TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

[Including Repair Parts Information and Supplemental Maintenance and Repair Parts Instructions)

TRAILER, FLATBED, 15 TON PAYLOAD MULTI AXLE (CCE)

NSN 2330-01-060-8141

This copy is a reprint which includes current pages from Changes 1 through 3.

HEADQUARTERS, DEPARTMENT OF THE ARMY
FEBRUARY 1980

CHANGE

NO. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, 23 August 1984

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

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TRAILER, FLATBED, 15 TON PAYLOAD, MULTI-AXLE (CCE)

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TM 5-2330-361-14&P, 18 February 1980, is changed as follows:

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

Remove Pages	Insert Pages	Remove Pages	Insert Pages
iii and 1-1	iii and 1-1	8-4 and 8-5	8-4 and 8-5
2-1 and 2-2	2-1 and 2-2	9-1 and 10-1	9-1 and 10-1
4-4 through 4-9	4-4 through 4-9	10-4 and 10-5	10-4 and 10-5
7-2 and 7-3	7-2 and 7-3	10-6 and 10-7	10-6 and 10-7
7-4 and 8-1	7-4 and 8-1		

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

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Distribution:

To be distributed in accordance with DA Form 12-39, Technical Manual Parts List requirements for Trailer, Flatbed, 15 Ton Payload, Multi Axle.

CHANGE
NO. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, 15 June 1981

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

(Including Repair Parts Information and Supplemental Maintenance and Repair Parts Instructions)

TRAILER, FLATBED, 15 TON PAYLOAD, MULTI-AXLE (CCE)

NSN 2330-01-060-8141

Current as of 1 November **1980**

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1 through 97	1 through 55/(56 blank)

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TECHNICAL MANUAL
No. 5-2330-361-14&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, 18 *February* *1980*

OPERATOR, ORGANIZATIONAL, DIRECT

SUPPORT AND GENERAL SUPPORT

(INCLUDING REPAIR PARTS INFORMATION AND

SUPPLEMENTAL MAINTENANCE AND REPAIR PARTS INSTRUCTIONS)

TRAILER, FLATBED,

15 TON PAYLOAD

MULTI-AXLE (CCE)

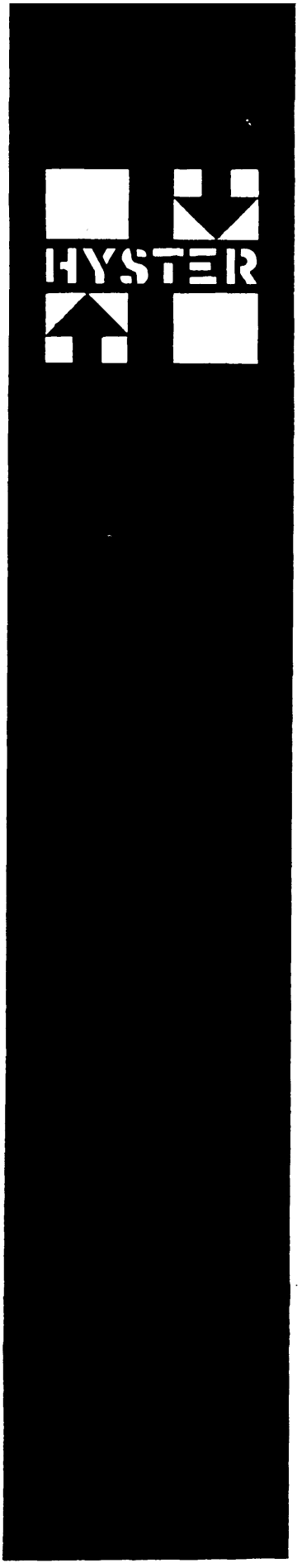
NSN 2330-01-060-8141

Reporting Errors and Recommending Improvements. You can help improve this manual. If you find any mistake or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Tank-Automative Materiel Readiness Command, ATTN: DRSTA-MBA, Warren, Michigan 48090. A reply will be furnished to you.

Page

This technical manual is an authentication of the manufacturers' commercial literature and does not conform with the format and content specified in AR 310-3, Military Publications. This technical manual does, however, contain available information that is essential to the operation and maintenance of the equipment.

Volume I
Operator, Service, and
Parts Manual
For
TRAILER, FLATBED
15-TON PAYLOAD
MULTI -AXLE (CCE)
NSN 2330-01-060-8141



OPERATOR, SERVICE, and PARTS MANUAL

HP15T-MIL.

Trailer, Flatbed,
15 Ton Payload,
Multi-Axle

Military Contract Number: DAAE07-77-C-0725

Serial Number Range: 21241 thru 21278

Part Number 7117M
5/78

NO MATTER HOW YOU SAY IT...

La Prudence Paye
La Seguridad Paga
Betriebssicherheit Macht Sich Bezahlt
Passaa Olla Huolellinen
Veiligheid Voor Alles
Säkerhet Först
Essere Sicuro Paga
Segurança Paga
Sikkerhet Først
Pinter Be Awas

सावधान और ज़िन्दा रहो !

في التأني السلامة

用心無難

WARRANTY SUMMARY

Hyster Company warrants this trailer to be free from defects in design, material and workmanship and to be in conformance with the specifications of contract DAAE07-77-C-0725 for a period of 15 months from the date of delivery for initial use or 1500 hours of operation, whichever occurs first. Remedies under this warranty are limited to those contained in contract DAAE07-77-C-0725. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EITHER EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. HYSTER COMPANY SHALL NOT BE RESPONSIBLE FOR DIRECT OR INDIRECT CONSEQUENTIAL OR INCIDENTAL DAMAGE OR LOSS OF USE FOR ANY REASON. REQUEST FOR WARRANTY SERVICE SHALL BE MADE DIRECTLY TO HYSTER COMPANY, KEWANEE, ILLINOIS.

WARNING: HP Series trailers must be coupled to the prime mover during all loading and unloading procedures.

WARNING: Do NOT load HP Series trailers from a ramp or dock with the platform in the horizontal position.

WARNING: Before demounting tire from disc wheel assembly, remove the valve core and exhaust all air. Check the valve stem by running a piece of wire through the stem to make sure it is not plugged.

WARNING: Mounting and demounting tires should be done by trained personnel.

WARNING: Block wheels during daily operating tests of the relay emergency valve.

TABLE OF CONTENT

Page

SECTION 5. TROUBLESHOOTING CONT.

SECTION 6. ELECTRICAL

SECTION 7. AIR SYSTEM

SECTION 8. BRAKES

SECTION 9. HYDRAULIC SYSTEM

SECTION 10. SUSPENSION & AXLES

SECTION 11. WHEELS & HUBS

SECTION 12. FRAMES

Page

SECTION 13. PARTS MANUAL

1-1. GENERAL.

1.-2. This manual. contains (operation, maintenance and service instructions for HYSTER HP15T-MIL traiLers. (see Figure l-l). The operating instructions must be reviewed and understood before attempting to operate the unit. The driver should be responsible for maintaining the unit in good condition to ensure prolonged efficiency.

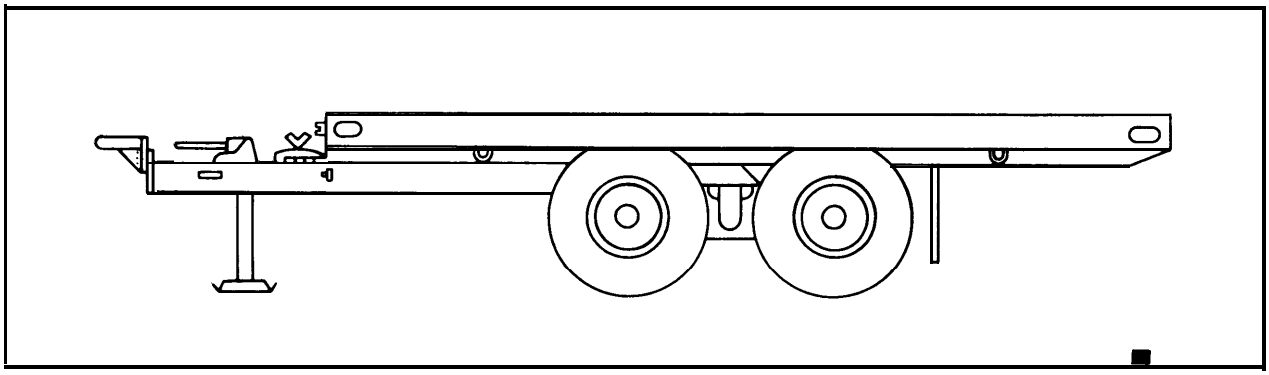


FIGURE 1-1 HP SERIES TRAILER.

1-3. UNIT NAMEPLATE (see figure 1-2).

1-4. The unit nameplate is located on the left-hand tongue beam. The nameplate must remain permanently affixed to the unit.

1-5. SERIAL NUMBER DATA (see figure 1-2).

NOTE: The complete serial number must be identified when ordering ports or communicating service information to HYSTER COMPANY.

1-6. The unit serial number is stamped onto the unit nameplate and into the web plate near the nameplate.

1-7. SYSTEM SPECIFICATIONS.

1-8. Unit specifications are listed in Section 2.

1-9. OPERATING INSTRUCTIONS.

1-10. Instructions necessary for safe and efficient operation are given in Section 3.

1-11. HYSTER-CARE MAINTENANCE.

1-12 HYSTER-CARE MAINTENANCE procedures such as servicing intervals are given in Section 4. Always follow the maintenance schedule and recommended procedures to ensure prolonged efficiency and service life.

1-13. TROUBLESHOOTING.

1–14. Troubleshooting procedures and analysis are given in Section 5.

1-15. SYSTEM DESCRIPTIONS AND REPAIRS.

1–16. Refer to the section which best fits the description of the system being serviced.

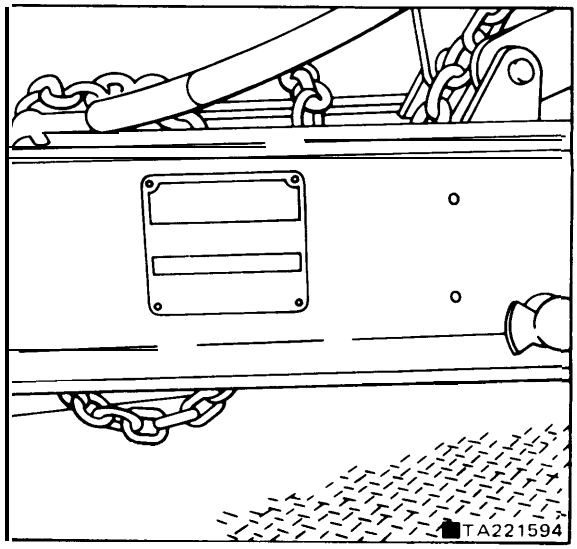


FIGURE 1-2 SERIAL NUMBER PLATE MOUNTED ON HP SERIES TRAILER.

2-1. GENERAL.

2-2. This section contains specifications which will aid in the maintenance and service of your trailer operating systems. The following is a list of tables included in this section.

TABLE INDEX

2-5. TRAILER CAPACITY.

2-6. Units manufactured in the United States are required to list the "Gross Vehicle Weight Rating" (GVWR) and "Gross Axle Weight Rating" (GAWR) on the trailer (see figure 2-1). This data will be found on the unit nameplate. The Gross Vehicle Rating is the sum of the trailer weight and the trailer capacity. This is the maximum structural capability of the trailer. The Gross Axle Weight Rating is the maximum any axle can carry. The GVWR may be attained under certain circumstances before the GAWR or vice versa. Do not exceed either the GVWR or GAWR. These weight limitations are independent of road weight limitations imposed by law.

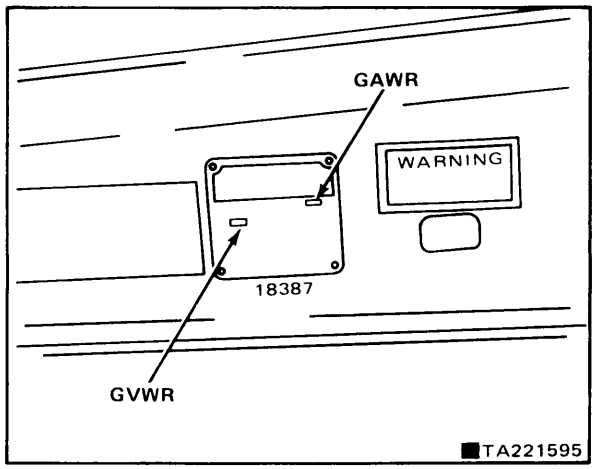


FIGURE 2-1. WEIGHT LIMITATION IDENTIFICATION PLATES

TABLE 2-1. FRAME PARTS SPECIFICATIONS.

HITCH-HP SERIES	
Type	Non–swivel, adjustable height lunette eye
In side Diameter	3 In. (76.2 mm)
Ring Section Diameter	1 5/8 In. (41.3 mm)
Drawbar Pull (pintle coupler) Rating	50,000 Lb. (22,690 kg) minimum
DECKING	2 in. (50.8 mm) thickness nominal

TABLE 2–2. AIR SYSTEM SPECIFICATIONS.

AIR LINES	
Service and Emergency	13/32 in. (10.3 mm) inside diameter
Relay Valve to Reservoir	½ in. (12.7 mm) inside diameter
RESERVOIR CAPACITY	
Tandem Axle	992 In^3 (16 256 cm^3)
AIR CHAMBERS	Type 30)

TABLE 2-3. UNDERCARRIAGE SPECIFICATIONS.

TYPE	Adjustable, rubber bushed walking beam
AXLE SPACING	
Tandem Axle	48 1/4 ln. (1 225.6 mm)
AXLES - TYPE	Tubular cambered

TABLE 2-4. AIR BRAKES SPECIFICATIONS.

BRAKES - TYPE	Cam actuated air brakes
LININGS	
Type	Rivet-on
Size with 15" wheels	
drum diameter	12.25 In. (311.2 mm)
width	7.50 In. (190.5 mm)
thickness	.75 In. (19.1 mm)

TABLE 2-5. TIRE SPECIFICATIONS.

TYPE	Tube type, nylon cord		
PLY RATING AND INFLATION			
Size	Ply Rating	Cold Inflation	
		PSI	kg/cm^2
10.00 x 15	12	75	5.3

TABLE 2-6. RIM AND WHEEL SPECIFICATIONS.

WHEELS - TYPE	Disc wheels 15 x 7.50V 10-hole

TABLE 2-7. HYDRAULIC SYSTEM SPECIFICATIONS.

CYLINDER	
HP series tilt-type	Shock absorber (1 Cyl.)
Capacity	7 pints (3.31 Itr.)
Stroke	11.5 in. (292.1 mm)
Bore	5 in. (127.0 mm)

TABLE 2-8. TORQUE SPECIFICATIONS FOR STANDARD HARDWARE (see figure 2-2).

CARBON STEEL CAPSCREWS (SAE GRADE 5)											
	FOOT-POUNDS (U. S.)						KILOGRAM-METERS (EUROPEAN)				
	TORQUE			TORQUE			TORQUE			TORQUE	
SIZE	UNC	UNF	SIZE	UNC	UNF	SIZE	UNC	UNF	SIZE	UNC	UNF
1/4	6	7	9/16	80	90	1/4	0.83	0.97	9/16	11.06	12.45
5/16	13	14	5/8	110	130	5/16	1.80	1.94	5/8	15.21	17.98
3/8	23	25	3/4	200	220	3/8	3.18	3.46	3/4	27.66	30.43
7/16	35	40	7/8	300	320	7/16	4.84	5.53	7/8	41.49	44.26
1/2	55	65	1	440	480	1/2	7.61	8.99	1	60.85	66.38
PLACE BOLTS AND SOCKET-HEAD CAPSCREWS (SAE GRADE 8)											
1/4	9	10	9/16	110	130	1/4	1.24	1.38	9/16	15.21	17.98
5/16	18	20	5/8	170	180	5/16	2.49	2.77	5/8	23.51	24.89
3/8	35	35	3/4	280	320	3/8	4.84	4.84	3/4	38.13	44.26
7/16	55	60	7/8	460	500	7/16	7.61	8.29	7/8	63.62	69.15
1/2	80	90	1/2	680	740	1/2	11.06	12.45	1	94.04	102.34

NOTE: This table lists torque values for standard hardware and is intended as a guide for average applications involving typical stresses and mechanical surfaces. Values are based on the physical limitations of clean, plated and lubricated hardware. In all cases, when an individual torque value is specified, it should take priority over values given in this table. Replace original equipment with hardware of equal grade.

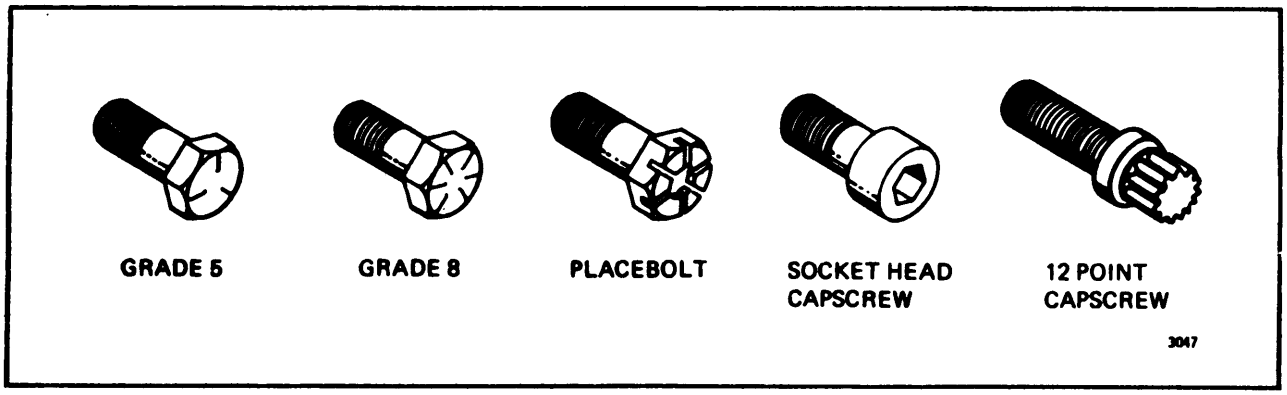


FIGURE 2-2.

3-1. GENERAL.

3-2. This section contains general information necessary for operation of HYSTER trailers. Review the instructions thoroughly before attempting to operate units.

3-3. The driver should maintain the trailer in good mechanical condition to ensure a long service life. Report faulty operation and structural damage immediately for correction. Minor damage can quickly result in a maior failure if not repaired.

3-5. HOOK-UP PROCEDURE - UNITS WITH AIR BRAKES.

3-6. These procedures should become routine before pulling a unit with air brakes:

a. Connect pintle coupler.

b. Connect gladhands and build up reservoir pressure,

c. Connect plug into electrical socket.

d. Connect emergency chains.

e. Check light sand reflectors (see Section 4).

f. Run brake application and release test (see Section 4).

g. Run emergency line test (see Section 4).

3-9. OPERATING PRECAUTIONS.

a. TRAINED AND AUTHORIZED OPERATORS ONLY.

b. Check emergency line function each day before starting out.

d. Lower landing gear before discon--necting.

e, Load and unload on solid, level terrain.

f. Check pintle coupler fcr proper engagement before traveling.

g. Lash loads in accordance with standard procedure.

i. Keep personnel away from frame and tongue area when loading and unloading HP series trailers.

l. Use properly constructed cages, guards, or baskets when in floting tires. TIRES ARE TO BE MOUNTED BY TRAINED SERVICE PERSONNEL ONLY,

m. Check brakes and air line system at frequent intervals (see MAINTENANCE SECTION).

n. Report damage and faulty operation immediately. Do not attempt to operate the unit until repaired.

3-30. HP SERIES GENERAL INFORMATION.

3-31. HP series provide a tilting incline without disconnecting from the truck. A cylinder controls the rate of tilt. The lunette eye should be positioned to match the truck coupler. Torque bolts and the lunette eye should be welded to the tongue before use.

3-32. OPERATING THE HP SERIES TILT.

hARNING : HP Series trailers must be coupled to the prime mover during all loading and unloading procedures.

WARNING : Do NOT load HP Series trailers from a ramp or tick with the platform in the horizontal position.

3-33. LOADING.

a. Release the platform lock.

b. Stand on trailer rear channel until the rear of the platform touches the ground. The trailer must be connected to the truck.

c. Drive the load up the incline until the trailer platform starts to tilt forward. DO NOT PROCEED FURTHER. The trailer bed will continue to tilt without further progress up the incline.

d. Lock the platform.

e. Position the Ioadonthe trailer platform, The maxim~m Ioadon the HP series Iunette eye is 10,000 lb. (4 536 kg),

3-34. UNLOADING.

a. Release the platform lock,

b. Drive the Ioad back on the bed until theplatform starts tilting back. DO NOT PROCEED FURTHER until platform contacts the ground.

c. Drive the load clear of the bed.

d. Stand on the bed frame front channel until the bed contacts the tongue.

e. Lock the platform.

3-35. SLINGING AND TIE DOWN INSTRUCTIONS. (see Figure 3-1).

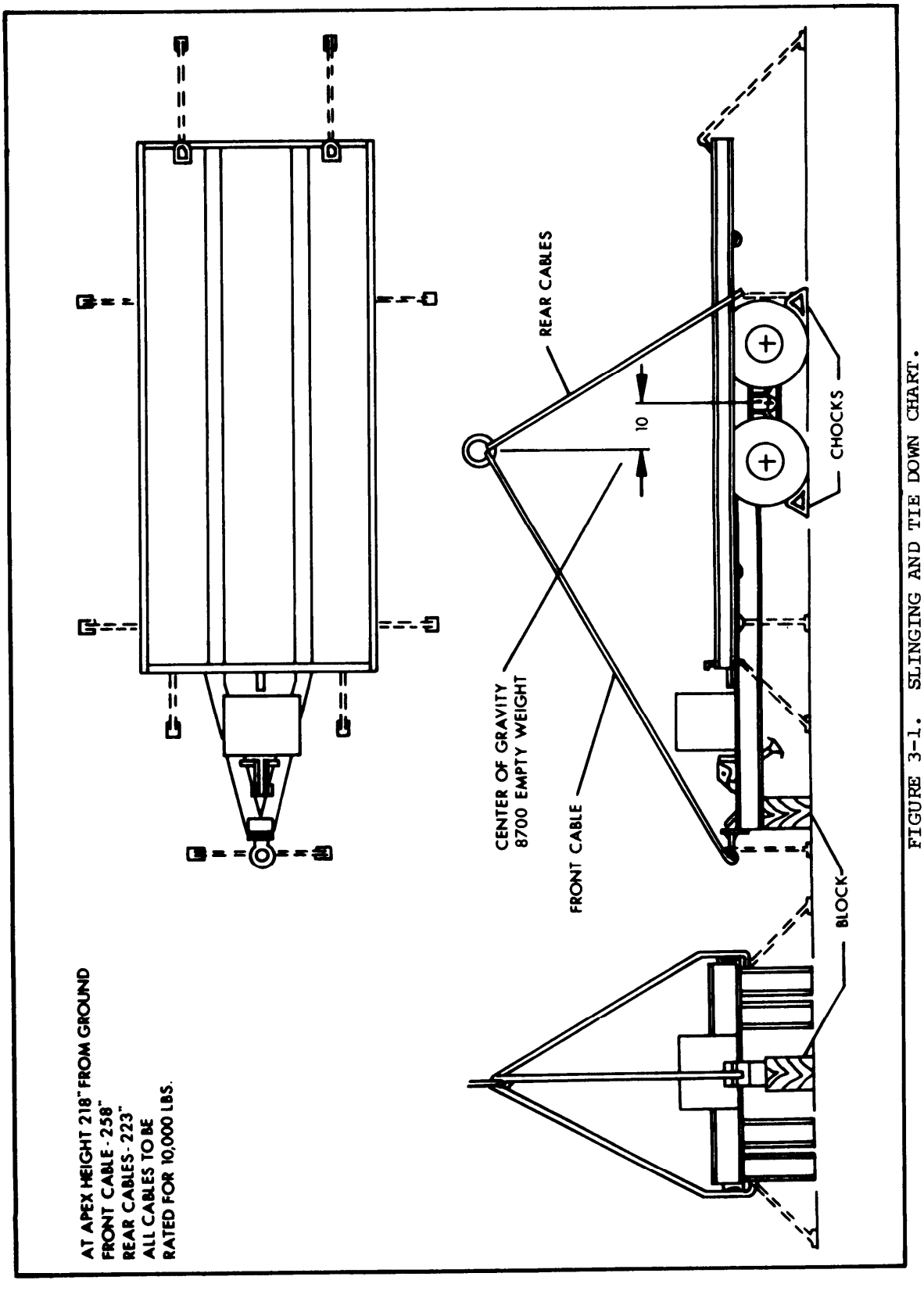


FIGURE 3-1. SLINGING AND TIE DOWN CHART.

4-1. GENERAL.

4-2. This section contains instructions necessary for proper HYSTER-CARE Maintenance of HYSTER trailers. HYSTER-CARE Maintenance is divided into two subsections: HYSTER-CARE Maintenance Schedule and HYSTER-CARE Maintenance Procedures. The maintenance schedule lists the recommended di stance/time intervals between maintenance checks. The procedure subsection provides detailed instructions for performing the maintenance checks. The instructions listed in the procedures subsection are given by systems and are not necessarily in the order listed in Table 4-1.

4-3. HYSTER-CARE MAINTENANCE SCHEDULE.

4-4. GENERAL.

4-5. HYSTER-CARE Maintenance is a planned program that includes periodic inspection and lubrication.

4-6. Table 4-1. Iists the recommended maintenance checks. It is outlined in two schedules: the mileage schedule and the periodic schedule. Perform maintenance on the basis of whichever occurs first.

4-7. The first column of the maintenance table 4-1 should be used to locate the applicable maintenance procedure and illustration. Figure 4-1 shows the maintenance points for the various series.

4-10. AIR LINE SYSTEM.

4-11. AIR SYSTEM TESTS.

4-12. A test series should be run every day before operating trailer.

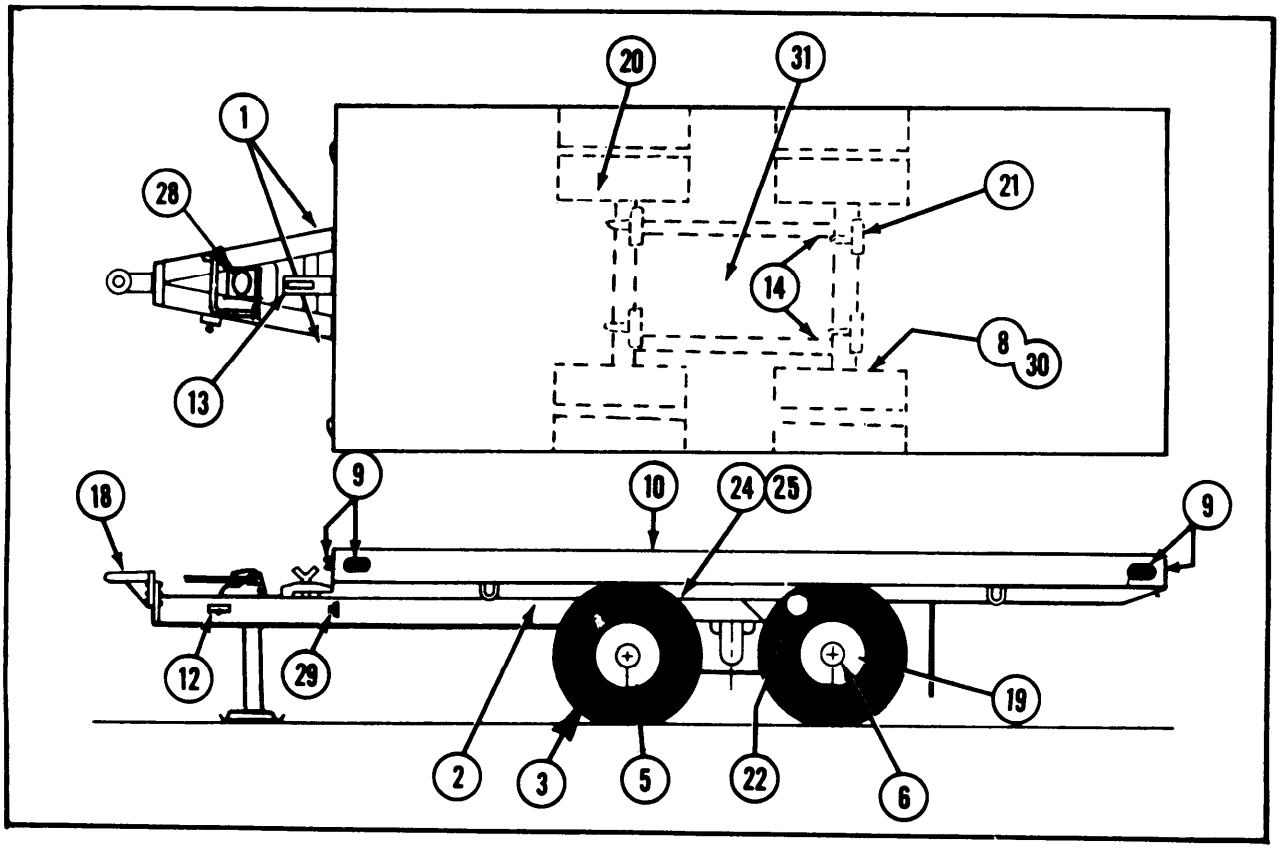


FIGURE 4-1. HP SERIES MAINTENANCE CHECKPOINTS.

TABLE 4-1. HYSTER-CARE MAINTENANCE SCHEDULE.

FIG. ITEM NO.	ITEM	SCHEDULE/PERIOD (1000)					QUAN.	TYPE OR REMARKS
		Day	Wk	2/mo	25/yr	50/yr		
1	Air Lines	X		X				Air Line Tests Inspection
2	Air Reservoir	X						Drain Condensation
3	Tires	X						Check Inflation and Remove Debris Between Duals
5	Wheels	X						Visual Check and Tighten Cap Nuts
6	Wheel Bearings (oil lubricated)	X				C	3 pints per axle (1.42ltr)	Multipurpose Gear Oil–Grade 90 MIL-L-2105B(90W)
8	Brakes (Air)	X		 X				Check for Overheating Inspect and Adjust
9	Lights & Reflectors	X						Check
10	Frame & Decking	X						Check
14	Undercarriage	X		 X				Visual Check Check Equalizer and Rubber Bushings
18	Lunette Eye			X				Inspect for Wear and Check Torque on Bolts
20	Brake Spider, Cam Bracket and Slack Adjuster				X		6 Fittings per Axle	Multipurpose Grease MIL-G-10924B

C-Change X - Check

TABLE 4-1. HYSTER-CARE MAINTENANCE SCHEDULE (CONT.).

FIG. ITEM NO.	ITEM	SCHEDULE/PERIOD (1000)					QUAN.	TYPE OR REMARKS
		Day	Wk	2/mo	25/yr	50/yr		
21	Brake Chambers			X				Check Condensation Holes
						X	2 diaphragms per axle	Clean, Inspect and Replace Diaphragm (see parts manual)
22	Tilting Platform Pins			X			2 zerks	Multipurpose Grease MIL-G-10924B
24	Tilt Cylinder			X				Check for Leaks
25	Hydraulic Oil			X		C		SAE 10W Hydraulic Oil MIL-L-2104C(10W)
28	Landing Gear			X			2 Zerks	MIL-G-10924B
31	Relay Emergency Valve					X		Clean

X – Check C – Change

a. Connect air lines, turn on air, and pressurize system. System should hold 100 PSI (7.0 kg/cm^2) pressure minimum.

b. Apply brakes. Inspect brake action on all wheels for prompt application.

c. Release brakes. The brakes should release promptly. Air pressure should discharge quickly from the relay emergency valve.

d. Disconnect the emergency line from the trailer. Trailer brakes should automatically apply.

e. Connect emergency line. Brakes should release.

4-13. RESERVOIR.

4-14. Drain condensation from the reservoir daily while the system is pressurized. Listen for leaks after closing the valve.

4-15. AIR HOSES.

4-16. Air hoses should be checked for chafing, bends, andkinking every month/2000 miles. Replace faulty hoses.

4-17. AIR BRAKE CHAMBERS.

4-18. The air system tests in paragraph 4-12 should disclose any malfunctioning brake chambers. Repair or replace faulty units. Every 2,000 miles check the condensation holes on the underside of the brake chambers to make sure they are open. The brake chambers should be disassembled and cleaned at 50,000 miles or yearly. The diaphragm and any marginal parts should be replaced. When replacing the diaphragm or spring, replace the corresponding ports for the other chamber on the same axle (to aid in even brake application and release). Examine yoke pin for wear and replace if necessary.

4-19. RELAY EMERGENCY VALVE.

4-20. The air system tests in paragraph 4-12 may disclose a malfunction of the reloy emergency valve. Repair or replace faulty units. The relay Valve should be disassembled and cleaned every 50,000 miles or yearly. Replace worn parts. Contact an authorized representative of the original equipment manufacturer for relay valve servicing.

4-21. AIR BRAKES.

4-22. GENERAL.

4-23. HYSTER trailers are equipped with cam actuated brakes. Braking force is supplied by air pressure in the brake chamber, which pushes a pushrod against the end of the slack adjuster. The slack adiuster rotates the camshaft, which forces the brake shoes against the brake drum.

4–24. OPERATING CHECKS.

4-25. During road stops, take time to check the brake drums for a heating condition. Proceed cautiously since malfunctioning or misadjusted brakes can case the drum to become extremely hot. Valve stems may be burned by the hot drum. Do not attempt to operate the vehicle until the problem causing the overheating is corrected. A cool brake drum may indicate an inoperative brake. Test is outlined in paragraph 4-12.

4-26. BRAKE ASSEMBLY.

4-27. The brake assemblies should be in~spected every 2000 miles or monthly. Remove the dust shields and examine the brake linings visua 1 ly to locate the lining showing the greatest amount of wear. The wheel and drum should be removed and the lining replaced if the thinnest portion of the lining is 3/8 in. (9.5 mm) or less. Do not allow the linings to wear thin enough so the lining rivet contacts the drum (see Figure 4-3).

4-28. Grease the camshaft bracket bearing and the spider bushing at 4 locations per axle every 25,000 miles (see Figure 4-4). Remove dust shields to grease cam shaft spider bushing. DO NOT use an excessive amount of grease on the anchor pins and spider bushing to avoid getting grease on brake lining surfaces.

4-29. SLACK ADJUSTER.

4-30. Automatic slack adjusters compensate for brake lining wear. Inspect and grease slack adjusters every 25,000 miles or yearly.

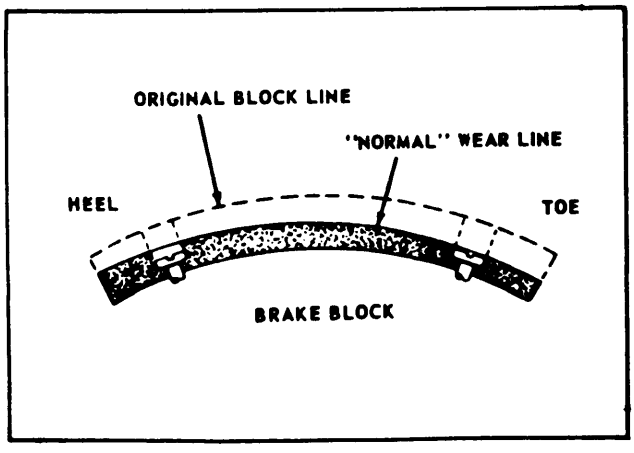


FIGURE 4-3. BRAKE BLOCK WEAR.

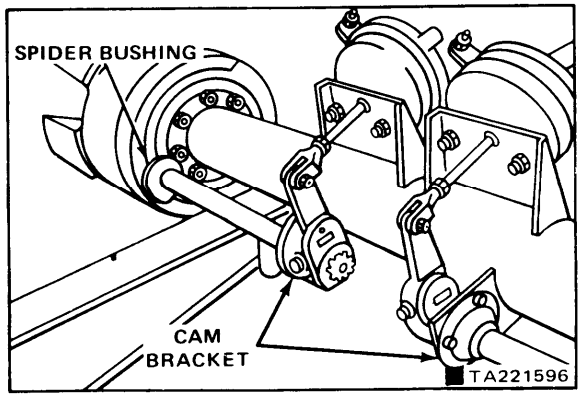


FIGURE 4-4. GREASE ZERK LOCATIONS ON AXLE.

4-40. TIRES.

4-41. INFLATION.

