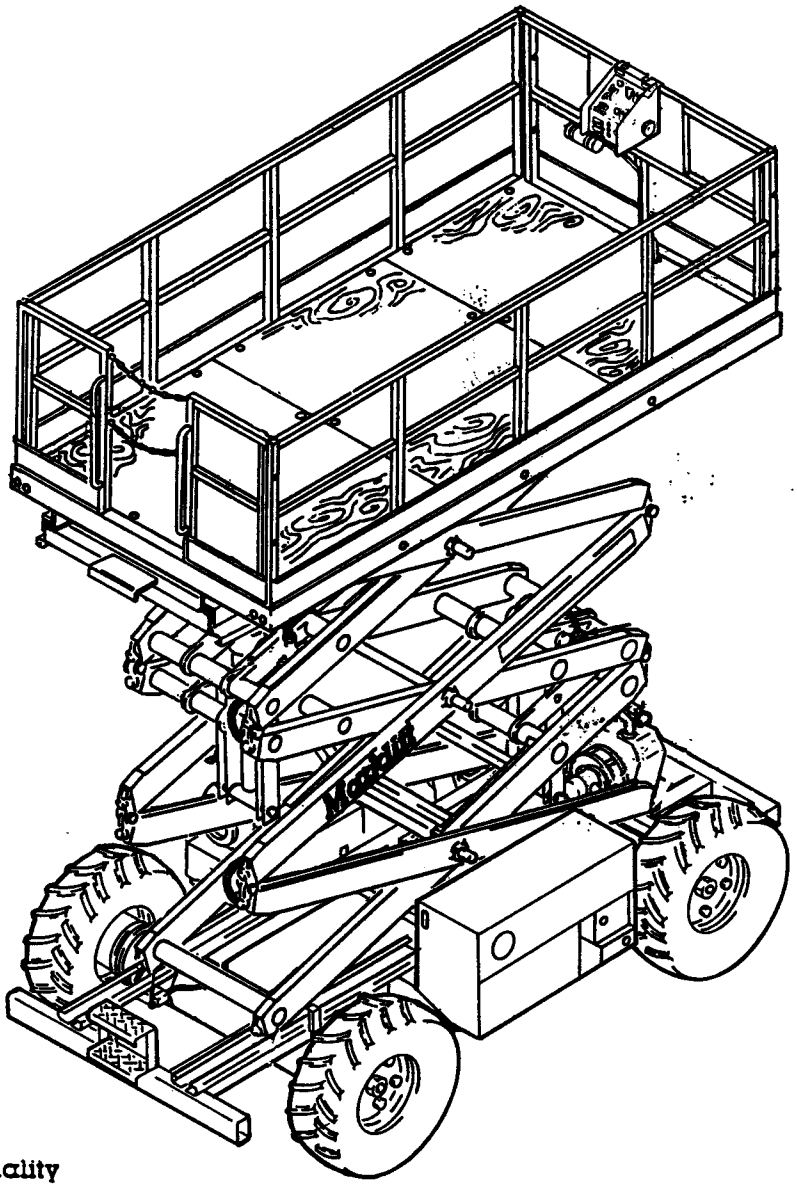
The Marklifts.®

A Product of Mark Industries

FIRST EDITION
FEBRUARY 1987

Marklift
SELF PROPELLED SCISSOR LIFT



MODELS MT-25/G and GT

OPERATION MAINTENANCE and PARTS MANUAL

Mark of Quality

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17210-888

THIS **MARKLIFT** SELF PROPELLED DUAL FUEL SCISSOR LIFT MODELS MT-25G AND MT-25GT OPERATION, MAINTENANCE, AND PARTS MANUAL IS DESIGNED AS:

The purpose of this manual is to provide the customer with operation, maintenance and parts information that will enhance the reliable performance of the **MARKLIFT.** Schematic and vendor information is also furnished.

WARNING: IMPROPER USE OF THIS **MARKLIFT** WILL RESULT IN SERIOUS INJURY OR DEATH! TO PROTECT YOURSELF AND THE EQUIPMENT, **STUDY THIS MANUAL BEFORE STARTING OPERATIONS.**

The model capacity, pressure settings and serial number can be found on the ID Plate mounted on the side, rear of the base.

The serial number should be used when ordering parts. This will insure our Parts Department in giving prompt and accurate service.

If additional information or service is needed, we recommend the customer contact his local dealer. If this is not possible, contact the **MARK INDUSTRIES** Service Department.

All **MARKLIFTS** are tested and operated to assure their proper operating condition before shipment. All necessary adjustments have been made and an overall physical inspection was conducted. After the unit is delivered, however, some minor adjustments and inspections must be made before putting the unit in service. These functions are outlined in the **INSPECTION AND CHECKOUT INSTRUCTIONS** in the operation section of this manual.

MT 25 G

HEIGHT-WORKING (ELEVATED)	31 FT.
HEIGHT-PLATFORM (ELEVATED)	25 FT.
(LOWERED)	48 IN.
LENGTH (OVERALL)	146 IN.
WIDTH (OVERALL)	80.5 IN.
PLATFORM-SIZE (INSIDE)	76 X 140 IN.
PLATFORM-SAFETY RAILS	42 IN.
PLATFORM-TOE PLATE	6 IN.
LIFT CAPACITY	1500 LBS.
WHEEL BASE	88 IN.
WHEEL TRACK	68.5 IN.
TURNING RADIUS	9.6 FT.
DRIVE SPEED	0 - 2.5 MPH.
LIFT SPEED--HIGH	27 SEC.
LOW	35 SEC.
LOWER SPEED	29 SEC.
POWER SYSTEM	25 HP. WISCONSIN
BATTERY VOLTAGE	12 VDC
CAPACITIES-BATTERY	95 AMP/HR.
CAPACITIES-HYDRAULIC TANK	18 GAL.
TIRE SIZE	29 X 12.50 X 15 NHS
SHIPPING WEIGHT	5330 LBS.
SHIPPING CUBE--U.S.	372.3 CU. FT.

HEIGHT-WORKING (ELEVATED)	31.5 FT.
HEIGHT-PLATFORM (ELEVATED)	25.5 FT.
(LOWERED)	54 IN.
LENGTH (OVERALL)	146 IN.
WIDTH (OVERALL)	80.5 IN.
PLATFORM-SIZE (INSIDE)	76 X 140 IN.
PLATFORM-SAFETY RAILS	42 IN.
PLATFORM-TOE PLATE	6 IN.
LIFT CAPACITY	1000 LBS.
WHEEL BASE	88 IN.
WHEEL TRACK	68.5 IN.
TURNING RADIUS	9.6 FT.
DRIVE SPEED	0 - 2.5 MPH.
LIFT SPEED--HIGH	26 SEC.
LOW	34 SEC.
LOWER SPEED	29 SEC.
POWER SYSTEM	25 HP. WISCONSIN
BATTERY VOLTAGE	12 VDC
CAPACITIES-BATTERY	95 AMP/HR.
CAPACITIES-HYDRAULIC TANK	18 GAL.
TIRE SIZE	29 X 12.50 X 15 NHS
SHIPPING WEIGHT	5880 LBS.
SHIPPING CUBE--U.S.	411.5 CU. FT.

MANUFACTURERS' LIMITED WARRANTY

MARK INDUSTRIES makes no warranty, express or implied, on any product manufactured or sold by MARK INDUSTRIES except for the following limited warranty against defects in materials and workmanship on products manufactured by MARK INDUSTRIES.

> MARK INDUSTRIES warrants the products manufactured by MARK INDUSTRIES to be free from defects in material and workmanship under normal use and service for a period of six (6) months from the date of shipment. This limited warranty does not extend to any product of another manufacturer or to any part, component, accessory or attachment not manufactured by MARK INDUSTRIES, The warranty, if any, with respect to any product of another manufacturer or to any part, component, accessory or attachment not manufactured by MARK INDUSTRIES is limited to the warranty, if any extended to MARK INDUSTRIES by the manufacturer of the other product, part, component, accessory or attachment.

This limited warranty does not extend to any product (or any part or parts of any product which has been subject to improper use or application, misuse, abuse, operation beyond its rated capacity, repair or maintenance except in accordance with the sales and service manuals and special instructions of MARK INDUSTRIES, or modification without the prior written authorization of MARK INDUSTRIES (whether by the substitution of nonapproved parts or otherwise).

The sole obligation and liability of MARK INDUSTRIES under this limited warranty (and the exclusive remedy for any purchaser, owner or user of MARK INDUSTRIES products) is limited to the repair or replacement, at the option of MARK INDUSTRIES, of any product (or any part or parts of any product) manufactured by MARK INDUSTRIES which, within six (6) months from the date of shipment, shall have been returned to the MARK INDUSTRIES facility in Brea, California (or any other location within the United States as shall be designated by MARK INDUSTRIES), at no expense to MARK INDUSTRIES, and demonstrated to the satisfaction of MARK INDUSTRIES as being defective in material or workmanship.

To make a claim under this limited warranty, contact MARK INDUSTRIES or the MARK INDUSTRIES distributor from whom the product was originally purchased. A statement giving the model and serial number of the allegedly defective product, the date and a description of the alleged defect, the date of the purchase and proof of the purchase and purchase date must accompany the returned product (or any part or parts of any product). Any product (or any part or parts of any product) determined by MARK INDUSTRIES to be defective will be repaired or replaced, at the option of MARK INDUSTRIES, free of charge, f.o.b. Brea, California. No credit will be given for any allegedly defective product (or any part or parts of any product) not returned to MARK INDUSTRIES.

There are no other warranties, express or implied, in addition to this limited warranty. **This limited warranty is exclusive and in lieu of all other warranties, express or implied (in fact or by operation of law or otherwise), including the implied warranties of merchantability and fitness for a particular purpose.**

MARK INDUSTRIES shall not be liable for any special, indirect or consequential damages. Further, no representation or warranty made by any person, including any representative of MARK INDUSTRIES, which is inconsistent or in conflict with, or in addition to the terms of the foregoing limited warranty (or the limitations of the liability of MARK INDUSTRIES as set forth above) shall be binding upon MARK INDUSTRIES unless reduced to writing and approved by an officer of MARK INDUSTRIES.

Tires, batteries, filter elements and electrical components are specifically excluded from this limited warranty.

Mark Industries
P.O. BOX 2255 Brea, CA 92622-2255
714-879-6275 800-448-MARK
TELEX 194402 FAX 1-714-879-8884

WARRANTY REGISTRATION

PURCHASER

COMPANY NAME

ADDRESS

TELEPHONE NUMBER

DATE SHIPMENT RECEIVED

UNIT WILL BE USED

DATE OF INVOICE

UNIT WILL BE SOLD

DATE UNIT PUT INTO SERVICE

INSPECTION		GEN'L MAINTENANCE		PAINTING/SANDBLAST	
MINING		HEATING/AIR COND.		STEEL FABRICATION	
WELDING		CARPENTRY		RIGGING	
CONSTRUCTION		PLUMBING		ROOFING	
SCAFFOLDING		ELECTRICAL		GLAZING	
MECHANICAL		SPRINKLER		OTHER	

COMMENTS:

INSPECTION COMPLETED BY:

WARRANTY WILL BE VOID UNLESS THIS INSPECTION REPORT IS POSTMARKED TO MARK INDUSTRIES NOT MORE THAN 14 DAYS FROM DATE SHIPMENT RECEIVED.

NEW EQUIPMENT CONDITION REPORT

		YES	NO
1.	PLATFORM CAPACITY DECAL _____ LBS.	☐	☐
2.	ALL WARNING, CAUTION & EMERGENCY DECALS INSTALLED	☐	☐
3.	EMERGENCY DESCENT VALVE FUNCTIONS PROPERLY	☐	☐
4.	OPERATION INSTRUCTIONS PROPERLY INSTALLED	☐	☐
5.	OPERATION & SAFETY HANDBOOK RECEIVED	☐	☐
6.	ELECTRICAL SCHEMATIC RECEIVED	☐	☐
7.	ALL CONTROLS (AERIAL & GROUND) ARE IDENTIFIED AND OPERATE CORRECTLY	☐	☐
8.	STOP SWITCHES OPERATE PROPERLY (AERIAL & GROUND)	☐	☐
9.	PLATFORM GUARD RAILS, SECURE AND UNDAMAGED	☐	☐
10.	PLATFORM ACCESS GATE WORKS PROPERLY	☐	☐
11.	HORN AND BEACON OPERATE PROPERLY (OPTIONAL)	☐	☐
12.	BRAKES ADJUSTED AND OPERATE CORRECTLY	☐	☐
13.	CIRCUIT BREAKERS OPERATE PROPERLY	☐	☐
14.	ENGINE R.P.M. _____	☐	☐
15.	ALL HYDRAULIC CYLINDERS FREE OF LEAKS	☐	☐
16.	ALL HYDRAULIC CYLINDER RODS FREE OF PAINT OR SCRATCHES	☐	☐
17.	HYDRAULIC PUMP FREE OF LEAKS	☐	☐
18.	HYDRAULIC HOSES & FITTINGS TIGHT	☐	☐
19.	HYDRAULIC OIL LEVEL _____	☐	☐
20.	HYDRAULIC TANK & FITTINGS FREE OF LEAKS	☐	☐
21.	DRIVE MOTORS FREE OF LEAKS	☐	☐
22.	TURRET ROTATION GEAR BOX OIL LEVEL _____	☐	☐
23.	TURRET RING GEAR BOLTS TORQUED TO _____ FT. LBS.	☐	☐
24.	WHEEL LUG NUTS TORQUED TO _____ FT. LBS.	☐	☐
25.	BATTERY WATER LEVEL _____	☐	☐
26.	ENGINE COOLANT (RADIATOR) LEVEL _____	☐	☐
27.	COOLANT HOSES & FITTINGS FREE OF LEAKS	☐	☐
28.	ELECTRIC RADIATOR FAN OPERATES PROPERLY	☐	☐
29.	TIRE PRESSURE _____ PSI	☐	☐
30.	SYSTEM PRESSURE _____ PSIG	☐	☐
31.	PILOT PRESSURE _____ PSIG	☐	☐
32.	FUEL TANK & FITTINGS FREE OF LEAKS	☐	☐
33.	MANUAL OVERRIDES OPERATE PROPERLY	☐	☐
34.	MUFFLER TIGHT AND FREE OF LEAKS	☐	☐
35.	ENGINE OIL LEVEL _____	☐	☐
36.	ENGINE OIL FILTER, FREE OF LEAKS	☐	☐
37.	ALL ELECTRICAL CONNECTIONS TIGHT	☐	☐
38.	ENGINE ALTERNATOR FUNCTIONS PROPERLY	☐	☐
39.	VALVE MANIFOLD & FITTINGS, FREE OF LEAKS	☐	☐
40.	DRIVE WHEEL, TORQUE HUB OIL LEVEL _____	☐	☐
41.	RETRACTION CABLE TENSION _____ FT. LBS.	☐	☐
42.	110V GENERATOR OPERATES PROPERLY (OPTIONAL)	☐	☐

MODEL NUMBER _____ SERIAL NUMBER _____

INSPECTOR _____ OPTIONS _____

Every operator of the **MARKLIFT** must read, understand and follow the safety rules set forth herein.

1. The **MARKLIFT** self-propelled aerial work platform is a personnel lifting device, and it is essential that it be properly maintained and operated to perform all functions with maximum safety and efficiency.

2. The operation of any new and unfamiliar equipment can be hazardous in the hands of untrained operators. Only trained operators must be assigned to operate the **MARKLIFT.**

3. Never exceed manufacturer's recommended platform load capacity. The load capacity of the **MARKLIFT** is the total combined weight of personnel and tools, fixtures, acessories, etc. Secure all equipment and distribute the weight evenly.

4. Although the **MARKLIFT** conforms to specified **ANSI & OSHA** requirements, it is the responsibility of the owner to instruct the operators with safety requirements made not only by **MARK INDUSTRIES**, but by various local safety boards, as well as the **ANSI & OSHA** requirements.

5. The **MARKLIFT** is an uninsulated personnel carrier and **must not** be operated within 10 feet of a 50,000-volt line (see pages 3 and 4).

6. It is recommended that head gear (hard hats) be worn by all personnel in the work platform.

7. Under no circumstances should horseplay be tolerated.

8. The **MARKLIFT** structure must not be used as a welding ground. Disconnect both battery leads prior to performing any welding operations.

9. **DO NOT** lean over platform guard railings to perform work.

10. **DO NOT** use ladders or scaffolding on the platform to obtain greater height.

11. **DO NOT** store loose material in the work platform such as pipe, rope, extension cords, wire or miscellaneous boxes. If necessary to store such items, they must be positioned in such a way that no one will trip over them when operating or working in the platform.

12. **DO NOT** alter equipment in any fashion.

13. **DO NOT** override any hydraulic, mechanical or electrical safety devices.

14. **DO NOT** drive on uneven, sloping or soft terrain, as this is hazardous and must be avoided. The **MARKLIFT** must not be operated on more than a 6-degree out-of-level condition fore and aft nor more than 3 degrees to the side.

15. **DO NOT** work on the platform if you feel dizzy or unsteady in any way.

16. **DO NOT** jump start other vehicles using the **MARKLIFT** battery.

17. **DO NOT** fill fuel tanks with the engine running.

18. When a machine is not in use, remove the key from the ground control panel to prevent unauthorized use.

19. When working under the elevated platform, always remember to raise the **Safety Support Arm** (see PARTS chapter, Section 4, Scissors, Figure 1 or 2, item no. 11 for location) to prevent accidental platform descent.

TITLE 8 DIVISION OF INDUSTRIAL SAFETY 358.38.113
(Register 73, No. 30--7-28-73)

Article 86. Provisions for Preventing Accidents

Article 86. Provisions for Preventing Accidents Due to Proximity to Overhead Lines

2946. Provisions for Preventing Accidents Due to Proximity to Overhead lines. (a) General. No person, firm, or corporation, or agent of same, shall require or permit any employee to perform any function in proximity to energized high-voltage lines; to enter upon any land, building, or other premises and thereto engage in any excavation, demolition, construction, repair, or other operation; or to erect, install, operate, or store in or upon such premises any tools, machinery, equipment, materials, or structures (including scaffolding, house moving, well drilling, pile driving, or hoisting equipment) unless and until danger from accidental contact with said high-voltage lines has been effectively guarded against.

(b) Clearances or Safeguards Required. Except where electrical distribution and transmission lines have been de-energized and visibly grounded or effective barriers have been erected to prevent physical and arcing contacts with the high-voltage lines, the following provisions shall be met:

(1) Over Lines. The operation, erection, or handling of tools, machinery, apparatus, supplies, or materials, or any part thereof, over energized high-voltage lines shall be prohibited.

(2) Equipment and Materials in Use. The operation, erection, or handling of tools, machinery, equipment, apparatus, materials, or supplies, or any part thereof within the minimum clearances from energized lines set forth in Table X shall be prohibited.

Table X
Required Clearances from Overhead High-Voltage Lines

Nominal voltage (Phase to Phase)	Minimum Required Clearance (Feet)
750 - 50,000	10
over 50,000 - 75,000	11
over 75,000 - 125,000	13
over 125,000 - 175,000	15
over 175,000 - 250,000	17
over 250,000 - 370,000	21
over 370,000 - 550,000	27
over 550,000 - 1,000,000	42

(3) Transportation or Transit. The transportation or transit of any tool, machinery, equipment, or apparatus, or the moving of any house or other building in proximity to overhead high-voltage lines shall be expressly prohibited if at any time during such transportation or transit such tool, machinery, equipment, apparatus, or building, or any part thereof, can come closer to high-voltage lines than the minimum clearances set forth in Table Y.

Article 86. Provisions for Preventing Accidents

Except where the boom of boom-type equipment is lowered and no load is imposed thereon, the equipment in transit shall conform to the minimum required clearances set forth in Table X.

Table Y
Required Clearances from Energized High-Voltage Conductors
(While in Transit)

Nominal Voltage (Phase to Phase)	Minimum Required Clearance (Feet)
750 - 50,000	6
over 50,000 - 345,000	10
over 345,000 - 750,000	16
over 750,000 - 1,000,000	20

(4) Storage. The storage of tools, machinery, equipment, supplies, materials, or apparatus under, by, or near energized high-voltage lines is hereby expressly prohibited if at any time during such handling or other manipulation it is possible to bring such tools, machinery, equipment, supplies, materials, or apparatus, or any part thereof, within the minimum required clearances from high-voltage lines as set forth in Table X.

(c) The specified clearance shall not be reduced by movement due to any strains impressed (by attachments or otherwise) upon the structures supporting the high-voltage line or upon any equipment, fixtures, or attachments thereon.

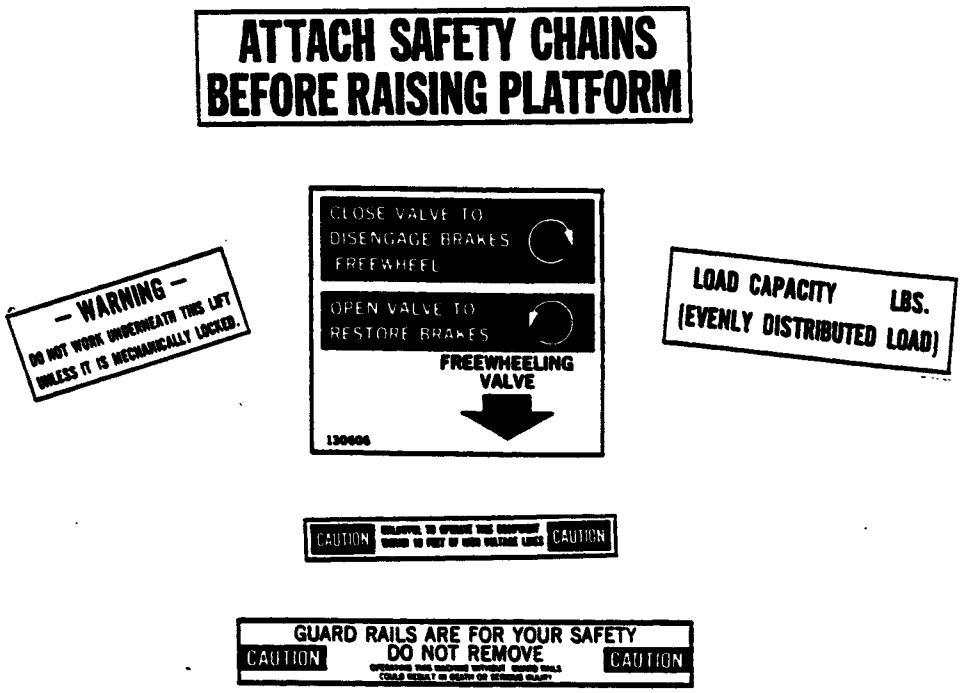
(d) Insulated cage-type boom guards, boom stops, insulating links, or proximity warning devices may be used on cranes, but the use of such devices shall not alter the required clearances set forth in Table X.

(e) Any overhead conductor shall be considered to be energized unless and until the person owning or operating such line verifies that the line is not energized, and the line is visibly grounded at the work site.

2947. Warning Signs Required. The owner, agent, or employer responsible for the operations of equipment shall post and maintain in plain view of the operator and driver on each crane, derrick, power shovel, drilling rig, hay loader, hay stacker, pile driver, or similar apparatus, a durable warning sign legible at 12 feet reading: "Unlawful To Operate This Equipment Within 10 Feet of High-Voltage Lines of 50,000 Volts Or Less."

In addition to the above wording, the following statement in small lettering shall be provided on the warning sign: "For Minimum Clearances of High-Voltage Lines In Excess of 50,000 Volts, See Article 86, Title 8, High-Voltage Electrical Safety Orders."

OBSERVE ALL DANGER, WARNING, CAUTION AND EMERGENCY DECALS AT THE VARIOUS LOCATIONS ON THE **MARKLIFT** IN ORDER TO TAKE TIMELY PREVENTIVE AND CORRECTIVE ACTIONS.



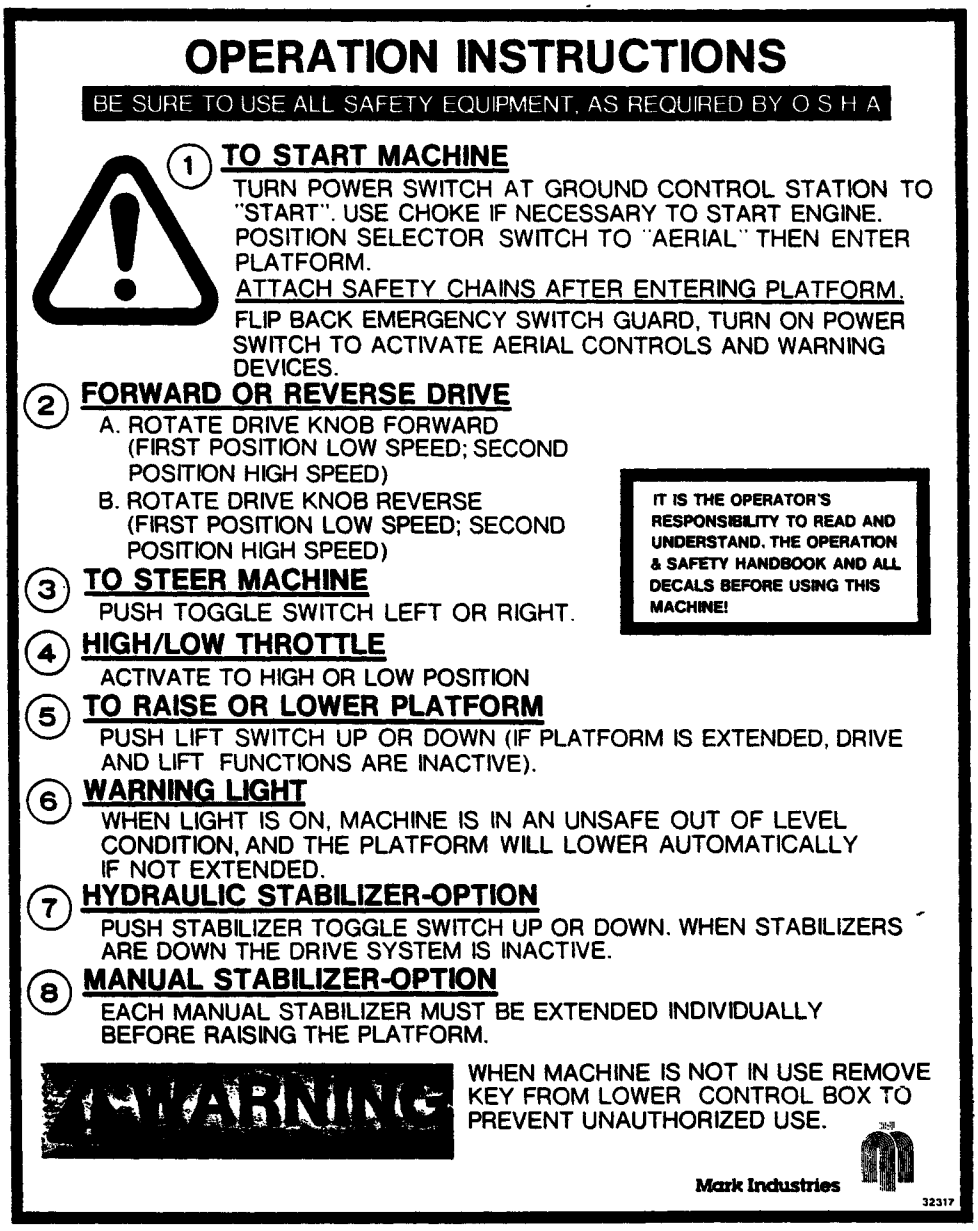
THE ANSI SAFETY ALERT SYMBOL  IDENTIFIES PERSONNEL SAFETY HAZARD DESCRIBED ON **MARKLIFT** DECALS. BE ALERT TO THE POTENTIAL HAZARDS INDICATED BY THESE MESSAGES.

IT IS THE PRIMARY RESPONSIBILITY OF THE USER AND OPERATOR TO BE THOROUGHLY KNOWLEDGEABLE OF ALL DECALS - INFORMATION, DEFINITION AND LOCATION.

THE FOLLOWING PAGE CONTAINS A CHART IN WHICH DECALS FOR THE **MARKLIFT** CAN BE IDENTIFIED FOR REPLACEMENT IF THE EXISTING DECAL(S) IS WORN-OUT, TORN, OR ILLEGIBLE. THIS CHART ALSO REFERS TO LOCATION AND QUANTITY USED IN THAT APPLICATION.

DECAL P/N	DECAL DESCRIPTION	ASSEMBLY (LOCATION)	QTY
67674	SET, DECAL	(ALL STANDARD DECALS)	1
130782	DRIVE	UPPER CONTROL PANEL	1
182718	STEER & LIFT	UPPER CONTROL PANEL	1
130796	HORN & FUEL	UPPER CONTROL PANEL	1
2014	CAUTION HIGH VOLTAGE	UPPER CONTROL PANEL	1
130820	OPERATION & SAFETY HANDBOOK	FINAL ASSY	1
32317	OPERATION INSTRUCTIONS	FINAL ASSY	1
2024	LOAD CAPACITY 1500 LBS. (MT-25G)	FINAL ASSY	5
2026	LOAD CAPACITY 1000 LBS. (MT-25GT)	FINAL ASSY	4
30520	PATENT NUMBER PLATE	FINAL ASSY	1
2041	DO NOT LIFT	FINAL ASSY	2
20661	ANSI A92 PLATE	FINAL ASSY	1
20660	IDENTIFICATION PLATE	FINAL ASSY	1
31260	MARKLIFT	FINAL ASSY	2
130596	A PRODUCT OF MARK INDUSTRIES	FINAL ASSY	2
130606	FREEWHEELING VALVE	FINAL ASSY	1
31109	CAUTION SCISSOR GUARD RAIL	FINAL ASSY	2
2016	DO NOT WORK UNDER	FINAL ASSY	1
2017	HYDRAULIC SYSTEM FLUID	FINAL ASSY	1
130938	MARK	FINAL ASSY	2
131061	BLUE STRIPE	FINAL ASSY	2
32345	GROUND CONTROL BOX	GROUND CONTROL PANEL	1
2004	VAPOR TANK ONLY	FINAL ASSY	1
2020	GASOLINE OR PETROL	FINAL ASSY	2
2003	BATTERY WATER LEVEL	FINAL ASSY	1
2019	EMERGENCY LOWERING VALVE (Used on MT-25G Only)	FINAL ASSY	2

It shall be the responsibility of all **MARKLIFT** operators to read and comply with the following operating instructions. They are designed to promote safety and a better understanding of the operation of the self-propelled aerial platform.



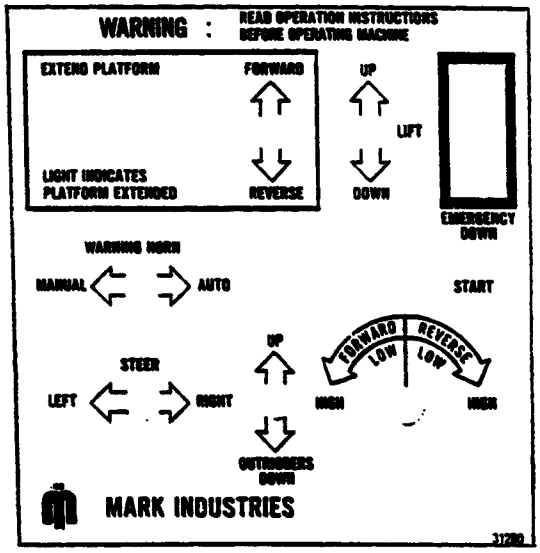
1. **STARTING**

The **MARKLIFT** can be started from either **AERIAL** or **EMERGENCY GROUND CONTROL.** Before either position will function, the master switch must be ON, and the selector switch must be activated. Push the selector switch on the ground control up to activate the aerial control or down to activate the ground control .

A. AERIAL CONTROL

Position the selector switch to AERIAL; then enter the platform. First, **ATTACH SAFETY CHAIN BEFORE RAISING THE PLATFORM.**

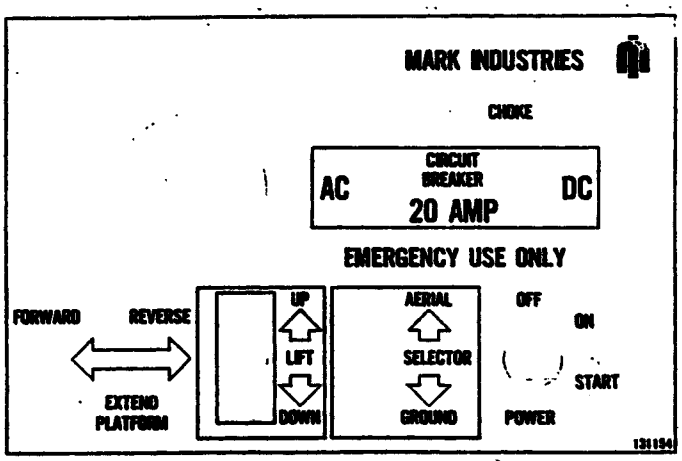
1. Select fuel, PROPANE or GASOLINE, with the switch on the right side of the box.
2. Pull out the red emergency ON/OFF knob located in the middle of the aerial control panel.
3. Use the engine choke on the left side of the box as needed.



B. EMERGENCY GROUND CONTROL

The only functions that can be operated from the lower control station are START/ON/OFF, LIFT UP/DOWN, and selector AERIAL/GROUND.

1. Position the selector switch to GROUND.
2. Start the engine with the master switch.
3. Use the choke as needed.



2. **DRIVE**

Forward and reverse travel is performed from the aerial control panel only. The **MARKLIFT** is capable of two speeds for both forward and reverse travel: LOW and HIGH.

Low and high speed travel are activated with a rotary switch: **LEFT FOR FORWARD, RIGHT FOR REVERSE.**

In either direction, the first position is low speed and the second is high.

3. **STEERING**

The steering of the **MARKLIFT** is performed from the aerial control panel only. While the engine is running, push the steering switch to the left or right to turn the front wheels. Because a momentary type switch is used, when the operator releases the switch it will automatically return to the off (center) position. The wheels will remain at the last angle traveled until changed by again pushing the toggle switch in the direction desired.

4. **LIFT**

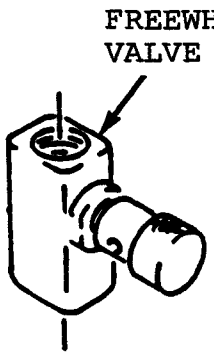
Raising and lowering of the platform is performed from either the aerial control panel or the ground control panel. The momentary switch has been designed so that, in order to raise the platform, the operator must push the lift switch to the UP position, and to lower the platform, to the DOWN position. When the switch is released, it will automatically return to the off (center) position, and the platform will remain stationary.

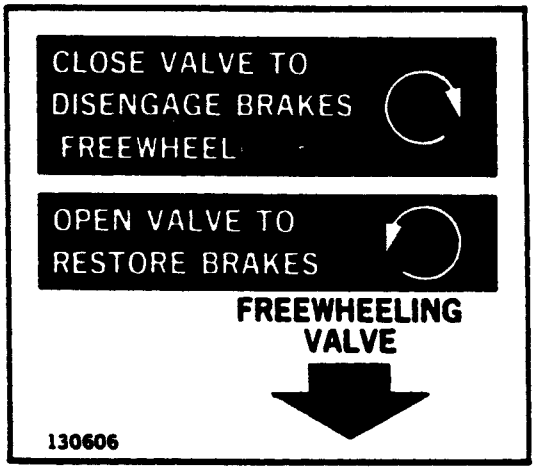
5. **FREE WHEELING** (BRAKE VALVE)

In order to move the **MARKLIFT** in a free wheeling condition for loading, unloading and positioning, make sure that the ground control selector switch is in the OFF position. The **MARKLIFT** may be free wheeled for very short distances at no greater than five (5) miles per hour.

When preparing for free wheeling, always check that the MARK-**LIFT** is on a level surface!

The brake is disengaged by closing the free wheeling valve and momentarily activating the rotary drive switch. Use caution when brakes are disengaged!





ALWAYS REMEMBER TO OPEN FREE WHEELING VALVE TO RESTORE BRAKING.

6. **EXTENDING PLATFORM** (MT-25GT)

Platform extending toggle switch, is located on the face of the aerial control box (upper center). Platform may be extended forward or reverse, by pushing extend platform toggle switch in direction desired.

When **yellow extend platform light** is on, platform is extended. Drive and descent are inactive.

7. **EMERGENCY DESCENT (MT-25GT)**

If the operator has platform extended and needs to descend, push down and hold **emergency down switch**, the push **lift switch** down.

Use caution when lowering platform in extended mode! Remember to **check below extended platform before using emergency down switch**, to avoid damage to anything underneath.

8. **OUT-OF-LEVEL WARNING LIGHT**

As a safety feature, the **MARKLIFT** has been equipped with a series of mercury switches that will disable the lift circuit whenever the unit is in an unsafe, out-of-level condition. An unstable condition consists of a tilt of three (3) degrees to the side and six (6) degrees forward and aft, is indicated by a red light located in the top center of the aerial control panel. If the platform is raised it will automatically descend; if in the down position, it cannot be raised.

9. **WARNING HORN (OPTION)**

For some industrial applications, and to meet particular safety requirements, a warning horn may be needed. The warning horn option on the **MARKLIFT** can be used as an automatic movement indicator, or manually activated, as required. The horn is activated by a three-position switch on the aerial control panel. The middle position is OFF. When the switch is positioned to the right, the horn will sound when either the drive or lift function is activated (forward and reverse, up and down).

10. **HYDRAULIC SYSTEM PRESSURE**

MARK INDUSTRIES has incorporated an integrated hydraulic system in all models. To prevent damage to either the pumps or any other part of the hydraulic system, the maximum system pressure should be 2700 psig.

MARK INDUSTRIES AUTHORIZED UNLOADING
AND TRANSPORTING PRODCEDURE FOR
MARKLIFT SELF-PROPELLED SCISSORS

1. UNLOADING

Before unloading the **MARKLIFT**, inspect for any physical damage. Note any such damage on the freight bill and report same to carrier.

When a loading dock is unavailable and a forklift must be used, make sure that the forklift used has forks sufficiently long for the forklift boots at the front of the unit. DO NOT attempt to lift the machine from the side .

2. TRANSPORTING

The **MARKLIFT** may be freewheeled for loading, unloading, and towing for a very short distances at a speed no greater than 5 mph. To transport the **MARKLIFT** over long distances, a truck or trailer must be used.

If a rollback truck with a winch is used, attach the winch cable to the tiedown brackets and pull the **MARKLIFT** onto the truck. Keep the winch cable taut at all times.

When securing the **MARKLIFT** to the truck, put the chains or straps through the tiedown brackets only. **DO NOT CHAIN OR STRAP OVER THE PLATFORM OR GUARD RAILS.** Severe damage to the scissor arms may result from excess pressure caused by securing the machine over the top of the platform.

All **MARKLIFT** units are tested and operated to assure their proper operating condition before shipment.

At that time, all necessary adjustments are made and an overall physical inspection is conducted. After the unit is delivered, some minor adjustments and inspections must be made before putting the unit into service.

The following items should be reviewed:

1. **Check gasoline power units.**
   - A. Engine oil level
   - B. Air filter
   - C. Fuel filter
   - D. Fuel Level (regular gasoline or propane)
   - E. Fuel lines and valves
   - F. Battery condition
   - G. Start engine

2. **Check operation of functions from both the ground control panel and the aerial control panel.**
   - A. Test drive: Forward and Reverse
   - B. Test steering: Left and Right
   - C. Test lift: Up and Down

3. **Inspect all electrical connections.**
   - A. See
   - B. Feel
   - C. Tighten

4. **Check hydraulic system.**
   - A. Hydraulic fluid level
   - B. In-line pressure valve filter
   - C. Hydraulic lines
   - D. Hydraulic pump
   - E. Hydraulic cylinders

5. **Check Tires and Wheels.**
   - **A.** For Cuts
   - **B.** Correct pressure
   - **C.** Tight lugs and wheel spindle nuts

6. **Structural connections and fittings**
   - **A.** Check all nuts and bolts for tightness.

7. **Brakes**
   - **A.** Check for holding on incline up to four (4) degrees.

This preventive maintenance information is intended as a general guide. Refer to vendor section in this manual for detailed information on engine, battery, etc.

MARK INDUSTRIES recommends the following items be checked:

DAILY

1. Operation and safety decals in place and legible.
2. Check gas & hydraulic tank levels.
3. Check engine oil level.
4. Check for loose or worn hardware.

WEEKLY

1. Check tire condition (free of serious cuts or defects)
2. Check & clean engine intake air cleaner.
3. Operation and safety decals in place and legible.
4. Proper brake operation.
5. Record hourmeter reading.
6. Clean unit by removing all dirt, oil, and grease. Machine may be washed with soap and water.
7. Check for hydraulic leaks and correct.
8. Check for structural damage and correct.
9. Check overall performance.
10. Check for wear on cables and hoses.

To properly and efficiently service your **MARKLIFT**, several basic tools are required. The following list of tools should be available.

SERVICE TOOLS

1. Voltmeter
2. Hydraulic pressure gage (0-3,000 PSI)
3. Battery hydrometer
4. Battery load tester
5. Photo tachometer
6. Standard mechanic's handtools
7. Scissor arm supports
8. Female quick disconnect coupler (MI #842)
9. Fuel pump vacuum/pressure gage (automatic type)
10. Electrical test light

Whenever troubleshooting any problem, the initial consideration must be to **"Check the basics".**

"Check the basics" means to insure that the batteries are in good shape and have **at least a three-quarter charge,** determined by use of a hydrometer and battery maintenance instructions.

A large percentage of electrical problems can be attributed to insufficiently charged or defective batteries.

1. **ELECTRICAL**

   A. If a problem seems to be electrical, utilize your applicable schematic (See Schematic Chapter for more information) and test light to trace power flow (electrical current), starting at the battery and continuing through system until the problem is located.

   B. Keep in mind, if you **DO NOT** have a good ground to a valve coil, relay, etc. , then even if you have proper electrical current to the coil or relay, the items will not function properly.

   C. Diodes can be thought of as **"One way electrical check valves."** They permit current flow in one direction and restrict it in the opposite direction.

Current Flow

ACTUAL

SCHEMATIC

D. The basic purpose of a relay is to maintain full electrical current. When sending an electrical signal to the relay coil, the electrical current flows through the relay contacts and to the desired valve coil.

2. HYDRAULIC

A. For the various hydraulic functions, the system pressure is utilized. If a slower drive speed is needed, a portion of the hydraulic fluid is dumped to tank by a flow control valve.

B. Directional valves (Steering and Drive) have two opposite electrical coils with a movable spool between the coils.

C. One-way valves (Lift, High-Drive and Descent) all can be both N/C (normally closed) or N/O (normally open), depending on whether flow is desired or not.

1. ENGINE

A. Will not start or run.

1) Check ground control box circuit breaker.
2) Make sure fuel shutoff valve is open.
3) Fuel selector should be in the GASOLINE position.
4) Check for low battery.
5) Check for fouled spark plugs.
6) Check for water in gas tank.
7) Check engine points.

B. Dies under load.

1) Check governor setting.
2) Check carburetor air/fuel mixture.

2. HYDRAULIC MOTOR AND PUMP

A. Wheel drive motor turns wheel while unloaded, but slows down or stops when load is applied.

1) Check hydraulic high pressure port with 3000 gage.

B. Pump producing excessive noise.

1) Check suction hose from tank to pump for kinks.
2) Check hydraulic oil level (sight gage on tank).
3) Check suction line fittings for tightness.
4) Check oil.

3. **STEERING**

A. **Steers in one direction only.**

1) Loose electrical connection.
2) Spool sticking in one direction.
3) Faulty steering switch.
4) Flow control valve to steering cylinder out of adjustment.
5) Faulty diode.

4. **DRIVE**

A. **Will drive forward. No reverse.**

1) Loose electrical connection in reverse circuit.
2) Faulty drive switch.
3) Valve spool sticking in one direction.
4) Faulty diode.

B. **No forward or reverse drive.**

1) Free wheeling valve open.
2) Faulty drive switch.
3) Stuck valve spool.

C. **No high speed.**

1) Loose electrical connections.
2) High speed dump valve inoperative.
3) Low speed relay inoperative.

D. **No functions working.**

1) Faulty circuit breaker.
2) Loose power connections.
3) Dump valve inoperative.

E. No system pressure.

1) No hydraulic oil.
2) Hydraulic tank valve is in OFF position.
3) Pressure relief valve inoperative.
4) Hydraulic pump inoperative.
5) Dump valve inoperative.

F. Low system pressure.

1) Pressure relief valve out of adjustment.
2) Low speed dump valve faulty.
3) Hydraulic pump faulty.
4) Hydraulic tank suction filter obstructed.

5. LIFT

A. Will not lift. All other functions work.

1) Loose electrical connections.
2) Descent valve stuck open.
3) Faulty lift switch.
4) Tilt switches out of adjustment.

B. Will not lift rated load.

1) Low system pressure.
2) Internal seal leaking in cylinder.

If this troubleshooting checklist does not help to solve your problem, contact your local **MARKLIFT** representative or the **MARK INDUSTRIES** service department.

A new fully charged battery will have a specific gravity of 1.260 or 1.280 at 80°F.

The tables (on Maintenance page 4) show the specific gravity as a function of percentage battery charge

1.260 Sp. Gr.	1.280	100% charged
1.230	1.250	75% charged
1.200	1.220	50% charged
1.170	1.190	25% charged
1.40	1.160	Very little useful capacity
1.110	1.130	Discharged

The percentage charge of a battery should be checked with a good hydrometer that has a thermometer and temperature correction scale built into it. This allows a temperature correction to be made readily. A correction of 0.04 points in gravity shall be made for each ten degrees either above or below 80°F. For every 10°F below 80°F, subtract 0.04 points; and for every 10°F above 80°F, add 0.04 points.

Within every thirty day period, the cell of each battery should be checked to determine the percentage charge. If any cell has a hydrometer reading of more than 0.020 less than the other cells in the battery, that cell is bad and the battery should be removed from service.

Periodic checks by hydrometer after charging, but prior to any discharge, is recommended to determine if batteries are receiving a full charge.

Either excessive overcharge or moderate undercharge can shorten battery life.

With proper attention to water level and charging time, compared to hydrometer reading, the batteries should give a long useful life.

TEMPERATURE/SPECIFIC GRAVITY CORRECTION TABLE FOR BATTERIES

Actual Hydrometer Reading at Actual Temperature*

80°F (27°C)	0°F (-18°C)	-10°F (-23°C)	-20°F (-29°C)	-30°F (-34°C)	-45°F (-43°C)	-65°F (-54°C)	Approx. State of Charge In %
1.280	1.312	1.316	1.320	1.324	1.330	1.338	100
1.250	1.282	1.286	1.290	1.294	1.300	1.308	75
1.220	1.252	1.256	1.260	1.264	1.270	1.278	50
1.190	1.222	1.226	1.230	1.234	1.240	1.248	25
1.160	1.192	1.196	1.200	1.204	1.210	1.218	0

Specific Gravity Corrected to 80°F (17°C)	Freezing Temperature	
1.280	-90°F	-68°C
1.250	-62°F	-52°C
1.200	-16°F	-27°C
1.150	+ 5°F	-15°C
1.000	+19°F	- 7°C

MILESTONE			HYDRAULIC FLUID TABLE			
OIL COMPANY			CHEVRON	GULF	SHELL	UNION
BRAND NAME			ATF Dexron 11	ATF Dexron 11	Donaz-T6	ATF Dexron
VISCOSITY	SUS AT 100°F (37.8°C)		187.4	195	200	200
	SUS AT 210°F (98.9°C)		49.2	50.4	50	52.3
	INDEX	°F	153°	155°	160°	172°
		°C	67.2°	68.3°	71.1°	77.8°
FLASH POINT		°F	400°	405°	390°	395°
		°C	204.4°	207.2°	198.9°	201.7°
POUR POINT		°F	-40°	-50°	-50°	-45°
		°C	-40°	-45.6°	-45.6°	-42.8°

MODEL:________ SER. NO.:________ DATE SOLD ________

DATE IN SERVICE ________ OPTIONS ________ WARRANTY PERIOD ________

CODE:
C-CHECKED N-NEW PART
A-ADJUSTED X-NEEDS REPAIR
R-REPAIRED

DATE	W.O.	MECH.	HR METER	PREVENTIVE MAINT.										ELECTRICAL						HYDRAULIC								FUEL			STEER				TIRE		MAJ.		MISC.				
				OIL CHANGE	OIL FILTER	AIR CLEANER	HYDRAULIC OIL CHANGE	HYDRAULIC OIL FILTER	WHEEL BEARING PACK	DRIVE MOTOR BRUSHES	PUMP MOTOR BRUSHES	ELECTRICAL CONTROLS	TRANS & DIFF OIL CHG	TUNE UP SPARK PLUGS	GENERATOR	VOLTAGE REGULATOR	BATTERY	STARTER	POINTS AND CONDENSER	HYDRAULIC SYSTEM	LEV CYL	LIFT CYL SEALS	HYD CONTROL VALVE	HYD PUMP	ROTARY MANIFOLD	LIFT ROLLERS	HYD HOSES	FUEL SYS	CARBURATOR	FUEL PUMP	STEERING	STEERING HOSES	STEER GEAR	STEER CYL	DRIVE TIRE	STEER TIRE	ENGINE O/H	DRIVE AXLE O/H	BRAKES				

DATE	REMARKS	DATE	REMARKS	AGENCY

MARKLIFT SERVICE MAINTENANCE RECORD

MODEL: _____ SERIAL NO. _____

DATE: _____ EQUIP. NO. _____

LOCATION: _____ MECHANIC: _____

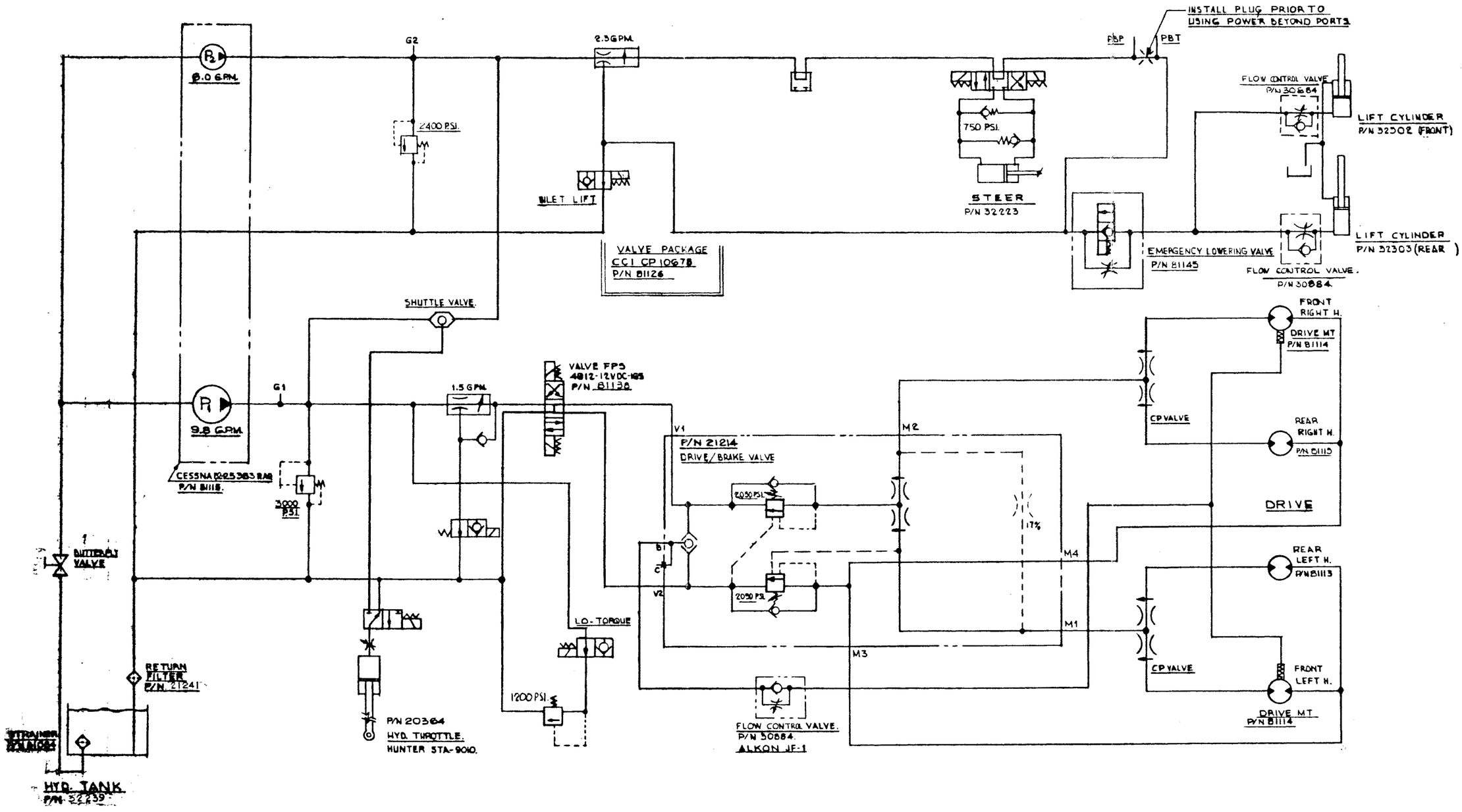
ITEM	CODE	COMMENTS	ITEM	CODE	COMMENTS
ENGINE OIL			SAFETY CUT-OUTS		
ENGINE OIL FILTER			BUSHINGS		
AIR FILTER			ROLLERS		
FUEL FILTER			WEAR PAD		
TUNE-UP			FRONT END ASSY.		
CHOKE			TIRE PRESSURE		
ENGINE RPM			TIRE CONDITION		
CHARGING SYSTEM			WHEEL NUTS		
FUEL SYSTEM LPG-GAS			WHEEL BEARING		
BATTERIES			NUTS & BOLTS		
BATTERY TERMINALS			GUARD RAILS		
MOTOR BRUSHES			LUBRICATION		
HYDRAULIC FLUID			WARNING DECALS		
HYD. OIL FILTER			OPERATION INSTRUCTIONS		
HYDRAULIC SYSTEMS			GENERAL DECALS		
HYDRAULIC PRESSURE			PAINT		
HYDRAULIC HOSES			ALL OPERATIONS		
CYLINDERS			LIFT		
DRIVE MOTORS			STEERING		
BRAKES			FORWARD DRIVE		
EMERGENCY LOWERING VALVE			REVERSE DRIVE		
AERIAL CONTROL BOX			TILT SWITCHES		
GROUND CONTROL BOX			FUEL LEVEL		
RELAYS			LITERATURE		
WIRE CONNECTIONS			OPTIONS		

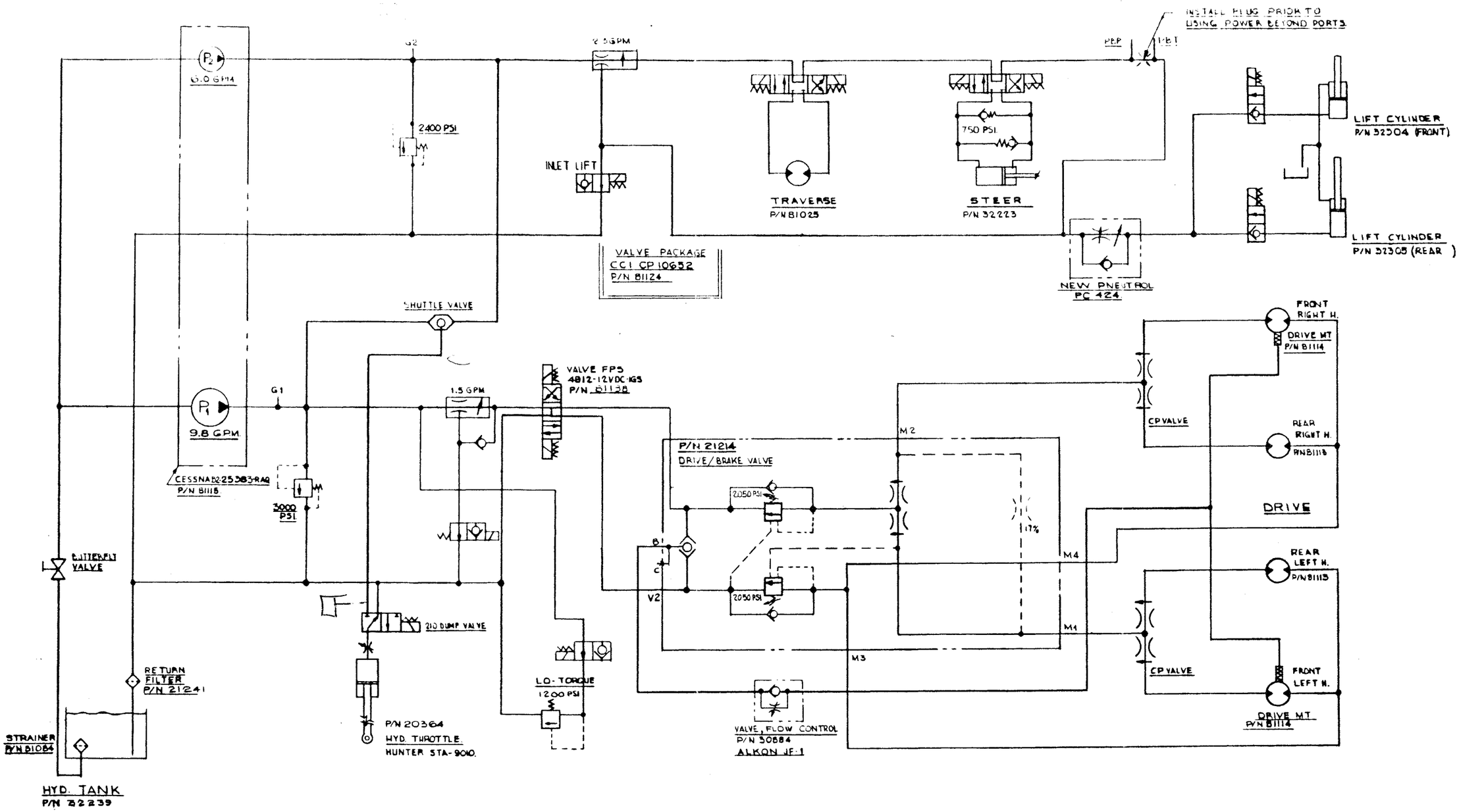
CODE

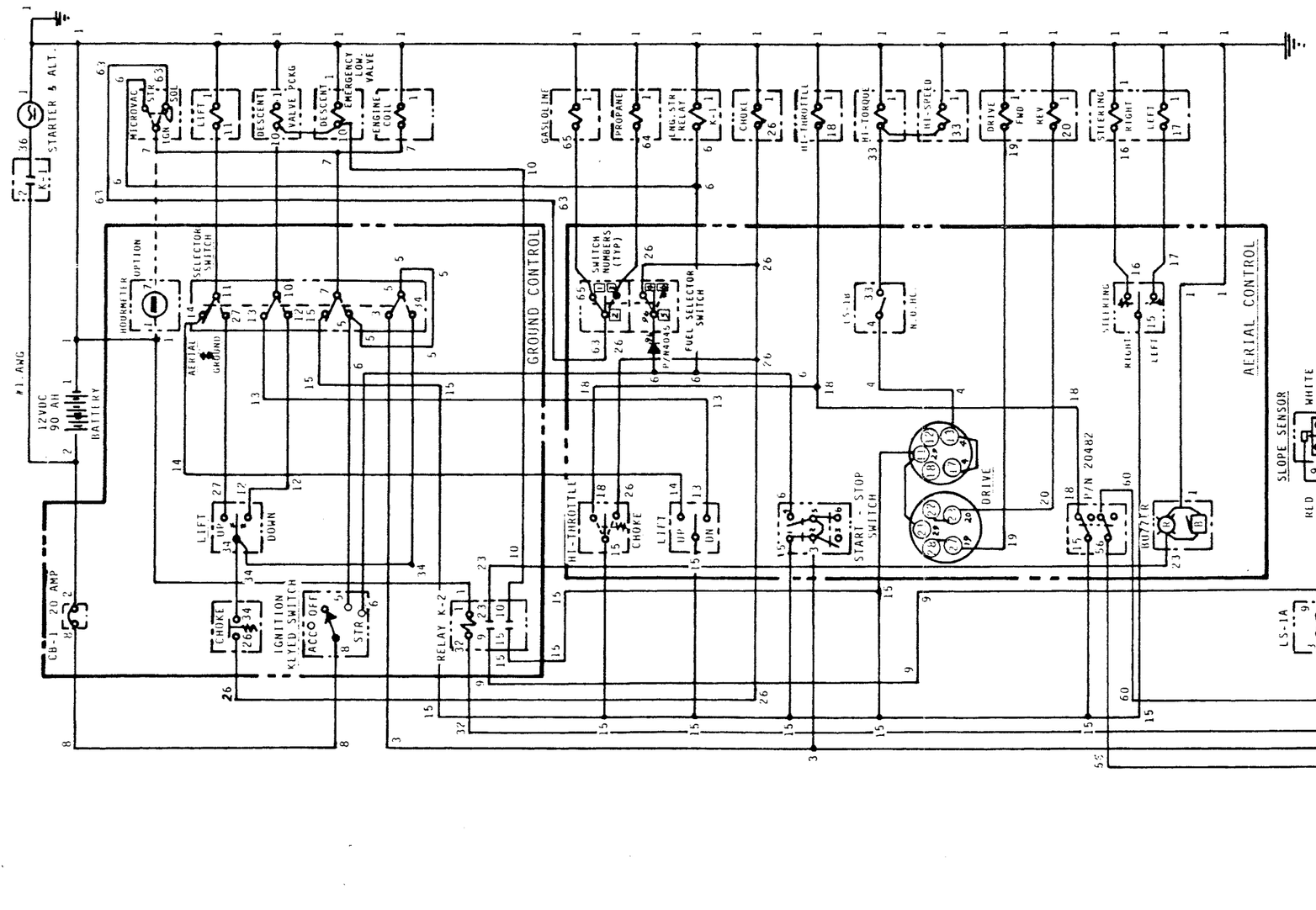
F - FILLED
R - REPAIRED
C - CHECKED
A - ADJUSTED
X - NEEDS REPAIR

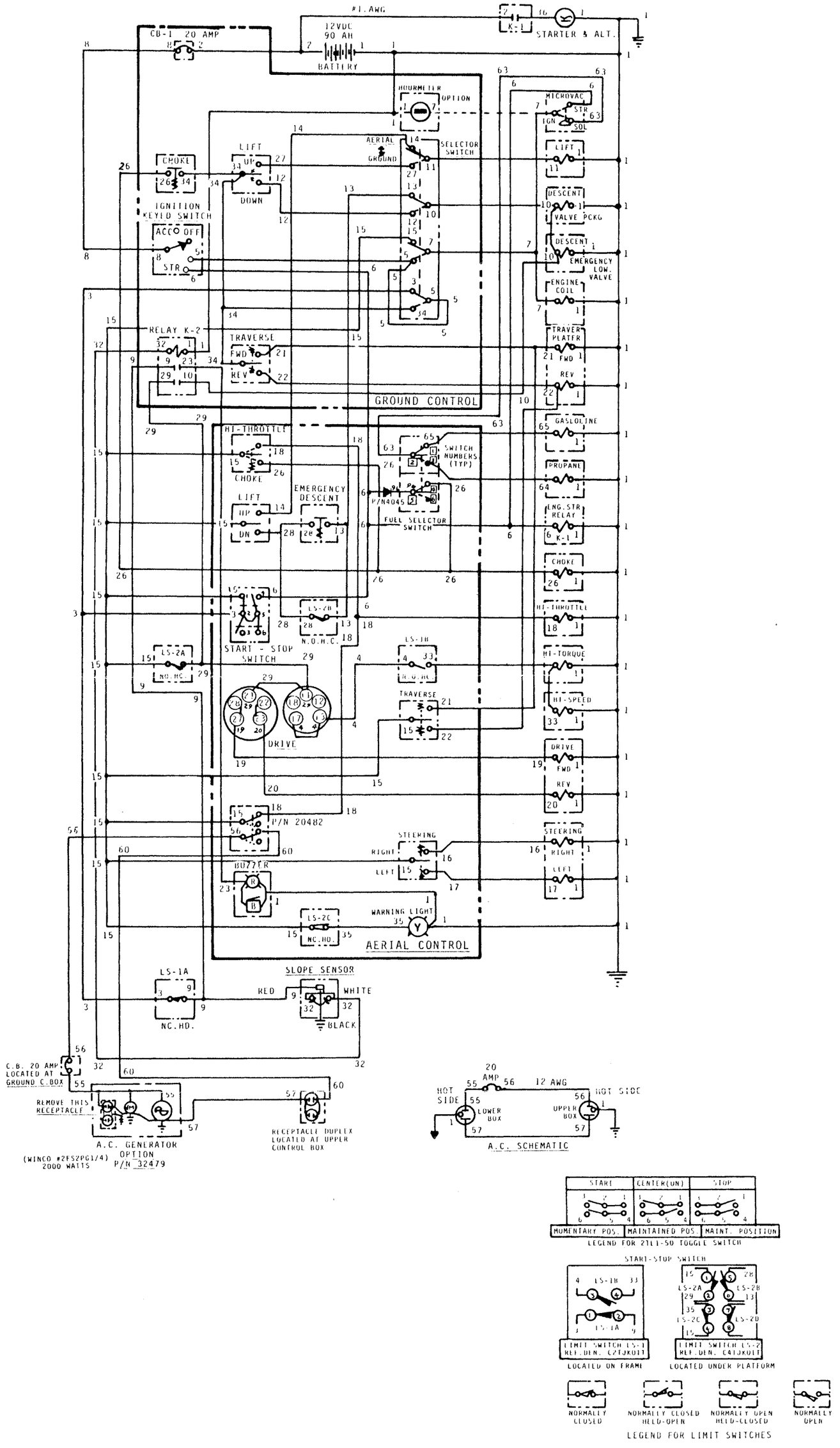
OTHER COMMENTS:

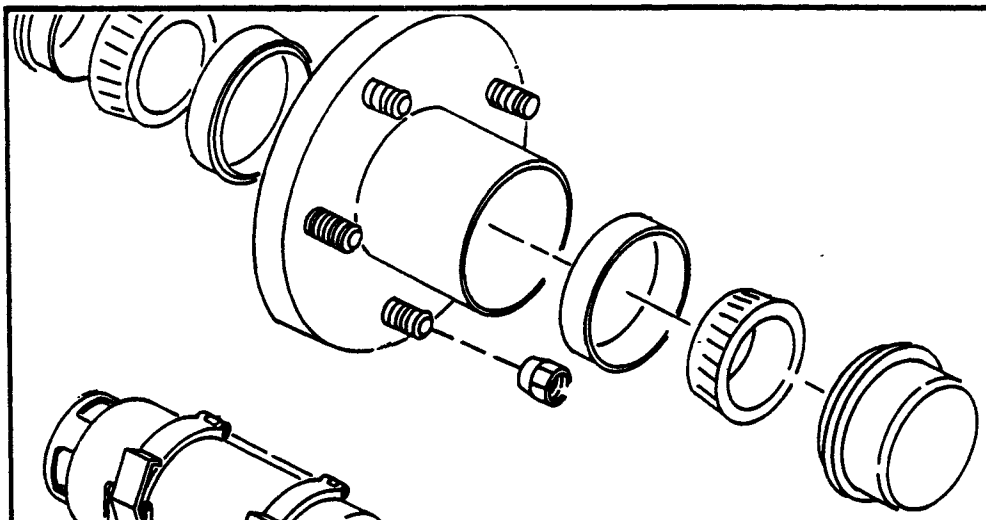
REV.

