating level. c. Engine coolant +190° F. d. Engine oil to +170° F. e. Transmission oil to +55° F. f. Battery Box to +55° F.	

Table 3-1. Unit Level Preventive Maintenance Checks and Services M915-M920

Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
	Interval		FINAL ROAD TEST After all services and inspections have been completed, take vehicle on a short road test to make sure all corrections have been accomplished. Correct any defects or malfunctions that occur during this test. During road test: 1. Listen for any noises. 2. Check steering operation. 3. Check operation of brakes. 4. Check transmission operation; all ranges. 5. Check engine retarder (JACOBS ENGINE BRAKE) operation (TM 9-2320-273-10). 6. Note any loss of power or rough running engine. 7. Check driveline lockup system operation (TM 9-2320-273-10).	

Table 1-1. Unit Level Preventive Maintenance Checks And Service M915-M920

Item No.	Interval	Item To B Inspected	Procedure	Not Mission Capable If:
37	Annual	Engine Throttle Lever	Lubricate with GAA the engine throttle lever pivot.	Fitting will not purge old lubricant out of component.
38	Annual	Head- lights	Check headlight adjustment. Adjust head- lights (paragraph 5-25.1).	
39	Annual or On Condi- tion	Hydraulic System (M916 and M920)	NOTE If AOAP laboratory is not available, drain and refill hydraulic reservoir every 6,000 miles (9,654 km) or annually, whichever comes first. a. Replace hydraulic fluid filters (all models paragraph 12-9). NOTE To drain hydraulic reservoir, remove bottom drain plug. b. Drain reservoir using drain plug. c. Refill hydraulic reservoir using OE/HDO. d. Inspect PTO Hydraulic pump for leaks or obvious damage.	"Do not operate" received from AOAP laboratory. b. AOAP indicates changes required.

Table 3-1. Unit Level Preventive Maintenance Checks and Services M915-M920

. ——	Table 3-1. Offic Level Freventive Maintenance Checks and Services M313-M320						
Item No.	Interval	tern To Be Inspected	Procedure	Not Mission Capable If:			
	Annual	1	NOTE Rotate tires (refer to TM 9-2610-200-14, paragraph 2-9). WARNING Changing tire pressure or wheel alinement, out of the recommended specifications, may adversely affect the vehicle's handling characteristics. Loss of vehicle control may result in serious injury or death and damage to equipment. Never mix radial tires and bias ply tires on the same axle. If radial tires are used in combination with bias ply tires on a vehicle, the radial tires must be placed on the rear axle only. Failure to do this may cause damage to equipment or injury to personnel.				
			Vehicle must be up on jack stands for the following checks. a. Inspect tires for uneven wear and balance. NOTE If vehicle is new, and has been driven less than 3,000 miles (4,800 km), it is not necessary to aline wheels unless abnormal handling is reported. b. Check alinement of front and rear wheels (see TM 9-2320-280-20-1, paragraph(s) 8-7 and 8-8).	a. Tires exhibit excessive or uneven wear or balance. b. Front or rear wheel are out of alinement.			

Table 3-1. Unit Level Preventive Maintenance Checks And Services M915-M920

	Tubio	O III OIIII EGA	rei Preventive Maintenance Checks And Servic	No 10 Me20	
Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:	
41	Annual	Front Wheel Bearings	NOTE Do not remove wheels from hubs. Use truck wheel lift to remove wheels and hub as an assembly.		
		M915 0nly	NOTE See paragraph 10-13 for bearing removal and installation.		
		M916/ M920	NOTE See paragraph 10-14 for bearing removal and installation.		
			 a. Remove, clean and re-pack with GAA front wheel bearings. 		
			b. Check wheel bearings for looseness, damage or wear (paragraph 10-13 b).	b. Loose, damaged or worn is evident.	
			c. Clean hub and brake shoe assemblies with brake cleaning solvent.		
			NOTE		
			If hub has one gouge or grooves, turn hub into Direct Support for resurfacing.		
			d. Check brake drums for obvious grooves and uneven wear.	d. Deep grooves or uneven wear is evi- dent.	
			e. Check that brake shoe linings are not worn less than 1/4 inch.	e. Brake shoe lin- ings worn less than 1/4 inch.	
42	Annual	Axle Brake Cam-Shaft and Slack	NOTE When using a grease gun, apply lubricant to the fitting until clean lubricant		
		Adjuster	squeezes out of the part being lubricated. Lubricate GAA No.1 -4 axle brake camshafts and slack adjusters.	Fitting will not purge old lubricant out of component.	

Table 3-1. Unit Level Preventive Maintenance Checks and Services M915-M92O

		<u> </u>		
Item No.	Interval	tern To Be Inspected	Procedure	Not Mission Capable If:
43	Annual	Rear Axles	a. Inspect each input and output shaft seal for damage and leaks.	
			NOTE Do not remove wheels from hubs. Use truck wheel lift to remove wheels and hub as an assembly.	
			b. Remove, clean, and check wheel bearings for damage or wear (paragraph 10-15).	b. Wheel bearings loose, damaged, or worn.
			c. Clean hub and brake shoe assemblies with brake cleaning solvent.	
			NOTE	
			NOTE If hub has one gouge or grove, turn hub into Direct Support for resurfacing.	
			d. Check brake drums for obvious grooves and uneven wear.	 d. Deep grooves or uneven wear is evi- dent.
44	Annual	Forward Rear Axle Oil Filter	Change forward rear axle oil filter (paragraph 8-13).	
45	Annual	Starter	a. Remove starter (paragraph 5-32).	
			b. Remove three socket head screws and add three to five drops of OE/HDO to each reservoir.	
			SOCKET HEAD SCREWS	

Table 3-1. Unit Level Preventive Maintenance Checks And Services M915-M920

	Table	3-1. Ullit Lev	el Preventive Maintenance Checks And Service	Ces Mais-Mazo
Item No.	Interval	tern To Be Inspected	Procedure	Not Mission Capable If:
45	Annual	Starter Continued	WARNING Adhesives, solvents, and sealing compounds can burn easily, can give off harmful vapors, and are harmful to skin and clothing. To avoid injury or death, keep away from fire and use in well-ventilated area. If adhesive, solvents, or sealing compund get on skin or clothing, wash immediately with soap and water. c. Clean drive and drive spline and apply a thin coat of grease (GAA).	
46	Annual	Speed- ometer	Lubricate speedometer with GAA.	
47	Annual	Pusher Axle Wheel Bearing (M920)	NOTE Do not remove wheels from hubs. Use truck wheel lift to remove wheels and hub as an assembly. NOTE See paragraph 10-16 for bearing removal and installation. a. Remove, clean, and repack with GAA the pusher axle wheel bearing.	

Table 3-1. Unit Level Preventive Maintenance Checks and Sewices M915-M920

Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:			
47	Annual	Pusher Axle Wheel Bearing (M920) Continued	 b. Check wheel bearings for looseness, damage, or wear (paragraph 10-16b). c. Clean hub and brake shoe assemblies with brake cleaning solvent. NOTE If hub has one gouge or groove, turn hub into Direct Support for resurfacing. d. Check brake drums for obvious grooves and uneven wear. e. Check that brake shoe linings are not worn less than 1/4 inch. 				
48	Annual	Front Stop- master Wedge Brakes and Cham- bers M916/ M920	NOTE Off-Highway (M916/M920 as applicable). Change grease whenever seals are replaced or when brakes are relined. Lubricate stopmaster wedge brake chambers annually or whenever seals are replaced or brakes are relined with GAA.				

Table 3-1 Unit Level Preventive Maintenance Checks And Services M915-M920

	Table 3-1 Unit Level Preventive Maintenance Checks And Services M915-M920					
Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:		
49	Annual	Front Wheel Knuckle	NOTE Pressure gun should be held on fittings until new grease appears. This will assure that all the old contaminated grease has been forced out. Lubricate wheel knuckle with GAA.	Fittings will not purge old lubricant out of component.		
			TIE ROD			
50	Annual	Cardan Universal Joint M916/ M920	Lubricate cardan universal joint with GAA.	Fittings will not purge old lubricant out of component.		
			LUBE			

Table 3-1. Unit Level Preventive Maintenance Checks and Services M915-M920

	Table 3-1. Offic Level 1 revenue maintenance offects and Services 19313-19320					
Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:		
	Interval		FINAL ROAD TEST After all services and inspections have been completed, take vehicle on a short road test to make sure all corrections have been accomplished. Correct any defects or malfunctions that occur during this test. During road test: 1. Listen for any noises. 2. Check steering operation. 3. Check brake operation. 4. Check transmission operation; all ranges. 5. Check engine retarder (JACOBS ENGINE BRAKE) operation (TM 9-2320-273-10). 6. Note any loss of power or rough running engine. 7. Check driveline lockup system operation (TM 9-2320-273-10).			

Table 3-1. Unit Level Preventive Maintenance Checks And Service M915-M920

	l able	3-1. Ullit Le	vel Preventive Maintenance Checks And Service	M915-M920
Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
51	Biennially	Transfer Case (M916 and M920 Only)	Drain oil from transfer case at drain plug. Refill with OE/HDO at fill plug.	
			FILL POINT (2) DRAINS	
52	Biennially	Tie Rod Ends (M915 Only)	Inspect tie rod for looseness.	Any looseness is evident.
53	Biennially	Front Stop- master Wedge Brakes and Cham- bers M916/ M920	NOTE On-Highway (M916/M920 as applicable). Change grease whenever seals are replaced, or when brakes are relined. Lubricate stopmaster wedge brake chambers annually or whenever seals are replaced or brakes are relined with GAA.	

Table 3-1. Unit Level Preventive Maintenance Checks and Services M915-M920

Item No.	Interval	Item To Be Inspected	Procedure	Not Mission Capable If:
54	Biennially	Rear Axles	NOTE Change lubricant in new or rebuilt axles within 1000 miles (1600 km) but no sooner than 500 miles (800 km). Following initial drain, change lubricant every 12,000 miles (19,300 km) or 2 years of service, whichever comes first. During all lubricant changes, remove metal particles from magnetic drain and filler plugs. Drain and refill all axle differentials with GO.	Differentials have not been drained within specified in- terval.
55	Biennially	Front Axles M916/ M920	NOTE Change lubricant in new or rebuilt axles within 1000 miles (1600 km) but no sooner than 500 miles (800 km). Following initial drain, change lubricant every 12,000 miles (19,300 km) or 2 years of service, whichever comes first. During all lubricant changes, remove metal particles from magnetic drain and filler plugs. Drain and refill front axle differential with GO.	Differentials have not been drained within specified in- terval.

M915 THROUGH M920 SERIES TRUCK (CHASSIS) PMCS PARTS LIST

ITEM <u>NO</u>	PART <u>NUMBER</u>	STOCK NUMBER	<u>NOMENCLATURE</u>	QTY	<u>REMARKS</u>
		Semi-Annual (6,000 Miles)		
1	286718	2940-01-081-1391	DESSICANT PACK	1	
2	LF6070	2940-01-019-4513	ENG-FF-OIL-FTR	1	
3	C175AP	2940-00-316-1413	ENG-BP-OIL-FTR	1	
		Annual (12,	000 Miles)		
1	286718	2940-01-081-1391	DESSICANT PACK	1	
2	LF6070	2940-01-019-4513	ENG-FF-OIL-FTR	1	
3	C175AP	2940-00-316-1413	ENG-BP-OIL-FTR	1	
4	FS1212	2910-01-146-1099	FUEL FILTER	1	
5	250C127S	2940-01-065-8396	INT-AIR-FILTER	1	DON'T REUSE
6	250C128S	2940-01-066-1327	EXT-AIR-FILTER	1	CLEAN 5X ONLY
7	3280-V-5040	2940-00-221-3470	F-RR-AXLE FTR	1	M915 ONLY
8	WF2071	4330-00-274-4712	ENG-WTR-FILTER	1	KIT OPTION
		Biennial (24	,000 Miles)		
1	286718	2940-01-081-1391	DESSICANT PACK	1	
2	LF6070	2940-01-019-4513	ENG-FF-OIL-FTR	1	
3	C175AP	2940-00-316-1413	ENG-BP-OIL-FTR	1	
4	FS1212	2910-01-146-1099	FUEL FILTER	1	
5	250C127S	2940-01-065-8396	INT-AIR-FILTER	1	DON'T REUSE
6	250C128S	2940-01-066-1327	EXT-AIR-FILTER	1	CLEAN 5X ONLY
7	3280-V-5040	2940-00-221-3470	F-RR AXLE FTR	1	M9150NLY
8	WF2071	4330-00-274-4712	ENG-WTR-FILTER	1	KIT OPTION
9	ERS27549	2530-00-445-4420	P/S PUMP FTR	1	AS REQUIRED
10	S58	2910-00-545-1350	WINCH-HYD-FTR	1	M916/M9200NLY
11	A-1205-L-1338	5330-01-082-7965	SEAL, WHL BRNG	2 N	1915FRONT AXLE
12	2208-M-819	5330-01-082-8595	HUB GASKET	2 N	1915FRONT AXLE
13	839495	5330-00-409-5771	SEAL, IN BRNG	4 9	15 TANDEM AXLE

Biennial (24,000 Miles) - Continued

ITEM	PART	STOCK	NOMENCLATURE	Q ⁻	<u> TY REM</u> ARKS
<u>N O</u>	<u>NUM</u> BER	<u>NUMBER</u>			
14	A-1205-N-612	5330-00-807-8123	SEAL, OUT BRNG	4	915 TANDEM AXLE
15	1229-X-518	5310-00-800-0695	STAR WASHERS	16	915 TANDEM AXLE
16	2208-X-440	5330-00-580-6567	GASKET, HUB	4	915 TANDEM AXLE
17	**2499 (78500)	5330-01-330-5412	SEALS, WH BRNG	4	915 TANDEM AXLE
	*A-1205-Y-1533	5330-01-088-9142	SEAL, WHL BRNG	2	M916-M920 F. AX
	*1199-T-3166	5330-01-090-2106	SEAL, WHL BRNG	2	M916-M920 F. AX
	*A-1205-T-774	2540-00-938-8160	SEAL, IN BRNG	4	M916-M920 T. AX
	¹ A-1205-U-619	5330-01-076-2886	SEAL, OUT BRNG	4	M916-M920 T. AX
	*1244U879	5330-01-075-0790	SEAL, WHL BRNG	4	M916-M920 T. AX
	*2208-W-413	5330-00-255-0310	HUB GASKET	2	M916-M920 T. AX
(*Part	t of kit identified above	with **)			
18	1205-P-1212	5330-01-090-2107	SEAL, IN BRNG	2	PUSHER AXLE
19	2208-P-796	5330-01-273-9944	HUB GASKET	2	PUSHER AXLE

LUBRICATION TABLE

	REFILL	EXPECTED TEMPERA		JRES
LUBRICANTS (SEE NOTE 20)	CAPACITY (APPR.)	Above +32°F	+40°F to -15°F (See Note 19)	O°F to-65°F
OE/HDO, AND OEA (ARC- TIC GRÄDE)-OIL ENGINE	11 GAL WITH BOTH FILTERS	OE/HDO 30	OE/HDO 10	OEA
OE/HDO-10, AND OEA ARCTIC GRADE)-OIL DEXRON* ATF PREFERRED) SEE NOTE 11 E) TRANSMISSION	32 QUARTS WITH EXTERNAL	OE/HDO 10	OE/HDO 10	OEA
GO LUBRICANT. MULTIPURPOSE	SEE NOTE 7C	GO 85/140	GO 80/90	GO 75 (-40°F LIMIT)
(EP 75W-90,SHC 75W-90, OR P.A.O. 75W 140 PER MIL-L-2105C) DIFFERENTIALS				(-40°F to-65°F)
OE/HDO-10, AND OEA (ARTIC GRADE)-OIL (DEXRON* ATF PREFERRED)	2 QUARTS	ALL	TEMPERATURES	
(SEE NOTE 4B) POWER STEERING	2 QUANTS	D - I	Daily	
GAA-GREASE AUTOMOTIVE & ARTILLERY	AS REQUIRED	W - Weekly, as required depend- ing upon use		nd-
CWII-LUBR, CHAIN EX- POSED GEAR AND WIRE ROPE	AS REQUIRED	1-1, mon	000 Miles or 1 th, whichever occurs first	
ROPE CLAIR AND WINE	AO NEQUINED	3-3,000 Miles or 3 month whichever occurs first		
		12-1 whice	12,000 Miles or 12 month	S,
		24-2 whic	24,000 Miles or 24 month hever occurs first	S,
		FOR ARTIC (PERATION REFER TO F	FM 9-207
	TOTAL MA	AN-HOURS		
INTERVAL D W	1	3	6 12	24
MAN-HOURS .3 .1	.7	.4	.6 .4	3.2
NOTE: The man-hours shown a are not applicable at m				

Section IV TROUBLESHOOTING SYMPTOM INDEX

3-8. INTRODUCTION.

Detailed troubleshooting procedures are provided in chapters 4 thru 12 of this manual. The procedures are arranged by subsystem categories under Malfunction Symptoms. The following composite Malfunction Symptom Index provides a cross reference to the troubleshooting procedures contained in the other chapters.

Table 3-2. Composite Troubleshooting Symptom Index

	Troublesho	ooting Procedures
	Table	Malfunction Number
BACKUP LAMPS.		
Backup lamp(s) inoperative.	5-12	1
BATTERY SYSTEM.		
All electrical systems are weak.	5-1	1
Engine fails to crank or cranks slowly.	5-1	2
Batteries do not hold a charge.	5-1	3
BLACKOUT LIGHTING SYSTEM.		
All blackout lamps inoperative.	5-13	1
One blackout marker, headlamp, tail lamp, or stop lamp inoperative.	5-13	2
Trailer blackout lamps inoperative.	5-13	3
CHARGINGCIRCUIT.		
Batteries are being undercharged or overcharged.	5-5	1
COMPRESSED AIR AND BRAKE SYSTEMS.		
Insufficient air pressure.	9-1	1
Excessive system pressure indicated.	9-1	2
Park brakes will not release.	9-1	3
Trailer brakes will not release.	9-1	4
Service brakes will not release (one wheel only).	9-1	5
Service brakes will not apply.	9-1	6

Table 3-2. Composite Troubleshooting Symptom Index (Continued).

	Troublesho	ooting Procedures
	Table	Malfunction Number
COMPRESSED AIR AND BRAKE SYSTEMS (Continued).		
No service brakes on trailer only.	9-1	7
Trailer hand control unit will not apply trailer	0.4	0
service braes.	9-1	8
Park brakes will not apply.	9-1	9
Service brakes are weak or slow responding (all wheels).	9-1	10
Front service brakes are weak or slow responding.	9-1	11
Rear service brakes are uneven or erratic.	9-1	12
Service brakes are uneven or erratic on one or		
more wheels.	9-1	13
Brakes overheat.	9-1	14
Stop lamps do not operate, brakes function normally.	9-1	15
Pressure gage(s) not indicating or not accurate, brakes normal.	9-1	16
Air horn does not operate.	9-1	17
Windshield wipers are inoperative.	9-1	18
Interaxle differential lockup inoperative.	9-1	19
ENGINE.		
Engine will not crank.	4-1	1
Engine will crank but not start.	4-1	2
Engine stops, not seized.	4-1	3
Engine stops, seized.	4-1	4
High oil consumption.	4-1	5
Intermittent loss of power.	4-1	6
Sudden loss of power.	4-1	7
Gradual loss of power, no smoke.	4-1	8
Slow deceleration, engine "floats".	4-1	9

Table 3-2. Composite Troubleshooting Symptop Index (Continued).

	Troublesh	ooting IProcedures
	Table	Malfunction Number
ENGINE (Continued).		
Erratic idle speed.	4-1	10
Excessive exhaust smoke during acceleration.	4-1	11
Excessive exhaust smoke throughout speed range.	4-1	12
High fuel consumption.	4-1	13
Low oil pressure.	4-1	14
No cab heat.	4-1	15
Excessive exhaust noise.	4-1	16
Exhaust fumes in cab.	4-1	17
Engine overheats	4-1	18
ENGINE RETARDER CONTROLS.		
No retarding action.	5-4	1
Retard inoperative in one or two selector position.	5-4	2
ETHER QUICK-START CONTROLS.		
Solenoid cannot be heard to click when ether button is pushed.	5-3	1
FRAME,		
Towing pintle does not pivot or latch, or jaw is stuck.	11-1	
Excessive jerking of towed trailer.	11-1	2
Excessive noise or popping sounds from fifth	''-'	2
wheel when turning.	11-1	3
HEADLAMPS.		
Both headlamps blink on and off.	5-8	1
One headlamp inoperative.	5-8	2
Both headlamps inoperative.	5-8	3
High beam indicator inoperative.	5-8	4

Table 3-2. Composite Troubleshooting Symptom Index (Continued).

	Troublest	nooting Procedures
	Table	Malfunction Number
INSTRUMENTS AND INDICATORS.		
Differential lockup lamp inoperative.	5-7	1
Park brake lamp inoperative.	5-7	2
Instrument panel gages inoperative.	5-7	3
Tachograph clock is inoperative.	5-7	4
Indicator/illumination lamp out.	5-7	5
MARKER LAMPS.		
Front marker lamps inoperative.	5-9	1
Intermediate marker lamps inoperative.	5-9	2
Rear marker lamps inoperative.	5-9	3
All marker lamps inoperative.	5-9	4
MISCELLANEOUS ELECTRICAL.		
Electric horn inoperative.	5-14	1
Personnel heater fan inoperative.	5-14	2
Dome lamp inoperative.	5-14	3
Work lamps inoperative.	5-14	4 & 5
Cigar lighter inoperative.	5-14	6
Winterization kit malfunctioning.	5-14	7
PARKING AND TAIL LAMPS.		
Single lamp inoperative.	5-10	1
Front lamps inoperative.	5-10	2
Rear lamps inoperative.	5-10	3
POWER TAKEOFF.		
PTO will not engage.	12-2	1
PTO is excessively noisy.	12-2	2
POWER TRANSFER CASE		
Power transfer case does not turn front axle		
propeller shaft.	7-1	1
Excessive heat buildup.	7-1	2

Table 3-2. Composite Troubleshooting Symptom Index (Continued).

	Troublesho	oting Procedures
	Table	Malfunction Number
POWER TRANSFER CASE (Continued).		
Lubricant leaking.	7-1	3
Transfer case noisy (oil level okay).	7-1	4
PROPELLER SHAFTS AND AXLES.		
Excessive shaft noise or vibration.	8-1	1
Excessive backlash.	8-2	1
Continuous axle or wheel noise.	8-2	2
Lubricant leaking.	8-2	3
Excessive or uneven tire wear.	8-2	4
STARTER SYSTEM.		
Starter fails to crank or cranks too slowly.	5-2	1
Starting motor is noisy and engagement is erratic	5-2	2
STEERING.		
Front tires wearing unevenly.	10-2	1
Hard steering.	10-2	2
Vehicle wanders or pulls to one side.	10-2	3
Lost motion or excessive play in steering wheel.	10-2	4
Temporary increase in effort when turning		
steering wheel.	10-2	5
Vehicle does not fully steer from stop to stop.	10-2	6
STOP AND TURN SIGNAL LAMPS.		
Turn signals inoperative.	5-11	1
Stop lamps inoperative.	5-11	2
SUSPENSION.		
Vehicle wanders or shimmies.	10-3	1
Pusher axle will not raise or lower.	10-3	2
Rear axle assembly not tracking properly.	10-3	3

Table 3-2. Composite Troubleshooting Symptom Index (Continued).

	Troubleshooting Procedures	
	Table	Malfunction Number
TRANSMISSION.		
Selector lever cannot be moved from NEUTRAL position.	6-1	1
Engine does not turn driveshaft in any speed, forward or reverse.	6-1	2
Engine turns driveshaft in some gears, but not others.	6-1	3
Engine does not turn power takeoff in NEUTRAL.	6-1	4
Truck moves when engine is at low idle and transmission in gear.	6-1	5
Transmission housing breather shows an air leak after the shift is complete.	6-1	6
Transmission feels like it is engaged, then not engaged, then engaged again – Transmission is also noisy.	6-1	7
Transmission has a decrease in oil level with an increase in oil in the engine.	6-1	8
Transmission gears make noise during a shift,	6-1	9
WARNING LAMPS AND ALARMS.		
Engine temperature warning lamp inoperative.	5-6	1
Engine oil pressure low warning lamp inoperative.	5-6	2
Low air pressure warning lamp and/or buzzer inoperative.	5-6	3
Backup alarm is inoperative.	5-6	4
WHEELS AND TIRES.		
Tires wearing unevenly.	10-1	1
Noisy or bumping sound while traveling on the road.	10-1	2
WINCH.		
Winch operates in one direction only.	12-1	1
Winch does not operate in either direction.	12-1	2
Winch operates at one speed only.	12-1	3
Winch will not hold suspended load.	12-1	4

Section V TORQUE INSTRUCTIONS

- 3-9. Use these guidelines when tightening bolts and capscrews:
 - a. If the text gives a specific torque value, use it.
 - b. Never torque engine capscrew beyond the values given for grade 5 in table 3-3.
 - c. If no torque is specified, refer to table 3-3 for torque value.



Never torque an engine capscrew beyond the value given for grade 5, even if it is marked as grade 6, 7 or 8.

Table 3-3. Standard Capscrew Markings and Torque.

Current Useage	Much Used	Much Used	Used at Times	Used at Times
Minimum Tensile	To 1/2-69,000 (4	76) To 3/4-120,000 (827)	To 5/8-140,000 (965)	150,000 (1034)
Strength PSI	To 3/4-64,000 (42	21) To 1-115,000 (793)	To 3/4-133,000 (917)	
MPa	To 1-55,000 (379)			
Quality of Material	Indeterminate	Minimum Commercial	Medium Commercial	Best Commercial
SAE Grade Number	1 or 2	5	6 or 7	8

Capscrew Head Markings

Manufacturer's marks may vary

These are all SAE Grade 5 (3 line)











Capscrew Body Size Torque		Torque	Torque	Torque
(Inches) - (Thread) Lb-Ft (N-m)		Lb-Ft (N•m)	Lb-Ft (N•m)	Lb-Ft (N•m)
1/4 – 20	5(7)	8(11)	10(14)	12(16)
-28	6(8)	10(14)		14(19)
5/16-18	11(15)	17(23)	19(26)	24(33)
-24	13(18)	19(26)		27(37)
3/8 – 16	18(24)	31(42)	34(46)	44(60)
-24	20(27)	35(47)		49(66)
7/16 – 14	28(38)	49(66)	55(75)	70(95)
- 20	30(41)	55(75)		78(106)
1/2 – 13	39(53)	75(102]	85(115)	105(142)
– 20	41(56)	85(115)		120(163)
9/16 – 12	51(69)	110(149)	120(163)	155(210)
– 18	55(75)	120(163)		170(231)
5/8 – 11	83(113)	150(203)	167(226)	210(285)
– 18	95(129)	170(231)		240(325)
3/4 – 10	105(142)	270(366)	280(380)	375(508)
– 16	115(156)	295(400)		420(569)
7/8 - 9	160(217)	395(536)	440(597)	605(820)
- 14	175(237)	435(590)		675(915)
1 – 8	2351319.)	590(800)	660(895)	910(1234)
– 14	250(339)	660(895)		990(1342)

^{1.} Always use the torque values listed above when definite specifications are not available.

Note: Do not use standard values in place of those specified in other sections of this manual; special attention should be observed when using SAE Grade 6, 7 and 8 capscrews.

- 2. The above is based on use of clean and dry threads.
- 3. Reduce torque by IO% when engine oil is used as a lubricant.
- 4. Reduce torque by 20% if new plated capscrews are used.

Caution: Capscrews threaded into aluminum may require reductions in torque of 30% or more, unless inserts are used.

TA 074608

CHAPTER 4

ENGINE AND ENGINE SYSTEMS MAINTENANCE

4-1. OVERVIEW.

This chapter provides you with the following information related to engine maintenance:

- a. All required special tools and equipment
- b. Other technical manuals
- c. Troubleshooting procedures
- d. Maintenance procedures

Section I REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

4-2. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

4-3. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.

The special tools, TM DE, and support equipment required for the engine maintenance procedures described in this chapter are limited to the oil filter strap wrench. (Refer to Organizational Maintenance RPSTL, TM 9-2320-273-20P for tool description and illustration.)

4-4. SPARES AND REPAIR PARTS.

Spares and repair parts are listed and illustrated in the Repair Parts and Special Tools List covering Organizational Maintenance for this equipment (TM 9-2320-273-20P).

Section II TROUBLESHOOTING

4-5. INTRODUCTION.

Procedures for troubleshooting the engine and engine systems are given in table 4-1. These procedures are limited to isolation of faulty components that can be repaired or replaced at the Organizational Maintenance level. (For repair and replacement, see section III in this chapter.) A complaint by the operator may have a variety of causes, singly or in combination. For example, in cases where internal engine parts have failed, the true cause can usually be found in one or more of the fluid systems and less frequently in the internal parts themselves. Therefore, a thorough repair would include the investigation and discovery of the faulty system.

Table 4-1. Engine and Engine Systems Troubleshooting.

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

1. ENGINE WILL NOT CRANK:

Step 1. Check battery condition.

Test, charge, or replace as indicated by hydrometer (para 5-7).

Step 2. Check battery cables and terminals for loose or dirty connections.

Clean and tighten connections.

- Step 3. Check electrical starting system.
 - a. Troubleshoot starting system (para 5-8).
 - b. Notify Direct Support Maintenance.

2. ENGINE WILL CRANK BUT NOT START:

Step 1. Check fuel level in tank.

Add fuel, if required.

Step 2. Check fuel solenoid shutoff valve.

Repair, if required (para 4-16).

Step 3. Check for leaking fuel lines.

Tighten connections or replace fuel lines as required (para 4-20).

Step 4. Check for air cleaner element restriction.

Service air cleaner element (para 4-24).

Step 5. Check for white exhaust smoke.

Use cold weather starting aid (Refer to TM 9-2320-273-10).

Step 6. Check for dirty fuel filter.

Service fuel filter (para 4-18).

Step 7. Check for congealed fuel (cold weather).

Check fuel specifications (Refer to TM 9-2320-273-10).

- 3. ENGINE STOPS, NOT SEIZED:
 - Step 1. Refer to steps 1 thru 7 of Malfunction 2 above.
 - Step 2. Check for obstructed air vent in fuel tank.

Remove air vent (para 4-23), then clean.

4. ENGINE STOPS, SEIZED:

Refer problem to Direct Support Maintenance.

Table 4-1. Engine and Engine Systems Troubleshooting (Continued).

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

5. HIGH OIL CONSUMPTION:

- Step 1. Check for overfilling.
 - a. Check oil level.
 - Determine that you have proper dipstick by matching against known proper configuration.
- Step 2. Check service records to determine that proper viscosity of oil is in use. (Refer to LO 9-2320-273-12.)
- Step 3. Check engine for external oil leaks with engine running.

Refer to Direct Support Maintenance for repair of oil leaks.

6. INTERMITTENT LOSS OF POWER:

- Step 1. Refer to steps 1, 3 and 4 of Malfunction 2.
- Step 2. Check fuel tank air vent.

Remove air vent (refer to para 4-23); then clean.

Step 3. Refer to step 6 of Malfunction 2.

Refer to Direct Support Maintenance.

7. SUDDEN LOSS OF POWER:

- Step 1. Check fuel level in tank.
- Step 2. Check for exhaust restriction.
 - a. Check for loose baffles. Replace muffler if damaged (para 4-37).
 - b. Check for damaged exhaust stack. Replace.
- Step 3. Check for dirty fuel filter.

Service fuel filter (para 4-18).

Step 4. Check for leaking fuel lines.

Tighten connections or replace fuel lines as required (para 4-20).

Step 5. Check for air cleaner element restriction.

Service air cleaner element as necessary (para 4-24).

Step 6. Check for congealed fuel (cold weather).

Check fuel specification (refer to TM 9-2320-273-10).

Table 4-1. Engine and Engine Systems Troubleshooting (Continued).

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

8. GRADUAL LOSS OF POWER, NO SMOKE:

Step 1. Check for leaking fuel lines.

Tighten connections or replace fuel lines as required (para 4-20).

Step 2. Check for air intake restriction.

Service air intake as necessary (para 4-25).

Step 3. Check for worn accelerator rod linkage.

Adjust and replace worn parts (para 4-21).

Step 4. Check for congealed fuel (cold weather).

Check fuel specification (refer to TM 9-2320-273-10).

9. SLOW DECELERATION, ENGINE "FLOATS":

Check for air leaks in fuel pump supply lines.

Service supply lines as necessary (para 4-20).

10. ERRATIC IDLE SPEED:

Check for air leaks in fuel pump supply lines.

Service supply lines as necessary (para 4-20).

11. EXCESSIVE EXHAUST SMOKE DURING ACCELERATION:

Step 1. Check for dirty fuel filter.

Service fuel filter (para 4-18).

Step 2. Check for air crossover tube leaks (para 4-28).

- a. Repair air crossover tube leaks (para 4-28).
- b. Refer to Direct Support Maintenance.

12. EXCESSIVE EXHAUST SMOKE THROUGHOUT SPEED RANGE:

Step 1. Check for dirty air cleaner element.

Clean or replace element (para 4-24).

Step 2. Check for poor quality fuel.

- a. Check fuel specification. (Refer to TM 9-2320-273-10).
- b. Refer to Direct Support Maintenance.

13. HIGH FUEL CONSUMPTION:

Step 1. Check for poor quality fuel.

- a. Check fuel specification trefer to TM 9-2320-273-10).
- b. Notify Direct Support Maintenance.

Table 4-1. Engine and Engine Systems Troubleshooting (Continued).

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

14. LOW OIL PRESSURE:

Step 1. Check oil level.

Fill to proper level (Refer to Lubrication Order LO 9-2320-273-12).

Step 2. Check filter.

Replace filter (para 4-14).

Step 3. Check for defective oil pressure gage.

Test pressure with a gage that is known to be good (para 5-59). If test gage indicates correct pressure, replace gage. If low or no pressure is indicated, notify Direct Support Maintenance.

15. NO CAB HEAT:

Step 1. Check for closed heater water control valve.

Open valve (para 4-50).

Step 2. Check for air in heater.

Bleed air from heater (para 4-50).

Step 3. Check for low coolant level.

Fill to proper level and check for leaks (para 4-42).

Step 4. Check thermostat and thermal control (engine running cold).

Replace thermostat (para 4-43).

16. EXCESSIVE EXHAUST NOISE:

Step 1. Check for defective exhaust pipe or gasket(s).

Replace defective item (para 4-34 thru 4-38, as applicable).

Step 2. Check for defective muffler.

Replace muffler (para 4-37).

17. EXHAUST FUMES IN CAB:

Check for loose or defective manifold or leaks in pipes.

Replace pipe (para 4-34 thru 4-38, as applicable) or refer to Direct Support Maintenance if manifold is defective.

18. ENGINE OVERHEATS:

Step 1. Check coolant level.

Add coolant until sight glass is full.

Table 4-1. Engine and Engine Systems Troubleshooting (Continued).

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

18. ENGINE OVERHEATS (Continued):

Step 2. Check for loose or broken fan belts.

Tighten or replace belts (para 4-45).

Step 3. Check thermostat.

Replace thermostat (para 4-43).

- Step 4. With engine running and radiator cap removed, check for proper coolant flow.
 - a. Check for clogged radiator hose. Clean or replace hoses (para 4-39).
 - b. Replace water pump (para 4-53).
- Step 5. Check fan clutch actuator.
 - a. Check actuator tubes. Replace if necessary (para 4-48 or 4-49).
 - b. Replace actuator (para 4-46 or 4-47).
 - c. Replace fan clutch (para 4-45).
 - d. Refer problem to Direct Support Maintenance.

Section III MAINTENANCE PROCEDURES

4-6. INTRODUCTION

This section provides Organizational Level maintenance procedures for the engine and engine systems. To find a specific maintenance procedure, see one of the following lists of task summaries:

- a. Engine Oil System Maintenance (para 4-7.
- b. Fuel and Air Intake System Maintenance (para 4-8).
- c. Engine Retarder Brake Maintenance (para 4-9).
- d. Ether Quick-Start System Maintenance (para 4-10).
- e. Exhaust System Maintenance (para 4-11).
- f. Cooling System Maintenance (para 4-12).
- a. Alternator Drive System Maintenance (para 4-13).

4-7. ENGINE OIL SYSTEM MAINTENANCE TASK SUMMARY.

INITIAL SETUP APPLICABLE CONFIGURATIONS

EQUIPMENT CONDITION PARA.

CONDITION DESCRIPTION

11-14A or C.

Left Front Fender Removed.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Oil, 40 qts (Refer to Appendix C). Containers, Five Gallon (3).

Rags.

Bypass Filter Element, 2122 (37099).

Cover Gasket, 4311 (37099).

Primary Filter Element, 299670 (15434).

Tape, Antiseizing Item 14, Appendix C.

PERSONNEL REWIRED

One (MOS-63B20).

REFERENCES (TM)

M9-2320-273-20P.

TM9-2320-273-10.

LO 9-2320-273-12 REFERENCES (TROUBLESHOOTING)

Table 4-1.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle parked on level ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
1.	Engine Oil Service:	4-14	4-1
	A. Draining oil.	4-14A	
	B. Removal of primary filter.	4-14B	
	C. Inspection of filter adapter.	4-14C	
	D. Installation of primary filter.	4-14D	
	E. Removal of bypass filter.	4-14E	
	F. Bypass filter inspection.	4-14F	
	G. Inspection/replacement of oil lines	4-14G	

LIST OF TASKS					
ASK 10.	TASK	TAS K REF	TROUBLESHOOTING REF (TABLE)		
1.	Engine Oil Service (Continued):				
	H. Installation of bypass filter element.	4-14H			
	I. Replenishing oil.	4-141			
	J. Checking for leaks.	4- 14J			
2.	Breather Tube Maintenance:	4-15			
	A. Removal.	4-15A			
	B. Cleaning.	4-15B			
	C. Inspection.	4-15C			
	D. Installation.	4-15D			

4-8. FUEL AND AIR INTAKE SYSTEM MAINTENANCE TASK SUMMARY.

INITIAL SETUP EQUIPMENT APPLICABLE CONFIGURATIONS **CONDITION PARA CONDITION DESCRIPTION** 5-37A._ All. Batteries Disconnected. 11-14 A or C. Left Front Fender Removed. **TEST EQUIPMENT** 4-22A. Hand Throttle Cable Disconnected

12-12A. None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Shield (2910-00-064-7787). Outer Filter Element V250C128. O-Ring (5330-00-081-9299). Inner Filter Element V250C127. Masking Tape. Container(s) (AR for fuel). Marking Pencil. Liquid Teflon (Appendix C).

Fuel Filter (2910-00-174-5822).

Soap Solution.
Dry Cleaning Solvent SD-2 (Appendix C). O-Ring, 213079 (15434).

Container (1 qt. Gasket (5330-00-951-3538). Tachometer RPM Drive Cable Cap Seal Ring (5330-00-961-9470). MA280J20000 (34623). Cotter Pin (3), 103362 (24617).

PERSONNEL REQUIRED

One, two or three (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-20P. TM 9-2320-273-10.

REFERENCES (TROUBLESHOOTING)

Table 4-1.

SPECIAL ENVIRONMENTAL CONDITIONS

at Throttle Mounting Bracket.

at Throttle Mounting Bracket

(M916 and M920).

Winch Throttle Cable Disconnected

Vehicle parked on level ground. Work in well ventilated area. Darkened area for filter check. Work area must be clean as dirt in the air passages can damage the turbocharger and engine.

GENERAL SAFETY INSTRUCTIONS

Engine off.

Transmission in Neutral.

Park brake set.

TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
1.	Fuel Solenold Shutoff Valve Maintenance:	4-16	4-1
	A. Removal.	4-16A	
	B. Installation.	4-16B	
	C. Operational Check.	4-16C	
2.	Fuel Pump Screen Maintenance:	4-17	
	A. Removal.	4-17A	
	B. Cleaning.	4-17B	

4-8. FUEL AND AIR INTAKE SYSTEM MAINTENANCE TASK SUMMARY (Continued).

LIST OF TASKS			
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
2.	Fuel Pump Screen Maintenance (Continued):	4.470	
	C. Installation.	4-17C 4-17D	
	D. Checking for leaks.	4-170	
3.	Fuel Filter Maintenance:	4-18	4-1
	A. Removal.	4-18A	
	B. Installation.	4-18B	
	C. Checking for leaks.	4- 18C	
4.	Tachograph RPM Cable Maintenance:	4-19	
	A. Removal.	4-19A	
	B. Installation.	4-19B	
	C. Operational check.	4-19C	
5.	Lines, Hoses, and Fittings Maintenance	4-20	4-1
6.	Accelerator Pedal and Rod Maintenance:	4-21	4-1
	A. Removal.	4-21A	
	B. Installation.	4-21B	
	C. Checking idle speed.	4-21C	
7.	Hand Throttle Linkage Maintenance:	4-22	
	A. Removal.	4-22A	
	B. Cleaning and inspection.	4-22B	
	C. Installation.	4-22C	
	D. Checking idle speed.	4-22D	
8.	Fuel Tank Maintenance:	4-23	4-1
	A. Removal.	4-23A	
	B. Installation.	4-23B	
	C. Checking for leaks.	4-23C	

LIST OF TASKS				
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)	
9.	Air Cleaner Element Maintenance:	4-24	4-1	
0.				
	A. Removal.	4-24A		
	B. Cleaning. C. Installation	4-24B 4-24C		
	G. Ilistaliation	4-240		
10.	Air Cleaner Assembly Maintenance:	4-25	4-1	
	A. Removal of filter assembly.	4-25A		
	B. Removal of brackets & fittings.	4-25B		
	C. installation of brackets & fittings.	4-25C		
	D. Installation of filter assembly.	4-25D		
11.	Air Cleaner Restriction Indicator Maintenance:	4-26		
	A. Removal of indicator.	4-26A		
	B. Installation of indicator.	4-26B		
	C. Removal of tube and filter.	4-26C		
	D. Installation of tube and filter.	4-26D		
12.	Turbo Air Inlet Maintenance:	4-27		
	A. Removal.	4-27A		
	B. Inspection.	4-27B		
	C. Installation.	4-27C		
	D. Checking for leaks.	4-27D		

4-9. ENGINE RETARDER BRAKE MAINTENANCE TASK SUMMARY.

INITIAL SETUP APPLICABLE CONFIGURATIONS

EQUIPMENT CONDITION PARA

CONDITION DESCRIPTION

AII.

TEST EQUIPMENT

4-15A. 4-27A. 4-28A&B. Breather tube removed. Turbo air inlet removed. Rocker arm housing covers removed.

SPECIAL TOOLS

None.

None.

MATERIALS/PARTS (P/N)

Dry cleaning solvent (Refer to Appendix C). Crossover tube gasket (center cover only) (216487). Gasket, rocker arm housing (3009999).

PERSONNEL REQUIRED

One, or two (MOS-63B20).

REFERENCES (TM)

TM9-2320-273-10. TM9-2320-273-20P.

REFERENCES (TROUBLESHOOTING)

Table 5-4.

SPECIAL ENVIRONMENTAL CONDITIONS

Work area must be clean, as dirt in the turbocharger and engine can cause damage. Vehicle parked on level ground.

GENERAL SAFETY INSTRUCTIONS

Engine off; transmission in neutral. Park brake set.

LIST OF TAS	SKS	
-------------	-----	--

TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)		
1.	Rocker Arm Housing Covers Maintenance:	4-28	5-4		
	A. Removal of crossover tube.	428A			
	B. Removal of cover.	4-28B			
	C. Cleaning.	4-28C			
	D. Installation of cover.	4-28D			
	E. Installation of crossover tube.	4-28E			
2.	Engine Retarder Brake Maintenance:	4-29	5-4		
	Inspection.	4-29			

4-10. ETHER QUICK-START SYSTEM MAINTENANCE TASK SUMMARY.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Ether cylinder (2910-01-072-1783). Solenoid valve, 913032-04 (06991). Atomizer, 91302406 (06991).

PERSONNEL REQUIRED

Two (MOS-63B20)

REFERENCES (TM)

TM9-2320-273-10. TM9-2320-273-20P.

REFERENCES (TROUBLESHOOTING)

Table 5-3.

EQUIPMENT

CONDITION PARA CONDITION DESCRIPTION

4-30A. 911A. Ether Cylinder Removed. Alcohol Evaporator Removed.

SPECIAL ENVIRONMENTAL CONDITIONS

Work in well ventilated area. Vehicle parked on level ground. Coolant temperature must be below 50°F or ether button will not function.

GENERAL SAFETY INSTRUCTIONS

Ether is highly explosive, dispose of cylinder properly. Be alert for the strong odor of spilled ether. Guard against flame or sparks in work area. Engine off; transmission in neutral. Park brake set.

TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
1.	Ether Cylinder Maintenance:	4-30	5-3
	A. Removal.	4-30A	
	B. Installation.	4-30B	
	C. Operational check.	4-30C	
2.	Solenoid Valve Maintenance:	4-31	5-3
	A. Removal.	4-31 A	
	B. Installation.	4-31 B	

ASK IO. TASK 3. Atomizer Maintenance: A. Removal. B. Installation and operational check. 4. Ether Tube Maintenance:	TASK REF 4-32 4-32A 4-32B	TROUBLESHOOTING REF (TABLE) 5-3
A. Removal. B. Installation and operational check.	4-32A	5-3
B. Installation and operational check.		
B. Installation and operational check.		
4. Ether Tube Maintenance:	-	
	4-33	5-3
A. Removal.	4-33A	
B. Inspection.	4-33B	
C. Installation,	4-33C	
D. Operational check.	4-33D	

4-11. EXHAUST SYSTEM MAINTENANCE TASK SUMMARY.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

EQUIPMENT CONDITION PARA

None.

CONDITION DESCRIPTION

None.

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Locknut (M916/M920) M 1219B-20002 (34623). Couplings (5) 5.0-1236 BJ (76700). (3) 5.0-1256 LJ [76700). 5.0-1259 LJ (76700).

PERSONNEL REQUIRED

One or two (MOS-63B20).

REFERENCES (TM)

TM9-2320-273-10. TM9-2320-273-20P.

REFERENCES (TROUBLESHOOTING)

Table 4-1.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle parked on level ground.

GENERAL SAFETY INSTRUCTIONS

Wait until exhaust components are cool. Engine off; transmission in neutral. Park brake set.

TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)		
1.	Turbo Outlet Pipe Maintenance:	4-34	4-1		
	A. Removal.	4-34A			
	B. Inspection of mating flanges.	4-34B			
	C. Installation.	4-34C			
	D. Checking for leaks.	4-34D			
2.	Flex Pipes Maintenance:	4-35	4-1		
	A. Removal.	4-35A			
	B. Inspection of mating flanges.	4-35B			

LIST OF TASKS			
ASK 10.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
2.	Flex Tubes Maintenance (Continued): C. Installation.	4-35C	
	D. Checking for leaks.	4-35D	
3,	Muffler Inlet Pipe Maintenance:	4-36	4-1
	A. Removal.	4-36A	
	B. Inspection of mating flanges.	4-36B	
	C. Installation.	4-36C	
	D. Checking for leaks.	4-36D	
4.	Muffler Maintenance:	4-37	4-1
	A. Removal.	4-37A	
	B. Inspection of mating flanges.	4-37B	
	C. Installation.	4-37C	
	D. Checking for leaks.	4-37D	
5.	Exhaust Stack Maintenance:	4-38	
	A. Removal.	4-38	
	B. Inspection of mating flanges and rain cap.	4-38B	
	C. Installation.	4-38C	
	D. Checking for leaks.	4-38D	

4-12. COOLING SYSTEM MAINTENANCE TASK SUMMARY.

INITIAL SETUP APPLICABLE CONFIGURATIONS	EQUIPMENT CONDITION PARA	CONDITION DESCRIPTION
All.	4-41A.	Upper fan shroud removed.
	4-42A.	Coolant drained.
TEST EQUIPMENT	4-49A, 4-51A. 4-47A.	Water pump belt removed.
	4-46A.	Fan clutch "actuator removed.
Belt tension gage.	4-25A.	Air cleaner removed.
zon tonoion gago.	4-41A.	Upper shroud & fan removed.
SPECIAL TOOLS	4-44A.	Fan removed.
0. 100.10	4-45A.	Fan belts removed.
Thermostat mandrel No. 139.	6-10A.	Transmission oil cooler hoses removed.
monatat manaror vo. 100.	5-73A.	Water temperature switch wire removed.
MATERIALS/PARTS (P/N)	4-27A.	Turbo air inlet removed
<u> (. /// / / / / / / / / / / / / / </u>	11-29A, 11-32A.	Hood removed
Insulators (2) CBA24-500 (76005)	11-16E.	Brush guard removed (M916/M920).
Liquid teflon (refer to appendix C).	11-16A.	Grille removed.
Container (60 qt min).	10-22A.	Steering pump cooler hoses removed.
Gasket (6620-00-047-281 1).	10 22/ !!	eteering pamp ecolor needs femerea.
Rubber seal (5330-00-864-5422).	S	PECIAL ENVIRONMENTAL CONDITIONS
O-Rings (4) (5330-00-506-4874).	<u>-</u>	LOIAE ENVIRONMENTAL CONDITIONS
Sealing rings (6) (5330-00-143-8369).	V	ehicle parked on level ground.
Gasket, 210859 (15434).	•	oniolo partica di lovoi giodila.
Soap solution.	G	SENERAL SAFETY INSTRUCTIONS
Gasket, 3011931 (15434).		
Gasket, 208132 (15434).	E	ingine off; transmission in neutral.
0	_	

PERSONNEL REQUIRED

Gasket, water pump to engine block

Gasket, water pump to heater manifold

One or two (MOS-63B20).

REFERENCES (TM)

(5330-01 -066-5350) .

208132 (15434).

TM 9-2320-273-10. TM 9-2320-273-20P.

REFERENCES (TROUBLESHOOTING)

Table 4-1.

Engine off; transmission in neutral. Park brake set.

4-12. (4-12. COOLING SYSTEM MAINTENANCE TASK SUMMARY (Continued).				
	LIST OF TASKS				
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)		
1.	Radiator Hoses Maintenance:	4-39	4-1		
	A. Inspection.	4-39A			
	B. Removal.	4-39B			
	C. Installation.	4-39C			
2.	Radiator Maintenance:	4-40	4-1		
	A. Removal.	4-40A			
	B. Installation.	4-40B			
3.	Fan Shrouds Maintenance:	4-41			
	A. Removal.	4-41A			
	B. Installation.	4-41B			
4.	Coolant System Maintenance:	4-42	4-1		
	A. Drain.	4-42A			
	B. Inspection/installation of draincocks	4-42B			
	C. Replenishing coolant,	4-42C			
	D. Checking for leaks.	4-42D			
5.	Thermostat and Housing Maintenance:	4-43	4-1		
	A. Removal.	4-43A			
	B. Testing.	4-43B			
	C. Installation.	4-43C			
	D. Operational check.	4-43D			
6.	Fan Maintenance:	4-44	4-1		
	A. Removal.	4-44A			
	B. Installation.	4-44B			
	C. Operational check.	4-44C			

4-12. COOLING SYSTEM MAINTENANCE TASK SUMMARY (Continued).					
	LIST OF TASKS				
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)		
7.	Fan Clutch and Belts Maintenance:	4-45			
	A. Removal.	4-45A			
	B. Inspection.	4-45B			
	C. Installation.	4-45C			
	D. Adjustment.	4-45D			
8.	Fan Clutch Actuator Maintenance (M915, M916, M917, M918, and M920):	4-46	4-1		
	A. Removal.	4-46A			
	B. Inspection of air tubes.	4-46B			
	C. Installation.	4-46C			
	D. Operational check.	4-46 D			
9.	Fan Clutch Actuator and Valve Maintenance (M919):	4-47	4-1		
	A. Removal.	4-47A			
	B. Inspection of air tubes.	4-47B			
	C. Installation.	4-47C			
	D. Operational check.	4-47 D			
10.	Fan Clutch Actuator Tubes Maintenance (M915, M916, M917, M918, and M920):	4-48	4-1		
	A. Removal.	4-48A			
	B. Installation.	4-48B			
	C. Checking for leaks.	4-48C			
11.	Fan Clutch Actuator Tubes Maintenance (M919):	4-49	4-1		
	A. Removal.	4-49A			
	B. Inspection.	4-49B			
	C. Installation.	4-49C			
	D. Checking for leaks.	4-49D			

LIST OF TASKS						
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)			
12.	Heater Shutoff Valve Maintenance:	4-50	4-1			
	A. Removal.	4-50A				
	B. Installation.	4-50B				
	C. Bleeding heater.	4-50C				
13.	Water Pump Belt Maintenance:	4-51				
	A. Removal.	4-51 A				
	B. Installation.	4-51 B				
	C. Adjustment.	4-51C				
14.	Water Manifold Maintenance:	4-52				
	A. Removal.	4-52A				
	B. Inspection.	4-52B				
	C. Installation.	4-52C				
15.	Water Pump Maintenance:	4-53	4-1			
	A. Removal.	4-53A				
	B. Installation.	4-53B				
16.	'Water Pump Idler Pulley Maintenance:	4-54				
	A. Removal.	4-54A				
	B. Installation.	4-54B				
	C. Operational check.	4-54C				
	NOTE					
	Maintenance procedures for the water temperature switch and transmitter are given in Chapter 5, section III.					

4-13. ALTERNATOR DRIVE SYSTEM MAINTENANCE TASK SUMMARY.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

EQUIPMENT CONDITION PARA

None.

CONDITION DESCRIPTION

None.

All.

AII.

TEST EQUIPMENT

Belt tension gage. **SPECIAL TOOLS**

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20)

REFERENCES (TM)

TM9-2320-273-10

REFERENCES (TROUBLESHOOTING)

Table 4-1.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle parked on level ground.

GENERAL SAFETY INSTRUCTIONS

Engine off; transmission in neutral. Park brake set.

TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
1	Alternator Belts Maintenance:	4-55	
	A. Removal.	4-55A	
	B. Installation.	4-55B	
	C. Adjustment	4-55C	

This page intentionally left blank.

OIL SYSTEM

4-14. ENGINE OIL SERVICE.

MIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Draining Oil.	(15)	g. Inspection/Replacement of Oil Lines.	(10)
b . Removal of Primary Filter.	(10)	h. Installation of Bypass Filter.	(15)
c. Inspection of Filter Adapter.	(5)	i. Replenishing Oil.	(15)
d. Installation of Primary Filter.	(10)	i. Checking for Leaks.	(10)

i. Installation of Primary Fliter, (10) j. Checking for Leaks. (1) Removal of Bypass Filter. (10)

Bypass Filter Inspection. (5) 105 Minutes Total.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

PARAGRAPH

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All, 11-14 A or C. Left Fender Removed.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Oil, 40 Qts (Refer to Appendix C). Containers (Three 5-gal buckets). Rag, Wiping. Bypass Filter Element, 2122 (37099). Cover Gasket, 4311 (37099). Primary Oil Filter, 299670 (15434). Liquid Teflon (Refer to Appendix C).

SPECIAL ENVIRONMENTAL CONDITIONS

One (MOS-63B20). Vehicle Parked on Level Ground.

REFERENCES (TM)

PERSONNEL REQUIRED

TM 9-2320-273-20P. LO 9-2320-273-12. TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

Table 4.1.

GENERAL SAFETY INSTRUCTIONS

Engine OFF. Transmission in Neutral. Park Brake Set.

OIL SYSTEM

4-14. ENGINE OIL SERVICE (Continued). **ACTION REMARKS** LOCATION/ITEM A. DRAINING OIL. **NOTE** Place container under crankcase drain plug (31) to catch oil. Allow sufficient time for 1. Vent plug 2) and Unscrew and remove. washer (3). oil to drain from bypass filter to crankcase. Oil should be drained a. Unscrew and remove. 2. Drain plug (31). from a warm engine. b. Allow all oil to drain out. c. Inspect magnet for foreign particles and wipe clean. Stop flow by reinserting plug to change containers. d. Screw in and tighten MOUNTING STUD (8) 9. MOUNTING BRACKET (2) 11. NUT (8) **BOLT (8)** 12. LOCKWASHER (8) 13. LOCKWASHER (8) 14. 15. NUT (8) DRAINCOCK 17. WASHER 18. CONNECTOR CONNECTOR 19. 26 20. FILTER TO 23 PUMP LINE FILTER TO 21. SUMP LINE 22. ELBOW (2) CANNISTER LEGEND: 24. MOUNTING **BRACKET CLAMP** FILLER PLUG 25. **FLANGE** VENT PLUG **ORIFICE** 26. WASHER 27. **BLEEDER HOLE** COVER PACK HOLD DOWN **COVER GASKET ASSEMBLY CLAMPING RING** 29. FILTER ADAPTER CLAMPING BOLT (2) 30. PRIMARY FILTER 8. BYPASS FILTER 31. **DRAIN PLUG ELEMENT** DIPSTICK 32.

TA 074609

OIL SYSTEM

4-14. ENGINE OIL SERVICE (Continued). LOCATION/ITEM **ACTION** REMARKS 32 10 27 30 29 31 26 25 24 23 22 14 13 12 21 16 NOTE: OIL 20 SAMPLE TAKEN 18 ¹⁹ AT THIS POINT LEGEND: 1. FILLER PLUG 12. BOLT (8) 23. CANISTER 2. VENT PLUG 13. LOCKWASHER (8) 24. MOUNTING 3. WASHER 14. LOCKWASHER (8) **BRACKET CLAMP** COVER 15. NUT (8) 25. FLANGE 26. ORIFICE COVER GASKET 16. DRAIN COCK 6. CLAMPING RING 17. WASHER 27. BLEEDER HOLE 7. CLAMPING BOLT (2) 18. CONNECTOR 28. PACK HOLD DOWN 8. BYPASS FILTER 19. CONNECTOR **ASSEMBLY** 20. FILTER TO ELEMENT 29. FILTER ADAPTER 9. MOUNTING STUD (8) **PUMP LINE** 30. PRIMARY FILTER MOUNTING 21. FILTER TO 31. DRAIN PLUG BRACKET (2) SUMP LINE 32. DIPSTICK 11. NUT (8) 22. ELBOW (2) TA 237219

4-14. ENGINE OIL SERVICE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
A.1. OIL SAMPLE FOR A	ANALYSIS.		
	NOTE		
	Before beginning this task check engine oil level according to Operator's manual (TM 9-2320-273-10).		
	Start engine (see TM 9-2320-273-10), warm vehicle to normal operating range and stop engine.		
1. Draincock (16).	a. Unscrew and loosen.	When taking a sample, first use a container to drain a small amount of oil to clean	
	 b. When completed with task 1., use the proper bottle and take oil sample from the oil bypass filter drain valve as shown in illustration on page 4-26, item 16. c. Check oil level to insure proper level after sampling. 	the valve assembly.	
B. REMOVAL OF PRIMA	ARY FILTER.		
	NOTE		
	Place container under primary filter (30) to catch oil.		
3. Primary filter (30).	Unscrew using filter wrench. Throw filter away.		
C. INSPECTION OF FILTER ADAPTER.			
4. Filter adapter (29).	Inspect for: a. Cracks. b. Nicks. c. Damaged threads.	If adapter is defective, notify Direct Support.	

4-14. ENGINE OIL SERVICE (Continued).				
LOCATION/ITEM	ACTION	REMARKS		
D. INSTALLATION OF PRIMARY	FILTER.			
5. New primary filter (30).	a. Apply lube to seal.b. Screw into filter adapter (29) and tighten by hand,	Do not use filter wrench,		
E. REMOVAL OF BYPASS FILTER.	_			
	- NOTE			
	ontainer under bypass filter draind	cock		
Bypass filter draincock (16) and washer (17).	a. Remove and allow oil to drain out.b. Screw in and tighten.			
7. Two clamping bolts (7).	Unscrew and remove.			
8. Clamping ring (6).	Remove.			
9. Cover (4) and cover gasket (5).	Remove.	Discard cover gasket (5).		
10. Pack hold down assembly (28).	Unscrew and remove.			
11. Bypass filter element (8).	Remove and discard.			
12. Filter to pump line (20) and filter to sump line (21).	Unscrew and remove from two elbows (22).			
13. Eight bolts (12), lockwashers (13) and nuts (11).	Unscrew and remove.			

4-14. ENGINE OIL SERVICE (Continued). LOCATION/ITEM **ACTION REMARKS** 32 28 24 31 26 23-13 16 20 19 18 LEGEND: 12. BOLT (8) 1. FILLER PLUG 23. CANISTER 13. LOCKWASHER (8) VENT PLUG 24. MOUNTING 14. LOCKWASHER (8) 3. WASHER **BRACKET CLAMP** 15. NUT (8) 4. COVER 25. FLANGE 16. DRAINCOCK COVER GASKET 26. ORIFICE 17. WASHER 6. CLAMPING RING 27. BLEEDER HOLE 18. CONNECTOR 7. CLAMPING BOLT (2) 28. PACK HOLD DOWN 8. BYPASS FILTER 19. CONNECTOR **ASSEMBLY** ELEMENT 20. FILTER TO 29. FILTER ADAPTER MOUNTING STUD (8) PUMP LINE 30. PRIMARY FILTER 10. MOUNTING 21. FILTER TO 31. DRAIN PLUG BRACKET (2) SUMP LINE 32. DIPSTICK 11. NUT (8) 22. ELBOW (2) TA 074610

4-14. ENGINE OIL SERVICE (Continued).				
LOCATION/ITEM	ACTION	REMARKS		
E. REMOVAL OF BYPASS FILTER	(Continued).			
14. Two mounting bracket clamps (24).	Lift off and remove canister (23).			
15. Two elbows (22).	Unscrew from canister (23).			
16. Eight nuts (15) and lock- washers (14).	Unscrew and remove two mounting brackets (10) from eight mounting studs (9) at firewall.			
F. BYPASS FILTER INSPECTION.				
17. Orifice (26) and bleeder hole (27).	Holes should not be blocked. Clean out with a piece of wire if necessary.			
18. Mounting brackets (10), clamps (24), canister (23) and elbows (22).	Inspect for: a. Damage, b. Looseness, c. Stains from leaks. d. Crossed threads.	Replace any damaged components if necessary.		
G. INSPECTION/REPLACEMENT O	F OIL LINES.			
19. Filter to pump line (20) and filter to sump line (24).	 a. Unscrew from two connectors (18). b. Inspect for: Cracks. Stains from leaks. Kinks. End fitting damage. 			
20. Two connectors (18) and 19).	a. Unscrew from oil pump and oil sump.b. Coat threads with liquid teflon.c. Screw into oil pump and oil sump.	Replace if threads are damaged.		
21. Filter to pump line (20) and filter to sump line (21).	Screw onto connectors (18) and (19).			

4-14. ENGINE OIL SERVICE (Continued).

LOCATION/ITEM **ACTION REMARKS** 32 27 31 26 13 16 LEGEND: 12. BOLT (8) FILLER PLUG 23. CANISTER 13. LOCKWASHER (8) VENT PLUG 24. MOUNTING 14. LOCKWASHER (8) 3. WASHER **BRACKET CLAMP** COVER 15. NUT (8) 25. FLANGE 16. DRAINCOCK COVER GASKET 26. ORIFICE 17. WASHER CLAMPING RING 27. BLEEDER HOLE 18. CONNECTOR 28. PACK HOLD DOWN 7. CLAMPING BOLT (2) 19. CONNECTOR **ASSEMBLY** BYPASS FILTER 29. FILTER ADAPTER ELEMENT 20. FILTER TO 30. PRIMARY FILTER MOUNTING STUD (8) PUMP LINE 31. DRAIN PLUG MOUNTING 21. FILTER TO 32. DIPSTICK BRACKET (2) SUMP LINE 11. NUT (8) 22. ELBOW (2) TA 074611

4-29

4-14. ENGINE OIL SERVICE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
H. INSTALLATION OF BYPASS FIL	TER.		
22. Two mounting brackets (10).	a. Position over eight mounting studs (9).b. Secure with eight lockwashers (14) and nuts (15).		
23. Two elbows (22).	a. Coat threads with liquid teflon.b. Screw into canister (23).		
24. Canister (23).	Secure to two mounting brackets (10) with two clamps (24), eight bolts (12). lockwashers (13), and nuts(11).		
25. Filter to pump line (20) and and filter to sump line (21).	Screw onto two elbows (22).		
26. Bypass filter element (8).	Place into canister (23).		
27. Pack hold down assembly (28).	a. Place thru center of bypass filter element (8) in canister (23).b. Screw all the way down to the stop.		
28. Cover (4) and new cover gasket (5).	Set in place on canister flange (25).		
29. Clamping ring (6).	a. Position over cover (4) and canister flange (25).b. Secure with two clamping bolts (7); draw up bolts until they stop against shoulder.		
30. Vent plug (2) and washer (3).	Install at cover (4) and tighten.		
I. REPLENISHING OIL.			
31. Filler cap (1).	a. Remove.b. Pour oil thru filler cap opening.c. Tighten filler cap.	See LO 9-2320-273-12. OEA IF SUB-ZERO.	
J. CHECKING FOR LEAKS.			
32. Engine.	a. Start up.b. Run 3-5 minutes, shut off and let set 8-10 minutes.	See TM 9-2320-273-10.	

4-14. ENGINE OIL SERVICE (Continued). LOCATION/ITEM **ACTION REMARKS** 32 28 27 30 26 23-15 13 16 19 18 LEGEND: 12. BOLT (8) 23. CANISTER 1. FILLER PLUG LOCKWASHER (8) 13. 24. MOUNTING VENT PLUG 14. LOCKWASHER (8) **BRACKET CLAMP** 3. WASHER 15. NUT (8) 25. FLANGE 4. COVER 16. DRAINCOCK 26. ORIFICE COVER GASKET 17. WASHER 27. BLEEDER HOLE CLAMPING RING 18. CONNECTOR 28. PACK HOLD DOWN CLAMPING BOLT (2) **ASSEMBLY** 19. CONNECTOR BYPASS FILTER 29. FILTER ADAPTER 20. FILTER TO ELEMENT 30. PRIMARY FILTER 9. MOUNTING STUD (8) PUMP LINE 21. FILTER TO 31. DRAIN PLUG 10. MOUNTING 32. DIPSTICK BRACKET (2) SUMP LINE 11. NUT (8) 22. ELBOW (2)

TA 075364

4-14. ENGINE OIL SERVICE (Continued).					
LOCATION/ITEM	ACTION	REMARKS			
J. CHECKING FOR LEAKS (Continued).					
33. Dipstick (32).	Pull out and check oil level. Should be near "H" mark.	If oil level is far above or below mark, check to be sure you have the correct dipstick for the NTC 400 engine.			
34. Primary filter (30), drain plug (31), connectors (18) and (19), two elbows (22), drain cock (16), cover (4), filter to pump line (20) and filter to sump line (21).	Check for leaks.	Tighten as necessary.			

4-14. ENGINE OIL SERVICE (Continued). LOCATION/ITEM **ACTION REMARKS** 32 30 26 13 16 20 18 LEGEND: 12. BOLT (8) 1. FILLER PLUG 23. CANISTER 13. LOCKWASHER (8) VENT PLUG 24. MOUNTING 14. LOCKWASHER (8) BRACKET CLAMP 3. WASHER 4. COVER 15. NUT (8) 25. FLANGE 16. DRAINCOCK 5. COVER GASKET 26. ORIFICE 17. WASHER 6. CLAMPING RING 27. BLEEDER HOLE 7. CLAMPING BOLT (2) 18. CONNECTOR 28. PACK HOLD DOWN 8. BYPASS FILTER 19. CONNECTOR **ASSEMBLY** 29. FILTER ADAPTER ELEMENT 20. FILTER TO 30. PRIMARY FILTER 9. MOUNTING STUD (8) PUMP LINE 31. DRAIN PLUG 10. MOUNTING 21. FILTER TO BRACKET (2) SUMP LINE 32. DIPSTICK 11. NUT (8) 22. ELBOW (2) TA 075635

4-15. BREATHER TUBE MAINTENANCE.

HIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (5)
b. Cleaning. (15)
c. Inspection. (5)
d. Installation. (5)

30 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

None.

PARAGRAPH

None.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

None.

4-15. BREATHER TUBE MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** A. REMOVAL. 1. Two clamps (2), and line (1). Remove from breather cup (3). 2. Tube (6). Remove by loosening capscrews (5). and pulling tube (6) out of loop clamp (4). LEGEND: 1. LINE 2. CLAMP (2) **BREATHER CAP** 4. LOOP CLAMP CAPSCREW 5. TUBE TA 074612

4-15. BREATHER TUBE MAINTENANCE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
B. CLEANING			
J. CLLANING			
3. Tube (6).	immerse and flush in solven	t.	
C. INSPECTION.			
4. Tube (6).	Check for: a. Cracks. b. Nicks. c. Dents.	If tube (6) is defective, replace.	
5. Line (1).	Check for cracks.	If line (1) is defective, replace.	
D. INSTALLATION.			
6. Line (1).	Attach to breather tube cap	(3).	
7. Clamps (2).	Put on line (1).		
8. Tube (6).	Push into line (1) and loop	clamp (4).	
9. Clamps (2).	Tighten capscrew (5).		
	Put into place.		

4-15. BREATHER TUBE MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** LEGEND: 1. LINE 2. CLAMP (2) 3. BREATHER CAP 4. LOOP CLAMP 5. CAPSCREW6. TUBE TA 074613

FUEL AND AIR INTAKE

4-16. FUEL SOLENOID SHUTOFF VALVE MAINTENANCE.

THIS TASK COVERS: (Approximate TIME REQUIRED FOLLOWS TASK Description.)

a. Removal. (10) b. Installation. (10) c. Operational Check. (5)

25 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Shield (2910-00-084-7787). O-Ring (5330-00-081-9299). Gasket (5330-00-951-3538). Masking Tape. Marking Pencil.

EQUIPMENT CONDITION

PARAGRAPH 11-14 A or C.

CONDITION DESCRIPTION

Left Fender Removed.

PERSONNEL REQUIRED

Two (MOS-63B20). (2nd mechanic turns engine run switch in part C.).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

Table 4-1.

SPECIAL ENVIRONMENTAL CONDITIONS

Work in Well Ventilated Area. Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF. Transmission in Neutral. Park Brake Set.

4-16. FUEL SOLENOID SHUTOFF VALVE MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM A. REMOVAL. Hold rear nut with wrench 1. Two nuts (11) and Unscrew and remove. as front nut is being loosened. washers (10). 2. Two wires (9). Remove from terminals (14). Mark wires for installation reference, using masking tape and marking pencil. 3. Four screws (12) and washers (13). Unscrew and remove. 16 LEGEND: 1. SCREW (2) 2. WASHER (2) 3. WASHER (2) 4. VALVE 5. SPRING WASHER 6. O-RING 7. SHIELD 8. COIL ASSEMBLY 9. WIRE (2) 10. WASHER (2) 11. NUT (2) SCREW (4) 12. 13. WASHER (4) 14, TERMINAL (2) 15. GASKET 16. VALVE TA 074614

4-16. FUEL SOLENOID SHUTOFF VA	LVE MAINTENANCE (Continue	ed).
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
4. Coil assembly (8), shield (7), O-ring (6), spring washer (5), and valve (4).	a. Remove.b. Throw away shield (7), and O-ring (6).	
5. Two screws (1), and two washers (2 and 3).	Unscrew and remove.	
6. Valve (16), and gasket (15).	a. Remove valve.b. Throw away gasket.	
B. INSTALLATION.		
7. Gasket (15), valve (16), two washers (2 and 3), and two screws (1).	a. Hold gasket (15) and valve (16), in place and insert two screws (1) and washers (2 and 3).b. Tighten screws (1).	
8. Coil assembly (8), shield (7), O-ring (6), spring washer (5), and valve (4).	Hold in place. Insert four screws (12), and washers (13).	
9. Four mounting screws (12), and washers (13).	Tighten.	
10. Two wires (9).	Attach to terminals (14).	
11, Nuts (11), and washers (10).	Install on terminals and tighter	ı.
C. OPERATIONAL CHECK.		
12. INSTRUMENT PANEL/ engine run switch.	Turn ON, and OFF again.	2nd mechanic.
13. Coil assembly (8).	Listen for "click" when run switch is turned ON or OFF.	1st mechanic.
14. Engine.	Start up (see TM 9-2320-273-10).	Engine will not start unless solenoid is working.
15. Coil assembly (8).	Check valve for leaks.	

4-16. FUEL SOLENOID SHUTOFF VALVE MAINTENANCE (Continued).	
LOCATION/ITEM ACTION REMARKS	
LEGEND: 1. SCREW (2) 2. WASHER (2) 3. WASHER (2) 4. VALVE 5. SPRING WASHER 6. O.RING 7. SHIELD 8. COIL ASSEMBLY 9. WIRE (2) 10. WASHER (2) 11. NUT (2) 12. SCREW (4) 13. WASHER (4) 14. TERMINAL (2) 15. GASKET 16. VALVE	TA 074615

1-17. FUEL PUMP SCREEN MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (10)
b. Cleaning. (10)
c. Installation. (10)
d. Checking for Leaks. (5)

35 Minutes Total,

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Cap Seal Ring (5330-00-961-9470).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

None.

EQUIPMENT CONDITION

PARAGRAPH

CONDITION DESCRIPTION

11-14 A or C. Left Fender Removed.

SPECIAL ENVIRONMENTAL CONDITIONS

Work in Well Ventilated Area. Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

1-17. FUEL PUMP SCREEN MAINTENANCE (Continued).

ACTION REMARKS LOCATION/ITEM

A. REMOVAL.

1. Filter screen cap (1).

2. Cap seal ring (2), filter spring (3), and fuel filter a. Take out.

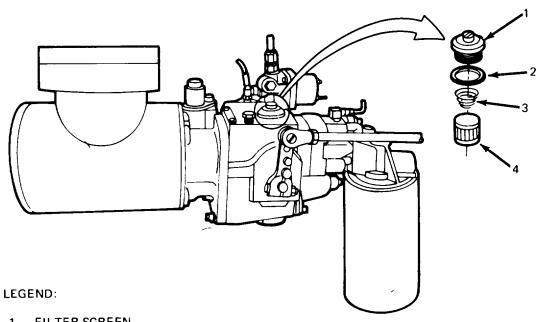
b. Throw away cap seal ring (2). screen assembly (4).

Unscrew and remove.

- a. Take out.

B. CLEANING.

3. Fuel filter screen assembly (4). Clean.



- 1. FILTER SCREEN
- 2. CAP SEAL RING
- 3. FILTER SPRING
- 4. FUEL FILTER SCREEN ASSEMBLY

TA 074616

4-17. FUEL PUMP SCREEN MAINTENANCE (Continued). LOCATION/ITEM ACTION REMARKS

C. INSTALLATION.

4. Fuel filter screen assembly (4). Drop into place. Opening must be down.

5. Filter spring (3) and new cap Set into place. seal ring (2).

6. Filter screen cap (1). Screw in.

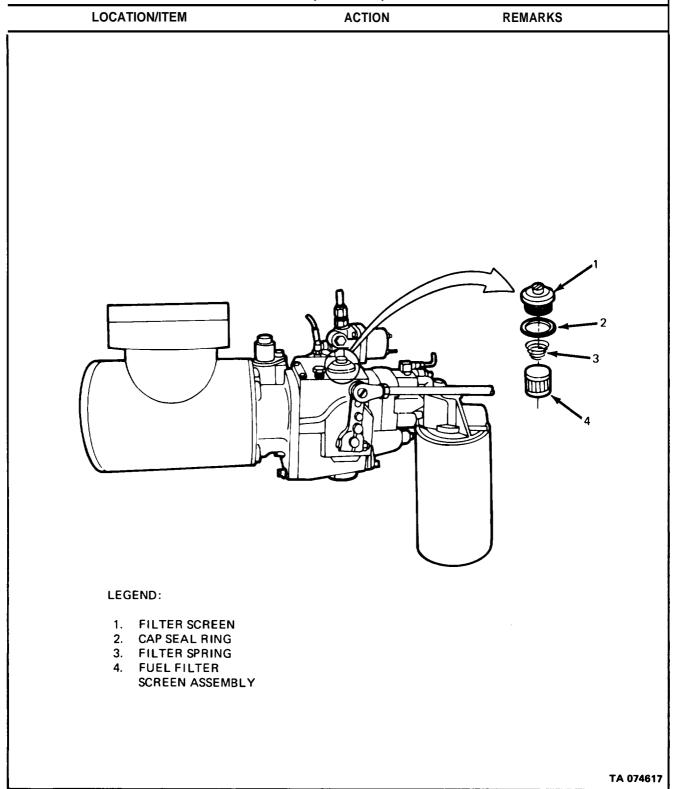
D. CHECKING FOR LEAKS.

7. Engine. Start up (see TM 9-2320-273-10).8. Filter screen cap (1). Look for leaking around edges.

NOTE

Follow-on maintenance required. Install left fender; refer to para 11-14.

4-17. FUEL PUMP SCREEN MAINTENANCE (Continued).



4-18. FUEL FILTER MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

(5)

b. Installation.

(10) c. Checking for leaks. (5)

20 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIAL/PARTS (P/N)

Fuel Filter (2910-00-174-5822). O-Ring, 213079 (15434). Container (1qt).

EQUIPMENT CONDITION

PARAGRAPH 11-14 A or C.

CONDITION DESCRIPTION

Left Fender Removal.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM9-2320-273-20P.

TM9-2320-273-10.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground. Work in Well Ventilated Area.

GENERAL SAFETY INSTRUCTIONS

Engine Off; Transmission in Neutral. Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 4-1.

4-18. FUEL FILTER MAINTENANCE (Continued). **REMARKS ACTION** LOCATION/ITEM A. REMOVAL . Fuel filter (4). Open draincock (3) and Unscrew draincock for use in drain fuel into suitable new replacement filter. container. Unscrew and remove. O-ring (2). Remove and throw away. **B. INSTALLATION.** 3. New fuel filter (4). Install draincock (3). a. Fill with clean fuel. b. C. Install new O-ring (2). d. Screw in until seal just Do not tighten with wrench. touches filter head (1). Screw in one-half turn to three-fourths turn more. LEGEND: 1. FILTER HEAD 2. O-RING DRAIN COCK FUEL FILTER TA 074618

4-18. FUEL FILTER MAINTENANCE (Continued). **ACTION** LOCATION/ITEM **REMARKS** C. CHECKING FOR LEAKS. 4. Engine. Start up (see TM 9-2320-273-10). Fuel filter (4). Check for leaks. **NOTE** Follow-on maintenance action required: Install left fender; refer to para 11-14. LEGEND: 1. FILTER HEAD O-RING 3. DRAIN COCK **FUEL FILTER**

TA 074619

This page intentionally left blank,

4-19. TACHOGRAPH RPM CABLE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (4)b. Installation. (6)c. Operational Check. (2)

12 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.
TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Tachometer RPM Cable, MA280J20000 (34623).

PERSONNEL REQUIRED

One (MOS-63B20). Vehicle Parked on Level Ground.

REFERENCES (TM)

TM9-2320-273-10.
TM9-2320-273-20P.

GENERAL SAFETY INSTRUCTIONS
Engine Off; Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

None.

EQUIPMENT CONDITION PARAGRAPH

5-37A. 11-14 A or C.

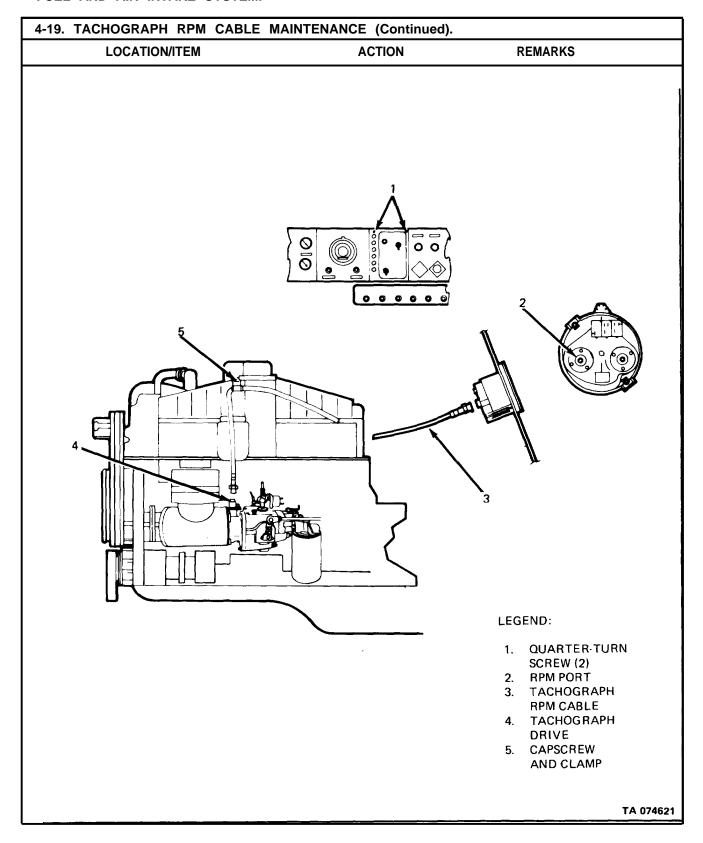
SPECIAL ENVIRONMENTAL CONDITIONS

CONDITION DESCRIPTION

Disconnect Batteries. Left Fender Removed.

4-19. TACHOGRAPH RPM CABLE MAINTENANCE (Continued). **ACTION** LOCATION/ITEM **REMARKS WARNING** Do not work behind dash panel until batteries are disconnected. A. REMOVAL. 1. Two quarter-turn screws Loosen. Lower panel. Closest cable to the lowered panel. 2. Tachograph RPM cable (3). a. Disconnect from RPM Tachograph RPM cable port (2) of tachograph. may be tied to the heater b. Remove capscrew and water control valve cable; clamp (5). if so remove tie. LEGEND: QUARTER-TURIN SCREW (2) **RPM PORT TACHOGRAPH** RPM CABLE **TACHOGRAPH** DRIVE 5. CAPSCREW AND CLAMP TA 074620

4-19. TACHOGRAPH RPM CABLE	MAINTENANCE (Continued).	
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
	c. Unscrew from tachograph drive (4) on fuel pump.d. Pull through firewall and remove.	
B. INSTALLATION.		
3. Tachograph RPM cable (3).	 a. Screw into tachograph drive (4) on fuel pump. b. Thread free end through firewall. c. Install capscrew and clamp (5). d. Connect to "RPM" port (2) of tachograph. 	Avoid bending the cable sharply. For proper operation, cable should be as straight as possible.
4. Two quarter-turn screws (1).	e. Replace cable tie. Close panel; tighten screws.	
C. OPERATIONAL CHECK.		
5. Engine.	Start up (see TM9-2320-273-	
6. Tachometer.7. Engine.	10). Check for appropriate reading (580-620 rpm if engine is idling normally) and responsiveness to changes in engine speed. Shut down (see TM 9-2320-273	3-10).
	NOTE	
Fo	llow-on maintenance action required	d:
	Connect batteries; refer to para 5-37 Install left fender; refer to para 11-	



4-20. LINES, HOSES AND FITTINGS MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (see Appendix C). Soap Solution.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM9-2320-273-10. TM9-2320-273-20P.

TROUBLESHOOTING REFERENCES

Table 4-1.

EQUIPMENT CONDITION

PARAGRAPH CONDITION DESCRIPTION

None. None.

SPECIAL ENVIRONMENTAL CONDITIONS

Work in Well Ventilated Area. Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off; Transmission in Neutral. Park Brake Set.

4-20. LINES, HOSES, AND FITTINGS MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

NOTE

The illustration below identifies all exterior lines and hoses of the fuel system. No special instructions or tools are needed if you follow standard shop practice techniques. During installation, observe the following:

1. Line-to-block fittings.

2. Line-to-line fittings.

3. Air line.

4. Hose-to-line fittings.

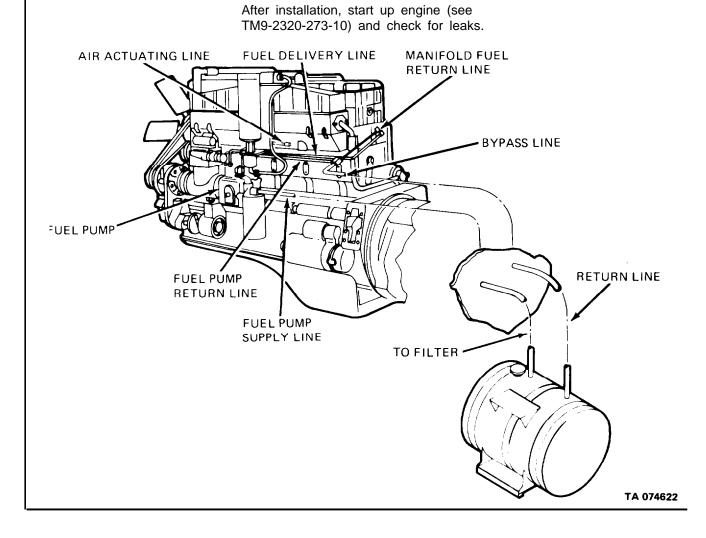
Coat pipes with liquid teflon before insertion.

Screw together.

Check for leakage with soap

solution.

Clamp securely.



4-21. ACCELERATOR PEDAL AND ROD MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

(15)

b. Installation.

(15)

c. Checking Idle Speed. (3)

33 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Cotter pin (3), 103362 (24617).

EQUIPMENT CONDITION PARAGRAPH

4-22A.

12-12A,

CONDITION DESCRIPTION

Hand Throttle Cable Disconnected at Throttle Mounting Bracket. Winch Throttle Cable Disconnected at Throttle Mounting Bracket (M916 and M920)_.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM9-2320-273-10.

TROUBLESHOOTING REFERENCES

Table 4-1.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle-Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission in Neutral.

Park Brake Set.

4-21. ACCELERATOR PEDAL AND ROD MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** NOTE Any time you repair or replace a part in this system, check that idle speed is correct (part C). A. REMOVAL. 1. Cotter pins (1) and (4). Remove and pull out clevis pin Discard cotter pins (1) (3) and straight pin (7); lift out and (4). pedal (2). LEGEND: THROTTLE MOUNTING 34. **COTTER PIN** 1. **BRACKET** PEDAL 2. 35. LOCKWASHER (2) **CLEVIS PIN** 3. 36. BOLT (2) **COTTER PIN** 4. 37. FORK 5. **BOLT (2) CLEVIS PIN** 38. 6. BRACKET 39. **COTTER PIN** 7. STRAIGHT PIN PIVOT LEVER 40. 8. **BOLT (2)** 49 50 41. **FLANGED** 9. BOLT 44 45 46 BEARING 10. NUT (2) 42. PEDAL STOP BELLCRANK BRACKET BRACKET **FLANGED** LOCKWASHER (2) 43. 12. **BEARING** 13. NUT (2) 44. **BOLT (4)** 14. FLAT WASHER 45. FLAT WASHER (4) 15. LOCKNUT 46. NUT (4) 16. LOCKNUT 42 17. FLAT WASHER 47. **ACCELERATOR** 41 18. LOCKWASHER SEAL 40 39 38 13 48. **SEAL RETAINER** AND NUT (2) 18 SPRING 49. ROD 19. LEVER 50. SCREW (3) 20. 15 TUN 14 21. 16 17 34 19 22. WASHER 37 23. **BALL STUD** 36 24. NUT 28 25. **BELLCRANK** ROD 26. NUT 20 27. **BALL STUD** 28. SPRING 29. NUT 23 22 30. WASHER BRACKET 31. 25 30 **FUEL PUMP** 31 32. 26 27 32 LEVER 33. NYLON FLANGED **BUSHING** TA 074623

	LOCATION/ITEM	ACTION	REMARKS
A.	REMOVAL (Continued).		
2.	Two bolts (5), lockwashers and nuts (18).	Unscrew and remove bracket (6).	
3.	Two bolts (8), lockwashers (12), and nuts (13).	Unscrew and remove pedal stop bracket (11),	
4.	Bolt (9) and two nuts (10).	Unscrew and remove from pedal stop bracket (11).	Count number of threads before disassembly.
5.	Three screws (50).	Unscrew and remove seal retainer (48) and accelerator seal (47).	
6.	Cotter pin (39).	Remove and pull out clevis pin (38); lift out rod (49).	Discard cotter pin (39).
7.	Locknut (16) and flat washer (17).	Unscrew and remove pivot lever (40), flanged bearing (41), and flanged bearing (43).	
8.	Four bolts (44), flat washers (45) and nuts (46).	Unscrew and remove bellcrank bracket (42).	
9.	Spring (19).	Unhook from lever (20) and attachment point to cab at other end of spring,	
10.	Nut (21) and washer (22).	Unscrew and remove lever (20).	
11.	Nut (29) and washer (30).	Unscrew from ball stud (27).	Remove items (23 thru (27) as an assembly. Count number of threads before disassembly to maintain idle speed setting.
12.	Ball stud (23) and (27) along with nuts (24) and (26).	Unscrew from bellcrank rod (25).	
13.	Spring (28).	Unhook from bracket (3) located at fuel pump lever (32), and from throttle mounting bracket (34).	

LOCATION/IT	EM ACTION	REMARKS
EGEND: COTTER PIN PEDAL CLEVIS PIN COTTER P	34. THROTTLE MOUNTING BRACKET 35. LOCKWASHER (2) 36. BOLT (2) 37. FORK 38. CLEVIS PIN 39. COTTER PIN 40. PIVOT LEVER 41. FLANGED BEARING 42. BELLCRANK BRACKET 43. FLANGED BEARING 44. BOLT (4) 45. FLAT WASHER (4) 46. NUT (4) 47. ACCELERATOR SEAL 48. SEAL RETAINER 49. ROD 50. SCREW (3) 34 33 29 30 32	1 2 49 50 8 7 48 9 8 7 47 10 11 10 11 10 10 11 10 10 11 10 10 11 10 10

4-2	1. ACCELERATOR PEDAL AND	ROD MAINTENANCE (Continued).				
	LOCATION/ITEM	ACTION	REMARKS			
Α.	A. REMOVAL (Continued).					
14.	Locknut (15) and flatwasher (14).	Unscrew and remove fork (37) and nylon flanged bushing (33).				
15.	Two bolts (36) and lockwashers (35).	Unscrew and remove throttle mounting bracket (34).				
В.	INSTALLATION.					
16.	Throttle mounting bracket (34).	Position against side of engine and install with two bolts (36) and lockwashers (35).				
17.	Nylon flanged bushing (33) and fork (37).	Attach to throttle mounting bracket (34) with flat washer (14) and locknut (15).				
18.	Spring (28).	Hook to bracket (31), located at fuel pump lever (32), and to throttle mounting bracket (34).				
19.	Nuts (24) and (26) along with ball stud (23) and (27),	Screw onto bellcrank rod (25).	Screw on the same number of threads you counted in step A 11.			
20.	Ball stud (27).	a. Insert threaded end thru bracket (31).b. Attach with washer (30) and nut (29).				
21.	Ball stud (23).	a. Insert threaded end thru lever (20).b. Attach with washer (22) and nut (21).				
22.	Bellcrank bracket (42).	Attach to cab with four bolts (44), flat washers (45) and nuts (46).				
23	Flanged bearing (41) and (43).	Position in either end of guide tube in bellcrank bracket (42).				
24	. Pivot lever (40).	 a. Insert threaded end thru flanged bearing (41), bell-crank bracket (42), flanged bearing (43) and lever (20). b. Secure with flat washer (17) and locknut (16). 				

4-21. ACCELERATOR PEDAL AND ROD MAINTENANCE (Continued).				
LOCATION/IT	ГЕМ	ACTION	REMARKS	
B. INSTALLATION (C	ontinued).			
25. Spring (19).		to lever (20) and cab ment point.		
26. Rod (49).	ope hol pive b. Ins c. See	ert up thru cab floor ening until mounting e alines with that in ot lever (40). ert clevis pin (38). cure with new cotter (39).	From underneath cab floor.	
LEGEND:	·			
1. COTTER PIN 2. PEDAL 3. CLEVIS PIN 4. COTTER PIN 5. BOLT (2) 6. BRACKET 7. STRAIGHT PIN 8. BOLT (2) 9. BOLT 10. NUT (2) 11. PEDAL STOP BRACKET 12. LOCKWASHER (2) 13. NUT (2) 14. FLAT WASHER 15. LOCKNUT 16. LOCKNUT 17. FLAT WASHER 18. LOCKWASHER AND NUT (2) 19. SPRING 20. LEVER 21. NUT 22. WASHER 23. BALL STUD 24. NUT 25. BELLCRANK ROD 26. NUT 27. BALL STUD 28. SPRING 29. NUT 30. WASHER 31. BRACKET 32. FUEL PUMP LEVER	34. THROTTLE MOUI BRACKET 35. LOCKWASHER (2 36. BOLT (2) 37. FORK 38. CLEVIS PIN 39. COTTER PIN 40. PIVOT LEVER 41. FLANGED BEARING 42. BELLCRANK BRACKET 43. FLANGED BEARING 44. BOLT (4) 45. FLAT WASHER (4 46. NUT (4) 47. ACCELERATOR SEAL 48. SEAL RETAINER 49. ROD 50. SCREW (3)	49 44 45 46 48 47 41 40 39 34 35 36 33 29 30 31	2 50 8 9 10 11 11 10 11 10 11 10 11 10 11 10 20 24 21 22 25 27 26	
33. NYLON FLANGED BUSHING			TA 075637	

LOCATION/ITEM ACTION REMARKS				
B. INSTALLATION (Continued).				
27. Accelerator seal (47) and and seal retainer (48).	Slide over rod (49) and secure to cab floor with three screws (50).	From inside cab.		
28. Bolt (9) and two nuts (10).	Install thru pedal stop bracket (11).	Screw nuts (10) onto bolt (9) the same number of threads you counted in step A. 4.		
29. Pedal stop bracket (11).	Attach to cab floor with two bolts (8), lockwashers (12) and nuts (13).			
30. Bracket (6).	Install to cab floor with two bolts (5), lockwashers and nuts (18).			
31. Pedal (2).	a. Install to bracket (6) with straight pin (7) and new cotter pin (4).b. Install to rod (49) with clevis pin (3) and new cotter pin (1).			
C. CHECKING IDLE SPEED.				
32. Engine.	 a. Start up (see TM 9-2320-273-20). b. With engine warmed to normal operating temperature, check to see that tachometer reads 580-620 rpm with your foot off the accelerator pedal. c. Shut down. 	If idle speed was below 580 rpm or above 620 rpm proceed to step 33.		
33. Nut (29), washer (30) and bracket (31).	Unscrew from ball stud (27).			
34. Ball stud (27).	 a. Loosen nut (26). b. Turn counterclockwise to increase idle speed or clockwise to decrease idle speed. c. Lock in position with nut (26). d. Reconnect to bracket (31) with washer (30) and nut (29). 			

4-21. ACCELERATOR PEDAL AND ROD MAINTENANCE (Continued).					
LOCATION/ITI	EM	AC.	TION	RE	MARKS
C. CHECKING IDLE S	PEED (Continue	ed).			
35. Engine.		10). b. Verify th within the	(see TM 9-232) at idle speed is e correct rpm i	Read range. equired:	just as necessary.
LEGEND:		at throttl refer to p b. Reconnecable at bracket;	ect hand throttle mounting broara 4-22C. ect winch throttle mount refer to para 12 and M920 only).	acket; tle ing 2-12C.	
1. COTTER PIN 2. PEDAL 3. CLEVIS PIN 4. COTTER PIN 5. BOLT (2) 6. BRACKET 7. STRAIGHT PIN 8. BOLT (2) 9. BOLT 10. NUT (2) 11. PEDAL STOP BRACKET 12. LOCKWASHER (2) 13. NUT (2) 14. FLAT WASHER 15. LOCKNUT 16. LOCKNUT 17. FLAT WASHER 18. LOCKWASHER AND NUT (2) 19. SPRING 20. LEVER	33. NYLON F BUSHING 34. THROTTL BRACKE 35. LOCKWAS 36. BOLT (2) 37. FORK 38. CLEVIS P 39. COTTER I 40. PIVOT LE 41. FLANGEI BEARING 42. BELLCRA BRACKE 43. FLANGEI BEARING 44. BOLT (4) 45. FLAT WAS 46. NUT (4) 47. ACCELER SEAL	E MOUNTIN T SHER (2) PIN PIN EVER D G ANK T D SHER (4)	44 45 46 43 42 41 42	49 50 18 9 47 10 11 10 39 38	2 4 3 6 8 7 12 13 18
21. NUT 22. WASHER 23. BALL STUD 24. NUT 25. BELLCRANK ROD 26. NUT 27. BALL STUD 28. SPRING 29. NUT 30. WASHER 31. BRACKET 32. FUEL PUMP LEVER	48. SEAL RE 49. ROD 50. SCREW (3		34 35 33 29 30	36 28 37 36 28 37 26 37 26	15 16 17 19 20 24 21 23 22 25 TA 075638

4-22. HAND THROTTLE LINKAGE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

(20)a.. Removal.

b. Cleaning and Inspection. (5) c. Installation. (30) c. Installation.

d. Checking Idle Speed. (2)

57 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

Vehicle on Level Ground.

EQUIPMENT CONDITION

PARAGRAPH

None.

CONDITION DESCRIPTION

None.

GENERAL SAFETY INSTRUCTIONS Engine Off; Transmission in Neutral.

SPECIAL ENVIRONMENTAL CONDITIONS

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 4-1.

4-22. HAND THROTTLE LINKAGE MAINTENANCE (Continued).

LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL. 1. Setscrew (6). 2. Two locknuts (8) and washers (9). 3. Hand throttle cable (3). 4. Two screws (12).	Unscrew and remove from pivot lever (5). Unscrew and remove. Pull through bracket (4). a. Remove from heater control panel (13). b. Remove back of heater control panel (13).	Screws are located on each end.
12 11 10 7 8 9 9 6	2 3 FIREWALL	LEGEND: 1. THROTTLE KNOB 2. LOCKNUT 3. HAND THROTTLE CABLE 4. BRACKET 5. PIVOT LEVER 6. SET SCREW 7. CABLE WIRE 8. LOCKNUT (2) 9. WASHER (2) 10. STAR WASHER 11. LOCKNUT 12. SCREW (2) 13. HEATER CONTROL PANEL
		TA 074625

4-22. HAND THROTTLE LINKAGE MAINTENANCE (Continued).					
LOCATION/ITEM	ACTION	REMARKS			
A. REMOVAL (Continued).					
5. Locknut (11) and starwasher (10).	Unscrew and remove from hand throttle cable (3).				
6. Hand throttle cable (3).	Pull from firewall and heater control panel (13).				
7. Locknut (2).	Unscrew and remove from hand throttle cable (3).				
B. CLEANING AND INSPECTION.					
8. Hand throttle cable (3).	Wipe clean and inspect for: a.Kinked cable. b. Cable end crossed or burred threads.	Replace as necessary.			
C. INSTALLATION.					
9. Locknut (2).	Screw onto hand throttle cable (3).				
10. Hand throttle cable (3).	Install thru front of heater control panel (13).				
11. Locknut (11) and starwasher (10	Screw onto hand throttle cable (3).				
12. Hand throttle cable (3).	Insert end thru firewall and bracket.				
13. Heater control panel (13).	a. Install back of panel.b. Install two screws (12) and tighten.				
14. Two locknuts (8) and	a. Install and tighten.				
washers (9).	 b. It may be necessary to either loosen or tighten the locknut (8) on the outer bracket face. 				
15. Setscrew (6).	Install and tighten to lock cable wire (7).				
16. Throttle knob (1).	Remove and lubricate hand throttle cable (3) per LO 9-2320-273-12.				

4-22. HAND THROTTLE LINKAGE MAINTENANCE (Continued). **REMARKS** LOCATION/ITEM **ACTION** D. CHECKING IDLE SPEED. 17. Engine. a. Start up (see TM 9-2320-273-10). b. With engine warmed up check that: (1) Engine idles at 580. 620 rpm when throttle knob (1) is pushed completely in. (2) Idle speed increases as soon as you begin to pull out on throttle knob (1). (Turning knob counterclockwise will also increase rpm.) 13 LEGEND: 11 1. THROTTLE KNOB LOCKNUT 3. HAND THROTTLE **CABLE** 4. BRACKET 5. PIVOT LEVER 6. SET SCREW 7. CABLE WIRE 8. LOCKNUT (2) FIREWALL 9. WASHER (2) 10. STAR WASHER LOCKNUT 11. 12. SCREW (2) HEATER CONTROL **PANEL** TA 074626

4-23. FUEL TANK MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

(35)a. Removal. (40)b. Installation. (5) c. Checking for Leaks.

80 Minutes Total.

INITIAL SETUP

EQUIPMENT CONDITION APPLICABLE CONFIGURATIONS PARAGRAPH

CONDITION DESCRIPTION All. None. None.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

SD-2 Dry Cleaning Solvent (Refer to Appendix C).

Containers for Fuel (AR). Masking Tape.

Marking Pencil.

PERSONNEL REQUIRED

SPECIAL ENVIRONMENTAL CONDITIONS

Three (MOS-63B20).

Work in Well Ventilated Area. Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

GENERAL SAFETY INSTRUCTIONS Engine Off; Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 4-1.

4-23. FUEL TANK MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** CAUTION Be sure that tank is supported so that it will not fall when straps (26) are removed. A. REMOVAL. **NOTE** Place container under drain plug (28) to catch fuel. 16 12 23 20. SLOTTED **HEAD SCREW FUEL CAP** 21. **GASKET FUEL CAP** 22. **CHAIN** FUEL CAP 23. RETAINER ELBOW (2) 24. **FUEL FILL** 29 27 NECK LEGEND: 26. STRAP (3) FUEL CAP 27. FUEL TANK NUT (2) 15. NUT (12) 8. **DRAIN PLUG FUEL SENDER** 28. HOSE CLAMP (2) 16. 9. **BOLT (12)** INSULATOR (3) 29. FLANGE **BOLT (2)** NUT (6) 10. 30. LOWER T-BOLT (3 TERMINAL (2) 17. BRACKET (2) LOCKWASHER (6) 11. 31. AIR VENT 18. WASHER (4) BOLT (2) WASHER (2) 12. 32. J-BRACKET (3) **PHILLIPS** 19. 13. WASHER (2) 6. NUT (2) FUEL LINE (2) **HEAD SCREW** 33. UPPER T-BOLT (3) 14. WASHER (2) TA 074627

LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
1. Drain Plug (28).	a. Remove and allow fuel to drain into container.b. Screw back into tank.	
2. Two fuel lines (33).	Unscrew from two elbows (24	4). Mark locations for reassembly.
3. Two elbows (24).	Unscrew and remove from fue tank (27).	el
 Phillips head screw (19), ted head screw (20) and washers (18). 		Mark wire locations for reassembly.
5. Six nuts (3) and lockwas (4).	hers Unscrew and remove three straps (26).	
6. Fuel tank (27).	Lower from vehicle to ground	d.
7. Two bolts (10), washers and nuts (8).	(7), Unscrew and remove two host clamps (9) from two brackets (11).	
8. Two bolts (12), washers washers (5), and nuts (6).		
9. Twelve bolts (2) and nuts	Unscrew and remove three J-brackets (32).	
10. Air vent (31).	Unscrew from fuel tank (27).	Run wire thru vent hole to ensure free air flow.
11. Three insulators (29).	Remove from three straps (2)	Replace if rubber is crack- ed or deteriorated.
12. Fuel cap (15).	Unscrew and pull out to poin where fuel cap retainer (23) catches on fuel filter screen inside tank.	nt
13. Fuel cap gasket (21) and fuel cap chain (22).	Inspect for damage.	Replace as necessary by unhooking chain from inside of fuel cap (15) and replacing, use needle nose pliers to open chain link.
14. Fuel sender flange (16) fuel sender attached.	with Remove; refer to para 5-79A.	

LOCATION/ITEM	ACTIO	DN	REMARKS	S
LEGEND: 1. NUT (12) 2. BOLT (12) 3. NUT (6) 4. LOCKWASHER (6) 5. WASHER (2) 6. NUT (2) 7. WASHER (2)	32 31 32 31	15. FUEL CAP 16. FUEL SENDER FLANGE 17. TERMINAL (2) 18. WASHER (4) 19. PHILLIPS HEAD SCREW	21. FU GA 22. FU GA 22. FU S CH 23. FU RE 24. EL 25. FU NE 26. ST 27. FU 28. DF 29. INS 30. LO 31. AI 32. J-B	OTTED AD SCREW EL CAP SKET EL CAP AIN EL CAP TAINER BOW (2) EL TANK RAIN PLUG SULATOR (3) ENER T-BOLT (3) ENER T-BOLT (3) ER VENT BRACKET (3) EL LINE (2)

4-23. FUEL TANK MAINTENANCE (Continued).				
LOCATION/ITEM	ACTION	REMARKS		
B. INSTALLATION.				
15. Fuel sender flange (16) with fuel sender attached.	Install; refer to para 5-79B.			
16. Fuel cap {15) with fuel cap gasket (21), fuel cap chain (22), and fuel cap retainer (23).	Position on fuel fill neck (25) and screw fuel cap (15) on.			
17. Three insulators (29).	Install on three straps (26).			
18. Air vent (31).	Screw into fuel tank (27).			
19. Three J-brackets (32).	Aline mounting holes to frame and install with twelve bolts (2) and nuts (1).			
20. Two brackets (11).	Install to two J-brackets (32) with two bolts (12), washers (13), washers (5), and nuts (6).	Install to the two forward most J-brackets.		
21. Two hose clamps (9).	a. Slide over two fuel lines (33).b. Secure to two brackets (11) with two bolts (10), washers (7) and nuts (8).			
22. Fuel tank (27).	Raise into position against three J-brackets (26).			
23. Three strap (26) with three insulators (29).	 a. Insert three lower T-bolts (30) thru bottom of three J-brackets (32) and secure with three lockwashers (4) and nuts (3). b. Insert three upper T-bolts (14) thru top center hole of three J-brackets (32) and secure with three lockwashers (4) and nuts (3). 			
24. Two terminals (17).	Position on fuel sender flange (16) and install with phillips head screw (19), slotted head screw (20) and four washers (18).	Install as you marked at disassembly.		
25. Two elbows (24).	a. Apply liquid teflon to threads.b. Screw into fuel tank (27).			

4-23. FUEL TANK MAINTENANCE (Continued).

	LOCATION/ITEM		ACTION		REMA	ARKS
3	6 5 6 6 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	9 11 13 12 14	24	21 22 23 25 26 28 27	20. 21. 22. 23. 24. 25.	SLOTTED HEAD SCREW
1. 2. 3. 4. 5. 6. 7.	NUT (12) 8. BOLT (12) 9. NUT (6) 10. LOCKWASHER (6) 11. WASHER (2) 12 NUT (2) 13. WASHER (2) 14.	HOSE CLAMP (2) BOLT (2) BRACKET (2) BOLT (2) WASHER (2)	16. FU FI 17. TU 18. W 19. PU	JEL CAP UEL SENDER LANGE ERMINAL (2) ASHER (4) HILLIPS EAD SCREW	26. 27. 28. 29. 30. 31. 32.	STRAP (3) FUEL TANK DRAIN PLUG INSULATOR (3) LOWER T-BOLT (3) AIR VENT J-BRACKET (3) FUEL LINE (2)
						TA 075639

4-23. FUEL TANK MAINTENANCE	(Continued).	
LOCATION/ITEM	ACTION	REMARKS
B. INSTALLATION (Continued).		
26. Two fuel lines (33).	Screw onto two elbows (24).	Install as you marked at disassembly.
C. CHECKING FOR LEAKS.		
27. Fuel fill neck (25).	Remove fuel cap (15) from fuel fill neck (25). Fill tank with fuel (see TM 9-2320-273-10).	Be sure drain plug (28) is tightened.
28. Fuel cap (15).	Put on and tighten to fuel fill neck (25).	
29. Engine.	Start up (see TM 9-2320-273-10).	
30. Fuel tank (27), two fuel lines (33), and two elbows (24).	Check for leaks.	Retighten as necessary.
31. Engine.	Shut down (see TM 9-2320-273-10).	
	NOTE	
For oth	ner fuel line locations refer to para	4-20.

4-23. FUEL TANK MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** 20 16 23 20. SLOTTED **HEAD SCREW** 21. **FUEL CAP** GASKET 30 22. **FUEL CAP** CHAIN 23. **FUEL CAP** RETAINER 26 24. ELBOW (2) 27 - 28 25. FUEL FILL LEGEND: NECK 26. STRAP (3) 15. FUEL CAP 1. NUT (12) NUT (2) 27. FUEL TANK 9. HOSE CLAMP (2) 2. BOLT (12) 16. FUEL SENDER 28. DRAIN PLUG 3. NUT (6) 10. BOLT (2) FLANGE 29. INSULATOR (3) 4. LOCKWASHER (6) 11. BRACKET (2) 17. TERMINAL (2) 30. LOWER T-BOLT (3 18. WASHER (4) 31. AIR VENT 5. WASHER (2) 12. BOLT (2) 6. NUT (2) 13. WASHER (2) 19. PHILLIPS 32. J-BRACKET (3) 7. WASHER (2) 14. UPPER T-BOLT (3) HEAD SCREW 33. FUEL LINE (2) TA 075640

4-24. AIR CLEANER ELEMENT MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.

a. Removal. (10) b. Cleaning. (15) c. Installation. (15)

40 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Inner Filter Element (If Outside Filter Has Been Cleaned Five Times.) (250C127). Outer Filter Element (250C128).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-20P.

SPECIAL ENVIRONMENTAL CONDITIONS

Darkened Area for Element Check. Vehicle Parked on Level Ground.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

None.

PARAGRAPH

None.

GENERAL SAFETY INSTRUCTIONS

Engine Off; Transmission in Neutral. Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 4-1.

4-24. AIR CLEANER ELEMENT MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

A. REMOVAL.

1. Handle (1) and retainer bar (2). Unscrew handle, slide bar out of slots and remove.

2. Outer filter element (3). Grasp bands on face and pull out of canister (7).

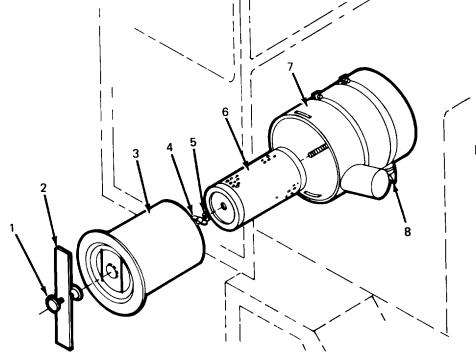
CAUTION

Do not clean inner element. Do not remove unless to replace with a new element. This should be done after the outside filter has been cleaned five times.

3. Inner filter element (6).

Remove if necessary, by unscrewing wing nut (4) and removing rubber backed washer (5).

Rubber seal at opposite end may stick making removal difficult. Grasp end and work back and forth to free.



LEGEND:

- 1. HANDLE
- 2. RETAINER BAR
- 3. OUTER FILTER ELEMENT
- 4. WING NUT
- 5. RUBBER BACKED WASHER
- 6. INNER FILTER ELEMENT
- 7. CANISTER
- 8. BOOT

TA 074629

4-24. AIR CLEANER ELEMENT MAINTENANCE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
e i	WARNING Compressed air used for cleaning purpose exceed 30 psi. Use only with effective ching and personal protective equipment (goshield, gloves, etc.).	p guard-	
B. CLEANING.			
4. Outer filter element (3).	a. Tap element to shake dust loose.b. Insert compressor air nozzle into element to blow out dust.	Pressure should not exceed 30 psi.	
	 c. Wash in water with mild non-sudsing detergent. Rinse gently with clean water and allow to air dry. (Replace after five washings.) 	Skip this step if filter seems clean and after steps a and b.	
	d. Shine light inside element. Watch outside for light shining through leaks.	If element is damaged, replace.	
5. Canister (7).	a. Squeeze boot (8) together to release trapped dust.b. Wipe inside of canister (7) clean.		
C. INSTALLATION.			
6. Inner filter element (6).	If removed, install new element by positioning rubber backed washer (5) over stud and screw on wing nut (4).		
7. Outer filter element (3).	Place in canister (7).		
8. Retainer bar (2), and hand (1).	lle Slide through slots and tighten.		

4-24. AIR CLEANER ELEMENT MAINTENANCE	(Continued).	
LOCATION/ITEM	ACTION	REMARKS
		8
	1. HANDLE 2. RETAINER BA 3. OUTER FILTE ELEMENT 4. WING NUT 5. RUBBER BACK WASHER 6. INNER FILTER ELEMENT 7. CANISTER 8. BOOT	R KED
		TA 074630

4-25. AIR CLEANER ASSEMBLY MAINTENANCE. THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.) (5) (5) a. Removal of Filter Assembly. b. Removal of Brackets and Fittings. c. Installation of Brackets and Fittings. (5) d. Installation of Filter Assembly. (5)20 Minutes Total. **EQUIPMENT CONDITION INITIAL SETUP APPLICABLE CONFIGURATIONS** PARAGRAPH **CONDITION DESCRIPTION** None. None. All. **TEST EQUIPMENT** None. SPECIAL TOOLS None MATERIALS/PARTS (P/N) None. SPECIAL ENVIRONMENTAL CONDITIONS PERSONNEL REQUIRED Vehicle Parked on Level Ground. Two (MOS-63820). REFERENCES (TM) **GENERAL SAFETY INSTRUCTIONS** None. Engine Off; Transmission in Neutral. Park Brake Set. TROUBLESHOOTING REFERENCES Table 4-1.

4-25. AIR CLEANER ASSEMBLY MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

A. REMOVAL OF FILTER ASSEMBLY.

1. Turbo air inlet pipe (7). Loosen clamp (6). at filter dis-

charge and remove inlet pipe.

2. Restriction indicator tube (3). Disconnect flare nut (4) from

elbow (5).

3. Air intake pipe (15). Loosen clamps (17) and slide

boot (16) off air intake pipe (15).

4. Four nuts (11) and four

lockwashers (10).

Remove from three studs (8)

and bolt (9).

5. Filter assembly (1). Remove.

B. REMOVAL OF BRACKETS AND FITTINGS (REPLACEMENT OF UNIT ONLY).

6. Two capscrews (12) and two

nuts and lockwashers (13).

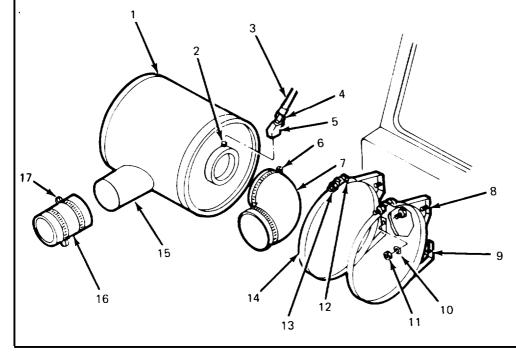
Remove.

7. Two brackets (14).

Spread and remove.

8. Nipple filter (2).

Remove with elbow (5) attached.



LEGEND:

- 1. FILTER ASSEMBLY
- 2. NIPPLE FILTER
- 3. RESTRICTION INDICATOR TUBE
- 4. FLARE NUT ELBOW
- 5.CLAMP (2)
- 7. TURBO AÍR INLET PIPE
- 8. STUD (3)
- 9. BOLT
- 10. LOCKWASHER (4)
- 11. NUT (4)
- 12. CAPSCREW (2)
- 13. NUT AND
 - LOCKWASHER (2)
- 14. BRACKET (2)
- 15. AIR INTAKÈ PIPE
- 16. BOOT
- 17. CLAMP (2)

TA 074631

4-25. AIR CLEANER ASSEMBLY MAINTENANCE (Continued).								
	LOCATION/ITEM	ACTION	REMARKS					
C. INSTALLATION OF BRACKETS AND FITTINGS (IF REMOVED).								
9.	Nipple filter (2).	Install with elbow (5) attached.						
10.	Two brackets (14).	Spread and position on air filter assembly (1).						
11.	Two capscrews (12) and two nuts and lockwashers (13).	Install finger tight.						
D.	D. INSTALLATION OF FILTER ASSEMBLY.							
12.	Filter assembly (1).	Place on three studs (8), and bolt (9), install four lockwashers (10) and nuts (11).	If brackets are removed it may be necessary to reposition them to fit over studs. Tighten nuts at this time.					
13.	Air intake pipe (15).	Slide boot (16) over air intake pipe (15) position and tighten two clamps (17).						
14.	Restriction indicator tube (3).	Connect flare nut (4) to elbow (5) and tighten.						
15.	Turbo air inlet pipe (7).	Install over filter discharge. Position and tighten clamps (6).						

4-25. AIR CLEANER ASSEMBLYIWAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM 9 16 10 13 LEGEND: 9. BOLT 1. FILTER ASSEMBLY LOCKWASHER (4) 10. NIPPLE FILTER NUT (4) 11. RESTRICTION CAPSCREW (2) 12. INDICATOR TUBE **NUT AND** FLARE NUT 13. LOCKWASHER (2) **ELBOW** CLAMP (2) TURBO AIR INLET BRACKET (2) AIR INTAKÈ PIPE 15. BOOT PIPE 16. 17. CLAMP (2) 8. STUD (3) TA 074632

4-26. AIR CLEANER RESTRICTION INDICATOR MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal of Indicator.
b. Installation of Indicator.
c. Removal of Tube and Filter.

d. Installation of Tube and Filter. (6)
15 Minutes Total.

INITIAL SETUP EQUIPMENT CONDITION

APPLICABLE CONFIGURATIONS PARAGRAPH CONDITION DESCRIPTION

All. None. None.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED SPECIAL ENVIRONMENTAL CONDITIONS

One (MOS-63B20). Vehicle Parked on Level Ground.

REFERENCES (TM)

None. GENERAL SAFETY INSTRUCTIONS

Engine Off; Transmission in Neutral

Park Brake Set.

TROUBLESHOOTING REFERENCES

None.

4-26. AIR CLEANER RESTRICTION INDICATOR MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** A. INDICATOR REMOVAL. 1. Flare nut (4). Reach behind bracket and unscrew nut from compression adapter (3). Disconnect tube (5). 2. Two screws (1) and Unscrew and remove. starwashers (11). If replacing indicator remove 3. Restriction indicator (2). Remove. compression adapter (3). **BRACKET MOUNTED TO INSTRUMENT PANEL FIREWALL** LEGEND: 10 1. SCREW (2) RESTRICTION **INDICATOR** 3. COMPRESSION **ADAPTER** 4. FLARE NUT TUBE GROMMET 7. FLARE NUT 8. FITTING ELBOW AIR CLEANER AIR INLET PIPE 9. 10. NIPPLE FILTER 11. STAR WASHER (2) TA 074633

4-26. AIR CLEANER RESTRICTION INDICATOR MAINTENANCE (Continued).						
LOCATION/ITEM	ACTION	REMARKS				
INDICATOR INSTALLATION						
3. INDICATOR INSTALLATION.						
4. Restriction indicator (2).	Position on bracket.					
5. Two screws (1) and starwashers (11).	Screw in and tighten.	If new indicator is being installed screw in and tighten compression adapter (3), into restriction indicator (2).				
	NOTE					
	plan to remove tube (5) and nipple 0), go directly to step 7, if not do					
6. Flare nut (4).	Screw onto compression adapter (3) and tighten.					
. TUBE AND FILTER REMOVAL.						
7. Flare nut (7).	Unscrew. Disconnect tube (5).					
8. Nipple filter (10).	Unscrew and remove from air cleaner with elbow (9) and fitting (8).					
9. Tube (5) and grommet (6).	Remove from firewall.					

4-26. AIR CLEANER RESTRICTION INDICATOR MAINTENANCE (Continued). **REMARKS ACTION** LOCATION/ITEM D. TUBE AND FILTER INSTALLATION. 10. Nipple filter (10), elbow Screw onto air cleaner. (9) and fitting (8). 11. Flare nut (7). Screw onto connector (8). 12. Tube (5) and grommet (6). Install grommet. Insert tube through firewall. 13. Flare nut (4). Screw onto adapter (3). Reach behind bracket. **BRACKET MOUNTED TO** INSTRUMENT PANEL **FIREWALL** LEGEND: 10 1. SCREW (2) RESTRICTION **INDICATOR** 3. COMPRESSION ADAPTER 4. FLARE NUT 5. TUBE GROMMET 7. FLARE NUT 8. **FITTING** 9. **ELBOW** AIR INLET PIPE AIR CLEANER 10. NIPPLE FILTER 11. STAR WASHER (2) TA 074634

4-27. TURBO AIR INLET MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (4)

b. Inspection. (5)

c. Installation. (6)

d. Checking for Leaks. (2)

17 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

ΑII

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

None.

EQUIPMENT CONDITION

PARAGRAPH

CONDITION DESCRIPTION

None.

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Work Area Must be Clean as Dirt in the Air Passages

Can Damage the Turbocharger and Engine.

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

4-27 TURBO AIR INLET MAINTENANCE (Continued).

LOCATION/ITEM

ACTION

REMARKS



Dirt in the air passages can severely damage the turbocharger and engine. Be sure your work area is clean. Clean parts before installation. Cover openings to keep out dust while you are working.

A. REMOVAL.

1. Six clamps (6).

Loosen.

2. Clamp (4), hose (3).

Loosen and remove.

3. Three elbow pipes (2), (7), and (9); three straight pipes (5), (8) and (9), and two boots (10) and (13).

Remove.

B. INSPECTION.

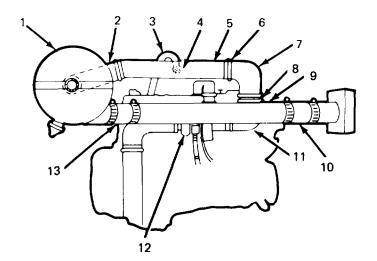
4. Three elbow pipes (2), (7), and (9); three straight pipes (5), (8) and (9), and two boots (10) and (13).

Inspect for a. cracks

b. leaks

c. blockage

Replace, if necessary.



LEGEND:

- 1. AIR CLEANER
- 2. ELBOW PIPE
- 3. HOSE
- 4. CLAMP
- 5. STRAIGHT PIPE
- 6. CLAMP (6)
- 7. ELBOW PÍPE
- 8. STRAIGHT PIPE
- 9. STRAIGHT PIPE
- 10. BOOT
- 11. ELBOW PIPE
- 12. TURBOCHARGER
- 13. BOOT

TA 074635

4-27. TURBO AIR INLET MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

C. INSTALLATION.

5. Two straight pipes Insert into elbow pipes (5) and (8). (2), (7) and (11).

6. Straight pipe (9). Insert into two boots (10)

and (13).

7. Two elbow pipes (2) and (11). Attach to turbocharger (12)

and air cleaner (1).

8. Six clamps (6). Tighten to 32-36 lb-in

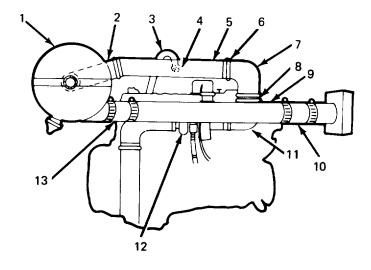
(3.6-4.1 N•m).

D. CHECKING FOR LEAKS.

9. Engine. Start up (see TM 9-2320-273-10).

WARNING

During normal operation, the turbocharger and outlet pipe can become very hot. Be careful not to touch these components with your bare hands. These components may be hot enough to cause severe burns.



LEGEND:

- 1. AIR CLEANER
- 2. ELBOW PIPE
- 3. HOSE
- 4. CLAMP
- 5. STRAIGHT PIPE
- 6. CLAMP (6)
- 7. ELBOW PIPE
- 8. STRAIGHT PIPE
- 9. STRAIGHT PIPE
- 10. BOOT
- 11. ELBOW PIPE
- 12. TURBOCHARGER
- 13. BOOT

TA 074636

This page intentionally left blank.

ENGINE RETARDER BRAKE

4-28. ROCKER ARM HOUSING COVERS MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

Removal of Crossover Tube. (5)
Removal of Cover. (5)
Cleaning. (20)
Installation of Cover. (5)
Installation of Crossover Tube(5)

40 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Dry Cleaning Solvent (Refer to Appendix C). Gasket for Crossover Tube (Center Cover Only.) (216487). Gasket for Rocker Arm Housing (3009999).

EQUIPMENT CONDITION PARAGRAPH

4-15A. 4-27A.

CONDITION DESCRIPTION

Breather Tube Removed (For Center Cover Only). Turbo Air Inlet Removed.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-20P.

SPECIAL ENVIRONMENTAL CONDITIONS

Work Area Must be Clean as Dirt in the Turbocharger and Engine Can Cause Damage.

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 5-4.

ENGINE RETARDER BRAKE.

4-28. ROCKER ARM HOUSING COVERS MAINTENANCE (Continued). LOCATION/ITEM ACTION REMARKS

CAUTION

Do not allow SD-2 dry cleaning solvents to come in contact with seals on flexible hoses. These cleaners may damage leather, rubber, and synthetic materials.

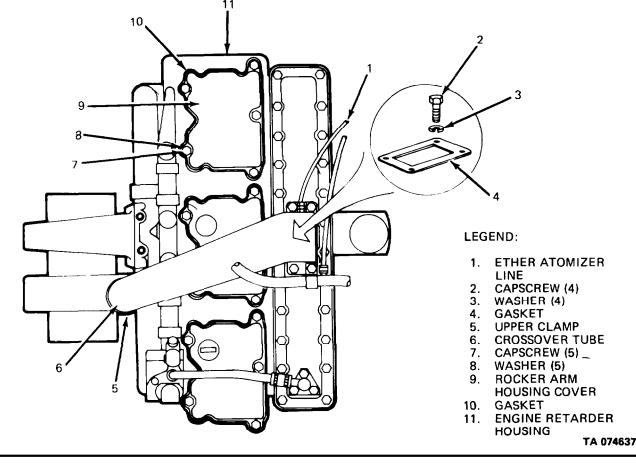
A. REMOVAL OF CROSSOVER TUBE (FOR CENTER COVER, ONLY).

1. Ether atomizer line (1).

Unscrew and remove.

2. Four capscrews (2), washers (3), and gasket (4).

Unscrew and remove. Throw away gasket (4). At this time tachograph cable and hose are free enough to move out of way.



ENGINE RETARDER BRAKE.

LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL OF CROSSOVER TU	BE (Continued).	
3. Upper clamp (5).	Loosen.	If rubber connector is damaged, replace.
4. Crossover tube (6).	Remove.	
B. REMOVAL OF COVER.		
5. Five capscrews (7), and washers (8).	Unscrew and remove.	
6. Rocker arm housing cover (9).	Lift off.	
7. Gasket (10).	Take off and throw away.	
CLEANING.		
8. Rocker arm housing cover (9).	Clean with dry cleaning solvent.	
9. Engine retarder housing (11).	Wipe grease from rim where gasket (10) rests.	
D. INSTALLATION OF COVER.		
10. New gasket (10).	Set in place on engine retarder housing (11).	
11. Rocker arm housing cover (9).	Set onto gasket (10).	
12. Capscrews (7) and washers (8).	Tighten to 15 lb-ft (20 N•m) with torque wrench.	
E. INSTALLATION OF CROSSOVE	R TUBE (CENTER COVER ONLY).	-
13. Crossover tube (6) and new crossover tube gasket (4).	Hold in place and attach with capscrews (2) and washers (3).	Clamp down tachograph cable and hose at this time.
14. Upper clamp (5).	Tighten.	
15. Crossover tube capscrews (2).	Tighten.	
16. Ether atomizer line (1).	Connect and tighten.	

ENGINE RETARDER BRAKE.

4-28. ROCKER ARM HOUSING COVERS MAINTENANCE (Continued). **REMARKS ACTION** LOCATION/ITEM **NOTE** Follow-on maintenance action required if center cover was removed: a. Install breather tube; refer to para 4-15D. b. Install turbo air inlet; refer to para 4-27C. 10 LEGEND: 1. ETHER ATOMIZER LINE 2. CAPSCREW (4) 3. WASHER (4) 4. GASKET 5. UPPER CLAMP **CROSSOVER TUBE** CAPSCREW (5) 7. 8. WASHER (5) **ROCKER ARM** HOUSING COVER 10. GASKET 11. ENGINE RETARDER **HOUSING** TA 074638

ENGINE RETARDER BRAKE

4-29. ENGINE RETARDER BRAKE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

Inspection, (20)

20 Minutes Total.

INITIAL SETUP APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

EQUIPMENT CONDITION PARAGRAPH

4-28A. 4-28B.

CONDITION DESCRIPTION

Remove Crossover Tube. Rocker Arm Housing Covers.

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

SPECIAL ENVIRONMENTAL CONDITIONS

Work Area Must be Clean as Dirt in the Turbocharger and Engine can Cause Damage.

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.
Transmission in Neutral.
Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 5-4.

ENGINE RETARDER BRAKE 4-29. ENGINE RETARDER BRAKE MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM WARNING During normal operation the turbocharger and outlet pipe can become very hot. Be careful not to touch these components with your bare hands. These components may be hot enough to cause serious burns. CAUTION You will be operating the engine with cover removed. Be absolutely certain that work area is clean and dust-free. Do not allow dirt, tools, or engine parts to fall into engine. 3. LEGEND:

ENGINE RETARDER ARMATURES
 ENGINE RETARDER PEDAL
 ENGINE RETARDER SWITCH

ENGINE RETARDER BRAKE.

4-29. ENGINE RETARDER BRAKE	MAINTENANCE (Continued).	
LOCATION/ITEM	ACTION	REMARKS
INSPECTION.	O	
1. Engine.	Start up (see TM 9-2320-273- 10) (1st mechanic).	
 Six engine retarder armatures (1). 	Bleed brakes by pressing each engine retarder armature five or six times in a row. (2nd mechanic).	
3. Cab/Engine Retarder Switch (3).	 a. Keep engine retarder pedal (2) pressed down to actuate engine retarder switch(3). b. Start with dash selector switch at LOW. c. Move to MED. d. Move to HIGH. (1st mechanic). 	Refer to TM 9-2320-273-10.
4. Engine retarder armatures (1).	Observe that: a. When dash selector switch is at LOW center armature remains down. b. When dash selector switch is moved to MED, center armature comes up, armature on ends go down. c. When dash selector switch is on HIGH, all armatures go down.	If brake does not work properly, refer problem to Direct Support Maintenance.
	NOTE	
a. Insta	on maintenance action required: Il rocker arm housing covers, and sover tube, para 4-28D and E.	

ENGINE RETARDER BRAKE.

4-29. ENGINE RETARDER BRAKE MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** 3 -LEGEND: 1. ENGINE RETARDER ARMATURES 2. ENGINE RETARDER PEDAL 3. ENGINE RETARDER SWITCH TA 074640

4-30. ETHER CYLINDER MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

b. Installation.

(5) (10)

c. Check Operation. (5)

20 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

AII.

TEST EQUIPMENT

None.

SPECIAL TOOLS

MATERIALS/PARTS (P/N)

Ether Cylinder (2910-01-072-1783).

EQUIPMENT CONDITION PARAGRAPH

None.

CONDITION DESCRIPTION

None.

PERSONNEL REQUIRED

Two (MOS-63B20). (2nd Mechanic Operates Cab Control in Part C). REFERENCES (TM)

TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

Table 5-3.

SPECIAL ENVIRONMENTAL CONDITIONS

- 1. Coolant Temperature Must be Below 50°F or Ether Solenoid Valve Will Not Function.
- 2. Work in a Well Ventilated Area Away From Sparks or Flame.
- 3. Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Ether is Highly Explosive. Be Alert for the Strong Odor of Spilled Ether. Guard Against Flame or Sparks in Work Area. Engine OFF. Transmission in Neutral.

Park Brake Set.

4-30. ETHER CYLINDER MAINTENANCE (Continued). LOCATION/ITEM ACTION REMARKS

WARNING

Ether is highly explosive. Dispose of cylinder properly. Be alert for the strong odor of spilled ether. Guard against flame or sparks in work area.

A. REMOVAL.

1. Clamp (4). Loosen.

2. Ether cylinder (1).

Unscrew from fitting (5) and lift out.

It may be necessary to hold fitting (5) with open-end wrench.

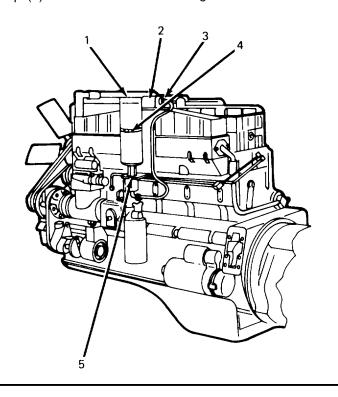
NOTE

Check neck of cylinder for dirt or lint prior to installation.

B. INSTALLATION.

3. Ether cylinder (1). Screw into fitting (5).

4. Clamp (4). Tighten.

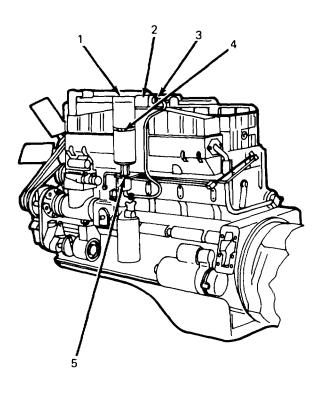


LEGEND:

- 1. ETHER CYLINDER
- 2. CROSSOVER TUBE
- 3. ATOMIZER LINE
- 4. CLAMP
- 5. FITTING

LOCATION/ITEM	ACTION	REMARKS
	NOTE	
	Coolant temperature must be below 50°F or solenoid valve will not function.	
C. OPERATIONAL CHECK.		
5. Atomizer Line (3).	Unscrew from crossover tube (2).	
6. INSTRUMENT PANEL/ Engine run switch.	Turn On.	Refer TM 9-2320-273-10 2nd Mechanic.
7. INSTRUMENT PANEL/ Ether button	Push and release.	
8. Atomizer Line (3)	Observe ether mist.	If mist is not observed, check ether temperature switch (para 5-74), solenoid valve (para 4-31), ether tube (para 4-33), and atomizer (para 4-32).
9. INSTRUMENT PANEL/ Engine run switch.	After check, turn OFF.	2nd Mechanic.
10. Atomizer Line (3).	Screw into crossover tube (2).	

4-30 FTHER CYLINDER MAINTENANCE	(Continued)	
LOCATION/ITEM	ACTION	REMARKS



LEGEND:

- 1. ETHER CYLINDER
- 2. CROSSOVER TUBE 3. ATOMIZER LINE 4. CLAMP 5. FITTING

4-31. SOLENOID VALVE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (20) b. Installation. (25)

45 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

ΑII

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS {P/N}

Solenoid Valve, 913032-04 (06991).

EQUIPMENT CONDITION PARAGRAPH

4-30A. 9-11A.

CONDITION DESCRIPTION

Ether Cylinder Removed. Remove Alcohol Evaporator.

PERSONNEL REQUIRED

Two (MOS-63B20). (2nd Mechanic Operates Cab Control in Part C of Para 4-30.)

REFERENCES (TM)

TM 9-2320-273-20P

TROUBLESHOOTING REFERENCES

Table 5-3.

SPECIAL ENVIRONMENTAL CONDITIONS

Coolant Temperature Must be Below 50°F or Ether Solenoid Valve Will Not Function.
Work in a Well Ventilated Area Away From Sparks or Flame.
Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Ether is Highly Explosive.
Be Alert for the Strong Odor of Spilled Ether.
Guard Against Flame or Sparks in Work Area.
Engine OFF; Transmission in Neutral.
Park Brake Set.

4-31. SOLENOID VALVE MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM WARNING Ether is highly explosive. Be alert for the strong odor of spilled ether. Guard against flames or sparks in work area. A. REMOVAL. Unplug from quick-disconnect (9). 1. Two wires (10). Unscrew from solenoid valve (8). 2. Ether tube (7). LEGEND: MOUNTING BRACKET 2. NUT 3. SPACER (2) 4. BRACKET 5. WASHER (2) 6. BOLT (2) 7. ETHER TUBE 8. SOLENOID VALVÈ 9. QUICK DISCONNECT 10. WIRE (2) 11. BOLT TA 074643

4-31. SOLENOID VALVE MAINTENANCE (Continued).				
LOCATION/ITEM	ACTION	REMARKS		
. REMOVAL (Continued).				
3. Two bolts (6), washers (5), and spacers (3).	Unscrew and remove.			
4. Bolt (11) and nut (2).	Unscrew and remove bracket (4) with solenoid valve (8) attached from mounting bracket (1).			
3. INSTALLATION.				
5. Bracket (4) with solenoid valve (8) attached.	Mount to engine with two bolts (6), washers (5), and spacers (3).			
6. Bolt (11) and nut (2).	Mount thru bracket (4) and mounting bracket (1) and tighten.			
7. Ether tube (7).	Screw onto solenoid valve (8).			
8. Quick disconnect (9).	Plug in two wires (10).			
	NOTE			
Inst	ow-on maintenance required: all ether cylinder and check operation; para 4-30 B and C.			

4-31. SOLENOID VALVE MAINTENANCE (Continued). **REMARKS ACTION** LOCATION/ITEM 11 LEGEND: MOUNTING BRACKET NUT 3. SPACER (2) 4. BRACKET 5. WASHER (2) BOLT (2) ETHER TUBE SOLENOID VALVE 9. QUICK DISCONNECT 10. WIRE (2) 11. BOLT TA 074644

4-32. ATOMIZER MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (2)

b. Installation and Operational Check. (3)

5 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS PARAGRAPH CONDITION DESCRIPTION

EQUIPMENT CONDITION

All. None. None.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Atomizer, 91302406 (06991)

PERSONNEL REQUIRED

Two (MOS-63B20). (2nd Mechanic Operates Cab Controls in Part B.)

REFERENCES (TM)

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Coolant Temperature Must Be Below 50°F or Ether Solenoid Valve Will Not Function.

Work in a Well Ventilated Area Away from Sparks or Flame.

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Ether is Highly Explosive.

Be Alert for the Strong Odor of Spilled Ether. Guard Against Flame or Sparks in Work Area. Engine OFF: Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 5-3.

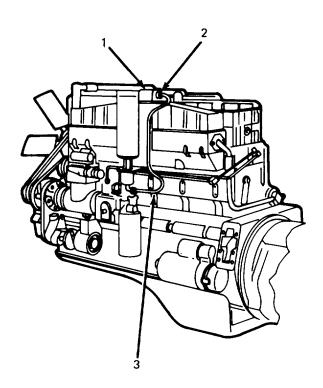
4-32. ATOMIZER MAINTENANCE (Continued).

LOCATION/ITEM **ACTION REMARKS**

A. REMOVAL.

1. Atomizer (2).

- a. Unscrew ether tube (3) and remove.
- b. Unscrew from crossover tube (1).

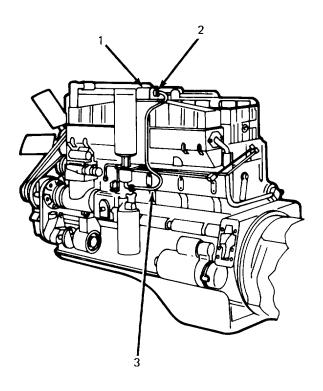


LEGEND:

- CROSSOVER TUBE
 ATOMIZER
 ETHER TUBE

LOCATION/ITEM	ACTION	REMARKS
	NOTE	
	Coolant temperature must be below 50 or solenoid valve will not function.	0°F
B. INSTALLATION AND OPER	RATIONAL CHECK.	
2. Ether tube (3). INSTRUMENT PANEL/	Screw on atomizer (2).	
3. Ether button.	Push (2nd mechanic).	Engine run switch must be ON
4. Atomizer (2).	Observe ether mist from atomizer (2) (2nd mechanic).	If mist is not observed, check ether temperature switch (para 5-74), ether cylinder (para 4-30), solenoid valve (para 4-31), and ether tube (para 4-33).
INSTRUMENT PANEL/		
5. Engine run switch.	Engine run switch OFF (2nd mechanic).	
6. Atomizer (2).	a. Remove from ether tube (3).b. Screw into crossover tube (1).	
7. Ether tube (3).	Screw into atomizer (2).	

4-32. ATOMIZER MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM



LEGEND:

- CROSSOVER TUBE
 ATOMIZER
 ETHER TUBE

ETHER QUICK-START MAINTENANCE.

4-33. ETHER TUBE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (10) b. Inspection. (5) c. Installation. (10) d. Operational Check. (5)

30 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C).

PERSONNEL REQUIRED

Two (MOS-63B20). (2nd Mechanic Operates Cab Controls in Part D.)

REFERENCES (TM)

None.

TROUBLESHOOTING REFERENCES

Table 5-3.

SPECIAL ENVIRONMENTAL CONDITIONS

Coolant Temperature Must be Below 50°F or Ether Solenoid Valve Will Not Function.

Work in a Well Ventilated Area Away From Sparks or Flame.

Vehicle Parked on Level Ground.

CONDITION DESCRIPTION

None.

GENERAL SAFETY INSTRUCTIONS

Ether is Highly Explosive. Be Alert for the Strong Odor of Spilled Ether. Guard Against Flame or Sparks in Work Area. Engine OFF.

Transmission in Neutral.

EQUIPMENT CONDITION

PARAGRAPH

None.

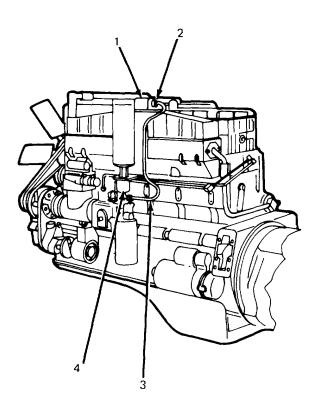
Park Brake Set.

ETHER QUICK-START SYSTEM. 4-33. ETHER TUBE MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM A. REMOVAL. 1. Ether tube (3). a. Unscrew from atomizer (2). b. Unscrew from solenoid valve (4). 2. Atomizer (2). Unscrew from crossover tube (1). LEGEND: 1. CROSSOVER TUBE 2. ATOMIZER 3. ETHER TUBE 4. SOLENOID VALVE

4-33. ETHER TUBE MAINTENANCE (Continued).				
LOCATION/ITEM	ACTION	REMARKS		
B. INSPECTION.				
3. Ether tube (3), solenoid valve (4), atomizer (2).	Look for: a. Cracks. b. Leaks. c. Kinks. d. Damaged fittings.	Replace, if necessary.		
C. INSTALLATION.				
4. Ether tube (3).	a. Screw onto solenoid valve (4).b. Screw onto atomizer (2).			
	NOTE			
	Coolant temperature must be below 50 or solenoid valve will not function.)°F		
D. OPERATIONAL CHECK.				
INSTRUMENT PANEL/ Ether button.	Push (2nd mechanic).	Engine run switch must be ON.		
6. Atomizer (2).	Observe ether mist (1st mechanic).	If mist is not observed, check ether temperature switch (para 5-74) ether cylinder (para 4-30), solenoid valve (para 4-31), and atomizer (para 4-32).		
7. INSTRUMENT/PANEL. Engine run switch.	Turn OFF (2nd mechanic).			
8. Atomizer (2).	a. Unscrew from ether tube (3).b. Screw into crossover tube (1).			
9. Ether tube (3).	Screw onto atomizer (2).			

4-33. ETHER TUBE MAINTENANCE (Continued).

ACTION REMARKS LOCATION/ITEM



LEGEND:

- CROSSOVER TUBE
 ATOMIZER
 ETHER TUBE
 SOLENOID VALVE

4-34. TURBO OUTLET PIPE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a Removal. (5)

b. Inspection of Mating Flanges. (5)

c. Installation. (10) d. Checking for Leaks. (5)

Checking for Leaks. (5)
25 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

AII.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Coupling, 5-0-1259LJ(76700). Coupling (3), 5-0-1236BJ (76700).

Locknut (M916/M920) M/219 B-20002 (34623).

EQUIPMENT CONDITION

PARAGRAPH

None.

CONDITION DESCRIPTION

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 92320-273-10.

TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

Table 4-1.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Wait Until Exhaust Components are Cool.

Engine OFF.

Transmission in Neutral.

Park Brake Set.

4-34. TURBO OUTLET PIPE MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS WARNING** During normal operation, the exhaust pipes and muffler can become very hot. Be careful not to touch these components with your bare hands. Do not allow your body to come in contact with the hot pipes or muffler. Exhaust system components may be hot enough to cause serious burns. 3 LEGEND: 13 **FLEX PIPE** 1. 2. COUPLING 3. SPACER WASHER (2) 5. CLAMP NUT (2) 6. **BRACKET TURBOCHARGER OUTLET PIPE** 8. CLAMP **TURBOCHARGER** 9. OUTLET 10. LOCKNUT 11. BOLT 12. COUPLING NUT (2) 13. **U-CLAMP** TA 074649

4-34. TURBO OUTLET PIPE MAINTENANCE (Continued).				
LOCATION/ITEM	ACTION	REMARKS		
A. REMOVAL				
1. Locknut (10) and bolt (11).	Unscrew and remove clamp (8).	Replace locknut (10).		
2. Two coupling nuts (12).	Loosen.			
3. Two clamp nuts (5) and washers (4).	Unscrew and remove U-clamp (13) and spacer (3) from bracket (6).			
Turbocharger outlet pipe (7).	Remove.			
5. Coupling (2).	Remove and discard.			
B. INSPECTION OF MATING FLAM	IGES.			
6. End of turbocharger outlet (9), turbocharger outlet pipe (7), and flex pipe (1).	Check for: a. Burrs. b. Cracks. c. Distortion.	Replace (1) and (7) if necessary, or refer to Direct Support for (9).		
C. INSTALLATION.				
7. Turbocharger outlet pipe (7), U-clamp (13), spacer (3).	Position at bracket (6) and install with two washers (4) and clamp nuts (5).	Do not tighten clamp nuts (5) yet.		
8. Turbocharger outlet (9).	a. Aline with turbocharger outlet pipe (7).b. Secure with clamp (8), bolt (11), and locknut (10).			
9. New coupling (2).	a. Position at connection of flex pipe (1) and turbocharger outlet pipe (7).b. Secure with two new coupling nuts (12).	Use torque wrench and tighten to 45 lb-ft (61 N·m).		
10. Two clamp nuts (5).	Tighten.			
D. CHECKING FOR LEAKS				
11. Engine.	Start up (see TM 9-2320- 273-10).			

4-34. TURBO OUTLET PIPE MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** D. CHECKING FOR LEAKS (Continued). 12. Coupling (2) and clamp (8). Listen for leaks. Tighten two coupling nuts (12) or locknut (10) as necessary. 13. Engine. Shut down (see TM 9-2320-273-10). 12 10 11 LEGEND: 13 FLEX PIPE 1. 2. COUPLING 3. SPACER 4. WASHER (2) CLAMP NUT (2) BRACKET TURBOCHARGER **OUTLET PIPE** 8. CLAMP TURBOCHARGER OUTLET 10. LOCKNUT 11. BOLT 12. COUPLING NUT (2) 13. U-CLAMP TA 074650

4-35. FLEX PIPES MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (5)
b. Inspection of Mating Flanges. (5)

c.Installation. (10) d.Checking for Leaks. (5)

25 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

AII.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Couplings (3), 5.0-1236BJ (76700). Coupling, 5.0-1259LJ (76700).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320273-10.

GENERAL SAFETY INSTRUCTIONS

Vehicle Parked on Level Ground.

Wait Until Exhaust Components are Cool.

SPECIAL ENVIRONMENTAL CONDITIONS

Engine OFF.

Transmission in Neutral.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

None.

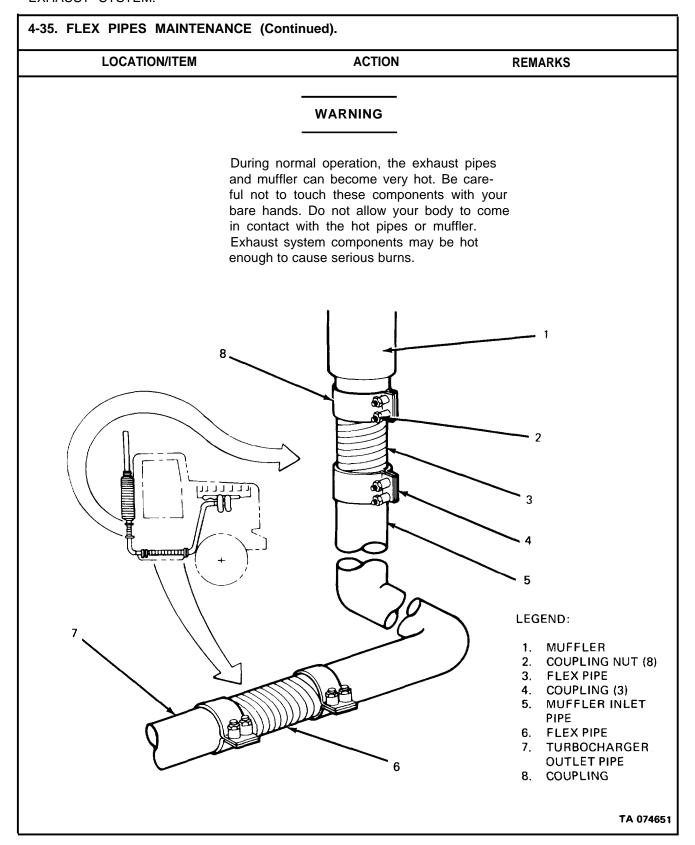
PARAGRAPH

None.

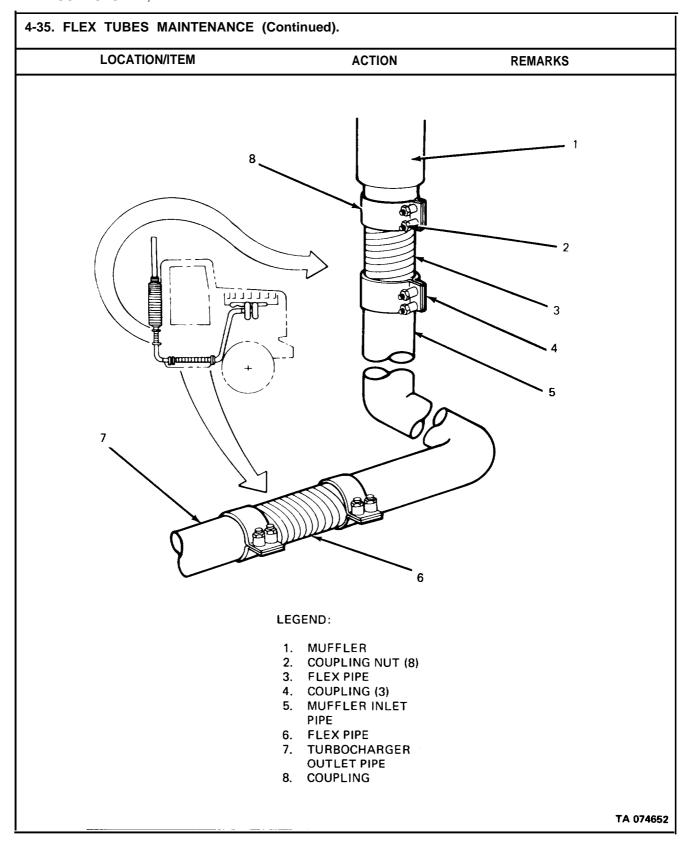
Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 4-1.



	LOCATION/ITEM	ACTION	REMARKS
A. REMOV	<u></u>		
	oupling nuts (2).	Loosen and slide three couplings (4) and coupling (8) onto flex pipes (3) and (6).	
2. Flex pip	es (3) and (6).	Remove.	
3. Three coupling	ouplings (4) and g (8).	Remove and discard.	
B. INSPEC	TION OF MATING FLA	NGES.	
muffler	parger outlet pipe (7), inlet pipe (5), (1), and flex pipes (6).	Inspect pipes and pipe ends for: a. Cracks. b. Distortion. c. Burring.	Replace if necessary.
C. INSTAL	LATION.		
	new couplings (4) upling (8).	Slide onto flex pipes (3) and (6).	
6. Flex pip	es (3) and (6).	Put in place.	
	new couplings (4) upling (8).	Slide into position over connections.	
8. Eight c	oupling nuts (2).	Tighten to 45 lb-ft (61 N·m) with torque wrench.	
D. CHECKI	NG FOR LEAKS.		
9. Engine		Start up (see TM 9-2320-273-10).	
	pes (3) and (6); couplings (4) and g (8).	Listen for leaks	Retighten coupling nuts (2) as necessary.
11. Engine		Shut down (see TM 9-2320-273-10).	



4-36. MUFFLER INLET PIPE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (6)b. Inspection of Mating Flanges. (5)(10)c.Installation.

(5)d. Checking for Leaks. 26 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Coupling (2), 5.0-1236BJ (76700).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

Table 4-1.

EQUIPMENT CONDITION

PARAGRAPH

CONDITION DESCRIPTION

None. None.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

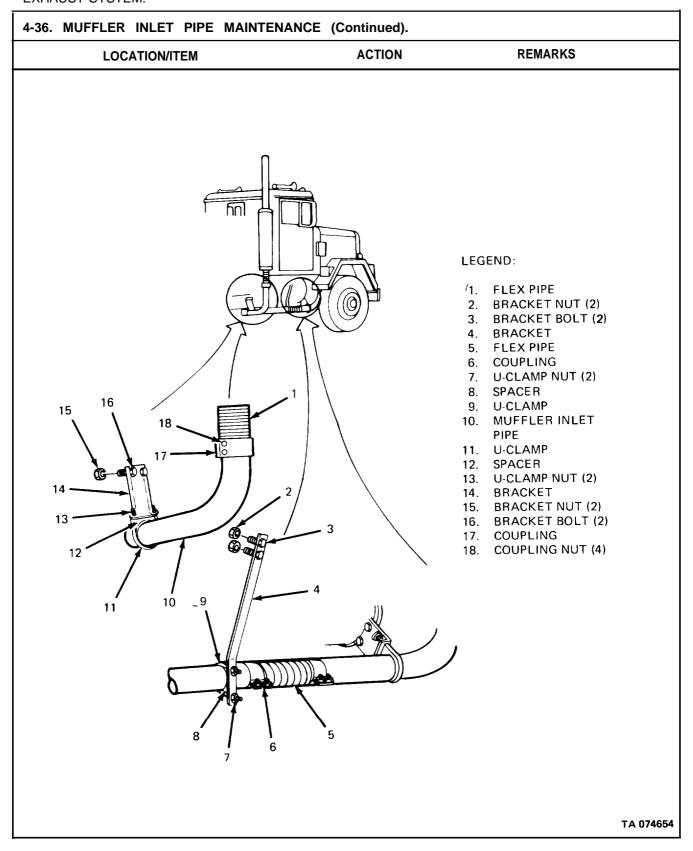
Wait Until Exhaust Components are Cool. Engine OFF.

Transmission in Neutral.

Park Brake Set.

4-36. MUFFLER INLET PIPE MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** WARNING During normal operation, the exhaust pipes and muffler can become very hot. Be careful not to touch these components with your bare hands. Do not allow your body to come in contact with the hot pipes or muffler. Exhaust system components may be hot enough to cause serious burns. LEGEND: FLEX PIPE 1. 2. BRACKET NUT (2) 3. BRACKET BOLT (2) **BRACKET FLEX PIPE** COUPLING 7. U-CLAMP NUT (2) 8. **SPACER** 9. U-CLAMP 10. MUFFLER INLET PIPE U-CLAMP 11. 12. SPACER 13. U-CLAMP NUT (2) 16 14. BRACKET 15 15. **BRACKET NUT (2)** 18 16. **BRACKET BOLT (2)** 17. COUPLING 18. COUPLING NUT (4) 13 12 TA 074653

	4-36. MUFFLER INLET PIPE MAINTENANCE (Continued).				
	LOCATION/ITEM	ACTION	REMARKS		
Α.	REMOVAL.				
1.	Two U-clamp nuts (7).	Unscrew and remove spacer (8) and U-clamp (9).			
2.	Two bracket bolts (3) and two bracket nuts (2).	Unscrew and remove bracket (4).			
3.	Two U-clamp nuts (13).	Unscrew and remove spacer (12) and U-clamp (11).			
4.	Two bracket bolts (16) and two bracket nuts (15).	Unscrew and remove bracket (14).			
5.	Four coupling nuts (18).	Loosen and slide couplings (6) and (17) onto muffler inlet pipe (10).			
6.	Muffler inlet pipe (10).	Remove.			
7.	Couplings (6) and (17).	Slide from muffler inlet pipe (10).	Discard couplings.		
В.	INSPECTION OF MATING FLAN	IGES.			
	Flex pipes (1) and (5) and muffler inlet pipe (10).	Inspect pipes for: a. Burrs, b. Cracks. c. Distortion.	Replace as necessary,		
8.	Flex pipes (1) and (5) and	Inspect pipes for: a. Burrs, b. Cracks.	Replace as necessary,		
8. C.	Flex pipes (1) and (5) and muffler inlet pipe (10).	Inspect pipes for: a. Burrs, b. Cracks.	Replace as necessary,		
8. C. 9.	Flex pipes (1) and (5) and muffler inlet pipe (10). INSTALLATION. Two new couplings (6)	Inspect pipes for: a. Burrs, b. Cracks. c. Distortion. Slide onto muffler inlet	Replace as necessary,		
8. 9.	Flex pipes (1) and (5) and muffler inlet pipe (10). INSTALLATION. Two new couplings (6) and (17).	Inspect pipes for: a. Burrs, b. Cracks. c. Distortion. Slide onto muffler inlet pipe (10). Set in position and slide couplings (6) and (17) over ends of flex pipes	Replace as necessary,		



LOCATION/ITEM	ACTION	REMARKS
C. INSTALLATION (Continued).		
3. Bracket (4).	Install to vehicle with two bracket bolts (3) and bracket nuts (2).	
4. U-clamp (9) and spacer (8).	Position around muffler inlet pipe (10) and secure to bracket (4) with two U-clamp nuts (7).	
5. Four coupling nuts (18).	Tighten to 45 lb-ft (61 N⋅m) with torque wrench.	
. CHECKING FOR LEAKS.		
6. Engine.	Start up (see TM 9-2320-273-10).	
7. Muffler inlet pipe (10).	Listen for leaks.	
8. Engine.	Shut down (see TM 9-2320-273-10).	

4-36. MUFFLER INLET PIPE MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM LEGEND: 1. FLEX RIPE 2. BRACKET NUT (2) 3. BRACKET BOLT (2) 4. BRACKET 5. FLEX PIPE COUPLING 7. U-CLAMP NUT (2) 8. SPACER 16 9. U-CLAMP 15 10. MUFFLER INLET 18 PIPE 11. U-CLAMP 12. SPACER 13. U-CLAMP NUT (2) 14 -14. BRACKET 15. BRACKET NUT (2) 13 . 16. BRACKET BOLT (2) 17. COUPLING 12 18. COUPLING NUT (4) 10 11 TA 075641

4-37. MUFFLER MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a.Removal. (10)

b.Inspection of Mating Flanges. (5)

c.Installation. (10) d. Checking for Leaks. (5)

30 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

AII.

TEST **EQUIPMENT**

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Coupling, 5.0-1259LJ (76700).

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

. We (WIGG 66B26).

GENERAL SAFETY INSTRUCTIONS

Vehicle Parked on Level Ground.

Wait Until Exhaust Components Are Cool.

SPECIAL ENVIRONMENTAL CONDITIONS

Engine OFF.

Transmission in Neutral.

EQUIPMENT CONDITION

PARAGRAPH

None.

CONDITION DESCRIPTION

None.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 4-1.

REMARKS

EXHAUST SYSTEM.

4-37. MUFFLER MAINTENANCE (Continued).

LOCATION/ITEM ACTION

WARING

During normal operation the exhaust pipes and muffler can become very hot. Be careful not to touch these components with your bare hands, Do not allow your body to come in contact with the hot pipes or muffler. Exhaust system components may be hot enough to cause serious burns.

A. REMOVAL.

1. Two coupling nuts (17).

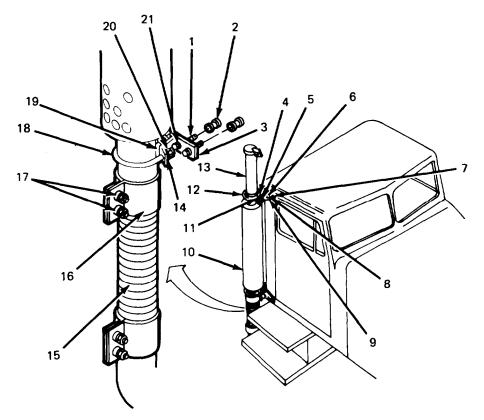
Loosen and slide coupling (16) down over flex pipe (15).

2. Two U-clamp nuts (5) and U-clamp washers (4).

Unscrew and remove U-clamp (2) and spacer (11).

LEGEND:

- 1. BRACKET BOLT (4)
- 2. INSULATOR (4)
- 3. U-CLAMP BRACKET
- 4. U-CLAMP WASHER (2)
- 5. U-CLAMP NUT (2)
- 6. U-CLAMP BRACKET
- 7. BRACKET BOLT (4)
- 8. BRACKET WASHER (4)
- 9. INSULATOR (4)
- 10. MUFFLER
- 11. SPACER
- 12. U-CLAMP
- 13. EXHAUST STACK
- 14. U-CLAMP WASHER (2)
- 15. FLEX PIPE
- 16. COUPLING
- 17. COUPLING NUT (2)
- 18. U-CLAMP
- 19. SPACER
- 20. U-CLAMP NUT (2)
- 21. BRACKET WASHER (4)



4-37. MUFFLER MAINTENANCE (Continued).					
	LOCATION/ITEM	ACTION	REMARKS		
Α.	REMOVAL (Continued).				
3.	Four bracket bolts (7), bracket washers (8) and insulators (9).	Unscrew and remove U-clamp bracket (6).			
4.	Two U-clamp nuts (20) and U-clamp washers (14).	Unscrew and remove U-clamp (18) and spacer (19).			
5.	Muffler (10) and exhaust stack (13).	Remove from flex pipe (15).	If muffler (10) is to be replaced, pull exhaust stack (13) from muffler.		
6.	Four bracket bolts (1), bracket washers (21), and insulators (2).	Unscrew and remove U-clamp bracket (3).			
7.	Coupling (16).	Slide off of flex tube (15).	Discard coupling (16).		
В.	INSPECTION OF MATING FLANG	ES.			
8.	Flex pipe (15), muffler (10), and exhaust stack (13).	Inspect pipe ends for: a. Burrs. b. Cracks. c. Distortion.	Replace as necessary.		
C.	INSTALLATION.				
9.	Four insulators (2) and U-clamp bracket (3).	a. Position to cab.b. Install with four bracket bolts (1) and bracket washers (21).			
10.	Four insulators (9) and U-clamp bracket (6).	a. Position to cab.b. Install with four bracket bolts (7) and bracket washers (8),			
11.	New coupling (16).	Slide over flex pipe (15).			
12.	Exhaust stack (13).	Slide into top of muffler (10).	If removed.		
13.	Muffler (10) and exhaust stack (13).	Slide into flex pipe (15).			
14.	Coupling (16).	Slide up over connection of muffler (10) and flex pipe (15).			
15.	Two coupling nuts (17).	Tighten to 45 lb-ft (61 N⋅m) with torque wrench.			
16.	U-clamp (18) and spacer (19).	Position around muffler (10) at U-clamp bracket (3).			

EXHAUST SYSTEM.

4-37. MUFFLER MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** 21 20 10 16 15 LEGEND: 12. U-CLAMP BRACKET BOLT (4) 13. EXHAUST STACK 14. U-CLAMP WASHER (2) 15. FLEX PIPE 2. INSULATOR (4) 3. U-CLAMP BRACKET 4. U-CLAMP WASHER (2) 16. COUPLING 5. U-CLAMP NUT (2) 17. COUPLING NUT (2) 6. U-CLAMP BRACKET 18. U-CLAMP BRACKET BOLT (4) 8. BRACKET WASHER (4) 19. SPACER 19. SPAGE:: 20. U-CLAMP NUT (2) 9. INSULATOR (4) 21. BRACKET WASHER (4) 10. MUFFLER 11. SPACER TA 074656

EXHAUST SYSTEM.

ACTION	REMARKS
Screw onto U-clamp (18) and tighten.	
Position around muffler (10) and exhaust stack (13) at U-clamp bracket (6).	
Screw onto U-clamp (12) and tighten.	
Start up (see TM 9-2320-273-10).	
If muffler is leaking, you will hear a hissing sound.	Tighten connections as necessary.
Shut down (see TM 9-2320-273-10).	
	and tighten. Position around muffler (10) and exhaust stack (13) at U-clamp bracket (6). Screw onto U-clamp (12) and tighten. Start up (see TM 9-2320-273-10). If muffler is leaking, you will hear a hissing sound. Shut down (see TM 9-2320-

EXHAUST SYSTEM

4-37. MUFFLER MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** 20 16 15 LEGEND: 12. U-CLAMP13. EXHAUST STACK14. U-CLAMP WASHER (2) 1. BRACKET BOLT (4) 2. INSULATOR (4) 3. U-CLAMP BRACKET 15. FLEX PIPE 4. U-CLAMP WASHER (2) 16. COUPLING 5. U-CLAMP NUT (2) 17. COUPLING NUT (2) 6. U-CLAMP BRACKET 18. U-CLAMP 7. BRACKET BOLT (4) SPACER 8. BRACKET WASHER (4) 20. U-CLAMP NUT (2) 9. INSULATOR (4) 21. BRACKET WASHER (4) 10. MUFFLER 11. SPACER TA 074656

TM 9-2320-273-20

EXHAUST SYSTEM.

4-38. EXHAUST STACK MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REWIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (5)

b. Inspection of Mating Flanges and Rain Cap. (5)

c. Installation. (5)
d. Checking for Leaks. (5)

20 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

AII. None.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIAL/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20). Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10. GENERAL SAFETY INSTRUCTIONS

Wait Until Exhaust Components are Cool.

SPECIAL ENVIRONMENTAL CONDITIONS

Engine OFF.

Transmission in Neutral.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

None.

PARAGRAPH

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 4-1.

4-38. EXHAUST STACK MAINTENANCE (Continued).

LOCATION/ITEM **ACTION REMARKS**

WARING

During normal operation, the exhaust pipes and muffler can become very hot. Be careful not to touch these components with your bare hands. Do not allow your body to come in contact with the hot pipes or muffler. Exhaust system components may be hot enough to cause serious burns.

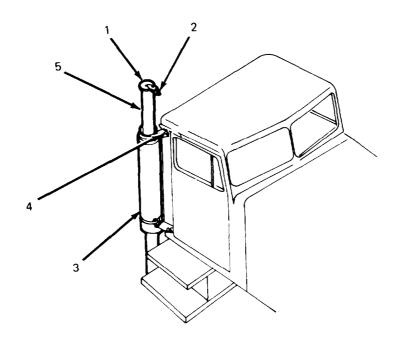
A. REMOVAL.

1. Two U-clamp nuts (4).

Loosen.

2. Exhaust stack (5).

Lift up out of U-clamp and muffler (3).



LEGEND:

- 1. RAIN CAP
- 2. NUT
- 3. MUFFLER
- 4. U-CLAMP NUT (2)5. EXHAUST STACK

TA 074657

EXHAUST SYSTEM.

LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
3. Nut (2).	Unscrew and remove rain cap (1).	
B. INSPECTION OF MATING FL	ANGES AND RAIN CAP.	
4. Exhaust stack (5) and muffler (3).	Inspect ends for: a. Burrs. b. Cracks. c. Distortions.	Replace if necessary.
5. Rain cap (1).	Check for free movement and a good seal to top of exhaust stack (5).	Replace if necessary.
C. INSTALLATION.		
6. Rain cap (1).	Position on exhaust stack (5) and tighten nut (2).	
7. Exhaust stack (5).	Slide into muffler (3).	
8. Two U-clamp nuts (4).	Tighten.	
D. CHECKING FOR LEAKS.		
9. Engine.	Start up (see TM 9-2320-273-10).	
10. Exhaust stack (5).	Listen for leaks, and tighten U-clamp nuts (4) as necessary.	
11. Engine.	Shut down (see TM 9-2320-273-10).	

4-38. EXHAUST STACK MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** LEGEND: 1. RAIN CAP 2. NUT 3. MUFFLER 4. U-CLAMP NUT (2) 5. EXHAUST STACK TA 074658

4-39. RADIATOR HOSES MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a.Inspection. (10) b. Removal. (15) c. Installation. (20)

45 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C).

PERSONNEL REQUIRED

One (MOS-63B20),

REFERENCES (TM)

None.

GENERAL SAFETY INSTRUCTIONS

Vehicle Parked on Level Ground.

SPECIAL ENVIRONMENTAL CONDITIONS

Engine OFF.

Transmission in Neutral.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

Coolant Drained.

PARAGRAPH

4-42A.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 4-1.

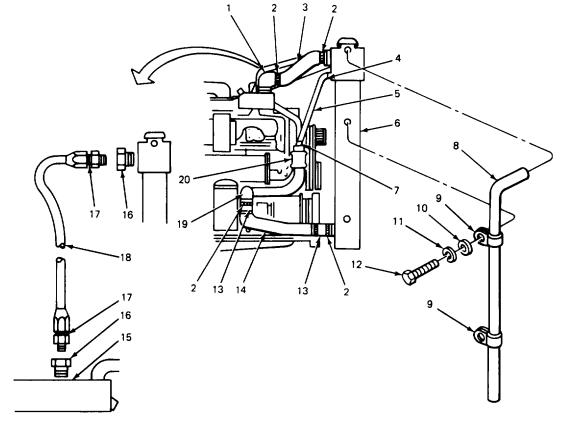
4-39. RADIATOR HOSES MAINTENANCE (Continued).

ACTION REMARKS LOCATION/ITEM

A. Inspection.

- 1. Radiator inlet hose (3), water pump aeration hose (5), overflow hose (8), two radiator outlet hoses (13), radiator outlet tube (14) and radiator aeration hose (18).
- Check for:
- a, Cracks.
- b. Kinks.
- c. Stains (may indicate leaks).

If hoses or tube are leaking or damaged, replace.



LEGEND:

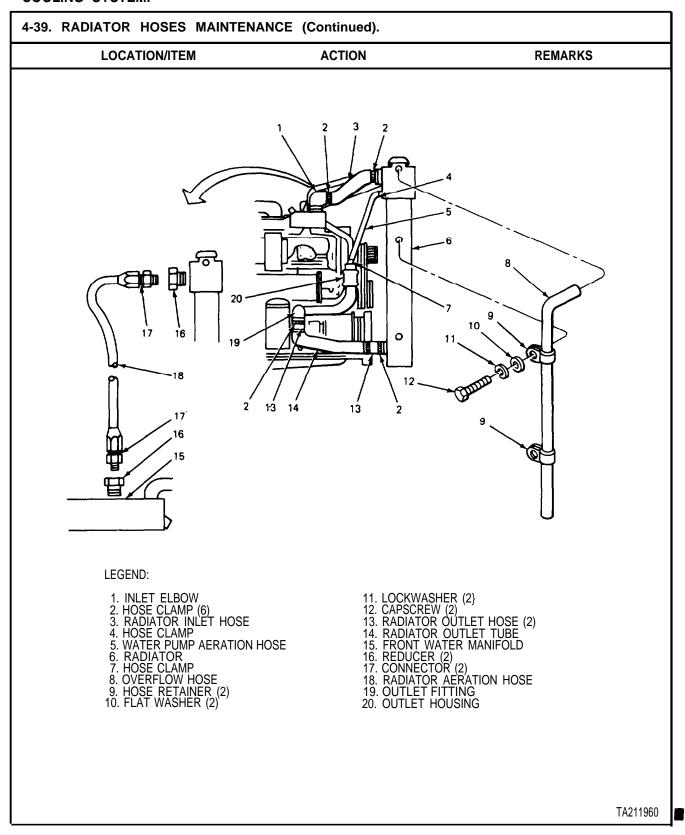
- 1. INLET ELBOW
 2. HOSE CLAMP (6)
 3. RADIATOR INLET HOSE
 4. HOSE CLAMP
 5. WATER PUMP AERATION HOSE

- 6. RADIATOR
 7. HOSE CLAMP
 B. OVERFLOW HOSE
 9. HOSE RETAINER (2)
 10. FLAT WASHER (2)

- 11. LOCKWASHER (2)
 12. CAPSCREW (2)
 13. RADIATOR OUTLET HOSE (2)
 14. RADIATOR OUTLET TUBE
 15. FRONT WATER MANIFOLD
 16. REDUCER (2)
 17. CONNECTOR (2)
 18. RADIATOR AERATION HOSE
 19. OUTLET FITTING
- 20. OUTLET HOUSING

TA211959

4-39. RADIATOR HOSES MAINTENANCE (Continued).		
ACTION	REMARKS	
Unscrew and remove radiator inlet hose (3).		
Unscrew and remove water pump aeration hose (5).		
Unscrew and remove radiator aeration hose (18).		
Unscrew from radiator (6) and front water manifold (15).		
Unscrew and remove two radiator outlet hoses (13) and radiator outlet tube (14).		
Unscrew and remove two hose retainers (9).		
Remove by twisting and pulling from barb fitting.		
Turn and push onto barb fitting on side of radiator fill neck.		
Position around overflow hose (8) and secure to side of radiator (6) with two capscrews (12), lockwashers (11), and flat washers (10).		
	Unscrew and remove radiator inlet hose (3). Unscrew and remove water pump aeration hose (5). Unscrew and remove radiator aeration hose (18). Unscrew from radiator (6) and front water manifold (15). Unscrew and remove two radiator outlet hoses (13) and radiator outlet tube (14). Unscrew and remove two hose retainers (9). Remove by twisting and pulling from barb fitting. Turn and push onto barb fitting on side of radiator fill neck. Position around overflow hose (8) and secure to side of radiator (6) with two capscrews (12), lockwashers (11), and flat	



4-39. RADIATOR HOSES MAINTENANCE (Continued). **REMARKS** LOCATION/ITEM **ACTION** C. INSTALLATION (Continued). a. Slide radiator outlet hose 11. Two radiator outlet hoses (13), radiator outlet tube (14), (13) over ends of radiator and four hose clamps (2). outlet tube (14). b. Slide four hose clamps (2) over radiator outlet hoses (13). c. Slide one radiator outlet hose (13) over outlet fitting (19) and secure with two hose clamps (2). d. Slide other radiator out. let hose (13) over outlet of radiator (6) and secure with two hose clamps (2). 12. Two reducers (16). a. Apply liquid teflon to threads. b. Screw into top of radiator (6) and front water manifold (15). 13. Radiator aeration hose (18) Screw connectors (17) into two with two connectors (17). reducers (16). a. Slide hose clamps (4) and (7) 14. Water pump aeration hose (5), hose clamp (4), and hose over water pump aeration clamp (7). hose (5). b. Secure water pump aeration hose (5) to top of radiator (6) and top of outlet housing (20) with hose clamps (4) and (7). 15. Radiator inlet hose (3) and a. Slide hose clamps (2) over radiator inlet hose (3). two hose clamps (2). b. Secure radiator inlet hose (3) to top of radiator (6) and inlet elbow (1) with two hose clamps (2). **NOTE** Follow-on maintenance required: Install draincock, fill with coolant, and check for leaks; refer to para 4-429, C, and D. Fill with Arctic Anti-Freeze if sub-zero conditions are anticipated.

4-39. RADIATOR HOSES MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** 8 20 10 17 16 0 19 13 14 13 2 17 16 LEGEND: 1. INLET ELBOW 11. LOCKWASHER (2) HOSE CLAMP (6) 12. CAPSCREW (2) 13. RADIATOR OUTLET HOSE (2) 3. RADIATOR INLET HOSE 4. HOSE CLAMP 14. RADIATOR OUTLET TUBE 5. WATER PUMP AERATION HOSE 15. FRONT WATER MANIFOLD 6. RADIATOR 16. REDUCER (2) 7. HOSE CLAMP 17. CONNECTOR (2) 8. OVERFLOW HOSE 18. RADIATOR AERATION HOSE 9. HOSE RETAINER (2) 19. OUTLET FITTING 10. FLAT WASHER (2) 20. OUTLET HOUSING TA211961

4-40. RADIATOR MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.

a. Removal. (25) b. Installation. (30)

55 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

ΑII

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Insulators (2) CBA 24-500 (76005). Liquid Teflon (refer to appendix C).

EQUIPMENT CONDITION

PARAGRAPH

4-42A. 11-32A. 11-16E. 11-16A.

10-22A.

6-10A.

CONDITION DESCRIPTION

Drain Coolant. Hood Removed, Brush Guard Removed (M916 thru M920). Grille Removed.

Steering Pump Cooler Hoses Removed.

Transmission Oil Cooler Hoses Removed.

PERSONNEL REQUIRED

Two (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-20P.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 4-1.

4-40. RADIATOR MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

A. REMOVAL.

1. Radiator aeration hose (9). Unscrew fitting from con-

nector in radiator top tank.

2. Three hose clamps (1), (2), Loosen and remove inlet hose and (16). (3), pump aeration hose (18)

and outlet hose (17) from radiator (15).

3. Two clamps (19). Loosen. Slide boot (20) onto

air filter inlet tube (21).

If desired, loosen forward clamp at opposite end of tube and remove tube.

4. Two nuts (8) and washers (7).

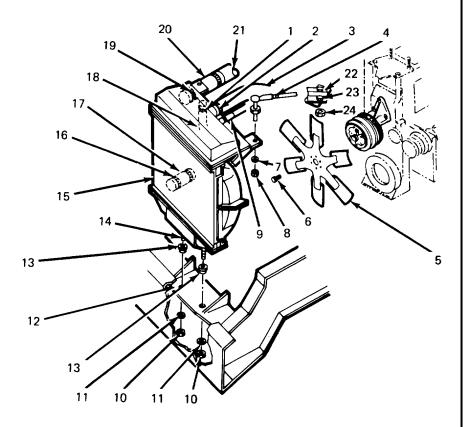
5. Two nuts (10) and washers (11).

Loosen and remove.

Loosen and remove.

LEGEND:

- 1. HOSE CLAMP
- 2. HOSE CLAMP
- 3. INLET HOSE
- 4. ROD ARM (2)
- 5. FAN
- 6. CAPSCREW (6)
- 7. WASHER (2)
- 8. NUT (2)
- 9. RADIATOR AERATION HOSE
- 10. NUT 1,2)
- 11. WASHER (2)
- 12. SUPPORT
- 13. INSULATOR (2)
- 14. MOUNTING STUD (2)
- 15. RADIATOR
- 16. HOSE CLAMP
- 17. OUTLET HOSE
- 18. PUMP AERATION HOSE
- 19. CLAMP (2)
- 20. BOOT
- 21. AIR FILTER INLET TUBE
- 22. CLAMP (2)
- 23. CLAMP BOLT (2)
- 24. NUT (2)

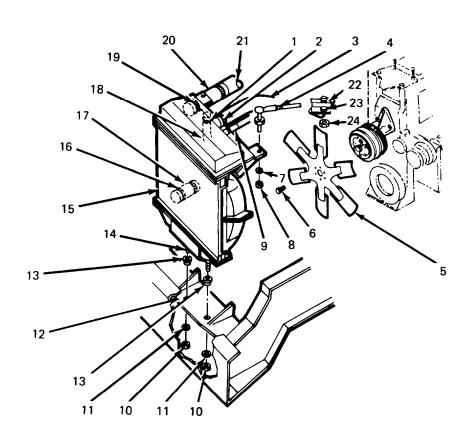


TA 074661

LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
6. Two rod arms (4).	 a. Remove two nuts (8) and washers (7). b. Remove two rod arms and attached ball studs from radiator. c. If required, separate rods by removing two nuts (24), clamp bolts (23) and clamps (22) from center of rod arms (4). 	
7. Radiator (15).	 a. Tilt forward and support. b. Remove six capscrews (6) from fan (5) and remove fan. c. Lift radiator (15) enough to clear insulators (13) and remove. 	If lifting device is available, install lifting eyes in rod arm holes.
8. Two insulators (13).	a. Remove. b. Throw away.	
	NOTE	
refe	remove shrouds from radiator assembly r to paragraph 4-41. Fan Shrouds ntenance.	
9. Two new insulators (13).	Position on mounting studs (14).	You may use tape to hold the insulators in place.
10. Radiator (15).	 a. Aline mounting studs (14) with support (12). Set in place. b. Tilt forward and support. Install six capscrews (6) into fan (5). Torque to 25-32 lb-ft (33.9 to 43.4 N•m). 	
11. Two rod arms (4).	 a. If separated, install two nuts (24), clamp bolts (23), and clamps (22) thru center of rod arms (4) and tighten. b. Insert in top support bracket. c. Install two washers (7) and nuts (8). Tighten. 	