4-42. Improper and proper inflation will produce the tire section and ground cattact character sties shown in figure 4-9. Tire inflation should be checked daily while cold. Do not exceed the cold inflation pres-sures shown in Table 2-6. Tire inflation should also be checked during road stops to locate air losses. Also, remove my foreign obiects iammed between duals. Do not attempt to a~ust the inflation pressure while the tires are warm. REPAIR ANY LEAKS IMMEDIATELY. All tires should be equipped with valve caps.

4-43. Either overinflation or underinflation will cause premature tire failure. Overinflation weakens the cord body of the tire by reducing its ability to obsorb road shocks. Overinflation will also in&ce added stresses on rims and wheels, which can cause fai lure due to fatigue cracks (see figure 4-10).

4-44. OVER INFLATION.

a. Inflate to correct pressure when tires are cool.

b. Never "bleed" tires to relieve excessive pressure buildup when tires are warm.

4-45. Excessive bui Idup of air pressure can be due to load, underinflation, speed, or a combination of the three.

4-46. UNDERINFLATION.

4-47. Underinflatian causes rqtid wear and premature failure. Underinflatian or overloading of tires an my vehicle driven at sustained speeds will result in weakening of the tire cords, which can make the tire susceptible to further dcmqe or failure even when under normal load and inflation conditions. See figure 4-11 for m illustration of the results of underinflatian md overloading.

4-48- DUAL MATCHING.

4-49. Proper matching of duals by size will result in longer tire life. Improper matching will cause the larger dimneter tire to carry a overload. This will cause the typical overloaded tire difficulties. The smaller diameter tire will also wear more rapidly due to scuffing.

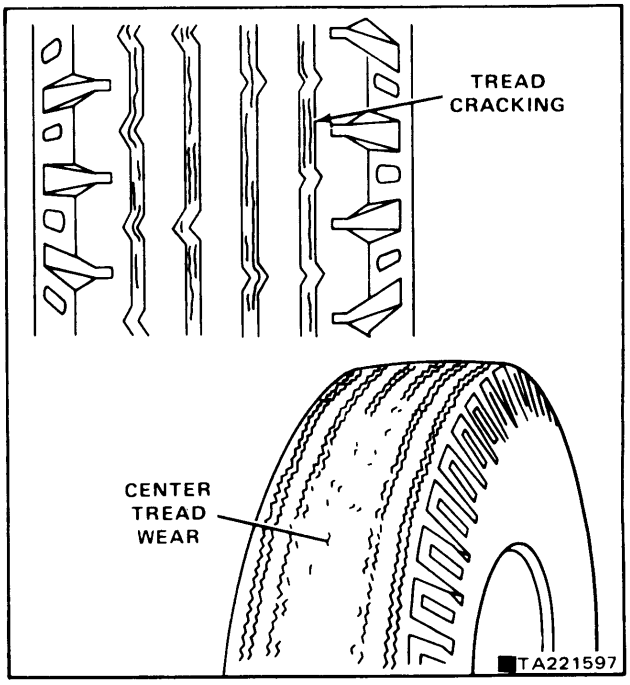


FIGURE 4-10. RESULT OF OVER INFLATED TIRES.

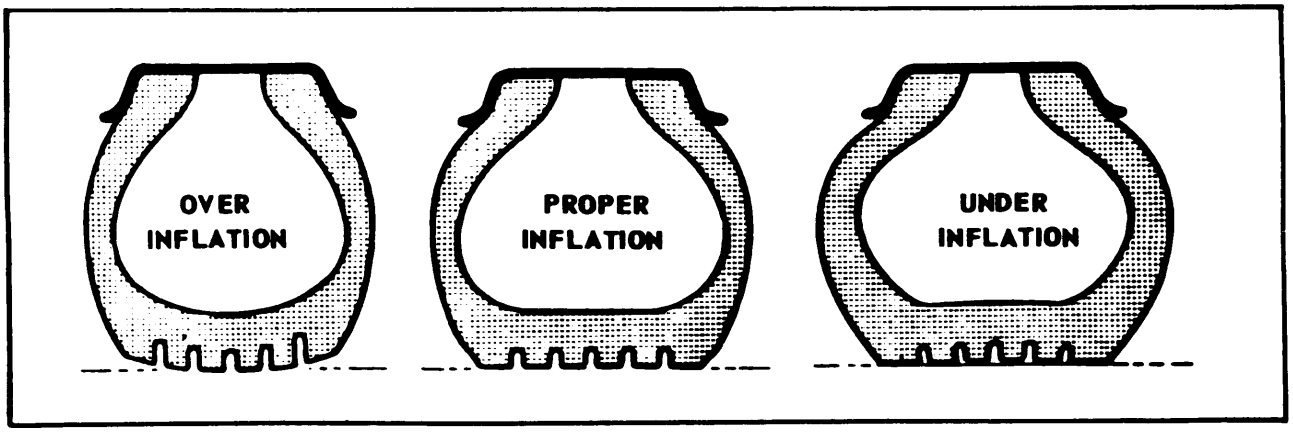


FIGURE 4-9. PROPER TIRE INFlATION.

4-50. SIZE MATCHING.

a. Tires through 8.25 (8-22.5 tubeless). Tire differences of not more than !4 in. (6.35 mm) in diameter or ¾ in. (19.1 mm) in circumference are allowed.

b. Tire size 9.00 (10-22.5 tubeless) and larger. Tire differences of not more than ½ in. (12.7 mm) in diameter or 1½ in. (38.1 mm) in circumference are allowed.

NOTE : The smaller of the two tires should be mounted on the inside.

4-51. TIRE MEASUREMENT.

4-52. Measure the circumference of the tire with an endless tape after being placed on the rim and inflated, but not mounted on the trailer (see figure 4-12). A straightedge, square or string gauge can be used to check the tires mounted on the trailer (see figure 4-13). The dimension between the straightedge and the tires should not exceed ½ of the allowable difference in diameter.

4-55. REMOVING TIRE AND DISC WHEEL ASSEMBLIES.

4-56. With the trailer supported by jades and blocked, loosen and remove outer cap nuts (see Figure 4-15). Remove tire and disc wheel. Loosen and remove the inner cap screws if the inside assembly needs changing.

4-57. MOUNTING AND REMOUNTING TIRES ON DISC WHEELS.

WARNING: Mounting and demounting tires should be done only by trained personnel.

WARNING: Before demounting tire and disc wheel assemblies, remove the valve core and exhaust all air from both tires in a dual set. Check the valve stem by running a piece of wire through the stem to make sure it is not plugged.

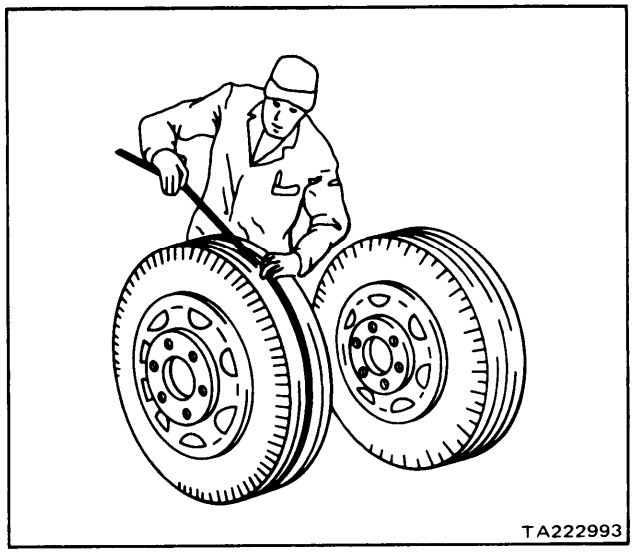


FIGURE 4-12. MEASURING TIRE WITH ENDLESS TAPE.

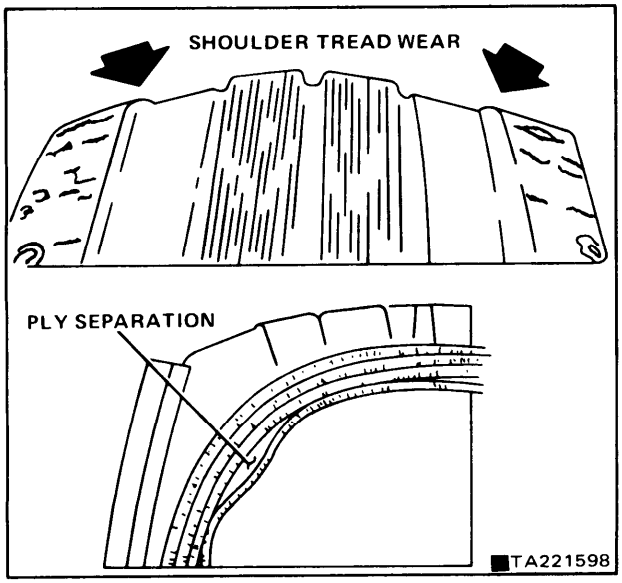


FIGURE 4-11. RESULT OF UNDER INFLATED TIRES.

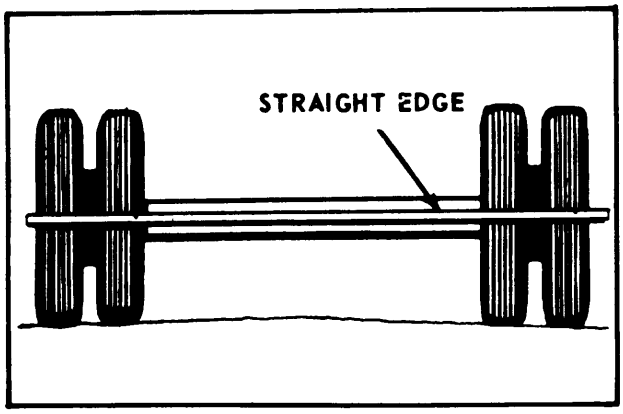


FIGURE 4-13. USE OF TIRE STRAIGHT EDGE.

4-58. Read the following list of points to watch when repairing tire and disc wheels.

CAUTION: DO NOT ATTEMPT TO) REPAIR DISC WEELS . SCRAP DAMAGED PARTS .

c. Match duals (see paragraphs 4-48 through 4-52).

f. Use proper valve stems and extensions. If valve spacers are used, be sure they are in place before reassembling.

CAUTION: DO NOT STAND IN FRONT OF A TIRE WHEN INFLATING.

h. Do not overinflate (see Table 2-6).

i. When tires are worn, the tube will also be worn. Replace it. Use the right tube size.

i. Replace chafed, pinched, stretched, or creased tubes.

k. Replace twi steal, creased, or folded flaps.

4-61. MOUNTING TIRE AND DISC WHEEL ASSEMBLIES.

4-62. Before mounting the disc wheel, clean the mounting face of dirt and excess paint. Mounting faces which have been damaged must be repaired or replaced. Right-hand threads are on the right side of the vehicle, and left-hand threads are on the left side. Place the inside tire ond disc wheel assembly on the hub and start the inner cap nuts. Tighten the inner cap nuts to the torque and sequence shown for your arrangement (see figuqe 4-17). Tighten in several stages to avoid di stortion of the disc. Place the outside tire and disc wheel assembly on the hub and start the outer cap nuts. Valve stems for the two wheels should be mounted in different circumferential positions for easy inflotion. Tighten the outer nuts in the same sequence and torque.

4-63. CHECKING TIGHTNESS ON MOUNTED DUAL DISC WHEELS.

4-64. Check the inner and outer cap nut torque after the first trip following mounting. An occasional check, thereafter, is also recommended. Loosen the outer cap nut before tightening the inner cap nut.

4-65. ELECTRICAL.

4-66. Check lights, lenses, and reflectors every day before using the trailer. This inspection should also include operation of the turn signals and brake lights.

4-72. WHEEL BEARINGS.

4-73. OIL LUBRICATION.

4-74. Oil level should be maintained between the "add" and "full" lines on the hub cap window (see figure 4-18). Check level daily. Also check for cracked windows and for oil leaks around the hub cap. The hub can be filled

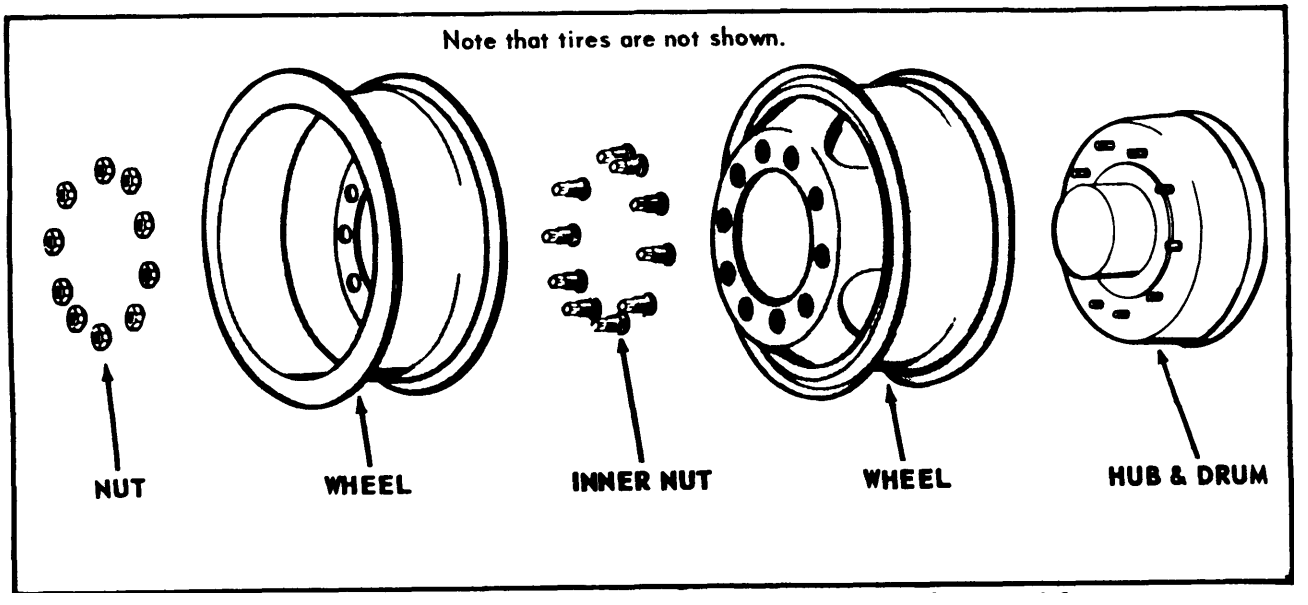


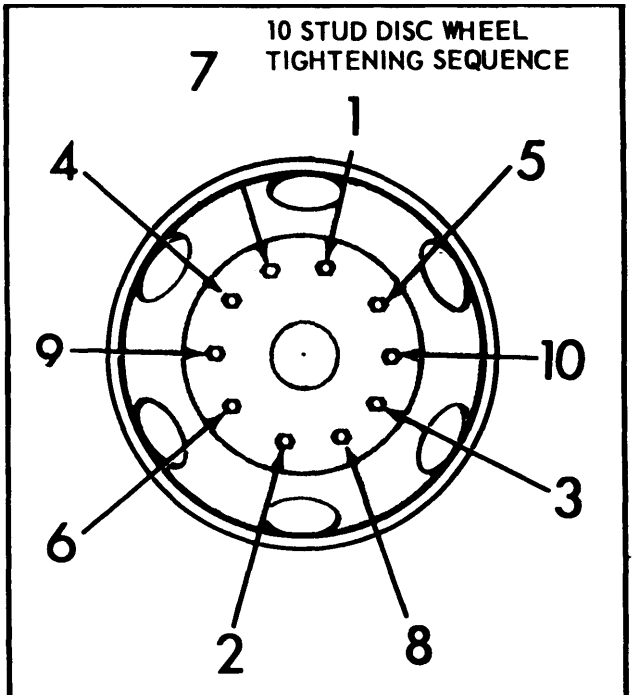
FIGURE 4-15. REMOVAL OF TIRES AND DISC WHEELS.

through the filler plug. Oil should be changed at 50,0~ miles or with brake relinings.

4-77. UNDERCARRIAGE AND WHEELS.

4-78. The undercarriage should be visually examined for broken and missing parts. Check brackets, adiusting screws, and walking beam ends. Replace faulty parts.

Check disc wheel mounting for tightness daily. See figure 4-17 for torque specifications and tiqhteninq sequence.



TORQUE VALUES FOR DUAL WHEELS
DRY THREADS – NO LUBRICATION

STUD SIZE	TORQUE INNER AND OUTER CAPNUT
3/4 – 16	450–500 ft.–lbs.
15/16 – 12	750–900 ft.–lbs.
1 1/8 – 16	650–750 ft.–lbs.

BACKNUT TORQUE

SIZE	TORQUE
3/4 – 16	175–200 ft.–lbs.
7/8 – 14	175–250 ft.–lbs.
1 – 14	175–300 ft.–lbs.

FIGURE 4-17. TIGHTENING SEQUENCE OF DISC WHEELS.

4-79. The undercarriage rubber bushings should be examined every 2,000 miles for breaking and signs of wear. Disc wheels; and broke drums should be carefully examined for cracks every 2,000 miles. Do not allow these areas to become excessively worn or expensive repairs will be required.

4-80. FRAME INSPECTION.

4-81. The frame should be checked daily for cracked welds, failing steel members, cracked decking.

4-82. Structural cracks will usually show best when the trailer is loaded. Structural repairs should only be attempted by persons experienced in this field.

4.83. Failure to maintain decking in good shape may cause damage to crossmembers.

4-87. HP SERIES TILTING PLATFORM PINS.

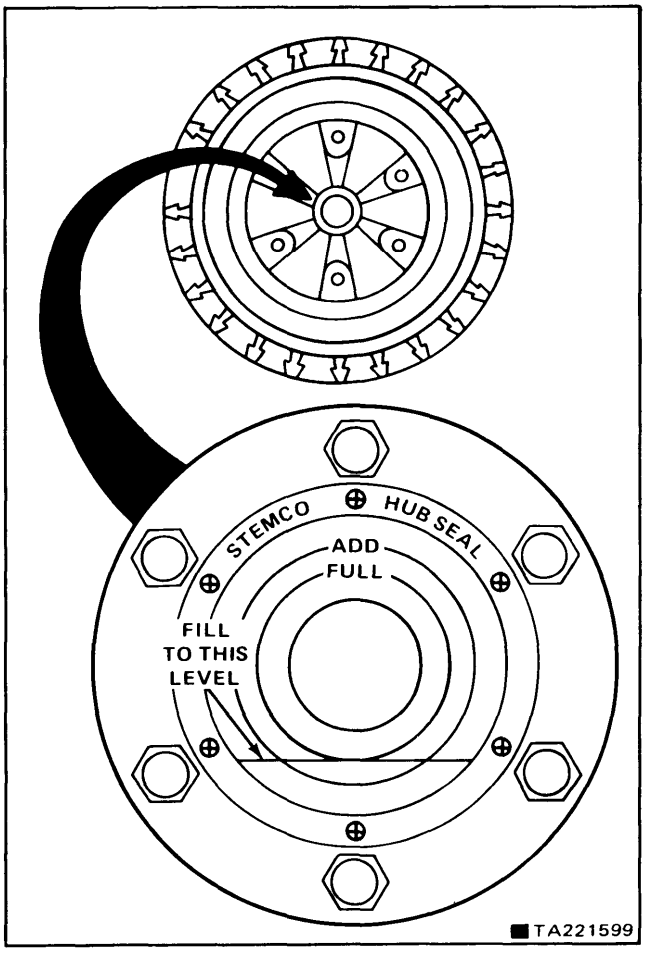


FIGURE 4-18. STEMCO HUB CAP.

4-88. Grease every 2,000 miles or 1 month at (2) zerks as shown in figure 4-22. Tighten 7/16 inch (11.1 mm) capscrews to 30 ft.-lbs. (4.15 kg/cm^2) every 2,000 miles. Examine pins for wear after 25,000 miles.

4-89. HP SERIES LUNETTE EYE.

4-90. Inspect the lunette eye monthly for excessive wear. The narrowest section through the ring should not measure less than 1 7/16 inch (36.5 mm). Also check the mounting bolts for tightness.

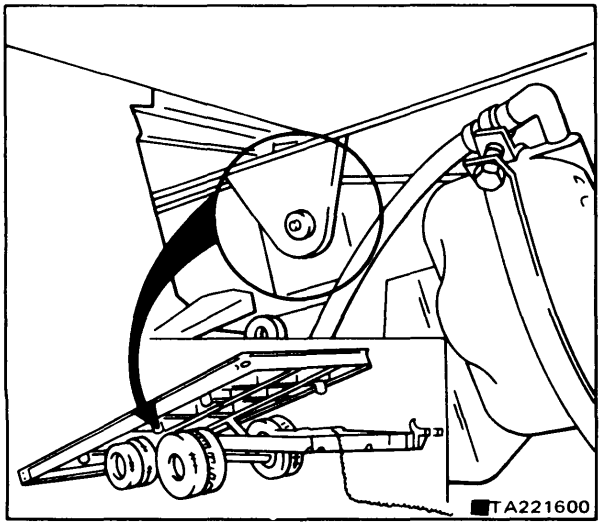


FIGURE 4-22. HP PLATFORM PIN AND GREASE ZERK.

4-105. CHECKING HP AND GHP SERIES CYLINDER.

4-106. The base of the HP and GHP series tilt cylinder should be inspected monthly for oil leakage at the base. Oil leakage will probably be accompanied by erratic tilt control due to excessive air in the cylinder. HP series hydroulic fluid must be checked with the cylinder removed. Cylinders should be checked and filled with SAE 10W hydraulic oil, MIL-L-2104C (10W).

MAINTENANCE ALLOCATION CHART
(MD SOP 700-5)

SECTION II- ASSIGNMENT OF MAINTENANCE FUNCTIONS

(1)	(2)	(3)	(4)					(5)
GROUP NUMBER	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	MAINTENANCE CATEGORY					TOOLS AND EQUIPMENT
			C	O	F	H	D	
06	Electrical							
		Repair		0.2				
0609	Lights	Inspect	0.1					
		Replace		0.2				
		Test		0.3				
0613	Wiring Harness	Inspect	0.3					
		Test		0.2				
		Service	0.2					
		Replace		1.0				
		Repair		0.3				
11	Rear Axle							
1108	Walking Beam and Parts	Inspect	0.2					
		Service		1.0				
		Replace			2.0			
		Repair			1.0			
12	Brakes							
1202	Service Brakes	Adjust		0.3				
	Brake Assy (L and R)	Replace		1.0				
		Repair		0.5				
	Backing Plate	Inspect		0.1				
		Replace		1.0				
	Anchor Support	Inspect		0.1				
	and Adjusters	Replace		0.5				
	Brake Shoes	Inspect		0.1				
		Replace		1.0				
		Repair		0.5				
	Lining Kits	Inspect		0.1				
		Replace		1.5				
1202	Camshaft	Inspect		0.2				
		Replace		0.6				
1206	Mechanical Brakes							
	Slack Adjusters	Adjust		0.3				
		Replace		0.6				
1208	Air Brake System							
	Air Reservoir	Service	0.3					
		Replace		1.0				
		Repair		.6				
	Brake Chamber	Inspect		0.3				
		Replace		1.5				
	Lines and Fitting	Replace		1.0				
		Repair		.6				
	Valve Emergency Relay	Replace		1.5				
		Repair		1.0				

MAINTENANCE ALLOCATION CHART

(MD SOP 700-5)

SECTION II - ASSIGNMENT OF MAINTENANCE FUNCTIONS

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQUIPMENT
	Filter Screen	Inspect		0.1				
		Service		0.2				
13	Wheels							
1311	Wheel Assembly	Service		0.3				
		Replace		0.6				
1311	Brake Drum	Inspect	1.0					
		Service		0.5				
		Replace		1.0				
1313	Tires and Tubes	Inspect	0.1					
		Service	0.1					
		Replace		0.5				
		Repair		0.6				
15	Frame, Towing ATTACHMENTS, and Drawbar							
1501	Frame	Inspect	0.4					
		Replace				3.0		
		Repair				2.0		
	Tilt Top	Inspect	0.4					
		Replace			3.0			
		Repair				2.0		
	Decking	Inspect		0.3				
		Repair			2.0			
1503	Pintles and Towing Attachments							
	Lunette	Inspect	0.2					
		Replace		1.0				
		Repair		.6				
	Platform Latch	Inspect	0.1					
		Replace		1.0				
		Repair		1.5				
1507	Landing Gear; Leveling Jack (Mechanical or Hydraulic)							
	Tongue Stand	Inspect	0.2					
		Service	0.4					
		Replace		1.0				
22	Body, Chassis, or Hull Accessory Items							

SECTION II - ASSIGNMENT OF MAINTENANCE FUNCTIONS

(1)	(2)	(3)	(4)					(5)
GROUP NUMBER	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	MAINTENANCE CATEGORY C	O	F	H	D	TOOLS AND EQUIPMENT
2202	Safety Chain	Inspect	0.1					
		Replace		0.2				
		Repair		0.2				
2210	Data Plates and Instruction Holders	Inspect		0.1				
		Replace		0.3				
24	Hydraulic Lift Components							
2404	Hydraulic Tilt Cylinders and Tilt Crank							
	Cushioning Cylinder, Tilt	Inspect	0.5					
		Service		1.0				
		Replace		1.5				
	Packing	Inspect	0.2					
		Replace		1.0				

TABLES 5-1. TROUBLE ANALYSIS FOR THE TRAILER LIGHTING SYSTEM.

TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
No lights	Improper connection at plug and socket.	Tighten connection.
	Broken or corroded wires.	Replace.
	Ground wire loose.	Tighten connection.
	Wires shorted.	Locate and insulate or replace.
All lights flickering	Wires shorted.	Locate and insulate or replace.
	Ground wire loose.	Tighten connection.
	Corrosion.	Replace corroded parts.

TABLE 5-2. TROUBLE ANALYSIS FOR TRAILER VIBRATION.

TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
Trailer vibration or tramp	Tire inflation incorrect.	Inflate to "cold" starting. pressure.
	Tires, or wheels incorrectly mounted.	See Section 4 for correct disc wheel mounting.
	Loose parts in undercarriage.	Tighten or replace.
	Brakes dragging.	Locate cause (see "Trouble Analysis for Brakes")
	Cupped tires, flat spots on tires (imbalance).	Balance tires, and disc wheels.

TABLES-4. TROUBLE ANALYSIS FOR HYDRAULIC SYSTEMS

TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
HP series tilt mechanism operates too fast or erratically.	Failure to load correctly.	Follow correct operating procedure (see Section 3).
	Defective cylinder packing.	Replace packing.
	Low fluid.	Check for leaking head packing. Replace defective parts.
	Crackedor split piston.	Replace defective parts.

TABLE 5-6. TROUBLE ANALYSIS FOR SUSPENSION.

TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
Tires hitting frame.	Undercarriage rubber bushings worn or broken.	Replace bushings.
	Rubber bushings loose.	Tighten retaining nuts until bushing retainer plates are shouldered.
	Undercarriage out of alignment.	Realign. Refer to Section 10.
	Broken or bent walking beams or equalizers.	Replace defective parts.
	Incorrect tires or wheels.	Use only original equipment type tires, and disc wheels.
trailer steers or “dogs” to one side.	Undercarriage out of alignment.	Realign. See Service Manual Section 10.
	Broken or bent walking beams or equalizers.	Replace defective parts.

TABLE 5-7. TROUBLE ANALYSIS FOR TIRES.

TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
Tread cracking or center tread wear or impact breaks.	Over inflation.	Use correct "cold" inflation pressure. See Section 2.
Shoulder tread wear (both sides of tire) or ply separation.	Under inflation.	Use correct "cold" inflation pressure. See Section 2.
	Overloading.	Check load distribution. Do not exceed "GAWR" and "GVWR" ratings. See Section 2.
Shoulder tread wear (one side of tire).	Bent spindle or negative camber in axle.	Replace axle.
Feathered edges on tread design.	Bent spindle or axle.	Replace axle.
Rapid tire wear.	Overloading.	Check load distribution. Do not exceed "GAWR" and "GVWR" ratings. See Section 2.
	High speeds.	Tailor speeds to load and road conditions.
	Incorrect dual matching.	Match duals. See Section 4.
	Quick stops.	Allow plenty of stopping distance.
Flat spots.	Quick stops.	Allow plenty of stopping distance.
	Grabbing brakes.	See "Brake problems – grabbing brakes."
	Worn or loose wheel bearings.	Adjust or replace.
	Out of balance wheel and tire.	Balance.
Uneven wear.	Undercarriage rubber bushings worn or broken.	Replace.
	Worn or loose wheel bearings.	Adjust or replace.
	Out of balance wheel and tire.	Balance.

TABLE 5-8 TROUBLE ANALYSIS FOR DISC WHEELS.

TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
Cracks.	Over inflation.	Use correct "cold" inflation pressure. See Section 2. Replace wheel.
	High speed.	Do not use excess speed loaded or unloaded. Lower speed with heavy loads. Replace wheel.
Bending or warping.	Damage caused by hitting holes or curbings (especially when combined with over inflation and high speed).	Replace wheel.
	Improper tightening sequence or over torquing.	Use correct wheel mounting procedure. See Section 4.

TABLE 5-9. TROUBLE ANALYSIS FOR HUBS.

TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
Broken studs and/or hub.	Improper tightening sequence or over torquing.	Replace broken parts. Follow mounting procedure from Section 4.
	Overloading and/or over inflation.	Replace broken parts. Use correct "cold" inflation pressure.

TABLE 5-10. TROUBLE ANALYSIS FOR AIR BRAKES.

TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
No brakes or intermittent brakes.	Brake air system improperly connected.	Reconnect correctly.
	Relay emergency valve contains water or oil.	Clean valve.
	Tractor protection valve malfunction.	Repair or replace.
	Restricted tubing or hose line.	Locate and remove restriction.
	No air pressure due to broken line or failure in tractor air supply.	Locate leak and repair or troubleshoot tractor air system.

TABLE 5-10. TROUBLE ANALYSIS FOR AIR BRAKES (CONT.).

TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
Single brake dragging, or locked.	Broken component within brake: a. Retract spring b. Brake roller c. Shoe d. Lining rivets e. Anchor pin f. Spider	Replace broken part.
	Flat spot on cam roller or camshaft.	Replace and lubricate.
	Improper adjustment.	Adjust slack adjusters.
	Spider bushing or cam bracket bushing binding.	Lubricate or replace bushing.
	Improper lubrication.	Lubricate.
	Brake drum distortion.	Repair or replace.
	Broken brake chamber spring.	Replace.
	Brake chamber pushrod binding.	Realign brake chamber bracket or install correct brake chamber.
Uneven brakes.	See "Single brake dragging or locked."	
	Restriction in brake hoses.	Locate and remove.
	Needs relining.	Reline brakes.
	Grease on lining.	Reline brakes.
	Broken slack adjuster.	Replace.
	Leaking brake chamber diaphragm.	Replace diaphragm.
Brakes apply too slowly.	Brakes need adjusting or lubricating.	Adjust and lubricate brakes.
	Low air pressure in brake system (below 80 PSI).	Check tractor air supply system.
	Restricted tubing or hose.	Blow clear or replace.
	Defective relay valve.	Clean or replace.

TABLE 5-10. TROUBLE ANALYSIS FOR AIR BRAKES (CONT.).

TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
Brakes release too slowly.	Brakes need adjusting or lubricating.	Adjust and lubricate brakes.
	Brake rigging binding.	Align brackets or replace bent parts.
	Exhaust port of relay valve restricted or plugged.	Clean valve.
All brakes do not release.	Air system improperly connected to towing vehicle.	Tighten or change connections.
	Brake valve on towing vehicle applied.	Release brake.
	Relay emergency valve in emergency position.	Check line pressure and check valve.
	Restricted tubing.	Blow clear or replace.
	Tractor protection valve malfunction.	Troubleshoot tractor system.
Insufficient brakes.	Brakes need adjusting.	Adjust brakes.
	Brakes need lubricating.	Lubricate brakes.
	Brakes need relining.	Reline brakes.
	Low air pressure.	Troubleshoot air supply.
	Defective relay emergency valve.	Repair or replace.
	Brakes overheated.	Stop and allow to cool. Locate cause of overheating.
Brakes grabbing.	Grease on brake lining.	Reline brake.
	Brake rigging binding.	Locate bent or maladjusted components.
	Defective brake valve on towing vehicle.	Repair or replace.
	Defective relay emergency valve.	Repair or replace.
Excessive leakage with brakes released.	Relay emergency valve leaking.	Repair or replace.
	Leaking tubing or hose line.	Replace.

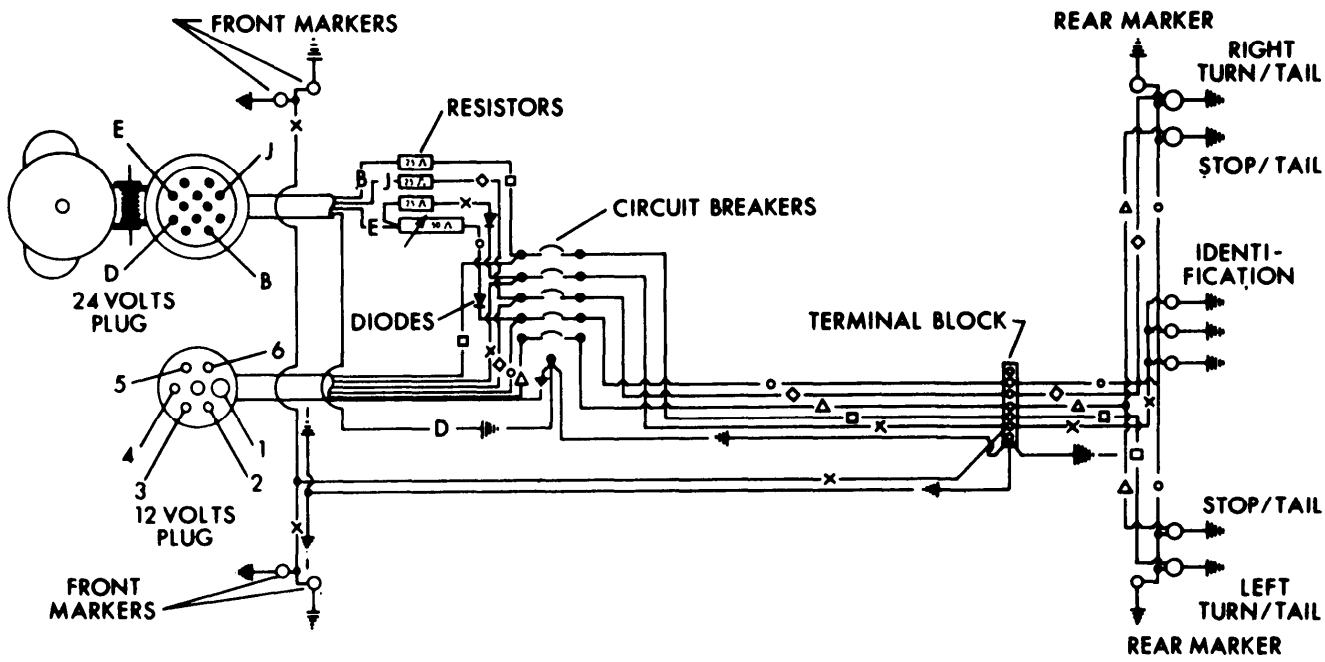
TABLE 5-10. TROUBLE ANALYSIS FOR AIR BRAKES (CONT.).

TROUBLE	PROBABLE CAUSE	CORRECTIVE ACTION
Excessive leakage with brakes applied.	Relay emergency valve leaking.	Repair or replace.
	Leaking brake chamber diaphragm.	Replace diaphragm or tighten.
	Leaking tubing or hose line.	Replace.
Excessive leakage with emergency system only applied – no leakage with normal brake application.	Defective relay emergency valve.	Clean and repair, or replace.
Excessive water present in brake system.	Reservoir not drained often enough.	Drain reservoir daily.
Excessive oil present in brake system.	Compressor on towing vehicle passing excessive oil.	Repair compressor.
Brake will not apply properly.	Flat spot on cam roller or camshaft.	Replace and lubricate.

6-1. GENERAL.

6-2. The trailer electrical system consists only of a lighting system which relies on the tractor electrical system for its output.

6-3. LIGHTING SYSTEM
12 VOLT - 24 VOLT (See Figure 6-1).



ELECTRICAL WIRING CHART FOR HP15T-MIL

CONDUCTOR NO.	COLOR	KEY	LAMP AND SIGNAL CIRCUITS
1	WHITE	⊣⊢	GROUND
2	BLACK	X	FRONT MARKER AND IDENTIFICATION
3	YELLOW	□	LEFT TURN
4	RED	△	STOP
5	GREEN	◇	RIGHT TURN
6	BROWN	○	REAR MARKER AND TAIL
	MIL. WIRING KEY		
7	B		LEFT TURN AND STOP
8	D		GROUND
9	E		TAIL, MARKER AND IDENTIFICATION
10	J		RIGHT TURN AND STOP

FIGURE 6-1. ELECTRICAL SCHEMATIC - 12 and 24 VOLT.

