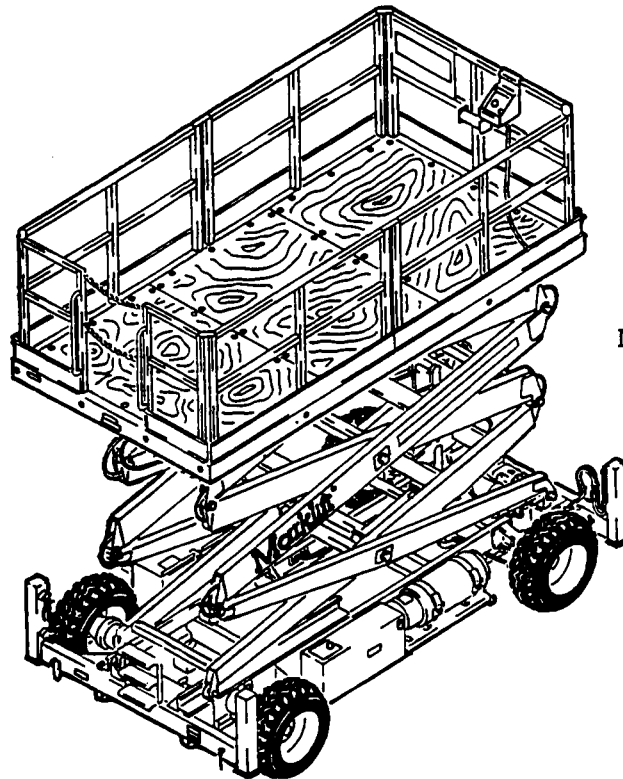


The Marklifts.[®]

A Product of Mark Industries

SELF-PROPELLED ROUGH TERRAIN SCISSOR OPERATION MAINTENANCE AND PARTS MANUAL



MODEL SRT-31G
SHOWN

**MODELS:
RT-31G, RT-31E, SRT-31G**

FIFTH EDITION: JUNE 1988



Mark Industries

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THIS MARKLIFT SELF-PROPELLED ROUGH TERRAIN SCISSOR MODELS RT-31G, RT-31E AND SRT-31G OPERATION, MAINTENANCE AND PART MANUAL (PART NUMBER 17204) IS DESIGNED AS:

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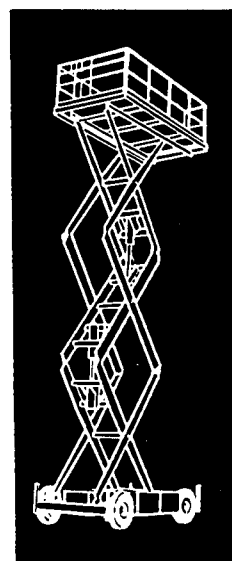
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MARK INDUSTRIES


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 MACHINE 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 rear of the base.

The serial number should be used when ordering parts. This will help our parts department in giving prompt and accurate service.

If additional information or service is needed, we urge the customer to contact his local dealer. If this is not possible, please get in touch with the MARK INDUSTRIES Service Department.

All MARKLIFTS are tested and operated to assure their proper operating condition before shipment. At this 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 in service. These functions are outlined in the INSPECTION AND CHECKOUT INSTRUCTIONS in the operation section of this manual.



DESCRIPTION	ENGLISH	METRIC
HEIGHT-WORKING (EXTENDED)	37'	11.28 m
HEIGHT-PLATFORM (EXTENDED)	31'	9.45 m
(LOWERED)	52"	1.32 m
LENGTH (OVERALL)	155"	3.94 m
WIDTH (OVERALL)	87.5"	2.22 m
PLATFORM (INSIDE SIZE)	73 x 145"	1.85 x 3.68 m
(REMOVABLE SAFETY RAILS)	42"	1.06 m
(TOE PLATE)	6"	0.15 m
LIFT CAPACITY	2,000 LBS	907.20 kg.
WHEEL (BASE)	108.5"	2.76 m
(TRACK)	77.5"	1.97 m
TURNING RADIUS (INSIDE)	14'10"	4.52 m
DRIVE SPEED (CREEP-OPTION)	0.5 MPH	0.8 km/hr.
(LOW)	1.5 MPH	2.4 km/hr.
(HIGH)	3.5 MPH	5.6 km/hr.
HIGH SPEED CUTOUT	12'	3.65 m
LIFT/LOWER SPEED	48/45 sec.	48/45 sec.
POWER SYSTEM	20 HP	20 HP
BATTERY VOLTAGE	12 VDC	12 VDC
CAPACITIES (BATTERY)	100 AMP/HR	100 AMP/HR
(HYDRAULIC TANK)	18 GAL	67.51 L
(FUEL TANK)	15 GAL	56.78 L
ALTERNATOR	20 AMP	20 AMP
BATTERY CHARGER	N/A	N/A
TIRE SIZE	10 x 15 LT	10 x 15 LT
OUTRIGGERS/STABILIZERS	MANUAL	MANUAL
SHIPPING (WEIGHT)	5,640 LBS	2,558.26 kg.
(CUBE)	422.5 cu. ft.	11.96 cu. m



DESCRIPTION	ENGLISH	METRIC
HEIGHT-WORKING (EXTENDED)	37'	11.28 m
HEIGHT-PLATFORM (EXTENDED)	31'	9.45 m
(LOWERED)	54"	1.37 m
LENGTH (OVERALL)	155"	3.94 m
WIDTH (OVERALL)	87.5"	2.22 m
PLATFORM (INSIDE SIZE)	73 x 145"	1.85 x 3.68 m
(REMOVABLE SAFETY RAILS)	42"	1.06 m
(TOE PLATE)	6"	0.15 m
LIFT CAPACITY	2,000 LBS	907.20 kg.
WHEEL (BASE)	108.5"	2.75 m
(TRACK)	77.5"	1.97 m
TURNING RADIUS (INSIDE)	14'10"	4.52 m
DRIVE SPEED (CREEP-OPTION)	0.5 MPH	0.8 km/hr.
(LOW)	1.5 MPH	2.4 km/hr.
(HIGH)	2.5 MPH	4.0 km/hr.
HIGH SPEED CUTOFF	12'	3.65 m
LIFT/LOWER SPEED	65/45 sec.	65/45 sec.
POWER SYSTEM (PUMP MOTOR ONLY)	24 VDC	24 VDC
BATTERY VOLTAGE	6 VDC	6 VDC
CAPACITIES (BATTERY)	250 AMP/HR (8)	250 AMP/HR (8)
(HYDRAULIC TANK)	18 GAL	67.51 L
(FUEL TANK)	N/A	N/A
ALTERNATOR	N/A	N/A
BATTERY CHARGER	40 AMP	40 AMP
TIRE SIZE	10 x 15 LT	10 x 15 LT
OUTRIGGERS/STABILIZERS	MANUAL	MANUAL
SHIPPING (WEIGHT)	6,190 LBS	2,807.78 kg.
(CUBE)	422.5 cu. ft.	11.96 cu. m



DESCRIPTION	ENGLISH	METRIC
HEIGHT-WORKING (EXTENDED)	37'	11.28 m
HEIGHT-PLATFORM (EXTENDED)	31'	9.45 m
(LOWERED)	54"	1.37 m
LENGTH (OVERALL)	155"	3.94 m
WIDTH (OVERALL)	84"	2.13 m
PLATFORM (INSIDE SIZE)	73 x 145"	1.85 x 3.68 m
(REMOVABLE SAFETY RAILS)	42"	1.06 m
(TOE PLATE)	6"	0.15 m
LIFT CAPACITY	2,000 LBS	907.20 kg.
WHEEL (BASE)	108.50"	2.75 m
(TRACK)	68.25"	1.73 m
TURNING RADIUS (INSIDE)	14'10"	4.52 m
DRIVE SPEED (CREEP-OPTION)	---	---
(LOW)	1.0 MPH	1.6 km/hr.
(HIGH)	2.0 MPH	3.2 km/hr.
HIGH SPEED CUTOUT	12'	3.65 m
LIFT/LOWER SPEED	48/45 sec.	48/45 sec.
POWER SYSTEM	20 HP	20 HP
BATTERY VOLTAGE	12 VDC	12 VDC
CAPACITIES (BATTERY)	100 AMP/HR	100 AMP/HR
(HYDRAULIC TANK)	18 GAL	67.51 L
(FUEL TANK)	15 GAL	56.78 L
ALTERNATOR	20 AMP	20 AMP
BATTERY CHARGER	N/A	N/A
TIRE SIZE (FRONT)	11 x 15 LT	11 x 15 LT
(REAR)	29 x 12 x 15	29 x 12 x 15
OUTRIGGERS/STABILIZERS	HYDRAULIC	HYDRAULIC
SHIPPING (WEIGHT)	6,250 LBS	2,834.95 kg.
(CUBE)	510.52 cu. ft.	14.46 cu. m



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 Carson, 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. Carson, 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**

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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.



	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 _____

The **MARKLIFT** self-propelled rough terrain scissor model **RT-31G**, **RT-31E** and **SRT-31G** has the following available options and accessories (See Parts Chapter, Section 6 for more information).

PART NUMBER	DESCRIPTION
SKP 0550(A)	TRAVEL WARNING HORN
20571	HOUR METER
30050	DECK EXTENSION
30052	SWING DECK
31009	LIFTING LUGS
32905	110 VAC, 2,000 WATT GENERATOR
32907	ROTATING AMBER BEACON
	MOVEMENT WARNING HORN
	SAFETY LIGHT PACKAGE
	HYDRAULIC OUTRIGGER



THIS GENERAL SECTION PAGE 13 HAS BEEN
PROVIDED TO KEEP MARK INDUSTRIES RECORD OF REVISIONS
THAT APPLY TO THE IMPROVEMENT OF YOUR MARKLIFT.

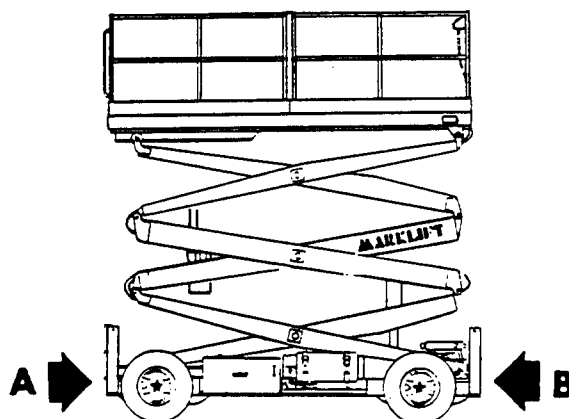


THE **MARK INDUSTRIES** AUTHORIZED UNLOADING
AND TRANSPORTING PROCEDURE FOR ALL **RT-SERIES**
MARKLIFT SELF-PROPELLED SCISSORS

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 as long as the **MARKLIFT** is wide. Do not attempt to lift the machine from under either the front or rear cross members. **ALWAYS LIFT THE MACHINE FROM THE SIDE.**



**DO NOT LIFT
FROM THIS END**

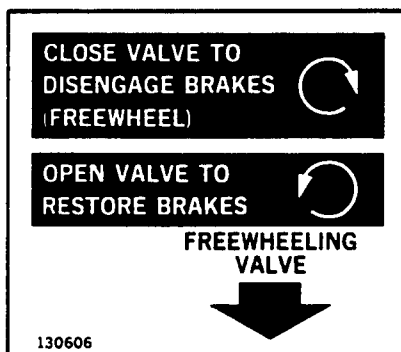
VIEW A and **B**

TRANSPORTING

The **MARKLIFT** may be free wheeled for loading, unloading, and towing for 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 tie down brackets and pull the **MARKLIFT** onto the truck.

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



Note: THE EMERGENCY LOWERING VALVE MUST BE OPEN WHENEVER THE **MARKLIFT** IS TRANSPORTED! (See Parts Chapter, Section 3, Figure 1A, 1B, 2A, 2B, 2C, 3A, 3B, 4A and 4B for valve location). This will prevent damage to the unit if a short occurs in the electrical system.

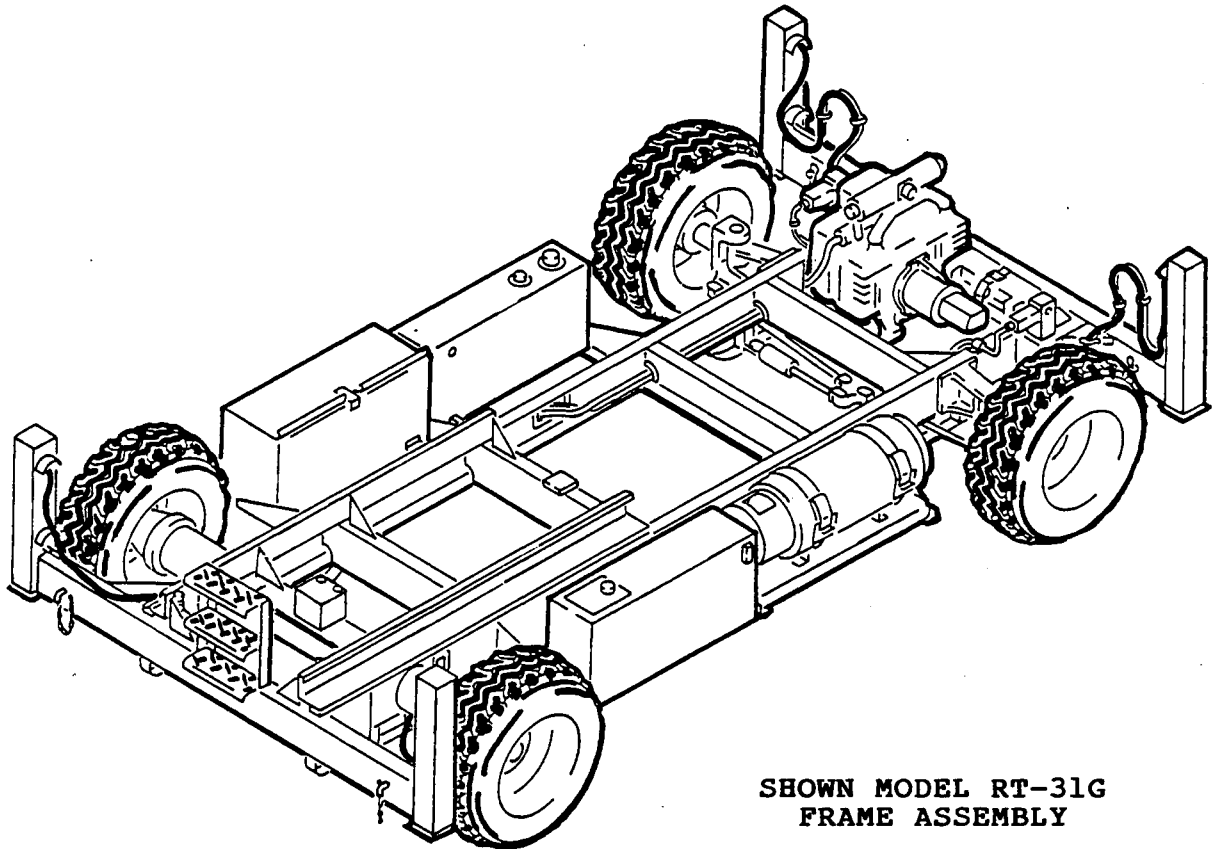


All **MARKLIFT** units are tested and operated to assure their proper operating condition before shipment.

At this 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
 - E. Fuel lines and valves
2. **Check electric power units.**
 - A. Electric power
 - B. Battery water level/gravity readings
 - c. Battery charger
 - D. Battery connection
3. **Check electrical system** by plugging hand control box into platform receptacle.
 - A. Test drive: Forward and Reverse
 - B. Test Steering: Left and Right
 - C. Test lift: Up and Down
4. **Inspect all electrical connections.**
 - A. See
 - B. Feel
 - C. Tighten
5. **Check hydraulic system.**
 - A. Hydraulic fluid level
 - B. In-line pressure valve filter
 - C. Hydraulic lines
 - D. Hydraulic pump
 - E. Hydraulic cylinders
 - F. Emergency lowering valve



6. Check Tires and Wheels.
 - A. For Cuts
 - B. Correct pressure
 - C. Tight lugs and wheel spindle nuts
7. Structural connections and fittings.
 - A. Check all nuts and bolts for tightness.
8. Brakes.
 - A. Check for holding on incline up to four (4) degrees.

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. It is the responsibility of the operator to read and understand this manual and to follow all recommendations made. Never exceed manufacturer's recommended platform load capacity.
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 the various safety boards in your area, as well as requirements set forth by **ANSI & OSHA**.
5. The **MARKLIFT** is a non-insulated personnel carrier and **must not** be operated within 10 feet of a 50,000 volt line. (See page 10 & 11 articles.)
6. Remember, the load capacity of the **MARKLIFT** is total combined weight of personnel and tools, fixtures, accessories, etc.
7. Always distribute load evenly over platform floor area.
8. The **MARKLIFT** platform is equipped with safety belt rings. A body belt for **each person must be worn attached** with lanyard to anchor points provided.
9. It is recommended that head gear (hard hats) be worn by all personnel in the work platform.
10. Under no circumstances should horseplay be tolerated.



11. The **MARKLIFT** structure must not be used as a welding ground. Disconnect both battery leads prior to performing any welding operations.
12. **DO NOT** lean over platform guard railings to perform work.
13. **DO NOT** use ladders or scaffolding on the platform to obtain greater height.
14. Battery sulphuric acid can cause a **serious burn**. Flush away acid with water as soon as possible.
15. Hydrogen and oxygen gases are produced during normal battery operation. This gas mixture can **explode** if frames or sparks are near battery vents.
16. **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.
17. **DO NOT** alter equipment in any fashion.
18. **DO NOT** override any hydraulic, mechanical, or electrical safety devices.
19. **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 5 degree out-of-plumb condition.
20. **DO NOT** work on platform if your physical condition is such that you feel dizzy or unsteady in any way.
21. **DO NOT** jump start other vehicles using **MARKLIFT** battery.
22. Monitor batteries during charging.
DO NOT allow batteries to overcharge and boil.
23. When machine is not in use, remove key from ground control box to prevent unauthorized use.
24. When working under elevated platform always remember to raise the **Safety Support Arm**, (See Chapter Part, Section 4, Figure 1A or 1B for location) to prevent accidental descent.



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

358.38.113

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.

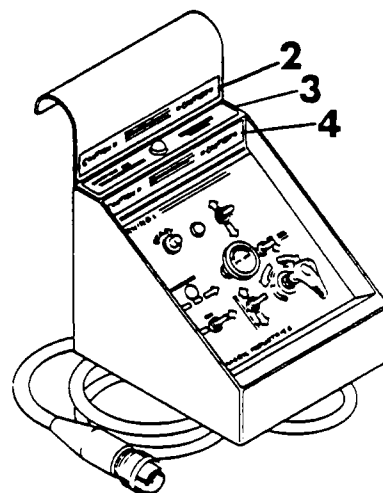
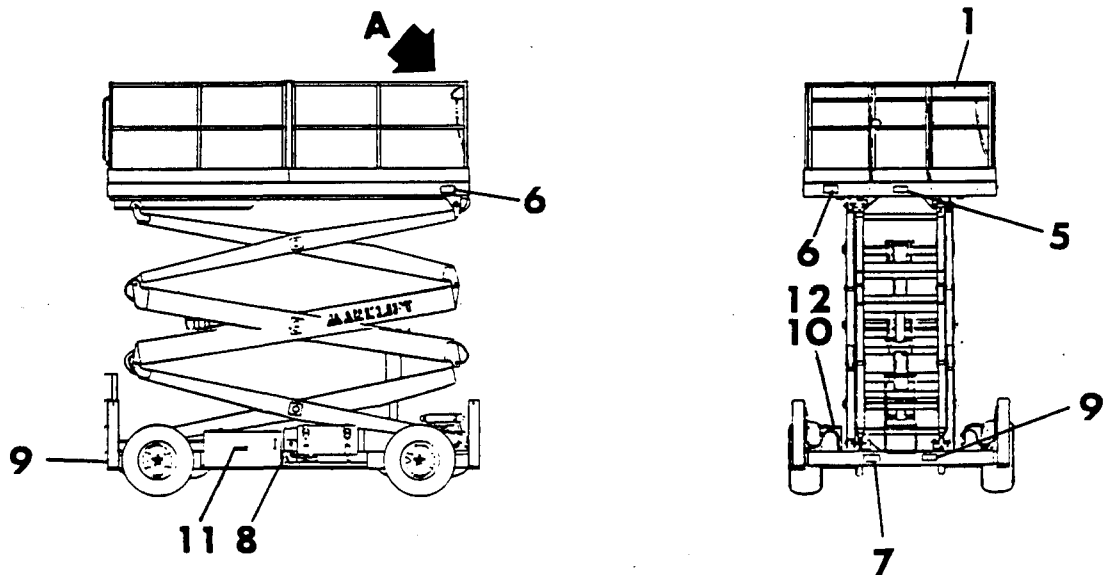
2947. Warning Signs Required. The owner, agent, or employer responsible for the operations of equipment shall post and maintain in plain view of the operator and driver on each crane, derrick, power shovel, drilling rig, hay loader, hay stacker, pile driver, or similar apparatus, a durable warning sign 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."

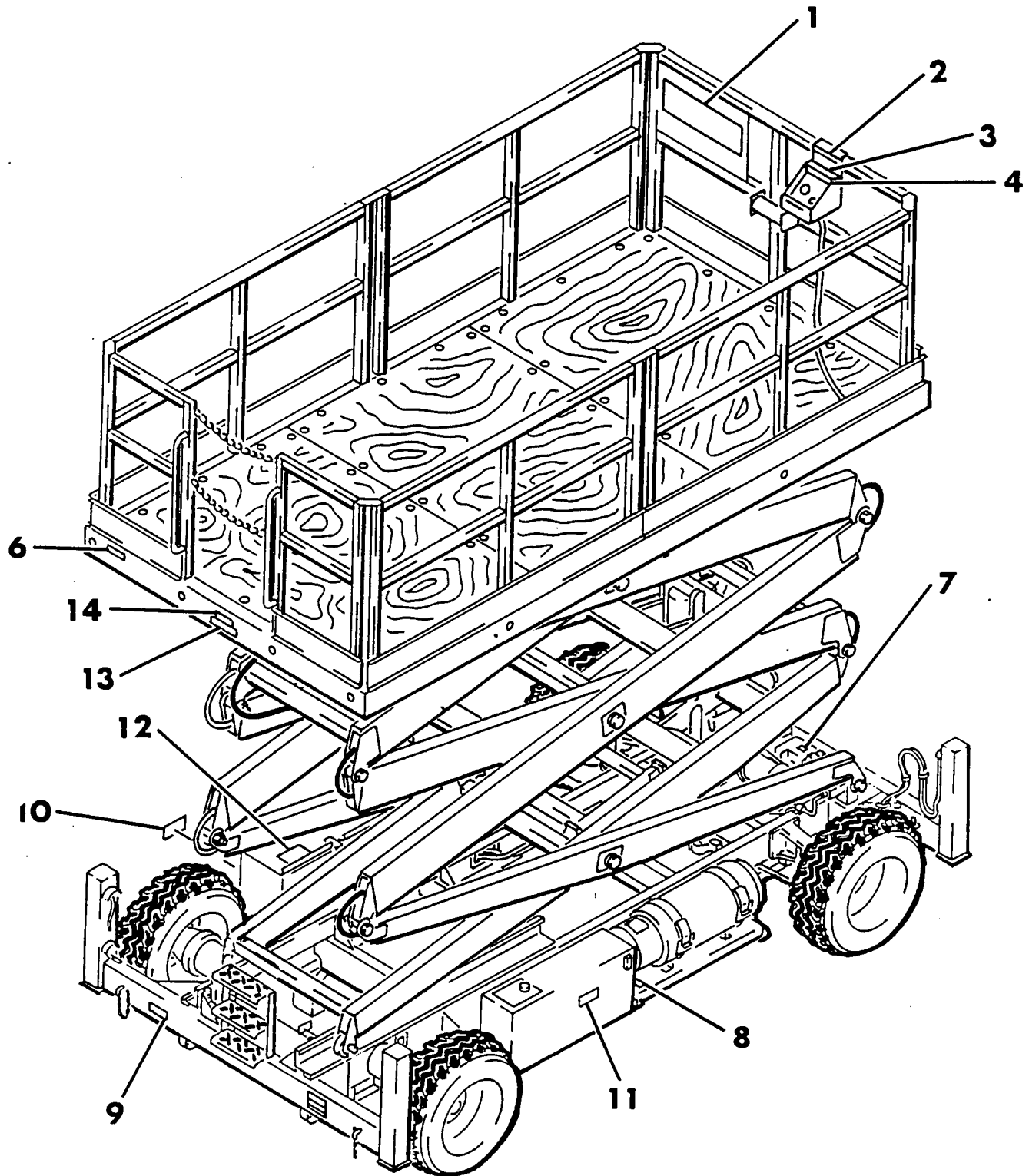


Be completely familiar with all warning and caution decals that are posted on the **MARKLIFT**.

Keep in mind to be alert and use common sense and judgment in responding to dangerous situations and conditions that might develop during unit operation.



VIEW A
HAND CONTROL BOX



SHOWN MODEL RT-31G



1

MARK INDUSTRIES

OPERATION INSTRUCTIONS

WARNING: DO NOT EXCEED LOAD LIMITS EVENLY DISTRIBUTED ON PLATFORM FOR SPECIFIC MODEL.

CAUTION: UNLAWFUL TO OPERATE THIS EQUIPMENT WITHIN 10 FEET OF HIGH VOLTAGE LINES.

BE SURE GUARD RAILS ARE BOLTED IN PLACE AND THAT SWING GATE IS LATCHED.

CAUTION: MACHINE IS TO BE USED ON LEVEL GROUND ONLY.

TO START MACHINE:

- Adjust MASTER POWER SWITCH to service.
- Set to "ON" position.
- Push EMERGENCY STOP SWITCH up on hand control bar (located at rear of machine) and hold.
- Push start button until gas engine starts.

TO STOP MACHINE:

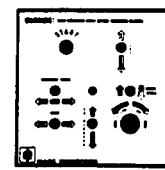
- Release TOGGLE SWITCH (up on right).

TO RAISE AND LOWER PLATFORM:

Activate master up or down on hand control bar (located at rear of machine).

CAUTION: IMPROPER USE MAY RESULT IN DEATH OR SERIOUS INJURY TO OPERATOR OR OTHERS.

- FORWARD AND REVERSE TRAVEL:**
 - Release the FORWARD STOP button on the hand control bar and push right speed.
 - Release the REVERSE STOP button on the hand control bar and push left speed.
- CRIP SPEED:**
 - Once raised or lowered, activate TOGGLE SWITCH to up position. It is used to raise at "CRIP" speed. CRIP speed is automatic.
- FREE WHEELING:**
 - Down MASTER POWER SWITCH and pushing brake pedal on any emergency and free wheeling will stop. Machine can be pushed or pulled at low speed up to 5 MPH maximum. Do not damage the tire and the bearing. Light on brake may be disengaged by automatically at stopping and a second brake pedal. Release brake pedal. DO NOT be re-extended before starting machine.
- MANUAL OUTRIGGER:**
 - Manually extend and retract outriggers. These outriggers to extend 1 inch of the ground surface. Do not extend out on uneven ground. Do not use at the extended position.
- OPTIONAL HYDRAULIC OUTRIGGERS:**
 - Release TOGGLE SWITCH to the left for manual travel. Release TOGGLE SWITCH to the right for automatic travel. When the TOGGLE SWITCH is in the manual position, the hand control bar will be locked. When the TOGGLE SWITCH is in the automatic position, the hand control bar will be unlocked.
- PARALLEL BRACES:**
 - Machine is equipped with having parallel hydraulic telescopic spreading braces which can be extended and retracted. They are used for the spreading and retraction of the machine.
- OPTIONAL WARNING HORN:**
 - Release TOGGLE SWITCH to the left for manual travel. Release TOGGLE SWITCH to the right for automatic travel. When the TOGGLE SWITCH is in the manual position, the horn will be locked. When the TOGGLE SWITCH is in the automatic position, the horn will be unlocked.
- WARNING LIGHT:**
 - Warning light is on. When there is an unstable condition and the operator and operator, the warning light will be on.
- HYDRAULIC SYSTEM PRESSURE:**
 - Maximum system pressure rating is 2500 PSI. Do not exceed 2500 PSI. Do not exceed 2500 PSI.



2

CAUTION

PLATFORM MUST NOT BE RAISED UNLESS
OUTRIGGERS ARE EXTENDED TO FULL WIDTH
AND STABILIZERS ARE DOWN

CAUTION

2013

(BEF. JUL. '86)

BEFORE RAISING PLATFORM!

CAUTION

BE SURE-OUTRIGGERS ARE EXTENDED TO
FULL WIDTH, AND STABILIZERS ARE DOWN

CAUTION

2013

(AFT. JUL. '86)

3

WARNING: LIGHT
INDICATES UNSTABLE CONDITION



PLATFORM WILL LOWER
AUTOMATICALLY

2013

4

CAUTION

UNLAWFUL TO OPERATE THIS EQUIPMENT
WITHIN 10 FEET OF HIGH VOLTAGE LINES

CAUTION

2014

5

This machine has been
designed and tested
to meet these standards:

ANSI A92.2 1969
ANSI A92.3 1973
OSHA GISO 1910.67

2018-1

7

IMPORTANT

**CHECK BATTERY
WATER LEVEL
AT LEAST
ONCE A WEEK.**

1001

6

LOAD CAPACITY

(EVENLY DISTRIBUTED LOAD)

LBS.



8

**USE VAPOR
TANK ONLY**

9

**DO NOT LIFT
FROM THIS END**

10

**EMERGENCY LOWERING VALVE
↓ OPEN VALVE TO LOWER PLATFORM**

11

**THE HYDRAULIC SYSTEM
OF THIS MACHINE IS DESIGNED
TO USE G. M. TRANSMISSION FLUID
TYPE "B" WITH DEXRON**

12

— WARNING —

**DO NOT WORK UNDERNEATH THIS LIFT
UNLESS IT IS MECHANICALLY LOCKED.**

see service manual for location
and use of mechanical locks

13

**ATTACH SAFETY CHAINS
BEFORE RAISING PLATFORM**

14

**GUARD RAILS ARE FOR YOUR SAFETY
DO NOT REMOVE**

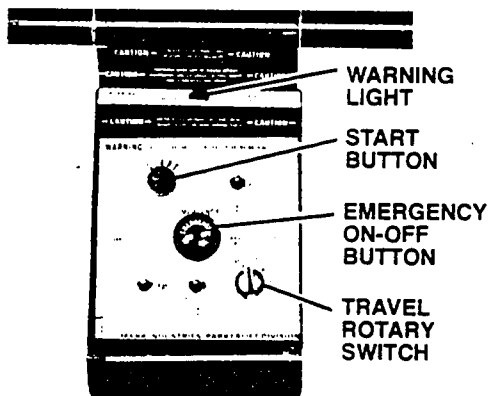
CAUTION

OPERATING THIS MACHINE WITHOUT GUARD RAILS
COULD RESULT IN DEATH OR SERIOUS INJURY

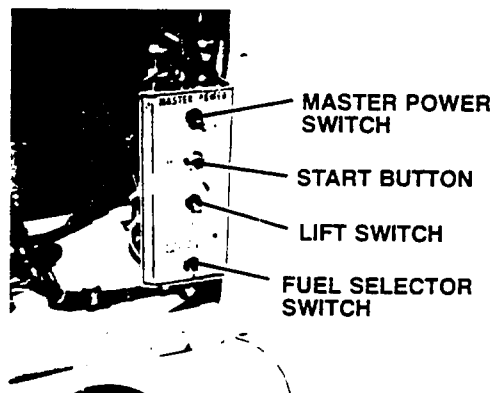
CAUTION

31109

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.



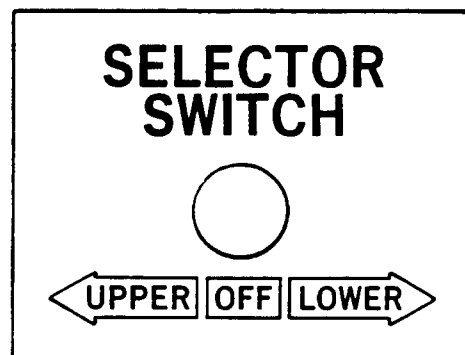
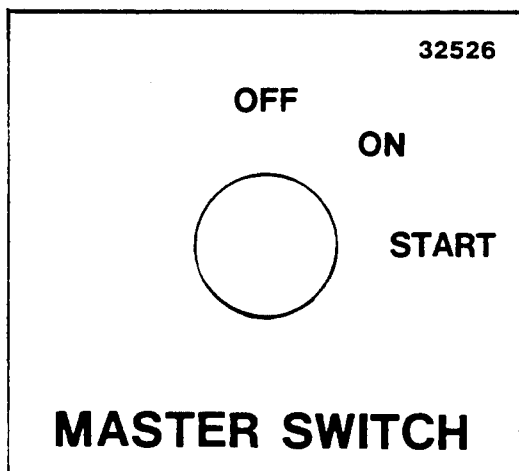
HAND CONTROL BOX



COMPONENT BOX SWITCH PANEL

1. STARTING

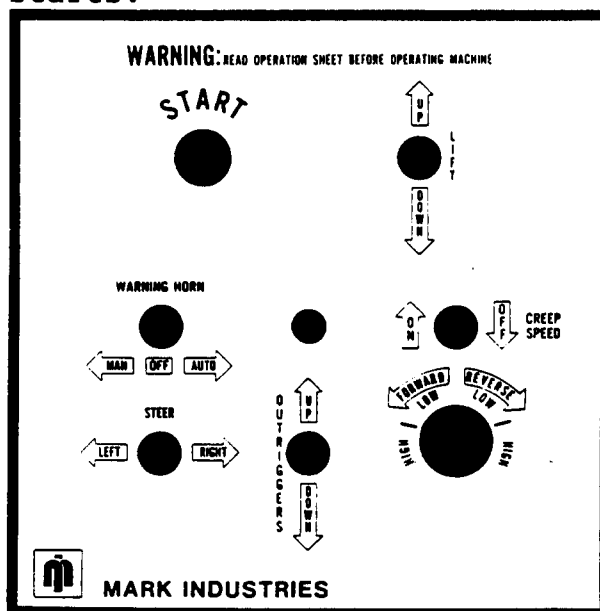
The **MARKLIFT** can be started from either **THE UPPER CONTROL**, (hand control box) or **THE LOWER CONTROL** (component box). Before either position will function the master switch must be "ON," and the selector switch must be activated. Push the selector switch in the component box to the left to activate the hand control box or to the right to activate the component box switch panel.




A. UPPER CONTROL

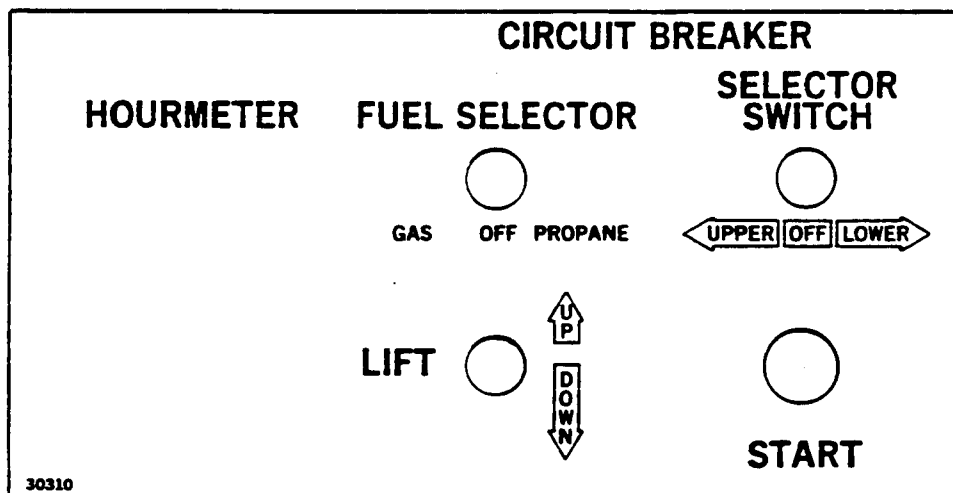
Position selector switch to "UPPER," then enter platform. First, **ATTACH SAFETY CHAIN BEFORE RISING PLATFORM.** Pull out the red emergency "ON/OFF" button located in the middle of the upper control box.

- 1) RT-40E is now operational.
- 2) RT-40G requires pushing the "START" button until the engine starts.


B. LOWER CONTROL

The only functions that can be operated from the lower control station are "START/ON/OFF", "UP/DOWN", "GAS/OFF/PROPANE", and selector "UPPER/LOWER."

- 1) RT-40E is now operational.
- 2) RT-40G REQUIRES PUSHING "START" button until the engine starts.

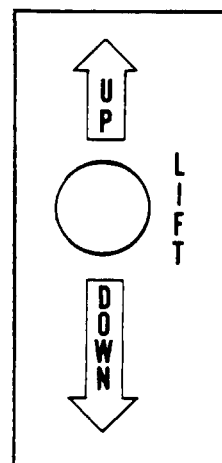
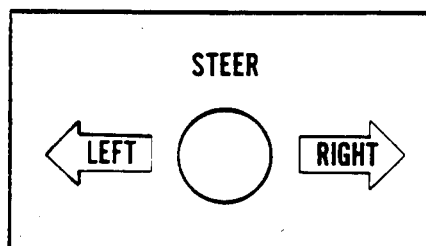


30310



2. STEERING

The steering of the **MARKLIFT** is performed from the upper control (hand control box) only. While the engine is running, pushing the toggle switch for the steering to the left, the front wheels will go left. Pushing the switch to the right, the front wheels will go right. Because a momentary type switch is used, when the operator releases the switch it will automatically return to the off position. The wheels will remain at the last angle traveled until returned, by pushing the toggle switch in the direction desired.



3. LIFT

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

There is an emergency lowering valve which can be reached through the hole in the front cover of the component box. This valve is part of the hydraulic system and can be used to safely lower the platform if there is a loss of electrical power, or if the operator is injured while on the fully extended platform. Before the platform can be lifted again, the emergency lowering valve must be closed.

**4. TRAVEL**

Forward and reverse travel is performed from the upper control (hand control box) only. The **MARKLIFT** is capable of three speeds for both forward and reverse travel: Low speed, High speed and Creep speed. (Bef. Jul. '86)

A. LOW SPEED AND HIGH SPEED

Low and high speed travel are activated with a rotary switch.

- 1) Turning the switch to the **LEFT FOR FORWARD**.

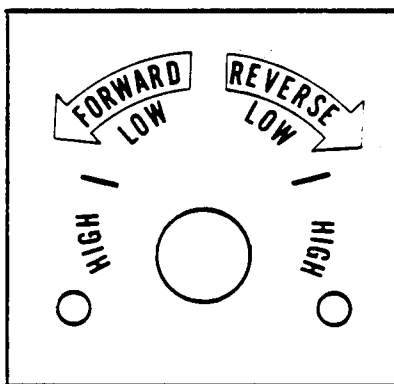
First position is low speed.

Second position is high speed.

- 2) Turning the switch to the **RIGHT FOR REVERSE**.

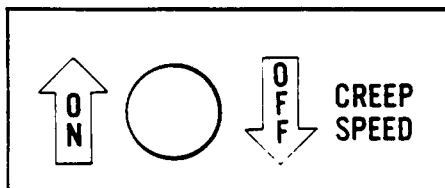
First position is low speed.

Second position is high speed.

**B. CREEP SPEED (BEF. JUL. '86)**

Creep speed will automatically function when the platform is raised over one half of its rated height. The hand control box has a creep speed switch in the middle right side. If creep speed is desired before the platform reaches one half of its extended height, the operator can manually activate the creep speed by pushing the switch to the up position.

NOTE: If creep speed is left "ON", normal, high or low speed will not operate.

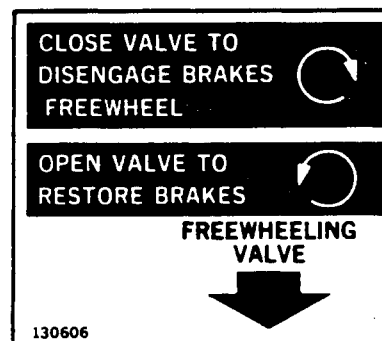
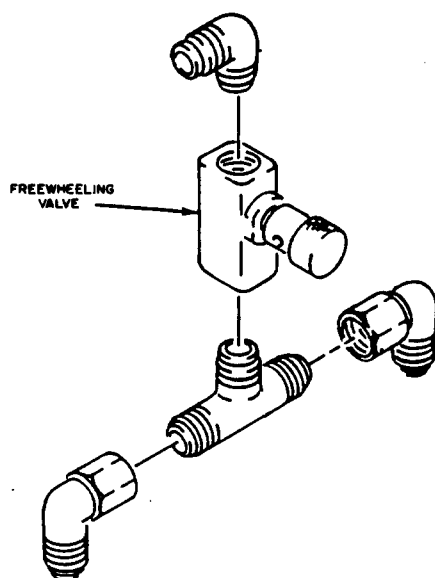


5. FREE WHEELING (BRAKE VALVE)

In order to move the **MARKLIFT** in a free wheeling condition for loading, unloading and positioning, make sure that the lower control (component box) 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!

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



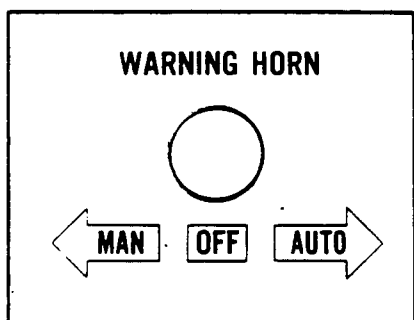
ALWAYS REMEMBER TO OPEN FREE WHEELING VALVE TO RESTORE BRAKING.

**6. 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 a unsafe, out of level condition. An unstable condition consists of a tilt of three (3) degrees side and six (6) degrees forward and aft. If the platform is extended it will automatically descend. If the platform is already in the down position, it cannot be raised. This unstable condition is indicated by a light located in the top center of the control box.

7. 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 upper control (hand control box). 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).



NOTE: Hook-up into the lift circuit is by customer request only. Hook-up into the drive circuit is standard. When the switch is pushed to the left the horn will sound continuously until turned off.

8. OUTRIGGERS

Located at each corner and utilized as added support for the stabilization of the **MARKLIFT**.

A. MANUALLY OPERATED

- 1) Release the safety cotter pin from the arm adjustment pin, slide out the arm and replace the pins.
- 2) Turn crank on all outriggers until the supports are flush with the surface of the terrain.

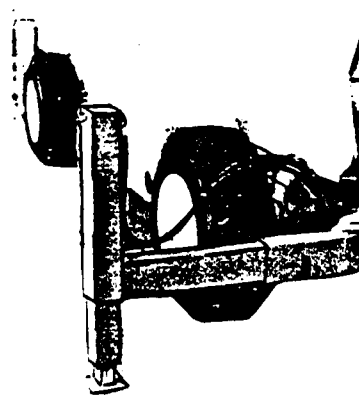
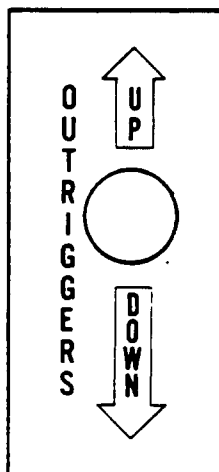
B. HYDRAULIC (OPTIONAL ON SOME MARKLIFTS)

- 1) Hydraulic outriggers can only be operated from the upper control box (hand control). The momentary switch for this function is located on the bottom center of the face of control box labeled "OUTRIGGERS"
- 2) Position the switch "Down" to lower the outriggers and "UP" to retract.

NOTE: The use of outriggers should always be enforced no matter how safe the condition may seem. On hydraulic outriggers a safety feature is designed in the **MARKLIFT** that would disable the lift process if the **MARKLIFT** is extended beyond thirty (30) feet without the use of outriggers.



MANUAL



HYDRAULIC OUTRIGGERS

9. 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 pump settings should be as follows:

MARK INDUSTRIES	
MAX. RATED LOAD CAPACITY AT MAX. HEIGHT	POUNDS
MAX. TRAVEL HEIGHT	FEET MAX. OPERATING PRESSURE
RATED LINE VOLTAGE	VOLTS
MODEL NUMBER	SERIAL NUMBER
This machine has been constructed in accordance with applicable portions of ANSI A92	
PATENT NUMBERS U.S. 3,983,960; CANADIAN 202,699; BRITISH 1,462,229	
ADDITIONAL PATENTS PENDING	
CARSON, CALIFORNIA 90746	

MAXIMUM PRESSURE IS 2300 PSIG FOR (RT) MODELS



This preventative 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 battery water level.
5. 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 hour meter 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.

**MONTHLY (or first 50 hours)**

1. Check and lube, if necessary. (See lubrication instructions).
2. Check battery condition.
3. Change engine oil and filter.
4. Change hydraulic oil return filter.
5. Grease steering linkage.
6. Check and clean engine intake air cleaner

EVERY SIX MONTHS (or 100 hours)

1. Check and lube, if necessary.
2. Change engine oil filter.
3. Change hydraulic oil return filter.

EVERY YEAR

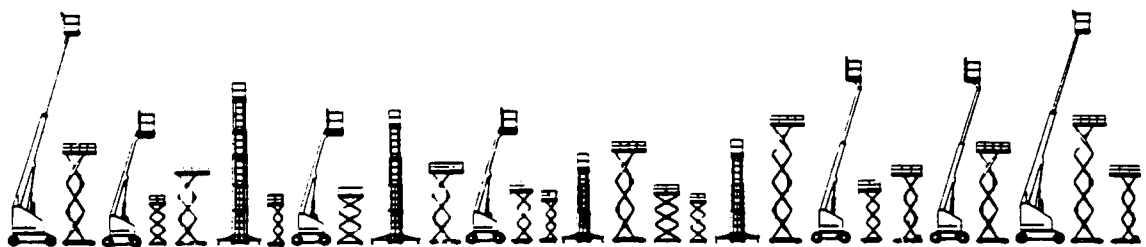
1. Repack all wheel bearings.
2. Change hydraulic oil.
3. Change hydraulic oil return filter.



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

SERVICE TOOLS

1. Volt/OHM meter
2. Hydraulic pressure gauge
(0-3,000 PSI)
3. Battery hydrometer
4. Battery load tester
5. Photo tachometer
6. Standard mechanics hand
tools
7. Scissor arm supports
8. Female quick disconnect
Coupler (MI #842)
9. Fuel pump vac./press.
gauge (automatic type)
10. Electrical test light





MILESTONE			HYDRAULIC FLUID TABLE			
OIL COMPANY			CHEVRON	GULF	SHELL	UNION
BRAND NAME			ATF DEXRON II	ATF DEXRON II	DONAX-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°

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
1.140	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
1.250
1.200
1.150
1.000

-90°F -68°C
-62°F -52°C
-16°F -27°C
+ 5°F -15°C
+19°F - 7°C

**INTRODUCTION**

Whenever trouble shooting 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. (See Maintenance Chapter, page 3 and 4 for more information).

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 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 stop it in the opposite direction.

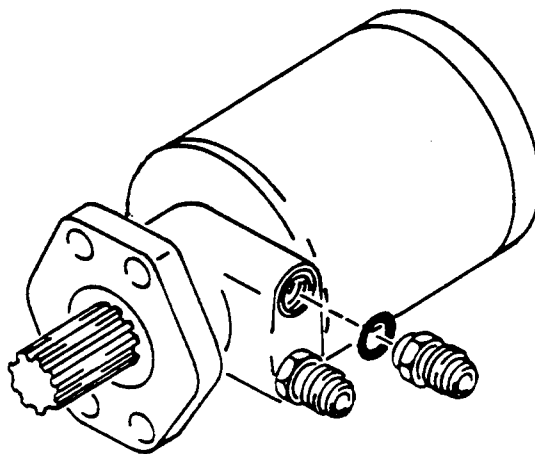
Current Flow**ACTUAL****SCHEMATIC**



- 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 (Outriggers, Steering, and Drive) have two opposite electrical coils with a moveable spool between the coils..
- C. One way valves (Lift, Hi-drive, Descent, and Creep-Speed or Low-Torque) all can be both N/C (normally closed) or N/O (normally open) depending on if flow is desired or not.





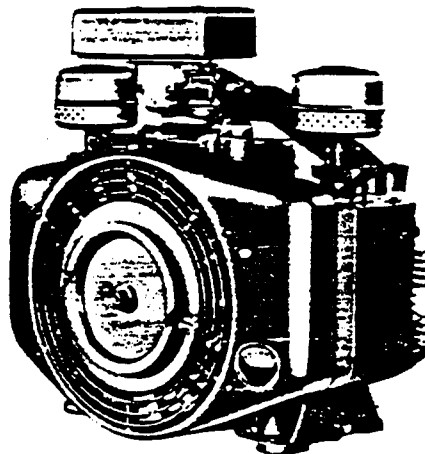
1. ENGINE

A. Will not start or run.

- 1) Check ground control box circuit breaker.
- 2) Make sure fuel shut-off 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 WHEEL DRIVE 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 PSI gauge.

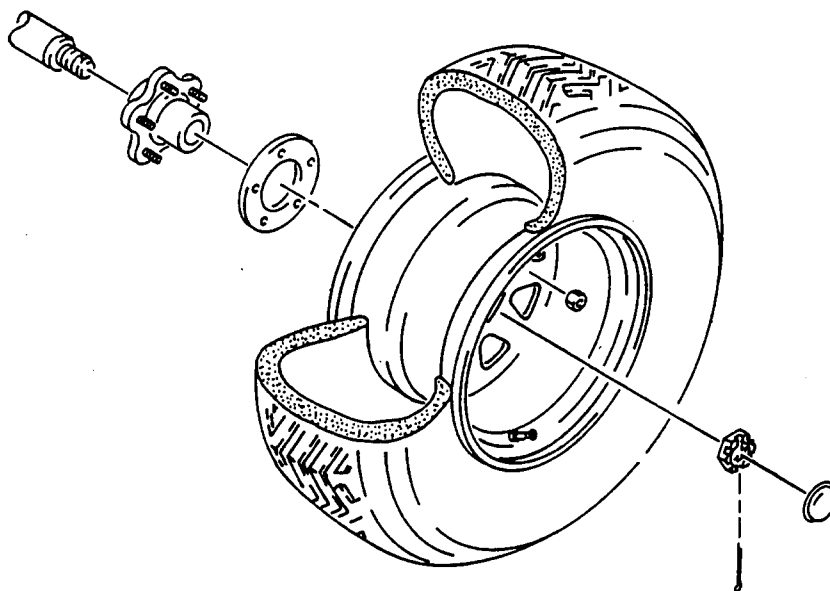
B. Pump producing excessive noise.

- 1) Check suction hose from tank to pump for kinks.
- 2) Check hydraulic oil level (sight gauge 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 (hand control box).
- 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.
- 4) Drive cut out switch in outrigger inoperative.

C. No high speed.

- 1) Loose electrical connections.
- 2) High speed valve inoperative

**D. No functions working.**

- 1) Faulty circuit breaker.
- 2) Loose power connections.
- 3) Power relay inoperative (RT-40E).

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.

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) Emergency lowering valve is open.
- 2) Low batteries (RT-40E).
- 3) Loose electrical connections.
- 4) Descent valve stuck open.
- 5) Faulty lift switch.
- 6) Tilt switches out of adjustment.

B. Will not lift rated load.

- 1) Low system pressure.
- 2) Low batteries (RT-40E).
- 3) Internal seal leaking in cylinder.

If this trouble shooting check list does not help to solve your problem, contact your local **MARKLIFT** representative or the **MARK INDUSTRIES** service department.

MODEL: _____ SER. NO.: _____ DATE SOLD _____
DATE IN SERVICE _____ WARRANTY PERIOD _____
OPTIONS _____

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

DATE	W.O.	MECH.	HR METER	PREVENTIVE MAINT.	ELECTRICAL	HYDRAULIC	FUEL	STEER	TIRE MAJ.	MISC.
				OIL CHANGE						
				AIR FILTER						
				HYDRAULIC OIL CHANGE						
				WHEEL BEARING PACK						
				PUMP MOTOR						
				ELECTRICAL BRUSHES						
				TUNE & DIFF OIL CHG						
				VOLTAGE REGULATOR						
				BATTERY						
				POINTS AND CONDENSER						
				LEV CYL						
				HYD CYL SEALS						
				HYD CONTROL VALVE						
				KOTAK PUMP						
				LIFT ROLLERS						
				HYD HOSES						
				FUEL SYS						
				CARBURETOR						
				FUEL PUMP						
				STEERING						
				STEERING HOSES						
				STEER GEAR						
				STEER CYL						
				STEER TIRE						
				ENGINE TIRE						
				DRIVE AXLE O/H						
				DRIVE AXLE O/H						
				BRAKES						

DATE	REMARKS	DATE	REMARKS	AGENCY



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		
CHARGE 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		
HYDRAULIC SYSTEMS			INSTRUCTIONS		
HYDRAULIC PRESSURE			GENERAL DECALS		
HYDRAULIC HOSES			PAINT		
CYLINDERS			ALL OPERATIONS		
DRIVE MOTORS			LIFT		
BRAKES			STEERING		
EMERGENCY			FORWARD DRIVE		
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:

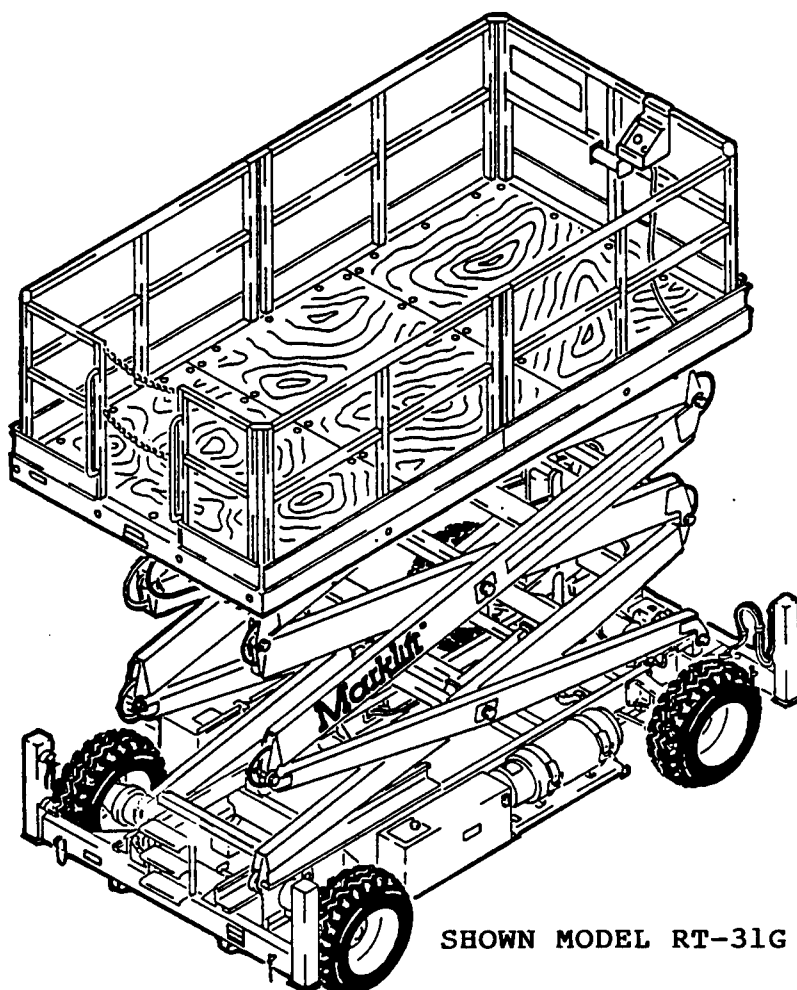


COMMON PARTS

<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
2	4014	MERCURY SWITCH
4	4045	6 AMP DIODE
2	16947	RETURN FILTER ELEMENT
1	3004	SUCTION FILTER
1	66063	LIFT LOWER VALVE
1	66082	DUMP/CREEP VALVE
4	4032	6 VOLT RELAY
1	4073	6 VOLT LONG COIL
1	4074	6 VOLT SHORT COIL
3	4021	SWITCH TOGGLE
1	4106	SWITCH 5 POSITION
2	65151	DRIVE SWITCH KNOB
1	4018	EMERGENCY ON/OFF SWITCH
2	5300	EMERGENCY ON/OFF KNOB
2	66258 *	LIFT CYLINDER SEAL KIT (AFT. NOV. '81)
2	3006-A *	LIFT CYLINDER SEAL KIT (BEF. JUL. '86)
2	66560 *	LIFT CYLINDER SEAL KIT (AFT. JUL. '86)
1	2730	CONTROL CABLE
1	784-A	SOCKET 8 PIN
2	20523	TIME DELAY RELAY
2	66971	BRAKE SEAL KIT
2	3036-A	MOTOR PUMP SEAL KIT
2	3062-1	STEERING CYLINDER SEAL KIT (BEF. NOV. '79)

<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
2	331-B *	STEERING CYLINDER SEAL KIT (AFT. NOV. '79)
2	66964 *	STEERING CYLINDER SEAL KIT (AFT. JUL. '86)
2	44-A	CUSHION CYLINDER SEAL KIT
2	4020	P.B. START SWITCH-GAS ONLY

* Confirm with the MARK INDUSTRIES Service Department.



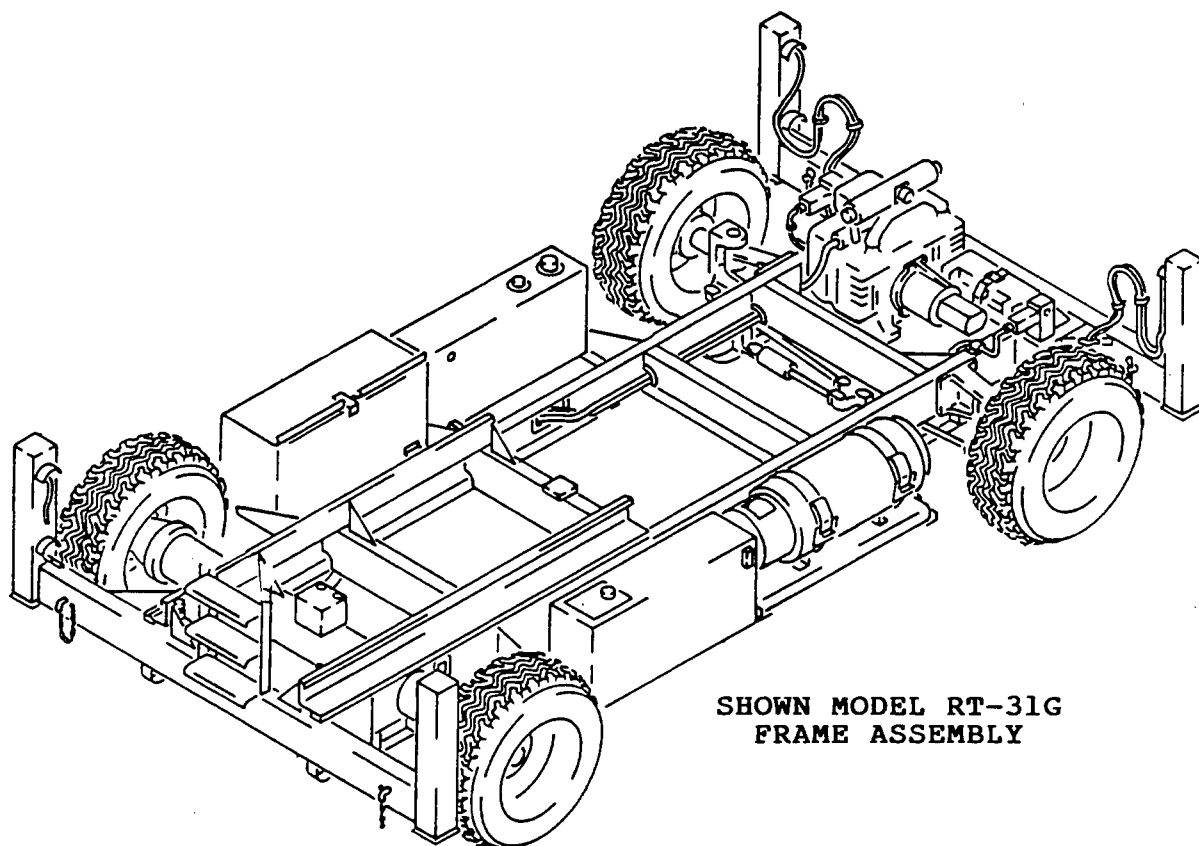
SHOWN MODEL RT-31G

The Marklifts.

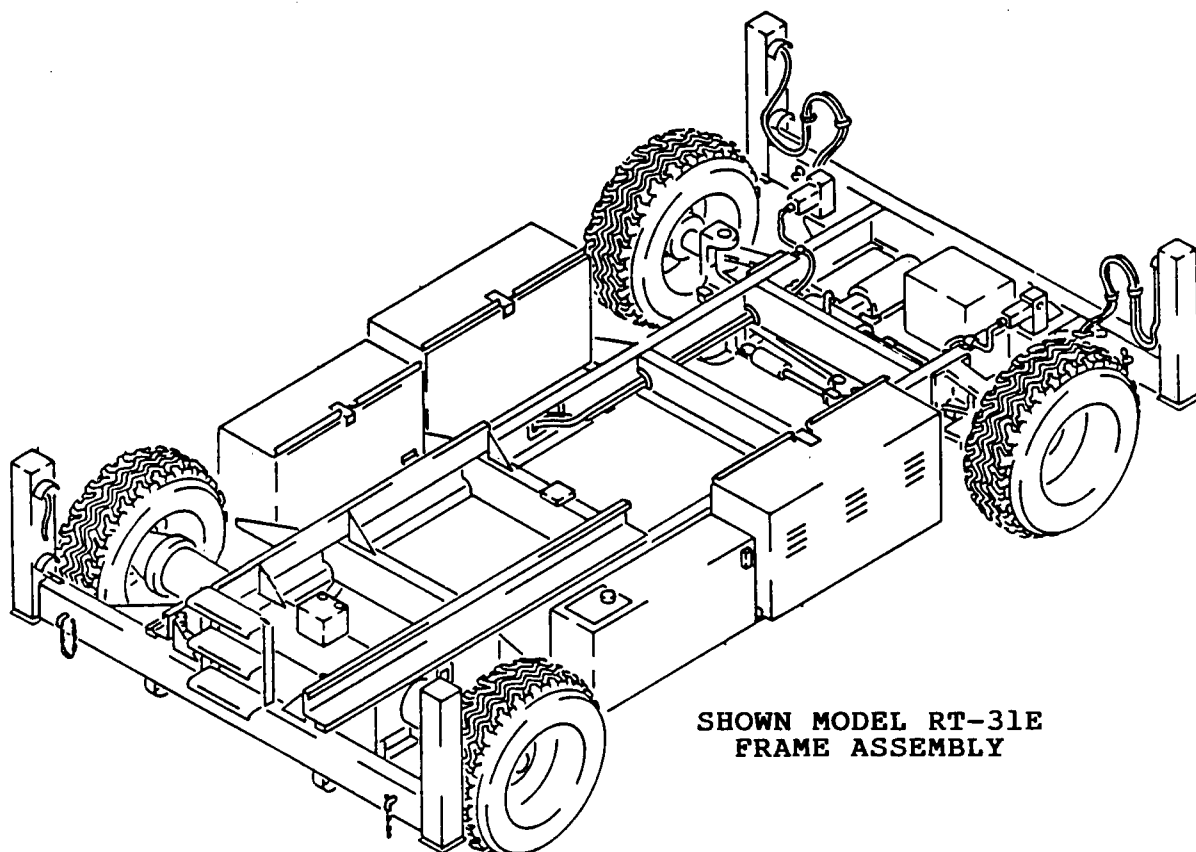
A product of Mark Industries, Brea, California

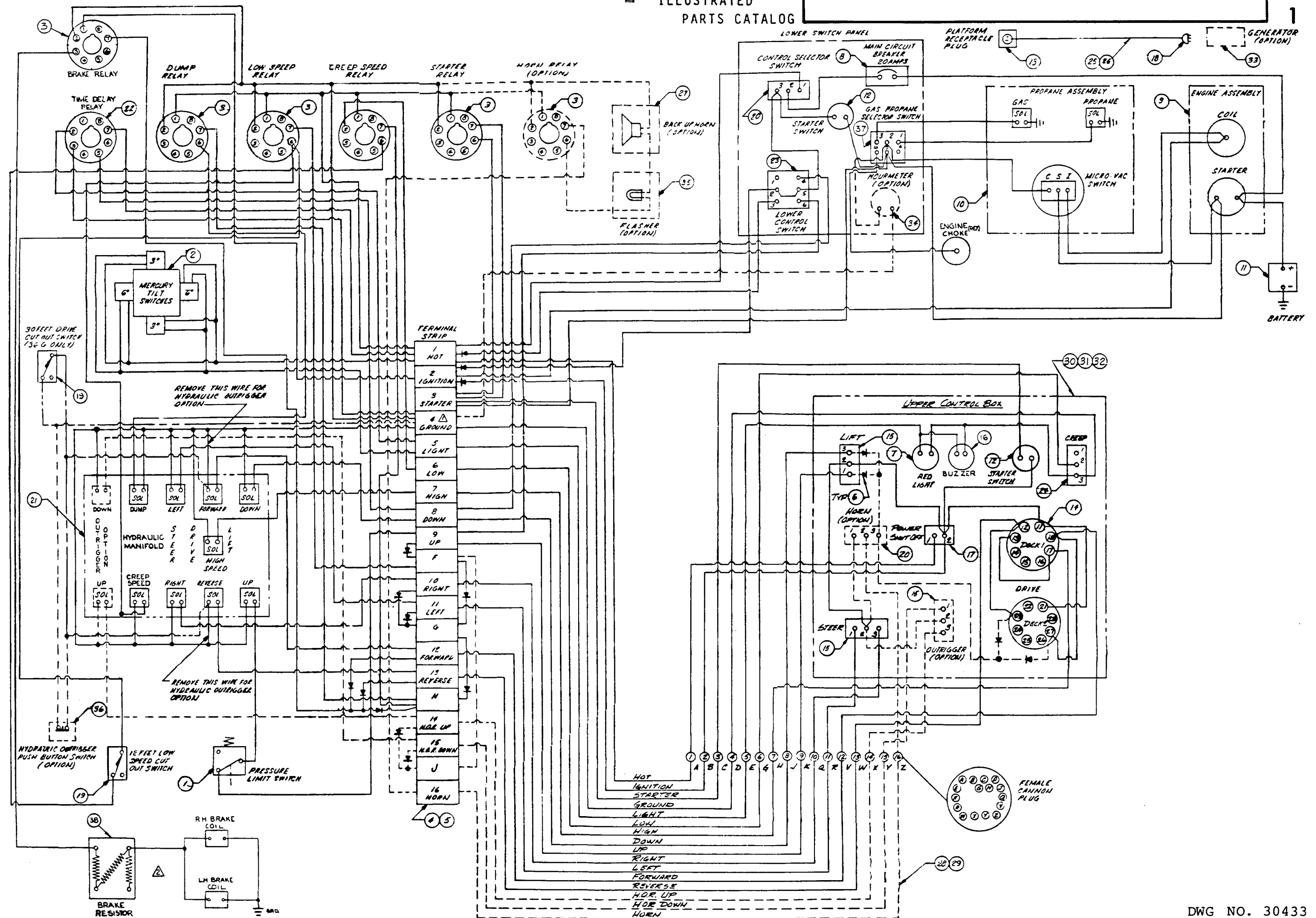


<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
2	16919	MICRO VAC REPAIR KIT
1	16965	REGULATOR REPAIR KIT
1	16925	FILTER LOCK
1	16955	MICRO FILTER
1	20832	FUEL SHUT OFF VALVE
1	20930	SPIDER COUPLER
1	70015	FUEL SELECTOR SWITCH
1	3038	HYDRAULIC PUMP

SHOWN MODEL RT-31G
FRAME ASSEMBLY

<u>QTY</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	3015-1	HYDRAULIC PUMP
1	4083	400 AMP RELAY
2	63-D	BATTERY CHARGER FUSE
2	63-E	BATTERY CHARGER DIODE
1	63-F	BATTERY CHARGER AMP METER
2	63-G	BATTERY CHARGER KNOB
1	237-A	BATTERY CHARGER TIMER
1	853	BATTERY CHARGER PIGTAIL
2	16321	PUMP TO MOTOR COUPLING


 SHOWN MODEL RT-31E
FRAME ASSEMBLY



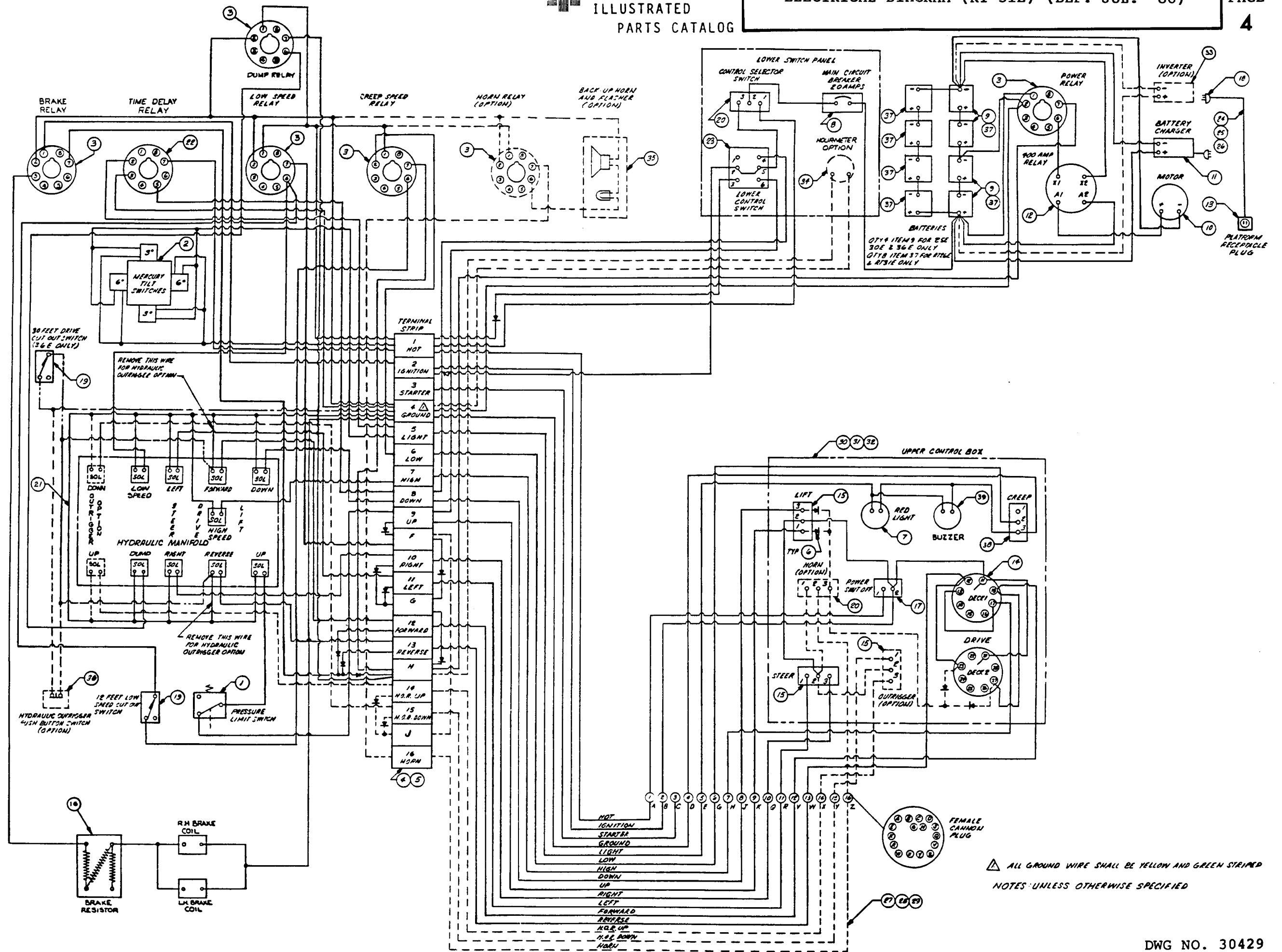


BILL OF MATERIAL IS FOR REFERENCE ONLY

				1	1	38		BRAKE RESISTOR	
				1	1	37	70015	GAS - PROPANE SELECTOR SWITCH	
		1				36	4011	PUSH BUTTON SWITCH	
			1			35	4029	FLASHER	
1						34	20571	HOURMETER	
	1					33	4070	GENERATOR	
		1				32	4068-5	UPPER CONTROL BOX ASSEMBLY	
			1			31	4068-3	UPPER CONTROL BOX ASSEMBLY	
				1	1	30	4068-1	UPPER CONTROL BOX ASSEMBLY	
						29	4033-	CABLE HARNESS ASSEMBLY	
				1	1	28	4033-	CABLE HARNESS ASSEMBLY	
		1				27	4028	BACK UP HORN	
						26	4034-	CABLE	3 CONDUCTOR
			1	1		25	4034-	CABLE	3 CONDUCTOR
			1	1		24	4017	ON OFF SWITCH	
			1	1		23	20481	ON OFF SWITCH	
			1	1		22	20523	TIME DELAY RELAY	
			1	1		21	30713	HYDRAULIC MANIFOLD ASSY	
		1	1	1		20	4019	ON OFF SWITCH	
			1	1		19	20803	LIMIT SWITCH	
			1	1		18	2624	PLUG 3 PRONG	
			1	1		17	4818	EMERGENCY ON OFF SWITCH	
			1	1		16		BUZZER	
	1		2	2		15	4021	MOMENTARY SWITCH	
			1	1		14	4106	DRIVE SWITCH	
			1	1		13	4060	RECEPTACLE	
			2	2		12	4020	STARTER SWITCH	
			1	1		11	4030	BATTERY	12V 95 AMPS
			1	1		10	30226	PROPANE ASSEMBLY	
			1	1		9	20506	PROPANE ASSEMBLY	
			1	1		8	20562	CIRCUIT BREAKER	20 AMPS
			1	1		7	4031	LIGHT	RED
	2	4	13	13		6	4045	DIODE	6 AMPS
			1	1		5	117A	TERMINAL BLOCK END	
			20	20		4	4027	TERMINAL BLOCK	
			1	5		3	4032	RELAY	
			1	1		2	30387	TILT SWITCH ASSEMBLY	
			1	1		1	2297	PRESSURE LIMIT SWITCH	
1050	1002	1015	1101	1016	1026	ITEM NO.	PART OR IDENTIFYING NO.	DESCRIPTION	DATA: SPECIFICATIONS SIZES, NOTES, SUPPLIERS
QTY PER OPTION					STD MACHINE	BILL OF MATERIAL DWG NO. 30433			



THIS SCHEMATIC SECTION PAGE 3
ELECTRICAL DIAGRAM (RT-31G) (AFT. JUL. '86),
PART NUMBER 32456 IS NOT AVAILABLE THIS REVISION .



