DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR'S MANUAL
SNOW REMOVAL UNIT, SELF-PROPELLED:
GASOLINE DRIVEN; ROTARY; WHEEL
MTD; WINTERIZED
(FWD MODEL 9349-V)
SERIAL NUMBERS G30681 THROUGH G30690 AND
G30750 THROUGH G30759 FSN 3825410-7074

HEADQUARTERS, DEPARTMENT OF THE ARMY
21 DECEMBER 1961

SAFETY PRECAUTIONS

Before Operation

Always correct or report any condition to organizational maintenance that may result in injury to personnel if operation is continued.

Before starting the engines make sure that all operating levers are in the neutral or disengaged position.

Before starting engines or operating any of the snow removal unit components, see that no loose bars, tools, or parts are lying in or on any part of the equipment, as they could cause serious damage to the equipment or bodily injury to personnel.

Never fill the fuel tank while the engine is running. Be sure there are no open flames which may ignite the fuel vapor while filling the tank. Always provide a metal-to-metal contact between the fuel container and fuel tank to avoid igniting the fuel vapors with a static spark. Be sure the plow is in a lowered position to assure grounding of the equipment.

Keep walkways and decks free of grease, oil, ice, and mud to prevent slipping and falling.

Exercise care when servicing the batteries to prevent electrolyte from splashing on skin or clothing. If electrolyte is spilled on skin or clothing, wash the contaminated skin area and change clothing.

Make certain that all personnel are clear of the snow removal unit before starting plowing operation as serious injury or death could result.

Ether is highly explosive and toxic. Handle ether capsules with extreme caution to prevent their rupture until they are installed in capsule chamber. Strict observance of this precaution will help prevent explosion, fire, and injury to personnel.

During Operation

Do not clean, adjust, or lubricate the components of the snow removal unit during operation.

Use extreme care in removing the radiator cap from an overheated engine. Hot coolant may cause bodily injury.

Never get on or off the snow removal unit when it is in motion.

After Operation

Always correct or report any condition to organizational maintenance that may result in injury to personnel if operation is continued.

Stop all operation when cleaning, adjusting, or lubricating the components of the snow removal unit.

Never fill the fuel tank while the engine is running. Be sure there are no open flames which may ignite the fuel vapor while filling the fuel tank. Always provide a metal-to-metal contact between the fuel container and fuel tank to avoid igniting the fuel vapor with static spark. Be sure the plow is in lowered position to assure grounding of the equipment.

Use handrails to avoid falling from the snow removal unit.

Use extreme caution in removing the radiator cap from an overheated engine. Hot coolant may cause bodily injury.

CHANGE

NO. 4

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington D.C., *14 July 1991*

OPERATOR'S MANUAL

SNOW REMOVAL UNIT, SELF-PROPELLED
GASOLINE DRIVEN; ROTARY WHEEL MTD;
WINTERIZED (FWD MODEL S-349V)
SERIAL NUMBERS G30681 THROUGH G30759

FSN 3825810-7074

TM 5-3825-213-10, 21 December 1961, is changed as follows:

Inside front cover. Add the following WARNING to the inside front cover of the manual:

WARNING

If NBC exposure Is suspected, all air filter media should be handled by personnel wearing protective equipment. Consult your unit NBC Officer or NBC NCO for appropriate handling or disposal instructions.

Page 3. The address listed in paragraph Id is changed to read" Commander, U.S. Army Tank-Automotive Command, ATTN: AMSTA-MB, Warren, MI 48397-5000".

Page 45. Add the following paragraph preceding paragraph 25:

24.1. AIR CLEANER/AIR FILTER NBC WARNING DECAL

A decal has been developed that warns of NBC exposure. It is to be positioned in a noticeable place on or near the air filter housing or air cleaner. You may order the decal using part number 12296626, CAGE 19207. Refer to TB 43-0219 for further information. (See *Figure 33.*)

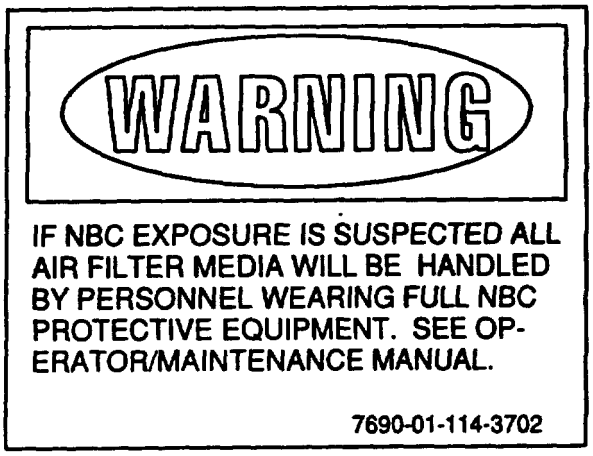


Figure 12.1. NBC Warning Decal

Add the following WARNING preceding paragraph 28*d*, page 47; preceding "Air Cleaner" at the top of *page 94*; preceding paragraph 43, *page 94*; preceding paragraph 51, *page 95*; preceding paragraph 73, *page 97*; and following Figure 33, *page 99*:

WARNING

If NBC exposure is suspected, all air filter media should be handled by personnel wearing protective equipment. Consult your unit NBC Officer or NBC NCO for appropriate handling or disposal instructions.

PAGE 138. Under the heading "Operating of equipment", add the entry "Air cleaner/air filter NBC warning decal, paragraph 24.1, page 45" preceding "General"

Page 99. Figure 33 is superseded as shown below:

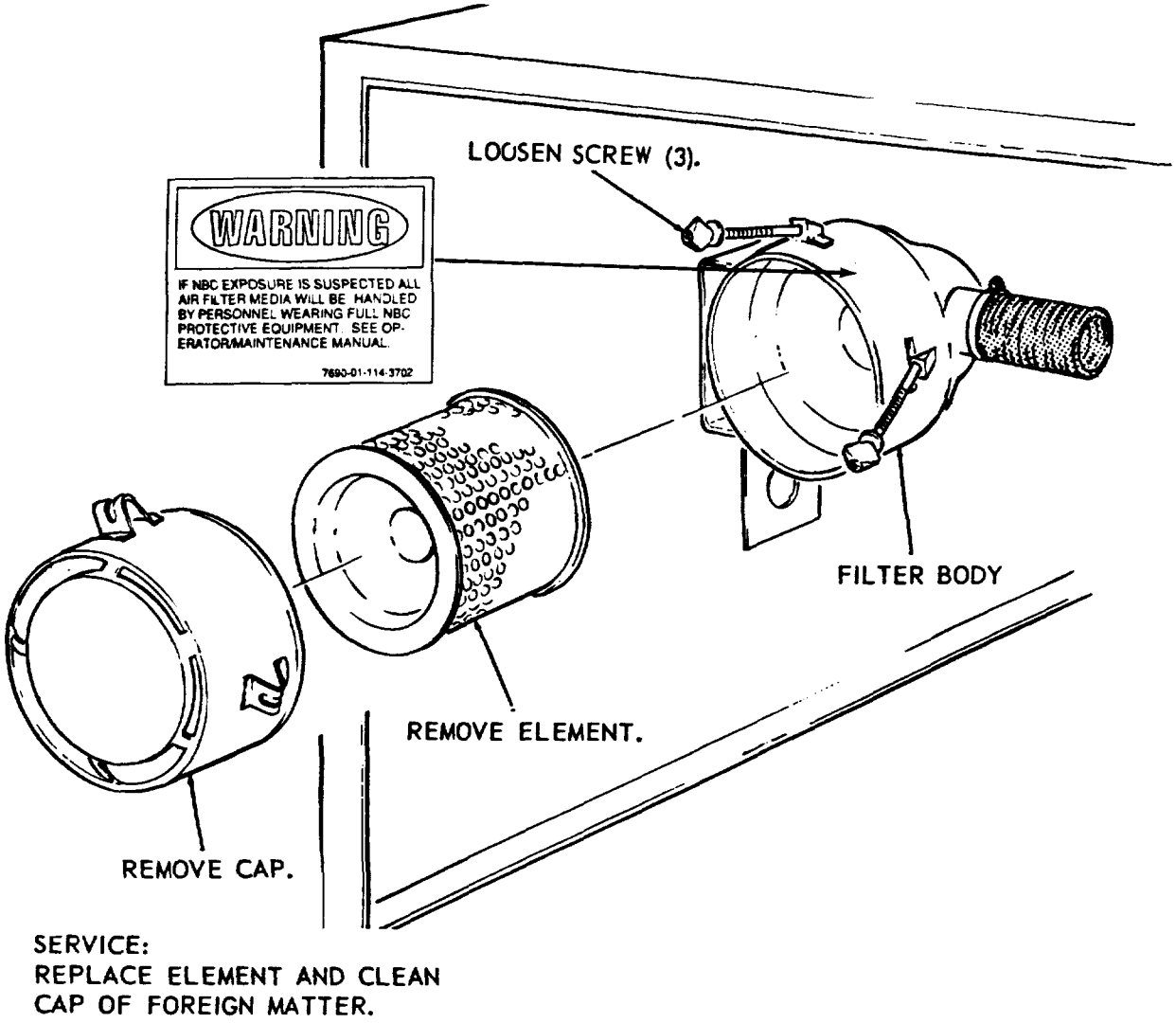


Figure 33. Carrier and plow engine air cleaner service

WARNING

If NBC exposure is suspected, all air filter media should be handled by personnel wearing protective equipment. Consult your unit NBC Officer or NBC NCO for appropriate handling or disposal instructions.

By Order of the Secretary of the Army:

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

Official:

PATRICIA P. HICKERSON
Brigadier General, United States Army
The Adjutant General

Distribution:

To be distributed IAW DA Form 12-25E (Block No. 1636) Operators maintenance requirements for TM 5-3825-213-10.

Changes in Force: C1 and C3

***TM 5-3825-213-10**
C3

CHANGE
No. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *7 September 1973*

Operator's Manual
SNOW REMOVAL UNIT, SELF-PROPELLED
GASOLINE DRIVEN; ROTARY; WHEEL MTD;
WINTERIZED (FWD MODEL S-349-V)
SERIAL NUMBERS G30681 THROUGH G30690
AND G30750 THROUGH G30759
FSN 3825-810-7074

TM 5-3825-213-10, 21 December 1961, is changed as follows:

Page 1. Appendix II title is superseded as follows: BASIC ISSUE ITEM LIST AND ITEMS TROOP INSTALLED OR AUTHORIZED LIST

Page 3. Paragraph 1*d* and 1*e* are rescinded.

Paragraph 2 is superseded as follows:

2. Forms and Records

a. DA Forms and records used for equipment maintenance will be only those prescribed by TM 38-750.

b. The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to Commander, US Army Troop Support Command, ATTN: AMSTS-MPP, 4300 Goodfellow Boulevard, St. Louis, MO. 63120.

Page 129. Appendix I is superseded as follows:

APPENDIX I
REFERENCES

1. Fire Protection	
TB 5-4200-200-10	Hand Portable Fire Extinguishers for Army Users.
2. Lubrication	
C9100 IL	Identification List; FSC Group 91; Fuels, Lubricants, Oils and Waxes.
3. Painting	
TM 9-213	Painting Instructions for Field Use.
4. Maintenance	
TM 9-2610-200-20	Organizational Care, Maintenance, and repair of Pneumatic Tires and Inner Tubes.
TB 750-651	Use of antifreeze solutions and Cleaning Compounds in Engine Cooling Systems.
TM 38-750	The Army Maintenance Management System (TAMMS)
TM 9-6140-200-14	Operator's, Organizational, Direct Support, and General Support Maintenance Manual: Storage Batteries: Lead-Acid Type.
5. Shipment and Storage	
TB 740-97-2	Preservation of USAMECOM Mechanic al Equipment for Shipment and Storage.
TM 740-90-1	Administrative Storage of Equipment

Page 131. Appendix II, Basic Issue Items List is superseded as follows:

*This change supersedes C2, 18 June 1968.

APPENDIX II
BASIC ISSUE ITEM LIST AND ITEMS TROOP INSTALLED OR AUTHORIZED LIST
Section I. INTRODUCTION

1. Scope

This appendix lists basic issue items and items troop installed or authorized which accompany the snow removal unit, and are required by the crew/operator for operation, installation, or operator's maintenance.

2. General

This basic issue items and items troop installed or authorized list is divided into the following sections:

a. Basic Issue Items List-Section II. Not applicable.

b. Items Troop Installed or Authorized List-Section III. A list in alphabetical sequence of items which, at the descretion of the unit commander, may accompany the end item, but are not subject to be turned in with the end item.

3. Explanation of Columns

The following provides an explanation of columns in the tabular list of items troop installed or authorized, section III.

a. Source, Maintenance, and Recoverability Code(s) (SMR): Not applicable.

b. Federal Stock Number. This column indicates the Federal stock number assigned to the item which will be used for requisitioning purposes.

c. Description. This column indicates the Federal item name and any additional description of the item required.

d. Unit of Measure (U/M). A 2-character alphabetic abbreviation indicating the amount of quantity of the item upon which the allowances are based; e.g., ft, ea, pr; etc.

e. Quantity Authorized. This column indicates the quantity of the item authorized to be used with the equipment.

Section III. ITEMS TROOP INSTALLED OR AUTHORIZED LIST

(1) *SMR code*	*(2)* *Federal stock number*	*(3)* *Description*	*(4)* *Unit of meas*	*(5)* *Qty auth*
	4210-889-2221	EXTINGUISHER, FIRE	ea	1

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:
To be distributed in accordance with DA Form 12-25B, (qty rqr block No. 445) Operator Maintenance Requirements for Road Clearing Equipment.

☆ U.S. GOVERNMENT PRINTING OFFICE 1973: 768109/287

TECHNICAL MANUAL

Operator's Manual

SNOW REMOVAL UNIT, SELF-PROPELLED: GASOLINE DRIVEN; ROTARY; WHEEL MTD; WINTERIZED (FWD MODEL S-349-V) SERIAL NUMBERS G30681 THROUGH G30690 AND G30750 THROUGH G30759, FSN 3825-810-7074

TM 5-3825-213-10
CHANGES No. 1

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *22 April 1963*

TM 5-3825-213-10, 21 December 1961, is changed as follows:

Page 3, paragraph 1*d*, lines 4 through 6. Delete "General, Military Construction Supply Agency/U.S. Army Engineer Maintenance Center, Corps of Engineers, ATTN: MCSDM," and substitute "Officer, U.S. Army Mobility Support Center, ATTN: SMOMS-MS,".

e. (Superseded) Report all equipment improvement recommendations as prescribed by TM 38-750.

Paragraph 2, line 2. Delete "5-505" and substitute "38-750".

Page 17, paragraph 6*d*, line 1. Delete "Before operation" and substitute "daily preventive maintenance".

Paragraph 7*a*, line 1. Delete "before-operation" and substitute "daily preventive maintenance".

Page 41, paragraph 16*a*(1), line 1. Delete "before operation" and substitute "daily preventive maintenance".

Paragraph 17*b*, line 1. Delete "after-operation" and substitute "daily preventive maintenance."

Paragraph 18*a* (1), line 1. Delete "before operation" and substitute "daily preventive maintenance".

Paragraph 19*b*, line 1. Delete "after-operation" and substitute "daily preventive maintenance".

Page 92.

39. General

(Superseded)

To insure that the snow removal unit is ready for operation at all times, it must be inspected systematically, so that defects may be discovered and corrected before they result in serious damage or failure. The necessary Preventive Maintenance Services to be performed are listed and described in paragraph 40. The item numbers indicate the sequence of minimum inspection requirements. Defects discovered during operation of the unit will be noted for future correction, to be made as soon as operation has ceased. Stop operation immediately if a deficiency is noted during operation which would damage the equipment if operation were continued. All deficiencies and shortcomings will be recorded, together with the corrective action taken, on DA Form 2404 at the earliest possible opportunity.

40. Daily Preventive Maintenance Services

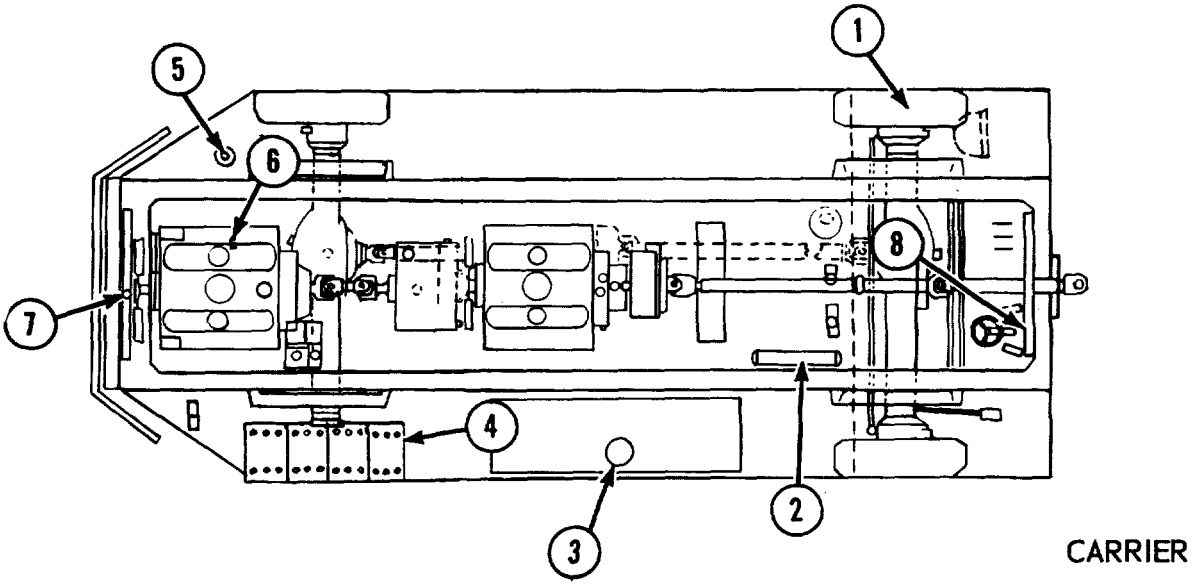
(Superseded)

This paragraph contains an illustrated tabulated listing of preventive maintenance services which must be performed by the operator. The item numbers are listed consecutively and indicate the sequence of minimum requirements. Refer to figure 30 for the Daily Preventive Maintenance Services.

Page 129, paragraph 4. Delete "AR 750-50, Maintenance Responsibilities and Shop Operation."

Add "TM 38-750, The Army Equipment Records System and Procedures."

Page 132, paragraph 4, lines 4 through 6. Delete "General, Military Construction Supply Agency/U.S. Army Engineer Maintenance Center, Corps of Engineers, ATTN: MCSDM," and substitute "Officer, U.S. Army Mobility Support Center, ATTN: SMOMS-MS,".



LUBRICATE IN ACCORDANCE WITH CURRENT LUBRICATION ORDER

ITEM		PAR REF
1	TIRES. Perform visual check for proper inflation. Correct pressure is 90 psi.	
2	AIR TANKS. Drain condensation.	
3	FUEL FILTERS, SEDIMENT BOWLS, AND WATER TRAPS. Drain. (Biweekly)	
4	BATTERIES. Check electrolyte level and hand tightness of connections. Fill to 3/8 inch above the plates. In freezing weather run the engine one hour after adding water. (Weekly)	
5	FIRE EXTINGUISHER. Check for broken seal.	
6	ENGINE OIL LEVEL. Check oil level. Add oil to proper level.	

Figure 30. (Superseded) Daily preventive maintenance services.

ITEM		PAR REF
7	COOLING SYSTEM. Check coolant level. Proper coolant level is 2 inches below filler neck.	
8	INSTRUMENTS. With the units operating check for proper operation. Normal operating readings should be as follows: CARRIER ENGINE: Air pressure - 85 to 103 psi, Coolant temperature - 1800 to 2000F, Tachometer - 2,600 rpm, Oil pressure - 40 to 60 psi, Battery generator indicator - in charge area, "IN" transmission oil pressure - 60 to 120 psi at a maximum "OUT" temperature of 2500F. PLOW ENGINE: Coolant temperature - 1800 to 200F, Oil pressure 40 to 60 psi, Tachometer - 2,600 rpm, Manifold vacuum - 3 to 6 inches at FULL throttle position.	
	NOTE 1. PLOW ENGINE. Items 6 and 7 are checked in a similar manner.	
	NOTE 2. OPERATION. During operation check all controls for proper operation.	

MSC 3825-213-10/30

Figure 30-Continued.

By Order of the Secretary of the Army:

EARLE G. WHEELER,
General, United States Army,
Chief of Staff.

Official:
J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

Distribution:
Active Army:
USASA (2)
DCSLOG (1)
CNGB (1)
TSG (1)
CofEngrs (3)
CSigO (1)
CofT (1)
USA Maint Bd (1)
USAARTYBD (2)
USAARMBD (2)
USAIB (2)
USARADBD (2)
USA Abn Elet & SPWAR Bd (2)
USAAVNBD (2)
USCONARC (3)
USAMC (5)
OS Maj Comd (5) except
USARJ (10)
MDW (1)
Armies (2)
Corps (2)
USA Corps (1)
Div (2)
Engr Bde (1)
USMA (2)
Svc Colleges (2)
Br Svc Sch (2) except
USAES (100)
GENDEP (OS) (10)
Engr Dep (OS) (10)
Army Dep (2)
USA Trans Tml Comd (2)
Army Tml (1)
USAOSA (2)
Engr Dist (2)
Div Engr (2)
Engr Fld Maint Shops (2)
USAERDL (3)
Engr Cen (5)
AMS (9.)
Chicago Engr Proc Ofc (10)
USA Mbl Spt Cen (36)
ESCO (10)
Fld Comd, DASA (8)
USACOMZEUR (2)
USAREUR Engr Sup Con Agcy (10)
USAREUR Engr Proc Cen (2)
MAAG (1)
JBUSMC (1)
Units org under fol TOE:
5-48 (2)
5-237 (5)
5-262 (5)
5-267 (1)
5-278 (5)
5-279 (2)
6-600 (EA, EB) (2)
NG: State AG (3).
USAR: Units-same as Active Army except allowance is one copy to each unit.
For explanation of abbreviations used, see AR 320-50.

☆**U. S. GOVERNMENT PRINTING OFFICE: 1963-650511**

TECHNICAL MANUAL
No. 5-3825-213-10

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *21 December 1961*

Operator's Manual

SNOW REMOVAL UNIT, SELF-PROPELLED: GASOLINE DRIVEN; ROTARY; WHEEL MTD; WINTERIZED (FWD MODEL S-349V) SERIAL NUMBERS G30681 THROUGH G30690 AND G30750 THROUGH G30759, FSN 3825-810-7074

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual is published for the use of the personnel to whom the FWD MODEL S-349-V Snow Removal Unit is issued. It provides information of the operation, lubrication, and preventive maintenance services of the equipment, accessories, components, and attachments.

b. Appendix I contains a list of publications applicable to this manual. Appendix II contains the basic issue items authorized for the use by the operator. The maintenance allocation chart is contained in TM 5-3825-213-20.

c. Numbers in parentheses on illustrations indicate quantity. Numbers preceding nomenclature callouts on illustrations indicate the preferred maintenance sequence.

d. Report all deficiencies in this manual on DA Form 2028. Submit recommendations for changes, additions, or deletions to the Commanding General, Military Construction Supply Agency/U.S. Army Engineer Maintenance Center, Corps of Engineers, ATTN: MCSDM, P.O. Box 119, Columbus 16, Ohio. Direct communication is authorized.

e. Report unsatisfactory equipment performance and suggestions for equipment improvement to the organizational unit for initiating necessary corrective action.

2. Record and Report Forms

For record and report forms applicable to the operator, refer to TM 5-505.

Note

Applicable forms, excluding standard Form 46 which is carried by the operator, will be kept in a canvas bag mounted on the equipment.

Section II. DESCRIPTION AND DATA

3. Description

a. General. The FWD Snow Removal Unit, Model S-349-V (figs. 1-3) is a truck-mounted, rotary snowplow driven by a gasoline engine power unit. The plow and its power unit are mounted on a gasoline-engine-driven carrier. The snow removal unit is designed to operate under conditions of extreme cold and to perform functions such as clearing roads and airfield runways. As a safety precaution, a rotating warning beacon is mounted on top of the operator's cab.

b. Snowplow. The augers break up the snow and feed it to the fan located behind the augers. The fan expels the snow through the snow direction chute when the blower housing is in the upright position. By rotating and raising and lowering the snow direction chute, the direction and distance to which the snow will be expelled is controlled. By turning the fan blower housing to the left or right and not using the snow direction chute, snow may be expelled a greater distance over a much larger area. The side cutters are used to break up high snow drifts. The plow assembly is raised and lowered hydraulically, to control the depth of the cut. The minimum height of the moldboard blade is set by adjusting the plow shoe adjustment shaft.

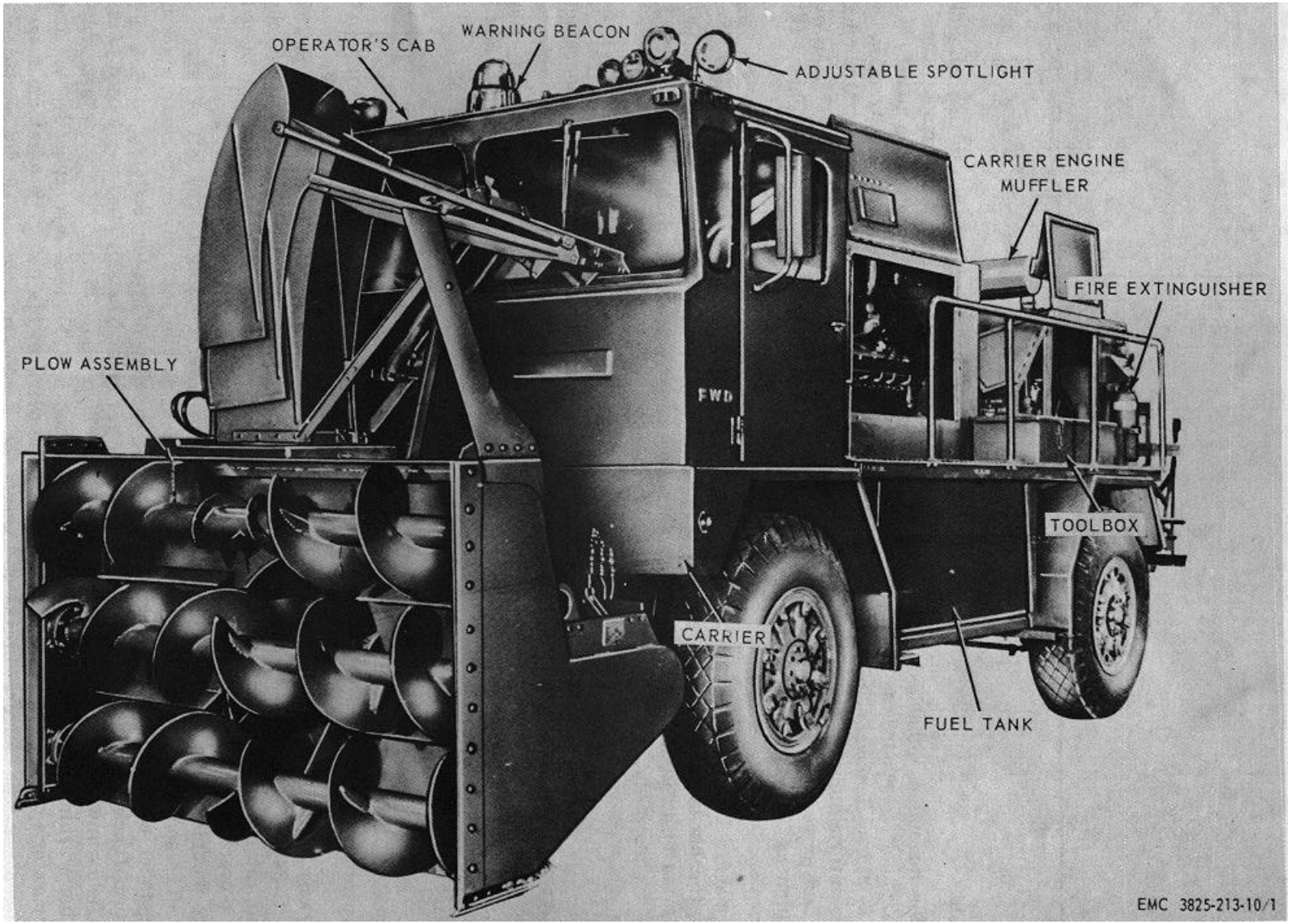


Figure 1. Snow removal unit, left front three-quarter view.

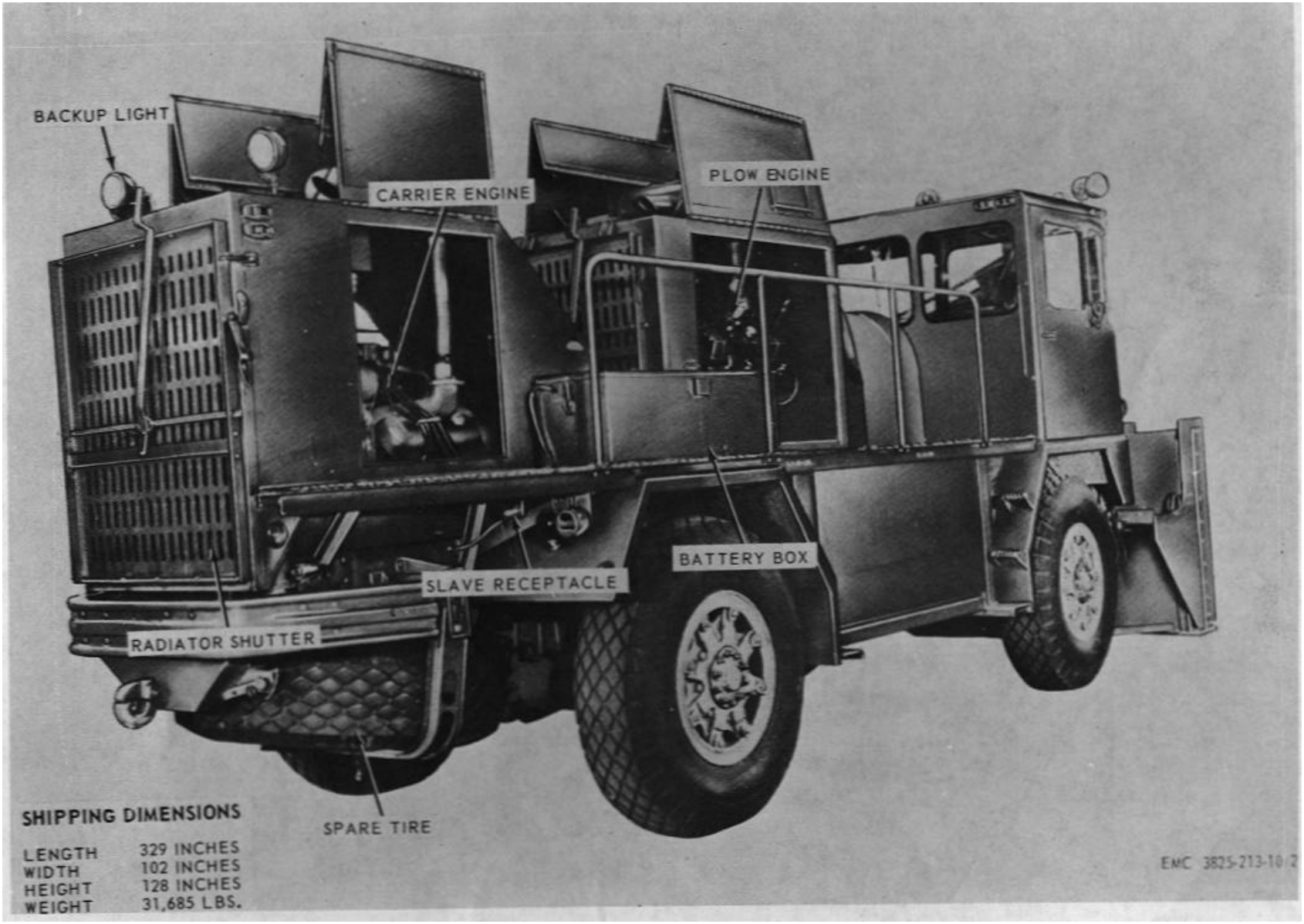


Figure 2. Snow removal unit, right rear three-quarter view, and shipping dimensions.

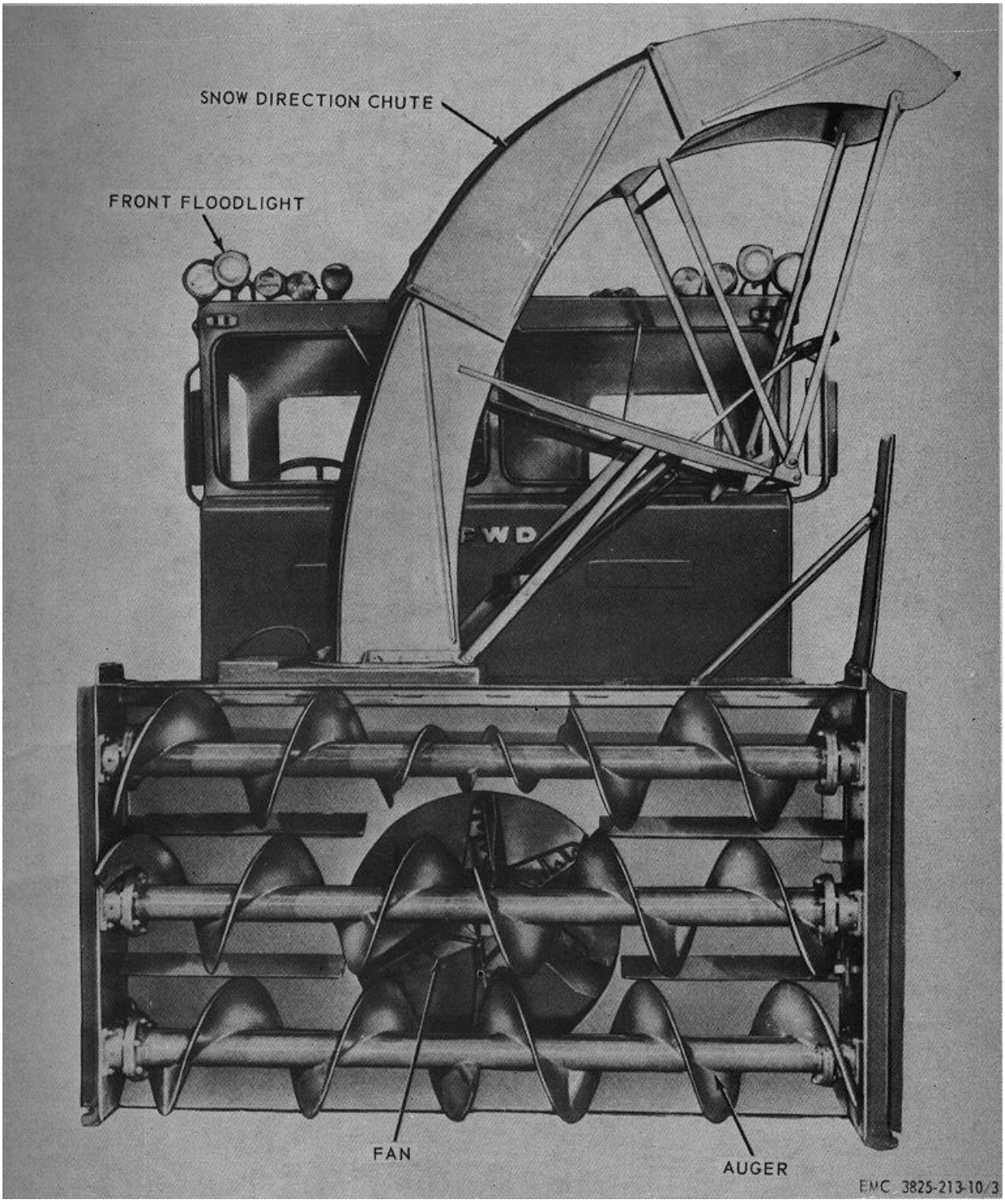


Figure 3. Snow removal unit, front view.

c. Plow Power Engine. The plow is powered by a Waukesha, Model TH 884, 8-cylinder, 4-cycle, overhead-valve type, liquid-cooled, gasoline engine. Power is transferred from the plow power unit through the transmission to the plow assembly drive shaft. The 24-volt engine ignition system consists of the wiring, distributor, spark plugs, and electrical starter.

d. Carrier. The carrier is the Four Wheel Drive Auto Co., Model 502300. It has three-speed transmission and a two-speed power transfer (auxiliary transmission), each manually shifted. The combination of the two transmissions provides six speeds forward and two in reverse. The power transfer assembly, mounted ahead of the transmission, supplies power to the front and rear wheels through propeller shaft. Both differentials are equipped with locks, which when engaged result in the same power to each wheel regardless of slippage at any wheel. Both front and rear wheels may be steered. The front wheels are steered mechanically with a hydraulic booster arrangement. The rear wheels are steered entirely by a hydraulic system. The brakes are entirely air-actuated. The carrier is equipped with two working floodlights, two adjustable spotlights, and two backup floodlights.

e. Carrier Engine. The carrier is powered by a Waukesha, Model TH 884, 8-cylinder, 4-cycle, overhead-valve type, liquid-cooled, gasoline engine. The engine has a down-draft carburetor and an electrically operated fuel pump. The electric starter is located on the left side of the engine. The dipstick, oil cooler, and tachometer drive are located on the right side of the engine. The fan assembly, air compressor, and generator are belt-driven by power from the crankshaft pulley. The carrier engine has a 24-volt electrical system, using the four 12-volt batteries which are also used as a power source for the plow engine.

4. Identification and Tabulated Data

a. Identification. The snow removal unit has 11 major identification and instruction plates as illustrated in figure 4.

(1) *Corps of Engineers identification plate*. Located on the left side of the snowplow assembly and above the auger drive chain case.

(2) *Snowplow manufacturer's identification plate.* Located on left-rear side of the snowplow assembly.

(3) *Truck loader manufacturers identification plate.* Located on the left side of the snow direction chute base.

(4) *Carrier engine identification plate.* Located on the left side of the carrier engine, near the top of the flywheel housing.

(5) *Plow engine identification plate.* Located on the left side of the plow engine, near the top of the flywheel housing.

(6) *Rectifier malfunction warning plate.* Located on the right side of the carrier engine winterization enclosure.

(7) *Plow transmission shift instruction plate.* Located on the left side of the instrument panel, below the heater controls.

(8) *Heater systems instruction plate*. Located on the left side of the instrument panel, to the left of the heater controls.

(9) *Cab identification plate.* Located inside the operator's cab on the right-hand rear side near the ceiling.

(10) *Power transfer shift instruction plate.* Located to the left of the transmission shift selector box.

(11) *Carrier transmission shift instruction plate.* Located to the left of the carrier operator's seat on the transmission shift selector box.

b. Tabulated Data.

(1) *Carrier engine*.

Manufacturer .....Waukesha Motor Company
Model .....TH 884
Type.....Industrial, v-Block, Military Standard, Gasoline
Horsepower .....330 at 2,600 rpm (revolutions per minute)
Cylinders.....8
Bore .....5-3/8 in. (inch) (es)

Stroke .....4-7/8 in.
Cycle 4
Displacement .....884 cu. in. (cubic inch) (es)
Governed speed:
No load .....2,850 rpm
Full load.....2,600 rpm
Low idle .....500 rpm
Maximum torque.....1,800 rpm 780 ft-lb (foot-pound) (s)
Compression ratio 7.6:1
Firing order 1-8-7-3-6-5-4-2
Fuel consumption rate.....36 gph (gallons per hour)
Batteries.....4 (12 volts each) (common power source with plow engine)
Electrical system 24-volt

(2) *Plow engine.*

Manufacturer.....Waukesha Motor Company
Model.....TH 884
Type.....Industrial, V-Block, Military Standard, Gasoline
Horsepower.....330 at 2,600 rpm
Cylinders.....8
Bore .....5-3/8 in
Stroke .....4-7/8 in.
Cycle 4
Displacement .....884 cu. in.
Governed speed:
No load .....2,850 rph
Full load .....2,600 rpm
Low idle .....500 rpm
Maximum torque.....At 1,800 rpm 780 ft-lb
Compression ratio 7.6:1
Firing order 1-8-7-3-6-5-4-2
Fuel consumption rate.....36 gph
Electrical system 24-volt

(3) *Carrier assembly*.

Manufacturer.....Four Wheel Drive Auto Co.
Model.....502300

(4) *Plow assembly*.

Manufacturer .....Klauser Manufacturing Co.
Model TU3
Serial number 2581
Capacity .....1,500 tons per hour

(5) *Capacities*.

(*a*) *Carrier engine*.

Fuel tank .....150 gal (gallon) (s)
Lubricating oil:
Crankcase.....18 qt (quart) (s)
Oil filter assembly .....2 qt
Coolant .....104 qt

(*b*) *Plow engine*.

Fuel tank .....150 gal
Lubricating oil:
Crankcase.....18 qt
Oil filter assembly .....2 qt
Coolant .....60 qt

(*c*) *Steering*.

Gearcase .....1 qt
Power steering .....9 qt

(*d*) *Transmission and torque converter* 49 qt

(*e*) *Transfer case*. 5 1/2 qt

(*f*) *Differential*.

Rear .....7 1/2 qt
Front .....7 1/2 qt

(*g*) *Differential lock.* 3/4 qt

(*h*) *Plow*.

Hydraulic reservoir .....34 qt
Plow transmission .....8 qt
Plow fan gearcase.....2 qt
Auger drive chain case.....1 qt

(6) *Dimensions and weights*.

(*a*) *Carrier assembly*.

Overall length* .....329 in.
Overall width (carrier) .....96 in.
Overall width with plow .....102 in.
Overall height .....128 in.
Shipping tonnage .....49.2 tons
Shipping weight.....31,695 lb
Shipping cubage* .....2,322 cu ft (cubic foot) (feet)

*Denotes total for carrier and plow assemblies.

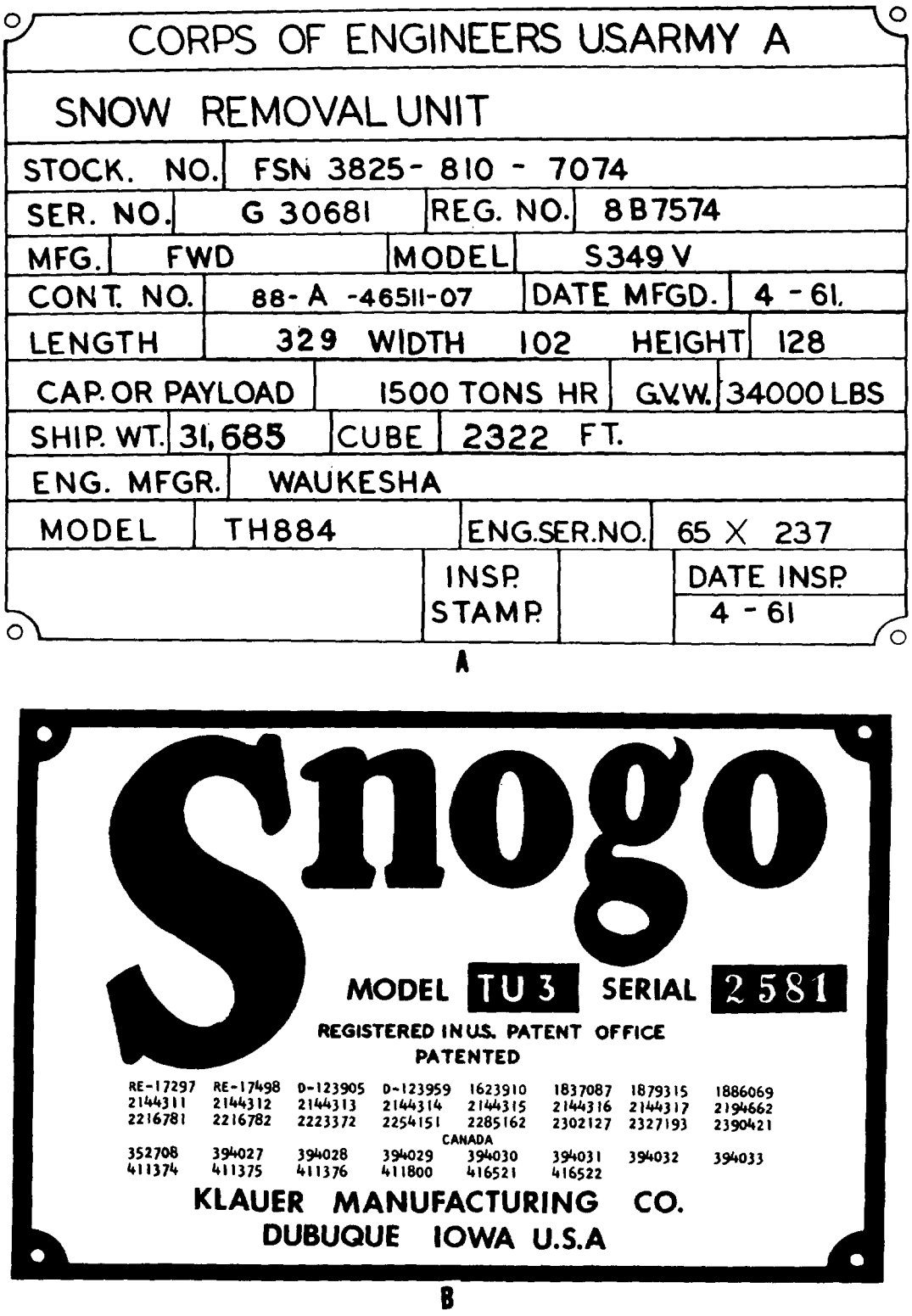
(*b*) *Plow assembly*.

Overall width.....102 in.
Overall length .....52 in.
Overall height (plow down chute lowered) 115 in.
Shipping tonnage 2.17

(7) *Maintenance and operating supplies.* The supplies necessary for maintaining and operating the snow removal unit are listed in table 1.

5. Difference in Modes

This manual covers only the FWD Model S-349V Snow Removal Unit. No known unit differences exist for the model covered by this manual.

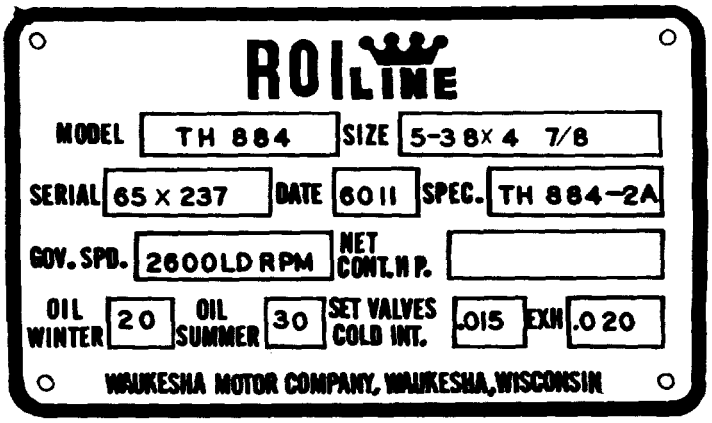


EMC 3825-213-10/4 ①

A. Corps of Engineers identification plate B. Snowplate manufacturer's identification plate

Figure 4. Identification and instruction plates.

C



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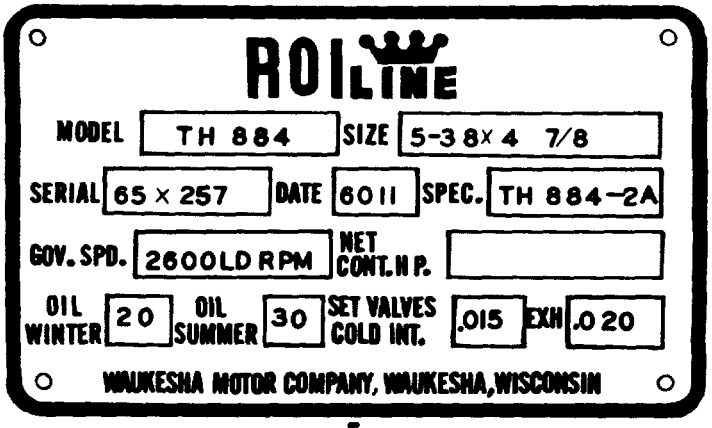
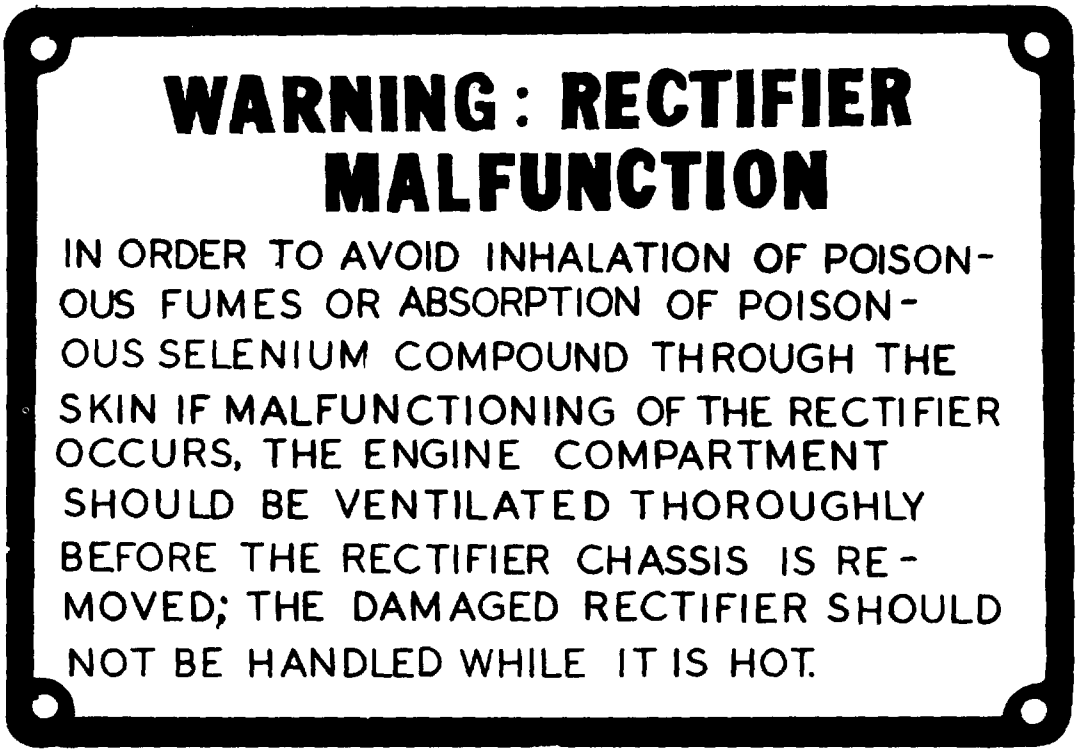


E

EMC 3825-213-10/4 ②

C. Truck loader manufacturer's identification plate D. Carrier engine identification plate
E. Plow engine identification plate

Figure 4 - Continued.



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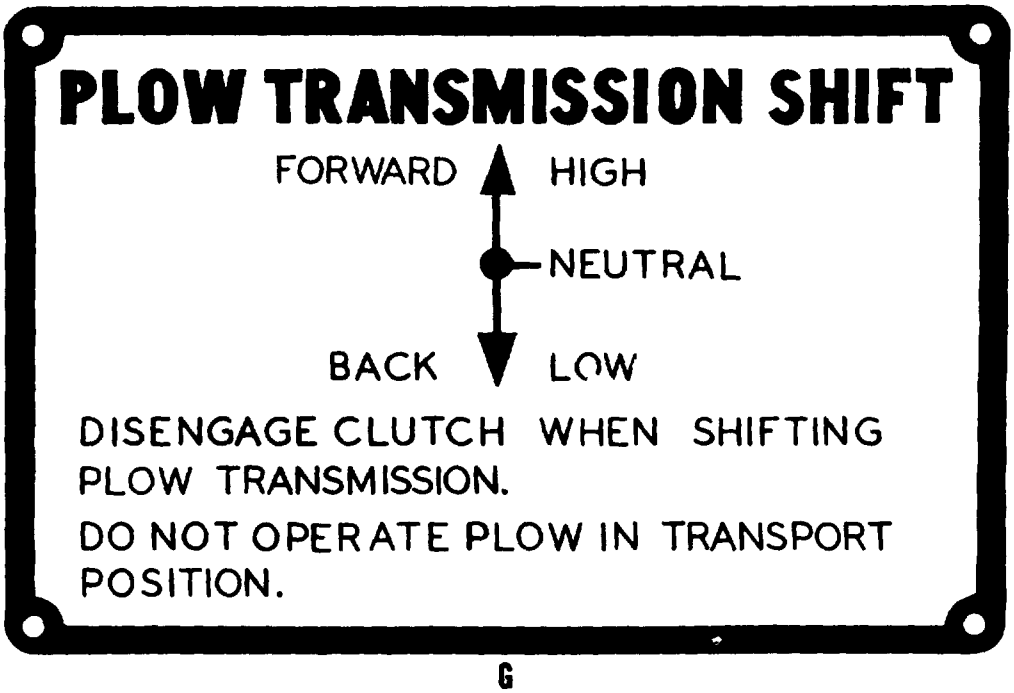
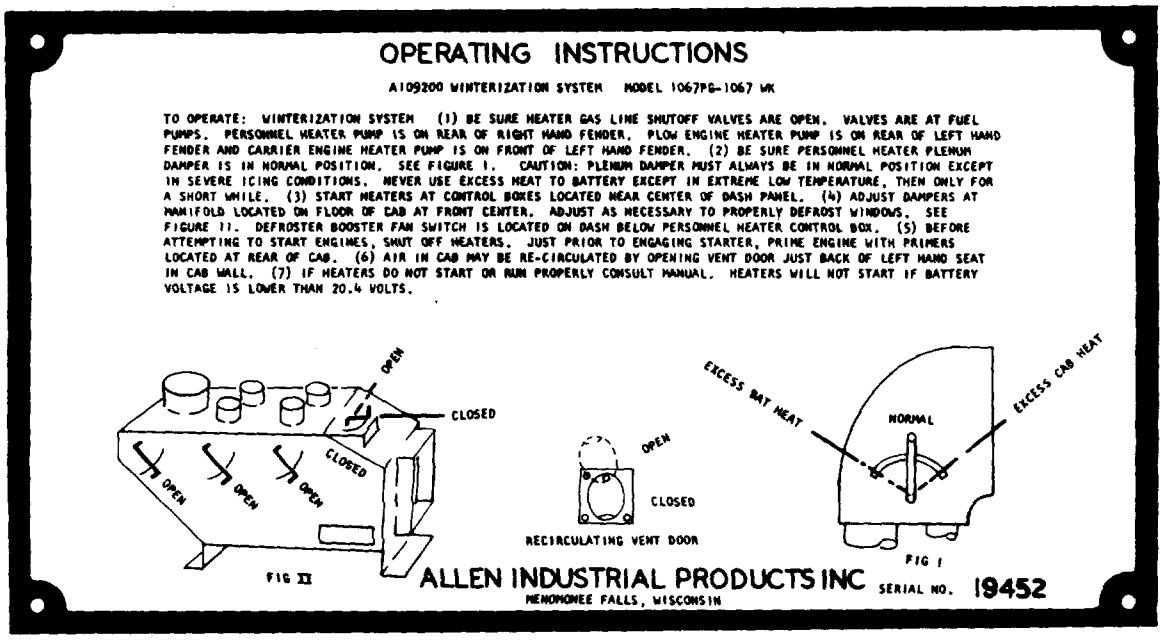


G

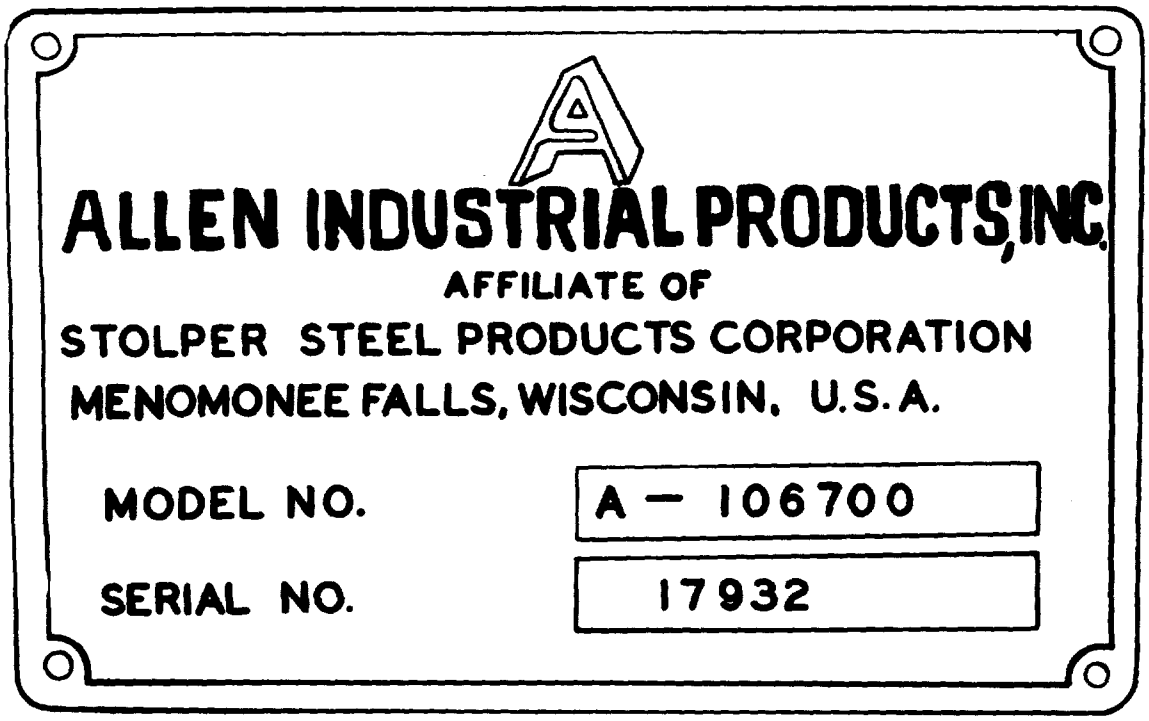
EMC 3825-213-10/4 ③

F. Rectifier malfunction warning plate G. Plow transmission shift instruction plate

Figure 4 - Continued.



H

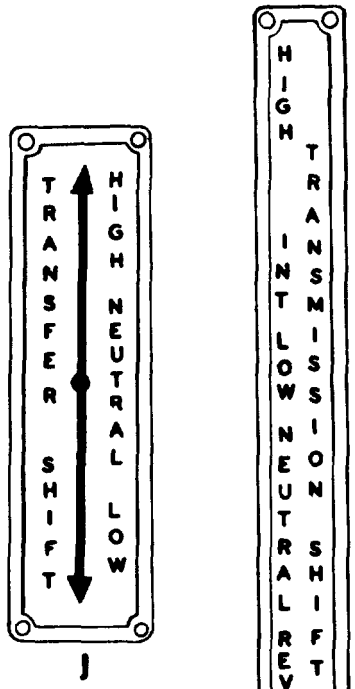


I

EMC 3825-213-10/4 (4)

H. Heater system instruction plate I. Cab identification plate

Figure 4 - Continued.



J. Power transfer shift instruction plate
K. Carrier transmission shift instruction plate

Figure 4 - Continued.

Table I. Maintenance and Operating Supplies

Item	Component application	Source of supply	Federal stock No.	Description	Quantity required for initial operation	Quantity required for 8 hours operation	Notes
1.	0101 CRANKCASE (1) (Carrier and Plow Engines).			OIL, LUBRICATING: 55-gal drums, as follows:			(1) Includes quantity of oil to fill engine oil system as follows: 18 qt-crankcase 2 qt-oil filter assembly (2) See current LO for grade application and replenishment intervals.
		10	9150-231-6655	Grade 9250 or	20 qt ea	(2)	
		10	9150-265-9436	OE-30	20 qt ea	(2)	
		10	9150-231-9039	Grade 9110 or	20 qt ea	(2)	
		10	9150-265-9429	OE-10	20 qt ea	(2)	
		10	9150-242-7604	OES	20 qt ea	(2)	
2.	0300 FUEL TANKS	--	----------	GASOLINE, AUTOMOTIVE: bulk.			(3) Tank capacity.
		10	9130-160-1818	91 A	150 gal ea (3)	(4)	(4) Average fuel consumption is 72 gph of continuous operation for both carrier and plow engines.
3.	0500 RADIATOR, CARRIER ENGINE.			WATER	104 qt	(5)	
		9	6850-243-1990	ANTIFREEZE: inhibited glycol.			(5) See TM 53825-213-20 for quantities, ambient temperature, specific gravities and replenishment.
		9	6850-174-1806	ANTIFREEZE: compound arctic.			
4.	0500 RADIATOR, PLOW ENGINE.	--	----------	WATER (6)	60 qt	(5)	
5.	0700 TORQUE CONVERTER AND TRANSMISSION.	--	----------	OIL, LUBRICATING: (7)			(6) Use antifreeze as prescribed in item 3.
6.	0800 TRANSFER CASE.	--	----------	OIL, LUBRICATING: (7)	5-1/2 qt	(2)	(7) Use oil as prescribed in item 1.
7.	0800 PLOW TRANSMISSION.	--	----------	OIL, LUBRICATING: (7)	8 qt	(2)	(9) Use oil as prescribed in item 8.
8.	1102 DIFFERENTIAL FRONT AND REAR.	--	----------	OIL, LUBRICATING: gear-55 gal drums, as follows:			(9) Use fluid as prescribed in item 11.
		10	9150-577-5848	GO-90	7-1/2 qt ea.	(2)	
				15 gal drums. as follows:			
		10	9150-257-5441	GOS	7-1/2 qt ea.	(2)	

Table 1. Maintenance and Operating Supplies - Continued.

