DEPARTMENT OF THE ARMY TECHNICAL MANUAL

Direct Support, General Support and Depot Maintenance Manual

TRUCK, LIFT, FORK, ELECTRIC, SOLID RUBBER TIRES 6,000 LBS. CAPACITY, 180 IN. LIFT, DREXEL DYNAMICS MODEL FL-60-EE5600, ARMY MODEL 206 FSN 3930-935-7867

HEADQUARTERS, DEPARTMENT OF THE ARMY
FEBRUARY 1970

WARNING

TRANSPORTING HAZARD

Failure to observe this warning may result in

SERIOUS INJURY OR DEATH

to personnel. Do not use a lifting device with a capacity of less than 15,000 pounds when lifting the forklift truck. Do not allow the truck to swing or sway while suspended. Attach lifting device to lifting eyes only.

WARNING

DANGEROUS CHEMICALS

are used in this equipment.

SERIOUS INJURY OR DEATH

may result if personnel fail to observe these safety precautions. Avoid contact with the battery electrolyte. If the solution comes in contact with the skin, rinse the area immediately with clear water to avoid skin burns. Do not smoke or use an open flame in the vicinity when servicing batteries as hydrogen gas, and explosive, is generated. Never use a sulfuric acid electrolyte solution in a Nickel-Iron Storage battery or use any accessories contaminated with it. Use only pure distilled water to maintain solution level and never add water during or shortly after normal rate charging.

WARNING

MAINTENANCE HAZARD

SERIOUS INJURY OR DEATH

to personnel may result if the forklift truck is not blocked securely before crawling under the truck.

WARNING

UNINTENTIONAL FAST TRAVELING SPEED

may result in this equipment.

Failure to observe this warning may result in

SERIOUS INJURY OR DEATH

to personnel. The speed of the vehicle may be unintentionally affected by radio interference if the vehicle is subjected to a strong radio frequency field in the 150 to 174 megahertz range. This may occur when a radio transmitter is used within a few feet of the vehicle or when a radio transmitter is carried on the vehicle.

WARNING

DANGEROUS CHEMICALS

are used in this equipment.

SERIOUS INJURY OR DEATH

may result if personnel fail to observe this safety precaution. Avoid contact with the battery electrolyte. If the solution comes in contact with the skin, rinse the area immediately with clean water to avoid skin burns. Do not smoke or sue an open flame in the vicinity when servicing batteries as hydrogen, an explosive, is generated. Never use a sulfuric acid electrolyte solution in a Nickel-Iron Storage Battery or use any accessories contaminated with it. Use only pure distilled water to maintain solution level and never add water during or shortly after normal rate charging.

CHANGE
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *14 October 1974*

Direct Support, General Support and
Depot Maintenance Manual
TRUCK, LIFT, FORK, ELECTRIC, SOLID RUBBER
TIRES, 4,000 LB. CAPACITY, 144 IN. LIFT
DREXEL DYNAMICS MODEL FL40-EE5600M,
ARMY MODEL 206
FSN 3930-347-6175

TM 103930-611-35, 17 February 1970 is changed as follows:

The title is changed as shown above.

Warning Page add the following:

WARNING

Dry cleaning solvent, P-D-680, 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.

Page 1-1, paragraph 1-1a, line 3, model number is changed to read "FL-40-EE5600M."

Paragraph 1-1c is superseded as follows:

c. You can help to improve this manual by calling attention to errors and by recommending improvements. Your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) should be mailed direct to Commander, U.S. Army Troop Support Command, ATTN: AMSTS-MPP, 4300 Goodfellow Boulevard, St. Louis, MO 63120. A reply will be furnished direct to you.

Paragraph 1-3, line 2, model number is changed to read "FL-40-EE5600M."

Page 3-12, figure 3-10 is superseded as follows."

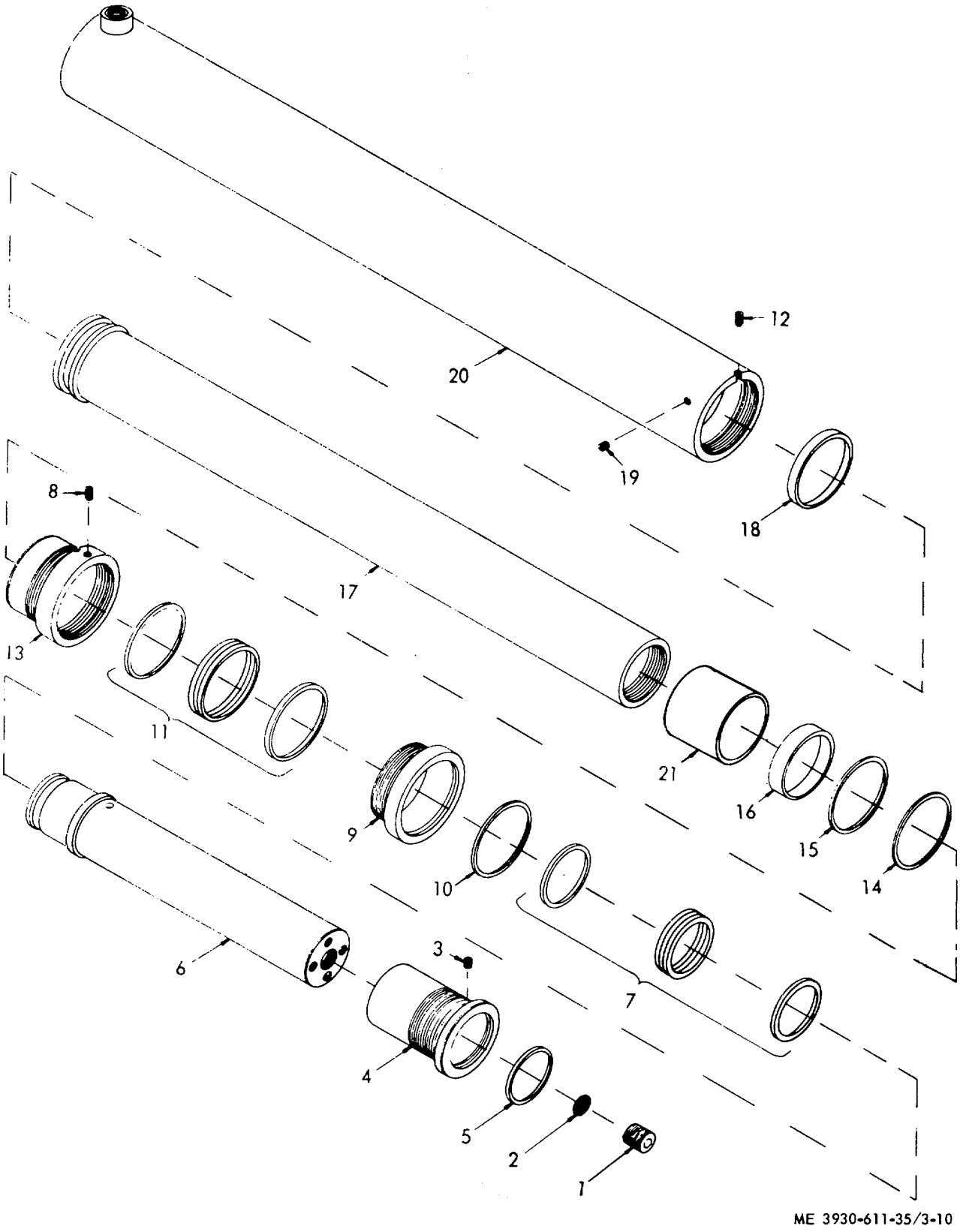


Figure 3-10. Lift cylinder, disassembly and reassembly.

Page 3-13, Add the following item to figure 3-10 legend: 21. Spacer

Page 3-13, figure 3-11, change item 3 to read "3. Remove capscrew from opposite end of mast pivot pin and remove the mast pivot pin."

Page 3-15, figure 3-12, change items 12 and 19 to read as follows: "12. Screw, flat HD (8 reqd)

19. Screw, Flat HD (16 reqd)."

Page 3-18, after paragraph 3-14*e* add:

"*f*. Adjustment.

(1) Adjust rod clevis (item 2, figure 3-16), as necessary to attain three degree forward tilt in the mast and ten degree rearward tilt in the full rearward position.

(2) If excessive twisting is noticed at full forward or rearward positions, adjust the rod clevis as necessary for correction of the excessive twisting.

(3) Refer to figure 3-15A and install tilt cylinder pivot pin and cotter pin and tighten allen set screw."

Page A-1, paragraph A-5, line 3. Delete "TB ORD 651 Use of Antifreeze solutions and cleaning compounds in engine cooling systems.

Last page of manual, fold out wiring schematic figure 1-1 is superseded as follows:

Figure 1-1. Electrical wiring schematic.

(Located in back of manual)

By Order of the Secretary of the Army:

FRED C. WEYAND
General, United States Army
Chief of Staff

Official:

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

Distribution:

To be distributed in accordance with DA Form 12-25A, (qty rqr block no. 895) Direct and General Support maintenance requirements for Warehouse, Equipment.

TECHNICAL MANUAL
No. 10-3930-611-35

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., 17 February 1970

DIRECT SUPPORT, GENERAL SUPPORT AND DEPOT MAINTENANCE MANUAL TRUCK, LIFT, FORK, ELECTRIC, SOLID RUBBER TIRES, 6,000 LBS. CAPACITY, 180 IN. LIFT, DREXEL DYNAMICS MODEL FL-60-EE5600, ARMY MODEL MHE 206, FSN 3930-935-7867

LIST OF ILLUSTRATIONS

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1-1. Scope

a. These instructions are for the use of the personnel to whom Drexel Dynamics Corporation Model FI60-EE5600 Electric Forklift Trucks are issued. It provides information on maintenance which is beyond the scope of the tools, equipment, personnel, or supplies normally available to the using organization.

b. The appendix contains a list of references. TM 10-3930-611-12 contains the maintenance allocation chart. The list of repair parts required by direct, general, and depot maintenance facilities for support of the equipment is contained in TM 10-3930-611-35P. (When printed).

c. Report of errors, omissions and recommendations for improving this publication by the individual user is encouraged. Report should be submitted on DA Form 2028 (Recommended Changes to Publications), and forwarded direct to Commanding General, U. S. Army Mobility Equipment Command, ATTN: AMSME-MPP, 4300 Goodfellow Boulevard, St. Louis, Mo. 63120.

d. Report all equipment improvement recommendations as prescribed by TM 38-750.

1-2. Record and Report Forms

Maintenance forms, records and reports which are to be used by direct, general, and depot maintenance personnel are listed in and prescribed by TM 38750.

Note. Applicable forms, excluding Standard Form 46, (United States Government Motor Vehicles Operator's Identification Card) which is carried by the operator shall be kept in a canvas bag mounted on the equipment.

Section II. DESCRIPTION AND DATA

1-3. Description

For a complete description of the Drexel Dynamics Corporation Model FL60-EE5600 Electric Forklift Truck, see TM 10-3930-611-12.

1 -4. Tabulated Data

a. Drive Motor.

Manufacturer---------- General Electric Company
Model Number---------- 5BT1364A122
Volts---------- 36
HP (Horsepower) ---------- 9.48
RPM (Revolutions per minute) 1130
Amperes ---------- 255
Winding ---------- Series-Series

b. Hydraulic Pump Motor.

Manufacturer---------- General Electric Company
Model Number---------- 5BT1364A123
Volts---------- 36
HP (Horsepower)---------- 9.48
RPM (Revolutions per minute) 1130
Amperes---------- 255
Winding ---------- Series-Series

c. Nut and Bolt Torque Data. For nut and bolt torque data TM 10-3930-611-12.

d. Schematic Wiring Diagram. Refer to figure 1-1 for wiring diagram.

Figure 1-1. Electrical wiring schematic.
(Located in back of manual)

CHAPTER 2
GENERAL MAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, SPECIAL TOOLS, AND EQUIPMENT

2-1. Special Tools and Equipment
No special tools or equipment are required to perform the repair operations described in this manual.

2-2. Direct Support, General Support, and Depot Maintenance Repair Parts
Direct Support, General Support, and Depot Maintenance Parts are listed in TM 10-3930-611-35P.

2-3. Specially Designed Tools and Equipment
No specially designed tools and equipment are required to perform maintenance on the forklift truck.

Section II. TROUBLESHOOTING

2-4. General
This section provides information useful in diagnosing and correcting unsatisfactory operation or failure of the forklift truck and its components. Malfunctions which may occur are listed in table 2-1. Each malfunction stated is followed by a list of probable causes of the trouble. The corrective action recommended is described opposite the probable cause.

Table 2-1. Troubleshooting

Malfunction	Probable cause	Corrective action
1. Brake pedal goes to floorboard or is spongy.	a. Oil or grease on brake lining	a. Replace brake shoe (para 3-23).
	b. Boot and gasket in master cylinder damaged or worn out.	b. Replace boot and gasket. (para 3-22).
	c. Brake shoes out of adjustment	c. Adjust (para 3-23).
	d. Defective wheel cylinder	d. Replace cylinder (para 3-23).
2. Brakes are dragging (either or both sides).	a. No return bleeding in master cylinder.	a. Adjust pushrod (para 3-22).
	b. Brake shoes out of adjustment	b. Adjust (para 3-23).
	c. Broken or loose brake shoe springs.	c. Replace or adjust (para 3-23).
	d. Shoe mounting plate loose	d. Tighten (para 3-23).
	e. Brake drum out-of-round. Spindle bent.	e. Replace (para 3-23).
3. Parking brake or seat brake does not hold.	Brake shoes soaked with oil or grease.	Replace brake shoes (para 3-24).
4. Failure to drive (forward or reverse).	a. Foot brake switch defective	a. Replace (TM 10-3930-611-12 para 3-29).
	b. Battery interlock switch defective.	b. Replace (TM 10-3930-611-12 para 3-31).
	c. Seat switch defective	c. Replace (TM 10-3930-611-12, para 3-28).
	d. Emergency switch defective	d. Replace (TM 10-3930-611-12 para 3-30).
	e. Directional switch defective	e. Replace (TM 10-3930-611-12 para 3-22).
	f. Accelerator switch defective	f. Replace (para 3-5).
	g. Line contactor defective	g. Replace (para 3-6).
	h. Forward and reverse contactor defective.	h. Replace (para 3-6).
	i. SCR defective	i. Replace (para 3-6).

Table 2-1. Troubleshooting - (Continued)

Malfunction	Probable cause	Corrective action
	j. 1A-Timer out of adjustment	j. Adjust (para 3-6).
	k. Broken wires or loose connections.	k. Replace or tighten (para 3-7).
	l. Drive motor burned out	l. Replace (para 3-3).
	m. Thermoswitch open	m. Wait to cool.
	n. Thermoswitch defective	n. Replace.
	o. Power train from motor to wheels interrupted.	o. Replace broken parts (para 3-23).
5. Truck will not operate at maximum speed.	a. 1A-Timer out of adjustment	a. Adjust (para 3-6).
	b. 1A-Contactor defective	b. Replace (para 3-6).
	c. Drive motor defective	c. Replace (para 3-3).
6. Truck will not operate in correct creeping speed.	a. Creeping speed adjuster off	a. Adjust creeping speed (para 3-6).
	b. Card 1 defective	b. Replace (para 3-6).
	c. Drive motor defective	c. Replace (para 3-3).
7. Truck will not operate under plugging.	a. Plugging adjustment off	a. Adjust (para 3-6).
	b. Sensor defective	b. Replace (para 3-6).
	c. Card 1 defective	c. Replace (para 3-6).
	d. Drive motor defective	d. Replace (para 3-3).
8. Failure to lift and/or tilt	a. Battery interlock switch defective.	a. Replace (TM 10-3930-611-12 para 3-31).
	b. Seat switch defective	b. Replace (TM 10-3930-611-12 para 3-28).
	c. Emergency switch defective	c. Replace (TM 10-3930-611-12 para 3-30).
	d. Control valve switch defective	d. Replace (TM 10-3930-611-12 para 3-33).
	e. Line contactor defective	e. Replace (para 3-6).
	f. Pump contactor defective	f. Replace (para 3-6).
	g. Control valve defective	g. Replace (para 3-12).
	h. Pump valve defective	h. Replace (para 3-13).
	i. Pump motor defective	i. Replace (para 3-2).
9. Truck does not steer within the ninimum turning radius.	a. Tie rods and/or bell crank linkage age out of adjustment.	a. Adjust (para 3-18).
	b. Excessive play in handwheel	b. Adjust.
	c. Worm gear out of adjustment	c. Adjust (para 3-16).
10. Power steering inoperative or partially operating.	a. Pump defective	a. Replace (para 3-13).
	b. Pump motor defective	b. Replace (para 3-2).
	c. Microswitch at booster end out of adjustment.	c. Adjust (para 3-17).
	d. Internal parts of booster dam aged.	i. Replace and/or correct (para 3-17).
11. Drive axle noise on drive	a. Bevel gear set worn out	a. Replace (para 3-26).
	b. Bevel gear set excessive backlash.	b. Adjust (para 3-26).
	c. Ring gear set worn out	c. Replace (para 3-23).
	d. Worn out bearings	d. Replace (para 3-23).

Section III. REMOVAL AND INSTALLATION OF MAJOR COMPONENTS AND AUXILIARIES

2-5. Battery Compartment Side Panels

a. Removal. Refer to TM 10-3930-611-12.

b. Installation. Refer to TM 10-3930-611-12.

2-6. Battery and Receptacle

a. Removal. Refer to TM 10-3930-611-12.

b. Installation. Refer to TM 10-3930-611-12.

2-7. Hydraulic Pump and Motor

a. Removal. Refer to figure 3-1 and remove the hydraulic pump and the hydraulic pump motor as an assembly.

b. Installation. Refer to figure 3-1 and install the pump and motor as an assembly.

2-8. Drive Motor

a. Removal. Refer to paragraph 3-3 and remove the drive motor.

b. Installation. Refer to paragraph 3-3 and install the drive motor.

CHAPTER 3
REPAIR INSTRUCTIONS

Section I. ELECTRICAL SYSTEM

3-1. General

This section provides information useful in the repair of the forklift electrical system. The electrical system consists of a drive motor, hydraulic pump motor, wiring, and various other components which assure the proper operation of the truck.

3-2. Hydraulic Pump Motor

a. Removal. Refer to figure 3-1 and remove the hydraulic pump and the hydraulic pump motor as an assembly.

b. Pump Coupling Chain Removal and Disassembly. Refer to figure 3-2 and remove the coupling chain.

c. Disassembly. Refer to figure 3-3 and disassemble the hydraulic pump motor.

d. Cleaning, Inspection and Repair.

(1) Wipe all electrical parts with a clean, dry cloth. Clean all other parts with dry cleaning solvent (Federal Specification P-D-680) and dry thoroughly.

(2) Inspect all wires and terminals for breaks and corrosion. Inspect brushes for amount of wear and evidence of chipping. Inspect brush holders for proper spring tension (2.5 lbs.). Inspect commutator for burns and high mica. Inspect chain and sprocket, and other parts for breaks, cracks, dents, loose or missing mounting hardware, or other defects.

(3) Clean corrosion from wires and electrical connections, tighten or replace loose or missing hardware. Replace a damaged or worn chain or sprocket. If necessary, undercut commutator mica to a depth equal to the thickness of the mica and take a light cut from the commutator in a lathe. If brushes are shorter than 13/16 inch, replace and sand in as necessary. Replace damaged parts.

e. Motor Testing. Using a multimeter, touch the probes to each end of the field coil terminals to test for continuity. Test for grounded field coils by touching one probe to the field coil circuit and the other to the field core frame. If lack of circuit continuity or grounded coil is indicated, replace the field coils. Touch one test probe to the commutator and the other to the armature core. If a grounded armature coil is evidenced, replace the armature.

f. Reassembly. Refer to figure 3-3 and reassemble the hydraulic pump motor.

g. Pump Coupling Chain Reassembly and Installation. Refer to figure 3-2 and install the coupling chain.

h. Installation. Refer to figure 3-1 and install the hydraulic pump and the hydraulic pump motor as an assembly.

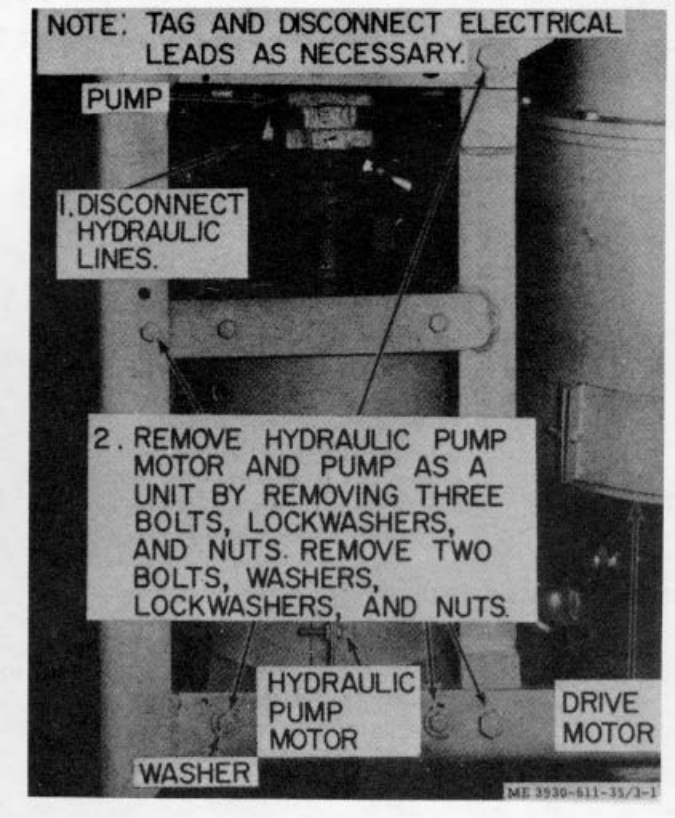
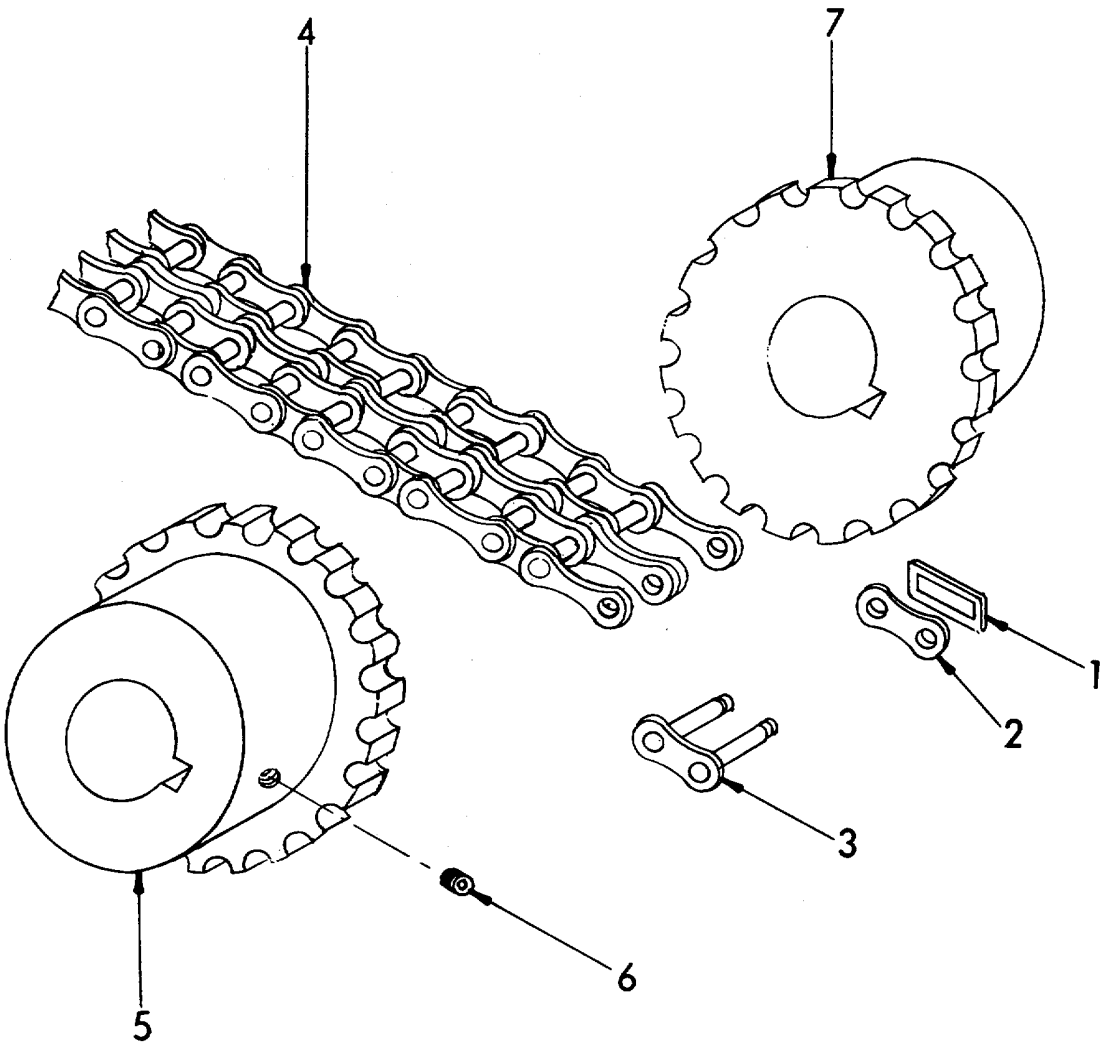


Figure 3-1. Hydraulic pump and hydraulic pump motor, removal and installation.