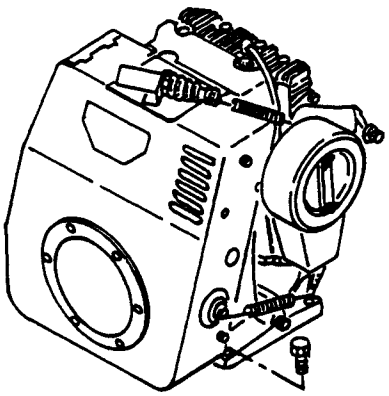

P2
8.0 G.P.M.
G2
2400 PSI.
2.3 G.P.M.
INLET LIFT
VALVE PACKAGE
CCI CP 10678
P/N 81126
INSTALL PLUG PRIOR TO
USING POWER BEYOND PORTS
PBP
PBT
750 PSI.
STEER
P/N 32223
FLOW CONTROL VALVE
P/N 30684
LIFT CYLINDER
P/N 32302 (FRONT)
LIFT CYLINDER
P/N 32303 (REAR)
EMERGENCY LOWERING VALVE
P/N 81145
FLOW CONTROL VALVE.
P/N 30884.
SHUTTLE VALVE.
VALVE FP3
4812-12VDC-HPS
P/N 81130
P
9.8 G.P.M.
G1
1.5 G.P.M.
CESSNA 2425383 RAG
P/N 81115.
3000 PSI
BUTTERFLY VALVE
RETURN FILTER
P/N 21241
STRAINER ELEMENT
HYD. TANK
P/N 32239
P/N 20364
HYD. THROTTLE.
HUNTER STA-9010.
LO-TORQUE
1200 PSI.
V1
P/N 21214
DRIVE/BRAKE VALVE
V2
B
C
2050 PSI.
2050 PSI.
M2
M4
M1
M3
17%
FLOW CONTROL VALVE.
P/N 30884.
ALKON JF-1
FRONT
RIGHT H.
DRIVE MT
P/N 81114
CP VALVE
REAR
RIGHT H.
P/N 81115
DRIVE
REAR
LEFT H.
P/N 81113
CP VALVE
FRONT
LEFT H.
DRIVE MT
P/N 81114

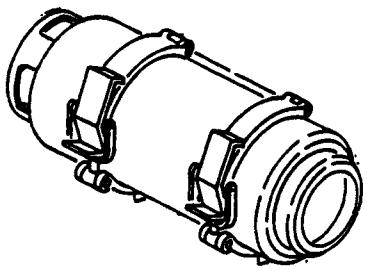

P2
6.0 GPM
G2
2400 PSI
2.5GPM
INLET LIFT
TRAVERSE
P/N 81025
750 PSI.
STEER
P/N 32223
PBP
PBT
INSTALL PLUG PRIOR TO USING POWER BEYOND PORTS
LIFT CYLINDER
P/N 32304 (FRONT)
LIFT CYLINDER
P/N 32305 (REAR)
VALVE PACKAGE
CCI CP10632
P/N 81124
NEW PNEUTROL
PC 424
SHUTTLE VALVE
P1
9.8 GPM
G1
CESSNA B25383-RAQ
P/N 81118
3000 PSI
1.5 GPM
VALVE FPS
4812-12VDC-IGS
P/N 81128
P/N 21214
DRIVE/BRAKE VALVE
2050 PSI
2050 PSI
17%
M2
M4
M1
M3
B
C
V2
BUTTERFLY VALVE
210 DUMP VALVE
RETURN FILTER
P/N 21241
STRAINER
P/N 81084
HYD. TANK
P/N 32239
LO-TORQUE
1200 PSI
P/N 20364
HYD. THROTTLE
HUNTER STA-9010.
VALVE, FLOW CONTROL
P/N 30884
ALKON JF-1
FRONT RIGHT H.
DRIVE MT
P/N 81114
CP VALVE
REAR RIGHT H.
P/N 81118
DRIVE
REAR LEFT H.
P/N 81115
CP VALVE
FRONT LEFT H.
DRIVE MT
P/N 81114

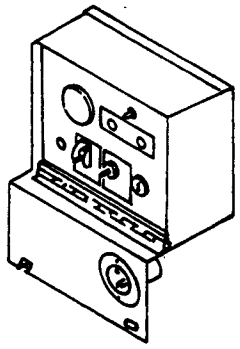

12VDC
90 AH
BATTERY
#1 AWG
CB-1 20 AMP
IGNITION
KEYED SWITCH
ACC OFF
STR
CHOKE
RELAY K-2
LIFT
UP
DOWN
HOURMETER
OPTION
SELECTOR SWITCH
AERIAL
GROUND
GROUND CONTROL
STARTER & ALT.
K-1
MICROVAC
PTO
IGN
SOL
LIFT
DESCENT
VALVE PCKG
EMERGENCY LOW. VALVE
ENGINE COIL
GASOLINE
PROPANE
ENG. STR RELAY
K-1
CHOKE
HI-THROTTLE
HI-TORQUE
HI-SPEED
DRIVE
FWD
REV
STEERING
RIGHT
LEFT
SWITCH NUMBERS (TYP)
FUEL SELECTOR SWITCH
P/N 40045
LS-1B
N.O. HD.
START - STOP SWITCH
DRIVE
P/N 20482
BU77ER
SLOPE SENSOR
WHITE
BLACK
RED
LS-1A
N.C. HD.
AERIAL CONTROL
HOT SIDE
20 AMP
12 AWG
UPPER BOX
A.C. SCHEMATIC
C.B. 20 AMP
LOCATED AT
GROUND C. BOX
REMOVE THIS
RECEPTACLE
RECEPTACLE DUPLEX
LOCATED AT UPPER
CONTROL BOX
A.C. GENERATOR
OPTION
(WINCO #2FS2PGJ/4)
2000 WATTS P/N 32479
START
CENTER(OFF)
STOP
MOMENTARY POS.
MAINTAINED POS.
MAINT. POSITION
LEGEND FOR 2TL1-50 TOGGLE SWITCH
START-STOP SWITCH
LS-1B
LS-1A
LIMIT SWITCH LS-1
ALT. DEN. CEJA011
LOCATED ON FRAME
NORMALLY CLOSED
NORMALLY OPEN
HELD-OPEN
HELD-CLOSED
LEGEND FOR LIMIT SWITCHES


#1 AWG
12VDC
90 AH
BATTERY
CB-1 20 AMP
K-1
STARTER & ALT.
HOURMETER
OPTION
MICROVAC
STR
IGN
SOL
AERIAL
GROUND
SELECTOR SWITCH
LIFT
UP
DOWN
CHOKE
IGNITION KEYED SWITCH
ACC
OFF
STR
RELAY K-2
TRAVERSE
FWD
REV
GROUND CONTROL
HI-THROTTLE
CHOKE
EMERGENCY DESCENT
SWITCH NUMBERS (TYP)
P/N4045
FULL SELECTOR SWITCH
LS-2B
N.O.H.C.
START - STOP SWITCH
LS-2A
NO. HC.
LS-1B
N.O. HC.
TRAVERSE
DRIVE
P/N 20482
BUZZER
STEERING
RIGHT
LEFT
WARNING LIGHT
LS-2C
NC.HO.
AERIAL CONTROL
DESCENT VALVE PCKG
DESCENT EMERGENCY LOW. VALVE
ENGINE COIL
TRAVER PLATFR
GASOLINE
PROPANE
ENG.STR RELAY
HI-TORQUE
HI-SPEED
SLOPE SENSOR
RED
WHITE
BLACK
LS-1A
NC.HO.
C.B. 20 AMP LOCATED AT GROUND C.BOX
REMOVE THIS RECEPTACLE
A.C. GENERATOR
(WINCO #2FS2PG1/4) 2000 WATTS
OPTION P/N 32479
RECEPTACLE DUPLEX LOCATED AT UPPER CONTROL BOX
20 AMP
12 AWG
HOT SIDE
LOWER BOX
UPPER BOX
A.C. SCHEMATIC
START
CENTER(ON)
STOP
MOMENTARY POS.
MAINTAINED POS.
MAINT. POSITION
LEGEND FOR 2TE1-50 TOGGLE SWITCH
START-STOP SWITCH
LIMIT SWITCH LS-1 RET.DEN. CAT.#XCIT
LOCATED ON FRAME
LIMIT SWITCH LS-2 RET.DEN. CAT.#XCIT
LOCATED UNDER PLATFORM
NORMALLY CLOSED
NORMALLY CLOSED HELD-OPEN
NORMALLY OPEN HELD-CLOSED
NORMALLY OPEN
LEGEND FOR LIMIT SWITCHES







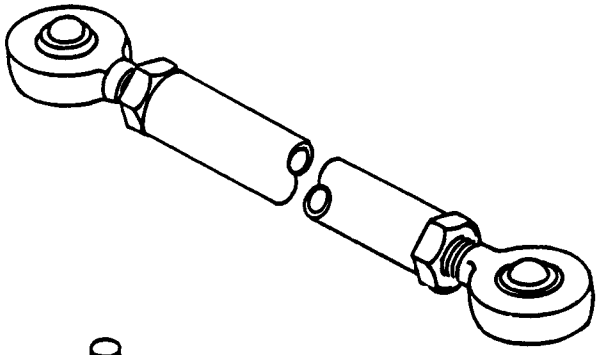


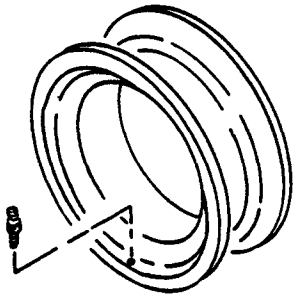
THIS **SECTION** 1 IS ILLUSTRATED AS:

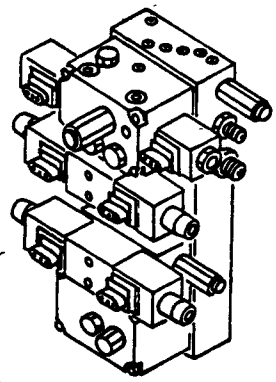
FIGURE 1 TABLE OF CONTENTS (PARTS ONLY)

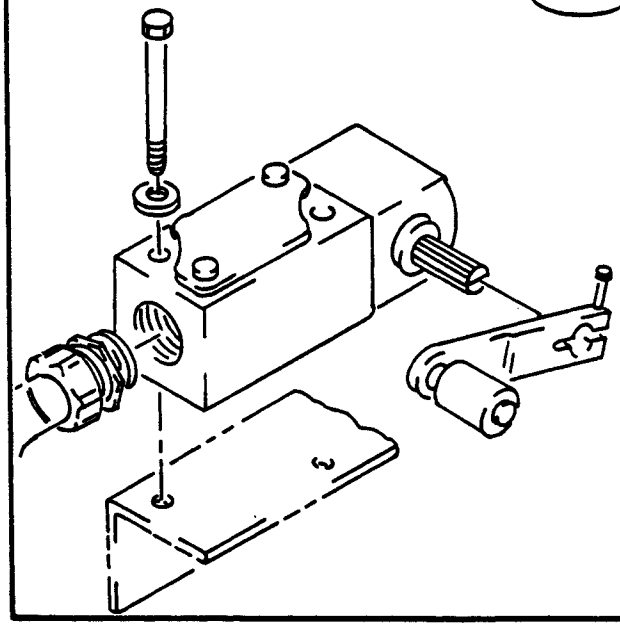
FIGURE 2 HOW TO USE PARTS CATALOG

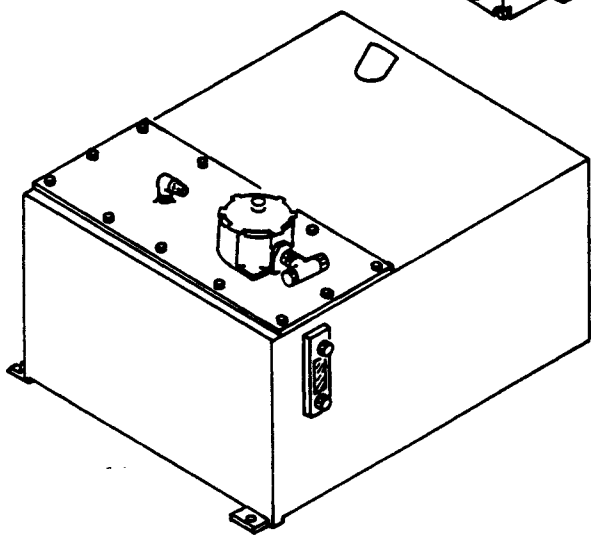
FIGURE 3 HOW TO ORDER PARTS







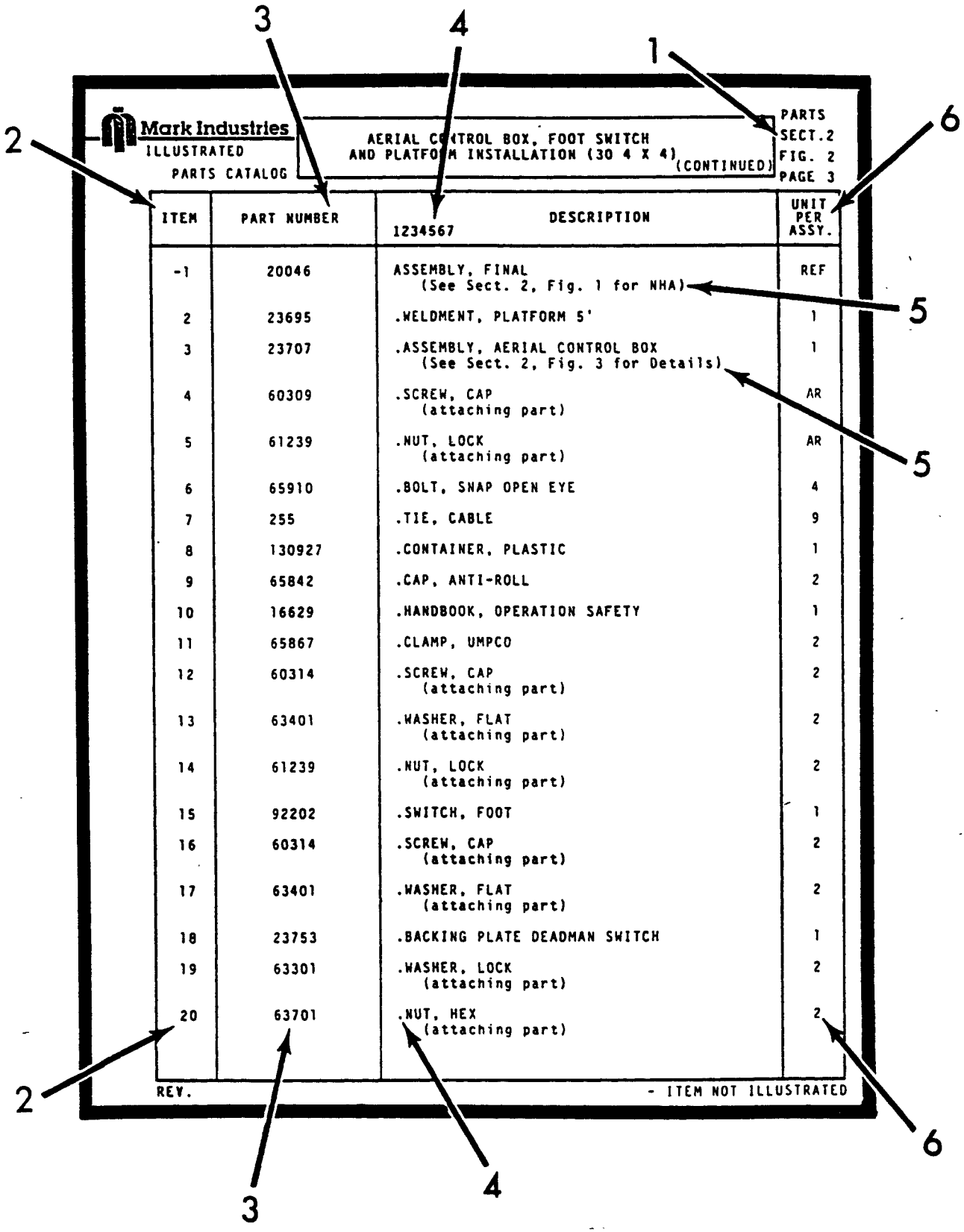




THIS PARTS CHAPTER IS DESIGNED AS:

*SECTION 3, FIGURES 3 THROUGH 10 NOT AVAILABLE FOR THIS REVISION

*THIS FIGURE IS NOT AVAILABLE FOR THIS REVISION



Mark Industries
ILLUSTRATED
PARTS CATALOG

AERIAL CONTROL BOX, FOOT SWITCH AND PLATFORM INSTALLATION (30 4 X 4) (CONTINUED)

PARTS
SECT.2
FIG. 2
PAGE 3

ITEM	PART NUMBER	1234567 DESCRIPTION	UNIT PER ASSY.
-1	20046	ASSEMBLY, FINAL (See Sect. 2, Fig. 1 for NHA)	REF
2	23695	.WELDMENT, PLATFORM 5'	1
3	23707	.ASSEMBLY, AERIAL CONTROL BOX (See Sect. 2, Fig. 3 for Details)	1
4	60309	.SCREW, CAP (attaching part)	AR
5	61239	.NUT, LOCK (attaching part)	AR
6	65910	.BOLT, SNAP OPEN EYE	4
7	255	.TIE, CABLE	9
8	130927	.CONTAINER, PLASTIC	1
9	65842	.CAP, ANTI-ROLL	2
10	16629	.HANDBOOK, OPERATION SAFETY	1
11	65867	.CLAMP, UMPCO	2
12	60314	.SCREW, CAP (attaching part)	2
13	63401	.WASHER, FLAT (attaching part)	2
14	61239	.NUT, LOCK (attaching part)	2
15	92202	.SWITCH, FOOT	1
16	60314	.SCREW, CAP (attaching part)	2
17	63401	.WASHER, FLAT (attaching part)	2
18	23753	.BACKING PLATE DEADMAN SWITCH	1
19	63301	.WASHER, LOCK (attaching part)	2
20	63701	.NUT, HEX (attaching part)	2

REV. - ITEM NOT ILLUSTRATED

1. This area refers to the corresponding illustration.

   1) **Chapter** should be divided with General, Operation, Maintenance, Schematics, Parts, Vendor and Service Bulletins.

   2) **Section and Figure** belong to Parts Chapter only. Please check page of contents and each Section in Parts Chapter.

   3) Page numbers are followed for chapter or section, and figure.

2. The **Item Number** corresponds to the item number shown for the part in the illustration. (Parts with item numbers preceded by a dash are not illustrated such as -1, -5, etc.)

3. **Parts** that carry a **Mark Industries** part number.

4. The **Indenture System** used in the detail parts list of this catalog shows the relationship of one part to another. For a given item, the number of indentures depicts the relationship of the item to the associated installation, next higher assembly, or components of the item as follows:

   1 2 3 4 5 6 7

   Installation
   . Detail parts for installation
   . Assembly
   . Attaching parts for Assembly
   . . Detail parts for Assembly
   . . Sub-Assembly
   . . Attaching parts for Sub-Assembly
   . . . Detail parts for Sub-Assembly
   . . . Sub-Sub-Assembly
   . . . Attaching parts for Sub-Sub-Assembly
   . . . . Detail parts for Sub-Sub-Assembly
   . . . . Sub-Sub-Sub-Assembly

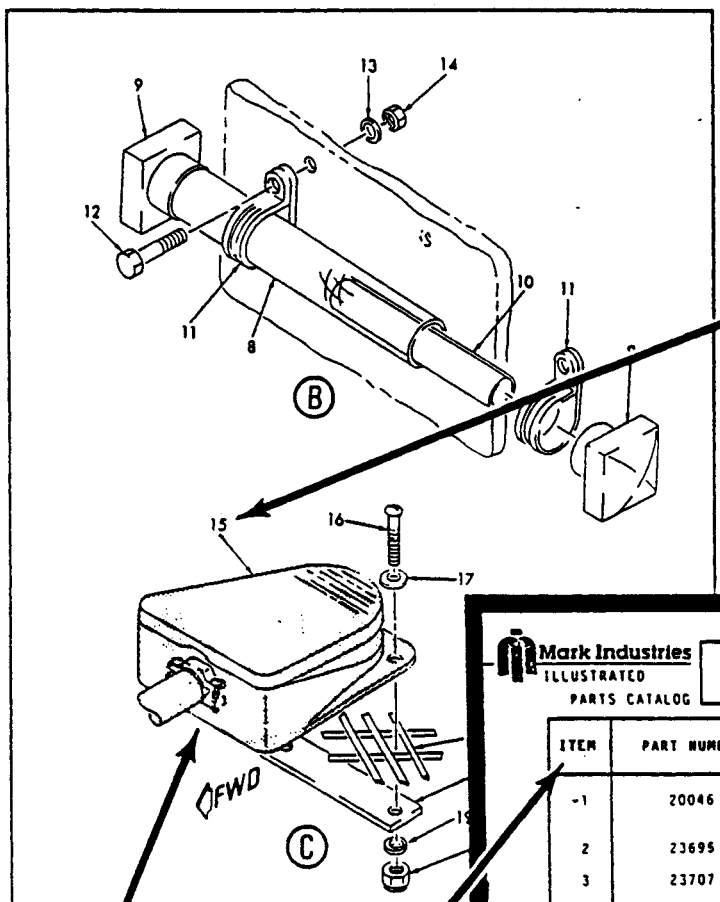
5. **NHA** (Next Higher Assembly) and **DETAILS** - Section and Figure reference catalog location indicates where the installation or assembly is listed under NHA and where illustrated for more detailed breakdown.

6. **UNIT PER ASSEMBLY** - Entries are as follows:

   1) **"REF"** indicates the item is listed previously in the NHA and then again in this figure.

   2) **"AR"** indicates the part is used in a quantity "As Required."

   3) **A number** entry indicates the quantity of the part used in its next higher application.



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	20046	ASSEMBLY, FINAL (See Sect. 2, Fig. 1 for NHA)	REF
2	23695	.WELDMENT, PLATFORM 5'	1
3	23707	.ASSEMBLY, AERIAL CONTROL BOX (See Sect. 2, Fig. 3 for Details)	1
4	60309	.SCREW, CAP (attaching part)	AR
5	61239	.NUT, LOCK (attaching part)	AR
6	65910	.BOLT, SNAP OPEN EYE	4
7	255	.TIE, CABLE	9
8	130927	.CONTAINER, PLASTIC	1
9	65842	.CAP, ANTI-ROLL	2
10	16629	.HANDBOOK, OPERATION SAFETY	1
11	65867	.CLAMP, UMPCO	2
12	60314	.SCREW, CAP (attaching part)	2
13	63401	.WASHER, FLAT (attaching part)	2
14	61239	.NUT, LOCK (attaching part)	2
15	92202	.SWITCH, FOOT	1
16	60314	.SCREW, CAP (attaching part)	2
17	63401	.WASHER, FLAT (attaching part)	2
18	23753	.BACKING PLATE DEADMAN SWITCH	1
19	63301	.WASHER, LOCK (attaching part)	2
20	63701	.NUT, HEX (attaching part)	2

REV.

- ITEM NOT ILLUSTRATED

1. PART NUMBER

STEP 1. Locate Section and Figure number within the table of contents and each Section page.

STEP 2. Match your required part with the illustration page.

STEP 3. Refer to the item number on the detail part list page.

STEP 4. Part number is located in the part number column. Order by using that part number.

2. TO ORDER:

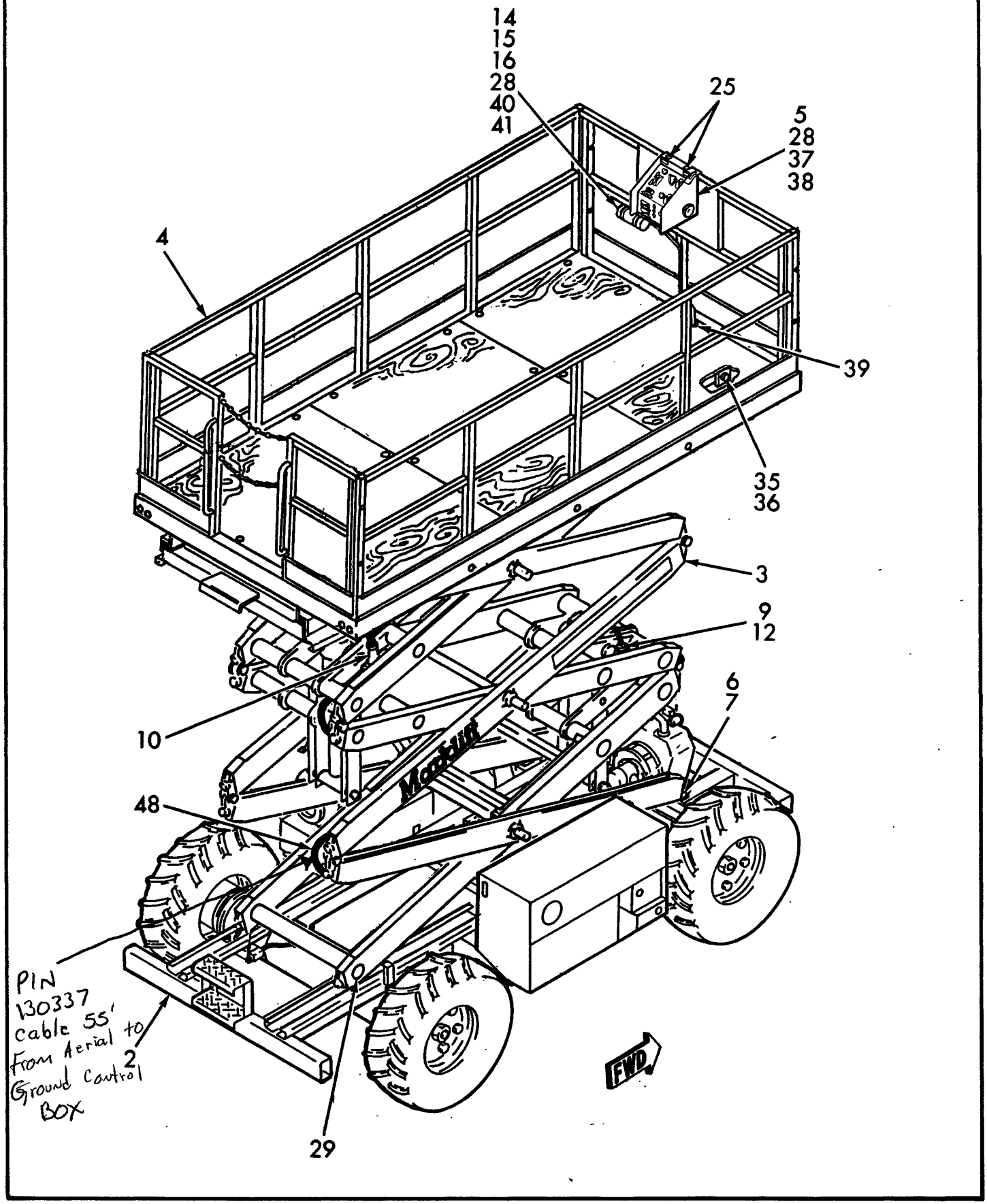
By phone: Service Department

(800) 421-1826
or
(213) 639-9700

By mail: Attention Service Department

MARK INDUSTRIES
Post Office Box 720
Long Beach, CA 90801

FIGURE 1. FINAL ASSEMBLY MT-25G



REV.

FIGURE 1. FINAL ASSEMBLY MT-25G

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	30042	ASSEMBLY, FINAL	REF
2	32231	. ASSEMBLY, FRAME (See Sect. 3, Fig. 1 for Details)	1
3	32351	. ASSEMBLY SCISSOR (See Sect. 4, Fig. 1 for Details)	1
4	32319	. ASSEMBLY, PLATFORM (See Sect. 5, Fig. 1 for Details)	1
5	32319	. ASSEMBLY, AERIAL CONTROL BOX (See Sect. 6, Fig. 1 for Details)	1
6	30889	. BOLT, EAR PIVOT	2
7	61304	. LOCK NUT	2
-8	80042-05	. UNION	5
9	80031-05	. UNION TEE	1
10	80014-05	. UNION ELBOW	1
-11	375	. RIVET, POP	12
12	80031-03	. UNION TEE	1
-13	765	. CLAMP, RUBBER	11
14	130927	. CONTAINER, PLASTIC	1
15	65867	. CLAMP	2
16	65842	. CAP, ANTI-ROLL	2
-17	16608	. PAINT, WHITE	5 Gal.
-18	16609	. PAINT, BLUE	2 Gal.
-19	2673	. PAINT, WHITE	AR
-20	2675	. PAINT, BLUE	AR
-21	65114	. GASOLINE	5 Gal.
-22	65116	. OIL, HYDRAULIC	10 Gal
-23	256	. CABLE TIE	50
-24	255	. CABLE TIE	50

- ITEM NOT ILLUSTRATED

FIGURE 1. FINAL ASSEMBLY MT-25G

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
25	61711	. SCREW, SELF-TAPPING	6
-26	16680	. TAPE	1 Roll
-27	2996	. OIL, MOTOR	¾ Gal.
28	61227	. LOCK NUT	4
29	65188	. PLUGS, CAP	20
-30	32256	. SCHEMATIC, HYDRAULIC(See Schematic Sect.)	1
-31	32257	. SCHEMATIC, ELECTRIC (See Schematic Sect.)	1
-32	32310	. DIAGRAM, HOSE KIT (See Sect. 2, Fig. 3 for Details)	1
-33	32234	. DIAGRAM, TUBE KIT (See Sect. 2, Fig. 3A for Details)	1
-34	130337-55	. CABLE CONDUCTOR	1
35	30706	. BOLT, EAR PIVOT	2
36	60706	. NUT	2
37	130776	. COVER, UPPER CONTROL BOX	1
38	60309	. CAP SCREW	4
39	2807	. STRAIN RELIEF	1
40	60315	. CAP SCREW	2
41	17034	. HANDBOOK, OPERATION AND SAFETY	1

- ITEM NOT ILLUSTRATED

FIGURE 1A. FINAL ASSEMBLY MT-25GT

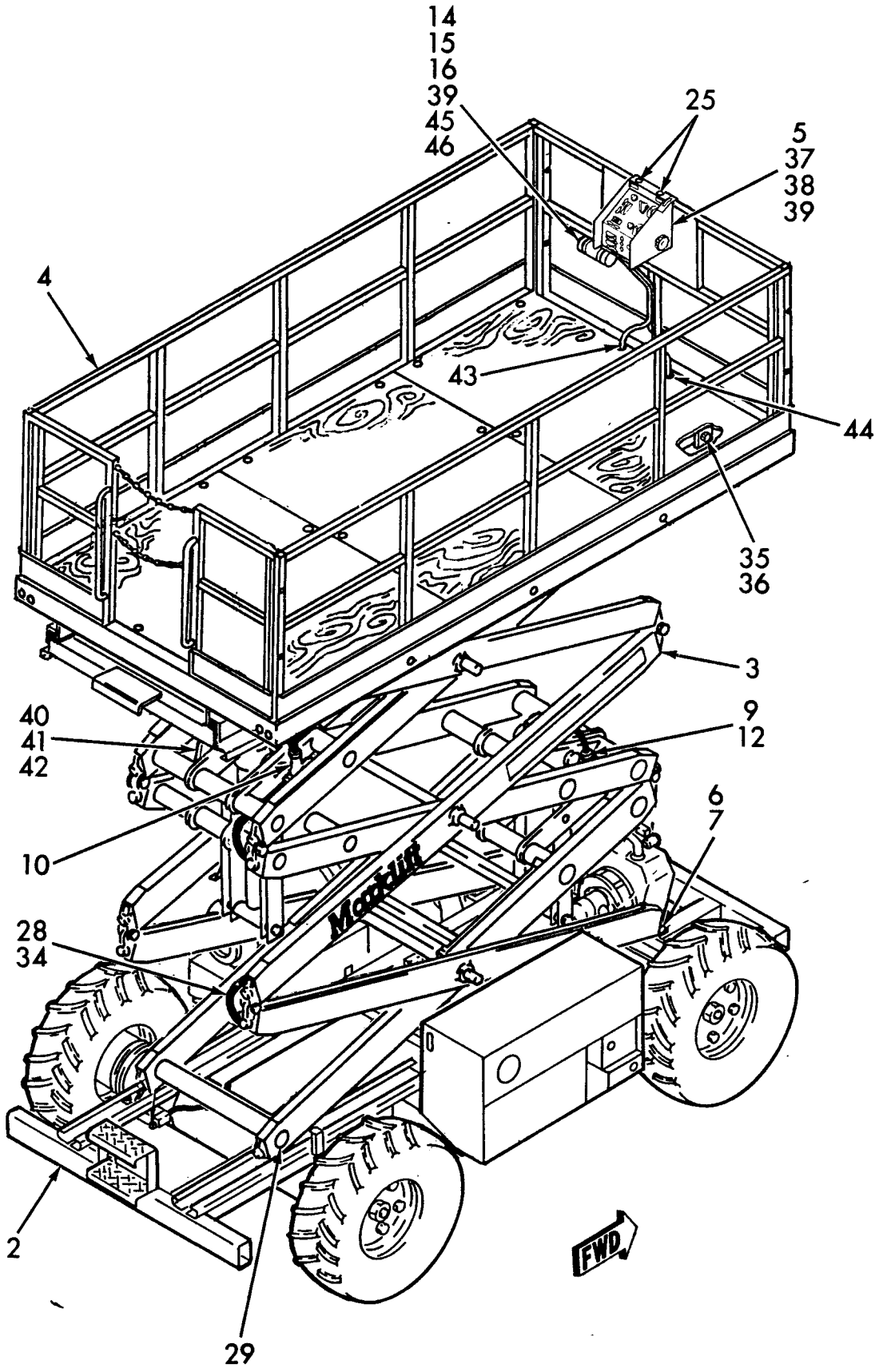


FIGURE 1. FINAL ASSEMBLY MT-25GT

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	30036	ASSEMBLY, FINAL	REF
2	32231	. ASSEMBLY, FRAME (See Sect. 3, Fig. 2 for Details)	1
3	32351	. ASSEMBLY SCISSOR (See Sect. 4, Fig. 2 for Details)	1
4	32319	. ASSEMBLY, PLATFORM (See Sect. 5, Fig. 2 for Details)	1
5	32319	. ASSEMBLY, AERIAL CONTROL BOX (See Sect. 6, Fig. 2 for Details)	1
6	30889	. BOLT, EAR PIVOT	2
-7	61304	. LOCK NUT	2
8	80042-05	. UNION	5
9	80031-05	. UNION TEE	1
10	80014-05	. UNION ELBOW	1
-11	375	. RIVET, POP	12
12	80031-03	. UNION TEE	1
-13	765	. CLAMP, RUBBER	11
14	130927	. CONTAINER, PLASTIC	1
15	65867	. CLAMP	2
16	65842	. CAP, ANTI-ROLL	2
-17	16608	. PAINT, WHITE	5 Gal.
-18	16609	. PAINT, BLUE	2 Gal.
-19	2673	. PAINT, WHITE	AR
-20	2675	. PAINT, BLUE	AR
-21	65114	. GASOLINE	5 Gal.
-22	65116	. OIL, HYDRAULIC	10 Gal
-23	256	. CABLE TIE	50
-24	255	. CABLE TIE	50

- ITEM NOT ILLUSTRATED

FIGURE 1. FINAL ASSEMBLY MT-25GT

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
25	61711	. SCREW, SELF-TAPPING	6
-26	16680	. TAPE	1 Roll
-27	2996	. OIL, MOTOR	¾ Gal.
28	4034	. CABLE	15 FT
29	65188	. PLUGS, CAP	20
-30	32216	. SCHEMATIC, HYDRAULIC (See Schematic Sect.)	1
-31	32289	. SCHEMATIC, ELECTRIC (See Schematic Sect.)	1
-32	32324	. DIAGRAM, HOSE KIT (See Sect. 2, Fig. 3 for Details)	1
-33	32328	. DIAGRAM, TUBE KIT (See Sect. 2, Fig. 3A for Details)	1
34	130337-55	. CABLE CONDUCTOR	1
35	30706	. BOLT, EAR PIVOT	2
36	60706	. NUT	2
37	130776	. COVER, UPPER CONTROL BOX	1
38	60309	. CAP SCREW	4
39	61227	. LOCK NUT	6
40	32439	. LOCKPLATE	1
41	60325	. CAP SCREW (attaching part)	3
42	63319	. LOCK WASHER (attaching part)	3
43	2807	. STRAIN RELIEF	1
44	16326	. STRAIN RELIEF	1
45	60315	. CAP SCREW	2
46	17034	. HANDBOOK, OPERATION AND SAFETY	1

- ITEM NOT ILLUSTRATED

FIGURE 2. DECAL KIT MT-25G & GT

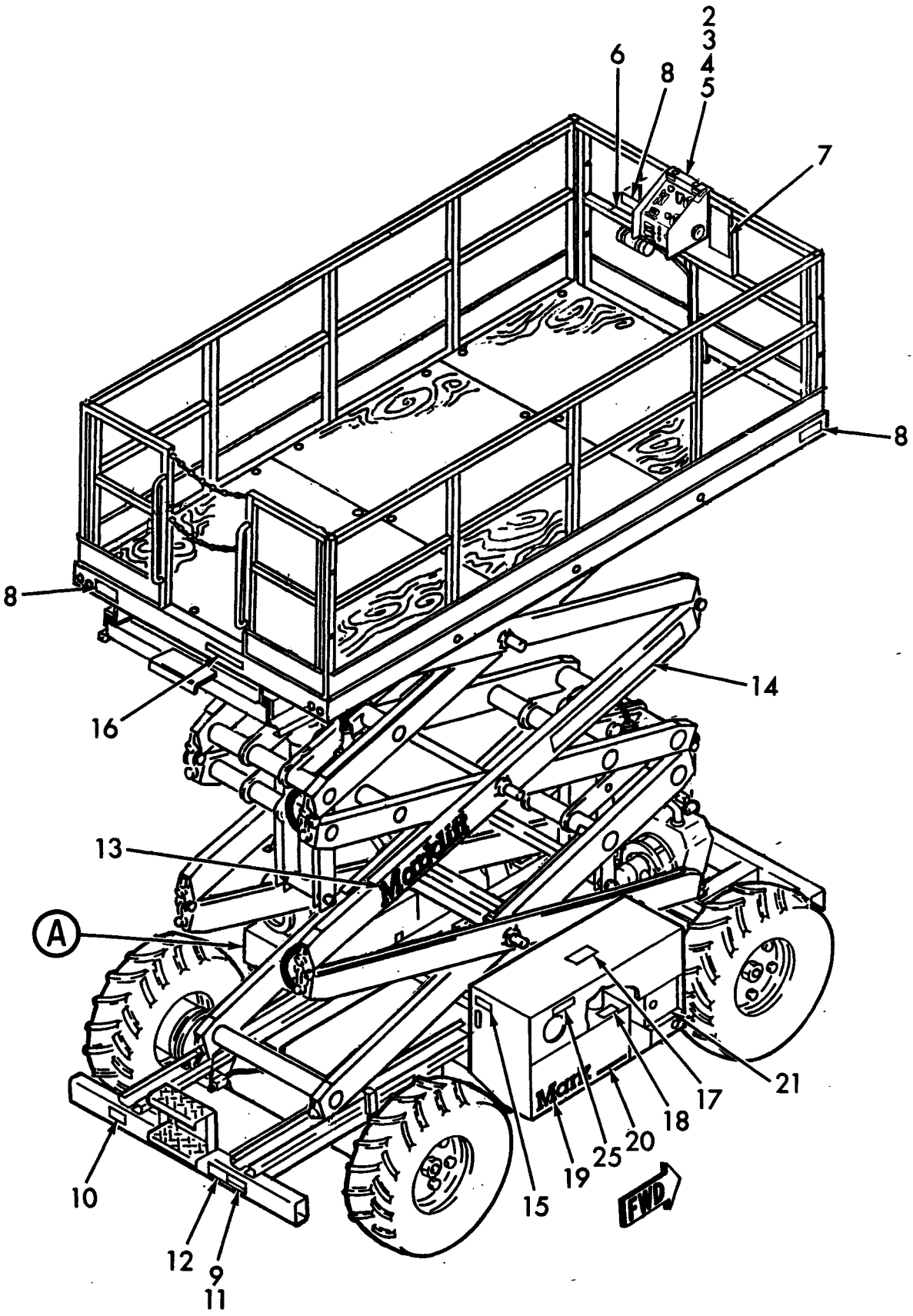


FIGURE 2. DECAL KIT MT-25G & GT

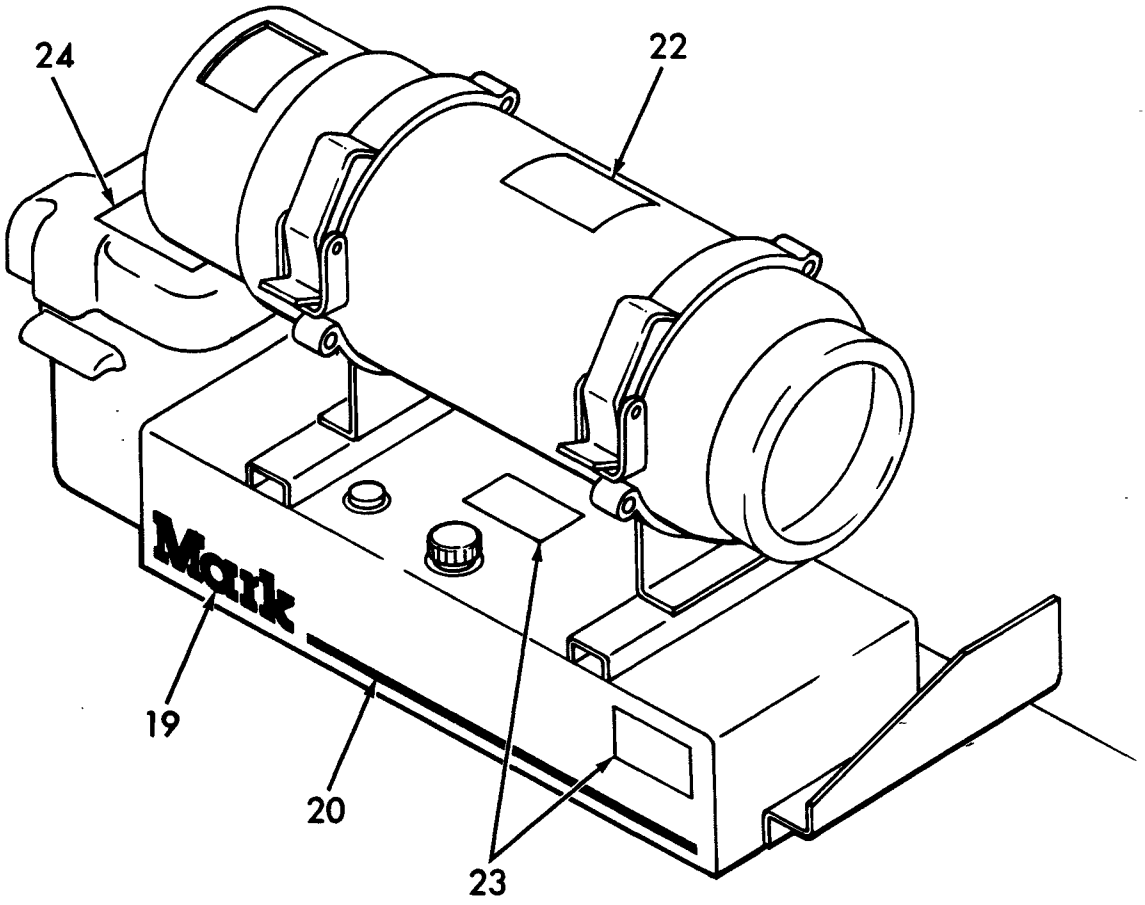


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FIGURE 2. DECAL KIT MT-25G & GT

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	67674	SET, DECAL	REF
2	130782	. DECAL, UPPER CONTROL BOX DRIVE (See Section 6, Fig. 1)	1
3	182718	. DECAL, UPPER CONTROL BOX STEER & LIFT (See Section 6, Fig. 1)	1
4	130796	. DECAL, UPPER CONTROL BOX HORN & FUEL (See Section 6, Fig. 1)	1
5	2014	. DECAL, CAUTION HIGH VOLTAGE LINES (See Section 6, Fig. 1)	1
6	130820	. DECAL, OPERATION & SAFETY HANDBOOK	1
7	32317	. DECAL, OPERATION INSTRUCTIONS	1
8	2024	. DECAL, LOAD CAPACITY 1500 LBS. (MT-25G)	5
	2026	. DECAL, LOAD CAPACITY 1000 LBS. (MT-25GT)	4
9	30520	. PLATE, PATENT NUMBER SCISSORS	1
10	2041	. DECAL, DO NOT LIFT	2
11	20661	. PLATE, ANSI A92	1
12	20660	. NAMEPLATE, IDENTIFICATION	1
13	31260	. DECAL, MARKLIFT	2
14	130596	. DECAL, A PRODUCT OF MARK INDUSTRIES	2
15	130606	. DECAL, FREEWHEELING VALVE	1
16	31109	. DECAL, CAUTION SCISSOR GUARD RAIL	2
17	2016	. DECAL, DO NOT WORK UNDER	1
18	2017	. DECAL, HYDRAULIC SYSTEM FLUID	1
19	130938	. DECAL, MARK	2
20	131061	. DECAL, BLUE STRIPE	2
21	32345	. DECAL, GROUND CONTROL BOX (See Section 3, Fig. 27)	1
22	2004	. DECAL, VAPOR TANK ONLY	1

- ITEM NOT ILLUSTRATED

FIGURE 2. DECAL KIT MT-25G & GT

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
23	2020	. DECAL, GASOLINE OR PETROL	2
24	2003	. DECAL, BATTERY WATER LEVEL	1
25	2019	. DECAL, EMERGENCY LOWERING VALVE (Used on MT-25G Only)	2

- ITEM NOT ILLUSTRATED

FIGURE 3. HOSE KIT DIAGRAM MT-25G

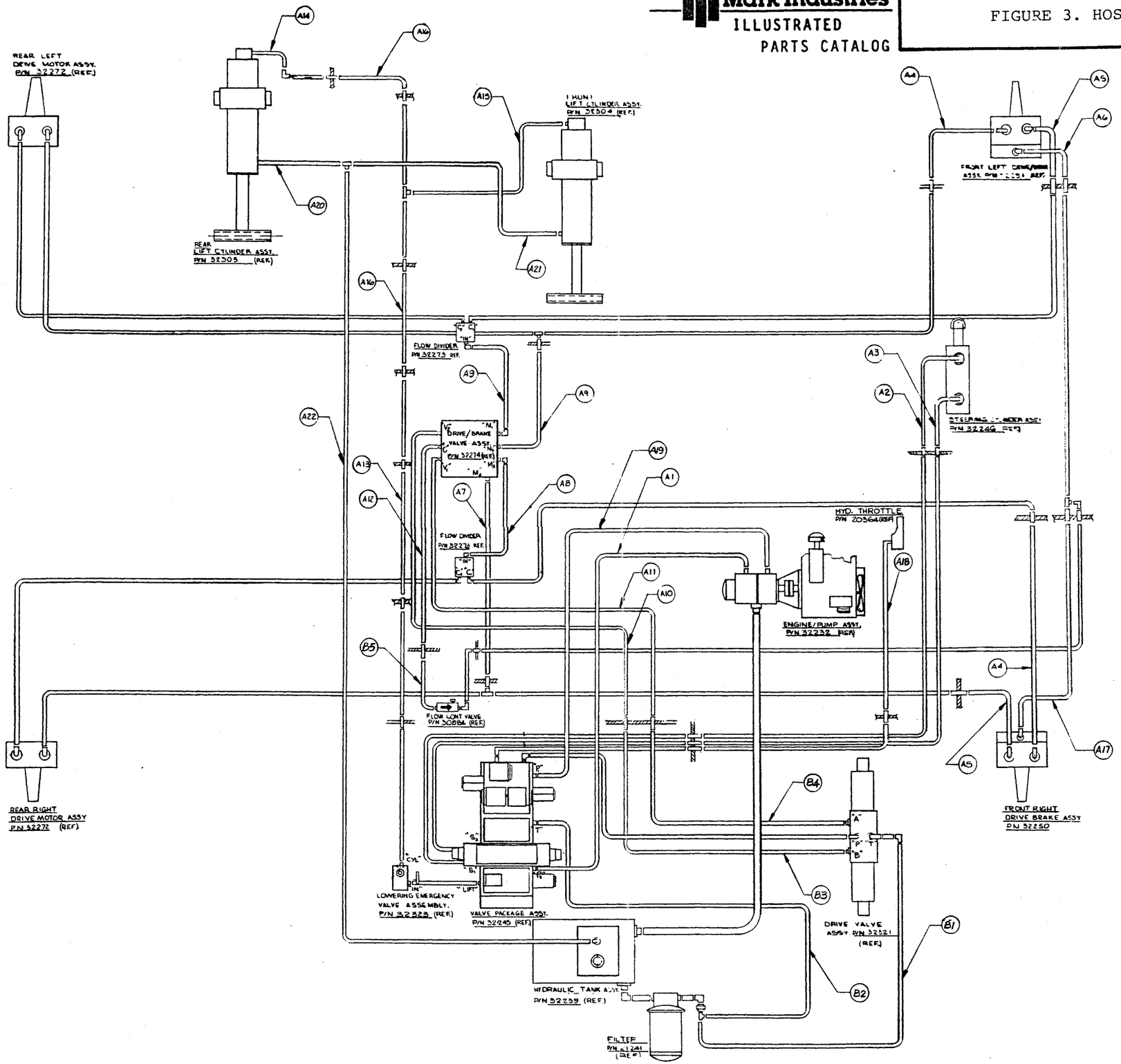


FIGURE 3. HOSE KIT DIAGRAM MT-25G

ITEM	PART NUMBER	DESCRIPTION 1234567		UNIT PER ASSY.
-1	32310	DIAGRAM, HOSE KIT		REF
A1	13212-08-0694	. HOSE ASSEMBLY		1
A2	13213-06-0180	.		1
A3	13213-06-0114	.		1
A4	13210-08-0310	.		2
A5	13210-08-0330	.		2
A6	13213-04-0350	.		1
A7	13210-08-0146	.		1
A8	13213-08-0162	.		1
A9	13213-08-0170	.		2
A10	13213-10-0342	.		1
A11	13213-10-0310	.	KIT "A"	1
A12	13210-04-0320	.		1
A13	13210-06-0524	.		1
A14	13210-06-0176	.		1
A15	13213-06-0230	.		1
A16	13210-06-0280	.		2
A17	13213-04-0384	.		1
A18	13210-04-0640	.		1
A19	13212-10-0694	.		1
A20	13200-04-1800	.		1
A21	13200-04-0480	.		1
A22	13200-04-2520	. HOSE ASSEMBLY		1
B1	13213-10-0150	. HOSE ASSEMBLY		1
B2	13210-08-0190	.		1
B3	13213-10-0350	.	KIT "B"	1
B4	13213-10-0370	.		1
B5	13213-04-0280	. HOSE ASSEMBLY		1

REV.

- ITEM NOT ILLUSTRATED

FIGURE 3A. TUBE KIT DIAGRAM MT-25G

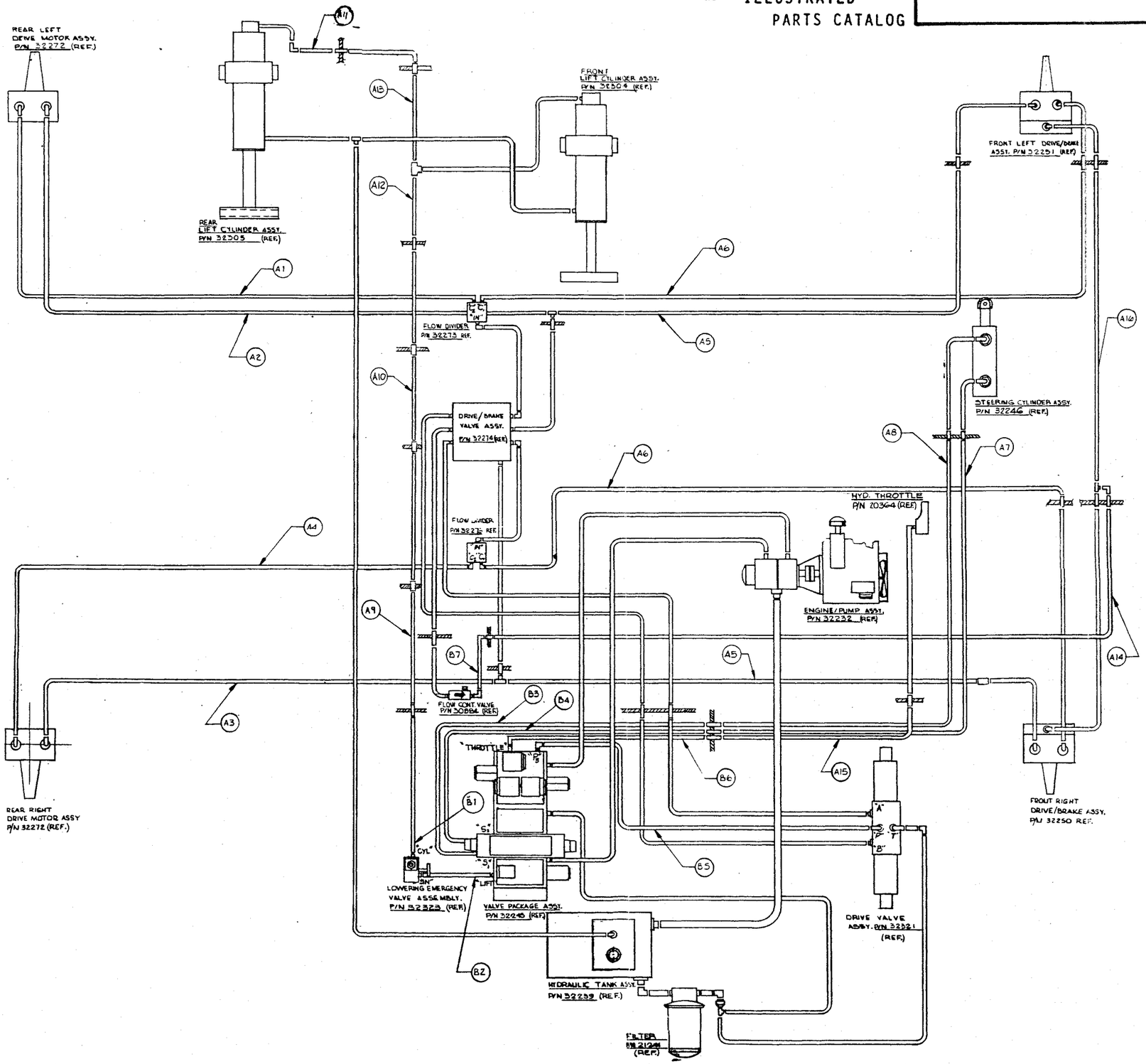


FIGURE 3A. TUBE KIT DIAGRAM MT-25G

ITEM	PART NUMBER	DESCRIPTION 1234567		UNIT PER ASSY.
-1	32234	DIAGRAM, TUBE KIT		REF
A1	32234-A1	. TUBE ASSEMBLY		1
A2	" -A2	.		1
A3	" -A3	.		1
A4	" -A4	.		1
A5	" -A5	.		2
A6	" -A6	.		2
A7	" -A7	.		1
A8	" -A8	.	KIT "A"	1
A9	" -A9	.		1
A10	" -A10	.		1
A11	" -A11	.		1
A12	" -A12	.		1
A13	" -A13	.		1
A14	" -A14	.		1
A15	" -A15	.		1
A16	32234-A16	. TUBE ASSEMBLY		1
B1	32234-B1	. TUBE ASSEMBLY		1
B2	" -B2	.		1
B3	" -B3	.		1
B4	" -B4	.	KIT "B"	1
B5	" -B5	.		1
B6	" -B6	.		1
B7	32234-B7	. TUBE ASSEMBLY		1

- ITEM NOT ILLUSTRATED

FIGURE 4. HOSE KIT DIAGRAM MT-25GT

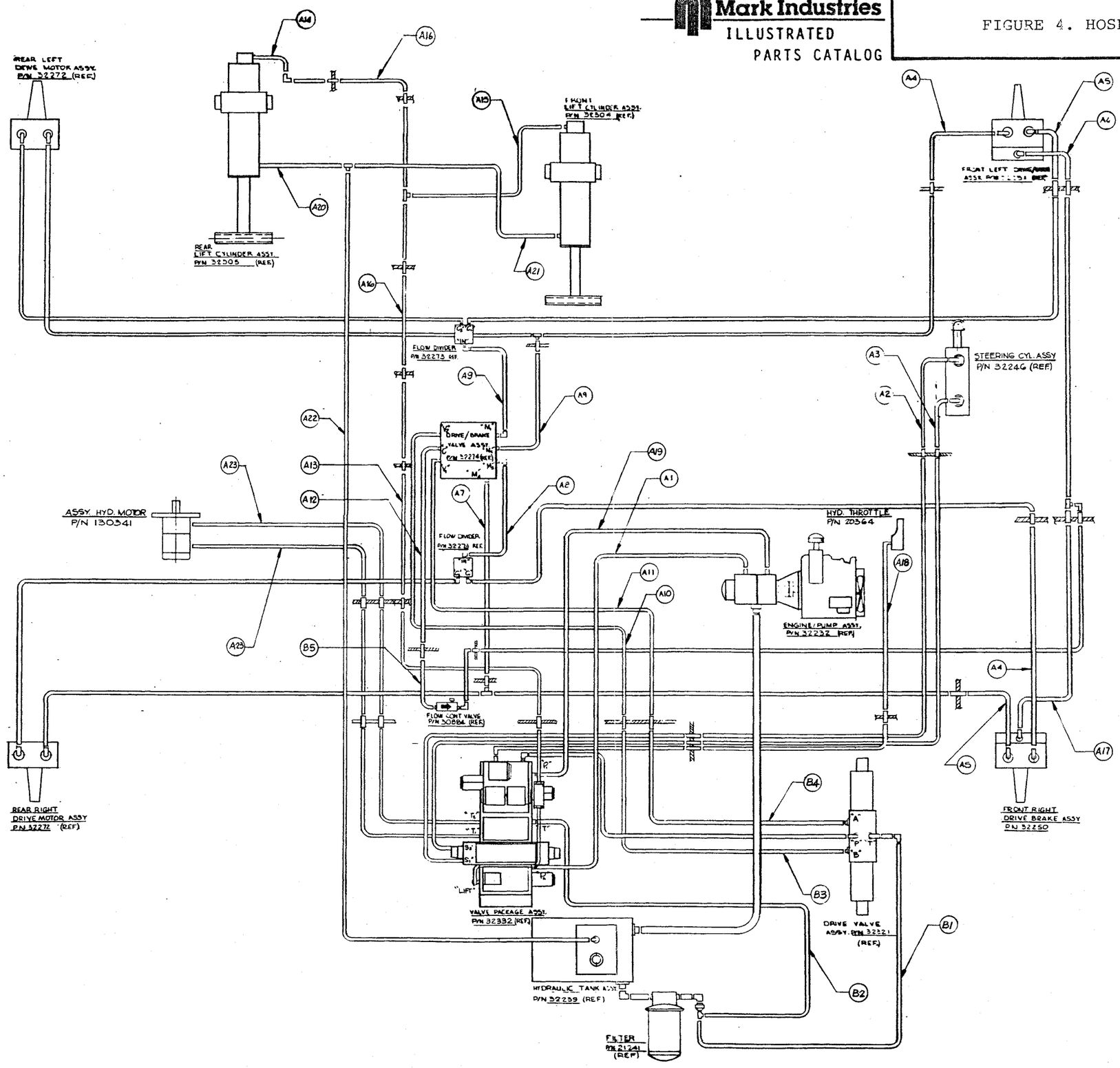


FIGURE 4. HOSE KIT DIAGRAM MT-25GT

ITEM	PART NUMBER	DESCRIPTION 1234567		UNIT PER ASSY.
-1	32328	DIAGRAM, HOSE KIT		REF
A1	13212-08-0694	. HOSE ASSEMBLY	KIT "A"	1
A2	13213-06-0180	.		1
A3	13213-06-0114	.		1
A4	13210-08-0310	.		2
A5	13210-08-0330	.		2
A6	13213-04-0350	.		1
A7	13210-08-0146	.		1
A8	13213-08-0162	.		1
A9	13213-08-0170	.		2
A10	13213-10-0342	.		1
A11	13213-10-0310	.		1
A12	13210-04-0320	.		1
A13	13210-06-0524	.		1
A14	13210-06-0176	.		1
A15	13213-06-0230	.		1
A16	13210-06-0280	.		2
A17	13213-04-0384	.		1
A18	13210-04-0640	.		1
A19	13212-10-0694	.		1
A20	13200-04-1800	.		1
A21	13200-04-0480	.		1
A22	13200-04-2520	.		1
A23	13228-03-4320	. HOSE ASSEMBLY		1
B1	13213-10-0150	. HOSE ASSEMBLY	KIT "B"	1
B2	13210-08-0190	.		1
B3	13213-10-0350	.		1
B4	13213-10-0370	.		1
B5	13213-04-0280	. HOSE ASSEMBLY		1

REV.

- ITEM NOT ILLUSTRATED

FIGURE 4A. TUBE KIT DIAGRAM MT-25GT

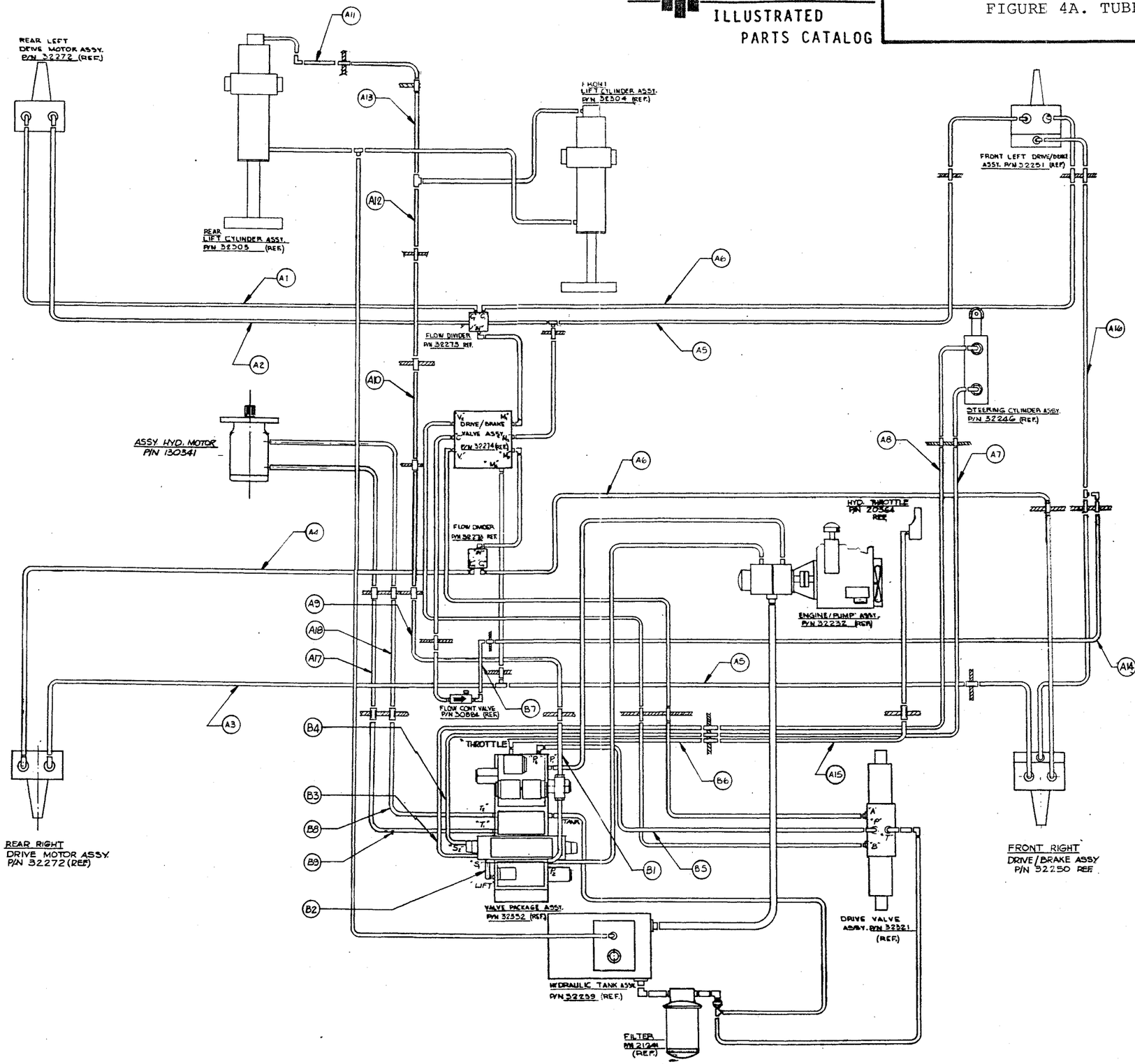


FIGURE 4A. TUBE KIT DIAGRAM MT-25GT

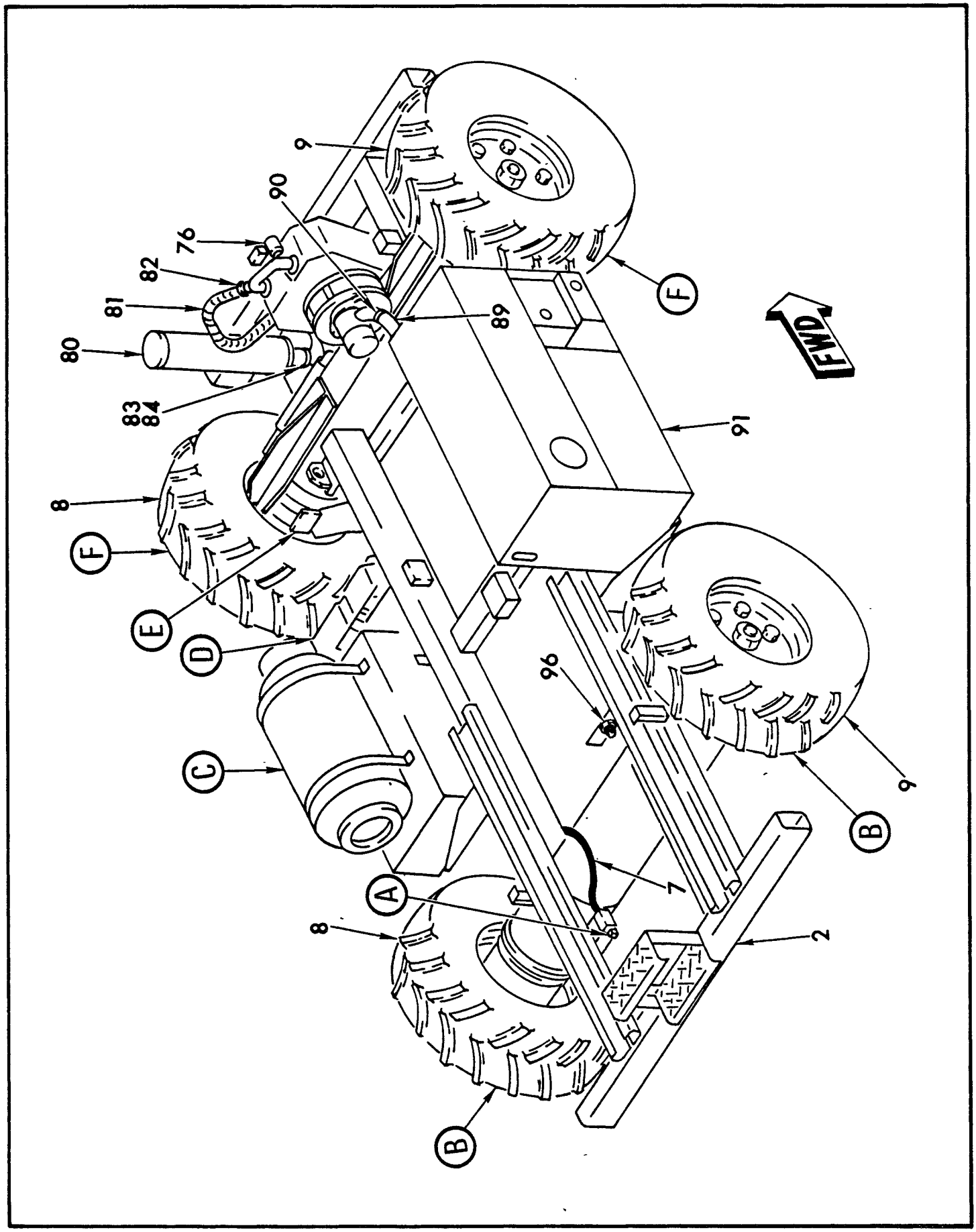
ITEM	PART NUMBER	DESCRIPTION 1234567		UNIT PER ASSY.
-1	32324	DIAGRAM, TUBE KIT		REF
A1	32324-A1	. TUBE ASSEMBLY	KIT "A"	1
A2	" -A2	.		1
A3	" -A3	.		1
A4	" -A4	.		1
A5	" -A5	.		2
A6	" -A6	.		2
A7	" -A7	.		1
A8	" -A8	.		1
A9	" -A9	.		1
A10	" -A10	.		1
A11	" -A11	.		1
A12	" -A12	.		1
A13	" -A13	.		1
A14	" -A14	.		1
A15	" -A15	.		1
A16	" -A16	.		1
A17	" -A17	.		1
A18	32324-A18	. TUBE ASSEMBLY		1
B1	32324-B1	. TUBE ASSEMBLY	KIT "B"	1
B2	" -B2	.		1
B3	" -B3	.		1
B4	" -B4	.		1
B5	" -B5	.		1
B6	" -B6	.		1
B7	" -B7	.		1
B8	" -B8	.		1
B9	32324-B9	. TUBE ASSEMBLY		1

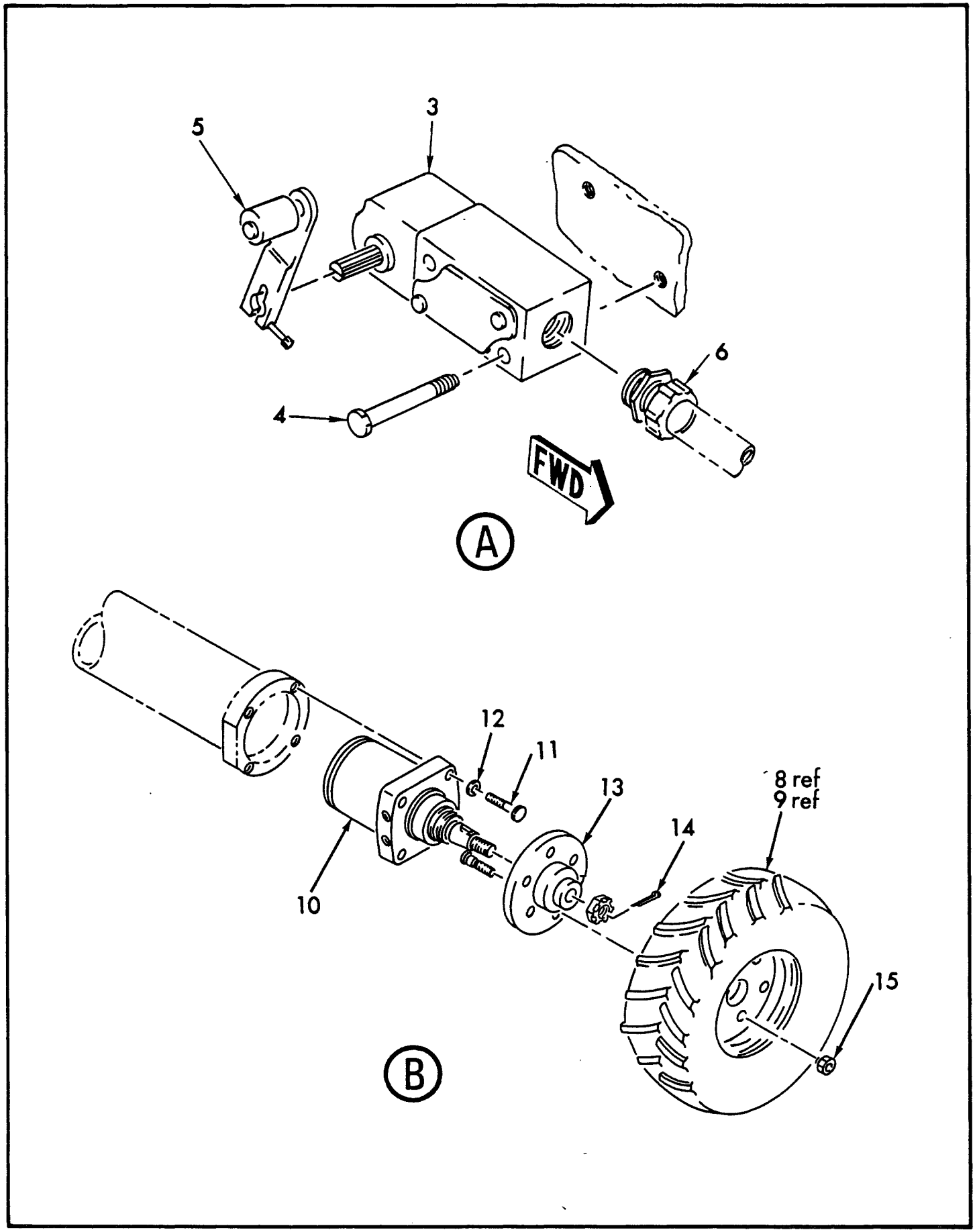
- ITEM NOT ILLUSTRATED

This SECTION 3, FRAME ASSEMBLIES, IS ILLUSTRATED AS:

*FIGURE 3 THRU FIGURE 10 ARE NOT AVAILABLE THIS REVISION.