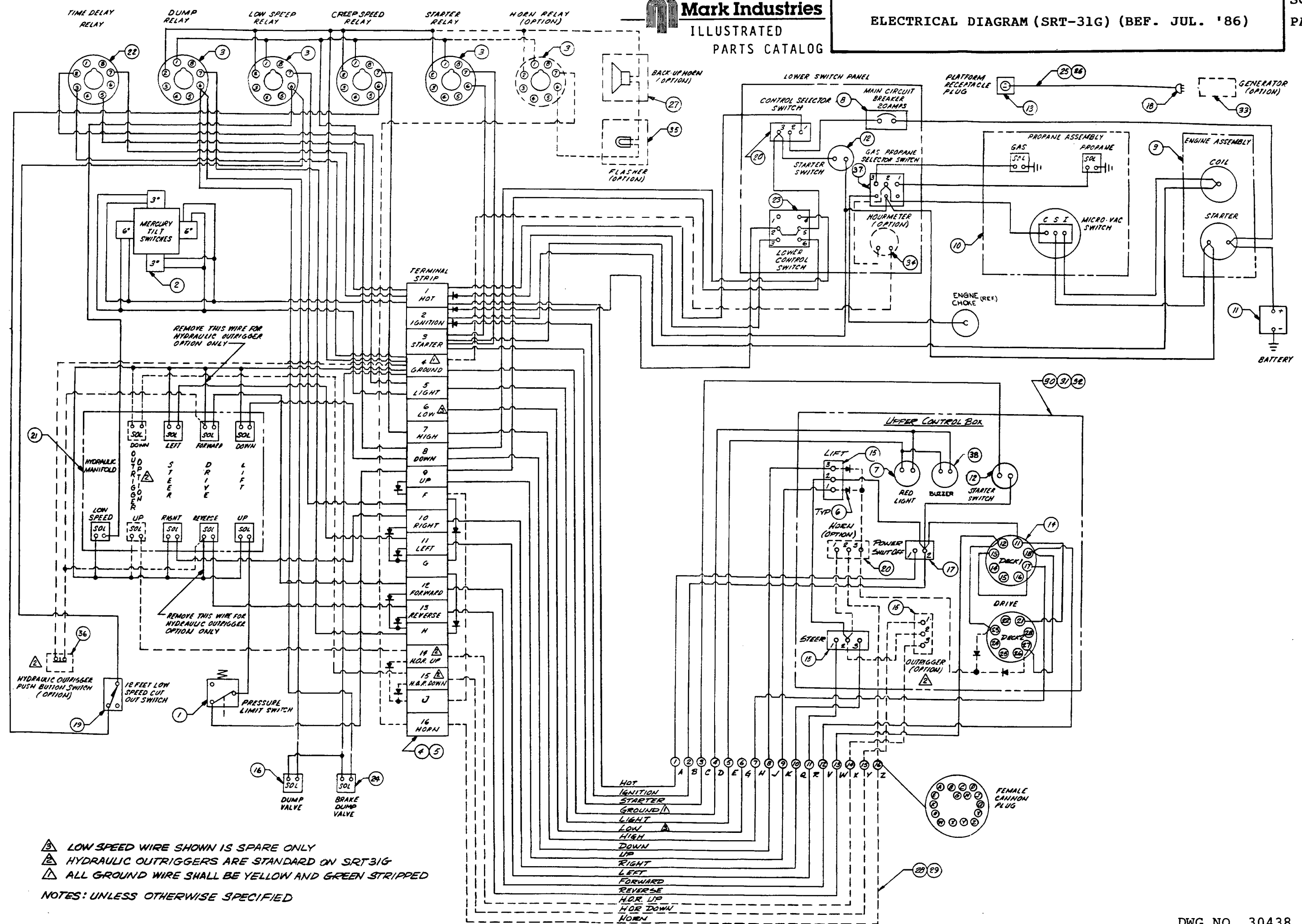


BILL OF MATERIAL IS FOR REFERENCE ONLY

						39		BUZZER	
				1	1	38	4017	ON OFF SWITCH	
				8	8	37	4007	BATTERY	6 V 250 AMPS
		1				36	4011	PUSH BUTTON SWITCH	
			1			35	30408	BACK UP HORN AND FLASHER	
1						34	20571	HOURMETER	
	1					33	446	INVERTER	
		1				32	4069-5	UPPER CONTROL BOX ASSEMBLY	
			1			31	4069-3	UPPER CONTROL BOX ASSEMBLY	
				1	1	30	4069-1	UPPER CONTROL BOX ASSEMBLY	
						29	4033-	CABLE HARNESS ASSEMBLY	
				1	1	28	4033-	CABLE HARNESS ASSEMBLY	
						27	4033-	CABLE HARNESS ASSEMBLY	
						26	4034-	CABLE	3 CONDUCTOR
				1	1	25	4034-	CABLE	3 CONDUCTOR
						24	4034-	CABLE	3 CONDUCTOR
				1	1	23	20481	ON OFF SWITCH	
				1	1	22	20523	TIME DELAY RELAY	
				1	1	21		HYDRAULIC MANIFOLD	
			1	1	1	20	4019	ON OFF SWITCH	
				1	1	19	20803	LIMIT SWITCH	
				1	1	18	2624	PLUG 3 PRONG	
				1	1	17	4018	EMERGENCY ON OFF SWITCH	
				1	1	16		BRAKE RESISTOR	
		1		2	2	15	4021	MOMENTARY SWITCH	
				1	1	14	4106	DRIVE SWITCH	
				1	1	13	4060	RECEPTACLE	
				1	1	12	4083	RELAY	400 AMP
				1	1	11	4006	BATTERY CHARGER	
				1	1	10	3015	MOTOR	
						9	30297	BATTERY	6 V 375 AMPS
				1	1	8	20562	CIRCUIT BREAKER	20 AMPS
				1	1	7	4031	LIGHT	RED
		2	4	9	9	6	4045	DIODE	6 AMPS
				1	1	5	117A	TERMINAL BLOCK END	
				20	20	4	4027	TERMINAL BLOCK	
			1	5	5	3	4032	RELAY	
				1	1	2	30387	FILT SWITCH ASSEMBLY	
				1	1	1	2297	PRESSURE LIMIT SWITCH	
INSQ11021	1105	1101	RT31E	RT31E	ITEM	PART OR	DESCRIPTION	DATA, SPECIFICATIONS	
					NO	IDENTIFYING NO		SIZES, NOTES, SUPPLIERS	
QTY PER OPTION	STD						BILL OF MATERIAL	DWG NO. 30429	
	MACHINE								



THIS SCHEMATIC SECTION PAGE 6
ELECTRICAL DIAGRAM (RT-31E) (AFT. JUL. '86),
PART NUMBER UNKNOWN IS NOT AVAILABLE THIS REVISION.



⚠ LOW SPEED WIRE SHOWN IS SPARE ONLY
 ⚠ HYDRAULIC OUTRIGGERS ARE STANDARD ON SRT31G
 ⚠ ALL GROUND WIRE SHALL BE YELLOW AND GREEN STRIPPED
 NOTES: UNLESS OTHERWISE SPECIFIED

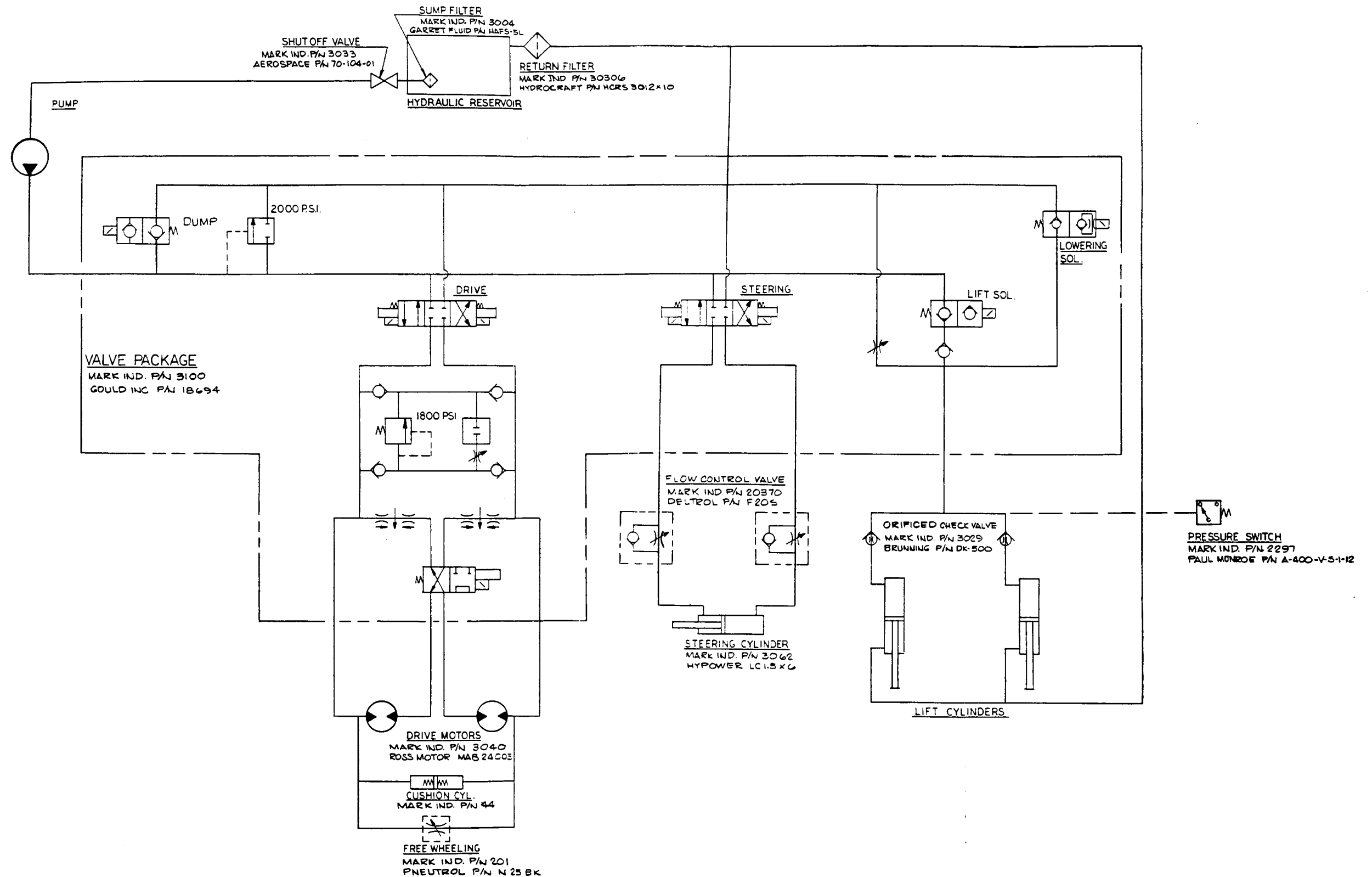


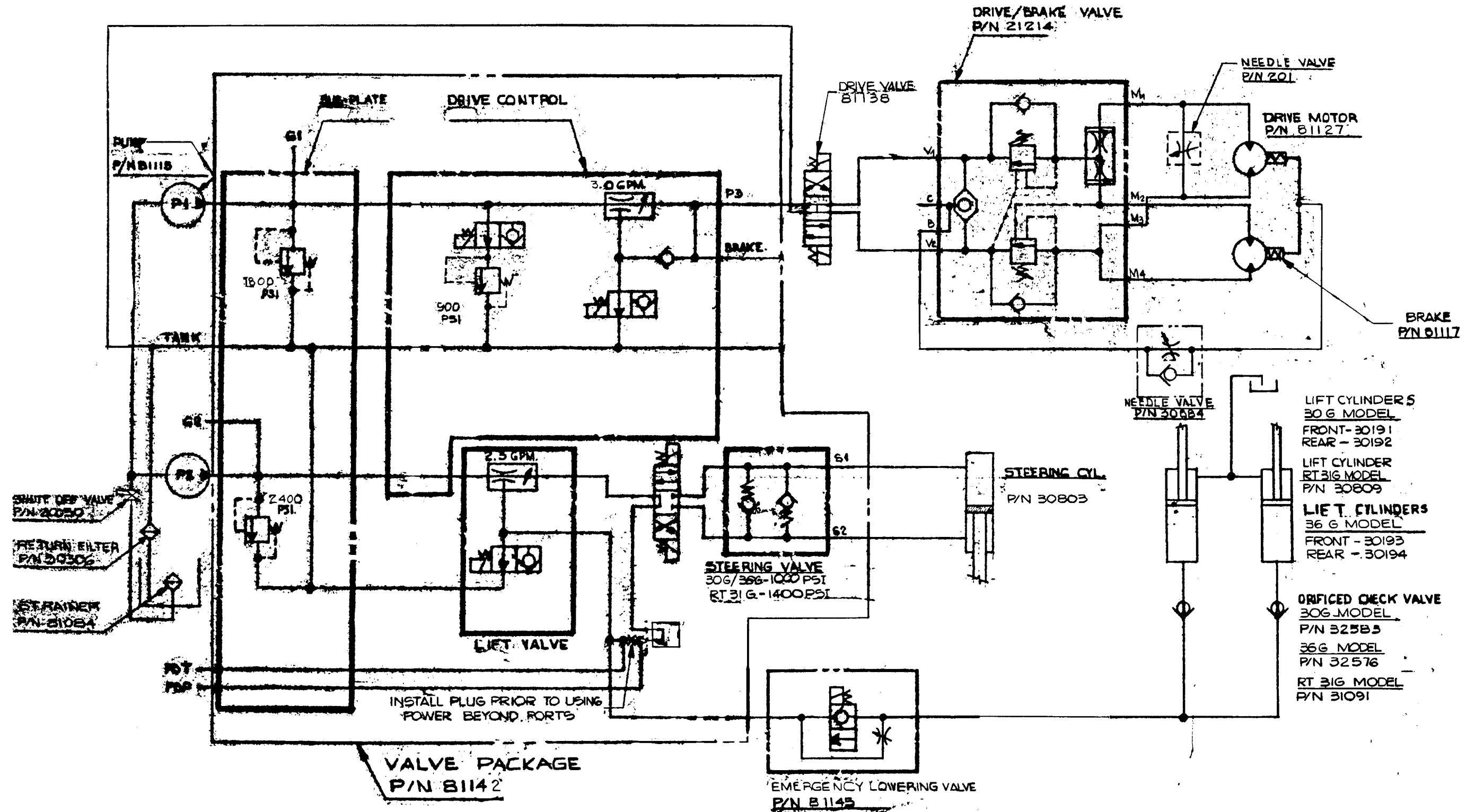
BILL OF MATERIAL IS FOR REFERENCE ONLY

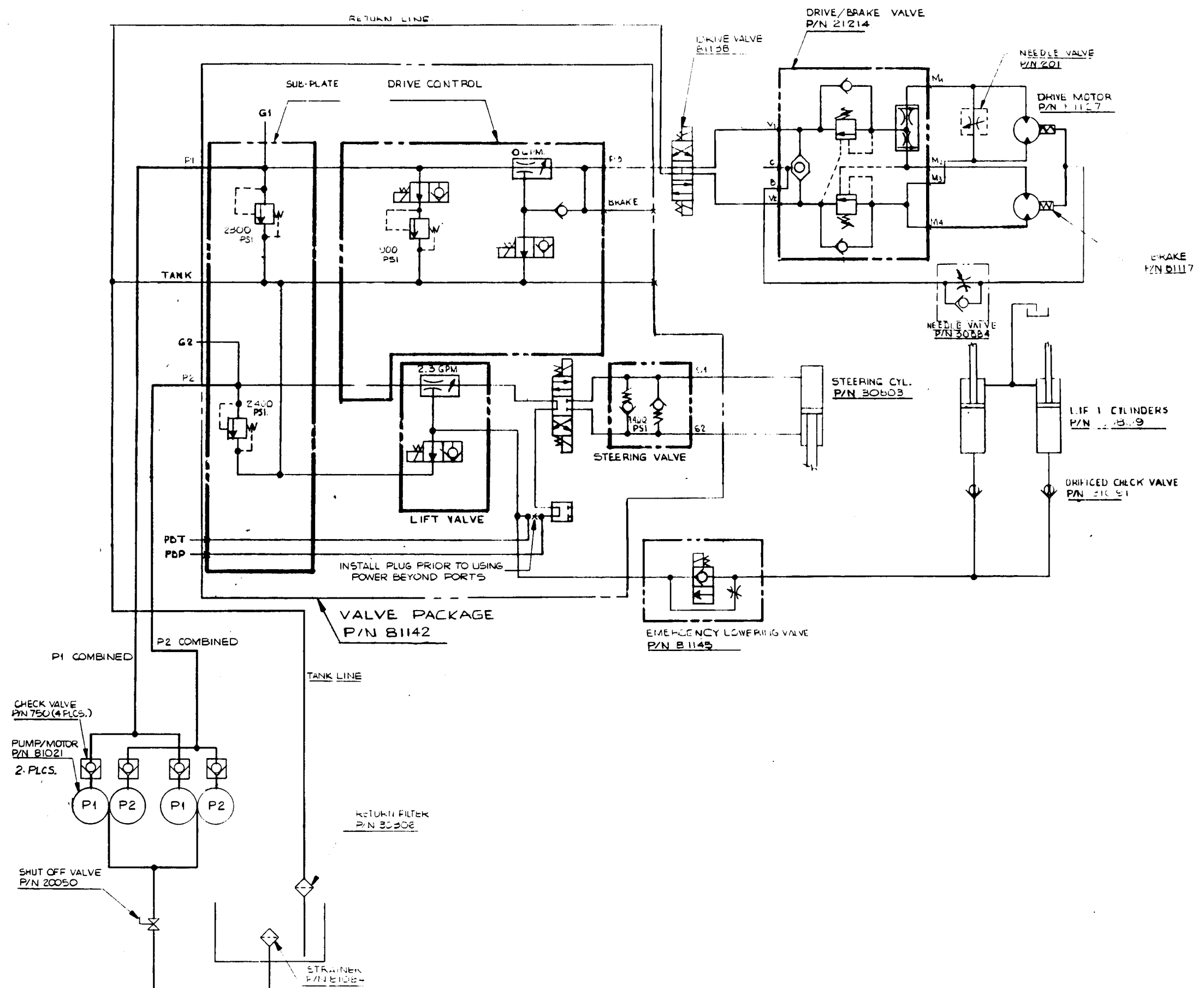
							1	38		BUZZER	
							1	37	70015	GAS - PROPANE SELECTOR SWITCH	
			1		1			36	4011	PUSH BUTTON SWITCH	
				1				35	4029	FLASHER	
		1						34	20571	HOURLY METER	
			1					33	4070	GENERATOR	
				1		1		32	8325-5	UPPER CONTROL BOX ASSEMBLY	
					1			31	8325-3	UPPER CONTROL BOX ASSEMBLY	
						1		30	8325-1	UPPER CONTROL BOX ASSEMBLY	
							1	29	4033-	CABLE HARNESS ASSEMBLY	
							1	28	4033-	CABLE HARNESS ASSEMBLY	
				1				27	4028	BACK UP HORN	
					1			26	4034-	CABLE	3 CONDUCTOR
						1		25	4034-	CABLE	3 CONDUCTOR
					1	1		24	30460	3 WAY VALVE	
					1	1		23	20481	ON OFF SWITCH	
					1	1		22	20523	TIME DELAY RELAY	
					1	1		21		HYDRAULIC MANIFOLD	
				1	1	1		20	4019	ON OFF SWITCH	
					1	1		19	20803	LIMIT SWITCH	
					1	1		18	2624	PLUG 3 PRONG	
					1	1		17	4018	EMERGENCY ON OFF SWITCH	
					1	1		16	410	DUMP VALVE	
			1		3	2		15	4021	MOMENTARY SWITCH	
					1	1		14	4106	DRIVE SWITCH	
					1	1		13	4060	RECEPTACLE	
					2	2		12	4020	STARTER SWITCH	
					1	1		11	4030	BATTERY	12V 95 AMPS
					1	1		10	30226	PROPANE ASSEMBLY	
					1	1		9	20506	ENGINE ASSEMBLY	
					1	1		8	20562	CIRCUIT BREAKER	20 AMPS
					1	1		7	4031	LIGHT	RED
			2	4	12	10	6	4045	DIODE	4 AMPS	
					1	1		5	117A	TERMINAL BLOCK END	
					20	20	4	4027	TERMINAL BLOCK		
				1	4	4	3	4032	RELAY		
					1	1		2	30387	TILT SWITCH ASSEMBLY	
					1	1		1	2297	PRESSURE LIMIT SWITCH	
		11050	4022	11045	11011	SRT31G	10750	ITEM NO.	PART OR IDENTIFYING NO.	DESCRIPTION	DATA: SPECIFICATIONS SIZES, NOTES, SUPPLIERS
QTY PER OPTION				QTY PER STD. MACHINE				BILL OF MATERIAL DWG NO. 30438			

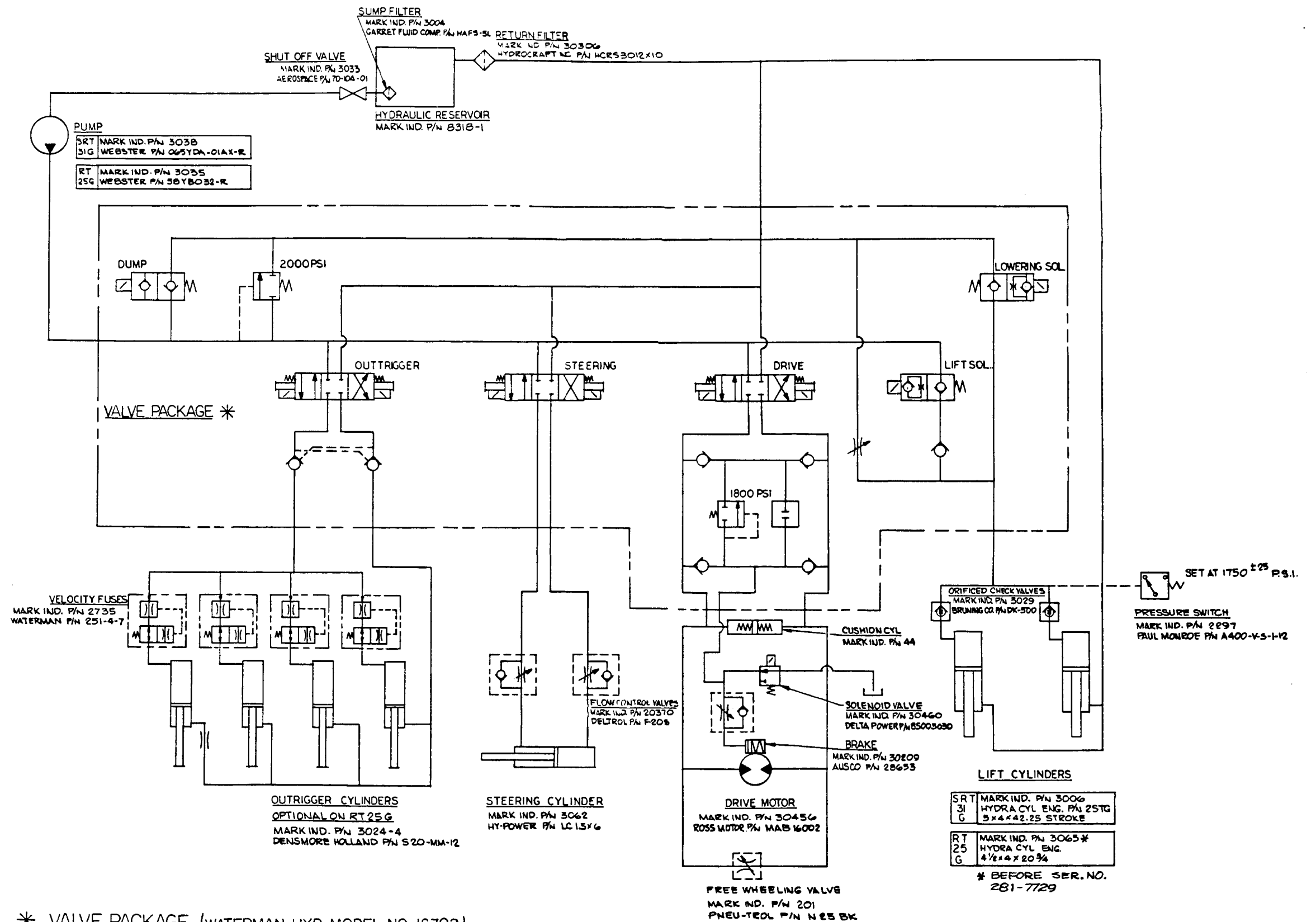


THIS SCHEMATIC SECTION PAGE 9
ELECTRICAL DIAGRAM (SRT-31G) (AFT. JUL. '86),
PART NUMBER 32451 IS NOT AVAILABLE THIS REVISION.

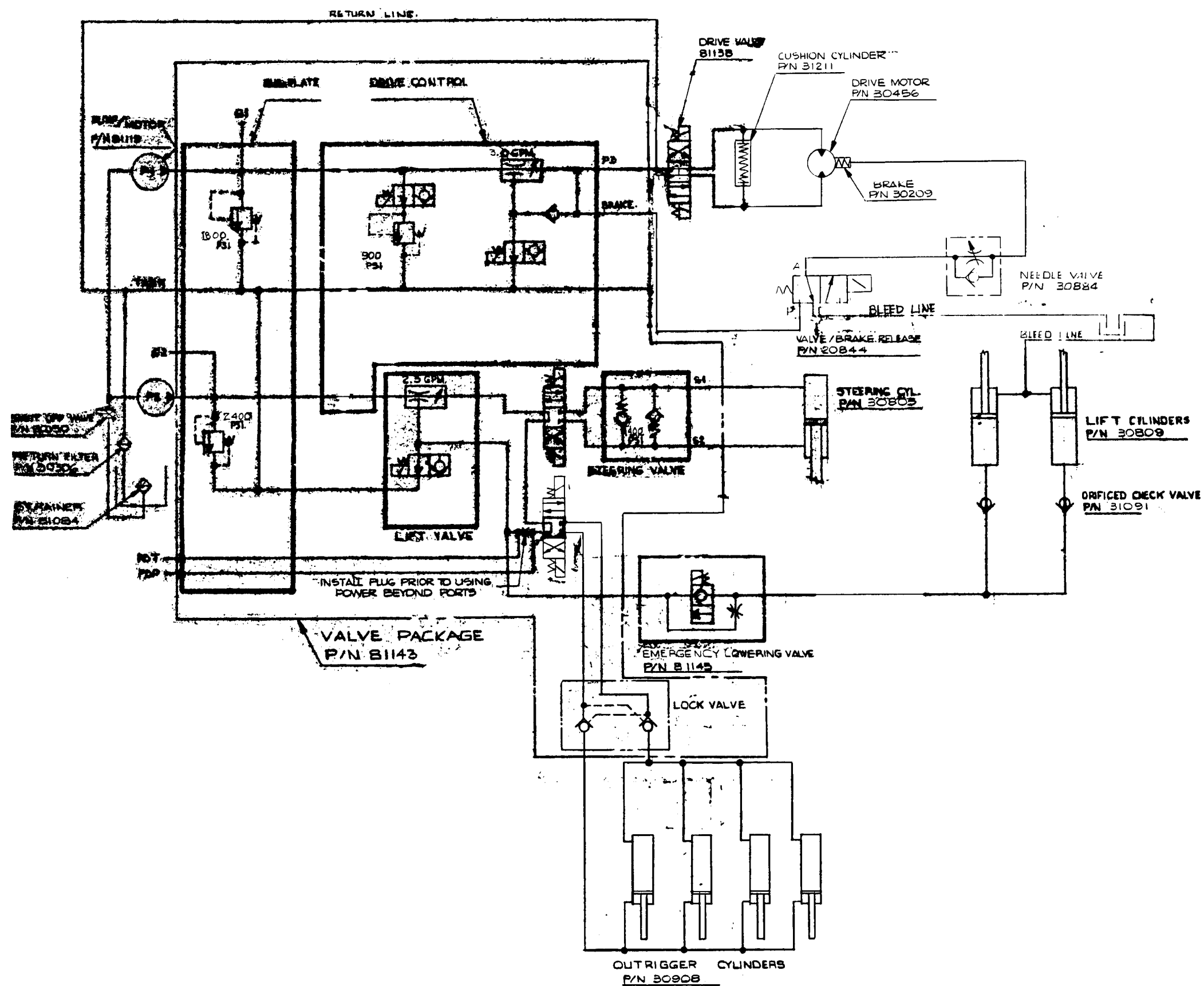


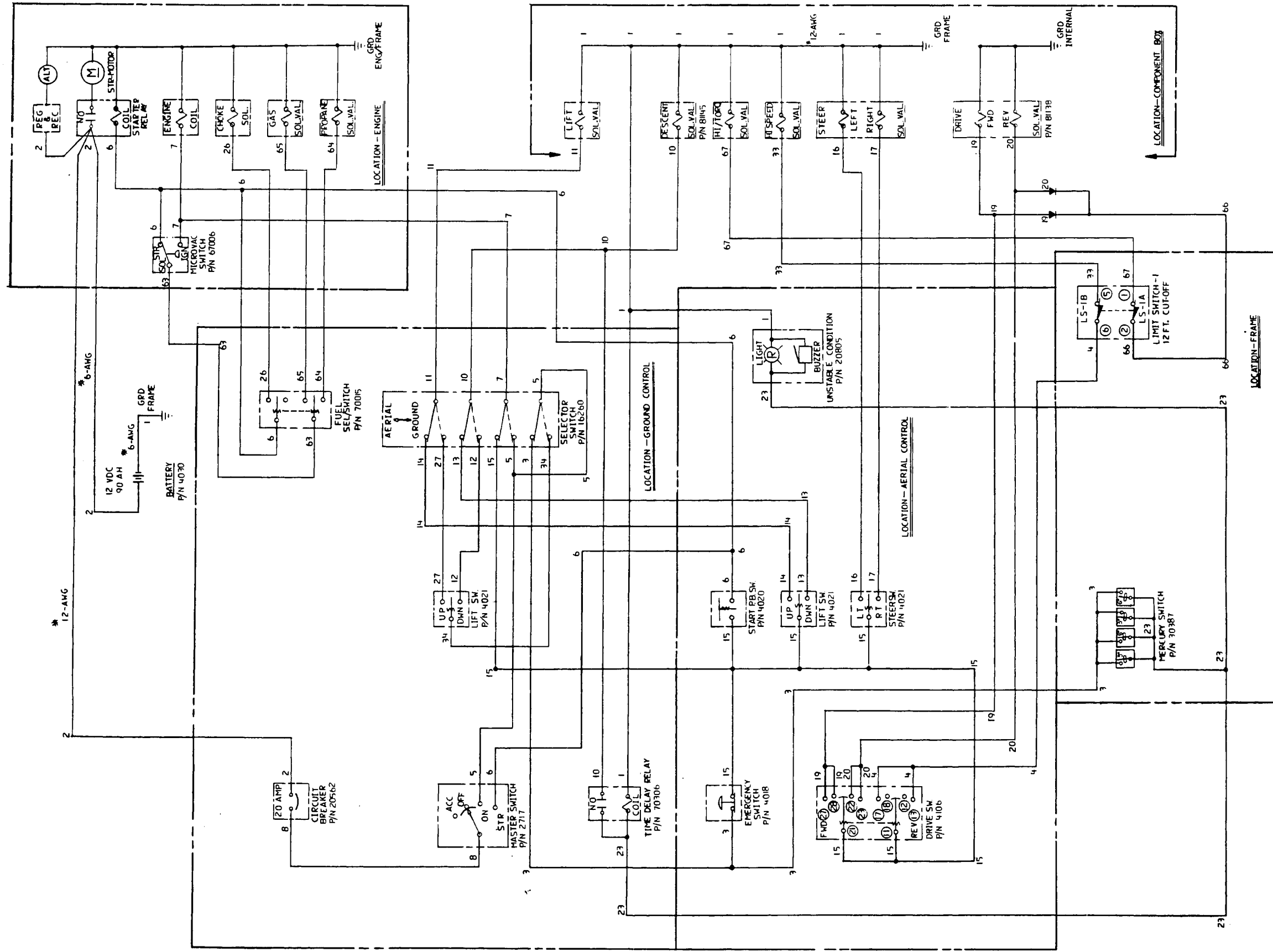




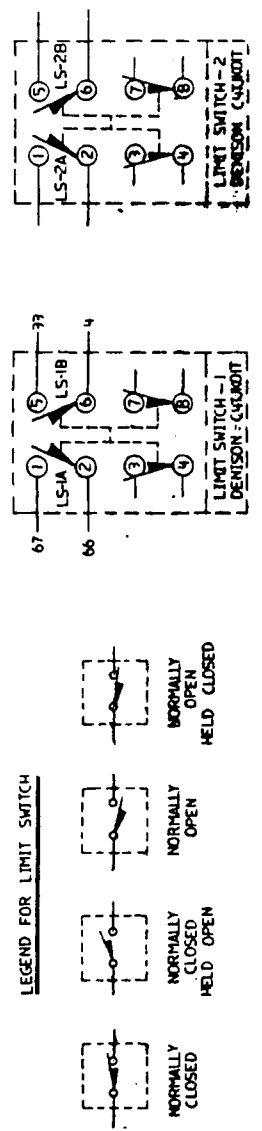


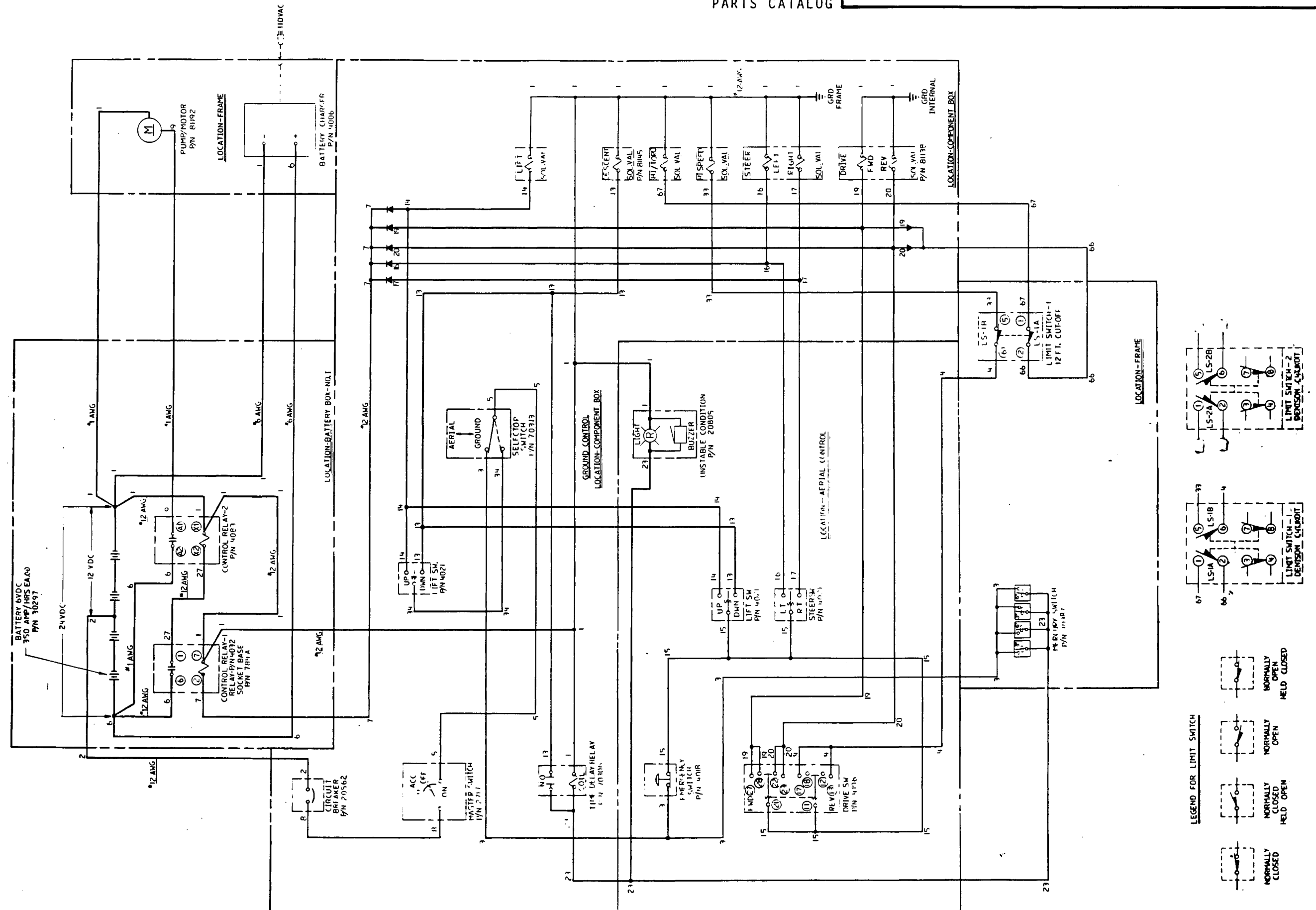
* VALVE PACKAGE (WATERMAN HYD. MODEL NO. 18702)
USE MARK IND. P/N 3069/3043 (WITH OUTRIGGER VALVE) FOR SRT 31G
USE MARK IND. P/N 3069 (WITH OUT OUTRIGGER VALVE) FOR RT 25G



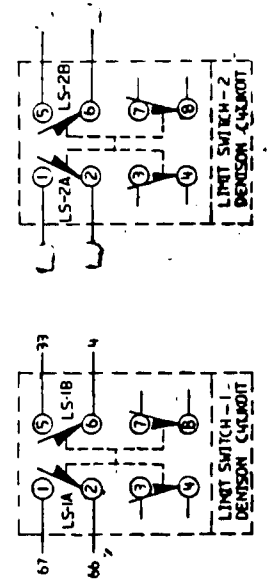
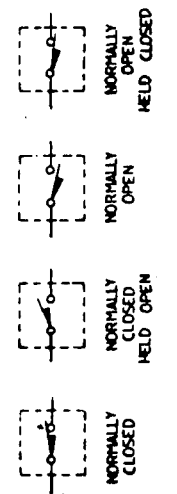


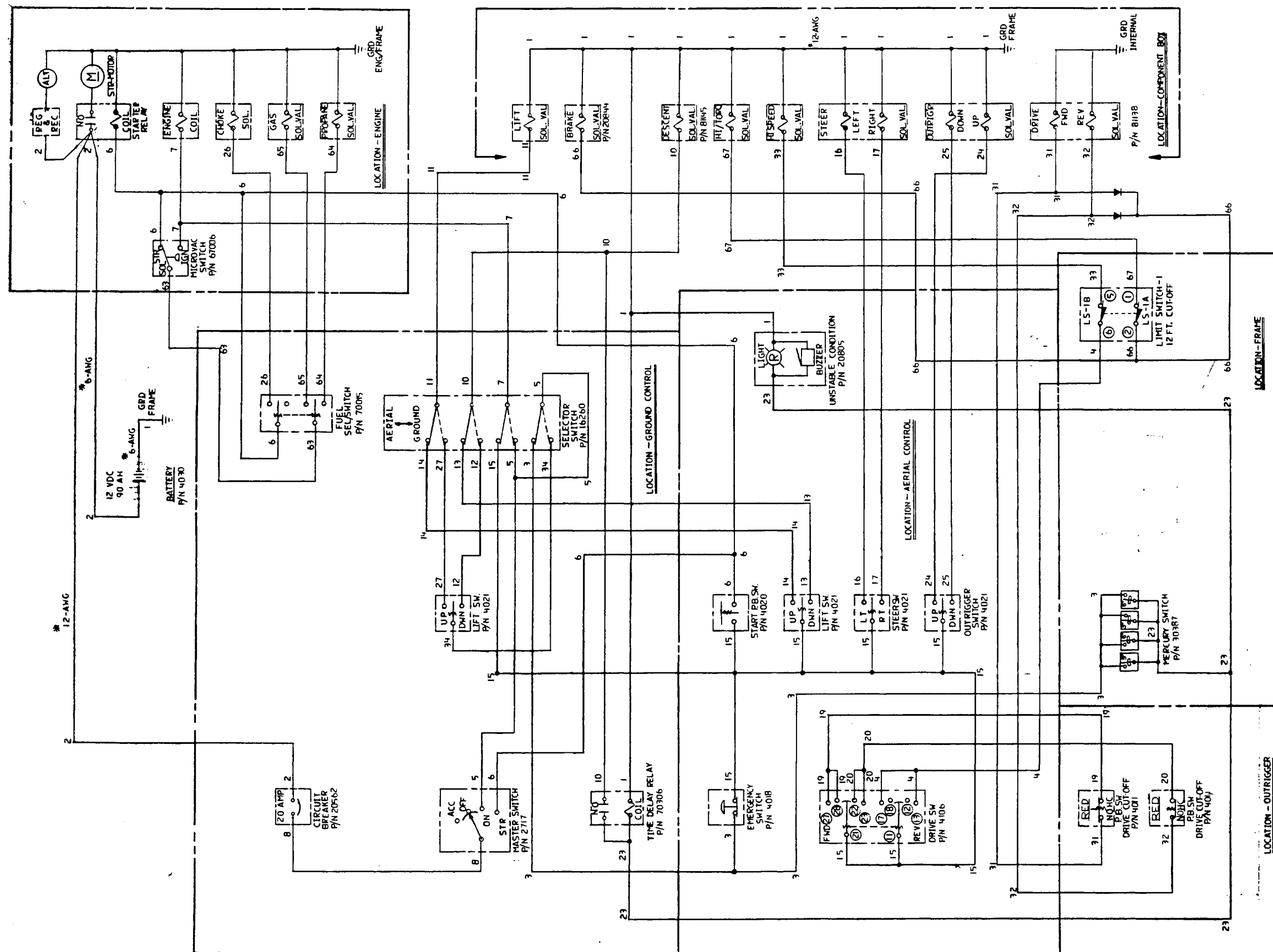
NOTES:
1 - CONNECT ARM CABLE WIRES NO. 6 AND NO. 49 TOGETHER (PARALLEL).



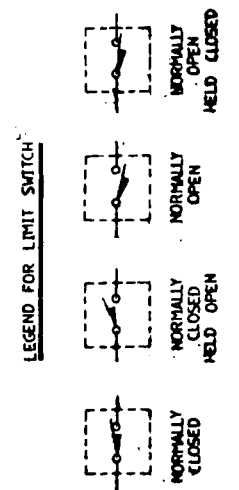
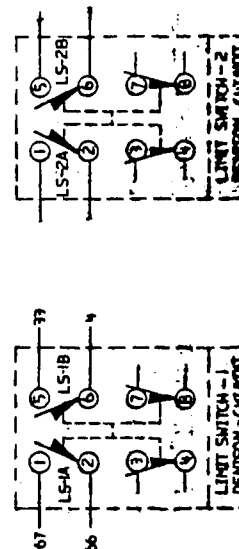


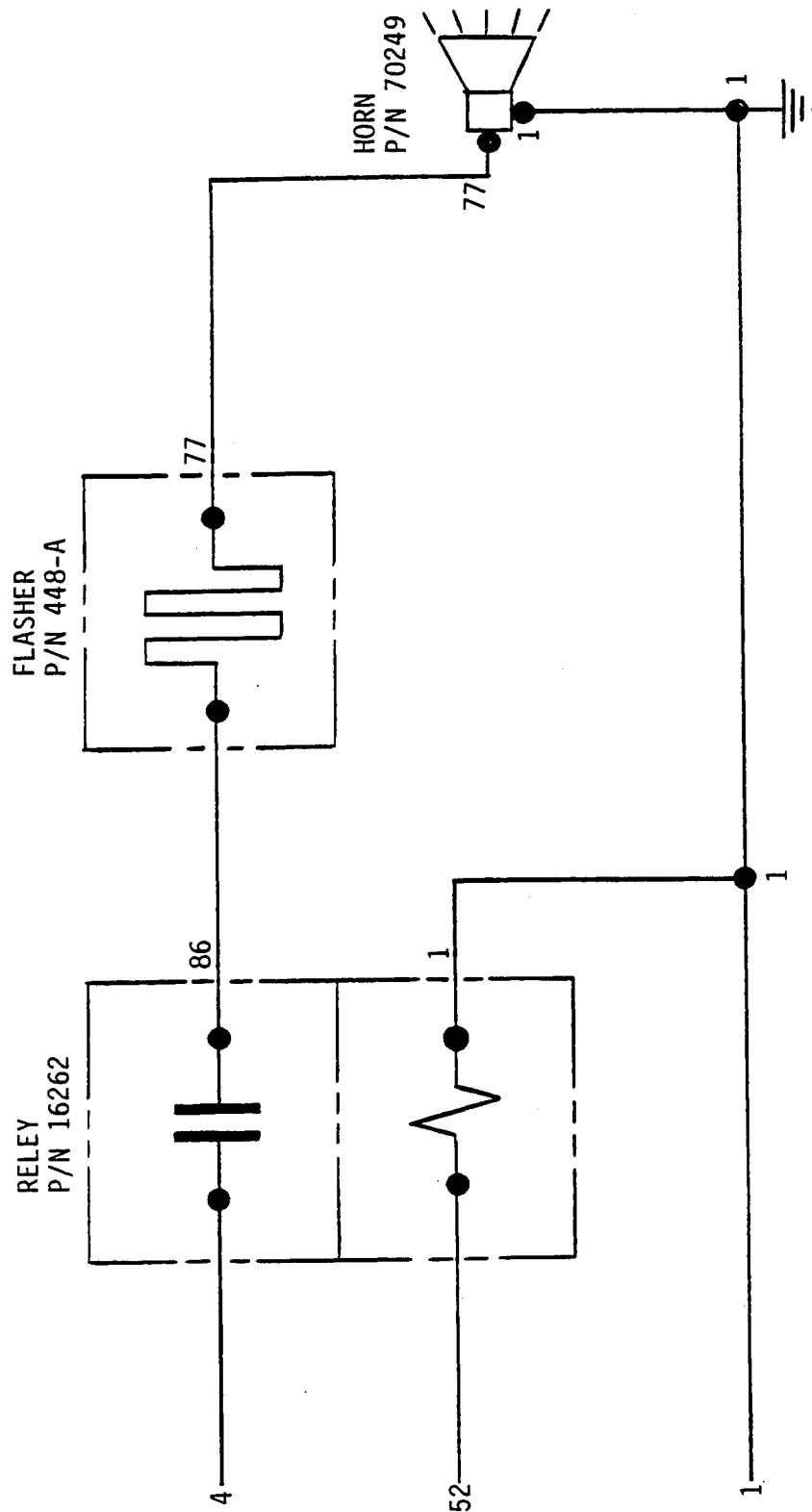
LEGEND FOR LIMIT SWITCH

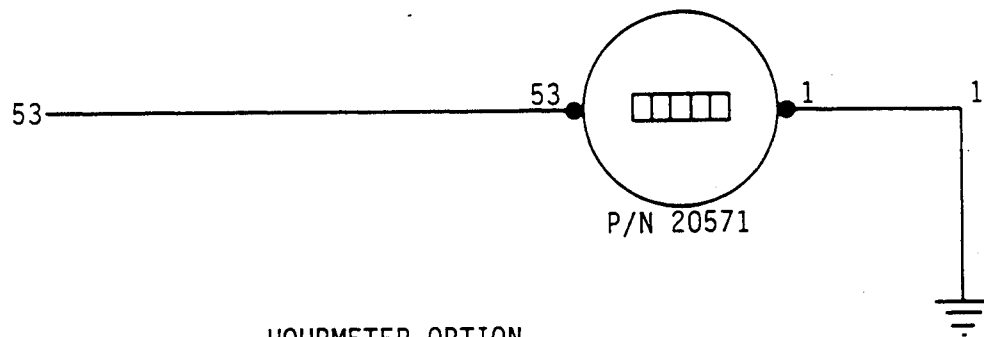




NOTES:
1 -- CONNECT WIRES NO. 49 AND NO.6 TOGETHER.(PARALLEL)



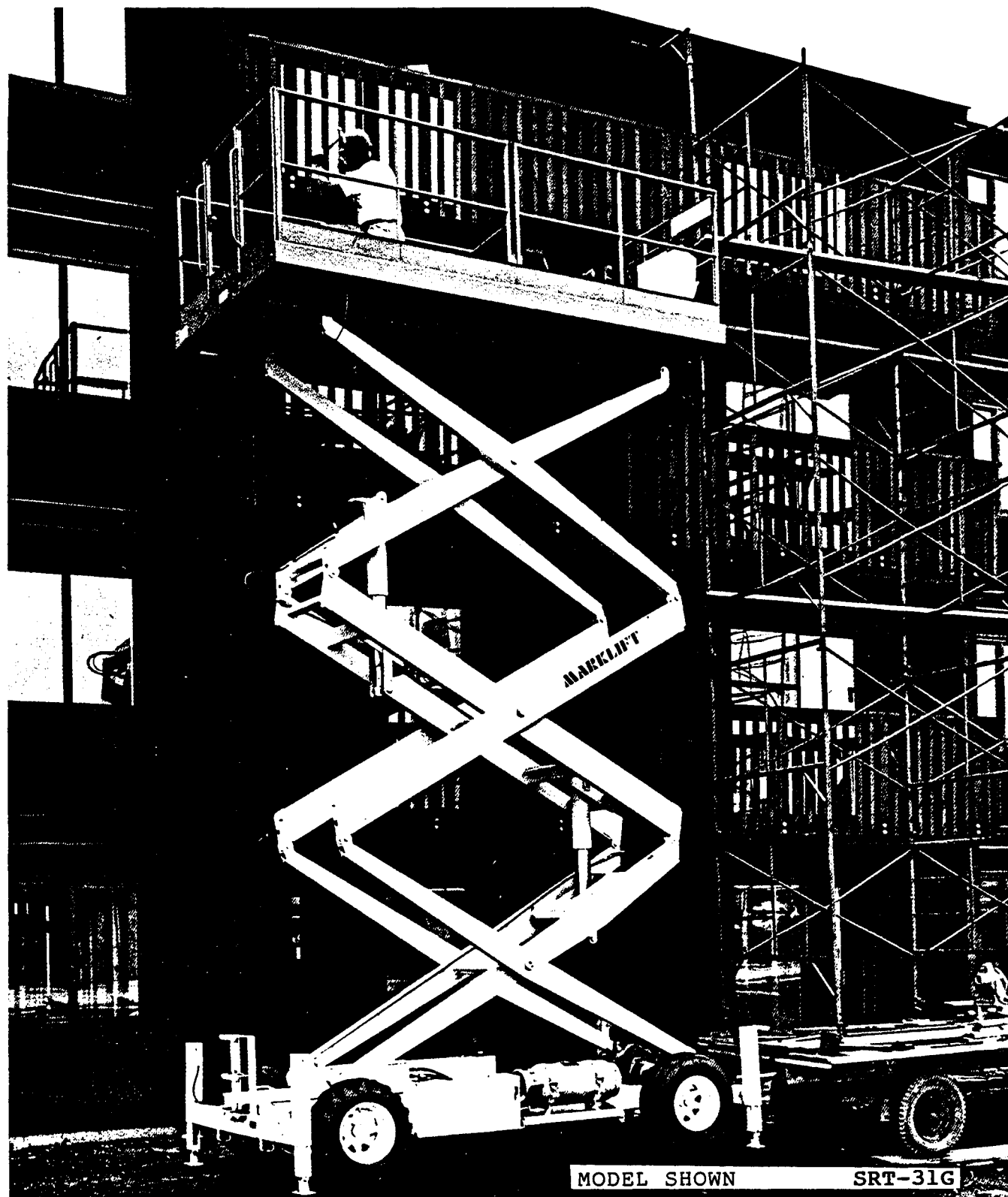




HOURLMETER OPTION



THIS SECTION 1 IS ILLUSTRATED AS
FIGURE 1 HOW TO USE PART CATALOG
FIGURE 2 HOW TO ORDER PARTS
FIGURE 3 TABLE OF CONTENTS (PARTS ONLY)





Mark Industries

ILLUSTRATED
PARTS CATALOG

HOW TO USE PARTS CATALOG

PARTS
SECT. 1
FIG. 1
PAGE 1

 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	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.





Mark Industries

ILLUSTRATED
PARTS CATALOG

HOW TO ORDER PARTS

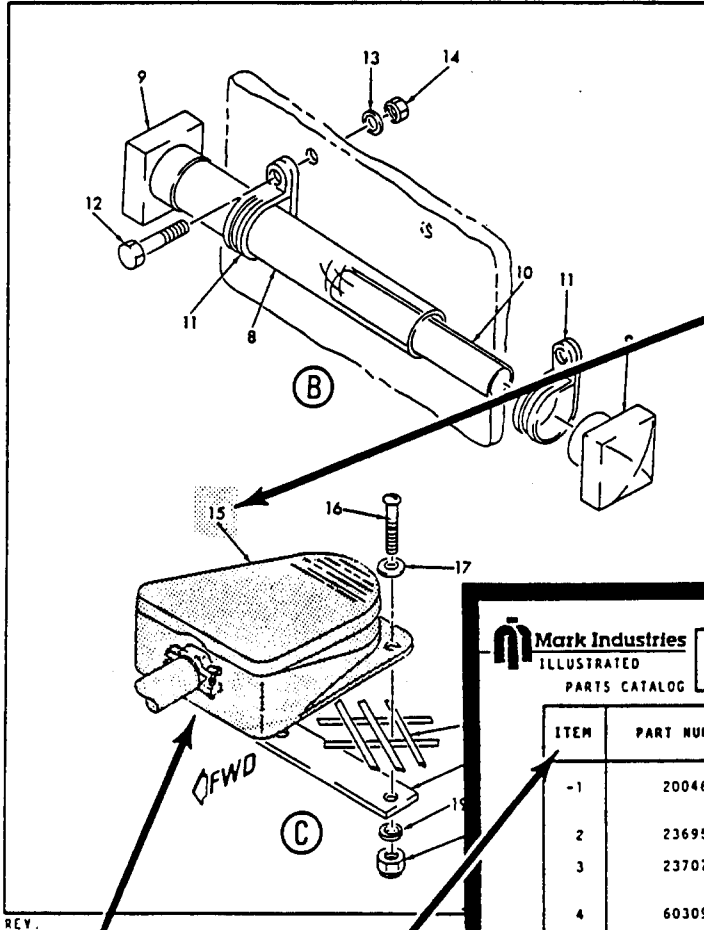
PARTS
SECT. 1
FIG. 2
PAGE 1



Mark Industries
ILLUSTRATED
PARTS CATALOG

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

PARTS
SECT. 2
FIG. 2
PAGE 2



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

REV.