ME 3930-611-35/3-2

1. Lock, snap
2. Link, plate
3. Link, connecting
4. Chain
5. Coupling half—driving
6. Screw, set
7. Coupling half—driven

Figure 3-2. Pump coupling chain, removal, disassembly, reassembly and installation.

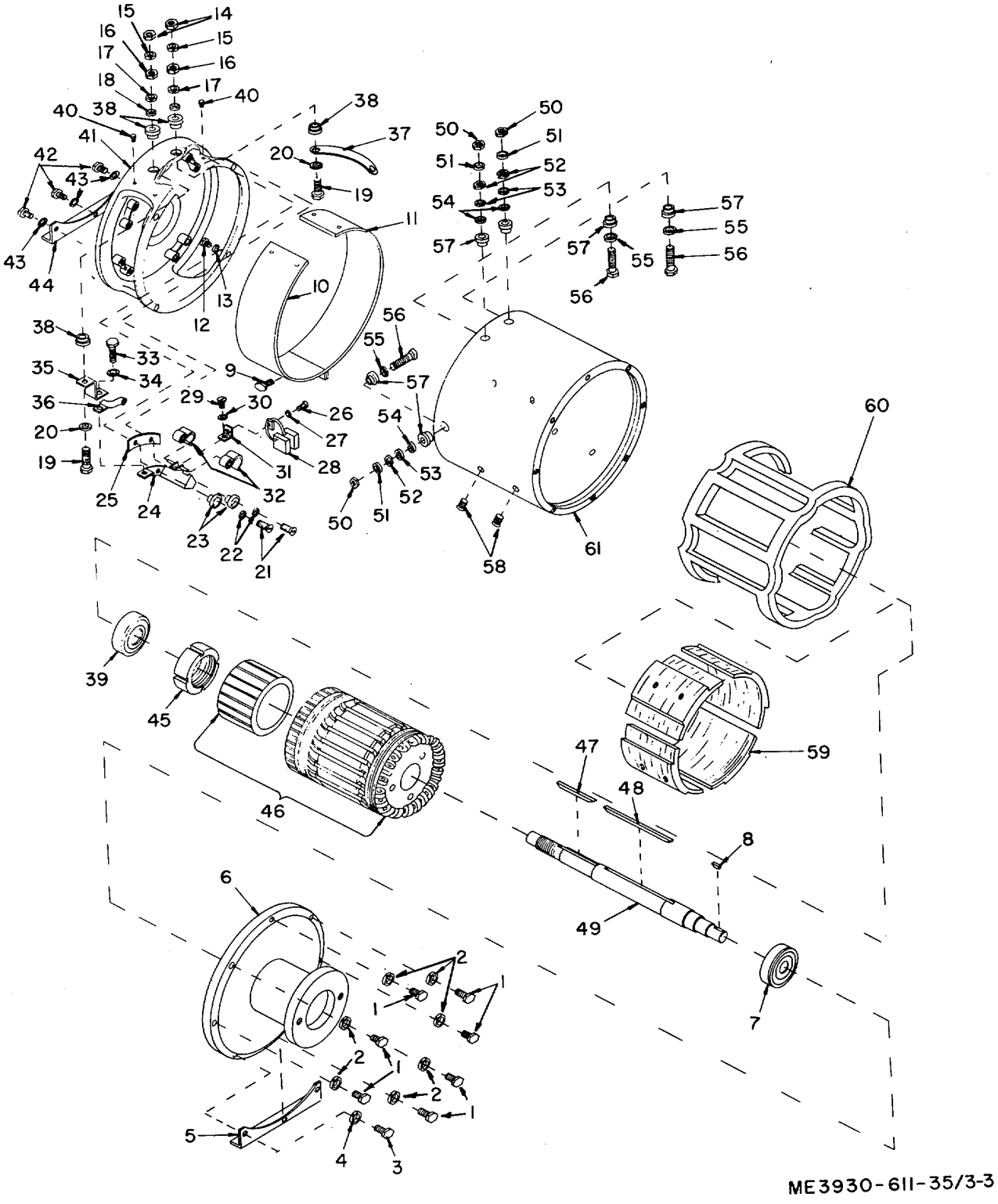


Figure 3-3. Hydraulic pump motor, disassembly and reassembly.

1. Screw (8 reqd)
2. Washer, lock (19 reqd)
3. Screw (ref item #1)
4. Washer, lock (ref item #2)
5. Foot
6. Bracket, bearing, drive end
7. Bearing, ball, drive end
8. Key
9. Screw
10. Dover (half)
11. Cover (half)
12. Screw (4 reqd)
13. Washer, lock (ref item #2)
14. Nut, hex (10 reqd)
15. Washer, lock (10 reqd)
16. Nut, hex (ref item #14)
17. Washer, lock (ref item #15)
18. Washer, flat (12 reqd)
19. Bolt, hex hd (5 reqd)
20. Washer, flat (ref item #18)
21. Screw (8 reqd)
22. Washer, flat (8 reqd)
23. Bushing (8 reqd)
24. Holder, brush (4 reqd)
25. Washer, insulation (4 reqd)
26. Screw (8 reqd)
27. Washer, lock (8 reqd)
28. Brush (4 reqd)
29. Screw (ref item #26)
30. Washer, lock (ref item #27)
31. Bracket, angle (reqd)
32. Spring (8 reqd)
33. Screw (4 reqd)
34. Washer, lock (ref item #2)
35. Connector (short)
36. Connector (long)
37. Connector, cross (2 reqd)
38. Bushing (10 reqd)
39. Bearing, ball, front end
40. Pin, cover (4 reqd)
41. Yoke and bearing support
42. Screw (3 reqd)
43. Washer, lock (ref item #2)
44. Foot
45. Nut, shaft
46. Armature (complete)
47. Key, commutator
48. Key, armature
49. Shaft
50. Nut, hex (ref item #14)
51. Washer, lock (ref item #15)
52. Nut, hex (ref item #14)
53. Washer, lock (ref item #15)
54. Washer, flat (ref item #18)
55. Washer, flat (ref item #18)
56. Bolt, hex hd (ref item #19)
57. Bushing (ref item #38)
58. Screw (8 reqd)
59. Pole, main (4 reqd)
60. Coils, field (1 set reqd)
61. Frame

Figure 3-3. Hydraulic pump motor, disassembly and reassembly.

3-3. Drive Motor

a. Removal.

(1) Remove the parking brake linkage (TM 10-3930-611-12, para 3-42).

(2) Disconnect the brake lines to the wheel cylinder. (TM 10-3930-611-12).

(3) Remove the mast assembly (para 3-10).

(4) Remove the differential (para 3-26).

(5) Refer to figure 3-4 and remove the drive motor.

b. Disassembly. Refer to figure 3-5 and disassemble the drive motor assembly.

c. Cleaning, Inspection and Repair.

(1) Wipe all electrical parts with a clean, dry cloth. Clean all other parts with dry cleaning solvent (Federal Specification P-D-680) and dry thoroughly.

(2) Inspect all wires and terminals for breaks and corrosion. Inspect brushes for amount of wear and evidence of chipping. Inspect brush holders for proper spring tension (2.5 lbs.). Inspect commutator for burns and high mica. Inspect all other parts for breaks, cracks, dents, loose or missing mounting hardware, or other defects.

(3) Clean corrosion from wires and electrical connections, tighten or replace loose or missing hardware. If necessary, undercut commutator mica to a depth equal to the thickness of the mica and take a light cut from the commutator in a lathe. If brushes are shorter than 13/16 inch, replace and sand in as necessary. Replace damaged parts.

d. Motor Testing. Using a multimeter, touch the probes to each end of the field coil terminals to test for continuity. Test for grounded field coils by touching one probe to the field coil circuit and the other to the field core frame. If lack of circuit continuity or a grounded coil is indicated, replace the field coils. Touch one test probe to the commutator and the other to the armature core. If a grounded armature coil is evidenced, replace the armature.

e. Reassembly. Refer to figure 3-5 and reassemble the drive motor.

f. Installation.

(1) Refer to figure 3-4 and install the drive motor.

(2) Install the differential (para 3-26).

(3) Install the mast assembly (para 3-10).

(4) Connect the brake lines to the wheel cylinders (TM 10-3930-611-12).

(5) Install the parking brake linkage (TM 10-3930-611-12, para 3-42).

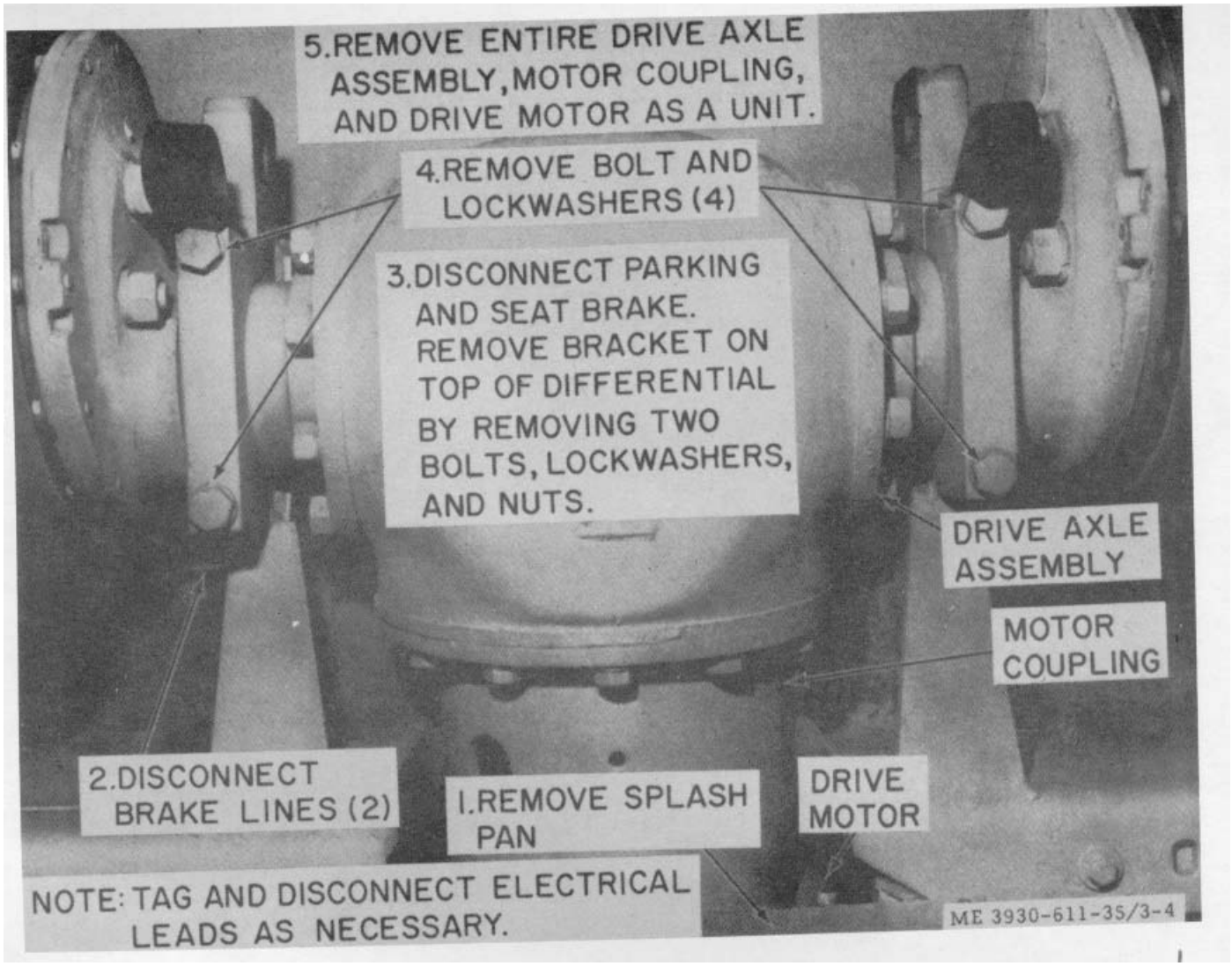


Figure 3-4. Drive motor, removal and installation.

3-4. Control Box

a. Removal. Refer to figure 3-6 and remove the control box.

b. Cleaning and Inspection.

(1) Wipe the box with a clean, dry cloth.

(2) Inspect for breaks, cracks, elongated mounting holes, loose or missing mounting hardware, or other defects.

(3) Tighten or replace loose or missing mounting hardware. Replace a damaged or defective control box as necessary.

c. Installation. Refer to figure 3-6 and install the control box.

3-5. Accelerator Switch

a. Removal. Refer to TM 10-3930-611-12 for removal of accelerator switch.

b. Disassembly. Refer to figure 3-7 and disassemble the accelerator switch.

c. Cleaning, Inspection and Repair.

(1) Wipe all electrical parts with a clean, dry cloth. Clean all other parts with dry cleaning solvent (Federal Specification P-D-680) and dry thoroughly.

(2) Inspect all wires and terminals for breaks and corrosion. Inspect all other parts for breaks, cracks, dents, loose or missing mounting hardware, or other defects.

(3) Clean corrosion from wires and electrical connections, and tighten or replace loose or missing mounting hardware. Replace damaged parts as necessary.

d. Reassembly. Refer to figure 3-7 and reassemble the accelerator switch.

e. Installation. Refer to TM 10-3930-611-12 for installation instructions.

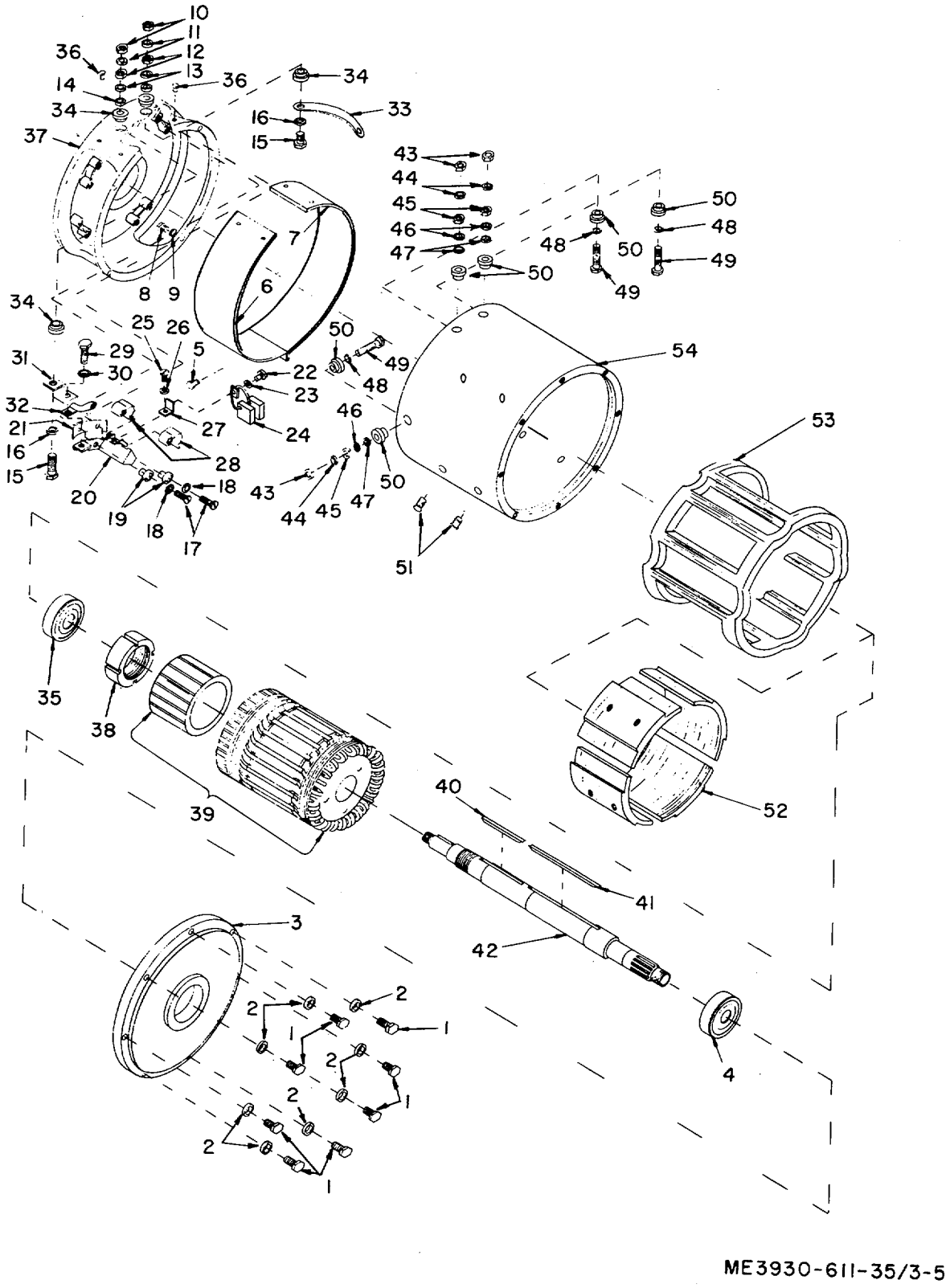


Figure 3-5. Drive motor, disassembly and reassembly.

1. Screw (8 reqd)
2. Washer, lock (8 reqd)
3. Bearing bracket, drive end
4. Ball bearing, drive end
5. Screw
6. Cover (half)
7. Cover (half) with nut
8. Screw (4 reqd)
9. Washer, lock (4 reqd)
10. Nut (10 reqd)
11. Washer, lock (10 reqd)
12. Nut, hex (ref item #10)
13. Washer, lock (ref item #11)
14. Washer, flat (10 reqd)
15. Screw (5 reqd)
16. Washer, flat (ref item #14)
17. Screw (8 reqd)
18. Washer, flat (8 reqd)
20. Holder, brush (4 reqd)
21. Washer, insulating (4 reqd)
22. Screw (8 reqd)
23. Washer, lock (8 reqd)
24. Brush (4 reqd)
25. Screw (ref item #22)
26. Washer, lock (ref item #23)
27. Bracket, angle (4 reqd)
28. Spring (8 reqd)
29. Screw (4 reqd)
30. Washer, lock (4 reqd)
31. Connector (short)
32. Connector (long)
33. Connector, cross (2 reqd)
34. Insulator (10 reqd)
35. Ball bearing, front end
36. Pin cover (4 reqd)
37. Yoke and bearing support
38. Nut, shaft
39. Armature (complete)
40. Key, commutator
41. Key, armature
42. Shaft
43. Nut (ref item #10)
44. Washer, lock (ref item #11)
45. Nut, hex (ref item #10)
46. Washer, lock (ref item #11)
47. Washer, flat (ref item #14)
48. Washer, flat (ref item #14)
49. Screw (ref item #15)
50. Insulator (ref item #34)
51. Screw (8 reqd)
52. Pole, main (4 reqd)
53. Coils, field (1 set reqd)
54. Frame

Figure 3-5. Drive motor, disassembly and reassembly.

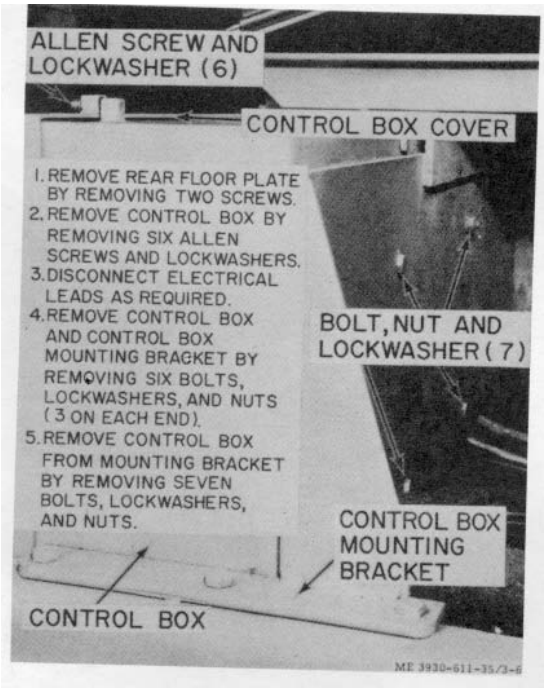


Figure 3-6. Control box, removal and installation.

3-6. Contractors, SCR Panel, Fuse Holders, Terminal Strips and Time Delay Relay

a. Removal.

(1) Remove the control box (para 3-4).

(2) Refer to figure 3-6 and remove the contactors, SCR panel, fuse holders, terminal strips and time delay relay.

b. Cleaning and Inspection.

(1) Wipe all parts with a clean, dry cloth.

(2) Inspect for breaks, cracks, corrosion, loose or missing mounting hardware, elongated mounting holes, or other defects.

(3) Tighten or replace loose or missing mounting hardware, replace a damaged contactor, SCR panel, terminal strip, fuse holder or time delay relay as necessary.

c. Installation.

(1) Refer to figure 3-8 and install the contactor, SCR panel, fuse holders, terminal strips and time delay relay.

(2) Install the control box, (para 3-4).