FRAME ASSEMBLY (MT-25G)




3
5
6
4
FWD
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13
8 ref
9 ref
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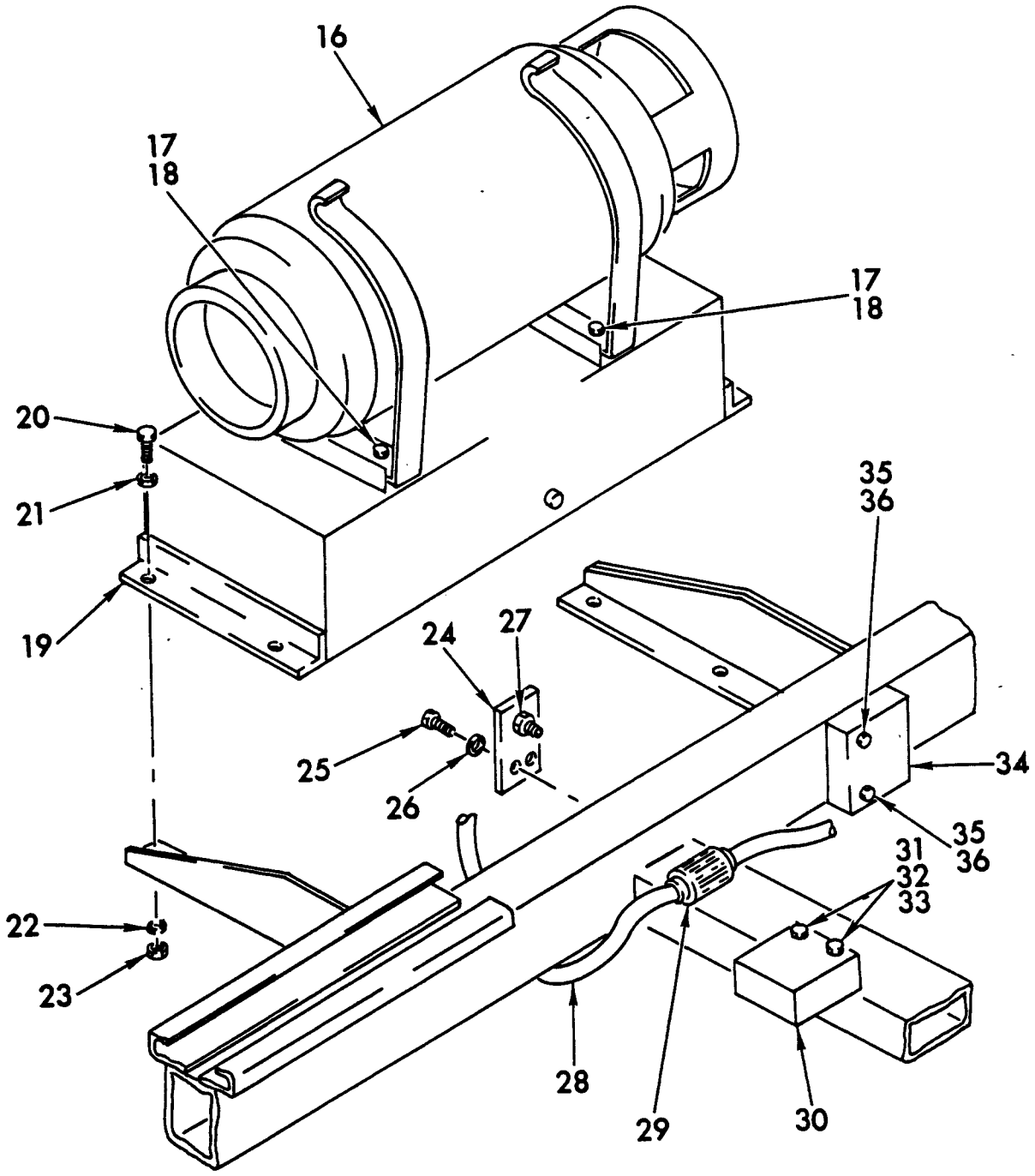
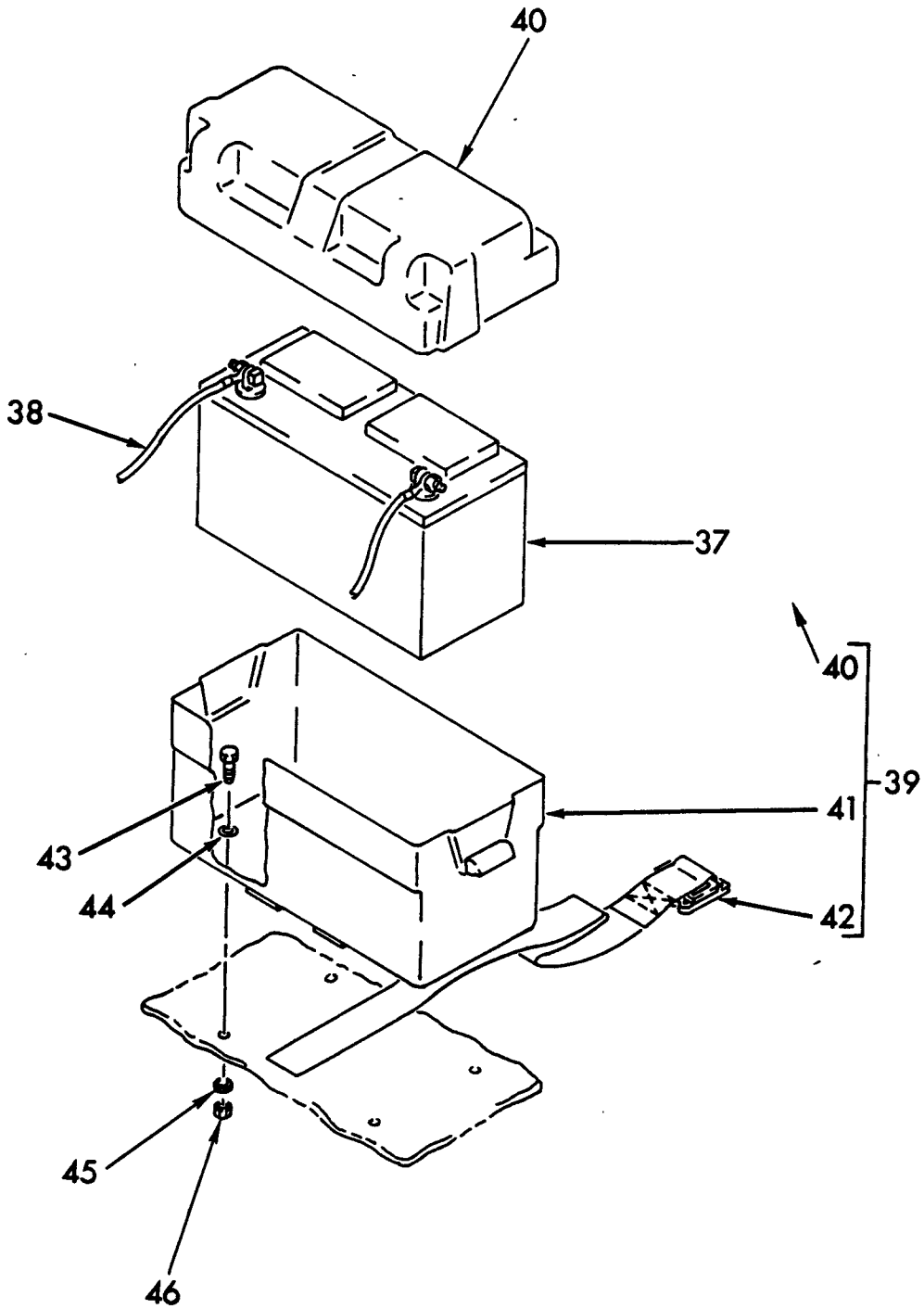
15
B

FRAME ASSEMBLY (MT-25G)
(continued)





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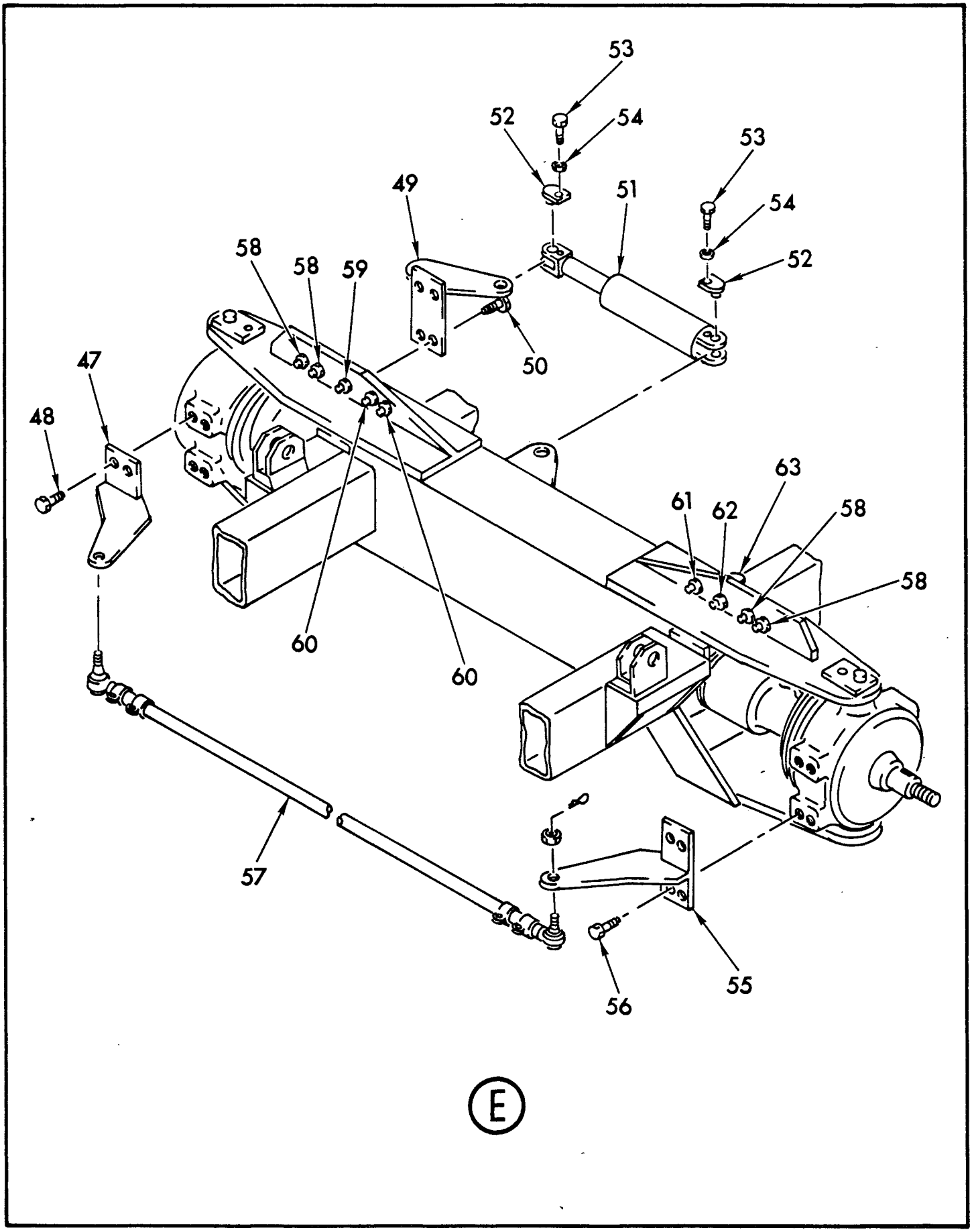
REV.

FRAME ASSEMBLY (MT-25G)
(continued)



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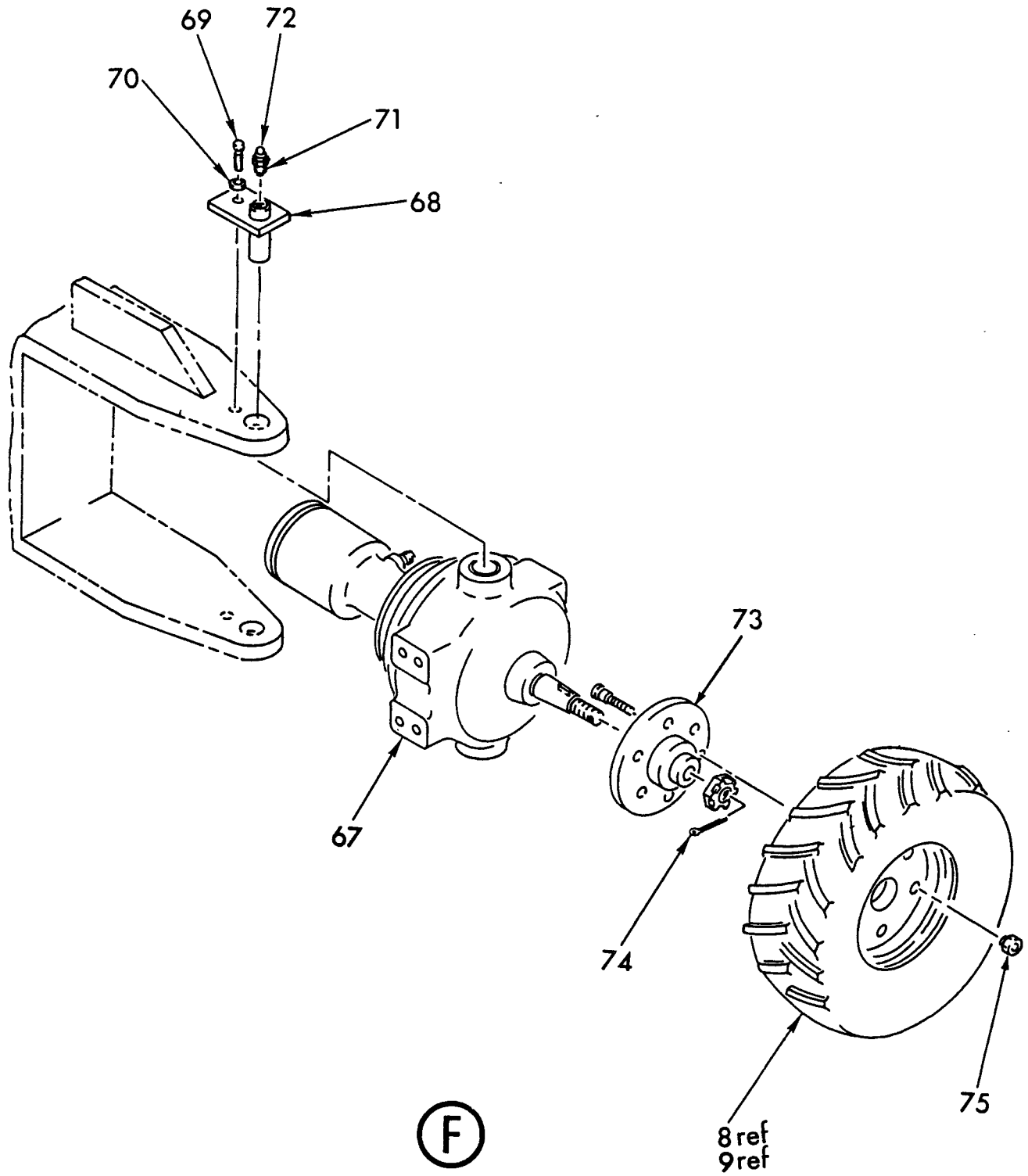
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FRAME ASSEMBLY (MT-25G) (continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32231	ASSEMBLY, FRAME (MT-25G) (See Sect. 2, Fig. 1 for NHA)	REF
2	32338	. WELDMENT, FRAME (MT-25G)	1
3	70173	. SWITCH, LIMIT	1
4	62708	. SCREW, MACHINE (attaching part)	2
5	70032	. LEVER, OPERATING	1
6	2806	. RELIEF, STRAIN	1
7	2912	. CABLE, CONDUCTOR (12FT)	AR
8	32166	. ASSEMBLY, TIRE AND WHEEL (L.H.) (See Sect. 3, Fig. 11 for Details)	2
9	32259	. ASSEMBLY, TIRE AND WHEEL (R.H.) (See Sect. 3, Fig. 12 for Details)	2
10	32272	. ASSEMBLY, DRIVE AND MOTOR (See Sect. 3, Fig. 13 for Details)	2
11	60521	. SCREW, CAP (attaching part)	8
12	60327	. WASHER, LOCK (attaching part)	8
13	32167	. HUB, DRIVE	2
14	64310	. PIN, COTTER	2
15	65256	. NUT, WHEEL (attaching post)	12
16	486-C	. TANK, LPG	1
17	60324	. SCREW, CAP (attaching part)	4
18	63402	. WASHER, FLAT (attaching part)	4
19	30285	. TANK, GAS (See Sect. 3, Fig. 14 for Details)	1
20	60309	. SCREW, CAP (attaching part)	4
21	63401	. WASHER, FLAT (attaching part)	4
22	63301	. WASHER, LOCK (attaching part)	4
23	60701	. NUT, HEX (attaching part)	4

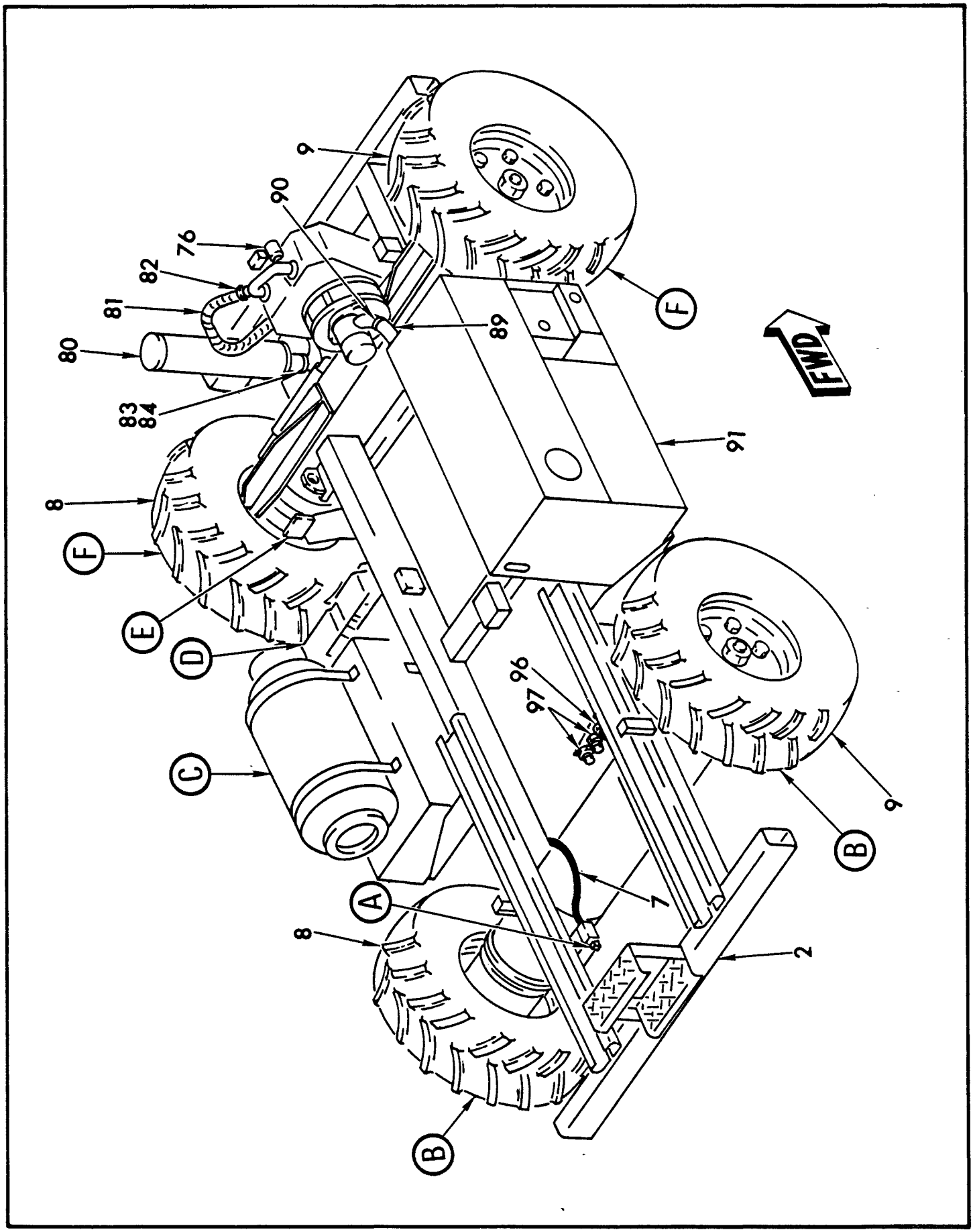
- ITEM NOT ILLUSTRATED

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
24	32097	. BRACKET, BULKHEAD	2
25	60309	. SCREW, CAP (attaching part)	4
26	63301	. WASHER LOCK (attaching part)	4
27	80035-06	. TEE, BULKHEAD	2
28	160-B	. HOSE, FUEL (12FT)	AR
29	160	. FILTER, FUEL	1
30	32274	. ASSEMBLY, DRIVE AND BRAKE VALVE (See Sect. 3, Fig 15 for Details)	1
31	60361	. SCREW, CAP (attaching part)	2
32	63319	. WASHER, LOCK (attaching part)	2
33	60703	. NUT, HEX (attaching part)	2
34	32273	. ASSEMBLY, FLOW DIVIDER (See Sect. 3, Fig 16 for Details)	2
35	60319	. SCREW, CAP (attaching part)	4
36	63301	. WASHER, LOCK (attaching part)	4
37	4030	. BATTERY (See Vendor for more informations)	1
38	31238-L	. CABLE, BATTERY	1
39	782	. ASSEMBLY, BOX	1
40		.. CAP	1
41		.. BOX	1
42	16935	.. BELT	1
43	60309	. SCREW, CAP (attaching part)	4
44	63401	. WASHER, FLAT (attaching part)	4
45	63301	. WASHER, LOCK (attaching part)	4
46	60701	. NUT, HEX (attaching part)	4
47	32194	. ARM, STEER (L.H.)	1
48	60370	. SCREW, CAP (attaching part)	4

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
49	32222	. BRACKET, STEERING CYLINDER	1
50	60370	. SCREW, CAP (attaching part)	4
51	32246	. ASSEMBLY, STEERING CYLINDER (See Sect. 3, Fig 17 for Details)	1
52	20252	. PIN, STEERING	2
53	60353	. SCREW, CAP (attaching part)	2
54	63301	. WASHER, LOCK (attaching part)	2
55	32170	. ARM, STEER (RIGHT)	1
56	60370	. SCREW, CAP (attaching part)	4
57	32213	. ASSEMBLY, TIE ROD (See Sect. 3, Fig. 18 for Details)	1
58	80011-06	. UNION, ELBOW BULKHEAD	4
59	80011-03	. UNION, ELBOW BULKHEAD	1
60	80011-05	. UNION, ELBOW BULKHEAD	2
61	80045-03	. UNION, BULKHEAD	1
62	80032-03	. TEE, BULKHEAD	1
63	70209	. VALVE, SOLENOID	1
-64	117-C	. CONNECTOR, RING	2
-65	60309	. SCREW, CAP (attaching part)	2
-66	63301	. WASHER, LOCK (attaching part)	2
67	32250	. ASSEMBLY, MOTOR AND BRAKE (See Sect. 3, Fig. 19 for Details)	2
68	32243	. WELDMENT, KING PIN	4
69	60322	. SCREW, CAP (attaching part)	4
70	63302	. WASHER, LOCK (attaching part)	4
71	65103	. FITTING, GREASE	4
72	65366	. CAP, GREASE	4
73	32157	. HUB, DRIVE	2

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
74	64310	. PIN, COTTER	2
75	65156	. NUT, WHEEL (attaching part)	12
76	32232	. ASSEMBLY, ENGINE AND PUMP (See Sect. 3 Fig. 20 for Details)	1
-77	60308	. SCREW, CAP (attaching part)	4
-78	63305	. WASHER, LOCK (attaching part)	4
-79	60705	. NUT, HEX (attaching part)	4
80	65772	. MUFFLER	1
81	65885	. CONNECTOR, EXHAUST	1
82	65791	. CLAMP, MUFFLER	1
83	32515	. SPOUT, TAIL	1
84	65791	. CLAMP, MUFFLER	1
-85	117-E	. TERMINAL, PUSH-ON	3
-86	70232	. WIRE, WHITE	AR
-87	764	. CLAMP, RUBBER	13
-88	63654	. RIVET, POP	AR
89	81179	. HOSE, SULTION	1
90	55	. CLAMP, HOSE	2
91	32239	. ASSEMBLY, HYDRAULIC TANK (See Sect. 3, Fig. 22 for Details)	1
-92	60309	. SCREW, CAP (attaching part)	4
-93	63401	. WASHER, FLAT (attaching part)	4
-94	63301	. WASHER, LOCK (attaching part)	4
-95	60701	. NUT, HEX (attaching part)	4
96	80045-05	. UNION, BULKHEAD	1

FRAME ASSEMBLY (MT-25GT)



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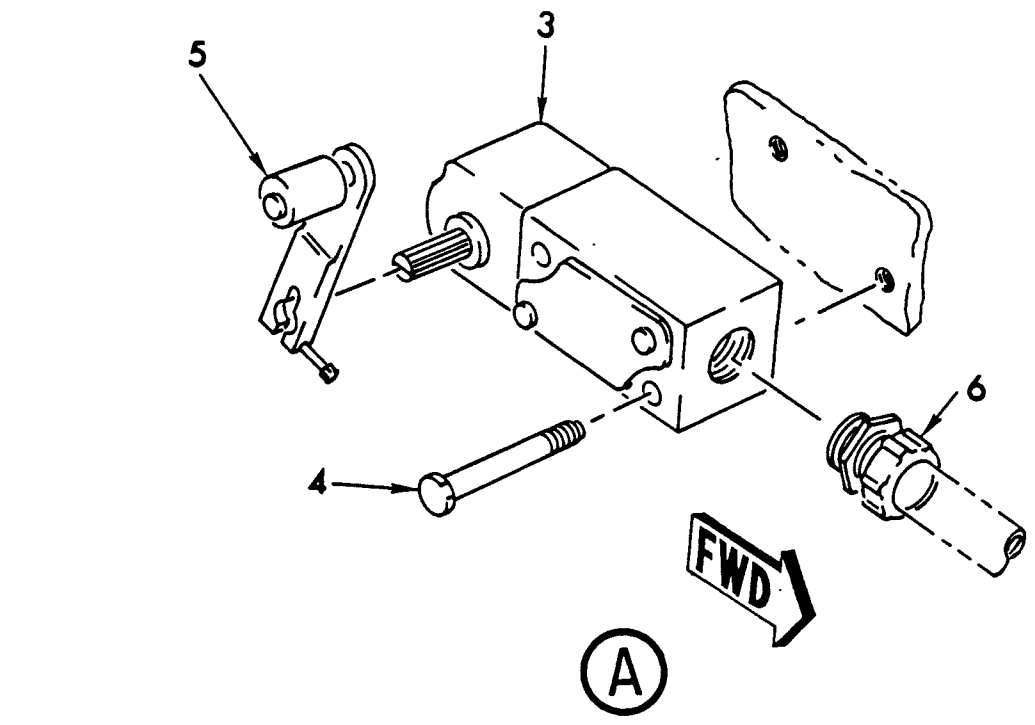
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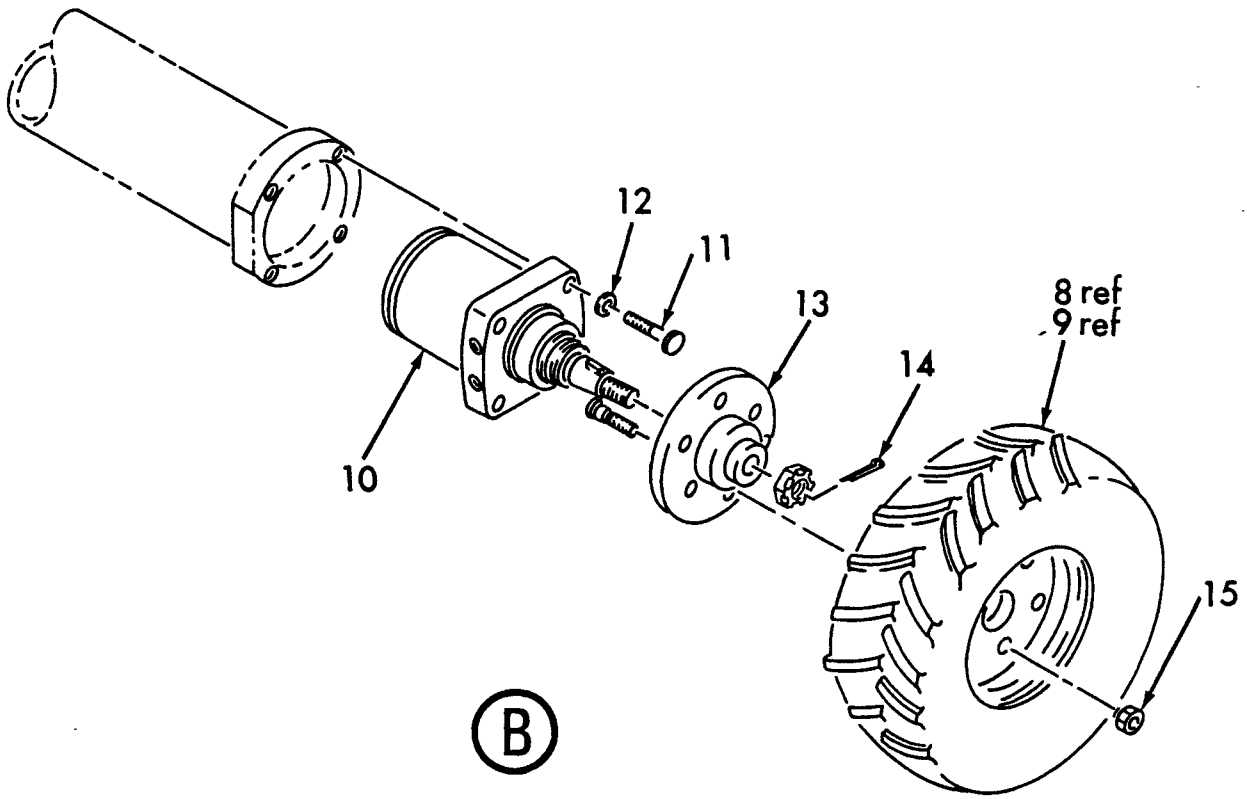
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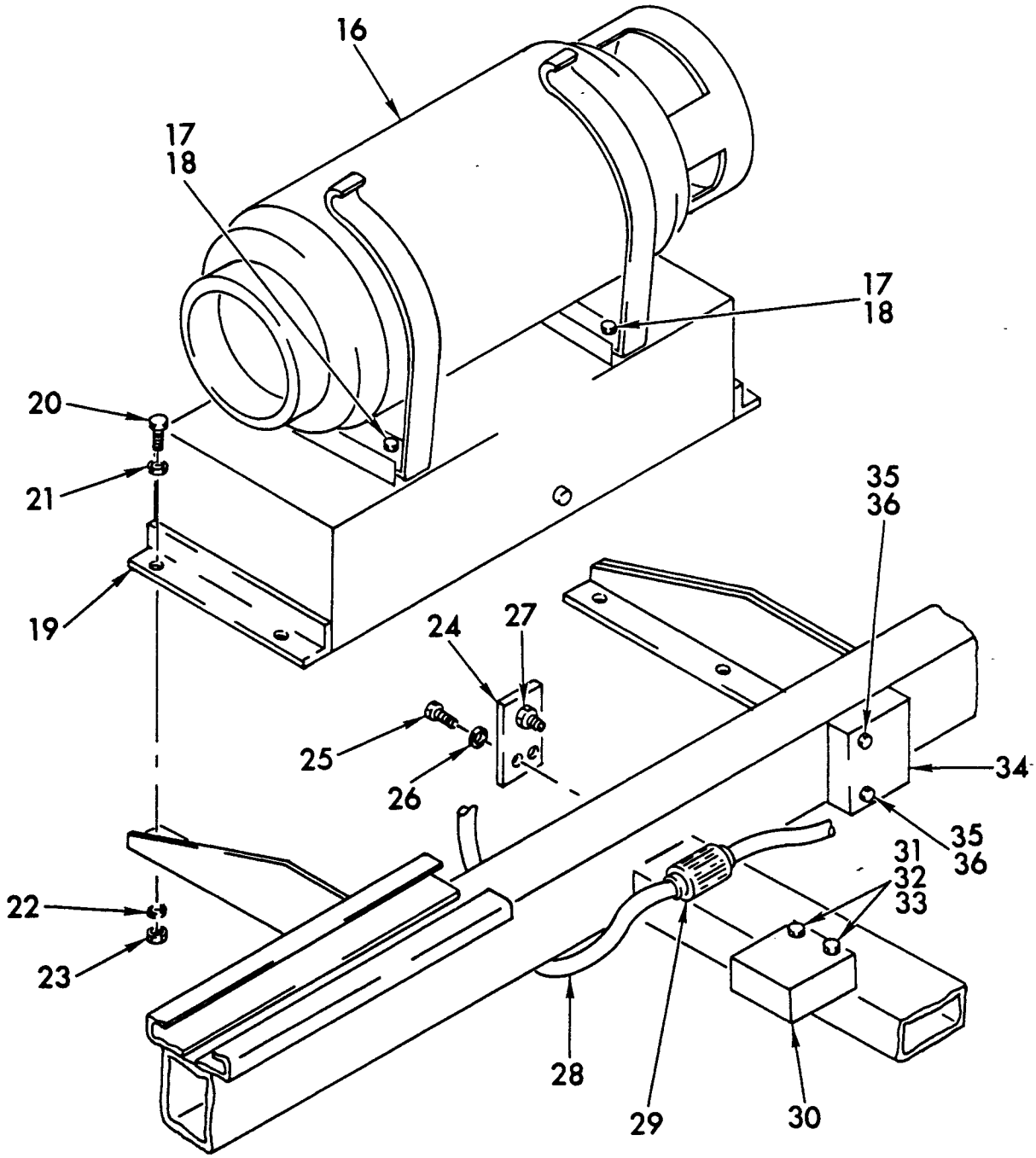
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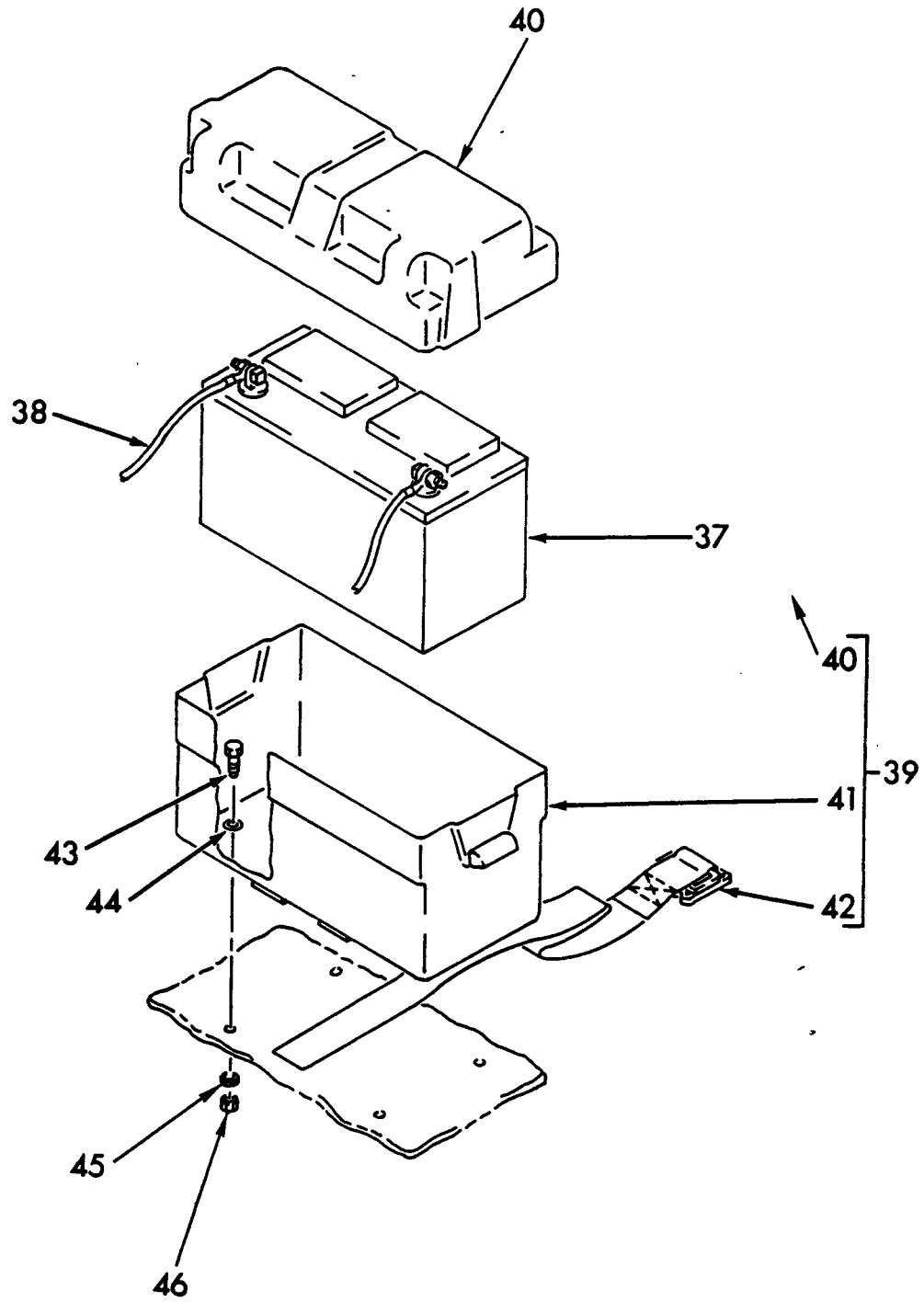
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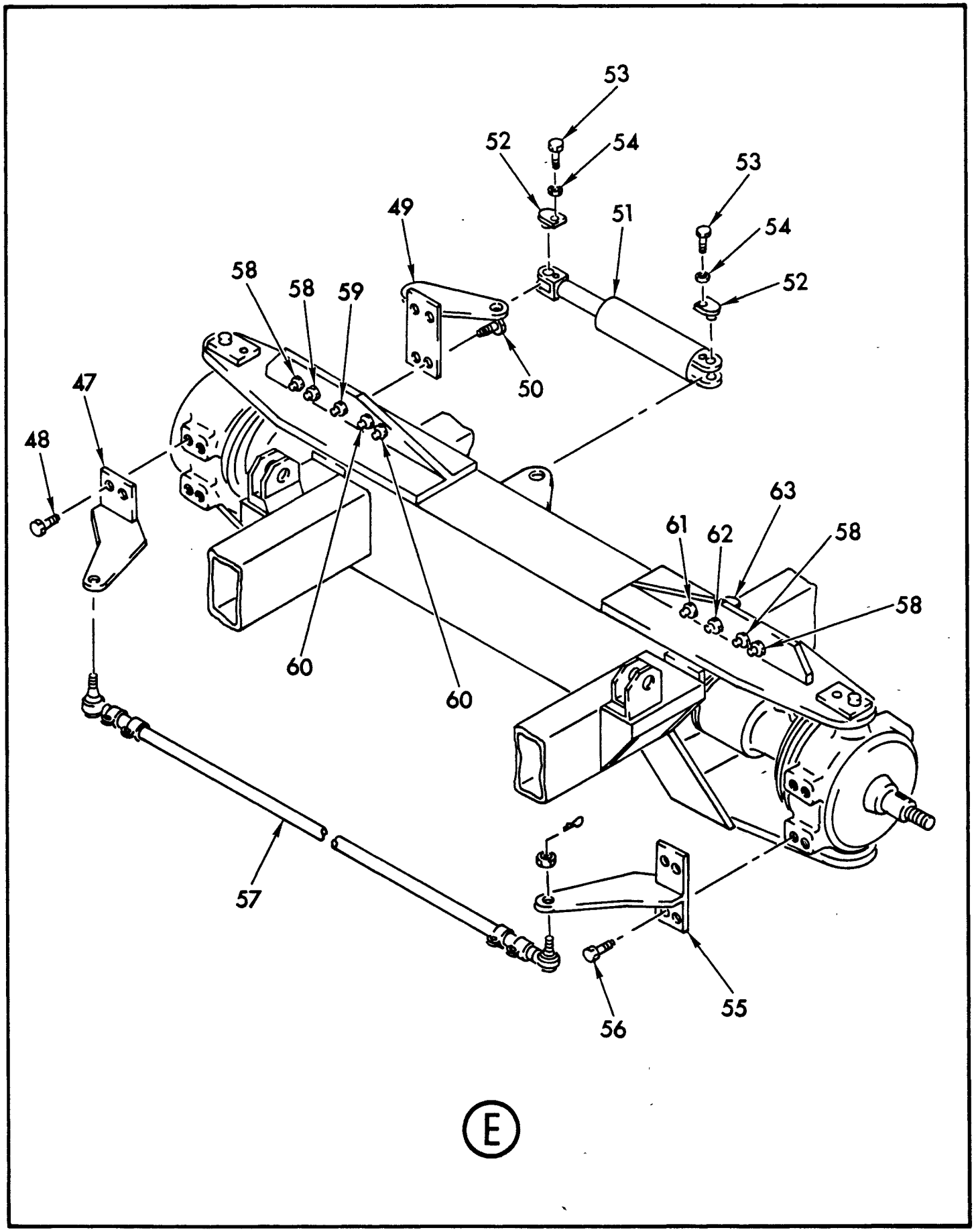
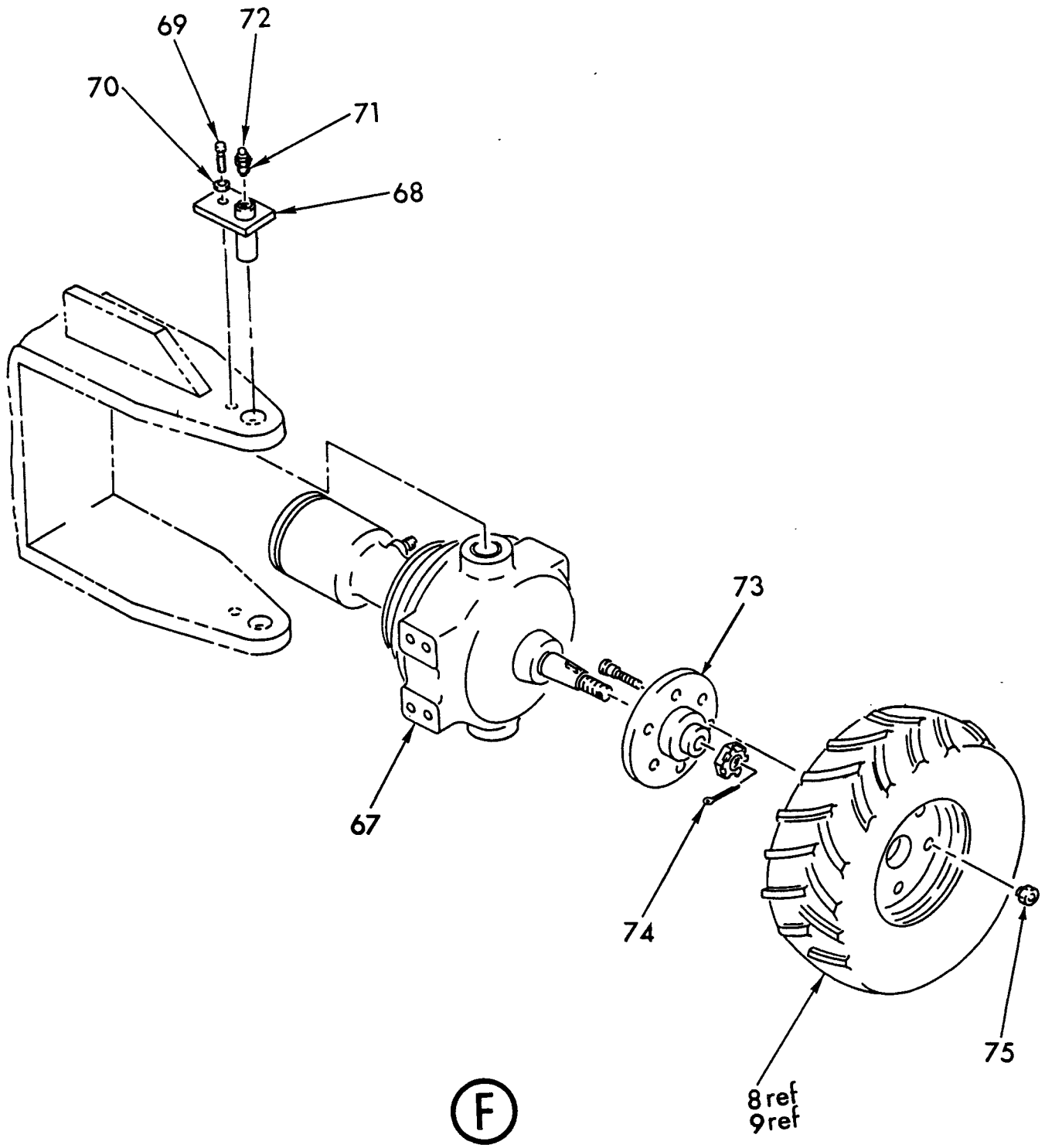
FRAME ASSEMBLY (MT-25GT)
(continued)



FRAME ASSEMBLY (MT-25GT)
(continued)



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FRAME ASSEMBLY (MT-25GT) (continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32230	ASSEMBLY, FRAME (MT-25GT) (See Sect. 2, Fig. 2 for NHA)	REF
2	32102	. WELDMENT, FRAME (MT-25GT)	1
3	70173	. SWITCH, LIMIT	1
4	62708	. SCREW, MACHINE (attaching part)	2
5	70032	. LEVER, OPERATING	1
6	2806	. RELIEF, STRAIN	1
7	2912	. CABLE, CONDUCTOR (12FT)	AR
8	32166	. ASSEMBLY, TIRE AND WHEEL (L.H.) (See Sect. 3, Fig. 11 for Details)	2
9	32259	. ASSEMBLY, TIRE AND WHEEL (R.H.) (See Sect. 3, Fig. 12 for Details)	2
10	32272	. ASSEMBLY, DRIVE AND MOTOR (See Sect. 3, Fig. 13 for Details)	2
11	60521	. SCREW, CAP (attaching part)	8
12	60327	. WASHER, LOCK (attaching part)	8
13	32167	. HUB, DRIVE	2
14	64310	. PIN, COTTER	2
15	65256	. NUT, WHEEL (attaching post)	12
16	486-C	. TANK, LPG	1
17	60324	. SCREW, CAP (attaching part)	4
18	63402	. WASHER, FLAT (attaching part)	4
19	30285	. TANK, GAS (See Sect. 3, Fig. 14 for Details)	1
20	60309	. SCREW, CAP (attaching part)	4
21	63401	. WASHER, FLAT (attaching part)	4
22	63301	. WASHER, LOCK (attaching part)	4
23	60701	. NUT, HEX (attaching part)	4

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
24	32097	. BRACKET, BULKHEAD	2
25	60309	. SCREW, CAP (attaching part)	4
26	63301	. WASHER LOCK (attaching part)	4
27	80035-06	. TEE, BULKHEAD	2
28	160-B	. HOSE, FUEL (12FT)	AR
29	160	. FILTER, FUEL	1
30	32274	. ASSEMBLY, DRIVE AND BRAKE VALVE (See Sect. 3, Fig 15 for Details)	1
31	60361	. SCREW, CAP (attaching part)	2
32	63319	. WASHER, LOCK (attaching part)	2
33	60703	. NUT, HEX (attaching part)	2
34	32273	. ASSEMBLY, FLOW DIVIDER (See Sect. 3, Fig 16 for Details)	2
35	60319	. SCREW, CAP (attaching part)	4
36	63301	. WASHER, LOCK (attaching part)	4
37	4030	. BATTERY (See Vendor for more informations)	1
38	31238-L	. CABLE, BATTERY	1
39	782	. ASSEMBLY, BOX	1
40		.. CAP	1
41		.. BOX	1
42	16935	.. BELT	1
43	60309	. SCREW, CAP (attaching part)	4
44	63401	. WASHER, FLAT (attaching part)	4
45	63301	. WASHER, LOCK (attaching part)	4
46	60701	. NUT, HEX (attaching part)	4
47	32194	. ARM, STEER (L.H.)	1
48	60370	. SCREW, CAP (attaching part)	4

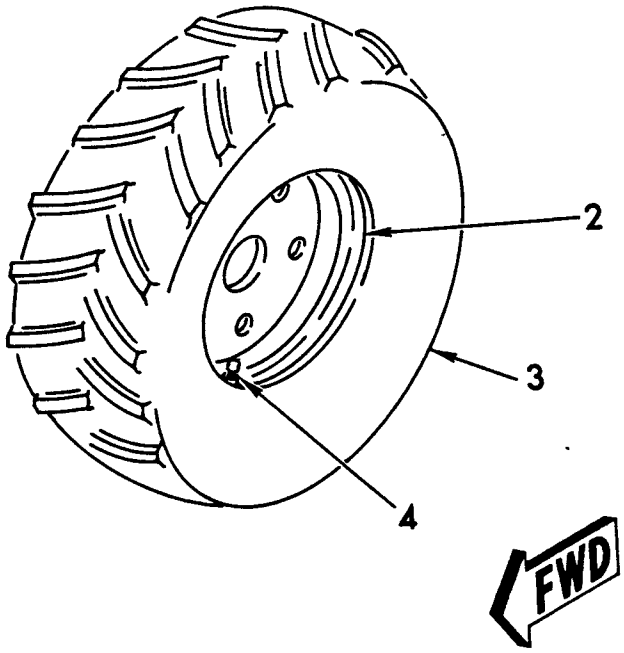
FRAME ASSEMBLY (MT-25GT) (continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
49	32222	. BRACKET, STEERING CYLINDER	1
50	60370	. SCREW, CAP (attaching part)	4
51	32246	. ASSEMBLY, STEERING CYLINDER (See Sect. 3, Fig 17 for Details)	1
52	20252	. PIN, STEERING	2
53	60353	. SCREW, CAP (attaching part)	2
54	63301	. WASHER, LOCK (attaching part)	2
55	32170	. ARM, STEER (RIGHT)	1
56	60370	. SCREW, CAP (attaching part)	4
57	32213	. ASSEMBLY, TIE ROD (See Sect. 3, Fig. 18 for Details)	1
58	80011-06	. UNION, ELBOW BULKHEAD	4
59	80011-03	. UNION, ELBOW BULKHEAD	1
60	80011-05	. UNION, ELBOW BULKHEAD	2
61	80045-03	. UNION, BULKHEAD	1
62	80032-03	. TEE, BULKHEAD	1
63	70209	. VALVE, SOLENOID	1
-64	117-C	. CONNECTOR, RING	2
-65	60309	. SCREW, CAP (attaching part)	2
-66	63301	. WASHER, LOCK (attaching part)	2
67	32250	. ASSEMBLY, MOTOR AND BRAKE (See Sect. 3, Fig. 19 for Details)	2
68	32243	. WELDMENT, KING PIN	4
69	60322	. SCREW, CAP (attaching part)	4
70	63302	. WASHER, LOCK (attaching part)	4
71	65103	. FITTING, GREASE	4
72	65366	. CAP, GREASE	4
73	32157	. HUB, DRIVE	2

- ITEM NOT ILLUSTRATED

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
74	64310	. PIN, COTTER	2
75	65156	. NUT, WHEEL (attaching part)	12
76	32232	. ASSEMBLY, ENGINE AND PUMP (See Sect. 3 Fig. 20 for Details)	1
-77	60308	. SCREW, CAP (attaching part)	4
-78	63305	. WASHER, LOCK (attaching part)	4
-79	60705	. NUT, HEX (attaching part)	4
80	65772	. MUFFLER	1
81	65885	. CONNECTOR, EXHAUST	1
82	65791	. CLAMP, MUFFLER	1
83	32515	. SPOUT, TAIL	1
84	65791	. CLAMP, MUFFLER	1
-85	117-E	. TERMINAL, PUSH-ON	3
-86	70232	. WIRE, WHITE	AR
-87	764	. CLAMP, RUBBER	13
-88	63654	. RIVET, POP	AR
89	81179	. HOSE, SULTION	1
90	55	. CLAMP, HOSE	2
91	32329	. ASSEMBLY, HYDRAULIC TANK (See Sect. 3, Fig. 23 for Details)	1
-92	60309	. SCREW, CAP (attaching part)	4
-93	63401	. WASHER, FLAT (attaching part)	4
-94	63301	. WASHER, LOCK (attaching part)	4
-95	60701	. NUT, HEX (attaching part)	4
96	80045-05	. UNION, BULKHEAD	1
97	80045-03	. UNION, BULKHEAD	3

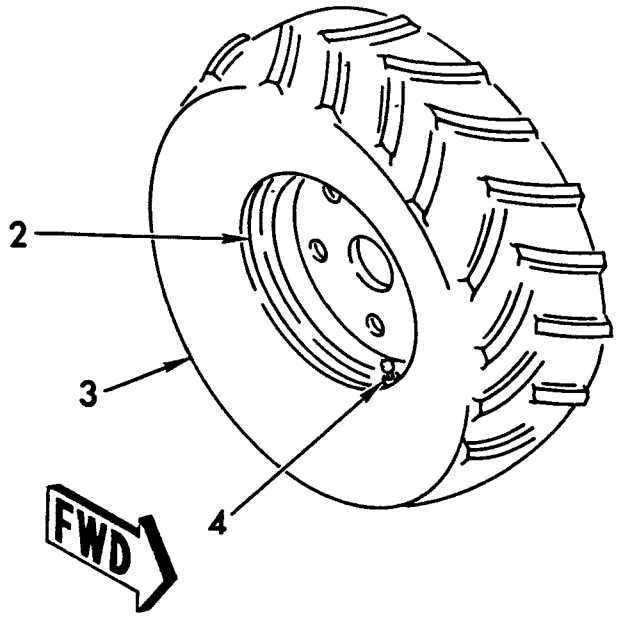
TIRE AND WHEEL ASSEMBLY (L.H.)



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32166	ASSEMBLY, TIRE AND WHEEL (L.H.) (See Sect. 3, Fig. 1 or 2 for NHA)	REF
2	32157	. WHEEL	1
3	30526	. TIRE	1
4	2252	. STEM, VALVE	1

- ITEM NOT ILLUSTRATED

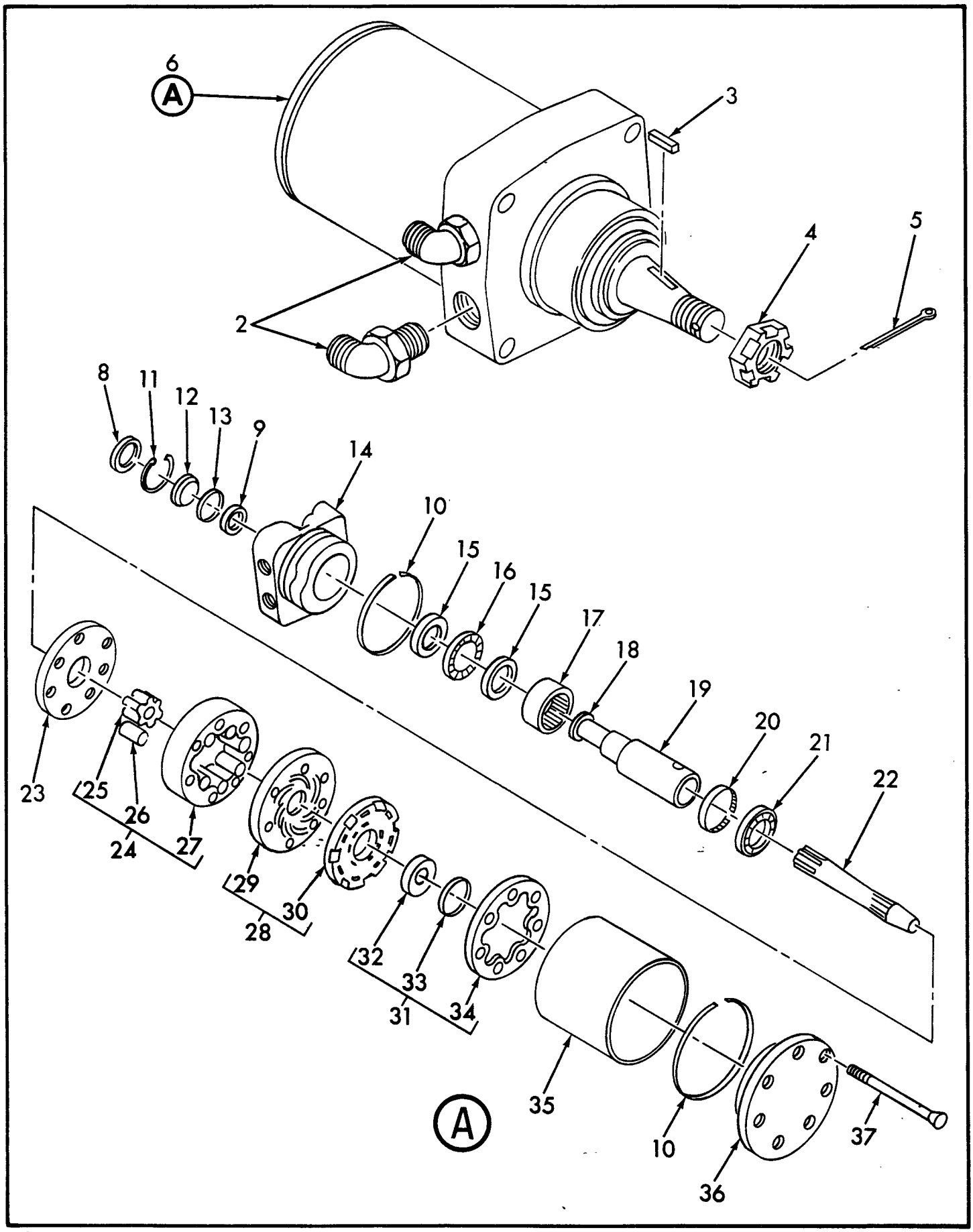
TIRE AND WHEEL ASSEMBLY (R.H.)



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32259	ASSEMBLY, TIRE AND WHEEL (R.H.) (See Sect. 3, Fig. 1 or 2 for NHA)	REF
2	32157	. WHEEL	1
3	30526	. TIRE	1
4	2252	. STEM, VALVE	1

- ITEM NOT ILLUSTRATED

DRIVE MOTOR ASSEMBLY



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DRIVE MOTOR ASSEMBLY (continued)

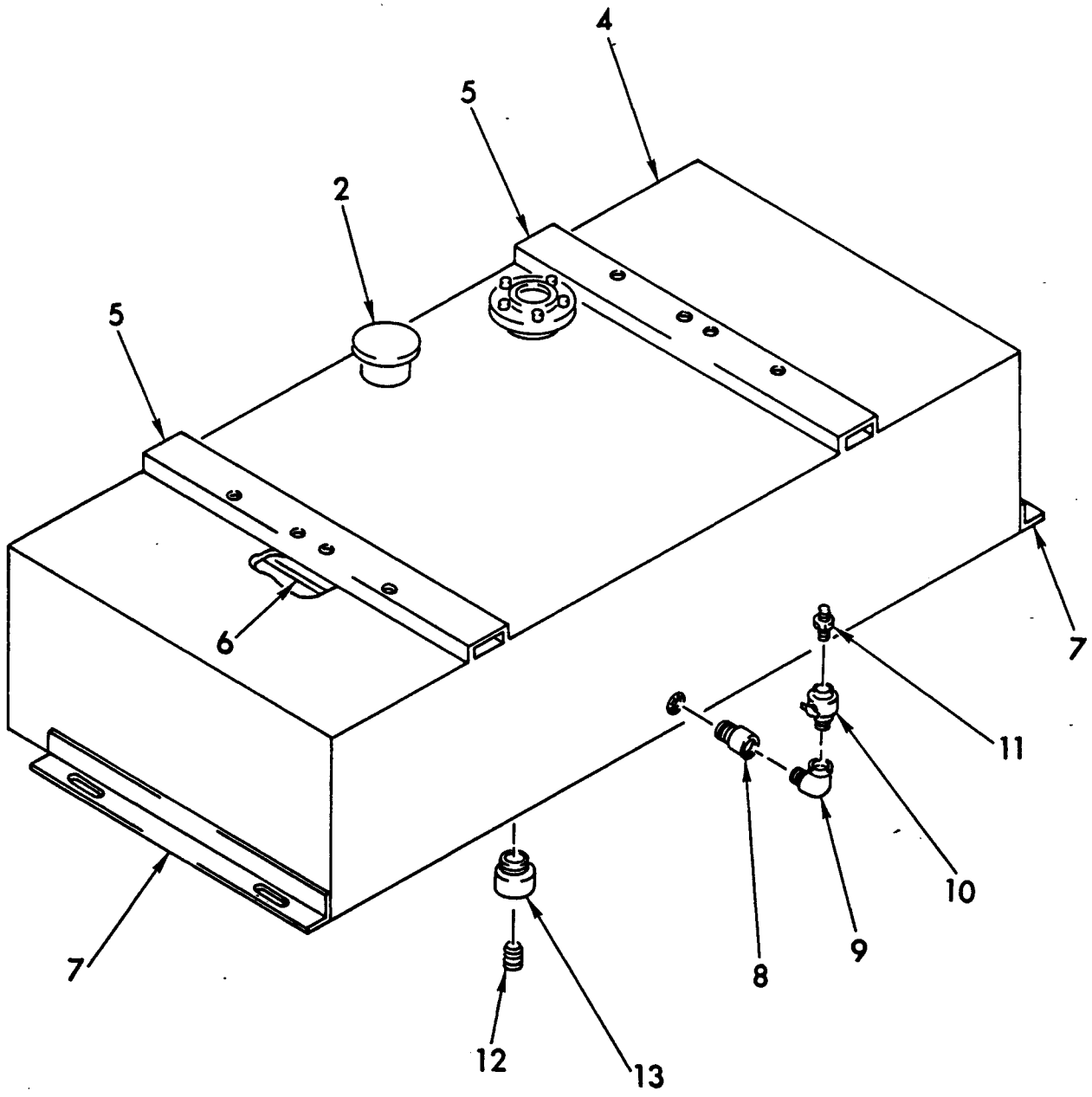
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32272	ASSEMBLY, DRIVE MOTOR (See Sect. 3, Fig. 1 or 2 for NHA)	REF
2	80012-13	. ELBOW, STRAIGHT THREAD	2
3		. KEY, WOODRUFF	1
4		. NUT	1
5		. PIN, COTTER	1
6	81113	. ASSEMBLY, DRIVE MOTOR (REAR)	1
-7	66162	.. KIT, SEAL	1
8		... SEAL	
9		... SEAL	1
10		... RING, SEAL	2
11		... RING, RETAINING	1
12		.. WASHER, BACK-UP	1
13		.. WASHER	
14		.. HOUSING	1
15		.. WASHER, THURST	2
16		.. BEARING, THRUST	1
17		.. BEARING	1
18		.. WASHER	1
19		.. SHAFT, COUPLING	1
20		.. BEARING	1
21		.. BEARING, THRUST	1
22		.. LINK, DRIVE	1
23		.. PLATE, WEAR	1
24		.. SET, ROTOR	1
25		... ROTOR	1
26		... VANE	7

DRIVE MOTOR ASSEMBLY
(continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
27		... STATOR	1
28		.. SET, MANIFOLD	1
29		... PLATE, MANIFOLD	1
30		... MANIFOLD	1
31		.. SET, COMMUTATOR	1
32		... COMMUTATOR	1
33		... RING, SEAL	1
34		... RING, COMMUTATOR	1
35		.. SLEEVE	1
36		.. ASSEMBLY, END COVER	1
37		.. BOLT, SPECIAL	7

- ITEM NOT ILLUSTRATED

FUEL TANK ASSEMBLY



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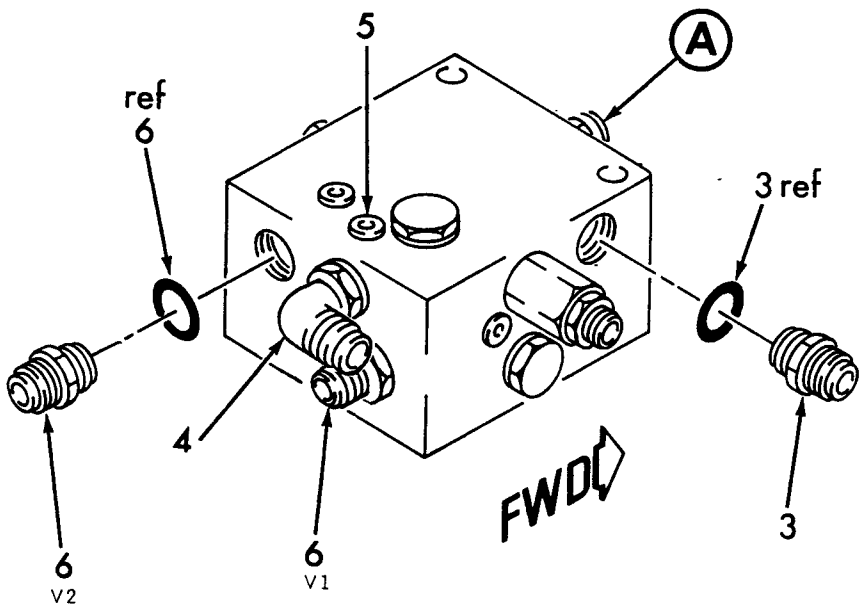
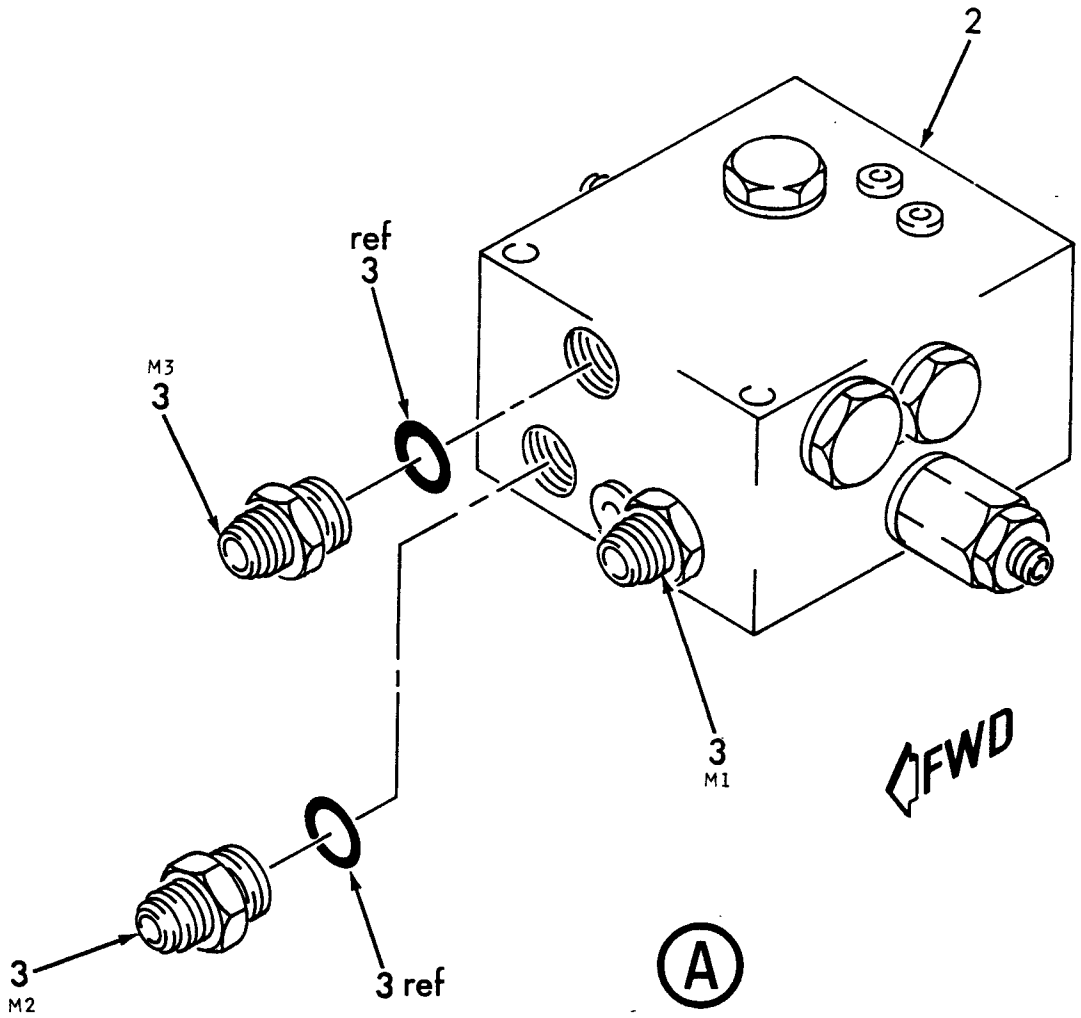
FUEL TANK ASSEMBLY (continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	30285	ASSEMBLY, GAS TANK (See Sect. 3, Fig. 1 or 2 for NHA)	REF
2	3005	. ASSEMBLY, BREATHER CAP	1
-3		.. FILTER, ELEMENT	1
4	32538	. WELDMENT, TANK	1
5	37112	. BAR CHANNEL	2
6	37111	. BAR CHANNEL	2
7	37110	. BAR ANGLE	2
8	54807	. COUPLING HALF	1
9	80021-03	. ELBOW, STREET	1
10	12000	. VALVE, NEEDLE	1
11	80001-04	. CONNECTOR, MALE	1
12	3027	. PLUG, DRAIN	1
13	54806	. COUPLING HALF	1
14	3017	. GAGE	1
15	61729	. SCREW (attaching part)	5

- ITEM NOT ILLUSTRATED

DRIVE AND BRAKE VALVE ASSEMBLY





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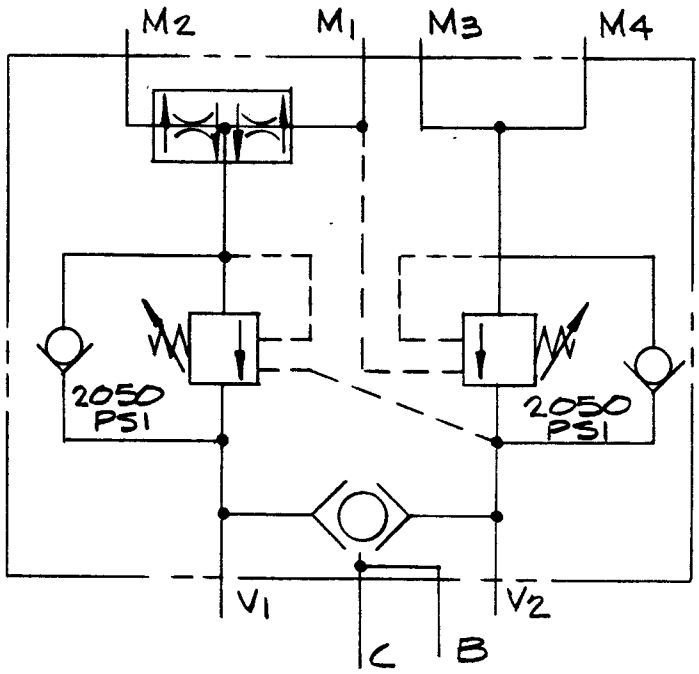