Item	Component application	Source of supply	Federal stock No.	Description	Quantity required for initial operation	Quantity required for 8 hours operation	Notes
9.	1102 DIFFERENTIAL LOCK RESERVOIR.	.....	.....	HYDRAULIC FLUID, NON-PETROLEUM BASE: 1 gal can			
		10	9150-252-6375	HBA	¾ qt	(2)	
10.	1400 STEERING GEARCASE.	.....	.....	OIL, LUBRICATING: gear. (8)	1 qt	(2)	
11.	1413 POWER STEERING RESERVOIR.	.....	.....	HYDRAULIC FLUID, PETROLEUM BASE: 55 gal drums, as follows:			
		10	9150-265-9408	OHA	9 qt	(2)	
12.	4308 HYDRAULIC RESERVOIR PLOW.	.....	.....	HYDRAULIC FLUID: (9)	34 qt	(2)	
13.	7100 FAN GEAR-CASE.	.....	.....	OIL, LUBRICATING: gear. (8)	9 qt	(2)	
14.	7100 AUGER DRIVE CHAIN CASE	.....	.....	OIL, LUBRICATING: gear (8) 5-gal drum, as follows:			
		10	9150-577-5841	GO-80	1 qt	(2)	
15.	GREASE POINTS.	.....	.....	GREASE AUTOMOTIVE AND ARTILLERY: 25-pound pail.			
		10	9150-190-0906	GAA	6 lb	(2)	

CHAPTER 2

INSTALLATION AND OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

6. Unloading Equipment

a. The operator will assist in unloading the snowplow if it is to be driven from a carrier down a ramp. The following operations must be performed and precautions observed by the operator before and during unloading.

b. Remove all blocking and tiedown cables from carrier and snowplow.

c. Remove preservatives and protective devices as necessary for driving snowplow from carrier.

d. Perform before-operation services (par. 40).

e. Start the engine (par. 16) and drive the snowplow down the unloading ramp.

f. The plow assembly will be removed from a highway carrier or flatcar with a suitable lifting device if a ramp is not available.

Caution

Make sure the ramp is properly constructed to support the weight of the snow removal unit before unloading.

7. Inspecting and Servicing Equipment

Note

Make sure equipment is completely deprocessed before servicing. Make sure all preservatives have been removed from the crankcase, fuel tank, gearboxes, and like items.

a. Perform the before-operation services listed in paragraph 40.

b. Make a complete visual inspection to see that the required tools, repair parts, publications, accessories, and attachments are on or with the snow removal unit.

c. Visually inspect the entire snow removal unit for loss of parts or damage which may have occurred during loading, removal, or shipment.

d. Inspect all controls and instruments for damage or improper operation. Inspect the instruments and gages for broken glass or illegibility.

e. Make a complete visual inspection of the entire snow removal unit compressed air system. Inspect for leaks, broken lines, and unserviceable chambers and valves.

f. Report to organizational maintenance all deficiencies that are beyond the scope of the operator to correct.

Caution

Special care should be exercised in cleaning the lubrication points before lubrication. Paint and foreign material will cause damage to moving joints and bearings.

8. Installation or Setting-up Instructions

a. Report to organizational maintenance, 2d echelon, to install the plow chute.

b. Start carrier engine (fig. 12).

c. Install snowplow as illustrated in figure 5.

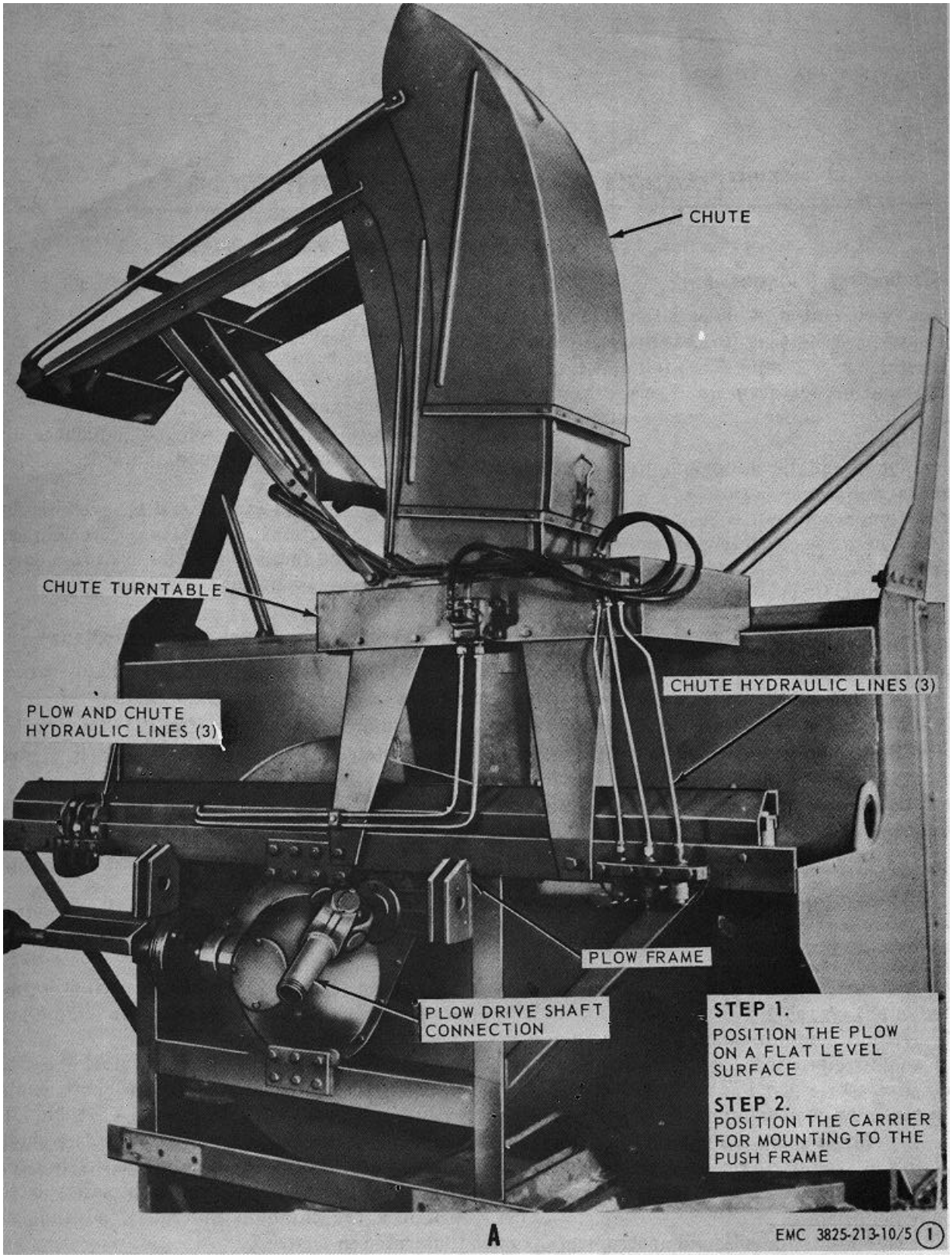
d. Remove the safety pins, right and left side, from the lower holes in the plow carrier track and guide rails as illustrated in figure 5.

e. Move snow removal plow height control lever to DOWN position as illustrated in figure 6.

f. Lower snowplow to the desired working position. Install the safety pins in the upper holes of carrier track.

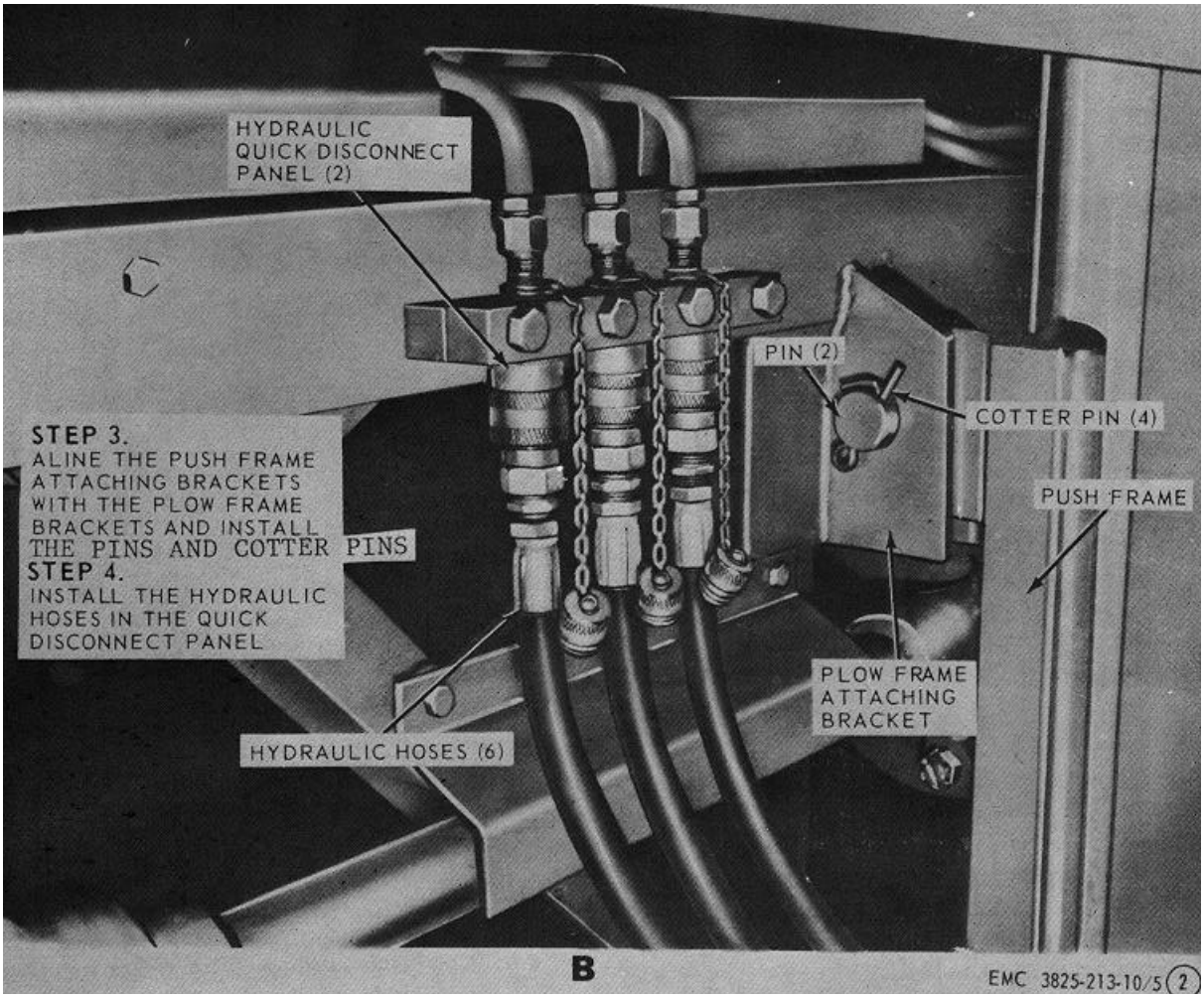
g. Move the selector valve control lever to CHUTE position and move the snow chute and fan blower control lever to CHUTE UP position as illustrated in figure 6. The chute extension will extend up and to the left or right side of the unit. The chute safety latch will lock the chute in the raised position as illustrated in figure 7.

h. Stop carrier engine (fig. 13).



A. Plow positioned for installation.

Figure 5. Snowplow installation.



B. Plow and hydraulic lines installation.

Figure 5. Continued.

9. Equipment Conversion

a. General. This snow removal unit is designed to expel snow in two different ways. By using the snow direction chute in the banking or truck loading position, and the fan blower housing for spreading, the delivery of snow can be closely controlled.

b. Conversion.

(1) *Banking and truck loading positions*.

(*a*) Start carrier engine (fig. 12).

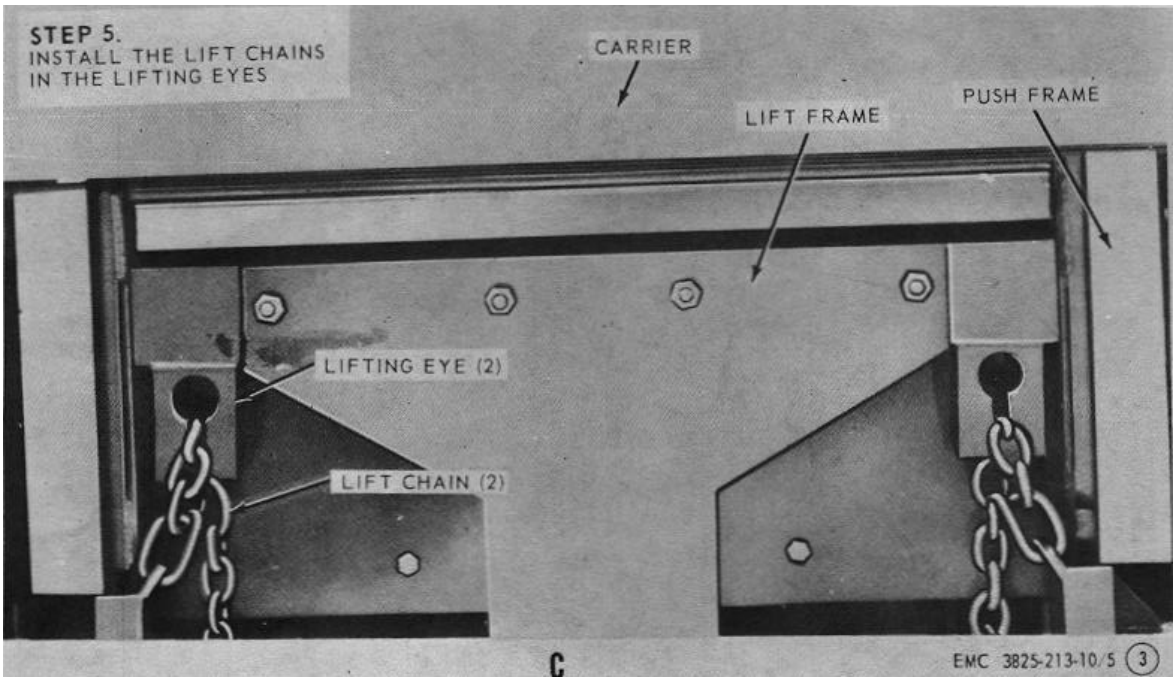
(*b*) Extend snow direction chute (fig. 6).

(*c*) Move selector valve control lever (fig. 6) to FAN BLOWER position and move snow chute and fan blower control lever as necessary to aline fan blower housing and snow direction chute as shown in figure 8.

Caution

Do not turn fan blower left of center with snow chute installed or damage will result.

(*d*) To bank with snow direction chute down, release the safety latch (fig. 7) and with selector control valve



C. Lifting chain installation.

Figure 5. Continued.

lever (fig. 6) in CHUTE position, move snow chute and fan blower control lever to CHUTE DOWN position.

(*e*) Control the snow direction chute rotation with the chute turn control lever as illustrated in figure 6.

(*f*) stop carrier (fig. 17).

(2) *Spreading position.*

(a) Start carrier (fig. 16).

(*b*) Move selector valve control lever (fig. 6), to FAN BLOWER position and move snow chute and fan blower control lever as necessary to put fan blower housing in the desired spreading angle as illustrated in figure 9.

Caution

Before attempting to use the fan blower housing in spreading position remove the stop rod from the upper right-hand side of the fan blower housing.

Note

If it is necessary to operate the snow removal unit with the fan blower housing in left side spreading position, report this condition to organizational maintenance.

(*c*) Stop carrier engine (fig. 13).

10. Movement to New Worksite

a. Securing for Movement.

(1) Start carrier engine (fig. 12).

Note

Be sure plow clutch is disengaged and all motion of plow is stopped.

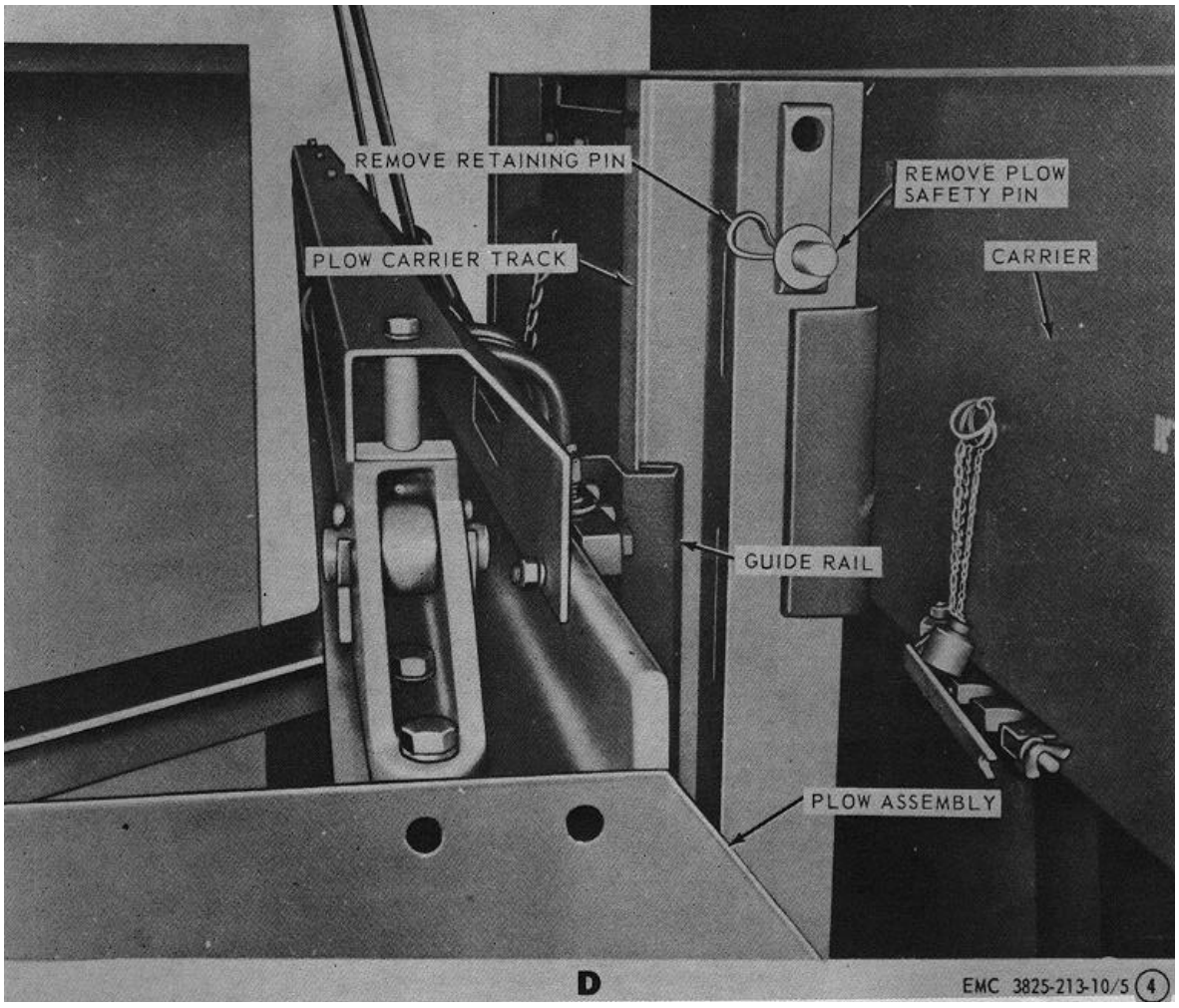
(2) Remove the plow safety pins (fig. 5).

(3) Raise plow assembly to its highest position (fig. 6).

(4) Install and secure the plow safety pins in the lower holes of the plow carrier track and guide rails (fig. 5).

Caution

Do not operate snowplow in the transport position.

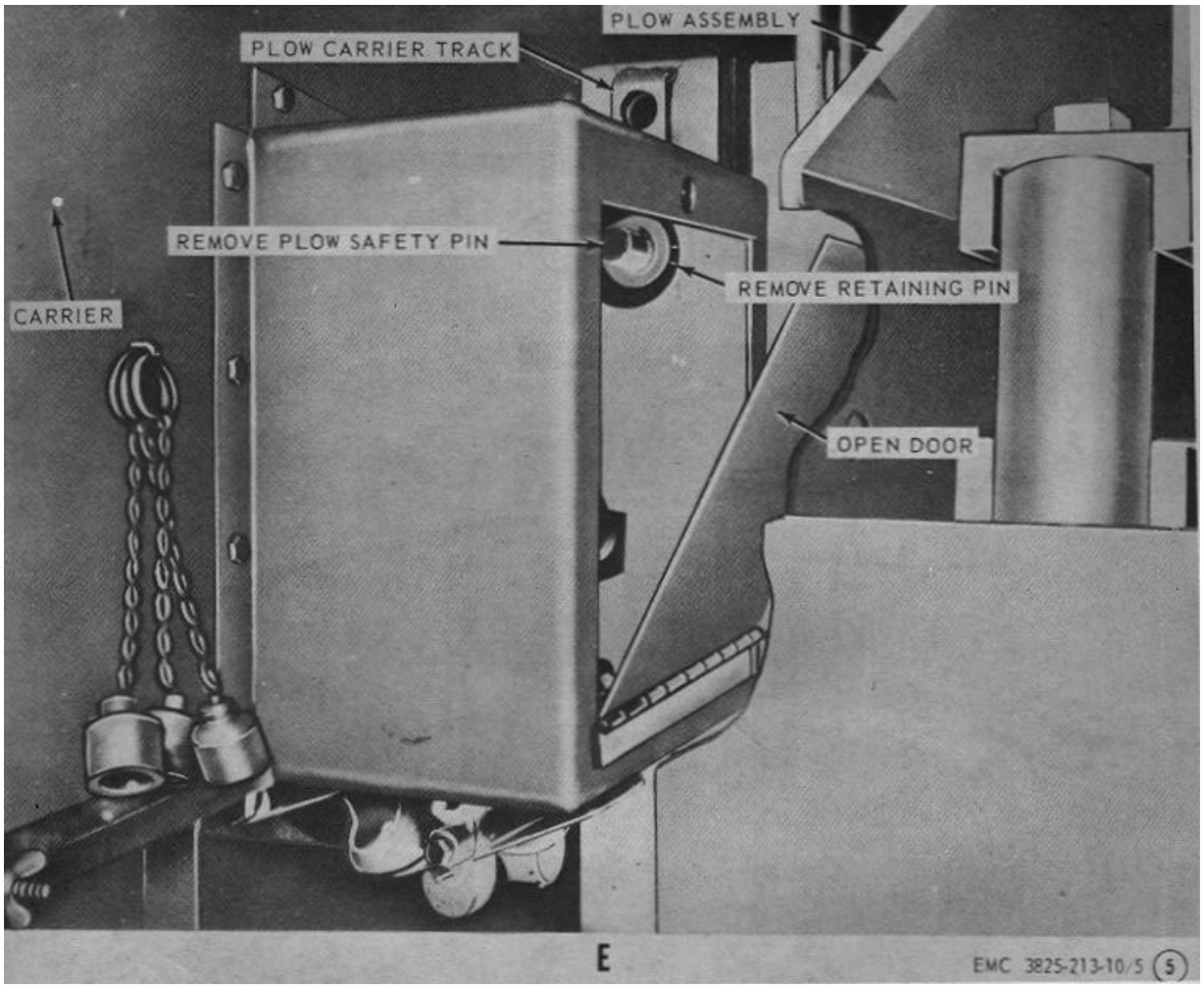


D. Let side plow safety pins in carry position.

Figure 5. Continued.

(5) See that all tools and equipment are properly stowed.

b. Movement and Reinstallation. Drive the truck to the new worksite and set up as instructed in paragraph 8.



E. Right side plow safety pins in carry position.

Figure 5. Continued.

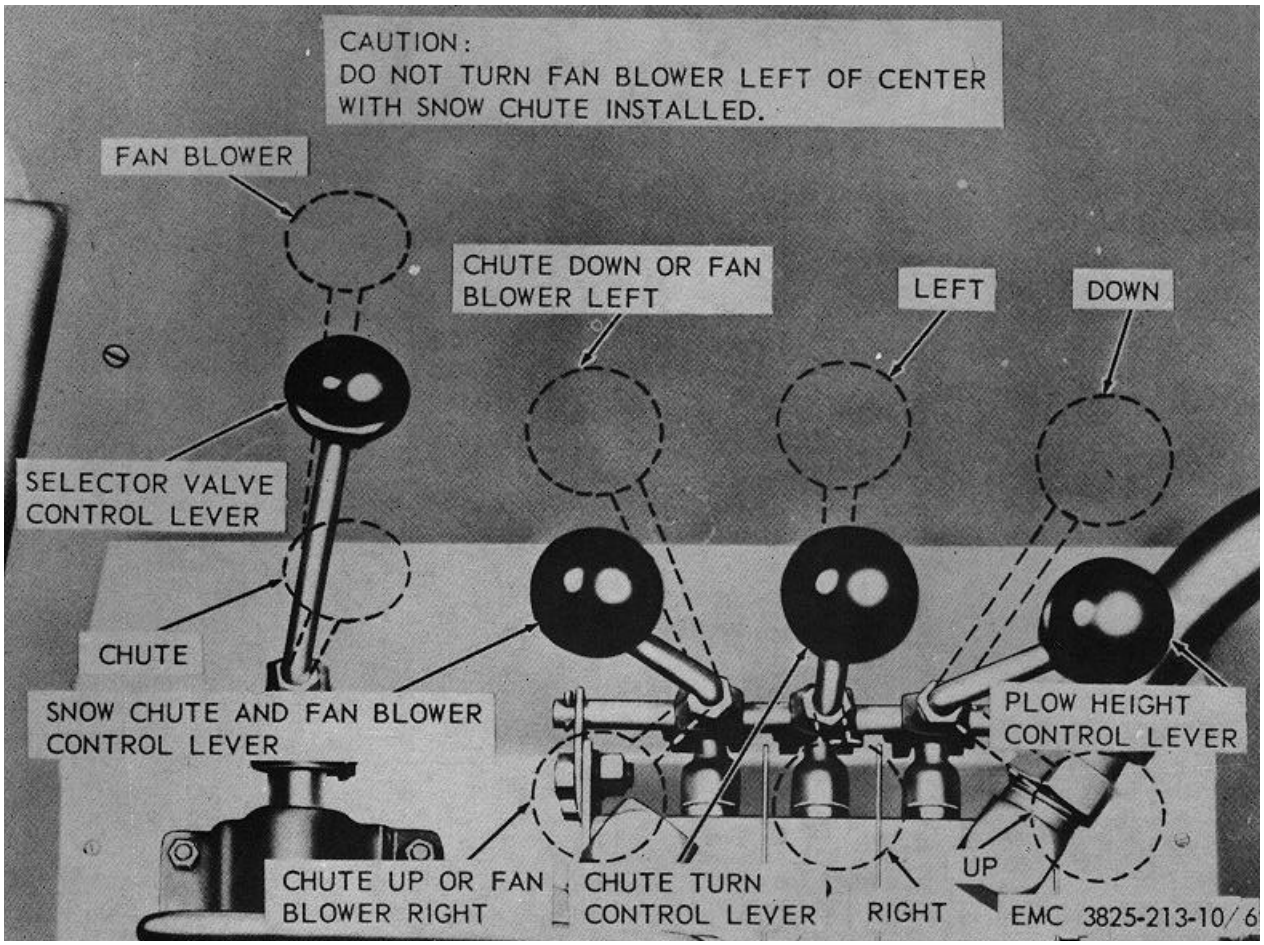


Figure 6. Snowplow and chute control levers.

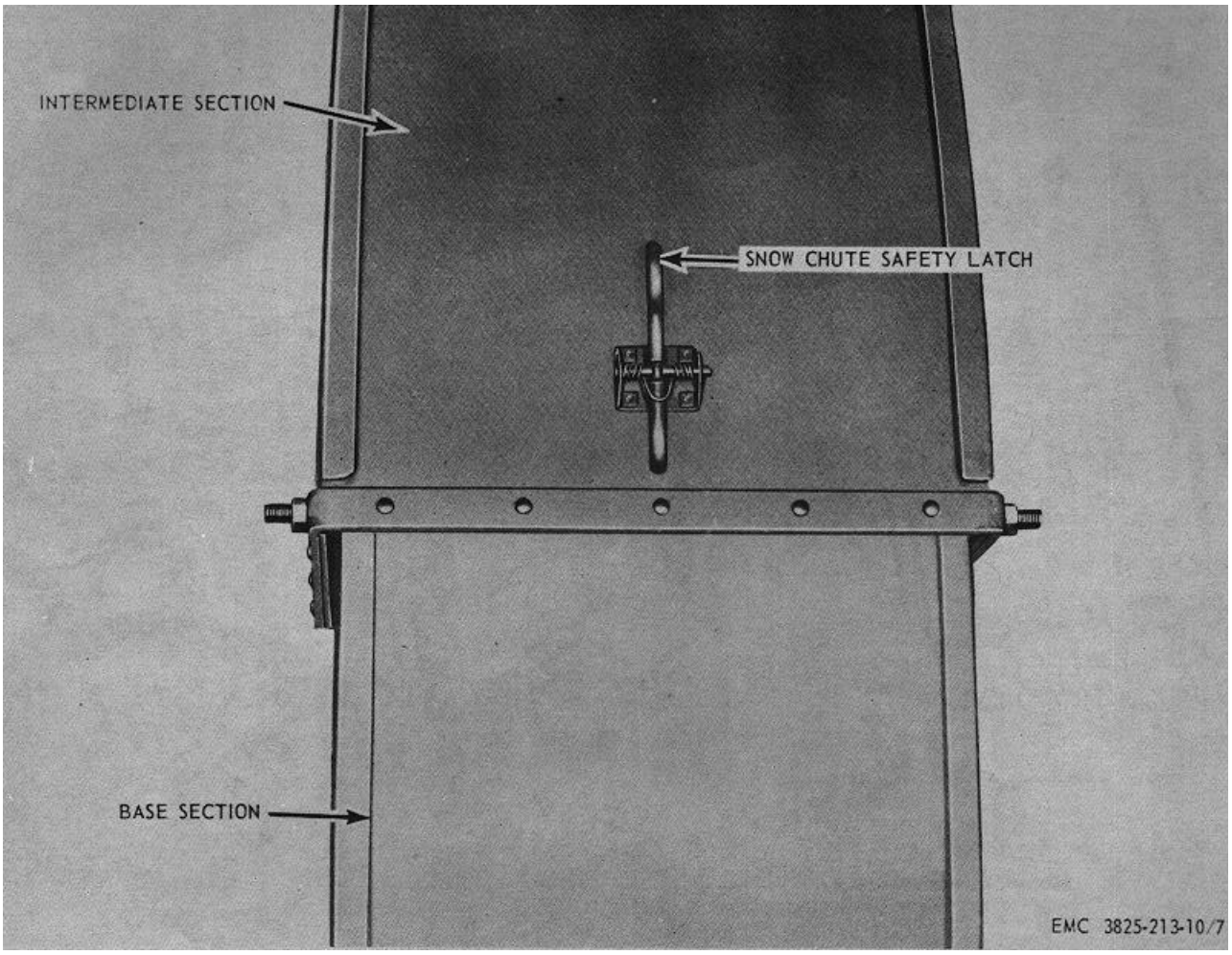
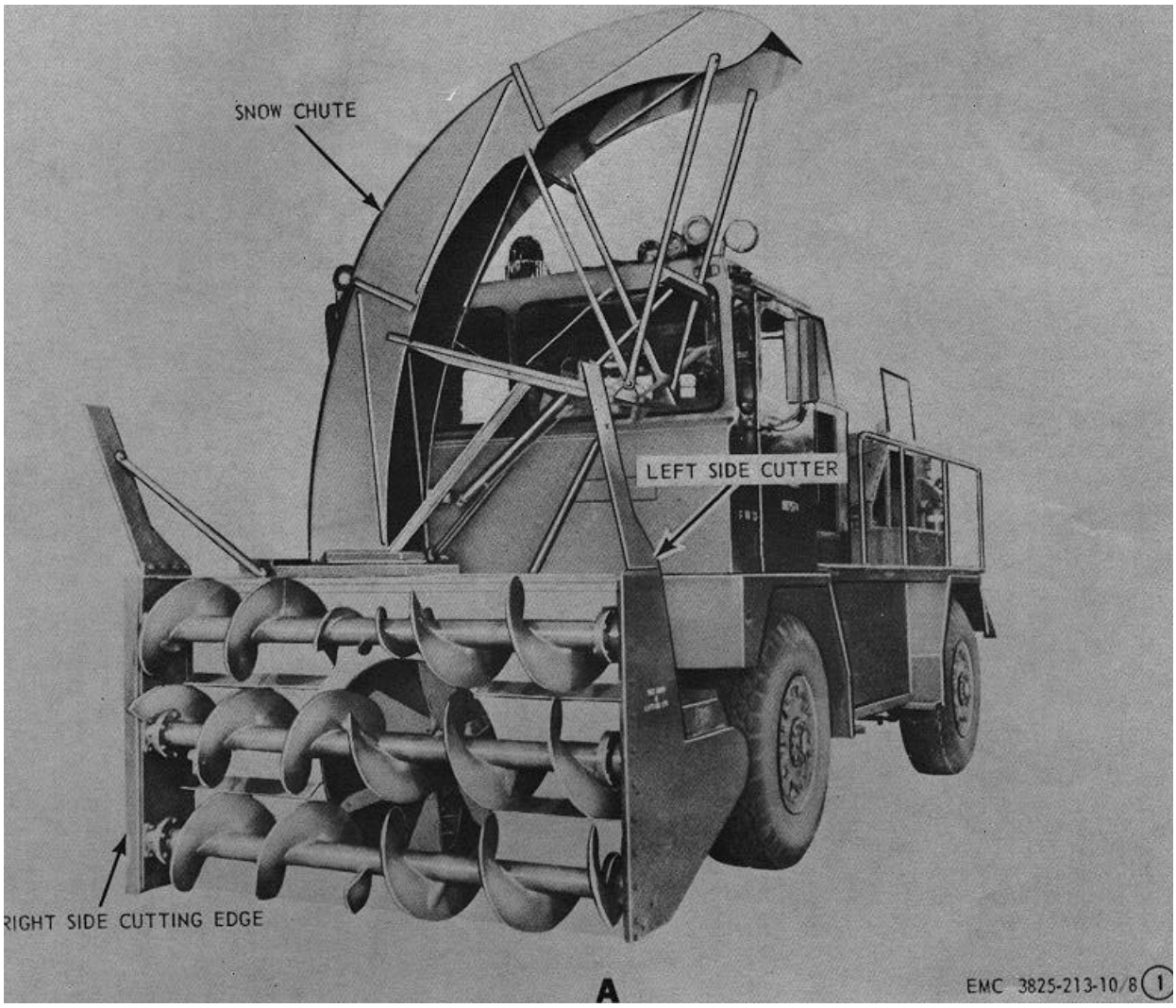
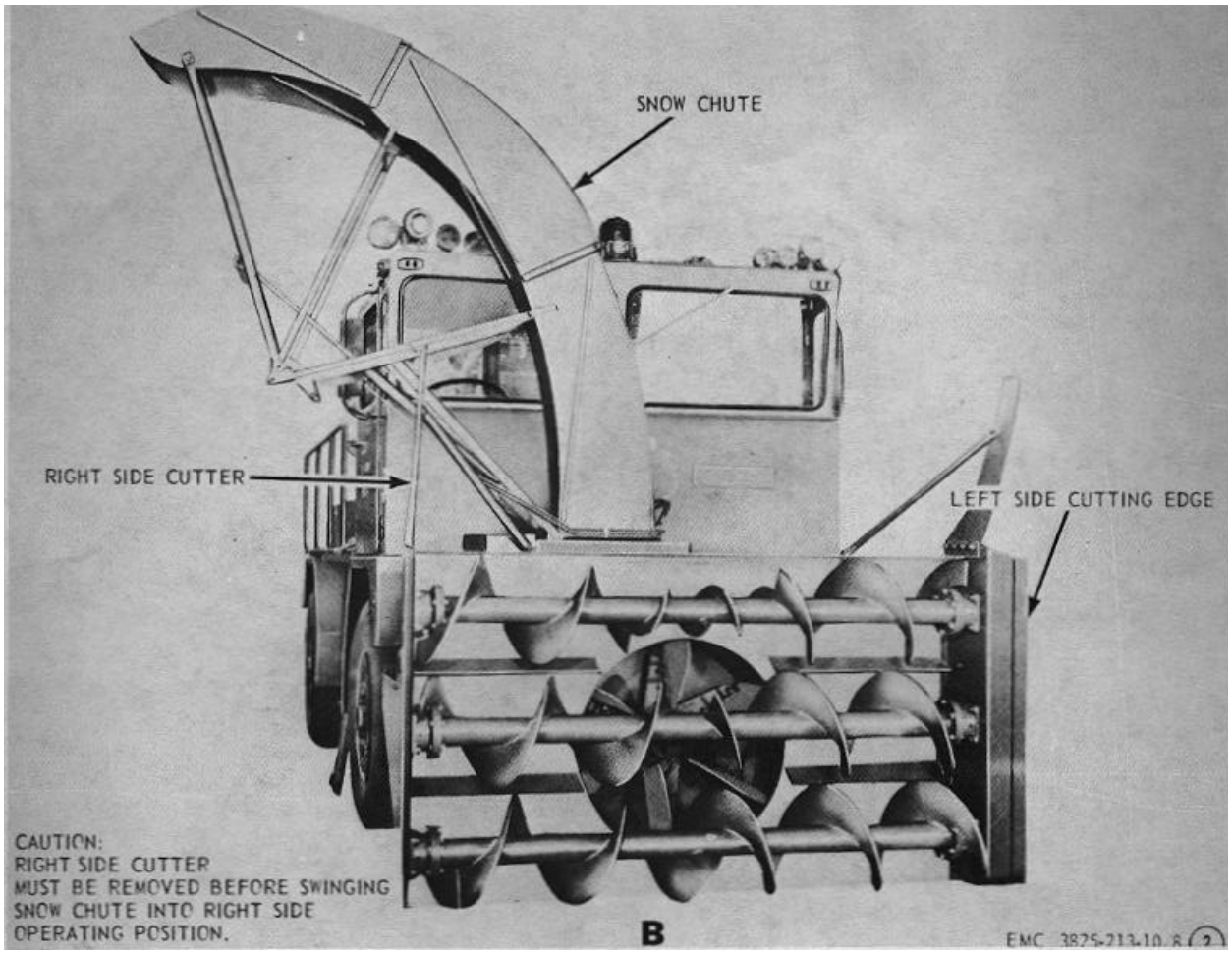


Figure 7. Snow chute safety latch in locked position.



A. Left side banking position.

Figure 8. Snow chute, banking positions.



B. Right Bide banking position.

Figure 8. Continued.

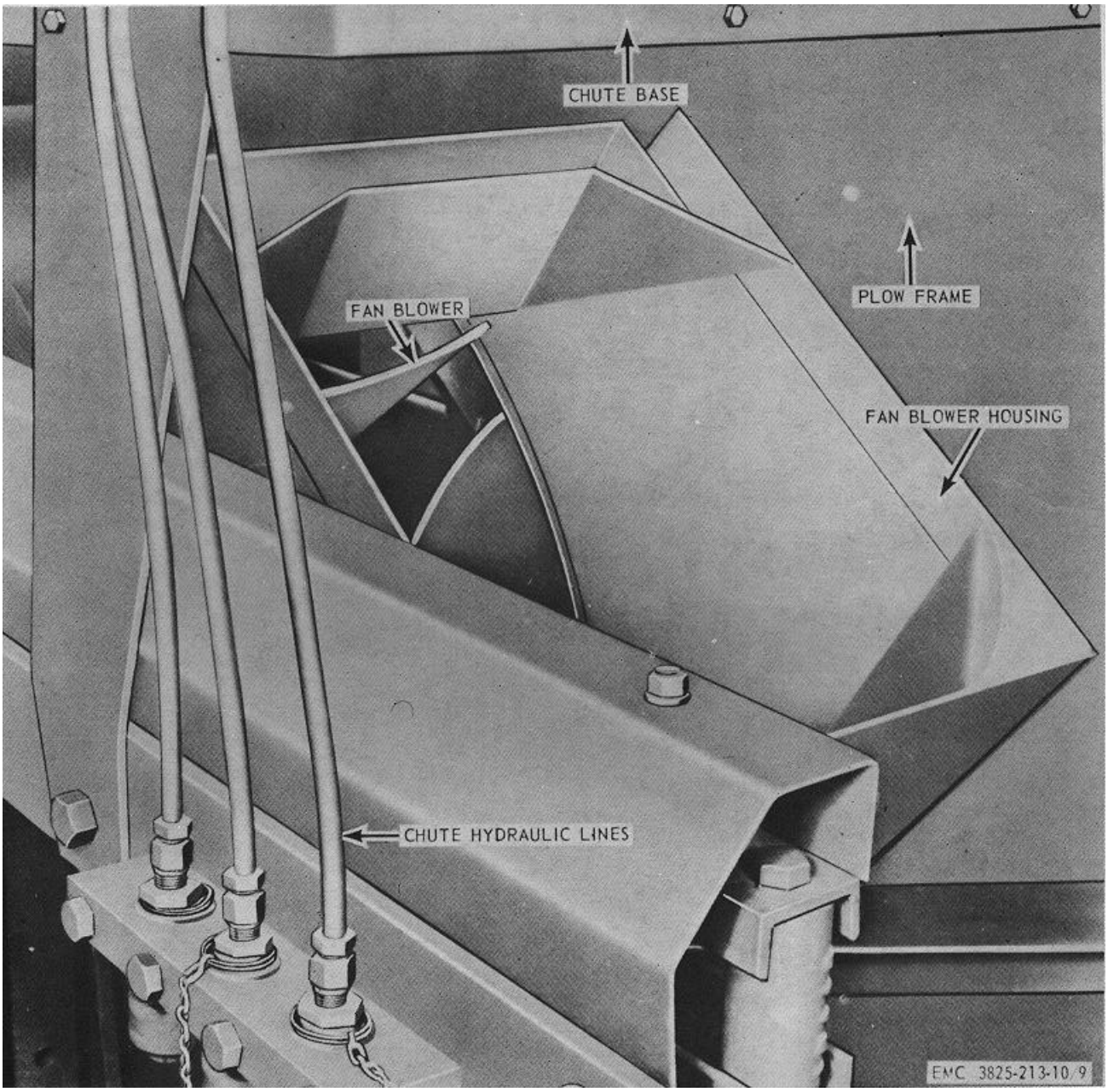


Figure 9. Fan blower housing, spread position.

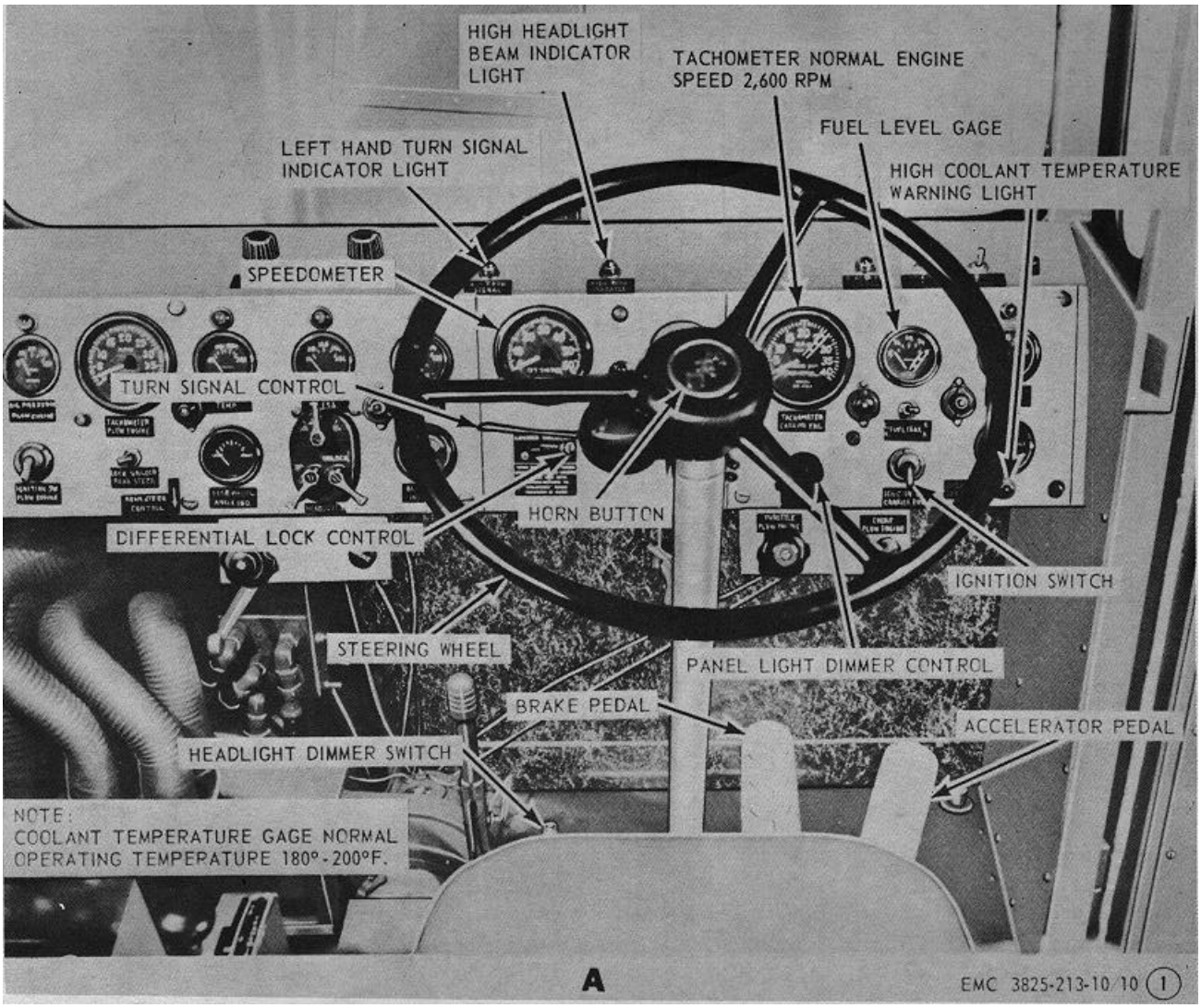
Section II. CARRIER AND ENGINE CONTROLS AND INSTRUMENTS

11. General

This section describes, locates, illustrates, and furnishes the operator, crew, or driver, sufficient information about the various controls and instruments for proper operation of the carrier unit.

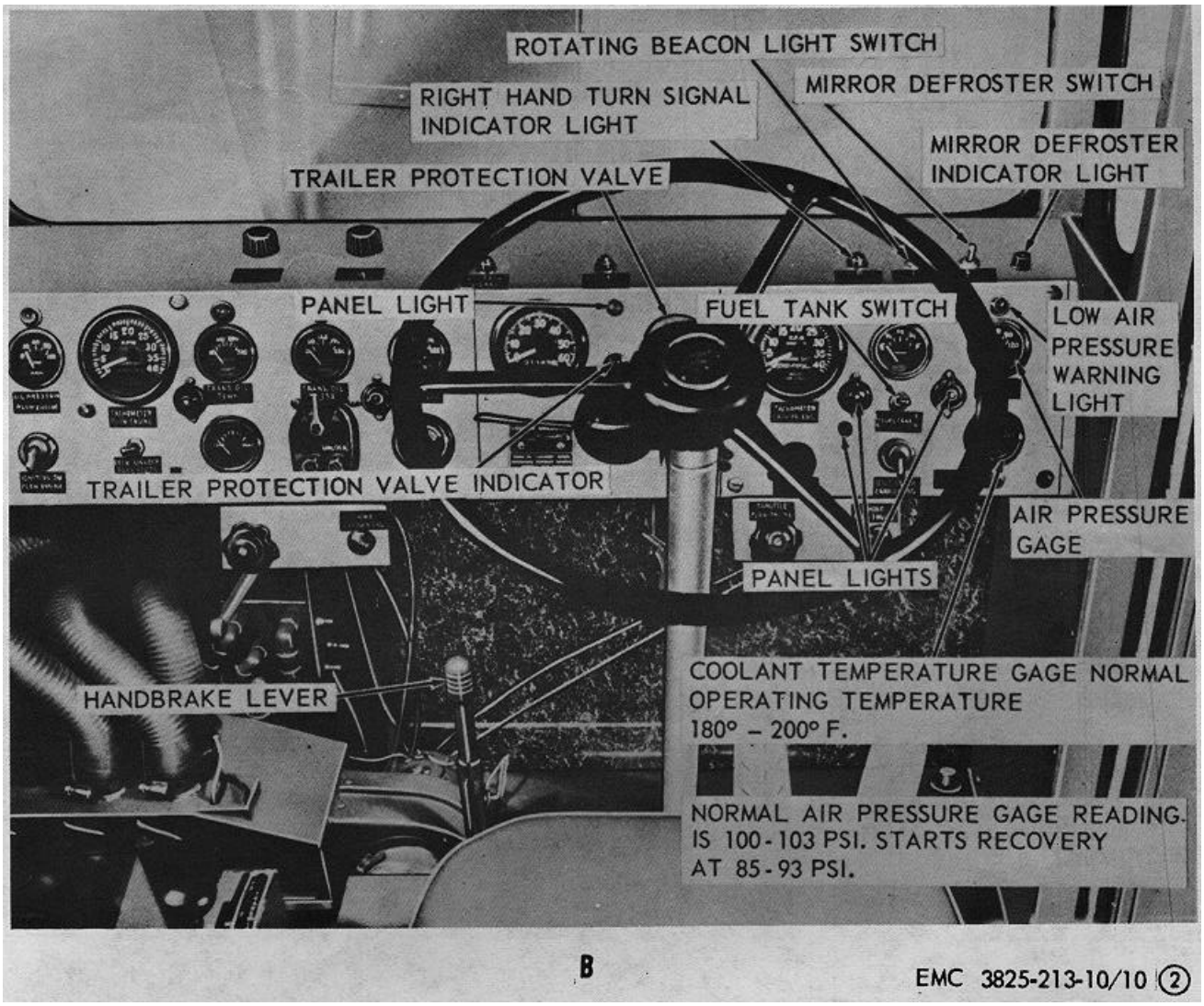
12. Controls and Instruments

The purposes and use of the carrier unit controls and normal readings of the carrier unit instruments and gauges are illustrated in figure 10.



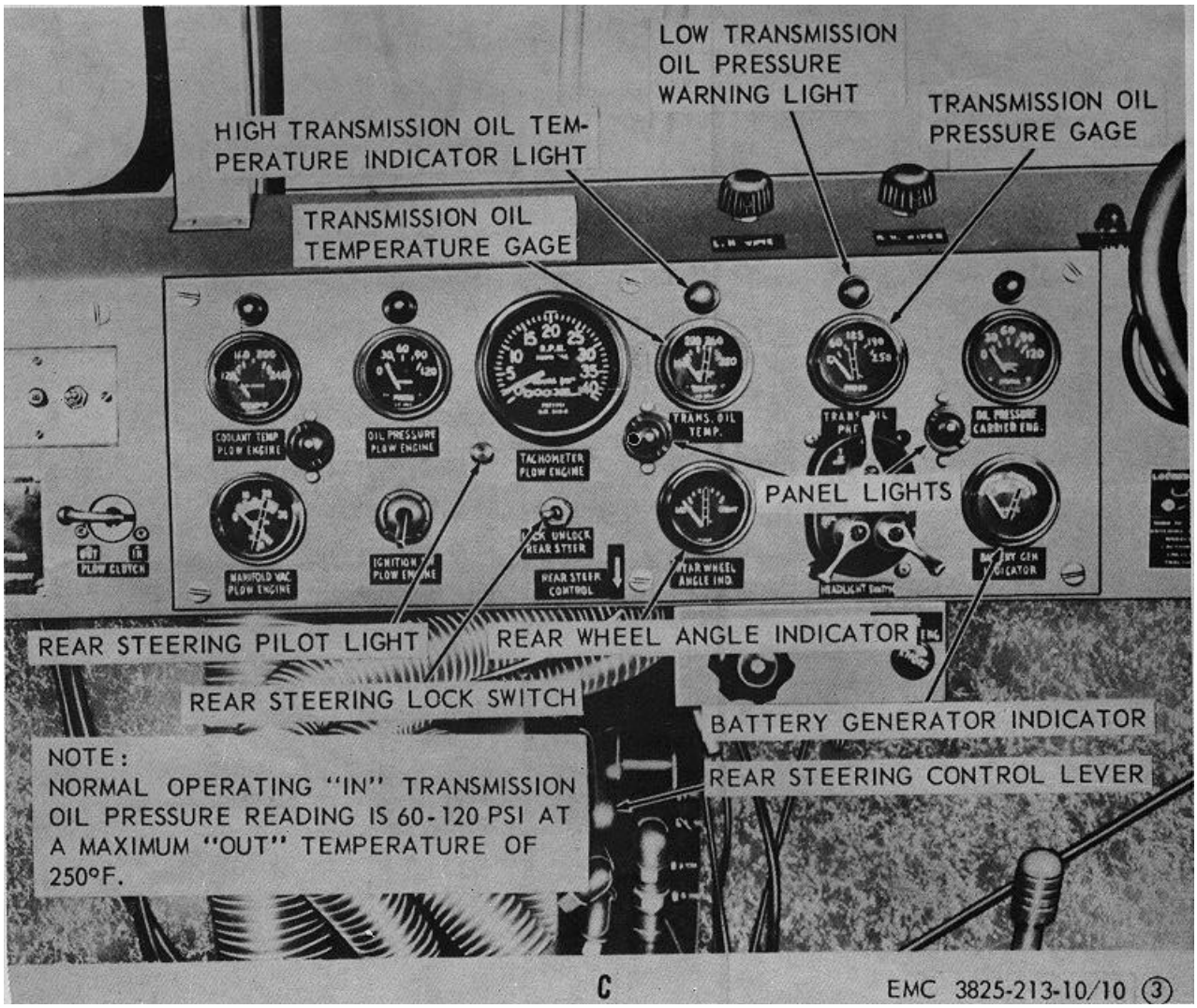
A. Operator's cab, right side.

Figure 10. Carrier and engine controls and instruments.



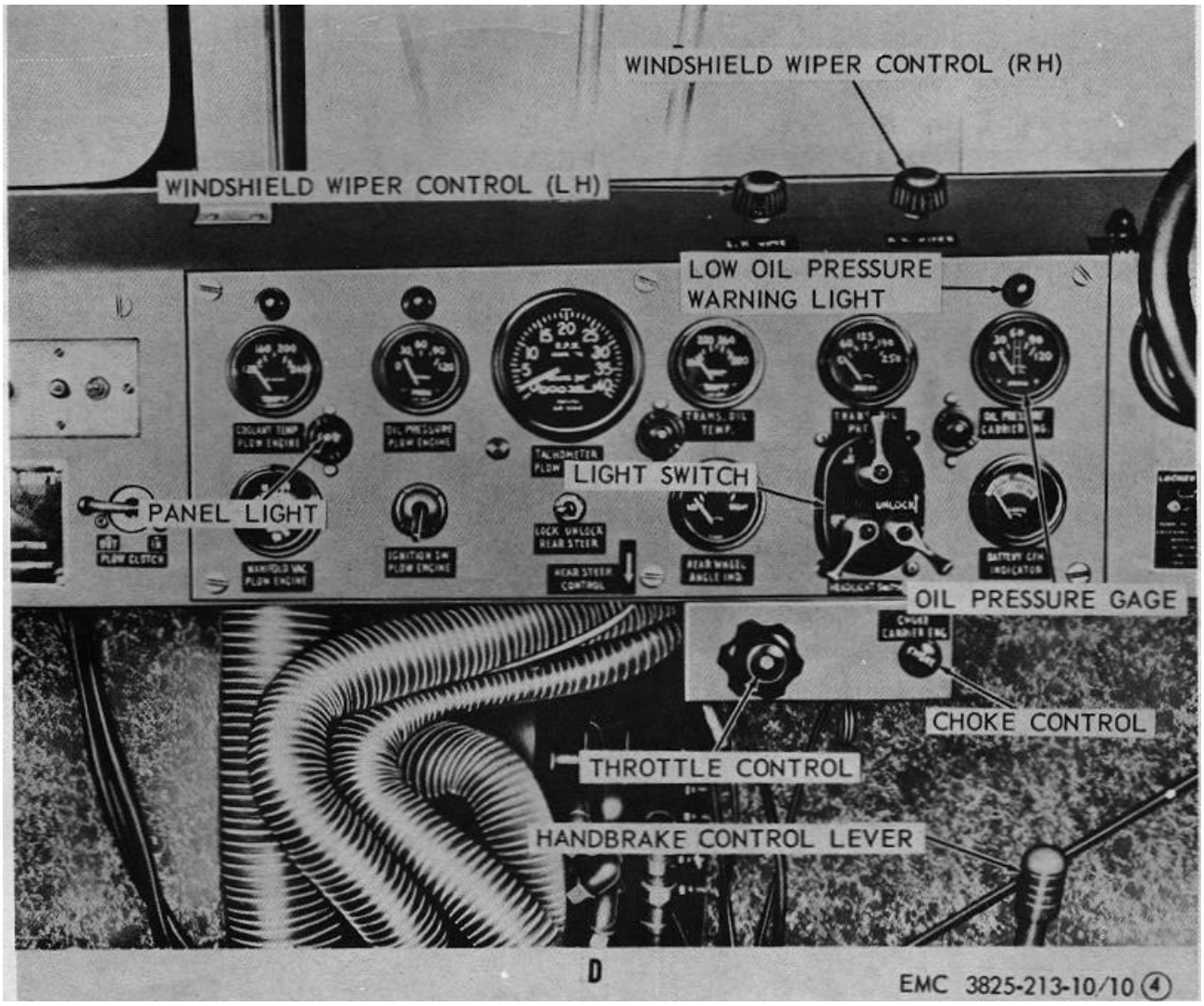
B. Operator's cab, right side-continued

Figure 10. Continued.



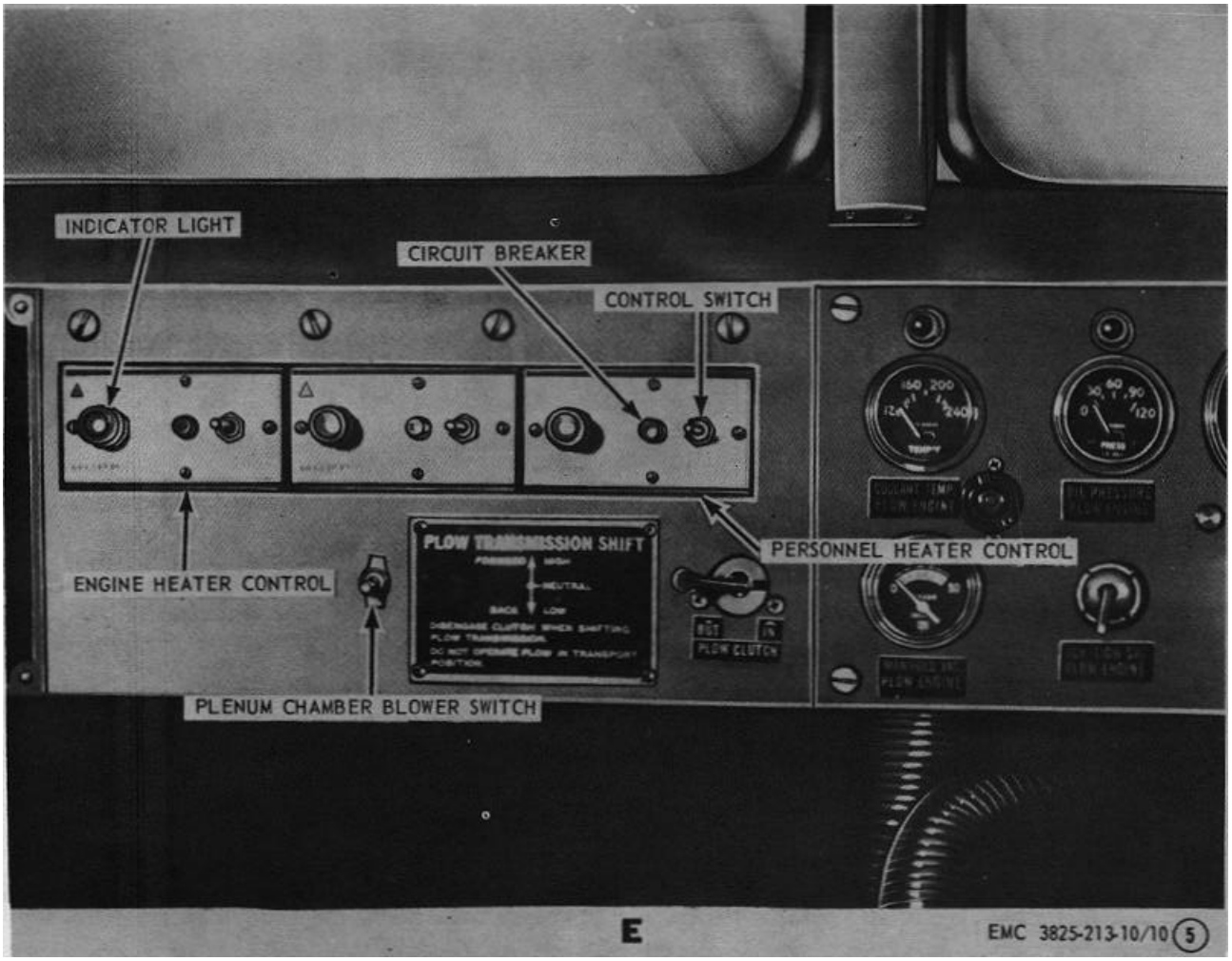
C. Operator's cab, center

Figure 10. Continued.