3-7. Wiring Harness

a. General. Most wires in the forklift truck, whether run individually or in a harness, are marked or numbered. The vast majority of the electrical leads have crimp-on connections at each end; some of the components have quick disconnect type connectors on the wire leads. Figure 3-6. Control box, removal and installation.

b. Inspection. Inspect the insulation for cracks or frayed material. Pay particular attention to wires

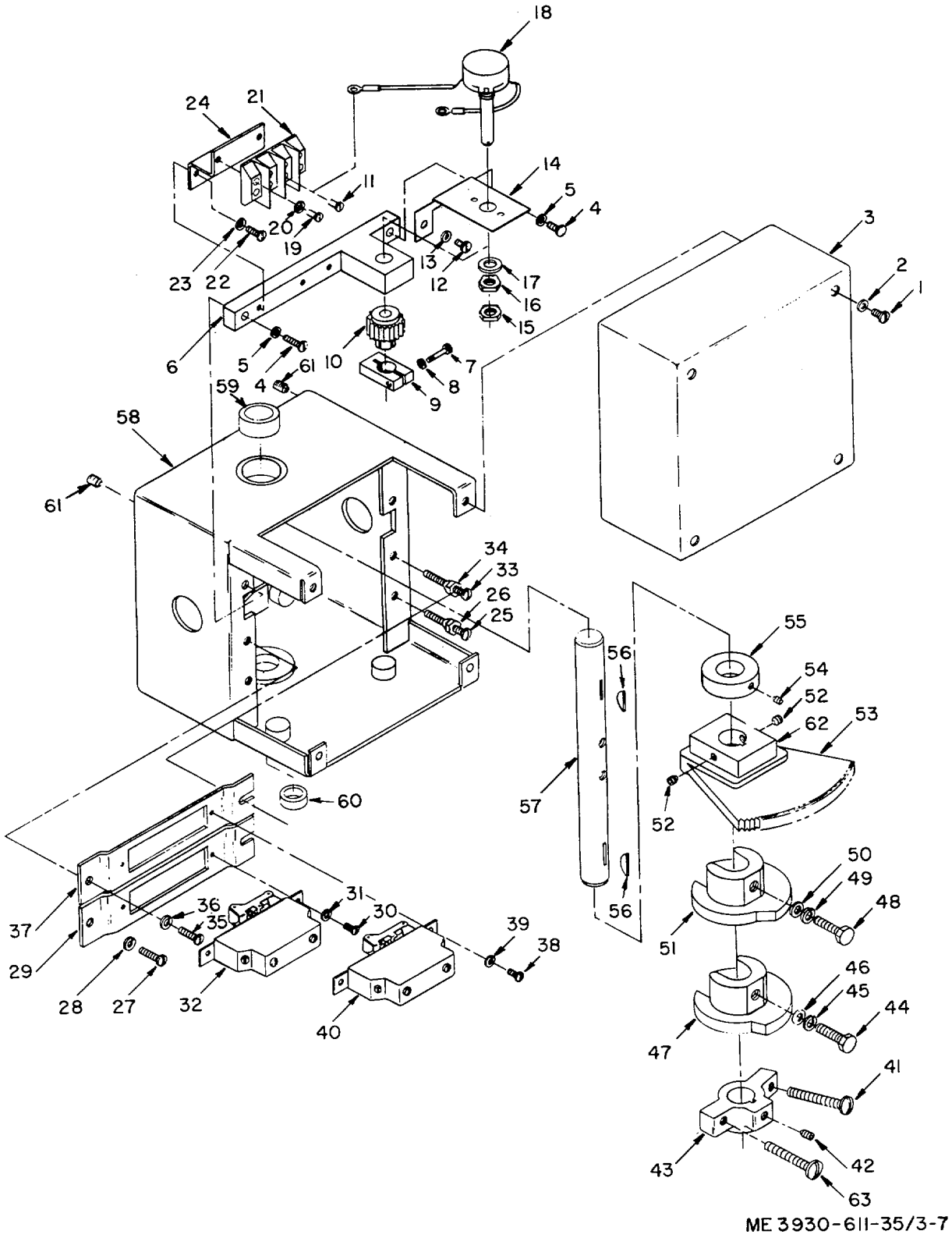


Figure 3-7. Accelerator switch, disassembly and reassembly.

1. Screw (7 reqd)
2. Washer, lock (12 reqd)
3. Cover, switch assy case
4. Screw (2 reqd)
5. Washer, lock (ref item #2)
6. Bracket, mounting
7. Screw
8. Washer, lock (7 reqd)
9. Clamp
10. Gear, pinion
11. Screw (6 reqd)
12. Screw (ref item #1)
13. Washer, lock (ref item #2)
14. Bracket
15. Nut, hex (2 reqd)
16. Nut, hex (ref item #15)
17. Washer, flat
18. Potentiometer
19. Screw (2 reqd)
20. Washer, lock (ref item #8)
21. Strip, terminal
22. Screw (ref item #1)
23. Washer, lock (ref item #2)
24. Bracket
25. Screw (2 reqd)
26. Nut, lock (2 reqd)
27. Screw (2 reqd)
28. Washer, lock (ref item #2)
29. Bracket, switch mtg
30. Screw (ref item #27)
31. Washer, lock (ref item #8)
32. Switch (2 reqd)
33. Screw (ref item #25)
34. Nut, lock (ref item #26)
35. Screw
36. Washer, lock (ref item #2)
37. Bracket, switch mtg (ref item #29)
38. Screw (ref item #27)
39. Washer, lock (ref item #8)
40. Switch (ref item #32)
41. Screw, adjusting
42. Screw, set (4 reqd)
43. Stop, shaft rotation
44. Screw (2 reqd)
45. Washer, lock (2 reqd)
46. Washer, flat (2 reqd)
47. Cam, switch actuating
48. Screw (ref item #44)
49. Washer, lock
50. Washer, flat (ref item #46)
51. Cam, switch actuating
52. Screw, set (ref item #42)
53. Gear sector
54. Screw, set (ref item #42)
55. Collar
56. Key woodruff (2 reqd)
57. Shaft
58. Case, switch assy
59. Bushing (2 reqd)
60. Bushing (ref item #59)
61. Screw, set (3 reqd)
62. Hub.
63. Screw, adjusting

Figure 3-7. Accelerator switch, disassembly and reassembly.

passing through holes in the frame or over rough edges. If inspection reveals a cut or broken wire, and the break in the wire is exposed, the wire must be repaired (para d below). If the wire is in the wiring harness or in an inaccessible area, replace the wire (para e below).

c. Testing. Test the wire for continuity by disconnecting one end from the component to which it is attached, as this will make an open circuit. Touch the test probes of a multimeter to each end of the wire. If the meter shows no indication, the wire is defective and should be repaired or replaced (para d or e below).

d. Repair. Shave the insulation on the wires to expose one-half inch of bare wire at both ends of the break. Twist the bare wire together and solder the connections. Cover the repaired break with electrical tape and friction tape. Do not leave any bare wires exposed. If a terminal lug breaks off a wire, replace it with an exact duplicate.

e. Replacement. Replace a wire by disconnecting it from the component or components to which it is attached and remove the wire. Install a new wire and connect it to the component. If a broken wire is part of a harness, disconnect the wire at each end and tape the loose ends with electrical tape. Install a new wire and attach it to the outside of the wiring harness.

Section II. MAST AND LIFT CYLINDER

3-8. General

This section is to provide information useful in the repair and maintenance of the mast and lift cylinder of the forklift truck.

3-9. Lift Cylinder

a. Removal.
- (1) Remove the lift chain, forks, lifting carriage, and load backrest (TM 10-3930-611-12).
- (2) Refer to figure 3-9 and remove the lift cylinder.

b. Disassembly. Refer to figure 3-10 and disassemble the lift cylinder.

c. Cleaning, Inspection and Repair.
- (1) Clean all parts with dry cleaning solvent (Federal Specification P-D-680) and dry thoroughly.
- (2) Inspect first stage filter screen for clogging. Inspect piston rods for spots of base metal showing through, and for pitting. Inspect wiper and o-rings for deterioration. Inspect wear rings (phenolic) for portions broken off or out. Check clearances of wear rings and

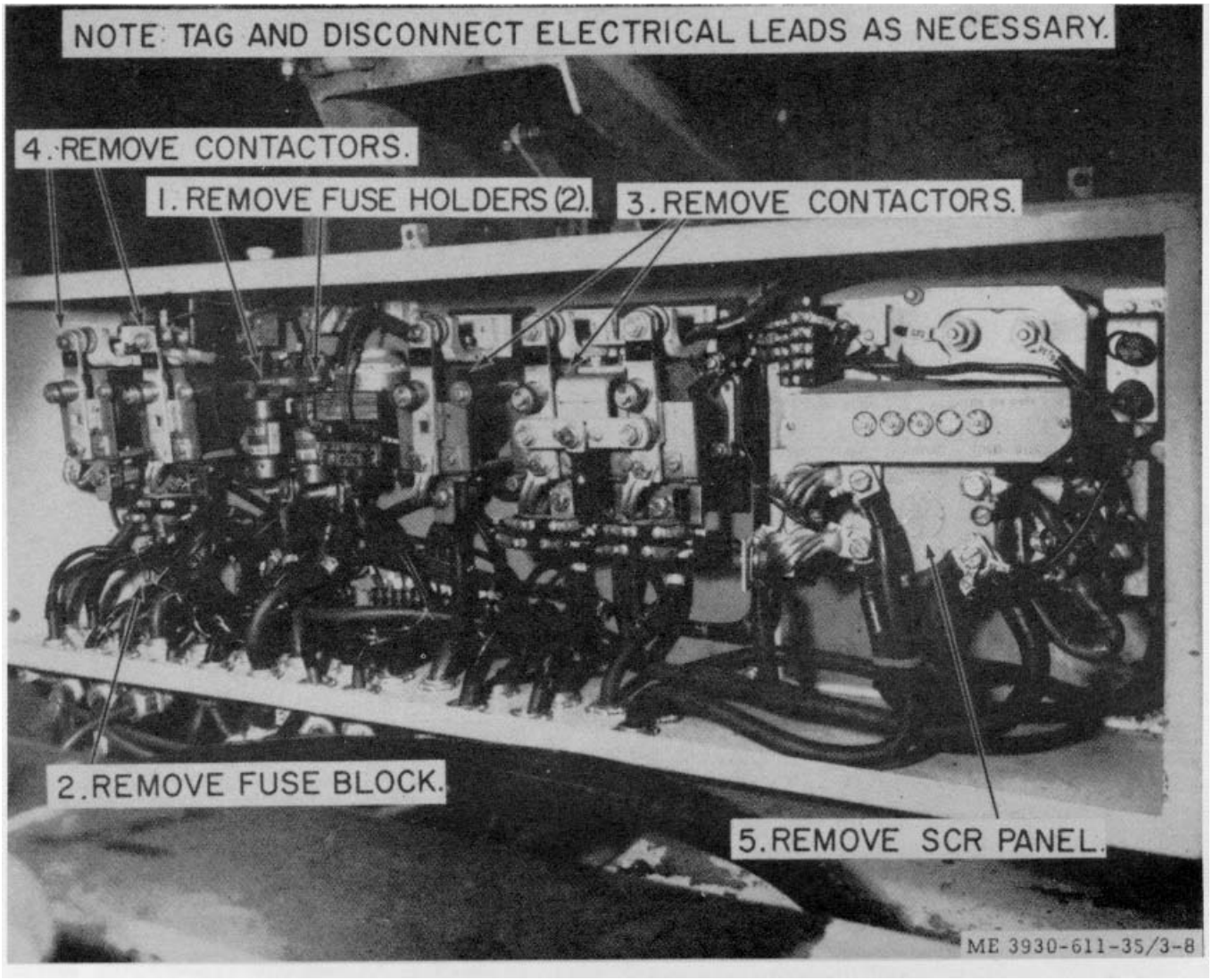


Figure 3-8. Contactors, SCR panel, fuse holders and terminal strips, and time delay relay, removal and installation.

gland bearings. Inspect all other parts for breaks, cracks, bends, elongated mounting holes, defective seals and other defects.

(3) Replace first stage filter screen if clogged. Replace piston rods if base metal is visible. Replace or rework piston rods if pitting marks are deeper than 0.020 inch. Replace wiper and o-rings if deteriorated. Replace wear rings if damaged or if clearance between ring and cylinder exceeds 0.020 inch. Replace gland bearings if clearance exceeds 0.015 inch. Replace defective seals and other defective parts.

d. Reassembly. Refer to figure 3-10 and reassemble the lift cylinder.

e. Installation.

(1) Refer to figure 3-9 and install the lift cylinder.

(2) Install the lift chain, forks, lifting carriage and load backrest.

3-10. Mast Assembly

a. Removal

(1) Remove the headlight (TM 10-3930-611-12).

(2) Refer to figure 3-11 and remove the mast assembly.

b. Disassembly. Refer to figure 3-12 and disassemble the mast assembly.

c. Cleaning, Inspection and Repair.

(1) Wash all parts in a dry cleaning solvent (Federal Specification P-D-680) and dry thoroughly.

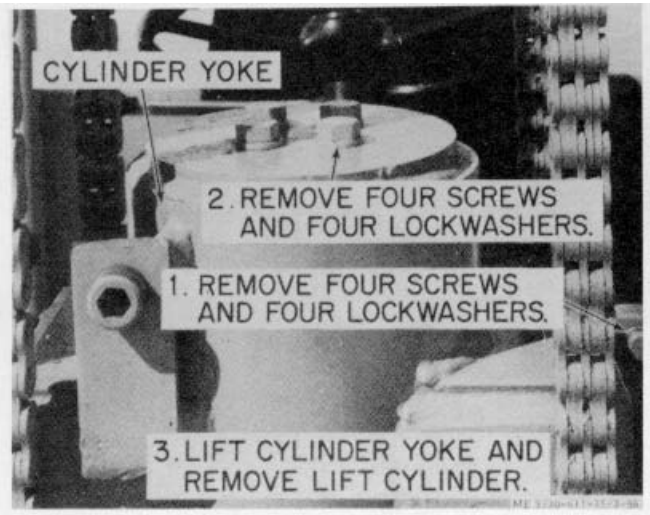


Figure 3-9A. Lift cylinder, removal and installation

(2) Inspect for breaks, cracks, bends, scratched or chipped painted areas, loose or missing mounting hardware, or other defects.

(3) Tighten or replace loose or missing mounting hardware, repaint damaged painted areas, replace a damaged or defective part as necessary.

d. Reassembly. Refer to figure 3-12 and reassemble the mast assembly. Figure 3-9B.- Continued

e. Installation.

(1) Refer to figure 3-11 and install the mast assembly.

(2) Install the headlight (TM 10-3930-611-12).

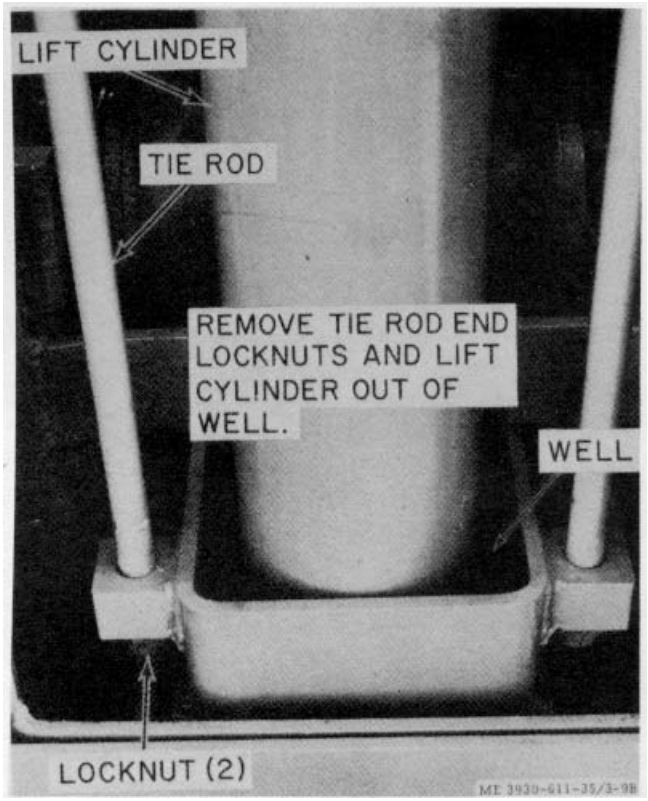


Figure 3-9B. - Continued

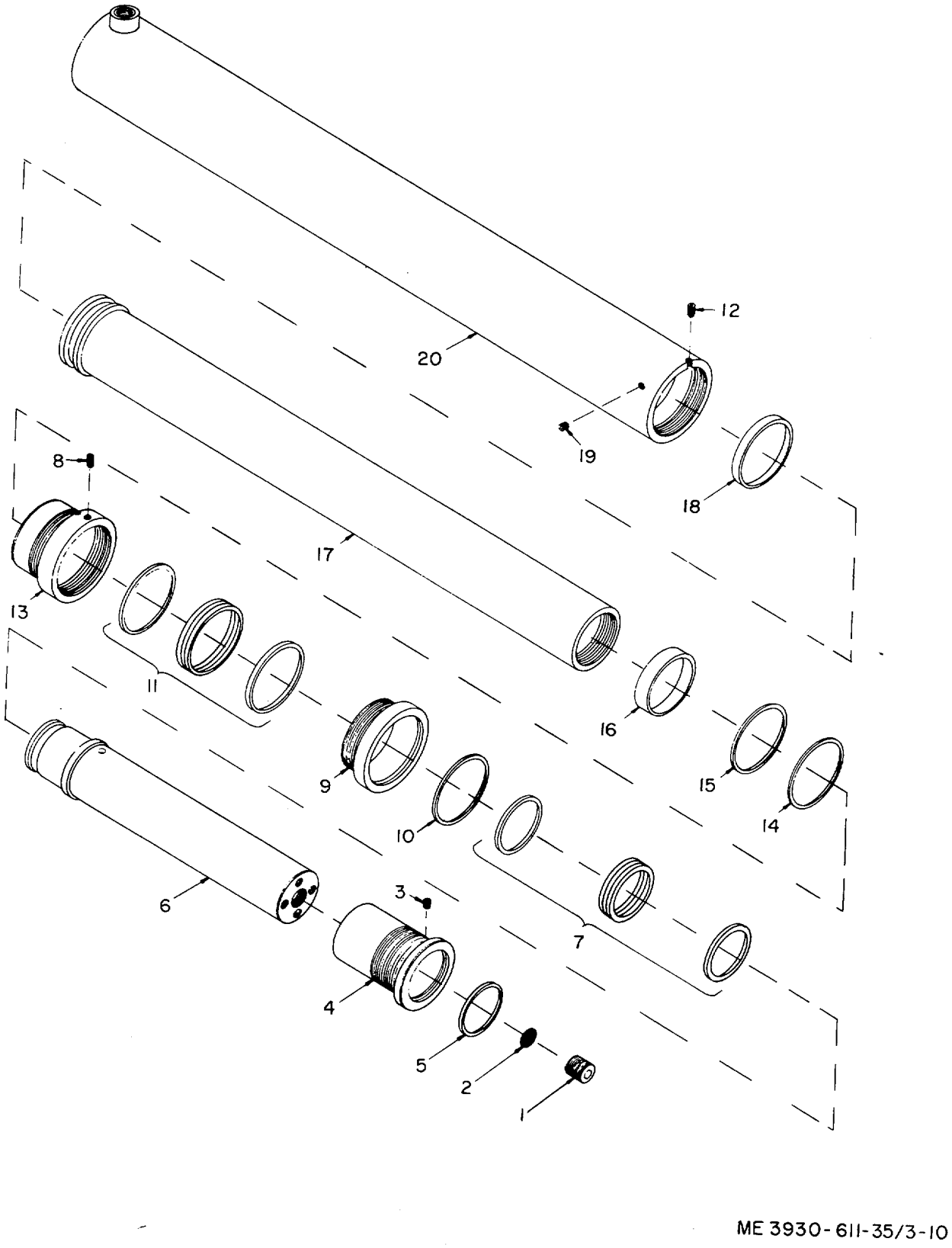


Figure 3-10. Lift cylinder, disassembly and reassembly.

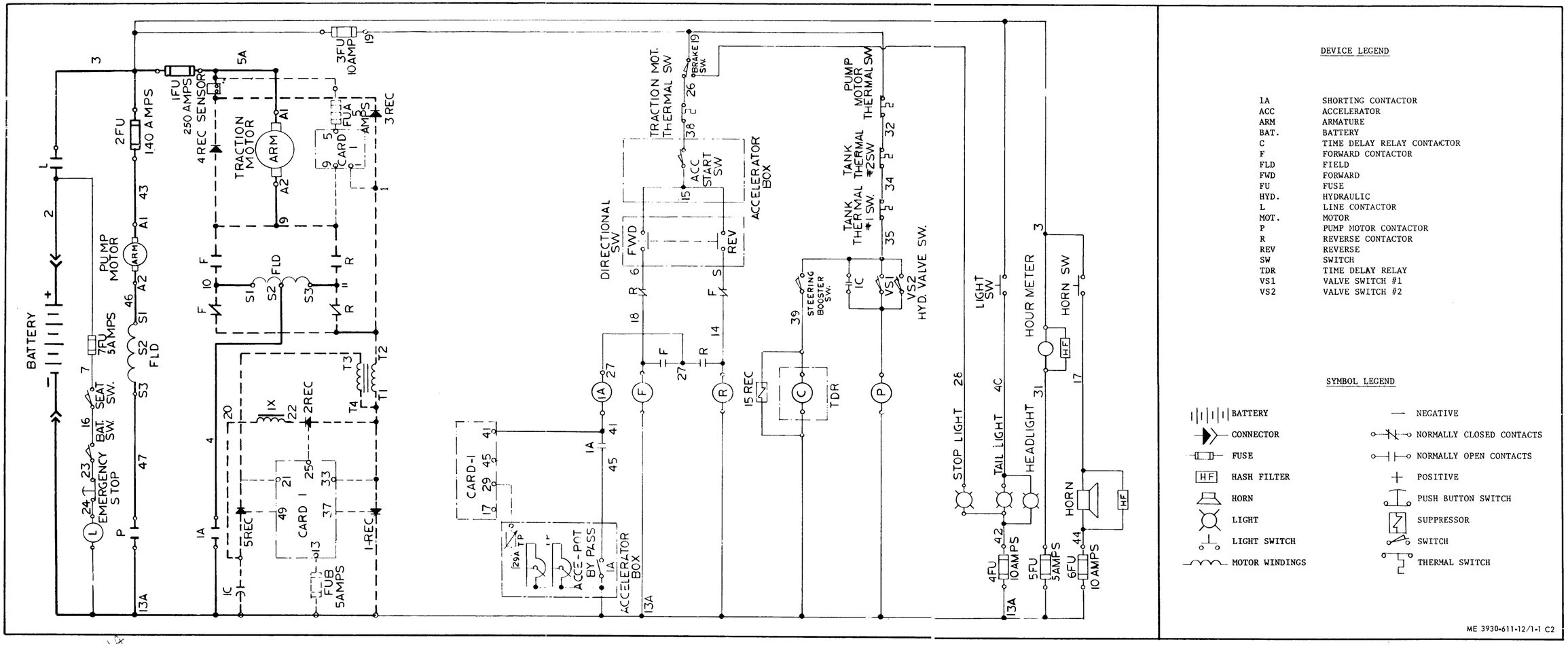


Figure 1-1. Electrical wiring schematic.