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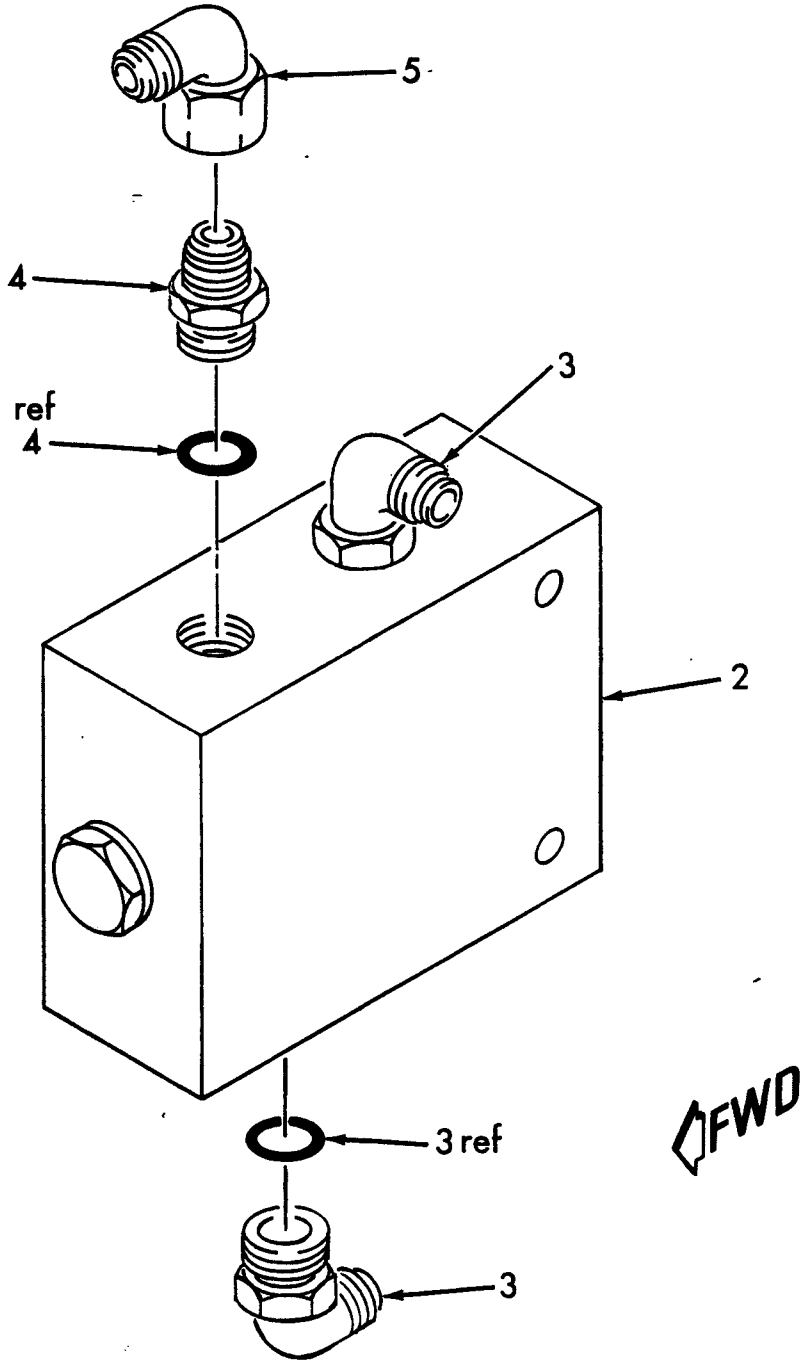
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32274	ASSEMBLY, DRIVE AND BRAKE VALVE (See Sect. 3, Fig. 1 or 2 for NHA)	REF
2	21214	. VALVE, DRIVE AND BRAKE	1
3	80004-11	. CONNECTOR (M1, M2, M3, M4)	4
4	80012-05	. ELBOW, STRAIGHT THREAD	1
5	80048-03	. PLUG, HEX	1
6	80004-16	. CONNECTOR (V1, V2)	2

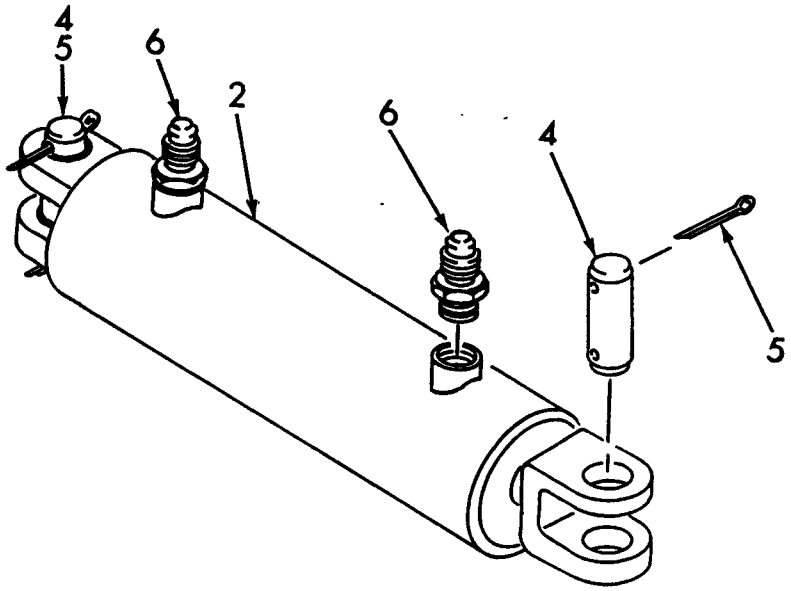
FLOW DIVIDER ASSEMBLY



FLOW DIVIDER ASSEMBLY (continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32273	ASSEMBLY, FLOW DIVIDER (See Sect. 3, Fig. 1 or 2 for NHA)	REF
2	81125	. DIVIDER, FLOW	1
3	80012-11	. ELBOW, STRAIGHT THREAD	2
4	80004-11	. CONNECOTR	1
5	80015-06	. ELBOW, SWIVEL NUT	1

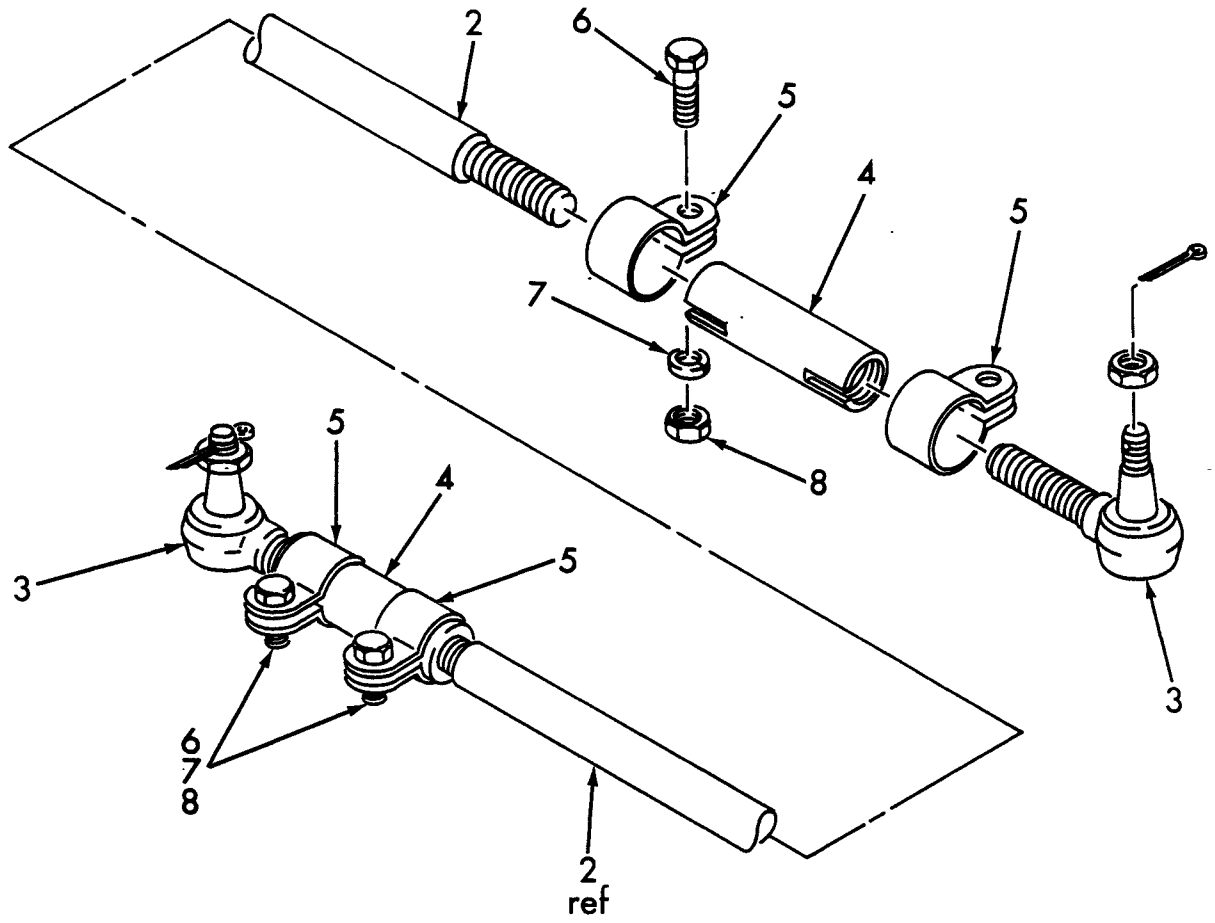
STEERING CYLINDER ASSEMBLY



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32246	ASSEMBLY, STEERING CYCLINDER (See Sect. 3, Fig. 1 or 2 for NHA)	REF
2	32223	. CYLINDER, STEERING	1
-3	66861	. KIT, SEAL	1
4		. PIN	2
5		. PIN, COTTER	4
6	81149	. ADAPTER	2

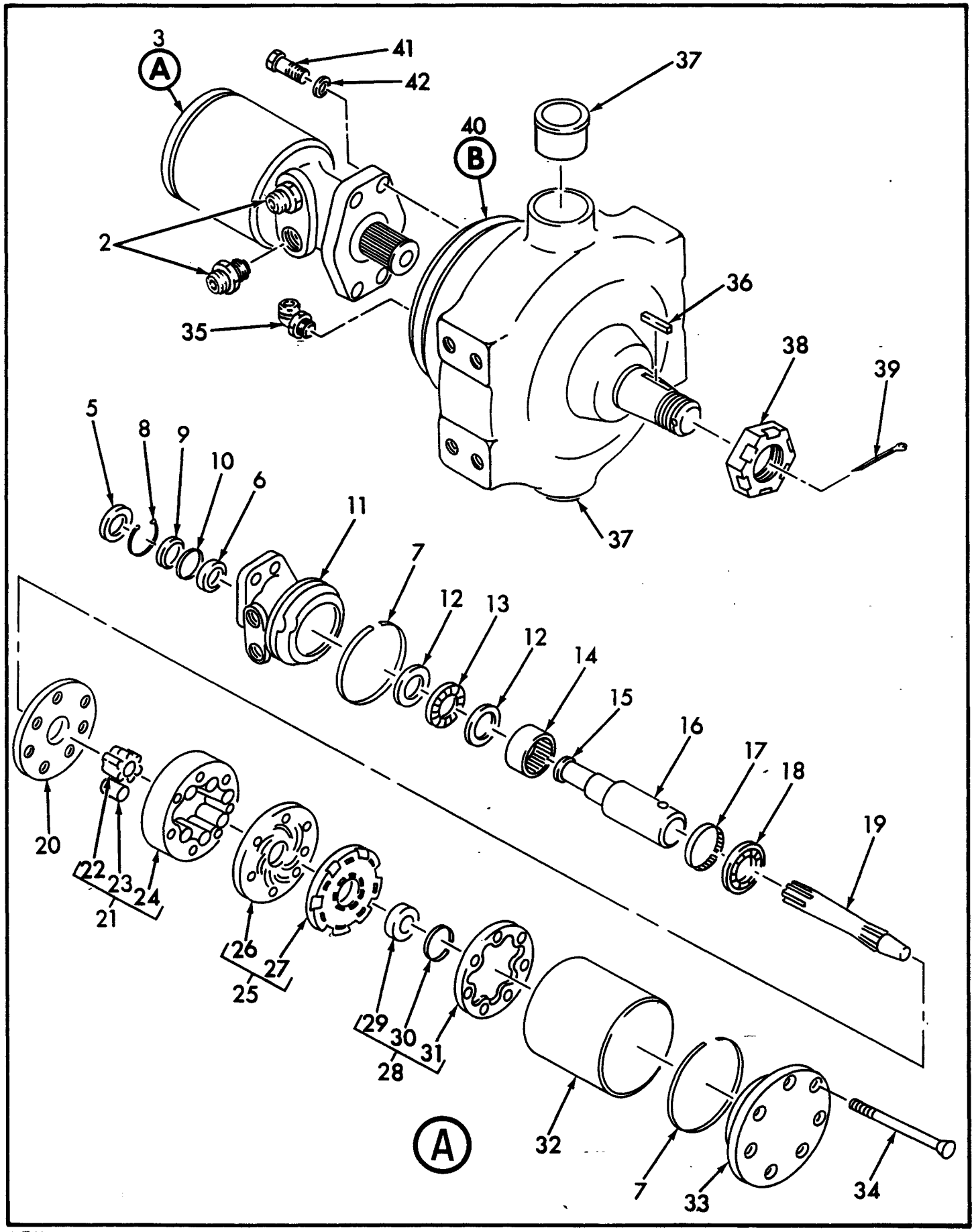
- ITEM NOT ILLUSTRATED

TIE ROD ASSEMBLY



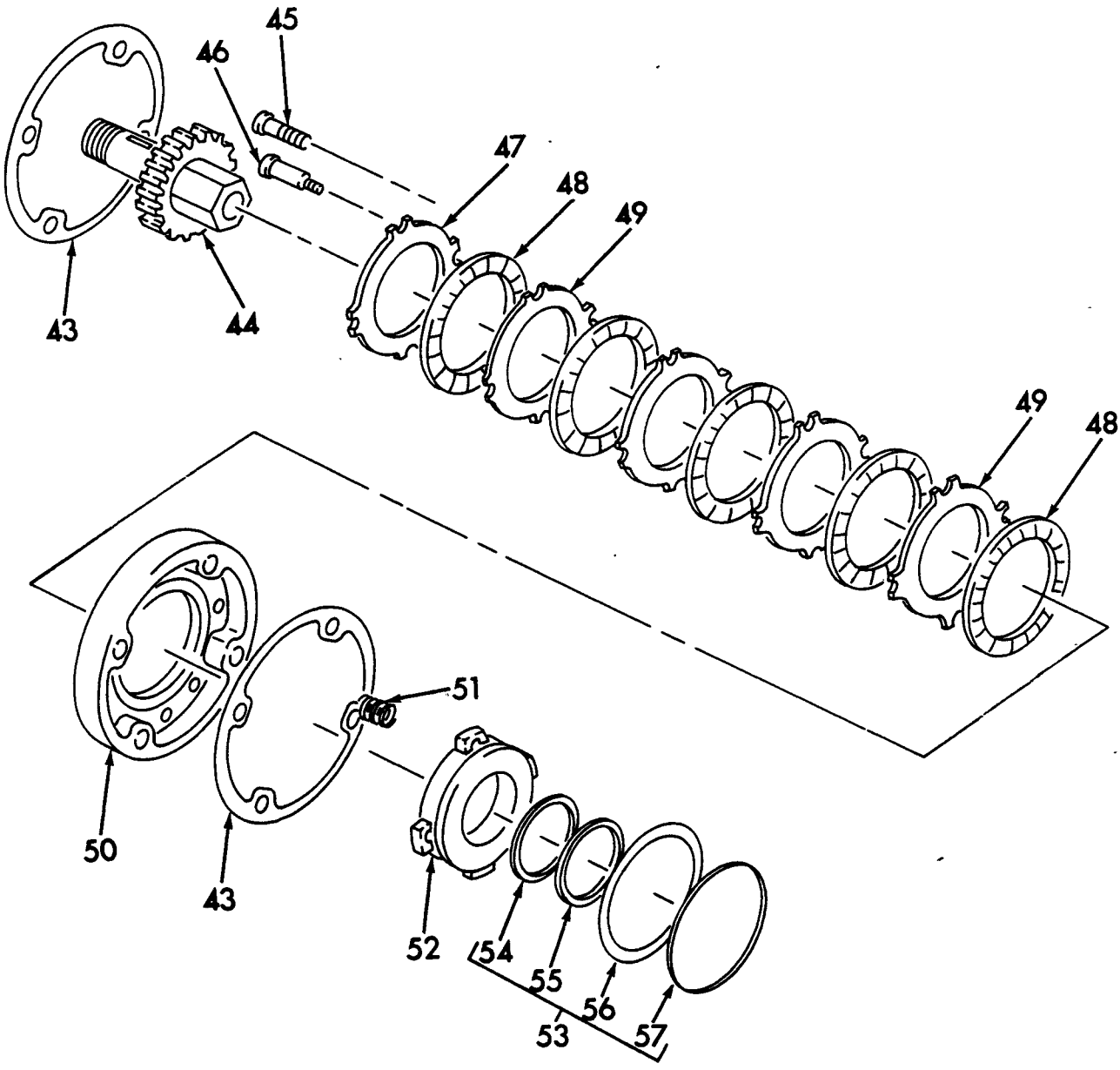
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32213	ASSEMBLY, TIE ROD (See Sect. 3, Fig. 1 or 2 for NHA)	REF
2	32158	. ROD, TIE	1
3	66037	. END, TIE ROD	2
4	32212	. BUCKLE, TURN	2
5	66239	. CLAMP	
6	60415	. SCREW, CAP (attaching part)	4
7	63303	. WASHER, LOCK (attaching part)	4
8	60803	. NUT, HEX (attaching part)	4

DRIVE MOTOR AND PARKING BRAKE ASSEMBLY



REV.

DRIVE MOTOR AND PARKING BRAKE ASSEMBLY (continued)



DRIVE MOTOR AND PARKING BRAKE ASSEMBLY
(continued)

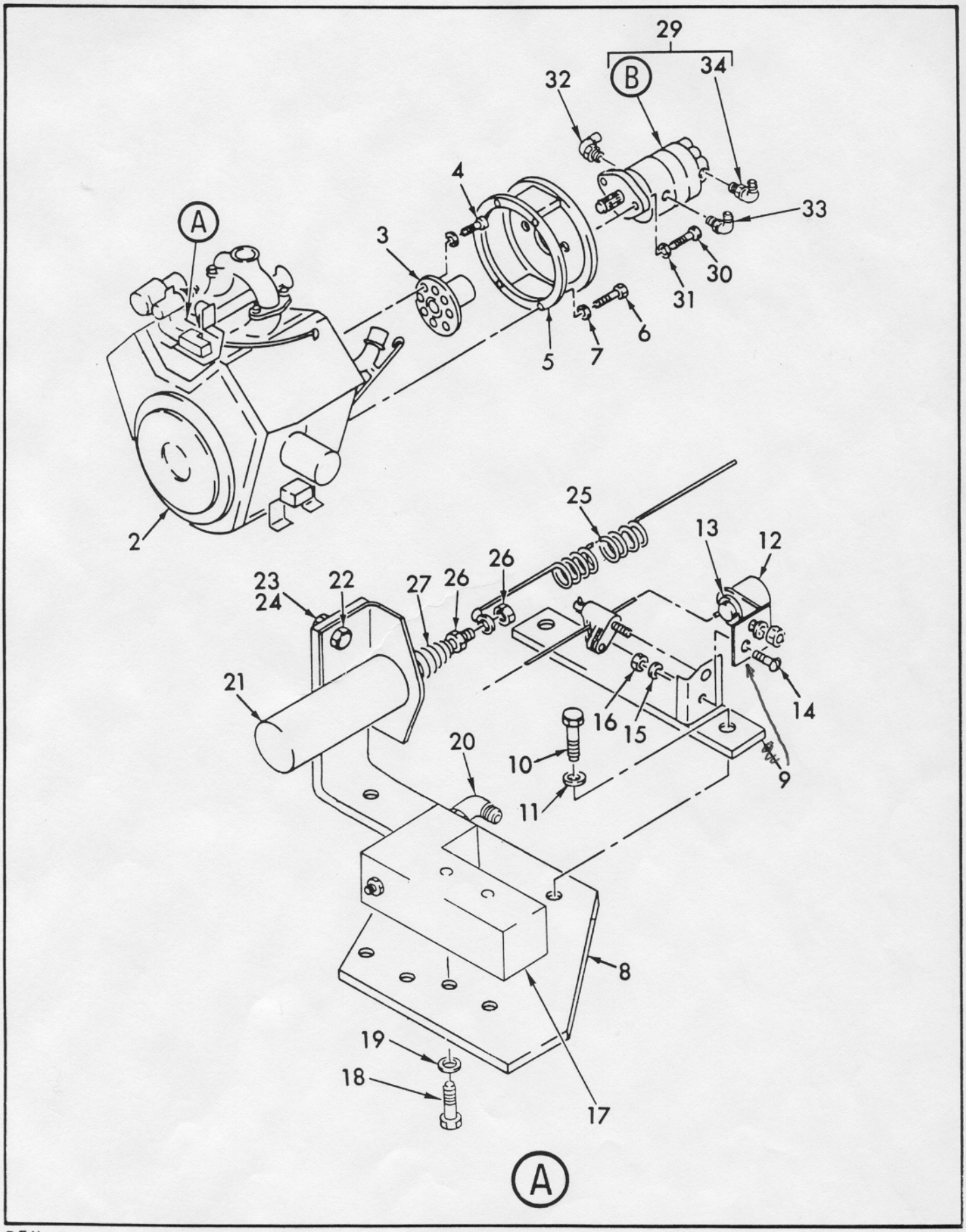
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32250	ASSEMBLY, DRIVE MOTOR AND PARKING BRAKE (See Sect. 3, Fig. 1 for NHA)	REF
2	80004-13	. CONNECTOR	2
3	81114	. ASSEMBLY, DRIVE MOTOR	1
-4	3036-A	. KIT, SEAL	1
5		. SEAL	1
6		. SEAL	1
7		. RING, SEAL	2
8		. RING, RETAINER	1
9		. WASHER, BACK-UP	1
10		. WASHER	1
11		. HOUSING	1
12		. WASHER, THRUST	2
13		. BEARING, THRUST	1
14		. BEARING	1
15		. WASHER	1
16		. SHAFT, COUPLING	1
17		. BEARING	1
18		. BEARING, THRUST	1
19		. LINK, DRIVE	1
20		. PLATE, WEAR	1
21		. SET, ROTOR	1
22		. ROTOR	1
23		. VALVE	7
24		. STATOR	1
25		. SET, MANIFOLD (FOR MAB TORQMOTORS)	1

- ITEM NOT ILLUSTRATED

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
26		... PLATE, MANIFOLD	1
27		... MANIFOLD	1
28		.. SET, COMMUTATOR	1
29		... COMMUTATOR	1
30		... RING, SEAL	1
31		... RING, COMMUTATOR	1
32		.. SLEEVE	1
33		.. ASSEMBLY, END COVER	1
34		.. BOLT, SPECIAL	7
35	80012-03	.. ELBOW, STRAIGHT THREAD	1
36	67037	. KEY, WOODRUFF	1
37	67036	. BUSHING	2
38	67035	. NUT	1
39	64310	. PIN, COTTER	1
40	81116	. ASSEMBLY, BRAKE	1
41	60622	. SCREW, CAP (attaching part)	4
42	63327	. WASHER, LOCK (attaching part)	4
43		.. GASKET, CASE	2
44	67034	.. ASSEMBLY, SPLINE SHAFT	1
45		.. SCREWS, SOCKET HEAD CAP (ASSEMBLY BOLTS)	4
46		.. BOLTS, SOCKET HEAD SHOULDERS (TENSION PINS)	4
47		.. DISC, PRIMARY	1
48		.. DISCS, ROTOR	5
49		.. DISCS, STATOR	4
50		.. PLATE, SPRING	1
51		.. SPRINGS	8

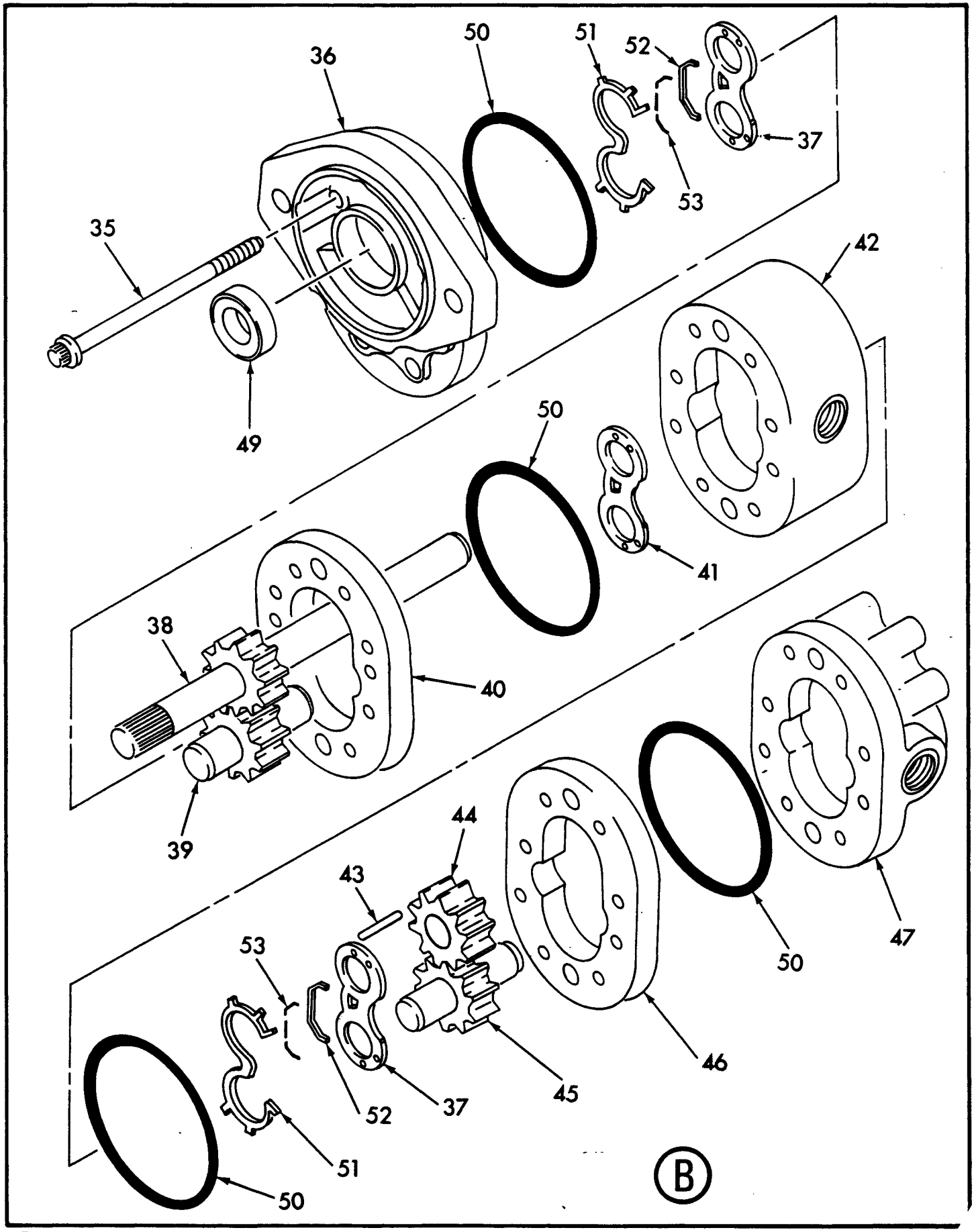
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
52		.. PISTON	1
53	66971	.. KIT, SEAL	1
54		... RING, BACK-UP	1
55		... O-RING	1
56		... RING, BACK-UP	1
57		... O-RING	1

ENGINE AND PUMP ASSEMBLY



REV.

ENGINE AND PUMP ASSEMBLY
(continued)



REV.

ENGINE AND PUMP ASSEMBLY (continued)

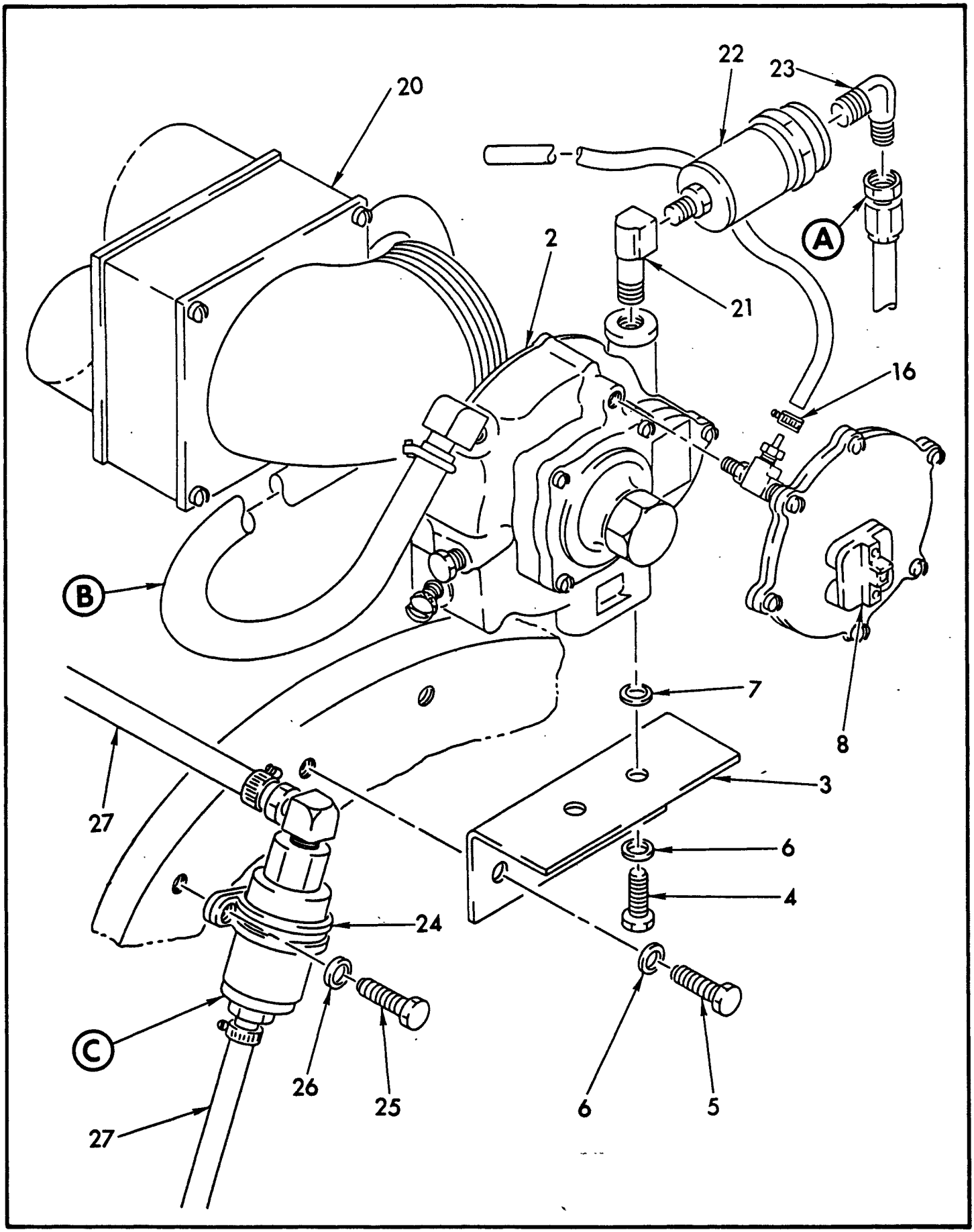
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32232	ASSEMBLY, ENGINE AND PUMP (See Sect. 3, Fig. 1 or 2 for NHA)	REF
2	32550	. ASSEMBLY, GASOLINE ENGINE (See Vendor for more informations)	1
3	32217	. SHAFT, STUB	1
4	60625	. SCREW, CAP (attaching part)	8
5	32219	. ADAPTER, PUMP	1
6	60630	. SCREW, CAP (attaching part)	4
7	63304	. WASHER, LOCK (attaching part)	4
8	22521	. BRACKET, MOUNTING SOLENOID VALVE AND HYDRAULIC THROTTLE	1
9	22663	. BRACKET, DASH POT	1
10	60322	. SCREW, CAP (attaching part)	2
11	63302	. WASHER, LOCK (attaching part)	2
12	65511	. DASH, POT	1
13	61232	. NUT, THIN FLEX (attaching part)	1
14	62703	. SCREW, MACHINE (attaching part)	1
15	63313	. WASHER, LOCK	1
16	60802	. NUT, HEX (attaching part)	1
17	20364	. THROTTLE, HYDRAULIC	1
18	60404	. SCREW, CAP (attaching part)	2
19	63302	. WASHER, LOCK (attaching part)	2
20	63302	. ELBOW, MALE	1
21	21777	. SYNCHRO, START	1
22	60309	. SCREW, CAP (attaching part)	2
23	63301	. WASHER, LOCK (attaching part)	2
24	60701	. NUT, HEX (attaching part)	2

- ITEM NOT ILLUSTRATED

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
25	65199	. SPRING, UNIVERSAL THROTTLE	1
26	60805	. NUT, HEX (attaching part)	2
27	66966	. SPRING	1
-28	32354	. KIT, DUAL FUEL (See Sect. 3, Fig. 21 for Details)	1
29	81115	. ASSEMBLY, DOUBLE GEAR PUMP	1
30	60630	. SCREW, CAP (attaching part)	2
31	63304	. WASHER, LOCK (attaching part)	2
32	81197	. TUBE, ELBOW	1
33	80012-15	. ELBOW, STRAIGHT THREAD	1
34	66995	.. FITTING, FLOW	1
35		.. CAP, SCREW	8
36	66909	.. ASSEMBLY, FRONT PLATE	1
37		.. WEAR, PLATE	2
38	66994	.. ASSEMBLY, SPLINE DRIVE GEAR	1
39	66991	.. ASSEMBLY, IDLER GEAR	1
40		.. ASSEMBLY, FRONT BODY	1
41		.. PLATE, OPTIONAL THRUST	1
42	66992	.. ASSEMBLY, ADAPTOR PLATE	1
43	66990	.. KEY, ROUND	1
44	66993	.. GEAR, SLIP FIT	1
45	66996	.. ASSEMBLY, IDLER GEAR	1
46	66998	.. ASSEMBLY, REAR BODY	1
47	66988	.. ASSEMBLY, BACK PLATE	1
-48		.. KIT, SEAL	1
49		... SEAL, SAHFT	1

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
50		... O-RING	4
51		... GASKET, BACK-UP	2
52		... SEAL, BEARING	2
53		... O-RING, MOLDED	2

DUAL FUEL KIT



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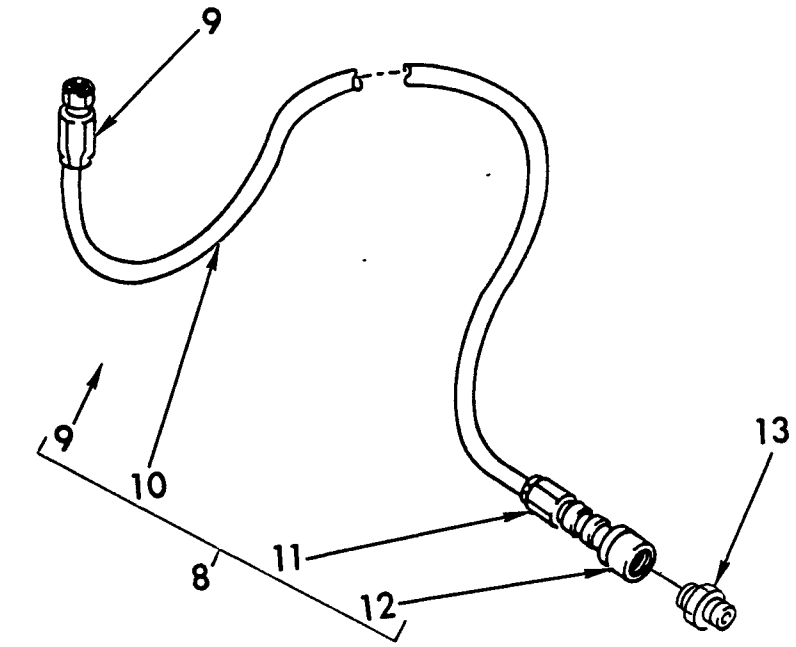
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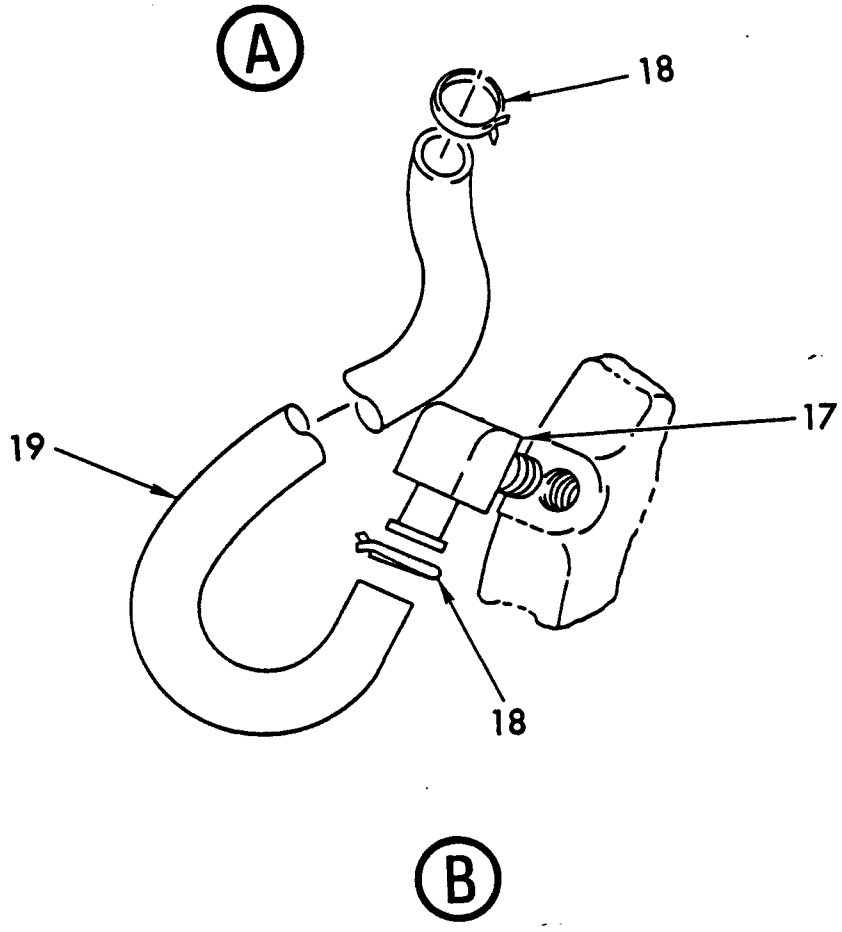
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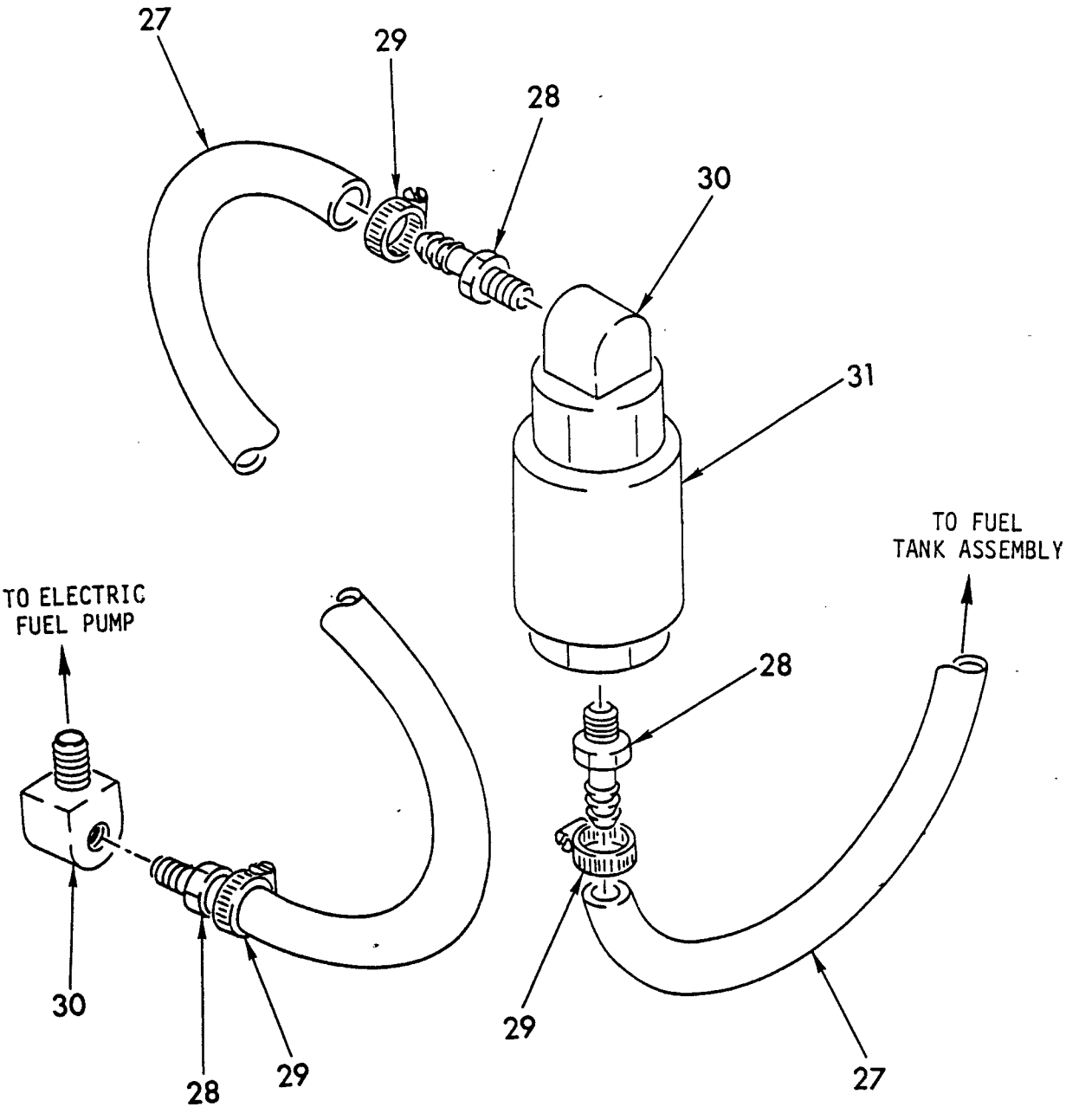
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TO FUEL
TANK ASSEMBLY
TO ELECTRIC
FUEL PUMP
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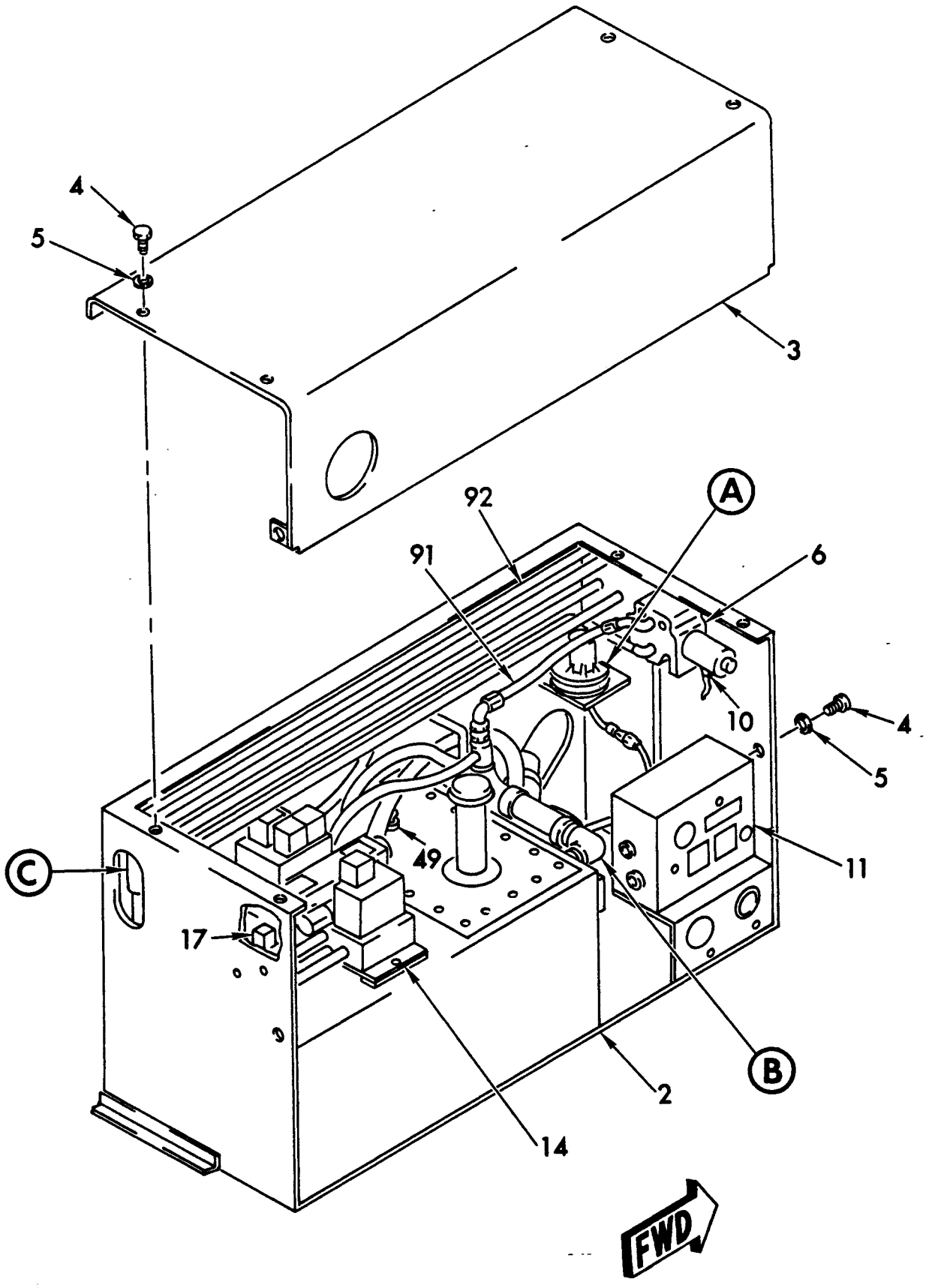
DUAL FUEL KIT (continued)

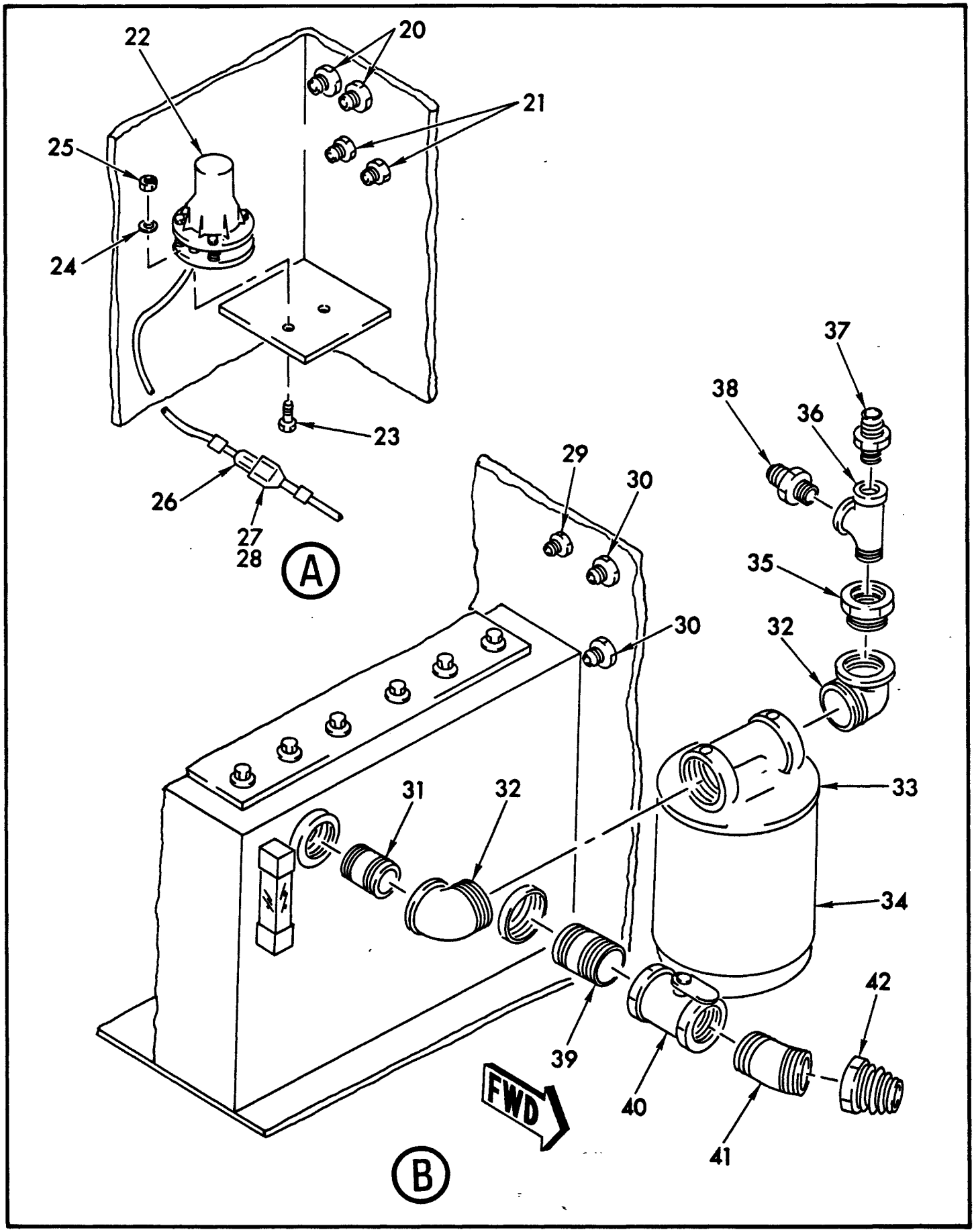
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32354	KIT, DUAL FUEL (See Sect. 3, Fig. 20 for NHA)	REF
2	16921	. REGULATOR	1
3	32454	. BRACKET, DUAL FUEL	1
4	60353	. SCREW, CAP (attaching part)	2
5	60309	. SCREW, CAP (attaching part)	2
6	63401	. WASHER, LOCK (attaching part)	4
7	63301	. WASHER, FLAT (attaching part)	2
8	16975	. KIT, MICROVAC	1
9	32517	. ASSEMBLY, PROPANE HOSE	1
10	16451	.. FITTING	1
11	2616	.. HOSE	1
12	16452	.. FITTING	1
13	65142	.. SOCKET	1
14	65141	. NIPPLE	1
-15	486-C	. ASSEMBLY, PROPANE TANK	1
16	161-A	. CLAMP, HOSE	1
17	65532	. HOSE, BARB	1
18	2713	. CLAMP, HOSE	2
19	65485-24	. HOSE	1
20	65510	. ADAPTER, CARBURETOR	1
21	16519	. ELBOW, STREET	1
22	16925	. FILTER, LOCK PROPANE	1
23	80008-08	. ELBOW, MALE	1
24	65867	. CLAMP	1
25	60353	. SCREW, CAP (attaching part)	1

- ITEM NOT ILLUSTRATED

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
26	63301	. WASHER, LOCK (attaching part)	1
27	160-B	. HOSE, FUEL (1.75 FT)	AR
28	240	. HOSE, BARB	3
29	161-A	. CLAMP, HOSE	3
30	66196	. ELBOW, STREET	2
31	20832	. VALVE, FUEL SHUT-OFF	1

HYDRAULIC TANK ASSEMBLY (MT-25G)

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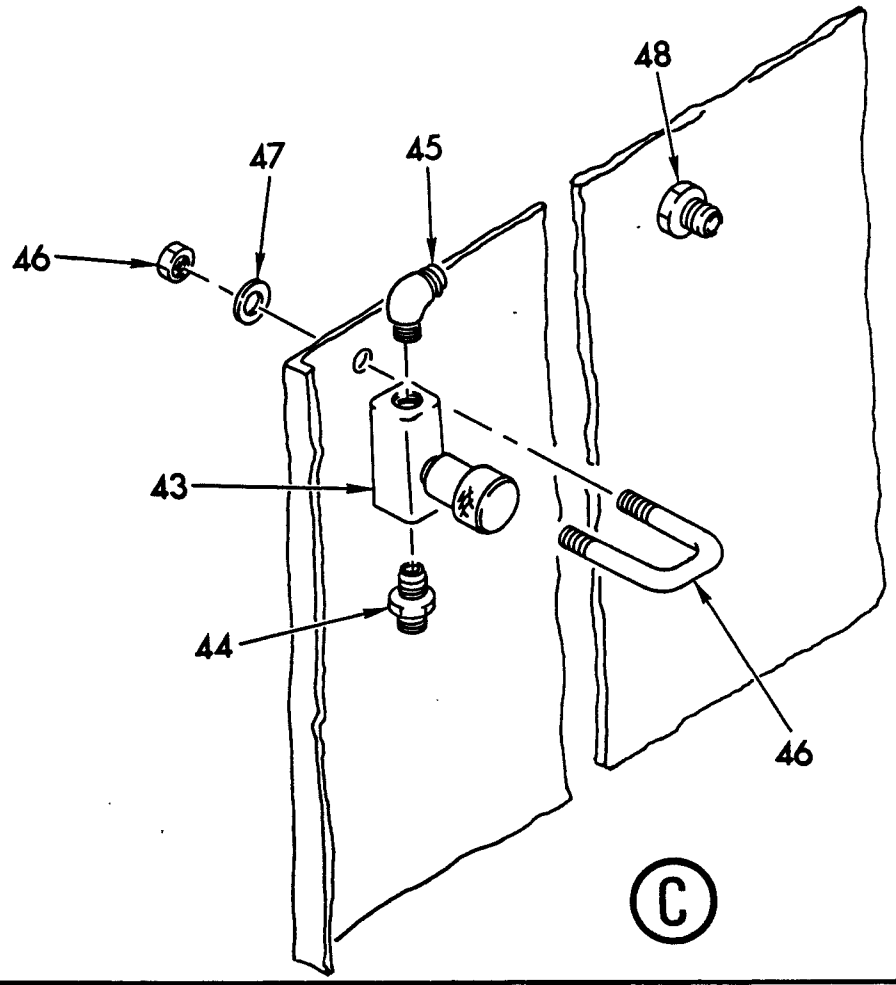
HYDRAULIC TANK ASSEMBLY (MT-25G)
(continued)



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32329	ASSEMBLY, HYDRAULIC TANK (MT-25G) (See Sect. 3, Fig. 1 for NHA)	REF
2	32393	. SUB-ASSEMBLY, HOUSING TANK (See Sect. 3, Fig. 24 for Details)	1
3	32171	. COVER, HYDRAULIC TANK	1
4	60353	. SCREW, CAP (attaching part)	6
5	63301	. WASHER, LOCK (attaching part)	6
6	32321	. ASSEMBLY, DRIVE SOLENOID VALVE (See Sect. 3, Fig. 25 for Details)	1
-7	60355	. SCREW, CAP (attaching part)	3
-8	63302	. WASHER, LOCK (attaching part)	6
-9	60702	. NUT, HEX (attaching part)	3
10	117-E	. TERMINAL, PUSH-ON	1

- ITEM NOT ILLUSTRATED

HYDRAULIC TANK ASSEMBLY (MT-25G) (continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
11	32249	. ASSEMBLY, GROUND CONTROL BOX (MT-25G) (See Sect. 3, Fig. 26 for Details)	1
-12	60324	. SCREW, CAP (attaching part)	3
-13	63302	. WASHER, LOCK (attaching part)	3
14	32245	. ASSEMBLY, VALVE PACKAGE	1
-15	60322	. SCREW, CAP (attaching part)	2
-16	63302	. WASHER, LOCK (attaching part)	2
17	32323	. ASSEMBLY, LOWERING CONTROL VALVE	1
-18	60337	. SCREW, CAP (attaching part)	2
-19	63301	. WASHER, LOCK (attaching part)	2
-19A	60701	. NUT, HEX (attaching part)	2
20	80011-05	. ELBOW, BULKHEAD UNION	2
21	80011-03	. ELBOW, BULKHEAD UNION	2
22	31074	. SENSOR, SLOPE	1
23	60309	. SCREW, CAP (attaching part)	2
24	63301	. WASHER, LOCK (attaching part)	2
25	60701	. NUT, HEX (attaching part)	2
26	66357	. TERMINAL, MALE	AR
27	66356	. TERMINAL, FEMALE	AR
28	117-E	. TERMINAL, PUSH-ON	1
29	80011-03	. ELBOW, BULKHEAD UNION	1
30	80011-07	. ELBOW, BULKHEAD UNION	2
31	65864	. NIPPLE	1
32	16503	. ELBOW, STREET	2
33	21241	. FILTER, RETURN	1
34		.. ELEMENT	1
35	80057-19	. REDUCTOR	1

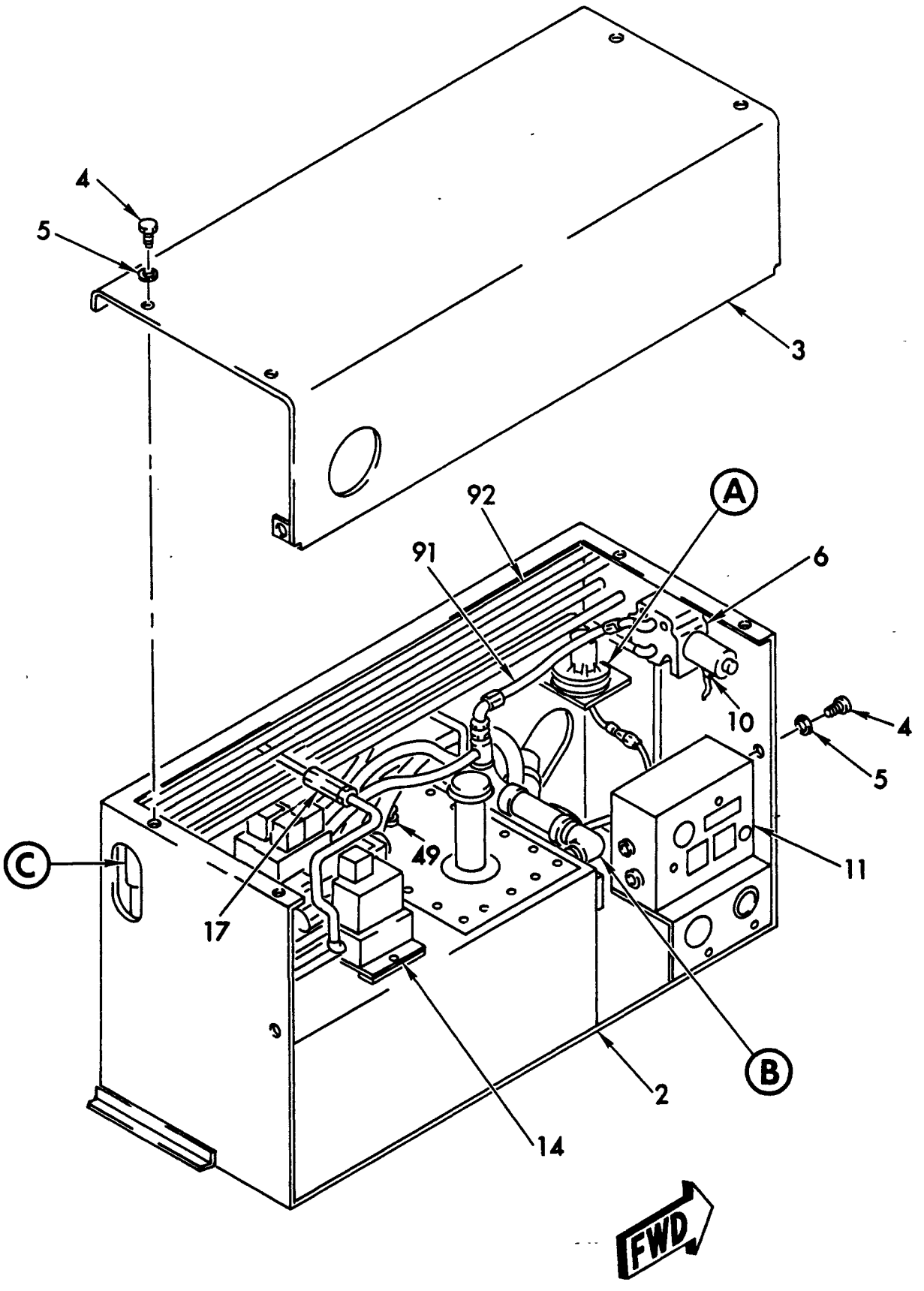
- ITEM NOT ILLUSTRATED

HYDRAULIC TANK ASSEMBLY (MT-25G)
(continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
36	80041-14	. TEE, STREET	1
37	80001-18	. CONNECTOR, MALE	1
38	80001-15	. CONNECTOR, MALE	1
39	16551	. NIPPLE	1
40	65837	. VALVE, BUTTERFLY	1
41	55201	. ELBOW, STREET	1
42	65831	. NIPPLE, COMBINATION	1
43	30884	. VALVE, FLOW CONTROL	1
44	80001-03	. CONNECTOR, MALE	1
45	80008-03	. ELBOW, MALE	1
46	65365	. U-BOLT (WITH NUT)	1
47	63301	. WASHER, LOCK (attaching part)	2
48	80011-05	. ELBOW, BULKHEAD UNION	1
49	80008-04	. ELBOW, MALE	1
-50	70029	. CONNECTOR	AR
-51	70271	. CONNECTOR	AR
91	32310	KIT, HOSE (See Sect. 2, Fig. 21 for Details)	REF
92	32234	KIT, TUBE (See Sect. 2, Fig. 31 for Details)	REF

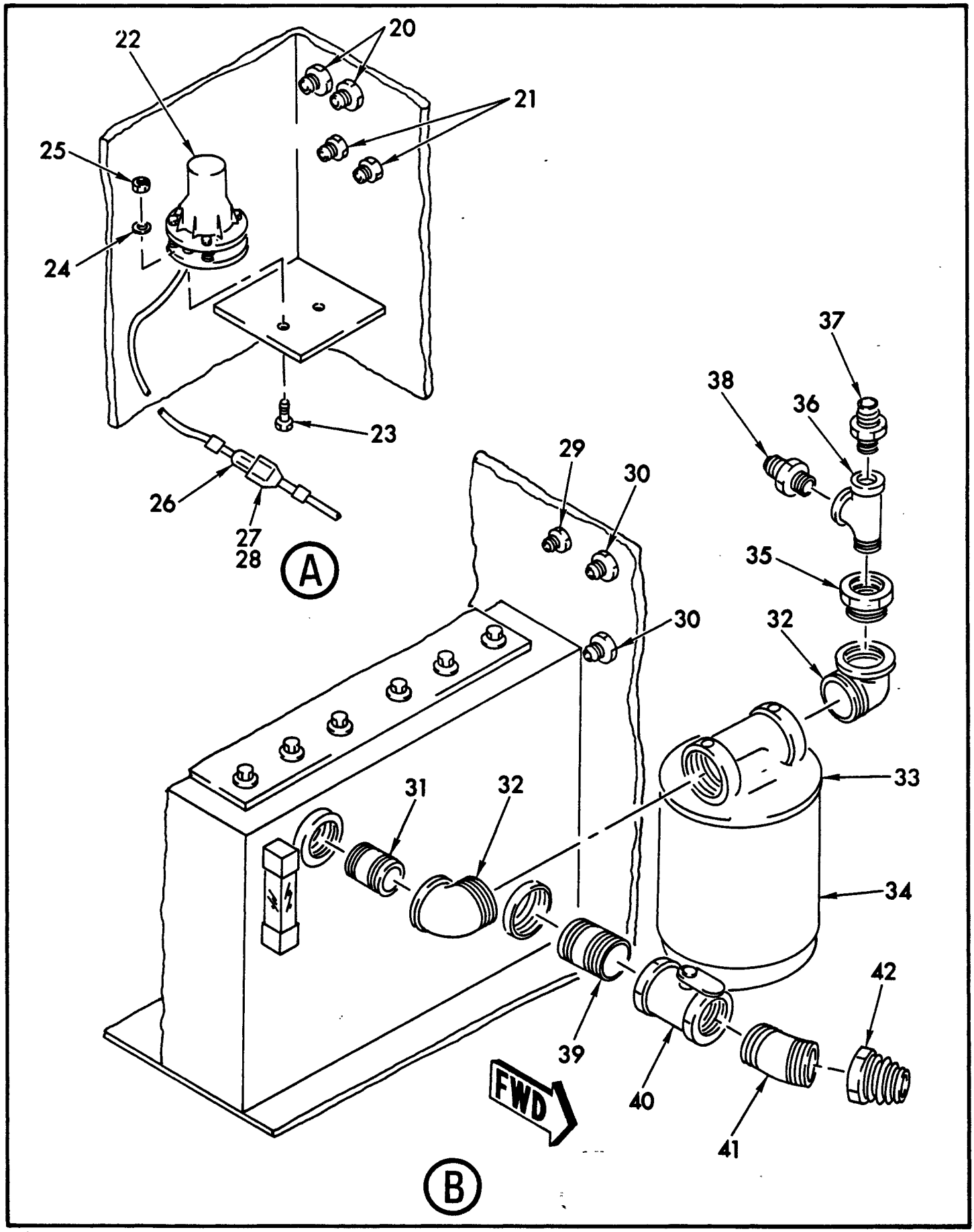
- ITEM NOT ILLUSTRATED

HYDRAULIC TANK ASSEMBLY (MT-25GT)

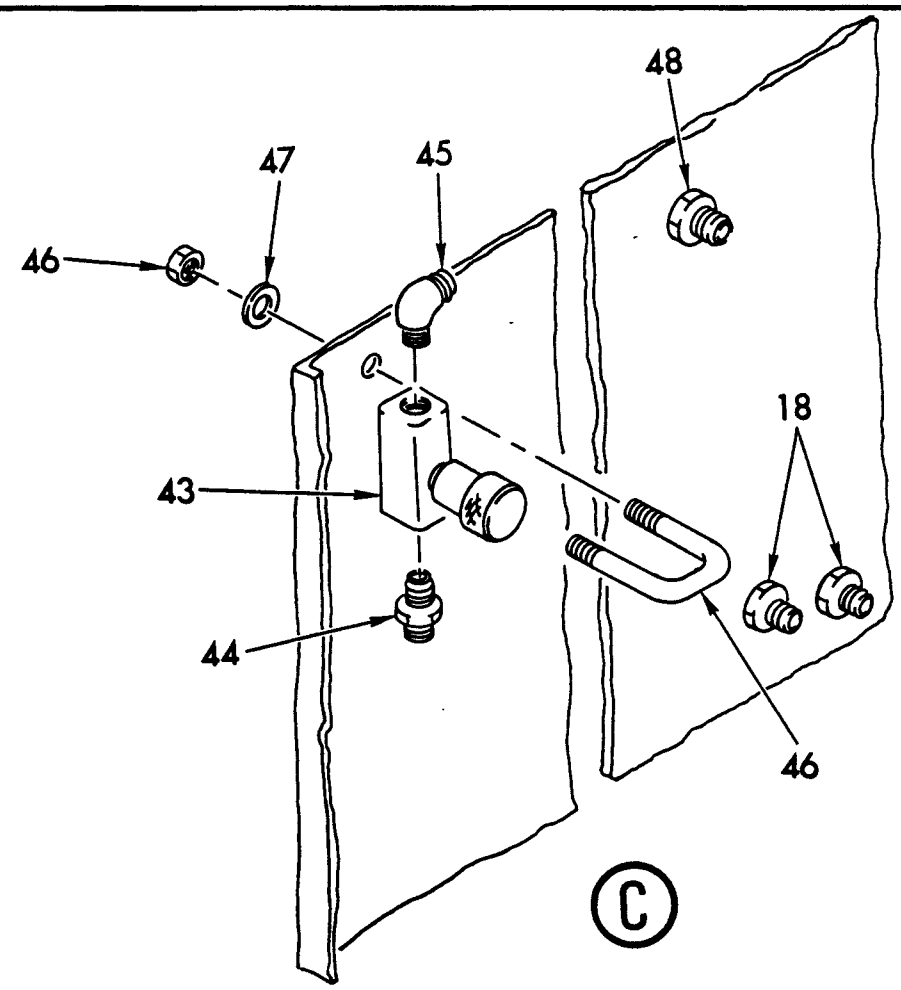


REV.