4-40. RADIATOR MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS



LEGEND:

- 1. HOSE CLAMP
- 2. HOSE CLAMP
- 3. INLET HOSE
- 4. ROD ARM (2)
- 5. FAN
- 6. CAPSCREW (6)
- 7. WASHER (2)
- 8. NUT (2)
- 9. RADIATOR AERATION HOSE
- 10. NUT (2)
- 11. WASHER (2)
- 12. SUPPORT

- 13. INSULATOR (2)
- 14. MOUNTING STUD (2)
- 15. RADIATOR
- 16. HOSE CLAMP
- 17. OUTLET HOSE
- 18. PUMP AERATION HOSE
- 19. CLAMP (2)
- 20. BOOT
- 21. AIR FILTER INLET TUBE
- 22. CLAMP (2)
- 23. CLAMP BOLT (2)
- 24. NUT (2)

TA 074662

LOCATION/ITEM	ACTION	REMARKS
3. INSTALLATION (Continued).		
12. Two washers (11) and nuts (10).	Install and tighten.	
13. Air filter inlet tube (21).	 a. If removed, reinser filter end and tight forward clamp, b. Slide boot (20) on inlet and tighten to clamps (19). 	ten to air
14. Three hose clamps (1), (2) and (16).	Reinstall inlet hose (3 pump aeration hose (3 and outlet hose (17) radiator. Position cla and tighten.	(18) to
15. Radiator aeration hose (9).	Apply liquid teflon to fitting and screw into connector.	
	NOTE	
Follo	w-on maintenance actions	required:
 a. Install steering pump cooler hoses, para 10-22. b. Install transmission cooler hoses, para 6-10C. c. Install grille, para 11-16. d. Install brush guard (M916/M920), para 11-16. e. Fill cooling system, para 4-42C; use Artic Anti Freeze if sub zer f. Install hood, para 11-32C. 		ses, para 6-10C. 920), para 11-16.

4-40. RADIATOR MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** 20 19 18 16 15 -13 ' 12 13 10 11 LEGEND: INSULATOR (2) 13. **HOSE CLAMP** MOUNTING STUD (2) 14. HOSE CLAMP 15. **RADIATOR INLET HOSE** 3. 16. HOSE CLAMP ROD ARM (2) 4. 17. **OUTLET HOSE** FAN 5. 18. PUMP AERATION HOSE CAPSCREW (6) 6. 19. CLAMP (2) 7. WASHER (2) 20. BOOT 8. NUT (2) 21. AIR FILTER INLET TUBE RADIATOR AERATION 9. 22. CLAMP (2) HOSE 23. CLAMP BOLT (2) NUT (2) 10. 24. NUT (2) 11. WASHER (2) 12. SUPPORT

4-41. FAN SHROUDS MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (20) b. Installation. (30)

50 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

ΑII

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCE (TM)

None.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

None.

PARAGRAPH

None.

Park Brake Set.

TROUBLESHOOTING REFERENCES

None.

4-41. FAN SHROUDS MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** A. REMOVAL. 1. Six capscrews (12), Unscrew and remove. nuts (6), and twelve washers (7) and (11). 2. Four capscrews (8), Unscrew and remove. flat washers (10), and lock washers (9). WARNING **DECAL** LEGEND: 1. UPPER FAN SHROUD 2. LOWER FAN SHROUD 3. FLAT WASHER (4) 4. LOCKWASHER (4) 5. CAPSCREW (4) 6. NUT (6) 7. FLAT WASHER (6) 8. CAPSCREW (4) 9. LOCKWASHER (4) 10. FLAT WASHER (4) 11. FLAT WASHER (6) 12. CAPSCREW (6) TA 074663

4-41. FAN SHROUDS MAINTENANCE (Continued).		
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
3. Upper fan shroud (1).	a. Remove.b. Remove fan (refer to para 4-4A).	
 Four capscrews (5), lock- washers (4) and fiat washers (3). 	Unscrew and remove.	
5. Lower fan shroud (2).	Remove.	
B. INSTALLATION.		
6. Lower fan shroud (2).	 a. Set in place and attach with four capscrews (5), lockwashers (4), and flat washers (3). b. Install fan (refer to para 4-4B). 	
7. Upper fan shroud (1).	Set in place and attach with four capscrews (8), flat washers (10), and lockwashers (9).	
8. Six capscrews (12), nuts (6), and twelve washers (7) and (11).	Screw on and tighten.	
9. Eight capscrews (5) and (8), lockwashers (4) and (9), and flat washers (3) and (10).	Tighten.	

LOCATION/ITEM	ACTION	REMARKS
WARNING DECAL 12 10 LEGEND: 1. UPPER FAN SHROUD 2. LOWER FAN SHROUD 3. FLAT WASHER (4) 4. LOCKWASHER (4) 5. CAPSCREW (4) 6. NUT (6) 7. FLAT WASHER (6) 8. CAPSCREW (4) 9. LOCKWASHER (4) 10. FLAT WASHER (4) 11. FLAT WASHER (6) 12. CAPSCREW (6)	9 8	
		TA 074664

4-42. COOLANT SYSTEM MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Drain.
b. Inspection/Installation of Draincocks.
c. Replenishing Coolant.
d. Checking for Leaks.
(21)
(1)
(5)

37 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS PARAGRAPH

All. None. None.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Container(s) (60 qt min).

Liquid Teflon (refer to appendix C).

PERSONNEL REQUIRED

One (MOS-63B20). Vehicle Parked on Level Ground.

REFERENCE (TM)

TM 9-2320-273-10. GENERAL SAFETY INSTRUCTIONS

TM 9-2320-273-20P. Engine OFF.

Transmission in Neutral.

SPECIAL ENVIRONMENTAL CONDITIONS

EQUIPMENT CONDITION

CONDITION DESCRIPTION

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 4-1.

4-42. COOLANT SYSTEM MAINTENANCE (Continued). LOCATION/ITEM ACTION REMARKS

NOTE

Before opening each drain cock, place container underneath to catch coolant.

A. DRAIN.

1. Radiator cap (2).

2. Radiator draincock (4).

3. Thermostat petcock (7).

4. Oil cooler draincock (5).

5. Ether quick-start sending unit (6).

Remove.

Open and let coolant drain out.

Open.

a. Open.

b. Let coolant drain out.

c. Close.

a. Disconnect wire.

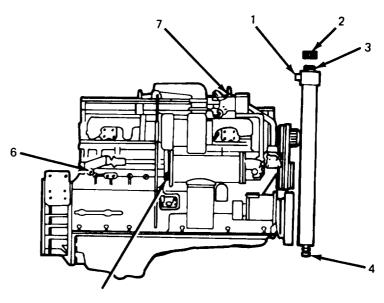
b. Remove ether quick-start sending unit and clean threads.

c. Allow coolant to drain out.

 d. Apply liquid teflon to threads and install ether quick-start sending unit.

LEGEND:

- 1. SIGHT GLASS
- 2. RADIATOR CAP
- 3. RADIATOR FILL NECK
- 4. RADIATOR DRAINCOCK
- 5. OIL COOLER DRAINCOCK
- 6. ETHER QUICK-START SENDING UNIT
- 7. THERMOSTAT PETCOCK



TA 074665

LOCATION/ITEM	ACTION	REMARKS
B. INSPECTION/INSTALLATIO	N OF DRAINCOCKS.	
 Radiator draincock (4), oil cooler draincock (5) and thermostat petcock (7). 	a. Remove as required.b. Inspect for damage.c. Coat threads with liquid teflon.d. Screw into place and close.	
C. REPLENISHING COOLANT	<u> </u>	
	NOTE	
Fi	Il with Artic Anti Freeze if sub-zero	
7. Radiator fill neck (3).	Add coolant until thermostat petcock (7) overflows.	
 Thermostat petcock (7). 	Close.	
9. Radiator fill neck (3).	Continue adding coolant until sight glass (1) is filled.	
D. CHECKING FOR LEAKS.		
10. Engine.	Start up (see TM 9-2320-273-	10).
11. Coolant system.	a. Check for leaks.b. Make sure coolant level is to the top of sight glass (1).	Add more if needed.
12. Radiator cap, (2).	Install.	

4-42. COOLANT SYSTEM MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM LEGEND: 1. SIGHT GLASS 2. RADIATOR CAP 3. RADIATOR FILL **NECK** 4. RADIATOR DRAINCOCK 5. OIL COOLER DRAINCOCK 6. ETHER QUICK-START **SENDING UNIT** 7. THERMOSTAT **PETCOCK** TA 074666

4-43. THERMOSTAT AND HOUSING MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (20) b. Testing. (10) c. Installation. (30) d. Operational Check. (15)

75 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None,

SPECIAL TOOLS

Thermostat Seal Mandrel, ST-1225 (15434).

MATERIALS/PARTS (P/N)

Gasket (6620-00-047-2811). Rubber Seal (5330-00-864-5422). Gasket, 210859 (15434). Container(s) for Coolant.

EQUIPMENT CONDITION PARAGRAPH

4-42A.

CONDITION DESCRIPTION

Cooling System
Drained Below
Thermostat Housing.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCE (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 4-1.

4-43. THERMOSTAT AND HOUSING MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

A. REMOVAL.

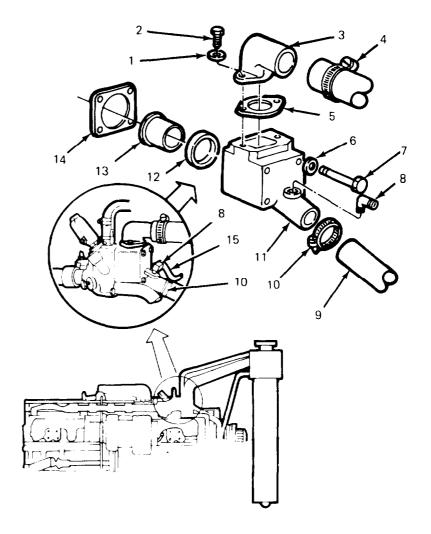
- 1. Bypass hose clamp (4), radiator inlet hose clamp (10), and hose (9).
- 2. Compressor coolant line (15).

Loosen and remove hoses.

Unscrew from fitting (8).

LEGEND:

- 1. WASHER
- 2. CAPSCREW
- 3. ELBOW
- 4. BYPASS HOSE CLAMP
- 5. GASKET
- 6. WASHER (4)
- 7. CAPSCREW (4)
- 8. FITTING
- 9. HOSE
- 10. RADIATOR INLET HOSE CLAMP
- 11. THERMOSTAT HOUSING
- 12. RUBBER SEAL
- 13. THERMOSTAT
- 14. GASKET
- 15. COMPRESSOR COOLANT LINE



TA 074667

4-43	4-43. THERMOSTAT AND HOUSING MAINTENANCE (Continued).			
	LOCATION/ITEM	ACTION	REMARKS	
Α.	REMOVAL (Continued).			
3.	Two capscrews (2), and washers (1).	Unscrew and remove.		
4.	Elbow (3) and gasket (5).	a. Remove.b. Check elbow for cracks.		
5.	Four capscrews (7) and washers (6).	Unscrew and remove.		
6.	Thermostat housing (11).	a. Tap with soft head hammer and remove.b. Check housing for: Cracks.Damaged fittings.Stains from leaks.	Replace if necessary.	
7.	Gasket (14), thermostat (13), and rubber seal (12).	Remove.		
B.	TESTING.			
8.	Thermostat (13).	 a. Check that at room temperature thermostat is closed. b. Put thermostat in hot water. When temperature reaches 185°F (85°C) thermostat should open. 	If thermostat does not work, replace it.	
C.	INSTALLATION.			
9.	Thermostat (13), gasket (14), and rubber seal (12).	Install rubber seal (12) in thermostat housing (11) using thermostat seal mandrel. Install thermostat (13), new gasket (14), and secure with four capscrews (7), and washers (6).	Seal must be installed with part number or metal flange of seal toward mandrel to ensure proper sealing.	
10.	Gasket (5), elbow (3), washer (1), and capscrew (2).	Secure new gasket (5), and elbow (3), with two capscrews (2), and washers (1).		
11.	Compressor coolant line (15).	Screw to fitting (8).		

COOLING SYSTEM 4-43. THERMOSTAT AND HOUSING MAINTENANCE (Continued). **REMARKS ACTION** LOCATION/ITEM LEGEND: 1. WASHER CAPSCREW 2. ELBOW 3. 13 12 4. BYPASS HOSE CLAMP GASKET 5. WASHER (4) 6. CAPSCREW (4) 15 7. 8. FITTING 9. HOSE RADIATOR INLET 10. HOSE CLAMP THERMOSTAT 11. HOUSING RUBBER SEAL 12. THERMOSTAT 13. GASKET 14. 15. COMPRESSOR COOLANT LINE

TA 074668

4-43. THERMOSTAT AND HOUSING MAINTENANCE (Continued).		
LOCATION ITEM	ACTION	REMARKS
C. INSTALLATION (Continued).		
12. Bypass hose clamp (4), radiator inlet hose clamp (10) and hose (9).	Install hoses to thermostat housing (11).	
13. Fill cooling system.	Refer to para 4-42C.	
D. OPERATIONAL CHECK.		
14. Engine.	Start up (see TM 9-2320-273-10).	
15. Cooling system.	a. Check for leaks at thermostat housing.b. Make sure coolant is to the top of the radiator sight glass.	

4-43. THERMOSTAT AND HOUSING MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM LEGEND: 1. WASHER 2. CAPSCREW 3. ELBOW 4. BYPASS HOSE CLAMP 5. GASKET 6. WASHER (4) 7. CAPSCREW (4) 15 8. FITTING 9. HOSE 10. RADIATOR INLET HOSE CLAMP 11. THERMOSTAT HOUSING 12. RUBBER SEAL 13. THERMOSTAT 14. GASKET 15. COMPRESSOR COOLANT LINE TA 075644

4-44. FAN MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (15) (15) b. Installation. c. Operational Check. (2)

32 Minutes Total.

INITIAL SETUP

EQUIPMENT CONDITION PARAGRAPH **APPLICABLE CONFIGURATIONS**

4-41A.

CONDITION DESCRIPTION

Upper Fan Shroud Removed.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCE (TM)

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Trasmission in Neutral.

Park Brake Set.

Fan Clutch May Engage at any

Time When Engine is Running.

TROUBLESHOOTING REFERENCES

Table 4-1.

4-44. FAN MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** A. REMOVAL 1. Six machine bolts (1) and Unscrew and remove. lockwashers (2). 2. Fan (4). Remove from fan clutch (3) and lay in lower fan shroud. 3. Fan clutch (3). Remove Refer to para 4-45A. 4. Fan (4). Remove from lower fan shroud. LEGEND: 1. MACHINE BOLT (6) 2. LOCKWASHER (6) 3. FAN CLUTCH 4. FAN TA 074669

4-44. FAN MAINTENANCE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
B. INSTALLATION.			
5. Fan (4).	Set in lower fan shroud.		
6. Fan clutch (3).	Install.	Refer to para 4-45 C & D.	
7 Fan (4), six machine bolts (1), and lockwashers (2).	 a. Mount on fan clutch (3). b. Tighten machine bolts to 25-31 lb-ft (34-42 N•m). 	Numbers on fan blade must face radiator.	
8. Upper fan shroud.	Reinstall.	Refer to para 4-41 B.	
C. OPERATIONAL CHECK.			
9. Engine.	Start up (see TM 9-2320-273-1	0).	
10. Fan (4).	With engine running, make sure that fan draws air from radiate		
11. Engine.	Shut down (see TM 9-2320-273- 10).		
LEGEND: 1. MACHINE BOLT (6) 2. LOCKWASHER (6) 3. FAN CLUTCH	3		
4. FAN		TA 074670	

This page intentionally left blank.

4-45. FAN CLUTCH AND BELTS MAINTENANCE.

HIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (10) b. Inspection. (5) c. Installation. (5) d. Adjustment. (15)

35 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

Belt Tension Gage.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCE (TM)

None.

TROUBLESHOOTING REFERENCES

None.

EQUIPMENT CONDITION

PARAGRAPH

4-41A.

CONDITION DESCRIPTION

Upper Fan Shroud Removed.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

Fan Clutch May engage at any

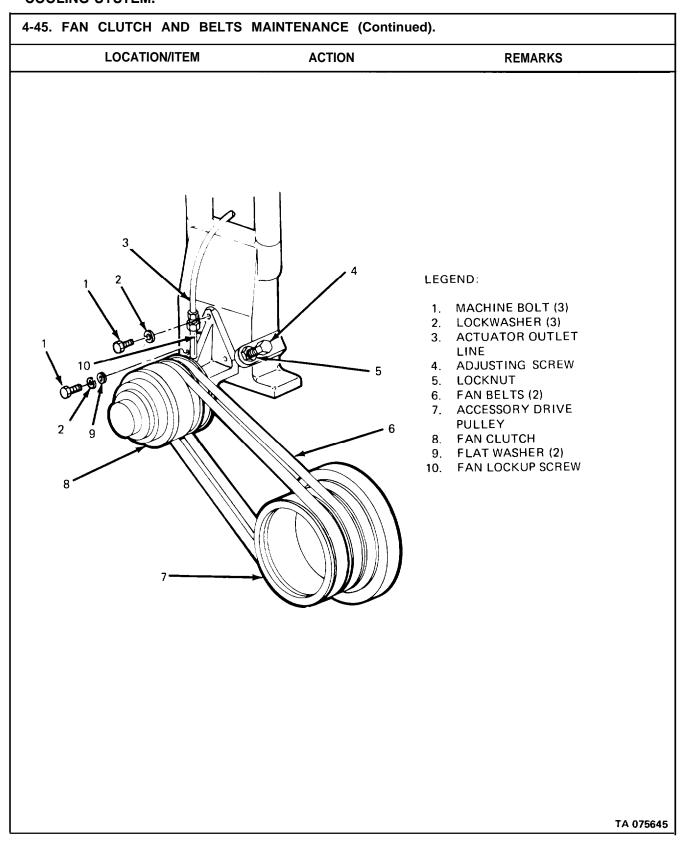
Time Engine is Running.

4-45. FAN CLUTCH AND BELTS MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** A. REMOVAL. 1. Fan. Remove from fan clutch (8) Refer to para 4-44 A. and set in lower fan shroud. 2. Three machine bolts (1). Loosen. 3. Two fan belts (6). Remove by loosening locknut (5) and adjusting screw (4). 4. Actuator outlet line (3). Loosen and remove from fan clutch (8). 5. Three machine bolts (1), three Remove. Flat washers (9) are used lockwashers (2), two flat with the two lower machwashers (9), and fan clutch (8). ine bolts (1). LEGEND: 1. MACHINE BOLT (3) 2. LOCKWASHER (3) 3. ACTUATOR OUTLET LINE 4. ADJUSTING SCREW LOCKNUT 6. FAN BELTS (2) 7. ACCESSORY DRIVE **PULLEY** 8. FAN CLUTCH 9. FLAT WASHER (2) 10. FAN LOCKUP SCREW TA 074671

LOCATION/ITEM	ACTION	REMARKS
B. INSPECTION.		
6. Actuator outlet line (3).	Check for: a. Leaks. b. Kinks. c. Cracks. d. Damaged threads.	Replace if necessary.
7. Two fan belts (6).	Check for: a. Cuts. b. Wear.	Replace if necessary. Belts must be replaced as a matched set.
C. INSTALLATION.		
8. Fan clutch (8), three machine bolts (1), three lockwashers (2), and two flat washers (9).	Install; hand tighten machine bolts (1).	Be sure fan lockup screw (10) is backed out. Flat washers (9) are used with the two lower machine bolts (1).
9. Two fan belts (6).	Install over fan clutch (8) and accessory drive pulley (7).	Rotate fan clutch (8) toward accessory drive pulley (7) for ease of installation.
	CAUTION	
unles	lockup screw (10) should not be used clutch stops functioning and engas to overheat.	sed gine

4-45. FAN CLUTCH AND BELTS MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** LEGEND: 1. MACHINE BOLT (3) 2. LOCKWASHER (3) 3. ACTUATOR OUTLET LINE 4. ADJUSTING SCREW 5. LOCKNUT 6. FAN BELTS (2) 7. ACCESSORY DRIVE **PULLEY** 8. FAN CLUTCH 9. FLAT WASHER (2) 10. FAN LOCKUP SCREW TA 074672

locknut (5) and fan belts adjust tension as necessary with adjusting screw (4). 11. Three machine bolts (1). 12. Two fan belts (6). 13. Locknut (5). 14. Actuator outlet line (3). 15. Tighten to 70-85 lb-ft (95-115 NŽm). 16. Check that tension is the same as described in step 9. 17. Tighten securely. 18. Install on fan clutch (8).	ACTION	REMARKS
Use belt tension gage to check tension. It should be 120 lb-ft (162 N•m) for new belts or 100 lb-ft (136 N•m) for used belts. Used belts have more than one thousand miles of use. 10. Adjusting screw (4), locknut (5) and adjust tension as necessary with adjusting screw (4). 11. Three machine bolts (1). 12. Two fan belts (6). 13. Locknut (5). 14. Actuator outlet line (3). 15. Fan. 16. Vighten to 70-85 lb-ft (95-115 NŽm). 17. Check that tension is the same as described in step 9. 18. Locknut (5). 19. Tighten securely. 19. Lift from lower fan shroud and install to fan clutch (8). 19. NOTE Follow-on maintenance action required:		
It should be 120 lb-ft (162 N•m) for new belts or 100 lb-ft (136 N•m) for used belts. Used belts have more than one thousand miles of use. 10. Adjusting screw (4), locknut (5) and adjust tension as necessary with adjusting screw (4). 11. Three machine bolts (1). 12. Two fan belts (6). 13. Locknut (5). 14. Actuator outlet line (3). 15. Fan. 16. Lift from lower fan shroud and install to fan clutch (8). 17. NOTE Follow-on maintenance action required:	NOTE	
locknut (5) and fan belts (6). adjust tension as necessary with adjusting screw (4). Tighten to 70-85 lb-ft (95-115 NŽm). Check that tension is the same as described in step 9. Locknut (5). Tighten securely. Install on fan clutch (8). Lift from lower fan shroud and install to fan clutch (8). NOTE Follow-on maintenance action required:	It should be 120 lb-ft (162 N•m) for new belts or 100 lb-ft (136 N•m) for used belts. Used belts have more than	
(95-115 NŽm). 12. Two fan belts (6). Check that tension is the same as described in step 9. 13. Locknut (5). Tighten securely. 14. Actuator outlet line (3). Install on fan clutch (8). Lift from lower fan shroud and install to fan clutch (8). NOTE Follow-on maintenance action required:	adjust tension as necessary	
same as described in step 9. Tighten securely. Install on fan clutch (8). Lift from lower fan shroud and install to fan clutch (8). NOTE Follow-on maintenance action required:		
14. Actuator outlet line (3). Lift from lower fan shroud and install to fan clutch (8). NOTE Follow-on maintenance action required:		
Lift from lower fan shroud Refer to para 4-44 B. NOTE Follow-on maintenance action required:	Tighten securely.	
and install to fan clutch (8). NOTE Follow-on maintenance action required:	Install on fan clutch (8).	
Follow-on maintenance action required:		Refer to para 4-44 B.
	NOTE	
Install upper fan shroud; refer to para 4-41 B.	Follow-on maintenance action required:	
	Install upper fan shroud; refer to para 4	-41 B.
		Use belt tension gage to check tension. It should be 120 lb-ft (162 N•m) for new belts or 100 lb-ft (136 N•m) for used belts. Used belts have more than one thousand miles of use. Loosen locknut (5) and adjust tension as necessary with adjusting screw (4). Tighten to 70-85 lb-ft (95-115 NŽm). Check that tension is the same as described in step 9. Tighten securely. Install on fan clutch (8). Lift from lower fan shroud and install to fan clutch (8). NOTE Follow-on maintenance action required:



1-46. FAN CLUTCH ACTUATOR MAINTENANCE (M915, M916, M917 AND M920).

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (10)b. Inspect Air Lines. (5)c. Installation. (15)d. Operational Check. (10)

40 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M915,'M916, M917, M918, M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

MATERIALS/PARTS (P/N)

Liquid Teflon (refer to appendix C).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

Coolant Drained Below Fan Clutch Actuator.

PARAGRAPH

4-42A.

PERSONNEL REQUIRED One (MOS-63B20).

REFERENCE (TM)

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS Engine OFF. TM 9-2320-273-20P.

Transmission in Neutral.

Park Brake Set.

Fan Clutch May Engage at Any Time Engine is Running.

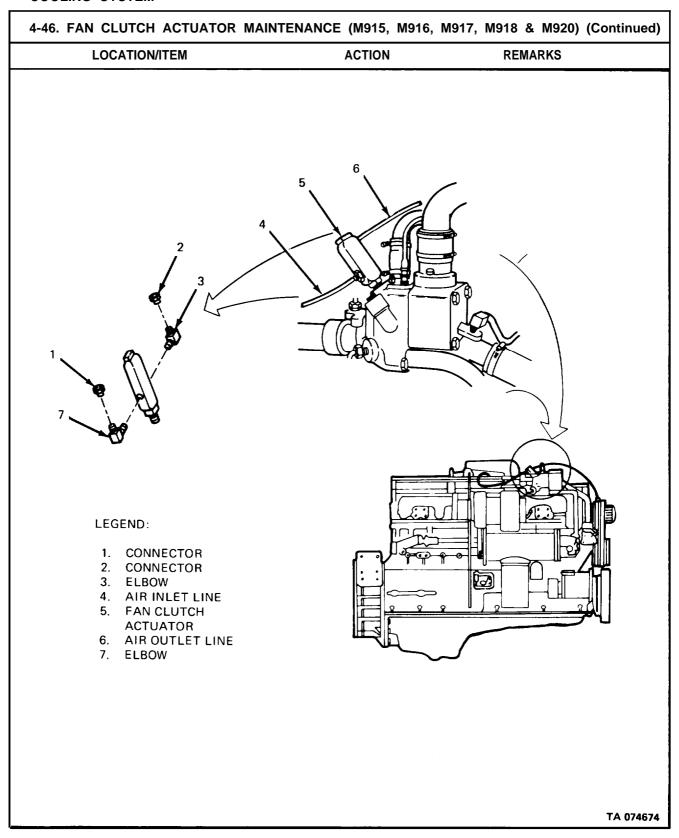
TROUBLESHOOTING REFERENCES

Table 4-1.

4-46. FAN CLUTCH ACTUATOR MAINTENANCE (M915, M916, M917, M918 AND M920) (Continued).

(Continued).			
LOCAT	TON/ITEM	ACTION	REMARKS
A. REMOVAL 1. Air inlet line (4).	Disconnect connector (1) and remove air inlet line (4) from fan clutch actuator (5).	
2. Air outlet line	(6).	Disconnect connector (2) and remove air outlet line (6) from fan clutch actuator (5).	
3. Fan clutch act	uator (5).	Unscrew and remove.	Use crows foot wrench, if necessary.
4. Elbows (3) and	d (7).	Unscrew and remove.	
7	2 3		
2. CC 3. EL 4. AI 5. FA AC 6. AI	D: DNNECTOR DNNECTOR BOW R INLET LINE IN CLUTCH CTUATOR R OUTLET LINE BOW		TA 074673

4-46. FAN CLUTCH ACTUA	TOR MAINTENANCE (M915, M916, M9	17, M918 & M920) (Continued).
LOCATION/ITEM	ACTION	REMARKS
B. INSPECT AIR LINES.		
5. Air inlet (4) and outlet (6) lines.	 a. Inspect lines for: 1. Cracks. 2. Kinks. b. Inspect elbows and connectors for: 1. Cracks. 2. Bends. 	Replace, if necessary. Replace, if necessary.
C. INSTALLATION.		
6. Fan clutch actuator (5).	Coat threads with liquid teflon, screw in.	
7. Elbows (3) and (7).	Coat threads with liquid teflon, screw in.	
8. Air outlet line (6).	Screw connector (2) into side marked OUTLET.	
9. Air inlet line (4).	Screw connector (1) into side marked INLET.	
	NOTE	
	Follow-on maintenance required before operational check:	
	Refill radiator; refer to para 4-42C.	
D. OPERATIONAL CHECK	- :	
10. Engine.	Start up (see TM 9-2320-273- 10.	
11. Fan.	Observe that fan begins to operate when engine water temperature (gage on instrument panel in cab) rises above 190°F, (88°C).	e
12. Engine.	Shut down (see TM 9-2320-273-10).	



4-47. FAN CLUTCH ACTUATOR AND VALVE MAINTENANCE (M919).

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (15)b. Insection of Air Tubes. (5)(15)c. Installation. d. Operational Check. (10)

40 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

4-42A.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

M919.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (refer to appendix C).

PARAGRAPH

Coolant Drained Below Fan Clutch Actuator Level.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCE (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

Table 4-1.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission in Neutral.

Park Brake Set.

Fan Clutch May Engage at Any Time Engine

is Running.

4-47. FAN CLUTCH ACTUATOR AND VALVE MAINTENANCE (M919) (Continued). TO FAN CLUTCH **ACTUATOR-SIDE** TO FAN CLUTCH VALVE-LOWER TO FAN CLUTCH 11 TO FAN CLUTCH TO FAN CLUTCH 10 VALVE-UPPER VALVE-UPPER TO AIR COMPRESSOR 13 4 LEGEND: 1. WIRE HEX NUT TUBE ASSEMBLY (2) 3. 4. LOCKWASHER (2) 5. HEX SCREW (2) 6. HEX NUT (2) 7. LOCKWASHER (2) 8. FLAT WASHER (2) 9. HEX SCREW (2) 10. BRACKET 11. FAN CLUTCH VALVE 12. FAN CLUTCH ACTUATOR 13. TUBE ASSEMBLY 14. TUBE ASSEMBLY TA 075646

LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL.		
1. Two tube assemblies (3).	Disconnect at fan clutch actuator (12) and fan clutch valve (11).	Tag for location.
2. Two tube assemblies (13) and (14).	Disconnect at fan clutch actuator (12).	Tag for location.
3. Fan clutch actuator (12).	Unscrew and remove.	Use crows foot wrench if necessary.
4. Hex nut (2).	Remove.	
5. Wire (1)	Remove.	
6. Two hex screws (5) and lockwashers (4).	Remove.	
7. Fan clutch valve (11).	Remove.	
8. Two hex screws (9), hex nuts (6), lockwashers (7), and flat washers (8).	Remove.	
9. Bracket (10).	Remove.	
B. INSPECTION OF AIR TUBES. !		
10. Four tube assemblies (3), (13), and (14).	a. Inspect tubes for:1. Cracks.2. Kinks.b. Inspect fittings for:1. Cracks.2. Bends.	Replace if necessary. Replace if necessary.
	NOTE	
valve from	new fan clutch actuator or fan d is being installed, transfer fittin defective valve or actuator to tl Use liquid teflon on threaded co	igs he new
11. Bracket (10).	Set in place and secure with two hex screws (9) hex nuts (6), lockwashers (7), and flat washers (8). Tighten securely.	

4-47. FAN CLUTCH ACTUATOR AND VALVE MAINTENANCE (M919) (Continued). TO FAN CLUTCH ACTUATOR-SIDE TO FAN CLUTCH VALVE-LOWER TO FAN CLUTCH 11 TO FAN CLUTCH TO FAN CLUTCH 10 VALVE-UPPER VALVE-UPPER TO AIR COMPRESSOR 13 7 LEGEND: 1. WIRE 2. HEX NUT 3. TUBE ASSEMBLY (2) 4. LOCKWASHER (2) 5. HEX SCREW (2) 6. HEX NUT (2) 7. LOCKWASHER (2) 8. FLAT WASHER (2) 9. HEX SCREW (2) 10. BRACKET 11. FAN CLUTCH VALVE 12. FAN CLUTCH ACTUATOR 13. TUBE ASSEMBLY 14. TUBE ASSEMBLY TA 075647

LOCATION/ITEM	ACTION	REMARKS
C. INSTALLATION (Continued).		
12. Fan clutch valve (11).	Set in place and secure with two hex screws (5) and lockwashers (4).	
13. Wire (1).	Install over terminal and secure with hex nuts (2).	
14. Fan clutch actuator (12).	Coat threads with liquid teflon and screw in.	Tighten securely with crows foot wrench.
15. Two tube assemblies (13) and (14).	Connect at fan clutch actuator (12).	Note identification tagged for ease of installation.
16. Two tube assemblies (3).	Connect at fan clutch actuator (12) and fan clutch valve (11).	Note identification tagged for ease of installation.
D. OPERATIONAL CHECK.		
17. Engine.	Start up (see TM 9-2320-273-10).	
18. Fan.	Observe that fan begins to operate when engine water temperature (gage on instrument panel in cab) rises above 190°F (88°C) and/ or when fan clutch valve switch is manually operated (see TM 9-2320-273-10).	
19. Engine.	Shut down (see TM 9-2320-273-10).	

4-47. FAN CLUTCH ACTUATOR AND VALVE MAINTENANCE (M919) (Continued). TO FAN CLUTCH ACTUATOR-SIDE TO FAN CLUTCH VALVE-LOWER TO FAN CLUTCH TO FAN CLUTCH TO FAN CLUTCH VALVE-UPPER 10 VALVE-UPPER TO AIR COMPRESSOR 13 * 12 LEGEND: 1. WIRE 2. HEX NUT 3. TUBE ASSEMBLY (2) 4. LOCKWASHER (2) 5. HEX SCREW (2) 6. HEX NUT (2) 7. LOCKWASHER (2) 8. FLAT WASHER (2) 9. HEX SCREW (2) 10. BRACKET11. FAN CLUT **FAN CLUTCH VALVE** 12. FAN CLUTCH ACTUATOR 13. TUBE ASSEMBLY 14. TUBE ASSEMBLY TA 075648

4-48 FAN CLUTCH ACTUATOR TUBES MAINTENANCE (M915, M916, M917, M918 & M920).

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (5) b. Installation. (5) c. Checking for Leaks. (2)

12 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M915, M916, M917, M918, M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Soap Solution.

Liquid Teflon (refer to appendix C).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCE (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

Table 4-1.

EQUIPMENT CONDITION

<u>PARAGRAPH</u>

None.

CONDITION DESCRIPTION

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

COOLING SYSTEM.		
4-48. FAN CLUTCH ACTUATOR M920) (Continued).	TUBES MAINTENANCE (M915,	M916, M917, M918 AND
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL.		
1. Four fittings (1).	Unscrew from fan clutch (7), actuator (3) and tee (5) located on compressor governor (6).	Replace if necessary.
2. Two elbows (2).	Unscrew from fan clutch actuator (3).	Replace if necessary.
3. Inlet tube (4) and outlet tube (8).	 a. Remove. b. Inspect for: Cracks. Leaks. Damaged fittings. c. Blow gently through tubes to see that air flow is not blocked. 	
	8	4
LEGEND: 1. FITTING 2. ELBOW 3. ACTUA 4. INLET 5. TEE 6. COMPRI GOVER 7. FAN CL 8. OUTLET	(2) TOR TUBE ESSOR NOR UTCH	5
J. 30122	, , ,	TA 074675

TA 074675

48. FAN CLUTCH ACTUAT M920) (Continued).	FOR TUBES MAINTENANCE (M915,	M916, M917, M918 AND
LOCATION/ITEM	ACTION	REMARKS
INSTALLATION.		
. Two elbows (2).	Coat threads with liquid teflon. Screw into fan clutch actuator.	
. Two tubes (4) and (8).	 a. Coat threads with liquid teflon. b. Screw four fittings (1) on fan clutch (7), actuator (3), and tee fitting (5) located on compressor governor (6). c. Tighten. 	
CHECKING FOR LEAKS.	-	
. Engine.	Start up (see TM 9-2320-273-10).	
	WARNING	
	Be sure to stay completely clear of fan blades. Do not reach into fan clutch area while engine is operating.	
. Tubes (4) and (8).	Use soap solution to check for leaks.	
s. Engine.	Shut down (see TM 9-2320-273-10).	

4-48. FAN CLUTCH ACTU (Continued).	ATOR TUBES MAINTENANCE (M915	
LOCATION/ITEM	ACTION	REMARKS
	3	
LEGEND: 1. FITTING (4) 2. ELBOW (2) 3. ACTUATO 4. INLET TUE 5. TEE 6. COMPRESS GOVERNO 7. FAN CLUT 8. OUTLET T	E OR T	5
		TA 07467

4-49. FAN CLUTCH ACTUATOR TUBES MAINTENANCE (M919).

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (10) b. Inspection. (5) c. Installation. (10) d. Checking for Leaks. (5)

30 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS PARAGRAPH CONDITION DESCRIPTION

EQUIPMENT CONDITION

M919. None. None.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Soap Solution.

Liquid Teflon (refer to appendix C).

PERSONNEL REQUIRED SPECIAL ENVIRONMENTAL CONDITIONS

One (MOS-63B20). Vehicle Parked on Level Ground.

REFERENCES (TM) GENERAL SAFETY INSTRUCTIONS

TM 9-2320-273-10. Engine Off.

TM 9-2320-273-20P. Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

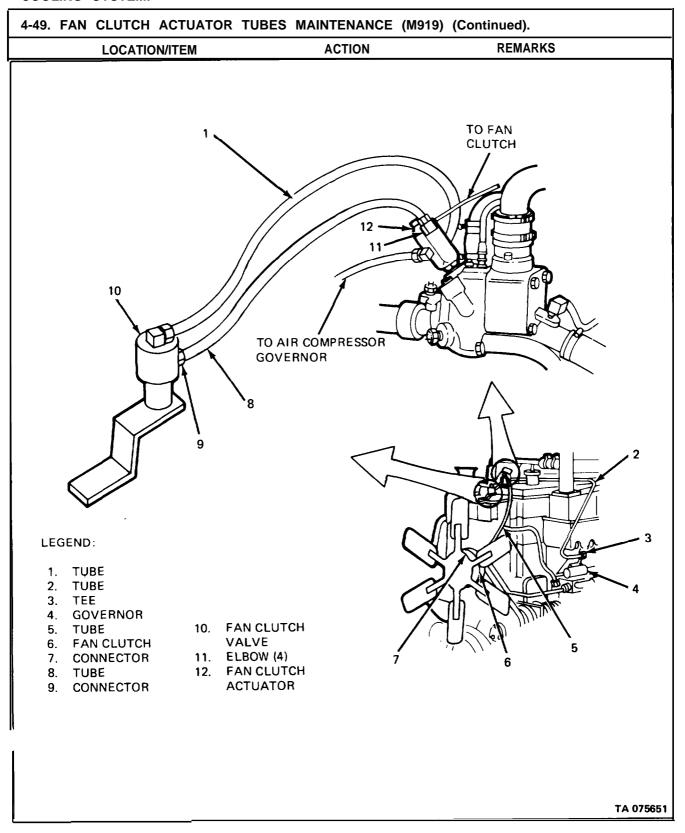
Table 4-1

		ACTION ACTION	REMARKS
LOCATION 10	1 TO AII	ACTION 12 11 R COMPRESSOR	TO FAN CLUTCH
LEGEND:	GOVE 8		2
1. TUBE 2. TUBE 3. TEE 4. GOVERNOR 5. TUBE 6. FAN CLUTCH 7. CONNECTOR 8. TUBE 9. CONNECTOR	10. FAN CLUTO VALVE 11. ELBOW (4) 12. FAN CLUTO ACTUATOR	7 7	6
			TA 0756

LOCATION/ITEM ACTION REMARKS				
LOGATIONTILM				
REMOVAL.				
Tube (1).	Disconnect at fan clutch valve (10) and fan clutch actuator (12).	Tag for location.		
Tube (2).	Disconnect at fan clutch actuator (12) and at governor (4).	Tag for location.		
Tee (3).	Remove at governor (4).			
Tube (5).	Disconnect from connector (7) located on fan clutch and at fan clutch actuator (12).	Tag for location.		
Tube (8).	Disconnect at fan clutch valve (10) and at fan clutch actuator (12).	Tag for location.		
Connector (9).	Remove.			
Four elbows (11).	Remove one elbow (11) at fan clutch valve (10) and three elbows (11) at the fan clutch actuator (12).			

4-49. FAN CLUTCH AC				
LOCATION/I	1 1	ACTION 12	TO FAN CLUTCH	
10	TO AIR O GOVERN	COMPRESSOR		2
LEGEND: 1. TUBE 2. TUBE 3. TEE 4. GOVERNOR 5. TUBE 6. FAN CLUTCH 7. CONNECTOR 8. TUBE 9. CONNECTOR	10. FAN CLUTCH VALVE 11. ELBOW (4) 12. FAN CLUTCH ACTUATOR	7	6 5	3
				TA 0756

LOCATION/ITEM	ACTION	REMARKS
B. INSPECTION.		
8. Tubes and fittings.	Inspect all components for cracks and defects.	Replace if necessary.
C. INSTALLATION.		
9. Four elbows (11).	Install one elbow (11) at fan clutch valve (10) and three elbows (11) at the fan clutch actuator (12).	Coat threads with liquic teflon.
10. Connector (9).	Install in fan clutch valve (10).	Coat threads with liquid teflon.
11. Tube (8).	Connect at fan clutch valve (10) and at fan clutch actuator (12).	Coat threads with liquic teflon.
12. Tube (5).	Connect tube (5) to connector (7) located on fan clutch (6) and at fan clutch actuator (12).	Coat threads with liquic teflon.
13. Tee (3).	Install tee into governor (4).	Coat threads with liquic teflon.



COOLING SYSTEM.				
4-49. FAN CLUTCH ACTUATOR TUBES MAINTENANCE (M919) (Continued).				
LOCATION/ITEM	ACTION	REMARKS		
C. INSTALLATION (Continued).				
14. Tube (2).	Connect at fan clutch actuator (12) and at tee (3).	Coat threads with liquid teflon.		
15. Tube.	Connect at fan clutch actuator (12) and at fan clutch valve (10).	Coat threads with liquid teflon.		
D. CHECKING FOR LEAKS.				
16. Engine.	Start up (see TM 9-2320-273-10).			
	WARNING			
Be sure to stay completely clear of fan blades. Do not reach into fan clutch area while engine is operating.				
Tubes, fittings, and connections.	Use soap solution to check for leaks.			
18. Engine.	Shut down (see TM 9-2320-273-10).			

4-49. FAN CLUTCH ACTUATOR TUBES MAINTENANCE (M919) (Continued).

REMARKS **ACTION** LOCATION/ITEM TO FAN CLUTCH 11 10 TO AIR COMPRESSOR GOVERNOR LEGEND: 1. TUBE 2. TUBE 3. TEE 4. GOVERNOR 10. FAN CLUTCH 5. TUBE VALVE 6. FAN CLUTCH 11. ELBOW (4) 7. CONNECTOR 12. FAN CLUTCH 8. TUBE ACTUATOR 9. CONNECTOR TA 075652

4-50. HEATER SHUTOFF VALVE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (10) b. Installation. (15) c. Bleeding Heater. (5)

30 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

AII.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Container(s).

Liquid Teflon (refer to appendix C).

SPECIAL ENVIRONMENTAL CONDITIONS

One (MOS-63B20). Vehicle Parked on Level Ground.

REFERENCE (TM)

PERSONNEL REQUIRED

TM 9-2320-273-10.

TM 9-2320-273-20P.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

Coolant Drained below Level of Valve.

PARAGRAPH

4-42A.

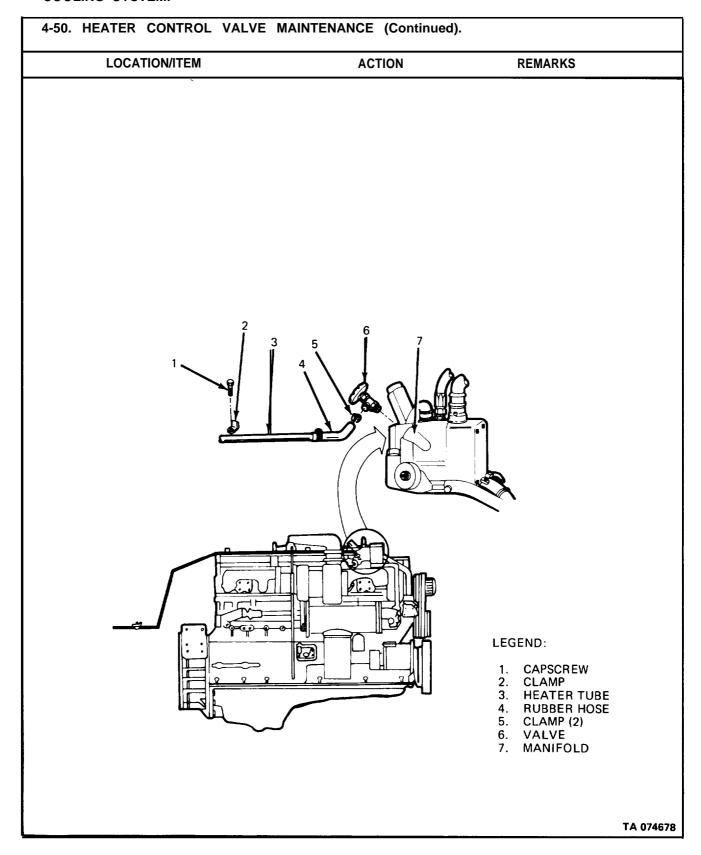
Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 4-1.

4-50. HEATER CONTROL VALVE MAINTENANCE (Continued). **ACTION** LOCATION/ITEM **REMARKS** A. REMOVAL. 1. Two clamps (5). Loosen. If necessary you may 2. Heater tube (3) and Remove from valve (6). remove clamp (2) by rubber hose (4). unscrewing capscrew (1). Unscrew and remove from 3. Valve (6). manifold (7). LEGEND: 1. CAPSCREW 2. CLAMP 3. HEATER TUBE 4. RUBBER HOSE 5. CLAMP (2) 6. 7. VALVE **MANIFOLD** TA 074677

4-50. HEATER CONTROL VALVE MAINTENANCE (Continued).				
LOCATION/ITEM	ACTION	REMARKS		
B. INSTALLATION.				
4. Valve (6).	a. Coat threads with liquid teflon.b. Screw into adapter manifold (7).			
5. Heater tube (3) and rubber hose (4).	a. Connect to valve (6).b. Tighten clamps (5),	If you removed clamp (1), put it back on and tighten capscrew (2).		
C. BLEEDING HEATER.				
	NOTE			
	Before removing outlet hose, place clean container under heater openings to catch coolant.			
6. Cab/heater outlet hose.	Loosen clamp and disconnect hose (para 11-27).			
7. Engine.	Start up (see TM 9-2320-273-10).			
8. Cab/heater knob, heater outlet hose.	 a. Pull knob (see TM 9-2320-273-10). b. When coolant flows from heater, push knob back in. c. Immediately connect hose to heater. Tighten clamp. d. Pull knob out again. 			
9. Valve (6).	With engine running, check for leaks.			



4-51. WATER PUMP BELT MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (5) b. Installation. (5) c. Adjustment. (1)

11 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

TEST EQUIPMENT

Belt Tension Gage.

SPECIAL TOOLS

None.

All.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCE (TM)

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

EQUIPMENT CONDITION PARAGRAPH _____

4-44A.

4-45A.

CONDITION DESCRIPTION

Fan Removed.

Fan Belts Removed.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Park Brake Set.

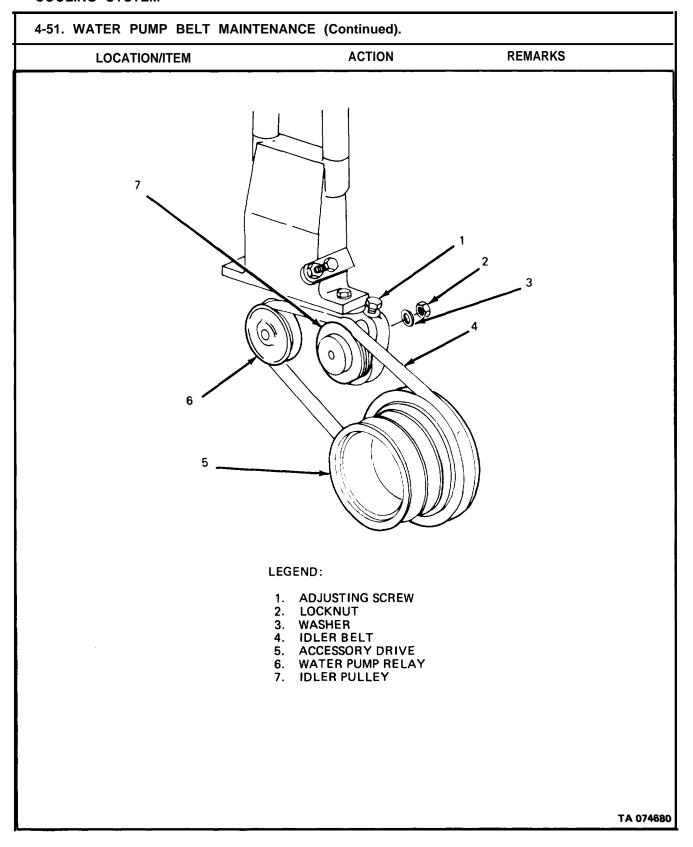
TROUBLESHOOTING REFERENCES

None.

4-51. WATER PUMP BELT MAINTENANCE (Continued).

REMARKS ACTION LOCATION/ITEM A. REMOVAL. Loosen. 1. Idler pulley locknut (2) and washer (3). Loosen. 2. Idler belt adjusting screw (1). Fan belts and fan must Take off. 3. Idler belt (4). be removed first. LEGEND: ADJUSTING SCREW 2. LOCKNUT 3. WASHER IDLER BELT ACCESSORY DRIVE WATER PUMP RELAY **IDLER PULLEY** TA 074679

4-51. WATER PUMP BELT MAINTENANCE (Continued).				
LOCATION/ITEM	ACTION	REMARKS		
D INOTALLATION				
B. INSTALLATION.				
4. Idler belt (4).	Put on over idler pulley (7), water pump pulley (6), and accessory drive (5).	Do not force belt on with screwdriver.		
C. ADJUSTMENT.				
5. Idler belt adjust- ing screw (1).	Adjust until belt tension is 90/100 on belt tension gage.			
6. Idler pulley locknut (2).	Tighten 50 lb-ft (68 N-m) with torque wrench.			
	N OTE			
	Follow-on maintenance action required:	:		
	Install and adjust fan belts; refer to 4-45B and C.			
	Install fan; refer to para 4-44B and C.			



4-52. WATER MANIFOLD MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (25) b. Inspection. (5) c. Installaticm. (30)

60 Minutes Total.

APPLICABLE CONFIGURATIONS PARAGRAPH CONDITION DESCRIPTION

All. 4-42A. Coolant Drained below Manifold Level.

TEST EQUIPMENT 4-46A. Fan Clutch Actuator

Removed.

SPECIAL TOOLS 5-73A. Water Temperature Switch

Wire Removed.

4-25A. Air Cleaner Assembly

Removed.

O-Rings (4) (5330-00-506-4874). 4-27A. Turbo Air Inlet Removed.

MATERIALS/PARTS (P/N)
O-Rings (4) (5330-00-506-4874).
Sealing Rings (6) (5330-00-143-8369).

None.

Gasket (3011931) (15434). Gasket (208132) (15434).

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCE (TM)

TM9-2320-273-20P.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Park Brake Set.

TROUBLESHOOTING REFERENCES

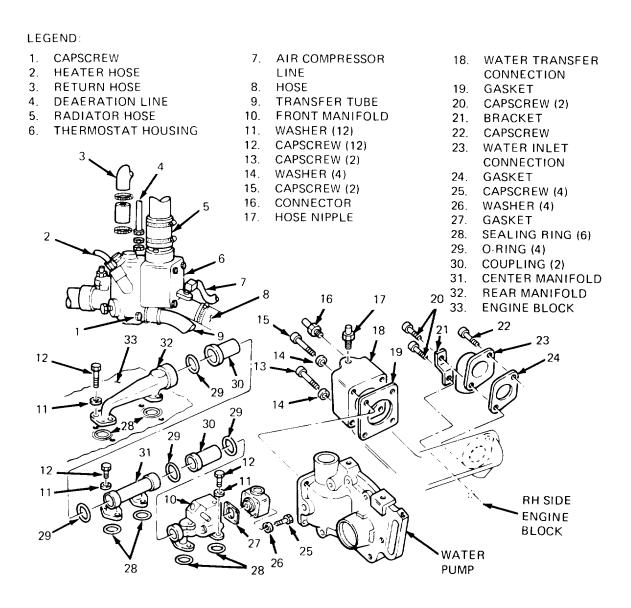
None.

4-52. WATER MANIFOLD MAINTENANCE (Continued).

|--|

A. REMOVAL.

- 1. Return hose (3) and radiator hose (5).
- a. Loosen clamp.
- b. Disconnect hose.



4-52. WATER MANIFOLD MAINTENANCE (Continued).				
LOCATION/ITEM	ACTION	REMARKS		
A. REMOVAL (Continued).				
2. Transfer tube (9).	a. Remove capscrew (1). b. Remove tube (9).			
 Deaeration line (4) heater hose (2), air compressor line (7), and hose (8). 	Remove from front manifold (10).			
4. Four capscrews (25) and washers (26).	Unscrew and remove thermostat housing (6).			
5. Rear manifold (32), two O-rings (29), coupling (30), two sealing rings (28), four capscrews (12),and washers (11).	a. Unscrew and remove capscrews and washers.b. Remove rear manifold and coupling.c. Throw away sealing rings and O-rings.	Examine O-rings and sealing rings as you remove them. Leaks may sometimes be repaired by replacing broken or damaged rings.		
6. Cencer manifold (31), coupling (30), two O-rings (29), sealing rings (28), four capscrews (12),and washers (11).	a. Unscrew and remove capscrews and washers.b. Remove center manifold and coupling,c. Throw away O-rings and sealing rings.	Examine O-rings and sealing rings as you remove them. Leaks may sometimes be repaired by replacing broken or damaged rings.		
7. Front manifold (10), gasket (27), two sealing (18), four capscrews (12), and washers (11).	a. Unscrew and remove capscrews and washers.b. Remove front manifold.c. Throw away gasket and sealing rings.	Examine sealing rings as you remove them. Leaks may sometimes be repaired by replacing broken or damaged rings.		
8. Hose nipple (17) and connector (16).	Unscrew and remove.			
Two capscrews (13), two capscrews (15), and four washers (14).	Unscrew and remove.			
10. Two capscrews (20) and capscrews (22).	Unscrew and remove water transfer connection (18), gasket (19), bracket (21), water inlet connection (23), and gasket (24).	Discard gasket (19)and (24).		

REMARKS

LOCATION/ITEM

4-52. WATER MANIFOLD MAINTENANCE (Continued).

LEGEND: 1. CAPSCREW 7. AIR COMPRESSOR 18. WATER TRANSFER HEATER HOSE LINE CONNECTION RETURN HOSE 8. HOSE 19. **GASKET** 4. DEAERATION LINE 9. TRANSFER TUBE 20. CAPSCREW (2) 5. RADIATOR HOSE 10. FRONT MANIFOLD 21. BRACKET 11. WASHER (12) 6. THERMOSTAT HOUSING 22. CAPSCREW 12. CAPSCREW (12) 23. WATER INLET 13. CAPSCREW (2) CONNECTION 14. WASHER (4) 24. GASKET 15. CAPSCREW (2) 25. CAPSCREW (4) 16. CONNECTOR 26. WASHER (4) 17. HOSE NIPPLE 27. **GASKET** 28. SEALING RING (6) 29. O-RING (4) 30. COUPLING (2) 31. CENTER MANIFOLD 32. REAR MANIFOLD 33. ENGINE BLOCK 16 20 17 RH SIDE **ENGINE** BLOCK WATER 28 **PUMP**

ACTION

LOCATION/ITEM	ACTION	REMARKS
INSPECTION.		
1. Front manifold (10), center manifold (31), rear manifold (32), two couplings (30), thermostat housing (6), engine block (33), water transfer connection (18), and water inlet connection (23).	 a. Inspect mating surfaces for: 1. Burrs. 2. Cracks. 3. Distortion. b. Inspect manifolds and couplings for: 1. Cracks. 2. Leaks. 3. Discoloration. 	Replace as necessary.
C. INSTALLATION.		
2. Hose nipple (17) and connector (16).	Screw into water transfer connection (18).	
New gasket (19) and water transfer connection (18).	Install to water pump with two capscrews (13), two capscrews (15), and four washers (14).	
 New gasket (24), water inlet connection (23), and bracket (21). 	Mount to water transfer connection (18) as shown and to side of engine with two capscrews (20) and one capscrew (22).	

4-52. WATER MAN I FOLD MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM LEGEND: 1. CAPSCREW 7. AIR COMPRESSOR 18. WATER TRANSFER 2. HEATER HOSE LINE CONNECTION 3. RETURN HOSE 8. HOSE 19. GASKET 4. DEAERATION LINE 9. TRANSFER TUBE 20. CAPSCREW (2) 5. RADIATOR HOSE 10. FRONT MANIFOLD 21. BRACKET 11. WASHER (12) 6. THERMOSTAT HOUSING 22. CAPSCREW 12. CAPSCREW (12) WATER INLET 13. CAPSCREW (2) CONNECTION 14. WASHER (4) 24. GASKET 15. CAPSCREW (2) 25. CAPSCREW (4) 16. CONNECTOR 26. WASHER (4) 17. HOSE NIPPLE 27. GASKET 28. SEALING RING (6) 29. O-RING (4) 30. COUPLING (2) CENTER MANIFOLD 31. 32. REAR MANIFOLD 33. ENGINE BLOCK 16 17 20 23 RH SIDE **ENGINE BLOCK** WATER 26 **PUMP** TA 074683

	LOCATION/ITEM	ACTION	REMARKS
C. I	NSTALLATION (Continued).		
15.	Front manifold (10), and two new sealing rings (28).	Place in position on engine block (33).	
16.	Four capscrews (12) and washers (11).	Screw on finger tight.	
17.	Coupling (30), two new 0-rings (29), center manifold (31) and two new sealing rings (28).	Place in position against front manifold (10) and engine block (33).	
18.	Four capscrews (12) and washers (11).	Screw on finger tight.	
19.	Rear manifold (32), two new O-rings (29), coupling (30), and two new sealing rings (28)	Place in position on engine block (33) against center manifold (31).	
20.	Four capscrews (12) and washers (11).	Screw on finger tight.	
21.	Twelve capscrews (12).	Tighten to 35 lb-ft (47 N-m) with torque wrench.	Alternate to tighten down evenly.
22.	New gasket (27) and thermostat housing (6).	Set in place.	
23.	Four capscrews (25) and washers (26).	Install and tighten.	
24.	Deaeration line (4) and heater hose (2).	Screw into front manifold (10).	
25.	Air compressor line (7).	Install and tighten.	
26.	Return hose (3), radiator hose (5) and hose (8).	Attach to front manifold (10) and tighten clamps.	
27.	Transfer tube (9).	Install to front manifold (10) with capscrew (1).	

4-52. WATER MANIFOLD MAINTENANCE (Continued). **REMARKS** LOCATION/ITEM **ACTION NOTE** Follow on maintenance required: Install water temperature switch wire; refer to paragraph 5-73B. Install fan clutch actuator; refer to paragraph 4-46C. Install air cleaner and turbocharger air intake; refer to paragraph 4-25D & 4-27C. Refill cooling system and check for leaks; refer to paragraph 4-42C & D. LEGEND: **CAPSCREW** 7. AIR COMPRESSOR 18. WATER TRANSFER 2. **HEATER HOSE** LINE CONNECTION **RETURN HOSE** 8. HOSE 19. GASKET DEAERATION LINE 9. TRANSFER TUBE 20. CAPSCREW (2) 5. RADIATOR HOSE 10. FRONT MANIFOLD 21. BRACKET 6. THERMOSTAT HOUSING 11. WASHER (12) 22. CAPSCREW 12. CAPSCREW (12) 23. WATER INLET 13. CAPSCREW (2) CONNECTION 14. WASHER (4) 24. **GASKET** 15. CAPSCREW (2) 25. CAPSCREW (4) 16. CONNECTOR 26. WASHER (4) 17. HOSE NIPPLE 27. **GASKET** 28. SEALING RING (6) 29. O-RING (4) 30. COUPLING (2) CENTER MANIFOLD 31. 20 32. **REAR MANIFOLD** 16 17 33. **ENGINE BLOCK** RH SIDE **ENGINE BLOCK** 25 WATER 28 **PUMP** TA 075653

4-53. WATER PUMP MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (15) b. Installation. (15)

30 Minutes Total.

INI.	ΓIAL	. SE	TUP
------	------	------	-----

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Gasket, Water Pump to

Engine Block (5330-01-066-5350).

Gasket, Water Pump to

Heater Manifold, 208132 (15434).

EQUIPMENT CONDITION

PARAGRAPH

Fan Removed.

4-44A. 4-45A.

Fan Clutch and Belts

Removed.

4-51A.

Water Pump Belts Removed.

CONDITION DESCRIPTION

4-42A. Coolant Drained.

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

None.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 4-1.

4-53. WATER PUMP MAINTENANCE (Continued).

LOCATION/ITEM	ACTION	REMARKS
13		LEGEND: 1. CAPSCREW (2) 2. WASHER (2) 3. CAPSCREW & WASHER (4) 4. ADJUSTING SCREW 5. HEX NUT 6. LOCKWASHER 7. IDLER PULLEY 8. WATER PUMP 9. CAPSCREW & WASHER (2) 10. CAPSCREW & WASHER (4) 11. BYPASS TUBE 12. CLAMP 13. LOCKWASHER 14. CAPSCREW
		TA 074684

4-53	4-53. WATER PUMP MAINTENANCE (Continued).				
	LOCATION/ITEM	ACTION	REMARKS		
Α. Ι	REMOVAL.				
1.	Adjusting screw (4).	Remove.			
2.	Idler pulley (7).	Remove hex nut (5) and lock-washer (6) and remove idler pulley from water pump (8).			
3.	Two capscrews (1) and washers (2).	Loosen and remove.			
4.	Four capscrews and washers (3).	Loosen and remove.			
5.	Two capscrews and washers (9).	Loosen and remove.			
6.	Capscrew (14). lockwasher (13), and clamp (12).	Unscrew and remove.			
7.	Four capscrews and washers (10).	Unscrew and remove.			
8.	Water pump (8) and gaskets.	a. Remove from engine and bypass tube (11).b. Throw away gaskets.			
В.	INSTALLATION.				
9.	Water pump (8) and new gaskets.	Put in position on bypass tube (11) and engine.			
10.	Four capscrews and washers, (10).	Install and tighten to 35 lb-ft (47 N-m).			
11.	Capscrew (14). lockwasher (13), and clamp (12).	Install and tighten securely,			
12.	Two capscrews and washer_, four capscrews and washers (3).	Install and tighten to 35 lb-ft (47 N-m).			
13.	Two capscrews (1) and washers (2).	Install and tighten securely.			
14.	Idler pulley (7).	Install in water pump (8) and secure with hex nut (5) and lockwasher (6).	Do not tighten.		

4-53. WATER PUMP MAINTENANCE (Continued). **REMARKS ACTION** LOCATION/ITEM B. INSTALLATION (Continued). No specific adjustment 15. Adjusting screw (4). Install. needed at this time. **NOTE** Follow-on maintenance action required: install water pump belt; refer to para 4-51 B and C. Adjust water pump belt; refer to para 4-51C. Install fan clutch; refer to para 4-45C. Install fan belt; refer to para 4-45C. Install fan; refer to para 4-44B. Replenish coolant and check for leaks, refer to para 4-42C and D. Fill with arctic anti freeze if sub zero. 13 LEGEND: CAPSCREW (2) WASHER (2) CAPSCREW (4) ADJUSTING SCREW **HEX NUT** LOCKWASHER 6. 7. **IDLER PULLEY** 8. **WATER PUMP** 9. CAPSCREW (2) 10. CAPSCREW (4) **BYPASS TUBE** 11. 12. CLAMP LOCKWASHER 13. **CAPSCREW**

-54. WATER PUMP IDLER PULLEY MAINTENANCE.

HIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

Removal. (10) Installation. (10) Operational Check. (5)

25 Minutes Total.

NIITIAL SETUP

EQUIPMENT CONDITION

APPLICABLE CONFIGURATIONS

PARAGRAPH CONDITION DESCRIPTION

None. None.

TEST EQUIPMENT

None.

All.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

None.

REFERENCES (TM)

TM 9-2320-273-10. GENERAL SAFETY INSTRUCTIONS

None.

TROUBLESHOOTING REFERENCES

None.

4-54. WATER PUMP IDLER PULLEY MAINTENANCE (Continued).

LOCATION/ITEM **ACTION REMARKS**

A. REMOVAL.

1. Nut (3) and washer

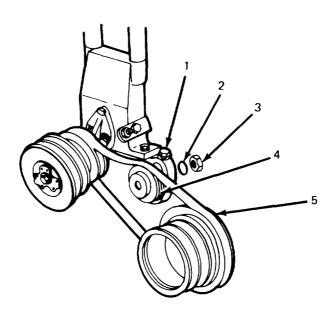
Loosen and remove.

2. Idler belt adjusting screw (I).

Remove.

3. Idler pulley (4).

Remove.



LEGEND:

- ADJUSTING SCREW
 WASHER
 NUT

- 4. IDLER PULLEY5. BELT

4-54. WATER PUMP IDLER	PULLEY MAINTENANCE (Contir	nued}.
LOCATION/ITEM	ACTION	REMARKS
B. INSTALLATION.		
4. Idler pulley (4).	Set into place.	
5. Idler belt adjusting screw	(1). Install.	
6. Washer (2) and nut (3).	Screw on finger tight.	
7. Belt (5).	 a. Adjust belt tension v adjusting screw (1) u belt tension gage read 90/100. b. Tighten locknut (3) t 50 lb-ft (68 N-m) wit a torque wrench. 	ntil s o
C. OPERATIONAL CHECK.		
8. Engine.	Start up (see TM 9-2320 273-10).)-
	WARNING	
	Be sure to stay completely clear of Do not reach into fan area while e operating.	
9. Idler pulley (4).	Check that belt rides smoothly on pulley and that pulley is not slipping.	
10, Engine.	Shut down (see TM 9-2 273-10).	320-

LOCATION/ITEM	ACTION	REMARKS
		4 5
1 2 3 4	EGEND: I. ADJUSTING SCREW 2. WASHER 3. NUT 4. IDLER PULLEY 5. BELT	

ALTERNATOR DRIVE SYSTEM.

4-55. ALTERNATOR BELTS MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (5) b. Installation. (5)

c. Adjustment. (1)

11 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

Belt Tension Gage.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

None.

GENERAL SAFETY INSTRUCTIONS

Vehicle Parked on Level Ground.

SPECIAL ENVIRONMENTAL CONDITIONS

Engine OFF.

Transmission in Neutral. Park Brake Set.

EQUIPMENT CONDITION

PARAGRAPH_____

None.

CONDITION DESCRIPTION

None.

TROUBLESHOOTING REFERENCES

None.

ALTERNATOR DRIVE SYSTEM.

4-55. ALTERNATOR BELTS MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

A. REMOVAL.

1. Alternator capscrews (6) and (9).

Loosen.

2. Adjusting nut (3).

Loosen.

3. Adjusting nut (2).

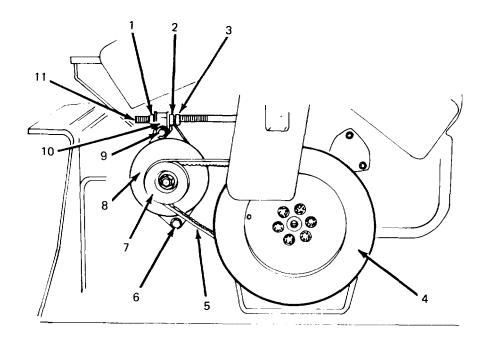
'Loosen to allow alternator (8) to slide towards engine along adjusting rod (11), enough to remove alternator

belts (5).

4. Two alternator belts (5).

Take off.

The belts are a matched set.



LEGEND:

- 1. JAM NUT
- 2. ADJUSTING NUT
- 3. ADJUSTING NUT
- 4. VIBRATION DAMPER
- 5. ALTERNATOR BELT (2)
- 6. CAPSCREW

- 7. ALTERNATOR PULLEY
- 8. ALTERNATOR
- 9. CAPSCREW
- 10. ADJUSTING ROD COLLAR
- 11. ADJUSTING ROD

ALTERNATOR DRIVE SYSTEM.

4-55. ALTERNATOR BELTS MAINTENANCE (Continued),

LOCATION/ITEM **ACTION REMARKS B. INSTALLATION.** 5. Alternator belts (5). a. Put onto alternator Do not pry on with pulley (7) and vibrascrewdriver. Always tion damper (4), replace belts as a set. b. Push alternator Never put on just one away from engine new belt. until belts stop the travel of alternator. C. ADJUSTMENT. 6. Adjusting nut (2). Tighten against adjusting A used belt is one rod collar (10) until belt that has been on the tension is 110 lbs for new truck more than a belts, or 80 lbs for used thousand miles. belts. 7. Jam nut (1) Tighten against collar (10). 8. Adjusting nut (3). Tighten against adjusting nut (2). 9. Alternator capsrews Torque to 30 lb-ft (41 N-m). (6) and (9). LEGEND: JAM NUT (Common or 2. **ADJUSTING NUT** 3. **ADJUSTING NUT** 10 VIBRATION DAMPER 9 **ALTERNATOR BELT (2) CAPSCREW** ALTERNATOR PULLEY **ALTERNATOR CAPSCREW** ADJUSTING ROD 10. COLLAR 11. ADJUSTING ROD TA 074689

CHAPTER 5

ELECTRICAL AND INSTRUMENTATION SYSTEMS MAINTENANCE

5-1. OVERVIEW.

This chapter provides you with the following information related to electrical and instrumentation systems maintenance:

- a. All required special tools and equipment,
- b. Other technical manuals.
- c. Troubleshooting procedures.
- d. Maintenance procedures.

Section I REPAIR PARTS, SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

5-2. COMMON TOOLS AND EQUIPMENT .

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

5-3. SPECIAL TOOLS, TMDE, SUPPORT EQUIPMENT.

The special tools, TMDE and support equipment required for the electrical and instrumentation maintenance procedures described in this chapter are limited to the test meters shown in para 5-6.

5-4. SPARES AND REPAIR PARTS.

Spares and repair parts are listed and illustrated in the Repair Parts and Special Tools List covering Organizational Maintenance for this equipment (TM 9-2320-273-20P).

Section II TROUBLESHOOTING

5-5. INTRODUCTION.

- a. Scope. This section contains detailed troubleshooting information for locating and correcting malfunctions in the electrical system. Each of the functional subsystems is treated separately by means of:
 - (1) A physical and functional description.
 - (2) A circuit schematic.
 - (3) A brief overall subsystem check.
 - (4) Step-by-step test to diagnose problems using authorized test equipment,
- b. Subsystem Circuits. The functional subsystem circuits covered in this section are presented in the following sequence:
 - (1) Battery (table 5-1).
 - (2) Starting (table 5-2).
 - (3) Ether Quick-Start Control (table 5-3).
 - (4) Engine Retarder Control (table 5-4).
 - (5) Battery Charging (table 5-5).
 - (6) Warning Lamps and Alarms (table 5-6).
 - (7) Instruments and Indicators (table 5-7).
 - (8) Headlamps (table 5-8).
 - (9) Marker Lamps (table 5-9).
 - (10) Parking and Tail Lamps (table 5-10).
 - (11) Stop and Turn Signal Lamps (table 5-11).
 - (12) Backup Lamps (table 5-12).
 - (13) Blackout Lighting System (table 5-13).
 - (14) Miscellaneous Electrical (table 5-14).
- c. General Troubleshooting Procedures. The following procedures are general "in nature and should be applied as appropriate during any electrical troubleshooting.
- (1) Research the problem. Before you start detail troubleshooting procedures, review the wiring diagram and schematic (Appendix D) to thoroughly familiarize yourself with the circuit(s) involved. Analyze the symptoms and conditions and use common sense and logic to determine the most likely cause for the problem, then troubleshoot that circuit first. The more information you have concerning the problem, the easier it will be to troubleshoot.

5-5. INTRODUCTION (Continued).

- (2) Genera/ Approach. First, isolate to the subsystem level (in cases where more than one subsystem is involved); next, isolate the problem to a single circuit within the subsystem; then isolate the problem to the faulty component. An example of-an exception to this rule would be in cases where a lamp is out; the first step would be to check the bulb.
- (3) Wiring. Frayed, broken, loose, or corroded wiring is a common source of problems in any electrical circuit. Always make a visual inspection before starting detail troubleshooting. Observe in particular, contacts to ground. Components with case grounds are especially troublesome.
 - (4) Circuit Breakers.



Never jumper a cycling circuit breaker unless specifically instructed to do so in the troubleshooting procedure. The overload could cause serious damage to equipment and result in a fire.

The circuit breakers in these circuits are the automatic recycling type. If an overload exists, the circuit breaker will open and shut off all circuits being fed by that particular circuit breaker. After cooling, the circuit breaker will close. If the problem still exists the circuit breaker will again open. This cycle will continue until the problem is corrected. When a circuit breaker is cycling, it will feel warm to the touch and you can hear a clicking sound.

(5) Re/ays. A relay is basically a two-element device – a coil and a set of contacts in a common housing. When voltage is applied to the coil, the contacts close (normally open relay) or open (normally closed relay). The relay provides a path of supply voltage to a circuit or component which draws a heavy current load. In troubleshooting, first be sure the coil is functioning. Connect a multi meter between frame ground and the hot side of the coil and check for 12 volts dc nominal. If voltage is present, disconnect the multi meter and measure voltage across any set of contacts with the coil voltage present. The meter should indicate either 12 or 24 volts dc nominal depending on the circuit involved. Sometimes it is advantageous to simply jumper across the relay contacts and if the inoperative circuit being checked works, a bad relay or voltage supply wiring is indicated.

5-6, TEST EQUIPMENT.

a. /introduction. I n automotive troubleshooting, the Simpson 160, the TS-352B/U, and the AN/URM-105 will do the same job. Therefore, your automotive shop sets may contain any one of these multi meters (fig. 5-1). Any of these three multi meters can be used to troubleshoot the electrical system.

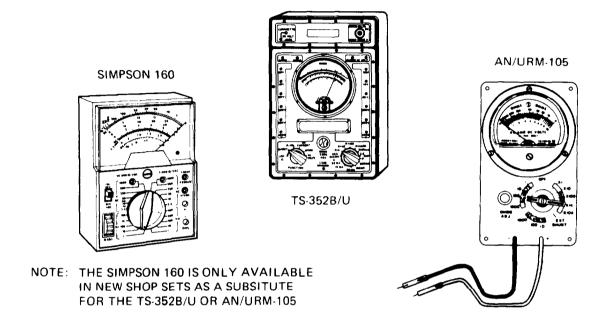


Figure 5-1. Multimeters

b. Using the Ohms Seale. The Ohms Scale (fig. 5-2 thru fig, 5-4) is used to make tests for continuity, shorts, and resistance. The multi meter must be set up and "zeroed" before making these tests. Do the following steps that match the multi meter you have:

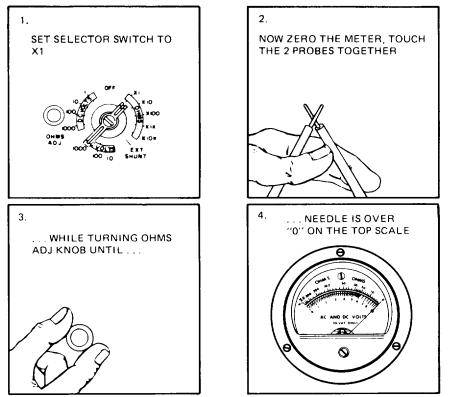


Figure 5-2. Using the Ohms Scale and "Zeroing" Multimeter AN/URM-105

NOTE

If needle will not "zero," replace the batteries. If the needle still will not "zero" after replacing the batteries, turn the meter in for repair.

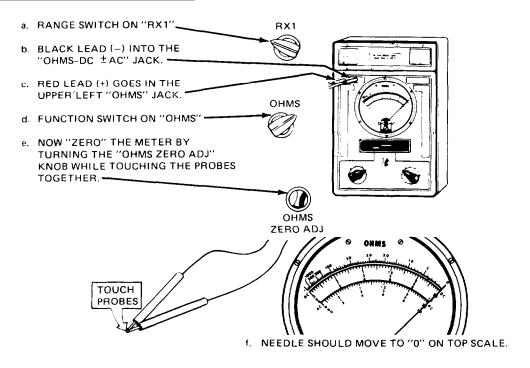


Figure 5-3. Using Ohms Scale and "Zeroing" Multimeter TS-352 B/U

NOTE

If needle will not "zero", replace the batteries. If the needle will not "zero" after replacing the batteries, turn the meter in for repair.

SIMPSON 160

- (1) Set selector switch on "RX1".
- (2) Put black probe in "COM-" jack.
- (3) Put red probe in "+" jack.
- (4) Now "zero" the meter. While touching the probes together, $turn'\Omega$ "ADJ" knob until needle is over the "0" on the top scale.

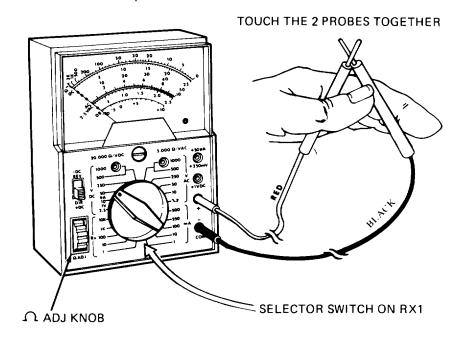


Figure 5-4. Using Ohms Scale and "Zeroing" Multimeter Simpson 160

NOTE

If the needle will not "zero", replace the batteries, If the needle still will not "zero" after replacing the batteries, turn the meter in for repair.

c. Continuity Tests. Continuity tests are made to check for breaks in a circuit (such as the switch, light bulb, or electrical cable illustrated). To make a continuity check ('Fig. 5-5), do the following steps:



Failure to perform the following step can damage the multimeter.

- (1) Disconnect the circuit being tested. To be safe, disconnect the battery ground strap.
- (2) Set up and "zero" the multimeter.
- (3) Connect the meter probes to both terminals of the circuit being tested. (The TS-352B/U is illustrated below, but the probes are connected to the circuit the same way with each of the three multi meters.)

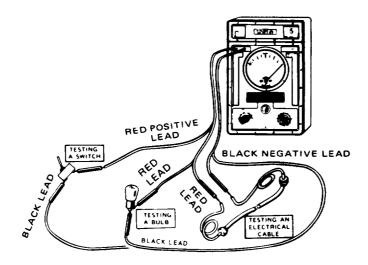


Figure 5-5. Making a Continuity Check

- (4) Look at the meter needle.
 - (a) If the needle swings to the far right over the "O" on the top scale (on all three multimeters), the circuit has continuity.
 - (b) If the needle doesn't move, the circuit is open (broken).
 - (c) If the needle jumps or flickers, there is a loose connection in the circuit being tested.

d. Testing for Shorts. A short (or short circuit) occurs when two circuits that should not be connected have metal-to-metal contact with each other. A short also occurs when a circuit that should not touch ground has metal-to-metal contact with ground. To check for shorts, do the following steps:



Failure to do the following step can damage the multimeter.

- (1) Disconnect the circuit being tested. To be safe, disconnect the battery ground cable.
- (2) Set UP and "zero" the multimeter (para b.).
- (3) Wiith any of the three multimeters, connect one probe to one circuit and the other probe to the other circuit or ground (if checking for a short to ground). Figure 5-6 shows a check to see if wire "A" is shorted to wire "B" in the wiring harness.

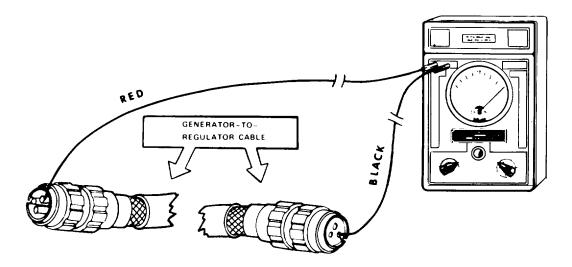


Figure 5-6. Testing for Shorts

- (4) Look at the needle.
 - (a) If the needle swings to the far right over the "O" on the top scale (on all three multi meters), the circuits are shorted.
 - (b) If the needle doesn't move, the circuits are not shorted.
 - (c) If needle jumps or flickers, the circuits are occasionally shorted.
- e. Testing Resistance. To measure resistance in a circuit do the following steps.



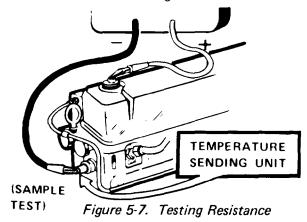
Failure to do the following step can damage the multimeter.

- (1) Disconnect the circuit being tested. To be safe, disconnect the battery ground cable.
- (2) Set up and "zero" the multimeter (para b).
- (3) If the test in this manual calls for an "Ohms Range" different than "RX" or "XI," set the selector switch to that range (like "RX10" or "X10").

NOTE

"ZERO" the meter whenever you change ranges.

(4) With any of the three multimeters, connect the probes across the circuit or item to be measured. Figure 5-7 below shows measuring the resistance of a temperature sending unit:



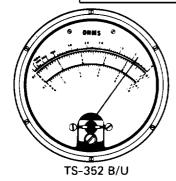
(5) Read the meter. If the meter switch is on the "RX1" or "X1" range, the reading is taken directly from the top scale. If the meter switch is on a different range, (fig. 5-8), multiply the reading on the scale according to the table below.

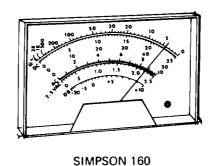
OHMS SWITCH SETTING.	YOU DO!			
X1 or RX1. X10 OR RX10 X100 OR RX 100. X1K OR RX1K. X10K OR RX10K.	READ NUMBER ON SCALE. MULTIPLY READING BY 10. MULTIPLY READING BY 1000. MULTIPLY READING BY 10,000.			
(REMEMBER: K = 1000)				

Figure 5-8. Ohms Switch Settings

For example, the meters in fig, 5-9 below show the following readings:

OHMS SWITCH SETTING.	READING.
X1 OR RX1.	4 OHMS.
X10 OR RX10.	40 OHMS.
X100 OR RX100.	400 OHMS.





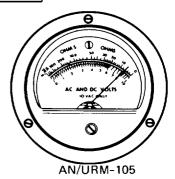


Figure 5-9. OHMS Switch Settings

f. Using the DC Volts Sea/e. The dc volts scale is used to measure all voltages in the electrical system.

Before using the multi meter to measure dc voltage, do the following steps that match the multi-meter you have (fig. 5-10 thru fig. 5-1 2).

(7) AN/URM-105

Set meter switch to dc volts range given in TM.. (To measure 24 volts dc, set switch on "100 DC VOLTS" range.)

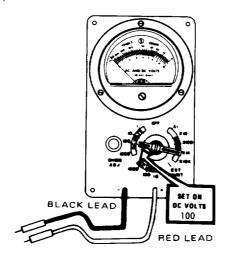


Figure 5-10. Using the DC Volts Scale AN/URM-105

- (2) TS-352 B/U
 - (a) Set FUNCTION switch (1) to DIRECT (range switch can be at any position).
 - (b) Put black lead in "DC/* AC/OHMS" jack (2).
 - (c) To measure 24 volts dc, plug red lead into "50V" jack on left side of meter (3). (If measuring less than 10 volts dc, use "10V" jack, If measuring less than 2.5 volts dc, use "2.5V" jack.)

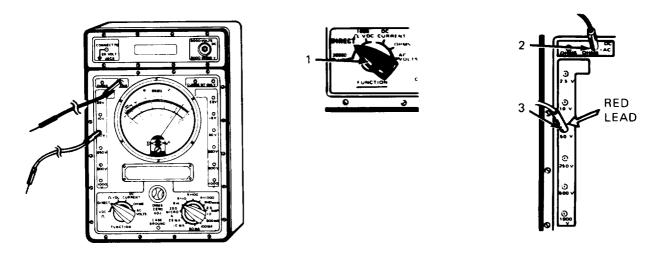


Figure 5-11. Setting the Function Switch TS-352 B/U

- (3) SIMPSON 160
 - (a) Connect black lead to COM- jack.
 - (b) Connect red lead to+ jack.
 - (c) To measure 24 volts dc, set selector switch to V/DC 50 position. (If measuring less than 10 volts dc, set selector switch to V/DC 10 position. If measuring less than 2.5 volts dc, set selector switch to V/DC 2.5 position.)

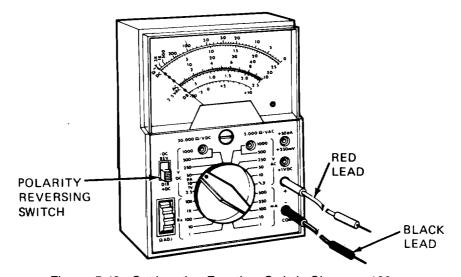


Figure 5-12. Setting the Function Switch Simpson 160

will protect the meter.

- g. Measuring DC Voltage. To measure dc volts (fig. 5-13), do the following steps:
 - (1) Set up multimeter (see para f).

NOTE

If you are not sure of the voltage to be measured on the vehicle, always start on the highest range shown in para f. This will protect the meter,

(2) With any of the three multimeters, connect the red probe to the positive (+) side of the circuit and the black probe to the negative (-) side. The example below shows 24 volts dc being measured across the batteries.

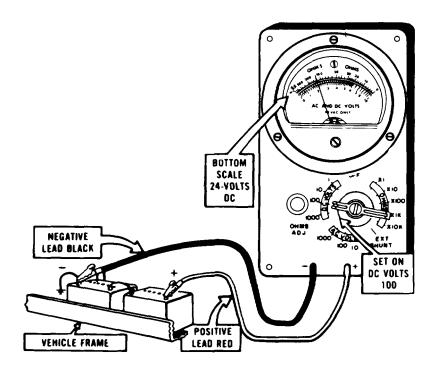


Figure 5-13. Measuring DC Voltage

(3) Read the meter. (Figures 5-14 thru 5-16 show how to read all three multi meters.) If the needle tries to move off scale to the left, reverse the probes on the circuit.

(a) AN/URM-105

Read the upper, black, straight-lined portion of the AC and DC VOLTS scale for the range the selector switch is set at:

SWITCH SETTING.	SCALE.
1000 DC VOLTS. 100 DC VOLTS. 10 DC VOLTS. 1 DC VOLT.	0.10 (AND MULTIPLY BY 100). 0.10 (AND MULTIPLY BY 10). 0.10. 0.10 (AND MULTIPLY BY 10).

Thus the meter illustrated is showing the following readings:

SWITCH SETTING.	READING.
100 DC VOLTS.	20 VOLTS DC.
10 DC VOLTS.	2 VOLTS DC.
1 DC VOLT.	.2 VOLTS DC.

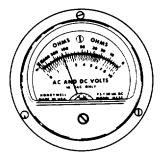


Figure 5-14. Reading DC Volts Scale AN/URM-105

(b) TS-352 B/U.

Read the DC volts scale for the range the red lead is plugged in at:

RANGE.	SCALE.
50V.	0.5 (AND MULTIPLY BY 10).
10V.	0.10.
2.5V.	0.2.5.

Thus the meter illustrated is showing the following readings:

RANGE.	READING.
50V.	20 VOLTS DC. 4 VOLTS DC.
2.5V.	1 VOLT DC.

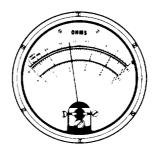


Figure 5-15. Reading DC Volts Scale- TS-352 B/U

(c) SIMPSON 160

Read the "DC VOLTS" scale for the range the selector switch is set at:

SWITCH SETTING.	SCALE.
V/DC 50. V/DC 10.	0.50.
V/DC 10.	0.10. 0.25 (AND DIVIDE BY 10).

Thus the meter illustrated is showing the following, readings:

SWITCH SETTING.	READING.
V/DC 50.	20 VOLTS DC.
V/DC 10,	4 VOLTS DC.
V/DC 2.5.	1 VOLT DC.

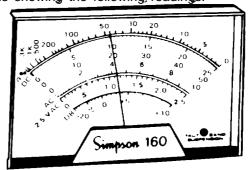


Figure 5-16. Reading DC Volts Scale - Simpson 160

5-7. BATTERY SYSTEM.

a Description. Four 12-volt, heavy-duty, maintenance-free batteries, (fig. 5-1 7) are located in an enclosure in the right-hand frame rail under the cab. The batteries are connected in a series-parallel combination to provide 24 volts for engine starting plus trailer lighting, and 12 volts for operation of all of the electrical equipment on the vehicle. Water never needs to be added to the maintenance-free batteries. There are no vent plugs in the cover. The batteries are completely sealed except for a small vent hole in the side. The test indicator in the cover can be used to determine if the battery is charged to the proper level for testing.

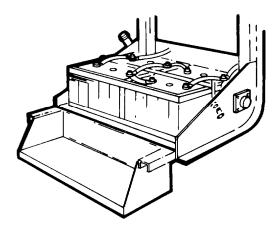


Figure 5-17. Battery System

5-7. BATTERY SYSTEM (Continued).

- b. Test Indicator. The test indicator is a built-in hydrometer in one cell which provides visual information for battery testing only. The test indicator will give correct indications only when the battery is relatively level and the top is clean. Under normal conditions, the indicator displays either green or dark to indicate readiness of battery for testing.
- (1) Green dot visible. Any green appearance is interpreted as a green dot, which means the battery is ready for testing. On rare occasions following prolonged cranking, the green dot may still be visible. If this should occur, the battery needs charging.
- (2) Dark green (dot not visible). The battery needs to be charged prior to testing. On rare occasions the test indicator may turn light yellow. In this case, the battery must be replaced and the vehicle charging system should be checked out.

WARNING

Do not charge, test, or jump start a battery when a light yellow color appears in the test indicator as the battery may explode, squirt electrolyte from the vent hole, and/or damage the charging system of this vehicle.

c. The negative terminals of the battery combination (fig. 5-18) are connected to the ground connector of the starting motor and from there to the engine, tractor frame, and cab (ground). The 24-volt cable of the battery combination is connected to the starting solenoid relay. When the relay contacts are closed, 24-volt power is routed to the starter motor. The 12-volt cable is connected to the alternator and to two circuit breakers for 12-volt distribution.

Table 5-1 Battery System Troubleshooting.

	-		able 5-1 Battery System	TTOUDIESTIOULI	19.	
F A M	E T S	INSTRUCTION	INDICATION	YES	NO	REMARKS
1		ALL ELECTRICAL SYSTEMS ARE WEAK.				
	1	Inspect battery ter- minals.	a. Loose.	Tighten.		
			b. Corroded or dirty.	Clean.	Go to Step 2.	
	2	Inspect battery cases.	a. Cracked or broken.	Replace (para 5-38).	Go to Step 3.	
	'3	Inspect cables.	a. Frayed or broken.	Replace (para 5-39).		
			b. Corroded.	Clean	Go to Step 4.	
	4	Check battery test indicators.	a. Green.	Test (Malf 2, Step 2).		
			b. Dark.	Charge (para 5-38).		
			c. Yellow	Replace (para 5-38).		Troubleshoot charging system (table 5-5).
			NO.	TE		
			A defective battery in the allel configuration will a affect the charge of the batteries.	dversely		
2		ENGINE FAILS TO	CRANK OR CRANKS SL I	OWLY.		
	1	Check battery test indicators.	a. Green.	Test (para 5-38).		
			b. Dark.	Charge (para 5-38).		
			c. Yellow.	Replace (para 5-38).		Troubleshoot charging system (table 5-5).
	2	Test batteries under load.				(
		a. Disconnect con- nector on fuel shutoff valve.				
I			I .	L	<u> </u>	l

Table 5-1. Battery System Troubleshooting (Continued).

1			ı	1	-	
MALF	PH-'S	INSTRUCTION	INDICATION	YES	NO	REMARKS
2		ENGINE FAILS TO	CRANK OR CRANKS S	LOWLY (Cont	ı inued).	
	2	Test batteries under load (Continued).				
		 b. Crank engine for approximately 15 seconds to remove battery surface charge. 				
		 Connect a multi- meter as shown in Figure 5-18. 				
		 d. Have an assistant crank the engine for 15 seconds. 				
		e. Observe voltmeter.	24 volts DC nominal.	Trouble- shoot start- ing circuit table 5-2).	Remove and test each bat- tery (para 5-38).	
			NO	ı TE	I	
			f the engine will not cr following steps,	ank, perform t	he	
		f. Disconnect the battery cables and jumper to a known good source, such as another vehicle.				
		 g. Connect the multi- meter as before, except on the jumper batteries. 				
		h. Have an assistant crank the engine for 15 seconds.				
		i. Observe voltmeter.	24 volts DC nominal.	Trouble- shoot start- ing circuit (table 5-2).	Remove and test each bat- tery (para 5-38).	
3		BATTERIES DO NOT	HOLD A CHARGE.			
	1	Check vehicle lights.	On.	Turn Off.	Go to step	

Table 5-1. Battery System Troubleshooting (Continued).

ı ı	ı — 1				,	
MALF	STEP	INSTRUCTION	INDICATION	YES	NO	REMARKS
3		BATTERIES DO NOT	HOLD A CHARGE (Co	ontinued).		
	2	Check for shorts to ground as follows:				
		 a. Disconnect battery ground cable at battery. 				
		b. Set multimeter to at least 30 volts DC.				
		c. Turn off all elec- trical systems.				
		d. Connect red test lead to disconnected ground cable and black test lead to the battery negative terminal.	Any voltage indication	Go to Step f .	Go to Step g.	
		e. Observe meter.				
		f. Disconnect con- nector to each cir- cuit breaker, one at a time, until meter drops to o volt.	0 voltage indication.	Check wire connection.		
		g. Disconnect devices on that circuit one at a time until meter drops below 4 volts.	0 voltage.	Replace defective component.		

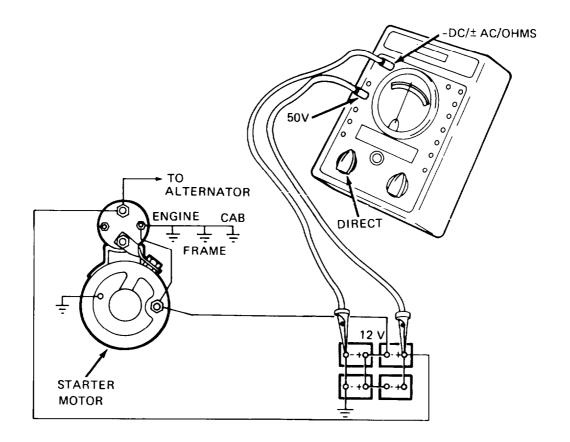


Figure 5-18. DC Voltage Tests

5-8. STARTING SYSTEM CIRCUIT.

- a. Description (fig. 5-79). The starting system consists of two sets of 12-volt batteries (connected in series/parallel to provide 24 volts for starting), a starter motor and solenoid, a starter relay, a neutral safety switch, a key switch (ENGINE RUN), and a start button. When the ENGINE RUN switch is turned ON, the fuel solenoid valve is opened and power is applied to one side of the ENGINE START switch. When the transmission ratio selector is in neutral (N) (closing the neutral safety switch), the starter relay is energized and 24 volts dc is applied to the starter solenoid coil. Starter solenoid contacts then close and apply 24 volts to the starter motor. When the engine starts, an overrunning clutch in the starter motor allows the motor to run free until the ENGINE RUN switch is released, thus removing 24-volt power from the starter motor.
- b. Troubleshooting the Starting System Circuits. When you suspect a starting system circuit problem, perform the steps in table 5-2.

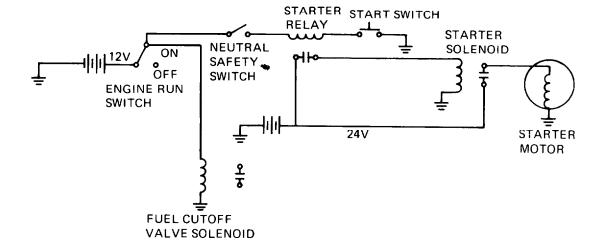


Figure 5-19. Starting System Circuit (Simplified Schematic)

Table 5-2. Starter System Circuit Troubleshooting.

	 -					
MALF	STEP					
W	ST	INSTRUCTION	INDICATION	YES	NO NO	REMARKS
1		STARTER FAILS TO	CRANK OR CRANKS	TOO SLOWLY	/. I	
	1	Turn on ignition key switch and check voltmeter (TM 9-2320-273-1 O).	Normal reading.	Go to Step 2.	Trouble- shoot bat- tery charg- ing circuit (para 5-11).	
	2	Push engine run button and have an assistant listen for heavy thump of the solenoid switch on the starting motor.	Thump.	Go to Step 4.	Check wiring to starter relay. Go to Step 3.	
	3	Push engine run button and have an assistant listen for a click of the starter relay located behind the center of the instrument panel.	Click.	Go to Step 4.	Check wiring to START switch. Go to Step 4.	
	4	Feel all battery, starter, and starter relay terminals.	Excessive heat.	Repair or replace cables or connectors.	Go to Step 5.	
	5	Check starting sole- noid switch with multi meter as shown (figure 5-20), while cranking engine.	24 volts (nominal).	Replace motor and/ or solenoid switch (para 5-32).	Go to Step 6.	

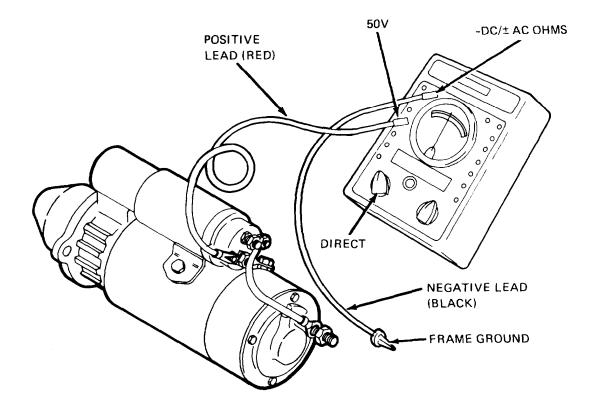


Figure 5-20. Starting Solenoid Switch Checks

Table 5-2. Starter System Circuit Troubleshooting (Continued).

	,		Titel System Circuit Ti	T	 	
MALF	STEP	INSTRUCTION	INDICATION	YES	NO	REMARKS
1		STARTER FAILS TO	CRANK OR CRANKS	TOO SLOWLY	(Continued).	
	6	Check starter relay with multimeter as shown (figure 5-21), while cranking engine.				
		a. Terminal C.	12 Volts (nominal).	Go to (b).	Check wiring to neutral safety switch. Go to Step 7.	
		b. Terminals A and B.	24 Volts (nominal).	Repair wiring to starting motor.	Replace relay (para 5-33).	
		POSITIVE LEAD (RED) A 24V dc (NOM) C 12V dc (NOM)	1H 24V dc (NOM) FRA	NEGATIVE BLACK ME GROUND	DIRECT	DC/± AC/OHMS
						TA 074706

Table 5-2. Starter System Circuit Troubleshooting (Continued).

. —				T			
MALL	STEP						
Σ	S	INSTRUCTION	INDICATION	YES	NO	REMARKS	
1		STARTER FAILS TO	CRANK OR CRANKS	ŤOO SLOWLY	(Continued).		
	7	Check operation of the transmission ratio selector neutral safety switch with multimeter as shown (figure 5-22). Check while attempting to crank the engine and the selector in neutral (N).	12 volts (nominal).		Check		
		Terminal No. 4.	12 voits (nominai).		wiring to engine run switch.		
		Terminal No. 3.	12 volts (nominal).	To Step 8.	Replace neutral safety switch (para 5-75).		
			NEGATIVE (BLACK)	LEAD			
			(BEAGK)				
			BB RD 2 3 4 2 VDC NOM.)	DIREC		AC/OHMS	
		POSITIVE LEAD (RED) Figure 5-22. Neutral Safety Switch Checks					
				Jaruty Jeriton	1	1	
<u>_</u>						TA 074707	

Table 5-2. Starter System Circuit Troubleshooting (Continued).

			arter System Circuit 110	ubiocito dang (
F F	ايوا					
MALF	STEP	INSTRUCTION	INDICATION	YES	NO	REMARKS
1		STARTER FAILS TO	CRANK OR CRANKS	OO SLOWLY	(Continued).	
	8	a. Check operation of the ENGINE RUN switch with multimeter as shown in (figure 5-23). Check for 12 volts nominal on the side of the switch that is wired to the starter relay while pushing the button.	12 volts nominal.	Go to Step 9.	Check wirin g starter relay. Go to Step 9.	
		b. Check wiring. Refer to wiring diagram and schematic in Appendix D.			Replace ENGINE RUN switch (para 5-35).	
			POSITIVE LEAD (RED)	DIREC		
	Ц	F	igure 5-23. ENGINE ST	ART Switch C	Checks	TA 074708

Table 5-2. Starter System Circuit Troubleshooting (Continued).

ш		_		 	<u> </u>		
MAL	STEP	INSTRUCTION	INDICATION	YES	NO	REMARKS	
1		STARTER FAILS TO	CRANK OR CRANKS	too slowly	(Continued)		
	9	Check ENGINE RUN as follows:					
		 Remove connector from back of ENGINE RUN switch. 					
		b. Install jumper wire as shown in figure 5-24.	Starter motor cranks.	Replace ENGINE RUN switch (para 5-35).	Go to Step 10.		
			NEGATIVE LEAD BLACK)	50V		-DC/ <u>+</u> AC/OHMS	
		FRAME GROUND					
				DIRE	ст		
		CONNECTOR	10G POSITIVE LEAD (RED)				
		Figur	re 5-24. ENGINE RUN S	witch Checks.			
			,				
			_			TA 074709	

Table 5-2. Starter System Circuit Troubleshooting (Continued).

MALF	STEP					
Σ	[်	INSTRUCTION	INDICATION	YES	NO	REMARKS
1		STARTER FAILS TO	CRANK OR CRANKS	TOO SLOWLY	(Continued)	
	10	Check for loose connections between batteries and the ENGINE RUN switch (circuits shown in figure 5-25).	Loose. Defective.	Tighten. Repair or replace.		
			12V	E RUN		
		Figu	ure 5-25. Starting Circuit	t to ENGINE F	RUN switch.	
2		STARTING MOTOR I	S NOISY AND ENGAG	EMENT IS E	RRATIC.	
	1	Replace motor and solenoid switch assembly (para 5-32).				
						TA 074710

5-9. ETHER QUICK-START CONTROLS.

- a. Description (fig. 5-26). The ether injection solenoid valve is opened to allow ether to flow from the storage canister into the intake manifold when the ETHER button is pushed and released and the ether temperature switch is closed (engine coolant temperature is less than 50°F (10°C).
- b. Troubleshooting Perform the steps in table 5-3 to isolate faulty components of the ether quick-start controls.

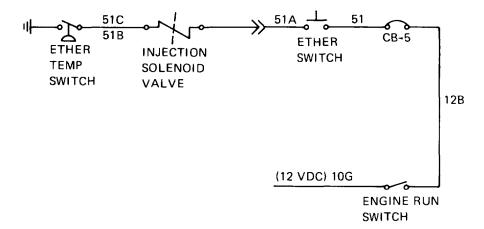


Figure 5-26. Ether Quick-Start Electrical Circuit

Table 5-3. Ether Quick Start Control Circuit Troubleshooting.

		Table 3-3. Ether Quick Start Control Circuit Troubleshooting.						
MALF	STEP	INSTRUCTION	INDICATION	YES	NO	REMARKS		
		SOLENOID CANNOT	BE HEARD TO CLICK	WHEN ETHE	R BUTTON I	S PUSHED.		
	1	Check engine coolant temperature gage.	Below 50°F (10°C).	Go to Step 2.		Solenoid is not sup- posed to work when coolant is above 50°F		
			NOTE	l				
			The ETHER button mus released when performi					
	2	Check for voltage at circuit 51 terminal of ETHER switch.	12 voltage nominal.	Go to Step 3.	Check cir- cuit breaker (para 5-5) and wiring.			
	3	Check for voltage at circuit 51A terminal of ETHER switch.	12 volts dc nominal.	Go to Step 4.	Replace witch (para 5-74).			
	4	Check for voltage at circuit 51B terminal of solenoid.	12 volts dc nominal.	Go to Step 5.	Repair wiring or connections			
	5	Check for voltage at circuit 51C terminal of solenoid.	12 volts dc nominal.	Go to Step 6.	Replace solenoid.			
	6	Check for voltage at terminal of ETHER temperature switch.	12 volts dc nominal.	Replace witch (para 5-74).	Repair wiring or connections			

5-10. ENGINE RETARDER CONTROLS.

- a. Description. The engine retarder solenoid valves are applied by the foot switch as selected by the three-position ENGINE RETARDER switch (fig. 5-27). The operator must let up on the foot throttle to close the throttle position sensing switch.
- b. Troubleshooting the Engine Retarder Control. Perform the steps in table 5-4 to isolate faulty components of the engine retarder circuit.

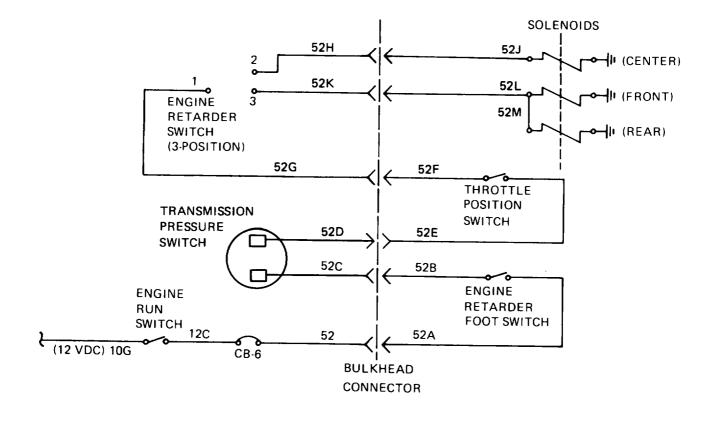


Figure 5-27. Engine Retarder Control Circuit

Table 5-4. Engine Retarder Control Circuit Troubleshoot ting.

ш							
MALF	STEP	INSTRUCTION	INDICATION	YES	NO	REMARKS	
1		NO RETARDING AC	TION.				
	1	With ENGINE RUN switch on, check for voltage to retarder foot switch (circuit 52A).	12 volts dc nominal.	Go to Step 2.	Check for faulty cir- cuit breaker (para 5-5 C),		
			NOTE				
				Before making the voltage checks de- cribed in steps 2 through 8, do the ollowing:			
			Apply parking brake. Check system air pressur Activate transmission co Put transmission in gear. Press and hold engine re during voltage checks.				
	2	Check for voltage at circuit 52B terminal of foot retarder switch.	12 volts dc nominal.	Go to Step 3	Replace switch.		
	3	Check for voltage at circuit 52C terminal of transmission pressure switch.	12 volts dc nominal.	Go to Step 4	Repair wiring between 52B and 52C.		
	4	Check for voltage at circuit 52D terminal of transmission pressure switch.	12 volts dc nominal.	Go to Step 5	Drain system air pressure and replace switch.		
	5	Check for voltage at circuit 52E terminal of throttle position sensing switch.	12 volts dc nominal.	Go to Step 6	Repair wir- ing (52D, 52E) or connection!		
	6	Check for voltage at circuit 52F terminal of throttle position sensing switch.	12 volts dc nominal.	Go to Step 7	Replace switch.		
	7	Check for voltage at circuit 52G terminal of panel ENGINE RETARDER switch.	12 volts dc nominal.	Go to Step 8	Repair wiring (52F, 52G) or connection:		

Table 5-4. Engine Retarder Control Circuit Troubleshooting (Continued).

		Tuble 0 4. Engine Retailed Control Chount Troubleshooting (Continued).					
MALF	STEP	INSTRUCTION	INDICATION	YES	NO	REMARKS	
1		NO RETARDING ACT	I				
	8	Check for voltage at circuit 52H and 52K terminals of panel ENGINE RETARDER switch with switch in HIGH position,		Go to Step 9.	Replace switch.		
	9	Check for voltage at each solenoid valve, circuits 52J, 52L and 52M.	12 volts dc nominal.	Refer to Di- rect Support Maintenance,	Repair wiring (52J, 52L, 52M) or connections.		

5-11. BATTERY CHARGING CIRCUIT.

a. Description. Charging of the batteries is accomplished by a 14-volt, 85-ampere, self-load limiting alternator with an integral transformer rectifier providing 24 volts for the cranking batteries and 12 volts for other vehicle electrical loads. This system uses two sets of 12-volt batteries in series to provide 24 volts for cranking. The cranking batteries are charged by the transformer rectifier unit, and as the load demand on these batteries is cranking only, the 15 amperes available from the transformer rectifier is more than sufficient for this application. As the cranking batteries become charged, the output current gradually drops to approximately one ampere when the terminal voltage of the battery reaches 13.8 volts (adjustable). The charging circuit is shown in figure 5-28.

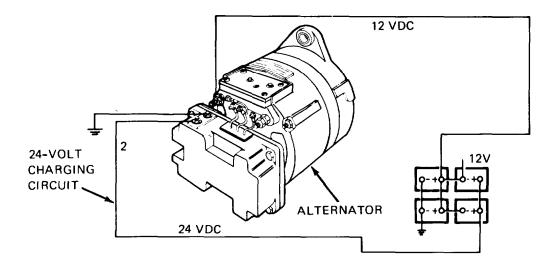


Figure 5-28. Battery Charging Circuit

Table 5-5. Battery Charging Circuit Troubleshooting.

π. τ	П				_	
MALF	STEP	INSTRUCTION	INDICATION	YES	NO	REMARKS
		BATTERIES ARE BE	I ING UNDERCHARGED I	OR OVERCH	ARGED.	
	1	Check batteries (table 5-1, malfunction 2, step 2).				
	2	Check the alternator drive belts for proper tension (para 4-55).	a. Loose. b. Damaged.	Tighten (para 5-43). Replace (para 5-43).	Go to Step 3. Go to Step 3.	
	3	Check all charging circuit wiring and connections.	a. Loose. b. Defective	Tighten. Repair or replace.		
	4	Refer to Direct Support Maintenance.				

5-12. WARNING LAMPS AND ALARMS.

- a. Description. The following warning lamps and alarms are employed in this vehicle series:
 - (1) ENGINE TEMPERATURE warning lamp.
 - (2) ENGINE OIL LOW warning lamp.
 - (3) LOW AIR PRESSURE warning lamp.
 - (4) BACKUP ALARM (M916 THRU M9ZO).

The ENGINE TEMPERATURE warning lamp is actuated when the water temperature sensing switch closes (at 225° F, 95°C) if the ignition switch is ON. The ENGINE OIL LOW warning lamp is actuated when the engine oil pressure sensing switch closes (at 5 psi, 100 kPa) if the ignition switch is ON. The LOW AI R PRESSURE warning lamp and buzzer are actuated when the low air switch closes (between 64 and 76 psi) if the ignition switch is ON. The backup alarm goes off when the backup switch is closed and the ignition switch is ON unless the manual backup alarm override switch is open. The circuits for these devices are shown in figure 5-29. Wire connection points and wire identification numbers are indicated.

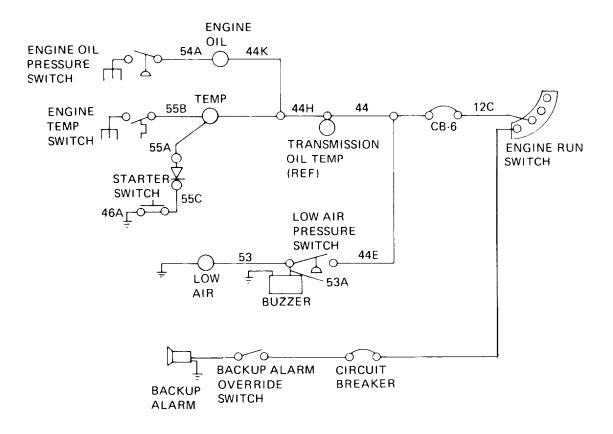


Figure 5-29. Warning Lamp and Alarm Circuits

Table 5-6. Warning Lamps and Alarms Circuit Troubleshooting.

ш						
MALF	STEP	INSTRUCTION	INDICATION	YES	NO	REMARKS
1		ENGINE TEMPERATU	JRE WARNING LAMP	 INOPERATIV	 E.	
	1	Press START switch.	Lamp lights.	Replace water tem- perature switch (para 5-73).	Replace the bulb.	
	2	Attach test lead between the ground side of the bulb (circuit 6A) and ground and turn on the ENGINE RUN switch.	Lamp lights.	Replace water tem- perature switch (para 5-73).	Go to Step 3.	
	3	Check the ENGINE lamp when the ENGINE RUN switch is ON.	Lamp lights.	Double check the temperature switch.	Check wir- ing to cir- cuit breaker.	
	4	Check for faulty circuit breaker No. 6 with multi meter.	12 volts dc nominal.	Repair wiring (circuits 44, 44H, 44J).	Replace cir- cuit breaker.	
2		ENGINE OIL PRESSU	JRE LOW WARNING L	-AMP INOPER	RATIVE.	
	1	Attach test lead between the ground side of the bulb (circuit 54A) and ground and turn on the ENGINE RUN switch.	Lamp lights.	Replace the switch (para 5-71).	Replace the bulb.	
	2	Troubleshoot wiring.				
3		LOW AIR PRESSURE	E' WARNING LAMP AN I	ID/OR BUZZE	R INOPERAT	TVE.
			NOTE			
			The air pressure must be below 60 psi to perform the following check.			
		Attach a test lead across both terminals on the LOW AIR PRESSURE switch	a. Lamp and buzzer operate.	Replace the pressure switch (para 5-81).		
		(located on the fire- wall inside cab at center).	b. Lamp only works.	Replace the buzzer (para 5-80).		

Table 5-6. Warning Lamps and Alarms Circuit Troubleshooting (Continued).

			-					
MALF	STEP							
ž	ST	INSTRUCTION	INDICATION	YES	NO	REMARKS		
3								
			c. Buzzer only works.	Replace the bulb (para 5-61).				
			d. Neither lamp nor buzzer operates.	Trouble- shoot wiring (refer to schematic in Appendix D).				
4		BACKUP ALARM IS	INOPERATIVE.					
			NOTE					
			The compressed air sys normal operating pressu backup switch.					
	1	Verify the backup alarm override switch is OFF, and the EN-GINE RUN switch is ON. Place the ratio selector in one of the reverse gears.						
	2	Check for voltage at the alarm with a multi meter.	12 dc volts nominal.	Go to Step 3.	Go to Step 4.			
	3	Check ground at alarm for loose or dirty ground.	Bad ground.	Repair ground.	Replace the alarm (para 5-78).			
	4	Attach a test lead across the terminals on the backup switch.	Alarm operates.	Replace backup switch (para 5-77).	Go to Step 5.			
	5'	Attach a test lead across the terminals on the override switch,	Alarm operates.	Replace switch.	Go to Step 6.			
	6	Troubleshoot wiring through circuit breaker. Refer to schematic in Appendix D.						

5-13. INSTRUMENTS AND INDICATORS.]

- a. Description. Electrically operated gages and indicators in the cab provide information for operation as follows:
 - (1) PARK BRAKE lamp.
 - (2) DIFFERENTIAL LOCKUP lamp.
 - (3) FUEL LEVEL gage.
 - (4) POWER TAKEOFF lamp.
 - (5) WATER TEMP gage.
 - (6) TRANS OIL TEMP gage.
 - (7) OIL PRESSURE gage.
 - (8) VOLTS meter.
 - (9) TACHOGRAPH (clock).
 - (10) LAMPS.

The circuits for these items are shown in figure 5-30. Wire connection points and wire identification numbers are indicated.

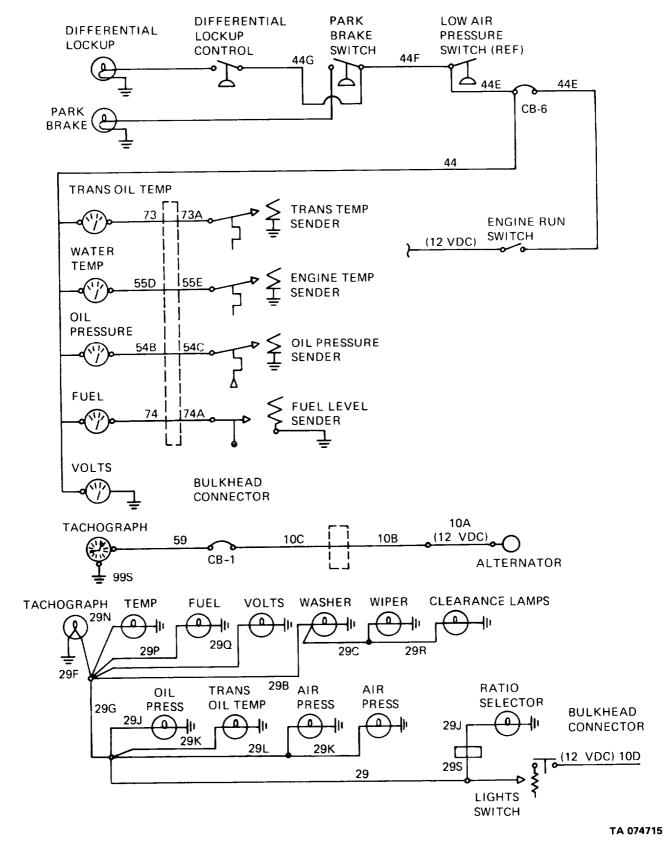


Figure 5-30. Instrument and Indicator Circuits

Table 5-7. Instruments and Indicators Circuit Troubleshooting.

111		Table 3-7. Instruments and indicators Circuit Troubleshooting.					
MALF	STEP	INSTRUCTION	INDICATION	YES	NO	REMARKS	
1		DIFFERENTIAL LOCK	UP LAMP INOPERATI	VE.			
	1	With differential lock- up control set to LOCK, and ENGINE RUN switch ON check for voltage to the lamp using a multi meter.	12 volts dc nominal.	Check for good ground at bulb. (Replace bulb) (para 5-63).	Go to Step 2.		
	2	Attach test lead across the differential lockup control terminals.	Lamp lights.	Replace differential lockup con- trol (para 5-83).	Go to Step 3.		
	3	Troubleshoot wiring. Refer to wire diagram and schematic in Appendix D.					
2		PARK BRAKE LAMP	INOPERATIVE.				
	1	With park brake applied and ENGINE RUN switch set to ON, use a multimeter to check voltage to the lamp.	12 volts dc nominal.	Check for a good ground at the bulb. (Replace the bulb) (para 5-63).	Go to Step 2.		
	2	Attach test lead across park brake switch terminals (located in instrument panel near circuit breaker).	Lamp lights.	Replace park brake switch (para 5-82).	Go to Step 3.		
	3	Troubleshoot wiring. Refer to wiring dia- gram and schematic in Appendix D.					

Table 5-7. Instruments and Indicators Circuit Troubleshooting (Continued).

10.0	$\overline{}$					-
MALF	STEP	INSTRUCTION	INDICATION	YES	NO	REMARKS
]] 3		INSTRUMENT PANEL	GAGES INOPERATIV	E.		
	1	Check the following gages: Trans oil temp, water temp, oil press, fuel.				
		Using a multi meter check for voltage at the gage terminals.	12 volts dc nominal.	Replace gage.	Go to Step b.	
		b. Attach jumper across terminals of sending unit.	Gage operates.	Replace sending unit	Go to Step c.	
		c. Troubleshoot wiring. Refer to wire diagram and schematic in Appendix D.				
	2	Check volts gage:				
		a. Using a multi meter check voltage at gage terminals.	12 volts dc nominal.	Replace gage.	Go to Step b.	
		b. Troubleshoot wiring. Refer to wire diagram and schematic in Appendix D.				

Table 5-7. Instruments and Indicators Circuit Troubleshooting (Continued).

T	7	1				
MALF	STEP	INSTRUCTION	INDICATION	YES	NO	REMARKS
4		TACHOGRAPH CLOCI	K IS INOPERATIVE.			,
	1	Check circuit 59 using a multi meter.	12 volts dc nominal.	Replace tachograph para 5-66)	Go to Step 2.	
	2	Check wiring. Refer to diagram and schematic in Appendix D.				
5		INDICATOR/ILLUMINAT	ION LAMP OUT.			
	1	Pull headlamp switch out.	All lamps come on with headlamp switch at full out or half way position.	Go to Step 4	Go to Step 2.	
	2	Check for voltage at the headlamp switch using a multimeter.	12 volts dc nominal.	Replace headlamp switch para 5-62).	Go to Step 3.	
	3	Check wiring to head- lamp switch. Refer to wire diagram and schematic in Appendix D.			:	
	4	For individual lamps that are out, replace bulb. Turn on headlamp switch.	Lamp comes on.			
	5	Check wiring. Refer to wire diagram and schematic in Appendix D.				

5-14. HEADLAMPS.

- a. Description (fig. 5-31). The headlamp system uses two sealed-beam lamps which provide separate and distinct high and low beams. A foot-operated dimmer switch controls the use of the high or low beam. The headlamp switch on the instrument panel turns the headlamps ON and OFF, A recycling type circuit breaker in the headlamp switch protects the circuit without a total loss of the headlamps in case of a short.
- b. Troubleshooting the Headlamp Circuit. Perform the steps in table 5-8 to isolate faulty components of the headlamp circuit.

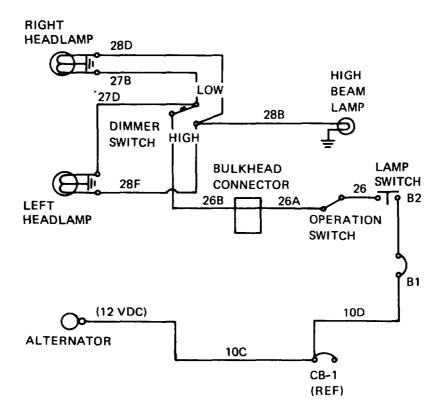
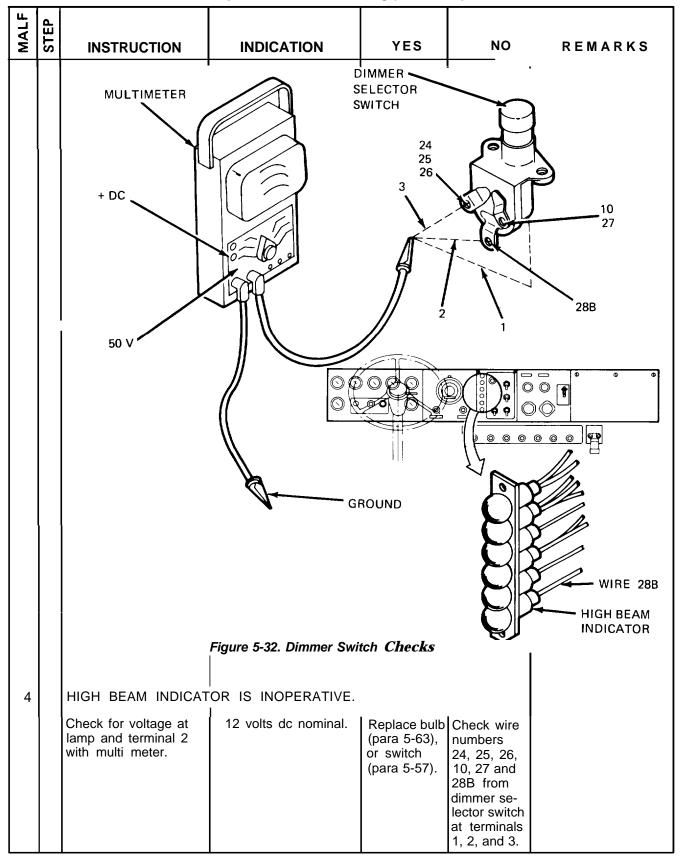


Figure 5-31. Headlamp Circuit

Table 5-8. Headlamp Circuit Troubleshooting

	Table 5-6. Headiamp Circuit Troubleshooting							
MALF	STEP	INSTRUCTION	INDICATION	YES	NO	REMARKS		
 								
1		BOTH HEADLAMPS E	BLINK ON AND OFF					
			NOTI	E				
			A short in the headlar the circuit breaker to		using			
2		ONE HEADLAMP IS	INOPERATIVE.					
		Remove the lamp and check for voltage at the lamp socket with multimeter.	12 volts dc nominal.	Replace lamp (para 5-44).	Repair ground connection at lamp.			
3		BOTH HEADLAMPS	ARE INOPERATIVE.					
	1	Check blackout lamp switch position.						
	2	Check for voltage at dimmer switch terminal (circuit 26B) using multimeter.	12 volts dc nominal. Fig. 5-32.	Replace (para 5-57).	Go to Step 3.			
	3	Check for voltage at lamp switch (circuit 26) terminal.	12 volts dc nominal.	Check cir- cuit 26 wiring.	Go to Step 4.			
	4	Check for voltage at lamp switch (circuit 10D) terminal.	12 volts dc nominal.	Replace switch (para 5-62).	Go to Step 5.			
	5	Troubleshoot wiring.						
	6	Check circuit breaker in headlamp switch.	Continuity.	Trouble- shoot wiring	Replace headlamp switch.			
1						<u>L</u>		

Table 5-8. Headlamp Circuit Troubleshooting (Continued).



5-15. MARKER LAMPS.

- a. Description. All vehicles in the series have five front marker lamps. The concrete mixer also has two intermediate side marker lamps. The dump, bituminous distributor, and the concrete mixer also have five rear marker lamps. Wiring to 24 V dc and 12 V dc trailer connectors is also provided. The lamps are turned on by the headlamp switch when the blackout switch is in the normal position. A momentary contact CLEARANCE LAMP switch allows the driver to flash the lamps.
- b. Troubleshooting. The marker lamps circuit is straightforward and troubleshooting can, for the most part, be based on observation of the lamp(s) not working and reference to the circuit schematic, figure 5-33. The checks in table 5-9 can be used to isolate a problem.

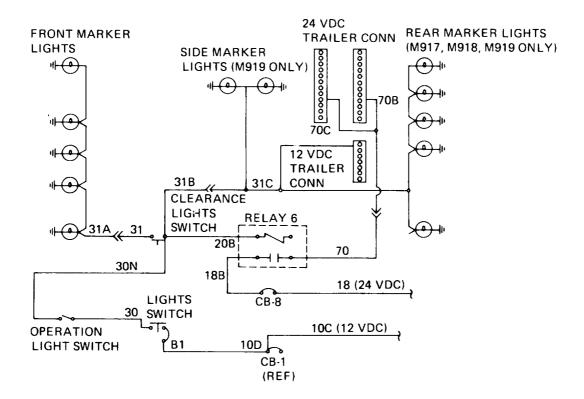


Figure 5-33. Marker Lamps Circuit

Table 5-9. Marker Lamps Circuit Troubleshooting.

L	<u>a</u> .					
MALF	STEP	INSTRUCTION	INDICATION	YES I	NO REM	ARKS
1		FRONT MARKER LAI	MPS INOPERATIVE.			
		If none of the front marker lamps operates check wiring from the switch.	Loose connection. Broken wire.	Tighten. Repair.	Replace any single lamp that is inoperative.	
2		INTERMEDIATE MAR	KER LAMPS INOPER	ATIVE.		
		If neither of the side marker lamps operate, check wiring from the switch.	Loose connection. Broken wire.	Tighten. Repair.	Replace bulb.	
3		REAR MARKER LAM	PS INOPERATIVE.			
		If none of the rear marker lamps oper- ates, check wiring from the switch.	Loose Connection. Broken wire.	Tighten. Repair.	Replace bulb.	
4		ALL MARKER LAMPS	INOPERATIVE.			
		Check for voltage at both switch terminals using multi meter.	12 volts dc nominal.	Trouble- shoot wiring.	Replace switch.	

5-16. PARKING AND TAIL LAMPS.

- a. Description. The (front) parking and (rear) tail lamps are combination lamps which also provide stop and turn functions. The parking and tail lamp functions are actuated by the headlamp switch when it is pulled either halfway or all the way out (fig. 5-34).
- b. Troubleshooting. Troubleshooting is indicated directly as the result of the observed malfunction as described in table 5-10.

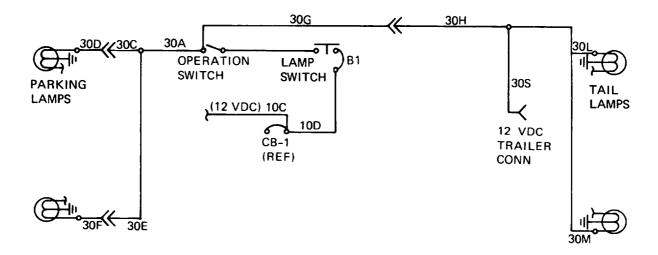


Figure 5-34. Parking and Tail Lamp Circuit

Table 5-10. Parking and Tail Lamps Circuit Troubleshooting.

	Table 5-10. Parking and Tall Lamps Circuit Troubleshooting.						
MALF	STEP	INSTRUCTION	INDICATION	YES	NO	REMARKS	
1		SINGLE LAMP INOP	ERATIVE.				
		Replace bulb.	Lamp lights.		Check		
		Replace buib.	Lamp lights.		wiring.		
2		FRONT LAMPS ARE	INOPERATIVE.				
		Check circuits 30C, 30D, 30E, and 30F wiring and connection points, using a multi- meter.					
3		REAR LAMPS ARE I	NOPERATIVE.				
		Check circuits 30L, and 30M wiring and connection points, using a multimeter.					

5-17. STOP AND TURN SIGNAL LAMPS.

a. Description. The turn signal and stop lamps (fig. 5-35) are combination lamps which also provide the parking and tail lamp functions. Referring to figure 5-35, you will see that circuits 35B and 36C provide the right turn directional flashing when the control handle is raised. Circuits 37 and 37F provide the left turn directional flashing when the control lever is lowered. The hazard lamps use those same circuits simultaneously to provide flashing of all four lamps. The stop lamp switch completes circuit 25 to actuate circuits 36C and 37F which provide the stop lamp function. The flashing functions override the stop and park functions. The flashing lamps on the control operate in conjunction with the flashing circuits (refer to table 5-11).

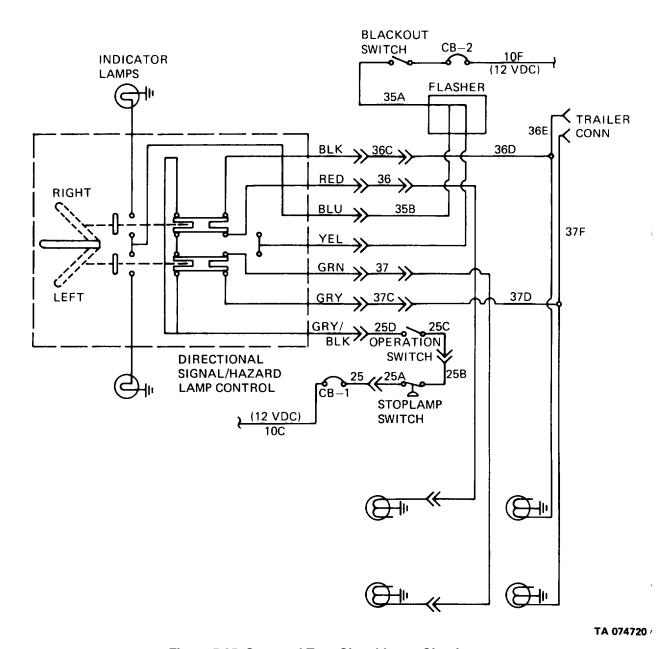


Figure 5-35. Stop and Turn Signal Lamp Circuit.

Table 5-11. Stop and Turn Signal Lamps Circuit Troubleshooting.

_	Table 5-11. Stop and Turn Signal Lamps Circuit Troubleshooting.							
- [MALF	STEP	INSTRUCTION	INDICATION	YES	NO	REMARKS	
[NOTE				
				If any single lamp does the lamp bulb first. Like circuits fail, replace the replacing any lamp bulb and check for a good gr the problem, proceed as ignition key switch is Of or park functions.				
	1		TURN SIGNALS INO	PERATIVE.				
		1	Jumper across the terminals of the flasher (P to L).	Lamp lights.	Replace flasher.	Go to Step 2.		
		2	Check circuit wiring and circuit breaker, using multimeter.	12 volts dc nominal.	Go to Step 3.	Repair/ replace.		
		3	Check for voltage at turn signal control connector.	12 volts dc nominal.	Replace control (para 5-58).	Repair wiring.		
		4	If the stop lamps work but the rear direction- als do not, replace the directionals control.					
	2		STOPLAMPS ARE IN	IOPERATIVE.				
				NOTE				
				Air pressure must be r to operate.	normal for the	stoplamps		
		1	If the turn signals work but the stop lamps do not, check for voltage on both terminals of the stoplamp switch while the brake pedal is being depressed.	12 volts dc nominal.	Go to Step 2.	Checking wiring to switch, then replace switch (para 5-85).		
		2	Check circuit 25 wiring.					

5-18. BACKUP LAMPS.

a. Description (fig. 5-36). When the ratio selector is placed in either reverse speed, the air-actuated backup switch (located on the transmission) will close and light up the backup lamps if the ENGINE RUN switch is turned on and the blackout switch is in the normal position. (Reference Table 5-12.)

NOTE

The compressed air system must be charged within the normal operating range in order to shift the transmission and actuate the backup switch.

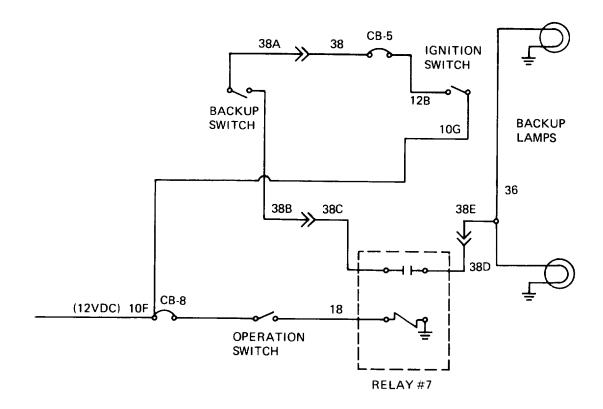


Figure 5-36. Backup Lamp Circuit.

Table 5-12. Backup Lamps Circuit Troubleshooting.

		74576 0	12. Backup Lamps Circu	1100000001100	, ang.	
MALF	STEP	INSTRUCTION	INDICATION	YES	NO	REMARKS
1		BACKUP LAMP(S) IN	NOPERATIVE.			
	1	Check for voltage at inoperative lamp using multimeter.	12 volts dc nominal.	Check ground, re- place bulb (para 5-46).	Go to Step 2.	
	2	Check for voltage at circuit 38B terminal of backup switch.	12 volts dc nominal.	Go to Step 3.	Check cir- cuit 38B wiring.	
	3	Check for voltage at circuit 38A terminal of backup switch.	12 volts dc nominal.	Replace switch (para 5-77).	Check circuit 38A wiring and circuit breaker.	

5-19. BLACKOUT LIGHTING SYSTEM.

- a. The blackout lighting system is shown and pictorially described in paragraphs 2-50 and 2-51. See illlustration in paragraph 2-51 for location of the major components in this system.
- b. To aid in troubleshooting, a schematic diagram (fig. 5-37) is provided below that isolates the blackout lighting system from the complete vehicle electrical system. You will find the vehicle electrical schematic diagram in Appendix D, along with the vehicle wiring harness drawings.

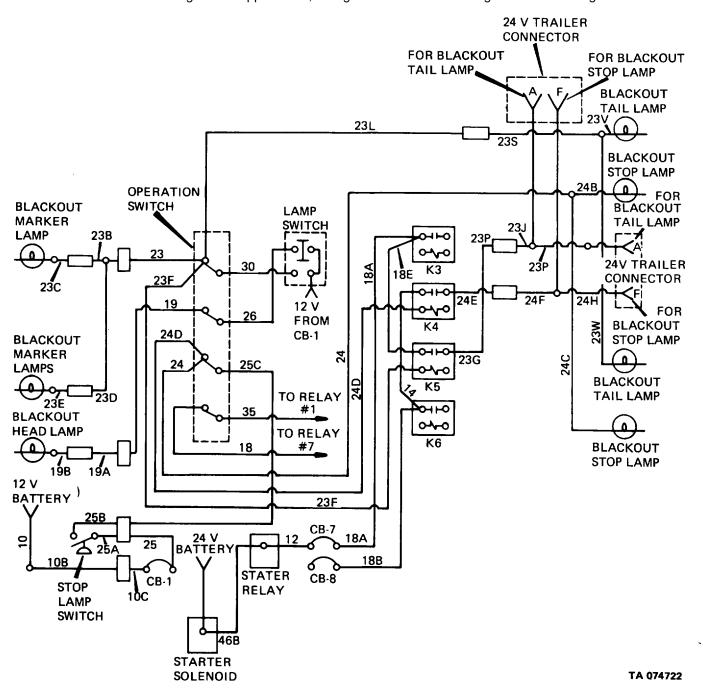


Figure 5-37. Blackout Lighting System Circuit

Table 5-13. Blackout Lighting System Circuit Troubleshooting.

		Table	5-13. Blackout Lighting	System Circui	Troublesho	oung.
MALF	STEP	INSTRUCTION	INDICATION	YES	NO	REMARKS
			NOTE			•
			The following procedu	res assume the	at:	
			a. Normal service properly (if not;b. OPERATION sw position.	refer to para	5-14).	
1		ALL BLACKOUT LAM	IPS INOPERATIVE.			
		Replace OPERATION switch.				
2		ONE BLACKOUT MAR	RKER, HEADLAMP, TAI	L LAMP OR	STOP LAMP	INOPERATIVE.
	1	Replace bulb.	Lamp goes on,	Go to Step 2.		
	2	Check for voltage at lamp connector; then work back to OPERA-TION switch checking for voltage at each wire connector.	12V nominal available at one test point; not available at preceding test point.	Inspect wiring be- tween points checked; then replace defective wire(s).		
3		TRAILER BLACKOUT	LAMPS INOPERATIV	E.		
	1	Check for voltage at trailer applicable connector pin (A or F); then work back to output of relay (K4 or K5) checking for voltage at each wire connection.	24V nominal available at one test point; not available at preceding test point.	Inspect wiring be- tween points checked; then replace defective wire(s).	Go to Step 2.	
	2	Check for voltage at input of relay coil (K4 or K5).	12V nominal.	Go to Step 3.	Go to Step 4.	If power is available, problem is in relay or 24V circuit from starter solenoid. If power is not available, problem is in relay or 12V circuit from OPERATIONS switch. Check relay as described in para. 5-5C.

Table 5-13. Blackout Lighting System Circuit Troubleshooting (Continued).

_	-		(Continuea).			
MALF	STEP	INSTRUCTION	INDICATION	YES	NO	REMARKS
3		TRAILER BLACKOUT	LAMPS INOPERATIVE	(Continued)		
	3	Check for voltage at relay contact terminal then work back to starter solenoid.	24V nominal available at one test point; not available at preceding test point.	Inspect wiring be- tween points checked; then replace defective wire(s).		
	4	Check for voltage at each wire contact from relay to OPERATION switch.	12V nominal available at one test point; not available at preceding test point.	Inspect wiring be- tween point checked; then replace defective wire(s).		

5-20. MISCELLANEOUS ELECTRICAL.

The items covered in this paragraph are:

- a. Electric horn.
- b. Heater fan.
- c. Dome lamp in the cab.
- d. Fixed work lamps (M916 and M920 only).
- e. Portable work lamp receptacles.
- f. Cigar lighter.
- g. Winterization kit.

Table 5-14. Miscellaneous Electrical Circuit Troubleshooting.

		Table 5-14. Wiscellaneous Electrical Circuit Troubleshooting.				
MALF	STEP	INSTRUCTION	INDICATION	YES	NO	REMARKS
1		ELECTRICAL HORN	IS INOPERATIVE			
	1	Check horn for a good ground.	Clean and tighten.	Go to Step 2.	Repair.	
	2	Check for voltage at horn using multimeter while pressing horn button.	12 volts dc nominal.	Replace horn (para 5-68).	Go to Step 3.	
	3	Check for voltage at terminal 3 (fig. 5-38) on horn relay while pressing horn button.	12 volts dc nominal.	Check cir- cuit 41 wiring.	Go to Step 4.	
	4	Check for voltage at terminal 1 on horn relay while pressing horn button.	12 volts dc nominal.	Go to Step 5.		
	5	Jumper terminal 2 on horn relay to ground.	Horn operates.	Go to Step 6.	Replace horn relay (para 5-67).	
	6	Check horn button switch ground and wiring to horn relay.	Wiring and ground okay.	Replace button switch (para 5-67).	Repair.	
	HORN RELAY HORN HORN HORN BUTTON HORN SWITCH HORN SWITCH					35
			Figure 5-38. Elect	tric Horn Circ	uit 1	1 TA 074723

Table 5-14. Miscellaneous Electrical Circuit Troubleshooting (Continued).

MALF	STEP	INSTRUCTION	INDICATION	YES	NO	REMARKS
2		PERSONNEL HEATER	R FAN INOPERATIVE.			
	1	Turn Engine Run switch ON and check for voltage at termin- al B on heater switch, fig. 5-39 using a multi meter.	12 volts dc nominal.	Replace switch (para 5-69).	Go to Step 3.	
	2	If any speed is working check wiring between switch and fan motor.	Detective switch.	Repair.	Replace switch (para 5-69).	
	3	Troubleshoot wiring (circuits 33 and 34).				
		SWITCH 33 LO B 7B CB-14 ENGINE RUN SWITCH HEATER FAN MOTOR				
				}	(12 VDC)	10G
			Figure 5-39. Heate	er Fan Circuit		
3		DOME LAMP INOPE	I RATIVE.			
	1	Replace the bulb.	Lamp lights.		Go to Step 2.	
	2	Using a multimeter check for voltage at dome lamp switch terminals (fig. 5-40).	12 volts dc nominal.	Replace switch (para 5-56).	Go to Step 3.	
	3	Troubleshoot wiring.				TA 074724

Table 5-14. Miscellaneous Electrical Circuit Troubleshooting (Continued).

ш		T				
MALF	STEP	INSTRUCTION	INDICATION	YES	NO	REMARKS
		DOME LAI & SWITCH	21A >> 21	10F (CB-3	(12 VDC)	
		CIGAR LIGHTER	40			
		Figure 5-4	40. Dome Lamp, Work La	amps, and Cig	ar Lighter Cir	cuits.
4		_	ERATIVE (FIXED, M916		_	ı
	1	Replace bulb.	Lamp lights.		Go to Step 2.	
	2	Check wiring between lamps and switch. Check for voltage at terminal on switch.	12 volts dc nominal.	Replace switch (para 5-62A).	Go to Step 3.	
	3	Troubleshoot wiring.				
5		WORK LAMPS INOP	ERATIVE (PORTABLE	RECEPTACLE	ĒS).	
	1	Replace bulb.	Lamp lights.		Go to Step 2.	
	2	Check wiring between lamps and switch. Check for voltage at terminal on switch.	12 volts dc nominal.	Replace switch (para 5-62A).	Go to Step 3.	
	3	Troubleshoot wiring.				
6		CIGAR LIGHTER IN	OPERATIVE.			
	1	Replace the lighter element.	Lighter works.		Go to Step 2.	
	2	Check for voltage at lighter receptacle, using a multimeter.	12 volts dc nominal.	Replace receptacle (para 5-60A).	Go to Step 3.	
	3	Troubleshoot wiring.				
						TA 074725

Table 5-14. Miscellaneous Electrical Circuit Troubleshooting (Continued).

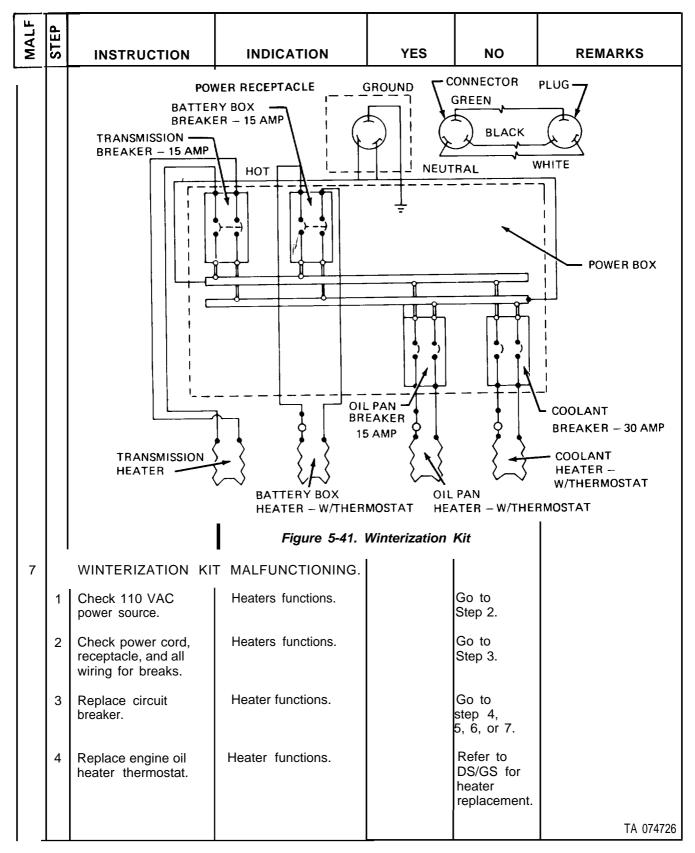
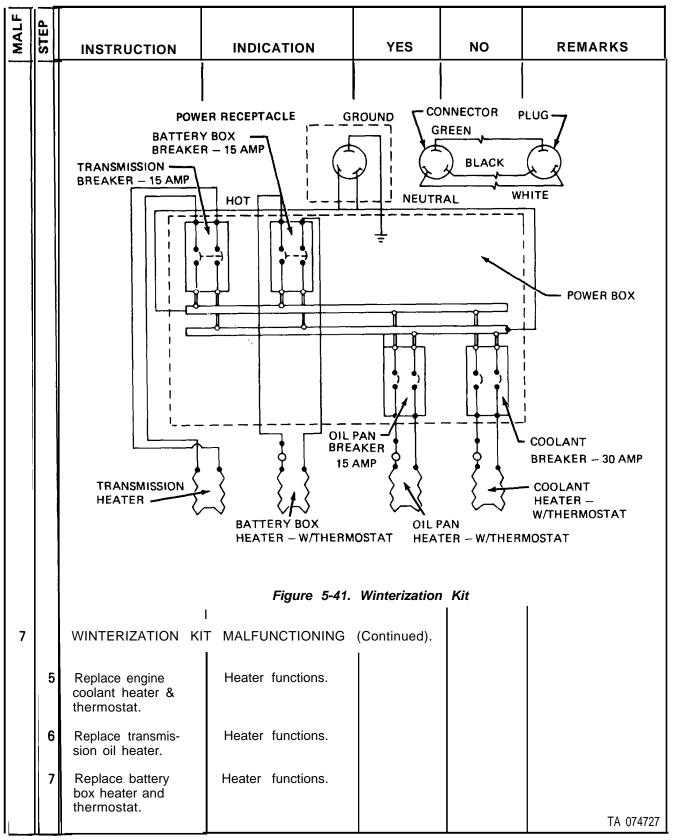


Table 5-14. Miscellaneous Electrical Circuit Troubleshooting (Continued).



Section III MAINTENANCE PROCEDURES

5-21. INTRODUCTION.

This section provides you with Organizational Level maintenance procedures for the electrical and instrumentation systems. To find a specific maintenance procedure, see one of the following task summaries.

- a. Circuit Breakers and Wiring (para 5-22).
- b. Starting and Starting Control (para 5-23).
- c. Batteries and Alternator (para 5-24).
- d. Exterior Lighting (para 5-25).
- e. Cab Interior Lighting and Switches (para 5-26).
- f. Panel-Mounted Instruments (para 5-27).
- g. Electric Horn and Cab Heater Control (para 5-28).
- h. Sending Units, Switching Devices and Winterization Kit (para 5-29).

5-22. CIRCUIT BREAKERS AND WIRING MAINTENANCE TASK SUMMARY.

INITIAL SETUP

EQUIPMENT CONDITION APPLICABLE CONFIGURATIONS PARAGRAPH

CONDITION DESCRIPTION

All-Circuit Breakers.

5-37A.

Batteries Disconnected.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TROUBLESHOOTING)

None.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TASK No.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
1	Circuit Breaker Maintenance: (M915, M916 and M920): A. Removal. B. Installation. C. Operational Check	5-30 5-30A 5-30B 5-30C	None
2	Circuit Breaker Maintenance (M917, M918 and M919): A. Removal. B. Installation. C. Operational Check.	5-30.1 5-30.1 A 5-30.1 B 5-30.1 C	None
3	Wiring Harness Maintenance:	5-31	None

5-23. STARTING AND STARTING CONTROL MAINTENANCE TASK SUMMARY.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

EQUIPMENT CONDITION PARAGRAPH

CONDITION DESCRIPTION

5-37A. Battery Disconnected. 11-14A or C. Left Fender Removed.

TEST EQUIPMENT

None.

<u>SPECIAL TOOLS</u> Small Flat Tip Punch.

MATERIALS/PARTS (P/N)

Gasket (5330-00-143-7737). Nylon Rope (10 feet). Gasket (5330-00-252-3274).

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20 P.

REFERENCES (TROUBLESHOOTING)

Table 5-2,4-1, 5-3.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission in Neutral. Park Brake Set.

TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)		
1	Starter Motor Maintenance:	5-32	4-1		
	A. Removal.	5-32A	5-2		
	B. Installation.	5-32B			
	C. Operational Check.	5-32C			
2	Starter Relay Maintenance:	5-33	5-2		
	A. Removal.	5-33A			
	B. Installation.	5-33B			
	C. Operational Check.	5-33C			

5-23. STARTING AND STARTING CONTROL MAIN	TENANCE TAS	K SUMMARY (Continued).
LIST OF TASK	KS	
TASK NO. TASK	TIM K REF	TROUBLESHOOTING REF (TABLE)
3 Starter Button Maintenance:	5-34	5-2
A. Removal. B. Installation. C. Operational Check.	5-34A 5-34B 5-34C	
4 Engine Run Switch Maintenance:	5-35	4-1
A. Removal. B. Installation. C. Operational Check.	5-35A 5-35B 5-35C	
5 Ether Button Maintenance:	5-36	5-3
A. Removal. B. Installation. C. Operational Check.	5-36A 5-36B 5-36C	

5-24. BATTERIES AND ALTERNATOR MAINTENANCE TASK SUMMARY.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

EQUIPMENT CONDITION PARAGRAPH

11-14 A&C.

CONDITION DESCRIPTION

Right Front Fender Removed.

All.

TEST EQUIPMENT

Battery Charger. **SPECIAL TOOLS**

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REWIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

REFERENCES (TROUBLESHOOTING)

Table 5-1, 5-5.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off. Park Brake Set.

Transmission in Neutral.

TASK NO.		TASK	TASK REF	TROUBLESHOOTING REF (TABLE)		
1	Discor	nect Batteries:	5-37	5-1		
	Α.	Removal.	5-37A			
	В.	Installation.	5-37B			
	C.	Operational Check.	5-37C			
	I					

5-24. E	BATTERIES AND ALTERNATOR MAINTENANCE	TASK SUMM	ARY (Continued).				
	LIST OF TASKS						
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)				
2	Battery Maintenance:	5-38	5-1				
	A. Removal.	5-38A					
	B. Cleaning.	5-38B					
	C. Inspection.	5-38C					
	D. Charging.	5-38D					
	E. Installation.	5-38E					
3	Battery Cables Maintenance:	5-39	5-1				
	A. Removal.	5-39A					
	B. Installation.	5-39B					
	C. Operational Check.	5-39C					
4	Battery Box Latch Maintenance:	5-40					
	A. Removal.	5-40A					
	B. Installation.	5-40B					
	C. Operational Check.	5-40C					
5	Battery Box Cover Maintenance:	5-41					
	A. Removal.	5-41A					
	B. Installation.	5-41B					
	C. Checking Fit.	5-41C					
6	Battery Box Maintenance:	5-42					
	A. Removal.	5-42A					
	B. Installation.	5-42B					
7	Alternator Maintenance:	5-43	5-5				
	A. Removal.	5-43A					
	B. Installation.	5-43B					
	C. Operational Check.	5-43C					

5-25. EXTERIOR LIGHTING MAINTENANCE TASK SUMMARY.

INITIAL SETUP APPLICABLE CONFIGURATIONS

EQUIPMENT CONDITION PARAGRAPH

CONDITION DESCRIPTION

ΑII

5-37A. 5-44A. Battery Disconnected. Headlamp Removed if Wire (3) is to be Removed.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

- 1. 35 W-12V Bulb GE 4419 (or equal).
- 2. Non Flammable Cleaning Solvent, (Refer to Appendix C).
- 3. Bearing Grease (Refer to Appendix C).
- 4. Tape.
- 5. Marking Pen.

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-20P. LO 9-2320-273-12.

TM 9-2320-273-10.

REFERENCES (TROUBLESHOOTING)

Table 5-8, 5-9, 5-10, 5-11, 5-13, 5-14.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Park Brake Set. Engine Off.

Transmisison in Neutral.

TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
1	Headlamps Maintenance:	5-44	5-8
	A. Removal.	5-44A	
	B. Installation.	5-44B	
	C. Operational Check.	5-44C	
2	Front Turn and Marker Lamps Maintenance:	5-45	5-9 5-11
	A. Removal.	5-45A	
	B. Installation.	5-45B	
	C. Operational Check.	5-45C	

5-25. EXTERIOR LIGHTING MAINTENANCE TASK SUMMARY (Continued).			
	LIST OF TASI	KS	
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
3	Rear Lamp Assembly Maintenance:	5-46	5-10
	A. Removal.	5-46A	
	B. Installation.	5-46B	
	C. Operational Check.	5-46C	
4	Clearance Lamps Maintenance:	5-47	5-9
	A. Removal.	5-47A	
	B. Installation.	5-47B	
	C. Operational Check.	5-47C	
5	Blackout Headlamp Maintenance:	5-48	5-13
	A. Removal.	5-48A	
	B. Installation.	5-48B	
	C. Operational Check.	5-48C	
6	Blackout Marker Lamps Maintenance:	5-49	5-13
	A. Removal.	5-49A	
	B. Installation.	5-49B	
	C. Operational Check.	5-49C	
7	Blackout Tail and Stop Lamps Maintenance:	5-50	5-13
	A. Removal.	5-50A	
	B. Installation.	5-50B	
	C. Operational Check.	5-50C	
8	Stationary Work lamp Bulb Replacement:	5-51	5-14
	A. Removal.	5-51A	
	B. Installation.	5-51 B	
	C. Operational Check.	5-51C	
9	Stationary Worklamp Replacement:	5-52	5-14
	A. Removal.	5-52A	
	B. Installation.	5-52B	
	C. Operational Check.	5-52C	

LIST OF TASK	(8	
TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
Portable Work Lamp Bulb Replacement:	5-53	5-14
A. Removal.	5-53A	
B. Installation.	5-53B	
C. Operational Check.	5-53C	
Portable Work Lamp Maintenance:	5-54	5-14
A. Disassembly.	5-54A	
B. Assembly.	5-54B	
C. Operational Check.	5-54C	
Trailer Lamp Connector Maintenance (12 and 24 Volt):	5-55	5-10
A Pamoval (24 Volt Connector)	5-55A	
` ,	5-55B	
C. Inspection (24 Volt and 12 Volt).	5-55C	
D. Installation (24 Volt Connector).	5-55D	
,	5-55E	
r. Test 24 voit and 12 voit).	5-55F	
	TASK Portable Work Lamp Bulb Replacement: A. Removal. B. Installation. C. Operational Check. Portable Work Lamp Maintenance: A. Disassembly. B. Assembly. C. Operational Check. Trailer Lamp Connector Maintenance (12 and 24 Volt): A. Removal (24 Volt Connector). B. Removal (12 Volt Connector). C. Inspection (24 Volt and 12 Volt).	TASK REF Portable Work Lamp Bulb Replacement: 5-53 A. Removal. 5-53A B. Installation. 5-53B C. Operational Check. 5-53C Portable Work Lamp Maintenance: 5-54 A. Disassembly. 5-54A B. Assembly. 5-54B C. Operational Check. 5-54C Trailer Lamp Connector Maintenance (12 and 24 Volt): 5-55B C. Inspection (24 Volt Connector). 5-55B C. Inspection (24 Volt Connector). 5-55C D. Installation (24 Volt Connector). 5-55D E. Installation (12 Volt Connector). 5-55E

5-26. CAB INTERIOR LIGHTING AND SWITCH MAINTENANCE TASK SUMMARY.

None.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

EQUIPMENT CONDITION PARAGRAPH

CONDITION DESCRIPTION

None.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

REFERENCES (TROUBLESHOOTING)

Table 5-8, 5-11, 5-14.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission in Neutral.

Park Brake Set.

TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
1	Dome Lamp Maintenance:	5-56	5-14
	A. Removal.	5-56A	
	B. Installation.	5-56B	
	C. Operational Check.	5-56C	
2	Headlamp Dimmer Switch Maintenance:	5-57	5-8
	A. Removal.	5-57A	
	B. Installation.	5-57B	
	C. Operational Check.	5-57C	

5-26. C	5-26. CAB INTERIOR LIGHTING AND SWITCH MAINTENANCE TASK SUMMARY (Continued).				
	LIST OF TASKS				
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)		
3	Turn Signal Control Maintenance:	5-58	5-11		
	A. Removal. B. Installation. C. Operational Check.	5-58A 5-58B 5-58C			

5-27. PANEL-MOUNTED INSTRUMENTS MAINTENANCE TASK SUMMARY.

INITIAL SETUP

EQUIPMENT CONDITION APPLICABLE CONFIGURATIONS PARAGRAPH

5-37A.

CONDITION DESCRIPTION

Battery Disconnected.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Seven Day Disk Pack (7530-01-060-1628).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10

REFERENCES (TROUBLESHOOTING)

Table 5-6, 5-7, 5-9, 5-14.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission in Neutral.

Park Brake Set.

TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
1	Electrical Instruments Maintenance (LH Cluster):	5-59	5-7
	A. Removal.	5-59A	
	B. Installation.	5-59B	
	C. Operational Check.	5-59C	
2	Cigar Lighter Maintenance:	5-60	5-14
	A. Removal.	5-60A	
	B. Installation.	5-60B	
	C. Operational Check.	5-60C	

5-27.	PANEL-MOUNTED INSTRUMENTS MAINTENA	NCE TASK SUMM	IARY (Continued).	
	LIST OF TASKS			
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)	
3.	Low Air Pressure Indicator Lamp Maintenance:	5-61	5-6	
	A. Removal.	5-61A		
	B. Installation.	5-61B		
	C. Operational Check.	5-61C		
4.	Electrical Switches Maintenance (R H Cluster):	5-62	5-6	
	A. Removal.	5-62A		
	B. Installation.	5-62B		
	C. Operational check.	5-62C		
5.	Indicator Lamps Maintenance (R H Cluster):	5-63	5-7	
	A. Removal.	5-63A		
	B. Installation.	5-63B		
	C. Operational Check.	5-63C		
6.	Clearance Lamps Switch Maintenance	5-64	5-9	
	A. Removal.	5-64A		
	B. Installation.	5-64B		
	C. Operational Check.	5-64C		
7.	Clearance Indicator Lamp Maintenance:	5-65	5-9	
	A. Removal.	5-65A		
	B. Installation.	5-65B		
	C. Operational Check.	5-65C		
8.	Tachograph Maintenance:	5-66	5-7	
	A. Reading Tachograph Disk.	5-66A		
	B. Disk Pack Removal.	5-66B		
	C. Disk Pack Installation.	5-66C		
	D. Tachograph Removal.	5-66D		
	E. Tachograph Installation.	5-66E		
	F. Operational Check.	5-66F		

5-28. ELECTRIC HORN AND CAB HEATER CONTROL MAINTENANCE TASK SUMMARY.

PARAGRAPH

INITIAL SETUP

APPLICABLE CONFIGURATIONS

EQUIPMENT CONDITION CONDITION DESCRIPTION

5-37A.

Batteries Disconnected.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

REFERENCES (TROUBLESHOOTING)

Table 5-14.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission in Neutral.

Park Brake Set.

TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
1	Horn Button Maintenance:	5-67	5-14
	A. Removal.	5-67A	
	B. Installation.	5-67B	
	C. Operational Check.	5-67C	
2	Horn Maintenance:	5-68	5-14
	A. Removal.	5-68A	
	B. Installation.	5-68B	
	C. Operational Check.	5-68C	

	LECTRIC HORN AND CAB HEATER CONTRO	L MAINTENANC	CE TASK SUMMARY		
	LIST OF TASKS				
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)		
3	Heater Fan Switch Maintenance:	5-69	5-14		
	A. Removal.	5-69A			
	B. Installation.	5-69B			
	C. Operational Check.	5-69C			

5-29. SENDING UNITS, SWITCHING DEVICES AND WINTERIZATION KIT MAINTENANCE TASK SUMMARY.

INITIAL SETUP EQUIPMENT CONDITION APPLICABLE CONFIGURATIONS PARAGRAPH **CONDITION DESCRIPTION** All. 4-42A. Radiator Drained Below Actuator Level. **TEST EQUIPMENT** 5-37A. Batteries Disconnected. 6-9A. Transmission Oil Drained. None. 6-9C. Cab Floor Inspection Plate Removed. **SPECIAL TOOLS** 9-13A. Air Reservoir Drained. None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C). Gasket, Fuel Level Sending Unit (2013). Container (Approx. 2 gal). 30 Amp Circuit Breaker. 15 Amp Circuit Breaker (3). Gasket (1020803).

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

REFERENCES (TROUBLESHOOTING)

Table 6-1, 5-6, 5-12, 5-7, 12-2, 5-3, 5-11, 5-14.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission in Neutral.

Park Brake Set.

TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
1	Oil Pressure Sending Unit Maintenance:	5-70	5-7
	A. Removal.	5-70A	
	B. Installation.	5-70B	
	C. Operational Check.	5-70C	
2	Oil Pressure Switch Maintenance:	5-71	5-6
	A. Removal.	5-71A	
	B. Installation	5-71B	
	C. Operational Check.	5-71C	

5-29. SENDING UNITS, SWITCHING DEVICES AND WINTERIZATION KIT MAINTENANCE TASK SUMMARY (Continued).

TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
3.	Water Temperature Sending Unit Maintenance:	5-72	5-7
0.	A. Removal.	5-72A	0 1
	B. Installation.	5-72A 5-72B	
	C. Operational Check.	5-72C	
4.	Water Temperature Switch Maintenance:	5-73	5-7
	A. Removal.	5-73A	
	B. Installation.	5-73B	
	C. Operational Check.	5-73C	
5.	Ether Temperature Switch Maintenance:	5-74	5-3
	A. Removal.	5-74A	
	B. Installation.	5-74B	
	C. Operational Check.	5-74C	
6.	Neutral Safety Switch Maintenance:	5-75	6-1
	A. Removal.	5-75A	
	B. Installation.	5-75B	
	C. Operational Check.	5-75C	
7.	Transmission Oil Temperature Sending Unit Maintenance:	5-76	5-7
	A. Removal.	5-76A	
	B. Installation.	5-76B	
	C. Operational Check.	5-76C	
8.	Backup Switch and Clutch Disengagement Sensor Maintenance:	5-77	5-12
	A. Removal.	5-77A	
	B. Installation.	5-77B	
	C. Operational Check.	5-77C	
9.	Backup Alarm Maintenance:	5-78	5-6
	A. Removal.	5-78A	
	B. Installation.	5-78B	
ı	C. Operational Check.	5-78C	

5-29. SENDING UNITS, SWITCHING DEVICES AND WINTERIZATION KIT MAINTENANCE TASK SUMMARY (Continued).

	LIST OF TASKS			
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)	
10	Fuel Level Sending Unit Maintenance:	5-79	5-7	
	A. Removal.	5-79A		
	B. Installation.	5-79B		
	C. Operational Check.	5-79C		
11	Low Air Pressure Buzzer Maintenance:	5-80	5-6	
	A. Removal.	5-80A		
	B. Installation.	5-80B		
	C. Operational Check.	5-80C		
12	Low Air Pressure Switch Maintenance:	5-81	5-6	
	A. Removal.	5-81A		
	B. Installation.	5-81B		
	C. Operational Check.	5-81C		
13	Park Brake Switch Maintenance:	5-82	5-7	
	A. Removal.	5-82A		
	B. Installation.	5-82B		
	C. Operational Check.	5-82C		
14	Differential Lock-Up Switch Maintenance:	5-83	5-7	
	A. Removal.	5-83A		
	B. Installation.	5-83B		
	C. Operational Check.	5-83C		
15	Power Takeoff (PTO) Switch Maintenance:	5-84	12-2	
	A. Removal.	5-84A		
	B. Installation.	5-84B		
	C. Operational Check.	5-84C		
16	Stop Lamp Switch Maintenance:	5-85	5-11	
	A. Removal.	5-85A		
	B. Installation.	5-85B		
	C. Operational Check.	5-85C		

5-29. SENDING UNITS, SWITCHING DEVICES AND WINTERIZATION KIT MAINTENANCE TASK SUMMARY (Continued).

LIST OF TASKS					
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)		
17	Instrument Relay Maintenance:	5-86	None		
	A. Removal.	5-86A			
	B. Installation.	5-86B			
	C. Operational Check.	5-86C			
18	Winterization Kit Circuit Breakers, Box, and Receptacle Maintenance:	5-87	5-14		
	A. Removal of Circuit Breakers.	5-87A			
	B. Installation of Circuit Breakers.	5-87B			
	C. Operational Check.	5-87C			
	D. Removal of Circuit Breaker Box and Receptacle.	5-87D			
	E. Installation of Circuit Breaker Box and Receptacle.	5-87E			
	F. Operational Check.	5-87F			
19	Winterization Kit Transmission Oil Heater		5-14		
13	Maintenance:	5-88	5-14		
	A. Removal of Heater.	5-88A			
	B. Installation of Heater.	5-88B			
	C. Operational Check.	5-88C			
20	Winterization Kit Engine Oil Heater Thermostat Maintenance:	5-89	5-14		
	A. Removal of Thermostat.	5-89A			
	B. Installation of Thermostat.	5-89B			
	C. Operational Check.	5-89C	5-14		
21	Winterization Kit Engine Coolant Heater Maintenance:	5-90	J-14		
	A. Removal of Heater.	5-90A			
	B. Installation of Heater.	5-90B			
	C. Operational Check.	5-90C	5-14		
22	Winterization Kit Battery Box Heater Maintenance:	5-91			
l	A. Removal of Heater.	5-91A			
	B. Installation of Heater.	5-91B			
	C. Operational Check.	5-91C			

5-29. SENDING UNITS, SWITCHING DEVICES AND WINTERIZATION KIT MAINTENANCE TASK SUMMARY (Continued).

LIST OF TASKS					
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)		
23	Winterization Kit Battery Box Thermostat and Terminal Strip Maintenance:	5-92	5-14		
	A. Removal.	5-92A			
	B. Installation.	5-92B			
	C. Operational Check.	5-92C			
24	Winterization Kit Battery Box Insulation Maintenance:	5-93	None		
	A. Removal.	5-93A			
	B. Cleaning.	5-93B			
	C. Installation.	5-93C			

This page intentionally left blank.

CIRCUIT BREAKERS AND WIRING.

5-30. CIRCUIT BREAKER MAINTENANCE. (M915, M916, and M920)

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

(4)

b. Installation.

(4)

c. Operational Check. (2)

10 Minutes Total.

INITIALSETUP

APPLICABLE CONFIGURATIONS

M915, M916, and M920 - (9) Circuit Breakers

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

Batteries Disconnected.

PARAGRAPH

5-37A.

PERSONNEL REQUIRED One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.
Transmission on Neutral.

Park Brake Set.

Always disconnect batteries to prevent electrical shorts when working in the circuit breaker area. An electrical short or arc can cause damage to wiring and other elec-

trical components.

TROUBLESHOOTING REFERENCES

None.

CIRCUIT BREAKERS AND WIRING.

5-30. CIRCUIT BREAKER MAINTENANCE (M915, M916, and M920) (Continued).

LOCATION/ITEM ACTION REMARKS

A. REMOVAL.



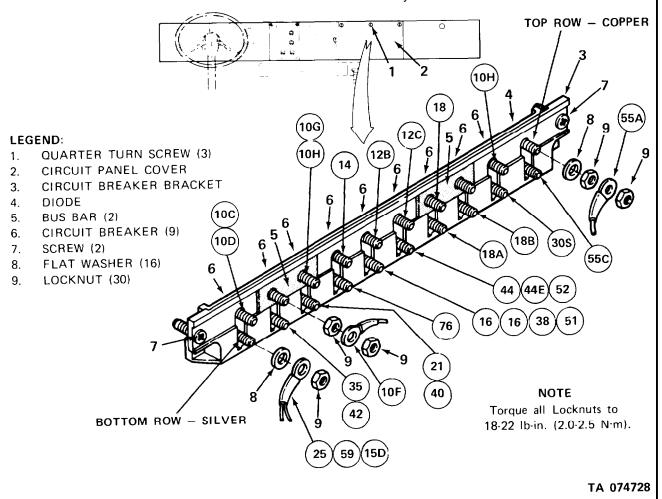
To prevent electrical shorts and damage to wiring or other components, always: use one flat washer and two locknuts on the top row of terminal studs (copper), except no flat washer is used where a bus bar is present. Use one flat washer and one locknut on the bottom row of terminal studs (silver).

Connect wire terminals to the correct circuit breaker or diode and to the correct color terminal stud as illustrated.

NOTE

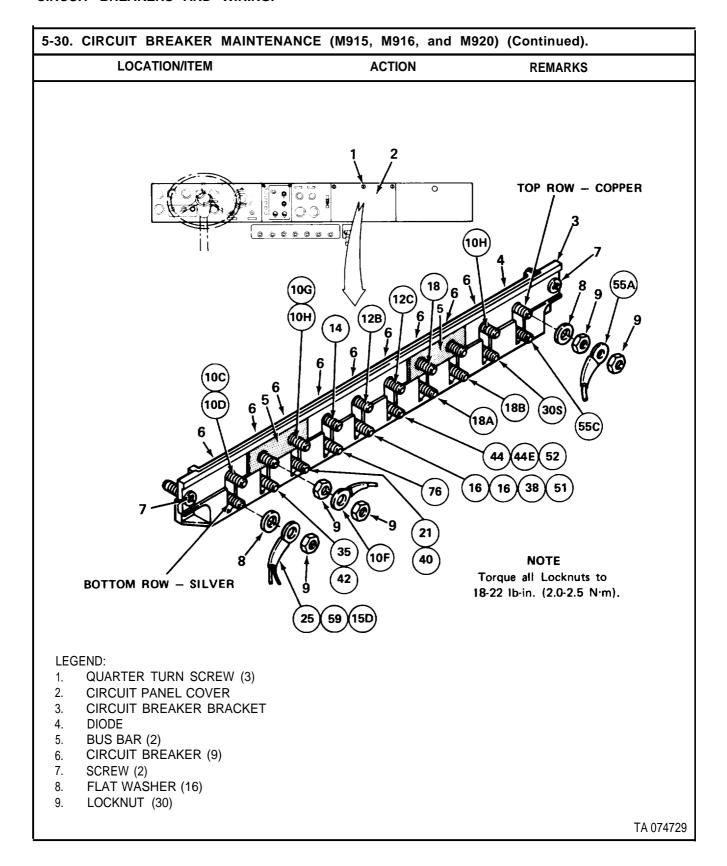
Circled numbers in the illustration are wire numbers, while uncircled numbers are legend items.

Wire number 15D used on M916 and M920 only.



CIRCUIT BREAKERS AND WIRING.

5-30. CIRCUIT BREAKER MAINTENANCE (M915, M916, AND M920) (CONTINUED).							
LOCATION/ITEM	ACTION	REMARKS					
A. REMOVAL (Continued).							
 Three quarter turn screws (1). Circuit Panel cover (2). Two screws (7). Three locknuts (9) and two flat washers (8). 	Loosen. Lower. Remove from circuit breaker bracket (3). a. Unscrew from diode (4) or circuit breaker (6). b. Remove wire terminals. c. Remove diode (4) or circuit breaker (6).	Only one flat washer (8) is used when a bus bar (5) is present. Also remove bus bar (5) if used.					
B. INSTALLATION.							
5. Diode (4) or circuit breaker (6).	a. Install in circuit breaker bracket (3).b. Position bus bar (5) if used.c. Install wire terminals.	Install per illustration, assuring the copper terminal stud is on top and the silver is on the bottom. Ensure wire terminals are connected to the correct circuit breaker or diode and to the correct color terminal stud.					
	d. Secure with two flat washers (8) and three locknuts (9); torque each locknut to 18-22 lb-in. (2.0-2.5 N•m).	Only one flat washer (8) used when a bus bar (5) is present.					
6. Circuit breaker bracket (3).	a. Aline mounting holes.b. Secure with two screws (7).						
7. Circuit panel cover (2).8. Three quarter turn screws (1).9. Batteries.	Raise into position. Tighten. Connect per paragraph 5-37B.						
C. OPERATIONAL CHECK. 10. Circuit breaker (6) or diode (4).	Refer to paragraph 2-34 and 2-35; check the operation of the circuit breaker or diode replaced.						



5-30.1 CIRCUIT BREAKER MAINTENANCE. (M917, M918, AND M919)

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a.Removal. (4) b.Installation. (4)

c. Operational Check. (2)

10 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M917, M918, M919 – (7) Circuit Breakers.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

None.

EQUIPMENT CONDITION PARAGRAPH

5-37A .

CONDITION DESCRIPTION

Batteries Disconnected.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission on Neutral.

Park Brake Set.

Always disconnect batteries to prevent electrical shorts when working in the circuit breaker area. An electrical short or arc can cause damage to wiring and other elec-

trical components.

5-30.1 CIRCUIT BREAKER MAINTENANCE (M917, M918, AND M919) (Continued).

LOCATION/ITEM ACTION REMARKS

A. REMOVAL.

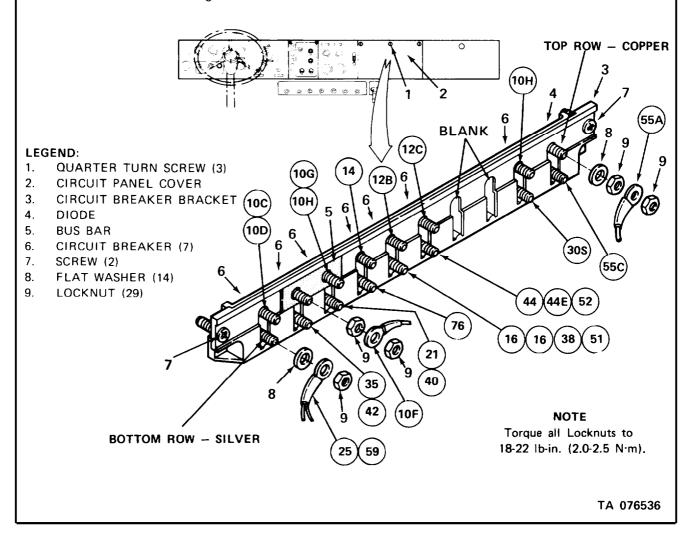


To prevent electrical shorts and damage to wiring or other components, always: use one flat washer and two locknuts on the top row of terminal studs (copper), except no flat washer is used where a bus bar is present. Use one flat washer and one locknut on the bottom row of terminal studs (silver).

Connect wire terminals to the correct circuit breaker or diode and to the correct color terminal stud as illustrated.

NOTE

Circled numbers in the illustration are wire numbers, while uncircled numbers are legend items.



5-30.1 CIRCUIT BREAKER MAIN	TENANCE (M917, M918, AND	M919) (CONTINUED).
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued). 1. Three quarter turn screws (1). 2. Circuit Panel cover (2). 3. Two screws (7). 4. Three locknuts (9) and two flat washers (8).	Loosen. Lower. Remove from circuit breaker bracket (3). a. Unscrew from diode (4) or circuit breaker (6). b. Remove wire terminals. c. Remove diode (4) or circuit breaker (6).	Only one flat washer (8) is used when a bus bar (5) is present. Also remove bus bar (5) if used.
B. INSTALLATION. Diode (4) or circuit breaker (6).	 a. Install in circuit breaker bracket (3). b. Position bus bar (5) if used. c. Install wire terminals. d. Secure with two flat washers (8) and three 	Install per illustration, assuring the copper terminal stud is on top and the silver is on the bottom. Ensure wire terminals are connected to the correct circuit breaker or diode and to the correct color terminal stud. Only one flat washer (8) used when a bus bar (5) is present.
6. Circuit breaker bracket (3).	locknuts (9); torque each locknut to 18-22 lb-in. (2.0-2.5 N•m).	when a bas bar (e) is present.
7. Circuit panel cover (2). 8. Three quarter turn screws (1). 9. Batteries.	b. Secure with two screws (7).Raise into position.Tighten.Connect per paragraph 5-37 B.	
C. OPERATIONAL CHECK. 10. Circuit breaker (6) or diode (4).	Refer to paragraph 2-34 and 2-35; check the operation of the circuit breaker or diode replaced.	

5-30.1 CIRCUIT BREAKER MAINTENANCE (M917, M918, AND M919) (Continued). LOCATION/ITEM **ACTION REMARKS** TOP ROW - COPPER **BLANK** (12B) 76 38 NOTE Torque all Locknuts to **BOTTOM ROW - SILVER** 18-22 lb-in. (2.0-2.5 N·m). 59 LEGEND: QUARTER TURN SCREW (3) CIRCUIT PANEL COVER 3. CIRCUIT BREAKER BRACKET DIODE 4. 5. **BUS BAR** 6. CIRCUIT BREAKER (7) 7. SCREW (2) 8. FLAT WASHER (14) TA 076535 9. LOCKNUT (29)

5-31. WIRING HARNESS MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

See Appendix D for Harness Routing and Location.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

None.

EQUIPMENT CONDITION

PARAGRAPH 5-37A. CONDITION DESCRIPTION

Batteries Disconnected.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission In Neutral.

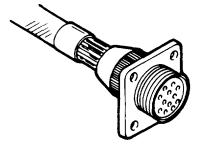
Park Brake Set.

5-31. WIRING HARNESS MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

NOTE

For removal and installation of vehicle wiring harness, refer to Appendix D for harness routing and location. Illustrated below are typical connectors and terminals used on the vehicle wiring harness. Use standard shop maintenance procedures in removing all harness clamps and cable ties.



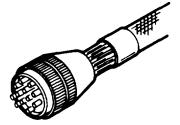
FEMALE TYPE RECEPTACLE BAYONET COUPLING



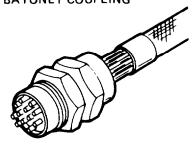
FEMALE TYPE RECEPTACLE BAYONET COUPLING



TERMINAL TYPE CONNECTOR



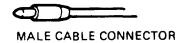
MALE TYPE CONNECTOR PLUG BAYONET COUPLING



MALE TYPE CONNECTOR PLUG BAYONET COUPLING



FEMALE CABLE CONNECTOR

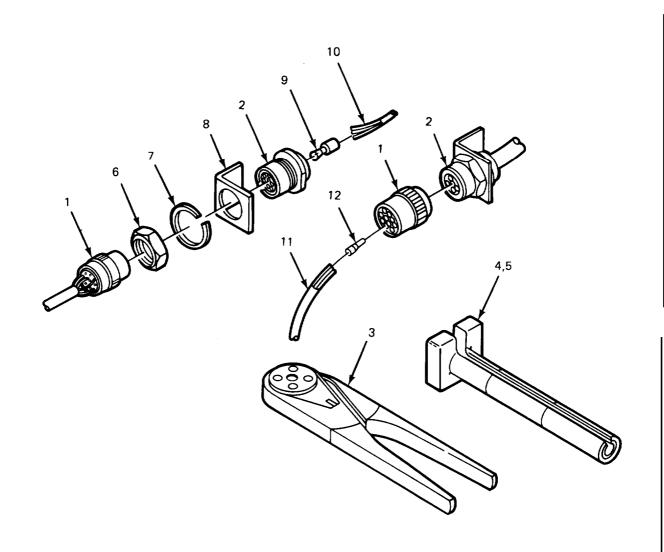


TA 074730

ELECTRICAL SYSTEM.

5-31.1. WIRING HARNESS REPAIR.

LOCATION/ITEM **ACTION REMARKS**



LEGEND:

- 1. CONNECTOR PLUG
- 2. CONNECTOR RECEPTACLE
- 3. CRIMPING TOOL
- 4. CONTACT REMOVAL TOOL (SIZE #12) 10. WIRE (AS REQUIRED)
- 5. CONTACT REMOVAL TOOL (SIZE #16) 11. WIRE (AS REQUIRED)
- 6. HEXAGON NUT

- 7. LOCKWASHER
- 8. BRACKET
- 9. TERMINAL (AS REQUIRED)

- 12. TERMINAL PIN (AS REQUIRED)

TA 237221

ELECTRICAL SYSTEM.

5-31.1. WIRING HARNESS REPAIR (Continued).

LOCATION/ITEM	ACTION	REMARKS	

A. CIRCULAR CONNECTOR PLUG REPAIR.				
NOTE				
	Use this procedure to repair any one of the connector plugs.			
1. Connector plug (1).	Unscrew and remove from connector receptacle (2).			
2. Terminal pin (12).	Using contact removal tool (4) or (5), pull out from rear side of connector plug (1).	If connector plug (1) is being replaced, repeat this step until all terminal pins (12) have been removed. Be sure to tag wires (11).		
3. All parts.	Clean and inspect.	If any terminal pins (12) are damaged, perform steps (4) and (5).		
4. Terminal pin (12).	Remove from wire (11) and discard.			
5. New terminal pin (12).	Using crimping tool (3), install onto wire (11).	Be careful not to damage terminal pin (12) during this step.		
6. Terminal pin (12).	Push into rear end of connector plug (1) until it snaps into place.	If connector plug (1) is new, repeat this step until all terminal pins (12) have been installed. Check the mating side of connector plug (1) to make sure all connector receptacles (2) are on the same level.		
7. Connector plug (1).	Line up slots with pins on connector receptacle (2) and screw in until it clicks into place.			

ELECTRICAL SYSTEM.