1. Breather
2. Filter, screen
3. Screw set (3 reqd)
4. Gland
5. Wiper, rod
6. Rod
7. Seal, piston (1 set reqd)
8. Screw set (ref item #3)
9. Gland
10. Wiper, rod
11. Seal, rod (1 set reqd)
12. Screw, set (ref item #3)
13. Head
14. O-ring
15. Ring, back-up
16. Bushing, rod
17. Rod
18. Ring, wear
19. Pipe plug
20. Barrel

Figure 3-10. Lift cylinder, disassembly and reassembly.

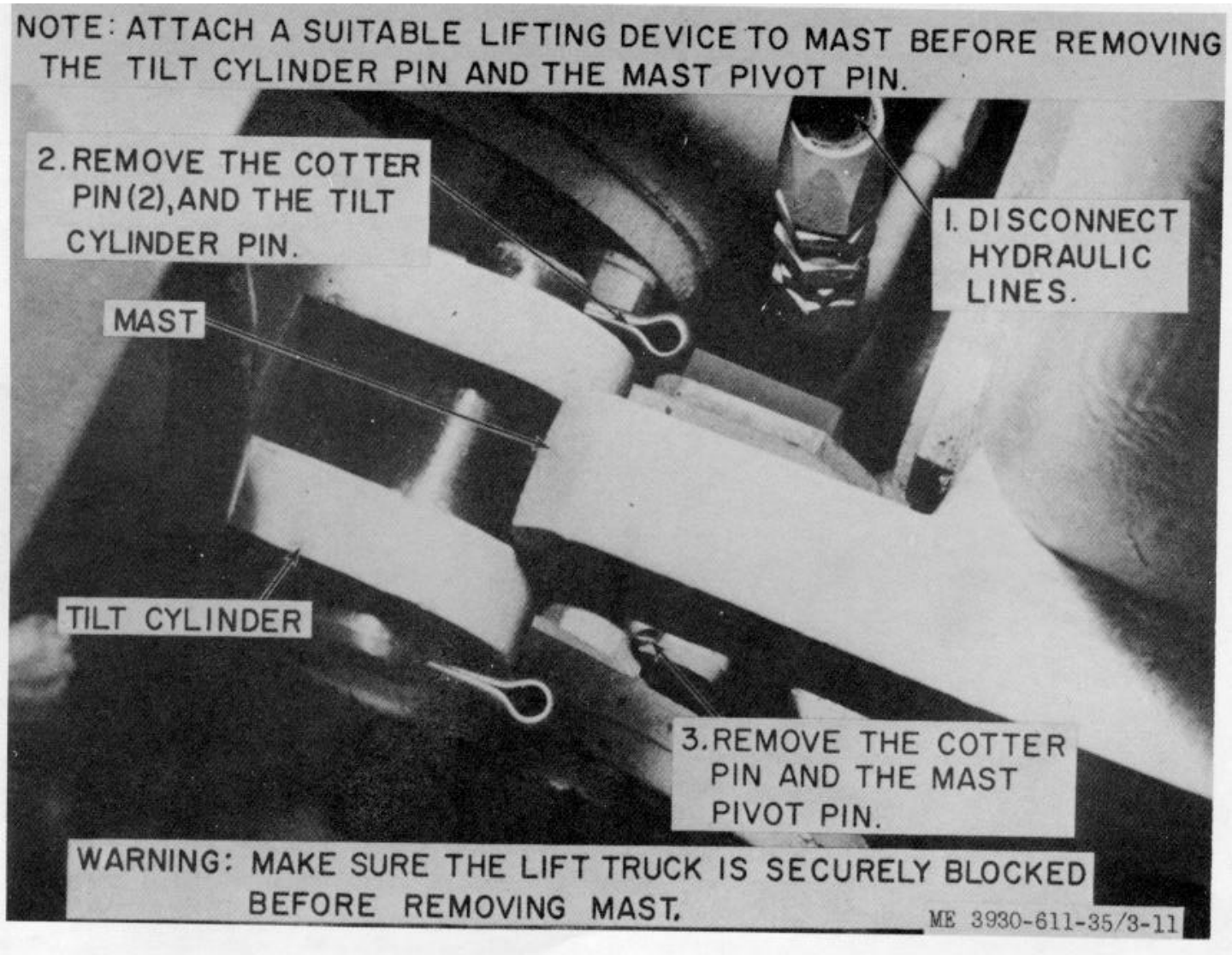


Figure 3-11. Mast assembly, removal and installation.

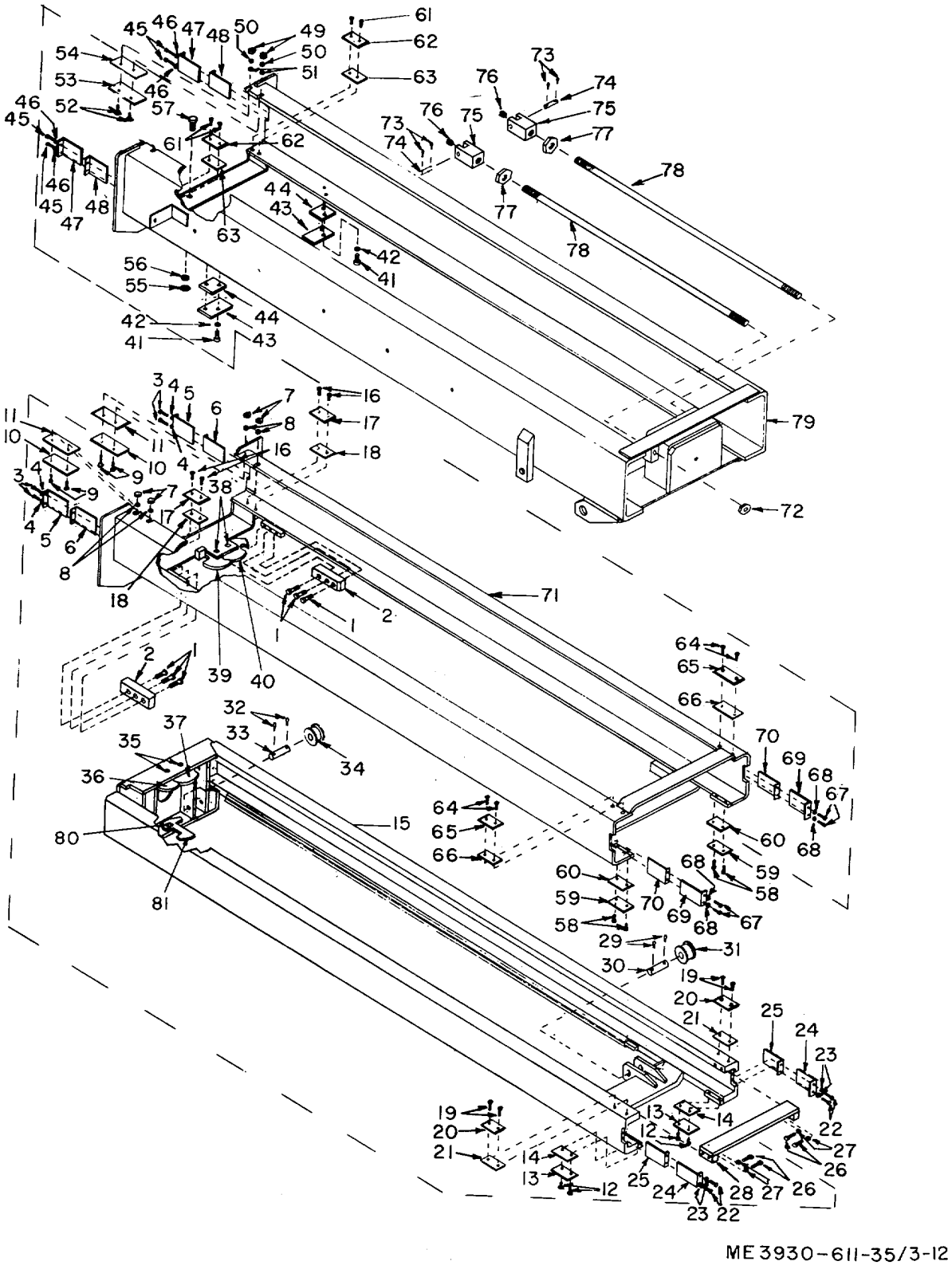


Figure 3-12. Mast assembly, disassembly and reassembly.

1. Screw, socket hd (6 reqd)
2. Block, stop (2 reqd)
3. Screw, socket hd (16 reqd)
4. Washer, lock (20 reqd)
5. Pad, bearing (8 reqd)
6. Shim (as reqd, approx 8 reqd)
7. Nut, hex (8 reqd)
8. Washer, flat (8 reqd)
9. Screw, flat hd (4 reqd)
10. Pad, bearing (2 reqd)
11. Shim (as reqd, approx 2 reqd)
12. Screw, flat hd (24 reqd)
13. Pad, bearing (4 reqd)
14. Shim (as reqd, approx 4 reqd)
15. Mast, telescoping (1st STG)
16. Screw, flat hd (ref item #12)
17. Pad, bearing (8 reqd)
18. Shim (as reqd, approx 8 reqd)
19. Screw, flat hd (ref item #12)
20. Pad, bearing (ref item #17)
21. Shim (ref item #18)
22. Screw, socket hd (ref item #3)
23. Washer, lock (ref item #4)
24. Pad, bearing (ref item #5)
25. Shim (ref item #6)
26. Bolt, hex hd (4 reqd)
27. Washer, lock (4 reqd)
28. Brace
29. Pin, cotter (12 reqd)
30. Pin, idler (6 reqd)
31. Idler, leaf chain (6 reqd)
32. Pin, cotter (ref item #29)
33. Pin, idler (ref item #30)
34. Idler, leaf chain (ref item #31)
35. Stud (4 reqd)
36. Latch
37. Latch (2 reqd)
38. Stud (ref item #35)
39. Latch
40. Latch (ref item #37)
41. Screw, socket hd (4 reqd)
42. Washer, lock (4 reqd)
43. Pad, stop (2 reqd)
44. Shim (2 reqd)
45. Screw, socket hd (ref item #3)
46. Washer, lock (ref item #4)
47. Pad, bearing (ref item #5)
48. Shim (ref item #6)
49. Nut, hex (ref item #7)
50. Washer, lock (ref item #4)
51. Washer, flat (ref item #8)
52. Screw, flat hd (4 reqd)
53. Pad, bearing (2 reqd)
54. Shim (2 reqd)
55. Nut, hex
56. Washer, lock
57. Screw, socket hd
58. Screw, flat hd (ref item #12)
59. Pad, bearing (ref item #13)
60. Shim (ref item #14)
61. Screw, flat hd (ref item #12)
62. Pad, bearing (ref item #17)
63. Shim (ref item #18)
64. Screw, flat hd (ref item #12)
65. Pad, bearing (ref item #17)
66. Shim (ref item #18)
67. Screw, socket hd (ref item #3)
68. Washer, lock (ref item #4)
69. Pad, bearing (ref item #5)
70. Shim (ref item #6)
71. Mast, telescoping (2 STG)
72. Nut, self-locking (2 reqd)
73. Pin, cotter (4 reqd)
74. Pin, clevis (2 reqd)
75. Clevis (2 reqd)
76. Spacer (2 reqd)
77. Nut, jam (2 reqd)
78. Rod (2 reqd)
79. Mast, fixed
80. Stud
81. Latch

Figure 3-12. Mast assembly, disassembly and reassembly.

Section III. HYDRAULIC SYSTEM

3-11. General

This section provides information useful in the maintenance and repair of the hydraulic system.

3-12. Stack Valve (Control Valve)

a. Removal Remove the stack valve (TM 10-3930-611-12).

b. Disassembly. Refer to figure 3-13 and disassemble the stack valve.

c. Cleaning, Inspection and Repair.

(1) Clean all parts with dry cleaning solvent (Federal Specification P-D-680) and dry thoroughly.

(2) Inspect for breaks, cracks, bends, loose or missing mounting hardware, or other defects.

(3) Tighten or replace loose or missing mounting hardware, replace a damaged or defective part as necessary.

d. Reassembly. Refer to figure 3-13 and reassemble the stack valve.

e. Installation. Install the stack valve (TM 10-3930-611-12).

3-13. Hydraulic Pump

a. Removal. Remove the hydraulic pump (para 3-2).

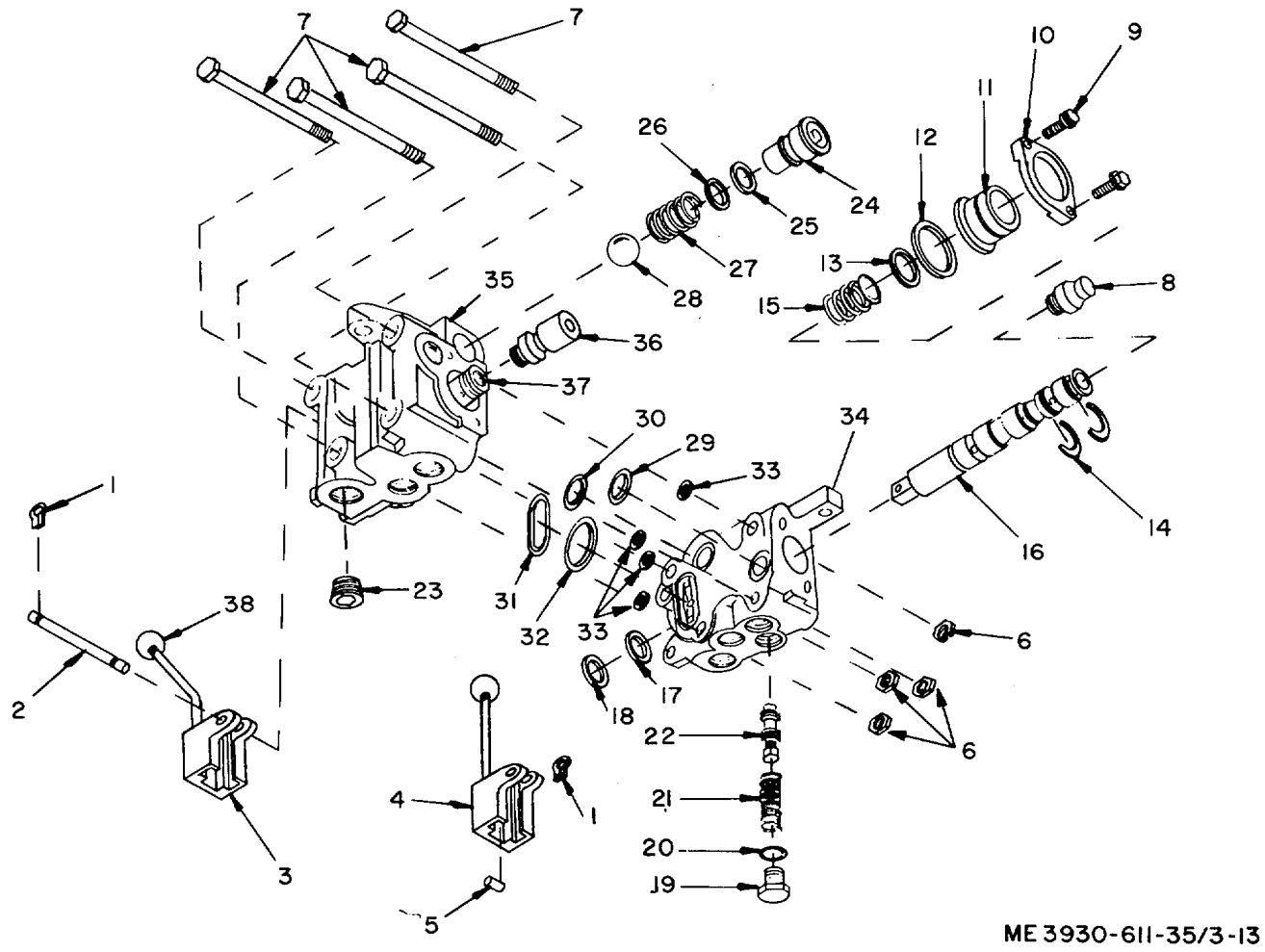
b. Disassembly. Refer to figure 3-14 and disassemble the hydraulic pump.

c. Cleaning, Inspection and Repair.

(1) Clean all parts with dry cleaning solvent (Federal Specification P-D-680) and dry thoroughly.

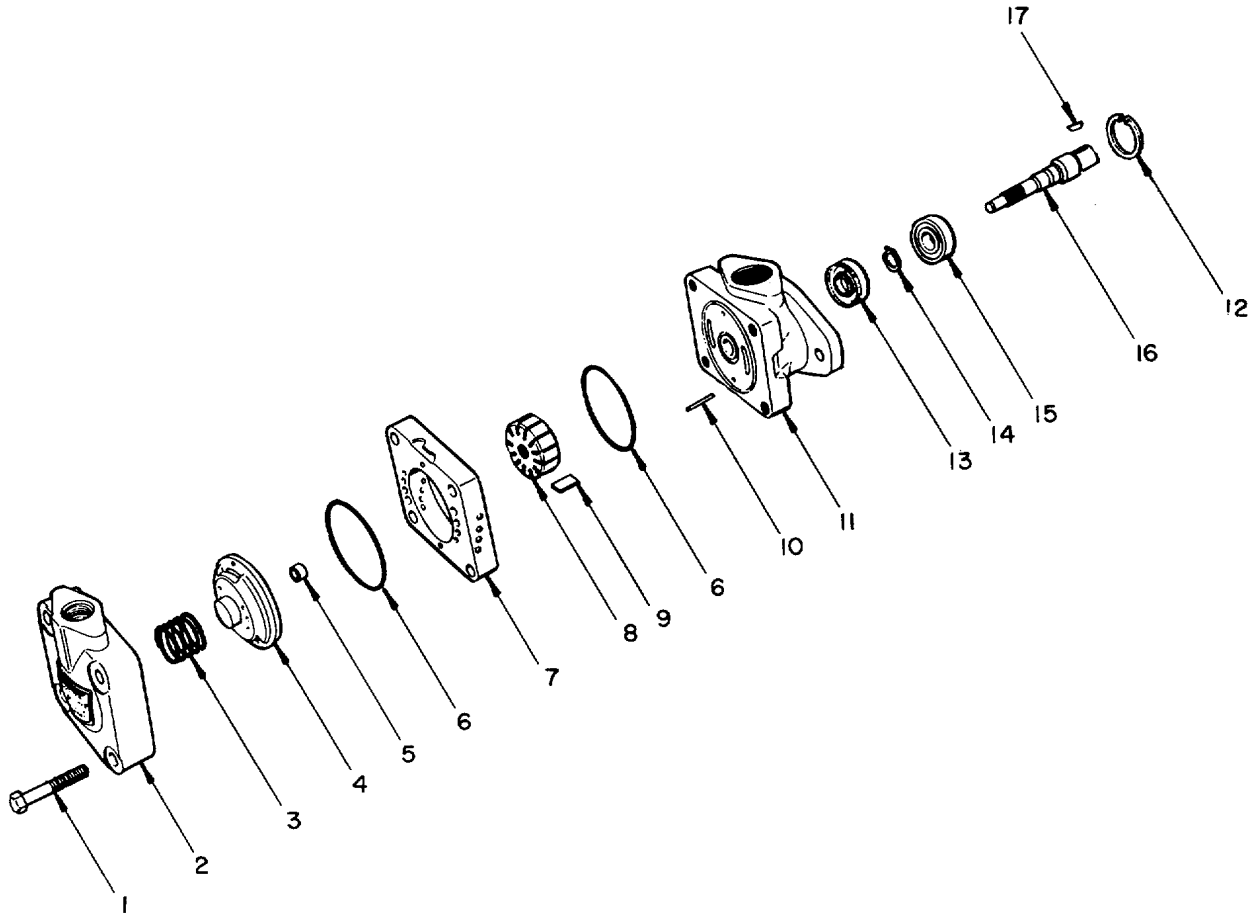
(2) Inspect for shaft seal leakage (possibility of sucking air). Inspect o-rings between sections (external leakage source). Inspect vanes for pitted or chipped surfaces. Inspect pressure plate for damage. Inspect all other parts for breaks, cracks, loose or missing hardware.

(3) Tighten or replace loose or missing hardware. Replace shaft seals and o-rings if deteriorated or damaged. Replace vanes and/or pressure plate if damage is evident.



1. Washer, "E" (2 reqd)
2. Rod
3. Lever, tilt
4. Lever, lift
5. Pin (2 reqd)
6. Nut (4 reqd)
7. Screw (4 reqd)
8. Extension, lift
9. Screw (4 reqd)
10. Retainer, spool (2 reqd)
11. Sleeve (2 reqd)
12. O-ring (2 reqd)
13. Ring, quad (2 reqd)
14. Washer, "C" (4 reqd)
15. Spring, centering (2 reqd)
16. Spool, "T"
17. Ring, quad (2 reqd)
18. Ring, back-up (2 reqd)
19. Plug
20. O-ring
21. Spring
22. Valve sub-assy, control
23. Plug
24. Plug
25. Ring, back-up
26. O-ring
27. Spring
28. Ball
29. Seal
30. Seal
31. Retainer
32. Seal
33. Shim (4 reqd)
34. Inlet section, "R"
35. Section, outlet
36. Extension, tilt
37. Spool, "D"
38. Knob (2 reqd)

Figure 3-13. Stack value, disassembly and reassembly.



ME 3930-611-35/3-14

1. Screw (4 reqd)
2. Cover
3. Spring
4. Plate, pressure
5. Bushing
6. O-ring (2 reqd)
7. Ring
8. Rotor
9. Vane (12 reqd)
10. Pin (2 reqd)
11. Body
12. Ring, snap
13. Seal
14. Ring, snap
15. Bearing
16. Shaft
17. Key

Figure 3-14. Hydraulic pump, disassembly and reassembly.

d. Reassembly. Refer to figure 3-14 and reassemble the hydraulic pump. Make sure vanes are placed in the rotor with the sharp edge leading in the direction of rotation.

e. Installation. Install the hydraulic pump (para 3-2).

3-14. Tilt Cylinders

a. Removal.

(1) Remove the front floor plates (TM 10-3930-611-12).

(2) Refer to figure 3-15 and remove the tilt cylinders.

b. Disassembly. Refer to figure 3-16 and disassemble the tilt cylinders.

c. Cleaning, Inspection and Repair.

(1) Clean all parts with dry cleaning solvent (Federal Specification P-D-680).