HYDRAULIC TANK ASSEMBLY (MT-25GT)
(continued)



HYDRAULIC TANK ASSEMBLY (MT-25GT)
(continued)



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32329	ASSEMBLY, HUDRAULIC TANK (MT-25GT) (See Sect. 3, Fig. 2 for NHA)	REF
2	32393	. SUB-ASSEMBLY, HOUSING TANK (See Sect. 3, Fig. 24 for Details)	1
3	32171	. COVER, HYDRAULIC TANK	1
4	60353	. SCREW, CAP (attaching part)	6
5	63301	. WASHER, LOCK (attaching part)	6
6	32321	. ASSEMBLY, DRIVE SOLENOID VALVE (See Sect. 3, Fig. 25 for Details)	1
-7	60355	. SCREW, CAP (attaching part)	3
-8	63302	. WASHER, LOCK (attaching part)	6
-9	60702	. NUT, HEX (attaching part)	3
10	117-E	. TERMINAL, PUSH-ON	1

- ITEM NOT ILLUSTRATED

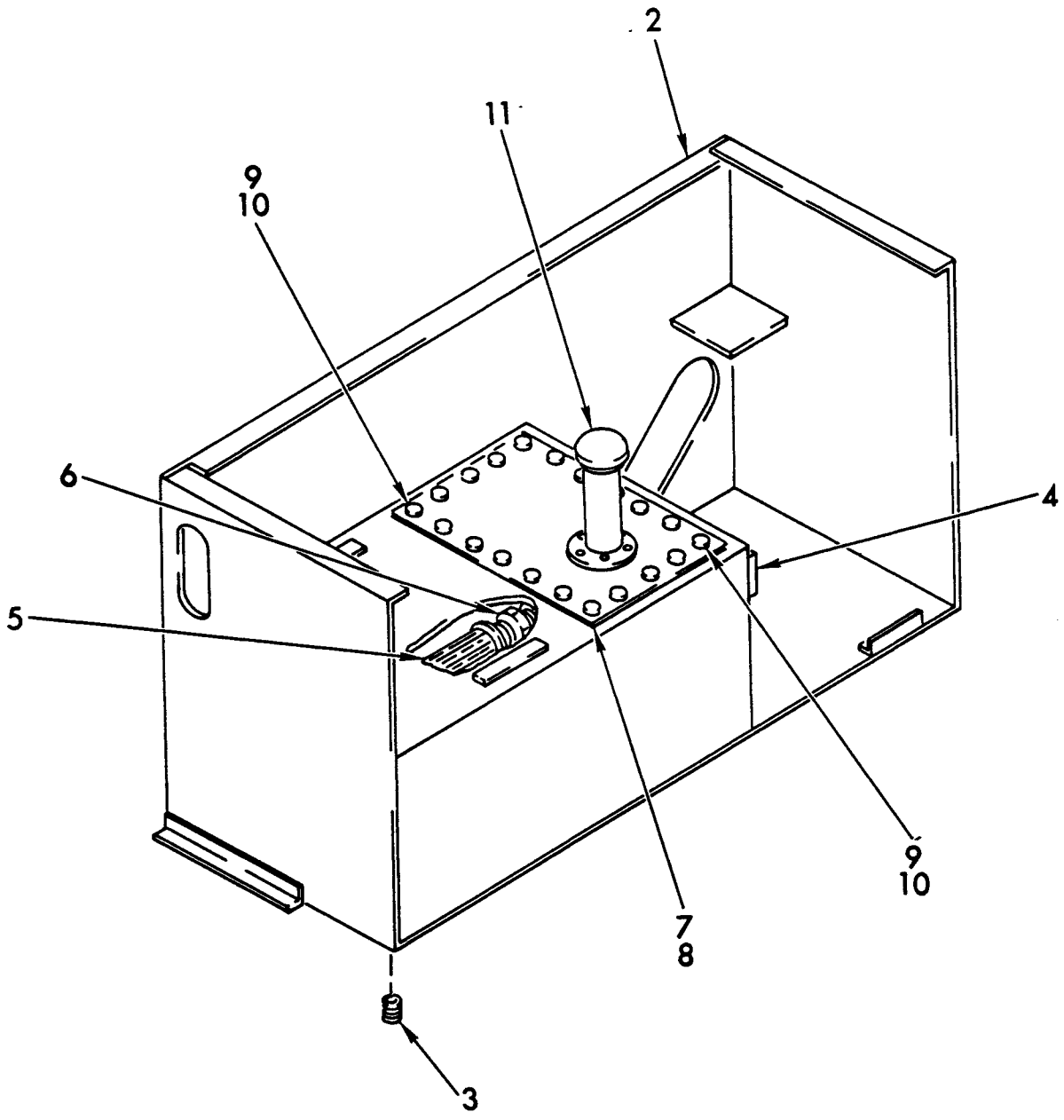
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
11	32333	. ASSEMBLY, GROUND CONTROL BOX (See Sect. 3, Fig. 27 for Details)	1
-12	60324	. SCREW, CAP (attaching part)	3
-13	63302	. WASHER, LOCK (attaching part)	3
14	32332	. ASSEMBLY, VALVE PACKAGE (See Sect. 3, Fig. 29 for Details)	1
-15	60322	. SCREW, CAP (attaching part)	2
-16	63302	. WASHER, LOCK (attaching part)	2
17	32322	. ASSEMBLY, FLOW VALVE (See Sect. 3, Fig. 31 for Details)	1
18	80011-03	. ELBOW, BULKHEAD UNION	2
20	80011-05	. ELBOW, BULKHEAD UNION	2
21	80011-03	. ELBOW, BULKHEAD UNION	2
22	31074	. SENSOR, SLOPE	1
23	60309	. SCREW, CAP (attaching part)	2
24	63301	. WASHER, LOCK (attaching part)	2
25	60701	. NUT, HEX (attaching part)	2
26	66357	. TERMINAL, MALE	AR
27	66356	. TERMINAL, FEMALE	AR
28	117-E	. TERMINAL, PUSH-ON	1
29	80011-03	. ELBOW, BULKHEAD UNION	1
30	80011-07	. ELBOW, BULKHEAD UNION	2
31	65864	. NIPPLE	1
32	16503	. ELBOW, STREET	2
33	21241	. FILTER, RETURN	1
34		.. ELEMENT	1
35	80057-19	. REDUCER	1
36	80041-14	. TEE, STREET	1

HYDRAULIC TANK ASSEMBLY (MT-25GT)
(continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
37	80001-18	. CONNECTOR, MALE	1
38	80001-15	. CONNECTOR, MALE	1
39	16551	. NIPPLE	1
40	65837	. VALVE, BUTTERFLY	1
41	55201	. ELBOW, STREET	1
42	65831	. NIPPLE, COMBINATION	1
43	30884	. VALVE, FLOW CONTROL	1
44	80001-03	. CONNECTOR, MALE	1
45	80008-03	. ELBOW, MALE	1
46	65365	. U-BOLT (WITH NUT)	1
47	63301	. WASHER, LOCK (attaching part)	2
48	80011-05	. ELBOW, BULKHEAD UNION	1
49	80008-04	. ELBOW, MALE	1
-50	70029	. CONNECTOR	AR
-51	70271	. CONNECTOR	AR
91	32328	KIT, HOSE (See Sect. 2, Fig. 22 for Details)	REF
92	32324	KIT, TUBE (See Sect. 2, Fig. 32 for Details)	REF

- ITEM NOT ILLUSTRATED

HOUSING TANK SUB-ASSEMBLY



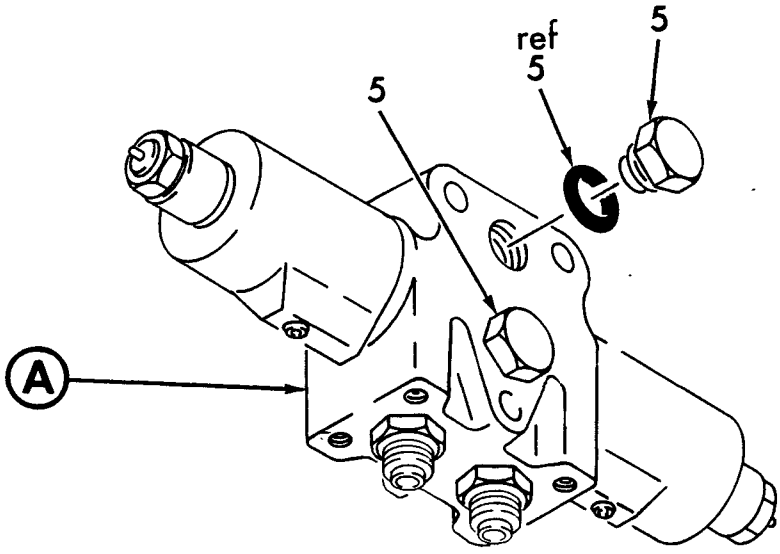
REV.

HOUSING TANK SUB-ASSEMBLY (continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32393	SUB-ASSEMBLY, HOUSING TANK (See Sect. 3, Fig. 22 or 23 for NHA)	REF
2	32189	. WELDMENT, HYDRAULIC HOUSING	1
3	3027	. PLUG, MAGNETIC	1
4	3018	. GAGE, FLUID LEVEL	1
5	81171	. STRAIER	1
6	80052-15	. NIPPLE, PIPE	1
7	32173	. COVER, HYDRAULIC TANK	1
8	32175	. GASKET, HYDRAULIC TANK	1
9	60353	. SCREW, CAP (attaching part)	20
10	63301	. WASHER, LOCK (attaching part)	20
11	81123	. ASSEMBLY, FILLER NECK	1

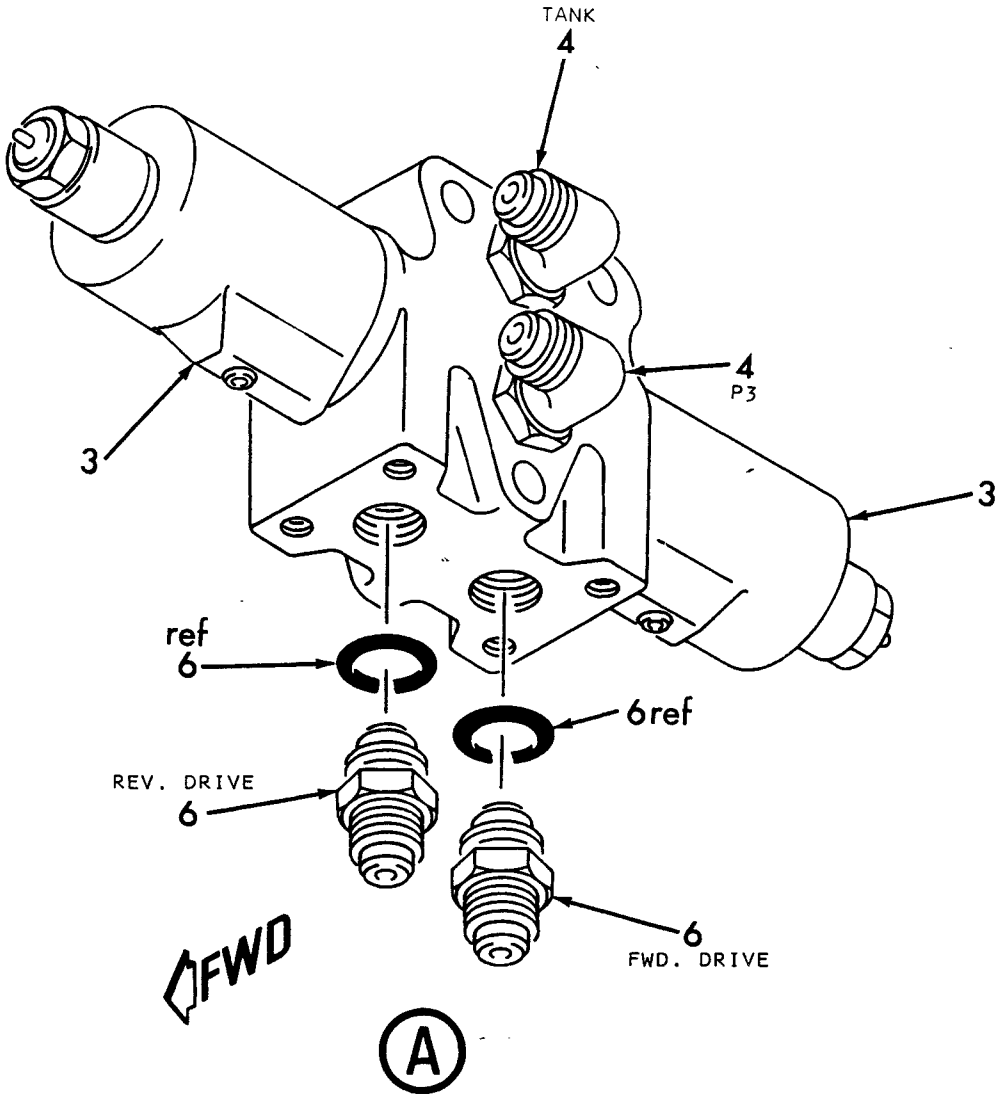
- ITEM NOT ILLUSTRATED

DRIVE SOLENOID VALVE ASSEMBLY



BOTTOM VIEW

FWD

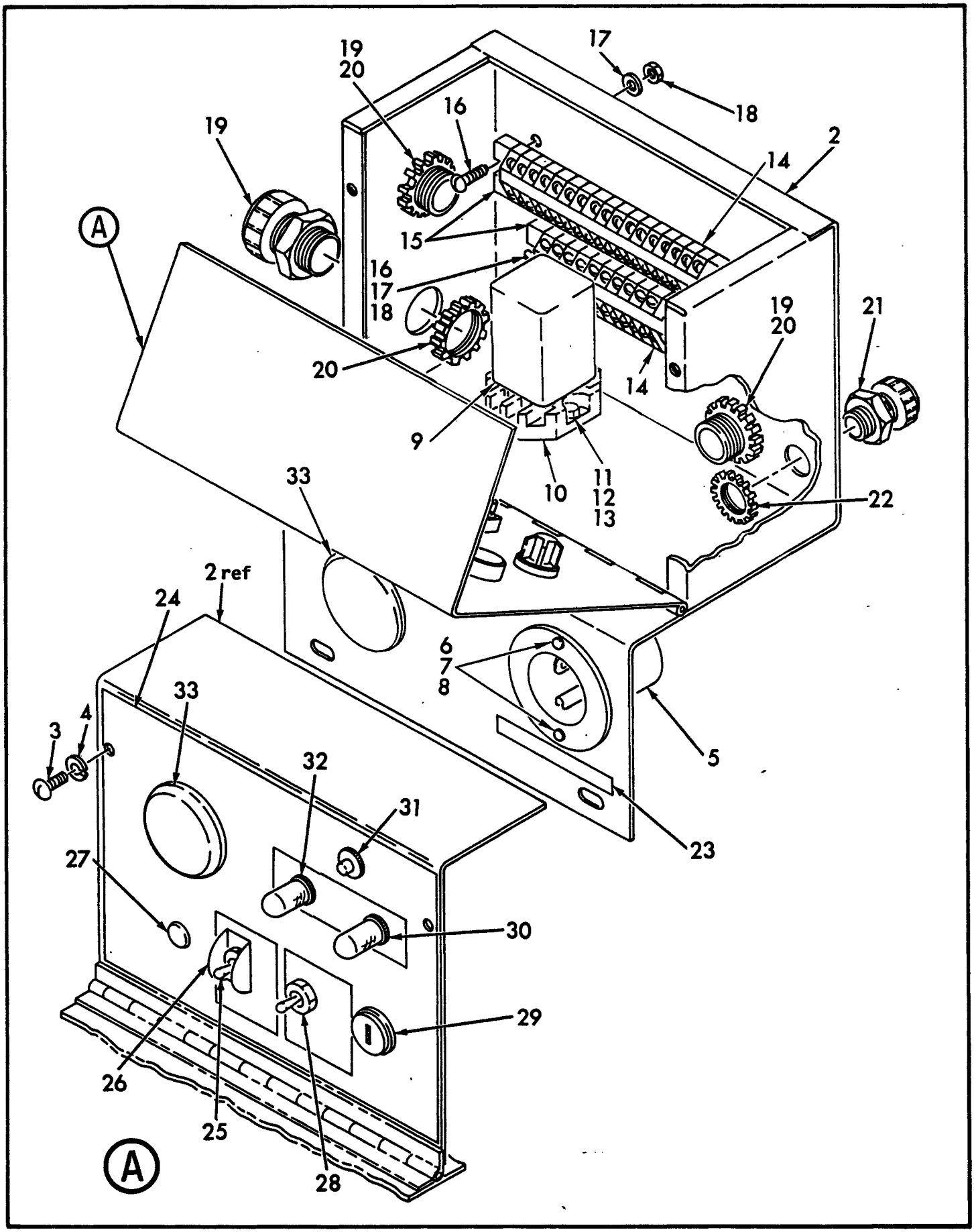


DRIVE SOLENOID VALVE ASSEMBLY (continued)

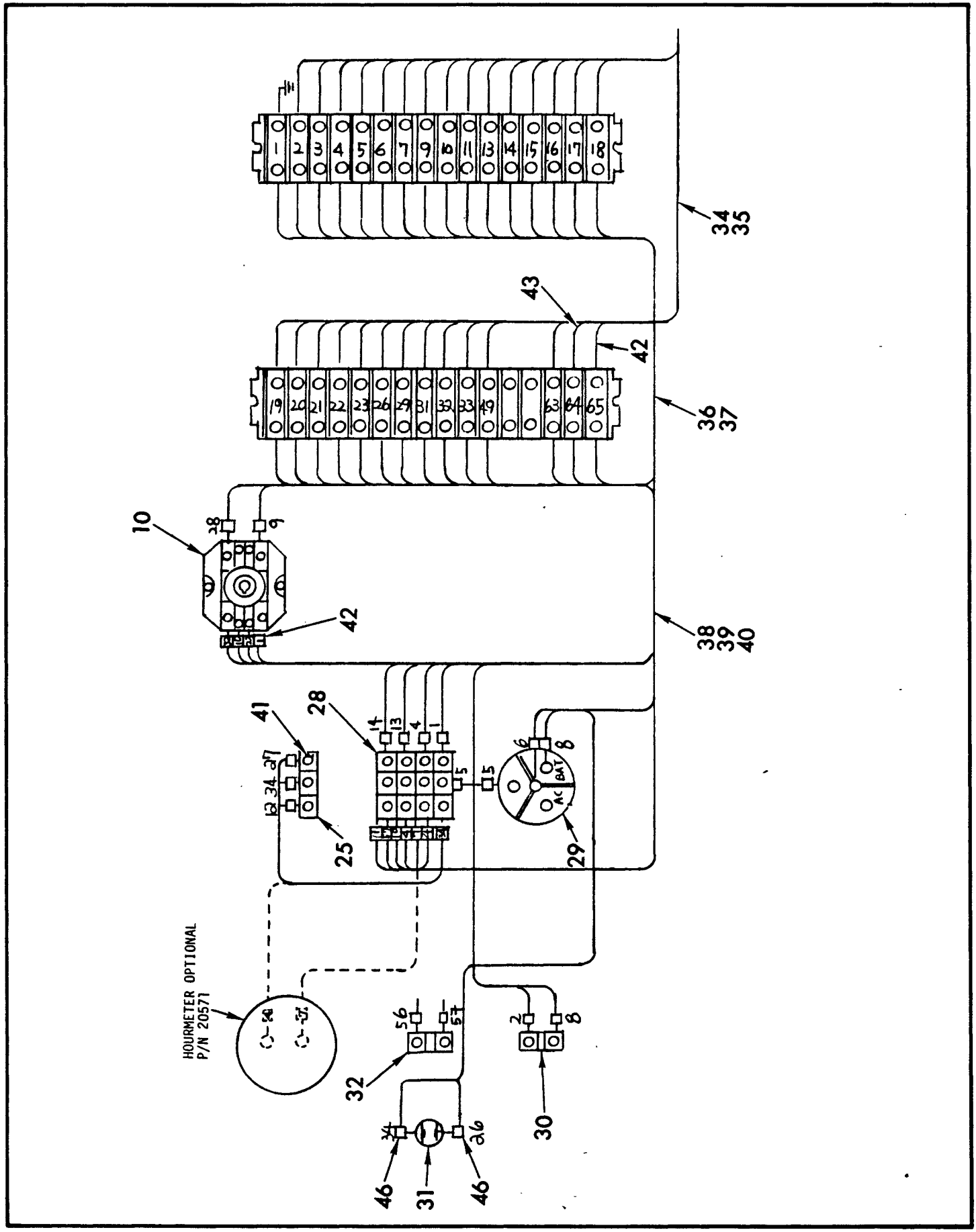
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32321	ASSEMBLY, DRIVE SOLENOID VALVE (See Sect. 3, Fig. 22 or 23 for NHA)	REF
2	81138	. VALVE, DRIVE SOLENOID	1
3	67012	.. COIL (ONLY)	2
4	80012-16	. ELBOW (P3, REV. DRIVE)	2
5	80051-06	. PLUG, HOLLOW HEX	2
6	80004-16	. CONNECTOR (TANK, FWD. DRIVE)	2

- ITEM NOT ILLUSTRATED

GROUND CONTROL BOX ASSEMBLY (MT-25G)



REV.


1 2 3 4 5 6 7 9 11 13 14 15 16 17 18
19 20 21 22 23 26 29 31 33 33 49 63 64 65
34 35
43
42
36 37
10
28
9
42
38 39 40
41
28
14 13 4 1
12 34 37
25
5
15
6
8
BAT
AC
29
HOURMETER OPTIONAL
P/N 20571
56
57
32
2
8
30
34
36
46
31
46

GROUND CONTROL BOX ASSEMBLY (MT-25G) (continued)

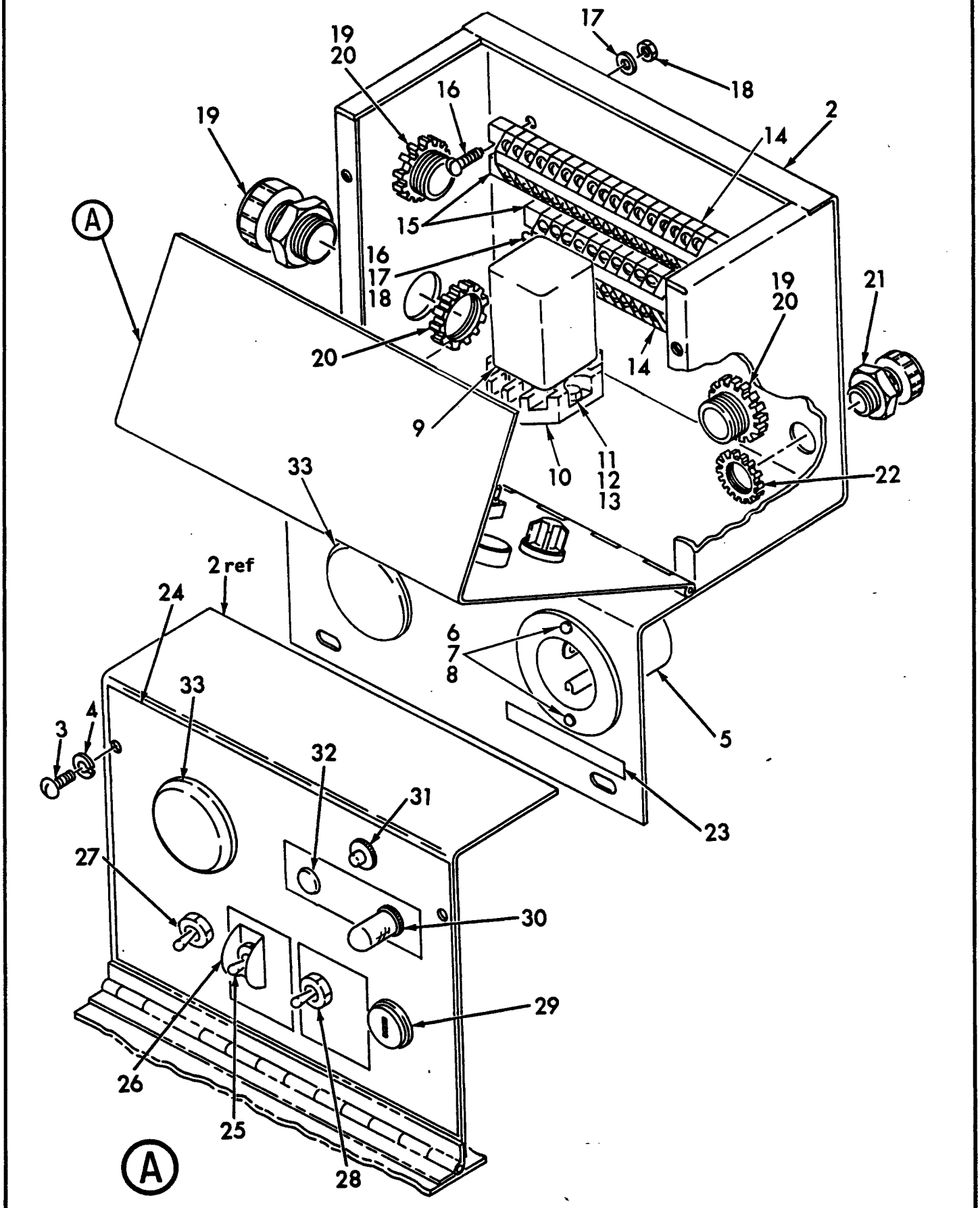
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32249	ASSEMBLY, GROUND CONTROL BOX (See Sect. 3, Fig. 22 for NHA)	REF
2	32390	. BOX, GROUND CONTROL	1
3	62612	. SCREW, CAP (attaching part)	2
4	63312	. WASHER, LOCK (attaching part)	2
5	70409	. RECEPTACLE	1
6	62636	. SCREW, MACHIN (attaching part)	2
7	63312	. WASHER, LOCK (attaching part)	2
8	61502	. NUT, HEX (attaching part)	2
9	70170	. RELAY	1
10	70239	. SOCKET	1
11	62623	. SCREW, CAP (attaching part)	2
12	63312	. WASHER, LOCK (attaching part)	2
13	61502	. NUT, HEX (attaching part)	2
14	4027	. BLOCK, TERMINAL	32
15	117-A	. END, TERMINAL BLOCK	2
16	62612	. SCREW, CAP (attaching part)	4
17	63312	. WASHER, LOCK (attaching part)	4
18	61502	. NUT, HEX (attaching part)	4
19	2807	. RELIEF, STRAIN	3
20	2809	. NUT, LOCK (attaching part)	3
21	2806	. RELIEF, STRAIN	1
22	2808	. NUT, LOCK (attaching part)	1
23	185707	. DECAL, POWER TO PLATFORM 110 VAC.	1
24	32345	. DECAL, GROUND CONTROL	1
25	4021	. SWITCH, TOGGLE (LIFT)	1
26	20884	. GUARD, SWITCH	1

GROUND CONTROL BOX ASSEMBLY (MT-25G)
(continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
27	771	. PLUG, WHITE	1
28	16260	. SWITCH, TOGGLE (SELECTOR)	1
29	2717	. SWITCH, IGNITION	1
30	20562	. BREAKER, CIRCUIT	1
31	4011	. PLUG, WHITE	2
32	20562	. BREAKER, CIRCUIT	1
33	65244	. PLUB, WHITE	2
34	70009	. WIRE, RED (15 FT)	AR
35	2991	. WIRE, WHITE (1 FT)	AR
36	70232	. WIRE, WHITE (9 FT)	AR
37	2990	. WIRE, WHITE (12 FT)	AR
38	70008	. WIRE, YELLOW (3 FT)	AR
39	4034	. CABLE (12 FT)	AR
40	70006	. WIRE, GREEN (15 FT)	AR
-41	6K	. WIRE, BLACK (4 FT)	AR
42	70004	. WIRE, BLUE (15 FT)	AR
43	70007	. WIRE, YELLOW (15 FT)	AR
44	117-C	. RING, CONNECTOR	33
45	16213	. CONNECTOR	6
46	117-E	. TERMINAL, PUSH-ON	2

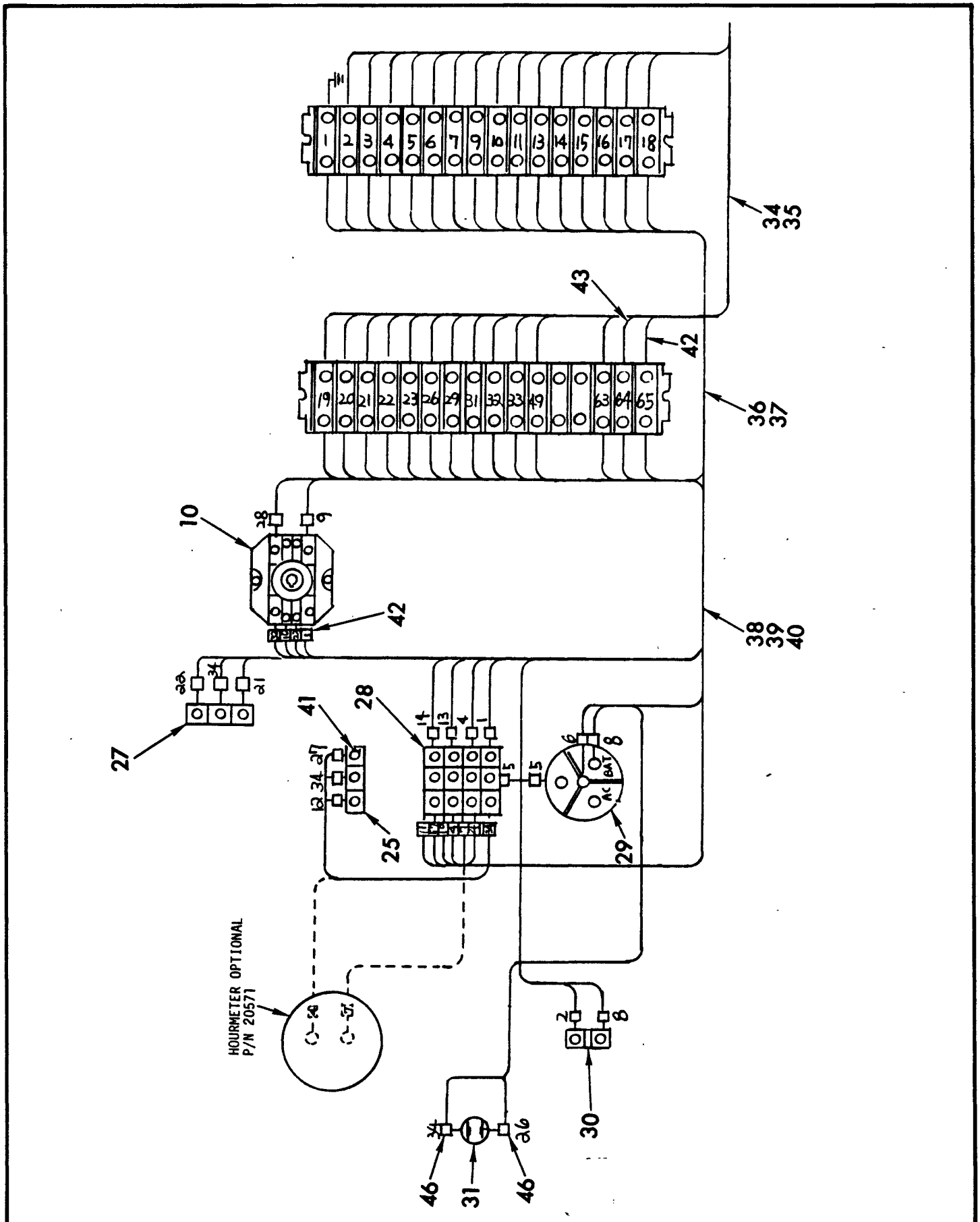
- ITEM NOT ILLUSTRATED

GROUND CONTROL BOX ASSEMBLY (MT-25GT)



REV.

GROUND CONTROL BOX ASSEMBLY (MT-25GT)
(continued)



REV.

GROUND CONTROL BOX ASSEMBLY (MT-25GT)
(continued)

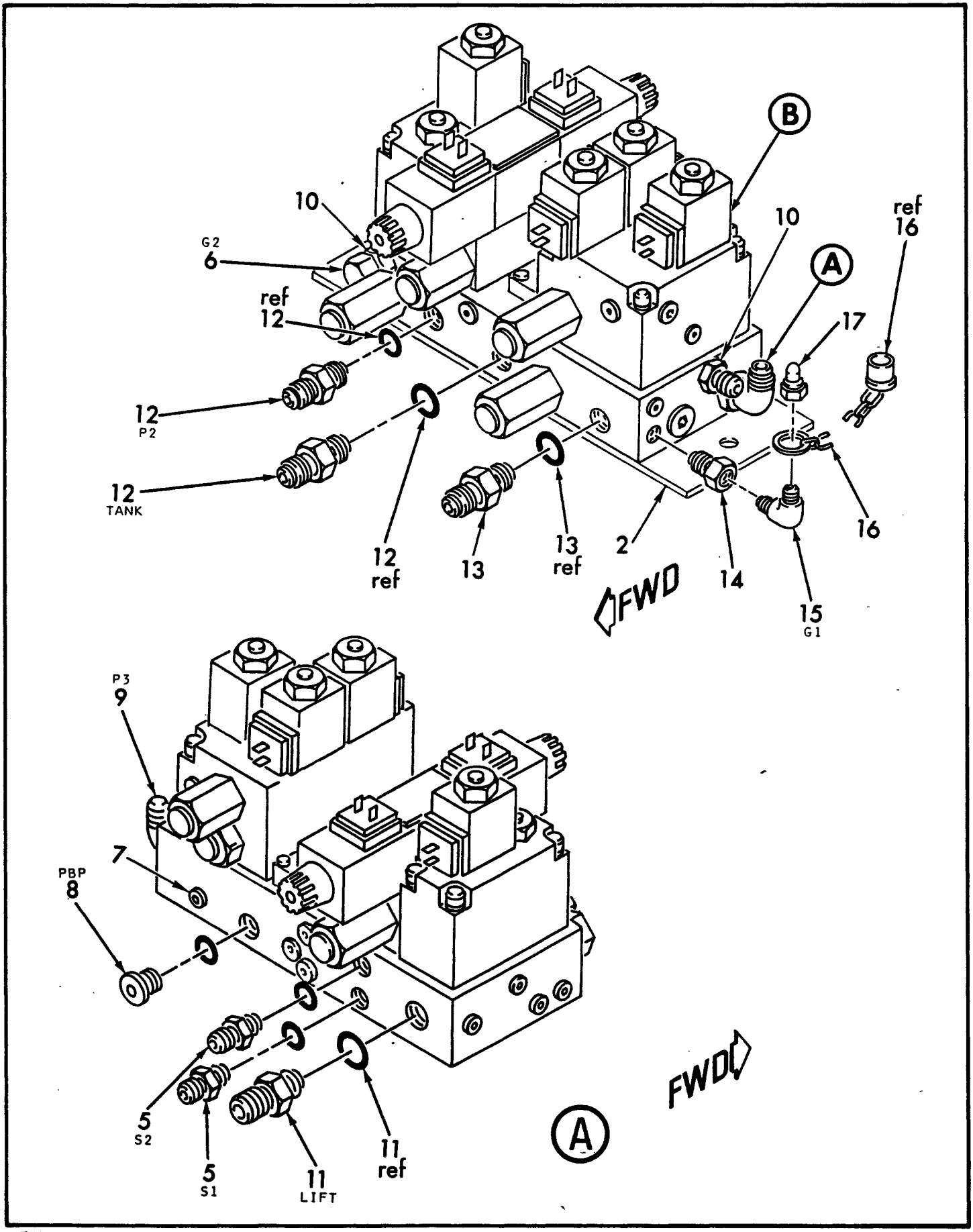
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32333	ASSEMBLY, GROUND CONTROL BOX (See Sect. 3, Fig. 23 for NHA)	REF
2	32390	. BOX, GROUND CONTROL	1
3	62612	. SCREW, CAP (attaching part)	2
4	63312	. WASHER, LOCK (attaching part)	2
5	70409	. RECEPTACLE	1
6	62636	. SCREW, MACHINE (attaching part)	2
7	63312	. WASHER, LOCK (attaching part)	2
8	61502	. NUT, HEX (attaching part)	2
9	70170	. RELAY	1
10	70239	. SOCKET	1
11	62623	. SCREW, CAP (attaching part)	2
12	63312	. WASHER, LOCK (attaching part)	2
13	61502	. NUT, HEX (attaching part)	2
14	4027	. BLOCK, TERMINAL	32
15	117-A	. END, TERMINAL GLOCK	2
16	62612	. SCREW, CAP (attaching part)	4
17	63312	. WASHER, LOCK (attaching part)	4
18	61502	. NUT, HEX (attaching part)	4
19	2807	. RELIEF, STRAIN	3
20	2809	. NUT, LOCK (attaching part)	3
21	2806	. RELIEF, STRAIN	1
22	2808	. NUT, LOCK (attaching part)	1
23	185707	. DECAL, POWER TO PLATFORM 110 VAC.	1
24	32345	. DECAL, GROUND CONTROL	1
25	4021	. SWITCH, TOGGLE (LIFT)	1
26	20884	. GUARD, SWITCH	1
27	4021	. SWITCH, TOGGLE (EXTEND PLATFORM)	1

GROUND CONTROL BOX ASSEMBLY (MT-25GT)
(continued)

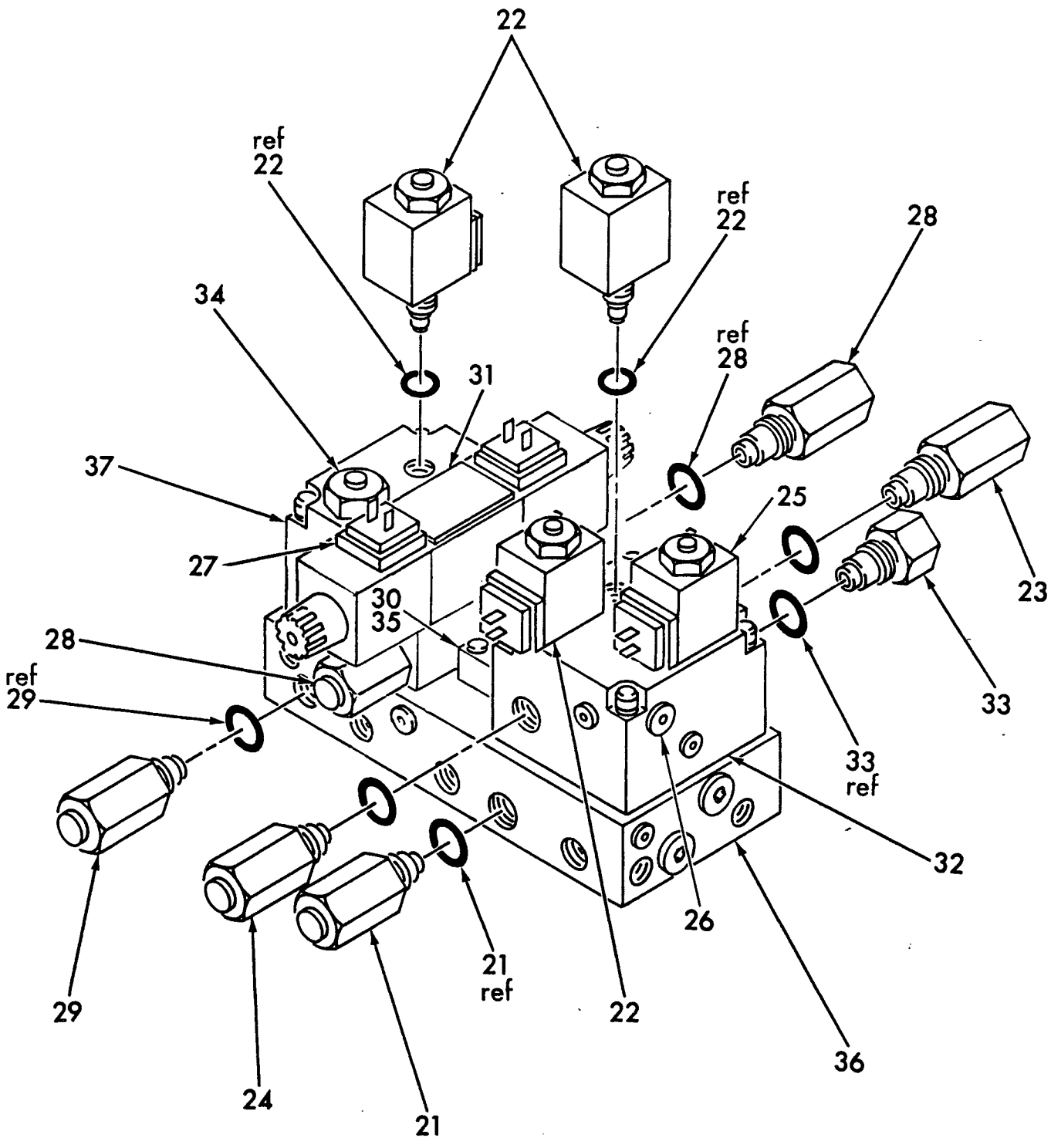
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
28	16260	. SWITCH, TOGGLE (SELECTOR)	1
29	2717	. SWITCH, IGNITION	1
30	20562	. BREAKER, CIRCUIT	1
31	4011	. SWITCH, PUSH BUTTON (CHOKE)	1
32	771	. PLUG, WHITE	1
33	65244	. PLUG, WHITE	2
34	70009	. WIRE, RED (15 FT)	AR
35	2991	. WIRE, WHITE (2 FT)	AR
36	70232	. WIRE, WHITE (8 FT)	AR
37	2990	. WIRE, WHITE (17 FT)	AR
38	70008	. WIRE, YELLOW (3 FT)	AR
39	4034	. CABLE (5 FT)	AR
40	70006	. WIRE, GREEN (15 FT)	AR
-41	6K	. WIRE, BLACK (4 FT)	AR
42	70004	. WIRE, BLUE (15 FT)	AR
43	70007	. WIRE, YELLOW (15 FT)	AR
44	117-C	. RING, CONNECTOR	33
45	16213	. CONNECTOR	6
46	117-E	. TERMINAL, PUSH-ON	2

- ITEM NOT ILLUSTRATED

VALVE PACKAGE ASSEMBLY (MT-25G)



VALVE PACKAGE ASSEMBLY (MT-25G)
(continued)



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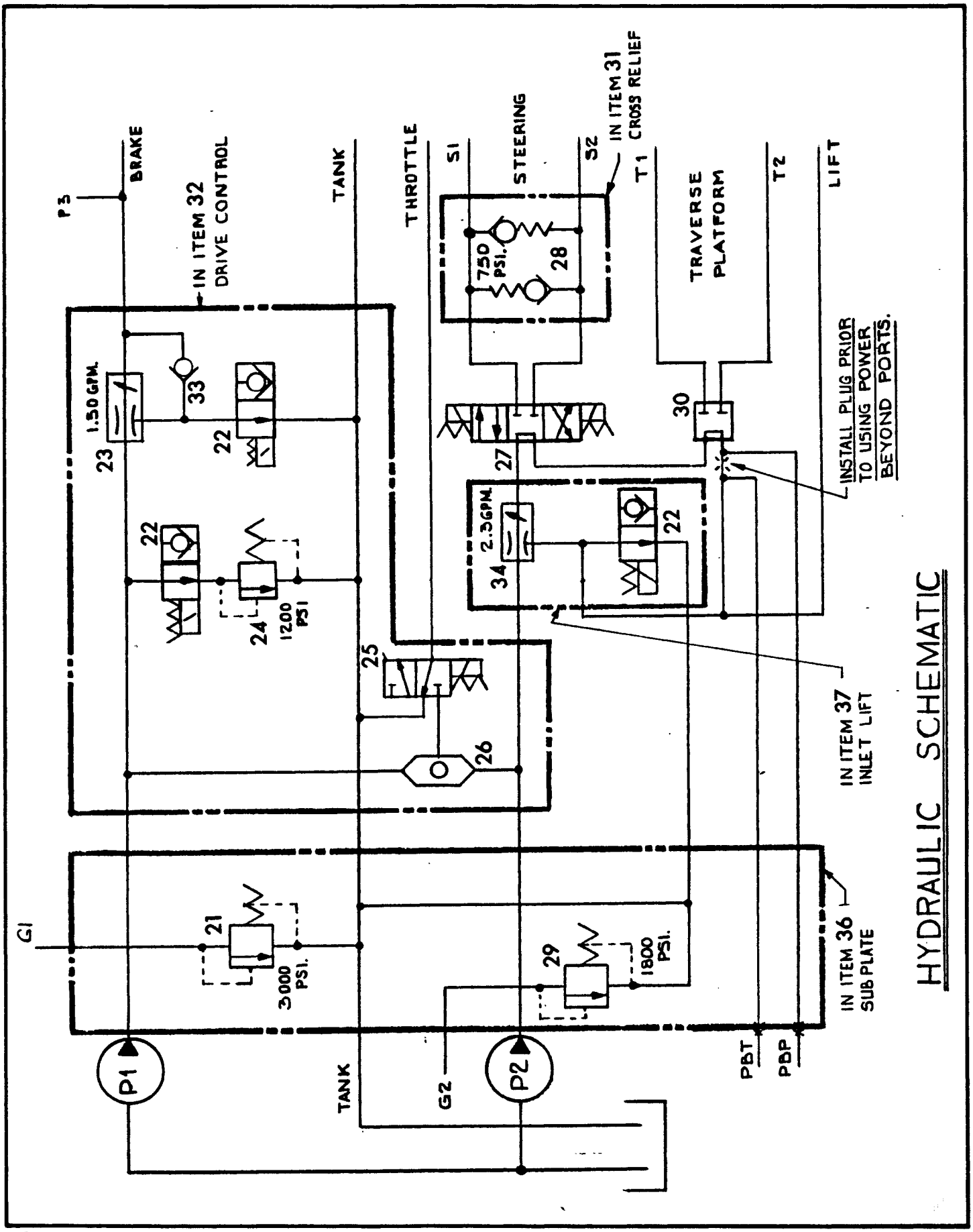

HYDRAULIC SCHEMATIC
P3
BRAKE
IN ITEM 32
DRIVE CONTROL
TANK
THROTTLE
S1
STEERING
S2
IN ITEM 31
CROSS RELIEF
T1
TRAVERSE
PLATFORM
T2
LIFT
750 PSI.
28
30
INSTALL PLUG PRIOR
TO USING POWER
BEYOND PORTS.
1.50 GPM.
23
33
22
27
2.3GPM.
34
22
24
1200 PSI
25
26
IN ITEM 37
INLET LIFT
G1
21
3000 PSI.
29
1800 PSI.
IN ITEM 36
SUB PLATE
P1
TANK
G2
P2
PBT
PBP

VALVE PACKAGE ASSEMBLY (MT-25G) (continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32245	ASSEMBLY, VALVE PACKAGE (See Sect. 3, Fig. 22 for NHA)	REF
2	32190	. PLATE MOUNTING	1
-3	60395	. SCREW, CAP (attaching part)	2
-4	63319	. WASHER, LOCK (attaching part)	2
5	81149	. ADAPTOR (S1, S2)	2
6	80059-03	. CAP (G2)	1
7	80051-03	. PLUG, HEX (BRAKE)	1
8	80051-06	. PLUG, HEX (TANK)	1
9	80012-16	. ELBOW (P3)	1
10	80004-03	. CONNECTOR	2
11	80004-09	. CONNECTOR (LIFT)	1
12	80004-11	. CONNECTOR (P2, TANK)	2
13	80004-16	. CONNECTOR (P1)	1
14	51903	. ADAPTER, FEMALE	1
15	80022-03	. ELBOW, MALE (G1)	1
16	845	. CAP	1
17	2527	. COUPLING	1
-20	81126	. PACKAGE, VALVE	1
21	66919	. VALVE, RELIEF	1
22	66920	.. SOLENOID, 2 WAY N.O.	3
23	66921	.. DIVIDER, FLOW	1
24	66922	.. VALVE, RELIEF	2
25	66923	.. SOLENOID, 2 POS. 3 WAY	1
26	66924	.. VALVE, SHUTTLE	1

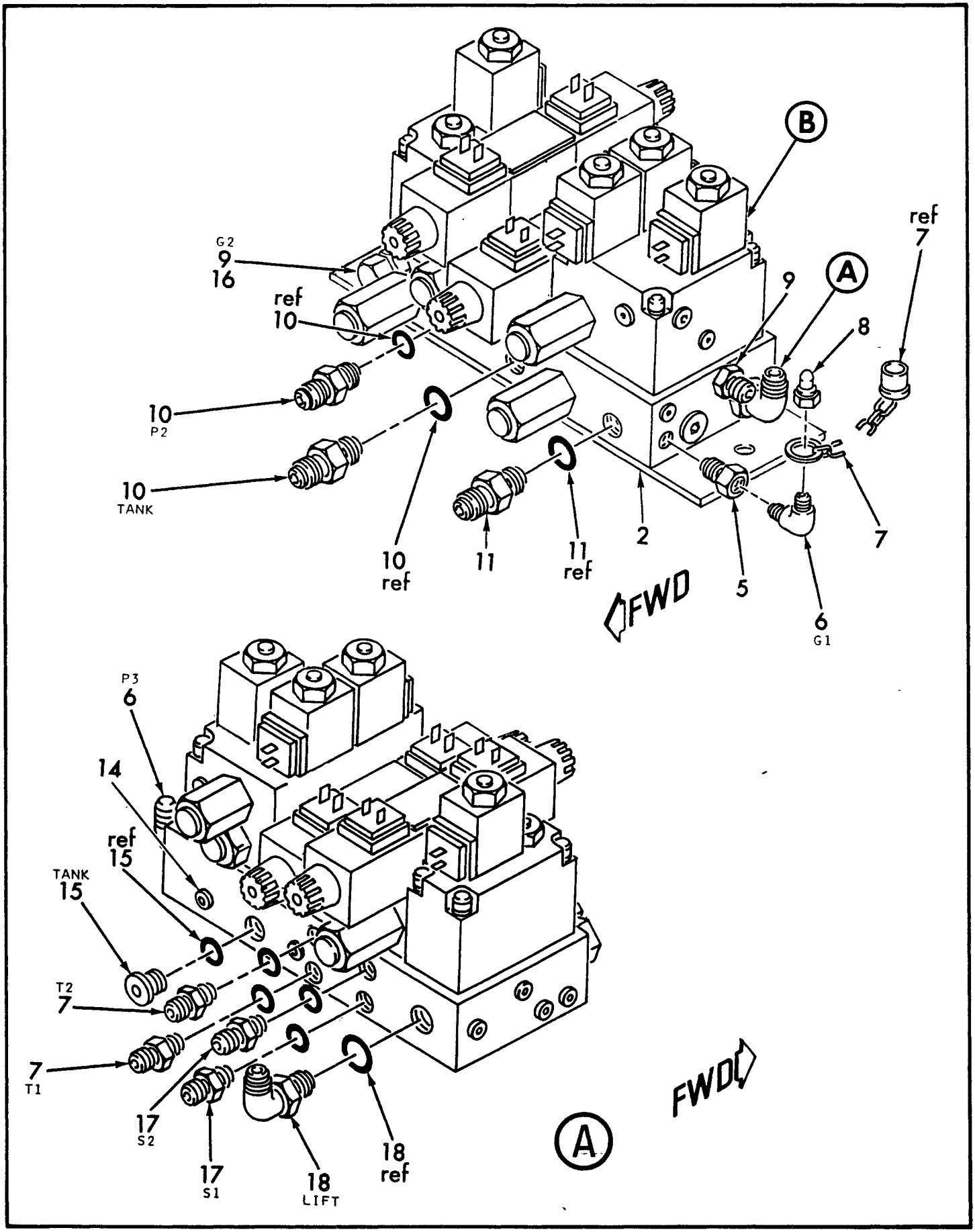
- ITEM NOT ILLUSTRATED

VALVE PACKAGE ASSEMBLY (MT-25G)
(continued)

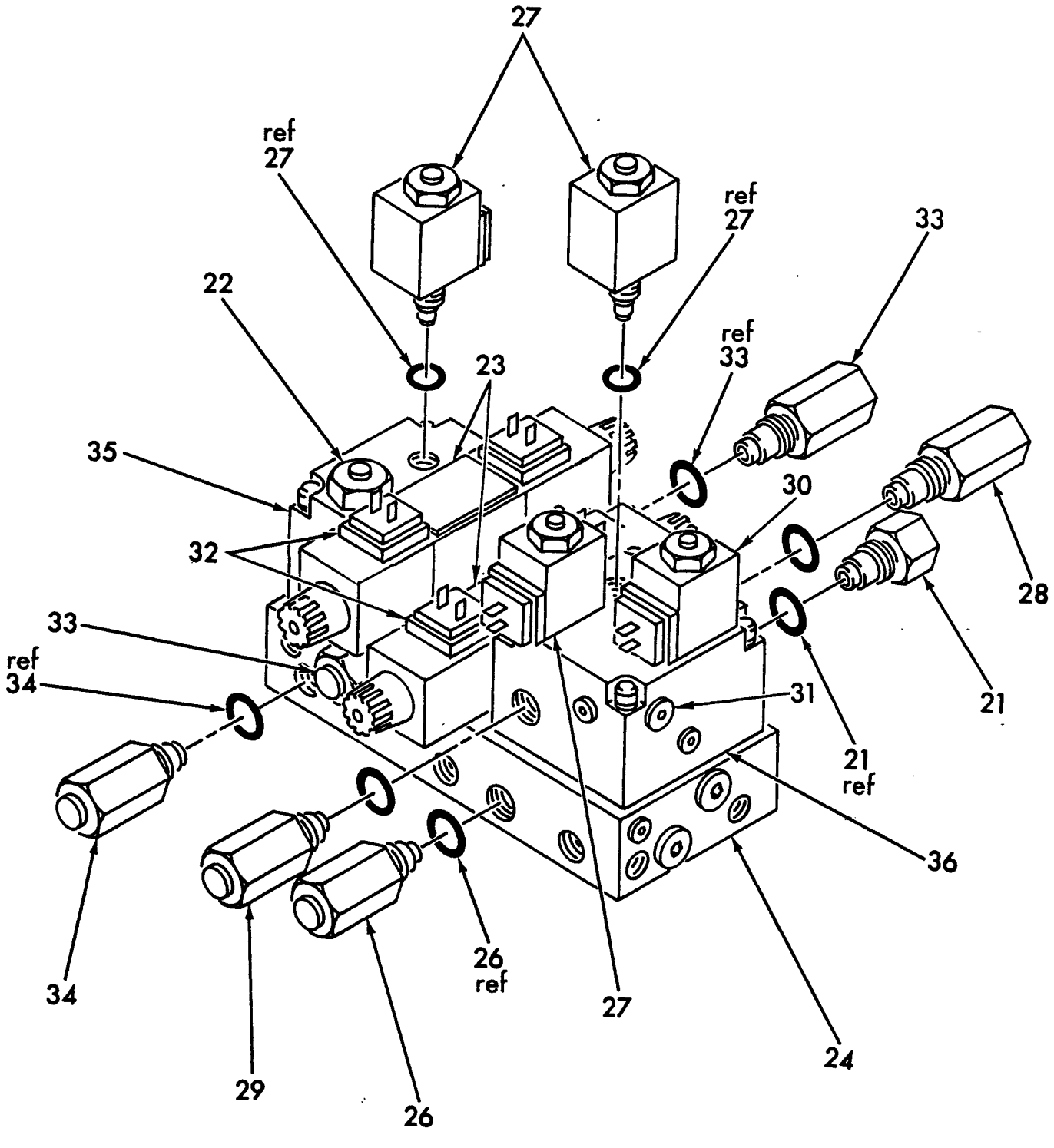
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
27	66925	.. VALVE, DO 1	1
28	66926	.. VALVE, RELIEF	2
29	66927	.. VALVE, RELIEF	1
30	66929	.. PLATE, P-T COVER	1
31	66930	.. RELIEF, CROSS	1
32	66931	.. CONTROL, DRIVE	1
33	66674	.. VALVE, CHECK	1
34	66677	.. REGULATOR, FLOW	1
35	66853	.. PLATE, COVER	1
36	66898	.. SUB-PLATE	1
37	66899	.. SECTION, INLET	1

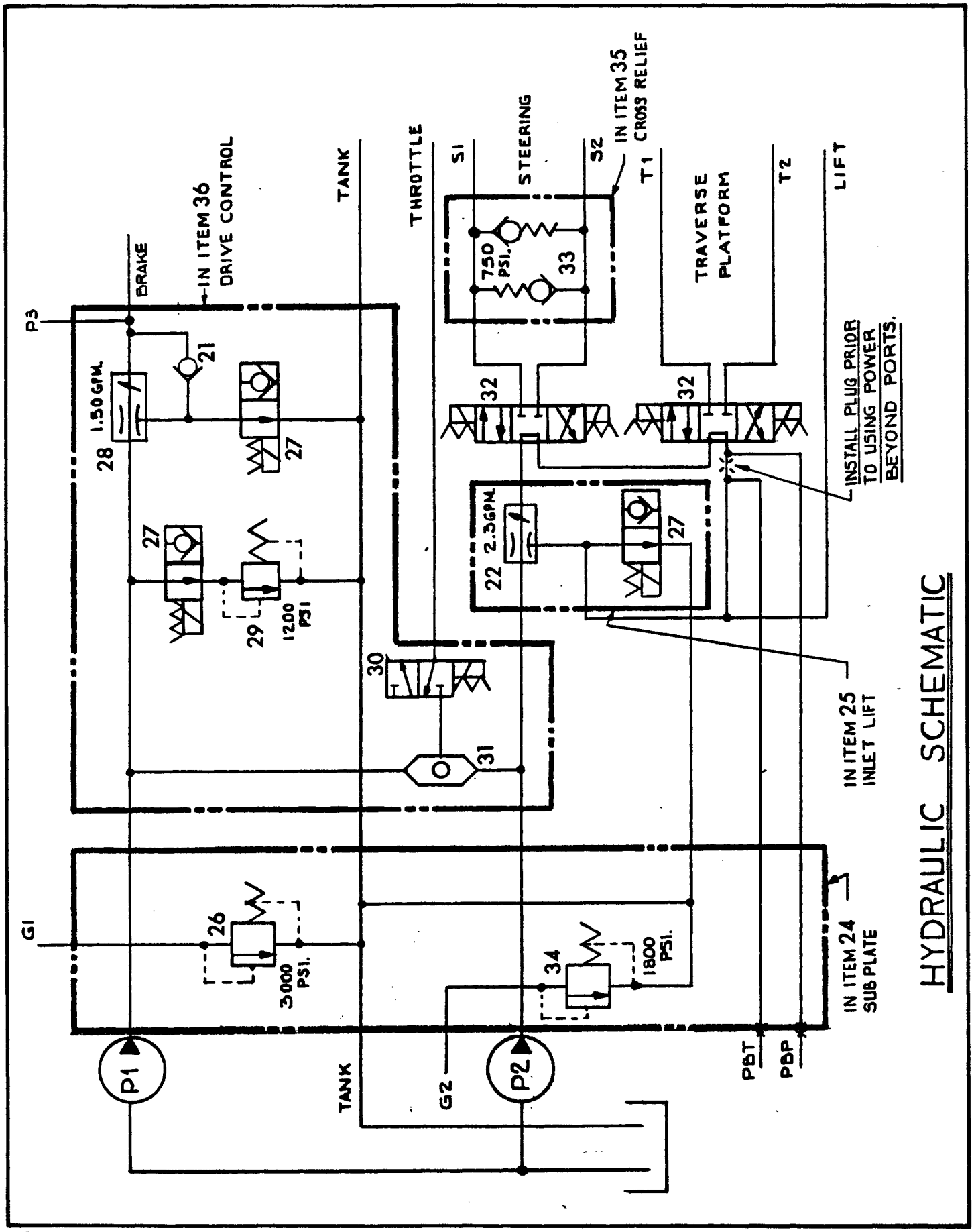
- ITEM NOT ILLUSTRATED

VALVE PACKAGE ASSEMBLY (MT-25GT)



VALVE PACKAGE ASSEMBLY (MT-25GT)
(continued)




HYDRAULIC SCHEMATIC
BRAKE
IN ITEM 36 DRIVE CONTROL
TANK
THROTTLE
S1
STEERING
S2
IN ITEM 35 CROSS RELIEF
T1
TRAVERSE PLATFORM
T2
LIFT
P3
21
28
1.50 GPM.
27
750 PSI.
33
32
INSTALL PLUG PRIOR TO USING POWER BEYOND PORTS.
22
2.3GPM.
29
1200 PSI
30
31
IN ITEM 25 INLET LIFT
G1
26
3000 PSI.
34
1800 PSI.
IN ITEM 24 SUB PLATE
P1
P2
G2
PBT
PBP

VALVE PACKAGE ASSEMBLY (MT-25GT) (continued)

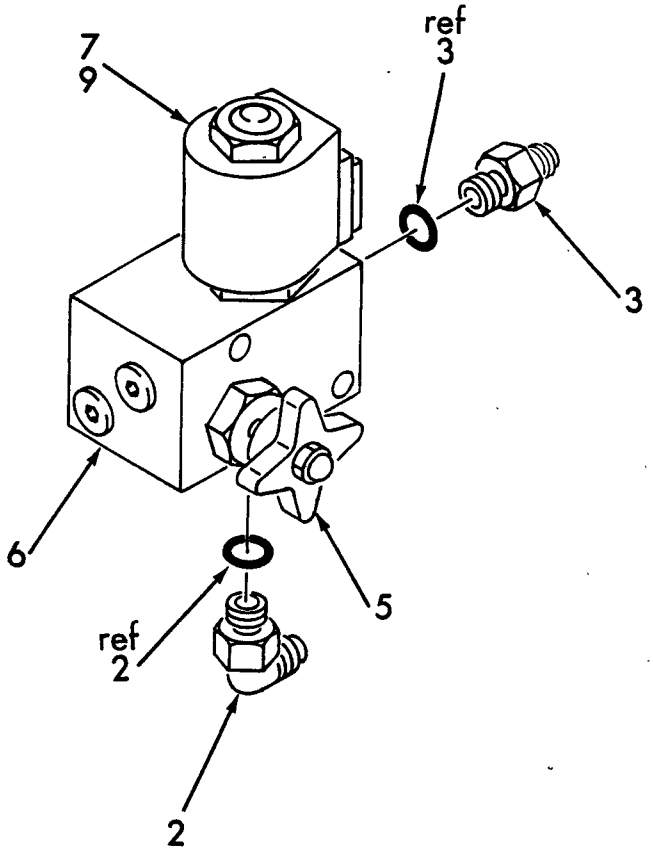
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32332	ASSEMBLY, VALVE PACKAGE (See Sect. 3, Fig. 23 for NHA)	REF
2	32190	. PLATE, MOUNTING	1
-3	60325	. SCREW, CAP (attaching part)	2
-4	63319	. WASHER, LOCK (attaching part)	2
5	51903	. ADAPTER, FEMALE	1
6	80022-03	. ELBOW, MALE (G1)	1
7	845	. CAP	1
8	2527	. COUPLING	1
9	80004-03	. CONNECTOR (G2, T1, T2, THROTTLE)	4
10	80004-16	. CONNECTOR (P2, TANK)	2
11	80012-09	. CONNECTOR (P1)	1
12	80012-09	. ELBOW (LIFT)	1
13	80012-16	. ELBOW (P3)	1
14	80051-06	. PLUG, HEX (BRAKE)	1
15	80051-06	. PLUG, HEX (TANK)	1
16	80059-03	. CAP	1
17	81149	. ADAPTER (S1, S2)	2
20	81124	. PACKAGE, VALVE	1
21	66674	.. VALVE, CHECK	1
22	66677	.. REGULATOR, FLOW	1
23	66853	.. PLATE COVER	2
24	66898	.. SUB-PLATE	1
25	66899	.. SECTION, INLET	1
26	66919	.. VALVE, RELIEF	1

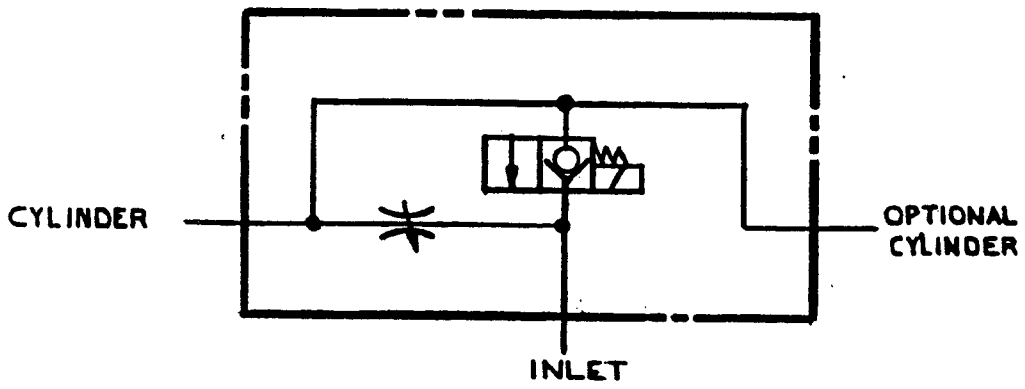
- ITEM NOT ILLUSTRATED

VALVE PACKAGE ASSEMBLY (MT-25GT)
(continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
27	66920	.. SOLENOID, 2 WAY N.O.	3
28	66921	.. DIVIDER, FLOW	1
29	66922	.. VALVE, RELIEF	1
30	66923	.. SOLENOID, 2 POS. 3 WAY	1
31	66924	.. VALVE, SHUTTLE	1
32	66925	.. VALVE, DO1	2
33	66926	.. VALVE, RELIEF	2
34	66927	.. VALVE, RELIEF	1
35	66930	.. RELIEF, CROSS	1
36	66931	.. CONTROL, DRIVE	1

LOWERING PACKAGE ASSEMBLY



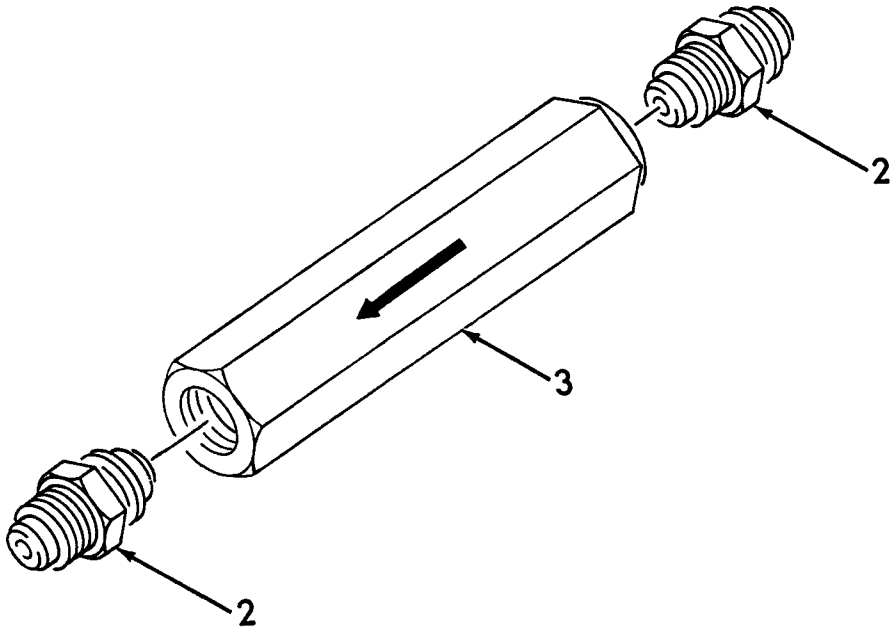


LOWERING PACKAGE ASSEMBLY (continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32323	ASSEMBLY, LOWERING CONTROL VALVE (See Sect. 3, Fig. 22 for NHA)	REF
2	80012-11	. ELBOW (INLET)	1
3	80004-11	. CONNECTOR (CYL.)	1
-4	81145	. VALVE, LOWERING CONTROL	1
5	67009	.. HANDLE (ONLY)	1
6	67010	.. VALVE, NEEDLE (WITH HANDLE)	1
7	67011	.. VALVE, SOLENOID	1
-8	67013	.. KIT, SEAL	1
9	66914	.. COIL (ONLY)	1

- ITEM NOT ILLUSTRATED

FLOW VALVE ASSEMBLY (MT-25GT)



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32322	ASSEMBLY, FLOW VALVE (See Sect. 3, Fig. 23 for NHA)	REF
2	80001-08	. CONNECTOR, MALE	2
3	81137	. VALUE, FLOW	1

- ITEM NOT ILLUSTRATED

THIS **SECTION 4 SCISSORS ASSEMBLIES** IS ILLUSTRATED AS:

FIGURE 1 SCISSOR ASSEMBLY (MT-25G)

FIGURE 2 SCISSOR ASSEMBLY (MT-25GT)

FIGURE 11 LOWER INNER ARM ASSEMBLY

FIGURE 12 LOWER OUTER ARM ASSEMBLY

FIGURE 13 MIDDLE OUTER ARM ASSEMBLY

FIGURE 14 MIDDLE INNER ARM ASSEMBLY

FIGURE 15 UPPER INNER ARM ASSEMBLY

FIGURE 16 UPPER OUTER ARM ASSEMBLY

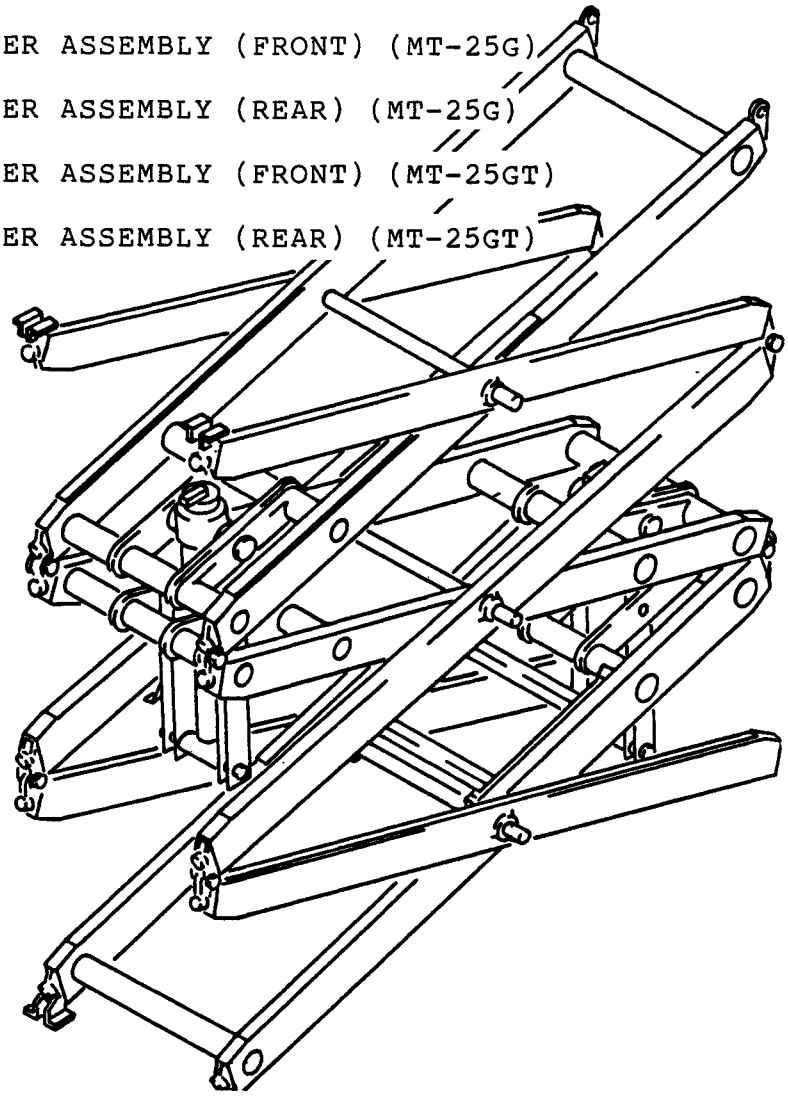
FIGURE 17 INNER ARM SUPPORT ASSEMBLY

FIGURE 21 MAIN LIFT CYLINDER ASSEMBLY (FRONT) (MT-25G)