ELECTRICAL SYSTEM.			
5-31.1. WIRING HARNESS REPAIR (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
B. CIRCULAR CONNECTOR REC	EPTACLE REPAIR.		
	NOTE		
	this procedure to repair any one ne connector receptacles.		
1. Connector plug (1).	Unscrew and remove from connector receptacle (2).		
Hexagon nut (6) and lockwasher (7).	Unscrew and remove from connector receptacle (2).		
3. Connector receptacle (2).	Remove from bracket (8).		
4. Terminal (9).	Using contact removal tool (4) or (5), pull out from rear side of connector receptacle (2).	If connector receptacle (2) is being replaced, repeat this step until all terminals (9) have been removed. Be sure to tag wires (10).	
5. All parts.	Clean and inspect.	If any terminals (9) are damaged, do steps 6 and 7.	
6. Terminal (9).	Remove from wire (10) and discard.		
7. New terminal (9).	Using crimping tool (3), install onto wire (10).	Be careful not to damage terminal (9) during this step.	
8. Terminal (9).	Push into rear end of connector receptacle (2) until it snaps into place.	If connector receptacle (2) is new, repeat this step until all terminals (9) have been in- stalled. Check the mating side of connector receptacle (2) to make sure all terminals (9) are on the same level.	
9. Connector receptacle (2).	a. Position on bracket (8).b. Secure with hexagon nut (6) and lockwasher (7).		
10. Connector plug (1).	Line up slots with pins on con- nector receptacle (2) and screw on until it clicks into place.		

5-32. STARTER MOTOR MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (30) b. Installation. (30)

c. Operational Check. (2)

62 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

- 1. Gasket (5330-00-143-7737).
- 2. Nylon Rope (10 Feet).
- 3. Gasket (5330-00-252-3274).

EQUIPMENT CONDITION PARAGRAPH

5-37A. 11-14A&C.

CONDITION DESCRIPTION

Batteries Disconnected. Left Fender Removed.

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10, TM 9-2320-273-20P.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF. Park Brake Set. Transmission In Neutral.

TROUBLESHOOTING REFERENCES

Table 4-1, 5-2.

5-32. STARTER MOTOR MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM **WARNING** Disconnect battery cables before removing starter. A. REMOVAL. 1. Two hex nuts (9) Remove. and washers (8). Remove. 2. Five wires (10) and ground strap (7). 10 WIRE 46B **WIRE 17 STARTER** SOLENOID, LEGEND: WIRE 46E 1. BOLT (3) 2. WASHER (3) **BLACK** 3. GASKET **BATTERY CABLE** 4. SPACER 5. GASKET **STARTER** 6. STARTER MOTOR MOTOR-7. GROUND STRAP 8. WASHER (2) 9. HEX NUT (2) 10. WIRE (5) TA 074731

LOCATION/ITEM	ACTION	REMARKS
REMOVAL (Continued).	NOTE	
	Wrap rope around starter motor mechanic holds rope while second anic performs steps 3, 4, 7, and	ond mech-
3. Three bolts (1) and washers (2).	Remove.	
4. Starter motor (6).	Remove.	
5. Gasket (3), spacer (4), and gasket (5).	Remove.	Discard gaskets (3) and (5).
INSTALLATION.		
6. New gasket (3), spacer (4) and new gasket (5).	, Aline and install on starter motor (6).	
7. Starter motor (6).	Aline and install.	
8. Three washers (2) and bolts (1) .	Install and tighten.	
9. Five wires (10) and ground strap (7).	Install on starter motor (6) according to figure.	
10. Two washers (8) and hex nuts (9).	Install and tighten.	
11. Batteries.	Connect per paragraph 5	5-37B.
OPERATIONAL CHECK.		
12. Engine.	Start up (see TM 9-2320 Verify that starter motor engages.	
	NOTE	
	Follow-on maintenance action Install left fender, para 11-	

5-32. STARTER MOTOR MAINTENANCE	(Continued).	
LOCATION/ITEM	ACTION	REMARKS
	NOTE	
Follow-on Replace	maintenance action red fender, para 11-14.	quired:
10 WIRE 46B STARTER SOLENOID WIRE 46B 9	8 6	
STARTER MOTOR	BLACK BATTERY CABLE	LEGEND: 1. BOLT (3) 2. WASHER (3) 3. GASKET
MOTOR) -	4. SPACER 5. GASKET 6. STARTER MOTOR 7. GROUND STRAP 8. WASHER (2) 9. HEX NUT (2) 10. WIRE (5)
		TA 074732

5-33. STARTER RELAY MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REWIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. b. Installation.

(5) (5)

c. Operational Check.

(2)

12 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

ΑII

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES Table 5-2.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

Batteries Disconnected.

PARAGRAPH

5-37A.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Park Brake Set.

5-33. STARTER RELAY MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM REMOVAL. 1. Three quarter-turn Loosen. screws (1). Lower hinged panel. 2. Circuit panel cover (2). 3. Four hex nuts (6) Remove. and washers (7). [O]10 WIRE 18 LEGEND: 1. QUARTER TURN SCREW (3) 2. CIRCUIT PANEL COVER WIRE 46C 3. HEX NUT (2) WIRE 47B 4. WASHER (2) 5. BOLT (2) HEX NUT (4) WIRE 46= WASHER (4) 7. 8. WIRE (5) 9. STARTER RELAY 10. ENGINE START BUTTON 11. ENGINE RUN SWITCH WIRE 46D TA 074733

5-33. STARTER RELAY MAINTENANCE (Continued).		
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
4. Five wires (8).	Remove.	
5. Two bolts (5), washers (4), and hex nuts (3).	Remove.	
6. Starter relay (9).	Remove.	
B. INSTALLATION.		
7. Starter relay (9).	Set relay in place and aline mounting holes.	
8. Two bolts (5), washers (4), and hex nuts (3).	Install and tighten.	
9. Five wires (8).	Connect wires according to figure.	
10. Four washers (7) and hex nuts (6).	Replace and tighten.	
11. Circuit panel cover (2).	Raise into place.	
Three quarter-turn screws (1).	Tighten.	
13. Batteries.	Connect per paragraph 5-37B.	

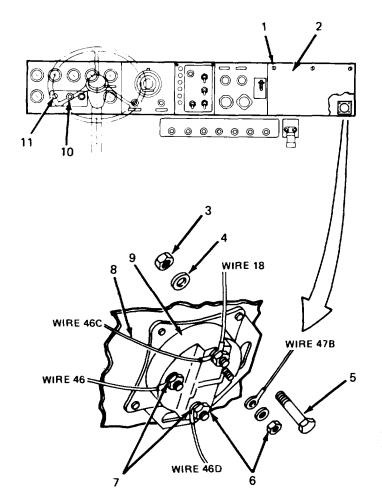
5-33. STARTER RELAY MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

C. OPERATIONAL CHECK.

14. ENGINE RUN switch (11). Turn ON.

15. ENGINE START button (10). Depress momentarily and observe that the starter motor engages.



LEGEND:

- 1. QUARTER TURN SCREW (3)
- 2. CIRCUIT PANEL COVER
- 3. HEX NUT (2)
- 4. WASHER (2)
- 5. BOLT (2)
- 6. HEX NÙT (4)
- 7. WASHER (4)
- 8. WIRE (5)
- 9. STARTÈR RELAY
- 10. ENGINE START BUTTON
- 1. ENGINE RUN SWITCH

TA 074734

5-34. ENGINE START BUTTON MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (5) b. Installation. (5)

c. Operational Check. (2)

12 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

Table 5-2.

EQUIPMENT CONDITION

PARAGRAPH _____

5-37A.

CONDITION DESCRIPTION
Batteries Disconnected.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

5-34. ENGINE START BUTTON MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** A. REMOVAL. 1. Four quarter-turn Loosen. screws (1). 2. Hinged instrument Lower. panel (2). LEGEND: QUARTER TURN SCREW (4) WIRE 46C WIRE 46A HINGED INSTRUMENT PANEL 2. WIRE 55C 3. SCREW (2) WIRE 46F 4. WASHER (2) 5. WIRE (4) 6. STARTER BUTTON • 6 7. ADJUSTING HEX NUT 8. KNURLED NUT **ENGINE RUN SWITCH INSTRUMENT PANEL** 8

TA 074735

5-34. ENGINE START BUTTON MAINTENANCE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
A. REMOVAL (Continued).			
3. Two screws (3) and washers (4).	Remove.		
4. Four wires (5).	Remove.		
5. Knurled nut (8).	Remove,		
6. Starter button (6).	Remove.		
7. Adjusting hex nut (7).	Remove.		
B. INSTALLATION.			
8. Adjusting hex nut (7).	Adjust to proper depth on starter switch to allow installation of knurled nut (8).		
9. Starter button (6).	Replace in panel.		
10. Knurled nut (8).	Install and tighten.		
11. Four wires (5), two washers (4) and screws (3).	Install according to figure and tighten.		
Hinged instrument panel (2).	Raise into place.		
13. Four quarter-turn screws (1).	Tighten.		

5-34. ENGINE START BUTTON MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

NOTE

Follow-on maintenance:

a. Hook up batteries; refer to para. 5-37B.

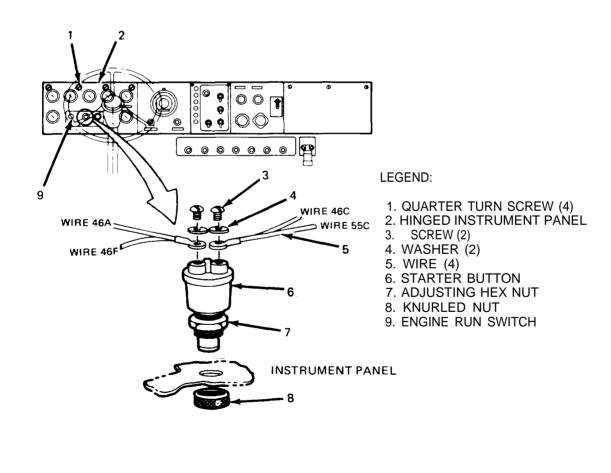
C. OPERATIONAL CHECK.

14. ENGINE RUN switch (9).

Turn ON.

15. ENGINE START button (6).

Depress momentarily and observe that the starter motor engages.



TA 074736

5-35. ENGINE RUN SWITCH MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

(5) b. Installation. (5)

c. Operational Check. (2)

12 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

TEST EQUIPMENT

None.

SPECIAL TOOLS Small Flat Tip Punch.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

Table 4-1.

EQUIPMENT CONDITION

PARAGRAPH

5-37A .

CONDITION DESCRIPTION

Batteries Disconnected.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

5-35. ENGINE RUN SWITCH MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** A. REMOVAL. 1. Four quarter-turn screws (1). Loosen. 2. Hinged instrument panel (2). Lower. 3. Wire connector (4) and two wires (3). Remove. 4. Hex nut (8). Remove. 5. ENGINE RUN switch (5). Remove from instrument panel. 6. Lock cylinder (7). Place switch in ON position. Insert flat tip punch in cylinder extraction hole (6) and remove lock cylinder (7). LEGEND: **WIRE 12C** 1. QUARTER TURN SCREW (4) **WIRE 14** 2. HINGED INSTRUMENT PANEL 3. WIRE (2) WIRE 10G **INSTRUMENT** 4. WIRE CONNECTOR WIRE 12A **PANEL** 5. ENGINE RUN SWITCH 6. CYLINDER EXTRACTION HOLE WIRE 12B 7. LOCK CYLINDER 8. HEX NUT TA 074737

5-35. ENGINE RUN SWITCH MAINTENANCE (Continued). **REMARKS ACTION** LOCATION/ITEM B. INSTALLATION. Aline lock cylinder (7) 7. ENGINE RUN switch (5). and press into switch. 8. ENGINE RUN switch (5). Aline and insert in instrument panel. 9. Hex nut (8). Install and tighten. Install on switch. 10. Wire connector (4) and wires (3). 11. Hinged instrument panel (2). Raise into place. 12. Four quarter-turn screws (1). Tighten. 13. Batteries. Connect per paragraph 37B. C. OPERATIONAL CHECK. 14. Engine Start up (see TM 9-2320-273-10). Verify that all circuits are operational. LEGEND: WIRE 12C 1. QUARTER TURN SCREW (4) **WIRE 14** 2. HINGED INSTRUMENT PANEL WIRE 10G 3. WIRE (2) INSTRUMENT 4. WIRE CONNECTOR WIRE 12A **PANEL** ENGINE RUN SWITCH 6. CYLINDER EXTRACTION HOLE WIRE 12B 7. LOCK CYLINDER 8. HEX NUT TA 074738

This page intentionally left blank.

5-36. ETHER BUTTON MAINTENANCE.

(5)

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

b. Installation. (5)

c. Operational Check. (5)

15 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

None.

SPECIAL TOOLS

TEST EQUIPMENT

None.

MATERIALS/PARTS (P/N)

PERSONNEL REQUIRED

One (M OS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES Table 5-3.

EQUIPMENT CONDITION

PARAGRAPH

5-37A .

Batteries Disconnected.

CONDITION DESCRIPTION

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

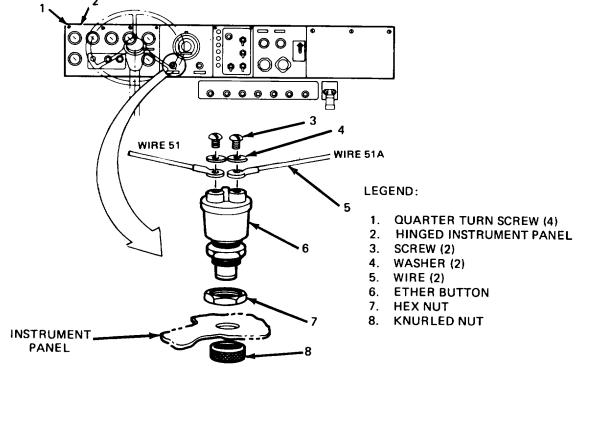
GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Sat.

5-36. ETHER BUTTON MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** A. REMOVAL. 1. Four quarter turn screws (1). Loosen. 2. Hinged instrument panel (2). Lower hinged panel. 3. Knurled nut (8). Remove. 4. ETHER button (6). Remove. 5. Hex nut (7). Remove. 6. Two screws (3) Remove. and washers (4). 7. Two wires (5). Remove.



TA 074739

5-36. ETHER BUTTON MAINTENANCE (Continued).		
LOCATION/ITEM	ACTION	REMARKS
B. INSTALLATION.		
8. Two wires (5).	Place on ETHER button (6).	
9. Two washers (4) and screws (3).	Install and tighten.	
10. Hex nut (7).	Install and adjust to proper depth on ETHER button (6) to allow installation of knurled nut (8).	1
11. ETHER button (6).	Install in instrument panel.	
12. Knurled nut (8).	Install and tighten.	
13. Hinged instrument panel(2).	Raise into place.	
14. Four quarter turn screws (1).	Tighten.	
15. Batteries.	Connect per paragraph 5-37B.	
C. OPERATIONAL CHECK.		
16. Engine.	Start up using cold start procedure (see TM 9-2320-273-10).	
WIRE 51	2. H 3. S 4. W 5. W 6. E 7. H	ND: DUARTER TURN SCREW (4) HINGED INSTRUMENT PANEL SCREW (2) VASHER (2) VIRE (2) ETHER BUTTON HEX NUT KNURLED NUT
PANEL	8	TA 074740

This page intentionally left blank.

BATTERIES AND ALTERNATOR MAINTENANCE.

5-37. DISCONNECT BATTERIES.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

- a. Removal.
- (5) (5)
- b. Installation.
- c. Operational Check. (2)

12 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

None.

PARAGRAPH

None.

REFERENCES (TM)

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 5-1.

5-37. DISCONNECT BATTERIES (Continued). **ACTION REMARKS** LOCATION/ITEM **CAUTION** Do not place edge of cover on cables. A. REMOVAL, 1. Two battery box cover Unfasten to slide off battery box cover (2). latches (1). 2. Hex nut (4). Remove. 3. Cable (3). Remove from terminals (5). Replace hex nut (4) on terminal (5). 4. Hex nut (7). Remove. Remove from terminal (8). 5. Cable (6). Replace hex nut (7) on terminal (8). 6. Hex nut (10). Remove. 10 LEGEND: 1. BATTERY BOX COVER LATCH (2) 2. BATTERY BOX COVER 3. CABLE 4. HEX NUT 5. TERMINAL 6. CABLE 7. HEX NUT 8. TERMINAL 9. TERMINAL 10. HEX NUT 11. CABLE TA 074741

5-37. DISCONNECT BATTE	ERIES (Continued).	
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).	- -	
7. Cable(11).	Remove from terminal (9). Replace hex nut (10) on terminal (9).	
B. INSTALLATION.		
8. Hex nut (10).	Remove from terminal (9).	
9. Cable(11).	Connect to terminal (9).	
10. Hex nut (10).	Install and tighten.	
11. Hex nut (7).	Remove from terminal (8).	
12. Cable (6).	Connect to terminal (8).	
13. Hex nut (7).	Install and tighten.	
14. Hex nut (4).	Remove from terminal (5).	
15. Cable (3).	Connect to terminal (5).	
16. Hex nut (4).	Install and tighten.	
	NOTE	
	Check cables at terminal connections for tightness; then, cover terminals with light coat of lubricant.	
17. Battery box cover (2).	Install.	
18. Two battery box cover latches (1).	Fasten to battery box cover (2).	
C. OPERATIONAL CHECK		
19. Engine.	Start up (see TM 9-2320-273-10). If system fails to operate, check connections for proper location and tighteners.	
20. Engine.	Shut down (see TM 9-2320-273-1	0).

5-37. DISCONNECT BATTERIES (Co	entinued).	
LOCATION/ITEM	ACTION	REMARKS
LEGEND: 1. BATTERY BOX COVER LATCH (2) 2. BATTERY BOX COVER 3. CABLE 4. HEX NUT 5. TERMINAL 6. CABLE 7. HEX NUT 8. TERMINAL 9. TERMINAL 10. HEX NUT 11. CABLE 8		
		TA 074742

5-38. BATTERY MAINTENANCE. THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

(20) a. Removal.

(10)b. Cleaning.

c. Inspection. (5)

(120)d. Charging. e. Installation. (20)

175 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

AII

TEST EQUIPMENT

Battery Charger.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES Table 5-1.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

None.

PARAGRAPH

None.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

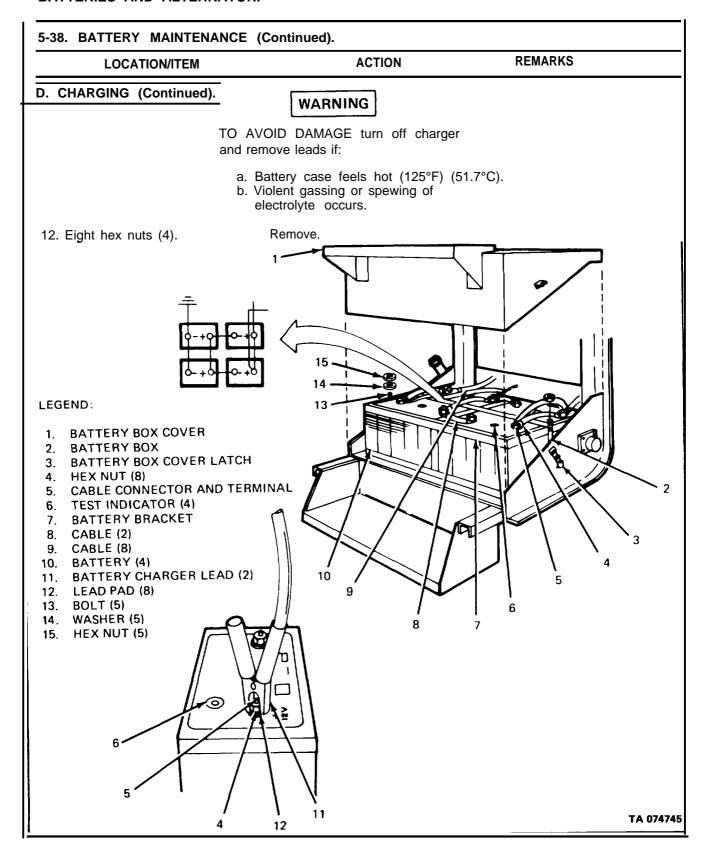
LOCATION/ITEM	ACTION	REMARKS
1. Two battery box cover	Unfasten to remove battery	Pull up and out to remove.
latches (3).	box cover (1).	
 Eight hex nuts (4). Ten cables (8) and (9). 	Remove.	
EGEND: 1. BATTERY BOX COVER 2. BATTERY BOX 3. BATTERY BOX COVER LATCH 4. HEX NUT (8) 5. CABLE CONNECTOR AND TEN 6. TEST INDICATOR (4) 7. BATTERY BRACKET 8. CABLE (2) 9. CABLE (8) 0. BATTERY (4) 1. BATTERY CHARGER LEAD (2) 2. LEAD PAD (8) 3. BOLT (5) 4. WASHER (5) 5. HEX NUT (5)	RMINAL 10 9 8	
4	\ 11 12	TA 0747

LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
4. Five bolts (13), washers (14), and hex nuts (15).	Remove.	
5. Battery bracket (7).	Remove.	
6. Four batteries (10).	Remove from battery box (2).	
B. CLEANING.		
7. Cable connectors and terminals (5), and battery top.	Use baking soda, water, and a wire brush to clean the parts. Cover connections with grease after installation.	
C. INSPECTION.		
8. Battery cases.	Make sure that none is leaking or cracked.	
9. Four test indicators (6).	Make sure that a GREEN DOT appears in the indicator window.	If indicator is completely dark the battery needs to be charged. If indicator shows yellow, the battery needs to be replaced.
D. CHARGING.		
	WARNING	
disc	rays turn off charger before connecting to a battery to prevent spaing which might cause explosion or ig	irks or
	WARNING	
Do Visi	Not Charge a Battery if the Green Do	t is
	Not Charge a Battery if the Test Indiciple.	cator

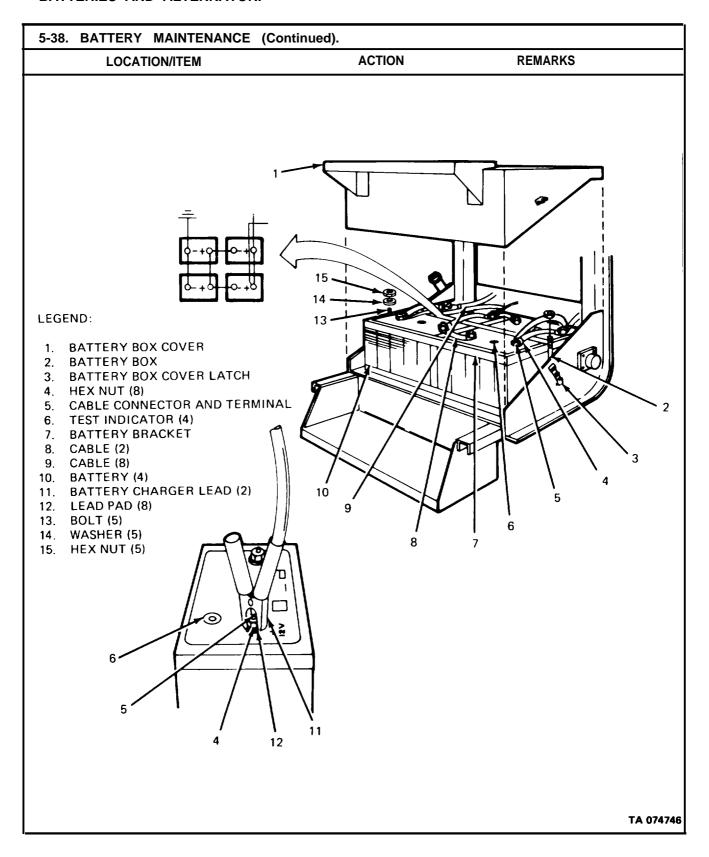
LOCATION/ITEM	ACTION	REMARKS
D. CHARGING (Continued).		
10. Eight hex nuts (4).	Install and tighten to positive and negative terminals.	d
11. Two battery charger leads (11).	Connect to hex nuts (4) and lead pad (12) on positive and negative terminals. Charge battery accord to table 5-15.	Э
LEGEND: 1. BATTERY BOX COVER 2. BATTERY BOX 3. BATTERY BOX COVER LATO 4. HEX NUT (8) 5. CABLE CONNECTOR AND TE 6. TEST INDICATOR (4) 7. BATTERY BRACKET 8. CABLE (2) 9. CABLE (8) 10. BATTERY (4) 11. BATTERY CHARGER LEAD (12. LEAD PAD (8) 13. BOLT (5) 14. WASHER (5) 15. HEX NUT (5)	RMINAL	
5	11	TA 0747

Table 5-15. Battery Charging Rates.

BATTERY MODEL	SLOW CHARGING RATE	FAST CHARGING RATE
1200	5A at 15 hours 10A at 7-1/2 hours	20A at 3-3/4 hours 30A at 2-1/2 hours 40A at 2 hours 50A at 1-1/2 hours



5-38. BATTERY MAINTEN	ANCE (Continued).	
LOCATION/ITEM	ACTION	REMARKS
E. INSTALLATION.		
13. Four batteries (10).	Set batteries in box as shown.	
14. Battery bracket (7).	Set in place.	
15. Five bolts (13), washers (14), and hex nuts (15).	Install and tighten.	
	Always check to make sure that the batteries are connected as shown in the illustration (series-parallel). Failure to connect batteries correctly can result in severe damage to the truck's electric system.	
16. Ten cables (8) and (9).	Connect to batteries as shown.	
17. Eight hex nuts (4).	Replace and tighten.	
18. Battery box cover latches (3).	Install cover (1) and fasten late	ches.
	NOTE	
	Follow-on maintenance action require	d:
	a. Check operation; refer to TM 9-232	20-273-10.



5-39. BATTERY CABLES MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

- a. Removal.
- (6)
- b. Installation.
- (6)
- c. Operational Check. (2)

14 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

EQUIPMENT CONDITION PARAGRAPH

CONDITION DESCRIPTION

Batteries disconnected.

5-37A.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Sat.

TROUBLESHOOTING REFERENCES

Table 5-1.

5-39. BATTERY CABLES MAINTENANCE (Continued). **REMARKS** LOCATION/ITEM ACTION A. REMOVAL 1. Two battery box cover Unfasten to slide and remove latches (23). battery box cover (1). 2. Two bolts (2), washers Remove. (12), and nuts (13). Remove, 3. Two cable clamps (3). Remove from terminal (21). 4. Hex nut (22). **SOLENOID** LEGEND: **SWITCH** 1. COVER 8 2. BOLT (2) 3. CLAMP (2) 9 4. CABLE 5. TERMINAL 6. WASHER 7. NUT 8. TERMINAL 9. WASHER STARTER 10. NUT **MOTOR** 11. CABLE 12. WASHER (2) 13. NUT (2) 14. NUT (4) 15. RUBBÉR GASKET 16. SCREW (2) 12 17. WASHER (2) 27 18. SLAVE RECEPTACLE 13 19. WASHER (8) 20. SCREW (4) 21. TERMINAL 15 22. HEX NUT 23. COVER LATCH (2) 21 24. CABLE 25. TERMINAL 26. CABLE 27. NUT 24 16 TA 074747

LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
5. Cable (4).	Remove from terminal (21).	
6. Nut (7) and washer (6).	Remove from terminal (5).	
7. Cable (4).	Lift from terminal (5) and remove.	
8. Nut (10) and washer (9).	Remove from terminal (8).	
9. Cable (11).	Remove from terminal (8).	
10. Nut (27).	Remove from terminal (25).	
11. Cable(11).	Lift from terminal (25) and remove.	
12. Cables (24) and (26).	Remove two screws (16) and washers (17); lift cables from slave receptacle (18).	Remove from battery terminals as shown, if required.
13. Slave receptacle (18).	a. Remove four screws (20), eight washers (19) and four nuts (14).b. Remove slave receptacle (18) with rubber gasket (15).	Replace if damaged.
B. INSTALLATION.		
14. Slave receptacle (18), and gasket (15).	Install to battery box with four screws (20), eight washers (19) and four nuts (14).	
15. Cables (24) and (26).	Install to slave receptacle (18) with two screws (16) and washers (17).	Reconnect to battery terminals as shown.
	NOTE	
	ter installation of cables, cover terminals d nuts with light coat of lubrication.	
16. Cable (11).	Connect to terminal (25).	
17. Nut (27).	Install on terminal (25) and tighten.	

LOCATION/ITEM ACTION REMARKS
LEGEND: 1. COVER 2. BOLT (2) 3. CLAMP (2) 4. CABLE 5. TERMINAL 6. WASHER 7. NUT 11. CABLE 12. WASHER (2) 13. NUT (2) 14. NUT (2) 15. RUBBER GASKET 16. SCREW (2) 17. WASHER (2) 18. SLAVE RECEPTACLE 19. WASHER (8) 20. SCREW (4) 21. TERMINAL 22. HEX NUT 23. COVER LATCH (2) 24. CABLE 25. TERMINAL 26. CABLE 27. NUT

5-39. BATTERY CABLES MAINTE	NANCE (Continued).	
LOCATION/ITEM	ACTION	REMARKS
B. INSTALLATION (Continued).		
18. Cable (11).	Connect to terminal (8).	
19. Nut (10) and washer (9).	Install on terminal (8) and tighten.	
20. Cable (4).	Connect to terminal (5).	
21. Nut (7) and washer (6).	Install on terminal (5) and tighten.	
22. Cable (4).	Connect to terminal (21).	
23. Nut (22).	Install on terminal (21) and tighten.	
24. Two cable clamps (3).	Install on cables (4) and (11).	
25. Bolts (2), washers (12), and nuts (13).	Install and tighten.	
C. OPERATIONAL CHECK.		
26. Cables (11) and (4).	Check connections at batteries, solenoid switch, and starter motor to verify tightness.	
27. Engine.	Start up (see TM 9-2320-273- 10.	
28. Engine.	Shut down (see TM 9-2320-273-10).	

LOCATION/ITEM	ACTION	REMARKS
LEGEND: 1. COVER 2. BOLT (2) 3. CLAMP (2) 4. CABLE 5. TERMINAL 6. WASHER 7. NUT 8. TERMINAL 9. WASHER 10. NUT 11. CABLE 12. WASHER (2) 13. NUT (2) 14. NUT (4) 15. RUBBER GASKET 16. SCREW (2) 17. WASHER (2) 18. SLAVE RECEPTACLE 19. WASHER (8) 20. SCREW (4) 21. TERMINAL 22. HEX NUT 23. COVER LATCH (2) 24. CABLE 25. TERMINAL 26. CABLE 27. NUT	25	5 6 7 SOLENOID SWITCH 8 9 9 11 12 11 13 13 14 15 16 17 18 19 22 23 17 16
		TA 07

5-40. BATTERY BOX LATCH MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

- Removal.
- (6)
- b. installation.
- (6)
- c. Operational Check.
- (1)

13 Minutes Total.

INITIAL SETUP

EQUIPMENT CONDITION

APPLICABLE CONFIGURATIONS

PARAGRAPH

CONDITION DESCRIPTION Battery Box Cover Removed.

5-41A.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM) TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

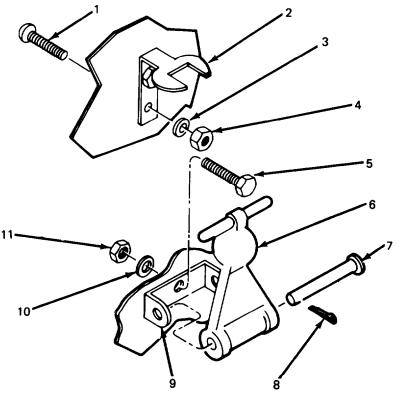
Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

None.

LOCATION/ITEM	ACTION	REMARKS
REMOVAL.		
1. Two nuts (4), washers (3) and screws (1).	Remove.	
2. Bracket (2).	Remove.	
3. Cotter pin (8) and pin (7).	Remove.	
. Battery box cover hook (6).	Remove.	
5. Hex nut (11), washer (10) and bolt (5).	Remove.	
. Anchor bracket (9).	Remove.	



LEGEND:

- 1. SCREW (2)
- BRACKET
- WASHER (2)
- NUT (2) BOLT HOOK
- 6.
- 7. PIN
- 8. COTTER PIN
- 9. ANCHOR BRACKET
- 10. WASHER
- 11. HEX NUT

TA 074749

5-40. BATTERY BOX LATCH MA	INTENANCE (Continued).	
LOCATION/ITEM	ACTION	REMARKS
B. INSTALLATION.		
7. Bracket (2), two screws (1), washers (3) and nuts (4).	Install and tighten.	
8. Anchor bracket (9), bolt (5), washer (10), and nut (11)	Install and tighten.	
9. Battery box cover hook (6), pin (7) and cotter pin (8).	Install	
C. OPERATIONAL CHECK.		
10. Battery box cover.	Install per paragraph 5-91 B.	
11. Battery box hook .	Check that battery box cover hook (6) engages bracket (2) and is under tension when released.	

LOCATION/ITEM	ACTION	REMARKS
		3 ————————————————————————————————————
LEGEND:		
 SCREW (2) BRACKET WASHER (2) NUT (2) BOLT HOOK PIN COTTER PIN ANCHOR BRACKET WASHER HEX NUT 		

5-41. BATTERY BOX COVER MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (2.0) b. Installation. (2.0) c. Checking Fit. (0.5)

4.5 Minutes Total.

INITIAL SETUP

EQUIPMENT CONDITION PARAGRAPH

APPLICABLE CONFIGURATIONS

CONDITION DESCRIPTION

None. None.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

One (MOS-63B20).

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission in Neutral

Park Brake Set.

TROUBLESHOOTING REFERENCES

None.

5-41. BATTERY BOX COVER MA	INTENANCE (Continued).	
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL.		
1. Two rubber hooks (3).	Unlatch.	
2. Battery box cover (2).	Remove. a. Pull forward. b. Lift up.	
B. INSTALLATION.		
3. Battery box cover (2).	Install. a. Position to aline pins (1) with mounting holes. b. Slide back, then lower.	
4. Two rubber hooks (3).	Fasten to battery box cover.	
C. CHECKING FIT.		
5. Battery box.	Check fit of cover (1) over bar make sure hooks (3) latch tigh the bracket.	
		LEGEND: 1. PIN (2) 2. COVER 3. RUBBER HOOK (2)
	3	TA 074751

5-42. BATTERY BOX MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

Removal. (10)b. Installation. (10)

20 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (PIN)

EQUIPMENT CONDITION

PARAGRAPH

9-16A.

5-38A. Batteries Removed.

> Air Reservoir Above Battery Box Removed.

CONDITION DESCRIPTION

None.

PERSONNEL REQUIRED

Two (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Park Brake Set.

TROUBLESHOOTING REFERENCES

None.

5-42. BATTERY BOX MAINTENANCE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
A. REMOVAL.			
1. Spacer (5).	Remove.		
2. Eight nuts (1), washers (2) and bolts (3).	Remove.		
3. Battery box (4).	Remove.		
B. INSTALLATION.			
4. Battery box (4).	Position and ho	ld.	
5. Eight bolts (3), washers (2) and nuts (1).	Install and tighte	en.	
6. Spacer (5).	Set in place.		
	NOTE		
Follow-on m	naintenance action	requ i red:	
	patteries, refer to p air reservoir; refer t		
5		3	LEGEND: 1. NUT (8) 2. WASHER (8) 3. BOLT (8) 4. BOX 5. SPACER
	لعقعا		TA 074752

5-43. ALTERNATOR MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQURED RED FOLLOWS TASK DESCRIPTION.)

a. Removal.

(15)

b. Installation. (20)c. Operational Check. (5)

40 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All .

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

EQUIPMENT CONDITION PARAGRAPH

5-37A.

11-14A&C.

CONDITION DESCRIPTION

Batteries Disconnected. Right Front Fender Removed.

PERSONNEL REQUIRED One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Engine OFF. Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 5-5.

LOCATION/ITEM	ANCE (Continued). ACTION	REMARKS
A. REMOVAL.		
1. Three nuts (14) and washers (13).	Remove.	
2. Three wires (12).	Remove.	
3. Adjusting nuts (2).	Unscrew to release tension on alternator (9).	
4. Bolt (4), washer (3) and nut (15).	Remove.	
5. Adjustment rod (1).	Raise out of way.	
6. Two nuts(11).	Loosen, but do not remove.	
7. Alternator (9).	Move towards engine and remove two belts (16).	
8. Two nuts (11), washers (10) and bolts (8).	Remove slowly while holding alternator (9) in place.	
9. Alternator (9).	Remove.	
LEGEND: 1. ROD 2. NUT (2) 3. WASHER 4. BOLT 5. KEY WIRE 6. NUT 7. PULLEY 8. BOLT (2) 9. ALTERNATOR 10. WASHER (2) 11. NUT (2) 12. WIRE (3) 13. WASHER (3)	13 15 15 WIRE 10A	3 5 5 7 8
14. NUT (3) 15. NUT 16. BELT (2)	8	

LOCATION/ITEM	ACTION	REMARKS
. REMOVAL (Continued).		
10. Nut (6), key (5), and pulley (7).	Remove from alternator shaft.	
. INSTALLATION.		
11. Pulley (7), key (5), and nut (6).	Install on alternator shaft.	Transfer parts if not damaged.
12. Alternator (9).	Aline and hold in place.	
13. Two bolts (8), washers (10) and nuts (11).	Install, but do not tighten.	
14. Adjustment rod (1).	Lower and aline with mounting hole on alternator (9).	
15. Bolt (4), washer (3) and nut (15).	Install but do not tighten.	
16. Alternator (9).	Push towards engine and replace two belts (16).	
17. Adjusting nuts (2).	Tighten until proper tension is applied to belts (16) (Refer to para 4-55).	
18. Bolt (4) and nut (15).	Tighten.	
19. Two nuts (11) and bolts (8).	Tighten.	
20. Three wires (12).	Install according to figure.	
21. Three washers (13) and nuts (14).	Install and tighten.	
22. Batteries.	Connect per paragraph 5-37B.	
. OPERATIONAL CHECK.		
23. Engine	Start up (see TM 9-2320-273-10). Verify voltmeter indicates normal.	
	NOTE	
Follo	w-on maintenance action required:	
Repl	ace fender paragraph 11-14B or D.	

5-43. ALTERNATOR MAINTENAN	CE (Continued).	
LOCATION/ITEM	ACTION	REMARKS
LEGEND: 1. ROD 2. NUT (2) 3. WASHER 4. BOLT 5. KEY 6. NUT 7. PULLEY 8. BOLT (2) 9. ALTERNATOR 10. WASHER (2) 11. NUT (2) 12. WIRE (3) 13. WASHER (3) 14. NUT (3) 15. NUT 16. BELT (2)	WIRE	9
		TA 074754

EXTERIOR LIGHTING MAINTENANCE.

5-44. HEADLAMPS MAINTENANCE.

THIS TASK COVERS: APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

(10)

b. Installation.

(10)

c. Operational Check. (2)

22 Minutes Total

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

Table 5-8.

EQUIPMENT CONDITION

PARAGRAPH

None.

CONDITION DESCRIPTION

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

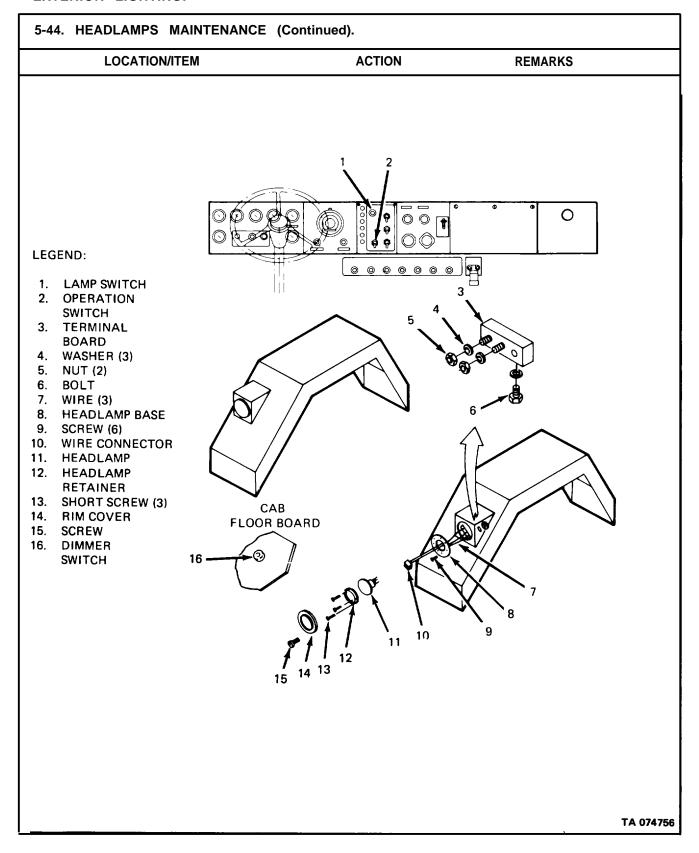
Engine OFF.

Transmission in Neutral.

Park Brake Set.

5-44. HEADLAMPS MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** 1. Screw (15). Remove. 2. Rim cover (14). Remove by pushing up and pulling outward to release spring clip. **NOTE** Do not remove spring and two screws which hold inner and outer bases together as headlight re-alinement will be necessary. 0 LEGEND: 1. LAMP SWITCH 2. OPERATION **SWITCH** 3. TERMINAL **BOARD** 4. WASHER (3) 5. NUT (2) BOLT 6. 7. WIRE (3) **HEADLAMP BASE** 9. SCREW (6) 10. WIRE CONNECTOR 11. HEADLAMP CAB 12. HEADLAMP FLOOR, BOARD RETAINER 13. SHORT SCREW (3) 16 14. RIM COVER 15. SCREW 16. DIMMER **SWITCH** 10 11 TA 074755

5-44. HEADLAMPS MAINTENANCE (Continued). **ACTION** LOCATION/ITEM **REMARKS** A. REMOVAL (Continued). 3. Three short screws (13). a. Remove b. Remove headlamp retainer (12). Disconnect wire connector 4. Headlamp (11). (10) and remove. 5. Six screws (9). Remove 6. Headlamp base (8). Remove. 7. Two nuts (5), one bolt (6) Remove three headlamp wires (7) and three washers (4). from terminal board (3). B. INSTALLATION. Install on terminal board (3). 8. Three wires (7). 9. Three washers (4) and two Install and tighten on nuts (5), and one bolt (6). terminal board (3). Install with six screws (9) and 10. Headlamp base (8). aline. 11. Wire connector (10). Connect to headlamp (11) and insert headlamp into base (8). 12. Headlamp retainer (12). Install with three short screws (13).13. Rim cover (14). Install with screw (15). C. OPERATIONAL CHECK. 14. OPERATION switch (2). Set to NORMAL. Pull ON to second position. 15. LAMP switch (1). 16. HEADLAMP (11). Observe that headlamp comes ON. 17. DIMMER switch (16). Press and verify that HIGH beam comes ON. Press again and verify that LOW beam comes ON.



5-45. FRONT TURN AND MARKER LAMPS MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

b. Installation. (6)

c. Operational Check, (1)

13 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

AII.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

Table 5-9, 5-11.

EQUIPMENT CONDITION

PARAGRAPH

None.

- None

None.

CONDITION DESCRIPTION

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

5-45. FRONT TURN AND MARKER LAMPS MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

A. REMOVAL.

1. Four screws (12).

Remove.

2. Lens (11).

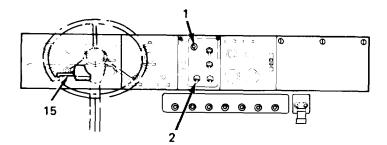
Remove.

3. Gasket (10).

Remove.

4. Bulb (14).

Remove.

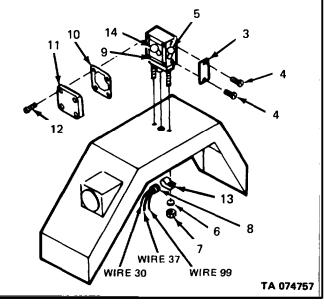


LEGEND:

- 1. LAMP SWITCH
- 2. OPERATION SWITCH
- 3. LENS
- 4. SCREW (2)
- 5. BULB
- 6. WASHER (2)
- 7. NUT (2)
- 8. WIRE

CONNECTOR

- 9. FRONT TURN AND MARKER LAMP
- 10. GASKET
- 11. LENS
- 12. SCREW (4)
- 13. WIRE CLAMP
- 14. BULB
- 15. TURN SIGNAL CONTROL



5-45. FRONT TURN AND MARKER	R LAMPS MAINTENANCE (Continued	i).
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
5. Two screws (4).	Remove.	
6. Lens (3).	Remove.	
7. Bulb (5).	Remove.	
8. Two nuts (7), washers (6) and wire clamp (13).	Remove.	
9. Wire connector (8).	Remove from front turn and marker lamp (9).	
10. Front turn and marker lamp (9).	Remove.	
B. INSTALLATION.		
11. Front turn and marker lamp (9).	Aline in mounting holes.	
12. Two washers (6), nuts (7) and wire clamp (13).	Install and tighten.	
13. Wire connector (8).	Connect to front turn and marker lamp (9).	
14. Bulb (5).	Insert and turn to tighten.	
15. Lens (3).	Replace and aline.	
16. Two screws (4).	Install and tighten.	
17. Bulb (14).	Insert and turn to tighten.	
18. Gasket (10).	Replace and aline.	
19. Lens(11).	Replace and aline.	
20. Four screws (12).	Install and tighten.	
C. C. OPERATIONAL CHECK.		
21. OPERATION switch (2).	Set to NORMAL.	
22. LAMP switch (1).	Pull out to first notch and verify that marker lamps (9) come ON.	

5-45. FRONT TURN AND MARKER LAMPS MAINTENANCE (Continued).

LOCATION/ITEM

ACTION

REMARKS

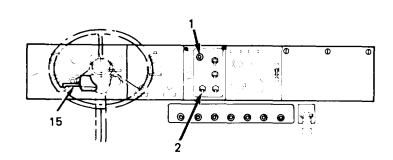
C. OPERATIONAL CHECK (Continued).

23. Turn signal control (15).

Push lever down. Verify that left turn lamp flashes.

24. Turn signal control (15).

Push lever up. Verify that right turn lamp flashes.

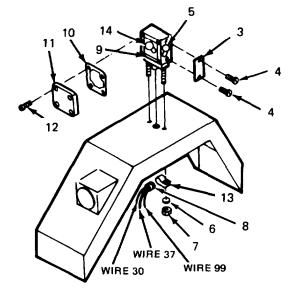


LEGEND:

- 1. LAMP SWITCH
- 2. OPERATION SWITCH
- 3. LENS
- 4. SCREW (2)
- 5. BULB
- 6. WASHER (2)
- 7. NUT (2)
- 8. WIRE

CONNECTOR

- 9. FRONT TURN AND MARKER LAMP
- 10. GASKET
- 11. LENS
- 12. SCREW (4)
- 13. WIRE CLAMP
- 14. BULB
- 15. TURN SIGNAL CONTROL



TA 074758

5-46. REAR LAMP ASSEMBLY MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

(5) (5)

b. Installation.

c. Operational Check. (2)

12 Minutes Total.

INITIAL SETUP

EQUIPMENT CONDITION

APPLICABLE CONFIGURATIONS

PARAGRAPH

None.

CONDITION DESCRIPTION

None.

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

- 1. Non-Flammable Cleaning Solvent (Refer to Appendix C)
- 2. Bearing Grease; GAA (Refer to Appendix C).

PERSONNEL REQUIRED

Two (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

REFERENCES (TM)

TM 9-2320-273-10.

LO 9-2320-273-12.

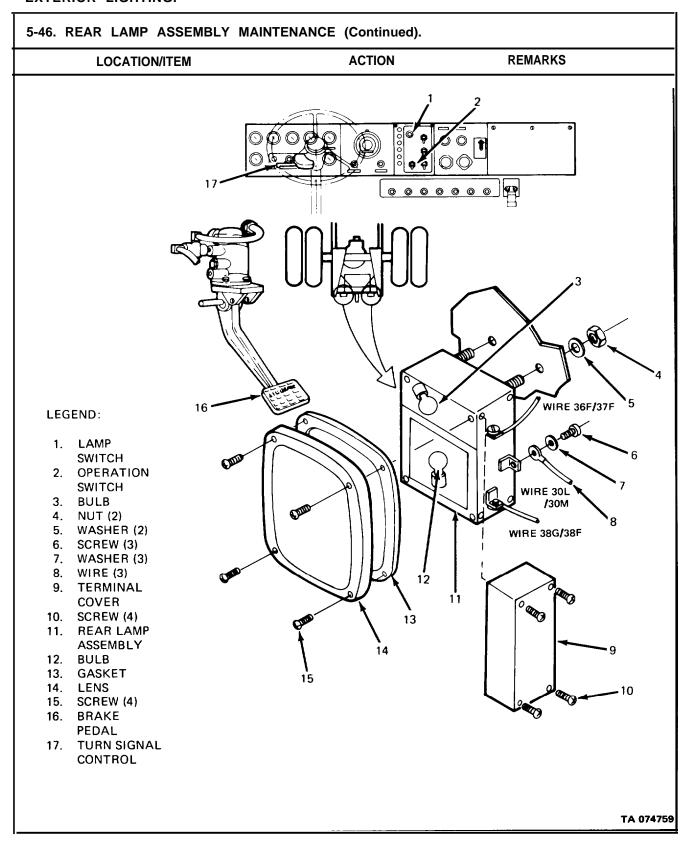
Engine OFF.

Transmission in Neutral.

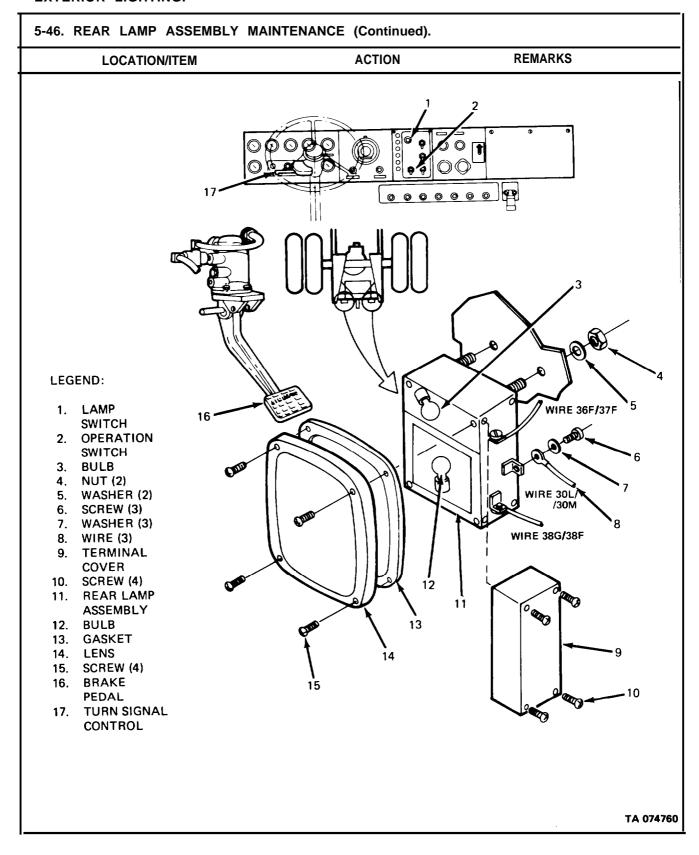
Park Brake Set.

TROUBLESHOOTING REFERENCES

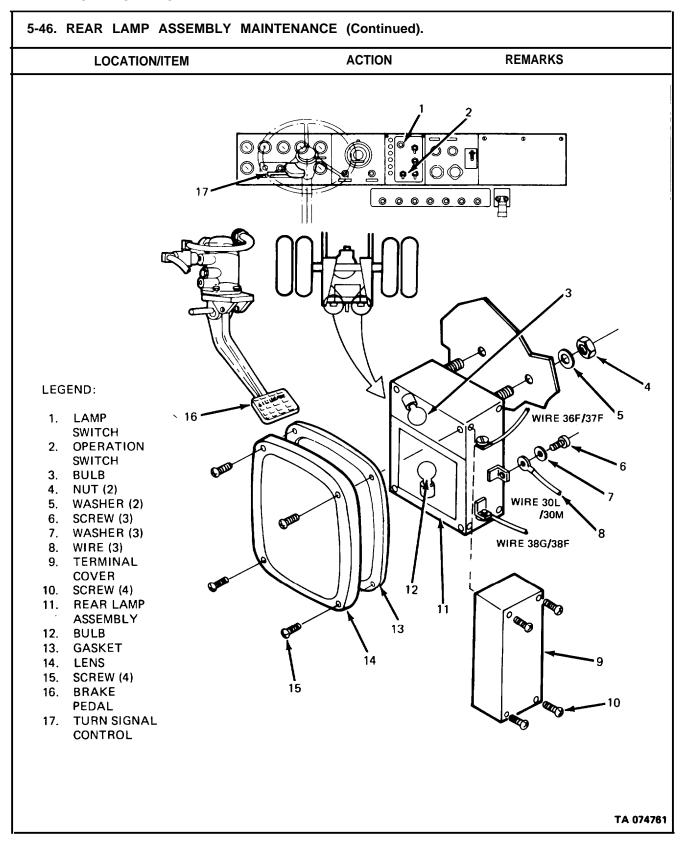
Table 5-10.



5-46. R	EAR LAMP ASSEMBL	Y MAINTENANCE	(Continued).	
	LOCATION/ITEM		ACTION	REMARKS
A. RE	MOVAL.			
1.	Four screws (15).	Remove		
2.	Lens (14).	Remove.		
3.	Gasket (13}.	Remove.		Discard if cracking or tears
4.	Bulb (12).	Remove.		are evident.
5.	Bulb (3).	Remove.		
6.	Four screws (10).	Remove.		
7.	Terminal cover (9).	Remove.		
		NO ⁻	ΓE	
	W	demove grease from ith cleaning solvento next step.		
	Three screws (6) and washers (7).	Remove.		
9.	Three wires (8).	Remove.		
	Two nuts (4) and washers (5).	Remove.		
11.	Rear lamp assembly (11). Remove.		
B. IN	STALLATION.			
12.	Rear lamp assembly (11). Aline mountir install.	ng studs and	
13.	Two washers (5) and nuts (4).	Install and ti	ghten.	
14.	Three wires (8).	Replace on rebly according	ear lamp assei to figure.	m-
	Three washers (7) and screws (6).	Install and ti	ghten.	
16.	Terminal cover (9).	Fill with bear then, aline a		



LOCATION/ITEM	ACTION	REMARKS
B. INSTALLATION (Continued).		
17. Four screws (10).	Install and tighten.	
18. Bulb (3).	Insert and twist to tighten.	
19. Bulb (12).	Insert and twist to tighten.	
20. Gasket (13).	Install if it was removed.	
21. Lens (14).	Aline and install.	
22. Four screws (15).	Install and tighten.	
23. OPERATION switch (2).	Set to NORMAL.	First mechanic.
24. LAMP switch (1).	Pull ON.	First mechanic.
25. Rear lamp assembly (11).	Verify that lights go ON.	Second mechanic.
26. Brake pedal (16).	Press down.	First mechanic.
27. Rear lamp assembly (11).	Verify that brake lights go ON.	Second mechanic.
28. Turn signal control (17).	Press lever down.	First mechanic.
29. Left rear lamp assembly (11).	Verify that left turn signal lamp flashes.	Second mechanic.
30. Turn signal control (17).	Push lever up.	First mechanic.
31. Right rear lamp assembly (11).	Verify that right turn signal lamp flashes.	Second mechanic.



EXTERIOR LIGHTING. 5-47. CLEARANCE LAMPS MAINTENANCE. THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.) (2)a. Removal. b. Installation. (2) c. Operational Check. (1) 5 Minutes Total. **EQUIPMENT CONDITION INITIAL SETUP** PARAGRAPH **CONDITION DESCRIPTION APPLICABLE CONFIGURATIONS** None. None. **TEST EQUIPMENT** None. SPECIAL TOOLS None. MATERIALS/PARTS (P/N) None. PERSONNEL REQUIRED SPECIAL ENVIRONMENTAL CONDITIONS Vehicle Parked on Level Ground. One (MOS-63B20). REFERENCES (TM) **GENERAL SAFETY INSTRUCTIONS** TM 9-2320-273-10. Engine OFF. Transmission in Neutral. Park Brake Set. TROUBLESHOOTING REFERENCES Table 5-9.

5-47. CLEARANCE LAMPS MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** 1. Screw (3) and seal (4). Remove. 2. Lens (5) and gasket (6). Remove. Remove. 3. Bulb (7). 4. Two screws (8) and Remove. ground washers (9). \bigcirc 13 LEGEND: 1. LAMP SWITCH 2. OPERATION **SWITCH** 3. SCREW 4. SEAL 5. LENS 6. GASKET 7. BULB 8. SCREW (2) 9. GROUND WASHER (2) 10. LAMP BASE 11. GASKET 10 12. WIRE CONNECTOR CLEARANCE BUTTON TA211962

-47. CLEARANCE LAMPS MAII	NTENANCE (Continued).	
LOCATION/ITEM	ACTION	REMARKS
5. Lamp base (10).	Remove.	
6. Gasket (11).	Remove.	Discard if cracking or tear are evident
7. Wire connector (12).	Disconnect.	
. INSTALLATION.		
8. Wire connector (12).	Connect.	
9. Gasket (11).	Install.	
10. Lamp base (10).	Aline mounting holes.	
11. Two screws (8) and ground washers (9).	Install and tighten.	
12. Bulb (7).	Install.	
13. Gasket (6) and lens (5).	Replace.	
14. Screw (3) and seal (4).	Install and tighten.	
. OPERATIONAL CHECK.		
15. OPERATION switch (2).	Set to NORMAL.	
16. LAMP switch (1).	Pull ON; verify that clearance lamps come on.	
17. CLEARANCE button (13).	Press and verify that clearance lamps go OFF.	
	NOTE	
su	oon completion of this task, apply a itable windshield sealant over screws to prevent water entry.	

5-47. CLEARANCE LAMPS MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM \bigcirc Û 13 LEGEND: 1. LAMP **SWITCH** 2. OPERATION SWITCH 3. SCREW 4. SEAL 5. LENS 6. GASKET 7. BULB 8. SCREW (2) 9. GROUND WASHER (2) 10. LAMP BASE 11. GASKET - 10 12. WIRE CONNECTOR 13. CLEARANCE - 11 BUTTON TA211963

5-48. BLACKOUT HEADLAMP MAINTENANCE.

THIS TASK COVERS (APPROXIMATE TIME REQURIRED FOLLOWS TASK DESCRIPTION.)

- a. Removal.
- b. Installation. (5)
- c. Operational Check. (2)

12 Minutas Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-232O.273-10.

TROUBLESHOOTING REFERENCES

Table 5-13.

EQUIPMENT CONDITION PARAGRAPH

5-44A.

CONDITION DESCRIPTION

Headlamp Removed if Wire (3) is To Be Removed.

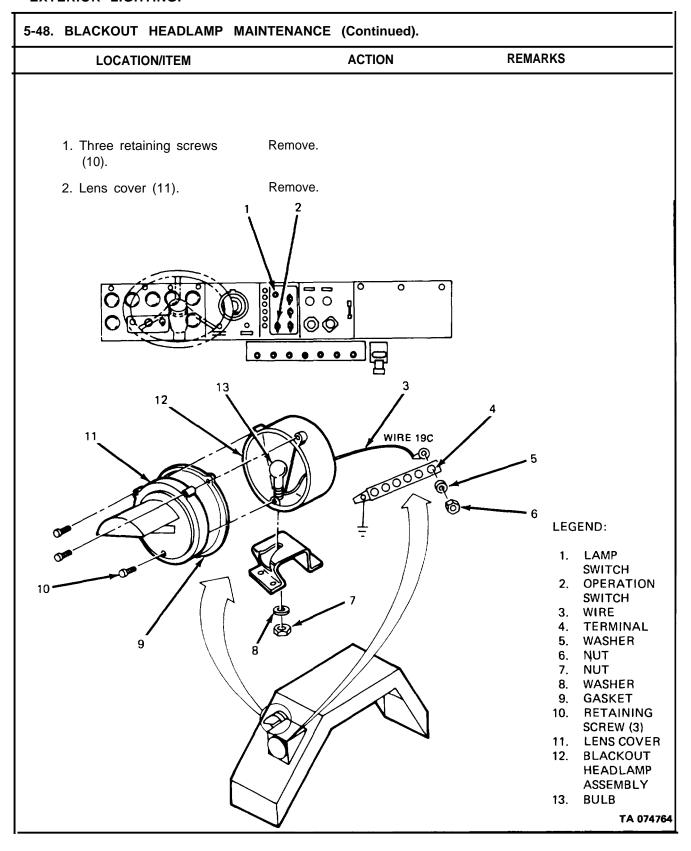
SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

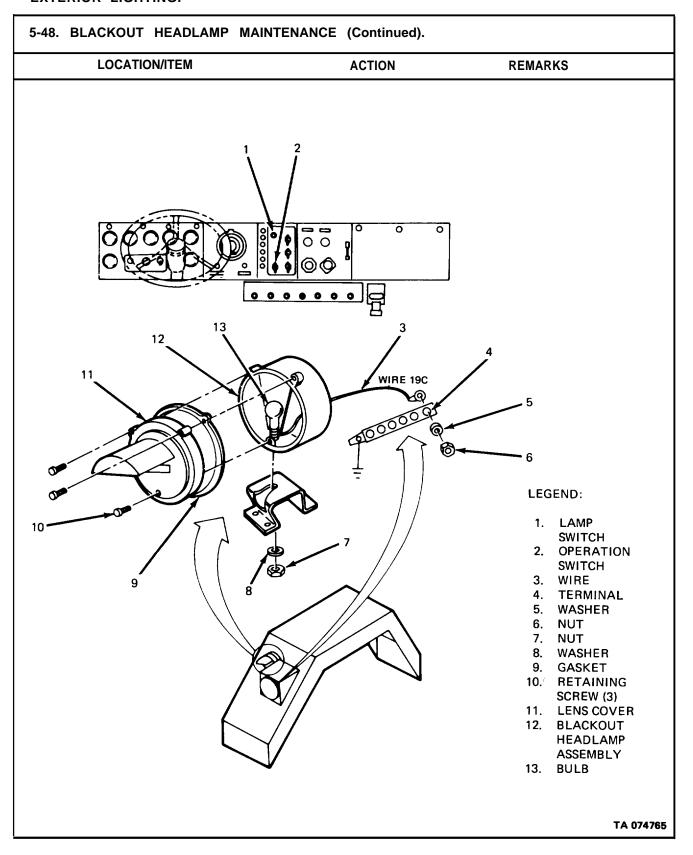
GENERAL SAFETY INSTRUCTIONS

Engine OFF.

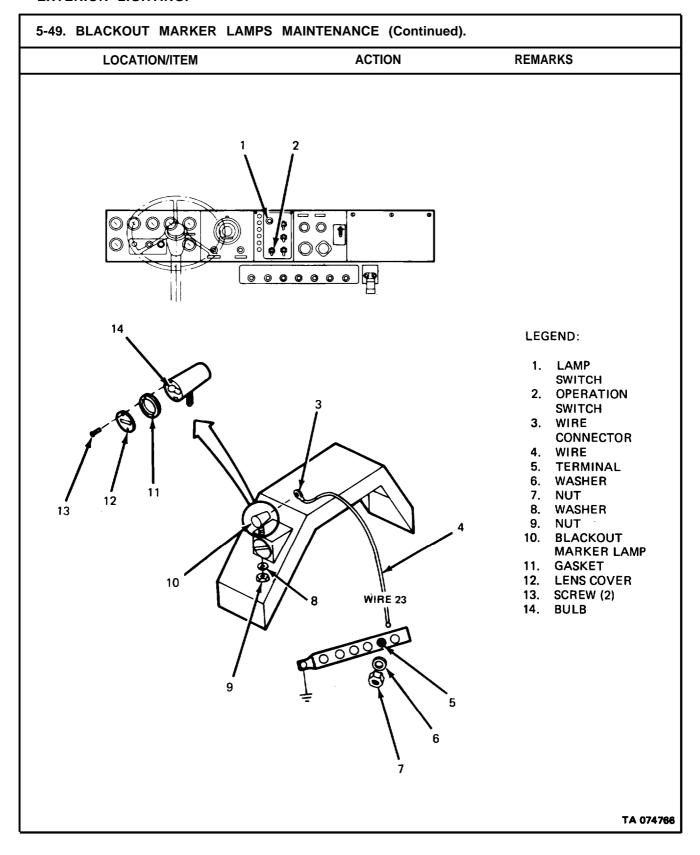
Transmission in Neutral. Park Brake Set.



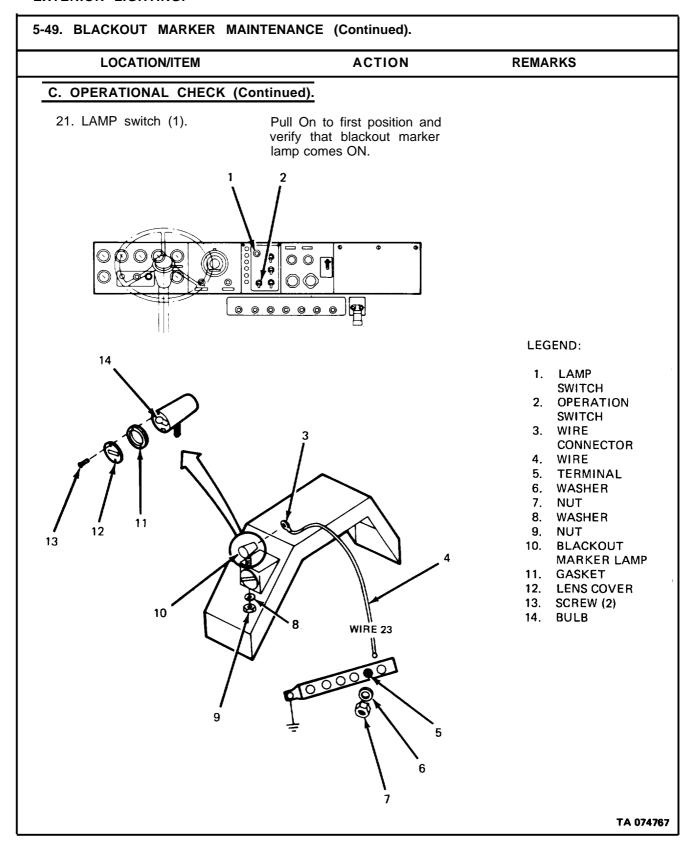
5-48. BLACKOUT HEADLAMP MAINTENANCE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
A. REMOVAL (Continued).			
3. Gasket (9).	Remove.	Discard if cracking or tears are evident.	
4. Bulb (13).	Remove.		
5. Nut (6) and washer (5).	Remove from terminal (4).		
6. Wire (3).	Remove from terminal (4).		
7. Nut (7) and washer (8).	Remove.		
Blackout headlamp assembly (12).	Remove.		
	NOTE		
To gain to para.	access to terminal block (4) ref 5-44.	er	
B. INSTALLATION.			
Blackout headlamp assembly (12).	Aline mounting stud and install.		
10. Washer (8) and nut (7).	Install and tighten.		
11. Wire (3).	Connect to terminal (4).		
12. Washer (5) and nut (6).	Install and tighten.		
13. Bulb (13).	Install and twist to tighten.		
14. Gasket (9).	Install.		
15. Lens cover (11).	Aline and install.		
16. Three retaining screws (10).	Tighten.		
17. Headlamp.	Install per paragraph 5-45.		
C. OPERATIONAL CHECK.			
18. OPERATION switch (2).	Set to BLACKOUT.		
19. LAMPswitch (1).	Pull ON. Verify that black- out headlamp comes ON.		



EXTERIOR LIGHTING. 5-49. BLACKOUT MARKER LAMPS MAINTENANCE. THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.) a. Removal. (5) b. Installation. c. Operational Check. (2) 12 Minutes Total. **INITIAL SETUP EQUIPMENT CONDITION** PARAGRAPH CONDITION DESCRIPTION APPLICABLE CONFIGURATIONS Headlamp Removed. 5-44A. **TEST EQUIPMENT** None. SPECIAL TOOLS None. MATERIALS/PARTS (P/N) None. SPECIAL ENVIRONMENTAL CONDITIONS PERSONNEL REQUIRED Vehicle Parked on Level Ground. One (MOS-63B20). REFERENCES (TM) **GENERAL SAFETY INSTRUCTIONS** TM 9-2320-273-10. Engine OFF. Transmission in Neutral. Park Brake Set. TROUBLESHOOTING REFERENCES Table 5-13.



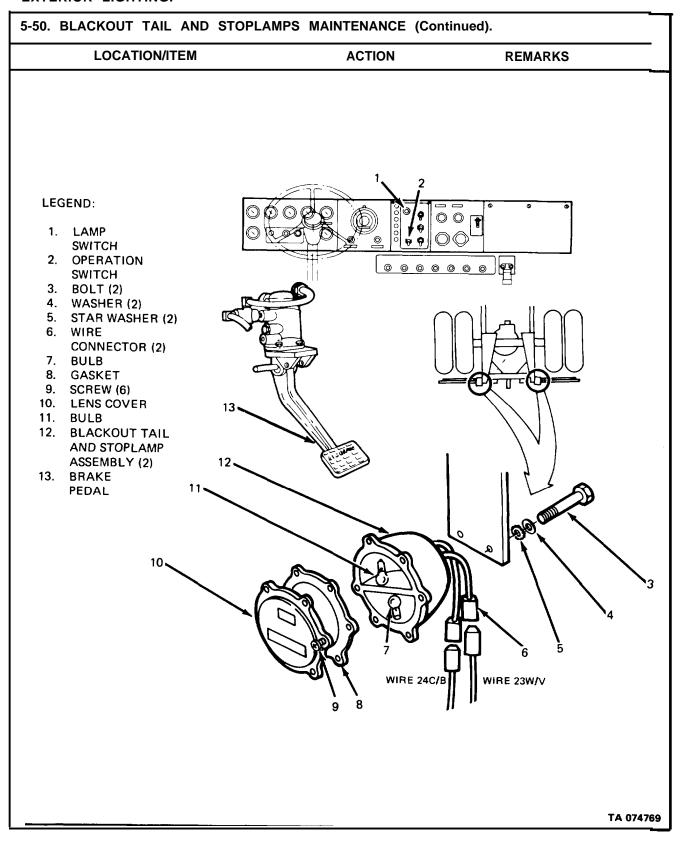
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL.		
1. Two screws (13).	Remove.	
2. Lens cover (12).	Remove.	
3. Gasket (11).	Remove.	Discard if cracking or tears are evident.
4. Bulb (14).	Remove.	
5. Wire connector (3).	Remove.	
6. Nut (9) and washer (8).	Remove.	
7. Blackout marker lamp (10).	Remove.	
8. Nut (7) and washer (6).	Remove from terminal (5).	
9. Wire (4).	Remove from terminal (5).	
3. INSTALLATION.		
10. Wire (4).	Install on terminal (5).	
11. Washer (6) and nut (7).	Install and tighten.	
12. Blackout marker lamp (10).	Aline mounting stud and install.	
13. Washer (8) and nut (9).	Install and tighten.	
14. Wire connector (3).	Install in blackout marker (10).	
15. Bulb (14).	Install and twist to tighten.	
16. Gasket (11).	Install.	
17. Lens cover (12).	Aline and install.	
18. Two screws (13).	Install and tighten.	
19. Headlamp.	Install per paragraph 5-44.	
C. OPERATIONAL CHECK.		
20. OPERATION switch (2).	Set to BLACKOUT.	



EXTERIOR LIGHTING. 5-50. BLACKOUT TAIL AND STOPLAMPS MAINTENANCE. THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.) a. Removal. b. Installation (S) c. Operational Check. (2) 12 Minutes Total. **EQUIPMENT CONDITION INITIAL SETUP APPLICABLE CONFIGURATIONS** PARAGRAPH **CONDITION DESCRIPTION** None. None. **TEST EQUIPMENT** None. SPECIAL TOOLS None. MATERIALS/PARTS (P/N) None. PERSONNEL REQUIRED SPECIAL ENVIRONMENTAL CONDITIONS Two (MOS-63B20). Vehicle Parked on Level Ground. **REFERENCES (TM) GENERAL SAFETY INSTRUCTIONS** TM 92320273-10. Engine OFF. Transmission In Neutral. Park Brake Set. TROUBLESHOOTING REFERENCES Table 5-13.

5-50. BLACKOUT TAIL AND STOPLAMPS MAINTENANCE (Continued).		
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL.		
1. Six screws (9).	Loosen from blackout tail and stop lamp assembly (12).	Screws (9) cannot be removed from lens cover (10).
2. Lens cover (10).	Remove.	
3. Gasket (8).	Remove.	Discard if cracking or tears are evident.
4. Bulbs (7) and (11).	Remove.	
LEGEND: 1. LAMP SWITCH 2. OPERATION SWITCH 3. BOLT (2) 4. WASHER (2) 5. STAR WASHER (2) 6. WIRE CONNECTOR (2) 7. BULB 8. ĠASKET 9. SCREW (6) 10. LENS COVER 11. BULB 12. BLACKOUT TAIL AND STOPLAMP ASSEMBLY (2) 13. BRAKE PEDAL 11	13 12 WIRE 24C/B	

5-50. BLACKOUT TAIL AND STOPLAMPS MAINTENANCE (Continued). **REMARKS ACTION** LOCATION/ITEM A. REMOVAL (Continued). 5. Two wire connectors (6). Disconnect. 6. Two bolts (3), washers (4), Remove. and star washers (5). 7. Blackout tail and stoplamp Remove. assembly (12). **B. INSTALLATION.** Aline with mounting holes. 8. Blackout tail and stoplamp assembly (12). 9. Two star washers (5), washers Install and tighten. (4) and bolts (3). 10. Two wire connectors (6). Reconnect. 11. Bulbs (7) and (11). Install and twist to tighten. 12. Gasket (8). Install. 13. Lens cover (10). Aline and install. 14. Six screws (9). Install and tighten. C. OPERATIONAL CHECK. Set to BLACKOUT. 15. OPERATION switch (2). First mechanic. 16. LAMP switch (1). Pull ON. First mechanic. 17. Blackout tail and Verify that both tail Second mechanic. lights (7) come ON. stoplamp assembly (12). 18. Brake pedal (13). Press down. First mechanic. 19. Blackout tail and Verify that both brake Second mechanic. stoplamp assembly (12). lamps (11) come ON.



5-51. STATIONARY WORK LAMP BULB REPLACEMENT.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION)

a. Removal. (5) b. Installation. (5) c. Operational (2)

12 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M916 and M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

35W 12V GE4419 (or equal) Bulb.

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

None.

PARAGRAPH

None.

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-201P

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 5-14,

5-51. STATIONARY WORK LAMP BULB REPLACEMENT (Continued). LOCATION/ITEM **ACTION REMARKS** LEGEND: 1. RETAINER RING 2. MACHINE SCREW 3. HEX NUT 4. SCREW (2) 5. BULB 6. WIRE (2)

NOTE Prior to the removal of the bulb make certain that the work lamp switch is in the OFF position. A. REMOVAL. 1. Machine screw (2) and hex nut (3). 2. Retainer ring (1). 3. Two screws (4). 4. Bulb (5). Remove. B. INSTALLATION. 5. Bulb (5). Hold in position and install wires (6). 6. Two screws (4). 7. Retainer ring (1). 8. Machine screw (2) and hex nut.(3). Install. Install and tighten. C. OPERATIONAL CHECK. 9. Work lamp switch. Place switch in ON Check to see that lamp is lit.	LOCATION/	TEM	ACTION	REMARKS
tain that the work lamp switch is in the OFF position. A. REMOVAL. 1. Machine screw (2) and hex nut (3). 2. Retainer ring (1). 3. Two screws (4). 4. Bulb (5). 4. Bulb (5). 5. Bulb (5). 6. Two screws (4). 7. Retainer ring (1). 8. Machine screw (2) and hex nut. (3). C. OPERATIONAL CHECK. 9. Work lamp switch. Place switch in ON Check to see that lamp is lit.			NOTE	
1. Machine screw (2) and hex nut (3). 2. Retainer ring (1). 3. Two screws (4). 4. Bulb (5). B. INSTALLATION. 5. Bulb (5). Hold in position and install wires (6). 6. Two screws (4). 7. Retainer ring (1). 8. Machine screw (2) and hex nut.(3). C. OPERATIONAL CHECK. 9. Work lamp switch. Remove. Remove. Remove. Remove. Remove. Install and remove wires (6). Remove. Install and install wires (6). Install and tighten.		tain that t	he work lamp switch is in	
nut (3). 2. Retainer ring (1). Remove. 3. Two screws (4). Loosen and remove wires (6). 4. Bulb (5). Remove. B. INSTALLATION. 5. Bulb (5). Hold in position and install wires (6). 6. Two screws (4). Tighten. 7. Retainer ring (1). Install. 8. Machine screw (2) and hex nut.(3). Install and tighten. C. OPERATIONAL CHECK. 9. Work lamp switch. Place switch in ON Check to see that lamp is lit.	A. REMOVAL.			
3. Two screws (4). 4. Bulb (5). Remove. B. INSTALLATION. 5. Bulb (5). Hold in position and install wires (6). 6. Two screws (4). 7. Retainer ring (1). 8. Machine screw (2) and hex nut.(3). C. OPERATIONAL CHECK. 9. Work lamp switch. Loosen and remove wires (6). Remove. Hold in position and install and install wires (6). Tighten. Install. Install. C. OPERATIONAL CHECK.		w (2) and hex	Remove.	
(6). 4. Bulb (5). Remove. B. INSTALLATION. 5. Bulb (5). Hold in position and install wires (6). 6. Two screws (4). Tighten. 7. Retainer ring (1). Install. 8. Machine screw (2) and hex nut.(3). Install and tighten. C. OPERATIONAL CHECK. 9. Work lamp switch. Place switch in ON Check to see that lamp is lit.	2. Retainer ring	(1).	Remove.	
B. INSTALLATION. 5. Bulb (5). Hold in position and install wires (6). 6. Two screws (4). Tighten. 7. Retainer ring (1). Install. 8. Machine screw (2) and hex nut.(3). Install and tighten. C. OPERATIONAL CHECK. 9. Work lamp switch. Place switch in ON Check to see that lamp is lit.	3. Two screws (4).		es
5. Bulb (5). Hold in position and install wires (6). 6. Two screws (4). Tighten. 7. Retainer ring (1). Install. 8. Machine screw (2) and hex nut.(3). Install and tighten. C. OPERATIONAL CHECK. 9. Work lamp switch. Place switch in ON Check to see that lamp is lit.	4. Bulb (5).		Remove.	
install wires (6). 6. Two screws (4). 7. Retainer ring (1). 8. Machine screw (2) and hex nut.(3). Install. Install wires (6). Install. Install. Install and tighten.	B. INSTALLATION	I.		
7. Retainer ring (1). Install. 8. Machine screw (2) and hex nut.(3). Install and tighten. C. OPERATIONAL CHECK. 9. Work lamp switch. Place switch in ON Check to see that lamp is lit.	5. Bulb (5).			
8. Machine screw (2) and hex nut.(3). C. OPERATIONAL CHECK. 9. Work lamp switch. Place switch in ON Check to see that lamp is lit.	6. Two screws (4).	Tighten.	
nut.(3). C. OPERATIONAL CHECK. 9. Work lamp switch. Place switch in ON Check to see that lamp is lit.	7. Retainer ring	(1).	Install.	
9. Work lamp switch. Place switch in ON Check to see that lamp is lit.		w (2) and hex	Install and tighten.	
	C. OPERATIONAL	CHECK.		
	9. Work lamp s	witch.		Check to see that lamp is lit.

5-51. STATIONARY WORK LAMP BULB REPLACEMENT (Continued). LOCATION/ITEM **ACTION REMARKS** LEGEND: 1. RETAINER RING 2. MACHINE SCREW 3. HEX NUT 4. SCREW (2) 5. BULB 6. WIRE (2) TA 074771

5-52. STATIONARY WORK LAMP REPLACEMENT.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (10) b. Installation. (15)

c. Operational Check. (2)

27 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M916, and M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

Table 5-14.

EQUIPMENT CONDITION

PARAGRAPH

None.

CONDITION DESCRIPTION

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Park Brake Set.

5-52. STATIONARY WORK LAMP REPLACEMENT (Continued).

LOCATION/ITEM ACTION REMARKS

A. REMOVAL.

1. Wire (2). Cut and remove connectors.

2. Hex nut (5) and Remove. lockwasher (4).

3. Cone spacer (3). Remove.

4. Lamp assembly (1). Remove.

B. INSTALLATION.

5. Lamp assembly (1). Install.

6. Cone spacer (3), hex nut (5) Install. Tighten nut. and lockwasher (4).

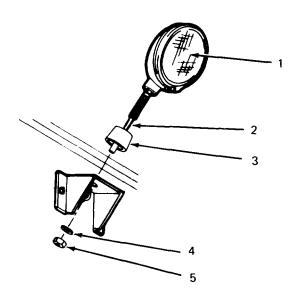
7. Wire (2). Reconnect, using suitable electrical connectors.

C. OPERATIONAL CHECK.

8. WORK LAMP switch. Place switch in Check to see that ON position. Check to see that lamp is lit.

LEGEND:

- 1. LAMP ASSEMBLY
- 2. WIRE
- 3. CONE SPACER
- LOCKWASHER
- 5. HEX NUT



TA 074772

5-53. PORTABLE WORK LAMP BULB REPLACEMENT.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

- a. Removal.
- (5) (5)
- b. Installation.
- c. Operational Check. (2)

12 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

AII.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

35W12VGE4419 (or equal) Bulb.

EQUIPMENT CONDITION

PARAGRAPH

None.

CONDITION DESCRIPTION

None.

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 5-14.

5-53. PORTABLE WORK LAMP BULB REPLACEMENT (Continued). LOCATION/ITEM **ACTION REMARKS** A. **REMOVAL** 1. Machine screw (6) and Remove. hex nut (7). 2. Retainer (1). Remove from housing (5), 3. Two screws (3). Loosen and remove two wires (4). 4. Bulb (2). Remove. LEGEND: 1. RETAINER 2. BULB 3. SCREW (2) 4. WIRE (2) 5. HOUSING 6. MACHINE SCREW 7. HEX NUT TA 074773

5-53. PORTABLE WORK LAMP BULB REPLACEMENT (Continued). LOCATION/ITEM **ACTION REMARKS** В. INSTALLATION. Hold in place and install 5. Bulb (2). wires (4). Tighten. 6. Two screws (3). Install in housing (5). 7. Bulb (2). 8. Retainer ring (1). Install on housing (5). 9. Machine screw (6) Install and tighten. and hex nut (7). C. OPERATIONAL CHECK. Plug into outside cab 10. Lamp. Lamp should now be lit. receptacle and flip switch to ON position. LEGEND: 1. RETAINER 2. **BULB** 3. SCREW (2) 4. WIRE (2) 5. HOUSING 6. MACHINE **SCREW** 7. HEX NUT TA 074774

This page intentionally left blank.

5-54. PORTABLE WORK LAMP MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Disassembly. (10) b. Assembly. (10)

c. Operational Check. (10)

30 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

PARAGRAPH

EQUIPMENT CONDITION

CONDITION DESCRIPTION

553A.

Bulb Removed.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 5-14.

LEGEND: 1. Lock nut (1) 2. Lock nut (1) 3. Switch (2). Remove. 4. Hex nut (16) and lockwasher (15). 18 18 19 10 10 10 10 10 10 10 10 10 10 10 10 10	5-54. PORTABLE WORK LAMP MAINT	ENANCE (Continued).	
1. Wire nut (17). Remove. 2. Lock nut (1) Remove. 3. Switch (2). Remove. 4. Hex nut (16) and lockwasher (15). 1. LOCK NUT 2. SWITCH 3. FLATWASHER 4. PLASTIC WASHER 5. BRACKET 6. PLASTIC WASHER 7. HEX BOLT 0. LOCKWASHER 1. LOC	LOCATION/ITEM	ACTION	REMARKS
2. Lock nut (1) 3. Switch (2). 4. Hex nut (16) and lockwasher (15). 18 18 10 10 10 10 10 10 10 10	A. DISASSEMBLY.		
3. Switch (2). 4. Hex nut (16) and lockwasher (15). 18 18 1 LOCK NUT 2. SWITCH 3. FLATWASHER 4. PLASTIC WASHER 5. BRACKET 6. PLASTIC WASHER 7. HEX BOLT 8. LOCKWASHER 9. HEX NUT 10. LEVER 11. RUBBER SUCTION CUP 12. HOUSING 13. SCREW 14. SPACER 15. LOCKWASHER 16. HEX NUT 17. WIRE NUT	1. Wire nut (17).	Remove.	
4. Hex nut (16) and lockwasher (15). 18 18 1	2. Lock nut (1)	Remove.	
Legend: 18	3. Switch (2).	Remove.	
LEGEND: 1. LOCK NUT 2. SWITCH 3. FLATWASHER 4. PLASTIC WASHER 5. BRACKET 6. PLASTIC WASHER 7. HEX BOLT 8. LOCKWASHER 9. HEX NUT 10. LEVER 11. RUBBER SUCTION CUP 12. HOUSING 13. SCREW 14. SPACER 15. LOCKWASHER 16. HEX NUT 17. WIRE NUT		Remove.	
	1. LOCK NUT 2. SWITCH 3. FLATWASHER 4. PLASTIC WASHER 5. BRACKET 6. PLASTIC WASHER 7. HEX BOLT 8. LOCKWASHER 9. HEX NUT 10. LEVER 11. RUBBER SUCTION CUP 12. HOUSING 13. SCREW 14. SPACER 15. LOCKWASHER 16. HEX NUT	15	7

5-54 PORTABLE WORK LAMP MAINTENANCE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
A. DISASSEMBLY (Continued).			
5. Hex bolt (7), plastic washer (6) and spacer (14).	Remove.		
6. Hex nut (9) and lockwasher (8).	Remove.		
 Bracket (5), plastic washer (4) and flat washer (3). 	Remwe,		
8. Screw (13).	Remove.		
9. Lever (10).	Remwe.		
10. Rubber suction cup (11).	Remove from housing (12).		
B. ASSEMBLY.			
11. Rubber suction cup (11).	Install in housing (12).		
12. Lever (10).	Insert through housing (12) and suction cup (11).		
13. Screw (13).	Install and tighten.		
14. Plastic washer (4) and flat washer (3).	Install.		
15. Bracket (5).	Install.		
16. Lockwasher (8) and hex nut (9).	Install and tighten.		
17. Hex bolt (7), spacer (14) and plastic washer (6).	Install.		
18. Hex nut (16) and lockwasher (15).	Install and tighten.		
19. Switch (2).	Install.		
20. Locknut (1).	Install and tighten.		

LOCATION/ITEM	ACTION	REMARKS
B. ASSEMBLY (Continued).		
21. Wire nut (17).	Twist one wire from switch and one wire from supply used together and install.	
22. Bulb (18).	Install	Refer to para 5-53.
C. OPERATIONAL CHECK.		
23. Lamp Assembly	Plug into outside cab receptacle and flip switch to ON position.	Lamp should now be lit.
LEGEND: 1. LOCK NUT 2. SWITCH 3. FLATWASHER 4. PLASTIC WASHER 5. BRACKET 6. PLASTIC WASHER 7. HEX BOLT 8. LOCKWASHER 9. HEX NUT 10. LEVER 11. RUBBER SUCTION CUP 12. HOUSING 13. SCREW 14. SPACER 15. LOCKWASHER 16. HEX NUT	16 15 14 12	3 4 5 6 8 8 9
17. WIRE NUT 18. BULB		TA 07477

5-55. TRAILER LAMP CONNECTOR MAINTENANCE (12 AND 24 VOLT).

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal (24 Volt Connector). (10) f. Test (24 Volt and 12 Volt). (5)

b. Removal (12 Volt Connector). (10)

c. Inspection (12 Volt and 24 Volt Connector). (10)

d. Installation (24 Volt Connector). (10)

e. Installation (12 Volt Connector). (10)

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M915, M916, M917, and M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Tape.

Marking Pen.

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

Table 5-10.

EQUIPMENT CONDITION PARAGRAPH

5-37A.

CONDITION DESCRIPTION

55 Minutes Total.

Batteries Disconnected.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

5-55. TRAILER LAMP CONNECTOR MAINTENANCE (12 VOLT AND 24 VOLT) (Continued). LOCATION/ITEM **ACTION REMARKS** NOTE If wires are to be cut, mark each with tape and pen. A. REMOVAL (24 VOLT CONNECTOR). 1. Connector assembly (8). Unscrew from back of connector assembly (8) and pull free. 2. Four bolts (1) and Remove. nuts (2). **M917 LOCATION** M915, M916, M920 MOUNTING M915 LOCATION LEGEND: 1. BOLT (4) 8. CONNECTOR 2. NUT (4) **ASSEMBLY** 3. WASHER (2) 9. CONNECTOR 4. NUT (2) **ASSEMBLY** 5. BOLT (2) 10. CONNECTOR 6. TERMINAL SCREW (7) **ASSEMBLY** 11 **RUBBER BOOT** 11. MOUNTING PLATE M916/M920 LOCATION TA 074777

CAB INTERIOR LIGHTING AND SWITCHES.

5-56. DOME LAMP MAINTENANCE.		
THIS TASK COVERS: (APPROXIMATE TIME REQUIR a. Removal. (5) b. Installation. (5) c. Operational Check. (1) 11 Minutes Total.	RED FOLLOWS TASK DESCRI	PTION.)
INTIAL SETUP APPLICABLE CONFIGURATIONS All. TEST EQUIPMENT None.	EQUIPMENT CONDITION PARAGRAPH None.	CONDITION DESCRIPTION None.
None. MATERIALS/PARTS (P/N) None.		
PERSONNEL REQUIRED One (MOS-63B20).	SPECIAL ENVIRONMENTAL Vehicle Parked on Level Grou	
REFERENCES (TM) TM 9-2320-273-10.	GENERAL SAFETY INSTRUCE Engine OFF. Transmission in Neutral. Park Brake Set.	<u>CTIONS</u>
TROUBLESHOOTING REFERENCES Table 5-14.		

LOCATION/ITEM	ACTION REMARKS
REMOVAL.	
1. Three screws (6).	Remove.
2. Lens (5).	Remove.
3. Bulb (4).	Remove.
4. Two screws (3) and trim washers (7).	Remove.
5. Dome lamp assembly (8).	Remove.
6. Wire connector (1).	Disconnect.
	√ ∠²
LEGEND: 1. WIRE CONNECTOR 2. DOME LAMP SWITCH 3. SCREW (2) 4. BULB 5. LENS 6. SCREW (3) 7. TRIM WASHER (2) 8. DOME LAMP ASSEMBLY	

LOCATION/ITEM	ACTION	REMARKS
INSTALLATION.		
7. Wire connector (1)	Reconnect.	
8. Dome lamp assembly (8).	Aline and install.	
9. Two trim washers (7) and screws (3).	Install and tighten.	
10. Bulb (4).	Install and twist to tighten.	
11. Lens (5)	Aline and install.	
12. Three screws (6).	Install and tighten.	
. OPERATIONAL CHECK.		
13. DOME LAMP switch (2).	Press ON and OFF. Verify that lamp comes ON and goes OFF.	

5-56. DOME LAMP MAINTENANCE (Continued). **ACTION** LOCATION/ITEM **REMARKS** LEGEND: 1. WIRE CONNECTOR 2. DOME LAMP SWITCH 3. SCREW (2) 4. BULB 5. LENS 6. SCREW (3) 7. TRIM WASHER (2) 8. DOME LAMP **ASSEMBLY** TA 074780

5-57. HEADLAMP DIMMER SWITCH MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (10) b. Installation. (10)

c. Operational Check. (2)

22 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (PIN)

None.

PERSONNEL REQUIRED

One MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

Table 5-8.

EQUIPMENT CONDITION

PARAGRAPH

CONDITION DESCRIPTION

None.

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

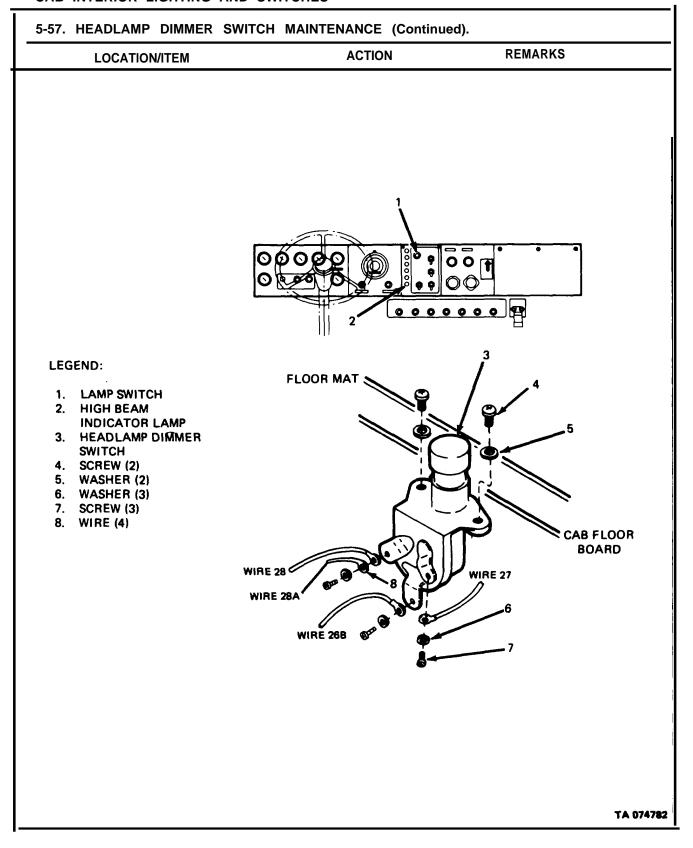
Engine OFF.

Transmission in Neutral.

Park Brake Set.

5-57. HEADLAMP DIMMER SWITCH MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** A. REMOVAL. Lift from dimmer switch (3). 1. Floor mat. Remove. 2. Two screws (4) and washers (5). Remove from under cab 3. Headlamp dimmer floor board. switch (3). 4. Three screws (7) Remove. and washers (6). 5. Four wires (8). Remove. LEGEND: **FLOOR MAT** 1. LAMP SWITCH 2. HIGH BEAM INDICATOR LAMP 3. HEADLAMP DIMMER **SWITCH** 4. SCREW (2) 5. WASHER (2) 6. WASHER (3) 7. SCREW (3) 8. WIRE (4) **CAB FLOOR BOARD** WIRE 28 WIRE 27 WIRE 28A WIRE 26B TA 074781

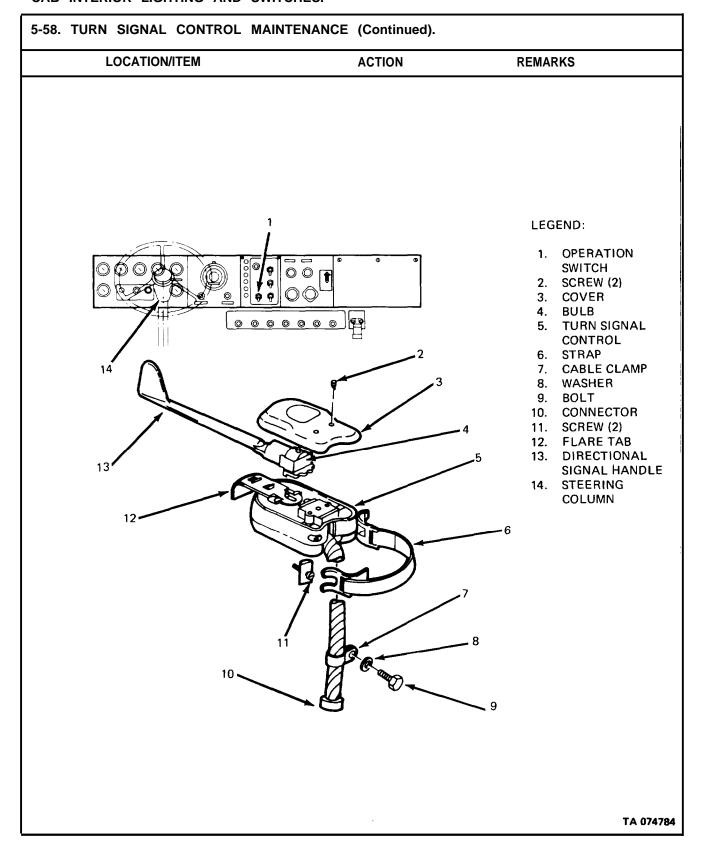
5-57. HEADLAMP DIMMER SWITCH MAINTENANCE (Continued).		
LOCATION/ITEM	ACTION	REMARKS
B. INSTALLATION.		
6. Four wires (8).	Install on dimmer switch (3) according to figure.	
7. Three washers (6) and screws (7).	Install and tighten.	
8. Headlamps dimmer switch (3).	Install into cab floor board.	
9. Two washers (5) and screws (4).	Install and tighten.	
10. Floor mat.	Replace.	
C. OPERATIONAL CHECK.		
11. LAMP switch (1).	Pull ON.	
12. HEADLAMP DIMMER switch (3).	Press down. Verify that high beam indicator lamp (2) come	
	Press down on headlamp dim switch (3) again and verify th beam indicator lamp (2) goes	at high



CAB INTERIOR LIGHTING AND SWITCHES. 5-58. TURN SIGNAL CONTROL MAINTENANCE. THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.) a. Removal. (7) b. Installation. c. Operational Check. (1) 15 Minutes Total. **EQUIPMENT CONDITION INITIAL SETUP** PARAGRAPH **CONDITION DESCRIPTION** APPLICABLE CONFIGURATIONS None. None. All. **TEST EQUIPMENT** None. SPECIAL TOOLS None. MATERIALS/PARTS (P/N) None. SPECIAL ENVIRONMENTAL CONDITIONS PERSONNEL REQUIRED Vehicle Parked on Level Ground. One (MOS-63B20). **REFERENCES (TM) GENERAL SAFETY INSTRUCTIONS** TM 9-2320-273-10. Engine OFF. Transmission in Neutral. Park Brake Set. TROUBLESHOOTING REFERENCES Table 5-11.

REMOVAL. Two screws (11) and strap (6). Two screws (2). Cover (3). Handle (13) with bulb (4).	Remove. Remove. Remove. Remove.	
Flare tab (12). Connector (10).	Remove. Disconnect.	
14		LEGEND: 1. OPERATION SWITCH 2. SCREW (2) 3. COVER 4. BULB 5. TURN SIGNAL CONTROL 6. STRAP 7. CABLE CLAMP 8. WASHER 9. BOLT 10. CONNECTOR 11. SCREW (2) 12. FLARE TAB 13. DIRECTIONAL SIGNAL HANDLE 14. STEERING COLUMN 6

5-58. TURN SIGNAL CONTROL MAINTENANCE (Continued).		
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
7. Bolt (9) and washer (8).	Remove from cable clamp (7).	
8. Turn signal control (5).	Remove from steering column (14).	
B. INSTALLATION.		
9. Flare tab (12).	Place over pin and press down.	
10. Handle (13) with bulb (4).	Install and twist to tighten.	
11. Cover (3).	Install.	
12. Two screws (2).	Install and tighten.	
13. Turn signal control (5).	Aline and install on steering column (14).	
14. Strap (6) and two screws (11).	Replace and tighten.	
15. Connector (10).	Reconnect.	
16. Cable clamp (7).	Aline.	
17. Washer (8) and bolt (9).	Install and tighten.	
C. OPERATIONAL CHECK.		
18. OPERATION switch (1).	Set to Normal.	
19. Directional signal handle (13).	Place in down position and observe that left green lamp flashes.	
	Place handle in up position and observe that right green lamp flashes.	
20. Flare tab (12).	Pull tab and observe that red lamp flashes.	



5-59. ELECTRICAL INSTRUMENTS MAINTENANCE (LH CLUSTER).

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

(5)

b. Installation.

(5)

c. Operational Check. (5)

15 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

EQUIPMENT CONDITION PARAGRAPH

5-37A.

CONDITION DESCRIPTION

Batteries Disconnected.

AII.

TEST EOUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

SPECIAL ENVIRONMENTAL CONDITIONS

One (MOS-63B20). Vehicle Parked on Level Ground.

REFERENCES (TM)

PERSONNEL REQUIRED

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.
Park Brake Set.

Transmission In Neutral.

TROUBLESHOOTING REFERENCES

Table 5-7.

5-59. ELECTRICAL INSTRUMENTS MAINTENANCE (LH CLUSTER) (Continued). LOCATION/ITEM **ACTION REMARKS NOTE** The gages covered in the following procedures are identical as far as removal and installation; therefore, only one is covered the FUEL gage. A. REMOVAL 1. Four quarter-turn Loosen. screws (1). 2. Hinged instrument Lower. panel (2). LEGEND: 1. QUARTER-TURN SCREW (4) 2. HINGED INSTRUMENT **PANEL** 3. NUT (2) 4. WASHER (2) WIRE 44 A 5. NUT (2) 6. WASHER (2) 7. WIRE (3) **WIRE 74** 8. FUEL GAGE 9. BRACKET 10. ILLUMINATING **BULB** TA 074785

5-59. ELECTRICAL INSTRUMENTS	MAINTENANCE (LH CLUSTI	ER) (Continued).
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
3. Illuminating bulb (10).	Remove.	
4. Two nuts (5) and washers (6).	Remove.	
5. Three wires (7).	Remove.	
6. Two nuts (3) and washers (4).	Remove.	
7. Bracket (9).	Remove.	
8. FUEL gage (8).	Remove from instrument panel.	
B. INSTALLATION.		
9. FUEL gage (8).	Aline and insert in panel.	
10. Bracket (9).	Install on back of FUEL gage (8).	
11. Two washers (4) and nuts (3).	Install and tighten.	
12. Three wires (7).	Install according to figure.	
13. Two washers (6) and nuts (5).	Install and tighten.	
14. Illuminating bulb (10).	Install.	
15. Hinged instrument panel (2).	Raise into place.	
16. Four quarter-turn screws (1).	Tighten.	
17. Batteries.	Connect per paragraph 5	-37B.
C. OPERATIONAL CHECK.		
18. Engine.	Start up (see TM 9-2320	-273-10).
19. Gages.	Observe gage replaced an operation.	nd verify

5-59. ELECTRICAL INSTRUMENTS MAINTENANCE (LH CLUSTER) (Continued). LOCATION/ITEM **ACTION REMARKS** 00 LEGEND: 0000000 1. QUARTER-TURN WIRE 29 P SCREW (4) 2. HINGED 10 INSTRUMENT **PANEL** 3. NUT (2) 4. WASHER (2) WIRE 44 A 5. NUT (2) WIRE 44 B 6. WASHER (2) 7. WIRE (3) WIRE 74 8. FUEL GAGE 9. BRACKET 29P 10. ILLUMINATING **BULB** TA 074786

5-60. CIGAR LIGHTER MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

(5) (5)

b. Installation,

c. Operational Check. (1)

11 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

PARAGRAPH 5-37A.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

Batteries Disconnected.

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 5-14.

5-60. CIGAR LIGHTER MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM A. REMOVAL. 1. Four quarter-turn Loosen. screws (1). 2. Hinged instrument panel (2). Lower. 3. Wire cap connector (6). Remove. INSTRUMENT PANEL LEGEND: 1. QUARTER-TURN SCREW (4) 2. HINGED INSTRUMENT **PANEL** 3. CIGAR LIGHTER UNIT 4. HEATING UNIT AND **BUTTON ASSEMBLY** 5. CIGAR LIGHTER CASING6. WIRE CAP CONNECTOR TA 074787

5-60. CIGAR LIGHTER MAINTENANCE	(Continued).	
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
Heating unit and button assembly (4).	Remove.	
5. Cigar lighter casing (5).	Unscrew from cigar lighter unit (3).	
6. Cigar lighter unit (3).	Remove from instrument panel.	
B. INSTALLATION.		
7. Cigar lighter unit (3).	Install in instrument panel.	
8. Cigar lighter casing (5).	Install on cigar lighter unit (3) and tighten.	
9. Wire cap connector (6).	Install on cigar lighter unit (3).	
10. Hinged instrument panel (2).	Raise into place.	
11. Four quarter-turn screws (1).	Tighten.	
12. Batteries.	Connect per paragraph 5-37B.	
C. OPERATIONAL CHECK		
13. Heating unit and button assembly (4).	Insert and press. Verify that element gets hot.	

5-60. CIGAR LIGHTER MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** INSTRUMENT PANEL LEGEND: 1. QUARTER-TURN SCREW (4) 2. HINGED INSTRUMENT PANEL 3. CIGAR LIGHTER UNIT 4. HEATING UNIT AND **BUTTON ASSEMBLY** 5. CIGAR LIGHTER CASING 6. WIRE CAP CONNECTOR TA 074788

5-61. LOW AIR PRESSURE INDICATOR	LAMP MAINTENANCE.	
THIS TASK COVERS: (APPROXIMATE TIME R		IPTION.)
a. Removal. (1) b. Installation (1) c. Operational Check. (1) 3 Minutes Total.	A STATE OF THE PROPERTY OF THE	
INITIAL SETUP APPLICABLE CONFIGURATIONS	EQUIPMENT CONDITION PARAGRAPH	CONDITION DESCRIPTION
All. TEST EQUIPMENT None. SPECIAL TOOLS None. MATERIALS/PARTS (P/N) None.	5-37A.	Batteries Disconnected.
PERSONNEL REQUIRED	SPECIAL ENVIRONMENTAI	L CONDITIONS
One (MOS-63B20).	Vehicle Parked on Level Grou	ind.
REFERENCES (TM) TM 9-2320-273-10.	GENERAL SAFETY INSTRUENTS OFF. Transmission in NEUTRAL. Park Brake Set.	<u>JCTIONS</u>
TROUBLESHOOTING REFERENCES		
Table 5-6.		

5-61. LOW AIR PRESSURE INDICATOR LAMP MAINTENANCE (Continued). **ACTION** LOCATION/ITEM **REMARKS** A. REMOVAL. 1. Four quarter-turn Loosen. screws (1). 2. Hinged instrument panel Lower. 3. Two wires (3) Remove. 4. LOW AIR PRESSURE Remove from instrument panel. indicator lamp unit (4).LEGEND: 1. QUARTER-TURN SCREW (4) 2. HINGED INSTRUMENT INSTRUMENT PANEL **PANEL** 3. WIRE (2) 4. LOW AIR PRESSURE INDICATOR LAMP UNIT 5. ENGINE RUN SWITCH TA 074789

5-61. LOW AIR PRESSURE INDICATOR LAMP MAINTENANCE (Continued).		
LOCATION/ITEM	ACTION	REMARKS
B. INSTALLATION.		
LOW AIR PRESSURE indicator lamp unit (4).	Aline and press into instrument panel.	
6. Two wires (3).	Connect to LOW AI R PRESSURE indicator lamp unit (4).	
7. Hinged instrument panel (2).	Raise into place.	
8. Four quarter-turn screws (1).	Tighten.	
9. Batteries.	Connect per paragraph 5-37B.	
C. OPERATIONAL CHECK.		
Air pressure supply reservoir.	Bleed off air pressure (see TM 9-2320-273-10).	
11. ENGINE RUN switch (5).	Turn on. Verify that LOW AIR PRESSURE lamp comes ON.	

5-61. LOW AIR PRESSURE INDICATOR LAMP MAINTENANCE (Continued). **REMARKS** LOCATION/ITEM **ACTION** INSTRUMENT PANEL LEGEND: 1. QUARTER-TURN SCREW (4) 2. HINGED INSTRUMENT **PANEL** 3. WIRE (2) 4. LOW AIR PRESSURE INDICATOR LAMP UNIT 5. ENGINE RUN SWITCH TA 074790

5-62. ELECTRICAL SWITCHES MAINTENANCE (RH CLUSTER).

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

5-37A.

a. Removal. (30)b. Installation. (30)c. Operational Check. (5)

65 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

EQUIPMENT CONDITION PARAGRAPH

CONDITION DESCRIPTION

Batteries Disconnected.

1. OPERATION Switch-All.

- 2. ENGINE RETARDER Switch-All.
- 3. LAMP Switch-All.
- 4. BACKUP ALARM Switch M916 Thru M920.
- 5. WORK LAMPS Switch M916 and M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Masking tape. Marking pen.

Tie Wrap, MS-3367-2-0 (96906).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

Table 5-4, 5-6, 5-14.

SPECIAL ENVIRONMENTAL CONDITIONS

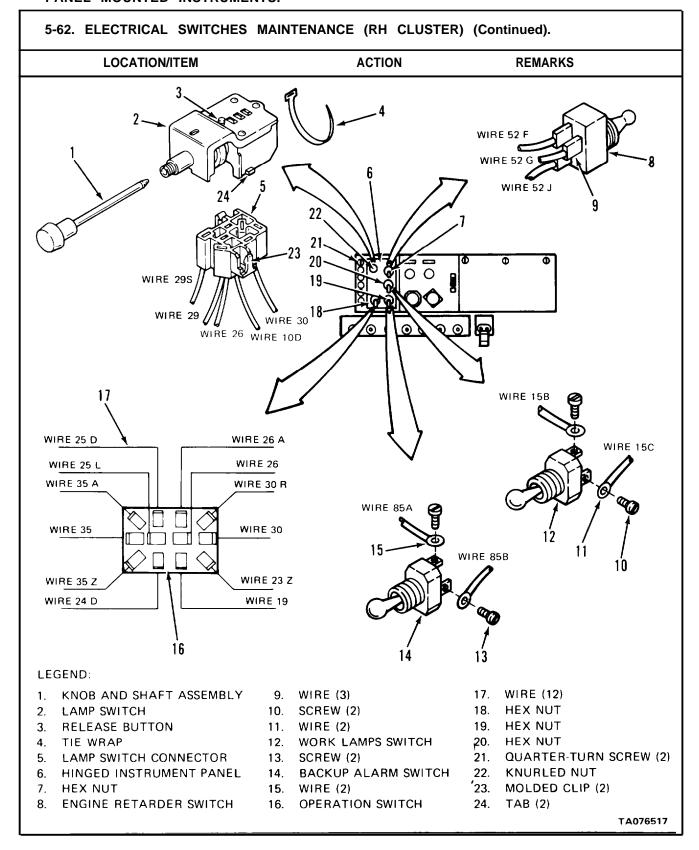
Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

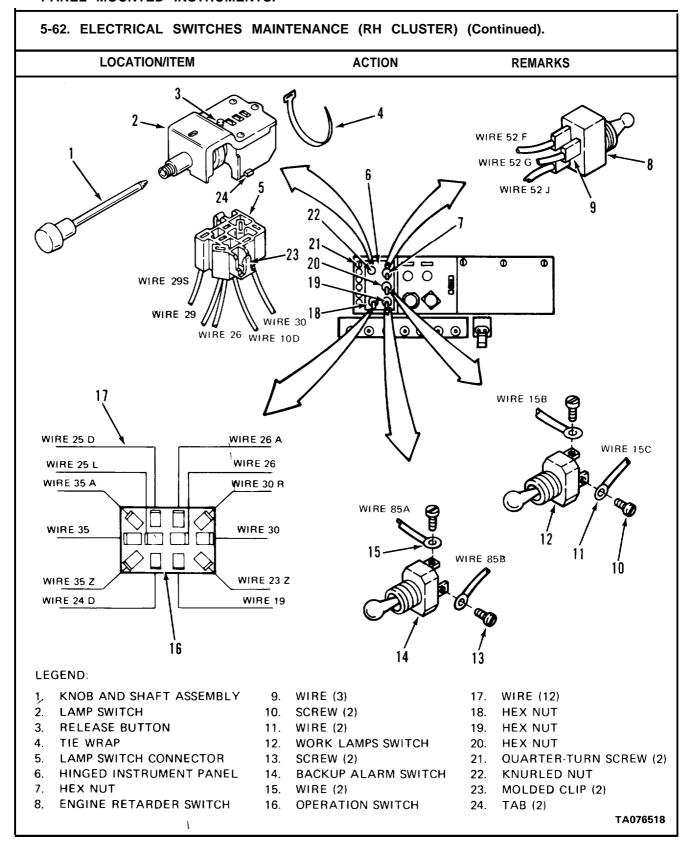
Transmission in Neutral.

Park Brake Set.

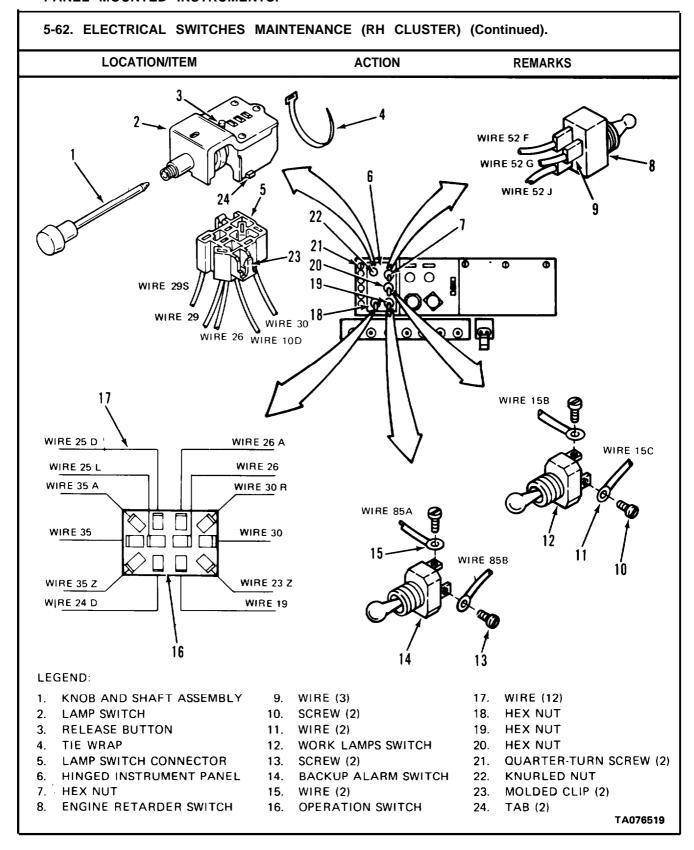


5-62. ELECTRICAL SWITCHES MAINTENANCE (RH CLUSTER) (Continued).

		,
LOCATION/ITEM	ACTION	REMARKS
-	NOTE	
l ag all wires installation.	prior to disconnecting for ease of correct	
A. REMOVAL		
 Two quarter-turn screws (21). 	Loosen.	
 Hinged instrument panel (6). 	Lower.	
3. Hex Nut (7).	Remove from ENGINE RETARDER switch (8).	
4. Three wires (9).	Disconnect and remove ENGINE RETARDER Switch (8).	
5. Hex nut (20).	Remove from WORK LAMPS switch (12).	M916 and M920 only.
6. Two screws (10) and wires (11).	Unscrew and remove WORK LAMPS switch (12).	M916 and M920 only.
7. Hex Nut (19).	Remove from BACKUP ALARM switch (14).	M916 thru M920.
8. Two screws (13) and wires (15).	Unscrew and remove BACKUP ALARM switch (14).	M916 thru M920.
9. Hex Nut (18).	Remove from OPERATION switch (16).	
10. Twelve wires (17).	Disconnect and remove OPERATION switch (16).	
11. Knob and shaft assembly (1).	Remove by pressing release button (3) on top of LAMP switch (2).	
12. Knurled nut (22).	Remove from LAMP switch (2).	
13. Tie wrap (4).	Cut and remove from around LAMP switch (2) and LAMP switch connector (5).	If used.
14. Lamp switch connector (5).	a. Disconnect by pulling outward slightly on two molded clips (23).b. Remove LAMP switch (2).	



5-62. ELECTRICAL SWITCHES MAINTENANCE (RH CLUSTER) (Continued).		
LOCATION/ITEM	ACTION	REMARKS
	NOTE	
B. INSTALLATION.	Install all wires as you marked at removal.	
	D. I	
15. LAMP switch con- nector (5).	Push on to LAMP switch (2).	Ensure two molded clips (23) are snapped over two tabs (24).
16. New tie wrap (4).	Install around LAMP switch (2) and LAMP switch connector (5).	If one was present at removal.
17. LAMP switch (2).	a. Position in hinged instrument panel (6).b. Secure with knurled nut (22).	
18. Knob and shaft assembly (1).	Insert shaft into LAMP switch (2).	Push in firmly until locked in position.
19. Twelve wires (17).	Connect to OPERATION switch (16).	
20. OPERATION switch (16).	a. Position in hinged instrument panel (6).b. Secure with hex nut (18).	
21. Two wires (15).	Secure to BACKUP ALARM switch (14) with two screws (13).	M916 thru M920.
22. BACKUP ALARM switch (14).	a. Position in hinged instrument panel (6).b. Secure with hex nut (19).	M916 thru M920.
23. Two wires (11).	Connect to WORK LAMPS switch (12) with two screws (10).	M916 and M920 only.
24. WORK LAMPS switch (12).	a. Position in hinged instrument panel (6).b. Secure with hex nut (20).	M916 and M920 only.
25. Three wires (9).	Connect to ENGINE RETARDER switch (8).	
26. ENGINE RETARDER switch (8).	a. Position in hinged instrument panel (6).b. Secure with hex nut (7).	
27. Hinged instrument panel (6).	Raise into position and secure with two quarter-turn screws (21).	
28. Batteries.	Connect (refer to para. 5-37B).	
C. OPERATIONAL CHEC	<u>к.</u>	
29. Switch (as required).	Check operation.	



5-63. INDICATOR LAMPS MAINTENANCE (RH CLUSTER).

THIS TASK COVERS: (APPROXIMATE: TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (3

b. Installation. (3) c. Operational Check. (3)

9 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M916 Thru M920-ALL.
 M915 ALL(Except PTO).

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

EQUIPMENT CONDITION

None.

PARAGRAPH CONDITION DESCRIPTION

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 5-7.

5-63. INDICATOR LAMPS MAINTENANCE (RH CLUSTER) (Continued).

LOCATION/ITEM ACTION REMARKS

A. REMOVAL.

1. Two quarter-turn screws (1).

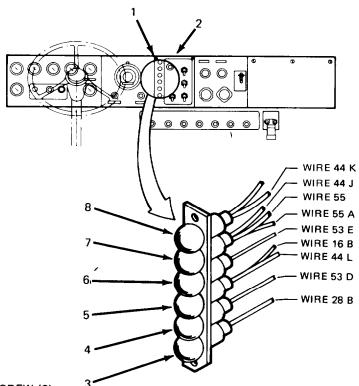
Loosen.

2. Hinged instrument panel (2).

Lower hinged panel.

3. HIGH BEAM bulb (3).

Remove.



LEGEND:

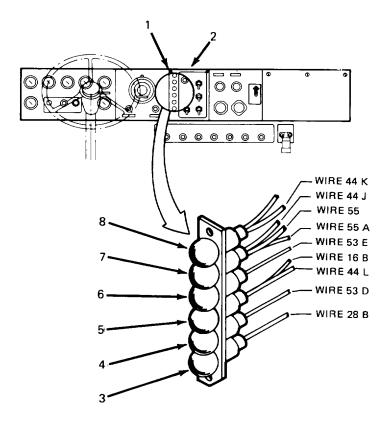
- 1. QUARTER-TURN SCREW (2)
- 2. HINGED INSTRUMENT PANEL
- 3. HIGH BEAM BULB
- 4. PARK BRAKE BULB
- 5. PTO BULB
- 6. DIFF LOCK BULB
- 7. ENG TEMP BULB
- 8. ENG OIL BULB

TA 074794

INDICATOR LAMPS MAINTENA	NCE (RH CLUSTER)	(Continued).
LOCATION/ITEM	ACTION	REMARKS
EMOVAL (Continued).		
PARK BRAKE bulb (4).	Remove.	
PTO bulb (5).	Remove.	
DIFF LOCK bulb (6).	Remove.	
ENG TEMP bulb (7).	Remove.	
ENG OIL bulb (8).	Remove.	
NSTALLATION.		
ENG OIL bulb (8).	Insert in holder.	
ENG TEMP bulb (7).	Insert in holder.	
DIFF LOCK bulb (6).	Insert in holder.	
PTO bulb (5).	Insert in holder.	
PARK BRAKE bulb (4).	Insert in holder.	
HIGH BEAM bulb (3).	Insert in holder.	
Hinged instrument panel (2).	Raise into place.	
Two quarter-turn Screws (1).	Tighten.	
DPERATIONAL CHECK.		
Switch (as required).	Turn on and verify operation of new bulb.	
	EMOVAL (Continued). PARK BRAKE bulb (4). PTO bulb (5). DIFF LOCK bulb (6). ENG TEMP bulb (7). ENG OIL bulb (8). NSTALLATION. ENG TEMP bulb (7). DIFF LOCK bulb (6). PTO bulb (5). PARK BRAKE bulb (4). HIGH BEAM bulb (3). Hinged instrument panel (2). Two quarter-turn Screws (1).	EMOVAL (Continued). PARK BRAKE bulb (4). Remove. PTO bulb (5). Remove. DIFF LOCK bulb (6). Remove. ENG TEMP bulb (7). Remove. ENG OIL bulb (8). Remove. NSTALLATION. ENG OIL bulb (8). Insert in holder. ENG TEMP bulb (7). Insert in holder. DIFF LOCK bulb (6). Insert in holder. PTO bulb (5). Insert in holder. PARK BRAKE bulb (4). Insert in holder. HIGH BEAM bulb (3). Insert in holder. Hinged instrument Raise into place. Two quarter-turn Screws (1). DPERATIONAL CHECK. Switch (as required). Turn on and verify

5-63. INDICATOR LAMPS MAINTENANCE (RH CLUSTER) (Continued).

LOCATION/ITEM ACTION REMARKS



LEGEND:

- 1. QUARTER-TURN SCREW (2)
- 2. HINGED INSTRUMENT PANEL
- 3. HIGH BEAM BULB
- 4. PARK BRAKE BULB
- 5. PTO BULB
- 6. DIFF LOCK BULB
- 7. ENG TEMP BULB
- 8. ENG OIL BULB

TA 074795

5-64. CLEARANCE LAMPS SWITCH MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

- a. Removal.
- (5) (5)
- b. Installation c. Operational Check.
- (1)

11 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

PARAGRAPH

5-37A.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

Batteries Disconnected.

ALL.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 5-9.

5-64. CLEARANCE LAMPS SWITCH MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** WIRE 31 WIRE 30 N WIRE 31 B WIRE 30 P **INSTRUMENT** PANEL - 8 LEGEND: 1. LAMP SWITCH 2. OPERATION SWITCH 3. SCREW (2) 4. WASHER (2) 5. WIRE (4) 6. CLEARANCE LAMPS SWITCH 7. HEX NUT 8. KNURLED NUT TA 074796

		LOCATION/ITEM	ACTION	REMARKS
_	PFI	MOVAL.		
	1.	Knurled nut (8).	Remove.	
	2.	Clearance lamps switch (6).	Remove from instrument panel.	
	3.	Hex nut (7).	Remove.	
	4.	Two screws (3) and washers (4).	Remove.	
	5.	Four wires (5).	Remove	
В.	INS	STALLATION.		
	6.	Four wires (5), two washers (4), and screws (3).	Install and tighten on clearance lamps switch (6).	
	7.	Hex nut (7).	Install and adjust to proper depth on switch (6) to al low installation of knurled nut (8).	
	8.	Clearance lamps switch (6).	Install in instrument panel.	
	9.	Knurled nut (8).	Install and tighten.	
	10.	Batteries.	Connect per paragraph 5-37B.	
C.	OPE	RATIONAL CHECK.		
	11.	LAMP switch (1).	Pull ON.	
	12.	OPERATION switch (2).	Set to Normal.	
	13.	CLEARANCE LAMPS switch (6).	Press and release.	First mechanic.
			Verify that lamps go	Second mechanic.

5-64. CLEARANCE LAMPS SWITCH MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** WIRE 31 WIRE 30 N WIRE 31 B WIRE 30 P **INSTRUMENT PANEL** LEGEND: LAMP SWITCH OPERATION SWITCH 3. SCREW (2) 4. WASHER (2) 5. WIRE (4) 6. CLEARANCE LAMPS SWITCH 7. HEX NUT 8. KNURLED NUT TA 074798

5-65. CLEARANCE INDICATOR LAMP MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

- a. Removal.
- (1) (1)
- b. Installation.
- c. Operational Check. (1)

3 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (PIN)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

None.

EQUIPMENT CONDITION PARAGRAPH

5-37A.

CONDITION DESCRIPTION

Batteries Disconnected.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

5-65. CLEARANCE INDICATOR LAMP MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** A. REMOVAL. Remove from underneath panel. Three wires (3). 1. Remove from instrument panel 2. Clearance indicator lamp unit (2). by pushing outward from behind panel. INSTRUMENT **PANEL** LEGEND: 1. LAMP SWITCH CLEARANCE INDICATOR LAMP UNIT 3. WIRE (3)

TA 074799

5-65. CLEARANCE INDICATOR LAMP MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS B. INSTALLATION.** Aline and press into 3. Clearance indicator instrument panel. lamp unit (2). Connect to clearance 4. Three wires (3). indicator lamp unit (2).5. Batteries. Connect per paragraph 5-38. C. OPERATIONAL CHECK. 6. LAMP switch (1). Pull ON. Verify that CLEARANCE LAMPS indicator (2) comes ON. LEGEND: INSTRUMENT 1. LAMP SWITCH **PANEL** 2. CLEARANCE INDICATOR LAMP UNIT 3. WIRE (3) TA 074800

This page intentionally left blank.

5-66. TACHOGRAPH MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Reading Tachograph Disk.
b. Disk Pack Removal.
c. Disk Pack Installation.
d. Tachograph Removal.
e. Tachograph Installation.
f. Operational Check.
(AR)
(2)
(2)
(7)
(7)

23 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Seven Day Disk Pack (7530-01-060-1628).

EQUIPMENT CONDITION PARAGRAPH

5-37A.

APH CONDITION DESCRIPTION

Batteries Disconnected.

PERSONNEL REQUIRED

One MOS-63B20).

REFERENCES (TM]

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Vehicle Parked on Level Ground.

SPECIAL ENVIRONMENTAL CONDITIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 5-7.

5-66. TACHOGRAPH MAINTENANCE (Continued).

A. READING TACHOGRAPH DISK.

TIME

The outer ring of the disk has markings for 24 hours. Any events shown on the disk by markings happened at the time shown on the outer ring of the disk. Also, each time the tachograph is opened, a small tic mark is put onto the disk by each stylus. (There is a stylus for vehicle speed, engine speed, and distance).

Next to the outer marks for time there is a band about 3/4" wide. The stylus moving in this area records vehicle speed at any moment. You can see at a glance if an operator has been speeding.

RPM

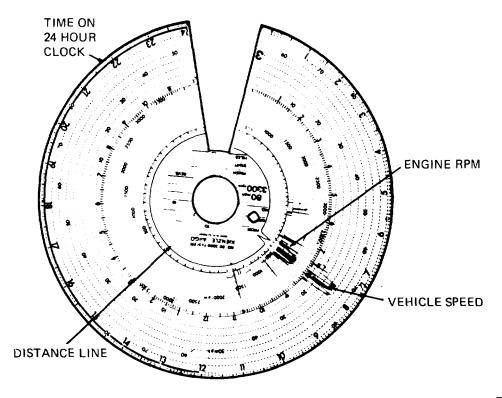
After the speed band, there is a narrower band (about 1/2"). Another stylus moves in this area recording engine RPM. You can see if the engine has been overrevved. You can also determine whether the driver warmed up the engine before moving out. To see this, compare RPM reading with vehicle speed. The disk should record the RPM for the proper number of minutes before vehicle speed is recorded.

DISTANCE A third stylus moves in the narrowest band, closest to the disk's center. This stylus moves away from the center for 5 miles and then toward the center for 5 miles.

In the disk shown, the vehicle did not move fro midnight to about 5:37 AM. Then the engine was started, rewed momentarily to about 1800 RPM, then idled at 600 RPM for six or seven minutes, rewed to 2100 RPM momentarily, then shut down at about 5:46. At 7:10 AM the engine was started again, idled for 22 minutes. At 7:32 it moved out attaining a speed of about 28 mph, then stopped and idled

idled for 22 minutes. At 7:32 it moved out, attaining a speed of about 28 mph, then stopped and idled for eight minutes. Then it moved out, accelerated to about 45 mph and did stop-and-go driving for about 32 minutes, accelerating from 0 to about 45 mph three times and traveling about 15 miles, At 8:11 it stopped, having traveled about 15 miles, it idled for about 48 minutes and then was shut down at about





TA 075702

5-66. TACHOGRAPH MAINTENANCE (Continued). LOCATION/ITEM ACTION REMARKS

B. DISK PACK REMOVAL.

CAUTION

The disk pack must be changed before the end of the seventh day to prevent stylus damage.

1. Key (6).

Unlock tachograph (3) with key (6) and swing open.

Retainer (1).
 a. Turn to the left and remove.
 b. Lift out used disk pack (2).

NOTE

If pack is not properly installed, instruments and dials may not function.

C. DISK PACK INSTALLATION.]

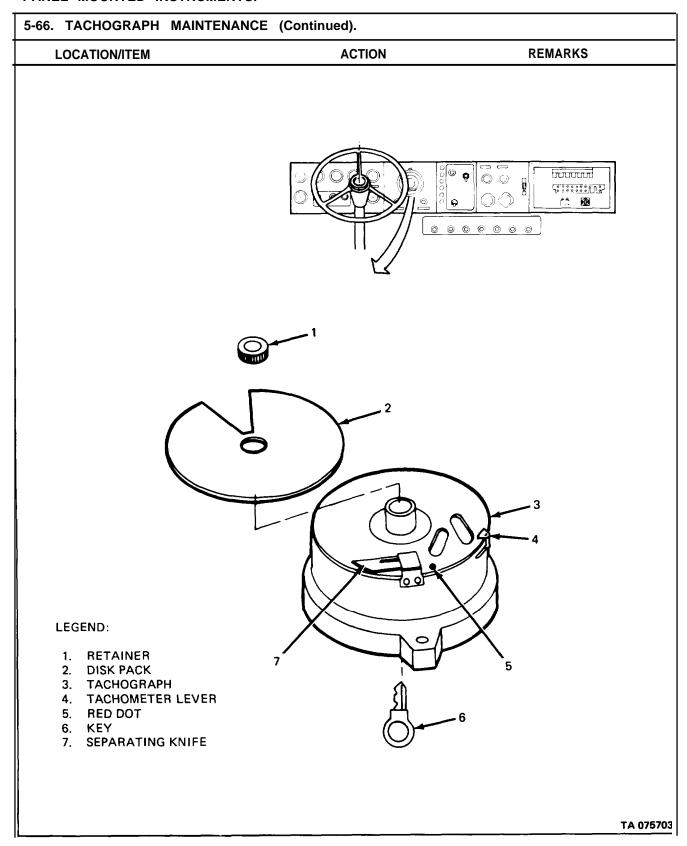
3. New disk pack (2).

- a. Enter date, driver's name, vehicle number and mileage.
- b. Ensure pack is under separating knife (7) and under tachometer lever (4).
- c. Aline time at installation with red dot (5) on disk.
- d. With disk pack in position on center hub, place retainer (1) in place and turn to the right.

4. Tachograph (3).

Swing up into closed position and lock with key (6).

Enter in center field on disk number one.



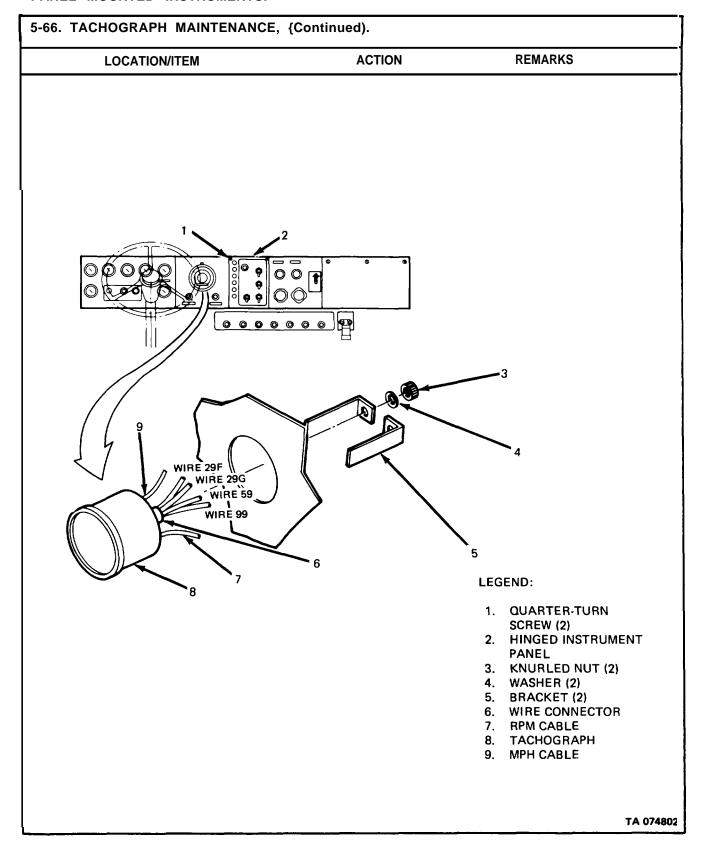
5-66	. TACHOGRAPH MAINTENANCE	(Continued).	
	LOCATION/ITEM	ACTION	REMARKS
D.	TACHOGRAPH REMOVAL.		
5.	Two quarter turn screws (1).	Remove.	
6.	Hinged instrument panel (2).	Lower hinged panel.	
7.	RPM cable (7).	Disconnect.	
8.	MPH cable (9).	Disconnect.	
9.	Wire connector (6).	Disconnect.	
10.	Two knurled nuts (3) and washers (4).	Remove.	
11.	Two brackets (5).	Remove.	
12.	Tachograph (8).	Remove.	
E. T	ACHOGRAPH INSTALLATION.		
13.	Tachograph (8).	Insert into panel.	
14.	Two brackets (5).	Install on tachograph (8).	
15.	Two washers (4) and knurled nuts (3).	Install and tighten.	
16.	Wire connector (6).	Reconnect.	
17.	MPH cable (9).	Reconnect.	
18.	RPM cable (7).	Reconnect.	
19.	Hinged instrument panel (2).	Raise into place.	
20.	Two quarter-turn screws (1).	Tighten.	
21.	Batteries.	Connect per paragraph 5-37B.	
F. C	PERATIONAL CHECK.		
22.	Engine.	Start (Refer to TM 9-2320-273-10).	
23.	Tachograph (8).	Check operation.	
24.	Engine.	Shut down (Refer to TM 9-2320-273-10).	

EXTERIOR LIGHTING.

5-55. TRAILER LIGHTS CONNECTOR MAINTENANCE (12 AND 24 VOLT) (Continued). LOCATION/ITEM **ACTION REMARKS** E. INSTALLATION (12 VOLT CONNECTOR) (Continued). 13. Rubber boot (7). Slide into position over terminal connections. F. TEST (24 VOLT AND 12 VOLT). 14. Connector assemblies a. Hook up suitable (9) and (10). trailer. b. Activate cab controls. 1st mechanic. c. Check for proper 2nd mechanic. functioning of all trailer lights. M917 LOCATION M915, M916, M920 MOUNTING M915 LOCATION LEGEND: BOLT (4) CONNECTOR NUT (4) **ASSEMBLY** CONNECTOR WASHER (2) **ASSEMBLY** NUT (2) 5. **BOLT (2)** 10. CONNECTOR **ASSEMBLY TERMINAL SCREW (7)** TA 074778 M916/M920 LOCATION **RUBBER BOOT** 11. MOUNTING PLATE

EXTERIOR LIGHTING.

5-55.	TRAILER LIGHTS CONNECTOR	R MAINTENANCE (12 AND 24	VOLT) (Continued).
	LOCATION/ITEM	ACTION	REMARKS
A.	REMOVAL (24 VOLT CONNE	CTOR) (Continued).	
	3. Connector assembly (9).	Remove from mounting plate (11).	
В.	REMOVAL (12 VOLT CONNE	CTOR).	
	4. Rubber boot (7).	Twist and pull from back of connector assembly (8).	Replace if cracked.
	5. Seven terminal screws (6).	Unscrew and remove wires.	Mark wires to facilitate installation.
	6. Two bolts (5), washers (3), and nuts (4).	Remove.	
	7. Connector assembly (10).	Remove from mounting plate (11).	
C.	INSPECTION (24 VOLT AND	12 VOLT).	
	8. Connectors assemblies (9) and (10).	Inspect pin receptacles (24V) and pins (12V) for corrosion.	Replace as necessary.
D.	INSTALLATION (24 VOLT CO	ONNECTOR).	
	9. Connector assembly (9).	Mount into plate (11) with four bolts (1) and nuts (2). Tighten.	
	10. Connector assembly (8).	Push into back of connector assembly (9) and screw on ring.	
E.	INSTALLATION (12 VOLT CO	NNECTOR).	
	11. Connector assembly (10).	Mount into mounting plate (11) with two bolts (5), washers (3), and nuts (4). Tighten.	
	12. Seven terminal screws (6).	Insert seven wires as marked at removal and fasten with screws (6). Tighten.	



5-67. HORN BUTTON MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (2.0)b. Installation. (2.0)c. Operational Check. (0.5)

4.5 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

ALL.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

Table 5-14.

EQUIPMENT CONDITION

PARAGRAPH

5-37A.

CONDITION DESCRIPTION

Batteries Disconnected.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked On Level Ground.

GENERAL SAFETY INSTRUCTIONS

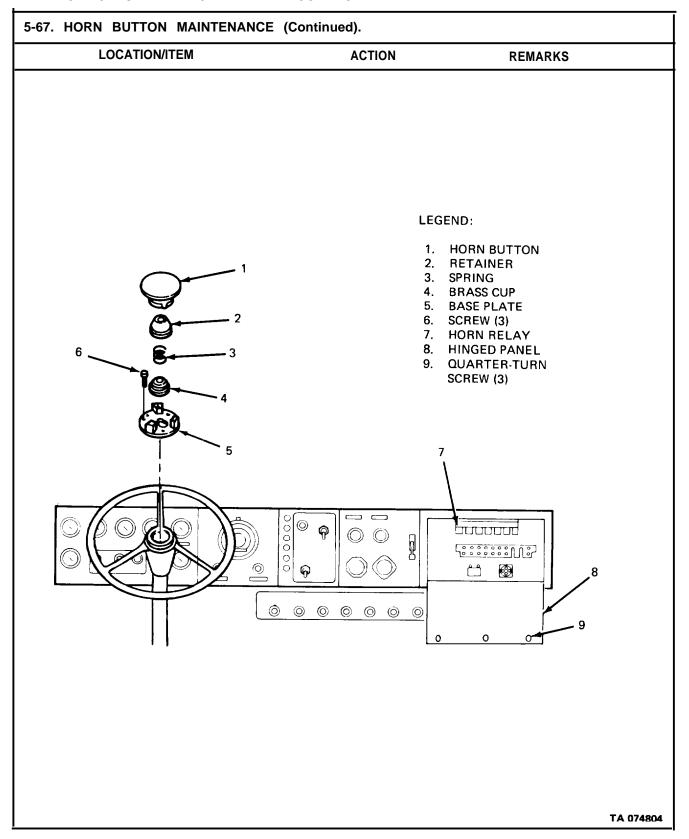
Engine OFF.

Transmission In Neutral.

Park Brake Set.

5-67. HORN BUTTON MAINTENANCE (Continued), LOCATION/ITEM **ACTION REMARKS** A. REMOVAL. 1. Three quarter turn screws (9). Loosen. 2. Hinged panel (8). Lower. 3. Horn relay (7). Remove. 4. Horn button (1). Push down and twist counterclockwise, and remove. 5. Retainer (2), and spring (3). Remove. 6. Brass cup (4). Remove. LEGEND: 1. HORN BUTTON 2. RETAINER 3. SPRING 4. BRASS CUP 5. BASE PLATE 6. SCREW (3) 7. HORN RELAY 8. HINGED PANEL 9. QUARTER-TURN SCREW (3) 000000 boooood 3 TA 074803

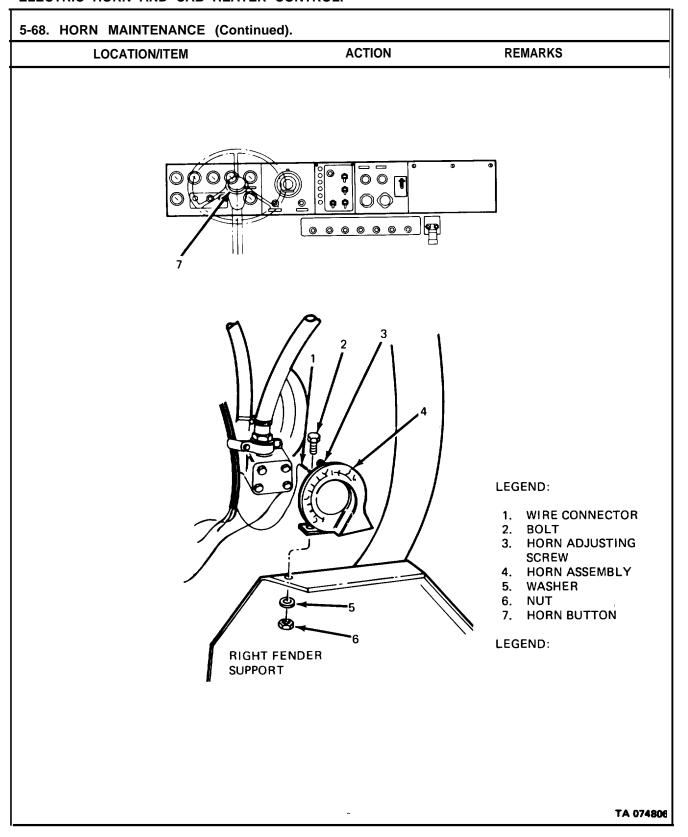
	LOCATION/ITEM	ACTION	REMARKS
А.	REMOVAL (Continued).		
7.	Three screws (6).	Loosen and remove.	
8.	Base plate (5).	Remove.	
В.	INSTALLATION.		
9.	Base plate (5).	Place in steering wheel.	
10.	Three screws (6).	Screw in and tighten.	
11.	Brass cup (4).	Install.	
12.	Spring (3) and retainer (2).	Install over brass cup.	
13.	Horn button (1).	Install.	Push down and turn clockwise.
14.	Horn relay (7).	Install.	
15.	Hinged panel (8).	Raise into position.	
16.	Three quarter turn screws (9).	Tighten.	
17.	Batteries.	Connect (refer to para 5-37 B).	
C.	OPERATIONAL CHECK.]		
18.	Horn button (1).	Press. Verify that horn operates.	



ELECTRIC HORN AND CAB HEATER CONTROL. 5-68. HORN MAINTENANCE. THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.) a. Removal. (5)b. Installation. (5)c. Operational Check. (1) 11 Minutes Total. **EQUIPMENT CONDITION INITIAL SETUP** PARAGRAPH **CONDITION DESCRIPTION APPLICABLE CONFIGURATIONS** 5-37A. Batteries Disconnected. **TEST EQUIPMENT** None. SPECIAL TOOLS None. MATERIALS/PARTS (P/N) None. SPECIAL ENVIRONMENTAL CONDITIONS PERSONNEL REQUIRED Vehicle Parked On Level Ground. Two (MOS-63B20). **REFERENCES (TM) GENERAL SAFETY INSTRUCTIONS** TM 9-2320-273-10. Engine OFF. Transmission In Neutral. Park Brake Set. TROUBLESHOOTING REFERENCES Table 5-14.

5-68. HORN MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM A. REMOVAL 1. Wire connector (1). Disconnect. 2. Bolt (2), washer (5) Remove. and nut (6). 3. Horn assembly (4). Remove. LEGEND: 1. WIRE CONNECTOR BOLT HORN ADJUSTING SCREW 4. HORN ASSEMBLY 5. WASHER 6. NUT 7. HORN BUTTON RIGHT FENDER SUPPORT TA 074805

LOCATION/ITEM	ACTION	REMARKS
3. INSTALLATION.		
I. Horn assembly (4).	Replace and aline mounting hole.	
5. Bolt (2), washer (5) and nut (6).	Replace and tighten.	
6. Wire connector (1).	Reconnect.	
7. Batteries	Connect (refer to para 5-37 B).	
C. OPERATIONAL CHECK.		
3. Horn button (7).	Press and verify the horn works.	
9. Horn adjusting screw (3).	Adjust for maximum loudness.	



5-69. HEATER FAN SWITCH MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (5)

b. Installation. (5)

c. Operational Check. (1)

11 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 92320273-10.

TROUBLESHOOTING REFERENCES

Table 5-14.

EQUIPMENT CONDITION

PARAGRAPH

537A.

CONDITION DESCRIPTION

Batteries Disconnected.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked On Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission In Neutral.

Park Brake Set.

5-69. HEATER FAN SWITCH MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM A. REMOVAL. Remove. 1. Two screws (2). Slide back over cables. 2. Back panel cover (7). 3. Heater knob (6). Pull off. 4. Hex nut (5). Remove. Remove from lower con-5. Heater fan switch (4). trol panel. 6. Four wires (3). Remove. Tag for proper location. <u>0</u>(0)000 **LOWER** CONTROL PANEL LEGEND: 1. ENGINE RUN SWITCH 2. SCREW (2) 3. WIRE (4) 4. HEATER FAN SWITCH 5. HEX NUTS 6. HEATER 7. BACK PANEL COVER TA 074807

Medium, Hi) and verify	install on heater fan witch (4). Iline and install in inwer control panel. Install and tighten. Install. Ilide over cables and ress on back of lower control panel. Install and tighten. Install and	5-69. HEATER FAN SWITCH MAIN	NTENANCE (Continued).	
7. Four wires (3). 8. Heater fan switch (4). 9. Hex nut (5). 10. Heater knob (6). 11. Back panel cover (7). 12. Two screws (2). 13. Batteries. C. OPERATIONAL CHECK. 14. ENGINE RUN switch (1). Install on heater fan switch (4). Aline and install in lower control panel. Install and tighten. Slide over cables and press on back of lower control panel. Connect per paragraph 5-37B. Turn left to accessory. Rotate heater knob (6) through all positions (Lo, Medium, Hi) and verify	witch (4). line and install in over control panel. Install and tighten. Install. lide over cables and ress on back of lower control panel. Install and tighten. Install and tighten. Install and tighten. It connect per paragraph I connect	LOCATION/ITEM	ACTION	REMARKS
7. Four wires (3). 8. Heater fan switch (4). 9. Hex nut (5). 10. Heater knob (6). 11. Back panel cover (7). 12. Two screws (2). 13. Batteries. C. OPERATIONAL CHECK. 14. ENGINE RUN switch (1). Install on heater fan switch (4). Aline and install in lower control panel. Install and tighten. Slide over cables and press on back of lower control panel. Connect per paragraph 5-37B. Turn left to accessory. Rotate heater knob (6) through all positions (Lo, Medium, Hi) and verify	witch (4). line and install in over control panel. Install and tighten. Install. lide over cables and ress on back of lower control panel. Install and tighten. Install and tighten. Install and tighten. It connect per paragraph and an			
switch (4). 8. Heater fan switch (4). 9. Hex nut (5). 10. Heater knob (6). 11. Back panel cover (7). 12. Two screws (2). 13. Batteries. C. OPERATIONAL CHECK. 14. ENGINE RUN switch (1). Switch (4). Aline and install in lower control panel. Install and tighten. Slide over cables and press on back of lower control panel. Connect per paragraph 5-37B. Turn left to accessory. Rotate heater knob (6) through all positions (Lo Medium, Hi) and verify	witch (4). line and install in over control panel. Install and tighten. Install. lide over cables and ress on back of lower control panel. Install and tighten. Install and tighten. Install and tighten. It connect per paragraph and an	B. INSTALLATION.		
lower control panel. 9. Hex nut (5). 10. Heater knob (6). 11. Back panel cover (7). 12. Two screws (2). 13. Batteries. 14. ENGINE RUN switch (1). 15. HEATER FAN switch (4). Install and tighten. Connect per paragraph 5-37B. Connect per paragraph 5-37B. Turn left to accessory. Rotate heater knob (6) through all positions (Lo Medium, Hi) and verify	wer control panel. Install and tighten. Install. Ilide over cables and ress on back of lower control panel. Install and tighten. Install and tighten. Install and tighten. It is is install and tighten. It is install and	7. Four wires (3).		
10. Heater knob (6). 11. Back panel cover (7). Slide over cables and press on back of lower control panel. 12. Two screws (2). Install and tighten. Connect per paragraph 5-37B. C. OPERATIONAL CHECK. 14. ENGINE RUN switch (1). Turn left to accessory. Rotate heater knob (6) through all positions (Lo Medium, Hi) and verify	Ilide over cables and ress on back of lower control panel. Install and tighten. Connect per paragraph -37B. Furn left to accessory. Rotate heater knob (6) conough all positions (Lo, Medium, Hi) and verify the heater fan increases and decreases accordingly. Verify that fan motor thuts off with heater knob	8. Heater fan switch (4).		
11. Back panel cover (7). Slide over cables and press on back of lower control panel. 12. Two screws (2). Install and tighten. Connect per paragraph 5-37B. C. OPERATIONAL CHECK. 14. ENGINE RUN switch (1). Turn left to accessory. Rotate heater knob (6) through all positions (Lo Medium, Hi) and verify	lide over cables and ress on back of lower control panel. Install and tighten. Connect per paragraph -37B. Furn left to accessory. Rotate heater knob (6) concuph all positions (Lo, Medium, Hi) and verify the heater fan increases and decreases accordingly. Verify that fan motor thuts off with heater knob	9. Hex nut (5).	Install and tighten.	
press on back of lower control panel. 12. Two screws (2). 13. Batteries. Connect per paragraph 5-37B. C. OPERATIONAL CHECK. 14. ENGINE RUN switch (1). Turn left to accessory. Rotate heater knob (6) through all positions (Lo Medium, Hi) and verify	ress on back of lower ontrol panel. Install and tighten. Sonnect per paragraph. -37B. Furn left to accessory. Rotate heater knob (6) Inrough all positions (Lo, Medium, Hi) and verify the heater fan increases and decreases according- y. Verify that fan motor thuts off with heater knob	10. Heater knob (6).	Install.	
13. Batteries. Connect per paragraph 5-37B. C. OPERATIONAL CHECK. 14. ENGINE RUN switch (1). Turn left to accessory. Rotate heater knob (6) through all positions (Lo. Medium, Hi) and verify	Connect per paragraph -37B. Furn left to accessory. Rotate heater knob (6) hrough all positions (Lo, Medium, Hi) and verify he heater fan increases hd decreases according- y. Verify that fan motor huts off with heater knob	11. Back panel cover (7).	press on back of lower	
C. OPERATIONAL CHECK. 14. ENGINE RUN switch (1). 15. HEATER FAN switch (4). Rotate heater knob (6) through all positions (Lo Medium, Hi) and verify	Furn left to accessory. Rotate heater knob (6) nrough all positions (Lo, Medium, Hi) and verify ne heater fan increases nd decreases according- y. Verify that fan motor huts off with heater knob	12. Two screws (2).	Install and tighten.	
14. ENGINE RUN switch (1). Turn left to accessory. 15. HEATER FAN switch (4). Rotate heater knob (6) through all positions (Lo. Medium, Hi) and verify	Rotate heater knob (6) hrough all positions (Lo, Medium, Hi) and verify he heater fan increases hd decreases according- y. Verify that fan motor huts off with heater knob	13. Batteries.		
15. HEATER FAN switch (4). Rotate heater knob (6) through all positions (Lo. Medium, Hi) and verify	Rotate heater knob (6) hrough all positions (Lo, Medium, Hi) and verify he heater fan increases hd decreases according- y. Verify that fan motor huts off with heater knob		Turn left to accessory.	
and decreases according- ly. Verify that fan motor		• •	Rotate heater knob (6) through all positions (Lo, Medium, Hi) and verify the heater fan increases and decreases accordingly. Verify that fan motor shuts off with heater knob	

5-69. HEATER FAN SWITCH MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** 0 0 0 0 0 0 0 LOWER **CONTROL PANEL** LEGEND: 1. ENGINE RUN SWITCH 2. SCREW (2) 3. WIRE (4) 4. HEATER FAN SWITCH 5. HEX NUTS 6. HEATER 7. BACK PANEL COVER TA 074808

5-70. OIL PRESSURE SENDING UNIT MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REWIRED FOLLOWS TASK DESCRIPTION.)

- a. Removal. (5)
- b. Installation. (5) c. Operational Check (2)

12 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 92320273-10. TM 9-2320-273-20F?

TROUBLESHOOTING REFERENCES

Table 5-7.

EQUIPMENT CONDITION PARAGRAPH

None.

CONDITION DESCRIPTION

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked On Level Ground.

GENERAL SAFETY INSTRUCTIONS

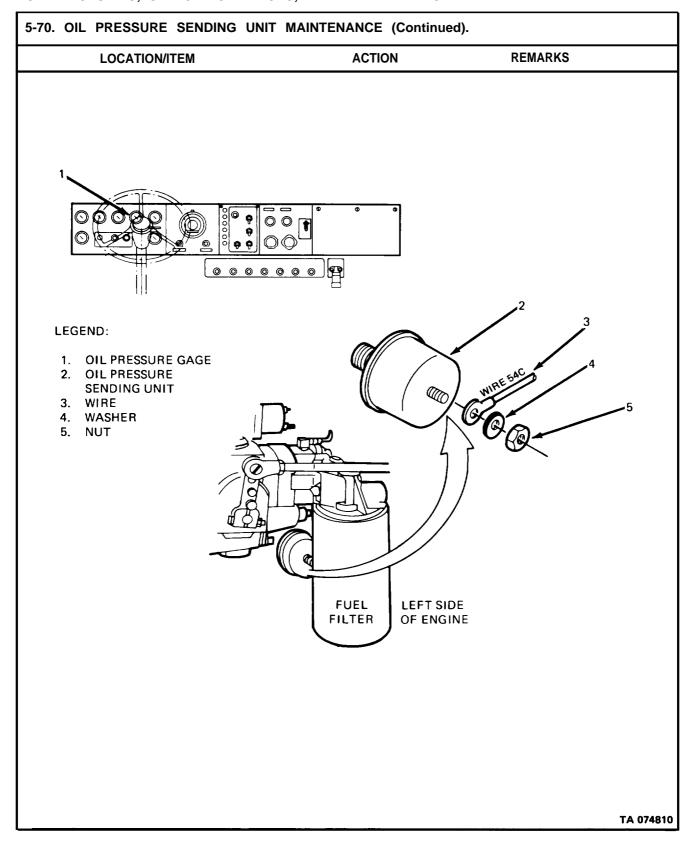
Engine OFF.

Transmission In Neutral.

Park Brake Set.

5-70. OIL PRESSURE SENDING UNIT MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM A. REMOVAL. 1. Nut (5) and washer (4). Remove. Remove. 2. Wire (3). 3. Oil pressure sending Remove. unit (2). LEGEND: 1. OIL PRESSURE GAGE 2. OIL PRESSURE SENDING UNIT 3. WIRE 4. WASHER 5. NUT **FUEL LEFT SIDE** FILTER OF ENGINE TA 074809

LOCATION/ITEM	ACTION	REMARKS	
s. INSTALLATION.			
Oil pressure sending unit (2).	Coat threads with liquid teflon. Install and tighter	1 .	
5. Wire (3).	Place on oil pressure se unit (2).	ending	
6. Washer (4) and nut (5).	Install and tighten.		
. OPERATIONAL CHECK.			
7. Engine.	Start up (see TM 9-2320-	273-10).	
3. Oil pressure gage (1).	Observe that gage indicate pressure reading.	es a	



5-71. OIL PRESSURE SWITCH MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (5) b. Installation. (5) c. Operational Check. (1)

11 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 92320273-10. TM 92320273-20P.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

None.

PARAGRAPH

None.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission In Neutral.

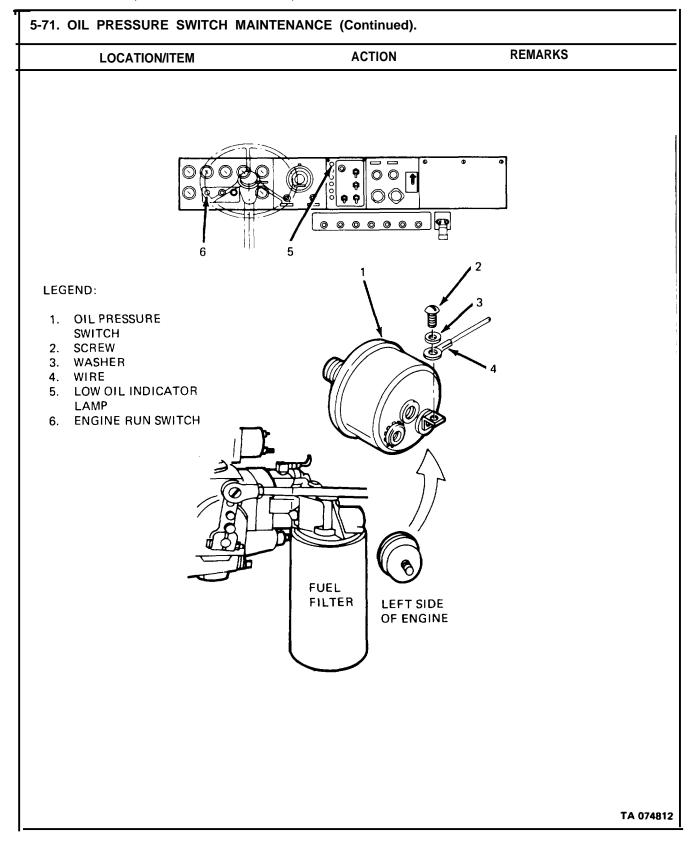
Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 5-6.

5-71. OIL PRESSURE SWITCH MAINTENANCE (Continued). **REMARKS ACTION** LOCATION/ITEM A.REMOVAL. Remove. 1. Screw (2) and washer (3). Remove. 2. Wire (4). Remove. 3. Oil pressure switch (1). LEGEND: 1. OIL PRESSURE SWITCH 2. SCREW 3. WASHER 4. WIRE 5. LOW OIL INDICATOR LAMP 6. ENGINE RUN SWITCH **FUEL** FILTER **LEFT SIDE** OF ENGINE TA 074811

LOCATION/ITEM	ACTION	REMARKS
3. INSTALLATION.		
. Oil pressure switch (1).	Coat threads with liquid teflon. Install and tighten.	
5. Wire (4).	Place on oil pressure switch (1).	
i. Washer (3) and screw (2).	Install and tighten.	
C. OPERATIONAL CHECK.		
'. Engine Run switch (6).	Turn ON. Verify that Low Oil indicator (5) lamp goes O	N.



5-72. WATER TEMPERATURE SENDING UNIT MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (5) b. Installation. (5)

c. Operational Check. (10)

20 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C).

EQUIPMENT CONDITION PARAGRAPH

4-42A.

CONDITION DESCRIPTION

Radiator Drained Below Sending Unit Level.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

Table 5-7.

SPECIAL ENVIRONMENTAL CONDITIONS

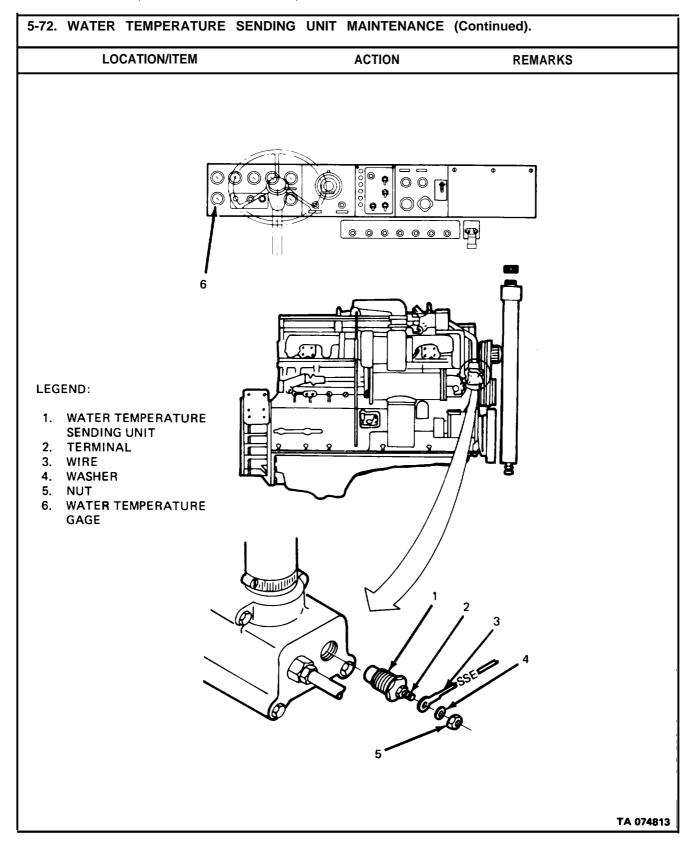
Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

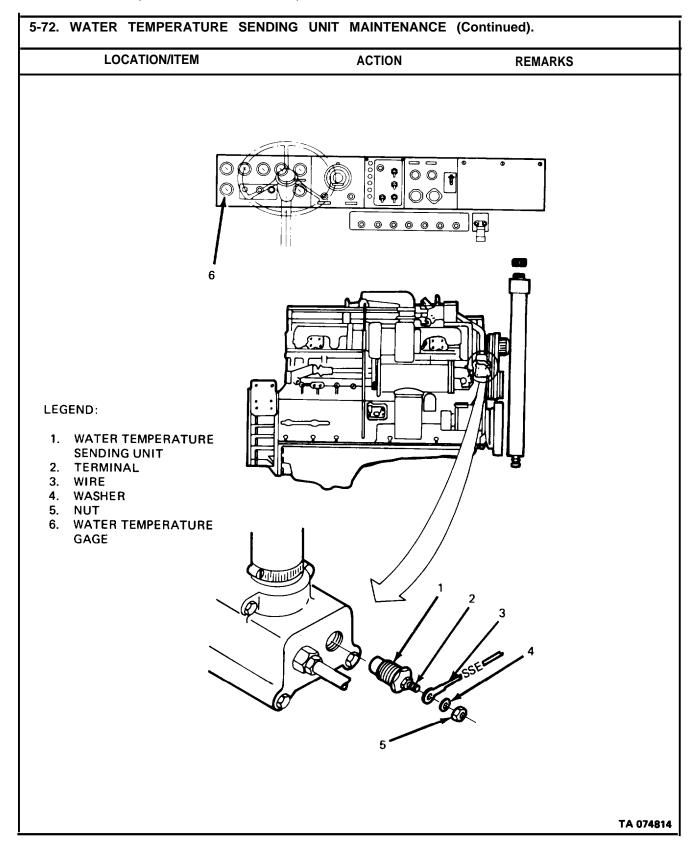
Engine OFF.

Transmission In Neutral.

Park Brake Set.



LOCATION/ITEM	ACTION	REMARKS
. REMOVAL.		
. Nut (5) and washer (4).	Remove.	
. Wire (3).	Remove from terminal (2).	
. Water temperature sending unit (1).	Remove.	
3. INSTALLATION.		
. Water temperature sending unit (1).	Coat threads with liquid teflon. Install and tighten	
i. Wire (3).	Place on terminal (2).	
S. Washer (4) and nut (5).	Install and tighten.	
C. OPERATIONAL CHECK.		
7. Engine	Start up (see TM 9-2320-2	273-10).
3. Water temperature gage (6).	Observe that temperature increases as truck engine warms up.	
	NOTE	
Fo	llow on maintenance required: radiator per paragraph 4-42.	



5-73. WATER TEMPERATURE SWITCH MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (5)

(5)b. Installation.

c. Operational Check. (20)

30 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320- 273-20P.

TROUBLESHOOTING REFERENCES

Table 5-7.

EQUIPMENT CONDITION

PARAGRAPH

4-42A.

CONDITION DESCRIPTION

Radiator Drained Below Switch Level.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

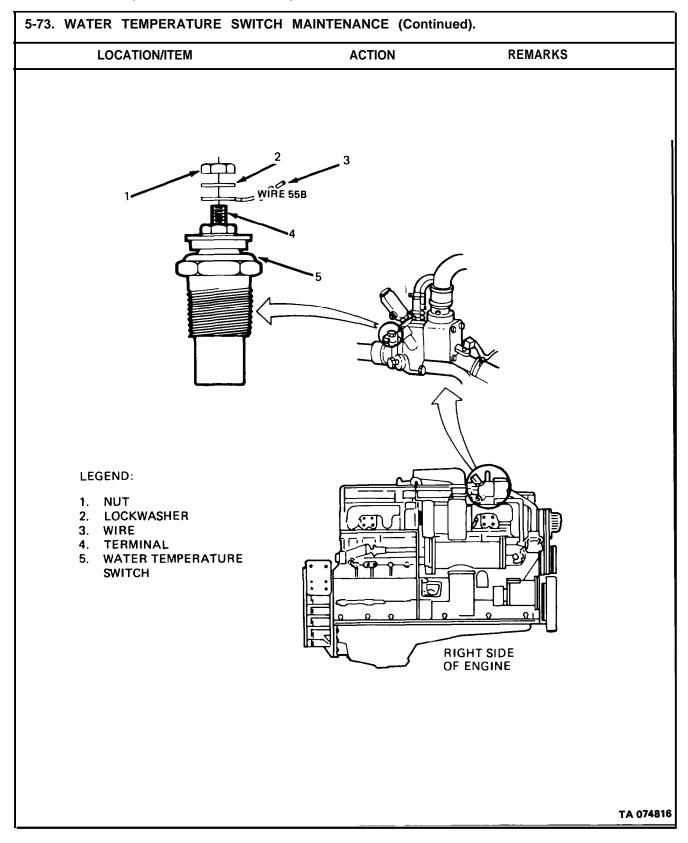
Engine OFF.

Transmission In Neutral.

Park Brake Set.

5-73. WATER TEMPERATURE SWITCH MAINTENANCE (Continued). LOCATION/ITEM **ACTION** REMARKS A. REMOVAL. 1. Nut (1) and Remove. lockwasher (2). Remove from terminal (4). 2. Wire (3). WIRE 55B LEGEND: 1. NUT 2. LOCKWASHER 3. WIRE TERMINAL WATER TEMPERATURE **SWITCH RIGHT SIDE** OF ENGINE TA 074815

LOCATION/ITEM	ACTION	REMARKS
. REMOVAL (Continued).		
3. Water temperature switch (5).	Remove.	
B. INSTALLATION.		
Water temperature switch (5).	Coat threads with liquid teflon. Install and tighten.	
5. Wire (3).	Place on terminal (4).	
6. Lockwasher (2) and nut (1).	Install on terminal (4) and tighten.	
radiate cloth e its firs the co until y	Start (refer to TM 9-232) Monitor WATER TEMP of should close and activate lamp when coolant reach (107°C). WARNING diator cool before removing cap. For cap in two steps. First, place a cover the cap and slowly rotate cap to stop; pause, and let pressure escapoling system. Then rotate cap farticular can remove it. Failure to follower can result in serious burns.	gage, switch e indicator nes 225°F Remove thick o left to ape from ther left
	NOTE	
	r-on maintenance required: Fill rac aph 4-42.	diator per



5-74. ETHER TEMPERATURE SWITCH MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REWIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (2)b. Installation. (2) c. Operational Check. (2)

6 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

EQUIPMENT CONDITION PARAGRAPH

4-42A.

CONDITION DESCRIPTION

Radiator Drained.

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C). Container (Approx 2 gal).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground. Coolant Temperature Below 50°F.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission In Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 5-3.

5-74. ETHER TEMPERATURE SWITC	CH MAINTENANCE (Conti	nued).
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL.		
1. Wire connector (1).	Remove.	
2. Ether temperature switch (2).	Remove.	Place container to catch coolant draining from block.
LEGEND:		
 WIRE CONNECTOR ETHER TEMPERATURE SWITCH 		
•	WIRE 51C	
		TA 074

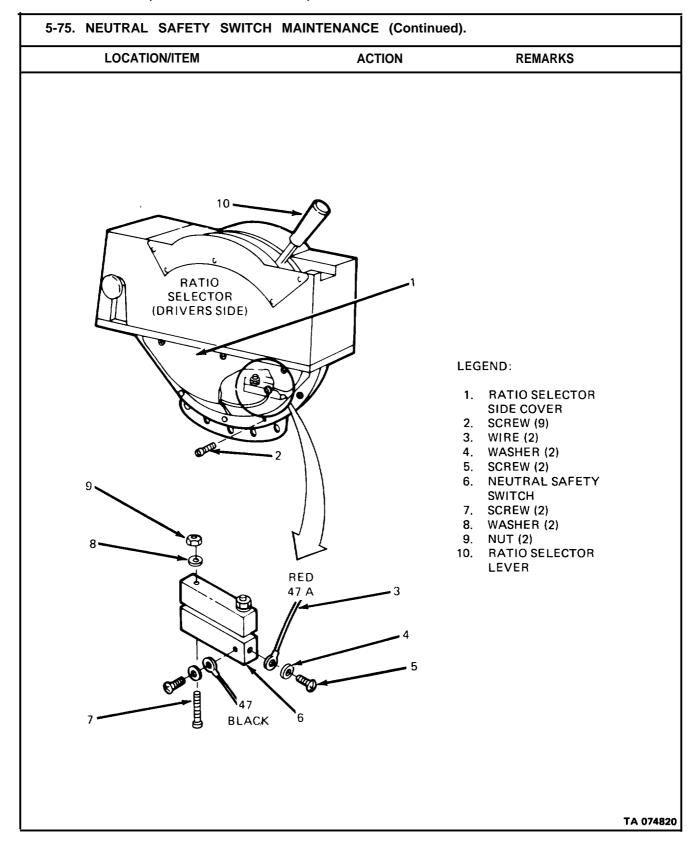
5-74. ETHER TEMPERATURE SWITCH MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** B. INSTALLATION. 3. Ether temperature Coat threads with liquid switch (2). teflon. Install and tighten. 4. Wire connector (1). Reconnect. C. OPERATIONAL CHECK. **NOTE** Follow-on maintenance required: Fill radiator per paragraph 4-42. 5. Engine. Start using cold start procedure (refer to TM 9-2320-273-10). LEGEND: 1. WIRE CONNECTOR 2. ETHER TEMPERATURE **SWITCH** WIRE 51C TA 074818

This page intentionally left blank.

5-75. NEUTRAL SAFETY SWITCH MAINTEN	IANCE.	
THIS TASK COVERS: (APPROXIMATE TIME REQUIR	RED FOLLOWS TASK DESCRI	PTION.)
a Removal. (5) b. Installation (5) c. Operational Check. (2) 12 Minutes Total.		<u> </u>
INITIAL SETUP APPLICABLE CONFIGURATIONS None. TEST EQUIPMENT None.	EQUIPMENT CONDITION PARAGRAPH None.	CONDITION DESCRIPTION None.
SPECIAL TOOLS None.		
MATERIALS/PARTS (P/N) None.		
PERSONNEL REQUIRED	SPECIAL ENVIRONMENTAL	CONDITIONS
One (MOS-63B20).	Vehicle Parked On Level Gro	und.
REFERENCES (TM) TM 9-2320-273-10.	GENERAL SAFETY INSTRU Engine OFF. Transmission In Neutral. Park Brake Set.	<u>ICTIONS</u>
TROUBLESHOOTING REFERENCES Table 6-1.		

5-75. NEUTRAL SAFETY SWITCH	H MAINTENANCE (Continue	d).
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL. 1. Nine screws (2). 2. Ratio selector side cover (1). 3. Two screws (5) and washers (4).	Remove. Remove.	
RATIO SELECTOR (DRIVERS SID		LEGEND: 1. RATIO SELECTOR SIDE COVER 2. SCREW (9) 3. WIRE (2) 4. WASHER (2) 5. SCREW (2) 6. NEUTRAL SAFETY SWITCH 7. SCREW (2) 8. WASHER (2) 9. NUT (2) 10. RATIO SELECTOR LEVER
, e s	LACK ^{`6}	TA 0748

. REMOVAL (Continued).	ACTION	REMARKS
	_	
4. Two wires (3).	Remove.	
5. Two screws (7), washers (8) and nuts (9).	Remove.	
6. Neutral safety switch (6).	Remove.	
B. INSTALLATION.		
7. Neutral safety switch (6).	Aline and install.	
8. Two screws (7), washers (8) and nuts (9).	Install and tighten.	
9. Two wires (3), washers (4) and screws (5).	Install and tighten on neutral safety switch (6).	Install per illustration.
Ratio selector side cover (1).	Aline and install.	
1. Nine screws (2).	Install and tighten.	
c. OPERATIONAL CHECK	<u>к.</u>	
2. Ratio selector lever (10).	Set to N.	
3. Engine.	Start up (see TM 9-2320-273-1	0).



5-76. TRANSMISSION OIL TEMPERATURE SENDING UNIT MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

(2)

b. Installation.

(2)

c. Operational Check. (20)

24 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

None.

SPECIAL TOOLS

TEST EQUIPMENT

None.

MATERIAL/PARTS (P/N)

Liquid Teflon (Refer to Appendix C).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. LO 9-2320-273-12. TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

Table 5-7.

EQUIPMENT CONDITION

PARAGRAPH

6-9A.

CONDITION DESCRIPTION

Transmission Drained.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission in Neutral.

Park Brake Set.

5-76. TRANSMISSION OIL TEMPERATURE SENDING UNIT MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** A. REMOVAL. 1. Hex nut (5) and washer (4). Remove. 2. Wire (3). Remove from terminal (2). 3. Transmission oil tempera-Remove. ture sending unit (1). - 3 LEGEND: 1. TRANSMISSION OIL TEMPERATURE **SENDING UNIT** TERMINAL WIRE WASHER HEX NUT TA 074821

5-76. TRANSMISSION-OIL TEMP	PERATURE SENDING UNIT MAI	NTENANCE (Continued).
LOCATION/ITEM	ACTION	REMARKS
B. INSTALLATION.		
 Transmisison oil tempera- ture sending unit (1). 	Coat threads with liquid teflon. Install and tighten.	
5. Wire (3).	Replace on terminal (2).	
6. Washer (4) and hex nut (5).	Replace on terminal (2), and tighten.	
	NOTE	
Follo	ow on maintenance required:	
	ill transmission per paragraph 9.	
		,
	WIRE 73A	2
LEGEND:		
1. TRANSMISSION OIL TEMPERATURE	3	3
SENDING UNIT 2. TERMINAL 3. WIRE 4. WASHER 5. HEX NUT		4
<u></u>	\ _5	TA 07482

5-76. TRANSMISSION OIL TEMPERATURE SENDING UNIT MAINTENANCE (Continued). **REMARKS ACTION** LOCATION/ITEM **OPERATIONAL CHECK.** Start-up (refer to TM 9-2320-273-10). Check TRANS OIL TEMP gage to be 7. Engine. certain temperature readings go up as the oil warms. . 3 LEGEND: 1. TRANSMISSION OIL TEMPERATURE **SENDING UNIT** 2. TERMINAL WIRE 4. WASHER 5. HEX NUT TA 074823

5-77. BACKUP SWITCH AND CLUTCH DISENGAGEMENT SENSOR MAINTENANCE. THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.) a. Removal. (5)b. Installation. (5)c. Operational Check. (2) 12 Minutes Total. **EQUIPMENT CONDITION INITIAL SETUP CONDITION DESCRIPTION** APPLICABLE CONFIGURATIONS PARAGRAPH 6-9C. All. Cab Floor Inspection Plate Removed. **TEST EQUIPMENT** 9-13A. Air Reservoirs Drained. None. SPECIAL TOOLS MATERIALS/PARTS (P/N) Liquid Teflon (Refer to Appendix C). SPECIAL ENVIRONMENTAL CONDITIONS PERSONNEL REQUIRED Two (MOS-63B20). Vehicle Parked on Level Ground. REFERENCES (TM) **GENERAL SAFETY INSTRUCTIONS** TM 9-2320-273-10. Engine Off. TM 9-2320-273-20P. Transmission in Neutral. Park Brake Set. TROUBLESHOOTING REFERENCES Table 5-12.

5-77. BACKUP SWITCH AND CLUTCH DISENGAGEMENT SENSOR MAINTENANCE (Continued). **REMARKS ACTION** LOCATION/ITEM **NOTE** On M915 model only, access can be gained outside truck by reaching through under cab floor. A. REMOVAL. 1. Wire Connector (2). Disconnect. 2. Backup switch (1). Remove. 3. Two screws (7) Unscrew and remove Mark for identification. and washers (6). two wires (5). 4. Clutch disengagement Unscrew and remove. sensor (4). WIRE 39A WIRE 39B **TRANSMISSION** LEGEND: 1. BACKUP SWITCH 2. WIRE CONNECTOR 3. RATIO SELECTOR LEVER 4. CLUTCH **DISENGAGEMENT SENSOR** 5. WIRE (2) 6. WASHER (2) 7. SCREW (2) TA 074824

5-77. BACKUP SWITCH AND CLUTCH DISENGAGEMENT SENSOR MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM **B. INSTALLATION.** Coat threads with liquid Tef-5. Backup switch (1). lon. Install and tighten. 6. Wire connector (2). Connect to backup switch (1). Apply liquid Teflon 7. Clutch disengagement to threads and screw sensor (4). into valve body. 8. Two wires (5). Fasten to terminals with two washers (6) and screws (7). 9. Cab floor inspection Replace per paragraph 6-9. (M916 thru M920 only). plate. C. OPERATIONAL CHECK. 10. Engine. Start up (see TM 9-2320-273-10). Set to R1 or R2 11. Ratio selector lever (3). First mechanic. Verify that backup lamps Second mechanic. come ON. Test drive. Check operation 12. Vehicle. Disengagernent sensor of engine retarder (see should override engine TM 9-2320-273-10). retarder when rpm drops below 700.

SENDING UNITS, SWITCHING DEVICES, AND WINTERIZATION KIT. 5-77. BACKUP SWITCH AND CLUTCH DISENGAGEMENT SENSOR MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM WIRE 39B WIRE 39A **TRANSMISSION** LEGEND: 1. BACKUP SWITCH 2. WIRE CONNECTOR 3. RATIO SELECTOR LEVER 4. CLUTCH **DISENGAGEMENT SENSOR** 5. WIRE (2) 6. WASHER (2) 7. SCREW (2)

TA 074825

5-78. BACKUP ALARM MAINTENANCE. THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.) (5)a. Removal. b. Installation. (5) c. Operational Check. (2) 12 Minutes Total. **INITIAL SETUP EQUIPMENT CONDITION** PARAGRAPH **CONDITION DESCRIPTION APPLICABLE CONFIGURATIONS** M916 thru M920. None. None. **TEST EQUIPMENT** None. SPECIAL TOOLS None. MATERIALS/PARTS (P/N) None. SPECIAL ENVIRONMENTAL CONDITIONS PERSONNEL REQUIRED Vehicle Parked on Level Ground. One (MOS-63B20). **REFERENCES (TM) GENERAL SAFETY INSTRUCTIONS** TM 9-2320-273-10. Engine Off. Transmission in Neutral. Park Brake Set. TROUBLESHOOTING REFERENCES Table 5-6.

5-78. BACKUP ALARM MAINTE	NANCE (Conti	nued).	
LOCATION/ITEM		ACTION	REMARKS
A. REMOVAL.			
1. Wire (4).	Disconnect.		
Four bolts (5), washers (6), and nuts (7).	Remove.		
3. Backup alarm (8).	Remove.		
	WIRES		LEGEND: 1. BACKUP ALARM SWITCH 2. PARKING BRAKE CONTROL
		•	3. RATIO SELECTOR 4. WIRE 5. BOLT (4)
'			6. WASHER (4) 7. NUT (4)
			8. BACKUP ALARM TA 074826

5-78. BACKUP ALARM MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM B. INSTALLATION. Aline mounting holes. 4. Backup alarm (8). Install and tighten. 5. Four bolts (5), washers (6), and nuts (7). Reconnect. 6. Wire (4). C. OPERATIONAL CHECK. Start up (see TM 9-2320-273-7. Engine. 10). Set to NORMAL. 8. BACKUP ALARM switch (1). 9. PARKING BRAKE Pull ON. control (2). Set to R1 or R2. 10. Ratio selector (3). Verify that alarm operates. 11. Backup alarm (8).