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 FAX: (213) 604-9760

BY PHONE: Parts Department
(213) 639-9700

BY MAIL: Attention Parts Department

MARK INDUSTRIES
Post Office Box 720
Long Beach, Calif. 90801



MARK INDUSTRIES
P.O. Box 2255, Brea, CA 92622
205 South Puente St., Brea, CA 92621
(714) 879-6275, FAX (714) 879-8884

THIS PARTS CHAPTER IS DESIGNED AS:

SECTION 1 PARTS CATALOG

- FIGURE 1 HOW TO USE PARTS CATALOG
- FIGURE 2 HOW TO ORDER PARTS
- FIGURE 3 TABLE OF CONTENTS (PARTS ONLY)

SECTION 2 FINAL ASSEMBLIES

- | | |
|-----------|---|
| FIGURE 1A | FINAL ASSEMBLY (RT-31G) (BEF. JUL. '86) |
| FIGURE 1B | FINAL ASSEMBLY (RT-31G) (AFT. JUL. '86) |
| FIGURE 2 | FINAL ASSEMBLY (RT-31E) |
| FIGURE 3A | FINAL ASSEMBLY (SRT-31G) (BEF. JUL. '86) |
| FIGURE 3B | FINAL ASSEMBLY (SRT-31G) (AFT. JUL. '86) |
| FIGURE 4 | HYDRAULIC TUBE INSTALLATION (RT-31G) (RT-31E) |
| FIGURE 5 | HYDRAULIC TUBE INSTALLATION (SRT-31G) |
| FIGURE 6 | HYDRAULIC HOSE INSTALLATION (RT-31G) |
| FIGURE 7 | HYDRAULIC HOSE INSTALLATION (RT-31E) |
| FIGURE 8 | HYDRAULIC HOSE INSTALLATION (SRT-31G) |

SECTION 3 FRAME ASSEMBLIES

- | | |
|-----------|--|
| FIGURE 1A | STEERING ASSEMBLY (BEF. JUL. '80) |
| FIGURE 1B | STEERING ASSEMBLY (AFT. JUL. '80) |
| FIGURE 2A | FRAME ASSEMBLY (RT-31G) (BEF. JUL. '82) |
| FIGURE 2B | FRAME ASSEMBLY (RT-31G) (AFT. JUL. '82) |
| FIGURE 2C | FRAME ASSEMBLY (RT-31G) (AFT. JUL. '86) |
| FIGURE 3A | FRAME ASSEMBLY (RT-31E) (BEF. JUL. '82) |
| FIGURE 3B | FRAME ASSEMBLY (RT-31E) (AFT. JUL. '82) |
| FIGURE 4A | FRAME ASSEMBLY (SRT-31G) (BEF. JUL. '86) |
| FIGURE 4B | FRAME ASSEMBLY (SRT-31G) (AFT. JUL. '86) |
| FIGURE 4B | FRAME ASSEMBLY (SRT-31G) (AFT. JUL. '86) |
| FIGURE 5A | FRONT AXLE ASSEMBLY (L.H.) (BEF. JUL. '80) |
| FIGURE 5B | FRONT AXLE ASSEMBLY (L.H.) (AFT. JUL. '80) |
| FIGURE 6A | FRONT AXLE ASSEMBLY (R.H.) (BEF. JUL. '80) |
| FIGURE 6B | FRONT AXLE ASSEMBLY (R.H.) (AFT. JUL. '80) |
| FIGURE 7 | STEERING AND DRIVE TIRE ASSEMBLY (RT-31E)
(BEF. JUL. '80) |
| FIGURE 8 | STEERING TIRE ASSEMBLY (R.H.) (RT-31G) (RT-31E)
(AFT. JUL. '80) |
| FIGURE 9 | STEERING TIRE ASSEMBLY (L.H.) (RT-31G) (RT-31E)
(AFT. JUL. '80) |



FIGURE 10	STEERING TIRE ASSEMBLY (SRT-31G)
FIGURE 11	DRIVE TIRE ASSEMBLY (R.H.) (RT-31G) (RT-31E) (AFT. JUL. '80)
FIGURE 12	DRIVE TIRE ASSEMBLY (L.H.) (RT-31G) (RT-31E) (AFT. JUL. '80)
FIGURE 13	DRIVE TIRE ASSEMBLY (R.H.) (SRT-31G)
FIGURE 14	DRIVE TIRE ASSEMBLY (L.H.) (SRT-31G)
FIGURE 15A	FRONT HUB AND DRUM ASSEMBLY (BEF. JUL. '80)
FIGURE 15B	FRONT HUB AND DRUM ASSEMBLY (AFT. JUL. '80)
FIGURE 16A	HUB ASSEMBLY (AFT. JUL. '81)
FIGURE 16B	HUB ASSEMBLY (AFT. JUL. '86)
FIGURE 17	DISC BRAKE INTENSIFIER (AFT. JUL. '82)
FIGURE 18	CALIPER DISC BRAKE ASSEMBLY (AFT. JUL. '82)
FIGURE 19	DRIVE MOTOR AND BRAKE ASSEMBLY (AFT. JUL. '86)
FIGURE 20	DRIVE CONE BRAKE HUB ASSEMBLY
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FIGURE 23	COMPONENT BOX ASSEMBLY (BEF. MAR. '80)
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FIGURE 24B	COMPONENT BOX ASSEMBLY (RT-31G) (AFT. JUL. '86)
FIGURE 25A	COMPONENT BOX ASSEMBLY (RT-31E) (AFT. MAR. '80)
FIGURE 25B	COMPONENT BOX ASSEMBLY (RT-31E) (AFT. JUL. '86)
FIGURE 26A	COMPONENT BOX ASSEMBLY (SRT-31G) (BEF. MAR. '80)
FIGURE 26B	COMPONENT BOX ASSEMBLY (SRT-31G) (AFT. MAR. '80)
FIGURE 26C	COMPONENT BOX ASSEMBLY (SRT-31G) (AFT. JUL. '86)
FIGURE 27	PRESSURE LIMIT SWITCH ASSEMBLY
FIGURE 28A	MANIFOLD ASSEMBLY (RT-31G) (AFT. MAR. '80)
FIGURE 28B	VALVE PACKAGE ASSEMBLY (RT-31G) (RT-31E) (AFT. JUL. '86)
FIGURE 29A	MANIFOLD PACKAGE SUB-ASSEMBLY (RT-31G) (RT-31E) (BEF. MAR. '80)
FIGURE 29B	MANIFOLD PACKAGE SUB-ASSEMBLY (RT-31G) (RT-31E) (AFT. MAR. '80)
FIGURE 30A	MANIFOLD ASSEMBLY (SRT-31G) (AFT. MAR. '80)
FIGURE 30B	VALVE PACKAGE ASSEMBLY (SRT-31G) (AFT. JUL. '86)
FIGURE 31A	MANIFOLD PACKAGE SUB-ASSEMBLY (SRT-31G) (BEF. MAR. '80)
FIGURE 31B	MANIFOLD PACKAGE SUB-ASSEMBLY (SRT-31G) (AFT. MAR. '80)

FIGURE 32	DRIVE SOLENOID VALVE ASSEMBLY (AFT. JUL. '86)
FIGURE 33	LOWERING CONTROL VALVE ASSEMBLY (AFT. JUL. '86)
FIGURE 34A	ELECTRIC PANEL ASSEMBLY (RT-31G) (AFT. MAR. '80)
FIGURE 34B	ELECTRIC PANEL ASSEMBLY (RT-31G) (AFT. JUL. '86)
FIGURE 35A	ELECTRIC PANEL ASSEMBLY (RT-31E) (AFT. MAR. '86)
FIGURE 35B	ELECTRIC PANEL ASSEMBLY (RT-31E) (AFT. JUL. '86)
FIGURE 36A	ELECTRIC PANEL ASSEMBLY (SRT-31G) (AFT. MAR. '80)
FIGURE 36B	ELECTRIC PANEL ASSEMBLY (SRT-31G) (AFT. JUL. '86)
FIGURE 37A	HYDRAULIC TANK ASSEMBLY (AFT. MAY '77)
FIGURE 37B	HYDRAULIC TANK ASSEMBLY (BEF. MAR. '80)
FIGURE 37C	HYDRAULIC TANK ASSEMBLY (AFT. MAR. '80)
FIGURE 37D	HYDRAULIC TANK ASSEMBLY (AFT. JUL. '86)
FIGURE 38	TILT SWITCH ASSEMBLY
FIGURE 39	NEEDLE VALVE ASSEMBLY (AFT. JUL. '86)
FIGURE 40	BELL CRANK ASSEMBLY
FIGURE 41A	TIE ROD ASSEMBLY (BEF. JAN. '80)
FIGURE 41B	TIE ROD ASSEMBLY (AFT. JAN. '80)
FIGURE 42A	TIE ROD ASSEMBLY (BEF. JAN. '80)
FIGURE 42B	TIE ROD ASSEMBLY (AFT. JAN. '80)
FIGURE 43A	STEERING CYLINDER ASSEMBLY (BEF. NOV. '79)
FIGURE 43B	STEERING CYLINDER ASSEMBLY (AFT. NOV. '79)
FIGURE 43C	STEERING CYLINDER ASSEMBLY (AFT. JUL. '86)
FIGURE 44	MANUAL STABILIZER ASSEMBLY
FIGURE 45A	HYDRAULIC OUTRIGGER ASSEMBLY (BEF. JUL. '86)
FIGURE 45B	HYDRAULIC OUTRIGGER ASSEMBLY (AFT. JUL. '86)
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FIGURE 46B	HYDRAULIC OUTRIGGER ASSEMBLY (AFT. JUL. '86)
FIGURE 47	HYDRAULIC OUTRIGGER CYLINDER ASSEMBLY
FIGURE 48	FLOW CONTROL VALVE ASSEMBLY
FIGURE 49	DRIVE AND BRAKE VALVE ASSEMBLY
FIGURE 50	CUSHION CYLINDER ASSEMBLY
FIGURE 51	HYDRAULIC MOTOR AND PUMP ASSEMBLY (AFT. JUL. '86)
FIGURE 52	BATTERY ASSEMBLY
FIGURE 53A	BATTERY BOX ASSEMBLY (AFT. MAY '77)
FIGURE 53B	BATTERY BOX ASSEMBLY (BEF. MAR. '80)
FIGURE 53C	BATTERY BOX ASSEMBLY (AFT. MAR. '80)

FIGURE 54 BATTERY BOX NO. 1 ASSEMBLY (AFT. JUL. '86)

FIGURE 55 BATTERY BOX NO. 2 ASSEMBLY (AFT. JUL. '86)

SECTION 4 SCISSOR ASSEMBLY

FIGURE 1 SCISSOR ASSEMBLY

FIGURE 2A MAIN LIFT CYLINDER ASSEMBLY (BEF. NOV. '81)

FIGURE 2B MAIN LIFT CYLINDER ASSEMBLY (AFT. NOV. '81)

SECTION 5 DECK ASSEMBLIES

FIGURE 1A DECK ASSEMBLY (BEF. JUL. '86)

FIGURE 1B DECK ASSEMBLY (AFT. JUL. '86)

FIGURE 2A HAND CONTROL BOX ASSEMBLY (RT-31G) (BEF. JUL. '86)

FIGURE 2B UPPER CONTROL BOX ASSEMBLY (RT-31G) (AFT. JUL. '86)

FIGURE 3 HAND CONTROL BOX ASSEMBLY (RT-31E)

FIGURE 4A HAND CONTROL BOX ASSEMBLY (SRT-31G) (BEF. JUL. '86)

FIGURE 4B UPPER CONTROL BOX ASSEMBLY (SRT-31G) (AFT. JUL. '86)

SECTION 6 OPTIONAL ASSEMBLIES

FIGURE 1 TRAVEL WARNING HORN ASSEMBLY

FIGURE 2 HOURMETER ASSEMBLY

FIGURE 3 2 FEET EXTENSION DECK ASSEMBLY

FIGURE 4 SWING DECK ASSEMBLY

FIGURE 5 LIFTING LUGS ASSEMBLY

FIGURE 6 110 VAC TO PLATFORM ASSEMBLY

FIGURE 7A A.C. OPTION BOX ASSEMBLY (BEF. SEP. '87)

FIGURE 7B A.C. OPTION BOX ASSEMBLY (AFT. SEP. '87)

FIGURE 8 ROTATING BEACON ASSEMBLY

FIGURE 9 HYDRAULIC OUTRIGGER COMPONENT BOX ASSEMBLY (RT-31G)
(AFT. MAR. '80)

FIGURE 10 HYDRAULIC OUTRIGGER COMPONENT BOX ASSEMBLY (RT-31E)
(AFT. MAR. '80)

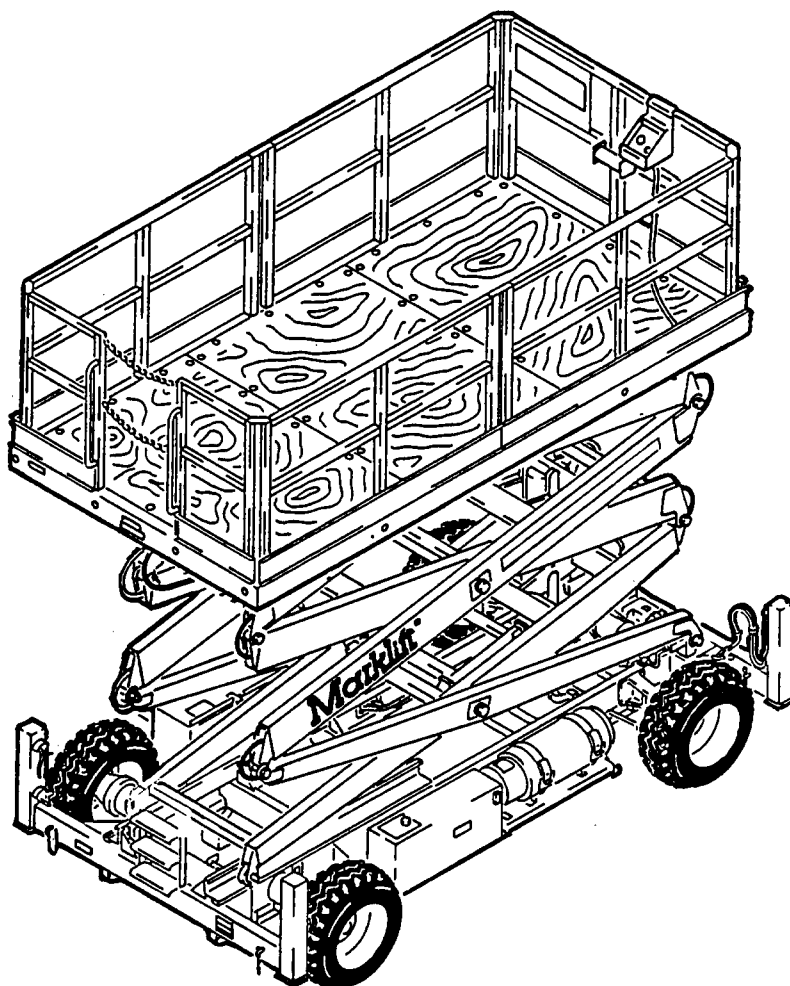
FIGURE 11 MANIFOLD OPTION ASSEMBLY

FIGURE 12A MANIFOLD OPTION SUB-ASSEMBLY (BEF. MAR. '80)

FIGURE 12B MANIFOLD OPTION SUB-ASSEMBLY (AFT. MAR. '80)

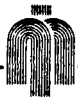
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CALIFORNIA



THIS SECTION 2 IS ILLUSTRATED AS

FIGURE 1A	FINAL ASSEMBLY (RT-31G) (BEF. JUL. '86)
FIGURE 1B	FINAL ASSEMBLY (RT-31G) (AFT. JUL. '86)
FIGURE 2	FINAL ASSEMBLY (RT-31E)
FIGURE 3A	FINAL ASSEMBLY (SRT-31G) (BEF. JUL. '86)
FIGURE 3B	FINAL ASSEMBLY (SRT-31G) (AFT. JUL. '86)
FIGURE 4	HYDRAULIC TUBE INSTALLATION (RT-31G) (RT-31E)
FIGURE 5	HYDRAULIC TUBE INSTALLATION (SRT-31G)
FIGURE 6	HYDRAULIC HOSE INSTALLATION (RT-31G)
FIGURE 7	HYDRAULIC HOSE INSTALLATION (RT-31E)
FIGURE 8	HYDRAULIC HOSE INSTALLATION (SRT-31G)



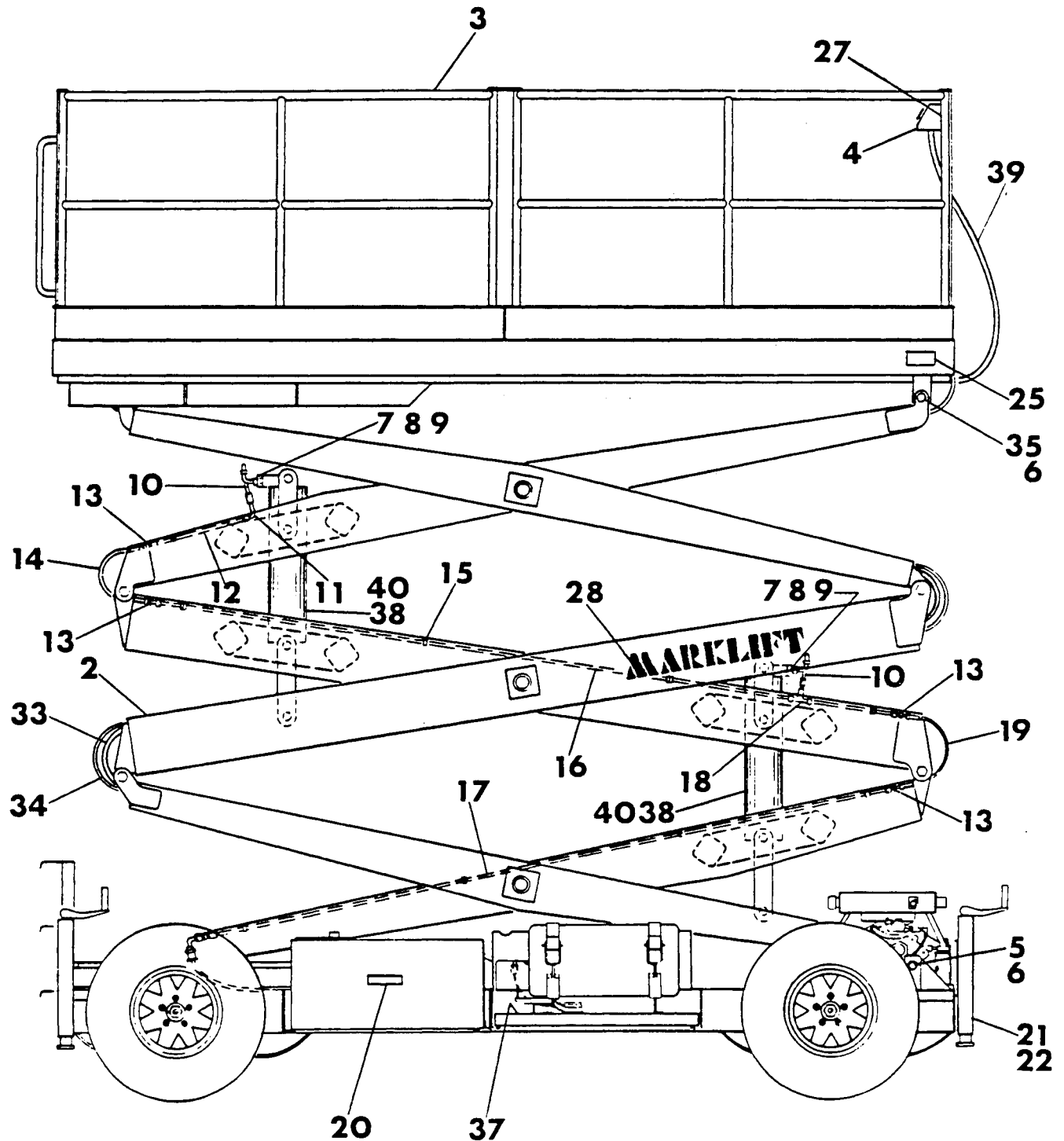
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ILLUSTRATED
PARTS CATALOG

FINAL ASSEMBLY (RT-31G) (BEF. JUL. '86)

PARTS
SECT. 2
FIG. 1A
PAGE 1

SERIAL NUMBER EFFECTIVITY IS 577-2022 ON



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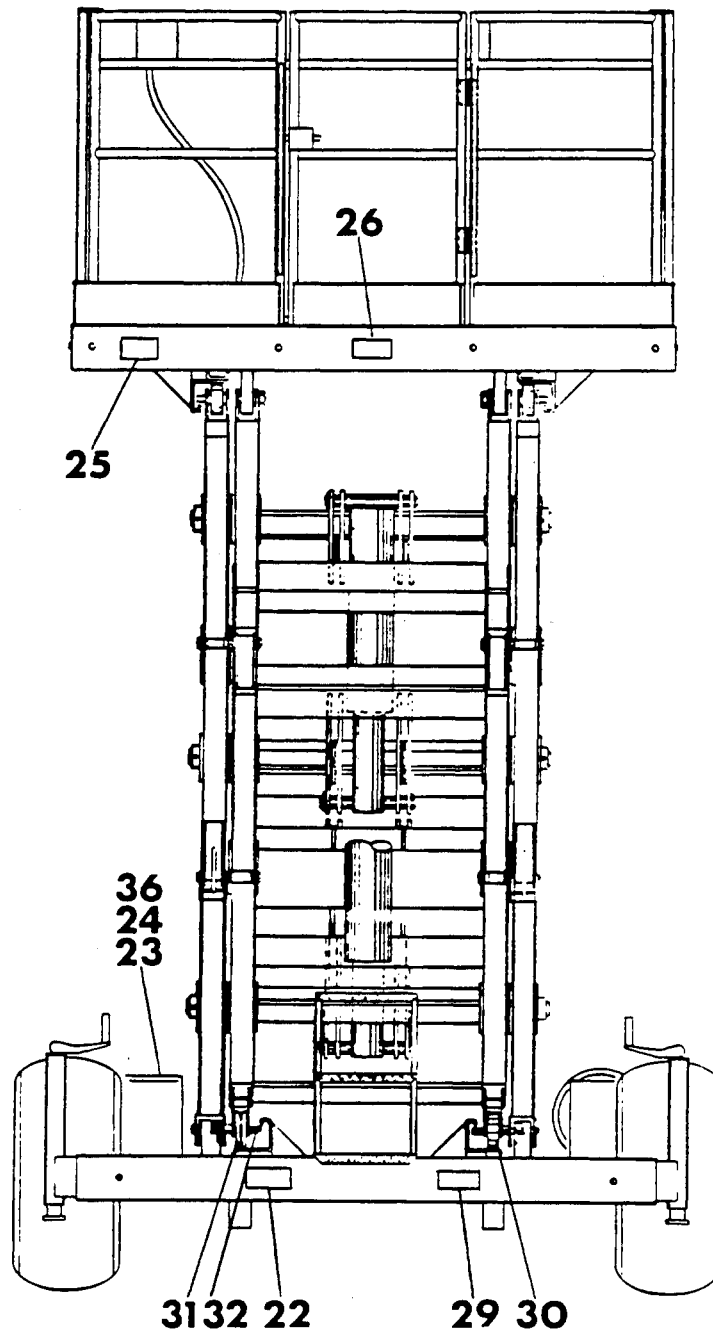
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FINAL ASSEMBLY (RT-31G) (BEP. JUL. '86)

(continued)

PARTS
SECT. 2
FIG. 1A
PAGE 2



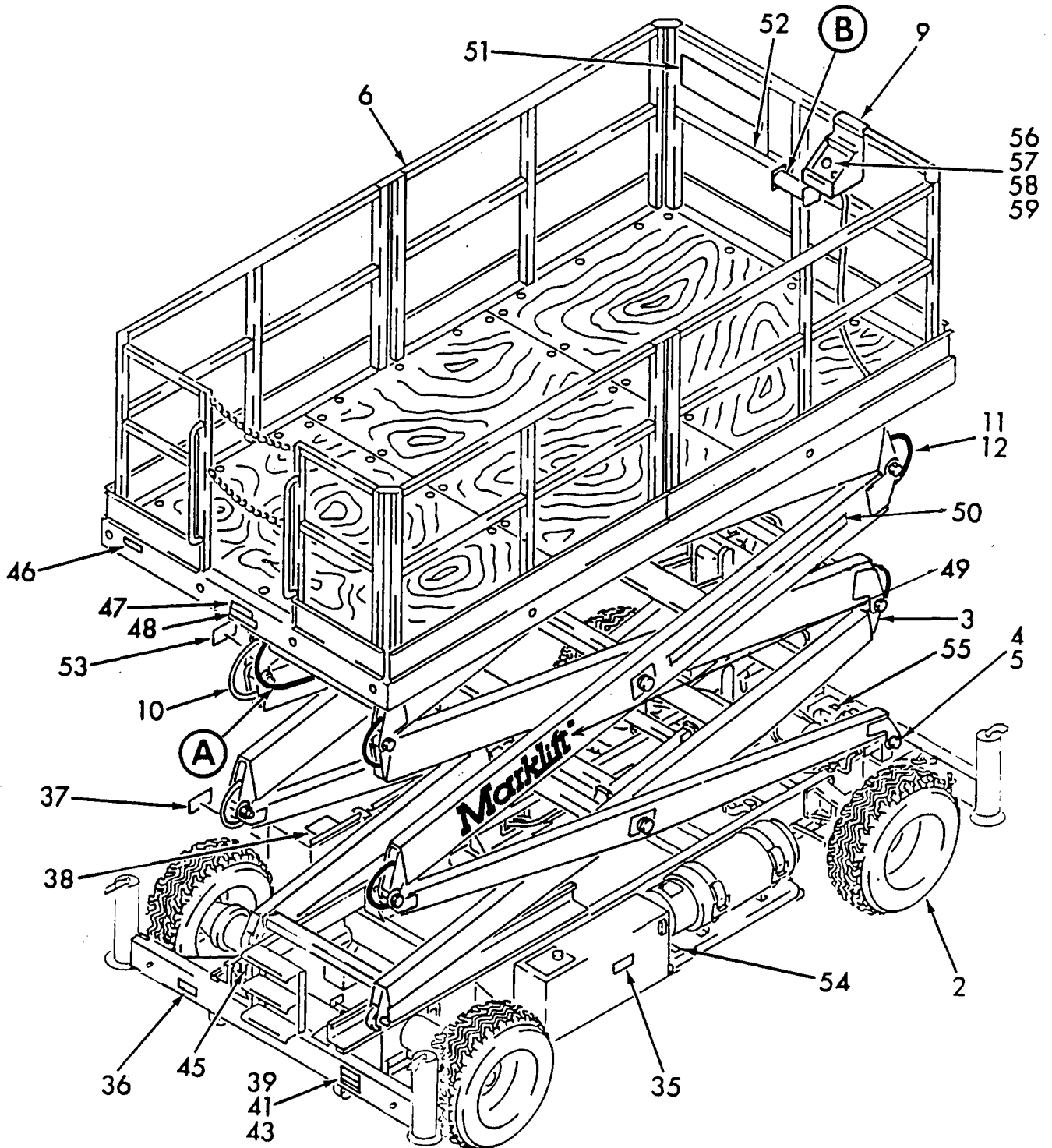
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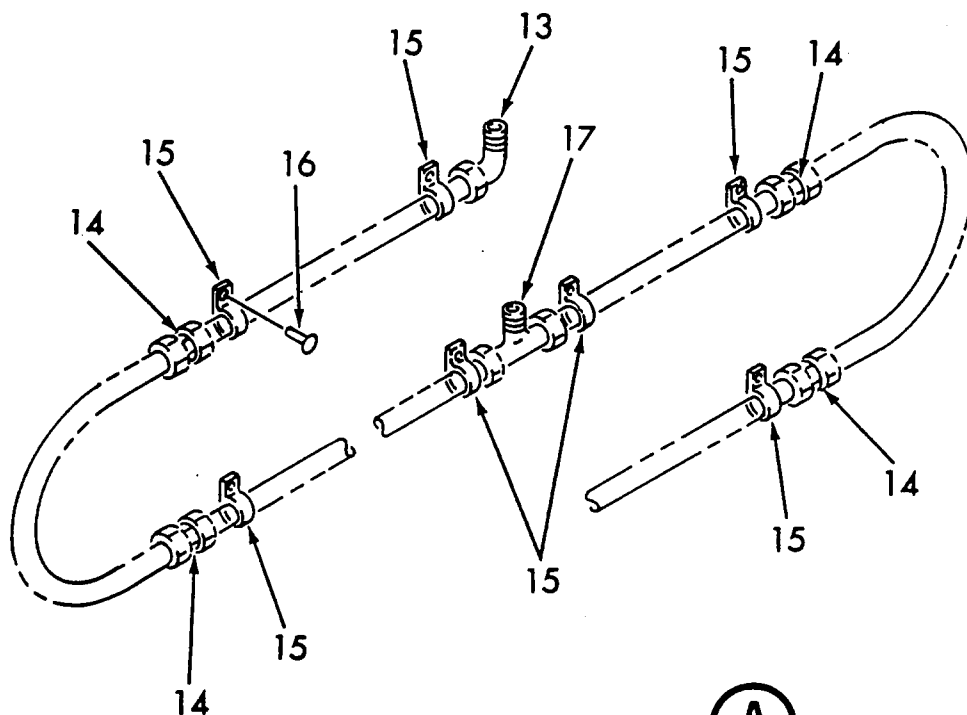


ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30004	ASSEMBLY, FINAL	REF
2	8115	.ASSEMBLY, SCISSOR (See Sect. 4, Fig. 1 for Details)	1
3	30556	.ASSEMBLY, DECK (See Sect. 5, Fig. 1A for Details)	1
4	4068-1	.ASSEMBLY, HAND CONTROL BOX (See Sect. 5, Fig. 2A for Details)	1
5	60336	.BOLT, EAR PIVOT	2
6	61310	.NUT	4
7	780	.ADAPTER	2
8	3023-1	.SPACER	2
9	3059	.VALVE, CHECK	2
10	339-186-186B	.ASSEMBLY, HOSE (16")	2
11	80014-06	.ELBOW, 90°	1
12	235-2500-2501	.ASSEMBLY, TUBE (1/2 X 18)	2
13	80042-06	.UNION	4
14	339-186B-186B	.ASSEMBLY, HOSE (27")	1
15	764	.CLAMP, TUBE	13
16	235-2500-2501	.ASSEMBLY, TUBE (1/2 X 10')	1
17	235-2500-2501	.ASSEMBLY, TUBE (1/2 X 10')	1
18	80031-06	.TEE	1
19	339-186B-186B	.ASSEMBLY, HOSE (31")	1
20	2017	.DECAL, HYDRAULIC FLUID SPEC.	2
21	2003	.DECAL, BATTERY WATER LEVEL	1
22	2041	.DECAL, DO NOT LIFT FROM THIS END	2
23	2019	.DECAL, EMERGENCY LOWERING VALVE	1
24	2016	.DECAL, WARNING DO NOT WORK UNDERNEATH	1
25	2027	.DECAL, LOAD CAPACITY 2000 LBS.	4

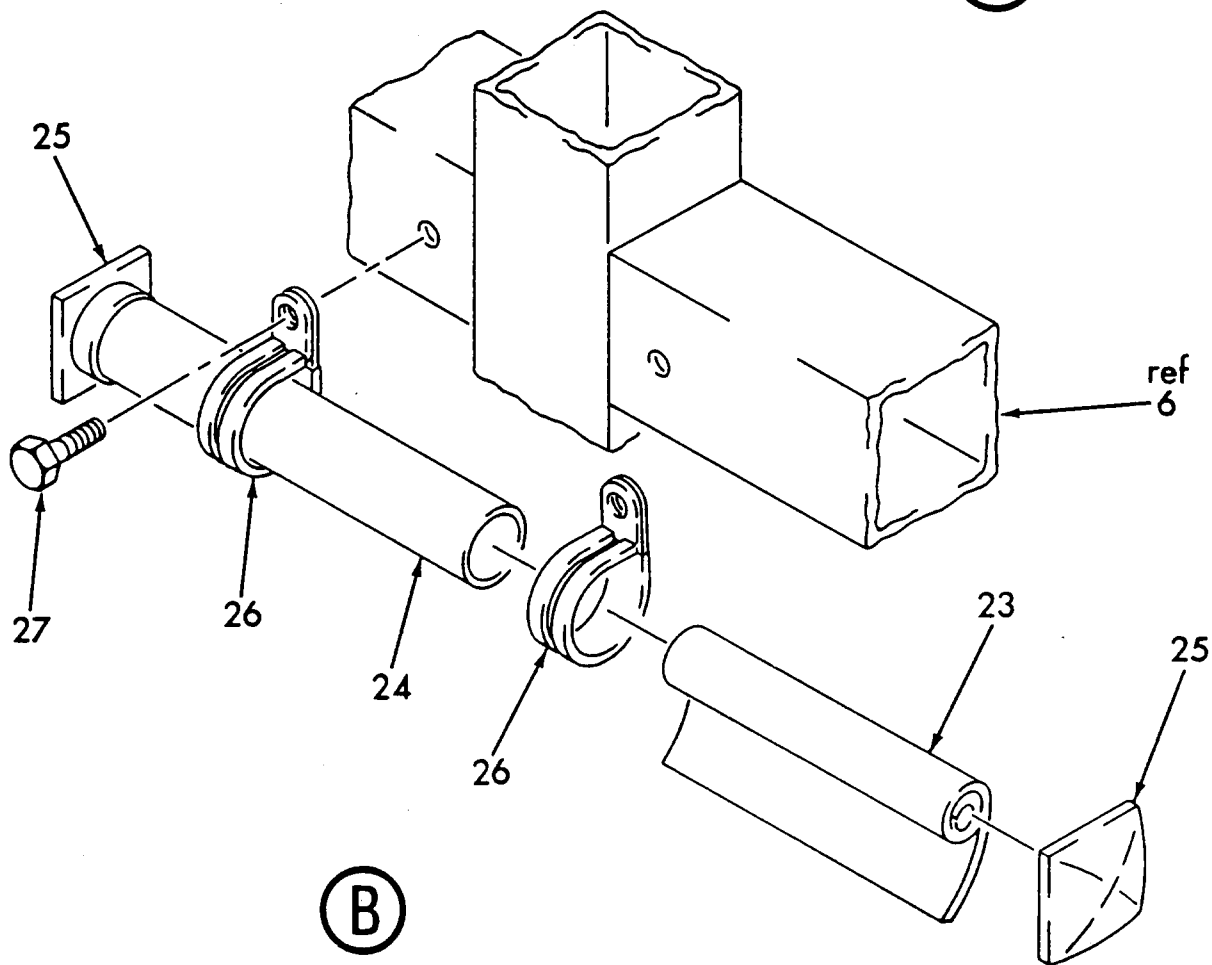


ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
26	2018	.DECAL, ANSI AND OSHA SPEC.	1
27	30416	.DECAL, OPERATING INSTRUCTIONS	1
28	2049	.DECAL, MARKLIFT	2
29	2012	.PLATE, MODEL AND SERIAL NUMBER	1
30	2361	.ROLLER, DECK	3
31	2362	.ROLLER, "V" DECK	1
32	2364	.PIN, ROLLER	4
33	4034	.CABLE, POWER TO PLATFORM	1
34	30392	.ASSEMBLY, ARM CONTROL CABLE	1
35	60350	.BOLT, EAR PIVOT	2
36	2020	.DECAL, GASOLINE OR PETROL	1
37	2004	.DECAL, USE VAPOR TANK ONLY	1
38	3006	.ASSEMBLY, MAIN LIFT CYLINDER (BEF. NOV. '81) (See Sect. 4, Fig. 2A for Details)	2
39	2730	.ASSEMBLY, CONTROL CABLE	1
40	30809	.ASSEMBLY, MAIN LIFT CYLINDER (AFT. NOV. '81) (See Sect. 4, Fig. 2B for Details)	2
41		.ASSEMBLY, STEERING (BEF. JUL. '80) (See Sect. 3, Fig. 1A for Details)	1
-42		.ASSEMBLY, STEERING (AFT. JUL. '80) (See Sect. 3, Fig. 1B for Details)	1
-43	8112	.ASSEMBLY, FRAME (BEF. JUL. '82) (See Sect. 3, Fig. 2A for Details)	1
-44	30856	.ASSEMBLY, FRAME (AFT. JUL. '82) (See Sect. 3, Fig. 2B for Details)	1





(A)



(B)



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30004	ASSEMBLY, FINAL (AFT. JUL. '86)	REF
2	32382	.ASSEMBLY, FRAME (See Sect. 3, Fig. 2C for Details)	1
3	8115	.ASSEMBLY, SCISSOR (See Sect. 4, Fig. 1 for Details)	1
4	30890	.BOLT, EAR PIVOT (attaching part)	2
5	61310	.NUT, LOCK (attaching part)	2
6	32049	.ASSEMBLY, DECK (See Sect. 5, Fig. 1B for Details)	1
-7	30890	.BOLT, EAR PIVOT (attaching part)	2
-8	61310	.NUT, LOCK (attaching part)	2
9	32409	.ASSEMBLY, UPPER CONTROL BOX (See Sect. 5, Fig. 2B for Details)	1
10	130337-75	.CONDUCTOR, CABLE	1
11	32420	.DIAGRAM, TUBE KIT (See Sect. 2, Fig. 4 for Details)	1
12	32416	.DIAGRAM, HOSE KIT (See Sect. 2, Fig. 6 for Details)	1
13	80014-06	.ELBOW, UNION	1
14	80042-06	.UNION	4
15	764	.CLAMP	13
16	63651	.RIVET, POP (attaching part)	13
17	80031-06	.TEE, UNION	1
-18	32456	.DIAGRAM, ELECTRIC (See Schematic Chapter for Details)	1
-19	32360	.SCHEMATIC, HYDRAULIC (See Schematic Chapter for Details)	1
-20	255	.TIE, CABLE	AR
-21	256	.TIE, CABLE	AR
-22	32400	.SCHEMATIC, ELECTRIC (See Chapter Schematic for Details)	1



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
23	16628	.HANDBOOK, SCISSOR	1
24	130927	.CONTAINER, PLASTIC	1
25	65842	.CAP, ANTI-ROLL	2
26	65867	.CLAMP	2
27	61711	.SCREW, CAP (attaching part)	2
-28	65114	.GASOLINE (5 GAL.)	AR
-29	65116	.OIL, HYDRAULIC (18 GAL.)	AR
-30	2673	.PAINT, WHITE (16 OZ.)	AR
-31	65368	.PAINT, BLUE (16 OZ.)	AR
-32	16608	.PAINT, WHITE (6 GAL.)	AR
-33	16609	.PAINT, BLUE (2 GAL.)	AR
-34		.KIT, DECAL	1
35	2017	..DECAL, HYDRAULIC FLUID SPECIFICATION	2
36	2041	..DECAL, DO NOT LIFT FROM THIS END	2
37	2019	..DECAL, EMERGENCY LOWERING VALVE	1
38	2016	..DECAL, WARNING DO NOT WORK	2
39	20661	..NAMEPLATE, ANSI-A92	1
-40	375	..RIVET, POP (attaching part)	4
41	20660	..NAMEPLATE, IDENTIFICATION	1
-42	375	..RIVET, POP (attaching part)	4
43	30520	..NAMEPLATE, PATTERN NUMBER	1
-44	375	..RIVET, POP (attaching part)	4
45	130606	..DECAL, FREE WHEELING VALVE	1
46	2027	..DECAL, LOAD CAPACITY 2,000 LBS.	4
47	31109	..DECAL, CAUTION	1
48	11064	..DECAL, ATTACH SAFE CHAIN	1
49	31260	..DECAL, MARKLIFT	2

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PARTS CATALOG

FINAL ASSEMBLY (RT-31G) (AFT. JUL. '86)

(continued)

PARTS
SECT. 2
FIG. 1B
PAGE 5

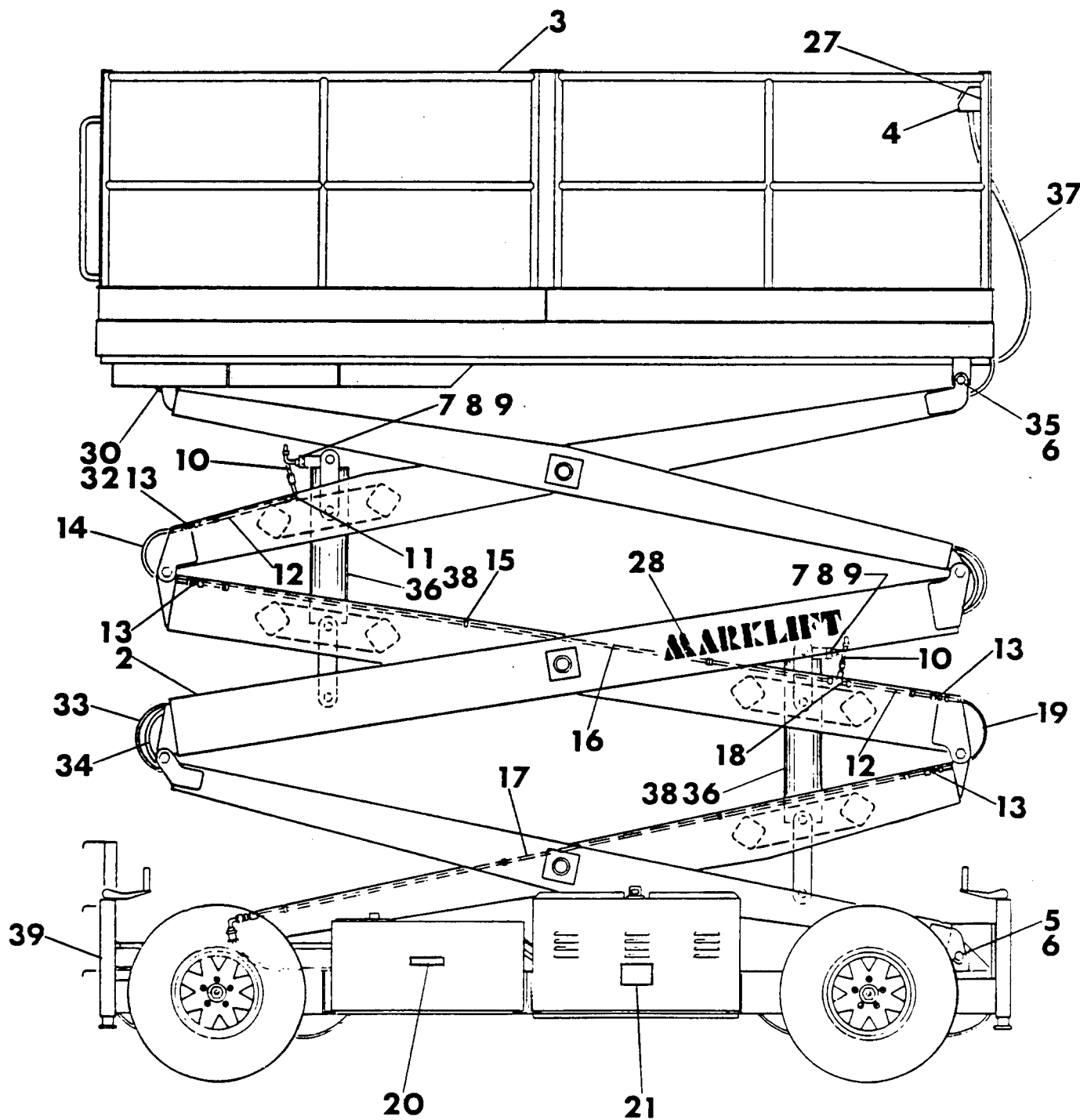
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
50	130596	..DECAL, A PRODUCT OF MARK INDUSTRIES	2
51	30416	..DECAL, OPERATING INSTRUCTIONS	1
52	130820	..DECAL, OPERATION AND SAFETY HANDBOOK	1
53	2020	..DECAL, GASOLINE OR PETROL	1
54	2004	..DECAL, USE VAPOR TANK ONLY	1
55	2003	..DECAL, BATTERY WATER LEVEL	1
56	2008	..DECAL, CONTROL BOX	1
57	2013	..DECAL, CAUTION	1
58	2014	..DECAL, CAUTION	1
59	2015	..DECAL, WARNING	1

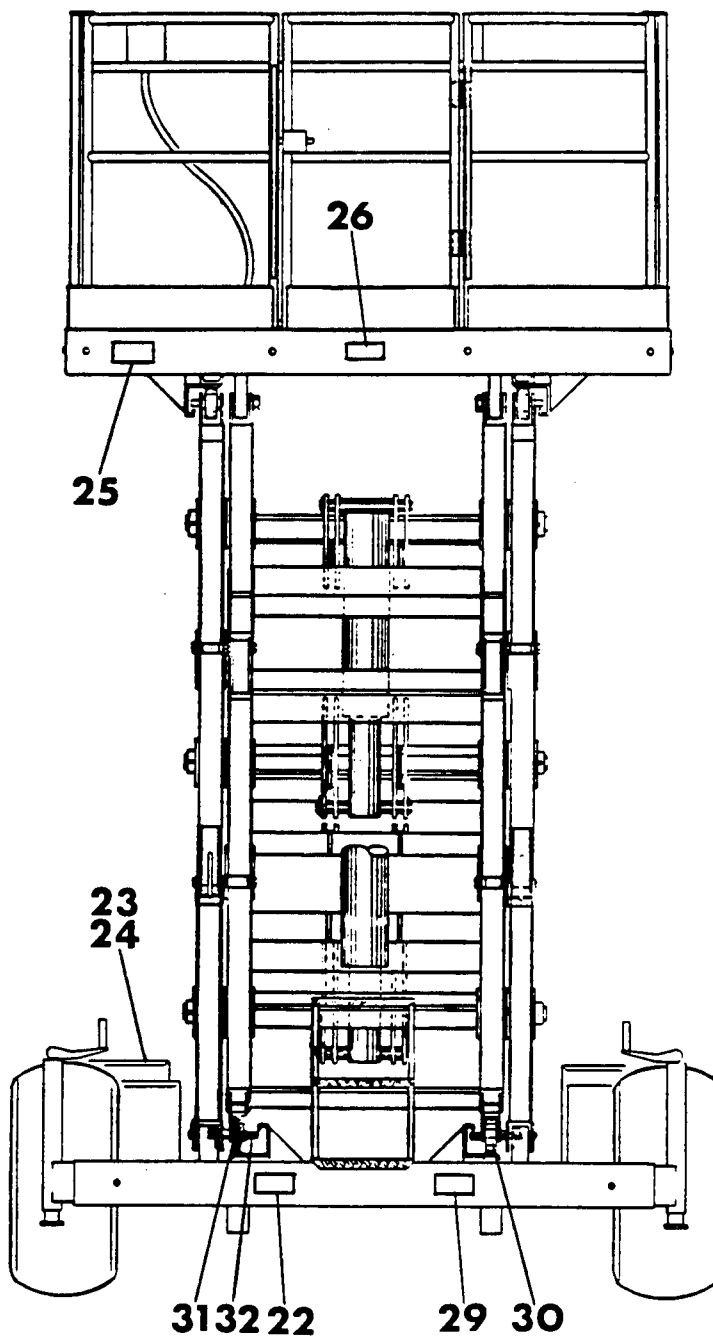
REV.

- ITEM NOT ILLUSTRATED



SERIAL NUMBER EFFECTIVITY IS 577-2000 ON





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PARTS CATALOG

FINAL ASSEMBLY (RT-31E)

(continued)

PARTS
SECT. 2
FIG. 2
PAGE 3

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	30005	ASSEMBLY, FINAL	REF
2	8115	.ASSEMBLY, SCISSOR (See Sect. 4, Fig. 1 for Details)	1
3	30556	.ASSEMBLY, DECK (BEF. JUL. '86) (See Sect. 5, Fig. 1A for Details)	1
-3A	32049	.ASSEMBLY, DECK (AFT. JUL. '86) (See Sect. 5, Fig. 1B for Details)	1
4	4069-1	.ASSEMBLY, HAND CONTROL BOX (See Sect. 5, Fig. 3 for Details)	1
5	30890	.BOLT, EAR PIVOT	2
6	61310	.NUT	4
7	80004-14	.ADAPTER	2
8	3023-1	.SPACER	2
9	3059	.VALVE, CHECK	2
10	339-186-186B	.ASSEMBLY, HOSE (16")	2
11	80014-06	.ELBOW, 90°	1
12	235-2500-2501	.ASSEMBLY, TUBE (1/2 X 18)	2
13	80042-06	.UNION	4
14	339-186B-186B	.ASSEMBLY, HOSE (27")	1
15	764	.CLAMP	13
16	235-2500-2501	.ASSEMBLY, TUBE (1/2 X 10')	1
17	235-2500-2501	.ASSEMBLY, TUBE (1/2 X 10')	1
18	80031-06	.TEE	1
19	339-186B-186B	.ASSEMBLY, HOSE (31")	1
20	2017	.DECAL, HYDRAULIC FLUID SPEC.	2
21	2003	.DECAL, BATTERY WATER LEVEL	1
22	2041	.DECAL, DO NOT LIFT FROM THIS END	2
23	2019	.DECAL, EMERGENCY LOWERING VALVE	1
24	2016	.DECAL, WARNING DO NOT WORK UNDERNEATH	1

REV.

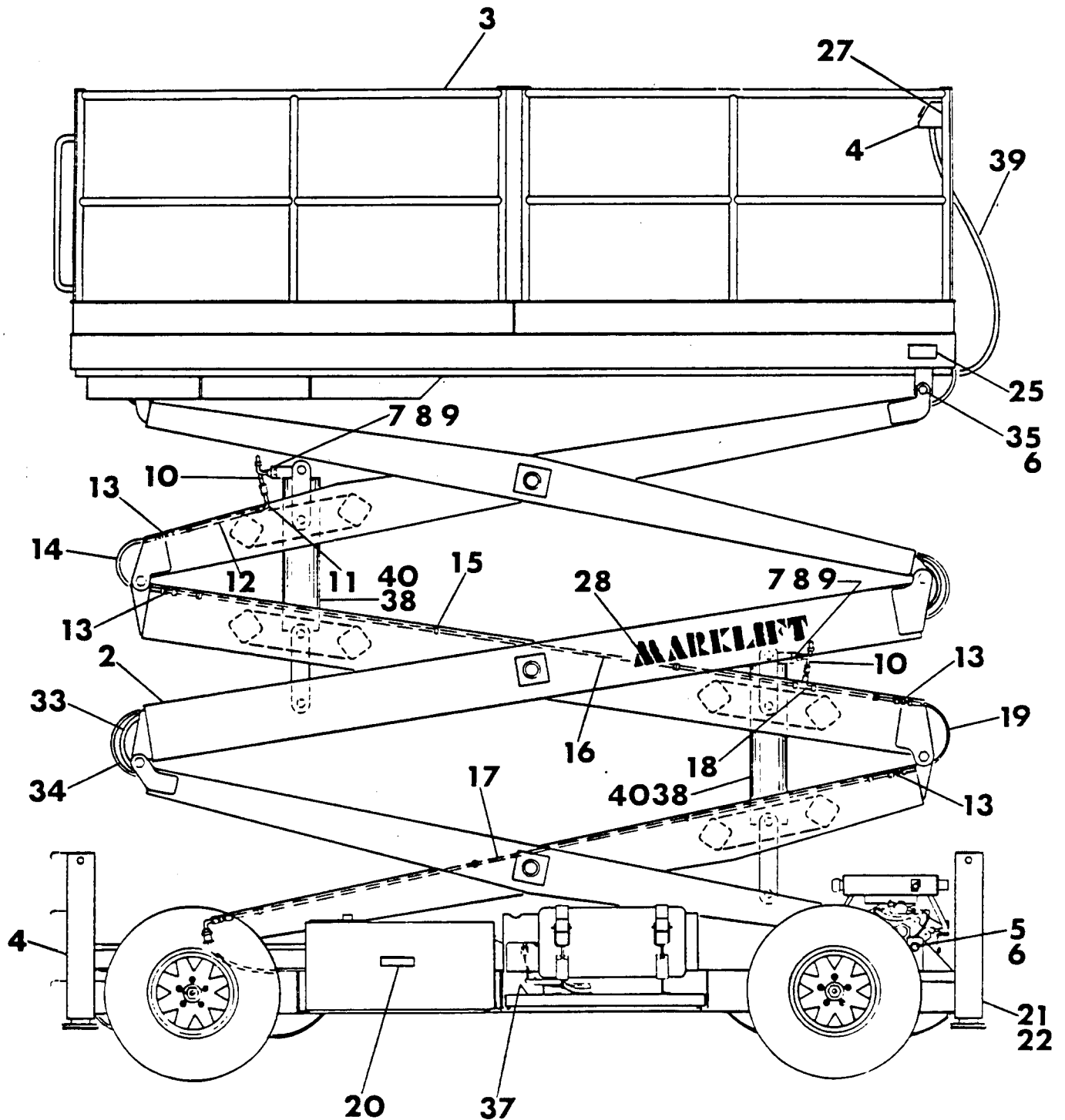
- ITEM NOT ILLUSTRATED



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
25	2027	.DECAL, LOAD CAPACITY 2,000 LBS.	4
26	20661	.DECAL, ANSI AND OSHA SPEC.	1
27	30416	.DECAL, OPERATING INSTRUCTIONS	1
28	31260	.DECAL, MARKLIFT	2
29	20660	.PLATE, MODEL AND SERIAL NUMBER	1
30	2361	.ROLLER, DECK	3
31	2362	.ROLLER, "V" DECK	1
32	35806	.PIN, ROLLER	4
33	4034	.CABLE, POWER TO PLATFORM	1
34	30392	.ASSEMBLY, ARM CONTROL CABLE	1
35	60350	.BOLT, EAR PIVOT	2
36	3006	.ASSEMBLY, MAIN LIFT CYLINDER (BEF. NOV. '81) (See Sect. 4, Fig. 2A for Details)	2
37	2730	.ASSEMBLY, CONTROL CABLE	1
38	30809	.ASSEMBLY, MAIN LIFT CYLINDER (AFT. NOV. '81) (See Sect. 4, Fig. 2B for Details)	2
39	8111	.ASSEMBLY, FRAME (BEF. JUL. '82) (See Sect. 3, Fig. 3A for Details)	1
-40		.ASSEMBLY, FRAME (AFT. JUL. '82) (See Sect. 3, Fig. 3B for Details)	1
-41	32420	.DIAGRAM, TUBE KIT (See Sect. 2, Fig. 4 for Details)	1
-42	32418	.DIAGRAM, HOSE KIT (See Sect. 2, Fig. 6 for Details)	1
-43	32436	.SCHEMATIC, HYDRAULIC (See Schematic Chapter for Details)	1
-44	32399	.SCHEMATIC, ELECTRIC (See Schematic Chapter for Details)	1
-45	32451	.DIAGRAM, ELECTRIC (See Schematic Chapter for Details)	1



SERIAL NUMBER EFFECTIVITY IS 577-2020 ON





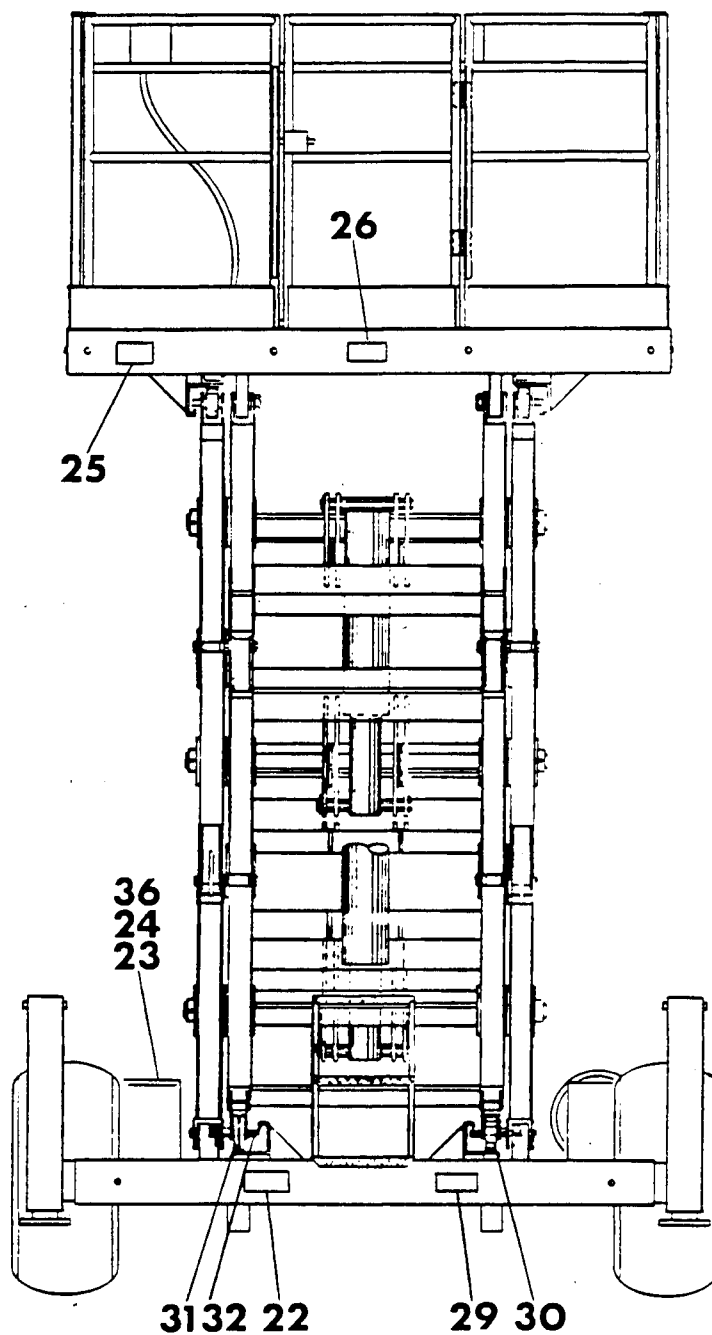
Mark Industries

ILLUSTRATED
PARTS CATALOG

FINAL ASSEMBLY (SRT-31G) (BEF. JUL. '86)

(continued)

PARTS
SECT. 2
FIG. 3A
PAGE 2



REV.



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30006	ASSEMBLY, FINAL	REF
2	8115	.ASSEMBLY, SCISSOR (See Sect. 4, Fig. 1 for Details)	1
3	30556	.ASSEMBLY DECK (See Sect. 5, Fig. 1A for Details)	1
4	8325-5	.ASSEMBLY, HAND CONTROL BOX (See Sect. 5, Fig. 4A for Details)	1
5	30890	.BOLT, EAR PIVOT	2
6	61310	.NUT	4
7	80004-14	.ADAPTER	2
8	3023-1	.SPACER	2
9	3059	.VALVE, CHECK	2
10	339-186-186B	.ASSEMBLY, HOSE (16")	2
11	80014-06	.ELBOW, 90°	1
12	235-2500-2501	.ASSEMBLY, TUBE (1/2 X 18)	2
13	80042-06	.UNION	4
14	339-186B-186B	.ASSEMBLY, HOSE (27")	1
15	764	CLAMP, TUBE	13
16	235-2500-2501	.ASSEMBLY, TUBE (1/2 X 10')	1
17	235-2500-2501	.ASSEMBLY, TUBE (1/2 X 10')	1
18	80031-06	.TEE	1
19	339-186B-186B	.ASSEMBLY, HOSE (31")	1
20	2017	.DECAL, HYDRAULIC FLUID SPEC.	2
21	2003	.DECAL, BATTERY WATER LEVEL	1
22	2041	.DECAL, DO NOT LIFT FROM THIS END	2
23	2019	.DECAL, EMERGENCY LOWERING VALVE	1
24	2016	.DECAL, WARNING DO NOT WORK UNDERNEATH	1
25	2027	.DECAL, LOAD CAPACITY 2,000 LBS.	4

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PARTS CATALOG

FINAL ASSEMBLY (SRT-31G) (BEF. JUL. '86)

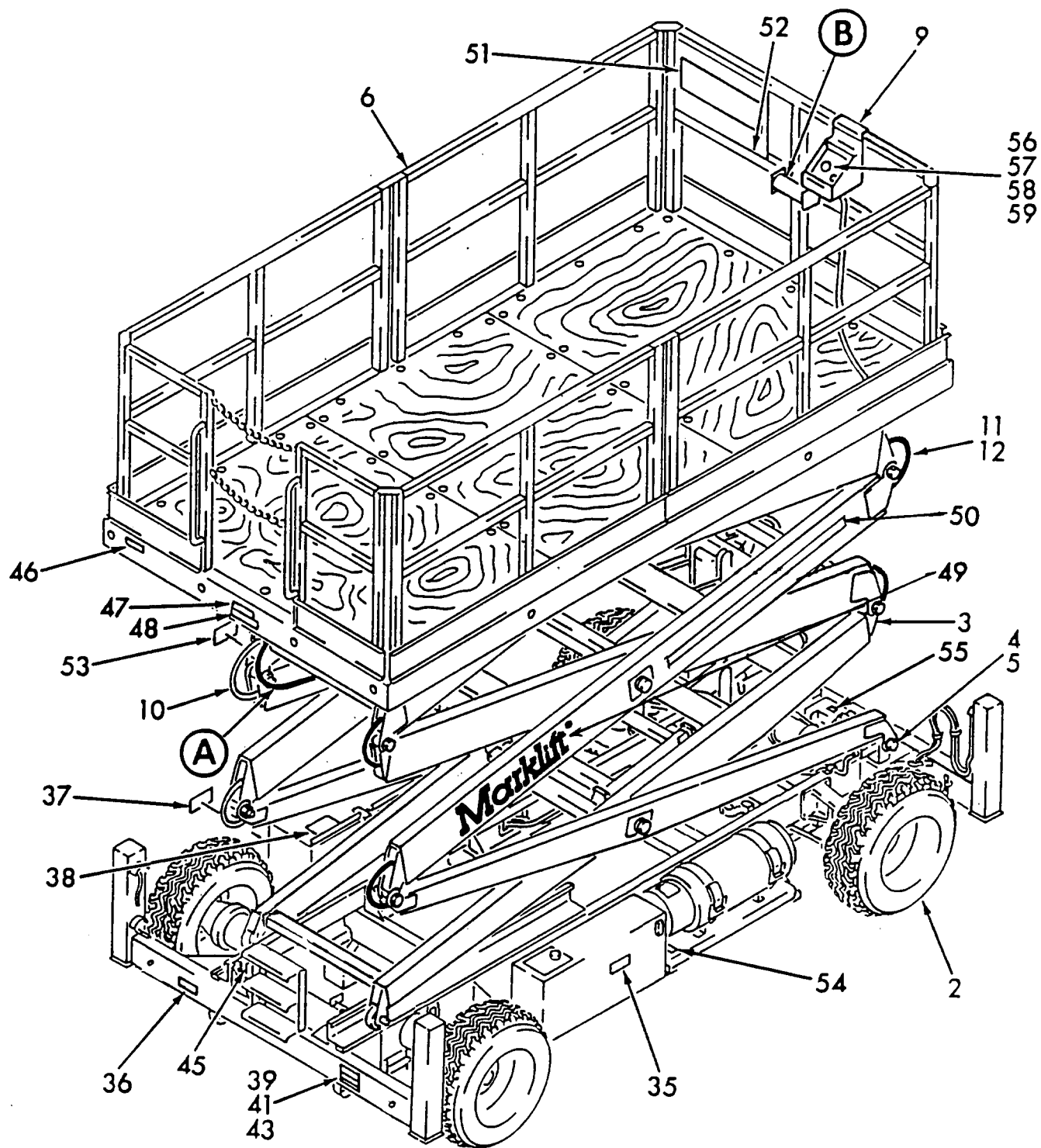
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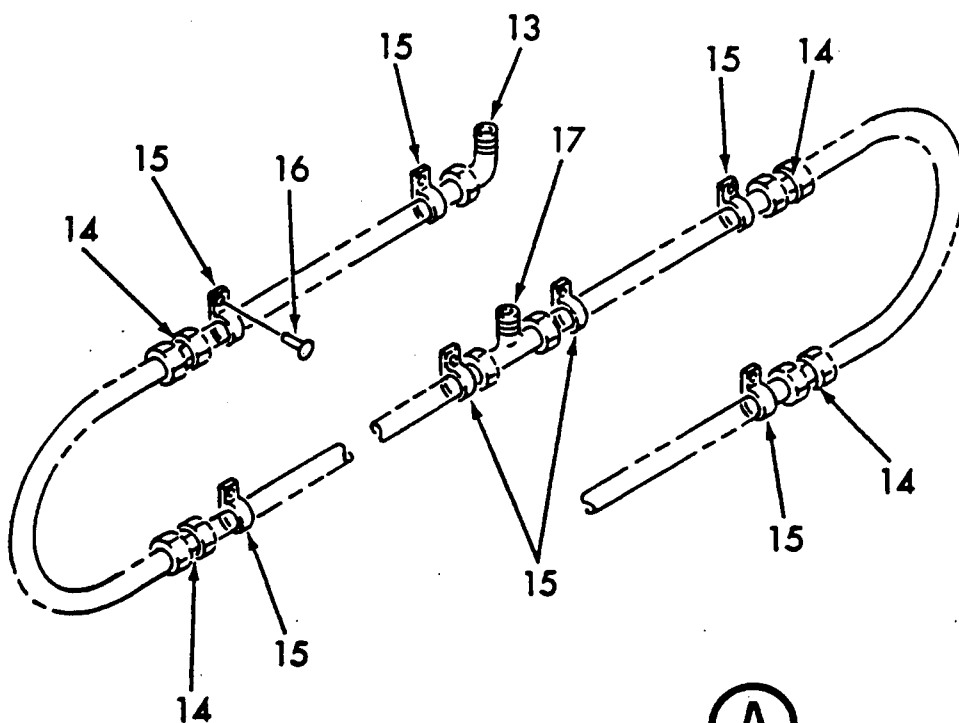
PARTS
SECT. 2
FIG. 3A
PAGE 4

ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
26	20661	.DECAL, ANSI AND OSHA SPEC.	1
27	30416	.DECAL, OPERATING INSTRUCTIONS	1
28	31260	.DECAL, MARKLIFT	2
29	20660	.PLATE, MODEL AND SERIAL NUMBER	1
30	2361	.ROLLER, DECK	3
31	2362	.ROLLER, "V" DECK	1
32	35806	.PIN, ROLLER	4
33	4034	.CABLE, POWER TO PLATFORM	1
34	30392	.ASSEMBLY, ARM CONTROL CABLE	1
35	60350	.BOLT, EAR PIVOT	2
36	2020	.DECAL, GASOLINE OR PETROL	1
37	2004	.DECAL, USE VAPOR TANK ONLY	1
38	3006	.ASSEMBLY, MAIN LIFT CYLINDER (BEF. NOV. '81) (See Sect. 4, Fig. 2A for Details)	2
39	2730	.ASSEMBLY, CONTROL CABLE	1
40	30809	.ASSEMBLY, MAIN LIFT CYLINDER (AFT. NOV. '81) (See Sect. 4, Fig. 2B for Details)	2
41		.ASSEMBLY, STEERING (BEF. JUL. '80) (See Sect. 3, Fig. 1A for Details)	1
-42		.ASSEMBLY, STEERING (AFT. JUL. '80) (See Sect. 3, Fig. 1B for Details)	1
-43	81113	.ASSEMBLY, FRAME (BEF. JUL. '86) (See Sect. 3, Fig. 4A for Details)	1

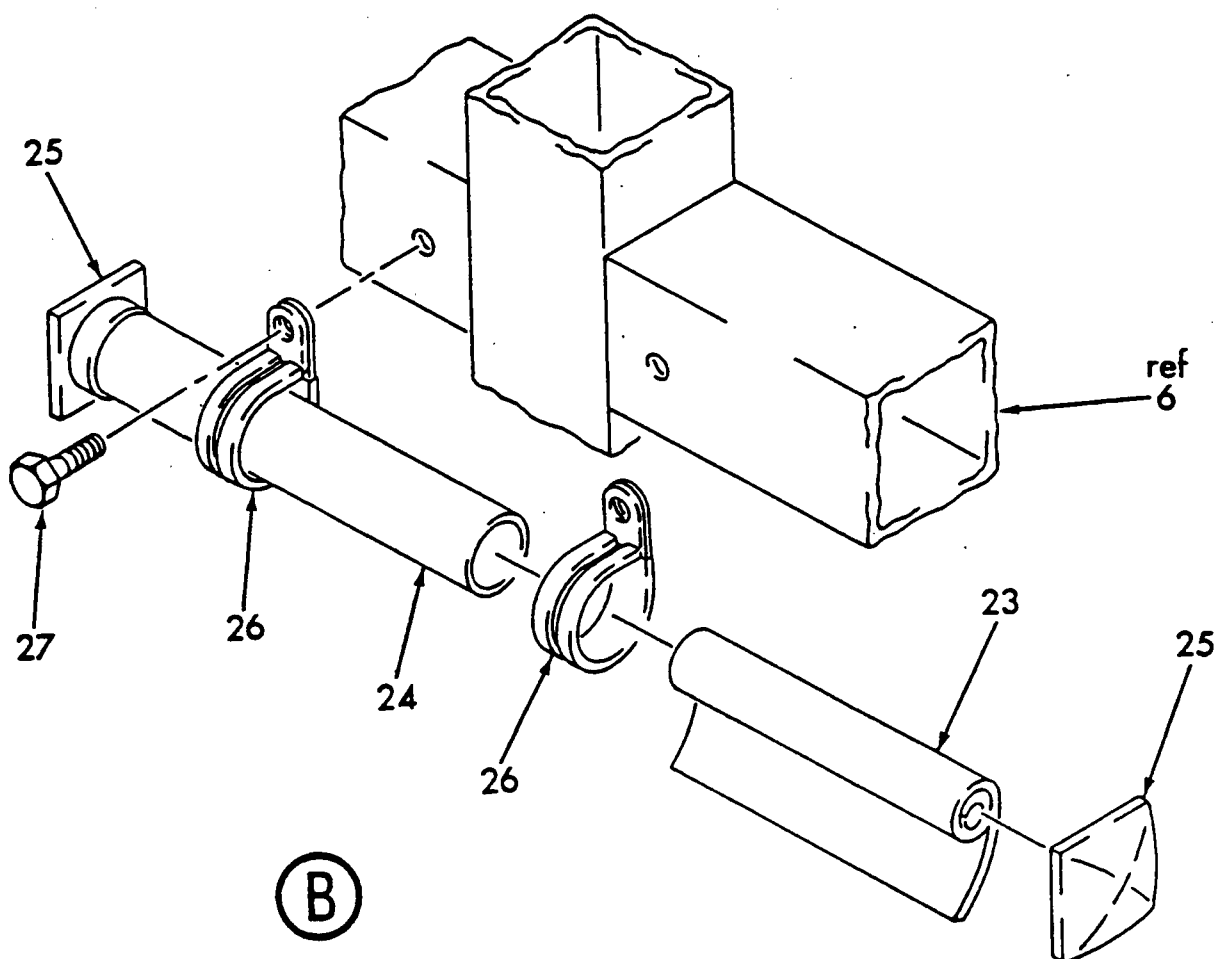
REV.

- ITEM NOT ILLUSTRATED





(A)



(B)



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	30006	ASSEMBLY, FINAL (AFT. JUL. '86)	REF
2	32387	.ASSEMBLY, FRAME (See Sect. 3, Fig. 4B for Details)	1
3	8115	.ASSEMBLY, SCISSOR (See Sect. 4, Fig. 1 for Details)	1
4	30890	.BOLT, EAR PIVOT (attaching part)	2
5	61310	.NUT, LOCK (attaching part)	2
6	32049	.ASSEMBLY, DECK (See Sect. 5, Fig. 1B for Details)	1
-7	30890	.BOLT, EAR PIVOT (attaching part)	2
-8	61310	.NUT, LOCK (attaching part)	2
9	32410	.ASSEMBLY, UPPER CONTROL BOX (See Sect. 5, Fig. 4B for Details)	1
10	130337-75	.CONDUCTOR, CABLE	1
11	32423	.DIAGRAM, TUBE KIT (See Sect. 2, Fig. 5 for Details)	1
12	32419	.DIAGRAM, HOSE KIT (See Sect. 2, Fig. 8 for Details)	1
13	80014-06	.ELBOW, UNION	2
14	80042-06	.UNION	4
15	764	.CLAMP	13
16	63651	.RIVET, POP (attaching part)	13
17	80031-06	.TEE, UNION	1
-18	32451	.DIAGRAM, ELECTRIC (See Schematic Chapter for Details)	1
-19	32437	.SCHEMATIC, HYDRAULIC (See Schematic Chapter for Details)	1
-20	255	.TIE, CABLE	AR
-21	256	.TIE, CABLE	AR
-22	32433	.SCHEMATIC, ELECTRIC (See Schematic Chapter for Details)	1



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
23	16628	.HANDBOOK, SCISSOR	1
24	130927	.CONTAINER, PLASTIC	1
25	65842	.CAP, ANTI-ROLL	2
26	65867	.CLAMP	2
27	61711	.SCREW, CAP (attaching part)	2
-28	65114	.GASOLINE (5 GAL.)	AR
-29	65116	.OIL, HYDRAULIC (18 GAL.)	AR
-30	2673	.PAINT, WHITE (16 OZ.)	AR
-31	65368	.PAINT, BLUE (16 OZ.)	AR
-32	16608	.PAINT, WHITE (6 GAL.)	AR
-33	16609	.PAINT, BLUE (2 GAL.)	AR
-34		.KIT, DECAL	1
35	2017	..DECAL, HYDRAULIC FLUID SPECIFICATION	2
36	2041	..DECAL, DO NOT LIFT FROM THIS END	2
37	2019	..DECAL, EMERGENCY LOWERING VALVE	1
38	2016	..DECAL, WARNING DO NOT WORK	2
39	20661	..NAMEPLATE, ANSI-A92	1
-40	375	..RIVET, POP (attaching part)	4
41	20660	..NAMEPLATE, IDENTIFICATION	1
42	375	..RIVET, POP (attaching part)	4
43	30520	..NAMEPLATE, PATENT NUMBER	1
-44	375	..RIVET, POP (attaching part)	4
46	2027	..DECAL, LOAD CAPACITY 2,000 LBS.	4
47	31109	..DECAL, CAUTION	1
48	11064	..DECAL, ATTACH SAFE CHAIN	1
49	31260	..DECAL, MARKLIFT	2

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PARTS CATALOG

FINAL ASSEMBLY (SRT-31G) (AFT. JUL. '86)

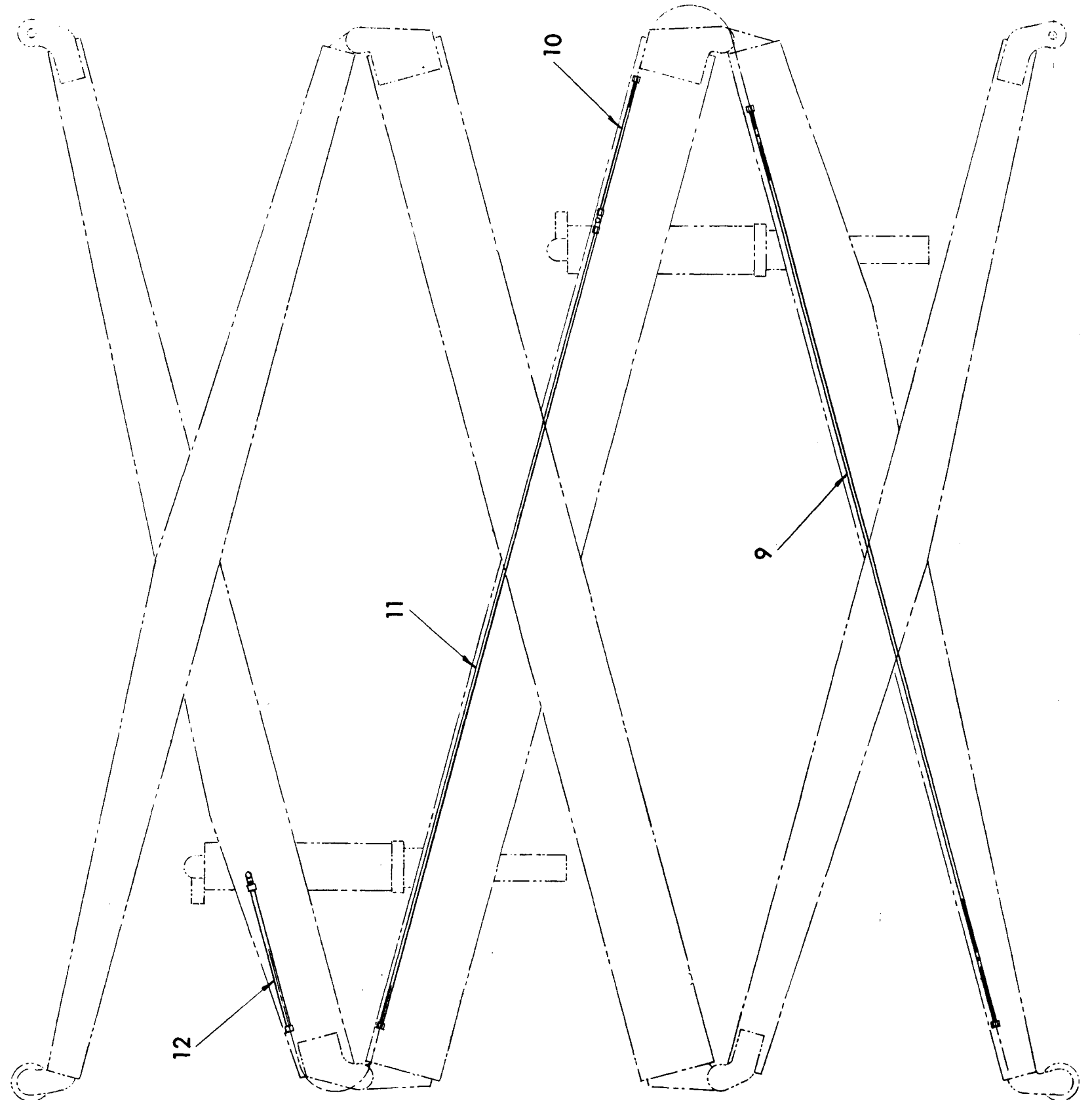
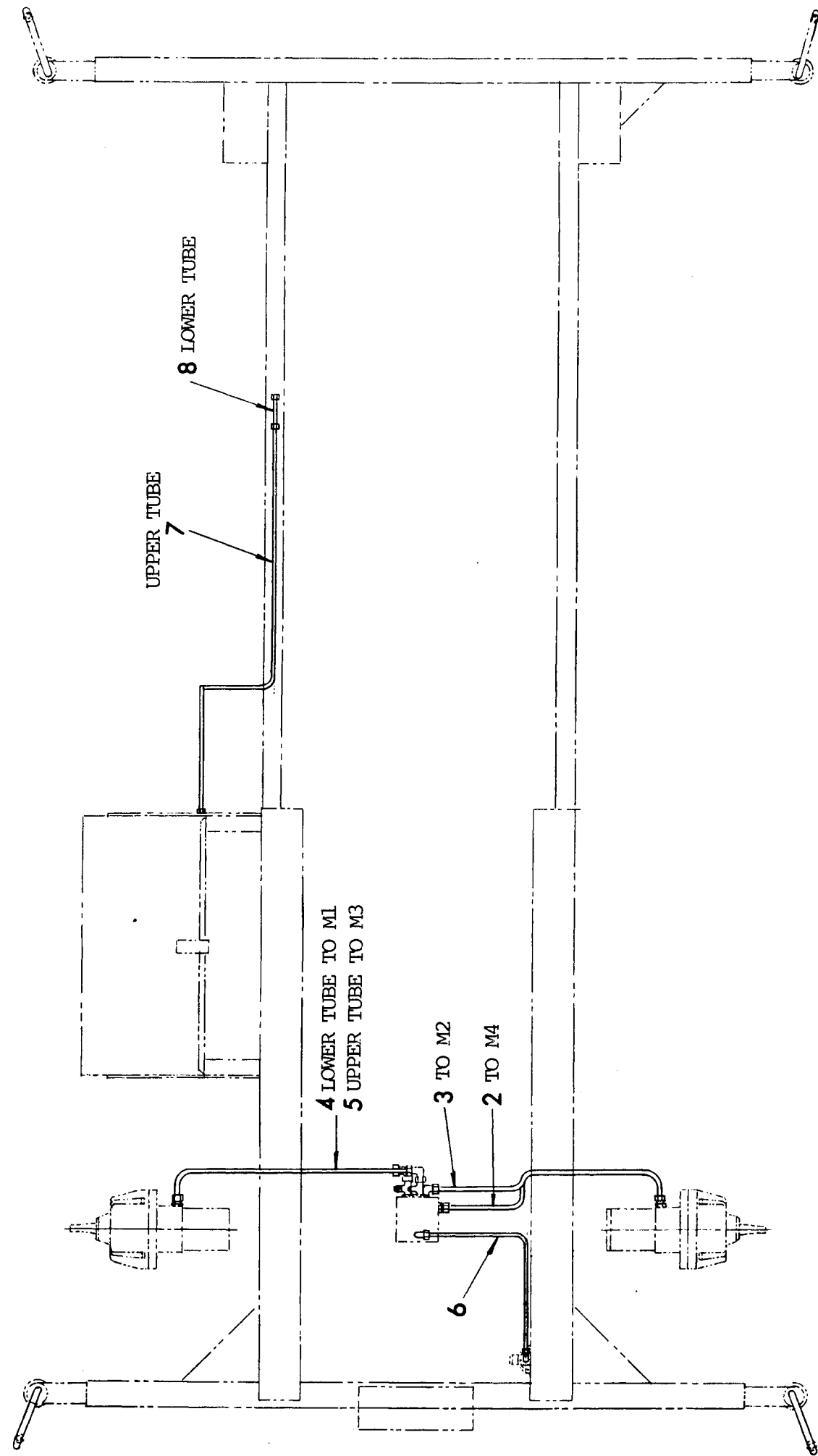
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PARTS
SECT. 2
FIG. 3B
PAGE 5

ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
50	130596	..DECAL, A PRODUCT OF MARK INDUSTRIES	2
51	30416	..DECAL, OPERATING INSTRUCTIONS	1
52	130820	..DECAL, OPERATION AND SAFETY HANDBOOK	1
53	2020	..DECAL, GASOLINE OR PETROL	1
54	2004	..DECAL, USE VAPOR TANK ONLY	1
55	2003	..DECAL, BATTERY WATER LEVEL	1
56	2008	..DECAL, CONTROL BOX	1
57	2013	..DECAL, CAUTION	1
58	2014	..DECAL, CAUTION	1
59	2015	..DECAL, WARNING	1

REV.