FIGURE 22 MAIN LIFT CYLINDER ASSEMBLY (REAR) (MT-25G)

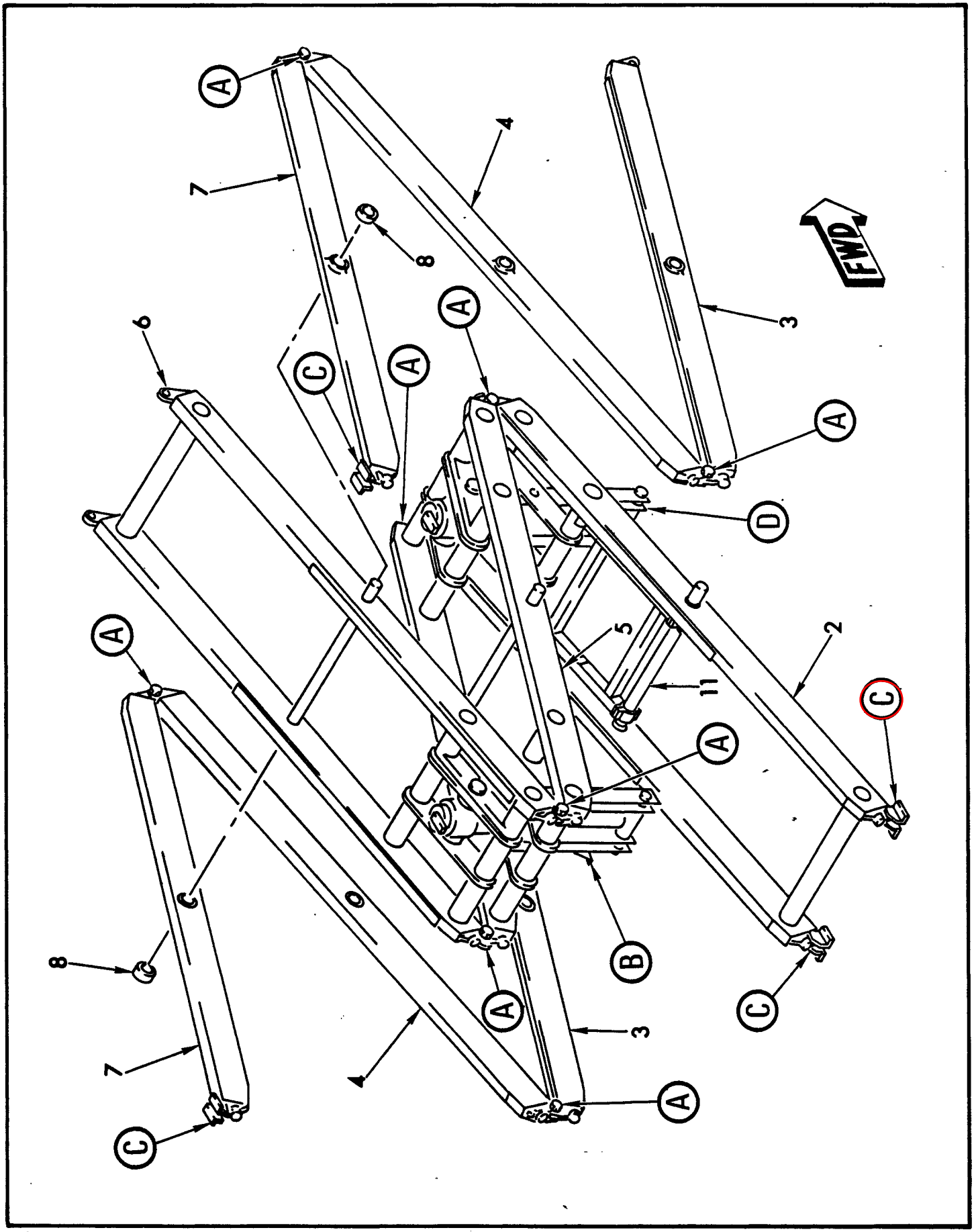
FIGURE 23 MAIN LIFT CYLINDER ASSEMBLY (FRONT) (MT-25GT)

FIGURE 24 MAIN LIFT CYLINDER ASSEMBLY (REAR) (MT-25GT)



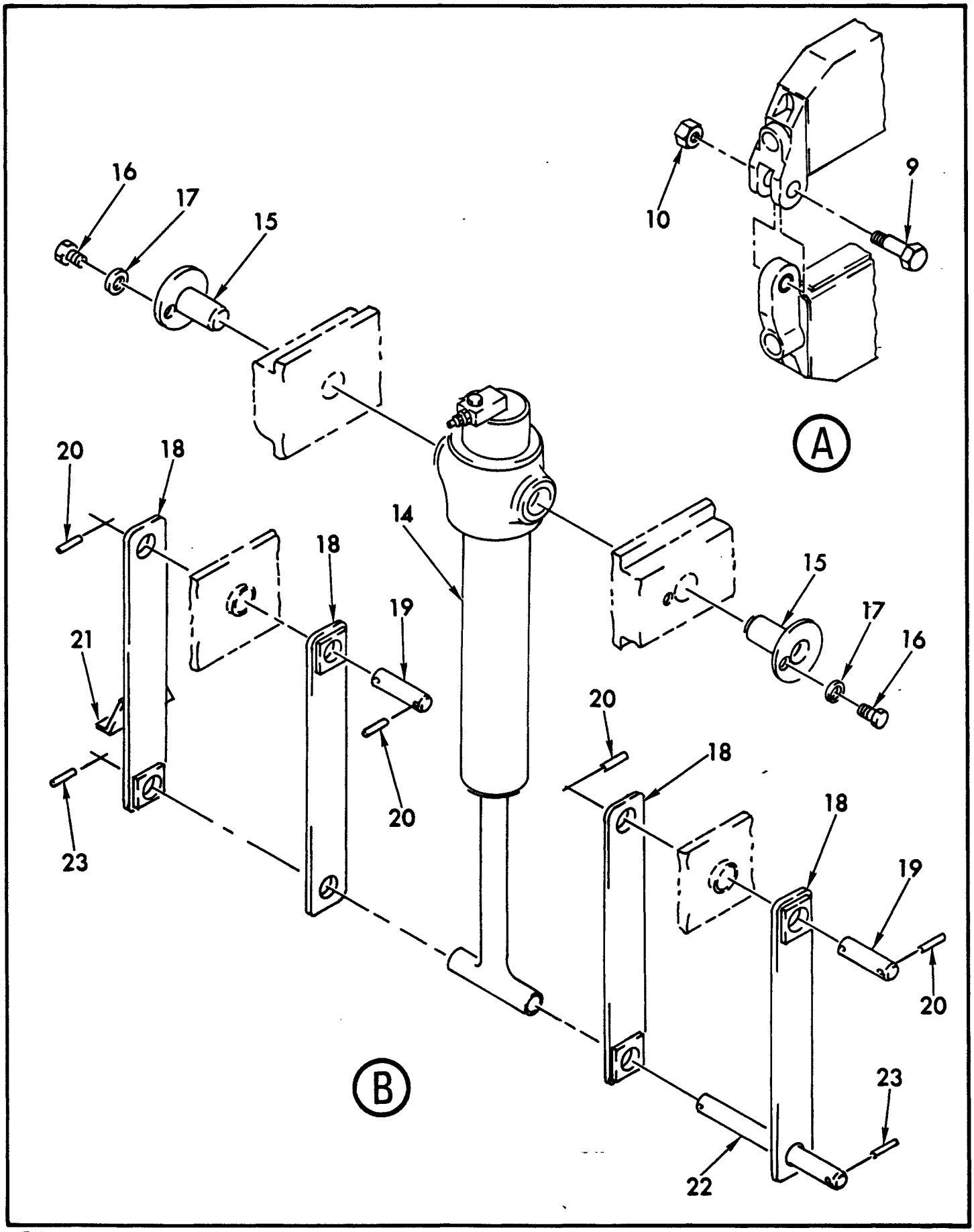
*** FIGURE 3 THRU FIGURE 10 AND FIGURE 18 THRU FIGURE 20 ARE NOT AVAILABLE THIS REVISION.**

SCISSOR ASSEMBLY (MT-25G)

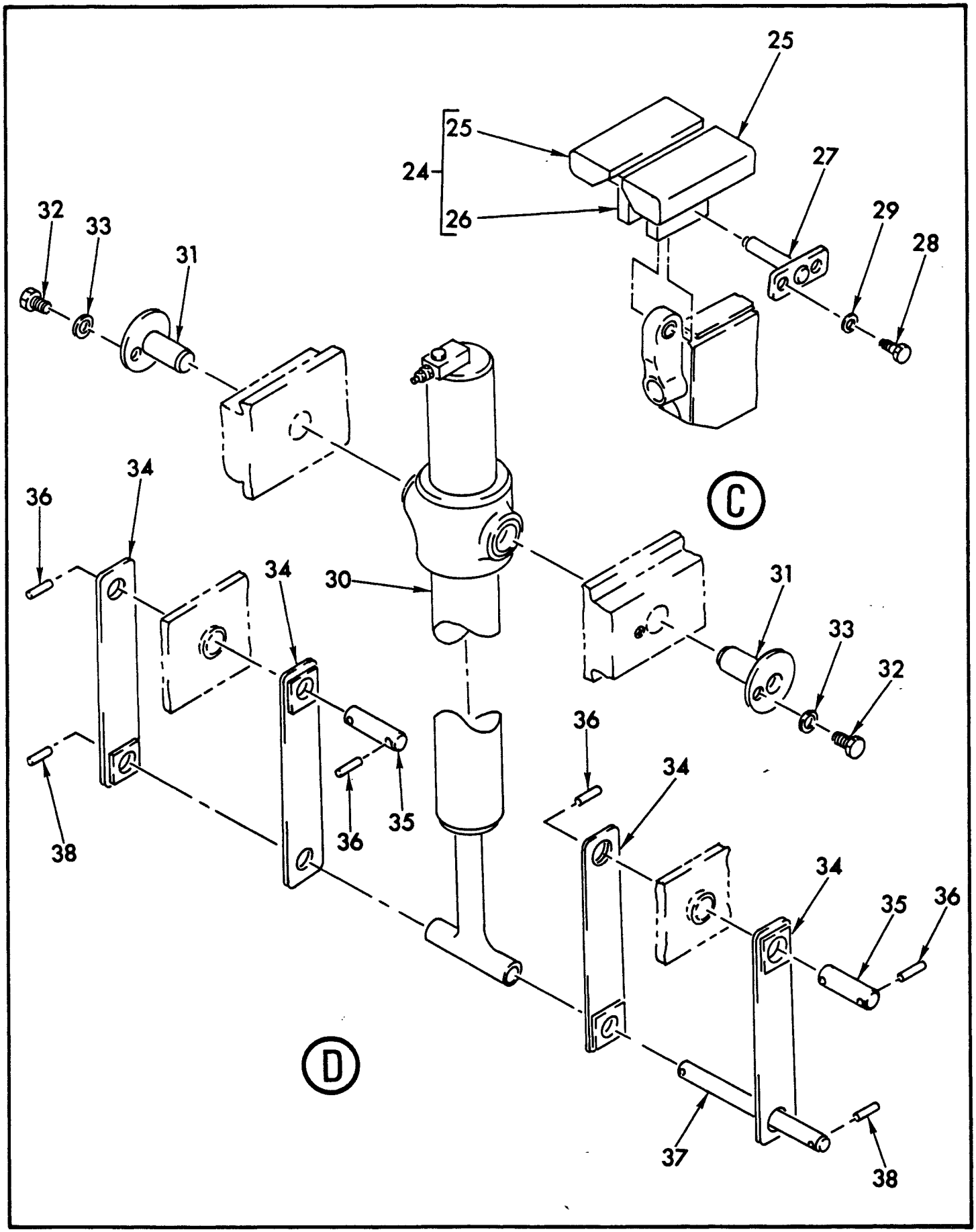


REV.

SCISSOR ASSEMBLY (MT-25G)
(continued)



SCISSOR ASSEMBLY (MT-25G)
(continued)



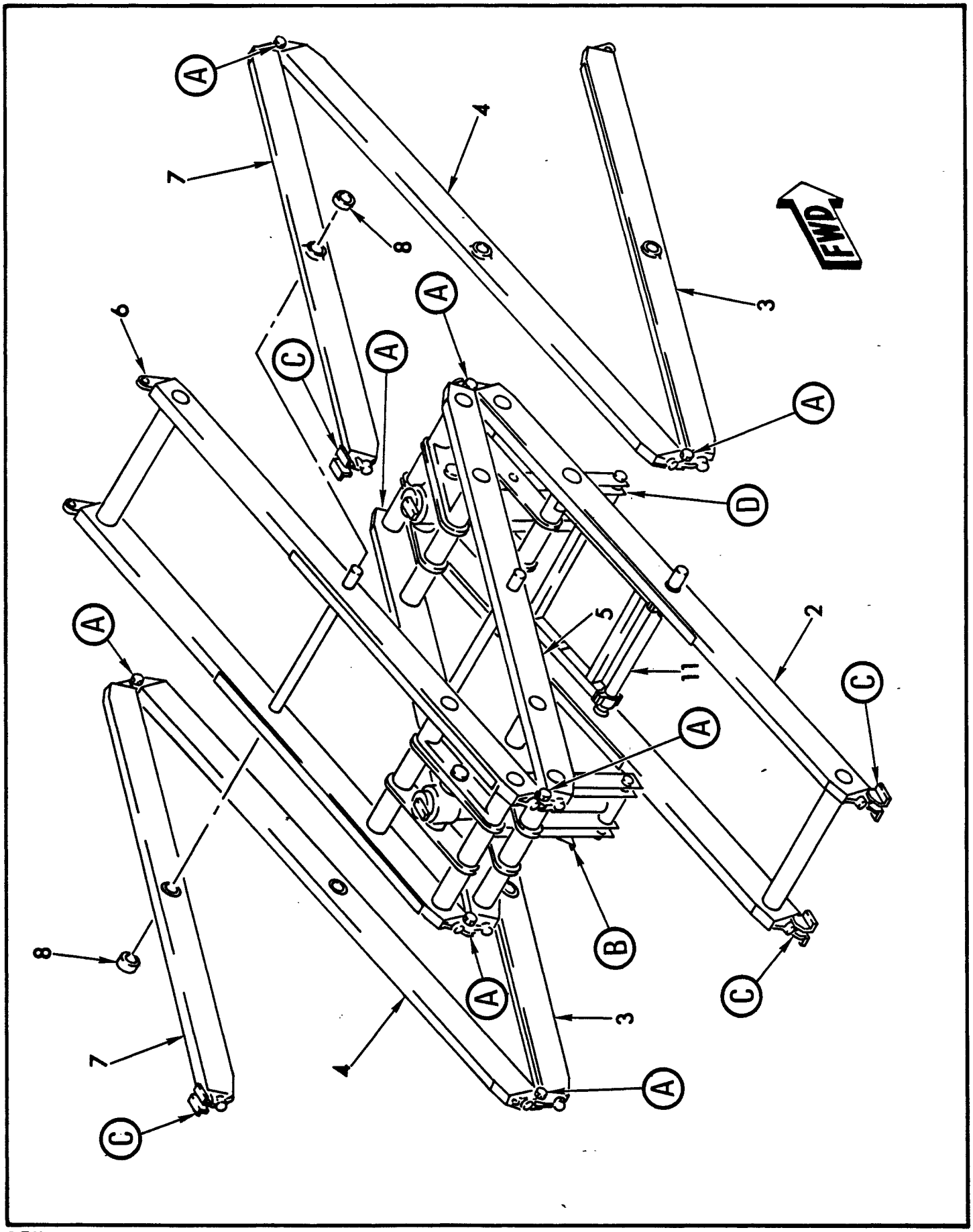
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32351	ASSEMBLY, SCISSOR (MT-25G) (See Sect. 2, Fig. 1 for NHA)	REF
2	32288	.ASSEMBLY, LOWER INNER ARM (See Sect. 4, Fig. 11 for Details)	1
3	30165	.ASSEMBLY, LOWER OUTER ARM (See Sect. 4, Fig. 12 for Details)	2
4	30166	.ASSEMBLY, MIDDLE OUTER ARM (See Sect. 4, Fig. 13 for Details)	2
5	30639	.ASSEMBLY, MIDDLE INNER ARM (See Sect. 4, Fig. 14 for Details)	1
6	30638	.ASSEMBLY, UPPER INNER ARM (See Sect. 4, Fig. 15 for Details)	1
7	32287	.ASSEMBLY, UPPER OUTER ARM (See Sect. 4, Fig. 16 for Details)	2
8	2214	.COLLAR (attaching part)	6
9	130696	.BOLT, EAR PIVOT (attaching part)	8
10	61249	.NUT, HEX LOCK (attaching part)	8
11	30338	.ASSEMBLY, INNER ARM SUPPORT (See Sect. 4, Fig. 17 for Details)	1
-12	12007	.PIN, BALL-LOC DETENT (attaching part)	2
-13	375	.RIVET, POP (attaching part)	2
14	32355	.ASSEMBLY, MAIN LIFT CYLINDER (FRONT) (See Sect. 4, Fig. 21 for Details)	1
15	30151	.PIN, LIFT CYLINDER TRUNNION	2
16	60367	.SCREW, CAP (attaching part)	2
17	63302	.WASHER, LOCK (attaching part)	2
18	32235	.STRAP, MACHING	4
19	32238	.PIN, TRUNNION	2
20	64206	.PIN, ROLL	4

SCISSOR ASSEMBLY (MT-25G) (continued)

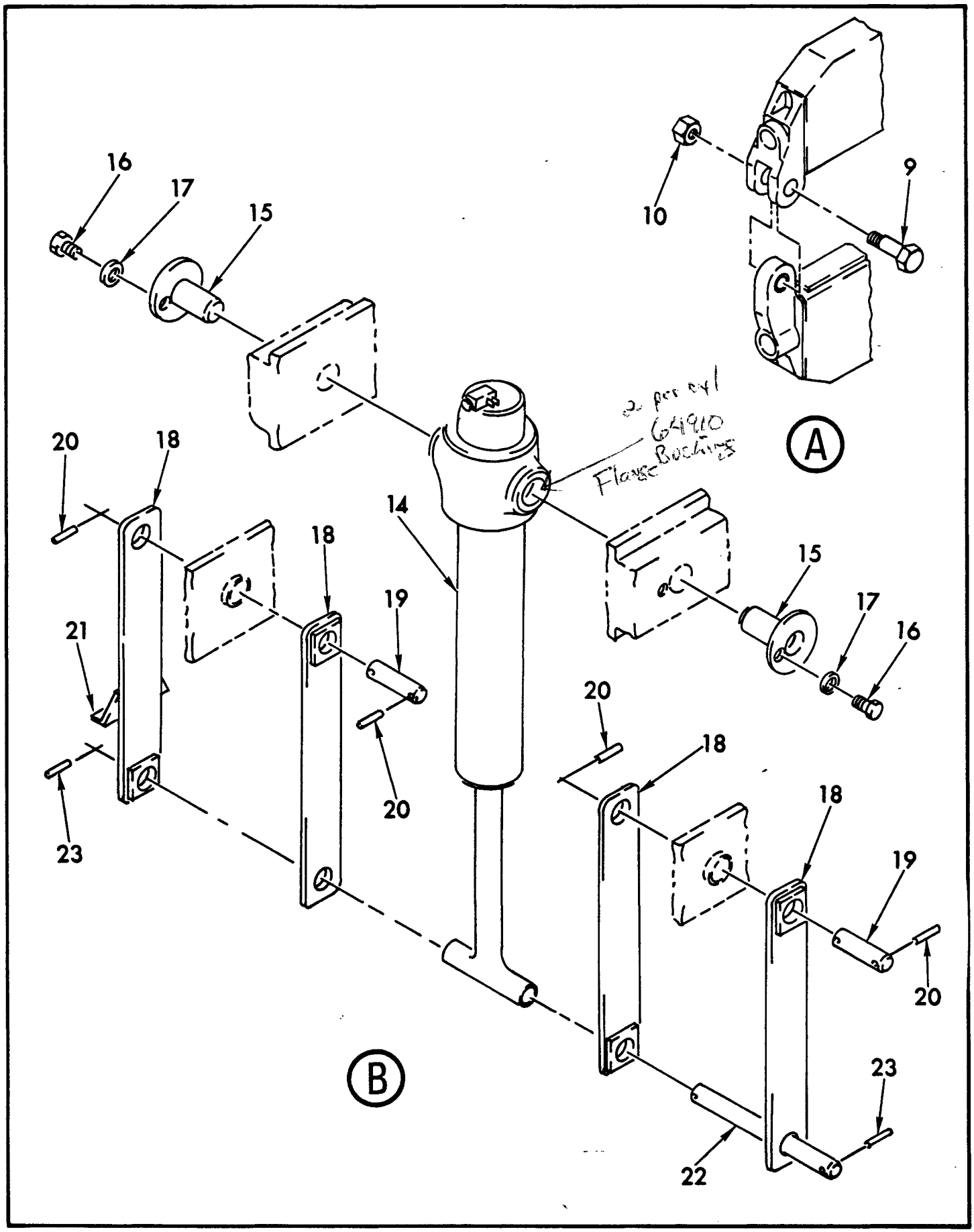
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
21	32397	.SWITCH, ACTUATOR LIMT	1
22	30196	.PIN, CYLINDER PIVOT	1
23	64206	.PIN, ROLL	2
24	32208	.ASSEMBLY, SLIDING SHOE	4
25	32169	..PAD, WEAR	8
26	32265	..SLIDE, MACHING SCISSOR	4
27	32270	.PIN, WELDMENT SLIDE	4
28	60309	.SCREW, CAP (attaching part)	8
29	63301	.WASHER, LOCK (attaching part)	8
30	32266	.ASSEMBLY, MAIN LIFT CYLINDER (REAR) (See Sect. 4, Fig. 22 for Details)	1
31	30151	.PIN, LIFT CYLINDER TRUNNION	2
32	60367	.SCREW, CAP (attaching part)	2
33	63302	.WASHER, LOCK (attaching part)	2
34	~~32337~~ 32237	.STRAP, MACHINING	4
35	32238	.PIN, TRUNNION	2
36	64206	.PIN, ROLL	4
37	30196	.PIN, CYLINDER PIVOT	1
38	64206	.PIN, ROLL	2

- ITEM NOT ILLUSTRATED

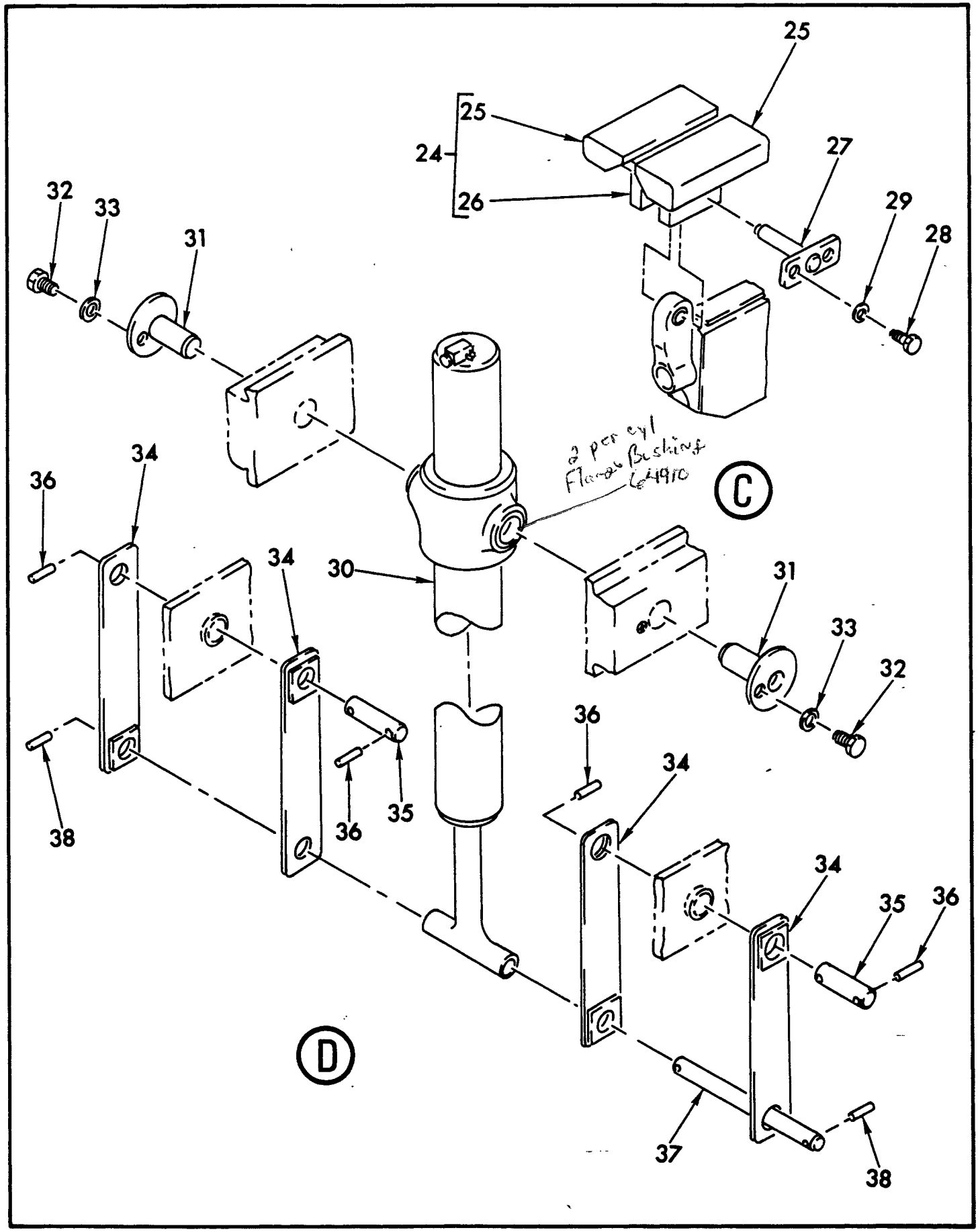
SCISSOR ASSEMBLY (MT-25GT)



SCISSOR ASSEMBLY (MT-25GT)
(continued)



SCISSOR ASSEMBLY (MT-25GT)
(continued)

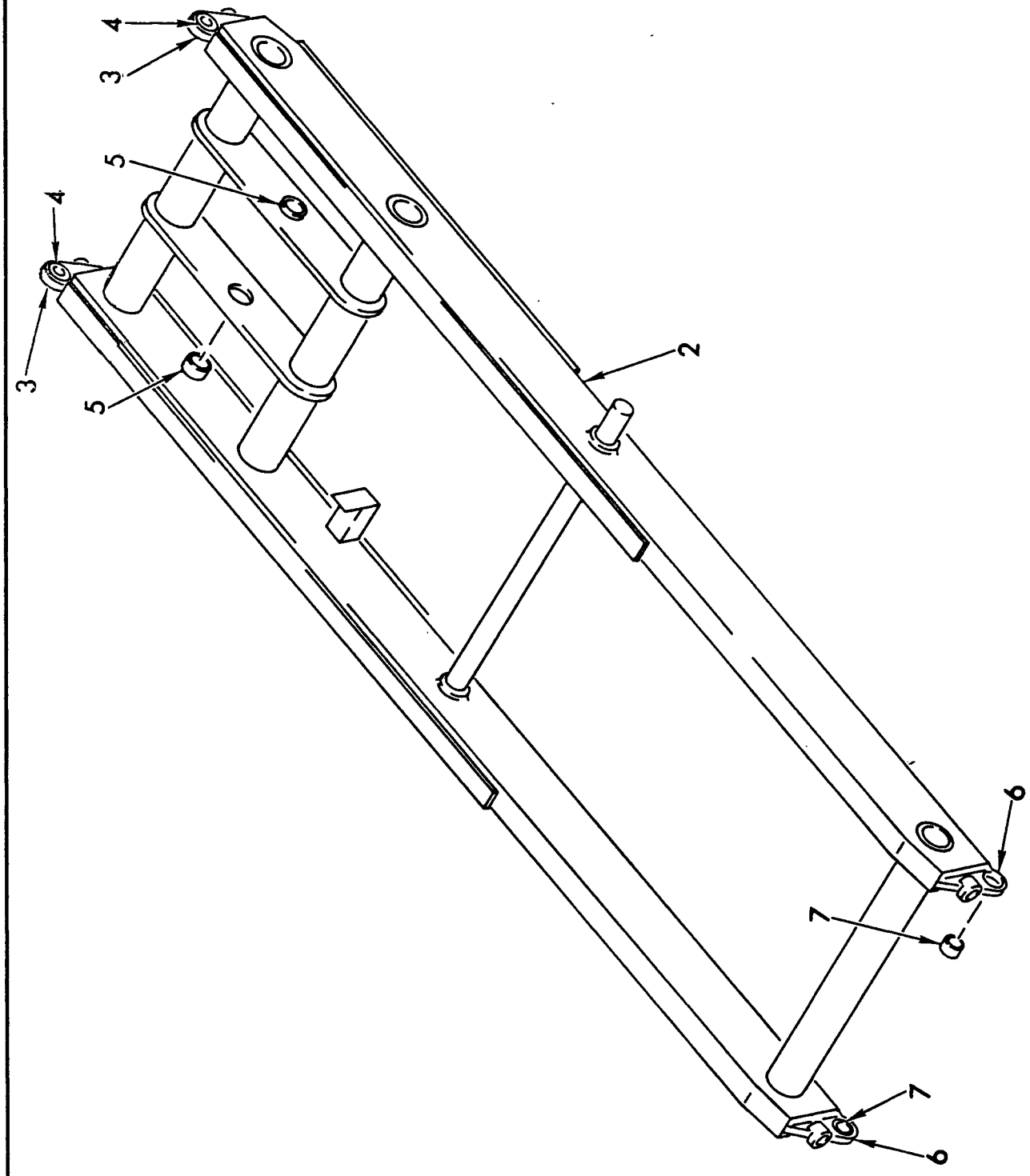


ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32244	ASSEMBLY, SCISSOR (MT-25G) (See Sect. 2, Fig. 2 for NHA)	REF
2	32288	.ASSEMBLY, LOWER INNER ARM (See Sect. 4, Fig. 11 for Details)	1
3	30165	.ASSEMBLY, LOWER OUTER ARM (See Sect. 4, Fig. 12 for Details)	2
4	30166	.ASSEMBLY, MIDDLE OUTER ARM (See Sect. 4, Fig. 13 for Details)	2
5	30639	.ASSEMBLY, MIDDLE INNER ARM (See Sect. 4, Fig. 14 for Details)	1
6	30638	.ASSEMBLY, UPPER INNER ARM (See Sect. 4, Fig. 15 for Details)	1
7	32287	.ASSEMBLY, UPPER OUTER ARM (See Sect. 4, Fig. 16 for Details)	2
8	2214	.COLLAR (attaching part)	6
9	130696	.BOLT, EAR PIVOT (attaching part)	8
10	61249	.NUT, HEX LOCK (attaching part)	8
11	30338	.ASSEMBLY, INNER ARM SUPPORT (See Sect. 4, Fig. 17 for Details)	1
-12	12007	.PIN, BALL-LOC DETENT (attaching part)	2
-13	375	.RIVET, POP (attaching part)	2
14	32304	.ASSEMBLY, MAIN LIFT CYLINDER (FRONT) (See Sect. 4, Fig. 22 for Details)	1
15	30151	.PIN, LIFT CYLINDER TRUNNION	2
16	60367	.SCREW, CAP (attaching part)	2
17	63302	.WASHER, LOCK (attaching part)	2
18	32235	.STRAP, MACHING	4
19	32238	.PIN, TRUNNION	2
20	64206	.PIN, ROLL	4

SCISSOR ASSEMBLY (MT-25GT) (continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
21	32397	.SWITCH, ACTUATOR LIMIT	1
22	30196	.PIN, CYLINDER PIVOT	1
23	64206	.PIN, ROLL	2
24	32208	.ASSEMBLY, SLIDING SHOE	4
25	32169	..PAD, WEAR	8
26	32265	..SLIDE, MACHING SCISSOR	4
27	32270	.PIN, WELDMENT SLIDE	4
28	60309	.SCREW, CAP (attaching part)	8
29	63301	.WASHER, LOCK (attaching part)	8
30	32305	.ASSEMBLY, MAIN LIFT CYLINDER (REAR) (See Sect. 4, Fig. 24 for Details)	1
31	30151	.PIN, LIFT CYLINDER TRUNNION	2
32	60367	.SCREW, CAP (attaching part)	2
33	63302	.WASHER, LOCK (attaching part)	2
34	~~32337~~ 32237	.STRAP, MACHINING	4
35	32238	.PIN, TRUNNION	2
36	64206	.PIN, ROLL	4
37	30196	.PIN, CYLINDER PIVOT	1
38	64206	.PIN, ROLL	2

INNER ARM ASSEMBLY



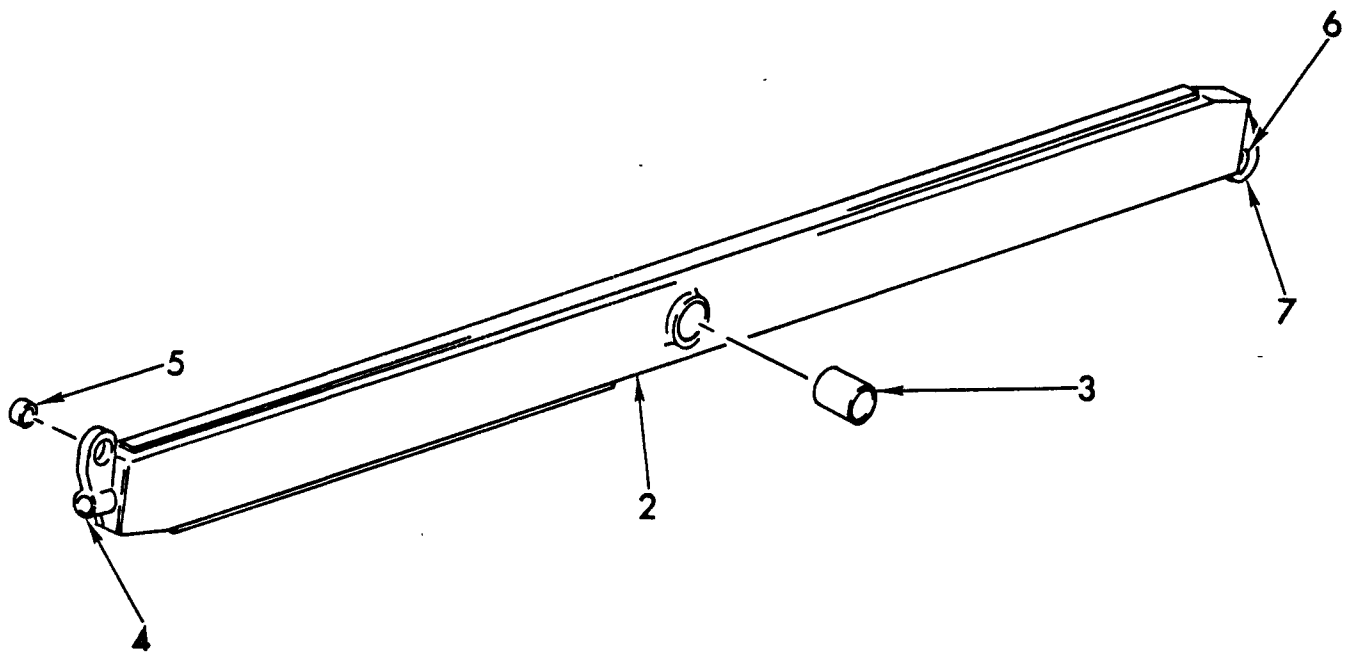
REV.

LOWER INNER ARM ASSEMBLY
(continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32288	ASSEMBLY, LOWER INNER ARM (See Sect. 4, Fig. 1 or 2 for NHA)	REF
2	30641	.ARM, INNER FABRICATION	1
3	30752	.EAR, MACHINING	2
4	916	.BUSHING	2
5	30200	.BUSHING, FIBERGLIDE	2
6	30755	.EAR, MACHINING	2
7	64932	.BEARING, SLEEVE	2

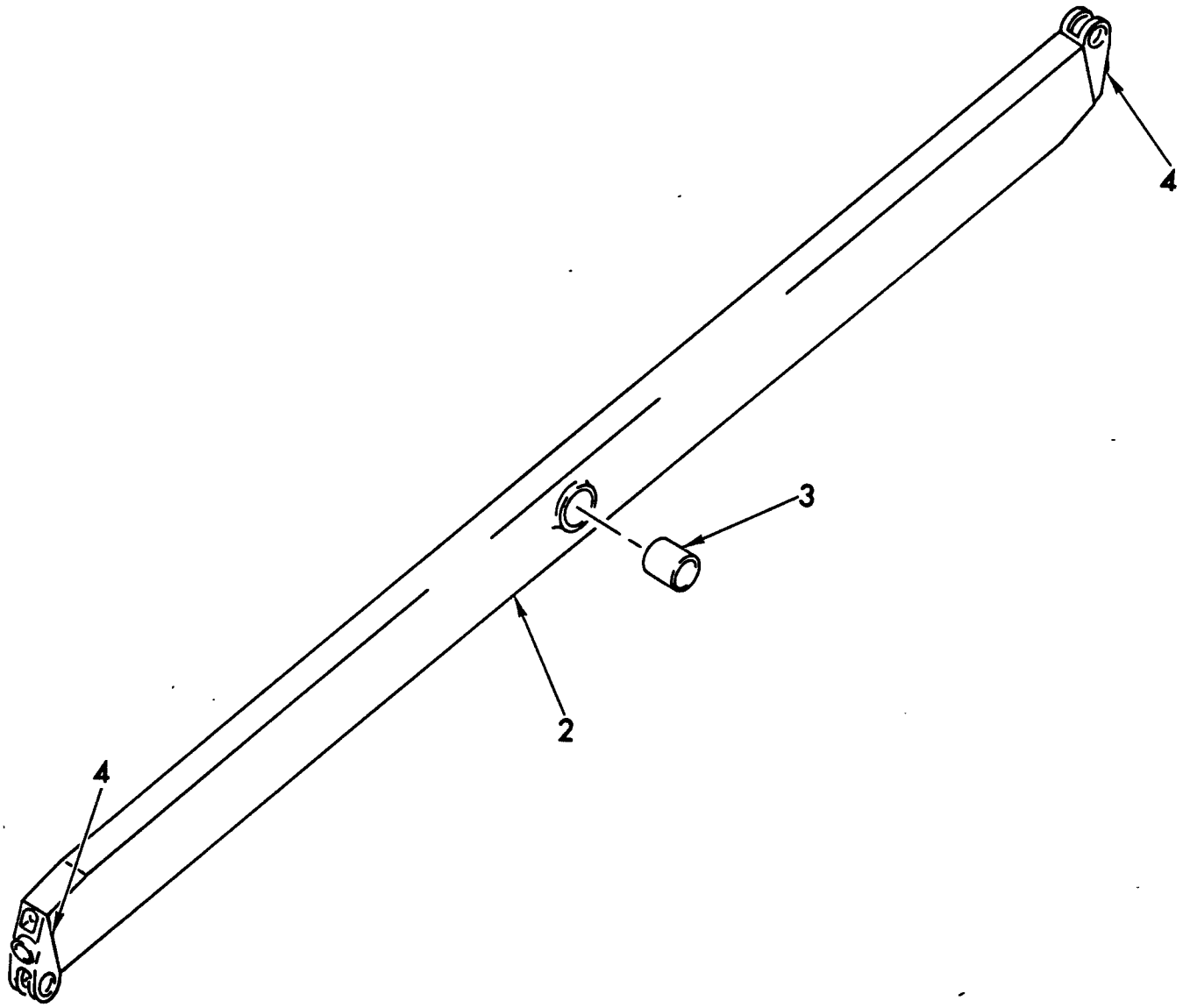
- ITEM NOT ILLUSTRATED

LOWER OUTER ARM ASSEMBLY



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	30165	ASSEMBLY, LOWER OUTER ARM (See Sect. 4, Fig. 1 or 2 for NHA)	REF
2	30160	.ARM, OUTER FABRICATION	1
3	30171	.BUSHING, PIVOT SHAFT	1
4	30756	.EAR, MACHINING	1
5	30172	.BUSHING, FIBER	1
6	30752	.EAR, MACHINING	1
7	916	.BUSHING	1

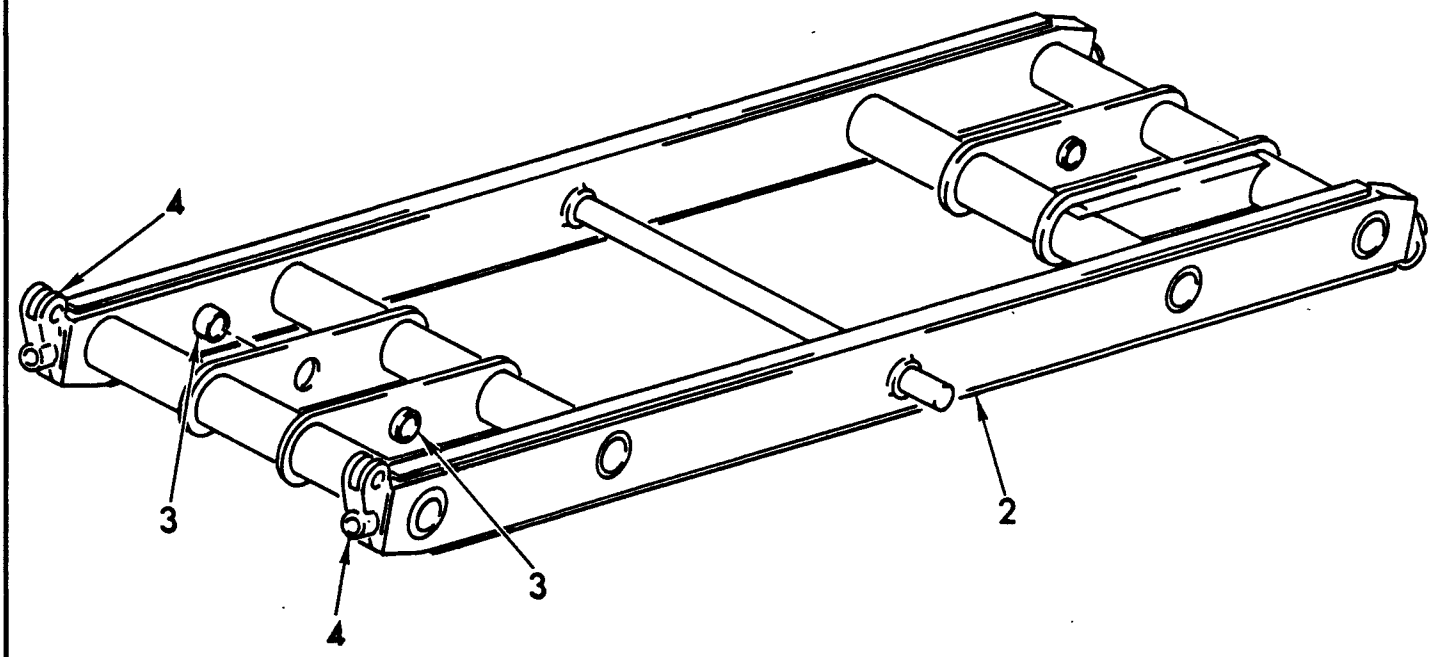
MIDDLE OUTER ARM ASSEMBLY



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	30166	ASSEMBLY, MIDDLE OUTER ARM (See Sect. 4, Fig. 1 or 2 for NHA)	REF
2	30161	.ARM, OUTER FABRICATION	1
3	30171	.BUSHING, PIVOT SHAFT	1
4	30758	.EAR, MACHINING	2

- ITEM NOT ILLUSTRATED

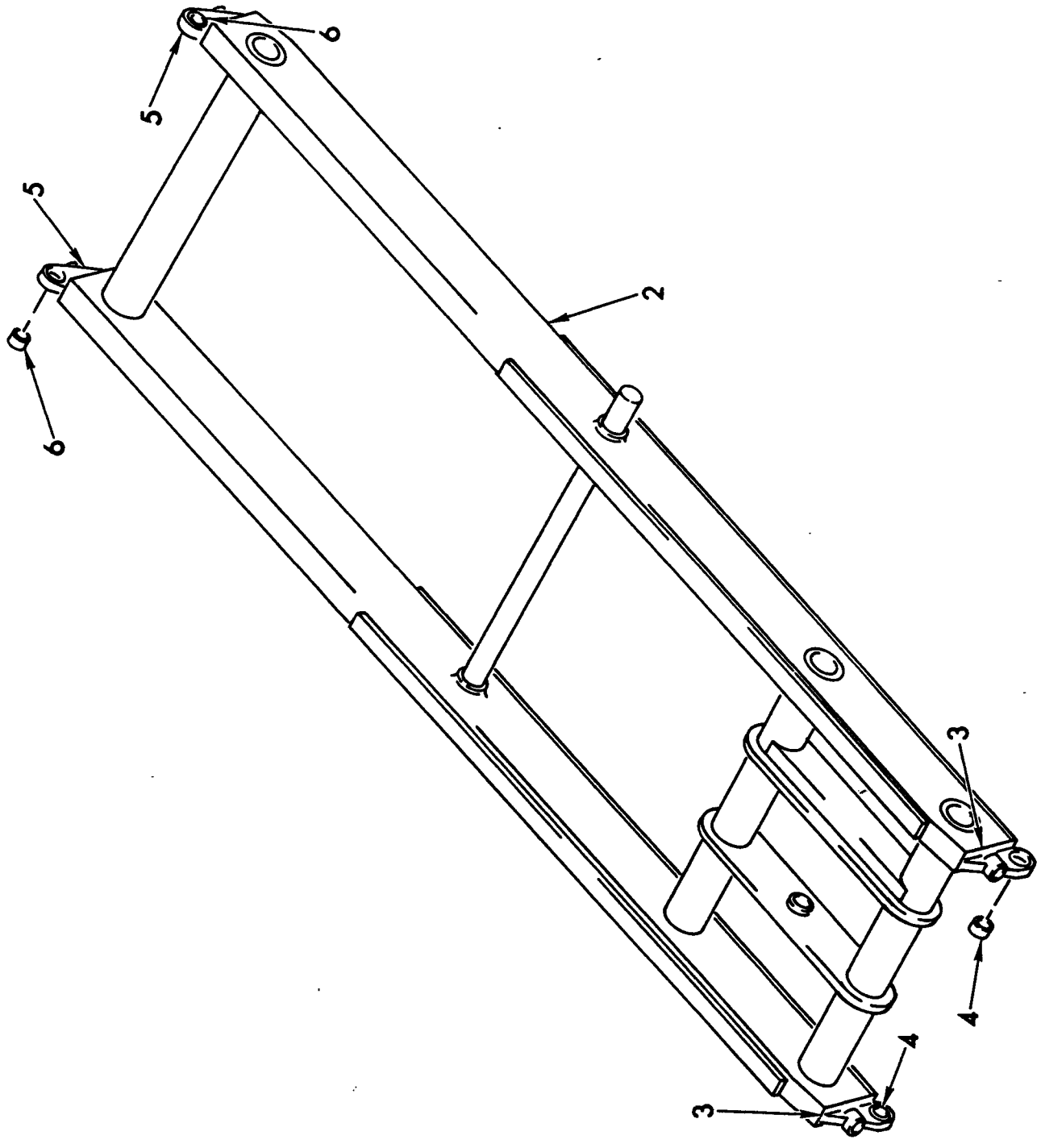
MIDDLE INNER ARM ASSEMBLY



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	30639	ASSEMBLY, MIDDLE INNER ARM (See Sect. 4, Fig. 1 or 2 for NHA)	REF
2	30642	.ARM, INNER FABRICATION	1
3	30200	.BUSHING, FIBERGLIDE	2
4	30758	.EAR, MACHINING	4

- ITEM NOT ILLUSTRATED

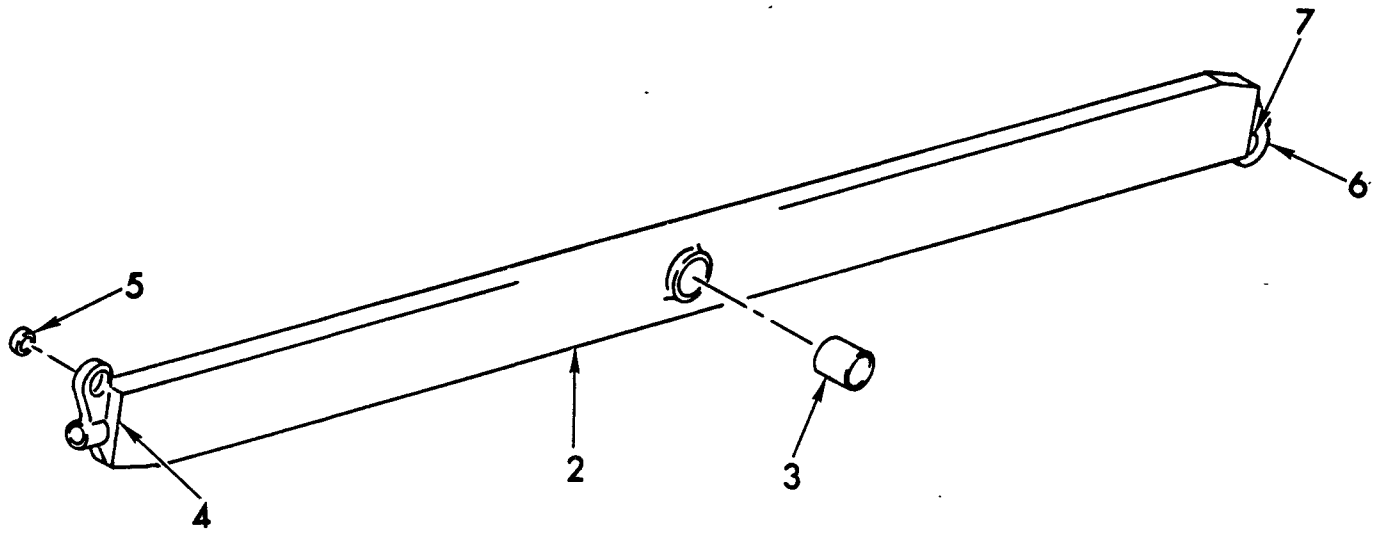
INNER ARM ASSEMBLY



UPPER INNER ARM ASSEMBLY (continued)

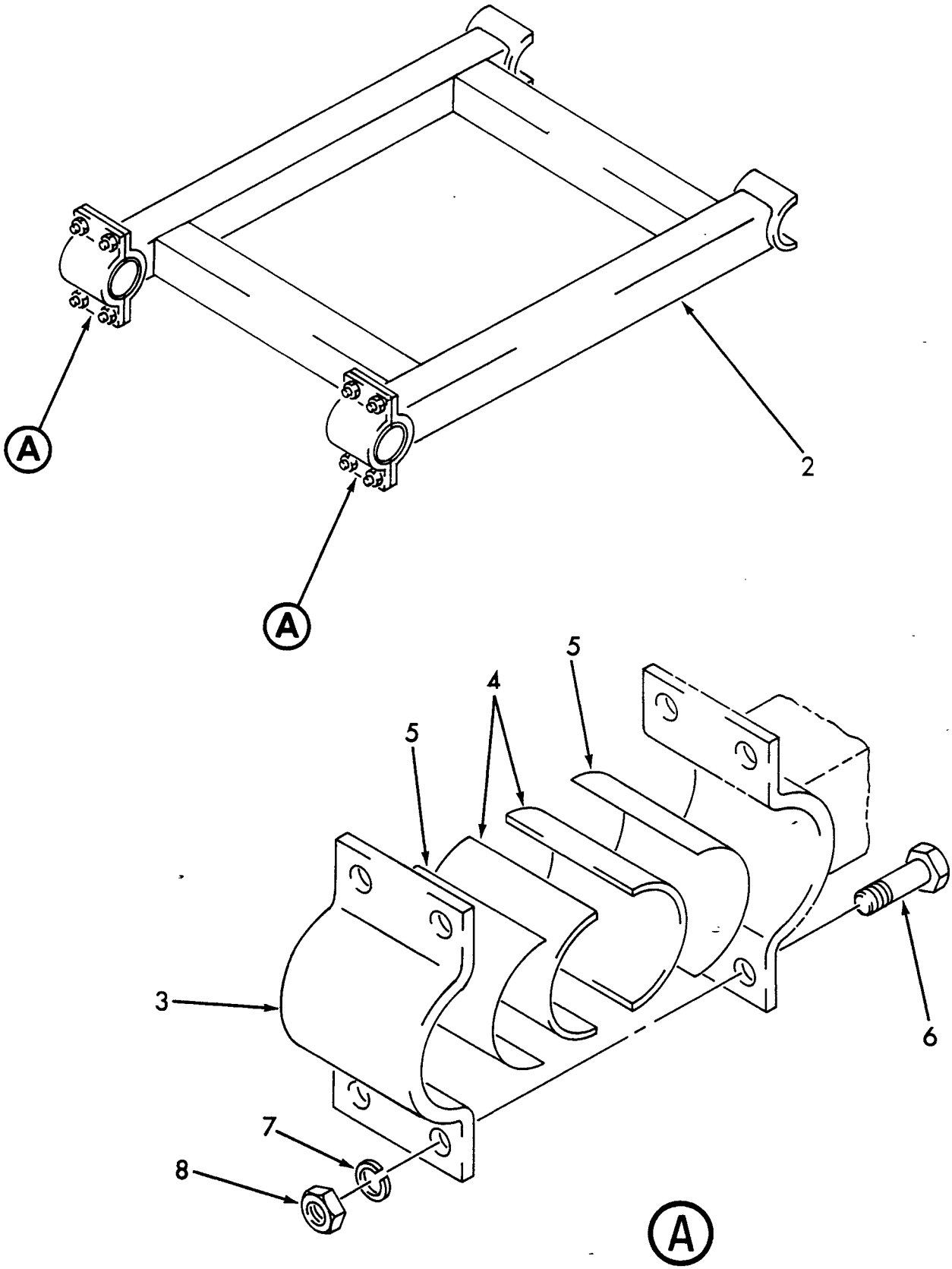
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	30638	ASSEMBLY, UPPER INNER ARM (See Sect. 4, Fig. 1 or 2 for NHA)	REF
2	30641	.ARM, INNER FABRICATION	1
3	30752	.EAR, MACHINING	2
4	916	.BUSHING	2
5	30756	.EAR, MACHINING	2
6	30172	.BUSHING, FIBER	2

UPPER OUTER ARM ASSEMBLY



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32287	ASSEMBLY, UPPER OUTER ARM (See Sect. 4, Fig. 1 or 2 for NHA)	REF
2	30160	.ARM, OUTER FABRICATION	1
3	30171	.BUSHING, PIVOT SHIFT	1
4	30756	.EAR, MACHINING	1
5	916	.BUSHING	1
6	30752	.EAR, MACHINING	1
7	64932	.BEARING, SLEEVE	1

INNER ARM SUPPORT ASSEMBLY

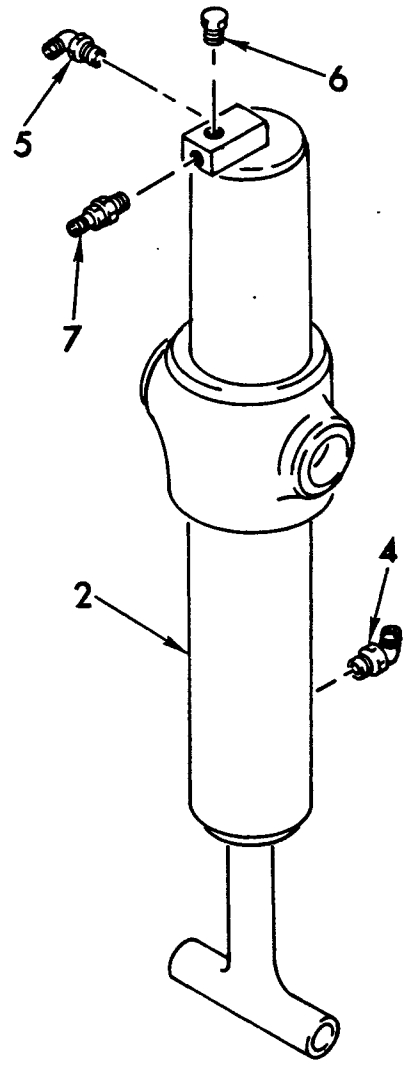


INNER ARM SUPPORT ASSEMBLY (continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	• 30338	ASSEMBLY, INNER ARM SUPPORT (See Sect. 4, Fig. 1 or 2 for NHA)	REF
2	30308	.WELDMENT, INNER ARM SUPPORT	1
3	30335	.CLAMP, INNER ARM SUPPORT	2
4	65792	.PAD, SPRING	4
5	65192	.ADHESIVE	AR
6	60343	.SCREW, CAP (attaching part)	8
7	63303	.WASHER, LOCK (attaching part)	8
8	60703	.NUT, HEX (attaching part)	8

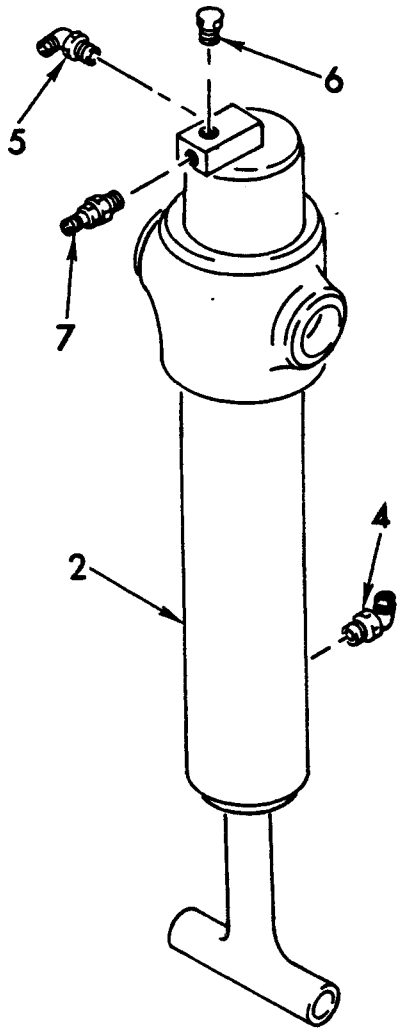
- ITEM NOT ILLUSTRATED

CYLINDER MAIN LIFT (FRONT) (MT-25G)



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32355	ASSEMBLY, CYLINDER MAIN LIFT (FRONT) (See Sect. 4, Fig. 1 for NHA)	REF
2	32302	.CYLINDER, MAIN LIFT	1
-3	66962	..KIT, SEAL (SIERRA NO. 23155)	1
4	80012-06	.ELBOW, STRAIGHT THREAD	1
5	80012-05	.ELBOW, STRAIGHT THREAD	1
6	80050-03	.PLUG, O-RING	1
7	81059	.VALVE, FLOW CONTROL	1

CYLINDER MAIN LIFT (REAR) (MT-25G)

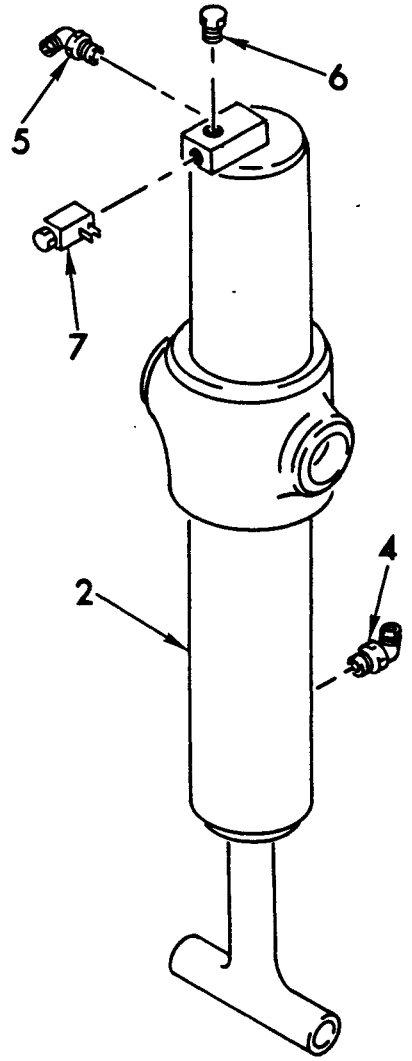


ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32266	ASSEMBLY, CYLINDER MAIN LIFT (REAR) (See Sect. 4, Fig. 1 for NHA)	REF
2	32303	.CYLINDER, MAIN LIFT	1
3	66962	..KIT, SEAL (SIERRA NO. 23155)	1
4	80012-06	.ELBOW, STRAIGHT THREAD	1
5	80012-05	.ELBOW, STRAIGHT THREAD	1
6	80050-03	.PLUG, O'RING	1
7	81059	.VALVE, FLOW CONTROL	1

REV.

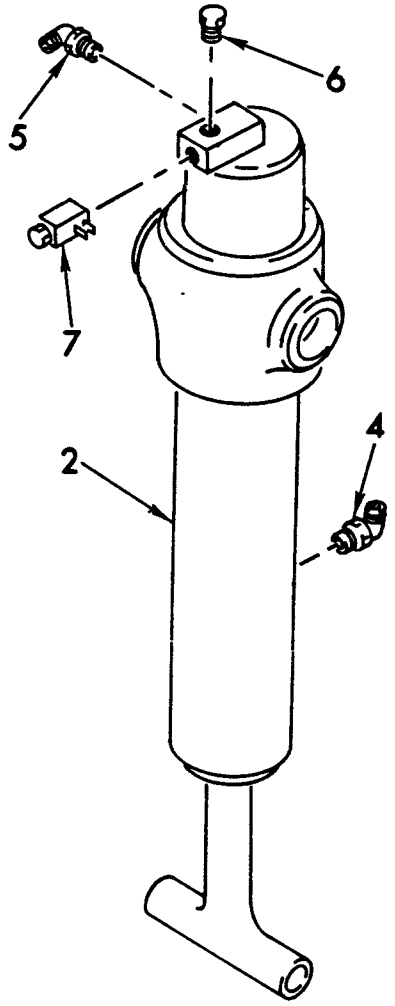
- ITEM NOT ILLUSTRATED

CYLINDER MAIN LIFT (FRONT) (MT-25GT)



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32304	ASSEMBLY, CYLINDER MAIN LIFT (FRONT) (See Sect. 4, Fig. 2 for NHA)	REF
2	32302	.CYLINDER, MAIN LIFT	1
-3	66962	..KIT, SEAL (SIERRA NO. 23155)	1
4	80012-06	.ELBOW, STRAIGHT THREAD	1
5	80012-05	.ELBOW, STRAIGHT THREAD	1
6	80050-03	.PLUG, O'RING	1
7	66675	.VALVE, SOLENOID	1

CYLINDER MAIN LIFT (REAR) (MT-25GT)



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32305	ASSEMBLY, CYLINDER MAIN LIFT (REAR) (See Sect. 4, Fig. 2 for NHA)	REF
2	32303	.CYLINDER, MAIN LIFT	1
-3	66962	..KIT, SEAL (SIERRA NO. 23155)	1
4	80012-06	.ELBOW, STRAIGHT THREAD	1
5	80012-05	.ELBOW, STRAIGHT THREAD	1
6	80050-03	.PLUG, O'RING	1
7	66675	.VALVE, SOLENOID	1

REV.