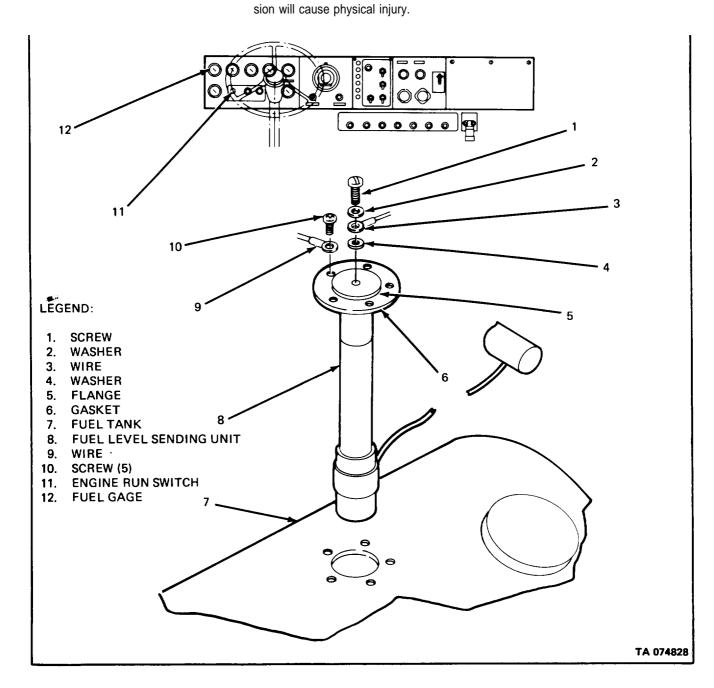
LOCATION/ITEM	ACTION	REMARKS
	8850	LEGEND: 1. BACKUP ALARM SWITCH 2. PARKING BRAKE CONTROL 3. RATIO SELECTOR 4. WIRE 5. BOLT (4) 6. WASHER (4) 7. NUT (4) 8. BACKUP ALARM

5-79. FUEL LEVEL SENDING UNIT MAINTENANCE. THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.) a. Removal. (5)(5)b. Installation. c. Operational Check. (1)11 Minutes Total. **INITIAL SETUP EQUIPMENT CONDITION** PARAGRAPH **CONDITION DESCRIPTION** APPLICABLE CONFIGURATIONS None. All. None. **TEST EQUIPMENT** None. SPECIAL TOOLS None. MATERIALS/PARTS (P/N) Sending Unit Gasket (2013). PERSONNEL REQUIRED SPECIAL ENVIRONMENTAL CONDITIONS Vehicle Parked on Level Ground. One (MOS-63B20). REFERENCES (TM) **GENERAL SAFETY INSTRUCTIONS** TM 9-2320-273-10. Engine Off. TM 9-2320-273-20P. Transmission in Neutral. Park Brake Set. TROUBLESHOOTING REFERENCES Table 5-7.

5-79. FUEL LEVEL SENDING UNIT MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS WARNING

Do not smoke or handle flammable materials while performing this task. Flame or explo-



5-79. FUEL LEVEL SENDING UNIT MAINTENANCE (Continued).		
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL.		
1. Screw (1) and washers (2) and (4).	Remove.	
2. Wire (3).	Remove.	
3. Five screws (10).	Remove.	
4. Wire (9).	Remove	
5. Flange (5). gasket (6). and fuel level sending unit (8).	Remove from tank (7).	Discard gasket (6).
B. INSTALLATION.		
6. Fuel level sending unit (8), gasket (6), and flange (5).	Aline and insert into tank (7).	
7. Wire (9) and five screws (10).	Install and tighten.	
8. Wire (3), washers (2) and (4), and screw (1).	Install and tighten.	
C. OPERATIONAL CHECK.		
9. ENGINE RUN switch (11).	Turn ON. Verify that FUEL gage (12) indicates fuel level.	

-	

5-80. LOW AIR PRESSURE BUZZER MAINTE	ENANCE.	
THIS TASK COVERS: (APPROXIMATE TIME REWIR	ED FOLLOWS TASK DESCRI	PTION.)
a. Removal. (8) b. Installation. (5) c. Operational Check. (3) 16 Minutes Total.		
INITIAL SETUP APPLICABLE CONFIGURATIONS	EQUIPMENT CONDITION PARAGRAPH	CONDITION DESCRIPTION
All. TEST EQUIPMENT None.	5-37A. 9-13A.	Batteries Disconnected. Air Reservoirs Drained.
SPECIAL TOOLS None.		
MATERIAL/PARTS (P/N) None.		
PERSONNEL REQUIRED	SPECIAL ENVIRONMENTAL	CONDITIONS
One (MOS-63B20).	Vehicle Parked on Level Grou	und.
REFERENCES (TM) TM 9-2320-273-10.	GENERAL SAFETY INSTRUE Engine Off. Transmission in Neutral. Park Brake Set.	CTIONS
TROUBLESHOOTING REFERENCES Table 5-6.		

5-80. LOW AIR PRESSURE BUZZER MAINTENANCE. (Continued). **ACTION** REMARKS LOCATION/ITEM A. REMOVAL. 1. Three quarter-turn screws (1). Loosen. 2. Circuit panel cover (2). Lower. LEGEND: 1. QUARTER-TURN SCREW (3) 2. CIRCUIT PANEL COVER 3. WIRE (2) 10 4. WASHER (2) 5. SCREW (2) 6. LOW AIR PRESSURE BUZZER 7. BOLT (2) 8. WASHER (2) 9. NUT (2) 10. AIR PRESSURE GAGE (2) WIRE 99E 11. LOW AIR PRESSURE INDICATOR

-3

TA 074830

	LOCATION/ITEM	ACTION	REMARKS
Α.	REMOVAL (Continued).		
3.	Two screws (5) washers (4).	Remove.	
4.	Two wires (3).	Remove.	
5.	Two bolts (7) washers (8) and nuts (9).	Remove.	
6.	Low air pressure buzzer (6).	Remove.	
В.	INSTALLATION.		
7.	Low air pressure buzzer (6).	Aline mounting holes.	
8.	Two bolts (7), washers (8), and nuts (9).	Install and tighten.	
9.	Two wires (3).	Place on low air pressure buzzer (6) according to figure.	
10.	Two washers (4) and screws (5).	Install and tighten.	
11.	Circuit panel cover (2).	Raise into place.	
12.	Three quarter-turn screws (1).	Tighten.	
13.	Batteries.	Connect per paragraph 5-37B.	
С.	OPERATIONAL CHECK		
14.	Engine.	Start up (see TM 9-2320-273-10).	
15.	Two AIR PRESSURE GAGES (10), LOW AIR PRESSURE INDICATOR (11), LOW AIR PRESSURE BUZZER (6).	Verify that gages indicate LOW PRESSURE. indicator lamp comes ON, and buzzer is ACTIVATED.	

5-80. LOW AIR PRESSURE BUZZER MAINTENANCE (Continued). **REMARKS ACTION** LOCATION/ITEM LEGEND: 1. QUARTER-TURN SCREW (3) 2. CIRCUIT PANEL COVER 3. WIRE (2) 4. WASHER (2) 5. SCREW (2) 6. LOW AIR PRESSURE BUZZER 7. **BOLT (2)** 8. WASHER (2) 9. NUT (2) 10. AIR PRESSURE GAGE (2) LOW AIR PRESSURE INDICATOR WIRE OGE - 3 TA 074831

5-81. LOW AIR PRESSURE SWITCH MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

b. Installation,

(10)

c. Operational Check, (6)

25 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C).

EQUIPMENT CONDITION PARAGRAPH

5-37A. 9-13A.

CONDITION DESCRIPTION

Batteries Disconnected. Air Reservoirs Drained.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

Table 5-6.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission in Neutral.

Park Brake Set.

5-81. LOW AIR PRESSURE SWITCH MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS NOTE** Switch is located on firewall. A. REMOVAL. 1. Two screws (3), washers (4) Remove. and four wires (5). 2. Two screws (2). Remove. 3. Low air pressure switch (6). Remove. 4. Low air pressure switch Remove. base (7). LEGEND: 1. LOW AIR PRESSURE BUZZER 2. SCREW (2) 3. SCREW (2) 4. WASHER (2) 5. WIRE (4) 6. LOW AIR PRESSURE SWITCH WIRE 44E 7. LOW AIR PRESSURE SWITCH BASE 8. AIR PRESSURE GAGE (2) 9. LOW AIR PRESSURE INDICATOR WIRE 44F **WIRE 53** WIRE 53A TA 074832

5-81. LOW AIR PRESSURE SWITCH MAINTENANCE (Continued). **ACTION** LOCATION/ITEM **REMARKS B. INSTALLATION.** 5. Low air pressure switch Coat threads with liquid teflon. Install and tighten. base (7). 6. Low air pressure Aline and install on base (7). switch (6). 7. Two screws (2). Install and tighten. 8. Four wires (5), two washers Install and tighten. (4) and screws (3). 9. Batteries. Connect per paragraph 5-37B. C. OPERATIONAL CHECK, Start up (see TM 9-2320-273-10. Engine. 10). Verify that gages indicate low 11. LOW AIR PRESSURE gages pressure, indicator lamp comes (8), LOW AIR PRESSURE ON, and buzzer is activated. indicator (9) and low air pressure buzzer (1).

5-81. LOW AIR PRESSURE SWITCH MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** LEGEND: 1. LOW AIR PRESSURE BUZZER 2. SCREW (2) 3. SCREW (2) 4. WASHER (2) WIRE (4) LOW AIR PRESSURE SWITCH WIRE 44E LOW AIR PRESSURE SWITCH BASE 8. AIR PRESSURE GAGE (2) 9. LOW AIR PRESSURE INDICATOR WIRE 44F **WIRE 53** WIRE 53A TA 074833

5-82. PARK BRAKE SWITCH MAINTENANCE. THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.) a. Removal. (3)b. Installation. b. Installation. (3) c. Operational Check. (5) 11 Minutes Total. **EQUIPMENT CONDITION INITIAL SETUP PARAGRAPH CONDITION DESCRIPTION** APPLICABLE CONFIGURATIONS All. 5-37A. Batteries Disconnected. 9-13A. Air Reservoirs Drained. **TEST EQUIPMENT** None. SPECIAL TOOLS None. MATERIALS/PARTS (P/N) Liquid Teflon (Refer to Appendix C). SPECIAL ENVIRONMENTAL CONDITIONS PERSONNEL REQUIRED One (MOS-63B20). Vehicle Parked on Level Ground. REFERENCES (TM) **GENERAL SAFETY INSTRUCTIONS** TM 9-2320-273-10. TM 9-2320-273-20P. Engine Off. Transmission in Neutral. Park Brake Set. TROUBLESHOOTING REFERENCES Table 5-7.

5-82. PARK BRAKE SWITCH MAINTENANCE (Continued). **ACTION** LOCATION/ITEM **REMARKS** A. REMOVAL. 1. Three quarter-turn screws (1). Loosen. 2. Circuit panel cover (2). Lower. LEGEND: 1. QUARTER-TURN SCREW (3) 2. CIRCUIT PANEL COVER 3. WIRE (3) 4. PARK BRAKE SWITCH 5. ADAPTER 6. WASHER (2) 7. SCREW (2) 8. PARKING BRAKE CONTROL 9. PARK BRAKE INDICATOR TA 074834

5-82. PARK BRAKE SWITCH MAINTENANCE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
A. REMOVAL (Continued).			
3. Two screws (7) and washers (6).	Remove.		
4. Three wires (3).	Remove.		
5. Park brake switch (4).	Remove from adapter (5).		
B. INSTALLATION.			
6. Park brake switch (4).	Coat threads with liquid tef- lon. Install and tighten into adapter (5).		
7. Three wires (3), two washers (6) and screws (7).	Install and tighten,		
8. Circuit panel cover (2).	Raise into place.		
9. Three quarter-turn screws (1).	Tighten.		
10. Batteries.	Connect per paragraph 5-37B.		
C. OPERATIONAL CHECK			
11. Engine.	Start up (see TM 9-2320-273-10).		
12. PARKING BRAKE control (8).	Pull ON.		
13. PARK BRAKE indicator (9).	Observe that indicator lamp comes ON.		

582. PARK BRAKE SWITCH MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM LEGEND: 1. QUARTER-TURN SCREW (3) 2. CIRCUIT PANEL COVER 3. WIRE (3) 4. PARK BRAKE SWITCH 5. ADAPTER 6. WASHER (2) 7. SCREW (2) 8. PARKING BRAKE CONTROL 9. PARK BRAKE INDICATOR TA 074835

5-83. DIFFERENTIAL LOCK-UP SWITCH MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

Removal. (3) Installation. (3) Operational Check. (2)

8 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-23202-273-10.

TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

Table 5-7.

EQUIPMENT CONDITION

PARAGRAPH

5-37A. 9-13A. **CONDITION DESCRIPTION**

Batteries Disconnected. Air Reservoirs Drained.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground,

GENERAL SAFETY INSTRUCTIONS

Engine OFF

Transmission in Neutral

Park Brake Set.

5-83. DIFFERENTIAL LOCK-UP SWITCH MAINTENANCE (Continued).

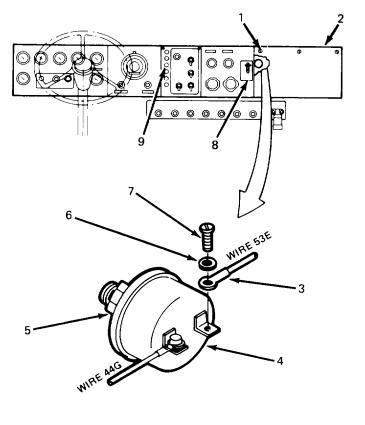
LOCATION/ITEM ACTION REMARKS

A. REMOVAL.

- 1. Three quarter-turn screws (1). Loosen.
- 2. Circuit panel cover (2). Lower.
- 3. Two screws (7) and Remove. washers (6).
- 4. Two wires (3). Remove.
- 5. Differential lock-up switch (4). Remove.
- 6. Hex nut (5). Remove.

LEGEND:

- 1. QUARTER-TURN SCREW (3)
- 2. CIRCUIT PANEL COVER
- 3. WIRE (2)
- 4. DIFFERENTIAL LOCK-UP SWITCH
- 5. HEX NUT
- 6. WASHER (2)
- 7. SCREW (2)
- 8. DIFFERENTIAL LOCK-UP CONTROL
- 9. DIFFERENTIAL LOCK-UP INDICATOR



TA 074836

INSTALLATION. 7. Hex nut (5). 8. Differential lock-up switch (4). 9. Hex nut (5). 10. Two wires (3), washers (6) screws (7). 11. Circuit panel cover (2). 12. Three quarter-turn screws (1). 13. Batteries. Connect per paragraph 5-37B. OPERATIONAL CHECK. 14. Engine. Start up (see TM 9-2320-273-10). Set to LOCK. 16. DIFFERENTIAL LOCK-UP control (8). 17. Hex nut (5). Install on differential lock-up switch (4). Raise into place. Tighten. Connect per paragraph 5-37B.	LOCATION/ITEM	ACTION	REMARKS
switch (4). 8. Differential lock-up switch (4). Coat threads with liquid teflon. Install and tighten. 9. Hex nut (5). Tighten. 10. Two wires (3), washers (6) screws (7). 11. Circuit panel cover (2). Raise into place. 12. Three quarter-turn screws (1). 13. Batteries. Connect per paragraph 5-37B. OPERATIONAL CHECK. 14. Engine. Start up (see TM 9-2320-273-10). 15. DIFFERENTIAL LOCK-UP control (8). 16. DIFFERENTIAL LOCK-UP Observe that indicator	INSTALLATION.		
teflon. Install and tighten. 9. Hex nut (5). 10. Two wires (3), washers (6) screws (7). 11. Circuit panel cover (2). 12. Three quarter-turn screws (1). 13. Batteries. Connect per paragraph 5-37B. OPERATIONAL CHECK. 14. Engine. Start up (see TM 9-2320-273-10). 15. DIFFERENTIAL LOCK-UP control (8). 16. DIFFERENTIAL LOCK-UP Observe that indicator	7. Hex nut (5).		
10. Two wires (3), washers (6) screws (7). 11. Circuit panel cover (2). Raise into place. 12. Three quarter-turn screws (1). 13. Batteries. Connect per paragraph 5-37B. OPERATIONAL CHECK. 14. Engine. Start up (see TM 9-2320-273-10). 15. DIFFERENTIAL LOCK-UP control (8). 16. DIFFERENTIAL LOCK-UP Observe that indicator	8. Differential lock-up switch (4)		
screws (7). 11. Circuit panel cover (2). Raise into place. 12. Three quarter-turn screws (1). 13. Batteries. Connect per paragraph 5-37B. OPERATIONAL CHECK. 14. Engine. Start up (see TM 9-2320-273-10). 15. DIFFERENTIAL LOCK-UP control (8). 16. DIFFERENTIAL LOCK-UP Observe that indicator	9. Hex nut (5).	Tighten.	
12. Three quarter-turn screws (1). 13. Batteries. Connect per paragraph 5-37B. OPERATIONAL CHECK. 14. Engine. Start up (see TM 9-2320-273-10). 15. DIFFERENTIAL LOCK-UP control (8). 16. DIFFERENTIAL LOCK-UP Observe that indicator		Install and tighten.	
screws (1). 13. Batteries. Connect per paragraph 5-37B. OPERATIONAL CHECK. 14. Engine. Start up (see TM 9-2320-273-10). 15. DIFFERENTIAL LOCK-UP control (8). 16. DIFFERENTIAL LOCK-UP Observe that indicator	11. Circuit panel cover (2).	Raise into place.	
OPERATIONAL CHECK. 14. Engine. Start up (see TM 9-2320-273-10). 15. DIFFERENTIAL LOCK-UP Set to LOCK. control (8). 16. DIFFERENTIAL LOCK-UP Observe that indicator		Tighten.	
 14. Engine. Start up (see TM 9-2320-273-10). 15. DIFFERENTIAL LOCK-UP Set to LOCK. control (8). 16. DIFFERENTIAL LOCK-UP Observe that indicator 	13. Batteries.	Connect per paragraph 5-37B.	
15. DIFFERENTIAL LOCK-UP Set to LOCK. control (8).16. DIFFERENTIAL LOCK-UP Observe that indicator	OPERATIONAL CHECK.		
control (8). 16. DIFFERENTIAL LOCK-UP Observe that indicator	14. Engine.	Start up (see TM 9-2320-273-10).	
		Set to LOCK.	

5-83. DIFFERENTIAL LOCK-UP SWITCH MAINTENANCE (Continued). **REMARKS** ACTION LOCATION/ITEM LEGEND: QUARTER-TURN SCREW (3) CIRCUIT PANEL COVER 3. WIRE (2) 4. DIFFERENTIAL LOCK-UP SWITCH 5. HEX NUT 6. WASHER (2) 7. SCREW (2) 8. DIFFERENTIAL LOCK-UP CONTROL 9. DIFFERENTIAL LOCK-UP INDICATOR TA 074837

5-84. POWER TAKEOFF(PTO) SWITCH MAINTENANCE. THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.) a. Removal. (5) b. Installation. (5) c. Operational Check. (2) 12 Minutes Total. **EQUIPMENT CONDITION INITIAL SETUP** PARAGRAPH **CONDITION DESCRIPTION** APPLICABLE CONFIGURATIONS M916 Thru M920. None. None **TEST EQUIPMENT** None. SPECIAL TOOLS None. MATERIALS/PARTS (P/N) None. SPECIAL ENVIRONMENTAL CONDITIONS PERSONNEL REQUIRED Vehicle Parked on Level Ground. One (MOS-63B20). REFERENCES (TM) **GENERAL SAFETY INSTRUCTIONS** TM 9-2320-273-10. Engine OFF. Transmission in Neutral. Park Brake Set. TROUBLESHOOTING REFERENCES Table 12-2.

5-84. POWER TAKEOFF (PTO) SWITCH MAINTENANCE (Continued).

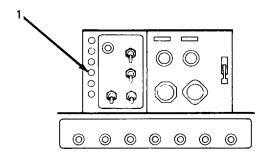
LOCATION/ITEM ACTION REMARKS

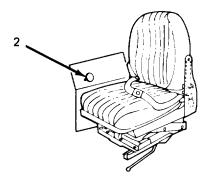
A. REMOVAL.

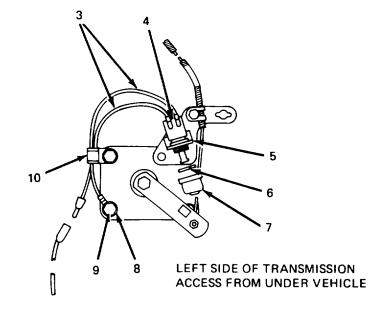
- 1. Nutcap (7) and lockwasher (6).
- 2. Two screws (9), grounding washer (8) and wire clamp (10).

Remove.

Remove with two wires (3).







LEGEND:

- 1. PTO INDICATOR
- 2. PTO CONTROL KNOB
- 3. WIRE (2)
- 4. PTO SWITCH
- 5. BRACKET
- 6. LOCKWASHER
- 7. NUTCAP
- 8. GROUNDING WASHER
- 9. SCREW (2)
- 10. WIRE CLAMP

TA 074838

5-84. POWER TAKEOFF (PTO) SWITCH MAINTENANCE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
A. REMOVAL (Continued).			
3. PTO switch (4).	Remove from bracket (5).		
B. INSTALLATION.			
4. PTO switch (4).	Install on bracket (5).		
5. Lockwasher (6) and nutcap (7).	Install and tighten.		
6. Two wires (3).	Install on PTO switch (4).		
7. Two screws (9), grounding washer (8) and wire clamp (10).	Install to PTO.		
C. OPERATIONAL CHECK.			
8. Engine.	Start up (see TM 9-2320- 273-10).		
9. PTO control knob (2).	Pull to engage.		
10. PTO indicator (1).	Observe that indicator lamp comes ON.		

LOCATION/ITEM	ACTION	N.	MARKS
	2		
9 8 LEFT SIDE OF THACCESS FROM U		1. 2. 3. 4. 5. 6. 7. 8.	PTO SWITCH BRACKET LOCKWASHER NUTCAP

SENDING UNITS, SWITCHING DEVICES, AND WINTERIZATION KIT. 5-85. STOPLAMP SWITCH MAINTENANCE. THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.) a. Removal. (2) (2) b. Installation c. Operational Check. (1) 5 Minutes Total. **EQUIPMENT CONDITION INITIAL SETUP CONDITION DESCRIPTION** PARAGRAPH **APPLICABLE CONFIGURATIONS** None. None. **TEST EQUIPMENT** None. SPECIAL TOOLS None. MATERIALS/PARTS (P/N) None. SPECIAL ENVIRONMENTAL CONDITIONS PERSONNEL REQUIRED Two (MOS-63B20). Vehicle Parked on Level Ground. References (TM) TM 9-2320-273-10. **GENERAL SAFETY INSTRUCTIONS** Engine OFF. Transmission in Neutral. Park Brake Set. TROUBLESHOOTING REFERENCES Table 5-11.

5-85. STOPLAMP SWITCH MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM REMOVAL. 1. Two nuts (2) and washers (3). Remove. Remove. 2. Two wires (4). 3. Two screws (5). Remove. 4. Stoplamp switch (6). Remove. LEGEND: 1. OPERATION 3 **SWITCH** WIRE 25A 2. NUT (2) 3. WASHER (2) 4. WIRE (2) WIRE 25B 5. SCREW (2) 6. STOPLAMP SWITCH 7. BRAKE PEDAL LEFT SIDE **ENGINE COMPARTMENT** FIRE WALL TA 074840

5-85. STOPLAMP SWITCH MAINTENANCE (Continued).		
LOCATION/ITEM	ACTION	REMARKS
INSTALLATION.		
5. Stoplamp switch (6).	Aline and install.	
6. Two screws (5).	Install and tighten.	
7. Two wires (4), washers (3) and nuts (2).	Install and tighten.	
. OPERATIONAL CHECK.		
8. Engine.	Start up (see TM 9-2320-273-10).	
9. OPERATION switch (1).	Set to NORMAL.	
10. BRAKE pedal (7).	Press DOWN.	First mechanic.
11. BRAKE lamps.	Verify that brake lamps come ON.	Second mechanic.

5-85. STOPLAMP SWITCH MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM LEGEND: - 3 WIRE 25A 1. OPERATION SWITCH 2. NUT (2) WIRE 25B 3. WASHER (2) 4. WIRE (2) 5. SCREW (2) 6. STOPLAMP **SWITCH** 7. BRAKE PEDAL LEFT SIDE **ENGINE COMPARTMENT** FIRE WALL TA 074841

5-86. INSTRUMENT RELAY MAINTENAN	ICE.	
a. Removal. b. Installation, c. Operational Check. (1) 5 Minutes Total.	JIRED FOLLOWS TASK DESCRI	PTION.)
INITIAL SETUP APPLICABLE CONFIGURATIONS 1. M917, M918, M919 – Two Relays. 2. M915 – Seven Relays. 3. M916 and M920 – Eight Relays. TEST EQUIPMENT None. SPECIAL TOOLS None. MATERIALS/PARTS (P/N) None.	EQUIPMENT CONDITION PARAGRAPH None.	CONDITION DESCRIPTION None.
PERSONNEL REQUIRED One (MOS-63B20).	SPECIAL ENVIRONMENTAL Vehicle Parked on Level Groun	
REFERENCES (TM) TM 9-2320-273-10. TROUBLESHOOTING REFERENCES None.	GENERAL SAFETY INSTRUENCE OFF. Transmission in Neutral. Park Brake Set.	JCTIONS

5-86. INSTRUMENT RELAY MAIN	TENANCE	
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL. 1. Three quarter-turn screws (1). 2. Circuit panel cover (2).	Loosen. Lower.	
3. Relay (4).	Remove from relay bracket	(3).
4. Relay (4).	Aline and press into relay b	racket (3).
K2 K3	K4 K5 K6 K7 K8	3
K1 K2		END:
	2. 3.	QUARTER-TURN SCREW (3) CIRCUIT PANEL COVER RELAY BRACKET RELAY
ra h	4	TA 074842

5-86. INSTRUMENT RELAY MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM B. INSTALLATION (Continued). 5. Circuit panel cover (2). Raise into place. 6. Three quarter-turn screws (1). Tighten. C. OPERATIONAL CHECK. 7. Relay. Refer to paragraph 2-34 and check the operation of the relay replaced. K1 K2 K3 K4 K5 K6 K7 K8 LEGEND: 1. QUARTER-TURN SCREW (3) 2. CIRCUIT PANEL COVER 3. RELAY BRACKET 4. RELAY TA 074843

This page intentionally left blank.

(15)

5-87. WINTERIZATION KIT CIRCUIT BREAKERS, BOX, AND RECEPTACLE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

- a. Removal of Circuit Breaker (es). (15)
- b. Installation of Circuit Breaker (es). (15)
- c. Operational Check.

- d. Removal of Circuit Breaker Box and Receptacle,
- e. Installation of Circuit Breaker Box and Receptacle. f. Operational Check

(60)(60)

> (30)195 Minutes

Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

None.

SPECIAL TOOLS

TEST EQUIPMENT

None.

MATERIALS/PARTS (P/N)

30 Amp Circuit Breaker (1). 15 Amp Circuit Breaker (3).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

GENERAL SAFETY INSTRUCTIONS

Vehicle Parked on Level Ground.

SPECIAL ENVIRONMENTAL CONDITIONS

Engine Off.

Transmission in Neutral.

Park Brake Set.

110 VAC Cable Disconnected From Power Source and Receptacle. All Breakers Set to OFF.

TROUBLESHOOTING REFERENCES

Table 5-14.

EQUIPMENT CONDITION PARAGRAPH

5-37A.

CONDITION DESCRIPTION

Batteries Disconnected.

5-87. WINTERIZATION KIT CIRCUIT BREAKERS, BOX, AND RECEPTACLE MAINTENANCE (Continued).						
LOCATION/ITEM	ACTION	REMARKS				
A. REMOVAL OF CIRCUIT BREAKER.						
1. Four screws (7) and washers (8).	Remove and lift out inner panel (6).	Open outer cover to gain access to (6), (7), and (8).				
2. Two screws (1) or (4).	Remove and lift off wires.	Screws (1) if 15 amp breaker; screws (4) if 30 amp breaker. Mark wires for location.				
3. Circuit breaker (2) or (3).	Remove by pulling out.	Circuit breakers are the plug in type. Item (2) 15 amp; Item (3) 30 amp.				
B. INSTALLATION OF CIRCUIT	BREAKER.					
 Circuit breaker or (3). 	Install by pushing into position.	Be sure breaker is securely snapped in.				
5. Two screws (1) or (4).	Place wires into position on circuit breaker and secure with screws.	Be sure to reattach wires as marked in step 2.				
6. Inner panel (6).	Set into position in box (5) and attach with four screws (7) and washers (8).					
LEGEND:		16 17 18				
2. CIRCUIT BREAKER (3) 3. CIRCUIT BREAKER 4. SCREW (2) 5. BOX 6. INNER PANEL 7. SCREW (4) 8. WASHER (4) 9. BOLT (3) 10. WASHER (3) 11. NUT (3) 12. NUT (4) 13. WASHER (4) 14. BOLT (4) 15. CONNECTOR (4) 16. RECEPTACLE BOX	。 12—	13 14 1 2 3				
17. WIRE (8)		TA 074844				

5-8	5-87. WINTERIZATION KIT CIRCUIT BREAKERS, BOX, AND RECEPTACLE MAINTENANCE (Continued).				
	LOCATION/ITEM	ACTION	REMARKS		
	OPERATIONAL CHECK.				
7.	Receptacle (18).	Plug in 110 VAC power cord,			
8.	Circuit breaker (2) or (3).	Flip replaced breaker to ON and verify that appropriate heater is functional.	After verifying proper heater functions, flip all breakers to OF F and disconnect power cord.		
D.	REMOVAL OF CIRCUIT BREAK	ER BOX AND RECEPTACLE.			
9.	Breaker box (5).	Open outer cover, remove four washers (8) and screws (7) and inner panel (6) to gain access to box attaching hardware.			
10.	Four cable to receptacle box connectors (15).	Unscrew.			
11.	Six screws (1) and two screws (4).	Unscrew and remove eight wires (17).	Mark each wire and pull wire out of receptacle box.		
12.	Three bolts (9) with washers (10) and nuts (11).	Unscrew and remove circuit breaker t/ox (5) with receptacle box (16) attached.			
13.	Receptacle (18).	Remove retaining screws.			
14.	Three wires (19).	Disconnect from receptacle (18) and remove receptacle.	Mark position before disconnecting.		
15.	Four bolts (14), washers (13) and nuts (12).	Unscrew and remove receptacle box (16) from circuit breaker box (5).	_		
E.	INSTALLATION OF CIRCUIT B	REAKER BOX AND RECEPTACLE.	_		
16.	Receptacle box (16).	Attach to circuit box (5) with four bolts (14), washers (13) and nuts (12).			
17.	Three wires	Connect to receptacle (18) and install receptacle to box (16).			
18.	Circuit breaker box (5).	Mount to vehicle with three bolts (9), washers (10) and nuts (11).			
19.	Eight wires (17).	Push thru either side of receptacle box and fasten to circuit breakers as marked, with six screws (1) and two screws (4).			

5-87. WINTERIZATION KIT CIRCUIT BREAKERS. BOX, AND RECEPTACLE MAINTENANCE (Continued).

LOCATION/ITEM **ACTION REMARKS** E. INSTALLATION OF CIRCUIT BREAKER BOX AND RECEPTACLE (Continued). 20. Four cable connectors (15), Screw onto receptacle box (16). 21. Inner panel (6). Fasten to box (5) with four Insure all breakers are OFF. screws (7) and washers (8). F. OPERATIONAL CHECK. Plug in 110 VAC power cord. 22. Receptacle (18). 23. Four circuit breakers Flip to ON and verify that all (2) and (3). four heaters are functioning. 24. Four circuit breakers Flip to OFF, disconnect power (2) and (3). cord and close outer cover on circuit breaker box (5). NOTE Follow-on maintenance action required: Connect 12 VDC vehicle batteries per para 5-37B. LEGEND: SCREW (2) **CIRCUIT BREAKER (3)** CIRCUIT BREAKER 18 4. SCREW (2) 5. BOX 6. **INNER PANEL** 7. SCREW (4) 8. WASHER (4) 9. BOLT (3) WASHER (3) 10. 11. NUT (3) 10 **NUT (4)** 12. 13. WASHER (4) 14. BOLT (4) CONNECTOR (4) 15. 16. RECEPTACLE BOX 17. **WIRE (8)** 18. RECEPTACLE 19. WIRE (3) TA 074845

5-88. WINTERIZATION KIT TRANSMISSION OIL HEATER MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal of Transmission Oil Heater, (30)

b. Installation of Transmission Oil Heater. (30)

c. Operational Check. (15)

75 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

EQUIPMENT CONDITION PARAGRAPH

6-9A. 5-37A. **CONDITION DESCRIPTION**

Transmission Oil Drained. Batteries Disconnected.

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

110 VAC Cable Disconnected From Power Source

and Receptacle.

All Breakers Set to OFF.

TROUBLESHOOTING REFERENCES

Table 5-14.

LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL OF HEATER.		
1. Heater cover (7).	a, Remove two bolts (5) and lockwashers (6).b. Remove heater cover (7) from heater mounting plate (2).	
2. Wire assembly (11).	Remove from heater mounting plate (2).	
	LEGEND:	
	3. LOCKY 4. SCREV 5. BOLT 6. LOCKY 7. COVER 8. NUT 9. WASH	ER MOUNTING PLATE NASHER (2) V (2) (2) NASHER (2) R
		3 6 7
11		
90		10 \ 9 8
		TA 074

5-88. WINTERIZATION KIT TRAN	NSMISSION OIL HEATER MAINTEN	ANCE (Continued).			
LOCATION/ITEM	ACTION	REMARKS			
A. REMOVAL OF HEATER (Continued).					
3. Cable grip (10).	a. Remove nut (8) and washer (9).b. Remove cable grip (10) from heater cover (7).				
Heater mounting plate (2) and heater (1).	a. Remove two screws (4) and lockwashers (3).b. Remove heater mounting plate (2) and heater (1) from transmission.				
B. INSTALLATION OF HEATER.	-				
5. Heater (1) and heater mounting plate (2).	a. Install in transmission.b. Secure with two screws (4) and lockwashers (3).				
6. Cable grip (10).	a. Install in heater cover (7).b. Secure with nut (8) and washer (9).				
7. Wire assembly (11).	Connect to heater mounting plate (2).				
8. Heater cover (7).	a. Install on heater mounting plate (2).b. Secure with two bolts (5) and lockwashers (6).				
C. OPERATIONAL CHECK.					
9. Refill transmission.	Refer to para 6-9E.				
10. 110 VAC power cord.	Plug into source and vehicle receptacle, flip transmission heater circuit breaker to ON.				
11. Heater (1).	Verify that heater is functioning,	Flip circuit breaker OFF and disconnect power cord after check.			
12. Vehicle batteries.	Reconnect per para 5-37B.				

5-88. WINTERIZATION KIT TRANSMISSION OIL HEATER MAINTENANCE (Continued). 11 10 LEGEND: 1. HEATER 2. HEATER MOUNTING PLATE 3. LOCKWASHER (2) 4. SCREW (2) 5. BOLT (2) 6. LOCKWASHER (2) 7. COVER 8. NUT 9. WASHER 10. CABLE GRIP 11. WIRE ASSEMBLY TA 074847

5-89. WINTERIZATION KIT ENGINE OIL HEATER THERMOSTAT MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal of Thermostat. (30)
b. Installation of Thermostat. (30)
c. Operational Check. (15)

75 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None,

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Gasket (1020803).

EQUIPMENT CONDITION

PARAGRAPH

4-14A. 5-37A. **CONDITION DESCRIPTION**

Engine Oil Drained.
Batteries Disconnected.

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

110 VAC Cable Disconnected From Power

Source and Receptacle. All Breakers Set to Off.

TROUBLESHOOTING REFERENCES

Table 5-14.

5-89. WINTERIZATION KIT ENGI	NE OIL HEATER THERMOSTA	AT MAINTENANCE (Continued).
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL OF THERMOSTAT	:	
 Two screws (6) and washers (7). 	Unscrew and remove cover (5).	
2. Wire assembly (4).	Disconnect from terminals on plate (8).	Mark locations.
		8 Coo
8 9 3		LEGEND: 1. GASKET 2. SCREW AND WASHER (2) 3. CLAMP 4. WIRE ASSEMBLY 5. COVER 6. SCREW (2) 7. WASHER (2) 8. PLATE 9. THERMOSTAT AND COIL 10. RETAINER 11. WASHER (2) 12. SCREW (2)
		TA 074848

3. Cl	EMOVAL OF THERMOSTAT	(Continued). Remove from transmission front	
4. Tv	lamp (3)	Remove from transmission front	
		by taking out one screw.	Remove if wire assembly is to be disconnected at circuit breaker box.
***	wo screws (2) with vashers.	Remove and lift off plate (8) with thermostat and coil (9) attached.	
	wo screws (12) and vashers (11).	Unscrew to remove retainer (10).	Lift out thermostat and coil (9). Replace as necessary.
6. G	asket (1).	Remove.	Discard.
B. IN	STALLATION OF THERMOS	STAT.	
7. Ne	ew gasket (1).	Install to side of oil pan.	
8. Th	hermostat and coil (9).	Install to plate (8) with retainer (10), two washers (11) and two screws (12).	
	ate (8) with coil and nermostat (9) attached.	Mount over gasket with two screws (2) and washers.	
10. C	lamp (3).	Install over wire assembly (4) at transmission front.	If removed.
11. W	ire assembly (4).	Connect to heater terminals on plate (8).	Install as marked.
12. C	over (5).	Install on plate (8) with two screws (2) and washers.	
C. OF	PERATIONAL CHECK.		
13. R	efill engine oil pan.	Refer to para 4-14.	
14. 1 ⁻	10 VAC power cord.	Plug into source and vehicle receptacle, flip engine oil circuit breaker ON and verify that heater is functioning properly.	Flip breaker to OFF and remove power cord after check.

5-89. WINTERIZATION KIT ENGINE OIL HEATER THERMOSTAT MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** 10 LEGEND: 1. GASKET 2. SCREW AND WASHER (2) CLAMP 4. WIRE ASSEMBLY 5. COVER 6. SCREW (2) 7. WASHER (2) 8. PLATE 9. THERMOSTAT AND COIL 10. RETAINER 11. WASHER (2) 12. SCREW (2) TA 074849

5-89. WI	NTERIZAT	ION KIT	ENGINE OIL	HEATER THER	MOSTAT MAINTENAN	CE (Continued)
	LOCAT	ION/ITEM		ACTION		REMARKS
C. OPER	ATIONAL	CHECK	(continued).			
			<u>`</u>	NOTE		
			does not fund	ostat maintenance tion properly, refe will have to be re heater,	er to DS/GS	
			Follow-on ma	intenance require	ed:	
			Reconnect v	ehicle batteries po	er para 5-37B.	

5-89. WINTERIZATION KIT ENGINE OIL HEATER THERMOSTAT MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM 10 //**©**© LEGEND: 1. GASKET 2. SCREW AND WASHER (2) 3. CLAMP 4. WIRE AŞ8EMBLY 5. COVER 6. SCREW (2) 7. WASHER (2) 8. PLATE 9. THERMOSTAT AND COIL 10. RETAINER 11. WASHER (2) 12. SCREW (2) TA 075704

5-90. WINTERIZATION KIT ENGINE COOLANT HEATER MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal of Heater (60)b. Installation of Heater. (60)c. Operational Check . (15)

135 Minutes Total

INITIAL SETUP

APPLICABLE CONFIGURATIONS

. 4-42A.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (See App C).

EQUIPMENT CONDITION

PARAGRAPH

4-25A/4-27A.

4-37A.

CONDITION DESCRIPTION

Engine Cooling System Drained.

Engine Air Filter and Ducts Removed.

Batteries Disconnected.

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

110 VAC Cable Disconnected From Power Source and Receptacle.

All Breakers Set to OFF.

TROUBLESHOOTING REFERENCES

Table 5-14.

5-90. WINTERIZATION KIT ENGINE COOLANT HEATER MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** LEGEND: 1. NIPPLE TEE 3. DRAIN COCK 4. ADAPTER 5. HOSE CLAMP (6) 6. HOSE (3) 7. PIPE NUT 8. LOCKWASHER 9. 10. BRACKET 11. LOCKWASHER NUT (2) 12. 13. HARNESS CLAMP 14. HARNESS CLAMP 15. CABLE GRIP 16. WASHER 17. LOCKNUT 18. THERMOSTAT 19. BUSHING 20. TERMINAL 39-21. SPLICE CONNECTOR 22. WIRE ASSEMBLY 23. HEATER 24. NIPPLE 25. DRAINCOCK 26. TEE 18 27. NIPPLE 21 28. ELBOW 29. SCREW (2) 33 30. ADAPTER 31. SUPPORT 32. BOLT (2) 33. LOCKWASHER (2) 34. NUT (2) 29 35. ADAPTER 36. VALVE 37. NUT 38. LOCKWASHER 26 39. CLAMP 25 40. SCREW 41. NIPPLE (2) 27 42. ELBOW 30 28 TA 075705

5-90	D. WINTERIZATION KIT ENGIN	NE COOLANT HEATER MAINTENANCE	(Continued).
	LOCATION/ITEM	ACTION	REMARKS
Α.	REMOVAL.		
1.	Two hose clamps (5).	Loosen and remove hose (6).	
2.	Tee (2) and nipple (1).	Unscrew and remove from water manifold. Remove draincock (3) and adapter (4).	
3.	Two hose clamps (5).	Loosen and remove hose (6) from pipe (7), adapter (4), and clamp (14).	
4.	Bushing (19).	Unscrew and remove from rear port of heater (23).	
5.	Two hose clamps (5).	Loosen and remove hose (6) from two adapters (30) and (35).	
6.	Two nipples (41) and valve (36).	Unscrew and remove from engine block with elbow (42) and adapter (35).	
7.	Elbow (28), two nipples (24) and (27), tee (26), and draincock (25).	Unscrew and remove from forward port on bottom of heater (23).	
8.	Wire assembly (22), cable grip (15), washer (16) and locknut (17).	Remove from thermostat (18).	
9.	Three harness clamps (13), (14), and (39).	 a. Remove two nuts (12), bolts (32) and lockwashers (11) and remove harness clamps (13) and (14). b. Remove nut (37), bolt (40) and lockwasher (38) and remove harness clamp (39). 	
10.	Wire assembly (22).	a. Pull thru to circuit breaker if service is required.b. Replace terminals (20) or splice connectors (21) as required.	
11.	Two screws (29), nuts (34) and lockwashers (33).	Unscrew and remove heater (23) and thermostat (18).	
12.	Bracket (10).	Separate from support (31) by removing bolt (32), lockwasher (9), and nut (8).	

5-90.	WINTERIZATION KI	T ENGINE COOLANT HEATER MAINTENANCE (Continued).	
	LOCATION/ITEM	ACTION REMARKS	
1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42.	HOSE CLAMP (6) HOSE (3)	33 4 5 6 5 7 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	— 14 —— 22

5-90. WINTERIZATION KIT ENGINE COOLANT HEATER MAINTENANCE (Continued).					
LOCATION/ITEM	ACTION	REMARKS			
B. INSTALLATION.					
	NOTE				
	nermostat (18) cannot be replaced ate of the heater.				
13. Bracket (10).	Assemble to support (31) and secure with bolt (32), lockwasher (9) and nut (8).				
14. Heater (23) and thermostat (12).	Mount to support (31) with two screws (29), nuts (34) and lockwashers (33).				
15. Wire assembly (22).	Reroute, if removed.				
16. Three harness clamps (13), (14), and (39).	 a. Install harness clamps (13) and (14) and secure with two nuts (12), bolts (32) and lockwashers (11). b. Install harness clamp (39) and secure with nut (37), bolt (40) and lockwasher (38). 				
17. Wire assembly (22), cable grip (15), washer (16) and locknut (17).	Install on thermostat (18).				
18. Elbow (28), two nipples (24) and (27), tee (26), and draincock (25).	a. Coat threads with liquid teflon.b. Install on forward port on bottom of heater (23).				
19. Two nipples (41), valve (36), elbow (42), and adapter (35).	a. Coat threads with liquid teflon.b. Install on engine block.				
29. Hose (6).	a. Install two hose clamps (5).b. Fit ends on adapters (30) and (35).c. Tighten hose clamps (5).				
21. Bushing (19).	a. Coat threads with liquid teflon.b. Install in rear port of heater (23).				

	LOCATION/ITEM	ACTION	REMARKS	, , , , , , , , , , , , , , , , , , , ,
.EG	END:	3 5 \ 4 \	6 5	
1. 2.	NIPPLE TEE	2		
3.	DRAIN COCK	2 3-01-61		/ 7
4.	ADAPTER			
5.	HOSE CLAMP (6)	1	- .	
6.	HOSE (3)	/ 	12	
7. 8.	PIPE NUT		F-7 11.\	
o. 9.	LOCKWASHER		8	
э. О.	BRACKET		13	
1.	LOCKWASHER		12 9	
2.	NUT (2)		11-3-1	, 5
3.	HARNESS CLAMP			
4.	HARNESS CLAMP	9 (m)		- 6
5.	CABLE GRIP	41	10	
6. 7.	WASHER LOCKNUT	42		14
7. 8.	THERMOSTAT			
9.	BUSHING	40 41		J
0.	TERMINAL	39		- 4
1.	SPLICE CONNECTOR	J. J. J.	36	
2.	WIRE ASSEMBLY	38 → @ 4 35	15	
3. 4.	HEATER NIPPLE	37		a 1
⊶. 5.	DRAINCOCK		16	
6.	TEE			20 []
7.	NIPPLE		18	_/))
8.	ELBOW	34	19 A	21
9.	SCREW (2)	33	32	11
0. 1.	ADAPTER SUPPORT			
۱. 2.	BOLT (2)	31	24	11
3.	LOCKWASHER (2)			//
4.	NUT (2)	5 / 🚳	29	[/
5.	ADAPTER			The state of the s
6.	VALVE	6		
7. 3.	NUT LOCKWASHER			•
o. 9.	CLAMP	5	26 \ 25	
0.	SCREW	/ 1	25	
1.	NIPPLE (2)	1	27	
2.	ELBOW	30	1	
			1	
			28	

5-90. WINTERIZATION KIT EN	GINE COOLANT HEATER MAINTEN	ANCE (Continued).
LOCATION/ITEM	ACTION	REMARKS
B. INSTALLATION (Continued)		
22. Hose (6).	a. Insert thru harness clamp (14).b. Install two hose clamps (5).c. Fit ends on adapter (4) and pipe (7).d. Tighten hose clamps (5).	
23. Nipple (1) and tee (2).	a. Coat threads with liquid teflon.b. Install nipple (1) into water manifold,c. Install draincock (3) and adapter (4).	
24. Hose (6).	a. Install two hose clamps (5).b. Fit ends on adapter (4) and pipe (7).c. Tighten hose clamps (5).	
C. OPERATIONAL CHECK.		
25. Engine coolant system.	Refill, refer to para 4-42C.	
26. Engine air cleaner.	Install, refer to para 4-25D.	
27. Engine turbo air inlet.	Install, refer to para 4-27C.	
28. 110 VAC power cord.	Plug into curcuit breaker box receptacle and power source.	
29. Engine coolant heater circuit breaker.	Flip to ON and verify that heater (23) functions properly.	After check, flip circuit breaker to OFF and disconnect power cord.
30. Vehicle batteries.	Reconnect, per para 5-37B.	
31. Engine.	Start up (refer to TM 9-2320-273-10) and check for leaks.	
32. Engine.	Shut down, refer to TM 9-2320-273-10.	

5-90. WINTERIZATION KIT ENGINE COOLANT HEATER MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** LEGEND: 1. NIPPLE TEE 2. 3. DRAIN COCK **ADAPTER** 4. 5. HOSE CLAMP (6) HOSE (3) 6. PIPE 7. 8. NUT 9. **LOCKWASHER** 10. **BRACKET** 11. LOCKWASHER 12. NUT (2) 13. HARNESS CLAMP HARNESS CLAMP 14. 15. **CABLE GRIP** 16. WASHER 17. LOCKNUT 18. **THERMOSTAT BUSHING** 19. 20. **TERMINAL** 39-21. SPLICE CONNECTOR 22. WIRE ASSEMBLY 23. **HEATER** 24. NIPPLE 25. DRAINCOCK 20 26. TEE 18 27. **NIPPLE** 21 19 28. ELBOW 34 29. SCREW (2) 30. ADAPTER 31. SUPPORT 31 32. **BOLT (2)** 33. LOCKWASHER (2) 34. NUT (2) 29 35. **ADAPTER** VALVE 36. 37. NUT LOCKWASHER 38. 26 39. CLAMP 25 **SCREW** 40. 27 41. NIPPLE (2) 42. ELBOW 30 28 TA 074852

5-91. WINTERIZATION KIT BATTERY BOX HEATER MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (60) b.Installation. (60) c. Operational Check. (15)

135 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

AII.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

Table 5-14.

EQUIPMENT CONDITION

PARAGRAPH CONDITION DESCRIPTION

5-38A. Batteries Removed.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level ground.

Battery Thermostat Must be Below 35°F

for Actuation of Heater.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

110 VAC Cable Disconnected From Power Source and Receptacle.

All Breakers Set to OFF.

LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL		
1. Cover assembly (1).	 a. Mark and disconnect terminals (2) from terminal strip, b. Remove six screws (15) and lockwashers (16). c. Remove cover assembly from bottom of battery box. 	Refer to para 5-92.
2. Heater (3) and loom (6).	a. Remove four capscrews (14), washers (8), and nuts (7).b. Remove heater (3) and loom (6) from bottom cover (13).	
3. Four brackets (9) and tube clips (4).	a. Remove four screws (5), lockwashers (10) and nuts (11).b. Remove four brackets (9) and tube clips (4).	
4. Cover (17), insulation (19), and seals (20) and (21).	a. Remove.b. Clean surface with Milsolv (18).	Milsolv (18) supplied with kit.
LEGEND:		
3. HEATER 17. COVE 4. TUBE CLIP (4) 18. MILSO 5. SCREW (4) 19. INSUI 6. LOOM 20. SEAL 7. NUT (4) 21. SEAL 8. WASHER (4) 22. ADHE 10. LOCKWASHER (4) 10. LOCKWASHER (4) 11. NUT (4) 12. INSULATION 13. COVER, BOTTOM 14. CAPSCREW (4) 19	WASHER (6) ER DLV LATION (2) (2)	1 2 3 4 5 6 10 9
15		

5-91. WINTERIZATION KIT	BATTERY B	OX HEATER	MAINTENANCE	(Continued).
LOCATION/ITEM		ACTION		REMARKS
A. REMOVAL (Continued).	_			
5. Insulation (12) and botto cover (13).	b. Cl	emove. lean surface wit 8).	h Milsolv	
B. INSTALLATION				
6. Insulation (12) and botto cover (13).		oply adhesive (2 ottom cover (13		Adhesive (22) supplied with kit.
7. Insulation (19) and cover	in	stall insulation place. stall cover (17).	. ,	
8. Four seals (20) and (21).	se	oply adhesive (2 als. ick in place.	22) to	
9. Heater (3) and loom (6).	an b. Se (5 an c. Po loo (1: ing d. In: wa an e. Ti	stall four bracked tube clips (4) ecure with four s), lockwashers d nuts (11). In the sition heater (3) and aline for g holes. In the stall four capsciashers (8) and red tighten. In the sition of th	corews (10),) and om cover our mount- rews (14), outs (7)	Do not tighten nuts (11) at this time.
10. Cover assembly (1).		II to bottom of	battery	Position loom (6) so it is accessible after installation of cover assembly (1).
11. Two terminals (2).	Conn	nect to terminal	strip.	Refer to para 5-92.

5-91. WINTERIZATION KIT	BATTERY BOX HEATER MAINTENA	NCE (Continued).
LOCATION/ITEM	ACTION	REMARKS
C. OPERATIONAL CHECK.		
2. 110 VAC power cord.	Plug into power source and vehicle receptacle. Flip battery heater circuit ON.	
13. Heater (3).	Verify that heater (3) functions properly.	Thermostat closes at 350F (1.7°C) and opens at 55°F (12.8°C).
	NOTE	
	Follow-on maintenance action required:	
	Install and connect batteries per para 5-	38E.
LEGEND:		
1. COVER ASSEMBLY 2. TERMINAL 3. HEATER 4. TUBE CLIP (4) 5. SCREW (4) 6. LOOM 7. NUT (4) 8. WASHER (4) 9. BRACKET (4) 10. LOCKWASHER (4) 11. NUT (4) 12. INSULATION 13. COVER, BOTTOM 14. CAPSCREW (4) 15. SCREW (6) 16. LOCKWASHER (6) 17. COVER 18. MILSOLV 19. INSULATION 20. SEAL (2) 21. SEAL (2) 22. ADHESIVE 19 18	16	TA 075708

5-92. WINTERIZATION KIT BATTERY BOX THERMOSTAT AND TERMINAL STRIP MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (45)b. Installation. (45)c. Operational Check. (15)

105 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS PARAGRAPH CONDITION DESCRIPTION

EQUIPMENT CONDITION

AII. 5-38A. Batteries Removal.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED SPECIAL ENVIRONMENTAL CONDITIONS

One (MOS-63B20). Vehicle Parked on Level Ground.
Battery Thermostat Must be Below 35°F

REFERENCES (TM) for Actuation of Heater.

TM 9-2320-273-10. **GENERAL SAFETY INSTRUCTIONS** TM 9-2320-273-20P.

Engine OFF.
Transmission in Neutral.
TROUBLESHOOTING REFERENCES
Park Brake Set.

Table 5-14. 110 VAC Cable Disconnected From Power Source and Receptacle.

All Breakers Set to OFF.

5-92. WINTERIZATION KIT BATTERY BOX THERMOSTAT AND TERMINAL STRIP MAINTENANCE (Continued).

MAINTENANCE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
A. REMOVAL 1. Rear cover assembly (1).	 a. Remove seven capscrews (17), seven lockwashers (18) and four hex nuts (19). b. Remove rear cover (16). 	Hex nuts (19) are only used on sides of rear cover (16).	
2. Cover (7).	Remove two screws (11), four teflon washers (3), two bushings (30) and hex nuts (29).		
3. Thermostat assembly (6).	 a. Remove two screws (31), lockwashers (5), and hex nuts (4). b. Remove thermostat assembly (6) from cover (7). 		
LEGEND:	1		
1. REAR COVER ASSEMBLY 2. WIRE ASSEMBLY 3. TEFLON WASHER (4) 4. HEX NUT (2) 5. LOCKWASHER (2) 6. THERMOSTAT ASSEMBLY 7. COVER 8. MILSOLV 9. CABLE GRIP 10. CABLE GRIP 11. SCREW (2) 12. LOCKWASHER (2) 13. SCREW (2) 14. SCREW (2) 15. GROMMET (2) 16. REAR COVER 17. CAPSCREW (7) 18. LOCKWASHER (7) 19. HEX NUT (4) 20. TERMINAL STRIP 21. COVER 22. LOCKWASHER 23. HEX NUT (2) 24. HEX NUT (2) 25. LOCKWASHER (2) 26. CONDUIT NUT (2) 27. REDUCING WASHER (2) 28. INSULATION 29. HEX NUT (2) 30. BUSHING (2) 31. SCREW (2) 32. ADHESIVE	32 29 31 28 15 24 25 24 20 21 22 23	3 2 3 4 5 9 10 7 8 11 12 13 14 15 16 17	

	LOCATION/ITEM	ACTION	REMARKS
A. REMO	VAL (Continued).		
4. Cover	(21).	Remove two hex nuts (23), lockwashers (22), and screws (14).	
5. Termii	nal strip (20).	a. Remove wire assembly (2).b. Remove two hex nuts (24), lockwashers (25) and screws (13).	Tag terminals to aid in reassembly.
6. Two c	able grips (9) and (10).	Remove two conduit nuts (26). and reducing washers (27).	
7. Two	grommets (15).	Remove.	
8. Insula	tion (28).	Remove with sharp tool or putty knife and clean off adhesive with Milsolv (8).	Milsolv (8) supplied with kit.
B. INSTA	<u>LLATIO</u> N		
9. Insula	tion (28).	a. Install adhesive (32) to rear cover (16).b. Put insulation (28) in place.	Adhesive (32) supplied with kit.
10. Two (grommets (15).	Install.	
11. Two c	able grips (9) and (10).	Install into rear cover and secure with two reducing washers (27) and conduit nuts (26).	
12. Termi	nal strip (20).	a. Install and secure with two screws (13), lockwashers (25) and screws (13).b. Install wire assembly (2).	
13. Cover	(21).	Install and secure with two hex nuts (23), lockwashers (22), and screws (14).	

5-92. WINTERIZATION KIT BATTERY BOX THERMOSTAT AND TERMINAL STRIP MAINTENANCE (Continued)

STRIP MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM LEGEND: 1. REAR COVER ASSEMBLY WIRE ASSEMBLY 2. TEFLON WASHER (4) HEX NUT (2) LOCKWASHER (2) THERMOSTAT ASSEMBLY 7. COVER MILSOLV 8. CABLE GRIP 10. CABLE GRIP 11. SCREW (2) 12. LOCKWASHER (2) 32 13. SCREW (2) 14. SCREW (2) 15. GROMMET (2) 16. **REAR COVER** CAPSCREW (7) 17. LOCKWASHER (7) 18. 29 19. HEX NUT (4) 20. TERMINAL STRIP 28 21. COVER 22. LOCKWASHER 23. HEX NUT (2) 24. HEX NUT (2) 25. LOCKWASHER (2) 26. CONDUIT NUT (2) 27. REDUCING WASHER (2) 28. INSULATION 29. HEX NUT (2) 30. BUSHING (2) 31. SCREW (2) 17 32. ADHESIVE 21 22 23 TA 075710

5-92. WINTERIZATION KIT BATTERY BOX THERMOSTAT AND TERMINAL STRIP MAINTENANCE (Continued).

MAINTENANCE (Continued	l).	
LOCATION/ITEM	ACTION	REMARKS
B. INSTALLATION (Continued).		
14. Thermostat assembly (6).	Install in cover (7) and secure with two screws (31), lockwashers (5), and hex nuts (4).	
15. Cover (7).	Install and secure with two screws (11), four teflon washers (3), two bushings (30), and hex nuts (29).	
16. Rear cover assembly (1).	Install and secure with seven capscrews, seven lockwashers (18), and four hex nuts (19).	Hex nuts (19) are only used on sides of rear cover (16).
C. OPERATIONAL CHECK.		
17. 110 VAC power cord.	Plug into power source and vehicle receptacle. Flip battery heater circuit ON.	
18. Thermostat assembly (6).	Verify operation.	Thermostat closes at 35°F (1.7°C) and opens at 55°F (12.8°C).
	NOTE	
Follo	w-on maintenance action required:	
Inst	tall and connect batteries per para 5-38	BE.

5-93. WINTERIZATION KIT BATTERY BOX THERMOSTAT AND TERMINAL STRIP MAINTENANCE (Continued).

STRIP MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** LEGEND: 1. REAR COVER ASSEMBLY 2. WIRE ASSEMBLY 3. TEFLON WASHER (4) 4. HEX NUT (2) 5. LOCKWASHER (2) 6. THERMOSTAT ASSEMBLY 7. COVER 8. MILSOLV 9. CABLE GRIP 10. CABLE GRIP 11. SCREW (2) 12. LOCKWASHER (2) 13. SCREW (2) 14. SCREW (2) 15. GROMMET (2) 16. REAR COVER 17. CAPSCREW (7) 18. LOCKWASHER (7) 19. HEX NUT (4) 20. TERMINAL STRIP 29 -**COVER** 21. 31-22. LOCKWASHER 28 15 23. HEX NUT (2) 24. HEX NUT (2) 25. LOCKWASHER (2) 26. CONDUIT NUT (2) 27. REDUCING WASHER (2) 28. INSULATION 29. HEX NUT (2) 30. BUSHING (2) 31. SCREW (2) 15 32. ADHESIVE 17 23 TA 075711

5-93. WINTERIZATION KIT BATTERY BOX INSULATION MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (30)b. Cleaning. (45)c. Installation. (15)

90 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

EQUIPMENT CONDITION PARAGRAPH

CONDITION DESCRIPTION

AII.

5-38A.

Batteries Removed.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (PIN)

None.

PERSONNEL REQUIRED

SPECIAL ENVIRONMENTAL CONDITIONS

One (MOS-63B20).

Vehicle Parked on Level Ground. Battery Thermostat Must be Below 35°F

REFERENCES (TM)

for Actuation of Heater.

TM 9-2320-273-10. TM 9-2320-273-20P.

None.

GENERAL SAFETY INSTRUCTIONS

Transmission in Neutral.

Engine OFF.

TROUBLESHOOTING REFERENCES Pa

Park Brake Set. 110 VAC Cable Disconnected From

Power Source and Receptacle. All Breakers Set to OFF.

5-93. WINTERIZATION KIT BATTERY BOX INSULATION MAINTENANCE (Continued).		
LOCATION/ITEM	ACTION	REMARKS
a. REMOVAL 1. Insulation (1), (3), (4), (5), and (15), and seal (2).	If insulation is damaged or needs replacement scrape off with sharp tool or putty knife and clean off adhesive with Milsolv (19).	Milsolv (19) supplied with kit.
1 2 3 4 4 17 16 15 14 13 +6	1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16.	SEAL INSULATION INSULATION (2) INSULATION TRANSITE (4) SCREW (4) RETAINER (4) RETAINER (2) SCREW (4) INSULATION (2) SCREW (2) LOCKWASHER (2) BRACKET (2) INSULATION NUT (8) LOCKWASHER (8) CAPSCREW (4) MILSOLV
12		TA 0757

5-93. WINTERIZATION KIT BATTERY BOX INSULATION MAINTENANCE (Continued).				
LOCATION/ITEM	ACTION	REMARKS		
A. REMOVAL (Continued).				
Four capscrews (18), lock- washers (17), nuts (16), and screws (7).	Remove and lift out four retainers (8), and transite (6).			
3. Four screws (10), and two retainers (9),	Remove.			
4. Two screws (12), lock- washers (13), and brackets (14).	Remove and scrape off insulation (11) with sharp tool or putty knife.			
B. CLEANING				
5. Battery compartment.	Wash out with high pressure water or steam and clean off adhesive with Milsolv (19).			
C. INSTALLATION				
6. Adhesive (20), insulation (1), (3), (4), (5), (11), and (15), and seal (2).	Apply adhesive (20) to all insulation panels and apply to their respective places.	Adhesive (20) supplied with kit.		
7. Two brackets (14), lock- washers (13), and screws (1 2).	Install.			
8. Four screws (10), and two retainers (9).	Install.			
9. Four capscrews (18), eight lockwashers (17), and nuts (16), four retainers (8), four transites (6), and screws (7).	Install four retainers (8) and transite (6) and secure with four capscrews (8) and screws (7).			

CHAPTER 6

TRANSMISSION MAINTENANCE

6-1. OVERVIEW.

This chapter provides you with the following information related to transmission maintenance:

- a. All required special tools and equipment.
- b. Other technical manuals.
- c. Troubleshooting procedures.
- d. Maintenance procedures.

Section I REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

6-2. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

6-3. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.

The special tools, TMDE and support equipment required for the transmission maintenance procedures described in this chapter are as follows: 0-150 psi (0-1-34 kPa) air pressure gage (refer to Organizational Maintenance RPSTL, TM 9-2320-273-20P for tool description and illustration).

6-4. SPARES AND REPAIR PARTS.

Spares and repair parts are listed and illustrated in the repair parts and special tools list covering Organizational Maintenance for this equipment (TM 9-2320-273-20P).

Section II TROUBLESHOOTING

6-5. INTRODUCTION.

Troubleshooting procedures (table 6-1) are limited to those on-vehicle checks for which corrective actions are within the scope of Organizational Maintenance. Prior to starting any trouble-shooting, the malfunction should be verified after the transmission has been warmed up to over 100° F (37.8°C) since a cold transmission can give faulty indications. To warm the transmission, run the engine for approximately 10 minutes with the transmission in NEUTRAL. The transmission will feel warm to the touch.

6-6. TEST EQUIPMENT.

An air pressure gage with a range of 0-150 psi (0-1034 kPa) is required to check for proper air pressure.

Table 6-1. Transmission Troubleshooting Procedures.

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

SELECTOR LEVER CANNOT BE MOVED:

Step 1. Inhibitor plate jammed with dirt.

Remove cover, clean, and lubricate (Seg LO 9-2320-273-12).

Step 2. Inhibitor centering piston assembly out of alinement or damaged.

Replace (Refer to Direct Support).

Step 3. Bolts holding air control line to ratio selector too long or incorrectly torqued.

Tighten to 9 lb-ft (12 N•m), replace damaged components, or use shorter bolts.

Step 4. Bolts incorrectly installed when ratio selector assembled.

Check to see that bolts are not run in at an angle.

- 2. ENGINE DOES NOT TURN DRIVESHAFT IN ANY SPEED FORWARD OR REVERSE:
 - Step 1. Check oil level in transmission.

Add oil to correct level (see LO 9-2320-273-12).

Step 2. Check to see that air hand control valve on ratio selector is pushed in.

Push in hand valve.

Step 3. Check to see that air pressure supply is available and adequate to transmission; 60-120 psi (414-827 kPa).

Troubleshoot compressed air system (para 9-5).

Step 4. Inspect air control line and connectors between ratio selector and transmission.

Tighten to 18 lb-ft (24 N•m) or replace damaged components.

Table 6-1. Transmission Troubleshooting Procedures (Continued).

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

- 2. ENGINE DOES NOT TURN DRIVESHAFT IN ANY SPEED FORWARD OR REVERSE (Continued):
 - Step 5. Check to see that air pressure is available at ratio selector from truck compressed air system.
 - a. Troubleshoot compressed air system (para 9-5).
 - b. Refer to Direct Support Maintenance for troubleshooting.
- 3. ENGINE TURNS DRIVE SHAFT IN SOME GEARS BUT NOT OTHERS:
 - Step 1. Check to see that adequate compressed air is available from truck.

 Troubleshoot compressed air system (para 9-5).
 - Step 2. Check air control line and connections between ratio selector and transmission for tight connections, damage and leaks.
 - Tighten to 18 lb-ft (24 N•m) or replace damaged components.
 - b. Refer to Direct Support Maintenance for troubleshooting.
- 4. ENGINE DOES NOT TURN POWER TAKEOFF IN NEUTRAL:

Perform same steps as in Malfunction 2.

- 5. TRUCK MOVES WHEN ENGINE IS AT LOW IDLE AND TRANSMISSION IN GEAR:
 - Step 1. Check engine low idle rpm (should be 580-620 rpm).

Refer to Direct Support Maintenance for adjustment.

Step 2. Check transmission operating temperature.

Allow transmission temperature to reach 100°F (37.8°C) before putting truck in gear.

- Step 3. Put selector lever in NEUTRAL and check engine rpm at low idle. Put selector lever in 4th gear and check engine rpm.
 - a. If engine rpm does not change, the problem is corrected.
 - b. If engine rpm decreases, the input clutch may be warped. Refer to Direct Support Maintenance for repairs.

Table 6-1. Transmission Troubleshooting Procedures (Continued).

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

6. TRANSMISSION HOUSING BREATHERS SHOW AN AIR LEAK AFTER THE SHIFT IS COMPLETE:

Refer to Direct Support Maintenance for troubleshooting.

7. TRANSMISSION FEELS LIKE IT IS ENGAGED, THEN NOT ENGAGED, THEN ENGAGED AGAIN – TRANSMISSION IS ALSO NOISY:

Refer to Direct Support Maintenance for troubleshooting.

- 8. TRANSMISSION HAS A DECREASE IN OIL LEVEL WITH AN INCREASE IN OIL IN THE ENGINE :
 - Step 1. Check for inoperative breathers.

Replace the breathers (para 6-9C and 6-9 D).

Step 2. Check engine crankshaft seal.

Refer to Direct Support Maintenance.

- 9. TRANSMISSION GEARS MAKE NOISE DURING A SHIFT:
 - Step 1. Check for correct oil level.

Add oil to correct level (refer to LO 9-2320-273-12).

Step 2. Check for oil leaks.

Refer problem to Direct Support Maintenance.

Step 3. Check for clogged oil pump suction screen.

Clean screen (para 6-9B).

Table 6-1. Transmission Troubleshooting Procedures (Continued).

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

- 10. TRANSMISSION TEMPERATURE GAGE READINGS ABNORMALLY HIGH:
 - Step 1. Check for correct oil level.

Add or remove oil to correct level (refer to LO 9-2320-273-12).

Step 2. Check for oil leaks.

Refer problem to Direct Support Maintenance.

Step 3. Check for clogged oil pump suction screen.

Clean screen (para 6-9 B).

Step 4. Check oil cooler fins for obstructions.

Clean cooling fins.

Section III MAINTENANCE PROCEDURES

6-7. INTRODUCTION.

This section provides you with Organizational Level maintenance procedures for the transmission. The scope of maintenance is limited to the work listed in the following summary of task procedures.

6-8. TRANSMISSION MAINTENANCE TASK SUMMARY.

INITIAL SETUP		
APPLICABLE CONFIGURATIONS	EQUIPMENT CONDITION	
<u> </u>	<u>PARAGRAPH</u>	CONDITION DESCRIPTION
All.		
	9-13A.	Air Reservoirs Drained.
TEST EQUIPMENT	11-16A.	Front Radiator Shell and
		Screen Removed.
None.	11-16E.	Brush Guard Removed
		(916 thru 920).
SPECIAL TOOLS	4-23A.	Fuel Tank Removed.
	4-30A.	Ether Cylinder Removed.
None.	5-37A.	Batteries Disconnected.
	6-11A.	Floor Access Plate Removed.
MATERIALS/PARTS (P/N)	9-16A.	Supply Air Reservoir Re-
• •		moval (M916 thru M920
Dry Cleaning Solvent SD-2 (Refer to Appendix C).		Only).
Oil - 5.5 Gallone (Pofor to Appendix C)		* '

Oil – 5.5 Gallons (Refer to Appendix C).
Case Breathers (12), (2520-01-077-2803).
Oil Funnel.
Container, 6 Gal Min.
Gaskets (2), 9N4010 (11083).
O-Ring, 3D2824 (11083).
Soap Solution.
Gaskets (2), 9N1507 (11083).
Loctite (242).
Masking Tape.
Marking Pen.
Cable Ties (8) SST4S (06383).

PERSONNEL REQUIRED

Liquid Teflon (Refer to Appendix C).

One (MOS (63B20).

References (TM)

TM 9-2320-273-10. TM 9-2320-273-20P. LO 9-2320-273-12.

REFERENCES (TROUBLESHOOTING)

Table 6-1, 5-7, 9-1.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.
Park Brake Set.
Transmission in Neutral.

	LIST OF TASKS	3	
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
1.	Oil Service :	6-9	6-1
	A. Draining Oil.	6-9A	
	B. Cleaning or Replacement of Pump Screen.	6-9B	
	C. Removal of Case Breather.	6-9C	
	D. Installation of New Case Breather.	6-9D	
	E. Replenishing Oil Supply.	6-9E	
	F. Checking for Leaks.	6-9F	
2.	Oil Cooler Maintenance:	6-10	6-1
	A. Removal.	6- 10A	
	B. Cleaning and Inspection.	6-10B	
	c. Installation.	6- 10C	
3.	Pneumatic Control Line Maintenance:	6-11	9-1
	A. Removal.	6-11A	
	B. Inspection.	6-11B	
	c. Installation.	6-11C	
	b. Checking for Leaks.	6-11D	
4.	Ratio Selector and Air Charging Valve	6-12	9-1
	Maintenance:		•
	A. Removal.	6-12A	
	B. Inspection of Lines and Fittings.	6-12B	
	C. Lubrication of Ratio Selector.	6-1 2C	
	D. Installation.	6-12D	
	E. Operational Check.	6-12E	
5.	Speedometer Cable Maintenance:	6-13	5-7
	A. Removal.	6-13A	
	B. installation.	6-13B	
	C. Operational Check.	6-13C	
6.	Transmission Control Heater Maintenance:	6-14	
	A. Removal.	6- 14A	
	B. Installation.	6-14B	
	c. Operational Check.	6-14C	

TRANSMISSION.

6-9. OIL SERVICE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Draining Oil. (10)

b. Cleaning or Replacement of Pump Screen. (15)

c. Removal of Case Breather. (5)

d. Installation of New Case Breather. (5)

e. Replenishing Oil Supply. (10) f. Checking for Leaks. (10)

55 Minutes Total

INITIAL SETUP

EQUIPMENT CONDITION

APPLICABLE CONFIGURATIONS PARAGRAPH CONDITION DESCRIPTION

AII. None. None.

TEST EQUIPMENT

None

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Nonflammable Cleaning Solvent SD-2 (Refer to Appendix C).

Oil, 5.5 gallons (21 Liters) (Refer to Appendix C);

OÉA if Šub-Zero Use.

Case Breathers (12) (2520-01-077-2803).

Oil Funnel.

Container, 6 gal min.

Loctite (242).

Gaskets (2), 9N1507 (11083).

O-Ring, 3D2824 (11083).

PERSONNEL REQUIRED

SPECIAL ENVIRONMENTAL CONDITIONS

One (MOS-63B20). Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

LO 9-2320-273-12.

TM 9-2320-273-20P.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 6-1.

6-9. OIL SERVICE (Continued).

REMARKS LOCATION/ITEM **ACTION**

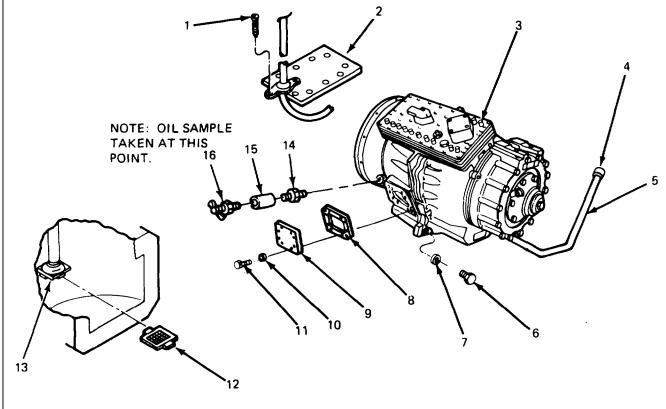
NOTE

Transmission should be warm for this task. Park the truck on level ground.

A. DRAINING OIL.

NOTE

Place container under drain plug to catch oil.



LEGEND:

- 1. SCREW (11)
- 2. ACCESS PLATE
- 3. CASE BREATHER (12)
- 4. DIPSTICK
- 5. DIPSTICK TUBE
- 6. DRAIN PLUG
- 7. O-RING
- 8. GASKET
- 9. ACCESS COVER
 - 10. WASHER (8)
 - 11. CAPSCREW (8)
 - 12. PUMP SCREEN
- 13. SUCTION TUBE
- 14. REDUCER PIPE
- 15. COUPLING PIPE
- 16. DRAIN COCK

TA 237222

TRANSMISSION.

A. DRAINING OIL (Continued). 1. Dipstick (4). 2. Drain plug (6) and O-ring (7). b. Throw away O-ring. c. Allow oil to drain out. d. Inspect magnetic base of plug. e. Install new O-ring (7) on drain plug (6). f. Screw in plug and tighten, A-1. TAKING OIL SAMPLE FOR ANALYSIS Before beginning this task check transmission oil level according to operator's manual (TM 9-2320-273-10). Start engine (see TM 9-2320-273-10), warm vehicle to normal operating range and stop engine. 1. Draincock (16) a. Unscrew and loosen. When taking a samp container to drain a of oil to clean the value of the transmission drain valve				
1. Dipstick (4). 2. Drain plug (6) and O-ring (7). a. Unscrew and remove. b. Throw away O-ring. c. Allow oil to drain out. d. Inspect magnetic base of plug. e. Install new O-ring (7) on drain plug (6). f. Screw in plug and tighten, A-1. TAKING OIL SAMPLE FOR ANALYSIS NOTE Before beginning this task check transmission oil level according to operator's manual (TM 9-2320-273-10), warm vehicle to normal operating range and stop engine. 1. Draincock (16) a. Unscrew and loosen. When taking a samp container to drain a of oil to clean the value of the proper bottle and take oil sample from				
2. Drain plug (6) and O-ring (7). a. Unscrew and remove. b. Throw away O-ring. c. Allow oil to drain out. d. Inspect magnetic base of plug. e. Install new O-ring (7) on drain plug (6). f. Screw in plug and tighten, A-1. TAKING OIL SAMPLE FOR ANALYSIS NOTE Before beginning this task check transmission oil level according to operator's manual (TM 9-2320-273-10). Start engine (see TM 9-2320-273-10), warm vehicle to normal operating range and stop engine. 1. Draincock (16) a. Unscrew and loosen. When taking a samp container to drain a of oil to clean the value of oil to clean the value of oil to clean the value of oil sample from				
D-ring (7). b. Throw away O-ring. c. Allow oil to drain out. d. Inspect magnetic base of plug. e. Install new O-ring (7) on drain plug (6). f. Screw in plug and tighten, A-1. TAKING OIL SAMPLE FOR ANALYSIS NOTE Before beginning this task check transmission oil level according to operator's manual (TM 9-2320-273-10). Start engine (see TM 9-2320-273-10), warm vehicle to normal operating range and stop engine. 1. Draincock (16) a. Unscrew and loosen. When taking a samp container to drain a of oil to clean the value and take oil sample from				
b. Throw away O-ring. c. Allow oil to drain out. d. Inspect magnetic base of plug. e. Install new O-ring (7) on drain plug (6). f. Screw in plug and tighten, A-1. TAKING OIL SAMPLE FOR ANALYSIS NOTE Before beginning this task check transmission oil level according to operator's manual (TM 9-2320-273-10). Start engine (see TM 9-2320-273-10), warm vehicle to normal operating range and stop engine. 1. Draincock (16) a. Unscrew and loosen. When taking a samp container to drain a of oil to clean the very sample from				
d. Inspect magnetic base of plug. e. Install new O-ring (7) on drain plug (6). f. Screw in plug and tighten, NOTE Before beginning this task check transmission oil level according to operator's manual (TM 9-2320-273-10). Start engine (see TM 9-2320-273-10), warm vehicle to normal operating range and stop engine. 1. Draincock (16) a. Unscrew and loosen. When taking a samp container to drain a of oil to clean the value of oil to clean the value of take oil sample from				
plug. notify Direct Support nance. e. Install new O-ring (7) on drain plug (6). f. Screw in plug and tighten, NOTE Before beginning this task check transmission oil level according to operator's manual (TM 9-2320-273-10). Start engine (see TM 9-2320-273-10), warm vehicle to normal operating range and stop engine. 1. Draincock (16) a. Unscrew and loosen. When taking a samp container to drain a of oil to clean the value of oil to clean the value of the proper bottle and take oil sample from				
drain plug (6). f. Screw in plug and tighten, NOTE Before beginning this task check transmission oil level according to operator's manual (TM 9-2320-273-10). Start engine (see TM 9-2320-273-10), warm vehicle to normal operating range and stop engine. 1. Draincock (16) a. Unscrew and loosen. When taking a samp container to drain a of oil to clean the value of oil to clean the value oil sample from				
NOTE Before beginning this task check transmission oil level according to operator's manual (TM 9-2320-273-10). Start engine (see TM 9-2320-273-10), warm vehicle to normal operating range and stop engine. 1. Draincock (16) a. Unscrew and loosen. When taking a samp container to drain a of oil to clean the value of oil to clean the value and take oil sample from				
Before beginning this task check transmission oil level according to operator's manual (TM 9-2320-273-10). Start engine (see TM 9-2320-273-10), warm vehicle to normal operating range and stop engine. 1. Draincock (16) a. Unscrew and loosen. When taking a samp container to drain a of oil to clean the value of oil to clean the value of take oil sample from				
Before beginning this task check transmission oil level according to operator's manual (TM 9-2320-273-10). Start engine (see TM 9-2320-273-10), warm vehicle to normal operating range and stop engine. 1. Draincock (16) a. Unscrew and loosen. When taking a samp container to drain a of oil to clean the value of oil to clean the value of take oil sample from				
mission oil level according to operator's manual (TM 9-2320-273-10). Start engine (see TM 9-2320-273-10), warm vehicle to normal operating range and stop engine. 1. Draincock (16) a. Unscrew and loosen. When taking a samp container to drain a of oil to clean the value of oil to clean the value oil sample from				
warm vehicle to normal operating range and stop engine. 1. Draincock (16) a. Unscrew and loosen. When taking a samp container to drain a of oil to clean the value b. When completed with task 1., use the proper bottle and take oil sample from	mission oil level according to operator's			
container to drain a of oil to clean the value oil to clean the value oil to clean the value of oil to clean the value of oil to clean the value oil to clean the valu				
1., use the proper bottle and take oil sample from	small amoun			
(see TB 43-0210).				
c. Check oil level to insure proper level after sampling.				

TRANSMISSION.

6-9. OIL SERVICE (Continued). LOCATION/ITEM ACTION REMARKS

B. CLEANING OR REPLACEMENT OF PUMP SCREEN.

3. Eight capscrews (11) and washers (10).

Unscrew and remove.

4. Access cover (9) and gasket (8).

a. Remove.b. Discard gasket (8).

On the M916 thru M920 the left side access cover is blocked by the PTO, so you will have to use the

right side cover.

CAUTION

Exercise care that when the pump screen is replaced, that it is properly latched. If not the screen will fall into the housing and may damage internal transmission parts.

5. Pump screen (12).

 a. Slide off of suction tube (13) by grasping metal spring tab and pushing down slightly while pulling out.

b. Inspect magnets.

If there are large metal

particles, notify Direct Support

Maintenance.

c. Clean with dry cleaning solvent.

d. Dry with compressed air.

6-9. OIL SERVICE (Continued).		DEMARKS
LOCATION/ITEM	ACTION	REMARKS
B. CLEANING OR REPLACEMENT	•	
	e. Inspect.	If screen or magnets are damaged, replace assembly.
	 f. Slide onto suction tube base, pushing down slightly on clip while sliding in. 	Be sure spring clip latches screen in place. A distinct click will be heard. Check for proper engagement by pulling out with slight pressure and not pushing down on clip.
6. New gasket (8).	a. Put in place.	
access cover (9), eight capscrews (11), and washers (10).	b. Tighten capscrews (11) to 31 lb-ft (42 N•m) with torque wrench.	
LEGEND: 1. SCREW (11) 2. ACCESS PLATE 3. CASE BREATHER (12) 4. DIPSTICK 5. DIPSTICK TUBE 6. DRAIN PLUG 7. O-RING 8. GASKET 9. ACCESS COVER 10. WASHER (8) 11. CAPSCREW (8) 12. PUMP SCREEN 13. SUCTION TUBE		3 3 4 5 7
	12	TA 07485

	LOCATION/ITEM	ACTION	REMARKS
) .	REMOVAL OF CASE BREATHER	<u> </u>	
	7. Floor mat.	Pull back at seam to expose access plate (2).	
	8. Eleven screw (1).	Remove.	
	9. Access plate (2).	Remove from cab floor.	
	 One case breather (3). 	Unscrew, remove and throw away.	
	10.1.lf required, change vents (14).	Unscrew, remove and throw away.	
D.	INSTALLATION OF NEW CASE	BREATHER.	
	11. One new case breather (3).	Apply loctite on threads, screw in and tighten carefully with pliers. Do not clamp too tightly, othewise the plastic cap may crack.	
	11.1. Eleven new breather vents (14).	Apply loctite on threads, screw in and tighten carefully with pliers. Do not clamp too tightly, otherwise the plastic cap may crack.	
	 Access plate (2) and control cable grommet and plate. 	Position and secure with twelve screws (1).	
	13. Floor mat.	Reinstall over cover plate.	
E.	REPLENISHING OIL SUPPLY.		
	14. Dipstick tube (5).	a. Insert tip of funnel.	
		b. Pour in 5.5 gal (20.8 liters) transmission oil.	
		c. Put dipstick (4) in place.	

6-9. OIL SERVICE (Continued).		
LOCATION/ITEM	ACTION	REMARKS
F. CHECKING FOR LEAKS.		
15. Engine.	Start up (see TM 9-2320-273-	10).
16. Transmission.	Check for fluid and air leaks whengine is at low idle.	nile
17. Dipstick (4).	Check oil level. Add more if ne	eded.
18. Engine.	Shut down (see TM 9-2320-27	73-10).

6-9. OIL SERVICE (Continued). **ACTION REMARKS** LOCATION/ITEM **CAUTION** Do not allow SD-2 dry cleaning solvents to come in contact with seals or flexible hoses. These cleaners may damage leather, rubber, and synthetic materials. LEGEND: 1. SCREW (11) 2. ACCESS PLATE 3. CASE BREATHER (1) 4. DIPSTICK 5. DIPSTICK TUBE 6. DRAIN PLUG 7. O-RING 8. GASKET 9. ACCESS COVER 10. WASHER (8) 11. CAPSCREW (8) 12. PUMP SCREEN 13. SUCTION TUBE 14. BREATHER VENTS (11) 13 10 11 TA211965

6-10. OIL COOLER MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

(15)

b. Cleaning and Inspection. (15)

c. Installation.

(15)

45 Minutes Total

INITIAL SETUP

APPLICABLE CONFIGURATIONS

AII.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

EQUIPMENT CONDITION

PARAGRAPH CONDITION DESCRIPTION

11-16A. Front Radiator Shell and

Screen Removed.

11-16E. Brush Guard Removed

(M916 thru M920)

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 6-1.

6-10. OIL COOLER MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM A. REMOVAL. Remove from two trans-Remove by unscrewing Hydraulic hoses (4) 1. mission mounted elbows barb fitting from elbow. and (10). (9).Retainers are located along 2. Three bolts (5), star-Unscrew and remove three washers (6), and rubber coated hose top of frame rail. retainers (8). nuts (7). Hydraulic hoses (4) a. Remove from two oil Remove by unscrewing 3. barb fitting from elbow. cooler mounted elbows and (10). (1) and (3). b. Pull hydraulic hoses (4) and (10) out of vehicle. 4. Four bolts (1 1), lock-Unscrew and remove oil washers (12), and cooler (2). washers (13). R H FRONT W/RADIATOR SHELL RIGHT SIDE OF TRANSMISSION AND SCREEN REMOVED LEGEND: 7. NUT (3) 1. ELBOW 8. HOSE RETAINER (3) 2. OIL COOLER 9. ELBOW (2) 3. ELBOW 10. HYDRAULIC HOSE 4. HYDRAULIC HOSE 11. **BOLT (4)** BOLT (3) LOCKWASHER (4) 12. 13. WASHER (4) STARWASHER (3)

TA 074858

6-1	0. OIL COOLER MAINTENANCE	(Continued).	
	LOCATION/ITEM	ACTION	REMARKS
В.	CLEANING AND INSPECTION.		
	5. Hydraulic hoses (4) and (10).	Inspect for cracking and leaks.	Replace as necessary.
	6. Oil cooler (2).	Clean cooling fins, inspect for bent fins and leaks.	Replace as necessary.
C.	INSTALLATION.		
	7. Oil cooler (2).	Install with four bolts (11), lockwashers (12), and washers (13).	
	8. Hydraulic hose (4) and (10).	a. Install to oil cooler mounted elbows (1) and (3).b. Install to transmission mounted elbows (9).	
	9 . Three hose retainers (8).	Install with three bolts (5), star washers (6), and nuts (7) and tighten.	Install hoses per illustration.

6-10. OIL COOLER MAINTENANCE (Continued).

LOCATION/ITEM

ACTION

REMARKS

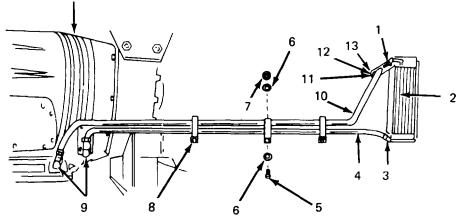
NOTE

Follow-on maintenance required:

- Install front radiator shell and screen; refer to paragraph 11-16D.
- b. Install Brush Guard; refer to paragraph 11-16F (M916 thru M920).

RIGHT SIDE OF TRANSMISSION

R H FRONT W/RADIATOR SHELL AND SCREEN REMOVED



LEGEND:

- 1. ELBOW
- 2. OIL COOLER
- 3. ELBOW
- 4. HYDRAULIC HOSE
- 5. BOLT (3)
- 6. STARWASHER (3)
- 7. NUT (3)
- 8. HOSE RETAINER (3)
- 9. ELBOW (2)
- 10. HYDRAULIC HOSE
- 11. BOLT (4)
- 12. LOCKWASHER (4)
- 13. WASHER (4)

TA 074859

6-11. PNEUMATIC CONTROL LINE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (15)b. Inspection. (5)c. Installation. (15)

d. Checking for Leaks. (25)

60 Minutes Total.

INITIAL SETUP EQUIPMENT CONDITION

APPLICABLE CONFIGURATIONS PARAGRAPH CONDITION DESCRIPTION

Air Reservoirs Drained.

AII. 9-13A.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Soap Solution.

Gaskets (Two), 9N4010 (11083).

PERSONNEL REQUIRED SPECIAL ENVIRONMENTAL CONDITIONS

One (MOS-63B20) Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10. GENERAL SAFETY INSTRUCTIONS

TM 9-2320-273-20P. Engine Off.

Transmission in Neutral.
Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 9-1.

6-11. PNEUMATIC CONTROL LINE MAINTENANCE (Continued).

LOCATION/ITEM

ACTION

REMARKS

WARNING

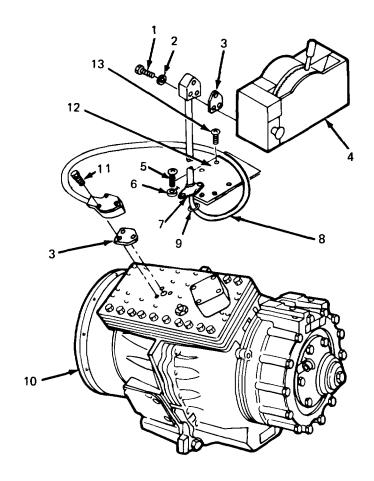
Do not begin work on air lines until pressure in air system has dropped completely.

NOTE

Pull back floor mat to expose access plate.

LEGEND:

- 1. BOLT (3)
- 2. WASHER (3)
- 3. GASKET (2)
- 4. RATIO SELECTOR
- 5. SCREW (2)
- 6. WASHER (2)
- 7. RETAINER
- 8. CONTROL LINE
- 9. GROMMET
- 10. TRANSMISSION
- 11. BOLT (3)
- 12. ACCESS PLATE
- 13. SCREW (10)



TA 074860

6-11. PNEUMATIC CONTROL LINE MAINTENANCE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
A. REMOVAL.			
1. Two screws (5) and washers (6). Loosen and remove.		
2. Retainer (7).	Remove.		
3. Ten screws (13).	Loosen and remove.		
4. Access plate (12).	Remove.		
5. Grommet (9).	Remove,		
6. Three bolts (11).	Loosen and remove.		
7. Three bolts (1) and washers (2).	Loosen and remove.		
8. Control line (8) and two gaskets (3).	Remove	Discard two gaskets (3).	
B. INSPECTION.			
9. Control line (8).	a. Inspect for:1. Cracks.2. Leaks.3. Kinks.b. Blow air through to see that line is not clogged.	Replace if necessary.	
C. INSTALLATION.			
10. Control line (8) and two new gaskets (3).	a. Attach to ratio selector(4) using three bolts (1)and washers (2).b. Attach to transmission (10)using three bolts (11).		
11. Six bolts (1) and (11).	Tighten to 18 lb-ft (24 N•m) using torque wrench.		
12. Grommet (9).	Install.		
3. Access plate (12).	Install.		
14. Ten screws (13).	Install and tighten.		
15. Retainer (7).	Install.		
16. Two screws (5) and washers (6).	Install and tighten.		

6-11. PNEUMATIC CONTROL LINE MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

NOTE

Follow on maintenance action required:

Close drain valve on air reservoir; (refer to para 9-13 D).

D. CHECKING FOR LEAKS.

17. Engine. Start up (See TM9-2320-273-10).

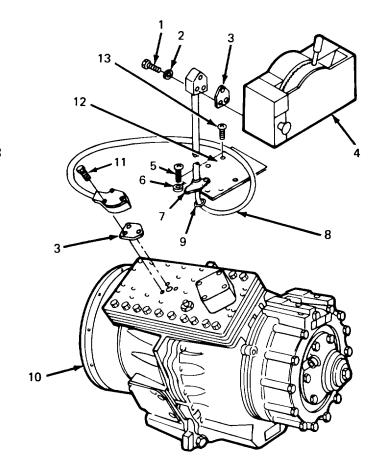
18. CAB/Air charging valve. Push in and charge until system reaches 65 psi

(448 kPa).

When system reaches 65 psi, valve will stay in without being held.

LEGEND:

- 1. BOLT (3)
- 2. WASHER (3)
- 3. GASKET (2)
- 4. RATIO SELECTOR
- 5. SCREW (2)
- 6. WASHER (2)
- 7. RETAINER
- 8. CONTROL LINE
- 9. GROMMET
- 10. TRANSMISSION
- 11. BOLT (3)
- 12. ACCESS PLATE
- 13. SCREW (10)



TA 074861

6-11. PNEUMATIC CONTROL LINE MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** D. CHECKING FOR LEAKS (Continued). 19. Control line (8). Check for leaks, using soap solution. LEGEND: 1. BOLT (3) 2. WASHER (3) 3. GASKET (2) 4. RATIO SELECTOR 5. SCREW (2) 6. WASHER (2) 7. RETAINER 8. CONTROL LINE 9. GROMMET 10. TRANSMISSION 11. BOLT (3) 12. ACCESS PLATE 13. SCREW (10) 8888888 S TA 074862

This page intentionally left blank.

6-12. RATIO SELECTOR AND AIR CHARGING VALVE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED RED FOLLOWS TASK DESCRIPTION.)

a. Removal.

(8) (2) b. Inspection of Lines and Fittings.

c. Lubrication of, Ratio Selecton. (5)

d. Installation. (8)

e. Operational Check. (5)

28 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

EQUIPMENT CONDITION

PARAGRAPH 9-13A.

CONDITION DESCRIPTION

Air Reservoirs Drained.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.'

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

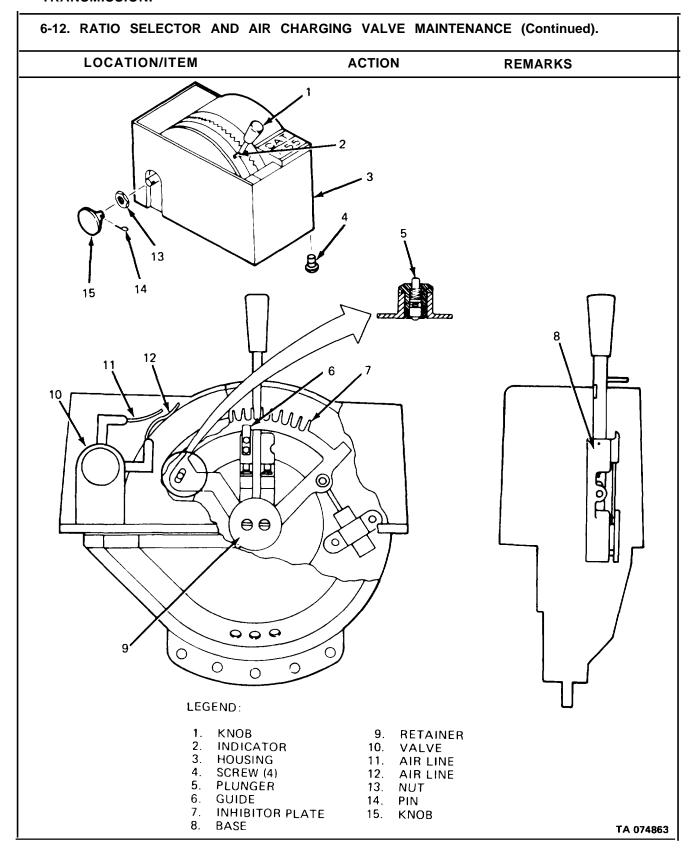
Engine Off.

Transmission in Neutral.

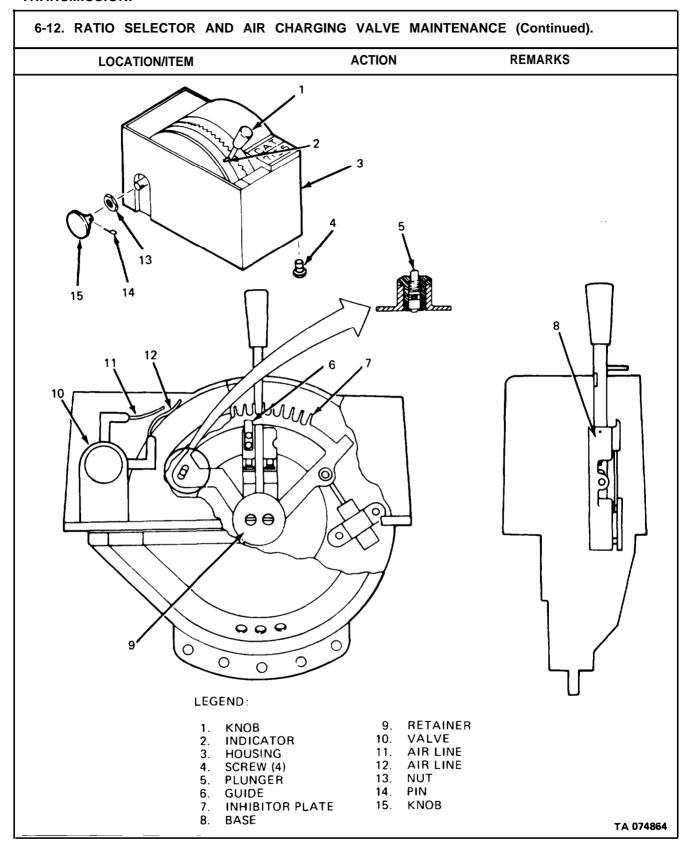
Park Brake Set.

TROUBLESHOOTING REFERENCES

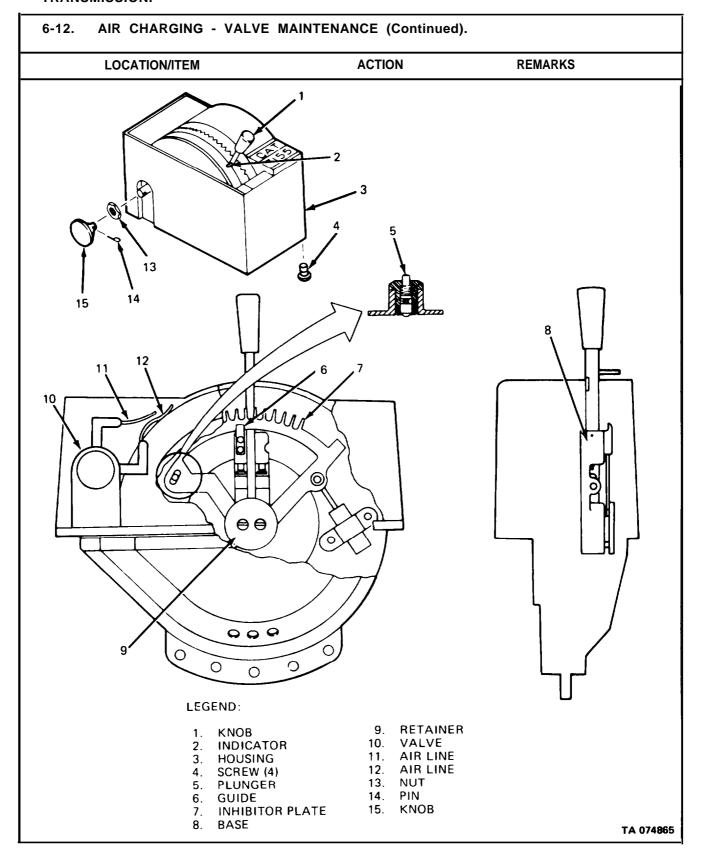
Table 9-1.



6-12. RATIO SELECTOR AND AIR	CHARGING VALVE MAINTEN	ANCE (Continued).			
LOCATION/ITEM	ACTION REMAR	KS			
A. REMOVAL.					
1. Knob (1) and indicator (2).	Unscrew and remove.				
2. Four screws (4).	Unscrew and remove.				
3. Housing (3).	Remove and lay on side.				
4. Pin (14).	Remove with hammer and punch.				
5. Knob (15).	Remove.				
6. Airlines(n) and (12).	Unscrew from valve (10), tag and remove.				
7. Nut (13).	Loosen and remove.				
8. Valve (10).	Remove.				
9. Air lines (11) and (12).	Inspect for: a. Cracks. b. Leaks. c. Damaged threads.	Also check threads on valve (10) for damage. Replace as necessary.			
C. LUBRICATION OF RATIO SELECTOR.					
10. Inhibitor plate (7), retainer (9), base (8), guide (6) and plunger (5).	Spray surfaces between these items any time sticking becomes evident.	See LO 9-2320-273-12.			



. Valve (10). Put in place. Screw on and tighten. a. Place on valve (10). b. Attach with pin (14). Air lines (11) and (12). Screw onto fittings. a. Attach with four screws (4). b. Tighten screws (4). Knob (1) and indicator (2). Screw in and tighten.	2. Nut (13). Screw on and tighten. a. Place on valve (10). b. Attach with pin (14). Screw onto fittings. a. Attach with four screws (4). b. Tighten screws (4).	
Nut (13). Screw on and tighten. a. Place on valve (10). b. Attach with pin (14). Air lines (11) and (12). Screw onto fittings. a. Attach with four screws (4). b. Tighten screws (4). Knob (1) and indicator (2). Screw in and tighten. PERATIONAL CHECK. T. Engine. Start up (see TM 9-2320-273-10). a. Push knob in with air pressure below 65 psi (448 kPa). It should pop out when released. b. Push knob in with air pressure above 65 psi (448 kPa). It should stay in and the sound of the transmission engaging should be evident. c. Test drive vehicle. Shifts should be smooth with no	2. Nut (13). Screw on and tighten. a. Place on valve (10). b. Attach with pin (14). Screw onto fittings. a. Attach with four screws (4). b. Tighten screws (4).	
a. Place on valve (10). b. Attach with pin (14). Screw onto fittings. a. Attach with four screws (4). b. Tighten screws (4). Knob (1) and indicator (2). Screw in and tighten. PERATIONAL CHECK. T. Engine. Start up (see TM 9-2320-273-10). a. Push knob in with air pressure below 65 psi (448 kPa). It should pop out when released. b. Push knob in with air pressure above 65 psi (448 kPa). It should stay in and the sound of the transmission engaging should be evident. C. Test drive vehicle. Shifts should be smooth with no	a. Place on valve (10). b. Attach with pin (14). Screw onto fittings. a. Attach with pin (14). Screw onto fittings. a. Attach with four screws (4). b. Tighten screws (4).	
b. Attach with pin (14). Screw onto fittings. a. Attach with four screws (4). b. Tighten screws (4). Knob (1) and indicator (2). Screw in and tighten. Start up (see TM 9-2320-273-10). a. Push knob in with air pressure below 65 psi (448 kPa). It should pop out when released. b. Push knob in with air pressure above 65 psi (448 kPa). It should stay in and the sound of the transmission engaging should be evident. c. Test drive vehicle. Shifts should be smooth with no	b. Attach with pin (14). Screw onto fittings. Housing (3). a. Attach with four screws (4). b. Tighten screws (4).	
a. Attach with four screws (4). b. Tighten screws (4). c. Knob (1) and indicator (2). Screw in and tighten. Start up (see TM 9-2320-273-10). a. Push knob in with air pressure below 65 psi (448 kPa). It should pop out when released. b. Push knob in with air pressure above 65 psi (448 kPa). It should stay in and the sound of the transmission engaging should be evident. c. Test drive vehicle. Shifts should be smooth with no	5. Housing (3). a. Attach with four screws (4). b. Tighten screws (4).	
b. Tighten screws (4). Screw in and tighten. PERATIONAL CHECK. The Engine Start up (see TM 9-2320-273-10). Start up (see TM 9-2320-273-10). Start up (see TM 9-2320-273-10). A. Push knob in with air pressure below 65 psi (448 kPa). It should pop out when released. B. Push knob in with air pressure above 65 psi (448 kPa). It should stay in and the sound of the transmission engaging should be evident. C. Test drive vehicle. Shifts should be smooth with no	b. Tighten screws (4).	
PERATIONAL CHECK. 7. Engine. Start up (see TM 9-2320-273-10). a. Push knob in with air pressure below 65 psi (448 kPa). It should pop out when released. b. Push knob in with air pressure above 65 psi (448 kPa). It should stay in and the sound of the transmission engaging should be evident. c. Test drive vehicle. Shifts should be smooth with no	6. Knob (1) and indicator (2). Screw in and tighten.	
7. Engine. Start up (see TM 9-2320-273-10). 3. Air charging valve knob (15). a. Push knob in with air pressure below 65 psi (448 kPa). It should pop out when released. b. Push knob in with air pressure above 65 psi (448 kPa). It should stay in and the sound of the transmission engaging should be evident. c. Test drive vehicle. Shifts should be smooth with no		
below 65 psi (448 kPa). It should pop out when released. b. Push knob in with air pressure above 65 psi (448 kPa). It should stay in and the sound of the transmission engaging should be evident. c. Test drive vehicle. Shifts should be smooth with no		,
	below 65 psi (448 kPa). It should pop out when release b. Push knob in with air pressure above 65 psi (448 kPa). It should stay in and the sound of the transmission engaging should be evident. c. Test drive vehicle. Shifts should be smooth with no	d.



6-13. SPEEDOMETER CABLE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (5) (10)b. Installation.

c. Operational check.

(5) Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

None.

PARAGRAPH

None.

REFERENCES (TM)

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

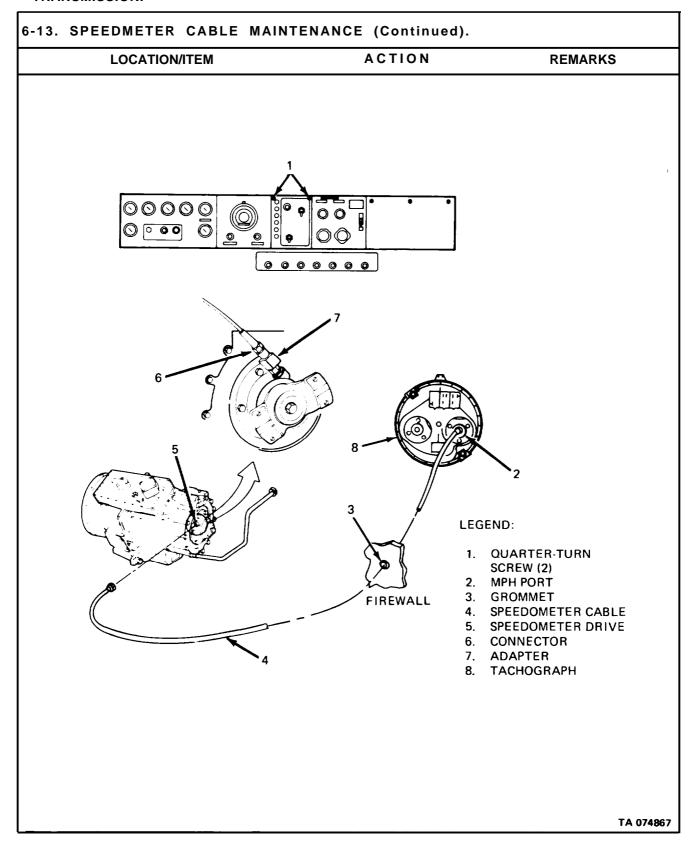
Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 5-7.

SPEEDOMETER CABLE MAINTENANCE (Continued). 6-13. LOCATION/ITEM **ACTION REMARKS** REMOVAL. 1. Two quarter-turn screws (1). Loosen and lower panel. 2. Speedometer cable (4). a. Disconnect from km/h MPH connection (2) on back of tachograph (8). b. Unscrew connector (6) M916/M920 - Unscrew from from speedometer drive adapter (7) at speedometer (5) at transmission. drive (5). c. Pull thru grommet (3) on firewall. 00000 00000 LEGEND: QUARTER-TURN SCREW (2) 2. MPH PORT **GROMMET FIREWALL** SPEEDOMETER CABLE SPEEDOMETER DRIVE CONNECTOR **ADAPTER** 7. **TACHOGRAPH** TA 074866



6-14. TRANSMISSION CONTROL HEATER MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (60)b. Installation. (60)c. Operational Check. (30)

150 Minutes Total.

INITIAL SETUP APPLICABLE CONFIGURATION	EQUIPMENT CONDITION PARAGRAPH	CONDITION DESCRIPTION
All.	4-23A.	Fuel Tank Removed.
	4-30A.	Ether Cylinder Removed.
TEST EQUIPMENT	5-37A.	Batteries Disconnected.
	6-11A.	Floor Access Plate Removed.
None.	9-16A.	Supply Air Resevoir Removed (M916 thru M920 Only).
		`

SPECIAL TOOLS

Non.

MATERIALS/PARTS (P/N)

Masking Tape. Marking Pen.

Cable Ties (8), SST4S (06383). Liquid Teflon (Refer to Appendix C).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES

TM 9-2320-273-10. TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

None

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground. Temperature of Transmission

Control 0°F (-17.8°C) or Less for Testing.

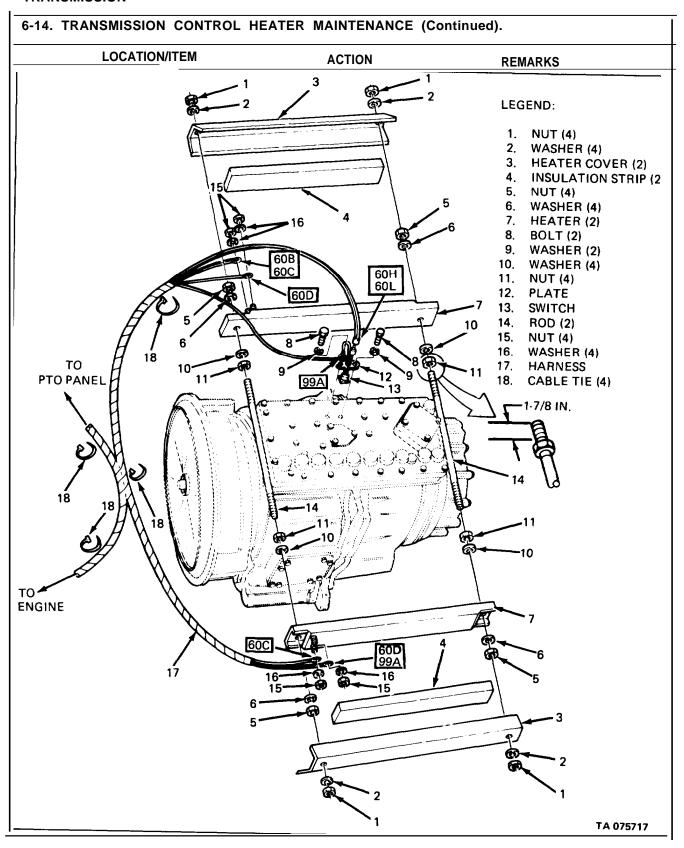
GENERAL SAFETY INSTRUCTIONS

Engine Off.

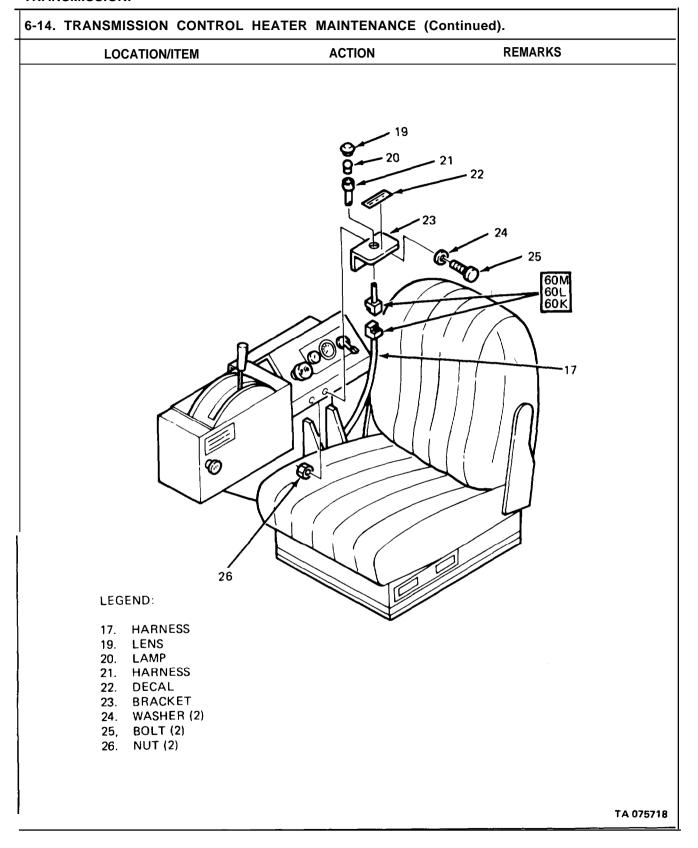
Transmission in Neutral. Park Brake Set.

6-14. TRANSMISSION CONTROL HEATER MAINTENANCE (Continued), LOCATION/ITEM **ACTION REMARKS** A. REMOVAL. 1. Four nuts (1) and washers (2). Unscrew and remove two heater covers (3) and insulation strips (4). LEGEND: 1. NUT (4) 2. WASHER (4) 3. HEATER COVER (2) 4. INSULATION STRIP (2) 5. NUT (4) 6. WASHER (4) 15 7. HEATER (2) 60B 60C 8. BOLT (2) 60D 9. WASHER (2) 60H 60L 10. WASHER (4) 17 11. NUT (4) 12. **PLATE** 13. SWITCH 14. ROD (2) 18 15. NUT (4) TO PTO 16. WASHER (4) **PANEL** 17. HARNESS 1-7/8 IN. 18. CABLE TIE (4) 60C TO **ENGINE** 60D 99A 16 15 5 15 TA 075716

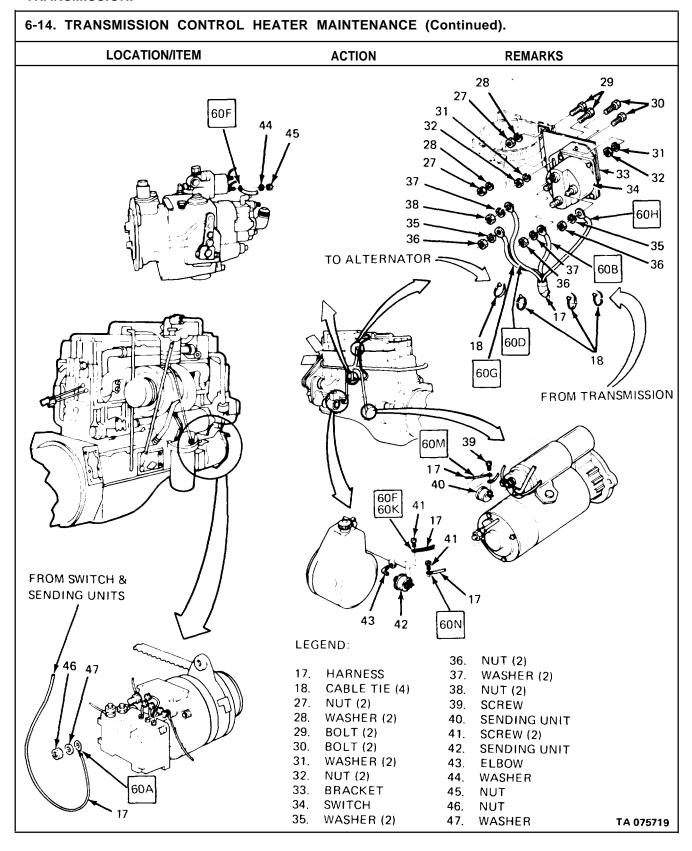
6-14. TRANSMISSION CONTROL	HEATER MAINTENANCE (Con	tinued).
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
2. Four nuts (15) and washers (16).	Unscrew and remove four wires from two heaters (7).	Wires are contained in harness (17). Tag for reassembly.
3. Two nuts (5) and washers (6).	Unscrew and remove bottom heater (7) and two washers (10) from two rods (14).	Remove only the bottom heater at this time.
4. Top heater (7), two nuts (5), washers (6), rods (14), washers (10), and four nuts (11).	Remove as an assembly from transmission.	After assembly has been removed, disassemble nuts, washers, and heater from rods.
5. Harness (17).	Unplug from switch (13).	Tag for reassembly. One terminal from harness (17) will still be connected to switch (13).
6. Two bolts (8) and washers (9).	Unscrew and remove harness (17), plate (12), and switch (13) from transmission.	Tag one terminal from harness (17) for reassembly.
7. Four cable ties (18).	Cut and remove from harness (17).	Discard.



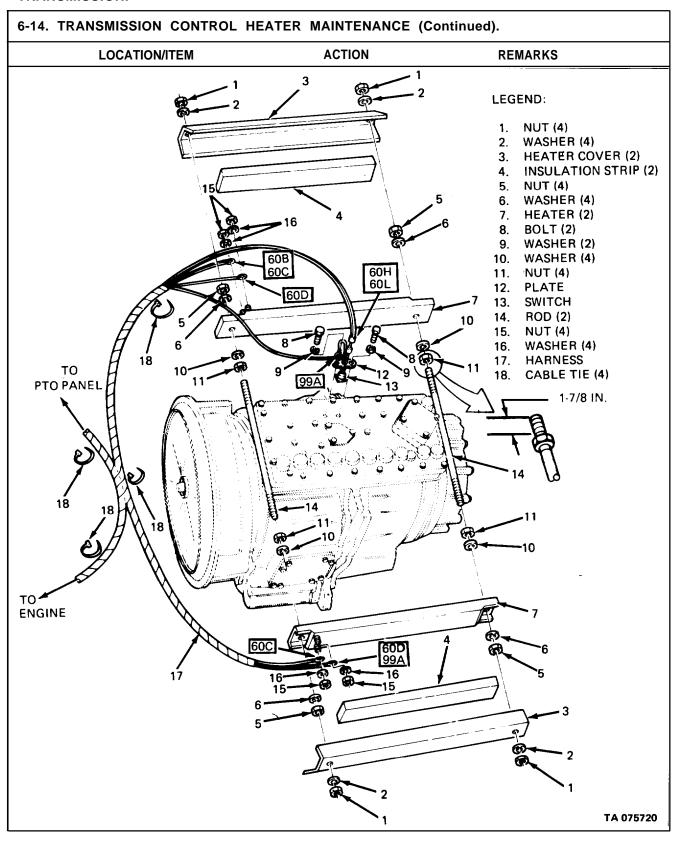
6-14. TRAN	NSMISSION CONTROL	HEATER MAINTENANCE (Cont	inued).
	LOCATION/ITEM	ACTION	REMARKS
A. REMOV	AL (Continued).		
8. Harness	s (17).	Unplug from harness (21).	Inside cab by driver's seat at ratio selector support (M915), or at PTO console (M916 thru M920). Tag for assembly.
9. Harnes	s (21).	Pull down to remove from bracket (23).	This step required to replace lamp.
10. Lens (19).	Push up from bottom to remove from bracket (23).	
	olts (25), washers and nuts (26).	Unscrew and remove bracket (23) with decal (22) attached.	



(40) and remove one wire. (41) Ether quick-start brack. (50) Four wires are contained in harness (17). Tag for assert one din harness (17). Tag for assert one din harness (17). Tag for assembly. (40) and remove one wire. (40) and remove one wire. (41) Ether quick-start brack. Four wires are contained in harness (17). Tag for assert one din harness (17). Tag for assembly. (42) Ether quick-start brack. (43) Four wires are contained in harness (17). Tag for assembly. (44) Ether quick-start brack. Four wires are contained in harness (17). Tag for assembly. (45) and washer (44). (46) Ether quick-start brack. (47) Ether quick-start brack. (47) Ether quick-start brack. (47) Ether quick-start brack. Four wires are contained in harness (17). Tag for assembly. (47) Ether quick-start brack. (54) Ether quick-start	LOCATION/ITEM	ACTION	REMARKS
3. Screw (39). Unscrew from sending unit (40) and remove one wire. Unscrew and remove four wires from switch (34). Unscrew and remove four wires are contained in harness (17). Tag for assist bly. At ether quick-start brack Four wires are contained in harness (17). Tag for asset bly. At ether quick-start brack Four wires are contained in harness (17). Tag for asset witch (34) and nuts (32). Unscrew and remove switch (33). Unscrew and remove bracket (33). Unscrew and remove one wire. At fuel pump. Wire is conted in harness (17). Tag for assembly. Unscrew and remove one wire. Unscrew and remove one wire. Unscrew and remove two wires from sending unit (42). Unscrew from elbow (43). Unscrew from engine block. Unscrew and remove one wire. On positive post of alternative wire is contained in harness (17). Tag for assembly.	. REMOVAL (Continued).		
(40) and remove one wire. (41) Elbow (43). (40) and remove one wire. (41) Elbow (43). (42) Unscrew and remove one wire. (43) Near power steering pump Wires are contained in harm (17). Tag for assembly. (40) and remove one wire. (40) and remove from elbow (43). (41) Unscrew from engine block. (42) Unscrew and remove one wire. (43) Near power steering pump Wires are contained in harm (17). Tag for assembly. (45) Elbow (43). (46), and washer (47). (47) Unscrew from engine block. (48) On positive post of alternative in harmes. (49) Unscrew and remove one wire. (40) At ether quick-start brack Four wires are contained in harness (17). Tag for assembly.	2. Four cable ties (18).	Cut and remove.	Discard.
(37), nuts (37), and washers (35). 15. Two bolts (30), washers (31) and nuts (32). 16. Two bolts (29), washers (28), and nuts (27). 17. Nut (45) and washer (44). 18. Two screws (41). 19. Sending unit (42). 20. Elbow (43). Wires from switch (34). Wires from switch (34). Unscrew and remove switch (33). Unscrew and remove bracket (33). At fuel pump. Wire is conted in harness (17). Tag for assembly. Near power steering pump Wires are contained in harm (17). Tag for assembly. Unscrew from elbow (43). Unscrew from engine block. Unscrew and remove two wires are contained in harm (17). Tag for assembly. Near power steering pump Wires are contained in harm (17). Tag for assembly. Unscrew from elbow (43). Unscrew from engine block. Unscrew and remove one wire. On positive post of alternative in harmes witch (34). Unscrew and remove one wire. Unscrew and remove one wire. On positive post of alternative in harmes witch (34).	3. Screw (39).		Near starter. Wire is contained in harness (17). Tag for assembly.
(31) and nuts (32). (34) from bracket (33). (35) In the content of the content	(37), nuts (37), and		At ether quick-start bracket. Four wires are contained in harness (17). Tag for assembly
(28), and nuts (27). (33). Unscrew and remove one wire. At fuel pump. Wire is conted in harness (17). Tag for assembly. Unscrew and remove two wires from sending unit (42). Unscrew from elbow (43). Unscrew from engine block. Unscrew and remove one wire. On positive post of alternativing wire is contained in harness (17). Tag for assembly. Unscrew from engine block. Unscrew and remove one wire. On positive post of alternativing wire is contained in harness (17). Tag for assembly.			
ed in harness (17). Tag for assembly. 18. Two screws (41). Unscrew and remove two wires from sending unit (42). Near power steering pump Wires are contained in harm (17). Tag for assembly. 19. Sending unit (42). Unscrew from elbow (43). Unscrew from engine block. 21. Nut (46), and washer (47). Unscrew and remove one wire. On positive post of alternative wire is contained in harness.			
wires from sending unit (42). Wires are contained in harm (17). Tag for assembly. 19. Sending unit (42). Unscrew from elbow (43). 20. Elbow (43). Unscrew from engine block. 21. Nut (46), and washer (47). Unscrew and remove one wire. On positive post of alternative is contained in harnes.	7, Nut (45) and washer (44).	Unscrew and remove one wire.	At fuel pump. Wire is contained in harness (17). Tag for assembly.
20. Elbow (43). Unscrew from engine block. 21. Nut (46), and washer (47). Unscrew and remove one wire. On positive post of alternative block. Wire is contained in harnes	8. Two screws (41).		Near power steering pump. Wires are contained in harness (17). Tag for assembly.
21. Nut (46), and washer (47). Unscrew and remove one wire. On positive post of alternative wire is contained in harnes	9. Sending unit (42).	Unscrew from elbow (43).	
Wire is contained in harnes	0. Elbow (43).	Unscrew from engine block.	
	1. Nut (46), and washer (47).	Unscrew and remove one wire.	On positive post of alternator. Wire is contained in harness (17) which is now completely removed from vehicle. Tag for assembly.

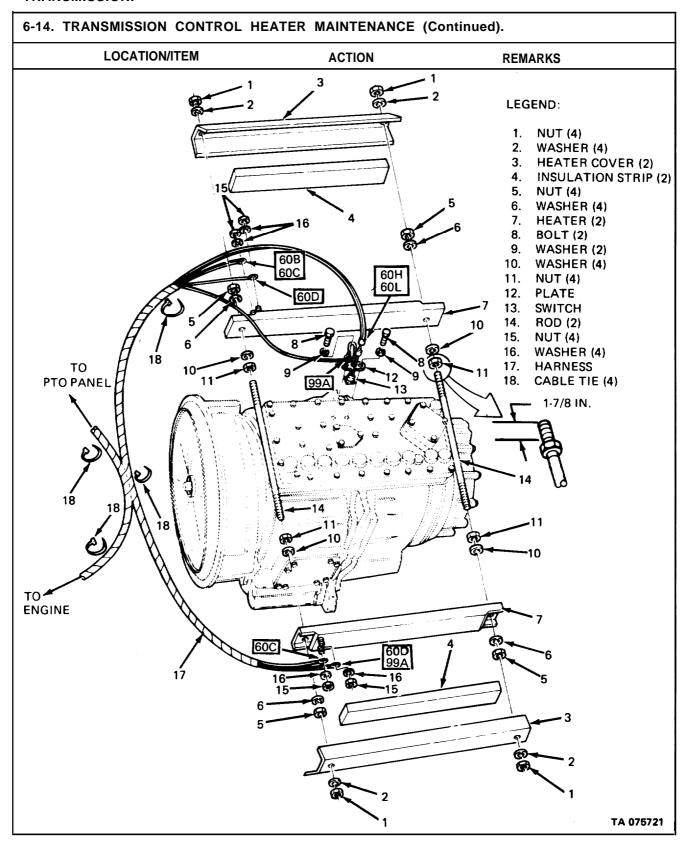


6-14. TRANSMISSION CONTROL HEATER MAINTENANCE (Continued).				
LOCATION/ITEM	ACTION	REMARKS		
B. INSTALLATION.				
22. Two nuts (11).	Screw one nut (11) onto each of two rods (14).	Nut must be exactly 1 7/8 inches from end of rod for proper installation clearance (see exploded view).		
23. Two washers (10) and one heater (7).	Slide onto two rods (14).	At same end of rods you installed nuts (11) on in step (22).		
24. Two nuts (5) and washers (6).	Install on two rods (14) and adjust down to contact heater (7).	Check for 1 7/8 inch measurement again from nuts (11) to end of rods (14). Adjust if necessary.		
25. Assembled heater (7), two nuts (11), nuts (5), washers (6), washers (10), and rods (14).	Position on top edge of transmission.			
	CAUTION			
Adji aga tigh and	not over tighten nuts (5) or (11). ust to retain heaters (7) snugly inst transmission control. Over tening will cause heaters to distort pull away from control block on smission.			
26. Second-heater (7), two nuts (11), washers (10), washers (6), and nuts (5).	a, Install at bottom of two rods (14).b. Tighten two bottom nuts (11) and two bottom nuts (5) to snug two heaters to transmission.	If heater(s) start to bow, loosen nuts (11) until heater(s) are straight, then lock in place with nuts(11).		



6-14. TRANSMISSION CONTROL HEATER MAINTENANCE (Continued).				
LOCATION/ITEM	ACTION	REMARKS		
B. INSTALLATION (Continued).				
27. Switch (13) and plate (12).	 a. Put switch (13) thru center of plate (12). b. Position plate (12) on transmission as shown. c. Install one bolt (8) and washer (9), but do not tighten. 			
28. Harness (17).	 a. Position one wire from harnes and one wire from switch (13 b. Install second bolt (8) and washer (9). c. Tighten two bolts (8) to 32 lb-ft (43 N-m). d. Plug harness (17) into switch (13). e. Install four harness wires, two to each heater (7) and secure with four washers (16) and nuts (15). 	disassembly. o Install as tagged during		
	CAUTION			
Do not over tighten nuts (1) as this will cause bowing of heaters (7) and heater covers (3).				
29. Two insulation strips (4) and heater covers (3).	Position as shown and secure with washers (2) and nuts (1).	Set insulation strips inside heater covers. Slide heater covers onto two rods (14).		
30. Four new cable ties (18).	Install around harness (17) to prevent slack.	At transmission air line and at engine or chassis harness.		

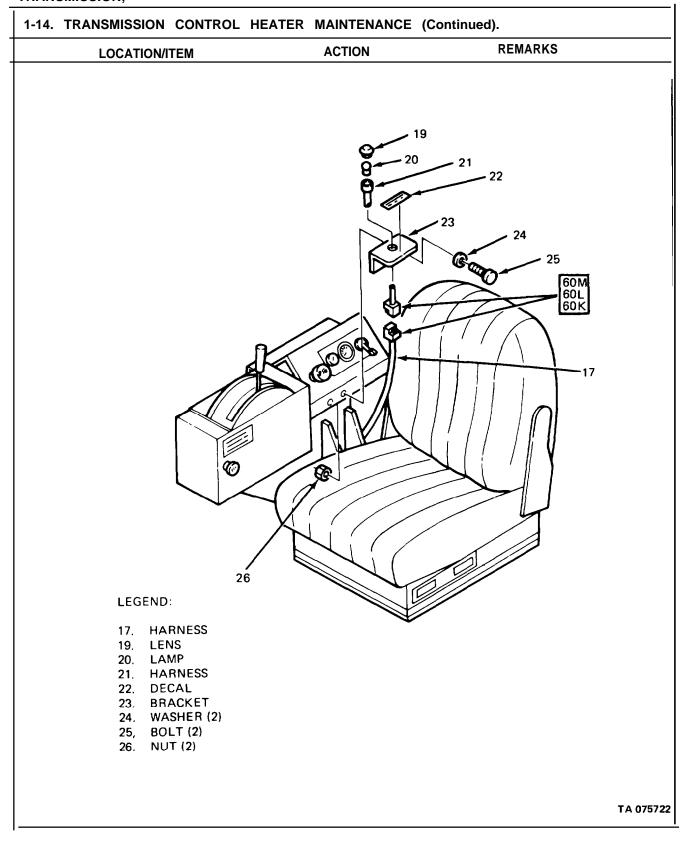
TRANSMISSION.



TRANSMISSION.

6-14	. TRANSMISSION CONTROL	HEATER MAINTENANCE (Cont	inued).
	LOCATION/ITEM	ACTION	REMARKS
В.	NSTALLATION (Continued).		
31.	Bracket (23).	Install to PTO console (M916 thru M920) or to ratio selector support (M915) with two bolts (25), washers (24), and nuts (26).	
32.	Lens (19).	Press down into bracket (23).	
33.	Lamp (20).	a. Plug into harness (21).b. Press into lens (19).	
34.	Harness (21).	Plug into harness (17).	Install as tagged at disassembly.

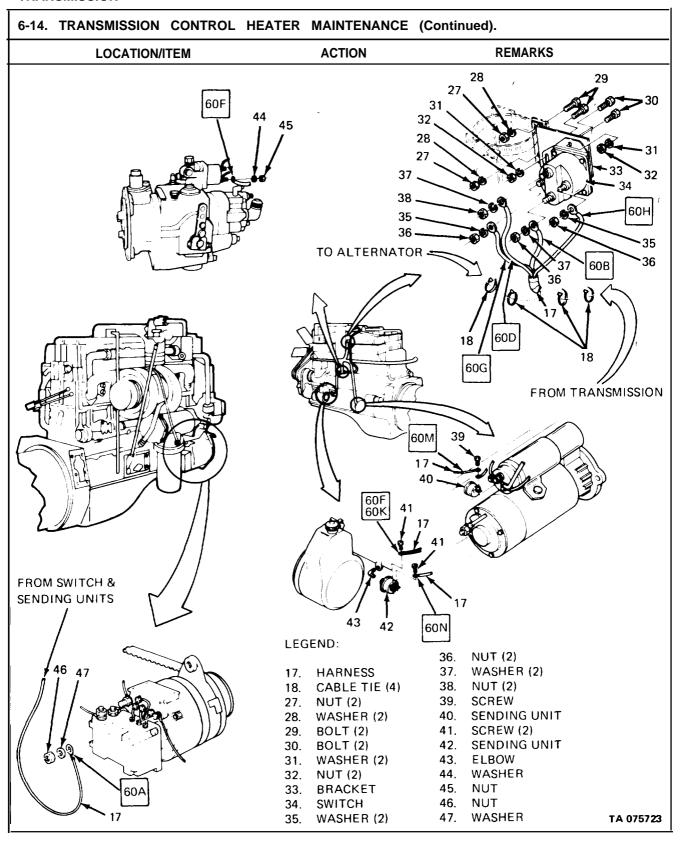
TRANSMISSION,



TRANSMISSION.

LOCATION/ITEM	ACTION	REMARKS
B. INSTALLATION (Continued).		
35. Harness (17).	a. Route along engine and secure with four new cable ties (18).b. Install one wire to sending unit (40) with screws (39).	Left side. Install as needed to prevent slack. Near starter. Install as tagged at disassembly.
36. Bracket (33).	Position at ether quick-start bracket and install with two bolts (29), washers (28) and nuts (27).	
37. Switch (34).	Install to bracket (33) with two bolts (30), washers (31), and nuts (32).	
38. Harness (17).	 a. Install four wires to four terminals on switch (34) with two nuts (38), washers (37), nuts (36), and washers (35). b. Install one wire to fuel pump and secure with nut (45) and washer (44). 	Install as tagged at disassembly. Install as tagged at disassembly.

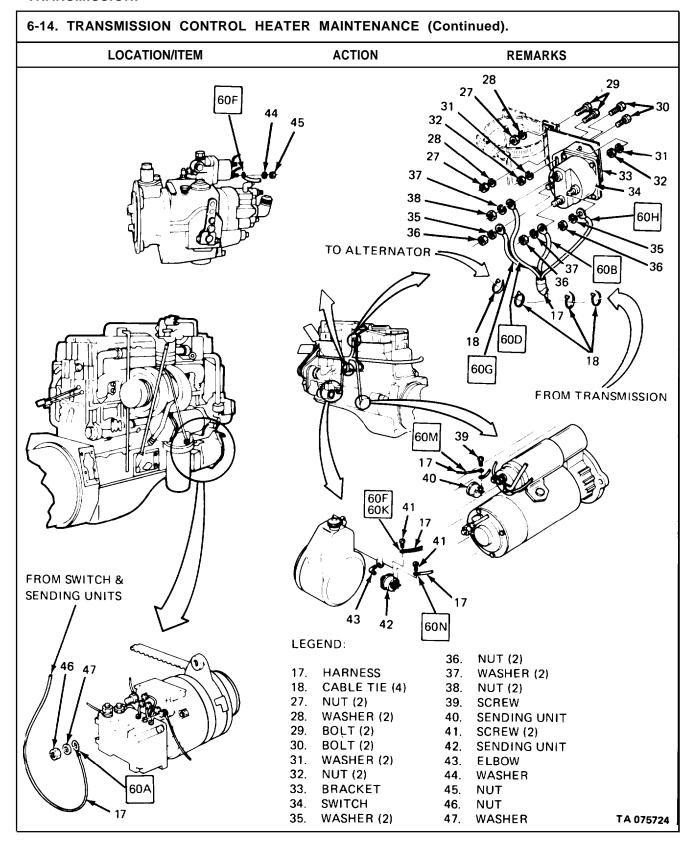
TRANSMISSION



TRANSMISSION.

6-14. TRANSMISSION CON	TROL HEATER MAINTENANCE (Co	ntinued).			
LOCATION/ITEM	ACTION	REMARKS			
B. INSTALLATION (Contin	ued).				
39. Elbow (43).	a. Coat threads with liquid teflon.b. Screw into engine block.	Near power steering pump.			
40. Sending unit (42).	Screw onto elbow (43).				
41. Harness (17).	a. Install two wires to sending unit (42) with two screws (41).b. Install one wire to alternator positive post with washer (47) and nut (46).	Install as tagged at disassembl y.			
	NOTE				
	Follow-on maintenance action require	ed:			
	 a. Install fuel tank; refer to para 4-23B and C. b. Install supply air reservoir (M916 thru M920 only); refer to para 9-166 and C. c. Connect batteries; refer to para 5-37B. d. Install floor access plate; refer to para 6-11C. e. Install ether cylinder; refer to para 4-30B and C. 				
C. OPERATIONAL CHECK.	•				
42. Engine.	Start up (see TM 9-2320-273-10).				
43. Lamp (20).	Should light and remain on until control temperature is in excess of 0°F (-17.8°C).	See decal (22) for further instructions.			
44. Engine.	Shut down (see TM 9-2320-273-10).				

TRANSMISSION.



CHAPTER 7

POWER TRANSFER CASE MAINTENANCE

7-1. OVERVIEW.

This chapter provides you with the following information related to power transfer case maintenance:

- a. All required special tools and equipment.
- b. Other technical manuals.
- c. Troubleshooting procedures.
- d. Maintenance procedures.

Section I REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

7-2. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

7-3. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.

No special tools, TMDE and support equipment are required for the power transfer case maintenance procedures described in this chapter.

7-4. SPARES AND REPAIR PARTS.

Spares and repair parts are listed and illustrated in the Repair Parts and Special Tools List covering Organizational Maintenance for this equipment (TM 9-2320-273-20P).

Section II TROUBLESHOOTING

7-5. INTRODUCTION.

Troubleshooting procedures (table 7-1) are limited to those on-vehicle checks for which corrective actions are within the scope of Organizational Maintenance.

Table 7-1. Power Transfer Case Troubleshooting Procedures.

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

POWER TRANSFER CASE DOES NOT TURN FRONT AXLE PROPELLER SHAFT:

Disconnect control air supply line at power transfer case air chamber and check for air supply with differential lockup control valve switch in LOCK position.

- a. Replace defective control valve (para 9-44).
- b. Troubleshoot truck compressed air system (para 9-5).
- c. If air control system is good, refer problem to Direct Support Maintenance.

2. EXCESSIVE HEAT BUILDUP:

Step 1. Check oil level in both the main case and the clutch housing for proper level.

Fill to proper level (para 7-8).

Step 2. Check oil cooler system for proper functioning.

Tighten fittings, clean cooling fins, replace pump (para 7-9).

- 3. LUBRICANT LEAKING:
 - Step 1. Check drain plugs for tightness.

Tighten drain plugs.

Step 2. Check for clogged or damaged breathers on clutch housing.

Replace breathers.

Step 3. Check for damaged gaskets or seals.

Refer problem to Direct Support Maintenance.

4. TRANSFER CASE NOISY (OIL LEVEL OKAY):

Refer problem to Direct Support Maintenance.

7-6. POWER TRANSFER CASE MAINTENANCE TASK SUMMARY.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M916 thru M920.

EQUIPMENT CONDITION PARAGRAPH

CONDITION DESCRIPTION

7-8A.

Power Transfer Case Oil Drained.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Oil, 5 Qts (4.7 Liters) (Refer to Appendix C); OEA if Sub-zero Use. Oil Funnel. Container, 1.5 Gal (5.68 Liters). Gaskets -2 18108F (34632). Plugs. Liquid Teflon (Refer to Appendix C). Cable Ties -2 5963577-A (06383).

Masking Tape.

Marking Pen.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P. LO 9-2320-273-12.

REFERENCES (TROUBLESHOOTING)

Table 7-1.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off. Transmission in Neutral Park Brake Set.

7-6. POWER TRANSFER CASE MAINTENANCE TASK SUMMARY (Continued), LIST OF TASKS **TASK TASK TROUBLESHOOTING** NO. **TASK REF REF (TABLE)** 7-1 1. Oil Service: 7-8 A. Draining Oil. 7-8A Replenishing Oil Supply. 7-8B C. Checking for Leaks. 7-8C 2. 7-9 7-1 Cooler System Maintenance: 7-9A Removal. В. Cleaning and Inspection. 7-9B Installation. 7-9C c. D. Operational Check. 7-9D

Section III MAINTENANCE PROCEDURES

7-7. INTRODUCTION.

This section provides you with Organizational Level maintenance procedures for the power transfer case. The scope of work is limited to oil service and cooler system maintenance.

NOTE

Maintenance procedures for the differential lockup control valve are given in Chapter 9, Section III, paragraph 9-44.

7-8. OIL SERVICE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

- a. Draining Oil.
- (15)
- b. Replenishing Oil Supply. (15)
- c. Checking for Leaks.

(15)

45 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M916 thru M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Oil Funnel.

Oil, 5 Qts (4.7 Liters) (Refer to Appendix C);

OEA if Sub-zero Use.

Container, 1.5 Gal (5.68 Liters).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES

TM 9-2320-273-10.

TM 9-2320-273-20P.

LO 9-2320-273-12.

TROUBLESHOOTING REFERENCES

Table 7-1.

EQUIPMENT CONDITION

PARAGRAPH

None.

CONDITION DESCRIPTION

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission in Neutral.

Park Brake Set.

7-8. OIL SERVICE (Continued).

LOCATION/ITEM **ACTION REMARKS** A. DRAINING OIL.. 1. Oil level plugs (1) and (2). Unscrew and remove. NOTE Before unscrewing drain plugs, place container underneath to catch oil. LEGEND: 1. OIL LEVEL PLUG 2. OIL LEVEL PLUG3. DRAIN PLUG 4. DRAIN PLUG TA 074868

LOCATION/ITEM	ACTION	REMARKS
A. DRAINING OIL (Continued).		
2. Drain plugs (3) and (4).	a. Unscrew and remove.b. Allow oil to drain out.c. Wipe plugs and openings with clean, dry rag.d. Screw in drain plugs (3) and (4) tightly.	
B. REPLENISHING OIL SUPPLY.		
3. Oil level plug (1).	a. Pour in two quarts of oil.b. Screw in oil level plug (1) tightly.	Use funnel.
4. Oil level plug (2).	a. Add oil until visible in fill hole of transfer case.b. Screw in oil level plug (2) tightly.c. Clean off spilled oil.	Use funnel
C. CHECKING FOR LEAKS.		
5. Two oil level plugs (1) and (2), and two drain plugs (3) and (4).	Road test vehicle, then check for leaks.	Retighten plugs as necessary.

7-8. OIL SERVICE (Continued). LOCATION/ITEM **ACTION REMARKS** LEGEND: 1. OIL LEVEL PLUG 2. OIL LEVEL PLUG 3. DRAIN PLUG 4. DRAIN PLUG TA 074869

7-9. COOLER SYSTEM MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (20) b. Cleaning and Inspection. (15) c. Installation. (20) d. Operational Check. (10)

65 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

7-8A.

PARAGRAPH

EQUIPMENT CONDITION

CONDITION DESCRIPTION

Povver Transfer Case Oil

Drained.

M916 and M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Gaskets 2, MA128-20004 (34623).

Pluas.

Liquid Teflon (Refer to Appendix C)

Masking Tape. Marking Pen.

Cable Ties 2, SST4S (06383).

PERSONNEL REQUIRED

SPECIAL ENVIRONMENTAL CONDITIONS

One (MOS-63B20). Vehicle Parked on Level Ground,

REFERENCES GENERAL SAFETY INSTRUCTIONS

TM 9-2320-273-10.

TM 9-2320-273-20P.

LO 9-2320-273-12.

Engine Off.
Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 7-1.

7-9. COOLER SYSTEM MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** A. REMOVAL. 1. Two bolts (32), six washers Unscrew and remove grille (20), and two nuts (21). (31).2. Lines (1) and (16). Remove from three adapters Plug openings; mark location (28).for reassembly. 13 10 LEGEND: 17 28 LINE **ELBOW** 2. TRANSFER CASE SHAFT 4. BOLT (4) RETAINER (2) **MOUNTING PLUG (4)** SUPPORT ANGLE (2) **WINCH PLATFORM** 18 19 **BRACE** 10. CABLE TIE (2) 34 - 20 NUT 11. WASHER 12. CLAMP (3) 13. 14. NUT (4) 15. **BOLT** 16. LINE 17. ELBOW (2) 18. WASHER (8) 19. NUT (4) 20. WASHER (6) 31 21. NUT (2) -28 - 21 22 22. PUMP 23 23. GASKET (2) 13 24. **SPACER** 16 25. BOLT (4) 26. LINE WARM WEATHER 27. ELBOW (2) **OPERATION** ADAPTER (6) 28. CONFIGURATION 29. TEE 30. PLUG 31. GRILLE 32. BOLT (2) 33. COOLER 23 34. BOLT (4) 26 30 22 28 29 COLD WEATHER OPERATION CONFIGURATION TA 075694

7-9.	7-9. COOLER SYSTEM MAINTENANCE (Continued).				
	LOCATION/ITEM	ACTION	REMARKS		
Α.	REMOVAL (Continued).				
3.	Two elbows (17) and one elbow (2).	Unscrew from cooler (33) and transfer case (3).	Remove adapters (28) from elbows (17) and (2) if necessary.		
4.	Four bolts (5), washers (18), and nuts (19).	a. Unscrew and remove two retainers (6), and four mounting plugs (7).b. Lower cooler (33) from two support angles (8).	If support angles (8) are to be removed from winch platform brace (9), remove four bolts (34), washers (18), and nuts (14).		
5.	Two cable ties (10).	Remove.	Discard.		
6.	Bolt (15), washer (12), and nut (11).	Unscrew and remove two adapters (28).			
7.	Lines (16) and (26).	Disconnect from two adapters (28).	Plug openings; mark location for reassembly.		
8.	Two elbows (27).	Unscrew and remove from pump (22).	Remove adapters (28) from elbows (27) if necessary.		
9.	Four bolts (25).	Unscrew and remove pump (22), spacer (24), and two gaskets (23).	Discard gaskets (23).		
10.	Line (26).	Disconnect from adapter (28).	Plug opening, mark location for reassembly.		
11.	Clamp (13).	Unscrew existing nuts and remove.			
12.	Adapter (28).	Unscrew from tee (29).			
13.	Tee (29).	Unscrew from bottom of transfer case (3).			
14.	Plug (30).	Unscrew from tee (29).			
B.	CLEANING AND INSPECTION.				
15.	Cooler (33).	a. Spray with water to clean off debris.b. Check fins and tubes for damage.	Replace as necessary.		

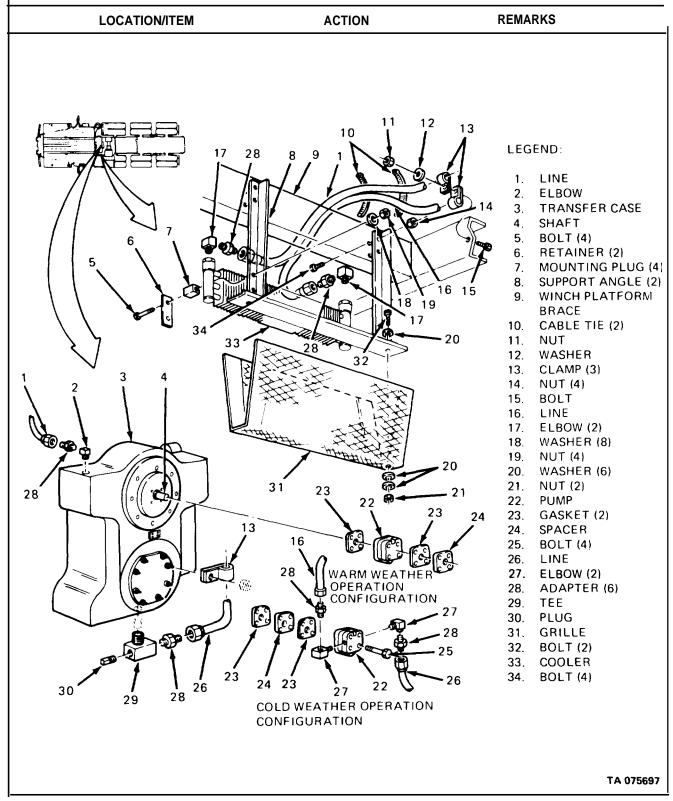
7-9. COOLER SYSTEM MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** 13 10 LEGEND: 17 28 9 8 LINE **ELBOW** TRANSFER CASE 4. SHAFT 5. BOLT (4) 6. RETAINER (2) 7. **MOUNTING PLUG (4)** 8. SUPPORT ANGLE (2) 16 15 9. WINCH PLATFORM 18 19 **BRACE** 17 10. CABLE TIE (2) - 20 11. NUT 33 12. WASHER CLAMP (3) 13. 14. NUT (4) 15. BOLT 16. LINE 17. ELBOW (2) 18. WASHER (8) 19. NUT (4) 20 20. WASHER (6) 31 21. NUT (2) 23 28 - 21 22. **PUMP** 23 23. GASKET (2) 24. **SPACER** 25. BOLT (4) 26. LINE WARM WEATHER OPERATION 28 27. ELBOW (2) 28. ADAPTER (6) CONFIGURATION 29. TEE 30. **PLUG** 31. GRILLE 32. BOLT (2) 33. COOLER 23 34. BOLT (4) • 26 26 30 28 29 **COLD WEATHER OPERATION** CONFIGURATION TA 075695

7-9.	7-9. COOLER SYSTEM MAINTENANCE (Continued).					
	LOCATION/ITE	ACTION	REMARKS			
B. CLEANING AND INSPECTION (Continued).						
16.	Lines (1), (16), and (26).	a. Wipe clean.b. Inspect for cracks.	Replace as necessary.			
17.	Fasteners and fittings;	all. Inspect for damaged threads.	Replace as necessary.			
C.	INSTALLATION.					
		NOTE				
		Remove plugs and apply liquid tefion to all oil carrying connection threads as reassembled.				
18.	Plug (30).	Screw into tee (29).				
19.	Adapter (28).	Screw into tee (29).				
20.	Tee (29).	Screw into bottom of transfer case (3).				
21.	Line (26).	Screw onto adapter (28).	Install as marked.			
22.	Clamp (13).	Install around line (26) and fasten to transfer case with existing nut.				
23.	Two new qaskets (23) spacer (24) and pump"	(22). four mounting holes.	Assemble per illustration for either warm or cold weather operation.			
24.	Two elbows (27)	Screw into pump (22).	Install adapters (28) to elbows if removed.			
25.	Lines (16) and (26).	Screw onto two adapters (28).	Install as marked.			
26.	Elbow (2).	Screw into top of transfer case (3).	Install adapter (28) to elbow, if removed.			
27.	Line (1).	Screw onto adapter (28).				
28.	Two support angles (8). If removed, fasten to winch platform brace (9) with four bolts (34), washers (18), and nuts (14).	Torque to 14 lb-ft (19 N.m).			

7-9. COOLER SYSTEM MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** 13 10 LEGEND: 17 28 LINE 1. ELBOW 2. 3. TRANSFER CASE 4. **SHAFT** 5. **BOLT (4)** RETAINER (2) 6. 7. **MOUNTING PLUG (4)** SUPPORT ANGLE (2) 16 15 WINCH PLATFORM 18 19 **BRACE** `17 CABLE TIE (2) 10. 34 20 33 11. NUT 12. WASHER 13. CLAMP (3) 14. NUT (4) 15. BOLT 16. LINE 17. ELBOW (2) WASHER (8) 18. 19. NUT (4) 20 20. WASHER (6) 31 NUT (2) 23 21. 28 - 21 22. **PUMP** 23 23. GASKET (2) 13 24. **SPACER** 16 25. BOLT (4) 26. LINE 28 WARM WEATHER 27. ELBOW (2) **OPERATION** 28. ADAPTER (6) CONFIGURATION 29. TEE 30. PLUG 31. GRILLE BOLT (2) 32. 25 COOLER 33. 23 34. BOLT (4) - 26 23 24 26 30 28 29 **COLD WEATHER OPERATION** CONFIGURATION TA 075696

LOCATION/ITEM	ACTION	REMARKS
C. INSTALLATION (Continued).		
29. Cooler (33).	Aline with mounting holes on two support angles (8) and secure with four bolts (5), two retainers (6), four mounting plugs (7), four washers (18), and four nuts (19).	Torque to 14 lb-ft (19 N•m).
30. Two elbows (17).	Screw into cooler (33).	Install adapters (28) to elbows if removed.
31. Lines (1) and (16.	a. Screw onto adapters (28).b. Fasten together with two new cable ties (10).	Route along LH frame rail.
	c. Fasten to winch platform with two clamps (13), one bolt (13), one bolt (15), washer (12), and nut (11).	Torque to 9 lb-ft (12 N•m).
32. Grille (31).	Fasten to cooler (33) with two bolts (32), six washers (20) and two nuts (21).	Torque to 14 lb-ft (19 N•m).
D. OPERATIONAL CHECK.		
33. Transfer case (3).	Refill with oil; para 7-8B.	
34. Engine.	Start up (refer to TM 9-2320-273-10).	
35. Cooler system.	Check for leakage at all connection points to transfer case (3) and cooler (33).	Tighten as necessary.
36. Engine.	Shut down (refer to TM 9-2320-273-10).	

7-9. COOLER SYSTEM MAINTENANCE (Continued).



CHAPTER 8

PROPELLER SHAFTS AND AXLE MAINTENANCE

8-1. OVERVIEW.

This chapter provides you with the following information related to propeller shaft and axle maintenance:

- a. All required special tools and equipment.
- b. Other technical manuals.
- c. Troubleshooting procedures,
- cl. Maintenance procedures.

Section I REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

8-2. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

8-3. SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT.

The special tools, TMDE and support equipment required for the propeller shaft and axle procedures described in this chapter are as follows. (Refer to Organizational Maintenance RPSTL, TM 9-2320-273-20P for tool description and illustration.)

Oil filter strap wrench.

8-4. SPARES AND REPAIR PARTS.

Spares and repair parts are listed and illustrated in the Repair Parts and Special Tools List covering Organizational Maintenance for this equipment (TM 9-2320-273-20P).

Section II TROUBLESHOOTING

8-5. INTRODUCTION.

Tables 8-1 and 8-2 contain instructions for troubleshooting the propeller shafts and axles. The corrective actions describe how to fix the problem or refer to a procedure for fixing the problem. The tables are arranged by malfunctions in the following order:

PROPELLER SHAFTS (table 8-1). Excessive shaft noise or vibration.

AXLES (table 8-2).

- a. Excessive backlash.
- b. Continuous axle or wheel noise.
- c. Lubricant leaking,
- d. Excessive or uneven tire wear.

If you cannot locate a problem using these procedures, refer to the troubleshooting procedures for wheels, steering, and suspension (para 10-5).

Table 8-1. Propeller Shafts Troubleshooting Procedures.

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

1. EXCESSIVE SHAFT NOISE OR VIBRATION:

Step 1. Check torque of yoke bolts at universal joints.

Torque bolts to 300 lb-ft (407 N•m).

Step 2. Check torque of capscrews.

Torque capscrews to 100 lb-ft (136 N•m).

Step 3. Inspect propeller shafts and universal joints for evidence of damage or excessive wear.

Replace worn or damaged components (para 8-11).

Step 4. Check universal joints for adequate lubrication.

Lubricate (para 8-11).

Step 5. Check for proper shaft alinement, propeller shafts are properly phased when the cross and bearing in the yokes at each end of shaft are in the same place.

Disassemble and aline as necessary (para 8-11).

NOTE

Look for arrow marks on the propeller shaft and slip yoke. The arrows will point toward each other. if marks are not discernible, punch mark each member insuring reassembly in the same relative position.

Step 6. Remove propeller shaft from vehicle. Check freedom of motion of splines by moving shaft from fully retracted to fully extended. If excessive force is required to retract or extend shaft, or it does not reach full travel, separate shaft halves and inspect splines for wear, damage, and lubrication.

Replace shaft assembly if required (para 8-11).

Table 8-2. Axles Troubleshooting Procedures.

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

EXCESSIVE BACKLASH:

Step 1. Check all universal joints.

Lubricate and replace as necessary (para 8-11).

Step 2. Check drive axle capscrews on universal joints for tightness.

Torque to 100-110 lb-ft (136-149 N•m) (para 8-11D). If the problem persists, notify Direct Maintenance Personnel.

2. CONTINUOUS AXLE OR WHEEL NOISE:

Step 1. Check lube level in axle housing.

Fill axle housing to proper level (para 8-12 for front axle or 8-13 for rear axle).

- Step 2. Check lube pump cover (forward rear axle) for visible damage. Remove and check for clogged filter (M915 only).
 - a. Replace filter as required (para 8-13).
 - b. Refer problem to Direct Support Maintenance if internal pump damage is evident.
- Step 3. Check that brake shoes are not dragging. Check for overheating of brake drum. Jack wheel clear of ground. Use tanker bar to pry up under wheel to check for loose bearings. Any movement of wheels indicates loose bearings. With brakes released spin wheels to check for overly tight bearings. Wheel should spin freely and smoothly. Remove hub and drum to check condition of bearings.

Adjust dragging brakes and clean, repack, or replace bearings as necessary (para 10-13 or 10-14, for front wheels, para 10-15 for rear wheels).

Step 4. Visually inspect tires.

Inflate tires to proper pressure or replace if necessary (refer to TM 9-2320-273-10).

Step 5. Check wheel balance.

Balance wheels, if necessary.

- 3. LUBRICANT LEAKING:
 - Step 1. Check all cover plate bolts for tightness.

Table 8-2. Axles Troubleshooting Procedures (Continued).

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

LUBRICANT LEAKING (Continued):

Tighten bolts or notify direct support personnel to reseal.

Step 2. Check breathers (driving axles) for obstruction or damage.

Clean or replace as necessary.

4. EXCESSIVE OR UNEVEN TIRE WEAR:

Step 1. Check wheel alinement (para 10-10 for front wheels).

Adjust alinement.

Step 2. Check brake adjustment.

Adjust brake if required (para 9-31 (M915), 9-32 (M916-M920) for front wheels or 9-33 (M915), 9-34 (M916-M920) for rear wheels).

Step 3. Check cold tire pressure.

Inflate to proper pressure (Refer to TM 9-2320-273-10).

Section III MAINTENANCE PROCEDURES

8-6. INTRODUCTION.

This section provides you with Organizational Level maintenance procedures for the propeller shafts and axles. To find a specific maintenance procedure, see one of the following task summaries.

- a. Propeller Shafts (para 8-7).
- b. Front Axle (para 8-8).
- c. Rear Axle (para 8-9).
- d. Pusher Axle (para 8-10).

8-7. PROPELLER SHAFTS MAINTENANCE TASK SUMMARY.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

EQUIPMENT CONDITION PARAGRAPH

All.

CONDITION DESCRIPTION None.

None.

TEST EQUIPMENT

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

GAA (Refer to Appendix C).

Blocks.

Nonflammable Dry Cleaning Solvent SD-2 (Refer to Appendix C).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

LO 9-2320-273-12.
REFERENCES (TROUBLESHOOTING)

Table 8-1, 8-2.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TASK NO. TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
Propeller Shafts:	8-11	8-1, 8-2
 A. Removal. B. Cleaning and Lubrication. C. Inspection of Universals. D. Installation. E. Checking for Vibration. 	8-11A 8-11 B 8-11C 8-11D 8-11E	

8-8. FRONT AXLE MAINTENANCE TASK SUMMARY.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M916 thru M920.

EQUIPMENT CONDITION PARAGRAPH

None.

CONDITION DESCRIPTION

Axle Oil Warm (Perform Oil Service immediately after truck has been driven).

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

GO (27 Pints, 12.7 Liters) (Refer to Appendix C). GOS Gear Oil if Sub-Zero Use (Refer to Appendix C).

Chassis Grease (Refer to Appendix C). Liquid Teflon (Refer to Appendix C).

Container (3 Gallon).

Nonflammable Cleaning Solvent SD-2 (Refer to Appendix C).

Grease Gun. PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

LO 9-2320-273-12.

REFERENCES (TROUBLESHOOTING)

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

0.40	
8-12	None
8-12A	
8-12B	
8-12C	
	8-12A 8-12B

8-9. REAR AXLE MAINTENANCE TASK SUMMARY.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

EQUIPMENT CONDITION PARAGRAPH

CONDITION DESCRIPTION

AII.

None.

Axle Oil Warm. (Perform Oil Service Immediately After Truck Has Been

Driven.)

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Container, 10 Gals (38 Liters).

Gear Oil, GOS if Sub-Zero Use (Refer to Appendix C).
M915
M916 Thru M920.
76 Pints (36 Liters).
62 Pints (29 Liters).

Oil Filter Element (M915), 3280-V-5040 (78500).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

LO 9-2320-273-12. REFERENCES (TROUBLESHOOTING)

Table 8-2.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.
Park Brake Set.

Transmission in Neutral.

TASK NO.		TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
	Oil Se	rvice:	8-13	8-2
	A.	Draining Oil.	8-13A	
	B.	Replacing Oil Filter (M915 Only).	8-13B	
	C.	Replenishing Oil.	8-13C	
	D.	Checking for Leaks.	8-13D	

8-10. PUSHER AXLE MAINTENANCE TASK SUMMARY.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M917, M919, and M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C).

EQUIPMENT CONDITION PARAGRAPH

TM 9-2320-273-10. 9-13A.

CONDITION DESCRIPTION

Pusher Axle Down. Air Reservoirs Bled.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

REFERENCES (TROUBLESHOOTING)

Table 9-1,

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Park Brake Set.

TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
1.	Pusher Axle Air Bags (M917, M919, and M920):	8-14	9-1
	A. Removal.	8-14A	
	B. Installation.	8-14B	
	C. Operational Check.	8-14C	
2.	Pusher Axle Lift Cylinders:	8-15	9-1
	A. Removal.	8-15A	
	B. Installation.	8-15B	
	C. Operational Check.	8-15C	

8-10. PUSHER AXLE MAINTENANCE TASK SUMMARY (Continued).				
LIST OF TASKS				
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)	
3.	Pusher Axle Pressure Gage :	8-16	9-1	
	A. Removal. B. Installation.	8-16A 8-16B		
	C. Operational Check.	8-16C		
4.	Pusher Axle Pressure Regulator Valve :	8-17	9-1	
	A. Removal.	8-17A		
	B. Installation.	8-17B		
	C. Operational Check.	8-17C		
5.	Pusher Axle Up-Down Selector Valve :	8-18	9-1	
	A. Removal.	8-18A		
	B. Installation.	8-18B		
	C. Operational Check.	8-18C		

This page intentionally left blank.

8-11. PROPELLER SHAFTS AND UNIVERSAL JOINTS MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.
b. Cleaning and Lubrication.
c. Inspection of Universals.
d. Installation.
e. Checking for Vibration.

85 Minutes Total .

INITIAL SETUP EQUIPMENT CONDITION

APPLICABLE CONFIGURATIONS PARAGRAPH CONDITION DESCRIPTION

All. None. None.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

GAA (Refer to Appendix C).

Blocks.

Nonflammable Cleaning Solvent SD-2 (Refer to Appendix C).

PERSONNEL REQUIRED SPECIAL ENVIRONMENTAL CONDITIONS

One (MOS63B20). Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10. LO 9-2320-273-12. TM 9-2320-273-20P.

Engine OFF.

Transmission in Neutral.

GENERAL SAFETY INSTRUCTIONS

Park Brake Set.

TROUBLESHOOTING REFERENCES

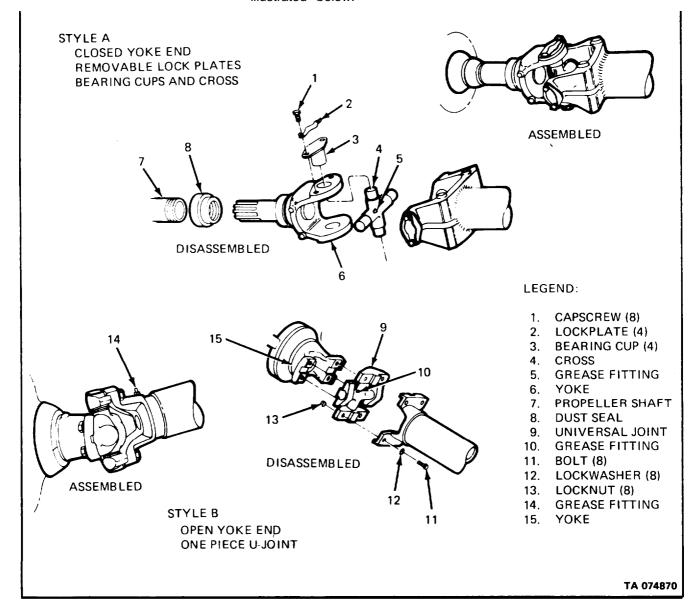
Table 8-1, 8-2.

8-11. PROPELLER SHAFTS AND UNIVERSAL JOINTS MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

NOTE

The M915 has two propeller shafts while the M916 thru M920 have four. Two styles of yokes and two universal joints are used throughout the model series as illustrated below.



			O UNIVERSAL JOINTS MAIN	<u> </u>	
	LOCATION/ITI	EM	ACTION	REMARKS	
			APPLICATION		
Model	Quantity	Style	Location		
M915	1	Α	Prop shaft from transmission	on to forward rear axle.	
	1	В	Prop shaft from forward rea	ar axle to rear rear axle.	
M916, M917	1	В	Prop shaft from transmission	on to top of transfer case.	
M918, M919	1	В	Prop shaft from bottom of	transfer case to front axle.	
M920	1	В	Prop shaft from bottom rea	r of transfer case to forward rear axle	
	1	Α	Prop shaft from forward rea	ar axle to rear rear axle.	
			NOTE		
		U-jo to ir read	ore disassembly of any prop sha pints, punch mark each shaft ar insure proper assembly alinemer dy punch marked, do not make use existing ones.	nd joint nt. If al-	
NOTE					
		slinç to ja OFF	ore disassembly, use a suitable g to support shaft. It may be ne ack up rear differential with Pasto release torque pressure on ft/joint connections.	cessary rk Brake	
A. REMOV	AL.				
STYLE	Α				
1. Four lo	ckplates (2).		Bend down tabs as needed.		
2. Eight capscrews (1).		Unscrew and remove.	Unscrew and remove.		
3. Four lockplates (2). Remove from bearing cups (3).		(3).			
4. Bearing	cups (3).		Remove.		
5. Yokes (6	6) and cross	(4).	a. Disengage cross from yolb. Remove cross (4).c. Swing shaft yoke free of or transmission.d. Unscrew grease fitting (5)		

8-11. PROPELLER SHAFTS AND UNIVERSAL JOINTS MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** A. REMOVAL (Continued). STYLE B 6. Eight hexhead bolts (11), Unscrew and remove. lockwashers (12), and locknuts (13), if so equipped. 7. Universal joint (9). a. Remove from shaft flange and yoke by inserting suitable tool into slots. Remove support and swing shaft voke free of axle or transfer case. b. Unscrew grease fitting (10). STYLE A CLOSED YOKE END REMOVABLE LOCK PLATES BEARING CUPS AND CROSS **ASSEMBLED** DISASSEMBLED LEGEND: 1. CAPSCREW (8) 2. LOCKPLATE (4) 3. BEARING CUP (4) 4. **CROSS** 5. **GREASE FITTING** 6. YOKE 7. PROPELLER SHAFT 8. **DUST SEAL** 9. UNIVERSAL JOINT **GREASE FITTING** 10. DISASSEMBLED 11. **BOLT (8)** 12. LOCKWASHER (8) **ASSEMBLED** 13. LOCKNUT (8) 12 14. **GREASE FITTING** STYLE B 11 15. YOKE OPEN YOKE END ONE PIECE U-JOINT TA 074871

8-II. PROPELLER SHAFTS AND UNIVERSAL JOINTS MAINTENANCE (Continued).

ACTION LOCATION/ITEM REMARKS

A. REMOVAL (Continued).

STYLES A AND B

- 8. Yoke (6) and propeller shaft (7).
- a. Pull yoke (6) out of propeller shaft (7).
- b. Screw on dust seal (8) and slide yoke (6) and propeller shaft (7) back together.

Inspect dust seal (8) and replace as necessary.

B. CLEANING AND LUBRICATION.

CAUTION

Do not allow SD-2 dry cleaning solvent to come in contact with seals or flexible hoses. These cleaners may damage leather, rubber, and synthetic materials.

STYLE A

- 9. Yoke (6), cross (4), four lockplates (2), eight capscrews (1), and grease fitting (5).
- a. Soak in dry cleaning solvent to loosen grease and foreign matter.
- b. Clean thoroughly and refer to 8-11C for inspection prior to lubrication.

NOTE

Do not disassemble bearing assembly inside bearing cups.

- 10. Four bearing cups (3).
- a. Clean with a short stiff brush being careful not to dislodge needle bearings.
- b. Coat lightly with GAA.
- 11. Grease fitting (5).

Screw into cross (4) and apply grease liberally thru grease fitting (refer to LO 9-2320-273-12) and on all mating surfaces.

8-11. PROPELLER SHAFTS AND UNIVERSAL JOINTS MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM STYLE A CLOSED YOKE END REMOVABLE LOCK PLATES **BEARING CUPS AND CROSS ASSEMBLED** DISASSEMBLED LEGEND: 1. CAPSCREW (8) 2. LOCKPLATE (4) 3. BEARING CUP (4) 4. CROSS 5. GREASE FITTING 6. YOKE 7. PROPELLER SHAFT 8. DUST SEAL 9. UNIVERSAL JOINT 10. GREASE FITTING 11. BOLT (8) DISASSEMBLED 12. LOCKWASHER (8) **ASSEMBLED** 13. LOCKNUT (8) 12 14. GREASE FITTING STYLE B 15. YOKE 11 **OPEN YOKE END** ONE PIECE U-JOINT TA 074872

PROPELLER SHAFTS AND UNIVERSAL JOINTS. 8-11. PROPELLER SHAFTS AND UNIVERSAL JOINTS MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM B. CLEANING AND LUBRICATION (Continued). STYLE B 12. Universal joint (9), yoke a. Clean with dry cleaning (15), grease fittings (5), solvent being careful not (10), and (14). to contact seals. Refer to 8-11C for inspection prior to lubrication. b. Screw grease fittings into yokes and joints and apply grease liberally through all grease fittings (5), (10), and (14) (refer LO 9-2320-273-12) and on all mating surfaces. C. INSPECTION OF UNIVERSALS. STYLE A Replace as necessary. 13. Universal joint yokes (6), Inspect for: crosses (4) and bearing a. Excess wear. b. Damaged grease seals. cups (3). Replace as necessary. 14. Propeller shaft (7). Slide shaft sections and inspect for excess spline wear and binding. 15. Grease fitting (5). Inspect for: Replace as necessary. a. Damaged threads. b. Damaged tip. STYLE B Inspect for damaged grease Replace as necessary. 16. Universal joint (9). seals. Inspect for damaged threads Replace as necessary. 17. Grease fittings (10) and (14). or tip. **CAUTION** Style A bearing cups (3) and cross (4) should be replaced as a set. Do not use an old cross with new cups or old cups with a new cross. Style B universal joints must be replaced as an assembly if excessive wear or grease leakage is evident. Repair parts

are available only in kits.

8-11. PROPELLER SHAFTS AND UNIVERSAL JOINTS MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** NOTE For proper alinement of propeller shafts, use the punch marks you made before removal, or the marks that were there from a previous removal. STYLE A CLOSED YOKE END REMOVABLE LOCK PLATES **BEARING CUPS AND CROSS ASSEMBLED** DISASSEMBLED LEGEND: 1. CAPSCREW (8) LOCKPLATE (4) 15 BEARING CUP (4) 4. **CROSS** 5. **GREASE FITTING** 6. YOKE PROPELLER SHAFT 7. 8. **DUST SEAL** 9. UNIVERSAL JOINT 10. GREASE FITTING DISASSEMBLED 11. **BOLT (8)** LOCKWASHER (8) 12. **ASSEMBLED** 13. LOCKNUT (8) 12 14. **GREASE FITTING** STYLE B 11 15. YOKE OPEN YOKE END ONE PIECE U-JOINT TA 074873

8-11. PROPELLER SHAFTS AND	UNIVERSAL JOINTS MAINTENANCE	(Continued).
LOCATION/ITEM	ACTION	REMARKS

D. INSTALLATION.

STYLE A

18. Yoke (6) and cross (5). Install cross in one yoke.

19. Two bearing cups (3). Press into yoke to secure cross.

20. Two lockplates (2).

a. Install one on each bearing cup.
b. Attach with capscrews (1).

21. Yoke (6) and cross (4). Install other yoke.

22. Two bearing cups (3). Press into yoke to secure cross.

23. Two lockplates (2).

a. Install one on each bearing cup.
b. Attach with capscrews (1).
c. Bend up tabs on lockplates (2).

STYLE B

24. Universal joint (9). Aline mounting holes to propeller

shaft flange, install hexhead bolts (11) and lockwashers (12). Tighten to 100-110 lb-ft (136-149 N•m).

25. Universal joint (9) Raise i mounting mounting (1)

flange.

Raise into alinement with yoke mounting holes, install hexhead bolts (11) and lockwashers (12). Tighten to 100-110 lb-ft (136-149 N•m). Install locknuts (13), if so equipped.

NOTE

Follow-on maintenance required: Lubricate all grease fittings (5), (10), and (14) (see LO 9-2320-273-12).

8-11. PROPELLER SHAFTS AND UNIVERSAL JOINTS MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** E. CHECKING FOR VIBRATION. STYLE A AND B 26. Vehicle. Road test. Check for unusual If vibration is present, recheck noise or vibration. alinement and bolt tightness. If this doesn't cure, refer to DS/GS maintenanance. STYLE A **CLOSED YOKE END** REMOVABLE LOCK PLATES **BEARING CUPS AND CROSS ASSEMBLED** DISASSEMBLED LEGEND: 1. CAPSCREW (8) LOCKPLATE (4) 2. BEARING CUP (4) 3. CROSS 5. GREASE FITTING 6. YOKE PROPELLER SHAFT 7. 8. DUST SEAL 9. UNIVERSAL JOINT 10. GREASE FITTING DISASSEMBLED 11. BOLT (8) 12. LOCKWASHER (8) **ASSEMBLED** 13. LOCKNUT (8) **GREASE FITTING** 14. STYLE B 15. YOKE 11 **OPEN YOKE END** ONE PIECE U-JOINT TA 074874

FRONT AXLE.

8-12. OIL SERVICE (M916 Thru M920).

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Draining Oil. (15)b. Replenishing Oil Supply. (20)

c. Operational Check. (30)

65 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M916 thru M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

CW, 27 Pt (12.7 Liters) (Refer to Appendix C).

GOS Gear Oil if Sub-Zero Use (Refer to Appendix C).

Chassis Grease, GAA (Refer to Appendix C).

Liquid Teflon (Refer to Appendix C).

Container (3 Gal).

Non-Flammable Cleaning Solvent SD-2 (Refer to Appendix C).

Grease Gun.

PERSONNEL REQUIRED

One, (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P. LO 9-2320-273-12.

TROUBLESHOOTING REFERENCES

None.

EQUIPMENT CONDITION PARAGRAPH

None.

CONDITION DESCRIPTION

Axle Oil Warm (Perform Oil Service Immediately After Truck Has Been

Driven.)

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

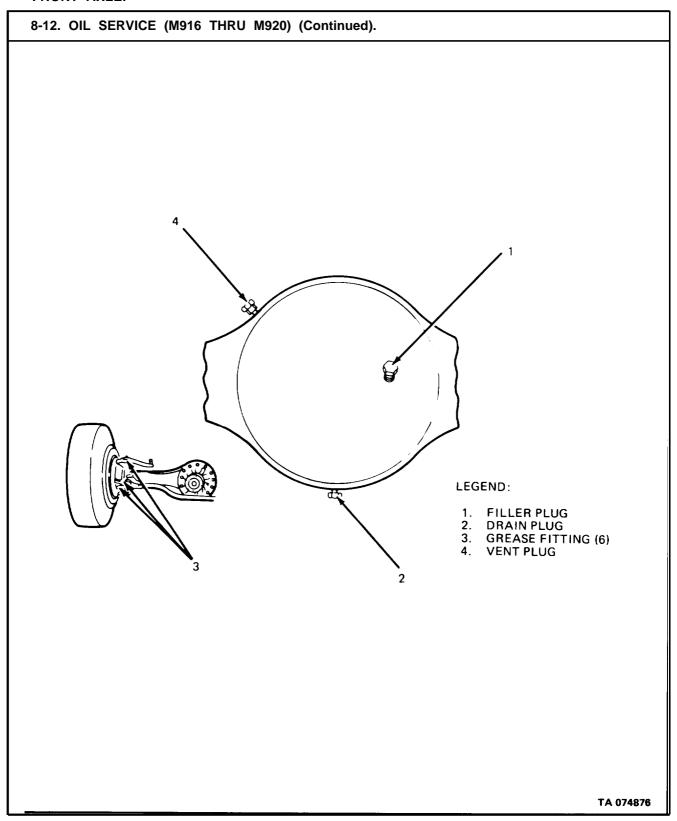
FRONT AXLE

LOCATION/ITEM	ACTION	REMARKS
DRAINING OIL.		
	NOTE	
	Before removing drain plug (2), place container underneath to catch oil.	
Filler plug (1) and drain plug (2).	Remove and allow oil to drain out.	
Vent plug (4).	a. Remove, inspect, and clean with solvent.b. Install; threads coated with Teflon.	
Drain plug (2).	a. Wipe plug and openings clean.b. Screw in and tighten.	
	4	/ ¹
		LEGEND:
The state of the s	The state of the s	1. FILLER PLUG 2. DRAIN PLUG 3. GREASE FITTING (6 4. VENT PLUG

FRONT AXLE.

LOCATION/ITEM	ACTION	REMARKS
. REPLENISHING OIL SUPPL	<u>.Y.</u>	
. Opening at filler plug (1).	a. Add 27 pts (12.7 liters) of GO.b. Wipe filler plug (1) and opening clean.c. Screw in filler plug (1) and tighten.	If sub-zero useage add GOS gear oil.
. Six grease fittings (3).	Lubricate with chassis grease, using grease gun.	
. Vehicle.	Road test. Check for unusual noise.	If excessively noisy, refer problem to Direct Support Maintenance.
. Front driving axle.	After road test, check for leaks.	Retighten plugs as necessary.

FRONT AXLE.



8-13. OIL SERVICE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Draining Oil. (15)
b. Replacing Oil Filter (M915). (5)
c. Replenishing Oil. (10)
d. Checking for Leaks. (20)

50 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Container. 10 Gals (38 Liters).

Gear Oil , GOS if Sub-Zero Use (Refer to Appendix C).
M915 M916 Thru M920.
76 Pints (36 Liters). 62 Pints (29 Liters).
Oil Filter Element (M915), 3280-V-5040 (78500).

EQUIPMENT CONDITION PARAGRAPH

None.

CONDITION DESCRIPTION

Axle Oil Warm. (Perform Oil Service Immediately After Truck Has Been Driven.)

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P. LO 9-2320-273-12.

TROUBLESHOOTING REFERENCES

Table 8-2.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Park Brake Set.

8-13. OIL SERVICE (Continued).

ACTION **REMARKS** LOCATION/ITEM

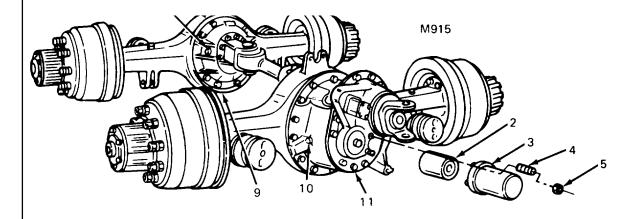
A. DRAINING OIL.

1. Filler plugs (1) and (10) or (7) and (12).

Unscrew and remove.

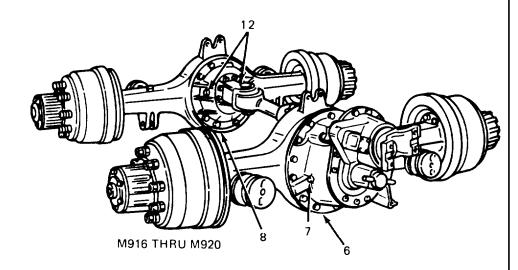
NOTE

Before removing a drain plug, place container underneath to catch oil. Drain plugs are magnetic and any metal particles should be completely removed. If excessive, refer to Direct Support.



LEGEND:

- 1. FILLER PLUG
- 2. FILTER
- 3. FILTER COVER
- 4. STUD (2)
- 5. LOCKNUT (2)
- 6. DRAIN PLUG
- 7. FILLER PLUG
- 8. DRAIN PLUG
- 9. DRAIN PLUG
- 10. FILLER PLUG
- 11. DRAIN PLUG12. FILLER PLUG (2)



TA 074877

LOCATION/ITEM	ACTION	REMARKS
A. DRAINING OIL (Continued).		
2. Magnetic drain plugs (9) and (11) or (6) and (8).	a. Remove.b. Allow oil to drain.c. Wipe magnetic plugs and axle housing.d. Screw in plugs.	
B. REPLACING OIL FILTER (M9	15 ONLY).	
3. Two filter cover locknuts (5).	Remove.	Replace studs (4) if damaged.
4. Filter cover (3).	Slide off filter.	
5. Filter (2).	Unscrew and throw away.	You will need to use a strap wrench.
6. New filter (2).	a. Moisten gasket with oil.b. Screw on until gasket contacts adapter.c. Tighten one more full turn.	
7. Filter cover (3).	a. Slide over new filter (2) and studs (4).b. Secure with two locknuts (5).	
C. REPLENISHING OIL.		
8. Front filler plug (10)	a. Pour in GO. (1) M95 -40 Pts (19	Fill with GOS if sub-zero useage.
	(2) M916 thru M920 - 34 pts (16 liters). b. Screw in filler plug.	
9. Rear filler plug(s) (1) or (12).	a. Pour in GO. (1) M915 -36pts(17	One plug.
	(2) M916 thru M920- 28 pts (13 liters). b. Screw in filler plug(s).	Two plugs.