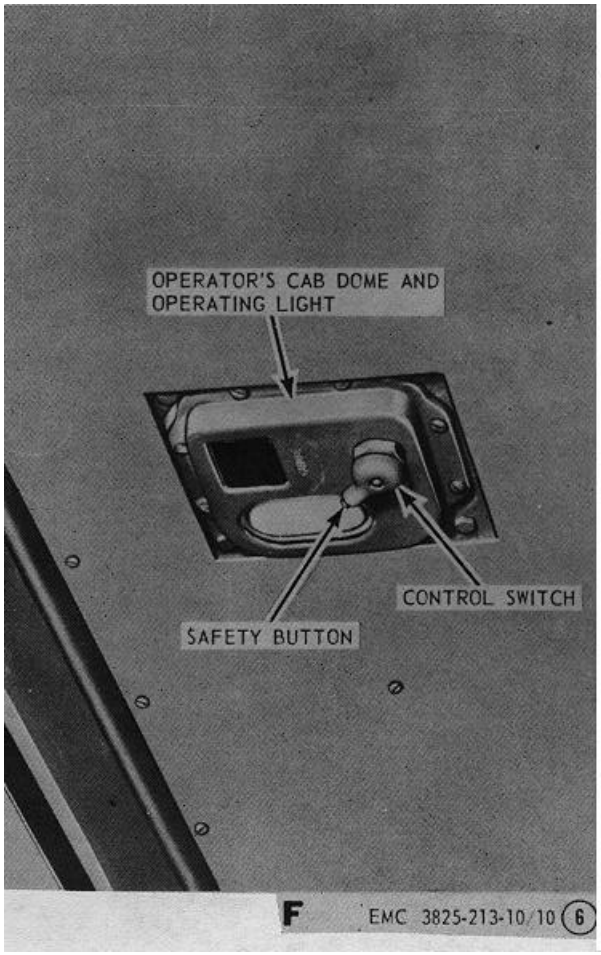
D. Operator's cab, center-continued

Figure 10-Continued.



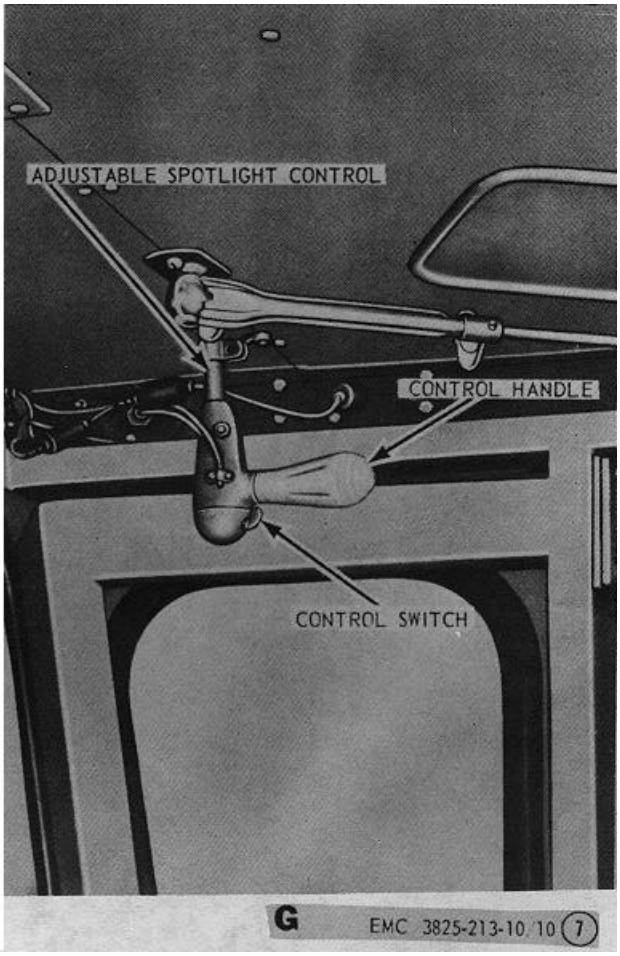
E. Operator's cab, left side.

Figure 10-Continued.



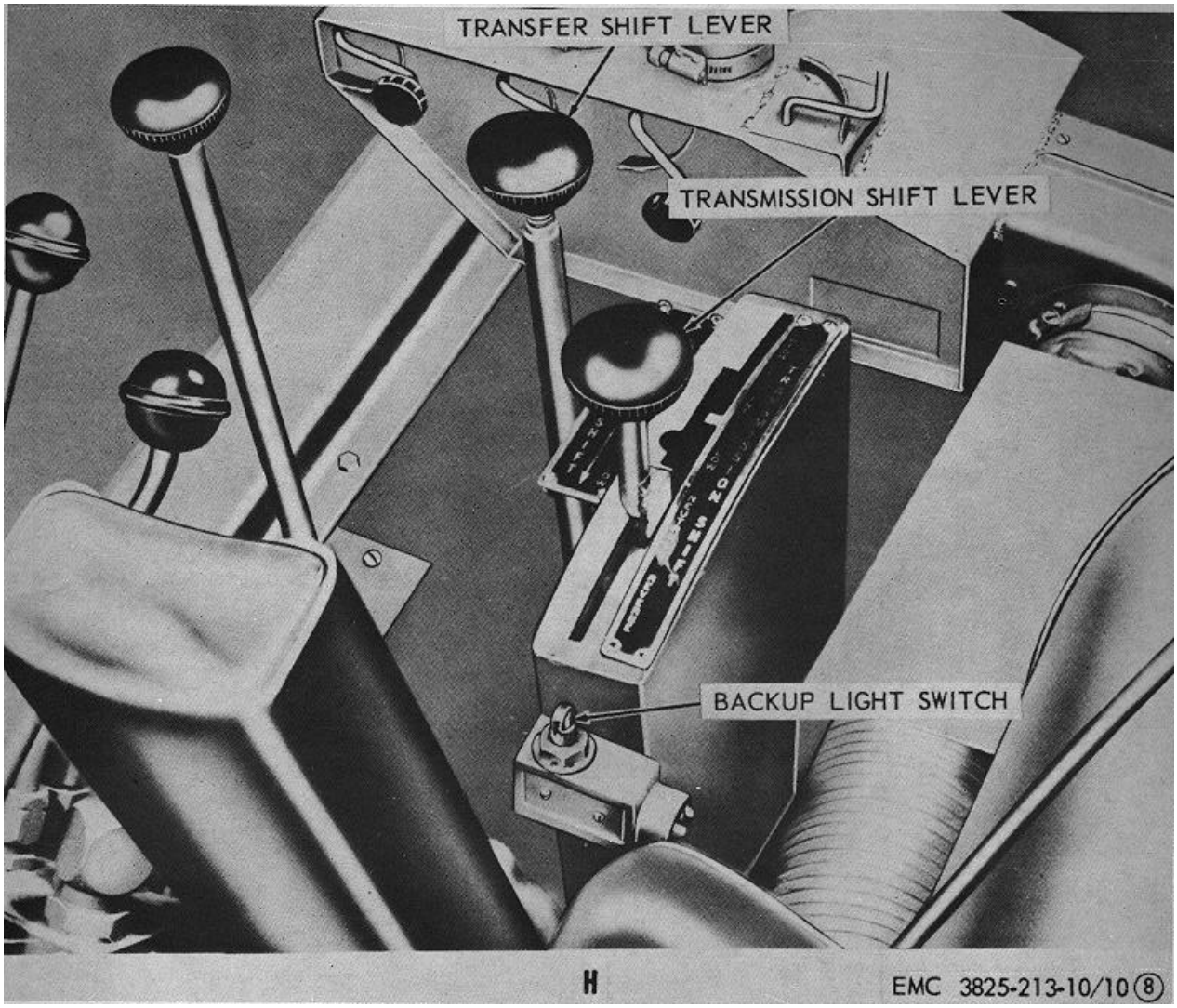
F. Operator's cab ceiling (center)

Figure 10-Continued.



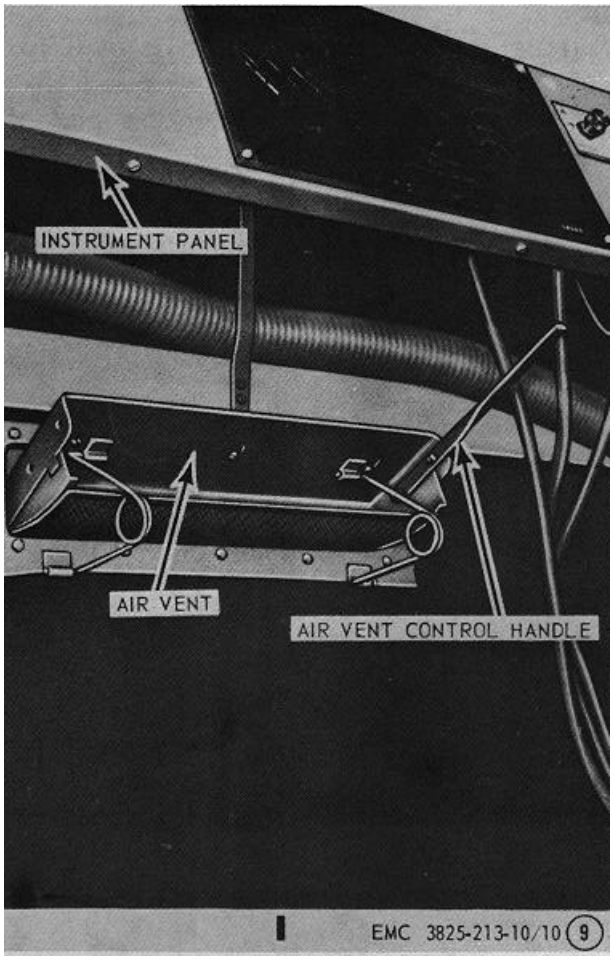
G. Operator's cab ceiling (right)

Figure 10-Continued.



H. Operator's cab floor (right side)

Figure 10-Continued.



I. Operator's cab, front

Figure 10-Continued.

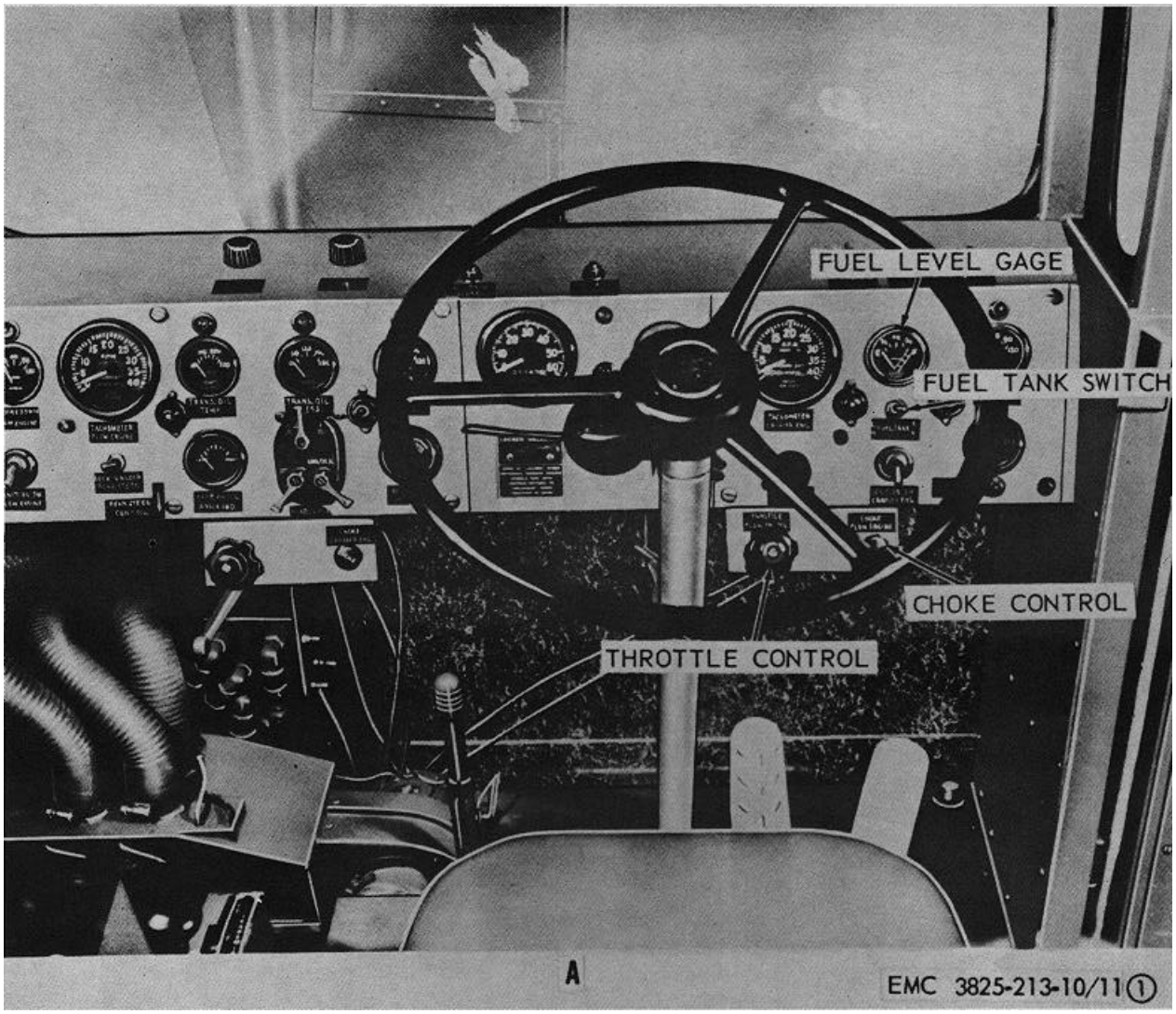
Section III. PLOW AND ENGINE CONTROLS AND INSTRUMENTS

13. General

This section describes, locates, illustrates, and furnishes the operator, crew, or driver sufficient information about the various controls and instruments for proper operation of the plow unit.

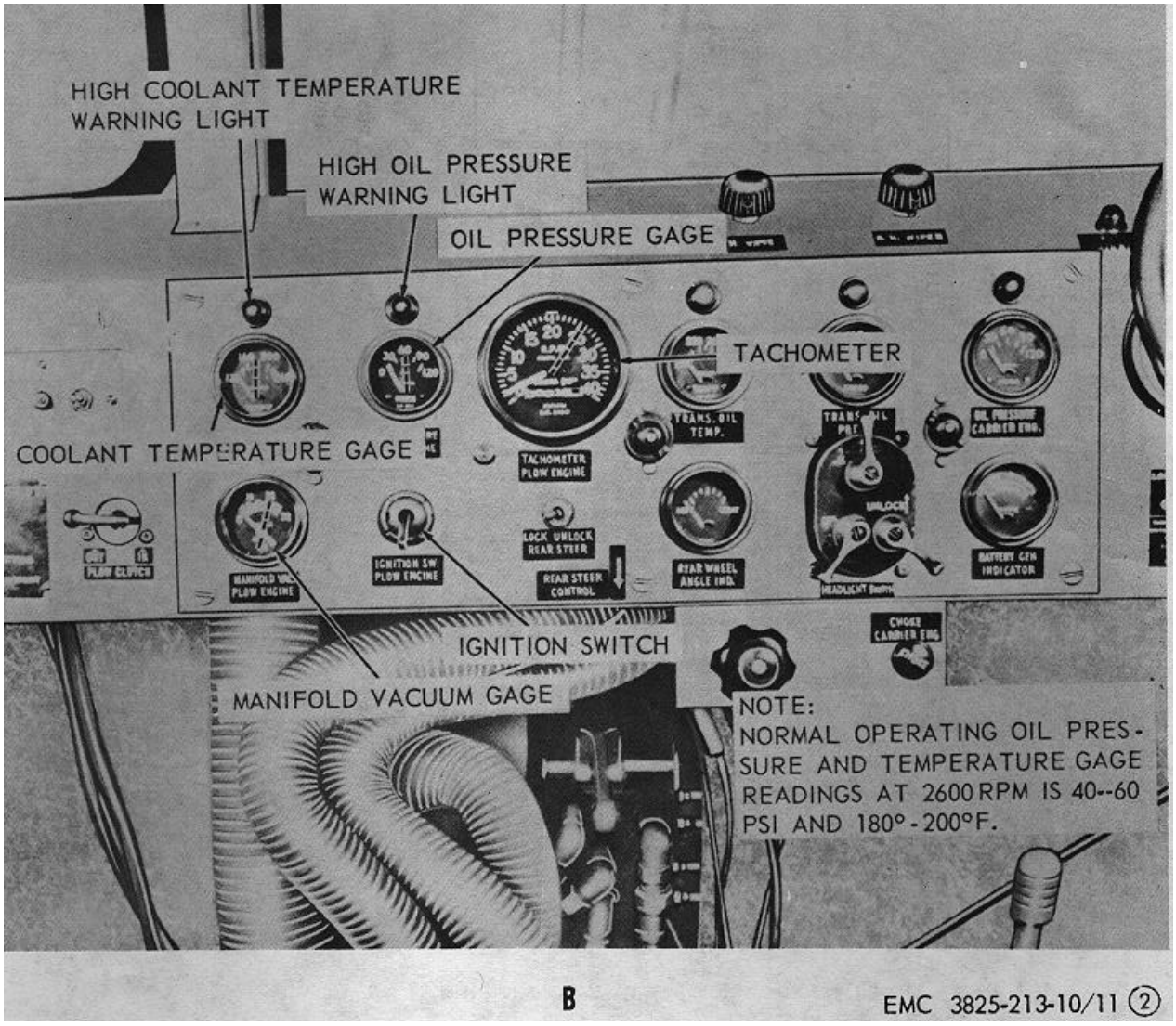
14. Controls and Instruments

The purposes and use of the plow unit controls and normal readings of the plow unit instruments and gages are illustrated in figure 11.



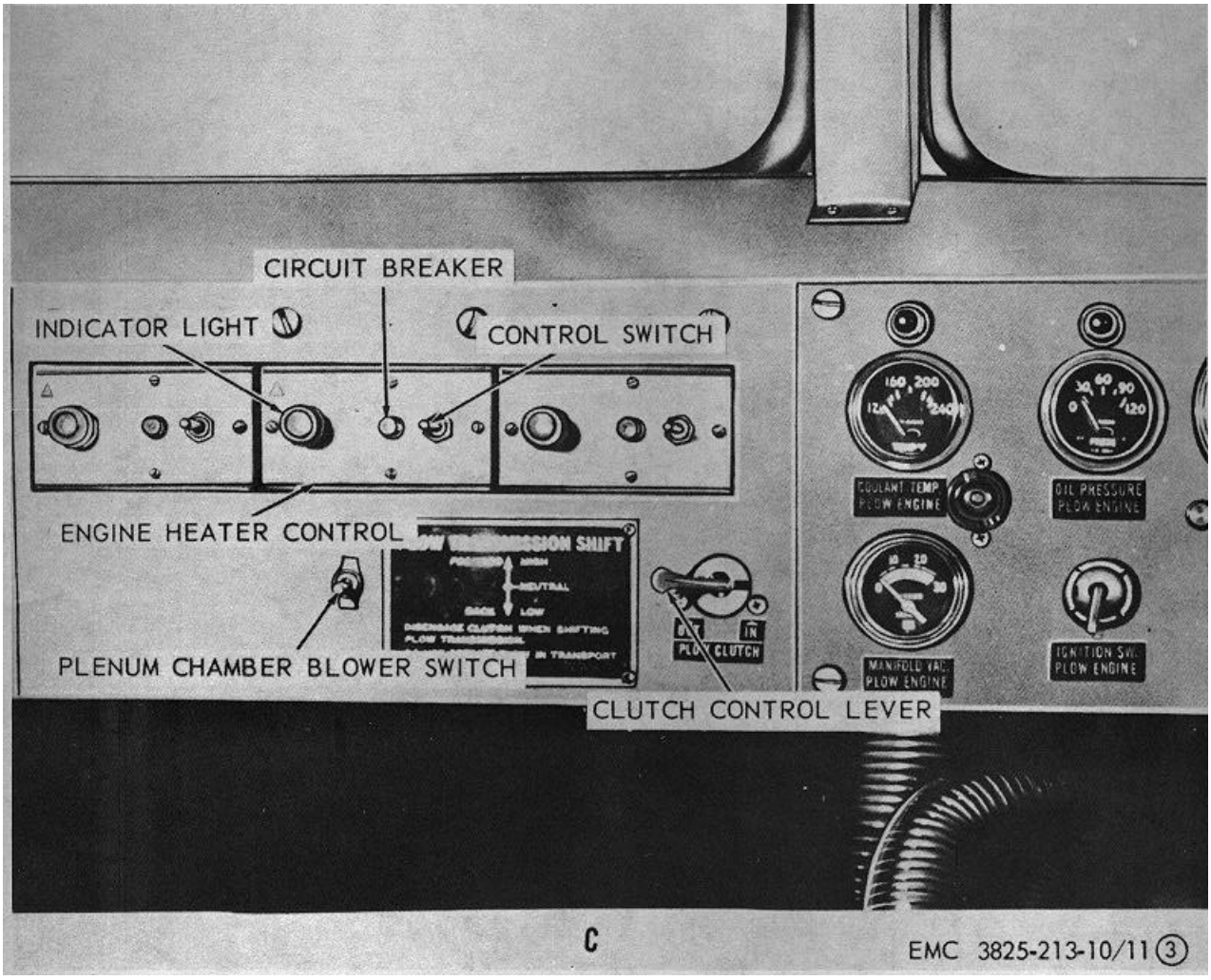
A. Operator's cab, right side

Figure 11. Plow and engine controls and instruments.



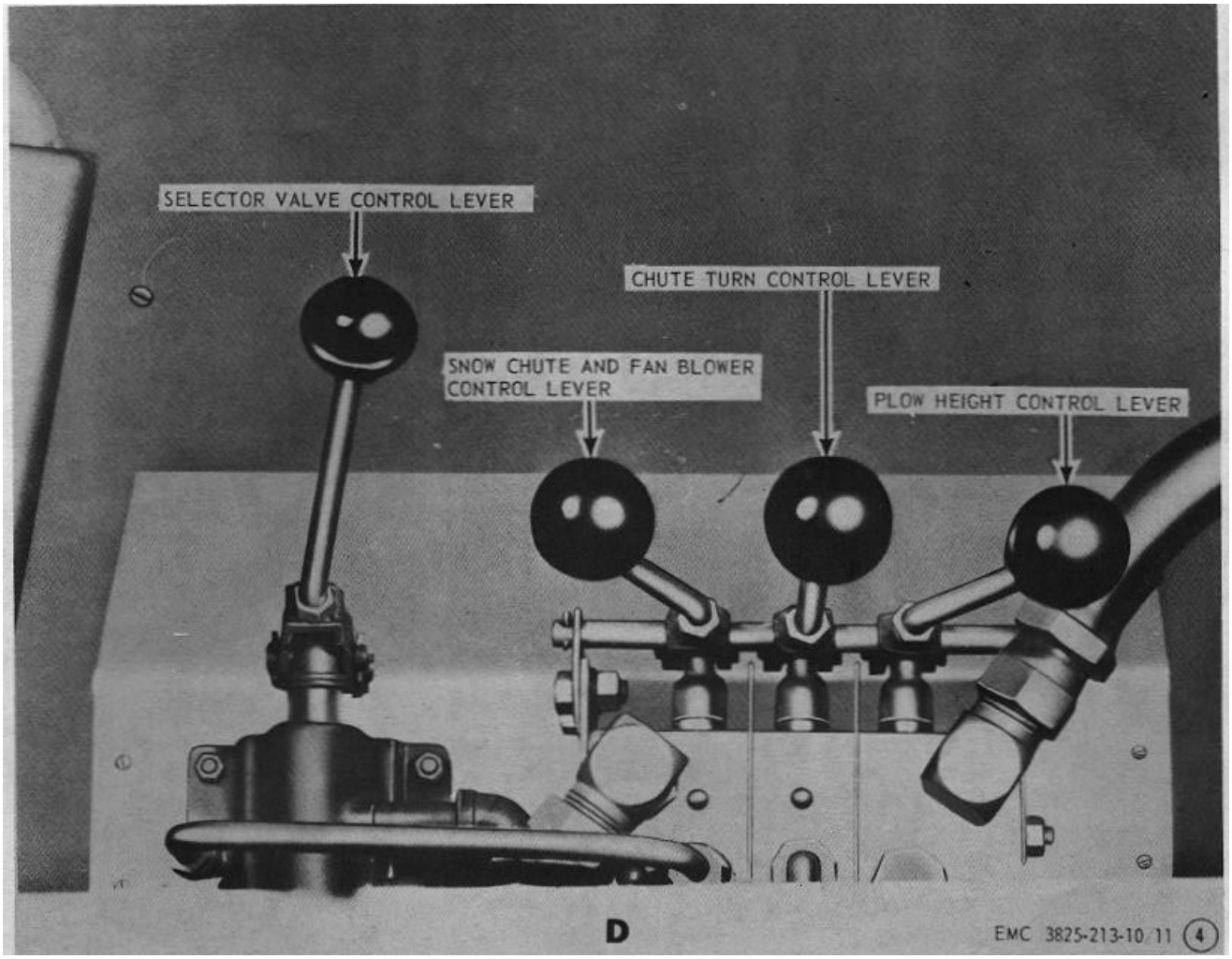
B. Operator's cab, center

Figure 11-Continued.



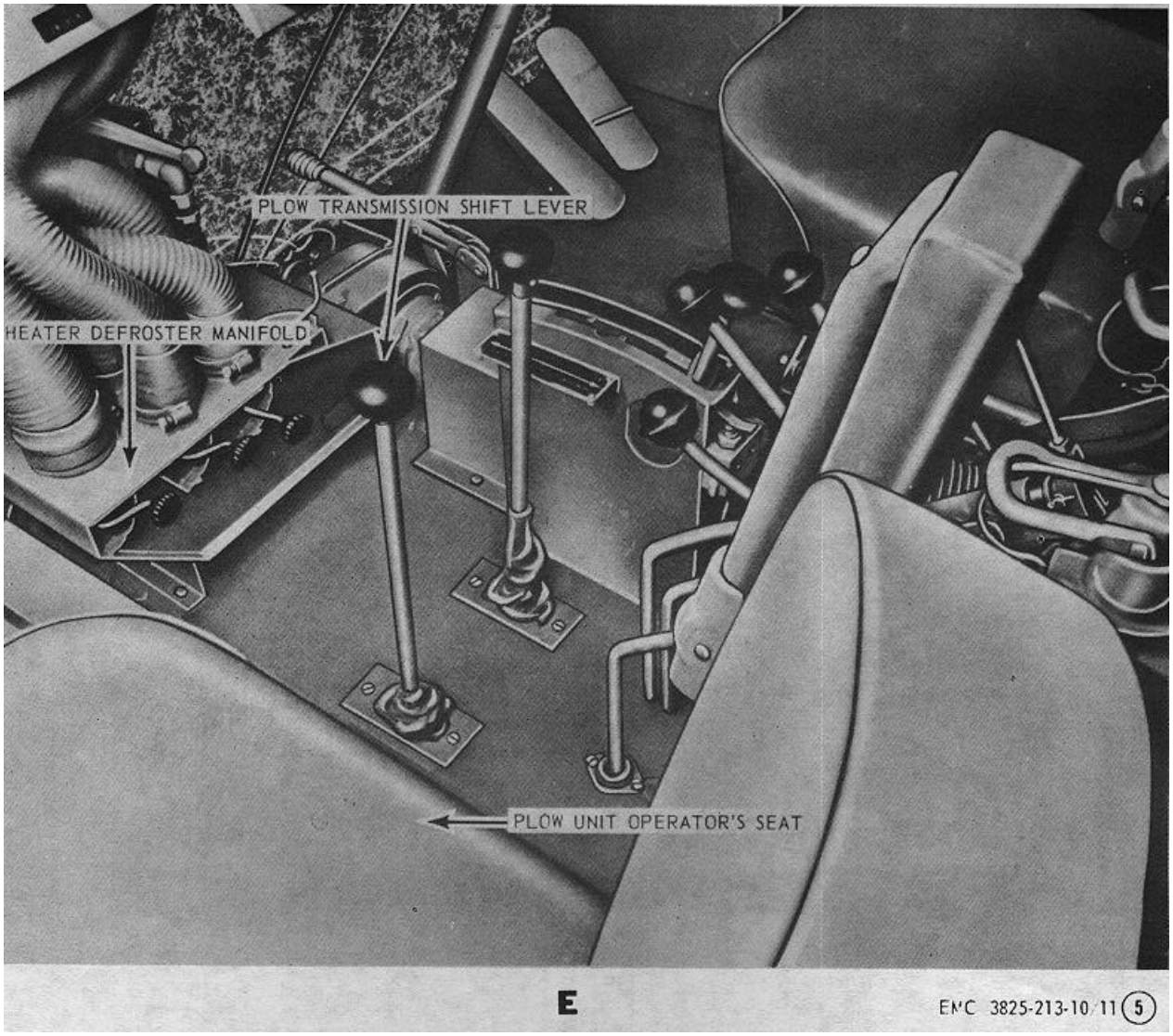
C. Operator's cab, left side

Figure 11-Continued.



D. Plow controls, center cab

Figure 11-Continued.



E. Operator's cab floor, center

Figure 11-Continued.

Section IV. OPERATION OF EQUIPMENT

15. General

a. The instructions in this section are published for the information and guidance of the personnel responsible for operation of the snow removal unit.

b. The operator must know how to perform every operation of which the snow removal unit is capable. This section gives instructions on starting and stopping the snow removal unit, basic motions of the snow removal unit, and on coordinating the basic motions to perform the specific tasks for which the equipment is designed. Since nearly every job presents a different problem, the operator may have to vary given procedures to fit the individual job.

16. Starting Carrier Engine

a. Preparation for Starting.

(1) Perform the before-operation services (par. 40 and fig. 30).

(2) Lubricate the snow removal unit in accordance with the current lubrication order (LO 5-3825-213-20).

b. Starting. Start carrier engine as illustrated in figure 12.

Note

Allow 5 minute warmup period before putting carrier in motion.

Warning

When it is necessary to operate the engine indoors, be sure proper ventilation is provided; the exhaust fumes are dangerous.

Note

For starting carrier and plow engines in cold weather, refer to paragraphs 31 and 32 for use of the heaters and the ether starting aids before starting as instructed above.

17. Stopping Carrier Engine

a. Stop carrier engine as illustrated in figure 13.

b. Perform the after-operation services (par. 40 and fig. 30).

18. Starting Plow Engine

a. Preparation for Starting.

(1) Perform before-operation services (par. 40 and fig. 30).

(2) Lubricate the snow removal unit in accordance with the current lubrication order.

b. Starting. Start plow engine as illustrated in figure 14.

Warning

When it is necessary to operate the engine indoors, be sure proper ventilation is provided; the exhaust fumes are dangerous.

Note

For starting in cold weather, refer to paragraphs 31 and 32 for use of the heaters and the ether starting aids before starting as instructed above.

19. Stopping Plow Engine

a. Stop plow engine as illustrated in figure 15.

b. Perform after-operation services (par. 40 and fig. 30).

20. Starting Carrier

a. Start carrier engine (fig. 12).

Caution

Be sure that all personnel are clear of the snow removal unit before starting operation.

Caution

The accelerator and brake pedals are air-powered. Do not attempt to move the carrier until the air pressure reaches normal operating level.

b. Start carrier into motion as illustrated in figure 16.

Caution

Never get on or off the snow removal unit when it is in motion .

21. Stopping Carrier

a. Using controls illustrated in figure 17, stop the carrier.

b. Stop carrier engine (fig. 13).

22. Starting Plow

a. Start plow engine (fig. 14).

b. Start plow into motion as illustrated in figure 18.

Caution

Be sure that all personnel are clear of the snow removal unit before putting the plow unit into motion or starting operation.

Caution

Before putting the plow unit into operation, see that no loose bars, tools, or parts are lying in or on any part of the equipment, as they could cause serious damage to the equipment or bodily injury to personnel.

23. Stopping Plow

a. Using controls illustrated in figure 19, stop the plow.

b. Stop plow engine (par. 19).

24. Operation Under Usual Conditions

a. General. Close coordination is necessary between the two operators while plowing snow. Under proper operating conditions the plow engine will turn at approximately 2,600 rpm under load and have 3 to 6 inches of vacuum. When operating the engine at high idle 18 to 22 inches of vacuum is pulled. To remove the maximum amount of snow the operator should keep the machine operating at full engine load at all times. This means that the transmission should be shifted to a higher or lower speed according to the depth and density of the snow. A noticeable drop in rpm and vacuum of the engine is an indication of too heavy a load, while a rise in vacuum and rpm indicates the unit is not removing snow

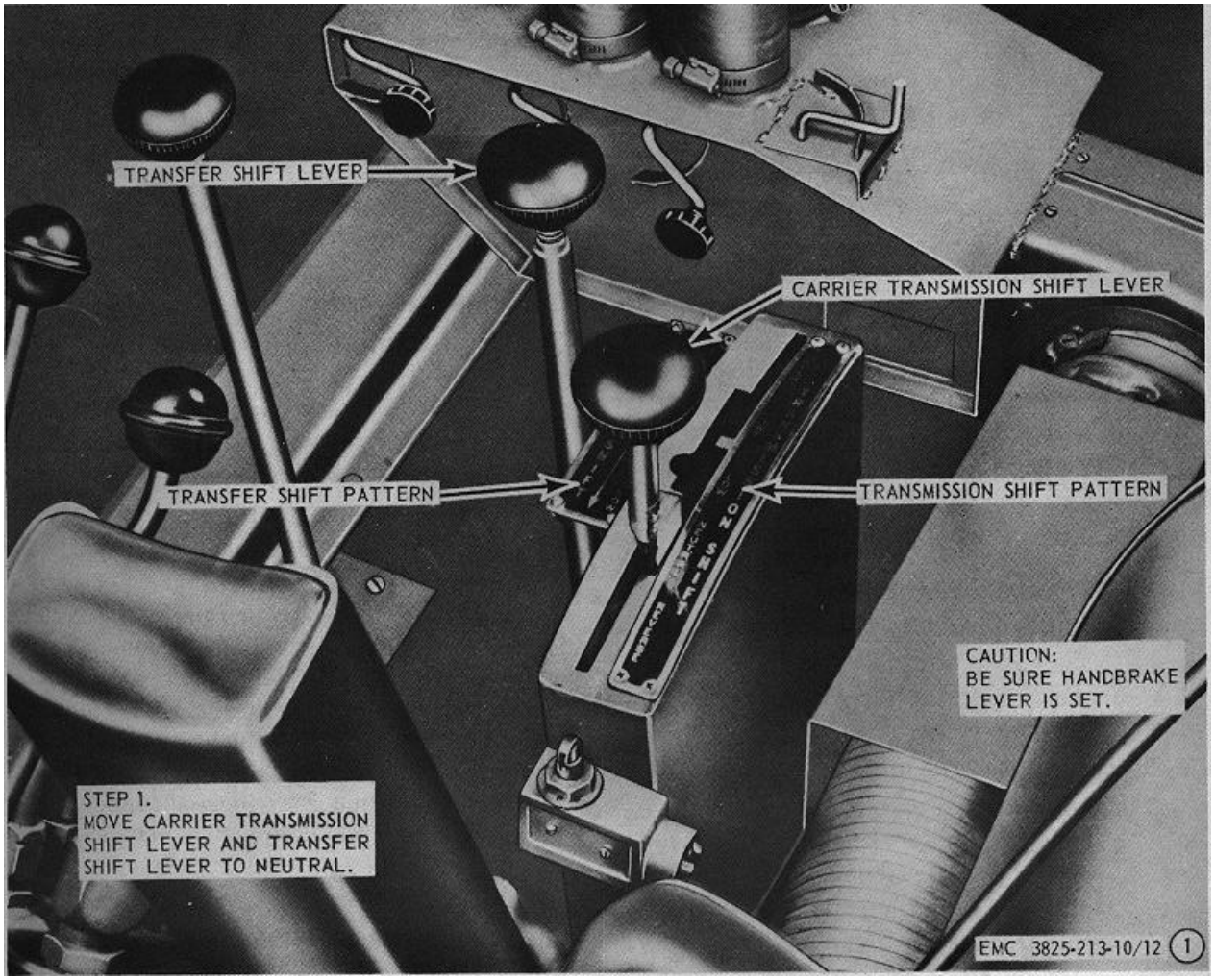


Figure 12. Starting carrier engine.

to its capacity. Casting direction and distance requirements must be determined, chute rotated and adjusted to suit the requirements before proceeding with the plowing operations. If possible always set the discharge opening so snow delivery will be with the wind. The snow removal unit is provided with a hydraulic actuated rear axle steering to aid in turning the unit and compensate for side slippage of the rear of the vehicle when side cutting snow banks and operating under other adverse conditions. Operate the rear steering as illustrated in figure 20.

b. Plowing Freshly Fallen Snow.

(1) Start carrier engine (fig. 12).

(2) Start plow engine (fig. 14).

(3) Start plow (fig. 18) and select the desired position (fig. 21).

(4) Start carrier (fig. 16).

(5) Adjust the forward speed of the carrier to provide the proper operating conditions (a above).

c. Plowing Hard Wind Driven Snow.

(1) Repeat *b*(1) through (4) above.

(2) Move the unit through the snow at the slowest possible speed, so that the auger discharges and feeds the snow to the impeller.

(3) In extremely hard snow, which chokes the plow, raise the plow and

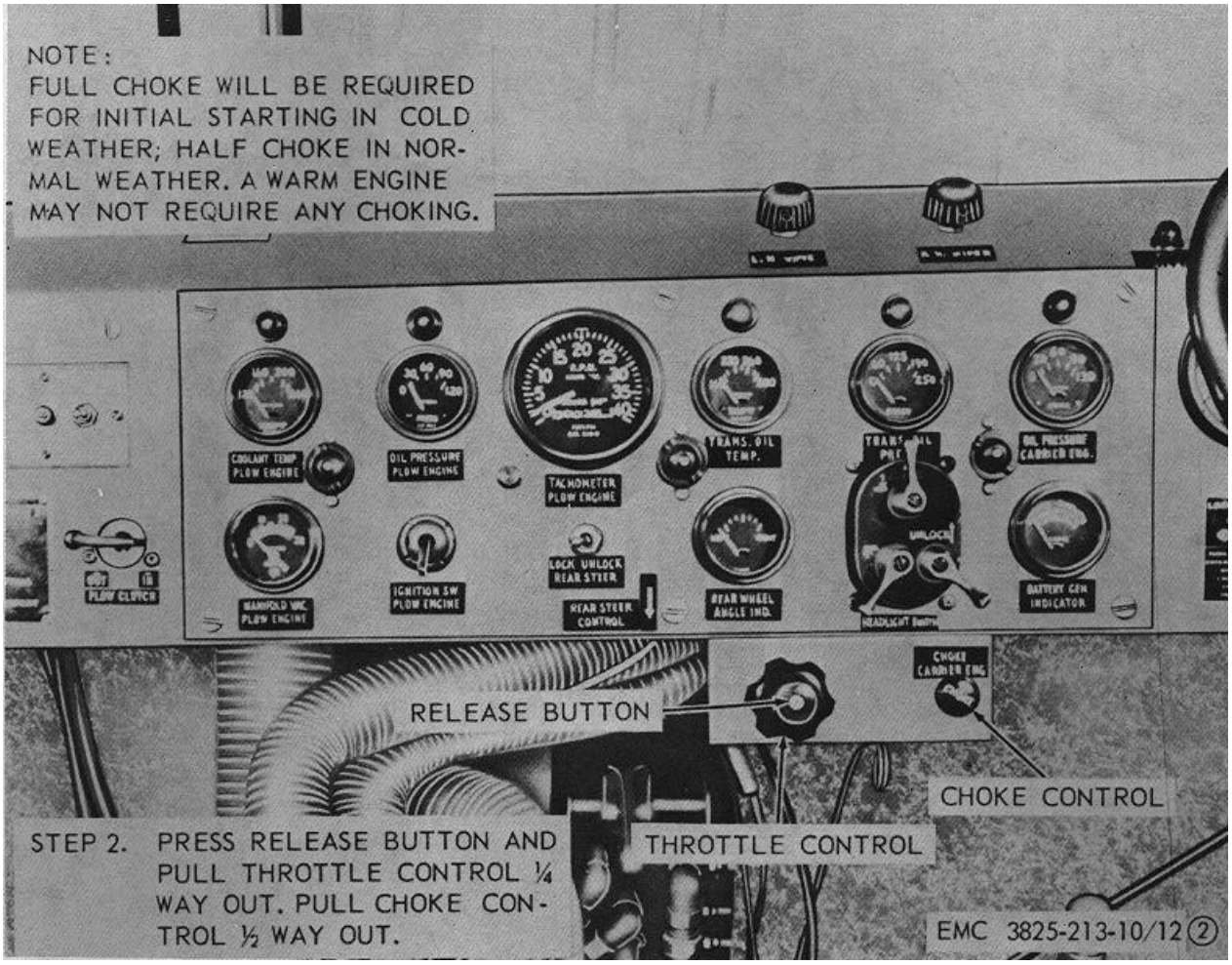


Figure 12-Continued.

move the snow removal unit up to the snow bank, and lower the plow slowly to break up the drift. If the snow is frozen to the ground, raise the plow and remove the snow above the frozen layer, and back up and remove the frozen layer slowly with the plow in the lowered position.

Caution

When raising, then lowering the plow to break up hard snow, lower the plow slowly.

d. Plowing Heavy, Wet Snow.

(1) *General*. Heavy, wet snow is plowed in the same manner as freshly fallen snow. The forward speed of the snow removal unit will be slower and must be regulated carefully to avoid clogging.

(2) *Cleaning the chute*. If the forward speed is too fast, the chute will clog immediately upon beginning the plowing operation. It may be cleared by raising and lowering it several times, using the hydraulic controls. Proceed with the plowing operation at a slower forward speed.

e. Plowing Deep Snow.

(1) Raise the plow to its maximum height and move forward into the snow bank as far as possible.

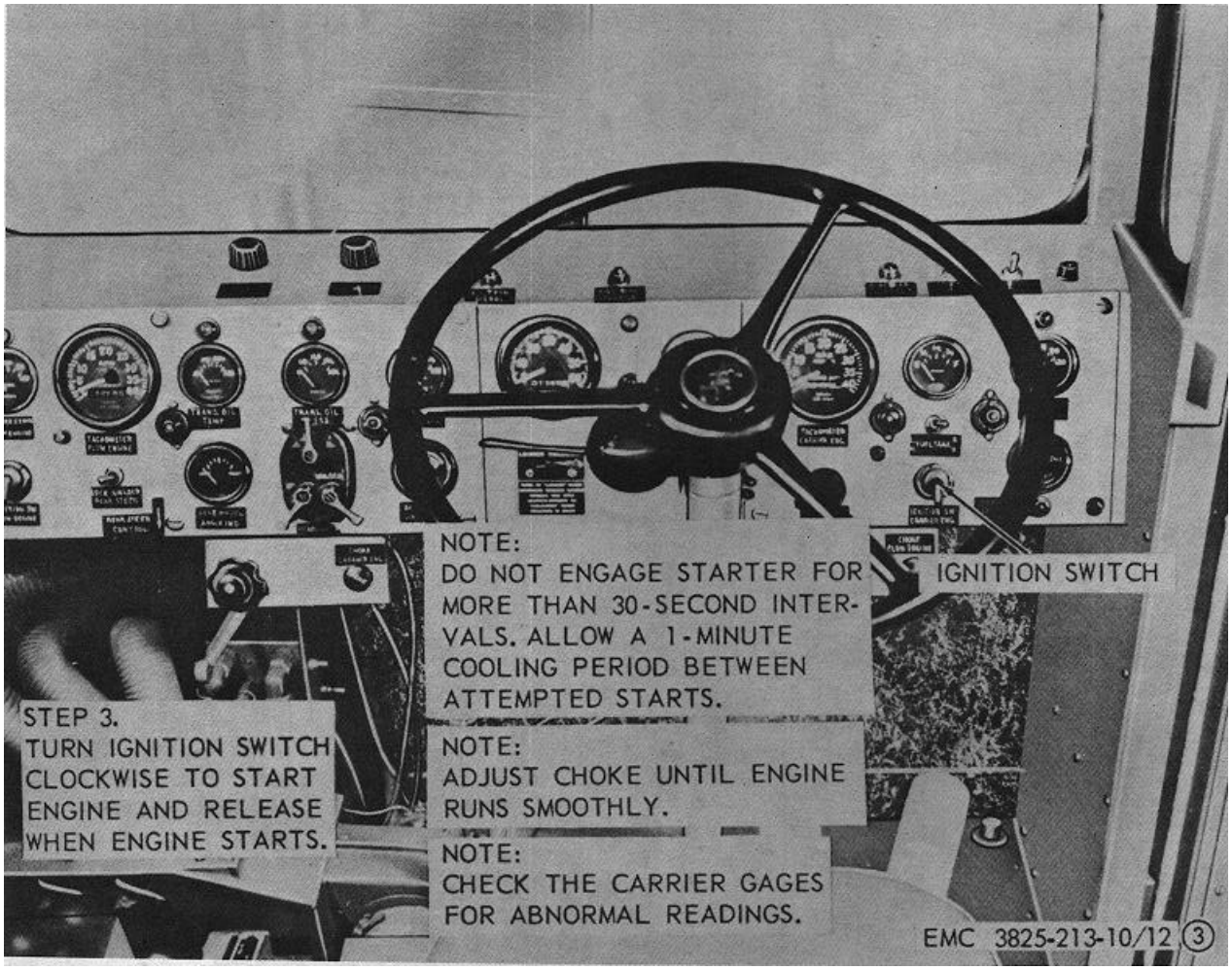


Figure 12-Continued.

(2) Lower the plow carefully to its lowest position.

(3) Back the snow removal unit away from the snow bank and repeat (1) and (2) above. Slow forward speed is required for plowing deep snow.

f. Removing Snow From Airport Runway.

(1) *General.* Airport runway snow removal operation is similar to highway operation, but care must be taken to cast the snow to a point as far as possible from' the runway. Avoid setting up "windrows" on the runway shoulders.

(2) *Wind direction parallel to runway*. When the wind is blowing parallel to the length of the runway, plow 44 the first path down the center of the runway. Widen the path by plowing additional paths adjacent to the first always casting the snow away from the runway.

(3) Wind direction across runway. When the wind is blowing across the runway, plow the first path along the windward side of the runway casting the snow with the wind, or out onto the runway. Widen the path by plowing additional paths adjacent to the first, always casting the snow with the wind.

g. Widening Paths Already Plowed on Highways. Widening is often done along the edges of paths already plowed on highways.

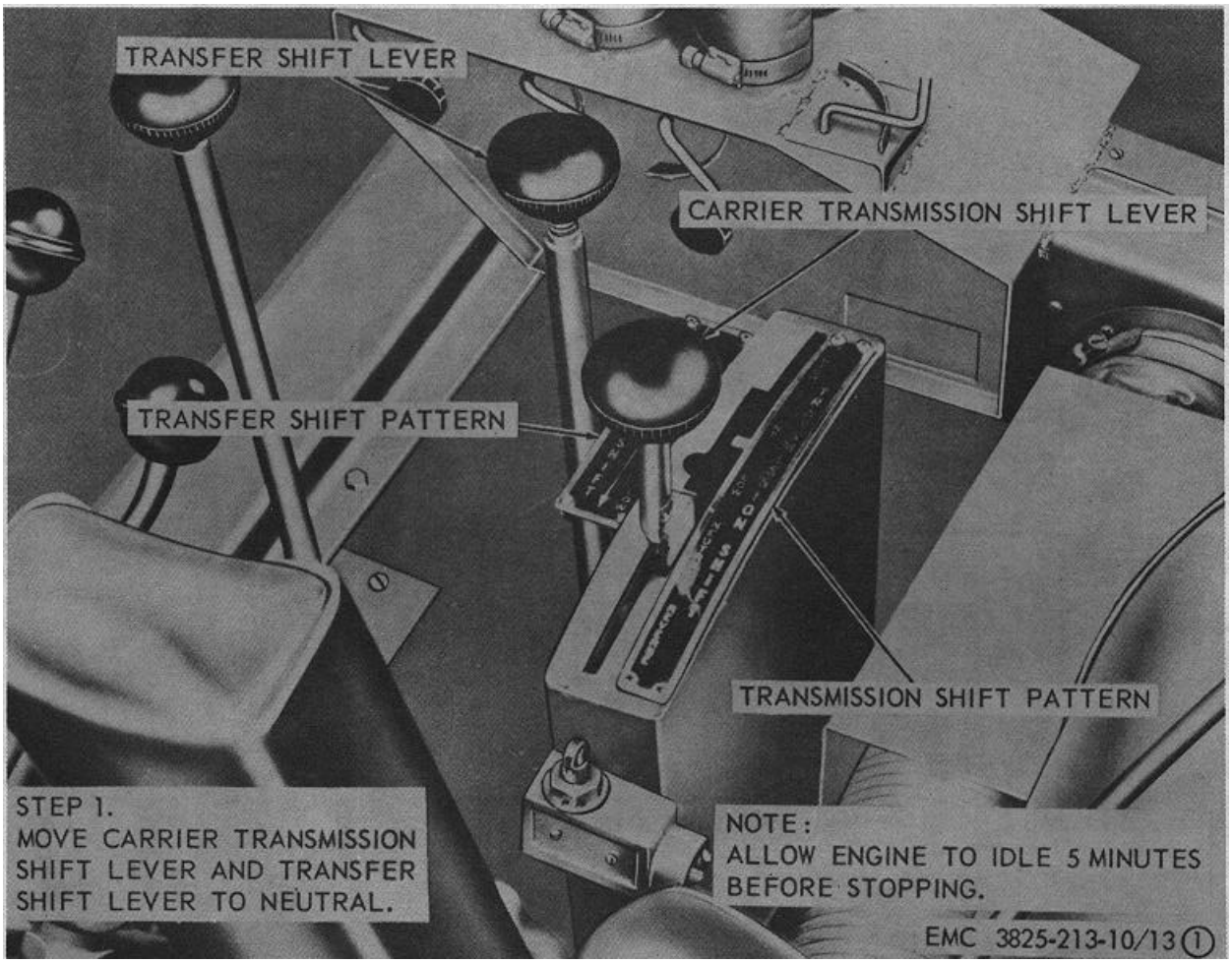


Figure 13. Stopping carrier engine.

In this case the snow may have been pushed upon road shoulders by a blade-type or V-type plow, and may contain or hide objects which might damage the fan unit. Exercise every precaution to avoid such concealed objects, And take extreme care to avoid slipping off the road shoulder into ditches, washouts, or cave-ins.

25. Operation Under Unusual Conditions

The following paragraphs contain special operating instructions necessary for proper functioning of the equipment under specific conditions such as extreme cold, rainy conditions, saltwater areas, high altitude or similar conditions not normally encountered.

26. Operation in Extreme Cold (Below 0 °F.)

a. Lubrication. Lubricate as specified in the current lubrication order and specific lubrication instructions (par. 38).

b. Cooling System. Inspect cooling system and correct or report any leaks.

c. Batteries. Keep batteries fully charged.

Caution
Run engine for one hour after adding distilled water to batteries. This permits the added water to mix with electrolyte and prevent freezing.

Caution
Keep fuel tank full at all times to prevent condensation.

d. Fan. Due to severe conditions of frozen ice or snow the fan may become bent or

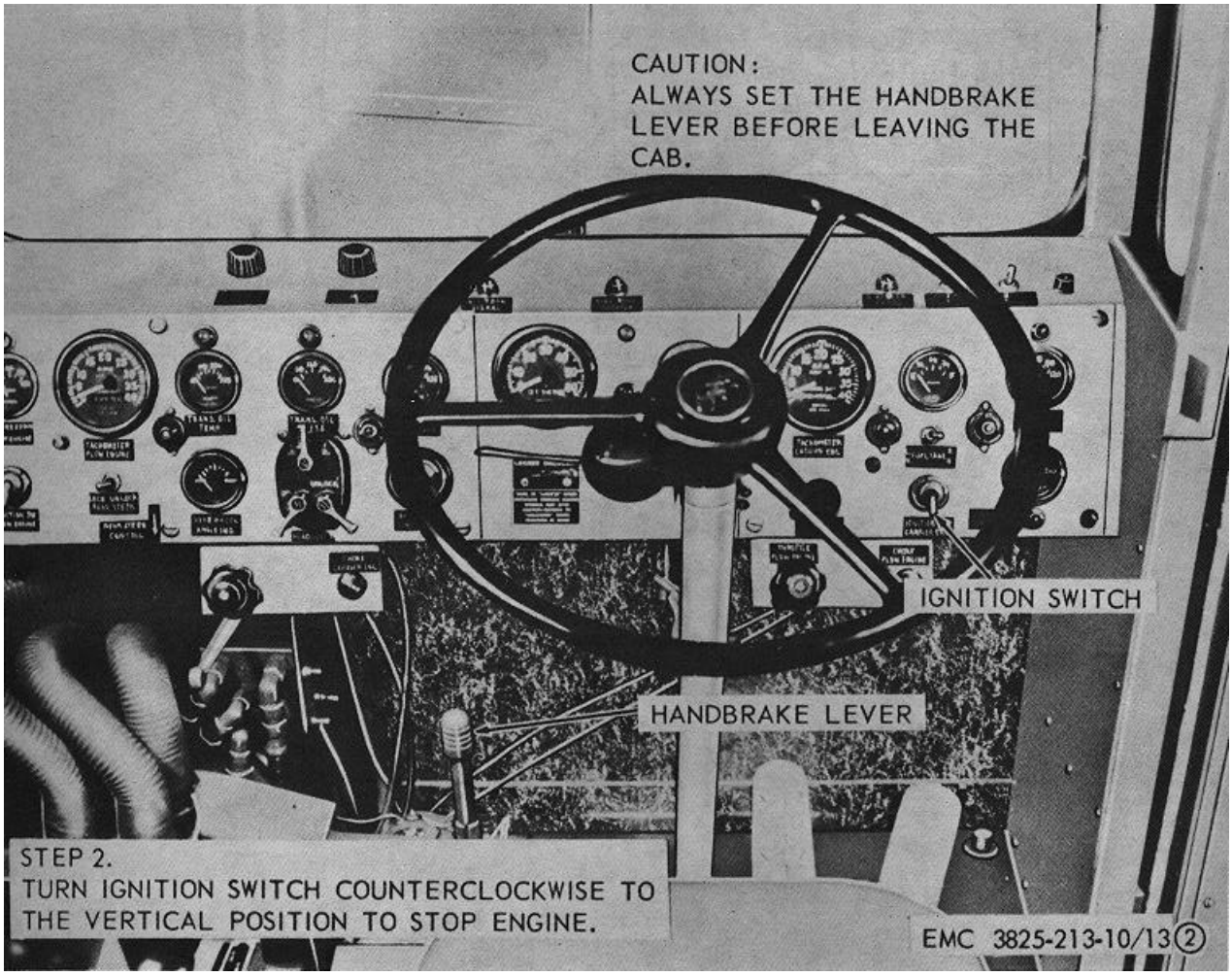


Figure 13-Continued.

broken. Do not operate the unit with a broken or bent fan.

e. Augers. Check augers frequently for alinement, and report any bends or dents.

f. Hydraulic System. Check the oil level, and keep vent in filler plug open.

27. Operation in Salt-Water Areas

a. General. Wash unit frequently with clean, fresh water. Do not contaminate fuel system or damage electrical equipment.

b. Protection. Coat exposed metal surfaces with rustproofing material. Remove rust immediately and apply paint and/or oil as applicable.

c. Cooling System. Be sure water used in the cooling system is free of salt and alkali.

Caution

The cooling system is not intended for use with salt water. However, salt water may be used in an emergency. Drain, flush, and refill the system with proper coolant at first opportunity.

d. Electrical System. Keep the electrical system clean and dry. Wipe off excess moisture and salt deposits. Pay particular attention to electrical connections.

e. Batteries. Keep the battery dry and free from corrosion. Coat the terminals with a light application of grease to prevent corrosion.

Caution

Keep electrical leads dry and in good condition.

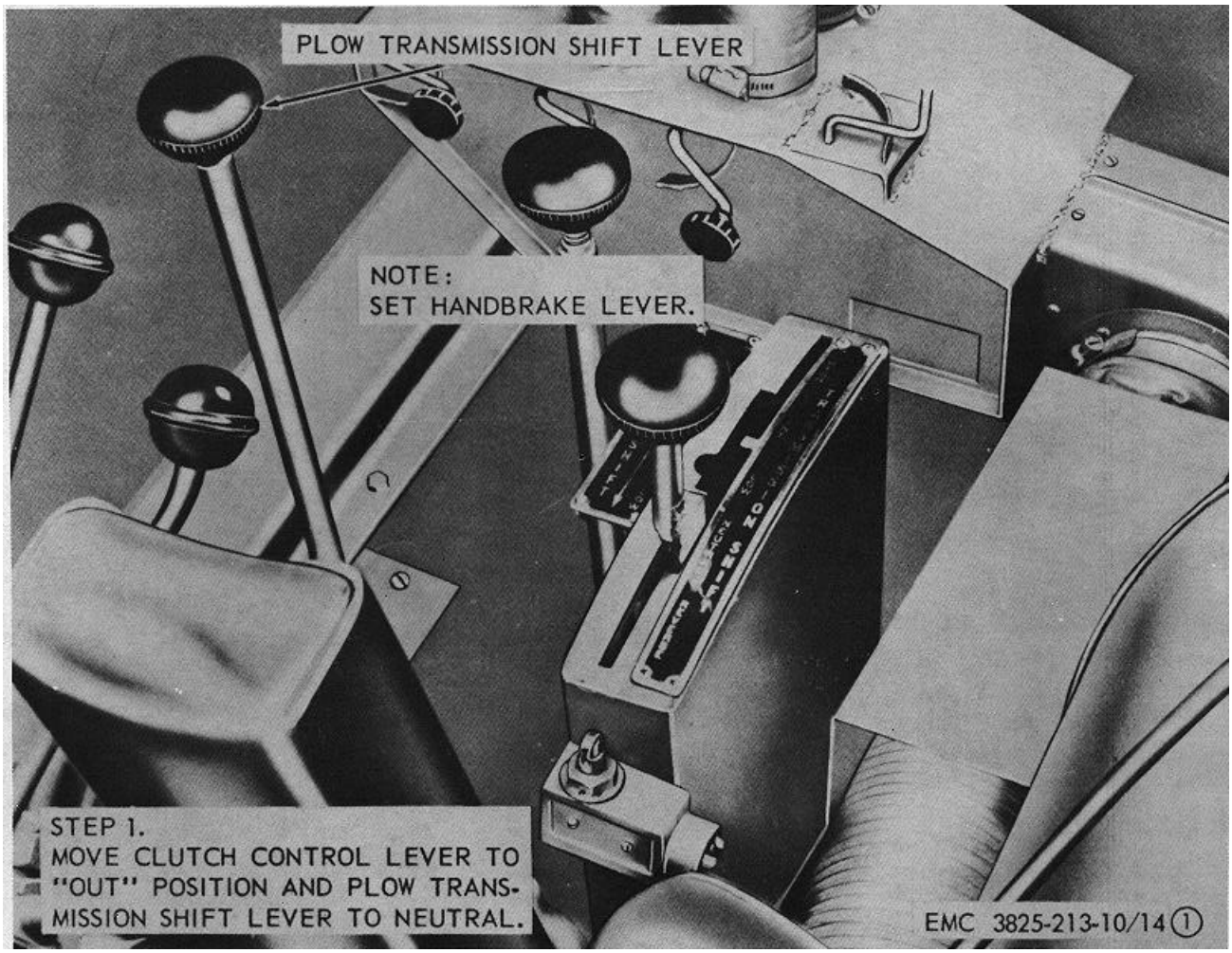


Figure 14. Starting plow engine.