7-1. GENERAL.

7-2. This section contains a description of the operation of the trailer brake air supply system. Also included in this section ore test instructions and disassembly and assembly procedures.

7-3. BRAKE AIR SUPPLY SYSTEM DESCRIPTION (see figure 7-1).

7-4. The trailer relies on the tractor for its air supply. A description of normal operation follows:

o. When the service and emergency lines are connected to the towing vehicle, the reservoir is charged to approximately the same pressure as is present in the tractor reservoirs. The RE-6 relay emergency valve will keep the trailer brakes opplied until the emergency line pressure reaches 60 PSI (4.22 kg/cm^2. Brake application will then be released.

b. When the vehicle is traveling over the road, the brakes are released and the emergency line and reservoir are charged to full pressure.

c. When the service brakes are applied normally in the towing vehicle, the pressure is increased in the service line. This fills the brake chambers with the same pressure as the service line, thus applying the brakes.

d. Releasing the service brakes will cause the pressure in the service line to decrease, thus causing the relay emergency valve to exhaust the pressure from the brake chambers.

e. The trailer brakes con also be applied independently from the tractor brakes by application of a hand controller, which supplies air pressure to the service line.

f. Brakes will also be applied by reducing the pressure in the emergency line to about 30 PSI (2.11 kg/cm). A gradual reduction in the emergency line pressure will cause a graduated increase in the pressure to the brake chambers.

g. A sudden release of pressure in the emergency line will cause a full release of reservoir pressure into the brake chambers with a resultant full brake application.

7-5. RELAY EMERGENCY VALVE RE-6 (see figure 7-2).

7-6. The relay emergency valve senses the line

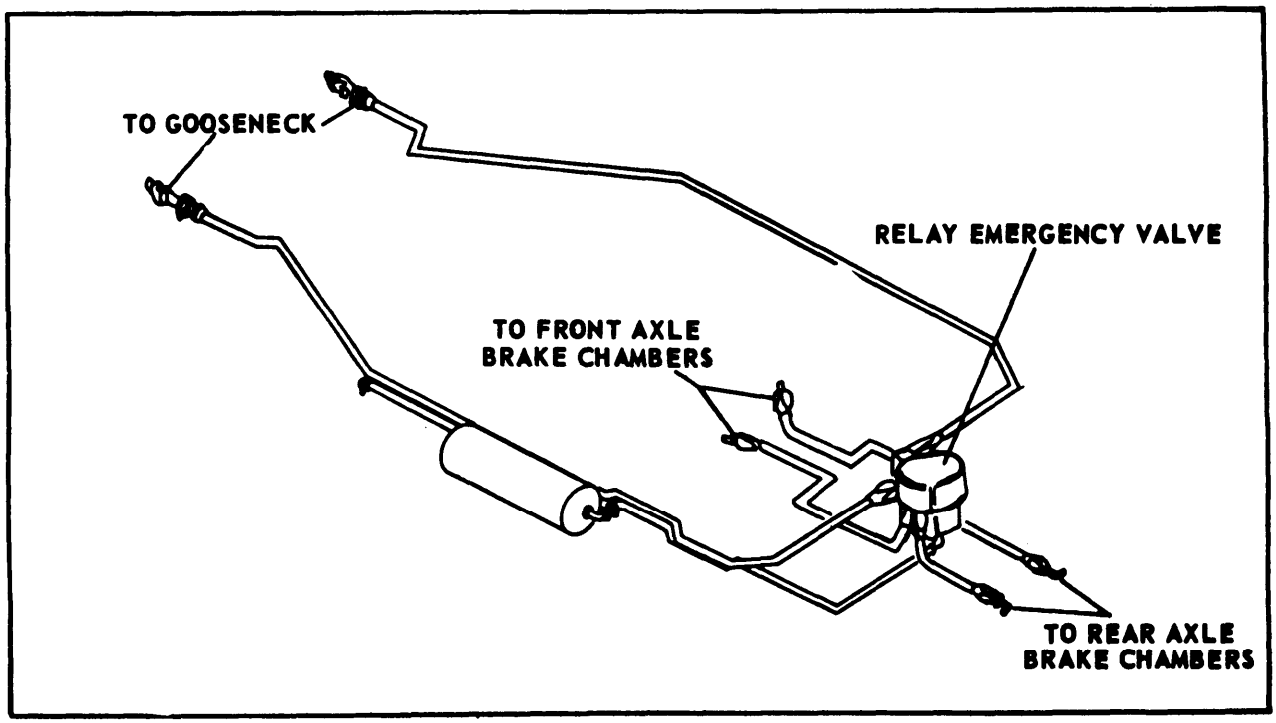


FIGURE 7-1. BRAKE AIR SUPPLY.

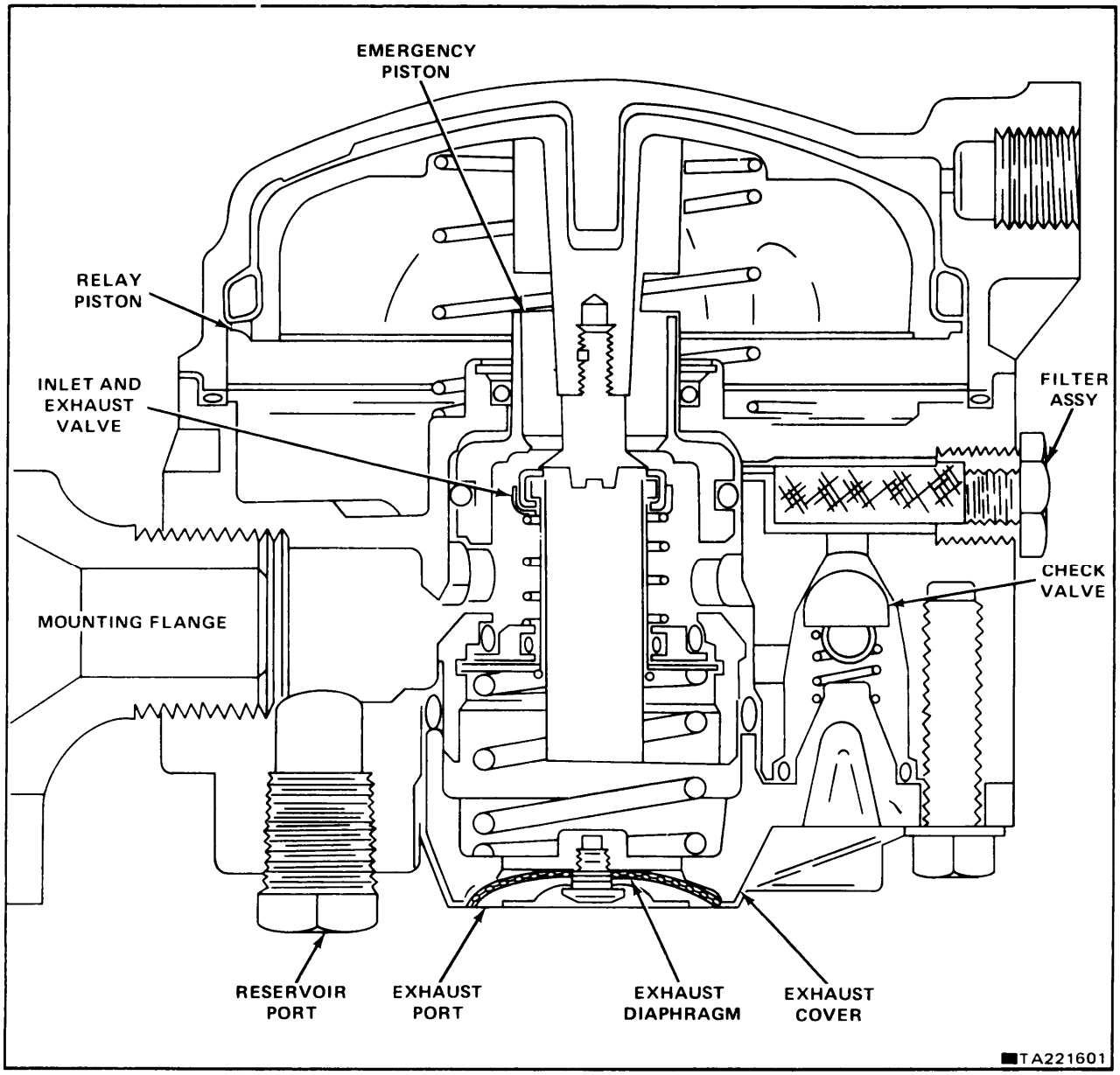


FIGURE 7-2. RE-6 RELAY EMERGENCY VALVE.

pressures and relays the response to the brake chambers. See Section 4 for daily operating tests. Before conducting further tests, check the tractor air gauge against an accurate test gauge.

WARNING: Block wheels during these tests.

a. Connect service and emergency lines. When the pressure reaches 60-65 PSI (4.22-4.57 kg/cm^2), the brakes should automatically release.

b. Apply service brakes several times, checking for prompt brake application and release.

c. Release the brakes and stop the engine with the system pressure between 90-100 PSI (6.33-7.03 kg/cm^2). A two minute check should show a pressure drop of no more than 6 PSI (.42 kg/cm^2) for the combination vehicle system.

d. If "c" indicates possible leakage, apply soap suds at the RE-6 exhaust port. A one inch (25.4 mm) soap bubble in not less than five seconds is permissible.

e. Apply soap suds at pipe plugs and fittings. Correct all leaks.

f. With the engine stopped and the pressure at 90-100 PSl (6.33-7.03 kg/cm^2) make and hold a full service brake application. A two minute check should show a pressure drop of no more than 8 PSI (.56 kg/cm^2) for the combination vehicle system.

g. If "f" indicates possible leakage, apply soap suds on the RE-6 cover and exhaust port. A one inch (25.4 mm) bubble in not less than three seconds is permissible.

h. Place the tractor protection control valve in "emergency" position or shut off cut-out cock on the emergency line and disconnect the emergency line coupling. Trailer brakes must apply promptly. Check for leakage at the emergency coupling. A leak indicates a leaking check valve or o-rings in the RE-6 valve. Also check for leakage on the service line. A leak here indicates leaky o-rings on the relay valve. Recharqe the svstem. Brakes should release at 65 PSI (4.57 kg/cm^2) emergency line pressure.

i. Shut off the engine with the system fully charged. Make a series of foot valve applications to reduce the pressure to 30 PSI (2.11 kg/cm^2) The trailer brakes should apply automatically at this pressure or at the emergency setting of the tractor protection equipment.

7-8. If the valve does not function properly or leakage is excessive, it should be replaced.

7–9. BRAKE CHAMBERS (see figure 7-4).

7-10. Air pressure on the pressure plate side of the brake chamber diaphragm pushes the diaphragm against the push rod assembly. This extension of the push rod pushes against the slack adjuster, which actuates the brakes.

7-11. BRAKE CHAMBER SERVICING.

7-12. If leakage is detected around the clamp ring, it may be tightened enough to stop the leakage. Overtightening may cause permanent distortion of the clamp ring. The clamp ring bolts (2) on Bendix Westinghouse air chambers can be tightened to 120-130 inch-lbs. (1.38-1.50 kg-m)

7-13. BRAKE CHAMBER REMOVAL.

7-14. Disconnect air line and push rod yoke. Remove nuts on mounting studs and remove air chamber.

7-15. BRAKE CHAMBER DISASSEMBLY:

a. Clean the exterior of the brake chamber.

b. Mark the parts so they can be reassembled the same way.

c. Pull out push rod and clamp it in this position with a vise or with vise grip pliers. The grips should be taped to prevent damage to the push rod.

d. Remove the bolts on the clamp ring.

e. Spread the clamp ring slightly to permit it to be removed. Be careful not to bend it out of shape.

f. Remove the pressure plate and diaphragm,

g. Remove the locknut and yoke from the push rod.

h. Release the grip on the push rod.

i. Remove the push rod and spring.

7-16. CLEANING AND INSPECTION OF PARTS.

7-17. Clean all metal parts in a suitable solvent. Inspect parts for damage, wear, or deterioration and replace if necessary.

7-18. BRAKE CHAMBER ASSEMBLY:

a. Stand the push rod assembly on a flat surface.

b. Put the return spring in position.

c. Place the non-pressure plate over the push rod.

d. Push the non-pressure plate down against the flat surface and clamp in place with vise grip pliers with taped grips.

e. Place the clamp ring over the non-pressure plate clamping surface.

f. Position the diaphragm in the pressure plate and assemble with the non-pressure plate by working the clamp ring over the pressure plate. Align all marks made during disassembly.

g. Draw the clamp lugs together and start the clamp bolts and nuts. Tighten these evenly to 120-130 inch lbs. (1.38-1.50 kg-m) (Bendix. Westinghouse).

7-19. INSTALLATION.

7-20. Place brake chamber in mounting bracket and tighten nuts on studs. The drain hole should be positioned down. Install yoke and locknut on push rod. Install yoke pin on slack adjuster and adjust brakes. Check the angle formed by the slack adjuster and push rod with the brakes applied. This angle should not be less than 90^{0}. Turn the yoke to obtain the desired angle. The angle should be the same for all slack adjusters when the brakes are adjusted.

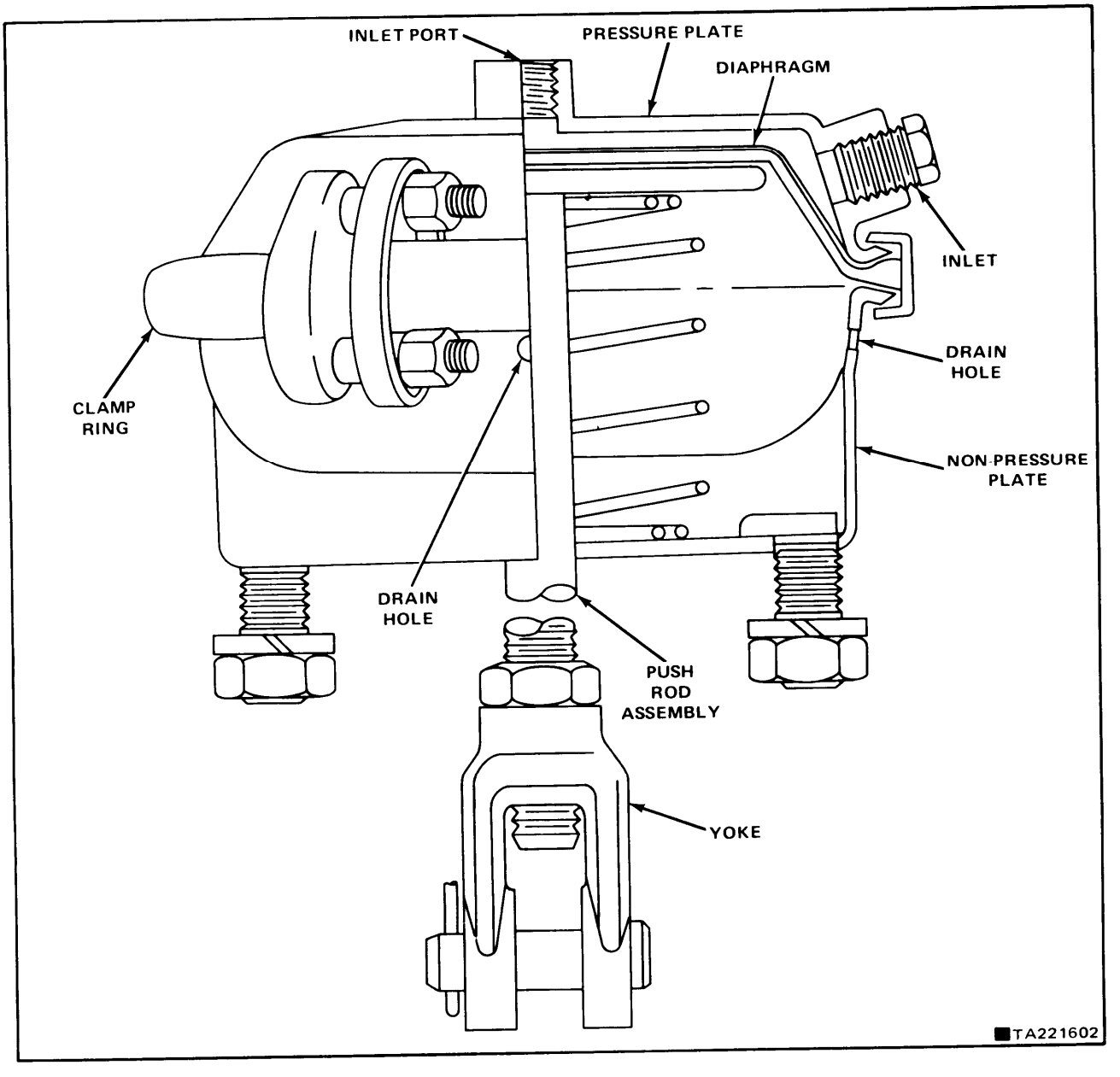


FIGURE 7-4. BRAKE CHAMBER.

8-1. GENERAL.

8-2. Section 4 includes a brief description of the operation of the air brakes. This section covers the servicing of the air brake assembly.

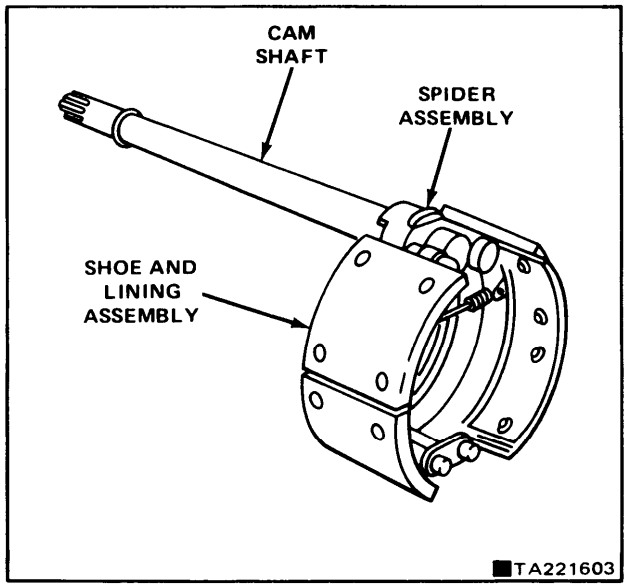


FIGURE 8-1. FOUNDATION BRAKE.

8-7. CAMSHAFT.

8-8. CAMSHAFT REMOVAL.

8-9. Before removal, support the trailer on blocks and remove the hub and drum (see Section 11). With this step complete, proceed as follows:

a. Remove brake shoe retainer springs and gently lower shoes to prevent damage.

b. Remove the yoke pin from the slack adjuster.

c. Remove the snap rings at the slack adjuster and brake spider.

d. Remove the slack adjuster.

e. Pull camshaft out. The cam retainer washer and cam spacer washer will also come off with the camshaft.

f. Remove the grease seals and the spider bushing from the spider.

8-10. CLEANING AND INSPECTION.

8-11. Clean metal parts in solvent. Check condition of the brake drum, linings, cam rollers, cam

bracket bushing, spider bushing, retainer springs, yoke, yoke pin, cam spacer washer, and cam retainer washer. Replace defective parts. If brakes need relining, see “relining brakes." Always replace the spider bushing grease seals when the camshaft is removed.

8-12. CAMSHAFT INSTALLATION.

a. Press in spider bushing. Line up the grease hole in the bushing with the grease hole in the spider.

b. Press new seals in place on both sides of the spider bushing. The lips of the seals must face the bushing.

c. Coat the spider bushing and the camshaft bracket bushing with multi-purpose grease.

d. Put a very light coating of grease on the cam spacer washer and place it under the camshaft head.

e. Start assembling the camshaft through the spider while being careful not to damage the bushing and seals.

f. Place the cam retainer washer and one snap ring over the cam spline and then push the camshaft through the camshaft bracket.

g. Put the slack adjuster in position on the camshaft splines.

h. Insert the snap rings in grooves.

i. Oil the cam roller. (Use a new roller and shaft if the camshaft is replaced.)

j. Hook up shoe retainer springs.

k. Turn the slack adjuster manual adjusting screw to get the slack adjuster in position to insert the yoke pin.

l. Install the hub and drum (see Section 11).

m. Adjust the brakes (see Section 4).

8-13. RELINING BRAKES - AIR.

8-14. See Section 4 for inspection of brake linings for wear. The procedure for relining follows:

8-15. DISASSEMBLY (see figure 8-2).

a. Back off the slack adjuster.

b. Remove the cast wheel or hub and drum (see Section ll).

c. Remove the brake shoe retainer springs.

d. Remove the anchor pin lock washer from anchor pin.

h. Remove the shoe and lining assembly.

j. Remove the snap ring retaining the cam rollIer shaft,

k. Remove the cam roller and shaft.

l. Remove the lining rivets.

8-16. CHECKING BRAKE DRUMS.

a. Scored or barrel-shaped drum - Drum will need turning down if a .010 in. (.254 mm) wire will pass between the drum and a straightedge placed on the brake drum surface (see figure 8-3).

b. Bell mouthing - Drums can be checked for inside diameters at both edges of lining contact points, Differences in diameter of more than .010 in. (.254 mm) should be turned out (see figure 8-4).

c. Recondition out-of-round brake drums. Check with inside micrometer or dial indicator (see figure 8-5). All out-of-round condition should be corrected.

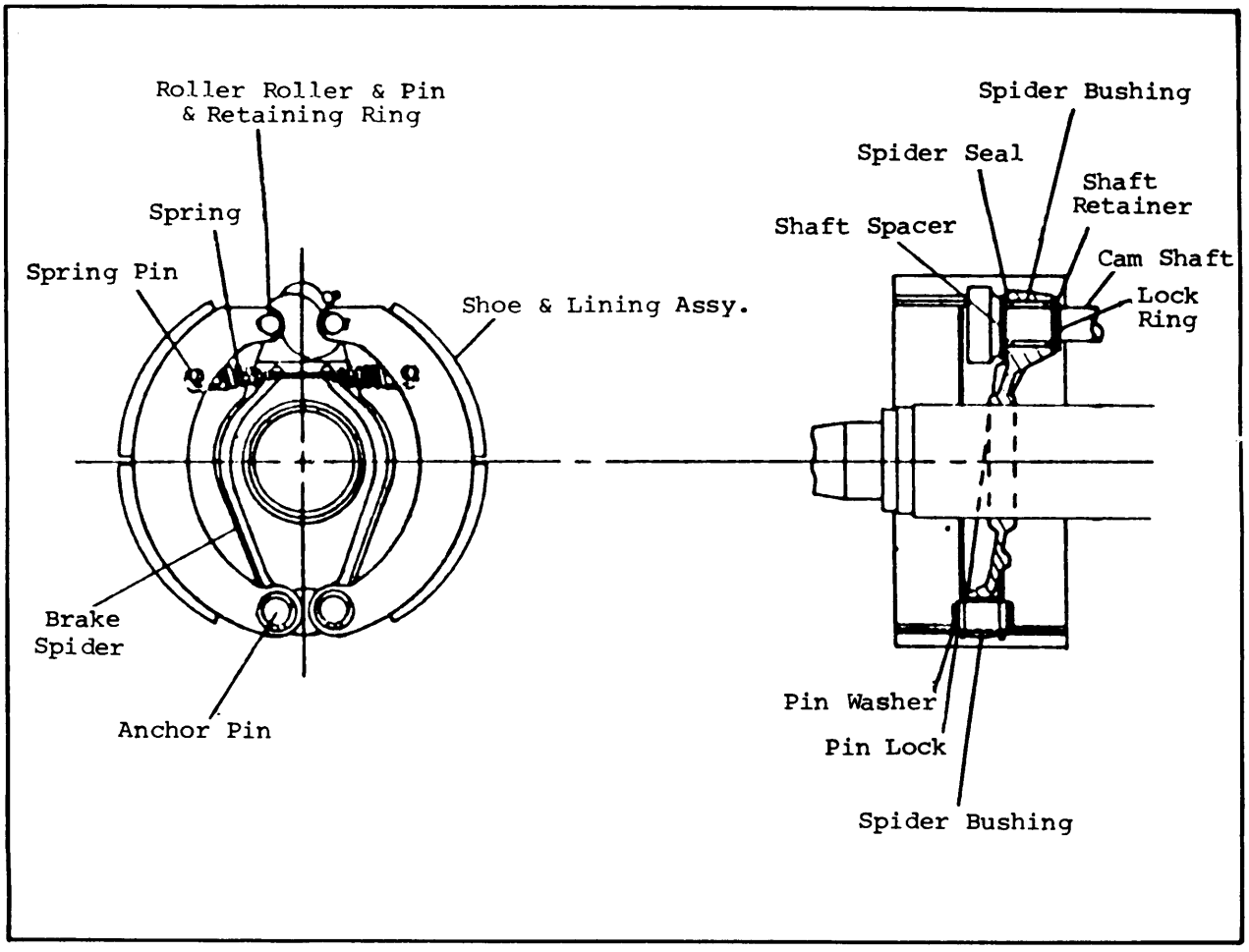


FIGURE 8-2. FOUNDATION BRAKE COMPONENTS.

d. Replace cracked, badly scored, or severly heat checked brake drums.

8-17. REFINISHING DRUMS.

a. Do not exceed maximum inside drum diameter specification cast into brake drum.

b. Refinish both drums on an axle at the same time.

c. Use a finish of 180 micro-inches roughness.

8-18. CHECKING BRAKE PARTS.

a. Check brake shoe against anew shoe (if possible) for distortion. Do not use distorted shoes.

b. Check retract spring for elongation.

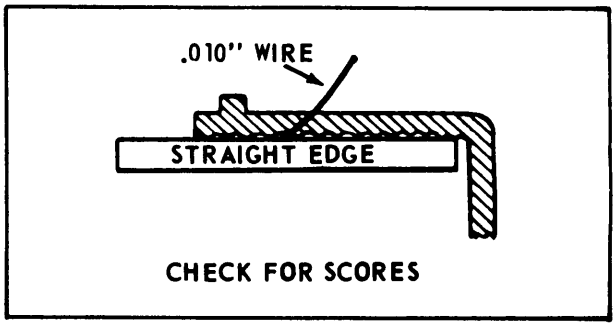


FIGURE 8-3. CHECKING FOR SCORED DRUM.

c. Use new anchor pin bushings, cam rollers, roller shafts and lining rivets

d. Examine the cam face, cam washers, anchor pins, clips and snap rings for wear, breakage, and distortion.

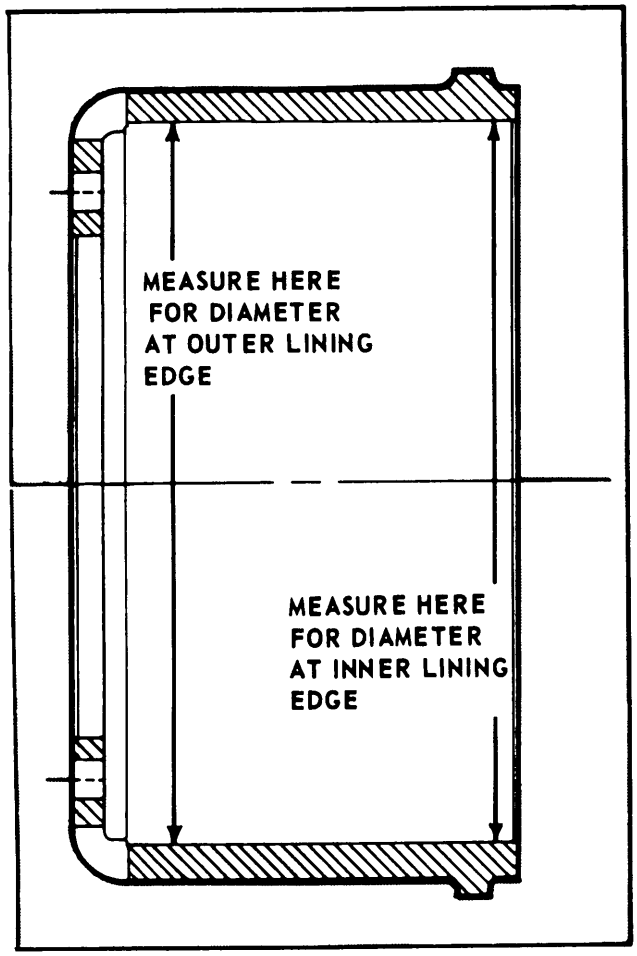


FIGURE 8-4. CHECKING FOR BELL MOUTHING.

e. Check for grease leakage under cam head. If excessive, pull camshaft and replace seals.

f. Check for side movement of cam in spider bushing. If detectable, replace bushing and seals.

g. See the procedure on camshaft removal and reassembly if camshaft bushings are worn, or if seals are leaking.

8-19. REASSEMBLING BRAKES.

a. Clean all metal parts in solvent and dry thoroughly.

b. Press new anchor pin bushings into brake spider.

c. Assemble new brake linings onto brake shoes. Use proper oversize linings if brake drums have been turned down .

d. Oil new roller and shaft and reassemble into shoe.

NOTE: Do not allow oil or grease to contact brake lining.

e. Assemble shoes into spiders with washers and snap rings

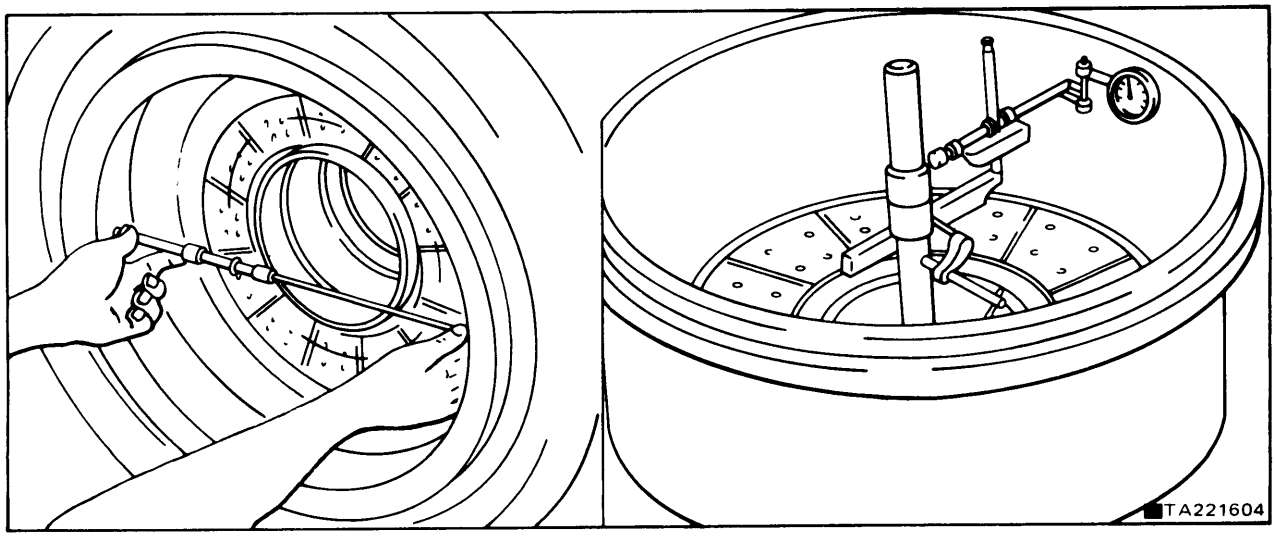


FIGURE 8-5. CHECKING FOR OUT-OF-ROUNDNESS.

9. Circle grind linings to drum diometer.

NOTE: When using a new brake drum with replacement linings, the linings must be buffed.

h. Reassemble hub and drums (see Section 11).

i. Reassemble slack adjustor to camshaft (see camshaft reassembly). Replace the slack adjuster if holes are. worn.

j. Adjust brakes (see Section 4).

k. Check braks adjustment frequently during the first 500 miles after relining.

9-1. GENERAL.

9-36. HP SERIES TILT CYLINDER.

9-37. FILLING.

9-38. Fill the tilt cylinder with the rod fully retracted. A very small air space needs to be left in the cylinder for proper operation. Filling the cylinder as full as possible when in the angle shown in figure 9–12 will leave about the right size air gap.

9-39. TESTING,

9-40. A test of the platform "free fall" will determine that the correct amount of air is present. Test as follows:

a. Tilt the platform to the ground.

b. Measure the vertical distance from the tongue to the top front edge of the frame.

c. Using an assistant to take the measurement, start walking towards the front of the platform (see figure 9-13).

d. The platform should drop suddenly a small amount when you walk past the pivot. The assistant should note the amount of "free fall".

e. The correct amount of "fall" is 3 to 4 inches (76.2 - 101.6 mm). If less, there is not enough air in the cylinder. If more, there is too much air in the cylinder.

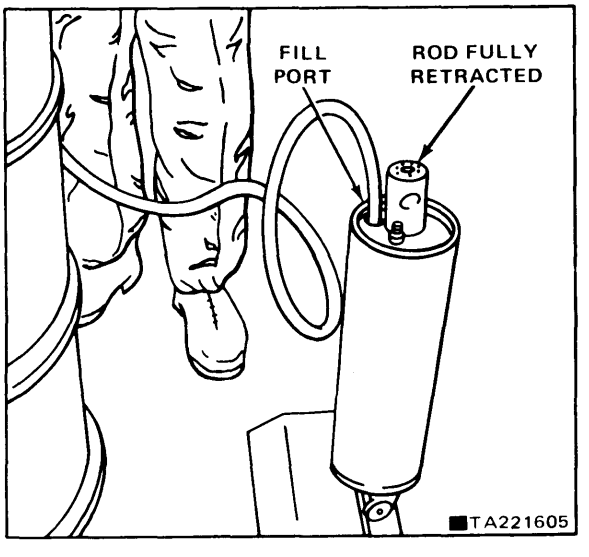


FIGURE 9-12. FILLING THE HP AND GHP SERIES TILT CYLINDER.

9-41. DISASSEMBLY OF TILT CYLINDERS

9-42. Be sure to have a retaining ring, o–rings, backup washer, and piston teflon seal on hand prior to disassembly of this cylinder. These parts will usually be damaged during disassembly. Disassemble *as* follows:

a. Using a punch or piece of key stock, push the retaining ring around the slot so that it can be forced out and gripped (see figure 9-14).

b. Pull the retaining ring out of the slot.

c. Extend the rod to dislodge the head.

d. If the rod needs repacking, it is recommended that the piston nut and piston be removed. The pin end of the rod may be slightly distorted.

9-43. REASSEMBLY OF TILT CYLINDERS

9–44. Reverse the procedure in 9-42 and drive in a new retainer ring.

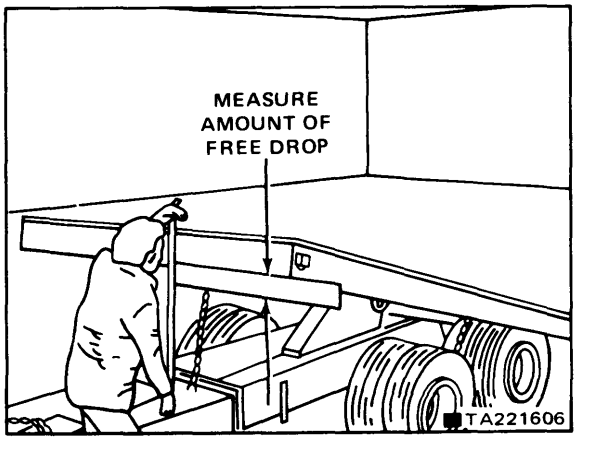


FIGURE 9-130 MEASURING FREE FALL ON HP SERIES PLATFORM.

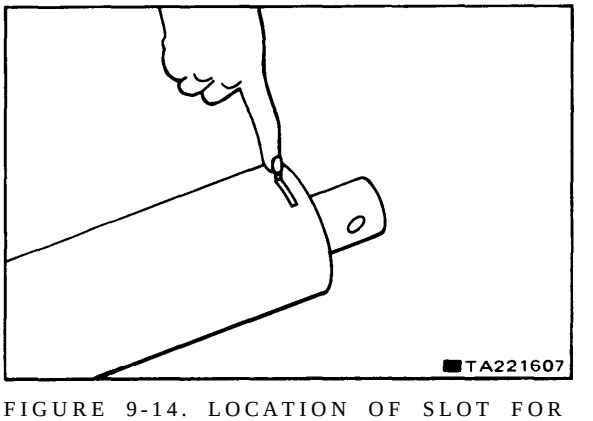


FIGURE 9-14. LOCATION OF SLOT FOR RETAINING RING.

10-1. GENERAL.