8-13. OIL SERVICE (Continued).

LOCATION/ITEM ACTION REMARKS

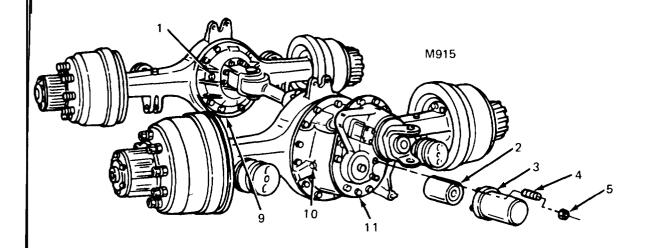
D. CHECKING FOR LEAKS.

- 10. Vehicle.
- 11. Filler plugs(1) and (10) or (7) and (12); drain plugs (9) and (11) or (6) and (8), filter (2) (M915 only).

Road test.

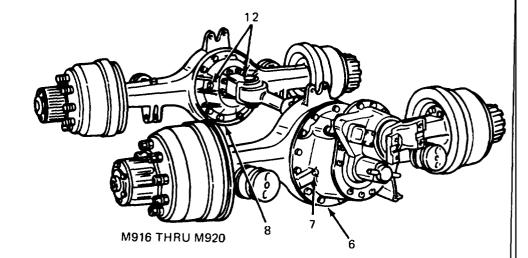
- a. Check for leaks.
- b. Check oil level.

Add more oil if necessary.



LEGEND:

- 1. FILLER PLUG
- 2. FILTER
- 3. FILTER COVER
- 4. STUD (2)
- 5. LOCKNUT (2)
- 6. DRAIN PLUG
- 7. FILLER PLUG
- 8. DRAIN PLUG
- 9. DRAIN PLUG
- 10. FILLER PLUG
- 11. DRAIN PLUG12. FILLER PLUG (2)



TA 074878

8-14. PUSHER AXLE AIR BAGS MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (20)b. Installation. (20)c. Operational Check. (10)

50 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M917, M919, M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C).

EQUIPMENT CONDITION PARAGRAPH

TM 9-2320-273-10. 9-13A.

CONDITION DESCRIPTION

Pusher Axle Down. Air Reservoirs Drained.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P,

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.
Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 9-1.

8-14. PUSHER AXLE AIR BAGS MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS NOTE** Air bags should be replaced as a pair. A. REMOVAL. 1. Two air lines (9). a. Unscrew and remove. Replace if necessary. b. Inspect for: Located on top plate (4) (1) Leaks. toward inside of chassis rails. (2) Cracks. (3) Damaged fittings. 2. Two air line fittings (1). Unscrew from studs (inner). Located on top plates (4). Unscrew from studs (inner). Located on top plates (4). 3. Two nuts (2). 4. Two nuts (3). Unscrew from studs (outer). Located on top plates (4). LEGEND: AIR LINE FITTING (2) NUT (2) NUT (2) TOP PLATE (2) 5. AIR BAG (2) 6. LOCKWASHER (8) **BOLT (8)** 8. **BOTTOM** PLATE (2) 9. AIR LINE (2) TA 074879

A. REMOVAL (Continued). 5. Eight bolts (7) and lockwashers (6). 6. Two air bags (5). 8. INSTALLATION. 7. Two air bags (5). 8. Eight bolts (7) and lockwashers (6). 9. Two nuts (3). 10. Two nuts (2). 11. Two air line fittings (1). Apply liquid teffon to threads and screw onto upper inner air stud above nuts (2). Apply liquid teffon and install on air line fittings (1). C. OPERATIONAL CHECK. 13. Engine. Shut down (see TM 9-2320-273-10). Selight bolts (7) and lockwashers (8). Replace if cracked or leaking. Replace if cracked or leaking. Replace as a set of two air bags (2). Replace if cracked or leaking. Replace as a set of two air bags (2). Replace if cracked or leaking. Replace as a set of two air bags (2). Replace if cracked or leaking. Replace as a set of two air bags (2). Replace if cracked or leaking. Rep	8-14. PUSHER AXLE AIR BAGS MAINTENANCE (Continued).				
5. Eight bolts (7) and lockwashers (6). 6. Two air bags (5). a. Slide out. b. Inspect for: (1) Deterioration. (2) Cracks. B. INSTALLATION. 7. Two air bags (5). Slide into position between top plates (4) and bottom plates (8); aline holes. 8. Eight bolts (7) and lockwashers (6). 9. Two nuts (3). Install and tighten on outer top plate stud. 10. Two air line fittings (1). Apply liquid teflon to threads and screw onto upper inner air stud above nuts (2). 11. Two air lines (9). Apply liquid teflon and install on air line fittings (1). C. OPERATIONAL CHECK. 13. Engine. Start up (see TM 9-2320-273-10). Replace if cracked or leaking.	LOCATION/ITEM	ACTION	REMARKS		
lockwashers (6). plates (8). a. Slide out. b. Inspect for: (1) Deterioration. (2) Cracks. B. INSTALLATION.	A. REMOVAL (Continued).				
b. Inspect for: (1) Deterioration. (2) Cracks. B. INSTALLATION. 7. Two air bags (5). Slide into position between top plates (4) and bottom plates (8); aline holes. 8. Eight bolts (7) and lockwashers (6). 9. Two nuts (3). Install and tighten on outer top plate stud. 10. Two nuts (2). Install and tighten on upper inner air line studs. 11. Two air line fittings (1). Apply liquid teflon to threads and screw onto upper inner air stud above nuts (2). 12. Two air lines (9). Apply liquid teflon and install on air line fittings (1). C. OPERATIONAL CHECK. 13. Engine. Start up (see TM 9-2320-273-10). Replace if cracked or leaking. Replace if cracked or leaking. Replace if cracked or leaking. Replace as a set of two air bags.	5. Eight bolts (7) and lockwashers (6).				
7. Two air bags (5). Slide into position between top plates (4) and bottom plates (8); aline holes. 8. Eight bolts (7) and lockwashers (6). 9. Two nuts (3). Install and tighten on outer top plate stud. 10. Two nuts (2). Install and tighten on upper inner air line studs. 11. Two air line fittings (1). Apply liquid teflon to threads and screw onto upper inner air stud above nuts (2). 12. Two air lines (9). Apply liquid teflon and install on air line fittings (1). C. OPERATIONAL CHECK. 13. Engine. Start up (see TM 9-2320-273-10). Raise and lower (see TM 9-2320-273-10). Check for proper inflation and deflation of both air bags. 15. Engine. Shut down (see TM 9-2320-	6. Two air bags (5).	b. Inspect for:(1) Deterioration.	Replace if cracked or leaking. Replace as a set of two air bags		
top plates (4) and bottom plates (8); aline holes. 8. Eight bolts (7) and lockwashers (6). 9. Two nuts (3). Install through bottom plates (8) and tighten. 10. Two nuts (2). Install and tighten on outer top plate stud. Install and tighten on upper inner air line studs. 11. Two air line fittings (1). Apply liquid teflon to threads and screw onto upper inner air stud above nuts (2). 12. Two air lines (9). Apply liquid teflon and install on air line fittings (1). C. OPERATIONAL CHECK. 13. Engine. Start up (see TM 9-2320-273-10). Raise and lower (see TM 9-2320-273-10). Check for proper inflation and deflation of both air bags. 15. Engine. Shut down (see TM 9-2320-	B. INSTALLATION.				
lockwashers (6). plates (8) and tighten. Install and tighten on outer top plate stud. Install and tighten on upper inner air line studs. Install and tighten on upper inner air line studs. Install and tighten on upper inner air line studs. Apply liquid teflon to threads and screw onto upper inner air stud above nuts (2). Install and tighten on outer top plate stud. Apply liquid teflon and install on air line fittings (1). C. OPERATIONAL CHECK. Start up (see TM 9-2320-273-10). Raise and lower (see TM 9-2320-273-10). Check for proper inflation and deflation of both air bags. Shut down (see TM 9-2320-	7. Two air bags (5).	top plates (4) and bottom			
top plate stud. 10. Two nuts (2). Install and tighten on upper inner air line studs. 11. Two air line fittings (1). Apply liquid teflon to threads and screw onto upper inner air stud above nuts (2). 12. Two air lines (9). Apply liquid teflon and install on air line fittings (1). C. OPERATIONAL CHECK. 13. Engine. Start up (see TM 9-2320-273-10). 14. Pusher axle. Raise and lower (see TM 9-2320-273-10). Check for proper inflation and deflation of both air bags. 15. Engine. Shut down (see TM 9-2320-					
inner air line studs. Apply liquid teflon to threads and screw onto upper inner air stud above nuts (2). 12. Two air lines (9). Apply liquid teflon and install on air line fittings (1). C. OPERATIONAL CHECK. Start up (see TM 9-2320-273-10). Raise and lower (see TM 9-2320-273-10). Check for proper inflation and deflation of both air bags. 15. Engine. Shut down (see TM 9-2320-	9. Two nuts (3).				
and screw onto upper inner air stud above nuts (2). 12. Two air lines (9). Apply liquid teflon and install on air line fittings (1). C. OPERATIONAL CHECK. Start up (see TM 9-2320-273-10). Raise and lower (see TM 9-2320-273-10). Check for proper inflation and deflation of both air bags. 15. Engine. Shut down (see TM 9-2320-	10. Two nuts (2).				
on air line fittings (1). C. OPERATIONAL CHECK. Start up (see TM 9-2320-273-10). Raise and lower (see TM 9-2320-273-10). Check for proper inflation and deflation of both air bags. Shut down (see TM 9-2320-	11. Two air line fittings (1).	and screw onto upper inner air			
13. Engine. Start up (see TM 9-2320-273-10). Raise and lower (see TM 9-2320-273-10). Check for proper inflation and deflation of both air bags. Shut down (see TM 9-2320-	12. Two air lines (9).				
10). 14. Pusher axle. Raise and lower (see TM 9-2320-273-10). Check for proper inflation and deflation of both air bags. 15. Engine. Shut down (see TM 9-2320-	C. OPERATIONAL CHECK.				
273-10). Check for proper inflation and deflation of both air bags. 15. Engine. Shut down (see TM 9-2320-	13. Engine.				
	14. Pusher axle.	273-10). Check for proper inflation and deflation of both air			
	15. Engine.				

8-14. PUSHER AXLE AIR BAGS MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** LEGEND: 1. AIR LINE FITTING (2) 2. NUT (2) 3. NUT (2) 4. TOP PLATE (2) 5. AIR BAG (2) 6. LOCKWASHER (8) 7. BOLT (8) 8. BOTTOM PLATE (2) 9. AIR LINE (2) TA 074880

8-15. PUSHER AXLE LIFT CYLINDERS MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (20)b. Installation. (20)Operational Check. (10)

50 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M917, M919, M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C).

EQUIPMENT CONDITION PARAGRAPH

TM 9-2320-273-10. 9-13A.

CONDITION DESCRIPTION

Pusher Axle Down. Air Reservoirs Drained.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

Table 9-1.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

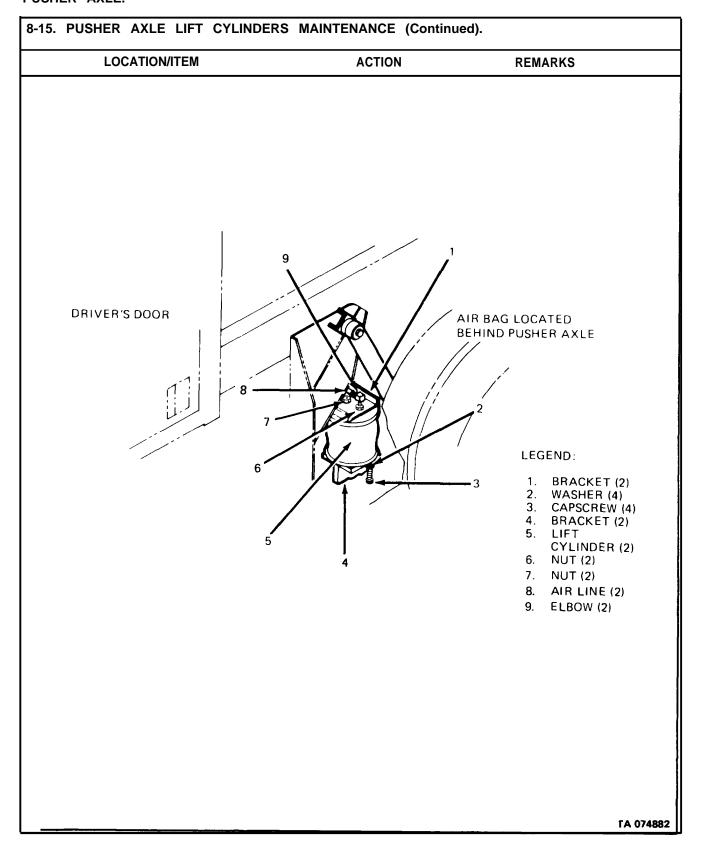
Engine OFF.

Transmission in Neutral.

Park Brake Set.

8-15. PUSHER AXLE LIFT CYLINDERS MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM **NOTE** Lift cylinders should be replaced as a pair. REMOVAL. One on each side of truck. a. Unscrew and remove. 1. Two air lines (8) and Replace if necessary. b. Inspect for: elbows (9). (1) Cracks. (2) Leaks. (3) Damaged fittings. Unscrew and remove. 2. Four capscrews (3), and washers (2). 3. Two nuts (7). Unscrew and remove. 4. Two nuts (6). Unscrew and remove. Remove two lift cylinders (5). DRIVER'S DOOR AIR BAG LOCATED BEHIND PUSHER AXLE LEGEND: 1. BRACKET (2) 2. WASHER (4) 3. CAPSCREW (4) BRACKET (2) 4. 5. LIFT CYLINDER (2) NUT (2) NUT (2) AIR LINE (2) ELBOW (2) TA 074881

8-15. PUSHER AXLE LIFT CYLINDERS MAINTENANCE (Continued).				
LOCATION/ITEM	ACTION	REMARKS		
B. INSTALLATION.				
5. Two lift cylinders (5).	Place in position, Aline bolt holes. Push studs through brackets (1).			
6. Four capscrews (3) with washers (2).	Screw in and tighten.			
7. Two nuts (7).	Screw on and tighten.			
8. Two nuts (6).	Screw on and tighten.			
9. Two elbows (9) and air lines (8).	a. Put liquid teflon on threads of elbows (9).b. Screw on air lines (8) and tighten.			
C. OPERATIONAL CHECK.				
10. Engine.	Start up (see TM 9-2320-273-10).			
11. Pusher axle.	Raise and lower (see TM 9-2320-273-10). Check for proper inflation and deflation of both lift cylinders.			
12. Engine.	Shut down (see TM 9-2320-273-10).			



8-16. PUSHER AXLE PRESSURE GAGE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (10)b. Installation. (10)c. Operational Check. (10)

30 Minutes Total .

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M917, M919, M920. **TEST EQUIPMENT**

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C).

EQUIPMENT CONDITION PARAGRAPH

TM9-2320-273-10. 9-13A .

CONDITION DESCRIPTION

Pusher Axle Down. Air Reservoirs Bled

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

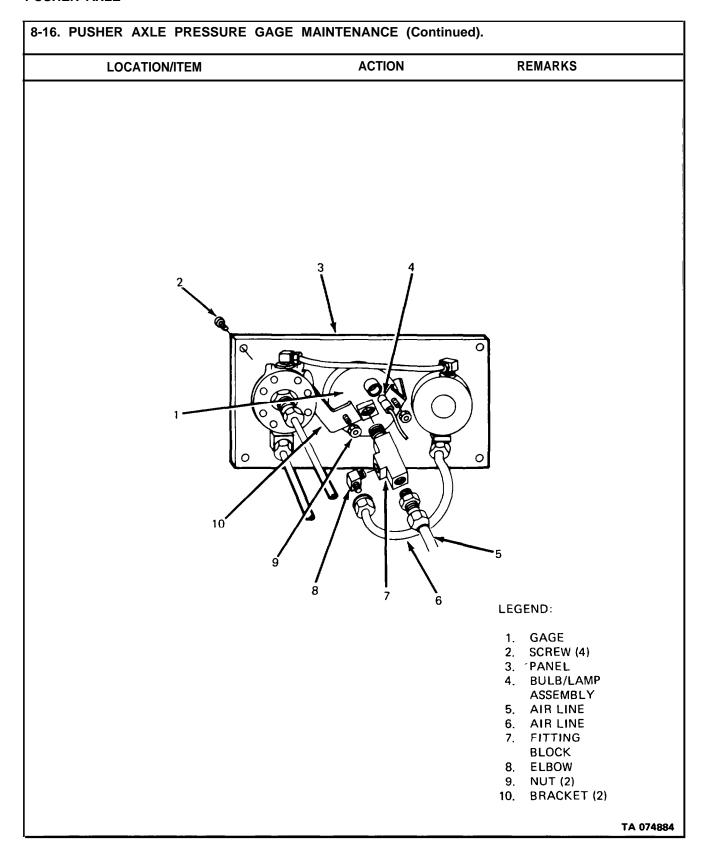
Transmission in Neutral. Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 9-1.

LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL.		
1. Four screws (2).	Loosen and remove. Remove panel (3).	
2. Bulb/lamp assembly (4).	Disconnect.	
3. Air lines (5) and (6).	 a. Unscrew and remove from fitting block (7) and elbow (8). b. Inspect for: (1) Cracks. (2) Leaks. (3) Damaged fittings. 	Replace if necessary.
4. Air line fitting block (7).	a. Unscrew from back of gage (1).b. Inspect for damaged threads.	Replace if necessary.
2	3 4	LEGEND:
	9 8 7 6	1. GAGE 2. SCREW (4) 3. PANEL 4. BULB/LAMP ASSEMBLY 5. AIR LINE 6. AIR LINE 7. FITTING BLOCK 8. ELBOW 9. NUT (2) 10. BRACKET (2)
		TA 07488

8-16. PUSHER AXLE PRESSURE GAGE MAINTENANCE (Continued). LOCATION/ITEM ACTION REMARKS				
ACTION	REMARKS			
Unscrew and remove.				
Remove.				
Remove.				
Place in panel (3).				
Place in position over gage studs.				
Screw on and tighten.				
Apply liquid teflon to threads and screw into the rear of gage (1).				
Screw on and tighten.				
Connect.				
Put in place. Screw in and tighten four screws (2).				
Start up (see TM 9-2320-273-10).				
Check readings as regulator valve is actuated (see TM 9-2320-273-10).				
Shut down (see TM 9-2320-273-10).				
	Remove. Remove. Place in panel (3). Place in position over gage studs. Screw on and tighten. Apply liquid teflon to threads and screw into the rear of gage (1). Screw on and tighten. Connect. Put in place. Screw in and tighten four screws (2). Start up (see TM 9-2320-273-10). Check readings as regulator valve is actuated (see TM 9-2320-273-10). Shut down (see TM 9-2320-	Unscrew and remove. Remove. Remove. Place in panel (3). Place in position over gage studs. Screw on and tighten. Apply liquid teflon to threads and screw into the rear of gage (1). Screw on and tighten. Connect. Put in place. Screw in and tighten four screws (2). Start up (see TM 9-2320-273-10). Check readings as regulator valve is actuated (see TM 9-2320-273-10). Shut down (see TM 9-2320-		



8-17. PUSHER AXLE REGULATOR VALVE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (3.5)b. Installation. (3.5)c. Operational Check. (2.0)

9.0 Minutes Total.

INITIAL SETUP

APPLICABLE CON FIGURATIONS

M917, M919, M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C).

EQUIPMENT CONDITION PARAGRAPH

TM9-2320-273-10 . 9-13A.

CONDITION DESCRIPTION

Pusher Axle Down. Air Reservoirs Drained.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked On Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 9-1.

LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL.		
I. Four screws (1).	Unscrew and remove. panel (2).	
2. Two air lines (3).	 a. Unscrew and remove from elbows (6). b. Inspect for: (1) Cracks. (2) Leaks. (3) Damaged fittings. 	Replace if necessary.
B. Elbows (6).	Unscrew from valve (4).	
1. Lockring (5).	Unscrew and remove from panel front. Remove valve (4).	
CONTROL SUSPEN PRESSURE	AXLE DOWN	3
LEGEND: 1. SCREV 2. PANEI 3. AIR LI 4. VALV	AXLE DOWN AXLE DOWN AXLE DOWN 6 N (4) L INE (2) E	4
LEGEND: 1. SCREW 2. PANEI 3. AIR L	AXLE DOWN AXLE DOWN AXLE DOWN 6 N (4) LINE (2) E RING	5

8-17. PUSHER AXLE REGULATOR	VALVE MAINTENANCE (Continued	i).
LOCATION/ITEM	ACTION	REMARKS
B. INSTALLATION.		
5. Elbows (6).	Apply liquid teflon to threads and screw into valve (4).	
6. Valve (4).	a. Insert in panel (2).b. Screw on and tighten lock-ring (5).	
7. Two air lines (3).	Screw onto fittings (6) and tighten.	
8. Panel (2).	Set in place. Screw in and tighten four screws (1).	
C. OPERATIONAL CHECK.		
9. Engine.	Start up (see TM 9-2320-273-10).	
10. Pressure regulator valve.	Check for increases and decreases in pressure readings on gage when valve is operated (see TM 9-2320-273-10).	
11. Engine.	Shut down (see TM 9-2320-273-10).	

8-17. PUSHER AXLE REGULATOR VALVE MAINTENANCE (Continued. LOCATION/ITEM **ACTION REMARKS** GRANNING SUSPENSIONS CONTROL PRESSURE 6 LEGEND: 1. SCREW (4) 2. PANEL 3. AIR LINE (2) 4. VALVE 5. LOCKRING 6. ELBOW (2) TA 074886

8-18. PUSHER AXLE UP-DOWN SELECTOR VALVE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

(10)a. Removal. b. Installation. (15)c. Operational Check. (10)

35 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M917, M919, M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS [P/N)

Liquid Teflon (Refer to Appendix C).

EQUIPMENT CONDITION PARAGRAPH

TM 9-2320-273-10. 9-13A.

Pusher Axle Down. Air Reservoirs Drained.

CONDITION DESCRIPTION

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 9-1.

PUSHER AXLE.

8-18. PUSHER AXLE UP-DOWN SELECTOR VALVE MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM REMOVAL. 1. Screw (7) and lever (6). Unscrew and remove. Unscrew and remove 2. Four screws (1). panel (5). a. Unscrew and remove from 3. Three air lines (2). two elbows (3) and straight fitting (9). b. Inspect for: Replace if necessary. (1) Cracks. (2) Leaks. (3) Damaged fittings. 4. Two elbows (3) and Unscrew from valve (4). straight fitting (9). 5. Four screws (8). Unscrew and remove valve (4). GRANNING CONTROL PRESSURE AXLE AXLE LEGEND: SCREW (4) 2. AIR LINE (3) 3. ELBOW (2) VALVE 4. 5. PANEL 6. LEVER 7. SCREW 8. SCREW (4) STRAIGHT **FITTING** TA 074887

PUSHER AXLE.

8-18. PUSHER AXLE UP-DOWN	SELECTOR VALVE MAINTENANG	CE (Continued).
LOCATION/ITEM	ACTION	REMARKS
B. INSTALLATION.		
6. Two elbows (3) and straight fitting (9).	Coat threads with liquid teflon and screw into valve (4).	
7. Valve (4).	Attach to panel (5) with four screws (8). Tighten screws.	
8. Three air lines (2).	Screw into two elbows (3) and straight fitting (9).	Supply line goes to center of valve, air bag line goes to top of valve, and lift cylinder line goes to bottom of valve.
9. Panel (5).	Set in place. Screw in and tighten four screws (1).	
10. Lever (6).	Attach to valve (4) and tighten screw (7).	
C. OPERATIONAL CHECK.		
11. Engine.	Start up (see TM 9-2320-273-10).	
12. Pusher axle.	Check for proper raising and lowering (see TM 9-2320-273-10).	
13. Engine.	Shut down (see TM 9-2320-273-10).	

PUSHER AXLE.

8-18. PUSHER AXLE UP-DOWN SELECTOR VALVE MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** 2 GRANNING SUSPENSIONS CONTROL PRESSURE AXLE LIFT DOWN LEGEND: 1. SCREW (4) 2. AIR LINE (3) 2 3. ELBOW (2) 4. VALVE 5. PANEL 6. LEVER 7. SCREW 8. SCREW (4) 9. STRAIGHT **FITTING** TA 074888

CHAPTER 9

COMPRESSED AIR AND BRAKE SYSTEMS

9-1. OVERVIEW.

This chapter provides you with the following information related to compressed air and brake maintenance:

- a. All required special tools and equipment.
- b. Other technical manuals.
- c. Troubleshooting procedures.
- d. Maintenance procedures.

Section I REPAIR PARTS, SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

9-2. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

9-3. SPECIAL TOOLS, TMDE, SUPPORT EQUIPMENT.

The special tools, TMDE and support equipment required for the compressed air and brake maintenance procedures described in this chapter are limited to the following items. (Refer to Organizational Maintenance RPSTL, TM 9-2320-273-20P for tool description and illustration.)

- a. Air Pressure Gage (0-200 psi min).
- b. Brake spring pliers.
- c. Wheel dolly jacks, and blocks.
- d. Oil filter strap wrench.

9-4. SPARES AND REPAIR PARTS.

Spares and repair parts are listed and illustrated in the Repair Parts and Special Tools list covering Organizational Maintenance for this equipment (TM 9-2320-273-20P).

Section II TROUBLESHOOTING

9-5. INTRODUCTION.

- a. General. The primary use of the compressed air system is to operate the service and park/emergency vehicle brakes. Other uses of compressed air are for transmission shifting control, air horn operation, windshield wiper and washer operation, the differential lockout, and on some vehicles, pusher axle controls, and front wheel drive. Air system component location illustrations for each truck model are contained in paragraphs 9-5e thru 9-5j. These same illustrations are contained in paragraphs 2-65 thru 2-70 and the components are further described in paragraph 2-64.
- b. Scope. This section contains troubleshooting instructions based on observed malfunctions starting with generalized pressure problems and continuing to more specific malfunctions of components and compressed air functions.
 - c. Test Equipment: Air pressure gage (0-200 psi min].
- d. Troubleshooting. Troubleshooting procedures are given in table 9-1. The procedures are grouped under the malfunctions listed below. Perform only those steps in a procedure required to remedy the malfunction.
 - 1. Insufficient air pressure (Malfunction No. 1).
 - 2. Excessive system pressure indicated (Malfunction No. 2).
 - 3. Park brakes will not release (Malfunction No. 3).
 - 4. Trailer or towed vehicle brakes will not release (Malfunction No. 4).
 - 5. Service brake will not release (one wheel only) (Malfunction No. 5).
 - 6. Service brakes will not apply (Malfunction No. 6).
 - 7. No service brakes on trailer or towed vehicle only (Malfunction No. 7).
 - 8. Trailer hand control will not apply trailer service brakes (Malfunction No. 8).
 - 9. Park brakes will not apply (Malfunction No. 9).
 - 10. Service brakes are weak or slow responding (all wheels) (Malfunction No. 10).
 - 11. Front service brakes are weak or slow responding (Malfunction No. 11).
 - 12. Rear service brakes are uneven or erratic (Malfunction No. 12).
 - 13. Service brakes are uneven or erratic on one or more wheels (Malfunction No. 13).
 - 14. Brakes overheat (Malfunction No. 14).
 - 15. Stop lamps do not operate, brakes function normally (Malfunction No. 15).
 - 16. Pressure gage(s) not indicating or is not accurate, brakes normal (Malfunction No. 16.
 - 17. Air horn does not operate (Malfunction No. 17).
 - 18. Windshield wipers or washers are inoperative (Malfunction No. 18).
 - 19. Interaxle differential lockup inoperative (Malfunction No. 19).

Table 9-1. Compressed Air and Brake System Troubleshooting Procedures.

TEST OR INSPECTION.

CORRECTIVE ACTION.

INSUFFICIENT AIR PRESSURE:

- Step 1. Check for air exhausting through open or damaged air reservoir drain valves.
 - a. Close or replace manual drain valve (para 9-13).
 - b. Replace automatic drain valve on supply reservoir (para 9-12).
- Step 2. Check for loose air connections between the compressor, governor, and air reservoirs.

Tighten any loose air connections and replace damaged components.

Step 3. Check governor for proper operation and adjustment. Should be set to control pressure in supply reservoir at 105-125 psi (724-862 kPa).

Refer problem to Direct Support Maintenance.

- Step 4. With the engine not running, loosen the compressor output line at the compressor and listen for escaping air.
 - If air escapes continuously, replace the check valve in that line at the supply reservoir (para 9-15).
 - b. If the check valve is okay, refer problem to Direct Support Maintenance.
- Step 5. Check air line connections for tightness and air lines for cracks or breaks.

Tighten or replace connections and lines as necessary.

- 2. EXCESSIVE SYSTEM PRESSURE INDICATED:
 - Step 1. Check for inoperative pressure safety relief valve on the supply reservoir.

Replace the safety release valve (para 9-14) only if reservoir exceeds 150 psi.

Step 2. Check governor for proper operation.

Refer problem to Direct Support Maintenance.

- 3. PARK BRAKES WILL NOT RELEASE:
 - Step 1. Check reservoir pressure gage and verify LOW PRESSURE warning lamp is out.

See Malfunction 1.

Step 2. Verify PARK BRAKE manual valve is closed.

Close valve; if valve will not close, refer to para 9-19.

Step 3. Check air lines for leakage or damage. Use a soap solution to check for leakage at connections and watch for bubbles.

Replace damaged lines and tighten loose connections (para 9-36).

Table 9-1. Compressed Air and Brake System Troubleshooting Procedures (Continued).

TEST OR INSPECTION.

CORRECTIVE ACTION.

- 3. PARK BRAKES WILL NOT RELEASE (Continued):
 - Step 4. (M915, M916 and M920 only). Inspect intervehicle air hoses for proper connections.

 Connect hoses properly.
 - Step 5. Check the air line between the two rear quick-release valves for damage or leaks using a soap solution.
 - Replace the line if damaged and tighten connections.
 - b. Replace the park brake quick-release valve (para 9-22).
- 4. TRAILER OR TOWED VEHICLE BRAKES WILL NOT RELEASE:
 - Step 1. Check intervehicle air hoses for proper connections. Close the trailer supply valve and disconnect the hoses.

Reconnect the hoses and open the supply valve.

Step 2. Check for trailer air leaks or defective brakes.

Troubleshoot trailer.

5. SERVICE BRAKES WILL NOT RELEASE (ONE WHEEL ONLY) :

Troubleshoot brake.

Refer to brake malfunctions 3 and 4, above.

- 6. SERVICE BRAKES WILL NOT APPLY:
 - Step 1. Check the pressure gages in the cab.

Operate the engine to build up proper pressure.

Step 2. Check position of park brake and trailer supply valves.

Position correctly.

Step 3. (M915, M916 and M920 only). Check intervehicle connections.

Connect air hoses correctly and open trailer supply valve.

Table 9-1. Compressed Air and Brake System Troubleshooting Procedures (Continued).

TEST OR INSPECTION.

CORRECTIVE ACTION.

- 6. SERVICE BRAKES WILL NOT APPLY (Continued):
 - Step 4. Check for leakage at the brake pedal valve using a soap solution.

 Tighten connections or replace defective brake pedal valve (para 9-21).
 - Step 5. Check brakes for proper adjustment and worn linings.

 Adjust brakes (para 9-31, 9-32, 9-33, 9-34).
- 7. NO SERVICE BRAKES ON TRAILER OR TOWED VEHICLE ONLY:
 - Step 1. Check service air hose connection and position of trailer supply valve.

 Reconnect hose properly and open trailer supply valve.
 - Step 2. Check trailer supply valve for damage or leakage using a soap solution.

 Replace defective valve (para 9-17).
 - Step 3. Check the double-check valve(s) for damage or leakage using a soap solution.

 Replace defective valve (para 9-27).
 - Step 4. Check tractor protection valve for damage or corrosion.

 If valve is defective, replace defective valve.
- 8. TRAILER HAND CONTROL WILL NOT APPLY TRAILER SERVICE BRAKES:
 - Step 1. Check air lines between trailer hand control and double check valve for leakage using a soap solution.

Repair leaks.

- Step 2. Check tractor protection valve for damage or leaks using a soap solution.

 Tighten connections or replace valve (para 9-26).
- Step 3. Check the double-check valve for damage or leaks using a soap solution.

 Tighten connections or replace valve (para 9-27).
- 9. PARK BRAKES WILL NOT APPLY:
 - Step 1. Inspect vent on the park brake valve for damage or clogging.

 Clean vent or replace valve (para 9-19).

Table 9-1. Compressed Air and Brake System Troubleshooting Procedures (Continued).

TEST OR INSPECTION.

CORRECTIVE ACTION.

9. PARK BRAKES WILL NOT APPLY (Continued):

Step 2. Check air chambers for proper position of caging bolt.

Adjust caging bolt (Para 9-37).

10. SERVICE BRAKES ARE WEAK OR SLOW RESPONDING (ALL WHEELS):

Step 1. Check for low reservoir pressure. Pressure should not be below 80 lbs. (Buzzer sounds at 80 lbs).

See Malfunction 1.

Step 2. Check service air lines for damage and leakage using a soap solution.

Tighten loose connections and replace damaged lines.

Step 3. Check brake linings and adjustment (para 9-31, 9-32, 9-33, 9-34, 9-35).

Replace brake linings and/or adjust as necessary.

11. FRONT SERVICE BRAKES ARE WEAK OR SLOW RESPONDING:

Step 1. Check air lines between brake pedal valve and front brake chambers for damage and leakage using a soap solution.

Tighten loose connections and replace damaged lines.

Step 2. Check the limiting valve for damage and leakage using a soap solution.

Replace defective limiting valve (para 9-25).

Step 3. Check the brake pedal valve for damage and leakage using a soap solution.

Replace defective valve (para 9-21).

Step 4. Check front brakes for worn linings (shoes) and proper adjustment.

Adjust brakes and replace linings if necessary (para 9-31, 9-32).

12. REAR SERVICE BRAKES ARE UNEVEN OR ERRATIC:

Step 1. Check for leakage in air lines between service brake relay valve and wheel air chambers using a soap solution.

Tighten loose connections or replace defective components.

Table 9-1. Compressed Air and Brake System Troubleshooting Procedures (Continued).

TEST OR INSPECTION.

CORRECTIVE ACTION.

12. REAR SERVICE BRAKES ARE UNEVEN OR ERRATIC (Continued):

Step 2. Check for air leakage between the air reservoir and the rear service brake relay valve.

Tighten loose connections or replace damaged line.

Step 3. Leak test rear brake part of the brake pedal valve.

Tighten loose connections or replace pedal valve (para 9-21).

Step 4. Check brake shoes for proper adjustment.

Adjust brake shoes (para 9-39).

13. SERVICE BRAKES ARE UNEVEN OR ERRATIC ON ONE OR MORE WHEELS:

Step 1. Have an assistant press and hold the brake pedal valve down and perform leakage test on air lines at affected wheels using a soap solution.

Tighten loose connections, repair or replace damaged air lines or hoses.

Step 2. Loosen line fitting at affected wheel air chamber and have an assistant lightly depress the treadle valve, Listen for air exhausting from line. No air indicates a clogged line.

Replace damaged or clogged line.

- Step 3. Check brake adjustment (para 9-31,9-32, 9-39):
 - a. Adjust brake and schedule for maintenance as soon as possible.
 - b. If manual adjustment does not correct the problem, refer problem to Direct Support Maintenance.
- Step 4. Press brake pedal down and listen for air leakage around wheel air chamber clamp.

Tighten clamp or replace ruptured chamber diaphragm (para 9-36 for front brakes, para 9-37 for rear brakes).

Step 5. Remove hub and drum assembly to inspect plunger and adjuster mechanism and brake return springs (para 9-31 and 9-32 for front brakes, para 9-33 and 9-34 for rear brakes).

Clean, repair or replace defective components.

Step 6. Check the brake linings for grease, glazing and proper installation (para 9-31 and 9-32 for front brakes, para 9-33 and 9-34 for rear brakes).

Clean, replace, or reinstall as required.

Table 9-1. Compressed Air and Brake System Troubleshooting Procedures (Continued).

TEST OR INSPECTION.

CORRECTIVE ACTION.

14. BRAKES OVERHEAT:

Step 1. Check for low reservoir pressure.

If below 80 psi, see Malfunction 1.

Step 2. Check for damaged or leaking front limiting valve or rear relay valves.

Tighten loose connections or replace defective valve (para 9-24 or 9-25, as applicable).

- Step 3. Pull hub and drum assembly (para 10-13 through 10-15 as applicable) and inspect brake assembly. Apply brakes lightly and observe shoe movement for smooth operation.
 - a. Replace weak or broken return springs (para 9-31 and 9-32 for front brakes, 9-33 and 9-34 for rear brakes).
 - b. Clean, service, and assemble brake mechanism.
- Step 4. Check for insufficient lining to drum clearance (para 9-31 and 9-32 for front brakes, para 9-33 and 9-34 for rear brakes).
 - a. Adjust.
 - b. If adjusting fails, refer problem to Direct Support Maintenance.
- Step 5. Inspect wheel bearings for damage and proper lubrication.

Adjust, lube, or replace bearings (para 10-13 through para 10-15 as applicable).

15. STOP LAMPS DO NOT OPERATE, BRAKES FUNCTION NORMALLY:

Step 1. Have an assistant step on the brake pedal (with ignition key switch on) and check for approximately 12 volts dc at both electrical connections on the stoplamp switch.

If voltage is not present on both terminals, replace the double-check valve/stop lamp switch (para 9-28 or 9-29),

Step 2. Check for defective wiring or electrical connectors.

Troubleshoot the electrical system (para 5-17).

Table 9-1. Compressed Air and Brake System Troubleshooting Procedures (Continued).

MALFUNCTION .

TEST OR INSPECTION .

CORRECTIVE ACTION .

16. PRESSURE GAGE(S) NOT INDICATING OR IS NOT ACCURATE, BRAKES NORMAL:

Step 1. Disconnect affected air line(s) at gage(s) and press the brake pedal. If no air exhausts, the line is clogged or broken.

Replace defective line or gage (para 9-20).

17. AIR HORN DOES NOT OPERATE:

Step 1. Check for air LOW PRESSURE.

If air pressure is below 20 lbs , operate engine until air pressure is back to 120 lbs. See Malfunction 1.

- Step 2. Inspect air lines for damage or clogging.
 - a. Replace damaged or clogged lines.
 - b. Replace defective manually-operated horn valve (para 9-45).

18. WINDSHIELD WIPERS OR WASHERS ARE INOPERATIVE:

Step 1. Check for air leakage in lines to the wiper or washer control valve using a soap solution.

Tighten loose connections and replace damaged lines.

Step 2. Check to see if the wiper mechanical linkage is binding or broken.

Replace defective linkage (para 9-42).

- Step 3. Loosen air line at the wiper motor and turn control to the run position. Air should exhaust from the line.
 - a. If no air exhausts, replace the control valve (para 9-43).
 - b. If air exhausts, replace the motor (para 9-42).

Table 9-1. Compressed Air and Brake System Troubleshooting Procedures (Continued).

TEST OR INSPECTION.

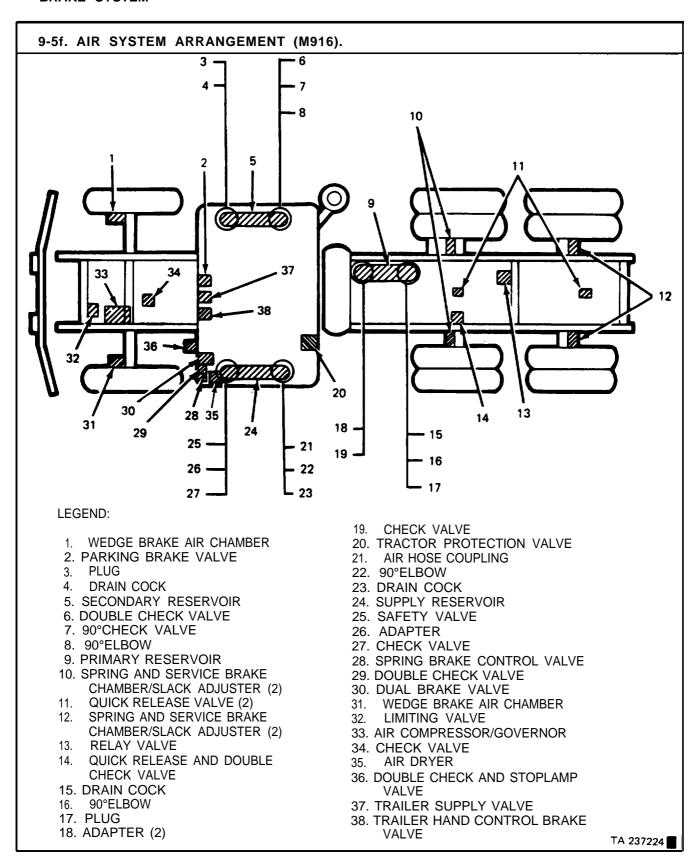
CORRECTIVE ACTION.

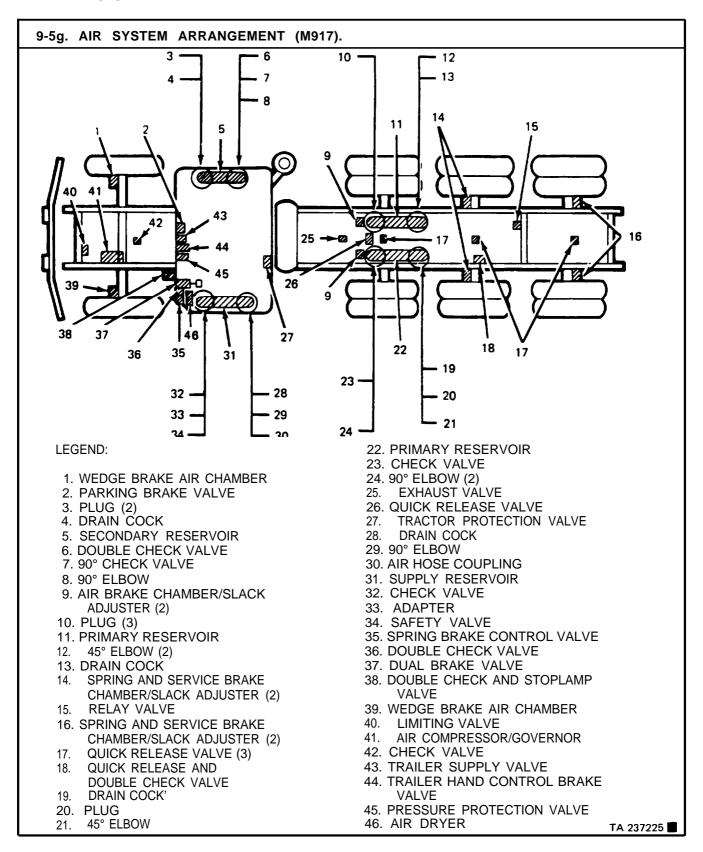
19. INTERAXLE DIFFERENTIAL LOCKUP INOPERATIVE:

Disconnect air lines at rear axle; then engage lockup control valve on instrument panel. Check for air pressure at rear axle. No air indicates clogged lines or defective control valve.

- a. Replace clogged lines.
- b. Replace defective control valve (para 9-44).
- If air controls are working normally, refer problem to Direct Support Maintenance.

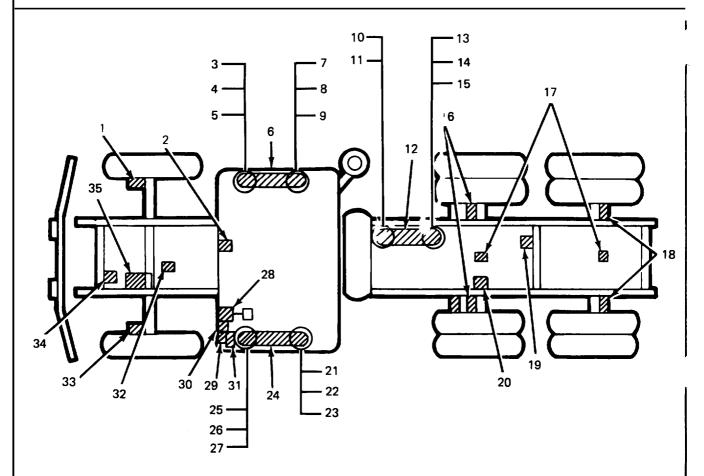
9-5e. AIR SYSTEM ARRANGEMENT (M915). **NOTE** The components shown below are described in paragraph 2-64. 10 12 13 14 8 11 -15 36 37 29 30 26 27, 28-21 20 13 35 33 32 38 22, 23, 24, 25⁻¹ **└**17, **18**, 19 LEGEND: 90° ELBOW 18. 16 **PLUG** 19. WEDGE BRAKE AIR 20. PRIMARY RESERVOIR TRACTOR PROTECTION VALVE CHAMBER (2) 21. PARKING BRAKE VALVE 22. DRAIN COCK DRAIN COCK 23. 90° ELBOW AIR HOSE COUPLING 4. PLUG (2) 5. SECONDARY RESERVOIR 25. SAFETY VALVE SUPPLY RESERVOIR 26. DOUBLE CHECK VALVE 27. 90° ELBOW (2) 90°CHECK VALVE 8. 90° ELBOW 28. **CHECK VALVE DRAIN COCK** 29. TRAILER SUPPLY VALVE 9. 45° ELBOW 30. TRAILER HAND CONTROL 10. **BRAKE VALVE** 45° CHECK VALVE 11. 31. **DUAL BRAKE VALVE** QUICK RELEASE/DOUBLE **CHECK VALVE** 32. DOUBLE CHECK VALVE 13. SPRING AND SERVICE BRAKE DOUBLE CHECK AND CHAMBER (FORWARD-REAR) (2) STOPLAMP VALVE 14. RELAY VALVE 34. WEDGE BRAKE AIR CHAMBER (2) 15. SPRING AND SERVICE BRAKE 35. LIMITING VALVE AIR COMPRESSOR/GOVERNOR CHAMBER (REAR-REAR) (2) 36. QUICK RELEASE VALVE 16. 37. CHECK VALVE AIR DRYER 17. **ADAPTER** 38. TA 237223





9-13

9-5h. AIR SYSTEM ARRANGEMENT (M918).

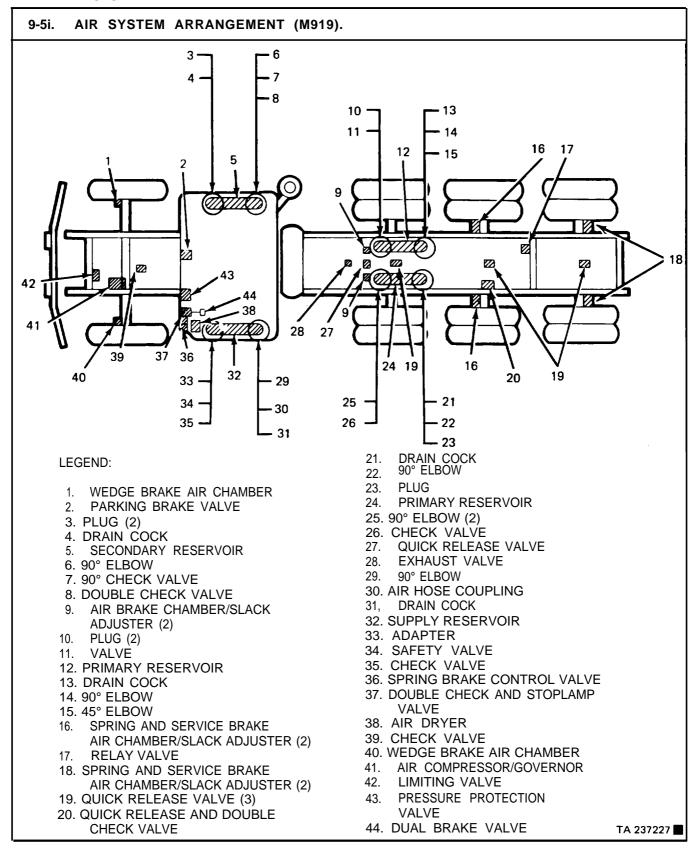


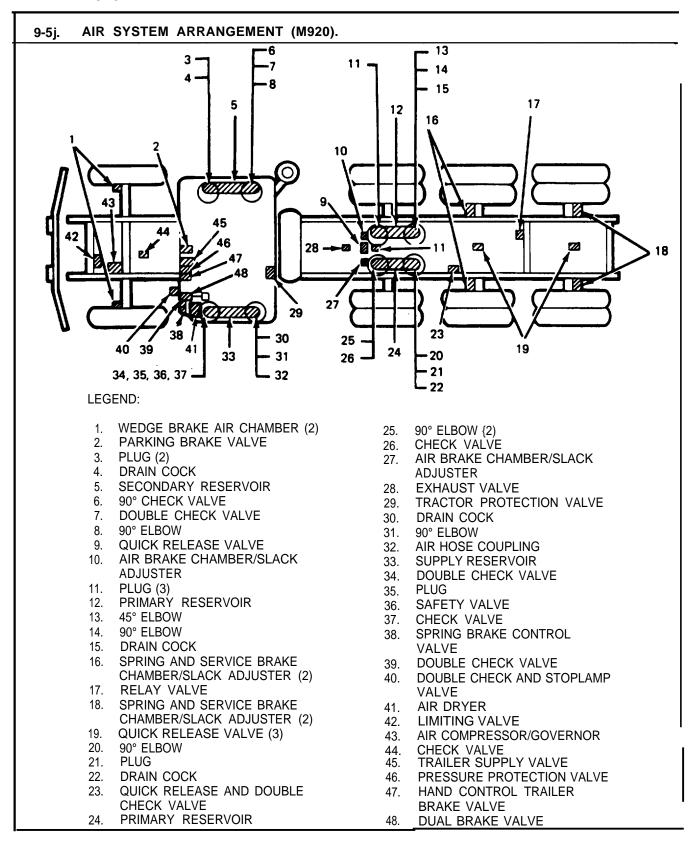
LEGEND:

- 1. WEDGE BRAKE AIR CHAMBER
- 2. PARKING BRAKE VALVE
- 3. VALVE
- 4. PLUG
- 5. DRAIN COCK
- 6. SECONDARY RESERVOIR
- 7. DOUBLE CHECK VALVE
- 8. 90°CHECK VALVE
- 90° ELBOW
- 10. CHECK VALVE
- 11. ADAPTER (2)
- 12. PRIMARY RESERVOIR
- 13. PLUG
- 14. 90° ELBOW
- 15. DRAIN COCK
- 16. SPRING AND SERVICE BRAKE CHAMBER/SLACK ADJUSTER (2)
- 17. QUICK RELEASE VALVE
- 18. SPRING AND SERVICE BRAKE CHAMBER/SLACK ADJUSTER (2)

- 19. RELAY VALVE
- 20. QUICK RELEASE AND DOUBLE CHECK VALVE
- 21. AIR HOSE COUPLING
- 22. 90° ELBOW
- 23. DRAIN COCK
- 24. SUPPLY RESERVOIR
- 25. CHECK VALVE
- 26. SAFETY VALVE
- 27. ADAPTER
- 28. DUAL BRAKE VALVE
- 29. SPRING BRAKE CONTROL VALVE
- 30. DOUBLE CHECK AND STOPLAMP VALVE
- 31. AIR DRYER
- 32. CHECK VALVE
- 33. WEDGE BRAKE AIR CHAMBER
- 34. LIMITING VALVE
- 35. AIR COMPRESSOR/GOVERNOR

TA 237226





Section III MAINTENANCE PROCEDURES

9-8. INTRODUCTION.

This section provides you with Organizational Level maintenance procedures for the compressed air and brake systems. To find a specific maintenance procedure, see one of the following task summaries.

- a. Compressed Air System (para 9-7).
- b. Brake System (para 9-8).
- c. Auxiliary Air-Powered Component Systems (para 9-9).

9-7. COMPRESSED AIR SYSTEM MAINTENANCE TASK SUMMARY.

INITIAL SETUP

EQUIPMENT CONDITION APPLICABLE CONFIGURATIONS PARAGRAPH

9-13A.

MATERIALS/PARTS (P/N)

Gasket (5330-00-755-71 91).

Soap Solution.

Silicone Sealant (Refer to Appendix C).

Controllable Shop Air Supply.

Non Flammable Cleaning Solvent SD-2 (Refer to Appendix C).

Tape, Antiseizing Item 14, Appendix C.

Check Valve, 275756 (06853).

Air Pressure Gage.

Marking Pen.

Masking Tape.

CONDITION DESCRIPTION

Air Reservoirs Drained.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground. Work in Well Ventilated Area Away From Sparks and Flames.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission in Neutral.

Park Brake Set.

REFERENCES (TM)

TM 9-2320-273-10.

TM 9.2320-273-20P.

LO 9-2320-273-12.

REFERENCES (TROUBLESHOOTING)

Table 9-1.

LIST OF TASKS

	TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
•	1.	Air Dryer Dehydrate Cartridge Replacement:	9-10	
			9- 10A	
•	2.	Air Dryer Replacement:	9-11	
		a. Removal.	9-11A	
		b. Installation.	9-11B	
		c. Checking for Leaks.	9-11C	
	2.1	Air Dryer Repair.	9- 11.1	

9-7. COMPRESSED AIR SYSTEM MAINTENANCE TASK SUMMARY (Continued). LIST OF TASKS **TASK** TASK **TROUBLESHOOTING** NO. **TASK** REF **REF (TABLE)** 3. Supply Reservoir Automatic Drain Valve and Air Hose Coupling: 9-12 9-1 Removal. 9-12A a. b. Installation. 9-12B Checking for Leaks. 9-12C Secondary Reservoir Manual Drain Valve 4. Maintenance: 9-1 9-13 Bleeding Reservoirs. 9-13A Removal. b. 9-13B Installation. 9-13C C. Checking for Leaks. d. 9-13D 5. 9-1 Safety Release Valve Maintenance: 9-14 Removal. 9- 14A Testing. b. 9-14B C. Installation. 9-14C d. Operational Check. 9-14D 9-1 6. Supply Reservoir Check Valve Maintenance: 9-15 Removal. a. 9-15A Testing. b. 9-15B Installation. 9-15C C. d. Operational Check. 9-15D 7. 9-16 9-1 Reservoirs and Air Lines Maintenance: Removal. 9-16A a. b. Installation. 9-16B Checking for Leaks. 9-16C C.

9-8. BRAKE SYSTEM MAINTENANCE TASK SUMMARY.

INITIAL SETUP APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None,

SPECIAL TOOLS

Snap Ring Pliers. Brake Spring Pliers.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C). Masking Tape.
Marking Pen.
Soap and Water Solution.
Seal, 1205-E-1409 (78500).
GAA (Refer to Appendix C).
Cotter Pin, K-227 (78500).
Cotter Pin, 210490 (06853).

EQUIPMENT CONDITION PARAGRAPH

9-13A. 5-37A. 9-27A and 9-28A. 10-13A.

10-14A.

(See TM 9-2320-273-10).

CONDITION DESCRIPTION

Air Reservoirs Drained.
Batteries Disconnected.
Double Check Valve Removed.
Hub and Drum Assembly
Removed (M915).
Hub and Drum Assembly
Removed (M916 Thru M920).

Wheel Raised OFF Ground; Park Brake Should Be Released and Wheels Blocked.

Cotter Pin, 210492 (06853).

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. LO 9-2320-273-12. TM 9-2320-273-20P.

REFERENCES (TROUBLESHOOTING)

Table 9-1.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.
Transmission in Neutral.
Park Brake Set.
Wheels Blocked.

LIST OF TASKS

TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
1.	Trailer Supply Brake Valve:	9-17	9-1
	a. Removal.	9-17A	
	b. Inspection of Lines and Fittings.	9-17B	
	c. Installation.	9-17C	
	d. Operational Check.	9-17D	
2.	Trailer Hand Brake Valve:	9-18	9-1
	a. Removal.	9-18A	

9-8. BF	RAKE SYSTEM MAINTENANCE TASK SUMMAR	Y (Continued).	
	LIST OF TASK	KS .	
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
2.	Trailer Hand Brake Valve (Continued):		
	b. Inspection of Air Lines and Fittings.	9-18B	
	c. Installation.	9-18C	
	d. Operational Check.	9-18D	
3.	Parking Brake Valve:	9-19	9-1
	a. Removal.	9-19A	
	b. Inspection of Lines and Fittings.	9-19B	
	c. Installation.	9-19C	
	d. Operational Check.	9-19D	
4.	Air Pressure Gages Maintenance: a. Removal. b. Installation.	9-20 9-20A 9-20B	9-1
	c. Operational Check.	9-20C	
5.	Brake Pedal and Valve Maintenance:	9-21	9-1
	a. Pedal Removal.	9-21A	
	b. Valve Removal.	9-21B	
	c. Valve Installation,	9-21C	
	d. Pedal Installation.	9-21D	
	e. Operational Check.	9-21E	
6.	Service Brakes Quick Release Valve:	9-22	9-1
	a. Removal.	9-22A	
	b. Installation	9-22B	
	c. Operational Check.	9-22C	
7.	Quick-Releasel/Double-Check Valve Maintenance	9-23	9-1
	a. Removal. b. Installation. c. Operational Check.	9-23A 9-23B 9-23C	

9-8. BR	AKE SYSTEM MAINTENANCE TASK SUMMAR	Y (Continued).	
	LIST OF TASK	(S	
TASK No.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE
8.	Relay Valve Maintenance :	9-24	9-1
	a. Removal.	9-24A	
	ხ. Installation.	9-24B	
	c. Checking for Leaks.	9-24C	
9.	Limiting Valve Maintenance :	9-25	9-1
	a. Removal,	9-25A	
	b. Installation.	9-25B	
	c. Operational Check.	9-25C	
10.	Tractor Protection Valve Maintenance:	9-26	9-1
	a. Removal.	9-26A	
	b. Installation.	9-26B	
	c. Operational Check.	9-26C	
11.	Double Check Valve Maintenance :	9-27	9-1
	a. Removal.	9-27A	
	b. Installation,	9-27B	
	c. Checking for Leaks.	9-27C	
12.	Double Check and Stoplamp Valve Maintenance (M918 and M919):	9-28	9-1
	a. Removal.	9-28A	
	b. Installation.	9-28B	
	c. Operational Check.	9-28C	
13.	Double Check and Stoplamp Valve Maintenance (M915, M916, M917, M920) : a. Removal.	9-29	9-1
	b. Installation.	9-29A	
	c. Operational Check.	9-29B 9-29C	

9-8. E	BRAKE SYSTEM MAINTENANCE TASK SUMM	ARY (Continued)).
	LIST OF TA	SKS	
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
14.	External Air Couplings Maintenance:	9-30	9-1
	a. Removal.	9-30A	
	b. Installation.	9-30B	
15.	Front Brake Shoes Maintenance (M915):	9-31	9-1
	a. Removal.	9-31A	
	b. Inspection.	9-31 B	
	c. Installation.	9-31 c	
	d. Adjustment.	9-31 D	
16.	Front Brake Shoes Maintenance (M916 Thru M920):	9-32	9-1
	a. Removal.	9-32A	
	b. Inspection.	9-32B	
	c. Installation.	9-32C	
	d. Adjustment.	9-32D	
17.	Rear Brake Shoes Maintenance (M915):	9-33	9-1
	a. Removal.	9-33A	
	b. Inspection.	9-33B	
	c. Installation.	9-33C	
18.	Rear Brake Shoes Maintenance (M916 thru M920).	9-34	9-1
	a. Removal.	9-34A	
	b. Inspection.	9-34B	
	c. Installation.	9-34C	

9-8. B	RAKE SYSTEM MAINTENANCE TASK SUMMAI	RY (Continued)	
	LIST OF TAS	KS	
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
19.	Pusher Axle Brake Shoes Maintenance:	9-35	9-1
	a. Removal.	9-35A	
	b. Inspection.	9-35B	
	c. Installation.	9-35C	
	d. Adjustment.	9-35D	
20.	Front Brake Air Chamber Maintenance:	9-36	9-1
	a. Removal.	9-36A	
	b. Disassembly.	9-36B	
	c. Reassembly.	9-36C	
	d. Installation.	9-36D	
	e. Operational Check.	9-36E	
21.	Rear Brake Air Chamber Maintenance:	9-37	9-1
	a. Caging Power Spring.	9-37A	
	b. Removal.	9-37B	
	c. Installation.	9-37C	
	d. Uncaging Power Spring.	9-37D	
	e. Operational Check.	9-37E	
22.	Pusher Axle Brake Air Chamber Maintenance:	9-38	9-1
	a. Removal.	9-38A	
	b. Disassembly.	9-38B	
	c. Assembly.	9-38C	
	d. Installation.	9-38D	
23.	Slack Adjusters Maintenance:	9-39	9-1
	a. Adjustment – Slack Adjuster (Forward Rear Tandem).	9-39A	
	b. Adjustment – Push Rod (Rear Rear Tandem).	9-39B	

This page intentionally left blank.

9-9. AUXILIARY AIR-POWERED COMPONENT SYSTEMS MAINTENANCE TASK SUMMARY.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C).

Masking Tape.

Marking Pen

Soap and Water Solution.

Gasket (4730-01-055-4013).

PERSONNEL REQUIRED

One or Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

REFERENCES (TROUBLESHOOTING)

Table 9-1.

EQUIPMENT CONDITION PARAGRAPH

5-37A.

9-13A.

5-83A.

CONDITION DESCRIPTION

Batteries Disconnected. Air Reservoirs Drained. Differential Lock-up Switch

Removed.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission in Neutral.

Park Brake Set.

LIST OF TASKS

TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
Windshield Washers Maintenance :	9-40	9-1
a. Removal.	9-40A	
b. Installation.	9-40B	
c. Operational Check.	9-40C	
Windshield Washer Control Maintenance:	9-41	9-1
a. Removal.	9-41 A	
b. Inspection of Air Lines	9-41 B	
	Windshield Washers Maintenance : a. Removal. b. Installation. c. Operational Check. Windshield Washer Control Maintenance: a. Removal.	TASK REF Windshield Washers Maintenance: 9-40 a. Removal. 9-40A b. Installation. 9-40B c. Operational Check. 9-40C Windshield Washer Control Maintenance: 9-41 a. Removal. 9-41 A

9-9. AUXILIARY AIR-POWERED COMPONENT SYSTEMS MAINTENANCE TASK SUMMARY (Continued).

LIST OF TASKS **TASK** TROUBLESHOOTING TASK NO. **TASK** REF REF (TABLE) 2. Windshield Washer Control Maintenance (Continued): 9-41 C Installation. c. 9-41 D Operational Check. 3. Windshield Wiper Motor Maintenance: 9-42 9-1 Removal. 9-42A a. Installation. b. 9-42B Operational Check. 9-42C C. 4. Windshield Wiper Control Maintenance: 9-1 9-43 Removal. 9-43A b. Inspection of Air Lines. 9-43B C. Installation. 9-43C Operational Check. 9-43D d. 5. Differential Lockup Control Valve Maintenance: 9-44 9-1 Removal. 9-44A a. Installation. 9-44B b. Checking for Leaks. 9-44C 6. Air Horn and Control Valve Maintenance: 9-45 9-1 Removal. 9-45A a. b. Installation. 9-45B C. Operational Check. 9-45C

9-10. AIR DRYER DEHYDRATE CARTRIDGE REPLACEMENT.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

- a. Removal. (0.4)
- b. Cleaning and Inspection. (0.3)
- c. Installation. (0.6)

1.3 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EOUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Grease, Silicone, Lubrication Item, Appendix B. Dehydrate Cartridge Assembly (06853) 286968. Tape, Antiseizing Item 14, Appendix C.

EQUIPMENT CONDITION PARAGRAPH

TM 9-2320-273-10.

CONDITION DESCRIPTION

Air System Draincocks Opened.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Work Area Clean and Away from Blowing Dirt and Dust.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Vehicle on Level Ground. Wheels Blocked.

9-10. AIR DRYER DEHYDRATE CARTRIDGE REPLACEMENT (Continued).

LOCATION/ITEM **ACTION REMARKS**

NOTE

Air dryer does not have to be removed from vehicle for this operation.

A. REMOVAL.

1. Electrical terminal (14).

- a. Remove insulating boot (8), nut (13) and electrical
- wire (7). b. Disconnect hose assembly (6)

from connector (12).

2. End cover assembly (5).

Loosen three screws (10) and turn three retaining clips (11) inward so they do not touch air dryer housing (1).

NOTE

Make alinement marks on the end cover assembly and air dryer housing. This will help you aline them during reassembly.

3. End cover assembly (5).

While pressing up on end cover assembly (5) pry out retaining ring (9) using flat tip screwdriver.

4. Air dryer housing (1).

Remove end cover assembly (5). Discard O-ring (4).

Discard cartridge.

5.

Using 3/4 inch socket wrench unscrew and remove dehydrate

cartridge (3).

B. CLEANING AND INSPECTION.

CAUTION

Do not put end cover assembly into cleaning solvent. This could damage the heating element or thermostat.

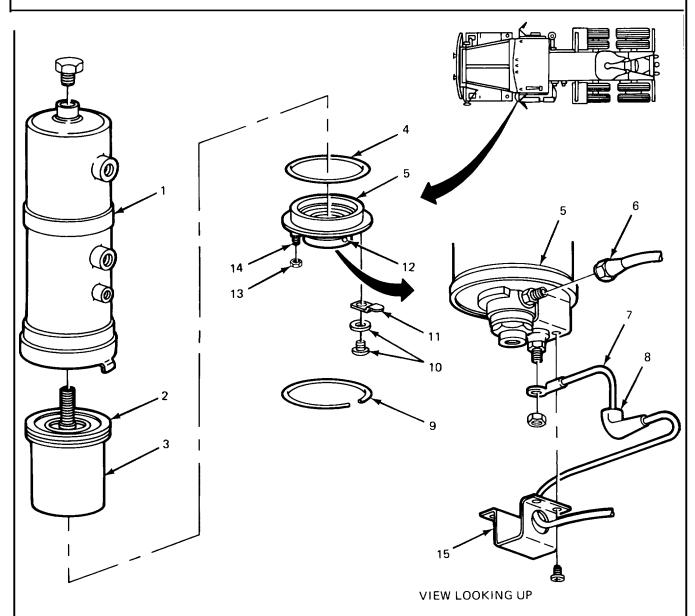
NOTE

Make sure all cleaning solvent residue has been removed before reassembly.

a. Lubricate O-ring (2) with silicone grease. b. Using 3/4 inch socket wrench screw in and tighten new dehydrate cartridge (3). Lubricate O-ring (4) with silicone grease and install in groove. NOTE Assistant may be required for this step. a. Join alinement marks and press end cover assembly (5) up as far as it will go. b. Secure with retaining ring (9). Turn outward and over the edge of air dryer housing (1) and tighten three screws (10). Electrical terminal (14). Install electrical wire (7), nut (13) and insulating boot (8).	LOCATION/ITEM	ACTION	REMARKS
silicone grease. b. Using 3/4 inch socket wrench screw in and tighten new dehydrate cartridge (3). Lubricate O-ring (4) with silicone grease and install in groove. NOTE Assistant may be required for this step. a. Join alinement marks and press end cover assembly (5) up as far as it will go. b. Secure with retaining ring (9). Turn outward and over the edge of air dryer housing (1) and tighten three screws (10). Electrical terminal (14). Install electrical wire (7), nut (13) and insulating boot (8). Apply antiseizing tape and connect hose assembly (6) to connector (12).	NSTALLATION.		
cone grease and install in groove. NOTE Assistant may be required for this step. a. Join alinement marks and press end cover assembly (5) up as far as it will go. b. Secure with retaining ring (9). Three retaining clips (11). Turn outward and over the edge of air dryer housing (1) and tighten three screws (10). Electrical terminal (14). Install electrical wire (7), nut (13) and insulating boot (8). Apply antiseizing tape and connect hose assembly (6) to connector (12).	Air dryer housing (1).	silicone grease. b. Using 3/4 inch socket wrench screw in and tighten new	Torque to 32 lb-ft.
Assistant may be required for this step. a. Join alinement marks and press end cover assembly (5) up as far as it will go. b. Secure with retaining ring (9). Turn outward and over the edge of air dryer housing (1) and tighten three screws (10). Electrical terminal (14). Install electrical wire (7), nut (13) and insulating boot (8). Apply antiseizing tape and connect hose assembly (6) to connector (12).		cone grease and install in	
a. Join alinement marks and press end cover assembly (5) up as far as it will go. b. Secure with retaining ring (9). Turn outward and over the edge of air dryer housing (1) and tighten three screws (10). Electrical terminal (14). Install electrical wire (7), nut (13) and insulating boot (8). Apply antiseizing tape and connect hose assembly (6) to connector (12).		NOTE	
press end cover assembly (5) up as far as it will go. b. Secure with retaining ring (9). Three retaining clips (11). Turn outward and over the edge of air dryer housing (1) and tighten three screws (10). Electrical terminal (14). Install electrical wire (7), nut (13) and insulating boot (8). Apply antiseizing tape and connect hose assembly (6) to connector (12).	Ass	istant may be required for this step	
of air dryer housing (1) and tighten three screws (10). Electrical terminal (14). Install electrical wire (7), nut (13) and insulating boot (8). Apply antiseizing tape and connect hose assembly (6) to connector (12).		press end cover assembly (5) up as far as it will go.	
(13) and insulating boot (8). Apply antiseizing tape and connect hose assembly (6) to connector (12).	Three retaining clips (11).	of air dryer housing (1) and	
connect hose assembly (6) to connector (12).	Electrical terminal (14).		
NOTE	End cover assembly (5).	connect hose assembly (6) to	
		NOTE	
Follow-on maintenance action required: Pressurize air system and check for leaks and proper operation.	Pressu	rize air system and check for leaks	

9-10. AIR DRYER DEHYDRATE CARTRIDGE REPLACEMENT (Continued).

LOCATION/ITEM ACTION REMARKS



LEGEND:

- 1. AIR DRYER HOUSING
- 2. O-RING (PART OF DEHYDRATE CARTRIDGE)
- 3. DEHYDRATE CARTRIDGE
- 4. O-RING
- 5. END COVER ASSEMBLY
- 6. HOSE ASSEMBLY
- 7. ELECTRICAL WIRE (AIR DRYER HEATER)
- 8. INSULATING BOOT

- 9. RETAINING RING
- 10. SCREW AND WASHER (3)
- 11. RETAINING CLIP (3)
- 12. CONNECTOR
- 13. NUT
- 14. ELECTRICAL TERMINAL
- 15. TERMINAL PROTECTOR

TA 237229

9-11. AIR DRYER REPLACEMENT.

THIS TASK COVERS (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (1.0)

b. Cleaning and Inspection. (0.2)

c. Installation. (1.0)

d. Operational Check. (0.3)

2.5 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

PARAGRAPH

EOUIPMENT CONDITION

TM 9-2320.273-10.

CONDITION DESCRIPTIONAir System Draincocks Opened.

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Tape, Antiseizing Item 14, Appendix C.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

SPECIAL ENVIRONMENTAL CONDITIONS

Work Area Clean and Away from Blowing Dirt and Dust.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Vehicle on Level Ground. Wheels Blocked.

TROUBLESHOOTING REFERENCES

None.

9-11. AIR DRYER REPLACEMENT (Continued).

LOCATION/ITEM	ACTION	REMARKS		
A. REMOVAL.				
1. Air dryer assembly (1).	Unscrew and remove hoses (3) and (11) and tubing (2).			
2. Electrical terminal (17).	Remove terminal protector (14), boot (13), nut (15) and wire (12).			
	NOTE			
	For the M916 thru M920 only, disconnect tube (23) from top of air dryer assembly (
3. Mounting brackets (21).	Remove four hexagon nuts (8), four lock washers (9), four flat washers (10) and (19), four capscrews (20) and dryer assembly (1).			
4. Frame bracket (7).	Remove four screws (6), four nuts (4), four washers (5) and two air dryer mounting brackets (21).			
5. Purge tank reservoir (25)	Unscrew and remove tubing (23).			
6. Four nuts (26) and four lock washers (27).	Unscrew and remove U-bolts (24) and purge tank reservoir (25).			
B. CLEANING AND INSPECTION.				
7.	Clean and inspect all parts.			
C. INSTALLATION.				
8. Air dryer brackets (21), frame bracket (7).	Secure with four screws (6), four washers (5) and four nuts (4).			
	NOTE			
	There should be 1/2 inch minimum clearance between fuel tank and mounting bracets (21), This may require moving the fue tank rearward.			

9-11. AIR DRYER REPLACEMENT (Continued).

LOCATION/ITEM	ACTION	REMARKS
C. INSTALLATION (Continued).	-	
9. Air dryer assembly (1).	Secure to mounting brackets (21) with four capscrews (20), four flat washers (19) and (10), four lock washers (9) and four hexagon nuts (8).	
10. Air dryer head assembly (22), electrical terminal (17).	Install wire (12), secure with nut (15). Install boot (13) and terminal protector (14).	
11. Air dryer assembly (1).	Apply antiseizing tape, install tubing (2), hoses (3) and (11).	
	NOTE	
seizir	he M916 thru M920 only, apply and tape and install tube (23) on air ombly (1).	
12. Cab mounting bracket (28), purge tank reservoir (25).	Secure with U-bolts (24), four lock washers (27), and four nuts (26).	
13. Tubing (23).	Apply antiseizing tape and con- nect to purge tank reservoir (25).
D. OPERATIONAL CHECK.		
	WARNING	
sion cause	e sure wheels are blocked and transmis in neutral. Failure to do this coule injury or death to persons working around vehicle.	d
14. Air system.	Close draincocks.	
15. Engine.	a. Start up (seeTM 9-2320-273-10).b. Charge air system to 100 psi.	
16. Air dryer assembly (1).	Check for air leakage at exhaust cover (18), or any air line connections.	

1-11. AIR DRYER REPLACEMENT (Continued).

LOCATION/ITEM ACTION REMARKS

D. OPERATIONAL CHECK (Continued).

17.

Allow system to reach operating pressure, a sharp burst of air should escape from exhaust cover (18).

NOTE

Step number 18 must be done in temperatures below 50° F (9.9°C).

18. Air dryer assembly (1).

Run engine for a minimum of five minutes, end cover (22) should be warm if not replace the heating element.

NOTE

No follow-on maintenance is required.

9-11. AIR DRYER REPLACEMENT (Continued). LOCATION/ITEM **ACTION REMARKS** 13 VIEW LOOKING UP LEGEND: 9. RETAINING RING 1. AIR DRYER HOUSING 2. O-RING (PART OF DEHYDRATE CARTRIDGE) 10. SCREW AND WASHER (3) 3. DEHYDRATE CARTRIDGE 11. RETAINING CLIP (3) 4. O-RING 12. CONNECTOR 5. END COVER ASSEMBLY 13. NUT 6. HOSE ASSEMBLY 14. ELECTRICAL TERMINAL 7. ELECTRICAL WIRE (AIR DRYER HEATER) 15. TERMINAL PROTECTOR

TA 237230

8. INSULATING BOOT

9-11. AIR DRYER REPLACEMENT (Continued). LOCATION/ITEM **ACTION REMARKS** 25 24 28 SIDE PORT LEGEND: 23. TUBE 24. U-BOLTS 23 25. PURGE TANK RESERVOIR 26. NUTS 27. LOCK WASHERS 28. CAB MOUNTING BRACKET TA 237231

9-11.1. AIR DRYER REPAIR.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Disassembly. (1.0)b. Cleaning, (0.3)c. Inspection and Repair. (0.4) d. Assembly. (1.0)

2.7 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

9-11.

PARAGRAPH

EOUIPMENT CONDITION

CONDITION DESCRIPTION

Air Dryer Removed.

TEST EQUIPMENT

None.

All.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Grease, Silicone, Lubrication Item, Appendix C.

Tape, Antiseizing Item 14, Appendix C. Kit, Check Valve Repair (06853) 287298.

Kit, Seal (06853) 287053.

Dehydrate Cartridge Assembly (06853) 286968.

PERSONNEL REQUIRED

One (MOS-63820).

REFERENCES (TM)

TM 9-2320-273-20P.

SPECIAL ENVIRONMENTAL CONDITIONS

Work Area Clean and Away from Blowing Dirt

and Dust.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Vehicle on Level Ground.

Wheels Blocked.

TROUBLESHOOTING REFERENCES

None.

BRAKE SYSTEM.				
9-11.1. AIR DRYER REPAIR (Continued).				
LOCATION/ITEM	ACTION	REMARKS		
A. DISASSEMBLY.				
	NOTE			
Add location marks between end cover housing (35) and air dryer housing (2) prior to disassembly. This will help you aline them correctly during reassembly.				
1. End cover housing (35).	Remove three screws (38) and three retaining clips (37).			
2. End cover assembly (17).	While pressing inward remove retaining ring (39) with a flat tip screwdriver.			
3. End cover housing (35), O-ring (16).	Unscrew and remove, discard O-ring.			
4. End cover housing (35), connector (36).	Unscrew and remove.			
5. Exhaust cover (28).	Remove screw (30), recessed washer (31) and exhaust diaphragm (32).			
6. Purge valve assembly (18).	Remove 3 screws (29) and exhaust cover (28).			
7. Air dryer end cover housing (35).	Remove purge valve assembly (18), by unscrewing purge valve housing (24).	Discard O-rings (22 and (23).		
8. Purge valve housing (24).	Remove screw (27), purge valve piston (20), spring (21), purge valve (25), lock washer (26) and O-ring (19). Discard O-ring, spring and purge valve.			
9. Dehydrate cartridge (15).	Unscrew and remove from air dryer housing (2) using a 3/4-inch socket wrench.	Discard dehydrate cartridge.		
10. Safety valve (13), and connector (11).	Unscrew and remove from air dryer housing (2).			
11. Air dryer housing (2).	Unscrew and remove check valve (3). Remove O-ring (9).	Discard O-ring (9).		

9-11.1. AIR DRYER REPAIR (Continued). **ACTION REMARKS** LOCATION/ITEM DISASSEMBLY (Continued). 12. Unscrew and remove valve Discard ball, spring and body (10) {rem end cap (4). sealing washer. Remove ball, (5), spring (6), spring guide (7) and sealing washer (8). 13. Remove two pipe plugs (1) and nipple (12). NOTE Mark the positions of the air dryer assembly mounting brackets (40) on the air dryer housing (2), The position of these mounting brackets is important when installing the air dryer to the vehicle. 14. Two nuts (41). Loosen and remove. 15. Two lock washers (42). Remove. 16. Two screws (43). Remove. 17. Two mounting brackets (40). Remove from air dryer housing (2). NOTE For M916 thru M920 only, remove elbow

For M916 thru M920 only, remove elbow (45) and reducer (46) from air dryer housing (2).

B. CLEANING.

CAUTION

Do not immerse (soak) end cover housing in cleaning solution. The end cover housing contains a thermostat and heating element which could be damaged.

Clean all parts.

18.

9-11.1. AIR DRYER REPAIR (Continued).

LOCATION/ITEM ACTION REMARKS

C. INSPECTION AND REPAIR.

NOTE

All repair consists of replacing defective parts discovered during inspection and replacing discarded parts with new items provided.

19.

Inspect all parts for damage and serviceability.

20. End cover assembly (17).

- a. Connect a 12VDC source to end cover housing (35). Connect a positive lead to electrical terminal (34), and a negative lead to the outer shell of the head assembly.
- b. Expose end cover housing
 (35) to temperatures below
 50°F (9.9° C). If the heating element is working
 properly the outer shell
 should become warmer
 within a few minutes. If the
 outer shell does not become
 warmer, the end cover
 housing must be replaced.

D. ASSEMBLY.

NOTE

When installing two mounting brackets (40), aline them with the marks on the air dryer housing (2).

- 21. Air dryer housing (2), two mounting brackets (40).
- a. Install two screws (43).
- b. Install and tighten two lock-washers (42) and two nuts (41).
- 22. Air dryer housing (2).

Apply antiseizing tape and install nipple (12) and two pipe

plugs (1).

9-11.1. AIR DRYER REPAIR (Continued).

9-11.1. AIR DRYER REPAIR (Continued).		
LOCATION/ITEM	M ACTION	REMARKS
D. ASSEMBLY (Continued).	
	NOTE	
	For the M916 thru M920 only, apply anti- seizing tape and install reducer (46) and elbow (45) in air dryer housing (2).	
23. Valve body (10).	Install new sealing washer (8), spring guide (7) with rounded bottom first in valve body. Install new spring (6) in groove of spring guide (7) and place new ball (5) on spring.	
24.	 a. Lubricate end cap (4) with silicone grease. Screw in and torque to 200 - 225 lb-in (280 - 315 N•m). b. Lubricate new O-ring (9) with silicone grease, and install. 	
25. Air dryer housing (2).	Screw in and tighten check valve (3).	
26. Valve body (10).	Apply antiseizing tape. Screw in and tighten connector (11).	
	CAUTION	
	Make sure exhaust hole in safety valve point downward when in place.	S
27. Air dryer housing (2).	a. Apply antiseizing tape to safety valve (13).b. Screw in and tighten.	
28.	 a. Lubricate O-ring (14) on dehydrate cartridge (15) with silicone grease. b. Screw in dehydrate cartridge (15), tighten using a 3/4-in. 	

socket wrench. Torque to

32 lb-ft (43.3 N•m).

9-11.1. AIR DRYER REPAIR (Continued). **ACTION REMARKS** LOCATION/ITEM D. ASSEMBLY (Continued). 29. End cover housing (35), Apply antiseizing tape, screw connector (36). in and tighten. 30. New O-ring (19). Lubricate with silicone grease and install on purge valve piston (20). 31. Purge valve housing (24). a. Lubricate purge valve piston (20) with silicone grease. b. Install purge valve piston (20), new spring (21), new purge valve (25) (rubber end goes in first), new lockwasher (26) and screw (27). Torque screw to 50 lb-in (67,8 N•m). 32. New O-rings (22) and (23). Lubricate with silicone grease and install on purge valve housing (24). 33. Purge valve assembly (18). Lubricate with silicone grease, screw into end cover housing (35). 34. Exhaust diaphragm (32), Install into new exhaust The rounded end of diaphragm diaphragm washer (31) washer should be facing the cover (28). and screw (30). exhaust diaphragm. 35. Exhaust cover (28). Install on purge valve assembly (18) using three screws (29). 36. New O-ring (16). Lubricate with silicone grease and install into groove on air dryer housing (2). **NOTE** Assistant may be required for this step. 37. End cover assembly (17). Lubricate with silicone grease, press into air dryer housing (2) as far as it will go. Install retaining ring (39) and secure with three retaining clips (37) and three screws (38).

9-11.1. AIR DRYER REPAIR (Continued).

LOCATION/ITEM ACTION REMARKS	
------------------------------	--

D. ASSEMBLY (Continued).

38. Boot (33).

Place in plastic bag and tape to air dryer assembly for use during installation.

NOTE

Follow-on maintenance action required: Install air dryer (para 9-11c).

9-11.1. AIR DRYER REPAIR (Continued).

LOCATION/ITEM **ACTION REMARKS** 43 36 6 _{7 8 9} 35 40 38 19 20 33 21 18 22 23 40 24 25 26 27 28 31 30 39 M916 THRU M920 LEGEND: 1. PIPE PLUG (2) 16. O-RING 32. EXHAUST DIAPHRAGM 2. AIR DRYER HOUSING 17. END COVER ASSEMBLY 33. BOOT 3. CHECK VALVE 18. PURGE VALVE ASSEMBLY 34. ELECTRICAL TERMINAL 4. END CAP 19. O-RING 35. END COVER HOUSING 20. PURGE VALVE PISTON 5. BALL 36. CONNECTOR 6. SPRING 21. SPRING 37. RETAINING CLIP (3) 7. SPRING GUIDE 22. O-RING 38. SCREW (3) 8. SEALING WASHER 23. O-RING 39. RETAINING RING 9. O-RING 24. PURGE VALVE HOUSING 40. MOUNTING BRACKET (2) 10. VALVE BODY 25. PURGE VALVE 41. NUT (2) 11. CONNECTOR 26. LOCKWASHER 42. LOCKWASHER (2) 12. NIPPLE 27. SCREW 43. SCREW (2) 13. SAFETY VALVE 28. EXHAUST COVER 44. TERMINAL PROTECTOR 14. O-RING (PART OF DEHYDRATE 29. SCREW (3) 45. ELBOW CARTRIDGE) 30. SCREW 46. REDUCER 15. DEHYDRATE CARTRIDGE 31. DIAPHRAGM WASHER

TA 237232

9-12. SUPPLY RESERVOIR AUTOMATIC DRAIN VALVE AND AIR HOSE COUPLING.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (5)b. Installation. (5)c. Checking for Leaks. (5)

15 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C).

EQUIPMENT CONDITION

PARAGRAPH

9-13A.

CONDITION DESCRIPTION

Primary Air Reservoirs Drained.

Soap Solution.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P. LO 9-2320-273-12.

TROUBLESHOOTING REFERENCES

Table 9-1.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF. Transmission in Neutral. Park Brake Set.

Ì	

9-12. SUPPLY RESERVOIR	AUTOMATIC DRAIN VALVE AND AIR	HOSE COUPLING (Continued).
LOCATION/ITEM	ACTION	REMARKS
B. INSTALLATION.		
4. Drain valve (3).	a. Coat threads with liquid teflon.b. Screw into supply reservoir (1) and tighten.	
5. Elbow (2) and air hose coupling (6).	 a. Coat threads with liquid teflon. b. Screw elbow (2) into supply reservoir (1). c. Screw air hose coupling (6) into elbow (2). 	
C. CHECKING FOR LEAKS.	_ <u>_</u>	
6. Engine.	Start up (see TM 9-2320-273-10). Allow system to reach operating pressure of 90-120 psi (621-827 kPa).	
 Drain valve (3), supply reservoir (1), elbow (2), and air hose coupling (6) 	. Use soap solution to check for leaks.	
8. Engine.	Shut down (see TM 9-2320-273-10).	

9-12. SUPPLY RESERVOIR AUTO	DMATIC DRAIN VALVE AN	D AIR HOSE COUPLING (Continued).
LOCATION/ITEM	ACTION	REMARKS
		LEGEND: 1. SUPPLY RESERVOIR 2. ELBOW 3. DRAIN VALVE 4. CONNECTOR 5. WIRE 6. AIR HOSE COUPLING

9-13. SECONDARY RESERVOIR MANUAL DRAIN VALVE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Bleeding Reservoirs.
b. Removal.
c. Installation.
d. Checking for Leaks.

10 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C). Soap Solution.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

Table 9-1.

EQUIPMENT CONDITION

PARAGRAPH

None.

CONDITION DESCRIPTION

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

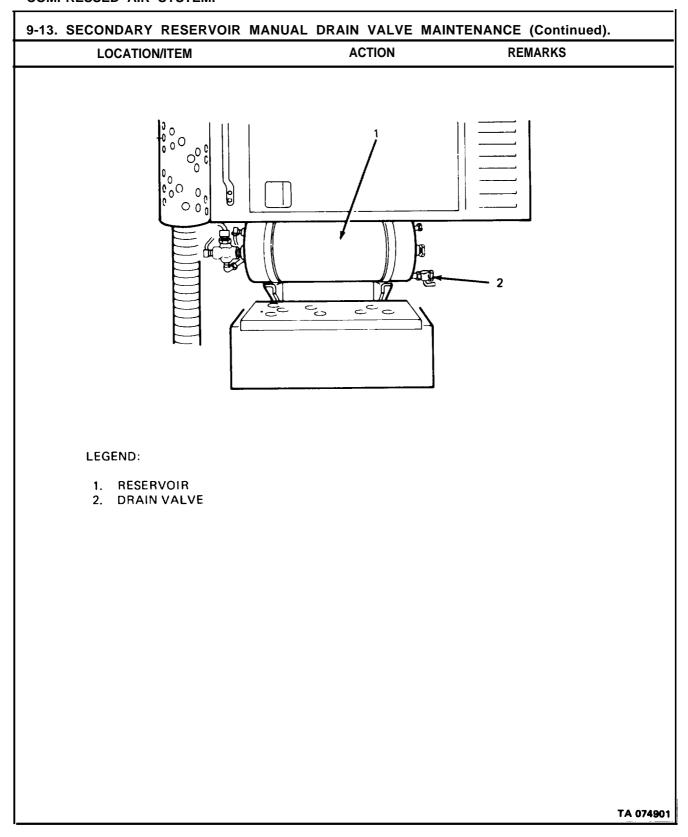
Engine OFF.

Transmission in Neutral.

Park Brake Set.

9-13. SECONDARY RESERVOIR MANUAL DRAIN VALVE MAINTENANCE (Continued). LOCATION/ITEM **REMARKS ACTION NOTE** For location, refer to locator illustration (para 9-5 e. thru 9-5 j.). A. BLEEDING RESERVOIRS. WARNING Before removing drain valve, bleed the secondary reservoir. There is one on all models located under passenger door. 1. Drain valve (2). Turn handle and allow air to exhaust. B. REMOVAL. Unscrew and remove from 2. Drain valve (2). reservoir (1). LEGEND: υ 1. RESERVOIR 2. DRAIN VALVE TA 074900

LOCATION/ITEM	ACTION	REMARKS
INSTALLATION.		
Drain valve (2).	a. Coat threads with liquid teflon.b. Screw into reservoir (1) and tighten.	
CHECKING FOR LEAKS.		
. Drain valve (2).	Turn handle to close valve,	Be sure valves are closed on al I service reservoirs.
. Engine.	Start up (see TM 9-2320-273-10). Allow system to reach operating pressure of 90-120 psi (621-827 kPa).	
. Drain valve (2).	Use soap solution to check for leaks.	Tighten as necessary.
. Engine.	Shut down (see TM 9-2320-273-10).	



9-14. SAFETY RELEASE VALVE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

(2) (10) a. Removal. b. Testing. Installation. (3)5) d. Operational Check

20 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C). Soap Solution. Controllable Shop Air Supply. Air Pressure Gage.

EQUIPMENT CONDITION PARAGRAPH

9-13A.

CONDITION DESCRIPTION

Air Reservoirs Drained. (M915 Primary M916 Thru M920-Secondary).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

Table 9-1.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

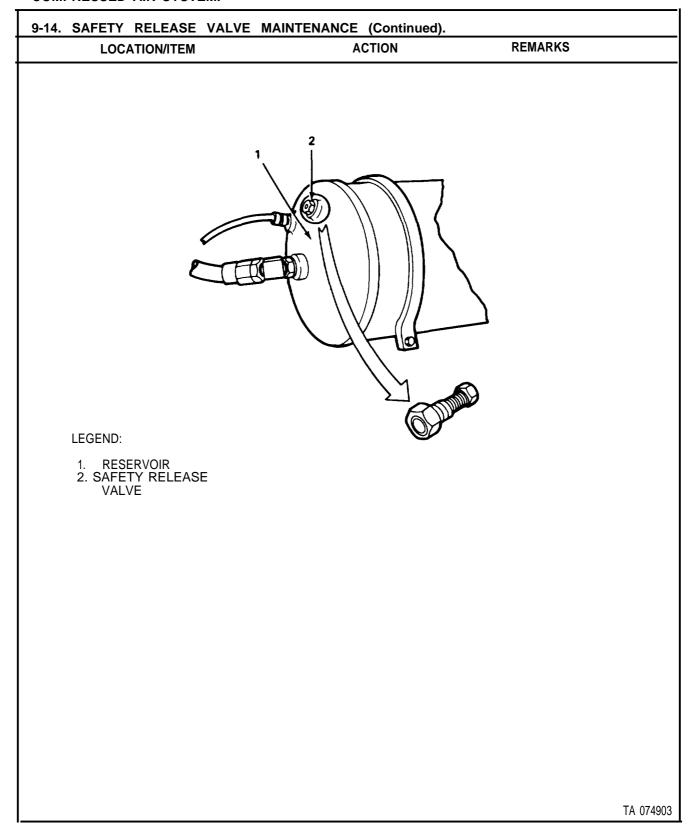
GENERAL SAFETY INSTRUCTIONS

Engine OFF. Transmission in Neutral. Park Brake Set.

9-14. SAFETY RELEASE VALVE MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS NOTE** For location refer to locator illustration (para 9-5 e. thru 9-5 j.). A. REMOVAL. WARNING Do not remove safety release valve until reservoir pressure is fully exhausted. 1. Safety release valve (2). Unscrew and remove from reservoir (1). B. TESTING. 2. Check safety release a. Connect to adjustable valve (2), pressure supply with pressure gage between valve and supply. LEGEND: **RESERVOIR** 2. SAFETY RELEASE VALVE

TA 074902

LOCATION/ITEM	ACTION	REMARKS
B. TESTING (Continued).		
	 b. Gradually increase pressure, Valve should exhaust air when pressure reaches 145-155 psi (1000-1069 kPa). 	If valve does not work properly, replace it.
C. INSTALLATION.		
3. Safety release valve (2).	a. Coat threads with liquid teflon.b. Screw into reservoir (1) and tighten.	
D. OPERATIONAL CHECK.		
4. Engine.	a. Start up (see TM 9-2320-273-10).b. Allow system to reach operating pressure of 105-120 psi (724-827 kPa).	
5. Safety release valve (2).	Use soap solution to check for	r leaks. Tighten as necess
6. Engine.	Shut down (see TM 9-2320-2	73-10).



9-15. SUPPLY RESERVOIR CHECK VALVE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (4)

(2) (4) b. Testing.

c. Installation.

(4) d. Operational Check.

14 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

TEST EQUIPMENT

None.

SPECIAL TOOLS

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C). Controllable Shop Air Supply.

EQUIPMENT CONDITION PARAGRAPH

9-13A.

CONDITION DESCRIPTION

Primary Air Reservoirs Drained.

Air Pressure Gage.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

Engine Off.

Transmission in Neutral. Park Brake Set.

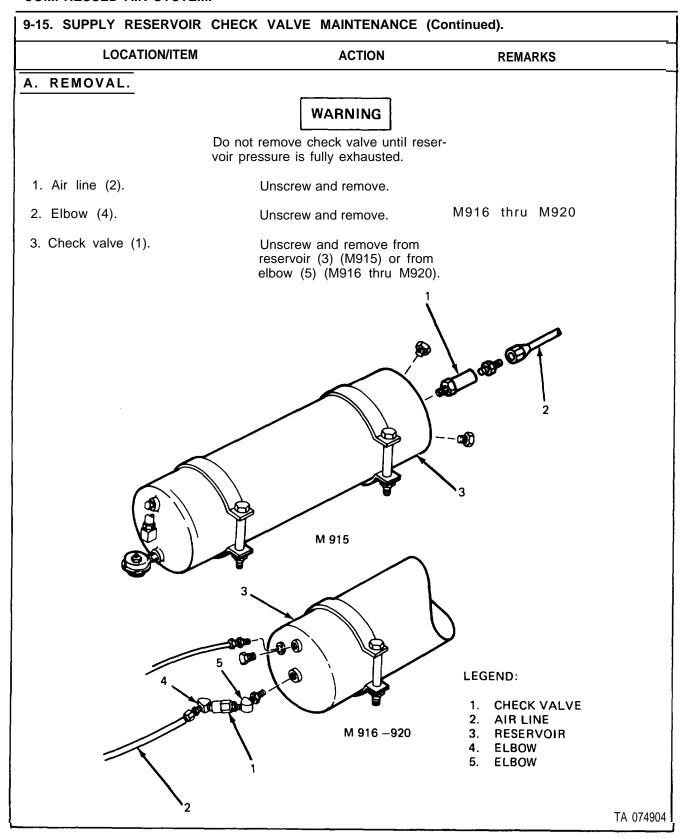
SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

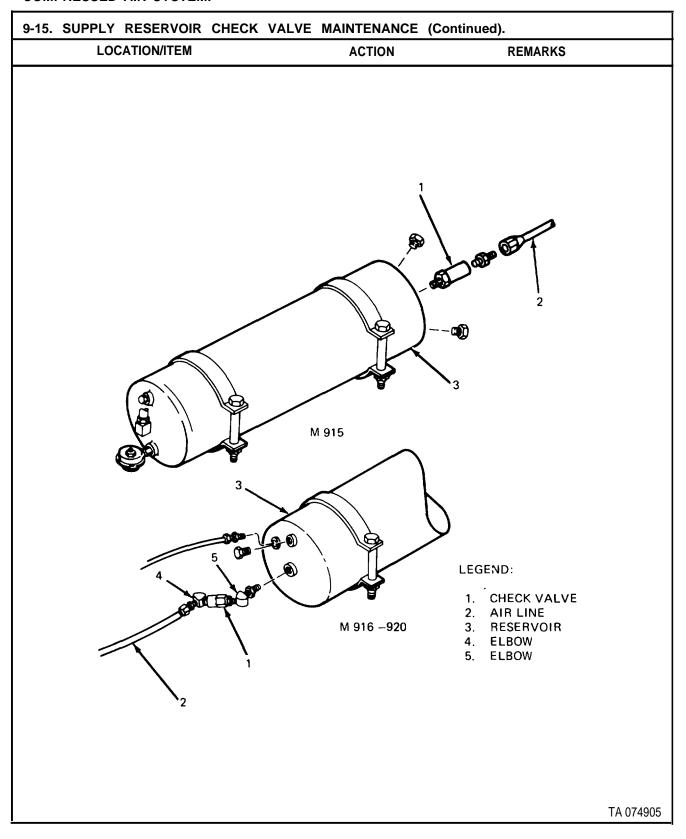
GENERAL SAFETY INSTRUCTIONS

TROUBLESHOOTING REFERENCES

Table 9-1.



	CK VALVE MAINTENANCE (Con	· · · · · · · · · · · · · · · · · · ·
LOCATION/ITEM	ACTION	REMARKS
B. TESTING.		
4. Check valve (1).	 a. Connect to adjustable pressure supply with pressure gage between valve and supply. b. Gradually increase pressure. Valve should begin exhausting air when pressure reaches 145-155 psi (1000-1069 kPa). 	If valve does not work properly, replace it.
C. INSTALLATION.		
5. Check valve (1).	a. Coat threads with liquid teflon.b. Screw into reservoir (3) and tighten.	M915.
	c. Screw into elbow (5).	M916 thru M920.
6. Elbow (4).	Screw into check valve (1).	M916 thru M920.
7. Air line (2).	Install and tighten.	
D. OPERATIONAL CHECK.		
8. Engine.	a. Start up (see TM 9-2320-273-10).b. Allow system to reach operating pressure of 105-120 psi (724-827 kPa).	
9. Check valve (1).	Use soap solution to check for leaks.	Tighten as necessary.
10. Engine.	Shut down (see TM 9-2320-273-10).	



9-16. RESERVOIRS AND AIR LINES MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (10)b. Installation. (10)c. Checking for Leaks. (5)

25 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

PARAGRAPH 9-13A.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

Air Reservoirs Drained.

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C).

Soap Solution. Marking Pen. Masking Tape.

PERSONNEL REQUIRED

SPECIAL ENVIRONMENTAL CONDITIONS

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

GENERAL SAFETY INSTRUCTIONS

Vehicle Parked on Level Ground.

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 9-1.

9-16. RESERVOIRS AND AIR LINES MAINTENANCE (Continued). **REMARKS ACTION** LOCATION/ITEM **NOTE** For locations of reservoirs see para 9-5 e. thru 9-5 j. of this manual. **WARNING** Do not remove any reservoir or air line until pressure is fully exhausted from all supply and service reservoirs. **NOTE** The illustrations below show a typical air reservoir and associated air lines and fittings of the M915 thru M920 truck tractors and chassis. No special instructions or tools are needed if you follow standard shop practice techniques. FRONT 10 -TYPICAL RESERVOIR, SIDE VIEW LEGEND: 0 NUT (2) 0 1. 0 2. BOLT (2) RESERVOIR 3. 4. PLUG(S) 5. REDUCER(S) 6. VALVE(S) STRAP (4) 7. 8. ELBOW(S) 9. CONNECTOR(S) AIR LINE(S) 10. TYPICAL RESERVOIR TYPICAL RESERVOIR REAR VIEW FRONT VIEW TA 074906

9-16. RESERVOIRS AND AIR LINES MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM A. REMOVAL. **NOTE** As you remove each component, tag for reassembly. Disconnect. 1. Air line(s) (10). 2. Two nuts (1). Loosen and remove. Remove. 3. Two bolts (2). 4. Reservoir (3). Slide forward or aft through two sets of straps (7) and remove. 5. All fittings on reservoir; Unscrew and remove. (plug{s) (4), reducer(s) (5), valve(s) (6), elbow(s) (8), connector(s) (9). **B. INSTALLATION. NOTE** Check all lines and fittings for leaks, cracks, and damaged threads. Replace, if necessary. Be sure hoses are connected to the proper reservoir or valve ports as you tagged at removal. 6. Plug(s) (4), reducer(s) (5), Coat threads with liquid valve(s) (6), elbow(s) (8) teflon and install. and connector(s) (9). 7. Reservoir (3). Slide back into place through two sets of straps (7). Install one through each set 8. Two bolts (2). of straps (7). Install and tighten. 9. Two nuts (1). 10. Air line(s) (10). Reconnect.

9-16. RESERVOIRS AND AIR LINES MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** C. CHECKING FOR LEAKS. 11. Engine. a. Start up (see TM 9-2320-273-10). b. Allow system to reach operating pressure of 105-120 psi (724-827 kPa). c. Check for leaks using soap Retighten as necessary. solution, then shut down engine. FRONT 10 -TYPICAL RESERVOIR, SIDE VIEW LEGEND: 0 1. NUT (2) 0 0 2. BOLT (2) 3. RESERVOIR 4. PLUG(S) REDUCER(S) 5. 6. VALVE(S) STRAP (4) 7. ELBOW(S) 8. CONNECTOR(S) 9. AIR LINE(S) 10. TYPICAL RESERVOIR TYPICAL RESERVOIR **REAR VIEW** FRONT VIEW TA 074907

9-16.1. AIR DRYER TUBING AND HOSE REPLACEMENT.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

c. Operational Check.

(1.0)

b. Inspection and Installation. (0.4)

(0.3)

1.7 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIAL/PARTS (P/N)

Tape, Antiseizing Item 14, Appendix C.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

None.

EQUIPMENT CONDITION PARAGRAPH

TM 9-2320-273-10.

CONDITION DESCRIPTION

Air System Draincocks Open.

SPECIAL ENVIRONMENTAL CONDITIONS

Work Area Clean and Away from Blowing Dirt and Dust.

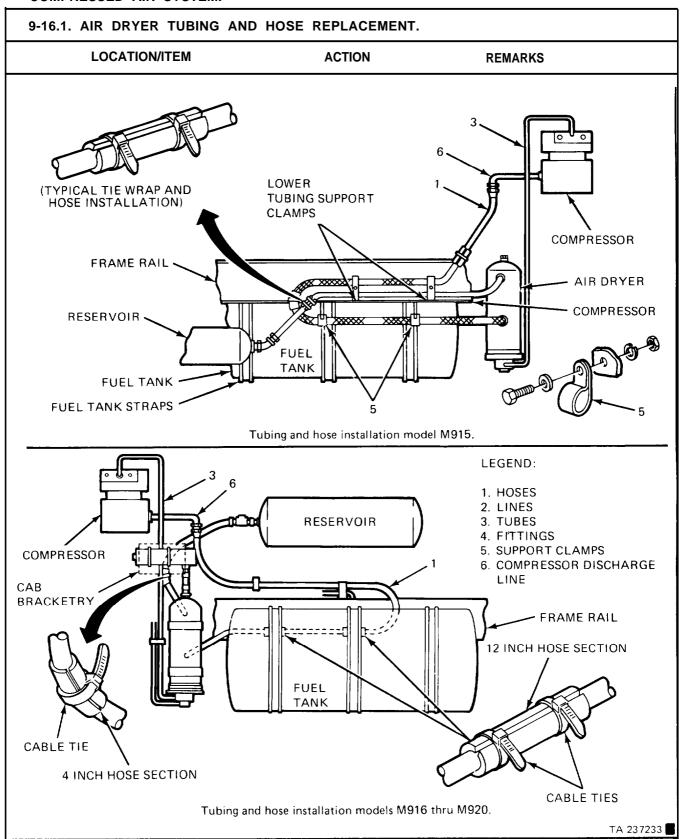
GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Vehicle on Level Ground.

Wheels Blocked.

9-16.1. AIR DRYER TUBING AND HOSE REPLACEMENT.				
LOCATION/ITEM	ACTION	REMARKS		
A. REMOVAL.				
1. Air dryer.	Disconnect damaged hoses (1), lines (2), tubes (3), or fittings (4).	Tag each component for reassembly. Note the routing of the hoses, lines and tubes when removing them.		
B. INSPECTION AND INSTALLA	TION.			
2. Air dryer.	Check all hoses (1), lines (2), tubes (3), or fittings (4) for leaks, cracks and damage.	Replace if necessary.		
3.	Install new hoses (1), lines (2), tubes (3) in the same location as the old ones.			
	CAUTION			
Make sure that all support clamps (5) are used when replacing lines or tubes. Do not let tubing touch any hot surface such as compressor discharge line (6), or oil lines.				
4. Hoses (1), lines (2), tubes (3) or fittings (4).	Apply antiseizing tape on all threads and reconnect as tagged during removal.			
C. OPERATIONAL CHECK.				
5. Air system.	Close draincocks and start engine to charge the air system.	Charge air system until it reaches 120 psi (827.4 kPa) and check for air leaks.		
	NOTE			
No	Follow-on maintenance required	d,		



9s-17. TRAILER SUPPLY BRAKE VALVE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (10)

b. Inspection of Lines and Fittings. (5)
c. Installation. (15)
d. Operational Check. (15)

45 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M915, M916, M917, and M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C). Masking Tape. Marking Pen.

Soap and Water Solution.

EQUIPMENT CONDITION PARAGRAPH

9-13A. 5-37A.

CONDITION DESCRIPTION

Air Reservoirs Drained. Batteries Disconnected.

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.
Park Brake Set.

Transmission in Neutral.

TROUBLESHOOTING REFERENCES

Table 9-1.

9-17. TRAILER SUPPLY BRAKE VALVE (Continued). LOCATION/ITEM **ACTION REMARKS NOTE** For location, refer to locator illustration para 9-5 e. thru 9-5 j. WARNING Disconnect battery before doing any work behind dash panel. A. REMOVAL. 1. Two quarter-turn screws (1). Loosen. 2. Hinged panel (2). Lower. 3. Roll pin (3). Push out. 4. Control Knob (4). Remove. 5. Locknut (5). Unscrew and remove. 00000 00000 LEGEND: 1. QUARTER-TURN SCREW (2) 2. HINGED PANEL 3. ROLL PIN 4. CONTROL KNOB 5. LOCKNUT 6. AIR LINE 7. VALVE 8. AIR LINE TA 074908

LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).	WARNING Do not remove any air lines until pressure is fully exhausted from all reserve	
6. Air line (6).	a. Label using masking tape and marker pencil.b. Unscrew and remove from	valve (7).
7. Air line (8).	a. Label using masking tapeand marker pencil.b. Unscrew and remove from	valve (7).
8. Valve (7).	Remove from dash panel.	
B. INSPECTION OF LINES	AND FITTINGS.	
9. Air lines (6) and (8).	Inspect for: a. Cracks. b. Leaks. c. Kinks. d. Damaged threads.	Replace, if necessary.
C. INSTALLATION.		
10. Valve (7).	Install behind dash panel.	
11. Two air lines (6) and (8).	a. Coat threads on valve (7) with liquid teflon.b. Screw into valve (7) and tighten.	
12. Locknut (5).	Screw into valve (7) and tighten.	
13. Control knob (4).	Install by alining hole in known with hole in valve handle.	b
14. Roll pin (3).	Push in.	
15. Hinged panel (2).	Raise into position.	
16. Two quarter-turn screws (1).	Tighten.	
D. OPERATIONAL CHECK.		
17. Engine.	Start up (see TM 9-2320-273 Allow pressure to reach 105- psi (724-827 kPa).	

LOCATION/ITEM	ACTION	REMARKS
OPERATIONAL CHECK (Continu	ued).	
18. Control knob (4).	Push in.	2nd mechanic.
CAB/Park brake control and brake pedal.	a. Apply and release parking brakes.b. Press and release brake pedal.	2nd mechanic.
20. Trailer brakes.	Check that brakes apply when: a. Park brake is applied. b. Brake pedal is pressed. c. Trailer emergency brake knob is pulled out.	1st mechanic.
21. Engine.	Shut down (see TM 9-2320-2	73-10).
COOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO		

9-18. TRAILER HAND BRAKE VALVE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (5)
b. Inspection of Air Lines and Fittings. (5)
c. Installation. (10)
d. Operational Check. (15)

35 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M915, M916, M917, M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Masking Tape. Marking Pen.

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

Table 9-1.

EQUIPMENT CONDITION

PARAGRAPH

9-13A.

CONDITION DESCRIPTION

Air Reservoirs Drained.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

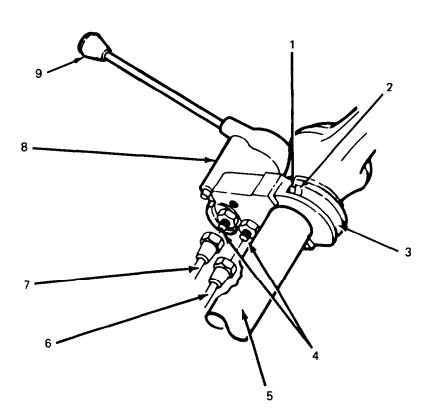
Park Brake Set.

9-18. TRAILER HAND BRAKE VALVE MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS NOTE** For location, refer to locator illustration (para 9-5 e. thru 9-5 j.). A. REMOVAL. 1. Air supply line (6) and air a. Use tape and marker pencil delivery line (7). to label lines. b. Unscrew from adapters (4) and remove. 2. Two capscrews (2) and Unscrew and remove. lockwashers (1). 3. Valve (8) and retaining Remove. strap (3). 4. Two adapters (4), Unscrew and remove from valve (8). Remove by twisting and 5. Knob (9). Knob is not threaded. pulling. LEGEND: 1. LOCKWASHER (2) 2. CAPSCREW (2) 3. RETAINING STRAP 4. ADAPTER (2) STEERING COLUMN 6. AIR SUPPLY LINE 7. AIR DELIVERY LINE 8. VALVE 9. KNOB TA 074910

9-18. TRAILER HAND BRAKE VALVE MAINTENANCE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
B. INSPECTION OF AIR LINES A	ND FITTINGS.		
6. Air supply line (6), air delivery line (7), two adapters (4), and valve (8).	Inspect for: a. Cracks. b. Leaks. c. Damaged threads.	Replace as necessary.	
C. INSTALLATION.			
7. Knob (9).	Push onto valve handle.		
8. Two adapters (4).	Screw into valve (8).		
9. Valve (8).	Position on steering column (5).		
10. Two capscrews (2) and lockwashers (1).	Screw in and tighten to secure retaining strap (3) to valve (8).		
11. Air supply line (6) and air delivery line (7).	Screw air lines onto adapters (4) and tighten.	Be sure to attach each line to the correct fitting as you marked.	
D. OPERATIONAL CHECK.			
12. Engine.	Start up (See TM 9-2320-273- 10). Allow pressure to reach 105 120 psi (724-827 kPa).	- -	
13. Knob (9).	a. Pull down slowly.b. Check for leaks at air supply line (6) and air delivery line (7).	1st mechanic. 1st mechanic.	
	c. Check for air pressure at gladhand connection or trailer.	2nd mechanic.	
	d. Return handle to normal position.	1st mechanic.	
14. Engine.	Shut down (see TM 9-2320-273-10).		

9-18. TRAILER HAND BRAKE VALVE MAINTENANCE (Continued).

LOCATION/ITEM **ACTION REMARKS**



LEGEND:

- 1. LOCKWASHER (2)
- CAPSCREW (2)
 RETAINING STRAP
- 4. ADAPTER (2)
- 5. STEERING COLUMN
- AIR SUPPLY LINE
- AIR DE LIVERY LINE
- 8. VALVE
- KNOB

TA 074911

9-19. PARKING BRAKE VALVE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

(15)a. Removal. (5)b. Inspection of Lines and Fittings.

c. Installation. (20)d. Operational Check. (15)

55 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (refer to appendix C).

EQUIPMENT CONDITION

PARAGRAPH 9-13A. 5-37A.

CONDITION DESCRIPTION

Air Reservoirs Drained. Batteries Disconnected.

Masking Tape. Marking Pen. Soap and Water Solution.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-20P.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS TM 9-2320-273-10.

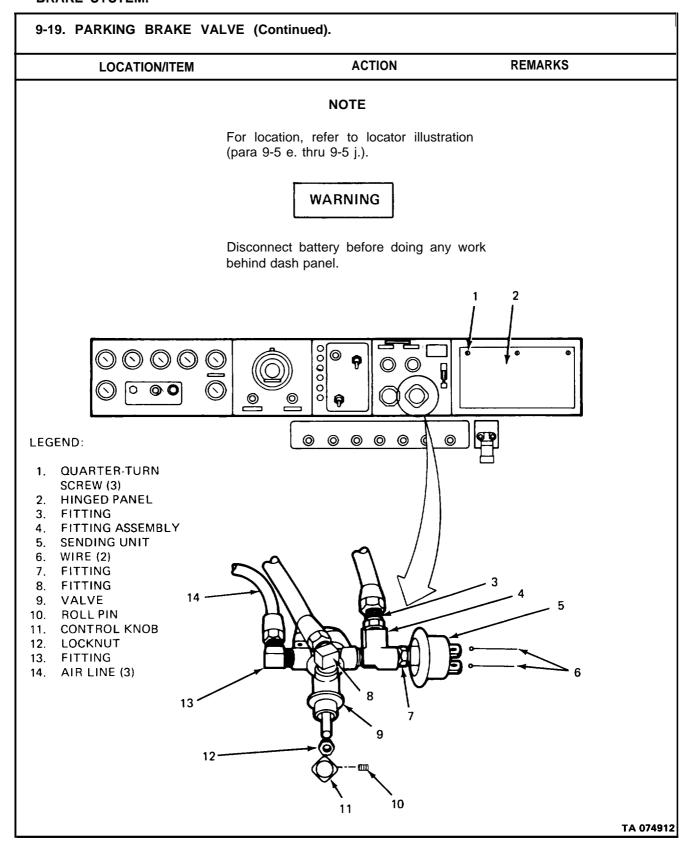
Engine OFF.

Transmission in Neutral.

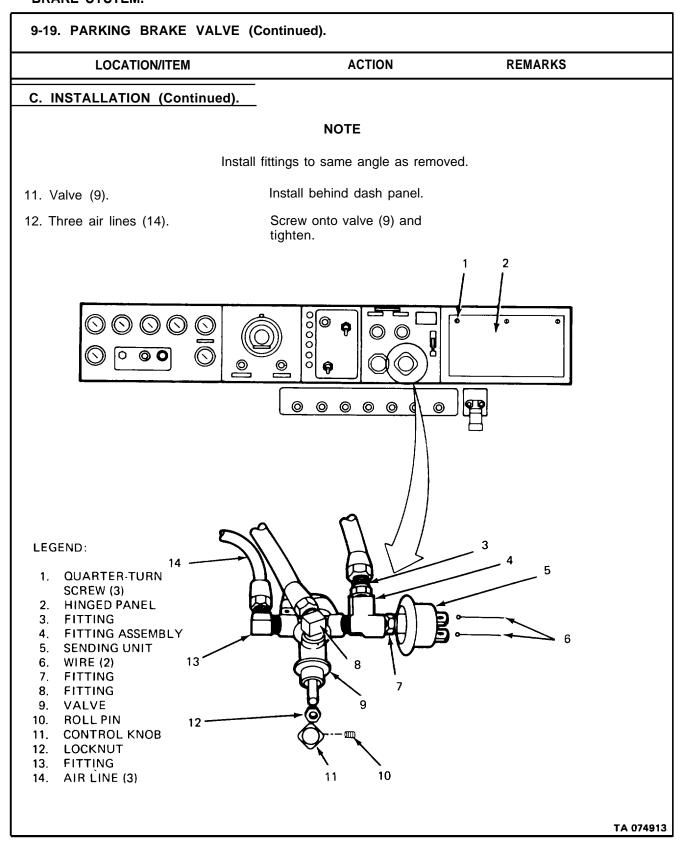
Park Brake Set.

TROUBLESHOOTING REFERENCES

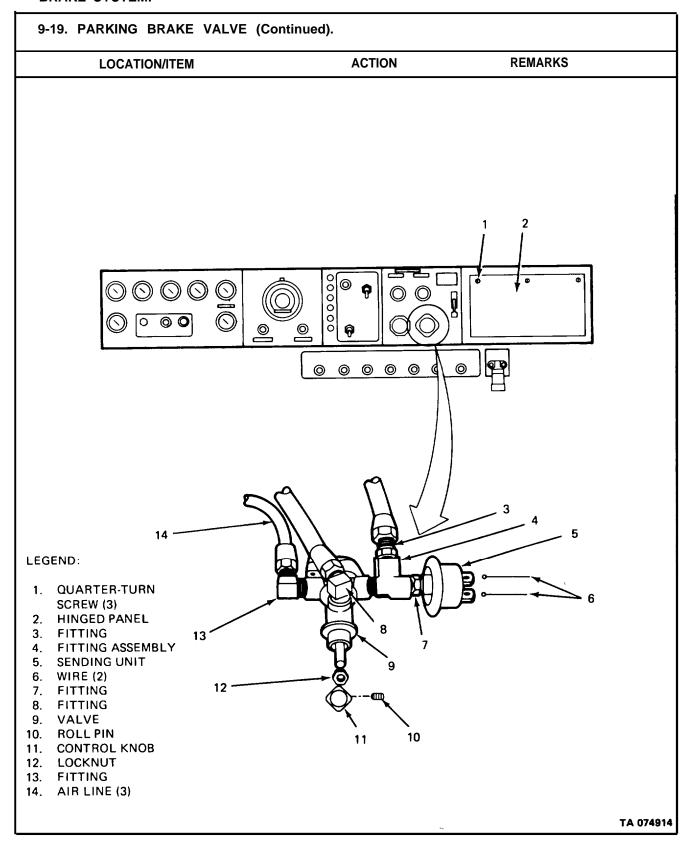
Table 9-1.



-19. PARKING BRAKE VALVE (Co	ontinuea).	
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL.		
1. Three quarter-turn screws (1).	Loosen.	
2. Hinged panel (2).	Lower.	
3. Roll pin (10).	Push out.	
4. Control knob (11).	Remove.	
5. Locknut (12).	Unscrew and remove.	
6. Two wires (6).	Mark and disconnect from sending unit (5).	
	WARNING WARNING	
Do r is fu	not remove any air lines until pressur illy exhausted from all reservoirs.	е
7. Three air lines (14)	a. Label using masking tape and marker pencil.b. Unscrew and remove.	
8. Valve (9).	Remove from dash panel.	
B. INSPECTION OF LINES AND	FITTINGS.	
9. Air lines (14).	Inspect for: a. Cracks. b. Leaks. c. Kinks. d. Damaged threads.	Replace if necessary.
C. INSTALLATION.		
10. Fittings.	Lay new valve beside old valve and remove fittings (13), (8) and assembly (4) from old valve, coat threads with liquid teflon and install in new valve.	



9-19. PARKING BRAKE VALVE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
C. INSTALLATION (Continued).			
13. Two wires (6).	Fasten to sending unit (5).		
14. Locknut (12).	Screw onto valve (9) and tighten.		
15. Control knob (11).	Install by alining hole in knob with hole in valve handle.		
16. Roll pin (10).	Push in.		
17. Hinged panel (2)	Raise into position.		
18. Three quarter-turn screws (1).	Tighten.		
D. OPERATIONAL CHECK.			
19. Engine	Start up (see TM 9-2320-273-10).		
20. Control knob (11).	 a. When valve is pushed in, parking brakes should be released. b. When valve is pulled out, parking brakes should apply. c. Apply soapy solution to the fittings and check for bubbles. If bubbles appear, tighten fittings. 	Brakes will not release until system reaches 65 psi.	
21. Engine.	Shut down (see TM 9-2320-273-10).		



9-20. AIR PRESSURE GAGES MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (10)b. Installation. (10)c. Operational Check. (10)

30 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All

EQUIPMENT CONDITION PARAGRAPH

CONDITION DESCRIPTION

9-13A.

Air Reservoirs Drained.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C).

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.
Park Brake Set.

Transmission in Neutral.

TROUBLESHOOTING REFERENCES

Table 9-1.

9-20. AIR PRESSURE GAGES MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

NOTE

The procedure below may be used to replace either of the two air gages on the left-hand instrument panel.

A. REMOVAL.

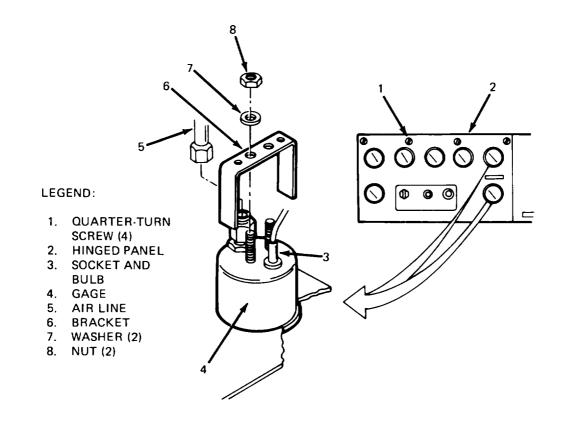
1. Four quarter-turn screws (1). Loosen. Lower hinged panel (2).

2. Air line (5).

a. Unscrew and remove.

Replace, if necessary.

- b. Inspect for:
 - 1. Leaks.
 - 2. Cracks.
 - 3. Damaged fittings.



TA 074915

pushed through bracket (6). transfer all components and us liquid teflon on threads. 8. Two nuts (8) and washers (7). 9. Socket and bulb (3). Press in until socket is flush with gage (4).	9-20. AIR PRESSURE GAGES MAINTENANCE (Continued).				
3. Socket and bulb (3). 4. Two nuts (8) and washers (7). 5. Bracket (6). 6. Gage (4). Remove. NOTE If you are pulling rear air gage do the same as above. B. INSTALLATION. 7. Gage (4). Place in panel (2) with studs pushed through bracket (6). Place in panel (6). If a new gage is being installed, transfer all components and us liquid teflon on threads. 8. Two nuts (8) and washers (7). 9. Socket and bulb (3). Press in until socket is flush with gage (4).	LOCATION/ITEM	ACTION	REMARKS		
4. Two nuts (8) and washers (7). 5. Bracket (6). 6. Gage (4). Remove. NOTE If you are pulling rear air gage do the same as above. B. INSTALLATION. 7. Gage (4). Place in panel (2) with studs pushed through bracket (6). Place in panel (6). If a new gage is being installed, transfer all components and us liquid teflon on threads. 8. Two nuts (8) and washers (7). 9. Socket and bulb (3). Press in until socket is flush with gage (4).	A. REMOVAL (Continued).				
washers (7). 5. Bracket (6). Remove. 6. Gage (4). Remove gage. NOTE If you are pulling rear air gage do the same as above. B. INSTALLATION. 7. Gage (4). Place in panel (2) with studs pushed through bracket (6). If a new gage is being installed, transfer all components and us liquid teflon on threads. 8. Two nuts (8) and washers (7). 9. Socket and bulb (3). Press in until socket is flush with gage (4).	3. Socket and bulb (3).	Remove by pulling on socket.			
6. Gage (4). Remove gage. NOTE If you are pulling rear air gage do the same as above. B. INSTALLATION. 7. Gage (4). Place in panel (2) with studs pushed through bracket (6). If a new gage is being installed, transfer all components and us liquid teflon on threads. 8. Two nuts (8) and washers (7). 9. Socket and bulb (3). Press in until socket is flush with gage (4).		Remove.			
NOTE If you are pulling rear air gage do the same as above. B. INSTALLATION. 7. Gage (4). Place in panel (2) with studs pushed through bracket (6). If a new gage is being installed, transfer all components and us liquid teflon on threads. 8. Two nuts (8) and washers (7). 9. Socket and bulb (3). Press in until socket is flush with gage (4).	5. Bracket (6).	Remove.			
If you are pulling rear air gage do the same as above. B. INSTALLATION. 7. Gage (4). Place in panel (2) with studs pushed through bracket (6). If a new gage is being installed, transfer all components and us liquid teflon on threads. 8. Two nuts (8) and washers (7). 9. Socket and bulb (3). Press in until socket is flush with gage (4).	6. Gage (4).	Remove gage.			
B. INSTALLATION. 7. Gage (4). Place in panel (2) with studs pushed through bracket (6). 8. Two nuts (8) and washers (7). 9. Socket and bulb (3). Place in panel (2) with studs transfer all components and us liquid teflon on threads. Press in until socket is flush with gage (4).		NOTE			
7. Gage (4). Place in panel (2) with studs pushed through bracket (6). 8. Two nuts (8) and washers (7). Press in until socket is flush with gage (4).			me		
pushed through bracket (6). transfer all components and us liquid teflon on threads. 8. Two nuts (8) and washers (7). 9. Socket and bulb (3). Press in until socket is flush with gage (4).	B. INSTALLATION.				
washers (7). 9. Socket and bulb (3). Press in until socket is flush with gage (4).	7. Gage (4).		If a new gage is being installed, transfer all components and use liquid teflon on threads.		
flush with gage (4).		Install and tighten.			
10. Air line (5). Screw into gage (4).	9. Socket and bulb (3).				
	10. Air line (5).	Screw into gage (4).			
11. Hinged panel (2). Close. Tighten four quarter-turn screws (1).	11. Hinged panel (2).				
NOTE		NOTE			
If you removed rear air gage do the same as above.		,	е		
C. OPERATIONAL CHECK.	C. OPERATIONAL CHECK	· :			
12, Engine. Start up (see TM 9-2320-273- 10).	12, Engine.	· ·			
13. Gage (4). Observe that pressure build up is registered on gage and that both front and rear show approximately the same pressure.	13. Gage (4).	is registered on gage and that both front and rear show ap-			
14. Engine. Shut down (see TM 9-2320-273-10).	14. Engine.				

9-20. AIR PRESSURE GAGES MAINTENANCE (Continued). **REMARKS ACTION** LOCATION/ITEM LEGEND: QUARTER-TURN SCREW (4) HINGED PANEL SOCKET AND BULB GAGE AIR LINE 6. BRACKET 7. WASHER (2) 8. NUT (2) TA 074916

9-21. BRAKE PEDAL AND VALVE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Pedal Removal. (5)
b. Valve Removal. (20)
c. Valve Installation. (20)
d. Pedal Installation. (10)
e. Operational Check. (2)

57 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C). Soap and Water Solution. Masking Tape. Marking Pen, Cotter Pin, 210490 (06853). Cotter Pin, 210492 (06853).

EQUIPMENT CONDITION PARAGRAPH

9-13A.

9-27A and 9-28A.

CONDITION DESCRIPTION

Air Reservoirs Drained, Double Check Valve

Removed.

PERSONNEL REQUIRED

Two (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

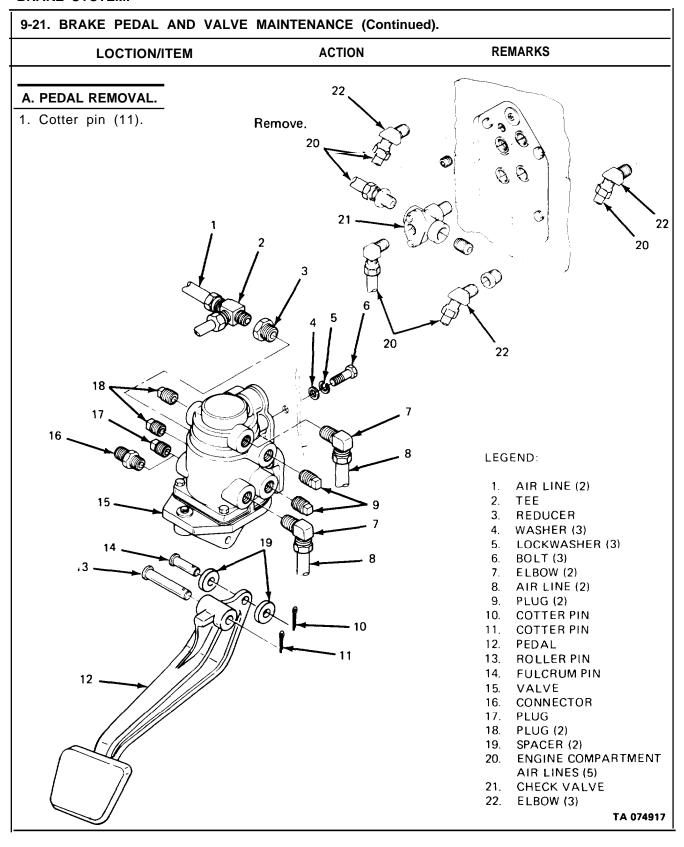
GENERAL SAFETY INSTRUCTIONS

Engine OFF.
Park Brake Set.

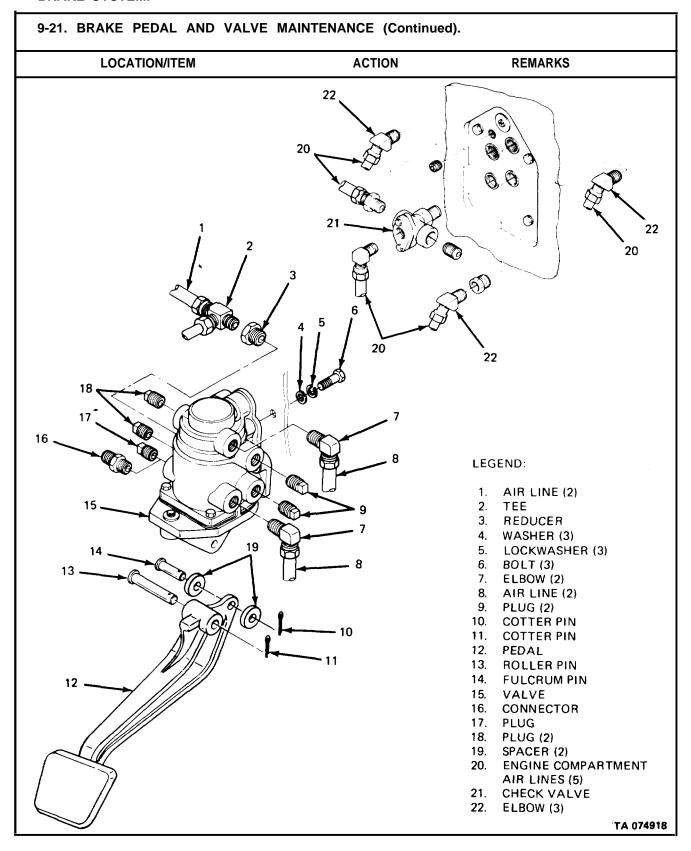
Transmission in Neutral.

TROUBLESHOOTING REFERENCES

Table 9-1.



9-21. BRAKE PEDAL AND VALVE MAINTENANCE (Continued). **REMARKS ACTION** LOCATION/ITEM A. PEDAL REMOVAL (Continued). CAUTION When brake pedal is removed, piston will drop from brake valve. 2. Roller pin (13). Remove. Remove. 3. Cotter pin (10). Push out and remove pedal (12), 4. Fulcrum pin (14). along with two spacers (19). **B. VALVE REMOVAL.** WARNING Do not remove brake valve until pressure is fully exhausted from all reservoirs. Replace if necessary. a. Unscrew and remove. 5. Two air lines (8). b. Tape and mark each line as an aid when installing c. Inspect for: 1. Leaks. 2. Cracks. 3. Damaged fittings. Replace if necessary. a. Unscrew and remove. 6. Two air lines (1). b. Tape and mark each line M918 and M919 only. as an aid when installing line. c. Inspect for: 1. Leaks. 2. Cracks. 3. Damaged fittings. 7. Five engine compartment a, Unscrew and remove. Replace if necessary. air lines (20) b. Tape and mark each line as an aid when installing line. c. Inspect for: 1. Leaks. 2. Cracks. 3. Damaged fittings. 8. Check valve (21). Remove.



9-21. BRAKE PEDAL AND VALVE MAINTENANCE (Continued).				
LOCATION/ITEM	ACTION	REMARKS		
B. VALVE REMOVAL (Continued)	<u>).</u>			
9. Three elbows (22).	a. Unscrew and remove.b. Tape and mark each fitting as an aid when installing.			
10. Three bolts (6), lockwashers (5) and washers (4).	a. Unscrew and remove.b. Remove valve (15).			
11. Two elbows (7).	a. Unscrew and remove.b. Tape and mark as an aid when installing.			
12. Two plugs (9).	a. Unscrew and remove.b. Tape and mark as an aid when installing.			
13. Connector (16).	a. Unscrew and remove.b. Tape and mark as an aid when installing.	M916 thru M920.		
14. Plug (17).	a. Unscrew and remove.b. Tape and mark as an aid when installing.	M915 only.		
15. Two plugs (18).	a. Unscrew and remove.b. Tape and mark as an aid when installing.			
16. Reducer (3).	a. Unscrew and remove with tee (2) attached.b. Tape and mark as an aid when installing.	M918 and M919 only.		
C. VALVE INSTALLATION.				
17. Reducer (3) with tee (2) attached.	a. Coat threads with liquid teflon.b. Install, noting position of tee and reducer when removed.	M918 and M919 only.		
18. Two plugs (18).	a. Coat threads with liquid teflon.b. Install, noting positions of plugs when removed.			

9-21. BRAKE PEDAL AND VALVE MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** 22 20 22 18 16 LEGEND: AIR LINE (2) 1. TEE 2. 3. REDUCER WASHER (3) LOCKWASHER (3) 6. BOLT (3) 13 7. ELBOW (2) 8. AIR LINE (2) 9. PLUG (2) 10. COTTER PIN 10 **COTTER PIN** 11. 12. PEDAL - 11 13. **ROLLER PIN FULCRUM PIN** 14. 12 15. VALVE CONNECTOR 16. **PLUG** 17. PLUG (2) 18. SPACER (2) 19. ENGINE COMPARTMENT 20. AIR LINES (5) 21. CHECK VALVE 22. ELBOW (3) TA 074919

	LOCATION/ITEM	ACTION	REMARKS
) .	VALVE INSTALLATION (Co	ntinued).	
19.	Plug (17).	a. Coat threads with liquid teflon.b. Install, noting position of plug when removed.	M915 only.
20.	Connector (16).	a. Coat threads with liquid teflon.b. Install, noting position of connector when removed.	M916 thru M920.
21.	Two plugs (9).	a. Coat threads with liquid teflon.b. Install, noting position of plugs when removed.	
22.	Two elbows (7).	a. Coat threads with liquid teflon.b. Install, noting position of elbows when removed.	
23.	Valve (15).	a. Aline with mounting holes on firewall in cab.b. Install with three bolts (6), lockwashers (5), and washers (4).	
24.	Three elbows (22).	a. Coat threads with liquid teflon.b. Install, noting position of elbows when removed.	
25.	Check valve (21).	a. Coat threads with liquid teflon.b. Install, noting position of check valve when removed.	
26.	Five engine compartment air lines (20).	Install, noting positions of air lines when removed.	
27.	Two air lines (1).	Install, noting positions of air lines when removed.	M918 and M919 only.
28.	Two air lines (8).	Install, noting positions of air lines when removed.	

9-21. BRAKE PEDAL AND VALVE MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM 22 G 20 22 16 LEGEND: 1. AIR LINE (2) TEE 2. REDUCER 4. WASHER (3) 5. LOCKWASHER (3) 6. BOLT (3) 7. ELBOW (2) 8. AIR LINE (2) 9. PLUG (2) 10. **COTTER PIN COTTER PIN** 11. PEDAL 12. **ROLLER PIN** 13. **FULCRUM PIN** 14. 12 15. VALVE 16. CONNECTOR 17. **PLUG PLUG (2)** 18. SPACER (2) 19. **ENGINE COMPARTMENT** AIR LINES (5) 21. CHECK VALVE 22. ELBOW (3) TA 075668

	LOCATION/ITEM	ACTION	REMARKS
		_	
D. PEDA	L INSTALLATION.	- -	
		NOTE	
		Install piston into brake valve before installing pedal.	
29. Pedal	(12).	a. Aline with mounting holes on valve (15).b. Install fulcrum pin (14) and two spacers (19).	
30. Cotte	r pin (10).	Install thru fulcrum pin (14).	
31. Roller	pin (13).	Install thru pedal (12).	
32. Cotte	r pin (11).	Install thru roller pin (13).	
		NOTE	
		Follow on maintenance action required:	
		Install double check valve; refer to para and 9-28B.	a 9-27B
E. OPER	ATIONAL CHECK.	-	
33. Engir	ie.	Start up (see TM 9-2320-273-10). Allow system to reach operating pressure of 105-120 psi (724-827 kPa).	
34. Pedal	(12).	Press down, then release.	Second mechanic.
35. All br	akes.	Check to see that all brakes are actuated when pedal is pressed, and that they are released when pedal is released.	First mechanic.
36. Valves	s (15) and (21).	Use soap solution to check for leaks.	Retighten as necessary.
	ne.	Shut down (see TM 9-2320-	

9-21. BRAKE PEDAL AND VALVE MAINTENANCE (Continued). **REMARKS ACTION** LOCATION/ITEM 22 20 20 20 22 16 LEGEND: 1. AIR LINE (2) 2. TEE 3. REDUCER 4. WASHER (3) 5. LOCKWASHER (3) 6. BOLT (3) ELBOW (2) 7. 8. AIR LINE (2) 9. **PLUG (2) COTTER PIN** 10. 11. **COTTER PIN** 12. PEDAL 13. **ROLLER PIN** 14. **FULCRUM PIN** 12 15. VALVE 16. CONNECTOR 17. PLUG **PLUG (2)** 18. 19. SPACER (2) 20. ENGINE COMPARTMENT AIR LINES (5) 21. CHECK VALVE 22. ELBOW (3) TA 075669

9-22. SERVICE BRAKES QUICK RELEASE VALVE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (5)b. Installation. (10)c. Operational Check. (10)

25 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M915, M916, M918 – 2 Valves Total. 1 each Axle. M917, M919, M920 – 3 Valves Total.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (PIN)

Liquid Teflon (Refer to Appendix C). Soap and Water Solution.

EQUIPMENT CONDITION

PARAGRAPH _____

9-13A.

CONDITION DESCRIPTION

Air Reservoirs Drained.

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 9-1.

9-22. SERVICE BRAKES QUICK RELEASE VALVE (Continued). **ACTION** REMARKS LOCATION/ITEM NOTE For location, refer to locator illustration (para 9-5 e thru 9-5 j). WARNING Do not remove quick-release valve until pressure is fully exhausted from all reservoirs. LEGEND: **BRACKET** AIR LINE (3) 2. 3. VALVE NUT (2) WASHER (2) 4. 5. BOLT (2) TA 074920

9-22. SERVICE BRAKES QUICK RELEASE VALVE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
A. REMOVAL.			
1. Three air lines (2).	a. Unscrew and remove.b. Inspect for:1. Leaks.2. Cracks.3. Damaged threads.	Replace if necessary.	
2. Two bolts (6), washers (5), and nuts (4).	Unscrew and remove.		
3. Valve (3).	Remove from bracket (1).		
B. INSTALLATION.			
4. Valve (3).	Transfer all components (elbows, adapters, etc.) to new valve. Use liquid teflon on threaded joints.		
5. Valve 3).	a. Coat threads with liquid teflon.b. Set onto bracket (7) and install two bolts (6).		
6. Tw o washers (5) and nuts (4).	Install on bolts (6) and tighten.		
7. Three air lines (2).	Screw on and tighten.		
C. OPERATIONAL CHECK.			
8. Engine.	Start up (see TM 9-2320-273-10). Allow system to reach operating pressure of 105-120 psi (724-827 kPa).		
9. CAB/Brake pedal.	Press down and release.	Second mechanic.	
10. Valve (3).	a. Check that air exhausts from valve when brake pedal is released.b. Use soap solution to check for leaks.		
11. Engine.	Shut down (see TM 9-2320-273-10).		

9-22. SERVICE BRAKES QUICK RELEA	SE VALVE (Continued	,
LOCATION/ITEM	ACTION	REMARKS
		LEGEND: 1. BRACKET 2. AIR LINE (3) 3. VALVE 4. NUT (2) 5. WASHER (2) 6. BOLT (2)
		TA 0749

9-23. QUICK RELEASE/DOUBLE-CHECK VALVE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

(5)

b. Installation.

(5) (5)

c. Operational Check.

12 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

EQUIPMENT CONDITION PARAGRAPH

CONDITION DESCRIPTION

9-13A. Drain Primary Air Reservoirs

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (refer to appendix C).

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 9-1.

9-23. QUICK RELEASE/DOUBLE-CHECK VALVE MAINTENANCE (Continued). **REMARKS ACTION** LOCATION/ITEM **NOTE** For location, refer to locator illustration (para 9-5 e. thru 9-5 j.). WARNING Do not remove quick-release/double-check valve until pressure is fully exhausted from all reservoirs. LEGEND: 1. AIR LINE (FOUR ON M915; FIVE ON M916 THRU M920) 2. WASHER (2) 3. NUT (2) 4. VALVE 5. BOLT (2)

TA 074922

1.0047101//7514	ACTION	REMARKS
LOCATION/ITEM	ACTION	REMARKS
	NOTE	
c C	On the M915, the valve is located forward the fifth wheel on the right frame rail on the M916 thru M920 it is on the left rame rail.	il.
. REMOVAL.		
1. Four air lines(1). (M916 thru M920 have five air lines.)	a. Unscrew and remove.b. Inspect for: Cracks.Damaged fittings.	Tag lines for ease of installation. Replace, if necessary.
2. Two nuts (3), washers (2), and bolts (5).	Unscrew and remove. Remove valve (4).	
B. INSTALLATION.		
3. New valve (4).	Transfer all components (elbows, adapters, etc.) to new valve. Use liquid teflon on threads.	
4. Valve (4).	Attach to frame rail with two nuts (3), washers (2), and bolts (5). Tighten nuts and bolts.	
5. Four air lines (1).	a. Coat fittings with liquid teflon.b. Screw on and tighten.	
C. OPERATIONAL CHECK.		
6. Engine.	Start up (see TM 9-2320-273-10). Allow system to reach operating pressure of 105-120 psi (724-827 kPa).	
7. CAB/Brake pedal.	Press and release.	Second mechanic.

9-23. QUICK RELEASE/DOUBLE-CHECK VALVE MAINTENANCE (Continued). **REMARKS** LOCATION/ITEM **ACTION** C. OPERATIONAL CHECK (Continued). First mechanic. a. Check to see that air 8. Valve (4). exhausts from-valve when brakes are released. b. Use soap solution to check for leaks. Shut down (see 9. Engine. TM 9-2320-273-10). LEGEND: 1. AIR LINE (FOUR ON M915; FIVE ON M916 THRU M920) WASHER (2) NUT (2) 4. VALVE 5. BOLT (2) TA 074923

1-24. RELAY VALVE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (15)b. Installation. (20)c. Checking for Leaks. (10)

45 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C). Soap and Water Solution.

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

Table 9-1.

EQUIPMENT CONDITION

PARAGRAPH ____

9-13A.

CONDITION DESCRIPTION

Air Reservoirs Drained.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

9-24. RELAY VALVE MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

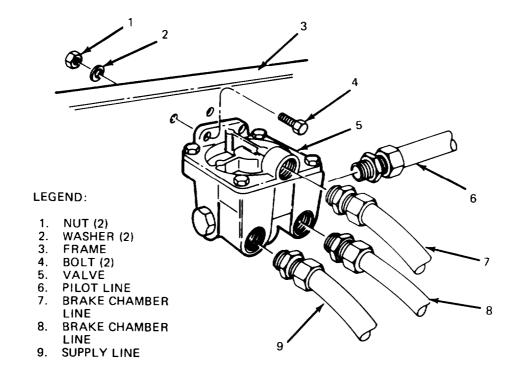
WARNING

Do not remove relay valve until pressure is fully exhausted from all reservoirs.

A. REMOVAL.

- 1. Pilot line (6), two brake chamber lines (7) and (8), and supply line (9).
- a. Unscrew and remove.
- b. Inspect for:
 - 1. Cracks.
 - 2. Damaged fittings.

Replace if necessary.



TA 074924

A. REMOVAL (Continued). 2. Two nuts (1), washers (2), and bolts (4). B. INSTALLATION. 3. Valve (5). 4. Valve (5), two nuts (1), washers (2), and bolts (4). 5. Pilot line (6), two brake chamber lines (7) and (8), and supply line (9). 6. Engine. C. CHECKING FOR LEAKS. 6. Engine. Start up (see TM 9-2320-273-10). Allow system to reach Operating pressure of 105-120 psi (724-827 kPa). Apply service brakes and check for leaks using soap solution. 8. Engine. Shut down (see TM 9-2320-273-10).	LOCATION/ITEM	ACTION	REMARKS
b. Remove valve (5). B. INSTALLATION. 3. Valve (5). Transfer all components (elbows, adapters, etc.) to new valve before installation. Use liquid teflon on joints. 4. Valve (5), two nuts (1), washers (2), and bolts (4). 5. Pilot line (6), two brake chamber lines (7) and (8), and supply line (9). CHECKING FOR LEAKS. 6. Engine. Start up (see TM 9-2320-273-10). Allow system to reach Qperating pressure of 105-120 psi (724-827 kPa). 7. Valve (5). Apply service brakes and check for leaks using soap solution. 8. Engine. Shut down (see	A. REMOVAL (Continued).		
Transfer all components (elbows, adapters, etc.) to new valve before installation. Use liquid teflon on joints. 4. Valve (5), two nuts (1), washers (2), and bolts (4). 5. Pilot line (6), two brake chamber lines (7) and (8), and supply line (9). 6. Engine. CHECKING FOR LEAKS. 6. Engine. Start up (see TM 9-2320-273- 10). Allow system to reach Qperating pressure of 105-120 psi (724-827 kPa). 7. Valve (5). Apply service brakes and check for leaks using soap solution. 8. Engine. Shut down (see			
(elbows, adapters, etc.) to new valve before installation. Use liquid teflon on joints. 4. Valve (5), two nuts (1), washers (2), and bolts (4). 5. Pilot line (6), two brake chamber lines (7) and (8), and supply line (9). 6. Engine. Start up (see TM 9-2320-273-10). Allow system to reach Qperating pressure of 105-120 psi (724-827 kPa). 7. Valve (5). Apply service brakes and check for leaks using soap solution. 8. Engine. Shut down (see	B. INSTALLATION.		
washers (2), and bolts (4). crossmember (3). b. Tighten nuts. 5. Pilot line (6), two brake chamber lines (7) and (8), and supply line (9). c. CHECKING FOR LEAKS. 6. Engine. Start up (see TM 9-2320-273-10). Allow system to reach Qperating pressure of 105-120 psi (724-827 kPa). 7. Valve (5). Apply service brakes and check for leaks using soap solution. 8. Engine. Shut down (see	3. Valve (5).	(elbows, adapters, etc.) to new valve before installation.	
chamber lines (7) and (8), and supply line (9). C. CHECKING FOR LEAKS. 6. Engine. Start up (see TM 9-2320-273-10). Allow system to reach Qperating pressure of 105-120 psi (724-827 kPa). 7. Valve (5). Apply service brakes and check for leaks using soap solution. 8. Engine. Shut down (see		crossmember (3).	
6. Engine. Start up (see TM 9-2320-273-10). Allow system to reach Operating pressure of 105-120 psi (724-827 kPa). 7. Valve (5). Apply service brakes and check for leaks using soap solution. 8. Engine. Shut down (see	chamber lines (7) and (8),	teflon. b. Screw into valve (5) and	
10). Allow system to reach Qperating pressure of 105-120 psi (724-827 kPa). 7. Valve (5). Apply service brakes and check for leaks using soap solution. 8. Engine. Shut down (see	. CHECKING FOR LEAKS.		
check for leaks using soap solution. 8. Engine. Shut down (see	6. Engine.	10). Allow system to reach Qperating pressure of 105-120	
·	7. Valve (5).	check for leaks using soap	
,	8. Engine.	Shut down (see TM 9-2320-273-10) .	

9-24. RELAY VALVE MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** LEGEND: 1. NUT (2) 2. WASHER (2) 3. FRAME 4. BOLT (2) 5. VALVE 6. PILOT LINE 7. BRAKE CHAMBER LINE 8. BRAKE CHAMBER LINE 9. SUPPLY LINE TA 074925

3-25. LIMITING VALVE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (5)b. Installation. (10)c. Operational Check. (5)

20 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (refer to appendix C) Soap and Water Solution.

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

Table 9-1.

EQUIPMENT CONDITION

PARAGRAPH

9-13A.

CONDITION DESCRIPTION

Air Reservoirs Drained.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

9-25. LIMITING VALVE MAINTENANCE (Continued). **REMARKS ACTION** LOCATION/ITEM WARNING Do not remove limiting valve until pressure is fully exhausted from all reservoirs. **NOTE** For location, refer to locator illustration (para 9-5 e. thru 9-5 j.). LEGEND: 1. AIR LINE (3) 2. VALVE NUT (2) 3. WASHER (2) CAPSCREW (2) 4. 6. BRACKET TA 074926

9-25. LIMITING VALVE MAINTE	ACTION	REMARKS
LOCATION/ITEM	ACTION	KLWIAKKO
1		
A. REMOVAL.		
1. Three air lines (I).	a. Unscrew and remove.b. Inspect for:1. Cracks.2. Damaged fittings.	Replace, if necessary.
2. Two capscrews (5), two washers (4) and two nuts (3).	a. Unscrew and remove.b. Remove valve (2).	
B. INSTALLATION .		
3. Valve (2).	Attach to bracket (6) with two capscrews (5), two washers (4) and two nuts (3).	If a new valve is installed transfer all components (elbows, adapters, etc.) to new valve. Use liquid teflon on threaded joints.
4. Three air lines 1).	a. Coat threads with liquid teflon.b. Screw in and tighten.	
C. OPERATIONAL CHECK.		
5. Engine.	Start up (see TM 9-2320-273-10).	
6. CAB/Brake pedal,	Press down.	Second mechanic.
7. Valve (2).	Use soap solution to check for leaks.	First mechanic. Perform this step while brake pedal is pressed down.
8. Vehicle.	Road test. Check for even application of front brakes.	

9-25. LIMITING VALVE MAINTENANCE	E (Continued).		
LOCATION/ITEM	ACTION	REMARKS	
LEGEND: 1. AIR LINE (3) 2. VALVE 3. NUT (2) 4. WASHER (2) 5. CAPSCREW (2) 6. BRACKET	3		
			TA 074927

3-26. TRACTOR PROTECTION VALVE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REWIRED FOLLOWS TASK DESCRIPTION.)

a . Removal. (15)b . Installation. (10)c . Operational Check. (10)

35 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M915, M916, M917, M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIAL/PARTS (PIN)

Liquid Teflon (Refer to Appendix C).

Marking Pen. Masking Tape.

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

Table 9-1.

EQUIPMENT CONDITION

PARAGRAPH

9-13A.

CONDITION DESCRIPTION

Air Reservoirs Drained.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

9-26. TRACTOR PROTECTION VALVE MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM **NOTE** For location, refer to locator illustration (para 9-5 e. thru 9-5 j.). **WARNING** Do not remove tractor protection valve until pressure is fully exhausted from all reservoirs. LEGEND: **©** AIR LINE AIR LINE 3. AIR LINE 4. AIR LINE NUT, LOCKWASHER, BOLT (2) 6. VALVE M915 LEGEND: AIR LINE 2. AIR LINE 3. AIR LINE AIR LINE NUT, LOCKWASHER, BOLT (2) SPACER CLIP VALVE 7. \circ M916, M917, M920 TA 074928

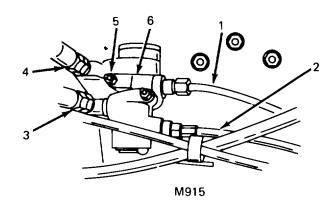
LOCATION/ITEM ACTION REMARKS				
Α.	REMOVAL.			
	Airlines (1), (2), (3), and	Remove.	Tag lines for ease of location at installation.	
2.	Two nuts, lockwashers, and bolts (5).	Remove.		
3.	Spacer clip (6).	Remove.	(M916, M917, and M920 only,)	
4.	Valve (7), M916, M917, M920 or valve (6), M915.	Remove.		
5.	Valve (7), M916, M917, M920 or valve (6), M915.	Transfer all components (elbows, fittings, adapters, etc.) to new valve. Coat threaded joints with liquid teflon,	If installing new valve,	
В.	INSTALLATION.			
6.	Valve (7), M916, M917, M920 or valve (6), M915.	Install in vehicle.		
7.	Spacer clip (6).	Install	(M916, M917, and M920 only.)	
8.	Two nuts, lockwashers, and bolts (5).	Install and tighten.		
9.	Air lines (1), (2), (3), and (4).	Install and tighten.	Replace any damaged lines and/or fittings.	
C.	OPERATIONAL CHECK.			
10.	Engine.	Start up (see TM 9-2320-273-10). Allow system to reach operating pressure of 105-120 psi (724-827 kPa).		
11.	Valve (7), M916, M917, M920 or valve (6), M915.	Apply trailer supply valve and brake pedal valve. Use soap solution to check for leaks.	Second mechanic	

926. TRACTOR PROTECTOR VALVE MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** C. OPERATIONAL CHECK (Continued): **NOTE**

If leaks are detected, re-tighten all fittings. If leaks persist, remove hoses and fittings and examine for cracks, and damaged fittings. Replace if necessary.

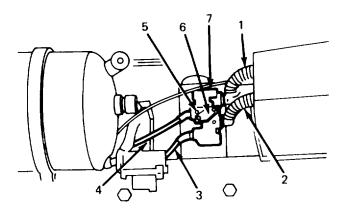
12. Engine.

Shut down (see TM 9-2320-273-10).



LEGEND:

- AIR LINE 1.
- 2. AIR LINE
- 3. AIR LINE
- 4. AIR LINE
- NUT, LOCKWASHER, BOLT (2) 5.
- 6. VALVE



M916, M9 7, M920

LEGEND:

- AIR LINE
- AIR LINE 2.
- AIR LINE
- AIR LINE
- 5. NUT, LOCKWASHER, BOLT (2) SPACER CLIP
- 6.
- VALVE

TA 074929

9-27. DOUBLE-CHECK VALVE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (5) b. Installation. (10) c. Checking for Leaks. (10)

25 Minutes Total.

INITIAL SETUP

EQUIPMENT CONDITION

APPLICABLE CONFIGURATIONS

PARAGRAPH

CONDITION DESCRIPTION

Air Reservoirs Drained.

9-13A.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (refer to appendix C).

Masking Tape. Marking Pencil.

Soap and Water Solution.

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 9-1.

9-27, DOUBLE-CHECK VALVE MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** Do not remove double-check valve until pressure is fully exhausted from all reservoirs. **NOTE** For location, refer to locator illustration (para 9-5 e. thru 9-5 j,). Double-check valves are attached to the rear of the secondary air reservoir and to the engine side of the brake pedal valve on all models. There is a double-check valve on the driver's side of the brake pedal valve on all models except the M918 and M919. All models use a double check valve with stoplamp switch attached to the engine side of the firewall near the brake pedal valve. The procedure below is general and may be used to service any of these double-check valves. LEGEND: WIRE (2) 1. DOUBLE CHECK VALVE WITH STOPLAMP **SWITCH** AIR LINE 3. **ELBOW** DOUBLE CHECK VALVE **BRAKE PEDAL VALVE** SECONDARY AIR RESERVOIR 3 8. TEE 3 TA 074930

	27. DOUBLE-CHECK VALVE MAINTENANCE (Continued).				
	LOCATION/ITEM	ACTION	REMARKS		
	REMOVAL.]				
		NOTE			
	and i	re removing air lines, use masking ta marking pencil to identify air lines fo illation in their proper location.			
1.	Wires (1), air lines (3), and tee (8).	Remove from double-check valve with stoplamp switch (2).	Replace damaged.		
2.	Double-check valve with stoplamp switch (2).	Unscrew and remove.			
3.	Air lines (3) and elbows (4).	Unscrew from double-check valve (5).	Replace if damaged.		
4.	Double-check valve (5).	Unscrew and remove.			
	INSTALLATION.				
		NOTE			
	elbo	y liquid teflon to threads of valves, ws, and tee as you assemble per the tions you marked at disassembly.			
	Double-check valve with stoplamp switch (2) or double-check valve (5).	Screw in and tighten to firewall, brake pedal valve (6), or secondary air reservoir (7).			
	Elbows (4) and tee (8).	Screw into double-check valve with stoplamp switch (2) or double-check valve [5).			
	Air lines (3).	Install at double-check valve with stoplamp switch (2) or double-check valve (5).			
	Wires (1).	Connect to terminals of double- check valve with stoplamp switch	ı		

BRAKE SYSTEM. 9-27. DOUBLE-CHECK VALVE MAINTENANCE (Continued). **REMARKS ACTION** LOCATION/ITEM C. CHECKING FOR LEAKS. Start up (see TM 9-2320-273-9. Engine. 10). Allow system to reach operating pressure of 105-120 psi (724-827 kPa). Tighten as necessary. 10. Double-check valve with Use soap solution to check for stoplamp switch (2), leaks. double-check valve (5), air lines (3), elbows (4), and tee (8). Shut down (see TM 9-2320-11. Engine. 273-10). 2 LEGEND: 1. WIRE (2) 2. DOUBLE CHECK VALVE WITH STOPLAMP **SWITCH** 3. AIR LINE 4. ELBOW 5. DOUBLE CHECK VALVE 6. BRAKE PEDAL VALVE SECONDARY AIR RESERVOIR TEE 8.

3

TA 075670

9-28a DOUBLE-CHECK AND STOPLAMP VALVE MAINTENANCE (M918 AND M919).

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (10)b. Installation. (10)c. Operational Check. (10)

30 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M918 and M919.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (refer to appendix C).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

Table 9-1.

EQUIPMENT CONDITION PARAGRAPH

9-13A.

CONDITION DESCRIPTION

Air Reservoirs Drained.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

9-28. DOUBLE-CHECK AND STOPLAMP VALVE MAINTENANCE (M918 AND M919) (Continued).

LOCATION/ITEM ACTION REMARKS

A. REMOVAL.

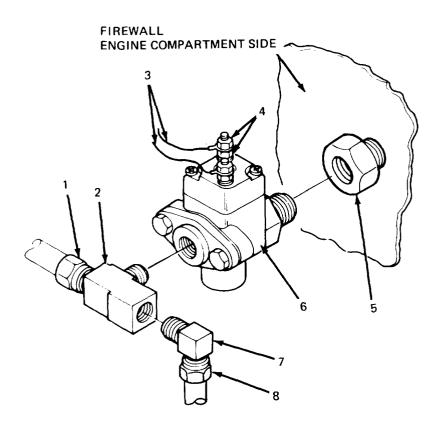
1. Fittings (1) and (8).

Unscrew and remove two air lines.

Mark location for reassembly.

2. Tee (2).

Unscrew and remove.



LEGEND:

- 1. FITTING
- 2. TEE
- 3. WIRE (2)
- 4. TERMINAL NUT (2)
- 5. BULKHEAD FITTING
- 6. DOUBLE CHECK AND STOPLAMP VALVE
- 7. ELBOW
- 8. FITTING

TA 074932

ntinued).	(M918 AND M919) (Co	STOPLAMP VALVE-MAINTENANCE	9-28. DOUBLE-CHECK AND
	REMARKS	ACTION	LOCATION/ITEM
			A. REMOVAL (Continued).
embly.	Mark location for reass	Unscrew and remove two wires (3).	3. Two terminal nuts (4).
		Unscrew from bulkhead fitting (5).	4. Double-check and stop- lamp valve (6).
		Unscrew and remove from tee (2).	5. Elbow (7).
			B. INSTALLATION.
		a. Coat threads with liquid teflon.b. Screw into tee (2).	6. Elbow (7).
		a. Coat threads with liquid teflon.b. Screw into bulkhead fitting (5).	7. Double-check and stop- lamp valve (6).
		a. Coat threads with liquid teflon.b. Screw into double-check and stoplamp valve (6).	8. Tee (2).
arked.	Install as previously ma	a. Coat threads with liquid teflon.b. Screw into tee (2) and elbow (7).	9. Fittings (1) and (8).
arked.	Install as previously ma	Install over terminals and secure with two terminal nuts (4).	10. Two wires (3).

9-28. DOUBLE-CHECK AND STOPLIGHT VALVE MAINTENANCE (M918 AND M919) (Continued). LOCATION/ITEM ACTION REMARKS

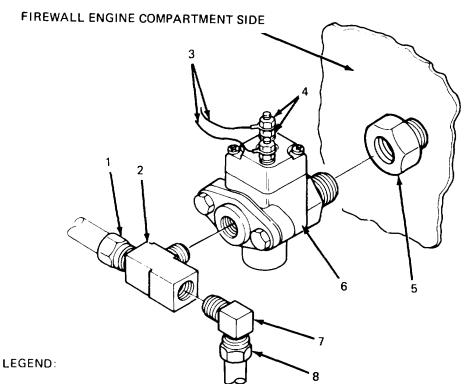
C. OPERATIONAL CHECK.

11. Vehicle.

Road test. Check operation of:

- a. Service brakes.
- b. Park brakes.
- c. Trailer brakes.
- d. Stoplamps.

Tighten fittings as necessary to stop any detected air leaks.



- 1. FITTING
- 2. TEE
- 3. WIRE (2)
- 4. TERMINAL NUT (2)
- 5. BULKHEAD FITTING
- 6. DOUBLE CHECK AND STOPLAMP VALVE
- 7. ELBOW
- 8. FITTING

TA 074933

1.29. DOUBLE-CHECK AND STOPLAMP VALVE MAINTENANCE (M915, M916, M917_cM920)

rHIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

Removal. (15)Installation. (15)Operational Check. (10)

40 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M915, M916, M917, M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (refer to appendix C).

EQUIPMENT CONDITION

PARAGRAPH

9-13A.

CONDITION DESCRIPTION

Secondary Air Reservoirs Drained.

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

TM 9-2320-273-20P.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 9-1.

9-29. DOUBLE-CHECK AND STOPLAMP VALVE MAINTENANCE (M915, M916, M917, M920) (Continued).

LOCATION/ITEM ACTION REMARKS

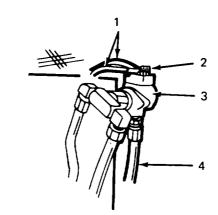
A. REMOVAL

1. Two nuts and washers (2). Remove.

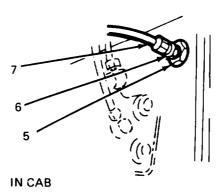
2. Two wires (1). Remove from stoplamp Tag for location. switch terminals.

3. Three air lines (4). Remove. Tag for location.

4. Air line (7). Remove. In cab.



ENGINE COMPARTMENT/FIREWALL



LEGEND:

- 1. WIRE (2)
- 2. NUT AND WASHER (2)
- 3. VALVE
- 4. AIR LINE (3)
- 5. NUT
- 6. ADAPTER
- 7. AIR LINE

TA 074934

LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
5. Adapter (6).	Remove.	In cab.
6. Nut (5).	Remove.	In cab, 2nd mechanic to hold valve to keep from twisting while nut removed.
7. Valve (3).	Remove from vehicle.	
8. Valve (3).	Remove elbows, adapters tee's from valve.	5,
B. INSTALLATION.		
9. Valve (3).	Install elbows, tee's, adapters in valve.	Coat threads with liquid teflon.
10. Valve (3).	Install in vehicle.	
11. Nut (5).	Install on valve.	2nd mechanic to hold valve from turning during tightening.
12. Adapter (6).	Install.	Coat threads with liquid teflon.
13. Air line (7).	Install.	
14. Three air lines (4).	Install.	
15. Two wires (1).	Install on terminals.	
16. Two nuts and washers (2).	Install.	

9-29. DOUBLE-CHECK AND STOPLAMP VALVE MAINTENANCE (M915, M916, M917, M920) (Continued). **REMARKS ACTION** LOCATION/ITEM C. OPERATIONAL CHECK. Road test check operation 17. Vehicle a. Service brakes. b. Park brakes. c. Trailer brakes. d. Stoplamps. ENGINE COMPARTMENT/FIREWALL LEGEND: 1. WIRE (2) 2. NUT AND WASHER (2) 3. VALVE 4. AIR LINE (3) 5. NUT 6. ADAPTER 7. AIR LINE IN CAB

9-30. EXTERNAL AIR COUPLINGS MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. b. Installation. (10)

15 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M915, M916, M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (refer to appendix C).

SPECIAL ENVIRONMENTAL CONDITIONS

GENERAL SAFETY INSTRUCTIONS

EQUIPMENT CONDITION

CONDITION DESCRIPTION

Air Reservoirs Drained.

PARAGRAPH

9-13A.

Vehicle Parked on Level Ground. One (MOS-63B20).

REFERENCES (TM)

PERSONNEL REQUIRED

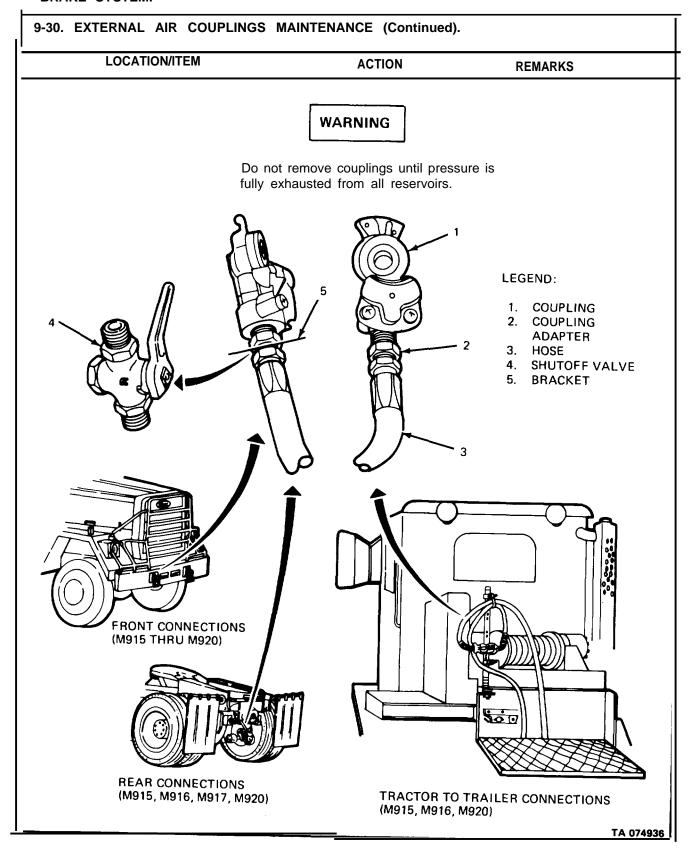
TM 9-2320-273-10. TM 9-2320-273-20P.

Engine OFF.

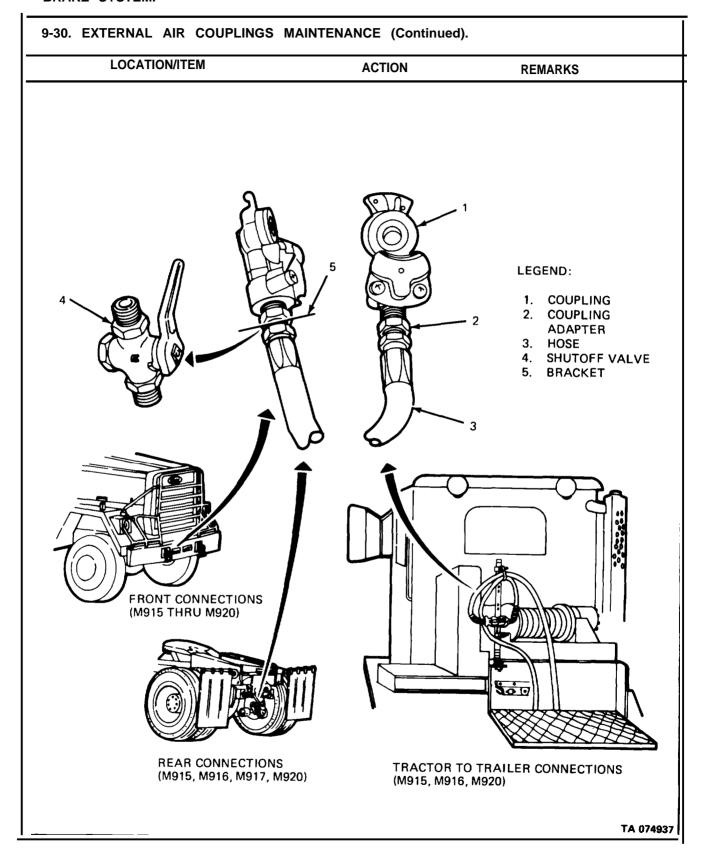
Transmission in Neutral. Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 9-1.



LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL.		
Couplings (1) and couplings adapter (2).	Unscrew and remove from hoses (3).	Tractor to trailer connections.
2. Shutoff valve (4).	Unscrew from coupling (1), coupling adapter (2), hose (3) and bracket (5).	Front and rear connections.
3. Hose (3) and shut-off valve (4).	Inspect for: a. Leaks. b. Cracks. c. Damaged fittings. d. Smooth valve handle operation.	Replace if necessary.
B. INSTALLATION.		
Couplings (1) and couplings adapter (2).	a. Apply liquid teflon to threads,b. Screw on hoses (3).	Tractor to trailer connections.
5. Shutoff valve (4).	a. Apply liquid teflon to threads.b. Install thru bracket(s) to coupling (1), coupling adapter (2), and hose (3).	Front and rear connections.



9-31. FRONT BRAKE SHOES MAINTENANCE (M915).

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (15) b. Inspection. (5) c. Installation. (15) d. Adjustment. (15)

50 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

GAA (Refer to Appendix C). Cotter Pin, K-227 (78500).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P. LO 9-2320-273-12.

TROUBLESHOOTING REFERENCES

Table 9-1

EQUIPMENT CONDITION

PARAGRAPH

CONDITION DESCRIPTION

10-13A. Hub and Drum Removed.

SPECIAL ENVIRONMENTAL CONDITIONS

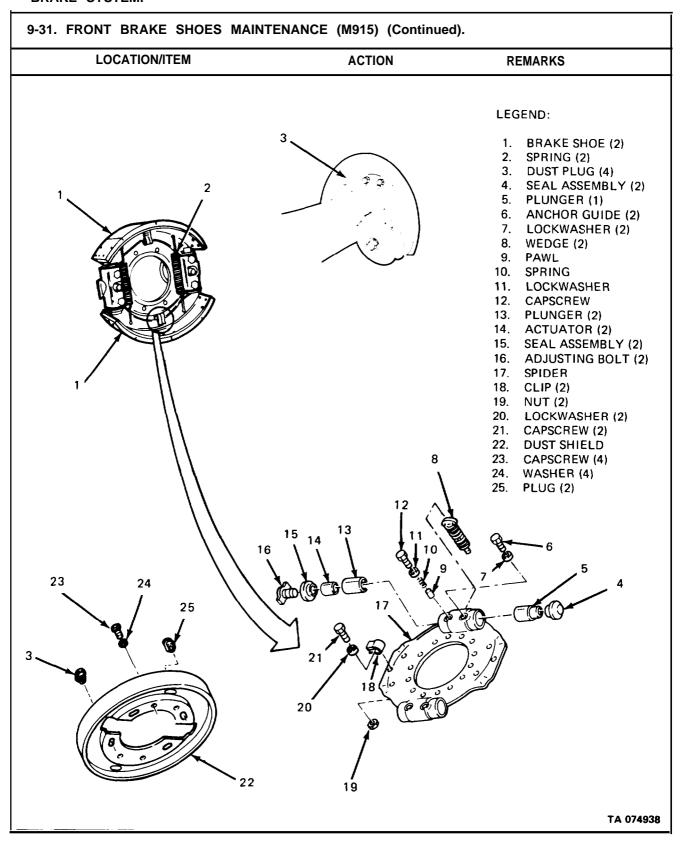
Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

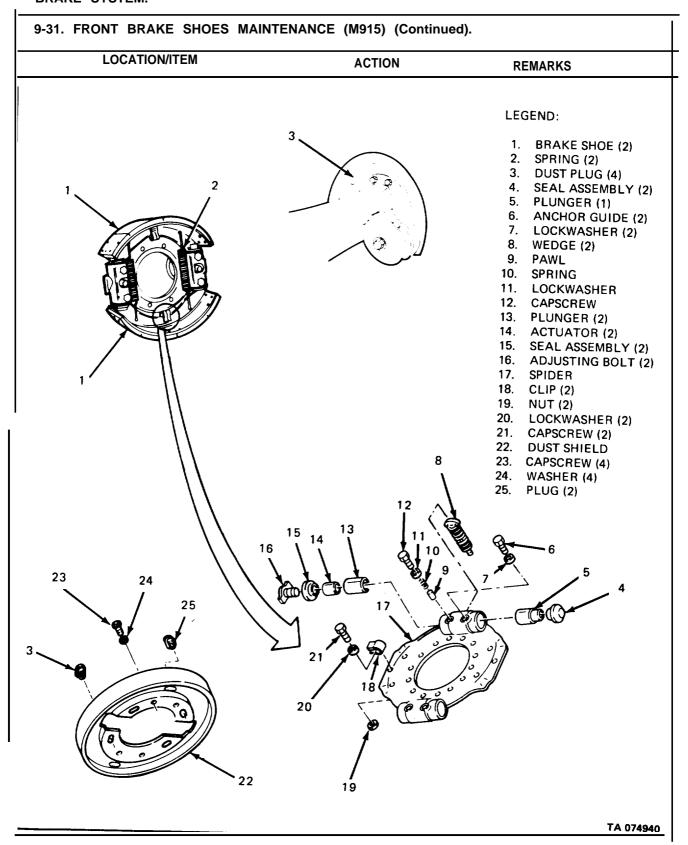
Engine OFF.

Transmission in Neutral.

Park Brake Set.



9-	9-31. FRONT BRAKE SHOES MAINTENANCE (M915) (Continued).			
	LOCATION/ITEM	ACTION	REMARKS	
A.	REMOVAL.			
1.	Two brake springs (2).	Remove with brake spring pliers.	Place notched tip of pliers against hood on spring, unnotched tip against inner ridge of brake shoe (1), squeezing pliers to stretch spring and remove it from the notch.	
2.	Two brake shoes (1).	Remove from clip (18) and lift off shoes.		
3.	Two clips (18), two nuts (19), two lockwashers (20), and two capscrews (21).	Loosen nut (19) and remove capscrew (21), lockwasher (20) and clip (18).	Remove only if damaged or broken.	
4.	Two anchor guides (6) and two lockwashers (7).	Remove.	Remove only if service on actuator is needed.	
5.	Capscrew (12), lockwasher (11), spring (10), and pawl (9).	Remove.	Remove only if service on actuator is needed.	
6.	Two seal assemblies (4), plunger (5), two plungers (13), two actuators (14), two seal assemblies (15), and two adjusting bolts (16).	Remove.	Clean, inspect, and replace as necessary.	
7.	Two wedges (8).	Remove and clean.	Replace if damaged.	
8.	Dust shield (22), four capscrews (23), and four washers (24).	Unscrew capscrews (23).	Remove only if replacement is needed,	
B.	INSPECTION.			
9.	Two brake springs (2), brake shoes (1), seal assemblies (4) and (15) and all hardware.	Inspect for: a. Dirt. b. Wear. c. Damage.	Clean and replace as necessary.	



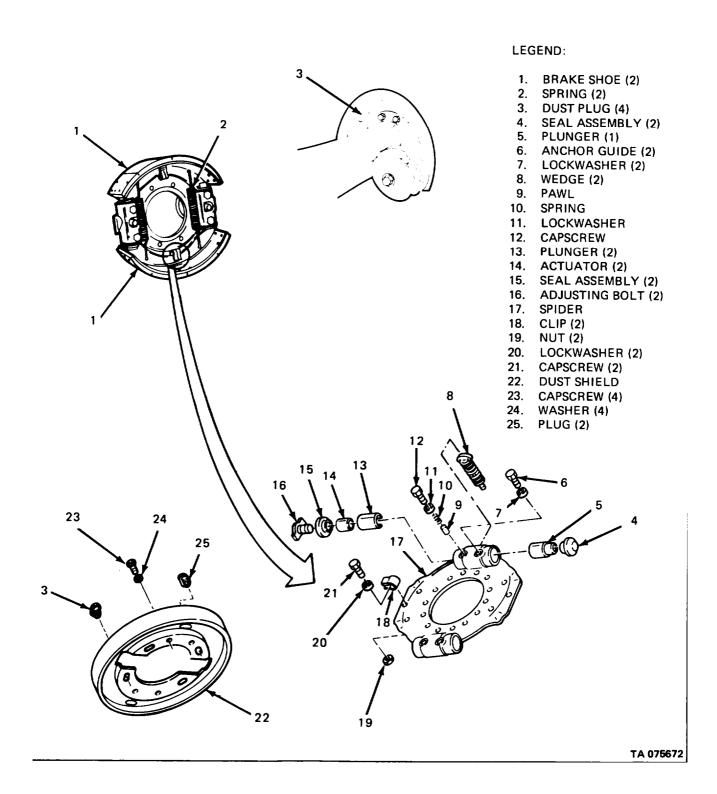
9-31	9-31. FRONT BRAKE SHOES MAINTENANCE (M915) (Continued).				
	LOCATION/ITEM	ACTION	REMARKS		
C.	INSTALLATION.				
10.	Dust shield (22), four capscrews (23), and four washers (24).	Install dust shield (22) and secure with capscrews (23) and washers (24).			
11.	Two wedges (8).	Install into spider (17).			
12.	Plunger (5), two seal assemblies (4), two plungers (13), two actuators (14), two seal assemblies (15), two adjusting bolts (16), two anchor guides (6), and two lockwashers (7).	Install into spider (17) and secure with anchor guide (6), lockwasher (7), capscrew (12), lockwasher (11), spring (10), and pawl (9).			
13.	Two clips (18), two nuts (19), two lockwashers (20), and two capscrews (21).	Install clips (18) and secure with capscrews (21), lockwashers (20), and nuts (19).	Install new if previously removed.		
	sh ar	you replace any brake shoe, replace noes on 'that axle. A combination of not old shoes on the same axle will cau neven braking. Make sure that the braking.	ew se		
	ar no	re clean before you install them. Be can be to get grease or oil on the linings as seemble them.	areful		
14.	Two brake shoes (1).	 a. Apply a thin film of grease to plunger (5) slots for adjusting bolt (16) and shoe rest pads. b. Position shoes on assembly with pads resting in slots for adjusting bolt (16). c. Double-check to be sure that arrows on shoes point in the direction that wheel will rotate. 	Do NOT get any grease on the braking surfaces.		
15.	Two springs (2).	a. Turn to latch shoes in position.b. Install with brake spring pliers. Curved part of each spring must be towards adjacent brake cylinder.			

9-31. FRONT BRAKE SHOES MAINTENANCE (M915) (Continued). LOCATION/ITEM **ACTION REMARKS** LEGEND: 3, 1. BRAKE SHOE (2) SPRING (2) 2. 3. DUST PLUG (4) SEAL ASSEMBLY (2) 2 4. PLUNGER (1) 6. ANCHOR GUIDE (2) 7. LOCKWASHER (2) 8. WEDGE (2) 9. **PAWL** 10. **SPRING** LOCKWASHER 11. 12. **CAPSCREW** PLUNGER (2) 13. 14. ACTUATOR (2) 15. SEAL ASSEMBLY (2) ADJUSTING BOLT (2) 16. 17. SPIDER 18. CLIP (2) 19. NUT (2) 20. LOCKWASHER (2) 21. CAPSCREW (2) 22. **DUST SHIELD** 23. CAPSCREW (4) 24. WASHER (4) 25. PLUG (2) 12 13 15 16 23 24 25 21 20 19 TA 075671

LOCATION/ITEM	ACTION	REMARKS
. INSTALLATION (Conti	nued).	
	NOTE	
	Follow-on maintenance action required before adjustment:	d
	Para 10-12B and C.	
. ADJUSTMENT.		
	WARNING If jack is used, support truck with block so that it will not fall if jack slips.	cks
6. Wheel.	Jack or hoist free of ground.	
7. Two dust plugs (3).	 a. Remove dust plugs (3). b. Insert adjusting spoon, c. Turn starwheel bolt (inside slot) until brakes drag heavily on drums. d. Back off starwheel just until wheels turn freely. e. Replace dust plugs (3). 	

9-31. FRONT BRAKE SHOES Maintenance (M915) (Continued).

LOCATION/ITEM	ACTION	REMARKS



9-32. FRONT BRAKE SHOES MAINTENANCE (M916 thru M920).

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (15) b. Inspection. (5) c. Installation. (15) d. Adjustment. (15)

50 Minutes Total,

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M916 thru M920

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

GAA (Refer to Appendix C). Cotter Pin (2), K227 (78500). Seal, 1205-E-1409 (78500).

EQUIPMENT CONDITION

PARAGRAPH

10-14A.

CONDITION DESCRIPTION

Hub and Drum Removed.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P. LO 9-2320-273-12.

TROUBLESHOOTING REFERENCES

Table 9-1.