(2) Inspect piston rod for spots of base metal showing through, and for pitting. Inspect wiper rings for deterioration. Inspect all parts for breaks,

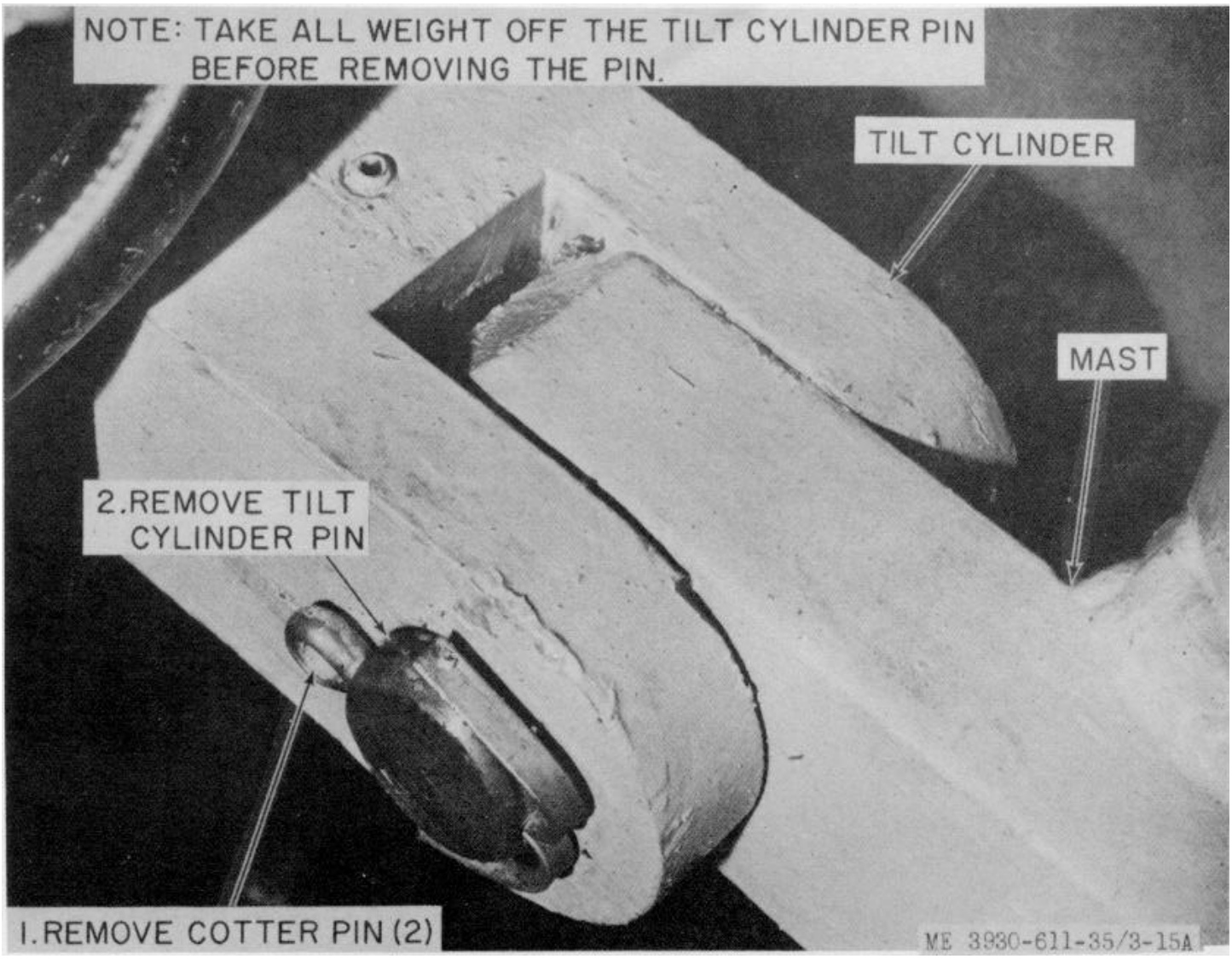


Figure 3-15A. Tilt Cylinder, Removal and installation

cracks, dents, defective seals, loose or missing hardware or other defects.

(3) Tighten or replace loose or missing hardware. Replace piston rod if base metal is visible. Replace or rework piston rods if marks or pittings are deeper than 0.015 inch. Replace wiper rings if deteriorated.

d. Reassembly. Refer to figure 3-16 and reassemble the tilt cylinder.

e. Installation.

(1) Refer to figure 3-15 and install the tilt cylinder.

(2) Install the front floor plates (TM 10-3930-611-12).

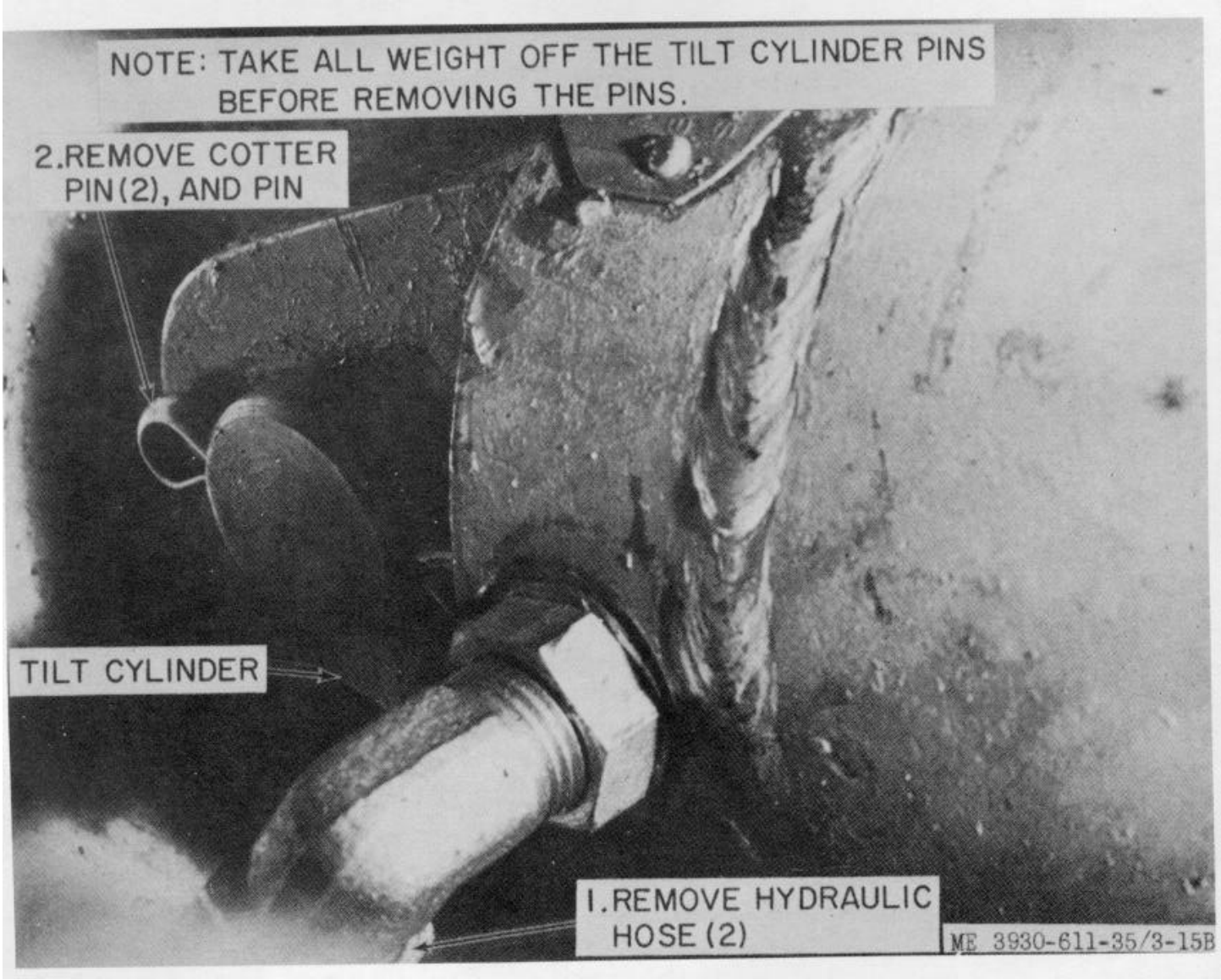
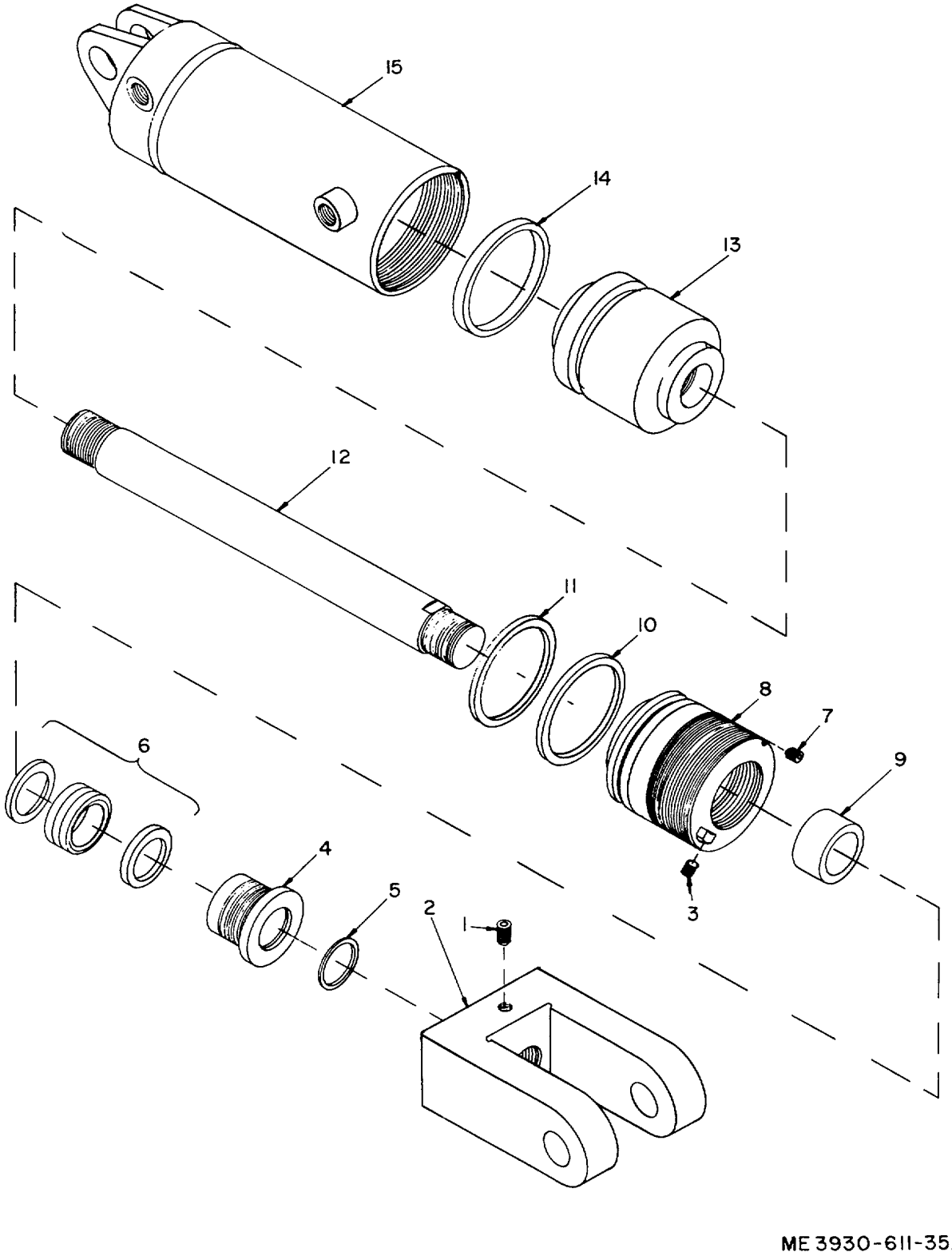


Figure 3-15B - Continued.



Fixture 3-16. Tilt cylinders, disassembly and reassembly.

1. Screw, set
2. Clevis
3. Screw, set (2 reqd)
4. Gland
5. Wiper, rod
6. Seal (1 set)
7. Screw, set (ref item #3)
8. Head
9. Bushing, rod
10. Ring, back-up
11. O-ring
12. Rod, piston
13. Piston
14. Seal, piston
15. Housing, cylinder

Figure 3-16. Tilt cylinders, disassembly, and reassembly.

Section IV. STEERING SYSTEM

3-15. General

This section provides information useful in the maintenance and repair of the steering system of the forklift truck.

3-16. Steering Gear Assembly

a. Removal.

(1) Remove the front floor plates (TM 10-3930-611-12).

(2) Remove the pitman arm and steering gear assembly (fig. 3-17).

b. Disassembly. Refer to figure 3-18 and disassemble the steering gear assembly.

c. Cleaning, Inspection and Repair.

(1) Clean all parts with dry cleaning solvent (Federal Specification P-D-680) and dry thoroughly.

(2) Inspect for breaks, cracks, dents, worn or chipped gear teeth, or other defects.

(3) Replace a damaged or defective part as necessary.

d. Reassembly. Refer to figure 3-18 and reassemble the steering gear assembly.

e. Installation.

(1) Install the steering gear assembly and pitman arm (fig. 3-17).

(2) Install the front floor plates (TM 10-3930-611-12).

f. Adjustment. Adjust the steering gear assembly (TM 10-3930-611-12).

3-17. Steering Booster

a. Removal.

(1) Remove the splash pan (TM 10-3930-611-12).

(2) Refer to figure 3-19 and remove the steering booster.

b. Disassembly. Refer to figure 3-20 and disassemble the steering booster.

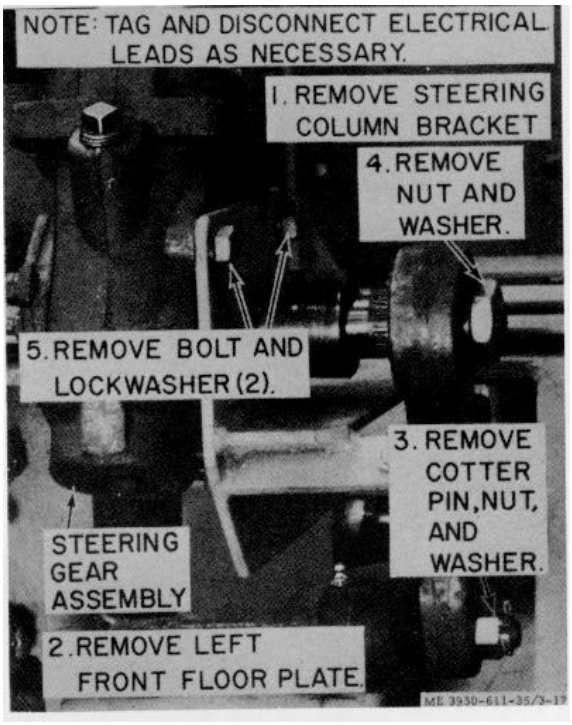


Figure 3-17. Pitman arm and steering gear assembly, removal and installation.

c. Cleaning, Inspection and Repair.

(1) Clean all parts with dry cleaning solvent (Federal Specification P-D-680) and dry thoroughly.

(2) Inspect for breaks, cracks, loose or missing mounting hardware, damaged seals, or other defects.

(3) Tighten or replace loose or missing mounting hardware, replace a damaged seal or part as necessary.

d. Reassembly. Refer to figure 3-20 and reassemble the steering booster.

e. Installation.

(1) Refer to figure 3-19 and install the steering booster.

(2) Install the splash pan (TM 10-3930-611-12).

3-18. Drag Link

a. Removal.

(1) Remove the pitman arm from the steering gear (para 3-16).

(2) Remove the battery (TM 10-3930-611-12).

(3) Refer to figure 3-21 and remove the steering linkage.

b. Disassembly. Refer to figure 3-22 and disassemble the drag link.

c. Cleaning, Inspection and Repair.

(1) Clean all parts with dry cleaning solvent (Federal Specification P-D-680) and dry thoroughly.

(2) Inspect for breaks, cracks, bends, damaged threaded areas, loose or missing mounting hardware, or other defects.

(3) Tighten or replace loose or missing mounting hardware, replace a damaged or defective part as necessary.

d. Reassembly. Refer to figure 3-22 and reassemble the drag link.

e. Installation.

(1) Refer to figure 3-21 and install the steering linkage.

(2) Install the battery (TM 10-3930-611-12).

(3) Install the pitman arm on the steering gear (para 3-16).

f. Adjustment. Refer to figure 3-18 and adjust the steering linkage.

3-19. Steering Axle

a. Removal.

(1) Remove pivot block mounting bolts.

(2) Disconnect steering booster from steering axle (para 3-17).

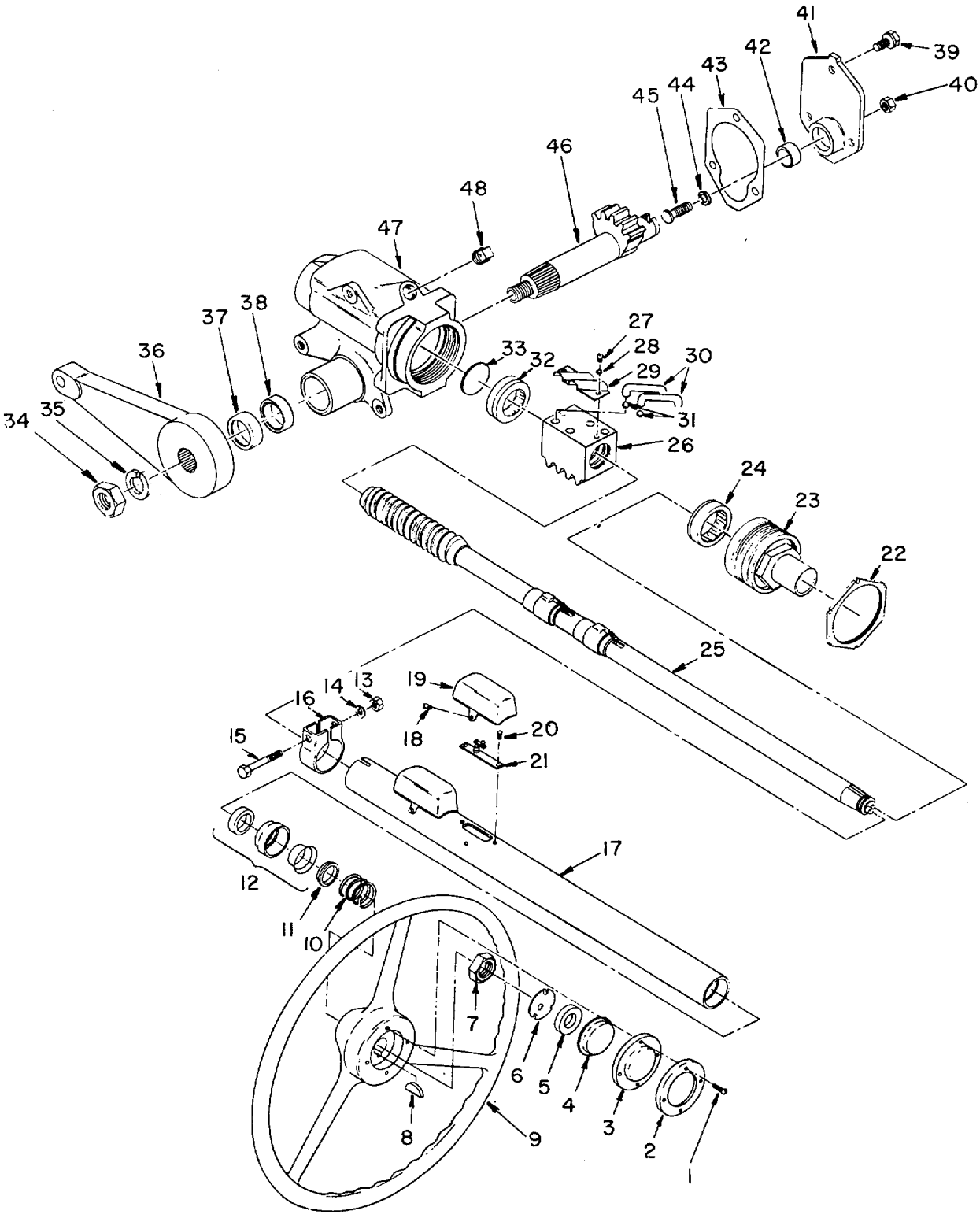


Figure 3-18. Steering gear assembly, disassembly and reassembly.

1. Screw (4 reqd)
2. Retainer
3. Button, horn
4. Diaphragm, horn button
5. Cushion, rubber
6. Plate, contracting
7. Nut, retaining, steer wheel
8. Key, woodruff
9. Wheel, steering
10. Spring
11. Seat, spring
12. Bearing assy
13. Nut, steering column jacket clamp
14. Washer, lock steering column jacket clamp
15. Screw, steering column jacket clamp
16. Clamp, steering column jacket
17. Jacket, steering column
18. Screw, conn assy cover (4 reqd)
19. Cover, conn assy (2 reqd)
20. Screw, conn assy (4 reqd)
21. Connector assy (2 reqd)
22. Nut, lock
23. Housing bearing
24. Bearing, tapered
25. Shaft assy
26. Nut, ball
27. Screw (2 reqd)
28. Washer, lock (2 reqd)
29. Clamp, retainer tube
30. Tube, retainer (2 reqd)
31. Ball, ball nut (106 reqd)
32. Bearing, tapered
33. Plate, end
34. Nut, pitman arm retaining
35. Washer, lock
36. Arm, pitman
37. Seal
38. Bushing, bronze
39. Screw, special, high strength
40. Nut, adjusting screw
41. Cover, housing
42. Bushing, bronze
43. Gasket, hsg, cover
44. Shim, lash adjuster
45. Screw, adjusting
46. Gear, sector
47. Housing
48. Plug filler

Figure 3-18. Steering gear assembly, disassembly and reassembly.

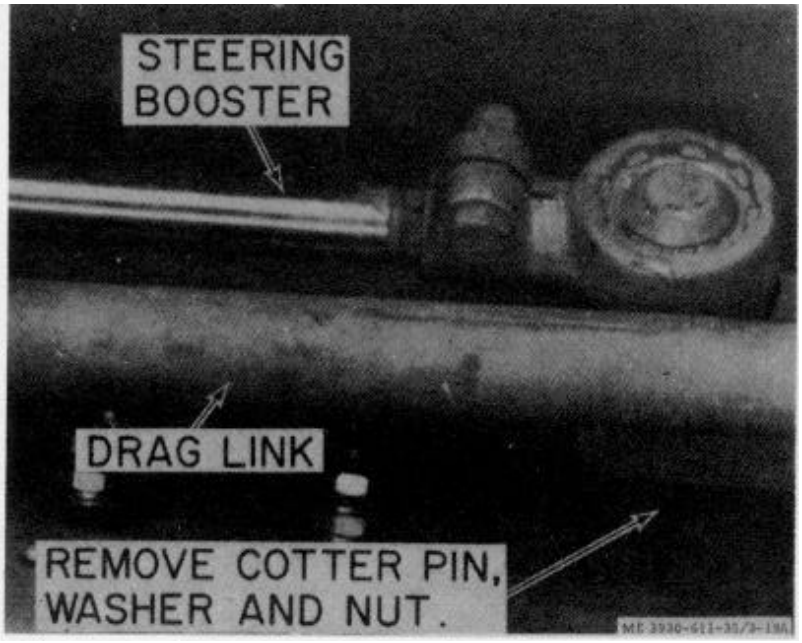


Figure 3-19A. Steering Booster, Removal and Installation.