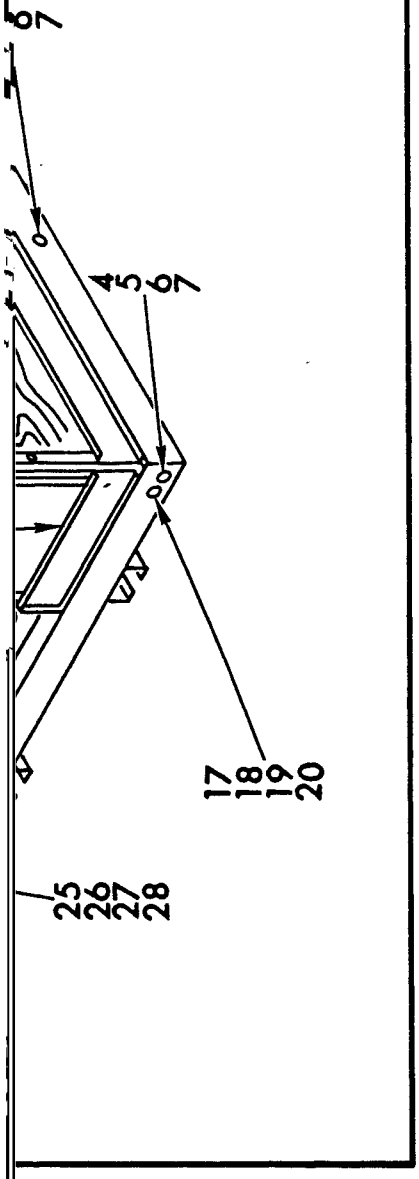
THIS **SECTION 5 PLATFORM ASSEMBLIES** IS ILLUSTRATED AS:

FIGURE 1 PLATFORM ASSEMBLY (MT-25G)

FIGURE 2 PLATFORM ASSEMBLY (MT-25GT)

FIGURE 3 HYDRAULIC MOTOR ASSEMBLY (MT-25GT)

PARTS
SECT. 5
FIG. 1
PAGE 1



PLATFORM ASSEMBLY (MT-25G) (continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32229	ASSEMBLY, PLATFORM (MT-25G) (See Sect. 2, Fig. 1 for NHA)	REF
2	32228	.WELDMENT, PLATFORM	1
3	32163	.GUARD RAIL, SIDE	2
4	60341	.SCREW, HEX HEAD (attaching part)	10
5	63041	.WASHER, FLAT (attaching part)	10
6	63301	.WASHER, LOCK (attaching part)	10
7	60701	.NUT, HEX (attaching part)	10
8	32162	.GUARD RAIL, FRONT	1
-9	60341	.SCREW, HEX HEAD (attaching part)	2
-10	63041	.WASHER, FLAT (attaching part)	2
-11	63301	.WASHER, LOCK (attaching part)	2
-12	60701	.NUT, HEX (attaching part)	2
13	60377	.SCREW, CAP (attaching part)	4
14	63301	.WASHER, LOCK (attaching part)	4
15	60701	.NUT, HEX (attaching part)	4
16	32210	.GUARD RAIL, R.H. REAR	1
17	60341	.SCREW, HEX HEAD (attaching part)	1
18	63041	.WASHER, FLAT (attaching part)	1
19	63301	.WASHER, LOCK (attaching part)	1
20	60701	.NUT, HEX (attaching part)	1
21	60377	.SCREW, CAP (attaching part)	2
22	63301	.WASHER, LOCK (attaching part)	2
23	60701	.NUT, HEX (attaching part)	2
24	32209	.GUARD RAIL, L.H. REAR	1
25	60341	.SCREW, HEX HEAD (attaching part)	1
26	63041	.WASHER, FLAT (attaching part)	1

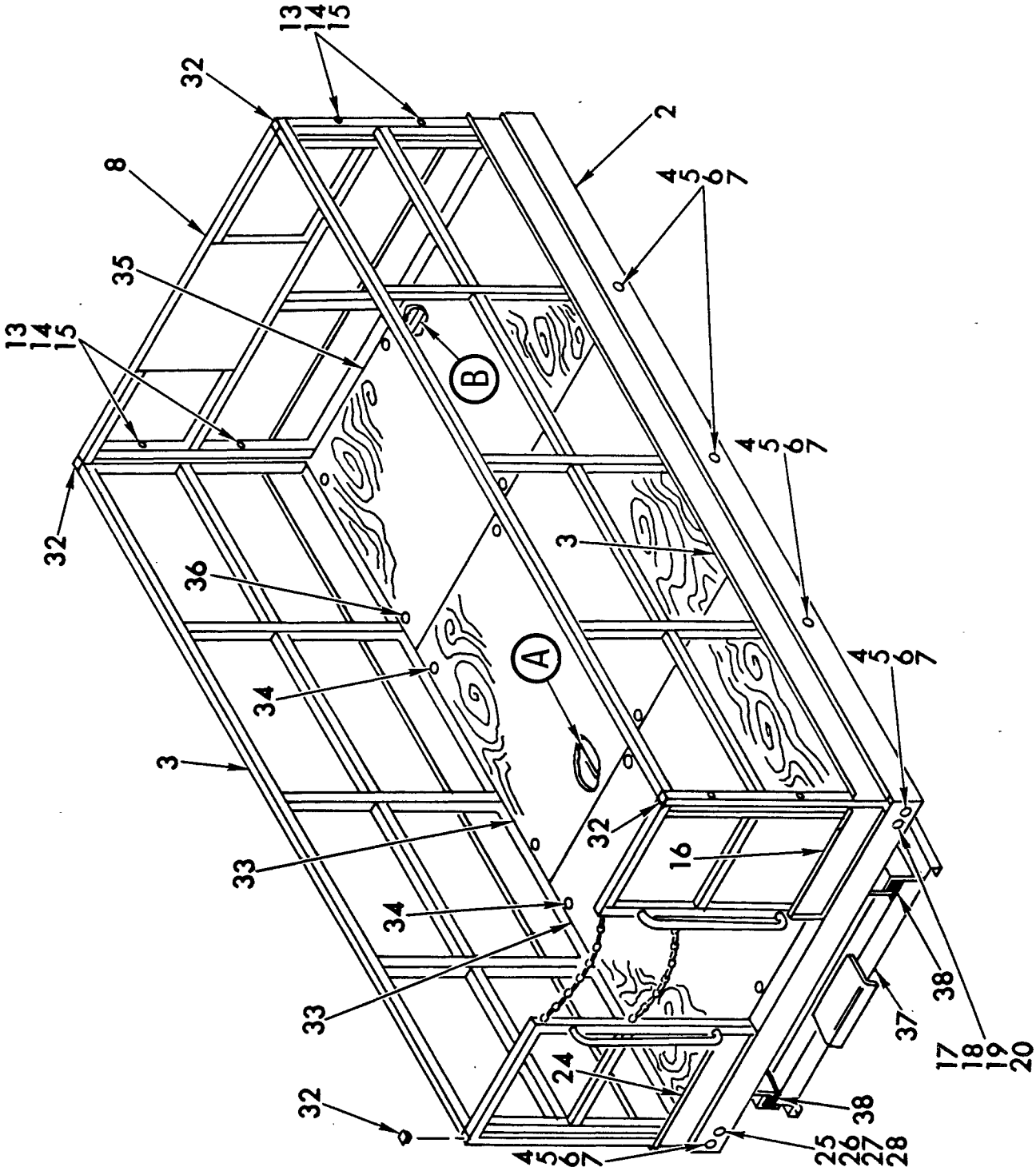
- ITEM NOT ILLUSTRATED

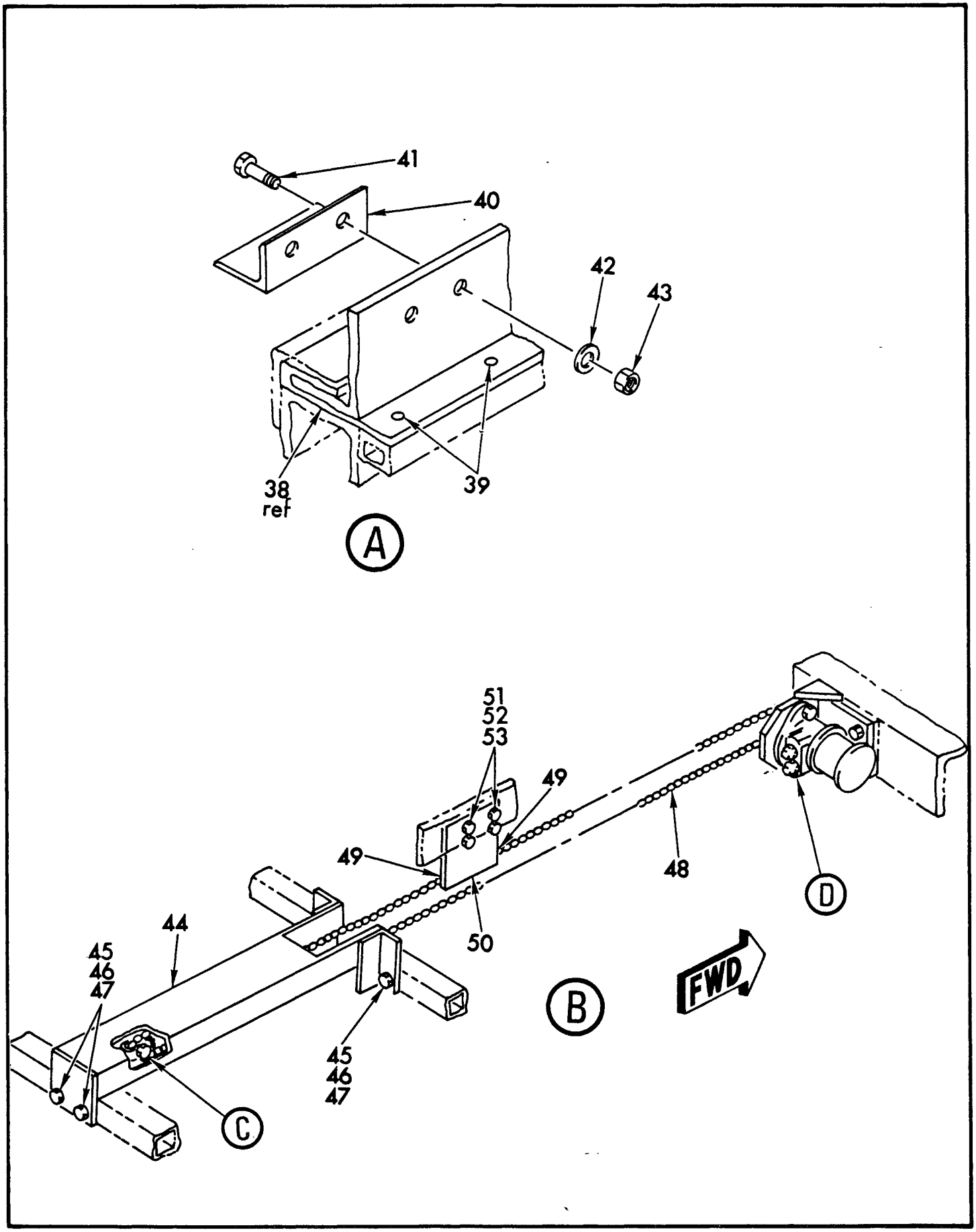
PLATFORM ASSEMBLY (MT-25G)
(continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
27	63301	.WASHER, LOCK (attaching part)	1
28	60701	.NUT, HEX (attaching part)	1
29	60377	.SCREW, CAP (attaching part)	2
30	63301	.WASHER, LOCK (attaching part)	2
31	60701	.NUT, HEX (attaching part)	2
32	91541	.PLUG, CAP	4
33	36636	.PLYWOOD	2
34	61706	.SCREW, FLAT (attaching part)	12
35	36638	.PLYWOOD	1
36	61706	.SCREW, FLAT (attaching part)	6

- ITEM NOT ILLUSTRATED

PLATFORM ASSEMBLY (MT-25GT)

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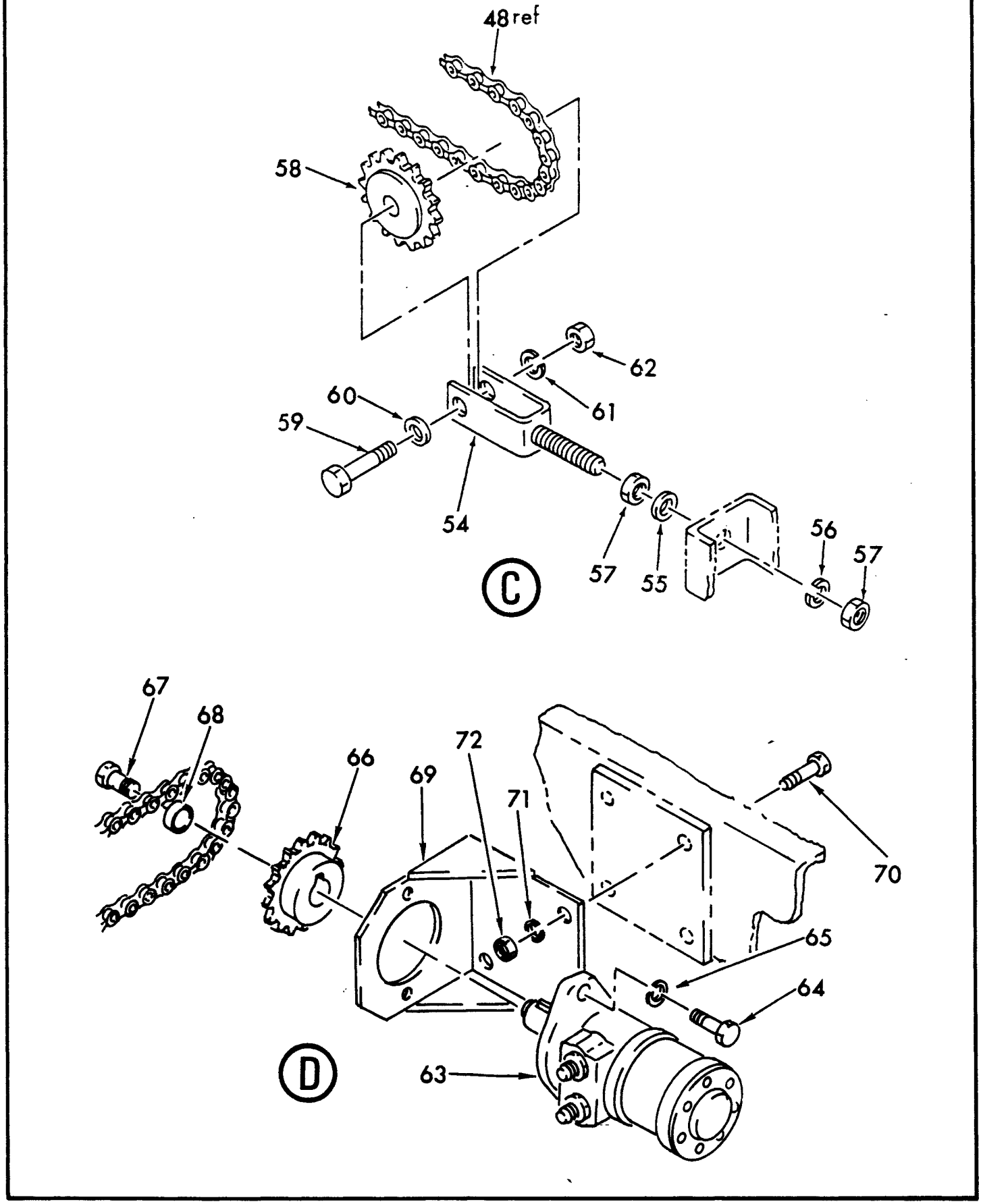
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PLATFORM ASSEMBLY (MT-25GT)
(continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32352	ASSEMBLY, PLATFORM (MT-25GT) (See Sect. 2, Fig. 2 for NHA)	REF
2	32151	.WELDMENT, PLATFORM	1
3	32163	.GUARD RAIL, SIDE	2
4	60341	.SCREW, HEX HEAD (attaching part)	10
5	63041	.WASHER, FLAT (attaching part)	10
6	63301	.WASHER, LOCK (attaching part)	10
7	60701	.NUT, HEX (attaching part)	10
8	32162	.GUARD RAIL, FRONT	1
-9	60341	.SCREW, HEX HEAD (attaching part)	2
-10	63041	.WASHER, FLAT (attaching part)	2
-11	63301	.WASHER, LOCK (attaching part)	2
-12	60701	.NUT, HEX (attaching part)	2
13	60377	.SCREW, CAP (attaching part)	4
14	63301	.WASHER, LOCK (attaching part)	4
15	60701	.NUT, HEX (attaching part)	4
16	32210	.GUARD RAIL, R.H. REAR	1
17	60341	.SCREW, HEX HEAD (attaching part)	1
18	63041	.WASHER, FLAT (attaching part)	1
19	63301	.WASHER, LOCK (attaching part)	1
20	60701	.NUT, HEX (attaching part)	1
21	60377	.SCREW, CAP (attaching part)	2
22	63301	.WASHER, LOCK (attaching part)	2
23	60701	.NUT, HEX (attaching part)	2
24	32209	.GUARD RAIL, L.H. REAR	1
25	60341	.SCREW, HEX HEAD (attaching part)	1
26	63041	.WASHER, FLAT (attaching part)	1

- ITEM NOT ILLUSTRATED

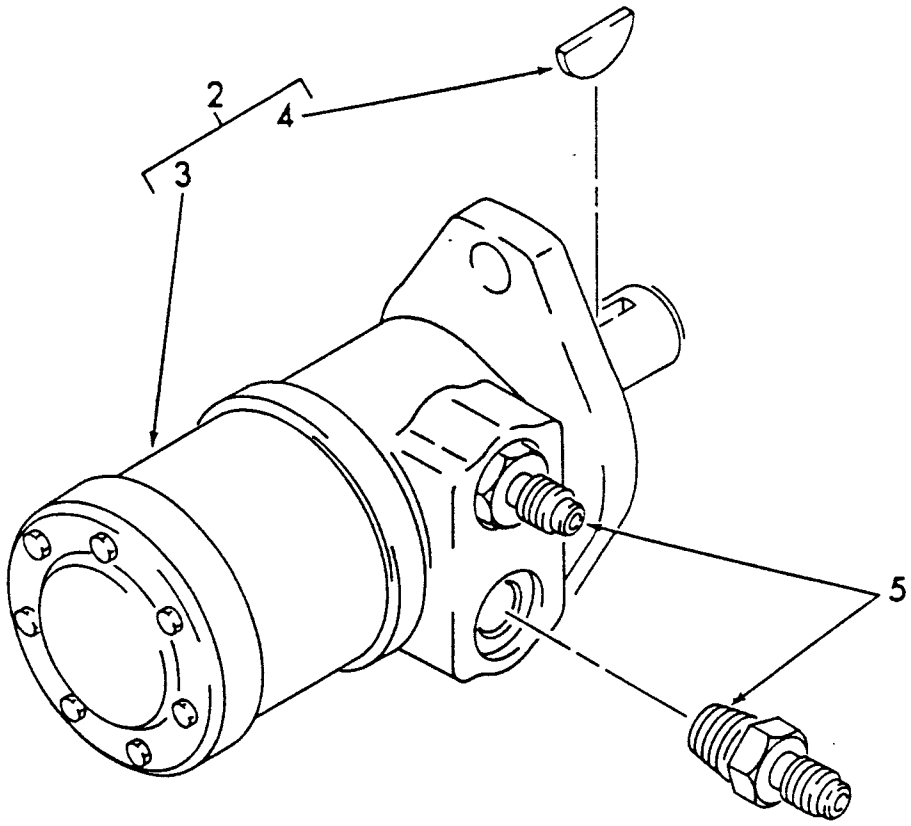
PLATFORM ASSEMBLY (MT-25GT) (continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
27	63301	.WASHER, LOCK (attaching part)	1
28	60701	.NUT, HEX (attaching part)	1
29	60377	.SCREW, CAP (attaching part)	2
30	63301	.WASHER, LOCK (attaching part)	2
31	60701	.NUT, HEX (attaching part)	2
32	91541	.PLUG, CAP	4
33	36636	.PLYWOOD	2
34	61706	.SCREW, FLAT (attaching part)	12
35	36638	.PLYWOOD	1
36	61706	.SCREW, FLAT (attaching part)	6
37	32103	.WELDMENT, TOP FRAME	1
38	32005	.PAD, WEAR	2
39	63651	.RIVET, POP (attaching part)	AR
40	32206	.STOP	1
41	60338	.SCREW, CAP (attaching part)	2
42	63302	.WASHER, LOCK (attaching part)	2
43	60702	.NUT, HEX (attaching part)	2
44	32346	.GUARD, CHAIN	1
45	60338	.SCREW, CAP (attaching part)	4
46	63302	.WASHER, LOCK (attaching part)	4
47	60702	.NUT, HEX (attaching part)	4
48	65662	.CHAIN, SELF LUBRICATING	1
49	65580	.LINK, MASTER (attaching part)	2
50	32168	.PLATE, MOUNTING	1
51	60328	.SCREW, CAP (attaching part)	4
52	63319	.WASHER, LOCK (attaching part)	4
53	60703	.NUT, HEX (attaching part)	4

- ITEM NOT ILLUSTRATED

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
54	130320	.CLEVIS, WELDMENT	1
55	63415	.WASHER, FLAT (attaching part)	1
56	63305	.WASHER, LOCK (attaching part)	1
57	61242	.NUT, LOCK	2
58	65585	.SPROCKET, IDLER	1
59	60370	.SCREW, H.H.C. (attaching part)	1
60	63415	.WASHER, FLAT (attaching part)	1
61	63305	.WASHER, LOCK (attaching part)	1
62	61242	.NUT, LOCK (attaching part)	1
63	130341	.ASSEMBLY, HYDRAULIC MOTOR (See Sect. 5, Fig. 11 for Details)	1
64	60311	.SCREW, H.H.C. (attaching part)	2
65	63305	.WASHER, LOCK (attaching part)	2
66	65578	.SPROCKET, STEEL 5/8 PITCH	1
67	60342	.SCREW, H.H.C. (attaching part)	1
68	31061	.WASHER, DRUM (attaching part)	1
69	130319	.BRACKET, MOTOR	1
70	60307	.SCREW, H.H.C. (attaching part)	4
71	63319	.WASHER, LOCK (attaching part)	4
72	60703	.NUT, HEX (attaching part)	4

HYDRAULIC MOTOR ASSEMBLY (MT-25GT)



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130341	ASSEMBLY, HYDRAULIC MOTOR (See Sect. 5, Fig. 2 for NHA)	REF
2	81025	.MOTOR, HYDRAULIC	1
3	66965	..KIT, SEAL	1
4		..KEY, WOODRUFF	1
5	80001-05	.CONNECTOR, MALE	2

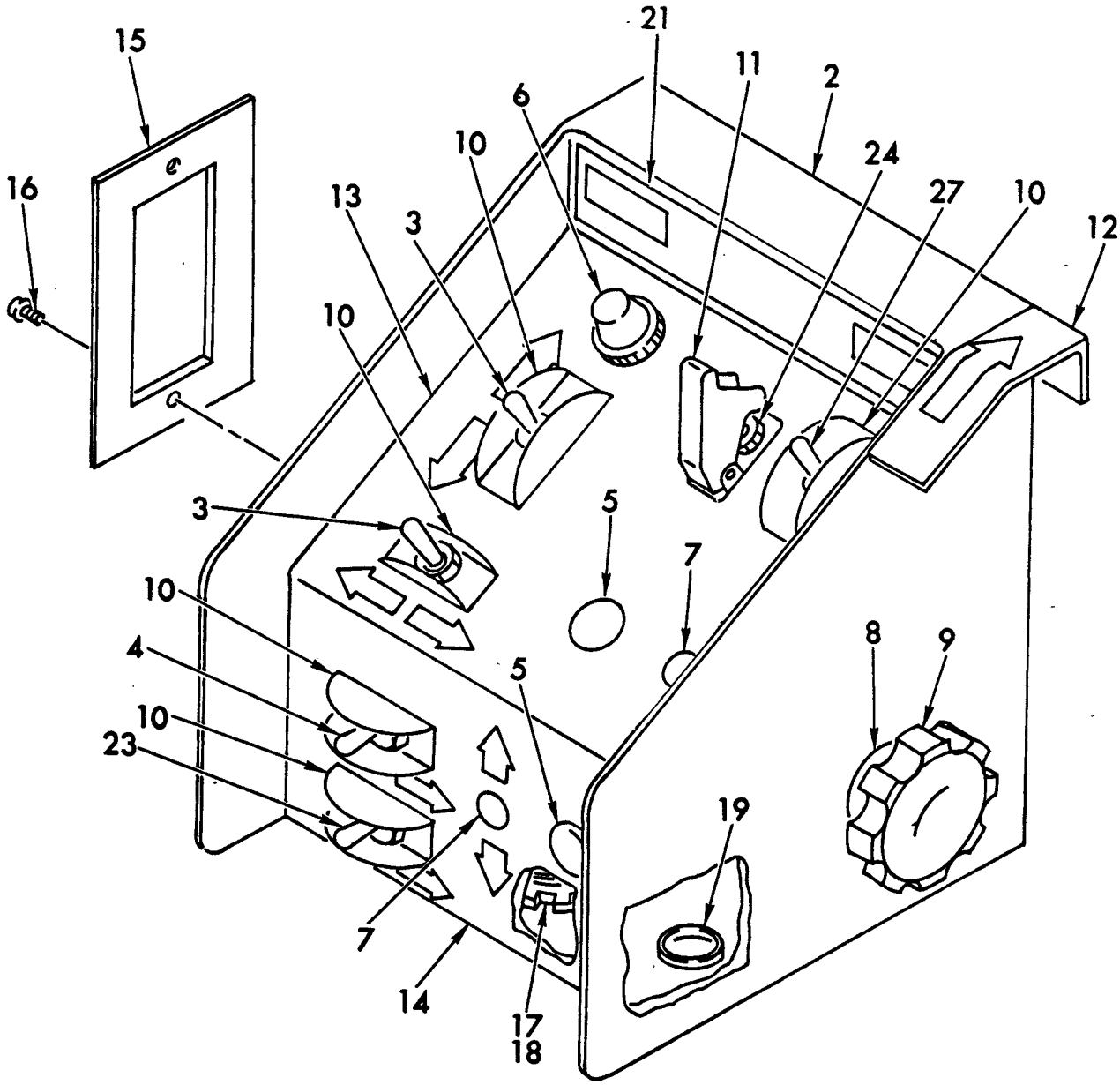
- ITEM NOT ILLUSTRATED

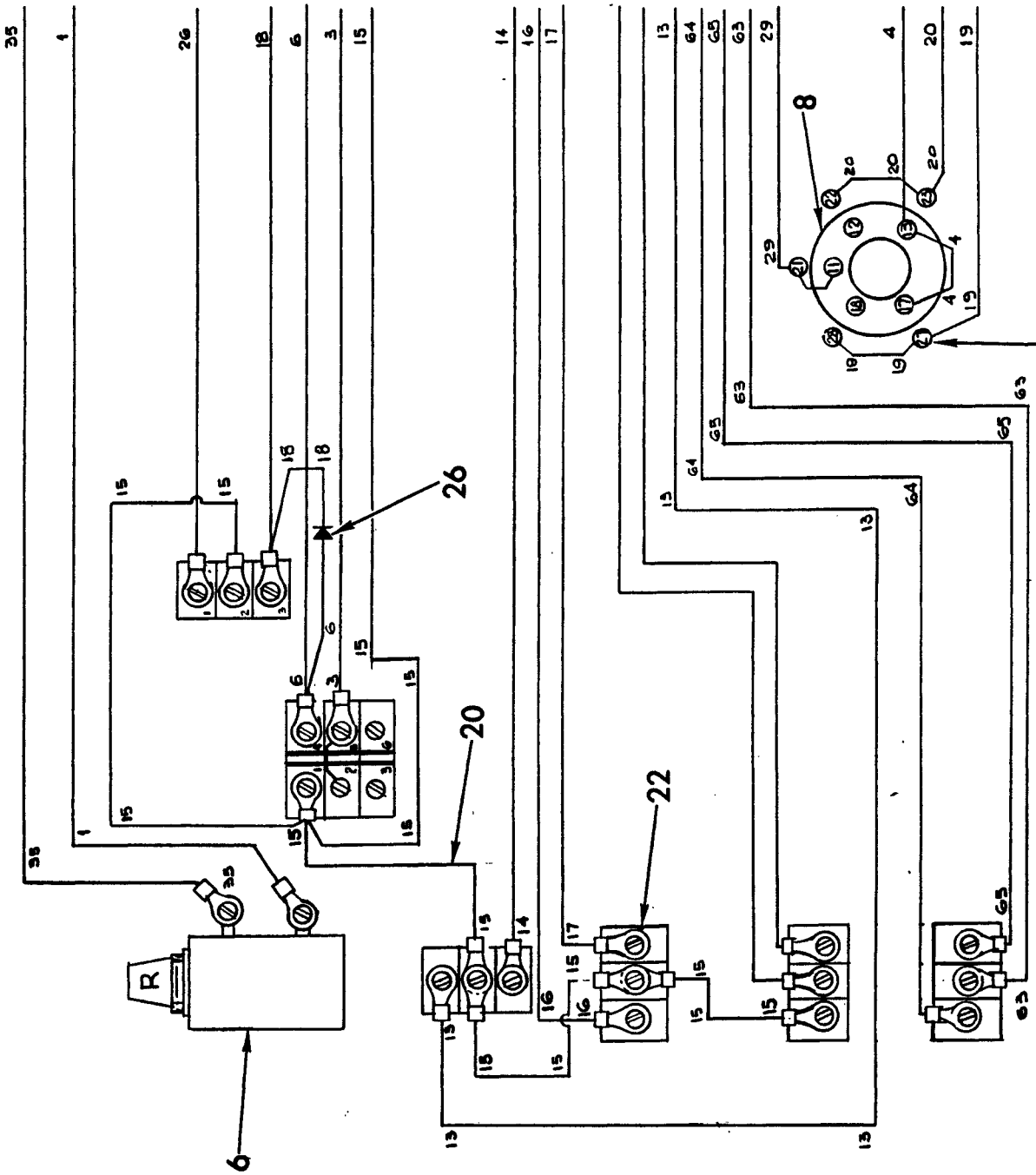
THIS **SECTION 6 UPPER CONTROL BOX ASSEMBLIES** IS ILLUSTRATED AS:

FIGURE 1 UPPER CONTROL BOX ASSEMBLY (MT-25G)

FIGURE 2 UPPER CONTROL BOX ASSEMBLY (MT-25GT)

UPPER CONTROL BOX ASSEMBLY (MT-25G)




ELECTRIC WIRING DIAGRAM (MT-25G)
R
6
8
20
22
25
26

UPPER CONTROL BOX ASSEMBLY (MT-25G) (continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32319	ASSEMBLY, UPPER CONTROL BOX (MT-25G) (See Sect. 2, Fig. 1 for NHA)	REF
2	130781	.WELDMENT, UPPER CONTROL BOX	1
3	4021	.SWITCH, TOGGLE (LIFT, STEER)	2
4	70057	.SWITCH, TOGGLE (WARNING HORN)	1
5	65241	.PLUG, WHITE	2
6	20805	.BUZZER, ALARM (RED)	1
7	771	.PLUG, WHITE	2
8	4106	.SWITCH, 5 POSITION (DRIVE)	1
9	65753	.KNOB, FLUTED TORQUE	1
10	20884	.SWITCH, GUARD	5
11	70303	.SWITCH, GUARD	1
12	130782	.DECAL, DRIVE	1
13	130794	.DECAL, OPERATION (UPPER)	1
14	130796	.DECAL, OPERATION (BELOW)	1
15	902	.PLATE, COVER	1
16		.SCREW, SELF TAPPING (attaching part)	2
17	2807	.RELIEF, STRAIN	1
18	2809	.NUT, LOCK (attaching part)	1
19	2219	.PLUG, WHITE	1
20	70009	.WIRE, RED (2FT)	AR
21	2014	.DECAL, CAUTION	1
22	117-C	.CONNECTOR, RING	29
23	4019	.SWITCH, TOGGLE (DUAL FUEL)	1

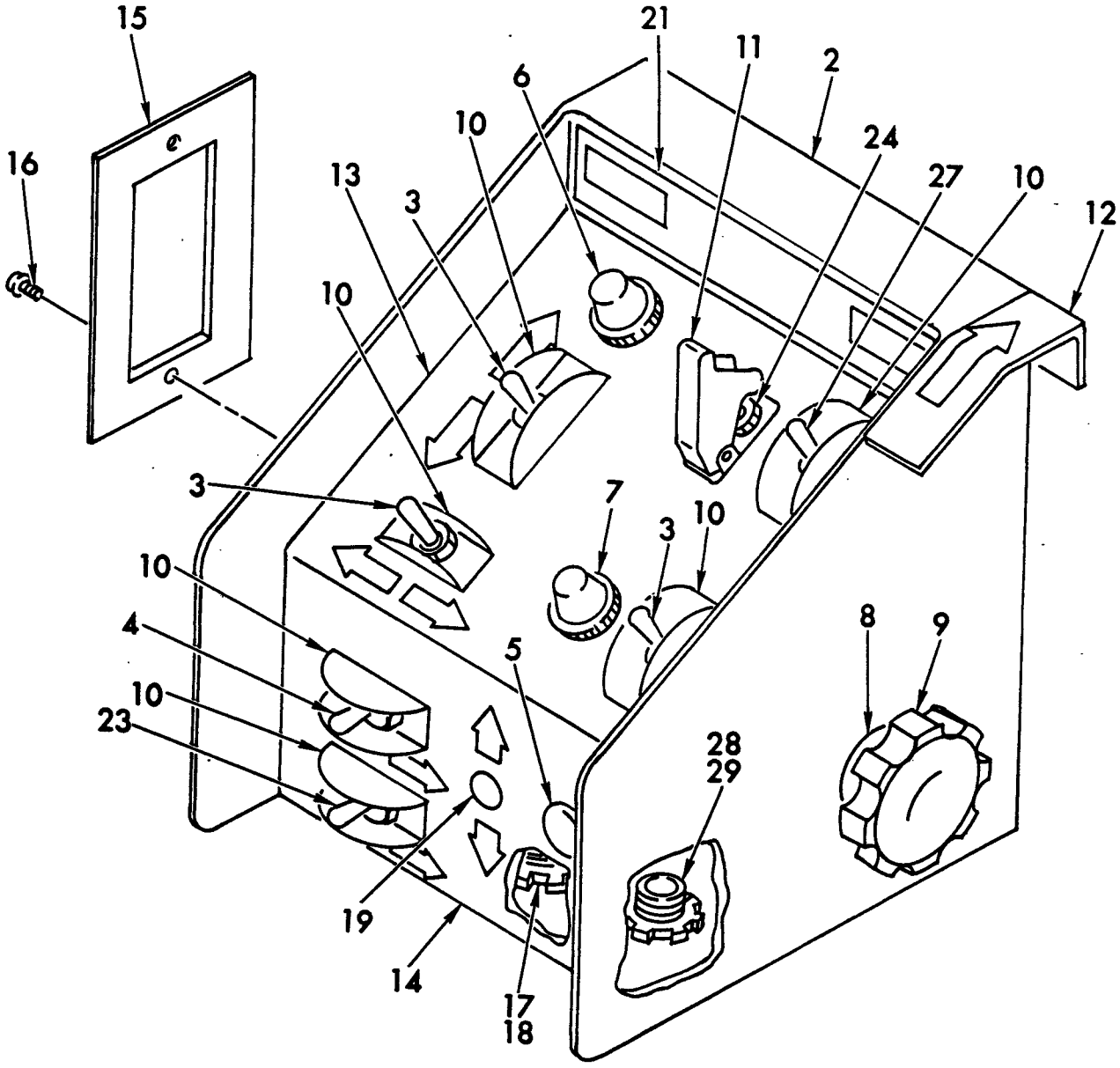
- ITEM NOT ILLUSTRATED

UPPER CONTROL BOX ASSEMBLY (MT-25G)
(continued)

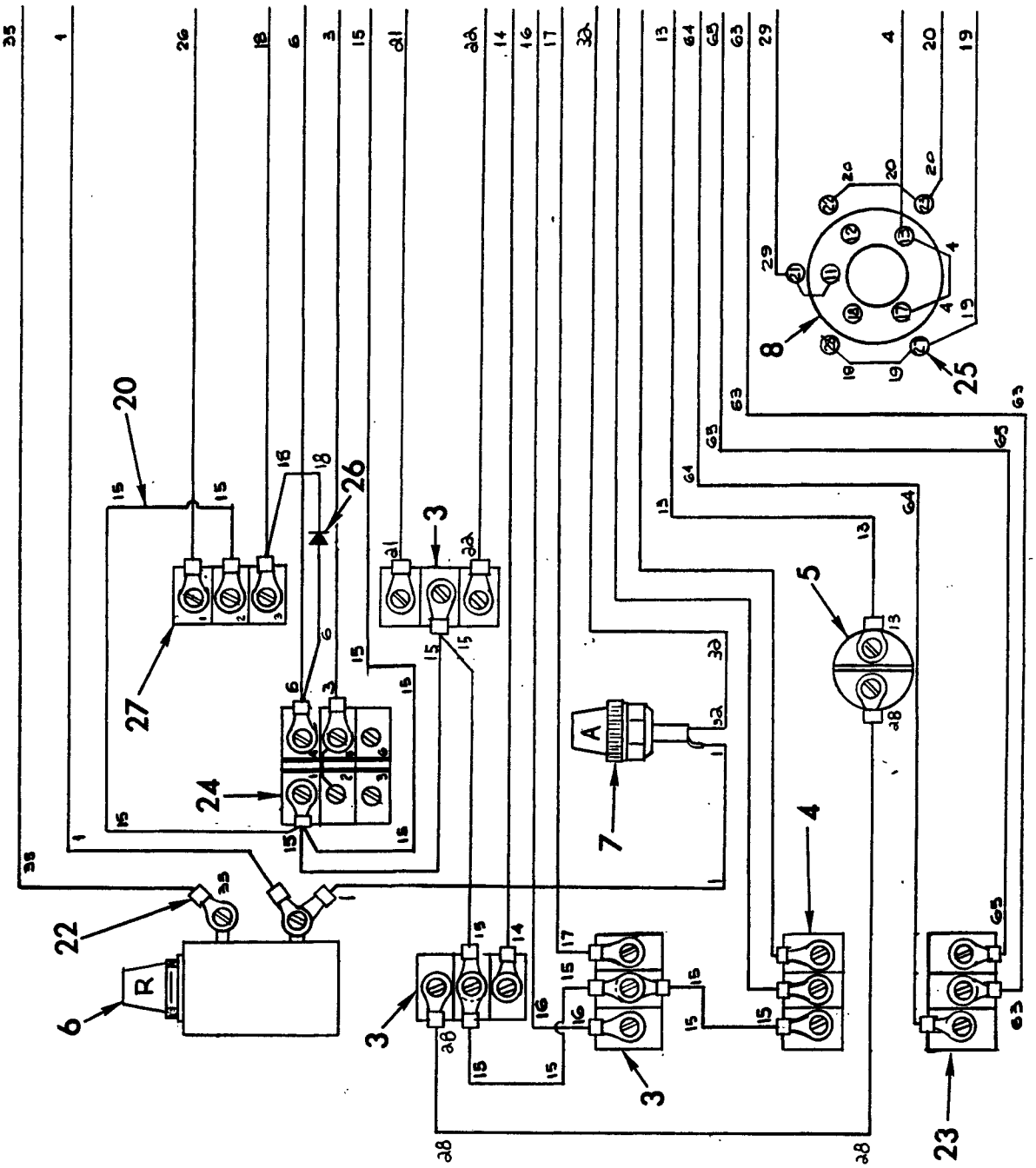
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
24	70304	.SWITCH, TOGGLE (EMERGENCY STOP)	1
25	16628	.CONNECTOR	10
26	4045	.DIODE	1
27	70057	.SWITCH, TOGGLE (THROTTLE)	1

- ITEM NOT ILLUSTRATED

UPPER CONTROL BOX ASSEMBLY (MT-25GT)



REV.


ELECTRIC WIRING DIAGRAM (MT-25GT)
20
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24
22
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3
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7
4
8
25
23
R
A

UPPER CONTROL BOX ASSEMBLY (MT-25GT) (continued)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32320	ASSEMBLY, UPPER CONTROL BOX (MT-25GT) (See Sect. 2, Fig. 2 for NHA)	REF
2	130781	.WELDMENT, UPPER CONTROL BOX	1
3	4021	.SWITCH, TOGGLE (PLATFORM EXTEND, LIFT, STEER)	3
4	70057	.SWITCH, TOGGLE (WARNING HORN)	1
5	4020	.BUTTON, PUSH	2
6	20805	.BUZZER, ALARM (RED)	1
7	70195	.BUZZER, ALARM (AMBER)	1
8	4106	.SWITCH, 5 POSITION (DRIVE)	1
9	65753	.KNOB, FLUTED TORQUE	1
10	20884	.SWITCH, GUARD	6
11	70303	.SWITCH, GUARD	1
12	130782	.DECAL, DRIVE	1
13	130794	.DECAL, OPERATION (UPPER)	1
14	130796	.DECAL, OPERATION (BELOW)	1
15	902	.PLATE, COVER	1
16		.SCREW, SELF TAPPING (attaching part)	2
17	2807	.RELIEF, STRAIN	1
18	2809	.NUT, LOCK (attaching part)	1
19	771	.PLUG, WHITE	1
20	70009	.WIRE, RED (3FT)	AR
21	2014	.DECAL, CAUTION	1
22	117-C	.CONNECTOR, RING	39
23	4019	.SWITCH, TOGGLE (DUAL FUEL)	1

- ITEM NOT ILLUSTRATED

UPPER CONTROL BOX ASSEMBLY (MT-25GT)
(continued)

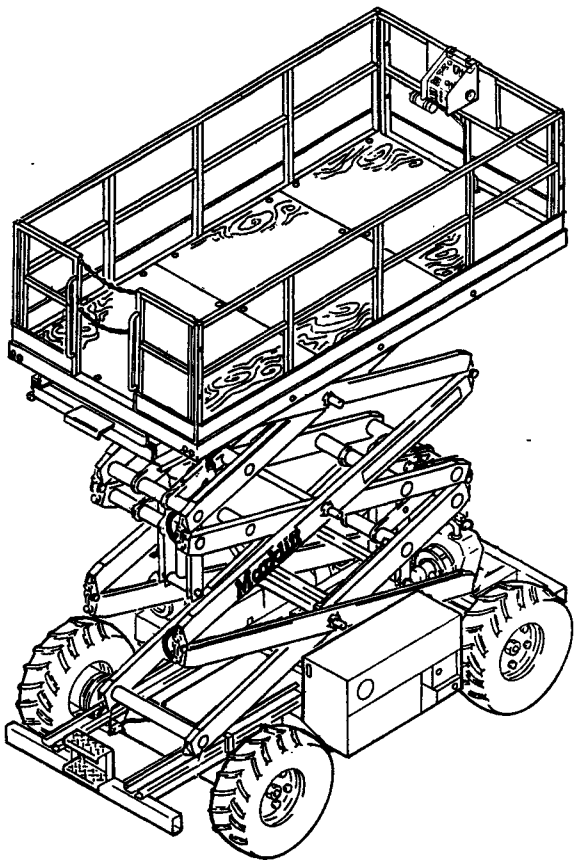
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
24	70304	.SWITCH, TOGGLE (EMERGENCY STOP)	1
25	16628	.CONNECTOR	14
26	4045	.DIODE	1
27	70057	.SWITCH, TOGGLE (THROTTLE)	1
28	2806	.RELIEF, STRAIN	1
29	2808	.NUT, LOCK (attaching part)	1

- ITEM NOT ILLUSTRATED

THE OPTIONS SHOWN IN THIS SECTION 7 APPLY TO BOTH THE MT 25G AND THE MT 25GT EXCEPT WHERE NOTED IE; G-XXXXXX, GT-XXXXXX.

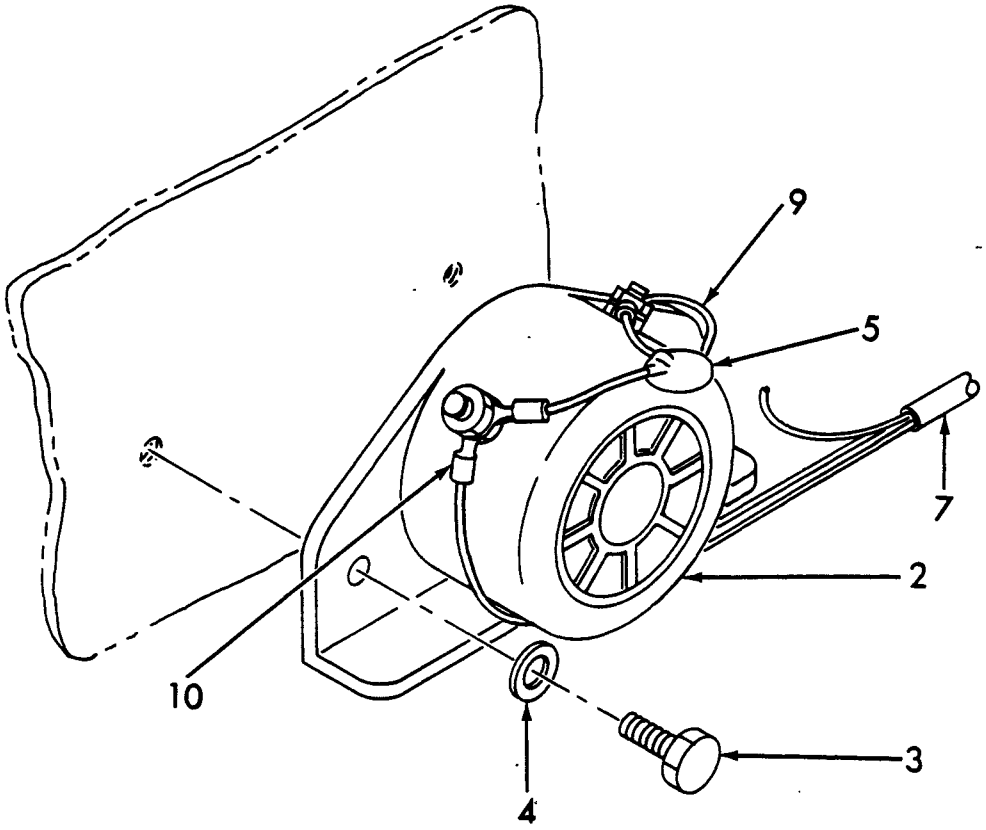
AT THE TIME OF THIS REVISION SOME PRINTS WERE NOT AVAILABLE FOR ILLUSTRATION OF A PART. WHEN THIS OCCURS, THE FOLLOWING NOTICE WILL APPEAR, AND THE PART NUMBER WILL BE GIVEN.

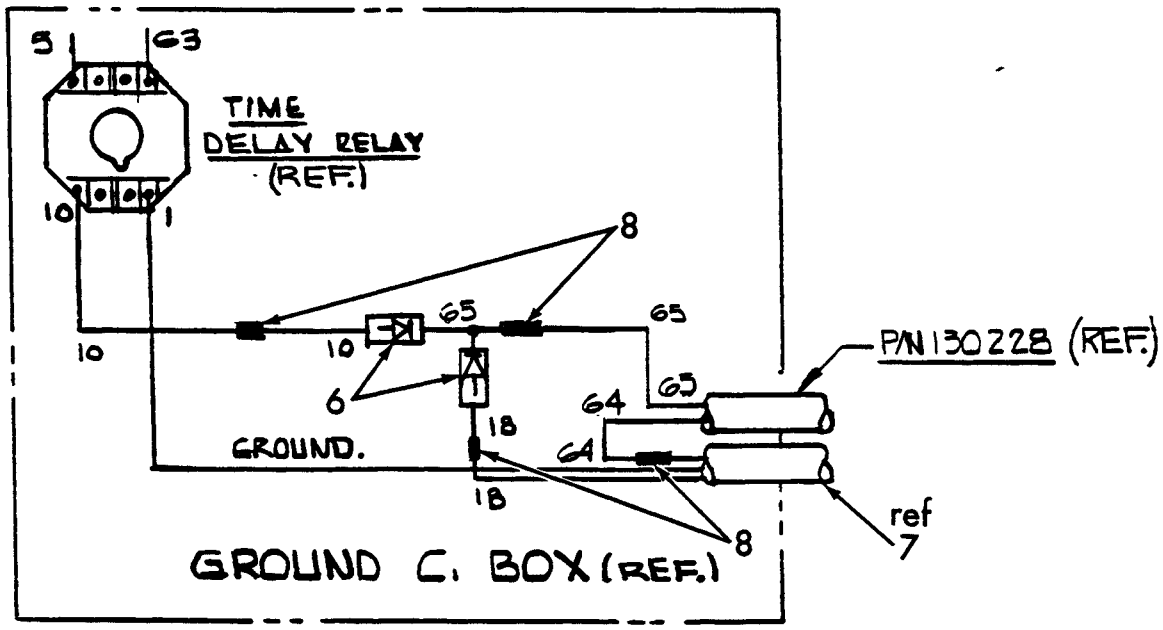
THIS SECTION 7 - OPTION ASSEMBLIES
PRINT No. _____
IS NOT AVAILABLE THIS REVISION.



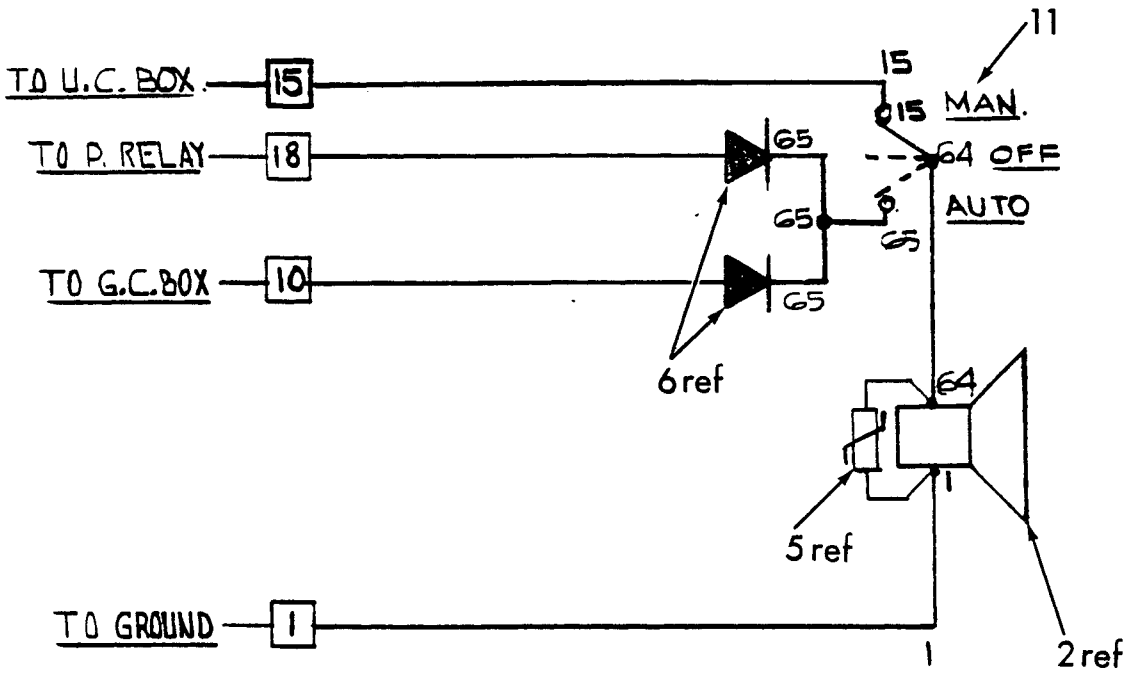
THIS SECTION 7 IS ILLUSTRATED AS:

*THIS FIGURE IS NOT AVAILABLE FOR THIS REVISION





WIRING DIAGRAM



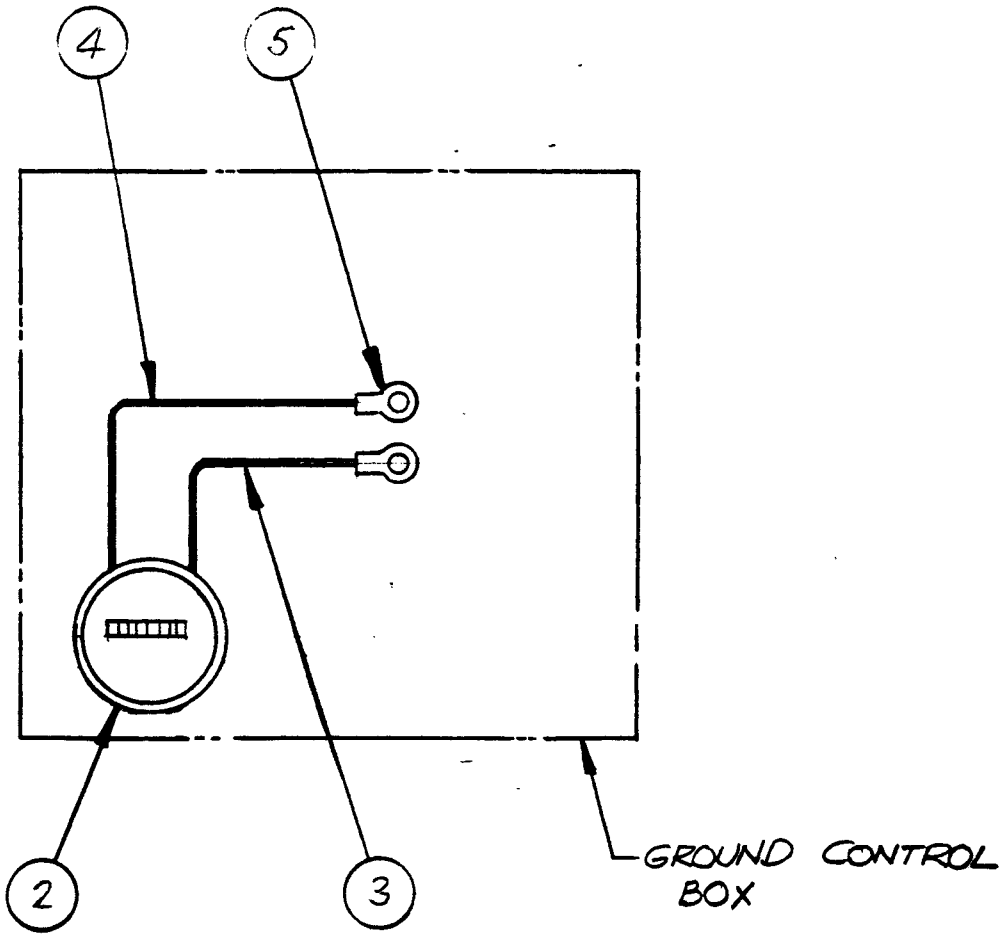
E. SCHEMATIC

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130912	ASSEMBLY, WARNING HORN	REF
2	70053	.HORN, WARNING	1
3	60309	.SCREW, CAP (attaching part)	2
4	63301	.WASHER, LOCK (attaching part)	2
5	130705	.ASSEMBLY, VARISTOR	1
6	4045	.DIODE	2
7	16201	.WIRE, 3 FT	AR
8	117-D	.CONNECTOR, BUTT	4
9	70007	.WIRE, YELLOW .5 FT	AR
10	117-C	.CONNECTOR, RING	10
11	70057	.SWITCH, TOGGLE (Located on Upper Control Box)	1

FIGURE 2. ALL MOTION ALARM - LIFT/LOWER/TRAVEL

THIS SECTION 7 - OPTION ASSEMBLIES
PRINT No. 32908
IS NOT AVAILABLE THIS REVISION.

FIGURE 3. HOURMETER



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	131065	HOURMETER	REF
2	20571	. HOURMETER	1
3	70232	. WIRE, WHITE, 16 AWG	1½FT
4	70008	. WIRE, YELLOW/GREEN, 16 AWG	1½FT
5	117-C	. CONNECTOR RING	2

FIGURE 4. ROTATING AMBER BEACON

THIS SECTION 7 - OPTION ASSEMBLIES
PRINT No. 131927
IS NOT AVAILABLE THIS REVISION.

FIGURE 5. 12 VOLT PLATFORM WORK LIGHT

THIS SECTION 7 - OPTION ASSEMBLIES
PRINT No. 131928
IS NOT AVAILABLE THIS REVISION.

FIGURE 6. WELDMENT, REAR GUARD RAIL

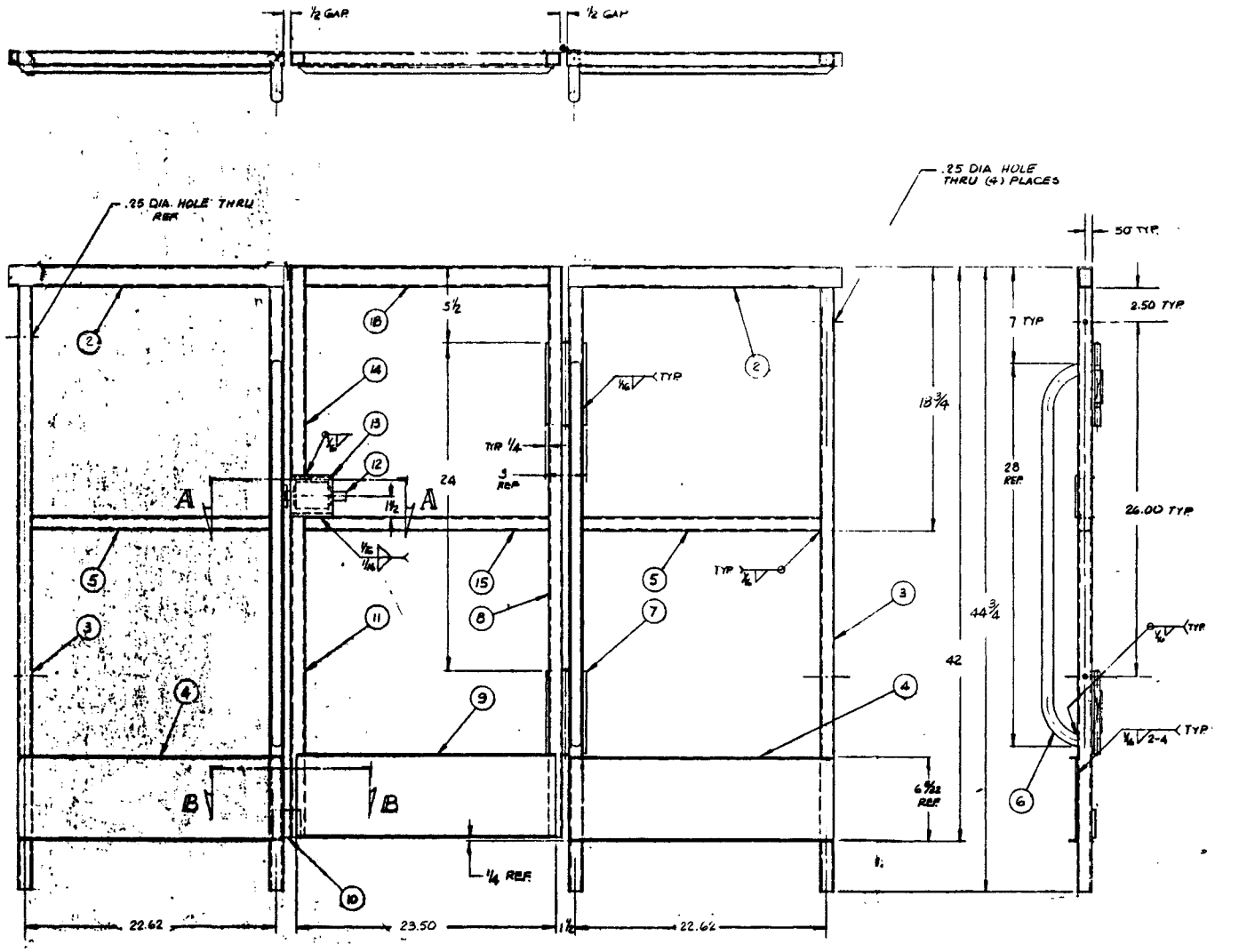
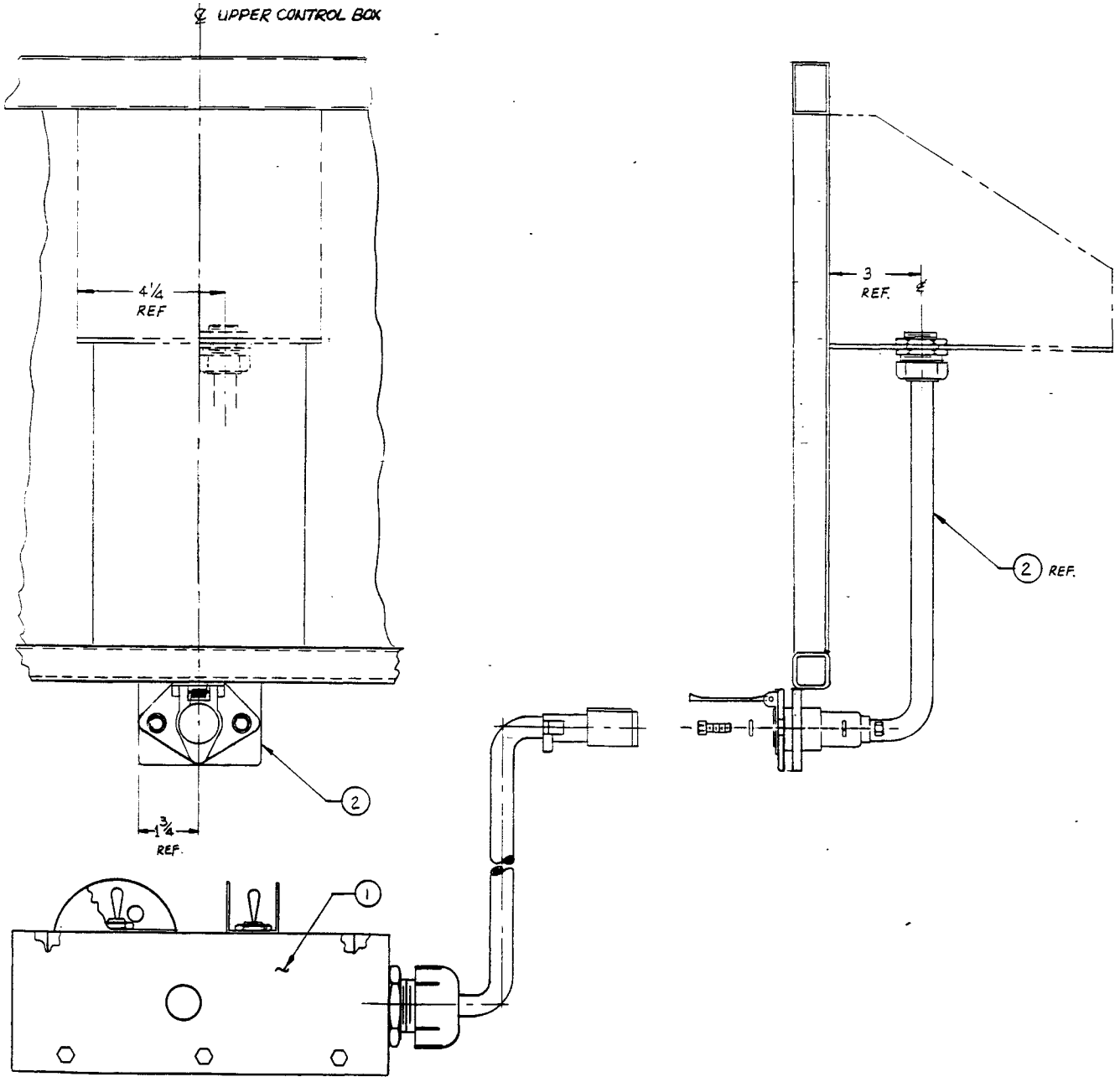


FIGURE 6. WELDMENT, REAR GUARD RAIL

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
	32926	WELDMENT, REAR GUARD RAIL	REF
1	37336	. TUBE, RECT.	1
2	36594	. TUBE, RECT.	2
3	36547	. TUBE, SQUARE	4
4	30149-29.62	. PLATE, TOE	2
5	36595	. TUBE, SQUARE	2
6	32031	. RAIL, HAND	2
7	12005	. ASSEMBLY, HINGE	2
8	36247	. TUBE, SQUARE	1
9	30149-23.50	. PLATE, TOE	1
10	25379	. BAR, FLAT	1
11	37337	. TUBE, SQUARE	1
12	16231	. BOLT, LATCH	1
13	35016	. CHANNEL	1
14	37338	. TUBE, SQUARE	1
15	37339	. TUBE, SQUARE	1
16	35043	. KEY STOCK	1

- ITEM NOT ILLUSTRATED

FIGURE 7. REMOTE DRIVE AND STEER



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
	131916	REMOTE UNIT, DRIVE AND STEER	REF
1	130911	. ENCLOSURE ASSEMBLY, REMOTE CONTROL	1
2	131940	. PLUG, FEMALE	1

REV.

FIGURE 8. FEMALE PLUG, REMOTE DRIVE

THIS SECTION 7 - OPTION ASSEMBLIES
PRINT No. 70267
IS NOT AVAILABLE THIS REVISION.

FIGURE 9. LANYARD/CONTROL BOX, REMOTE DRIVE

THIS SECTION 7 - OPTION ASSEMBLIES
PRINT No. 130911
IS NOT AVAILABLE THIS REVISION.

FIGURE 10. TUV PACKAGE

THIS SECTION 7 - OPTION ASSEMBLIES
PRINT No. 32929
IS NOT AVAILABLE THIS REVISION.

FIGURE 11. PROPORTIONAL DRIVE CONTROLS

THIS SECTION 7 - OPTION ASSEMBLIES
PRINT No. 32928
IS NOT AVAILABLE THIS REVISION.

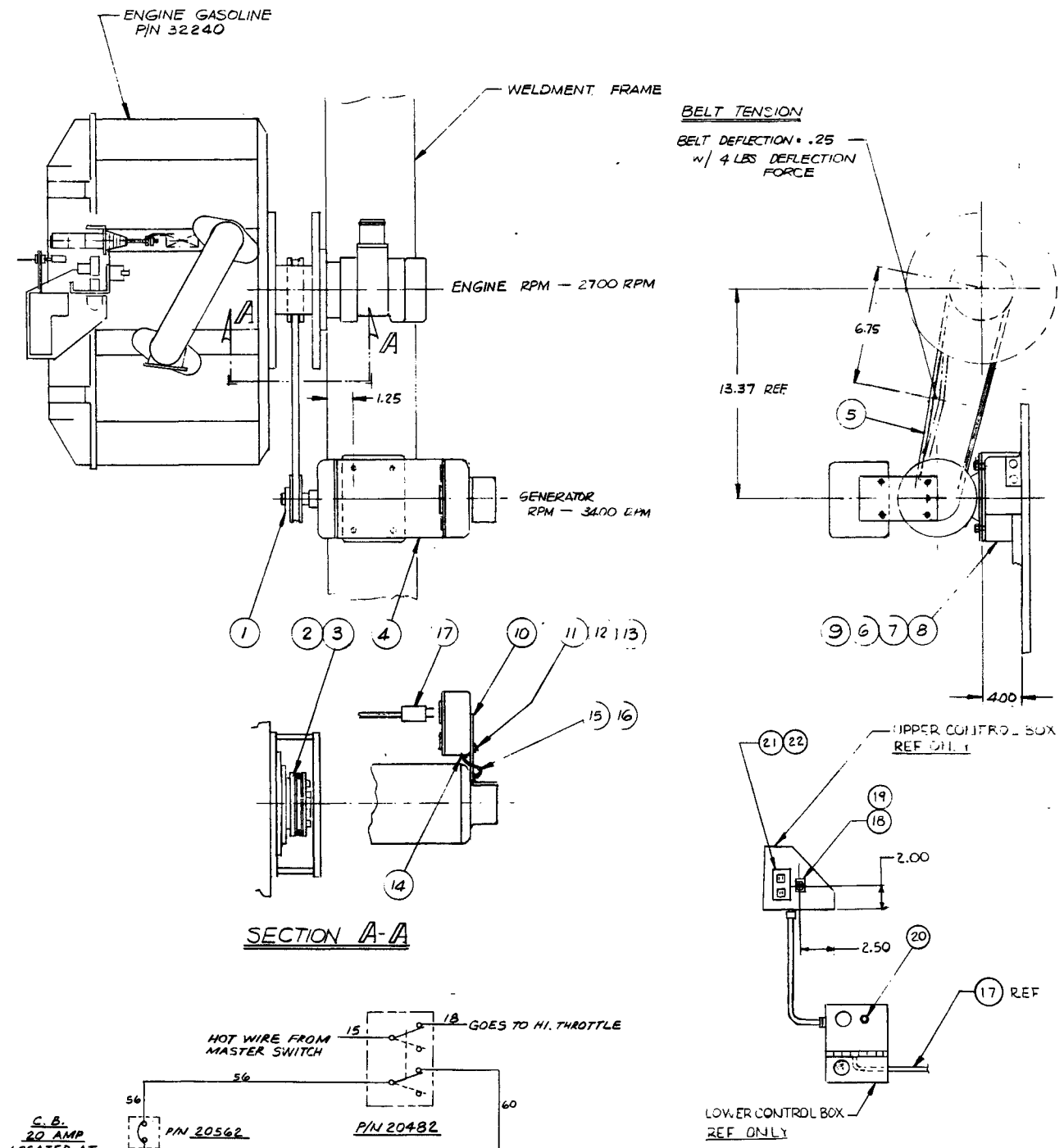
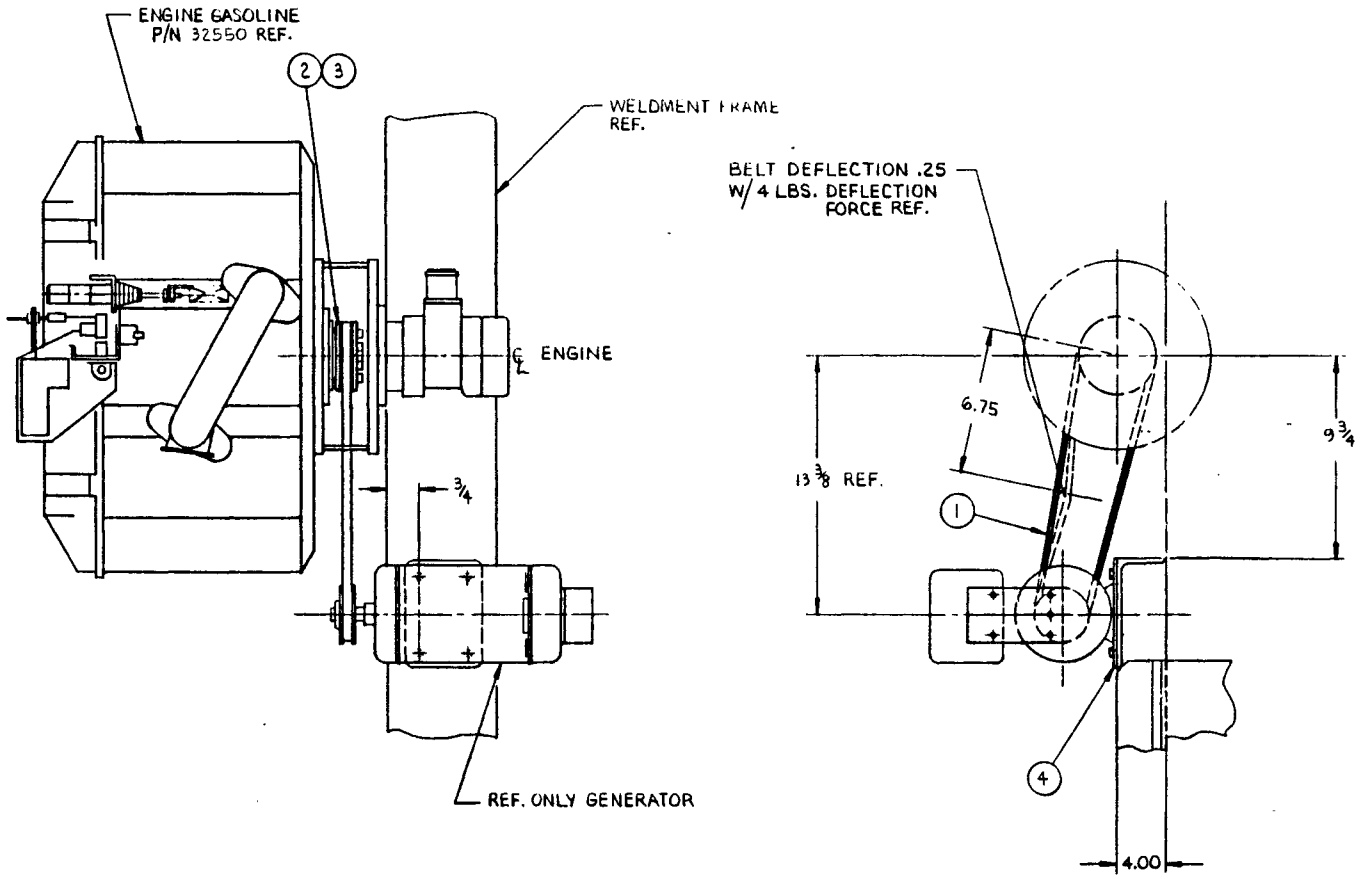

ENGINE GASOLINE
P/N 32240
WELDMENT FRAME
ENGINE RPM — 2700 RPM
1.25
GENERATOR
RPM — 3400 RPM
1
2
3
4
17
10
11
12
13
15
16
14
SECTION A-A
BELT TENSION
BELT DEFLECTION = .25
w/ 4 LBS DEFLECTION
FORCE
6.75
13.37 REF
5
9
6
7
8
4.00
21
22
UPPER CONTROL BOX
REF ONLY
19
18
2.00
2.50
20
17 REF
LOWER CONTROL BOX
REF ONLY
HOT WIRE FROM
MASTER SWITCH
15
18
GOES TO HI. THROTTLE
56
60
C.B.
20 AMP
LOCATED AT
GROUND C.BOX
P/N 20562
P/N 20482
55
57
P/N 70126
RECEPTACLE DUPLEX
LOCATED AT UPPER
CONTROL BOX
A.C. GENERATOR "OPTION"
P/N 32479
(WINCO # 2FS2 PG ¼)
2000 WATTS
SCHEMATIC ELECTRICAL

FIGURE 12. GENERATOR

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
	32479	GENERATOR	REF
1	16246	. PULLEY	1
2	32459	. STUB SHAFT AND PULLEY	1
3	60323	. SCREW, CAP	8
4	4071	. GENERATOR	1
5	65874	. BELT	1
6	32460	. BRACKET, GENERATOR MOUNTING	1
7	60325	. SCREW, CAP	4
8	63319	. WASHER, LOCK	4
9	63428	. WASHER, FLAT	4
10	32504	. BRACKET	1
11	62604	. SCREW, MACHINE	2
12	60701	. NUT, HEX	2
13	63301	. WASHER, LOCK	2
14	729	. BUSHING	1
15	6K	. WIRE	1 ft.
16	70197	. CONNECTOR, RING	2
17	32505	. CABLE, POWER	1
18	20494	. DECAL	1
19	20482	. SWITCH, SELECTOR	1
20	20562	. CIRCUIT BREAKER	1
21	70126	. RECEPTACLE, DUPLEX	1
22	288	. PLATE, COVER	1

- ITEM NOT ILLUSTRATED

FIGURE 13. GENERATOR BRACKET PULLEY & BELT



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
	32932	GENERATOR BRACKET PULLEY & BELT	REF
1	65874	. BELT	1
2	32459	. STUB SHAFT AND PULLEY	1
3	60323	. SCREW, CAP	8
4	32737	. BRACKET, GENERATOR MOUNTING	1

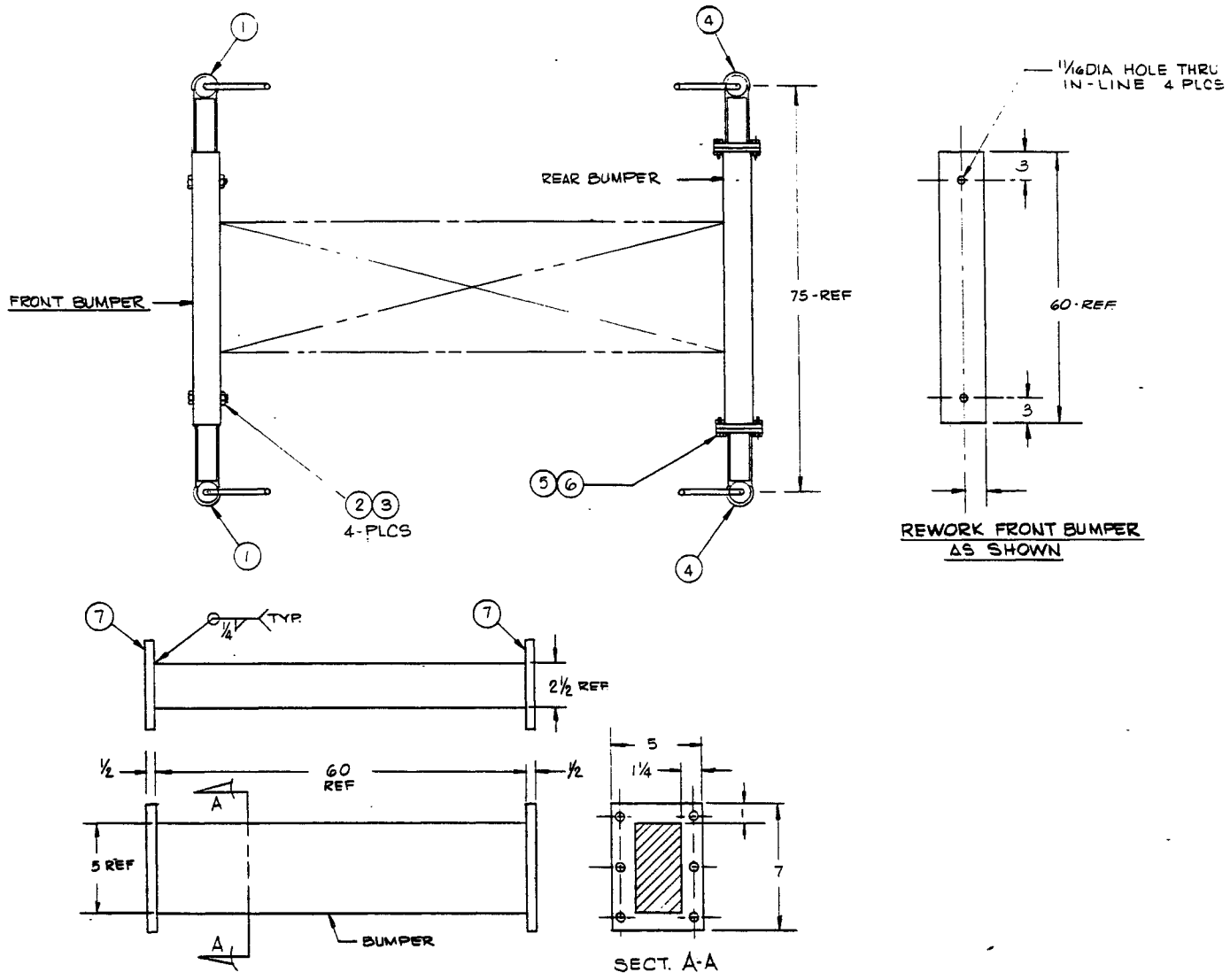
REV.