28. Operation at High Altitudes

a. General. The snowplow is designed to operate under normal conditions at altitudes up to 5,000 feet above sea level without special attention. Operation at higher altitudes presents special problems due to lower atmospheric pressure and wide differences in temperature during the day and night.

b. Carburetor. Adjust the carburetor to compensate for variance in atmospheric pressure.

c. Brakes. The pressure delivered by the brake system may decrease at high altitudes. The operator must give this careful consideration when heavy demands are made on the braking system.

d. Air Cleaner. Clean and service the air cleaner daily (fig. 33) so that the maximum air intake can be accomplished for most efficient operation.

e. Tires. Check for slow leaks that might occur at high altitudes.

f. Cooling System. Keep the cooling system clean and filled to the proper level (fig. 36). Check frequently, as water evaporates more rapidly at high altitudes.

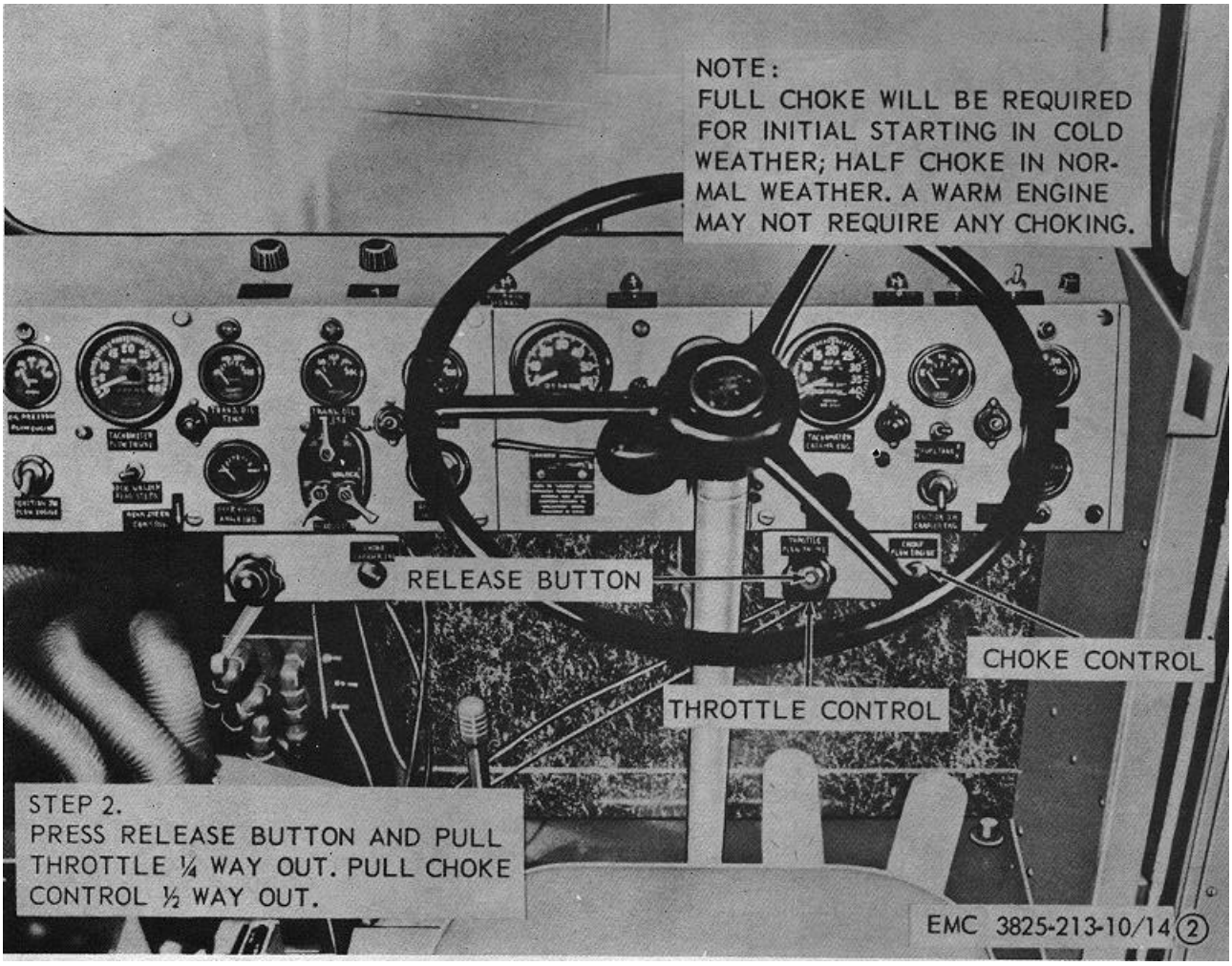


Figure 14-Continued.

Section V. OPERATION OF AUXILIARY MATERIAL USED IN CONJUNCTION WITH EQUIPMENT

29. Fire Extinguisher (Monobromotrifluoromethane Type)

a. Description. The monobromotrifluoromethane type fire extinguisher replaces the carbon tetrachloride type fire extinguishers used in the past. It is generally suitable for use on all types of fire, with exception of fires involved with LOX (liquid oxygen) generating equipment. The fire extinguisher is furnished with a disposable type cylinder.

b. Operation. To operate the fire extinguisher perform the following operations:

(1) Remove fire extinguisher from its location.

(2) Break the seal by pulling the safety pin from the handle.

(3) Point the horn at the base of the flame.

(4) Depress trigger for discharge and direct the stream of contents at the base of the fire.

Warning
Avoid breathing of smoke.

(5) Replace with new cylinder immediately after using.

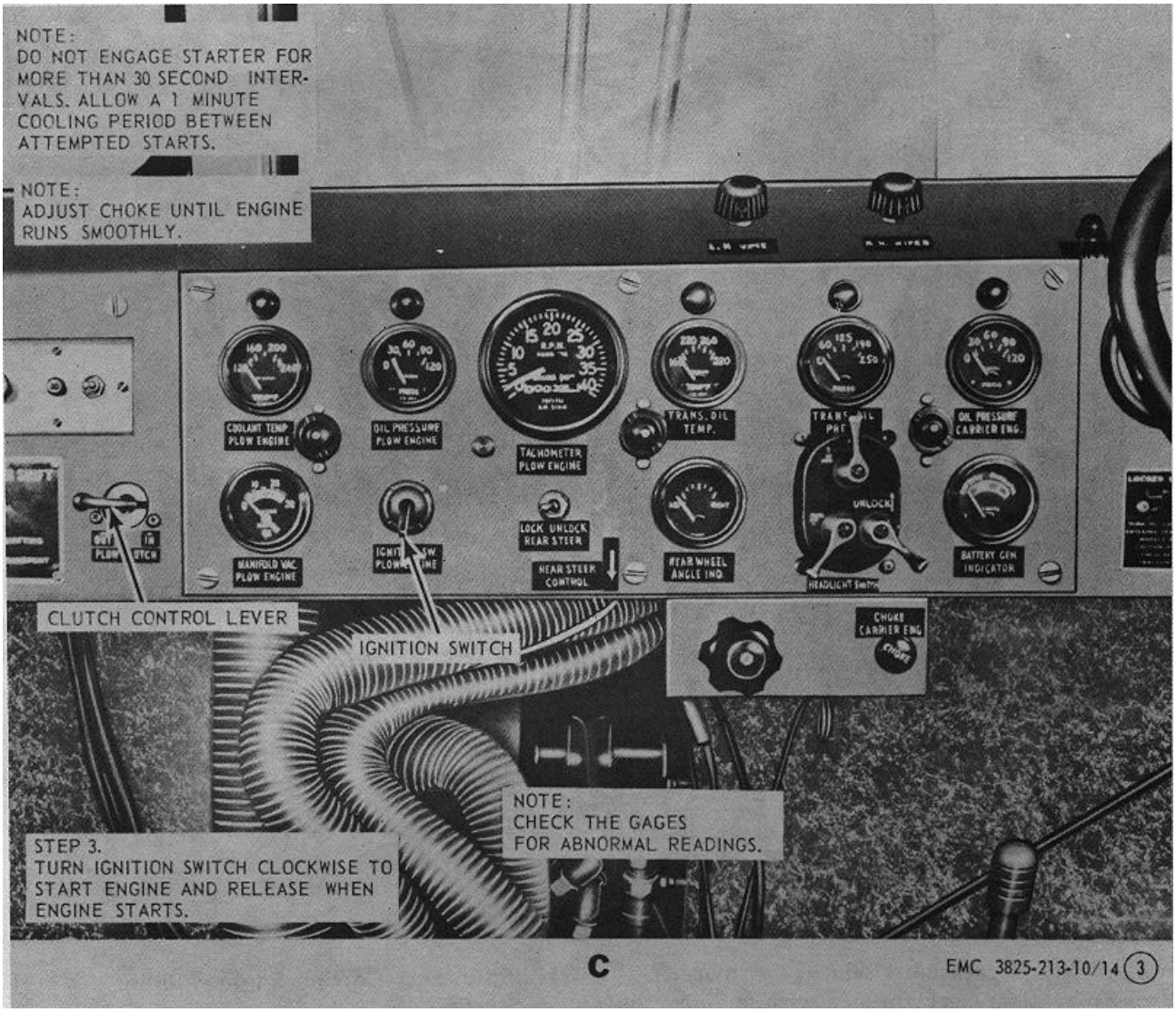


Figure 14-Continued.

c. Replacement of Cylinder. To replace with new cylinder, perform the following operations:

(1) Press lever to release pressure from old cylinder.

(2) Loosen swivel valve coupling nut and remove the valve assembly from used cylinder.

(3) Remove instruction band from used cylinder.

(4) Place new cylinder through the instruction band.

(5) Replace safety pin in valve and seal pin with seal wire.

(6) Attach valve assembly and tighten swivel coupling nut on the new cylinder and replace fire extinguisher in mounting bracket.

(7) Adjust instruction band on cylinder to show maintenance and operating instructions.

d. Maintenance. Weigh fire extinguisher every 3 months and replace cylinder if gross

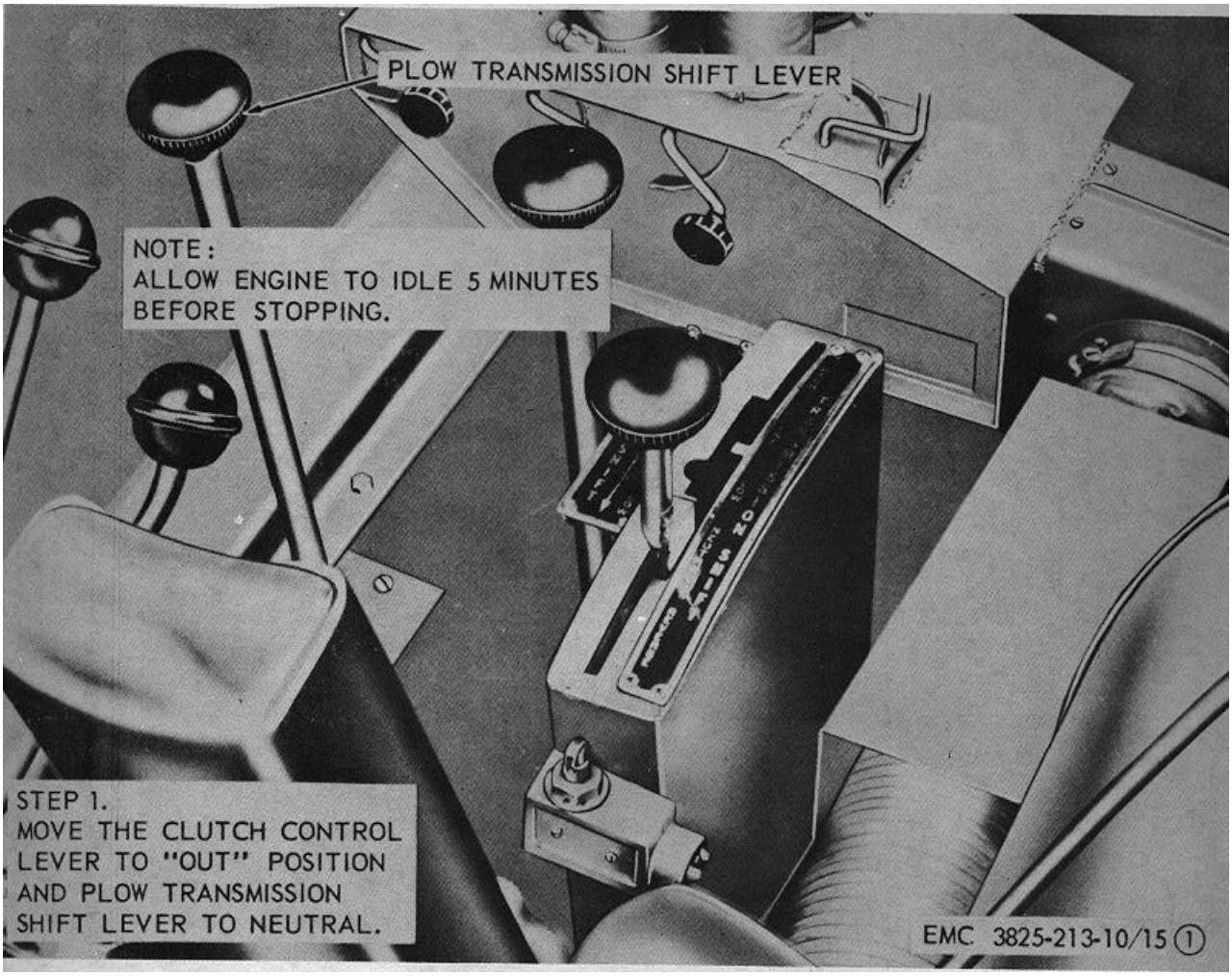


Figure 15. Stopping plow engine.

weight has decreased 4 ounces or more. Lubricate cylinder neck threads with one drop of OE 30 oil before reassembly.

30. Fire Extinguisher (Carbon Dioxide Type)

a. Description. The carbon dioxide type fire extinguisher is suitable for use on electrical and flammable liquid fires. The carbon dioxide types are of the 5- and 15-pound sizes.

b. Operation. Remove the fire extinguisher from its location, break the seal, operate the control valve, and direct the stream of contents at the base of the flame.

c. Refilling and Maintenance. For detailed instructions on refilling and maintenance of carbon dioxide type fire extinguisher refer to TM 5-687 and TM 9-1799.

31. Plow and Carrier Engines Ether Starting Aids

a. Description. The ether starting aids are located at the rear of the cab. They are capsule holding, manually operated controls. Ether is added to the engine fuel to facilitate starting in cold weather.

b. Operation. Operate the ether starting aids as instructed in figure 22.

32. Engine Heaters

a. Description. Both the carrier and plow engines are equipped with heaters, as part of the winterization equipment. The purpose of these heaters is to heat the coolant and crankcase oil for both engines. The carrier engine

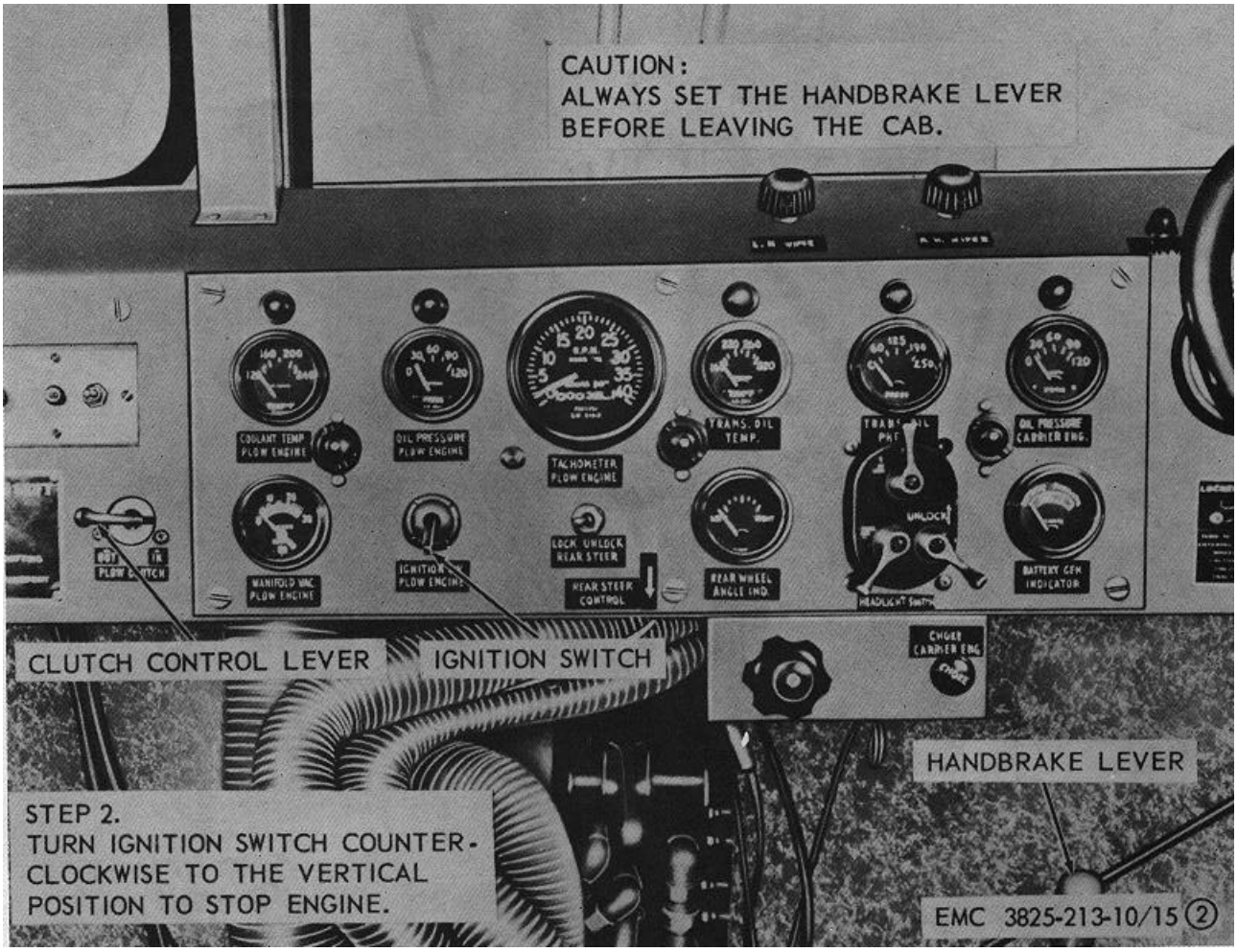


Figure 15-Continued.

heater is located on the carrier frame near the front of the carrier engine. The plow engine heater is located just in front of the plow engine.

b. Operation. Operate engine heaters as instructed in figure 23.

33. Personnel Heater

a. Description. The fresh air heater is designed to supply large quantities of heated fresh air for the purpose of heating the operator's cab and the battery box, and to furnish sufficient heat to the defroster tubes for defrosting the windshield. Operation of the heater is controlled by a manual control switch. The supply of heated air is controlled by use of a manually operated damper lever.

b. Operation. Operate personnel heater as illustrated in figure 23.

34. Slave Receptacle

a. Description. The slave receptacle is located near the catwalk at the rear of the unit, right side. It is used as a battery charging receptacle and also used as a connection for a jumper cable to start the engine when the batteries are low.

b. Operation. Operate the slave receptacle as instructed in figure 24.

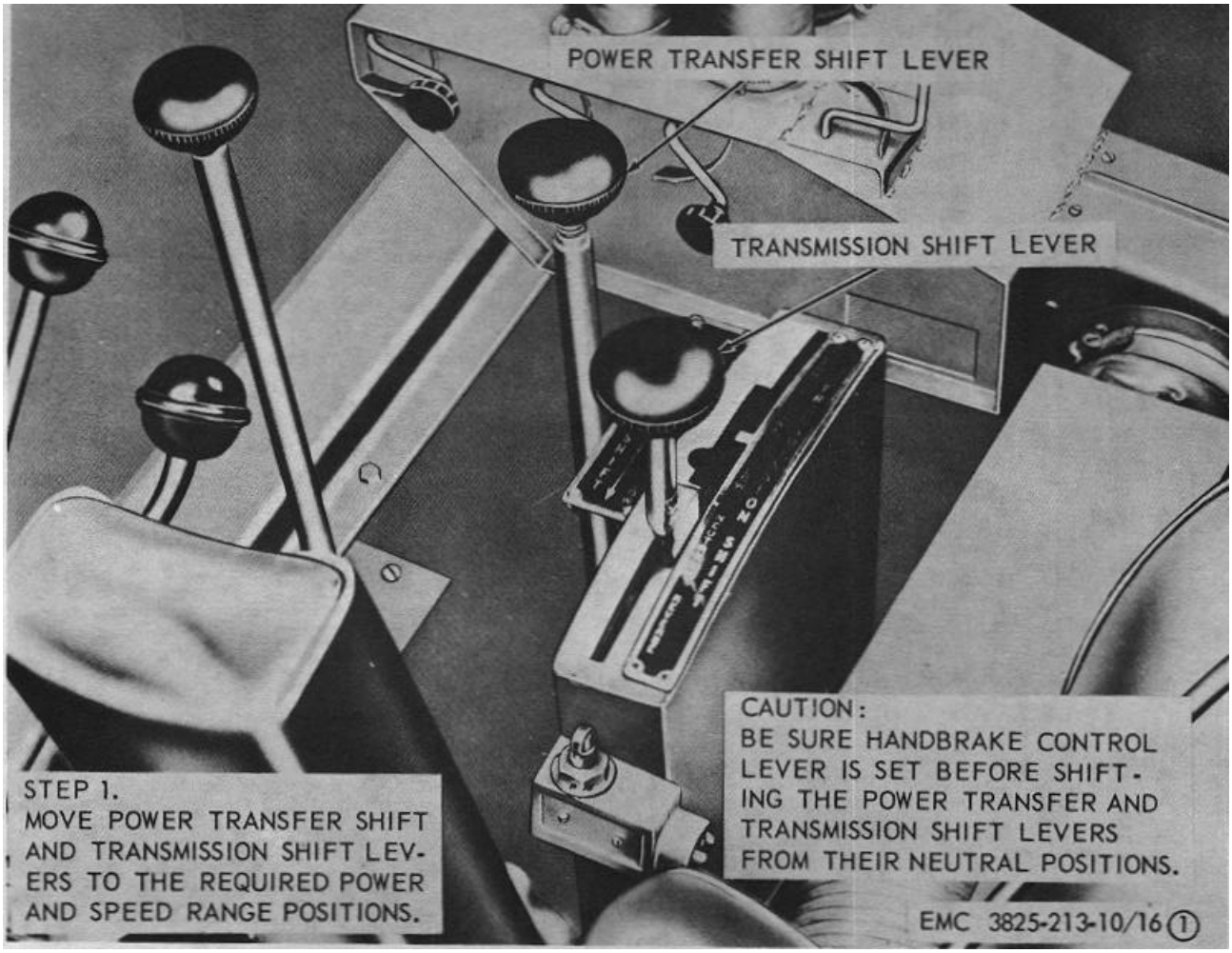


Figure 16. Starting carrier.

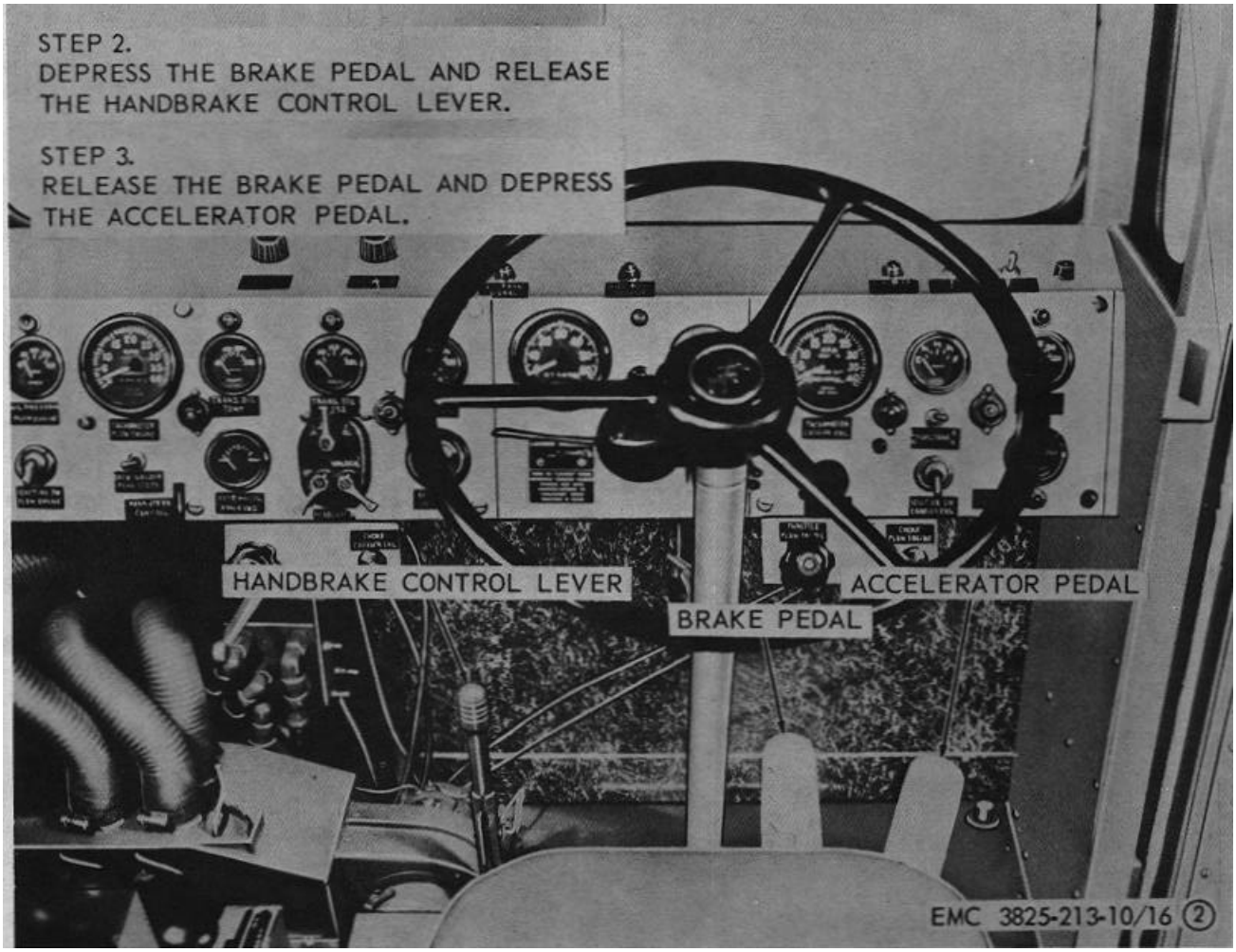


Figure 16-Continued.

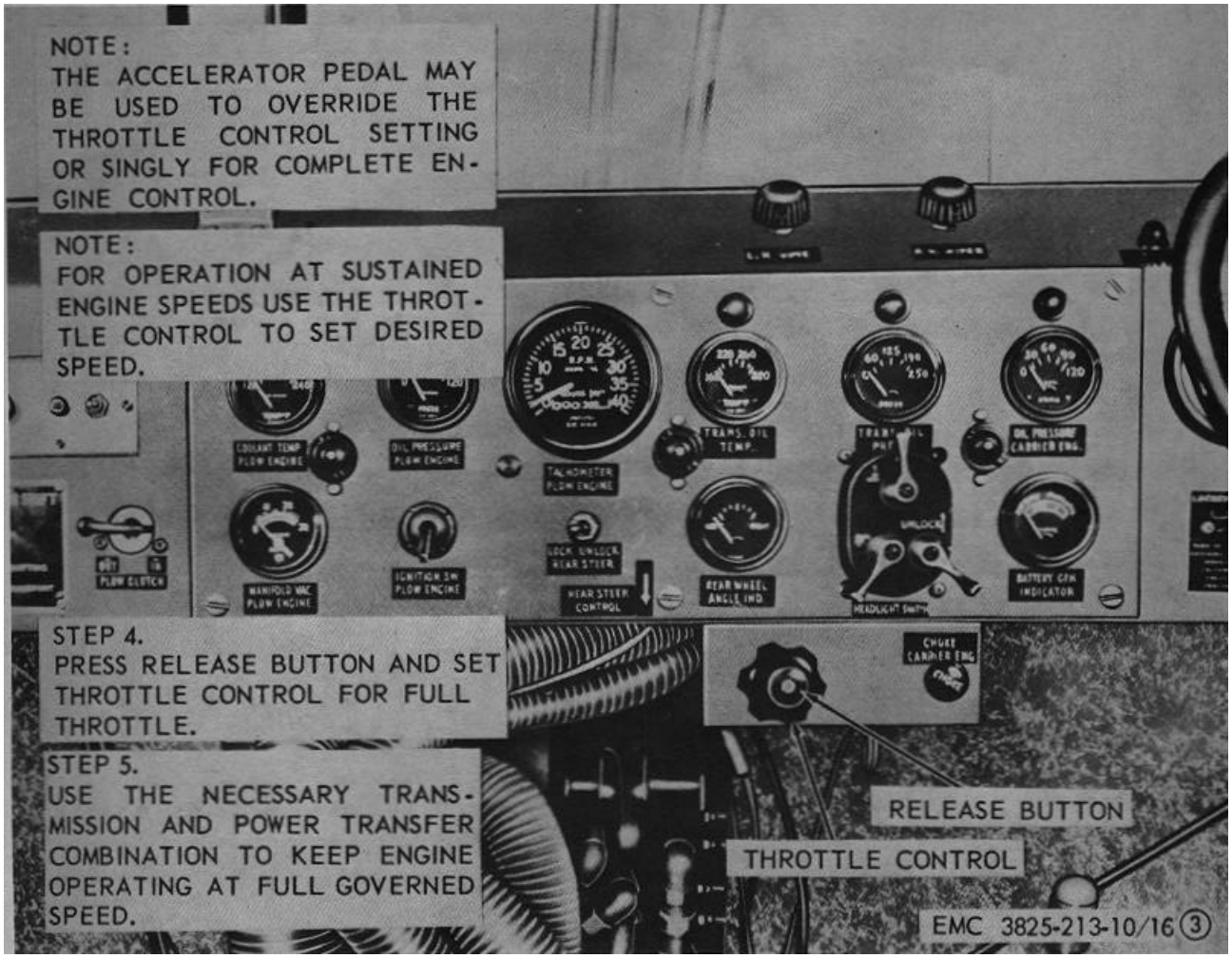


Figure 16-Continued.

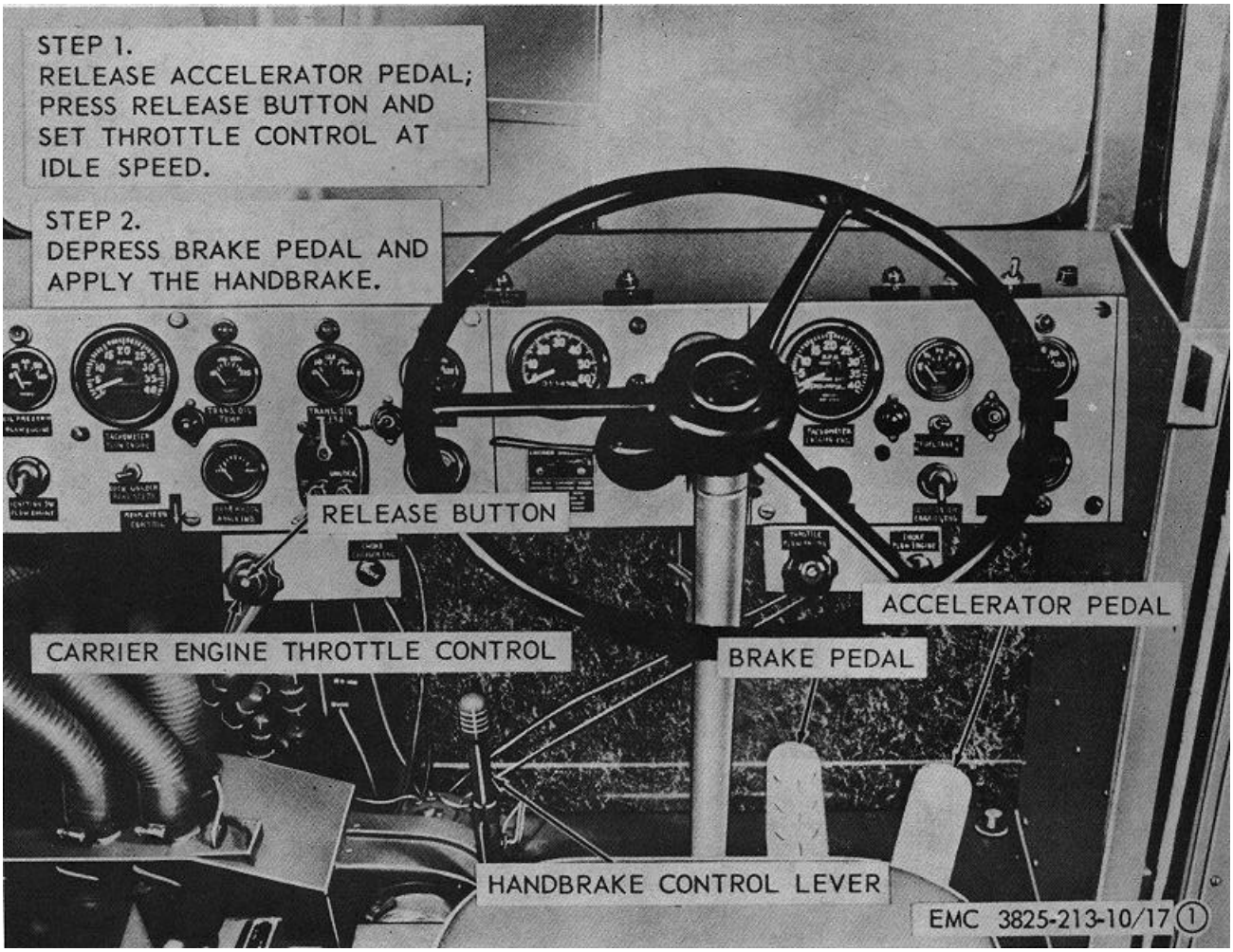


Figure 17. Stopping carrier.

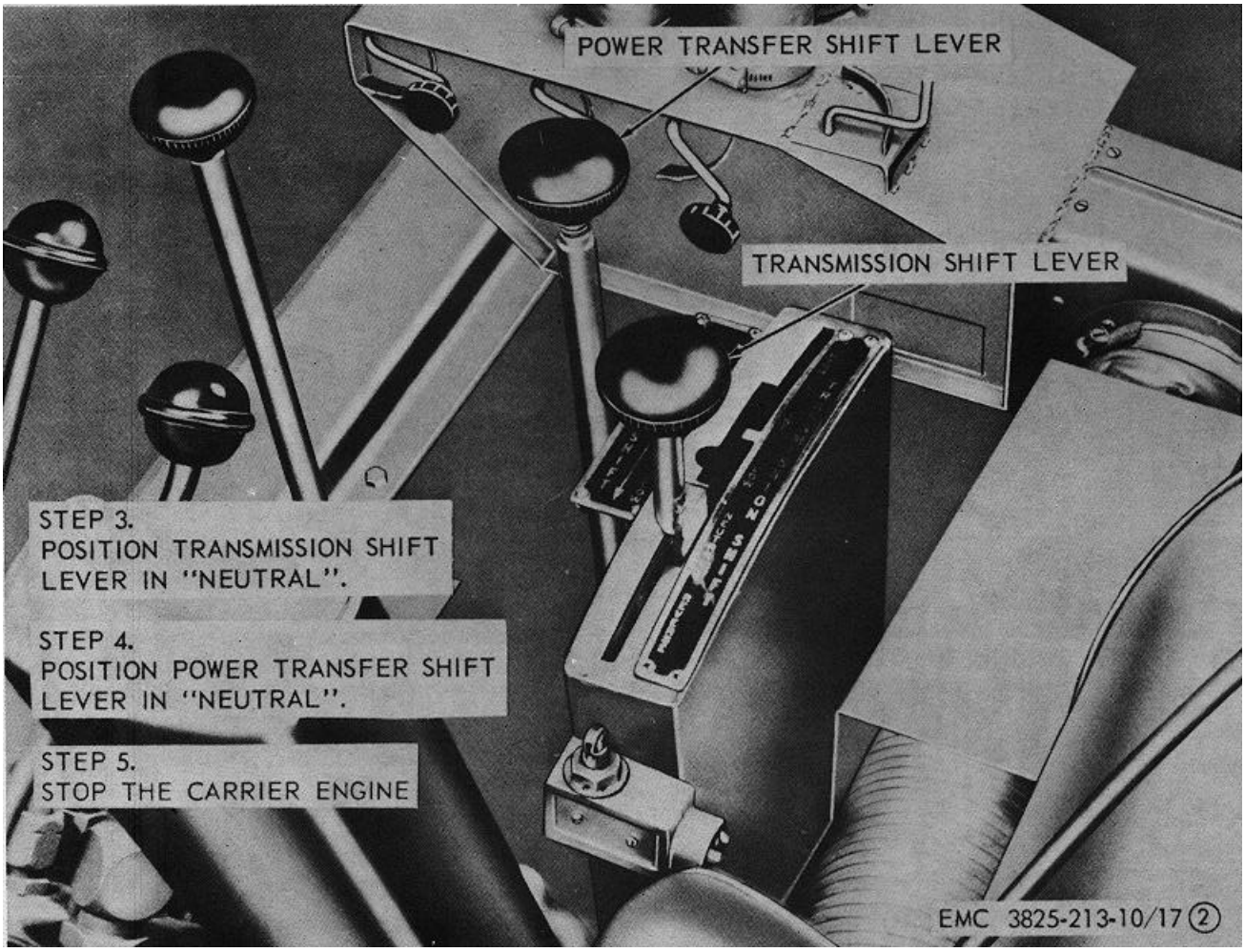


Figure 17-Continued.

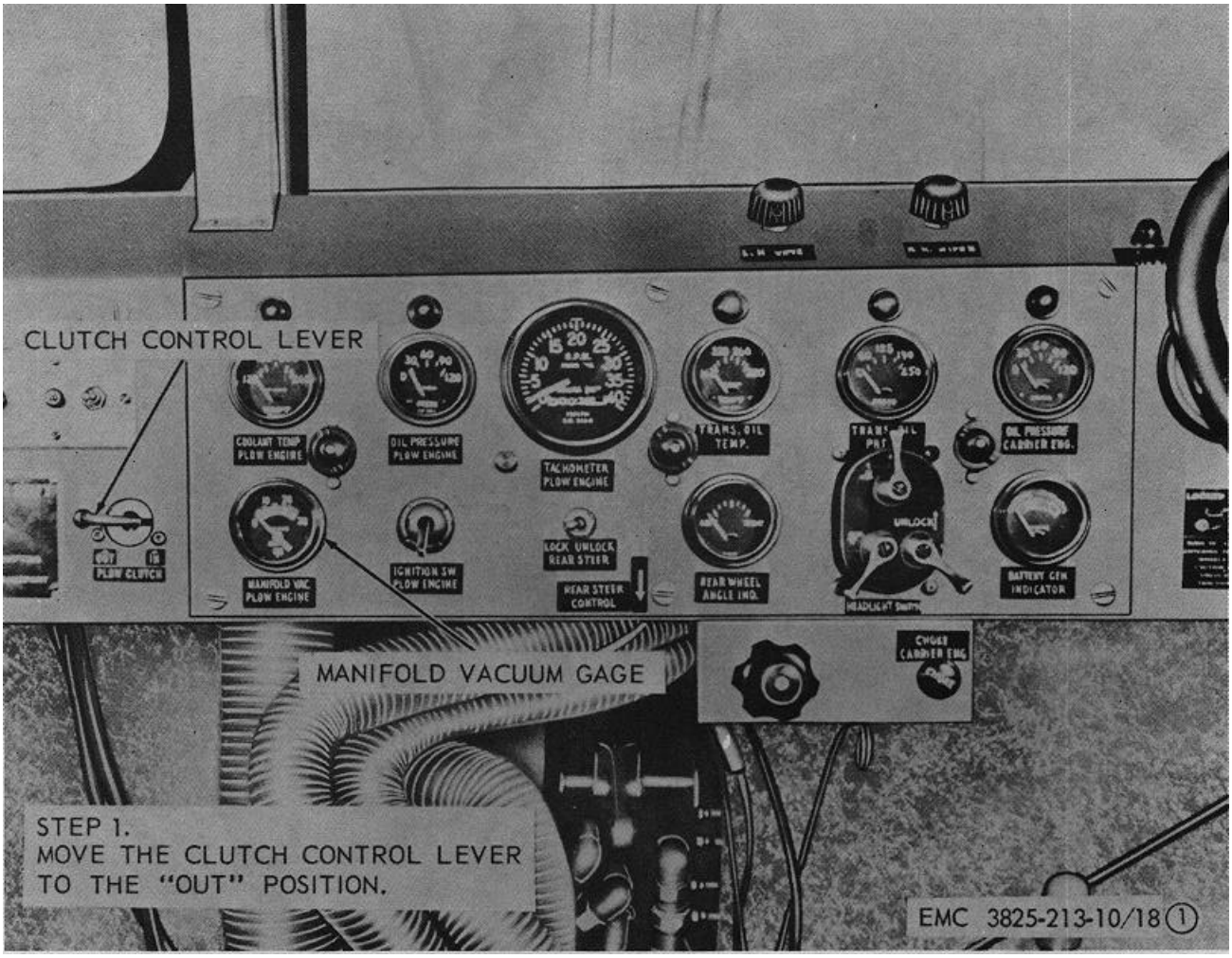


Figure 18. Starting plow.

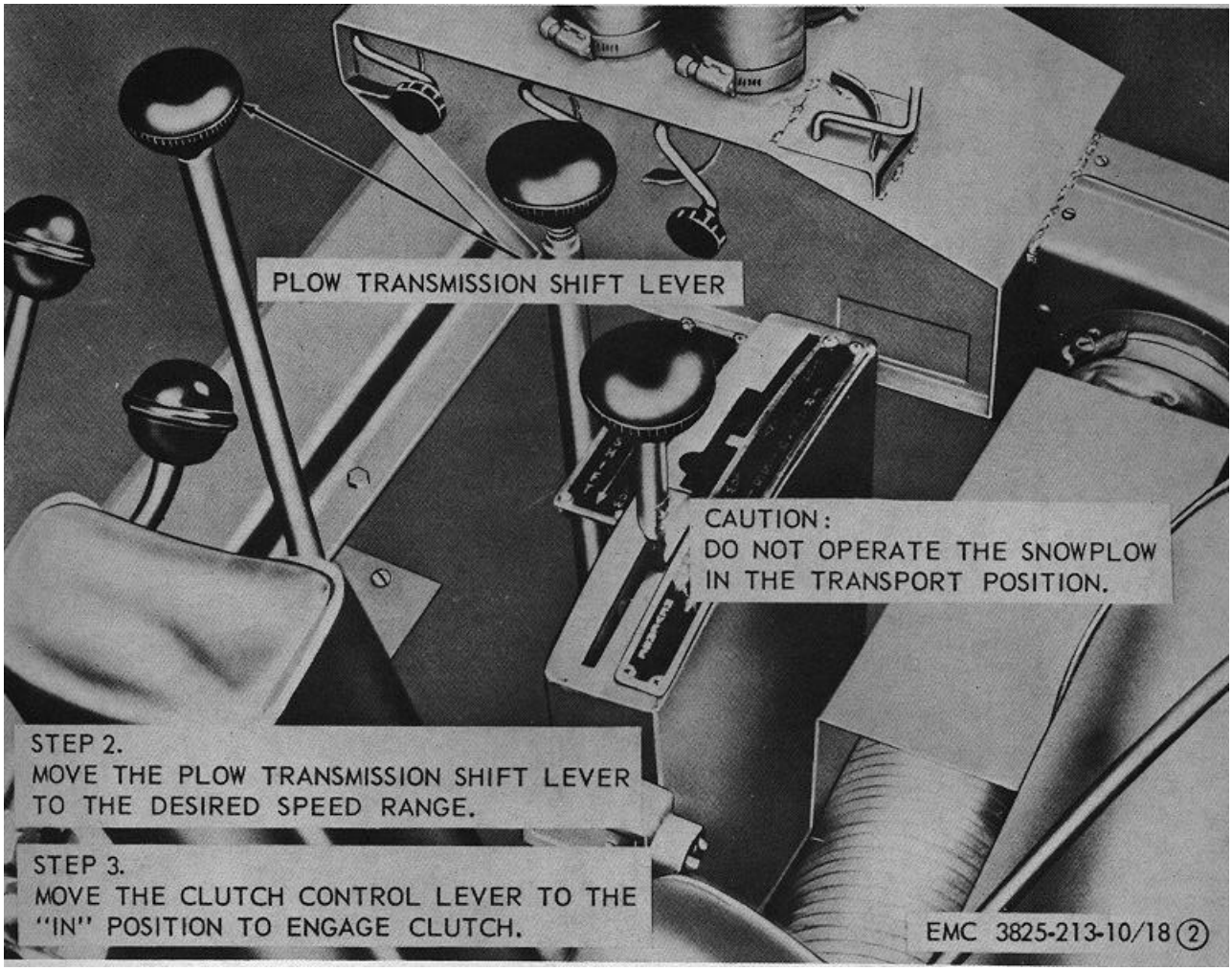
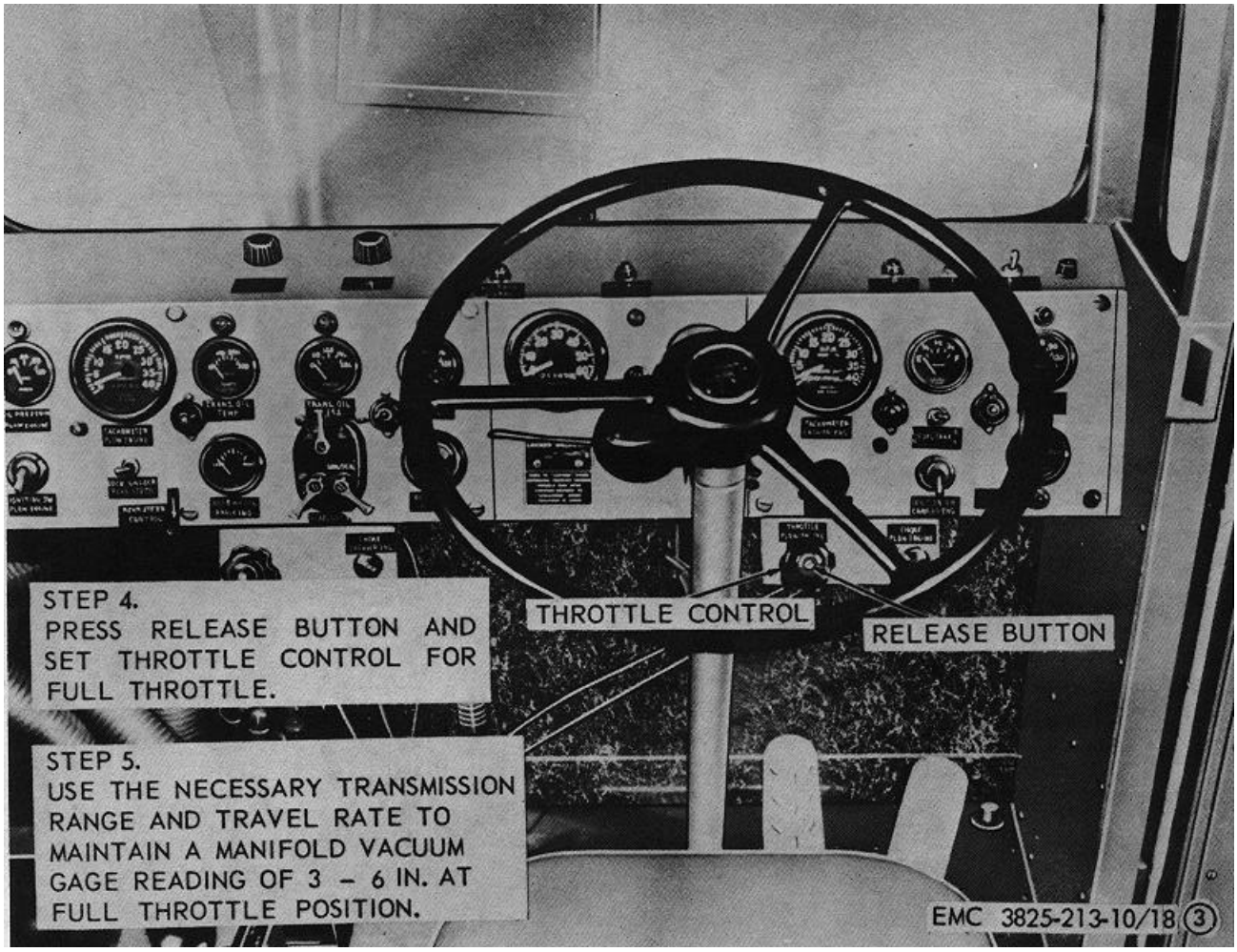


Figure 18-Continued.


STEP 4.
PRESS RELEASE BUTTON AND SET THROTTLE CONTROL FOR FULL THROTTLE.
THROTTLE CONTROL
RELEASE BUTTON
STEP 5.
USE THE NECESSARY TRANSMISSION RANGE AND TRAVEL RATE TO MAINTAIN A MANIFOLD VACUUM GAGE READING OF 3 – 6 IN. AT FULL THROTTLE POSITION.
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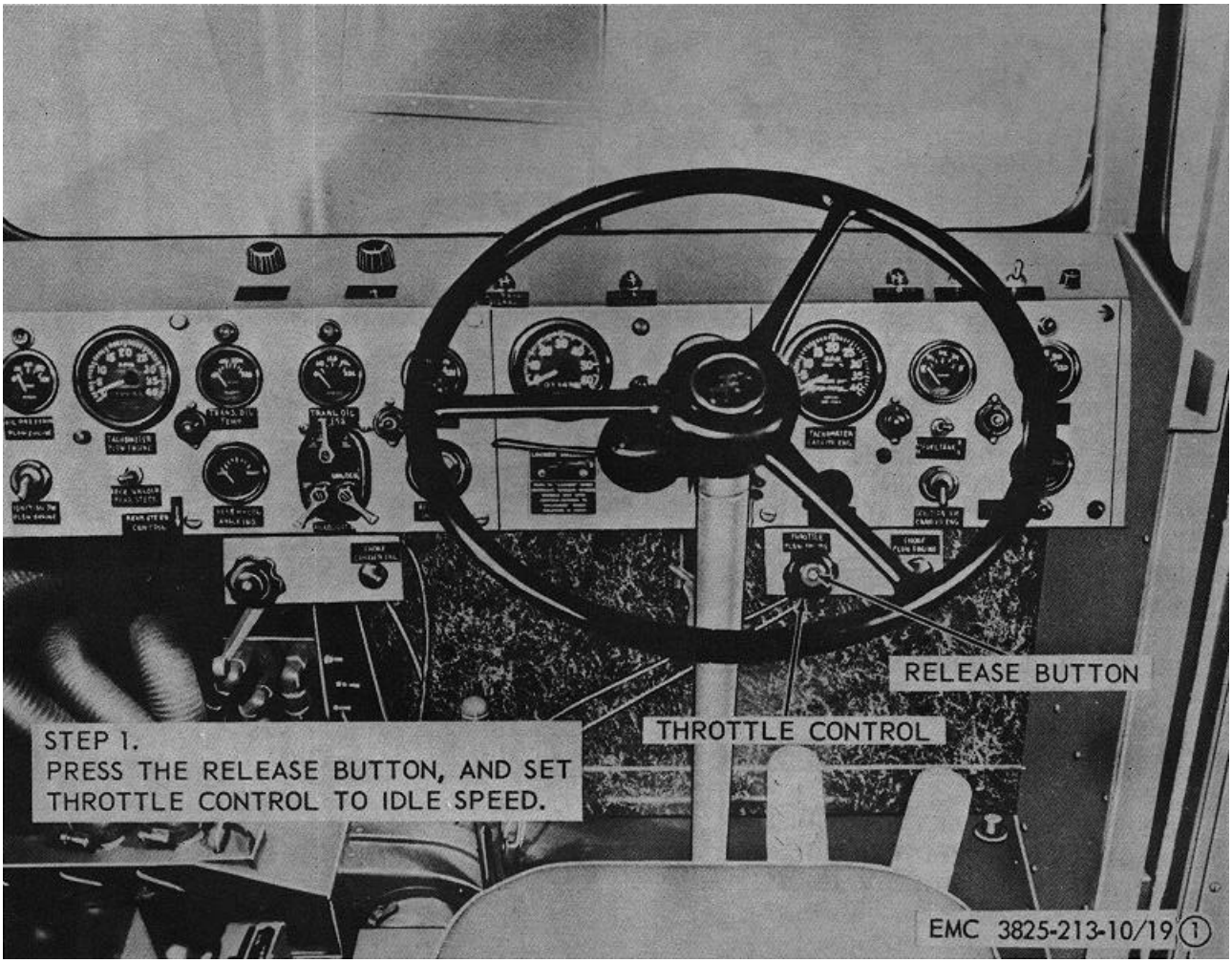


Figure 19. Stopping plow.

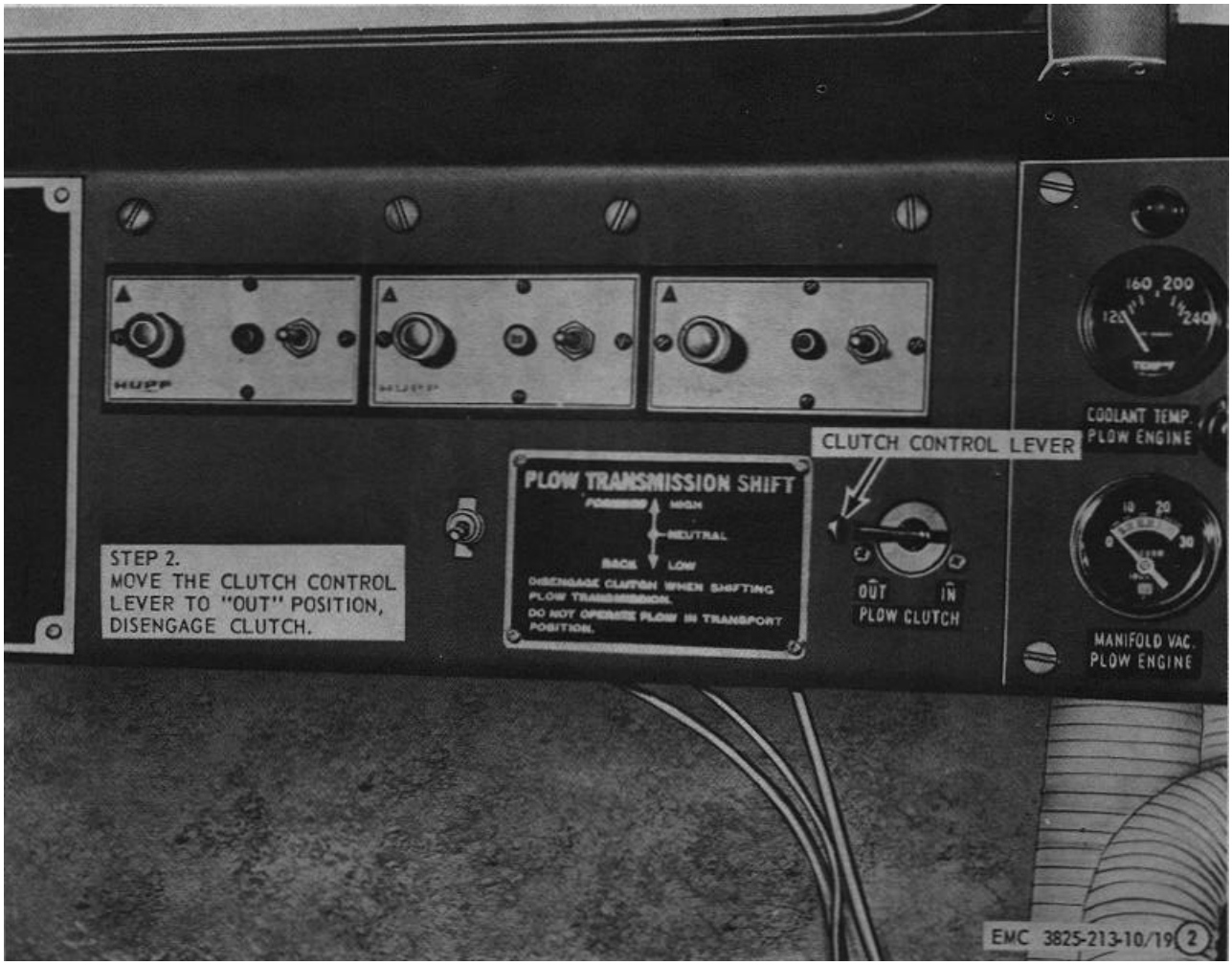


Figure 19-Continued.

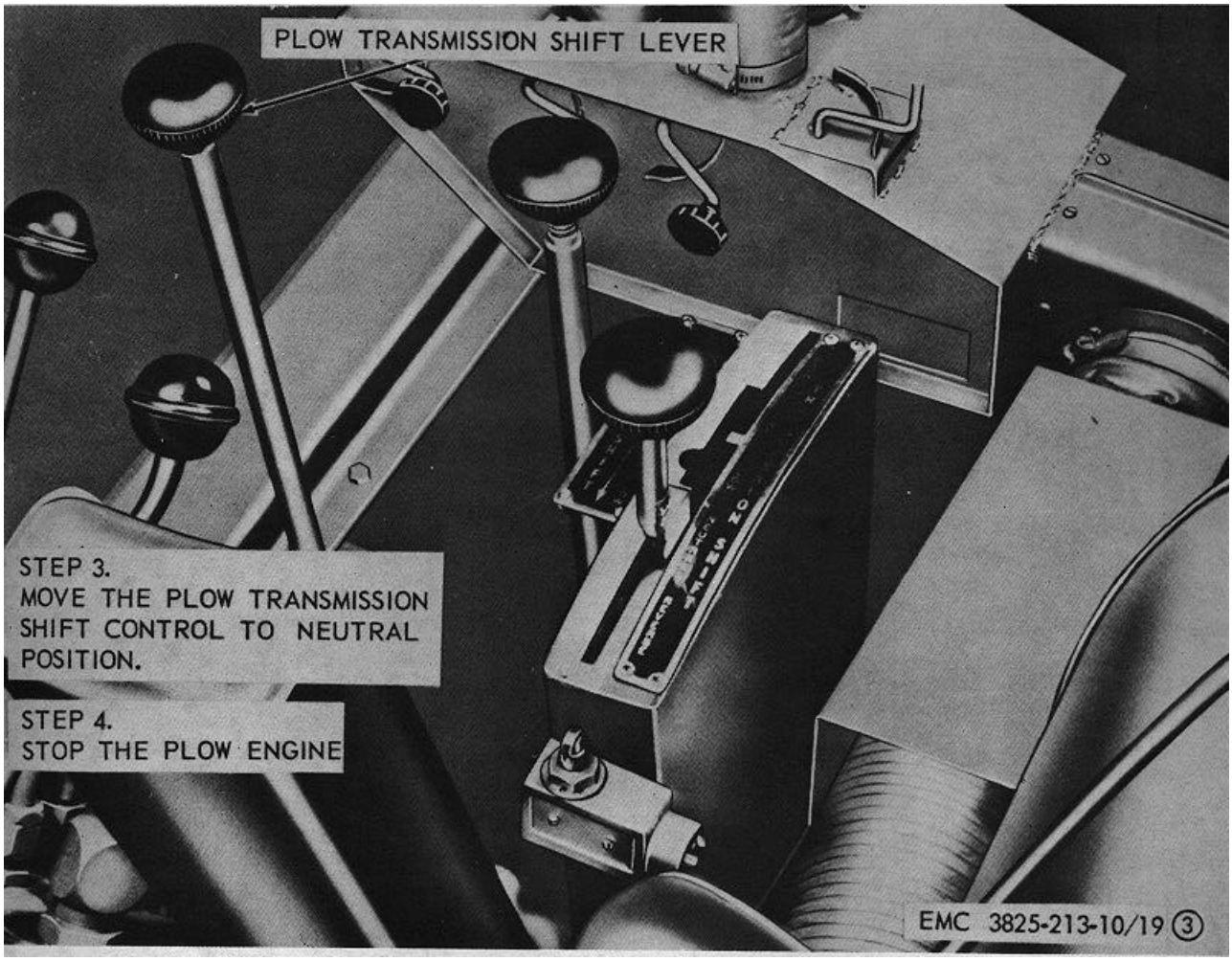


Figure 19-Continued.