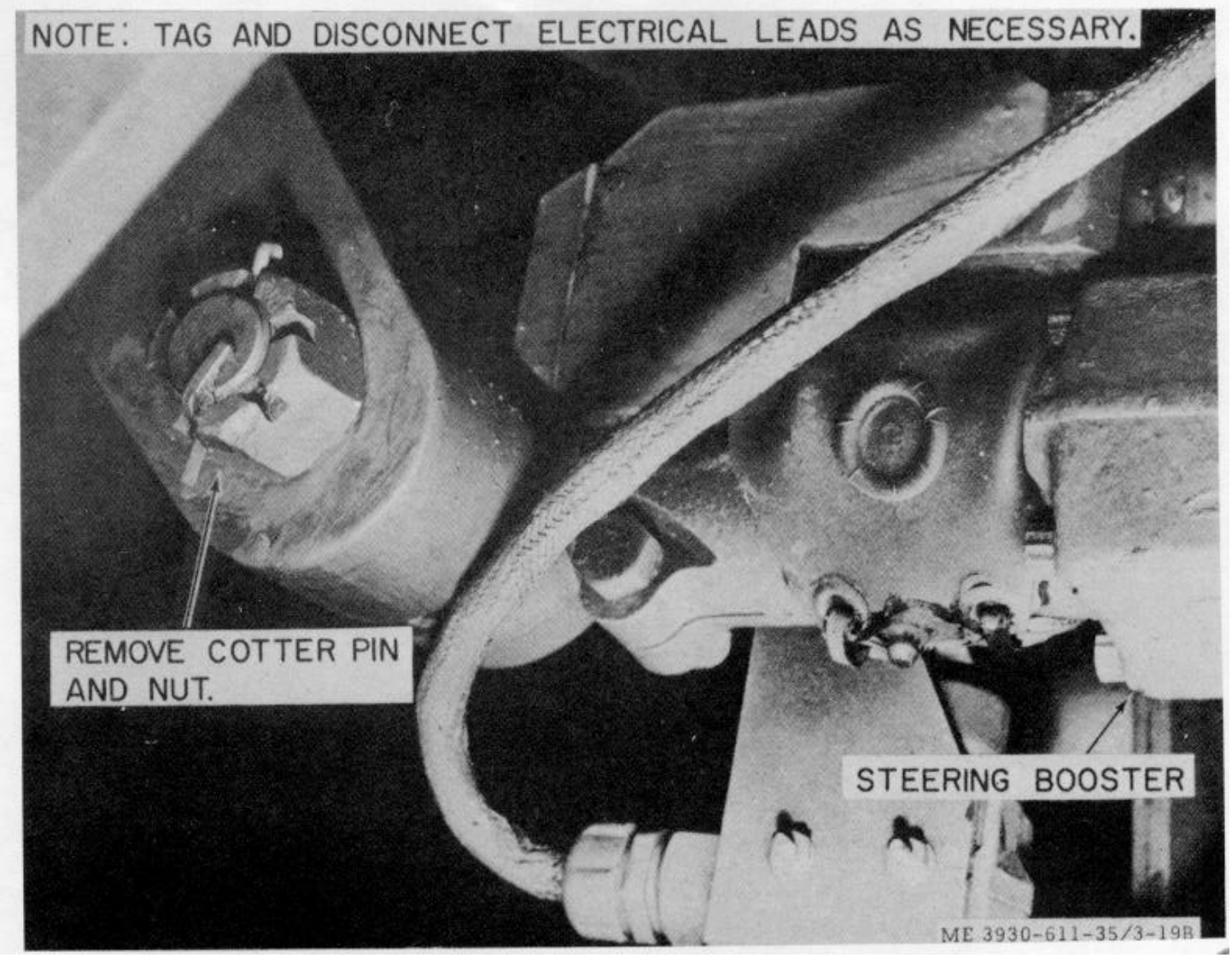


Figure 3-19B - Continued

(3) Refer to figure 3-23 and remove the steering axle.

b. Disassembly. Refer to figure 3-24 and disassemble the steering axle assembly.

c. Cleaning, Inspection and Repair.

(1) Clean all parts with dry cleaning solvent (Federal Specification P-D-680).

(2) Inspect wheel bearings for pitting and spindles for out-of-straightness. Inspect oil seal for deterioration and tires for wear. Inspect all parts for breaks, cracks, loose or missing mounting hardware, or other defects.

(3) Tighten or replace loose or missing hardware. Replace tires if rubber is worn down to approximately 14 3/4 inch diameter. Replace tapered roller bearings if excessive pittings in race are visible. Replace king pin needle bearings if king pin has been removed. Replace spindles if out-of-straightness exceeds 1/16 inch. Replace oil seal if deterioration is evident.

d. Reassembly. Refer to figure 3-24 and reassemble the steering axle assembly.

e. Installation.

(1) Refer to figure 3-23 and install the steering axle.

(2) Install the pivot block mounting bolts.

(3) Connect the steering booster (para 3-17).

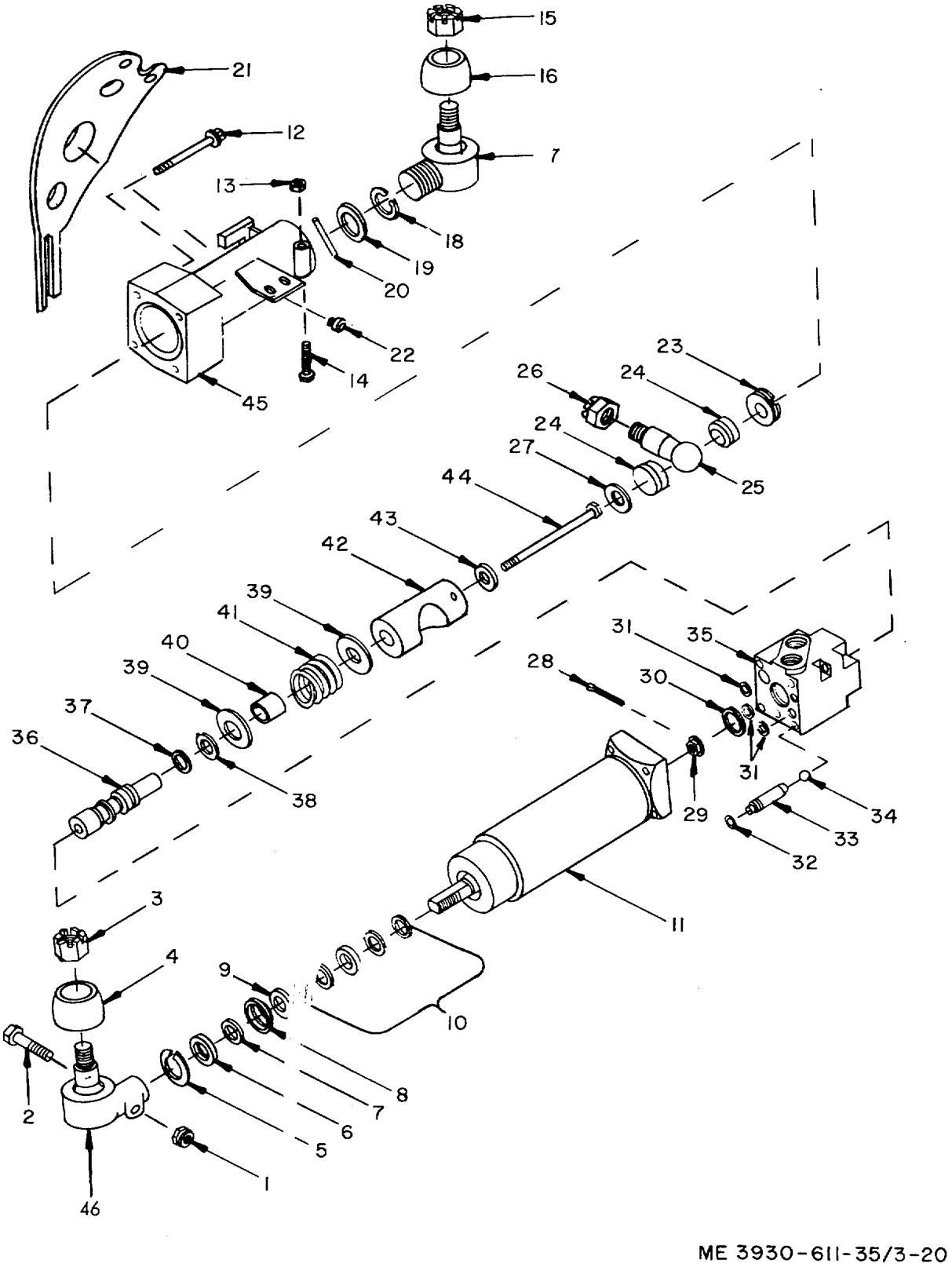


Figure 3-20. Steering booster, disassembly and reassembly.

1. Nut, lock (2 reqd)
2. Screw (2 reqd)
3. Nut (2 reqd)
4. Cover, dust (2 reqd)
5. Ring, snap
6. Scraper
7. Ring, wiper
8. Retainer
9. Washer
10. Seal (1 set reqd)
11. Cylinder, sub-assy
12. Bolt (4 reqd)
13. Nut, lock (ref item #1)
14. Screw (ref item #2)
15. Nut (ref item #3)
16. Cover, dust (ref item #4)
17. Stud sub-assy, ball
18. Ring, snap
19. Washer
20. Pin
21. Cover, dust
22. Fitting
23. Plug
24. Seat (2 reqd)
25. Stud, ball
26. Nut, special
27. Spring
28. Pin, cotter
29. Nut
30. O-ring
31. Seal (3 reqd)
32. O-ring
33. Valve
34. Ball
35. Body
36. Spool
37. 0-ring
38. Ring, back-up
39. Washer (2 reqd)
40. Spacer
41. Spring, centering
42. Sleeve
43. Washer
44. Screw
45. Housing

Figure 3-20. Steering booster, disassembly and reassembly.

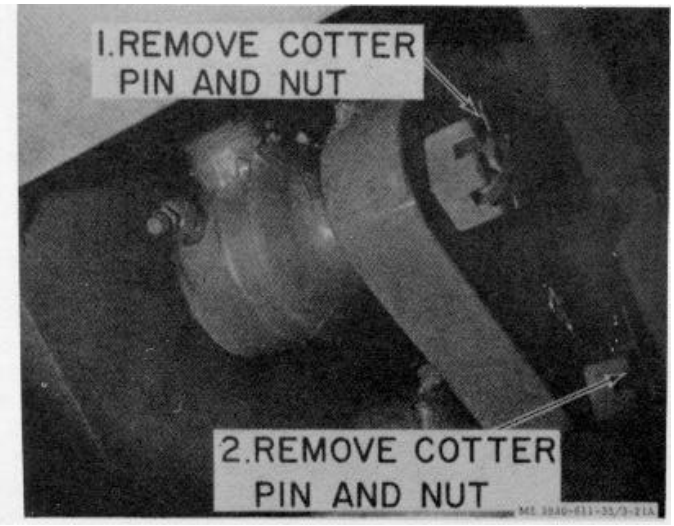
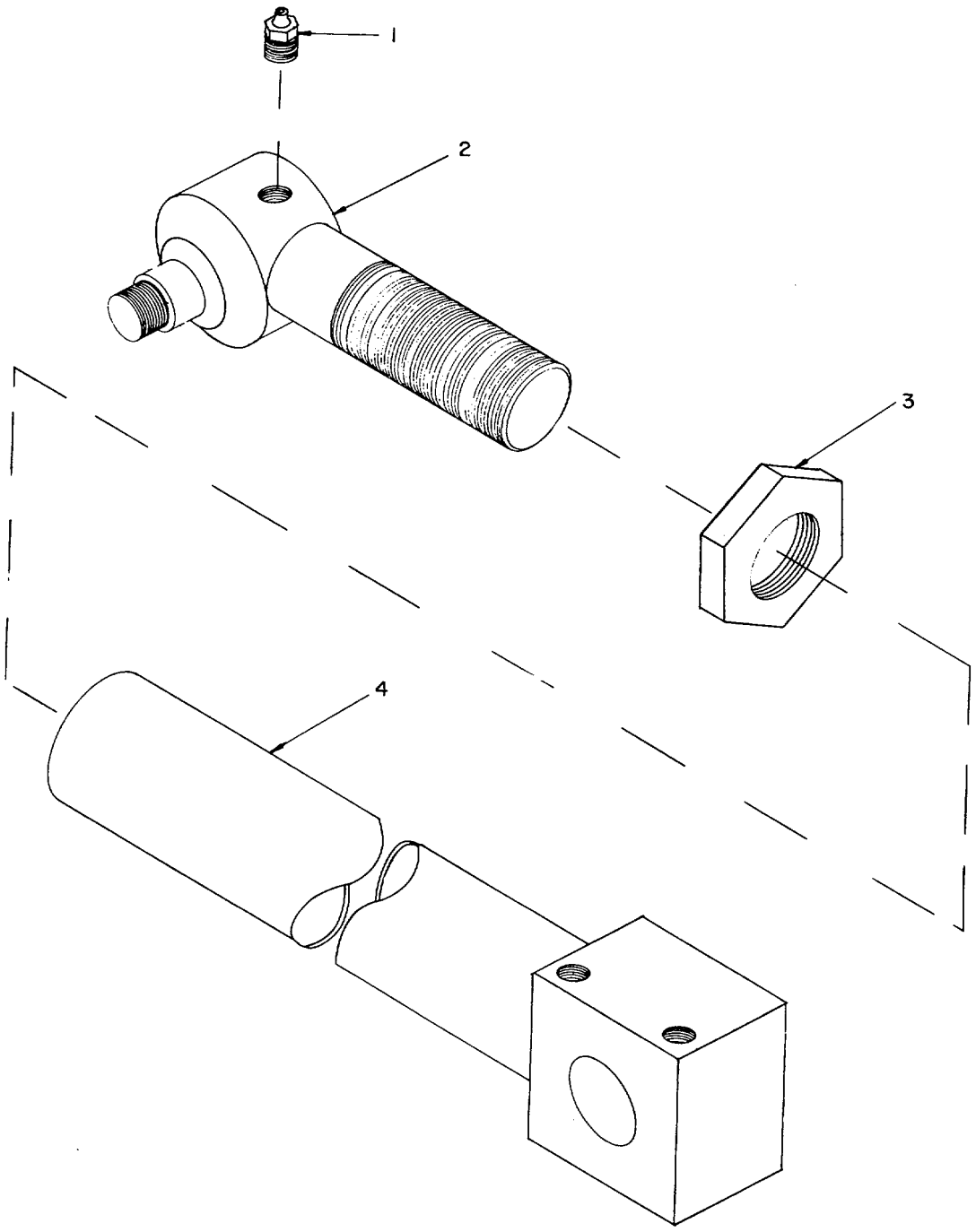


Figure 3-21A. Steering linkage, removal and installation

Figure 3-21B - Continued



1. Lube fitting
2. Ball joint
3. Jam nut
4. Tube assembly

Figure 3-22. Drag link, disassembly and reassembly.

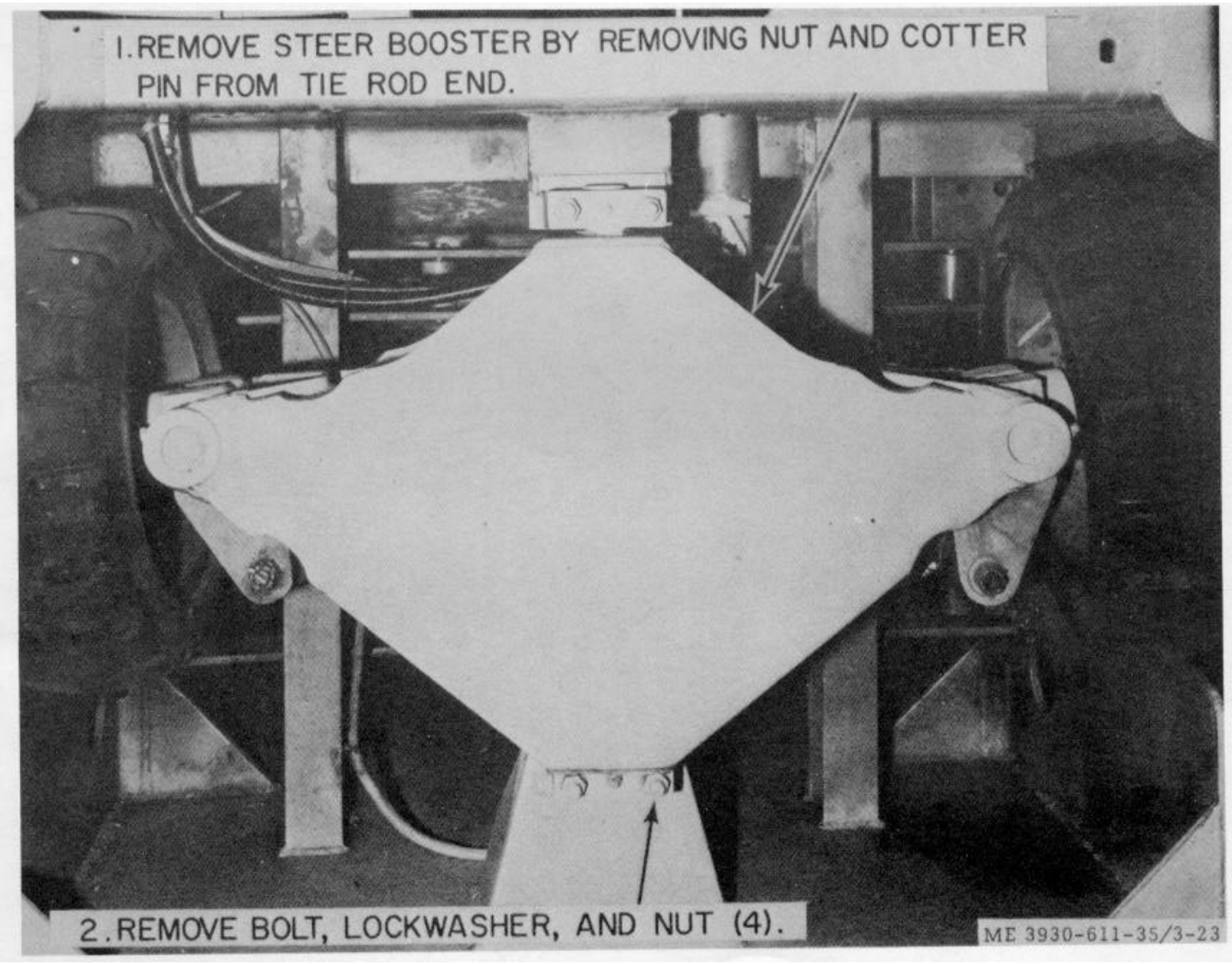


Figure 3-23. Steering axle, removal and installation.

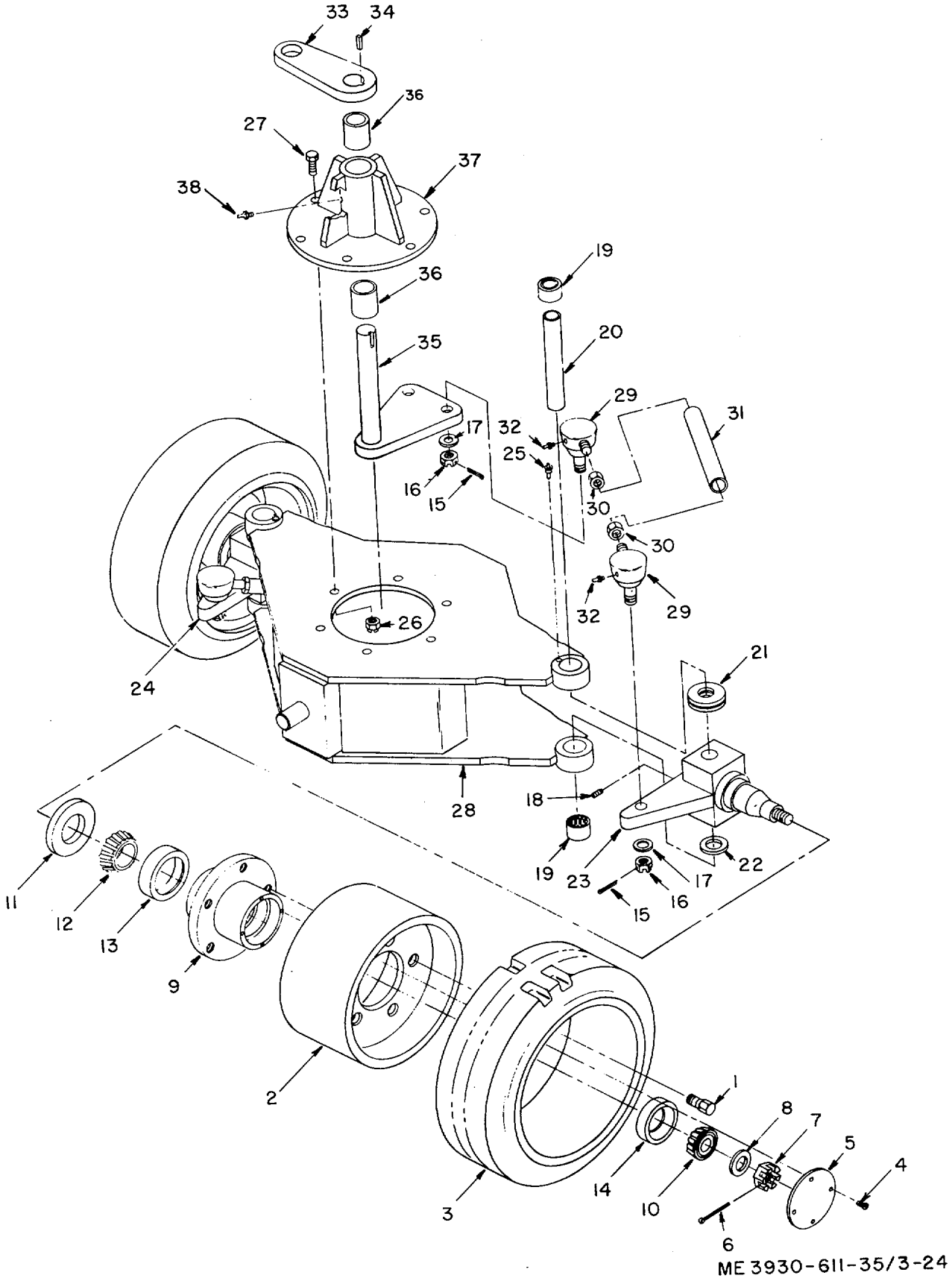


Figure 3-24. Steering axle assembly, disassembly and reassembly.

1. Bolt, wheel (10 reqd)
2. Wheel (2 reqd)
3. Tire (2 reqd)
4. Screw, flat head (8 reqd)
5. Cover, hub (2 reqd)
6. Pin, cotter (2 reqd)
7. Nut, slotted hex (2 reqd)
8. Washer, flat (2 reqd)
9. Weldment, hub (2 reqd)
10. Cone, outer roller brg (2 reqd)
11. Seal (2 reqd)
12. Cone, inner roller brg (2 reqd)
13. Cup, inner roller brg (2 reqd)
14. Cup, outer roller brg (2 reqd)
15. Pin, cotter (4 reqd)
16. Nut, slotted hex (4 reqd)
17. Washer, flat (4 reqd)
18. Screw, set, cup point (2 reqd)
19. Bearing, needle (4 reqd)
20. Pin, king (2 reqd)
21. Bearing, thrust (2 reqd)
22. Washer, thrust (2 reqd)
23. Spindle, RH
24. Spindle, LH
25. Fitting, hub (4 reqd)
26. Nut, lock (6 reqd)
27. Bolt, close tolerance (6 reqd)
28. Weldment, articulating axle
29. Joint, ball (4 reqd)
30. Nut, jam (4 reqd)
31. Tube (2 reqd)
32. Fitting, lub (4 reqd)
33. Arm, lever
34. Key
35. Crank, bell
36. Bearing (2 reqd)
37. Housing, bearing
38. Fitting, lub (ref item #32)

Figure 3-24. Steering axle assembly, disassembly and reassembly.