10-2. This HYSTER trailer is equipped with a 2 axle rubber bushed, walking beam suspension with alignment features. Before servicing undercarriage components be sure that the parts are blocked or supported by a hoist or other equipment capable of holding this heavy equipment.

10-3. UNDERCARRIAGE ALIGNMENT.

10-4. GENERAL.

10-5. When a trailer steers or dogs to one side, the undercarriage should be aligned.

10-6. ALIGNMENT CHECK PROCEDURE (see figure 10-1).

a. Block trailer level with tires clear of ground and remove front wheels and hub caps.

b. With steel tape measure distance "R" and “L” from lunette eye to center of axle spindle, as shown in figure 10-1.

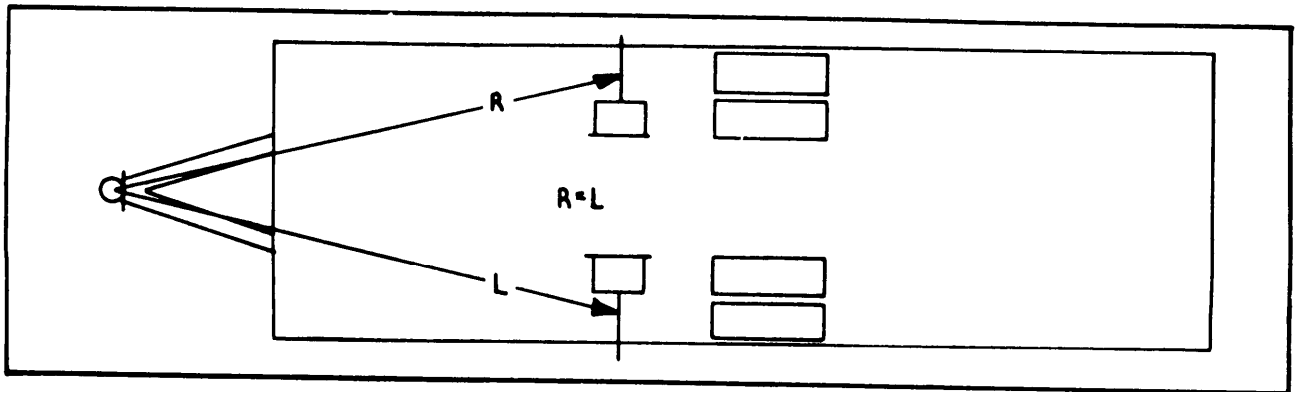


FIGURE 10-1. FRONT AXLE ALIGNMENT.

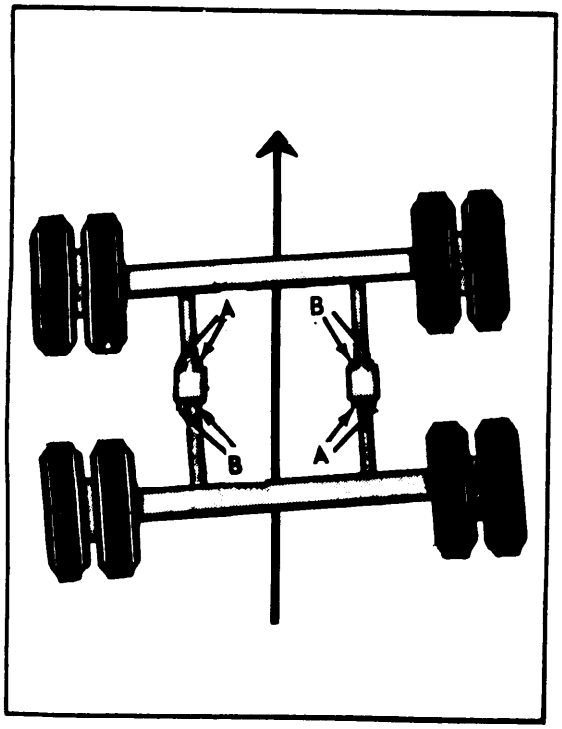


FIGURE 10-2. TANDEM ALIGNMENT DETAIL.

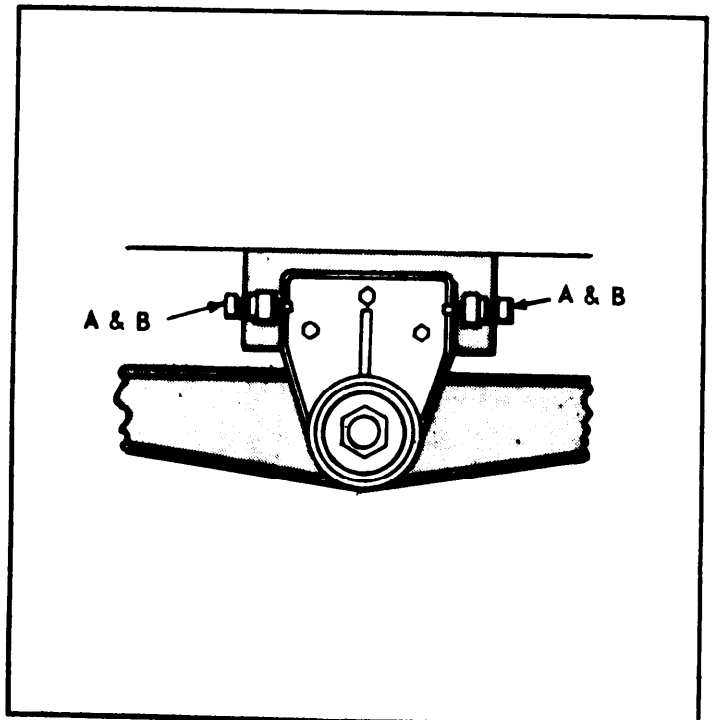


FIGURE 10-3. ALIGNMENT SCREWS

c. Distance “R” and “L” should be equal, If not, make adjustment of alignment screws using procedure given in paragraph 10-7 until equal “R” and “L'' distance is obtained.

10-7. TANDEM ALIGNMENT PROCEDURE.

10-8. If the unit is steering left, as shown in figure 10-2, correct the alignment as follows:

a, Loosen all locknuts at points “A” and “B” (see figure 10-3).

b. Loosen the four (4) alignment screws “A” and tighten the four (4) alignment screws “B”. Continue this procedure until tandem is in alignment.

NOTE: To prevent ports from binding, it is recommended that pairs of screws be tightened at the same time.

c. Tighten all locknuts after tandem is aligned and screws are tight.

d. If unit is steering right, loosen the four (4) alignment screws “B” and tighten the four (4) alignment screws “A”, the opposite of above procedure.

10-14. CORRECTING TIRE SCUFF AND UNEVEN WEAR.

10-15. CHECKING TIRE SCUFF - FIRST WHEEL ALIGNMENT TEST.

10-16. Feather edging, scuffing, and uneven wear of tires show need for alignment check. “scuff” has to be checked on a wheel alignment tester. A reading of 16 ft. (4.88 metres) runout per mile or less indicates satisfactory alignment. A reading in excess of 16 ft. (4.88 metres) per mile reveals a need for checking the cause of excessive runout. Check the wheel bearings, and check for wheels which are bent or broken. If the wheel bearing and wheel check reveal nothing, check for bent axles and spindles.

10-17. CHECKING AXLE SPACING - SECOND ALIGNMENT TEST.

10-18. Another check to determine the causes of the wear characteristics above is as follows:

a. With trailer unloaded, see that all axles are level.

b. Remove hub caps and, using trammel equipped with extended points, check center distances of the first and second axle on both sides of the trailer (see figure 10-5).

c. If above distances vary more than ±1/16 in. ±1.59 mm), check further for bent spindle, axle or other mechanical damage.

10-19. CHECKING AXLE FOR BEND.

10-20. Scuffed tires or uneven wear may indicate a bent axle. Check as follows:

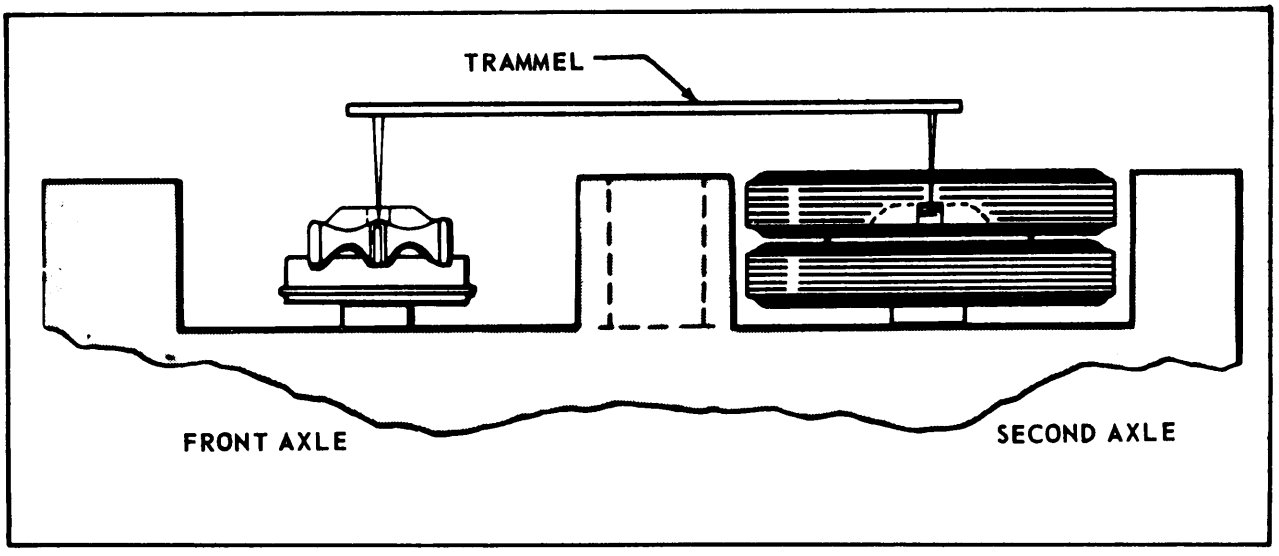


FIGURE 10-5. MEASURING AXLE CENTERS.

a. Remove wheel assembly and bearings.

b. Place axle gauge in position on front side of the axle (see paragraph 10-6).

c. With the single pronged end of the gauge held firmly against the inner bearing surface, adjust the double prongs on the other end of the gauge until they contact the inner and outer bearing surface.

d. Now move the gauge over to the rear side of the axle. If either of the two (2) prongs fails to make contact, a bent spindle is indicated. Use a feeler gauge to determine the amount of the bend. If bend is in excess of .0156 in. (0.3962 mm), replace the axle.

e. If checking both sides of one spindle reveals no bend in the axle, turn the gauge end for end and check the other spindle without disturbing the setting of the prongs.

f. If there is clearance at either bearing surface, check with a feeler gauge. If the prongs are in contact at both points, the axle is not bent.

10-21. CHECKING AXLE CAMBER.

10-22. Incorrect camber will cause wear on one side of the tread. Check as follows:

a. Follow procedure presented to determine axle is not bent. If so determined, proceed with steps b thru e.

b. Set the points of the axle gauge in exactly the same position on the axle and in the same manner as outlined in steps b and c in paragraph 10-20.

c. Place the gauge directly under the axle.

d. Positive camber - clearance between the inner prong and the bearing surface should normally be between .040 in. (1.016 mm) and .080 in. (2.032 mm). As long as the axle maintains camber, it should be satisfactory (see figure 10-7).

e. Negative camber - clearance between the outer prong and the bearing surface will indicate a sagging axle. Recamber or replace axle (see figure 10-7).

10-23. RUBBER BUSHINGS.

10-24. GENERAL.

10-25. The rubber bushed tandem is designed to provide long and satisfactory life. However, if it is impossible to secure proper tandem alignment or if inspection reveals need for replacement (rubber bulging, breaks, or slices), the change can be made with a minimum of equipment.

10-26. REPLACEMENT OF RUBBER BUSHINGS.

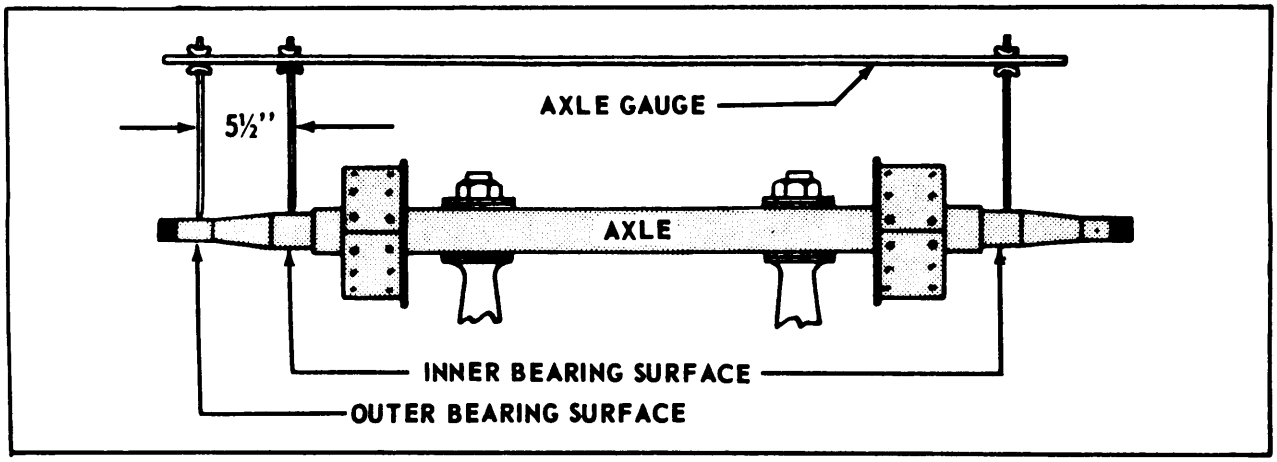


FIGURE 10-6. CHECKING FOR AXLE BEND AND CAMBER.

10-27. To replace rubber bushings at center of walking beam, proceed as follows:

a. Jack up trailer frame to relieve tandem of weight.

b. Identify shafts, plates and nuts as noted in above caution statement.

c. Remove three mounting bracket bolts and retainer nuts on one side of walking beam only (see figure 10-8).

d. Remove one-half mounting bracket and remove exposed rubber bushing.

e. Push balance of assembly out other side of walking beam and remove other half of mounting bracket.

f. Inspect parts removed, replace if required.

NOTE: Rubber bushings - should be free of cracks or tears, must properly fill bushing cavity, close fit on shaft.

NOTE: Mounting brackets should not be worn, broken, or cracked.

g. Reassemble bushings and mounting brackets in reverse order of removal. Proper tightness of the rubber bushings is obtained when the retainer plates or mounting brackets are shouldered. Properly tighten mounting bracket nuts. Refer to TABLE 2-8 for torque specifications.

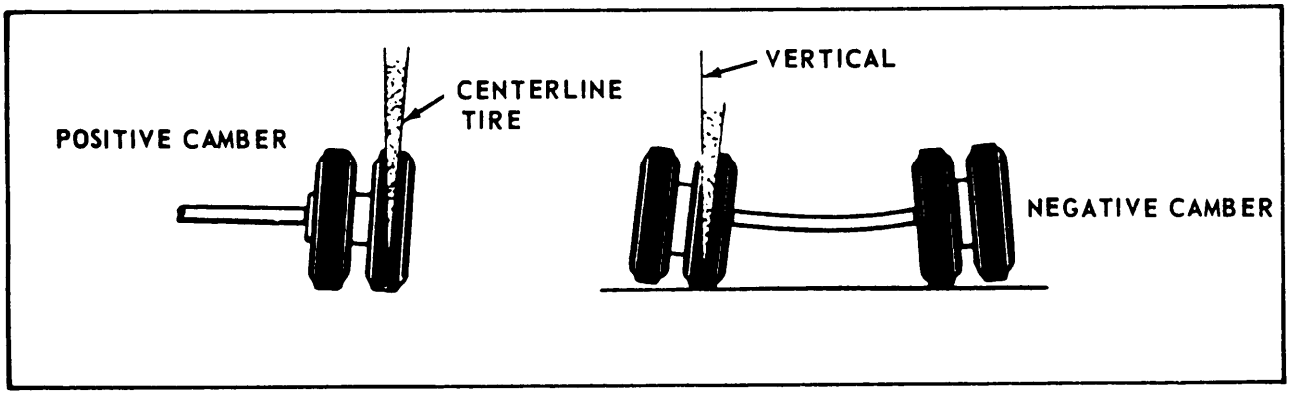


FIGURE 10-7. ILLUSTRATION OF AXLE CAMBER.

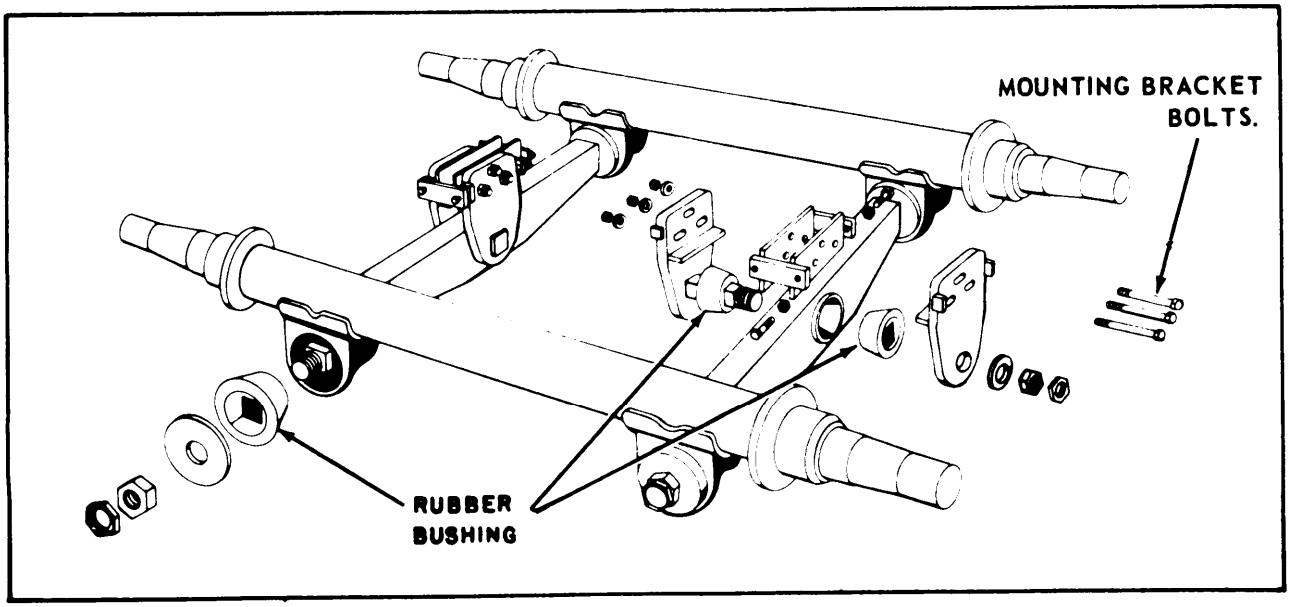


FIGURE 10-8. TANDEM RUBBER BUSHING

10-30. REMOVING AXLES.

10-31. Using equipment of adequate capacity, remove the entire tandem axle assembly being serviced. Proceed as follows:

a. Record the distance from the top of the axle to the top of the cam, and whether the cam is to the front or rear.

b. Remove wheels, drums and foundation brakes.

c, Remove the nuts and rubber bushings retaining the axle on the walking beams.

d. Remove the axle.

10-32. INSTALLING AXLES.

a. Set the tandem brackets at the same centers as the brackets welded to the trailer frame.

b. Install new cast retainer brackets on the ends of the walking beams with an axle seated, but not welded, in the saddle of the brackets (see figure 10-10). The camber marks should be located on top of the axle during this procedure. See figure 10–11 for camber mark location.

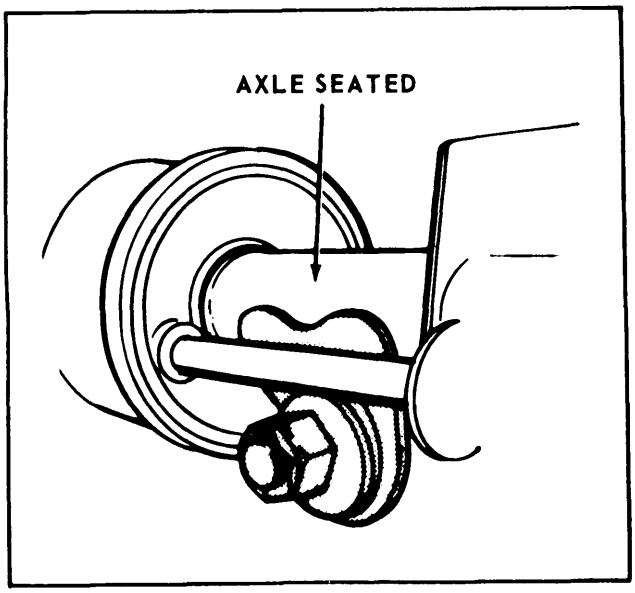
c. Square the undercarriage. The existing axle should be squared with the walking beams as closely as possible without changing the centers on the tandem hangers.

d. Check the distance from a straightedge placed over the spindle ends to the tandem mounting bracket plate (see figure 10–12). Compare this distance with a corresponding distance on the opposite side. Move the axle in the cast retainer saddle to get these dimensions equal.

e. Check the new axle for bend as shown elsewhere in this section. If bend is over 1/64 in. (.397 mm) as shown in the procedure, rotate the axle very slightly and check again. If the bend dimension becomes greater, try rotating the axle the opposite direction. When the axle falls under the 1/64 in. (.397 mm) maximum bend, mark the axle in some way to keep this position. Check the cam location to ensure that it will be close to being the same as that on the axle being replaced.

f. Check the distance from the center of the spindle of one axle to the center of the other. Check this distance on the other side (see figure 10-13). If these distances are not equal (R1=L1), place a wedge between the axle and saddle to get them the same (see figure 10-14).

g. Check dimensions across corners. Locate the top center of the axle at 2 in. (50.8 mm) in from the brake spider. Mark this point (see figure 10-15). Be very accurate as this dimension is critical. Make this mark at four (4) locations. Measure the distance between marks diagonally across the tandem. The two diagonal measurements (A & B) should be equal. If not, adjust the new axle in its seat as required (see figure 10-16).



FUGURE 10-10. AXLE SEATED IN CAST BUSHING RETAINER.

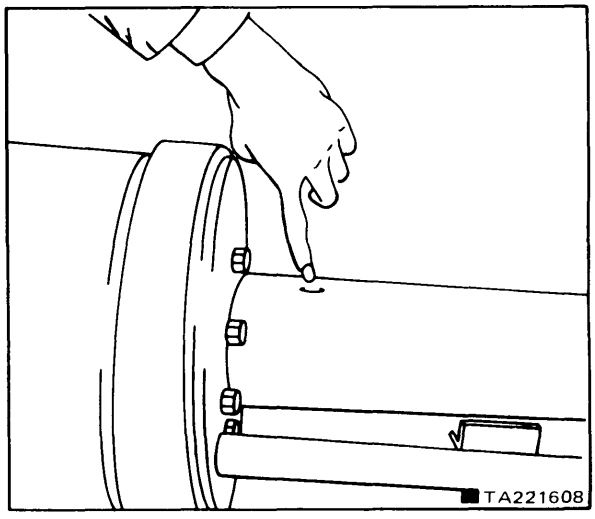


FIGURE 10-11. AXLE CAMBER MARK.

h. Check steps c through g again to get the undercarriage as close as possible to alignment prior to welding the axle in place. If difficulty is experienced in step g, check the location of your marks for accuracy.

i. Tack the axle in position on the cast retainer.

j. Assemble the foundation brakes onto the axle.

k. Put a new cam bushing bracket over the cams. Put on the slack adjuster and snap ring to fixture the bracket. Weld the bracket in place.

l. Bolt the power chamber in position on the power chamber bracket and connect the yoke to the slack adjuster.

m. Position the power chamber bracket on the

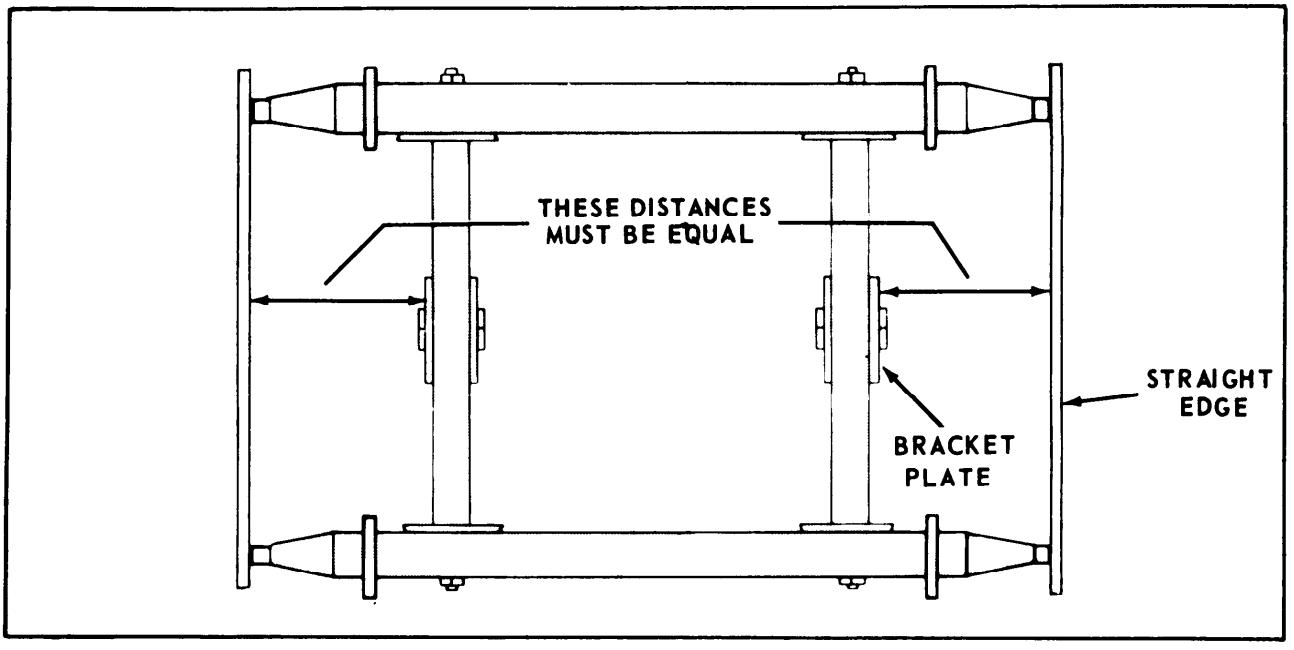


FIGURE 10–12. EQUALIZING AXLE OVERHANG.

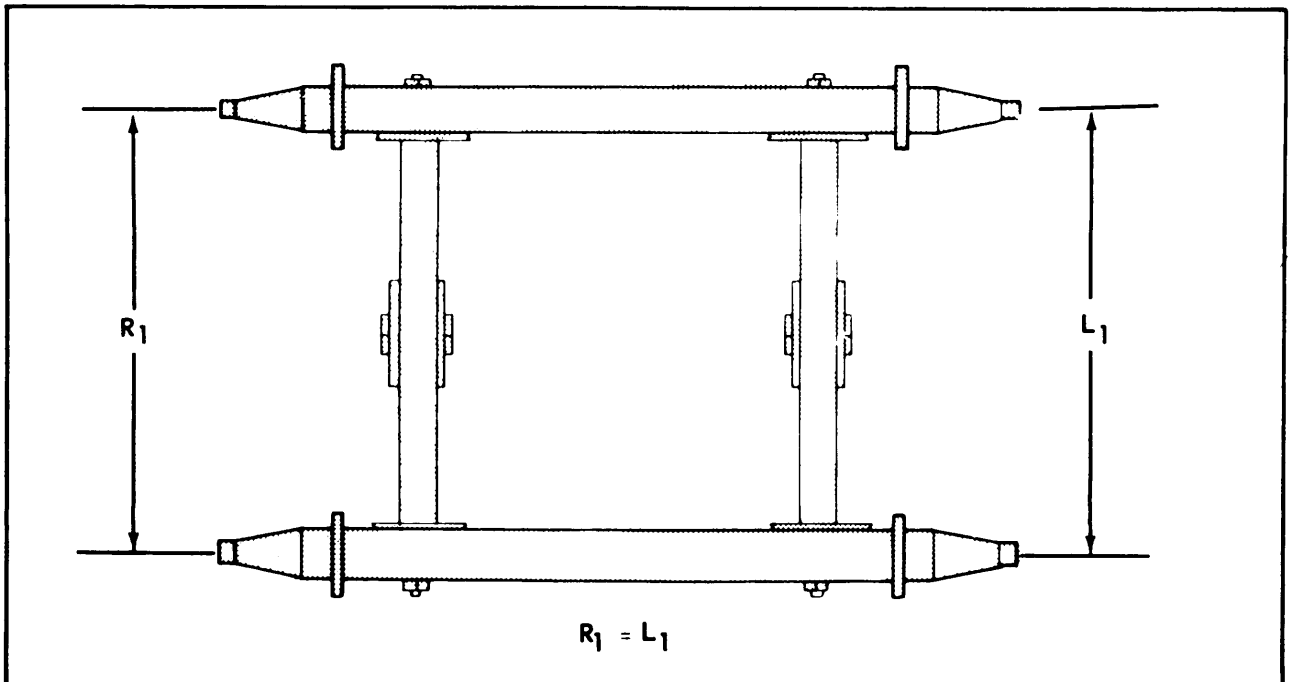


FIGURE 10-13. EQUALIZING AXLE CENTERS.

axle while the slack adjuster, push rod, and power chamber mounting face are in the same position as on the existing axle (see figure 10-17).

n. Tack weld the power chamber in place.

o. Check all clearances and weld the cast retainer on the axle using 5/32 (3.97 mm) E7018 electrode (see figure 10-18). Peen immediately after welding.

P. Assemble the hub and drum assemblies to the axle and adjust the brakes.

q. Again compare the slack adjuster angle, push rod angle, and push rod to mounting face angle with that of the original axle. Also, check for bind between the push rod and push rod hole. If this checks out, weld the power chamber bracket on.

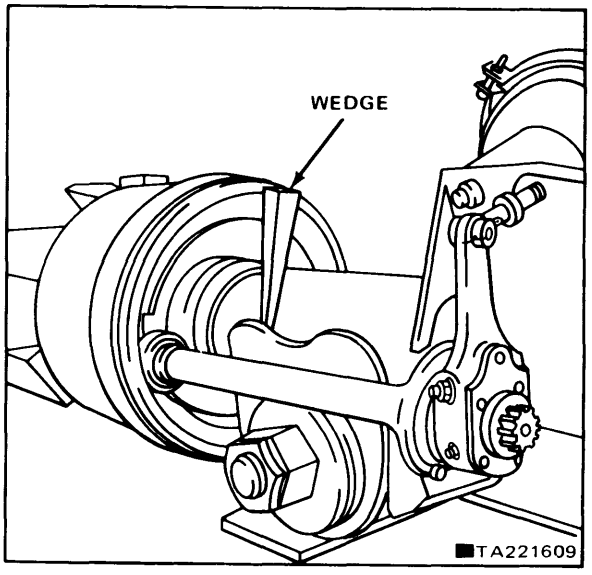


FIGURE 10-14. WEDGING BETWEEN CAST RETAINER AND AXLE TO OBTAIN FINE ADJUSTMENT OF AXLE CENTERS.

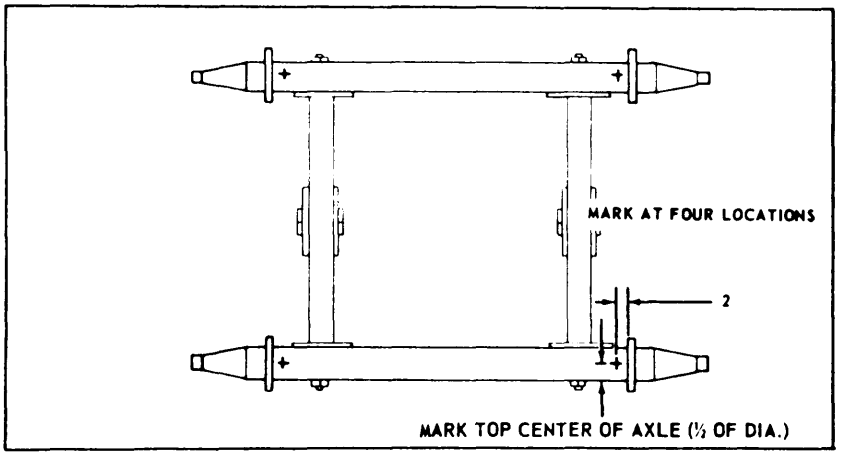


FIGURE 10-15 MARKING CHECK POINTS FOR DIAGONAL MEASUREMENT

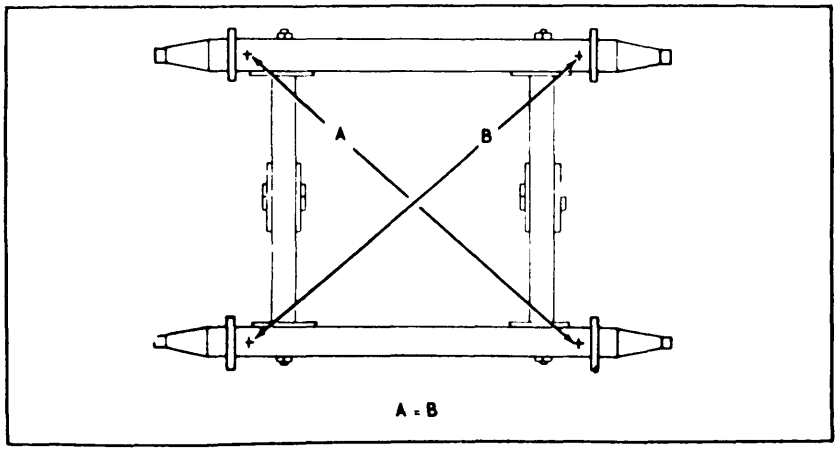


FIGURE 10-16. EQUALIZING AXLES THROUCH DIAGONAL MEASUREMENT.

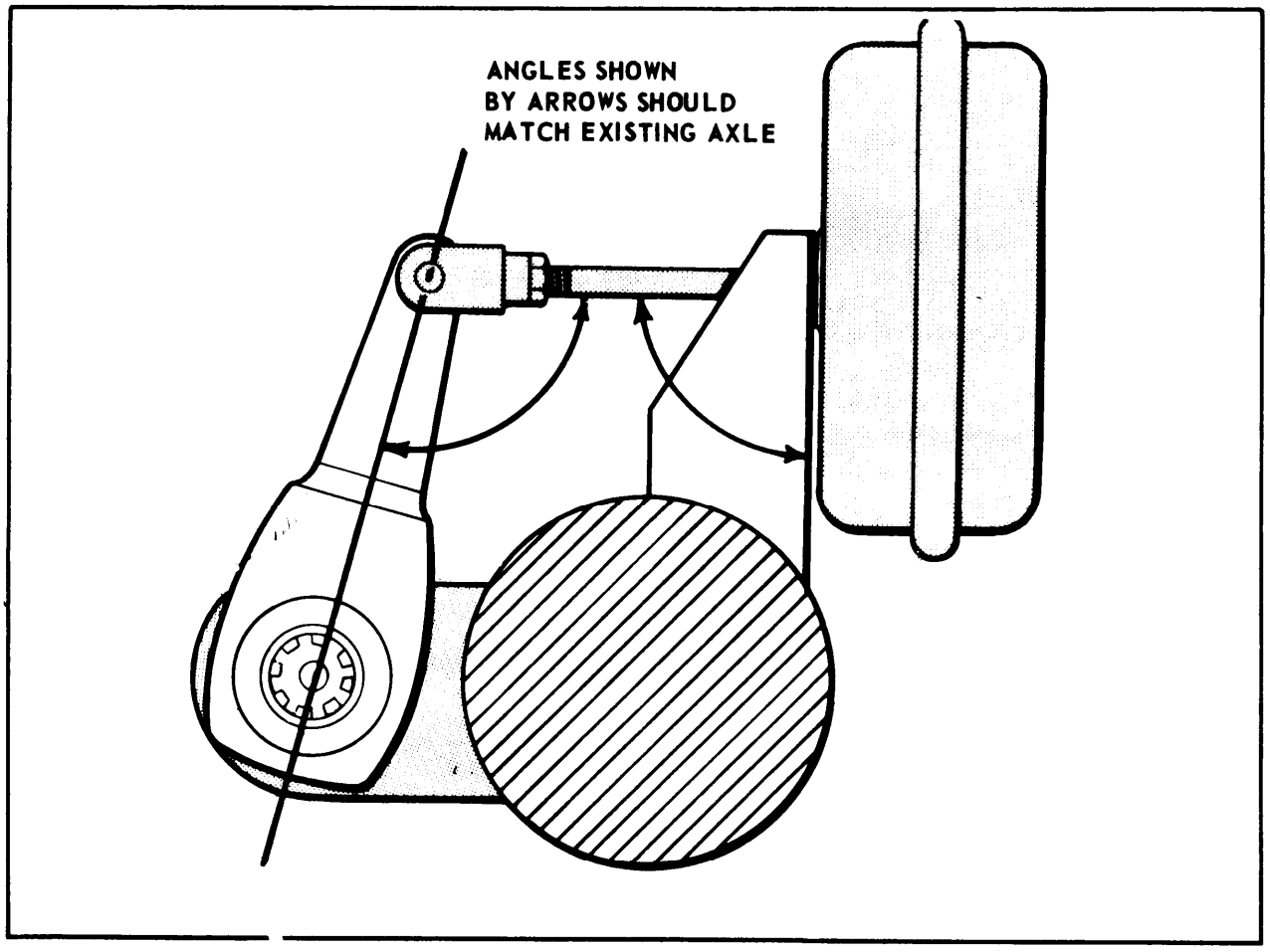


FIGURE 10-17. BRAKE ACTUATOR GEOMETRY.