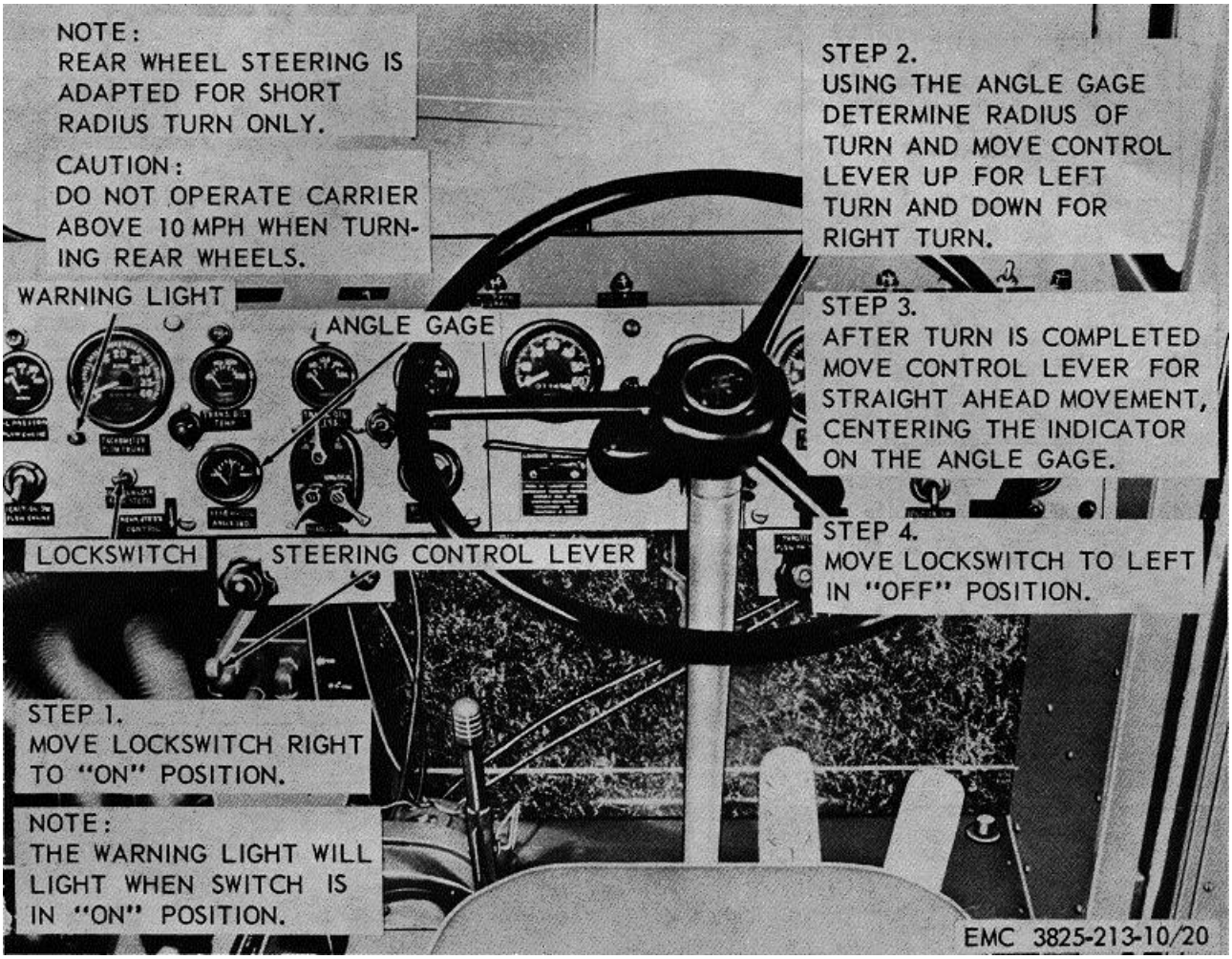
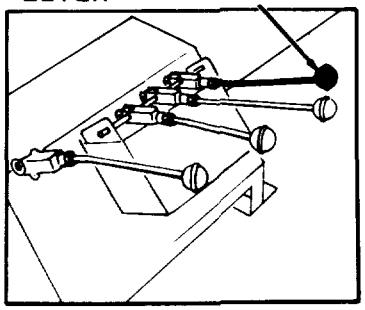


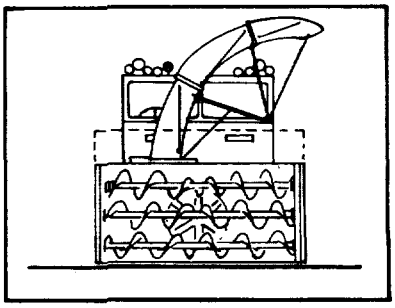
Figure 20. Rear axle steering operation.

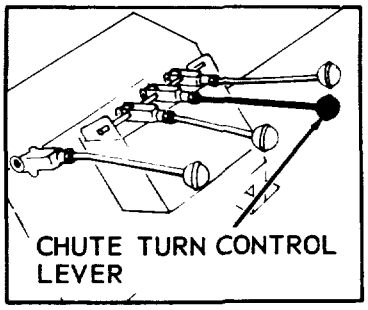
PLOW HEIGHT CONTROL LEVER



RAISING THE PLOW. PUSH THE PLOW HEIGHT CONTROL LEVER FORWARD.

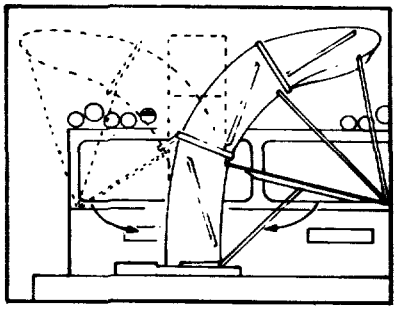
LOWERING THE PLOW. PULL THE PLOW HEIGHT CONTROL LEVER BACK.



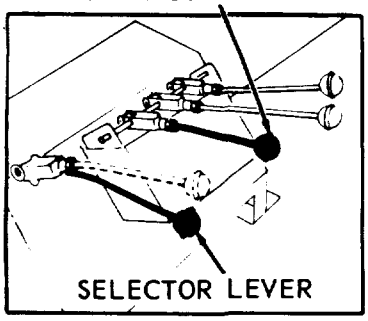


TURNING THE CHUTE RIGHT. PUSH THE CHUTE TURN CONTROL LEVER FORWARD.

TURNING THE CHUTE LEFT. PULL THE CHUTE CONTROL LEVER BACK.



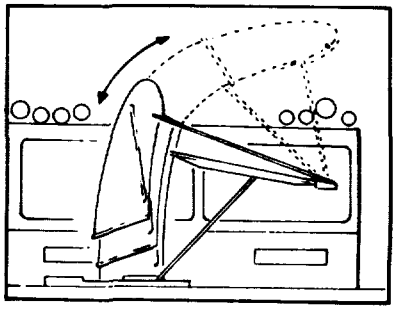
SNOW CHUTE AND FAN BLOWER CONTROL



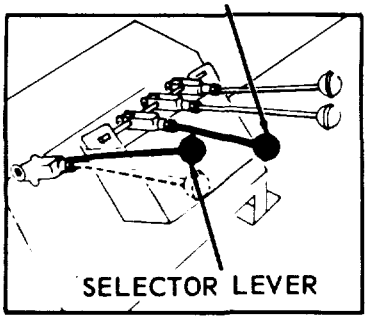
RAISING THE CHUTE. PUSH THE SELECTOR VALVE CONTROL LEVER FORWARD. PUSH THE SNOW CHUTE AND THE FAN BLOWER CONTROL LEVER FORWARD.

LOWERING THE CHUTE. PUSH THE SELECTOR VALVE CONTROL LEVER FORWARD. PULL THE SNOW CHUTE AND FAN BLOWER CONTROL LEVER BACK.

NOTE: RELEASE CHUTE SAFETY CATCH BEFORE LOWERING CHUTE.



SNOW CHUTE AND FAN BLOWER CONTROL



TURNING THE FAN BLOWER RIGHT. PULL THE SELECTOR VALVE CONTROL LEVER BACK. PUSH THE SNOW CHUTE AND FAN BLOWER CONTROL LEVER FORWARD. TURNING THE FAN BLOWER LEFT. PULL THE SELECTOR VALVE CONTROL LEVER BACK. PULL THE SNOW CHUTE AND FAN BLOWER CONTROL LEVER BACK.

NOTE: DO NOT TURN FAN BLOWER LEFT OF CENTER WITH SNOW CHUTE INSTALLED.

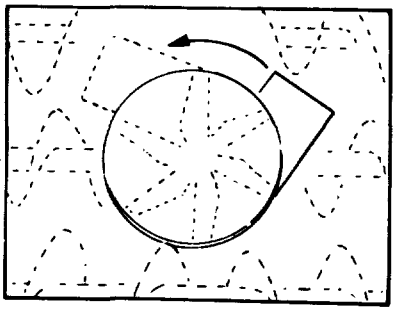


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Figure 21. Snow removal operation and controls in position.

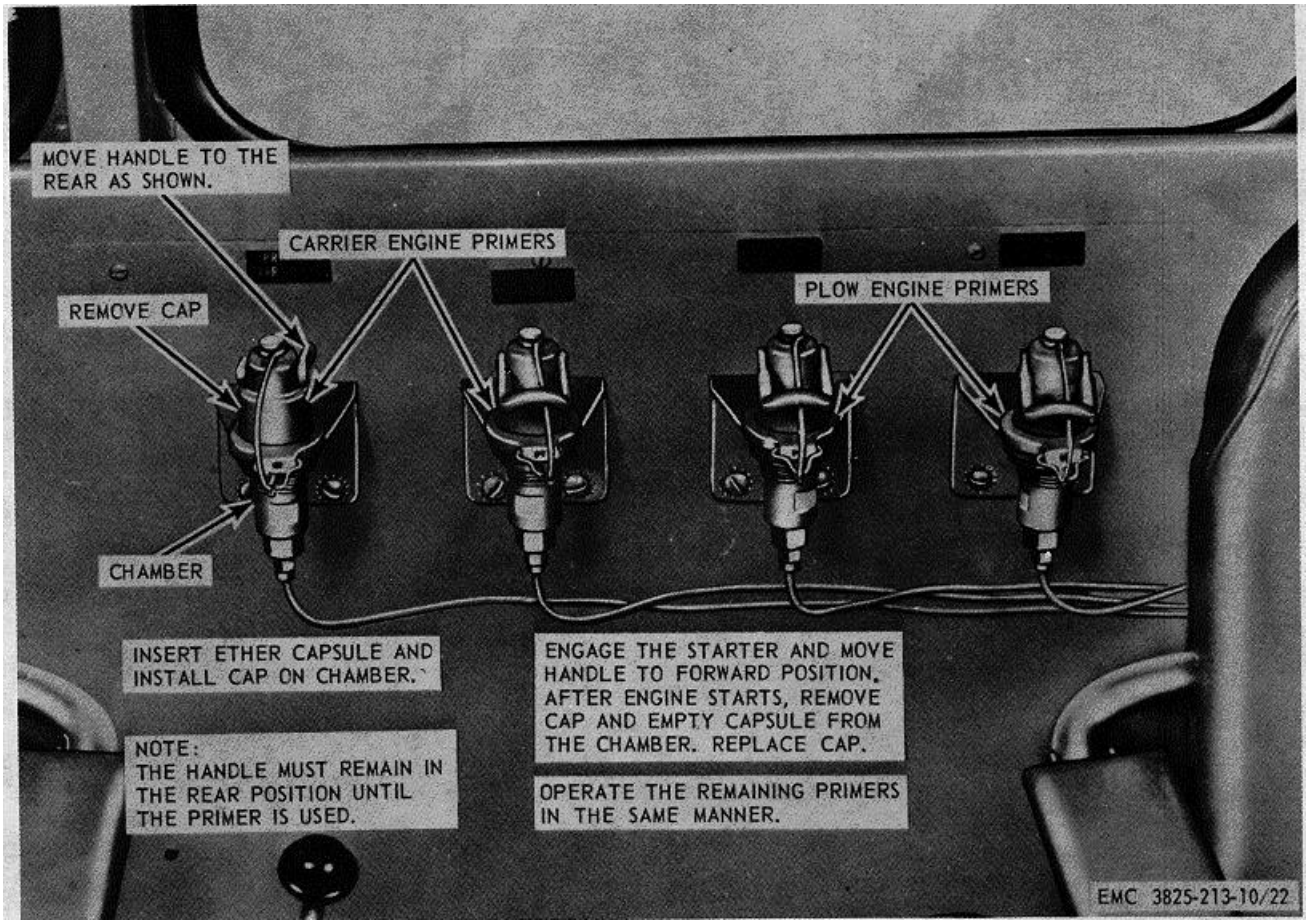
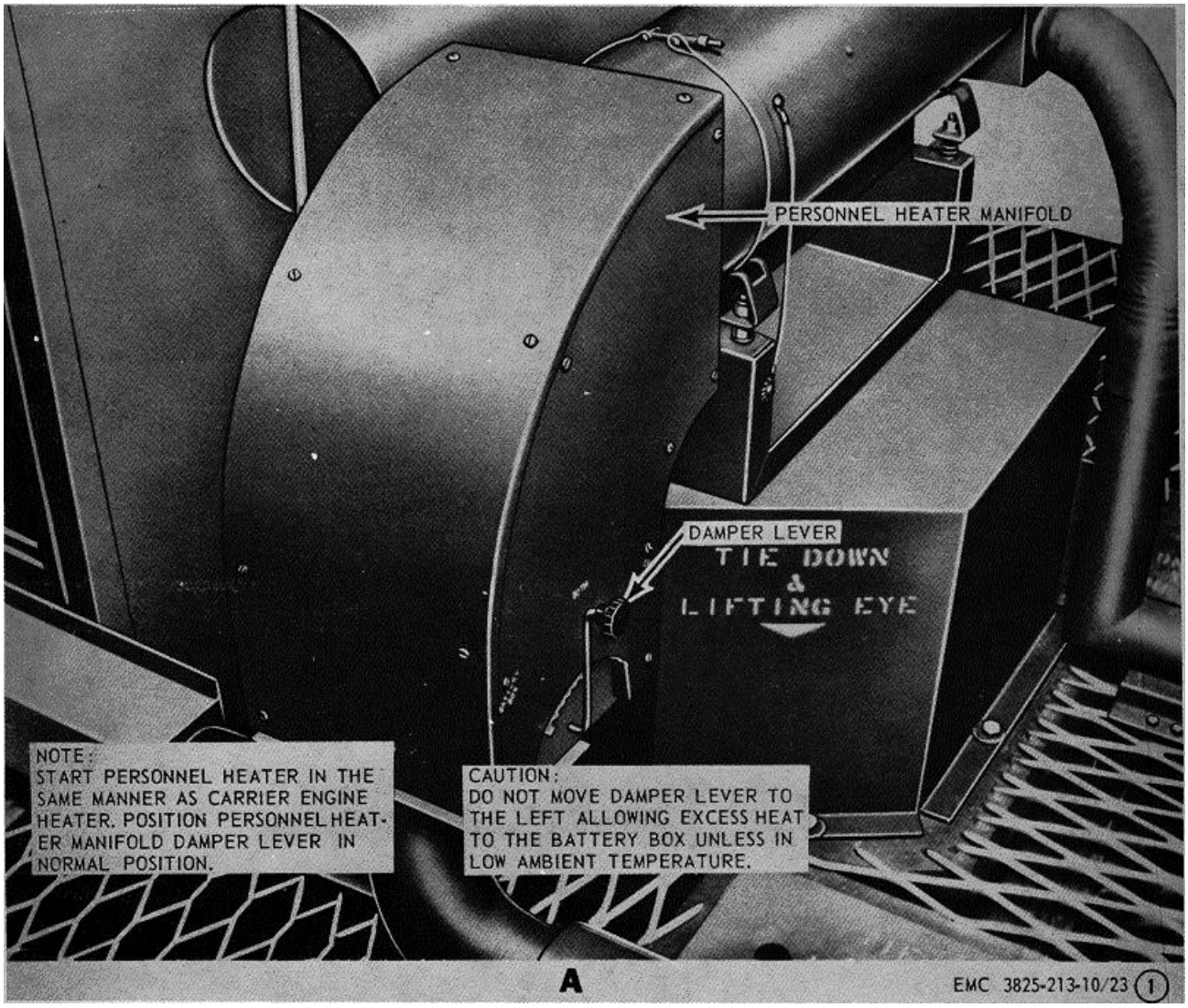
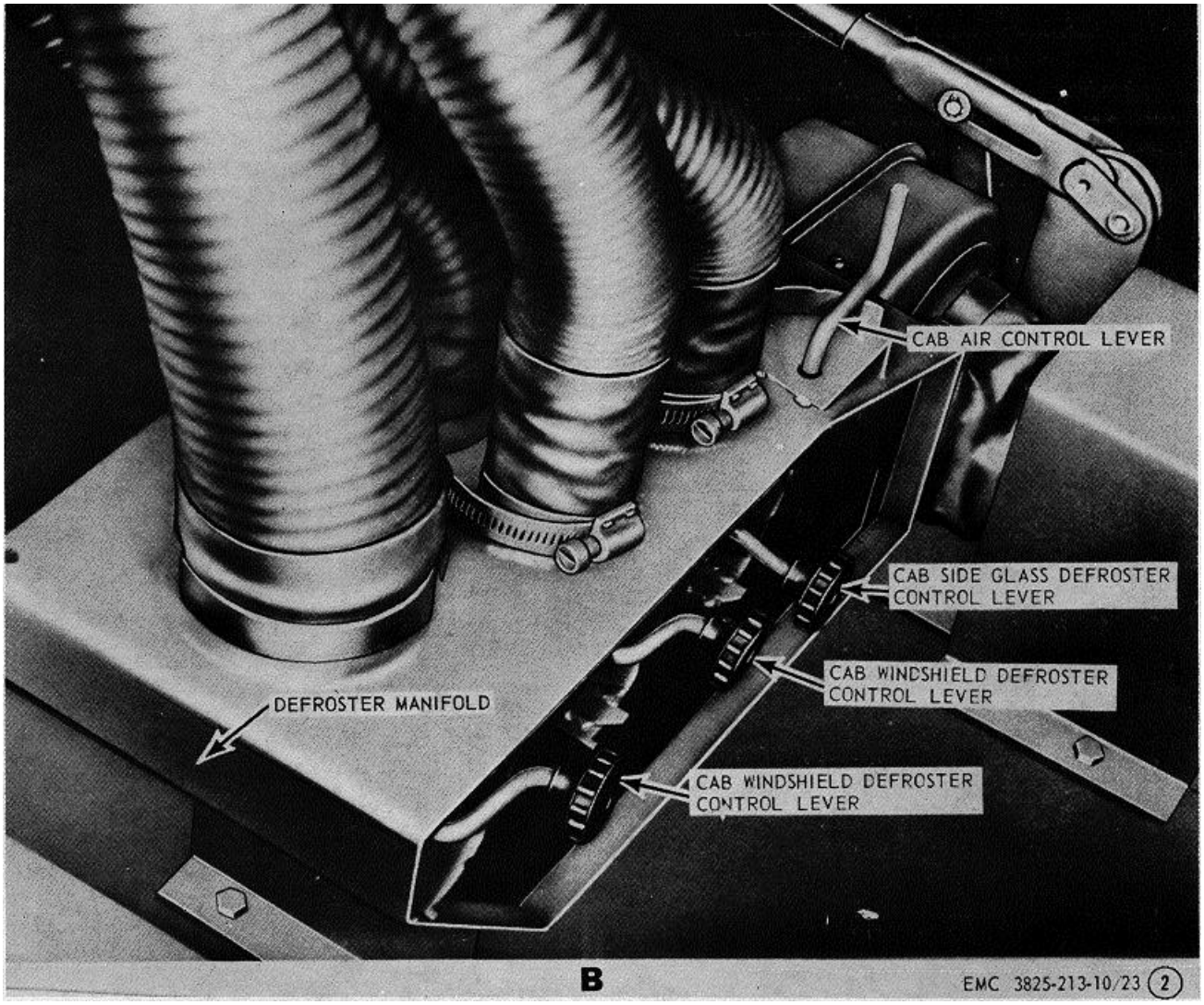


Figure 22. Carrier and plow engines starting aids.



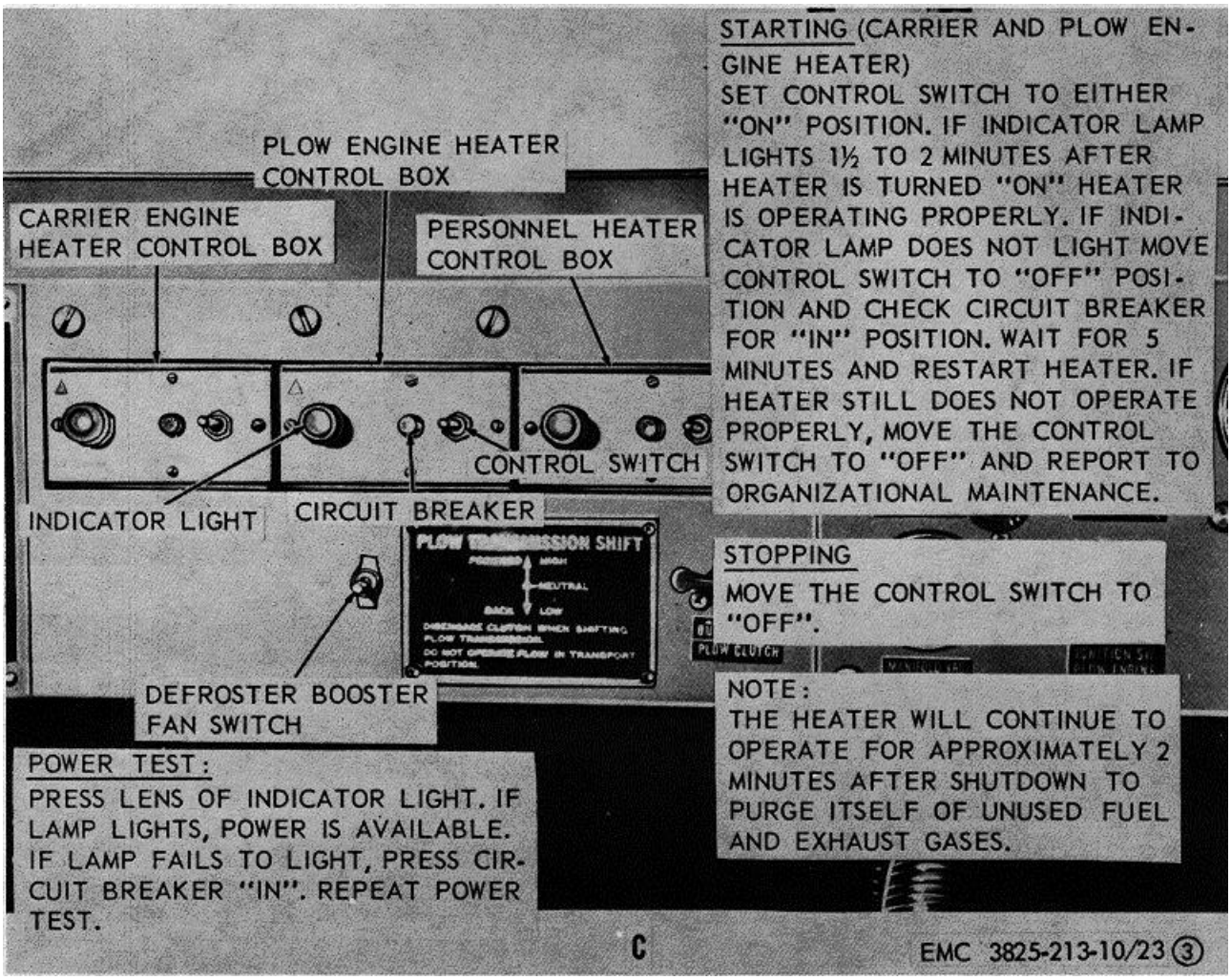
A. Personnel heater manifold control

Figure 23. Carrier and plow engine and personnel heaters.



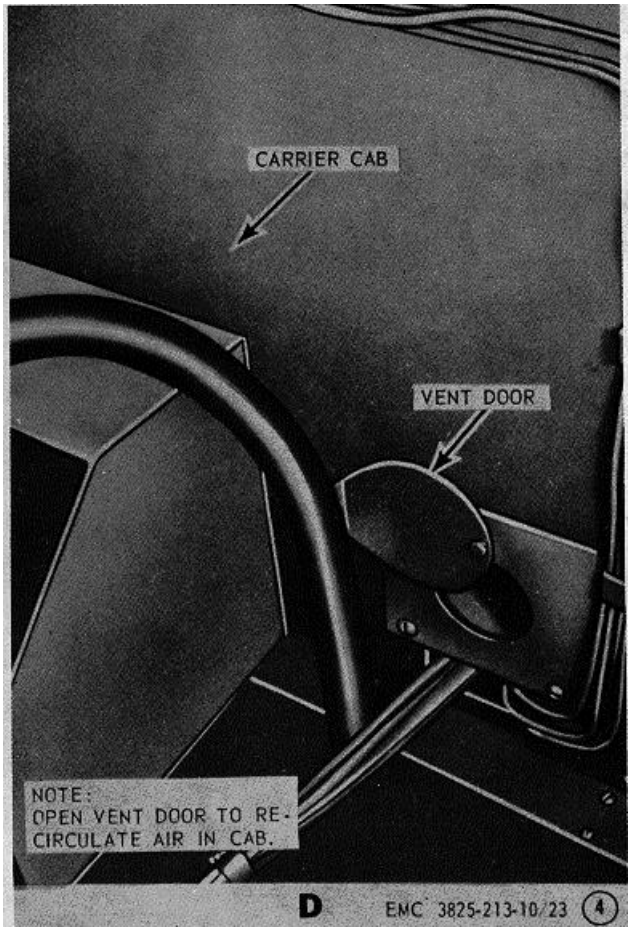
B. Defroster manifold controls

Figure 23-Continued.



C. Heater controls

Figure 23-Continued.



D. Carrier cab ear recirculating vent door

Figure 23-Continued.

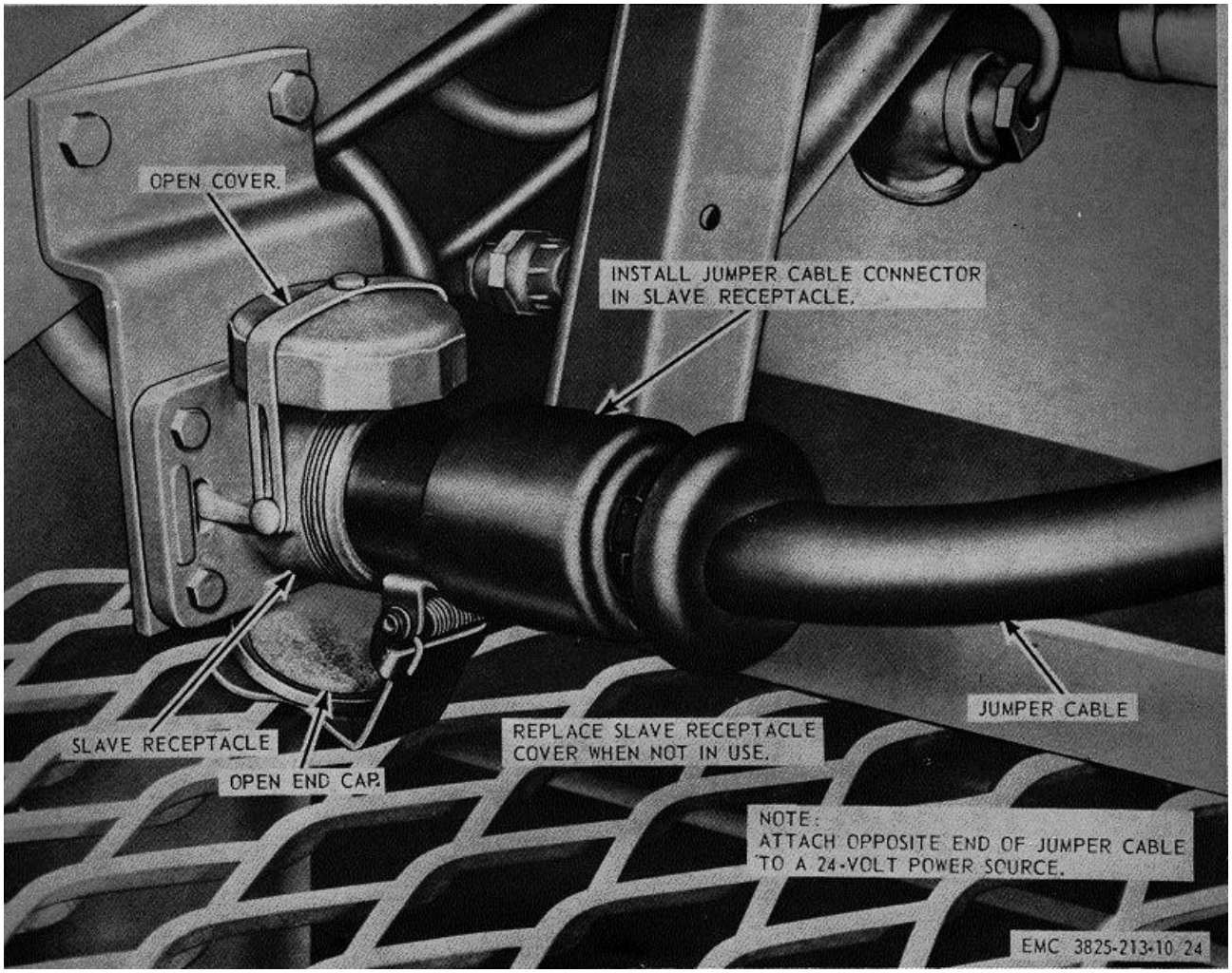


Figure 24. Slave receptacle operation.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

Section I. OPERATOR'S TOOLS AND EQUIPMENT

35. Special Tools and Equipment

No special tools or equipment are required by the operator for the maintenance of this snow removal unit.

36. Basic Issue Tools and Equipment

Tools and repair parts issued with or authorized for the snow removal unit are listed in appendix II.

Section II. LUBRICATION

37. General Lubrication Information

a. This section contains a reproduction of the lubrication order (LO 5-3825-213-20) and lubrication instructions which are supplemental to, and not specifically covered in the lubrication order.

b. The lubrication order shown in figure 25 is an exact reproduction of the approved lubrication order for the snow removal unit. For the current lubrication order, always refer to DA Pam 310-4.

38. Detailed Lubrication Information

a. Care of Lubricants. Replace covers on lubricant containers after use and store in a clean dry place. Keep all containers used in handling lubricating oil or gasoline clean and ready for use.

b. Cleaning. Use an approved cleaning solvent to clean all surfaces surrounding the point of application before applying the lubricant.

c. Points of Application. Follow the detailed lubrication instructions given beneath each illustrated lubrication instruction point. Always apply the lubricant specified on the current lubrication order (LO 5-3825-213-20).

Caution
Overlubrication may cause equipment failure or damage to working parts.

d. Oil Filter Assemblies Service. Service oil filter assemblies as illustrated in figure 26.

e. Carrier and Plow Engine Crankcase Breather Service. Service crankcase breather as illustrated in figure 27.

f. Torqmatic Transmission and Torque Converter Service. Service transmission and torque converter as illustrated in figure 28.

g. Carrier and Plow Engine Crankcase Ventilation Service. Service carrier and plow engine crankcase ventilation as illustrated in figure 29.

LUBRICATION ORDER

LO 5-3825-213-20-1

25 OCTOBER 1961 (SUPERSEDES LO 5-3825-213-20, 27 JULY 1961)

SNOW REMOVAL UNIT, SELF-PROPELLED: GASOLINE DRIVEN; ROTARY; WHEEL MTD; WINTERIZED (FWD MODEL S-349-V) W/TWO ENGINES WAUKESHA MODEL TH 884

Reference: LO 5-3825-213-20-2 and 3, SM 10-1-C4-1

Intervals are based on normal hours of operations. Reduce to compensate for abnormal operations and severe conditions. During inactive periods sufficient lubrication must be performed for adequate preservation.

Clean fittings before lubricating.

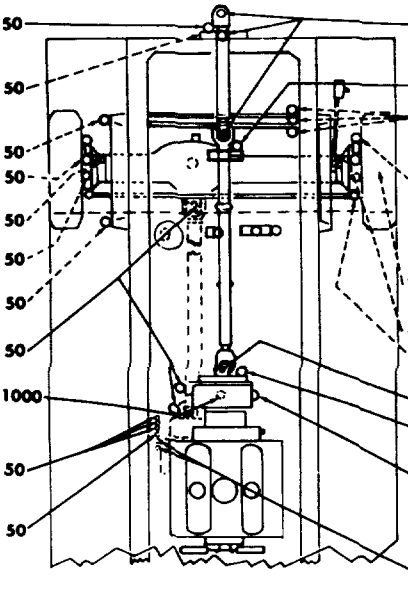
Relubricate after washing or fording.

Clean parts with SOLVENT, dry-cleaning, or with OIL, fuel, Diesel. Dry before lubricating.

Lubricate points indicated by dotted arrow shafts on both sides of equipment.

Drain gearcases when hot. Fill and check level.

	LUBRICANT • INTERVAL			INTERVAL • LUBRICANT		
FOLD						FOLD
1	Plow Hydraulic Cylinder Ram	GAA	50	50	GAA	Plow Universal Joints and Spline 12
2	Plow Vertical Guide Rail (Clean and coat)	GAA	50	50	GAA	Pillow Block Bearing 13
3	Spring Hanger	GAA	50	50	GAA	Control Lever Shaft Bearings 14
4	Brake Camshaft	GAA	50	500	GAA	Slack Adjuster (Remove plug, install fitting, lubricate, and re-install plug.) 15
5	Axle Bearing	GAA	50			
6	Axle Ball Pivot (Upper and lower.)	GAA	50	1000	GAA	Wheel Bearings (See Note 3.) 16
7	Spring Shackle (2 fittings.)	GAA	50	50	GAA	Axle Ball Joint 17
8	Main Drive Universal *Joints and Spline*	GAA	50	50	*GAA*	*Tie Rod End* 18
9	Plow Transmission Drain (Drain and refill.)		1000	50	GAA	Plow Universal Joint 19
				50	GAA	Plow Transmission Shift Pivot 20
10	Plow Transmission Shaft Bearings	GAA	50	50	GO	Plow Transmission Fill and Level (See Key.) (Check level.) 21
11	Clutch Throwout Bearing (Sparingly)	GAA	50	50	GAA	Clutch Release Shaft 22



PLAN VIEW FRONT SECTION

CONTINUED ON FOLLOWING PAGE

EMC 3825-213-10/25 (1)

Front LO 5-3825-213-20-1

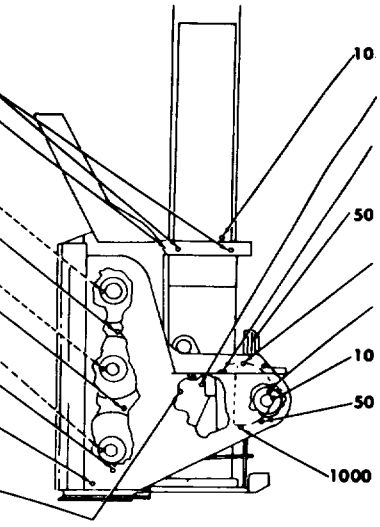
Figure 25. Lubrication order.

LUBRICANT • INTERVAL

CONTINUED FROM PRECEDING PAGE

INTERVAL • LUBRICANT

23	Chute Turret	GAA	10	10	GAA	Chute Turret Gearcase	33
24	Turret Drive Chain (Remove cover for access.) (Clean and coat.)	OE	50		GAA	Fan Hub (See Note 4.)	34
25	Auger Bearing	GAA	10		GO	Auger Drive Chain Case Fill (See Key.)	35
26	Upper Stationary Idler Bearing	GAA	10	50	GAA	Directional Guide Rail (Clean and Coat.)	36
27	Auger Bearing	GAA	10		GO	Fan Gearcase Fill (See Key.)	37
28	Lower Stationary Idler Bearing	GAA	10		GAA	Shear Coupling (See Note 4.)	38
29	Auger Bearing	GAA	10	10	GAA	Auger Drive Bearing	39
30	Auger Drive Chain Case Level (Check level.)		50	50		Fan Gearcase Level (Check level.)	40
31	Auger Drive Chain Case Drain (Drain and refill.)		1000	1000		Fan Gearcase Drain (Drain and refill.)	41
32	Adjustable Idler Bearing	GAA	10				



END VIEW ROTARY SNOW REMOVAL UNIT

— KEY —

LUBRICANTS	CAPACITY	EXPECTED TEMPERATURES			INTERVALS
		Above + 32°F	+ 40°F to -10°F	0°F to -65°F	
OE –OIL, Engine, Heavy Duty		OE 30 or 9250	OE 10 or 9110	OES	Intervals given are in hours of normal operation.
Oil Can Points					
OES –OIL, Engine, Sub-zero					
GO – LUBRICATING OIL, Gear		GO 90	GO 90	GOS	
Plow Transmission	8 qt				
Fan Gearcase	2 qt				
Auger Drive Chaincase	1 qt				
GOS – LUBRICATING OIL, Gear, Sub-zero		GO 90	GO 80	GOS	
GAA – GREASE, Automotive and Artillery		All Temperatures			

NOTES:

1. FOR OPERATION OF EQUIPMENT IN PROTRACTED COLD TEMPERATURES BELOW -10°F. Remove lubricants prescribed in the key for temperatures above -10°F. Clean parts with SOLVENT, dry-cleaning. Relubricate with lubricants specified in the key for temperatures below -10°F.

2. OIL CAN POINTS. Every 50 hours lubricate linkage, pins and clevises, door hinges, and all exposed adjusting threads with OE.

3. WHEEL BEARINGS. Every 1000 hours remove wheels, clean and inspect all parts, replace damaged or worn parts, repack bearings, and reassemble.

4. SHEAR COUPLING AND FAN HUB. Lubricate according to frequency that shear bolts break.

Copy of this Lubrication Order will remain with the equipment at all times; instructions contained herein are mandatory.

By Order of the Secretary of the Army:

G. H. DECKER,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

EMC 3825-213-10/25 (2)

Back LO 5-3825-213-20-1

Figure 25-Continued.

LUBRICATION ORDER

LO 5-3825-213-20-2

25 OCTOBER 1961 (SUPERSEDES LO 5-3825-213-20, 27 JULY 1961)

SNOW REMOVAL UNIT, SELF-PROPELLED: GASOLINE DRIVEN; ROTARY; WHEEL MTD; WINTERIZED (FWD MODEL S-349-V) W/TWO ENGINES WAUKESHA MODEL TH 884

Reference: LO 5-3825-213-20-1 and 3, SM 10-1-C4-1

Intervals are based on normal hours of operations. Reduce to compensate for abnormal operations and severe conditions. During inactive periods sufficient lubrication must be performed for adequate preservation.

Clean fittings before lubricating.

Relubricate after washing or fording.

Clean parts with SOLVENT, dry-cleaning, or with OIL, fuel, Diesel. Dry before lubricating.

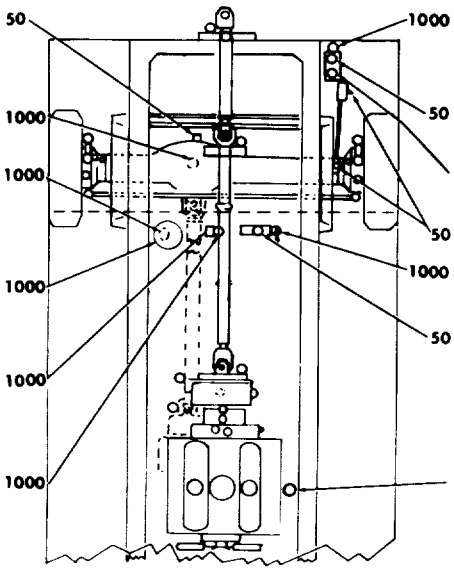
Lubricate points indicated by dotted arrow shafts on both sides of equipment.

Drain gearcases when hot. Fill and check level.

FOLD

LUBRICANT • INTERVAL

42	Differential Housing Fill and Level (See Key.) (Check level.)	GO	50
43	Differential Housing Drain (Drain and refill.)		1000
44	Power Steering Hydraulic Reservoir and Filter Drain (Drain and refill.)		1000
45	Power Steering Hydraulic Oil Filter (See Note 3.)		1000
46	Plow Hydraulic Reservoir Oil Filter (See note 4.)		1000
47	Plow Hydraulic Reservoir and Filter Drain (Drain and refill.)		1000



PLAN VIEW FRONT SECTION

INTERVAL • LUBRICANT

FOLD

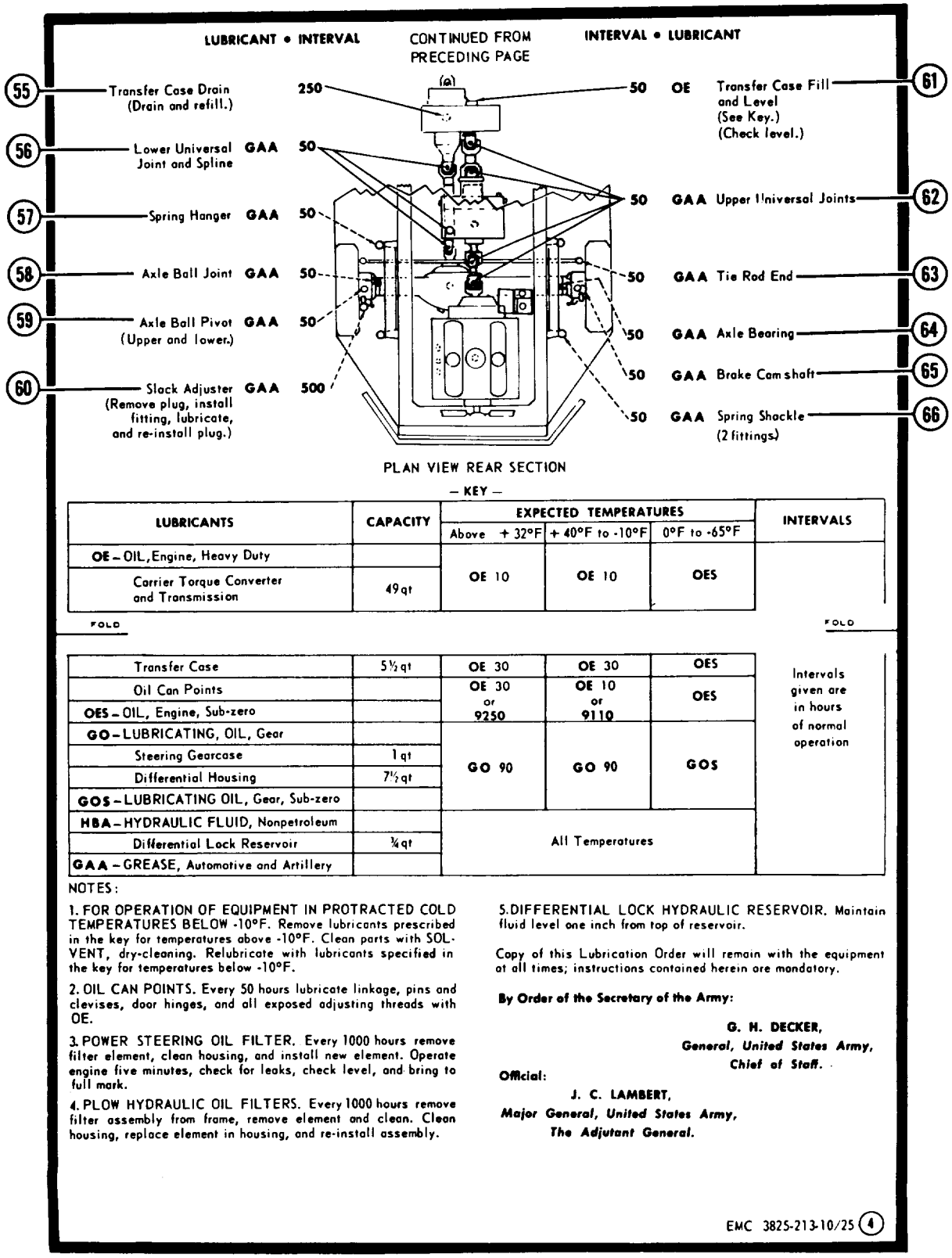
48	Steering Gearcase Drain (Drain and refill.)		1000
49	Steering Gearcase Level (Check level.)		50
50	Steering Gearcase Fill (See Key.)	GO	1000
51	Drag Link	GAA	50
52	Differential Lock Hydraulic Reservoir Drain (Drain and refill.)		1000
53	Differential Lock Hydraulic Reservoir Fill and Level (See Key.) (Check level.) (See Note 5.)	HBA	50
54	Carrier Torque Converter Transmission Fill (See key.)	OE	1000

CONTINUED ON FOLLOWING PAGE

EMC 3825-213-10 25 (3)

Front LO 5-3825-213-20-2

Figure 25-Continued.



PLAN VIEW REAR SECTION

– KEY –

LUBRICANTS	CAPACITY	EXPECTED TEMPERATURES: Above +32°F	EXPECTED TEMPERATURES: +40°F to -10°F	EXPECTED TEMPERATURES: 0°F to -65°F	INTERVALS
OE – OIL, Engine, Heavy Duty		OE 10	OE 10	OES	
Carrier Torque Converter and Transmission	49 qt				
Transfer Case	5½ qt	OE 30	OE 30	OES	Intervals given are in hours of normal operation
Oil Can Points		OE 30 or 9250	OE 10 or 9110	OES	
OES – OIL, Engine, Sub-zero					
GO – LUBRICATING, OIL, Gear		GO 90	GO 90	GOS	
Steering Gearcase	1 qt				
Differential Housing	7½ qt				
GOS – LUBRICATING OIL, Gear, Sub-zero					
HBA – HYDRAULIC FLUID, Nonpetroleum		All Temperatures			
Differential Lock Reservoir	¾ qt				
GAA – GREASE, Automotive and Artillery					

FOLD FOLD

NOTES:

1. FOR OPERATION OF EQUIPMENT IN PROTRACTED COLD TEMPERATURES BELOW -10°F. Remove lubricants prescribed in the key for temperatures above -10°F. Clean parts with SOLVENT, dry-cleaning. Relubricate with lubricants specified in the key for temperatures below -10°F.

2. OIL CAN POINTS. Every 50 hours lubricate linkage, pins and clevises, door hinges, and all exposed adjusting threads with OE.

3. POWER STEERING OIL FILTER. Every 1000 hours remove filter element, clean housing, and install new element. Operate engine five minutes, check for leaks, check level, and bring to full mark.

4. PLOW HYDRAULIC OIL FILTERS. Every 1000 hours remove filter assembly from frame, remove element and clean. Clean housing, replace element in housing, and re-install assembly.

5. DIFFERENTIAL LOCK HYDRAULIC RESERVOIR. Maintain fluid level one inch from top of reservoir.

Copy of this Lubrication Order will remain with the equipment at all times; instructions contained herein are mandatory.

By Order of the Secretary of the Army:

G. H. DECKER,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

EMC 3825-213-10/25 (4)

Back LO 5-3825-213-20-2

Figure 25-Continued.

LUBRICATION ORDER

LO 5-3825-213-20-3

25 OCTOBER 1961 (SUPERSEDES LO 5-3825-213-20, 27 JULY 1961)

SNOW REMOVAL UNIT, SELF-PROPELLED: GASOLINE DRIVEN; ROTARY; WHEEL MTD; WINTERIZED (FWD MODEL S-349-V) W/TWO ENGINES WAUKESHA MODEL TH 884

Reference: LO 5-3825-213-20-1 and 2, SM 10-1-C4-1

Intervals are based on normal hours of operations. Reduce to compensate for abnormal operations and severe conditions. During inactive periods sufficient lubrication must be performed for adequate preservation.

Clean fittings before lubricating.

Relubricate after washing or fording.

Clean parts with SOLVENT, dry-cleaning, or with OIL, fuel, Diesel. Dry before lubricating.

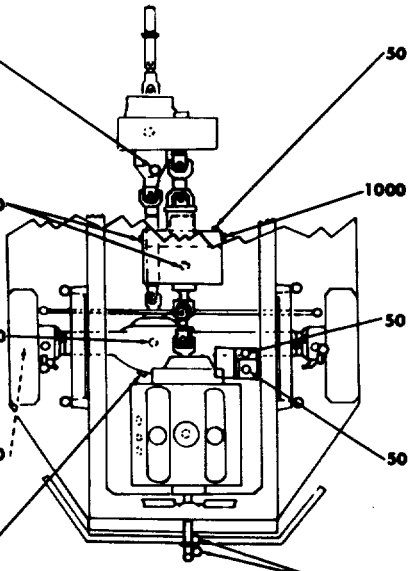
Lubricate points indicated by dotted arrow shafts on both sides of equipment.

Drain crankcase and gearcases when hot. Fill and check level.

LUBRICANT • INTERVAL

FOLD

67	Speedometer Drive (Remove cover, clean and coat gears.)	GAA	50	
68	Carrier Torque Converter and Transmission Drain (Remove plug and oil line to drain.) (Drain and refill.)		1000	
69	Differential Housing Drain (Drain and refill.)		1000	
70	Wheel Bearings (See Note 7.)	GAA	1000	
71	Differential Housing Fill and Level (See Key.) (Check level.)	GO	50	



PLAN VIEW REAR SECTION

INTERVAL • LUBRICANT

FOLD

72	Carrier Torque Converter and Transmission Level (Check level.) (See note 5.)		50	
73	Torque Converter and Transmission Screen (Remove, clean, and reinstall.)		1000	
74	Plow Hydraulic Reservoir Fill and Level (See Key.) (Check level.) (See Note 3.)	OHA	50	
75	Power Steering Hydraulic Reservoir Fill and Level (See Key.) (Check level.) (Level is 3 inches below fill opening.)	OHA	50	
76	Pintle Hook	GAA	50	

CONTINUED ON FOLLOWING PAGE

EMC 3825-213-10/25 (5)

Front LO 5-3825-213-20-3

Figure 25--Continued.

LUBRICANT • INTERVAL

CONTINUED FROM PRECEDING PAGE

INTERVAL • LUBRICANT

(77) Distributor Cam Wick — OE 500

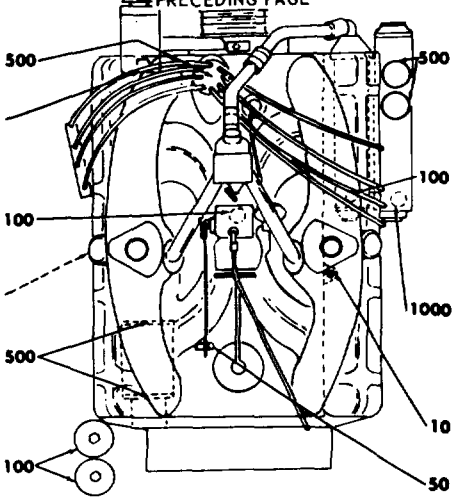
Generator (Sealed bearings; no lubrication required.)

(78) Crankcase Drain (Drain and refill.) — 100

(79) Crankcase Fill (See Key.) — OE

(80) Starter (Sparingly) (Remove plugs to lubricate.) — OE 500

(81) Engine Oil Filters (See Note 4.) — 100



500 — Carrier Torque Converter and Transmission Oil Filters (See note 4.) (82)

100 — Engine Oil Cooler Drain (Drain and refill.) (See Note 6.) (83)

1000 — Carrier Torque Converter and Transmission Oil Cooler Drain (Drain and refill.) (Rear engine only.) (84)

10 — Crankcase Level Gage (Check level.) (85)

50 GAA Throttle Linkage (86)

— KEY —

LUBRICANTS	CAPACITY	EXPECTED TEMPERATURES			INTERVALS
		Above +32°F	+40°F to -10°F	0°F to -65°F	
OE–OIL, Engine, Heavy Duty		OE 30 or 9250	OE 10 or 9110	OES	
Crankcase	20 qt ea				
Oil Can Points					
OES–OIL, Engine, Sub-zero					

FOLD

FOLD

GO–LUBRICATING OIL, Gear		GO 90	GO 90	GOS	Intervals given are in hours of normal operation
Differential Housing	7½ qt				
GOS–LUBRICATING OIL, Gear, Sub-zero					
OHA–HYDRAULIC FLUID, Petroleum		All Temperatures			
Plow Hydraulic Reservoir	34 qt				
Power Steering Hydraulic Reservoir	9 qt				
GAA–GREASE, Automotive and Artillery					

NOTES:

1. FOR OPERATION OF EQUIPMENT IN PROTRACTED COLD TEMPERATURES BELOW -10°F. *Remove lubricants prescribed* in the key for temperatures above -10°F. Clean parts with SOLVENT, dry-cleaning. Relubricate with lubricants specified in the key for temperatures below -10°F.

2. OIL CAN POINTS. Every 50 hours, lubricate governor and throttle linkage pins, door hinges and all exposed adjusting *threads with* OE.

3. PLOW HYDRAULIC RESERVOIR. To check level, lower plow to ground, retract chute to shortest dimension. Maintain oil level three inches from top of reservoir.

4. CARRIER TORQUE CONVERTER, TRANSMISSION, AND ENGINE OIL FILTERS. *Remove filter elements,* clean housings, install new elements, fill reservoirs, operate engine for five minutes, check for leaks, check oil level, and bring to full mark.

5. CARRIER TORQUE CONVERTER AND TRANSMISSION LEVEL. Check level with carrier engine running and speed selector lever in neutral position.

6. CARRIER ENGINE OIL COOLER. To gain access to oil *cooler, lower spare wheel, and remove winterization panel* directly below carrier engine.

7. WHEEL BEARINGS. Every 1000 hours, remove wheels, clean and inspect all parts, replace damaged or worn parts, repack bearings, and reassemble.

Copy of this Lubrication Order will remain with the equipment at all times; instructions contained herein are mandatory.

By Order of the Secretary of the Army:

G. H. DECKER,
General, United States Army,
Chief of Staff.

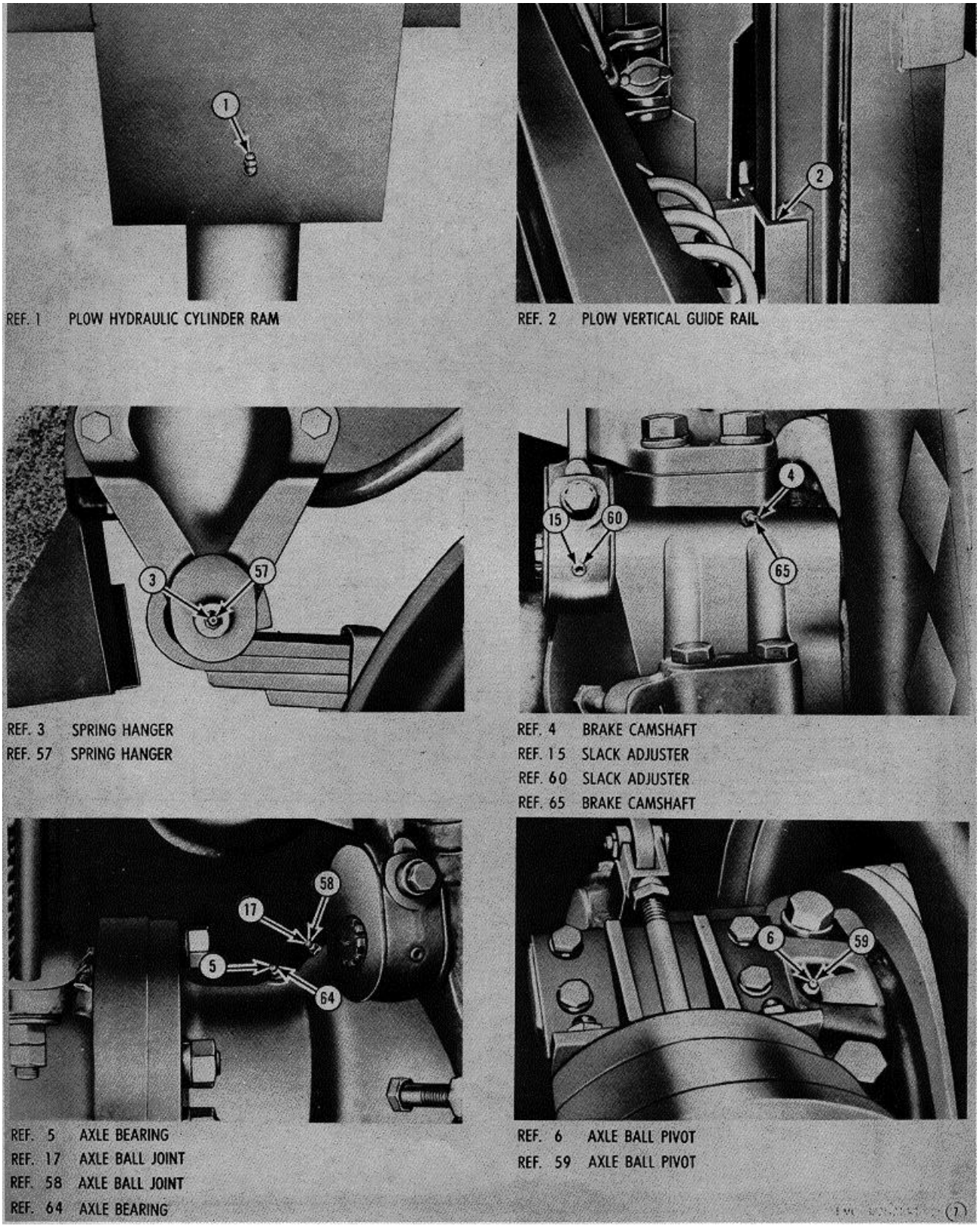
Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

EMC 3825-213-10/25 (6)

Back LO 5-3825-213-20-3

Figure 25--Continued.



REF. 1 PLOW HYDRAULIC CYLINDER RAM

REF. 2 PLOW VERTICAL GUIDE RAIL

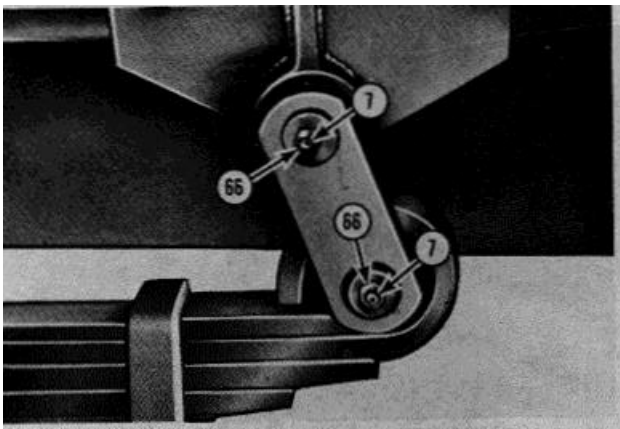
REF. 3 SPRING HANGER
REF. 57 SPRING HANGER

REF. 4 BRAKE CAMSHAFT
REF. 15 SLACK ADJUSTER
REF. 60 SLACK ADJUSTER
REF. 65 BRAKE CAMSHAFT

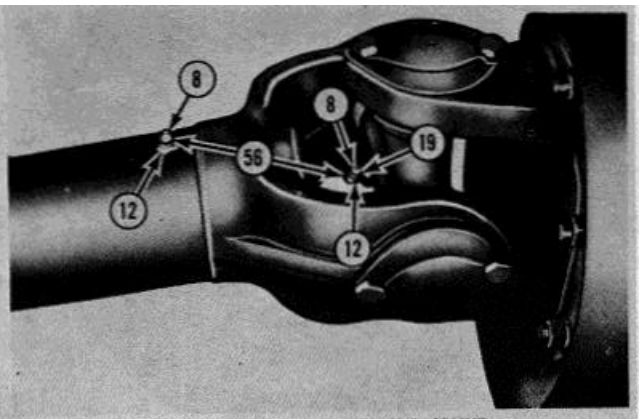
REF. 5 AXLE BEARING
REF. 17 AXLE BALL JOINT
REF. 58 AXLE BALL JOINT
REF. 64 AXLE BEARING

REF. 6 AXLE BALL PIVOT
REF. 59 AXLE BALL PIVOT

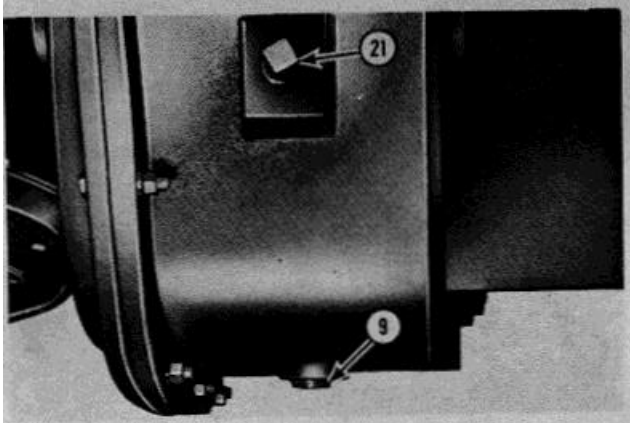
Figure 25-Continued.