Section V. DRIVE AXLE, BRAKE ASSEMBLY AND DIFFERENTIAL

3-20. General

This section provides information useful in the maintenance and repair of the drive axle, brake assembly, and differential of the forklift truck.

3-21. Brake Pedal Assembly

a. Removal.

(1) Remove the front and rear floor plates and brake master cylinder (TM 10-3930-611-12).

(2) Refer to figure 3-25 and remove the service brake pedal.

b. Cleaning and Inspection.

(1) Clean all parts with dry cleaning solvent (Federal Specification P-D-680) and dry thoroughly.

(2) Inspect for breaks, cracks, bends, loose or missing mounting hardware, or other defects.

(3) Tighten or replace loose or missing mounting hardware, replace a damaged or defective part as necessary.

c. Installation.

(1) Refer to figure 3-25 and install the service brake pedal.

(2) Install the brake master cylinder and the front and rear floor plates (TM 10-3930-611-12).

3-22. Brake Master Cylinder

a. Removal. Remove the brake master cylinder (TM 10-3930-611-12).

b. Disassembly. Refer to figure 3-26 and disassemble the brake master cylinder.

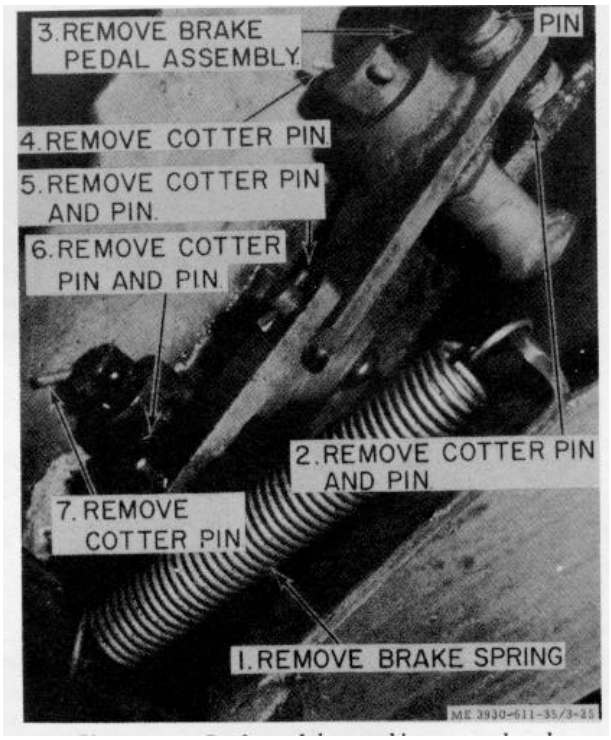


Figure 3-25. Brake pedal assembly, removal and installation.

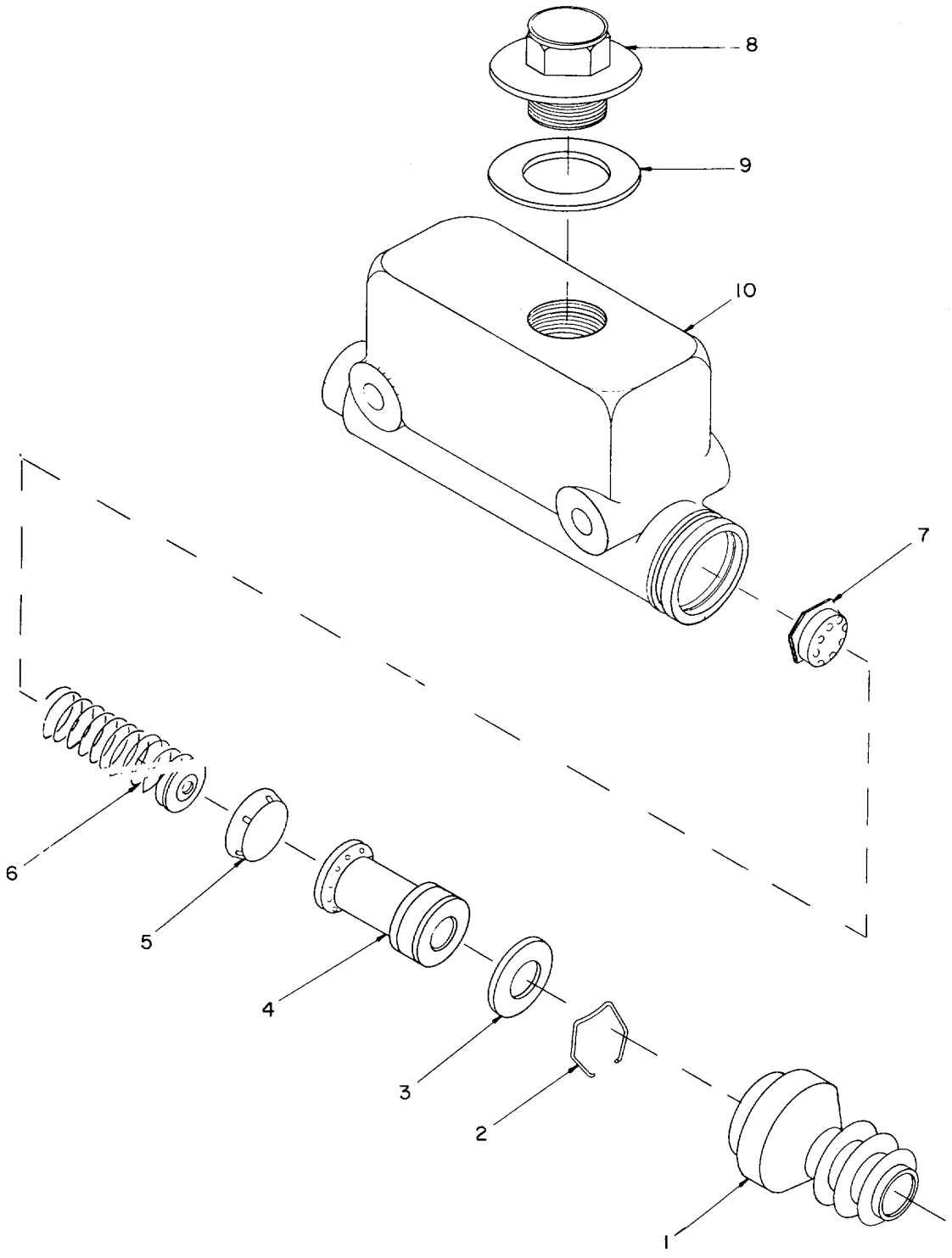
c. *Cleaning and Inspection*.

(1) Clean all parts with dry cleaning solvent (Federal Specification P-D-680) and dry thoroughly.

(2) Inspect for deteriorated cups or cuts in lip of cups. Inspect for breaks, cracks, deteriorated seals, or other defects.

(3) Replace deteriorated or cut cups and other damaged or defective parts as necessary.

d. Reassembly. Refer to figure 3-26 and reassemble



1. Boot
2. Ring, lock
3. Plate, stop
4. Assembly, piston
5. Cup
6. Spring
7. Valve, check
8. Cover
9. Gasket
10. Housing

Figure 3-26. Brake master cylinder, disassembly and reassembly.

the brake master cylinder.

e. Installation. Install the brake master cylinder (TM 10-3930-611-12).

f. Bleeding. Bleed the air from the brake system (TM 10-3930-611-12).

g. Push Rod Adjustment.

(1) Ensure that the foot pedal is in the fully upward position.

(2) Observe the piston travel through the filler hole. Adjust the cylinder push rod (fig. 3-28) to approximately 1/16 inch free travel without any movement of the piston.

3-23. Drive Axle, Wheel Cylinder and Brake Shoes

a. Removal.

(1) Remove the drive wheels (TM 10-3930-611--12).

(2) Refer to figure 3-27 and remove the drive axle assembly.

b. Disassembly. Refer to figure 3-28 and disassemble the drive axle, wheel cylinder, and brake shoe assembly.

c. Cleaning, Inspection and Repair.

(1) Wipe the brake shoe with a clean, dry cloth. Clean all other parts with dry cleaning solvent (Federal Specification P-D-680) and dry thoroughly.

(2) Inspect brake lining for glaze, grease or oil soaked condition, and wear. Inspect wheel bearings for pitting and spindles for out-of-straightness. Inspect wheel cylinder for leaking oil. Inspect tires for wear. Inspect all parts for breaks, cracks, loose or missing mounting hardware, or other defects.

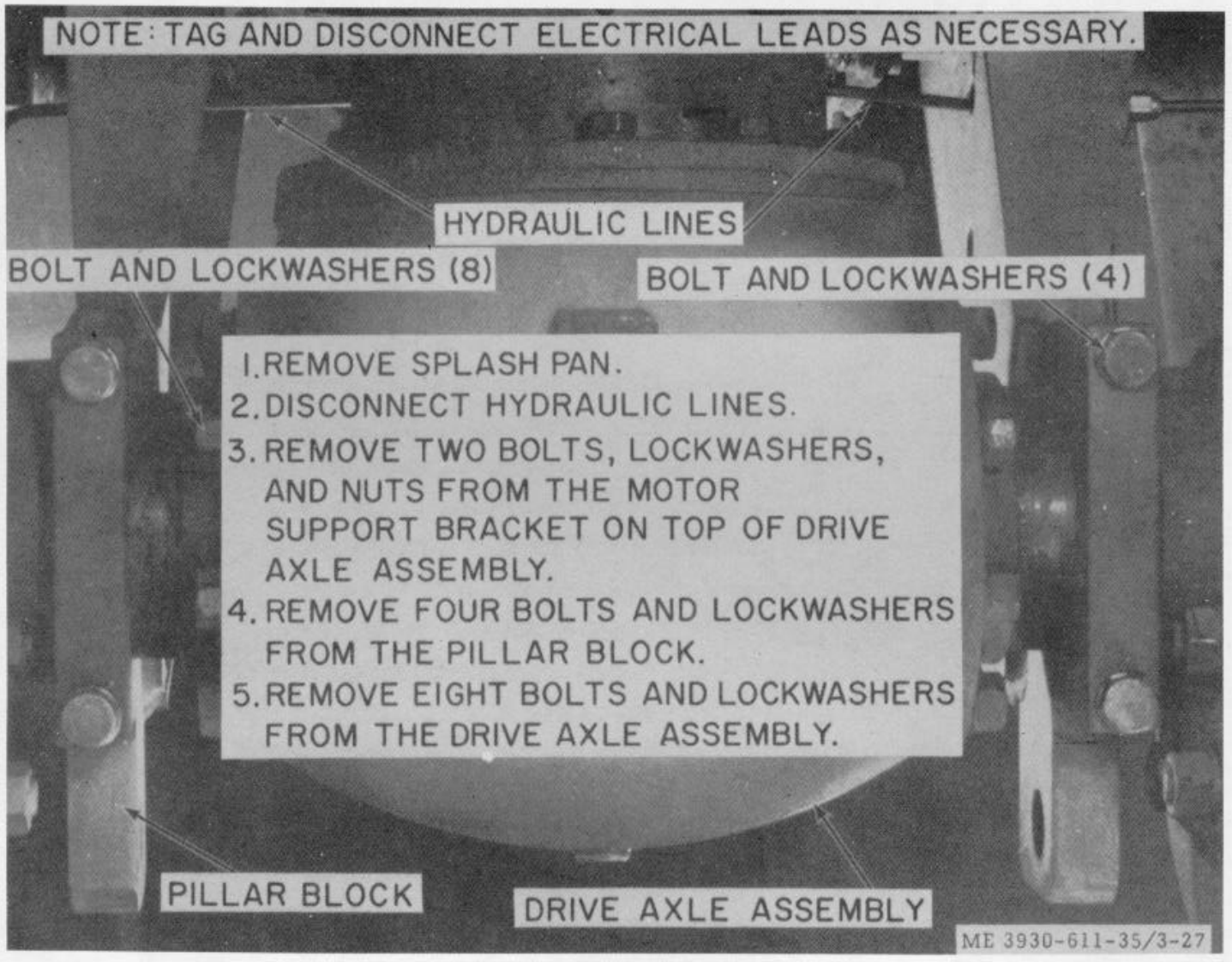


Figure 3-27. Drive axle assembly, removal and installation.

(3) Tighten or replace loose or missing hardware. Replace brake shoes if lining is glazed, grease or oil soaked, or if lining thickness is -less than l/8 inch. Replace tires if rubber is worn down to approximately 161/2 inch diameter. Replace tapered roller bearings if excessive pittings in races are visible. Replace spindles if out-of-straightness exceeds 1/16 inch. Replace cups an/or piston in wheel cylinder if leaks are evident.

d. Reassembly. Refer to figure 3-28 and reassemble the drive axle, wheel cylinders, and brake shoe assembly.

e. Installation.

(1) Refer to figure 3-27 and install the drive axle.

(2) Install the drive wheel (TM 10-3930-611-12).

f. Brake Shoe Adjustment.

(1) Depress brake pedal applying pressure to center the brake shoes.

(2) Rotate tire and wheel until access hole aligns with either forward or rear cam adjusting bolt (fig. 3-28).

(3) Insert the blade of an 8 or l0 inch, square shank screwdriver through access hole into slot in adjusting cam. Use wrench to apply torque to the screwdriver.

(4) Rotate the forward cam bolt clockwise or the rear cam bolt counterclockwise until lining drags on drum.

(5) Back off adjustment by turning screwdriver in opposite direction, increasing clearance until drag is relieved.

(6) Repeat adjustment sequence steps (4) and (5) on reverse shoe.

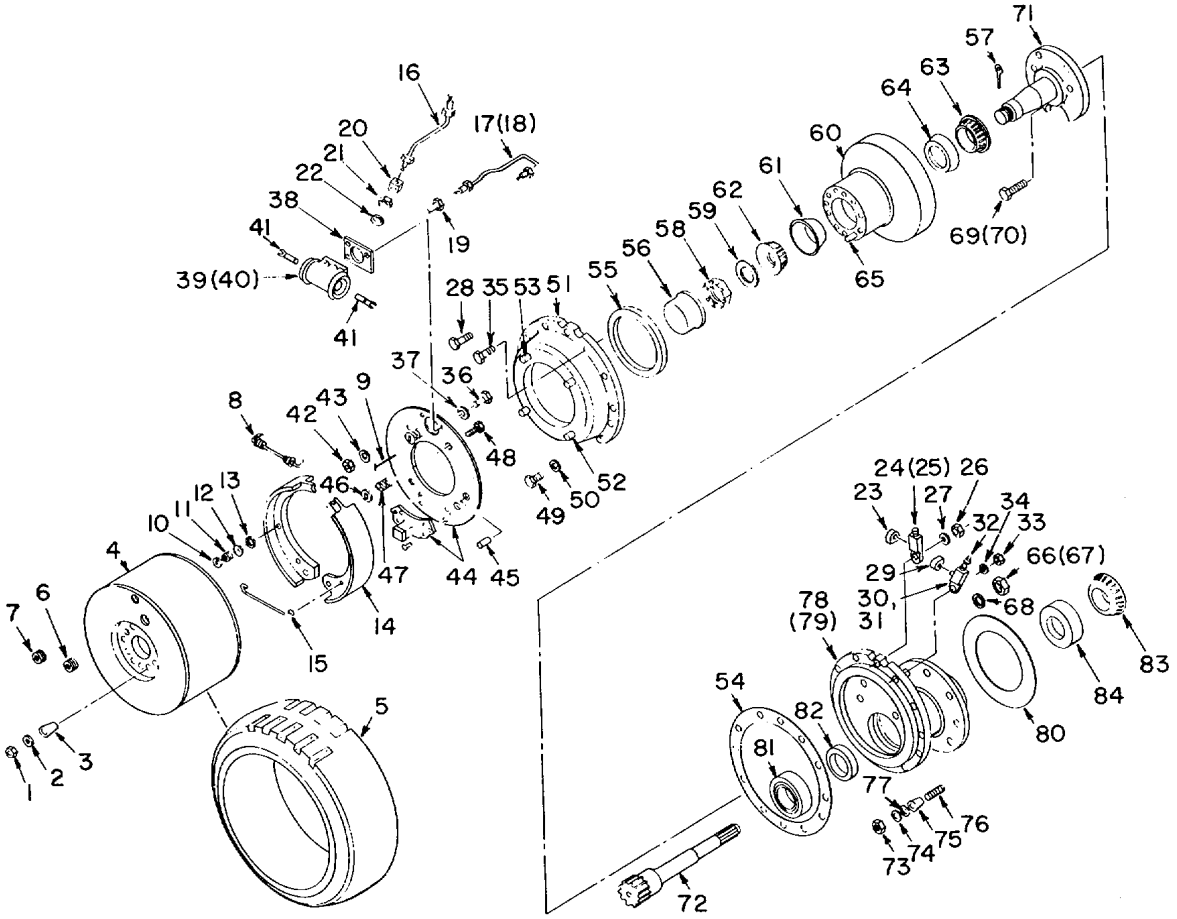


Figure 3-28. Drive axle, wheel cylinder and brake shoe assembly, disassembly and reassembly.

1. Nut (24 reqd)
2. Washer (24 reqd)
3. Dowel (12 reqd)
4. Brake drum & wheel (2 reqd)
5. Tire, rubber cushion (2 reqd)
6. Plug, brake inspection hole (2 reqd)
7. Plug, brake inspection hole (2 reqd)
8. Spring, return (2 reqd)
9. Rod, anti-rattle (2 reqd)
10. Retainer (8 reqd)
11. Spring (4 reqd)
12. Retainer (ref item #10)
13. Washer (as reqd, approx 4 reqd)
14. Assy, brake shoe and lining (4 reqd)
15. Spring, retaining
16. Tube assy, brake actuating (2 reqd)
17. Tube assy, bleeder
18. Tube assy, bleeder
19. Adapter, brake bleeder screw (2 reqd)
20. Elbow, brake line fitting (6 reqd)
21. Adapter. hydr brake cyl (2 reqd)
22. Gasket, hydr inlet adapter (2 reqd)
23. Fitting, brake line
24. Elbow, brake line (ref item #20)
25. Fitting, brake line
26. Nut, jam (4 reqd)
27. Washer (4 reqd)
28. Screw, cap (4 reqd)
29. Elbow, brake line fitting
30. Fitting, bleeder screw
31. Fitting, bleeder screw
32. Screw, bleeder (2 reqd)
33. Nut, jam (ref item #26)
34. Washer (ref item #27)
35. Screw, cap (ref item #28)
36. Washer, lock (6 reqd)
37. Screw, cap (6 reqd)
38. Spacer (2 reqd)
39. Cyl assy, brake RH
40. Cyl assy, brake LH
41. Push rod, cyl (4 reqd)
42. Nut (16 reqd)
43. Washer, lock (16 reqd)
44. Plate, brake backing (2 reqd)
45. Dowel (4 reqd)
46. Dowel (4 reqd)
47. Spring (4 reqd)
48. Cam bolt assy, adjusting (4 reqd)
49. Screw, cap (24 reqd)
50. Washer, lock (24 reqd)
51. Case; F.D. gear (2 reqd)
52. Stud (12 reqd)
53. Stud (4 reqd)
54. Gasket (2 reqd)
55. Seal, oil (2 reqd)
56. Cap, wheel (2 reqd)
57. Pin, cotter (2 reqd)
58. Nut, wheel spindle (2 reqd)
59. Washer, hub bearing nut (2 reqd)
60. Gear, F.D. internal (2 reqd)
61. Cone outer gear bearing (2 reqd)
62. Cup, outer gear bearing (2 reqd)
63. Cone, inner gear bearing (2 reqd)
64. Cup, inner gear bearing (2 reqd)
65. Stud, brake drum and drive gear (24 reqd)
66. Nut (6 reqd)
67. Nut (2 reqd)
68. Washer, lock (6 reqd)
69. Bolt (6 reqd)
70. Bolt (2 reqd)
71. Spindle, wheel (2 reqd)
72. Shaft, axle (2 reqd)
73. Nut (16 reqd)
74. Washer (8 reqd)
75. Dowel (8 reqd)
76. Stud (16 reqd)
77. Washer, lock (8 reqd)
78. Housing, axle LH
79. Housing, axle RH
80. Gasket (18 reqd)
81. Bearing, axle shaft (2 reqd)
82. Collar, axle shaft brg ret (2 reqd)
83. Cone, differential brg (2 reqd)
84. Cup, differential brg (2 reqd)

Figure 3-28. Drive axle, wheel cylinder and brake shoe assembly, disassembly and reassembly.

3-24. Parking Brake Shoes (Drive Axle Removed)

a. Removal.

(1) Remove the drive motor (para 3-3).

(2) Refer to figure 3-29 and remove the parking brake shoes.

b. Cleaning and Inspection.

(1) Wipe the brake shoe with a clean, dry cloth. Clean all other parts with dry cleaning solvent (Federal Specification P-D-680) and dry thoroughly.

(2) Inspect lining for glaze and for grease or oil soaked condition. Inspect for breaks, cracks, loose or missing mounting hardware, worn lining or other defects.

(3) Tighten or replace loose or missing mounting hardware. Replace brake shoes if glazed, grease or oil soaked, or if lining thickness is less than 1/8 inch.

c. Installation.

(1) Refer to figure 3-29 and install the parking brake shoes.

(2) Install the parking linkage (TM 10-3930-611-12, para 3-42).

(3) Install the drive motor (para 3-3).

(4) Install the drive axle assembly (para 3-23).

3-25. Parking Brake Drum and Mounting Plate

a. Removal.

(1) Remove the brake shoes (para 3-24).

(2) Refer to figure 3-30 and remove the brake drum and mounting plate.

b. Cleaning and Inspection.

(1) Clean all parts with dry cleaning solvent (Federal Specification P-D- 680, and dry thoroughly.