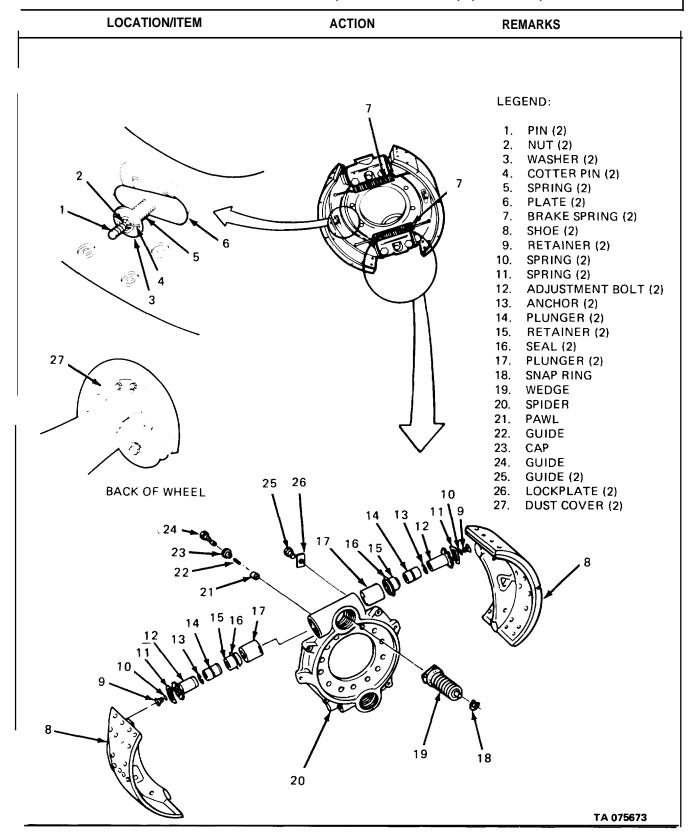
SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

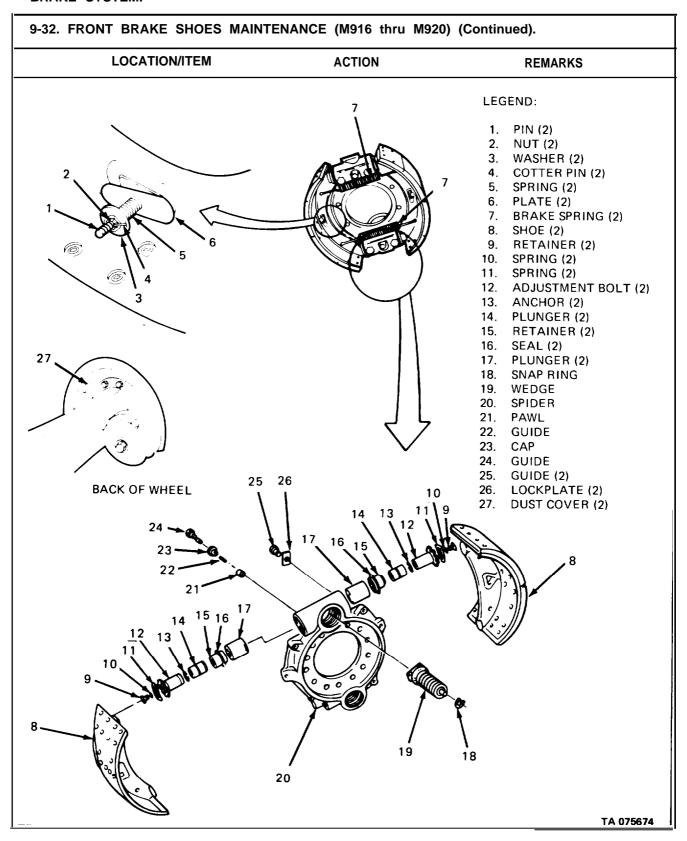
GENERAL SAFETY INSTRUCTIONS

Engine OFF.
Transmission in Neutral.
Park Brake Set.

9-32. FRONT BRAKE SHOES MAINTENANCE (M916 THRU M920) (Continued).



	LOCATION/ITEM	ACTION	REMARKS
A.	REMOVAL.		
1.	Two brake springs (7).	Remove with brake spring pliers.	Place notched tip of pliers against hood on spring, unnotched tip against inner ridge of brake shoe (8), squeezing pliers to stretch spring and remove it from the notch.
2.	Two cotter pins (4).	Remove and discard.	
3.	Two nuts (2) and washers (3).	Remove.	
4.	Two springs (5).	Remove.	
5.	Two plates (6).	Remove.	
6.	Two pins (1).	Remove.	
7.	Two brake shoes (8).	Remove.	
8.	Guide (24), and (22), cap (23), pawl (21), two guides (25), and two lock plates (26).	Remove to provide access to wedge cylinder parts.	Remove for inspection, not normally needed unless trouble is indicated.
9.	Two retainers (9), two springs (10) and (11), two adjusting bolts (12), two anchors (13), two plungers (14), two retainers (15), two seals (16), and two plungers (17).	Remove and clean; discard seals (16).	
10.	Snap ring (18) and wedge (19).	Remove for inspection.	Replace if damaged.
B I	NSPECTION.		
	Brake springs (7), shoes (8), and all hardware.	Inspect for: a. Dirt. b. Wear. c. Damage.	Replace as necessary.



9-32. FRONT BRAKE SHOES MAINTENANCE (M916 THRU M920) (Continued). LOCATION/ITEM ACTION REMARKS

C. INSTALLATION.

CAUTION

If you replace any brake shoe, replace all the shoes on that axle. A combination of new and old shoes on the same axle will cause uneven braking. Make sure that the brake shoes are clean before you install them. Be careful not to get grease or oil on the linings as you assemble them.

12. Wedge (19) and snap ring (18).

Install into spider (20).

Two plungers (17), two new seals (16), two retainers (15), two plungers (14), two anchors (13), two adjusting bolts (12), two springs (10) and (11) and two retainers (9).

Install as shown.

14. Guides (24) and (22), cap (23), pawl (21), two guides (25), and two lockplates (26).

Install pawl (21) with guides (24) and (22), and cap (23).

15. Two brake shoes (8).

Install.

16. Two pins (1), two plates (6), two springs (5), two washers (3), two nuts (2), and two new cotter pins (4).

Install pins (1) and plates (6) with springs (5), washers (3), nuts (2), and new cotter pins (4).

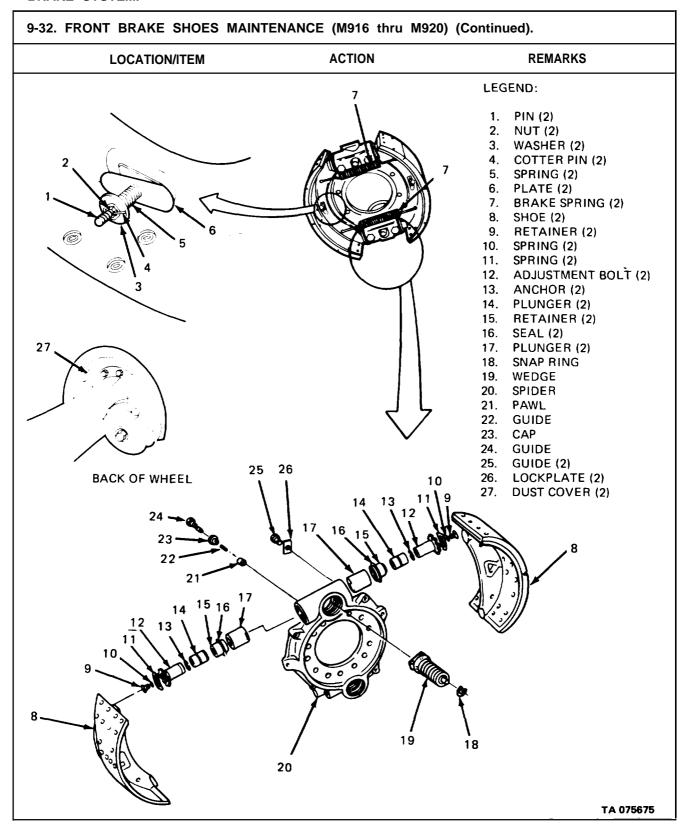
17. Two springs (7).

Install with brake spring pliers.

NOTE

Follow-on maintenance action required before adjustment:

Install hub and drum; refer to para 10-14B and C.



9-32. FRONT BRAKE SHOES MAINTENANCE (M916 THRU M920) (Continued).		
LOCATION/ITEM	ACTION	REMARKS
D. ADJUSTMENT.]		
	WARNING If jack is used, support truck with block so that it will not fall if jack slips.	ks
18. Wheel.	Jack or hoist free of ground.	
19. Two dust covers (27)	ground. a. Remove. b. Insert adjusting tool. c. Turn starwheel bolt (inside slot) until brakes drag heavily on drums. d. Back off starwheel just until wheels turn freely. e. Replace dust covers (27).	

9-32. FRONT BRAKE SHOES MAINTENANCE (M916 thru M920) (Continued). LOCATION/ITEM **ACTION REMARKS** LEGEND: PIN (2) 1. 2. NUT (2) 3. WASHER (2) 4. COTTER PIN (2) 5. SPRING (2) 6. PLATE (2) 7. **BRAKE SPRING (2)** 8. SHOE (2) 9. RETAINER (2) 0 10. SPRING (2) SPRING (2) 11. **ADJUSTMENT BOLT (2)** 12. ANCHOR (2) 13. 14. PLUNGER (2) 15. RETAINER (2) 16. SEAL (2) PLUNGER (2) 27 17. **SNAP RING** 18. 19. WEDGE 20. SPIDER 21. **PAWL** 22. **GUIDE** 23. CAP 24. **GUIDE** 25. GUIDE (2) 25 26 **BACK OF WHEEL** 26. LOCKPLATE (2) 27. DUST COVER (2) 14 15 16 19 18 20 TA 075676

9-33. REAR BRAKE SHOES MAINTENANCE (M915).

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

Removal. (15) Inspection. (15) Installation . (20)

50 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M915.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

Hub and Drum removed.

PARAGRAPH

10-15A.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral Park Brake Set.

TROUBLESHOOTING REFERENCES

9-1.

BRAKE SYSTEM. 9-33. REAR BRAKE SHOES MAINTENANCE (M915) (Continued). LOCATION/ITEM **ACTION REMARKS** 10 22 21 23 30 20 20

LEGEND:

- 1. GASKET 2. LOCKWASHER (4)
- 3. CAPSCREW (4)
- 4. BRACKET ASSEMBLY
- 5. BRACKET ASSEMBLY
- 6. BRACKET
- 7. BRACKET
- 8. BEARING
- 9. SEAL
- 10. WASHER (2)
- 11. WASHER

- 12. RETAINING RING
- 13. ANCHOR PIN (2)
- 14. SPRING (2)
- 15. LOCKSCREW (2)
- 16. SEAL

27

28, 29

- 17. BEARING
- 18. BUSHING (2)
- 19. SPIDER
- 20. SHOE ASSEMBLY (2)
- 21. SHOE (2)
- 22. LINING

- 23. LINING
- 24. RIVET
- 25. PIN (2)
- 26. ROLLER (2)
- 27. WASHER
- 28. CAMSHAFT, RH
- 29. CAMSHAFT, LH
- 30. SPRING
- 31. CAPSCREW (4)
- 32. DUST SHIELD

TA 075677

9-33. REAR BRAKE SHOES MAINTENANCE (M915) (Continued).		
LOCATION/ITEM	ACTION	REMARKS
1. RH and LH camshafts (28) and (29).	Back off on slack adjuster until camshafts (28) and (29) are in fully released position.	
2. Two shoe assemblies (20) and two rollers (26).	With a pry bar, pry upon shoe assemblies (20) and pull out rollers (26).	
3. Spring (30) and two pins (25).	Remove,	
4. Two springs (14).	Tilt shoe assemblies (20) out 180 degrees to release springs (14) and remove.	
5. Two lock screws (15) and two anchor pins (13).	Cut lock wire and loosen lock screw (15) to remove anchor pin (13) and shoe assemblies (20).	
B. INSPECTION.		
6. Camshafts (28) and (29), bearings (17) and (8), and two bushings (18).	Inspect for excessive wear and looseness in bearings (17), bushing (18), and bearing (8).	
7. Two shoe assemblies (20).	Inspect for wear or damage and replace as necessary.	If linings (22) and (23) are to be serviced separately, refer to Direct Support Maintenance as rivets (24) will have to be drilled out of linings and shoes (21).
	NOTE	
Perfo wear	orm steps 8 thru 14 only if excessive has been found.	ve
8. Retaining ring (12) and washer (11).	Remove,	
9. Slack adjuster.	Remove (refer to para 9-39A and B).	

11. WASHER

9-33. REAR BRAKE SHOES MAINTENANCE (M915) (Continued). LOCATION/ITEM **ACTION REMARKS** 10 15 13 32 22 21 23 30 20 20 28, 29 27 LEGEND: 1. GASKET 12. RETAINING RING 23. LINING 13. ANCHOR PIN (2) 24. RIVET 2. LOCKWASHER (4) 25. PIN (2) 14. SPRING (2) 3. CAPSCREW (4) 26. ROLLER (2) 15. LOCKSCREW (2) 4. BRACKET ASSEMBLY 27. WASHER 16. SEAL 5. BRACKET ASSEMBLY 28. CAMSHAFT, RH 6. BRACKET 17. BEARING 29. CAMSHAFT, LH 18. BUSHING (2) 7. BRACKET 30. SPRING 8. **BEARING** 19. SPIDER 9. SEAL 20. SHOE ASSEMBLY (2) 31. CAPSCREW (4) 10. WASHER (2) 21. SHOE (2) 32. DUŞT SHIELD

22. LINING

TA 075678

9-33. REAR BRAKE SHOES MAINTENANCE (M915) (Continued).		
LOCATION/ITEM	ACTION	REMARKS
B. INSPECTION (Continued).		
10. Camshafts (28) and (29), two washers (10), and washer (27).	Remove by tapping gently from rear.	
11. Bracket assemblies (4) and (5) and gasket (1).	Remove by unscrewing four capscrews (3) with four lockwashers (2).	
12. Bearing (8) and seal (9).	Remove from brackets (6) and (7).	
13. Two bushings (18), seal (16), and bearing (17).	Remove from spider (19).	
14. Four capscrews (31) and dust shield (32).	Remove from spider (19).	Remove only if damaged or replacing spider.
C. INSTALLATION.		
15. Two bushings (18), seal (16), and bearing (17).	Push into spider (19).	
16, Bearing (8) and seal (9).	Insert into brackets (6) and (7),	
17. Bracket assemblies (4) and and (5) and gasket (1).	Install and secure with four capscrews (3) and lockwashers (2).	
18. Camshafts (28) and (29) and washer (27).	Install through bearings (17) and (8).	
19. Two shoe assemblies (20) and two anchor pins (13).	a. Install to spider (19)thru two bushings (18).b. Tighten lock screw (15)and install new lock wire.	

9-33. REAR BRAKE SHOES MAINTENANCE (M915) (Continued). **ACTION REMARKS** LOCATION/ITEM 10 22 21 23 30 20 20 27 28, 29 LEGEND: 23. LINING 24. RIVET 25. PIN (2) 26. ROLLER (2) 27. WASHER 28. CAMSHAFT, RH 29. CAMSHAFT, LH 30. SPRING 31. CAPSCREW (4) GASKET 12. RETAINING RING 13. ANCHOR PIN (2) 2. LOCKWASHER (4) 13. ANCHOR PIN (2) 14. SPRING (2) 15. LOCKSCREW (2) 16. SEAL 17. BEARING 18. BUSHING (2) 19. SPIDER 20. SHOE ASSEMBLY (2) 21. SHOE (2) 3. CAPSCREW (4) 4. BRACKET ASSEMBLY 5. BRACKET ASSEMBLY BRACKET 7. **BRACKET** 8. **BEARING** 9. SEAL 31. CAPSCREW (4) 10. WASHER (2) 21. SHOE (2) 32. DUST SHIELD 11. WASHER 22. LINING TA 075679

LOCATION/ITEM	ACTION	REMARKS
C. INSTALLATION (Continued).		
20. Two springs (14).	Hook up springs (14) to shoe assemblies (20).	
21. Two pins (25) and spring (30).	Insert pins (25) into two shoe assemblies (20) and hook spring (30) in position.	
22. Two rollers (26).	With a long handled screwdriver, pry shoe assemblies (20) away from camshafts (28) and (29) and install rollers (26).	Repeat for opposite shoe to install rollers.
23. Dust shield (32) and four capscrews (31).	Install dust shield and secure with capscrews (31) to spider (19).	
24. Two washers (10) and (11), and retainer ring (12).	Install and adjust slack adjuster (refer to para 9-36A and B).	
	NOTE	
	Follow-on maintenance action	required:
	Install hub and drum (refer to	para 10-15C).

9-33. REAR BRAKE SHOES MAINTENANCE (M915) (Continued). LOCATION/ITEM **ACTION REMARKS** 10 11 12 22 21 30 20 20 28, 29 27 LEGEND: 23. LINING24. RIVET 1. GASKET 12. RETAINING RING 13. ANCHOR PIN (2) 2. LOCKWASHER (4) 25. PIN (2) 3. CAPSCREW (4) 14. SPRING (2) 4. BRACKET ASSEMBLY 15. LOCKSCREW (2) 26. ROLLER (2) 5. BRACKET ASSEMBLY 16. SEAL 27. WASHER 28. CAMSHAFT, RH 6. BRACKET 17. BEARING 29. CAMSHAFT, LH 7. BRACKET 18. BUSHING (2) 19. SPIDER 30. SPRING 8. BEARING 20. SHOE ASSEMBLY (2) 31. CAPSCREW (4) 9. SEAL 32. DUST SHIELD 10. WASHER (2) 21. SHOE (2) 11. WASHER 22. LINING TA 075680

9-34. REAR BRAKE SHOES MAINTENANCE (M916 THRU M920).

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (15)
b. Inspection, (15)
c. Installation. (20)

50 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M916 Thru M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

Snap Ring Pliers. Brake Spring Pliers.

MATERIAL/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

Hub and Drum Removed.

PARAGRAPH

10-14A.

REFERENCES (TM)

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

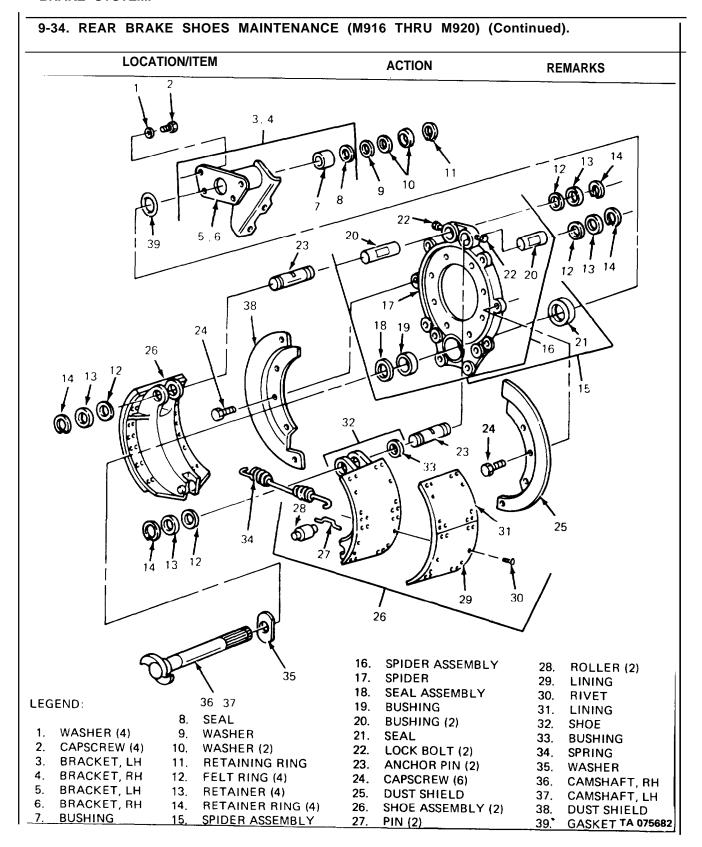
Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 9-1.

9-34. REAR BRAKE SHOES MAINTENANCE (M916 THRU M920) (Continued). LOCATION/ITEM **ACTION REMARKS** 3,4 39 13 14 12 22 20 38 **(** 18 24 26 14 13 15 24 23 25 31 34 30 29 26 16. SPIDER ASSEMBLY 28. ROLLER (2) 35 17. SPIDER 29. LINING 18. SEAL ASSEMBLY 30. RIVET 36 37 LEGEND: 19. BUSHING 31. LINING 8. SEAL 20. BUSHING (2) 32. SHOE WASHER (4) 9. WASHER 21. SEAL 33. BUSHING 2. CAPSCREW (4) 10. WASHER (2) 22. LOCK BOLT (2) 34. SPRING 3. BRACKET, LH 11. **RETAINING RING** 23. ANCHOR PIN (2) 35. WASHER 4. BRACKET, RH 12. 24. CAPSCREW (6) FELT RING (4) 36. CAMSHAFT, RH 5. BRACKET, LH 13. RETAINER (4) 25. DUST SHIELD 37. CAMSHAFT, LH 6. BRACKET, RH 14. **RETAINER RING (4)** 26. SHOE ASSEMBLY (2) 38. DUST SHIELD 7. BUSHING GASKET TA 075681 15. SPIDER ASSEMBLY 27. PIN (2) 39.

9-34. REAR BRAKE SHOES MAINTENANCE (M916 THRU M920) (Continued).			
LOCATION/ITE	M ACTI	ION REMARKS	
A. REMOVAL.			
1. Camshafts (36) and (Back off on sla- until camshafts released positio	are in the	
2. Two brake shoe asser (26) and two rollers (e shoe) away from and (37),	
3. Spring (34) and two p	oins Remove.	Use brake spring pliers.	
4. Two retainer rings (1- two retainers (13), an two felt rings (12).			
5. Two lockbolts (22), to anchor pins (23), two retainer rings (14), two retainers (13), and two felt rings (12).	b. Loosen lock o and pull anch	bolts (22) hor pins (23) er rings (14), 3) and felt	
6. Two shoe assemblies and bushings (33).	(26) Remove.		
7. Two bushings (20).	Remove.	Inspect for wear.	
8. Retaining ring (11), t washers (10), washer and camshafts (36) an and washer (35).	(9),	Remove only if excessive looseness is evident.	
9. Four capscrews (2), f washers (1), and brac (3) and (4).		asket (39).	
10. Two bushings (7) and seals (8).	Remove from b (5) and (6).	prackets	
11. Seal assembly (18), bushing (19), and sea	Remove. I (21).	Replace only if excessive wear is evident.	
12. Six capscrews (24).	Unscrew and re shields (25) and		
13. Spider (17).	Replace only if damaged.	broken or	



9-34. REAR BRAKE SHOES MAINTENANCE (M916 THRU M920) (Continued).

LOCATION/ITEM ACTION REMARKS

B. INSPECTION.

- 14. Gasket (39), seals (8), (18), and (21), bushings (7), (19), (20) and (23), and camshafts (36) and (37), and shoe assemblies (26).
- a. Inspect for wear and replace as needed.
- b. If linings (29) and (31) are to be serviced separately, refer to Direct Support Maintenance as rivets (30) will have to be drilled out and replaced with new.

C. INSTALLATION.



If you replace any brake shoe, replace all the shoes on that axle. A combination of new and old shoes on the same axle will cause uneven braking. Make sure that the brake shoes are clean before you install them. Be careful not to get grease or oil on the linings as you assemble them.

15. Bushing (19), seal assembly (18), and seal (21).

Push seal (21) in place then bushing. (19), and seal assembly (18).

16. Brackets (5) and (6), bushing (7) and seal (8).

Push bushing (7) into place then install seal (8).

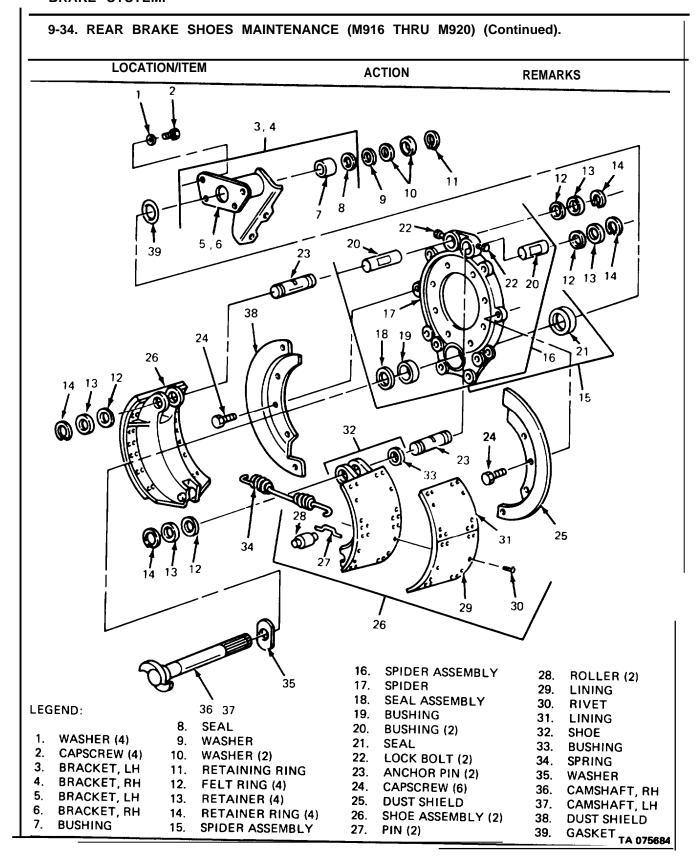
17. Brackets (3) and (4), and gasket (39).

Install one gasket (39) into brackets (3) and (4) and secure with four capscrews (2) and washers (1).

- 18. Camshafts (36) and (37) and washer (36).
- a. Install one washer (35) on on each camshaft and install through bushings (19) and (7).
- b. Install washers (9) and (10) then retaining ring (11).
- c. Position two shoe assemblies (26).
- 19. Two anchor pins (23) and two bushings (20).
- a. Install anchor pins (23) through shoe assemblies (26).
- b. Install bushings (20) into spider (17).
- c. Tighten lock bolt (22) and install lockwire.

9-34. REAR BRAKE SHOES MAINTENANCE (M916 THRU M920) (Continued). LOCATION/ITEM **ACTION REMARKS** 3,4 12 13 14 22 20 38 **@** 24 26 14 13 15 32 24 23 25 31 34 30 29 26 16. SPIDER ASSEMBLY 28. ROLLER (2) 35 17. SPIDER 29. LINING 18. SEAL ASSEMBLY 30. RIVET 36 37 LEGEND: 19. BUSHING 31. LINING 8. SEAL 20. **BUSHING (2)** 32. SHOE WASHER (4) 9. WASHER 21. SEAL 33. BUSHING 34. SPRING CAPSCREW (4) 10. WASHER (2) 22. LOCK BOLT (2) BRACKET, LH 11. RETAINING RING 23. ANCHOR PIN (2) 35. WASHER BRACKET, RH 12. FELT RING (4) 24. CAPSCREW (6) 36. CAMSHAFT, RH BRACKET, LH 13. **RETAINER (4)** 25. DUST SHIELD 37. CAMSHAFT, LH BRACKET, RH 14. RETAINER RING (4) 26. SHOE ASSEMBLY (2) 38. DUST SHIELD **BUSHING** 15. SPIDER ASSEMBLY 39. GASKET_{TA 075683} 27. PIN (2)

ACTION	REMARKS
Slide onto anchor pins (23) from rear.	
Install on anchor pin (23) from front side and secure.	Use snap ring pliers on retainer rings (14).
Install pins (27) and hook on spring (34) with brake spring pliers.	
With long screwdriver pry up on shoe assembly (26) and install roller (28).	Repeat operation for opposite shoe.
Install with six capscrews (24).	
Adjust (see para 9-39A and B).	
NOTE	
ow-on maintenance action require	ed:
tall hub and drum; refer to para 1	0-14C
, , , , , , , , , , , , , , , , , , ,	
	Install on anchor pin (23) from front side and secure. Install pins (27) and hook on spring (34) with brake spring pliers. With long screwdriver pry up on shoe assembly (26) and install roller (28). Install with six capscrews (24). Adjust (see para 9-39A and B).



9-35. PUSHER AXLE BRAKE SHOES MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (15) b. Inspection. (5) c. Installation. (15) d. Adjustment. (15)

50 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M917, M919, M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

GAA (Refer to Appendix C).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P. LO 9-2320-273-12.

TROUBLESHOOTING REFERENCES

Table 9-1.

EQUIPMENT CONDITION

PARAGRAPH

10-16A.

CONDITION DESCRIPTION

Hub and Drum Removed.

SPECIAL ENVIRONMENTAL CONDITIONS

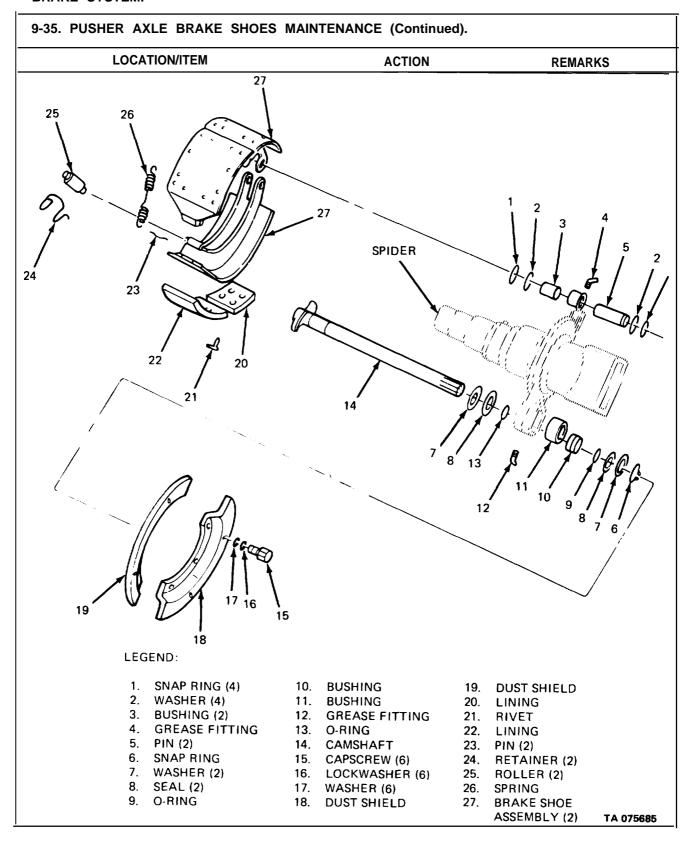
Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

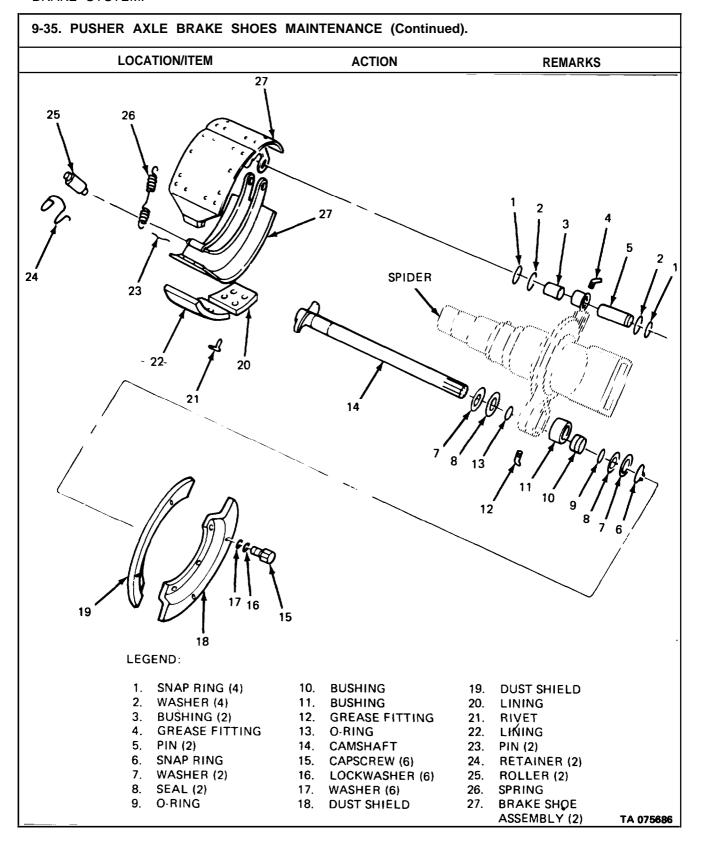
Engine OFF.

Transmission in Neutral.

Park Brake Set.

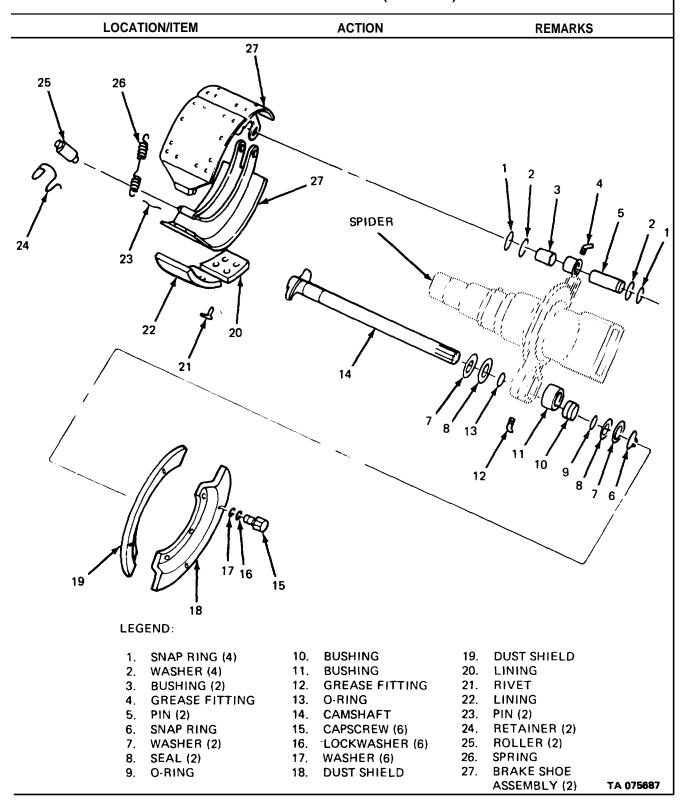


9-35. PUSHER AXLE BRAKE SHOES MAINTENANCE (Continued).			
LC	OCATION/ITEM	ACTION	REMARKS
A. REMOVA	<u>L.</u>		
Two brake assemblies		With a long handle screw- driver lift brake shoe assemblies and remove two rollers (25) and retainers (24).	
2. Spring (26 pins (23).) and two	Remove.	
	rings (1), four 2) and two pins	From rear side remove snap ring (1) and washer (2), then pull out pin (5).	
4. Two brake assemblies		Lift off.	
5. Two bushir grease fitt		Remove.	
(7), two se	(6), two washers eals (8), O-ring O-ring (13).	Remove and pull camshaft (14) out of spider.	
7. Bushing (1 (11), and	0), bushing grease fitting (12).	Remove.	
six capscr	shers (16), and	Remove.	Remove only if damaged and replacement is needed.
B. INSPECTION	ON.		
	s (27), O-ring g (13) and all	Inspect for: a. Dirt. b. Wear. c. Damage	Replace as necessary.
NOTE			
	If lining (22) is to be replaced separately, rivets (21) will have to be drilled out and replaced with new. Refer to Direct Support Maintenance.		



9-35. PUSHER AXLE BRAKE SHOES MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM C. INSTALLATION. CAUTION If you replace any brake shoe, replace all the shoes on that axle. A combination of new and old shoes on the same axle will cause uneven braking. Make sure that the brake shoes are clean before you install them. Be careful not to get grease or oil on the linings as you assemble them. 10. O-ring (13), seal (8), Install bushings (10) and washer (7), and camshaft (11), O-ring (13), seal (8), washer (7), and then install (14).camshaft (14) thru bushings (10)and(11). Install. 11. O-ring (9), seal (8), washer (7), snap ring (6), and grease fitting (12). Install into spider. 12. Two bushings (3) and grease fitting (4). Place on spider. 13. Two brake shoe assemblies (27).14. Two pins (5), two washers Install snap ring (1) on pin (2) and two snap rings (1). (5) with washer (2) and push through brake shoe assembly (27) and bushing (3). Install washer (2) on back side 15. Two washers (2) and two of pin (5) and install snap ring (1). snap rings (1). Install pins (23) and hook UP 16. Spring (26) and two pins (23). spring (26). With long handle screwdriver Repeat operation for opposite 17. Two rollers (25) and two raise brake shoe to allow shoe. retainers (24). room to install roller (25) and retainer (24).

9-35. PUSHER AXLE BRAKE SHOES MAINTENANCE (Continued).



9-35. PUSHER AXLE BRAKE SHOES MAINTENANCE (Continued).

LOCATION/ITEM ACTION

C. INSTALLATION (Continued).

18. Dust shields (18) and (19).

Install and secure with six capscrews (15), lockwashers (16), and washers (17).

If previously removed.

REMARKS

NOTE

Follow-on maintenance action required:

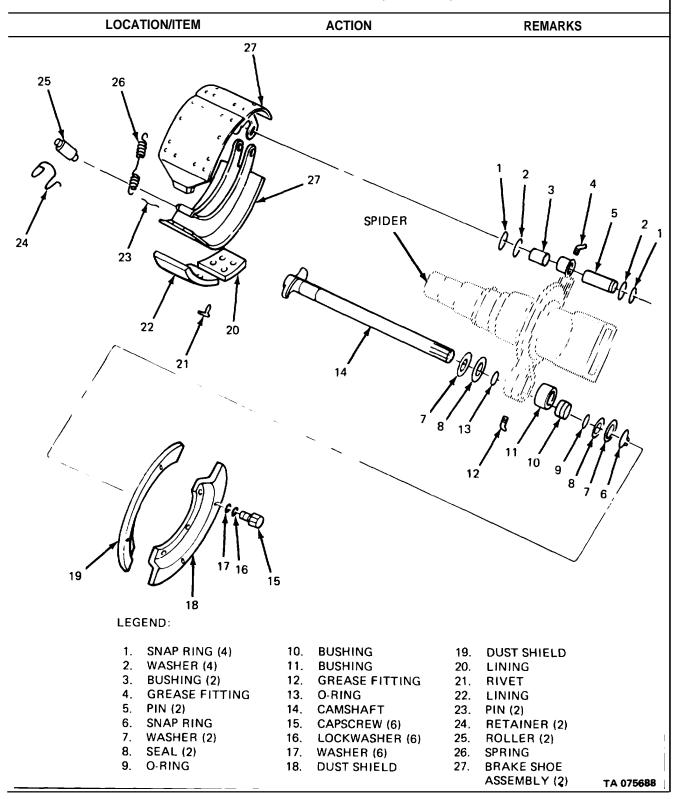
Install hub and drum; refer to para 10-16C.

D. ADJUSTMENT.

19. Adjust slack adjuster.

See para 9-39.

9-35. PUSHER AXLE BRAKE SHOES MAINTENANCE (Continued).



9-36. FRONT BRAKE AIR CHAMBER MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (15)
b. Disassembly. (15)
c. Reassembly. (15)
d Installation. (15)

e Operational Check. (10)
70 Minutes Total.

INITIAL SETUP

EQUIPMENT CONDITION

9-13A.

APPLICABLE CONFIGURATIONS

PARAGRAPH

CONDITION DESCRIPTION

Air Reservoirs Drained.

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C). Soap and Water Solution.

PERSONNEL REQUIRED

SPECIAL ENVIRONMENTAL CONDITIONS

Two (MOS-63B20). Vehicle Parked on Level Ground.

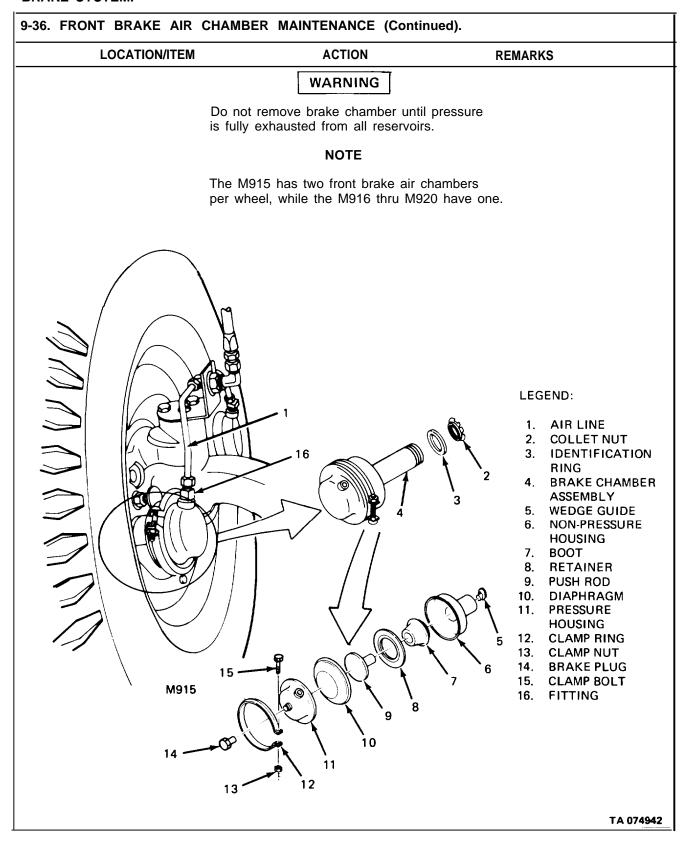
REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P. **GENERAL SAFETY INSTRUCTIONS**

Engine OFF. Transmission in Neutral. Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 9-1.



9-36. FRONT BRAKE AIR CHAMBER MAINTENANCE (Continued).		
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL.		
1. Air line (1).	a. Unscrew and remove.b. Inspect for: Cracks.Leaks.Damaged fittings.	Replace if necessary.
2. Collet nut (2).	Loosen.	M915 only.
3. Fitting (16).	Remove.	
 Brake chamber assembly (4) and identification ring (3). 	Unscrew and remove the brake chamber; the identification ring can also be removed now.	Be careful not to lose wedge guide (5).
B. DISASSEMBLY.		
5. Brake plug (14).	Remove.	M916 thru M920.
6. Clamp bolt (15) and clamp	Unscrew and remove clamp ring (12).	
 Pressure housing (11) and non-pressure housing (6). 	Pull apart for access to boot (7), retainer (8), push rod (9), and diaphragm (10).	
C. REASSEMBLY.		
8. Boot (7), retainer (8), push rod (9), and diaphragm (10).	Assemble within non- pressure housing (6) and pressure housing (11).	Be sure to assemble as illustrated.
9. Clamp ring (12).	Secure to housings (6) and (11) with clamp bolt (14) and clamp nut (13).	
10. Brake plug (14).	Install into pressure housing (11).	M916 thru M920.
11. Wedge guide (5).	Insert into non-pressure housing (6).	

9-36. FRONT BRAKE AIR CHAMBER MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** LEGEND: 1. AIR LINE 2. COLLET NUT IDENTIFICATION RING BRAKE CHAMBER **ASSEMBLY** WEDGE GUIDE NON-PRESSURE HOUSING 7. **BOOT** 8. RETAINER **PUSH ROD** 9. 10. **DIAPHRAGM** 11. **PRESSURE HOUSING CLAMP RING** 12. 13. **CLAMP NUT BRAKE PLUG** 14. 15 **CLAMP BOLT** 15. M915 16. FITTING 13

TA 075689

D. INSTALLATION. 12. Brake chamber assembly (4) and identification ring (3) onto neck of brake chamber assembly (4) and identification ring (3). 13. Fitting (16). 14. Airline (1). 15. Engine. 16. Cab/brake pedal. 17. Front brake air chamber assembly (4). 18. Vehicle. 19. Engine. 20. Slip identification ring (3) onto neck of brake chamber assembly (4). 21. Screw on collet nut (2) and tighten. 22. Coat threads with liquid tef lon. 23. Coat threads with liquid tef lon. 24. Coat threads with liquid tef lon. 25. Screw into fitting (16) and tighten. 26. Screw into fitting (16) and tighten. 27. Allow system to reach operating pressure of 105-120 psi (725-827 kPa). 28. Check that brakes apply when pedal is pressed. 29. Use soap solution to check for leaks. 20. Use soap solution to check for leaks. 20. Stut down (see TM 9-2320-273-10). 20. Start up (see TM 9-2320-273-10). 21. Start up (see TM 9-2320-273-10). 22. Start up (see TM 9-2320-273-10). 23. Slip identification ring (3) onto neck of brake chamber assembly (4) and tighten. 24. Coat threads with liquid tef lon. 25. Screw brake chamber assembly (16) and tighten. 26. Coat threads with liquid tef lon. 27. Screw into brake chamber assembly (16) and tighten. 28. Coat threads with liquid tef lon. 29. Coat threads with liquid tef lon. 20. Coat threads with liquid tef lon. 21. Coat threads with liquid tef lon. 22. Coat threads with liquid tef lon. 23. Coat threads with liquid tef lon. 24. Coat threads with liquid tef lon. 25. Crew brake chamber assembly (4) and tighten. 26. Coat threads with liquid tef lon. 27. Coat threads with liquid tef lon. 28. Coat threads with liquid tef lon. 29. Coat threads with liquid tef lon. 20. Coat threads with liquid tef lon. 20. Coat threads with liquid teflon. 20. Coat	9-36. FRONT BRAKE AIR CHAMBER MAINTENANCE (Continued).		
12. Brake chamber assembly (4) and identification ring (3). (4) and identification ring (3). 13. Fitting (16). 13. Fitting (16). 14. Airline (1). 15. Engine. 16. Cab/brake pedal. 17. Front brake air chamber assembly (4). 18. Vehicle. 19. Engine. 20. Slip identification ring (3) onto neck of brake chamber assembly (4). 21. Screw on collet nut (2) and tighten. 22. Coat threads with liquid tef lon. 23. Coat threads with liquid tef lon. 24. Airline (1). 25. Screw into brake chamber assembly (4) and tighten. 26. Screw into fitting (16) and tighten. 27. Start up (see TM 9-2320-273-10). Allow system to reach operating pressure of 105-120 psi (725-827 kPa). 28. Check that brakes apply when pedal is pressed. 29. Use soap solution to check for leaks. 20. Start up (see TM 9-2320-273-10). Allow system to reach operating pressure of 105-120 psi (725-827 kPa). 20. Start up (see TM 9-2320-273-10). Allow system to reach operating pressure of 105-120 psi (725-827 kPa). 20. Screw on collet nut (2) and tighten. 20. Screw on collet nut (2) and tighten. 21. Start up (see TM 9-2320-273-10). Allow system to reach operating pressure of 105-120 psi (725-827 kPa). 22. Screw on collet nut (2) and tighten. 23. Coat threads with liquid tef lon. 24. Start up (see TM 9-2320-273-10). Allow system to reach operating pressure of 105-120 psi (725-827 kPa). 25. Screw on collet nut (2) and tighten. 26. Screw on collet nut (2) and tighten. 27. Screw brake chamber assembly (4). 28. Coat threads with liquid tef lon. 29. Start up (see TM 9-2320-273-10). Allow system chamber assembly (4). 29. Screw into brake chamber assembly (4). 20. Screw into brake chamber assembly (4). 21. Screw into brake chamber assembly (4). 22. Screw into brake chamber assembly (4). 23. Screw into brake chamber assembly (4).	LOCATION/ITEM	ACTION	REMARKS
(4) and identification ring (3). b. Screw on collet nut (2) and tighten. c. Screw brake chamber assembly (4). b. Screw on collet nut (2) and tighten. c. Screw brake chamber assembly (4) into wheel backing plate. a. Coat threads with liquid tef Ion. b. Screw into brake chamber assembly (4) and tighten. a. Coat threads with liquid tef Ion. b. Screw into fitting (16) and tighten. 5. Coperational Check. 5. Engine. Start up (see TM 9-2320-273-10). Allow system to reach operating pressure of 105-120 psi (725-827 kPa). 7. Front brake air chamber assembly (4). 8. Check that brakes apply when pedal is pressed. b. Use soap solution to check for leaks. 8. Vehicle. Road test. Check for proper braking. 9. Shut down (see TM 9-2320-	D. INSTALLATION.		
tef Ion. b. Screw into brake chamber assembly (4) and tighten. 14. Airline (1). a. Coat threads with liquid teflon. b. Screw into fitting (16) and tighten. E. OPERATIONAL CHECK. Start up (see TM 9-2320-273-10). Allow system to reach operating pressure of 105-120 psi (725-827 kPa). Press down. 16. Cab/brake pedal. Press down. 2nd mechanic. 17. Front brake air chamber assembly (4). a. Check that brakes apply when pedal is pressed. b. Use soap solution to check for leaks. Road test. Check for proper braking. 19. Engine. Shut down (see TM 9-2320-	(4) and identification	onto neck of brake chamber assembly (4). b. Screw on collet nut (2) and tighten. c. Screw brake chamber assembly (4) into wheel backing	
teflon. b. Screw into fitting (16) and tighten. E. OPERATIONAL CHECK. Start up (see TM 9-2320-273-10). Allow system to reach operating pressure of 105-120 psi (725-827 kPa). 16. Cab/brake pedal. Press down. 2nd mechanic. 17. Front brake air chamber assembly (4). a. Check that brakes apply when pedal is pressed. b. Use soap solution to check for leaks. 18. Vehicle. Road test. Check for proper braking. Shut down (see TM 9-2320-	13. Fitting (16).	tef Ion. b. Screw into brake chamber	
Start up (see TM 9-2320-273- 10). Allow system to reach operating pressure of 105-120 psi (725-827 kPa). 16. Cab/brake pedal. Press down. 2nd mechanic. 17. Front brake air chamber assembly (4). a. Check that brakes apply when pedal is pressed. b. Use soap solution to check for leaks. 18. Vehicle. Road test. Check for proper braking. 19. Engine. Shut down (see TM 9-2320-	14. Airline (1).	teflon. b. Screw into fitting (16) and	
10). Allow system to reach operating pressure of 105-120 psi (725-827 kPa). 16. Cab/brake pedal. Press down. 2nd mechanic. 17. Front brake air chamber assembly (4). a. Check that brakes apply when pedal is pressed. b. Use soap solution to check for leaks. 18. Vehicle. Road test. Check for proper braking. 19. Engine. Shut down (see TM 9-2320-	. OPERATIONAL CHECK.		
 17. Front brake air chamber assembly (4). a. Check that brakes apply when pedal is pressed. b. Use soap solution to check for leaks. 18. Vehicle. Road test. Check for proper braking. 19. Engine. Shut down (see TM 9-2320- 	5. Engine.	10). Allow system to reach operating pressure of 105-120	
assembly (4). when pedal is pressed. b. Use soap solution to check for leaks. Road test. Check for proper braking. Shut down (see TM 9-2320-	16. Cab/brake pedal.	Press down.	2nd mechanic.
9. Engine. Shut down (see TM 9-2320-		when pedal is pressed. b. Use soap solution to check	1st mechanic.
	18. Vehicle.		
	19. Engine.		

9-32. FRONT BRAKE AIR CHAMBER MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** LEGEND: 1. AIR LINE **COLLET NUT IDENTIFICATION** RING **BRAKE CHAMBER ASSEMBLY WEDGE GUIDE** NON-PRESSURE HOUSING **BOOT** RETAINER 9. **PUSH ROD** 10. DIAPHRAGM **PRESSURE** HOUSING 12. **CLAMP RING** 13. **CLAMP NUT** 14. **BRAKE PLUG** 15 **CLAMP BOLT** 15. M915 16. FITTING TA 075690

9-32. REAR BRAKE AIR CHAMBER MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Caging Power Spring. (5)
b. Removal. (20)
c. Installation (25)
d. Uncaging Power Spring. (10)
e. Operational check. (2)

62 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

EQUIPMENT CONDITION

PARAGRAPH

None.

CONDITION DESCRIPTION

None.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C). Soap and Water Solution.

PERSONNEL REQUIRED

Two (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

GENERAL SAFETY INSTRUCTIONS

Engine OFF. Wheels Blocked. Transmission in Neutral.

TROUBLESHOOTING REFERENCES

Table 9-1.

9-37. REAR BRAKE AIR CHAMBER MAINTENANCE (Continued).

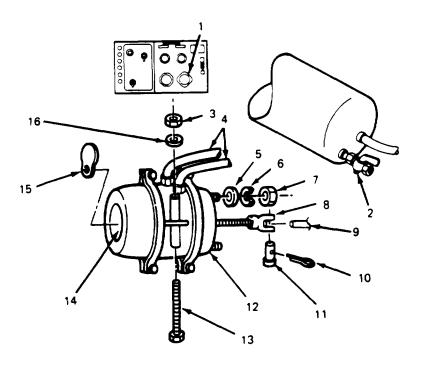
LOCATION/ITEM ACTION REMARKS

WARNING

Block the truck wheels before you cage the power spring, since caging the spring releases the parking brakes.

WARNING

The spring brake chamber contains a powerful spring. Do not remove the clamp rings or disassemble the chambers even with the compression spring caged. Refer to DS/GS Maintenance if internal service is required.



LEGEND:

- 1. PARK BRAKE CONTROL
- 2. MANUAL DRAIN VALVE
- 3. RELEASE NUT
- 4. AIR LINE (2)
- 5. FLAT WASHER (2)
- 6. LOCKWASHER (2)
- 7. NUT (2)
- 8. YOKE
- 9. SLACK ADJUSTER
- 10. COTTER KEY
- 11. PIN
- 12. AIR CHAMBER
- 13. RELEASE STUD
- 14. ACCESS HOLE
- 15. CAP
- 16. WASHER

TA216416

9-37. REAR BRAKE AIR CHAMBER MAINTENANCE (Continued).		
LOCATION/ITEM	ACTION	REMARKS
A. CAGING POWER SPRING.		
Do no torque	t use an impact wrench with a setting higher than 30 lb-ft m) to cage power spring.	
1. Wheels	Block.	
2. CAB/Park brake control (1).	Push to release park brakes.	
3. Cap(15).	Pull out from access hole (14).	
4. Release nut (3) and washer (16).	Unscrew from release stud (13). Remove stud from its holder.	
5. Release stud (13).	 a. Insert stud through access hole (14) and turn 1/4 turn to secure cross pin into pressure plate. b. Screw on nut (3) and washer (16). c. Turn release stud assembly with wrench until compression spring is fully caged. 	
B. REMOVAL.		
6. Manual drain valves (2).	 a. Turn to drain air pressure. Exhaust pressure from both service reservoirs on the M915, M916, and M918 at all three service reservoirs on the M917, M919 and M920. b. Close drain valves. 	nd
7. Two air lines (4).	a. Use tape to mark air lines.	This will help you connect them properly during
	b. Unscrew and removec. Inspect for:1. Cracks.2. Leaks.3. Damaged fittings.	installation. Replace if necessary.
8. Cotter key (10) and pin (11).	Remove.	
9. Yoke (8).	Disconnect from slack adjuster ((9).
10. Two nuts (7), lockwashers (6), and flat washers (5).	Unscrew and remove. Remove air chamber (12).	

9-37. REAR BRAKE AIR CHAMBER MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

C. INSTALLATION.

11. Air chamber (12).

Position on mounting bracket.

Exhaust check valve should point down.

12. Two nuts (7), lockwashers (6) and flat washers (5).

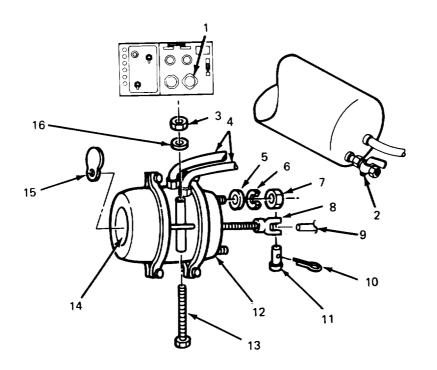
a. Screw on. b. Tighten nuts to 100 lb-ft (136 N·m) with torque wrench.

NOTE

Upper nut on both chambers cannot be torqued unless a 15/16 crowfoot is used.

13. Yoke (8) Attach to slack adjuster (9).

14. Pin (11) and cotter key (10). Install in yoke (8).



LEGEND:

- 1. PARK BRAKE CONTROL
- 2. MANUAL DRAIN VALVE
- 3. RELEASE NUT
- 4. AIR LINE (2)
- 5. FLAT
- WASHER (2) 6. LOCKWASHER (2)
- 7. NUT (2)
- 8. YOKE
- 9. SLACK ADJUSTER
- 10. COTTER KEY
- 11. PIN
- 12. AIR CHAMBER
- 13. RELEASE STUD
- 14. ACCESS HOLE
- 15. CAP
- 16. WASHER

TA 074952

9-37. REAR BRAKE AIR CHAMBER MAINTENANCE (Continued).		
LOCATION/ITEM	ACTION	REMARKS
C. INSTALLATION (Continued).		
15. Two air lines (4).	a. Coat threads with liquid teflon.b. Screw in and tighten.	Be sure to connect each
16. Manual drain valves (2).	Ensure they are closed.	line to the correct port.
D. UNCAGING POWER SPRING.		
17 Engine.	Start up (see TM 9-2320-273-10). Allow system to reach operating pressure of 105-120 psi (724-827 kPa).	
18. CAB/Park brake control (1).	Push in.	
19. Release stud (13).	 a. Turn nut (3) with washer (16) to release spring. b. Remove nut (3) and washer (16) from stud (13). c. Turn stud (13) 1/4 turn counterclockwise (left) and remove from access hole (14). d. Insert stud (13) into holder and secure with washer (16) and nut (3). 	
20. Cap (15).	Press into access hole (14).	
E. OPERATIONAL CHECK.		
	NOTE	
sure	ational check requires system pres- of at least 100 psi (690 kPa). Run e until this pressure is reached.	
21. Engine.	Shut down.	
22. CAB/Park brake control (1).	a. Push in. b. pull out.	Second mechanic.
23. Air chamber (12).	 Should actuate when valve is pulled out, and release when valve is pushed in. 	First mechanic.

9-37. REAR BRAKE AIR CHAMBER MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM E. OPERATIONAL CHECK (Continued). b. Use soap solution to check for leaks. Second mechanic. a. Press down. 24. CAB/Brake pedal. b. Release. Should apply when pedal is 25. Air chamber (12). pressed, and release when pedal is released. LEGEND: 1. PARK BRAKE CONTROL MANUAL DRAIN **VALVE** 16 3. RELEASE NUT AIR LINE (2) FLAT WASHER (2) LOCKWASHER (2) NUT (2) 7. 8. YOKE SLACK **ADJUSTER** 10. **COTTER KEY** 11. PIN 12. AIR CHAMBER 13. RELEASE STUD 14. **ACCESS HOLE** 15. CAP 11 16. WASHER 13

TA 074953

9-38. PUSHER AXLE BRAKE AIR CHAMBER MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (10) b. Disassembly. (15) c. Assembly. (15) d. Installation. (10)

50 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

EQUIPMENT CONDITION

PARAGRAPH

9-13A.

CONDITION DESCRIPTION

Air Reservoirs Drained.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Tape.

Marking Pen.

Liquid Teflon (Refer to Appendix C).

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Wheels Blocked.

TROUBLESHOOTING REFERENCES

Table 9-1.

9-38. PUSHER AXLE BRAKE AIR	CHAMBER MAINTENANCE	(Continued).
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL.		
1. Air line (3).	Unscrew and remove from fitting (2).	
2. Fitting (2).	Remove from housing (4).	
3. Cotter key (13) and pin (14).	Remove and disassemble yoke (12) on push rod (9) from slack adjuster (15)	
10 16 18 15 12 14 13	9 January 11	LEGEND: 1. AIR CHAMBER 2. FITTING 3. AIR LINE 4. HOUSING 5. DIAPHRAGM 6. CLAMP RING 7. CLAMP BOLT (2) 8. NUT (2) 9. PUSH ROD 10. SPRING 11. HOUSING 12. YOKE 13. COTTER KEY 14. PIN 15. SLACK ADJUSTER 16. NUT (2) 17. WASHER (2) 18. NUT TA 074954

9-38. PUSHER AXLE BRAKE AIR CHAMBER MAINTENANCE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
A. REMOVAL (Continued).			
4. Two nuts (16) and washers (17).	Unscrew and remove housing (11) with assembled air chamber (1) from mounting bracket on vehicle.		
B. DISASSEMBLY.			
5. Push rod (9).	a. Wrap with tape.b. Apply suitable pressure with vice grips to retain spring (10) in position.	Clamp vise grips onto rod close to housing (11).	
6. Assembled housings (4) and (11).	Using marker pencil, draw a line from one end to the other.	You will use this line to aline parts during reassembly.	
7. Two nuts (8).	Unscrew and remove clamp bolts (7).		
8. Clamp ring (6).	Pull apart and separate housings (4) and (11) for access to diaphragm (5).	Replace diaphragm if necessary.	
C. ASSEMBLY.			
9. Diaphragm (5).	Position between housings (4) and (11).	Use the line you drew in step 6 to aline housings.	
10. Clamp ring (6).	Position over housings joint and secure with two clamp bolts (7), and nuts (8).		
11. Push rod (9).	a. Remove vise grips.b. Remove tape.		
D. INSTALLATION.			
12. Housing (11) with assembled air chamber.	Position housing studs thru vehicle mounting bracket and secure with two washers (17) and nuts (16).		
13. Slack adjuster (15) and yoke (12) on push rod (9).	Aline holes, slide pin (14) in position and secure with new cotter key (13).		

LOCATION/ITEM	ACTION	REMARKS
D. INSTALLATION (Continued	<u>,,</u>	
14. Fitting (2).	a. Apply liquid teflon to threads.b. Screw into housing (4) and tighten.	
15. Air line (3).	a. Apply liquid teflon to hose fitting threadsb. Screw into fitting (2) and tighten.	3 2 4
	10 9	
17 16 18 15 12 14 13	11	LEGEND: 1. AIR CHAMBER 2. FITTING 3. AIR LINE 4. HOUSING 5. DIAPHRAGM 6. CLAMP RING 7. CLAMP BOLT (2) 8. NUT (2) 9. PUSH ROD 10. SPRING 11. HOUSING 12. YOKE 13. COTTER KEY 14. PIN 15. SLACK ADJUSTER

9-39. SLACK ADJUSTERS MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

- a. Adjustment Slack Adjuster (15) (Forward Rear Tandem).
- b. Adjustment Push Rod (30) (Rear Rear Tandem).

45 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

EQUIPMENT CONDITION PARAGRAPH

(See TM 9-2320-273-10).

CONDITION DESCRIPTION

Wheel Raised OFF Ground; Park Brake Should Be Released And Wheels Blocked.

PERSONNEL REQUIRED

Two (MOS63B20).

REFERENCES (TM)

TM 9-2320-273-10.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked On Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission In Neutral.

TROUBLESHOOTING REFERENCES

None.

9-39. SLACK ADJUSTERS MAINTENANCE (Continued).

LOCATION/ITEM

ACTION

REMARKS

A. ADJUSTMENT – SLACK ADJUSTER.

NOTE

The procedure in this paragraph is limited to adjustment; it should be performed with wheel off of ground and parking brake released.

- 1. Adjusting screw (2).
- a. While turning wheel rotate adjusting screw (2) until brakeshoes are tight against brakedrum.
- b. Back off adjusting screw (2) approximately one turn or until wheel does not drag.
- 2. CAB/Brake pedal.

Push completely down.

Second mechanic.

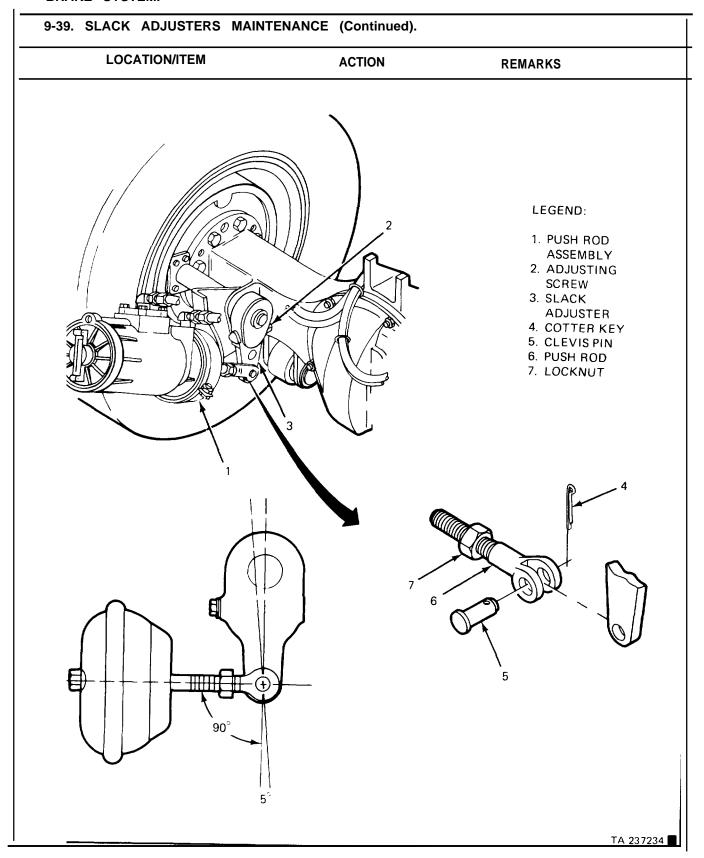
- 3. Slack adjuster (3) and push rod (6).
- a. If brake chamber push rod
 (6) travel is less than 3/4
 inch (1.9 cm) or more than
 1 inch (2.54 cm) go to
 part B.
- b. If brake chamber push rod(6) travel is 3/4 to 1 inch(1.9 cm to 2.54 cm), adjustment is satisfactory.
- c. If angle between slack adjuster (3) and push rod
 (6) is less than 90°, go to part B.
- d. If angle between slack adjuster (3) and push rod
 (6) is more than 90°, adjustment is satisfactory.

B. ADJUSTMENT - PUSH ROD.

WARNING

Do this procedure carefully. The slack adjuster may be turned toward the brake chamber and might snap back.

9-39. SLACK ADJUSTERS MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM B. ADJUSTMENT - PUSH ROD (Continued). 4. Slack adjuster (3). If push rod travel does not fall between 3/4 to 1 inch (1.9 cm to 2.54 cm), tighten adjusting screw to decrease travel or loosen to increase travel. 5. Cotter key (4) and clevis a. Remove. pin (5). b. Disconnect slack adjuster (3) from push rod (6). 6. Push rod locknut (7). a. Loosen. b. Turn push rod (7) to shorten. 7. Clevis pin (5). Insert into slack adjuster (3). 8. CAB/Brake pedal. Push completely down. Second mechanic. 9. Slack adjuster (3) and If angle between slack ad-First mechanic. push rod (6). juster (3) and push rod (6) is at least 90°, go to step 10. 10. Locknut (7). Tighten. 11. Cotter key (4) Push into clevis pin (5). **NOTE** If adjustment to the push rod/slack adjuster angle is necessary, the push rod travel must be rechecked.



9-40. WINDSHIELD WASHER MAINTENANCE.

(5)

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

b. Installation.

(5) (2) c. Operational Check.

12 Minutas Total.

INITIAL SETUP

EQUIPMENT CONDITION

PARAGRAPH **CONDITION DESCRIPTION** APPLICABLE CONFIGURATIONS

None. None.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

SPECIAL ENVIRONMENTAL CONDITIONS PERSONNEL REQUIRED

Vehcile Parked on Level Ground. One (MOS-63B20).

REFERENCES (TM)

GENERAL SAFETY INSTRUCTIONS TM 9-2320-273-10.

Engine OFF.

Transmission in Neutral. Park Brake Sat.

TROUBLESHOOTING REFERENCES

Table 8-1.

9-40. WINDSHIELD WASHER MAI	INTENANCE (Continued).	
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL.		
1. Two small hoses (2).	Disconnect from wiper pivot assemblies (4).	Remove heater duct to gain access to hose (2) on right side.
2. Air line (5) and waterline (8).	Disconnect from reserv (6).	voir
2	2	OUTSIDE CAB
		LEGEND:
6	INSIDE CAB	1. T-CONNECTION 2. SMALL HOSE (2) 3. NOZZLE (2) 4. WIPER PIVOT ASSEMBLY 5. AIR LINE 6. RESERVOIR 7. BRACKET 8. WATERLINE
		TA 0749 5

9-40. WINDSHIELD WASHER MAINTENANCE (Continued).		
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
3. Reservoir (6).	Lift out of bracket (7).	
4. Two small hoses (2), T-connection (1), and water line (8).	Inspect for: a. Leaks. b. Cracks.	Replace if necessary.
B. INSTALLATION.		
5. Reservoir (6).	Set into bracket (7).	
6. Air line (5) and waterline (8).	Connect to reservoir (6)	
7. Two small hoses (2).	Connect to wiper pivot assemblies (4).	Reconnect heater duct.
C. OPERATIONAL CHECK,		
8. INSTRUMENT PANEL/ Washer button.	Push. Check that washer fluid is squirted onto wishield. Adjust nozzles (3 if necessary. Check for left)	ind- may need to start engine 3) before washers will work.

9-40. WINDSHIELD WASHERS MAINTENANG	CE (Continued).	
LOCATION/ITEM	ACTION	REMARKS
8 INSIDE 6	5	LEGEND: 1. T-CONNECTION 2. SMALL HOSE (2) 3. NOZZLE (2) 4. WIPER PIVOT ASSEMBLY 5. AIR LINE 6. RESERVOIR 7. BRACKET 8. WATERLINE
		TA 074957

9-41. WINDSHIELD WASHER CONTROL MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

(7)

b. Inspection of Air Lines.

ines. (7) (1)

c. Installation.d. Operational Check.

(5)

20 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

PARAGRAPH 5-37A.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

Batteries Disconnected.

`

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (refer to appendix C).

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 9-1.

9-41. WINDSHIELD WASHER CONTROL MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

A. REMOVAL.

1. Two quarter-turn screws (1). Loosen so that instrument

panel can be lowered.

2. Supply line fitting (6). Unscrew from valve body (7).

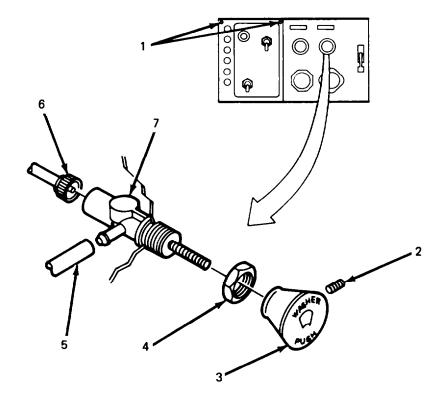
Allen screw (2).
 Control knob (3).
 Remove.

5. Nut (4). Loosen and remove.

6. Valve body (7). Remove from back side of

panel.

7. Outlet hose (5). Pull off of valve body (7).



LEGEND:

- 1. QUARTER-TURN SCREW (2)
- 2. ALLEN SCREW
- 3. CONTROL KNOB
- 4. NUT
- 5. OUTLET HOSE
- 6. SUPPLY LINE FITTING
- 7. VALVE BODY

TA 074958

9-41. WINDSHIELD WASHER CONTROL MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

B. INSPECTION OF AIR LINES AND FITTINGS.

8. Air supply line, and fitting (6), air outlet hose (5).

Inspect for:

a. Cracks.

b. Leaks.

c. Brittleness.

d. Damaged fittings.

C. INSTALLATION.

9. Outlet hose (5).

Push onto arm of valve

body (7).

10. Valve body (7).

a. Put through hole in instru-

ment panel.

b. Screw on and tighten

nut (4).

c. Install control knob (3)

and tighten Allen screw

(2).

11. Supply line fitting (6).

Screw into valve body (7).

12. Two quarter-turn screws (1).

Tighten to fasten instrument

panel in position.

NOTE

Follow-on maintenance required:

Reconnect batteries per para 5-37B.

D. OPERATIONAL CHECK.

13. Engine RUN switch.

Turn ON (see TM 9-2320-

273-10).

14. Washer control knob (3).

Push.

If washer does not work, lower dash panel and check for leakage at air line connections. If there is no leakage, troubleshoot the rest of the washer system

Replace if necessary.

(para 9-5).

15. Engine RUN switch.

Turn OFF (see TM 9-2320-

273-10).

9-41. WINDSHIELD WASHER CONTROL	MAINTENANCE (Continu	ied).
LOCATION/ITEM	ACTION	REMARKS
	3 September 1997	LEGEND: 1. QUARTER-TURN SCREW (2) 2. ALLEN SCREW 3. CONTROL KNOB 4. NUT 5. OUTLET HOSE 6. SUPPLY LINE FITTING 7. VALVE BODY

9-42. WINDSHIELD WIPER MOTOR MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (30)(30)b. Installation. c. Operational Check. <u>(11)</u>

71 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C).

Masking Tape. Marking Pen.

Gasket (4730-01-055-4013).

SPECIAL ENVIRONMENTAL CONDITIONS

GENERAL SAFETY INSTRUCTIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

Two (MOS-63B20).

PERSONNEL REQUIRED

TM 9-2320-273-10.

TM 9-2320-273-20P.

Engine OFF.

Transmission in Neutral.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

None.

PARAGRAPH

None.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 9-1.

9-42. WINDSHIELD WIPER MOTOR MAINTENANCE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
A. REMOVAL. 1. Clip (3).	Remove.		
2. Drive lever (2).	Remove from motor shaft.		
ENGINE COMPARTMENT		LEGEND: 1. AIR LINE (2) 2. DRIVE LEVER	
	J -6	3. CLIP 4. NUT (4) 5. WASHER (4) 6. CAPSCREW (4) 7. MOTOR 8. GASKET	
			TA 074960

9-42. WINDSHIELD WIPER MOTOR MAINTENANCE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
A. REMOVAL (Continued).			
3. Two air lines (1).	a. Use masking tape to mark PARK and RUN air lines.b. Unscrew and remove.		
4. Four capscrews (6), washers (5) and nuts (4).	Unscrew and remove motor (7) and gasket (8).	Discard gasket.	
B. INSTALLATION.			
5. New gasket (8) and motor (7)	Position against firewall.		
6. Four capscrews (6), washers (5) and nuts (4).	Screw in and tighten.		
7. Two air lines (1).	Screw into ports marked PARK and RUN. Tighten.		
8. Drive lever (2).	Slide onto motor shaft.		
9. Clip (3).	Clip onto shaft.		
C. OPERATIONAL CHECK.			
10. Engine.	Start up (see TM 9-2320-273-10). Allow system to reach operating pressure of 105-120 psi (724-827 kPa).		
11. Windshield wipers.	Check operation at high and low speeds.		
12. Engine.	Shut down (see TM 9-2320- 273-10		

9-43. WINDSHIELD WIPER CONTROL MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

(7) (2)

b. Inspection of Air Lines

c. Installation. d. Operational Check. (11)(1)

21 Minutes Total.

INITIAL SETUP

EQUIPMENT CONDITION

APPLICABLE CONFIGURATIONS

PARAGRAPH

CONDITION DESCRIPTION

Batteries Disconnected.

5-37A.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (PIN)

Masking Tape. Marking Pen.

Liquid Teflon (refer to appendix C).

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 9-1.

9-43. WINDSHIELD WIPER CONTROL MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

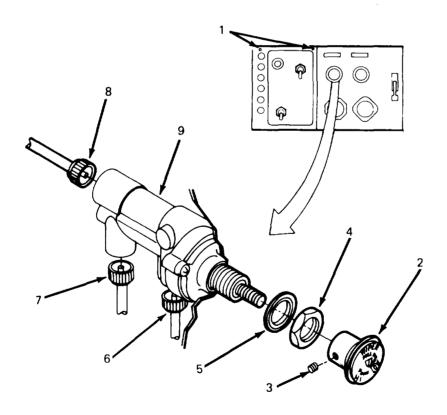
A. REMOVAL

- 1. Allen screw (3).
- 2. Two quarter-turn screws (1).
- 3. Supply line (8), wiper park line (7), and wiper run line (6).
- 4. Nut (4) and washer (5).

- a. Loosen with Allen wrench.
- b. Remove knob (2).

Loosen so that instrument panel can be lowered.

- a. Use tape and marker pen to identify each line.
- b. Unscrew fittings from valve body (9).
- a. Unscrew and remove.
- b. Remove valve body (9) from back side of panel.



LEGEND:

- 1. QUARTER-TURN SCREW (2)
- 2. KNOB
- 3. ALLEN SCREW
- 4. NUT
- WASHER
- 6. RUN LINE
- 7. PARK LINE
- 8. SUPPLY LINE
- 9. VALVE BODY

TA 074962

LOCATION/ITEM	ACTION	REMARKS
B. INSPECTION OF LINES AND	FITTINGS.	
5. Supply line (8), wiper park line (7), and wiper run line (6).	Inspect for: a. Cracks. b. Leaks. c. Damaged fittings.	Replace if necessary.
C. INSTALLATION.		
6. Supply line (8), wiper park line (7), and wiper run line (6).	Screw into valve body (9). Be sure that each line is screwed into the proper opening.	
7. Valve body (9).	a. Push forward through hole in rear of instrument panel.b. Screw on and tighten washer (5) and nut (4).	
8. Two quarter-turn screws (1).	Tighten to fasten instrument panel cover.	
9. Knob (2).	a. Push onto valve body and twist until Allen setscrew(3) is seated properly on stem of valve body.b. Tighten with Allen wrench.	
10. Batteries.	Connect (see para 5-37 B).	
D. OPERATIONAL CHECK.		
10. Engine RUN switch.	Turn ON (see TM 9-2320-273-10	0).
11. Wiper knob.	Pull out. Check to see that wipers operate properly on HI, LOW, and PARK.	If wipers do not work, open panel and check for air leaks at fittings. If no leaks are present troubleshoot the rest of the wiper system (see para 9-5).
12. Engine RUN switch.	Turn OFF (see TM 9-2320-273-10	0)

LEGEND: 1. QUARTER-TURN SCREW (2) 2. KNOB 3. ALLEN SCREW 4. NUT 5. WASHER 6. RUN LINE 7. PARK LINE 8. SUPPLY LINE 8. SUPPLY LINE
LEGEND: 1. QUARTER-TURN SCREW (2) 2. KNOB 3. ALLEN SCREW 4. NUT 5. WASHER 6. RUN LINE 7. PARK LINE 8. SUPPLY LINE
9. VALVE BODY TA 074963

9-44. DIFFERENTIAL LOCKUP CONTROL VALVE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

b. Installation.

c. Checking for Leaks. (2)

13 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (refer to appendix C). Soap and Water Solution.

EQUIPMENT CONDITION PARAGRAPH

9-13A. 5-83A.

CONDITION DESCRIPTION

Air Reservoirs Drained. Differential Lockup Switch Removed.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Differential Lockup Engaged. Engine OFF. Transmission in Neutral. Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 9-1.

9-44. DIFFERENTIAL LOCKUP CONTROL VALVE MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS WARNING** Do not remove differential lockup control valve until pressure is completely exhausted from all reservoirs. **REMOVAL** A. 1. Two screws (1). Loosen and remove valve (2). **NOTE** The figure below shows M915 valve. M916 through M920 valves have three air line connections. LEGEND: SCREW (2) **VALVE** 2. AIR LINE 3. AIR LINE TA 074964

9-44. DIFFERENTIAL LOCKUP CONTROL VALVE MAINTENANCE (Continued).				
LOCATION/ITEM	ACTION	REMARKS		
A. REMOVAL (Continued).				
2. Air lines (3) and (4).	a. Unscrew and remove.b. Inspect for: Cracks.Leaks.Damaged fittings.	Replace if necessary.		
B. INSTALLATION.				
3. Air lines (3) and (4).	Screw into valve (2) and tighten.			
4. Valve (2).	Remount in instrument panel and install two screws (1).			
C. CHECKING FOR LEAKS.				
5. Engine.	Start up (see TM 9-2320-273-10) Allow system to reach operat- ing pressure of 105-120 psi (724-827 kPa).).		
6. Valve (2).	Engage, use soap solution to check for leaks.			
7. Engine.	Shut down (see TM 9-2320-273-10).			
NOTE				
Follow-on maintenance action required:				
Inst to p	all differential lockup switch; refer ara 5-83B.			

9-44. DIFFERENTIAL LOCKUP CONTROL VALVE MAINTENANCE (Continued).

LOCATION/ITEM **ACTION REMARKS** NOTE The figure below shows M915 valve, M916 through M920 valves have three air line connections. وممصمصط 3 LEGEND: 1. SCREW (2) 2. VALVE 3. AIR LINE 4. AIR LINE TA 074965

9-45. AIR HORN AND CONTROL VALVE MAINTENANCE.

THIS TASK_COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (18)b. Installation. (22)c. Operational Check. (5)

45 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

EQUIPMENT CONDITION PARAGRAPH

CONDITION DESCRIPTION 9-13A.

Air Reservoirs Drained.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (Refer to Appendix C). Soap and Water Solution.

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

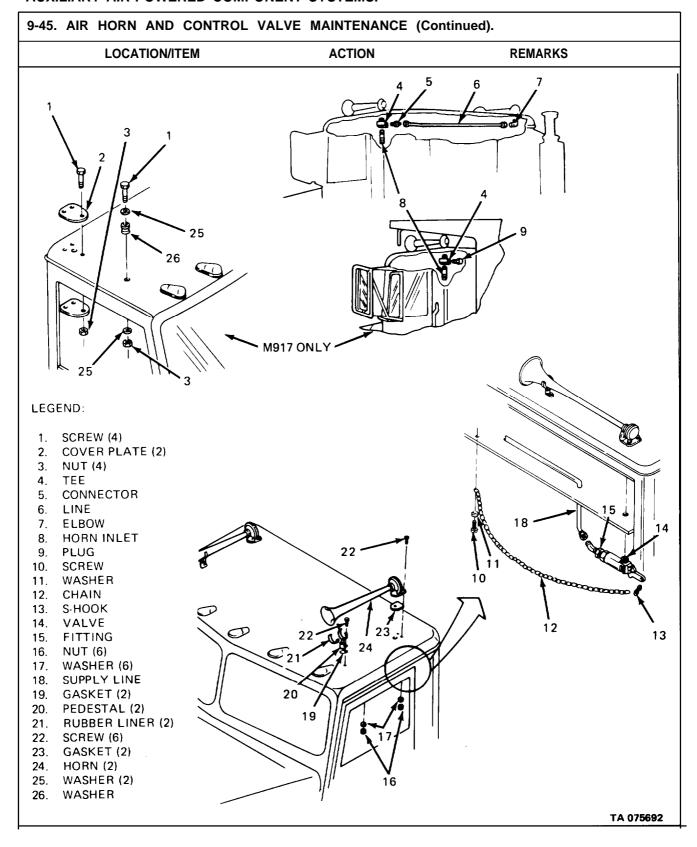
TM 9-2320-273-10. LO 9-2320-273-12. **GENERAL SAFETY INSTRUCTIONS**

Engine OFF.

Transmission in Neutral. Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 9-1.



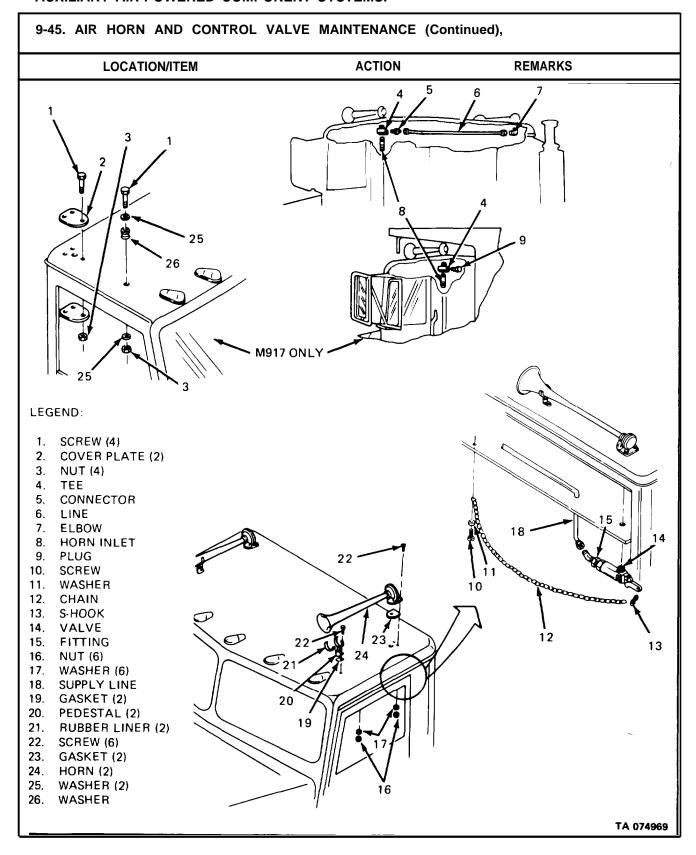
9-45. AIR HORN AND CONTROL VALVE MAINTENANCE (Continued).					
LOCATION/ITEM ACTION REMARKS					
	WARNING				
	t remove valve (14) until pressure xhausted from all reservoirs.	is			
	NOTE				
liner s	cess to horns and valve remove he crews and pull down headliner as ssary.	ad-			
1. Screw (10) and washer (11).	Unscrew and remove one end of chain (12).				
2. Chain (12).	Disconnect from handle on valve (14) by slightly opening S-hook (13).	Use pliers to open S-hook.			
3. Supply line (18).	Unscrew from fitting (15).				
4. Fitting (15).	Unscrew from valve (14).				
5. Valve (14).	Unscrew from horn inlet (8).				
6. Horn inlet (8).	Unscrew from tee (4).				
7. Line (6).	Unscrew from connector (5) and elbow (7).				
8. Connector (5).	Unscrew from tee (4).				
9. Plug (9).	Unscrew from tee (4).	M917 only.			
10. Tee (4).	Unscrew from left hand horn (24).				
11. Elbow (7).	11. Elbow (7). Unscrew from right hand horn (24).				
12. Six screws (22), washers (17), and nuts (16).	Unscrew and remove two horns (24), pedestals (20), gaskets (23), gaskets (19), and rubber liners (21).	M917 has only one horn located on left hand side.			
13. Four screws (1) and nuts (3).	Unscrew and remove two plate covers (2), washers (25), and washer (26).	M917 only.			

LOCATION/ITEM	ACTION	
		REMARKS
1 25 26 26 M917 ONL LEGEND: 1. SCREW (4) 2. COVER PLATE (2) 3. NUT (4) 4. TEE	8 8	REWARKS 9
5. CONNECTOR 6. LINE 7. ELBOW 8. HORN INLET 9. PLUG 10. SCREW 11. WASHER 12. CHAIN 13. S-HOOK 14. VALVE 15. FITTING 16. NUT (6) 17. WASHER (6) 18. SUPPLY LINE 19. GASKET (2) 20. PEDESTAL (2) 21. RUBBER LINER (2) 22. SCREW (6) 23. GASKET (2) 24. HORN (2) 25. WASHER	24	18 15 14 14 12 13 TA 074967

9-45. AIR HORN AND CONTROL VALVE MAINTENANCE (Continued).					
LOCATION/ITEM	ACTION	REMARKS			
NOTE					
	all threaded connections with liquen as you assemble.	uid			
14. Two gaskets (19), gaskets (23), pedestals (20), rubber liners (21), and horns (24).	Position on cab roof and install with six screws (22), washers (17), and and nuts (16).	M917 has only one horn.			
15. Elbow (7).	Screw into horn (24) on right hand side.				
	NOTE				
Follo	ow step 16. For M917 only.				
16. Two cover plates (2), washers (25), and washers (26).	Position on right hand cab roof and install with four screws (1) and nuts (3).				
17. Tee (4).	Screw into horn (24) on left hand side.				
18. Connector (5).	Screw into tee (4).				
19. Plug (9).	Screw into tee (4).	M917 only.			
20. Line (6).	Screw onto connector (5) and elbow (7).				
21. Horn inlet (8).	Screw into bottom of tee (4).				
22. Fitting (15).	Screw into valve (14).				
23. Valve (14).	Screw onto horn inlet (8).				
24. Supply line (18).	Screw onto fitting (15).				
25. S-hook (13).	a. Hook thru hole in handle of valve (14) and one end of chain (12).b. Clamp S-hook closed with pliers.				

9-45. AIR HORN AND CONTROL VALVE MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** M917 ONLY LEGEND: 1. SCREW (4) 2. COVER PLATE (2) 3. NUT (4) 4. TEE 5. CONNECTOR 6. LINE 7. ELBOW 8. HORN INLET 9. PLUG 22 10. SCREW 10 11. WASHER 12. CHAIN S-HOOK 13. 14. VALVE 12 15. FITTING 13 16. NUT (6) 17. WASHER (6) 18. SUPPLY LINE 19. GASKET (2) 20. PEDESTAL (2) 21. RUBBER LINER (2) 22. SCREW (6) 23. GASKET (2) 24. HORN (2) 25. WASHER (2) 26. WASHER TA 075693

9-45. AIR HORN AND CONTROL	VALVE MAINTENANCE (Contin	ued).			
LOCATION/ITEM	ACTION	REMARKS			
B. INSTALLATION (Continued).					
26. Chain (12).	Secure other end to cab roof with screw (10) and washer (11).				
C. OPERATIONAL CHECK.					
27. Engine.	Start up (see TM 9-2320-273-10). Allow system to reach operating pressure of 105-120 psi (724-827 kPa).				
28. Chain (12).	a. Pull. b. Release.	Horn should blow. Horn should stop blowing.			
29. Valve (14).	Check for leaks with soap and water solution.	Retighten as necessary.			
30. Engine.	Shut down (see TM 9-2320-273-10).				
	NOTE				
Repo with s	osition headliner, if lowered, and sec screws and trim washers.	cure			



CHAPTER 10

WHEELS, STEERING, AND SUSPENSION SYSTEMS MAINTENANCE

This chapter provides you with the following information related to wheels, steering, and suspension systems maintenance.

- a. All required special tools and equipment.
- b. Other technical manuals.
- c. Troubleshooting procedures.
- d. Maintenance procedures.

Section I REPAIR PARTS, SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

10-2. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

10-3. SPECIAL TOOLS, TMDE, SUPPORT EQUIPMENT.

The special tools, TMDE and support equipment required for the wheels, steering, and suspension systems maintenance procedures described in this chapter are limited to the following items: (Refer to Organizational Maintenance RPSTL, TM 9-2320-273-20P for tool description and illustration.)

- a. Toe-in gage.
- b. Valve core removing tool.
- c. Gooseneck tool.
- d. Rim tool.
- e. Safety cage.
- f 4-inch, 6-point wheel bearing nut wrench.
- g. Wheel bearing packing tool.
- h. Wheel dolly.
- i. Tie rod end puller.
- j. Pitman arm removing tool.
- k. Pitman arm spacer.
- I. Spacer removing tool.
- m. Ball joint puller.

10-4. SPARES AND REPAIR PARTS.

Spares and repair parts are listed and illustrated in the Repair Parts and Special Tools List covering organizational maintenance for this equipment (TM 9-2320-273-20P).

Section II TROUBLESHOOTING

10-5. INTRODUCTION.

Tables 10-1 thru 10-3 contain instructions for troubleshooting the wheels, steering, and vehicle suspension. The correction actions describe how to fix the problem or refer to a procedure for fixing the problem. The troubleshooting tables are arranged by malfunctions in the following order.

WHEELS AND TIRES (table 10-1):

- a. Tires wearing unevenly,
- b. Noisy or bumpy sound while traveling down the road.

STEERING (table 10-2):

- a. Front tires wearing unevenly.
- b. Hard steering.
- c. Vehicle wanders or pulls to one side.
- d. Lost motion or excessive play in steering wheel.
- e. Temporary increase in effort when turning steering wheel.
- f. Vehicle does not fully steer from stop to stop.

SUSPENSION (table 10-3):

- Vehicle wanders or shimmies.
- b. Pusher axle will not raise or lower.
- c. Rear axle assembly not tracking properly.

Table 10-1. Wheel and Tire Troubleshooting Procedures.

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

1. TIRES WEARING UNEVENLY:

Step 1. Check wheel alinement if problem is on front wheels.

Aline front wheels (para 10-10).

Step. 2. Check rear brakes for proper adjustment. (Front brakes are self -adjusting.)

Adjust brakes (para 9-33, 9-34, 939).

Step 3. Check wheel bearing for adjustment, lubrication, and damage.

Adjust, lubricate, or replace (para 10-13, 10-14, 10-15 or 10-16, as applicable).

- 2. NOISY OR BUMPING SOUND WHILE TRAVELING ON THE ROAD:
 - Step 1. Check lug wheel stud cap nuts for proper torque.

Tighten lug nuts to 450 lb-ft (610 N.m).

Step 2. Inspect U-bolts for tightness.

Tighten U-bolts (125-165 lb-ft (170-224 N.m) for M915, 200-270 lb-ft (271-366 N.m) for M916 thru M920).

Step 3. Inspect spring shackle pins for looseness using a pry bar. No noticeable movement is allowable.

Refer to Direct Support Maintenance.

Step 4. Check wheel bearings for vertical looseness using a prying bar beneath the tire. Check for proper lubrication and damage.

Adjust, lubricate, or replace bearing (para 10-13, 10-14, 10-15 or 10-16, as applicable).

Step 5. Inspect rear axle shaft for damage by jacking up both wheels. Turn wheels to one extreme and rotate one wheel by hand while listening for a rumbling or grinding sound within the axle. Repeat on other wheel.

Replace axle shaft (para 10-15),

Step 6. Check pusher axle for damaged components or leaking air lines.

Replace components as necessary (para 9-38, 10 16) or contact Direct Support Maintenance.

Table 10-1. Wheel and Tire Troubleshotting Procedures (Continued).

MAI	LFUNCTION.
	TEST OR INSPECTION.
	CORRECTIVE ACTION.
2.	NOISY OR BUMPING SOUND WHILE TRAVELING ON THE ROAD (Continued):
	Step 7. Inspect front driving axle (M916 thru M920) as in Step 5.
	Refer to paragraph 10-14 or Direct Support Maintenance.

Table 10-2. Steering Troubleshooting Procedures.

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

1. FRONT TIRES WEARING UNEVENLY:

Step 1. Inspect U-bolts for tightness.

Tighten U-bolts (125-165 lb-ft (170-224 N-m) for M915; 200-270 lb-ft (271-366 N-m for M916 thru M920.

Step 2. Inspect spring shackle pins for looseness using a pry bar. No noticeable movement is allowable.

Refer to Direct Support Maintenance.

Step 3. Check wheel bearings for vertical looseness using a pry bar beneath the tire. Check for proper lubrication and damage,

Adjust, lubricate, or replace bearing (para 10-13 or 10-14, as applicable).

Step 4. Check for proper toe-in (0 to 1/8-inch).

Adjust toe-in (para 10-10).

Step 5. Check brakes for proper adjustment.

Adjust brakes (para 9-31 and 9-32).

2. HARD STEERING:

Step 1. Check oil level in power steering pump.

Fill to proper level (LO 9-2320-273-12).

Step 2. Check all steering linkage for proper lubrication.

Lubricate (LO 9-2320-273-12).

Step 3. Check U-bolts for tightness.

Tighten U-bolts (125-165 lb-ft (170-224 N-m) for M915; 200-270 lb-ft (271-366 N-m) for M916 thru M920).

Step 4. Inspect all hydraulic lines and fittings for leakage or damage.

Tighten or replace lines or fittings (para 10-22 and 10-23).

Step 5. Check tie rod for damage or loose ends. No play is allowable.

Tighten or replace (para 10-20).

Table 10-2. Steering Troubleshooting Procedures (Continued).

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

- 2. HARD STEERING (Continued):
 - Step 6. Inspect drag link for damage.

Replace drag link (para 10-19).

Step 7. Check steering gear for proper adjustment.

Refer to Direct Support Maintenance.

Step 8. Inspect axle shaft for damage (M916 thru M920).

Refer problem to Direct Support Maintenance.

- 3. VEHICLE WANDERS OR PULLS TO ONE SIDE:
 - Step 1. Check U-bolts for tightness.

Tighten U-bolts (125-165 lb-ft (170-224 N.m) for M915, 200-270 lb-ft (271-336 N-m) for M916 thru M920).

Step 2. Check front spring pin for damage by using a pry bar. No noticeable play is allowed.

Refer to Direct Support Maintenance.

Step 3. Check auxiliary cylinder for damage (M916 thru M920).

Replace cylinder (para 10-23).

Step 4. Check drag link for damage.

Replace drag link (para 10-19).

Step 5. Check tie rod for looseness or damage.

Adjust or replace tie rod assembly (para 10-20).

Step 6. Check for dragging brake by jacking vehicle and spinning wheel by hand.

Adjust brake (para 9-31 and 9-32).

Step 7. Check hub and drum for damage.

Replace (para 10-13 or 10-14, as applicable).

Table 10-2. Steering Troubleshooting Procedures (Continued).

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

3. VEHICLE WANDERS OR PULLS TO ONE SIDE (Continued):

Step 8. Check wheel bearing adjustment by using a pry bar. No noticeable play is allowable. Check for proper lubrication or damage.

Adjust, lubricate, or replace bearing (para 10-13 or 10-14, as applicable).

- 4. LOST MOTION OR EXCESSIVE PLAY IN STEERING WHEEL:
 - Step 1. Check free play. Tape a piece of stiff wire or weld rod to the instrument panel so that one end is near the rim of the steering wheel. Turn the wheel to one extreme of free travel (wheels do not move) and mark the wheel at the wire. Turn the wheel the other way to the end of the free play and mark the wire position on the wheel. Measure the free play around the circumference of the steering wheel. Maximum free play with engine running is 2-1/2 inches.

Refer to Direct Support Maintenance.

Step 2. Check drag link for looseness or damage.

Replace drag link (para 10-19).

Step 3. Check tie rod for damage or loose end. No free play is allowable in tie rod end.

Adjust or replace tie rod (para 10-20).

Step 4. Check pitman arm for damage.

Replace pitman arm (para 10-21).

Step 5. Check pump reservoir for damage.

Replace reservoir (para 10-22).

Step 6. Check auxiliary cylinder for damage. (M916 thru M920).

Replace cylinder (para 10-23).

- 5. TEMPORARY INCREASE IN EFFORT WHEN TURNING STEERING WHEEL.
 - Step 1. Check all steering linkage for proper lubrication.

Lubricate (LO 9-2320-273-12).

Step 2. Check hydraulic reservoir for damage and leakage.

Replace reservoir (para 10-22).

Table 10-2. Steering Troubleshooting Procedures (Continued).

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

5. TEMPORARY INCREASE IN EFFORT WHEN TURNING STEERING WHEEL (Continued):

Step 3. Check steering gear mounting bolts for tightness.

Tighten to 180 lb-ft (244 N-m).

Step 4. Check steering gear adjustment.

Refer to Direct Support Maintenance.

Step 5. Check auxiliary cylinder for damage or leakage (M916 thru M920).

Replace cylinder (para 10-23).

Step 6. Inspect drag link for damage.

Replace drag link (para 10-19).

Step 7. Inspect tie rod for damage or loose end. No play is allowable.

Replace tie rod end (para 10-20).

Step 8. (All models except M915). Inspect axle shaft for damage by jacking up both wheels, turning wheels to one extreme, and rotating one wheel by hand. Listen for rumbling or grinding sound within the axle. Repeat on other wheel.

Refer to Direct Support Maintenance.

- 6. VEHICLE DOES NOT FULLY STEER FROM STOP TO STOP:
 - Step 1. Check all steering linkage for proper lubrication.

Lubricate (LO 9-2320-273-12).

Step 2. Check pitman arm for damage.

Replace pitman arm (para 10-21).

Step 3. Check drag link for damage or looseness. No play is allowable.

Replace drag link (para 10-19).

Step 4. Check the tie rod for damage or loose end. No play is allowable.

Replace tie rod end if loose (para 10-20).

- Step 5. Check steering gear mounting bolts for tightness,
 - a. Tighten bolts to 180 lb-ft (244 N.m).
 - Refer to Direct Support Maintenance.

Table 10-3. Suspension Troubleshooting Procedures

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

1. VEHICLE WANDERS OR SHIMMIES:

Step 1. Check for insufficient lubrication.

Lubricate (LO 9-2320-273-12).

Step 2. Check for loose wheel stud cap nuts.

Tighten nuts to 450 lb-ft (610 N-m).

Step 3. Check for loose spring U-bolts.

Tighten nuts on U-bolts (125-165 lb-ft (170-224 N-m) for M915, 200-270 lb-ft (271-366 N-m) for M916 thru M920).

Step 4. Check wheel bearings for play using a pry bar.

Adjust or replace bearing (para 10-13 or 10-14, as applicable).

Step 5. Inspect tie rod for damage and ends for looseness. No play is allowable.

Replace tie rod end if loose (para 10-20).

Step 6. Inspect drag link for damage.

Replace drag link (para 10-19).

Step 7. Check propeller shafts and universal joints for wear and damage. Wear is indicated by any movement between the shaft and the joint in any direction.

Replace (para 8-11).

Step 8. Check spring pins for wear using a pry bar, No noticeable movement is allowed.

Refer to Direct Support Maintenance.

Step 9. (N/A M915). Check front axle shaft for damage by jacking up both wheels, turning wheels to one extreme and rotating one wheel by hand. Listen for a rumbling or grinding sound within the axle. Repeat on other wheel.

Refer to Direct Support Maintenance.

Table 10-3. Suspension Troubleshooting Procedures (Continued)

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

2. PUSHER AXLE WILL NOT RAISE OR LOWER:

Step 1. Check air bags for damage and leakage by listening for a hissing sound or using a soap solution and watching for bubbles.

Replace air bags (para 8-14).

Step 2. Check air lines for leakage using a soap solution.

Replace lines (para 8-14 and 8-15).

Step 3. Check lifting bags for damage.

Replace defective bags (para 8-15).

Step 4. Inspect all brackets and connecting arms for bends or other damage.

Refer to Direct Support Maintenance.

Step 5. Check control valves for damage and leakage using a soap solution with valve under pressure. A 1-inch bubble in 5 seconds is permissible.

Tighten connections and/or replace the control valves (para 8-17 pusher axle pressure regulator valve, or para 8-18 pusher axle up-down selector valve).

Step 6. Check shock absorbers for damage and tight mounting.

Tighten or replace (para 10-25).

3. REAR AXLE ASSEMBLY NOT TRACKING PROPERLY:

Step 1. (M915, M916, M920). Check fifth wheel for secure mounting. This step applies only if a trailer is attached.

Tighten, refer to torque table, para 3-9.

Step 2. Check torque rod for security and damage.

Tighten (105 lb-ft (142 N-m) for the M915, 180 lb-ft (244 N-m) for the M916 thru M920), or replace (para 10-26).

Step 3. Check for dragging brake by jacking vehicle and rotating wheels by hand.

Adjust or replace (para 9-33, 9-34). Refer to Direct Support Maintenance.

Table 10-3. Suspension Troubleshooting Procedures (Continued).

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

- 3. REAR AXLE ASSEMBLY NOT TRACKING PROPERLY (Continued):
 - Step 4. Check wheel bearing adjustment using a pry bar. No noticeable movement is allowable. Check for damage and proper lubrication.

Adjust, lubricate, or replace (para 10-15 or 10-16).

Step 5. Check hubs and drums for damage.

Replace (para 10-15 or 10-16).

Section III MAINTENANCE PROCEDURES

10-6. INTRODUCTION.

This section provides you with Organizational Level maintenance procedures for the wheels, steering, and suspension systems. To find a specific maintenance procedure, see one of the following task summaries:

- a. Wheels and Tires (para 10-7).
- b. Steering Mechanism (para 10-8).
- c. Suspension System (para 10-9).

This page intentionally left blank.

10-7. WHEEL AND TIRE MAINTENANCE TASK SUMMARY.

INITIAL SETUP

EQUIPMENT

APPLICABLE CONFIGURATIONS

CONDITION PARAGRAPH

CONDITION DESCRIPTION

All.

(See TM 9-2320-273-10.) (See TM 9-2320-273-10.) Wheel and Tire Assembly Removed. Axle Jacked Up.

TEST EQUIPMENT

None.

SPECIAL TOOLS

Toe-in Gage.
Ball Joint Puller.

MATERIALS/PARTS (P/N)

Soap Solution,

Hub Gasket, 2208-M-819 (78500). Bearing Seal, A-1205-L-1338 (78500).

GAA (Refer to Appendix C).

Nonflammable Cleaning Solvent SD-2 (Refer to Appendix C).

Seal Installer.

Wheel Bearing Packing Tool.

Wheel Dolly.

Wheel Bearing Nut Wrench, Permatex (Refer to Appendix C).

Silicone (RTV) Gasket Material (Refer to Appendix C).

Cotter Pin (2) K-2616 (78500).

Inner Bearing Seal, 1205-P-1212 (78500).

PERSONNEL REQUIRED

One or Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

LO 9-2320-273-12.

REFERENCES (TROUBLESHOOTING)

Table 10-1, 10-2, 10-3.

Hub Cap Gasket, 2208-P-796 (78500). Oil Seal, A-1205-Y-1533 (78500).

Inner Bearing Seal M915, A-1205-T-696 (78500).

M916/M920, A-1 205-T-774

(78500).

Outer Bearing Seal M915, A1205-N-612 (78500). M916/M920, A-1 205-U-619

(78500).

Star Washers (16), 1229-X-518 (78500).

Gasket (2) M915, 2208-X-440 (78500).

M916/M920, 2208-W-41 3 (78500).

Brass Drift.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Wheels Blocked. Engine OFF.

Transmission in Neutral.

Park Brake Set

LIST OF TASKS

TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
1.	Front Wheels Maintenance:	10-10	10-1
	A. Checking Alinement.	10-10A	
	B. Adjustment of Alinement (M915).	10-10B	
	C. Adjustment of Alinement (M916 thru M920).	10-10C	
2.	Tire and Tube Maintenance (M915):	10-11	10-1
	A. Removal.	10-11A	
	B. Inspection.	10-11B	
	C. Installation.	10-11C	

10-7	. WHEEL AND TIRE MAINTENANCE TASK SUM	MARY (Continu	ued).		
	LIST OF TASKS				
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)		
3.	Tire and Tube Maintenance (M916 thru M920):	10-12	10-1		
	A. Removal.	10-12A			
	B. Inspection.	10-12B			
	C. Installation.	10-12C			
4.	Front Wheel Bearings and Seals Maintenance (M915):	10-13	10-2		
	A. Removal.	10-13A			
	B. Inspection.	10-13B			
	C. Packing and Installation of Bearings.	10-13C			
5.	Front Wheel Bearings and Seals Maintenance (M916 thru M920):	10-11	10-2		
	A. Removal.	10-14A			
	B. Inspection.	10-14B			
	c. Packing and Installation of Bearings.	10-14C			
6.	Rear Wheel Bearings, Shafts, and Seals Maintenance:	10-15	10-3		
	A. Removal.	10-15A			
	B. Inspection.	10-15B			
	c. Packing and Installation of Bearings.	10-15C			
7.	Pusher Axle Bearings and Seals:	10-16	10-3		
	A. Removal.	10-16A			
	B. Inspection.	10-16B			
	C. Packing and Installation of Bearings.	10-16C			

10-8. STEERING MECHANISM MAINTENANCE TASK SUMMARY.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

AII.

TEST EQUIPMENT

None.

EQUIPMENT

CONDITION PARAGRAPH

Balljoint Puller.

Clean Container (Quart).

Cable Tie, PLT4H-MO (06383).

Cable Tie, MS-3367-2-O (96906).

Jack Stands.

Grease Gun.

Plugs.

5-67A. 11-14A or C. 11-16A.

5-37A.

4-18A.

CONDITION DESCRIPTION

Horn Button Assembly Removed. Front Fenders Removed.

Grille Removed.

Batteries Disconnected.

Fuel Filter and Adapter Removed.

(M916 thru M920).

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

GAA (Refer to Appendix C).

Nonflammable Cleaning Solvent SD-2 (Refer to Appendix C).

Cotter Pin, 103415 (24617). Cotter Pin, 103389 (24617). Snapring, 100475 (15434).

Gasket, Oil Pump to Adapter (5330-01-071-5727).

O-Ring, 008771-026 (19954).

Wheel Puller.

Silicone RTV Sealant (Refer to Appendix C).

Cotter Pin (2), K-2616 (78500).

PERSONNEL REQUIRED

One or Two MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. LO 9-2320-273-12.

TM 9-2320-273-20P.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

Power Steering Fluid (Refer to Appendix C).

Liquid Teflon (Refer to Appendix C).

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

REFERENCES (TROUBLESHOOTING)

Table 10-2.

LIST OF TASKS

TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
1.	Steering Wheel Maintenance:	10-17	10-2
	A. Removal.	10-17A	
	B. Installation.	10-17B	
	C. Operational Check.	10-17C	
2.	Lower Steering Shaft Maintenance:	10-18	10-2
	A. Removal.	10-18A	
	B. Disassembly.	10-18B	
	C. Assembly.	10-18C	

10-8.	-8. STEERING MECHANISM MAINTENANCE TASK SUMMARY (Continued).				
	LIST OF TASKS				
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)		
2.	Lower Steering Shaft Maintenance (Continued):				
	D. Installation.	10-18D			
	E. Operational Check,	10-18E			
3.	Drag Link Maintenance:	10-19	10-2		
	A. Removal.	10-19A			
	B. Inspection of Mating Connections.	10-19B			
	C. Installation.	10-19C			
	D. Operational Check.	10-19D			
4.	Tie Rod Maintenance:	10-20	10-2		
	A. Removal.	10-20A			
	B. Inspection.	10-20B			
	C. Installation.	10-20C			
5.	Pitman Arm Maintenance:	10-21	10-2		
	A. Removal.	10-21A			
	B. Inspection of Mating Surfaces.	10-21B			
	C. Installation.	10-21C			
6.	Hydraulic Power Steering Pump and Cooler Maintenance:	10-22	10-2		
	A, Removal.	10-22A			
	B. Inspection of Lines, Fittings, and Cooler.	10-22B			
	C. Installation.	10-22C			
	D. Filling and Bleeding System.	10-22D			
	E. Operational Check.	10-22E			

TASK NO. TASK TASK TROUBLESHOOTING REF (TABLE) 7. Auxiliary Cylinder (M916 Thru M920): 10-23 10-2	G
NO. TASK REF (TABLE)	G
7. Auxiliary Cylinder (M916 Thru M920): 10-23 10-2	
A. Removal. 10-23A	
B. Inspection. 10-23B	
C. Installation.	
D. Operational Check. 10-23D	

10-9. SUSPENSION SYSTEM MAINTENANCE TASK SUMMARY.

INITIAL SETUP

EQUIPMENT CONDITION PARAGRAPH

CONDITION DESCRIPTION

None.

AII.

None.

_ ___.

APPLICABLE CONFIGURATIONS

TEST EQUIPMENT

None.

TOOLS

None.

MATERIALS/PARTS (P/N)

GAA (Refer to Appendix C).

Shock Absorbers (2) (2540-00-740-961 7).

Rubber Bushings (8) (6365-00-740-9618). Nonflammable Cleaning Solvent SD-2 (Refer to Appendix C).

Shock Absorbers (2) (2540-01-011-0614).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

LO 9-2320-273-12.

REFERENCES (TROUBLESHOOTING)

Table 10-3.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.
Transmission in Neutral.
Park Brake Set.

LIST OF TASKS

TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
1.	Front Axle Shock Absorbers Maintenance (M91 5):	10-24	10-3
	A. Removal.	10-24A	
	B. Cleaning and Inspection.	10-24B	
	C. Installation.	10-24C	

10-9.	SUSPENSION SYSTEM MAINTENANCE T	ASK SUMMARY	(Continued).						
LIST OF TASKS									
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)						
2.	Pusher Axle Shock Absorbers Maintenance:	10-25	10-3						
	A. Removal.	10-25A							
	B. Cleaning and Inspection.	10-25B							
	C. Installation.	10-25C							
3.	Torque Rods Maintenance:	10-26	10-3						
	A. Removal (M915).	10-26A							
	B. Removal (M916 Thru M920).	10-26B							
	C. Cleaning and Inspection (All).	10-26C							
	D. Installation (M915).	10-26D							
	E. Installation (M916 Thru M920).	10-26E							

This page intentionally left blank.

10-10. FRONT WHEELS MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

(10)

a. Checking Alinement.

b. Adjustment of Alinement (M915).

c. Adjustment of Alinement

(M916 thru M920). (25)

35 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

None.

EQUIPMENT CONDITION

PARAGRAPH

CONDITION DESCRIPTION

None.

TEST EQUIPMENT

None.

SPECIAL TOOLS

Toe-In Gage. Ball Joint Puller.

MATERIALS/PARTS (P/N)

Cotter Pin (2) K-2616 (78500).

PERSONNEL REQUIRED

SPECIAL ENVIRONMENTAL CONDITIONS

One (MOS-63B20). Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P. **GENERAL SAFETY INSTRUCTIONS**

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 10-1.

10-10. FRONT WHEELS MAINTENANCE (Continued). **ACTION** LOCATION/ITEM **REMARKS** NOTE Before checking or adjusting toe-in, be sure tires are properly inflated (see TM 9-2320-273-10), Truck should be parked in a level area, When parking truck, straighten wheels and pull straight forward for final fifteen feet. A. CHECKING ALINEMENT. 1. Front wheels - front side. See illustration below. a. Place toe-in gage (1) between wheels on front side. Chain should just touch ground. LEGEND: 1. TOE-IN GAGE 2. GAGE POINTER TA 074970

LOCATION/TEM A. CHECKING ALINEMENT (Continued). b. Set gage pointer (2) to zero. c. Remove gage. 2. Front wheels - back side. a. Place gage between front wheels on back side. Chains should just touch ground. b. Gage should read 0-1/8 inch (0-3.175 mm). Adjust toe-in (step 8) if necessary.	10-10. FRONT WHEEL MAINTENANCE (Continued).							
b. Set gage pointer (2) to zero. c. Remove gage. 2. Front wheels - back side. a. Place gage between front wheels on back side. Chains should just touch ground. b. Gage should read 0-1/8 inch (0-3.175 mm). Adjust toe-in (step 8) if necessary. LEGEND: 1. TOE-IN GAGE 2. GAGE POINTER	LOCATION/ITEM	ACTION	REMARKS					
to zero. c. Remove gage. 2. Front wheels - back side. a. Place gage between front wheels on back side. Chains should just touch ground. b. Gage should read 0-1/8 inch (0-3.175 mm). Adjust toe-in (step 8) if necessary. LEGEND: 1. TOE-IN GAGE 2. GAGE POINTER	A. CHECKING ALINEMENT (Co.							
LEGEND: 1. TOE-IN GAGE 2. GAGE POINTER	2. Front wheels - back side.	to zero. c. Remove gage. a. Place gage between front wheels on back side. Chains should just touch ground. b. Gage should read 0-1/8 inch (0-3.175 mm).	See illustration below.					
TA 07497	1. TOE-IN GAGE	if necessary.	TA 07497					

10-10. FRONT WHEEL MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** B. ADJUSTMENT OF ALINEMENT (M915). 3. Two bolts (1), lockwashers Loosen. (2), and clamp nuts (3). 4. Tie rod (4). Screw further onto ball joint (5) to decrease toe-in. Unscrew to increase toe-in. 5. Front wheels. a. Check toe-in (para A). b. Repeat adjustment procedure until toe-in is 1/16 ± 1 1/16 inch (1.6± 1.6 mm). Tighten clamp nut to 6. Two bolts (1), lockwashers 40-55 lb-ft (54-68 N-m). (2), and clamp nuts (3). LEGEND: BOLT (2) 2. LOCKWASHER (2) 3. CLAMP NUT (2) 4. TIE ROD **BALL JOINT** M915 TA 074972

	LOCATION/ITEM	ACTION	REMARKS				
	LOCATION/ITEM	ACTION	VENIMALVO				
. ADJUSTMENT OF ALINEMENT (M916 THRU M920).							
		NOTE					
		o one end at a time because drop the tie rod to adjust					
7.	Bolt (2), lockwasher (8) and clamp locknut (4).	Loosen from clamp	(5),				
8.	Cotter pin (1) and castellated nut (9).	Remove from top st joint (6).	Remove from top stud of ball joint (6).				
9.	Ball joint (6).	 a. Use ball joint puller and remove from steering knuckle (7), or tap with rawhide hammer. b. Screw ball joint in to tie rod (3) to decrease toe-in and out to increase toe-in. c. Repeat adjustment procedure until toe-in is 1/16 + 1/16 inch (1.6 +1.6 mm). 					
0.	Bolt (2), lockwasher (8) and clamp locknut (4).	Torque to 40-55 lb-	ft (54-68 N-m).				
1.	Ball joint (6).	Install back into ste	ering knuckle (7).				
2.	Castellated nut (9).	 a. Install on top stud of ball joint (6). b. Torque to 110-125 lb-ft (149-169 N-m). 					
3.	Cotter pin (1).	Insert new cotter pi and top ball joint strends over.					

LOCATION/ITEM ACTION REMARKS LEGEND: 1. COTTER PIN 2. BOLT 3. TIE ROD 4. LOCKNUT 5. CLAMP 6. BALL JOINT 7. STEERING KNUCKLE 8. LOCKWASHER 9. CASTELLATED NUT M916 THRU M920
1. COTTER PIN 2. BOLT 3. TIE ROD 4. LOCKNUT 5. CLAMP 6. BALL JOINT 7. STEERING KNUCKLE 8. LOCKWASHER 9. CASTELLATED NUT
TA 0'

10-11. TIRE AND TUBE MAINTENANCE (M915).

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (20) b. Inspection. (10) c. Installation. (30)

60 Minutes Total,

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M915.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Soap Solution.

EQUIPMENT CONDITION PARAGRAPH

(See TM 9-2320-273 -10.)

CONDITION DESCRIPTION

Wheel and Tire Assembly Removed.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Vehicle Parked on Level Ground.

SPECIAL ENVIRONMENTAL CONDITIONS

Engine OFF.

Transmission in Neutral. Park Brake Set. Wheels Blocked.

TROUBLESHOOTING REFERENCES

Table 10-1.

10-11. TIRE AND TUBE MAINTENANCE (M915) (Continued). LOCATION/ITEM **ACTION REMARKS WARNING** Always remove the valve core and exhaust all air from a single tire and from both tires of a dual assembly prior to removing any rim components, or any wheel components, such as nuts and rim clamps. Check the valve stem by running a piece of wire through the stem to make sure it is not plugged. SAFETY CAGE. LEGEND: 1. TIRE 2. RIM LOCKRING 3. INNER LINER 4. 5. TUBE **VALVE STEM** 6. **VALVE CAP M915 CONFIGURATION** TA 074974

2. Valve stem (6). Remove core with valve core removing tool or valve cap. 3. Tire (1). Use gooseneck tool to free tire bead from lockring (3) may be he tire loose for tire from rim (2). 4. Lockring (3). Use rim tool to pry lockring (3) free from rim (2). 5. Tire (1) and rim (2) a. Turn over. b. Use gooseneck tool to separate second tire bead from rim. c. Remove tire (1), inner liner (4) and tube (5). 6. Tube (5) and inner liner (4). Remove from tire (1). 7. Tire (1), tube (5) and inner liner (4). Inspect for: Replace, if repair. b. Uneven wear. c. Cracks. d. Leaks. See TM 9-information	remove core. A heavy soft headed mallet may be helpful in breaking tire loose from lockring. remove tire (1). remove tire (1), inner ner (4) and tube (5). recessive wear. recessive acks. recessive wear. recessive in necessary, or repair. See TM 9-2610-200-20 for information on pneumatic tires and tubes. Replace, if necessary. For rust streaks or corrosion, wire brush and repaint.	LOCATION/ITEM	ACTION	REMARKS
1. Valve cap (7). Remove. Remove core with valve core remove core removing tool or valve cap. 3. Tire (1). Use gooseneck tool to free tire bead from lockring (3) all around tire. 4. Lockring (3). Use rim tool to pry lockring (3) free from rim (2). 5. Tire (1) and rim (2) a. Turn over. b. Use gooseneck tool to separate second tire bead from rim. c. Remove tire (1), inner liner (4) and tube (5). Remove from tire (1). 7. Tire (1), tube (5) and inner liner (4). Inspect for: a. Excessive wear. b. Uneven wear. c. Cracks. d. Leaks. See TM 9-information	remove core. A heavy soft headed mallet may be helpful in breaking tire loose from lockring. rim tool to pry lockring ee from rim (2). rim over. regoseneck tool to reparate second tire bead om rim. remove tire (1), inner ner (4) and tube (5). rect for: ressive wear. recessive acks. rect for: remove core. A heavy soft headed mallet may be helpful in breaking tire loose from lockring. Replace, if necessary, or repair. See TM 9-2610-200-20 for information on pneumatic tires and tubes. Replace, if necessary. For rust streaks or corrosion, wire brush and repaint.			
remove core 2. Valve stem (6). Remove core with valve core removing tool or valve cap. 3. Tire (1). Use gooseneck tool to free tire bead from lockring (3) may be he tire loose for tire from rim (2). 4. Lockring (3). Use rim tool to pry lockring (3) free from rim (2). 5. Tire (1) and rim (2) a. Turn over. b. Use gooseneck tool to separate second tire bead from rim. c. Remove tire (1), inner liner (4) and tube (5). 6. Tube (5) and inner liner (4). 7. Tire (1), tube (5) Inspect for: Replace, if repair. b. Uneven wear. c. Cracks. d. Leaks. See TM 9-information	remove core. A heavy soft headed mallet may be helpful in breaking tire loose from lockring. rim tool to pry lockring ee from rim (2). rim over. regoseneck tool to reparate second tire bead om rim. remove tire (1), inner ner (4) and tube (5). recessive wear. recessive acks. rect for: recessive wear. recessive acks. rect for: remove core. A heavy soft headed mallet may be helpful in breaking tire loose from lockring. Replace, if necessary, or repair. See TM 9-2610-200-20 for information on pneumatic tires and tubes. Replace, if necessary. For rust streaks or corrosion, wire brush and repaint.	A. REMOVAL.		
removing tool or valve cap. 3. Tire (1). Use gooseneck tool to free tire bead from lockring (3) may be he all around tire. 4. Lockring (3). Use rim tool to pry lockring (3) free from rim (2). 5. Tire (1) and rim (2) a. Turn over. b. Use gooseneck tool to separate second tire bead from rim. c. Remove tire (1), inner liner (4) and tube (5). 6. Tube (5) and inner liner (4). 7. Tire (1), tube (5) Inspect for: Replace, if repair. b. Uneven wear. c. Cracks. d. Leaks.	gooseneck tool to free lead from lockring (3) yound tire. rim tool to pry lockring lee from rim (2). Inn over. Be gooseneck tool to exparate second tire bead form rim. Permove tire (1), inner lier (4) and tube (5). Bove from tire (1). Replace, if necessary, or repair. See TM 9-2610-200-20 for information on pneumatic tires and tubes. Replace, if necessary. See TM 9-2610-200-20 for information on pneumatic tires and tubes. Replace, if necessary. For rust streaks or corrosion, wire brush and repaint.	1. Valve cap (7).	Remove.	•
tire bead from lockring (3) may be he all around tire. 4. Lockring (3). Use rim tool to pry lockring (3) free from rim (2). 5. Tire (1) and rim (2) a. Turn over. b. Use gooseneck tool to separate second tire bead from rim. c. Remove tire (1), inner liner (4) and tube (5). 6. Tube (5) and inner liner (4). 7. Tire (1), tube (5) Inspect for: Replace, if and inner liner (4). Inspect for: Replace, if repair. b. Uneven wear. c. Cracks. d. Leaks.	may be helpful in breaking tire loose from lockring. may be helpful in breaking tire loose from lockring. may be helpful in breaking tire loose from lockring. may be helpful in breaking tire loose from lockring. may be helpful in breaking tire loose from lockring. may be helpful in breaking tire loose from lockring. may be helpful in breaking tire loose from lockring. Regovering tire loose from lockring. Regovering tire loose from lockring. Regovering tire loose from lockring. Replace, if necessary, or repair. See TM 9-2610-200-20 for information on pneumatic tires and tubes. Replace, if necessary. Replace, if necessary. For rust streaks or corrosion wire brush and repaint.	2. Valve stem (6).		
(3) free from rim (2). 5. Tire (1) and rim (2) assembly. a. Turn over. b. Use gooseneck tool to separate second tire bead from rim. c. Remove tire (1), inner liner (4) and tube (5). 6. Tube (5) and inner liner (4). 7. Tire (1), tube (5) and inner liner (4). Inspect for: a. Excessive wear. b. Uneven wear. c. Cracks. d. Leaks. See TM 9-information	ree from rim (2). Inn over. See gooseneck tool to exparate second tire bead from rim. Semove tire (1), inner from tire (4) and tube (5). Sove from tire (1). Replace, if necessary, or repair. See TM 9-2610-200-20 for information on pneumatic tires and tubes. Replace, if necessary. See TM 9-2610-200-20 for information on pneumatic tires and tubes. Replace, if necessary. For rust streaks or corrosion wire brush and repaint.	3. Tire (1).	tire bead from lockring (3)	may be helpful in breaking
b. Use gooseneck tool to separate second tire bead from rim. c. Remove tire (1), inner liner (4) and tube (5). Remove from tire (1). Tire (1), tube (5) and inner liner (4). Inspect for: a. Excessive wear. b. Uneven wear. c. Cracks. d. Leaks. Remove from tire (1). Replace, if repair. See TM 9-information	see gooseneck tool to eparate second tire bead om rim. emove tire (1), inner her (4) and tube (5). Exect for: cessive wear. neven wear. racks. racks. eaks. See TM 9-2610-200-20 for information on pneumatic tires and tubes. Replace, if necessary, or repair. See TM 9-2610-200-20 for information on pneumatic tires and tubes. Replace, if necessary. For rust streaks or corrosion wire brush and repaint.	4. Lockring (3).		
7. Tire (1), tube (5) and inner liner (4). Inspect for: a. Excessive wear. b. Uneven wear. c. Cracks. d. Leaks. Replace, if repair. See TM 9-information	Replace, if necessary, or repair. See TM 9-2610-200-20 for information on pneumatic tires and tubes. Sect for: Replace, if necessary. See TM 9-2610-200-20 for information on pneumatic tires and tubes. Replace, if necessary. For rust streaks or corrosion wire brush and repaint.		b. Use gooseneck tool to separate second tire bead from rim.c. Remove tire (1), inner	
and inner liner (4). a. Excessive wear. b. Uneven wear. c. Cracks. d. Leaks. repair. See TM 9-3 information	repair. See TM 9-2610-200-20 for information on pneumatic tires and tubes. ect for: Replace, if necessary. For rust streaks or corrosion wire brush and repaint.		Remove from tire (1).	
c. Cracks. See TM 9- d. Leaks. information	See TM 9-2610-200-20 for information on pneumatic tires and tubes. The sect for: The sect for:		a. Excessive wear.	
	st streaks. orrosion. acked rims. maged threads on studs. For rust streaks or corrosion wire brush and repaint.		c. Cracks.	information on pneumatic
,	orrosion. For rust streaks or corrosion wire brush and repaint. Imaged threads on studs.	8. Rim (2).	·	Replace, if necessary.
D. COHUSION.			b. Corrosion.c. Cracked rims.d. Damaged threads on studs.	

10-11. TIRE AND TUBE MAINTENANCE (M915) (Continued). **ACTION REMARKS** LOCATION/ITEM C. INSTALLATION. **WARNING** Mismatched tires will make truck handle poorly and may cause accidents. All tires on an axle should have the same diameter, ±1/8 inch (3.2 mm). When replacing a tire, measure it and the other tires on the axle to be sure that the distances from top to bottom do not vary by more than 1/4 inch (6.4 mm). Use a depth gage to measure tires. SAFETY CAGE. LEGEND: 1. TIRE 2. RIM LOCKRING 3. INNER LINER TUBE **VALVE STEM** 6. 7. VALVE CAP M915 CONFIGURATION TA 074975

10-11. TIRE AND TUBE MAIN	ITENANCE (M915) (Continued).	
LOCATION/ITEM	ACTION	REMARKS
C. INSTALLATION (Contin		
9. Tire (1), tube (5), rim (2) and inner liner (4).	a. Place tube in tire.	
(2) and inner inter (4).	b. Place liner over tube.	
	 c. Lubricate both beads of tire with soap solution and, using gooseneck tool, work both tire beads onto rim. 	
	d. Place valve stem (6) through hole in rim.	Rim should be laying with outer side on top.
10. Lockring (3).	Set in place.	
	CAUTION	
	Heavy hammer blows will damage rim. bead into rim gently.	Тар
11. Lockring (3).	a. Insert one end into rim (2).	
	 b. Walk along ring to push it into place. 	
	 c. Tap final few inches into rim with hammer. 	
	 d. Check to be sure that ring is securely seated all the way around. 	

10-11. TIRE AND TUBE MAINTENANCE (M915) (Continued). LOCATION/ITEM **ACTION REMARKS WARNING** When inflating tires (wheel removed from vehicle) always use safety cage to prevent injury if ring should fly off. 12. Tire and wheel a. Place in safety cage and assembly. inflate. b. Install valve cap. c. Mount on truck (see TM-9-2320-273-10). SAFETY CAGE. LEGEND: TIRE RIM LOCKRING **INNER LINER** 5. TUBE **VALVE STEM** 7. VALVE CAP TA 074976

10-12. TIRE AND TUBE MAINTENANCE (M916 THRU M920)

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (20)b. Inspection. (10)c. Installation. (30)

60 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M916 thru M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (PIN)

Soap Solution.

EQUIPMENT CONDITION PARAGRAPH

(See TM 9-2370-273-10).

CONDITION DESCRIPTION

Wheel and Tire Assembly Removed.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Vehicle Parked on Level Ground.

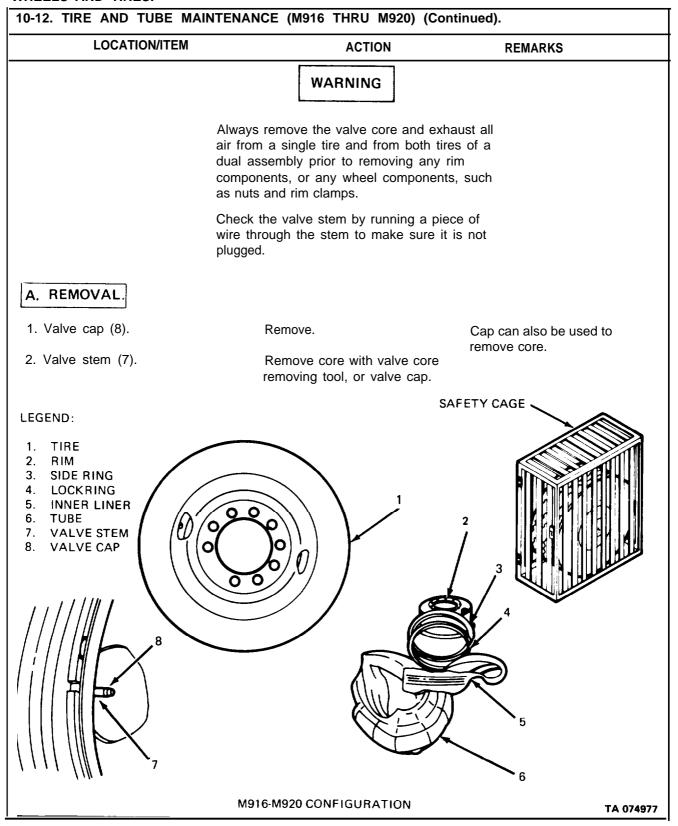
SPECIAL ENVIRONMENTAL CONDITIONS

Engine OFF.

Transmission in Neutral. Park Brake Set. Wheels Blocked.

TROUBLESHOOTING REFERENCES

Table 10-1.



LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
3. Tire (1).	Use gooseneck tool to free tire bead from side ring all around tire.	A heavy soft headed mallet may be used in breaking tire loose from ring.
4. Lockring (4) and side ring (3).	a. Use rim tool to pry side ring (3) free from rim (2).	
	b. Remove both rings.	
5. Tire (1) and rim (2).	a. Turn over.	
	 b. Use gooseneck tool to separate second tire bead from rim. 	
	c. Remove tire (1), inner liner (5) and tube (6).	
6. Tube (6) and inner liner (5).	Remove from tire (1).	
B. INSPECTION.		
7. Tire (1) tube (6) and inner liner (5).	Inspect for: a. Excessive wear. b. Uneven wear. c. Cracks. d. Leaks.	Replace, if necessary, or repair. See TM 9-2610-200-20 for information on pneumatitires and tubes.
8. Rim (2).	Inspect for:	Replace, if necessary.
	a. Rust streaks.b. Corrosion.c. Cracked rims.d. Damaged threads on studs.e. Wheel cracks.	For rust streaks or corrosion, wire brush and repaint.

10-12. TIRE AND TUBE MAINTENANCE (M916 THRU M920) (Continued). **ACTION** LOCATION/ITEM **REMARKS** C. INSTALLATION. WARNING Mismatched tires will make truck handle poorly and may cause accidents. All tires on an axle should have the same diameter, ± 1/8 inch (3.2 mm) when replacing a tire, measure it and the other tires on the axle to be sure that the distances from top to bottom do not vary by more than 1/4 inch (6.4 mm). Use a depth gage to measure tires. 9. Tire (1), tube (6), a. Place tube in tire. rim (2), and inner b. Place liner over tube. liner (5). c. Lubricate both beads of tire with soap solution. d. Place valve stem (7) Rim should be laying through hole in rim. with outer side on top. LEGEND: SAFETY CAGE . 1. TIRE 2. RIM 3. SIDE RING 4. LOCKRING 5. INNER LINER TUBE **VALVE STEM** 8. VALVE CAP M916 THRU M920 CONFIGURATION TA 074978

D-12. TIRE AND TUBE MAINTENANCE (M916 THRU M920) (Continued).

LOCATION/ITEM

ACTION

REMARKS

C. INSTALLATION (Continued).



Heavy hammer blows will damage rim. Tap bead into rim gently.

10. Lockring (4).

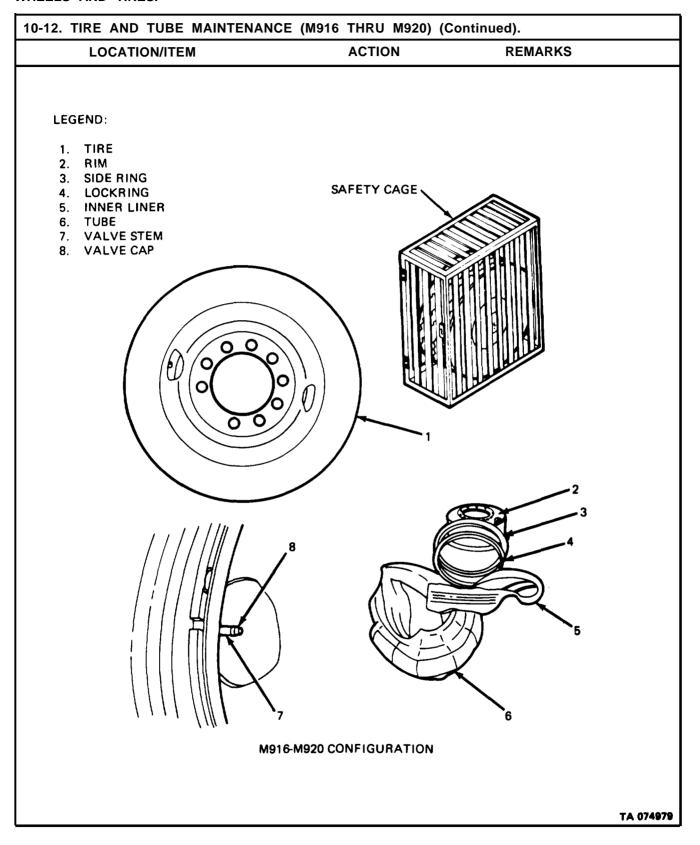
- a. Insert one end into rim (2).
- b. Walk along ring to push it into place.
- c. Tap final few inches into gutter with hammer.
- d. Check to be sure that ring is securely seated all the way around.
- e. Install side ring (3).

WARNING

When inflating tires (wheel removed from vehicle) always use a safety cage to prevent injury if ring should fly off.

11. Tire and wheel assembly.

- a. Place in safety cage and inflate.
- b. Install valve cap.
- c. Mount on truck (see TM 9-2320-273-10).



10-13. FRONT WHEEL BEARINGS AND SEALS MAINTENANCE (M915).

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (10)

b. Inspection. (5)
c. Packing and Installation of Bearings. (30)

45 Minutes Total.

INITIAL SETUP APPLICABLE CONFIGURATIONS

M915.

TEST EQUIPMENT

None.

EQUIPMENT CONDITION PARAGRAPH

(See TM 9-2320-273-10). (See TM 9-2320-273-10).

CONDITION DESCRIPTION

Axle Jacked-Up.
Wheel and Tire Assembly
Removed.

SPECIAL TOOLS

Outside Wheel Bearing Nut Wrench, P/N 1920 (45152) NSN 5120-01-089-9068. Inside Wheel Bearing Nut Wrench, P/N 1922 (45152) NSN 5120-01-112-0593.

MATERIALS/PARTS (P/N)

Seal Installer.
Wheel Bearing Packing Tool.
Hub Gasket, 2208-M-819 (78500).
Bearing Seal, A-1 205-L-1338 (78500).
GAA (Refer to Appendix C).
Washer.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P. LO 9-2320-273-12.

TROUBLESHOOTING REFERENCES

Table 10-2.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.
Transmission in Neutral.
Park Brake Set.
Wheel Blocked.

10-13. FRONT WHEEL BEARINGS AND SEALS MAINTENANCE (M915) (Continued).

LOCATION/ITEM ACTION REMARKS

A. REMOVAL.

- 1. Drum (7).
- 2. Six capscrews (6) and washers (5)
- 3. Hub cap (8) and gasket (9)
- 4. Nut (10), washer (11), and lockring (12).
- 5. Nut (13).
- 6. Outer Bearing (14).
- 7. Hub (1).

Remove.

It may be necessary to tap with hammer to break drum loose.

Unscrew and remove.

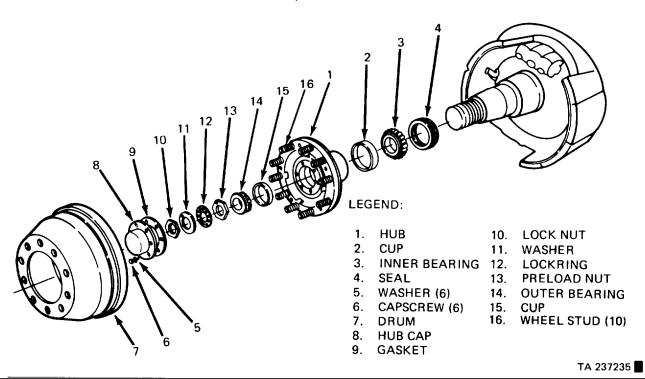
- a. Remove.
- b. Throw gasket away.

Remove. Install new washer (11).

Remove.

Remove.

- a. Remove.
- b. Damaged wheel studs (16) can be removed with an arbor press and a new stud pressed in.



LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
8. Seal (4) and inner bearing (3).	Remove and throw seal away.	Tap out from inside of hub (1) using hammer and wood block.
9. Cup (2).	Remove.	
10. Cup (15).	Remove.	
	NOTE	
Cle	an all component parts with SD-2	solvent.
	WARNING	
Do	not use compressed air to clean b	earings.
B. INSPECTION.		
11. Inner bearing (3) and outer bearing (14).	Inspect for: a. Flat spots or chips in bearing rollers. b. Cracks. c. Breaks. d. Smooth operation. e.Discoloration.	Replace as necessary
12. Cups (2) and (15).	Inspect for: a. Flat spots. b. Cracks. c. Gouges. d. Discoloration.	Replace as necessary.
13. Axle spindle.	Inspect for: a. Grooves. b. Gouges. c. Abnormal wear. d. Discoloration.	Notify Direct Support Maintenance.
	NOTE	
	component parts must be clean a e of all dirt and foreign matter.	and

10-13. FRONT WHEEL BEARINGS AND SEALS MAINTENANCE (M915) (Continued).

LOCATION/ITEM ACTION REMARKS

C. PACKING AND INSTALLATION OF BEARINGS.

14. Inner bearing (3) and
outer bearing (14).

Use bearing packing tool
and pack bearings. If
packing tool is not avail-

able, bearings may be

hand packed.

15. Cup (2). Place in hub (1).

16. Inner bearing (3). Place in cup (2).

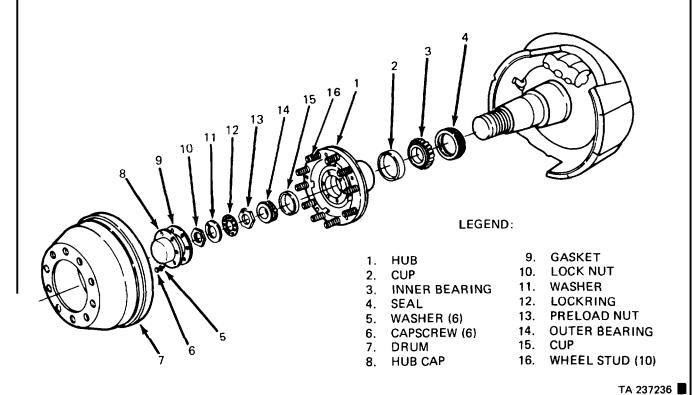
17. Seal (4). Tap new seal in hub (1), Lettering on seal should

using a seal installer. face truck.

18. Cup (15). Place in hub (1).

19. Hub (1). Place in axle spindle.

20. Outer bearing (14). Place in cup (15).



10-13. FRONT WHEEL BEARINGS AND SEALS MAINTENANCE (M915) (Continued). LOCATION/ITEM **ACTION REMARKS** C. PACKING AND INSTALLATION OF BEARINGS (Continued). 22. Lockring (12). Install. Adjust nut (13) to slip into nearest hole in lockring (12). 23. Washer (11). Slide over axle. a. Install. 24. Locknut (10). b. Torque to 125 lb-ft (169.5 N•m). 25. Washer (11). Bend tabs over nut (10). 26. Deleted. 27. Gasket (9) and hubcap (8). Align with hub (1). 28. Six capscrews (6) and a. Install. washers (5 b. Torque to 9-12 lb-ft See inset for sequence. (12-16 N•m). 29. Drum (7). Place over hub (1) and seat Lug nuts on left side of vehicle into position by installing are left-handed threads. two nuts equally spaced, then remove nuts and install tire and wheel assembly. Reinstall lug nuts and torque lug nuts to 450 lb-ft (610 N•m) (see TM 9-2320-273-10). 30. Remove jack. Road test vehicle. NOTE Follow-on maintenance action required: Install wheel and tire, road test vehicle, refer to TM 9-2320-273-10.

10-13. FRONT WHEEL BEARING	S AND SEALS M	AINTENANCE	E (M915) (Continued).
LOCATION/ITEM	AC	TION	REMARKS
8 9 10 11 12 13		(Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q
7 6 5	LEGEN	D:	
4. 5. 6.		14. OUTER 15. CUP	NUT ER
			TA 227227

10-14. FRONT WHEEL BEARINGS AND SEALS MAINTENANCE (M916 THRU M920).

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

b. Inspection of Bearings. (5)

c. Packing and Installation of Bearings. (30)

60 Minutes Total.

PARAGRAPH

EQUIPMENT CONDITION

(see TM 9-2320-273-10).

(see TM 9-2320-273-10).

CONDITION DESCRIPTION

Front Axle Jacked Up.

Wheel Removed.

<u>INITIAL SET</u>UP

APPLICABLE CONFIGURATIONS

M916 Thru M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

Wheel Bearing Nut Wrench, PN 1919 (45152) Part of Wrench Set, NSN 5120-00-169-4586.

MATERIALS/PARTS (P/N)

Wheel Dolly.

Wheel Bearing Nut Wrench.

Permatex (Refer to Appendix C).

Silicone (RTV) Gasket Material (Refer to Appendix C).

Oil Seal, A-1205-Y-1533 (78500).

GAA (Refer to Appendix C).

PERSONNEL REWIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

LO 9-2320-273-12.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

Wheels Blocked.

TROUBLESHOOTING REFERENCES

Table 10-2.

10-14. FRONT WHEEL BEARINGS AND SEALS MAINTENANCE (M916 THRU M920) (Continued).

LOCATION/ITEM ACTION REMARKS

WARNING

Block rear wheels of truck to keep it from rolling. Block up axle so that truck will not fall if jacks give way.

A. REMOVAL.

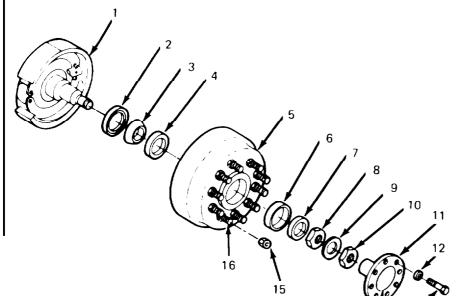
Eight capscrews (13) and washers (12).

Unscrew and remove.

- 2. Drive flange (11).
- a. Remove.

Several blows with a hammer may be needed to loosen drive flange. Do not hit studs.

b. Drive out expansion plug (14) with hammer and punch. Replace expansion plug (14) only if damaged.



LEGEND:

- 1. SPINDLE
- 2. OIL SEAL
- 3. INNER BEARING CONE
- 4. INNER BEARING CUP
- HUB AND DRUM ASSEMBLY
- 6. OUTER BEARING CUP
- 7. OUTER BEARING CONE
- 8. PRELOAD NUT
- 9. RETAINER
- 10. LOCK NUT
- 11. DRIVE FLANGE
- 12. WASHER (8)
- 13. CAPSCREW (8)
- 14. EXPANSION PLUG
- 15. WHEEL STUD NUT (10)
- 16. WHEEL STUD (10)

TA 237238

10-14. FRONT WHEEL BEARINGS AND SEALS MAINTENANCE (M916 THRU M920) (Continued).

LOCATION/ITEM ACTION REMARKS

A. REMOVAL (Continued).

3. Jam Nut (10), retainer (9), and bearing adjusting nut (8).

Use wheel bearing nut wrench to remove.

NOTE

Outer bearing cone (7) is loose and will will drop out when hub is removed and shook.

4. Hub and drum assembly (5).

Remove.

- 5. Oil seal (2), and inner bearing cone (3).
- a. Remove.
- b. Throw away oil seal (2).
- 6. Inner and outer bearing cups (4) and (6).
- a. Clean and inspect these items.
 If discoloration or pitting is noted, refer problem to DS/GS, as inner and outer bearings cups
 (4) and (6) must be pressed out and in.
- b. Damaged wheel studs (15) can be pressed out and installed with an arbor press.

Wheel studs (15) on left side of vehicle will have LH threads and RH threads on right side of vehicle.

B. INSPECTION OF BEARINGS.

7. Inner and outer bearing cones (3) and (7).

- a. Inspect for:
 - 1. Missing rollers.
 - 2. Flat, chipped, or pitted surfaces.
 - 3. Secure fit.

b. If bearings are to be reused:

See TM 9-214 fpr information on maintenance of bearings.

Replace if necessary.

- 1. Remove surface oil and gum deposits.
- 2. Soak in hot oil (140°F, 60°C) to loosen hardened oil and grease.
- 3. Wipe dry. Do not use compressed air.
- 4. Coat with a light film of oil. Wrap bearings in paper until you are ready to install.

10-14. FRONT WHEEL BEARINGS AND SEALS MAINTENANCE (M916 THRU M920) (Continued).

LOCATION/ITEM **ACTION REMARKS**

C. PACKING AND INSTALLATION OF BEARINGS.

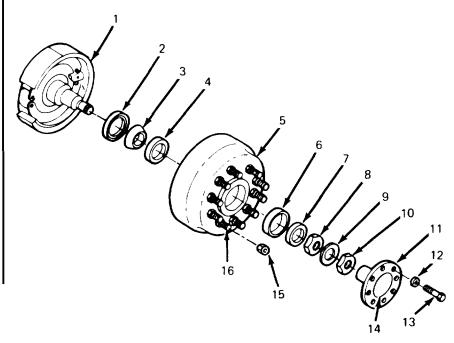
- 8. Inner bearing cone (3).
- a. Use bearing packing tool to pack with grease, or pack by hand.
- b. Place in hub and drum assembly (5) so that smaller end will point away from truck.

9. New oil seal (2).

Place in hub and drum assembly (5).



Do not use excessive pressure to install seal. Do not tap seal after it has bottomed. These actions will crush the set sleeve and damage the seal.



LEGEND:

- 1. SPINDLE
- OIL SEAL
- INNER BEARING CONE
- INNER BEARING CUP
- **HUB AND DRUM ASSEMBLY**
- OUTER BEARING CUP
- 7. **OUTER BEARING CONE**
- 8. **PRELOAD NUT**
- RETAINER 9.
- **LOCK NUT** 10.
- **DRIVE FLANGE** 11.
- 12. WASHER (8)
- 13. CAPSCREW (8) 14. **EXPANSION PLUG**
- 15. WHEEL STUD NUT (10)
- WHEEL STUD (10) 16.

TA 237239

10-14. FRONT WHEEL BEARINGS AND SEALS MAINTENANCE (M916 THRU M920) (Continued.

LOCATION/ITEM

ACTION

REMARKS

C. PACKING AND INSTALLATION OF BEARINGS (Continued).

CAUTION

Be careful not to damage oil seal (2) as you install the hub and drum assembly.

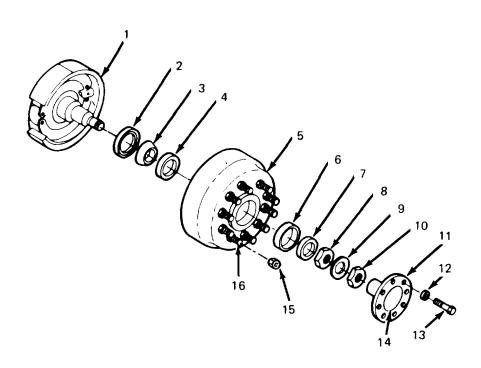
- 10. Hub and drum assembly (5).
- a. Mount assembly on spindle (1).
- b. Press hub until inner bearing cone (3) is seated flush on spindle.
- 11. Outer bearing cone (7).
- a. Use wheel bearing packing tool to pack with grease, or pack by hand.
- b. Place on spindle (1) against outer bearing cup (6). Small end of bearing shoud point towards truck.

10-14. FRONT WHEELS BEARINGS AND SEALS MAINTENANCE (M916 THRU M920 (Continued.

LOCATION/ITEM

ACTION

REMARKS



LEGEND:

- 1. SPINDLE
- 2. OIL SEAL
- 3. INNER BEARING CONE
- 4. INNER BEARING CUP
- 5. HUB AND DRUM ASSEMBLY
- 6. OUTER BEARING CUP
- 7. OUTER BEARING CONE
- 8. PRELOAD NUT
- 9. RETAINER
- 10. LOCK NUT
- 11. DRIVE FLANGE
- 12. WASHER (8)
- 13. CAPSCREW (8)
- 14. EXPANSION PLUG
- 15. WHEEL STUD NUT (10)
- 16. WHEEL STUD (10)

TA 237240

10-14. FRONT WHEEL BEARINGS AND SEALS MAINTENANCE (M916 THRU M920) (Continued).

LOCATION/ITEM

ACTION

REMARKS

C. PACKING AND INSTALLATION OF BEARINGS (Continued).

12. Preload nut (8).

- a. Install the preload nut using wheel bearing nut wrench.
- b. If reusing the same bearings, torque to 50 lb-ft (68 N•m) while rotating wheel in both directions.
- c. If new bearings have been installed, torque to 100 lb-ft (136 N•m). While rotating wheel in both directions, back off to 0 lb-ft. Torque to 50 lb-ft (68 N•m).
- d. Back off preload nut no more than 1/4 turn counterclockwise to install cotter pin.
- 13. Retainer (9) and locknut (10).
- a. Screw onto spindle (1).
- b. Tighten locknut (10) to 250 to 400 lb-ft, (340-544 N•m).

10-14. FRONT WHEEL BEARINGS AND SEALS MAINTENANCE (M916 THRU M920) (Continued).

LOCATION/ITEM	ACTION	REMARKS
C. PACKING AND INSTALLAT	TION OF BEARINGS (Continued).	
14. Drive flange (11).	 a. Coat inside surface with silicone (RTV) gasket materia b. Attach to hub with eight capscrews (13) and washers (12). c. Install expansion plug (14), if removed. 	
15. Eight capscrews (13) and washers (12).	Tighten to 175-205 lb-ft (237-282 N•m) with torque wrench. Tighten as shown.	
16. Tire and wheel assembly	Install (refer to TM 9-2320-273- Tighten wheel stud nuts (15) wi torque wrench to 450 lb-ft (610 in sequence shown.	ith

10-15. REAR WHEEL BEARINGS, SHAFTS, AND SEALS MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REWIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (25)

b. Inspection of Bearings.
 c. Packing and Installation of Bearings. (30)

c. Packing and Installation of Bearings. (30)

60 Minutes Total

EQUIPMENT CONDITION

INITIAL SETUP

APPLICABLE CONFIGURATIONS

PARAGRAF

PARAGRAPH CONDITION DESCRIPTION

All. None. None.

TEST EQUIPMENT

None.

SPECIAL TOOLS

Wheel Bearing Nut Wrench, PN 1914 (45152) Part of Wrench Set, NSN 5120-00-169-4586.

MATERIALS/PARTS (P/N)

Non-Flammable Cleaning Solvent SD-2 (Refer to Appendix C). Inner Bearing Seal M915 (A1205-T-696) M916 Thru M920 (A1205-T-774) (78500). Outer Beering Seal M915 (A1205-N-612) M916 Thru M920 (A1205-4-619) (78500). Star Washers (16) (1229-X-518) (78500). Gasket (2) M915 (2208-X-440) M916 Thru M920 (2208-W-413) (78500).

PERSONNEL REQUIRED

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P. LO 9-2320-273-12. **GENERAL SAFETY INSTRUCTIONS**

Engine OFF.
Transmission in Neutral.
Park Brake Set.
Wheels Blocked.

TROUBLESHOOTING REFERENCES

Table 10-3.

10-15. REAR WHEEL BEARINGS, SHAFTS, AND SEALS MAINTENANCE. **ACTION REMARKS** LOCATION/ITEM A. REMOVAL. a. Remove. 1. Eight nuts (6) and star washers (5). b. Throw away star washers (5). CAUTION Do not pry between flange of axle shaft (3) and mating surface of hub. Do not hit studs (13). LEGEND: GASKET (2) 2. **BEARING SEAL AXLE SHAFT** 4. TAPERED SPACER (8) 5. STARWASHER (8) 6. NUT (8) 7. WHEEL/HUB/DRUM ASSEMBLY 14 8. OUTER OIL SEAL WIPER 9. LOCKNUT 10. KEYED SPACER 11. PRELOAD NUT 12. **OUTER WHEEL BEARING** 13. STUD (8) 14. OIL SLINGER (M915) 15. WASHER (5) (M915) 16. CAPSCREW (5) (M915) 10 17. INNER WHEEL BEARING 18. INNER BEARING SEAL 8 19. INNER OIL SEAL WIPER 20. BRAKE TA 237242

10-15. REAR WHEEL BEARINGS,	SHAFTS, AND SEALS MAINTEI	NANCE (Continued).
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
2. Axle shaft (3) and eight tapered spacers (4).	a. Use slidge hammer to pound until tapered spacers (4) loosen.	Do not hit studs (13).
	b. Remove.	
3. Two gaskets (1), bearing seal (2), and outer oil seal wiper (8).	a. Remove.	Replace outer oil seal wiper (8), if damaged.
wiper (6).	b. Throw away bearing seal (2) and two gaskets (1).	
 Locknut (9), keyed spacer (10), and preload nut (11). 	Remove with wheel nut wrench	h.
5. Outer wheel bearing (12).	Pull out.	
Bloc	mot depend on jacks to support truk it securely so that it will not fall gives way.	
6. Rear wheels	Jack up (see TM 9-2320-273-10	0).
7. Wheel, hub, and drum assembly (7).	Remove.	
8. (M915 Only) Oil Slinger (14), five washers (15) and capscrews (16).	Remove.	
 Inner bearing seal (18), inner wheel bearing (17), and inner oil seal wiper (19). 	a. Remove.	 a. You should now be reaching into the side of the hub that was facing the truck.
	b. Throw away inner bearing seal (18).	b. Replace inner oil seal wiper (18), if damaged.

10-15. REAR WHEEL BEARINGS. SHAFTS, AND SEALS MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM **B. INSPECTION OF BEARINGS.** Replace, if necessary. 10. Outer wheel bearing (12) and a. Inspect for: inner wheel bearing (17). 1. Missing rollers. 2. Flat, chipped, or pitted surfaces. 3. Discoloration. 4. Secure fit. LEGEND: GASKET (2) BEARING SEAL 17 AXLE SHAFT TAPERED SPACER (8) 5. STARWASHER (8) 14 NUT (8) WHEEL/HUB/DRUM ASSEMBLY **OUTER OIL SEAL WIPER** LOCKNUT **KEYED SPACER** 10. PRELOAD NUT **OUTER WHEEL BEARING** 13. STUD (8) OIL SLINGER (M915) 14. 13 WASHER (5) (M915) 15. 16. CAPSCREW (5) (M915) INNER WHEEL BEARING 18. INNER BEARING SEAL 19. INNER OIL SEAL WIPER 20. BRAKE TA 237243

10-15. REAR WHEEL BEARINGS, SHAFTS, AND SEALS MAINTENANCE (Continued).

LOCATION/ITEM ACTION

B. INSPECTION OF BEARINGS (Continued).

- Outer wheel bearing (12) and inner wheel bearing (17) (continued).
- b. If bearings are to be reused:
 - 1. Remove surface oil and gum deposits.

until you are ready to

2. Clean with solvent.

install them.

3. Wipe dry, Do not use compressed air

compressed air. on maintenance.
4. Coat with a light film of oil. Wrap bearings in paper

REMARKS

See TM 9-214 for information

C. PACKING AND INSTALLATION OF BEARINGS.

11. (M915 only) Oil slinger (14), five washers (15) and capscrews (16).

Install.

- 12. Inner wheel bearing (17).
- a. Use bearing packing tool to pack with grease.
- b. Place in wheel/hub/drum assembly (7) so that smaller end will point away from truck.
- 13. New inner bearing seal (18) and inner oil seal wiper (19).

Place over inner wheel bearing (17) in wheel/hub/drum assembly (7). Lettering should face truck when wheel is mounted.

- 14. Wheel/hub/drum assembly (7).
- Place in position over brake (20), using wheel dolly.
- 15. Outer wheel bearing (12).
- a. Use bearing packing tool to pack with grease.
- b. Place on hub with small end towards truck.

10-15. REAR WHEEL BEARINGS, SHAFTS, AND SEALS MAINTENANCE (Continued).

LOCATION/ITEM

ACTION

REMARKS

C. PACKING AND INSTALLATION OF BEARINGS.

- 16. Preload nut (11).
- a. Install preload nut using wheel bearing nut wrench.
- b. If reusing the same bearings, torque to 50 lb-ft (68 N•m) while rotating wheel in both directions,
- c. If new bearings have been installed, torque to 100 lb-ft (136 N•m) while rotating wheel in both directions, back off to 0 lb-ft. Torque to 50 lb-ft.
- d. Back off preload nut no more than 1/4 turn counterclockwise.
- 17. Keyed spacer (10) and locknut (9).
- a. Install with wheel bearing nut wrench.
- b. Torque locknut (9) to 250-400 lb-ft (340-544 N•m).

20.

BRAKE

10-15. REAR WHEEL BEARINGS, SHAFTS, AND SEALS MAINTENANCE (Continued). **ACTION** LOCATION/ITEM **REMARKS** C. PACKING AND INSTALLATION OF BEARINGS (Continued) Put in place over studs (13). 18. New bearing seal (2), two new flange gaskets (1), and outer oil seal wiper (8). 19. Axle shaft (3). Set in place. 20. Eight tapered spacers (4), star Screw on. Tighten to 175 lb-ft washers (5), and nuts (6). (237 N•m) with torque wrench. Tighten in this order: NOTE Follow-on maintenance action required: After road testing vehicle, check for oil leaks. 20 LEGEND: 18 GASKET (2) **BEARING SEAL AXLE SHAFT** 3. 4. TAPERED SPACER (8) 5. STARWASHER (8) 6. NUT (8) 7. WHEEL/HUB/DRUM ASSEMBLY 14 **OUTER OIL SEAL WIPER** 9. LOCKNUT 10. KEYED SPACER 11. PRELOAD NUT 12. OUTER WHEEL BEARING 13. STUD (8) 14. OIL SLINGER (M915) 15. WASHER (5) (M915) 16. CAPSCREW (5) (M915) 17. INNER WHEEL BEARING 18. INNER BEARING SEAL INNER OIL SEAL WIPER 19.

10-16. PUSHER AXLE BEARINGS AND SEALS.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (30)b. Inspection. (10)c. Packing and Installation of Bearings. (30)

70 minutes Total.

INITIAL SETUP EQUIPMENT CONDITION

APPLICABLE CONFIGURATIONS PARAGRAPH CONDITION DESCRIPTION

M917, M919, M920. None. None.

TEST EQUIPMENT

None.

SPECIAL TOOLS

Outside Wheel Bearing Nut Wrench, PN 1909, Part of Set NSN 5120-00-169-4586. Inside Wheel Bearing Nut Wrench, PN 1927, Part of Set NSN 5120-00-169-4586.

MATERIALS/PARTS (P/N)

Seal Installer.

Brass Drift.

GAA (Refer to Appendix C).

Non-Flammable Cleaning Solvent SD-2 (Refer to Appendix C).

Inner Bearing Seal, 1205-P-1212 (78500). Hub Cap Gasket, 2208-P-796 (78500).

PERSONNEL REQUIRED

Two (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P. LO 9-2320-273-12.

GENERAL SAFETY INSTRUCTIONS

Engine OFF. Transmission in Neutral. Park Brake Sat. Wheels Blocked.

TROUBLESHOOTING REFERENCES

10-16. PUSHER AXLE BEARINGS AND SEALS (Continued).

LOCATION/ITEM ACTION REMARKS

A. REMOVAL.

1. Axle. Jack up.

2. Tire/hub assembly (5). Place on wheel dolly.

3. Six capscrews (14) Remove. and washers (15).

4. Hub cap (13) and gasket (12).

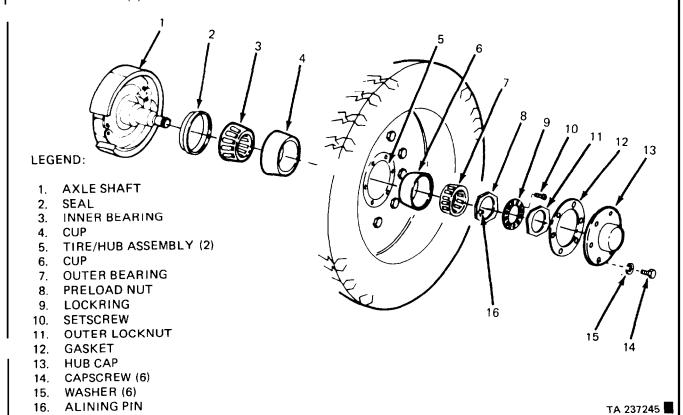
Remove. Discard gasket.

5. Allen head setscrew Remove. (10).

6. Outer locknut (11). Remove.

7. Lockring (9). Remove.

8. Preload nut (8). Remove.



LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued). 9. Outer bearing (7).	Remove.	
10. Tire/hub assembly (5).	Slide off axle shaft (1).	
11. Inner bearing (3) and seal (2).	Remove.	Use hammer and brass drift. Tap out bearing and seal. Discard seal (2).
	NOTE	
	Clean all parts with cleaning solv	vent SD-2.
	WARNING	
J	Do not use compressed air to clean	bearings.
B. INSPECTION.		
12. Inner bearing (3) and outer bearing (7).	Inspect for: a. Cracks. b. Chips. c. Breaks. d. Flat spots on rollers. e. Smooth operation. f. Discoloration (straw colored or bluish tint).	Replace as necessary. Refer to TM 9-2320-273-20P
13. Cups (4) and (6).	Inspect for: a. Flat Spots. b. Roughness. c. Cracks. d. Gouges. e. Wear. f. Discoloration (straw colored or bluish tint).	Refer to Direct Support Maintenance. If replacement is needed, cups must be pressed out and in.
14. Axle Shaft (1).	Inspect for: a. Grooves. b. Gouges. c. Abnormal wear. d. Discoloration.	Refer to Direct Support Maintenance. If replacement is needed, cups must be pressed out and in.

10-16. PUSHER AXLE BEARING AND SEALS (Continued).

REMARKS ACTION LOCATION/ITEM

C. PACKING AND INSTALLATION OF BEARINGS.

- 15. Inner bearings (3).
- a. Use bearing packing tool to pack with grease or pack by hand.
- b. Place in cup (4) inside of hub (5).

16. New seal (2).

Tap in place.

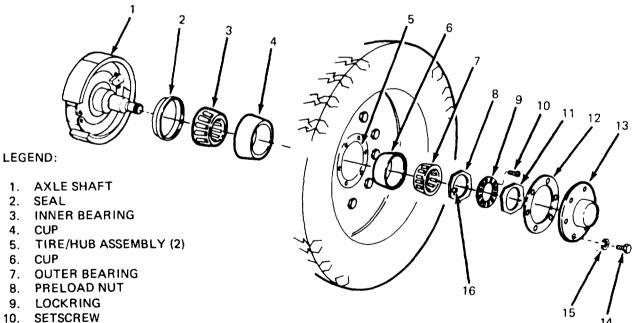
Use hammer and seal

installer.

17. Tire/hub assembly (5).

Slide over axle shaft (1), using wheel dolly.

- 18. Outer bearing (7).
- a. Use bearing packing tool to pack with grease or pack by hand.
- b. Insert in cup (6) inside of hub (5).



- 11. OUTER LOCKNUT
- 12. GASKET
- 13. HUB CAP
- 14. CAPSCREW (6)
- 15. WASHER (6)
- 16. ALINING PIN

WHEELS AND TIRES.				
10-16. PUSHER AXLE BEARINGS AND SEALS (Continued).				
LOCATION/ITEM	ACTION	REMARKS		
C. PACKING AND INSTALLATION	OF BEARINGS (Continued).			
19. Preload nut (8).	 a. Install preload nut using wheel bearing nut wrench. b. If reusing the same bearings, torque to 50 lb-ft (68 N•m) while rotating wheel in both directions. c. If new bearings have been installed, torque to 100 lb-ft (136 N•m) while rotating wheel in both directions, back off to 0 lb-ft. Torque to 50 lb-ft (68 N•m). d. Back off preload nut no more than 1/4 turn counterclockwise to install cotter pin. 	Alining pin (16) must face toward lockring (9).		
20. Lockring (9).	Install.	Adjust preload nut (8) so that alining pin (16) slips into nearest hole in lockring (9).		
21. Outer locknuts (11).	a. Install. b. Torque to 250-300 lb-ft (339-406.8 N•m).			

10-16. PUSHER AXLE BEARINGS AND SEALS (Continued).

LOCATION/ITEM ACTION REMARKS

C. PACKING AND INSTALLATION OF BEARINGS (Continued).

22. Setscrew (10). Install in one of four

tappings.

23. Gasket (12) hub Line up holes. cap (13).

24. Capscrews (14) and

10. SETSCREW11. OUTER LOCKNUT

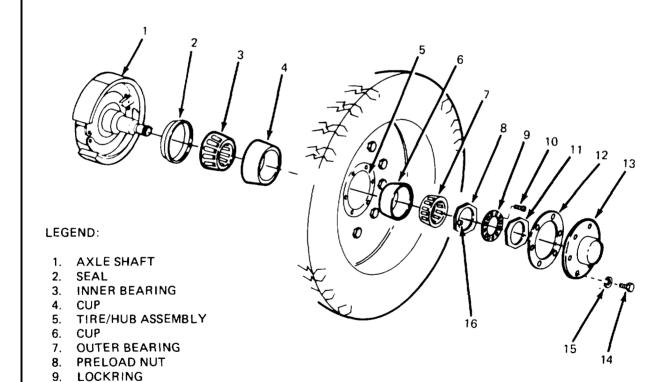
12. GASKET13. HUB CAP14. CAPSCREW (6)15. WASHER (6)16. ALINING PIN

washers (15). Ib-ft (33.90–42.04 N•m)

in sequence shown.

Tighten to 25-31

25. Jack. Remove from axle.



10-17. STEERING WHEEL MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (7) b. Installation. (7) c. Operational Check. (1)

15 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

AII.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Wheel Puller.

EQUIPMENT CONDITION

<u>PARAGRAPH</u> <u>CONDITION DESCRIPTION</u>

5-67A. Horn Button Assembly Removed.

5-37A. Batteries Disconnected.

PERSONNEL REQUIRED

One (MOS-63B20).

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P:

GENERAL SAFETY INSTRUCTIONS

SPECIAL ENVIRONMENTAL CONDITIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

10-17. STEERING WHEEL MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** A. REMOVAL. 1. Nut(1). Unscrew and remove. 2. Steering wheel (2). Remove using suitable wheel puller. **B. INSTALLATION.** Place on steering column. 3. Steering wheel (2). Turn gently to seat splines. 4. Nut (1). Screw onto shaft (3) and tighten. C. OPERATIONAL CHECK. 5. Engine. Start up (see TM 9-2320-273-10). Turn both directions. 6. Steering wheel (2). Check that front wheels turn. Follow on Maintenance. a. Install horn button assembly (para 5-67B). b. Connect batteries (para 5-37B). LEGEND: 1. NUT 2. STEERING WHEEL 3. SHAFT TA 074993

10-18. LOWER STEERINGSHAFT MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (10)b. Disassembly. (18)c. Assembly. (18)d. Installation. (30)e. Operational Check. <u>(2)</u>

78 Minutes Total.

INITIAL SETUP

EQUIPMENT CONDITION PARAGRAPH

CONDITION DESCRIPTION APPLICABLE CONFIGURATIONS

None. None. All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

GAA (Refer to Appendix C). Non-Flammable Dry Cleaning Solvent SD-2 (Refer to Appendix C).

PERSONNEL REQUIRED

(MOS-63B20). Two

TM 9-2320-273-10. TM 9-2320-273-20P.

LO 9-2320-273-12.

REFERENCES (TM)

GENERAL SAFETY INSTRUCTIONS

Vehicle Parked on Level Ground.

SPECIAL ENVIRONMENTAL CONDITIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

10-18. LOWER STEERING SHAFT MAINTENANCE (Continued).

LOCATION/ITEM **ACTION REMARKS**

NOTE

Turn wheels to left for better access.

A. REMOVAL.

1. Nut (1), washer (8), and capscrew (12).

Unscrew and remove.

2. Yoke (11).

Remove from steering gear (6).

3. Nut (7), washer (2), and capscrew (5).

Unscrew and remove.

4. Universal joint yoke (3).

10

13

16

17

15

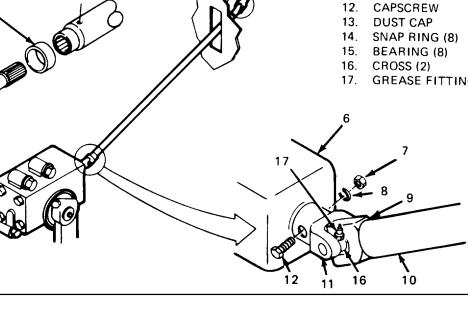
Slide off of upper steering shaft (4).



- 1. NUT
- 2. WASHER
- 3. U-JOINT YOKE
- **UPPER STEERING** SHAFT
- 5. **CAPSCREW**
- STEERING GEAR 6.
- 7. NUT
- 8. WASHER
- U-JOINT YOKE (2) 9.
- 10. LOWER

STEERING SHAFT

- 11. YOKE
- 12.
- **GREASE FITTING (3)**



LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
5. Lower steering shaft (10).	Remove through firewall from under hood.	U-Joints and yokes will still be attached.
B. DISASSEMBLY.		
	CAUTION	
	bearings only hard enough to be away from snap rings.	reak
6. Four snap rings (14).	Remove.	
7. Four bearings (15).	Remove.	You can push out the first bearing of each yoke by presing gently on the opposite bearings. Press cross end to push out second bearing.
8. Three grease fittings (17).	Remove from two crosses (16) and lower steering shaft (10).	Check for thread or ball tip damage and replace as necessary.
9. Two crosses (16) and four yokes (9), (11), and (3).	Separate.	
10. Lower steering shaft (10).	Slide splined sections apart.	
11. Dust cap (13).	Inspect.	If damage is evident, remove by prying up tabs and instal new dust cap by staking tabs with a center punch.
	WARNING	
PUI USI GU	MPRESSED AIR USED FOR CRPOSES WILL NOT EXCEED 3 E ONLY WITH EFFECTIVE CHARDING AND PERSONAL PRUIPMENT (GOGGLES/SHIELD)	0 PSI. HIP ROTECTIVE

10-18. LOWER STEERING SHAFT MAINTENANCE (Continued).

15

LOCATION/ITEM

ACTION

REMARKS

B. DISASSEMBLY (Continued).



Do not allow SD-2 dry cleaning solvents to come in contact with seals or flexible hoses. These cleaners may damage leather, rubber, and synthetic materials.

12. Four yokes (3), (9), (11), two crosses (16), and eight bearings (15).

16

10

- a. Clean with SD-2 dry cleaning solvent and dry with compressed air.
- b. Inspect for cracks, wear, nicks, burrs, and scratches.

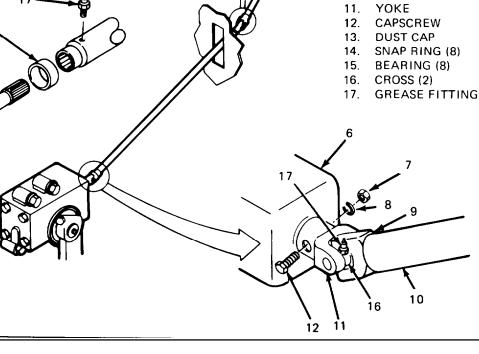
Use Fine stone to remove light marks. Replace as necessary as a set.



- 1. NUT
- 2. WASHER
- U-JOINT YOKE
- **UPPER STEERING** SHAFT
- **CAPSCREW**
- 6. STEERING GEAR
- 7. NUT
- 8. WASHER
- 9. U-JOINT YOKE (2)
- 10. LOWER

STEERING SHAFT

GREASE FITTING (3)



10-18. LOWER STEERING SHAFT MAINTENANCE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
	NOTE		
	gs and cross should be replaced as a s cross or any bearing is damaged, repla t.		
C. ASSEMBLY.			
13. Lower steering shaft (10).	Slide splined sections together at dust cap (13).		
14. Three grease fittings (17).	Install in two crosses (16) and lower steering shaft (10).		
15. Two crosses (16).	a. Place between four yokes (3), (9), and (11).		
	b. Lubricate assembly with GAA.		
16. Eight bearings (15).	a. Lubricate with GAA.		
	 b. Use soft hammer to care- fully tap bearings into yokes. 		
17. Eight snap rings (14).	Seat in yoke grooves.		
D. INSTALLATION.			
18. Lower steering shaft (10).	From under hood, insert through hole in firewall.	Upper and lower U-joints and yokes are attached to shaft at this time.	
19. U-joint yoke (3).	Push onto splined shaft of upper steering shaft (4).		
20. Yoke (11).	Push onto splined shaft of steering gear (6).		
21. Capscrew (12), washer (8), and nut (7).	Screw in and tighten.		
22. Capscrew (5), washer (2), and nut (1).	Screw on and tighten.		
23. Three grease fittings (17).	Use grease gun and apply GAA.		

10-18. LOWER STEERING SHAFT MAINTENANCE (Continued).

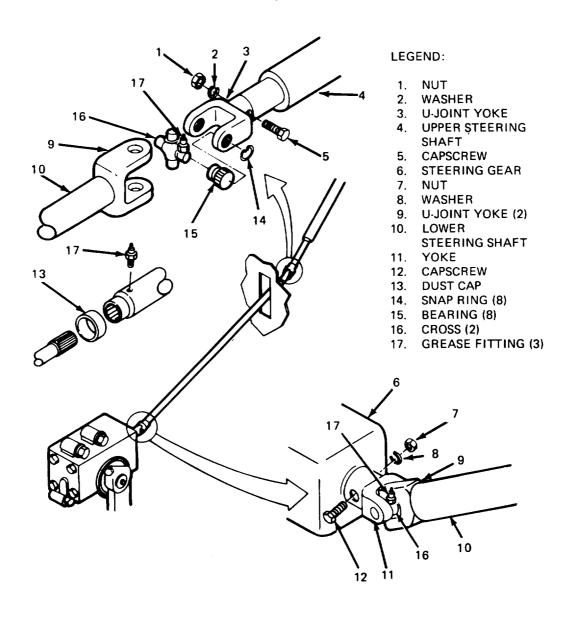
LOCATION/ITEM ACTION REMARKS

E. OPERATIONAL CHECK.

24. Engine. Start up (see TM 9-2320-273-10).

25. Steering wheel.

Turn. Check that front wheels turn freely.



10-19. DRAG LINK MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.
b. Inspection of Mating Connections.
c. Installation.
d. Operational Check.

60 Minutes Total.

None.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

AII.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Cotter Pin (2), K-2616 (78500). Grease Gun GAA (refer to Appendix C).

EQUIPMENT CONDITION

PARAGRAPH CONDITION DESCRIPTION

None.

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Park Brake Set.

TROUBLESHOOTING REFERENCES

10-19. DRAG LINK MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** NOTE Turn wheel left or right for easy accessibility in performing task. REMOVAL. 1. Cotter pins (2) Remove with pliers and If pins stick, tighten or loosen and (5). throw away. castle nuts (3) and (6) slightly to aline slot. 2. Castle nuts (3) a. Back off nuts until they and (6). are flush with threaded portion of shaft. b. Using a sledge hammer hit this area until drag link unseats. c. Unscrew and remove. LEGEND: 1. STEERING ARM 2. COTTER PIN 3. CASTLE NUT 4. DRAG LINK 5. COTTER PIN 6. CASTLE NUT 7. PITMAN ARM 8. LUBRICATION FITTING (2) TA 074997

LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
3. Drag link (4).	Remove.	
4. Two lubrication fittings (8).	Unscrew and remove.	
B. INSPECTION OF MATING CO	NNECTIONS.	
5. Drag link (4), steering arm (1), and pitman arm (7).	Inspect mating surfaces for: a. Scoring. b. Gouging. c. Excess or uneven wear.	Replace if necessary, If connections are damaged, troubleshoot steering system (para 10-5).
6. Two lubrication fittings (8).	Inspect for: a. Damaged ball end seal. b. Damaged threads.	Replace as necessary.
C. INSTALLATION.		
7. Two lubrication fittings (8).	Install at either end of drag link.	
8. Drag link (4).	a. Place one end in steering arm (1).b. Place the other end in pitman arm (7).	
9. Castle nuts (3) and (6).	Screw on and tighten to 120 lb-ft (163 N•m) with torque wrench.	
10. New cotter pins (2) and (5).	Insert cotter pins (2) and (5) with pliers and bend ends over.	It may be necessary to tighten castle nuts (3) and (6) further in order to aline slots with hole.
11. Two lubrication fittings (8).	Grease with GAA until grease is visible at either end connection.	Use grease gun.
D. OPERATIONAL CHECK.		
12. Engine.	Start up (see TM 9-2320-273-1	0).
13. Steering wheel.	Check to see that wheels turn freely.	
14. Engine.	Shut down (see TM 9-2320-27	3-10).

10-19. DRAG LINK MAINTENANCE (Continued).	
LOCATION/ITEM	ACTION	REMARKS
LEGEND: 1. STEERING ARM 2. COTTER PIN 3. CASTLE NUT 4. DRAG LINK 5. COTTER PIN 6. CASTLE NUT 7. PITMAN ARM 8. LUBRICATION FITTING (2)	7 6 5	
		TA 074998

10-20. TIE ROD MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (20)

b. Inspection of End Assemblies. (5)

c. Installation. (25)

50 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

AII.

EQUIPMENT CONDITION

PARAGRAPH CONDITION DESCRIPTION

11-14A or C. Front Fenders Removed.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Ball joint Puller. Jack Stands.

Cotter Key (2), K-2616 (78500).