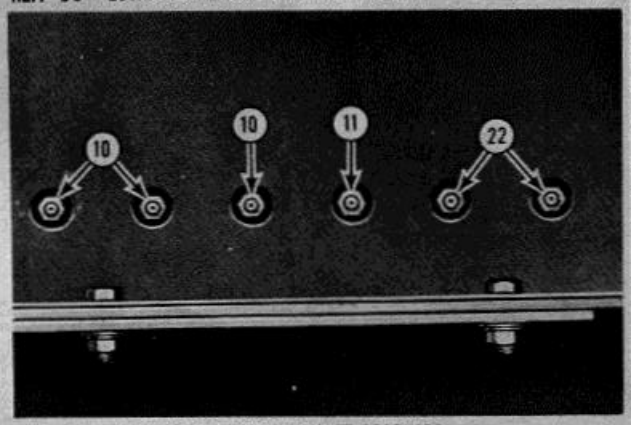
REF. 7 SPRING SHACKLE
REF. 66 SPRING SHACKLE



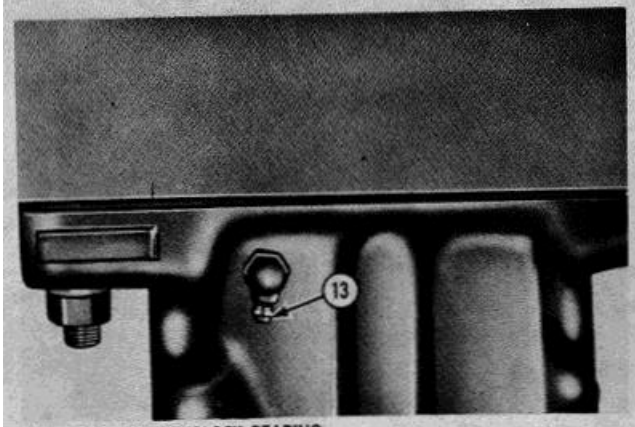
REF. 8 MAIN DRIVE UNIVERSAL JOINTS AND SPLINE
REF. 12 PLOW UNIVERSAL JOINTS AND SPLINE
REF. 19 PLOW UNIVERSAL JOINT
REF. 56 LOWER UNIVERSAL JOINT AND SPLINE



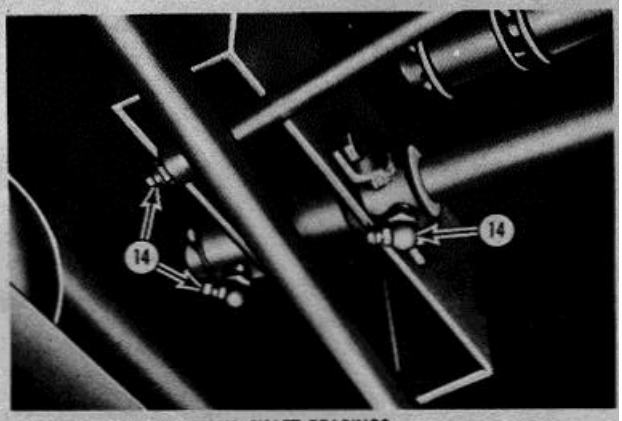
REF. 9 PLOW TRANSMISSION DRAIN
REF. 21 PLOW TRANSMISSION FILL AND LEVEL



REF. 10 PLOW TRANSMISSION SHAFT BEARINGS
REF. 11 CLUTCH THROWOUT BEARING
REF. 22 CLUTCH RELEASE SHAFT



REF. 13 PILLOW BLOCK BEARING



REF. 14 CONTROL LEVER SHAFT BEARINGS

EMC 3825-213-10 75 (8)

Figure 25-Continued.

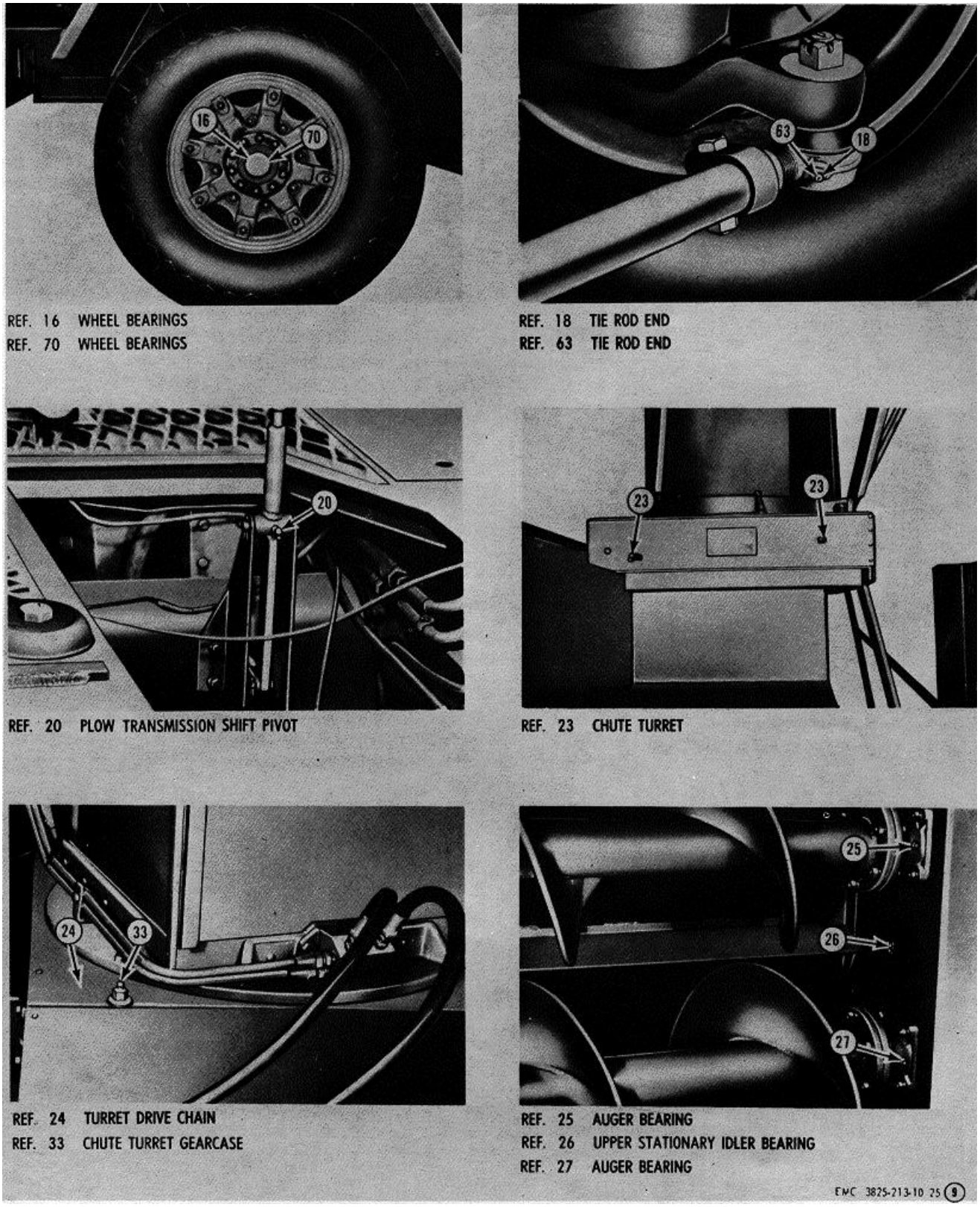


Figure 25-Continued.

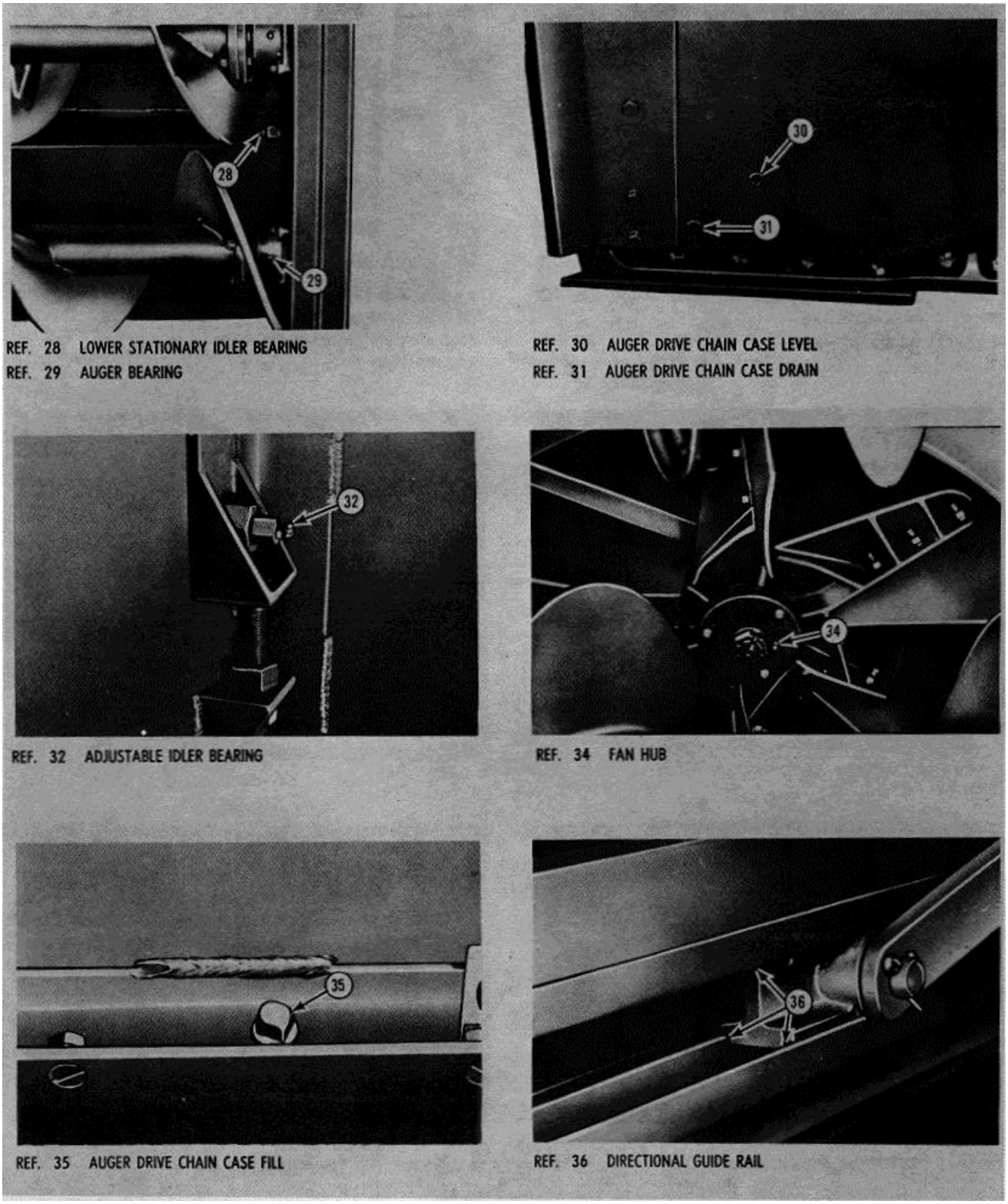


Figure 25-Continued.

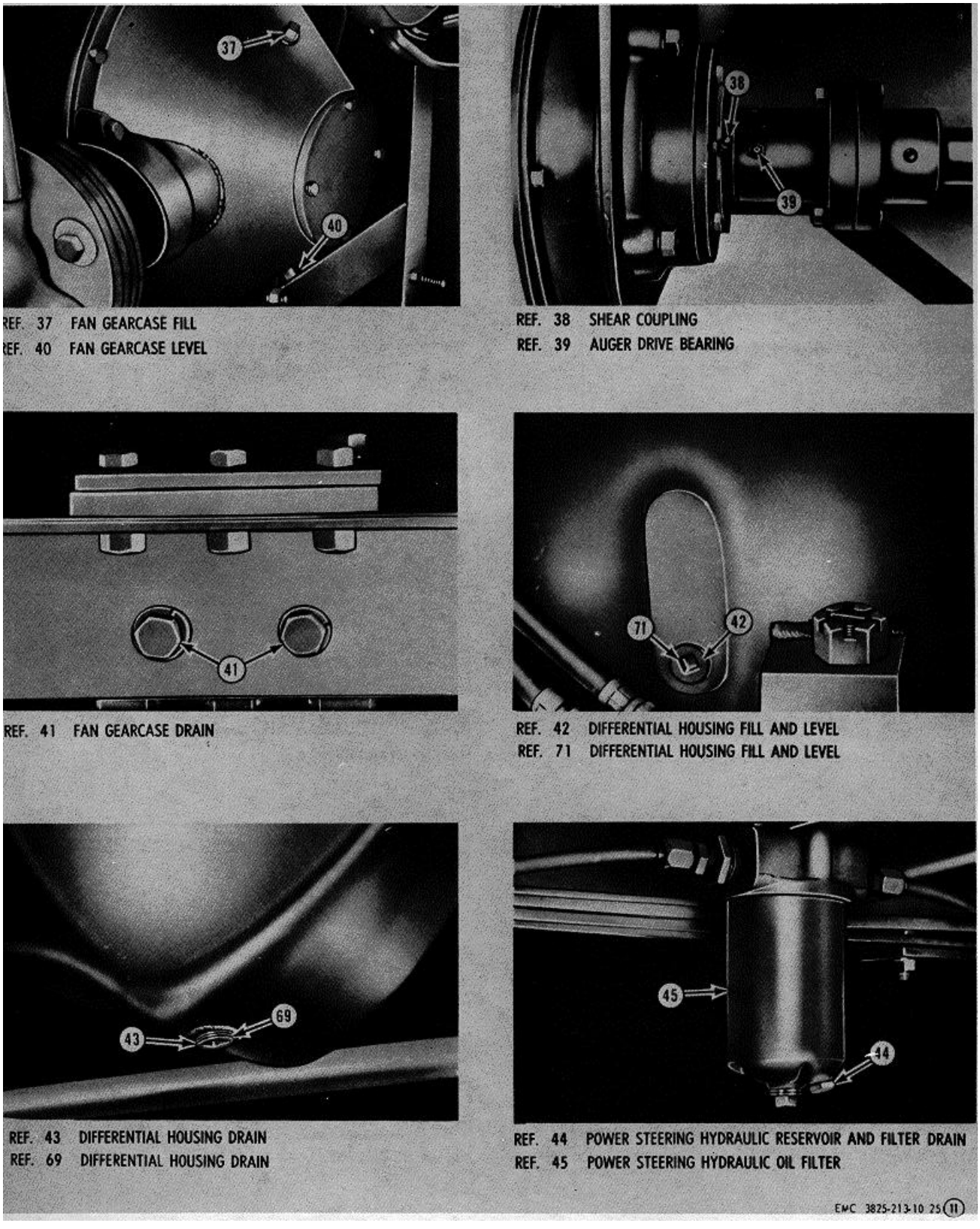
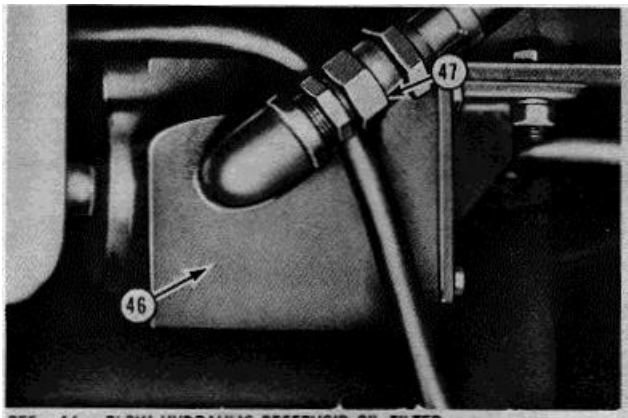
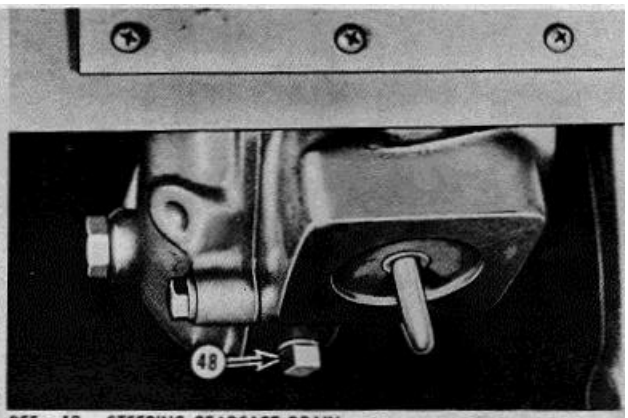


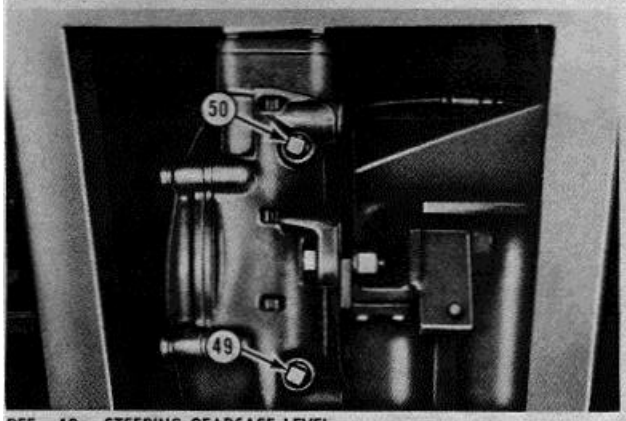
Figure 25-Continued.



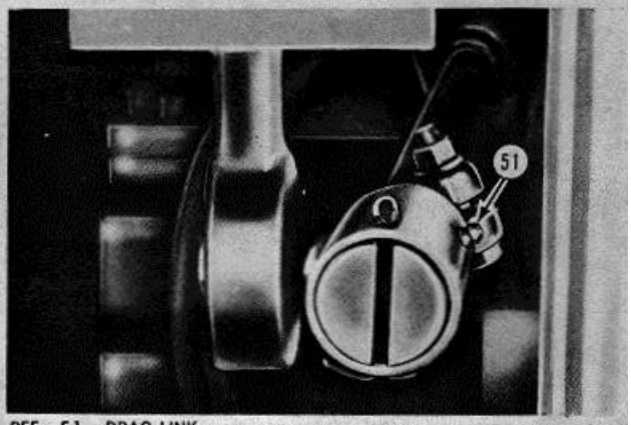
REF. 46 PLOW HYDRAULIC RESERVOIR OIL FILTER
REF. 47 PLOW HYDRAULIC RESERVOIR AND FILTER DRAIN



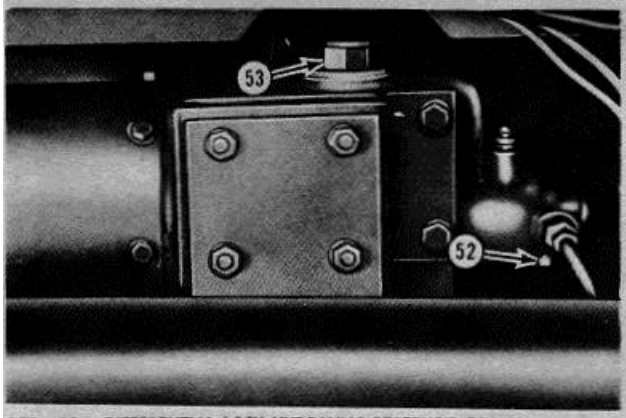
REF. 48 STEERING GEARCASE DRAIN



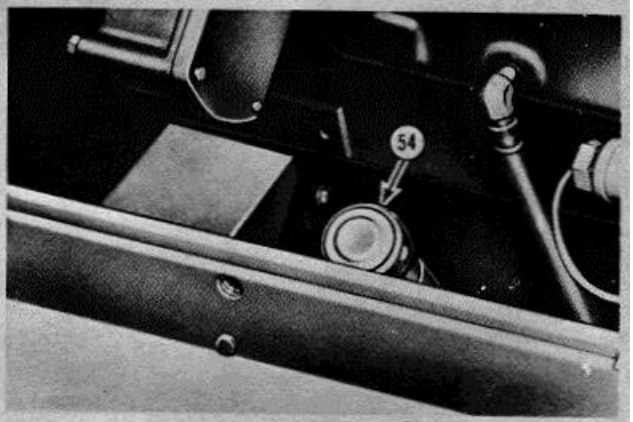
REF. 49 STEERING GEARCASE LEVEL
REF. 50 STEERING GEARCASE FILL



REF. 51 DRAG LINK



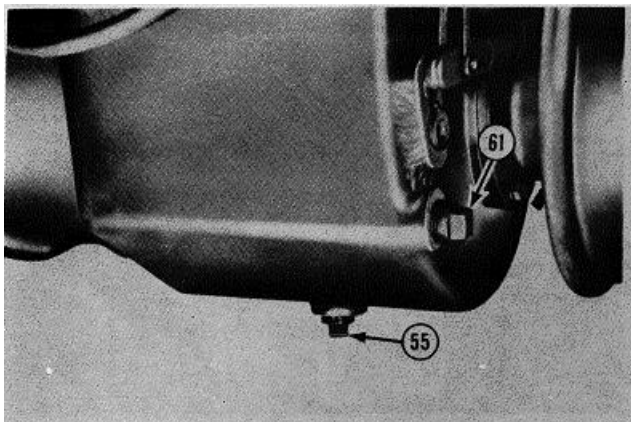
REF. 52 DIFFERENTIAL LOCK HYDRAULIC RESERVOIR DRAIN
REF. 53 DIFFERENTIAL LOCK HYDRAULIC RESERVOIR FILL AND LEVEL



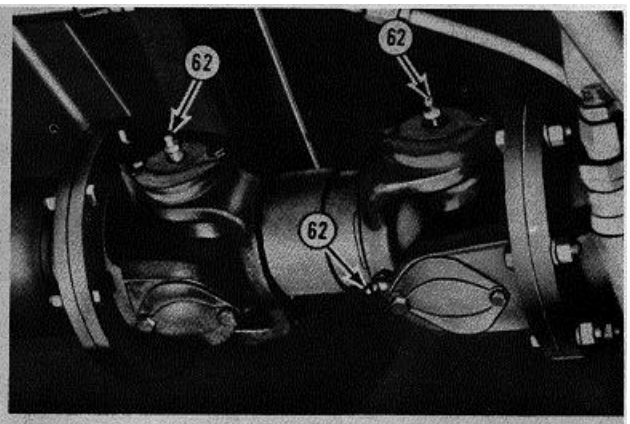
REF. 54 CARRIER TORQUE CONVERTER AND TRANSMISSION FILL

EMC 3825-213-10 25 (12)

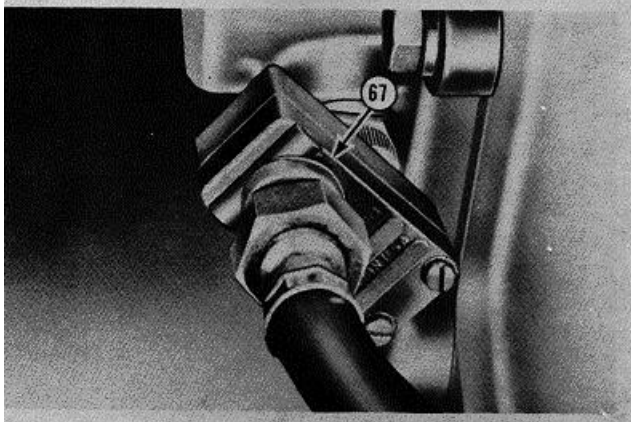
Figure 25-Continued.



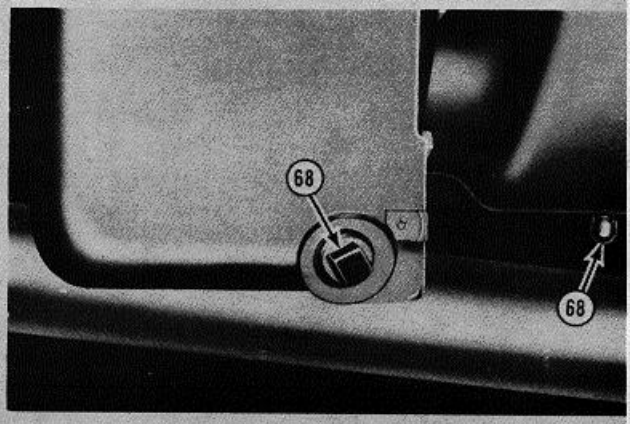
REF. 55 TRANSFER CASE DRAIN
REF. 61 TRANSFER CASE FILL AND LEVEL



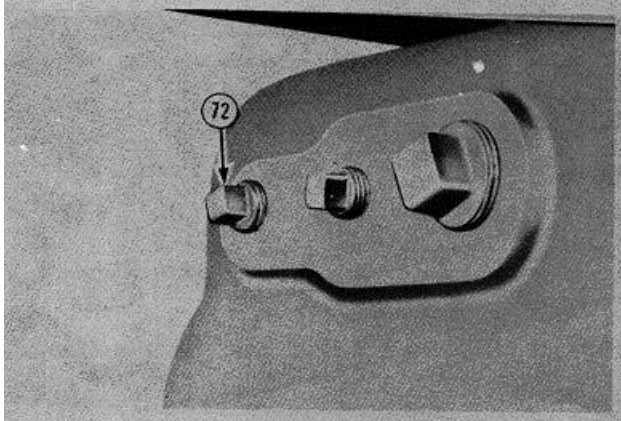
REF. 62 UPPER UNIVERSAL JOINTS



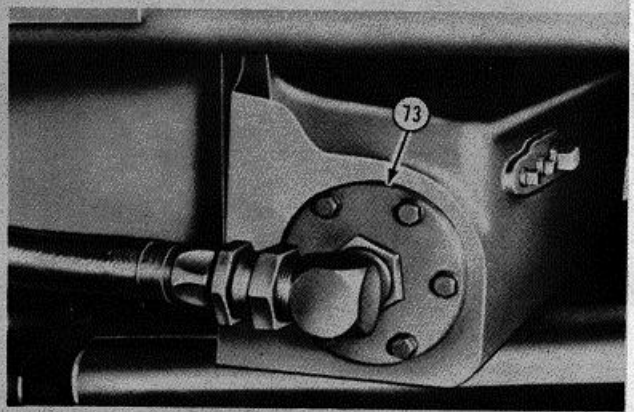
REF. 67 SPEEDOMETER DRIVE



REF. 68 CARRIER TORQUE CONVERTER AND TRANSMISSION DRAIN

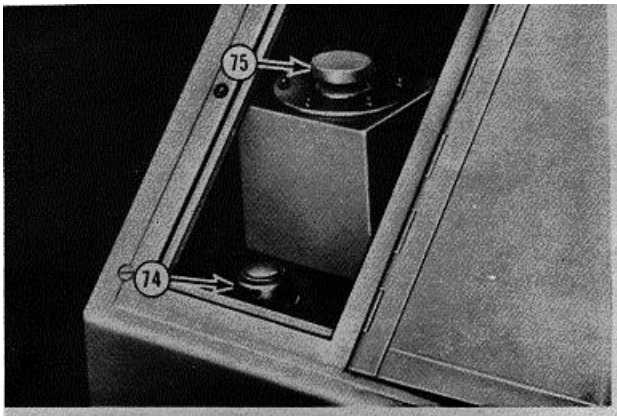


REF. 72 CARRIER TORQUE CONVERTER AND TRANSMISSION LEVEL

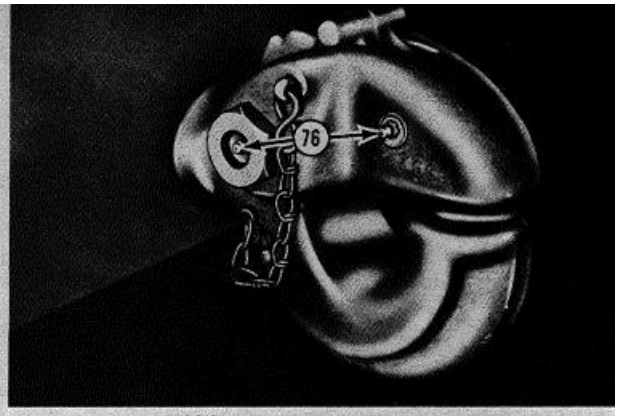


REF. 73 TORQUE CONVERTER AND TRANSMISSION SCREEN

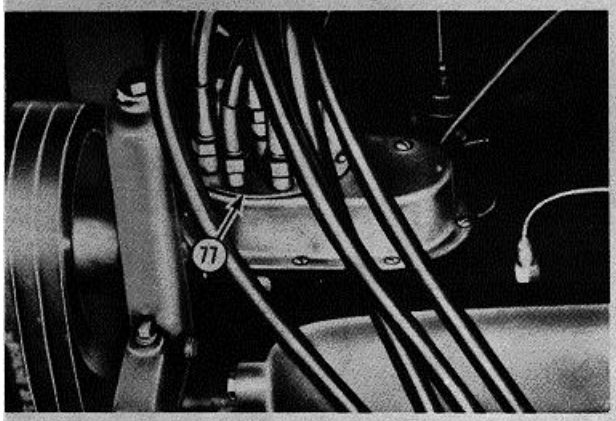
Figure 25-Continued.



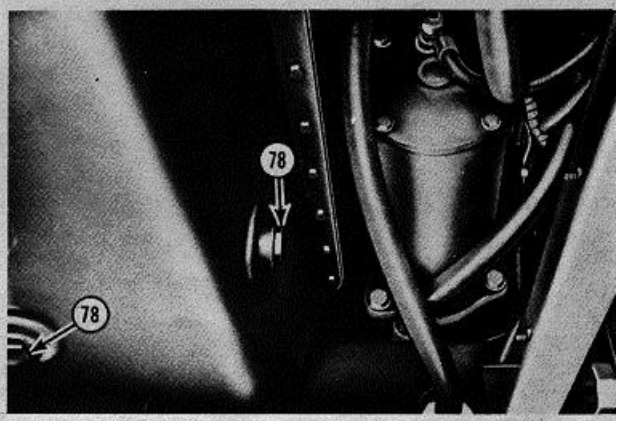
REF. 74 PLOW HYDRAULIC RESERVOIR FILL AND LEVEL
REF. 75 POWER STEERING HYDRAULIC RESERVOIR FILL AND LEVEL



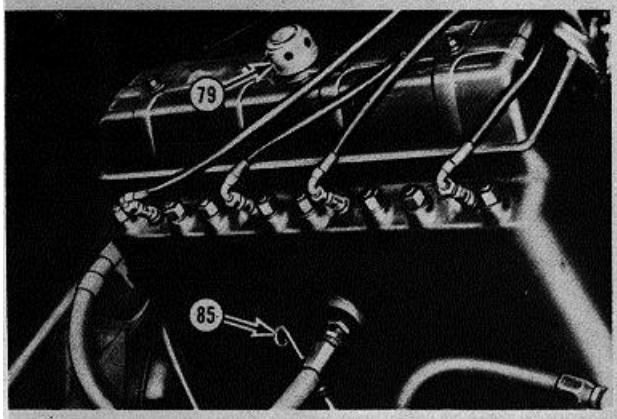
REF. 76 PINTLE HOOK



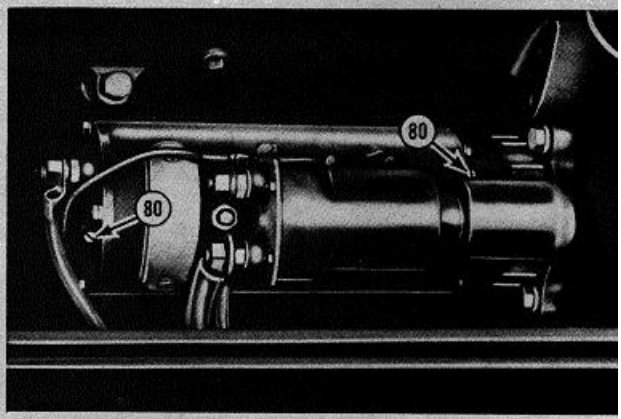
REF. 77 DISTRIBUTOR CAM WICK



REF. 78 CRANKCASE DRAIN



REF. 79 CRANKCASE FILL
REF. 85 CRANKCASE LEVEL GAGE



REF. 80 STARTER

EMC 3825-213-10. 25 (14)

Figure 25-Continued.

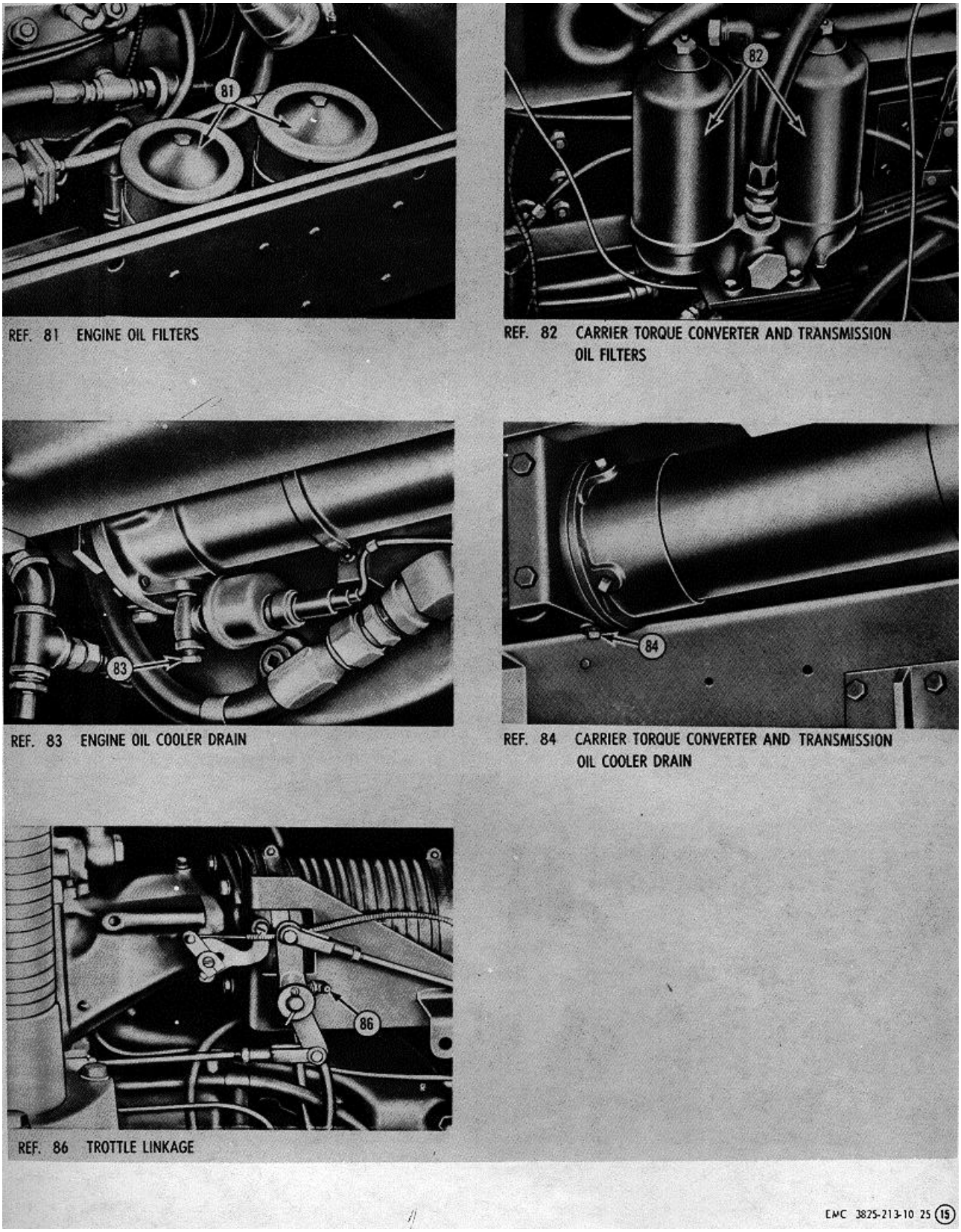


Figure 25-Continued.

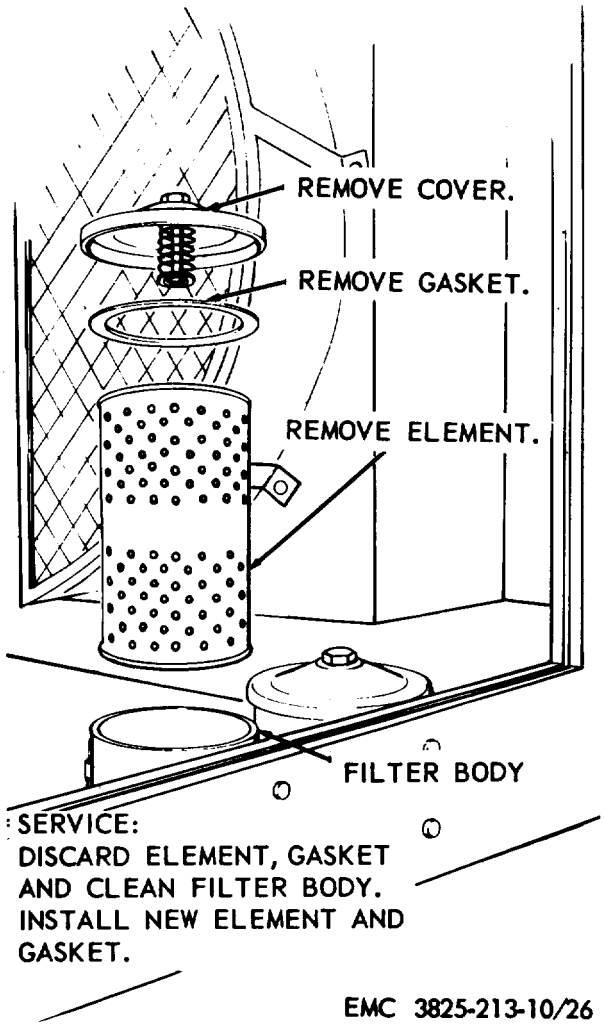


Figure 26. Carrier and plow engine oil filter assemblies service.

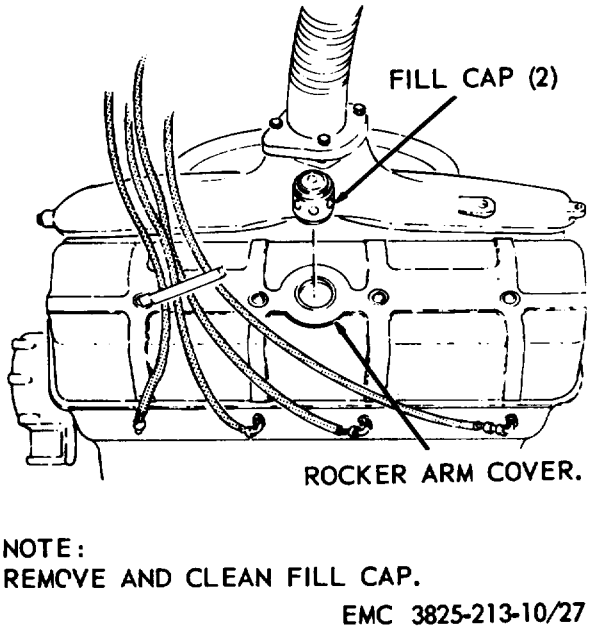
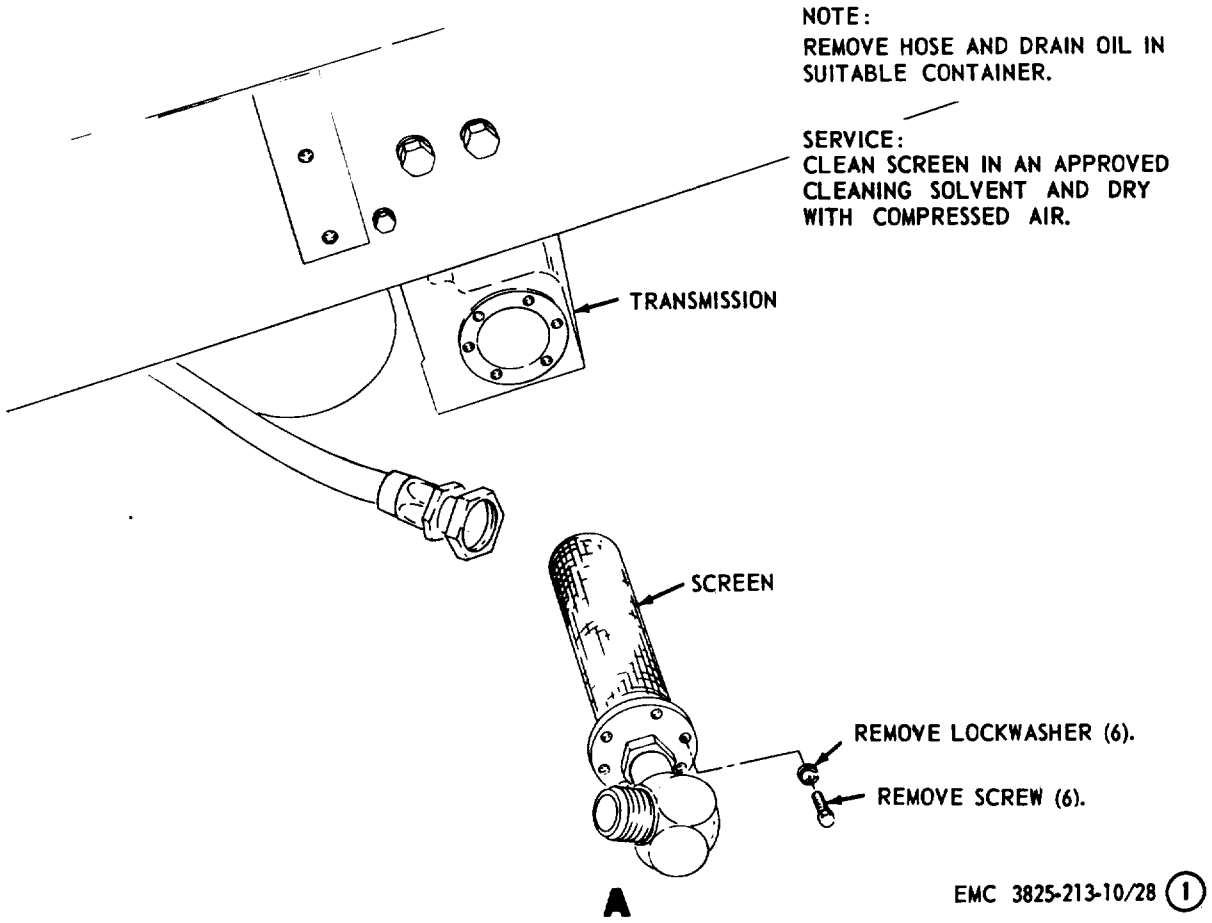
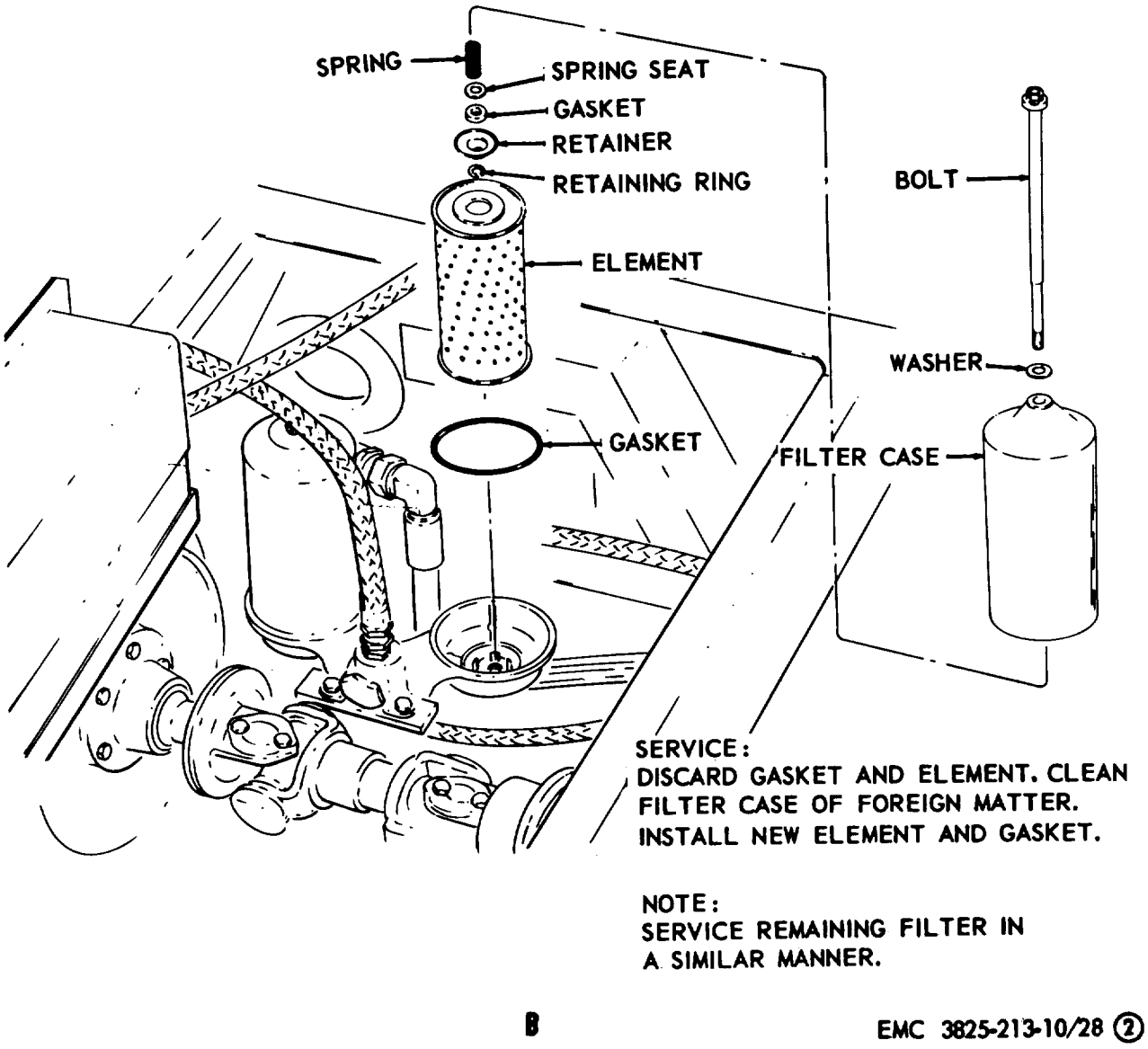


Figure 27. Carrier and plow engine crankcase breather service.



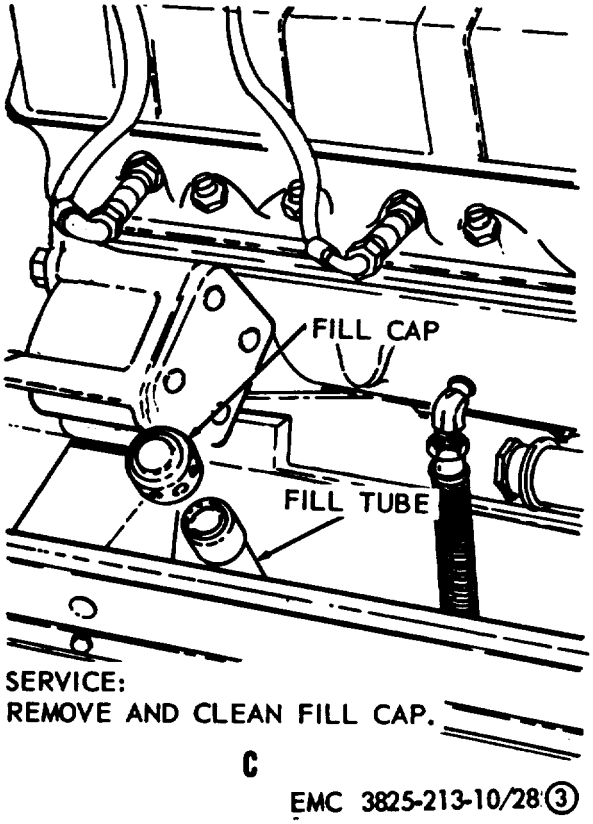
A. Transmission screen service

Figure 28. Torqmatic transmission and torque converter screen filter and fill cap service.



B. Torque converter filter service

Figure 28-Continued.



C. Fill cap service

Figure 28-Continued.

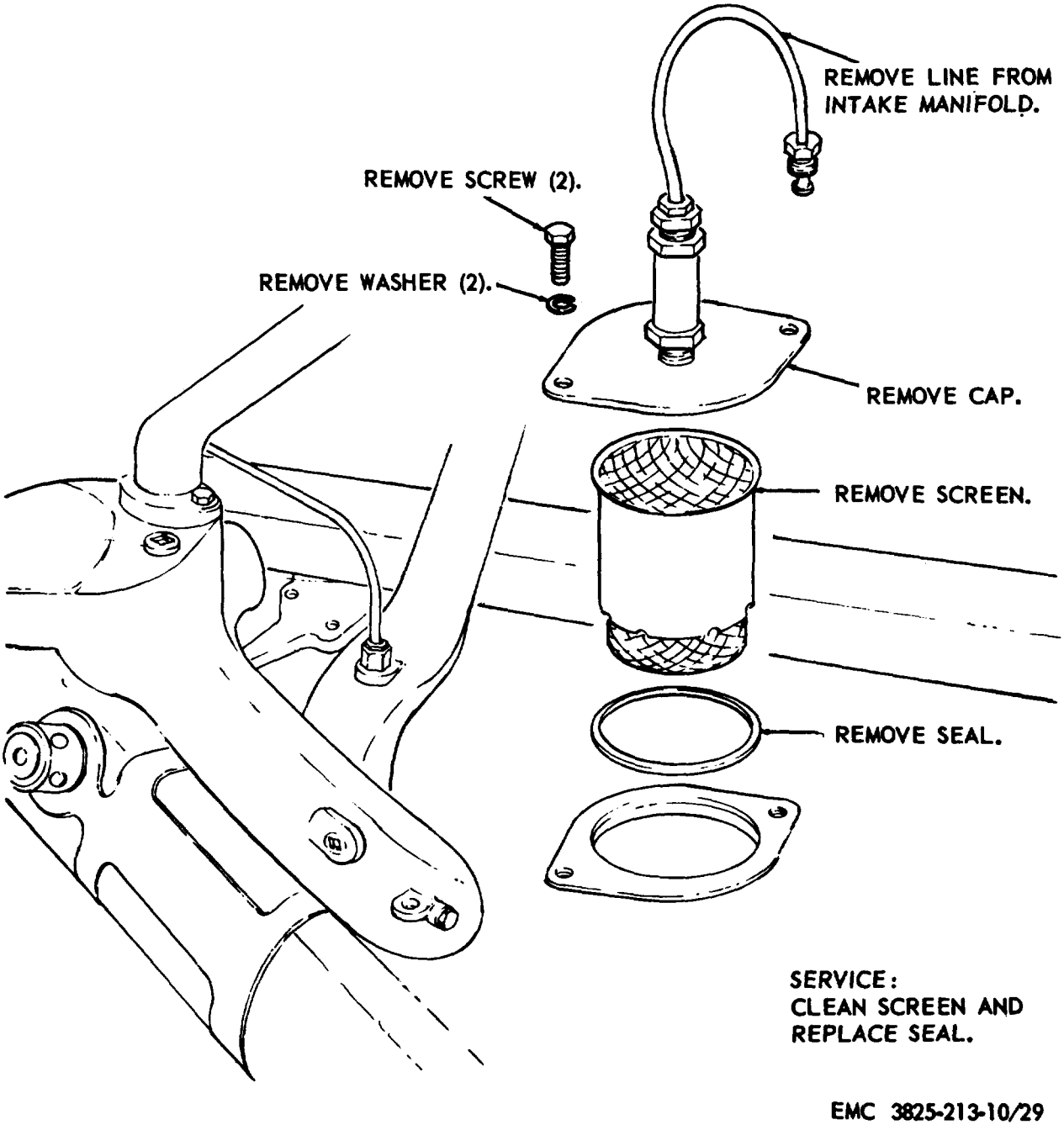


Figure 29. Carrier and plow engine crankcase ventilation service.

Section III. PREVENTIVE MAINTENANCE SERVICES

39. General

To insure that the equipment is ready for operation at all times it must be inspected systematically before operation, during operation, and after operation, so that defects may be discovered and corrected before they result in serious damage or failure. The necessary preventive maintenance services will be performed before operation. Defects discovered during operation of the unit will be noted for future correction to be made as soon as operation has ceased. Stop operation immediately if a deficiency is noticed during operation which would damage the equipment if operation were continued. After-operation services will be performed by the operator after every operating period. After-operation services will be performed at intervals based on the normal operations of the equipment. Reduce intervals to compensate for abnormal conditions. Defects or unsatisfactory operating characteristics beyond the scope of the operator to correct must be reported at the earliest opportunity to organizational maintenance. Responsibility for performance of preventive maintenance services rests not only with the operator but with the entire chain of command from section chief to commanding officer (AR 750-5).

40. Operator's Doily Services

a. General. The intervals at which specific daily services are to be performed by the operator or crew are indicated by an X in the appropriate column in figure 30 as follows:

B ----- Before operation
D ----- During operation
A ----- After operation.

b. Additional Daily Services (Not Illustrated). An X in the appropriate column (s) indicates the interval at which the service is to be performed.

Intervals			Procedure
B	D	A	
X	X	X	*Visual inspection*. Make a visual inspection of the entire unit, checking for insecurely mounted, damaged, or missing parts. Inspect all wires and terminals for damage or loose connections and any other damage that might have occurred since the equipment was last inspected. Correct or report any deficiency to organizational maintenance.
X			*Tools and equipment*. See that all tools and equipment assigned to the snow removal unit are in serviceable condition, clean, and properly mounted or stored. Replace any damaged or missing tools or equipment.
X			*Lights.* Inspect condition and mountings of all lights and reflectors.
X			*Windshield and cab*. Clean windshield. Inspect wipers and replace as necessary.
	X		*Unusual operation and noises*. Investigate any abnormal or unusual operation such as engine overheating, too rnuch vibration, or failure to respond to controls. If irregularities are noticed, stop operation at once and correct the condition or report it to organizational maintenance.
X			*Tampering*. Inspect to see whether the snow removal unit has been tampered with or damaged. Do not operate the unit until all deficiencies noticed have been corrected.
		X	*Cleaning*. Remove any accumulation of dirt or frozen material from the snow removal unit, paying particular attention to the working platforms and steps.
X			*Crankcase oil*. Check the level and add oil if necessary (LO 5 3825-213-20).
X			*Transmission and torque converter service*. Add oil if necessary (LO 5-3825-213-20).
X	X		*Fuel filters and strainer*. Inspect fuel filters and strainer for dirt and water. Service fuel filters (fig. 32) and strainer (fig. 31).

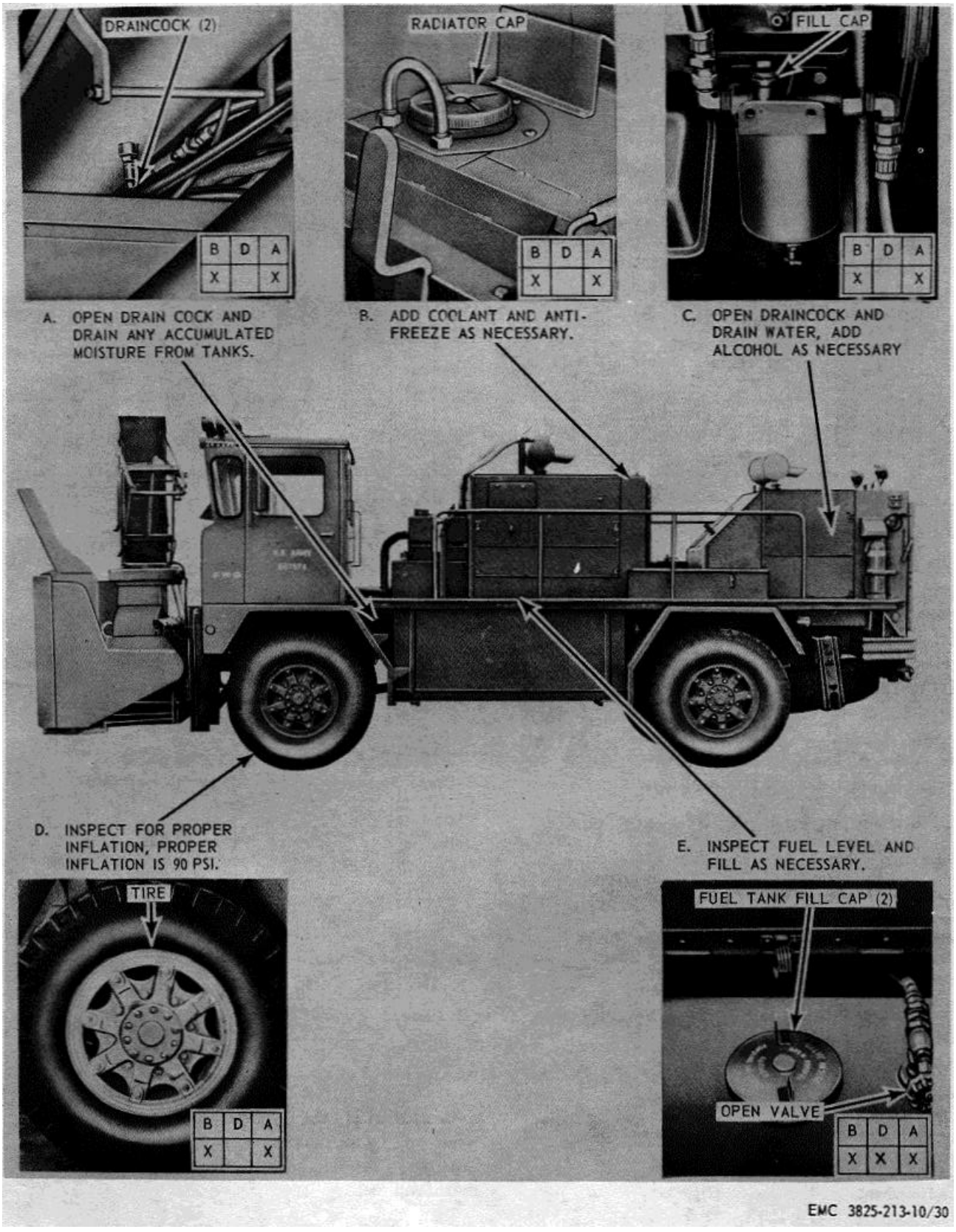


Figure 30. Operator's daily services.

Intervals			Procedures
B	D	A	
X		X	*Fire extinguisher*. Check condition of the fire extinguisher. See that seal is not broken and that mounting hardware is not loose or missing.
	X		*Instrument and gages*. Check all instruments and gages frequently while the unit is in operation.
X		X	*Leaks, general*. Inspect entire unit for leaks, giving particular attention to the fuel line and hydraulic oil lines and connections. Look for signs of leaks under the engine. Repair all leaks, or report condition to organizational maintenance.
X		X	*Belt*. Inspect fan, alternator, compressor, and hydraulic pump drive belts for proper tension (figs. 37, 39, 41, and 45). Check for cracked or frayed condition.
X		X	*Protection*. If engine has not been winterized and freezing weather is expected, drain the cooling system completely and leave the draincocks open.
X			*Batteries*. Check level and cable connections (fig. 44).
X			*Publications*. See that a copy of this manual and the current lubrication order (LO 5-3825-213-20) are on or with the equipment and in serviceable condition.
		X	*Air Cleaner*. Inspect condition and mounting of the air cleaners (fig. 33).
X			*Handbrake*. Adjust handbrake to proper tension (fig. 40).

Section IV. TROUBLESHOOTING

41. General

This section provides information useful in diagnosing and correcting unsatisfactory operation or failures of the snow removal unit and its components. Each trouble symptom stated is followed by a list of probable causes of the trouble. The possible remedy recommended is described opposite the probable cause. Any operational trouble that is beyond the scope of the operator or crew must be reported to organizational maintenance.

42. Carrier Engine Hard To Start or Fails To Start

Probable cause	*Possible remedy*
Fuel shutoff valve closed	Open shutoff valve (fig. 30).
Lack of fuel	Fill fuel tank (fig. 30).
Dirt, gum or water in fuel filter.	Service fuel filter (fig. 32).

43. Carrier Engine Operates Erratically or Lacks Power

Probable cause	*Possible remedy*
Sediment or water in fuel system.	Service fuel filter (fig. 32).
Air cleaner clogged	Service air cleaner (fig. 33).
Carburetor out of adjustment.	Adjust carburetor (fig. 35).

44. Carrier Engine Exhaust Smokes Excessively

Probable cause	*Possible remedy*
Lubricating oil to thin	Drain and refill engine crankcase with proper grade of oil (LO 5-3825-213-20).
Fuel mixture too rich	Adjust the carburetor (fig. 35).

45. Carrier Engine Overheat

Probable cause	*Possible remedy*
Insufficient water in cooling system.	Check coolant level in radiator (fig. 30).
Cooling system clogged	Service radiator (fig. 36).
Lubrication improper	Drain and refill engine crankcase with proper grade of oil (LO 5-3825 218-20).

46. Carrier Engine Knock or Develops Unusual Noise

Probable cause	*Possible remedy*
Oil level low	Fill crankcase to proper level (LO 5-3826-213 20).
Poor grade of fuel	Use approved fuel (table 1).

Caution

If the engine knocks or is noisy when oil is at proper level, stop engine (par. 17) and report condition to organizational maintenance.

47. Carrier Engine Stops Suddenly

Probable cause	*Possible remedy*
Fuel tank empty	Fill fuel tank (fig. 30).
Water in fuel system	Drain fuel tank. Service fuel filters (fig. 32).
Carburetor out of adjustment.	Adjust carburetor (fig. 35).

48. Carrier Engine Oil Pressure Too Low

Probable cause	*Possible remedy*
Lack of oil	Inspect level of oil in crankcase, add oil if necessary (LO 5-382213-20).
Oil filter clogged	Service oil filters (fig. 26).