- ITEM NOT ILLUSTRATED



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PARTS CATALOG

HYDRAULIC TUBE INSTALLATION (RT-31G) (RT-31E)

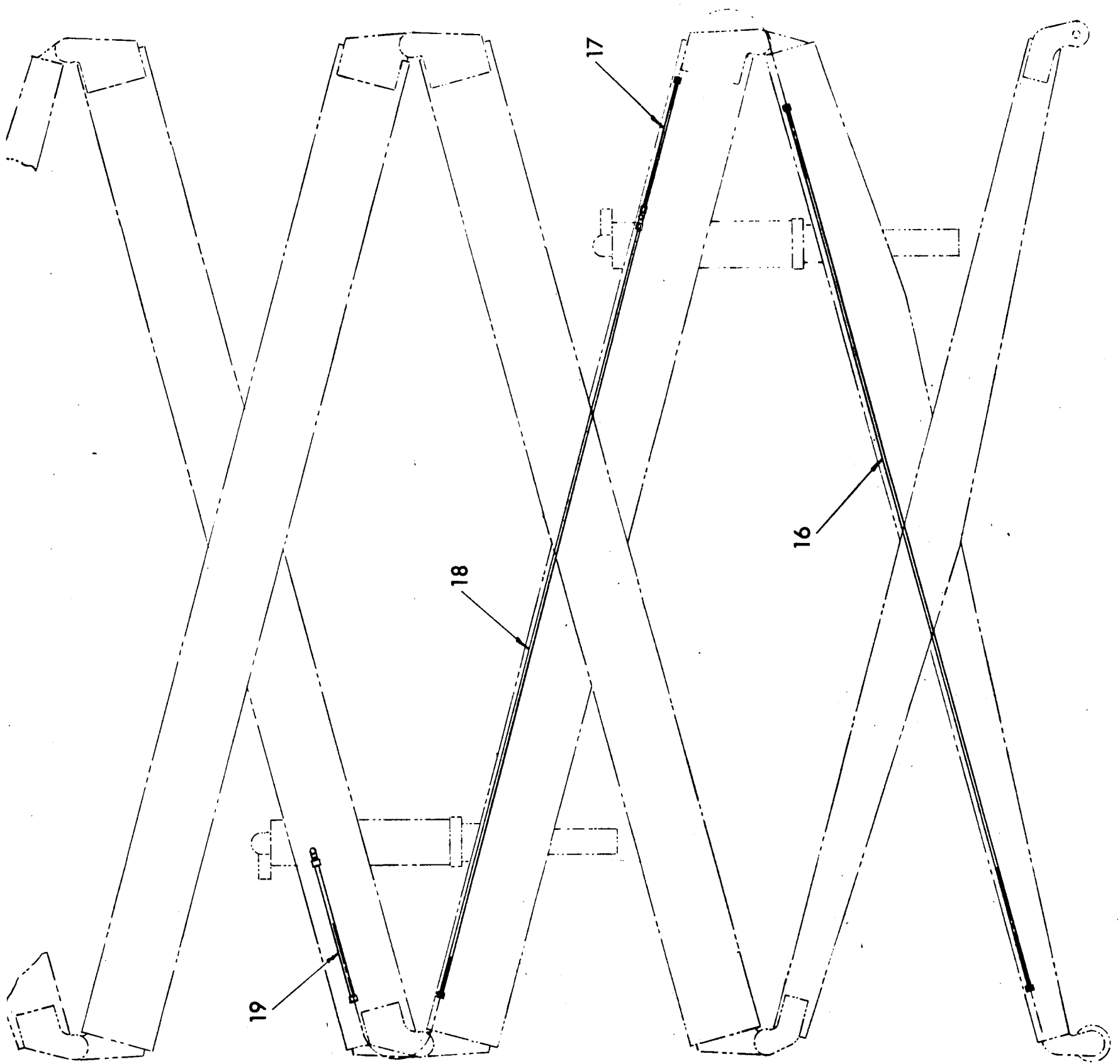
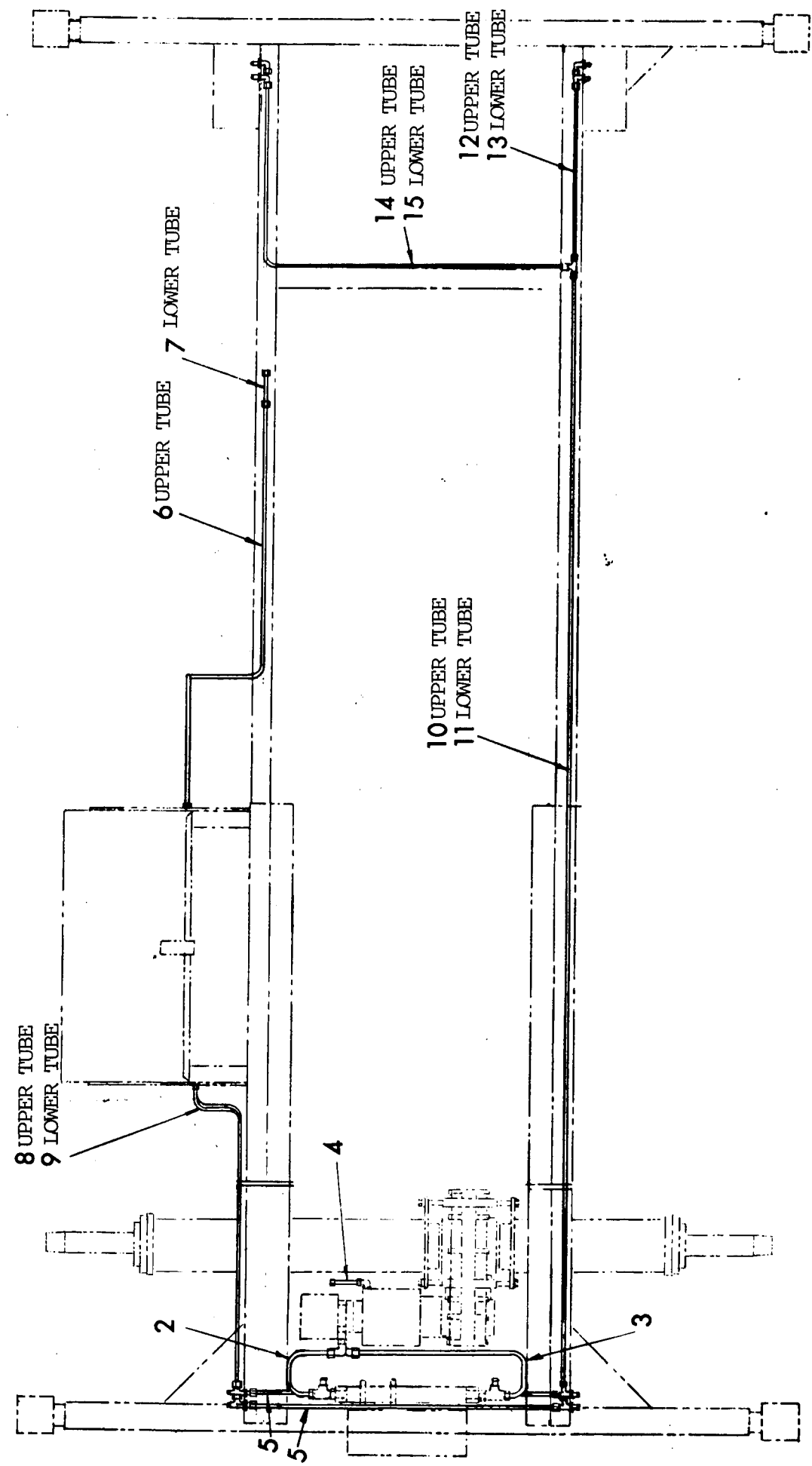
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PARTS
SECT. 2
FIG. 4
PAGE 2

ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32420	INSTALLATION, HYDRAULIC TUBE KIT (See Sect. 2, Fig. 1B or 2 for NHA)	REF
2	32420-1	.ASSEMBLY, TUBE (1/2)	1
3	32420-2	.ASSEMBLY, TUBE (1/2)	1
4	32420-3	.ASSEMBLY, TUBE (1/2)	1
5	32420-4	.ASSEMBLY, TUBE (1/2)	1
6	32420-5	.ASSEMBLY, TUBE (1/4)	1
7	32420-6	.ASSEMBLY, TUBE (3/8)	1
8	32420-7	.ASSEMBLY, TUBE (3/8)	1
9	32420-8	.ASSEMBLY, TUBE (1/2)	1
10	32420-9	.ASSEMBLY, TUBE (1/2)	1
11	32420-10	.ASSEMBLY, TUBE (1/2)	1
12	32420-11	.ASSEMBLY, TUBE (1/2)	1

REV.

- ITEM NOT ILLUSTRATED



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PARTS CATALOG

HYDRAULIC TUBE INSTALLATION (SRT-31G)

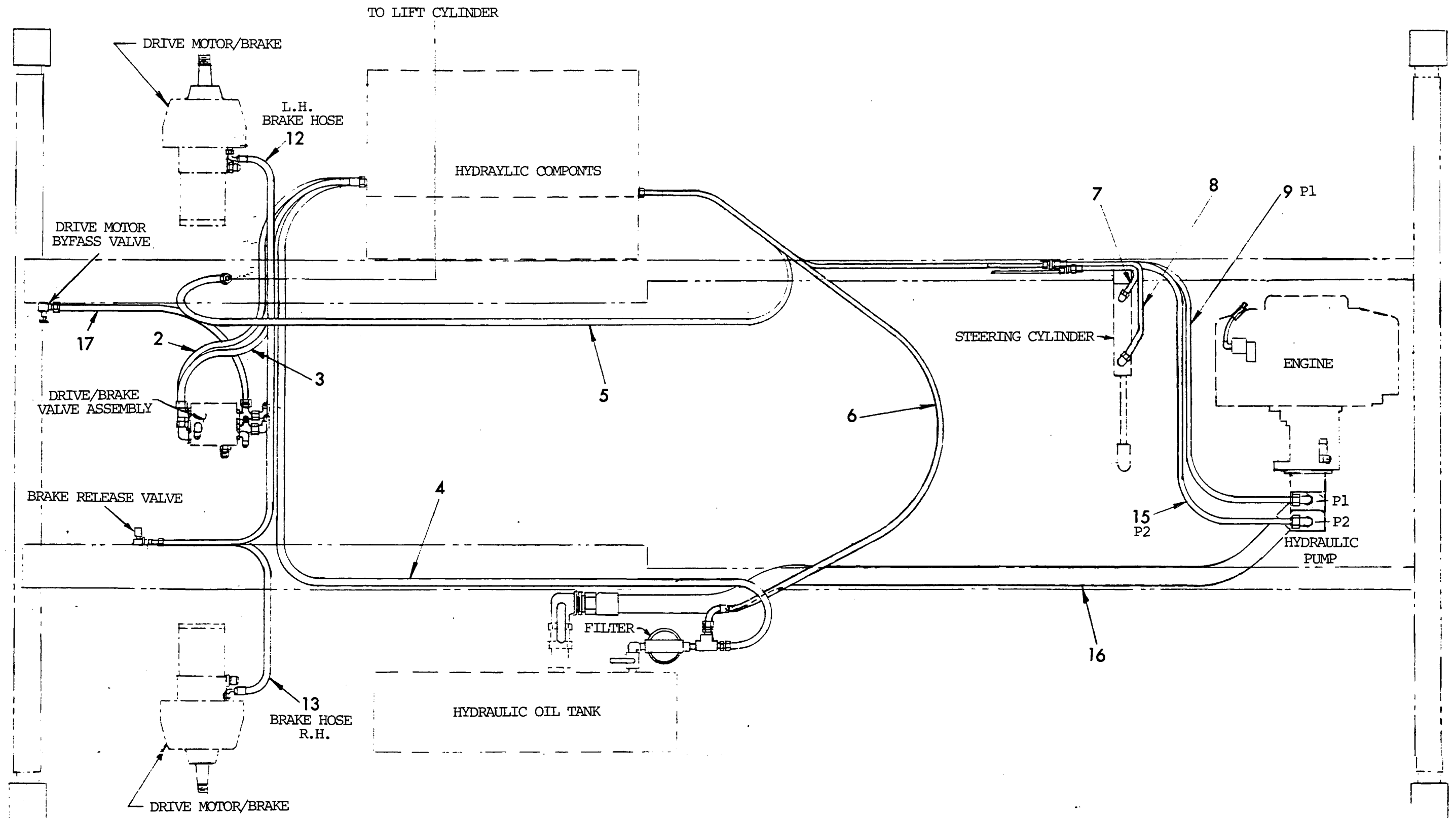
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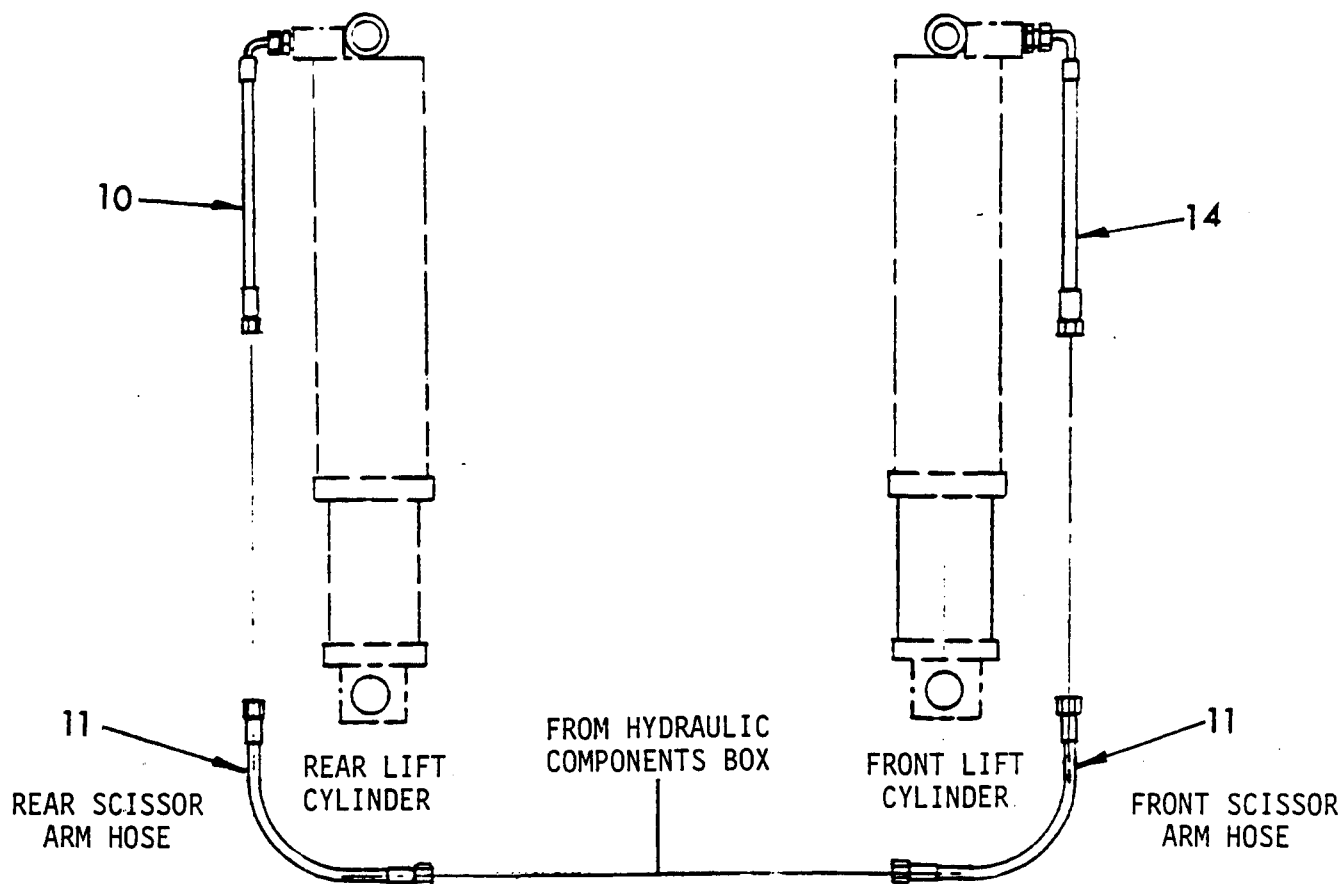
PARTS
SECT. 2
FIG. 5
PAGE 2

ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32423	INSTALLATION, HYDRAULIC TUBE KIT (See Sect. 2, Fig. 3B for NHA)	REF
2	32423-1	.ASSEMBLY, TUBE (1/2)	1
3	32423-2	.ASSEMBLY, TUBE (1/2)	1
4	32423-3	.ASSEMBLY, TUBE (1/4)	1
5	32423-4	.ASSEMBLY, TUBE (3/8)	2
6	32423-5	.ASSEMBLY, TUBE (3/8)	1
7	32423-6	.ASSEMBLY, TUBE (3/8)	1
8	32423-7	.ASSEMBLY, TUBE (3/8)	1
9	32423-8	.ASSEMBLY, TUBE (3/8)	1
10	32423-9	.ASSEMBLY, TUBE (3/8)	2
11	32423-10	.ASSEMBLY, TUBE (3/8)	1
12	32423-11	.ASSEMBLY, TUBE (3/8)	1
13	32423-12	.ASSEMBLY, TUBE (3/8)	1
14	32423-13	.ASSEMBLY, TUBE (3/8)	1
15	32423-14	.ASSEMBLY, TUBE (3/8)	1
16	32423-15	.ASSEMBLY, TUBE (1/2)	1
17	32423-16	.ASSEMBLY, TUBE (1/2)	1
18	32423-17	.ASSEMBLY, TUBE (1/2)	1
19	32423-18	.ASSEMBLY, TUBE (1/2)	1

REV.

- ITEM NOT ILLUSTRATED





ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32416	INSTALLATION, HYDRAULIC HOSE KIT (See Sect. 2, Fig. 1B for NHA)	REF
2	13210-10-0460	.ASSEMBLY, HOSE	1
3	13210-10-0440	.ASSEMBLY, HOSE	1
4	13210-10-1020	.ASSEMBLY, HOSE	1
5	13210-08-1180	.ASSEMBLY, HOSE	1
6	13213-10-0890	.ASSEMBLY, HOSE	1
7	13213-06-0140	.ASSEMBLY, HOSE	1
8	13213-06-0220	.ASSEMBLY, HOSE	1
9	13210-10-1120	.ASSEMBLY, HOSE	1

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PARTS CATALOG

HYDRAULIC HOSE INSTALLATION (RT-31G)

(continued)

PARTS
SECT. 2
FIG. 6
PAGE 3

ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
10	13213-08-0200	.ASSEMBLY, HOSE	1
11	13210-08-0290	.ASSEMBLY, HOSE	4
12	13213-04-0620	.ASSEMBLY, HOSE	1
13	13213-04-0400	.ASSEMBLY, HOSE	1
14	13213-08-0220	.ASSEMBLY, HOSE	1
15	13210-08-1120	.ASSEMBLY, HOSE	1
16	13205-20-0780	.ASSEMBLY, HOSE	1
17	13210-08-0300	.ASSEMBLY, HOSE	2

REV.

- ITEM NOT ILLUSTRATED



THIS PARTS SECTION 2, FIGURE 7
HYDRAULIC HOSE INSTALLATION (RT-31E) (AFT. JUL. '86)
PART NUMBER 32418 IS NOT AVAILABLE THIS REVISION



THIS PARTS SECTION 2, FIGURE 8
HYDRAULIC HOSE INSTALLATION (SRT-31G) (AFT. JUL. '86)
PART NUMBER 32419 IS NOT AVAILABLE THIS REVISION

THIS SECTION 3 IS ILLUSTRATED AS

- FIGURE 1A STEERING ASSEMBLY (BEF. JUL. '80)
- FIGURE 1B STEERING ASSEMBLY (AFT. JUL. '80)
- FIGURE 2A FRAME ASSEMBLY (RT-31G) (BEF. JUL. '82)
- FIGURE 2B FRAME ASSEMBLY (RT-31G) (AFT. JUL. '82)
- FIGURE 2C FRAME ASSEMBLY (RT-31G) (AFT. JUL. '86)
- FIGURE 3A FRAME ASSEMBLY (RT-31E) (BEF. JUL. '82)
- FIGURE 3B FRAME ASSEMBLY (RT-31E) (AFT. JUL. '82)
- FIGURE 4A FRAME ASSEMBLY (SRT-31G) (BEF. JUL. '86)
- FIGURE 4B FRAME ASSEMBLY (SRT-31G) (AFT. JUL. '86)
- FIGURE 5A FRONT AXLE ASSEMBLY (L.H.) (BEF. JUL. '80)
- FIGURE 5B FRONT AXLE ASSEMBLY (L.H.) (AFT. JUL. '80)
- FIGURE 6A FRONT AXLE ASSEMBLY (R.H.) (BEF. JUL. '80)
- FIGURE 6B FRONT AXLE ASSEMBLY (R.H.) (AFT. JUL. '80)
- FIGURE 7 STEERING AND DRIVE TIRE ASSEMBLY (RT-31E)
(BEF. JUL. '80)
- FIGURE 8 STEERING TIRE ASSEMBLY (R.H.) (RT-31G) (RT-31E)
(AFT. JUL. '80)
- FIGURE 9 STEERING TIRE ASSEMBLY (L.H.) (RT-31G) (RT-31E)
(AFT. JUL. '80)
- FIGURE 10 STEERING TIRE ASSEMBLY (SRT-31G)
- FIGURE 11 DRIVE TIRE ASSEMBLY (L.H.) (RT-31G) (RT31E)
(AFT. JUL. '80)
- FIGURE 12 DRIVE TIRE ASSEMBLY (L.H.) (RT-31G) (RT-31E)
(AFT. JUL. '80)
- FIGURE 13 DRIVE TIRE ASSEMBLY (R.H.) (SRT-31G)
- FIGURE 14 DRIVE TIRE ASSEMBLY (L.H.) (SRT-31G)
- FIGURE 15A FRONT HUB AND DRUM ASSEMBLY (BEF. JUL. '80)
- FIGURE 15B FRONT HUB AND DRUM ASSEMBLY (AFT. JUL. '80)
- FIGURE 16A HUB ASSEMBLY (AFT. JUL. '81)
- FIGURE 16B HUB ASSEMBLY (AFT. JUL. '86)
- FIGURE 17 DISC BRAKE INTENSIFIER (AFT. JUL. '82)
- FIGURE 18 CALIPER DISC BRAKE ASSEMBLY (AFT. JUL. '82)
- FIGURE 19 DRIVE MOTOR AND BRAKE ASSEMBLY (AFT. JUL. '86)
- FIGURE 20 DRIVE CONE BRAKE HUB ASSEMBLY
- FIGURE 21A ENGINE AND PUMP ASSEMBLY (BEF. JUL. '86)
- FIGURE 21B ENGINE AND PUMP ASSEMBLY (AFT. JUL. '86)

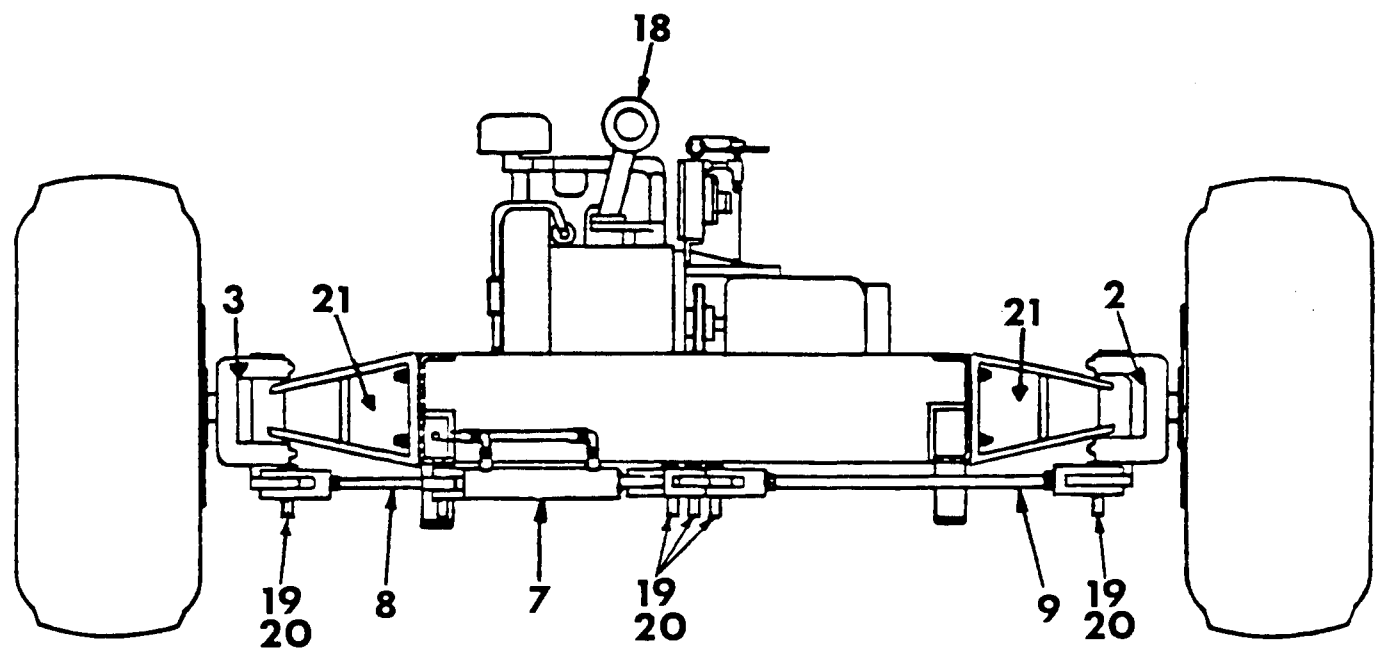
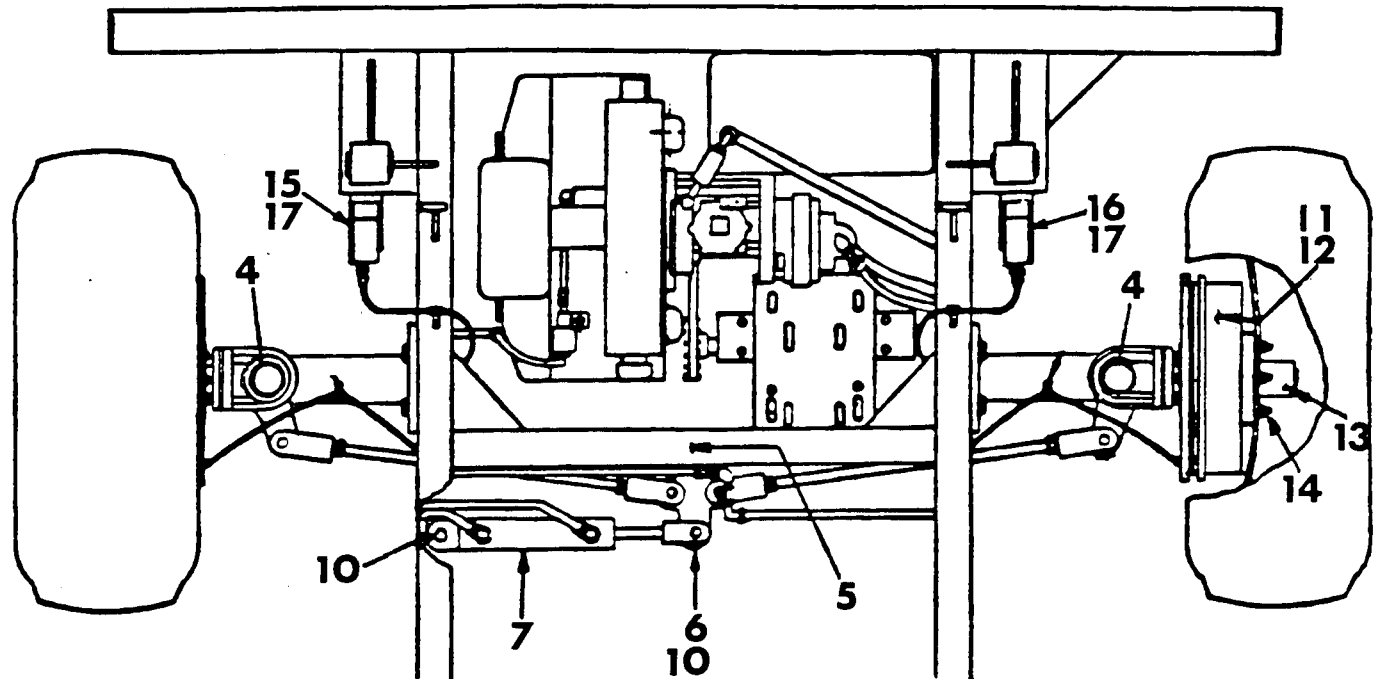


FIGURE 22	FUEL TANK ASSEMBLY
FIGURE 23	COMPONENT BOX ASSEMBLY (BEF. MAR. '80)
FIGURE 24A	COMPONENT BOX ASSEMBLY (RT-31G) (AFT. MAR. '80)
FIGURE 24B	COMPONENT BOX ASSEMBLY (RT-31G) (AFT. JUL. '86)
FIGURE 25A	COMPONENT BOX ASSEMBLY (RT-31E) (AFT. MAR. '80)
FIGURE 25B	COMPONENT BOX ASSEMBLY (RT-31E) (AFT. JUL. '86)
FIGURE 26A	COMPONENT BOX ASSEMBLY (SRT-31G) (BEF. MAR. '80)
FIGURE 26B	COMPONENT BOX ASSEMBLY (SRT-31G) (AFT. MAR. '80)
FIGURE 26C	COMPONENT BOX ASSEMBLY (SRT-31G) (AFT. JUL. '86)
FIGURE 27	PRESSURE LIMIT SWITCH ASSEMBLY
FIGURE 28A	MANIFOLD ASSEMBLY (RT-31G) (AFT. MAR. '80)
FIGURE 28B	VALVE PACKAGE ASSEMBLY (RT-31G) (RT-31E) (AFT. JUL. '86)
FIGURE 29A	MANIFOLD PACKAGE SUB-ASSEMBLY (RT-31G) (RT-31E) (BEF. MAR. '80)
FIGURE 29B	MANIFOLD PACKAGE SUB-ASSEMBLY (RT-31G) (RT-31E) (AFT. MAR. '80)
FIGURE 30A	MANIFOLD ASSEMBLY (SRT-31G) (AFT. MAR. '80)
FIGURE 30B	VALVE PACKAGE ASSEMBLY (SRT-31G) (AFT. JUL. '86)
FIGURE 31A	MANIFOLD PACKAGE SUB-ASSEMBLY (SRT-31G) (BEF. MAR. '80)
FIGURE 31B	MANIFOLD PACKAGE SUB-ASSEMBLY (SRT-31G) (AFT. MAR. '80)
FIGURE 32	DRIVE SOLENOID VALVE ASSEMBLY (AFT. JUL. '86)
FIGURE 33	LOWERING CONTROL VALVE ASSEMBLY (AFT. JUL. '86)
FIGURE 34A	ELECTRIC PANEL ASSEMBLY (RT-31G) (AFT. MAR. '80)
FIGURE 34B	ELECTRIC PANEL ASSEMBLY (RT-31G) (AFT. JUL. '86)
FIGURE 35A	ELECTRIC PANEL ASSEMBLY (RT-31E) (AFT. MAR. '86)
FIGURE 35B	ELECTRIC PANEL ASSEMBLY (RT-31E) (AFT. JUL. '86)
FIGURE 36A	ELECTRIC PANEL ASSEMBLY (SRT-31G) (AFT. MAR. '80)
FIGURE 36B	ELECTRIC PANEL ASSEMBLY (SRT-31G) (AFT. JUL. '86)
FIGURE 37A	HYDRAULIC TANK ASSEMBLY (AFT. MAY '77)
FIGURE 37B	HYDRAULIC TANK ASSEMBLY (BEF. MAR. '80)
FIGURE 37C	HYDRAULIC TANK ASSEMBLY (AFT. MAR. '80)
FIGURE 37D	HYDRAULIC TANK ASSEMBLY (AFT. JUL. '86)
FIGURE 38	TILT SWITCH ASSEMBLY
FIGURE 39	NEEDLE VALVE ASSEMBLY (AFT. JUL. '86)



- FIGURE 40** BELL CRANK ASSEMBLY
- FIGURE 41A** TIE ROD ASSEMBLY (BEF. JAN. '80)
- FIGURE 41B** TIE ROD ASSEMBLY (AFT. JAN. '80)
- FIGURE 42A** TIE ROD ASSEMBLY (BEF. JAN. '80)
- FIGURE 42B** TIE ROD ASSEMBLY (AFT. JAN. '80)
- FIGURE 43A** STEERING CYLINDER ASSEMBLY (BEF. NOV. '79)
- FIGURE 43B** STEERING CYLINDER ASSEMBLY (AFT. NOV. '79)
- FIGURE 43C** STEERING CYLINDER ASSEMBLY (AFT. JUL. '86)
- FIGURE 44** MANUAL STABILIZER ASSEMBLY
- FIGURE 45A** HYDRAULIC OUTRIGGER ASSEMBLY (BEF. JUL. '86)
- FIGURE 45B** HYDRAULIC OUTRIGGER ASSEMBLY (AFT. JUL. '86)
- FIGURE 46A** HYDRAULIC OUTRIGGER ASSEMBLY (BEF. JUL. '86)
- FIGURE 46B** HYDRAULIC OUTRIGGER ASSEMBLY (AFT. JUL. '86)
- FIGURE 47** HYDRAULIC OUTRIGGER CYLINDER ASSEMBLY
- FIGURE 48** FLOW CONTROL VALVE ASSEMBLY
- FIGURE 49** DRIVE AND BRAKE VALVE ASSEMBLY
- FIGURE 50** CUSHION CYLINDER ASSEMBLY
- FIGURE 51** HYDRAULIC MOTOR AND PUMP ASSEMBLY (AFT. JUL. '86)
- FIGURE 52** BATTERY ASSEMBLY
- FIGURE 53A** BATTERY BOX ASSEMBLY (AFT. MAY '77)
- FIGURE 53B** BATTERY BOX ASSEMBLY (BEF. MAR. '80)
- FIGURE 53C** BATTERY BOX ASSEMBLY (AFT. MAR. '80)
- FIGURE 54** BATTERY BOX NO. 1 ASSEMBLY (AFT. JUL. '86)
- FIGURE 55** BATTERY BOX NO. 2 ASSEMBLY (AFT. JUL. '86)







ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
- 1		ASSEMBLY, STEERING (BEF. JUL. 80) (See Sect. 2, Fig. 1A or 3A for NHA)	REF
2		.ASSEMBLY, YOKE AND SPINDLE (L.H.) (See Sect. 3, Fig. 5A for Details)	1
3		.ASSEMBLY, YOKE AND SPINDLE (R.H.) (See Sect. 3, Fig. 6A for Details)	1
4	20321	.PIN, KING	2
5	20796	.PIN, PIVOT	1
6	8044	.ASSEMBLY, BELL CRANK (See Sect. 3, Fig. 40 for Details)	1
7	3062	.ASSEMBLY, STEERING CYLINDER (See Sect. 3, Fig. 43A for Details)	1
-7A	3013	.ASSEMBLY, STEERING CYLINDER (See Sect. 3, Fig. 43B for Details)	1
8		.ASSEMBLY, TIE ROD (See Sect. 3, Fig. 41A for Details)	1
9		.ASSEMBLY, TIE ROD (See Sect. 3, Fig. 42A for Details)	1
10	3013-2	.PIN, CLEVIS	2
11	2238-1	.SET, ELECTRIC BRAKE (L.H.)	1
12	2238-2	.SET, ELECTRIC BRAKE (R.H.)	1
13	2240	.ASSEMBLY, DRUM AND HUB (See Sect. 3, Fig. 15A for Details)	2
14	65156	.NUT, LUG	10
15	70173	.SWITCH, LIMIT	1
16	70107	.SWITCH, LIMIT	1
17	70032	.ARM, LIMIT SWITCH	2
18	20506	.ASSEMBLY, ENGINE (See Vendor Chap. for more Information)	1
19	61215	.NUT, LOCK	4
20	60519	.BOLT	4
21	30257	.AXLE	2

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PARTS CATALOG

STEERING ASSEMBLY (BEF. JUL. '80)

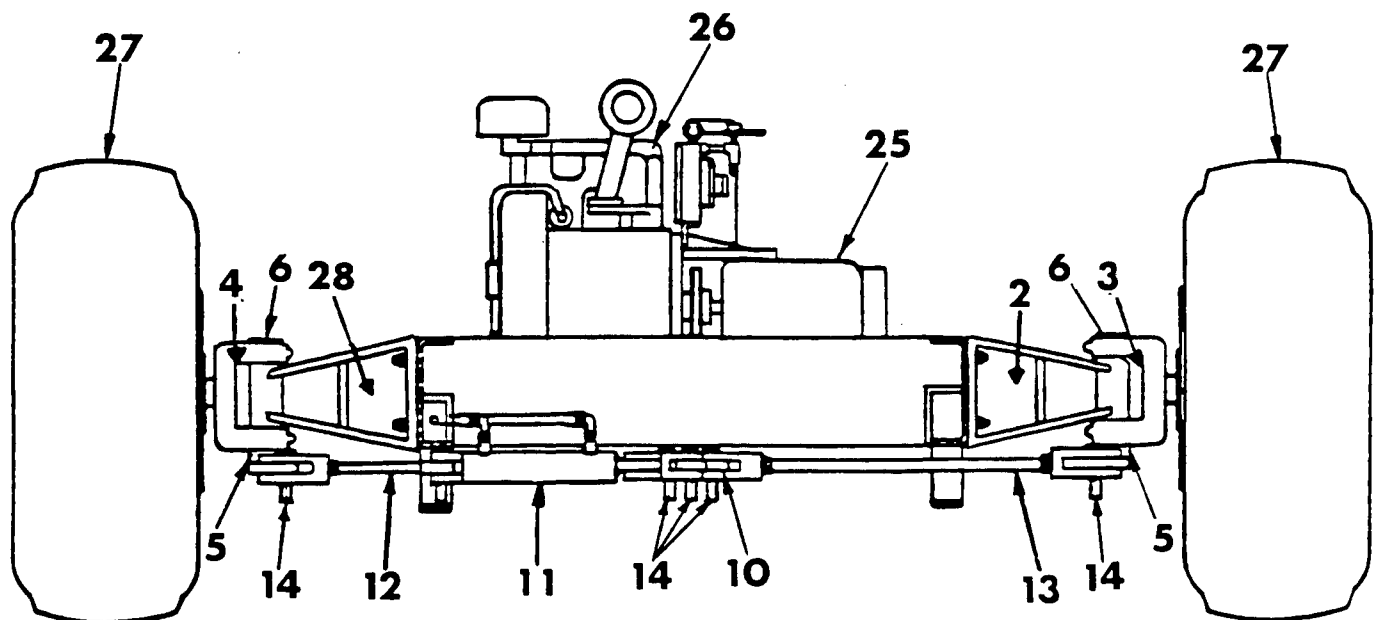
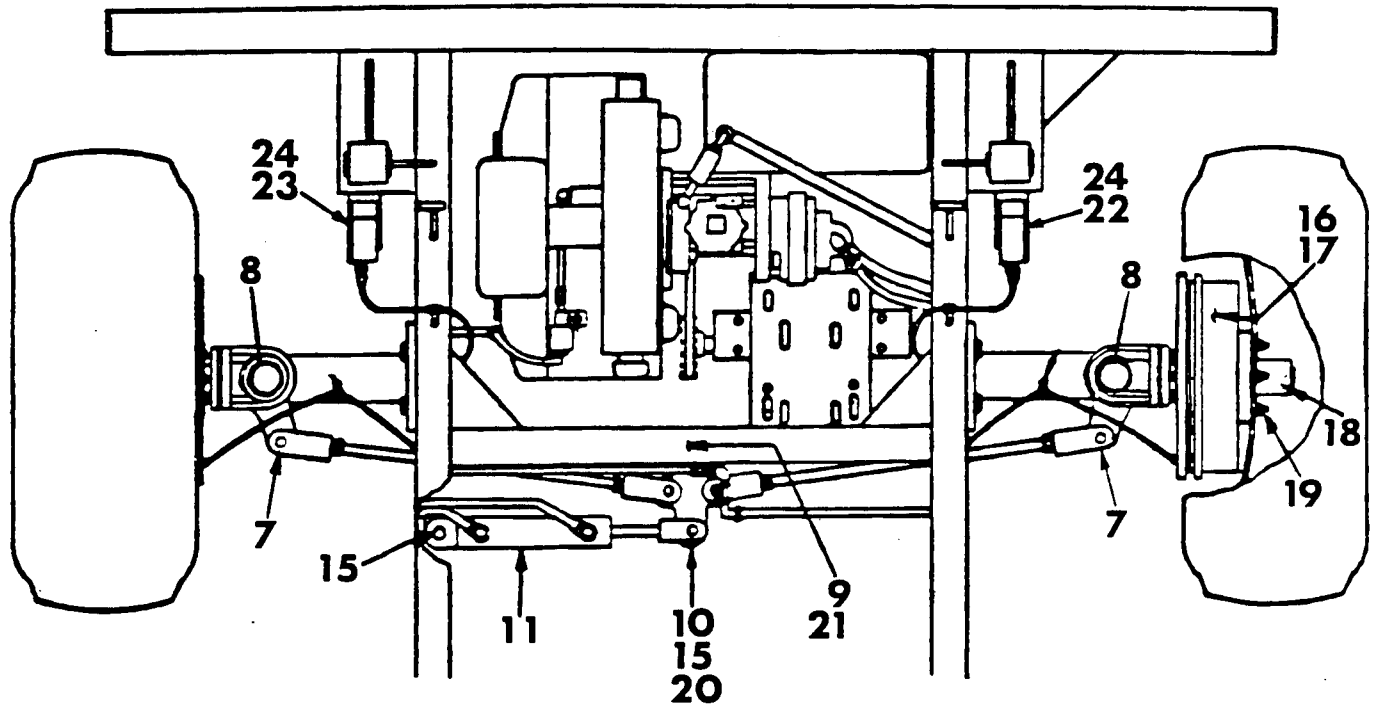
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PARTS
SECT. 3
FIG. 1A
PAGE 3

ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-22		.ASSEMBLY, FRONT AXLE (See Sect. 3, Fig. 6A for Details)	2
-23		.ASSEMBLY, STEERING AND DRIVE TIRE (See Sect. 3, Fig. 7 for Details)	4
-24		.ASSEMBLY, COMPONENT BOX (See Sect. 3, Fig. 23 for Details)	1
-25	8318-2	.ASSEMBLY, HYDRAULIC TANK (See Sect. 3, Fig. 37A for Details)	1

REV.

- ITEM NOT ILLUSTRATED

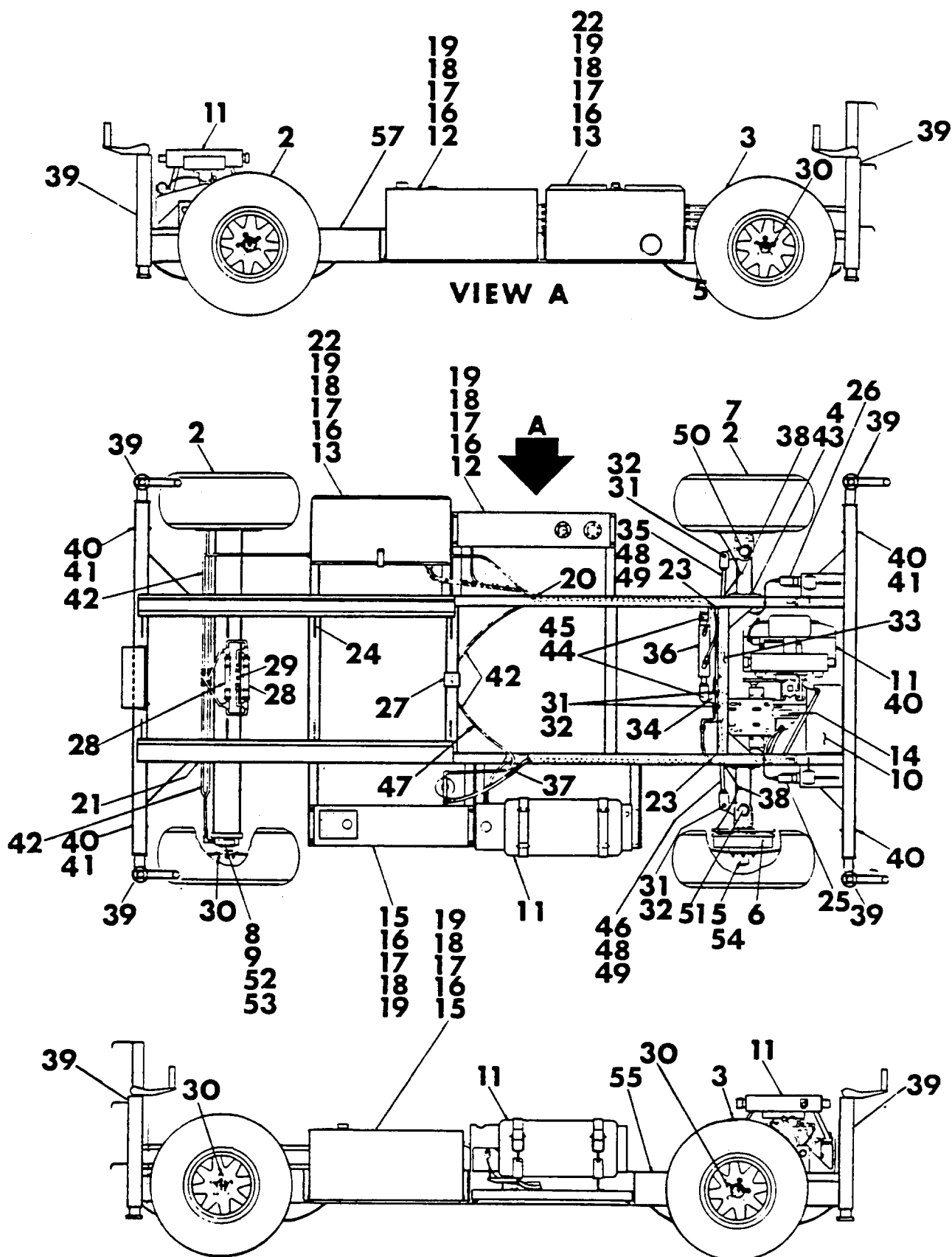




ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
1		ASSEMBLY, STEERING (AFT. JUL. '80) (See Sect. 2, Fig. 1A or 3A for NHA)	REF
2	30493	.ASSEMBLY, AXLE (See Sect. 3, Fig. 6B for Details)	1
3	30239	.ASSEMBLY, YOKE AND SPINDLE (L.H.)	1
4	30238	.ASSEMBLY, YOKE AND SPINDLE (R.H.)	1
5	30242	.BUSHING, BOTTOM FLANGE	2
6	20322	.BUSHING, TOP	2
7	30332	.BUSHING, SLEEVE	2
8	20321	.PIN, KING	2
9	20796	.PIN, PIVOT	1
10	8044	.ASSEMBLY, BELL CRANK (See Sect. 3, Fig. 40 for Details)	1
11	3013	.ASSEMBLY, STEERING CYLINDER (See Sect. 3, Fig. 43B for Details)	1
12	30302	.ASSEMBLY, TIE ROD (See Sect. 3, Fig. 41B for Details)	1
13	30301	.ASSEMBLY, TIE ROD (See Sect. 3, Fig. 42B for Details)	1
14	64102	.PIN, TIE ROD	4
15	3013-2	.PIN, CLEVIS	2
16	2238-1	.SET, ELECTRIC BRAKE (L.H.)	1
17	2238-2	.SET, ELECTRIC BRAKE (R.H.)	1
18	30482	.ASSEMBLY, DRUM AND HUB (RT-31G) (See Sect. 3, Fig. 15B for Details)	2
-18A	30472	.ASSEMBLY, DRUM AND HUB (SRT-31G) (See Sect. 3, Fig. 16A for Details)	2
19	65156	.NUT, LUG	10
20	2278	.BUSHING	1
21	2269	.BUSHING	1
22	70107	.SWITCH, LIMIT	1



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
23	70173	.SWITCH, LIMIT	1
24	70032	.ARM, LIMIT SWITCH	1
25	782	.ASSEMBLY, BATTERY BOX (See Vendor Chap. for more Information)	1
26	20506	.ASSEMBLY, ENGINE (See Vendor Chap. for more Information)	1
27	30784	.ASSEMBLY, TIRE & WHEEL (See Sect. 3, Fig. 8 for Details)	2
28	30492	.ASSEMBLY, AXLE (See Sect. 3, Fig. 5B for Details)	1
-29		.ASSEMBLY, COMPONENT BOX (See Sect. 3, Fig. 23 for Details)	1
-30	8318-2	.ASSEMBLY, HYDRAULIC TANK (See Sect. 3, Fig. 37A for Details)	1



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PARTS CATALOG

FRAME ASSEMBLY (RT-31G) (BEF. JUL. '82)

(continued)

PARTS
SECT. 3
FIG. 2A
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ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	8112	ASSEMBLY, FRAME (See Sect. 2, Fig. 1A for NHA)	REF
2	30783	.ASSEMBLY, DRIVE TIRE (See Sect 3, Fig. 11 for Details)	2
3	30784	.ASSEMBLY, STEERING TIRE (See Sect. 3, Fig. 8 for Details)	2
4	61311	.NUT, CRUSH TYPE LOCK	8
5	30482	.ASSEMBLY, FRONT HUB (See Sect. 3, Fig. 15B for Details)	2
6	2238-1	.BRAKE, ELECTRIC (L.H.)	1
7	2238-2	.BRAKE, ELECTRIC (R.H.)	1
-8A	66518	..SHAFT, OUTPUT	1
-8B	66773	..SHAFT, INNER	1
-8C	66915	..SHAFT, KEY	1
-8D	66162	..KIT, SEAL	1
-8E	66514	..COMMUTATOR WITH RING	1
9	30294	.HUB, DRIVE (See Sect. 3, Fig. 20 for Details)	2
10	9064	.ASSEMBLY, BATTERY BOX (See Sect. 3, Fig. 50 for Details)	1
11	30235	.ASSEMBLY, ENGINE (See Sect. 3, Fig. 4A for Details)	1
12	8316	.ASSEMBLY, FUEL (See Sect. 3, Fig. 22 for Details)	1
13	30723	.ASSEMBLY, COMPONENT BOX (See Sect. 3, Fig. 24A for Details)	1
14	3038	.ASSEMBLY, HYDRAULIC PUMP	1
-14A	3038-A	..KIT, SEAL	1
15	8318-2	HYDRAULIC TANK ASSEMBLY (See Sect. 3, Fig. 37B for Details)	1
16	63301	.WASHER, LOCK	12

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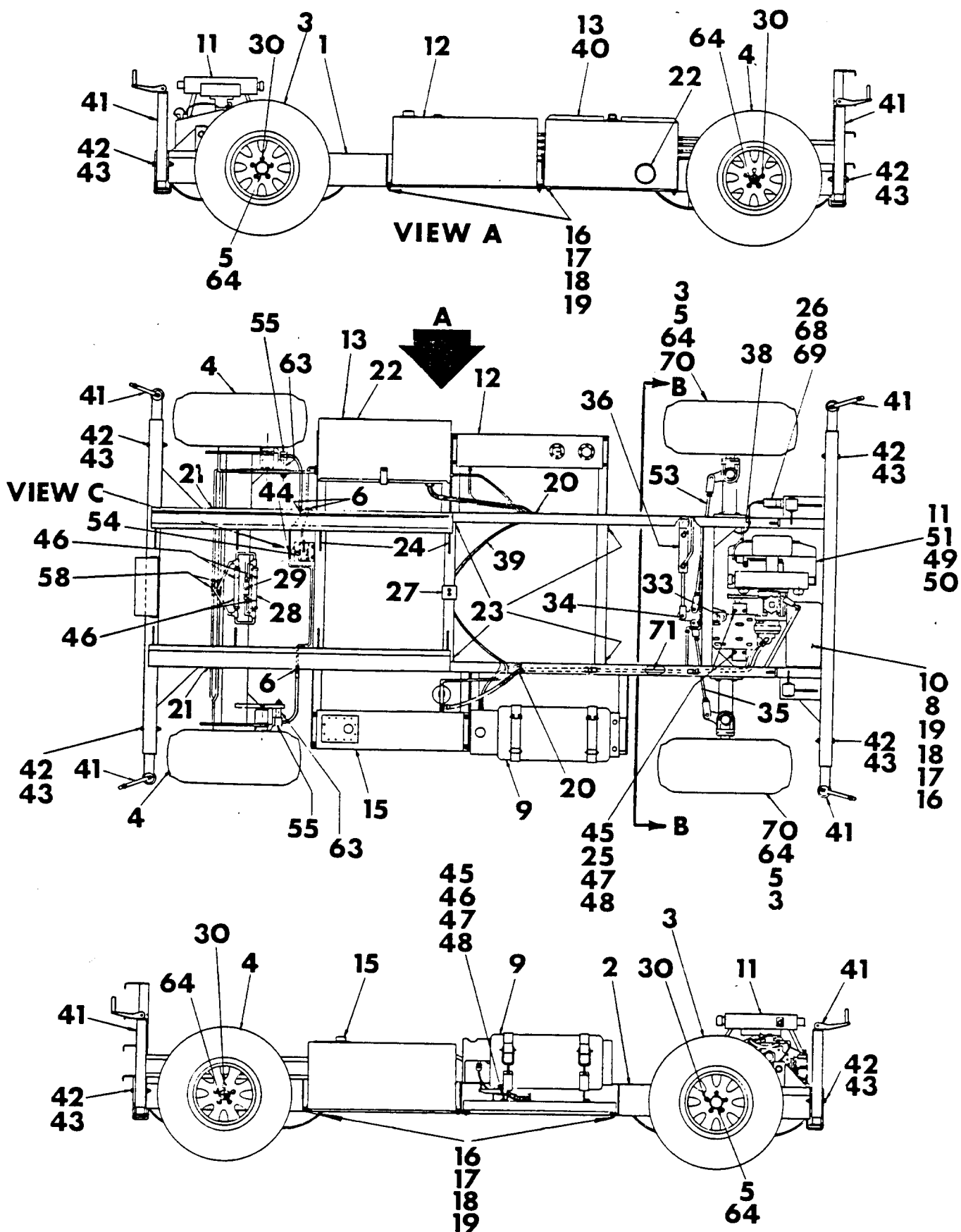
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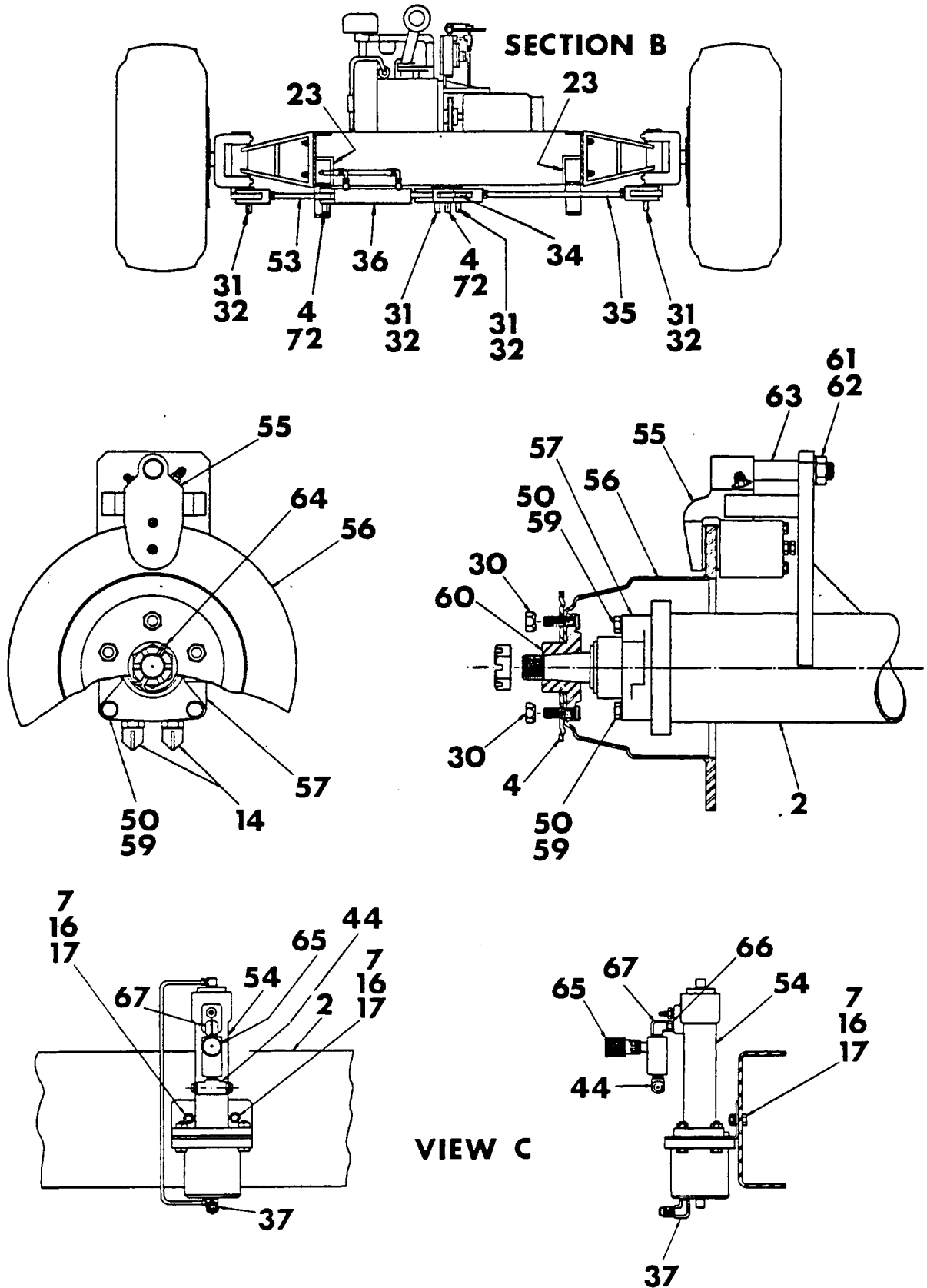


ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
17	60701	.NUT, HEX	12
18	60302	.WASHER, FLAT	12
19	60131	.SCREW, HEX HEAD	12
20	411	.MOULDING, RUBBER (20 1/4)	2
21	411	.MOULDING, RUBBER (13 1/4)	2
22	411	.MOULDING, RUBBER (12 1/2)	1
23	411	.MOULDING, RUBBER (5 1/2)	8
24	165	.MOULDING, RUBBER (SUCTION HOSE, 4)	3
25	70107	.SWITCH, LIMIT	1
26	70032	.LEVER, LIMIT SWITCH	1
27	30387	.ASSEMBLY, TILT SWITCH (See Sect. 3, Fig. 38 for Details)	1
28	30496	.ASSEMBLY, CUSHION CYLINDER (See Sect. 3, Fig. 50 for Details)	2
29	20730	.VALVE, FLOW	3
30	65156	.NUT, WHEEL	20
31	64102	.PIN, CLEVIS	4
32	64307	.PIN, COTTER	1
33	20796	.PIN, BELL CRANK	1
34	8044	.ASSEMBLY, BELL CRANK (See Sect. 3, Fig. 40 for Details)	1
35	30302	.ASSEMBLY, TIE ROD (See Sect. 3, Fig. 41B for Details)	1
36	3013	.ASSEMBLY, STEERING CYLINDER (See Sect. 3, Fig. 43B for Details)	1
37	863	.GUARD, SPRING	1
38	764	.CLAMP	5
39	9059-1	.ASSEMBLY, MANUAL STABILIZER (See Sect. 3, Fig. 44 for Details)	4



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
40	60142	.BOLT	4
41	63105	.NUT, LOCK	4
42	30720	.KIT, HYDRAULIC TUBING	1
43	60514	.SCREW, HEX HEAD CAP	8
44	64101	.PIN, CLEVIS	2
45	64303	.PIN, COTTER	2
46	30301	.ASSEMBLY, TIE ROD (See Sect. 3, Fig. 42B for Details)	1
47	30600	.KIT, HOSE	1
48	60903	.NUT, JAM (L.H.)	2
49	60902	.NUT, JAM (R.H.)	2
50	30492	.ASSEMBLY, FRONT AXLE (See Sect. 3, Fig. 5B for Details)	1
51	30493	.ASSEMBLY, FRONT AXLE (See Sect. 3, Fig. 6B for Details)	1
52	3034	.ASSEMBLY, DRIVE MOTOR	2
-52A	2955	..SHAFT, OUTPUT	
-52B	66773	..SHAFT, INNERPUT	
-52C	66514	..COMMUTATOR WITH RING	
-52D	3036-A	..KIT, SEAL	
53	30299	.ASSEMBLY, DRIVE HUB	2
54	2240	.ASSEMBLY, FRONT DRUM AND HUB (See Sect. 3, Fig. 15A for Details)	2
55	30398	.WELDMENT, FRAME	1







ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30856	ASSEMBLY, FRAME (See Sect. 2, Fig. 1A for NHA)	REF
2	30398	.WELDMENT, FRAME	1
-2A	30492	..ASSEMBLY, FRONT AXLE (L.H.) (See Sect. 3, Fig. 5B for Details)	1
-2B	30493	..ASSEMBLY, FRONT AXLE (R.H.) (See Sect. 3, Fig. 6B for Details)	
3	30784	.ASSEMBLY, STEERING TIRE (See Sect. 3, Fig. 8 for Details)	2
4	30783	.ASSEMBLY, DRIVE TIRE (See Sect. 3, Fig. 11 for Details)	2
5	30472	.ASSEMBLY, FRONT HUB (See Sect. 3, Fig. 16A for Details)	2
6	16408	.UNION, BULKHEAD	3
7	60131	.SCREW, HEX HEAD CAP	2
8	4030	.BATTERY (12 VOLT) (See Vendor Chap. for More Information)	1
9	486-C	.ASSEMBLY, PROPANE TANK	1
10	782	.BOX, BATTERY	1
11	30235	.ASSEMBLY, ENGINE (See Sect. 3, Fig. 21A for Details)	1
12	8316	.ASSEMBLY, FUEL TANK (See Sect. 3, Fig. 22 for Details)	1
13	30723	.ASSEMBLY, COMPONENT BOX (See Sect. 3, Fig. 24A for Details)	1
14	16511	.ELBOW, STRAIGHT THREAD	4
15	30583	.ASSEMBLY, HYDRAULIC TANK (See Sect. 3, Fig. 37C for Details)	1
16	63301	.WASHER, SPLIT LOCK	20
17	60701	.NUT, HEX	20
18	63401	.WASHER, FLAT	18
19	60123	.SCREW, HEX HEAD CAP	18



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
20	411	.MOULDING, RUBBER (20 1/4)	2
21	411	.MOULDING, RUBBER (13 1/4)	2
22	411	.MOULDING, RUBBER (12 1/2)	1
23	411	.MOULDING, RUBBER (5 1/2)	8
24	165	.MOULDING, RUBBER (4)	3
25	63402	.WASHER, FLAT	8
26	70173	.SWITCH, LIMIT	1
27	30387	.ASSEMBLY, TILT SWITCH (See Sect. 3, Fig. 38 for Details)	1
28	30496	.ASSEMBLY, CUSHION CYLINDER (See Sect. 3, Fig. 50 for Details)	2
29	201	.VALVE, NEEDLE	1
30	65156	.NUT, WHEEL	20
31	64102	.PIN, CLEVIS	4
32	64307	.PIN, COTTER	4
33	20796	.PIN, BELL CRANK	1
34	8044	.ASSEMBLY, BELL CRANK (See Sect. 3, Fig. 40 for Details)	1
35	30301	.ASSEMBLY, TIE ROD (See Sect. 3, Fig. 42B for Details)	1
36	3013	.ASSEMBLY, STEERING CYLINDER (See Sect. 3, Fig. 43B for Details)	1
37	80008-03	.ELBOW, MALE	1
38	764	.CLAMP	AR
39	255	.RAP, TIE	AR
40	256	.RAP, TIE	AR
41	9059	.ASSEMBLY, MANUAL STABILIZER (See Sect. 3, Fig. 44 for Details)	4
42	60378	.SCREW, HEX HEAD CAP	4



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
43	60706	.NUT, HEX	4
44	2492	.TEE, UNION	1
45	60338	.SCREW, HEX HEAD CAP	8
46	55	.CLAMP	4
47	63302	.WASHER, SPLIT LOCK	8
48	60702	.NUT, HEX	8
49	60308	.SCREW, CAP	4
50	63305	.WASHER, SPLIT LOCK	12
51	60705	.NUT, HEX	4
52	16316	.PIN, COTTER	2
53	30302	.ASSEMBLY, TIE ROD	1
54	30829	.ASSEMBLY, INTENSIFIER (See Sect. 3, Fig. 17 for Details)	1
55	20860	.ASSEMBLY, CALIPER DISC BRAKE (See Sect. 3, Fig. 18 for Details)	2
56	30876	.WELDMENT, DRUM AND DISC	2
57	32043	.ASSEMBLY, DRIVE MOTOR	2
-57A	66518	..SHAFT, OUTPUT	1
-57B	66773	..SHAFT, INNER	1
-57C	66915	..SHAFT, KEY	1
-57D	66162	..KIT, SEAL	1
-57E	66514	..COMMUTATOR WITH RING	1
58	2432	.TEE, UNION	2
59	60512	.SCREW, CAP	8
60	30294	.HUB, DRIVE	2
61	60707	.NUT, HEX	2
62	63307	.WASHER, SPLIT LOCK	2

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PARTS CATALOG

FRAME ASSEMBLY (RT-31G) (AFT. JUL. '82)

(continued)

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FIG. 2B
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ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
63	30866	.PIN, CALIPER PIVOT	2
64	64310	.PIN, COTTER	4
65	30884	.VALVE, FLOW	1
66	51005	.CONNECTOR, MALE	1
67	52308	.ELBOW, STREET	1
68	62708	.SCREW, ROUND HEAD CAP	2
69	70032	.LEVER, LIMIT SWITCH	1
70	30856	.SPACER, FRONT RIM	2
71	30883	.ASSEMBLY, HYDRAULIC PIPE	1
72	64101	.PIN, CLEVIS	2

REV.