PERSONNEL REQUIRED
Two (MOS-63820).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

10-20. TIE ROD MAINTENANCE (Continued). **ACTION** LOCATION/ITEM **REMARKS** A. REMOVAL. 1. Tie downs (9) and Tie a suitable rope between tie rod (4). these two points, on either side, to support weight of tie rod ends when disconnected. M915 LEGEND: 1. NUT (2) 2. COTTER KEY (2) 3. BOLT (2) 4. TIE ROD 5. WASHER (2) M916 thru M920 6. NUT (2) 7. BALL JOINT (2) 8. STEERING ARM (2) 9. TIE DOWN (2) 10. KNUCKLE (2) 11. CLAMP (2) TA 074999

10-20. TIE ROD MAINTENANCE	(Continued).	
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
2. Two cotter keys (2) and nuts (1).	Remove from ball joints (7) on each side.	
3. Two ball joints (7).	 a. Using ball joint puller or tapping with mallet remove from steering arms (8) on each side (M915). Remove from knuckles (10) (M916 thru M920). 	
	 b. Lower and remove tie rod (4) with ball joints (7) by unfastening and lowering rope sling on either side. 	
4. Two bolts (3), washers (5), and nuts (6).	Loosen.	
5. Two ball joints (7).	 Counting the number of turn unscrew from tie rod (4). 	S,
	b. Slide off clamp (11) from tie rod (4).	
B. INSPECTION OF END ASSEM	MBLIES.	
6. Two ball joints (7).	Holding tie rod connection in one hand and steering arm connection in other hand, check for any play or looseness.	If there is any looseness, replace assembly.
C. INSTALLATION.		
7. Two ball joints (7).	 a. Slide one clamp (11) onto either end of tie rod (4). 	
	 b. Screw onto tie rod (4), using same number of turns as you counted in step 5. 	
8. Two bolts (3), washers (5), and nuts (6).	Install thru two clamps (11) and torque to 40-55 lb-ft (54-74 N•	
9. Two ball joints (7).	Fasten ropes to tie downs (9) a tie rods (4) and hoist up into steering arms (8) (M915) or knuckles (10) (M916 thru M92 Tie rope sling securely.	

10-20. TIE ROD MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM C. INSTALLATION (Continued). 10. Two nuts (1). a. Torque to 110-125 lb-ft (149-169 NŽm). b. Secure with new cotter key (2) at each end. **NOTE** Follow-on maintenance action required: Check wheel alinement; refer to paragraph 10-10A. Install front fenders; refer to paragraph 11-14 B or D. M915 LEGEND: 1. NUT (2) 2. COTTER KEY (2) BOLT (2) TIE ROD WASHER (2) 5. 6. NUT (2) 10 7. BALL JOINT (2) 8. STEERING ARM (2) M916 thru M920 9. TIE DOWN (2) 10. KNUCKLE (2) 11. CLAMP (2) TA 075000

10-21. PITMAN ARM MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUI RED FOLLOWS TASK DESCRIPTION.)

b. Inspection of Mating Surfaces. (5) c. Installation.

(20)

40 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

CONDITION DESCRIPTION

None.

None.

PARAGRAPH

EQUIPMENT CONDITION

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Cotter Pin, K-2616 (78500).

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

10-21. PITMAN ARM MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

NOTE

Check for alinement marks (1) and (3) on pitman arm (7) and steering gear shaft (9). If none are found, put scribe lines on at this time.

A. REMOVAL.

1. Cotter pin (5), nut (6), and drag link (4).

Remove.

Discard cotter pin (5).

2. Nut (2) and bolt (8).

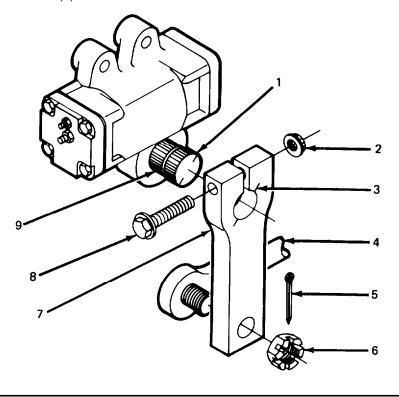
Unscrew and remove.



Be careful not to damage shaft when removing pitman arm.

3. Pitman arm (7).

Remove.



LEGEND:

- 1. ALINEMENT MARK
- 2. NUT
- 3. ALINEMENT MARK
- 4. DRAG LINK
- 5. COTTER PIN
- 6. NUT
- 7. PITMAN ARM
- 8. BOLT
- 9. STEERING GEAR SHAFT

LOCATION/ITEM	ACTION	REMARKS
B. INSPECTION OF MATING SUF	RFACES.	
4. Pitman arm (7) and steering gear shaft (9).	Inspect mating surfaces for: a. Burrs. b. Gouges. c. Uneven or excess wear.	If pitman arm is damaged, replace. If shaft is damaged, replace steering gear or refer problem to Direct Support Maintenance.
C. INSTALLATION.		
5. Pitman arm (7) and steering gear shaft (9).	a. Aline marks (1) and (3)b. Insert wedge to open are slightly.c. Drive on with mallet.d. Check that marks are stalined.	m
6. Nut (2) and bolt (8).	Screw on. Tighten to 400 (542 NŽm) with torque w	
7. Drag link (4), nut (6), and new cotter pin (5).	a. Install.b. Torque nut to 120 lb-f (163 N•m).	't

10-21. PITMAN ARM MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** .3 LEGEND: 1. ALINEMENT MARK 2. NUT 3. ALINEMENT $\mathsf{MAR}\ \mathsf{K}$ 4. DRAG LINK 5. COTTER PIN 6. NUT 7. PITMAN ARM 8. BOLT 9. STEERING **GEAR SHAFT**

CONDITION DESCRIPTION

STEERING MECHANISM.

10-21.1. STEERING ARM MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Preparation c. Cleaning/Inspection d. Assembly b. Disassembly

2 Hours Total.

EQUIPMENT CONDITION INITIAL SETUP APPLICABLE CONFIGURATIONS **PARAGRAPH**

M915 None None

TEST EQUIPMENT

Analyzer, Power Steering, NSN 4910-01-160-3618 P/N J26487 (33287)

SPECIAL TOOLS

Pushrod Driver (fabricate IAW Section 10-21.4, page 10-85) P/N DTA177323 (19207) Puller, NSN 5120-00-595-9305 P/N GGG-P-781 (81348) Torque Wrench, NSN 5120-00-221-7983 P/N SW130-301 (10001) Multiplier, Torque Wrench NSN 5120-01-142-6941 P/N 392 (87641) Steering Stop Template (fabricate IAW Section 10-21.4, page 10-85)

MATERIALS/PARTS (P/N)

Steering Arm Kit, 2MPS-3993 (78500) Includes: Cotter Pin, (MS24665-498 (96906) Key, 16X202 (78500) Nut, Drag Link/Steering Arm, MS35692-69 (96906) Nut, Knuckle/Steering Arm, MS35692-1824 (96906) Boot, Grease, 415172C1 (89346) Steering Arm, 3133-G-6663 (78500)

PERSONNEL REQUIRED

SPECIAL ENVIRONMENTAL CONDITIONS Vehicle Parked on Level Ground.

One (MOS-63S)

REFERENCES (TM)

TM 9-2320-273-10 TM 9-2320-273-24&P TM 9-2320-273-34

GENERAL SAFETY INSTURCTIONS

Engine OFF. Transmission in Neutral. Parking Brake Set. Rear Wheels Chocked.

TROUBLESHOOTING REFERENCES

10-21.1. STEERING ARM MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

A. PREPARATION.

- 1. Perform front axle toe-in/toe-out check. (See paragraph 10-1 0).
- 2. Chock rear wheels.
- 3. Set parking brakes and break loose both front wheel lug nuts.
- 4. Lift front of vehicle off ground and secure with floor jacks.
- 5. Remove both front wheels. IAW TM 9-2320-273-10.
- 6. Turn steering wheel fully left.

B. DISASSEMBLY.

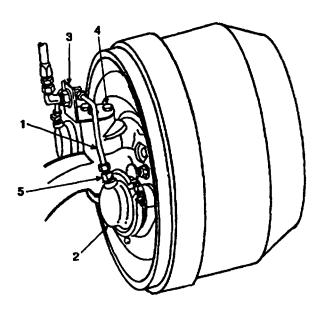
1. Brake line (1), left front brake chamber (2) and fitting (5).

Disconnect and remove.

2. Three bolts (4), bracket and king pin cover plate (3).

Remove.

Do not discard. Move bracket and brake line to one side. Cover exposed fitting hole.



10-21.1. STEERING ARM MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS B. DISASSEMBLY (Continued)** 3. Cotter pin (6), castle nut (7) and drag link (8). Remove. Discard cotter pin and castle nut. 4. Steering arm boss (10), drag link (8), Remove using Discard dust boot (12). steering arm (11), and dust boot (12). puller tool (9).

10-21.1. STEERING ARM MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS B. DISASSEMBLY (Continued)** 5. Cotter pin (13), castle nut (14), and steering arm (11). Discard cotter pin and Remove. castle nut. 13 16 **NOTE** If push rod driver (15) does not align with steering arm (11), perform step (6) first, to permit more steering travel and alignment of tool. Thread pushrod driver (15) squarely Drive steering arm out of 6. Push rod driver (15), steering arm (11), knuckle housing. and knuckle housing (16). onto end of steering arm. 7. Key (17) Remove. Discard. 8. Steering arm (11). 9. Jam nut (18) and stop bolt (19). Remove. Destroy. (Not for reuse) Loosen nut and Remove bolt. 16

10-21.1. STEERING ARM MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** C. CLEANING AND INSPECTION. Knuckle assembly bore (20). Clean off rust, Inspect for obvious damburrs, and foreign age. material. D. ASSEMBLY **NOTE** Before performing step 1 verify that a new key (17) is in place on the tapered end of the steering arm (11). Clean and install onto 1. Steering arm (11) knuckle assembly (16). Install castle nut (14) 2. Castle nut (14) and steering arm (11). Place nut on threaded end of steering arm (11), and finger tighten. If dust boot (12) was removed during disassembly, install dust boot onto drag link (8) and insert into steering arm boss (10). Secure with **CAUTION** castle nut (7) and finger tighten. • Do not exceed 785 lb-ft (1064 N-m). Do not back off castle nut (14) during this step. • Do not exceed 230 lb-ft (312 N-m). Do not back off castle nut (7) during this step. 3. Castle nut (14), steering arm cotter pin Torque castle nut. Torque to minimum hole (14). of 560 lb-ft (759 N-m). Align with steering arm cotter pin hole. 4. Cotter pin (13)5. Castle nut (7) and drag link cotter Install and secure. Torque to minimum of pin hole (22). 165 lb-ft (224 N-m), align and secure.

10-21.2. STEERING STOP INSPECTION AND ADJUSTMENT PROCEDURES.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

- a. Inspection
- b. Adjustment

1/2 Hour Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS
M915

EQUIPMENT CONDITION
PARAGRAPH
None

CONDITION DESCRIPTION

None

TEST EQUIPMENT

Analyzer, Power Steering, NSN 4910-01-160-3618 P/N J26487 (33287)

SPECIAL TOOLS

Pushrod Driver (fabricate IAW Section 10-21.1 G, page 10-85)
P/N DTA177323 (19207)
Puller, NSN 5120-00-595-9305
P/N GGG-P-781 (81348)
Torque Wrench, NSN 5120-00-221-7983
P/N SW130-301 (10001)
Multiplier, Torque Wrench NSN 5120-01-142-6941
P/N 392 (87641)
Steering Stop Template (fabricate IAW Section 10-21.1 G, page 10-85)

MATERIALS/PARTS(P/N)

Steering Arm Kit, 2MPS-3993 (78500)
Includes:
Cotter Pin, (MS24656-498 (96906)
Key, 16X202 (78500)
Nut, Drag Link/Steering Arm, MS35692-69 (96906)
Nut, Knuckle/Steering Arm, MS35692-1824 (96906)
Boot, Grease, 415172C1 (89346)
Steering Arm, 3133-G-6663 (78500)

PERSONNEL REQUIRED

SPECIAL EVIRONMENTAL CONDITIONS

One (MOS-63S) Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10 TM 9-2320-273-24&P TM 9-2320-273-34

GENERAL SAFETY INSTRUCTIONS

Engine OFF. Transmission in Neutral. Parking Brake Set. Rear Wheels Chocked.

TROUBLESHOOTING REFERENCES

10-21.2. STEERING STOP INSPECTION AND ADJUSTMENT PROCEDURES (Continued).

ACTION REMARKS LOCATION/ITEM

NOTE

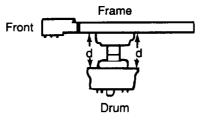
Check that alignment marks on the pitman arm steering gear sector shaft are in alignment before performing the steering stop adjustment procedure.

1. Template (23), steering knuckle housing (16), and three cover bolts (4).

Install.

2. Front brake drums (24).

3. Template (23).



Center and measure.

Mark lines.

housing, and partially install bolts to position template. Make two measurements. the first at the forward side of the brake drum, measuring the distance "d" from the frame to the back of the brake drum. Then make the same measurement at the rear of the brake drum. Adjust as

Put template on top of

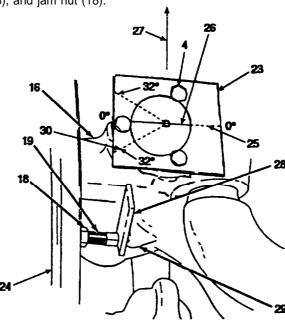
necessary to make the measurements equal. Put straight edge on zero degree reference line (25) and mark a line (26) across the king pin. Line (26) should be perpendicular to the line of travel (27)

NOTE

A 1/8-inch spacer must be used when adjusting the steering stops in order to acquire the correct steer angle.

4. 1/8-inch spacer (28), steering stop bolt (19), steering stop boss (29), brake drum (24), king pin line (26), 32 degree reference line (30), template (23), and jam nut (18).

Position, adjust, and tighten.



Put spacer between steering stop bolt and steering stop boss, turn brake drum full left until king pin line aligns with 32 degree reference line on template. If the 32 degree reference line does not line up with the king pin line, adjust steering stop bolt. Tighten jam nut and remove spacer.

10-21.2. STEERING STOP INSPECTION AND ADJUSTMENT PROCEDURES (Continued).

LOCATION/ITEM **ACTION REMARKS**

NOTE

Brake drum must be turned full right before performing step 6.

Perform same procedure (steps 1 thru 5) for the right side steering stop adjustment.

Coat threads using

teflon sealant.

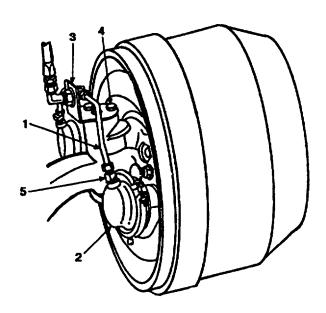
6. Template (23).

7. Fitting threads (5) and left front brake chamber (2).8. King pin cover plate and bracket (3), bolts (4) and fitting (5).

Coat and install.

Remove.

Install and secure onto knuckle assembly.



9.

10.

11. Wheels and tires.

Install.

Paint new steering arm and touch Up IAW TB 43-0209. Grease the steering knuckle and drag link IAW LO 9-2320-273-12. Torque lug nuts IAW para 3-9.

10-21.3. STEERING GEAR POPPET ADJUSTMENT.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Analyzeb. Adjustment

1/2 Hour Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

EQUIPMENT CONDITION
PARAGRAPH
None

CONDITION DESCRIPTION

None

TEST EQUIPMENT

Analyzer, Power Steering, NSN 4910-01-160-3618 P/N J26487 (33287)

SPECIAL TOOLS

Pushrod Driver (fabricate IAW Section 10-21.1 G, page 10-85)
P/N DTA177323 (19207)
Puller, NSN 5120-00-595-9305
P/N GGG-P-781 (81348)
Torque Wrench, NSN 5120-00-221-7983
P/N SW130-301 (10001)
Multiplier, Torque Wrench NSN 5120-01-142-6941
P/N 392 (87641)
Steering Stop Template (fabricate IAWSection 10-21.1 G, page 10-85)

MATERIAL/PARTS (P/N)

Steering Arm Kit, 2MPS-3993 (78500)
Includes:
Cotter Pin, (MS24656-498 (96906)
Key, 16X202 (78500)
Nut, Drag Link/Steering Arm, MS35692-69 (96906)
Nut, Knuckle/Steering Arm, MS35692-1824 (96906)
Boot, Grease, 415172C1 (89346)
Steering Arm, 3133-G-6663 (78500)

PERSONNEL REQUIRED

SPECIAL ENVIRONMENTAL CONDITIONS

One (MOS-63S) Vehicle Parked on Level Ground.

REFERENCE (TM)

TM 9-2320-273-10 TM 9-2320-273-24&P TM 9-2320-273-34

GENERAL SAFETY INSTRUCTIONS

Engine OFF. Transmission in Neutral. Parking Brake Set. Rear Wheels Chocked.

TROUBLESHOOTING REFERENCES

Table 10-2.

10-21.3. STEERING GEAR POPPET ADJUSTMENT (Continued).

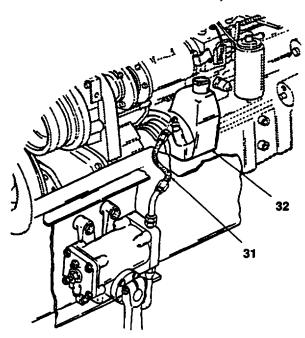
LOCATION/ITEM ACTION REMARKS

NOTE

The following procedure sets the steering gear poppet adjusting screws so that power steering system pressure is reduced before the steering stop bolts contact the axle beam boss.

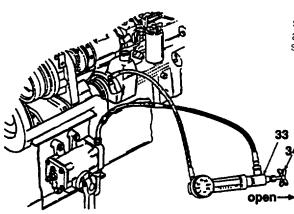
1. Discharge line (31) on power steering pump (32).

Remove line at pump side only.



- 2. Power steering analyzer (33) and valve (34).
- 3. Analyzer (33).

Install and fully open valve on analyzer. Start engine.



Run at idle (600 rpm).
Cycle steering wheel full left and right 3-4 times to purge all air from analyzer and warm fluid. Shut off engine. Check power steering fluid level and adjust as necessary. Restart engine.

10-21.3. STEERING GEAR POPPET ADJUSTMENT (Continued).

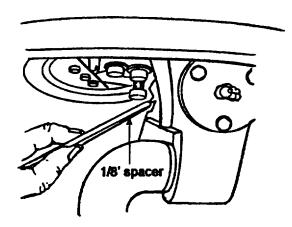
LOCATION/ITEM ACTION REMARKS

CAUTION

When setting poppets, do not hold steering in full lock position for more than 15 seconds. If full lock position Is held for more than 15 seconds, excessive heat will build up in system and extensive damage may occur.

NOTE

Poppet adjusting screws are adjusted to relieve pressure at 32 degree steering angle. Make sure 1/8-inch (3mm) spacer is between steering knuckle stop screw and axle beam boss when adjusting poppet adjusting screws.



NOTE

The power steering pump has an internal system relief valve to limit maximum pump pressure to 1850-2050 psi (12756-14135 kPa). Observed operating pressure is variable and dependent on the resistance within the steering system (e.g. tire inflation, floor surface). Typically, system pressure will be approximately 1100-1500 psi (7585-10343 kPa) with properly inflated tires on concrete floor.

4. Rear poppet adjusting screw (35), and locknut (36).

Adjust, lock and tighten.

Note system operating pressure on analyzer as you turn wheel from straight ahead to full left. Pressure should be above 900 psi (6205 kPa) until the steering stop contacts the I/8-inch spacer and steering stop boss, then drops to 400-900 psi (2758-6205 kPa). If observed operating pressure does not hold until the stop makes contact, back out the left side rear poppet adjusting screw.

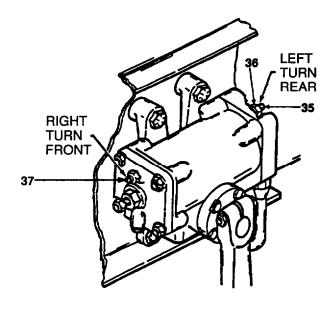
10-21.3. STEERING GEAR POPPET ADJUSTMENT (Continued).

LOCATION/ITEM **ACTION REMARKS**

4. Rear poppet adjusting screw (35), and locknut (36) (Continued).

Adjust, lock and tighten.

If system pressure does not relieve as the stop makes contact, turn poppet adjusting screw in. Leek poppet adjusting screw in this position by tightening nut. Torque to 12-18 lb-ft (16-23 N-m) and remove spacer.

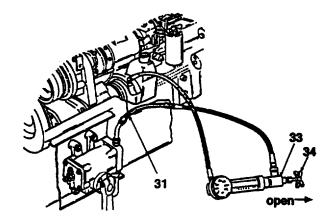


- 5. Right turn poppet adjusting screw (37)
- 6. Engine
- 7. Power steering analyzer (33). 8. Discharge line (31).

Shut Off. Remove. Install onto power steering pump.

Repeat step 4 for the right side poppet adjusting screw.

Cycle system and recheck fluid level.



10-21.4. FABRICATION OF PUSHROD DRIVER AND STEERING STOP TEMPLATE.

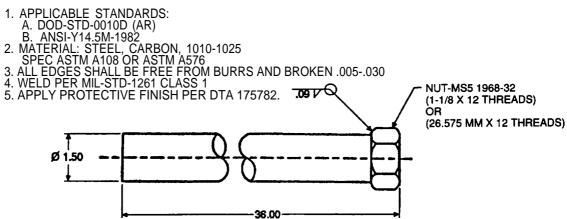
REMARKS ACTION LOCATION/ITEM

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Fabrication

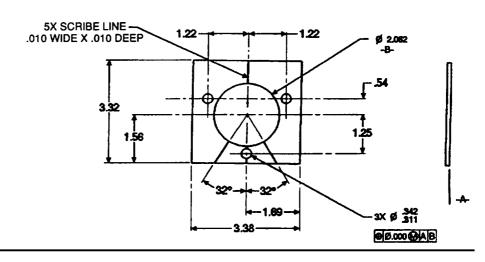
1 Hour Total.

NOTES:



NOTES:

- 1. APPLICABLE STANDARDS: A. DOD-STD-00100D (AR) B. ANSI-Y14.5M-1982
- 2. MATERIAL: ALUMINUM ALLOY SHEET 6061 -T6 SPEC QQ-A-250/11 .125 THICK
- 3. ALL EDGES SHALL BE FREE FROM BURRS AND BROKEN .005-.030



10-22. HYDRAULIC POWER STEERING PUMP AND COOLER MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a.Removal. (20)
b.Inspection of Lines, Fittings, and Cooler. (5)
c.Installation. (20)
d. Filling and Bleeding System. (10)
e. Steering Operational Check. (5)

60 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Plugs

Gasket, Adapter to Oil Pump (5330-01-071-5727). Silicone RTV Sealant (Refer to Appendix C). Power Steering Fluid (Refer to Appendix C). Spanning, 100475(15434).

Snapring, 100475(15434). O-Ring, 008771-026 (19954).

EQUIPMENT CONDITION PARAGRAPH

11-14A or C. 11-16A. 4-18A.

CONDITION DESCRIPTION

Left Front Fender Removed. Grille Removed. Fuel Filter and Adapter Removed (M916 Thru M920 Only).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10 TM 9-2320-273-20P LO 9-2320-273-12

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 10-2.

10-22. HYDRAULIC POWER STEERING PUMP AND OIL COOLER MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS CAUTION** Dirt may severely damage the power steering system. Make sure your work area is clean. Cover openings in the pump to keep dust out. REMOVAL. 1. Two capscrews (6) Remove. Push engine retarder and washers (5). switch (4) aside. LEGEND: 1. HOSE CLAMP 2. CAP 3. HYDRAULIC PUMP AND RESERVOIR ASSEMBLY 4. ENGINE RETARDER SWITCH 5. WASHER (2) 6. CAPSCREW (2) 23 7. OIL LINE 22 8. HOSE STRAP 9. WASHER 10. CAPSCREW 11. FITTING 12. HOSE (2) 13. FITTING (2) 14. HOSE 15. BOLT 16. LOCKWASHER 17. FLATWASHER 18. NUT AND WASHER (4) 19. HOSE RETAINER STEERING GEAR 20. BOLT AND LOCKWASHER (4) 15 16 21. OIL PUMP 22. HOSE CLAMP (2) 23. COOLER 24. COUPLING 25. SNAP RING 26. LOCKNUT (2) 27. O-RING 28. STUD (2) 29. CAPSCREW (2) 30. WASHER (2) 31. ADAPTER 10 32. GASKET TA 075003

10-2	2. HYDRAULIC POWER STEERI	NG PUMP AND COOLER MAIN	TENANCE (Continued).
	LOCATION/ITEM	ACTION	REMARKS
Α.	REMOVAL (Continued).		
2.	Hydraulic pump and reservoir assembly (3).	Wipe away surface dirt and grease.	
		NOTE	
	Plug op	penings as soon as you disconnect	lines.
3.	Two hose clamps (22).	Remove.	
4.	Bolt (15), lockwasher (16) and flat washer (17).	Unscrew and remove hose retainer (19).	
5.	Hose clamp (1).	Remove.	
6.	Hose (14).	Remove from upper rear connection on hydraulic pump and reservoir assembly (3) and lower fitting on cooler (23).	Mark location for reassembly.
7.	Two fittings (13) and one (11).	Unscrew and remove two hoses (12),	Mark locations for reassembly.
8.	Four bolts and lockwashers (20),	Unscrew from four nuts and washers (18); remove cooler (23).	
9.	Capscrew (10) and washer (9).	a. Unscrew and remove from hose strap (8).b. Push oil line (7) out of way.	
10.	Two locknuts (26).	a. Unscrew and remove.b. Pull hydraulic pump and reservoir assembly (3) free from adapter (31),c. Throw away O-ring (27).	Remove from bottom through frame rail notch (M915). Remove from top over frame rail (M916 thru M920).
		NOTE	
		ng (24) may fall out when adapter oved. Do not lose it.	r (31)
11.	Snapring (25).	Remove from coupling (24); slide coupling from shaft.	Throw away snapring.

10-22. HYDRAULIC POWER STEERING PUMP AND COOLER MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** A. REMOVAL (Continued). 12. Two capscrews (29) and a. Unscrew and remove. You may need to tap washers (30). b. Remove adapter (31) from adapter (31) loose with a brass drift. oil pump (21), c. Throw away gasket (32). 13. Two studs (28). Unscrew from hydraulic pump and reservoir assembly (3). B. INSPECTION OF LINES, FITTINGS, AND COOLER. 14. Two hoses (12) and Inspect for: Replace as necessary. one hose (14). a. Cracks. b. Discoloration/staining. c. Damaged fittings. LEGEND: 1. HOSE CLAMP 2. CAP 3. HYDRAULIC PUMP AND RESERVOIR ASSEMBLY 4. ENGINE RETARDER SWITCH 5. WASHER (2) 6. CAPSCREW (2) 7. OIL LINE 8. HOSE STRAP 9. WASHER 10. CAPSCREW 11. FITTING 12. HOSE (2) 13. FITTING (2) 14. HOSE **15. BOLT** 16. LOCKWASHER 17. FLATWASHER 18. NUT AND WASHER (4) 19. HOSE RETAINER STEERING GEAR 20. BOLT AND LOCKWASHER (4) 15 16 21. OIL PUMP 22. HOSE CLAMP (2) 23. COOLER 24. COUPLING 25. SNAP RING 26. LOCKNUT (2) 27. O-RING 28. STUD (2) 29. CAPSCREW (2) 30. WASHER (2) 31. ADAPTER 32. GASKET TA 075004

10-22. HYDRAULIC POWER STEERING PUMP AND COOLER MAINTENANCE (Continued).				
LOCATION/ITEM	ACTION	REMARKS		
B. INSPECTION OF LINES, FITTIN	GS AND COOLER (Continued).	-		
15. Oil cooler (23).	Inspect for: a. Bent or broken cooling fins and tubing, b. Debris lodged between fins.	Clean or replace as necessary.		
C. INSTALLATION.				
16. Two studs (28),	Screw into hydraulic pump and reservoir assembly (3).			
17. Adapter (31).	a. Coat oil pump side with silicone RTV sealant.b. Put new gasket (32) on oil pump side.c. Attach to oil pump (21) with two capscrews (29) and washers (30).			
18. Coupling (24).	Slide on and install new snapring (25).			
19. Adapter (31).	a. Coat power steering pump side with silicone RTV sealant.b. Put new O-ring (27) in position.			
	NOTE			
	nstalling pump, be sure oil line (7) d out of way.			
20. Hydraulic pump and reservoir assembly (3).	 a. Hold with fill cap (2) on top and shaft pointed away from engine. Push up between frame and engine until shaft catches on frame (M915). b. Turn fill cap towards cab. Tilt shaft upwards. Lift 	On M916 thru M920, lift pump over frame rail and into position. Pump shaft may have to be turned slightly to aline		
21. Two locknuts (26).	into position. Screw onto two studs (28) and tighten.	splines in coupling (24).		

10-22. HYDRAULIC POWER STEERING PUMP AND COOLER MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** C. INSTALLATION (Continued). 22. Cooler (23). a. Aline flange holes with those on front metal. b. Attach with four bolts and lockwashers (20), and four nuts and washers (18). 23. Two hoses (12) and a. Unplug openings. Install in locations one hose (14). b. Fasten with two hose marked upon removal. clamps (22), and one hose clamp (1) as shown. c. Screw in two hose fittings (13) and one fitting (11) LEGEND: as shown. 1. HOSE CLAMP 2. CAP 3. HYDRAULIC PUMP AND RESERVOIR ASSEMBLY 4. ENGINE RETARDER SWITCH 5. WASHER (2) 6. CAPSCREW (2) 23 7. OIL LINE 22 8. HOSE STRAP 9. WASHER 10. CAPSCREW 11. FITTING 12. HOSE (2) 13. FITTING (2) 14. HOSE 15. BOLT 16. LOCKWASHER 17. FLATWASHER 18. NUT AND WASHER (4) 19. HOSE RETAINER STEERING GEAR 20. BOLT AND LOCKWASHER (4) 16 21. OIL PUMP 22. HOSE CLAMP (2) 23. COOLER 24. COUPLING 25. SNAP RING 26. LOCKNUT (2) 27. O-RING 28. STUD (2) 29. CAPSCREW (2) 30. WASHER (2) 31. ADAPTER 10 32. GASKET TA 075005

LOCATION/ITEM	ACTION	REMARKS
C. INSTALLATION (Continued).		
24. Engine retarder switch (4).	Attach to fuel pump with two capscrews (6) and washers (5).	
25. Oil line (7).	Attach with capscrew (10), washer (9), and hose strap (8); tighten capscrew to 18 lb-ft (24 N·m).	
26. Hose retainer (19).	Install over hoses (12) and (14) to front metal with bolt (15), lockwasher (16), and flatwasher (17).	
D. FILLING AND BLEEDING SY	STEM.	
27. Fill cap (2).	a. Remove.b. Add fluid if needed.	Fluid should be checked when warm with engine off.
	prepared to add fluid to the system as pump begins operating.	as
28. Engine.	Start up (see TM 9-2320-273-1	0).
29. Filler cap (2).	 a. Watch fluid level. If it drops, add more fluid immediately. Continue until fluid stabilizes. b. Replace cap. c. Check for oil leaks. 	
E. STEERING OPERATIONAL C	HECK.	
30. Steering wheel.	Turn in both directions. Wheel should turn easily with no jogging,	
31. Engine.	Shut down (see TM 9-2320-273	3-10).

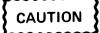
10-22. HYDRAULIC POWER STEERING PUMP AND COOLER MAINTENANCE (Continued). LOCATION/ITEM **ACTION** REMARKS NOTE Follow-on maintenance required: Install fender; refer to paragraph 11-14B OR D. Install grille; refer to paragraph 11-16D. Install fuel filter and adapter; refer to paragraph 4-18B (M916 thru M920). LEGEND: 1. HOSE CLAMP 2. CAP 3. HYDRAULIC PUMP AND RESERVOIR ASSEMBLY 26 4. ENGINE RETARDER SWITCH 5. WASHER (2) 11 6. CAPSCREW (2) 23 7. OIL LINE 22 8. HOSE STRAP 9. WASHER 10. CAPSCREW 11. FITTING 12. HOSE (2) 13. FITTING (2) 14. HOSE 15. BOLT 16. LOCKWASHER 17. FLATWASHER 18. NUT AND WASHER (4) STEERING GEAR 19. HOSE RETAINER 20. BOLT AND 15 LOCKWASHER (4) 16 21. OIL PUMP 22. HOSE CLAMP (2) 23. COOLER 24. COUPLING 25. SNAP RING 26. LOCKNUT (2) 27. O-RING 28. STUD (2) 29. CAPSCREW (2) 30. WASHER (2) 31. ADAPTER 32. GASKET TA 075006

10-22. HYDRAULIC POWER STEERING PUMP AND COOLER MAINTENANCE (Continued).

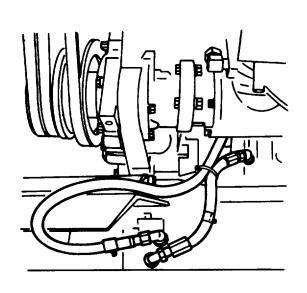
LOCATION/ITEM

ACTION

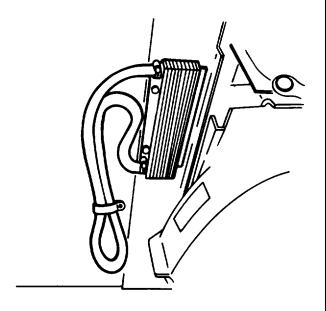
REMARKS



At temperatures at or below 0°F, the cooler must be disconnected from the power steering fluid system. Failure to do so may cause the cooler tubing to rupture. The proper procedure is to disconnect one hose (12) which runs from the steering gear to the cooler (20) and reconnect same to the hydraulic pump and reservoir assembly (3). Then, the hose from the cooler to the reservoir should be taken off and reconnected to the cooler input per illustration below.



PUMP TO STEERING GEAR HOSE ROUTING



FLUID COOLER HOSE ROUTING

TA 075007

This page intentionally left blank.

10-23. AUXILIARY CYLINDER (M916 THRU M920).

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (22)
b. Inspection. (5)
c. Installation. (30)
d. Operational Check. (5)

62 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M916 Thru M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIAL/PARTS (P/N)

Container, 1 Pint.

Liquid Teflon (Refer to Appendix C).

Power Steering Fluid (Refer to Appendix C).

Cotter Pin, 103415 (24617).

Cotter Pin, 103389 (24617).

GAA (Refer to Appendix C).

Cable Tie, PLT44-MO (06383).

Cable Tie, MS-3367-2-0 (96906).

EQUIPMENT CONDITION

PARAGRAPH

CONDITION DESCRIPTION

Right Front Fender Removed.

11-14C.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

LO 9-2320-273-12.

TROUBLESHOOTING REFERENCES

Table 10-2.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

fron	nes (6) and (13) are to be remove in vehicle, unscrew from bottom or ering gear.	
A. REMOVAL.	n vehicle, unscrew from bottom oring gear.	
	D:	
1. Line (6).	D'	
	Disconnect from elbow (14) and drain oil.	Approximately 1/2 pint.
2. Line (13).	Disconnect from elbow (14) and drain oil.	Approximately 1/2 pint.
3. Bolt (8), lockwasher (10) and nut (12).	Unscrew and remove two hos retainers (7) from bracket (9)	
4. Two cable ties (11).	Snip off.	Discard. Lines (6) and (13) may now be removed from vehicle, if needed.
3. CLAMP 4. CLAMP BOLT 5. CYLINDER 6. LINE 7. HOSE RETAINER (2) 8. BOLT 9. BRACKET 10. LOCKWASHER 11. CABLE TIE (2) TO POWER 12. NUT STEERING GEAF 13. LINE REAR CONNECT 14. FITTING (2) 15. END CAP 16. SPRING 17. BALL CUP (2) 18. COTTER PIN 19. BALL JOINT 20. WASHER 21. NUT 22. COTTER PIN 23. NUT 24. STEERING ARM 25. RUBBER BOOT	10N-10N-15	TO POWER STEERING GEAR FRONT CONNECTION 13 2 14 GREASE FITTING

10-23. AUXILIARY CYLINDER (M91	6 THRU M920) (Continued).	
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
5. Two fittings (14).	Unscrew and remove.	
6. Cotter pin (22).	Remove and throw away.	
7. Nut (23).	Remove.	
8. Ball joint (1).	Remove from steering arm (24)	, Tap out with hammer.
9. Rubber boot (25).	Lift out of steering arm (24).	
10. Cotter pin (18).	Remove and throw away.	
11. End cap (15), spring (16), and outer ball cup (17).	Unscrew end cap (15) and remove cap, spring, and outer ball cup.	
12. Cylinder (5).	Line up ball portion of slot with head of ball joint (19) and remove from ball. Set cylinder (5) with ball joint (1) and clamp (3) on bench.	
13. Inner ball cup (17).	Remove from cylinder (5).	
14. Nut (21) and washer (20).	Remove from back side of ball joint (19) stud.	
15. Ball joint (19).	Remove from frame mounting plate.	
16. Clamp nut (2).	See NOTE below, then unscrew from clamp bolt (4) and remove clamp (3).	
	NOTE	
of threa	proceeding with step (17), count ds showing between ball joint (1) (5) on cylinder shaft for installa	and
17. Ball joint (1).	Unscrew from shaft on cylinder (5).	
B. INSPECTION.		
18. Ball joint (1).	Inspect for wear.	Replace as necessary.
19. Ball joint (19).	Inspect for wear.	Replace as necessary.
20. Steering arm (24).	Inspect for wear.	Replace as necessary.

10-23. AUXILIARY CYLINDER (M9	16 THRU M920) (Continued).	
LOCATION/ITEM	ACTION	REMARKS
B. INSPECTION (Continued).		
21. Cylinder (5).	Hole worn (out of round). Inspect for: a. Wear. b. Dents c. Cracks.	Replace as necessary.
22. Spring (16).	Inspect for coil breaks.	Replace as necessary.
23. Two ball cups (17).	Inspect for wear or scoring.	Replace as necessary.
24. Rubber boot (25).	Inspect for tears or cracking.	Replace as necessary.
1. BALL JOINT 2. CLAMP NUT 3. CLAMP 4. CLAMP BOLT 5. CYLINDER 6. LINE 7. HOSE RETAINER (2) 8. BOLT 9. BRACKET 10. LOCKWASHER 11. CABLE TIE (2) TO POWER 12. NUT STEERING GEAR 13. LINE REAR CONNECTIO 14. FITTING (2) 15. END CAP 16. SPRING 17. BALL CUP (2) 18. COTTER PIN 19. BALL JOINT 20. WASHER 21. NUT 22. COTTER PIN 23. NUT 24. STEERING ARM 25. RUBBER BOOT	9 10 11 12 13 15 15 15 15 15 15 15 15 15 15 15 15 15	GREASE FITTING GREASE FITTING 17
		TA 075009

LOCATION/ITEM	ACTION	REMARKS
C. INSTALLATION.		
25. Ball joint (1).	Screw onto shaft of cylinder (5).	Screw on shaft until same number of threads that were showing on disassembly are showing now.
26. Clamp (3).	Slide over ball joint arm and secure with clamp bolt (4) and clamp nut (2).	
27. Ball joint (19).	Slide joint stud through the frame mounting plate. Use mallet if necessary.	
28. Nut (21) and washer (20).	a. Screw onto stud of ball joint (19) and tighten.b. Apply GAA to ball.	
29. Inner ball cup (17).	a. Apply GAA to cup surface.b. Slide into cylinder end until seated with cup surface facing out.	
30. Cylinder (5).	Line up ball portion of slot and slide over ball joint (19).	
31. Rubber boot (25).	Place in steering arm (24).	Small end down.
32. Ball joint (1).	Insert in steering arm (24).	
33. Nut (23).	Screw on until tight, then advance nut for cotter pin hole alinement.	
34. New cotter pin (22).	Insert through hole in stud of ball joint (1) and bend tabs over.	
35. Outer ball cup (17), spring (16) and end cap (15).	 a. Apply GAA to ball face of cup (17) outer. b. insert outer cup into cylinder with cup face inward toward ball (19). c. Slide Spring (16) into cylinder and seat against outer cup flat face. d. Screw in cap (15) until flush. e. Aline cap slot with next cotter pin hole in cylinder. 	

10-23. AUXILIARY CYLINDER (M91	6 THRU M920) (Continued).	
LOCATION/ITEM	ACTION	REMARKS
C. INSTALLATION (Continued).		
36. New cotter pin (18).	Install through cylinder end and bend over tabs.	
37. Two fittings (14).	Apply liquid teflon to threads; insert in cylinder and tighten; advance so that line end faces u	ıр.
38. Line (6).	Install to one elbow (14) and tighten in position shown.	
39. Line (13).	Install to one elbow (14) and tighten in position shown.	
	NOTE	
	9 10 12 12 13 4 5 6 15	TO POWER STEERING GEAR FRONT CONNECTION 13 GREASE FITTING 17 18 GREASE FITTING
	21 20	TA 075010

10-23. AUXILIARY CYLINDER (M916 THRU M920) (Continued).				
LOCATION/ITEM	ACTION	REMARKS		
C. INSTALLATION (Continued).				
40. Two hose retainers (7).	Place over lines (6) and (13) and secure to bracket (9) with bolt (8), lockwasher (10), and nut (12).			
41. Two new cable ties (11).	Install around two lines (6) and (13) and front cross frame tube.			
42. Cylinder (5).	Lubricate with GAA at two ball joint grease fittings as shown.			
43. Power steering fluid level.	Check (refer to LO 9-2320-273-	12).		
	NOTE			
	on maintenance action required: ; refer to paragraph 11- 14D.	Install		
D. OPERATIONAL CHECK.				
44. Engine.	Start up.	Refer to TM 9-2320-273-10.		
45. Wheels.	Turn all the way to left and to right.			
46. Cylinder (5), line (6) and line (13).	Check for leaks.	Tighten as necessary.		
47. Engine.	Shut down.	Refer to TM 9-2320-273-10.		

10-23. AUXILIARY	CYLINDER (M916 TH	IRU M920) (Continued).	
LOCATION	/ITEM	ACTION	REMARKS
LEGEND: 1. BALL JOINT 2. CLAMP NUT 3. CLAMP 4. CLAMP BOLT 5. CYLINDER 6. LINE 7. HOSE RETAINER 8. BOLT 9. BRACKET 10. LOCKWASHER 11. CABLE TIE (2) 12. NUT 13. LINE 14. FITTING (2) 15. END CAP 16. SPRING 17. BALL CUP (2) 18. COTTER PIN 19. BALL JOINT 20. WASHER 21. NUT 22. COTTER PIN 23. NUT 24. STEERING ARM 25. RUBBER BOOT	TO POWER STEERING GEAR REAR CONNECTION	ST	
			I A U/5/14

10-24. FRONT AXLE SHOCK ABSORBERS MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a.Removal. (10) b.Cleaning and inspection. (10) c.Installation. (10)

30 Minutes Total.

INITIAL SETUP

EQUIPMENT CONDITION

None.

APPLICABLE CONFIGURATIONS

PARAGRAPH

CONDITION DESCRIPTION

None.

M915. **TEST EQUIPMENT**

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

GAA (Refer to Appendix C).

Shock Absorbers (2) (2540-00-740-961 7). Rubber Bushings (8) (6365-00-740-9618).

Nonflammable Cleaning Solvent SD-2 (Refer to Appendix C).

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P. LO 9-2320-273-12.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.
Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 10-3.

LOCATION/ITEM NOTE a. Shock absorbers should be replaced Perform the following procedure two neach side of the truck. b. Shock absorbers should be replaced 1. Spring action is not dampened, worn shock absorbers. 2. Fluid leakage is noted on outer sabsorber surfaces; bottom sections.	ice, once if: indicating shock on.
 a. Shock absorbers should be replaced Perform the following procedure tw on each side of the truck. b. Shock absorbers should be replaced 1. Spring action is not dampened, worn shock absorbers. 2. Fluid leakage is noted on outer steps 	ice, once if: indicating shock on.
Perform the following procedure two neach side of the truck. b. Shock absorbers should be replaced 1. Spring action is not dampened, worn shock absorbers. 2. Fluid leakage is noted on outer states.	ice, once if: indicating shock on.
 Spring action is not dampened, worn shock absorbers. Fluid leakage is noted on outer statements. 	indicating shock on.
worn shock absorbers. 2. Fluid leakage is noted on outer s	shock on.
	on.
	ed for
c. Procedure is written based upon ne new shock absorbers.	<u>,</u>
LEGEND: 1. BUSHING (4) 2. WASHER (2) 3. NUT (2) 4. SHOCK ABSORBER 5. SHAFT (2) 6. NUT, WASHER AND BOLT (4)	7 A 075011

LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL.		
1. Two nuts (3).	Unscrew and remove from axle and two shafts (5).	
Two washers (2), four bushings (1), and shock absorbers (4).	Remove.	
B. CLEANING AND INSPECTION	- -	
 Clean and inspect shaft thread (5) and nuts (3). 	a. Clean in solvent and blow dry.b. Apply GAA to threads.	Replace shafts if threads are worn or damaged. a. Replace upper shaft (5) by removing four bolts, nuts
C. INSTALLATION.		and washers.b. Notify Direct Support Maintenance for replace-
 Two new inner bushings (1). 	Place on axle and two shafts (5) with large ends toward truck.	ment of lower shaft (5).
 New shock absorber (4). 	Place against bushings on shafts (5).	
6. Two new outer bushings (1).	Place on axle and two shafts (5) with small ends toward shock absorber.	
7. Two washers (2) and nuts (3).	a. Screw on to shafts (5).b. Tighten nuts to 125-165 lb-ft (170-224 N·m).	

10-24. FRONT AXLE SHOCK ABSORBERS MAINTENANCE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
LEGEND: 1. BUSHING (4) 2. WASHER (2) 3. NUT (2) 4. SHOCK ABSORBER 5. SHAFT (2) 6. NUT, WASHER AND BOL	4		
			TA 075012

10-25. PUSHER AXLE SHOCK ABSORBERS MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a.Removal. (10) b.Cleaning and Inspection. (10) c.Installation. (10)

30 Minutes Total.

INITIAL SETUP EQUIPMENT CONDITION

APPLICABLE CONFIGURATIONS PARAGRAPH CONDITION DESCRIPTION

M917, M919, M920. None. None.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Shock Absorbers (2) (2540-01 -011-061 4). Rubber Bushings (8) (6365-00-740-961 8).

Nonflammable Cleaning Solvent SD-2 (Refer to Appendix C).

PERSONNEL REQUIRED SPECIAL ENVIRONMENTAL CONDITIONS

One (MOS-63B20). Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P. LO 9-2320-273-12.

Engine OFF.

Transmission in Neutral. Park Brake Set.

GENERAL SAFETY INSTRUCTIONS

TROUBLESHOOTING REFERENCES

Table 10-3.

10-25. PUSHER AXLE SHOCK ABSORBERS MAINTENANCE (Continued).

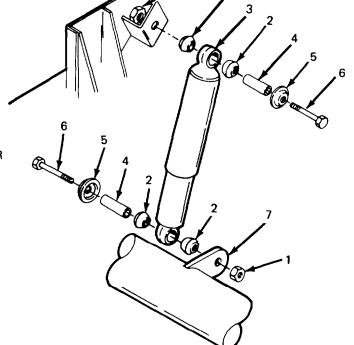
LOCATION/ITEM ACTION REMARKS

NOTE

Shock absorbers should be replaced in pairs. Perform the following procedures twice, once on each side of the truck. Shock absorbers should be replaced if spring action is not dampened or if fluid leakage is noted on outer shock absorber surfaces, bottom section. This procedure is based upon need for new shock absorbers.

LEGEND:

- 1. NUT (2)
- 2. BUSHING (4)
- 3. SHOCK ABSORBER
- 4. SLEEVE (2)
- 5. SPACER (2)
- 6. BOLT (2)
- 7. BRACKET



TA 075013

10-25. PUSHER AXLE SHOCK ABSORBERS MAINTENANCE (Continued).

LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL.		
1. Two nuts (1).	Unscrew and remove.	
 Four bushings (2), two spacers (5), two bolts (6), two sleeves (4) and shock absorber (3). 	Pull bolt (6) out to disassemble spacers (4), bushings (2) and sleeves (4).	
B. CLEANING AND INSPECTION.		
3. Bolts (6) and nuts (1).	Soak in non-flammable solvent and wipe dry.	Replace as necessary.
	b. Inspect threads for wear, chips, and crossed threads.	
C. INSTALLATION.		
4. Two new bushings (2) and sleeve (4).	Place in top end of shock absorber (3).	Small ends of bushings should face shock absorber.
5. New shock absorber (3) and spacer (5).	Attach to top bracket with nut (1) and bolt (6) in order illustrated.	
6. Two new bushings (2) and sleeve (4).	Place in bottom end of shock absorber (3).	Small ends of bushings should face shock absorber.
7. New shock absorber (3) and spacer (5).	Attach to bottom bracket (7) with nut (1) and bolt (6) in order illustrated.	

10-25. PUSHER AXLE SHOCK ABSORBERS MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM LEGEND: 1. NUT (2) 2. BUSHING (4) 3. SHOCK ABSORBER 4. SLEEVE (2) 5. SPACER (2) 6. BOLT (2) 7. BRACKET TA 075014

10-26. TORQUE RODS MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal (M915). (b. Removal (M916 Thru M920). (

b. Removal (M916 Thru M920). (10) c. Cleaning and Inspection (All). (10) d. Installation (M915). (10)

d. Installation (M915). (10) e. Installation (M916 Thru M920). (15)

APPLICABLE CONFIGURATIONS

50 Minutes Total.

INITIAL SETUP

EQUIPMENT CONDITION

PARAGRAPH

None.

CONDITION DESCRIPTION

None.

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Nonflammable Cleaning Solvent SD-2 (Refer to Appendix C).

PERSONNEL REQUIRED

SPECIAL ENVIRONMENTAL CONDITIONS

One (MOS-63B20). Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

LO 9-2320-273-12.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 10-3.

10-26. TORQUE RODS MAINTENANCE (Continued). **REMARKS** LOCATION/ITEM **ACTION**

A. REMOVAL (M915).

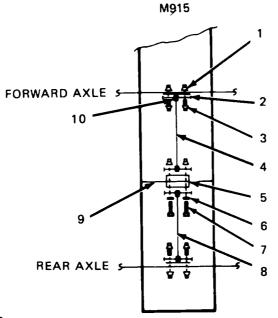
- 1. Four washer base nuts (1) and four washer base bolts (3).
- 2. Two hex head bolts (7), two flat washers (6), and two washer base nuts (1).
- 3. Torque rods (4) and (8).

Unscrew and remove from two axle brackets (2) and torque rods (4) and (8).

Unscrew and remove from center torque rod connections at shim sets (5).

Shim sets (5) may drop from cross-member (9) when torque rods are removed.

Remove.

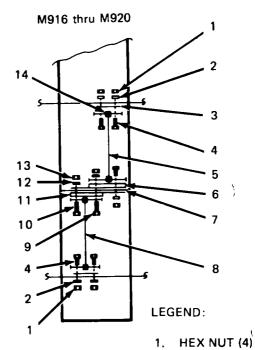


REAR OF CHASSIS

LEGEND:

- 1. HEX NUT (7)
- 2. FLAT WASHER (7)
- 3. AXLE BRACKET (2)
- 4. BOLT (7)
- 5. TORQUE ROD
- 6. SHIM SET
- 7. CROSS MEMBER
- 8. TORQUE ROD
- 9. PLATE
- 10. RUBBER

BUSHING (4)



- **REAR OF CHASSIS**
- 2. FLAT WASHER (4)
 - 3. AXLE BRACKET (2)
 - 4. BOLT (4)
 - 5. TORQUE ROD
 - 6. SHIM SET
 - 7. CROSS MEMBER
 - 8. TORQUE ROD
 - 9. BOLT
 - 10. BOLT (2)
 - 11. PLATE
 - 12. FLAT WASHER (3)
 - 13. HEX NUT (3)
 - 14. **RUBBER BUSHING (4)**

TA 075015

10-26. TORQUE RODS MAINTENA			
LOCATION/ITEM	ACTION	REMARKS	
B. REMOVAL (M916 THRU M920).			
4. Four hex nuts (1), flatwashers (2), and bolts (4).	Unscrew and remove from two axle brackets (3) and torque rods (5) and (8).		
5. Two hex nuts (13), flatwashers (12), and bolts (10).	Unscrew and remove from center torque rod connections at shim sets (6).	Shim sets (6) may drop from cross-member (7) and cross-member plates (11) when torque rods are removed. Plates (11) are welded to cross-member (7).	
6. Hex nut (13), flatwasher (12), and bolt (9).	Unscrew and remove from center torque rod connections at shim sets (6).		
7. Torque rods (5) and (8).	Remove.		
C. CLEANING AND INSPECTION	·		
8. Fasteners (1), (2), and (4) plus shim block sets (5) (M915) or (6) (M916 thru M920).	Clean in solvent and wipe dry. Inspect for:		
	a. Crossed threads.	Replace as necessary.	
	b. Burrs.		
	c. Egg shaped holes (5) or (6).		
9. Torque rod rubber bushings (14).	Wipe clean and inspect for:		
	a. Egg shaped bushing		
	 b. Deterioration and cracking. 		
D. INSTALLATION (M915).			
0. Torque rods (4) and (8), shim block sets (5).	Aline mounting holes with those in cross member (9).		
11. Two hex head bolts (7), flat washer base nuts(1).	Install bolts through torque rods (4) and (8), shim block sets (5) and cross-member (9), washers and nuts as illustrated. Torque to 105 lb-ft (142 N·m).		

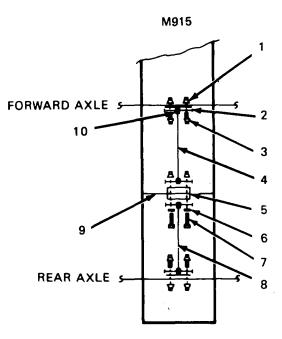
SUSPENSION SYSTEM.

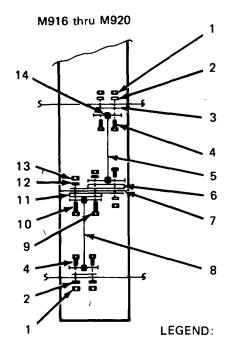
10-26. TORQUE RODS MAINTENANCE (Continued).

REMARKS LOCATION/ITEM **ACTION**

D. INSTALLATION (M915) (Continued).

- 12. Torque rod (4) and (8), axle brackets (2).
- Aline mounting holes.
- 13. Four washer base bolts (3) and washer base nuts (1).
- Install bolts through outer torque rod ends and fasten to axle brackets (2) with nuts (1). Torque to 105 Ib-ft (142 N·m).





LEGEND:

- **REAR OF CHASSIS**
- 1. HEX NUT (7)
- 2. FLAT WASHER (7)
- 3. AXLE BRACKET (2)
- 4. BOLT (7)
- 5. TORQUE ROD
- SHIM SET
- 7. CROSS MEMBER
- 8. TORQUE ROD
- 9. PLATE
- 10. RUBBER **BUSHING (4)**

- **REAR OF CHASSIS**
- 1. HEX NUT (4)
- 2. FLAT WASHER (4)
- 3. AXLE BRACKET (2)
- 4. BOLT (4)
- **TORQUE ROD** 5.
- SHIM SET 6.
- **CROSS MEMBER** 7.
- **TORQUE ROD** 8.
- 9. **BOLT**
- 10. BOLT (2)
- 11. PLATE
- 12. FLAT WASHER (3)
- 13. HEX NUT (3)
- 14. RUBBER BUSHING (4)

TA 075016

SUSPENSION SYSTEM.

axle brackets (3). 7. Four bolts (4), flat vashers (2), and hex Install bolts through outer torque rod ends and fasten	LOCATION/ITEM	ACTION	REMARKS
those in cross member (7) and cross member plates (11). Three bolts (9) and (10), flatwashers (12) and hex nuts (13). Install bolts through torque rods (5) and (8), shim block sets (6), cross member plates (11) and cross member (7) as illustrated. Install washers and nuts. Torque to 180 lb-ft (244 N·m). Torque rods (5) and (8), axle brackets (3). Aline mounting holes. Four bolts (4), flat shers (2), and hex to rque rod ends and fasten to axle brackets (3) with washers (2) and nuts (1). Torque to 180 lb-ft	INSTALLATION (M916 THRU	M920).	
flatwashers (12) and rods (5) and (8), shim block sets (6), cross member plates (11) and cross member (7) as illustrated. Install washers and nuts. Torque to 180 lb-ft (244 N·m). 6. Torque rods (5) and (8), axle brackets (3). 7. Four bolts (4), flat ashers (2), and hex uts (1). Install bolts through outer torque rod ends and fasten to axle brackets (3) with washers (2) and nuts (1). Torque to 180 lb-ft		those in cross member (7) and cross member plates	
axle brackets (3). 17. Four bolts (4), flat vashers (2), and hex nuts (1). Install bolts through outer torque rod ends and fasten to axle brackets (3) with washers (2) and nuts (1). Torque to 180 lb-ft	flatwashers (12) and	rods (5) and (8), shim block sets (6), cross member plates (11) and cross member (7) as illustrated. Install washers and nuts. Torque to 180 lb-ft	
vashers (2), and hex torque rod ends and fasten to axle brackets (3) with washers (2) and nuts (1). Torque to 180 lb-ft		Aline mounting holes.	
	shers (2), and hex	torque rod ends and fasten to axle brackets (3) with washers (2) and nuts (1). Torque to 180 lb-ft	

SUSPENSION SYSTEM.

10-26. TORQUE RODS MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM M915 M916 thru M920 FORWARD AXLE 5-10 13 • 12 11 ٠ 7 10 9 ' REAR AXLE 5 LEGEND: **REAR OF CHASSIS REAR OF CHASSIS** 1. HEX NUT (7) LEGEND: 2. FLAT WASHER (7) 3. AXLE BRACKET (2) 1. HEX NUT (4) 4. BOLT (7) 2. FLAT WASHER (4) 5. TORQUE ROD 3. AXLE BRACKET (2) 6. SHIM SET 4. BOLT (4) 5. TORQUE ROD 7. CROSS MEMBER 6. SHIM SET 8. TORQUE ROD 7. CROSS MEMBER 9. PLATE 8. TORQUE ROD 10. RUBBER 9. BOLT **BUSHING (4)** 10. BOLT (2) 11. PLATE 12. FLAT WASHER (3) 13. HEX NUT (3) 14. RUBBER BUSHING (4) TA 075017

CHAPTER 11

FRAME, BODY AND CAB MAINTENANCE

11-1. OVERVIEW.

This chapter provides you with the following information related to frame, body and cab maintenance:

- a. All required special tools and equipment.
- b. Other technical manuals.
- c. Troubleshooting procedures.
- d. Maintenance procedures.



- a. Do not drill holes in frame flanges.
- b. Do not weld frame.

Section I REPAIR PARTS, SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

11-2. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

11-3. SPECIAL TOOLS, TMDE, SUPPORT EQUIPMENT.

The special tools, TMDE and support equipment required for the frame, body and cab maintenance procedures described in this chapter are limited to the 1000-lb hoist and lift hook. (Refer to Organizational Maintenance RPSTL, TM 9-2320-273-20P for tool description and illustrations.)

11-4. SPARES AND REPAIR PARTS.

Spares and repair parts are listed and illustrated in the Repair Parts and Special Tools List covering Organizational Maintenance for this equipment (TM 9-2320-273-20P).

Section II TROUBLESHOOTING

11-5. INTRODUCTION.

Table 11-1 contains instructions for troubleshooting the frame components. The corrective actions describe how to fix a problem or refer to a procedure for fixing the problem. The Troubleshooting table is arranged by malfunctions in the following order:

FRAME:

- a. Towing pintle does not pivot or latch, or jaw is stuck (Malfunction No. 1).
- b. Excessive jerking of towed trailer (Malfunction No. 2).
- c. Excessive noise or popping sounds from fifth wheel when turning (Malfunction No. 3).

Table 11-1. Frame Troubleshooting Procedures.

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

- 1. TOWING PINTLE DOES NOT PIVOT OR LATCH, OR JAW IS STUCK:
 - Step 1. Check for proper lubrication.

Lubricate (LO 9-2320-273-12).

Step 2. Check lock for damage.

Replace (para 11-10).

- 2. EXCESSIVE JERKING OF TOWED TRAILER:
 - Step 1. Check for proper lubrication of fifth wheel.

Lubricate (LO 9-2320-273-12).

Step 2. Check bolts and bracket on fifth wheel for tightness.

Tighten, refer to torque table (para 3-9).

Step 3. Inspect coupler jaw and locks for damage.

Replace fifth wheel (para 11-13).

- 3. EXCESSIVE NOISE OR POPPING SOUNDS FROM FIFTH WHEEL WHEN TURNING:
 - Step 1. Check for proper lubrication of fifth wheel.

Lubricate (LO 9-2320-273-12).

Step 2. Check all mounting bolts on fifth wheel for tightness.

Tighten, refer to torque table (para 3-9).

Step 3. Inspect locks for damage.

Replace fifth wheel (para 11-13).

Section III MAINTENANCE PROCEDURES

11-6. INTRODUCTION.

This section provides you with Organizational Level Maintenance procedures for the frame, body, and cab. To find a specific maintenance procedure, see one of the following task summaries.

- a. Frame (para 11-7).
- b. Body and Cab (para 11-8).

11-7. FRAME MAINTENANCE TASK SUMMARY.

INITIAL SETUP APPLICABLE CONFIGURATIONS

EQUIPMENT CONDITION PARAGRAPH

All.

(See TM 9-2320-273-10). 11-16E. CONDITION DESCRIPTION

Spare Wheel/Tire Removed.
Brush Guard Removed (M916
Thru M920).

TEST EQUIPMENT

None.

TOOLS

1,000 lb Hoist.

Lift Hook.

M916 and M920 5th Wheel Adjustment Tool (CT447ALX2).

MATERIALS/PARTS (P/N)

Lithium (Chassis) Grease (Refer to Appendix C).

Cotter Pin, 108656 (24617). GAA (Refer to Appendix C).

Cotter Pin, 773 (74410).

Sleeve (M915), 188-4-VM (97706). Sleeve (M916), S409-1SB (75535). Cable (M915), 1/8 x 15/7 x 19 (75535). Cable (M916), 1/8 x 15 ft/7 x 19 (75535).

PERSONNEL REQUIRED

One MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

LO 9-2320-273-12

TM 9-2320-273-20P.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

REFERENCES (TROUBLESHOOTING)

Table 11-1.

LIST OF TASKS

TASK NO.		TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
1.	Bumper	and Towing Eyes Maintenance:	11-9	11-1
	A.	Removal.	11-9A	
	B.	Installation.	11-9B	
2.	Pintle M M920) :	Maintenance (M915 thru M917 and	11-10	11-1
	A.	Removal.	11-10A	
	B.	Cleaning and Inspection.	11-10B	
	C.	Installation.	11-10C	
	D.	Lubrication and Adjustment.	11-10D	

11-7. FRAME MAINTENANCE TASK SUMMARY (Continued). LIST OF TASKS			
ASK IO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)
3.	Spare Tire Hoist Cable (M915 and M916):	11-11	11-1
	A. Removal.	11-11A	
	B. Installation.	11-11B	
4.	Spare Tire Hoist Maintenance (M915 and M916)	11-12	11-1
	A. Removal.	11-12A	
	B. Installation.	11-12B	
5.	Fifth Wheel Maintenance:	11-13	11-1
	A. Removal.	11-13A	
	B. Lubrication.	11-13B	
	C. Adjustment.	11-13C	
	D. Installation.	11-13D	

11-8. BODY AND CAB MAINTENANCE TASK SUMMARY.

EQUIPMENT CONDITION INITIAL SETUP PARAGRAPH **CONDITION DESCRIPTION** APPLICABLE CONFIGURATIONS Heater Removed. 11-26A. Fenders Removed. 11-14A or C. Seats Removed. **TEST EQUIPMENT** 11-20A and 11-21A. Air Cleaner Removed. 4-25A. None. 4-42A. Coolant Drained. 5-44A. Headlamp Assembly TOOLS None. Removed. **Brush Guard Removed** 11-16E. (M916 Thru M920) MATERIALS/PARTS (P/N) Grille Removed. Lubriplate (Refer to Appendix C). 11-16A. Hood Removed. GAA (Refer to Appendix C). 11-32A. Mud Flaps Removed. Non Flammable Cleaning Solvent (SD-2) 11-19A. Tow Eyes Removed, (Refer to Appendix C). 11-9A. Cotter Pin, 137155 (24617) Rivet (10), SSLQ-66 (05693). Blackout Taillamps 5-50A. Removed. Rivet (30), SSLQ-64 (05693). Grease Gun. Electrical Tape. Clean Container. Hose Tie (3), PLT 4H-MO (06363). Hoist. Jack Stands. PERSONNEL REQUIRED SPECIAL ENVIRONMENTAL CONDITIONS Vehicle Parked on Level Ground. Two (MOS-63B20). GENERAL SAFETY INSTRUCTIONS **REFERENCES (TM** TM 9-2320-273-10. Engine OFF.

TM 9-2320-273-20P. REFERENCES (TROUBLESHOOTING)

Table 4-1.

LO 9-2320-273-12.

LIST OF TASKS

Transmission in Neutral.

Park Brake Set.

	LIST OF TASKS				
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)		
1.	Fender Maintenance:	11-14			
	A. Removal of Front Fender (M915).	11-14A			
	B. Installation of Front Fender (M915).	11-14B			
	C. Removal of Front Fender (M916 thru M920).	11-14C			
	D. Installation of Front Fender (M916 thru M920).	11-14D			
	E. Removal of Rear Fender.	11-14E			
	F. Installation of Rear Fender.	11-14F			

11-8. BODY AND CAB MAINTENANCE TASK SUMMARY (Continued).					
	LIST OF TASKS				
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)		
2.	Ventilator Maintenance:	11-15			
	A. Removal.	11-15A			
	B. Installation.	11-15B			
3.	Grille Maintenance:	11-16			
	A. Removal.	11-16A			
	B. Disassembly.	11-16B			
	C. Assembly.	11-16C			
	D. Installation.	11-16D			
	E. Brush Guard Removal.	11-16E			
	F. Brush Guard Installation.	11-16F			
4.	Optional Winter Front Maintenance:	11-17			
	A. Original Installation.	11-17A			
	B. Removal.	11-17B			
	C. Installation	11-17C			
5.	Grille Support Brackets Maintenance:	11-18			
	A. Removal.	11-18A			
	B. Installation.	11-18B			
6.	Mud Flaps Maintenance:	11-19			
	A. Removal.	11-19A			
	B. Installation.	11-19B			
7.	Driver's Seat Maintenance:	11-20			
	A. Removal.	11-20A			
	B. Cleaning and Lubricating of Hardware.	11-20B			
	C. Installation.	11-20C			
8.	Passenger's Seat Maintenance:	11-21			
	A. Removal.	11-21A			
	 B. Cleaning and Lubricating Adjusting Mechanism. 	11-21B			
	C. Installation.	11-21C			
9.	Seat Riser and Tool Box Maintenance:	11-22			
	A. Removal.	11-22A			
	B. Installation.	11-22B			

11-8.	11-8. BODY AND CAB MAINTENANCE TASK SUMMARY (Continued).				
	LIST OF TASKS				
TASK NO.	TASK	TASK REF	TROUBLESHOOTING REF (TABLE)		
10.	Windshield Wiper and Blade Assembly Maintenance:	11-23			
	A. Removal.	11-23A			
	B. Installation.	11-23B			
	C. Operational Check.	11-23C			
11.	Windshield Wiper Arms Maintenance:	11-24			
	A. Removal.	11-24A			
	B. Installation.	11-24B			
	C. Operational Check.	11-24C			
12.	Rear View Mirror Maintenance:	11-25			
	A. Removal.	11-25A			
	B. Disassembly,	11-25B			
	C. Assembly.	11-25C			
	D. Installation.	11-25D			
	E. Adjustment.	11-25E			
13.	Heater Maintenance:	11-26	4-1		
	A. Removal.	11-26A			
	B. Installation.	11-26B			
14.	Heater Hose Maintenance:	11-27	4-1		
15.	Heater Control Panel Maintenance:	11-28	4-1		
	A. Removal of Knob and Cable.	11-28A			
	B. Installation of Knob and Cable.	11-28B			
	C. Operational Check.	11-28C			
16.	Heater Control Valve Maintenance:	11-29	4-1		
	A. Removal.	11-29A			
	B. Installation.	11-29B			

TASK	TROUBLESHOOTING
REF	REF (TABLE)
11-30	4-1
11 -30A	
11-30B	
11-30C	
11-31	
11-32	
11-32A	
11-32B	
11-33	
11-33A	
11-33B	
	11 -30A 11-30B 11-30C 11-31 11-32 11-32A 11-32B 11-33 11-33A

11-9. BUMPER AND TOWING EYES MAINTENANCE.

THIS TASK COVERS: (Approximate TIME REQUIRED FOLLOWS TASK Description.)

a. Removal. (15) b. Installation. (15)

30 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Cotter Pin, 108656 (24617).

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

Table 11-1.

EQUIPMENT CONDITION PARAGRAPH

11-16E

CONDITION DESCRIPTION

Brush Guard Removed (M916 Thru M920).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission In Neutral.

Park Brake Set.

FRAME.			
11-9. BUMPER AND TOWING EYE	S MAINTENANCE.		
LOCATION/ITEM	ACTION	REMARKS	
A. REMOVAL.			
1. Two cotter pins (5).	Remove and throw away.		
2. Clevis (6) and pin (7).	Slide pin (7) out and remove clevis (6).		
3. Four screws (9), washers (11), and nuts (12).	Unscrew and remove classification sign (10) and bracket (13).	M915 thru M920.	
4. Two screws (9), washers (11), and nuts (12).	Unscrew and remove bracket (14).	M916 thru M920.	
	NOTE		
	removing capscrews (8) support r to keep it from falling.		
5. Eight capscrews (8) and nuts (2).	Unscrew and remove.	If you want to change a single towing eye, remove only the four capscrews on that side.	
9 13 12 14 11 12		LEGEND: 1. BUMPER 2. NUT (8) 3. FRONT EXTENSION (2) 4. TOWING EYE (2) 5. COTTER PIN (2) 6. CLEVIS (2) 7. PIN (2) 8. CAPSCREW (8) 9. CAPSCREW (6) 10. CLASSIFICATION SIGN 11. WASHER (6) 12. NUT (6) 13. BRACKET 14. BRACKET	

 A. REMOVAL (Continue) 6. Bumper (1) and two towing eyes (4). B. INSTALLATION. 7. Bumper (1). 8. Two towing eyes (4) and eight capscrews 9. Eight nuts (2). 	a. Remove. b. Inspect for rust or Replace if necessary. damage. Put in place against front extension (3). Put eyes in place and insert
towing eyes (4). B. INSTALLATION. 7. Bumper (1). 8. Two towing eyes (4) and eight capscrews	b. Inspect for rust or Replace if necessary. damage. Put in place against front extension (3). Put eyes in place and insert
7. Bumper (1). 8. Two towing eyes (4) and eight capscrews	extension (3). Put eyes in place and insert
8. Two towing eyes (4) and eight capscrews	extension (3). Put eyes in place and insert
and eight capscrews	Put eyes in place and insert
9. Eight nuts (2).	
	Put on; tighten capscrews (8) and nuts (2).
10. Clevis (6).	Position, slide in pin (7), and secure with new cotter pin (5).
11. Bracket (14).	Install to bumper (1) with M916 thru M920. two screws (9), washers (11) and nuts (12).
12. Bracket (13).	a. Install to bracket (14) with M916 thru M920. two screws (9), washers (11), and nuts (12).
	b. Install to bumper (1) with M915.two screws (9), washers (11),and nuts (12).
13. Classification sign (1	0). Install to bracket (13) with M915 thru M920. two screws (9), washers (11), and nuts (12).
	Follow-on maintenance action required:
	Install brush guard (M916 thru M920 only); refer to para 11-16F.

FRAME. 11-9. BUMPER AND TOWING EYES MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** LEGEND: 1. BUMPER 2. NUT (8) 3. FRONT 10 **EXTENSION (2)** 4. TOWING EYE (2) 5. COTTER PIN (2) 6. CLEVIS (2) 7. PIN (2) 8. CAPSCREW (8) 9. CAPSCREW (6) 10. CLASSIFICATION SIGN 11. WASHER (6) 12. NUT (6) 13. BRACKET 14. BRACKET

TA 075019

11-10. PINTLE MAINTENANCE (M915 THRU M917 AND M920).

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (15)

b. Cleaning and Inspection. (15)c. Installation. (20)

d. Lubrication and Adjustment. (15)

65 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M915 Thru M917 and M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

MATERIALS/PARTS (P/N)

Lithium (Chassis) Grease (Refer to Appendix C). Cotter Pin, 773 (74410).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P. LO 9-2320-273-12.

TROUBLESHOOTING REFERENCES

Table 11-1.

EQUIPMENT CONDITION None.

PARAGRAPH

CONDITION DESCRIPTION

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS Engine OFF.

Transmission in Neutral. Park Brake Set.

11-10. PINTLE MAINTENANCE (M915 THRU M917 AND M920) (Continued). **ACTION REMARKS** LOCATION/ITEM A. REMOVAL. 1. Cotter Pin (1). Remove and discard. 2. Slotted nut (2) and a. Unscrew and remove. spacer (3). b. Remove hook assembly (5). NOTE If you do not need to remove brackets (9) go directly to step 6. LEGEND: 1. COTTER PIN 2. SLOTTED NUT 3. SPACER 10 4. GREASE FITTING (4) 5. HOOK ASSEMBLY 6. COTTER PIN 7. CHAIN 8. CAPSCREW (2) 9. BRACKET (2) 10. WASHER (2) 11. NUT (2) TA 075020

11-10. PINTLE MAINTENANCE (M915 THRU M917 AND M920) (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
A. REMOVAL (Continued).			
3. Two capscrews (8), washers (10), nuts (11).	a. Unscrew and remove.b. Remove two brackets (9).		
B. CLEANING AND INSPECTION.	- -		
4. Cotter pin (6).	Remove from hook assembly (5) and spread jaws.	Check that chain (7) is securely riveted to hook assembly (5) and that links are not damaged.	
5. All parts.	Clean and lubricate with diesel fuel or suitable light oil. inspect for signs of damage or wear and replace as necessary.		
C. INSTALLATION.			
6. Two brackets (9).	Hold in position.		
7. Two capscrews (8), washers (10) and nuts (11).	Screw in loosely.	Insure grease fittings face down.	
8. Hook assembly (5).	Push through bracket (9) from back end.		
Spacer (3) and slotted nut (2).	Screw on loosely.		
10. Two capscrews (8) and nuts(11).	Tighten.		
D. LUBRICATION AND ADJUST	MENT.		
11. Cotter pin (6)	Install in hook assembly (5).		
12. Four grease fittings (4).	Apply grease with grease gun.		
13. Slotted nut (2).	 Tighten until pintle hook binds when turned. 		
	 b. Loosen just until hook turns with some resistance. 		
14. New cotter pin (1).	a. Insert to hold slotted nut(2) in place.		
	b. Spread ends.		

11-10. PINTLE MAINTENANCE (M915 TH	RU M917 AND M920) (Continued).
LOCATION/ITEM	ACTION	REMARKS
11 10 g	9 8 SEND: COTTER PIN	5
2. 3. 4. 5. 6. 7. 8. 9.	SLOTTED NUT SPACER GREASE FITTING (4) HOOK ASSEMBLY COTTER PIN CHAIN CAPSCREW (2) BRACKET (2)	
	WASHER (2) NUT (2)	TA 075021

11-11. SPARE TIRE HOIST CABLE (M915 AND M916).

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (5) b. Installation. (10)

15 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M915 and M916.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Sleeve (M915), 188-4-VN (97706). Sleeve (M916), S409-1SB (75535). Cable (M915), 1/8 x 15/7 x 19 (75535). Cable (M916), 1/8 x 15 ft/7 x 19 (75535).

EQUIPMENT CONDITION

PARAGRAPH

(See TM 9-2320-273-10).

CONDITION DESCRIPTION

Spare Wheel and Tire Removed.

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 11-1.

11-11. SPARE TIRE HOIST CABLE (M915 AND M916) (Continued). LOCATION/ITEM **ACTION REMARKS** REMOVAL. Loosen. 1. Two nuts (5). Unwind. Pull cable end out 2. Cable (3). from under clamp (1) and remove. Remove by cutting old cable (3). 3. Hook (4). INSTALLATION. 4. New cable (3). Install sleeve (2), pass thru hook (4), place end of cable thru other side of sleeve (2) and secure with suitable crimping tool. Insert under clamp (1). 5. Cable (3). Tighten. 6. Two nuts (5). LEGEND: 1. CLAMP 2. SLEEVE 3. CABLE 4. HOOK 5. NUT (2) TA 075022

11-12. SPARE TIRE HOIST MAINTENANCE (M915 and M916).

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal (30) b. Installation. (35)

65 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M915 and M916.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

Table 11-1.

EQUIPMENT CONDITIONPARAGRAPH

(See TM 9-2320-273-10).

CONDITION DESCRIPTION

Spare Wheel and Tire Removed.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission in Neutral. Park Brake Set.

11-12. SPARE TIRE HOIST	MAINTENANCE (Continued)).
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL.		
1. Four screws (17), washe (22), and nuts (21).	Unscrew and remove (10) with assembled from pedestal (26).	
2. Retaining ring(1).	Remove.	
3. Spring (2), handle (3), and disk (4).	Remove.	NOTE If M016 padastal is to be convised.
1. RETAINING RING 2. SPRING 3. HANDLE 4. DISK 5. RATCHET GEAR 6. BRAKE FACE 7. PINION SHAFT ASSEMBLY 8. RETAINING RING 9. BUSHING 10. FRAME & PLATE ASSEMBLY 11. BUSHING 12. LOCKNUT 13. RATCHET SPRING 14. RATCHET SPACER 15. RATCHET SPACER 15. RATCHET BOLT 17. MOUNTING SCREW (4) 18. DRUM ASSEMBLY 19. FRAME SPACER 20. LOCKNUT 21. MOUNTING NUT (4) 22. MOUNTING WASHER (4) 23. SCREW 24. PEDESTAL MOUNTING NUT (2) 25. TIE DOWN 26. PEDESTAL 27. NUT (2) 28. BOLT (2) 29. CARRIER 30. COTTER PIN	32 33 34 3 32 33 34 3 32 33 34 3	If M916 pedestal is to be serviced, remove one bolt and nut attaching thru frame rail. 10 10 17 18 19 20 18 19 30 31 31 31 32 32 32 33 39 39 30 30 31 31 32 31 32 32 33 34 37 39 39 30 30 31 31 31 32 32 33 34 34 37 39 39 30 30 30 31 31 32 32 33 34 34 35 37 39 39 30 30 31 31 32 32 33 34 35 36 37 39 39 30 30 31 31 32 32 33 34 35 36 37 38 39 30 30 30 30 30 30 30 30 30 30 30 30 30
35. NUT (2) 36. CLEVIS	26 25 M915	TA 075023

11-12. SPARE TIRE HOIST MAINT	ENANCE (Continued).	
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
4. Screw (23) and locknut (20).	Unscrew and remove frame spacer (19) and drum assembly (18).	
5. Retaining ring (8).	Remove, slide pinion shaft assembly (7) to side and remove brake face (6), and ratchet gear (5).	
6. Ratchet bolt (16) and locknut (12).	Unscrew and remove ratchet spring (13), ratchet spacer (14), and ratchet pawl (15).	
7. Bushings (9), and (11).	Remove.	
8. Cotter pin (30) and clevis pin (31).	Remove and unscrew clevis (36) from tension rod (37).	Discard cotter pin.
9. Three nuts (38) and (39).	Unscrew and remove tension rod (37) from tension rod support assy (40) and clevis (36).	Nut (38) attaches to clevis (36) and two nuts (39) attach at either side of tension rod support assy (40).
10. Tie down (25) and two pedestal mounting nuts (24).	Unscrew and remove pedestal (26).	
11, Two bolts (32), washers (34), and nuts (35).	Unscrew and remove two cable rollers (33).	
12. Two bolts (28) and nuts (27).	Unscrew and remove carrier (29).	
B. INSTALLATION.		
13. Carrier (29),	Install with two bolts (28) and nuts (27).	
14. Two cable rollers (33).	Install to pedestal (26) with two bolts (32), washers (34), and nuts (35).	
15. Pedestal (26).	Install with tie down (25) and two pedestal mounting nuts (24)	
16. Tension Rod (37).	Install with three nuts (38) and (39) to tension rod support assy (40) and clevis (36).	Nut (38) attaches to clevis (36) and two nuts (39) attach at either side of tension rod support assy (40).
17. Clevis (36).	Screw onto tension rod (37) and fasten to pedestal with clevis pin (31) and new cotter pin (30).	
18. Bushings (9) and (11).	Install in frame (10).	

11-12. SPARE TIRE HOIST MAINTENANCE (M915 and M916) (Continued). **ACTION REMARKS** LOCATION/ITEM B. INSTALLATION (Continued). Install to frame (10) with ratchet 19. Ratchet spring (13), ratchet spacer (14), and ratchet pawl bolt (16) and locknut (12). (15).20. Ratchet gear (5), brake Install on pinion shaft (7), slide face (6). shaft (7) into frame (10), and fasten with retaining ring (8). 21. Spacer (19) and drum (18). Install to frame (10) with screw (23) and nut (20). Install on pinion shaft (7) and 22. Disk (4), handle (3), and spring (2). fasten with retaining ring (1). 23. Frame (10) with assembled Install to pedestal (26) with four screws (17), washers (22), and hoist. nuts (21). NOTE Follow on maintenance required: Install spare tire and wheel (see TM 9-2320-273-10). 8 32 35 30 11 36 20 17 19 37 31 M916 29 23 . BOLT (2) 28. CARRIER 29. 15. RATCHET PAWL 24 28 30. **COTTER PIN** 16. RATCHET BOLT 31. **CLEVIS PIN** 17. **MOUNTING SCREW (4)** 32. **BOLT (2)** M915 18. DRUM ASSEMBLY PINION SHAFT 33. CABLE ROLLER (2) 19. FRAME SPACER 26 **ASSEMBLY** 34. WASHER (2) 20. LOCKNUT **RETAINING RING** 8. 35. LEGEND: 21. **MOUNTING NUT (4)** NUT (2) **BUSHING** 9 22. 36. CLEVIS MOUNTING WASHER (4) **FRAME & PLATE** 1. RETAINING RING 10. 23. **SCREW** 37. **TENSION ROD** 2. **SPRING** ASSEMBLY 24. 38. NUT PEDESTAL 3. HANDLE 11. **BUSHING** 39. NUT (2) **MOUNTING NUT (2)** 12. LOCKNUT **TENSION ROD** 4. DISK 25. TIE DOWN SUPPORT ASSEMBLY 5. RATCHET GEAR 13. RATCHET SPRING 26. **PEDESTAL** TA 075024 6. **BRAKE FACE** 14. RATCHET SPACER 27. NUT (2)

11-13. FIFTH WHEEL MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (15) b. Lubrication. (10) c. Adjustment. (10) d. Installation. (25)

60 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M915, M916, M920

TEST EQUIPMENT

None.

SPECIAL TOOLS

1,000 Lb Hoist. Lift Hook.

M916 and M920 Fifth Wheel Adjustment Tool (CT447ALX2).

MATERIALS/PARTS (P/N)

GAA (Refer to Appendix C).

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P. LO 9-2320-273-12.

TROUBLESHOOTING REFERENCES

Table 11-1.

EQUIPMENT CONDITION

PARAGRAPH

None.

CONDITION DESCRIPTION

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission In Neutral.

Park Brake Set.

4. KING PIN PLATE

6. LOCK JAW (2)

5. BAR

11-13. FIFTH WHEEL MAINTENANCE. **ACTION REMARKS** LOCATION/ITEM A. ADJUSTMENT (M915 ONLY). **NOTE** • Clean 5th wheel thoroughly before making adjustment. Use tool TLN 1000 in the following 12 procedure. 5 ·12_13 10 LEGEND: 1. FIFTH WHEEL LOCK 7. FIFTH WHEEL PLATE ASSY TESTER 8. GROSS TIE 9. RELEASE HANDLE 2. LEVER 10. SECONDARY LOCK HANDLE 3. KING PIN

11. LOCK ADJUSTING TAG 12. HEXAGON HEAD NUT

13. RUBBER BLOCK

14. YOKE

TA 237248

11-13. FIFTH WHEEL MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

A. ADJUSTMENT (M915 ONLY) (Continued).

NOTE

To install the fifth wheel lock tester, the fifth wheel lock jaws must be open. Do step 1 to open lock jaws, if necessary.

- 1. Secondary lock handle (10) release handle (9), and lock jaws (6).
- a. Pull out secondary lock handle (10) until it catches on the 5th wheel plate assembly (7).
- b. Pull out release handle and pry open lock jaws (6).
- 2. 5th wheel lock tester (1).
- a. Grasp handle of king pin plate (4) and place king pin (3) into lock jaws (6).
- b. Place lever (2) over front of 5th wheel plate assembly (7).
- c. While pushing down on king pin plate (4), rotate lever
 (2), away from 5th wheel plate assembly (7) until king pin (3) is locked in lock jaws (6).

Be sure king pin plate (4) is flat against 5th wheel plate assembly (7) during this operation.

- d. Position bar (5) over edge of cross tie (8).
- e. Pry forward with lever (2) and rearward with bar (5) to check for play (1/8" (.31 cm) or less).

Do step 3 to adjust lock jaws (6), if necessary.

3. Nut (11).

- a. Turn nut counter-clockwise to allow for yoke (13) to slide down and reposition on the lock jaws (6).
- b. Tighten nut (11) until rubber block (12) fits snugly against the 5th wheel plate assembly, but still can be turned by hand.

If there is still play after adjusting lock jaws (6), refer to Direct Support and General Support Maintenance.

- 4. Fifth wheel lock tester (1).
- a. Rotate lever (2) towards5th wheel plate assembly (7).
- b. Position bar (5) on edge of cross tie (8), using leverage remove king pin (3) from lock jaws (6).

11-13. FIFTH WHEEL MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

A. ADJUSTMENT (M915 ONLY) (Continued).

NOTE

Repeat this procedure to verify proper adjustment of fifth wheel.

Follow-on maintenance action required: Re-lubricate as per LO 9-2320-273-12.

B. ADJUSTMENT (M916 and M920 ONLY).

NOTE

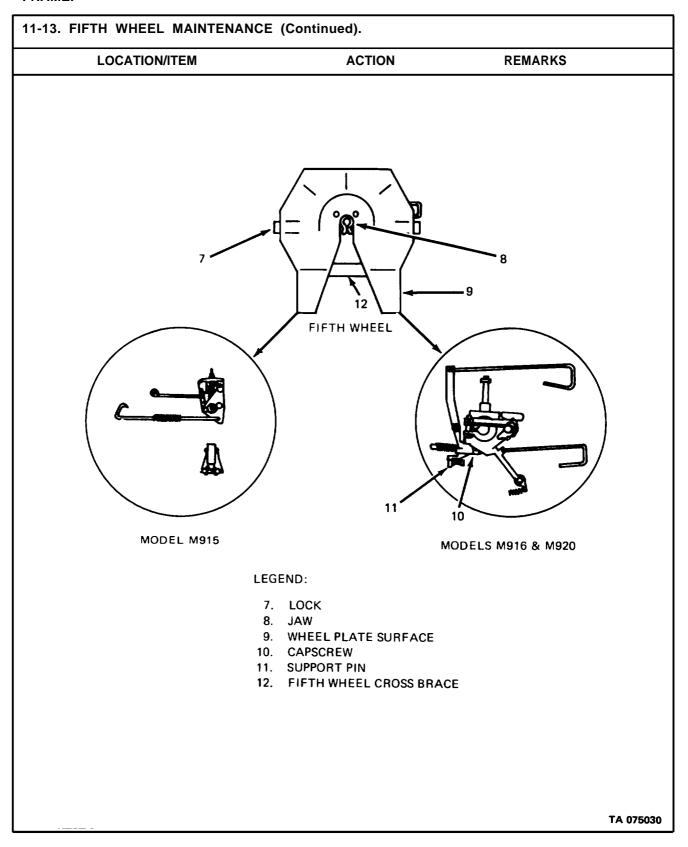
- Clean 5th wheel thoroughly before making adjustment.
- Use tool TLN 1500 in the following procedure.

11-13. FIFTH WHEEL MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM B. ADJUSTMENT (M916 and M920 ONLY) (Continued). 10 0 0 LEGEND: 1. FIFTH WHEEL LOCK 7. FIFTH WHEEL PLATE ASSY TESTER 8. CROSS TIE 9. RELEASE HANDLE 2. LEVER KING PIN 10. SECONDARY LOCK HANDLE 3. KING PIN 10. SECONDARY LOCK HA 4. KING PIN PLATE 11. HEXAGON HEAD NUT 5. BAR 6. LOCK JAW (2) TA 237249

11-13. FIFTH WHEEL MAINTENAN	ICE (Continued).	
LOCATION/ITEM	ACTION	REMARKS
B. ADJUSTMENT (M916 and M920	ONLY) (Continued).	
	NOTE	
fifth who	all the fifth wheel lock tester, the eel lock jaws must be open. Do een lock jaws, if necessary.	step
Secondary lock handle (10), release handle (9) and lock jaws (6).	 a. Pull out secondary lock handle (10), until it catches on 5th wheel plate assembly (7). b. Pull out release handle (9), and pry open lock jaws (6). 	
2. Fifth wheel lock tester (1).	 a. Grasp handle of king pin plate (4) and place king pin (3) into lock jaws (6). b. Place lever (2) over front of 5th wheel plate assembly. c. While pushing down on king pin plate (4), rotate lever (2) away from 5th wheel plate assembly (7) until king pin (3) is locked in lock jaws (6). d. Position bar (5) over edge of cross tie (8). e. Pry forward with lever (2) and rearward with bar (5) to check for play (1/8" (.31 cm) or less). 	Be sure king pin plate (4) is flat against the 5th wheel plate assembly (7) during this operation. Do step 3 to adjust lock jaws (6), if necessary.
3. Hexagon head nut (11).	Tighten or loosen to obtain a snug fit against 5th wheel plate assembly (7).	If there is still play after adjusting lock jaws (6) refer to Direct Support and General Support Maintenance.
4. Fifth wheel lock tester (1).	 a. Rotate lever (2) towards 5th wheel plate assembly (7). b. Position bar (5) on edge of cross tie (8), using lev- erage remove king pin (3) from lock jaws (6). 	

LOCATION/ITEM	ACTION	REMARKS
		NEMAKKO
ADJUSTMENT (M916 and M920 ON	_	
	NOTE	
Repeat the adjustment	nis procedure to verify prop nt of fifth wheel.	per
Follow-on	maintenance action requi	red:
Re-lubrica	ate as per LO 9-2320-273-1	2.

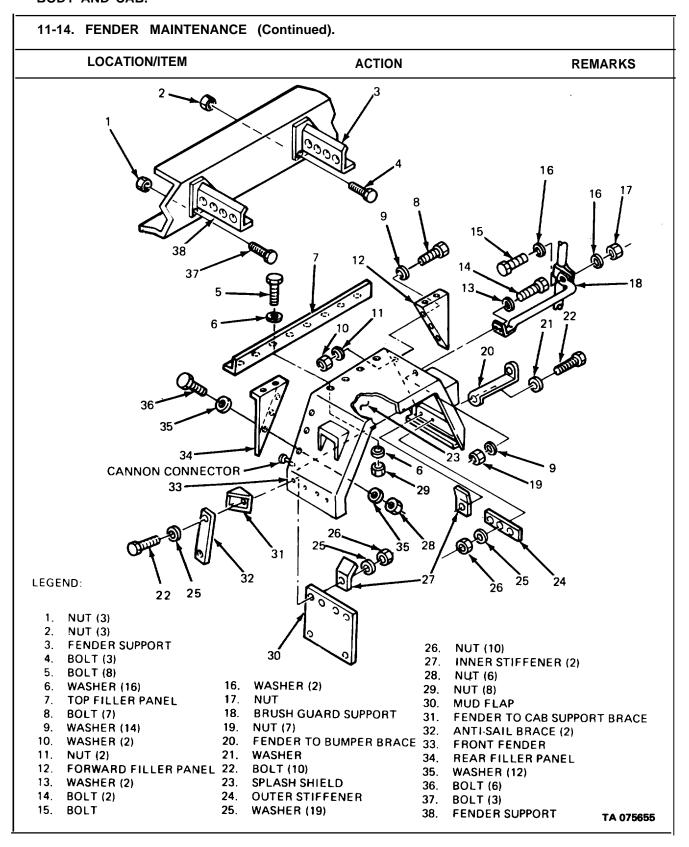
FRAME.



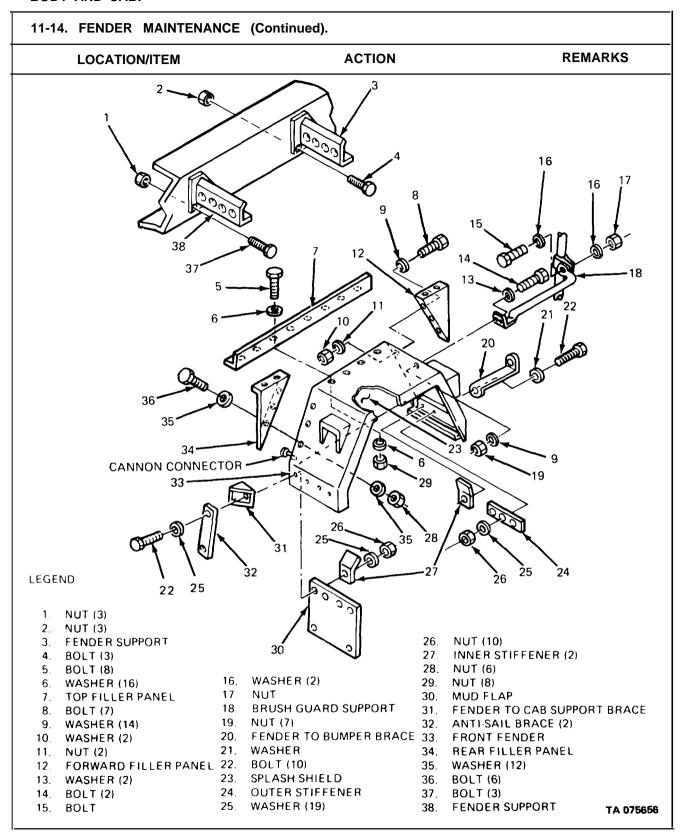
11-14. FENDER MAINTENANCE.		
THIS TASK COVERS: (APPROXIMATE TIME REQ	UIRED FOLLOWS TASK DE	ESCRIPTION.)
a. Removal of Front Fender (M915).	(10)	
b. Installation of Front Fender (M915).	(10)	
c. Removal of Front Fender (M916 Thru M920).	(15)	
d. Installation of Front Fender (M916 Thru M920). e. Removal of Rear Fender.	(15) (5)	
f. Installation of Rear Fender.	(5)	
in motalitation of recall remain	60 Minutes Total.	
INITIAL SETUP	EQUIPMENT CONDITI	ON
APPLICABLE CONFIGURATIONS	PARAGRAPH	CONDITION DESCRIPTION
All.	5-44A	If damaged Front Fenders
		are to be Removed:
TEST EQUIPMENT		Headlamp Assembly
None.		Removed.
SPECIAL TOOLS		
None.	11-16E	Brush guard removed
None.		(M916 thru M920).
MATERIALS/PARTS (P/N)		
None.		
PERSONNEL REQUIRED Two (MOS-63B20). REFERENCES (TM) TM 9-2320-273-10.	SPECIAL ENVIRONME Vehicle Parked on Leve	el Ground.
Two (MOS-63B20). REFERENCES (TM) TM 9-2320-273-10.	Vehicle Parked on Leve	el Ground.
Two (MOS-63B20). REFERENCES (TM) TM 9-2320-273-10. TROUBLESHOOTING REFERENCES	Vehicle Parked on Level GENERAL SAFETY IN Engine Off. Park Brake Set.	el Ground.
Two (MOS-63B20). REFERENCES (TM) TM 9-2320-273-10.	Vehicle Parked on Level GENERAL SAFETY IN Engine Off. Park Brake Set.	el Ground.
Two (MOS-63B20). REFERENCES (TM) TM 9-2320-273-10. TROUBLESHOOTING REFERENCES	Vehicle Parked on Level GENERAL SAFETY IN Engine Off. Park Brake Set.	el Ground.
Two (MOS-63B20). REFERENCES (TM) TM 9-2320-273-10. TROUBLESHOOTING REFERENCES	Vehicle Parked on Level GENERAL SAFETY IN Engine Off. Park Brake Set.	el Ground.
Two (MOS-63B20). REFERENCES (TM) TM 9-2320-273-10. TROUBLESHOOTING REFERENCES	Vehicle Parked on Level GENERAL SAFETY IN Engine Off. Park Brake Set.	el Ground.
Two (MOS-63B20). REFERENCES (TM) TM 9-2320-273-10. TROUBLESHOOTING REFERENCES	Vehicle Parked on Level GENERAL SAFETY IN Engine Off. Park Brake Set.	el Ground.
Two (MOS-63B20). REFERENCES (TM) TM 9-2320-273-10. TROUBLESHOOTING REFERENCES	Vehicle Parked on Level GENERAL SAFETY IN Engine Off. Park Brake Set.	el Ground.

11-14. FENDER MAINTENANCE (Continued). LOCATION/ITEM **REMARKS ACTION** A. REMOVAL OF FRONT FENDER (M915). 1. Unlatch hood. Refer to TM 9-2320-273-10. 2. Cannon connector. Twist and remove from firewall connector. 3. Ten bolts (22), washer (21), Remove. Fender to bumper brace nineteen washers (25) and (20) and fender to cab ten nuts (26). support brace (31) may be removed from vehicle by unscrewing one existing nut. 4. Front fender (33), two inner Remove from fender supports (3) Second mechanic to stiffeners (27), one outer and (38). assist. stiffener (24), mud flap (30), and two anti-sail braces (32). LEGEND: FŔAME NUT (3) NUT (3) 3. FENDER SUPPORT 4. BOLT (3) 5. **BOLT (8)** 6. WASHER (16) TOP FILLER PANEL 18 8. **BOLT (7)** 9. WASHER (14) 10+09 10. WASHER (2) 11 NUT (2) 12.* FORWARD FILLER PANEL 13. WASHER (2) 35 34 14. BOLT (2) 15. BOLT **CANNON CONNECTOR** WASHER (2) 16. 17 NUT 18 BRUSH GUARD SUPPORT NUT (7) 19. 20. FENDER TO BUMPER BRACE 21. WASHER 25 22 26 22 BOLT (10) 23. SPLASH SHIELD 24 **OUTER STIFFENER** 25. **WASHER (19)** ANTI SAIL BRACE (2) 32 26. NUT (10) 33. FRONT FENDER 27. INNER STIFFENER (2) 34. REAR FILLER PANEL 28. NUT (6) 35. WASHER (12) 29. NUT (8) 36. BOLT (6) 30. MUD FLAP 37. **BOLT (3)** TA 075654 31. FENDER TO CAB SUPPORT BRACE 38. FENDER SUPPORT

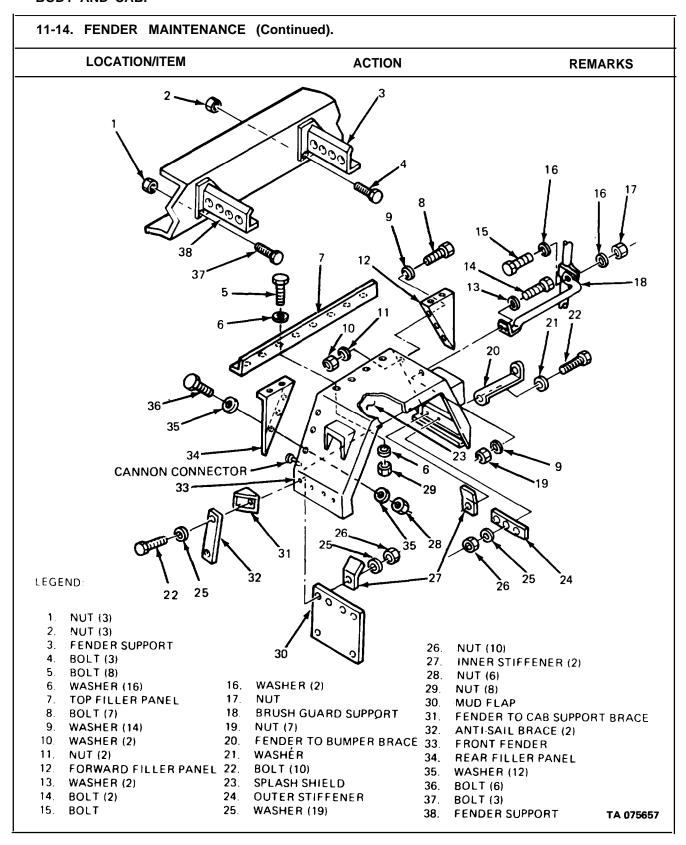
11-14. FENDER MAINTENANCE (Co	ontinued).	
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL OF FRONT FENDER	(M915) (Continued).	
5. Eight bolts (5), sixteen washers (6), and eight nuts (29).	Unscrew and remove top filler panel (7).	
6. Six bolts (36), twelve washers (35), and six nuts (28).	Unscrew and remove forward filler panel (12) and rear filler panel (34).	
7. Three bolts (37) and nuts (1).	Unscrew and remove fender support (38).	
8. Three bolts (4) and nuts (2).	Unscrew and remove fender support (3).	
B. INSTALLATION OF FRONT FE	NDER (M915).	
9. Fender support (3).	install to frame rail with three bolts (4) and nuts (2).	
10. Fender support (38).	Install to frame rail with three bolts (37) and nuts (1).	
11. Forward filler panel (12) and rear filler panel (34).	a. Aline with mounting holes on fender (33).b. Attach with six bolts (36), twelve washers (35), and six nuts (28).	
12. Top filler panel (7).	 a. Aline with mounting holes on fender (33), forward filler panel (12), and rear filler panel (34). b. Attach with eight bolts (5), sixteen washers (6), and eight nuts (29). 	
13. Front fender (33), two inner stiffeners (27), one outer stiffener (24), mud flap (30), two anti-sail braces (32), fender to bumper brace (20) and fender to cab support brace (31)	 a. Aline with mounting holes on fender supports (3) and (38). b. Attach with ten bolts (22), washer (21), nineteen washers (25) and ten nuts (26). 	If braces (20) or (31) were removed from vehicle, reinstall with one existing nut.
14. Cannon connector.	Twist onto firewall connector.	
15. Latch hood.	Refer to TM 9-2320-273-10.	
C. REMOVAL OF FRONT FENDER	(M916 thru M920).	
16. Unlatch hood.	Refer to TM 9-2320-273-10.	
17. Cannon connector.	Twist and remove from firewall connector.	



	11-14. FENDER MAINTENANCE (Continued).			
		LOCATION/ITEM	ACTION	REMARKS
-		Two nuts (11), washers (10),	(M916 thru M920) (Continued). Unscrew and remove.	
		washers (13), and bolts (14).		
	19.	Bolt (15), two washers (16) and nut (17).	Unscrew and remove with brush guard support (18).	
	20.	Ten bolts (22), washer (21), nineteen washers (25) and ten nuts (26).	Remove.	Fender to bumper brace (20) and fender to cab support brace (31) may be removed from vehicle by unscrewing one existing nut.
	21.	Front fender (33), two inner stiffeners (27), one outer stiffener (24), mud flap (30), and two anti-sail braces (32).	Remove from fender supports (3). and (38).	Second mechanic to assist.
	22.	Eight bolts (5), sixteen washers (6), and eight nuts (29).	Unscrew and remove top filler panel (7).	
	23.	Six bolts (36), twelve washers (35), and six nuts (28).	Unscrew and remove forward filler panel (12) and rear filler panel (34).	
	24.	Three bolts (37) and nuts (1).	Unscrew and remove fender support (38).	
	25.	Three bolts (4) and nuts (2).	Unscrew and remove fender support (3).	
-	D. I	NSTALLATION OF FRONT FEN	NDER (M916 thru M920).	
	26.	Fender support (3).	Install to frame rail with three bolts (4) and nuts (2).	
	27.	Fender support (38).	Install to frame rail with three bolts (37) and nuts (1).	
	28.	Forward filler panel, (12) and rear filler panel (34).	a. Aline with mounting holes on fender (33).b. Attach with six bolts (36), twelve washers (35), and six nuts (28).	
	29.	Top filler panel (7).	 a. Aline with mounting holes on fender (33), forward filler panel (12), and rear filler panel (34). b. Attach with eight bolts (5), sixteen washers (6), and eight nuts (29). 	
	30.	Front fender (33), two inner stiffeners (27), one outer stiffener (24), mud flap (30), two anti-sail braces (32), fender to bumper brace (20) and fender to cab support brace (31)	washer (21), nineteen washers (25) and ten nuts (26).	If braces (20) or (31) were removed from vehicle, reinstall with one existing nut.



LOCATION/ITEM	ACTION	REMARKS
D. INSTALLATION OF FRONT I	FENDER (M916 thru M920) (Continued).	
1. Brush guard support (18).	 a. Aline mounting holes. b. Install to fender with two bolts (14), washers (10), washers (13), and nuts (11). c. Install to brush guard with bolt (15), two washers (16) and nut (17). 	
2. Cannon connector.	Twist onto firewall connector.	
3. Latch hood.	Refer to TM 9-2320-273-10.	



LOCATION/ITEM	ACTION	REMARKS
E. REMOVAL OF REAR FENDER	.]	
34. Bolt (12) and nut (14).	 a. Unscrew, loosen clamp (13), and slide mounting tube (15) with fender (19) attached, from mounting pin (6) or mounting pin plate (10). b. Slide clamp (13) off mounting tube (15). 	Mounting pin (6) used or M916, M917, M920; mounting pin plate (10) used on M915.
35. Three bolts (16) and nuts (18).	Unscrew and remove mounting tube (15).	
36. Three bolts (5) and nuts (20).	Unscrew and remove with three supports (17).	
37. Six bolts (3), washers (2), and nuts (1).	Unscrew and remove mud guard (4).	
38. Bolt (7) and nut (6).	Unscrew from frame rail and remove mounting pin (6).	M916, M917, and M920 only.
39. Four bolts (11) and nuts (9).	Unscrew from frame rail and remove mounting pin plate (10).	M915 only.
F. INSTALLATION OF REAR FEI	NDER.	
40. Mounting pin plate (10).	a. Aline with frame rail holes.b. Attach with four bolts (11) and nuts (9).	M915 only.
41. Mounting pin (6).	a. Aline with frame rail hole.b. Attach with bolt (7) and nut (8).	M916, M917, and M920 only.
42. Mud guard (4).	a. Aline with mounting at top of rear quarter fender (19).b. Attach with six bolts (3), washers (2), and nuts (1).	
43. Three supports (17).	a. Aline with mounting holes on rear quarter fender (19).b. Attach with three bolts (5) and nuts (20) at upper fender curvature.	
44. Mounting tube (15).	a. Aline with lower mounting holes on three supports (17) and rear quarter fender (19).b. Attach with three bolts (16) and nuts (18).	
45. Clamp (13).	Slide over mounting tube (15).	

11-14. FENDER MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

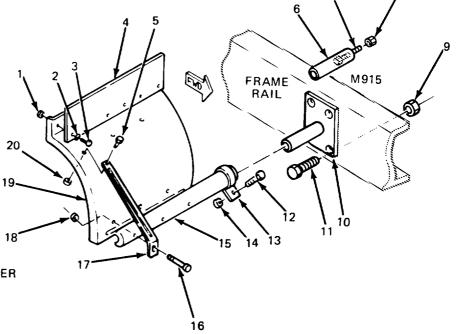
F. INSTALLATION OF REAR FENDER (Continued).

- 46. Mounting tube (15).
- a. Slide over mounting pin (6) (M916, M917, and M920), or mounting pin plate (10) (M915).
- b. Secure with bolt (12) and nut (14) thru clamp (13).

M916, M917, M920

LEGEND:

- 1. NUT (6)
- 2. WASHER (6)
- 3. BOLT (6)
- 4. MUD GUARD
- 5. BOLT (3)
- MOUNTING PIN
- 7. BOLT
- 8. NUT
- 9. NUT (4)
- 10. MOUNTING PIN PLATE 20
- 11. BOLT (4)
- 12. BOLT
- 13. CLAMP
- 14. NUT
- 15. MOUNTING TUBE
- 16. BOLT (3)
- 17. SUPPORT (3)
- 18. NUT (3)
- 19. REAR QUARTER FENDER
- 20. NUT (3)



TA 075658

1-15. VENTILATOR MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (10) b. Installation. (10)

20 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

AII.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES TM

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

None.

EQUIPMENT CONDITION

PARAGRAPH

11-26A.

CONDITION DESCRIPTION

Heater Removed.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission In Neutral.

Park Brake Set.

11-15. VENTILATOR MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

NOTE

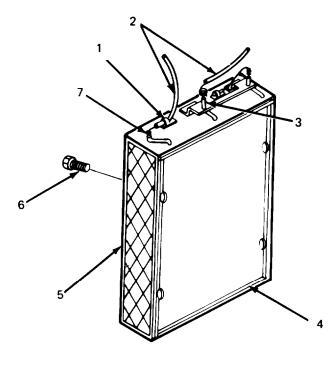
The driver's side ventilator is riveted into the side of the cab. It is not maintained at the Organizational level.

A. REMOVAL

1. Two clips (1). Loosen, Remove two cable wires (2) from clips.

2. Two wire ends (7). Slide off of two pins (3). If ned

If necessary, tag for location.



LEGEND:

- 1. CLIP (2)
- 2. CABLE WIRE (2)
- 3. PIN (2)
- 4. SEAL
- 5. VENTILATOR
- 6. SCREW (4)
- 7. WIRE END (2)

TA 075032

3. Four screws (6) 4. Ventilator (5). 5. Seal (4). 6. Ventilator (5). Consider the seal for deterioration. If necessary, remove using a suitable tool. D. If seal is being replaced, cut seal to desired length and remove adhesive backing. Install seal on ventilator applying firm and even pressure. Consider the seal for deterioration. If necessary, remove using a suitable tool. D. If seal is being replaced, cut seal to desired length and remove adhesive backing. Install seal on ventilator applying firm and even pressure. Consider the seal for deterioration. Seal (4). Set in place. Consider the seal for deterioration. If necessary, remove using a suitable tool. Set in place, Consider the seal for deterioration. If necessary, remove using a suitable tool. Set in place, Consider the seal for deterioration. If necessary, remove using a suitable tool. Set in place, Consider the seal for deterioration. If necessary, remove using a suitable tool. Set in place, Consider the seal for deterioration. If necessary, remove using a suitable tool. Set in place, Consider the seal for deterioration. If necessary, remove using a suitable tool. Set in place, Set in place, Consider the seal for deterioration.	LOCATION/ITEM	ACTION	REMARKS
4. Ventilator (5). Remove. a. Inspect seal for deterioration. If necessary, remove using a suitable tool. b. If seal is being replaced, cut seal to desired length and remove adhesive backing. Install seal on ventilator applying firm and even pressure. B. INSTALLATION. 6. Ventilator (5). Set in place. 7. Four screws (6). Screw in and tighten. 8. Two wire ends (7). Slide onto two pins (3). 9. Two clips (1). Fasten over cable wires (2). NOTE Follow-on maintenance action required:	A. REMOVAL (Continued).		
a. Inspect seal for deterioration. If necessary, remove using a suitable tool. b. If seal is being replaced, cut seal to desired length and remove adhesive backing. Install seal on ventilator applying firm and even pressure. B. INSTALLATION. 6. Ventilator (5). Set in place. 7. Four screws (6). Screw in and tighten. 8. Two wire ends (7). Slide onto two pins (3). 9. Two clips (1). Fasten over cable wires (2). NOTE Follow-on maintenance action required:	3. Four screws (6)	Unscrew and remove.	
If necessary, remove using a suitable tool. b. If seal is being replaced, cut seal to desired length and remove adhesive backing. Install seal on ventilator applying firm and even pressure. 3. INSTALLATION. 6. Ventilator (5). Set in place. 7. Four screws (6). Screw in and tighten. 8. Two wire ends (7). Slide onto two pins (3). 9. Two clips (1). Fasten over cable wires (2). NOTE Follow-on maintenance action required:	4. Ventilator (5).	Remove.	
seal to desired length and remove adhesive backing. Install seal on ventilator applying firm and even pressure. B. INSTALLATION. 6. Ventilator (5). Set in place. 7. Four screws (6). Screw in and tighten. 8. Two wire ends (7). Slide onto two pins (3). 9. Two clips (1). Fasten over cable wires (2). NOTE Follow-on maintenance action required:	5. Seal (4).	If necessary, remove using a	
6. Ventilator (5). 7. Four screws (6). 8. Two wire ends (7). 9. Two clips (1). Set in place. Screw in and tighten. Slide onto two pins (3). Fasten over cable wires (2). NOTE Follow-on maintenance action required:		seal to desired length and remove adhesive backing. Install seal on ventilator applying firm and even	
 Four screws (6). Screw in and tighten. Two wire ends (7). Slide onto two pins (3). Two clips (1). Fasten over cable wires (2). NOTE Follow-on maintenance action required: 	3. INSTALLATION.		
8. Two wire ends (7). Slide onto two pins (3). 9. Two clips (1). Fasten over cable wires (2). NOTE Follow-on maintenance action required:	6. Ventilator (5).	Set in place.	
9. Two clips (1). Fasten over cable wires (2). NOTE Follow-on maintenance action required:	7. Four screws (6).	Screw in and tighten.	
NOTE Follow-on maintenance action required:	8. Two wire ends (7).	Slide onto two pins (3).	
Follow-on maintenance action required:	9. Two clips (1).	Fasten over cable wires (2).	
		NOTE	
Install heater; refer to paragraph 11-24B.		Follow-on maintenance action required:	
		Install heater; refer to paragraph 11-24B.	

11-15. VENTILATOR MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** LEGEND: 1. CLIP (2) 2. CABLE WIRE (2) 3. PIN (2) 4. SEAL 5. VENTILATOR 6. SCREW (4) 7. WIRE END (2) TA 075663

11-16. GRILLE AND BRUSH GUARD MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

(10) (5) a. Removal. b. Disassembly. c. Assembly. (10)d. Installation. (10)e. Brush Guard Removal. (10)f. Brush Guard Installation. (10)

55 Minutes Total

INITIAL SETUP

EQUIPMENT CONDITION PARAGRAPH APPLICABLE CONFIGURATIONS

None. None. All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

SPECIAL ENVIRONMENTAL CONDITIONS PERSONNEL REQUIRED

Vehicle Parked on Level Ground. One (MOS-63B20).

REFERENCES TM

GENERAL SAFETY INSTRUCTIONS TM 9-2320-273-10.

Engine Off.

Transmission In Neutral.

CONDITION DESCRIPTION

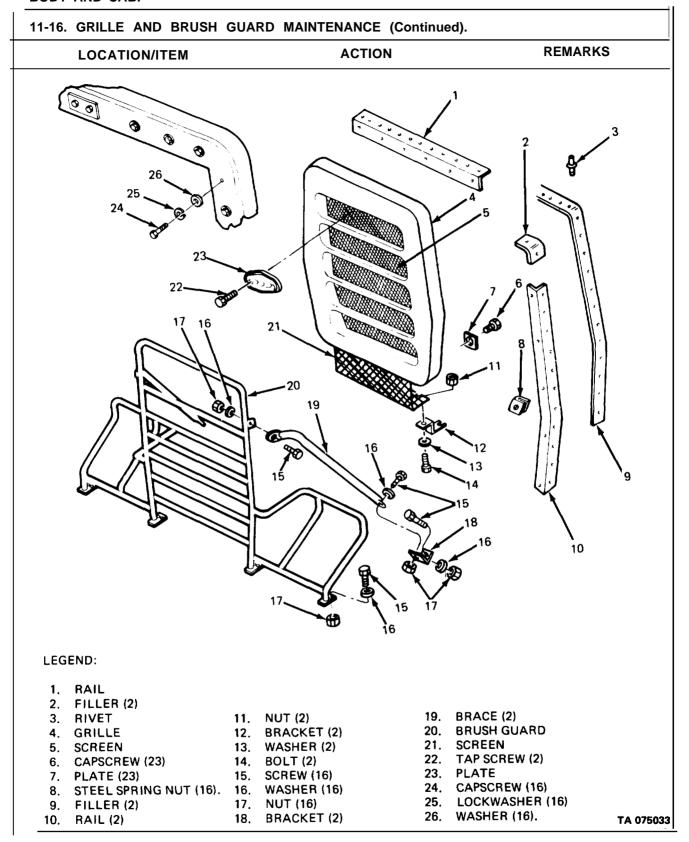
Park Brake Set.

TROUBLESHOOTING REFERENCES

None.

11-16. GRILLE AND BRUSH GUARD MAINTENANCE (Continued). **REMARKS ACTION** LOCATION/ITEM A. REMOVAL. **NOTE** On M916 thru M920, remove brush guard; refer to para 11-16E. 1. Sixteen capscrews (24), Unscrew and remove grille (4). lockwashers (25) and washers (26). Top of grille will need to 2. Two bolts (14), washers Unscrew and remove screen (21). be tipped forward to (13), nuts (11), and brackets remove bolts (M916 thru (12).M920). LEGEND: RAIL FILLER (2) RIVET 3. 4. GRILLE 5. SCREEN 6. CAPSCREW (23) 7. PLATE (23) 8. STEEL SPRING NUT (16). 9. FILLER (2) RAIL (2) 10. 11. NUT (2) 17 16 BRACKET (2) 12. 13, WASHER (2) BOLT (2) **SCREW (16)** WASHER (16) 16. NUT (16) 17. 18. BRACKET (2) 19. BRACE (2) 20. BRUSH GUARD 21, SCREEN 22. TAP SCREW (2) 23. PLATE 24, CAPSCREW (16) 10 25. LOCKWASHER (16) 26. WASHER (16). TA 075034

11-16. GRILLE AND BRUSH GUARD MAINTENANCE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
B. DISASSEMBLY.			
3. Rail (1) two fillers (2), two fillers (9), and two rails (10).	Drill out rivets (3) and remove.	It is not necessary to remove steel spring nuts (8) unless they are broken.	
 Twenty-three capscrews (6) and plates (7). 	Unscrew and remove screen 5).		
Two tap screws (22) and plate (23).	Unscrew and remove.		
C. ASSEMBLY.			
6. Plate (23).	Fasten to grille (4) with two tap screws (22).		
7. Screen (5).	Aline with grille (4) and attach with twenty-three capscrews (6) and plates (7).		
8. Rail (I), two fillers (2), two fillers (9), and two rails (10).	Install to grille (4) with new rivets (3).	Replace any broken steel spring nuts (8) as needed.	
D. INSTALLATION.			
9. Grille (4).	Position on truck.		
10. Screen (21).	Install with two bolts (14), washers (13), brackets (12), and nuts (11).	Top of grille must be tipped forward to install bolts (M916 thru M920).	
11. Grille (4).	Install with sixteen capscrews (24), lockwashers (25) and washers (26).		
12. Install brush guard.	Refer to para 11-16F.	M916 thru M920 only.	
E. BRUSH GUARD REMOVAL (M9	16 thru M920 only).		
13. Eight screws (1 5), washers (16), and nuts (17).	Unscrew and remove two brackets (18) and braces (19).		
14, Eight screws (15), washers (16), and nuts (17).	Unscrew and remove brush guard (20) from front bumper.		
F. BRUSH GUARD INSTALLATION	(M916 thru M920 only).		
15. Brush guard (20).	Aline with mounting holes on top of bumper and secure with eight screws (15), washers (16), and nuts (17).		
16. Two braces (19) and brackets (18).	Aline with mounting holes at front fenders and brush guard (20) and secure with eight screws (15), washers (16), and nuts (17).		



11-17. OPTIONAL WINTER FRONT MAINTENANCE.

THIS TASK COVERS: (Approximate TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Original Installation. (30)b. Removal. (15)c. Installation (15)

30 minutes total.*

*Not including original installation.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

EQUIPMENT CONDITION

PARAGRAPH CONDITION DESCRIPTION

11-16A. Grille Removed.
11-16E. Brush Guard Removed (M916 thru M920).

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

SPECIAL ENVIRONMENTAL CONDITIONS

Two (MOS-63B20). Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission In Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

None.

LEGEND:

1. WINTER FRONT

5. SCREW (15)

8. NUT (15)

11.

12.

3. TOP BAR ASSEMBLY 4. SIDE BAR ASSEMBLY (2)

6. LOCKWASHER (21) 7. TWIST LOCK (21)

9. FLAT WASHER (15) 10. LOCKWASHER (15)

INSTALLATION

DRAWING 13. TEMPLATE

BOTTOM BAR ASSEMBLY

11-17. OPTIONAL WINTER FRONT MAINTENANCE (Continued).

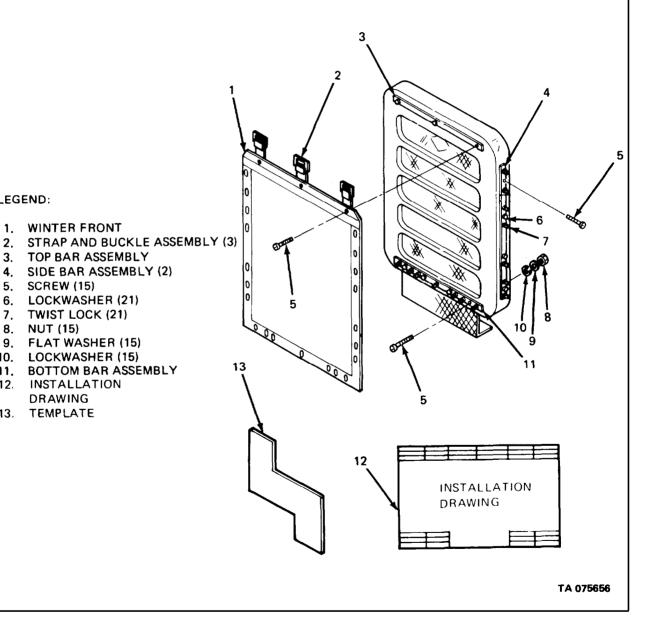
LOCATION/ITEM **ACTION REMARKS**

A. ORIGINAL INSTALLATION.

1. Installation drawing (12) and template (13).

Follow the instructions contained within the installation drawing and and drill template is supuse the template for proper drill locations on the grille.

An installation drawing plied with each Winter Front Kit.



11-17. OPTIONAL WINTER FRONT	MAINTENANCE (Continued).	
LOCATION/ITEM	ACTION	REMARKS
B. REMOVAL.		
2. Three screws (5), lockwashers (10), flat washers (9), and nuts (8).	Unscrew and remove top bar assembly (3) along with three strap and buckle assemblies (2).	
 Twenty-one twist locks (7) and lockwashers (6). 	a. Turn to unlock and remove winter front (1).	
	b. Unscrew from two side bar assemblies (4) and bottom bar assembly (11).	
4. Twelve screws (5), lock-washers (10), flat washers (9) and nuts (8).	Unscrew and remove two side bars (4) and bottom bar (11).	
C. INSTALLATION.		
5. Two side bars (4) and bottom bar (11).	Attach to grille with twelve screws (5), lockwashers (10), flat washers (9), and nuts (8).	Twist locks (7) and lock- washers (6) are replaced only with bottom bar (11) and side bars (4).
 Winter front (1), three strap and buckle assemblies (2), and top bar (3). 	Fasten to grille with three screws (5), lockwashers (10), flat washers (9) and nuts (8).	
7. Winter front (1).	Adjust grille coverage for weather conditions with strap and buckle assemblies (2) and twist locks (7).	
Follov	v on Maintenance Action required:	
b. Ir	estall grille; refer to para 11-16D. estall brush guard (M916 thru M920); efer to para 11-16F.	

11-17. OPTIONAL WINTER FRONT MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** LEGEND: 1. WINTER FRONT 2. STRAP AND BUCKLE ASSEMBLY (3) 3. TOP BAR ASSEMBLY 4. SIDE BAR ASSEMBLY (2) 5. SCREW (15) 6. LOCKWASHER (21) 7. TWIST LOCK (21) 8. NUT (15) 9. FLAT WASHER (15) 10. LOCKWASHER (15) 11. BOTTOM BAR ASSEMBLY TA 075660

11-18. GRILLE SUPPORT BRACKETS MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (15)

b. Installation. (15)

30 Minutes Total.

INITIAL SETUP **EQUIPMENT CONDITION**

APPLICABLE CONFIGURATIONS PARAGRAPH CONDITION DESCRIPTION

11-16E. Brush Guard Removed All. (M916 thru M920).

TEST EQUIPMENT

11-16A. Grille Removed. None.

SPECIAL TOOLS 11-29A. Hood Removed.

MATERIALS/PARTS (P/N)

None.

Rivet (10) SSLQ-66 (05693).

Rivet (30) SSLQ-64 (05693).

PERSONNEL REQUIRED

SPECIAL ENVIRONMENTAL CONDITIONS Two (MOS-63B20). Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10. **GENERAL SAFETY INSTRUCTIONS**

Engine Off.

Transmission In Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

None.

11-18. GRILLE SUPPORT BRAC	CKETS MAINTENANCE (Continue	ed).
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL.		
1. Thirty rivets (9) and seal (10	Drill out rivets (9) and remove seal (10).	е
 Bolt (15), six capscrews (3), lockwashers (2) and washers (1). 	Remove bracket (8) from bra (4).	acket
3. Three rivets (9).	Drill out and remove baffle (1 and seal (14).	13)
LEGEND:	7 6	5 SPACKET
1. WASHER (12) 2. LOCKWASHER (12) 3. CAPSCREW (12) 4. BRACKET (2) 5. SHIELD (2)	6. RETAINER (2) 11 7. RIVET (10) 12 8. BRACKET (2) 13 9. RIVET (30) 14 10. SEAL 15	2. CAPSCREW 3. BAFFLE (2) 4. SEAL TA 075661

LOCATION/ITEM	ACTION	REMARKS
REMOVAL (Continued).		
4. Six capscrews (3), lock- washers (2) and washers (1)	Unscrew and remove bracket (4).	
5. Five rivets (7), retainer (6), and shield (5).	Drill out rivets (7) to remove shield (5) and retainer (6).	
6. Bracket (11).	Repeat steps (2), (3), (4), and (5) on opposite side and remove bracket (11).	
. INSTALLATION.		
7. Bracket (4), shield (5), retainer (6), and five new rivets (7).	Install onto bracket (4) with new rivets (7).	
3. Six capscrews (3), washers (1) and lockwasher (2).	Install bracket (4) to radiator support.	
 Bracket (8), bolt (16), bracket (11), six capscrews (3), washer (1), and lockwasher (2). 	Install.	
O. Three new rivets (9), baffle (13) and seal (14).	Install and secure with rivets (9).	
1. Brackets (4) and (5).	Repeat steps (7), (8), (9) and (10) for opposite side.	
2. Thirty-seven new rivets (9) and seal (10).	Install rivets to secure seal (10).	
	Follow on Maintenance Action required:	:
	a. Install grille; refer to para 11-16D.b. Install brush guard (M916 thru M92 refer to para 11-16F.c. Install hood; refer to para 11-29B.	0);

11-18. GRILLE SUPPORT BR	ACKETS MAINTENANCE (Cont	inued).
LOCATION/ITEM	ACTION	REMARKS
LEGEND: 1. WASHER (12) 2. LOCKWASHER (3) 3. CAPSCREW (12) 4. BRACKET (2) 5. SHIELD (2)	13 14 13 14 15 16 17 18 19 19 10 10 10 11 11 11 11 11 11 11 11 11 11	11. BRACKET 12. CAPSCREW 13. BAFFLE (2) 14. SEAL 15. BOLT
		TA 075662

11-19. MUD FLAPS MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (5)b. Installation. (10)

15 Minutes Total.

INITIAL SETUP APPLICABLE CONFIGURATIONS

M915, M916, M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

EQUIPMENT CONDITION

PARAGRAPH CONDITION DESCRIPTION

None. None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked On Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission In Neutral. Park Brake Set.

TROUBLESHOOTING REFERENCES

None.

11-19. MUD FLAPS MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

NOTE

Procedure is same for removal of either flap.

A. REMOVAL

 Spring pin (11) (M915) or cotter pin (7) (M916, and M920). Remove from spring bracket (2).

2. Spring bracket (2).

Lift out of mounting bracket (8).

3. Mud flap (5).

Remove from spring bracket (2) by removing four bolts (3), washers

(4) and four nuts (6).

4. Two bolts (9) and washers (10).

Unscrew and remove mounting

bracket (8).

5. Two bolts (12) and nuts (1).

Unscrew and remove stowage bracket (13).

M915 only.

B. INSTALLATION.

6. Stowage bracket (13).

Attach to RH frame rail with two bolts (12) and nuts (1).

M915 only.

7. Mounting bracket (8).

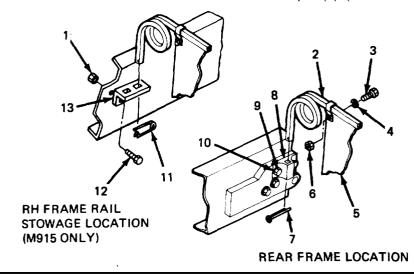
Attach to rear frame with two washers (10) and bolts (9).

8. Mud flap (5)

Install mud flap onto spring bracket (2) and secure with four bolts (3), washers (4) and four nuts (6).

9. Spring bracket (2).

Insert into mounting bracket (8) and install spring pin (11) (M915) or cotter pin (7) (M916 and M920).



LEGEND:

- 1. NUT (2)
- 2. SPRING BRACKET
- 3. BOLT (4)
- 4. WASHER (4)
- 5. MUD FLAP
- 6. NUT (4)
- 7. COTTER PIN
- 8. MOUNTING BRACKET
- 9. BOLT (2)
- 10. WASHER (2)
- 11. SPRING PIN
- 12. BOLT (2)
- 13. STOWAGE BRACKET

TA 075036

11-20. DRIVERS SEAT MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (4)

b. Cleaning and Lubricating Hardware. (5)
c. Installation. (6)

15 Minutes Total.

INITIAL SETUP EQUIPMENT CONDITION

APPLICABLE CONFIGURATIONS PARAGRAPH CONDITION DESCRIPTION

AII. None. None.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Grease Gun.

GAA (Refer to Appendix C). Lubriplate (Refer to Appendix C).

Non-Flammable Dry Cleaning Solvent SD-2 (Refer to Appendix C).

PERSONNEL REQUIRED <u>SPECIAL ENVIRONMENTAL CONDITIONS</u>

Two (MOS-63B20). Vehicle Parked On Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

LO 9-2320-273-12.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission In Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

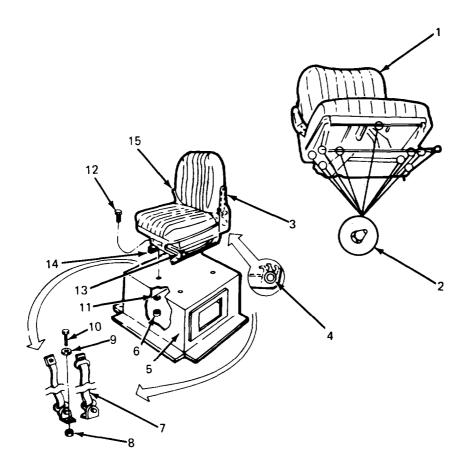
None.

11-20. DRIVERS SEAT MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** A. REMOVAL 1. Four nuts (6), washers (11), Unscrew and remove. and bolts (12). 2. Seat (1). Lift out and remove from seat Two mechanics. base (5). 3. Two bolts (10), lockwashers Unscrew and remove seat belt (9), and nuts (8). assembly (7). LEGEND: 1. SEAT **GREASE FITTING (9) ADJUSTING MECHANISM TORSION BAR END** SEAT BASE NUT (4) 7. SEAT BELT ASSEMBLY NUT (2) 9. LOCKWASHER (2) BOLT (2) 10. 11. WASHER (4) 12. BOLT (4) 13. **ADJUSTING MECHANISM** 14. SLIDE RAILS 15. ADJUSTING MECHANISM TA 075037

11-20. DRIVERS SEAT MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM B. CLEANING AND LUBRICATING HARDWARE. **CAUTION** Do not allow dry cleaning solvents to come in contact with non-metal materials, These cleaners may damage leather, rubber, and synthetics. 4. Slide rails (14) and other Clean with SD-2 dry cleaning metal parts. solvent. 5. Grease fittings (2). See LO 9-2320-273-12. Lubricate, using grease gun. 6. Two torsion bar ends (4), Lubricate liberally with three adjusting mechanisms Lubriplate. (3), (13), and (15), and slide rails (14). C. INSTALLATION. 7. Adjusting mechanisms (3), Move to center positions. (13), and (15). Set in place and aline mounting 8. Seat (1). holes. 9. Four washers (11), bolts (12), Screw on and tighten to secure seat (1) to seat base (5). and nuts (6). 10. Seat belt assembly (7). a. Aline mounting holes. b. Install with two bolts (10), lockwashers (9), and nuts (8).

11-20. DRIVERS SEAT MAINTENANCE (Continued).

LOCATION/ITEM **ACTION REMARKS**



LEGEND:

- 1. SEAT
- 2. GREASE FITTING (9)
- 3. ADJUSTING MECHANISM
- 4. TORSION BAR END
- 5. SEAT BASE
- 6. NUT (4)
- 7. SEAT BELT ASSEMBLY
- 8. NUT (2)

- 9. LOCKWASHER (2)
 10. BOLT (2)
 11. WASHER (4)
 12. BOLT (4)
 13. ADJUSTING MECHANISM
 14. SLIDE RAILS
 15. ADJUSTING MECHANISM

TA 075038

11-21. PASSENGER'S SEAT MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REWIRED FOLLWS TASK DESCRIPTION.)

a. Removal.

c. Installation.

b. Cleaning and Lubricating Adjusting Mechanism.

(5) **(7)**

17 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

EQUIPMENT CONDITION PARAGRAPH CONDITION DESCRIPTION

None.

None.

None.

AII.

SPECIAL TOOLS

TEST EQUIPMENT

None.

MATERIALS/PARTS (P/N)

Lubriplate (Refer to Appendix C).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked On Level Ground. One (MOS-63B20).

REFERENCES (TM)

PERSONNEL REQUIRED

GENERAL SAFETY INSTRUCTIONS TM 9-2320-273-10.

Engine Off.

Transmission In Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

None.

LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL		
1. Tool box door (5).	Open for access to nuts (3) and washers (4).	Remove tools if necessary.
2. Four nuts (3) and washers (4).	Unscrew and remove.	
3. Seat (1).	Lift out and remove.	
B. CLEANING AND LUBRICATI	NG ADJUSTING MECHANISM.	
Adjusting rack and tooth mechanism (2).	a. Clean with soap and water.Dry thoroughly.b. Apply Lubriplate to both sides.	
C. INSTALLATION		
5. Seat (1).	a. Place back in position.b. Set in place with studs (6) in holes.	
6. Four washers (4) and nuts (3).	Screw on and tighten.	
7. Tool box door (5).	Close.	Put tools back in if you took them out.
6	2	LEGEND: 1. SEAT
5		 ADJUSTING RACK 8 TOOTH MECHANISM NUT (4) WASHER (4) TOOL BOX DOOR STUD (4)
	3	

CAB AND BODY.

11-22. SEAT RISER AND TOOL BOX MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REWIRED FOLLOWS TASK DESCRIPTION.)

(45)a. Removal. (45)b. Installation.

90 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

EQUIPMENT CONDITION

<u>PARAGRAPH</u>

CONDITION DESCRIPTION

11-20A.

11-21A.

Drivers Seat Removed (for Seat Riser Removal).

Passenger's Seat Removed (For Tool Box Removal).

None.

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked On Level Ground

GENERAL SAFETY INSTRUCTIONS

Engine Off. Park Brake Set.

Transmission In Neutral.

TROUBLESHOOTING REFERENCES

None.

CAB AND BODY.

11-22. SEAT RISER AND TOOL BOX MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

NOTE

Instructions for repairing metal tool box and seat riser may be found in FM 43-2.

A. REMOVAL

1. Three bolts (2) and nuts (4).

Unscrew and remove fire extinguisher bracket (3).

2. Four bolts (10), nuts (5), and eight washers (11).

Unscrew and remove two piece ratio selector brace (6).

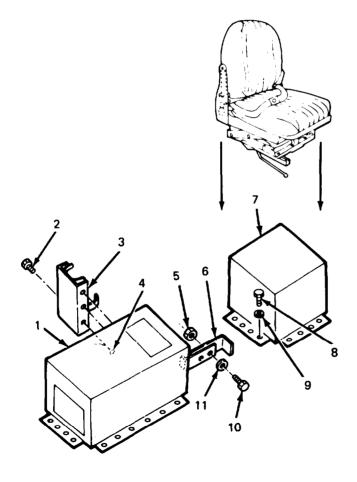
3. Thirty-six bolts (8), washers (9).

Unscrew and remove.

Total fasteners for both riser and tool box.

4. Seat riser (7) and tool box (1).

Remove



LEGEND:

- 1. TOOL BOX
- 2. BOLT (3)
- 3. FIRE EXTINGUISHER BRACKET
- 4. NUT (3)
- 5. NUT (4)
- 6. RATIO SELECTOR BRACE (2)
- 7. SEAT RISER
- 8. BOLT (36)
- 9. WASHER (36)
- 10. BOLT (4)
- 11. WASHER (8)

TA 075040

CAB AND BODY.

11-22. SEAT RISER AND TOOL BOX MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS B. INSTALLATION** Place in cab. Aline with 5. Seat riser (7) and tool box (1). bolt holes in cab floor. 6. Thirty-six bolts (8) Screw in and tighten. and washers (9). 7. Ratio selector brace (6). Install with four bolts (10), nuts (5), and eight washers (11). 8. Fire extinguisher bracket (3). Install with three bolts (2) and nuts (4). Follow-on maintenance actions required. Install driver's seat; refer to para 11-20 C. b. Install passenger's seat; refer to para 11-21 C. LEGEND: 1. TOOL BOX 2. BOLT (3) FIRE EXTINGUISHER **BRACKET** 4. NUT (3) 5. NUT (4) 6. RATIO SELECTOR BRACE (2) 7. SEAT RISER 8. **BOLT (36)** WASHER (36) BOLT (4) 10. 11. WASHER (8) TA 075041

This page intentionally left blank.

11-23. WINDSHIELD WIPER BLADE AND ASSEMBLY MAINTENANCE.

11-23. WINDSHIELD WIPER BLADE AND ASSEMBLY MAINTENANCE.

(4) (3) a. Removal.

b. Installation.

c. Operational Check. (1)

8 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

AII. TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

None.

EQUIPMENT CONDITION

<u>PARAGRAPH</u> **CONDITION DESCRIPTION**

None. None.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked On Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission In Neutral.

Park Brake Set.

11-23. WINDSHIELD WIPER BLADE AND ASSEMBLY MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

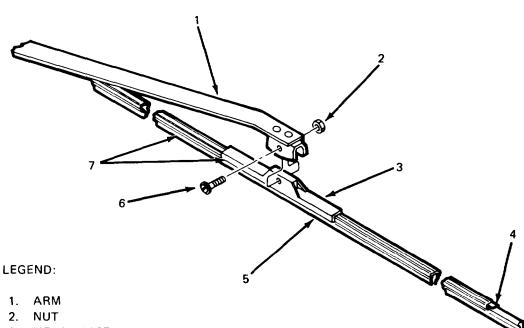
A. REMOVAL

1. Screw (6) and nut (2). Unscrew and remove.

2. Wiper blade assembly (7). Remove from arm (1).

3. Locking tab (4) Pry up.

4. Rubber blade (5). Slide out of metal case (3).



- 3. METAL CASE
- 4. LOCKING TAB
- 5. RUBBER BLADE
- 6. SCREW
- 7. WIPER BLADE ASSEMBLY

TA 075042

11-23. WINDSHIELD WIPER BLADE AND ASSEMBLY MAINTENANCE (Continued).		
LOCATION/ITEM	ACTION	REMARKS
B. INSTALLATION.		
5. Rubber blade (5).	Slide into metal case (3).	
6. Locking tab (4).	Push down over rubber blade (5).	
7. Blade assembly (7).	Aline with arm (1).	
8. Screw (6) and nut (2).	a. Put screw through arm (1) and blade assembly (7).b. Screw nut on and tighten.	
C. OPERATIONAL CHECK.		
9. Wiper knob.	Pull out.	
10. Wiper blade (5).	Check to see that blade moves across windshield with good contact.	Squirting windshield with washer fluid will make it easy to tell if wiper blade is operating properly.
	1	
7		-3
LEGEND: 6	- Same	
		4
1. ARM 2. NUT		
3. METAL CASE 4. LOCKING TAB	5	
5. RUBBER BLADE		
6. SCREW 7. WIPER BLADE		

This page intentionally left blank.

11-24. WINDSHIELD WIPER ARMS MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESRIPTION.)

a. Removal. (4)
 b. Installation. (3)
 (1)

c. Operational Check. 8 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All. None. None.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED SPECIAL ENVIRONMENTAL CONDITIONS

One (MOS-63B20). Vehicle Parked On Level Ground.

REFERENCES (TM)

TM 9-2320-273-10. GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission In Neutral.

EQUIPMENT CONDITION

<u>PARAGRAP</u>H

CONDITION DESCRIPTION

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 9-1.

BODY AND CAB. 11-24. WINDSHIELD WIPER ARMS MAINTENANCE (Continued). **REMARKS** ACTION LOCATION/ITEM REMOVAL. Unscrew and remove. 1. Nut (1) and lockwasher Lift off of knurled driver 2. Wiper arm (3). (4). If spring is stretched so that Unhook and remove. 3. Spring (5). it does not hold arm tightly, replace. **NOTE** Procedures for removing and installing blade are given in para 11-23. LEGEND: 1. NUT 2. LOCKWASHER 3. WIPER ARM 4. KNURLED DRIVER 5. SPRING

TA 075044

11-24. WINDSHIELD WIPER ARMS MAINTENANCE (Continued).		
LOCATION/ITEM	ACTION	REMARKS
INSTALLATION		
4. Spring (5).	Lock into place.	Arm should be in same position as when you removed it.
5. Arm (3).	Seat firmly on knurled driver (4).	
Lockwasher (2) and nut(1).	Screw on and tighten.	
C. OPERATIONAL CHECK.		
	NOTE	
	Operate wipers to see that they Squirt windshield with washer fl that it is removed without strea	uid and check
	If wipers do not operate correct wiper system as described in Tale	ctly, troubleshoot ble 9-1.

11-24. WINDSHIELD WIPER ARMS MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** LEGEND: 1. NUT 2. LOCKWASHER 3. WIPER ARM 4. KNURLED DRIVER 5. SPRING TA 075045

11-25. REAR VIEW MIRROR MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

(10)a. Removal. (15)b. Disassembly. c. Assembly. (15)d. Installation. (10)e. Adjustment. <u>(10)</u>

60 Minutes Total.

INITIAL SETUP

EQUIPMENT CONDITION PARAGRAPH CONDITION DESCRIPTION APPLICABLE CONFIGURATIONS

None. None. AII.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked On Level Ground. One (MOS-63B20).

REFERENCES (TM)

GENERAL SAFETY INSTRUCTIONS TM 9-2320-273-10.

Engine Off.

Transmission In Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

None.

11-25. REAR VIEW MIRROR MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

NOTE

Procedure shown is for right side mirror. Identical procedure is used for left side mirror.

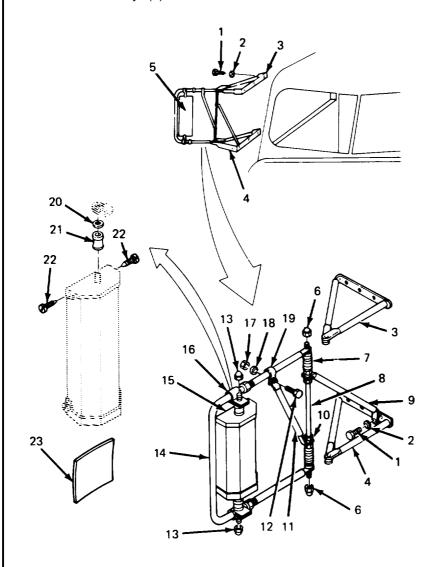
A. REMOVAL

1. Six bolts (1) and lockwashers (2).

Loosen and remove.

2. Mirror assembly (5).

Remove.



LEGEND:

- 1. BOLT (6)
- LOCKWASHER (6)
- 3. BRACKET (UPPER)
- 4. BRACKET (LOWER)
- 5. MIRROR ASSEMBLY
- ACORN NUT (2)
- COMPRESSION SPRING (2)
- 8. PIVOT ROD
- 9. CROSS BRACE BRACKET
- 10. JAM NUT (4)
- 11. LOOP CROSS BRACE
- 12. CAPSCREW
- 13. ACORN NUT (2)
- 4. LOOP DETENT ASSEMBLY
- 15. MIRROR HEAD ASSEMBLY
- 16. TUBE CLAMP (2)
- 17. ACORN NUT
- 18. LOCKWASHER
- 19. TUBE CLAMP
- 20. LOCKWASHER (2)
- 21. SPACER (2)
- 22. SCREW (4)
- 23. MIRROR ASSEMBLY (2) (PRESSURE SENSITIVE)

TA 075046

	LOCATION/ITEM	ACTION	REMARKS
В.	DISASSEMBLY.		
3.	Two acorn nuts (13).	Loosen and remove.	
4.	Two tube clamps (16), two lockwashers (20) and spacers (21).	Remove.	
5.	Mirror assembly (23).	Pull free from face of mirror head assembly (15).	If damaged.
6.	Capscrew (12), acorn nut (17) and lockwasher (18).	Loosen and remove.	
7.	Two acorn nuts (6).	Loosen and remove.	
8.	Loop detent assembly (14). bracket (upper) (3), bracket (lower) (4) and two compression springs (7).	Remove from pivot rod (8).	
9.	Cross brace bracket (9) and loop cross brace (11).	Remove by unthreading two outer jam nuts (10) and removing from pivot rod (8).	
C.	ASSEMBLY.		
10.	Cross brace bracket (9) and loop cross brace (11).	Install on pivot rod (8) and secure with jam nuts (10).	
11.	Two compression springs (7), loop detent assembly (14), bracket (upper) (3) and bracket (lower) (4).	Install on pivot rod (8).	
12.	Two acorn nuts (6).	Install and tighten.	
13.	Capscrew (12), acorn nut (17), and lockwasher (18).	Install to fasten loop cross brace (1 1) to tube clamp (19) and tighten.	
14.	Two tube clamps (16),	Position mirror head assembly (15) and pivot tube clamps over screws (22) to secure.	
15.	Two acorn nuts (13).	Install and tighten.	
16.	Mirror assembly (23).	Stick onto face of mirror head assembly (15).	If removed.
D.	INSTALLATION.		
17.	Mirror assembly (5).	Position on door and aline mounting holes.	
18.	Six bolts (1) and lockwashers (2).	Install and tighten.	

11-25. REAR VIEW MIRROR MAINTENANCE (Continued).

LOCATION/ITEM

ACTION

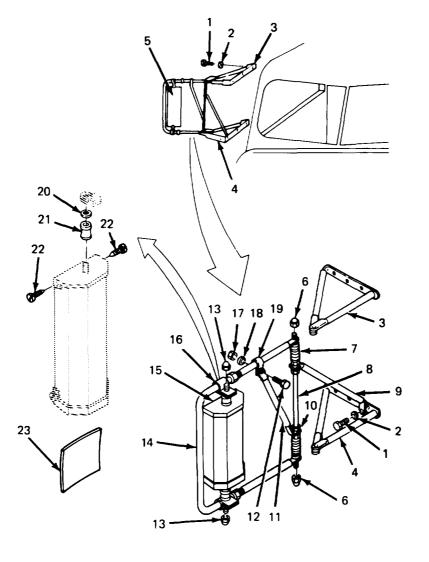
REMARKS

E. ADJUSTMENT

19. Mirror head assembly (15). Adjust for best view.

NOTE

If hauling extra wide loads, loosen two nuts on loop detent assembly (14). Mirrors can be telescoped an additional five inches.



LEGEND:

- 1. BOLT (6)
- 2. LOCKWASHER (6)
- 3. BRACKET (UPPER)
- 4. BRACKET (LOWER)
- 5. MIRROR ASSEMBLY
- 6. ACORN NUT (2)
- 7. COMPRESSION
- SPRING (2) B. PIVOT ROD
- 9. CROSS BRACE BRACKET
- 10. JAM NUT (4)
- 11. LOOP CROSS BRACE
- 12. CAPSCREW
- 13. ACORN NUT (2)
- 14. LOOP DETENT ASSEMBLY
- 15. MIRROR HEAD ASSEMBLY
- 16. TUBE CLAMP (2)
- 17. ACORN NUT
- 18. LOCKWASHER
- 19. TUBE CLAMP
- 20. LOCKWASHER (2)
- 21. SPACER (2)
- 22. SCREW (4)
- 23. MIRROR ASSEMBLY (2) (PRESSURE SENSITIVE)

TA 075047

11-26. HEATER MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (27) b. Installation. (55)

82 Minutes Total.

INITIAL SETUP EQUIPMENT CONDITION

APPLICABLE CONFIGURATIONS PARAGRAPH CONDITION DESCRIPTION

AII. 4-25A. Air Cleaner Cannister

TEST EQUIPMENT Removed.

None. 4-42A. Radiator Drained.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Electrical Tape.

PERSONNEL REQUIRED SPECIAL ENVIRONMENTAL CONDITIONS

One (MOS-63B20). Vehicle Parked On Level Ground.

REFERENCES (TM)

TM 9-2320-273-10. GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission In Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 4-1.

11-26. HEATER MAINTENANCE	(Continued).	
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL. 1. ENGINE COMPARTMENT/ Heater hoses (8) and (9).	a. Loosen two clamps (10).b. Disconnect hoses.	Keep hose ends raised to prevent coolant from running out.
2. ENGINE COMPARTMENT/ Four nuts (7) and washers (6).	Loosen and remove.	
10 9 ENGINE COMPARTMENT	2. WIRE (3)	7. NUT (4) 8. HEATER HOSE 9. HEATER HOSE
	4. HEATER 1 5. CABLE CLIP (2) 1 6. WASHER (4)	 9. HEATER HOSE 0. CLAMP (2) 1. HEATER MOUNTING STUD (4) 2. INSULATOR (2)

LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
3. CAB/Three wires (2).	Remove electrical tape and disconnect wires.	
4. CAB/Two air ducts (1).	a. Loosen clamps (3).b. Remove ducts.	
5. CAB/Two cable clips (5).	a. Loosen. b. Remove cables.	
6. CAB/Heater (4).	a. Remove eight screws from runner and slide floor mat out of way of heater.b. Remove.	
7. Two insulators (12).	Remove from four heater mounting studs (11).	
B. INSTALLATION.		
8. Two insulators (12).	Install over four heater mounting studs (11).	
9. CAB/Heater (4).	Set in place.	
10. CAB/Two cable clips (5).	a. Attach cables.b. Tighten clips.	PASSENGER cable goes bottom, DRIVER cable goes to top.
11. CAB/Two air ducts (1).	Attach and tighten clamps (3).	
12. CAB/Three wires (2).	a. Connect.b. Wrap connections with electrical tape.	Wires are color-coded to help you match them up.
13. Floor mat.	Install eight screws to secure runner over floor mat.	
14. ENGINE COMPARTMENT/ four nuts (7) and washers (6).	Install and tighten.	
15. ENGINE COMPARTMENT/ Heater hoses (8) and (9).	a. Install hoses.b. Secure with two clamps (10).	

11-26 HEATER MAINTENANCE (Continued). **REMARKS ACTION** LOCATION/ITEM **NOTE** Follow-on Maintenance Action required: a. Fill cooling system; refer to para 4-42C and D. b. Install air cleaner cannister; refer to para 4-25D. c. Bleed heater; refer to para 4-50C. 12 LEGEND: **ENGINE** COMPARTMENT 7. NUT (4) 1. AIR DUCT (2) 2. WIRE (3) 8. HEATER HOSE 3. CLAMP (2) 9. HEATER HOSE 4. HEATER 10. CLAMP (2) 5. CABLE CLIP (2) **HEATER MOUNTING** 11. 6. WASHER (4) **STUD (4)** 12. INSULATOR (2) TA 075048

11-27. HEATER HOSE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

INITIAL SETUP
APPLICABLE CONFIGURATIONS

ΑI

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

EQUIPMENT CONDITION PARAGRAPH CO

PARAGRAPH 4-42a.

CONDITION DESCRIPTION

Radiator Drained.

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

GENERAL SAFETY INSTRUCTIONS

Engine Off.
Park Brake Set.

Transmission In Neutral.

TROUBLESHOOTING

Table 4-1.

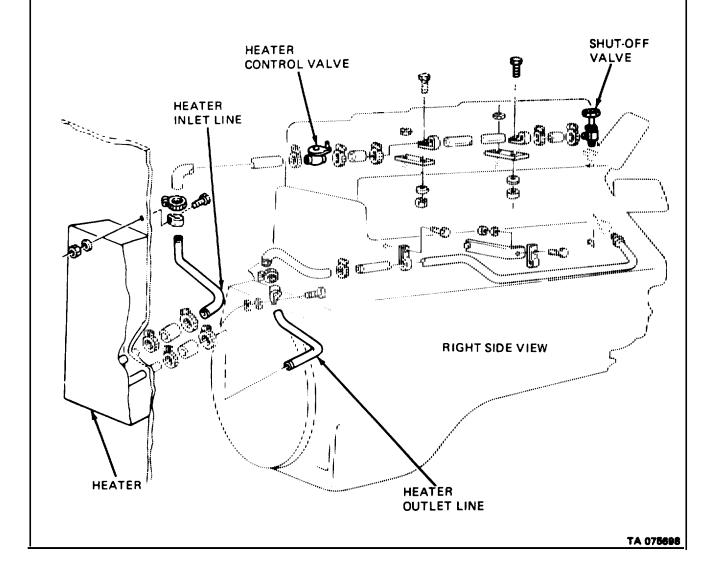
11.27. HEATER HOSE MAINTENANCE (Continued).

NOTE

All heater hoses and clamps are maintained using standard shop practices and techniques, Replace hoses that are cracked or deteriorated and any defective clamps.

Follow on maintenance action required:

- a. Fill cooling system; refer to para 4-42 C and D.
- b. Bleed heater; refer to para 4-50C.
- c. Check for leaks.



11-28. HEATER CONTROL PANEL MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal of Knob and Cable. (5)
b. Installation of Knob and Cable. (10)
c. Operational Check. (6)

20 Minutes Totel.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

TEST EQUIPMENT

None.

AII.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Cable tie, MS-3367-1-9 (96906)

EQUIPMENT CONDITION

PARAGRAPH CONDITION DESCRIPTION

None. None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked On Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off. Park Brake Set.

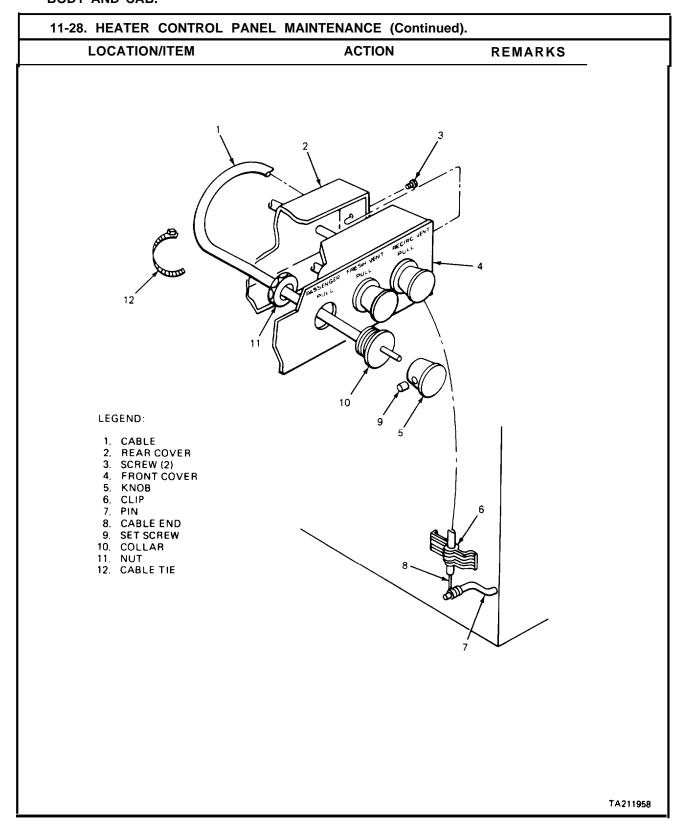
Transmission In Neutral.

TROUBLESHOOTING REFERENCES

Table 4-1.

11-28 HEATER CONTROL PANEL MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS CAUTION** This procedure tells you how to remove and install the passenger heat control knob and cable. Follow the same steps to replace controls for driver heat, fresh vent, recirculation vent, and heater. Be sure to secure a new cable tie around cables after task completion to prevent contact and possible electrical short against air pressure warning switch located on the firewall. LEGEND: 1. CABLE 2. REAR COVER 3. SCREW (2) 4. FRONT COVER 5. KNOB 6. CLIP 7. PIN 8. CABLE END 9. SET SCREW 10. COLLAR 11. NUT 12. CABLE TIE TA211957

LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL OF KNOB AND	CABLE.	
1. Clip (6).	Loosen. Remove cable (1) from clip.	
2. Cable end (8).	Slide off of pin (7).	
3. Setscrew (9).	Loosen. Remove knob (5).	
4. Two screws (3).	Remove rear cover (2) from front cover (4).	
5. Nut (11).	Unscrew from collar (10).	
6. Cable tie (12)	Cut and remove from cable (1) and four other cables.	
7. Cable (1).	Remove through rear cover (2), nut (11), and front cover (4).	
B. INSTALLATION OF KNOB	AND CABLE.	
8. Cable (1).	Thread cable end (8) through front cover (4), nut (11), and rear cover (2).	
9. Cable tie (12)	Install around cable (1) and four other cables.	
10. Nut(n).	Screw onto collar (10) and tighten.	
11. Rear cover (2).	Slide onto front cover (4) and secure with two screws (3).	
12. Knob (5).	a. Place onto cable (1).b. Tighten setscrew (9).	
13, Cable end (8).	Slide onto pin (7).	
14. Cable (1).	Fasten with clip (6).	
C. OPERATIONAL CHECK.		
15. Knob (5).	Pull out and push in. Check that pin (7) swings as you move the knob.	Check for binding in cable (1), if pin (7) fails swing.



11-29. HEATER CONTROL VALVE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REWIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. b. Installation. <u>(15)</u>

30 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

AII.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Clean Container.

EQUIPMENT CONDITION <u>PARAGRAPH</u> None.

CONDITION DESCRIPTION

None.

PERSONNEL REWIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked On Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

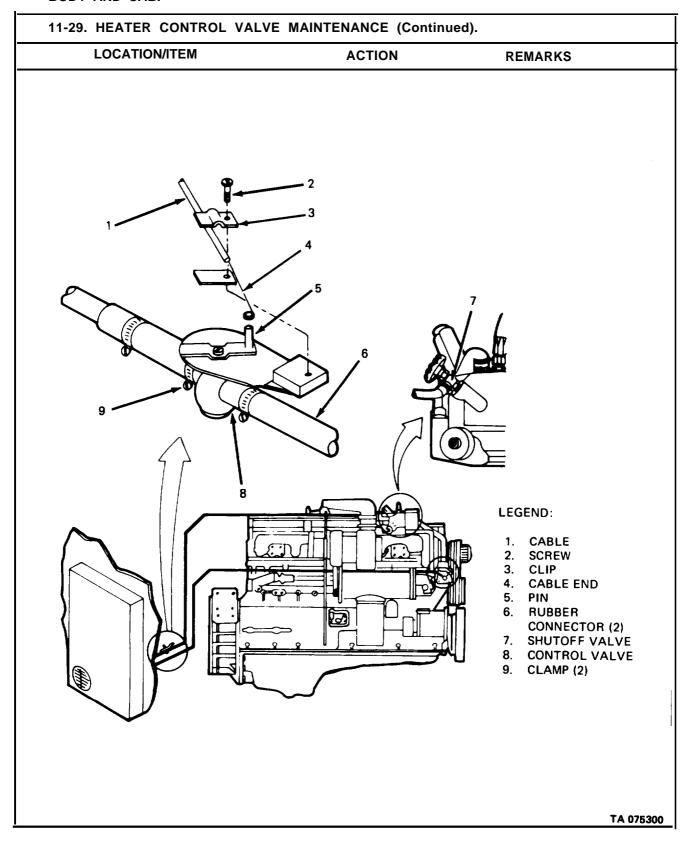
Transmission In Neutral. Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 4-1.

11-29. HEATER CONTROL VALVE MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS NOTE** Control knob and cable replacement procedures are given in paragraph 11-28. A. REMOVAL 1. Shutoff valve (7). Close (turn handle clockwise). LEGEND: 1. CABLE 2. SCREW 3. CLIP 4. CABLE END 5. PIN 6. RUBBER CONNECTOR (2) 7. SHUTOFF VALVE 8. CONTROL VALVE 9. CLAMP (2) TA 075052

LOCATION/ITEM	ACTION	REMARKS
REMOVAL (Continued).		
2. Screw (2).	Loosen. Remove cable (1) from clip (3).	
3. Cable end (4).	Slide off of pin (5).	
	NOTE	
	Before removing control valve (8), place clean container underneath to catch spilled coolant.	
4. Two clamps (9).	Loosen.	
5. Control valve (8).	Remove from two rubber connectors (6).	
. INSTALLATION.		
6. Control valve (8).	Push into two rubber connectors (6).	
7. Two clamps (9).	Tighten.	
8. Cable (1).	Place in clip (3) and tighten screw (2).	
9. Cable end (4).	Slide onto pin (5).	
	NOTE	
	Follow-on maintenance action required:	
	Bleed heater and adjust shutoff valve; refer to paragraph 4-50C.	



11-30. HEATER AIR DUCTS MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REWIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (7)

b. Installation. (8)
c. Checking for Leaks. (5) (8)

20 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

AII.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Hose Tie (3), PLT4A-MO (06383).

EQUIPMENT CONDITION <u>PARAGRAPH</u>

CONDITION DESCRIPTION

None. None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked On Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission In Neutral.

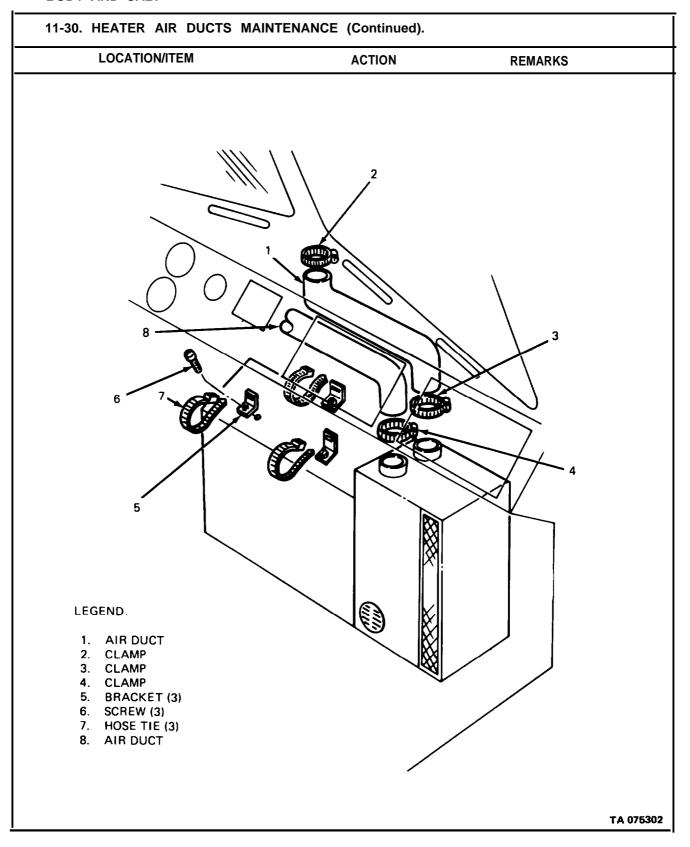
Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 4-1.

LOCATION/ITEM	ACTION	REMARKS	
		TCIII/ TTTC	
REMOVAL.			
Clamps (2), (3), and (4).	Loosen.		
Three hose ties (7)	Cut and remove.		
Air ducts (1) and (8).	Remove.		
LEGEND: 1. AIR DUCT 2. CLAMP 3. CLAMP 4. CLAMP 5. BRACKET (3) 6. SCREW (3) 7. HOSE TIE (3) 8. AIR DUCT		3	

11-30. HEATER AIR DUCTS MA	AINTENANCE (Continued).	
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
4. Three screws (6). and three brackets (5).	Remove.	
B. INSTALLATION.		
5. Three screws (6) and brackets (5).	Install.	
6. Air ducts (1) and (8).	Set in place.	
7. Clamps (2), (3), and (4).	Tighten.	
8. Three new hose ties (7).	Install thru brackets (5) and around air ducts (1) and (8).	
C. CHECKING FOR LEAKS.		
9. Engine.	Start up (see TM 9-2320-273-10).	
 INSTRUMENT PANEL/ heater controls. 	Turn on heater and fan.	
11. Air ducts (1) and (8).	Check for leaks. Tighten clamps (2), (3) or (4) as necessary.	
12. Engine.	Shut down (see TM 9-2320-273-10).	



1-31. DATA AND INSTRUCTION PLATES MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

INITIAL SETUP

APPLICABLE CONFIGURATIONS

ΑII

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

None.

EQUIPMENT CONDITION

PARAGRAPH

None.

CONDITION DESCRIPTION

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked On Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission In Neutral.

Park Brake Set.

LOCATION/ITEM	ACTION	REMARKS
	All data and instruction plates are identified in TM 9-2320-273-10. Maintenance is limited to cleaning and replacement. To clean, use a shop rag and dry cleaning solvent. Replace by removing existing means of attachment; then install new plate and fasten with identical attaching parts.	

11-32. HOOD MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (20) b. Installation. (25)

45 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

All.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Cotter Pin, 137155 (24617).

EQUIPMENT CONDITION

PARAGRAPH

None.

CONDITION DESCRIPTION

None.

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked On Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine Off.

Transmission In Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

None.

11-32. HOOD MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS NOTE** The following procedure is applicable to both the left or right hood top and side panels. A. REMOVAL a. Remove and discard. 1. Cotter pin (12). b. Remove pin (11) and two washers (10). 2. Four capscrews (3), Unscrew and remove handle (2). washers (4) and nuts (5).3. Four capscrews (6), Unscrew and remove two hook brackets (7). washers (8) and nuts (9). LEGEND: 21 HOOD TOP PANEL 2. HANDLE 15 3. CAPSCREW (4) 4. WASHER (4) 5. NUT (4) 6. CAPSCREW (4) 7. HOOK BRACKÉT (2) 8. WASHER (4) 9. NUT (4) 10. WASHER (2) 11. PIN 13 12. COTTER PIN 13. HOOD SIDE PANEL 14. CAPSCREW (14) 15. WASHER (14) 16. NUT (14) 17. NUT (14) 18. WASHER (28) 19. CAPSCREW (14) 20. CAPSCREW, WASHER, 10 AND NUT (4) RUBBER 21. FRONT BRACKET **GROMMET** 22. PIN PLATE 23. HOOD CENTER PANEL **HOOD PROP** S-HOOK **SAFETY CHAIN** TA 075303

11-:	11-32. HOOD MAINTENANCE (Continued).				
	LOCATION/ITEM	ACTION	REMARKS		
A.	REMOVAL (Continued).				
4.	Fourteen capscrews (14), washers (15) and nuts (16).	Unscrew and remove I panel (13).	nood side		
5.	Fourteen capscrews (19), twenty-eight washers (18), and fourteen nuts (17).	Unscrew and remove panel (1).	hood top		
6,	Four capscrews, washers, and nuts (20).	a. Remove from pin pb. Slide pin plate (22) bracket (21).			
7.	Hood center panel (23).	Remove from rear bra	cket (21)		
		NOTE			
	and ru	ct hood prop safety chain bber grommets for dama cessary.			
В.	INSTALLATION.				
8.	Hood center panel (23).	Insert pin into rear broon firewall.	acket (21)		
9.	Four capscrews, washers, and nuts (20).	a. Insert pin plate (22 bracket (21).b. Install pin plate (22 panel (23).			
10.	Hood top panel (1).	Position and secure we capscrews (19), twenty (18) and fourteen nuts	y-eight washers		
11.	Hood side panel (13).	Position and secure w fourteen capscrews (1 washers (15) and nuts	4),		
12.	Hood brackets (7).	Position on hood side (13) and secure with capscrews (6), washer and nuts (9).	four		
13.	Handle (2).	Position and secure w four capscrews (3), wa (4) and nuts (5).			

11-32. HOOD MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS** B. INSTALLATION (Continued). 14. Two washers (10) Insert and secure with cotter and pin (11). pin (12). 17 18 15 22 LEGEND: 1. HOOD TOP PANEL 2. HANDLE 3. CAPSCREW (4) 4. WASHER (4) 5. NUT(4) 6. CAPSCREW (4)7. HOOK BRACKET (2) 8. WASHER (4) 9. NUT (4) 10. WASHER (2) 11. PIN 12. COTTER PIN 13. HOOD SIDE PANEL RUBBER 14. CAPSCREW (14) **GROMMET** 15. WASHER (14) 16. NUT (14) **HOOD PROP** S-HOOK 17. NUT (14) SAFETY CHAIN 18. WASHER (28) 19. CAPSCREW (14) 20. CAPSCREW, WASHER, AND NUT (4) 21. FRONT BRACKET 22. PIN PLATE 23. HOOD CENTER PANEL TA 075304

11-33. TAIL ROLLER MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

(20)a. Removal. b. Installation. (20)

40 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

CONDITION DESCRIPTION

M916 and M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Hoist.

Jack Stands.

EQUIPMENT CONDITION PARAGRAPH

11-19A. Mud Flaps Removed. 11-9A. Tow Eyes Removed. Blackout Tail Lamps 5-50A.

Removed.

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P. LO 9-2320-273-12.

REFERENCES (TROUBLESHOOTING)

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF. Transmission in Neutral.

Park Brake Set.

Use Suitable Jack Stands and Hoist to Support Tail Roller Assembly; it is Very Heavy.

11-33. TAIL ROLLER MAINTENANCE (Continued).

LOCATION/ITEM ACTION REMARKS

WARNING

The Tail Roller is very heavy. Use extreme caution when raising or lowering to prevent injury if it should fall.

A. REMOVAL.

1. One roller mounting bracket (5).

Support with suitable jack stand.

Choose the roller mounting bracket on the side where bolt (3) and nut (6) are used.

2. Tail roller (2).

Support with suitable hoist.

3. Four washer base bolts (7) and washer base nuts (2).

Remove from roller mounting bracket (5) and the frame rail (8).

4. Tail roller (2) with assembled roller mounting bracket (5).

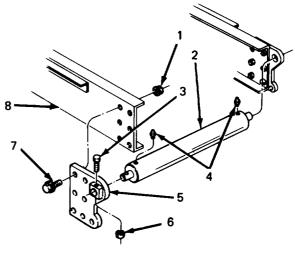
a. Move tail roller in the direction of the roller mounting bracket without bolts. The tail roller's axle shaft will be pulled out of the other roller mounting bracket.

b. Slowly lower jackstand and hoist.

Second mechanic guides assembly to the ground.

LEGEND:

- 1. WASHER BASE NUT (8)
- 2. TAIL ROLLER
- 3. BOLT
- 4. LUBRICATION FITTING (2)
- 5. ROLLER MOUNTING BRACKET (2)
- 6, NUT
- 7. WASHER BASE BOLT (8)
- 8. FRAME RAIL (2)



TA 076699

11-33. TAIL ROLLER MAINTENANCE (Continued).			
LOCATION/ITEM	ACTION	REMARKS	
A. REMOVAL (Continued).			
 One bolt (3), one nut (6), and the roller mounting bracket (5). 	Remove.		
 Roller mounting bracket and tail roller (2). 	Pull tail roller's axle shaft out of roller mounting bracket.		
7. Four washer base nuts (1) and washer base bolts (7).	Unscrew and remove second roller mounting bracket (4).	Removal is necessary only if replacement is needed due to wear or damage.	
	NOTE		
shaft a	rings inside tail roller or axle are to be serviced, refer to Support Maintenance.		
B. INSTALLATION.			
8. One roller mounting bracket (5).	Aline with holes in frame rail (8) and install with four washer base bolts (7) and washer base nuts (1).	Make sure you use correct holes in roller mounting bracket. M916 uses two top rows; M920 uses bottom two rows.	
Second roller mounting bracket (5).	Slide over axle shaft of tail roller (2) and secure with bolt (3) and nut (6).		
10. Tail roller (2) with assembled roller mounting bracket (5).	 a. Lift into position with hoist and aline mounting holes with those in frame rails (8) and tail roller axle into first roller mounting bracket already installed. b. Block in position with axle stands. 	First mechanic operates hoist while second guides assembly.	
11. Four washer base bolts (7) and washer base nuts (1).	Install thru second roller mounting bracket (5) and frame rail (8).	Make sure you use correct bolt holes in roller mounting bracket. M916 uses two top rows; M920 uses bottom two rows.	

11-33. TAIL ROLLER MAINTENANCE (Continued).

ACTION REMARKS LOCATION/ITEM

B. INSTALLATION (Continued).

12. Two lubrication fittings (4).

Clean, inspect and lubricate using grease gun (see LO 9-2320-273-12). Maintenance if replace-

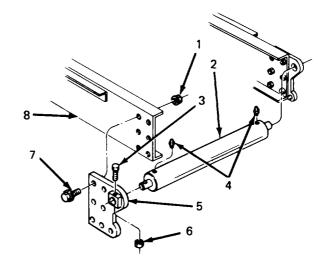
Refer to Direct Support ment is necessary.

Follow-on maintenance action required:

- a. Install blackout tail lamps (para 5-50B).
- b. Install tow eyes (para 11-9B).
- c. Install mud flaps (para 11-19B).

LEGEND:

- WASHER BASE NUT (8)
- 2. TAIL ROLLER
- 3. **B0LT**
- LUBRICATION
- FITTING (2) ROLLER MOUNTING BRACKET (2)
- NUT 6.
- WASHER BASE BOLT (8)
- FRAME RAIL (2)



TA 075700

CHAPTER 12

WINCH AND PTO LINKAGE MAINTENANCE

12-1. OVERVIEW.

This chapter provides you with the following information related to winch and power takeoff maintenance:

- a. All required special tools and equipment.
- b. Other technical manuals.
- c. Troubleshooting procedures.
- d. Maintenance procedures.

Section I REPAIR PARTS, SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

12-2. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

12-3. SPECIAL TOOLS, TMDE, SUPPORT EQUIPMENT.

The special tools, TMDE and support equipment required for the winch and power takeoff maintenance procedures described in this chapter are limited to the oil filter strap wrench. (Refer to Organizational Maintenance RPSTL, TM 9-2320-273-20P for tool description and illustration.)

12-4. SPARES AND REPAIR PARTS.

Spares and repair parts are listed and illustrated in the Repair Parts and Special Tools List covering Organizational Maintenance for this equipment (TM 9-2320-273-20P).

Section II TROUBLESHOOTING

12-5. INTRODUCTION.

Tables 12-1 and 12-2 contain instructions for troubleshooting the winch and the power takeoff, which are driven by the transmission. The corrective actions tell you how to fix the

12-5. INTRODUCTION (Continued).

problem or refer you to a procedure that will fix the problem. The Troubleshooting tables are arranged by malfunctions in the following order:

WINCH (M916 and M920) (Table 12-1)

- a. Winch operates in one direction only.
- b. Winch does not operate in either direction.
- c. Winch operates at one speed only.
- d. Winch will not hold suspended load.

POWER TAKEOFF (PTO) (M916 thru M920) (Table 12-2).

- a. PTO will not engage.
- b. PTO is excessively noisy.

Section III MAINTENANCE PROCEDURES

12-6. INTRODUCTION.

This section provides you with Organizational Level maintenance procedures for the winch. The scope of maintenance is limited to the work listed in the following summary of task procedures.

Table 12-1. Winch Troubleshooting Procedures.

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

- 1. WINCH OPERATES IN ONE DIRECTION ONLY:
 - Step 1. Inspect all oil lines for damage and leakage.

Replace lines (para 12-13).

Step 2. Inspect directional control valve for leakage.

Tighten connections or replace valve (para 12-11).

Step 3. Check winch motor for leakage and visible signs of overheating.

Replace winch motor (para 12-14).

Step 4. Check to see if pilot orifice in winch brake valve is plugged.

Clean orifice.

- 2. WINCH DOES NOT OPERATE IN EITHER DIRECTION:
 - Step 1. Check all oil lines for damage and leakage.

Tighten loose connections and replace defective components.

Step 2. Check pump inlet strainer and in line filter for clogging.

Replace filter element (para 12-9 and 12-10).

Step 3. Check reservoir for proper oil level.

Fill to proper level (LO 9-2320-273-12).

Step 4. Check pump for leakage and visible signs of overheating.

Replace pump (para 12-15).

Step 5. Connect a pressure gage in line between each control valve and winch motor (one at a time) and attempt to operate.

If pressure is normal (2350 psi maximum), refer winch to Direct Support Maintenance for replacement.

Table 12-1. Winch Troubleshooting Procedures (Continued).

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

3. WINCH OPERATES AT ONE SPEED ONLY:

Check the auxiliary control valve for damage and leakage.

- a. Tighten or repair leaking connections or lines.
- b. Replace valve (para 12-11).
- c. Check rear gear section of dual pump (refer to Direct Support).

4. WINCH WILL NOT HOLD SUSPENDED LOAD:

Step 1. Check failsafe brake disk to see if it is oil soaked.

Replace brake assembly.

Step 2. Check failsafe brake disks for wear.

Replace brake.

Table 12-2. Power Takeoff (PTO) Troubleshooting Procedures.

MALFUNCTION.

TEST OR INSPECTION.

CORRECTIVE ACTION.

1. PTO WILL NOT ENGAGE:

Have an assistant attempt to engage the PTO (TM 9-2320-273-10) and visually check the shift rod (lever) on the PTO for movement.

- a. If shift does not move, replace PTO linkage (para 12-16).
- b. If the shift rod moves, refer the problem to Direct Support Maintenance for PTO replacement.

2. PTO IS EXCESSIVELY NOISY:

Notify Direct Support Maintenance.

2-7. WINCH MAINTENANCE TASK SUMMARY.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

EQUIPMENT CONDITION PARAGRAPH

CONDITION DESCRIPTION

M916 and M920.

None.

None.

TEST EQUIPMENT

None.

TOOLS

None.

MATERIALS/PARTS (P/N)

Clean Container.

Marking Pen.

Filter Element, 74011 (34623).

Oil (1 qt).

Gasket (9995).

Gasket (2), 11027 (34623).

Pin Kit, 1V1701 (34623).

Non-flammable Dry Cleaning Solvent SD-2 (Refer to Appendix C).

Liquid Teflon (Refer to Appendix C).

Masking Tape.

Plugs.

Gasket, Hydraulic Motor to Failsafe Brake, 28426 (34625).

PERSONNEL REQUIRED

SPECIAL ENVIRONMENTAL CONDITIONS

GENERAL SAFETY INSTRUCTIONS

Two MOS-63B20)

Vehicle Parked Level.

REFERENCES (TM)

TM 9-2320-273-10

TM 9-2320-273-20P

LO 9-2320-273-12

REFERENCES (TROUBLESHOOTING)

Table 12-1, 12-2.

Engine OFF.

Transmission in Neutral.

Park Brake Set.

12-7. WINCH MAINTENANCE TASK SUMMARY (Continued). LIST OF TASKS **TASK TROUBLESHOOTING TASK TASK REF REF (TABLE)** NO. 1. Winch Cable Maintenance: 12-8 Α. Removal. 12-8A 12-1 12-8B 12-2 B. Installation. 2. Inline Filter Maintenance: 12-9 12-1 12-9A 12-2 A. Removal. 12-9B Installation. C. Checking for Leaks. 12-9C Reservoir Screen and Strainer Maintenance: 12-10 12-1 3. 12-10A 12-2 Removal. 12-10B B. Cleaning. C. Installation. 12-10C 4. Control Valves Maintenance: 12-11 12-1 Removal. 12-11A Α. 12-11B 12-2 B. Installation. C. Operational Check. 12-11C. 5. Throttle Maintenance: 12-12 12-1 12-12A Α. Removal. 12-2 B. Cleaning and Inspection. 12-12B C. Installation. 12-12C 12-12D D. Operational Check. 12-1 12-13 6. Hydraulic Lines and Fittings Maintenance: 12-2 A. Removal. 12-13A Installation. 12-13B В. C. Checking for Leaks. 12-13C

12-7. WINCH MAINTENANCE TASK SUMMARY (Continued). LIST OF TASKS **TASK TASK** TROUBLESHOOTING **TASK** NO. REF REF (TABLE) 7. Hydraulic Motor Maintenance: 12-14 12-1 Removal. Α. 12-14A 12-2 B. Cleaning and Inspection. 12-14B C. Installation and Operational Check. 12-14C Hydraulic Pump Maintenance: 12-1 8. 12-15 A. Removal. 12-15A 12-2 Installation. В. 12-15B C. Operational Check. 12-15C PTO Linkage Maintenance: 9. 12-16 12-1 A. Removal. 12-16A 12-2 B. Installation. 12-16B C. Operational Check. 12-16C

This page intentionally left blank.

2-8. WINCH CABLE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (15) b. Installation. (20)

35 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M916 and M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

Two (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

Table 12-1, 12-2.

EQUIPMENT CONDITION

PARAGRAPH

None.