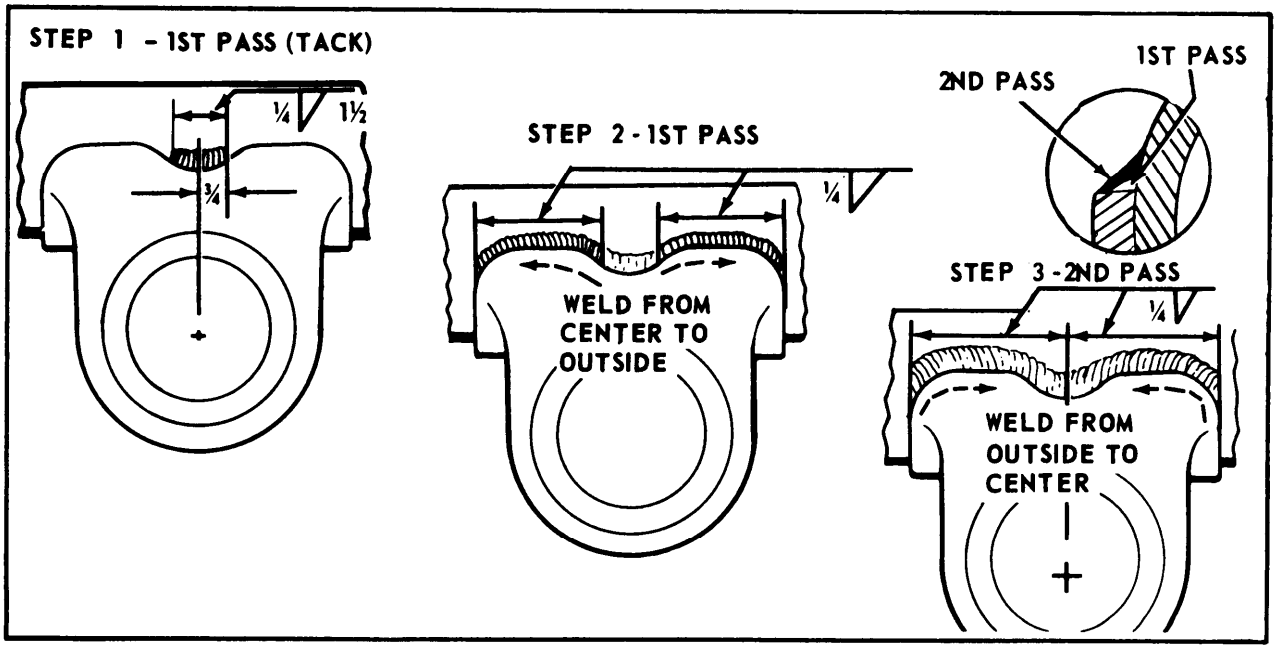


FIGURE 10-18. WELDING CAST BUSHING RETAINER TO THE AXLE.

11-1. GENERAL.

11-3. HUB REMOVAL.

11-4. Section 4 covers removal of disc wheels. These should be removed before removing hubs. Support the hub assemblies prior to removal. The hub and drum are removed as an assembly using the following procedure:

a. Back off the brake adjustment by turning the adjusting screw on the slack adjuster.

b. Remove the hubcap.

c. Bend the flap or tang of the lockwasher away from the flat of the outer spindle nut.

d. Remove the outer spindle nut, two (2) lockwashers, and the inner spindle nut.

e. Pull the hub and drum assemblies carefully to avoid damage to the bearings, spindle, and inner seal. Catch the bearing cones as the hub is removed from the spindle.

11-5. INSPECTION AND CLEANING,

11-6. While the hub is removed, inspect the condition of the brake drum and linings (see Section 8). Also check the condition of the cups, cones, seal, and axle ring.

11-9. PREPARING BEARINGS (OIL LUBRICATION).

11-10. Coat the bearing cones and cups with oil prior to assembly.

11-11. HUB INSTALLATION.

11-12. After the parts have been inspected and cleaned, install as follows:

a. Assemble the inner cone and seal into the hub.

b. Place the hub over the spindle being careful to avoid damage to the spindles, seals and brakes.

c. Put the outer cone into position.

d. Tighten the inner spindle nut while rotating the wheel both directions until a slight bind is felt.

e. Back off the nut 1/4 turn. The hub should rotate freely.

f. Install inner nut lock and place the lockwasher on the spindle.

g. Tighten the outer nut.

h. The end play should be .001 in. (.0254 mm) to .010 in. (.054 mm).

i. Lock the outer spindle nut in place by bending the tangs or edge of the lockwasher ove one flat on the outer nut.

j. Install hub cap gasket and hub cap. Fill oil lubricated assembly to the “full” line on the hub cap window.

k. Readjust the brakes.

12-1. GENERAL.

12-2. An important phase of trailer upkeep and maintenance is the inspection and repair, if any, of all structural steel members of the trailer frame. It is readily apparent that the frame must be one solid unit to carry the load safely and quickly without danger of accident or further damage to the trailer. This also prevents subsequent major repair costs and trailer downtime.

12-3. The need for a complete frame inspection stems from various reasons. Due to the heavy loads and difficult road conditions under which they are often operated, trailers are subject to considerable abuse. A trailer loaded to maximum rated capacity, or greater, and pulled at sustained speeds greater than accepted design standards, will depreciate at an accelerated rate. This rough handling may also cause structural failures of varying, degrees.

12-4. Failures are the result of metal fatigue due to flexing, bending, twisting, vibration and distortion. They will show up in the steel frame members as weld cracks, cracked and loosened steel sections.

12-5. WELD REPAIRS.

12-6. GENERAL.

12-7. Minor repairs to a crossmembers, floorplates, and other parts which are not part of a main structural member may be repaired without special instruction if good welding practices are followed. Repairs to major structural members should be made with an expert eye to the requirements of the part being repaired. Care should be taken to ensure that the repairs do not contain stress risers; areas which contain character sties that could lead to another failure.

12-8. Table 12-1 lists the recommended electrodes for the various steel used in HYSTER trailers.

TABLE 12-1.. ELECTRODES FOR WELD REPAIRS. *Low Hydrogen

TYPE STEEL	POSITION OF WORK	AWS ELECTRODE	USUAL SIZE
Manten or Ex-Ten 50	Vertical and Overhead	E6012*	3/16"
Manten or Ex-Ten 50	Down Hand	E6014	3/16"

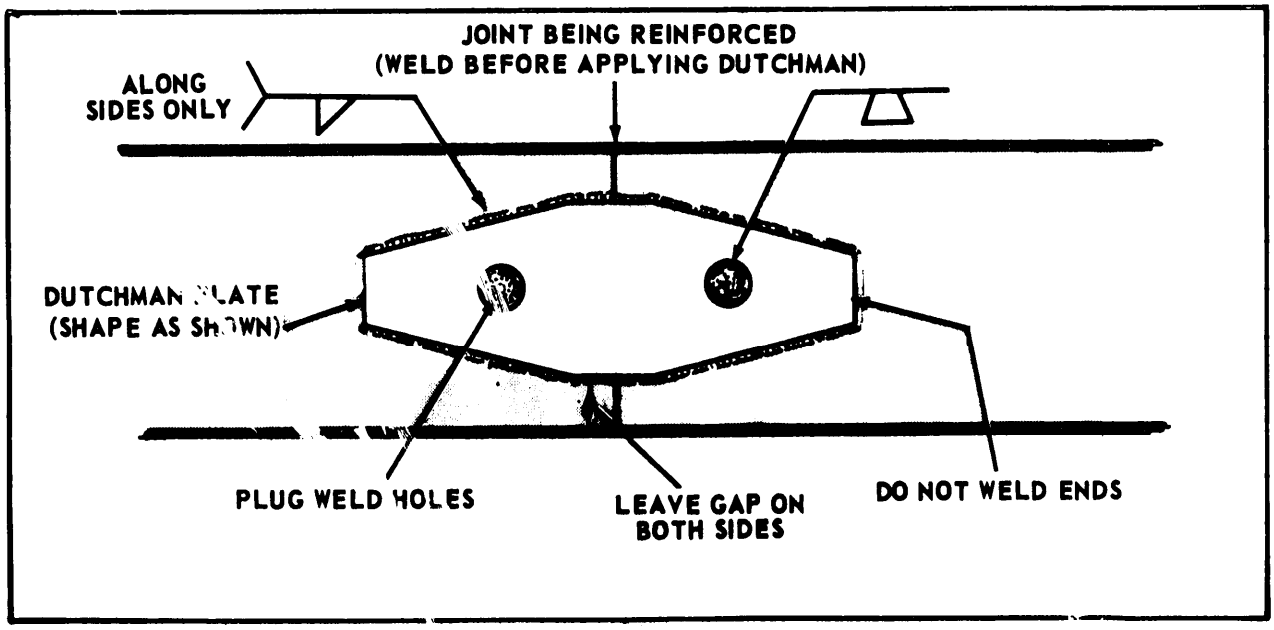


FIGURE 12-1. DUTCHMAN PLATE INSTALLATION.

12-9. REPAIR PROCEDURES.

12-10. Old weld metal and some material around cracks should be ground away and weld repairs made. Avoid welding on the edge of plates or flats used as load-carrying members unless absolutely necessary to cover a fracture. The addition of a dutchman (see figure 12-1) or fishplate, possibly with plug weld holes, may be required to transfer stress across weld repair areas. Weld rod choice should match the lesser strength steel being repaired under normal conditions. A downhand repair being made between a crossmember made of Ex-Ten 50 steel and a T-1 steel beam, for example, requires an AWS E6014 electrode.

12-13. LASH RINGS.

12-14. Figure 12-3 shows how to weld lash ring clips.

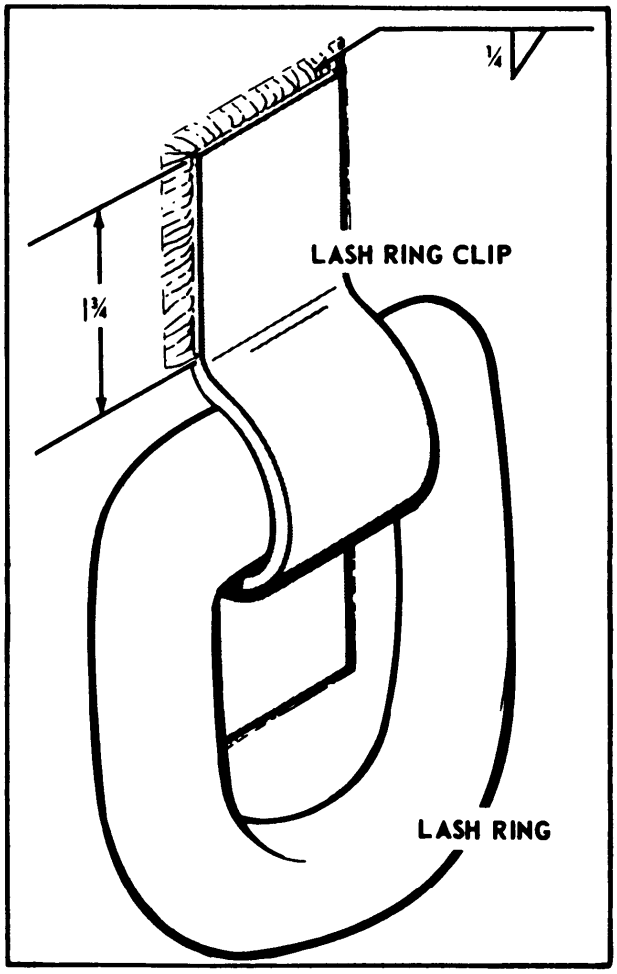


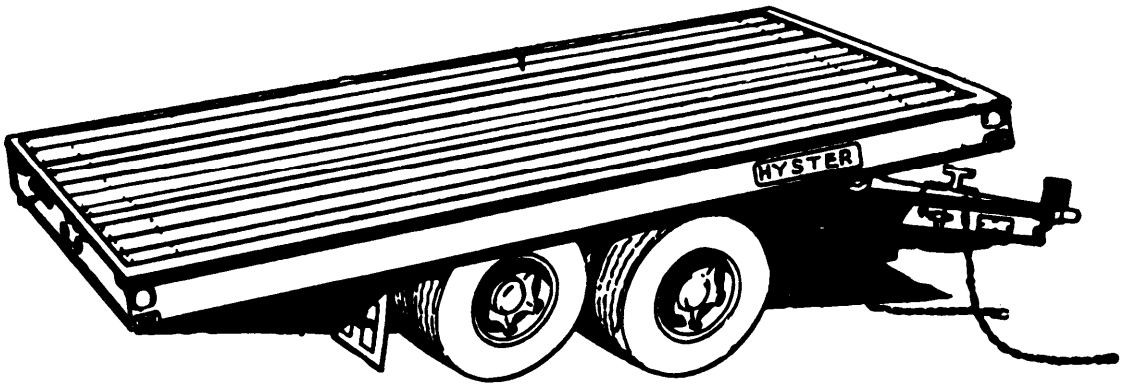
FIGURE 12-3. LASH RING CLIP INSTALLATION.

PARTS MANUAL
HP15T-MIL

INTRODUCTION

HYSTER COMPANY

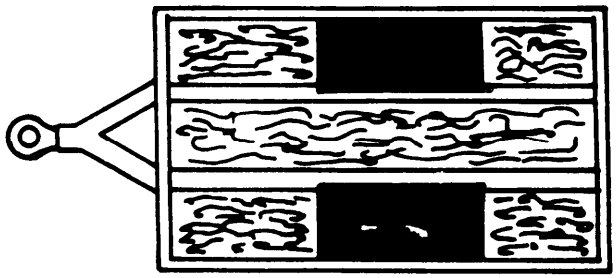
HP SERIES



"HP" SERIES PICTURED

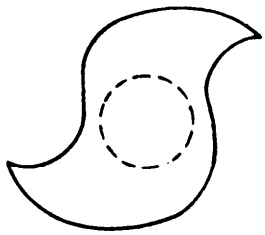
Parts referred to in this book as right or left hand parts are in accordance with the sketch below of the top of an "HP" series trailer.

R.H. SIDE

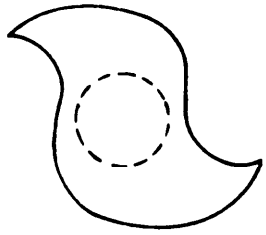


L.H. SIDE

Camshafts right or left hand is determined by the camshaft profile indicated below. (Illustrated at "Cam Head" End)



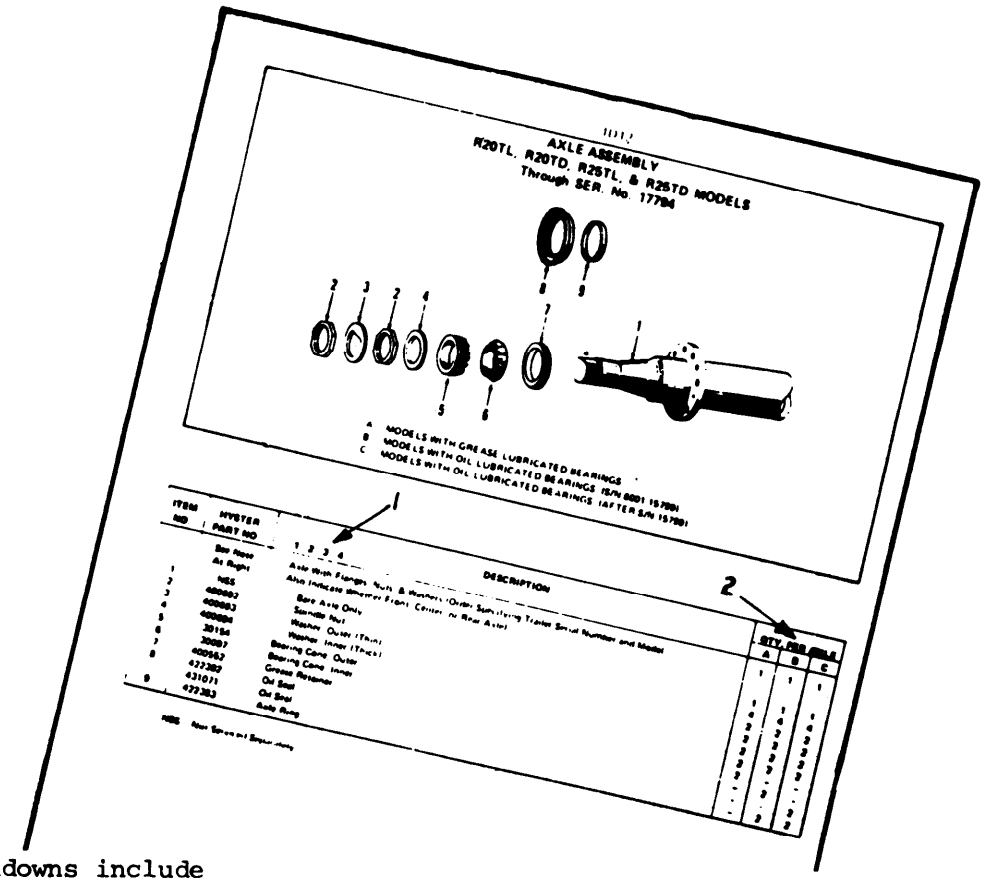
LEFT HAND



RIGHT HAND

How To The The Illustrated Parts Manual

This Parts Book describes and illustrates assemblies, sub-assmblies and detail parts needed for service replacefnent.



GENERAL: The assembly breakdowns include numbers, description and quantities required.

1. Indented numbers are used to indicate assemblies and sub-parts of assemblies. Number 1 is the major assembly. Part descriptions which are indented under 2, 3 or 4 are sub-parts of that major assembly shown above.

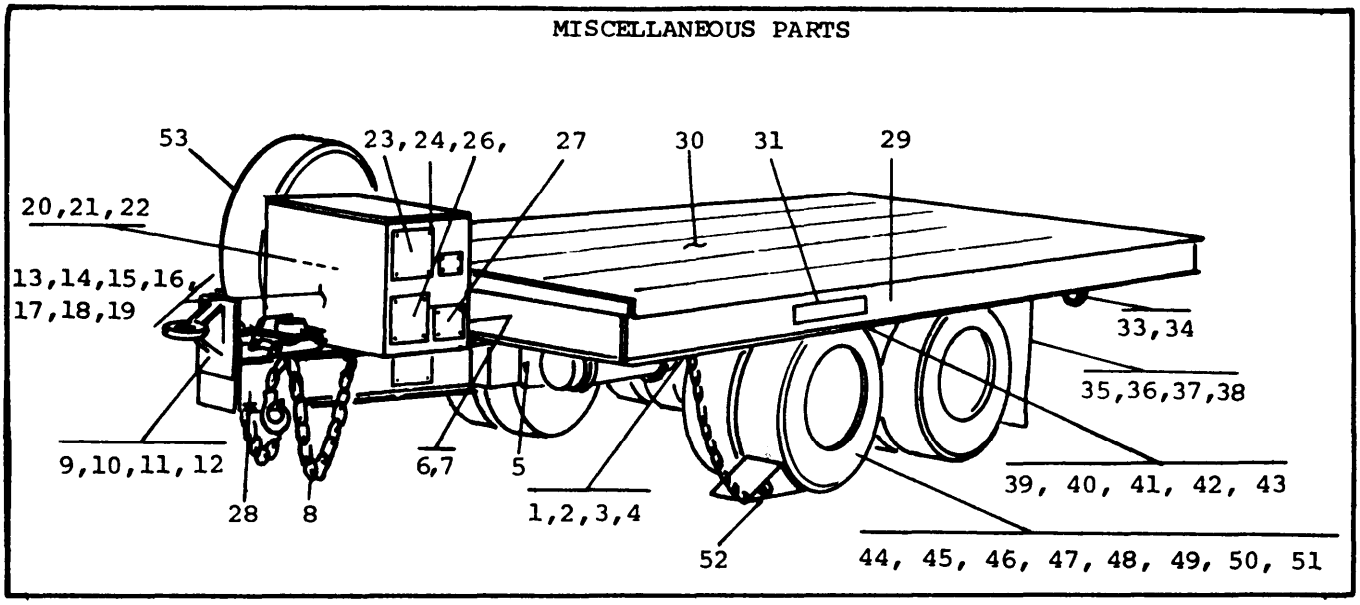
2. Quantities shown are for one assembly as illustrated unless otherwise specified.

ORDERING PARTS:

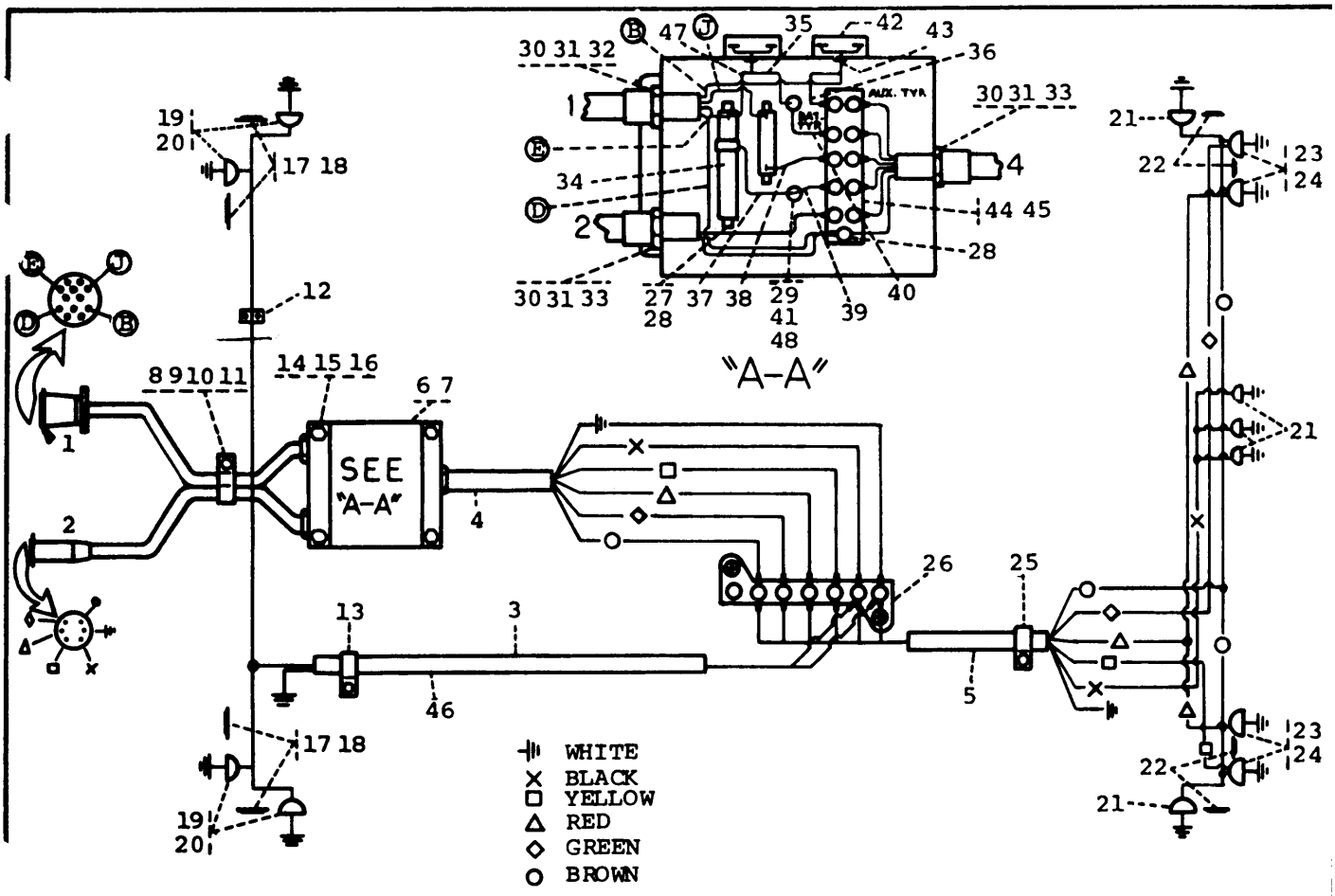
When ordering replacement parts, give the trailer serial number, model, part number, name of part and quantity required.

For any further information on parts, service, or ordering, consult your Hyster dealer.

MISCELLANEOUS PARTS

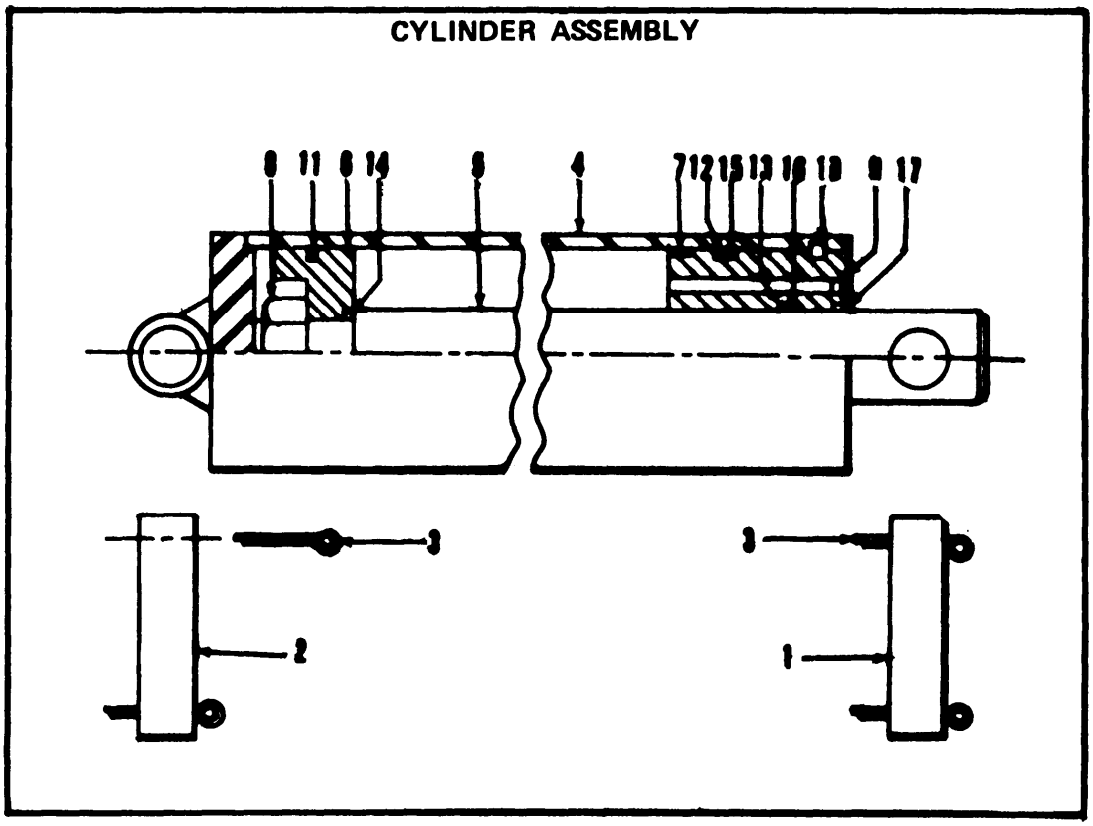


ITEM NO.	HYSTER PART NO.	DESCRIPTION 1 2 3 4	QTY.	ITEM NO.	HYSTER PART NO.	DESCRIPTION 1 2 3 4	QTY.
1	423721	Frame Pivot Shaft	2	30		Decking Parts	
2	16806	Capscrew 7/16 UNFx1 1/4	2		450178	2" Lumber Kit for Complete Deck	1
3	177413	Grease Fitting	2				
4	423722	Rod End	2		450177	Deck Bolt 5/16UNCx2½	115
5	400153	Grommet	6		15114	Nut 5/16 UNC	115
6	400520	Wing Nut	1		401082	Deck Clip	115
7	400519	Tongue Lock Bar	1	31	400115	Hyster Plate	1
8	450509	Safety Chain	2	32			
9	450405	Hitch	1	33	400201	Lash Ring Clip(As req'd)	
10	18668	Capscrew 1 UNC x 2 1/2	4	34	400200	Lash Ring (As req'd)	
11	15166	Lockwasher 1	4	35	446216	Mud Flap	2
12	15066	Hex Nut 1 UNC	4	36	401293	Retaining Plate	2
13	450418	Tool Box	1	37	25062	Capscrew 3/8 UNC x1 1/4	8
14	450423	Plate	1	38	15056	Nut 3/8 UNC	8
15	450424	Plate	1	39	450396	Axle Pad	4
16	138365	Eye Bolt	4	40	16816	Capscrew 3/8 UNCx1 3/4	16
17	15156	Washer 3/8	4	41	15156	Washer 3/8	16
18	15056	Nut 3/8 UNC	8	42	15056	Nut 3/8	16
19	15134	Washer 3/8	4	43	450403	Plate	8
20	419303	Spindle Nut Wrench	1	44	450427	Tire/Wheel Assy.	9
21	450510	Wheel Wrench	1	45	440760	Wheel Assy.	9
22	450511	Wrench Bar	1	46	450428	Tire Assy.	9
23	450605	Plate-Lifting, Tie Down & Shipping	1	47	450429	Tire	9
				48	450430	Tube-Radial Type	9
24	451001	Rivet	24	49	450431	Flap	9
25				50	402767	Valve Spacer	9
26	450204	Electrical Wire Chart	1	51	402397	Valve Extension	4
27	450604	Lubrication Chart	1	52	450501	Wheel Chock Assy.	4
28	451079	GVW Decal	1	53	401888	Outer Nut	2
29	451080	Tire Pressure Decal	1				

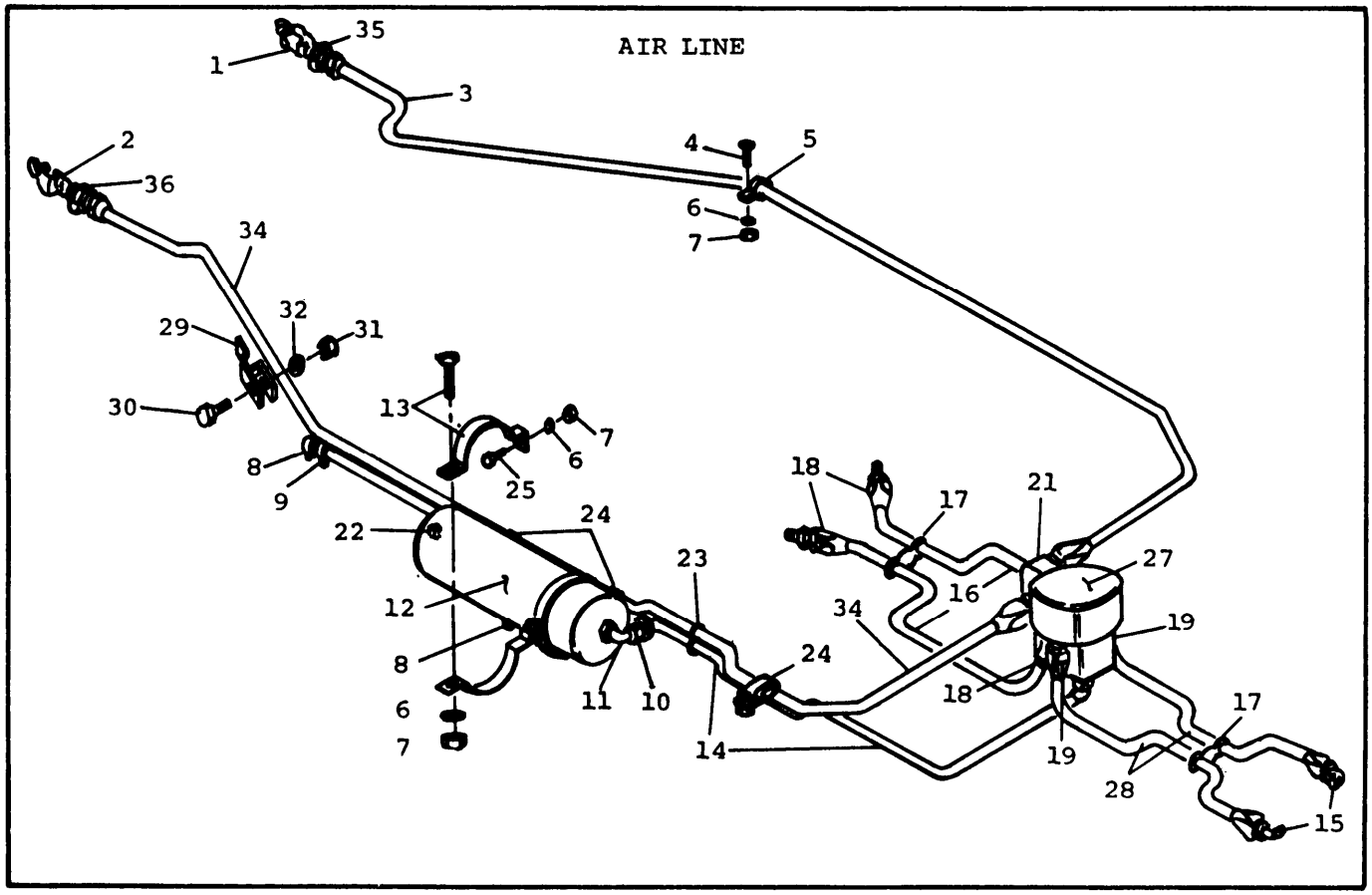


ITEM NO.	HYSTER PART NO.	DESCRIPTION	QTY.	ITEM NO.	HYSTER PART NO.	DESCRIPTION	QTY.
1	450461	24 V. Jumper Cable	1	25	400153	Grommet	7
2	450490	12 V. Jumper Cable	1	26	400230	Terminal Block	1
3	450077	Front Harness	1	27	450432	Capscrew #8 UNC x 1/2	19
4	450076	Cable Assy.	1	28	15039	Nut #8 UNC	20
5	450075	Rear Channel Harness	1	29	15002	Nut #10 UNF	8
6	450088	Box - Junction	1	30	450202	Locknut	3
7	450089	Panel	1	31	450203	O-Ring Gasket Assy.	3
8	16805	Capscrew 3/8 UNC x 1	16	32	450081	Electric Fitting	1
9	15156	Washer 3/8	16	33	450093	Electric Fitting	2
10	15056	Nut 3/8 UNC	16	34	450496	Resistor	1
11	140660	Clamp	6	35	450503	Wire	1
12	124359	Clamp	3	36	450505	Wire	1
13	153069	Clamp	7	37	450507	Wire	1
14	18497	Capscrew 5/16 UNC x 1	4	38	450506	Wire	1
15	15055	Nut 5/16 UNC	4	39	450508	Wire	1
16	15155	Washer 5/16	4	40	450504	Wire	1
17	451001	Rivet	16	41	450090	Diode	2
18	400216	Reflector, Amber	4	42	450084	Resistor	3
19	450083	Grommet	9	43	450495	Grommet	2
20	450080	CLRNC Light, Yellow	4	44	450086	Bracket	1
21	450079	CLRNC Light, Red	5	45	450087	Circuit Breaker	5
22	400217	Reflector, Red	4	46	400243	Loom	15'0"
23	450078	Stop/Tail Light	4	47	450607	Wire	1
24	450498	Grommet	4	48	197067	Washer #10	4