- ITEM NOT ILLUSTRATED

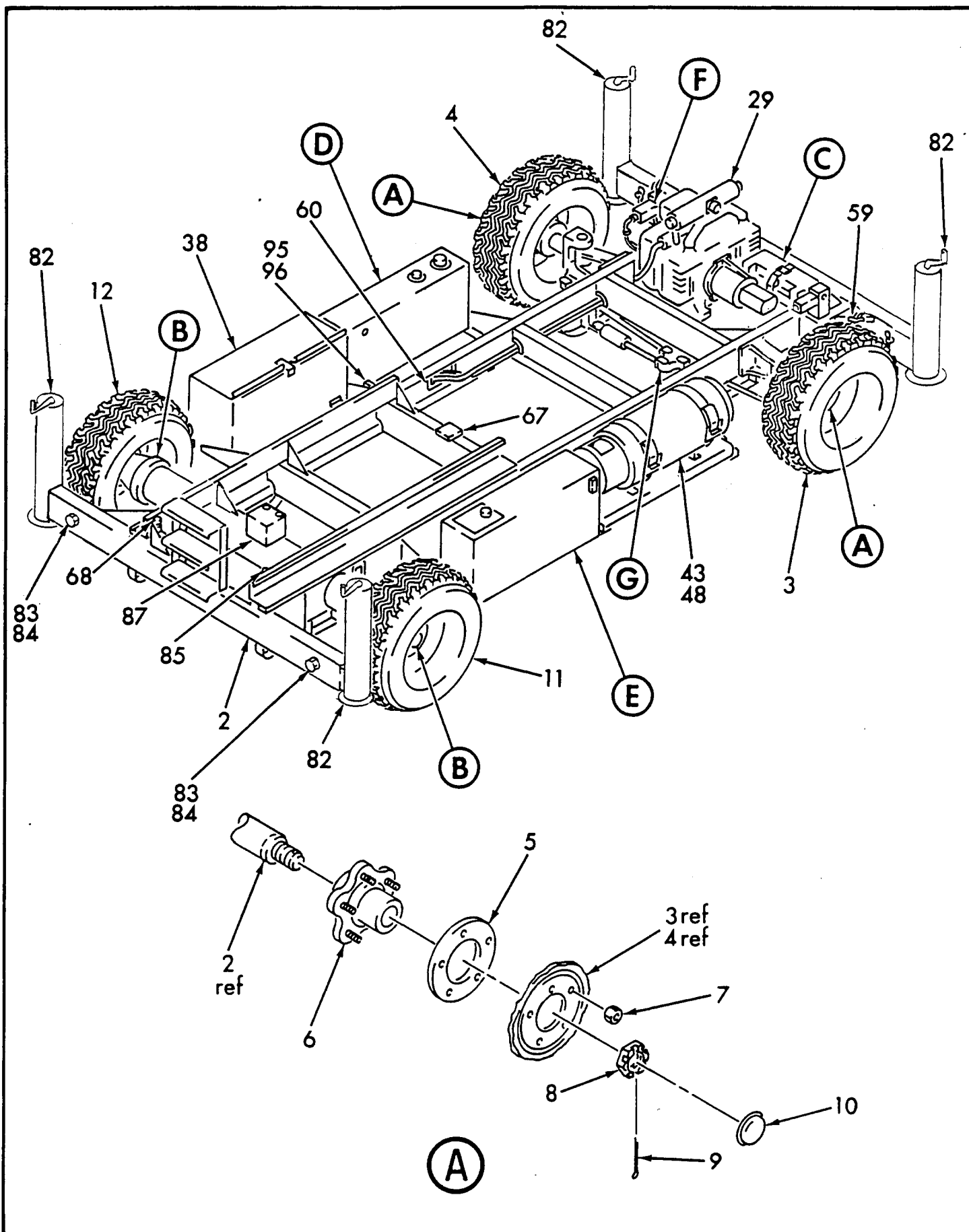


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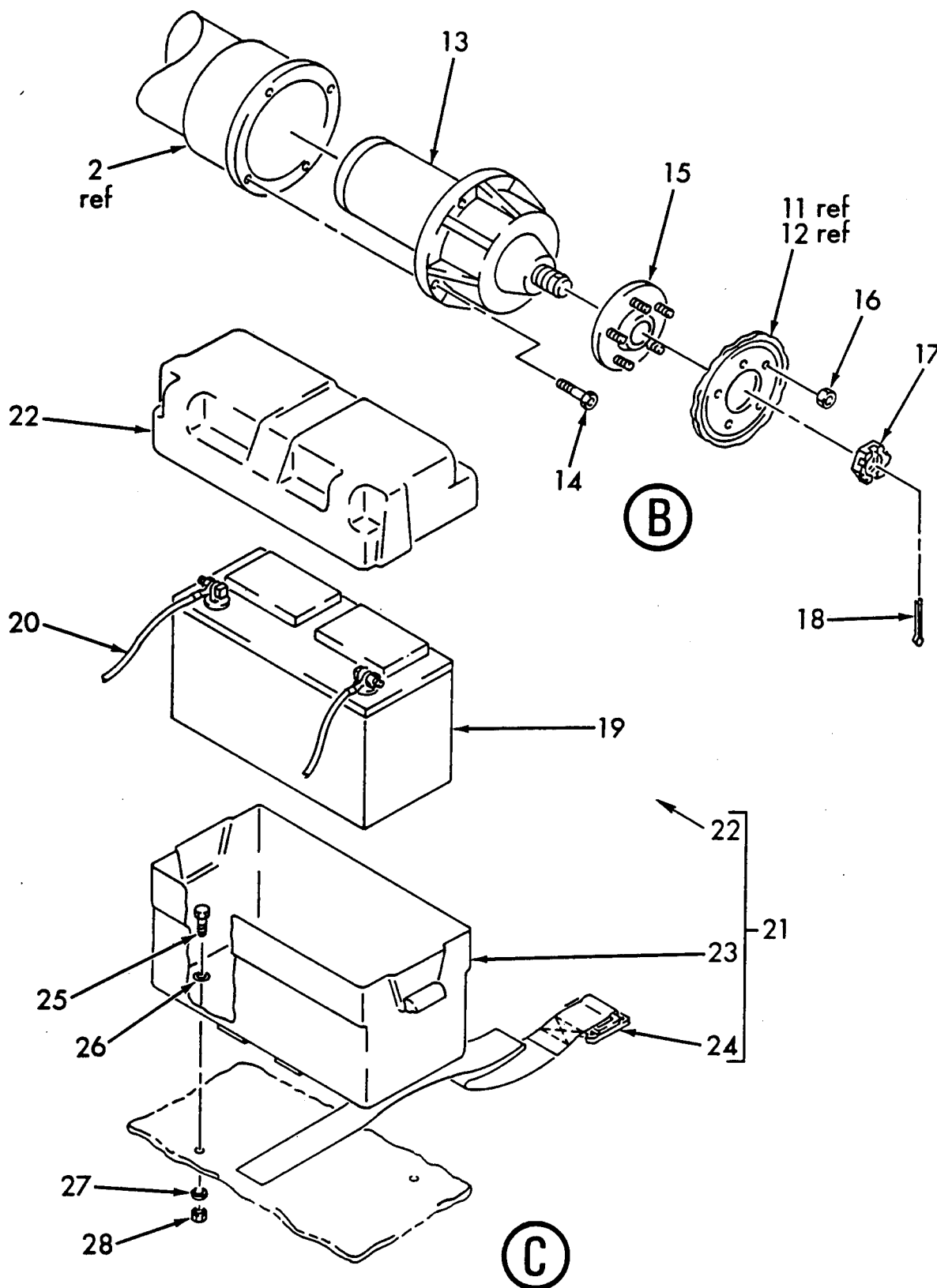
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PARTS CATALOG

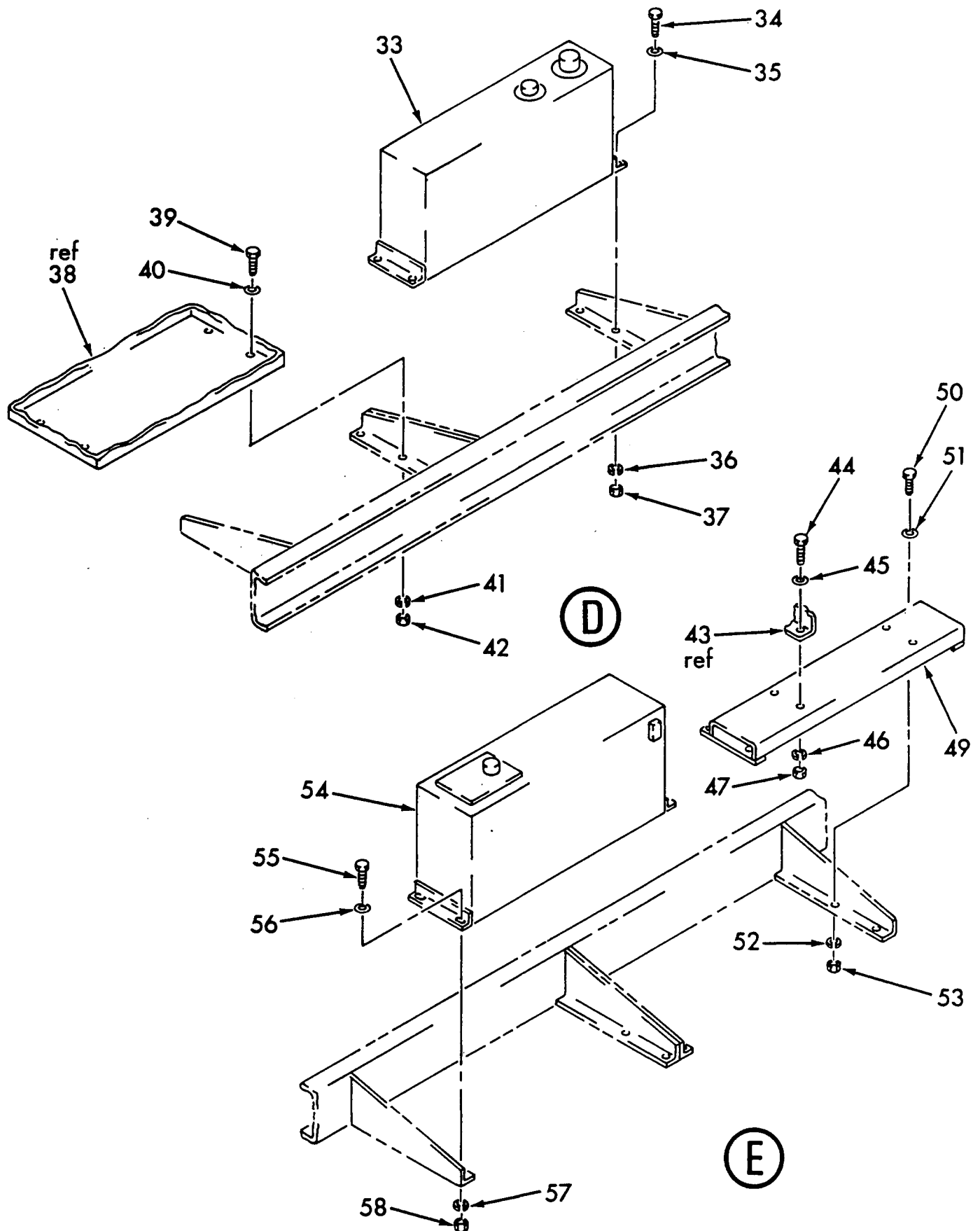
FRAME ASSEMBLY (RT-31G) (AFT. JUL. '86)

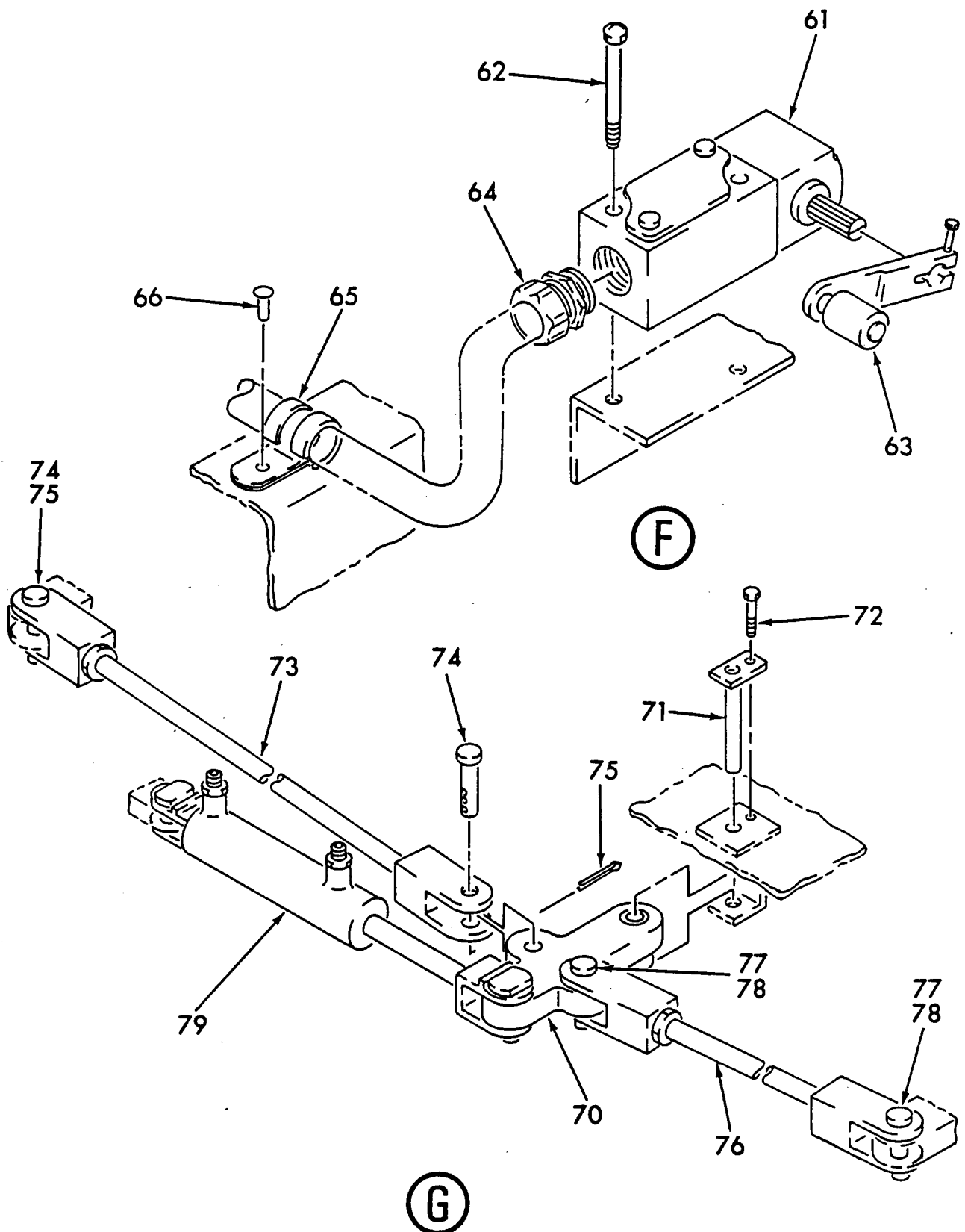
PARTS
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FIG. 2C
PAGE 1



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FRAME ASSEMBLY (RT-31G) (AFT. JUL. '86)

(continued)

PARTS
SECT. 3
FIG. 2C
PAGE 5

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	32382	ASSEMBLY, FRAME (See Sect. 2, Fig. 1B for NHA)	REF
2	32446	.WELDMENT, FRAME	1
-2A	30492	..ASSEMBLY, AXLE (L.H.) (See Sect. 3, Fig. 5B for Details)	1
-2B	30493	..ASSEMBLY, AXLE (R.H.) (See Sect. 3, Fig. 6B for Details)	1
3	30784	.ASSEMBLY, STEERING TIRE (See Sect. 3, Fig. 8 for Details)	1
4	32495	.ASSEMBLY, STEERING TIRE (See Sect. 3, Fig. 9 for Details)	1
5	30813	.SPACER, FRONT RIM	2
6	31283	.ASSEMBLY, HUB (See Sect. 3, Fig. 16B for Details)	2
7	65156	.NUT, WHEEL (attaching part)	10
8	66142	.NUT, CASTLE (attaching part)	2
9	64310	.PIN, COTTER (attaching part)	2
10	65126	.CAP, DUST (attaching part)	2
11	30783	.ASSEMBLY, DRIVE TIRE (R.H.) (See Sect. 3, Fig. 11 for Details)	1
12	32494	.ASSEMBLY, DRIVE TIRE (L.H.) (See Sect. 3, Fig. 12 for Details)	1
13	32461	.ASSEMBLY, DRIVE MOTOR AND BRAKE (See Sect. 3, Fig. 19 for Details)	1
14	62006	.SCREW, CAP (attaching part)	8
15	30294	.ASSEMBLY, DRIVE CONE BRAKE HUB (See Sect. 3, Fig. 20 for Details)	2
16	65156	.NUT, WHEEL (attaching part)	10
17	66142	.NUT, CASTLE (attaching part)	2
18	64310	.PIN, COTTER (attaching part)	2
19	4030	.BATTERY (See Vendor Chap. for more Information)	1

REV.

- ITEM NOT ILLUSTRATED



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
20	31238-L	.ASSEMBLY, BATTERY CABLE	1
21	782	.ASSEMBLY, BATTERY BOX	1
22	16934	..CAP	1
23		..BOX, BATTERY	1
24	16935	..ASSEMBLY, BELT	1
25	60309	.SCREW, CAP (attaching part)	2
26	63401	.WASHER, FLAT (attaching part)	2
27	63301	.WASHER, LOCK (attaching part)	2
28	60701	.NUT, HEX (attaching part)	2
29	32378	.ASSEMBLY, ENGINE AND PUMP (See Sect. 3, Fig. 21B for Details)	1
-30	60308	.SCREW, CAP (attaching part)	4
-31	63305	.WASHER, LOCK (attaching part)	4
-32	60702	.NUT, HEX (attaching part)	4
33	8316	.ASSEMBLY, FUEL TANK (See Sect. 3, Fig. 22 for Details)	1
34	60309	.SCREW, CAP (attaching part)	4
35	63401	.WASHER, FLAT (attaching part)	4
36	63301	.WASHER, LOCK (attaching part)	4
37	60701	.NUT, HEX (attaching part)	4
38	33412	.ASSEMBLY, COMPONENT BOX (See Sect. 3, Fig. 24B for Details)	1
39	60309	.SCREW, CAP (attaching part)	4
40	63401	.WASHER, FLAT (attaching part)	4
41	63301	.WASHER, FLAT (attaching part)	4
42	60701	.NUT, HEX (attaching part)	4
43	486-C	.TANK, LPG	1
44	60338	.SCREW, CAP (attaching part)	4



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
45	63402	.WASHER, FLAT (attaching part)	4
46	63302	.WASHER, LOCK (attaching part)	4
47	60702	.NUT, HEX (attaching part)	4
48	486-A	.BRACKET, TANK (pair)	1
49	9085	.ASSEMBLY, BRACKET PROPANE TANK MTG.	1
50	60309	.SCREW, CAP (attaching part)	4
51	63401	.WASHER, FLAT (attaching part)	4
52	63301	.WASHER, LOCK (attaching part)	4
53	60701	.NUT, HEX (attaching part)	4
54	32431	.ASSEMBLY, HYDRAULIC TANK (See Sect. 3, Fig. 37D for Details)	1
55	60309	.SCREW, CAP (attaching part)	4
56	63401	.WASHER, FLAT (attaching part)	4
57	63301	.WASHER, LOCK (attaching part)	4
58	60701	.NUT, HEX (attaching part)	4
59	22	.CLIP	6
60	411	.EXTRUSION (4 FT)	AR
61	70173	.SWITCH, LIMIT	1
62	62708	.SCREW, MACHINE (attaching part)	2
63	70032	.ARM, LIMIT SWITCH	1
64	2806	.RELIEF, STRAIN	1
65	764	.CLAMP	10
66		.RIVET, POP (attaching part)	AR
67	30387	.ASSEMBLY, TILT SWITCH (See Sect. 3, Fig. 38 for Details)	1
68	32578	.ASSEMBLY, NEEDLE VALVE (See Sect. 3, Fig. 39 for Details)	1
-69	65218	.BOLT, U (attaching part)	1



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
70	8044	.ASSEMBLY, BELL CRANK (See Sect. 3, Fig. 40 for Details)	1
71	20796	.PIN	1
72	60338	.SCREW, CAP (attaching part)	1
73	30302	.ASSEMBLY, TIE ROD (See Sect. 3, Fig. 41B for Details)	1
74	64102	.PIN, CLEVIS (attaching part)	2
75	64307	.PIN, COTTER (attaching part)	2
76	30301	.ASSEMBLY, TIE ROD (See Sect. 3, Fig. 42B for Details)	1
77	64102	.PIN, CLEVIS (attaching part)	2
78	64307	.PIN, COTTER (attaching part)	2
79	32584	.ASSEMBLY, STEERING CYLINDER (See Sect. 3, Fig. 43C for Details)	1
-80	255	.CABLE, TIE	25
-81	256	.CABLE, TIE	25
82	31189	.ASSEMBLY, MANUAL STABILIZER (See Sect. 3, Fig. 44 for Details)	4
83	60378	.SCREW, CAP (attaching part)	4
84	60706	.NUT, HEX (attaching part)	4
85	32579	.ASSEMBLY, FLOW CONTROL VALVE (See Sect. 3, Fig. 48 for NHA)	1
-86	65218	.BOLT, U (attaching part)	1
87	32475	.ASSEMBLY, DRIVE AND BRAKE VALVE (See Sect. 3, Fig. 49 for Details)	1
-88	60428	.SCREW, CAP (attaching part)	2
-89	63303	.WASHER, LOCK (attaching part)	2

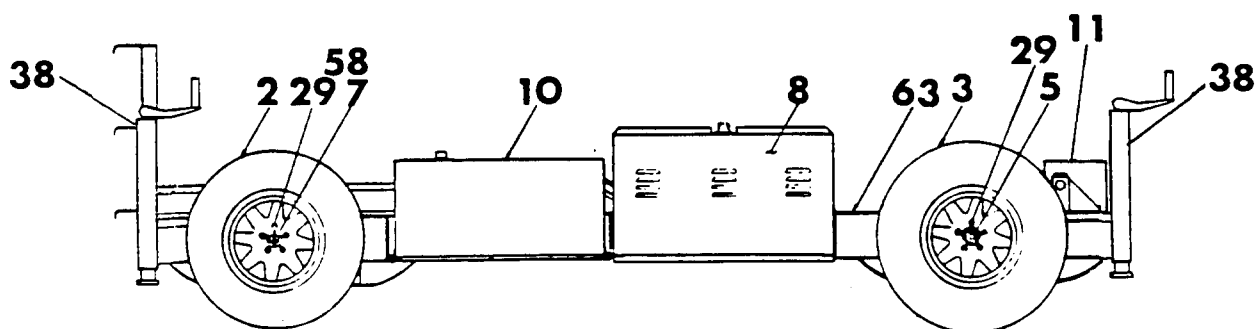
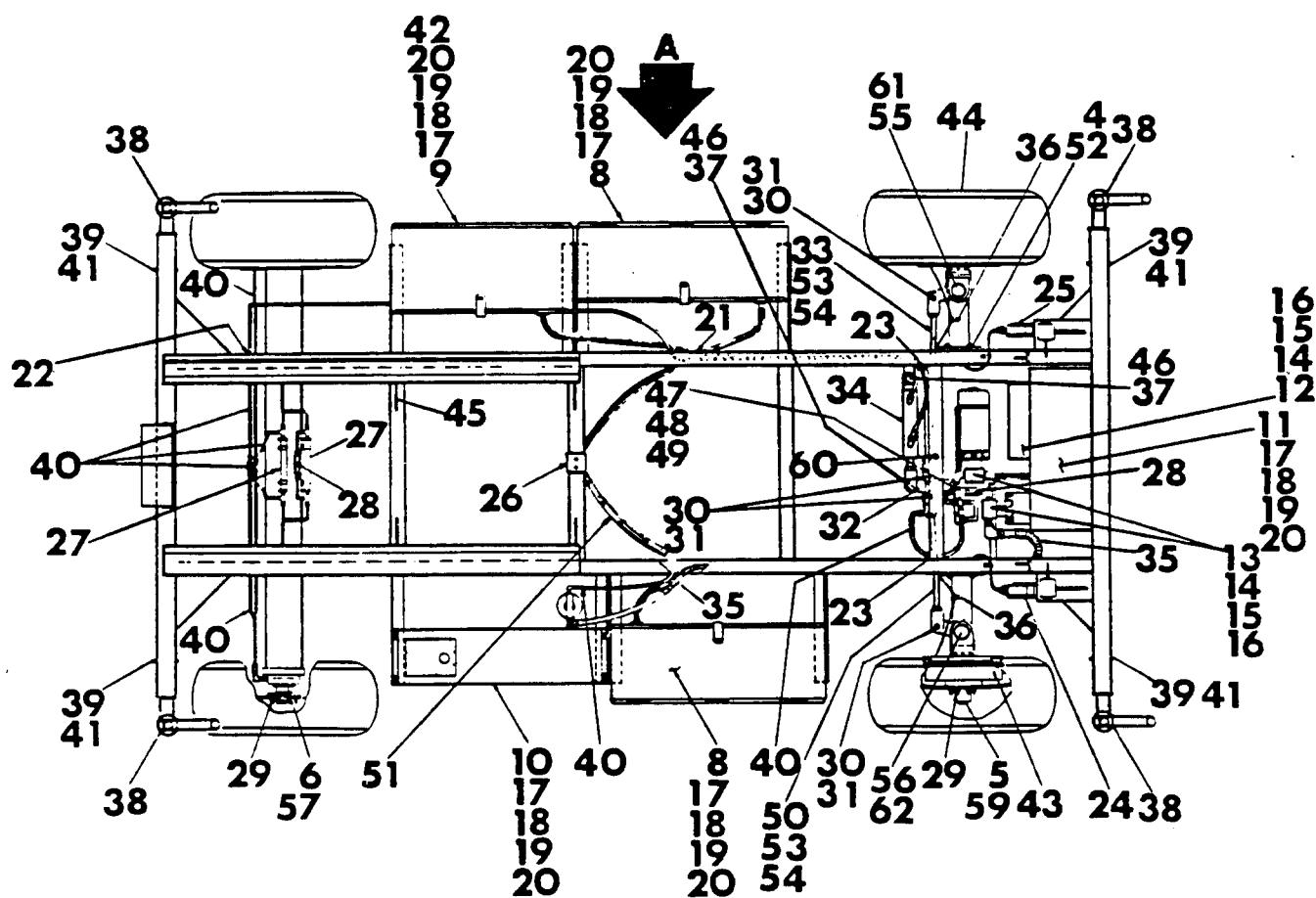
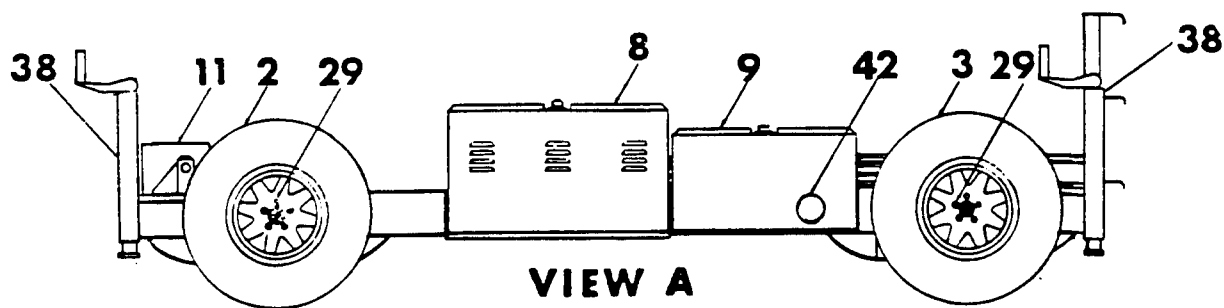


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FRAME ASSEMBLY (RT-31E) (BEF. JUL. '82)

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ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	8111	ASSEMBLY, FRAME (See Sect. 2, Fig. 2 for NHA)	REF
2	30783	.ASSEMBLY, DRIVE TIRE (See Sect. 3, Fig. 11 for Details)	2
3	30784	.ASSEMBLY, STEERING TIRE (See Sect. 3, Fig. 8 for Details)	2
4	61319	.NUT, CRUSH TYPE LOCK	8
5	30482	.ASSEMBLY, FRONT HUB (See Sect. 3, Fig. 15B for Details)	2
6	30243	.ASSEMBLY, HYDRAULIC MOTOR	2
-6A	66518	..SHAFT, OUTPUT	1
-6B	66773	..SHAFT, INNER	1
-6C	66915	..KEY, SHAFT	1
-6D	66514	..COMMUTER WITH RING	1
-6F	66162	..KIT, SEAL	1
7	30294	.HUB, DRIVE (See Sect. 3, Fig. 20 for Details)	2
8	30861	.ASSEMBLY, BATTERY BOX (AFT. MAY '77) (See Sect. 3, Fig. 53A for Details)	2
-8A	8317	.ASSEMBLY, BATTERY BOX (BEF. MAR. '80) (See Sect. 3, Fig. 53B for Details)	2
-8B	30466	.ASSEMBLY, BATTERY BOX (AFT. MAR. '80) (See Sect. 3, Fig. 53C for Details)	2
9	30722	.ASSEMBLY, COMPONENT BOX (See Sect. 3, Fig. 25A for Details)	1
10	8318-2	.ASSEMBLY, HYDRAULIC TANK (See Sect. 3, Fig. 37B for Details)	1
11	8326	.BRACKET, INVERTER	1
12	4006	.CHARGER, BATTERY (See Vendor Chapt. for More Information)	1
13	3015	.ASSEMBLY, PUMP MOTOR	1
-13A	3015-1	..PUMP	1



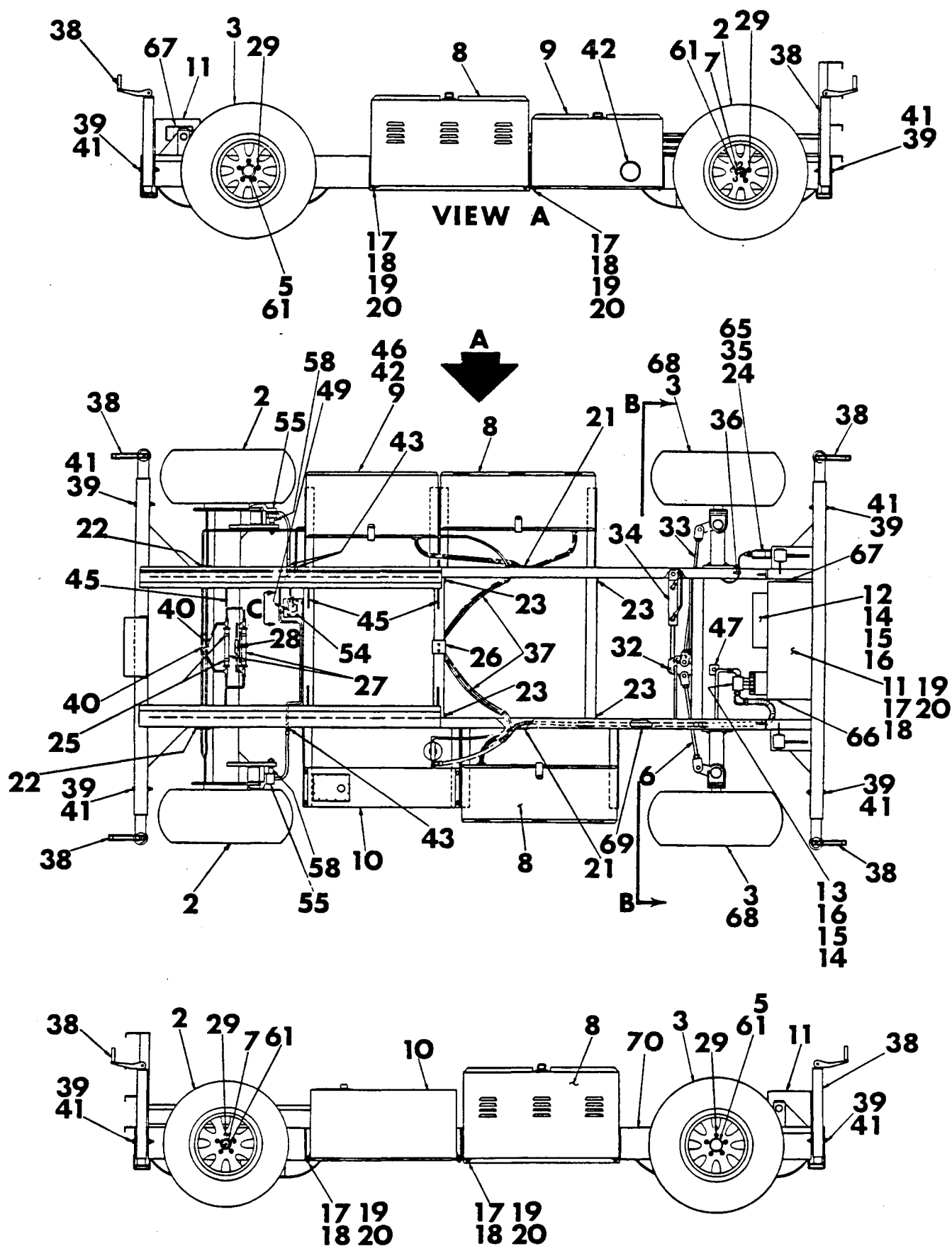
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-13B	3015-2	..MOTOR	1
-13C	2793	...BRUSHES	1
14	882	.MOUNT, SHOCK	12
15	63302	.WASHER, LOCK	24
16	60702	.NUT, HEX	24
17	64302	.WASHER, FLAT	20
18	63301	.WASHER, LOCK	20
19	60701	.NUT, HEX	20
20	60131	.SCREW, HEX HEAD CAP	20
21	411	.MOULDING, RUBBER (20 1/4)	2
22	411	.MOULDING, RUBBER (13 1/4)	2
23	411	.MOULDING, RUBBER (5 1/2)	8
24	70107	.SWITCH, LIMIT	1
25	70173	.LEVER, LIMIT SWITCH	1
26	30387	.ASSEMBLY, TILT SWITCH (See Sect. 3, Fig. 38 for Details)	1
27	30496	.ASSEMBLY, CUSHION CYLINDER (See Sect. 3, Fig. 50 for Details)	2
28	201	.VALVE, FLOW	1
29	65156	.NUT, WHEEL	20
30	64102	.PIN, CLEVIS	4
31	64307	.PIN, COTTER	4
32	8044	.ASSEMBLY, BELL CRANK (See Sect. 3, Fig. 40 for Details)	1
33	30302	.ASSEMBLY, TIE ROD (See Sect. 3, Fig. 41B for Details)	1
34	3013	.ASSEMBLY, STEERING CYLINDER (See Sect. 3, Fig. 43B for Details)	1
35	863	.GUARD, SPRING	2

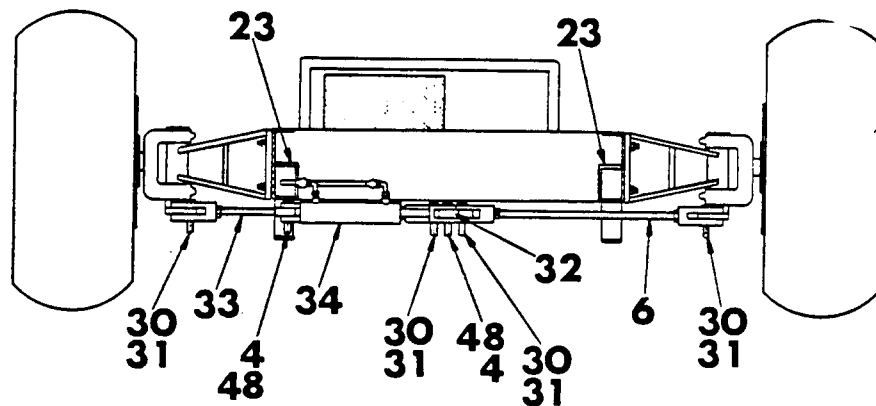


ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
36	764	.CLAMP	5
37	3013-2	.PIN, CLEVIS	2
38	9059-1	.ASSEMBLY, MANUAL STABILIZER (See Sect. 3, Fig. 44 for Details)	4
39	60142	.BOLT	4
40	30721	.KIT, HYDRAULIC TUBING	1
41	63105	.NUT, LOCK	4
42	411	.MOULDING, RUBBER (12 1/2)	1
43	2238-1	.BRAKE, ELECTRIC (L.H.)	1
44	2238-2	.BRAKE, ELECTRIC (R.H.)	1
45	165	.MOULDING, RUBBER (SUCTION HOSE, 4)	3
46	64303	.PIN, COTTER	2
47	20796	.PIN, STEERING	1
48	60603	.SCREW, CAP	1
49	63302	.WASHER, LOCK	1
50	30301	.ASSEMBLY, TIE ROD (See Sect. 3, Fig. 42B for Details)	1
51	30601	.KIT, HOSE	1
52	60514	.SCREW, HEX HEAD CAP	8
53	60903	.NUT, JAM (L.H.)	2
54	60902	.NUT, JAM (R.H.)	2
55	30492	.ASSEMBLY, FRONT AXLE (L.H.) (See Sect. 3, Fig. 5B for NHA)	1
56	30493	.ASSEMBLY, FRONT AXLE (R.H.) (See Sect. 3, Fig. 6B for NHA)	1
57	3034	.ASSEMBLY, DRIVE MOTOR (BEF. JUL. '80)	2
-57A	2955	..SHAFT, OUTPUT	1
-57B	66773	..SHAFT, INNER	1

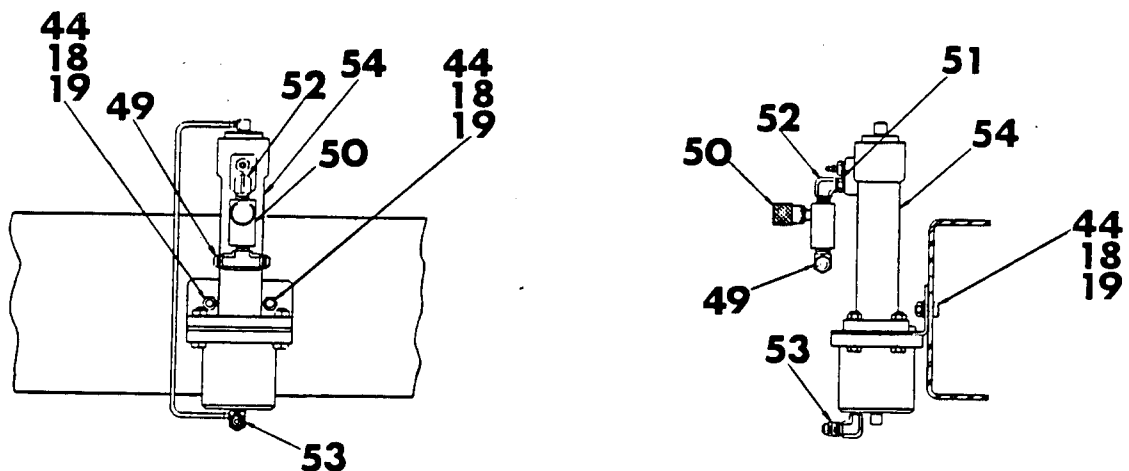
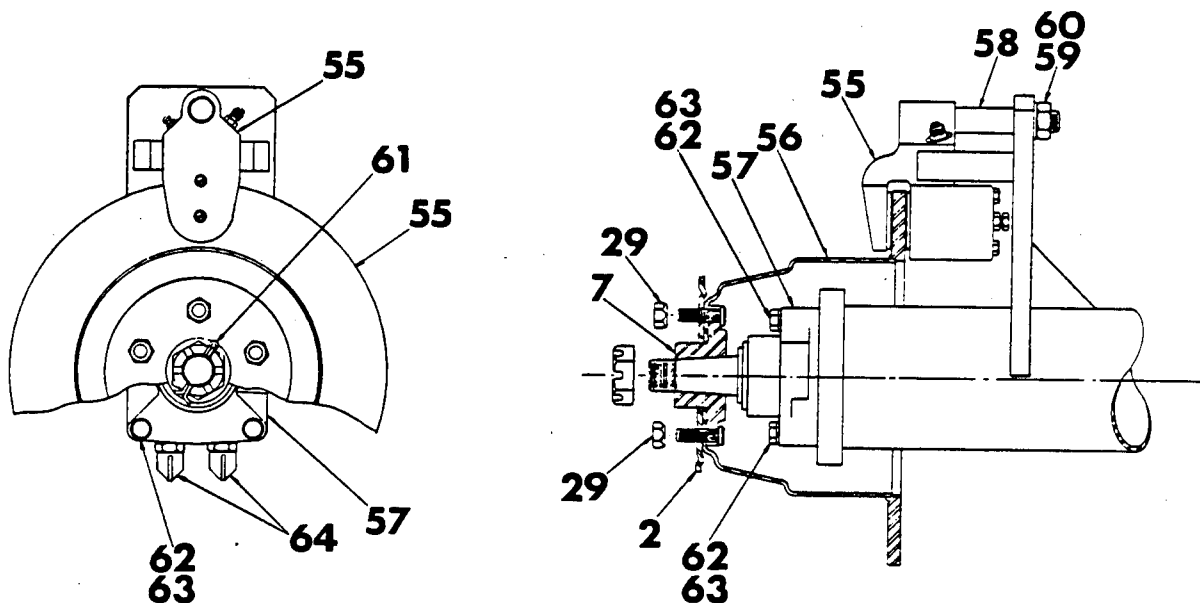


ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-57C	66514	..COMMUTATOR WITH RING	1
-57D	66915	..KEY, SHAFT	1
-57E	3036-A	..KIT, SEAL	1
58	30299	.ASSEMBLY, DRIVE HUB (BEF. JUL. '80)	2
59	2240	.ASSEMBLY, FRONT HUB (BEF. JUL. '80) (See Sect. 3, Fig. 15A for Details)	2
60	20796	.PIN, BELL CRANK	1
61	6313-2	.ASSEMBLY, FRONT AXLE (L.H.) (BEF. JUL. '80) (See Sect. 3, Fig. 5A for Details)	1
62	6313-1	.ASSEMBLY, FRONT AXLE (R.H.) (BEF. JUL. '80) (See Sect. 3, Fig. 6A for Details)	1
63	30394	.WELDMENT, FRAME	1





SECTION B



VIEW C



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30857	ASSEMBLY, FRAME (See Sect. 2, Fig. 2 for NHA)	REF
2	30783	.ASSEMBLY, DRIVE TIRE (See Sect. 3, Fig. 11 for Details)	2
3	30784	.ASSEMBLY, STEERING TIRE (See Sect. 3, Fig. 8 for Details)	2
4	3013-2	.PIN, CLEVIS	2
5	30472	.ASSEMBLY, FRONT HUB (See Sect. 3, Fig. 15B for Details)	2
6	30301	.ASSEMBLY, TIE ROD (L.H.) (See Sect. 3, Fig. 42B for Details)	1
7	30294	.ASSEMBLY, DRIVE HUB (See Sect. 3, Fig. 20 for Details)	2
8	30466	.ASSEMBLY, BATTERY BOX (AFT. MAR. '80) (See Sect. 3, Fig. 53C for Details)	2
-8A	30466	.ASSEMBLY, BATTERY BOX no.1 (L.H.) (AFT. JUL. '86) (See Sect. 3, Fig. 54 for Details)	1
-8B	32586	.ASSEMBLY, BATTERY BOX no.2 (R.H.) (AFT. JUL. '86) (See Sect. 3, Fig. 55 for Details)	1
9	30722	.ASSEMBLY, COMPONENT BOX (AFT. MAR. '80) (See Sect. 3, Fig. 25A for Details)	1
-9A	32413	.ASSEMBLY, COMPONENT BOX (AFT. JUL. '86) (See Sect. 3, Fig. 25B for Details)	1
10	30583	.ASSEMBLY, HYDRAULIC TANK (AFT. MAR. '80) (See Sect. 3, Fig. 37C for Details)	1
-10A	32431	.ASSEMBLY, HYDRAULIC TANK (AFT. JUL. '86) (See Sect. 3, Fig. 37D for Details)	1
11	8326	.BRACKET, INVERTER	1
12	4006	.ASSEMBLY, BATTERY CHARGER (See Vendor Chapt. for More Information)	1
13	3015	.ASSEMBLY, MOTOR PUMP	1
-13A	3015-1	..PUMP	1



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-13B	3015-2	..MOTOR	1
-13C	2793	...BRUSHES	1
-13D	32577	.ASSEMBLY, HYDRAULIC MOTOR AND PUMP (AFT. JUL. '86) (See Sect. 3, Fig. 51 for Details)	1
14	882	.MOUNT, SHOCK	8
15	63302	.WASHER, SPLIT LOCK	16
16	60702	.NUT, HEX	16
17	63401	.WASHER, FLAT	20
18	63301	.WASHER, SPLIT LOCK	22
19	60701	.NUT, HEX	22
20	60123	.SCREW, HEX HEAD CAP	20
21	411	.MOULDING, RUBBER (20 1/4)	2
22	411	.MOULDING, RUBBER (13 1/4)	2
23	411	.MOULDING, RUBBER (5 1/2)	8
24	70173	.SWITCH, LIMIT	1
25	55	.CLAMP	4
26	30387	.ASSEMBLY, TILT SWITCH (See Sect. 3, Fig. 38 for Details)	1
27	30496	.ASSEMBLY, CUSHION CYLINDER (See Sect. 3, Fig. 50 for Details)	2
28	201	.VALVE, FLOW	1
29	65156	.NUT, WHEEL	20
30	64102	.PIN, CLEVIS	4
31	64307	.PIN, COTTER	4
32	8044	.ASSEMBLY, BELL CRANK (See Sect. 3, Fig. 40 for Details)	1
33	30302	.ASSEMBLY, TIE ROD (R.H.) (See Sect. 3, Fig. 41B for Details)	1



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
34	3013	.ASSEMBLY, STEERING CYLINDER (AFT. NOV. '79) (See Sect. 3, Fig. 43B for Details)	1
-34A	32584	.ASSEMBLY, STEERING CYLINDER (AFT. JUL. '86) (See Sect. 3, Fig. 43C for Details)	1
35	62708	.SCREW, ROUND	2
36	764	.CLAMP	AR
37	255	.RAP, TIE	AR
38	9059-1	.ASSEMBLY, MANUAL STABILIZER (See Sect. 4, Fig. 44 for Details)	4
39	60378	.SCREW, HEX HEAD CAP	4
40	80031-06	.TEE, UNION	2
41	60706	.NUT, HEX	4
42	411	.MOULDING, RUBBER (12 1/2)	1
43	16408	.UNION, BULKHEAD	3
44	60131	.SCREW, HEX HEAD CAP	2
45	165	.MOULDING, RUBBER (SUCTION HOSE)	3
46	256	.RAP, TIE	AR
47	20796	.PIN, BELL CRANK	1
48	16316	.PIN, COTTER	2
49	80034-03	.TEE, UNION	1
50	30884	.VALVE, FLOW	1
51	51005	.CONNECTOR, MALE	1
52	52308	.ELBOW, STREET	1
53	80008-03	.ELBOW	1
54	30829	.INTENSIFIER (See Sect. 3, Fig. 17 for Details)	1



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
55	30860	.ASSEMBLY, CALIPER DISC BRAKE (See Sect. 3, Fig. 18 for Details)	2
56	30876	.WELDMENT, DRUM AND DISC	2
57	30243	.ASSEMBLY, DRIVE MOTOR	2
-57A	66518	..SHAFT, OUTPUT	1
-57B	66773	..SHAFT, INNER	1
-57C	66915	..KEY, SHAFT	1
-57D	66514	..COMMUTER WITH RING	1
-57E	66162	..KIT, SEAL	1
58	30866	.PIN, CALIPER PIVOT	2
59	60707	.NUT, HEX	2
60	63307	.WASHER, SPLIT LOCK	2
61	64310	.PIN, COTTER	4
62	60512	.SCREW, HEX HEAD CAP	8
63	63305	.WASHER, SPLIT LOCK	8
64	16511	.ELBOW, STRAIGHT THREAD	4
65	70032	.LEVER, LIMIT SWITCH	1
66	411	.MOULDING, RUBBER (8 3/4)	1
67	411	.MOULDING, RUBBER (18)	1
68	30813	.SPACER, FRONT RIM	2
69	30883	.ASSEMBLY, HYDRAULIC PIPE	1
70	30394	.WELDMENT, FRAME	1
-71	30492	..ASSEMBLY, FRONT AXLE (L.H.) (See Sect. 3, Fig. 5B for Details)	1
-72	30493	..ASSEMBLY, FRONT AXLE (R.H.) (See Sect. 3, Fig. 6B for Details)	1

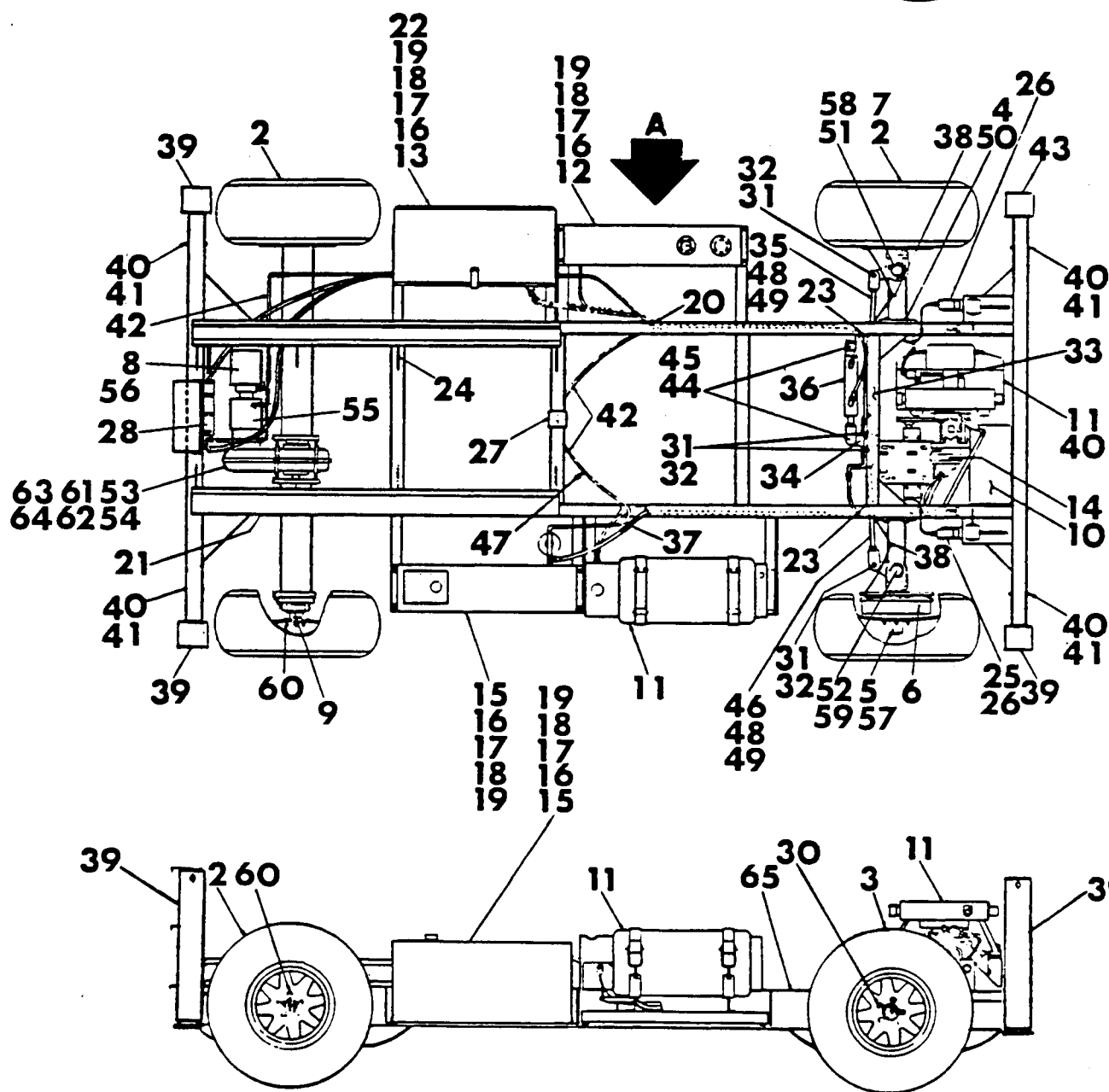
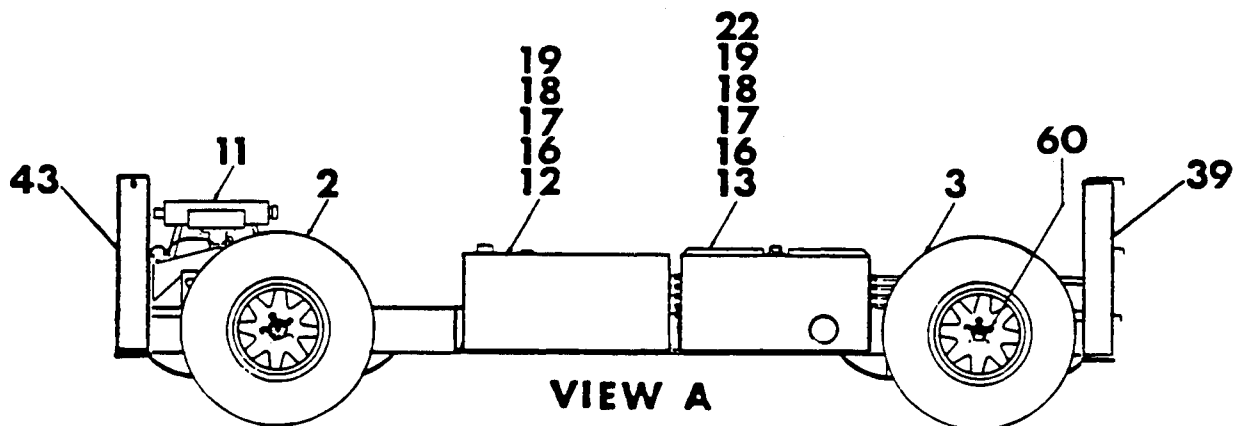


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FRAME ASSEMBLY (SRT-31G) (BEF. JUL. '86)

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FRAME ASSEMBLY (SRT-31G) (BEF. JUL. '86)

(continued)

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ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	8113	ASSEMBLY, FRAME (See Sect. 2, Fig. 3A for NHA)	REF
2	30796	.ASSEMBLY, DRIVE TIRE (See Sect. 3, Fig. 14 for Details)	2
3	30795	.ASSEMBLY, STEERING TIRE (See Sect. 3, Fig. 10 for Details)	2
4	61319	.NUT, CRUSH TYPE LOCK	8
5	30472	.ASSEMBLY, FRONT HUB (See Sect. 3, Fig. 16A for Details)	2
6	2238-1	.BRAKE, ELECTRIC (L.H.)	1
7	2238-2	.BRAKE, ELECTRIC (R.H.)	1
8	30456	.ASSEMBLY, HYDRAULIC MOTOR	2
9	1558	.ASSEMBLY, DRIVE HUB	2
10	9064	.ASSEMBLY, BATTERY BOX (See Sect. 3, Fig. 52 for Details)	1
11	30235	.ASSEMBLY, DUAL FUEL ENGINE (See Sect. 3, Fig. 21A for Details)	1
12	8316	.ASSEMBLY, FUEL TANK (See Sect. 3, Fig. 22 for Details)	1
13	30726	.ASSEMBLY, COMPONENT BOX (See Sect. 3, Fig. 26A for Details)	1
14	3038	.PUMP, HYDRAULIC	1
15	8318-2	.ASSEMBLY, HYDRAULIC TANK (See Sect. 3, Fig. 37B for Details)	1
16	63301	.WASHER, LOCK	12
17	60701	.NUT, HEX	12
18	60302	.WASHER, FLAT	12
19	60131	.SCREW, HEX HEAD	12
20	411	.MOULDING, RUBBER (20 1/4)	2
21	411	.MOULDING, RUBBER (13 1/4)	2
22	411	.MOULDING, RUBBER (12 1/2)	1

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ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
23	411	.MOULDING, RUBBER (5 1/2)	8
24	165	.MOULDING, RUBBER (SUCTION HOSE) (4)	3
25	70107	.SWITCH, LIMIT	1
26	70032	.LEVER, LIMIT SWITCH	1
27	30387	.ASSEMBLY, TILT SWITCH (See Sect. 3, Fig. 38 for Details)	1
28	30496	.ASSEMBLY, CUSHION CYLINDER (See Sect. 3, Fig. 50 for Details)	1
29	20370	.VALVE, FLOW	3
30	65156	.NUT, WHEEL	20
31	64102	.PIN, CLEVIS	4
32	64307	.PIN, COTTER	4
33	20796	.PIN, BELL CRANK	1
34	8044	.ASSEMBLY, BELL CRANK (See Sect. 3, Fig. 40 for Details)	1
35	30302	.ASSEMBLY, TIE ROD (See Sect. 3, Fig. 41B for Details)	1
36	3013	.ASSEMBLY, STEERING CYLINDER (See Sect. 3, Fig. 43B for Details)	1
37	863	.GUARD, SPRING	1
38	764	.CLAMP	5
39	3026	.ASSEMBLY, HYDRAULIC OUTRIGGER (See Sect. 3, Fig. 45A for Details)	3
40	29-B	.PIN WITH CHAIN	4
41	721	.PIN	4
42	30720	.KIT, HYDRAULIC TUBING	1
43	3024	.ASSEMBLY, HYDRAULIC OUTRIGGER (See Sect. 3; Fig. 46A for Details)	1
44	66039	.PIN, CLEVIS	2
45	64303	.PIN, COTTER	2



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
46	30301	.ASSEMBLY, TIE ROD (See Sect. 3, Fig. 42B for Details)	1
47	30600	.KIT, HOSE	1
48	60903	.NUT, JAM (L.H.)	2
49	60902	.NUT, JAM (R.H.)	2
50	60514	.SCREW, HEX HEAD CAP	8
51	30492	.ASSEMBLY, FRONT AXLE (L.H.) (See Sect. 3, Fig. 5B for Details)	1
52	30493	.ASSEMBLY, FRONT AXLE (R.H.) (See Sect. 3, Fig. 6B for Details)	1
53	483	.BOX, GEAR REDUCTION	1
54	6096	.ASSEMBLY, REAR AXLE	1
55	30209	.ASSEMBLY, BRAKE TO GEAR BOX (AFT. MAR. 80)	1
56	3036	.ASSEMBLY, DRIVE MOTOR (BEF. MAR. 80)	1
57	2240	.ASSEMBLY, DRUM AND HUB (BEF. JUL. 80) (See Sect. 3, Fig. 15B for Details)	2
58	6313-2	.ASSEMBLY, FRONT AXLE (L.H.) (BEF. JUL.'80) (See Sect. 3, Fig. 5A for Details)	1
59	6313-1	.ASSEMBLY, FRONT AXLE (R.H.) (BEF. JUL.'80) (See Sect. 3, Fig. 6A for Details)	1
60	2221	.BOLT, CONE	10
61	35150	.SPACER	4
62	35149	.SPACER	4
63	60155	.SCREW, HEX HEAD CAP	4
64	60705	.NUT, HEX	4
65	30395	.WELDMENT, FRAME	1

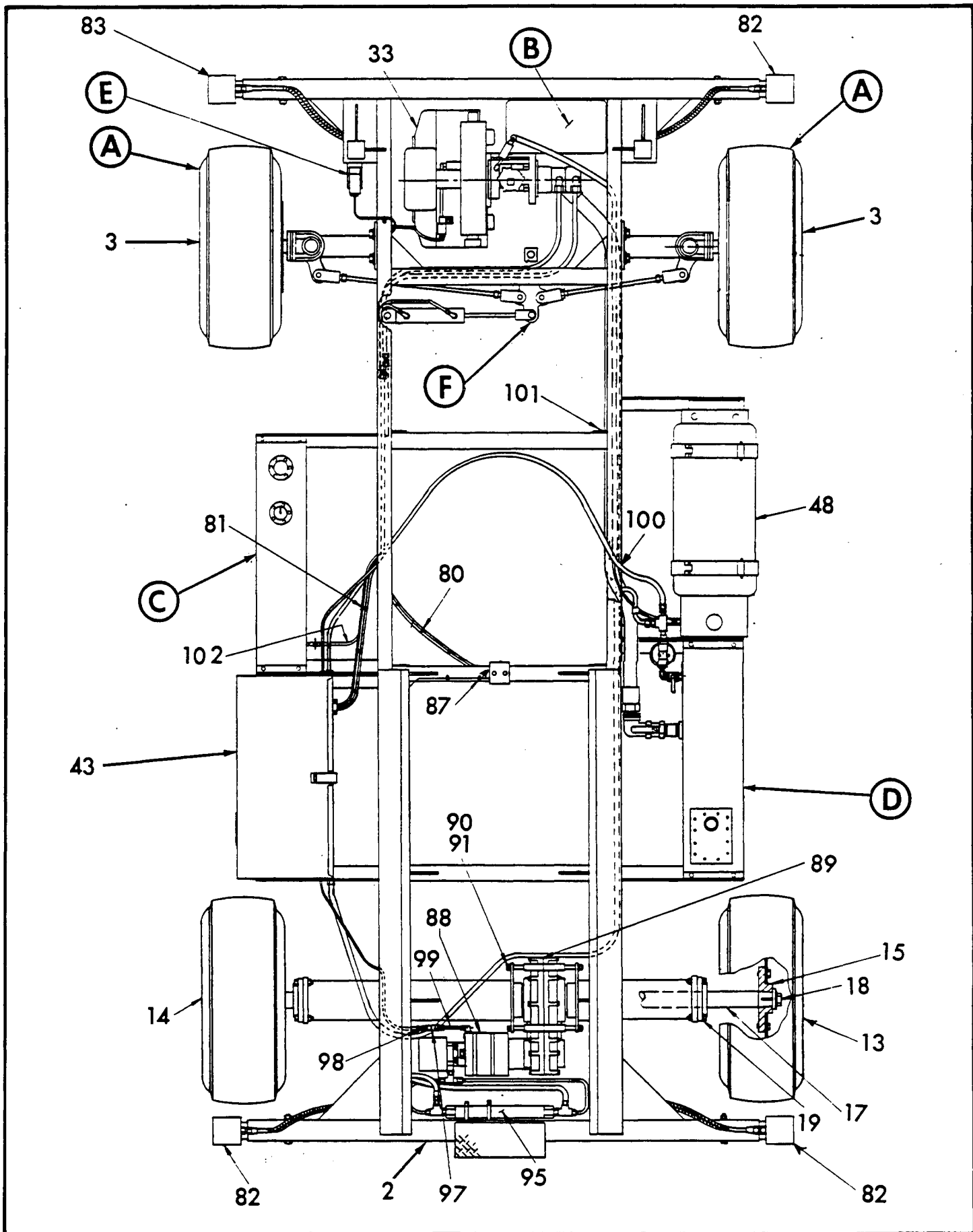


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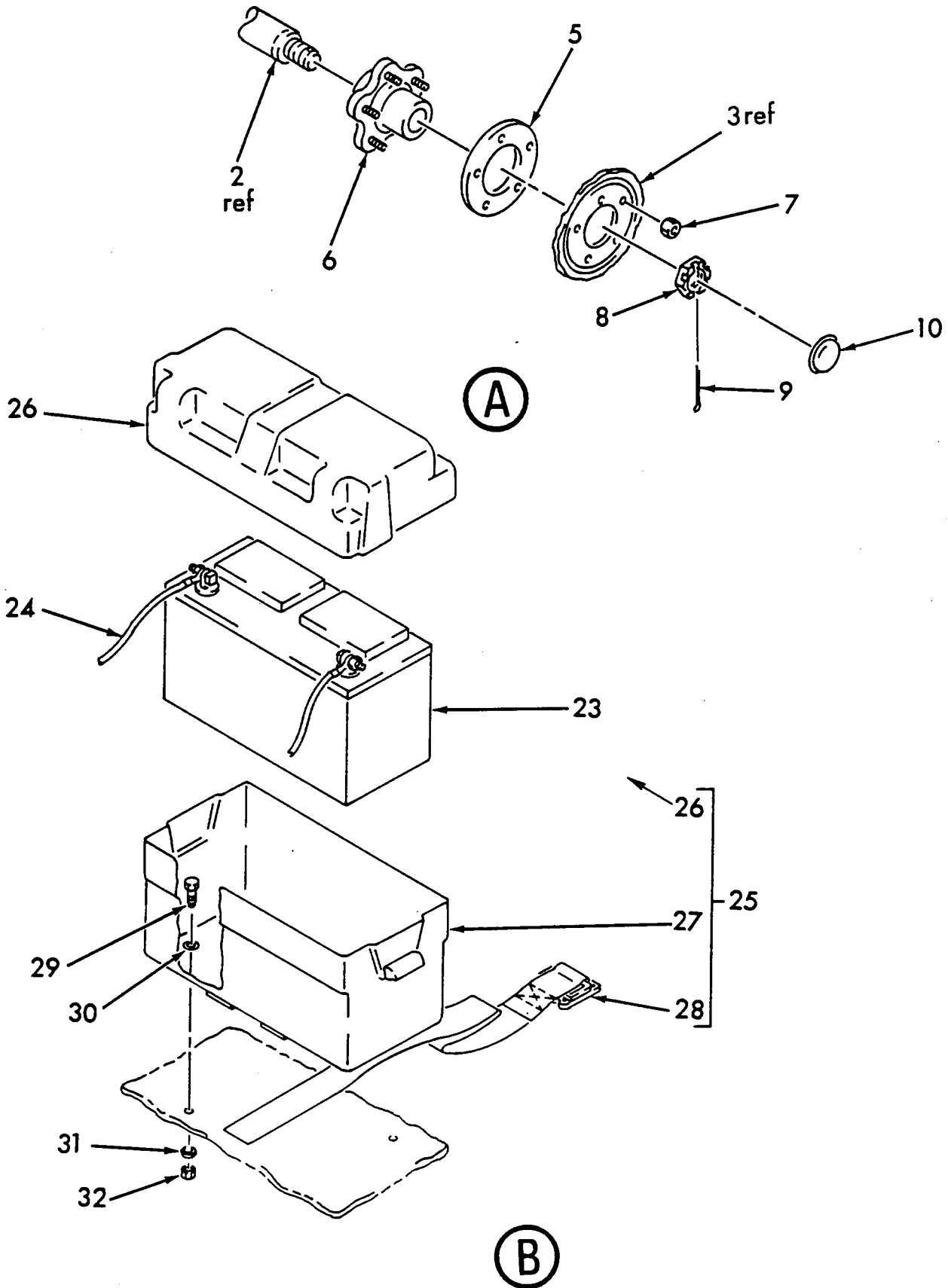
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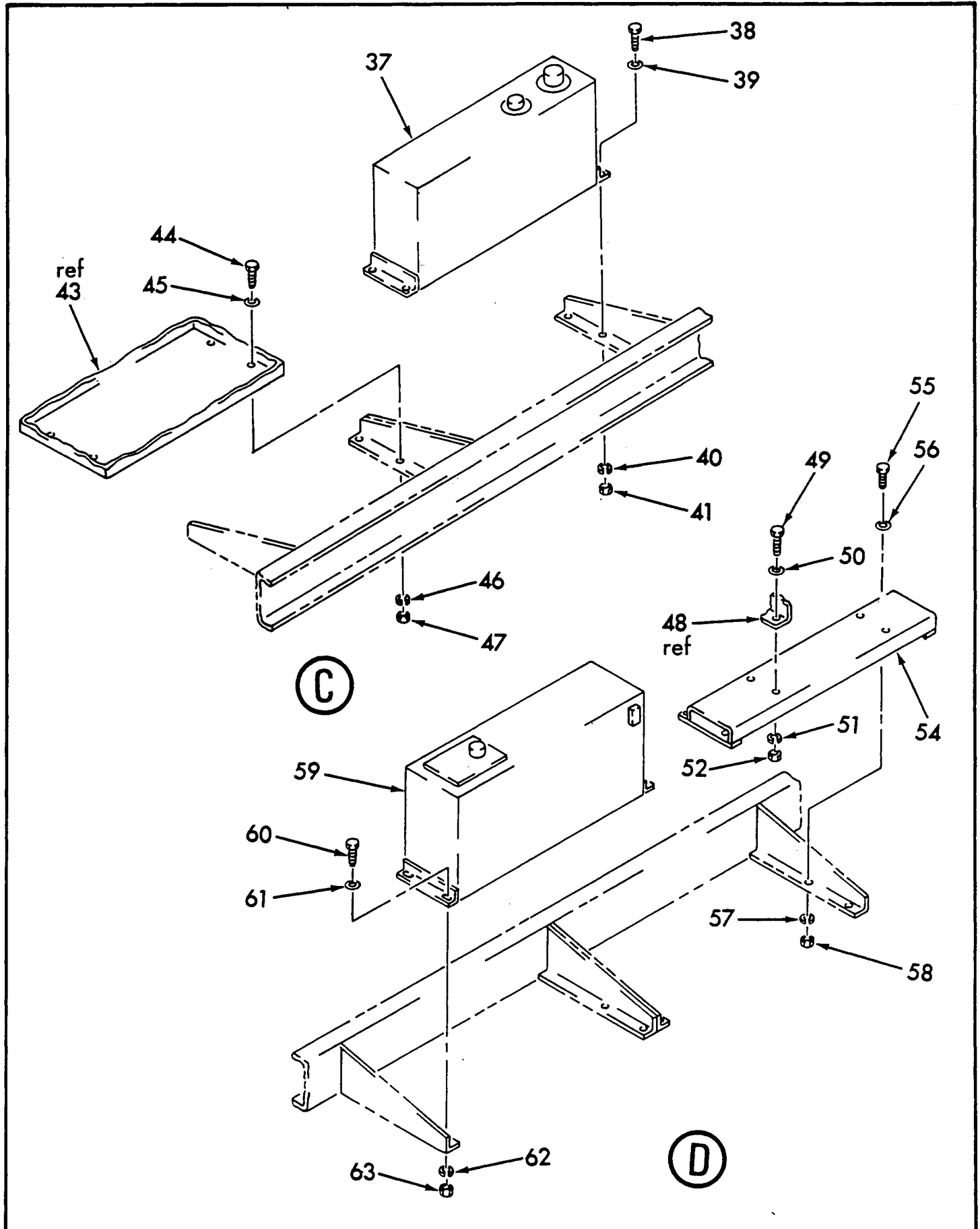
FRAME ASSEMBLY (SRT-31G) (AFT. JUL. '86)