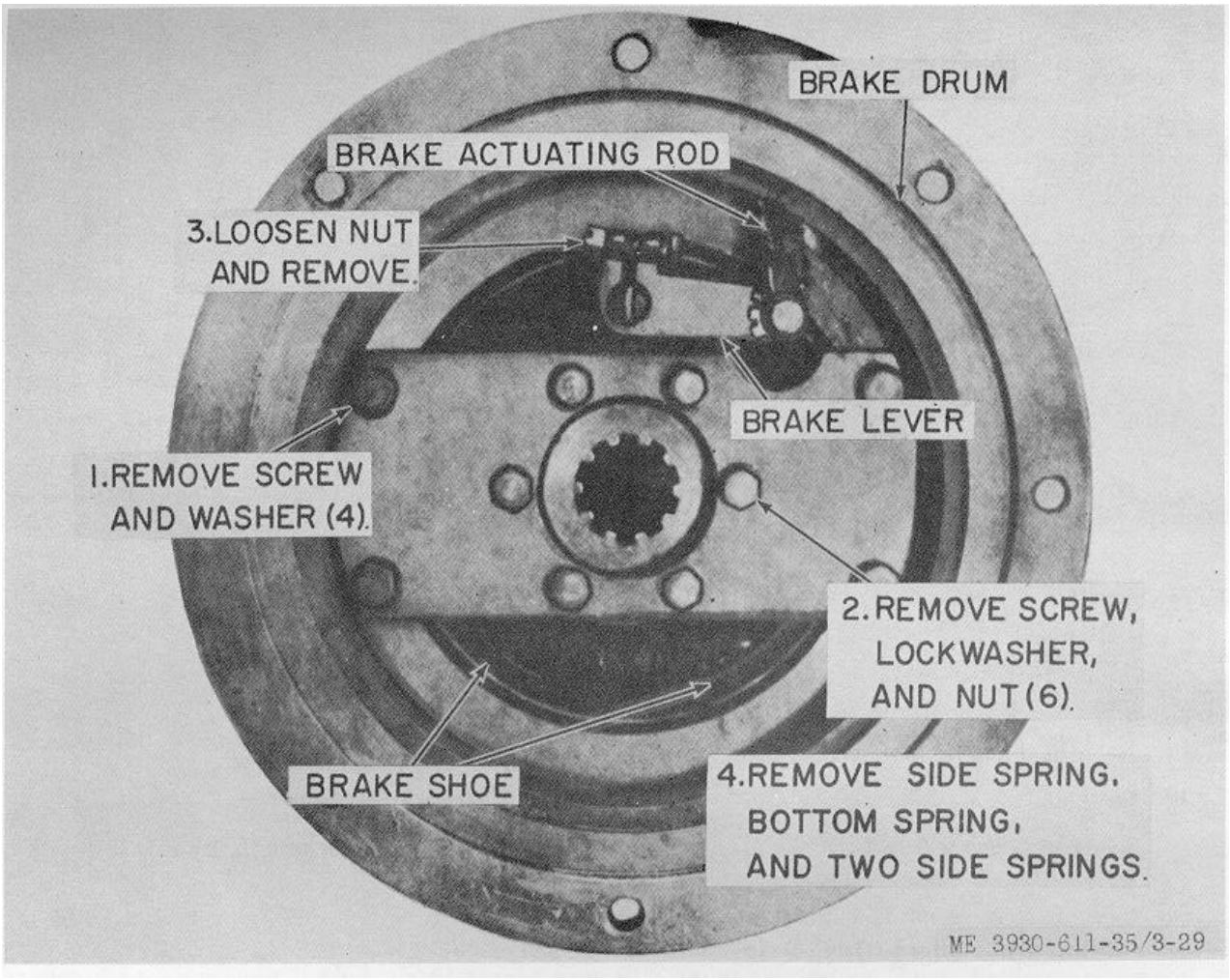


Figure 3-29. Parking brake shoes, removal and installation.

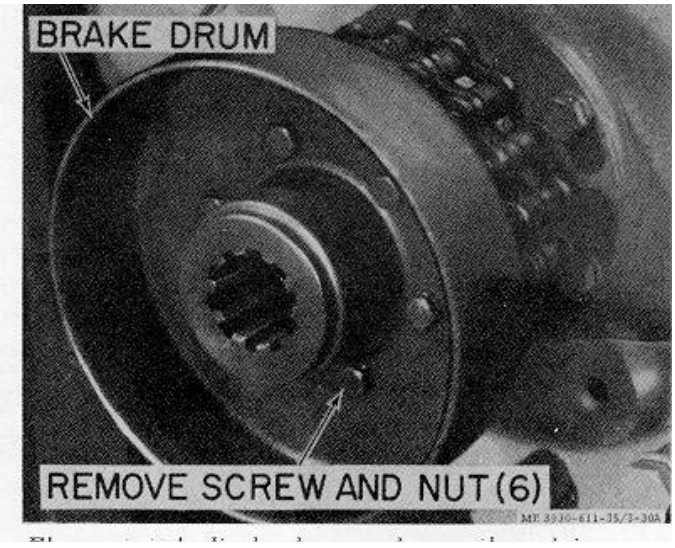


Figure 3-30A. Brake drum and mounting plate, removal and installation.

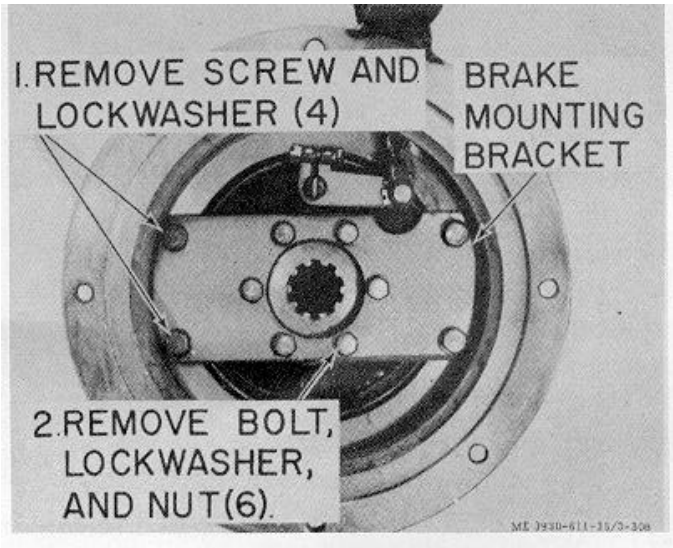


Figure 3-30B - Continued.

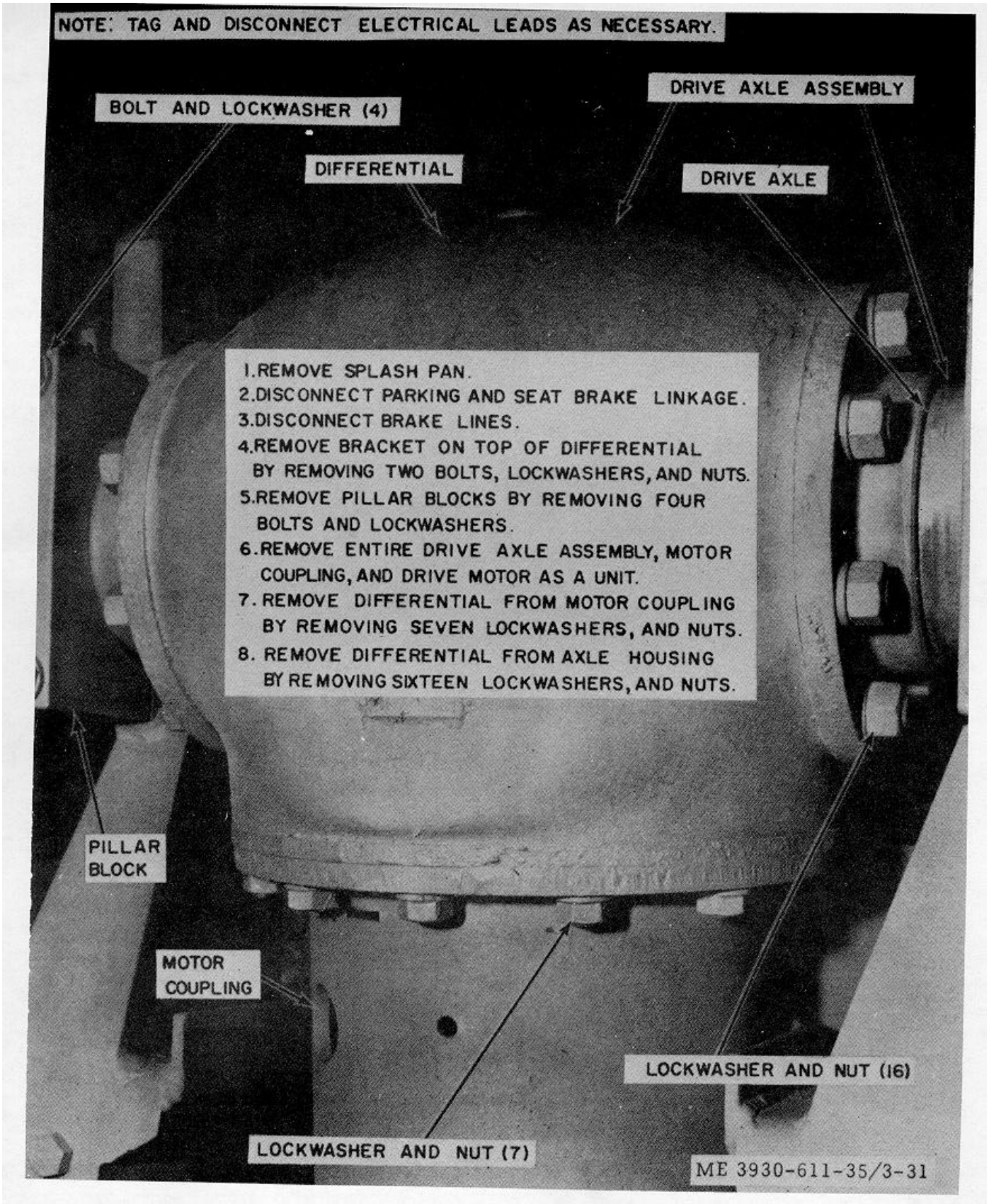
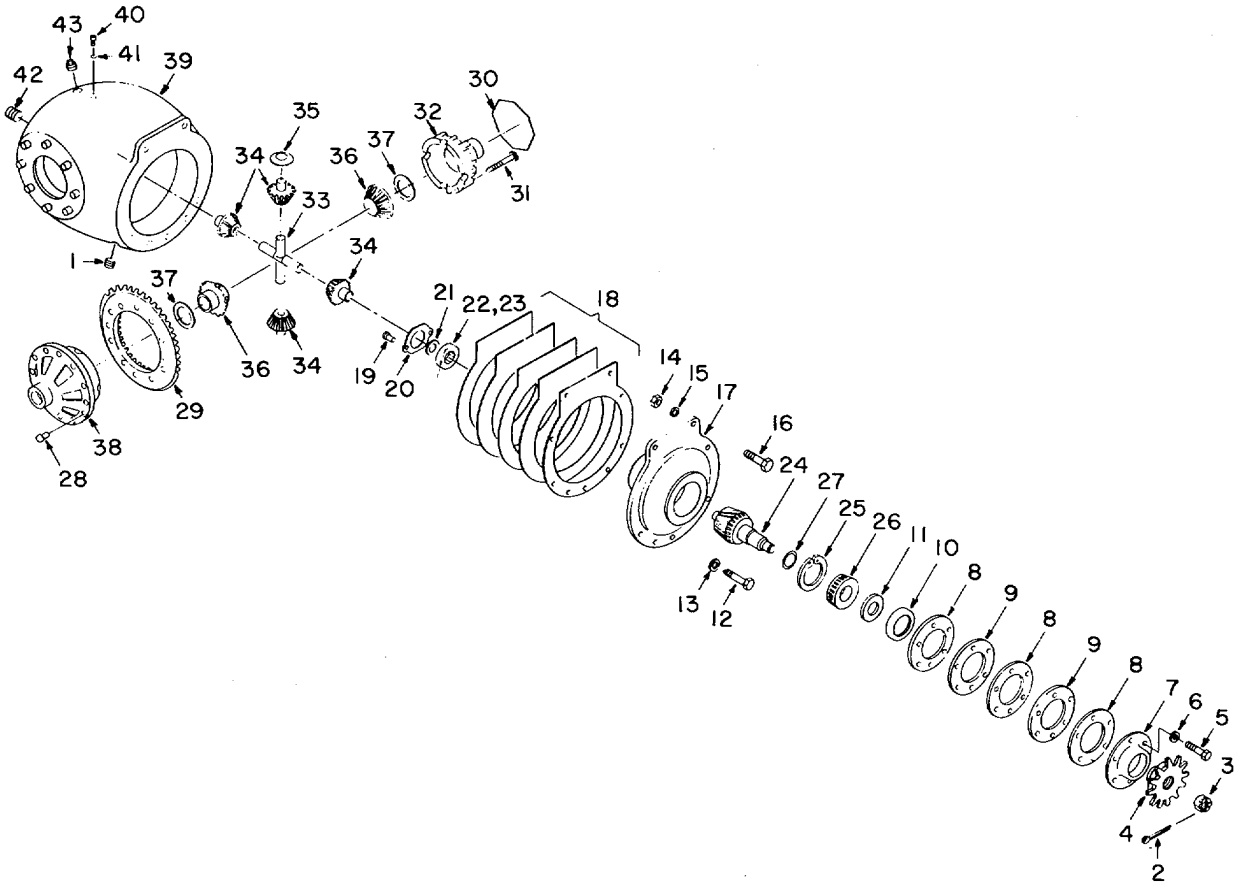


Figure 3-31. Differential, removed and installation.



1. Plug, oil drain
2. Pin, cotter
3. Nut
4. Coupling, driven half
5. Screw, cap (6 reqd)
6. Washer, lock (6 reqd)
7. Seal, oil
8. Gasket (3 reqd)
9. Cover, pinion brg oil seal
10. Retainer
11. Washer
12. Screw, cap (7 reqd)
13. Washer, lock (2 reqd)
14. Nut (2 reqd)
15. Washer, lock (ref item #12)
16. Screw, cap (2 reqd)
17. Cage, bevel pinion bearing
18. Gasket, adapter plate (.005 and .010) (5 reqd)
19. Rivet (2 reqd)
20. Retainer
21. Ring, lock, pinion bearing
22. Bearing, bevel pinion rear
23. Race
24. Pinion, bevel
25. Ring, snap
26. Bearing
27. Shim, bevel pinion brg. (.005 and 003) (2 reqd)
28. Rivet (12 reqd)
29. Gear, bevel
30. Wire, lock, diff case bolt
31. Screw, cap (8 reqd)
32. Case, differential, plain half
33. Spider, differential
34. Pinion, differential (4 reqd)
35. Washer, thrust (4 reqd)
36. Gear, differential side (2 reqd)
37. Washer, thrust (2 reqd)
38. Case, differential, flange half
39. Housing, final drive
40. Screw
41. Seal, copper
42. Plug, hsg, oil level
43. Plug, hsg, oil filler

Figure 3-32. Differential assembly, disassembly and reassembly.

(2) Inspect for breaks, cracks, wear, loose or missing mounting hardware, or other damage.

(3) Tighten or replace loose or missing mounting hardware, replace a damaged or defective part as necessary.

c. Installation

(1) Refer to figure 3-30 and install the brake drum and mounting plate.

(2) Install the brake shoes (para 3-24).

3-26. Differential

a. Removal.

(1) Remove the mast assembly (para 3-10).

(2) Refer to figure 3-21 and remove the differential.

b. Disassembly. Refer to figure 3-32 and disassemble the differential assembly.

c. Cleaning, Inspection and Repair.

(1) Clean all parts with dry cleaning solvent (Federal Specification P-D-680) and dry thoroughly.

(2) Inspect for breaks, cracks, chipped gears, damaged threaded areas, loose or missing mounting hardware, or other defects.

(3) Tighten or replace loose or missing mounting hardware, replace a damaged or defective part as necessary.

d. Reassembly. Refer to figure 3-32 and reassemble the differential assembly.

e. Installation.

(1) Refer to figure 3-31 and install the differential.

(2) Install the mast assembly (para 3-10).

3-27. Operator Console Components

a. Removal.

(1) Remove the horn (TM 10-3930-611-12).

(2) Remove the two front floor plates (TM 10-3930-611-12).

(3) Remove the stack valve switches and controls (TM 10-3930-611-12).

(4) Remove the steering column (para 3-16).

(5) Disconnect the accelerator switch (TM 10-3930-611-12).

(6) Remove the directional switch (TM 10-3930-611-12).

(7) Remove the accelerator linkage (TM 10-3930-611-12).

(8) Refer to figure 3-33 and remove the front panel.

b. Cleaning, Inspection and Repair.

(1) Clean all parts with dry cleaning solvent (Federal Specification P-D-680) and dry thoroughly.

(2) Inspect for breaks, cracks, damaged parts, chipped paint, loose or missing mounting hardware, or other defects.

(3) Tighten or replace loose or missing mounting hardware, replace a damaged or defective part as necessary.

c. Installation.

(1) Refer to figure 3-33 and install the front panel.

(2) Install the accelerator linkage (TM 10-3930-611-12).

(3) Install the directional switch (TM 10-3930-611-12).

(4) Connect the accelerator switch (TM 10-3930-611-12).

(5) Install the steering column (para 3-16).

(16) Install the stack valve switches and controls (TM 10-3930-611-12).

(7) Install the two front floor plates (TM 10-3930-611-12).

(8) Install the horn (TM 10-3930-611-12).

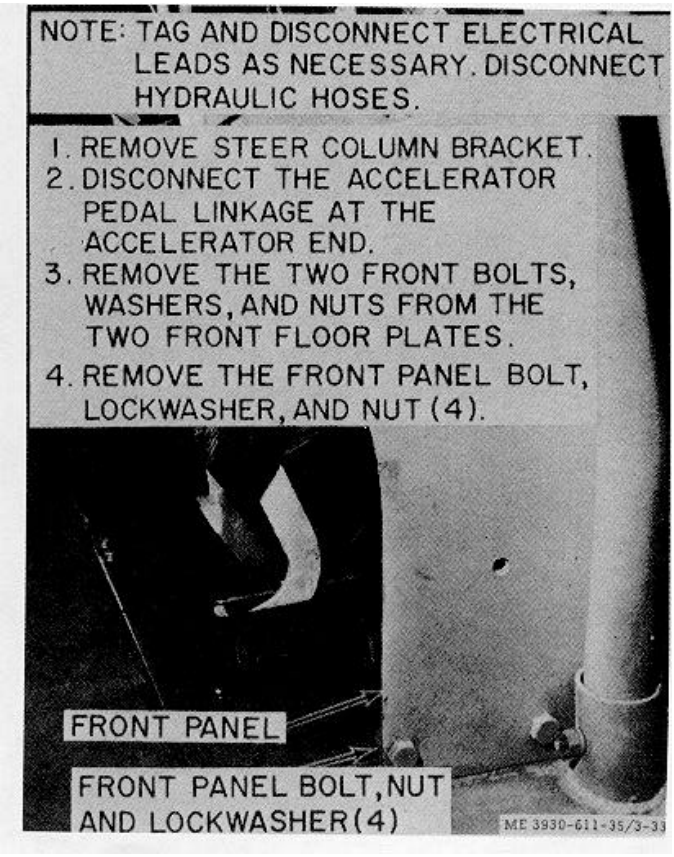


Figure 3-33. Front panel, removal and installation.

APPENDIX A

REFERENCES

A-1. Fire Protection

TB 5-4200-200-10	Hand Portable Fire Extinguishers for Army Users

A-2. Lubrication

C9100IL	Fuels, Lubricants, Oils and Waxes
LO 10-3930-611-12	Lubrication Order

A-3. Painting

TM 9-213	Painting Instructions for Field Use

A-4. Radio Suppression

TM 11-483	Radio Interference Suppression

A-5. Maintenance

TM 750-244-3	Procedures for Destruction of Equipment to Prevent Enemy use. (Mobility Equipment Command).
TM 5-764	Electric Motor and Generator Repair
TB ORD 651	Use of Antifreeze Solutions and Cleaning Compounds in Engine Cooling Systems
TM 38-750	Army Equipment Record Procedures
TM 10-3930-611-201	Organizational Maintenance Repair Parts
TM 10-3930-611-12	Operator and Organizational Maintenance Manual
TM 10-3930-611-35P	Direct Support, General Support and Depot Maintenance, Repair Parts
TM 9-6140-200-15	Operation and Organizational, Field & Depot Maintenance Storage Batteries, Lead Acid Type.
TM 10-1690A	Industrial Motive Power Storage Batteries for Materials Handling Equipment

A-6. Shipment and Storage

TB 740-93-2	Preservation of USAMEC Mechanical Equipment for Shipment and Storage
TM 740-90-1	Administrative Storage of Equipment

INDEX

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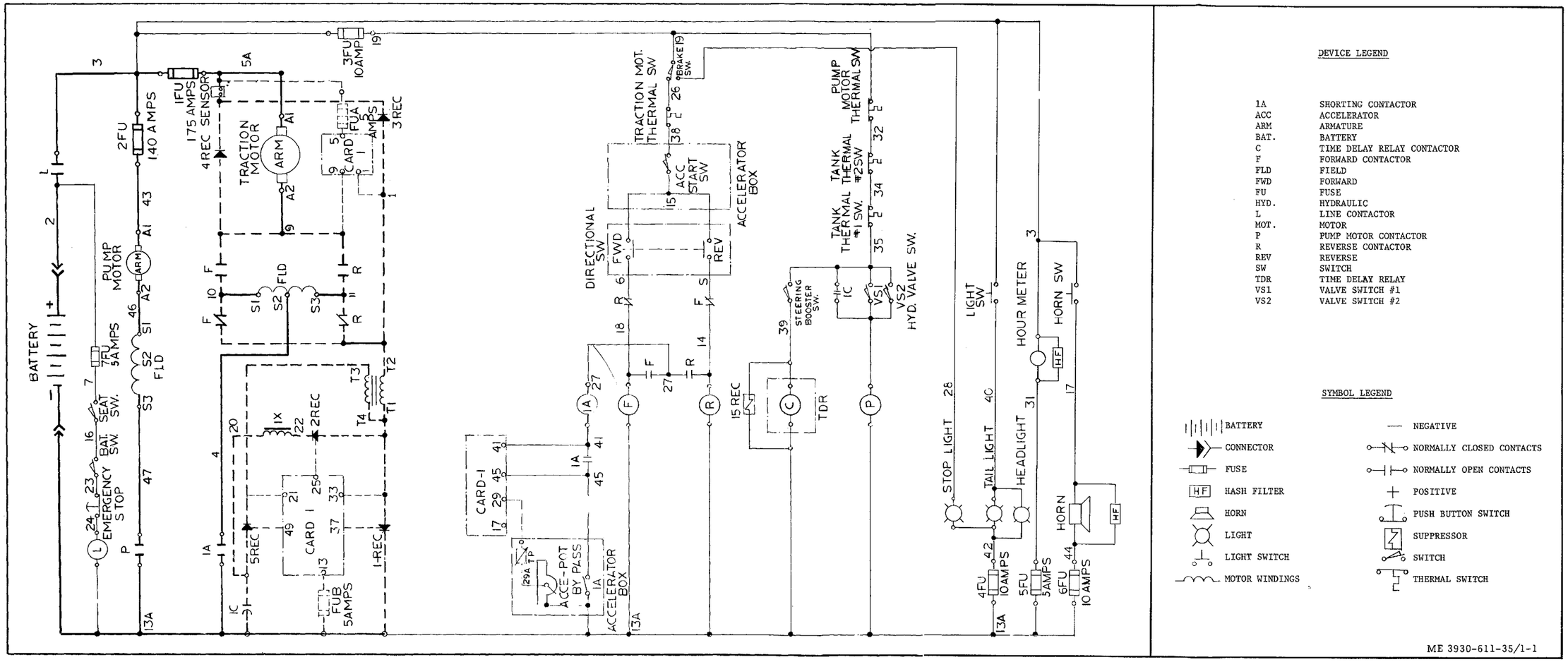

Figure 1-1. Electrical wiring schematic.

TEAR ALONG PERFORATED LINE

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PAGE NO.	PARA-GRAPH	FIGURE NO	TABLE NO.

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

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PREVIOUS EDITIONS ARE OBSOLETE.

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

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