CYLINDER ASSEMBLY

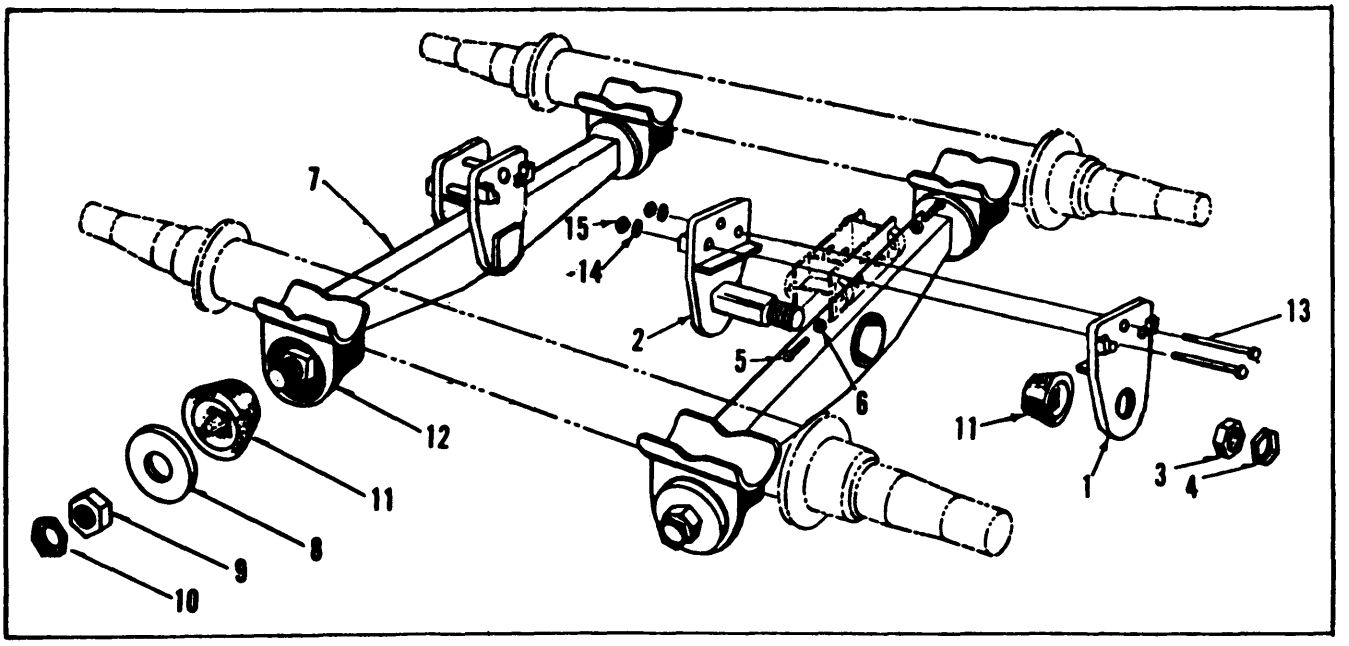


ITEM NO.	HYSTER PART NO.	DESCRIPTION 1 2 3 4	QTY.
1	400572	Rod End Pin	1
2	400547	Base End Pin	1
3	15255	Cotter Pin	4
4	433801	Cylinder Assembly	1
	433867	Cylinder Tube	1
5	433866	Piston Rod	1
6	433916	Piston	1
7	433917	Gland	1
8	433918	Lock Nut	1
9	15302	Pipe Plug, Sq. Hd 3/8 NPT	1
	433922	Packing Repair Kit	1
10	433919	Sq. Retaining Ring	1
11	433920	Teflon Seal Assembly	1
12	16082	O-Ring	1
13	46468	O-Ring	1
14	39358	O-Ring	1
15	232335	Back Up Washer	1
16	615190	Back Up Washer	1
17	433921	Wiper	1



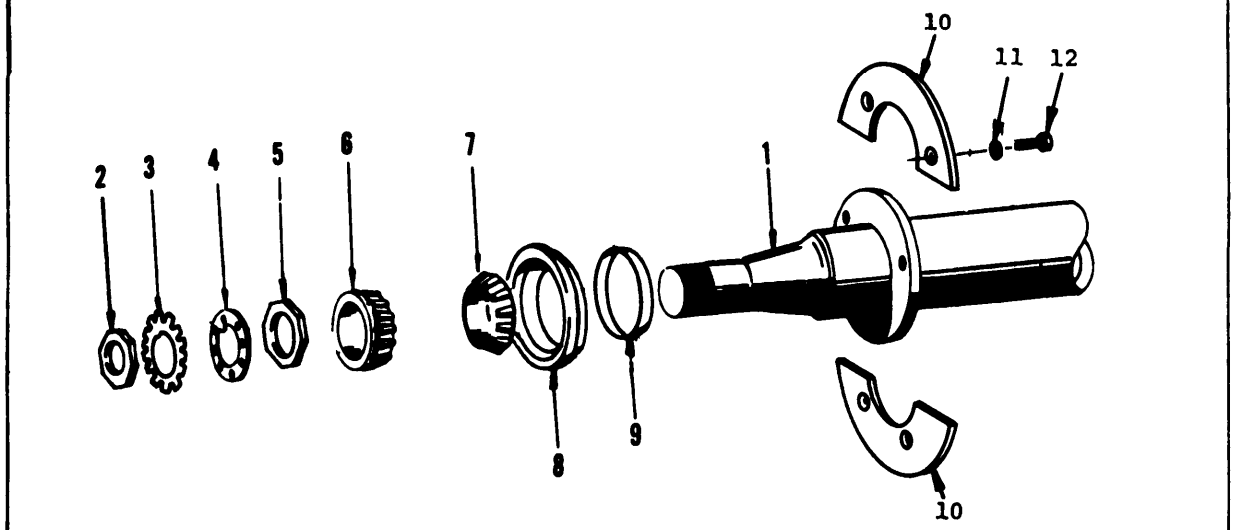
ITEM NO.	HYSTER PART NO.	DESCRIPTION	QTY.	ITEM NO.	HYSTER PART NO.	DESCRIPTION	QTY.
1	450352	Coupler Service ½ NPTF	1	19	14678	Connector	2
2	402717	Coupler Emergency ½ NPTF	1	20			
3	450047	Hose	1	21	14506	Elbow - 90 Degree	7
4	16805	Capscrew 3/8 UNC x 1	11	22	15302	Plug	2
5	153069	Clamp	7	23	400153	Grommet	5
6	15156	Washer 3/8	18	24	140660	Clamp	3
7	15056	Nut 3/8 UNC	18	25	16828	Capscrew 3/8 UNC x 1¼	7
8	450417	Drain Valve Assy.	1	26			
9	124359	Clamp	1	27	428800	Valve Assembly	1
10	96730	Grommet	2	28	450051	Hose	2
11	17536	Elbow - 90 Degree	2	29	411956	Dummy Coupler	2
12	400492	Air Reservoir	1	30	18497	Capscrew 5/16 UNC x 1	4
13	450121	Reservoir Bracket	2	31	15055	Nut 5/16 UNC	4
14	450048	Hose	1	32	15155	Washer 5/16	4
15	17309	Elbow - 90 Degree	2	33			
16	450050	Hose	2	34	450120	Hose	1
17	400241	Hose Clamp	2	35	450353	Service ID Tag	1
18	17315	Connector	4	36	450346	Emergency ID Tag	1

TANDEM ASSEMBLY



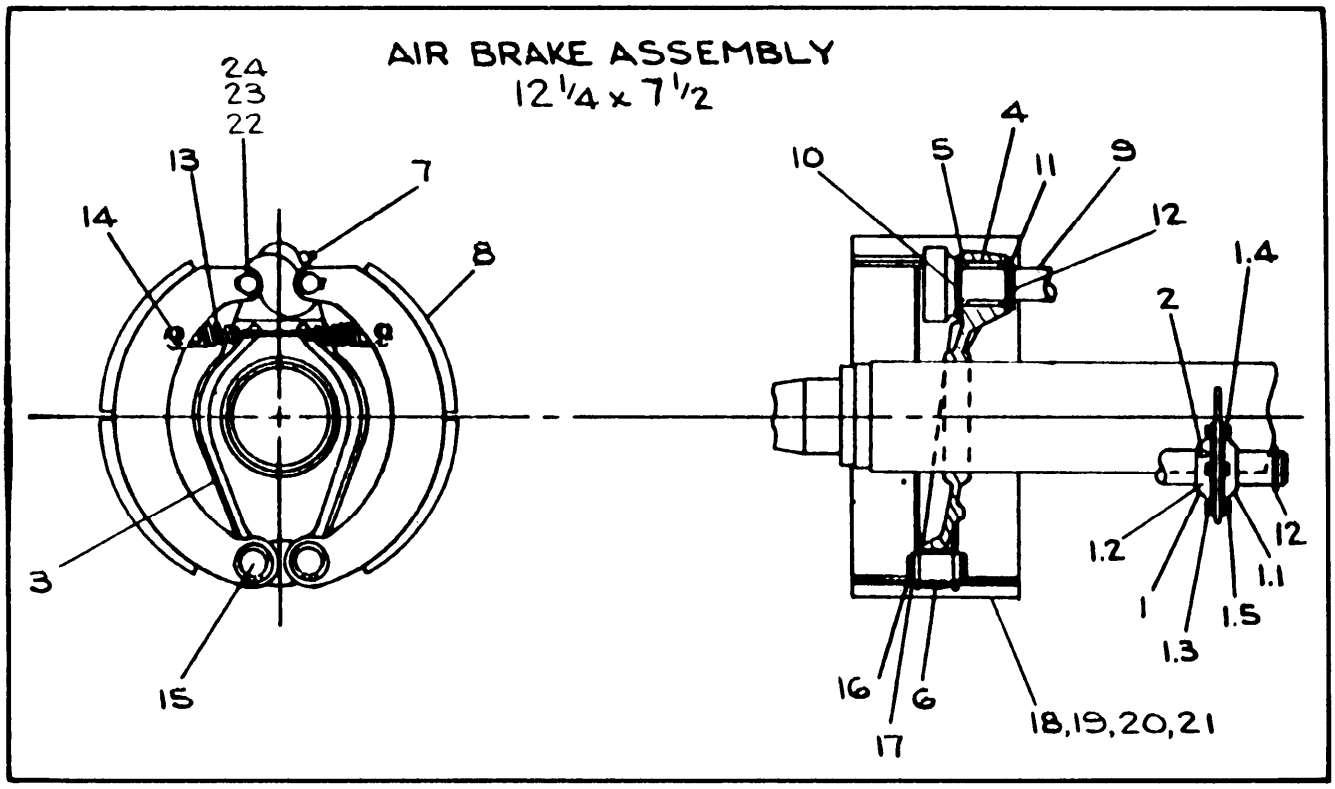
ITEM NO.	HYSTER PART NO.	DESCRIPTION 1 2 3 4	REQ. PER TRAILER
1	429214	Mounting Bracket	2
2	429216	Mounting Bracket	2
3	15073	Hex Nut	2
4	400314	Locknut	2
5	400012	Alignment Screw	8
6	15019	Hex Nut	8
7	401440	Walking Beam Assembly	2
8	400324	Bushing Retainer Plate	4
9	15074	Hex Nut	4
10	400315	Locknut	4
11	400329	Rubber Bushing	12
12	400320	Cast Bushing Retainer (5" Diameter Axles)	4
13	16066	Capscrew	6
14	15162	Lockwasher	6
15	15012	Hex Nut	6

AXLE ASSEMBLY



ITEM NO.	HYSTER PART NO.	DESCRIPTION 1 2 3 4	QTY. PER AXLE
	451089	Axle With Dust Shield Flanges, Nuts, and Washers	1
1	NSS	Bare Axle Only	1
2	400676	Spindle Nut, Outer	2
3	428788	Lockwasher, Outer	2
4	400677	Lockwasher, Inner	2
5	400678	Spindle Nut, Inner	2
6	401262	Bearing Cone, Outer	2
7	390304	Bearing Cone, Inner	2
8	403079	Oil Seal	2
9	403080	Axle Ring	2
10	450789	Dust Shield	4
11	15156	Washer 3/8	8
12	16597	Capscrew 3/8 UNC x 3/4	8

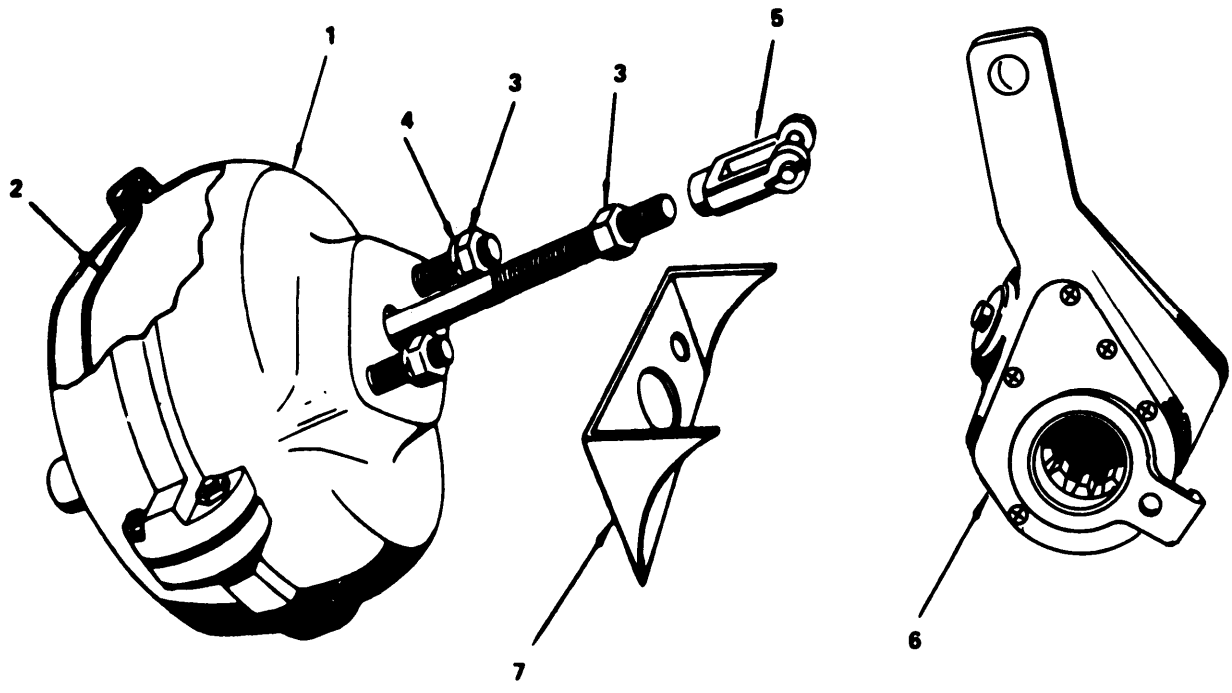
NSS = Not Serviced Separately



ITEM NC.	HYSTER PART NO.	DESCRIPTION 1 2 3 4	QTY. PER AXLE	ITEM NO.	HYSTER PART NO.	DESCRIPTION 1 2 3 4	QTY. PER AXLE
1	434473	Camshaft Brkt. Assy.	2	9	417799	Camshaft-Right Hand	1
					417800	Camshaft-Left Hand	1
1.1	NSS	Side Plate	4	10	444457	Cam Spacer Washer	2
1.2	434475	Bushing	2	11	445389	Cam Retainer Washer	2
1.3	18462	Capscrew ⅜ UNCx7/8	8	12	58931	Snap Ring	4
1.4	15154	Lockwasher 1/4	8	13	442831	Retract Spring	2
1.5	15054	Nut 1/4 UNC	8	14	444285	Retract Spring Pin	4
2	177413	Grease Fitting	2	15	445390	Anchor Pin	4
3	445388	Spider Assembly	2	16	445391	Anchor Pin Lock	8
	NSS	Spider	2	17	445392	Anchor Pin Washer	8
4	431540	Bushing & Seal Set	2	18	442833	Brake Shoe Assy.	4
	NSS	Bushing(Camshaft)	2	19	445643	Brake Shoe	4
5	429182	Seal	4	20	445644	Lining Set (8 pcs)	1
6	445393	Bushing(Anchor Pin)	4	21	422798	Rivet	96
7	16022	Grease Fitting	2	22	444288	Cam Roller	2
8	445511	Foundation Brake (RH)	1	23	444337	Roller Pin	4
	445512	Foundation Brake (LH)	1	24	444289	Roller Retainer	4

NSS = Not Serviced Separately

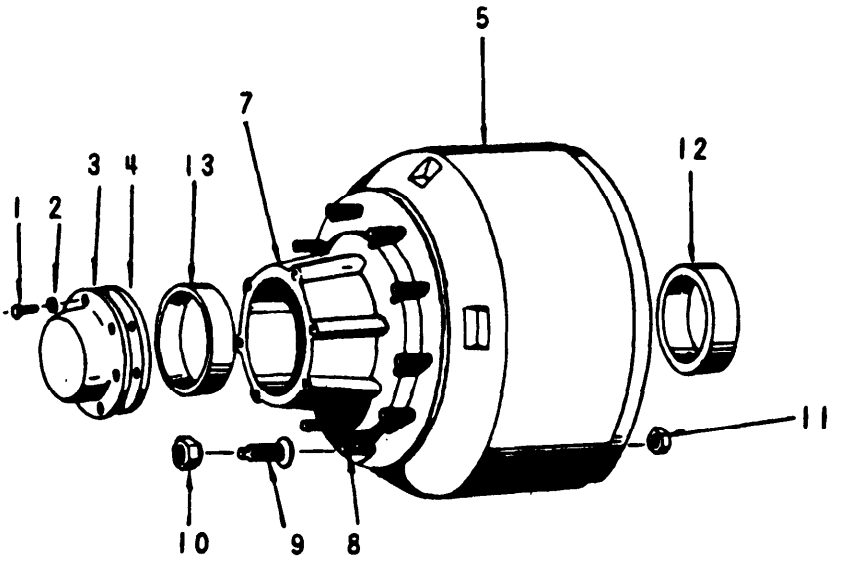
AIR BRAKE ACTUATING PARTS



ITEM NO.	HYSTER PART NO.	DESCRIPTION 1 2 3 4	QTY. PER AXLE
1	{427323	Power Chamber Assembly	2
	{ NSS	Power Chamber	2
2	401834	Diaphragm	2
3	15030	Hex Nut 5/8 UNF	6
4	15160	Lockwasher 5/8	4
5	400339	Yoke Assembly	2
6	450323	Slack Adjuster Kit	1
7	434452	Power Chamber Bracket	2

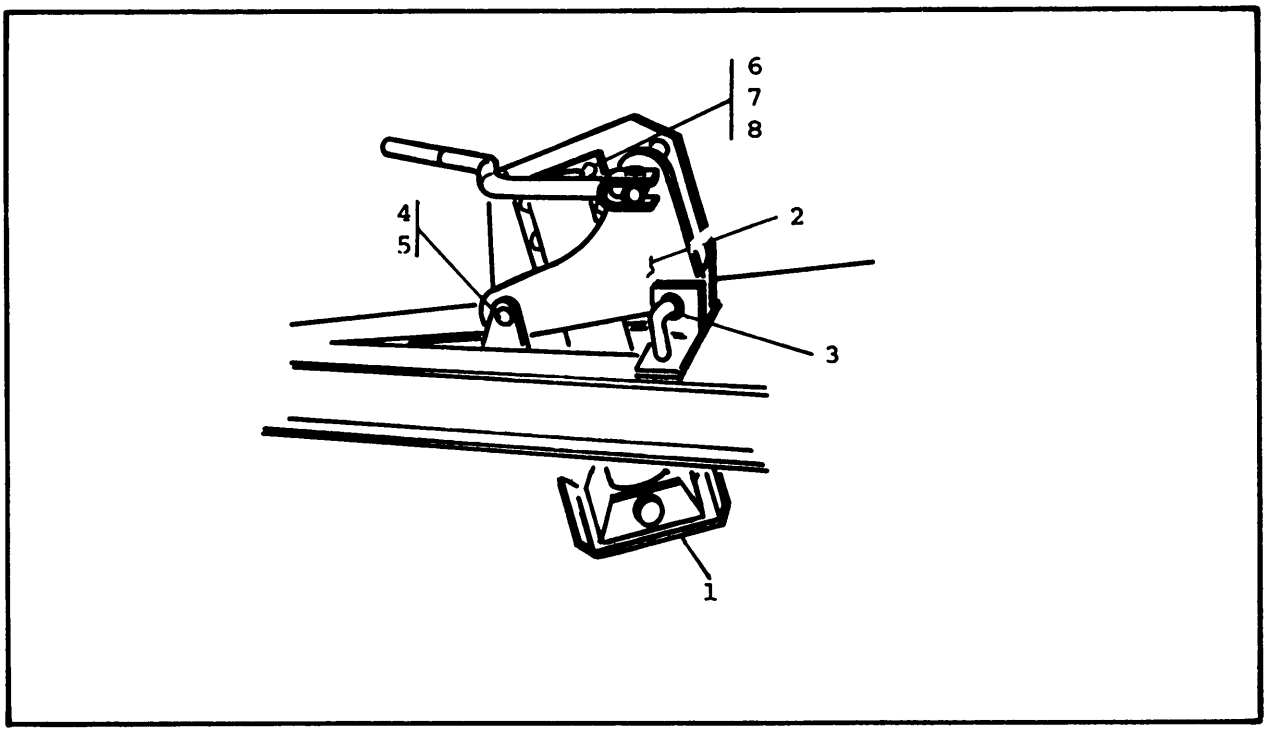
NSS = Not Serviced Separately

HUB AND DRUM ASSEMBLY



ITEM NO.	HYSTER PART NO.	DESCRIPTION 1 2 3 4	QTY. PER AXLE	ITEM NO.	HYSTER PART NO.	DESCRIPTION 1 2 3 4	QTY. PER AXLE
1	18496	Capscrew 5/16 UNC x 7/8	12	11	248320	Hex Nut 3/4 UNF	10
2	15155	Lockwasher 5/16	12	12	390105	Inner Bearing Cone	1
3	451086	Hub Cap (Front Axle)	2	13	401263	Outer Bearing Cone	1
	451086	Hub Cap (Rear Axle)	1				
	450326	Hubodometer	1		446101	HUB and DRUM ASSEMBLY	
4	413458	Hub Cap Gasket	2			(Left Hand)	1
				5	441808	Brake Drum	1
	446100	HUB and DRUM ASSEMBLY		7	446103	Hub Assembly	1
		(Right Hand)	1	8	401885	Wheel Stud	10
5	441808	Brake Drum	1	9	401887	Inner Cap Nut	10
7	446102	Hub Assembly	1	10	401889	Outer Cap Nut	10
8	401884	Wheel Stud	10	11	248320	Hex Nut 3/4 UNF	10
9	401886	Inner Cap Nut	10	12	390105	Inner Bearing Cone	1
10	401888	Outer Cap Nut	10	13	401263	Outer Bearing Cone	1

LANDING GEAR



SWING BACK LANDING GEAR

ITEM NO.	HYSTER PART NO.	DESCRIPTION 1 2 3 4	QTY.
1	450407	Landing Gear	1
2	450419	Bracket	1
3	450420	Lock Pin	1
4	424849	Bar	1
5	15255	Cotter Pin-1/4 x 2	2
6	18588	Capscrew-1/2-20 UNF x 1 1/2	8
7	15158	Lockwasher 1/2	8
8	15058	Nut, 1/2 UNF	8

Volume 2

Supplemental Maintenance

and Repair

Parts Instructions

For

TRAILER, FLATBED

15 TON PAYLOAD

MULTI-AXLE (CCE)

NSN 2330-01-060-8141

Supplemental Maintenance and Repair Parts Instructions

For

15 Ton Trailer

Section I GENERAL

1-1. Purpose

To provide user and support personnel supplemental maintenance and repair parts instructions that have special application to Commercial Construction Equipment (CCE) items.

1-2. *scope*

This publication applies to Department of the Army Units, Organizations and Activities that, use and or support the 15 Ton Flatbed Trailer.

1-3. CCE item

The term "CCE Item" used in this publication applies to a standard commercial item of commercial equip ment that has been approved for a specific TOE requirement and is procured and supported under the CCE System Plan. This plan permits maximum utilization of the civilian construction industry's competitive research and development, manufacturer's equipment publications, and commercial sources for repair parts.

1-4. Description

The 15 Ton Flatbed Trailer is manufactured by Hyster Company of Kewanee, Illinois. The trailer is a tandem axled, tiltbed, with eight 10.00 X 15" wheels. It is equipped with 12 and 24 volt electrical systems and air operated brakes, making it compatible with the 5 ton tactical trucks or comparable commercial trucks as a prime mover.

1-5. Operational Concept

The principal function of the trailer is to provide added mobility for light construction equipment. As they are accepted from the manufacturer the new trailer will be replacing the current 6 and 12 ton trailers which are nearing the end of their life cycle. The 15 ton trailer is capable of operations in all climatic categories of Chapter 2, AR 70-38.

1-6. Procurement Status

The procurement contract number for the trailers is DAAE07-77-C-0725 and was awarded 27 September 1977. Deliveries under the contract are to begin in June 1978:

1-7. Equipment Publications

a. Initially two sets of the manufacturer's commercial publications are overpacked and shipped with each new trailer.

b. The overpacked publications are located in a canvas bag affixed to the inside of the tool box on the

c. Commercial publications are superseded by this TM.

1-8. Personnel and Training

a MOS Requirements.

(1) Operator: MOS-64C Motor Transporter Operator.

(2) Organizational Maintenance: MOS-63B Wheel Vehicle Mechanic.

(3) Direct and General Support Maintenance: MOS-63H Automotive Repairman; MOS-63G Fuel and Electrical System Repairman; MOS-44C Welder; MOS-44E Machinist.

b. New equipment training support (IAW AMCR 350-6) is not justified since the personnel and training is considered minimal.

1-9. Logistics Assistance

a. Tank-Automotive Command Field Maintenance Technicians stationed at CONUS and OCONUS installations will be fully qualified and available to furnish on-site training or assistance concurrent with receipt of the trailer.

b. Assistance can be obtained by contacting the Logistics Assistance Office listed in chapter 5, AR 700-4.

1-10. warranty

The CCE trailer contractor warrants the products furnished under this contract according to the terms and conditions described in the equipment publications. All warranties furnished to the trailer contractor by subcontractors of assemblies or components utilized in the manufacture of the end item will be extended to the Government.

Section II. MAINTENANCE

2-1. Maintenance Concepts

The CCE trailer will not require any new or special maintenance considerations. All maintenance functions can be accomplished within the current maintenance concepts established for construction equipment.

a Operator/Crew Maintenance. Operator and crew maintenance is limited to daily preventive maintenance checkes and services.

b. Organizational Maintenance. Organizational maintenance consists of scheduled preventive maintenance services, minor repairs, and adjustments.

c. Direct Support Maintenance. Direct support maintenance consists of repairs onsite or in a direct support unit's shop. Repairs are accomplished with a minimum of tools and test equipment; the assemblies and end items thus repaired are returned to their users.

d. General Support Maintenance. General support maintenance overhauls selected assemblies and repairs items designated by the area support command for return to stock.

e. Depot maintenance. Depot Maintenance overhauls end items and selected major assemblies when they are required to satisfy overall Army requirements. Overhaul of the end item may also be performed by contract with the manufacturer.

2-2. Maintenance Allocation Chart

Maintenance will be performed as necessary by the category indicated in the Maintenance Allocation Chart (MAC) to retain or restore serviceability. All authorized maintenance within the capability of a using organization will be accomplished before referring the item to support maintenance. Higher categories will perform the maintenance functions of lower categories when required or directed by the appropriate Commanders. Using and support units may exceed their authorized scope and functions in the MAC when approval is granted by the next higher support maintenance Commander.

2-3. Modifications

Modifications will be accomplished by the end item manufacturer after TARCOM approves the field campaign or modification plan.

2-4. Equipment Improvement Recommendations (EIR)

Equipment Improvement Recommendations will be submitted in accordance with TM 38-750.

2-5. Readiness Reporting

steadiness reporting is accomplished as required by the current TM 38-750.

2-6. Maintenance Expenditure Limits

The average life expectancy for the trailer is 16 years.

Percent of Repair	*Year*
65%	1979
61%	1980
58%	1981
55%	1982
51%	1983
48%	1984
45%	1985
40%	1986
38%	1987
35%	1988
31%	1989
27%	1990
22%	1991
16%	1992
10%	1993
5%	1994

2-7. Shipment and Storage

a. *Shipment and Storage.* Refer to TB 740-97-2 for procedures covering preservation of equipment for shipment and storage.

b. Administrative Storage. Refer to TM 740-90-1 for administrative storage of equipment.

2-8. Destruction to Prevent Enemy Use

Refer to TM 750-244-3 for procedures covering destruction of equipment to prevent enemy use.

2-9. Fire Prevention

a. A hand operated fire extinguisher is to be installed at the discretion of the using unit.

b. Approved hand-portable fire extinguishers are listed in TB 5-4200-200-10.

2-10. Special Tools and Equipment

No special tools or equipment are required for operation and maintenance of the trailer.

2-11. Maintenance Forms and Records

Operational Maintenance and historical records will be maintained as specified in TM 38-750.

2-12. Clarification of Hyster-Care Maintenance Schedule

Table 4-1 of Hyster's Operator, Service, and Parts Manual (PN7117 M) is shown as two schedules: The mileage schedule and periodic schedule. Maintenance is to be performed on the basis of whichever occurs first, i.e. 2/mo is 2,000 miles/1 month.

Section III. REPAIR PARTS SUPPLY

3-1. General

a. The basic policies and procedures in AR 710-2 and AR 725-50 are generally applicable to repair parts management for CCE items.

b. Manufacturer's parts manuals are furnished with CCE items instead of Department of the Army Repair Parts and Special Tool List (RPSTL).

c. National Stock Numbers (NSN's) are initially assigned only to PLL/ASL parts and major assemblies. Additional NSNS are assigned by the supply support activities as demands warrant.

d. Requisitions transmitted by AUTODIN for NSN repair parts will be automatically routed by the Defense Automated Addressing System (DASS) to the responsible Federal Supply Class Manager.

e. Repair parts are available from commercial sources and maybe purchased locally in accordance with AR 710-2 and AR 735-110.

f. When non-NSN repair parts cannot be obtained locally for this equipment, requisitions can also be routed by the DAAS. Requisitions must contain R.I.C. AKZ in columns 4-6 of the requisition format; these requisitions will be forwarded by the DAAS to the U.S. Army Tank-Automotive Materiel Readiness Command, Warren, MI 48090. When the manufacturer's part number and the Federal Supply Code for the Manufacturer (FSCM) exceed columns 8-22 of the requisition format (DD Form 1348-1), prepare an A05-AOE requisition (DD Form 1348-6) and mail to: Commander, U.S. Army Tank-Automotive Materiel Readiness Command, ATTN: DRSTA-FDI, Warren, Mi 48090.

3-2. Prescribed Load List (PLL)

The PLL distributed by TARCOM is an estimated 15 days supply recommended for initial stockage at organizational maintenance. Management of PLL items will be governed by the provisions of AR 710-2 and local command procedures. Selection of PLL parts for shipment to CONUS/OCONUS units is based upon the receiving command's recommendation after their review of the TARCOM prepared list. Organization's and activities in CONUS/OCONUS will establish PLL stocks through normal requisitioning process.

3-3. Authorized Stockage List (ASL)

The ASL distributed by TARCOM is an estimated 45 days supply of repair parts for support units and activities. The ASL parts will be shipped according to the recommendations of the receiving commands, after they have reviewed the initial list distributed by TARCOM. Support units and activities in CONUS/OCONUS will establish ASL stocks through normal requisitioning process.

3-4. Project Codes (Columns 57-59)

The applicable project code will be entered in card columns 57-59 of requisitions for NSN parts, whether CONUS or OCONUS customers. The code is also used by CONUS customers when requisitioning part numbered parts. Supply customers OCONUS will use project code "JZC" for part numbered parts.

You are cautioned that these requisitioning instructions and supply procedures contained in this SMARPI apply only to this equipment, the Flatbed Trailer, Hyster Model HP15T.

Section IV

AUTOMATIC SLACK ADJUSTER MAINTENANCE AND OPERATION

4-1. Operation

a. The Automatic Slack Adjusters incorporate a series of worm gears, load sensing springs and clutches housed in an environmentally sealed body. The control arm is secured to the axle assembly by means of an anchor bracket.

b. During brake application and when the shoes contact the drum, torque is generated at the foundation brake which overcomes the internal spring load. This allows a worm shaft to disengage from the adjusting mechanism, resulting in the adjusting clutches being isolated and protected from the high torques and stress developed during brake application.

c. During brake release, the rack begins to rotate the one-way clutch gear in a driving direction. Since the worm shaft is still disconnected from the clutch mechanism, no adjustment is made. As the brake shoes leave the drum, the torque from the foundation brake is reduced allowing spring force to reconnect the worm shaft and adjusting clutches. At this point, the rack stops driving the one-way clutch and passes through a clearance notch which results in a "No Adjust" signal to the clutches. This "No Adjust" portion of the return travel is the point at which the predetermined running clearance is installed. After the rack passes through the clearance notch, and additional return travel is required for complete brake release, the rack again rotates the one-way clutch gear in the driving direction (worm shaft now reconnected) which rotates the worm shaft resulting in an adjustment at the brake shoe.

d. This process is repeated on every brake apply and release. The greater the amount of return travel (after the clearance notch is passed through) the greater the amount of adjustment. On each subsequent brake apply and release, the amount of adjustment becomes smaller until the excess clearance is removed. When the adjuster reaches the full release position at the same time the rack passes through the clearance notch, the predetermined shoe-to-drum clearance is reached and no additional adjustment is required.

4-2. Installation

Important-Before installing adjusters CHOCK WHEELS

1. Check that brake chambers are in fully released position.

2. Before installing adjusters, inspect condition of foundation brake and check for any needed repair or adjustment such as:

a. Brack Drums-cracked or out-of-round.

b. Brake Shoes-loose linings, broken return springs, anchor pins.

c. Camshaft Bushings-worn, cracked, seized.

d. Camshaft Splines-cracks, broken teeth, burrs.

e. Brake Chamber-mounting bolts, equal push rod length, alignment.

f. Pushrod clevis yoke installed at proper distance from brake chamber as specified by vehicle manufacture.

3. Assemble control arm anchor bracket onto the stationary member but do not tighten.

4. Install slack adjuster on camshaft spline with adjusting hex pointing away from brake chamber. Use camshaft spacing washers to align slack adjuster with clevis and achieve proper end play clearance (approximately .030" to .060") without binding. Secure slack adjuster on camshaft with standard retainer.

5. Pull slack adjuster in the breaking direction by hand and release to verify the assembly is free to return to full off position.

6. Using a 12mm wrench, manually rotate adjusting hex (A) clockwise until clevis pin holes in adjuster arm (B) and brake chamber push rod clevis are aligned. Install clevis pin (C) and retainer (CAUTION: do not push level arm into clevis, or pull out chamber pushrod to align pin holes). Check that clevis yoke jam nut (D) is tight.

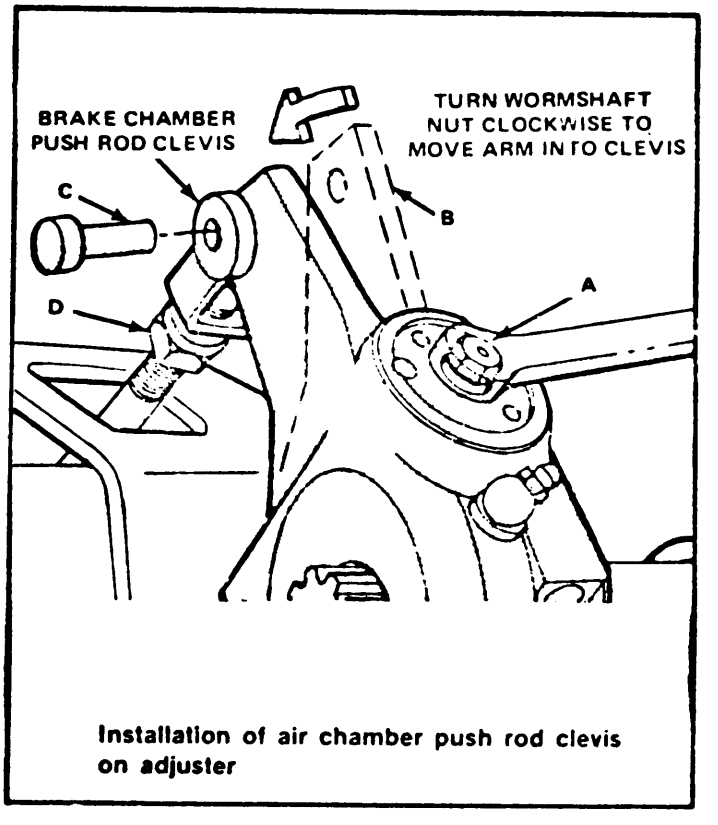


Figure 1 Installation of chamber Push Rod Clevis on Adjuster

7. Rotate control arm in direction away from adjusting hex (toward brake chamber) until the positive internal stop (full release position) is contacted. Do not hammer on control arm, as internal damage may result.