CONDITION DESCRIPTION

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Park ad on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

12-8. WINCH CABLE MAINTENANCE (Continued). LOCATION/ITEM **ACTION** REMARKS **REMOVAL** 1. Cable (1). Unreel from drum (2). Refer to TM 9-2320-273-10. 2. Nuts (3). Remove. 3. U-bolt (4). Remove. INSTALLATION. 4. U-bolt (4). Install through holes on side of drum. 5. Nuts (3). Screw onto U-bolt (4). Do not tighten at this time. Slide unswaged end of cable 6. Cable (1). between U-bolt (4) and drum (2). Cable should protrude approximately 1.00 inch. Tighten. 7. Nuts (3). Refer to TM 9-2320-273-10. Rewind on drum (2). 8. Cable (1). LEGEND: 1. CABLE DRUM 3. NUT (2) 4. U-BOLT TA 075306

12-9. INLINE FILTER MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal.

(5) (5) b. Installation.

c. Checking for Leaks. (5)

15 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M916 and M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Filter Element, 74011 (34623).

Oil, 1 qt (1 liter) (refer to appendix C).

Container.

EQUIPMENT CONDITION

PARAGRAPH

None.

CONDITION DESCRIPTION

None.

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

LO 9-2320-273-12.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

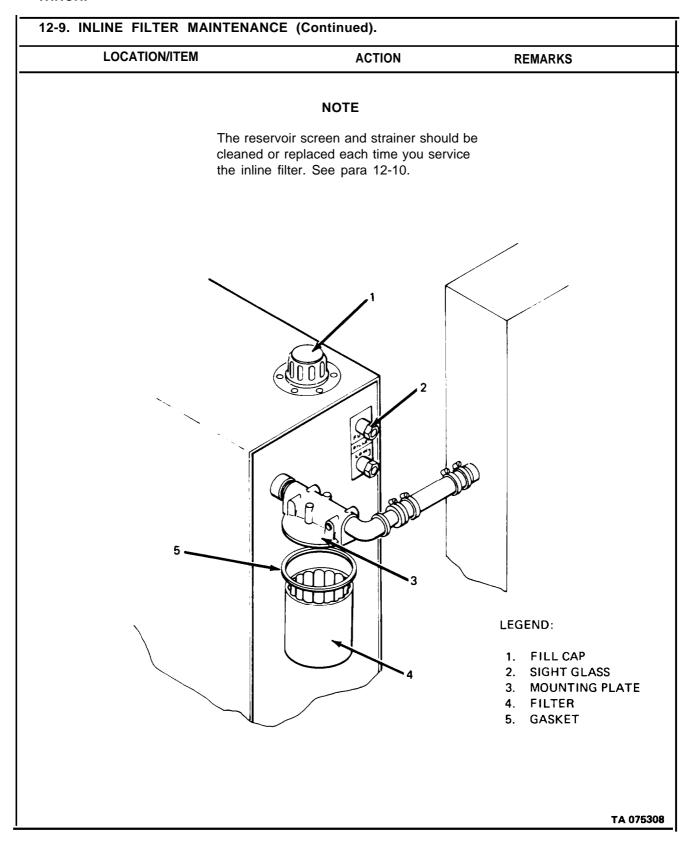
Transmission in Neutral. Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 12-1, 12-2.

12-9. INLINE FILTER MAINTENANCE (Continued). LOCATION/ITEM **ACTION REMARKS WARNING** Winch system retains some pressure even when not in use. Before you begin maintenance, vent pressure by carefully removing fill cap (1). LEGEND: 1. FILL CAP 2. SIGHT GLASS 3. MOUNTING PLATE 4. FILTER 5. GASKET TA 076307

12-9. INLINE FILTER MAINTEN	ANCE (Continued).	
LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL		
1. Filter (4).	Using wrench, unscrew and throw away.	Place container under filter.
2. Gasket (5).	Inspect.	Replace if necessary.
B. INSTALLATION .	CAUTION	
Do	not use strap wrench to install filter.	
3. Filter (4).	a. POur in 1 qt (1 liter)	
	b. Install gasket (5).	
	 c. Screw on until filter top just touches mounting plate 	e (3).
	d. Tighten 1/4 turn more.	
4. Sight glass (2).	Check that oil is visible in top sight glass.	Add oil if necessary.
5. Fill cap (1).	Screw on and tighten.	
C. CHECKING FOR LEAKS.		
6. Engine.	Start up (see TM 9-2320-273-10).	
7. PTO.	Engage (see TM 9-2320-273-10).	
8. Filter (4).	Check for oil leaks.	Tighten as necessary.
9. Engine.	Shut down (see TM 9-2320-273-10).	



12-10. RESERVOIR SCREEN AND STRAINER MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (5) b. Cleaning. (10) c. Installation. (5)

20 Minutes Total.

INITIAL SETUP

EQUIPMENT CONDITION

APPLICABLE CONFIGURATIONS

PARAGRAPH

CONDITION DESCRIPTION

None.

M916 and M920. None.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Non-flammable Cleaning Solvent SD-2 (refer to appendix C).

Clean Container.

Gasket (2), 11027 (34623).

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

LO 9-2320-273-12.

GENERAL SAFETY INSTRUCTIONS

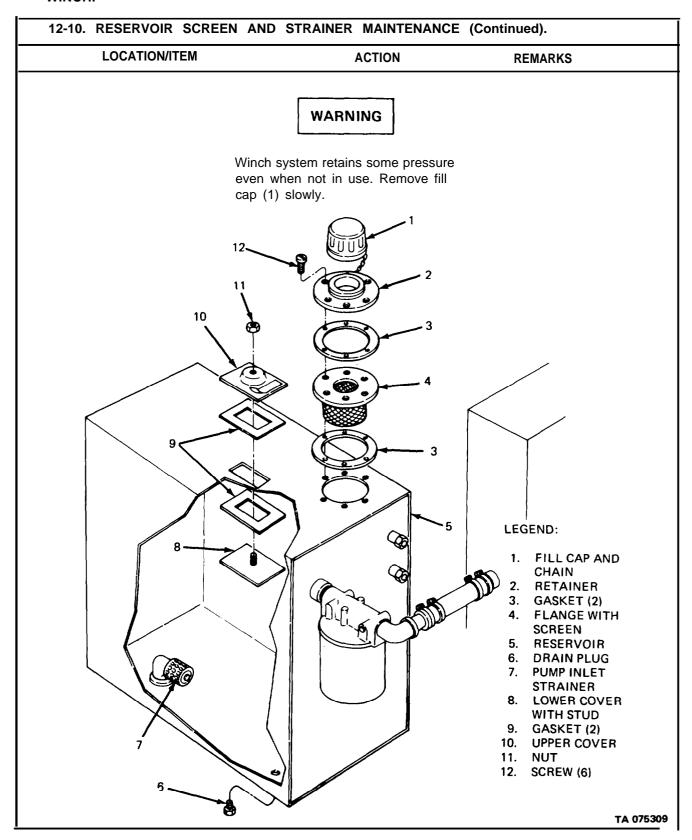
Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 12-1, 12-2.



12-1	10. RESERVOIR SCREEN AND	STRAINER MAINTENANCE (Co	ontinued).
	LOCATION/ITEM	ACTION	REMARKS
Α.	REMOVAL.		
1.	Fill cap with chain (1).	Unscrew.	
2.	Drain plug (6).	Unscrew and drain fluid into clean container.	
3.	Nut (11).	a. Loosen.b. Remove nut (11) with other hand.	Slide upper cover (10), two gaskets (9) and lower cover, with stud (8) to the side with one hand.
4.	Upper cover (10), two gaskets (9), and lower cover with stud (8).	Lift out of reservoir (5).	Discard gaskets (9).
5.	Pump inlet strainer (7).	Unscrew and remove.	
6.	Six screws (12).	Remove and lift out retainer (2), two gaskets (3), and flange and screen (4).	Inspect gaskets (3). If damaged, make from stock using old gasket for a template.
B.	CLEANING.	Management	
		CAUTION	
	come i Such d	allow dry cleaning solvent SD-2 n contact with seals or flexible hostleaners may damage leather, rubbonthetic materials.	ses.
7.	Flange and screen (4) and pump inlet strainer (7).	a. Clean with dry cleaning solvent.b. Allow to dry.	If damaged, replace.
C.	INSTALLATION.		
8.	Flange and screen (4), two gaskets (3) and retainer (2).	Place in reservoir fill opening and secure with six screws (12).	
9.	Pump inlet strainer (7).	Insert thru access hole and screw onto pipe.	
10.	Lower cover with stud (8), two new gaskets (9), and upper cover (10).	a. Hold in position with one hand at access hole in reservoir (5).b. Install nut (11) and tighten.	To keep parts in proper position first turn nut (11) by hand while pulling up. Once snug, tighten with wrench.

12-10. RESERVOIR SCREEN AND	STRAINER MAINTENANCE	(Continued).
LOCATION/ITEM	ACTION	REMARKS
C. INSTALLATION (Continued).		
11. Drain plug (6).	Screw into reservoir bottom.	
12. Resemoir (5).	Fill.	See LO 9-2320-273-12.
13. Fill cap with chain (1).	Screw on.	
10		LEGEND: 1. FILL CAP AND CHAIN 2. RETAINER 3. GASKET (2) 4. FLANGE WITH SCREEN 5. RESERVOIR 6. DRAIN PLUG 7. PUMP INLET STRAINER 8. LOWER COVER WITH STUD 9. GASKET (2) 10. UPPER COVER 11. NUT 12. SCREW (6)

12-11. CONTROL VALVES MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (10) b. Installation. (15) c. Operational Check. (10)

35 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M916 and M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (refer to appendix C).

Plugs.

Masking Tape. Marking Pen.

Pin Kit, IV1701 (34623).

EQUIPMENT CONDITION PARAGRAPH

None.

CONDITION DESCRIPTION

None.

PERSONNEL REQUIRED

One (MOS-63B20).

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

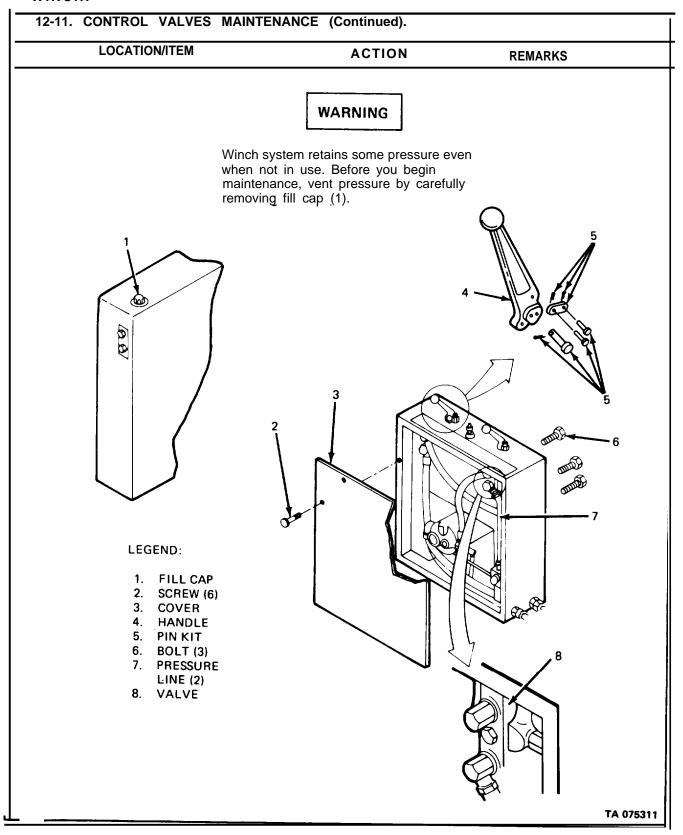
Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 12-1, 12-2.

WINCH.



12-11. CONTROL VALVES	MAINTENANCE (Continued).	
LOCATION/ITEM	ACTION	REMARKS
	NOTE	
	The following procedure describes remove and installation of the directional control valve. Follow the same steps to remove and install the auxiliary control valve.	
A. REMOVAL.		
1. Six screws (2).	Unscrew and remove cover (3).	
2. Pin kit (5) and handle (4)	a. Remove three cotter pins.b. Remove three straight pins.c. Remove one plate.d. Lift off handle (4).	Discard pin kit (5).
	NOTE	
	Plug each line as soon as you have disconnected it. This will prevent loss of fluid from the system.	
3. Two pressure lines (7).	 a. Disconnect at valve (8) and plug. b. Inspect for: Leaks. Cracks. Discoloration. Damaged fittings. 	Tag and mark where each line connects. Replace if necessary.
4. Three bolts (6).	Unscrew and remove valve (8).	
B. INSTALLATION.		
5. Valve (8).	a. Set in place.b. Screw on and tighten three bolts (6).	
6. Two pressure lines (7).	Unplug and connect to valve (8).	
7. Handle (4).	Attach to valve (8) with new pin kit (5).	
8. Fill cap (1).	Screw on, and tighten.	
C. OPERATIONAL CHECK.	<u>-</u> <u>-</u>	
9. Engine.	Start up (see TM 9-2320-273- 10). Engage PTO.	

12-11. CONTROL VALVES MAINTENANCE (Continued). **ACTION REMARKS** LOCATION/ITEM C. OPERATIONAL CHECK (Continued). 10. Control valve (8). Operate winch and check for: a. Leakage. Tighten connections as necessary. b. Proper operation. 11. Cover (3). Aline with mounting holes in winch control panel and install with six screws (2). 12. Engine. Disengage PTO and shut down engine (see TM 9-2320-273-10). 8 0 LEGEND: 1. FILL CAP 2. SCREW (6) 3. COVER 4. HANDLE 5. PIN KIT 6. BOLT (3) 7. PRESSURE LINE (2) 8. VALVE TA 075312

2-12. THROTTLE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REWIRED FOLLOWS TASK DESCRIPTION.)

(10)a. Removal.

b. Cleaning and Inspection. (10)

c. Installation. (10)

d. Operational Check. (5)

35 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M916 and M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

Table 12-1, 12-2.

EQUIPMENT CONDITION

PARAGRAPH ____

None.

CONDITION DESCRIPTION

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

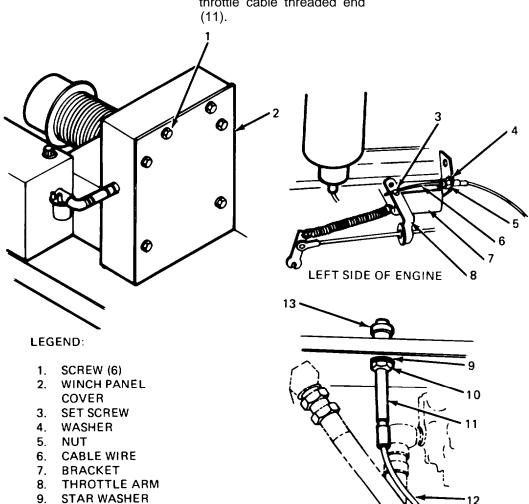
12-12. THROTTLE MAINTENANCE (Continued).

LOCATION/ITEM	ACTION	REMARKS
	71011011	KEMAKKO

A. REMOVAL

1. Setscrew (3). Loosen from throttle arm (8) on left side of engine.

2. Nut (5) and washer (4). Unscrew nut from winch throttle cable threaded end



11. WINCH THROTTLE **CABLE THREADED END**

12. CABLE

10. NUT

13. WINCH THROTTLE CONTROL



12

TA 07531

LOCATION/ITEM	ACTION	REMARKS
A. REMOVAL (Continued).		
3. Cable wire (6).	a. Pull free from throttle arm(8) and bracket (7).b. Feed cable wire (6) down underneath chassis.	
4. Six screws (1).	a. Remove.b. Remove winch panel cover (2).	
5. Nut (10), and star- washer (9).	Remove from winch throttle cable threaded end (11).	
6. Winch throttle control (13).	Pull up and out to remove cable (12).	Feed cable from under chassis up through winch control panel carefully so as not to damage cable.
B. CLEANING AND INSPECTION	ON.	
7. Cable (12).	Wipe cable and threaded ends clean and inspect for: a. Cracks in cable exterior. b. Kinks which will cause binding. c. Crossed or burred threads.	Replace as necessary.
C. INSTALLATION.		
8. Winch throttle cable threaded end (11).	Install with starwasher (9) and nut (10). Tighten.	
9. Cable (12).	Feed down under chassis over cross frame brace, and up into engine compartment.	
10. Cable wire (6).	Insert through bracket (7) and into throttle arm (8).	
11. Setscrew (3).	Tighten into cable wire (6).	
12. Winch panel cover (2).	Install with six screws (1).	

LOCATION/ITEM	ACTION	REMARKS
D. OPERATIONAL CHECK.		
12. Engine.	Start up and engage PTO (see TM 9-2320-273-10).	
 Winch throttle control (13). 	Operate and check that eng rpm rises and falls according	
14. Engine.	Shut down (see TM 9-2320-273-10).	
LEGEND:	LEFT SIDE	3 4 E OF ENGINE 8
 SCREW (6) WINCH PANEL COVER SET SCREW WASHER NUT 		9 10 11
6. CABLE WIRE 7. BRACKET 8. THROTTLE ARM 9. STAR WASHER 10. NUT 11. WINCH THROTTLE		12
CABLE THREADED END 12. CABLE	/ WINCH PANEI	L WITH COVER REMOVED
13. WINCH THROTTLE CONTROL	=	TA 0753

12-13. HYDRAULIC LINES AND FITTINGS MAINTENANCE.

THIS TASK COVERS (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (15)b. Installation. (15)c. Checking for Leaks. (10)

40 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M916 and M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Liquid Teflon (refer to appendix C).

Masking Tape. Marking Pencil.

SPECIAL ENVIRONMENTAL CONDITIONS

One (MOS-63B20). Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10.

TM 9-2320-273-20P.

PERSONNEL REQUIRED

GENERAL SAFETY INSTRUCTIONS

Engine OFF. Park Brake Set.

Transmission in Neutral.

EQUIPMENT CONDITION

CONDITION DESCRIPTION

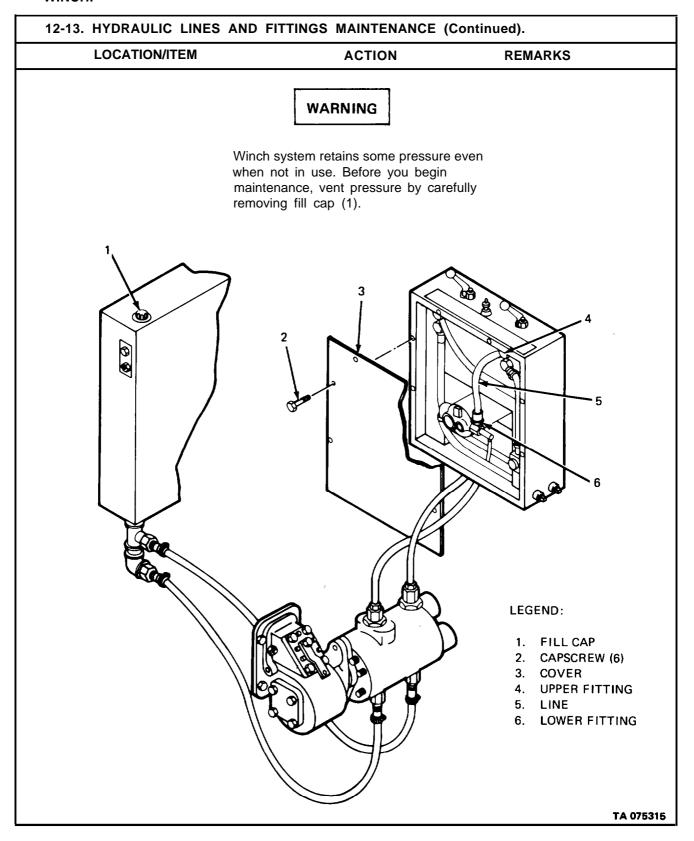
None.

PARAGRAPH

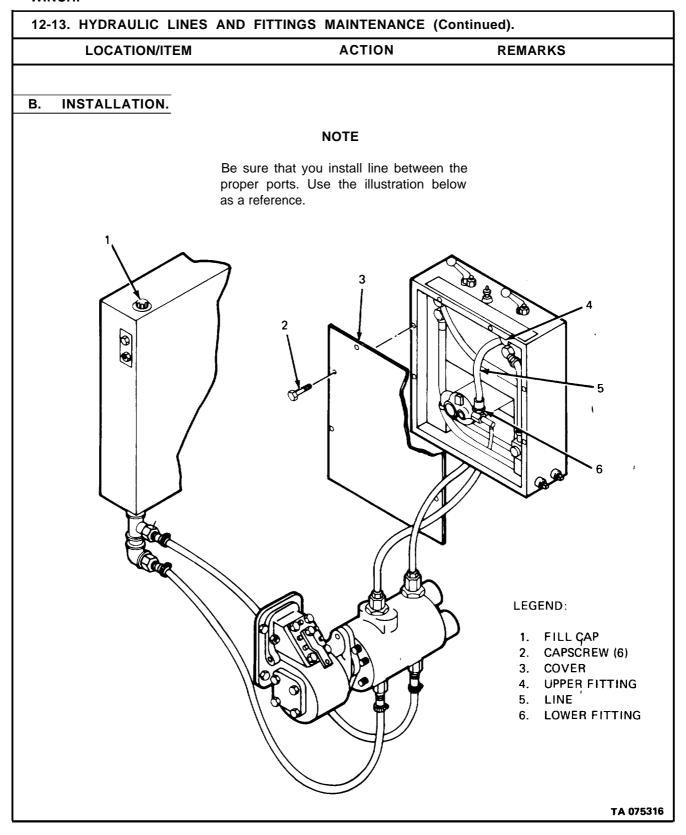
None.

TROUBLESHOOTING REFERENCES

Table 12-1, 12-2.

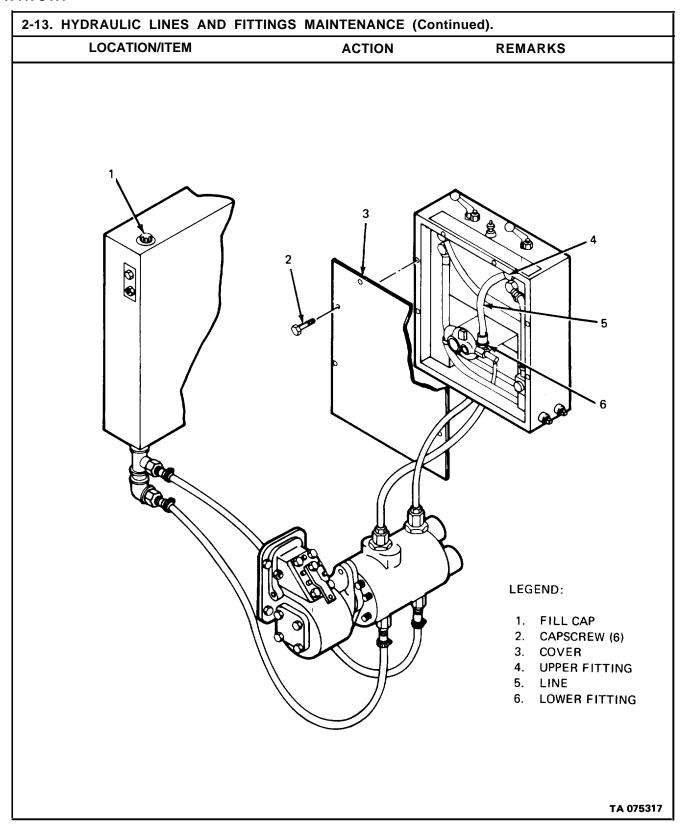


12-13. HYDRAULIC LINES AND FITTINGS MAINTENANCE (Continued).							
LOCATION/ITEM	ACTION	REMARKS					
NOTE							
The illustration at right shows major lines and fittings of the winch hydraulic system. The procedure describes removal and installation of the directional control valve-to-motor line, but the same steps may be used to remove and install any of the lines.							
A. REMOVAL							
1. Six capscrews (2).	Unscrew and remove cover (3).	Skip this step if you are changing a line outside the winch panel.					
NOTE							
th	s soon as you disconnect a line, plune port and the line. Tag and mark ll lines.	9					
2. Upper fitting (4).	Unscrew. Plug port and line.						
3. Lower fitting (6).	Unscrew. Plug port and line.						
4. Line (5).	Remove and inspect for: a. Cracks. b. Leaks. c. Discoloration. d. Damaged fittings.	Replace if necessary.					
NOTE							
If line contains a large amount of fluid, drain the fluid from the line and pour it into reservoir fill neck.							



12-13. HYDRAULIC LINES AND FITTI	NGS MAINTENANCE (Continu	ued).
LOCATION/ITEM	ACTION	REMARKS
B. INSTALLATION (Continued).		
5. Lower fitting (6).	a. Coat threads with liquid teflon.b. Unplug port and line. Screw together and tighten.	
6. Upper fitting (4).	a. Coat threads with liquid teflon.b. Unplug port and line. Screw together and tighten.	
7. Fill cap (1).	Screw on and tighten.	
C. CHECKING FOR LEAKS		
8. Engine.	Start up (see TM 9-2320-273-10). Engage PTO.	
9. Line (5).	a. Wipe away dirt and oil. b. Check for leaks.	Retighten as necessary.
	NOTE	Religition do necessary.
to check wil	ng for leaks, use sight glasses nch oil level. Add oil if necesto LO 9-2320-273-12).	
10. Engine.	Disengage PTO and shut down (see TM 9-2320-273-10).	
11. Cover (3).	Set in place. Screw in and tighten six capscrews (2).	

WINCH.



2-14. HYDRAULIC MOTOR MAINTENANCE

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (15)

b. Cleaning and Inspection. (15)

c. Installation and Operational Check. (15)

45 Minutes Total.

INITIAL SETUP

EQUIPMENT CONDITION PARAGRAPH **APPLICABLE CONFIGURATIONS**

M916 and M920. None. None.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Clean Container.

Gasket, Hydraulic Motor to Failsafe Brake, 26426 (34625).

Hydraulic Oil (Refer to Appendix C).

Silastic Gasket Sealer (Refer to Appendix C).

Plugs.

PERSONNEL REQUIRED

One (MOS-63B20). Vehicle Parked on Level Ground.

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P.

LO 9-2320-273-12.

GENERAL SAFETY INSTRUCTIONS

SPECIAL ENVIRONMENTAL CONDITIONS

CONDITION DESCRIPTION

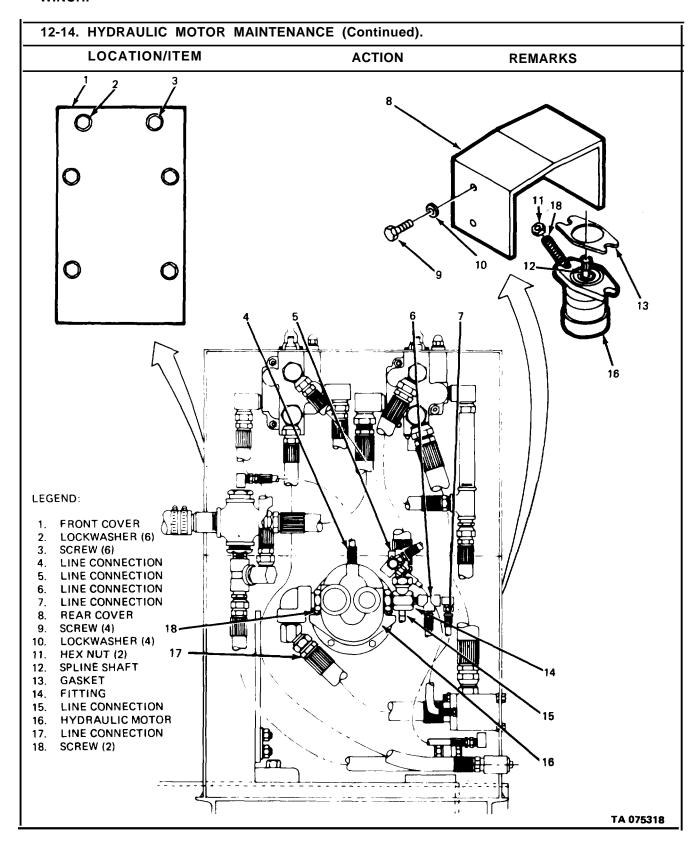
Engine OFF.

Transmission in Neutral.

Park Brake Set.

TROUBLESHOOTING REFERENCES

Table 12-1, 12-2.



12-14. HYDRAULIC MOTOR MAINTENANCE. (Continued). LOCATION/ITEM **REMARKS ACTION**

WARNING

Winch system retains some pressure even when not in use. Before you begin maintenance, vent pressure by carefully removing reservoir fill cap.

A. REMOVAL.

Unscrew and remove winch 1. Six screws (3) and front cover (1). lockwashers (2).

2. Four screws (9) and Unscrew and remove winch lockwashers (10). rear cover (8).

3. Five hydraulic line Unscrew from hydraulic motor connections: (4), (5), (6), (16) and plug connections. (7), and (17).

4. Two screws (18) and Unscrew and pull hydraulic motor (16) straight out from hex nuts (11). failsafe brake.

Discard. 5. Gasket (13).

B. CLEANING AND INSPECTION.

6. Hose fittings at Wipe clean and inspect for Replace fitting connections (4), (5), (6), crossed threads, burrs, as necessary. (7), and (17). and cracked hoses.

7. Motor spline shaft (12). Wipe clean and inspect for gouges, chips, and broken

splines.

Refer to Direct Support/ General Support Maintenance if shaft splines or spline sleeve on failsafe

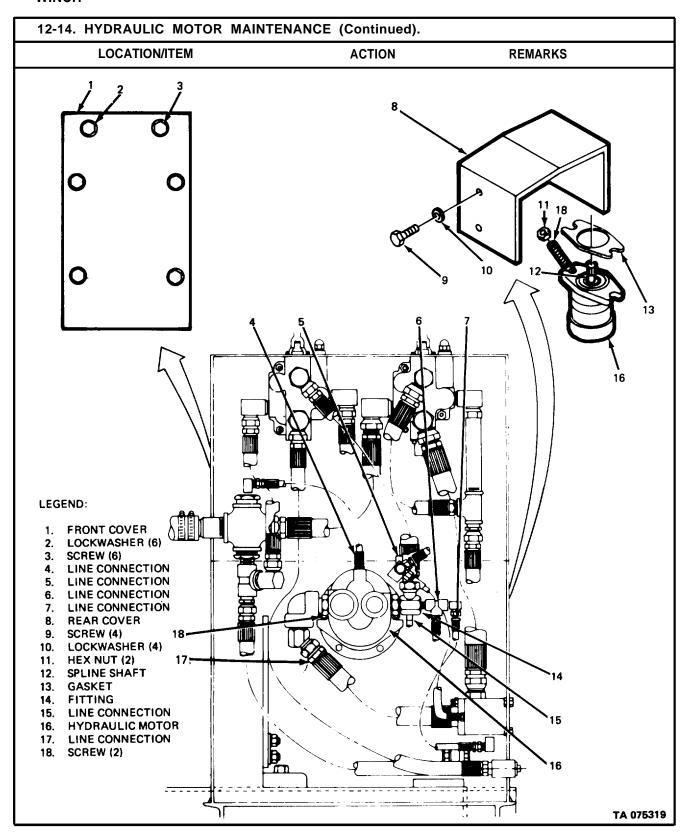
brake are damaged.

C. INSTALLATION AND OPERATIONAL CHECK

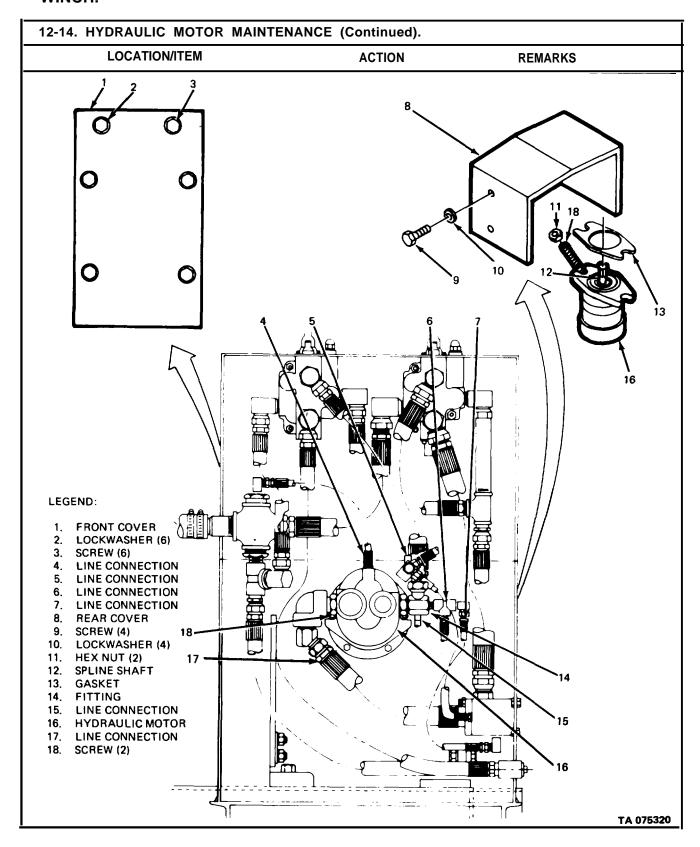
8 New gasket (13). Coat both sides with silastic gasket sealer and place on flange of hydraulic motor (16).

9. Two screws (18). Position in flange slots of

hydraulic motor (16).



12-14. HYDRAULIC MOTOR MAINTENANCE (Continued).							
LOCATION/ITEM	ACTION	REMARKS					
C. INSTALLATION AND OPERATIONAL CHECK (Continued).							
10. Hydraulio motor (16).	Aline capscrews (18) and spline shaft (12); push into position against failsafe brake.						
11. Two hex nuts (11).	Screw on to screws (18) and tighten.						
12. Five hydraulic line connections: (4), (5), (6), (7), and (17).	a. Remove plugs.b. Coat threads with liquid teflon.c. Install and tighten as illustrated.						
13. Winch rear cover (8).	Install with four screws (9) and lockwashers (10).						
14. Engine.	Start up and engage PTO (see TM 9-2320-273-10).						
15. Winch.	Engage (see TM 9-2320-273-10). a. Check for leaks. b. Disconnect PTO and shut down engine (see TM 9-2320-273-10).	Tighten fittings as necessary.					
16. Winch front cover (1).	Install with six lockwashers (2) and screws (3).						



2-15. HYDRAULIC PUMP MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REWIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (20)

b. Installation. (20)

c. Operational Check. (5)

45 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M916 and M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Clean Container.

Plugs.

Liquid Teflon (Refer to Appendix C).

EQUIPMENT CONDITION

PARAGRAPH

None.

CONDITION DESCRIPTION

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10. TM 9-2320-273-20P. LO 9-2320-273-12.

TROUBLESHOOTING REFERENCES

Table 12.1.

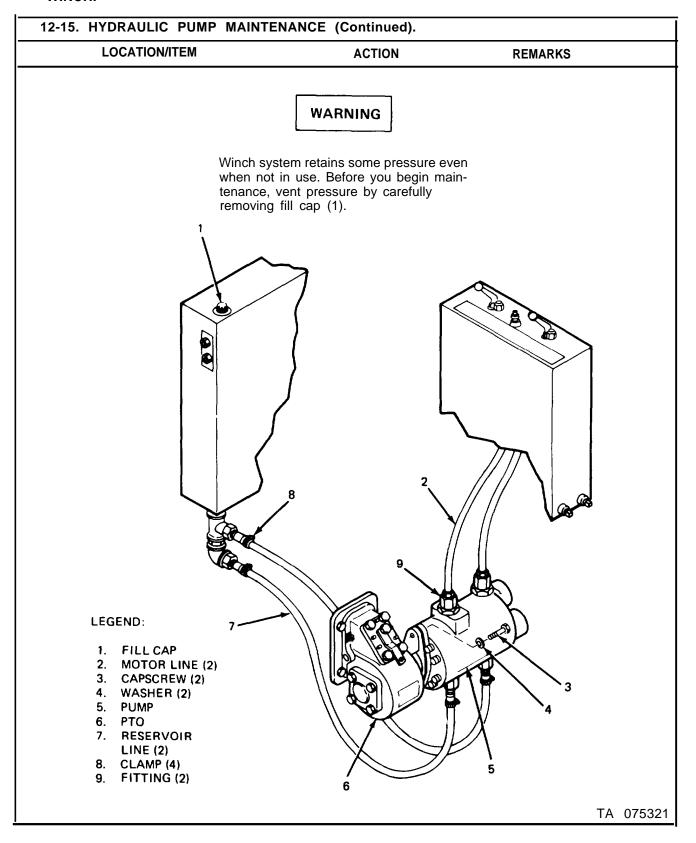
SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

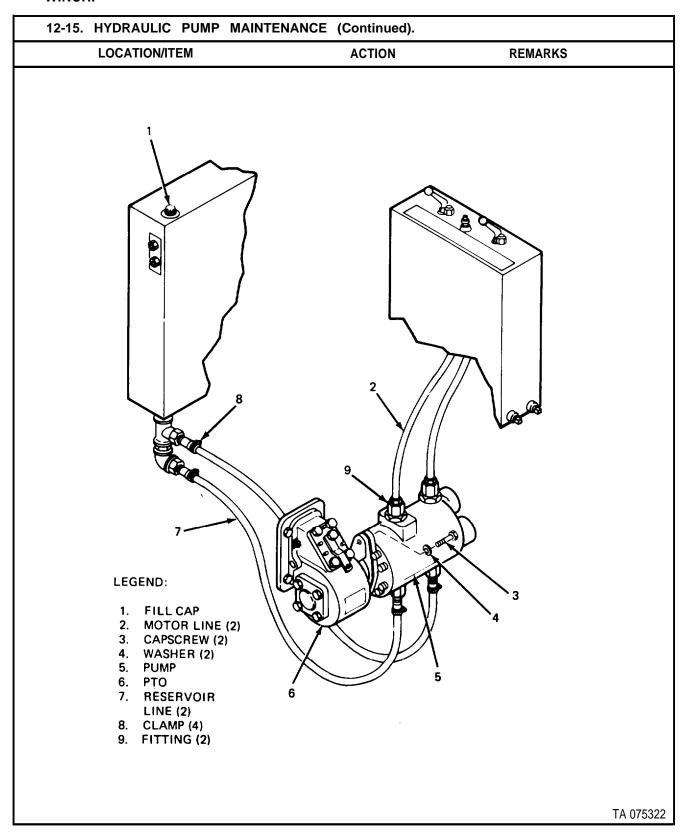
GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Park Brake Set.



A. REMOVAL. Plug each line as soon as you have disconnected it. This will prevent loss of fluid from system. As an alternate the reservoir may be drained. 1. Four clamps (8). As an alternate the reservoir may be drained. 1. Four clamps (8). As an alternate the reservoir may be drained. 1. Four clamps (8). As an alternate the reservoir may be drained. 1. Four clamps (8). As an alternate the reservoir may be drained. 1. Four clamps (8). 2. Leaks.	12-15. HYDRAULIC PUMP	MAINTENANCE (Continued).	
NOTE Plug each line as soon as you have disconnected it. This will prevent loss of fluid from system. As an alternate the reservoir may be drained. 1. Four clamps (8). a. Unscrew and remove two reservoir lines (7). b. Inspect for: 1. Cracks. 2. Leaks. 3. Discoloration. 4. Damaged fittings. NOTE Before you unscrew motor lines, place clean container underneath to catch oil draining from pump. 2. Two fittings (9). a. Unscrew and remove two motor lines (2). b. Inspect for: 1. Cracks. 2. Leaks. 3. Discoloration. 4. Damaged fittings. 3. Two capscrews (3) and washers (4). 4. Pump (5). Remove from PTO (6). B. INSTALLATION. 5. Pump (5). Position against PTO (6). Screw in and tighten.	LOCATION/ITEM	ACTION	REMARKS
Plug each line as soon as you have disconnected it. This will prevent loss of fluid from system. As an alternate the reservoir may be drained. 1. Four clamps (8). a. Unscrew and remove two reservoir lines (7). b. Inspect for: 1. Cracks. 2. Leaks. 3. Discoloration. 4. Damaged fittings. NOTE Before you unscrew motor lines, place clean container underneath to catch oil draining from pump. 2. Two fittings (9). a. Unscrew and remove two motor lines (2). b. Inspect for: 1. Cracks. 2. Leaks. 3. Discoloration. 4. Damaged fittings. Replace if necessary. Plug lines as removed. Replace if necessary. Plug lines as removed. Manual remove two motor lines (2). Replace if necessary. 1. Cracks. 2. Leaks. 3. Discoloration. 4. Damaged fittings. 3. Two capscrews (3) and washers (4). 4. Pump (5). Remove from PTO (6). B. INSTALLATION. 5. Pump (5). Position against PTO (6).	A. REMOVAL.		
it. This will prevent loss of fluid from system. As an alternate the reservoir may be drained. 1. Four clamps (8). a. Unscrew and remove two reservoir lines (7). b. Inspect for: 1. Cracks. 2. Leaks. 3. Discoloration. 4. Damaged fittings. NOTE Before you unscrew motor lines, place clean container underneath to catch oil draining from pump. 2. Two fittings (9). a. Unscrew and remove two motor lines (2). b. Inspect for: 1. Cracks. 2. Leaks. 3. Discoloration. 4. Damaged fittings. 3. Two capscrews (3) and washers (4). 4. Pump (5). Remove from PTO (6). B. INSTALLATION. 5. Pump (5). Position against PTO (6). 6. Two capscrews (3).		NOTE	
reservoir lines (7). b. Inspect for: 1. Cracks. 2. Leaks. 3. Discoloration. 4. Damaged fittings. NOTE Before you unscrew motor lines, place clean container underneath to catch oil draining from pump. 2. Two fittings (9). a. Unscrew and remove two motor lines (2). b. Inspect for: 1. Cracks. 2. Leaks. 3. Discoloration. 4. Damaged fittings. 3. Two capscrews (3) and washers (4). 4. Pump (5). Remove from PTO (6). B. INSTALLATION. 5. Pump (5). Position against PTO (6). Screw in and tighten.		it. This will prevent loss of fluid from s	system.
1. Cracks. 2. Leaks. 3. Discoloration. 4. Damaged fittings. NOTE Before you unscrew motor lines, place clean container underneath to catch oil draining from pump. 2. Two fittings (9). a. Unscrew and remove two motor lines (2). b. Inspect for: 1. Cracks. 2. Leaks. 3. Discoloration. 4. Damaged fittings. 3. Two capscrews (3) and washers (4). 4. Pump (5). Remove from PTO (6). B. INSTALLATION. 5. Pump (5). Position against PTO (6). 6. Two capscrews (3). Screw in and tighten.	1. Four clamps (8).	reservoir lines (7).	Plug lines as removed.
Before you unscrew motor lines, place clean container underneath to catch oil draining from pump. 2. Two fittings (9). a. Unscrew and remove two motor lines (2). b. Inspect for: 1. Cracks. 2. Leaks. 3. Discoloration. 4. Damaged fittings. 3. Two capscrews (3) and washers (4). 4. Pump (5). Remove from PTO (6). B. INSTALLATION. 5. Pump (5). Position against PTO (6). Screw in and tighten.		 Cracks. Leaks. Discoloration. 	Replace if necessary.
container underneath to catch oil draining from pump. 2. Two fittings (9). a. Unscrew and remove two motor lines (2). b. Inspect for: 1. Cracks. 2. Leaks. 3. Discoloration. 4. Damaged fittings. 3. Two capscrews (3) and washers (4). 4. Pump (5). B. INSTALLATION. 5. Pump (5). Position against PTO (6). Screw in and tighten.		NOTE	
motor lines (2). b. Inspect for: 1. Cracks. 2. Leaks. 3. Discoloration. 4. Damaged fittings. 3. Two capscrews (3) and washers (4). 4. Pump (5). B. INSTALLATION. 5. Pump (5). Position against PTO (6). Screw in and tighten.		container underneath to catch oil drain	
b. Inspect for: 1. Cracks. 2. Leaks. 3. Discoloration. 4. Damaged fittings. 3. Two capscrews (3) and washers (4). 4. Pump (5). B. INSTALLATION. 5. Pump (5). Position against PTO (6). Screw in and tighten.	2. Two fittings (9).		Plug lines as removed.
and washers (4). 4. Pump (5). Remove from PTO (6). 5. Pump (5). Position against PTO (6). 6. Two capscrews (3). Screw in and tighten.		b. Inspect for:1. Cracks.2. Leaks.3. Discoloration.	Replace if necessary.
 B. INSTALLATION. 5. Pump (5). Position against PTO (6). 6. Two capscrews (3). Screw in and tighten. 		Unscrew and remove.	
5. Pump (5). Position against PTO (6). 6. Two capscrews (3). Screw in and tighten.	4. Pump (5).	Remove from PTO (6).	
5. Pump (5). Position against PTO (6). 6. Two capscrews (3). Screw in and tighten.	B. INSTALLATION.		
		Position against PTO (6).	
		Screw in and tighten.	



B. INSTALLATION (Continued). NOTE Be sure you connect each hose to the proper port. 7. Two fittings (9) with two motor lines (2) attached. 8. Pump (5). 9. Two reservoir lines (7). 10. Fill cap (1). Start up (see TM 9-2320-273-10). Engage PTO. 12. Winch. NOTE Attach with liquid teflon. S. Coat threads with liquid teflon. I upplug, screw in, and tighten. Attach with four clamps (8). Screw on and tighten. Start up (see TM 9-2320-273-10). Engage PTO. Check operation.	12-15.	HYDRAULIC PUMP MA		
NOTE Be sure you connect each hose to the proper port. 7. Two fittings (9) with two motor lines (2) attached. 8. Pump (5). 9. Two reservoir lines (7). 10. Fill cap (1). C. OPERATIONAL CHECK. 11. Engine. Start up (see TM 9-2320-273-10). Engage PTO. Check operation. Check for leaks. Check for leaks. Check for leaks. Retighten connections as necessary. Retighten connections as necessary. NOTE Use sight glasses to check oil level in reservoir. Add oil if necessary (refer		LOCATION/ITEM	ACTION	REMARKS
NOTE Be sure you connect each hose to the proper port. 7. Two fittings (9) with two motor lines (2) attached. 8. Pump (5). 9. Two reservoir lines (7). 10. Fill cap (1). C. OPERATIONAL CHECK. 11. Engine. Start up (see TM 9-2320-273-10). Engage PTO. Check operation. Check for leaks. Check for leaks. Check for leaks. Retighten connections as necessary. Retighten connections as necessary. NOTE Use sight glasses to check oil level in reservoir. Add oil if necessary (refer	B. IN	STALLATION (Continued		
Be sure you connect each hose to the proper port. 7. Two fittings (9) with two motor lines (2) attached. 8. Pump (5). 9. Two reservoir lines (7). 10. Fill cap (1). C. OPERATIONAL CHECK. 11. Engine. Start up (see TM 9-2320-273-10). Engage PTO and shut down (see TM 9-2320-273-10). Check operation. Check oil level in reservoir. Add oil if necessary (refer	<u> </u>	OTALLATION (COMMIGGO		
7. Two fittings (9) with two motor lines (2) attached. 8. Pump (5). 9. Two reservoir lines (7). 10. Fill cap (1). C. OPERATIONAL CHECK. 11. Engine. Start up (see TM 9-2320-273-10). Engage PTO and shut down (see TM 9-2320-273-10). Check for leaks. Disengage PTO and shut down (see TM 9-2320-273-10). NOTE Use sight glasses to check oil level in reservoir. Add oil if necessary (refer		D		
teflon. b. Unplug, screw in, and tighten. 8. Pump (5). Using funnel, pour oil from container into top ports. 9. Two reservoir lines (7). Attach with four clamps (8). 10. Fill cap (1). Screw on and tighten. C. OPERATIONAL CHECK. 11. Engine. Start up (see TM 9-2320-273-10). Engage PTO. 12. Winch. Check operation. Check for leaks. Retighten connections as necessary. 14. Engine. Disengage PTO and shut down (see TM 9-2320-273-10). NOTE Use sight glasses to check oil level in reservoir. Add oil if necessary (refer				
container into top ports. 9. Two reservoir lines (7). Attach with four clamps (8). 10. Fill cap (1). Screw on and tighten. C. OPERATIONAL CHECK. 11. Engine. Start up (see TM 9-2320-273-10). Engage PTO. 12. Winch. Check operation. 13. Pump (5). Check for leaks. Retighten connections as necessary. 14. Engine. Disengage PTO and shut down (see TM 9-2320-273-10). NOTE Use sight glasses to check oil level in reservoir. Add oil if necessary (refer			teflon. b. Unplug, screw in, and	
10. Fill cap (1). Screw on and tighten. C. OPERATIONAL CHECK. 11. Engine. Start up (see TM 9-2320-273-10). Engage PTO. 12. Winch. Check operation. Check for leaks. Retighten connections as necessary. 14. Engine. Disengage PTO and shut down (see TM 9-2320-273-10). NOTE Use sight glasses to check oil level in reservoir. Add oil if necessary (refer	8. P	ump (5).		
C. OPERATIONAL CHECK. 11. Engine. Start up (see TM 9-2320-273-10). Engage PTO. 12. Winch. Check operation. Check for leaks. Retighten connections as necessary. 14. Engine. Disengage PTO and shut down (see TM 9-2320-273-10). NOTE Use sight glasses to check oil level in reservoir. Add oil if necessary (refer	9. Tv	wo reservoir lines (7).	Attach with four clamps (8).	
11. Engine. Start up (see TM 9-2320-273-10). Engage PTO. 12. Winch. Check operation. Check for leaks. Retighten connections as necessary. 14. Engine. Disengage PTO and shut down (see TM 9-2320-273-10). NOTE Use sight glasses to check oil level in reservoir. Add oil if necessary (refer	10. Fi	ill cap (1).	Screw on and tighten.	
11. Engine. Start up (see TM 9-2320-273-10). Engage PTO. 12. Winch. Check operation. Check for leaks. Retighten connections as necessary. 14. Engine. Disengage PTO and shut down (see TM 9-2320-273-10). NOTE Use sight glasses to check oil level in reservoir. Add oil if necessary (refer	C OF	PERATIONAL CHECK		
13. Pump (5). Check for leaks. Retighten connections as necessary. Disengage PTO and shut down (see TM 9-2320-273-10). NOTE Use sight glasses to check oil level in reservoir. Add oil if necessary (refer			Start up (see TM 9-2320-273- 10). Engage PTO.	
necessary. 14. Engine. Disengage PTO and shut down (see TM 9-2320-273-10). NOTE Use sight glasses to check oil level in reservoir. Add oil if necessary (refer	12. V	Vinch.	Check operation.	
(see TM 9-2320-273-10). NOTE Use sight glasses to check oil level in reservoir. Add oil if necessary (refer	13. P	ump (5).	Check for leaks.	Retighten connections as necessary.
Use sight glasses to check oil level in reservoir. Add oil if necessary (refer	14. E	Engine.		
reservoir. Add oil if necessary (refer			NOTE	
		re	servoir. Add oil if necessary (refer	

12-16. PTO LINKAGE MAINTENANCE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (20) b. Installation. (25)

c. Operational Check. (5)

50 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

M916 Thru M920.

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

None.

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-10.

TROUBLESHOOTING REFERENCES

Table 12-1, 12-2.

EQUIPMENT CONDITION

PARAGRAPH

None.

CONDITION DESCRIPTION

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Vehicle Parked on Level Ground.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral.

Park Brake Set.

12-16. PTO LINKAGE MAINTENANCE (Continued).					
LOCATION/ITEM		ACTION	REMARKS		
A. REMOVAL. 1. Screw (9) and retaining nut (8). 2. Capscrew (11). 3. Bracket (12).	Loosen. Remove. Remove.				
12 1. KNOB 2. LOCKNUT 3. LOCKNUT 4. CABLE 5. NUT 6. CLAMP 7. CAPSCREW 8. RETAINING NUT 9. SCREW 10. PTO ARM 11. CAPSCREW 12. BRACKET			1 —2 —3 —4 —6 —7	TA 075324	

12-16. PTO LINKAGE MAINTENANCE (Continued).					
LOCATION/ITEM	ACTION	REMARKS			
A. REMOVAL (Continued).					
4. Capscrew (7) and nut (5).	Remove.				
5. Clamp (6).	Remove.				
6. Knob (1).	Remove.				
7. Locknut (2) and (3).	Remove.				
8. Cable (4).	Remove and inspect for kinks or breaks.				
B. INSTALLATION.					
9. Cable (4).	Secure with locknuts (2), and (3).				
10. Knob (1).	Install.				
11. Clamp (6).	Secure with capscrew (7) and nut (5).				
12. Cable (4).	Secure at PTO arm (10) by running thru hole in retaining nut (8) and tightening screw (9).				
13. Bracket (12).	Secure with capscrew (11).				
C. OPERATIONAL CHECK.					
14. Start engine.	(Refer to TM 9-2320-273-10.)				
15. Check PTO operation.	(Refer to TM 9-2320-273-10.)				

LOCATION/ITE	ACTION	N REMARKS
LEGEND: 1. KNOB 2. LOCKNUT 3. LOCKNUT 4. CABLE 5. NUT 6. CLAMP 7. CAPSCREW 8. RETAINING NUT 9. SCREW 10. PTO ARM 11. CAPSCREW 12. BRACKET		

12-17. TAKING HYDRAULIC SYSTEM OIL SAMPLE.

THIS TASK COVERS: (APPROXIMATE TIME REQUIRED FOLLOWS TASK DESCRIPTION.)

a. Removal. (0.4)b. Installation. c. Operational Check. (0.2)

1.0 Minutes Total.

INITIAL SETUP

APPLICABLE CONFIGURATIONS

TEST EQUIPMENT

None.

SPECIAL TOOLS

None.

MATERIALS/PARTS (P/N)

Bushing, MS51847-1 (96906). Bushing, MS51847-9 (96906). Drain Cock, 7-2177-4 (86768).

Tape, Antiseizing Item 14, Appendix C.

EQUIPMENT CONDITION

PARAGRAPH

None.

None.

CONDITION DESCRIPTION

PERSONNEL REQUIRED

One (MOS-63B20).

REFERENCES (TM)

TM 9-2320-273-20P.

TROUBLESHOOTING REFERENCES

None.

SPECIAL ENVIRONMENTAL CONDITIONS

Work Area Clean and Away from Blowing Dirt and Dust.

GENERAL SAFETY INSTRUCTIONS

Engine OFF.

Transmission in Neutral. Vehicle on Level Ground.

Wheels Blocked.

12-17.	TAKING	HYDRAULIC	SYSTEM	OIL	SAMPLE.	

LOCATION/ITEM ACTION REMARKS

A. REMOVAL.

1. Winch Console (5). Place drain pan under

plug (1).

2. Remove and discard Allow oil to drain.

plug (1).

B. INSTALLATION.

NOTE

Apply antiseizing tape to all threaded

connections.

3. Winch Console (5). Install bushing (2).

4. Install bushing (3) into

bushing (2).

5. Install drain cock (4) into

bushing (3).

6. Winch reservoir. Refill to proper level.

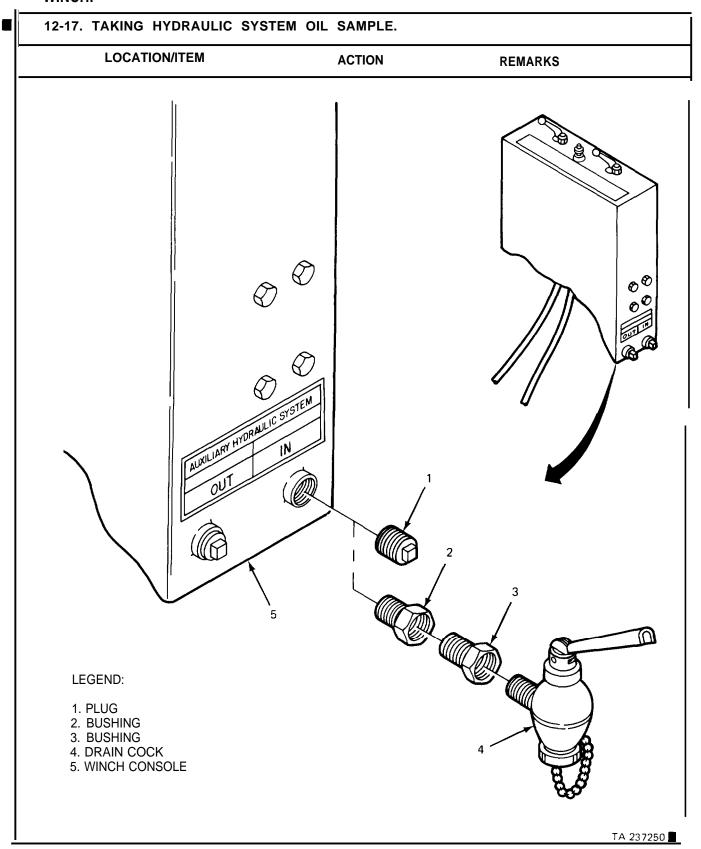
C. OPERATIONAL CHECK.

NOTE

Start engine (see TM 9-2320-273-10).

7. Winch Console (5). Operate winch. Check bushings (2) and (3) and

drain cock (4) for leaks.



APPENDIX A

REFERENCES

A-1. PUBLICATION INDEXES.

The following indexes should be consulted frequently for latest changes or revisions and for new publications relating to material covered in this technical manual.

Index of Army Motion Pictures and Related Audio-Visual Aids DA PAM 108-1

Consolidated Index of Army Publications and Blank Forms. DA PAM 310-1

A-2. FORMS.

The following forms pertain to this material. (Refer to DA Pamphlet 310-2 for index of blank forms.)

Standard Form 46, U.S. Government Motor Vehicle Operator's Identification Card.

Standard Form 91, Operator's Report of Motor Vehicle Accident.

DA Form 2028, Recommended Changes to Publications and Blank Forms.

Refer to DA PAM 738-750, The Army Maintenance Management Systems (TAMMS), for instructions on the use of maintenance forms pertaining to this material.

A-3. OTHER PUBLICATIONS.

The following publications contain information pertinent to the major item materiel and associated equipment.

a. Operating Vehicle

A-3. OTHER PUBLICATIONS (Continued).

Army Motor Transport: Units and Operations. FM 55-30 Manual for the Wheeled Vehicle Driver. FM 21-305 Prevention of Motor Vehicle Accidents. AR 385-55 Accident Reporting and Records AR 385-40 b. Maintenance and Repair Organizational Maintenance for M915, M916, and M920 Truck Tractors and Chassis for M917, M918, and M919. TM 9-2320-273-20 Organizational Maintenance Repair Parts and Special Tools List for M915, M916, and M920 Truck Tractors and Chassis for M917, M918, and M919. TM 9-2320-273-20 Lubrication Order for M915, M916, and M920 Truck Tractors and Chassis for M917, M918, and M919. LO 9-2320-273-12 Direct Support and General Support Repair Parts and Special Tools List for M915, M916, and M920 Truck Tractors and Chassis for M917, M918, and M919. TM 9-2320-273-34 Organizational Care, Maintenance and Repair of Pneumatic Tires and Inner Tubes . TM 9-2610~200~24	
Prevention of Motor Vehicle Accidents	
Accident Reporting and Records	
b. Maintenance and Repair Organizational Maintenance for M915, M916, and M920 Truck Tractors and Chassis for M917, M918, and M919	
Organizational Maintenance for M915, M916, and M920 Truck Tractors and Chassis for M917, M918, and M919	
Tractors and Chassis for M917, M918, and M919	
List for M915, M916, and M920 Truck Tractors and Chassis for M917, M918, and M919)
and Chassis for M917, M918, and M919 LO 9-2320-273-12 Direct Support and General Support Repair Parts and Special Tools List for M915, M916, and M920 Truck Tractors and Chassis for M917, M918, and M919	ıΡ
Tools List for M915, M916, and M920 Truck Tractors and Chassis for M917, M918, and M919	!
·	ŀΡ
	1
Description Has Bonding Techniques and Proporties of	
Description, Use, Bonding Techniques, and Properties of Adhesives	
Materiels Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Materiel and Related Materials Including Chemicals TM 9-247	
Metal Body Repair and Related Operations	
Welding Theory and Application	
Painting instructions for Field Use	
Inspection, Care, and Maintenance of Anti-friction Bearings TM 9-214	
Use of Antifreeze Solutions and Cleaning Compounds in Engine Cooling Systems	

A-3. OTHER PUBLICATIONS (Continued).

	Cooling Systems: Tactical Vehicles	TM 50-254
	Functional Grouping Codes	. TB 750-93-1
С.	Cold Weather Operation and Maintenance	
	Basic Cold Weather Manual	. FM 31-70
	Northern Operations	.FM 31-71
	Operation and Maintenance of Ordnance Materiel in Extreme Cold Weather (0°F to -65°F)	. FM 9-207
	Winterization Kits for Army Tank-Automotive Materiel	SB 9-16
d.	Decontamination	
	Chemical, Biological, and Radiological (CBR) Decontamination	. TM 3-220
	Chemical, Biological, Radiological, and Nuclear Defense	. FM 21-40
e.	Truck Bodies	
	Organizational, Direct Support and General Support Maintenance Manual for M917 Dump Truck Body	. TM 5-3805-274-24&P
	Organizational, Direct Support and General Support Maintenance Manual for M918 Bituminous Distributor Truck Body	TM 5-3895-371-24&P
	Organizational Maintenance Manual for M919 Concrete-Mobile Mixer Mixer Truck Body	TM 5-3895-372-20
	Direct Support and General Support Maintenance Manual For M919 Concrete-Mobile Mixer Truck Body	. TM 5-3895-372-34
f.	General	
	Principles of Automotive Vehicles	. TM 9-8000
	Camouflage	. FM 5-20
	Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use	. TM 750-244-6
	Administrative Storage of Equipment	. TM 740-90-1
	Color, Marking and Camouflage Painting of Military Vehicles	. TB 43-0209
	Preservation, Packaging, and Packing of Military Supplies and Equipment	TM 38-230-1 & TM 38-230-2
	Shipment and Limited Storage	MI L-V-62038
	Tracked Vehicles, Wheeled Vehicles, and Component parts	. SB 740-98-1
g. '	Warranty	. TB 9-2300-295-15/17

APPENDIX B MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

THE ARMY MAINTENANCE SYSTEM (AMS)

This introduction provides a general explanation of all maintenance and repair functions authorized at the two maintenance levels under the Two-Level Maintenance System concept.

The MAC (immediately following the introduction) designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component shall be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column 4 as:

Field - includes two subcolumns, Unit C (operator/crew) and O (unit/organizational

maintenance) and Direct Support (F) maintenance

Sustainment - includes two subcolumns, general support (H) and depot (D).

The tools and test equipment requirements (immediately following the MAC) list the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC.

The remarks (immediately following the tools and test equipment requirements) contain supplemental instructions and explanatory notes for a particular maintenance function.

MAINTENANCE FUNCTIONS

Maintenance functions are limited to and defined as follows:

- 1. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).
- 2. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards on a scheduled basis, i.e., load testing of lift devices and hydrostatic testing of pressure hoses.
- Service. Operations required periodically to keep an item in proper operating condition: e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.
- Adjust. To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.
- 5. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

MAINTENANCE FUNCTIONS - Continued

- 6. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments of test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.
- Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.
- 8. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and assigned maintenance level is shown as the third position code of the Source, Maintenance and Recoverability (SMR) code.

NOTE

The following definitions are applicable to the "repair" maintenance function:

Services. Inspect, test, service, adjust, align, calibrate, and/or replace.

Fault location/troubleshooting. The process of investigating and detecting the cause of equipment malfunctioning: the act of isolating a fault within a system or Unit Under Test (UUT).

Disassembly/assembly. The step-by-step breakdown (taking apart) of a spare/functional group coded item to the level of its least component, that is assigned an SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).

Actions. Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

- Repair. The application of maintenance services, including fault location/troubleshooting, 9. removal/installation, disassembly/assembly procedures, and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.
- Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.
- Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

EXPLANATION OF COLUMNS IN THE MAC

Column 1, Group Number. Column 1 lists FGC numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).

Column 2, Component/Assembly. Column 2 contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

Column 3, Maintenance Function. Column 3 lists the functions to be performed on the item listed in Column 2. (For a detailed explanation of these functions, refer to "Maintenance Functions" outlined above.)

EXPLANATION OF COLUMNS IN THE MAC - Continued

Column 4, Maintenance Level. Column 4 specifies each level of maintenance authorized to perform each function listed in Column 3, by indicating work time required (expressed as manhours in whole hours or decimals) in the appropriate subcolumn. This work time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work time figures are to be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC. The symbol designations for the various maintenance levels are as follows:

Field:

C Operator or crew maintenance

O Unit maintenace

F Direct support maintenance

Sustainment:

H General support maintenance

D Depot maintenance

NOTE

The "L" maintenance level is not included in Column 4 of the MAC. Functions to this level of maintenance are identified by a work time figure in the "H" column of Column 4, and an associated reference code is used in the REMARKS Column 6. This code is keyed to the remarks and the SRA complete repair application is explained there.

Column 5, Tools and Equipment Reference Code. Column 5 specifies, by code, those common tool sets (not individual tools), common Test, Measurement and Diagnostic Equipment (TMDE), and special tools, special TMDE and special support equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.

Column 6, Remarks Code. When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks table entries.

EXPLANATION OF COLUMNS IN THE TOOLS AND TEST EQUIPMENT REQUIPMENTS

Column 1, Tool or Test Equipment Reference Code. The tool or test equipment reference code correlates with a code used in Column 5 of the MAC.

Column 2, Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

Column 3, Nomenclature. Name or identification of the tool or test equipment.

Column 4, National Stock Number (NSN). The NSN of the tool or test equipment.

Column 5, Tool Number. The manufacturer's part number, model number, or type number.

Explanation of Columns in the Remarks

Column 1, Remarks Code. The code recorded in Column 6 of the MAC.

Column 2, Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC.

Section II. MAINTENANCE ALLOCATION CHART

(1) Group	(2) Component/	(3) Maintena	(3) (4) Maintena Maintenance Level						(6) Remarks
Number	Assembly	nce		Field	nenanc		inment	Tools and	Kemarks
		Function		nit	DS	GS	Depot	Equipment	
			С	0	F	Н	D		
01	ENGINE	Repair Adjust Test	C	0	3.8 0.4	19.2		2-3-4	
0100	Engine (Diesel)	Service Replace Repair	2.0			11.0 65.0		1 thru 77- 81-84-85-97	
	Engine Mount	Inspect Replace		0.2	0.4			99 thru 180- 189 thru 221	
0101	Cylinder Head	Inspect Replace Repair			1.0 7.0	10.4		2 thru 44- 50-81	
	Engine Block	Inspect Repair				2.0 40.0		99 thru 116- 128-129	
	Cylinder and Sleeve Assembly	Inspect Replace				0.5 18.0		99 thru 101- 128	
0102	Crankshaft & Main Bearings	Inspect Replace				0.5 17.3		117 thru 119	
	Main Seals	Inspect Replace			0.1 20.0			120 thru 127-194- 195	
	Vibration Damper	Inspect Replace			0.5 1.0				
0103	Flywheel Assembly	Replace				13.0		45	Requires removing Trans/Flex
0104	Connecting Rods, Bearings And Pistons Assembly	Inspect Replace Repair				0.3 27.0 8.0		207 thru 215-221	Plate
0105	Valves	Inspect Adjust Replace			0.8 1.8	14.0		71 thru 77 2	
	Cam Shaft and Bearing	Inspect Replace				0.8 27.0		197 thru 206	
	Cam Follower Housing	Inspect Replace				0.2 12.0		46 thru 49- 51thru 54- 81	

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group	(2) Component/	(3) Maintenance			(4) ntenanc		(5) Tools	(6) Remarks	
Number	Assembly	Function		Field		Susta	ainment	and Equipment	
			ι	Jnit	DS	GS	Depot		
			С	0	F	Н	D		
01	ENGINE (Continued)								
	Cam Follower	Inspect Replace				0.2 14.0			
	Push Tubes (Valve)	Inspect Replace				0.1 8.0			
	Timing Gear	Inspect Replace				0.6 24.0			
	Rocker Arm Assembly	Inspect Replace			0.6 2.5				
	Valve Cover and Gasket	Inspect Replace		0.1 0.5					
0106	Oil Pump	Inspect Replace Repair			1.5 2.5	3.0			
	Oil Filter	Service Replace		0.6 0.2				130 thru	
	Oil Filter Adapter	Replace			0.8			132-143	
	Bypass Oil Filter	Service Replace		0.6 0.6					
	Oil Pan	Inspect Replace Repair	0.1		2.0 1.3				
	External Lines	Inspect Replace		0.1 1.0					
	Oil Breather	Inspect Service Replace		0.1 0.2 0.2					
	Oil Cooler	Inspect Replace		0.1	3.0			55	
	Oil Pressure Regulator	Inspect Test Replace			0.1 0.8 0.2				
	Level Gage (dipstick)	Replace		0.1					
0108	Aftercooler	Inspect Repair Replace		0.1	2.0 2.5				

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly					e Level	ainment	(5) Tools and	(6) Remarks
Number	Assembly	i dilotion	U	Unit		GS	Depot	Equipment	
			С	0	F	Н	D		
01	ENGINE (Continued)								
	Exhaust Manifold	Inspect Replace		0.1	2.8				
0109	Accessory Drive	Inspect Repair Replace			0.5	2.0 4.5		56 thru 65	
0112	Engine Retarder	Inspect Repair Replace Adjust		0.5	3.0 1.5	6.0		81	
03	FUEL SYSTEM								
0301	Fuel Injector Assembly	Test Adjust Replace Calibrate Repair			0.8 4.0 4.0		1.0 1.8	71 thru 77- 84 3 thru 12-84- 152	
0302	Fuel Pump Assembly Service of Filter & Screen	Inspect Service Test Replace Calibrate		0.5 0.2	4.8 2.0	3.5		151-154 166-171-188 144-150 196 159,160, 166 thru 171,	
		Repair				8.9		174, 192 155-156 158, 161 thru 164 165-172-173 177 thru 179 189 thru 191 193	
0302	Engine Fuel Lines and Fittings	Inspect Replace		0.5 1.5				216 thru 220	
0304	Air Cleaner Assembly	Inspect Service Replace	0.1	0.2 0.5					
	Air Cleaner Restriction Indicator	Inspect Replace	0.1	0.2					
0305	Turbocharger	Inspect Replace Repair	0.1		1.8	3.0		175-176-219	

TM 9-2320-273-20

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/	(3) (4) Maintenance Maintenance Level Function Field Sustainment				(5) Tools and	(6) Remarks			
Number	Assembly	Function						Equipment		
			U	nit	DS	GS	Depot			
03	FUEL		С	0	F	Н	D			
03	SYSTEM(Continued)									
	Turbocharger Air Inlet	Inspect Replace		0.1 0.3						
0306	Fuel Tank	Inspect Service Repair	0.1 0.2			1.5			Requires Welding	
		Replace		2.0					vveiding	
0309	Fuel Filter	Inspect Service Replace	0.1	0.3 0.3						
0311	Ether Quick-Start Kit	Inspect Service Replace Repair	0.1	0.3 0.5 0.5						
0312	Accelerator Pedal and Linkage	Inspect Replace Repair		0.1 0.8 0.5						
	Throttle Control and Linkage	Inspect Replace Adjust		1.0 0.3 0.2						
04	EXHAUST SYSTEM									
	Muffler	Inspect Replace	0.1	0.5						
	Exhaust Pipe	Inspect Replace	0.1	0.4						
	Flex Tube	Inspect Replace	0.1	0.4						
	Expansion Tube	Inspect Replace	0.1	0.4						
	Tailpipe	Inspect Replace	0.1	0.2						
05	COOLING SYSTEM			J						
0501	Draincock	Inspect Replace	0.1	0.2						

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Nu		(3) Maintenance						(5) Tools	(6) Remarks
-	Assembly	Function		Field			ainment	and Equipment	
			u	Init	DS	GS	Depot	-quipilient	
			С	0	F	Н	D		
05	COOLING SYSTEM (Continued)				-				
	Radiator Assembly	Inspect Service Replace Repair Test	0.2 0.2	3.0	2.0 0.3				
0502	Fan Shrouds	Inspect Replace		0.1 1.5					
0503	Lines, Fittings, Hoses	Inspect Replace	0.1	2.5					
	Thermostat	Replace		1.0				97	
	Thermostat Housing	Replace		1.0					
	Water Manifold	Replace Repair		2.0 2.0					
	Water Control Valve	Inspect Replace		0.2 0.4					
0504	Water Pump	Inspect Replace Repair	0.1	3.0	2.0			56 thru 70	
0505	Fan	Inspect Replace	0.1	0.5					
	Fan Clutch	Inspect Replace	0.1		1.5				
	Water Pump Idler Pulley	Replace		0.5					
	Crankshaft Pulley	Replace		0.1					
	Accessory Drive Belts	Inspect Adjust Replace		0.2 0.2 1.0					
0507	Fan Clutch Actuator	Inspect Replace	0.2	0.5					
	Fan Clutch Actuator Hoses	Inspect Replace	0.1	0.5					

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group	(2) Component/	(3) Maintenance						(5) Tools	(6) Remarks
Number	Assembly	Function		Field		Sust	ainment	and Equipment	
			U	nit	DS	GS	Depot	_qa.p	
			С	0	F	н	D		
06	ELECTRICAL SYSTEM				-				
0601	Alternator & Regulator (Internal)	Inspect Replace Adjust Test Repair	0.2	1.0		0.5 0.5 2.0		78-79	
	Alternator Drive Belts	Inspect Adjust Replace	0.1	0.1 0.3					
0603	Starter Motor/Solenoid	Replace Repair		0.9		1.8		80	
	Starter Magnetic Switch	Inspect Replace	0.1	0.5					
0607	Instruments-LH Cluster	Replace		0.5					
0608	Engine Run Switch	Replace		0.5					
	Start Switch	Replace		0.5					
	Ether Quick-Start Button	Replace		0.5					
	Clearance Lamp	Replace		0.5					
	Headlight	Replace		0.5					
	Blackout Switch	Replace		0.5					
	Engine Retarder Selector Switch	Replace		0.5					
	Engine Retarder Foot Switch	Replace		0.5					
	Turn Signal Control	Replace		0.5					
	Backup Alarm Override	Replace		0.5				916/920	
	Work Lamp Switch	Replace		0.5					
	Heater Fan Switch	Replace		0.5					
	Dimmer Switch	Replace		0.5					
0609	Service Head Lamp	Replace		0.6					

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1 Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level Field Sustainment					(5) Tools and	(6) Remarks
	,		ı	Init	DS	GS	Depot	Equipment	
			С	0	F	Н	D		
06	ELECTRICAL SYSTEM (Continued)				•				
	Marker & Turn Signal Lamps	Replace		0.3					
	Clearance Lamps	Replace		0.3					
	Tail, Brake, Turn Signal, Stop, and Backup Lights	Replace		0.3					
	Work Lamps	Replace		0.3					916 & 920
	Blackout Head Lamp	Replace		0.3					920
	Blackout Tail & Stop Lamps	Replace		0.3					
	Dome Lamp & Switch	Replace		0.3					
	Instrument Illumination Lamps	Replace		0.3					
0610	Sending Units								
	Fuel Level	Replace		0.4					
	Water Temperature	Replace		0.2					
	Oil Pressure	Replace		0.2					
	Transmission Oil Temperature	Replace		0.2					
	Switches and Relays								
	High Engine Water Temperature	Replace		0.2					
	Low Engine Oil Pressure	Replace		0.2					
	Low Brake Air Pressure	Replace		0.2					
	Backup	Replace		0.2				916-920	
0610	Park Brake Engaged	Replace		0.2					
	Turn Signal Flasher	Replace		0.2					
	PTO Engaged	Replace		0.2				916-920	

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group	Component/	(3) Maintenance	(4) Maintenance Level				(5) Tools	(6) Remarks	
Number	Assembly	Function		Field		Sus	tainment	and Equipment	
			U	nit	DS	GS	Depot	4.54	
			С	0	F	н	D		
06	ELECTRICAL SYSTEM (Continued)								
	Neutral Safety Switch	Replace		0.2					
	Differential Lockout Engaged	Replace		0.2					
	Instrument Panel Circuit Breakers	Replace		0.2					
	Instrument Panel Relays	Replace		0.2					
0611	Horn	Replace		0.4					
	Horn Button	Replace		0.5					
	Low Air Buzzer	Replace		0.2					
	Backup Alarm	Replace		0.2					
0612	Batteries, Box & Cables								
	Batteries	Inspect Replace	0.5	0.6					
	Battery Box	Inspect Replace Repair	0.2	1.5 1.0					
	Battery Cable	Inspect Replace Repair	0.2	0.5 0.3					
0613	Chassis Wiring Harnesses	Inspect Replace Repair	0.2	3.5 1.0					
0617	Trailer Coupling (Electric)	Inspect Replace	0.2	0.2					
07	TRANSMISSION								
0706	Ratio Selector	Inspect Adjust Replace Test	0.1	0.3 0.6			0.7		Lots of Little Parts
	Air Control Line	Repair Replace		0.5		2.0			
3-12	Change 5	, topiaoo	I	0.0	1	I	I	I	1

B-12 Change 5

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group	(2) Component/	(3) Maintenance	e Maintenance Level Field Sustainmen					(5) Tools	(6) Remarks
Number	Assembly	Function		Field		Susta	unment	and Equipment	
			U	Init	DS	GS	Depot		
			С	0	F	Н	D		
07	TRANSMISSION (Continued)								
	Control Group	Inspect Adjust Replace Test Repair	0.3		2.3	0.5 1.0 2.5			
0710	Transmission	Inspect Service Replace Repair	0.1	2.0	8.0 4.0	22.0		183 thru 185	Includes Strainer
	Pump, Oil	Inspect			0.2			165	
	Oil Cooler	Inspect Replace		0.2 0.1					
08	POWER TRANSFER								
0801	Transfer Assembly	Inspect Service Replace Repair	0.1	0.5	4.0	3.0			
0803	Power Transfer/Diff. Lockout Control	Replace		0.5					
09	PROPELLER SHAFTS & UNIVERSAL JOINTS								
	Universal Joints	Inspect Service Replace		0.3 0.2 1.4					
	Propeller Shafts	Inspect Service Replace		0.3 0.2 1.0					
10	FRONT AXLE								
1000	Driving Axle Assembly	Inspect Service Replace Repair	0.2	1.0	6.0	40.0			M916 thru M920

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function			(4) ntenanc		James 1	(5) Tools and	(6) Remarks
Number	Assembly	Function		Field			inment	and Equipment	
			U	nit	DS	GS	Depot		
			С	0	F	Н	D		
10	FRONT AXLE (Continued)								
	Non-Driving Axle Assembly	Inspect Service Repair Replace	0.1	0.3	4.0	6.0			M915 Only
	Bearings, Axle Shaft and Flanges	Inspect Replace	0.1	4.0		10.0		98	
1002	Differential Assembly	Replace Repair Overhaul			4.5 8.0	17.5			M916 thru M920
1004	Front Axle End Assembly	Inspect Replace	0.5	2.0					M915 Only
11	REAR AXLE								
1100	Rear Bogie Axle	Inspect Service Replace Repair Overhaul	0.1	0.7	4.0	4.0 17.5			M915 Only (include filter)
	Rear Axle Housing	Inspect Replace	0.1		10.0				M916 thru
1102	Differential and Carrier	Replace Repair Overhaul			9.8	9.8 11.8			M920
	Filter	Inspect Replace	0.1	0.2					
	Flange, Companion Drive Pinion	Inspect Replace	0.1		1.0			87-88-90 thru 95-186-	
	Seal, Oil, Drive Pinion Bearing	Inspect Replace	0.1		1.5			187	
1104	Rear Axle Shaft, Right or Left	Replace		3.5					
1105	Differential Lockout Air Chamber	Repair Replace			1.0 1.0				

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group	(2) Component/	(3) Maintenance			(4) ntenanc		(5) Tools	(6) Remarks	
Number	Assembly	Function		Field	1	Sust	ainment	and Equipment	
			ι	Jnit	DS	GS	Depot	Equipment	
			С	0	F	н	D		
11	REAR AXLE (Continued)								
1108	Pusher Axle	Inspect Service Replace Repair	0.1	2.0	6.0	6.0			M917, M919 & M920
1108	Air Bags	Replace		1.0					
	Lift Cylinders	Replace		1.0					
12	BRAKES								
1201	Park Brake Assembly	Inspect Adjust Repair	0.1	0.5	0.8				
		Replace		1.4					
1202	Foundation Brakes								
	Brake Shoe Assemblies	Inspect Adjust		1.0 0.5					Rear
		Repair Replace		3.0	3.5				Only
	Slack Adjuster	Replace		0.3					Rear Only
	S-Cam Mechanism	Replace		3.0					Rear Only
1208	Air Lines and Fittings (Truck Tractor)	Inspect Replace	0.1	2.2					Individual
	Air Reservoirs	Inspect Service	0.2 0.1						Lines
		Replace		1.1					
	Automatic Drain	Replace		0.2					Supply Reservoir Only
1208	Air Brake Chambers	Adjust Replace Repair		0.2 2.0 2.2					Spring Brake Chamber Only
	Double Brake Chambers	Adjust Replace Repair		0.2 2.0		2.2			

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function		Mair Field	(4) ntenanc		I tainment	(5) Tools and	(6) Remarks
	,				DS	GS		Equipment	
				nit			Depot		
12	BRAKES (Continued)		С	0	F	Н	D		
	Wedge and Actuator Assemblies	Replace		2.0					Front and Pusher Axle Only
1208	Trailer Hand Brake	Inspect Replace Repair	0.1	1.8 1.5					Spring Brake Chamber Only
	Dual Brake Valve Pedal	Replace		1.5					
	Trailer Protection Valve	Replace		1.5					
	Relay Valve	Replace		1.5					
	Quick Release	Replace		1.5					
	Limiting Valve	Replace		1.5					
	Double Check Valves	Replace		1.5					
1209	Air Compressor	Replace Repair			4.0	2.0		85-177 thru 180-219	
	Air Compressor Governor	Adjust Replace			1.0 0.5				
	Air Dryer	Inspect Service Replace	0.1 0.2	1.5 0.8					
1211	Trailer Connector Brake Lines and Couplings	Inspect Replace Repair	0.1	1.0	1.3				
13	WHEELS								
1300	Wheel Alinement	Inspect Adjust		0.8 0.5					
1311	Hub Assemblies	Replace		0.5					
	Drums	Replace Repair		1.5		1.5			

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group	Component/	(3) Maintenance					(5) Tools	(6) Remarks	
Number	Assembly	Function		Field			ainment	and Equipment	
			U	nit	DS	GS	Depot		
13	WHEELS (Continued)		С	0	F	Н	D		
	Bearings and Seals	Service Replace		1.5 1.5				82-83-96-98	Inner and Outer Bearings and Seals
	Wheel Assembly	Inspect Replace Service	0.1 0.5 0.1						Include Tire
1313	Tire and Tube Assembly	Replace Repair		2.1 1.3					
14	STEERING								
1401	Steering Wheel	Inspect Replace	0.1	0.5					
	Upper Steering Column	Replace			3.0				
	Lower Steering Column	Repair Replace Repair		1.0 0.5		3.5			
	Drag Links	Inspect Adjust Replace Repair	0.1	0.3 1.0 1.5					
	Pitman Arm	Replace		0.8					
	Tie Rod	Inspect Adjust Replace Repair	0.1	1.0 1.5 1.0					
1410	Steering Gear	Adjust Replace Repair			0.2 1.5	2.0			
	Hydraulic Steering Pump and Reservoir Assembly	Inspect Service Replace Repair	0.1 0.2	1.0		2.0			
1411	Power Steering Cylinder	Inspect Replace Repair	0.1	2.0		1.5			916-920

TM 9-2320-273-20

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function		Maiı Field	(4) ntenanc			(5) Tools and	(6) Remarks
Number	Assembly	Function		Field		Sus	tainment	Equipment	
			U	nit	DS	GS	Depot	-	
			С	0	F	Н	D		
15	FRAME ASSEMBLY								
1501	Frame	Inspect	0.5						
	Bumper	Replace		1.0					
1503	Pintle Hook Assembly	Inspect Replace Repair	0.1	0.6 0.2					
1503	Towing Eyes	Inspect Replace	0.1	0.5					
1504	Spare Wheel Carrier	Replace			1.5				
1506	Fifth Wheel								
	Fifth Wheel Assembly	Inspect Adjust Service Repair Replace	0.5	1.0 0.5 4.0		3.0		181 182	M915, M916 and M920
16	SPRINGS, SHOCK ABSORBERS, AND TORQUE RODS								
1601	Springs	Inspect Service Replace Repair	0.1	0.2	4.0	6.0			
	Front Spring Pins	Replace		0.1					
1604	Shock Absorbers	Inspect Replace	0.1	1.0					Non- Driving Front Axle (M915) and Pusher Axle (M917, M919 and
1605	Torque Rods	Replace		1.0					M920)

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level Field Sustainment					(5) Tools and	(6) Remarks
			U	nit	DS	GS	Depot	Equipment	
			С	0	F	Н	D		
18	CAB AND BODY				-				
1801	Cab Mounts	Inspect Replace	0.1		1.0				
	Cab	Inspect	0.1						
	Doors	Inspect Replace Repair	0.1		2.0 1.0				
1801	Steps	Inspect Repair	0.1			1.0			Requires Welding
	Hood Panels and Crossbar Support	Inspect Replace Repair	0.1			0.5 0.2			
	Ventilators & Control	Inspect Replace Repair	0.1	0.2 0.5					
	Grille	Inspect Replace Repair	0.1	0.5 0.5					
	Splash Shields	Inspect Replace	0.1	0.3					
1802	Fenders	Inspect Replace Repair	0.1	1.0 1.5	1.5				
	Windshield	Inspect Replace	0.1		1.2			89	
	Seats	Inspect Replace	0.1	0.5	1.2			00	
1808	Stowage Box	Repair Inspect Replace Repair	0.1	1.0	0.5				
2001	WINCH AND POWER TAKEOFF								
	Winch	Inspect Service Replace Repair	0.3 0.3	0.4	4.0	8.0		86	M916 and M920

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function		Maiı Field	(4) ntenanc		I ainment	(5) Tools and	(6) Remarks
Number	Assembly	Tunction	U	Init	DS	GS	Depot	Equipment	
			С	0	F	н	D		
2001	WINCH AND POWER TAKEOFF (Continued)				-				
	Cable Assemblies	Inspect Service Replace	0.2	1.0 1.5					
	Controls, Valves	Replace		0.5					
	Hydraulic Lines and Fittings	Replace Repair		2.0	2.0				
	Hydraulic Motor	Inspect Replace Repair	0.2	3.0		1.5			
	Hydraulic Pump	Inspect Replace Repair	0.1	3.0		1.0			
	Reservoir, In-Line Filter, and Screen	Replace Service		4.0 1.0					
2004	Power Takeoff	Inspect Replace Repair	0.2		1.0	2.0		M916 thru M920	
	Power Takeoff Adapter	Replace			1.0				
	Power Takeoff Linkage	Replace		0.8					
	Power Takeoff Coupling	Replace		0.5					
22	ACCESSORY ITEMS								
	Windshield Washer Motors	Replace		0.8					
	Windshield Wiper Controls	Replace		0.3					
	Arm and Wiper Blades	Inspect Replace	0.1	0.2					
	Mirrors	Inspect Replace	0.1	0.3					
	Windshield Washer	Inspect Service Replace	0.1 0.2	0.5					
B-20 Ch	Windshield Washer Control	Replace		0.3					

B-20 Change 5

Section II. MAINTENANCE ALLOCATION CHART (continued)

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	Main Field		(4) ntenanc		I ainment	(5) Tools and	(6) Remarks
			U	nit	DS	GS	Depot	Equipment	
			С	0	F	н	D		
22	ACCESSORY ITEMS (Continued)								
	Air Horn and Control Valve	Replace		0.3					
2207	Personnel Heater	Inspect Replace Repair	0.1	2.0		1.0			
	Air Ducts	Inspect Replace	0.1	0.8					
	Heater Control Valve and Cable	Adjust Replace		0.2 0.5					
	Heater Control Panel	Replace Repair		1.0	1.0				
2210	Data and Instruction Plates	Inspect Replace	0.1	0.5					
47	GAGES NON-ELECTRIC								
4701	Tachograph	Service Replace		0.2 0.3					
	Speedometer Cable	Replace		0.4					
	Tachometer Cable	Replace		0.4					
4702	Pressure Gages	Inspect Replace	0.1	0.5					
	Gages	Inspect Replace	0.1	0.5					

TM 9-2320-273-20

Section III. TOOLS AND TEST EQUIPMENT REQUIREMENTS

Tools or Test Equipment				
Reference	Maintenance		National	
Code	Level	Nomenclature	Stock Number	Tool Number
1	FΗ	Checking Tool, Blow-By		3375150
2	FΗ	Reamer, Valve Guide	5110-00-980-7347	ST-646
3	F H	Cutting Tool, Bead	5110-00-932-2089	ST-788
4	F H	Expander, Tube, Roller	3441-00-922-6699	ST-880
5	FΗ	Cage		ST-880-1
6	FΗ	Roll		ST-880-2
7	FΗ	Nut, Thrust		ST-880-6
8	FΗ	Mandrel		ST-880-7
9	FΗ	Cutter, Injector Sleeve	4910-00-981-3105	ST-884
10	FΗ	Holder		ST-884-1
11	FΗ	Cutter		ST-884-3
12	FΗ	Pilot		ST-884-6
13	FΗ	Tool, Cylinder Head	4910-00-999-1499	ST-913
14	FΗ	Lockscrew		ST-913-1
15	FΗ	Bearing		ST-913-7
16	FΗ	Plug, Locking		ST-913-11
17	FΗ	Insert, Fiber		ST-913-18
18	FΗ	Screw Assembly, Adjusting		ST-913-23
19	FΗ	Tool Holder		ST-913-14
20	FΗ	Tool Bit		ST-913-17
21	FΗ	Tool, Grooving	5120-00-178-0948	ST-1100
22	FΗ	Body (5-1/2 In. Bore)		ST-1100-10
23	FΗ	Nut, Adjusting (1 1/4-20 Thread)		ST-1100-7
24	FΗ	Capscrew (1/4-28 x 3/16 ln.)		ST-1100-6
25	FΗ	Sleeve, Rod		ST-1100-8
26	FΗ	Rod, Tool Adjusting		ST-1100-11
27	FΗ	Spring, Rod		ST-1100-9
28	FΗ	Cap, Tool Setting		ST-1100-14
29	FΗ	Cutting Tool		ST-1100-13
30	FΗ	Spring Tool		ST-1100-12
31	FΗ	Sleeve Injector	4910-00-150-5858	ST-1140
32	FΗ	Holding Tool, Injector Sleeve	5120-00-104-1795	ST-1179
33	FΗ	Driver Injector Sleeve	5120-00-981-3108	ST-1227
34	FΗ	Puller, Injector Sleeve	5120-00-113-5271	ST-1244
35	FΗ	Tip, Extractor		ST-1244-7
36	FΗ	Rod		ST-1244-2

Tool or Test Equipment Number Reference Code	Maintenance Category	Nomenclature	National/Nato Stock Number	Tool
37	FΗ	Collar, Forming		ST-1244-6
38	FΗ	Spacer		ST-1244-9
39	FΗ	Bridge, Support		ST-1244-1
40	FΗ	Washer, Thrust		ST-1244-5
41	FΗ	Nut (I-8 Thread)		ST-1244-4
42	FΗ	Nut (9/16-12 Thread)		ST-1244-3
43	FΗ	Driver		ST-1244-8
44	FΗ	Driver, Valve Guide		3375282
45	FΗ	Attachment, Dial Gage		ST-1325
46	FΗ	Bushing, Block and Mandrel, Lever	5180-00-916-1813	ST-249
47	FΗ	Mandrel		ST-249-1
48	FΗ	Mandrel		ST-249-2
49	FΗ	Sleeve		ST-249-3
50	FΗ	Spacer, Crosshead Guide	4910-00-150-3797	ST-633
51	FΗ	Mandrel Set, Machine	3460-00-499-1210	ST-691
52	FΗ	Mandrel		ST-691-1
53	FΗ	Block		ST-691-2
54	FΗ	Mandrel		ST-691-3
55	FΗ	Mandrel, "O" Ring, Lubricating Oil Cooler		ST-1218
56	FΗ	Pulley Assembly, Tool	5180-00-944-0374	ST-386
57	FΗ	Arbor		ST-386-2
58	FΗ	Nut		ST-386-3
59	FΗ	Adapter, Ball, Thrust Bearing		ST-386-11
60	FΗ	Spacer		ST-386-5
61	FΗ	Adapter		3375205
62	FΗ	Adapter (2-1/4 In. X 7/8 in. Dia.)		ST-386-10
63	FΗ	Adapter (2-1/4 in. X 1 In. Dia.)		ST-386-9
64	FΗ	Adapter (2-1/4 In. X 1 In. Dia.)		ST-386-8
65	FΗ	Adapter (1-7/8 In. X 1 In. Dia.)		ST-386-6
66	FΗ	Mandrel, Water Pump Seal		ST-658
67	FΗ	Mandrel, Water Pump Seal	5120-00-159-8916	ST-659
68	FΗ	Fixture, Bearing Disassembly		ST-1114
69	FΗ	Water Pump Seal Driver		ST-1159
70	FΗ	Driver, Water Pump Drive Shaft Oil Seal		3375180
71	FΗ	Adapter, Torque Wrench	5120-00-103-4687	ST-669
72	FΗ	Driver, 3/8 In., Plastic Handle		F-40A

[Section III TOOL & TEST EQUIPMENT REQUIREMENTS (Continued).					
Tool or Test Equipment Number Reference Code	Maintenance Category	Nomenclature	National/Nato Stock Number	Tool				
73	FΗ	Handle		ST-699-1				
74	FΗ	Blade, Screwdriver 1/2 In. X 0.062 In.		M-1302 A-5				
75	FΗ	Blade, Screwdriver 1/4 In. X 0.032 In.		TM-82				
76	FΗ	Socket, 3/4 In. Deep Double Hex		M-1302B-24				
77	FΗ	Socket, 9/1 6 In. Deep Double Hex		M-1302B-18				
78	FΗ	Rod, Expanding		CG-40-4				
79	FΗ	Collet 43/64 to 52/64		CG-40-11				
80	FΗ	Socket 1/4 In. 12 Point, 1/4 In. Drive		STMD-8				
81	FΗ	Socket, Jacobs Brake		B1465A				
82	OF H	Installing Tool, Seal		RD259A				
83	OFH	Handle, Seal Installing Tool		RD263				
84	FΗ	Fixture, Injector Timing	4910-00-712-0537	ST-593				
85	FΗ	Wrench, Air Compressor	5120-01-072-2952	3375159				
86	FΗ	Bar, Bearing Puller		11074				
87	FΗ	Yoke Installer		J-26422-10				
88	FΗ	Wrench, Differential Adjusting Nut		J-972				
89	FΗ	Tool, Remove-Replace Windshield Moulding	5120-00-279-8422	CPR109701				
90	FΗ	Tool, Yoke Installer	4120-01-014-0017	J-26422				
91	FΗ	Shaft, 1 1/4-12 Thread		J-26422-2				
92	FΗ	Nut		J-26422-3				
93	FΗ	Shaft 1 1/4-12		J-26422-4				
94	FΗ	Sleeve		J-26422-1				
95	FΗ	Wear Sleeve Installation Tool		J-26424				
96	OF H	Socket, Pusher Axle 3 3/16 In.		J-7757-2				
97	OF H	Thermostat Seal Mandrel		ST-1225				
98	OF H	Socket, Wheel Bearing		1902				
99	Н	Tool, Counterbore	5120-00-150-7488	ST-1295				
100	Н	Holder, Tool	5120-00-150-7489	ST-1065				
101	Н	Tool Bit, Counterbore		ST-1059-17				
102	Н	Boring Tool, Liner Counterbore		ST-1168				
103	Н	Bearing, Drive		ST-1168-4				
104	Н	Screw, Drive		ST-1168-6				
105	Н	Shaft, Drive		ST-1168-3				
106	Н	Sprocket, Drive		ST-1168-5				
107	Н	Chain, Drive		ST-1168-7				
108	Н	Sprocket, Drive		ST-1168-10				
109	Н	Tool Bit		ST-1168-19				
110	Н	Ring, Snap, Drive Shaft		ST-1168-8				

Tool or Test Equipment Number Reference Code	Maintenance Category	Nomenclature	National/Nato Stock Number	Tool
111	Н	Ring, Snap, Drive Bearing		ST-1168-9
112	Н	Counterbore Tool Liner		ST-1255
113	Н	Chamfer Tool, Lower Bore Sleeve		ST-1318
114	Н	Tool Bit		ST-1318-23
115	Н	Bore Tool, Lower Liner		ST-1287
116	Н	Tool Bit		ST-1287-10
117	Н	Puller, Shoulder Bolt, Gear Crank		3375081
118	Н	Puller, Gear, Crank Bridge Assembly		3375075
119	Н	Puller, Jaw, Crankshaft Gear		3375077
120	Н	Puller-installer, Oil Seal		ST-1259
121	Н	Spacer Ring (1-7/16 In.)		ST-1259-4
122	Н	Plate, Top		ST-1259-1
123	Н	Spacer Ring (3/16 In.)		ST-1259-2
124	Н	Screw, Allen Head (1/4-20 X 1/2 ln.)		ST-1259-3
125	Н	Screw, Main Puller (1/2-13 X 2 In.)		ST-1259-7
126	Н	Screw, Allen Head (1/4-20 X 1-3/4 In.)		ST-1259-5
127	Н	Screw, Seal Puller		ST-1259-6
128	Н	Clamp, Cylinder Liner	5120-00-104-1816	ST-1184
129	Н	Driver		3375153
130	Н	Gear & Spacer Mandrel, Lubricating Oil Pump		ST-1157
131	Н	Bushing Mandrel, Lubricating Pump		ST-1158
132	Н	Bushing Tool, Lubrication Pump Body Cover		3375206
133	Н	Bushing, Guide		3375223
134	Н	Adapter, Drive		3375229
135	Н	Housing, Main Bore		3375220
136	Н	Knob, Plastic		3375228
137	Н	Dial Indicator		3375227
138	Н	Tool Bit		3375226
139	Н	Tool Bit		3375225
140	Н	Tool Bit		3375207
141	Н	Knob, Cutter Adjusting		3375224
142	Н	Bushing, Guide		3375221
143	Н	Bushing, Guide		3375222
144	Н	Orifice Torque	5120-01-072-2955	ST-1090
145	Н	Driver, Torque Wrench		ST-1090-1
146	Н	Screwdriver		ST-1090-2
147	Н	Screw, Set		ST-1090-4
148	Н	Wrench, Allen, 5/64 In.		ST-1090-3
149	Н	Checking Tool, Injector Protrusion		ST-981

Tool or Test Equipment Number Reference Code	Section III TOOL & TEST EQUIPMENT REQUIREMENTS (Continued).					
151	Equipment Number		Nomenclature		Tool	
152	150	Н	Torque Tool, Injector		ST-1145	
153	151	Н	Fixture, Top Stop Injector Setting			
154	152	Н				
155	153	Н	Crowsfoot, 1-3/8 In., Locknut Wrench			
156	154	Н	Wrench, Inch Pound Torque			
157	155	Н	Block, Weight Carrier		ST-1231	
158	156	Н	Puller, Tachometer Drive			
159	157	Н	Collar			
160 H Gasket 3375015 161 H Front Cover, Main Shaft Assembly 3375175 162 H Driver, Front Cover 3375174 163 H Driver, Main Shaft Seal 3375174 164 H Installation Tool, Main Shaft & Bearing 3375172 165 H Installation Tool, Throttle Shaft Ball 3375172 166 H Adjust Kit, AFC Fuel Pump 3375189 167 H Installation Tool, No Air Screw "O" Ring 3375148 168 H Tool, AFC No Air Adjusting 3375140 169 H Installation Tool, Glyd Ring 3375147 170 H Forming Tool, Glyd Ring 3375137 172 H Installation Tool, Cast Governor Weight Carrier 3375271 173 H Mandrel, Tachometer Drive Cup Plug 3375271 174 H Throttle Travel Template 5120-01-074-0020 3375355 175 H Turbo Support Block ST-608 ST-608 176	158	Н	Collet			
161	159	Н	Adapter Plate, Fuel Filter			
162 H Driver, Front Cover 3375174 163 H Driver, Main Shaft Seal 3375173 164 H Installation Tool, Main Shaft & Bearing 3375172 165 H Installation Tool, Throttle Shaft Ball 3375172 166 H Adjust Kit, AFC Fuel Pump 3375189 167 H Installation Tool, No Air Screw "O" Ring 3375148 168 H Tool, AFC No Air Adjusting 3375140 169 H Installation Tool, Glyd Ring 3375147 170 H Forming Tool, Glyd Ring 3375147 171 H Tool, AFC Adjusting 3375147 172 H Installation Tool, Cast Governor Weight Carrier 3375230 173 H Mandrel, Tachometer Drive Cup Plug 3375271 174 H Throttle Travel Template 5120-01-074-0020 3375355 175 H Turbo Support Block ST-608 ST-608 176 H Socket, Wrench 5120-00-065-1031 ST-544- <	160	Н	Gasket		3375015	
163 H Driver, Main Shaft Seal 3375173 164 H Installation Tool, Main Shaft & Bearing 3375172 165 H Installation Tool, Throttle Shaft Ball 3375172 166 H Adjust Kit, AFC Fuel Pump 3375189 167 H Installation Tool, No Air Screw "O" Ring 3375148 168 H Tool, AFC No Air Adjusting 3375140 169 H Installation Tool, Glyd Ring 3375146 170 H Forming Tool, Glyd Ring 3375137 171 H Tool, AFC Adjusting 3375137 172 H Installation Tool, Cast Governor Weight Carrier 3375230 173 H Mandrel, Tachometer Drive Cup Plug 3375271 174 H Throttle Travel Template 5120-01-074-0020 3375355 175 H Turbo Support Block ST-608 ST-608 176 H Socket, Wrench 5120-00-116-7625 ST-1095 177 H Puller 5120-00-065-1031 ST-544-	161	Н	Front Cover, Main Shaft Assembly		3375175	
164 H Installation Tool, Main Shaft & Bearing 3375172 165 H Installation Tool, Throttle Shaft Ball 3375204 166 H Adjust Kit, AFC Fuel Pump 3375189 167 H Installation Tool, No Air Screw "O" Ring 3375148 168 H Tool, AFC No Air Adjusting 3375140 169 H Installation Tool, Glyd Ring 3375146 170 H Forming Tool, Glyd Ring 3375147 171 H Tool, AFC Adjusting 3375137 172 H Installation Tool, Cast Governor Weight Carrier 3375230 173 H Mandrel, Tachometer Drive Cup Plug 3375251 174 H Throttle Travel Template 5120-01-074-0020 3375355 175 H Turbo Support Block 5120-00-116-7625 ST-608 176 H Socket, Wrench 5120-00-0165-1031 ST-544 178 H Puller ST-544-1 179 H Puller ST-544-1 18	162	Н	Driver, Front Cover		3375174	
165 H Installation Tool, Throttle Shaft Ball 3375204 166 H Adjust Kit, AFC Fuel Pump 3375189 167 H Installation Tool, No Air Screw "O" Ring 3375148 168 H Tool, AFC No Air Adjusting 3375140 169 H Installation Tool, Glyd Ring 3375146 170 H Forming Tool, Glyd Ring 3375147 171 H Tool, AFC Adjusting 3375137 172 H Installation Tool, Cast Governor Weight Carrier 3375230 173 H Mandrel, Tachometer Drive Cup Plug 3375271 174 H Throttle Travel Template 5120-01-074-0020 3375355 175 H Turbo Support Block ST-608 ST-608 176 H Socket, Wrench 5120-00-116-7625 ST-1095 177 H Puller Assembly 5120-00-665-1031 ST-544-2 179 H Puller ST-544-1 ST-544-2 180 H Holder 5120-00-923-0856 <td>163</td> <td>Н</td> <td>Driver, Main Shaft Seal</td> <td></td> <td>3375173</td>	163	Н	Driver, Main Shaft Seal		3375173	
166 H Adjust Kit, AFC Fuel Pump 3375189 167 H Installation Tool, No Air Screw "O" Ring 3375148 168 H Tool, AFC No Air Adjusting 3375140 169 H Installation Tool, Glyd Ring 3375146 170 H Forming Tool, Glyd Ring 3375147 171 H Tool, AFC Adjusting 3375137 172 H Installation Tool, Cast Governor Weight Carrier 3375230 173 H Mandrel, Tachometer Drive Cup Plug 3375271 174 H Throttle Travel Template 5120-01-074-0020 3375355 175 H Turbo Support Block ST-608 ST-608 176 H Socket, Wrench 5120-00-116-7625 ST-1095 177 H Puller Assembly 5120-00-065-1031 ST-544- 178 H Puller ST-544-2 ST-544-2 179 H Puller TLN-1000 ITL42 181 H Lock Tester 2 In. ITL42 <td>164</td> <td>Н</td> <td>Installation Tool, Main Shaft & Bearing</td> <td></td> <td>3375172</td>	164	Н	Installation Tool, Main Shaft & Bearing		3375172	
167 H Installation Tool, No Air Screw "O" Ring 3375148 168 H Tool, AFC No Air Adjusting 3375140 169 H Installation Tool, Glyd Ring 3375146 170 H Forming Tool, Glyd Ring 3375147 171 H Tool, AFC Adjusting 3375137 172 H Installation Tool, Cast Governor Weight Carrier 3375230 173 H Mandrel, Tachometer Drive Cup Plug 3375271 174 H Throttle Travel Template 5120-01-074-0020 3375355 175 H Turbo Support Block ST-608 ST-608 176 H Socket, Wrench 5120-00-116-7625 ST-1095 177 H Puller Assembly 5120-00-065-1031 ST-544-2 179 H Puller ST-544-2 ST-544-1 180 H Holder 5120-00-923-0856 ST-851 181 H Lock Tester 2 In. ITLN-1000 ITL42 183 H Step Plate, Mechanic	165	Н	Installation Tool, Throttle Shaft Ball		3375204	
168 H Tool, AFC No Air Adjusting 3375140 169 H Installation Tool, Glyd Ring 3375146 170 H Forming Tool, Glyd Ring 3375147 171 H Tool, AFC Adjusting 3375137 172 H Installation Tool, Cast Governor Weight Carrier 3375230 173 H Mandrel, Tachometer Drive Cup Plug 3375271 174 H Throttle Travel Template 5120-01-074-0020 3375355 175 H Turbo Support Block ST-608 ST-608 176 H Socket, Wrench 5120-00-116-7625 ST-1095 177 H Puller Assembly 5120-00-065-1031 ST-544 178 H Screw ST-544-2 ST-544-2 179 H Puller ST-544-1 ST-544-1 180 H Holder 5120-00-923-0856 ST-851 181 H Lock Tester 3 In. ITLN-1000 ITL42 183 H Step Plate, Mechanic <t< td=""><td>166</td><td>Н</td><td>Adjust Kit, AFC Fuel Pump</td><td></td><td>3375189</td></t<>	166	Н	Adjust Kit, AFC Fuel Pump		3375189	
169	167	Н	Installation Tool, No Air Screw "O" Ring		3375148	
170 H Forming Tool, Glyd Ring 3375147 171 H Tool, AFC Adjusting 3375137 172 H Installation Tool, Cast Governor Weight Carrier 3375230 173 H Mandrel, Tachometer Drive Cup Plug 3375271 174 H Throttle Travel Template 5120-01-074-0020 3375355 175 H Turbo Support Block ST-608 ST-608 176 H Socket, Wrench 5120-00-116-7625 ST-1095 177 H Puller Assembly 5120-00-065-1031 ST-544 178 H Screw ST-544-2 ST-544-2 179 H Puller 5120-00-923-0856 ST-851 181 H Lock Tester 2 In. ITLN-1000 182 H Lock Tester 3 In. Step Plate, Mechanic 5120-00-473-6921 8B7560 184 H Bracket F7901 2P8260	168	Н	, ,		3375140	
171 H Tool, AFC Adjusting 3375137 172 H Installation Tool, Cast Governor Weight Carrier 3375230 173 H Mandrel, Tachometer Drive Cup Plug 3375271 174 H Throttle Travel Template 5120-01-074-0020 3375355 175 H Turbo Support Block ST-608 ST-608 176 H Socket, Wrench 5120-00-116-7625 ST-1095 177 H Puller Assembly 5120-00-065-1031 ST-544 178 H Screw ST-544-2 ST-544-2 179 H Puller ST-851 TLN-1000 180 H Holder 5120-00-923-0856 ST-851 181 H Lock Tester 2 In. ITL42 183 H Step Plate, Mechanic 5120-00-473-6921 8B7560 184 H Bracket FT901 2P8260	169	Н	Installation Tool, Glyd Ring		3375146	
172 H Installation Tool, Cast Governor Weight Carrier 3375230 173 H Mandrel, Tachometer Drive Cup Plug 3375271 174 H Throttle Travel Template 5120-01-074-0020 3375355 175 H Turbo Support Block ST-608 ST-608 176 H Socket, Wrench 5120-00-116-7625 ST-1095 177 H Puller Assembly 5120-00-065-1031 ST-544 178 H Screw ST-544-2 ST-544-2 179 H Puller ST-544-1 ST-544-1 180 H Holder 5120-00-923-0856 ST-851 181 H Lock Tester 2 In. TLN-1000 182 H Lock Tester 3 In. ITL42 183 H Step Plate, Mechanic 5120-00-473-6921 8B7560 184 H Bracket FT901 2P8260	170	Н	Forming Tool, Glyd Ring		3375147	
173 H Mandrel, Tachometer Drive Cup Plug 3375271 174 H Throttle Travel Template 5120-01-074-0020 3375355 175 H Turbo Support Block ST-608 176 H Socket, Wrench 5120-00-116-7625 ST-1095 177 H Puller Assembly 5120-00-065-1031 ST-544 178 H Screw ST-544-2 ST-544-2 179 H Puller ST-544-1 ST-544-1 180 H Holder 5120-00-923-0856 ST-851 181 H Lock Tester 2 In. ITLN-1000 182 H Lock Tester 3 In. ITL42 183 H Step Plate, Mechanic 5120-00-473-6921 8B7560 184 H Bracket FT901 185 H Installer 2P8260	171	Н	Tool, AFC Adjusting		3375137	
174 H Throttle Travel Template 5120-01-074-0020 3375355 175 H Turbo Support Block ST-608 176 H Socket, Wrench 5120-00-116-7625 ST-1095 177 H Puller Assembly 5120-00-065-1031 ST-544 178 H Screw ST-544-2 179 H Puller ST-544-1 180 H Holder 5120-00-923-0856 ST-851 181 H Lock Tester 2 In. TLN-1000 182 H Lock Tester 3 In. ITL42 183 H Step Plate, Mechanic 5120-00-473-6921 8B7560 184 H Bracket FT901 185 H Installer 2P8260	172	Н	Installation Tool, Cast Governor Weight Carrier		3375230	
175 H Turbo Support Block ST-608 176 H Socket, Wrench 5120-00-116-7625 ST-1095 177 H Puller Assembly 5120-00-065-1031 ST-544 178 H Screw ST-544-2 179 H Puller ST-544-1 180 H Holder 5120-00-923-0856 ST-851 181 H Lock Tester 2 In. TLN-1000 182 H Lock Tester 3 In. ITL42 183 H Step Plate, Mechanic 5120-00-473-6921 8B7560 184 H Bracket FT901 185 H Installer 2P8260	173	Н	Mandrel, Tachometer Drive Cup Plug		3375271	
176 H Socket, Wrench 5120-00-116-7625 ST-1095 177 H Puller Assembly 5120-00-065-1031 ST-544 178 H Screw ST-544-2 179 H Puller ST-544-1 180 H Holder 5120-00-923-0856 ST-851 181 H Lock Tester 2 In. TLN-1000 182 H Lock Tester 3 In. ITL42 183 H Step Plate, Mechanic 5120-00-473-6921 8B7560 184 H Bracket FT901 185 H Installer 2P8260	174	Н	Throttle Travel Template	5120-01-074-0020	3375355	
177 H Puller Assembly 5120-00-065-1031 ST-544 178 H Screw ST-544-2 179 H Puller ST-544-1 180 H Holder 5120-00-923-0856 ST-851 181 H Lock Tester 2 In. TLN-1000 182 H Lock Tester 3 In. ITL42 183 H Step Plate, Mechanic 5120-00-473-6921 8B7560 184 H Bracket FT901 185 H Installer 2P8260	175	Н	Turbo Support Block		ST-608	
178 H Screw ST-544-2 179 H Puller ST-544-1 180 H Holder 5120-00-923-0856 ST-851 181 H Lock Tester 2 In. TLN-1000 182 H Lock Tester 3 In. ITL42 183 H Step Plate, Mechanic 5120-00-473-6921 8B7560 184 H Bracket FT901 185 H Installer 2P8260	176	Н	Socket, Wrench	5120-00-116-7625	ST-1095	
179 H Puller ST-544-1 180 H Holder 5120-00-923-0856 ST-851 181 H Lock Tester 2 In. TLN-1000 182 H Lock Tester 3 In. ITL42 183 H Step Plate, Mechanic 5120-00-473-6921 8B7560 184 H Bracket FT901 185 H Installer 2P8260	177	Н	Puller Assembly	5120-00-065-1031	ST-544	
180 H Holder 5120-00-923-0856 ST-851 181 H Lock Tester 2 In. TLN-1000 182 H Lock Tester 3 In. ITL42 183 H Step Plate, Mechanic 5120-00-473-6921 8B7560 184 H Bracket FT901 185 H Installer 2P8260	178	Н	Screw		ST-544-2	
181 H Lock Tester 2 In. TLN-1000 182 H Lock Tester 3 In. ITL42 183 H Step Plate, Mechanic 5120-00-473-6921 8B7560 184 H Bracket FT901 185 H Installer 2P8260	179	Н	Puller		ST-544-1	
182 H Lock Tester 3 In. ITL42 183 H Step Plate, Mechanic 5120-00-473-6921 8B7560 184 H Bracket FT901 185 H Installer 2P8260	180	Н	Holder	5120-00-923-0856	ST-851	
183 H Step Plate, Mechanic 5120-00-473-6921 8B7560 184 H Bracket FT901 185 H Installer 2P8260	181	Н	Lock Tester 2 In.		TLN-1000	
184 H Bracket FT901 185 H Installer 2P8260	182	Н	Lock Tester 3 In.		ITL42	
184 H Bracket FT901 185 H Installer 2P8260	183	Н	Step Plate, Mechanic	5120-00-473-6921	8B7560	
	184	Н	•		FT901	
186 H Staking Tool, Pinion Bearing 26883	185	Н	Installer		2P8260	
	186	Н	Staking Tool, Pinion Bearing		26883	

Tool or Test Equipment Number Reference Code	Maintenance Category	Nomenclature	National/Nato Stock Number	Tool
187	Н	Carrier Stand		J-3409-1
188	Н	Adapter Pot, Injector		3375086
189	Н	Assembly Tool, "O" Ring	5120-00-396-8089	ST-422
190	Н	Assembly Tool, Tube	5120-00-999-1505	ST-835
191	Н	Driver, Governor Cylinder	4910-00-150-5801	ST-853
192	Н	Adjusting Tool	4910-00-150-5805	ST-984
193	Н	Assembly Tool, Tachometer	5120-00-896-8087	ST-1032
194	Н	Driver, Seal, Crankshaft	4910-00-150-5810	ST-997
195	Н	Pins		ST-997-6
196	Н	Wrench, Injector	5120-00-150-7492	ST-995
197	Н	Mandrel, Camshaft Bushing	5120-00-055-4013	ST-1228
198	Н	Shank, Mandrel		ST-1228-3
199	Н	Driver		ST-1228-9
200	Н	Puller Assembly		ST-1228-13
201	Н	Guide		ST-1228-5
202	Н	Guide (2-1/2 In.)		3375154
203	Н	Shaft Assembly		ST-1228-4
204	Н	Roll Pin		ST-1228-14
205	Н	Rod		ST-1228-2
206	Н	Slide Hammer		ST-1228-1
207	Н	Bushing Driver	4910-00-150-5802	ST-1242
208	Н	Block		ST-1242-3
209	Н	Cup		ST-1242-2
210	Н	Pin, Cotter		ST-1242-6
211	Н	Driver (Tapered)		ST-1242-4
212	Н	Knock-Out Ring (Tapered)		ST-1242-5
213	Н	Knock-Out Ring (Straight)		ST-1242-7
214	Н	Driver, Straight		ST-1242-8
215	Н	Mandrel		ST-1242-1
216	Н	Fixture, Ream, Fuel Pump Front Main Bearing	5110-00-981-3107	ST-490
217	Н	Puller, Mechanical	5120-00-999-1504	ST-709
218	Н	Puller, Bushing		3375108
219	Н	Vise, Ball Joint	4910-00-999-5106	ST-302
220	Н	Front Seal Assembly	5120-00-896-8097	ST-419
221	Н	Gage, Groove Wear	5210-00-999-1209	ST-560

APPENDIX C

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I INTRODUCTION.

C-1. SCOPE.

This appendix lists expendable supplies and materials you will need to operate and maintain the M915, M916, M920 Truck Tractors and Chassis for M917, M918, and M919.

These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

C-2. EXPLANATION OF COLUMNS.

- a. Column 1 Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, App. D").
- b. Column 2 Level. This column identifies the lowest level of maintenance that requires the listed item.
 - C Operator/Crew.
 - O Organizational Maintenance.
 - F Direct Support Maintenance.
 - H General Support Maintenance.
- c. Column 3 National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.
- d. Column 4 Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (BSCM) in parentheses, if applicable.
- e. Column 5 Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differes from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II EXPENDABLE SUPPLIES AND MATERIALS LIST.

(1)	(2)	(3)	(4)	(5)
ITEM NUMBER	LEVEL	NATIONAL STOCK NUMBER	DESCRIPTION	U/M
1	С		Grease, Automotive and Artillery GAA (MIL-G-10924C)	
		9150-00-065-0029 9150-00-935-1017 9150-00-190-0904 9150-00-190-0905 9150-00-190-0907	2-1/4-oz tube 14-oz cartridge 1-lb can 5-lb can 35-lb can	oz oz Ib Ib Ib
2	С		Oil, Lubricating, Ex- posed Gear, CW (VV-L-751C)	
		9150-00-234-5197 9150-00-261-7891	5-lb can 35-lb pail	lb lb
3	0		Oil, Lubricating, Gear Subzero, GOS (MIL-L-10324)	
		9150-00-261-7904 9150-00-257-5440 9150-00-257-5443	1-qt can 5-gal drum 55-gal drum	q t gal gal
4	С		Oil, Lubricating OE/HDO 10 (MIL-L-2104C)	
		9150-00-265-9425 9150-00-265-8428 9150-00-265-9429 9150-00-265-9430	1-qt can 5-gal drum 55-gal drum, 16 gage 55-gal drum, 18 gage	qt gal gal gal
5	С	9150-00-265-9433 9150-00-265-9435 9150-00-265-9436 9150-00-265-9437	Oil, Lubricating, OE/HDO 30 (MIL-L-2104C) 1-qt can 5-gal drum 55-gal drum, 16 gage 55-gal drum, 18 gage	qt gal gal gal

Section II EXPENDABLE SUPPLIES AND MATERIALS LIST (Continued).

(1)	(2)	(3)	(4)	(5)
ITEM NUMBER	LEVEL	NATIONAL STOCK NUMBER	DESCRIPTION	U/M
6	С		Oil, Lubricating, OE/HDO 50 (MIL-L-2104C)	
		9150-00-265-9440 9150-00-265-9442 9150-00-265-9441	1 -qt can 5-gal drum 55-gal drum, 16 gage	q t gal gal
7	0		Oil, Lubricating, OHT, (MI L-H-60830)	
8	0		Oil, Lubricating, OEA, ICE, Subzero, (MIL-L-46167)	
9	0		Lubricant, Gear, Universal, (MIL-L-2106)	
10	С		Oil, Fuel Diesel DF-1 Winter (VV-F-800)	
		9140-00-286-5286 9140-00-286-5287 9140-00-286-5288 9140-40-286-5289	Bulk 5-gal can 55-gal drum, 16 gage 55-gal drum, 18 gage	gal gal gal gal
11	С		Oil, Fuel, Diesel DF-2 Regular (VV-F-800)	
		9140-00-286-5294 9140-40-286-5295 9140-00-286-5296 9140-00-286-5297	Bulk 5-gal can 55-gal drum, 16 gage 55-gal drum, 18 gage	gal gal gal gal
			MISCELLANEOUS	
12	С		Solvent, Dry Cleaning, SD-2 (P-D-680)	
		6850-00-664-5685 6850-00-281-1985	1-qt can 1-gal can	qt gal

TM 9-2320-273-20

Section II EXPENDABLE SUPPLIES AND MATERIALS LIST (Continued).

(1)	(2)	(3)	(4)	(5)
ITEM NUMBER	LEVEL	NATIONAL STOCK NUMBER	DESCRIPTION	U/M
13	С	6850-00-243-1992	Antifreeze, Permanent, Glycol, Inhibited (MIL-A-46153)	1 gal
14	0	8030-00-889-3535	Tape, Antiseizing	
15	0		Soap Solution	
16	0		Lubriplate	
17	0	8030-00-252-3391	Silicone Sealant	

APPENDIX D

SCHEMATIC DIAGRAMS

Section I INTRODUCTION.

D-1. SCOPE.

This appendix provides you with electrical system and compressed air system schematic diagrams.

NOTE

Fold out diagrams are located at the end of this technical manual.

D-2. ELECTRICAL DIAGRAMS.

Figure FO-1.	Left and Right Hand From	ont Signal Lamp Harness	Assemblies (M915 thru M920).

Figure FO-2.	Left and Right Hand	Fender Harness	Assemblies	(M915 thru M920).

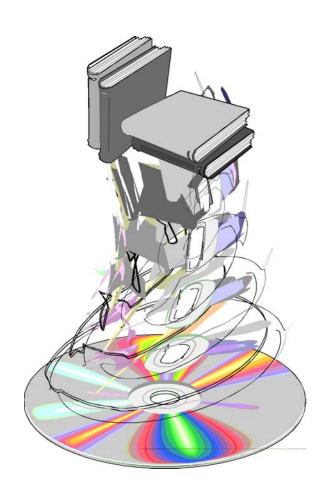
- Figure FO-3. Engine Harness Assembly (M915 thru M920).
- Figure FO-4. Cab Marker Lamp Harness Assembly (M91681 M920).
- Figure FO-5. Cab Front and Underbody Harness Assembly (M915 thru M920).
- Figure FO-6. Chassis Harness Assembly (M915, M916 & M920).
- Figure FO-7. Chassis Harness Assembly (M917).
- Figure FO-8. Chassis Harness Assembly (M918 & M919).
- Figure FO-9. Instrument Panel Harness Assembly (M915).
- Figure FO-10. Instrument Panel Harness Assembly (M916 and M920).
- Figure FO-11. Instrument Panel Harness Assembly (M917, M918 and M919).
- Figure FO-12. M915, Line Haul Truck Tractor Electrical Diagram.
- Figure FO-13. M916 Light Equipment and M920 Medium Equipment Transporter Truck Tractor Electrical Diagram.
- Figure FO-14. M917, 20-Ton Dump Truck Chassis Electrical Diagram.
- Figure FO-15. M918 Bituminous Distributor and M919 Concrete-Mobile* Mixer Truck Chassis Electrical Diagram.

D-3. COMPRESSED AIR.

- Figure FO-16. M915 Tractor Schematic Diagram.
- Figure FO-17. M916 Tractor Schematic Diagram.
- Figure FO-18. M917 Dump Truck Connecting Schematic Diagram.
- Figure FO-19. M918 Bituminous Distributor Connecting Schematic Diagram.
- Figure FO-20. M919 Concrete-Mobile Mixer Connecting Schematic Diagram.
- Figure FO-21. M920 Tractor Schematic Diagram.

The fold-outs in this technical publication are not available. Please refer to your paper or microfiche copy as appropriate.

NOT DIGITIZED



APPENDIX E

ILLUSTRATED LIST OF MANUFACTURED ITEMS

Section I INTRODUCTION.

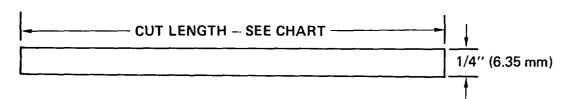
E-1. GENERAL.

- a. This appendix includes complete instructions for making items authorized to be manufactured or fabricated at organizational level.
- b. A part number index in alphanumeric order is provided for cross-referencing the part number of the item to be manufactured to the figure which covers fabrication criteria.
- c. All bulk materials needed for manufacture of an item are listed by part number or specification number in a tabular list on the illustration.

E-2. MANUFACTURED ITEM PART NUMBER INDEX.

PART NO.	FIGURE NO.	PART NO.	FIGURE NO.	PART NO.	FIGURE NO.
M/145-20027	E-5	M/357-20071	E-1	M/357-20101	E-1
M/145-20028	E-5	M/357-20072	E-1	M/357-20102	E-1
M/145-20049	E-5	M/357-20073	E-1	M/357-20103	E-4
M/357-20001	E-1	M/357-20074	E-3	M/357-20112	E-3
M/357-20002	E-2	M/357-20075	E-3	M/357-20113	E-3
M/357-20005	E-3	M/357-20076	E-3	M/357-20114	E-3
M/357-20006	E-3	M/357-20077	E-3	M/357-20115	E-3
M/357-20008	E-4	M/357-20078	E-1	M/357-20116	E -3
M/357-20009	E-4	M/357-20080	E-4	M/357-20117	E-3
M/357-20012	E-4	M/357-20046	E-3	M/357-20118	E-1
M/357-20052	E-4	M/357-20087	E-3	M/357-20119	E-1
M/357-20053	E-4	M/357-20088	E-3	M/357-20120	E-1
M/357-20057	E-3	M/357-20089	E-3	M/357-20126	E-3
M/357-20059	E-1	M/357-20090	E-3	M/357-20127	E-2
M/357-20060	E-1	M/357-20091	E-2	M/357-20128	E-2
M/357-20061	E-2	M/357-20092	E-2	M/357-20129	E-2
M/357-20062	E-1	M/357-20093	E-2	M/357-20130	E-2
M/357-20063	E-1	M/357-20094	E-2	M/357-20131	E-2
M/357-20064	E-2	M/357-20095	E-2	M/357-20132	E-2
M/357-20066	E-1	M/357-20096	E-1	M/357-20133	E-2
M/357-20067	E-1	M/357-20097	E-1	M/357-20134	E-2
M/357-20068	E-2	M/357-20098	E-1	M/357-20135	E-2
M/357-20069	E-2	M/357-20089	E-1	MA145-20001	E-5
M/357-20070	E-2	M/357-20100	E-1	MB147-20001	E-6

Section II ILLUSTRATED MANUFACTURING INSTRUCTIONS. MATERIAL BLOCK STOCK SIZE DESCRIPTION SPECIFICATION 1/4" (6.35 mm) OUTER DIA. TUBE, NONMETALLIC SAEJ844, TYPE 3A



			END FITTINGS PART NUMBER						
ITEM NO.	TUBE PART NUMBER	CUT LENGTH Inches (mm)	VENDOR NO.	FSCM	NSN	VENDOR NO.	FSCM	NSN	
1	M/357-20059	5.50 (139.7)	1468X4	79470	4730-01-055-4017	1468X4	79470	4730-01-055-4017	
2	M/357-20097	10.50 (266.7)	68NTA-4-6	30759	1	68NTA-4-4	30759		
3	M/357-20060	11.00 (279.4)	1468X4	79470	4730-01-055-4017	1468X4	79470	4730-01-055-4017	
4	M/357-20062	12.00 (304.8)	1468X4	79470	4730-01-055-4017	1468X4	79470	4730-01-055-4017	
5	M/357-20098	14.50 (368.3)	68NTA-4-4	30759		68NTA-4-4	30759		
6	M/357-20119	14.75 (374.6)	1468X4	79470	4730-01-055-4017	1469X4	79470	4730-01-055-4013	
7	M/357-20067	16.75 (425.4)	1469X4	79470	4730-01-055-4013	1468X4	79470	4730-01-055-4017	
8	M/357-20071	18.00 (457.2)	1466X4	79470	l	1466X4	79470		
9	M/357-20078	18.00 (457.2)	68NTA-4-6	30759	1	68NTA-4-6	30759		
10	M/357-20072	19.00 (482.6)	1466X4	79470]	1466X4	79470		
11	M/357-20066	20.75 (527.05)	1469X4	79470	4730-01-055-4013	1468X4	79470	4730-01-055-4017	
12	M/357-20118	23.00 (584.2)	1468X4	79470	4730-01-055-4017	1469X4	79470	4730-01-055-4013	
13	M/357-20102	24.00 (609.6)	1464X4	79470		68NTA-4-4	30759		
14	M/357-20096	24.00 (609.6)	62NTA-4	30759		1469X4	79470	4730-01-055-4013	
15	M/357-20120	29.00 (736.6)	1466X4	79470		1469X4	79470	4730-01-055-4013	
16	M/357-20001	38.00 (965.2)	68NTA-4-6	30759		68NTA-4-6	30759		
17	M/357-20073	58.25 (1479.5)	272NTA-4-4	30759		68NTA-4-6	30759		
18	M/357-20099	65.00 (1651.0)	68NTA-4-4	30759		1469X4X6	79470		
19	M/357-20063	100.00 (2540.0)	279NTA-4-4	30759	i	68NTA-4-4	30759		
20	M/357-20101	120.00 (3048.0)	269NTA-4-4	30759		264NTA-4-4	30759		
21	M/357-20100	150.00 (3810.0)	269NTA-4-4	30759		264NTA-4-4	30759		

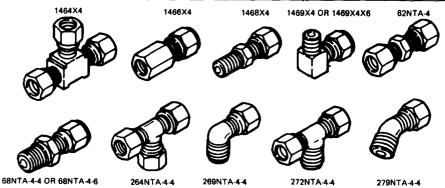
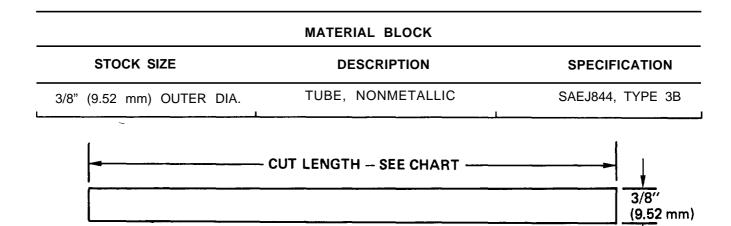


Figure E-1. 1/4" (6.35mm) O.D. Nonmetallic Tubing and Fittings, Fabricate Tube From NSN 4720-01-058-7213

TA 075725

- 1. Determine tube part number needed from RPSTL and cut squarely to correct length as shown above.
- 2. Select proper end fittings based upon tube part number.
- 3. Insert tube into fitting and tighten nut with wrench until one thread remains visible on the fitting body.



			END FITTINGS PART NUMBER					
ITEM NO.	TUBE PART NUMBER	CUT LENGTH Inches (mm)	VENDOR NO.	FSCM	NSN	VENDOR NO.	FSCM	NSN
1	M/357-20002	8.50 (215.9)	1480X6X6	79470		1472X6X6X6	79470	
2	M/357-20061	9.50 (241.3)	68NTA-6-6	30759	ļ	269NTA-6-4	30759	4730-01-082-6475
3	M/357-20070	11.00 (279.4)	68NTA-6-4	30759	4730-01-062-2570	269NTA-6-6	30759	
4	M/357-20069	11.50 (292.1)	269NTA-6-6	30759		68NTA-6-6	30759	
5	M/357-20095	12.00 (304.8)	1472X6X6X6	79470		68NTA-6-6	30759	
6	M/357-20092	20.00 (508.0)	269NTA-6-6	30759		68NTA-6-6	30759	
7	M/357-20064	25.00 (635.0)	68NTA-6-4	30759	4730-01-062-2570	68NTA-6-4	30759	4730-01-062-2570
8	M/357-20068	27.00 (685.8)	68NTA-6-4	30759	4730-01-062-2570	269NTA-6-6	30759	
9	M/357-20091	33.00 (838.2)	68NTA-6-4	30759	4730-01-062-2570	269NTA-6-4	30759	4730-01-082-6475
10	M/357-20128	38.50 (977.9)	169NTA-6-8	30759		68NTA-6-6	30759	
11	M/357-20127	38.50 (977.9)	169NTA-6-8	30759	Ì	68NTA-6-6	30759	
12	M/357-20133	86.00 (2184.4)	269NTA-6-4	30759	4730-01-082-6475	269NTA-6-8	30759	
13	M/357-20131	103.00 (2616.2)	269NTA-6-4	30759	4730-01-082-6475	169NTA-6-8	30759	
14	M/357-20135	124.00 (3,149.6)	68NTA-6-8	30759	l	68NTA-6-6	30759	
15	M/357-20134	127.00 (3225.8)	68NTA-6-8	30759		68NTA-6-6	30759	
16	M/357-20132	135.00 (3429.0)	68NTA-6-6	30759		269NTA-6-4	30759	4730-01-082-6475
17	M/357-20129	157.00 (3987.8)	68NTA-6-6	30759		68NTA-6-8	30759	
18	M/357-20130	168.00 (4267.2)	1480X6X8	79470		68NTA-6-6	30759	
19	M/357-20093	194.00 (4927.6)	68NTA-6-4	30759	4730-01-062-2570	68NTA-6-4	30759	4730-01-062-2570
20	M/357-20094	207.00 (5257.8)	68NTA-6-4	30759	4730-01-062-2570	1480X6X8	79470	



1472X6X6X6



1480X6X6 OR 1480X6X8



68NTA-6-4 OR 68NTA-6-6 OR 68NTA-6-8



169NTA-6-8 OR 269NTA-6-4

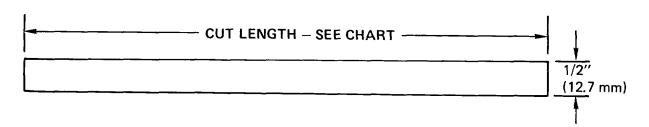
TA 075726

Figure E-2. 3/8" (9.52mm) O. D. Nonmetallic Tubing and Fittings, Fabricate Tube From NSN 4720-01-040-0591

- 1. Determine tube part number needed from RPSTL and cut squarely to correct length as shown above.
- 2. Select proper end fittings based upon tube part number.
- 3. Insert tuba into fitting and tighten nut with wrench until one thread remains visible on the fitting body.

MATERIAL	BL	ock
----------	----	-----

STOCK SIZE	DESCRIPTION	SPECIFICATION
1/2" (12.7 mm) OUTER DIA.	TUBE, NONMETALLIC	SAEJ844, TYPE 3B



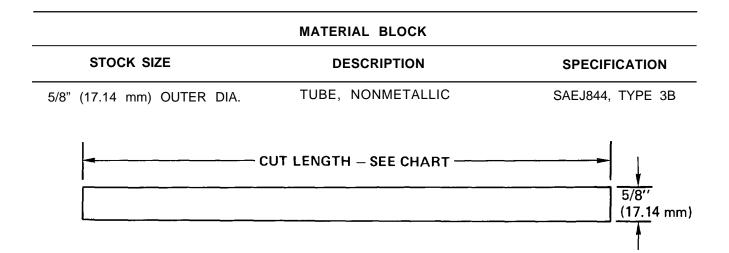
			END FITTINGS PART NUMBER					
ITEM NO.	TUBE PART NUMBER	CUT LENGTH Inches (mm)	VENDOR NO.	FSCM	NSN	VENDOR NO.	FSCM	NSN
1	M/357-20090	12.50 (317.5)	264NTA-8	30759		1469X8	79470	
2	M/357-20005	14.00 (355.6)	68NTA-8-6	30759		68NTA-8-6	30759	
3	M/357-20112	19.50 (495.3)	68NTA-8-6	30759		68NTA-8-6	30759	
4	M/357-20086	20.00 (508.0)	68NTA-8-6	30759	1	1469X8	79470	1
5	M/357-20116	20.50 (520.7)	68NTA-8-6	30759		68NTA-8-6	30759	
6	M/357-20117	23.00 (584.2)	68NTA-8-6	30759	l	68NTA-8-6	30759	
7	M/357-20057	23.00 (584.2)	68NTA-8-6	30759	1	68NTA-8-6	30759	
8	M/357-20006	23.50 (596.9)	264NTA-8	30759		68NTA-8-6	30759	ļ
9	M/357-20087	24.00 (609.6)	68NTA-8-6	30759	l ,	68NTA-8-6	30759	
10	M/357-20114	24.50 (622.3)	68NTA-8-6	30759		68NTA-8-6	30759	
11	M/357-20076	26.00 (660.4)	1469X8	79470		272NTA-8-6	30759	
12	M/357-20115	26.50 (673.1)	68NTA-8-6	30759		68NTA-8-6	30759	
13	M/357-20089	31.00 (787.4)	269NTA-8-6	30759		68NTA-8-6	30759	
14	M/357-20075	41.00 (1041.4)	1469X8	79470		272NTA-8-6	30759	
15	M/357-20126	69.00 (1752.6)	1469X8	79470	1	68NTA-8-6	30759	
16	M/357-20077	72.00 (1828.8)	1469X8	79470		1480X8	79470	
17	M/357-20113	73.00 (1854.2)	68NTA-8-6	30759		68NTA-8-6	30759	
18	M/357-20074	75.00 (1905.0)	1469×8	79470		1480X8X6	79470	
19	M/357-20088	100.00 (2540.0)	269NTA-8-6	30759		269NTA-8-6	30759	

1469X8 1480X8 OR 1480X8X6 68NTA-8-6 264NTA-8 269NTA-8-6 272NTA-8-6

TA 075727

Figure E-3. 1/2" (12.7mm) O.D. Nonmetallic Tubing and Fittings, Fabricate Tube From NSN 4720-01-040-0592

- 1. Determine tube part number needed from RPSTL and cut squarely to correct length as shown above.
- 2. Select proper end fittings based upon the part number.
- 3. Insert tube into fitting and tighten nut with wrench until one thread remains visible on the fitting body.



			END FITTINGS PART NUMBER					
ITEM NO.	TUBE PART NUMBER	CUT LENGTH Inches (mm)	VENDOR NO.	FSCM	NSN	VENDOR NO.	FSCM	NSN
1	M/357-20009	28.00 (711.2)	1468X10	79470		1468×10	79470	
2	M/357-20008	32.00 (812.8)	1468X10X6	79470	4730-01-082-3799	1468X10	79470	
3	M/357-20053	37.50 (952.5)	1480X10	79470		68AB-10-8	30759	ļ
4	M/357-20052	41.50 (1054.1)	1469X10X6	79470		1469X10	79470	
5	M/357-20012	53.50 (1358.9)	1468X10X12	79470		1468X10X6	79470	4730-01-082-3799
6	M/357-20103	56.50 (1435.1)	1469X10	79470	[68NTA-10-6	30759	
7	M/357-20080	88.00 (2235.2)	1480X10	79470		1469X10X12	79470	

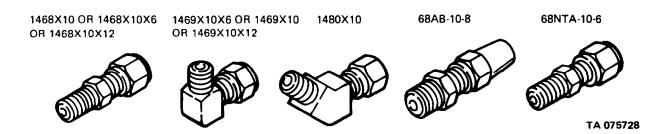


Figure E-4. 5/8" (17.14mm) O.D. Nonmetallic Tubing and Fabricate Tube From NSN 4720-01-009-9058

- 1. Determine tube part number needed from RPSTL and cut squarely to correct length as shown above.
- 2. Select proper end fittings based upon tube part number.
- 3. Insert tube into fitting and tighten nut with wrench until one thread remains visible on the fitting body.

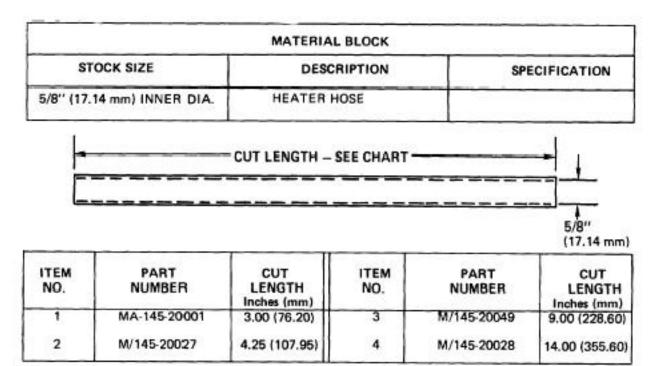


Figure E-5. 5/8" (17.14mm) I.D. Heater Hose, Fabricate From M/145-20038, FSCM 34623

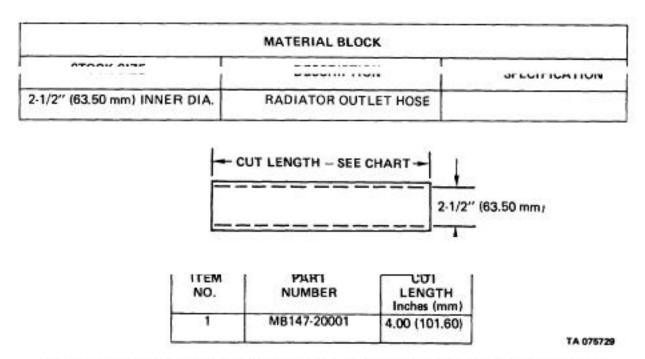


Figure E-6. 2-1/2" (63.50mm) I.D. Radiator Outlet Hose, Fabricate From NSN 4720-00-203-3031

ALPHABETICAL INDEX

Subject, Para

Subject, Para

Α

Accelerator
Description, 2-9
Pedal, 4-21
Rod (Linkage) 4

Rod (Linkage), 4-21 Troubleshooting, 4-5

Accessory Drive Description, 2-32

Accessory Drive Belts
(See Fan Belts and Water Pump Belt)

Adapter, Oil Filter (See Oil Filter Adapter)

Aftercooler Description, 2-25

Air Bags (Pusher Axle)
Description, 2-16
Maintenance, 8-14

Air Brakes Chambers (See Air Chambers)

Air Chambers
Description, 2-18
Front Brake, 9-36
Lines and Fittings, 9-17
Pusher Axle Brake, 9-38
Rear Brake, 9-37

Air Charging Valve Description, 2-12 Maintenance, 6-12

Air Cleaner
Assembly Maintenance, 4-25
Description, 2-25
Servicing Element, 4-24

Air Cleaner Restriction Indicator Description, 2-25 Maintenance, 4-26

Air Compressor Governor (See Compressor Governor)

Air Cooler/Intake Manifold (See Aftercooler)

Air Dryer Description, 2-60

Air Horn Control Valve, 9-45 Description, 2-73 Maintenance, 9-45 Troubleshooting, 9-5

Air Intake System
Air Cleaner Assembly, 4-25
Air Cleaner Element, 4-24
Air Cleaner, Restriction Indicator, 4-26
Description, 2-25
Troubleshooting, 4-5
Turbo Air Inlet, 4-27
Turbocharger, 2-25

Air Lines and Fittings, 9-17

Air Pressure Gages
Description, 2-52, 2-62
Maintenance, 9-20

Air Reservoirs
Automatic Drain Valve, 9-12
Description, 2-60
Lines and Fittings, 9-17
Maintenance, 9-16
Manual Drain Valve, 9-13

ALPHABETICAL INDEX (Continued)

Subject, Para

Alinement, Front Wheels, 10-10

Alternator and Rectifier Description, 2-42 Drive Belts, 4-55 Maintenance, 5-43

Analysis, Oil Sample, 4-14

Atomizer (Quick-Start System)
Description, 2-40
Maintenance, 4-32

Auxiliary Cylinder, Power Steering (M916 thru M920) Description, 2-76 Maintenance, 10-23

В

Backup Alarm Maintenance, 5-78

Backup Alarm Switch, 5-62

Backup Lamps
(See Rear Light Assembly)

Backup Switch
Description, 2-47
Maintenance, 5-77

Subject, Para

Batteries

Description, 2-42 Disconnection, 5-37 Maintenance, 5-38

Battery Box Heater, 5-91 Latch, 5-40 Cover,5-41 Maintenance, 5-42

Battery Cables
Maintenance, 5-39

Bearings and Seals (See Wheel Bearings and Seals)

Belts

Alternator, 4-55 Fan, 4-45 Water Pump, 4-51

Blackout Lamps
Blackout Headlamp, 5-48
Blackout Marker Lamps, 5-49
Blackout Tail and Stop Lamps, 5-50
Description, 2-51
Troubleshooting, 5-19

Blackout Lamp Operation Switch Description, 2-51 Maintenance, 5-50

Bogey Axle (See Rear Axle)

Brake Control Valve (See Park Brake Valve)

Brake Lamps
(See Rear Lamp Assembly)

Brake Pedal and Valve Description, 2-62 Maintenance, 9-21

Brake Reservoirs (See Air Reservoirs)

ALPHABETICAL INDEX (Continued)

Subject, Para

Brake Shoe Assemblies

Description, 2-64 thru 2-70

Front (M915), 9-31

Front (M916 thru M920), 9-32

Pusher Axle, 9-35 Rear (M915), 9-33

Rear (M916 thru M920), 9-34

Brake System, Air

Air Chambers, Front, 9-36 Air Chambers, Rear, 9-37

Air Dryer Dehydrate Cartridge

Replacement, 9-10

Air Dryer Repair, 9-11.1

Air Dryer Replacement, 9-11

Air Pressure Gages, 9-20

Brake Drums, Front (M915), 10-13

Brake Drums, Front (M916 thru M920), 10-14

Brake Drums, Rear, 10-15

Brake Shoes, Front, 9-31, 9-32

Brake Shoes, Pusher Axle, 9-35

Brake Shoes, Rear, 9-33, 9-34

Description, 2-61 thru 2-70

Lines and Fittings, 9-17

Pusher Axle Brake Air Chamber, 9-38

Slack Adjusters, 9-39

Troubleshooting, 9-5

Valves (See Brake Valves)

Brake Valves

Air Lines and Fittings, 9-17

Brake Pedal Valve, 9-21

Description, 2-62

Double-Check Valve. 9-27

Limiting Valve, 9-25

Park Brake Valve, 9-19

Quick-Release/Double-Check Valve, 9-24

Relay Valve, 9-24

Service Brakes Quick-Release Valve, 9-22

Tractor Protection Valve, 9-26

Tractor/Trailer Brake Valve, 9-18

Trailer Supply Valve, 9-17

Breathers

Crankcase, 4-15

Transmission, 6-9

Breather Tube, 4-15

Brush Guard, 11-16

Bumper, 11-9

Bypass Filter

Description, 2-27

Subject, Para

Maintenance, 4-14

Bypass Oil Filter

(See Bypass Filter)

C

Cable Assembly, Winch Description, 2-80

Maintenance, 12-8

Cables, Battery

(See Battery Cables)

Chassis Wiring Harness, 5-31

Cigar Lighter, 5-60

Circuit Breakers

Description, 2-35

Maintenance, 5-30, 5-30.1, 5-87.

Clearance Lamps

Description, 2-45

Maintenance, 5-47

Clearance Lamp Switch

Description, 2-45

Maintenance, 5-64

Cold Start System

(See Ether Quick-Start System)

Compressed Air System

Air Pressure Gages, 9-20

Air Dryer Tubing and Hose Replacement, 9-16.1

Automatic Drain Valve, 9-12

Description, 2-60

Manual Drain Valve, 9-13

Reservoirs, 9-16

Safety Release Valve, 9-14

Trailer Supply Valve, 9-17

Troubleshooting, 9-5

(See Also, Brake System and Brake Valves)

Compressor Governor

Description, 2-60

Control Valves, Winch

Description, 2-80

Maintenance, 12-11

Change 2 Index-3

ALPHABETICAL INDEX (Continued)

Subject, Para

Coolant

Draining, 4-42 Heater, 5-90 Replenishing, 4-42

Cooler, Oil

Description, 2-27,2-32 Inspection, 3-7

Cooling System

Description, 2-31 thru 2-33

Drain Cock, 4-42

Draining and Filling, 4-42

Fan, 4-44 Fan Belts, 4-45

Fan Clutch, 4-45

Fan Clutch Actuator

(M915, M916, M917, M918 & M920), 4-46

Fan Clutch Actuator (M919), 4-47

Fan Clutch Actuator Tubes

(M915, M916, M917, M918 & M920), 4-48

Fan Clutch Actuator Tubes (M919), 4-49

Fan Shrouds, 4-41

Heater Control Valve, 4-50, 11-26

Heater Shutoff Valve, 4-50

Radiator, 4-40

Radiator Hoses, 4-39

Thermostat and Housing, 4-43

Troubleshooting, 4-5, 5-13

Water Manifold, 4-52

Water Pump, 4-53

Water Pump Belts, 4-51

Water Pump Idler Pulley, 4-54

Water Temperature Sending Unit, 5-72

Water Temperature Switch, 5-73

Crossover Tube

Description, 2-25

Maintenance, 4-28

Cross Tube

(See Tie Rod)

Cylinder Head Cover

(See Rocker Arm Housing Cover)

D

Data and Instruction Plates, 11-31

Subject, Para

Differential Lockup Engaged (See Lockup Switch)

Differential Lockup Control Valve

Description, 2-14 Maintenance, 9-44

Dimmer Switch

Description, 2-44

Maintenance, 5-57

Directional Control Valve, Winch

Description, 2-80

Maintenance, 12-11

Dome Lamp and Switch Assembly

Description, 2-49

Maintenance, 5-56

Double-Check Valve

Description, 2-64

Maintenance, 9-27

Drag Link

Description, 2-76

Maintenance, 10-19

Drain Cock, Radiator, 4-42

Driver's Seat, 11-20

Driving Axle Assembly

(See Front Axle (M916 thru M920)

and Rear Axle)

Drums, Brake

Description, 2-18,2-21

Front (M915), 10-13

Front (M916 thru M920), 10-14

Rear, 10-15

Dual Brake Valve and Pedal

(See Brake pedal and Valve)

Dual Control Valve

(See Brake Pedal and Valve)

Subject, Para

Subject, Para

Ε

Electrical System
Wiring Harness Repair, 5-31.1
Circular Connector Plug Repair, 5-31.1
Circular Connector Receptacle Repair, 5-31.1

End Assembly
Front Axle (M915), 10-13
Front Axle (M916 thru M920), 10-14
Pusher Axle, 10-16
Rear Axle, 10-15
Tie Rod, 10-20

Engine
Description, Exterior Components, 2-7
Troubleshooting, 4-5

Engine Coolant Heater, 5-90

Engine Fuel Lines and Fittings Description, 2-24 Maintenance, 4-20

Engine Mount, 3-7

Engine Oil Heater Thermostat, 5-89

Engine Retarder Brake Cover, 4-28 Description, 2-10 Foot Switch, 4-29 Inspection, 4-29 Selector Switch, 5-62

Engine Run Switch
Description, 2-38
Maintenance, 5-35

Engine Temperature Indicator Lamp Description, 2-33 Maintenance, 5-63

Ether Cylinder
Description, 2-40
Maintenance, 4-30

Ether Quick-Start Button Description, 2-40 Maintenance, 5-36

Ether Quick-Start Kit Atomizer, 4-32

Description, 2-40 Ether Button, 5-36 Ether Cylinder, 4-30 Ether Tube, 4-33 Solenoid Valve, 4-31 Temperature Switch, 5-74 Troubleshooting, 5-9

Ether Tube
Description, 2-40
Maintenance, 4-33

Exhaust Manifold Description, 2-30

Exhaust Pipe (See Turbo Outlet Pipe)

Exhaust Stack
Description, 2-30
Maintenance, 4-38

Exhaust System
Description, 2-29, 2-30
Exhaust Stack, 4-38
Flex Pipes, 4-35
Muffler, 4-37
Muffler Inlet Pipe, 4-36
Troubleshooting, 4-5
Turbo Outlet Pipe, 4-34

Extension Tube (See Muffler Inlet Pipe)

External Lines, Oil, 4-14

F

Fan
Description, 2-32
Maintenance, 4-44

Fan Belts, 4-45

Fan Clutch Description, 2-32, 2-74 Maintenance, 4-45

Fan Clutch Actuator Description, 2-32, 2-74

Change 2 Index-5

Subject, Para

Maintenance (M915, M916, M917, M918 & M920), 4-46 Maintenance (M919), 4-47

Fan Clutch Actuator Tubes (M915, M916, M917, M918 & M920), 448 Fan Clutch Actuator Tubes (M919), 4-49

Fan Shrouds, 4-41

Fan Switch (See Heater Switch)

Fenders, 11-14

Fifth Wheel Maintenance, 11-13

Filter Adapter, Oil (See Oil Filter Adapter)

Filters

Air Cleaner, 4-24
Fuel, 4-18
Fuel Pump Screen, 4-17
Inline, Winch, 12-9
Oil, 4-14
Rear Axle (M915), 8-13
Reservoir Screen& Strainer, Winch, 12-10
Transmission Pump Screen, 6-9

Flasher Unit Description, 2-46

Flex Pipes
Description, 2-30
Maintenance, 4-35

Foot Switch. Engine Retarder Brake Description, 2-10 Maintenance, 4-29

Forms, Maintenance, 1-3

Bumper, 11-9

Frame

Fifth Wheel, 11-13
Pintle, 11-10
Spare Tire Hoist (M915 & M916), 11-12
Spare Tire Hoist Cable (M915 & M916), 11-11

Subject, Para

Towing Eyes, 11-9 Troubleshooting, 11-5

Front Axle, (M915)
Description, 2-18
Drag Link, 10-19
End Assembly, 10-13

Shock Absorbers, 10-24 Tie Rod, 10-20 Troubleshooting, 10-5

Front Axle (M916 thru M920)
Bearings and Seals, 10-14
Description, 2-19
Oil Semite, 8-12
Troubleshooting, 8-5, 10-5

Front Wheels

Alinement, 10-10
Bearings and Seals (M915), 10-13
Bearings and Seals (M916 thru M920), 10-14
Hubs (M915), 10-13
Hubs (M916 thru M920), 10-14
Tires and Tubes, 10-11
Troubleshooting, 10-5

Fuel Filter
Description, 2-24
Maintenance, 4-18

Fuel Gage Description, 2-24 Maintenance, 5-59

Fuel Level Sending Unit Description, 2-24 Maintenance, 5-79

Fuel Lines, Hoses, and Fittings Description, 2-24 Maintenance, 4-20

Fuel Pump Assembly
Description, 2-24
Filter, 4-18
Lines, Hoses, and Fittings, 4-20
Pump Screen, 4-17
Solenoid Shutoff Valve, 4-16
Tachometer Cable, 4-19

Subject, Para

Fuel Pump Screen
Description, 2-24
Maintenance, 4-17

Fuel Solenoid (See Solenoid Shutoff Valve)

Fuel System
Description, 2-24
Fuel Filter, 4-18
Fuel Gage, 5-59
Fuel Level Sending Unit, 5-79
Fuel Pump Screen, 4-17
Hand Throttle and Linkage, 4-22
Lines, Hoses, and Fittings, 4-20
Solenoid Shutoff Valve, 4-16
Tachometer Cable, 4-19

Tank, 4-23 Troubleshooting, 4-5

Fuel Tank
Description, 4-23
Maintenance, 4-23

G

Gages

Air Pressure, 9-20 Fuel, 5-59 Oil Pressure, 5-59 Pusher Axle Air Pressure, 8-16 Tachograph, 5-66 Transmission Oil Temperature, 5-59 Troubleshooting, 5-13, 9-5 Voltmeter, 5-59 Water Temperature, 5-59

Grille, 11-16

Grille Support Brackets, 11-18

Н

Hand Control Valve (See Trailer Brake Valve)

Hand Throttle and Linkage Description, 2-9 Maintenance, 4-22 Troubleshooting, 4-5

Subject, Para

Hazard Warning Switch Description, 2-46 Maintenance, 5-58

Headlamps

Description, 2-44 Dimmer Switch, 5-57 Lamps, 5-44 Switch, 5-62

Heater

Air Ducts, 11-30 Control Panel, 11-28 Control Valve, 11-29 Description, 2-56, 2-57 Fan Switch, 5-69 Hoses, 11-27 Motor, 11-24 Shutoff Valve, 4-48

High-Beam Indicator Description, 2-44 Maintenance, 5-63

High Engine Water Temperature Switch (See Water Temperature Switch)

Hood, 11-32

Horn, Air (See Air Horn)

Horn, Electric
Button and Cable, 5-67
Description, 2-54
Maintenance, 5-68

Horn Switch (See Horn, Electric)

Hub Assemblies and Drums Front (M915), 10-13 Front (M916 thru M920), 10-14 Rear, 10-15

Hydraulic Pump and Reservoir Assembly, Power Assembly Description, 2-76 Maintenance, 10-22

Subject, Para

Hydraulic Steering Pump

(See Hydraulic Pump and Reservoir Assembly)

Hydraulic System, Winch

Description, 2-80 Inline Filter, 12-9

Lines and Fittings, 12-13

Motor, 12-14 Pump, 12-15

Reservoir Screen & Strainer, 12-10

Valves, 12-11

ī

Idler Pulley, 4-52

Inline Filter (Winch)
Description, 2-80

Maintenance, 12-9

Instruction Plates, 11-31

Instrument Panel Circuit Breakers

Description, 2-35 Maintenance, 5-30

Instrument Panel Relays, 5-86

(See Individual Systems)

Instruments

Description, 2-52

Front Wheel Brake Air Pressure Gage, 9-20

Fuel Gage, 5-59 Oil Pressure Gage, 5-59

Pusher Axle Air Pressure Gage, 8-16

Tachograph, 5-66

Transmission Oil Temperature, 5-59 Troubleshooting, 5-12, 5-13,5-20

Voltmeter, 5-59

Water Temperature Gage, 5-59

Instruments - L.H. Cluster

Air Pressure Gages, 9-20

Description, 2-52 Fuel Gage, 5-59

Oil Pressure Gage, 5-59

Transmission Oil Temperature Gage, 5-59

Voltmeter, 5-59

Water Temperature Gage, 5-59

Subject, Para

Intake Manifold

(See Aftercooler)

Intercooler

(See Aftercooler)

Intermediate Pipe

(See Muffler Inlet Pipe)

J

Jacobs Brake

(See Engine Retarder Brake)

Jake Brake

(See Engine Retarder Brake)

K

L

Limiting Valve, 9-25

Lines, Fittings, and Hoses (Cooling System)

Description, 2-32 Maintenance, 4-42,4-39

Linkage, Accelerator (See Accelerator)

Lockup Switch, 5-83

Low Air Pressure Warning Indicator

Description, 2-62 Maintenance, 5-61

Low Air Buzzer, 5-80

Low Air Pressure Switch

Maintenance, 5-81

Low Brake Air Pressure Switch (See Low Air Pressure Switch)

Subject, Para

Low Engine Oil Pressure (See Oil Pressure Switch)

Lower Steering Column Maintenance, 10-18

M

Maintenance, Forms, 1-3

Manifold, Water, 4-52

Manual Drain Valve Maintenance, 9-13

Marker and Turn Signal Lamps Description, 2-45,2-46 Maintenance, 5-45

Mud Flaps, 11-19

Muffler

Description, 2-30 Maintenance, 4-37

Muffler Inlet Pipe Description, 2-30 Maintenance, 4-36

N

Neutral Safety Switch Description, 2-38 Maintenance, 5-75

Non-Driving Axle Assembly (See Front Axle, M915)

0

Oil System

Breather Tube, 4-16 Cooler, 3-7 Description, 2-26, 2-27, 2-28 Filter, 4-14 Filter Adapter, 4-14 Oil Lines, 4-14 Oil Pressure Gage, 5-59 Oil Pressure Switch, 5-71

Oil Sample for Analysis, 4-14

Subject, Para

Oil Service, 4-14 Rocker Arm Housing Cover, 4-28 Troubleshooting, 4-5

Р

Park Brake

Control Valve, 9-19 Description, 2-62, 2-63 Indicator, 5-63 Relay Valve, 9-24 Switch, 5-82

Park Brake Engaged Switch (See Park Brake)

Park Brake Valve Description, 2-62 Maintenance, 9-19

Passenger's Seat, 11-21

Pedal, Accelerator (See Accelerator)

Pedal, Brake (See Brake Pedal and Valve)

Personnel Heater (See Heater)

Pintle, 11-10

Pitman Arm
Description, 2-76
Maintenance, 10-21

Pivot Lever, Accelerator Description, 2-9 Maintenance, 4-21

Pneumatic Control Lines (Transmission)
Description, 2-12
Maintenance, 6-11

Power Steering Cylinder (See Auxiliary Cylinder)

Power Steering Gear (See Steering Gear)

Subject, Para

Power Steering Pump

(See Hydraulic Pump and Reservoir Assembly)

Power Steering Reservoir

(See Hydraulic pump and Reservoir Assembly)

Power Steering System (See Steering System)

Power Takeoff (See PTO)

Power Train

Description (M915), 2-4

Description (M916 thru M920), 2-5

Maintenance (See Individual Components)

Power Transfer Case

Cooler Maintenance, 7-9

Description, 2-14

Oil Semite, 7-8

Troubleshooting, 7-5

Power Transfer/Differential Lockout Control

(See Differential Lockup Control Valve)

Pressure Gages, Air

Front Brake Air, 9-20

Pusher Axle, 8-16

Rear Brake Air, 9-20

Pressure Regulator Valve, Pusher Axle

Description, 2-16

Maintenance, 8-17

Propeller Shafts

Description, 2-4,2-5,2-21,2-22

Shaft Maintenance, 8-11

Troubleshooting, 8-5

Universal, 8-11

PTO

Description, 2-78

Linkage, 12-16

Switch, 5-84

Troubleshooting, 7-5, 12-5

PTO Engaged Switch

(See PTO)

Subject, Para

Pulleys

Accessory Drive, 2-32

idler, 4-54

Water Pump, 4-51,4-54

Pusher Axle (M917, M918, & M920)

Air Bags, 8-14

Description, 2-16

Lift Cylinders, 8-15

Pressure Gage, 8-16

Pressure Regulator Valve, 8-17

Shock Absorbers, 10-25

Troubleshooting, 8-5

Up-Down Selector Valve, 8-18

Wheel Bearings and Seals, 10-16

Q

Quick-Release Valves

Quick-Release/Double-Check, 9-23

Service Brakes, 9-22

R

Radiator

Description, 2-32

Drain and Fill, 4-42

Drain Cock, 4-42

Fan Shrouds, 4-41

Lines and Hoses, 4-39

Remove and Install ,4-40

Ratio Selector

Description

Description, 2-12

Maintenance, 6-12

Ratio Valve

(See Limiting Valve)

Rear Axle

Bearing and Seals, 10-15

Description, 2-21,2-22

Oil Service, 8-13

Torque Rods, 10-26

Troubleshooting, 8-5, 10-5

Subject, Para

Rear Bogey Axle (See Rear Axle)

Rear Lamp Assembly Description, 2-46, 2-47 Maintenance, 5-46

Rear View Mirror, 11-25

Relays

Description, 2-35 Maintenance, 5-86 (See Individual Systems)

Relay Valves, 9-24

Reservoirs. Air

Automatic Drain Valve, 9-12 Description, 2-60 Maintenance, 9-16 Manual Drain Valve, 9-13 Safety Release Valve, 9-14 Troubleshooting, 9-5

Reservoir, Winch
Description, 2-80
Inline Filter, 12-9
Screen and Strainer, 12-10

Rocker Arm Housing Cover, 4-28

Roller, Tail, 11-33

S

Safety Release Valve Description, 2-60 Maintenance, 9-14

Safety Valve (See Safety Release Valve)

S-Cam Mechanism, 9-34

Screens

Fuel Pump, 4-17 Fuel Tank, 4-23 Transmission, 6-9 Winch Reservoir, 12-10 Subject, Para

Seat Risers, 11-22

Seats

Driver's, 11-20 Passenger's, 11-21

Selector Switch, Engine Retarder Brake Description, 2-10 Maintenance, 5-62

Service Brakes (See Brake System)

Service Head Lamps (See Headlamps)

Shock Absorbers
Description, 2-16,2-18
Front Axle, 10-24
Pusher Axle, 10-25

Slack Adjusters Adjust, 9-39 Remove and Install, 9-39

Solenoid Shutoff Valve (Fuel)
Description, 2-24
Maintenance, 4-16

Solenoid Valve, Quick-Start Description, 2-40 Maintenance, 4-31

Solenoid Valves, Engine Retarder Brake Description, 2-10 Inspection, 4-29

Spare Wheel Mount Hoist Cable, 11-11 Hoist, 11-12

Speedometer Cable Description, 2-52 Maintenance, 6-13

Splash Shields (See Mud Flaps)

Starter

Description, 2-38

Subject, Para

Motor, 5-32 Relay, 5-33 Switch, 5-34 Troubleshooting, 5-8

Starter Magnetic Switch (See Starter)

Starter Solenoid (See Starter, Motor)

Steering Arm Maintenance, 10-84.3
Assembly, 10-84.7
Cleaning and Inspection, 10-84.7
Disassembly, 10-84.4
Fabrication of Pushrod Driver and
Steering Stop Template, 10-85
Preparation, 10-84.4

Steering Column, 10-18

Steering Gear Description, 2-76

Steering Gear Poppet Adjustment, 10-84.11

Steering System
Auxiliary Cylinder, 10-23
Description, 2-76
Drag Link, 10-19
Hydraulic Pump and Reservoir Assembly,
10-22
Lower Steering Column, 10-18
Pitman Arm, 10-21
Steering Wheel, 10-17
Tie Rod, 10-20
Troubleshooting, 10-5
U-Joints, 10-18

Steering Stop Inspection and Adjustment Procedures, 10-84.8

Steering Wheel
Description, 2-76
Maintenance, 10-17

Stop Lamps (See Rear Lamp Assembly)

Subject, Para

Stop Switches
Description, 2-76
Maintenance, 5-85

Stowage Box (See Seat Risers)

Supply Rervoir
Automatic Drain Valve, 9-12
Description, 2-60
Maintenance, 9-16

Suspension System
Front Axle Shock Absorbers, 10-24
Pusher Axle Shock Absorbers, 10-25
Rear Axle Torque Rods, 10-26
Troubleshooting, 10-5

Switches and Relays (See Specific Items)

Т

Tachograph Assembly
Description, 2-52
Maintenance, 5-66
Speedometer Cable, 6-13
Tachometer Cable, 4-19

Tail Lamps (See Rear Lamp Assembly)

Tail Pipe (See Exhaust Stack)

Tail Roller, 11-33

Thermal Switch, Quick-Start (See Ether Quick-Start Kit)

Thermostat Control and Linkage Description, 2-9 Maintenance, 4-22 Troubleshooting, 4-5

Throttle, Winch
Description, 2-80
Maintenance, 12-12

Subject, Para

Tie Rod Adjust, 10-10 Description, 2-18,2-76 Remove and Install, 10-20

Tires and Tubes, 10-11

Tool Box, 11-22

Subject, Para

Torque Rods, 10-26

Torque Table, 3-9

Towing Eyes, 11-9

Tractor Protection Valve, 9-26

Trailer Brake Valve Description, 2-62 Maintenance, 9-18

Trailer Connector Brake Lines and Couplings (See Brake System)

Trailer Couplings, Electric, 5-55

Trailer Hand Brake Valve (See Trailer Brake Valve)

Trailer Hand Control Valve (See Trailer Brake Valve)

Trailer Supply Valve Description, 2-62 Maintenance, 9-17

Transmission

Air Charging Valve, 6-12 Breather, 6-9

Control Heater, 6-14 Control Lines, 6-11 Description, 2-12

Neutral Safety Switch, 5-75

Oil Heater, 5-88

Oil Temperature Gage, 5-59

Oil Temperature Sending Unit, 5-76

Oil Service, 6-9 Ratio Selector, 6-12 Screen Filter, 6-9 Troubleshooting, 6-5, 6-6

Troubleshooting

Axles, 8-5

Backup Lamps, 5-18
Battery Charging, 5-11
Battery System, 5-7

Blackout Lighting System, 5-19

Brakes, 9-5

Compressed Air System, 9-5

Subject, Para

Engine, 4-5

Engine Retarder, 5-10 Ether Quick-Start, 5-9

Frame, 11-5

Gages, and Sending Units, 5-13

Headlamps, 5-14 Marker Lamps, 5-15

Miscellaneous Electrical, 5-20 Parking and Tail Lamps, 5-16 Power Transfer Case, 7-5 Propeller Shafts, 8-5 Starting System, 5-8

Steering System, 10-5

Stop and Turn Signal Lamps, 5-17

Suspension, 10-5 Symptom Index, 3-8 Transmission, 6-5, 6-6

Warning Lamps and Alarms, 5-12

Wheels, 10-5 Winch, 12-5

Turbo Air Inlet
Description, 2-25
Maintenance, 4-27

Turbocharger Description, 2-25

Turbocharger Air Inlet (See Turbo Air Inlet)

Turbo Outlet Pipe Description, 2-30 Maintenance, 4-34

Turn Signals
Control, 5-58
Description, 2-46
Lamps, Front, 5-45
Lamps, Rear, 5-46
Troubleshooting, 5-17

Turn Signal Switch (Control) (See Turn Signals)

U

Universal Joints (Drive Train) Inspect, 8-11 Maintenance. 8-11

Subject, Para

Universal Joints (Steering Column)
Description, 2-76
Maintenance, 10-18

Up-Down Selector Valve Description, 2-80 Maintenance, 8-18

٧

Valve Cover

(See Rocker Arm Housing Cover)

Valves

Air Charging, 6-11
Air Horn Control, 9-43
Atomizer, 4-32
Automatic Drain, 9-12
Brake Pedal, 9-21
Differential Lockup, Co.

Differential Lockup Control, 9-42 Double-Check, 9-28,9-29 Fuel Solenoid Shutoff, 4-16

Heater Shutoff, 4-50

Heater Water Control, 11-26

Limiting, 9-25 Manual Drain, 9-13 Park Brake, 9-19

Pusher Axle Pressure Regulator, 8-17 Pusher Axle Up-Down Selector, 8-18 Quick-Release/Double-Check, 9-23

Quick-Start Solenoid, 4-31

Relay, 9-24

Safety Release, 9-14

Service Brakes Quick-Release, 9-22

Tractor Protection, 9-26 Tractor/Trailer Brake, 9-18 Trailer Supply, 9-17 Winch Control, 12-11

Ventilator

Description, 2-58 Maintenance, 11-15

Voltmeter

Description, 2-52 Maintenance, 5-59

Subject, Para

W

Water Manifold
Description, 2-32
Maintenance, 4-52

Water Pump
Belt, 4-51
Description, 2-32
Idler Pulley, 4-54
Maintenance, 4-53

Water Temperature Gage Description, 2-33 Maintenance, 5-59

Water Temperature Sending Unit Description, 2-33 Maintenance, 5-72

Water Temperature Switch Description, 2-33 Maintenance, 5-73

Wheels

Alinement, 10-10

Drums: Covered w/Wheel Bearings and Seals Front Wheel Bearings and Seals (M915), 10-13 Front Wheel Bearings and Seals (M916 thru M920), 10-14 Hubs: Covered w/Wheel Bearings and Seals

Pusher Axle Wheel Bearings and Seals, 10-16 Rear Wheel Bearings and Seals, 10-15

Tires and Tubes, 10-11 Troubleshooting, 10-5

Winch

Cables, 12-8
Control Valves, 12-11
Description, 2-80
Hydraulic Lines and Fittings, 12-13
Hydraulic Motor, 12-14

Hydraulic Motor, 12-14 Hydraulic Pump, 12-15 Inline Filter, 12-9 PTO Linkage, 12-16

Reservoir Screen & Strainer, 12-10
Taking Hydraulic System Oil Sample, 12-17

Throttle, 12-12

Wiring Harness Repair, 5-31.1

Circular Connector Plug Repair, 5-31.1 Circular Connector Receptacle Repair, 5-31.1

Subject, Para

Subject, Para

Troubleshooting, 12-5

Windshield Washers Control Button, 9-41 Description, 2-72 Maintenance, 9-40

Windshield Wipers Arms, 11-24 Blades, 11-23 Control, 9-43 Description, 2-72 Motor, 9-42 Troubleshooting, 95

Winter Front, 11-17

Winterization Kit
Battery Box Heater, 5-91
Circuit Breaker Box, 5-87
Circuit Breakers,5-87
Description, 2-81, 2-82
Engine Coolant Heater, 5-90
Engine Oil Heater Thermostat, 5-89
Receptacle, 5-87
Transmission Oil Heater, 5-88

Wire Identification, 2-36

Work Lamps (M916 & M920) Description, 2-48 Lamps, 5-54 Switch, 5-62

X Y Z

By Order of the Secretary of the Amy

E. C. MEYER General, United States Army Chief of Staff

Official:

J. C. PENNINGTON

Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-38, organizational maintenance requirements for M915, M916, M920 trucks and truck chassis for M917, M918, and M919,

*U.S. GOVERNMENT PRINTING OFFICE: 19940- 300-421 (03051)

RE	COMME	NDED C	HANGE:	S TO PUE	BLICATIO	ONS	H D-4	II (de Douts and	DATE	
		IK FORN					Use Part II (reverse) for Repa Special Tool Lists (RPSTL) a		and Supply	Date you filled out	
For u	use of this f	orm, see Al	R 25-30; th	e proponer	nt agency is	ODISC4.	DISC4. Catalogs/Supply Manuals (SC/SM). Date you filled this form.				
					de ZIP Code	FROM: (Activity and location) (Include ZIP Code)					
	TALC-LF ck Island :	PIT / TECI Arsenal	H PUBS,	TACOM	-RI		Your ma	ailing address			
		61299-7				LICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS					
PUBLICATION/FORM NUMBER					BLICATIO	DATE	T RPSTL			16/M020 and Truck	
TM 9 -2320-273-20							28 November Chassis, M917/M918/M919				
ITEM NO.	PAGE NO.	PARA- GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON (Provide exact wording of recommended changes, if possible).					
	0004	4 7				Wrong POC is listed.					
	0004 00-2	4-7				Wrong PC	JC IS IISIE	u.			
								30			
							M				
						and the					
						-					
				*R				graph or subparagrap			
		ADE OR TIT	LE		TELEPHON	E EXCHANGE/	/AUTOVON,	PLUS EXTENSION	SIGNATURE		
Your	Name		Your Name						Your Signature		

AMST 1 Rock		PIT / TE(Arsenal		1-RI	FROM: (Activity and location) (Include ZIP Code) Your address Date you filled out this form						
				ARTS AND SPEC	IAL TOOL L	AL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS					
PUBLICATION NUMBER TM 9 -2320-273-20					DATE 28 Nove	ember 1	1980	TITLE Truck Tracto Truck Chassis, M ^o	or, M915/M916/M920 and 917/M918/M919		
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMI	MENDED ACTION		
	PART III –	DEMARK	S. /Anu gangal sare					of publications and blank			
		- KLWAKK	forms. Additional b	plank sheets may b	e used if mo	re space	is needed.)	п риысаноть апи шапк			
TYPED N	NAME, GRA	ADE OR TI	TLE	TELEPHONE EX	XCHANGE/A	UTOVON	I, PLUS EXTENSIO	ON SIGNATURE			
Your Name								Your Signature			

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4.							Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).			
To: (Forward to proponent of publication or form) (Include ZIP Code) AMSTALC-LPIT / T ECH PUBS, TACOM-RI 1 Rock Island Arsenal Rock Island, IL 61299-7630							FROM: (Activity	y and location)	(Include ZIP Code)	
				PART I – AL	L PUBLICA		T RPSTL AND S			
	:2320-27	RM NUMBER 3-20	2			DATE 28 Novem	nber 1980		ck Tractor, M915 M917/M918/M9	5/M916/M920 and Truck 19
ITEM NO.	PAGE NO.	PARA- GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.				D CHANGES AND REA frecommended chang	
-		*DE 05 =:		*R			thin the paragraph		•	
		ADE OR TIT		REPLAC	EXTENSI	ON	DEC 68, WHIC		SIGNATURE USED.	USAPPC V3.00

AMST 1 Rock	ALC-LF (Island)	PIT / TE(Arsenal		1-RI	FROM: (A	ictivity and	a location) (include	ZIP Code)	DATE
ROCK I	siana, il	61299		ARTS AND SDEC	IAL TOOL I	IA 2T2I	D SLIPPI V CATAL	OGS/SUPPLY MANUAL	<u> </u>
	ATION NUM 2320-27		TAKE INC.	TIKTO TIND SI LO	DATE 28 Nove				or, M915/M916/M920 and
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOM	MENDED ACTION
PART III – REMARKS (Any general remarks or recommendations, or suggestions for improvement of publications and blank									
	PART III -	REWARK	forms. Additional b	olank sheets may b	nations, or su to e used if mo	ggestions re space	is needed.)	r pudiications and diank	
TYPED NAME, GRADE OR TITLE TELEPHONE EX						UTOVON	I, PLUS EXTENSIO	ON SIGNATURE	

ΑN	RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4.							Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).		
TO: (Forward to proponent of publication or form) (Include ZIP Code) AMSTALC-LPIT / TECH PUBS, TACOM-RI 1 Rock Island Arsenal Rock Island, IL 61299-7630 PART I – ALL PUBLICATIONS (EXC) (Include ZIP Code)	
5.15.16				PART I – AL	L PUBLICA		T RPSTL AND S			
	2320-27					DATE 28 Novem	nber 1980		uck Tractor, M915/N , M917/M918/M919	1916/M920 and Truck
ITEM NO.	PAGE NO.	PARA- GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.				ED CHANGES AND REASO of recommended changes,	
				*R	eference to l	ine numbers wi	thin the paragrap	h or subparag	raph.	
TYPFN	NAME, GRA	ADE OR TIT	1 F	"R			<i>thin the paragrap</i> E/AUTOVON, PLI		<i>rapn.</i> SIGNATURE	
				DEDI AC	EXTENSIO	ON				USAPPC V3.00
ם אט	DA FORM 2028, FEB 74 REPLACES DA FORM 2028,							OLI AAITT RE	USED.	USAPPC V3.00

AMST. 1 Rock	ALC-LF Island <i>i</i>	PIT/TEC	see listed in publication) CH PUBS, TACON .7630	1-RI	FROM: (A	ctivity and	d location) (Include	ZIP Code)	DATE	
TOOK	. 01277		ARTS AND SPEC							
PUBLICATION NUMBER TM 9 -2320-273-20					DATE 28 Nove				or, M915/M916/M920 and	
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOM	MENDED ACTION	
	PART III -	REMARK	S (Any general rema forms. Additional b	arks or recommend plank sheets may b	lations, or su be used if mo	ggestions re space	for improvement o is needed.)	f publications and blank		
TYPED NAME, GRADE OR TITLE TELEPHONE EX					KCHANGE/A	UTOVON	I, PLUS EXTENSIC	N SIGNATURE		

THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

- 1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
- 1 Meter= 100 Centimeters = 1000 Millimeters = 39.37 Inches
- 1 Kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

- 1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
- 1 Kilogram =1000 Grams =2.2 Lb
- 1 Metric Ton=1000 Kilograms=1 Megagram=1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces 1 Liter=1000 Milliliters=33.82 Fluid Ounces

SQUARE MEASURE

- 1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
- 1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet 1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches 1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

TEMPERATURE

 $5.9({}^{0}F - 32) = {}^{0}C$

212⁰ Fahrenheit is equivalent to 100⁰ Celsius 90⁰ Fahrenheit is equivalent to 32.2⁰ Celsius 32⁰ Fahrenheit is equivalent to 0⁰ Celsius 9 5 C⁰ + 32 = F⁰

ADDOONINATE CONVEDCION EACTOD

APPROXIMATE CONVERSION FACTORS							
TO CHANGE TO	MULTIPLY BY						
Inches Centimeters							
Feet Meters							
Yards Meters							
Miles Kilometers							
Square Inches Square Centimeters							
Square Feet Square Meters							
Square Yards Square Meters	0.836						
Square Miles Square Kilometers.	2.590						
Acres Square Hectometers							
Cubic Feet Cubic Meters							
Cubic Yards Cubic Meters							
Fluid Ounces Milliliters							
Pints Liters							
Quarts Liters							
Gallons Liters							
Ounces							
Pounds Kilograms							
Short Tons Metric Tons							
Pound-Feet Newton-Meters							
Pounds per Square Inch Kilopascals							
Miles per Gallon Kilometers per Lite							
Miles per Hour Kilometers per Hour	1.609						
TO CHANGE TO	MULTIPLY BY						
Centimeters Inches	0.394						
	2 200						

TO CHANGE	<u>U</u>	MULTIPLY BY
Centimeters I	nches	0.394
Meters, , , , , , , , , , , , , , , , , , ,	eet	3.280
Meters Y	ards	1.094
Kilometers M	iles	0.621
Square Centimeters S	quare Inches	0.155
Square Meters S	quare Feet	10.764
Square Meters 5	quare Yards	1.196
Square Kilometers S	quare Miles	0.386
Square Hectometers A	cres	2.471
Cubic Meters C	ubic Feet	35.315
Cubic Meters C	ubic Yards	1.308
Milliliters F	luid Ounces	0.034
Liters P	ints	2.113
Liters Q	uarts	1.057
Liters,	allons	0.264
Grams 0	unces	0.035
Kilograms P	ounds	2.205
Metric Tons S	hort Tons	1.102
Newton-Meters P	ound-Feet	0.738
Kilopascals P	ounds pe r Square I.	nch . 0.145
Kilometers per Liter M	iles per Gallon .	2.354
Kilometers per Hour M	iles per Hour	0.621



TA 075664

PIN: 047617-000