49. Front Axle Steers Hard

Probable cause	*Possible remedy*
Improper tire inflation	Inflate tires to proper inflation (fig. 30).
Lack of lubrication	Lubricate tie rod ends and steering sockets (LO 5-3825-213-20).
Steering hydraulic system fluid level low.	Service hydraulic tanks (LO 53825-213-20).

50. Plow Engine Hard to Start or Fails To Start

Probable cause	*Possible remedy*
Fuel shutoff valve closed	Open shutoff valve.
Lack of fuel	Fill fuel tank (fig. 30).
Dirt, gum, or water in fuel filter	Service fuel filter (fig. 32).

51. Plow Engine Operates Erratically or Lacks Power

Probable cause	*Possible remedy*
Sediment or water in fuel system.	Service fuel filter (fig. 32).
Air cleaner clogged	Service air cleaner (fig. 33)
Carburetor out of adjustment.	Adjust carburetor (fig. 35).

52. Plow Engine Exhaust Smokes Excessively

Probable cause	*Possible remedy*
Lubricating oil too thin	Drain and refill engine crankcase with proper grade of oil (LO 5-3825-213-20).
Fuel mixture too rich	Adjust carburetor (fig. 35).

53. Plow Engine Overheats

Probable cause	*Possible remedy*
Insufficient water in cooling system.	Check coolant level in radiator (fig. 36).
Cooling system clogged	Service radiator (fig. 36).
Improper lubrication	Drain and refill crankcase with proper grade of oil (LO 6826-213-20).

54. Plow Engine Knocks or Develops Unusual Noise

Probable cause	*Possible remedy*
Oil level low	Fill crankcase to proper level (LO 5-3825-213-20).
Poor grade of fuel	Use approved fuel (table 1).

Caution:
If engine knocks or is noisy when oil is at proper level, stop engine (par. 19) and report condition to organizational maintenance.

55. Plow Engine Stops Suddenly

Probable cause	*Possible remedy*
Fuel tank empty	Fill fuel tank (fig. 30).
Water in fuel system	Drain fuel tank. Service fuel filter (fig. 32).
Carburetor out of adjustment.	Adjust carburetor (fig. 35).

56. Plow Engine Oil Pressure Too Low

Probable cause	*Possible remedy*
Lack of oil	Inspect level of oil in crankcase. Add oil if necessary. (LO 5-5825-213-20).
Oil filters clogged	Service oil filters (fig. 26).

57. Rear Wheels Fail To Steer

Probable cause	*Possible remedy*
Improper tire inflation	Inflate tire to proper inflation (fig. 30).
Hydraulic pump defective.	Report to organizational maintenance.
Lack of lubrication	Lubricate tie rod ends and steering sockets (LO 5-3825-213-20).
Steering hydraulic system fluid level low.	Service hydraulic tanks (LO 5-3825-213-20).

58. Engine or Personnel Heaters Fail To Operate

Probably cause	*Possible remedy*
Fuel supply cut off	Turn on fuel supply.
Batteries discharged or defective.	Report to organizational maintenance.
Circuit breaker on control box open.	Push in on circuit breaker (fig. 28).
Fresh air intake clogged	Report to organizational maintenance.

59. Plow Falls To Elevate

Probably cause	*Possible remedy*
Low hydraulic oil level in tank.	Fill tank with hydraulic oil (LO 5-825-213-20).
Filter clogged	Change filter (fig. 50).
Hydraulic oil in tank is dirty.	Drain and fill tank with clean oil (LO 5-3825-218-20).
Hydraulic pump does not operate.	Report to organizational maintenance
Loose or broken hydraulic line.	Report defective line to organizational maintenance.

60. Chute Assembly Fall To Elevate or Swing

Probably cause	*Possible remedy*
Loose or broken hydraulic line.	Report defective line to organizational maintenance.
Defective hydraulic controls.	Report to organizational maintenance.
Hydraulic pump or motor does not operate.	Report to organizational maintenance.
Low hydraulic oil level in tank.	Fill tank with hydraulic oil (LO 5-3826-213-20).
Hydraulic filter is clogged.	Service hydraulic filter (fig. 50).

61. Transmission Oil Cooler Fails To Operate

Probably cause	*Possible remedy*
Clogged oil filters	Service oil filters (fig. 28)
Lack of oil	Fill transmission (LO 5-3825-213-20).
Leak in oil line	Report to organizational maintenance.

62. Fan Assembly Fails To Operate

Probably cause	*Possible remedy*
Shear bolts broken	Replace shear bolts (fig. 52).
Clutch out of adjustment	Adjust clutch.
Propeller shaft defective	Report to organizational maintenance.

63. Auger Assembly Fails To Operate

Probably cause	*Possible remedy*
Shear bolts broken	Replace shear bolts (fig. 51).
Propeller shaft defective	Report to organizational maintenance.
Clutch out of adjustment	Adjust clutch (fig. 48).

Section V. FIELD EXPEDIENT REPAIRS

64. Field Expedient Repairs

The following troubles may occur while the snow removal unit is operating in the field. Also, supplies and repair parts may not be available and normal remedial action cannot be performed. When this is so, the expedient remedy provided may be used. Field expedients will be used only during emergency conditions.

65. Engines Operate Erratically or Lack Power

Trouble	*Expedient remedy*
Fuel filter clogged	Remove and discard clogged filters (fig. 32). Reinstall bowl and operate until new filters are available.

66. Fuel Tank Leaks

Trouble	*Expedient remedy*
Fuel tank has pinhole leak.	Drain fuel tank, close shut-off valve and operate engines on one fuel tank.

67. Engine Overheats

Trouble	*Expedient remedy*
Defective thermostats	Remove thermostat and operate until defective thermostat is replaced.

68. Hand Throttle Inoperative

Trouble	*Expedient remedy*
Bent or broken cable	Interchange with choke cable.

69. Snow Shute Hydraulic System Inoperative

Trouble	*Expedient remedy*
Snow chute hydraulic lines damaged.	Extend and operate chute manually.

CHAPTER 4

CARRIER MAINTENANCE INSTRUCTIONS

Section I. CARRIER ENGINE FUEL SYSTEM

70. General

The carrier engine fuel system consists of a carrier engine fuel tank, two fuel pumps, fuel filter, and air cleaner. The following paragraphs describe and illustrate the maintenance functions to be performed by the operator for the carrier and plow engine fuel system.

71. Carrier Engine Fuel Tank Strainer and Breather Service

Service carrier engine fuel tank strainer and breather as illustrated in figure 31.

72. Carrier Engine Fuel Filter Service

Service carrier engine fuel filter as illustrated in figure 32.

73. Carrier Engine Air Cleaner Service

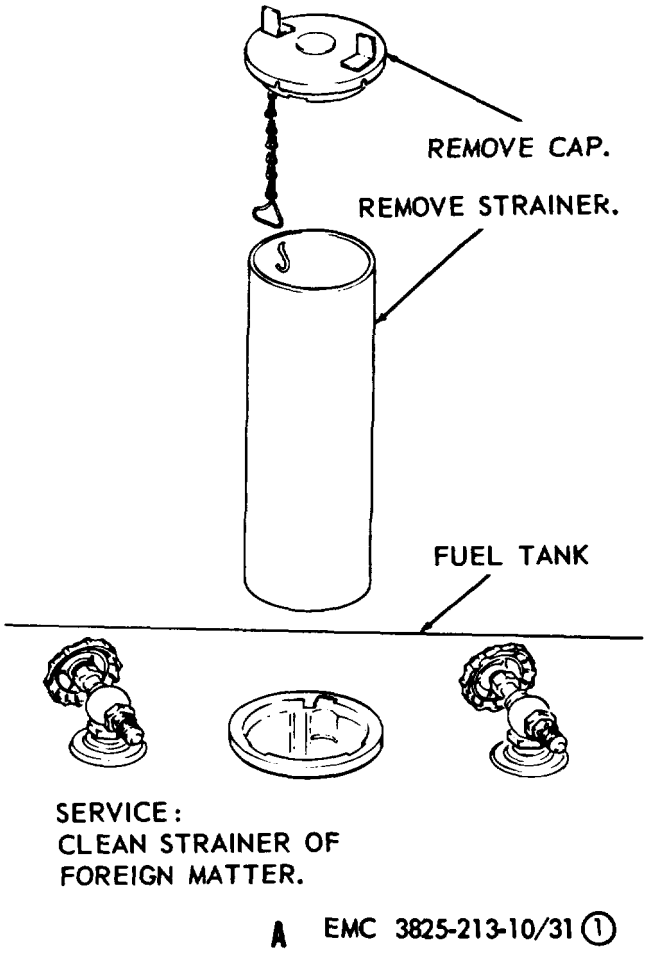
Service carrier engine air cleaner as illustrated in figure 33.

74. Carrier Engine Fuel Pump Service

Service carrier engine fuel pump as illustrated in figure 34.

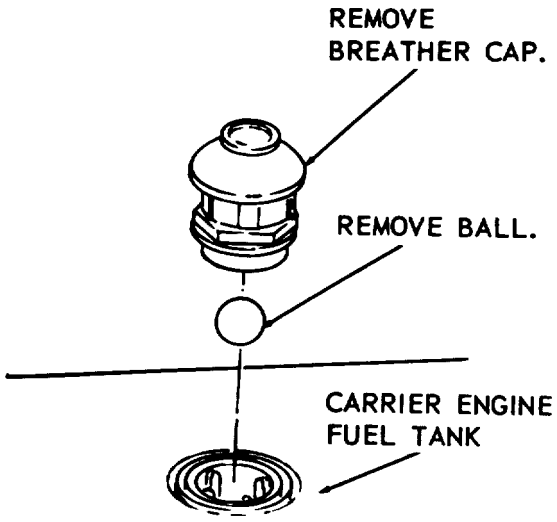
75. Carrier Engine Carburetor Adjustment

Adjust carrier engine carburetor as illustrated in figure 35.



A. Strainer service

Figure 31. Carrier and plow engine fuel tank strainer and breather service.



B. Breather service

Figure 31-Continued.

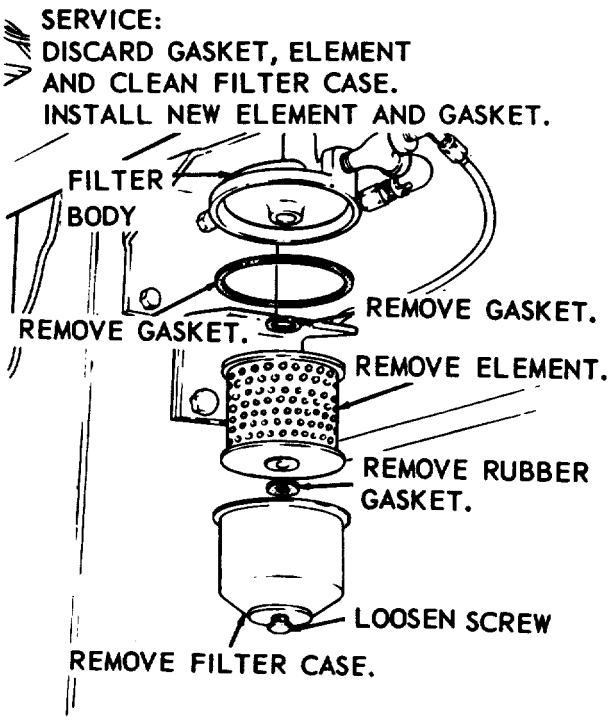


Figure 32. Carrier and plow engine fuel filter service.

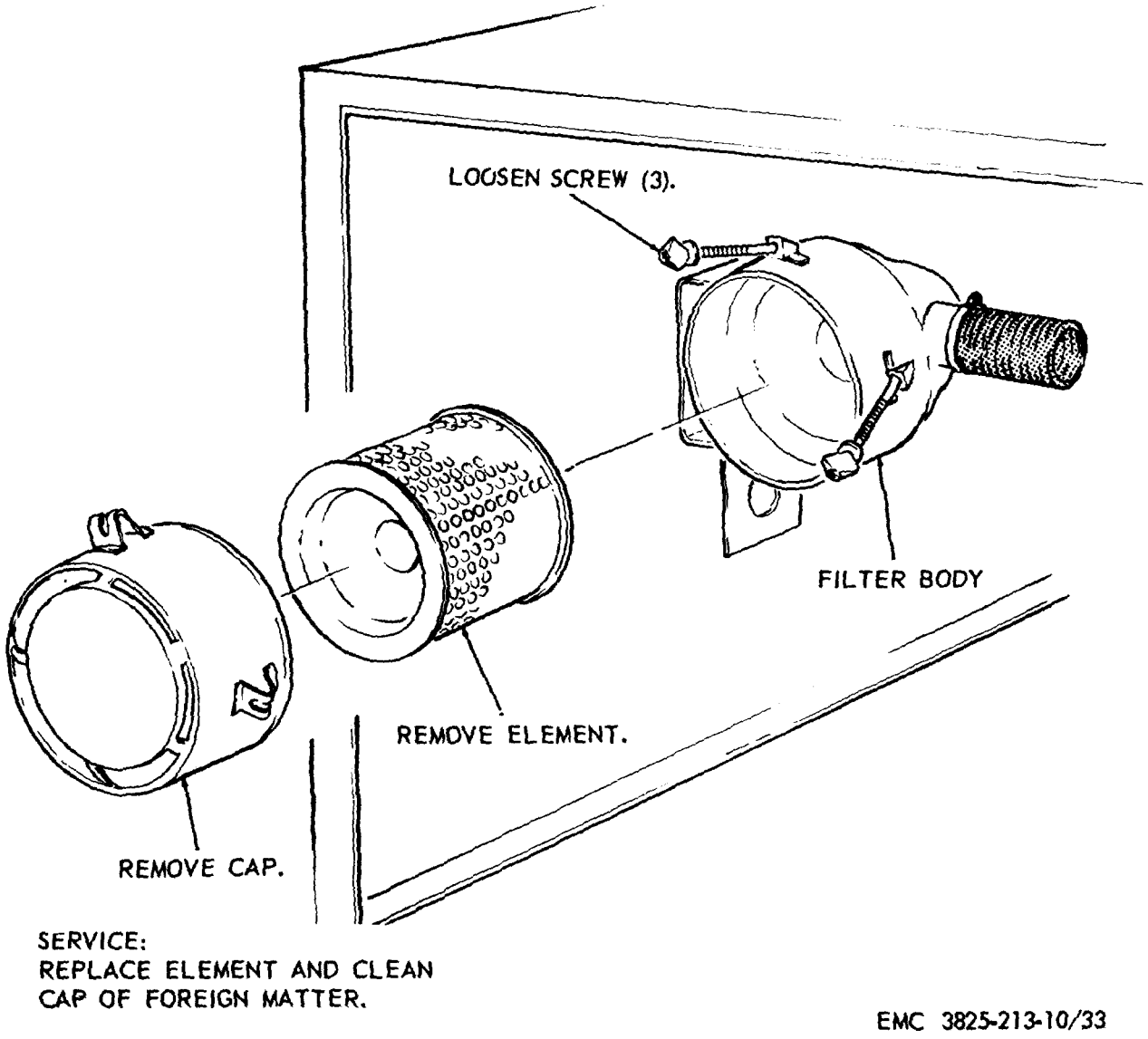


Figure 33. Carrier and plow engine air cleaner service.

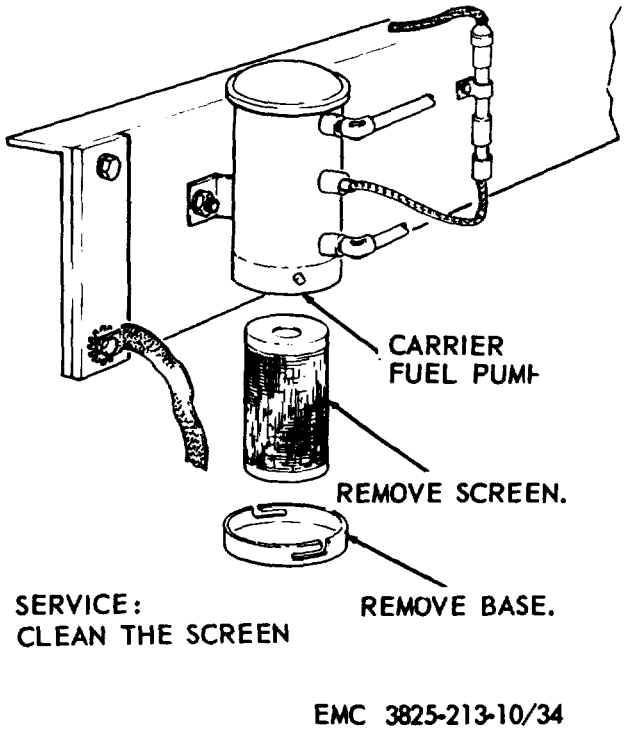


Figure 34. Carrier and plow engine fuel pump service.

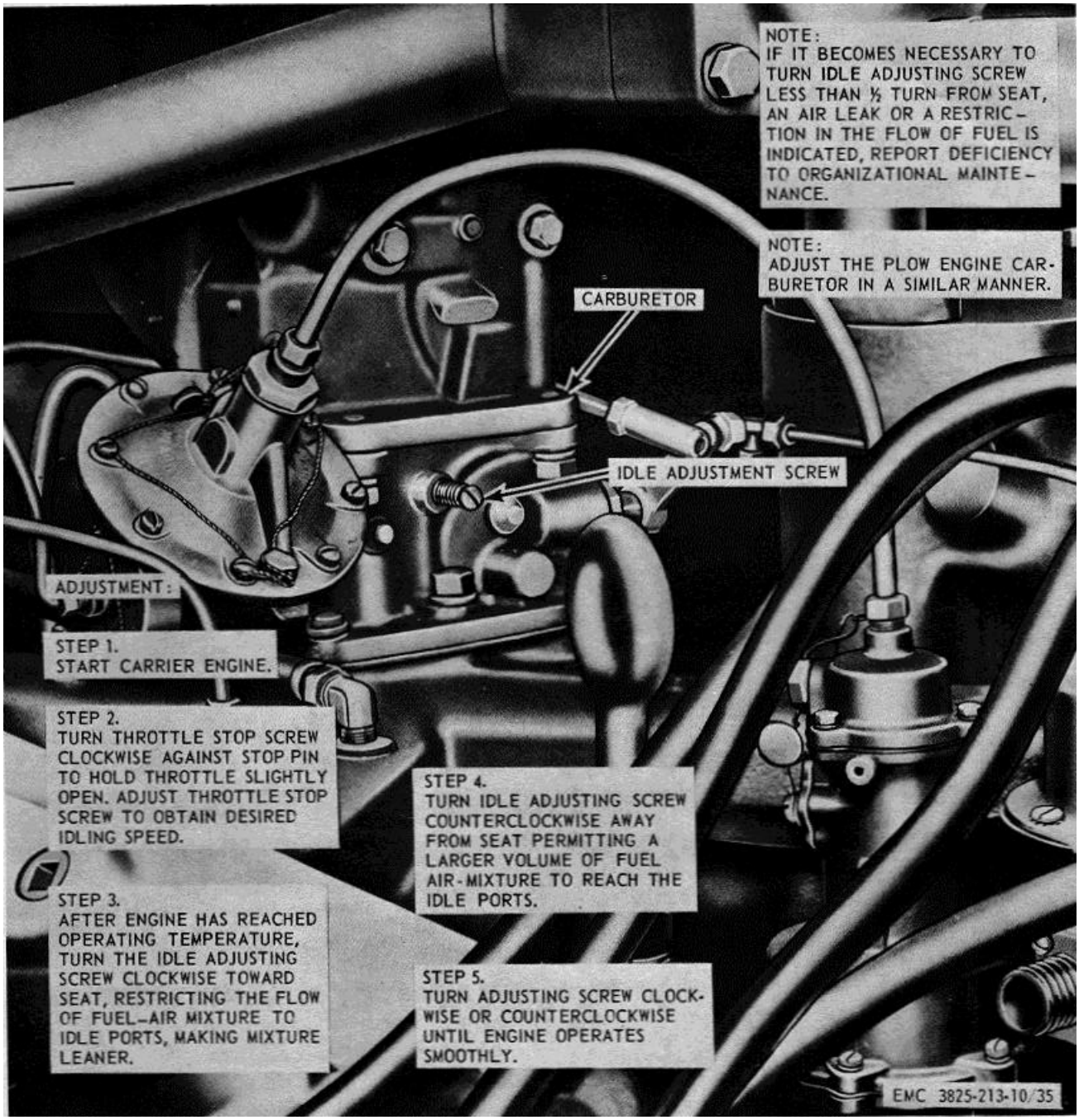


Figure 35. Carrier and plow engine carburetor adjustment.

Section II. CARRIER ENGINE COOLING SYSTEM

76. General

The carrier engine cooling system consists of a radiator, water pump, fan, and necessary connecting lines and fittings. Thermostats automatically maintain the correct engine temperature under normal operating conditions. In

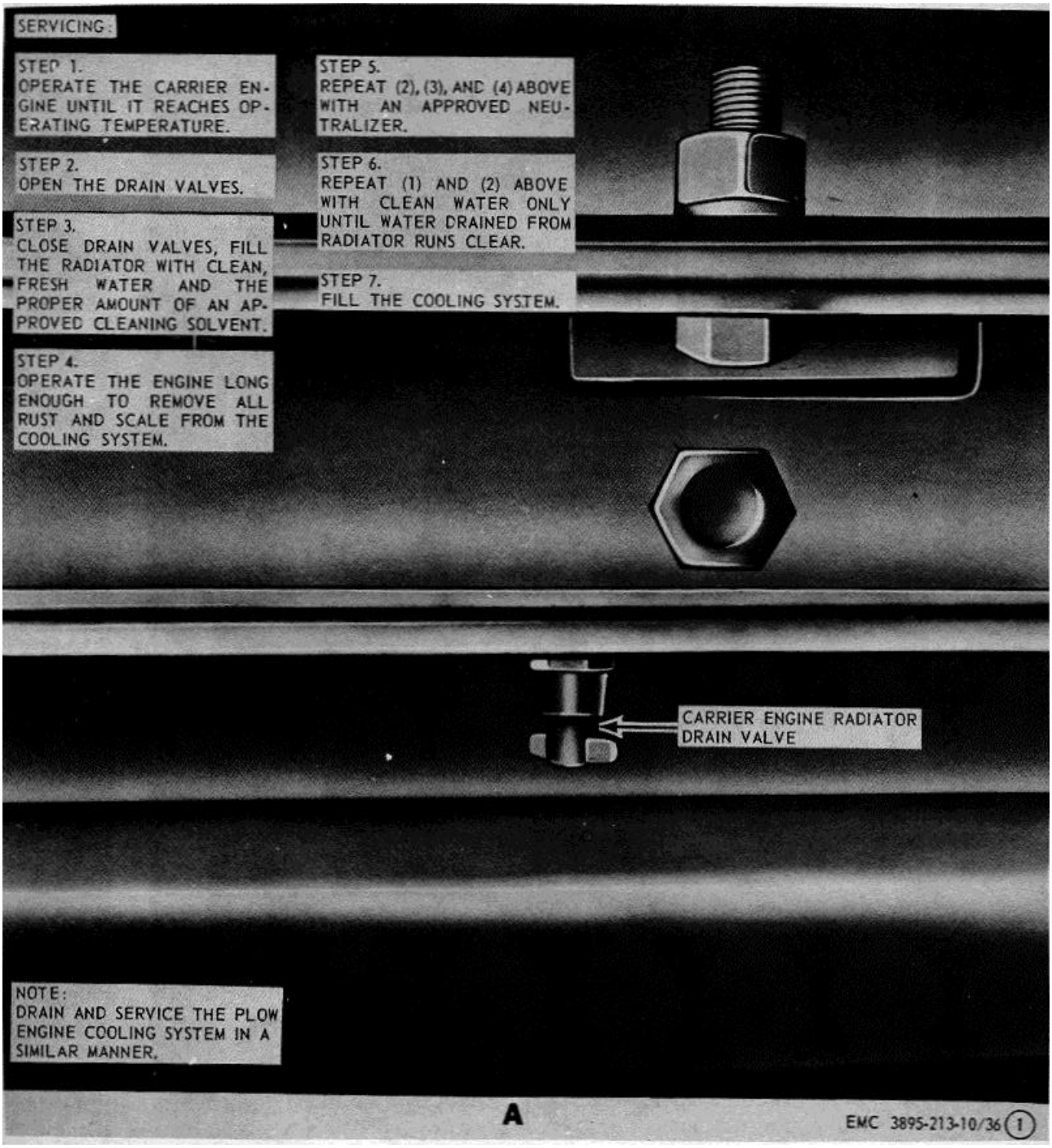
extreme cold weather coolant is circulated through the engine heaters to preheat the coolant as an aid in starting.

77. Carrier Engine Radiator Service

Service carrier engine radiator as illustrated in figure 36.

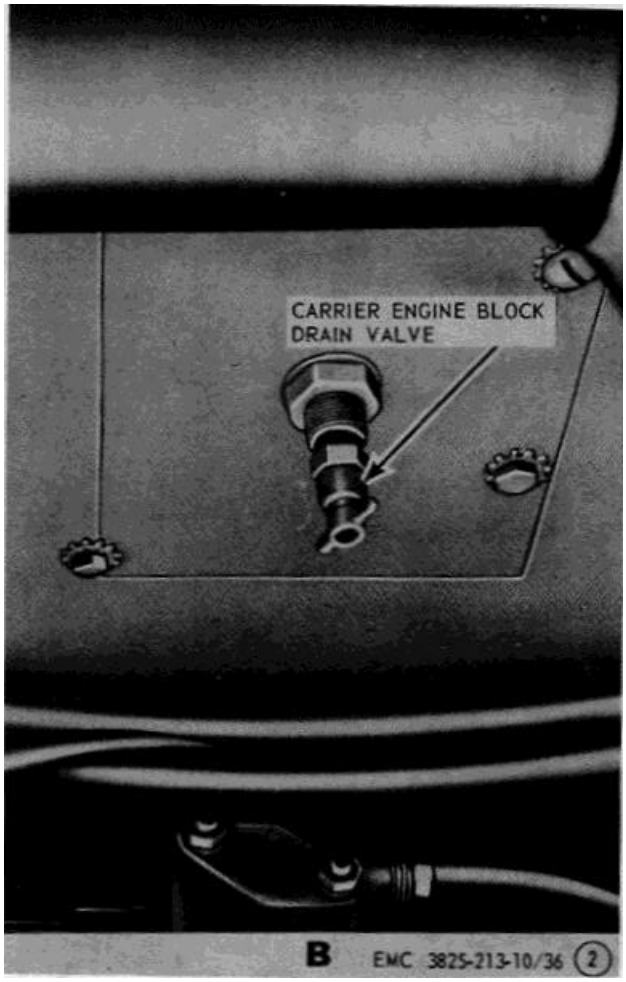
78. Carrier Engine Fan Belt Adjustment

Adjust carrier engine fan belt as illustrated in figure 37.



A. Carrier engine radiator draining

Figure 36. Carrier and plow engine radiator and block service.



B. Carrier engine block draining

Figure 36-Continued.

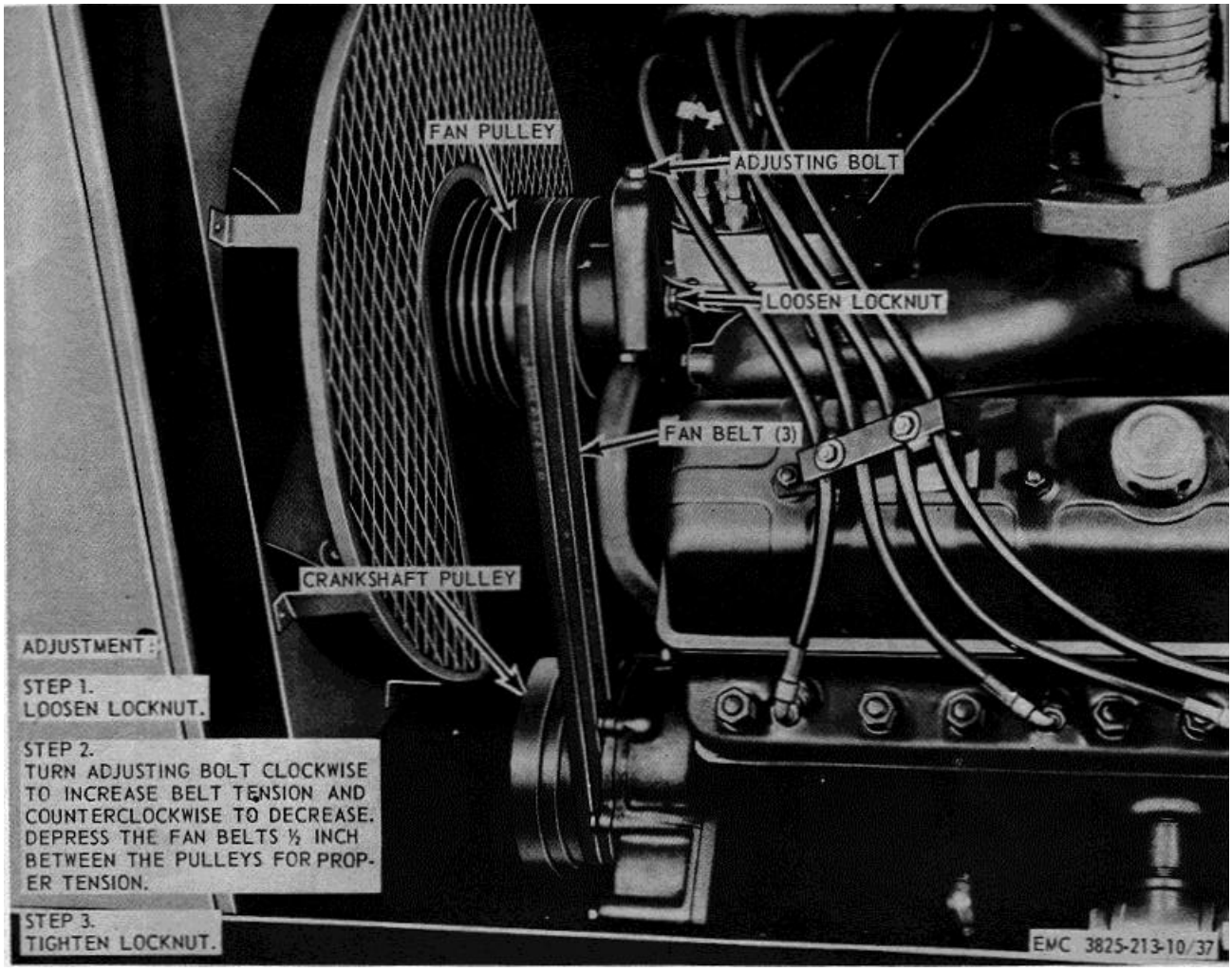


Figure 37. Carrier and plow engine fan belt adjustment.

Section III. CARRIER ENGINE HEATER FUEL SYSTEM

79. General

The carrier engine heater fuel system assembly consists of a fuel pump and fuel filter. Fuel is pumped from the carrier fuel tank through the filter to the carrier heater.

80. Carrier Engine Heater Fuel Filter Service

Service carrier engine heater fuel filter as illustrated in figure 38.

81. Carrier Engine Heater Fuel Pump Service

Service carrier engine heater fuel pump as illustrated in figure 38.

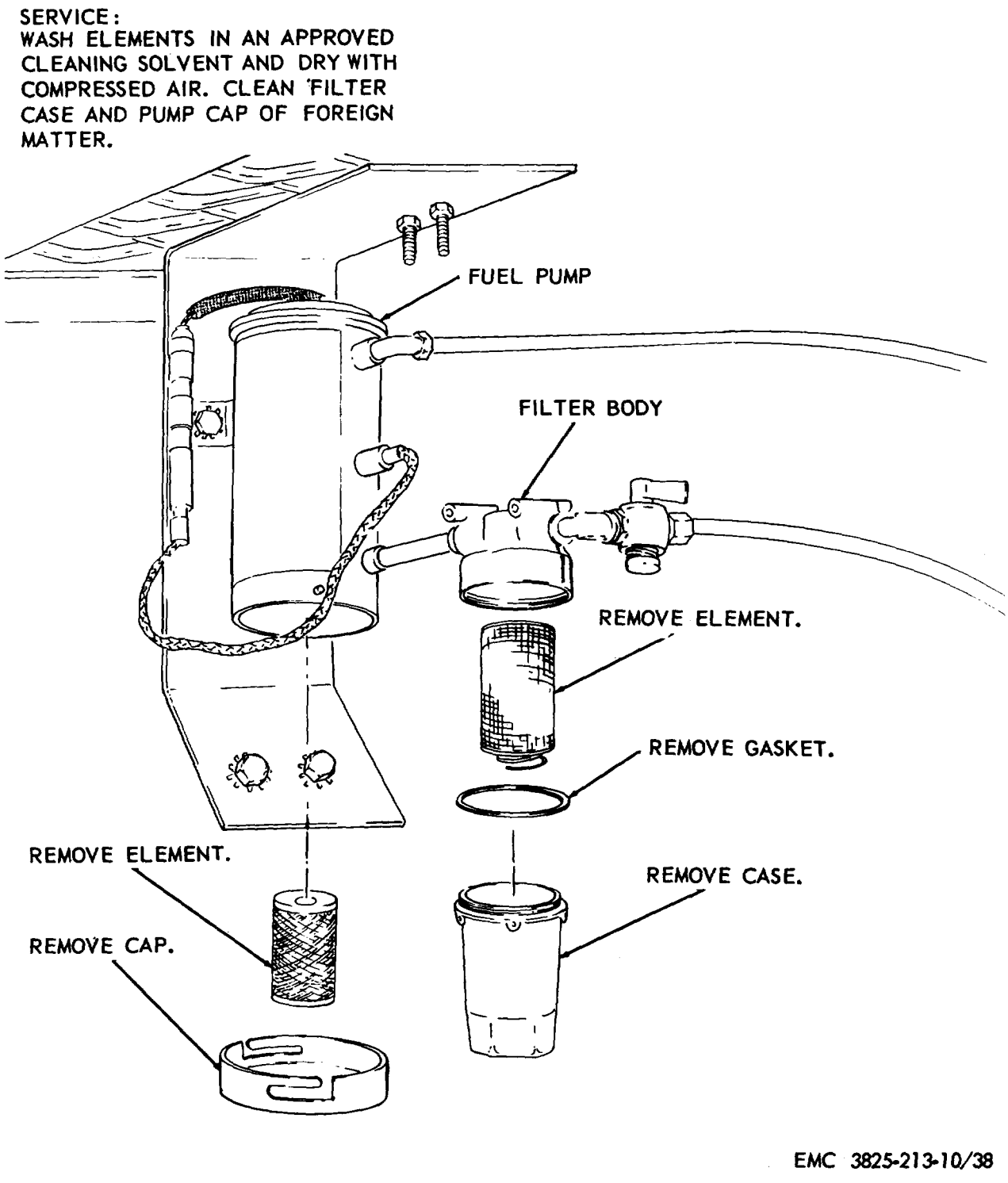


Figure 38. Carrier and plow engine heater fuel filter and pump service.

Section IV. CARRIER AIR AND HANDBRAKE SYSTEM

82. General

Brakes of the carrier are actuated by compressed air supplied, through lines and fittings, from the air reservoirs. A compressor, mounted on the carrier engine, maintains pressure in the reservoirs.

83. Air Compressor Breather Service

Service air compressor breather as illustrated in figure 39.

84. Air Compressor Drive Belts Adjustment

Adjust air compressor drive belts as illustrated in figure 39.

85. Handbrake Adjustment

Adjust handbrake as illustrated in figure 40.

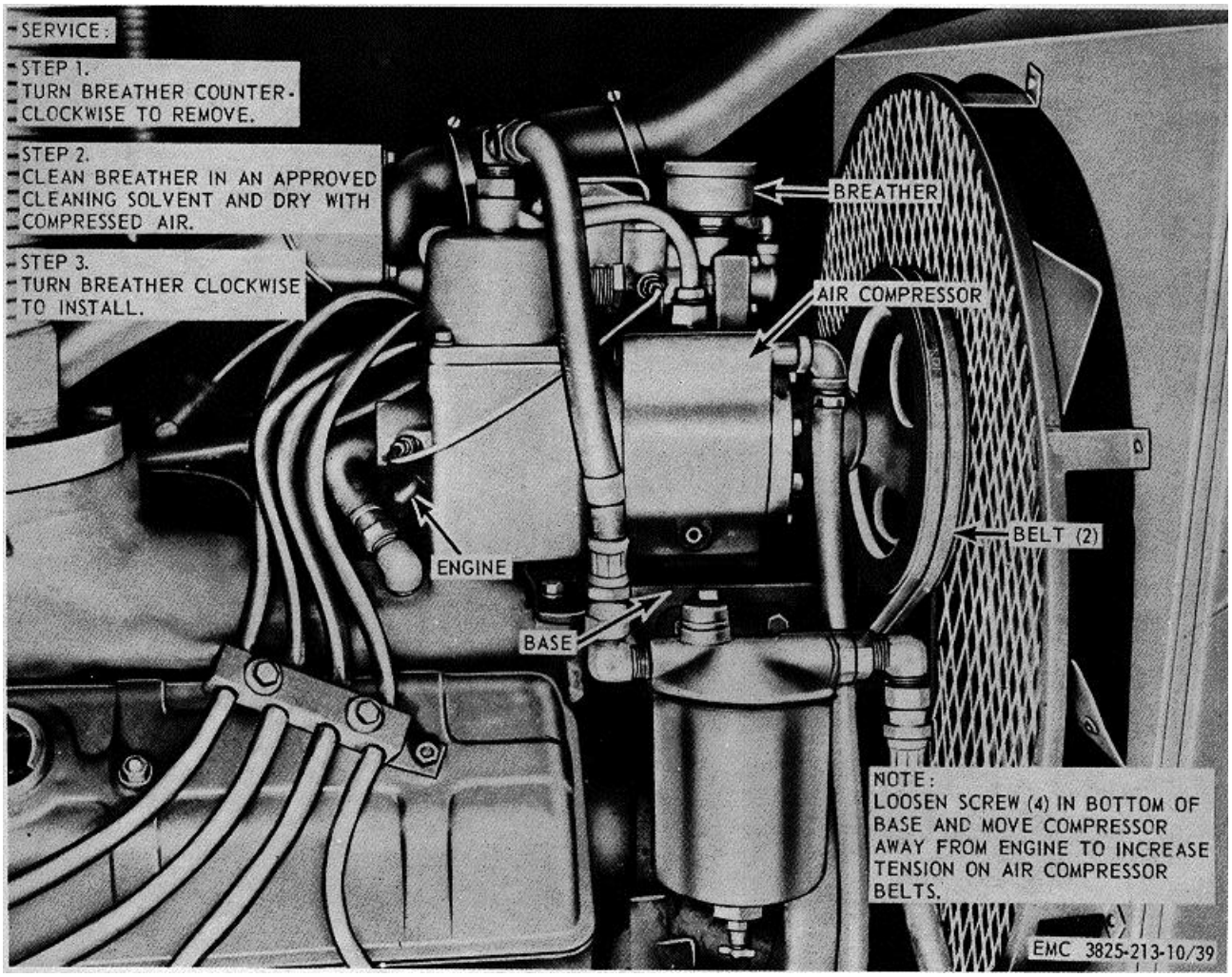


Figure 39. Air compressor breather service and drive belt adjustment.

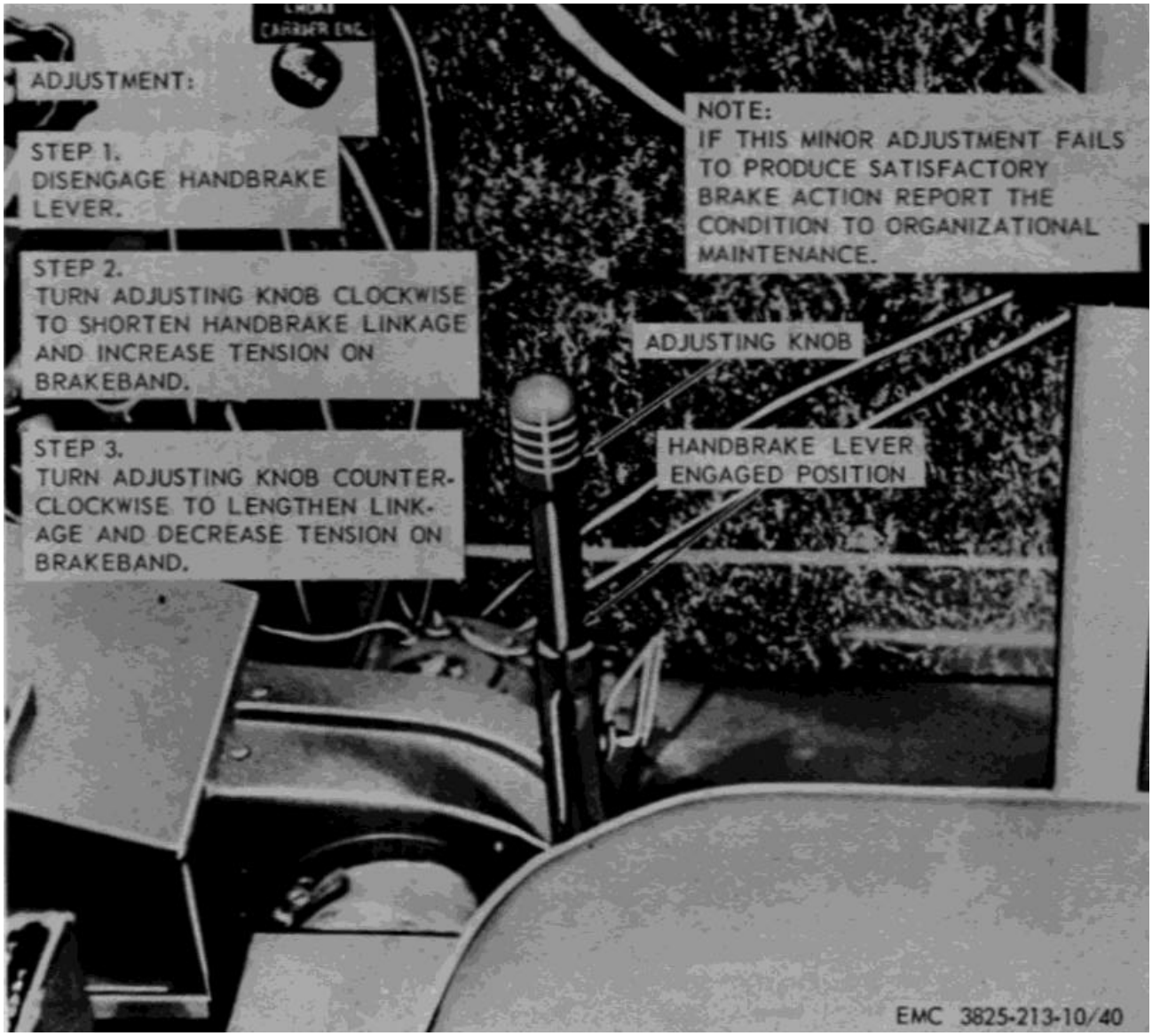


Figure 40. Handbrake adjustment.

Section V. CARRIER HYDRAULIC SYSTEM

86. General

The carrier hydraulic system consists of a hydraulic pump, which supplies power to both the carrier hydraulic system and the plow hydraulic system, a steering hydraulic tank and filter. The carrier hydraulic system operates the rear axle steering and also supplies aid in steering the front axle.

87. Hydraulic Pump Belt Adjustment

Adjust hydraulic pump drive belt as illustrated in figure 41.

88. Carrier Steering Hydraulic Oil Filter Service

Service carrier steering hydraulic oil filter as illustrated in figure 42.

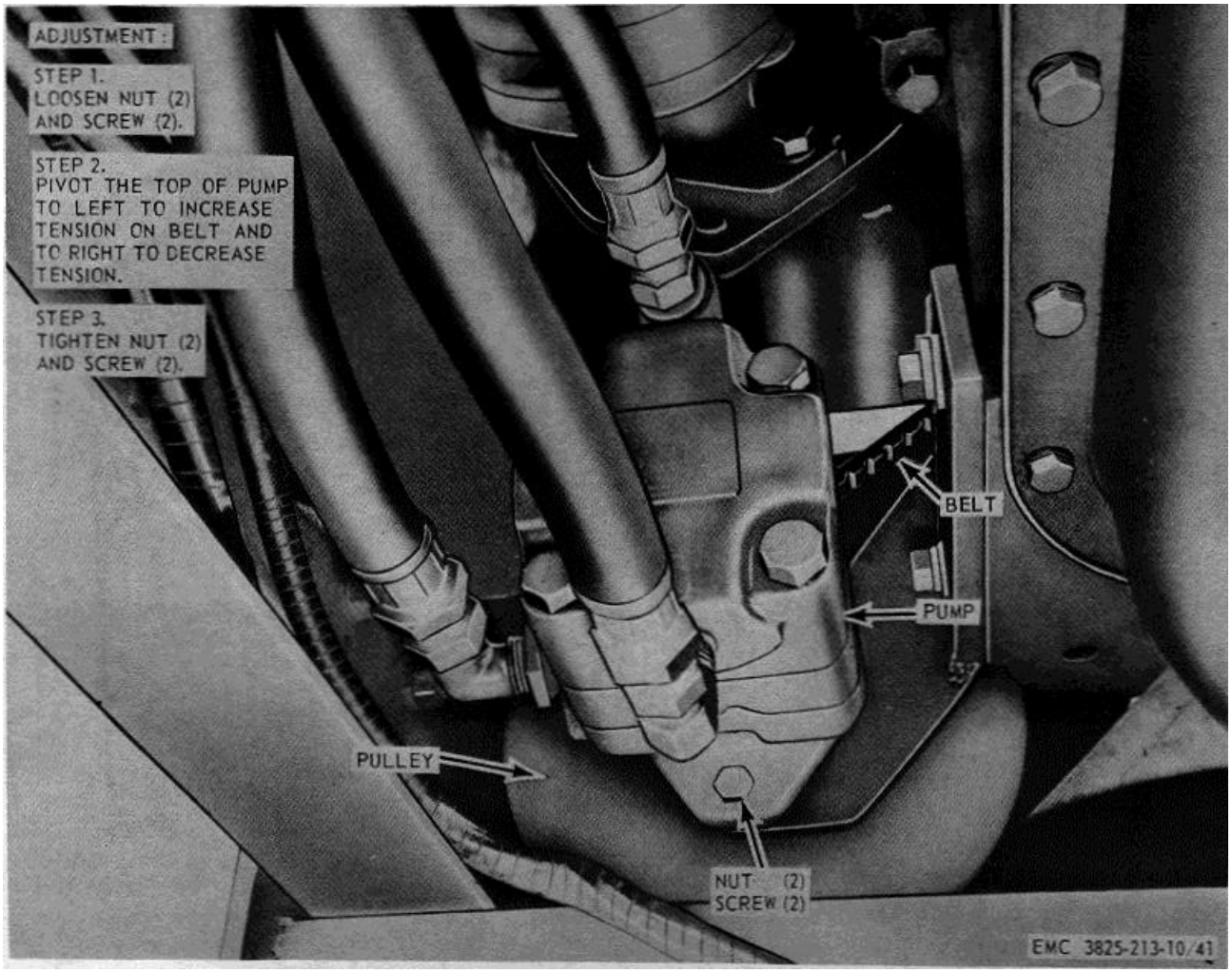


Figure 41. Hydraulic pump drive belt adjustment.

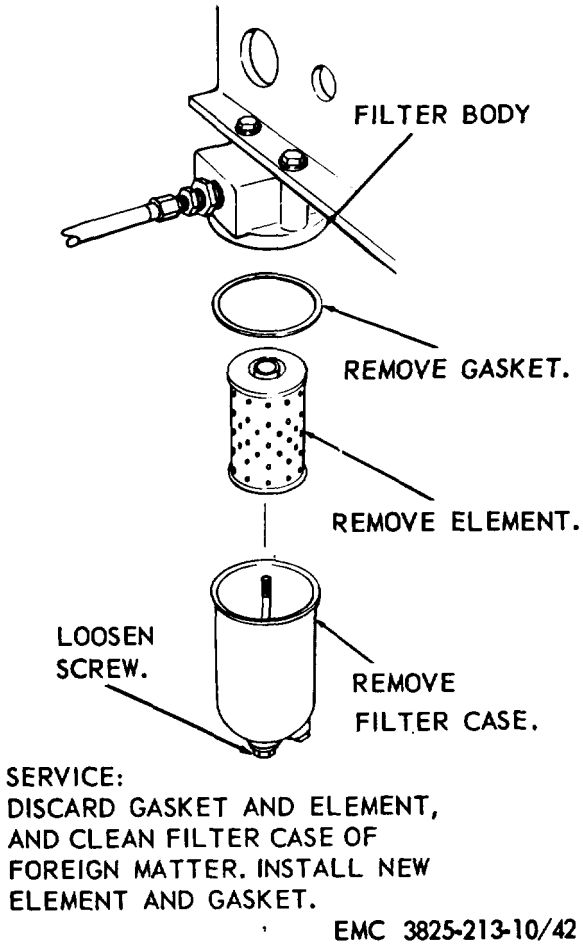


Figure 42. Carrier steering hydraulic oil filter service.

Section VI. CARRIER TIRES AND TUBES

89. General

The five tires of the snow removal unit are size 14:00 x 24, military type, having high traction, nondirectional tread.

90. Carrier Tires and Tubes

a. Inspection. Inspect the tires for cuts and bruises. A bruise will show a slight bulge in the tire. Report any cuts or bruises to organizational maintenance.

b. Service. Inflate the tires to 90 pounds per square inch (fig. 30).

Section VII. FRONT AND REAR AXLE VENTILATION SYSTEM

91. General

There are two ventilation breathers on the snow removal unit. One is located on the rear axle, top, right side, the other is on the front axle, top, left side. The breathers allow the escape of pressure built up within the axle housing.

92. Front and Rear Axle Ventilation Breather Service

Service the front and rear axle ventilation breathers as illustrated in figure 43.

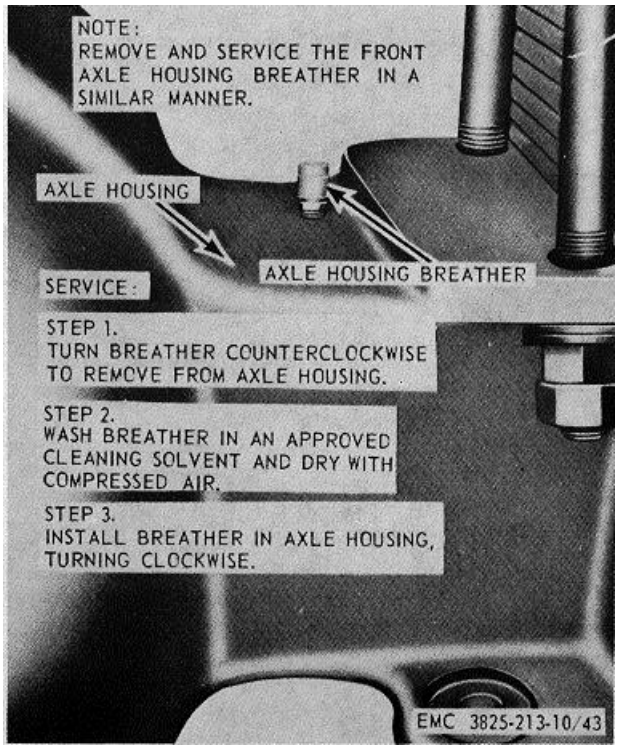


Figure 43. Front and rear axle ventilation breather service.

CHAPTER 5

SNOWPLOW MAINTENANCE INSTRUCTIONS

Section I. PLOW ENGINE FUEL SYSTEM

93. General

The plow engine fuel system consists of a plow engine fuel tank, two fuel pumps, fuel filter, and air cleaner. The following paragraphs describe and illustrate the maintenance functions to be performed by the operator for the plow engine fuel system.

94. Plow Engine Fuel Tank Service

Service plow engine fuel tank (fig. 31).

95. Plow Engine Fuel Filter Service

Service plow engine fuel filter (fig. 32).

96. Plow Engine Fuel Pump Service

Service plow engine fuel pump (fig. 34).

97. Plow Engine Air Cleaner Service

Service plow engine air cleaner (fig. 33).

98. Plow Engine Carburetor Adjustment

Adjust plow engine carburetor (fig. 35).

Section II. PLOW ENGINE COOLING SYSTEM

99. General

The plow engine cooling system consists of a radiator, water pump, fan, and necessary connecting lines and fittings. Thermostats automatically maintain the most desirable engine temperature under normal operating conditions. In extreme cold weather coolant is circulated through the engine heaters to preheat the coolant to aid in starting.

100. Plow Engine Radiator Service

Service plow engine radiator (fig. 36).

101. Plow Engine Fan Belt Adjustment

Adjust plow engine fan belt (fig. 37).

Section III. PLOW ENGINE HEATER FUEL SYSTEM

102. General

The plow engine heater fuel system consists of a fuel pump and fuel filter. Fuel is pumped from the plow fuel tank through the filter to the plow heater.

103. Plow Engine Heater Fuel Filter Service

Service plow engine heater fuel filter (fig. 38).

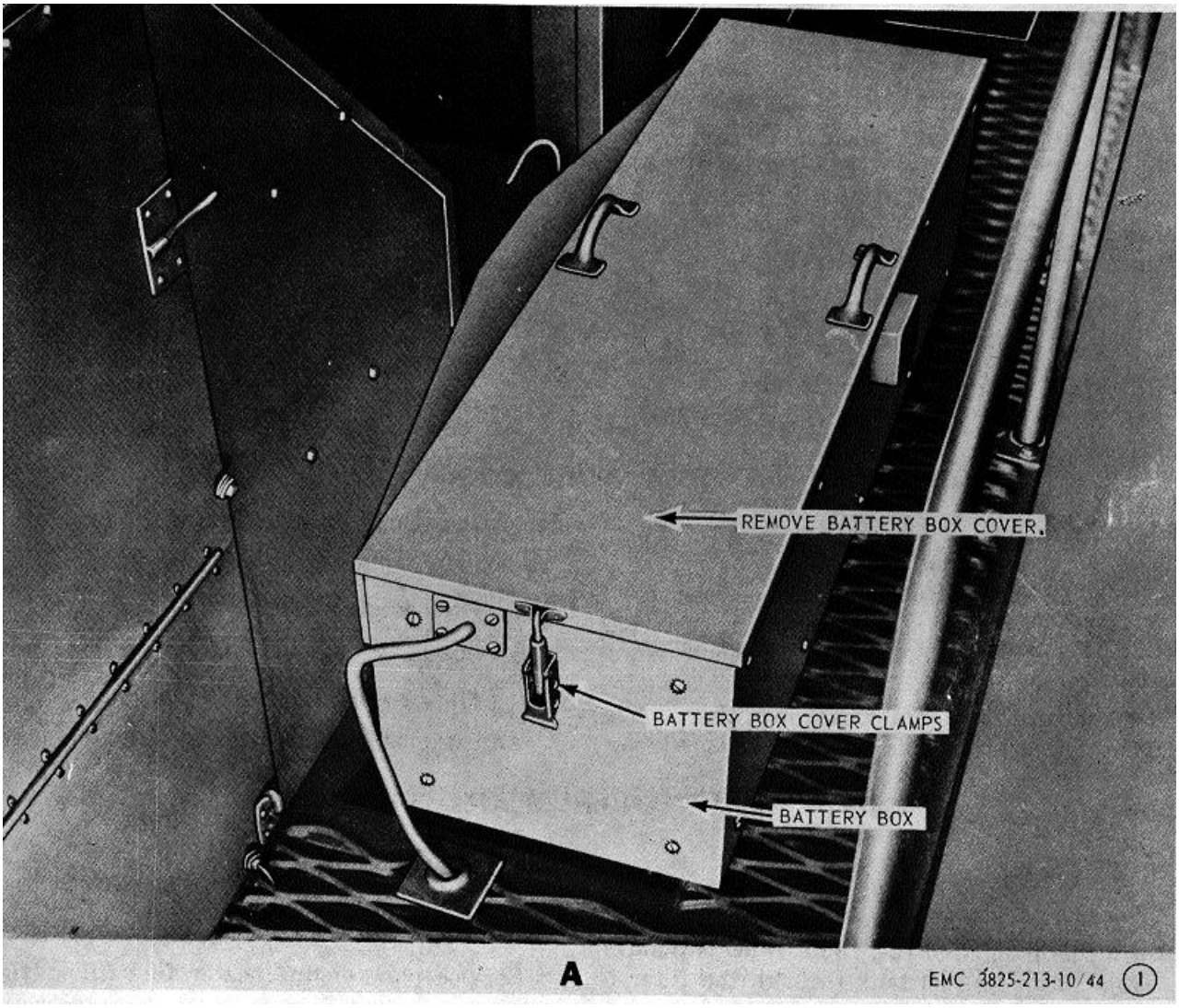
Section IV. CARRIER AND PLOW ELECTRICAL SYSTEM

104. General

The electrical system, which operates on 24 volts supplied by four 12-volt batteries, consists of a starter motor and a distributor. The carrier engine is supplied with an alternator which keeps the batteries charged when the unit is in operation. The following paragraphs describe and illustrate the maintenance functions to be performed by the operator for the carrier and plow electrical system.

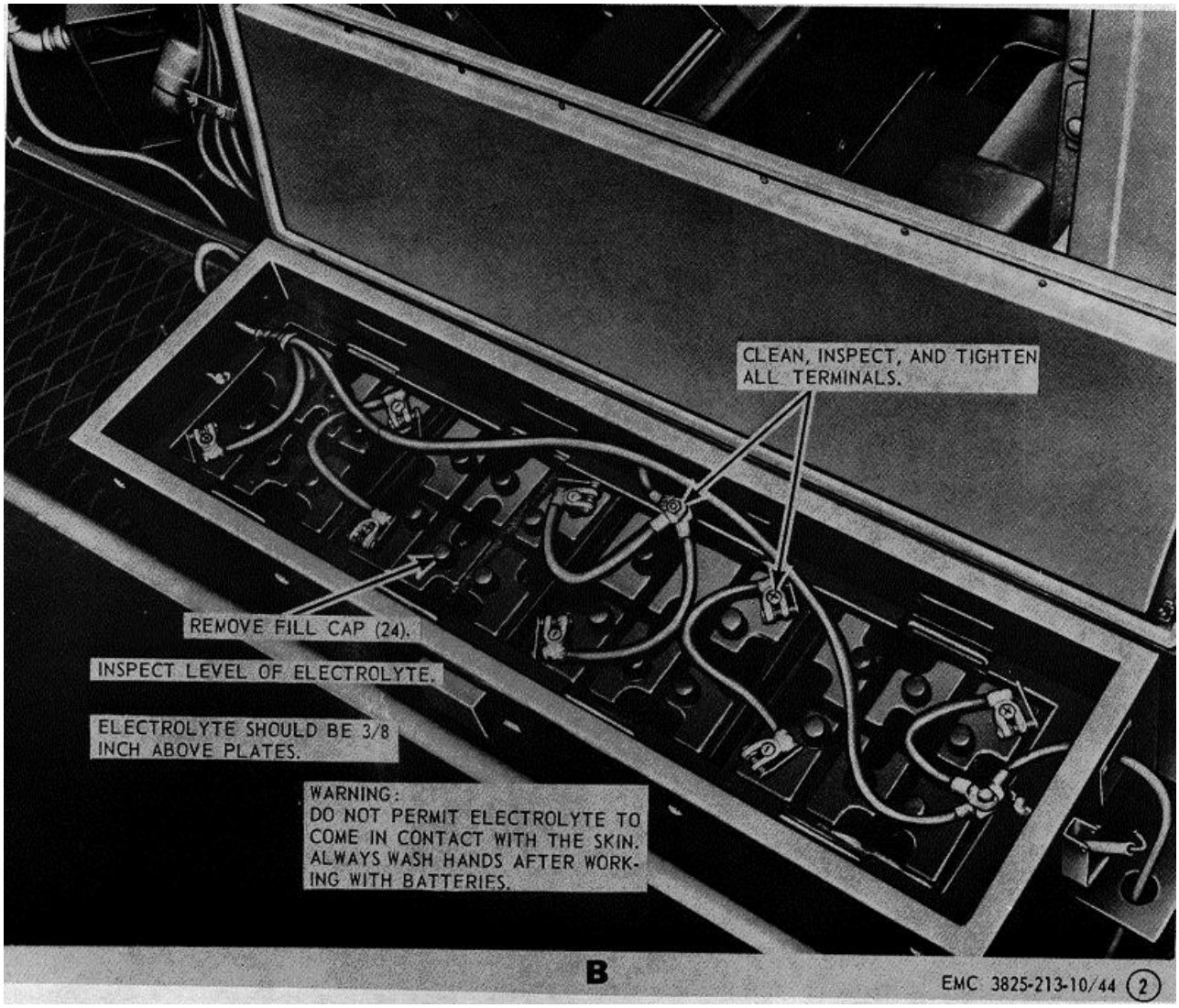
105. Batteries Service

Service batteries as illustrated in figure 44.



A. Battery box cover removal and installation

Figure 44. Battery box cover removal and installation and batteries service.



B. Battery service

Figure 44-Continued.

106. Alternator Belts Adjustment

Adjust alternator belts as illustrated in figure 45.

107. Instrument Panel Lamps

Replace panel lamps as illustrated in figure 46.