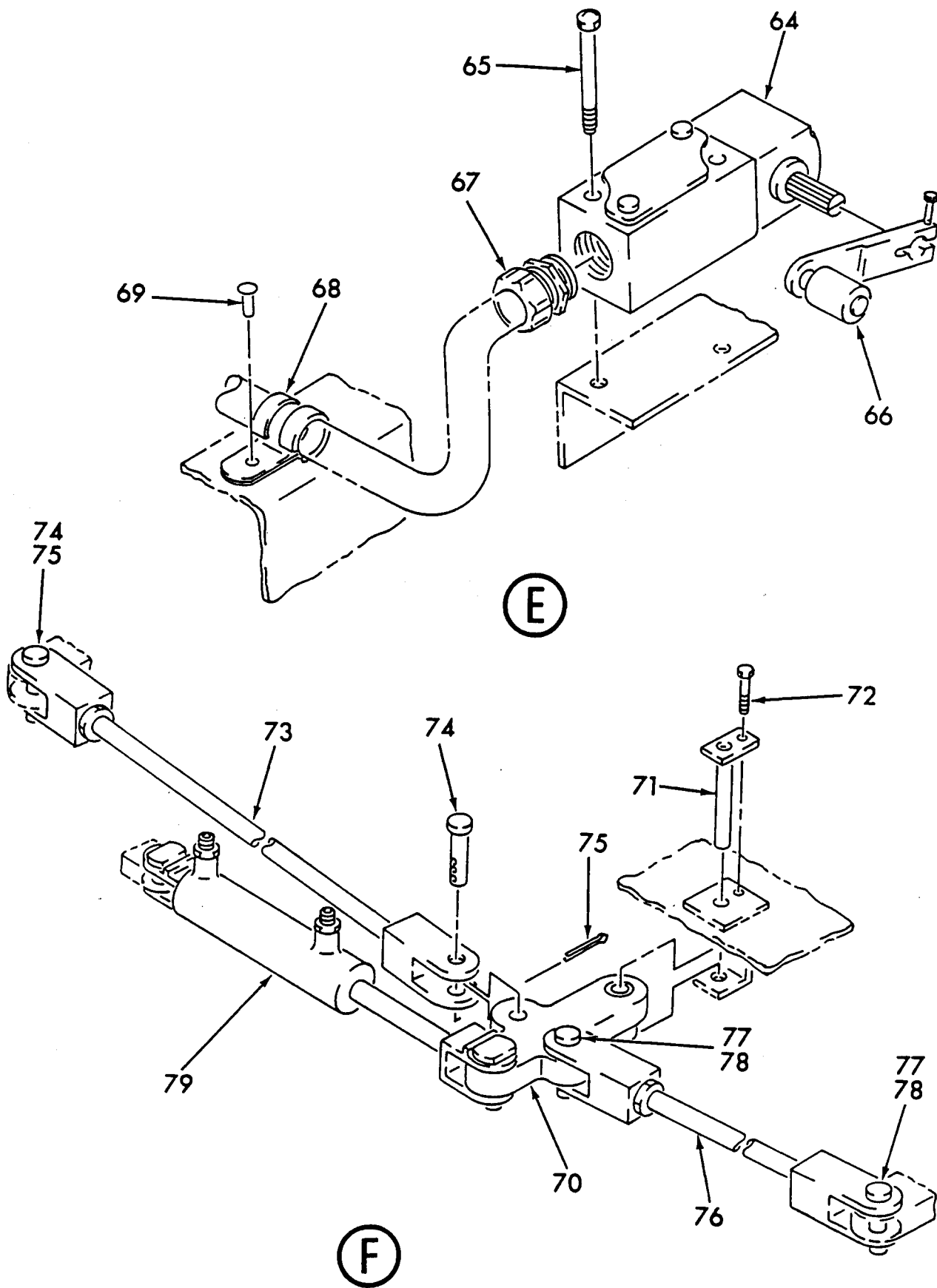
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FIG. 4B
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ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32387	ASSEMBLY, FRAME (See Sect. 2, Fig. 3B for NHA)	REF
2	30395	.WELDMENT, FRAME	2
-2A	30492	..ASSEMBLY, AXLE (L.H.) (See Sect. 3, Fig. 5B for Details)	1
-2B	30492	..ASSEMBLY, AXLE (R.H.) (See Sect. 3, Fig. 6B for Details)	1
3	30795	.ASSEMBLY, STEERING TIRE (See Sect. 3, Fig. 10 for Details)	2
5	30813	.SPACER, FRONT RIM	2
6	31283	.ASSEMBLY, FRONT HUB (See Sect. 3, Fig. 16B for Details)	2
7	65156	.NUT, WHEEL (attaching part)	10
8	66142	.NUT, CASTLE (attaching part)	2
9	64310	.PIN, COTTER (attaching part)	2
10	65126	.CAP, DUST	2
-11	63453	.WASHER, KEY FLAT	2
-12	16115	.NUT, JAM	2
13	32509	.ASSEMBLY, DRIVE TIRE (R.H.) (See Sect. 3, Fig. 13 for Details)	1
14	30796	.ASSEMBLY, DRIVE TIRE (L.H.) (See Sect. 3, Fig. 14 for Details)	1
15	1558	.ASSEMBLY, HUB	2
-16	2221	.BOLT, WHEEL (attaching part)	10
17	6096	.AXLE, REAR	1
18	60601	.SCREW, CAP (attaching part)	2
19	734	.BEARING, AXLE	1
-20	63408	.WASHER, LOCK (attaching part)	8
-21	60392	.SCREW, CAP (attaching part)	8
-22	61304	.NUT, HEX (attaching part)	8



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
23	4030	.BATTERY (See Vendor Chap. for more Information)	1
24	31238-L	.ASSEMBLY, BATTERY CABLE	1
25	782	.ASSEMBLY, BATTERY BOX	1
26	16934	..CAP	1
27		..BOX, BATTERY	1
28	16935	..ASSEMBLY, BELT	1
29	60309	.SCREW, CAP (attaching part)	2
30	63401	.WASHER, FLAT (attaching part)	2
31	63301	.WASHER, LOCK (attaching part)	2
32	60701	.NUT, HEX (attaching part)	2
33	32378	.ASSEMBLY, ENGINE AND PUMP (See Sect. 3, Fig. 21B for Details)	1
-34	60308	.SCREW, CAP (attaching part)	4
-35	63305	.WASHER, LOCK (attaching part)	4
-36	60705	.NUT, HEX (attaching part)	4
37	8316	.ASSEMBLY, FUEL TANK (See Sect. 3, Fig. 22 for Details)	1
38	60309	.SCREW, CAP (attaching part)	4
39	63401	.WASHER, FLAT (attaching part)	4
40	63301	.WASHER, LOCK (attaching part)	4
41	60701	.NUT, HEX (attaching part)	4
-42	30726	.ASSEMBLY, COMPONENT BOX (AFT. MAR. '80) (See Sect. 3, Fig. 26B for Details)	1
43	32486	.ASSEMBLY, COMPONENT BOX (AFT. JUL. '86) (See Sect. 3, Fig. 26C for Details)	1
44	60309	.SCREW, CAP (attaching part)	4
45	63401	.WASHER, FLAT (attaching part)	4
46	63301	.WASHER, FLAT (attaching part)	4



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
47	60701	.NUT, HEX (attaching part)	4
48	486-C	.TANK, LPG	1
49	60338	.SCREW, CAP (attaching part)	4
50	63402	.WASHER, FLAT (attaching part)	4
51	63302	.WASHER, LOCK (attaching part)	4
52	60702	.NUT, HEX (attaching part)	4
-53	486-A	.BRACKET, TANK (pair)	1
54	9085	.ASSEMBLY, BRACKET PROPANE TANK MTG.	1
55	60309	.SCREW, CAP (attaching part)	4
56	63401	.WASHER, FLAT (attaching part)	4
57	63301	.WASHER, LOCK (attaching part)	4
58	60701	.NUT, HEX (attaching part)	4
59	32431	.ASSEMBLY, HYDRAULIC TANK (See Sect. 3, Fig. 37D for Details)	1
60	60309	.SCREW, CAP (attaching part)	4
61	63401	.WASHER, FLAT (attaching part)	4
62	63301	.WASHER, LOCK (attaching part)	4
63	60701	.NUT, HEX (attaching part)	4
64	70173	.SWITCH, LIMIT	1
65	62708	.SCREW, MACHINE (attaching part)	2
66	70032	.ARM, LIMIT SWITCH	1
67	2806	.RELIEF, STRAIN	1
68	764	.CLAMP	10
69		.RIVET, POP (attaching part)	AR
70	8044	.ASSEMBLY, BELL CRANK (See Sect. 3, Fig. 40 for Details)	1
71	20796	.PIN	1
72	60338	.SCREW, CAP (attaching part)	1



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
73	30302	.ASSEMBLY, TIE ROD (See Sect. 3, Fig. 41B for Details)	1
74	64102	.PIN, CLEVIS (attaching part)	2
75	64307	.PIN, COTTER (attaching part)	2
76	30301	.ASSEMBLY, TIE ROD (See Sect. 3, Fig. 42B for Details)	1
77	64102	.PIN, CLEVIS (attaching part)	2
78	64307	.PIN, COTTER (attaching part)	2
79	32584	.ASSEMBLY, STEERING CYLINDER (See Sect. 3, Fig. 43C for Details)	1
80	255	.CABLE, TIE	AR
81	256	.CABLE, TIE	AR
82	30916	.ASSEMBLY, HYDRAULIC OUTRIGGER (See Sect. 3, Fig. 45B for Details)	3
83	30909	.ASSEMBLY, HYDRAULIC OUTRIGGER (See Sect. 3, Fig. 46B for Details)	1
-84	60378	.SCREW, CAP (attaching part)	4
-85	63306	.WASHER, LOCK (attaching part)	4
-86	60706	.NUT, HEX (attaching part)	4
87	30387	.ASSEMBLY, TILT SWITCH (See Sect. 3, Fig. 38 for Details)	1
88	30209	.ASSEMBLY, BRAKE GEAR BOX	1
89	483	.BOX, GEAR REDUCTION	1
90	35282	.PIPE	4
91	35283	.PIPE	4
-92	60421	.SCREW, CAP (attaching part)	4
-93	63305	.WASHER, LOCK (attaching part)	4
-94	60705	.NUT, (attaching part)	4
95	30496	.ASSEMBLY, CUSHION CYLINDER See Sect. 3, Fig. 50 for Details)	1

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FRAME ASSEMBLY (SRT-31G) (AFT. JUL. '86)

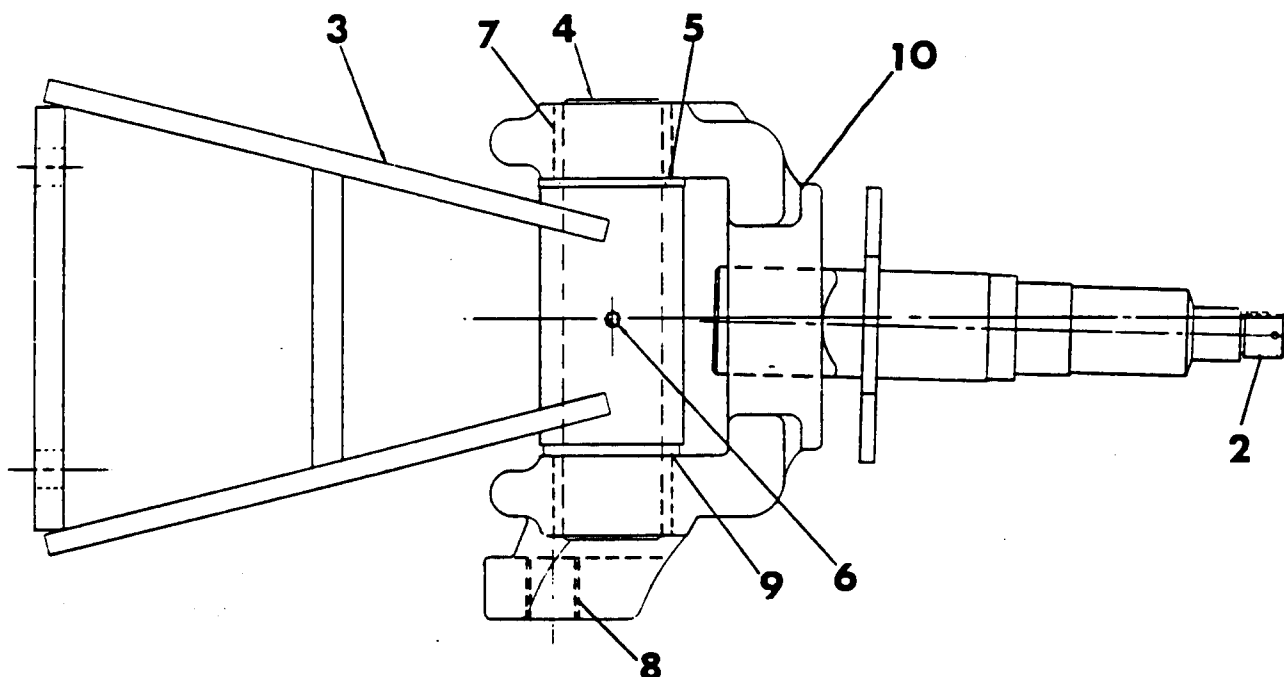
(continued)

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FIG. 4B
PAGE 9

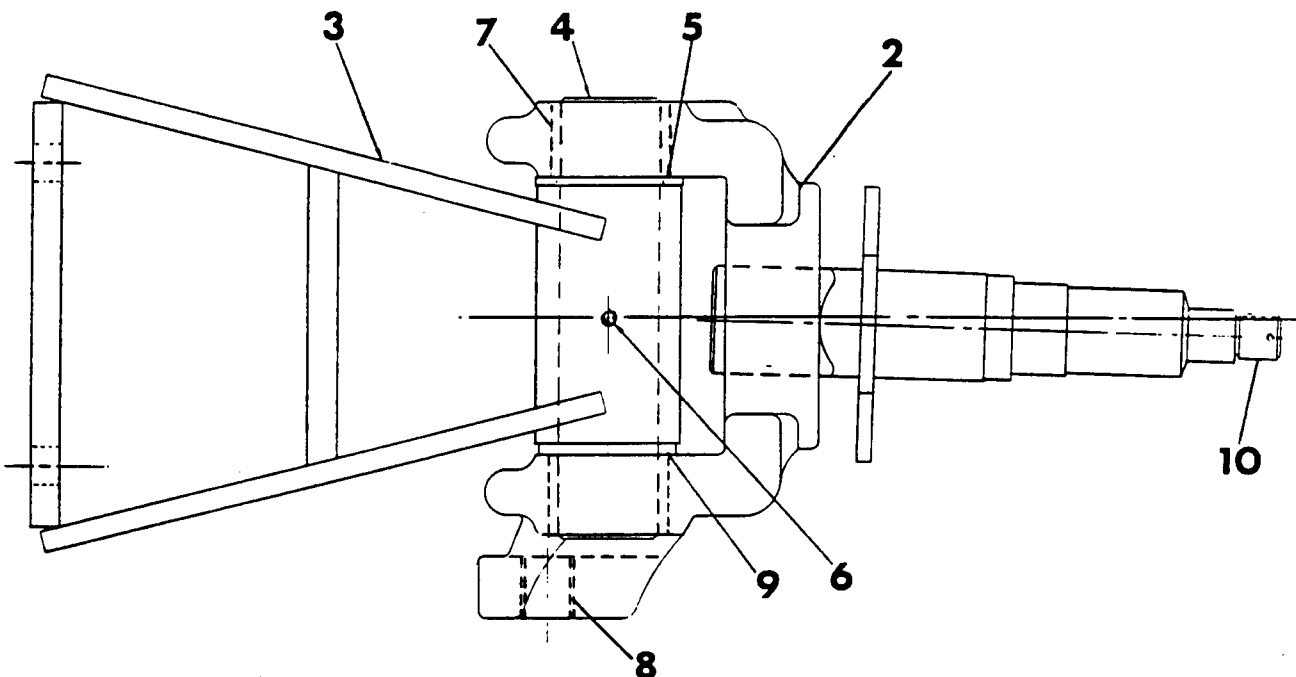
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
96	55	.CLAMP, HOSE	2
97	32579	.ASSEMBLY, FLOW CONTROL VALVE (See Sect. 3, Fig. 48 for Details)	1
98	80001-03	.CONNECTOR, MALE	1
99	32387-31	.ASSEMBLY, TUBE	1
100	160-B	.HOSE, FUEL (7 FT)	1
101	411	.EXTRUSION (4 FT)	1
102	161-A	.CLAMP, HOSE	2

REV.

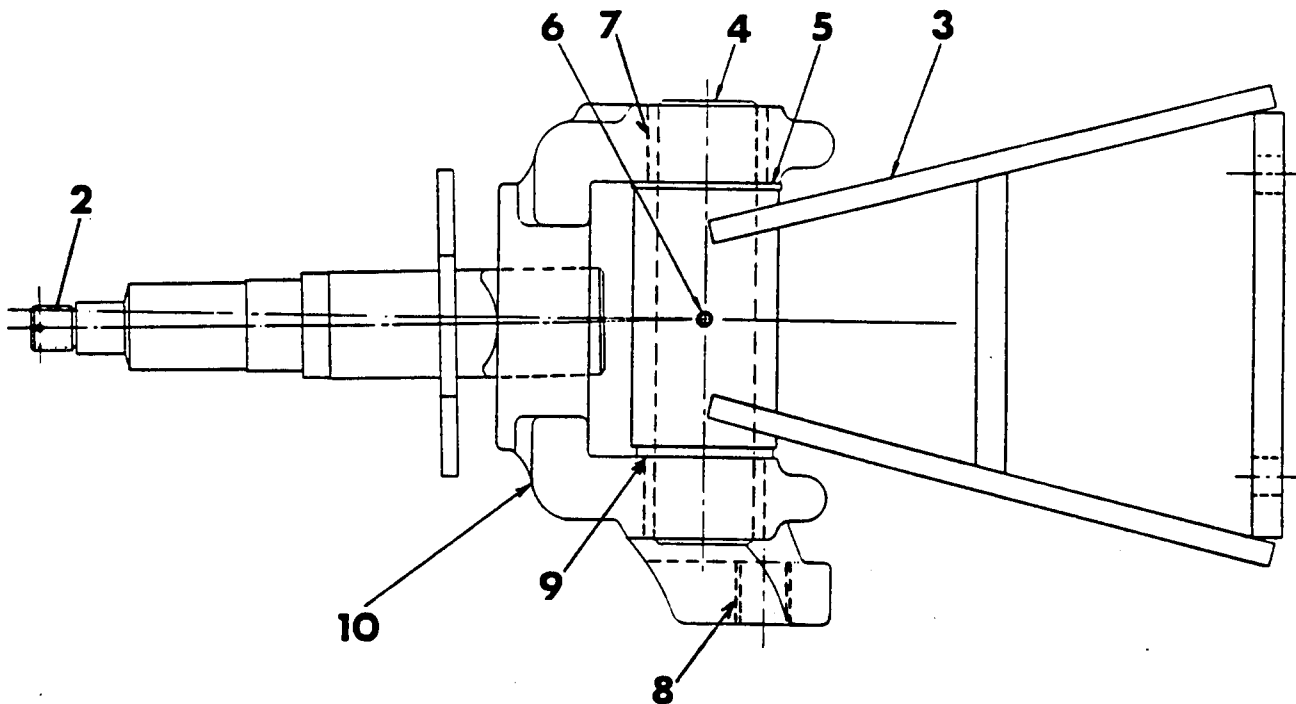
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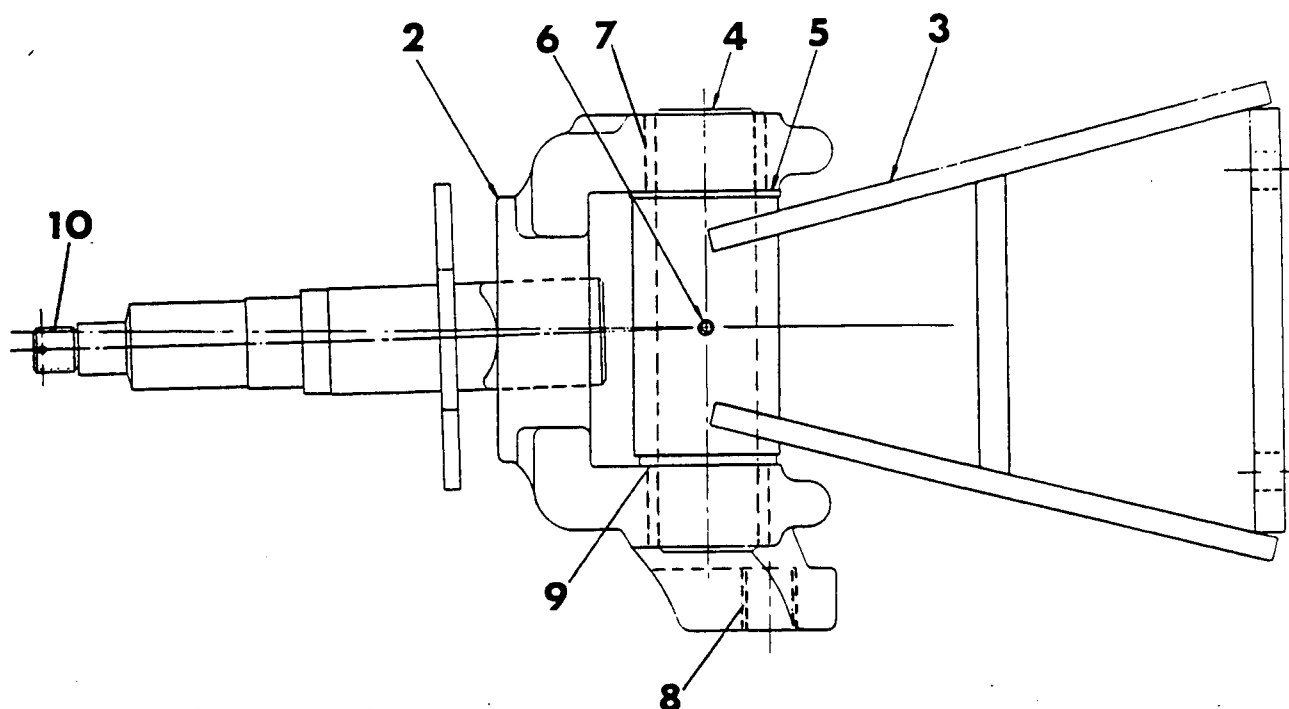
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1		ASSEMBLY, FRONT AXLE (See Sect. 3, Fig.1A, 3A, or 4A for NHA)	REF
2	16115	.NUT, SPINDLE	1
3	30257	.AXLE	1
4	20321	.PIN, KING	1
5	2281	.BEARING, THRUST	2
6	64206	.PIN, ROLL	1
7	20322	.BUSHING, SLEEVE	2
8	30332	.BUSHING, SLEEVE	1
9	30242	.BUSHING, FLANGED	1
10	6313-2	.YOKE AND SPINDLE, L.H.	1



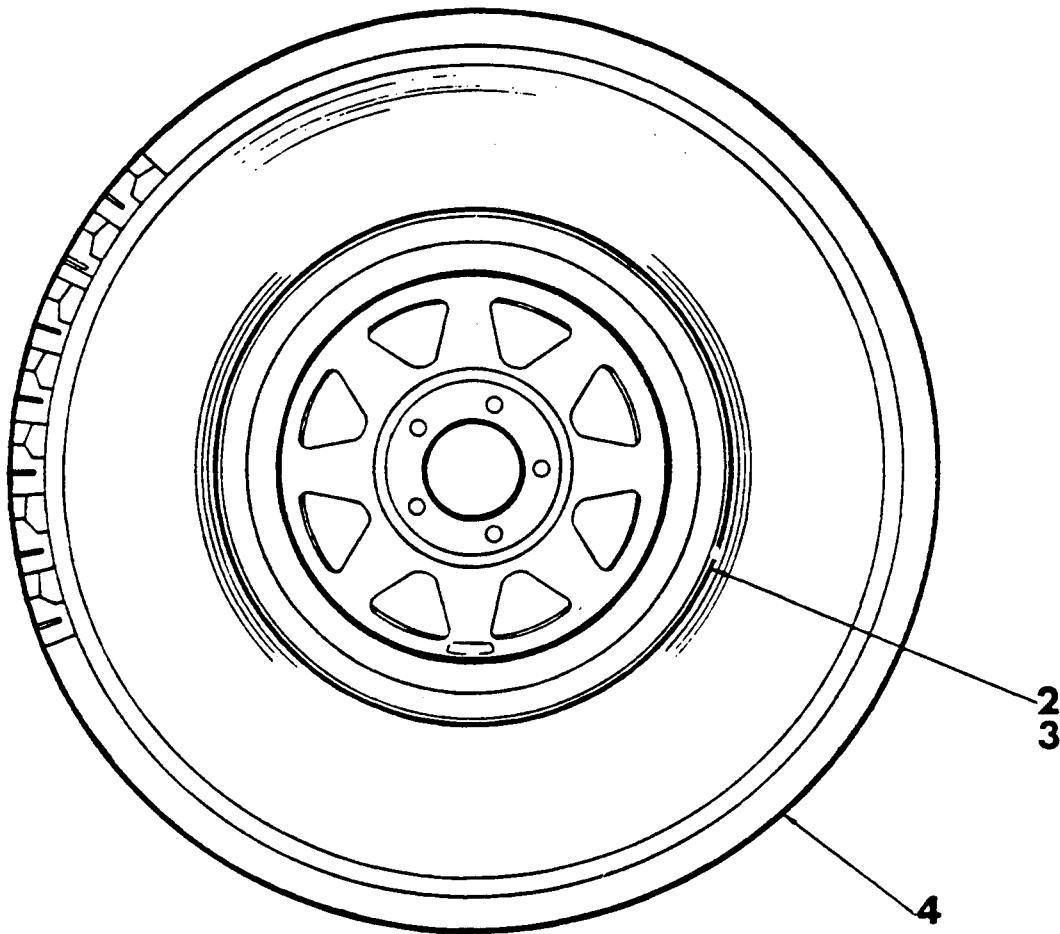
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
-1	30492	ASSEMBLY, FRONT AXLE (See Sect. 3, Fig. 1B, 2A, 2B, 2C, 3A, 3B, 4A or 4B for NHA)	REF
2	30239	.ASSEMBLY, YOKE AND SPINDLE, L.H.	1
3	30257	.AXLE	1
4	20321	.PIN, KING	1
5	30269	.BEARING, THRUST	1
6	64206	.PIN, ROLL	1
7	20322	.BUSHING, SLEEVE	1
8	30332	.BUSHING, SLEEVE	1
9	30242	.BUSHING, FLANGE	1
10	66142	.NUT, SPINDLE	1



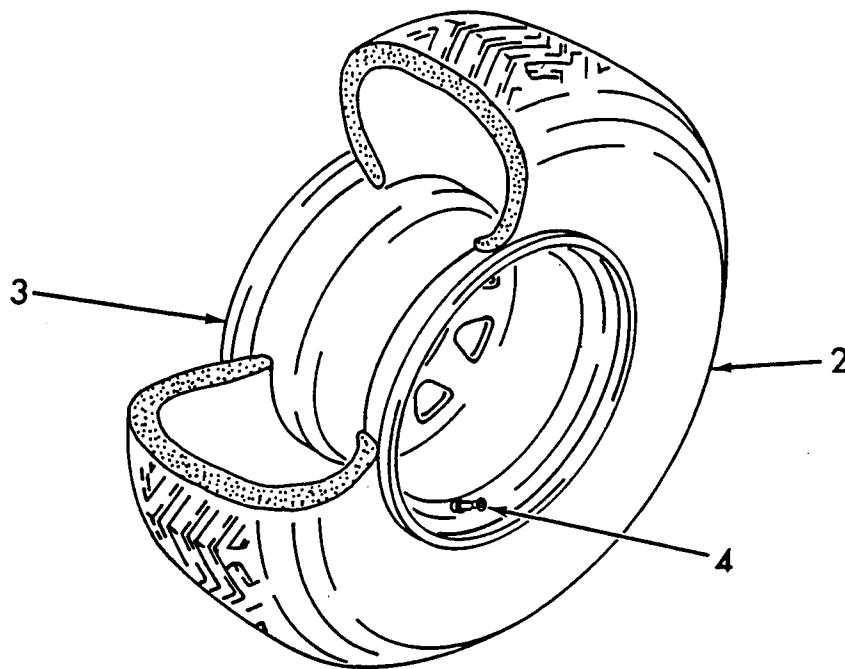
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
-1		1234567 ASSEMBLY, FRONT AXLE (See Sect. 3, Fig. 1A 3A or 4A for NHA)	REF
2	16115	.NUT, SPINDLE	1
3	30257	.AXLE	1
4	20321	.PIN, KING	1
5	2281	.BEARING THRUST	2
6	64206	.PIN, TOLL	1
7	20322	.BUSHING, SLEEVE	2
8	30332	.BUSHING, SLEEVE	1
9	30242	.BUSHING, FLANGED	1
10	6313-1	.YOKE AND SPINDLE, R.H.	1



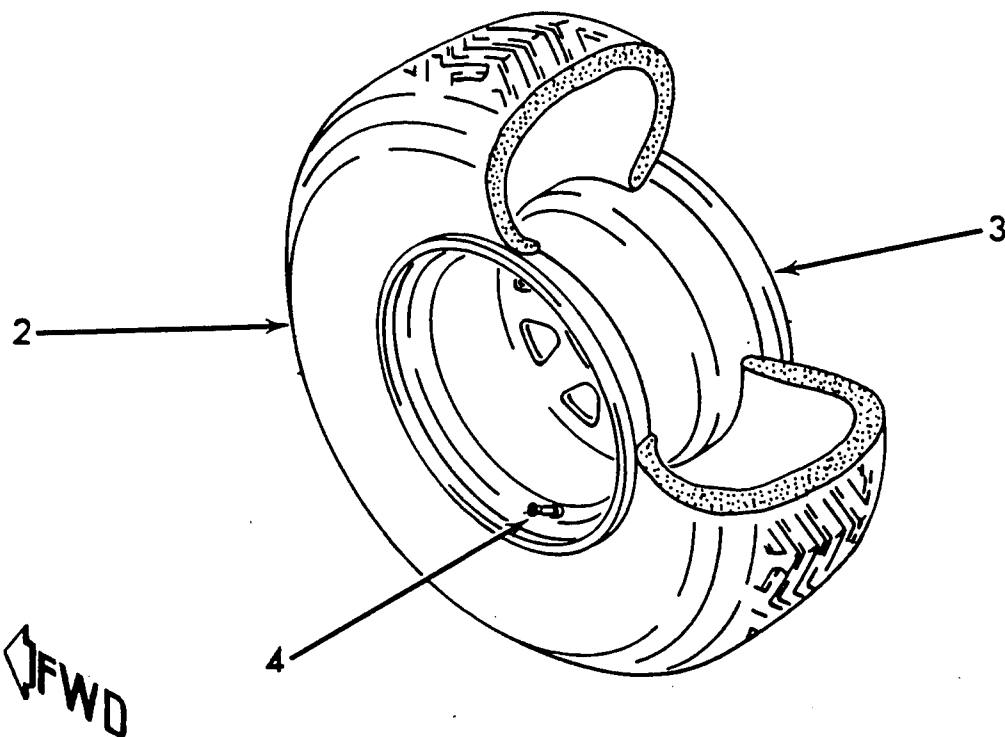
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30493	ASSEMBLY, FRONT AXLE (See Sect. 3, Fig. 1B, 2A, 2B, 2C, 3A, 3B, 4A or 4B for NHA)	REF
2	30238	.ASSEMBLY, YOKE AND SPINDLE, R.H.	1
3	30257	.AXLE	1
4	20321	.PIN, KING	1
5	30269	.BEARING, THRUST	1
6	64206	.PIN, ROLL	1
7	20322	.BUSHING, SLEEVE	1
8	30332	.BUSHING, SLEEVE	1
9	30242	.BUSHING, FLANGE	1
10	66142	.NUT, SPINDLE	1



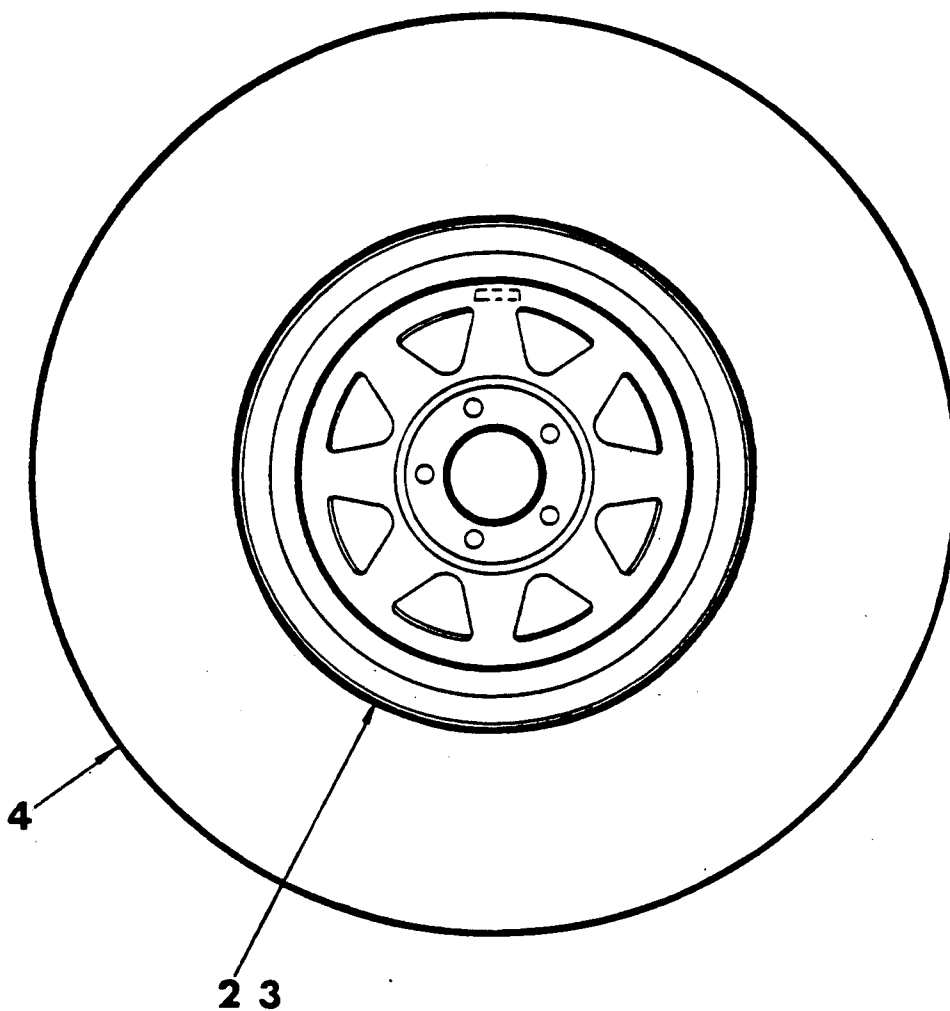
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1		ASSEMBLY, STEERING AND DRIVE TIRE (See Sect. 3, Fig. 1A for NHA)	REF
2	157-A	.WHEEL	1
3	2252	.STEM, VALVE	1
4	157	.TIRE	1



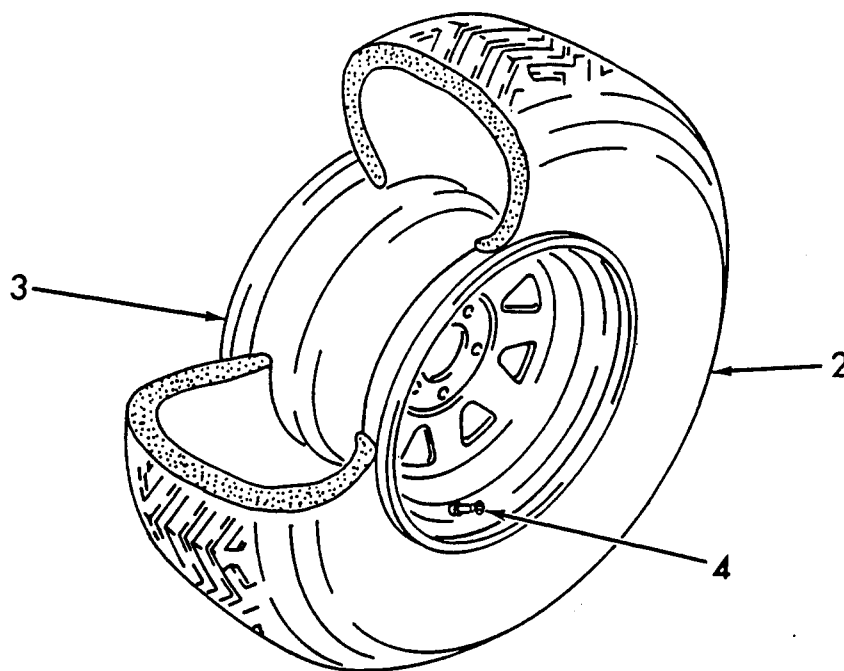
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30784	ASSEMBLY, STEERING TIRE (See Sect. 3, Fig. 1B, 2A, 2B, 2C, 3A, 3B for NHA)	REF
2	30800	.TIRE	1
3	30611	.WHEEL	1
4	2252	.VALVE, STEM	1



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32495	ASSEMBLY, STEERING TIRE (See Sect. 3, Fig. 2C for NHA)	REF
2	30800	.TIRE	1
3	30611	.WHEEL	1
4	2252	.VALVE, STEM	1

**STEERING TIRE ASSEMBLY (SRT-31G)**

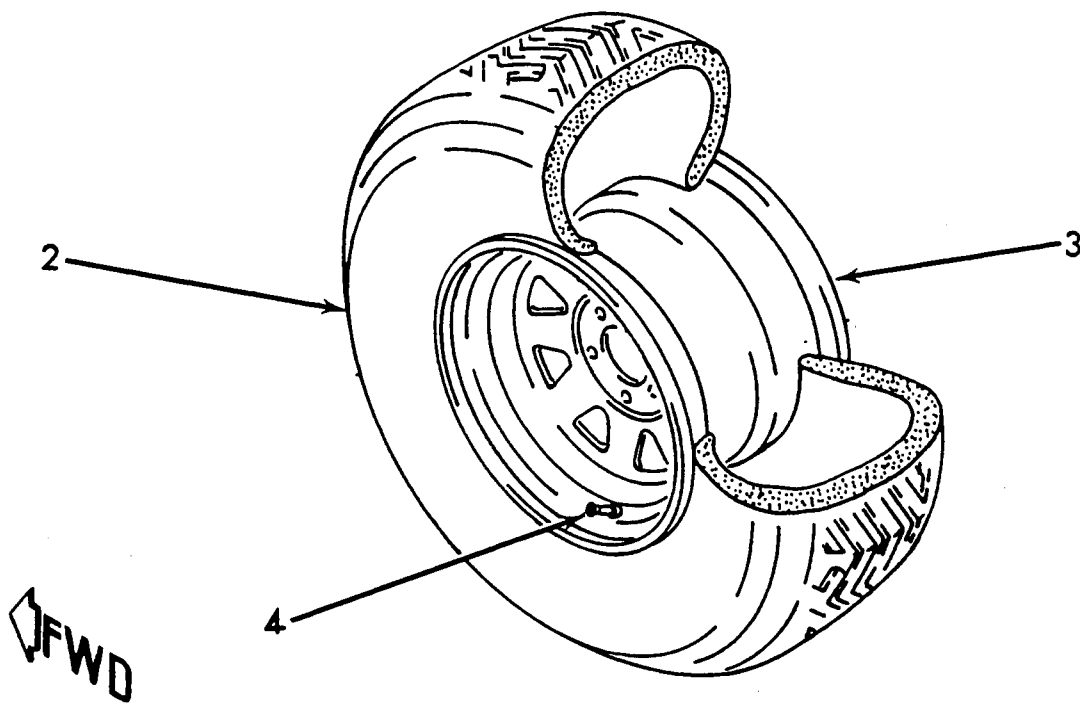
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30795	ASSEMBLY, STEERING TIRE (See Sect. 3, Fig. 4A or 4B for NHA)	REF
2	30536	.WHEEL	1
3	2252	.STEM, VALVE	1
4	30801	.TIRE	1



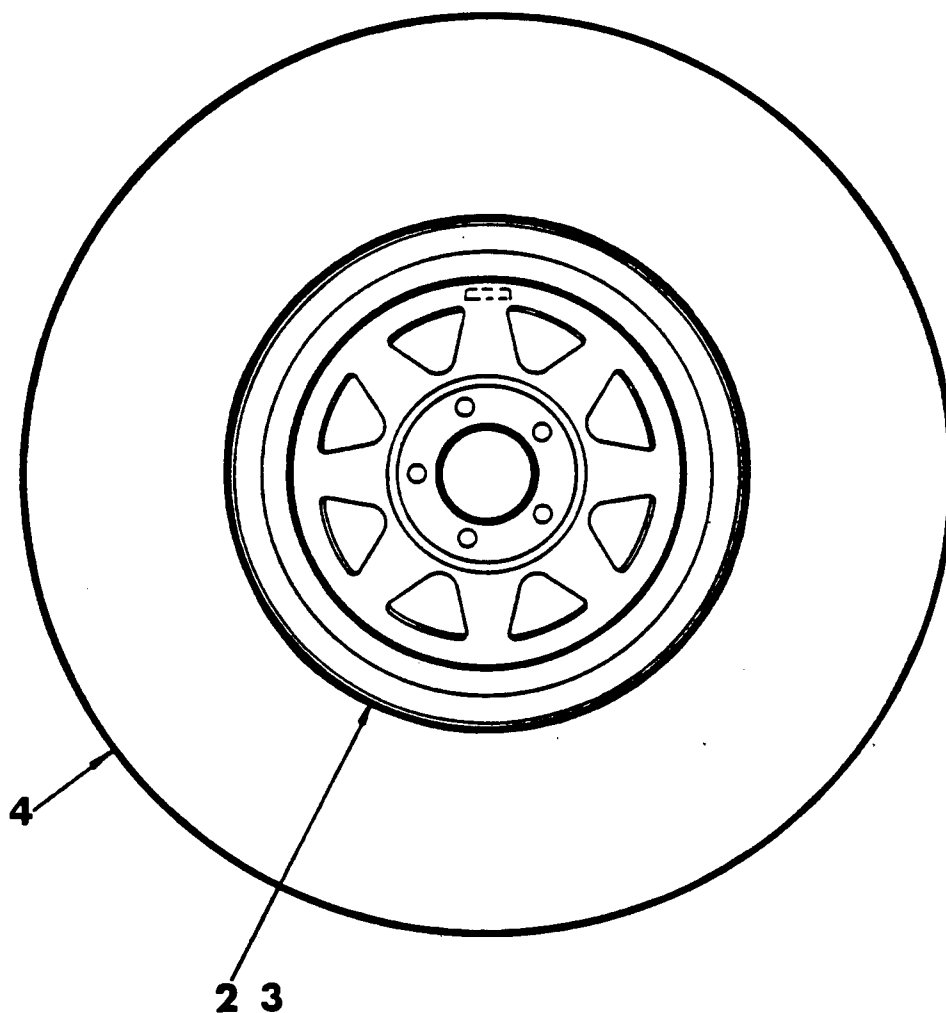
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30783	ASSEMBLY, DRIVE TIRE (See Sect. 3, Fig. 2A, 2B, 2C, 3A, 3B, for NHA)	REF
2	30800	.TIRE	1
3	30536	.WHEEL	1
4	2252	.VALVE, STEM	1



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30712	ASSEMBLY, MANIFOLD (See Sect. 6, Fig. 9 OR 10 for NHA)	REF
2	80004-11	.CONNECTOR, STRAIGHT THREAD	1
3	80004-09	.CONNECTOR, MALE	4
4	80004-05	.CONNECTOR, MALE	1
5	80012-11	.ELBOW, STRAIGHT THREAD	4
6	80015-06	.ELBOW, SWIVEL NUT	1
7	80033-11	.TEE, STRAIGHT THREAD RUN	1
8	80015-05	.ELBOW, SWIVEL NUT	1
9	80059-03	.CAP	1
10	80012-12	.ELBOW, STRAIGHT THREAD	1
11	3021	.SUB-ASSEMBLY, MANIFOLD (See Sect. 6, Fig. 12A for Details)	1
12	3101	.SUB-ASSEMBLY, MANIFOLD (See Sect. 6, Fig. 12B for Details)	1

**DRIVE TIRE ASSEMBLY**

ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32494	ASSEMBLY, DRIVE TIRE (See Sect. 3, Fig. 2C for NHA)	REF
2	30800	.TIRE	1
3	30536	.WHEEL	1
4	2252	.VALVE, STEM	1



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32509	ASSEMBLY, DRIVE TIRE (See Sect. 3, Fig. 4B for NHA)	REF
2	30536	.WHEEL	1
3	2252	.STEM, VALVE	1
4	30526	.TIRE	1

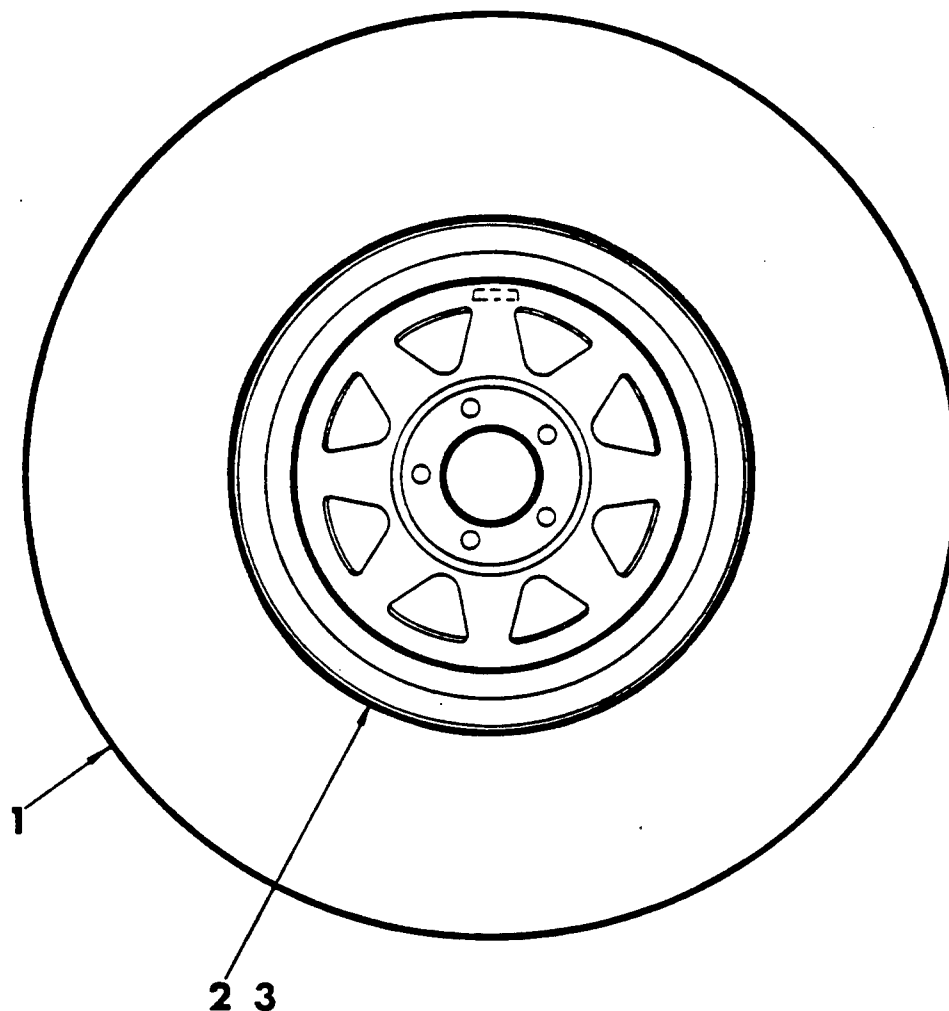


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DRIVE TIRE ASSEMBLY (L.H.) (SRT-31G)

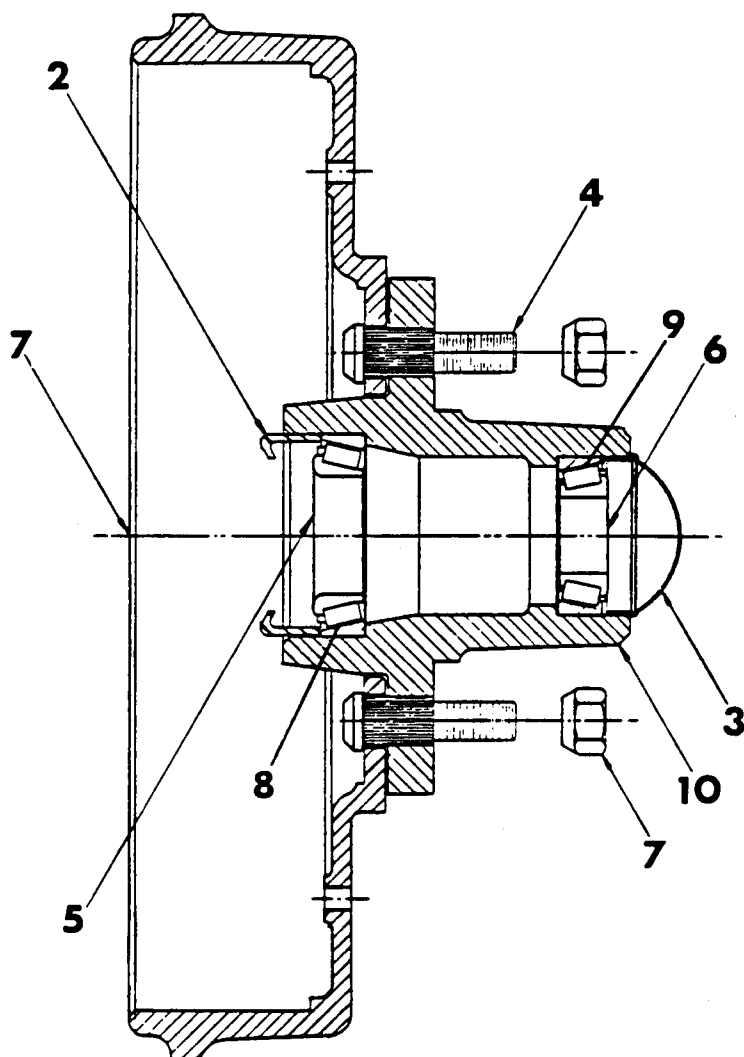
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ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30796	ASSEMBLY, DRIVE TIRE ASSEMBLY (See Sect. 3, Fig. 4A or 4B for NHA)	REF
2	30536	.WHEEL	1
3	2252	.STEM, VALVE	1
4	30526	.TIRE	1

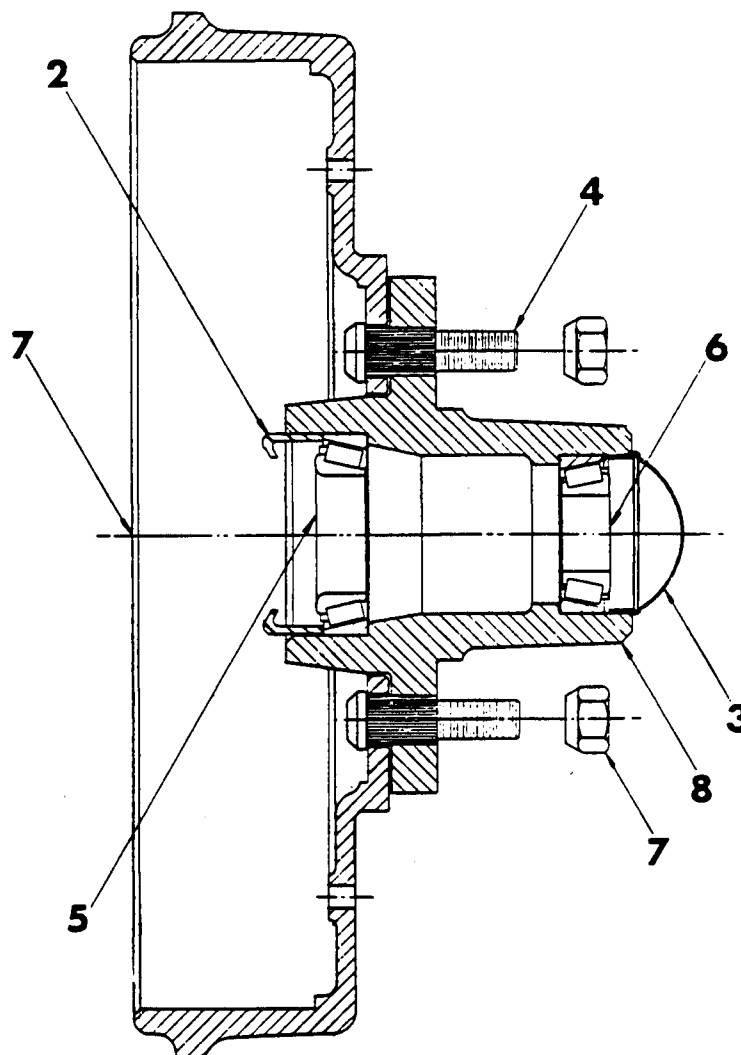
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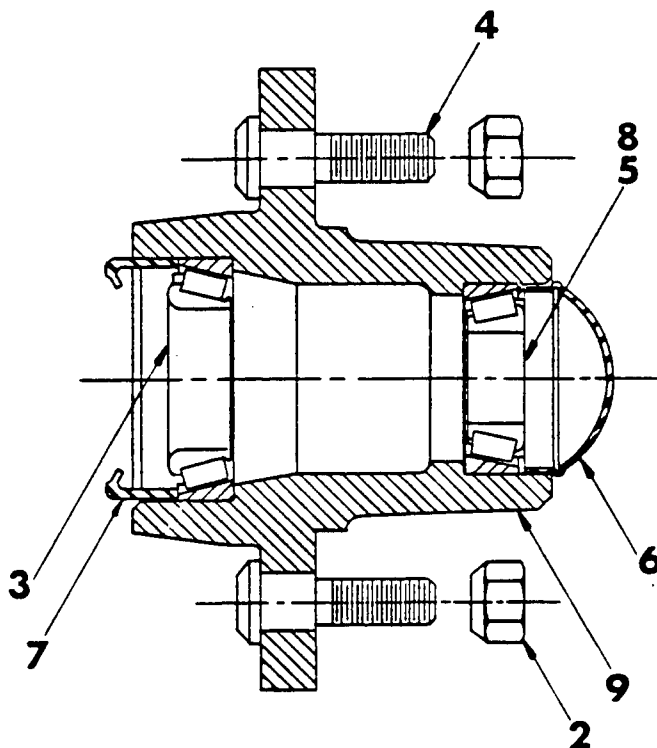




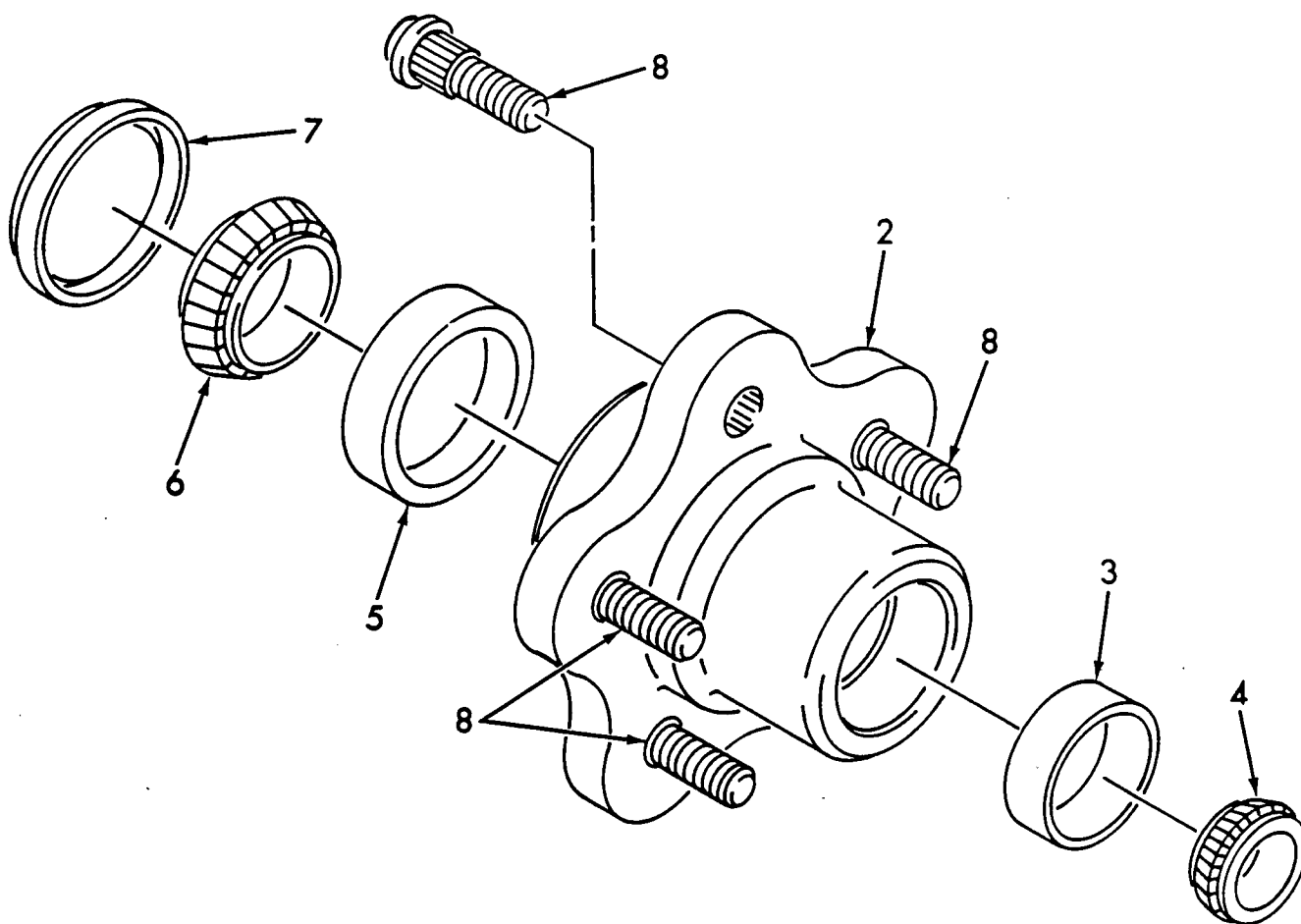
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	2240	ASSEMBLY, FRONT HUB AND DRUM (HADCO) (See Sect. 3, Fig. 1A, 2A or 3A or 4A for NHA)	REF
2	66134	.SEAL, GREASE	1
3	16274	.CAP, GREASE	1
4	65105	.BOLT, SHEEL	5
5	66135	.CONE, INNER BEARING	1
6	66139	.CONE, OUTER BEARING	1
7	65156	.NUT, CONE	5
8	66136	.CUP, INNER	1
9	66138	.CUP, OUTER	1
10	31144	.HUB, MACHINED ROUND	1
-11	30717	.DRUM (ONLY)	1



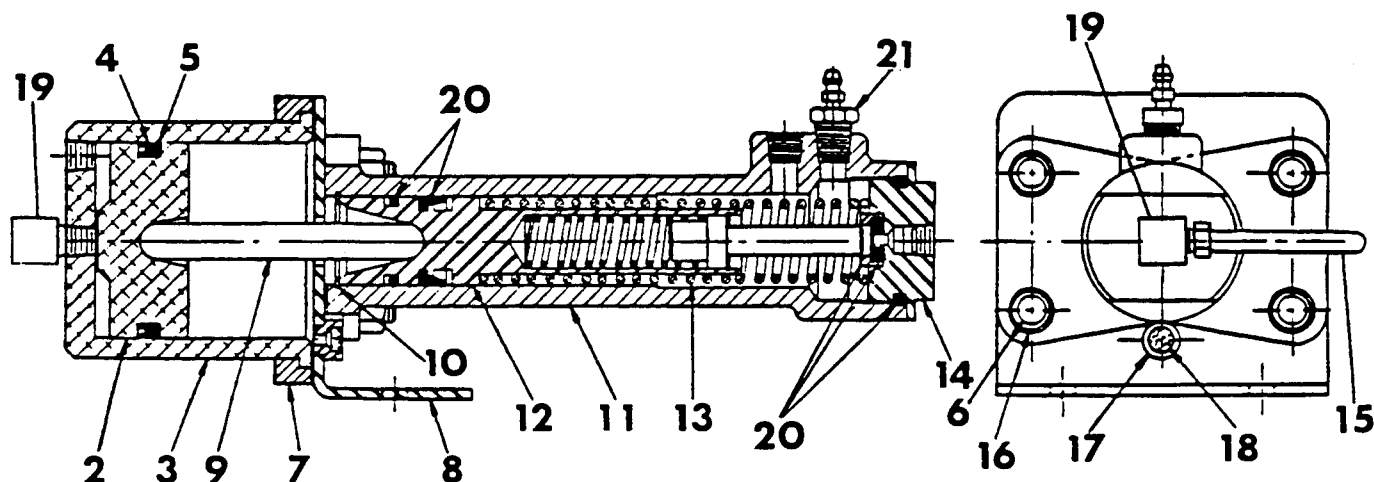
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30482	ASSEMBLY, FRONT HUB AND DRUM (HADCO) (See Sect. 3, Fig. 1B, 2A, 3A, or 3B for NHA)	REF
2	66114	.SEAL, GREASE	1
3	65126	.CAP, GREASE	1
4	66233	.BOLT, WHEEL	5
5	65058	.CONE, INNER BEARING	1
6	65056	.CONE, OUTER BEARING	1
7	65156	.NUT, CONE	5
8	31145	.HUB, MACHINED	1



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30472	ASSEMBLY, HUB (See Sect. 3, Fig. 1B, 2B or 4A for NHA)	REF
2	65156	.NUT, CONE	5
3	65058	.CONE, INNER BEARING	1
4	65530	.BOLT, WHEEL	5
5	65056	.CONE, OUTER BEARING	1
6	65126	.CAP, GREASE	1
7	66114	.SEAL, GREASE	1
8	66142	.NUT, CASTLE	1
9	31145	.HUB, MACHINED	1
-10	30717	.DRUM (ONLY)	1



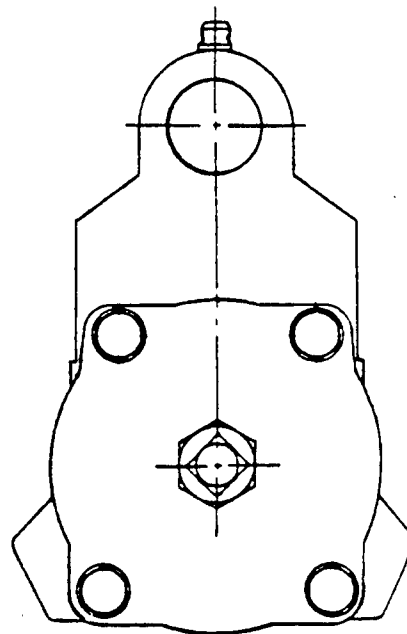
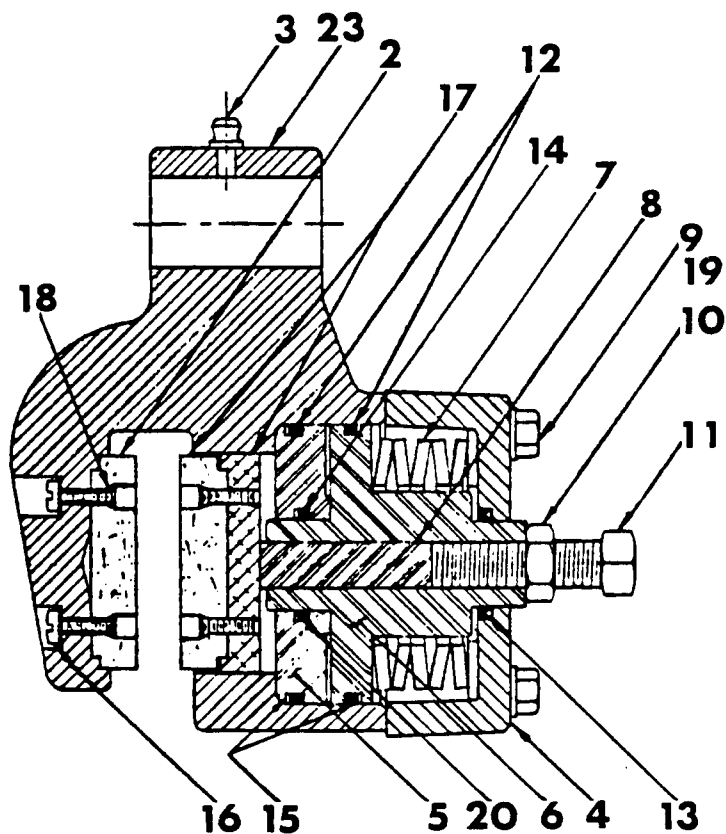
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	31283	ASSEMBLY, HUB (See Sect. 3, Fig. 2C OR 4B for NHA)	REF
2	31145	.HUB	1
3	65055	.CUP, OUTER BEARING	1
4	65056	.CONE, OUTER BEARING	1
5	65057	.CUP, INNER BEARING	1
6	65058	.CONE, INNER BEARING	1
7	66114	.SEAL, GREASE	1
8	65530	.BOLT, WHEEL	5