- ITEM NOT ILLUSTRATED

FIGURE 14. SPARK ARRESTOR MUFFLER

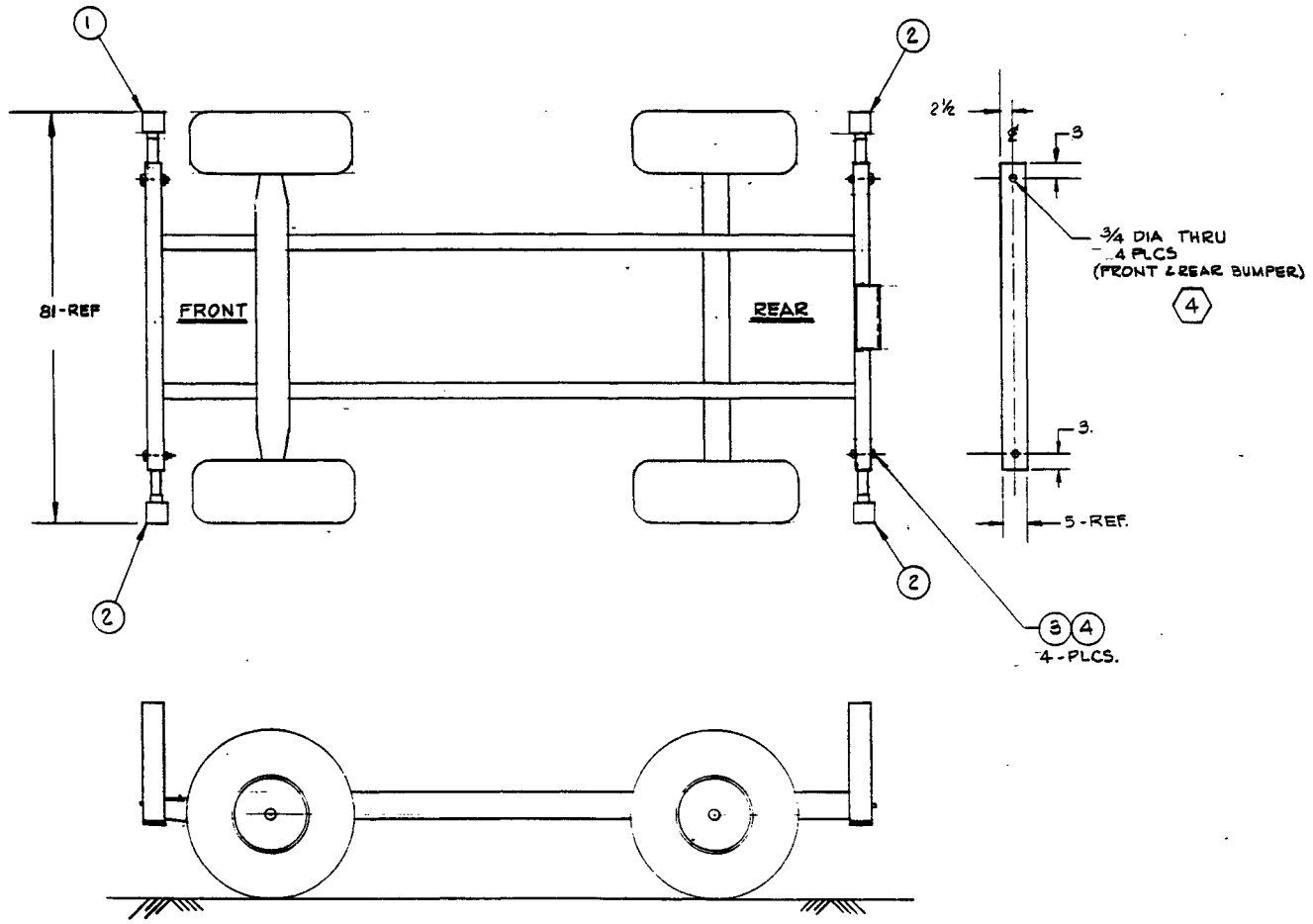
THIS SECTION 7 - OPTION ASSEMBLIES
PRINT No. 32924
IS NOT AVAILABLE THIS REVISION.

FIGURE 15. MANUAL STABILIZER



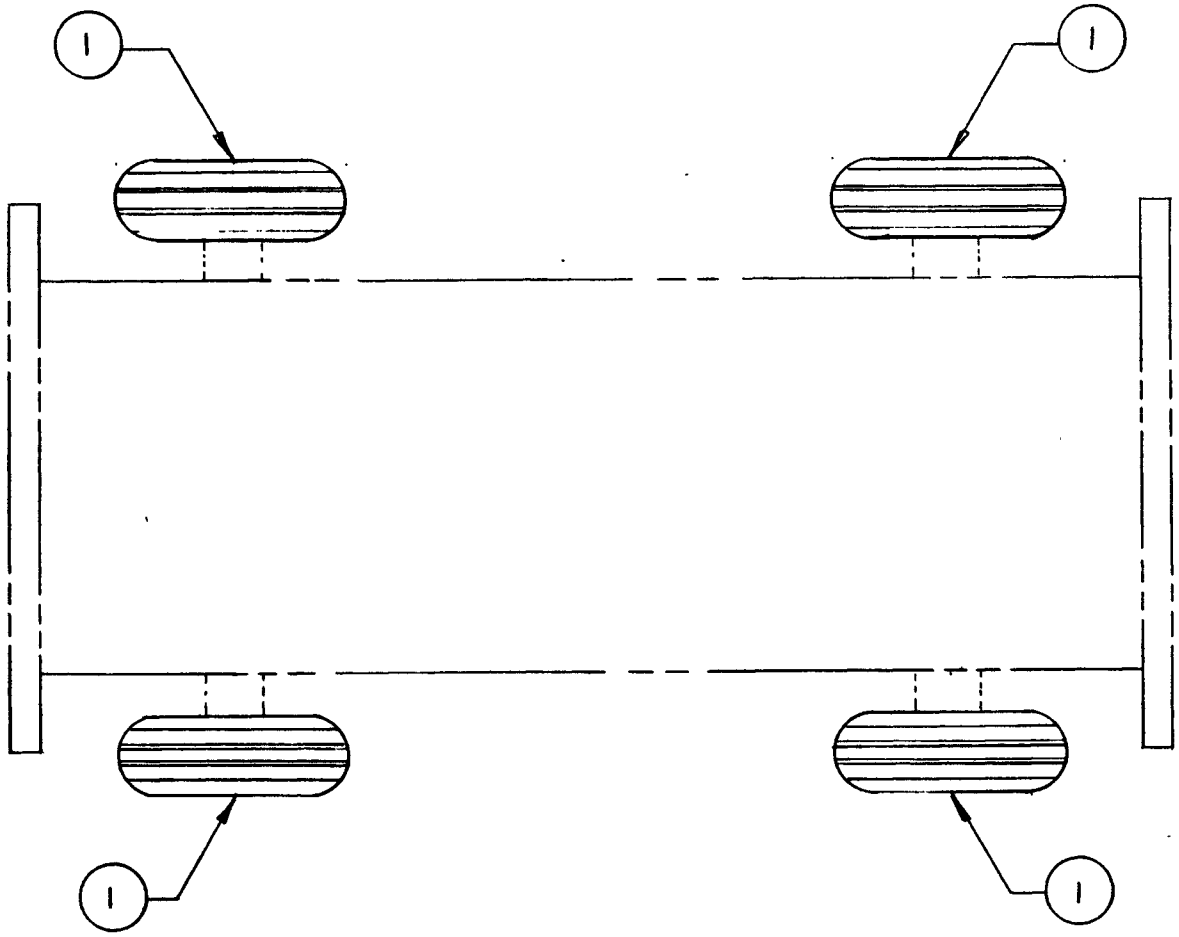
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
	32465	MANUAL STABILIZER (M-25G)	REF
	32466	MANUAL STABILIZER (M-25GT)	REF
1	32463	. MANUAL STABILIZER ASSEMBLY	2
2	60378	. SCREW, CAP HEAD, 5/8-11 UNC X 4"	2
3	61311	. NUT, SELF-LOCKING, 5/8-11 UNC	2
4	32468	. MANUAL STABILIZER ASSEMBLY	2
5	60529	. SCREW, CAP HEAD, ½-13 UNC X 1½"	12
6	61242	. NUT, SELF-LOCKING, ½-13 UNC	12
7	32467	. MOUNTING PLATE	2

FIGURE 16. HYDRAULIC OUTRIGGER



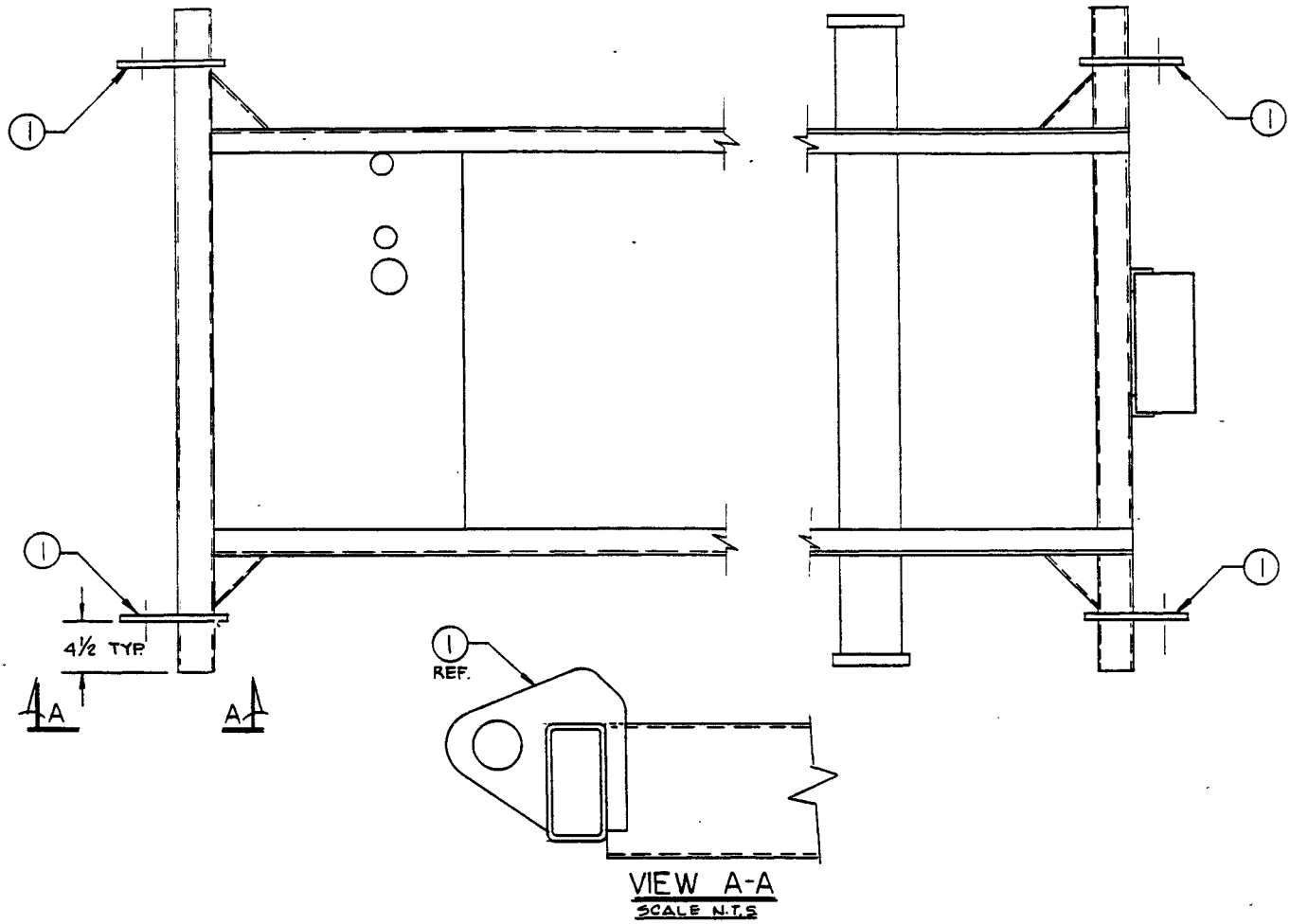
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
	32916	HYDRAULIC OUTRIGGER	REF
1	32665	. OUTRIGGER ASSEMBLY	1
2	32664	. OUTRIGGER ASSEMBLY	3
3	60378	. SCREW, CAP HEAD, 5/8-11 UNC X 4"	4
4	60706	. NUT, HEX, 5/8-11 UNC	4
5	4021	. SWITCH, TOGGLE	1

FIGURE 17. SAND TIRES



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
	32415	SAND TIRE	REF
1	32440	. TIRE AND WHEEL ASSEMBLY, SAND	4

FIGURE 18. LIFTING LUGS



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
	31010	LIFTING LUGS	REF
1	30920	. LIFTING LUG	4

FIGURE 19. CATALYTIC CONVERTER

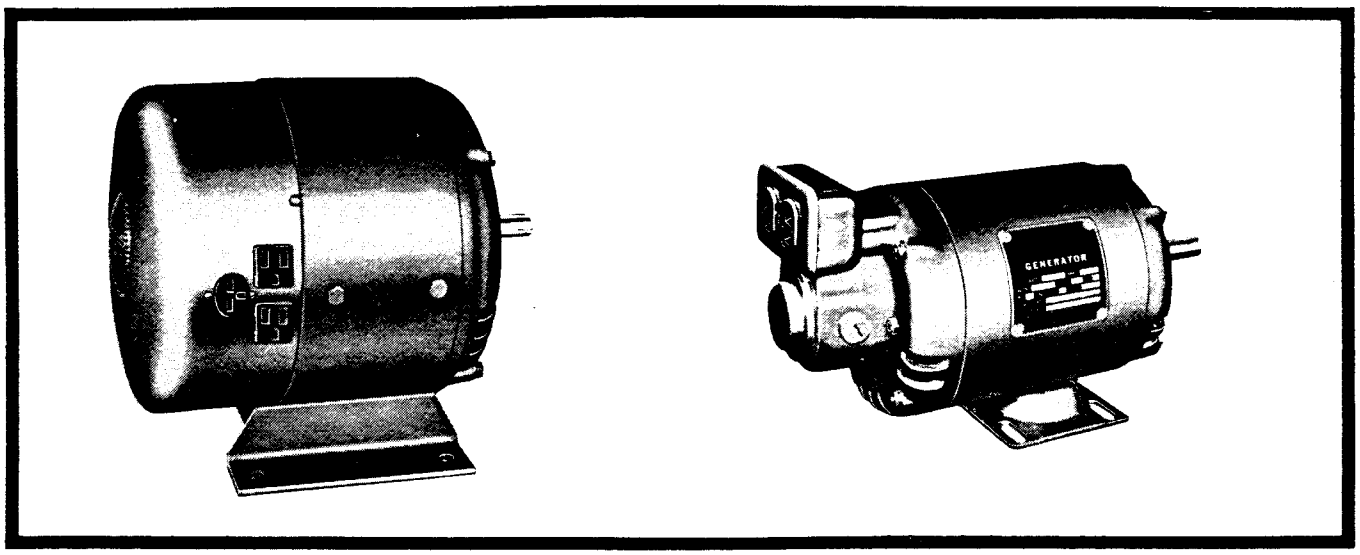
THIS SECTION 7 - OPTION ASSEMBLIES
PRINT No. 32922
IS NOT AVAILABLE THIS REVISION.

REPAIR PROCEDURES FOR THE TELEDYNE ENGINE MODEL W2-1250 WERE NOT AVAILABLE AT PRESS TIME.

INSTALLATION and OPERATION INSTRUCTIONS

TWO BEARING A.C. GENERATORS

★ BELT DRIVEN TYPES ★ TWO POLE - FOUR POLE ★ 60 CYCLE - 50 CYCLE



Representative models covered by this instruction book are pictured above. For complete specifications see the nameplate on the generator frame.
Write the model number and serial number of the generator in the spaces below and save this book for future reference. Be sure to give these numbers if corresponding about the generator.

GENERATOR MODEL_____ SERIAL _____

A SEPARATE INSTRUCTION BOOK IS PROVIDED FOR THE ENGINE. READ IT CAREFULLY BEFORE STARTING THE ENGINE. The engine Model Number, specification number and Serial Number is stamped on a nameplate attached to the engine. Record these numbers on the engine instruction book and refer to them whenever ordering parts or requesting information from the engine service distributor or engine manufacturer.

UNPACKING

When unpacking the machine, be sure to inspect it carefully to see that no damage occurred in transit. If damage is noted, notify the transporation company immediately and have them write the nature of the damage on the freight bill, so that a claim can be filed if necessary.

LOCATION

For best service there are several factors which should be taken into consideration:

1. MOISTURE. All electrical equipment should be protected from excessive moisture. Failure to do so will result in deterioration of the insulation and will result in short circuits and grounds. If the unit is to be left in the open, it should be covered with a piece of canvas to keep out water and dust.

2. DIRT. Foreign materials such as dust, sand, lint and abrasive particles have a tendency to cause excessive wear to bearings, gears, brushes, etc. These materials will also clog the ventilation holes and cause excessive heating. It is, therefore, important that the unit be protected as much as possible to extend its useful life.

CONNECTING THE LOAD

1. UNITS WITH CONTROLS.

These generators are equipped with outlet receptacles for convenient connection of electrical loads. The output voltage and maximum load of each receptacle is marked on the panel face. Do not connect any load whose electrical characteristics differ from those specified on the panel or that exceed the rating of the receptacle or the generator.

USE OF ELECTRIC MOTORS

The power required to start any electric motor is considerably more than is required for keeping it running after it is once started. Some motors require much more current to start them than others. Split phase (A.C.) motors require more current to start them, under similar circumstances, than other types. They are commonly used on easy starting loads, such as washing machines or where loads are applied after the motor is started such as small power tools. Since they require 5 to 7 times as much current to start as to run, their use should be avoided whenever possible if the electric motor is to be driven by a small generator. Capacitor and repulsion-induction motors require from 2 to 4 times as much current to start them as to run them. The current required to start any motor varies with the load connected to it. An electric motor connected to an air compressor, for example, will require more than a motor to which no load is connected.

In general, the current required to start 115 volt motors connected to medium starting loads will be approximately as follows:

MOTOR SIZE	AMPS FOR RUNNING	AMPS FOR STARTING
1/6	3.2	6.4 to 22.4*
1/4	4.6	9.2 to 32.2*
1/3	5.2	10.4 to 72.8*
1/2	7.2	14.4 to 29.2
3/4	10.2	20.4 to 40.8
1	13	26 to 52

*Note that in the above table the maximum "amps for starting" is more for some small motors than for larger ones. This is because the hardest starting types, (split-phase) are not made in larger sizes.

Because the heavy surge of current required for starting motors is required for only an instant, the generator will not be damaged if it can bring the motor up to speed in a few seconds of time. If difficulty is exeprienced in starting motors, turn off all other electrical loads and if possible reduce the load on the electric motor.

TRANSFER SWITCH

Any generator which is installed for standby or emergency power must be equipped with a suitable double-throw switch for use when the power line fails. The switch transfers the load from the power line to the generator. It may be an automatic type or may be manually operated.

When the transfer switch is thrown to the "power line" the standby generator is not connected to either the load or the power line. When the switch is thrown to the "standby" side, the generator is connected to the load but the load is disconnected from the power line. Consequently, no electricity produced by the generator can feed back to the power line where it would be hazardous to line repairmen.

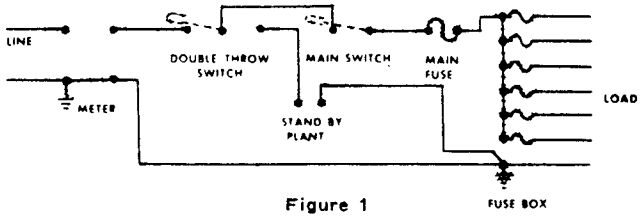


Figure 1

There are two general classifications of transfer switch installations: those which switch the entire electrical load from the power line to the standby generator as in the circuit shown above and those which switch only one or a few circuits. If the system is connected as in Fig. 1 and the generator does not have sufficient capacity to carry the entire electrical load the user may find it necessary to turn off or disconnect some of the lights or appliances. Since the transfer switch carries all the current when the system is connected to the power line, the switch must have the same (ampere rating) as the main service entrance.

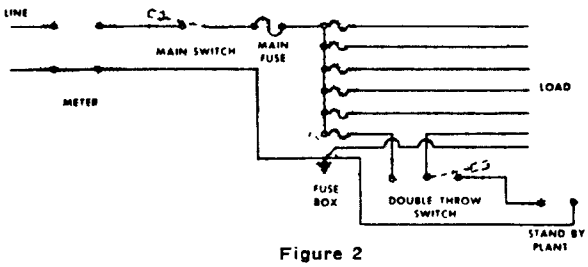


Figure 2

When a double-throw switch is connected into the circuit as shown in Fig. 2 the load on only one branch is transferred. The capacity of the switch need be only as large as the total of the rating of the circuits to which it is connected. For example, if the transfer switch is to switch only two 15 ampere circuits, a 30 ampere switch is large enough. Such installations have the disadvantage that only part of the electrical circuits can be used with the standby plant. With small generators, however, they have the advantage that the generator less likely will be overloaded.

The above circuits are for 115 volts only. Fig. 3 shows how a 115/230 volt circuit may be connected.

ALL WIRING MUST BE DONE IN CONFORMANCE WITH THE NATIONAL CODE AND THE STATE AND LOCAL REGULATIONS.

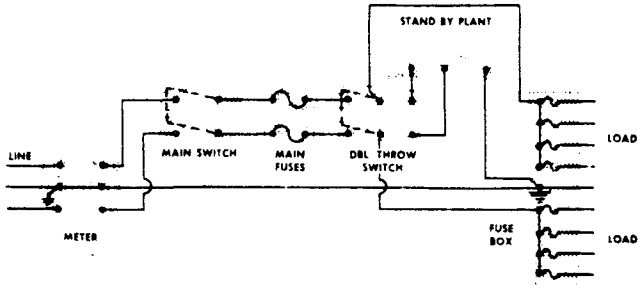


Figure 3

REQUIRED OPERATING SPEED

An engine of adequate size and with a good governor is required for satisfactory operation of the generator. At least 2 or 2½ horsepower should be allowed for every 1000 watts of generator capacity. That is, for a 2000 watt generator use at least a 4 or 5 H.P. engine; for a 3000 watt generator use at least a 6 to 7.5 H.P. engine. When determining the pulley ratio to drive the generator at the correct operating speed, bear in mind that the power rating of the engine varies with the speed — that is, the engine must be run at a high speed so that it develops sufficient power to maintain a nearly constant speed of the generator.

All engines have a tendency to slow down when a load is applied. The governor on the engine is designed to hold the speed as nearly constant as possible. When the electrical load connected to the generator is increased, the engine is more heavily loaded and as a result the speed drops slightly. This slight decrease in speed, together with the "voltage drop" within the generator itself, results in a slightly lower voltage when the generator is loaded to its full capacity than when running idle. The slight variation in speed also affects the frequency of the output current. This frequency variation has no appreciable effect in the operation of motors, lights and most appliances. However, timing devices and clocks will not keep perfect time when used on these generators.

Although individual units and models may vary slightly, the normal voltage and frequency of typical 60 cycle engine-driven generators described in this book are approximately as follows when run first with no load applied, then at half the generator capacity and finally when loaded to its full capacity as rated on the nameplate:

Load Applied	Generator Speed		Frequency	Generator Voltage	
	2 Pole	4 Pole		115v. Plants	230v. Plants
None	**3660**	**1830**	**61**	**129**	**258**
Half	**3600**	**1800**	**60**	**120**	**240**
Full	**3510**	**1755**	**58½**	**115**	**230**

When driven by engines ordinarily used for this purpose, generators designed for 50 cycles (per second) operation will show a similar variation in voltage and frequency from "no load" to "full load."

The speed of the engine must be adjusted so that the generator produces proper voltage. If the adjustment is made while the generator is still "cold", set the voltage a little higher than normal since it will drop a few volts as the generator warms up. When operating continuously at full load the generator will get so warm that it will be uncomfortable to the touch — this is normal for any generator of this type.

The output voltage should be checked periodically to insure proper operation of the generating plant and appliances. If the generator is not equipped with a voltmeter, it can be checked with a portable meter. A convenient voltage tester, which can be plugged into any ordinary outlet, shown in Figure 4, is available from the factory under part No. 24743.

Figure 4

Low voltage may damage both the generator and any motors or appliances connected to it. Running the generator at excessively high speeds results in too high voltage which may also damage electrical devices connected to it. Excessively high speed may also cause damage to the armature winding.

The drive belt must be of adequate size and must be tight enough to drive the generator without slippage. It must not be tightened to the extent that it puts excessive strain on the bearings — doing so will cause bearing failure and possible damage to the generator.

MAINTENANCE

See the engine instruction book for engine maintenance.

Brushes — Check the brushes for wear after about 1000 hours of operation and every few hundred hours of operation thereafter. They should be replaced when worn down to ½ inch. Whenever replacing brushes or removing them to do other service work, remove one brush at a time and put the screws back into the brush holder to hold the lead wire terminals in place so there will be no difficulty in connecting the wires to the correct positions.

Commutator — A commutator in good condition has a glossy finish and is brownish in color. If it gets greasy, rough or dirty, it may be cleaned with very fine sandpaper. (Do not use emery cloth).

Bearings — All ball bearings used in these generators are packed with grease before assembly — no further greasing is required. If they become rough or worn they should be replaced.

LOCATING TROUBLE

If the generator does not work properly, first check the conditions under which it has been operating and then if necessary make the electrical tests as outlined below:

1. **Is the speed correct?** Check the speed with a tachometer or frequency meter and adjust the engine governor if necessary. If the generator cannot be kept to specified speed when it is loaded to its rated capacity the engine is too small, or is not working properly or the governor is not sensitive enough to hold the speed constant over a wide load range.

2. **Is the generator overloaded?** Check the nameplate for maximum safe load and if uncertain about the amount of load, check it with an ammeter and voltmeter.

3. **Is the location satisfactory?** See "Location" regarding sufficient ventilation if the generator is being operated in an enclosed area. If it is being operated under dusty or dirty conditions be sure all ventilation holes and slots are cleaned periodically.

4. **Are brushes properly seated?** Remove the end cover with the generator in operation and examine the brushes to determine if there is any appreciable arking and sparking. If so, refer to the article on brushes under Maintenance.

5. **No output is obtained from the generator.** Try a different light bulb or load to determine if the generator is defective or the load is not operating properly.

6. **If no output voltage is obtained at the outlet receptacles or output wires,** disconnect all electrical loads and connect a voltmeter directly to the A.C. Brushes. If no voltmeter is available, use any ordinary small 115 volt bulb (230 volt bulb on 230 volt generators). If normal voltage is obtained at the A.C. Brushes but not at the output terminals, there must be an open circuit between these points. (**CAUTION —** On 115/230 volt plants, the center brush is neutral and grounded. Check from this brush to each of the other two brushes).

7. **Using an Ohmmeter** check the field circuit for open circuits. To do this, remove the field coil leads from the brushes or the rectifier and check continuity through the coils. If continuity is not obtained, examine the coil leads for possible opens and the spliced connectors connecting the coils together. Repair the open. If the field coils are open internally, the defective coil must be replaced.

8. **If the trouble is not located,** use the Ohmmeter to check the field coils (with the terminals disconnected) to the generator frame to determine if the coils are grounded. If a high voltage tester is available, it should be checked for grounds at 1100 volts. If either coil is grounded, it should be removed and insulated at the point of ground or replaced.

9. **Remove all lead terminals from the A.C. Brush.** If the generator operates properly with these wires disconnected, there is a short circuit in one of the condensers or the control box. Isolate and correct the short circuit. If the condenser is shorted, the wire can be taped and the unit can be operated until a condenser is obtained. The condensers are used to eliminate radio interference.

10. **Excitation (Units with Commutator).**
    A. Check the excitor voltage with a D.C. Voltmeter connected across the D.C. Brushes. The D.C. Voltage should be a minimum of 14 volts. If a D.C. Voltmeter is not available, a light bulb can be used. It will produce a very dim light on a 115 volt bulb. If D.C. voltage is satisfactory, omit steps B & C.

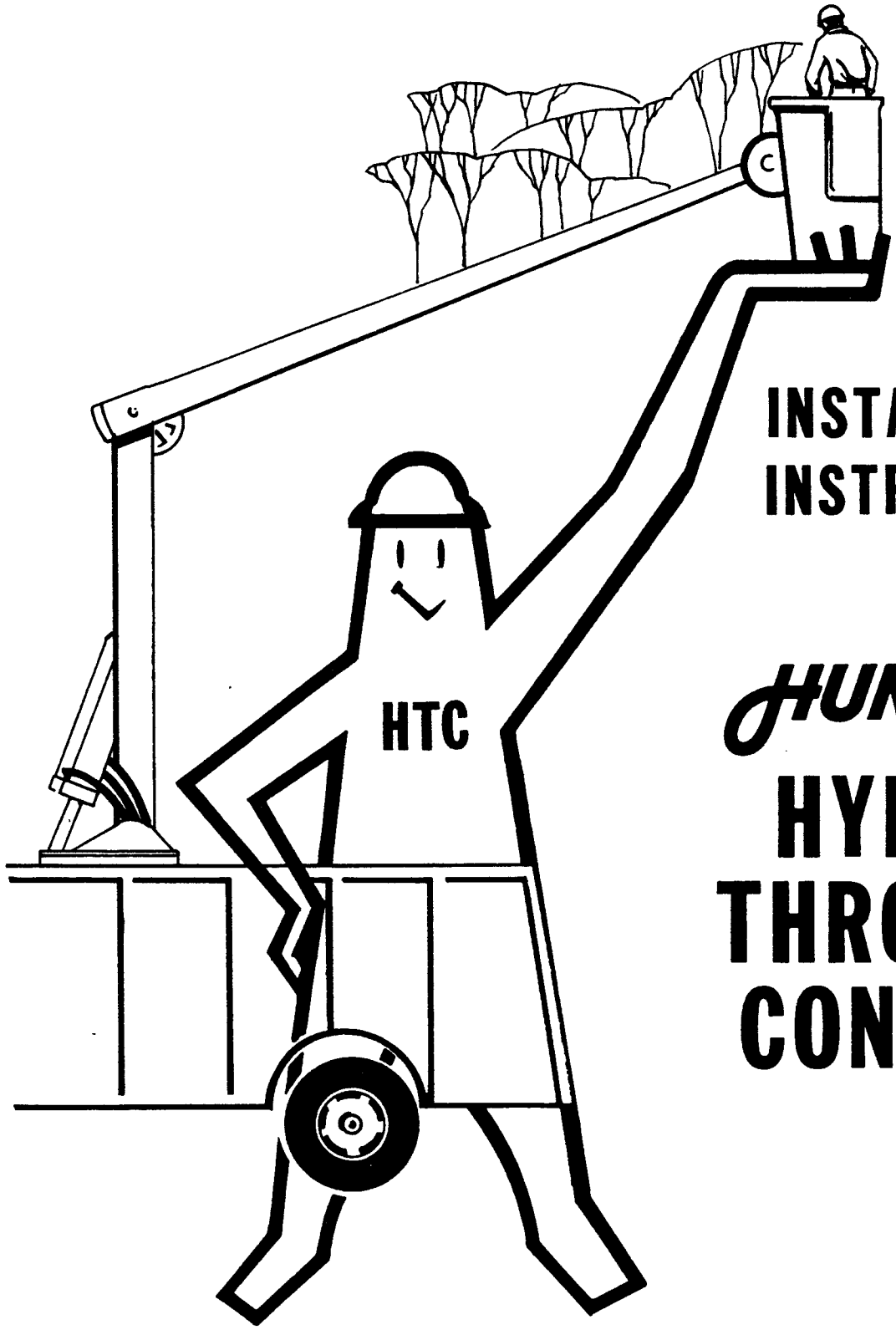
    B. Remove each of the D.C. (Commutator) Brushes to be sure that they are clean and free in the holder. Examine the brush springs to be sure that they have several ounces of tension. Replace brushes if necessary. Always replace with a complete set of brushes, not a single brush.

    C. One side of the D.C. circuit is connected or grounded to the generator frame. The other side is said to be either live or hot. Any short circuit from the hot side or either circuit on any metal part of the circuit will result in a grounded connection which prevents the generator from producing electricity. Carefully inspect the hot side of the terminals for evidence of a grounded condition.

11. **Excitation (Units with Rectifiers).**
    A. The rectifier can be checked with an Ohmmeter by removing the lead wires from the rectifier and connecting the lead wires from the Ohmmeter to adjacent terminals. A high resistance reading will be obtained when the Ohmmeter leads are connected in one way and when they are reversed, a low resistance reading will be obtained. All adjacent terminals should be checked in this manner. The rectifier can also be checked by separately exciting the field coils with a 12 volt automotive battery. With this excitation, output on the generator should be 70 to 90 volts with no load applied.

    B. If the field coils have lost their residual magnetism, the fields may be flashed with a 6 volt automotive battery, a 12 volt automotive battery, or by use of 2 "D" size flashlight batteries. Stop the generator and remove the end cover. You will note the positive (+) lead from the field coil is connected to the rectifier terminal with a red dot. The negative (—) lead from the field coil is connected to the grounded A.C. Brush holder. The positive (+) lead should be connected to the positive (+) side of the battery and the negative (—) lead should be connected to the negative (—) side of the battery for approximately 10 seconds.

12. **If all of the previous tests are of no avail,** remove the armature and have it tested for opens, shorts, and grounds on a growler. The same equipment and procedure used for testing D.C. generator armatures also applies to these armatures.



INSTALLATION INSTRUCTIONS

HUNTER

HYDRO-THROTTLE CONTROL

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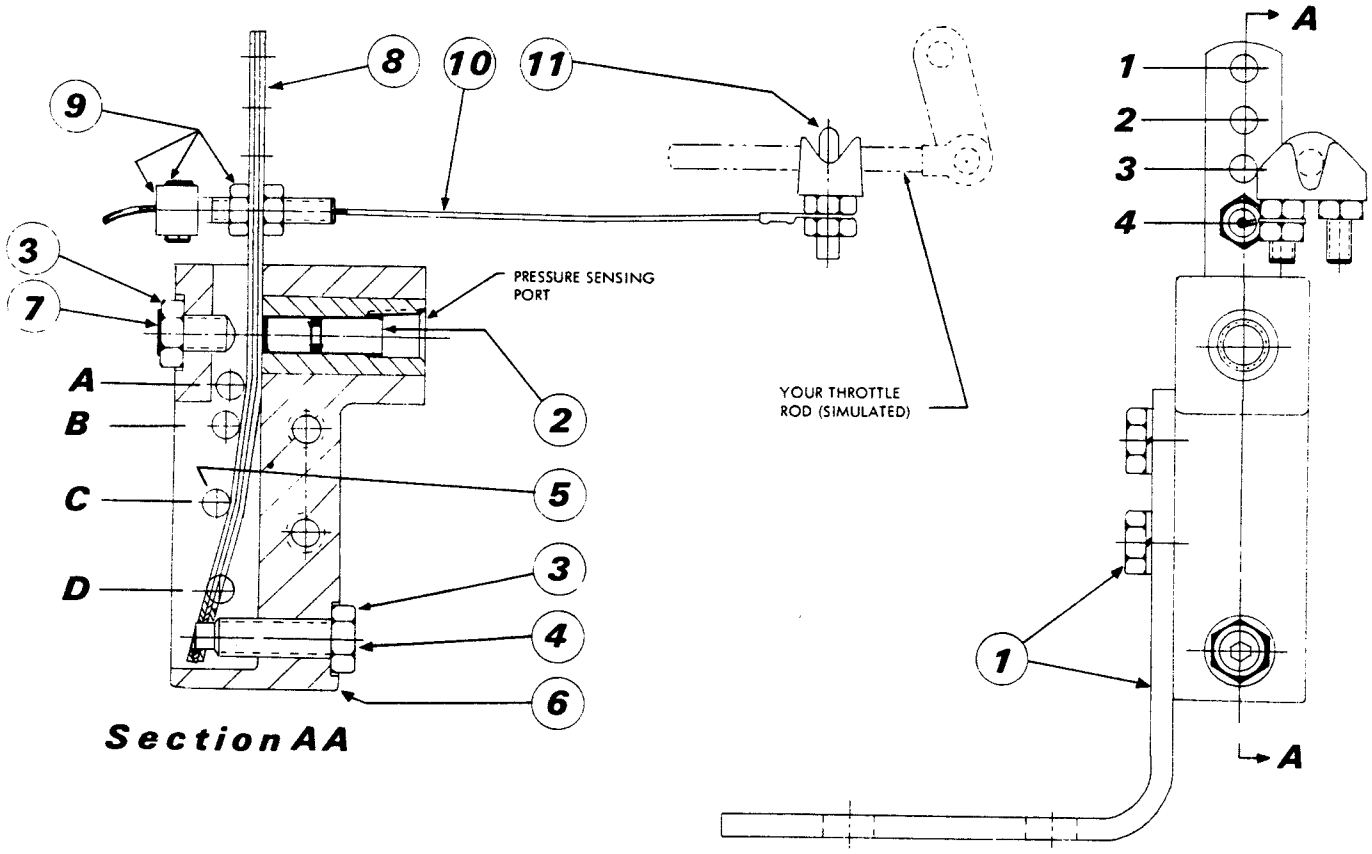
PARTS LIST

SERIES 90 THROTTLE CONTROL



Model 1-9010

Item	Part No.	Description
1	2-8124	Bracket and Bolt Assembly
2	2-9002	Piston Assembly
3	5322	Nut, Jam 3/8 - 16
4	5050	Screw 3/8 - 16 x 1-1/4 Spring Tension Adjusting
5	9004	Screw, Fulcrum
6	2-9007	Housing and Liner Assembly
7	5049	Screw 3/8 - 16 x 3/4 Speed Adjusting
8	8118	Spring, Leaf (3 required)
9	1-170211	Rod, Actuating, with Nuts and Set Screws
10	2-170212	Cable Assembly
11	180960	Clamp

I. INSTALLATION OF THE THROTTLE CONTROL

A. Introduction

Refer to sketch shown with parts list, included on page 2.

One Throttle Control can operate an unlimited number of circuits, that are driven by the same pump discharge line in the hydraulic system.

The Throttle Control piston (2) senses the pump discharge line pressure. The pressure increases, and pulls the throttle open, when you operate a circuit to move a load. The pump by-passes, and allows the throttle to close when the valve circuit lever is returned to neutral.

The pressure must increase, above by-passing pressure, at least 15 PSI for each pound of throttle pull, plus the amount your by-passing pressure will vary, due to oil viscosity changes, over your oil operating temperature range.

Highly loaded circuits usually increase the pressure to a level far above the pump by-passing pressure, and produce a motivating force far beyond the minimum required to open the throttle.

Lightly loaded circuits, such as, when the boom is lowering, swing circuits, outriggers lowering, etc., produce the least pressure. The plumbing flow restrictions must be revised in these circuits if the load cannot increase the circuit pressure sufficiently above by-passing pressure to produce the motivating force needed to open the throttle.

The pressure will increase at a greater rate as the engine speed increases because the plumbing relating to the circuits usually contain greater restrictions. A lightly loaded circuit may then become operable at a higher engine speed, if it did not operate at idle.

The motivating force can be increased by revising your plumbing, downstream of the throttle control connection, as follows:

Restrict the plumbing relating to the circuits. (1) Add an orifice. (2) Reduce diameter and/or lengthen line size. (3) Add a two-way check valve with a heavier spring in the direction of flow. This will increase pressure more at idle speed where needed most. It, therefore, is the best type of restriction.

Decrease your by-passing pressure. (1) Remove "bottle necks", and elbows. (2) Increase diameter and/or shorten line size.

B. Mounting Bracket

One is furnished in the kit. Modify it to fit if necessary. Make the bracket rigid and mount it to your engine rather than another surface to prevent erratic operation due to flexing and/or movement.

Position the Throttle Control so the connecting cable is in line with the accelerator rod and pulls in the same direction.

C. Pressure Connection to Pump Discharge Line

Use a 1/4" minimum sized high pressure tube or hose.

Make the connection at the control valve inlet rather than the pump discharge so it will sense the lowest pressure. The pressure will then change by a smaller amount when the oil viscosity changes. The spring tension will also become more effective.

For cold climates, consider whether you need to add a heater to your reservoir and/or shut off valve in this pressure connection to prevent high speed operation of your hydraulic components with cold oil. An oil temperature sensing switch would make them automatic.

D. Engine Throttle Linkage Check

Start the engine. Engage PTO to load the idling engine with by-passing oil pressure. Try to reduce the engine throttle pull to a minimum. Make sure it is well oiled and in good repair. Check with the engine manufacturer whether the return spring load can be reduced if it appears to be excessive for its application.

When the engine has warmed up, make sure it is capable of returning to its proper idle speed after operating the accelerator. Make necessary adjustments now before the connecting cable is applied.

E. Cable Slack Adjustment

Refer to the sketch on page 2. Make sure the actuating rod (9) is still located in hole 4 as shipped.

Secure the clamp (11) to the throttle rod. Engage the cable (10) eyelet to one of the clamp studs. Thread the cable through the hole in the rod, remove almost all slack, and secure it with the set screws.

Finalize the cable slack adjustment with the nuts provided on the actuating rod (9). The cable should have some slack but not excessive. Check to make sure the engine returns to idle after operating the accelerator.

F. Adjusting Procedure

The spring rate is adjustable by moving the fulcrum screw (5) and changing the number of leaf springs (8). See table below for the possible variations. The spring rate increases as the variation number decreases. For instance, the table indicates the spring will be three (3) times stiffer with variation No. 2 than No. 3.

Variation Number	No. of Springs	Fulcrum Hole	Spring Tension			Actuating Rod Hole Location
			*Turns	*Pressure	Rate	
1	3	A	3	1100	11X	4
2	3	B	3	780	3X	4
3	3	C	2-1/2	640	Normal	4
4	2	C	2	370	3/4X	4
5	2	D	5/8	300	1/4X	4

* Note: Apply turns from when the screw (4) just begins to deflect the spring at zero load. Pressure is approximate when piston will begin to move.

The control was shipped with variation 3. Try it first. The adjusting procedure will direct you to another variation, if another is needed.

1. Disengage PTO. Turn in speed screw (7) until it touches spring (8). Then turn out one turn, temporarily, to limit stroke and prevent accidental racing of engine.

2. Engage PTO. Air bleed sensing line by cracking fitting at Throttle Control. Proceed after oil warms up to within normal operating temperature range.

3. Operate a highly loaded circuit valve lever. Bottom out a cylinder to obtain system relief valve pressure if this is easier. The throttle will open.

4. Make speed adjustment. Turn speed screw (7) in or out with the circuit loaded. Use the nut (3) to lock it when it regulates your desired speed. Move actuating rod from hole 4 to hole 3, only if the spring should stop on the housing instead of the screw.

5. Return lever to neutral. The throttle must close and the engine must return to idle. Check Trouble Shooting section, Part II, Section C. If unsuccessful, increase the spring rate, see table above. Repeat entire procedure.

F. Adjusting Procedure (Continued)

6. Determine which of the circuits produce the lowest pressure. Operate it and decide which of the following applies, paragraph 6a, 6b, or 6c.

a. Throttle Opens and Closes Properly From Idle

(1) Finalize engine speed screw (7) adjustment by alternately operating the lowest and the highest loaded circuits. Lock nut (3) securely.

(2) Operate and check all other circuits. They should operate because they are loaded between the highest and lowest circuits used for adjustments.

(3) Installation is now complete.

b. Throttle Does Not Open From Idle Speed, but Will at Higher Speed

Check if it will open at higher engine speeds.

(1) Operate a higher pressure circuit lever to open the throttle and bring the engine up to speed, then operate the lowest pressure circuit lever.

(2) If it stays open, after the higher pressure lever is returned, decide whether the required sequence of operation is acceptable. It usually is acceptable. It now contains the highest spring setting.

(3) If not acceptable, or if it did not stay open, proceed with step (c) below.

c. Throttle Will Not Open at All

Make spring tension adjustment. Proceed as follows:

(1) Disengage PTO. Turn out screw (4) until leaf spring (8) is loose. Then turn it in until the spring just begins to deflect and is at zero load.

(2) Engage PTO. The throttle will open.

(3) Turn screw (4) in gradually. Count turns, and record as "B", until the throttle just closes. Do not overshoot and leave the screw at this point. Note how the throttle closed. If it closed suddenly, increase the spring rate, see table above. Repeat adjustment from paragraph c (1).

6c. (Continued)

(4) Operate the lowest pressure circuit. The throttle must open. If it opened, proceed directly to step 5. Otherwise, choose between (a) and (b) below.

(a) If it did not open, the motivating force is below zero. Revise the plumbing to increase the amount the pressure will increase when the circuit is operated. See Section A.

(b) Operate the next higher loaded circuit, etc. until you find a circuit that does operate from idle. Use this circuit for the adjustments specified in paragraph 5 below. You will find out later whether the lower pressure circuits, that did not operate from idle, will become operable at a higher speed.

(5) Turn in on screw (4) in small increments equal to approximately 10% of the total turns given in the table above.

After each increment, operate the lowest pressure circuit lever from neutral to fully open the throttle, and then return it to neutral to fully close the throttle.

Wait for the engine to idle before repeating.

Count, and record as "C", the number of turns to exactly when the throttle no longer opens from idle.

Note: Increase the spring rate, see table above, if the total turns counted (B plus C), exceeds by more than 20% the number of turns noted in the table above.

Decrease your spring rate if you observed the throttle will no longer fully open.

Repeat adjustment from paragraph c(1), if spring rate was changed.

(6) Turn screw (4) out 1/8 turn or 1/4 times "C" turns whichever is greater to provide an operating margin between the lowest circuit pressure and the final spring tension.

(7) Check operation as per paragraph F6a or F6b. If the lighter loaded circuits do not operate, revise the plumbing to increase the amount the pressure will increase when these circuits are operated. See Section A.

II. TROUBLE SHOOTING HINTS

A. Problem: Engine Does Not Idle But Speeds Up When PTO Is Engaged

Probable Cause	Remedy
1. Control lever stuck open.	1. Return all valves to neutral.
2. Low leaf spring tension.	2. Repeat calibration.
3. Cold Oil.	3. Warm oil. Also check Part I, Section "C".

B. Problem: Engine Does Not Speed Up When Light Load Is Applied

Probable Cause	Remedy
1. PTO not engaged.	1. Engage PTO.
2. Air in sensing line.	2. Bleed line. Crack fitting at control.
3. Connecting cable.	3. Reduce slack to minimum.
4. Stops on speed screw.	4. Adjust screw.
5. Hot oil.	5. Allow oil to cool.
6. Your engine throttle linkage.	6. Oil and repair. Check manufacturer for lighter spring if it is excessive.
7. Circuit pressure is too low.	7. Revise plumbing to increase spread between your circuit and by-passing pressures. See Part I, Section "A".
8. Excessive leaf spring tension.	8. Repeat calibration.
9. Excessive leaf spring rate.	9. Reduce spring rate. See table in Part I, Section "F".

C. Problem: Engine Does Not Return To Idle After A Load Is Applied

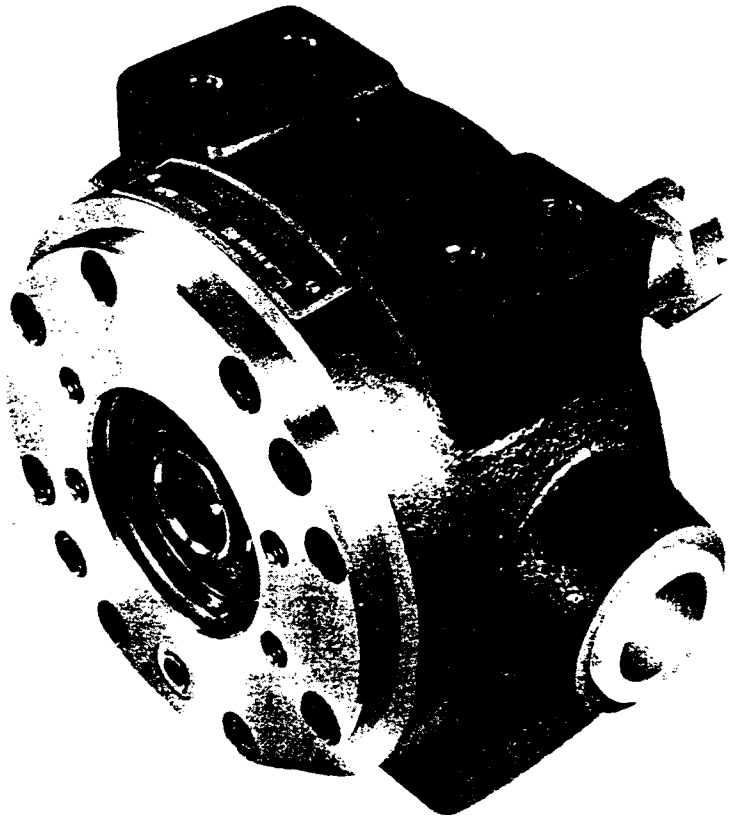
Probable Cause	Remedy
1. Engine speed excessive.	1. Reset speed screw adjustment.
2. Your engine.	2. Make sure it can idle.
3. Connecting cable.	3. Check for slack.
4. Low leaf spring rate.	4. Increase spring rate. See table in Part I, Section "F".
5. Low leaf spring rate.	5. Repeat calibration.
6. Excessive by-passing pressure.	6. Remove "bottlenecks" or increase line size downstream of the control connection.

SY·TEC SERIES

MULTIPLE DISC BRAKE

(trunnion)

SERVICE MANUAL MICO



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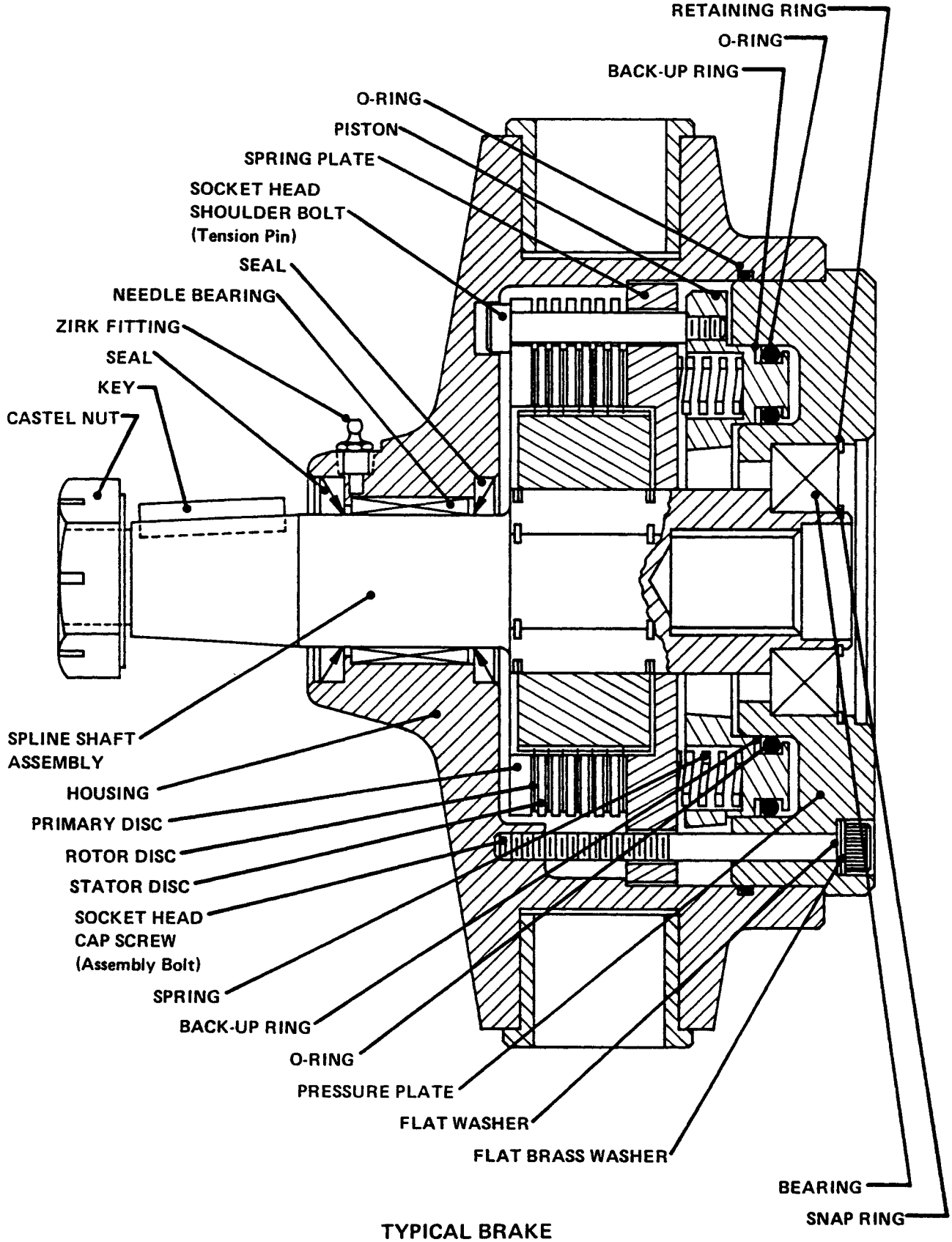


TYPICAL BRAKE

FIGURE 1

REV.

PRINCIPLES OF OPERATION

These brakes are spring-set, hydraulically released, multi-disc brakes. They are used primarily for holding loads, vehicles, conveyors, etc. in place when the hydraulic drive system is shut down or fails. Although the brakes are rated at 3,000 psi, they only require from 100 psi to 220 psi to make them function normally. The exact pressure required for operation is dependent upon the number of springs used to generate the torque necessary to hold the designed load. Thus, a brake with a full compliment of springs, will generate the highest level of torque and require approximately 220 psi to fully release the brake and provide adequate running clearance for the individual discs. A brake with 1/2 of the full spring compliment will have 1/2 as much torque and will require only 100 psi to fully release the brake. Consult catalog to choose the torque which best suits your design parameters.

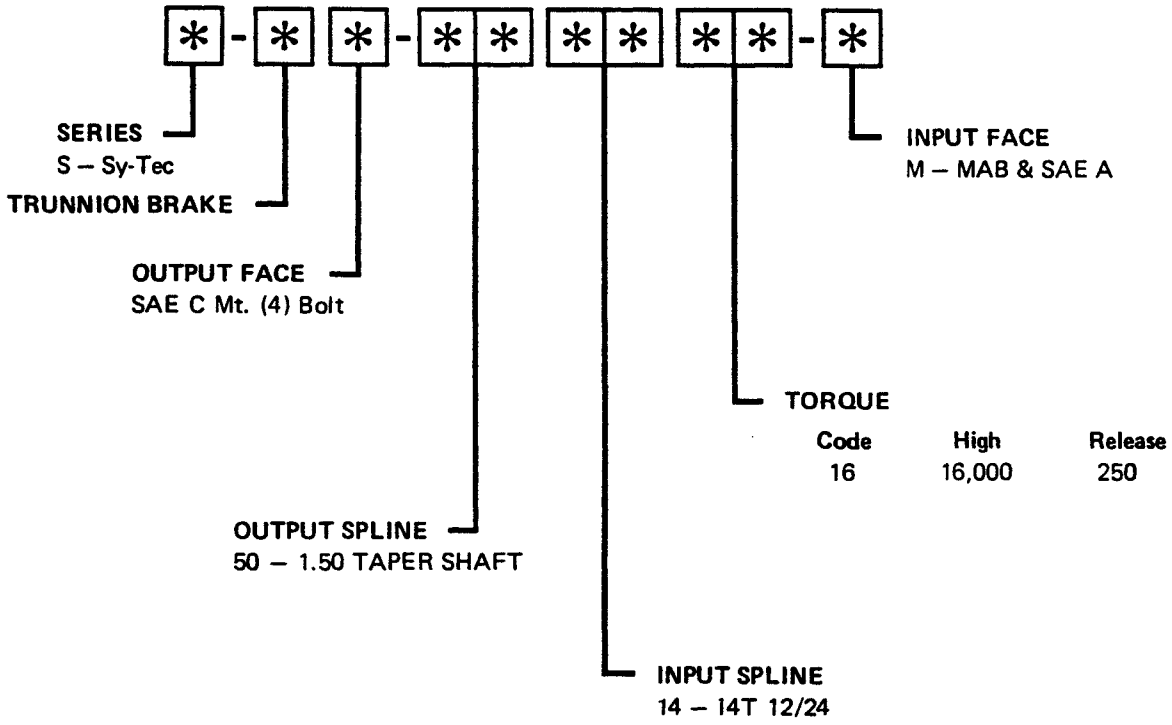
It is very important to remember that any pressure on the brake's release piston will directly effect the level of torque.

Two application examples:

1. The brake has a release pressure of 200 psi. The actuation pressure is provided by a charge pump. During certain phases of the machine's operation, the charge pump pressure dips from 200 psi to 100 psi. At 200 psi, the brake runs free (zero torque) but at 100 psi the brake will generate slightly less than half of its rated torque. The brake will drag — failure may occur. In this case, a brake should be selected which has a lower release pressure.
2. A brake has a release pressure of 200 psi. The system is set up to hold a load when a variable pump is shifted into neutral. Everything is running fine until the filter clogs, causing a build-up of back pressure in the return line to the tank. At a pressure of 60 psi, the brake will lose 25% of its holding torque; thus the load may slip. The situation can be corrected by replacing the filter or adding an extra margin of safety to your required brake torque in the initial design.

These brakes are designed to give thousands of trouble-free hours of service when set up correctly in the hydraulic circuit.

DESCRIPTION OF MODEL NUMBERS



DISASSEMBLY

1. Remove castle nut (item 26) and key (item 20) from output end of spline shaft assembly (item 19).
2. Remove 10 socket head assembly bolts (item 4) and flat washers (items 5 & 6). Washers (item 5) are brass. A suitable holding fixture is useful to keep brake in position.
3. Tap output end of spline shaft assembly (item 19) with a soft mallet to separate housing (item 22) from internal parts assembly.
4. Remove o-ring (item 21) from housing (item 22).
5. Needle bearing (item 24) and seals (items 23 & 25) will remain in housing (item 22). Inspect parts for wear and remove only if necessary.
6. Remove snap ring (item 1) from input end of spine shaft aassembly (item 19).
7. Tap input end of spline shaft assembly (item 19) with a soft mallet to separate spline shaft from internal parts assembly.
8. Bearing (item 3) and retaining ring (item 2) will remain in pressure plate (item 7). Remove both and inspect for wear.
9. Remove four socket head shoulder bolts (item 18). A suitable holding fixture is useful to hold brake in position.

   CAUTION: Do not remove shoulder bolts without pressurization of brake (approx. 200 psi) or damage may result.

10. Remove primary disc (item 17), seven rotor discs (items 16) and six stator discs (items 15).
11. Remove spring plate (item 14).
12. Before removing springs (items 13), note pattern for reassembly purposes.
13. Separate piston (item 12) and pressure plate (item 7) by carefully exerting hydraulic pressure through brake release port on pressure plate.
14. Remove outside and inside o-rings (items 8 & 10) and outside and inside back-up rings (items 9 & 11) from piston (item 12).

    CAUTION: Care must be taken so as not to scratch or mar piston.

ASSEMBLY

LUBRICATE ALL RUBBER COMPONENTS FROM REPAIR KIT WITH CLEAN TYPE FLUID USED IN SYSTEM.

1. Use an alkaline wash to clean parts before assembly.
2. Install back-up rings (items 9 & 11) on piston (item 12) toward spring pockets.
3. Install o-rings (items 8 & 10) on piston (item 12). Be sure o-rings are flat and all twists removed.

   CAUTION: Care must be taken so as not to scratch or mar piston.

4. Lubricate piston (item 12) with type fluid found in the system. Carefully press piston into pressure plate (item 7). Be sure piston is aligned correctly at all times and that there are no extrusions. Press piston until it bottoms on pressure plate (item 7).
5. Install springs (item 13) according to pattern noted during disassembly. Different colored springs must be alternated.
6. Place spring plate (item 14) over springs (item 13).
7. Install stator discs (item 15) and rotor discs (item 16). Begin with a rotor disc (item 16) and alternate with stator discs (item 15).
8. Install primary disc (item 17).
9. Align discs and partially screw in four socket head shoulder bolts (item 18).

   NOTE: Socket head shoulder bolts (items 18) should have loctite applied. Place one or two drops of loctite to the threads.

   Inspect for free movement of stack and check to see if spline shaft assembly (item 19) lines up with discs so it can fit through stack. Pressurize brake release port (approx. 200 psi) to release discs. Torque shoulder bolts to 20 ft. lbs. and release pressure. A suitable holding fixture is useful to hold brake in position.
10. Install spline shaft assembly (item 19) through stack input end first and out pressure plate (item 7).
11. Install bearing (item 3) and retaining ring (item 2) in pressure plate (item 7).
12. Install snap ring (item 1) on input end of spline shaft assembly (item 19).
13. If seals (items 23 & 25) and needle bearing (item 24) were removed from housing (item 22) they must be installed. Note direction of both seals.
14. Install o-ring (item 21) in housing (item 22).
15. Install housing (item 22) with the internal parts assembly using 10 socket head assembly bolts (item 4) and flat washers (items 5 & 6).

    NOTE. The ten socket head assembly bolts (item 4) should have loctite applied. Place one or two drops of loctite to the threads.

    Washers (item 5) are brass and should be first on the bolts. Torque bolts to 45 ft. lbs.
16. Install castle nut (item 26) and key (item 20) on output end of spline shaft assembly (item 19).

FOR REPAIR KIT INFORMATION REFER TO PAGE 7

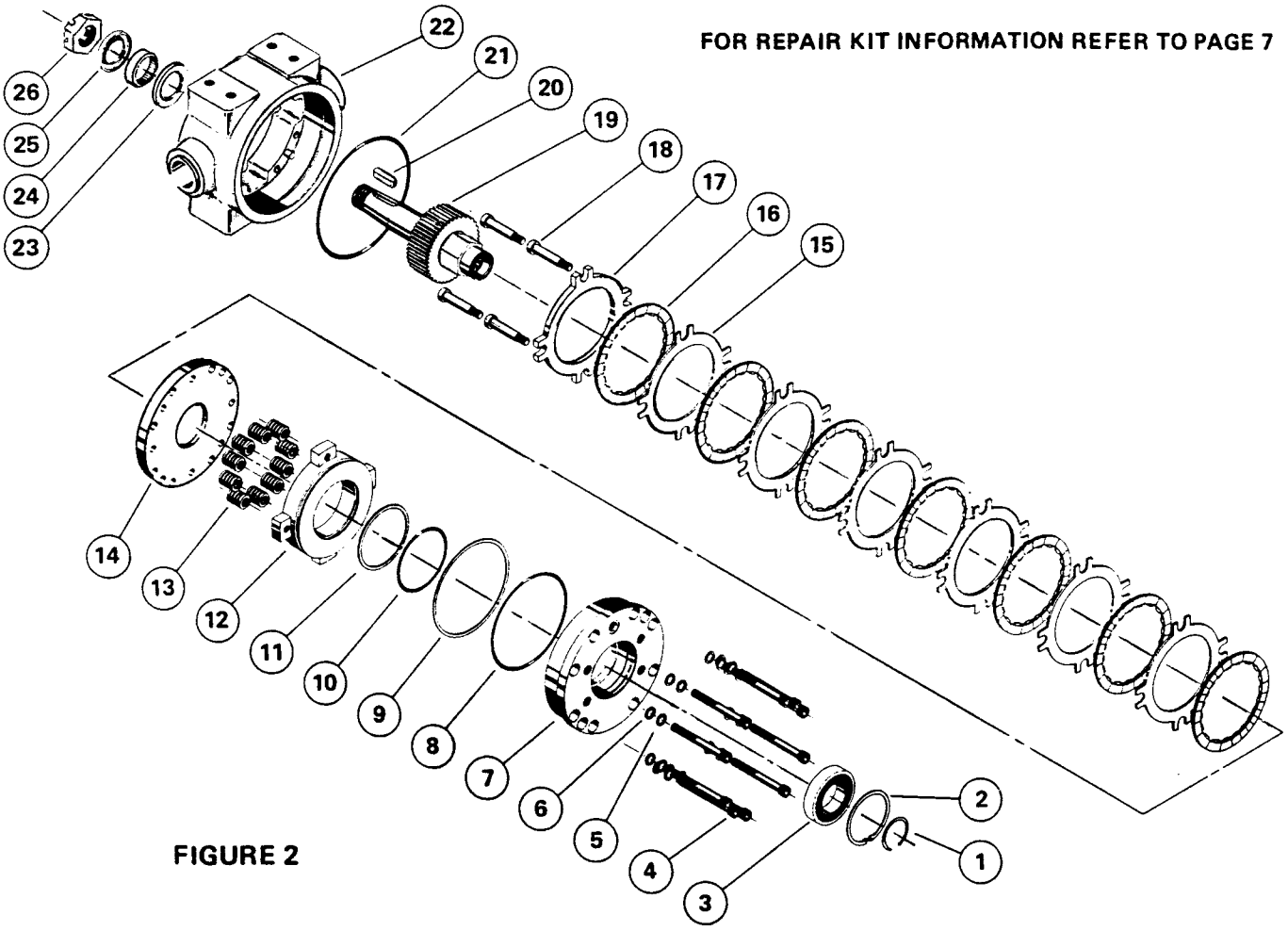


FIGURE 2

PARTS LIST

ITEM	DESCRIPTION
1	SNAP RING
2	RETAINING RING
3	BEARING
4	SOCKET HEAD CAP SCREWS (10) (Assembly Bolts)
5	FLAT BRASS WASHERS (10)
6	FLAT WASHERS (10)
7	PRESSURE PLATE
8	O-RING
9	BACK-UP RING
10	O-RING
11	BACK-UP RING
12	PISTON
13	SPRINGS (10)
14	SPRING PLATE
15	STATOR DISCS (6)
16	ROTOR DISCS (7)
17	PRIMARY DISC
18	SOCKET HEAD SHOULDER BOLTS (4) (Tension Pins)
19	SPLINE SHAFT ASSEMBLY
20	KEY
21	O-RING
22	HOUSING
23	SEAL
24	NEEDLE BEARING
25	SEAL
26	CASTLE NUT

BLEEDING

1. Install brake in system and connect pressure lines.
2. Bleed pressure release section of brake by pressurizing side inlet port and allowing air to escape from top port. Pressure should not exceed 100 psi during bleeding.
3. Apply sufficient pressure to release brake and check for proper operation in system.

SERVICE DIAGNOSIS

PROBLEM	CAUSE	EXPLANATION	ACTION
Brake slips	A. Excessive pressure in hydraulic system	If there is back pressure in the brakes actuation line, the holding torque of the brakes is reduced.	Check filters, hose size, restrictions in other hydraulic components.
	B. Oil in brake if designed for dry use	Dry linings generate 66% more torque than linings saturated with oil. If the brake has oil in it, check the type of oil hydraulic or gearbox. 1. Gearbox oil 2. Hydraulic oil	Replace oil seal in brake Check motor seal Check piston seals Note: Internal components will need to be inspected, cleaned and replaced as required.
	C. Disc plates worn	The thickness of the disc stack sets the torque level. A thin stack reduces torque.	Check disc thickness
	D. Springs broken or have taken a permanent set	Broken or set springs can cause reduced torque - a rare occurrence	Check release pressure
Brake drags or runs hot	A. Low actuation pressure	The brake should be pressurized to minimum of 20 psi over the specified release pressure under normal operating conditions. Lower pressures will cause the brake to drag thus generating heat.	Place pressure gauge in bleed port & check pressure with system on
	B. Bearing failure	If the bearing should fail, a large amount of drag can be generated	Replace bearing
	C. Oil in brake	Excess fill of oil in sump condition thru wet brakes can cause the unit to run hot. Also excessive rpm in sump condition.	Drain oil and refill as specified for brakes Switch to flow thru cooling.
Brake will not release	A. Stuck valve or clogged	Brakes are designed to come on when system pressure drops below stated release pressure. If pressure cannot get to brake, the brake will not release.	Place pressure gauge in bleed port - check for adequate pressure - Replace defective line or component
	B. Bad o-rings	If release piston will not hold pressure, brake will not release.	
	C. Discs frozen	Sy-Tec brakes are designed for only limited dynamic braking. A severe emergency stop or prolonged reduced release pressure operation may result in this type of damage.	Replace disc stack

REPAIR KITS

(Refer to Page 5 for item numbers)

NUMBER	DESCRIPTION	INCLUDES
12-501-026	O-ring and Back-up Ring Kit	Flat Brass Washers (items 5) Seals (items 23 & 25) O-rings (items 8, 10 & 21) Back-up Rings (items 9 & 11) Loctite
12-501-106	Lining Kit	Flat Brass Washers (items 5) O-ring (item 21) Primary Disc (item 17) Stator Discs (items 15) Rotor Discs (items 16) Loctite
12-501-108	Bearing Kit	Flat Brass Washers (items 5) O-ring (item 21) Seals (items 23 & 25) Bearings (items 3 & 24) Loctite
12-501-114	Spring Kit	Flat Brass Washers (items 5) O-ring (item 21) Springs (items 13) Loctite

THIS CHAPTER HAS BEEN PROVIDED TO KEEP **MARK INDUSTRIES** SERVICE BULLETINS THAT APPLY TO THE IMPROVEMENT OF YOUR **MARKLIFT.**