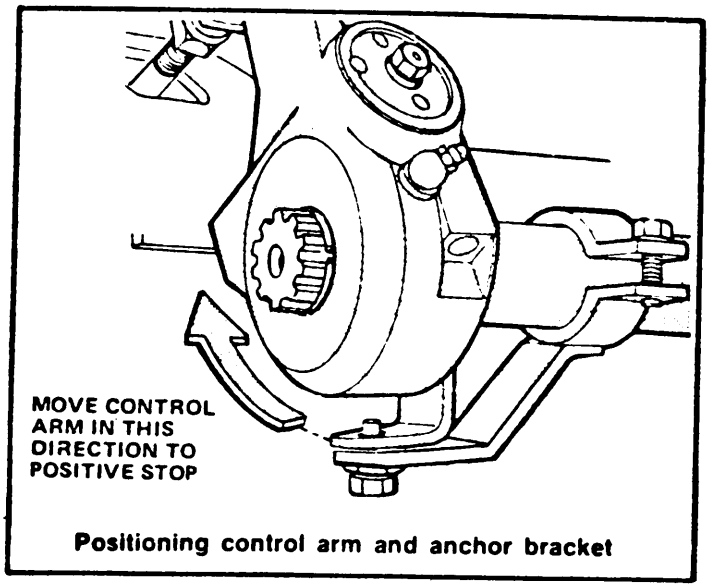


Figure 2 Position control Arm and Anchor bracket

ANCHOR BRACKETS FOR STUDDED CONTROL ARM LEVERS

Holding control arm in full release position, place anchor bracket on the threaded stud in control arm and loose assemble with flat washer, lock washer and nut. Assemble bracket to stationary member. Rotate control arm (A) away from adjusting hex to the full release position. Making certain control arm does not move, tighten all fasteners.

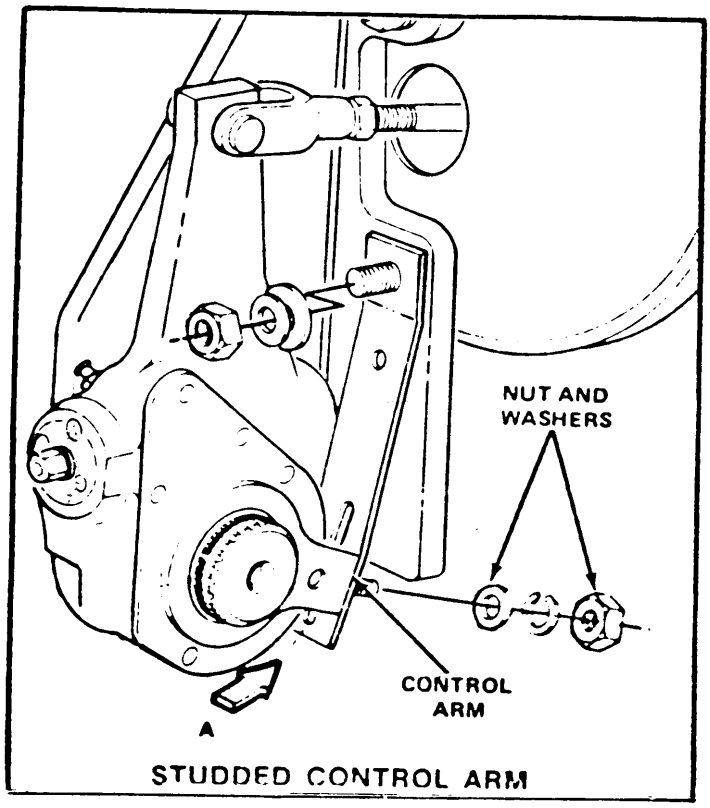


Figure 3 Studded Control Arm

8. Check installation of slack adjuster by removing clevis pin and lightly push adjuster into clevis and release. If holes remain in alignment-a proper installation was made. If holes in adjuster and clevis DO NOT remain in alignment —

a. Realign adjuster with clevis and reinstall clevis pin and retainer.

b. Loosen anchor bracket mounting fasteners.

c. Repeat step 7 and recheck.

9. Prior to release of vehicle for service, initial brake adjustment maybe accomplished by–

a. Manually adjusting brakes according to regular practice and procedure.

NOTE

Readjustment of adjuster takes considerable effort and will be accompanied by a ratcheting sound.

-OR-

b. With full pressure in the vehicle air system, operate the service brakes (allow full return on brake release) until the brake chamber pushrod travel is reduced to within acceptable limits.

Final operating pushrod travels will not be obtained until the vehicle has been driven and the brakes heated.

4-3. Removal

lMPORTANT–Before removing adjusters, CHOCK WHEELS, buildup full system air pressure and place all brake controls in off or release position. Make certain spring chambers are caged and/or fully released.

1. Remove clevis pin from brake chamber clevis.

2. Using 12mm wrench or socket, turn adjusting hex counterclockwise until adjuster rotates clear of brake chamber clevis.

NOTE

Rotation of adjusting hex in this direction takes considerable effort, and will be accompanied by a ratcheting sound.

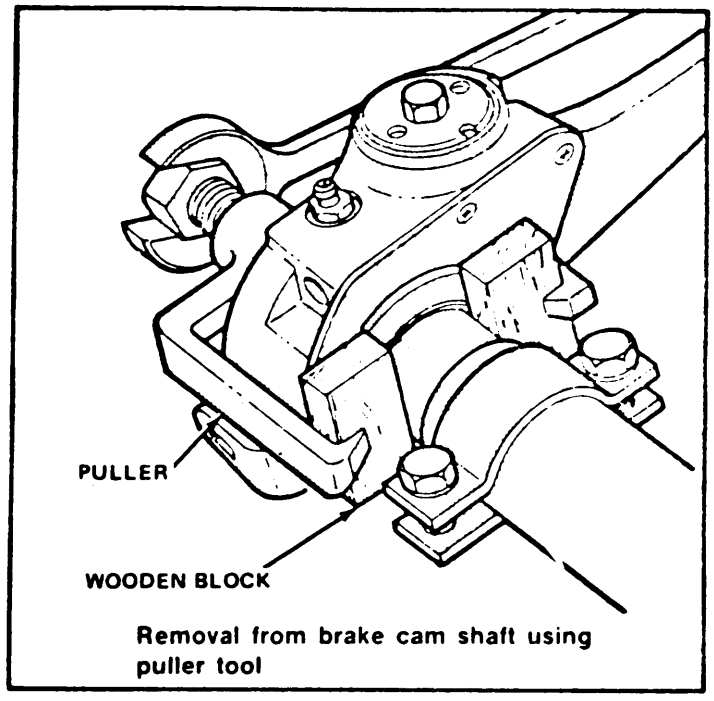


Figure 4 Removal from brake Cam Shaft using puller tool

3. Disconnect control arm lever from anchor bracket by: Remove nut and washers from control arm stud and bend strap bracket clear of stud.

4. Remove camshaft retaining ring or bolt and spacing washers.

5. Remove adjuster from camshaft. If adjuster does not slide off easily, use a puller tool. DO NOT HAMMER ON COVER PLATE.

CAUTION

Do not apply puller jaws directly on face of cover-use wooden blocks to prevent internal damage.

4-4. Trouble Shooting

a. When vehicle braking complaints occur, use the following guide as an aid to determine cause:

(1) Measure Chamber Pushrod Travel.

(2) Install wheel chocks.

(3) Build up full system air pressure and place all brake controls in off or release position.

(4) Measure the distance the brake chamber pushrod travels during a full pressure service brake application.

(5) The pushrod travel should not exceed values listed as follows:

1-3/8″ to 1-3/4″ Maximum Travel

b. Tight or dragging brakes. Check foundation brake components for:

(1) Out-of-round drums

(2) Brake chamber not fully releasing:

—Spring brakes not fully released

—Pushrod binding on chamber housing or damaged.

—Air supply not exhausting completely.

(3) Wheel bearing adjustment

(4) Broken shoe return spring

(5) Loose linings

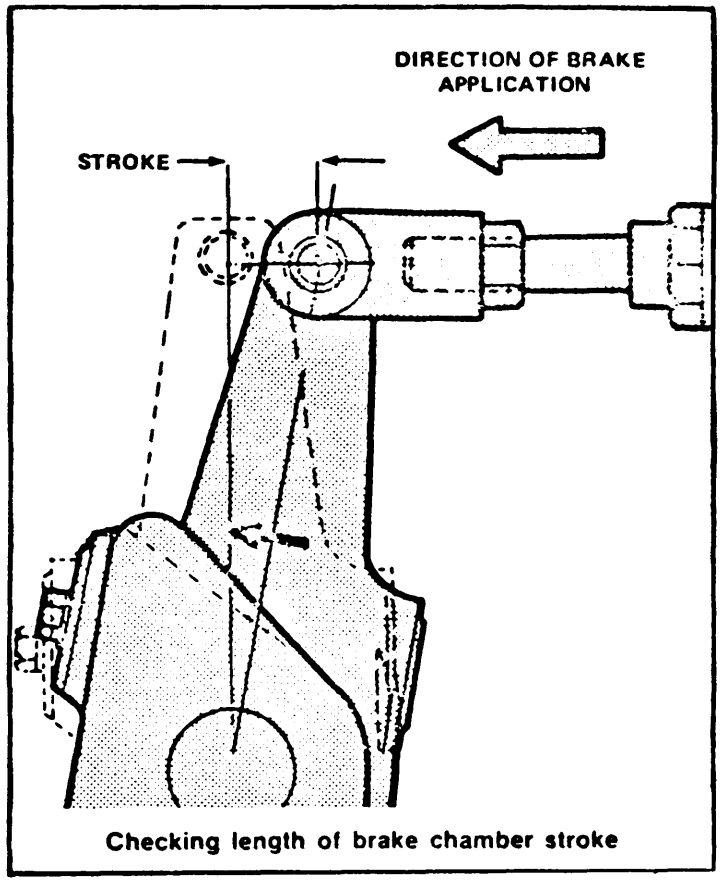


Figure 6. Checking length of brake chamber stroke.

INSPECT SLACK ADJUSTERS FOR:

Condition	Corrective Action
(1) Control arm anchor bracket not positioned properly	(1) Refer to installation procedures and reposition control arm anchor bracket
(2) Slack bound against camshaft housing—no end play	(2) Eliminate bind (refer to installation procedures)
(3) Sticking rack or broken rack return springs	(3) Replace slack adjustor and/or recondition (refer to overhaul procedures)
(4) Worm shaft not disengaging from adjusting clutch	(4) (Same as item 3 above)

c. *Excessive chamber pushrod travel.* Check foundation brake components for:
(1) Out-of-round or cracked drums
(2) Worn camshaft bushings
(3) Binding camshaft
(4) Loose brake chamber mounting
(5) Extreme differences in lining-to-drum clearance between shoes on same wheel.

INSPECT SLACK ADJUSTER FOR:

	Condition		Corrective Action
(1)	Loose, broken or bent control arm anchor bracket.	(1)	Re-position and tighten bracket or replace (refer to installation procedures).
(2)	Excessive wear or movement between anchor bolt in bracket and control arm slot.	(2)	Replace anchor bolt and /or control arm assembly (refer to overhaul procedures).
(3)	Damaged or worn control arm assembly, resulting in lateral movement between control arm and cover plate.	(3)	Replace control arm assembly (refer to overhaul procedures).
(4)	Broken Rack—Manually de-adjust slack adjuster and determine if unit adjusts on brake release (refer to check-out procedures—Section "D").	(4)	Replace slack adjuster and/or recondition (refer to overhaul procedures).
(5)	Insufficient belleville spring load (check-out same as item 4 above).	(5)	(Same as item 4 above).
(6)	Worn clutch assembly—(check-out same as item 4 above).	(6)	(Same as item 4 above).

4-5. Check-Out Procedures

a. On vehicle. Functional operation of the slack adjuster can be performed on vehicle by:

(1) Insure that wheels are chocked and emergency/park brakes are in full off position.

(2) Manually de-adjust brakes (turn adjustment hex counterclockwise) to create an excessive clearance condition.

(3) Make a full service brake application and full brake release. During the brake release, observe rotation of the adjustment hex (attaching a wrench on the hex will make this rotation easier to see). This rotation indicates that an excessive clearance condition has been determined by the slack adjuster, and it is making an adjustment to compensate. On each subsequent brake release the amount of adjustment and pushrod travel will be reduced until the desired clearance is achieved and no additional adjustment is required.

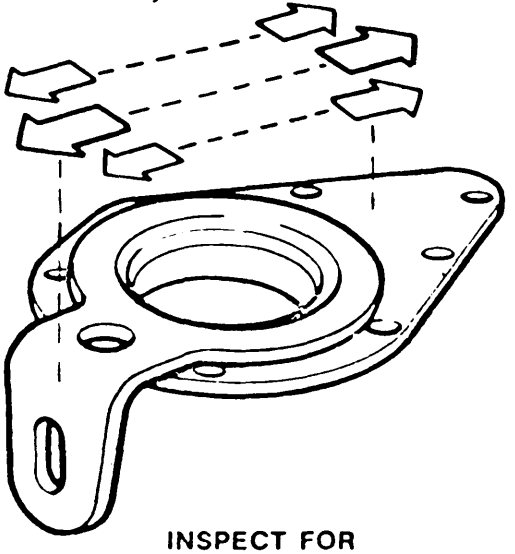
If adjuster fails to adjust, remove from vehicle and perform "Off Vehicle" functional test.

b. Periodic "Bench Test" of the automatic slack adjuster is recommended at brake reline or major brake overhaul.

c. It is during these intervals that it would be most convenient to remove adjusters from vehicle and perform the following checks to insure proper function of the internal mechanisms. (Refer to assembly removal section)

CONTROL ARM ASSEMBLY

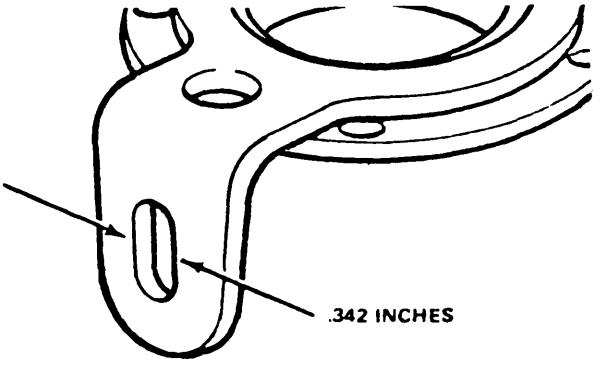
Secure slack adjuster lever arm in vise. Attempt to move control arm in a lateral direction, and note if any free play exists between control arm and cover plate. If free play is apparent, this indicates excessive seal wear which could result in contamination entering the slack adjuster assembly.



INSPECT FOR LATERAL MOVEMENT

Figure 6. Inspect for Lateral Movement

On slotted-type control arm assemblies, inspect the anchor bolt contact area of slot. The width of the slot should not exceed .342 inches.



INSPECT FOR EXCESSIVE WEAR

Figure 7. Inspect for Excessive wear

Should either of these conditions exist it is recommended that the control arm assembly be replaced (refer to overhaul procedures).

4-6. Functional Bench Test

MANUAL ADJUSTMENT TORQUE

With adjuster lever arm secured in vise, place a 12mm socket and inch pound torque wrench on the adjusting hex. Rotate adjustment hex approximately twenty (20) revolutions in a clockwise direction. Note highest reading. This reading should not exceed a maximum of 35 lb./in. torque. A greater torque value indicates excessive internal friction and the assembly should be overhauled.

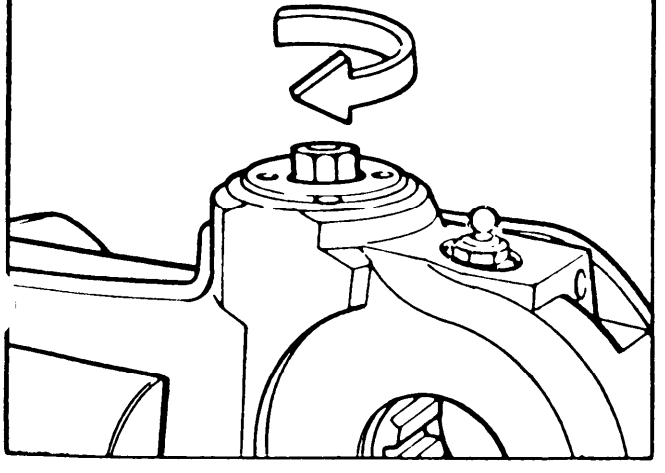


Figure 8. Manual Adjustment Torque

DE-ADJUSTMENT TORQUE

With adjuster lever arm secured in vise, place a 12mm socket and foot pound torque wrench on the adjusting hex. Rotate adjustment hex in a counter-clockwise direction until clutch disengagement occurs (Note: this event is determined by an audible "click"). This reading should be a minimum of 180 in./lbs. (15 lb./ft.) torque. Perform this function three (3) times and average the values. If the torque value is lower than specified, it would indicate unacceptable clutch performance and the assembly should be overhauled.

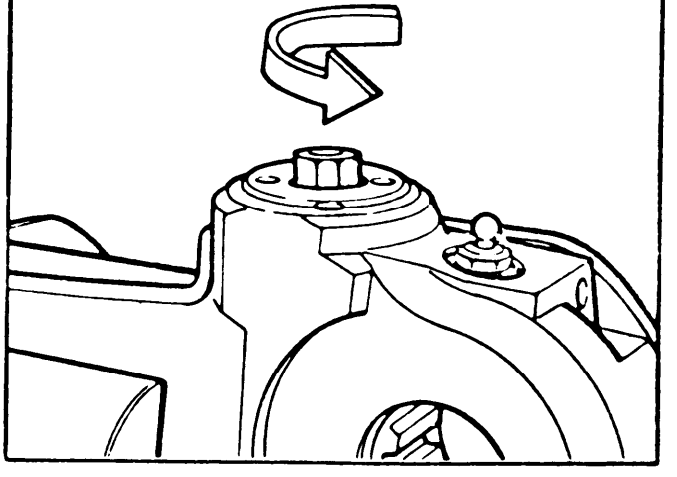


Figure 9. De-Adjustment Troque

APPENDIX A

REFERENCES

NOT APPLICABLE

APPENDIX B

WARRANTY INFORMATION

1.

A warranty period of 15 months after delivery to the Government applies to the 15 ton flatbed trailer contract number DAAE07-77-C-0725 manufactured by Hyster Co. This warrant y applies to the end item components and all supplies furnished under the contract.

2.

CONSU units may contact the local dealer shown on the distributor list furnished with each end item. OCONUS units must report all warranty claims as indicated in paragraph 3a below.

3. General Information

a. DA Form 2407. (prepared in accordance with warranty claims actions in TM 38-750) will be used to submit warrant y claims actions for end items when components, parts, or assemblies are defective and are covered by a manufacturer's warranty. End item under warranty are identified by a decal plate and or warranty statement included in the operator's and maintenance manual for the end item. All warranty actions settled or unsettled will be reported to the National Maintenance Point (NMP) on DA Form 2407. For warranties settled locally the DJ Form 2407 will contain a statement' 'For Information Only" in block 35.

b. Maintenance activities in support of organizational maintenance are the responsible points of contact between the originator of warranty claims and the National Maintenance Point, US Army Tank-Automotive Materiel Readiness Command, DRSTA-MVB, Warren, Michigan 48090, which serves as the DA represen tative with the contractor in warranty matters.

NOTE

In certain instances, the originating organization and support activity are one and the same.

c. Before you take your equipment to a dealer for repair, whether or not it was necessary for you to go through the NMP (TARCOM). check with your local procurement office to see if a funds commitment document is needed. Sometimes, even though the majority of the repairs are Covered by the warranty, there may be a small charge for normal maintenance costs, i.e., oil filters, oil etc. Further the cause of damage could be determined by the dealer to be directly related to "operator abuse." In that case, the Government maybe obligated to pay for teardown services even if the repairs are no longer desired, or for the complete cost if repairs are to be completed by the dealer.

d. When the equipment is given to the dealer for repairs, find out how long the work will take, the extent of the problem if possible, and the charges, if any, which maybe involved. Leave the name and telephone number of the person to be contacted for pickup of the equipment and specifically state that he should be called as soon as the repairs are finished. In addition state he should be telephoned if unexpected problems, costs and/or delays are encountered. Get the name and telephone number of the Service Manager, for any required follow-Up purposes.

e. When you arrive to pick up your equipment after completion services, make certain that you know exactly what repairs were performed and/or parts replaced. This is required for overall problem trend evaluation by the NMP and must be identified upon completion of warrant y services.

f. Telephone the NMP at TARCOM, Warren,Michigan,if

(1) Your equipment requires repairs and you cannot obtain these services using the procedures listed above.

(2) The length of time required for repairs may seriously hamper your mission, or if the dealer's overall response to your requirements is not satisfactory.

(3) You have any questions regarding warranty procedures-either in general or about a specific job. Do not wait until your problems become critical.

g. *Do not attempt to conduct negotiations regarding a breach of warranty. This is* a function of the Contracting Officer, through the NMP at TARCOM.

APPENDIX C

MAINTENANCE ALLOCATION CHART

FOR

15 TON FLATBED TRAILER (CCE)

Section l. INTRODUCTION

1. General

This Maintenance Allocation Chart designates responsibility for performance of maintenance functions to specific maintenance categories.

2. **Maintenance Functions**

a. Inspect: To determine the serviceability of an item by comparing its physical, mechanical and/or electrical characteristics with established standards through examination.

b. Test: To verify serviceability and detect incipient failures by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service: Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. *Adjust:* To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. *Align:* To adjust specified variable elements of an item to bring about optimum or desired performance.

f. *Calibrate:* To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. *Install: The* act of emplacing, seating, or fixing into position an item, part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system,

h. Replace.. The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. *Repair:* The application of maintenance services or other maintenance actions to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item or system.

j. *Overhaul:* That maintenance effort (service/action) necessary to restore an item to a completely servicable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) consideration in classifying Army equipment/components.

3. Column Entries

Columns used in the maintenance allocation chart are explained below:

a. *Columm 1, Group Number:* Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly: Column 2, contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. *Column* 3, *Maintenance Function Column* 3 lists the functions to be performed on the item listed in column 2.

d. *Column* 4, *Maintenance Category:* Colunn 4 specifies, by the listing of a "work item" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate "work time" figures will be shown for each category. The number of manhours specified by the "work time" figure represents the average time required to restore an item (assembly, Subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control item in addition to the time required to perform the specified tasks identified for the maintenance functions authorized in the Maintenance Allocation Chart.

e. *Column 5, Tools and Equipment:* Column 5 specifies by code those common tool sets (not individual tools) and special tools, test and support equipment required to perform the designated function.

f. *Column* 6, *Remarks:* column 6 contains an alphabetic code which leads to the remark in Section IV, Remarks, which is pertinent to the item opposite the particular code.

SECTION II. MAINTENANCE ALLOCATION CHART

FOR

15 TON FLATBED TRAILER (CCE)

(1) Group Number	(2) Component/Assembly	(3) Maintenance function	(4) Maintenance level					(5) Tools and equipment	(6) Remarks
			C	O	F	H	D		
06	ELECTRICAL	Repair		0.2				1	
0609	Lights	Replace		0.2					
		Test		0.3					
0613	Wiring Harness	Test		0.2					
		Service		0.2					
		Replace		1.0					
		Repair		0.3					
11	REAR AXLE							1,2,3	
1108	Walking Beam and Parts	Service		1.0					
		Replace			2.0				
		Repair			1.0				
12	BRAKES							1,2,3	
1202	Service Brakes	Adjust		0.3					
	Brake assy (L and R)	Replace		1.0					
		Repair		0.5					
	Backing Plate	Replace		1.0					
	Anchor Support and Adjusters	Replace		0.5					
	Brake Shoes	Replace		1.0					
	Lining Kits	Repair		0.5					
		Replace			1.5				
1202	Camshaft	Replace		0.6					
1206	Mechanical Brakes								
	Slack Adjusters	Adjust		0.3					
		Replace		0.6					

*The subcolumns are as follows:
C—operator/crew
O—organizational
F—direct support
H—general support
D—depot

**Worktimes are included in DMWR

(1) Group Number	(2) Component/Assembly	(3) Maintenance function	(4) Maintenance level C	O	F	H	D	(5) Tools and equipment	(6) Remarks
1208	Air Brake System								
	Air Reservoir	Service	0.3						
		Replace			1.0				
		Repair			0.6				
	Brake Chamber	Replace		1.5					
		Repair			2.0				
	Lines and Fittings	Replace		1.0					
		Repair		0.6					
	Valve Emergency Relay	Replace		1.5					
		Repair			1.0				
	Filter Screen	Service		0.2					
13	WHEELS							1,2,3	
1311	Wheel assy	Service		0.3					
		Replace		0.6					
	Wheel Bearings	Repair			1.0				
		Service		0.1					
		Replace		1.0					
1311	Brake Drum	Service			1.0				
		Replace		1.0					
1313	Tires and Tubes	Inspect	0.1						
		Service	0.1						
		Replace		0.5					
		Repair		0.6					
15	FRAME, TOWING ATTACHMENTS, and DRAWBAR							1,2,3	
1501	Frame	Replace					3.0		
		Repair					2.0		
	Tilt Top	Replace			3.0				
		Repair					2.0		

*The subcolumns are as follows:
C—operator/crew
O—organizational
F—direct support
H—general support
D—depot

**Worktimes are included in DMWR

(1) Group Number	(2) Component/Assembly	(3) Maintenance function	(4) Maintenance level C	O	F	H	D	(5) Tools and equipment	(6) Remarks
1503	Pintles and Towing Attachments								
	Lunette	Replace		1.0					
		Repair		0.6					
	Platform Latch	Replace			1.0				
		Repair			1.5				
1507	Landing Gear; Leveling Jack (Mechanical or Hydraulic)								
	Tongue Stand	Service	0.4						
		Replace		1.0					
18	BODY, CAB, HOOD, HULL							1	
1805	Decking	Repair			2.0				
22	BODY, CHASSIS, or HULL ACCESSORY ITEMS							1	
2202	Safety Chain	Replace		0.2					
		Repair		0.2					
2210	Data Plates and Instruction Holders	Replace		0.3					
24	HYDRAULIC LIFT COMPONENTS							1,2	
2404	Hydraulic Tilt Cylinders and Tilt Crank								
	Cushioning Cylinder, Tilt	Service			1.0				
		Replace			1.5				

*The subcolumns are as follows:
C—operator/crew
O—organizational
F—direct support
H—general support
D—depot
**Worktimes are included in DMWR

Tool and Test Equipment Requirements

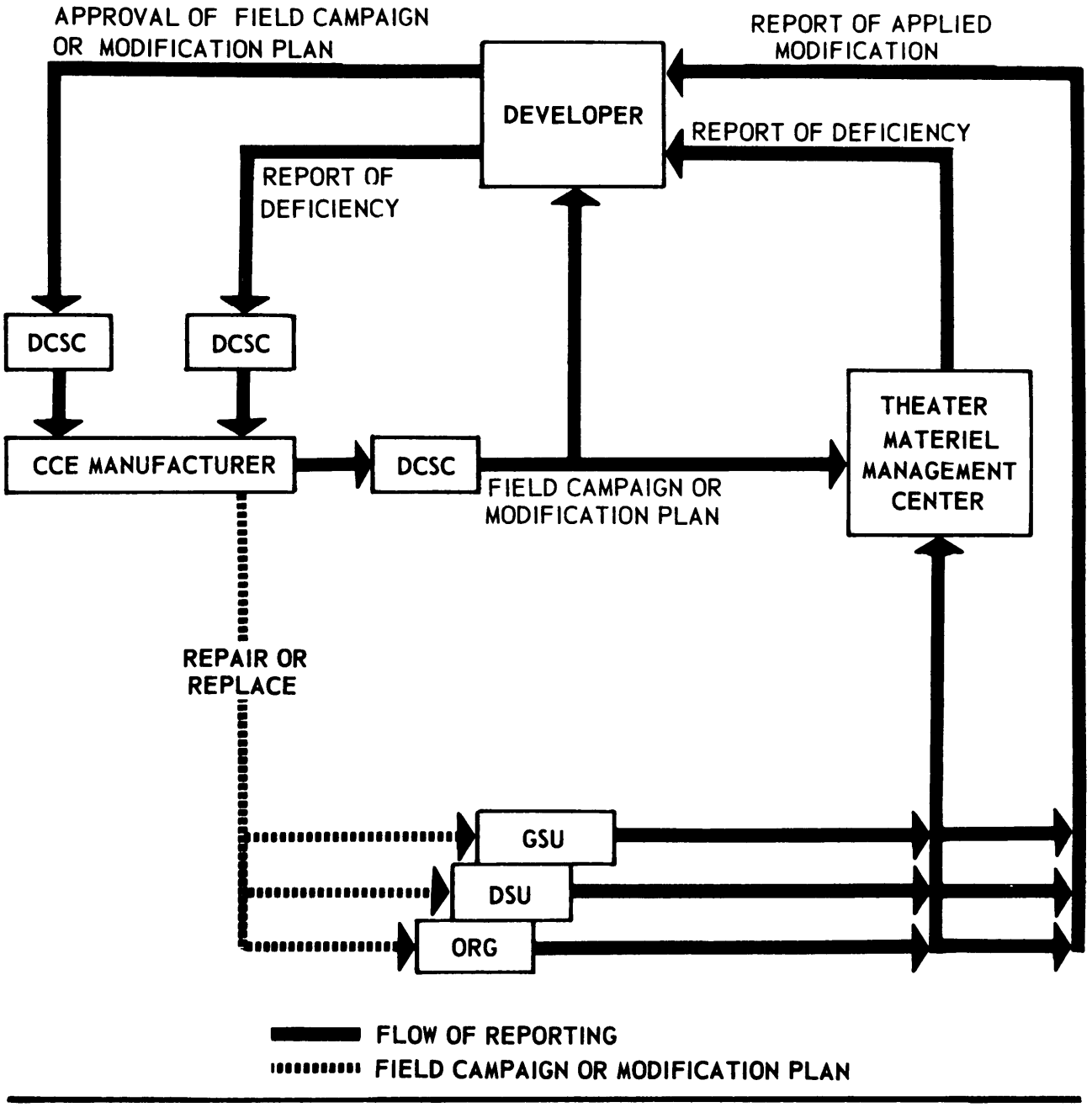
Tool or Test Equipment Reference Code	Maintenance Category	Nomenclature	National/Nato Stock Number	Tool Number
		Unless otherwise noted, all maintenance functions can be accomplished with the tools contained in the following common tool sets.		
1	F,H	Shop Equip, Contact Maint., TRK MTD (SC 4940-95-CL-B04)	4940-00-294-9518	T10138
	F,H,	Shop Equip, Gen Purp Repair, Semitrlr MTD (SC 4940-95-CL-B02)	4940-00-287-4894	T10549
	F,H	Shop Equip, Org Repair, Light TRK MTD (SC 4940-97-CL-E04)	4940-00-294-9516	T13152
	F,H	Tool Kit, Automotive, Fuel and Elec Sys Repair (SC 5180-95-CL-B08)	5180-00-754-0655	W32456
	O,F,H	Tool Kit, Automotive Maint, Org Maint Common #1 (SC 4910-95-CL-A47)	4910-00-754-0654	W32593
	O,F,H	Tool Kit, Automotive Maint, Org Maint Common #2 (SC 4910-95-CL-72)	4910-00-754-0650	W32730
	O,F,H	Tool Kit, Light Weight (SC 5180-90-CL-N26)	5180-00-177-7033	W33004
	F,H	Tool Kit, Master Mechanic and Equip Maint and Repair (SC 5180-90-CL-N05)	5180-00-699-5273	W45060
	F,H	Shop Set, Fuel and Elec Sys, Field Maint Basic (SC 4910-95-CL-A01)	4910-00-754-0714	T30414

Tool and Test Equipment Requirements—Continued

Tool or Test Equipment Reference Code	Maintenance Category	Nomenclature	National/Nato Stock Number	Tool Number
	F,H	Shop Set, Fuel and Elec Sys, Field Maint Basic Supp #2 (SC 4910-95-CL-A65)	4910-00-390-7775	T30688
	F,H	Shop Equip, Auto Maint and Repair, Org Maint Suppy #1 (SC 4910-95-CL-A73)	4910-00-754-0653	W32867
	F,H	Shop Equip, Machine Shop, Field Maint Basic (SC 3470-95-CL-A02)	3470-00-754-0708	T15644
	F,H	Measuring and Lay Out Tool Set, Mach (SC 5280-95-CL-A02)	5280-00-511-1950	W44512
	F,H	Shop Equip, Welding, Field Maint (SC 3470-95-CL-A08)	3470-00-357-7268	T16714
2	F,H	Wrench Set, Socket, 3/4" Drive, Hex Type	5310-00-357-5735	Y75239
3	F,H	Wrench, Torque, 3/4" Drive, 500 lb Cap	5120-00-542-5577	Y84966

APPENDIX D

CCE MANUFACTURER FIELD CAMPAIGNS AND MODIFICATION PROCEDURES



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APPENDIX E

COMPONENTS OF END ITEM LIST

Section I INTRODUCTION

1. scope

This appendix lists integral components of and basic issue items for the trailer to help you inventory items required for safe and efficient operation.

2. General

This Components of End Item List is divided into the following sections:

a. Section II. Integral Components of the End Item. There are no integral components that comprise the trailer.

b. Section III. Basic Issue Items: These are the minimum essential items required to place the trailer in operation, to operate it, and to perform emergency repairs. Although shipped separately packed, they must accompany the trailer during operation and whenever it is transferred between accountable officers. The illustrations will assist you with hard-to-identify items. This manual is your authority to requisition replacement BII, based on TOE/MTOE authorization of the end item.

3. Explanation of Columns

a. *Illustration.* This column is divided as follows:

(1) *Figure Number.* Indicates the figure number of the illustration on which the item is shown.

(2) *Item Number.* The number used to identify item called out in the illustration.

b. National Stock Number. Indicates the National stock number assigned to the item and which will be used for requisitioning.

c. *Part Number.* Indicates the primary number used by the manufacturer, which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

d. *Description.* Indicates the Federal item name and, if required, a minimum description to identify the item.

e. *Location* The physical location of each item listed is given in this column. The lists are designed to inventory all items in one area of the major item before moving on to an adjscent area.

f. Usable on Code. "USABLE ON" codes are not used in this manual.

g. *Quantity Required (Qty Reqd).* This column lists the quantity of each item required for a complete major item.

h. Quantity. This column is left blank for use during an inventory. Under the Rcv'd column, list the quantity you actually receive on your major item. The Date columns are for your use when you inventory the major item at a later date; such as for shipment to another site.

Section II. INTEGRAL COMPONENTS OF END ITEMS

There are no integral components of the trailer.

Section III. BASIC ISSUE ITEMS

(1) Illustration (a) Fig No.	(1) Illustration (b) Item No.	(2) National Stock Number	(3) Part No.	(4) Description	(5) Location	(6) Usable on Code	(7) Qty Req'd	(8) Quantity Rev'd	(8) Quantity Date	(8) Quantity Date	(8) Quantity Date
				NOTE The following items are over-packed with the trailer.							
		7520-00-559-9618		Case, Cotton Duck: MIL-V-11743 (81349)			1				
		7510-00-889-3494		Log Book Binder: MIL-B-43064			1				
				NOTE The following items are authorized but not issued with the trailer.							
		4210-00-889-2221		Extinguisher, Fire, Dry Chemical			1				
		3990-00-171-9774		Load Binder			4				
		4010-00-182-8788		Chain Assy			4				

APPENDIX F

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I INTRODUCTION

1. scope

This appendix lists expendable supplies and materials you will need to operate and maintain the trailer. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Hearldic Items).

2. Explanation of Columns

a Column 1—Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g. "Use cleaning compound, item 5, App. D").

b. Column 2–Leuel This column identifies the lowest level of maintenance that requires the listed item.