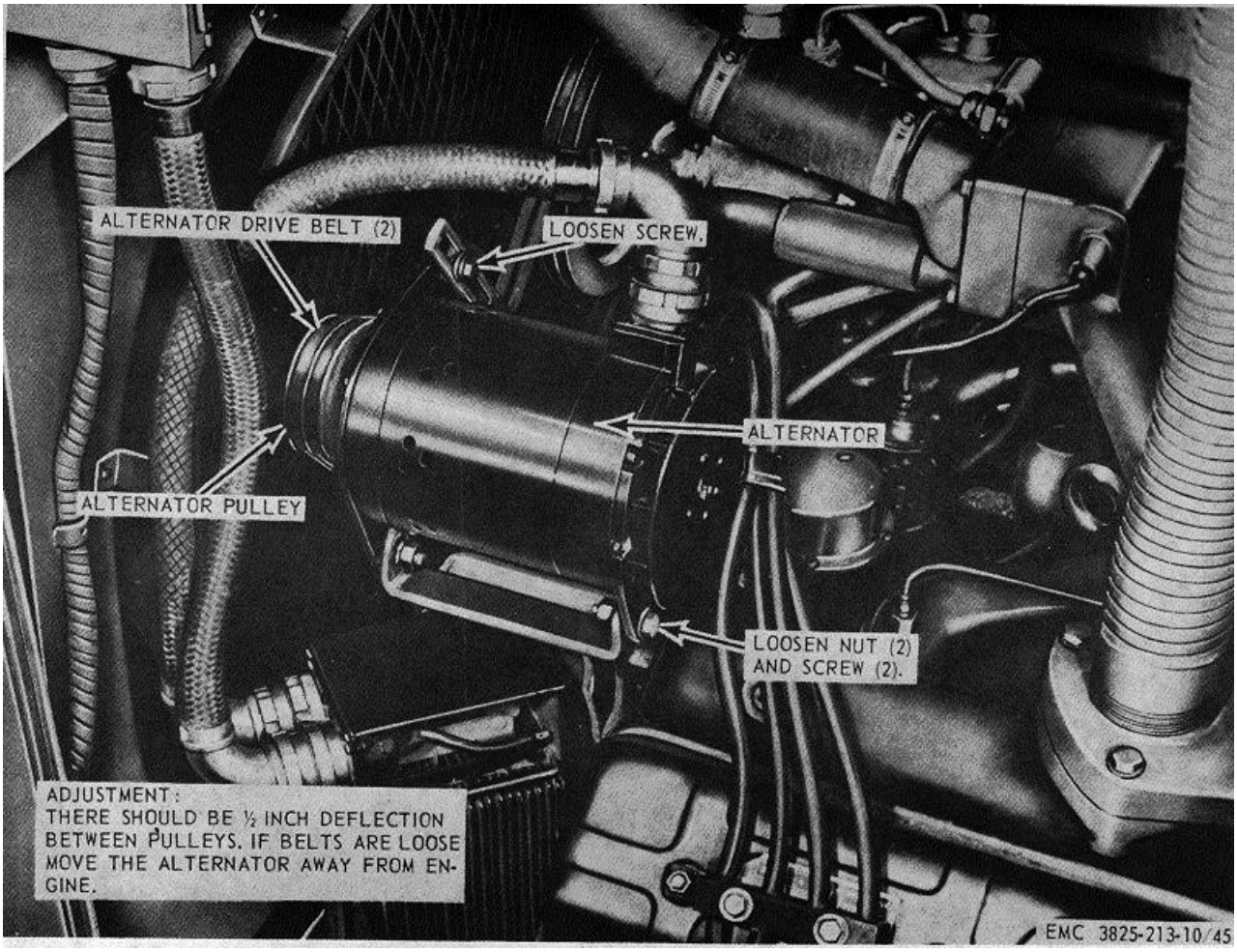


Figure 45. Alternator drive belts adjustment.

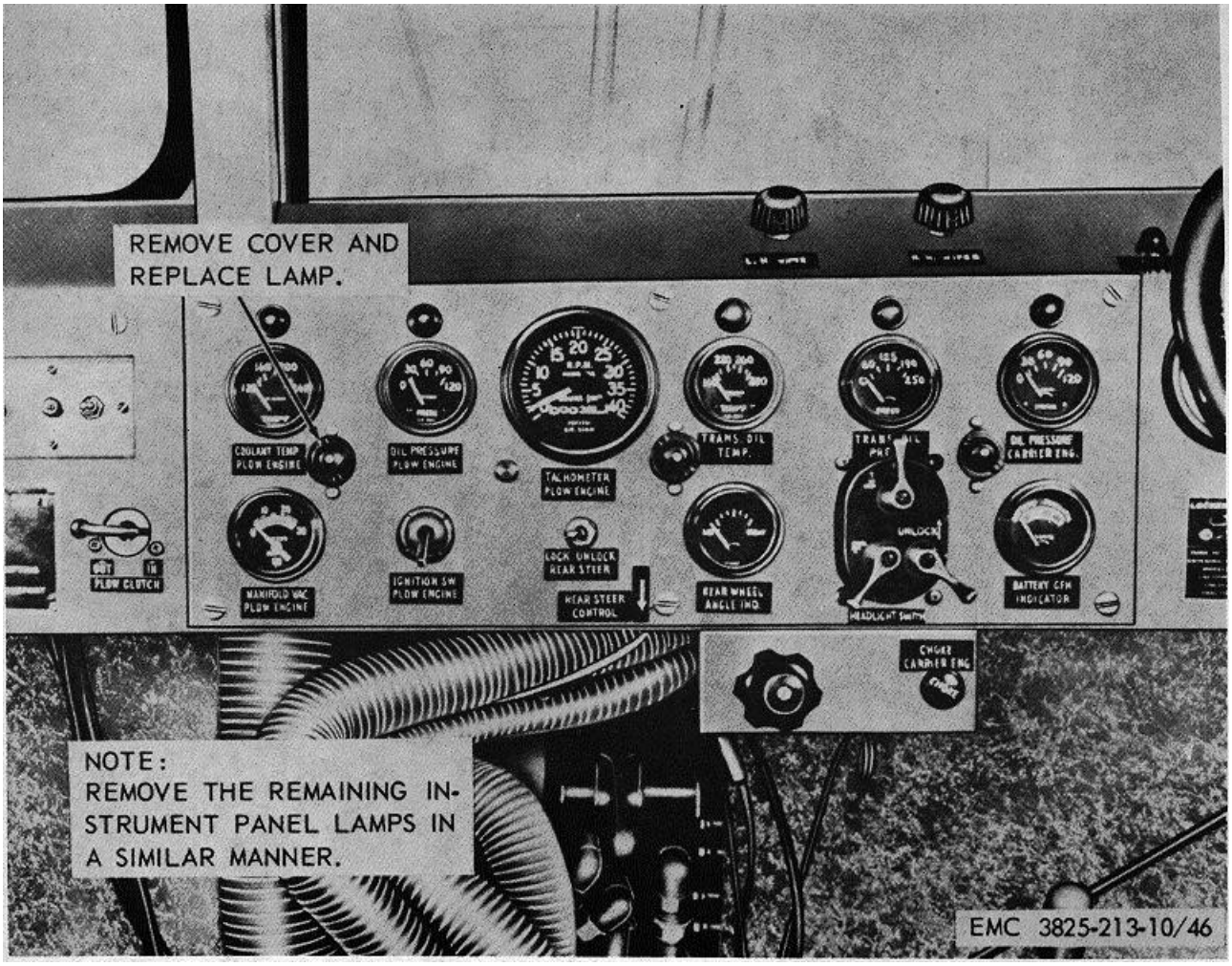


Figure 46. Instrument panel lamps removal and installation.

Section V. PLOW SHOE ASSEMBLY

108. General

The plow shoe assembly consists of the plow shoe and adjusting bracket. This section describes and illustrates the maintenance functions to be performed by the operator for the plow shoe assembly.

109. Plow Shoe Assembly Adjustment

Adjust plow shoe assembly as illustrated in figure 47.

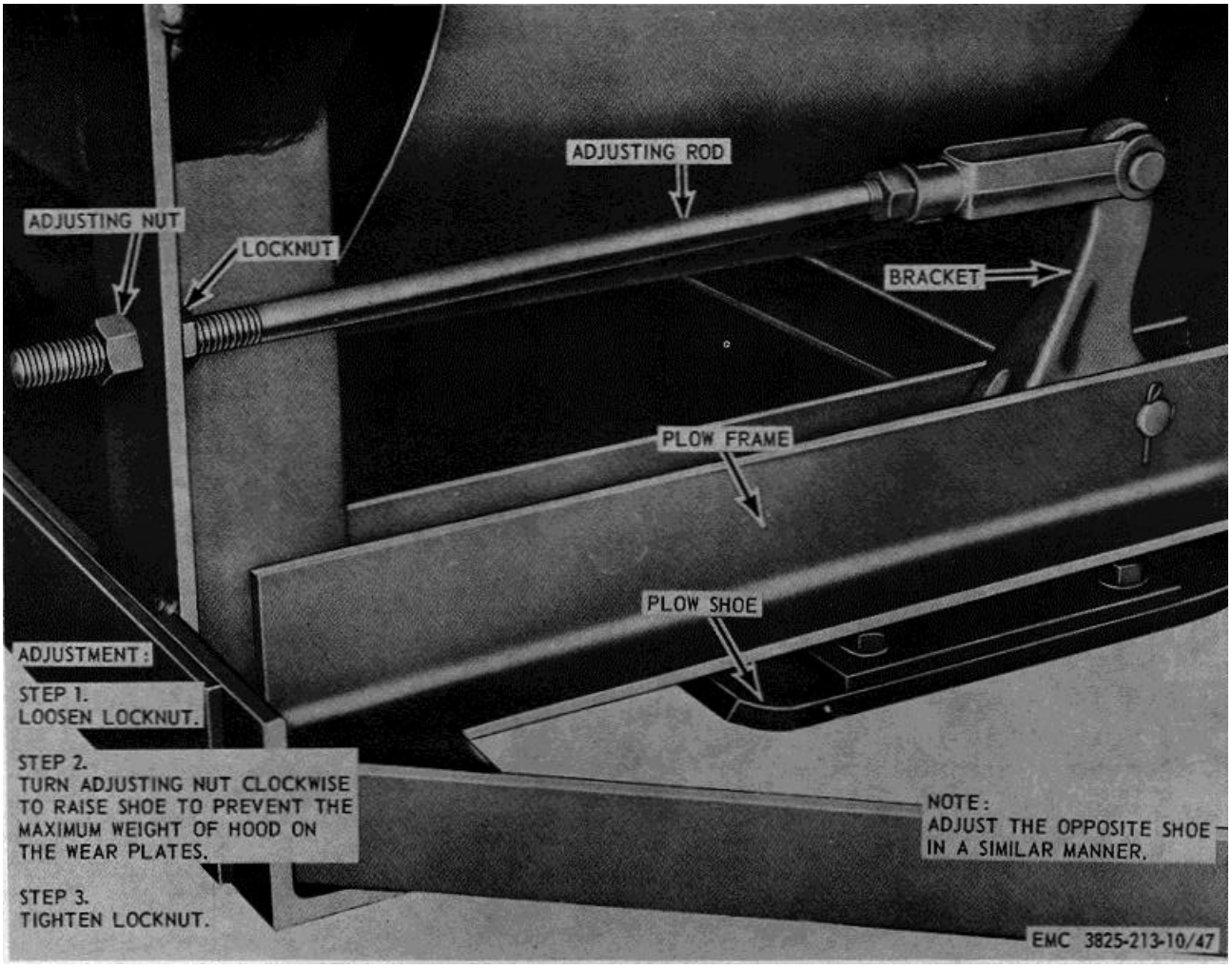


Figure 47. Plow shoe assembly adjustment.

Section VI. PLOW ENGINE CLUTCH ASSEMBLY

110. General

The plow engine clutch is air operated, controlled by a valve mounted within the carrier cab which actuates the clutch air chamber and linkage.

111. Plow Engine Clutch Adjustment

Adjust plow engine clutch as illustrated in figure 48.

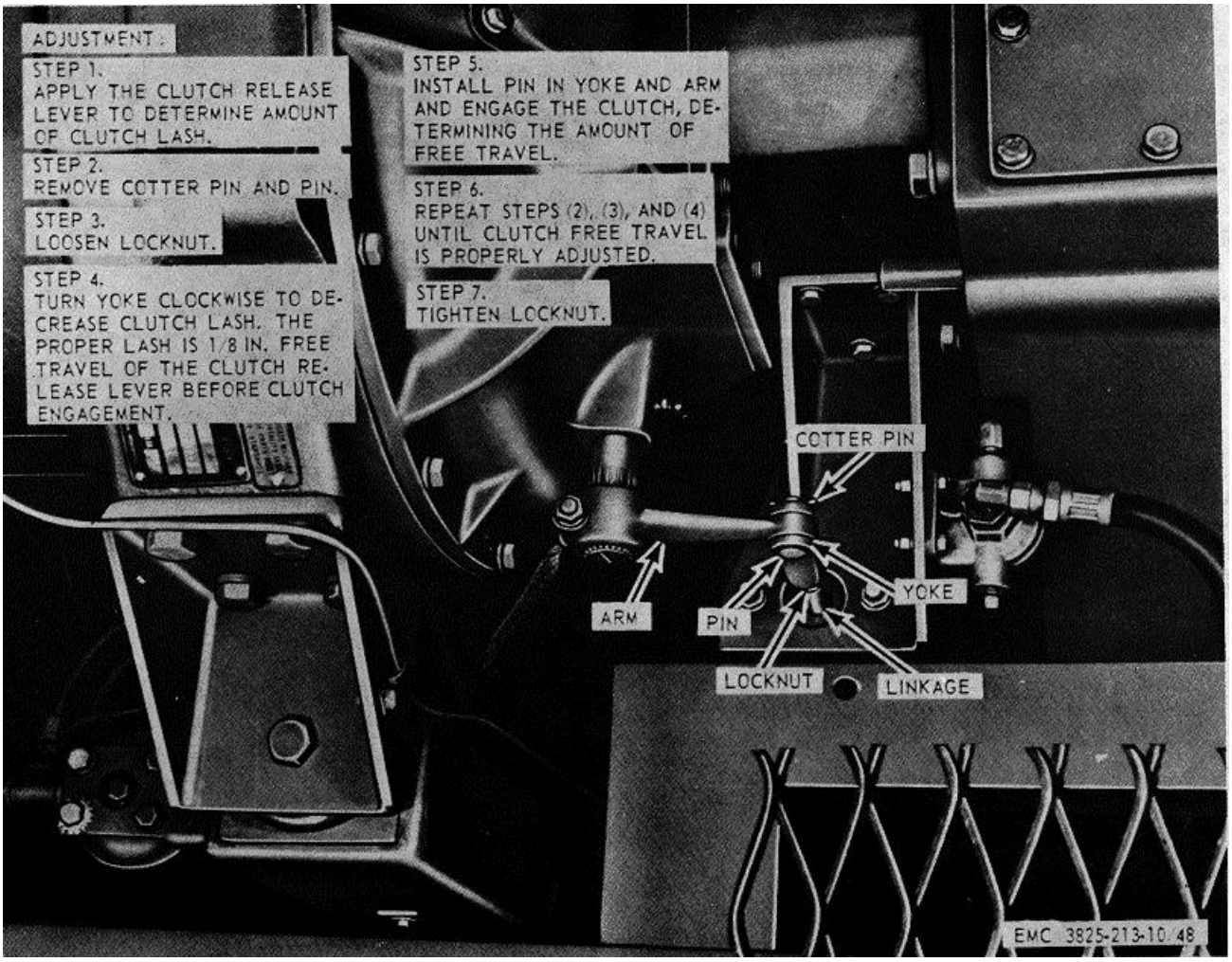


Figure 48. Plow engine clutch adjustment.

Section VII. PLOW HYDRAULIC SYSTEM

112. General

The plow hydraulic system consists of a plow hydraulic tank and filters, and hydraulic cylinders to actuate the vertical movement of the plow assembly A hydraulic motor operates the rotation of the plow chute.

113. Plow Hydraulic Tank Strainer Service

Service plow hydraulic tank strainer as illustrated in figure 49.

114. Plow Hydraulic Oil Filter Service

Service plow hydraulic oil filter as illustrated in figure 50.

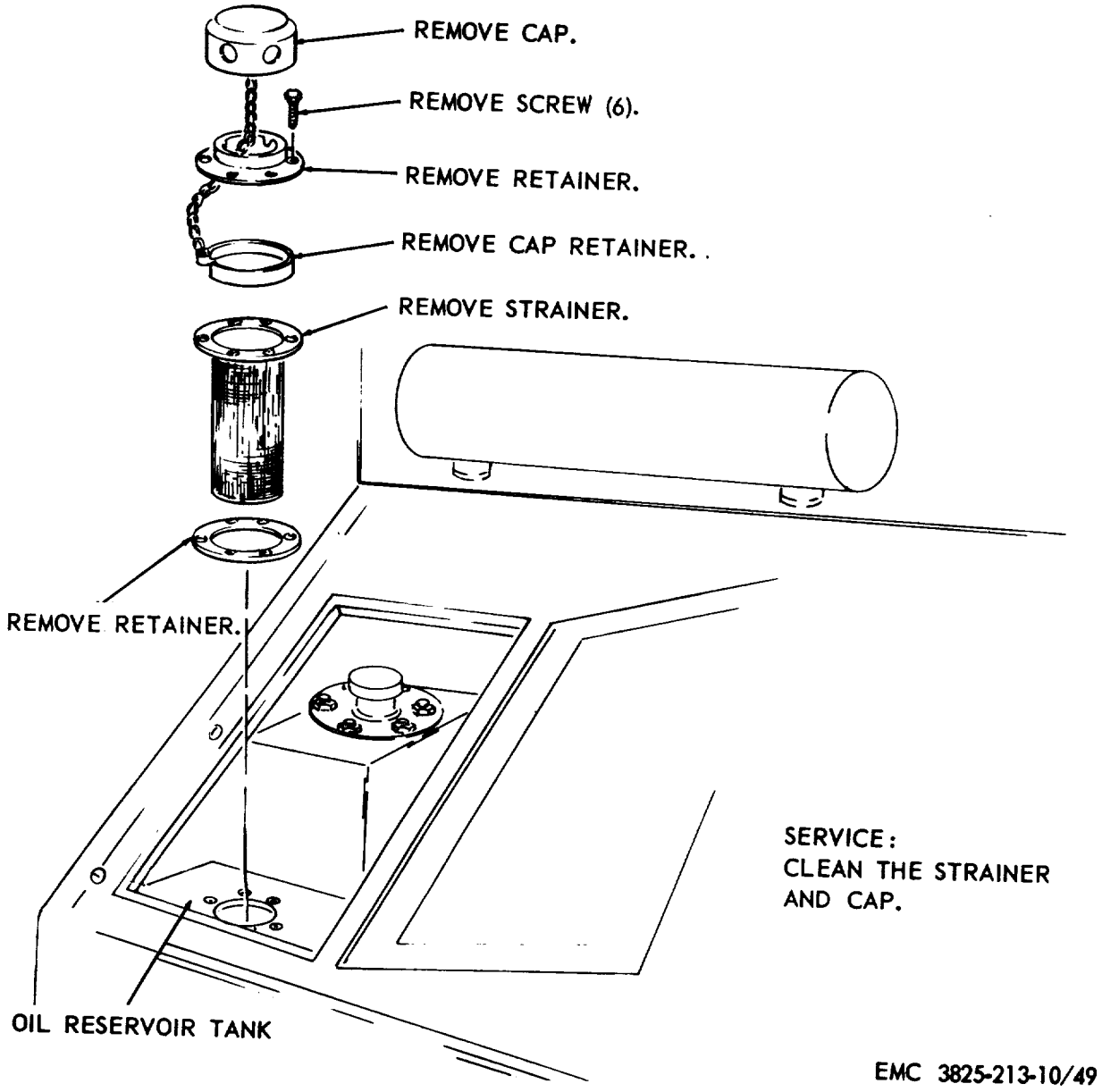


Figure 49. Plow hydraulic tank strainer service.

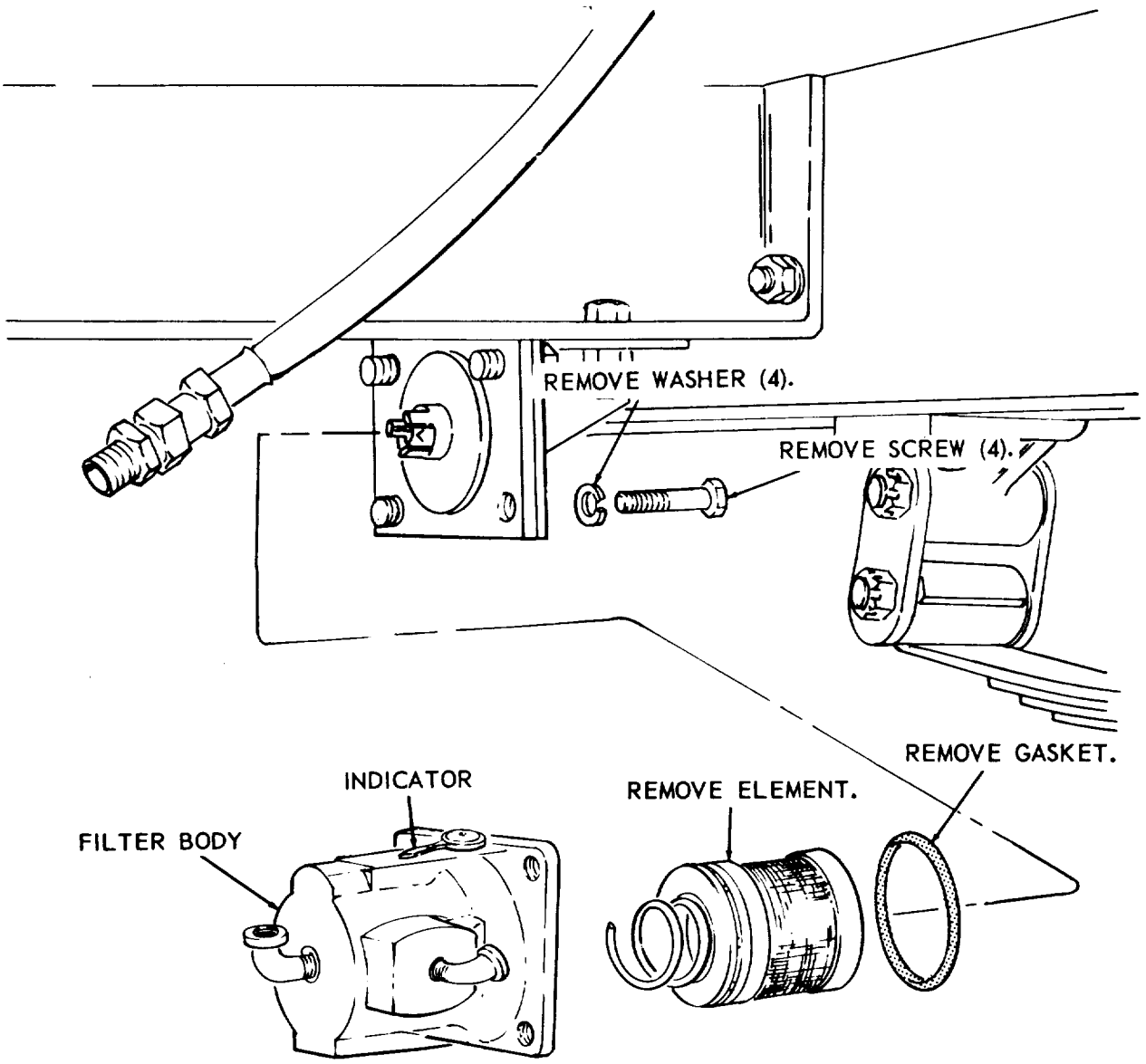


Figure 50. Plow hydraulic oil filter service.

Section VIII. FAN AND AUGER ASSEMBLY

115. General

This section describes and illustrates the maintenance functions to be performed by the operator for the fan and auger assemblies.

116. Auger Drive Shear Bolts Removal and Installation

Remove and install auger drive shear bolts as illustrated in figure 51.

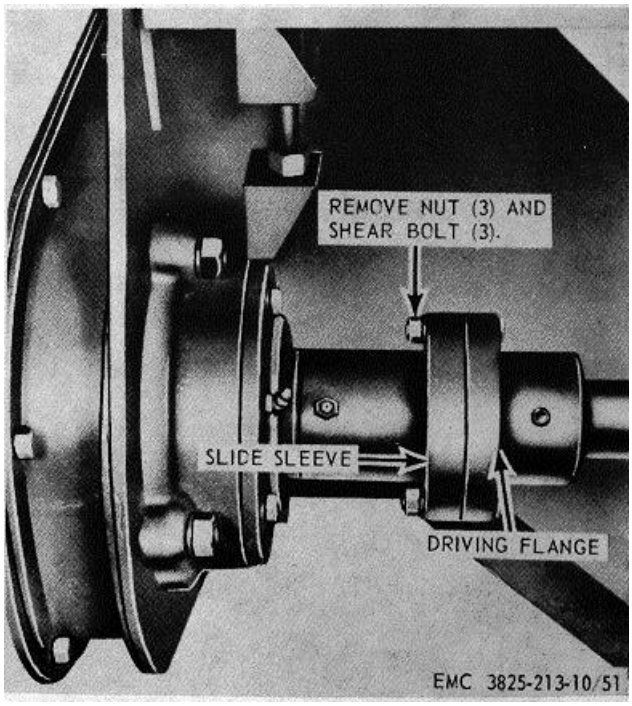


Figure 51. Auger drive shear bolts removal and installation.

117. Fan Shear Bolts Removal and Installation

Remove and install fan shear bolts as illustrated in figure 52.

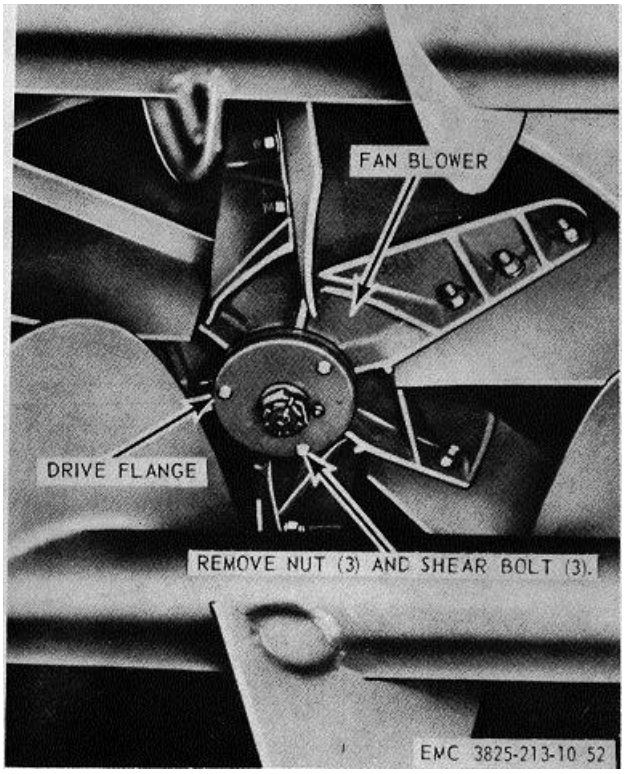


Figure 52. Fan shear bolts removal and installation.

Section IX. ACCESSORIES, COMPONENTS, AND ATTACHMENTS

118. General

This section describes and illustrates the services, adjustment, and maintenance functions to be performed by the operator for the cutter bar assembly and the carrier tire chains.

119. Snowplow Cutter Bar Assemblies

a. Description. The snowplow cutter bars serve as cutting knives for deep snow embankments. When the plow is moved into deep snow the cutter bars cut snow enbankments.

b. Removal and Installation. Remove and install the cutter bar assemblies as illustrated in figure 53.

120. Carrier Tire Chain

a. Description. The carrier tire chains are provided to give the unit more traction under icy conditions.

b. Removal and Installation. Remove and install the carrier tire chains as illustrated in figure 54.

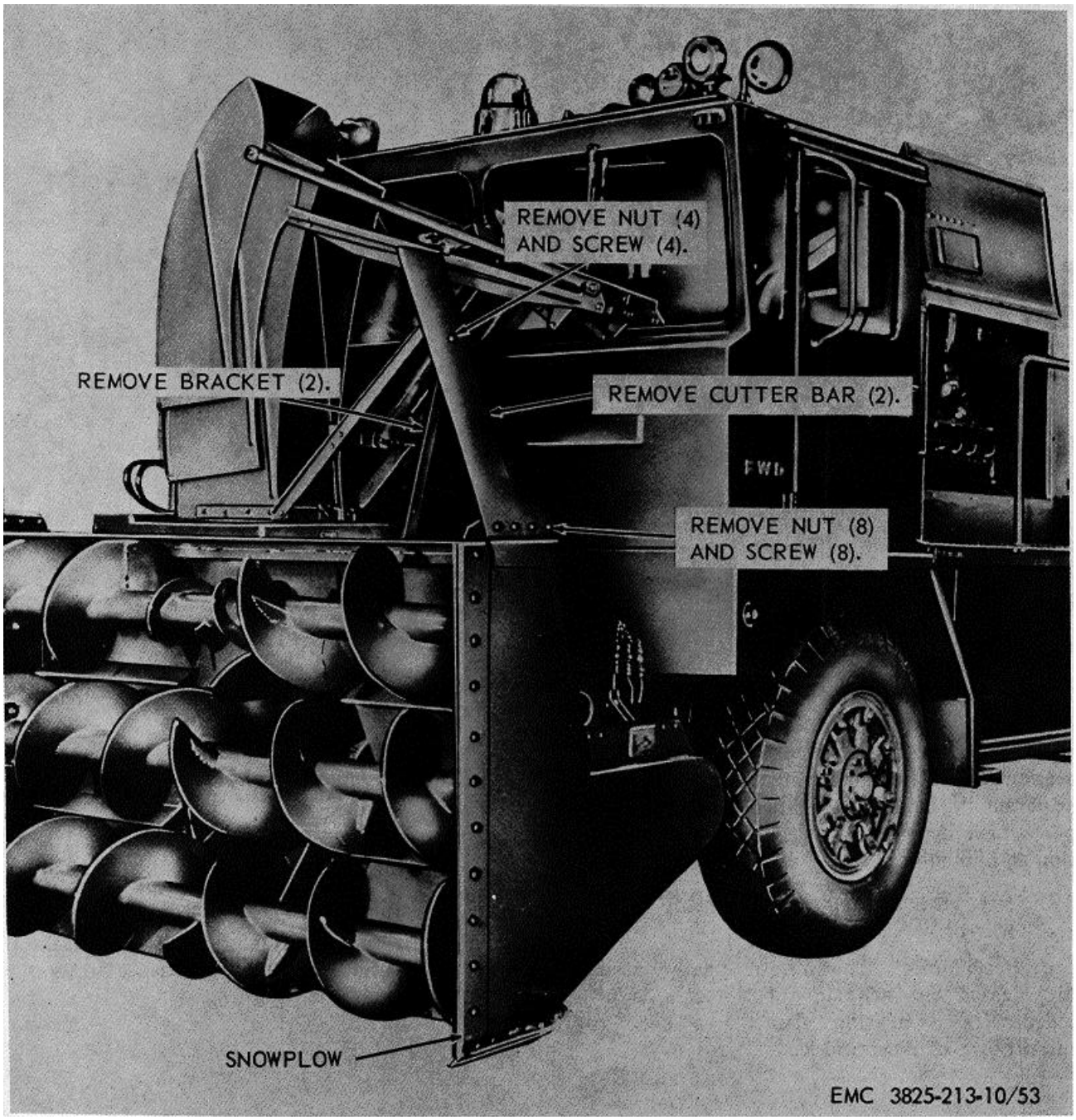


Figure 53. Snowplow cutter bars and brackets removal and installation.

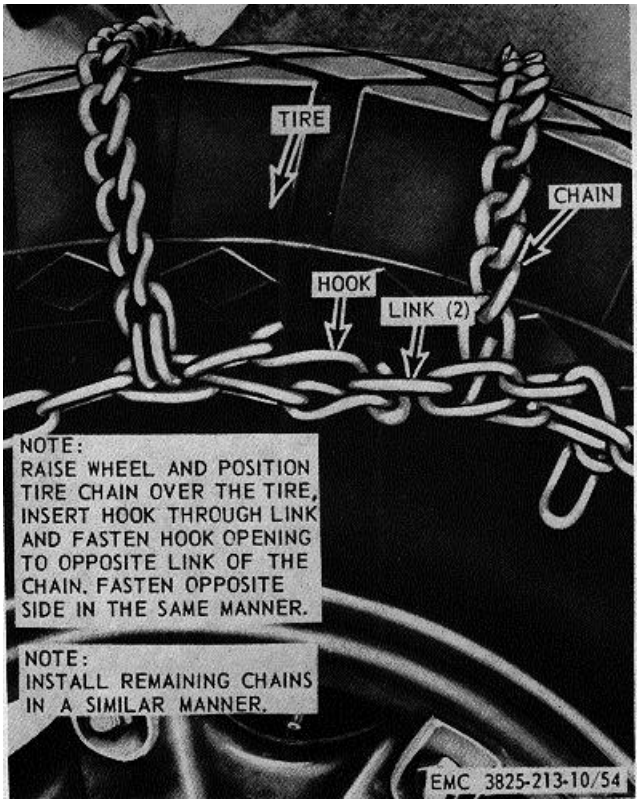


Figure 54. Carrier tire chains removal and installation

Section X. WINTERIZATION EQUIPMENT

121. General

The winterization equipment consists of the mirror heater assembly, transmission oil cooler, and air system alcohol dispenser. This section describes and illustrates the services, adjustments, and maintenance functions to be performed by the operator for the winterization equipment.

122. Rearview and Heater Assembly Mirror

a. Description. The mirror heater assembly located on each side of the cab, is provided with a heating element to keep the mirror free of frost and ice.

b. Operation and Adjustment. Operate and adjust mirror heater assembly as illustrated in figure 55.

123. Air System Alcohol Dispenser

The alcohol dispenser is located on the carrier engine just below the air compressor. Its purpose is to dispense alcohol into the air compressor return lines absorbing condensate in the lines and trapping condensate in the bowl.

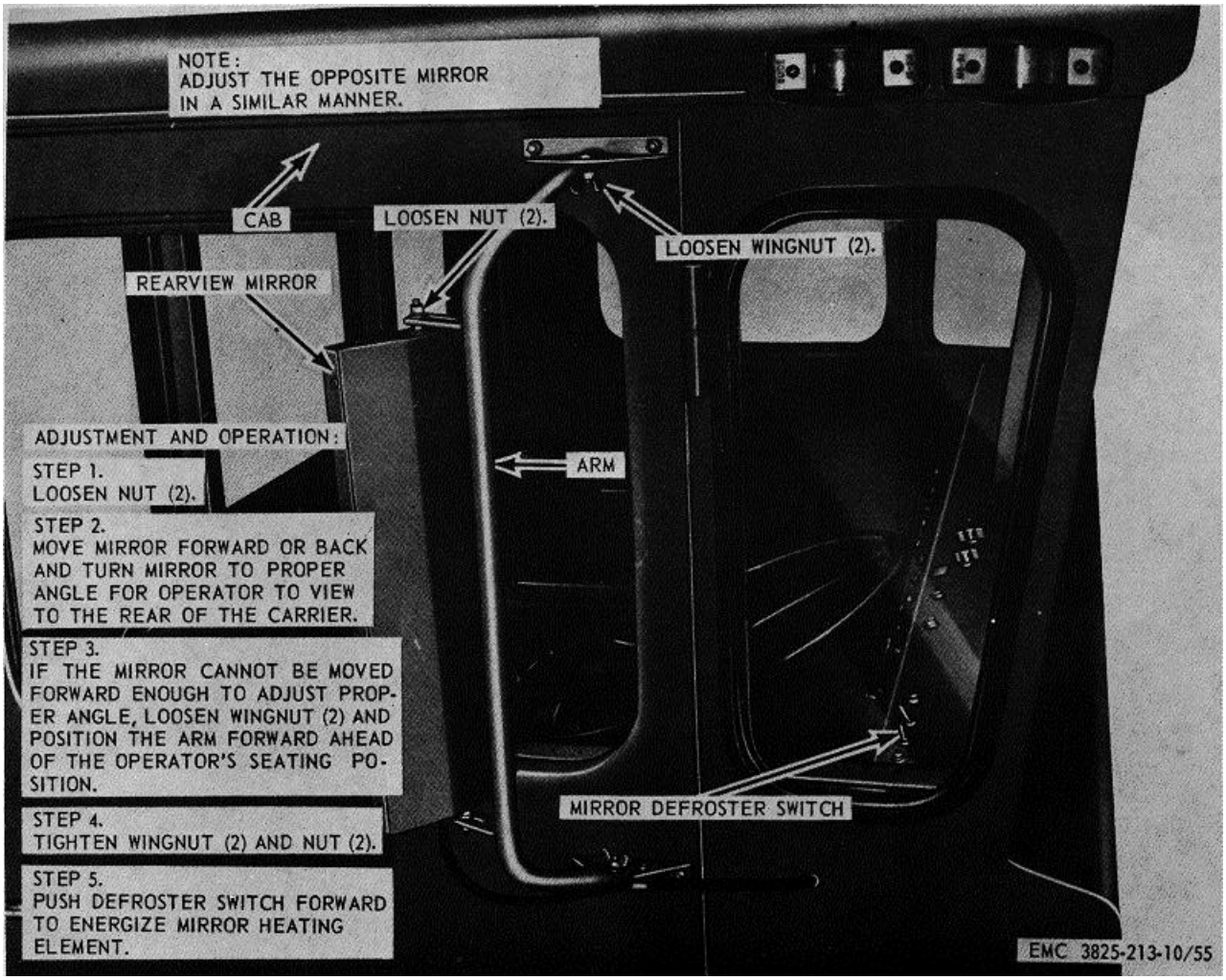


Figure 55. Rearview mirror adjustment and mirror heater operation.

CHAPTER 6

DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

124. General

When capture or abandonment of the snow removal unit is imminent, the responsible unit commander makes the decision either to destroy the unit or to render it inoperative. Based on this decision, orders are issued which cover the desired extent of destruction. Whatever method of demolition is employed, it is essential to destroy the same vital parts of all snow removal units and all corresponding repair parts.

125. Demolition To Render Equipment Inoperative

a. Mechanical Means. Use sledge hammers, crowbars, picks, axes, or any other heavy tools which may be available, together with tools normally included with the snow removal unit to destroy the following:

(1) Carrier transmission housing.

(2) Power transfer housing.

(3) Plow transmission housing.

(4) Carrier engine fuel pump, carburetor, distributor, governor, water pump, air compressor, block, and manifold.

(5) Plow engine fuel pump, carburetor, magnetos, governor, water pumps, cylinder block, crankcase and manifolds.

(6) Controls and instruments.

Note.

The above steps are minimum requirements for this method.

(7) Carrier propeller shafts.

(8) Tires and wheels.

(9) Engine starting motors.

(10) Carrier engine alternator.

(11) Engine radiator.

(12) Fuel tanks.

b. Misuse.

(1) Drain radiator and engine crankcase. Put sand, gravel, nuts, bolts, screws, or broken glass in the oil filter tube.

(2) Disconnect radiator fan and run engine at full throttle.

Note

The above steps are minimum requirements for this method.

126. Demolition by Explosives or Weapons Fire

a. Explosives. Place as many of the following charges (fig. 56) as the situation permits and detonate them simultaneously with detonating cord and a suitable detonator.

(1) *Carrier assembly*.

(a) One 1/2-pound charge on front differential housing.

(b) One 1/2-pound charge on carrier transfer case.

(c) One 1/2-pound charge on carrier transmission.

(d) One 1/2-pound charge on rear differential housing.

(e) One 1/2-pound charge on carrier torque converter.

(f) Two 1/2-pound charges on carrier engine block between manifolds.

(g) Two 1/2-pound charges on plow engine block between manifolds.

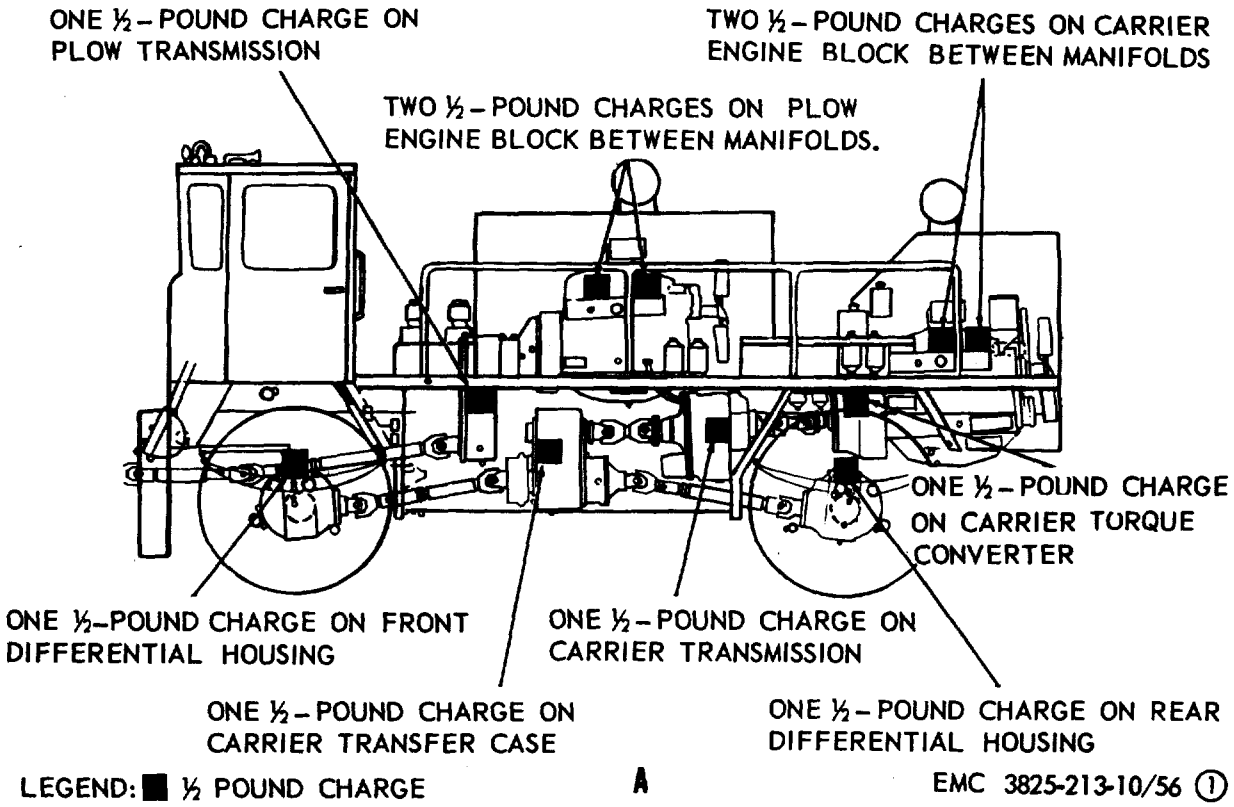
(h) One 1/2-pound charge on plow transmission.

(2) *Plow assembly*.

(a) One 1/2-pound charge on middle auger bearing.

(b) One 1/2-pound charge under fan gearcase.

b. Weapons Fire. Fire on the snow removal unit with the heaviest practical weapons available.



A. Carrier assembly

Figure 56. Placement of charges.

127. Other Demolition Methods

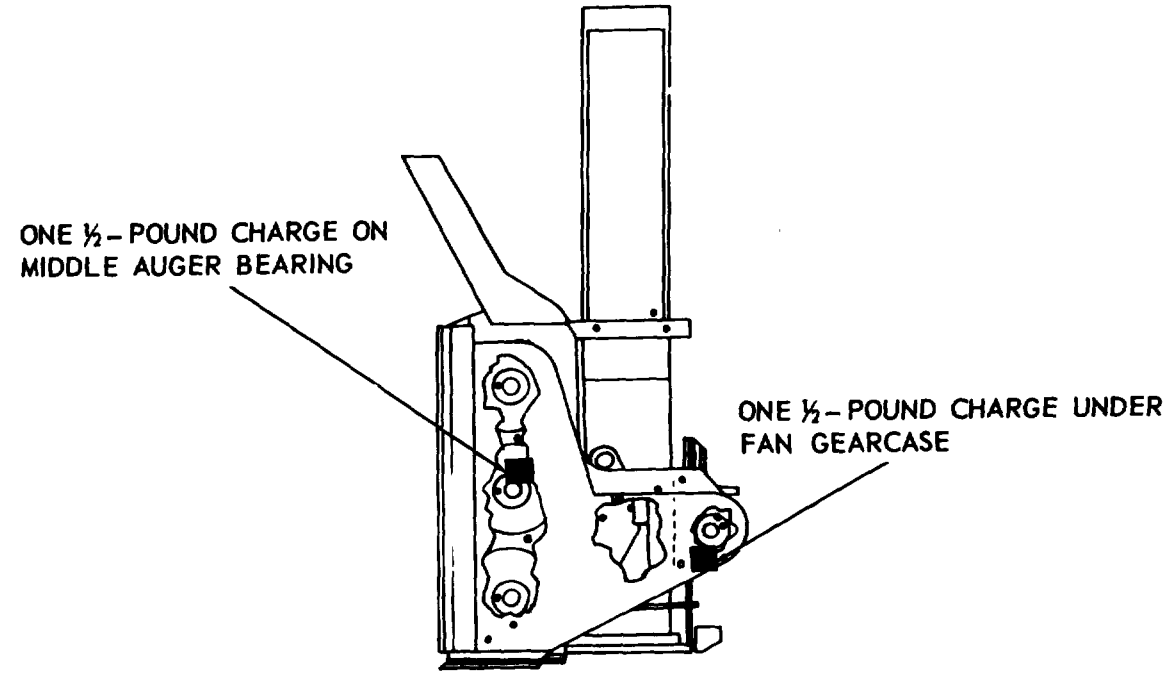
a. Scattering and Concealment. Remove all easily accessible parts such as the carburetor, fuel pump, distributor, governor, alternator, and spark plugs. Scatter these parts through dense foliage, bury them in dirt or sand, or throw them in a lake, well, stream, or other body of water.

b. Burning. Pack rags, clothing, or canvas under, around, and inside the engines. Saturate this packing with gasoline, oil, or diesel fuel, and ignite.

c. Submersion. Drive the unit into a body of water to provide some water damage and concealment. Salt water will do the greatest damage to vital parts.

128. Training

All operators should receive thorough training in the destruction of the snow removal unit. Refer to FM 5-25. Simulated destruction, using all of the methods listed above, should be included in the operator training program It must be emphasized in training, that demolition operations are usually necessitated by critical situations when time available for carrying out instructions is limited. For this reason, it is necessary that operators be thoroughly familiar with all methods of destruction of equipment and be able to carry out demolition instructions without reference to this or any other manual.



LEGEND: ■ ½ POUND CHARGE

B

EMC 3825-213-10/56 ②

B. Plow assembly

Figure 56-Continued.

APPENDIX I

REFERENCES

1. Dictionaries of Terms and Abbreviations

AR 320-6	Dictionary of United States Army Terms.
AR 320-50	Authorized Abbreviations and Brevity Codes.

2. Fire Protection

TM 5687	Repairs and Utilities: Fire Protection Equipment and Appliances: Inspection, Operations and Preventive Maintenance.
TM 9-1799	Ordnance Maintenance Fire Extinguishers.

3. Lubrication

LO 5825-213-20	Snow Removal Unit, Self-Propelled: Gasoline Driven; Rotary; Wheel MTD; Winterized (FWD Model 9349-V).

4. Preventive Maintenance

AR 750-50	Maintenance Responsibilities and Shop Operation.
TB ENG 347	Winterization Techniques for Engineer Equipment.
TM 5-505	Maintenance of Engineer Equipment.
TM 9-6140-200-15	Storage Batteries, Lead Acid Types.

5. Publication Indexes

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Lubrication Orders, and Modification Work Orders.

6. Supply Publications

SM 10-1-C4-1	Petroleum, Petroleum Base Products, and Related Material.

7. Painting

TB ENG 60	Preservation and Painting of Serviceable Corp of Engineers Equipment.

8. Training Aids

FM 5-25	Explosives and Demolition.

APPENDIX II

BASIC ISSUE ITEMS

Section I. INTRODUCTION

1. General

Section II lists the accessories, tools, and publications required in 1st echelon maintenance and operation, initially issued with, or authorized for the snow removal unit.

2. Explanation of Columns

a. Source Codes.

(1) *Technical service*. This column lists the basic number of technical service assigned supply responsibility for the part. Blank spaces denote Corps of Engineers supply responsibility. General Engineer supply parts are identified by the letters GE in parentheses, following the nomenclature in the description column. Other technical services basic numbers are-

9-Ordnance Corps
10-Quartermaster Corps
12-Adjutant General's Corps

(2) *Source*. The selection status and source of supply for each part are indicated by one of the following code symbols:

(a) P-applied to high mortality repair parts which are stocked in or supplied from the technical service depot system, and authorized for use at indicated maintenance echelons.

(b) P1-applied to repair parts which are low mortality parts, stocked in or supplied from technical service depots, and authorized for installation at indicated maintenance echelons.

(3) *Maintenance*. The lowest maintenance echelon authorized to use, stock, install, or manufacture the part is indicated by the following code symbol:

O-Organizational Maintenance (lst and 2d Echelon)

b. Federal Stock Numbers. When a Federal stock number is available for a part, it will be shown in this column, and used for requisitioning purposes.

c. Description.

(1) The item name and a brief description of the part are shown.

(2) A five-digit Federal supply code for manufacturers and/or other technical services is shown in parentheses followed by the manufacturer's part number. This number will be used for requisitioning purposes when no Federal stock number is indicated in the Federal stock number column. *Example*: (33844) 16161

(3) The letters GE shown in parentheses immediately following the description, indicate General Engineer supply responsibility for the part.

d. Unit of Issue. Where no abbreviation is shown in this column, the unit of issue is "each."

e. Expandability. Those items classified as nonexpendable are indicated by letters NX. Items not indicated by NX are expendable.

f. Quantity Authorized. This column lists the quantities or repair parts, accessories, tools, or publications authorized for issue to the equipment operator or crew as required.

g. Quantity Issued With Equipment. This column lists the quantities of repair parts, accessories, tools, or publications that are initially issued with each item of equipment. Those indicated by an asterisk are to be requisitioned through normal supply channels as required.

h. Illustrations.

(1) *Figure number*. Provides the identifying number of the illustration.

(2) *Item number*. Provides the referenced number for the part shown in the illustration.

3. Federal Supply Cod for Manufacturers

23382-Four Wheel Drive Auto Co.

33844-Klauer Mfg. Co.

4. Comments and Suggestions

Suggestions and recommendations for changes to the basic issue items list will be submitted on DA Form 2028 to the Commanding General, Military Construction Supply Agency/U.S. Army Engineer Maintenance Center, Corps of Engineers, ATTN: MCSDM, P.O. Box 119, Columbus 16, Ohio. Direct communization is authorized.

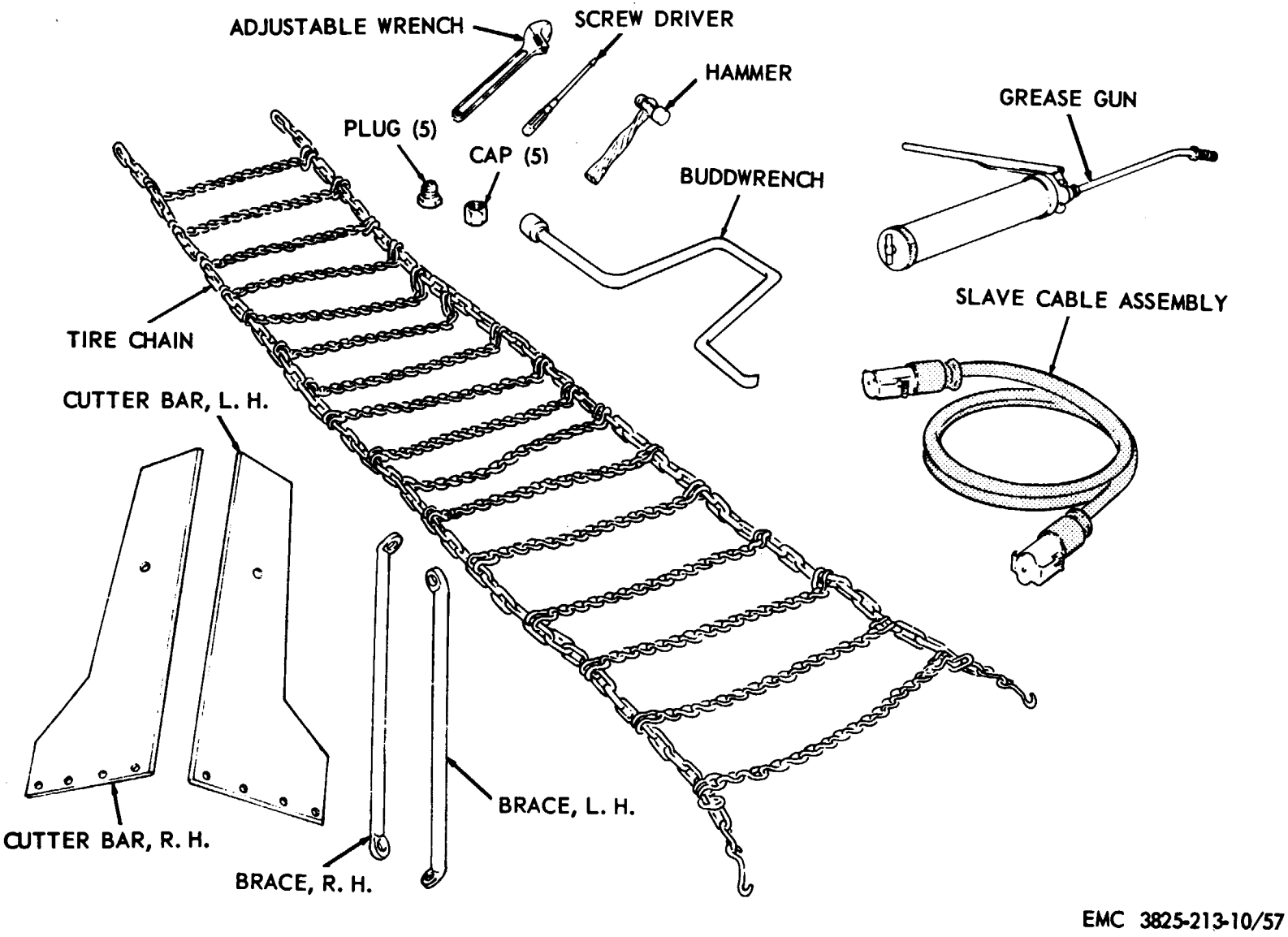


Figure 57. Basic issue items.

Section II. BASIC ISSUE ITEMS LIST

Source codes				Federal Stock Stock No.	Description	Unit of issue	Ex-pend ability	Qty Auth-or-ized	Qty Issued with Equip-ment	Illustrations	
Tech-nical Service	Source	Mainte-nance	Re-cover-ability							Fig No.	Item No.
					GROUP 06-ELECTRICAL SYSTEM (ENGINE AND VEHICULAR)						
					0612-BATTERIES						
9	P	O	----	6140-057-2554	BATTERY, STORAGE: 12 volts, 6 cell.	----	NX	4	4		
9	P	O	----	6810-264-9063	SULPHURIC ACID: elec-trolyte.	GAL	----	7	7		
					GROUP 26-ACCESSORIES, PUBLICATIONS. TEST EQUIPMENT AND TOOLS						
					2602.1-ACCESSORIES						
10	P	O	----	7520-559-9618	CASE: operation and maintenance pub lications, cotton duck, water repellent and mildew resistant MIL-B-11743-B	----	----	1	1		
10	X2	O	----	----------	SLAVE CABLE ASSEMBLY (23382) 195882	----	----	1	(*)	57	
10	P	O	----	----------	CUTTER BLADE FOR PLOW: left-hand, right-hand (33844).	----	----	2	(*)		
5	--	--	----	3825-351-0867	16161-right-hand						
5	--	--	----	3825-431-1766	16162-left-hand						
10	P	O	----	2540-054-0031	TIRE CHAINS (23382) 2296-SH	----	----	4	(*)	57	
10	X2	O	----	----------	CAP 5/16" (23382) 10615564	----	----	1	1	57	
10	X2	O	----	----------	PLUG 5/16" (23382) 10615566	----	----	1	1	57	
10	X2	O	----	----------	CAP 3/8" (23382) 10615411	----	----	2	2	57	
10	X2	O	----	----------	PLUG 3/8" (23382) 10615567	----	----	2	2	57	
10	X2	O	----	----------	CAP 1/2" (23382) 10615565	----	----	2	2	57	
10	X2	O	----	----------	PLUG 1/2" (23382) 10615568	----	----	2	2	57	
					The above 6 items are for use when the front axle is removed for Berne clearance.						
					2602.2-COMMON TOOLS						
9	P	O	----	5120-277-9491	SCREWDRIVER, FLAT: 1/4 in. tip 9 in. lg.	----	----	1	(*)		
10	P	O	----	5120-240-5328	WRENCH, open end, adjustable, 8 in.	----	----	1	(*)		
10	P	O	----	5120-243-2963	HAMMER, ball peen 1-1/2 lb.						
10	P	O	----	4930-360-2801	GUN, grease, lever type.	----	----	1	(*)		
10	P	O	----	5120-473-6541	WRENCH, wheel stud nut	----	----	1	(*)	57	

Source codes				Federal Stock Stock No.	Description	Unit of issue	Ex-pend ability	Qty Auth-or-ized	Qty Issued with Equip-ment	Illustrations	
Tech-nical Service	Source	Mainte-nance	Re-cover-ability							Fig No.	Item No.
					2602.4-PUBLICATIONS						
12	--	--	----	----------	DEPARTMENT OF THE ARMY LUBRICATION ORDER LO 5-3825-213-20.			1	1		
12	--	--	----	----------	DEPARTMENT OF THE ARMY OPERATOR'S TECHNICAL MANUAL TM 5-3825-213-10.	----	----	2	2		
12	--	--	----	----------	DEPARTMENT OF THE ARMY ORGANIZATIONAL MAINTE-NANCE MANUAL TM 5-3825-213-20.	----	----	2	2		
12	--	--	----	----------	DEPARTMENT OF THE ARMY ORGANIZATIONAL MAINTE-NANCE REPAIR PARTS AND SPECIAL TOOL LISTS MANUAL TM 5-3825-213-20P.	----	----	2	2		
					GROUP 76-FIRE FIGHTING. EQUIPMENT						
					7603-FIRE EXTINGUISHERS						
	P1	O	----	4210-202-7858	EXTINGUISHER, FIRE, CARBON DIOXIDE: charged, hand, nonshatterable cylinder, permanent shutoff valve, squeeze grip control, 15 lbs MIL Spec E, 468-C Type 1, Class 1. (GE)	----	----	1	1		
	P1	O	----	4210-383-7129	EXTINGUISHER, FIRE, CARBON DIOXIDE: charged, hand, nonshatterable cylinder, permanent shutoff valve, squeeze grip or trigger control 5 lbs MIL Spec E-468-C Type 1, Class 1. (GE)	----	----	See note.			
	P1	O	----	4210-555-8837	EXTINGUISHER, FIRE MONOBROMOTRIFLUORO-METHANE: charged, hand-shatter-able cylinder, penetrating seal valve, stored pressure, w/bracket, 2.75 lbs (Halon-1301) MIL Spec E-52031. (GE)	----	----	1	1		

Source codes				Federal Stock Stock No.	Description	Unit of issue	Ex-pend ability	Qty Auth-or-ized	Qty Issued with Equip-ment	Illustrations	
Tech-nical Service	Source	Mainte-nance	Re-cover-ability							Fig No.	Item No.
	P	O	----	4210-708-0031	CYLINDER, FIRE EXTIN-GUISHER: charged; 2.75 lb monobromotrifluoromethane; pressurized w/nitrogen or air; red body, shade 1136 MIL Spec-T-707. (GE)	----	----	1	(*)		
	P	0	----	4210-779-3516	SEAL, FIRE EXTINGUISHER, SELF-LOCKING Stoffel Seals Corp. SEL-1 or equal (GE)	----	----	1	(*)		
					Note. Requisition CO_2 extinguisher until depot stocks are exhausted.						

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BY ORDER OF THE SECRETARY OF THE ARMY:

G. H. DECKER,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:
USASA (2)
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Atlanta GENDEP (4)
Utah GENDEP (4)
Memphis GENDEP (4)
Sharpe GENDEP (4)
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5-267 (1)
5-278 (5)
5-279 (2)
5-500 EA, EB (2)

NG: State AG (3).
USAR: Same as Active Army except allowance is one copy to each unit.
For explanation of abbreviations used, see AR 320-50.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1990 0 - 262-912 (30434)

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN...JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL.

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PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.

IN THIS SPACE, TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT.

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER	SIGN HERE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 decagram = 10 grams = .35 ounce
1 hectogram = 10 decagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

PIN: 005494-004