C–Operator/Crew
O–Organizational Maintenance
F–Direct Support Maintenance
H–General support Maintenance.

c. *Column 3-Nationul Stock Number. This* is the National stock number assigned to the item; use it to request or requisition the item.

d. *Column 4–Description* Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply code for Manufacturer (FSCM) in parentheses, if applicable.

e. *Column 5— Unit of Measure (U/M)* Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea. in. pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National stock Number	(4) Description	(5) U/M
1	C	9150-00-190-0905	Grease, GAA MIL-G-10924 (81349) (General Application)	lb
2	C	9150-01-035-5392	Oil, Hypoid SAE 90 MIL-L 2105C (81349) (Wheel Hubs)	gal
3	O	3439-00-853-2718	Electrode, Welding 5/32 (MIL-E-22-200-1) (81349) (Frame)	ea
4	C	9150-00-698-2383	Fluid, Hydraulic, Auto (Shock Absorber)	pt
			or	
	C	9150-00-189-6727	Oil, Lubricating, OE/HDO10 MIL-L-2104	pt
5	O	9150-00-269-8255	Grease, Pneumatic System (Air Relay Valve)	lb

APPENDIX G

PRESCRIBED LOAD LIST (PLL)

AUTHORIZED STOCKAGE LIST (ASL)

END ITEM:	MAKE:	MODEL:
15 Ton Flatbed Trailer (CCE),	Hyster	HP15T

MFR PART NO:	NSN:	SERIAL NUMBER RANGE	DATE:
HP15T	2330-01-060-8141	21241 TO 21278	Mar 79

SMR Code	National Stock Number	Part Number	FSCM	Part Description	U/M	Qty of Parts Req'd for No. of End Item			
						PLL			ASL
						1-5	1-5	6-20	21-50
PAOZZ	5330-01-073-9913	433922	30076	Packing Repair Kit	ea	1	1	1	2
PAOZZ	5330-01-076-2966	400520	30076	Wingnut	ea	1	1	2	2
PAOZZ	5315-01-078-4965	450420	30076	Lock Pin	ea	1	1	2	2
PAOZZ	4820-01-072-8345	450417	30076	Drain Valve	ea	1	1	2	2
PAOZZ	4820-01-075-0020	428800	30076	Valve	ea	1	1	2	2
PAOZZ	5310-01-068-5742	428788	30076	Lockwasher, Outer	ea	1	1	2	4
PAOZZ	5307-00-637-1084	13989	09386	Stud, LH	ea	2	2	4	4
PAOZZ	5307-01-074-6670	401884	30076	Stud, RH	ea	2	2	4	4
PAOZZ	5310-00-572-0218	401887	30076	Cap Nut, Inner, LH	ea	2	2	4	4
PAOZZ	5310-00-637-7760	401889	30076	Cap Nut, Outer, LH	ea	2	2	4	4
PAOZZ	5310-01-076-0141	401886	30076	Cap Nut, Inner, RH	ea	2	2	4	4
PAOZZ	3110-00-100-0335	390105	30076	Bearing Cup	ea	1	1	2	2
PAOZZ	3110-00-293-8997	HM212011	60038	Bearing Cup	ea	1	1	2	2
PAOZZ	2530-01-077-0989	445644	30076	Brake Lining	ea	1	1	2	2
PAOZZ	5307-01-068-2252	422798	30076	Rivet	ea	8	8	16	16
PAOZZ	2530-01-071-9893	201140	12730	Brake Shoe	ea		2	2	2
PAOZZ	2530-00-293-4373	234101	06853	Diaphragm	ea	1	1	2	3
PAOZZ	5330-00-198-6190	408106	12730	O-Ring	ea	2	2	4	4
PAOZZ	5330-01-026-4231	320-2109	26151	Oil Seal	ea	2	2	4	4
PAOZZ	2530-01-066-0138	403080	30076	Axle Ring	ea	2	2	4	4
PAOZZ	3110-00-100-0670	390104	30076	Bearing Cone	ea	1	1	2	2
PAOZZ	3110-00-298-8998	HM212049	60038	Bearing Cone	ea	1	1	2	2
PAOZZ	5340-01-073-0108	343-4106	26151	Hub Cap	ea	2	2	2	2
PAOZZ	5330-01-069-1473	413458	30076	Hub Cap Seal	ea	2	2	4	4
PAOZZ	5310-00-880-2005	401888	30076	Nut, Cap, Outer, RH	ea	2	2	4	4

CROSS REFERENCE

PARTS LIST

FOR

15 TON FLATBED TRAILER

This list is to assist in identifying parts supplied by vendors for the 15 ton trailer. The Cross-Reference Parts list is broken down into seven columns which areas follows:

Column (1) –Nomenclature-Name of part
Column (2) –Hyster's part number
Column (3) –Hyster's FSCM
Column (4) –Vendor's part number from which Hyster purchased the part.
Column (5) –Vendor's FSCM
Column (6) -Estimated purchase price of the part.
Column (7) –National Stock Number assigned to the item. (*following a part number indicates it is the prime part number for the NSN assignment.

Nomenclature (1)	Hyster PN (2)	Hyster FSCM (3)	Vendor PN (4)	Vendor FSCM (5)	EST Cost (6)	NSN (Prime Part No.) (Identified By *) (7)
Hinge Pin	423721	30076	N/A		$24.99	
Rod End	423722	30076	24A	09310	2.14	
Hyd. Cyl.	433801	30076	J392	27152	374.93	
Packing Repair	433922	30076	PMCK-J392	27152	22.25	5330-01-073-9913
Pin Base	400547	30076	N/A		14.59	
Pin Rod	400572	30076	N/A		5.02	
Wing Nut	400520	30076	N/A		31.13	5310-01-076-2966
Landing Gear	450407	30076	7-10-400	80837	200.00	
Bracket	450419	30076	N/A		35.00	
Lock Pin	450420	30076	N/A		7.00	5315-01-078-4965
Bar	424849	30076	N/A		10.00	2590-01-077-1632
Coupler Service	450352	30076	N/A		35.00	4780-01-072-3162
Coupler Emerg.	400275	30076	N/A		2.94	2530-01-072-3115
Hose	450047	30076	N/A		15.00	4720-01-076-7119
Drain Valve	450417	30076	N/A		7.00	4820-01-072-8345
Hose	450048	30076	N/A		15.00	4720-01-076-7574
Hose	450050	30076	N/A		15.00	
Valve	428800	30076	205267*	06853	78.08	4820-01-075-0020
Hose	450051	30076	N/A		15.00	4720-01-075-6975
Hose	450120	30076	N/A		15.00	4720-01-075-8212
Spindle Nut, Outer	400676	30076	103102-001	12730	2.25	5310-01-068-5438
Lockwasher	400677	30076	105107	12730	1.66	5310-01-068-5741
Spindle, Inner	400678	30076	103103-002	12730	3.17	5310-01-068-3422
Lockwasher Outer	428788	30076	105106	12730	1.66	5310-01-068-5742
Hub and Drum LH	446101	30076	399106-L*	12370	200.00	2530-01-076
Stud LH	401885	30076	13989	09386	.63	5307-00-637-1084
Cap Nut, Inner LH	401887	30076	10709	09386	.66	5310-00-572-0218
Cap Nut, Outer LH	401889	30076	37892*	09386	.66	5310-00-637-7760
Hub and Drum RH	446100	30076	3991006R	12730	200.00	2530-01-072-3577
Stud, RH	401884	30076	13988*	09386	.70	5307-01-874-6670
Cap Nut, Inner RH	401886	30076	303101	12730	.84	5310-00-572-0218
Cap Nut, Outer RH	401888	30076	37891	09826	.84	5310-00-637-7760
Bearing Cup	390105	30076	308107	12730	7.91	3110-00-100-0335
Bearing Cup	401263	30076	HM212011	60038	4.77	3110-00-293-8997
Brake Lining	445644	30076	N/A		50.00	2530-01-077-0989
Brake Shoe	445643	30076	201140	12730	90.00	2530-01-071-9893
Rivet	422798	30076	N/A		.25	5320-01-068-2252
Air Chamber	427323	30076	229851*	06853	66.91	2530-00-311-4881
Diaphragm	401834	30076	234101	06853	7.66	2530-00-293-4373
Yoke Assy	400339	30076	228790	06853	4.00	5340-00-855-3255
Slack Adjuster	450323	30076	408-10038	71000	85.00	
Camshaft Brkt. Bushing	434475	30076	405128	12730	2.85	
Ring	55287	30076	408106	12730	2.02	5330-00-198-6190
Oil Seal	403079	30076	320-2109*	26151	5.62	5330-01-026-4231
Axle Ring	403080	30076	315-1507	26151	1.26	2530-01-066-0138
Bearing Cone	390104	30076	104107	12730	13.47	3110-00-100-0670
Bearing Cone	401262	30076	HM21249*	60038	8.19	3110-00-293-8998
Hub Cap	451086	30076	343-4106*	26151	5.00	5340-01-073-0108
Hub Cap Gasket	413458	30076	330-3009	26151	1.00	5330-01-069-1473

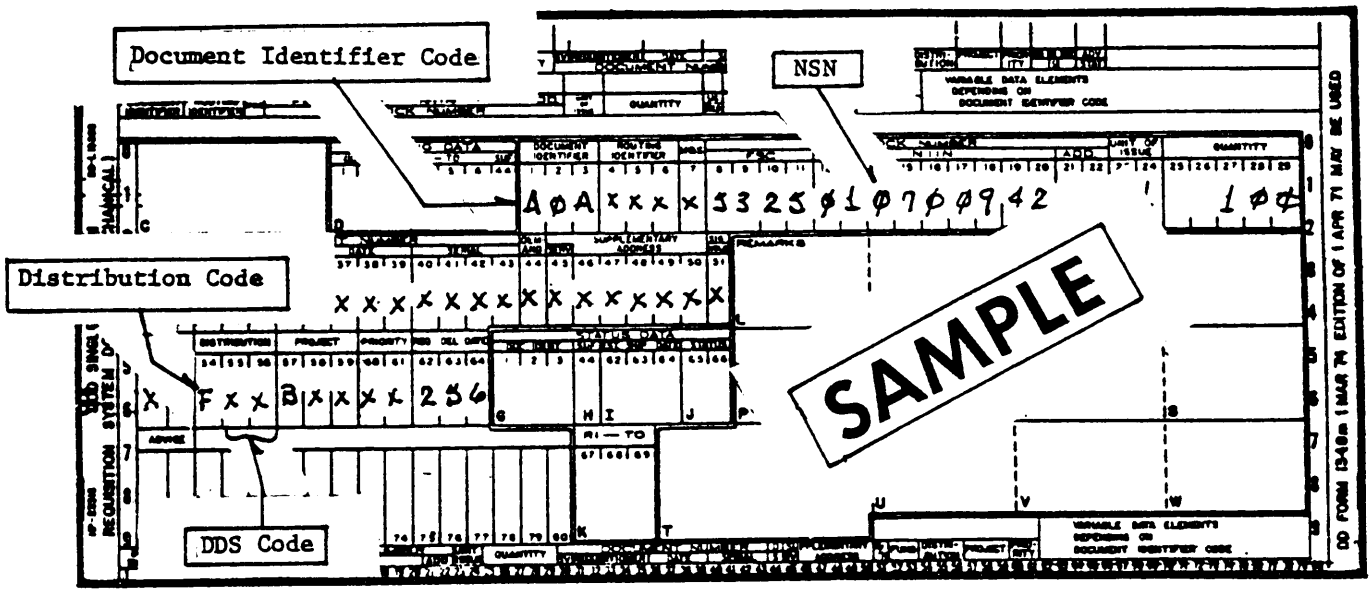
Nomenclature (1)	Hyster PN (2)	Hyster FSCM (3)	Vendor PN (4)	Vendor FSCM (5)	EST Cost (6)	NSN (Prime Part No.) (Identified By *) (7)
Wheel Chock	450501	30076	N/A		20.00	
Grommet	450083	30076	10700	13548	1.50	5325-01-070-0942
Clearance Light-Red	450079	30076	10300R	13548	7.00	
Reflector, Red	400217	30076	40192	81834	3.00	
Stop-Tail Light	450078	30076	40210R	13548	15.00	
Cable	450076	30076	N/A		17.00	2590-01-077-5185
Circuit Breaker	450087	30076	N/A		6.00	
Resistor	450084	30076	N/A		25.00	
Resistor	450496	30076	N/A		25.00	
Diode	450090	30076	SK3500	49671	35.00	
24 Volt Jumper	450461	30076	N/A		7.50	2920-01-072-3589
12 Volt Jumper	450490	30076	N/A		7.50	2590-01-073-5820
Clearance Lite-Yellow	450080	30076	10300Y	13548	7.00	6220-01-085-4846
Reflector, Amber	400216	30076	40193	81834	3.00	4950-01-080-3144
Grommet	450498	30076	40700	135;8	1.50	5325-01-073-2815
Tire	450429	30076	N/A		160.00	2610-00-163-0417
Tube (Radial)	450430	30076	510-432	22337	40.00	2610-00-052-7969
Flap	450431	30076	N/A		1.00	

APPENDIX H

DELETED

APPENDIX I

SAMPLE FORMAT - MILSTRIP REQUISITION FOR CCE (NSN)

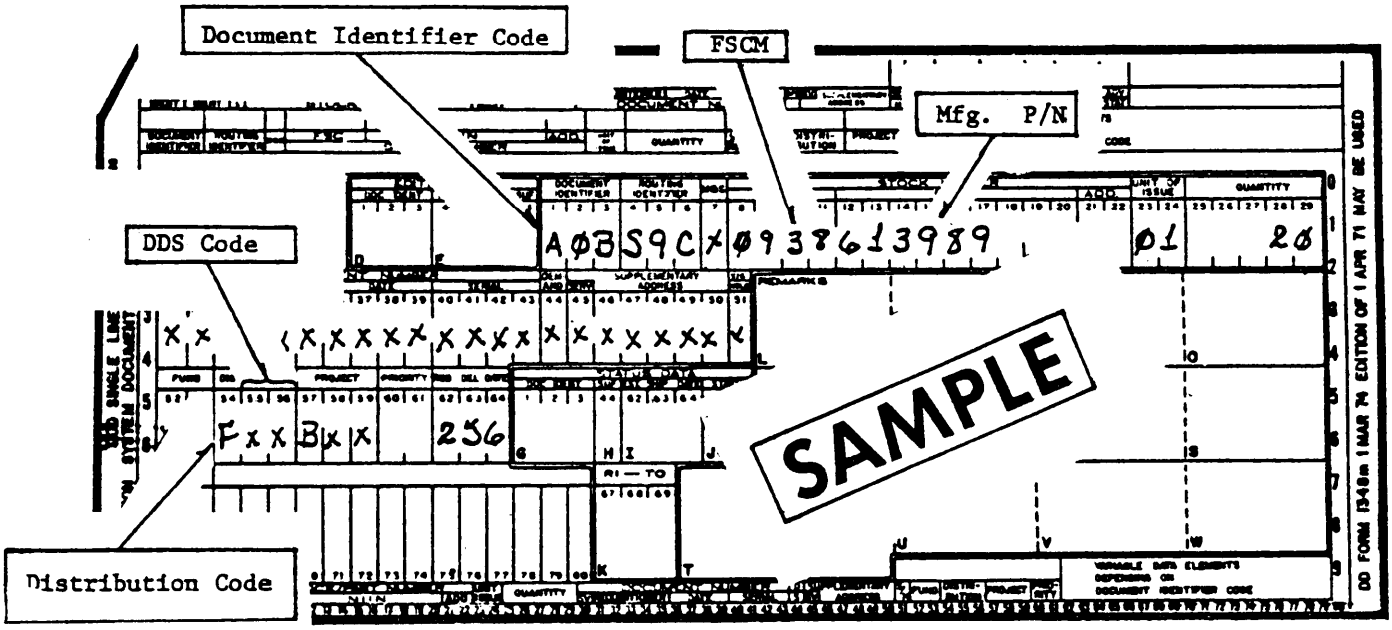


CARD COLUMN	DESCRIPTION OF DATA	MANDATORY ENTRY FOR CCE
1-3	Document Identifier Code	AØA - CONUS AØ1 - Overseas
4-6	Routing Identifier Code	
7	Media/Status Code	
8-22	NSN	
23-24	Unit of Issue	
25-29	Quantity	
30-43	Document Number	
44	Demand Code	
45-50	Supplementary Address	
51	Signal Code	
52-53	Fund Code	
54-56	Distribution Code CC-54	"F" for CONUS; see AR 725-50 for OCONUS
	CC-55-56	Weapon System Code (DSS) Code
57-59	Project Code	
60-61	Priority Code	
62-64	Required Delivery Date	
65-66	Advice Code	

TA 126334

APPENDIX J

SAMPLE FORMAT - MILSTRIP REQUISITION FOR CCE (NON-NSN)

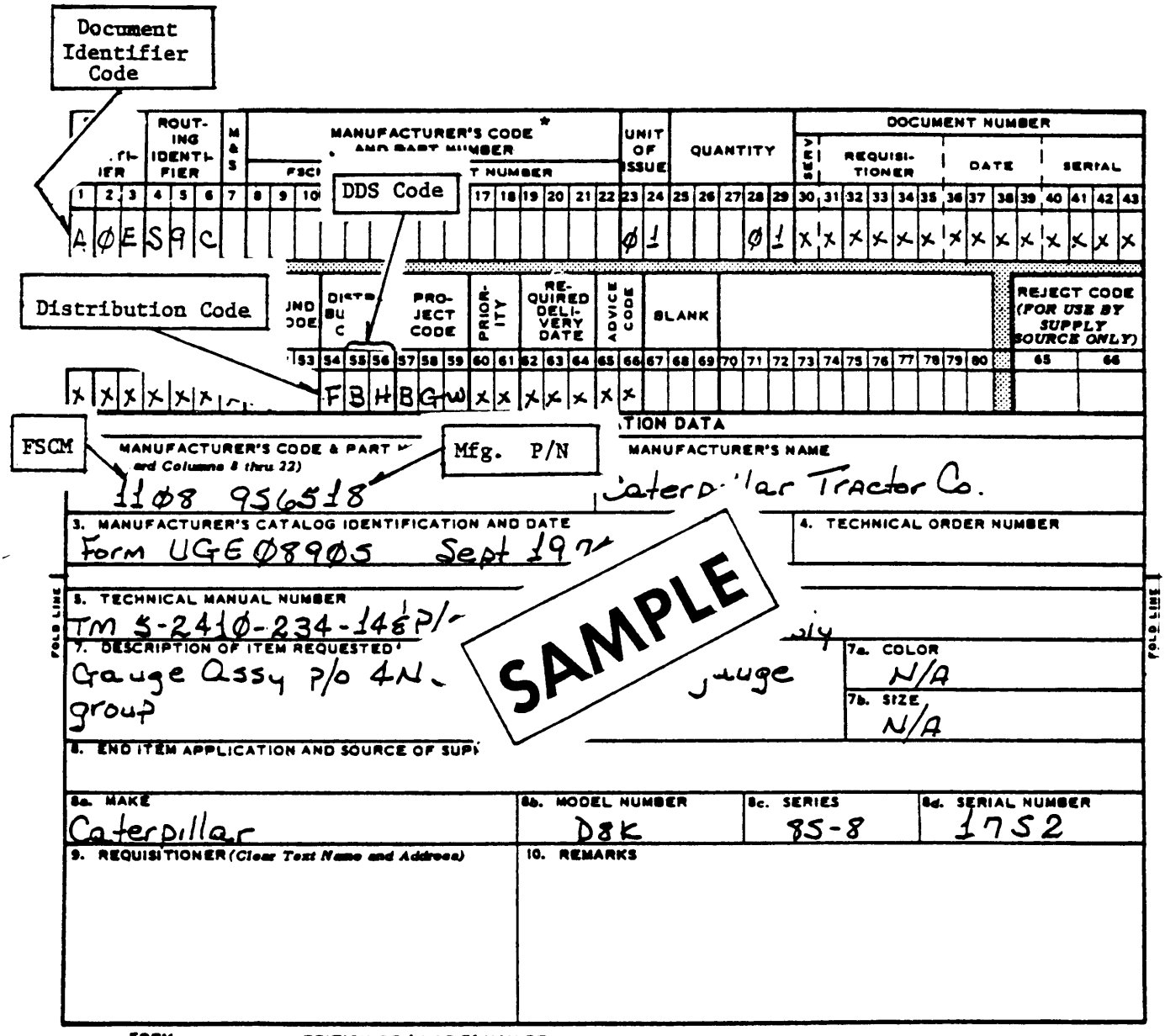


CARD COLUMN	DESCRIPTION OF DATA	MANDATORY ENTRY FOR CCE
1-3	Document Identifier Code	AØB - CONUS AØ2 - Overseas
4-6	Routing Identifier Code	Always S9C
7	Media/Status Code	
8-22	FSCM and Part Number	
23-24	Unit of Issue	
25-29	Quantity	
30-43	Document Number	
44	Demand Code	
45-50	Supplementary Address	
51	Signal Code	
52-53	Fund Code	
54-56	Distribution Code CC-54	"F" for CONUS; see AR 725-50 for OCONUS
	CC-55-56	Weapon System Code
57-59	Project Code	CCE (DSS) Code
60-61	Priority Code	
62-64	Required Delivery Date	
65-66	Advice Code	

TA 1126335

APPENDIX K

SAMPLE FORMAT - MILSTRIP REQUISITION FOR CCE (NON-NSN) (MANUAL)



TA 126336

APPENDIX K — Continued

INSTRUCTIONS

This form will only be used in those cases where the manufacturer's code and part number exceed the spaces allocated in card columns 8 - 22 of the requisition.

COLUMN CARD	DESCRIPTION OF DATA	MANDATORY ENTRY FOR CCE
1 - 3	Document Identifier Code	AØE - CONUS AØ5 - OVERSEAS
4 - 6	Routing Identifier Code	Always S9C
7	Media Status Code	
8 - 22	FSCM and Part Number	Leave Blank Enter in Block 1 under Identification Data
23 - 24	Unit of Issue	
25 - 29	Quantity	
30 - 43	Document Number	
44	Demand Code	
45 - 50	Supplementary Address	
51	Signal Code	
52 - 53	Fund Code	
54 - 56	Distribution Code CC-54	"F" for CONUS. (See AR 725-50 for overseas).
	CC-56	Weapon System Code
57 - 59	Project Code	Appropriate CCE Project Code
60 - 61	Priority Code	
62 - 64	Required Delivery Date	
65 - 66	Advice Code	
67 - 80		Blank

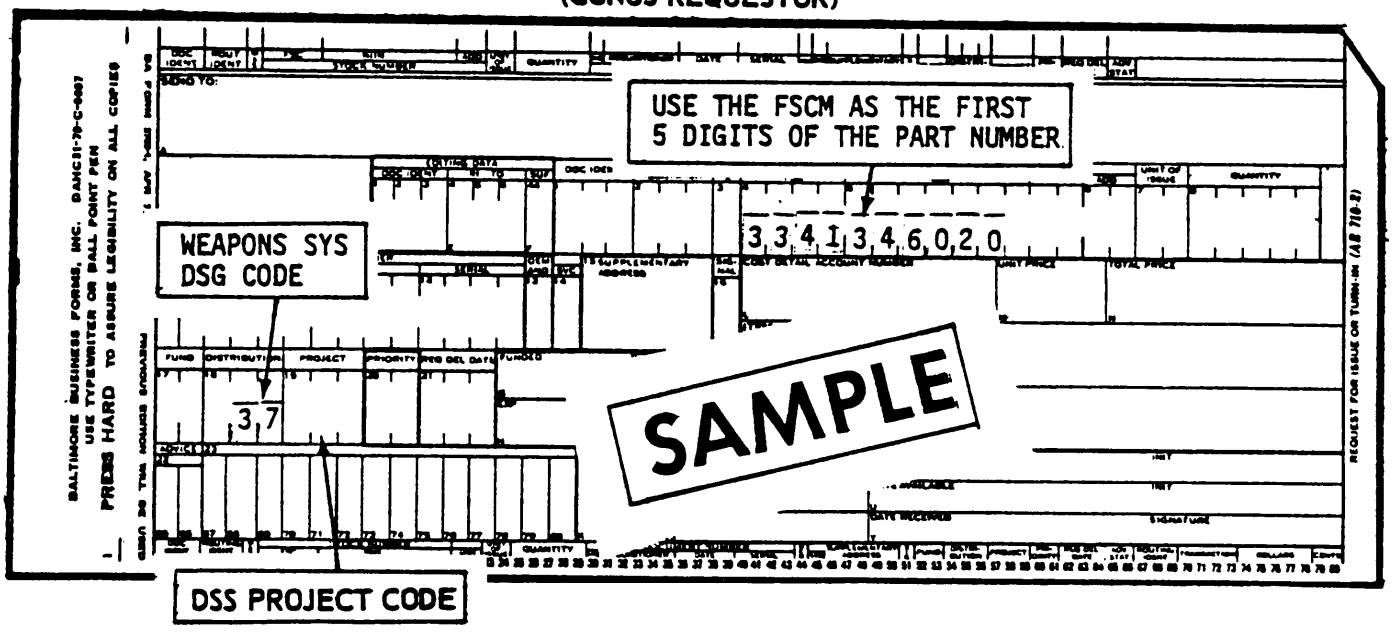
IDENTIFICATION DATA – Lower half of DD Form 1348–6, complete blocks 1 thru 9.

TA 162337

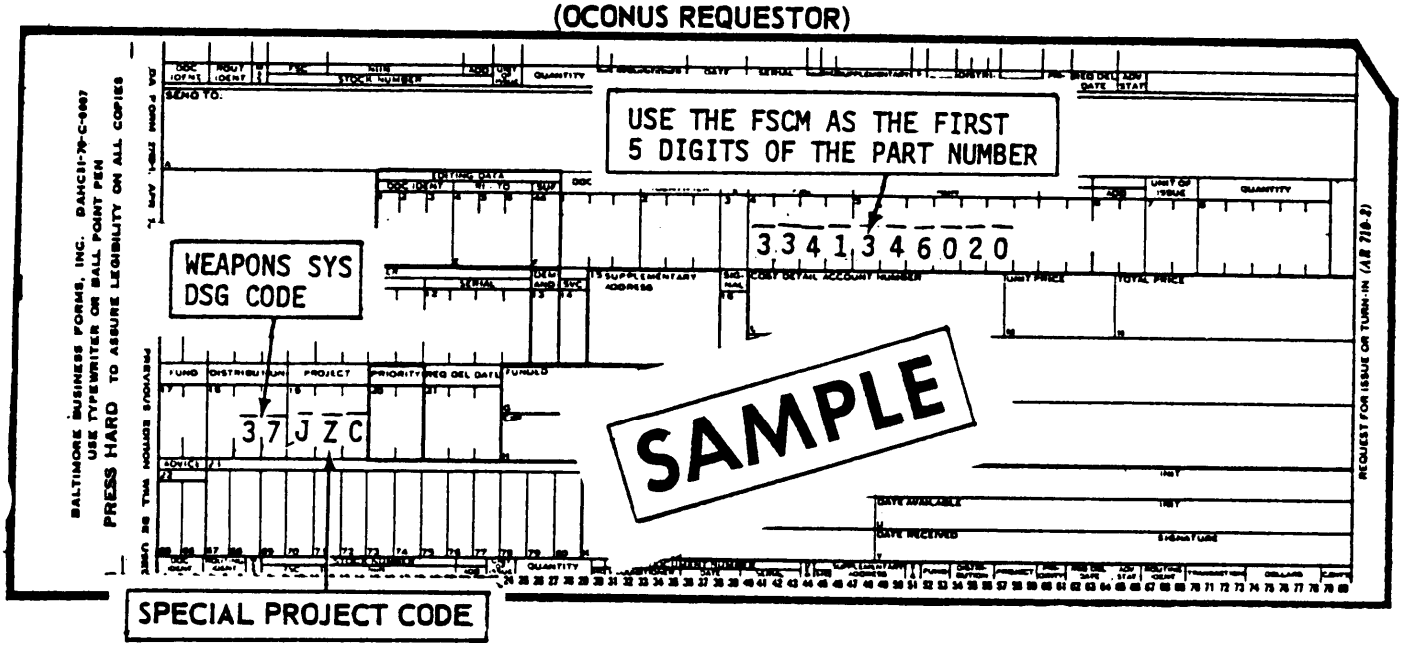
APPENDIX L

SAMPLE FORMAT
-
DA FORM 2765 PART NUMBER REQUEST

(CONUS REQUESTOR)



(OCONUS REQUESTOR)



TA 126340

APPENDIX M

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

1. Do your (B) PREVENTIVE MAINTENANCE just before you operate the equipment. Pay attention to the CAUTIONS and WARNINGS.

2. Do your (D) PREVENTIVE MAINTENANCE while you operate the equipment and at halts and rest stops.

3. Do your (A) PREVENTIVE MAINTENANCE right after operating the equipment. Pay attention to the CAUTIONS and WARNINGS.

4. Do your (W) PREVENTIVE MAINTENANCE weekly.

5. Do Your(M) PREVENTIVE MAINTENANCE once a month.

6. If something doesn't work, troubleshoot it with the instructions in this manual or notify your supervisor.

7. Always do your PREVENTIVE MAINTENANCE in the same order, so it gets to be a habit. Once you've had some practice, you'll spot anything wrong in a hurry.

8. If anything looks wrong and you can't fix it, write it on your DA Form 2404. If you find something seriously wrong, report it to organizational maintenance RIGHT NOW!

9. When you do your PREVENTIVE MAINTENANCE, take along the tools you need to make all the checks. You always need a rag or two.

10. Keep it clean: Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Clean as you work and as needed. Use drycleaning solvent (SD-2) on all metal surfaces. Use soap and water when you clean rubber or plastic materials.

11. Bolt, nuts, and screws: Check them all for obvious looseness, missing, bent, or broken condition. You can't try them all with a tool, of course. But look for chipped paint, bare metal, or rust around bolt heads.

12. If you find one loose, tighten it, and report it to organizational maintenance.

13. Welds: Look for loose or chipped paint, rust, or gaps where parts are welded together. If you find a bad weld, report it to organizational maintenance,

14. Electric wires and connectors: Look for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors and make sure the wires are in good shape.

15. Hoses and fluid lines: Look for wear, damage, and leaks, and make sure clamps and fittings are tight. Wet spots show leaks, of course. But a stain around a fitting or connector can mean a leak. If a leak comes from a loose fitting or connector, tighten it. If something is broken or worn out, report it to organizational maintenance.

16. It is necessary for you to know how fluid leakage affects the status of your equipment. The following are definitions of the types/classes of leakage you need to know to be able to determine the status of your equipment. Learn, then be familiar with them and REMEMBER—WHEN IN DOUBT, NOTIFY YOUR SUPERVISOR!

Leakage Definitions for Crew/Operator PMCS

Class I	Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.
Class II	Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected.
Class III	Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

CAUTION

Equipment operation is allowable with minor leakages (Class I or II). Of course, consideration must be given to the fluid capacity in the item/system being checked/inspected. When in doubt, notify your supervisor.

When operating with Class I or II leaks, continue to check fluid levels as required in your PMCS.

Class III leaks should be reported to your supervisor or to organizational maintenance.

WARNING

Drycleaning solvent, SD-2, used to clean parts is potentially dangerous to personnel and property. Do not use near open flame or excessive heat. Flash point of solvent is 100%F-138%F.

Operator/Crew Preventive Maintenance Checks and Services

B—Before D—During A—After W—Weekly M—Monthly

Item No.	Interval					ITEM TO BE INSPECTED Procedure: Check for and have repaired, filled, or adjusted as needed	For readiness reporting equipment is not ready/available if:
	B	D	A	W	M		
						NOTE PERFORM WEEKLY AS WELL AS BEFORE PMCS'S IF: a. You are the assigned driver but have not operated vehicle since the last weekly. b. You are operating the vehicle for the first time.	
1						GENERAL	
	•					a. Check for loose wiring.	
	•					b. Check for damaged hoses and lines.	
	•					c. Look for evidence of fluid leakage.	
	•					d. Look for damage to the frame.	Class III leaks are found.
2						AIR LINE SYSTEM	
	•					a. When system is at operating pressure, inspect brake action on all wheels for proper application and release. When brakes release, air pressure should discharge quickly from the emergency valve.	Brake on any wheel fails to operate.
	•					b. Disconnect the trailer emergency line. The trailer brakes should apply automatically. Connect the trailer emergency line. The trailer brakes should release.	Emergency braking system fails to operate properly.

Operator/Crew Preventive Maintenance Checks and Services—Continued

B—Before D—During A—After W—Weekly M—Monthly

Item No.	Interval					ITEM TO BE INSPECTED Procedure: Check for and have repaired, filled, or adjusted as needed	For readiness reporting equipment is not ready/available if:
	B	D	A	W	M		
			•			c. Drain condensation from the air reservoir while system is pressurized.	
					•	d. Check air hoses for chafing, bends, and kinking. Replace faulty hoses.	
3.						AIR BRAKES	
					•	a. Remove dust shields and examine the brake linings. Report linings that are worn to 3/8 inch or less. Do not allow linkings to wear so thin that the lining rivets contact the brake drum.	
		•				b. Check brake drums for an unusual heat conditioning during road stops.	
4.						TIRES	
		•				a. Check for cuts and general condition.	
				•		b. Check for correct air pressure, 75 psi (517 kpa).	One or more tires missing, flat, and/or unserviceable.
	•					c. Remove debris from between duals.	
5.						WHEELS	
	•					Check for loose mounting bolts, and cracked wheels. Tighten loose bolts	Any visible cracks in wheel.
6.						WHEEL BEARINGS	
	•					a. Maintain oil level between the "add" and "full" lines on the hub cap window. Add oil through hub filler plug.	
	•					b. Check for cracked window and oil leaks around the hub cap.	Class III leaks are found.

B—Before D—During A—After W—Weekly M—Monthly

Item No.	Interval					ITEM TO BE INSPECTED Procedure; Check for and have repaired, filled, or adjusted as needed	For readiness reporting equipment is not ready/available if:
	B	D	A	W	M		
7.						TILTING PLATFORM PINS	
					•	Grease at the two grease fittings provided.	
8						TILT CYLINDER	
					•	a. Inspect for oil leakage at the base of the cylinder.	Class III leaks are found.
		•				b. Check for proper operation. Report any erratic operation to your supervisor.	

Operator/Crew Preventive Maintenance Checks and Services

Legend

Q—Quarterly
S—Semiannually
A—Annually
B—Biennially
H—Hours
MI—Miles

Item No.	Interval						ITEM TO BE INSPECTED Procedure: Check for and have repaired, filled, or adjusted as needed	Equipment will be reported not ready (RED) if:
	Q	S	A	B	H	MI		
1	•	•					AIR BRAKE CHAMBERS a. Check condensation holes on the underside to make sure they are not clogged. b. Disassemble and clean the brake chamber. Replace the diaphragm and all other parts that are worn beyond safe limits.	
2			•				RELAY EMERGENCY VALVE Disassemble and clean. Replace worn parts.	
3			•				BRAKE ASSEMBLY Grease the camshaft bracket bearing and the spider bushings at 4 locations per axle.	
4			•				SLACK ADJUSTER Grease and inspect for wear.	
5			•				WHEEL BEARINGS Change bearing lubricating oil.	

Legend

Q—Quarterly
S—Semiannually
Annually
B—Biennially
H—Hours
MI—Miles

Item No.	Interval						ITEM TO BE INSPECTED Procedure: Check for and have repaired, filled, or adjusted as needed	Equipment will be reported not ready (RED) if:
	Q	S	A	B	H	MI		
6							WHEELS	
	•						Check torque on wheel mounting bolts.	
7							TILTING PLATFORM PINS	
	•						a. Tighten the 7/16-inch capscrews to 80 ft/lbs.	
	•						b. Examine the pins for wear.	

By Order of the Secretary of the Arny:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

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

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FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 5-2330-361-14&P	18 Feb 80	Flatbed Trailer

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
75		183		Change illustration. Reason: Tube end shown assembled on wrong side of lever cam.
105	3-12			This paragraph says to refer to chapter 6 for repair of auxiliary engine, but procedures are not in chapter 6. Please add procedures or give correct reference.

SAMPLE

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

John Smith, SP4 -- 798-XXXX

SIGN HERE: John Smith

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Warren, MI 48090

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  Readiness Command
ATTN: DRSTA-MBA
Warren, MI 48090

WARNING

To maintain brake air pressure and hydraulic pressure the trailer must be coupled to the prime mover during all loading and unloading operations. Failure to do this may lead to loss of control of the trailer and injury to personnel.

WARNING

Do not attempt to load the trailer from a ramp or dock with the trailer platform in the horizontal position. The sudden application of the load at the rear of the trailer platform may cause damage to the trailer coupler and tilt system. Injury to operating personnel could result by the sudden tilt of the trailer platform.

WARNING

All air must be exhausted from disc wheel assembly before demounting tire. Serious injury or death to personnel could result if retaining ring is removed with air pressure still in the tire. Remove valve core and check for plugging of the stem by running a piece of wire through it. Only trained personnel should attempt to mount or demount the trailer tires.

WARNING

Block the trailer wheels to prevent it from moving while performing the daily test of the relay emergency valve.

PIN: 044826-000