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30829	ASSEMBLY, DISC BRAKE INTENSIFIER (See Sect. 3, Fig. 2B or 3B for NHA)	REF
2	66304	.PISTON	1
3	66305	.HOUSING	1
4	66306	.SEAL	1
5	66307	.WASHER, BACK-UP	1
6	66308	.SCREW	4
7	66309	.RETAINER	1
8	66310	.BRACKET	1
9	66311	.ROD, PUSH	1
10	66312	.RING, SNAP	1
11	66313	.HOUSING	1
12	66314	.ASSEMBLY, PISTON	1



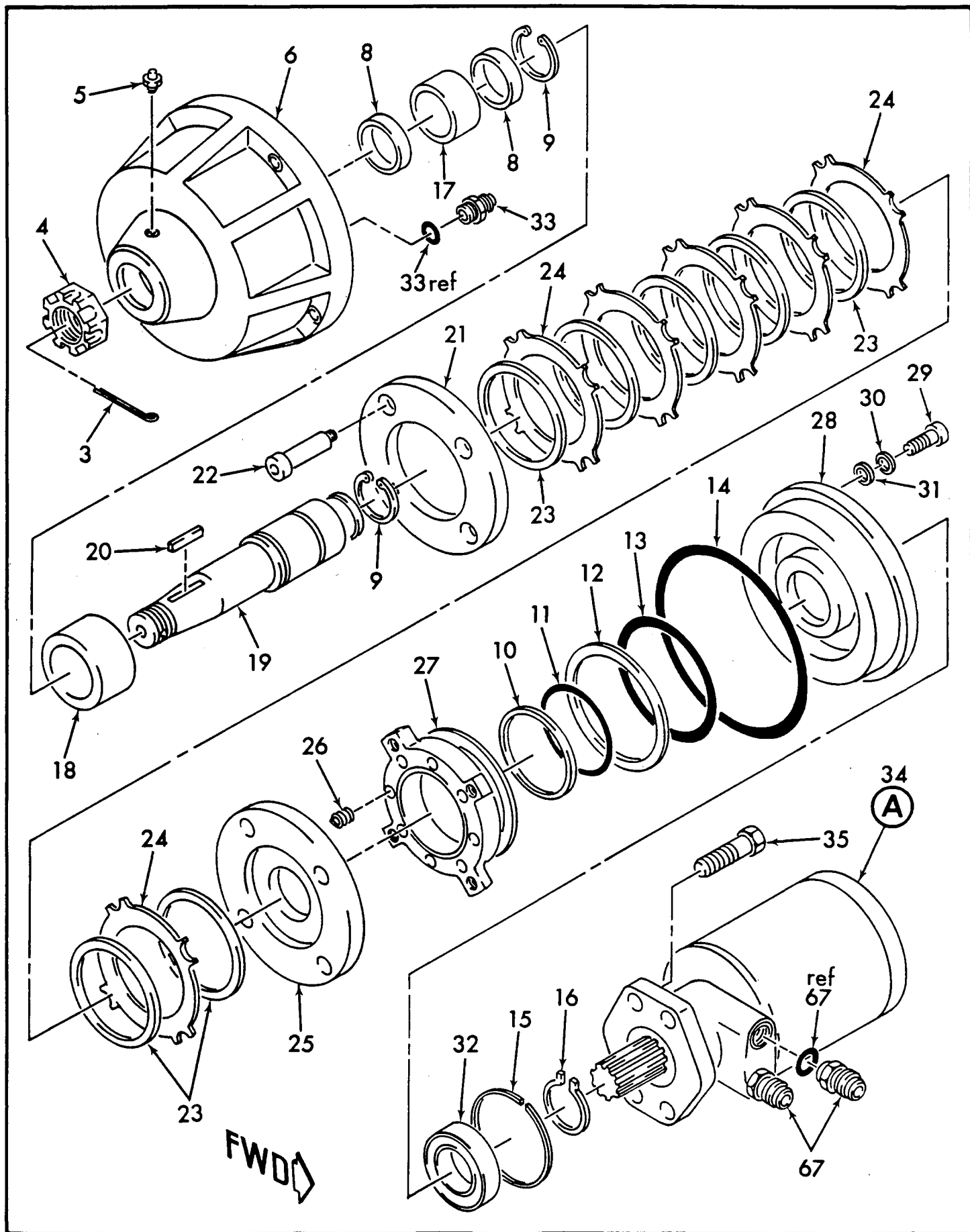
ITEM	PART NUMBER	DESCRIPTION		UNIT PER ASSY.
		1234567		
13	66315	.SPRING		1
14	66316	.ASSEMBLY, END PLUG		1
15		.ASSEMBLY, TUBE		1
16	66318	.NUT, LOCK		4
17	66319	.ADAPTOR		1
18	66320	.SNUBBER		1
19		.ELBOW		2
20	66332	.KIT, REPAIR (INCLUDES ITEMS 2, 4 AND 5)		1
21	66303	.ASSEMBLY, BLEEDER SCREW		1
-22	66970	.HOUSING (for 81132 BRAKE)		1
-23	66969	.ASSEMBLY, PISTON (for 81132 BRAKE)		1

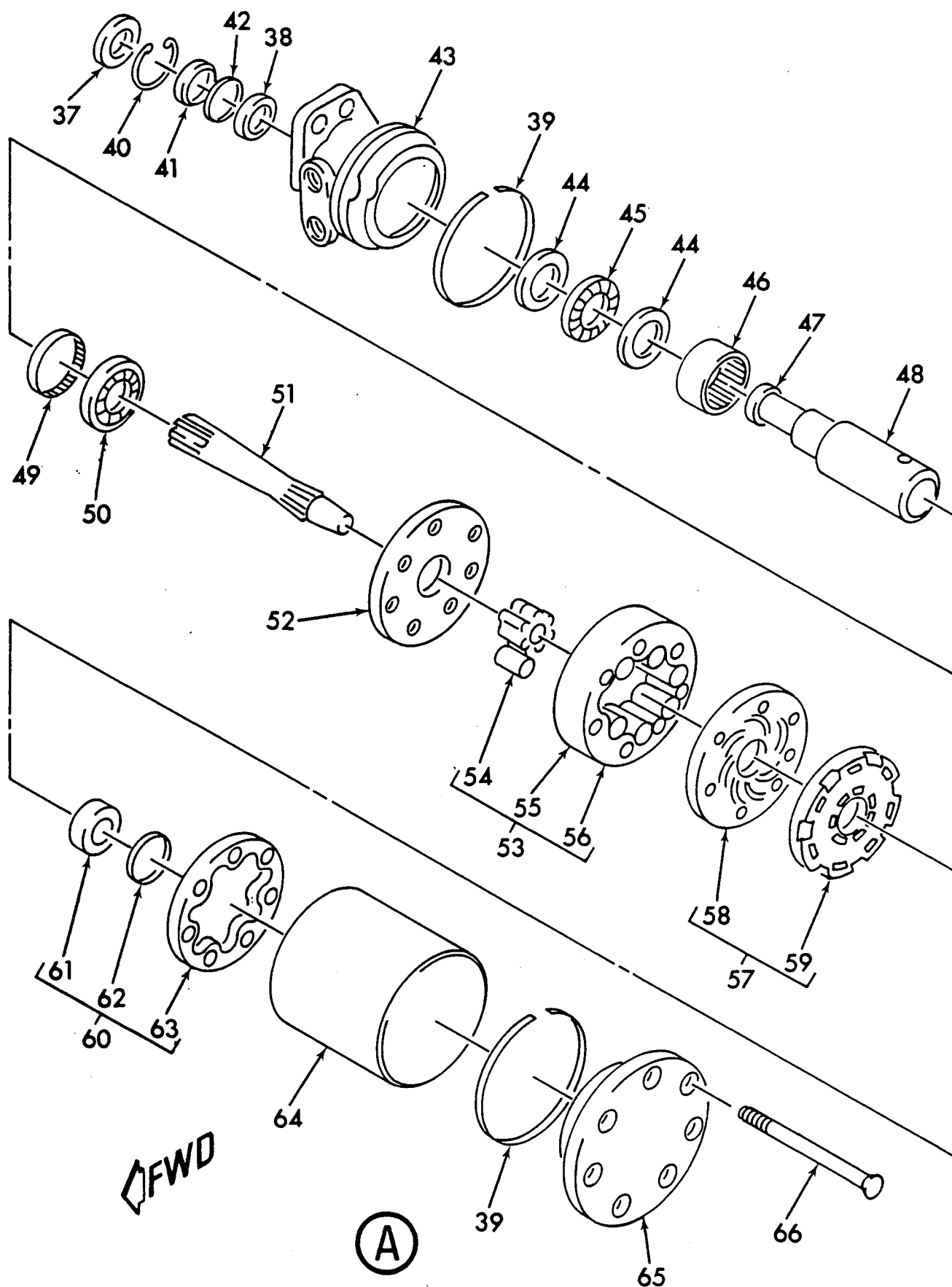


ITEM	PART NUMBER	DESCRIPTION							UNIT PER ASSY.
		1	2	3	4	5	6	7	
-1	30860	ASSEMBLY, CALIPER DISC BRAKE (See Sect. 3, Fig. 2B for NHA)							REF
2	66376	.PAD, LINING							1
3	66377	.FITTING							1
4	66378	.COVER							1
5	66379	.PISTON							1
6	66380	.PISTON							1
7	66381	.SPRING, BELLEVILLE							5
8	66382	.ROD, PUSH							1
9	66383	.SCREW, HEX HEAD CAP							4
10	66384	.NUT, JAM							1



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
11	66385	.SCREW, SET	1
12	66386	.O-RING	2
13	66387	.SEAL, WIPER	1
14	66388	.O-RING	1
15	66389	.RING, BACK-UP	2
16	66390	.SCREW	2
17	66391	.ASSEMBLY, LINING	1
18	66392	.INSERT	2
19	66393	.WASHER, LOCK	4
20	66394	.RING, BACK-UP	1
-21	66395	.SCREW, BLEEDER	1
-22	66396	.CONNECTOR	2
23	66375	.HOUSING	1



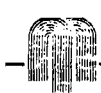




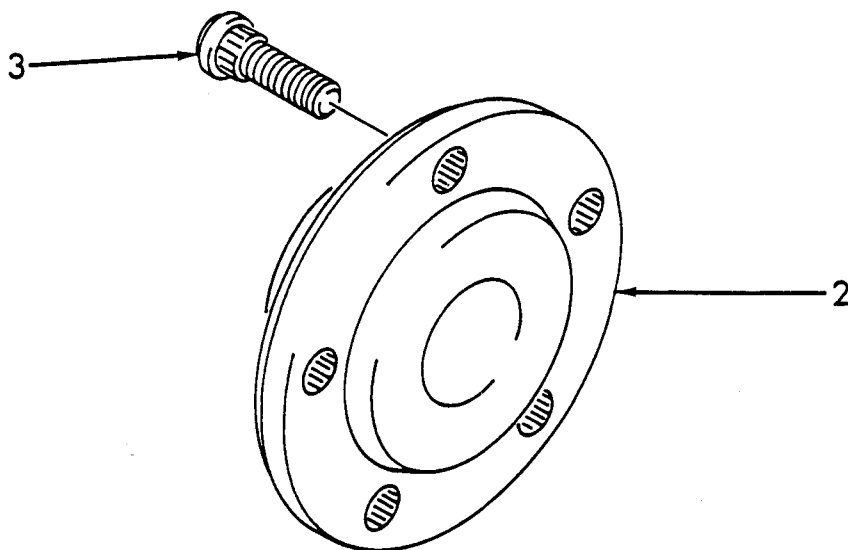
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32461	ASSEMBLY, DRIVE MOTOR AND BRAKE (See Sect. 3, Fig. 2C for NHA)	REF
-2	81117	.BRAKE, WHEEL MOUNTING	1
3	64310	..PIN, COTTER	1
4	67035	..NUT, HEX	1
5		..FITTING	1
6		..COVER, HOUSING	1
-7	66971	..KIT, SEAL	1
8		...SEAL, NATIONAL	2
9		...RING, RETAINING	2
10		...RING, B.U.	1
11		...O-RING	1
12		...RING, B.U.	1
13		...O-RING	1
14		...O-RING	1
15		...RING, RET	1
16		...RING, RET	1
17		..BEARING, NEEDLE	1
18		..SPLINE, OUTER	1
19	67034	..SHAFT	1
20	67037	..KEY	1
21		..PRIMARY	1
22		..PIN, SHOULDER BOLT (attaching part)	4
23		..ROTATOR	7
24		..STATOR	6
25		..PLATE, SPRING	1



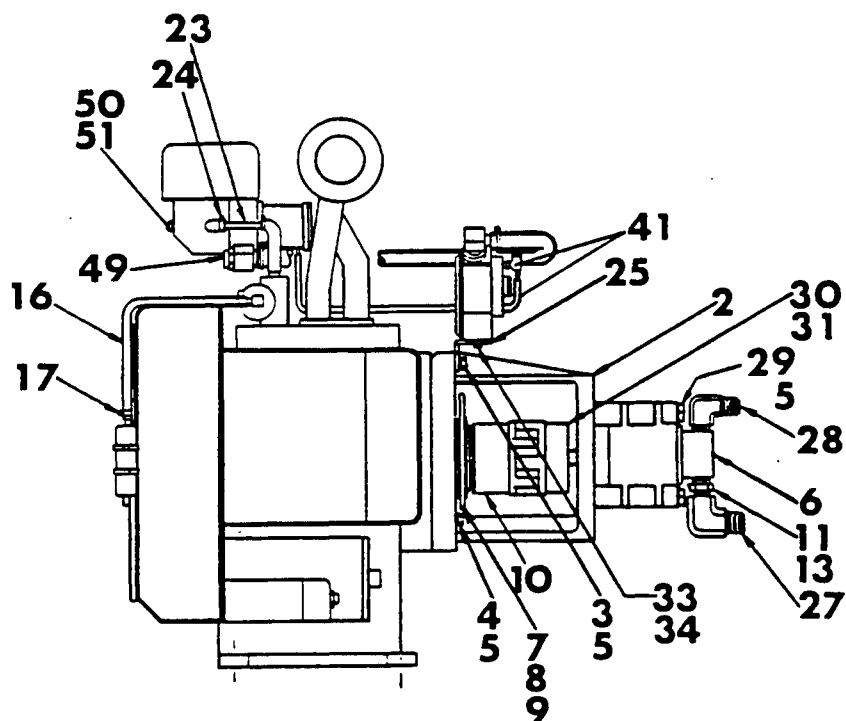
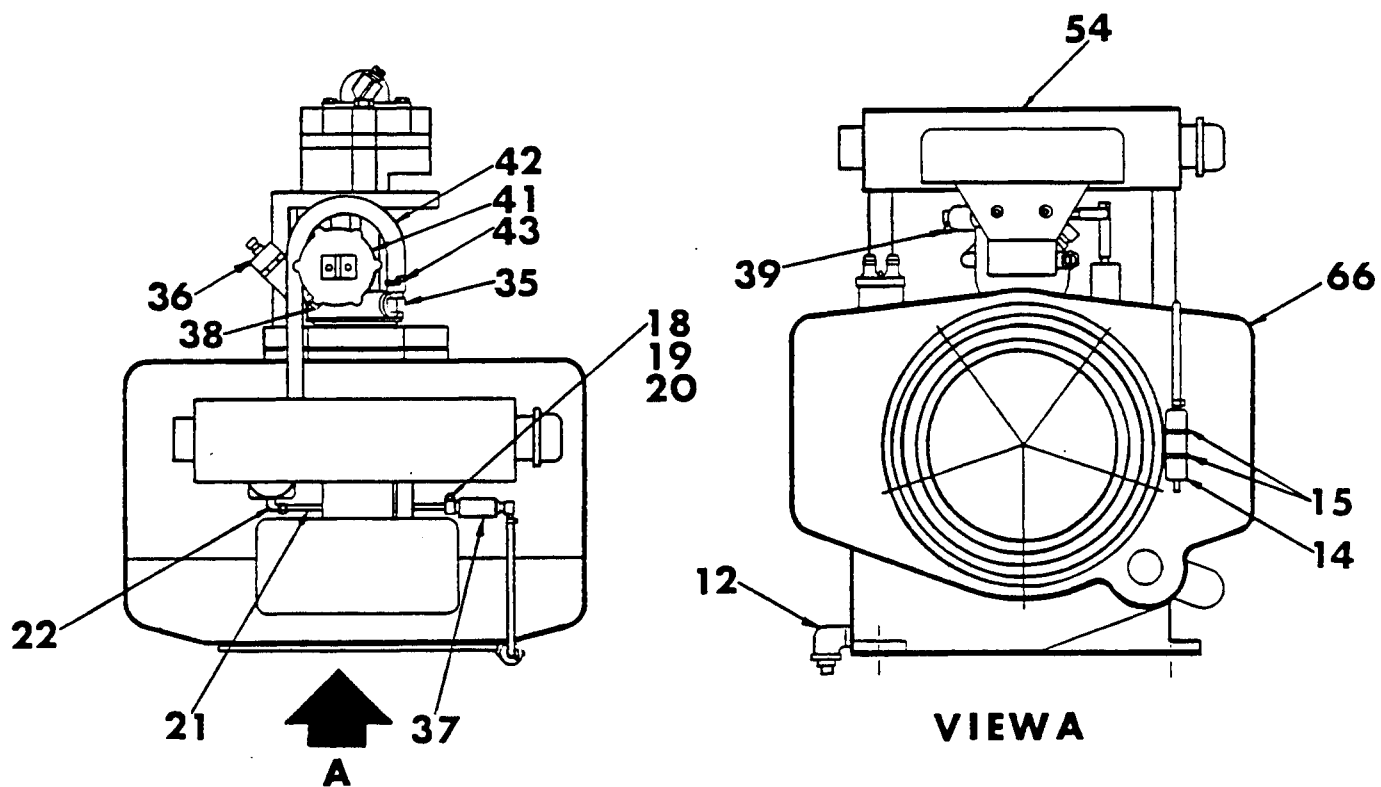
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
26		..SPRING, RED	8
27		..SPRING, PISTON	1
28		..PLATE, PRESSURE	1
29		..SCREW (attaching part)	10
30		..WASHER, FLAT (attaching part)	10
31		..WASHER, SEAL (attaching part)	10
32		..BEARING	1
33	80004-03	.CONNECTOR	1
34	81127	.MOTOR, DRIVE	1
35	60622	.SCREW (attaching part)	4
-36	3036-A	..KIT, SEAL	1
37		...SEAL	1
38		...SEAL	1
39		...RING, SEAL	2
40		..RING, RETAINER	1
41		..WASHER, BACK-UP	1
42		..WASHER	1
43		..HOUSING	1
44		..WASHER, THRUST	2
45		..BEARING, THRUST	1
46		..BEARING	1
47		..WASHER	1
48		..SHAFT, COUPLING	1
49		..BEARING	1
50		..BEARING, THRUST	1
51		..LINK, DRIVE	1



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
52		..PLATE, WEAR	1
53		..SET, ROTOR	1
54		...ROTOR	1
55		...VALVE	7
56		...STATOR	1
57		..SET, MANIFOLD (FOR MAB TORQMOTORS)	1
58		...PLATE, MANIFOLD	1
59		...MANIFOLD	1
60		..SET, COMMUTATOR	1
61		...COMMUTATOR	1
62		...RING, SEAL	1
63		...RING, COMMUTATOR	1
64		..SLEEVE	1
65		..ASSEMBLY, END COVER	1
66		..BOLT, SPECIAL	7
67	80004-13	.CONNECTOR, STRAIGHT THREAD	2

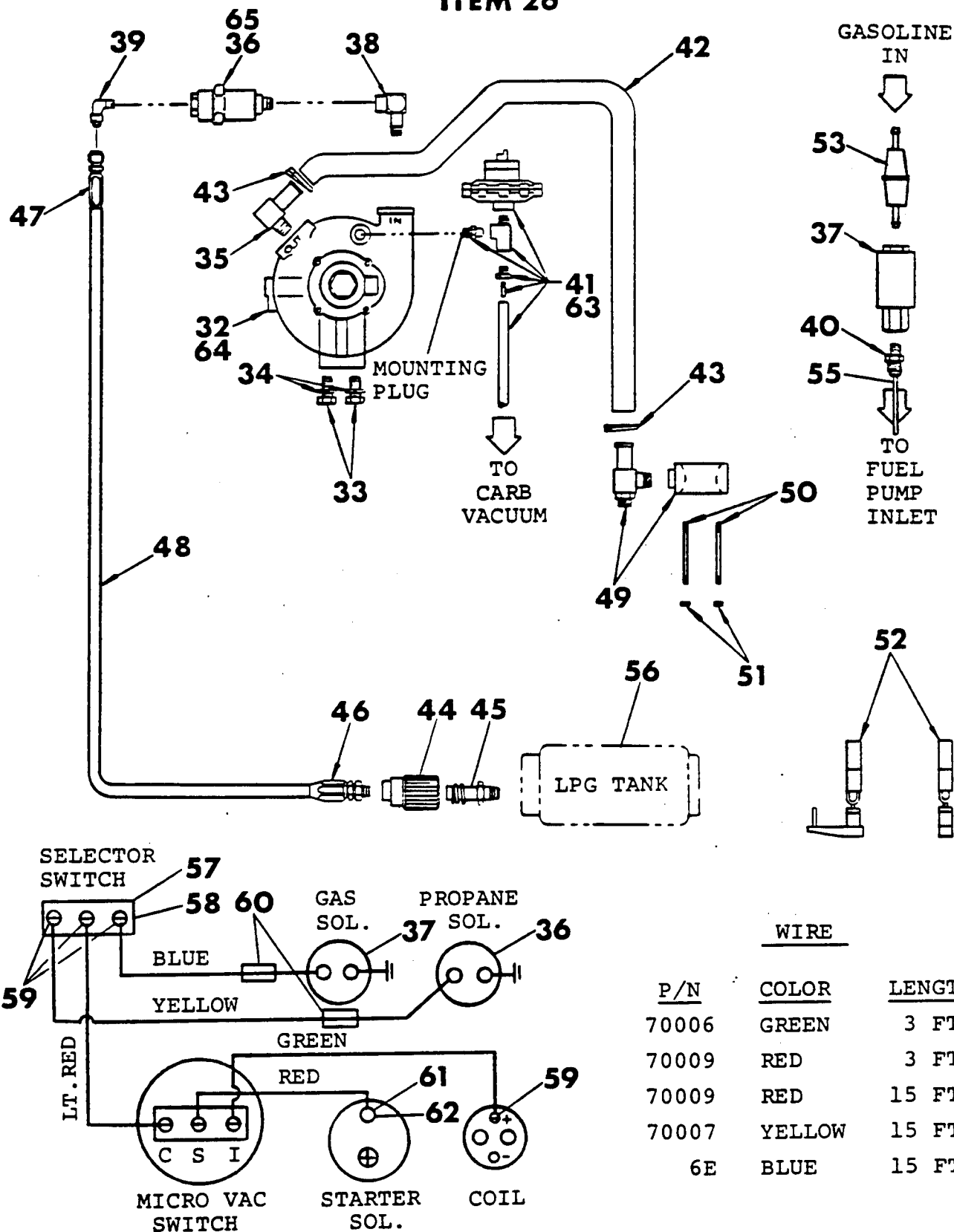


ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30294	ASSEMBLY, DRIVE-CONE BRAKE HUB (See Sect. 3, Fig. 2A, 2C, 3A, 3B or 3C for NHA)	REF
2	35870	.HUB, DRIVE	1
3	30309	.STUD, WHEEL	5





ITEM 26





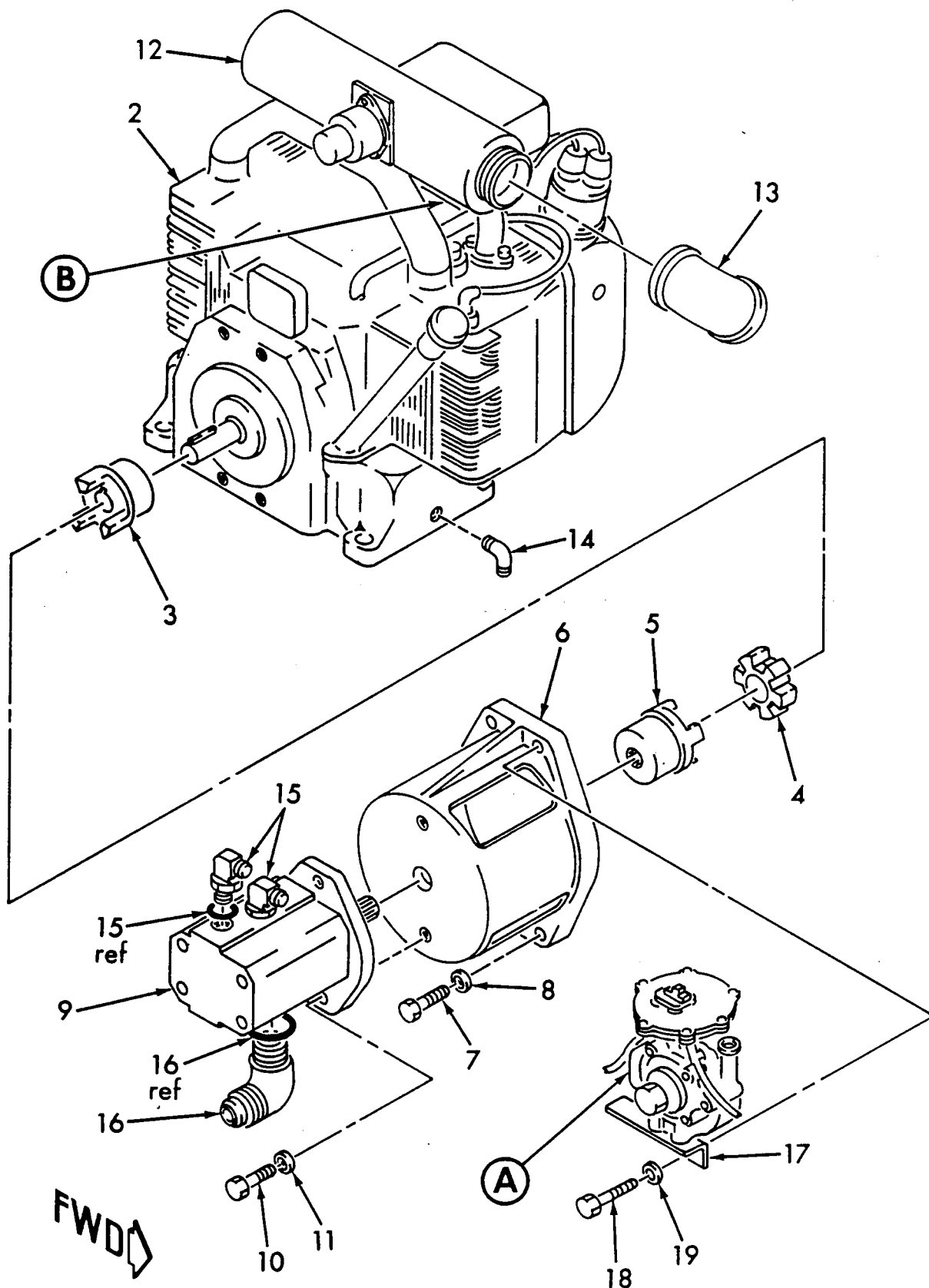
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30235	ASSEMBLY, ENGINE AND PUMP (See Sect. 3, Fig. 2A, 2B or 4A for NHA)	REF
2	9066-1	.ADAPTER, PUMP	1
3	60321	.SCREW, HEX HEAD	2
4	60307	.SCREW, HEX HEAD CAP	2
5	63303	.WASHER, LOCK	6
6	3038	.PUMP, HYDRAULIC (See Vendor Chap. for more Information)	1
7	352-C	.BELT	1
8	498	.PULLEY	1
9	711	.BUSHING, TAPER	1
10	20929	.COUPLING, ENGINE SIDE	1
11	2493	.NIPPLE	1
12	52300	.ELBOW, STREET	1
13	854	.BUSHING	1
14	160	.FILTER, GASOLINE	1
15	255	.TIE, CABLE	2
16	160-B	.HOSE, FUEL	1
17	161-A	.CLAMP, HOSE	2
18	22	.CLAMP, RIGID	1
19	374	.RIVET, BLIND	1
20	80001-03	.ADAPTER, STRAIGHT	1
21	30237	.TUBE, FUEL	1
22	80008-03	.ELBOW	1
23	235	.TUBING, STEEL	1
24	161-A	.CLAMP, HOSE	2
25	9086	.BRACKET, REGULATOR MOUNTING	1

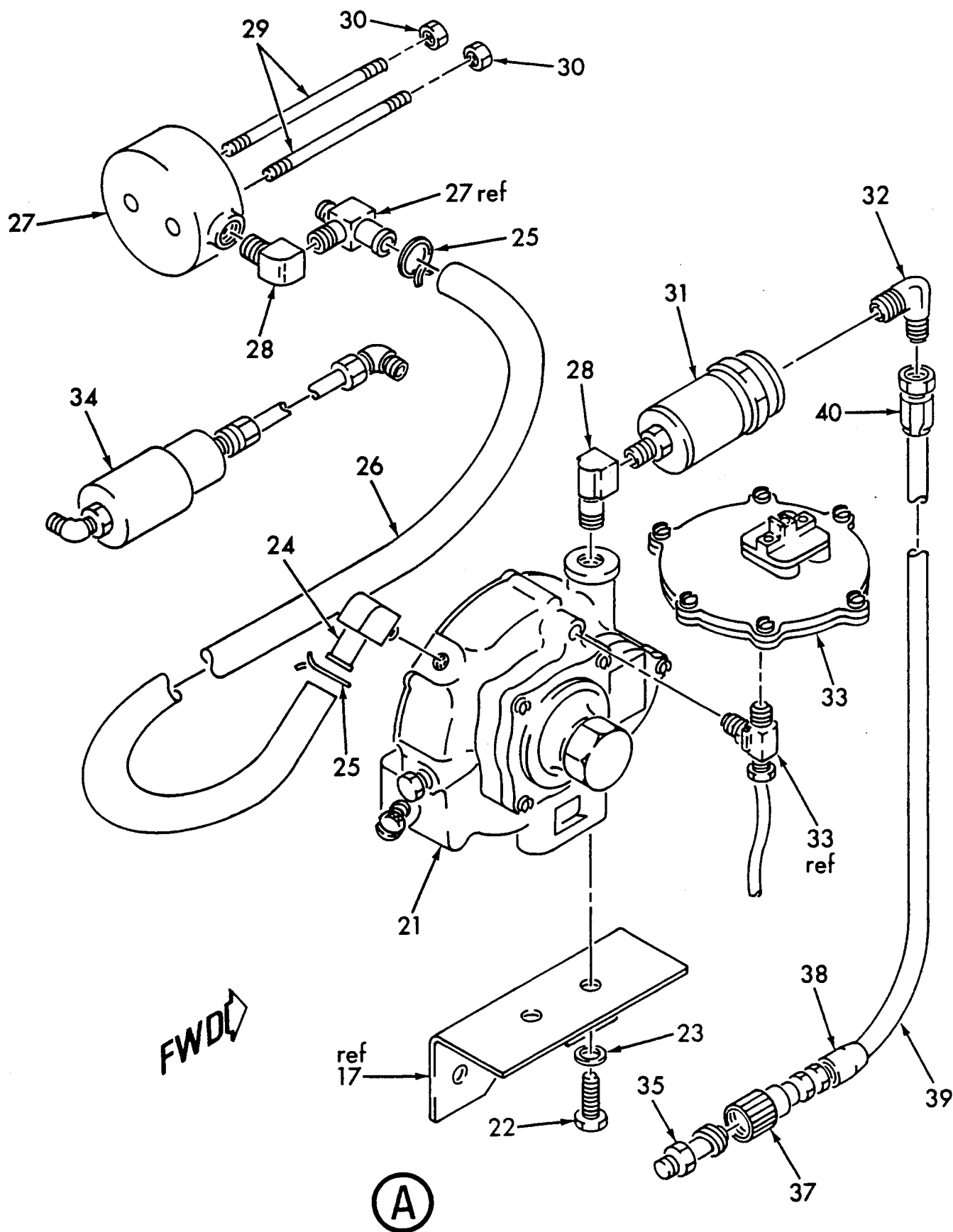


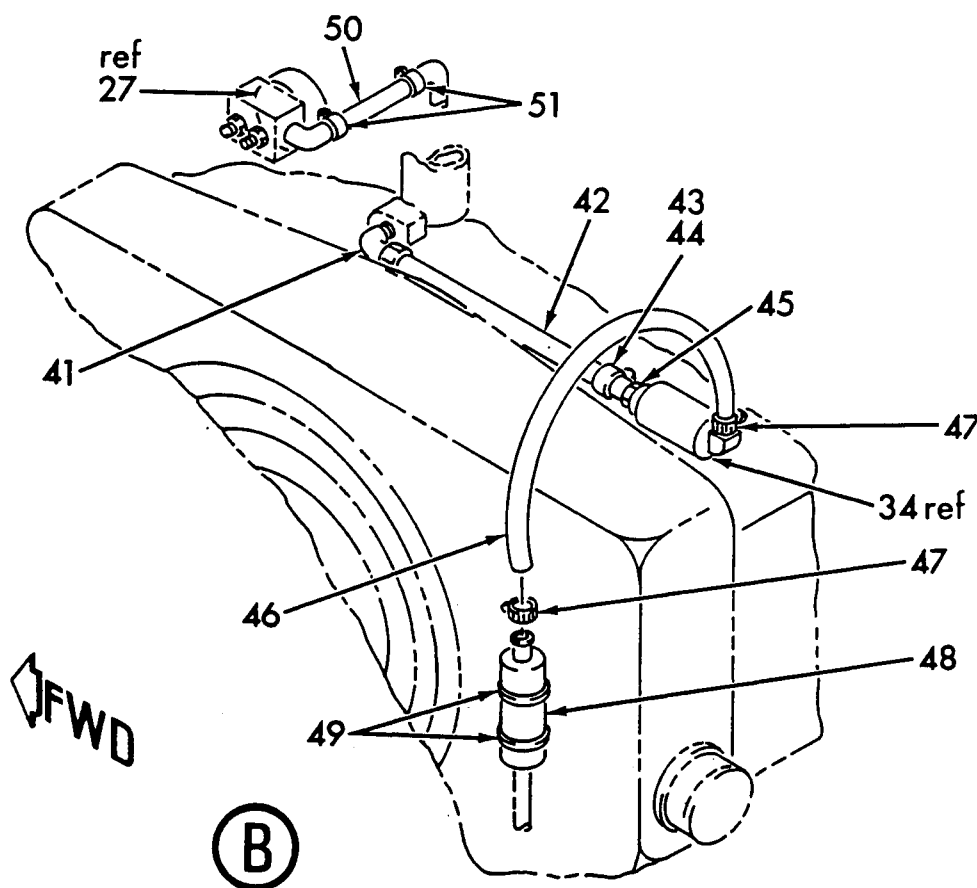
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
26	30226	.KIT, DUAL FUEL	1
27	80009-14	.ELBOW	1
28	80008-15	.ELBOW	1
29	60306	.SCREW, HEX HEAD CAP	2
30	30574	.COUPLING, PUMP SIDE	1
31	20930	.SPIDER	1
32	16921	.REGULATOR	
33	60107	.SCREW, HEX HEAD CAP	2
34	63301	.WASHER, LOCK	2
35	66143	.ELBOW	1
36	16925	.LOCK, FILTER	1
37	20832	.VALVE, GASOLINE SHUT-OFF	1
38	16519	.ELBOW, STREET	1
39	66144	.ELBOW	1
40	80008-03	.ADAPTER	1
41	16923	.SWITCH, VACUUM SAFETY	1
42	66146	.HOSE	1
43	66147	.CLAMP, HOSE	1
44	16927	.SOCKET, QUICK DISCONNECT	1
45	16928	.NIPPLE, QUICK DISCONNECT	1
46	16425	.FITTING, HOSE	1
47	66148	.FITTING, HOSE	1
48	66149	.HOSE, HIGH PRESSURE	1
49	16922	.ADAPTER, CARB	1
50	16956	.STUD, CARB ADAPTER	2
51	16958	.NUT, LOCK	2



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
52	486-A	.BRACKET, TANK (PAIR)	1
53	160	.FILTER, GAS	1
54	16280	.MUFFLER	1
55	30287	.ASSEMBLY, STEEL TUBING	1
56	486-C	.TANK, PROPANE	1
57	4019	.SWITCH, ON-OFF	1
58	20543	.DECAL	1
59	117-B	.CONNECTOR	4
60	117-D	.CONNECTOR, BUTT	3
61	16332	.CONNECTOR	1
62	117-E	.CONNECTOR, SPADE	1
63	16919	.KIT, REPAIR FOR VACUUM SAFETY SWITCH NO. 16923	1
64	16965	.KIT, REPAIR FOR PROPANE REGULATOR NO. 16921	1
65	16955	.FILTER, MICROBON FOR PROPANE FILTER LOCK NO. 16925	1
66	20506	.ENGINE, 20 H.P. (See Vendor Chap. for more Information)	1
-67	3038-A	.KIT, SEAL (for 3038 PUMP)	1







ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32378	ASSEMBLY, ENGINE AND PUMP (See Sect. 3, Fig. 2C or 4B for NHA)	REF
2	20506	.ENGINE, 20 H.P. (See Vendor Chap. for more Information)	1
3	20929	.COUPLING, HALF JAW	1
4	20930	.SPIDER, RUBBER	1
5	32284	.COUPLING, HALF JAW	1
6	9066-3	.MOUNT, PUMP	1
7	60307	.SCREW, CAP (attaching part)	2
8	63303	.WASHER, LOCK (attaching part)	2
9	81175	.PUMP, DOUBLE GEAR	1
10	60351	.SCREW, CAP (attaching part)	2



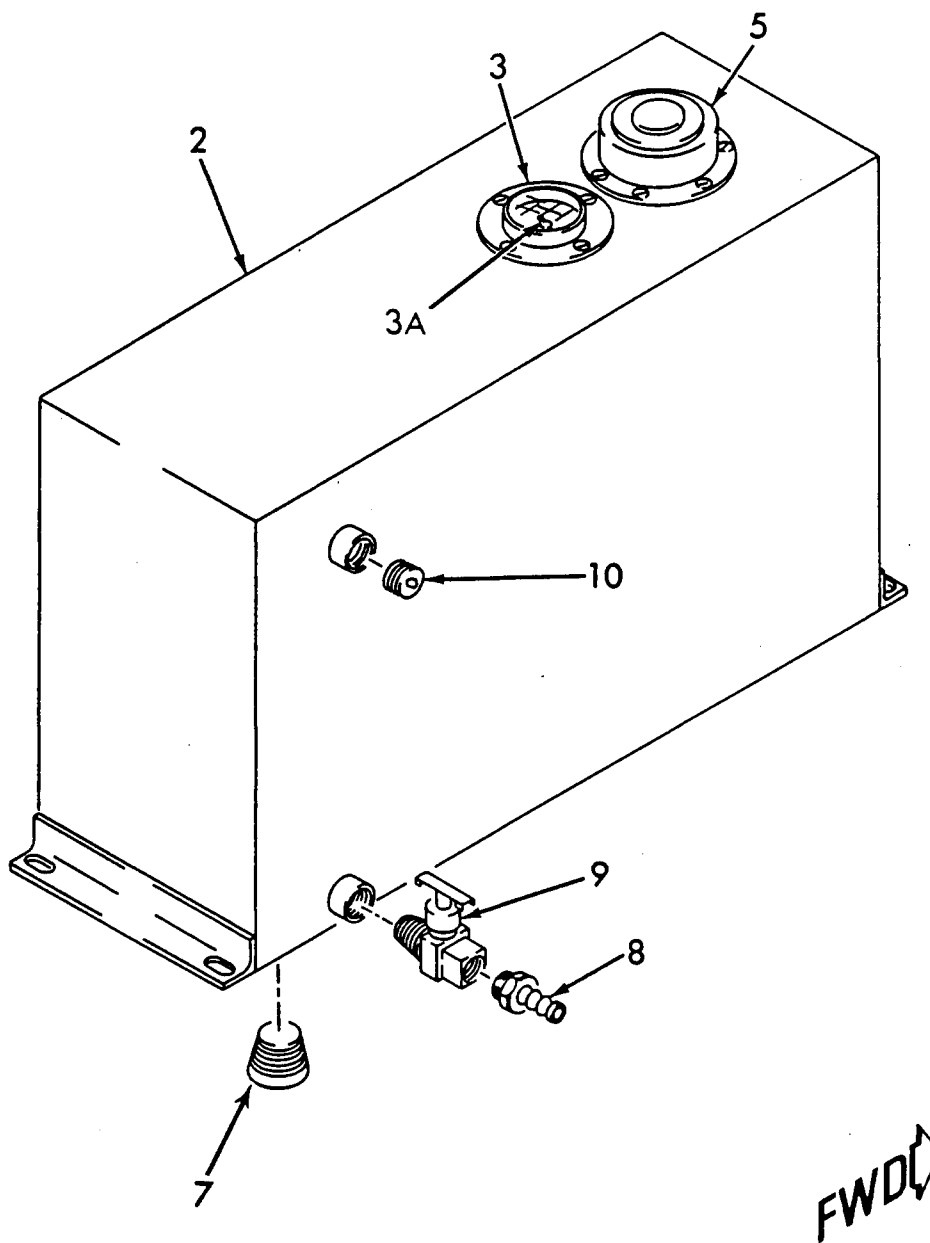
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
11	63304	.WASHER, LOCK (attaching part)	2
12	32441	.MUFFLER	1
13	52301	.ELBOW, 90° STREET	1
14	52300	.ELBOW, 90°	1
15	80012-13	.ELBOW, STRAIGHT THREAD	2
16	80012-28	.ELBOW, STRAIGHT THREAD	1
17	30236	.BRACKET, REGULATOR	1
18	60321	.SCREW, CAP (attaching part)	2
19	63303	.WASHER, LOCK (attaching part)	2
-20	30226	.KIT, DUAL FUEL	1
21	16921	..REGULATOR	1
22	60342	..SCREW, CAP (attaching part)	2
23	63301	..WASHER, LOCK (attaching part)	2
24	66143	..ELBOW, 90°	1
25	66147	..CLAMP, HOSE	2
26	66146	..HOSE, 2 FT	AR
27	16922	..ADAPTER, CARBURATOR	1
28	16519	..ELBOW, 90° STREET	2
29	16956	..STUD, CARBURATOR ADAPTER	2
30	16958	..NUT, LOCK	2
31	16925	..FILTER LOCK, PROPANE	1
32	80008-08	..ELBOW, MALE	1
33	16975	..KIT, MICROVAC	1
34	20832	..VALVE, FUEL SHUT-OFF	1
35	65141	..NIPPLE, QUICK DISCONNECT	1
36	32517	..ASSEMBLY, PROPANE HOSE	1



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
37	65142	...SOCKET, QUICK DISCONNECT	1
38	16452	...FITTING, MALE HOSE	1
39	2616	...HOSE	1
40	16451	...FITTING, MALE HOSE	1
41	80008-03	..ELBOW, MALE	1
42	30237	..TUBE, FUEL	1
43	22	..CLIP	1
44	63651	..RIVET, POP	1
45	80001-03	..CONNECTOR, MALE	1
46	160-B	..HOSE, FUEL	1
47	161-A	..CLAMP, HOSE	2
48	160	..FILTER, GASOLINE	1
49	255	..TIE, CABLE	2
50	66152	..TUBE, PCV	1
51	65167	..CLAMP	2

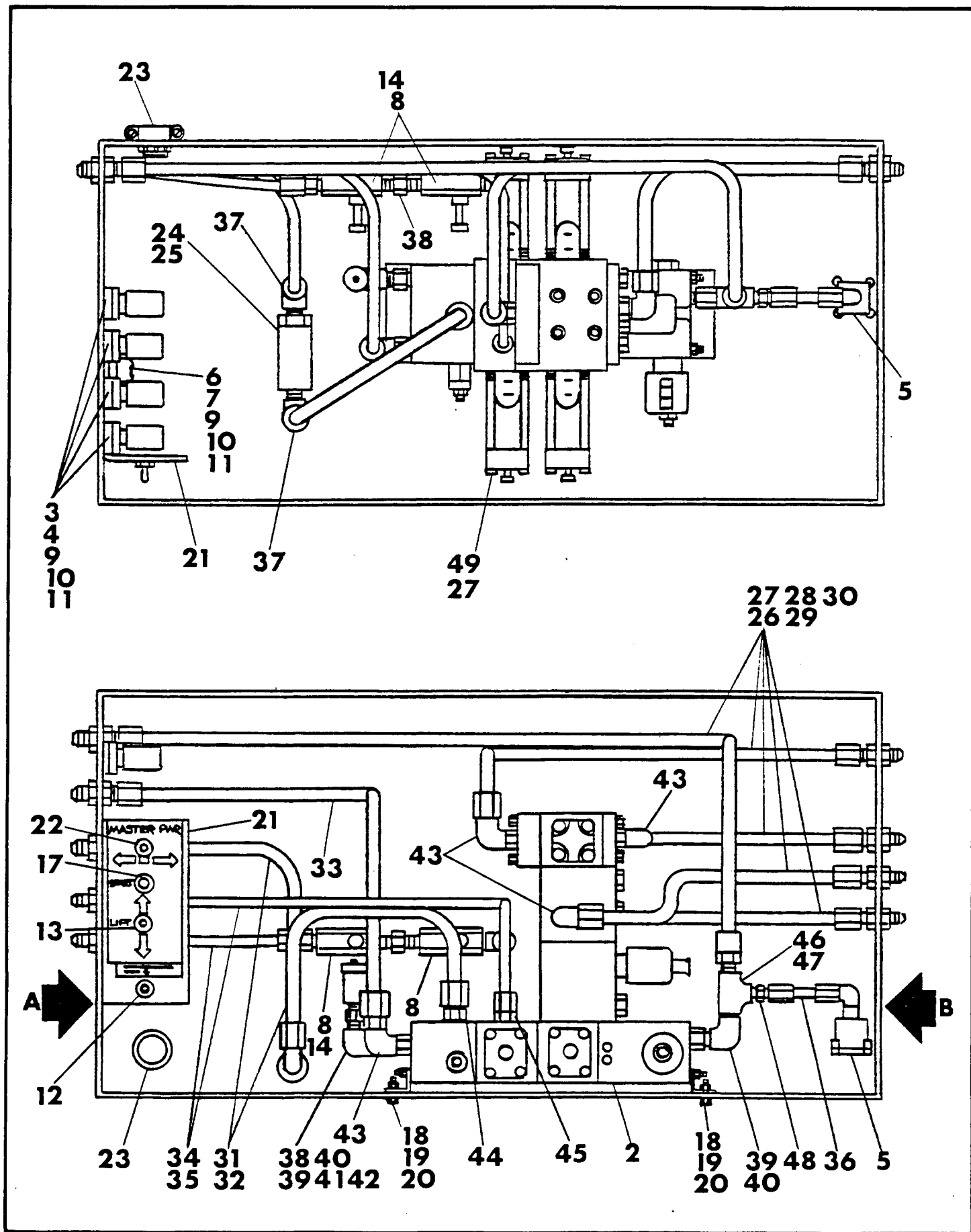


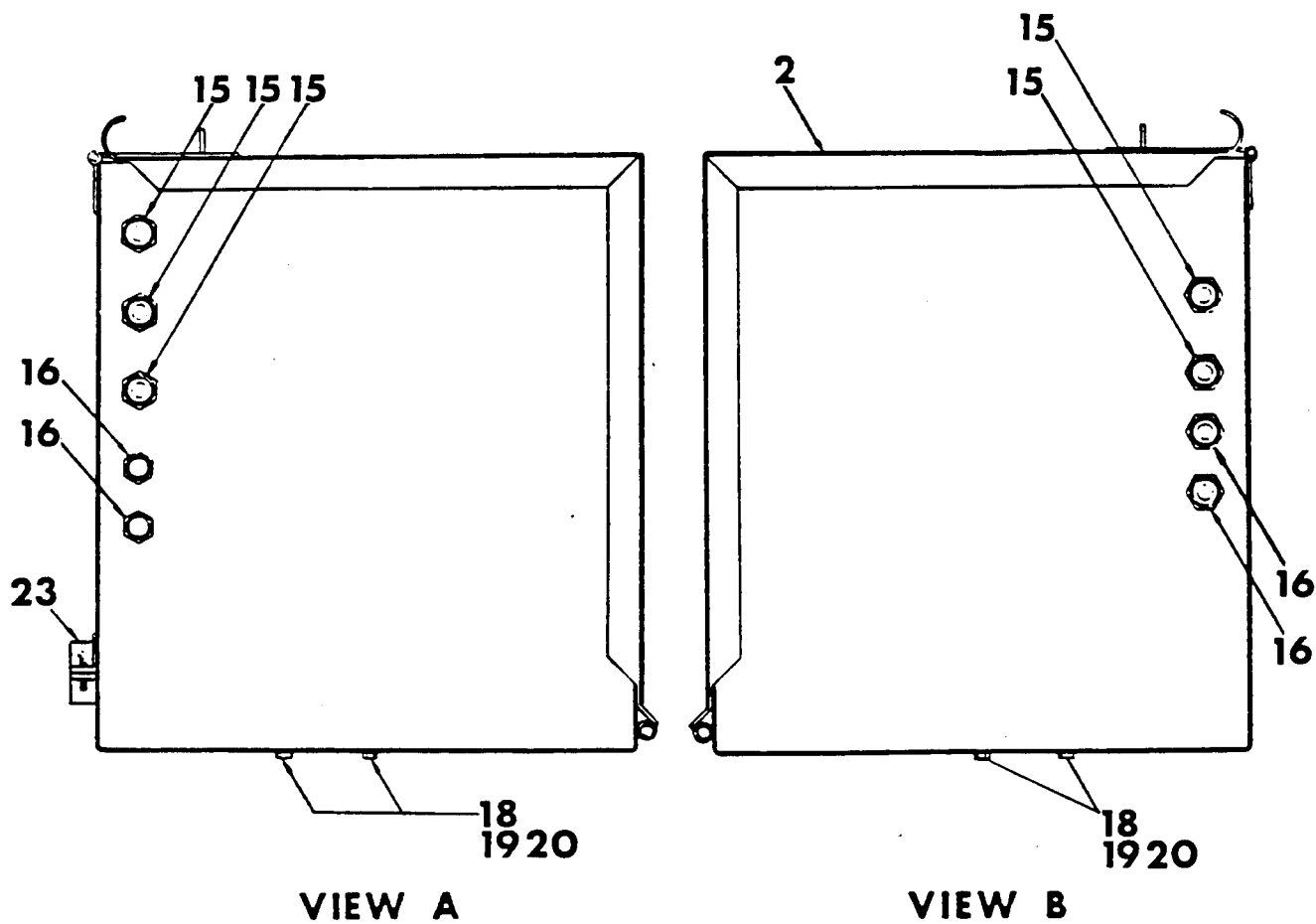
FUEL TANK ASSEMBLY





ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	8316	ASSEMBLY, FUEL TANK (See Sect. 3, Fig. 2A, 2B, 2C, 4A or 4B for NHA)	REF
2	8316-1	.TANK, FUEL	1
3	3017	.FUEL (sending unit)	1
3A	3017-A	..FUEL GAUGE	1
-4	61703	.SCREW (attaching part)	5
5	3005	.BREATHER, CAP	1
-6		..SCREW, SELF TAPPING	6
7	3027	.PLUG, MAGNETIC	1
8	864	.BARB, HOSE	1
9	12000	.VALVE, NEEDLE	1
10	80048-03	.PLUG	1



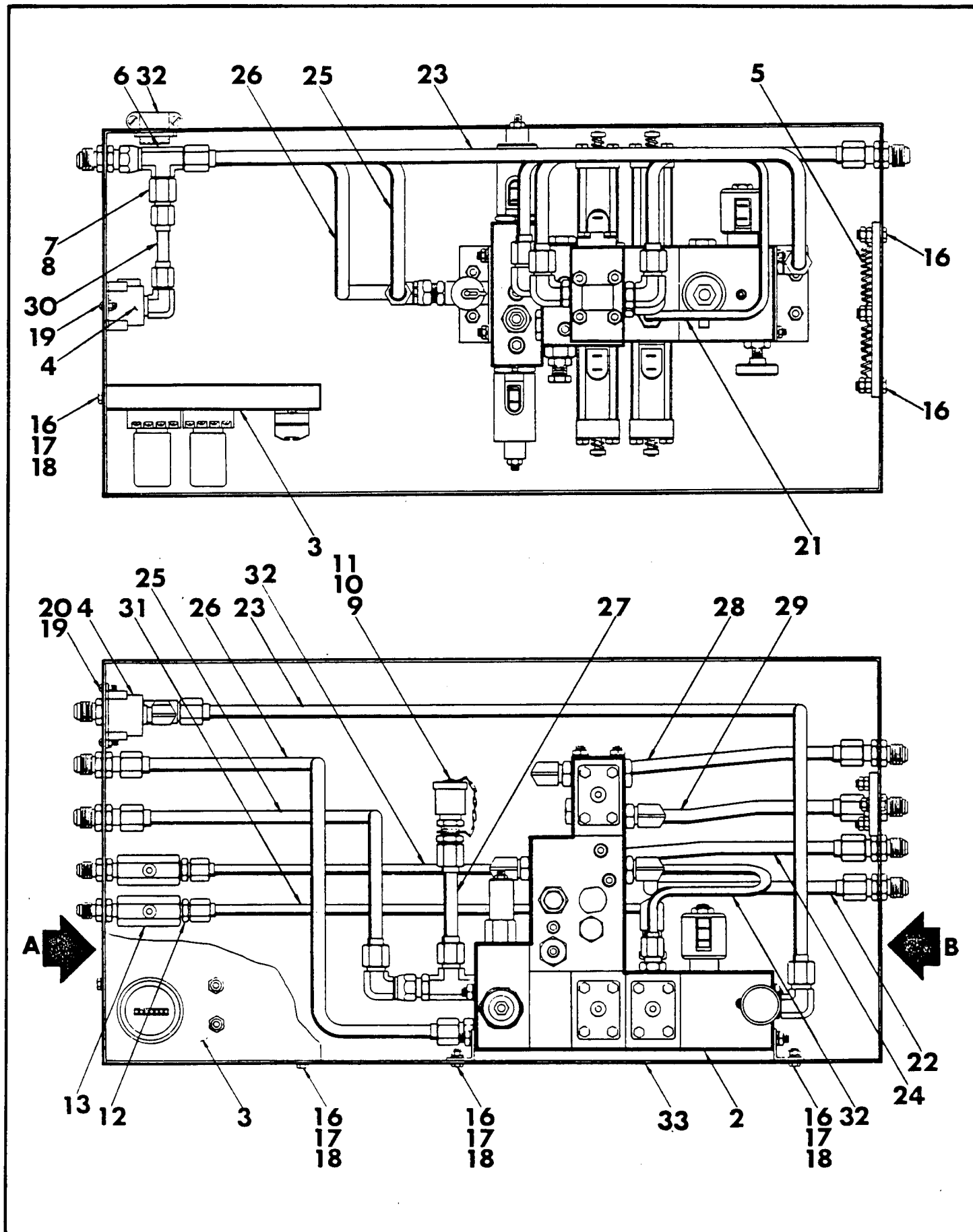




ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1		ASSEMBLY, COMPONENT BOX (See Sect. 3, Fig. 1A or 1B for NHA)	REF
2	8315	.BOX, COMPONENT	1
3	784-A	.BASE, RELAY	4
4	4032	.RELAY	4
5	30495	.ASSEMBLY, PRESSURE LIMIT SWITCH (See Sect. 3, Fig. 27 for Details)	1
6	117-A	.END, TERMINAL BLOCK	1
7	4027	.BLOCK, TERMINAL BLOCK	16
8	3037	.VALVE, FLOW	2
9	61502	.NUT, HEX	10
10	62623	.SCREW, ROUND HEAD CAP	10
11	63312	.WASHER, LOCK	10
12	70015	.SWITCH, FUEL SELECTOR	1
13	4021	.SWITCH, MOMENTARY	1
14	80001-08	.CONNECTOR	2
15	80045-06	.UNION, BULKHEAD	5
16	80045-05	.UNION, BULKHEAD	4
17	4020	.SWITCH, STARTER	1
18	60123	.SCREW, HEX HEAD CAP	6
19	63301	.WASHER, LOCK	6
20	60701	.NUT, HEX	6
21	2204	.PLATE, SWITCH MOUNT	1
22	4019	.SWITCH, SELECTOR	1
23	213	.CONNECTOR, ROMEX	1
24	3007	.FILTER, IN LINE	1
25	3007-1	.FILTER ELEMENT FOR 3007	1



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
26		.ASSEMBLY, TUBE	1
27		.ASSEMBLY, TUBE	1
28		.ASSEMBLY, TUBE	1
29		.ASSEMBLY, TUBE	1
30		.ASSEMBLY, TUBE	1
31		.ASSEMBLY, TUBE	1
32		.ASSEMBLY, TUBE	1
33		.ASSEMBLY, TUBE	1
34		.ASSEMBLY, TUBE	1
35		.ASSEMBLY, TUBE	1
36		.ASSEMBLY, TUBE	1
37	80008-14	.ELBOW, STREET	2
38	80052-04	.NIPPLE	2
39	80063-01	.ADAPTER, FEMALE PIPE	1
40	80021-03	.ELBOW, STREET	2
41	2527	.DISCONNECTOR, MALE QUICK	1
42	845	.CAP	1
43	80012-12	.ELBOW, STRAIGHT THREAD	5
44	80004-12	.CONNECTOR, STRAIGHT THREAD	1
45	80004-08	.CONNECTOR, STRAIGHT THREAD	2
46	80041-03	.TEE, STREET	1
47	80001-13	.CONNECTOR, MALE	1
48	80001-08	.CONNECTOR, MALE	1
49	3021	.SUB-ASSEMBLY, MANIFOLD PACKAGE	1
-50	9390	.SUB-ASSEMBLY, MANIFOLD PACKAGE (RT-31G) (See Sect. 3, Fig. 29A for Details)	1
-51	3019-3043	.SUB-ASSEMBLY, MANIFOLD PACKAGE (SRT-31G) (See Sect. 3, Fig. 31A for Details)	1





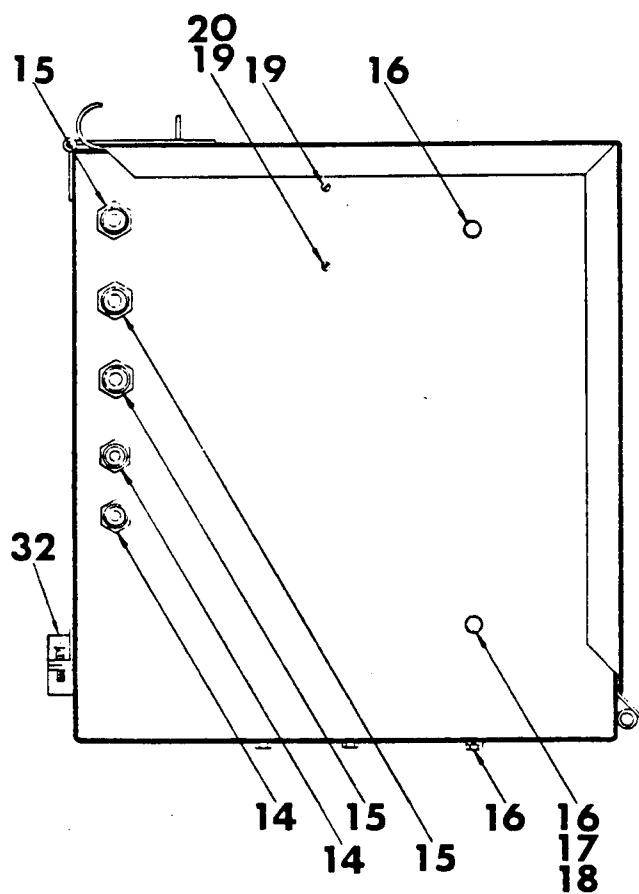
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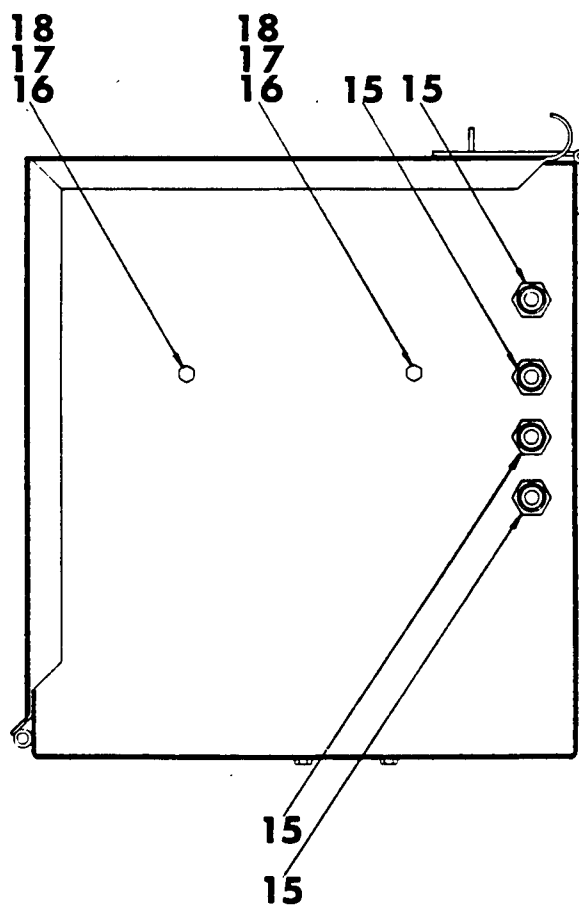
COMPONENT BOX ASSEMBLY (RT-31G) (AFT. MAR. '80)

(continued)

PARTS
SECT. 3
FIG. 24A
PAGE 2



VIEW A



VIEW B

REV.



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30723	ASSEMBLY, COMPONENT BOX (See Sect. 3, Fig. 2A, 2B for NHA)	REF
2	30713	.ASSEMBLY, MANIFOLD (See Sect. 3, Fig. 28A for Details)	1
3	30651	.ASSEMBLY, PANEL (See Sect. 3, Fig. 34A for Details)	1
4	30495	.ASSEMBLY, PRESSURE LIMIT SWITCH (See Sect. 3, Fig. 27 for Details)	1
5	4050	.RESISTOR, BRAKE	1
6	80028-06	.TEE, SWIVEL NUT RUN	1
7	80060-06	.NUT	1
8	80056-03	.REDUCER, TUBE END	1
9	845	.CAP	1
10	2527	.DISCONNECT, QUICK	1
11	80001-13	.FITTING, MALE	1
12	80001-08	.FITTING	2
13	20370	.VALVE, NEEDLE	2
14	50207	.UNION, BULKHEAD	2
15	80045-06	.UNION, BULKHEAD	7
16	60123	.SCREW, HEX HEAD CAP	9
17	63301	.WASHER, LOCK	9
18	60701	.NUT	9
19	62612	.SCREW, ROUND HEAD CAP	2
20	61502	.NUT	2
21		.ASSEMBLY, TUBE (3/8)	1
22		.ASSEMBLY, TUBE (1/2)	1
23		.ASSEMBLY, TUBE (1/2)	1
24		.ASSEMBLY, TUBE (1/2)	1



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
25		.ASSEMBLY, TUBE (1/2)	1
26		.ASSEMBLY, TUBE (1/2)	1
27		.ASSEMBLY, TUBE (1/2)	1
28		.ASSEMBLY, TUBE (1/2)	1
29		.ASSEMBLY, TUBE (1/2)	1
30		.ASSEMBLY, TUBE (3/8)	1
31		.ASSEMBLY, TUBE (3/8)	1
32	213	.CONNECTOR, ROMEX	1
33	8315	.BOX, COMPONENT	1

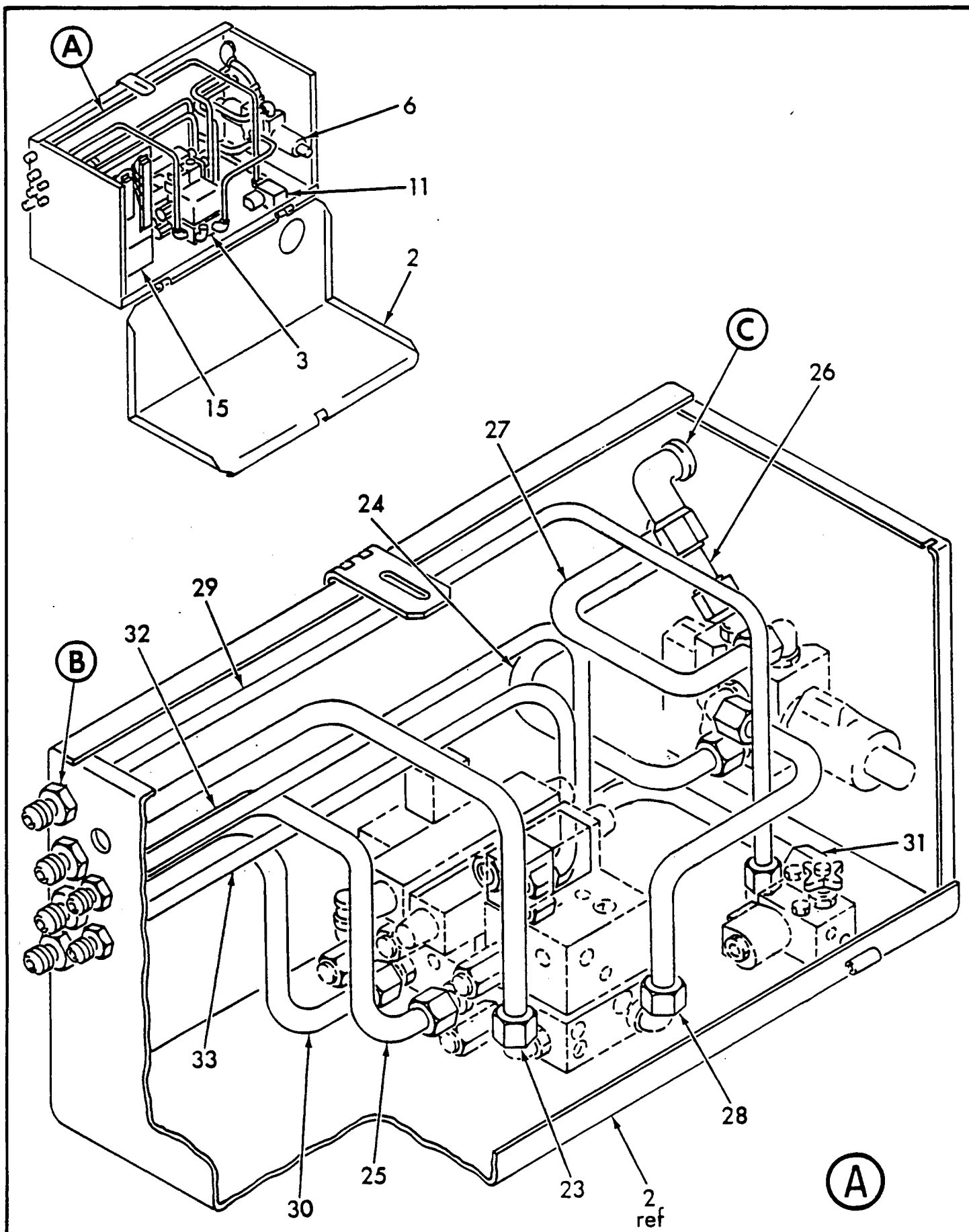


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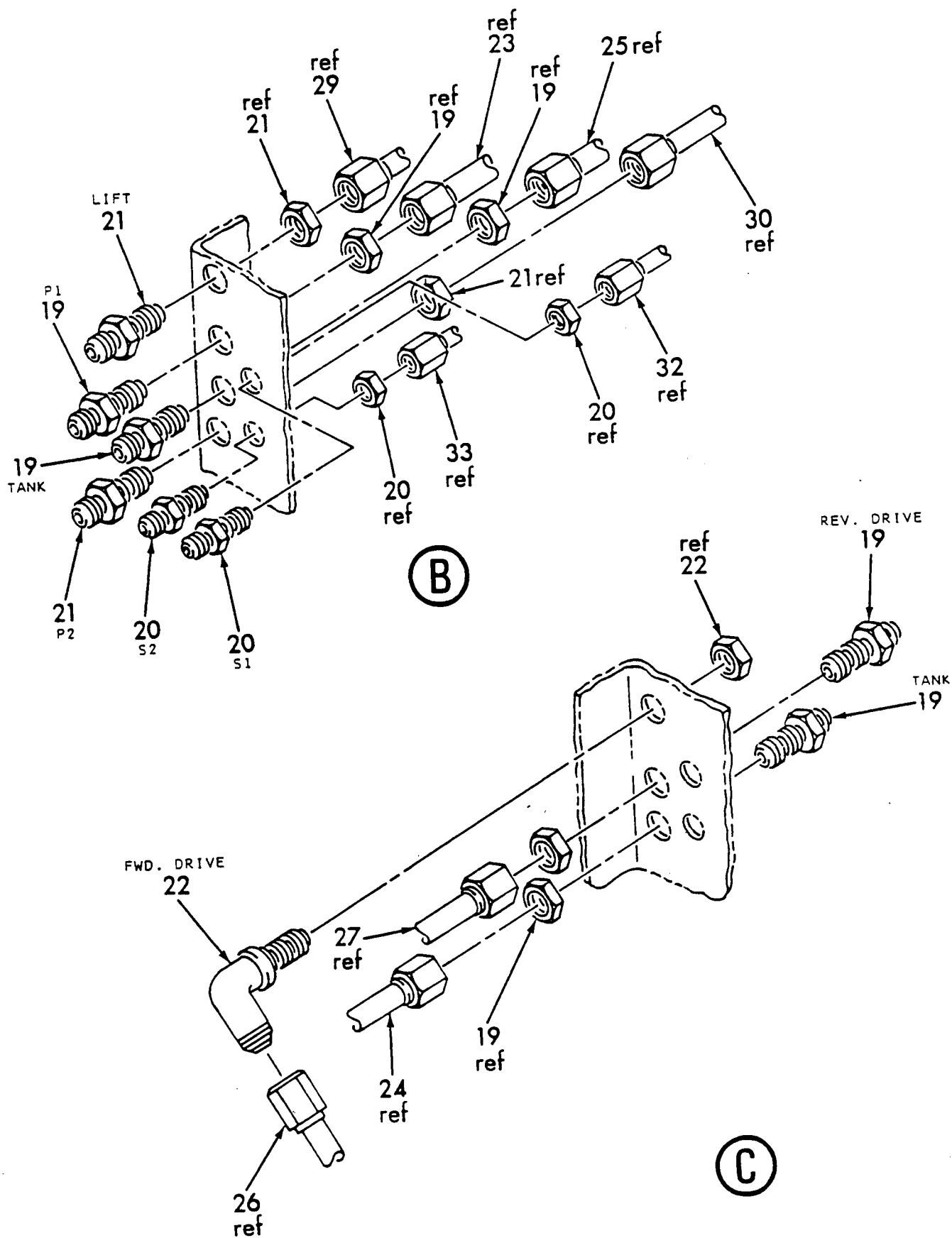
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COMPONENT BOX ASSEMBLY (RT-31G) (AFT. JUL. '86)

PARTS
SECT. 3
FIG.24B
PAGE 1



REV.





ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32412	ASSEMBLY, HYDRAULIC COMPONENT BOX (See Sect. 3, Fig. 26 for NHA)	REF
2	32529	.WELDMENT, COMPONENT BOX	1
3	32411	.ASSEMBLY, VALVE PACKAGE (See Sect. 3, Fig. 28B for Details)	1
-4	60320	.SCREW, CAP (attaching part)	2
-5	63303	.WASHER, LOCK (attaching part)	2
6	32532	.ASSEMBLY, DRIVE SOLENOID VALVE (See Sect. 3, Fig. 32 for Details)	1
-7	60339	.SCREW, CAP (attaching part)	3
-8	63302	.WASHER, LOCK (attaching part)	3
-9	63402	.WASHER, FLAT (attaching part)	6
-10	60702	.NUT, HEX (attaching part)	3
11	32531	.ASSEMBLY, LOWERING CONTROL VALVE (See Sect. 3, Fig. 33 for Details)	1
-12	60352	.SCREW, CAP (attaching part)	2
-13	63301	.WASHER, LOCK (attaching part)	2
-14	60701	.NUT, HEX (attaching part)	2
15	32395	.ASSEMBLY, ELECTRICAL PANEL (See Sect. 3, Fig. 34B for Details)	1
-16	60353	.SCREW, CAP (attaching part)	3
-17	63301	.WASHER, LOCK (attaching part)	3
-18	60701	.NUT, HEX (attaching part)	3
19	80045-07	.UNION, BULKHEAD (P1, TANK, REV. DRIVE, TANK)	4
20	80045-05	.UNION, BULKHEAD (S1, S2)	2
21	80045-06	.UNION, BULKHEAD (LIFT, P2)	2
22	80011-07	.UNION. <u>BULKEAD</u> ELBOW (FWD. DRIVE)	1
23	32412-1	.ASSEMBLY, TUBE (5/8)	1

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PARTS CATALOG

COMPONENT BOX ASSEMBLY (RT-31G) (AFT. JUL. '86)

(continued)

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SECT. 3
FIG. 24B
PAGE 4

ITEM	PART NUMBER	DESCRIPTION		UNIT PER ASSY.
		1234567		
24	32412-2	.ASSEMBLY, TUBE (5/8)		1
25	32412-3	.ASSEMBLY, TUBE (5/8)		1
26	32412-4	.ASSEMBLY, TUBE (5/8)		1
27	32412-5	.ASSEMBLY, TUBE (5/8)		1
28	32412-6	.ASSEMBLY, TUBE (5/8)		1
29	32412-7	.ASSEMBLY, TUBE (1/2)		1
30	32412-8	.ASSEMBLY, TUBE (1/2)		1
31	32412-9	.ASSEMBLY, TUBE (1/2)		1
32	32412-10	.ASSEMBLY, TUBE (3/8)		1
33	32412-11	.ASSEMBLY, TUBE (3/8)		1

REV.

- ITEM NOT ILLUSTRATED

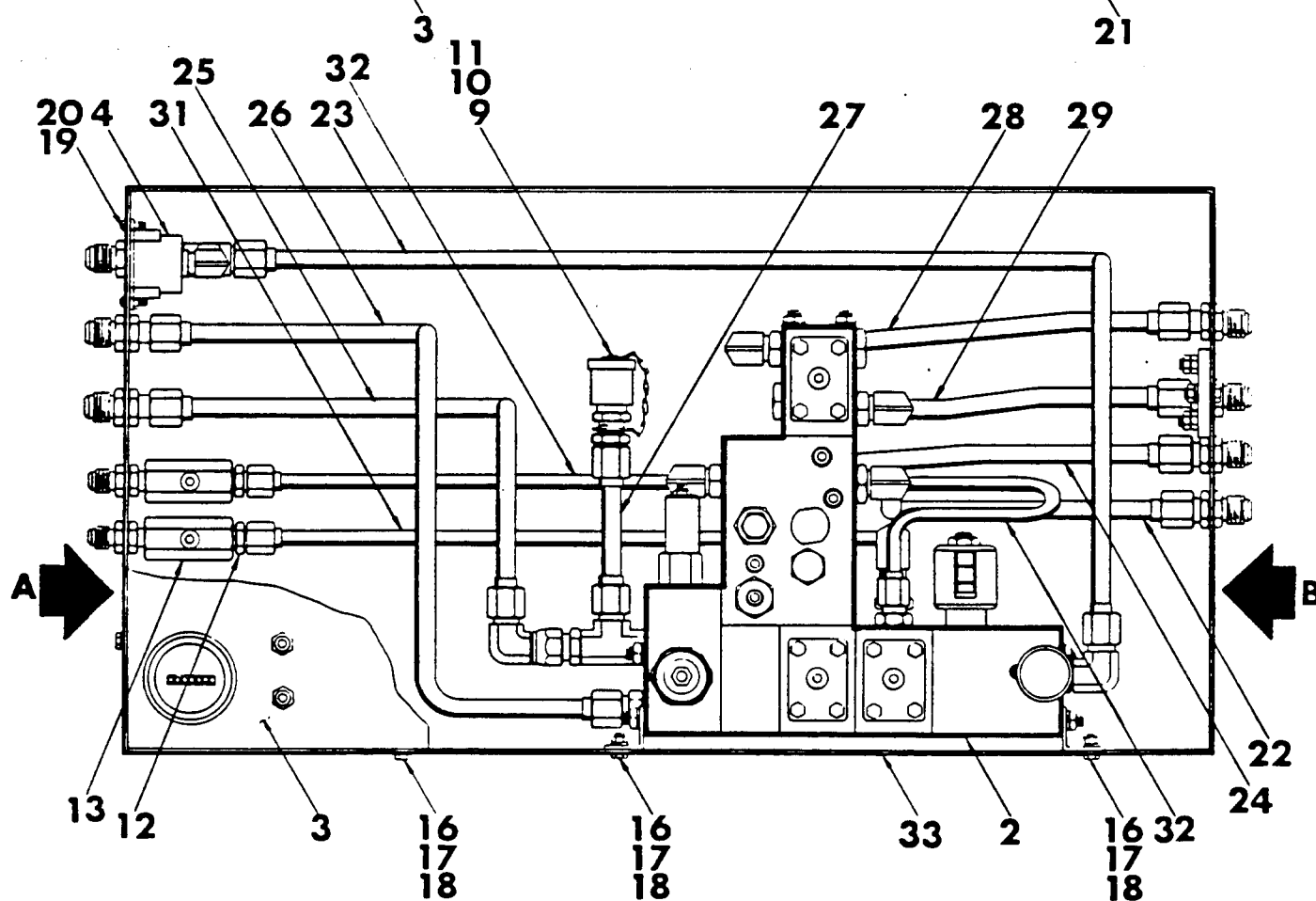
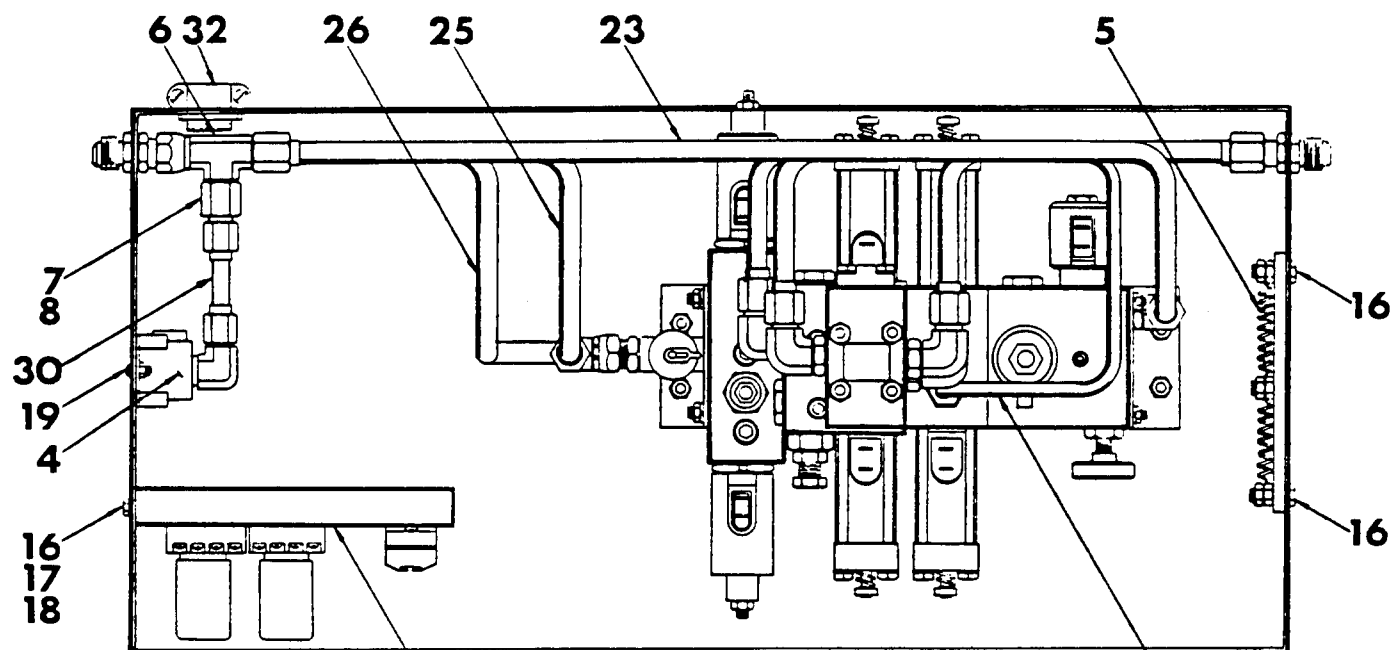


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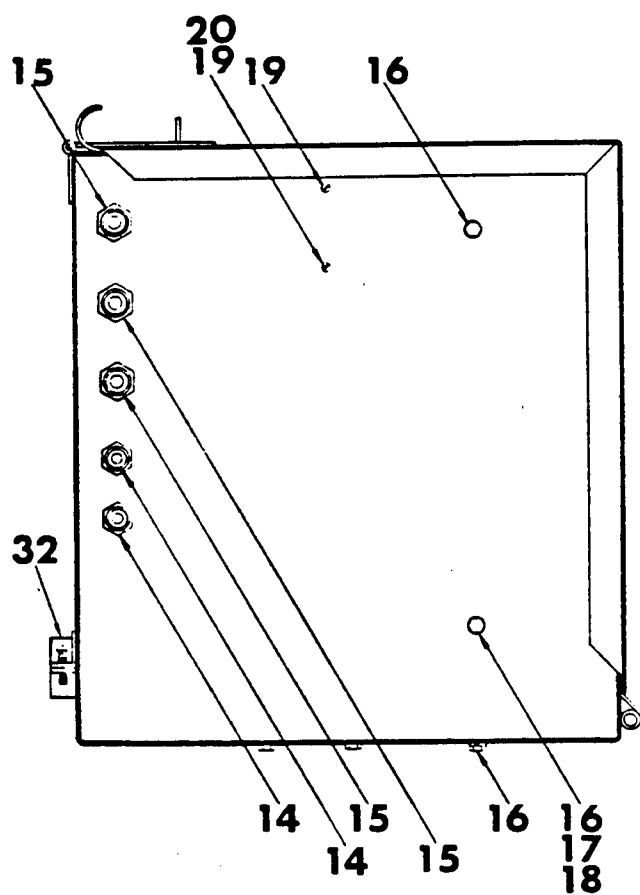
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PARTS CATALOG

COMPONENT BOX ASSEMBLY (RT-31E) (AFT. MAR. '80)

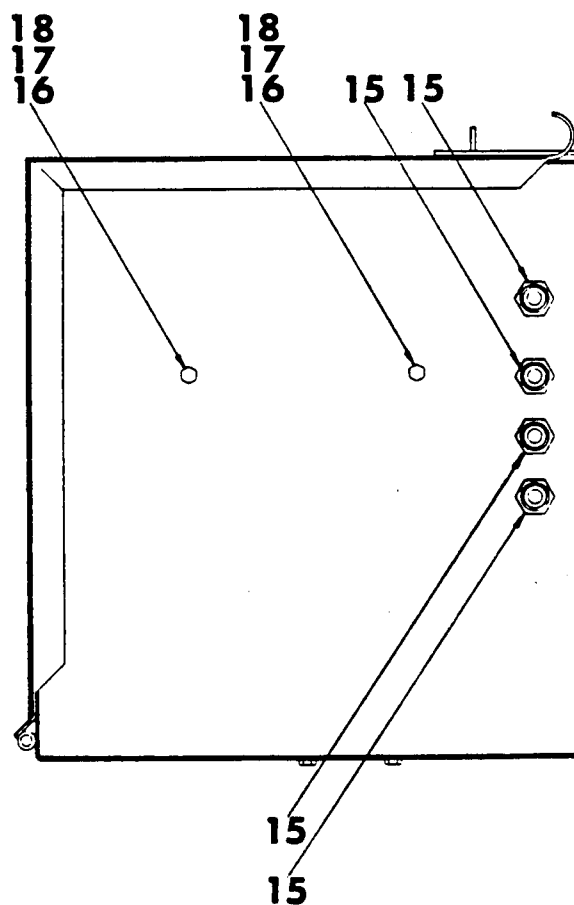
PARTS
SECT.3
FIG.25A
PAGE 1



REV.



VIEW A



VIEW B



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30722	ASSEMBLY, COMPONENT BOX (See Sect. 3, Fig. 3A or 3B for NHA)	REF
2	30713	.ASSEMBLY, MANIFOLD (See Sect. 3, Fig. 28A for Details)	1
3	30652	.ASSEMBLY, PANEL (See Sect. 3, Fig. 35A for Details)	1
4	30495	.ASSEMBLY, PRESSURE LIMIT SWITCH (See Sect. 3, Fig. 27 for Details)	1
5	4050	.RESISTOR, BRAKE	1
6	80028-06	.TEE, SWIVEL NUT RUN	1
7	80060-06	.NUT	1
8	80056-03	.REDUCER, TUBE END	1
9	845	.CAP	1
10	2527	.DISCONNECT, QUICK	1
11	80001-13	.FITTING, MALE	1
12	80001-08	.FITTING	2
13	20370	.VALVE, NEEDLE	2
14	50207	.UNION, BULKHEAD	2
15	80045-06	.UNION, BULKHEAD	7
16	60123	.SCREW, HEX HEAD	9
17	63301	.WASHER, LOCK	9
18	60701	.NUT	9
19	62612	.SCREW, ROUND HEAD CAP	2
20	61502	.NUT	2
21		.ASSEMBLY, TUBE (3/8)	1
22		.ASSEMBLY, TUBE (1/2)	1
23		.ASSEMBLY, TUBE (1/2)	1
24		.ASSEMBLY, TUBE (1/2)	1
25		.ASSEMBLY, TUBE (1/2)	1

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PARTS CATALOG

COMPONENT BOX ASSEMBLY (RT-31E) (AFT. MAR. '80)

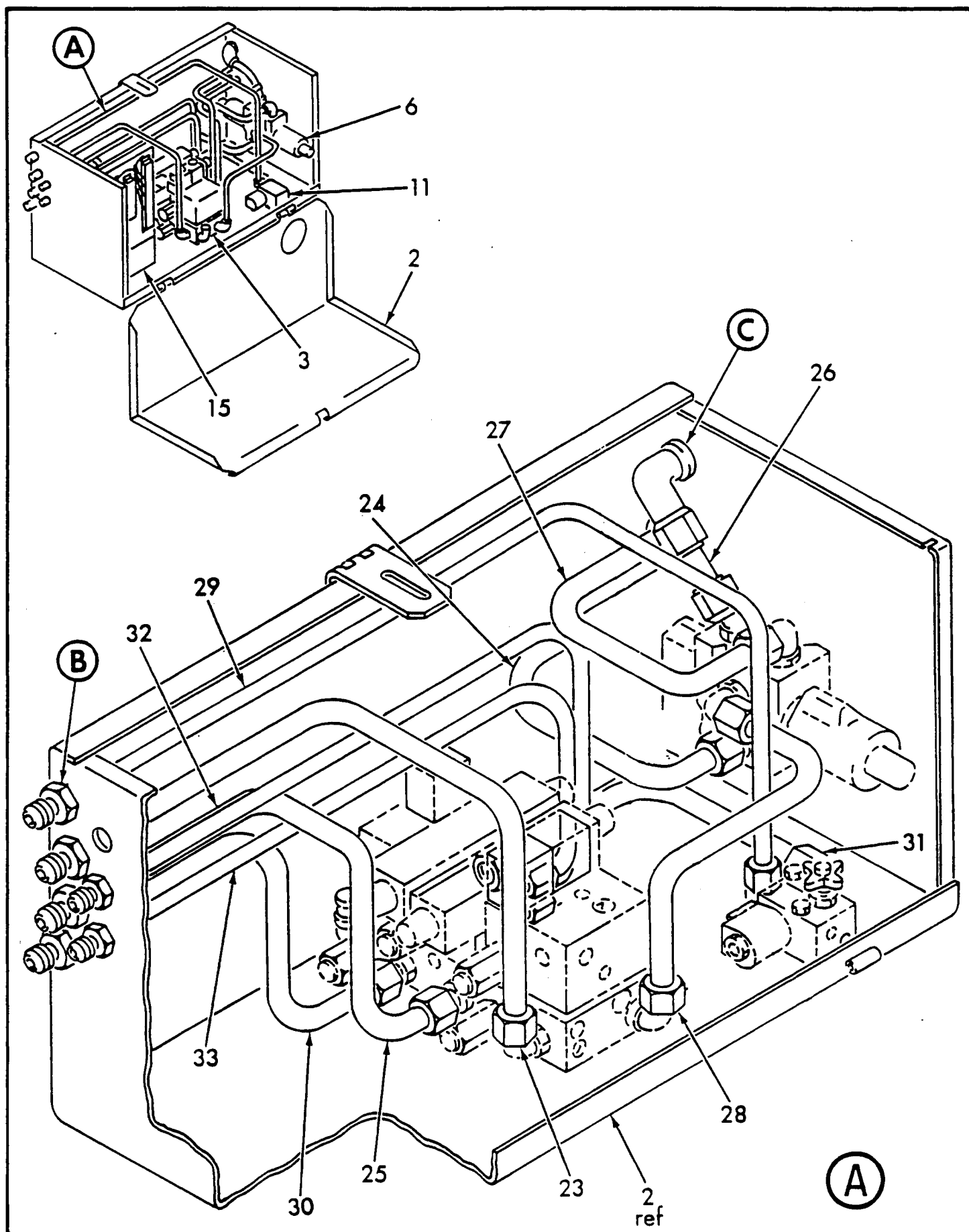
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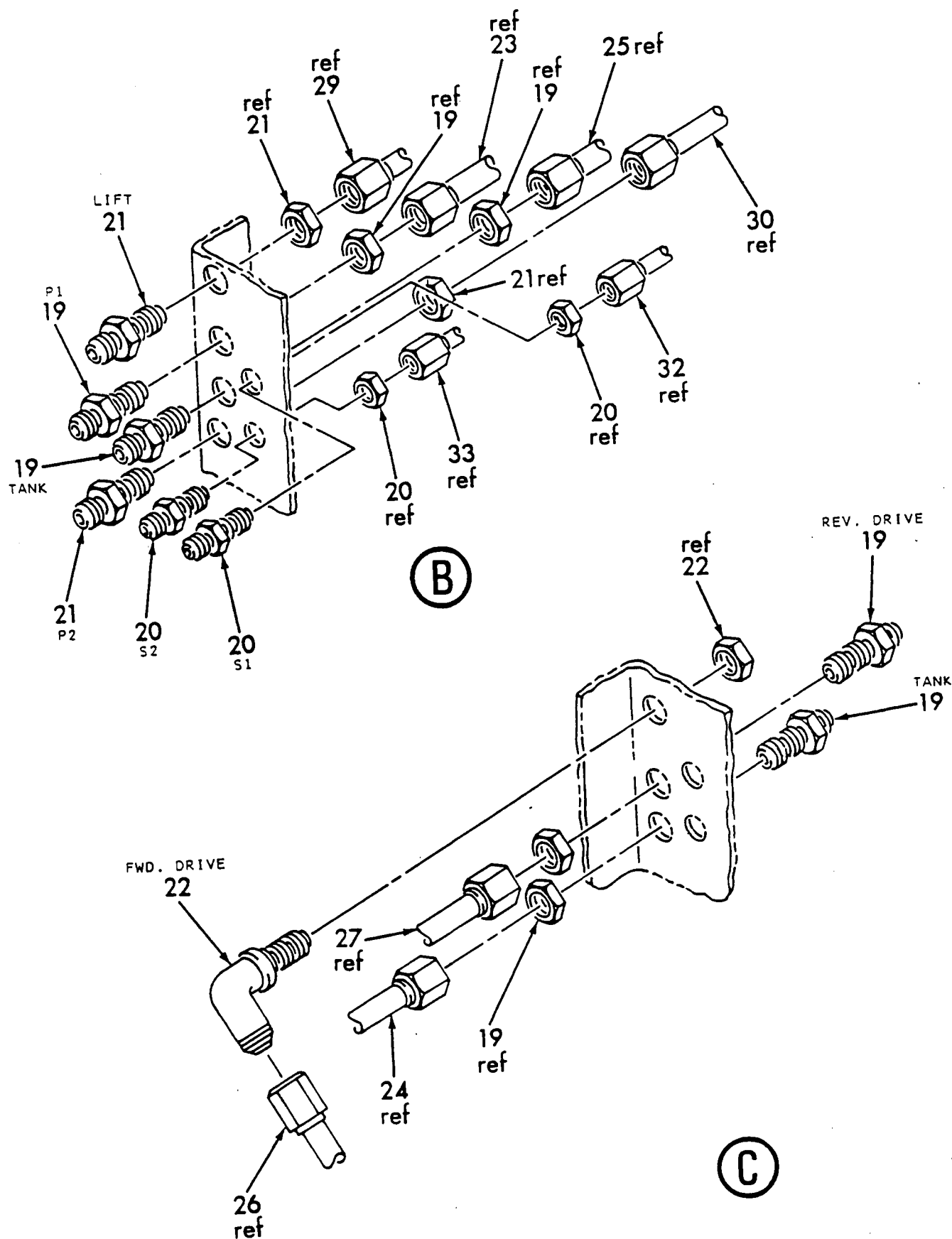
PARTS
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FIG.25A
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ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
26		.ASSEMBLY, TUBE (1/2)	1
27		.ASSEMBLY, TUBE (1/2)	1
28		.ASSEMBLY, TUBE (1/2)	1
29		.ASSEMBLY, TUBE (1/2)	1
30		.ASSEMBLY, TUBE (3/8)	1
31		.ASSEMBLY, TUBE (3/8)	1
32	213	.CONNECTOR, ROMEX	1
33	8315	.BOX, COMPONENT	1

REV.

- ITEM NOT ILLUSTRATED







ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32413	ASSEMBLY, HYDRAULIC COMPONENT BOX (See Sect. 3, Fig. 3B for NHA)	REF
2	32529	.WELDMENT, COMPONENT BOX	1
3	32411	.ASSEMBLY, VALVE PACKAGE (See Sect. 3, Fig. 28B for Details)	1
-4	60320	.SCREW, CAP (attaching part)	2
-5	63303	.WASHER, LOCK (attaching part)	2
6	32532	.ASSEMBLY, DRIVE SOLENOID VALVE (See Sect. 3, Fig. 32 for Details)	1
-7	60339	.SCREW, CAP (attaching part)	3
-8	63302	.WASHER, LOCK (attaching part)	3
-9	63402	.WASHER, FLAT (attaching part)	6
-10	60702	.NUT, HEX (attaching part)	3
11	32531	.ASSEMBLY, LOWERING CONTROL VALVE (See Sect. 3, Fig. 33 for Details)	1
-12	60352	.SCREW, CAP (attaching part)	2
-13	63301	.WASHER, LOCK (attaching part)	2
-14	60701	.NUT, HEX (attaching part)	2
15	32394	.ASSEMBLY, ELECTRICAL PANEL (See Sect. 3, Fig. 35B for Details)	1
-16	60353	.SCREW, CAP (attaching part)	3
-17	63301	.WASHER, LOCK (attaching part)	3
-18	60701	.NUT, HEX (attaching part)	3
19	80045-07	.UNION BULKHEAD (P1, TANK, REV, DRIVE, FLUSH LEFT TANK)	4
20	80045-05	.UNION, BULKHEAD (S1, S2)	2
21	80045-06	.UNION, BULKHEAD (LIFT, P2)	2
22	80011-07	.UNION, BULKHEAD ELBOW (FWD. DRIVE)	1
23	32413-1	.ASSEMBLY, TUBE (5/8)	1



ITEM	PART NUMBER	DESCRIPTION		UNIT PER ASSY.
		1234567		
24	32413-2	.ASSEMBLY, TUBE (5/8)		1
25	32413-3	.ASSEMBLY, TUBE (5/8)		1
26	32413-4	.ASSEMBLY, TUBE (5/8)		1
27	32413-5	.ASSEMBLY, TUBE (5/8)		1
28	32413-6	.ASSEMBLY, TUBE (5/8)		1
29	32413-7	.ASSEMBLY, TUBE (1/2)		1
30	32413-8	.ASSEMBLY, TUBE (1/2)		1
31	32413-9	.ASSEMBLY, TUBE (1/2)		1
32	32413-10	.ASSEMBLY, TUBE (3/8)		1
33	32413-11	.ASSEMBLY, TUBE (3/8)		1

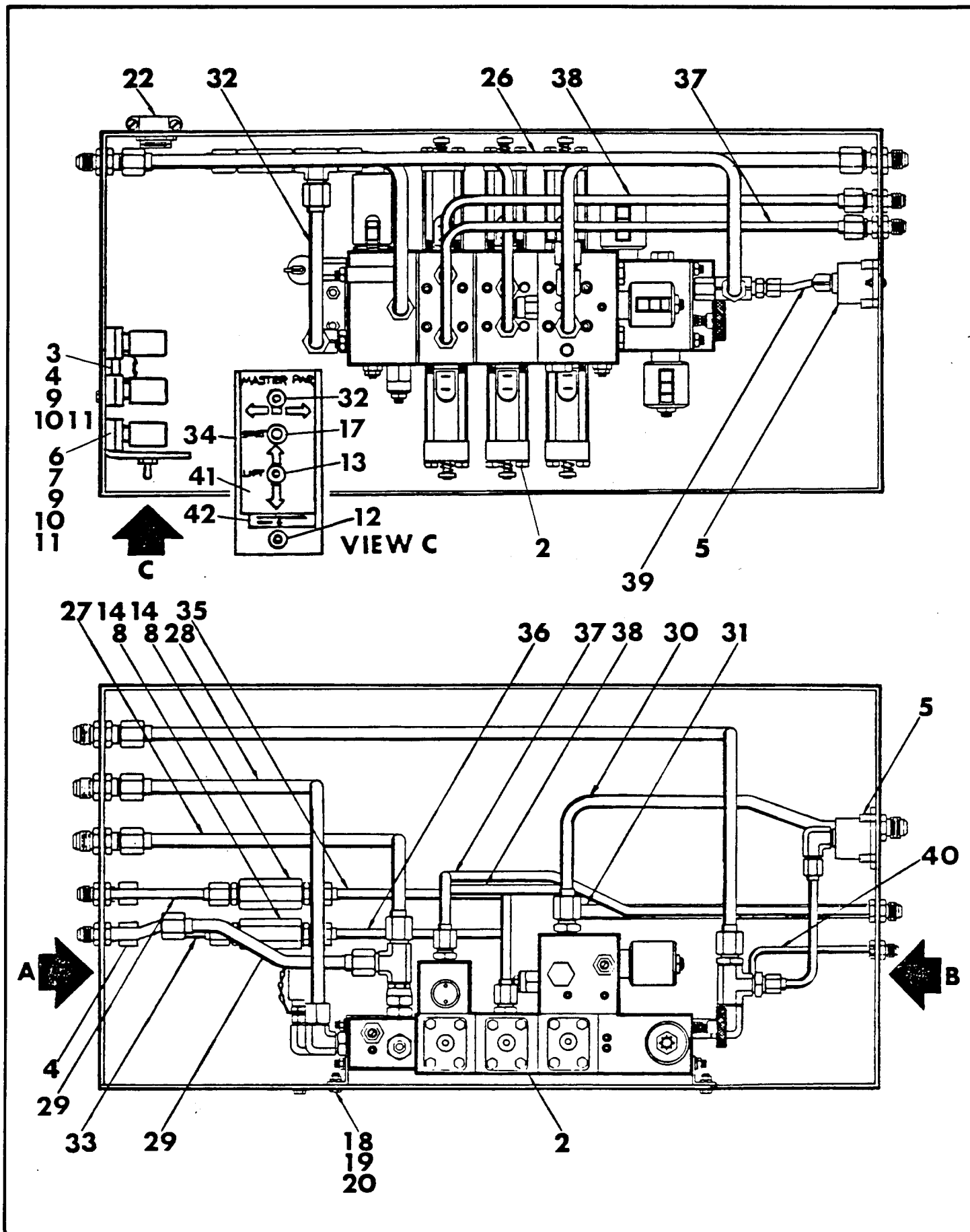


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PARTS CATALOG

COMPONENT BOX ASSEMBLY (SRT-31G) (BEF. MAR. '80)

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FIG.26A
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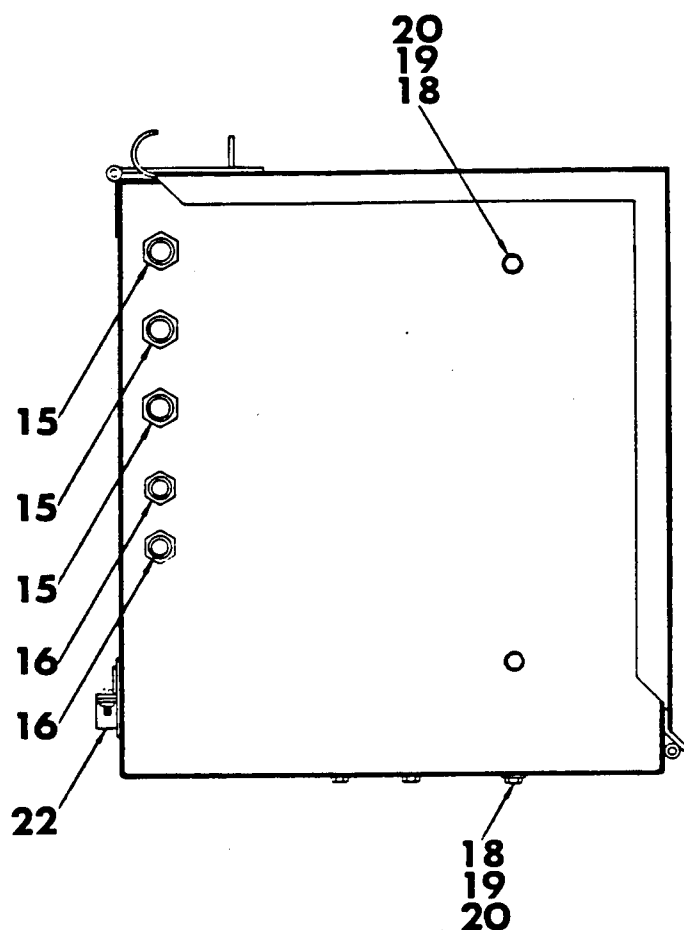
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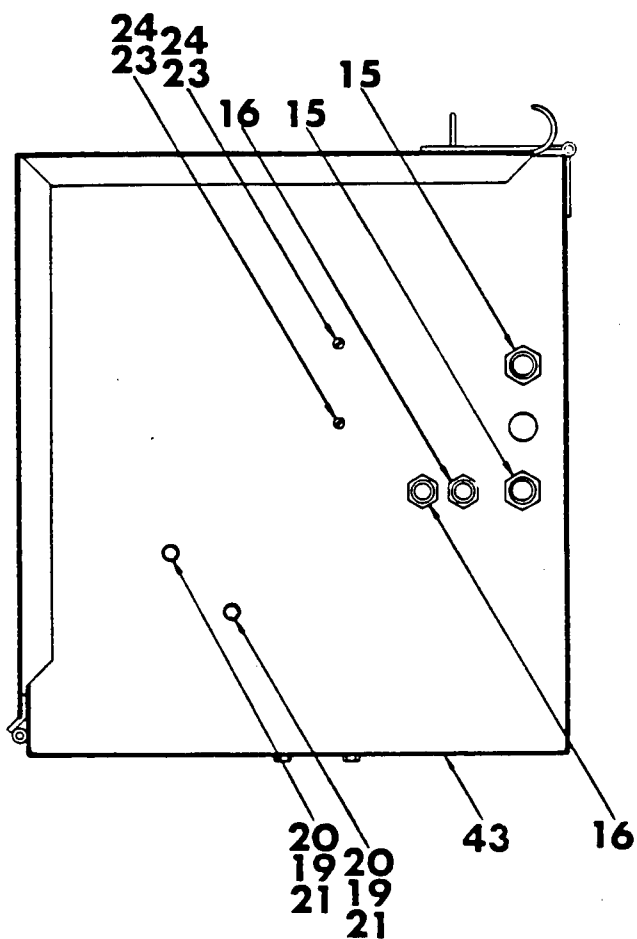
COMPONENT BOX ASSEMBLY (SRT-31G) (BEF. MAR. '80)

(continued)

PARTS
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FIG. 26A
PAGE 2



VIEW A



VIEW B

REV.



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30726	ASSEMBLY, COMPONENT BOX (See Sect. 3, Fig. 4A for NHA)	REF
2	30711	.ASSEMBLY, MANIFOLD (See Sect. 3, Fig. 30A for Details)	1
3	784-A	.BASE, RELAY	3
4	4032	.RELAY, 6 VOLT	3
5	30495	.ASSEMBLY, PRESSURE LIMIT SWITCH (See Sect. 3, Fig. 27 for Details)	1
6	117-A	.END, TERMINAL BLOCK	1
7	4027	.BLOCK, TERMINAL	20
8	3037	.VALVE, FLOW	2
9	61502	.NUT, HEX HEAD	8
0	62623	.SCREW, ROUND HEAD CAP	8
-11	63312	.WASHER, LOCK	8
-12	70015	.SWITCH, FUEL SELECTOR	1
13	4021	.SWITCH, MOMENTARY	1
14	80001-08	.CONNECTOR	4
15	80045-06	.UNION, BULKHEAD	5
16	80045-05	.UNION, BULKHEAD	4
17	4020	.SWITCH, STARTER	1
18	60123	.SCREW, HEX HEAD CAP	7
19	63301	.WASHER, LOCK	9
20	60701	.NUT	9
21	60352	.SCREW, HEX HEAD CAP	2
22	213	.CONNECTOR, ROMEX	1
23	62612	.SCREW, ROUND HEAD CAP	2
24	61502	.NUT	2
25	80008-13	.ELBOW, 90°	2

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PARTS CATALOG

COMPONENT BOX ASSEMBLY (SRT-31G) (BEF. MAR. '80)

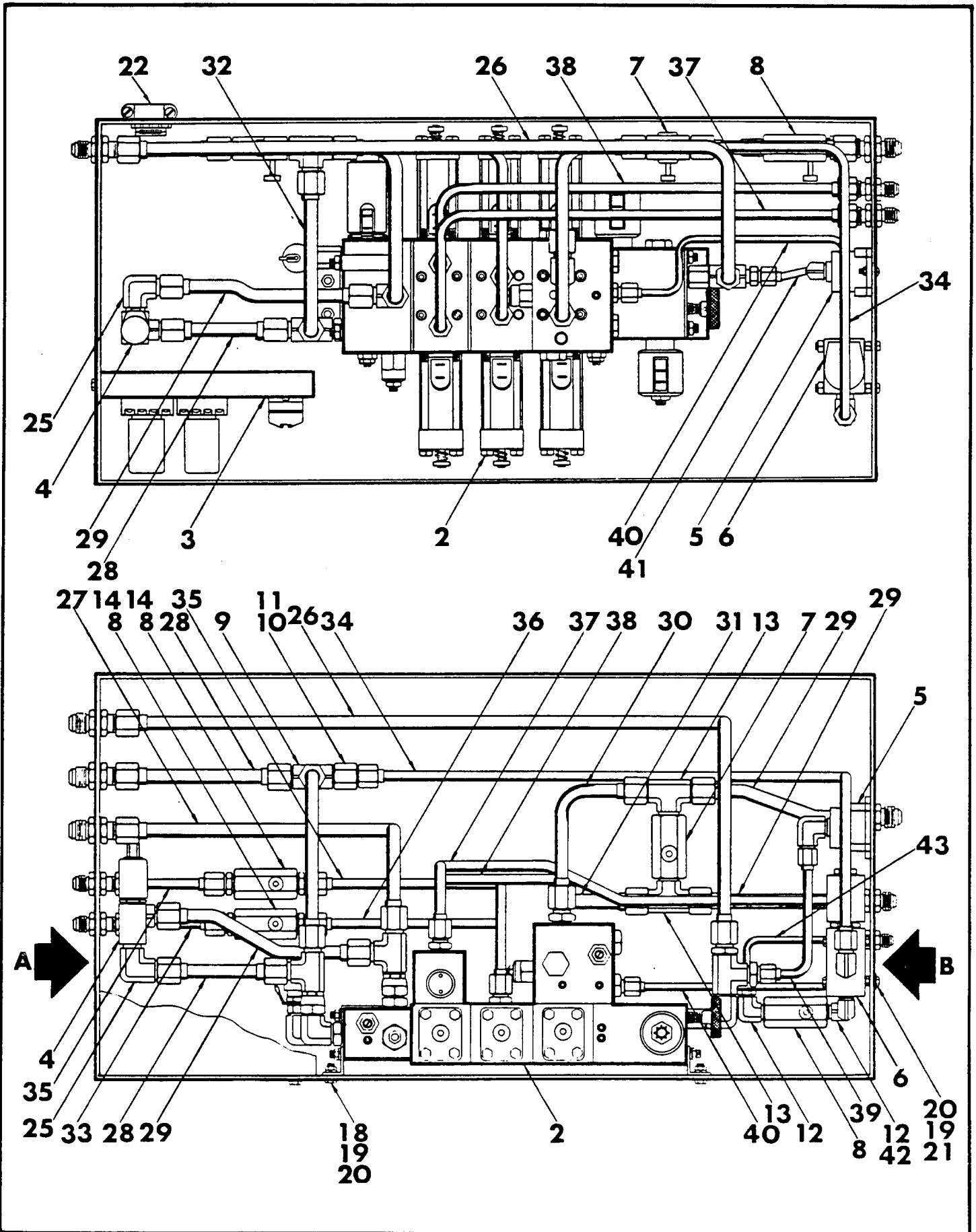
(continued)

PARTS
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FIG.26A
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ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
26		.ASSEMBLY, TUBE (1/2)	1
27		.ASSEMBLY, TUBE (1/2)	1
28		.ASSEMBLY, TUBE (1/2)	2
29		.ASSEMBLY, TUBE (1/2)	2
30		.ASSEMBLY, TUBE (1/2)	1
31		.ASSEMBLY, TUBE (1/2)	1
32	4019	.SWITCH, SELECTOR	1
33		.ASSEMBLY, TUBE (1/2)	1
34	2204	.PLATE, SWITCH MOUNTING	1
35		.ASSEMBLY, TUBE (3/8)	1
36		.ASSEMBLY, TUBE (3/8)	1
37		.ASSEMBLY, TUBE (3/8)	1
38		.ASSEMBLY, TUBE (3/8)	1
39		.ASSEMBLY, TUBE (1/4)	1
40		.ASSEMBLY, TUBE (1/4)	1
41	2010	.DECAL, MASTER POWER	1
42	2035	.DECAL, FUEL SELECTOR	1
43	8315	.BOX, COMPONENT	1

REV.

- ITEM NOT ILLUSTRATED





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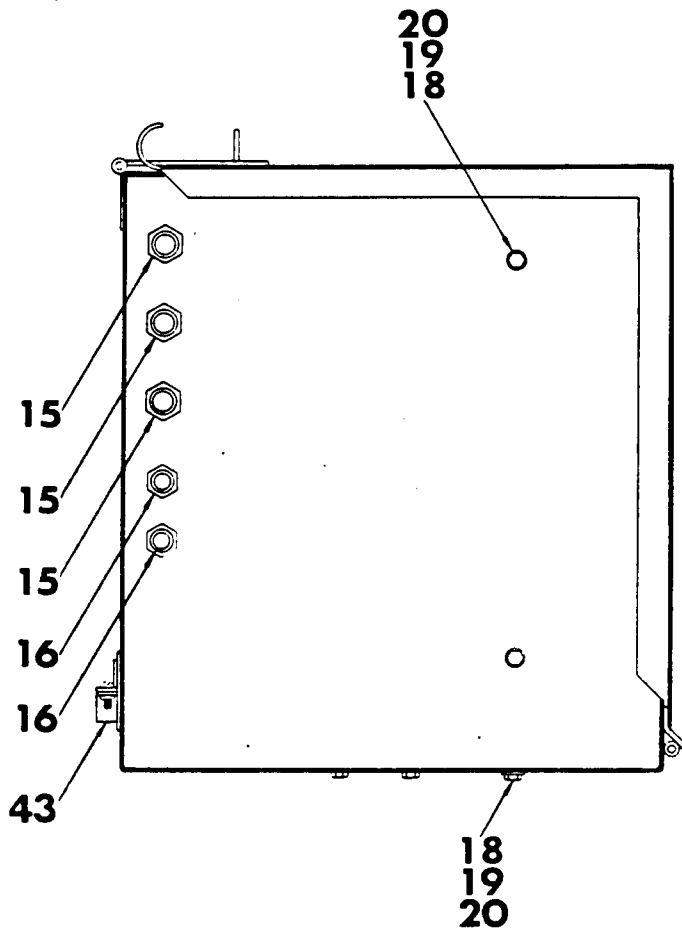
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PARTS CATALOG

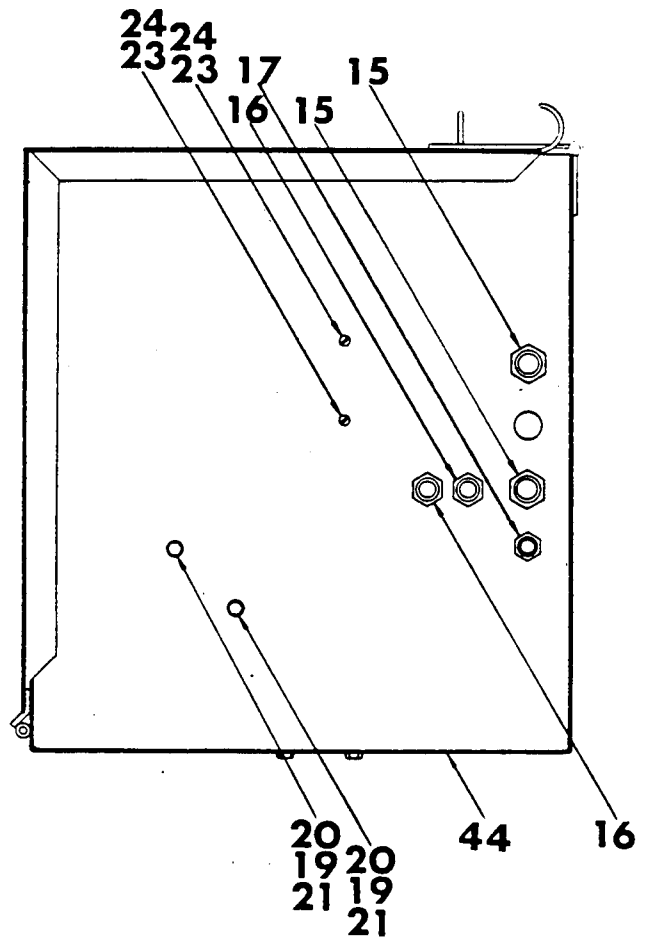
COMPONENT BOX ASSEMBLY (SRT-31G) (AFT. MAR. '80)

(continued)

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FIG. 26B
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VIEW A



VIEW B

REV.



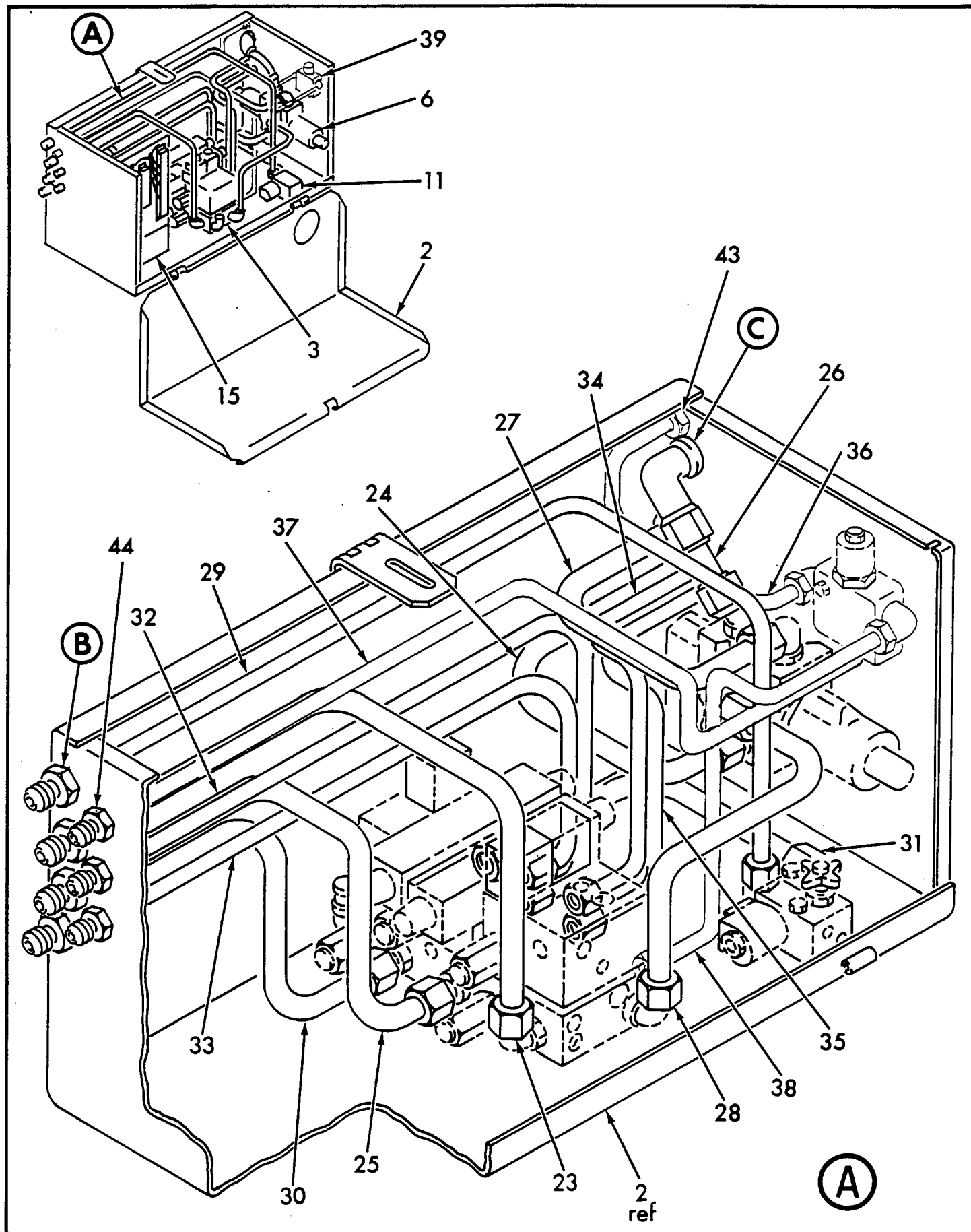
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30726	ASSEMBLY, COMPONENT BOX (See Sect. 3, Fig. 4B for NHA)	REF
2	30711	.ASSEMBLY, MANIFOLD (See Sect. 3, Fig. 30A for Details)	1
3	30653	.ASSEMBLY, CONTROL PANEL (See Sect. 3, Fig. 36A for Details)	1
4	410	.VALVE, FLUID CONTROL	1
5	30495	.ASSEMBLY, PRESSURE LIMIT SWITCH (See Sect. 3, Fig. 27 for Details)	1
6	30330	.ASSEMBLY, SOLENOID VALVE	1
7	201	.VALVE, CHECK	1
8	20370	.VALVE, NEEDLE	3
9	80031-06	.TEE	1
10	80060-06	.NUT	1
11	80056-03	.REDUCER, TUBE END	1
12	80008-04	.ELBOW	2
13	80034-12	.TEE	2
14	80001-08	.CONNECTOR	4
15	80045-06	.UNION, BULKHEAD	5
16	80045-05	.UNION, BULKHEAD	4
17	16408	.UNION, BULKHEAD	1
18	60123	.SCREW, HEX HEAD CAP	7
19	63301	.WASHER, LOCK	9
20	60701	.NUT	9
21	60352	.SCREW, HEX HEAD CAP	2
22	213	.CONNECTOR, ROMEX	1
23	62612	.SCREW, ROUND HEAD CAP	2
24	61502	.NUT	2
25	80008-13	.ELBOW, 90°	2

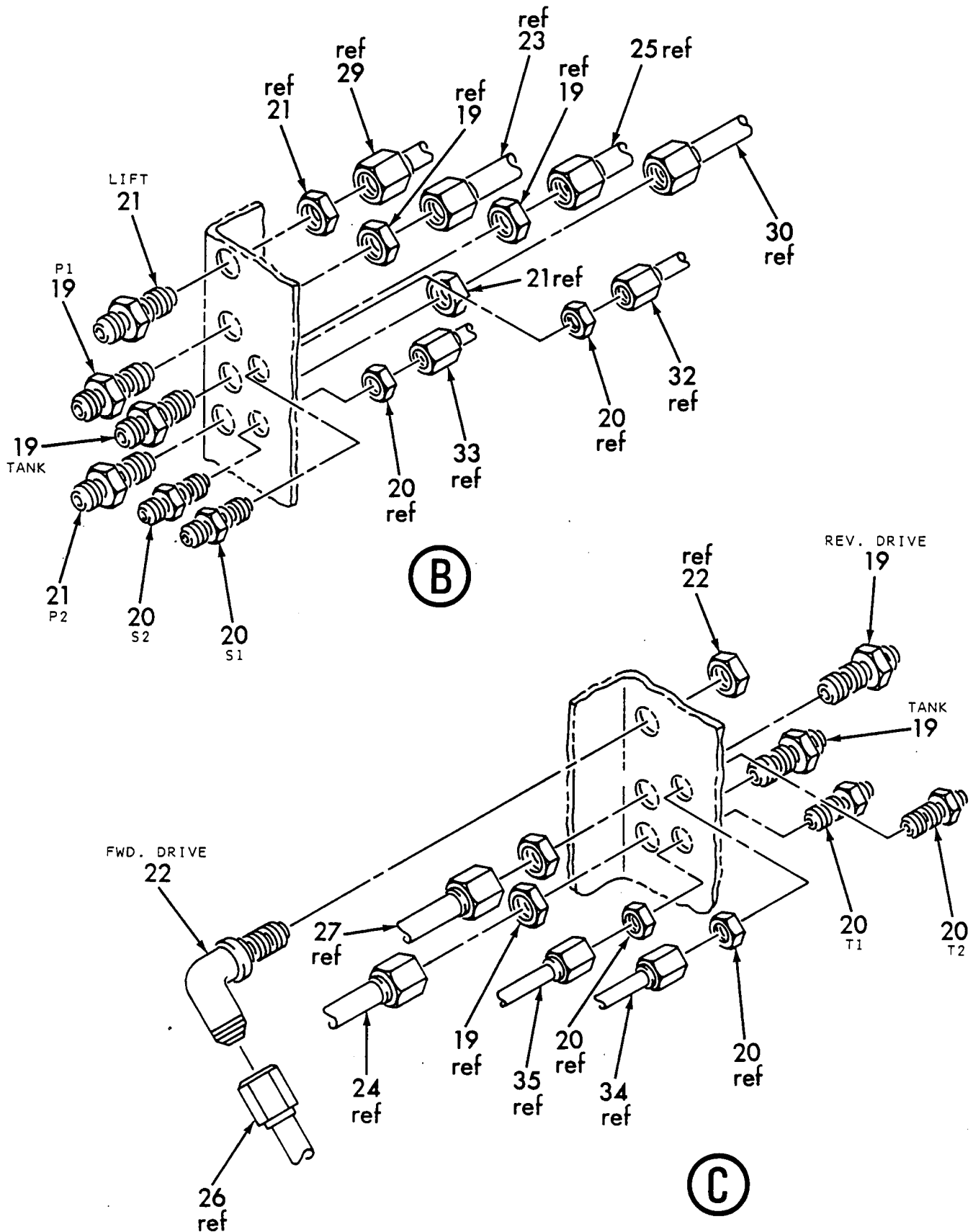


ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
26		.ASSEMBLY, TUBE (1/2)	1
27		.ASSEMBLY, TUBE (1/2)	1
28		.ASSEMBLY, TUBE (1/2)	2
29		.ASSEMBLY, TUBE (1/2)	2
30		.ASSEMBLY, TUBE (1/2)	1
31		.ASSEMBLY, TUBE (1/2)	1
32		.ASSEMBLY, TUBE (1/2)	1
33		.ASSEMBLY, TUBE (1/2)	1
34		.ASSEMBLY, TUBE (3/8)	1
35		.ASSEMBLY, TUBE (3/8)	1
36		.ASSEMBLY, TUBE (3/8)	1
37		.ASSEMBLY, TUBE (3/8)	1
38		.ASSEMBLY, TUBE (3/8)	1
39		.ASSEMBLY, TUBE (3/8)	1
40		.ASSEMBLY, TUBE (1/4)	1
41		.ASSEMBLY, TUBE (1/4)	1
42		.ASSEMBLY, TUBE (1/4)	1
43		.ASSEMBLY, TUBE (1/4)	1
44	8315	.BOX, COMPONENT	1



COMPONENT BOX ASSEMBLY
(SRT-31G) (AFT. JUL. '86)



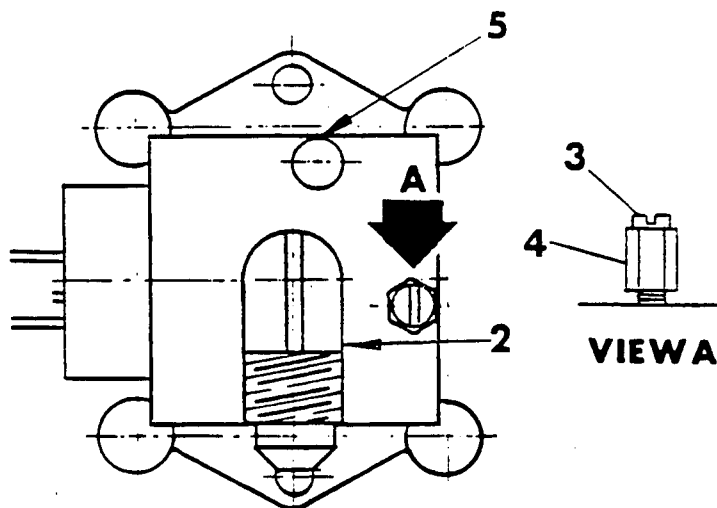




ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32486	ASSEMBLY, HYDRAULIC COMPONENT BOX (See Sect. 3, Fig. 4B for NHA)	REF
2	32529	.WELDMENT, COMPONENT BOX	1
3	32356	.ASSEMBLY, VALVE PACKAGE (See Sect. 3, Fig. 30B for Details)	1
-4	60320	.SCREW, CAP (attaching part)	2
-5	63303	.WASHER, LOCK (attaching part)	2
6	32532	.ASSEMBLY, DRIVE SOLENOID VALVE (See Sect. 3, Fig. 32 for Details)	1
-7	60339	.SCREW, CAP (attaching part)	3
-8	63302	.WASHER, LOCK (attaching part)	3
-9	63402	.WASHER, FLAT (attaching part)	6
-10	60702	.NUT, HEX (attaching part)	3
11	32531	.ASSEMBLY, LOWERING CONTROL VALVE (See Sect. 3, Fig. 23 for Details)	1
-12	60352	.SCREW, CAP (attaching part)	2
-13	63301	.WASHER, LOCK (attaching part)	2
-14	60701	.NUT, HEX (attaching part)	2
15	32483	.ASSEMBLY, ELECTRICAL PANEL (See Sect. 3, Fig. 36B for Details)	1
-16	60353	.SCREW, CAP (attaching part)	3
-17	63301	.WASHER, LOCK (attaching part)	3
-18	60701	.NUT, HEX (attaching part)	3
19	80045-07	.UNION, BULKHEAD (P1, TANK, REV. DRIVE, TANK)	4
20	80045-05	.UNION, BULKHEAD (S1, S2, T1, T2)	4
21	80045-06	.UNION, BULKHEAD (LIFT, P2)	2
22	80011-07	.UNION, BULKHEAD ELBOW (FWD. DRIVE)	1
23	32486	.ASSEMBLY, TUBE (5/8)	1



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
24	32486-2	.ASSEMBLY, TUBE (5/8)	1
25	32486-3	.ASSEMBLY, TUBE (5/8)	1
26	32486-4	.ASSEMBLY, TUBE (5/8)	1
27	32486-5	.ASSEMBLY, TUBE (5/8)	1
28	32486-6	.ASSEMBLY, TUBE (5/8)	1
29	32486-7	.ASSEMBLY, TUBE (1/2)	1
30	32486-8	.ASSEMBLY, TUBE (1/2)	1
31	32486-9	.ASSEMBLY, TUBE (1/2)	1
32	32486-10	.ASSEMBLY, TUBE (3/8)	1
33	32486-11	.ASSEMBLY, TUBE (3/8)	1
34	32406-12	.ASSEMBLY, TUBE (3/8)	1
35	32486-13	.ASSEMBLY, TUBE (3/8)	1
36	32486-14	.ASSEMBLY, TUBE (1/4)	1
37	32486-15	.ASSEMBLY, TUBE (1/4)	1
38	32486-16	.ASSEMBLY, TUBE (1/4)	1
39	32561	.ASSEMBLY, SOLENOID VALVE	1
-40	60340	.SCREW, CAP (attaching part)	2
-41	63301	.WASHER, LOCK (attaching part)	2
-42	60701	.NUT, HEX (attaching part)	2
43	80045-04	.UNION, BULKHEAD (BLEED LINE ONLY, BRAKE)	2
44	80004-03	.CONNECTOR (BRAKE)	1



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30495	ASSEMBLY, PRESSURE LIMIT SWITCH (See Sect. 3, Fig. 23, 24A, 25A, 26A 26B, Sect. 6, Fig. 9 or 10 for NHA)	REF
2	80008-09	.ELBOW, 90° MALE	1
3		.SCREW, ADJUSTMENT	1
4		.NUT, LOCKING	1
5	2297	.SWITCH, PRESSURE	1

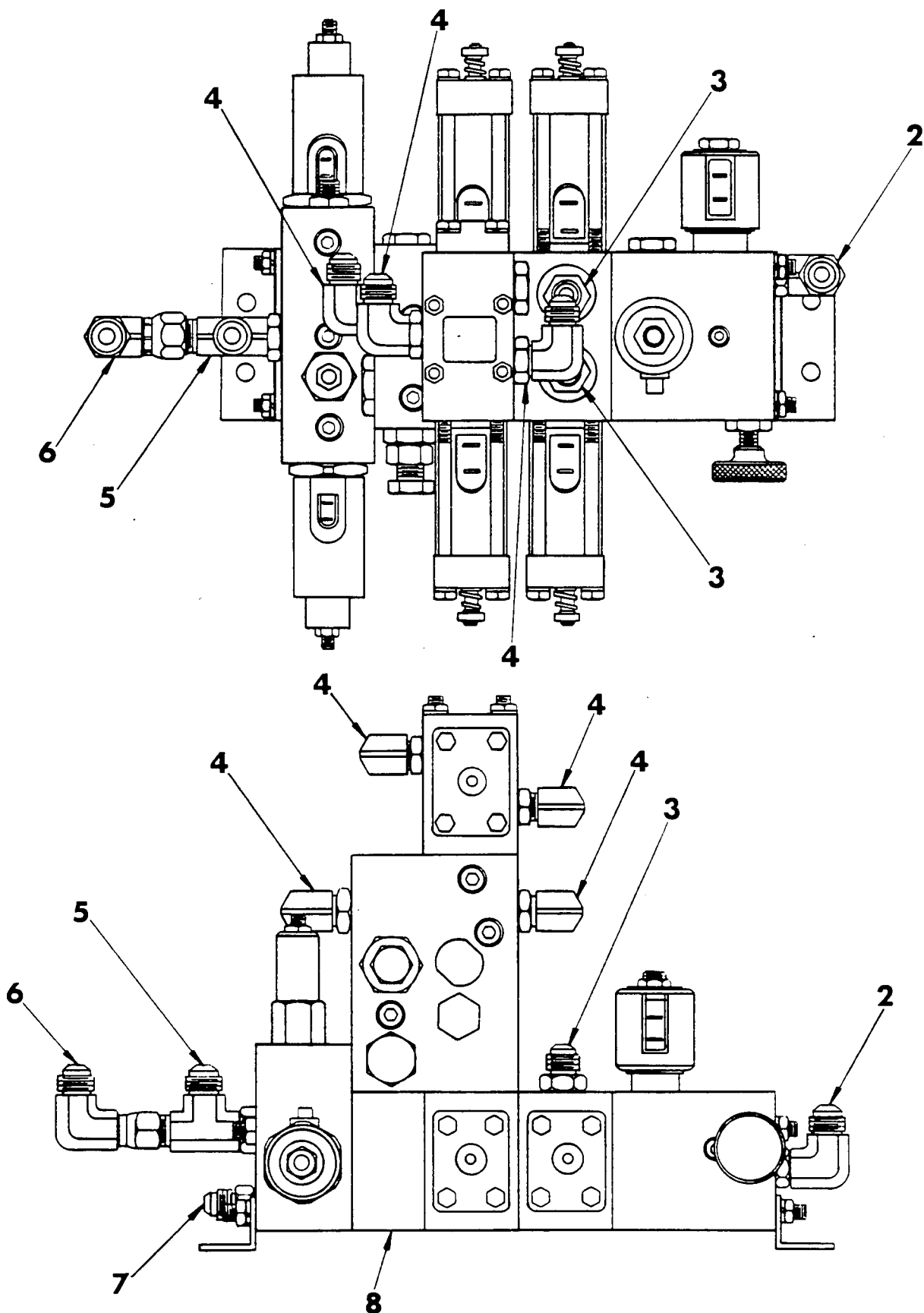


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PARTS CATALOG

MANIFOLD ASSEMBLY (RT-31G) (AFT. MAR. '80)

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FIG. 28A
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ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30713	ASSEMBLY, MANIFOLD (See Sect. 3, Fig. 24A or 25A for NHA)	REF
2	80012-12	.ELBOW, STRAIGHT THREAD	1
3	80004-09	.CONNECTOR, STRAIGHT THREAD	2
4	80012-11	.ELBOW, STRAIGHT THREAD	4
5	80033-11	.TEE, STRAIGHT THREAD RUN	1
6	80015-06	.ELBOW, SWIVEL NUT	1
7	80004-11	.CONNECTOR, STRAIGHT THREAD	1
8	3100	.SUB-ASSEMBLY, MANIFOLD PACKAGE (See Sect. 3, Fig. 29B for Details)	1

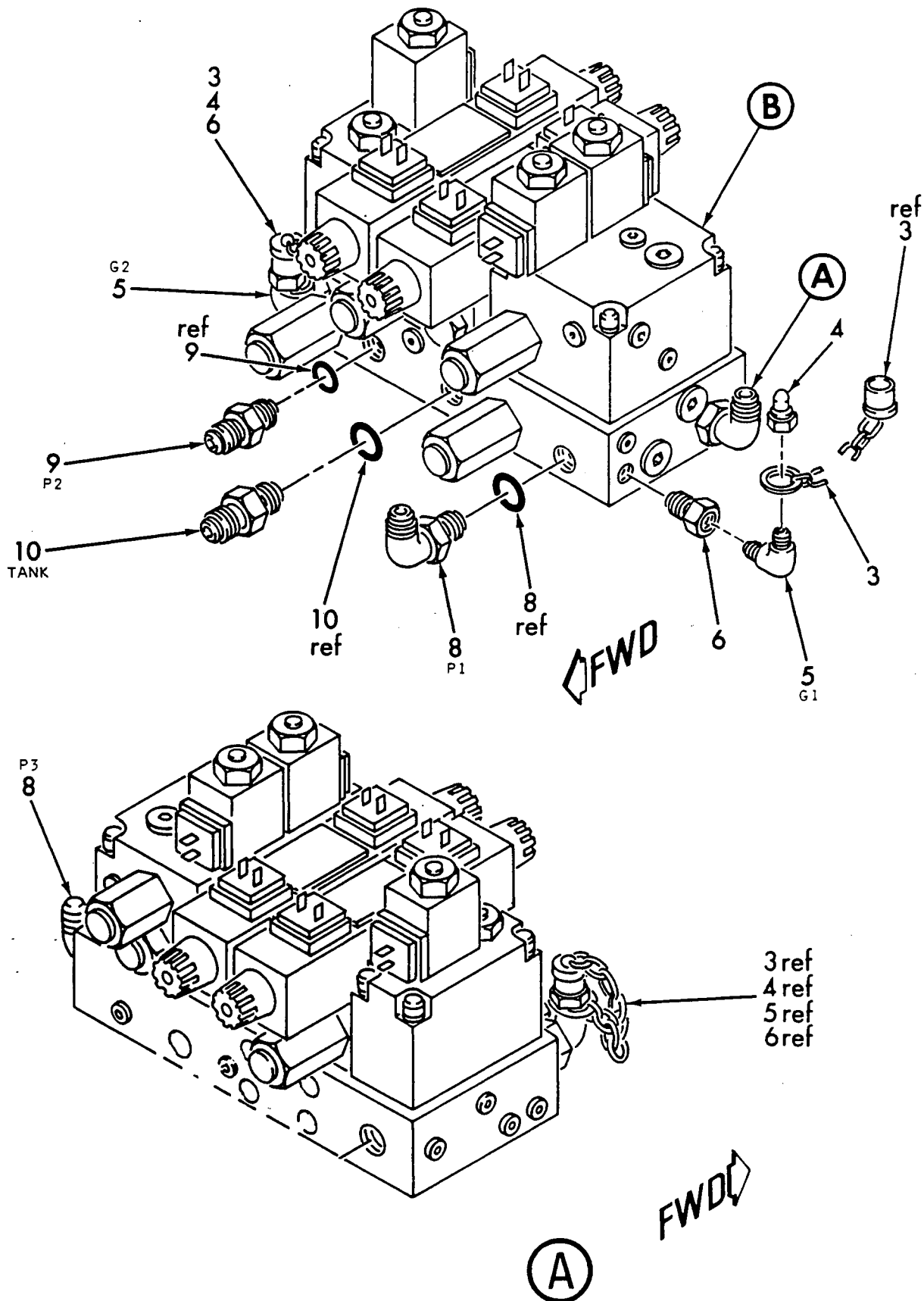


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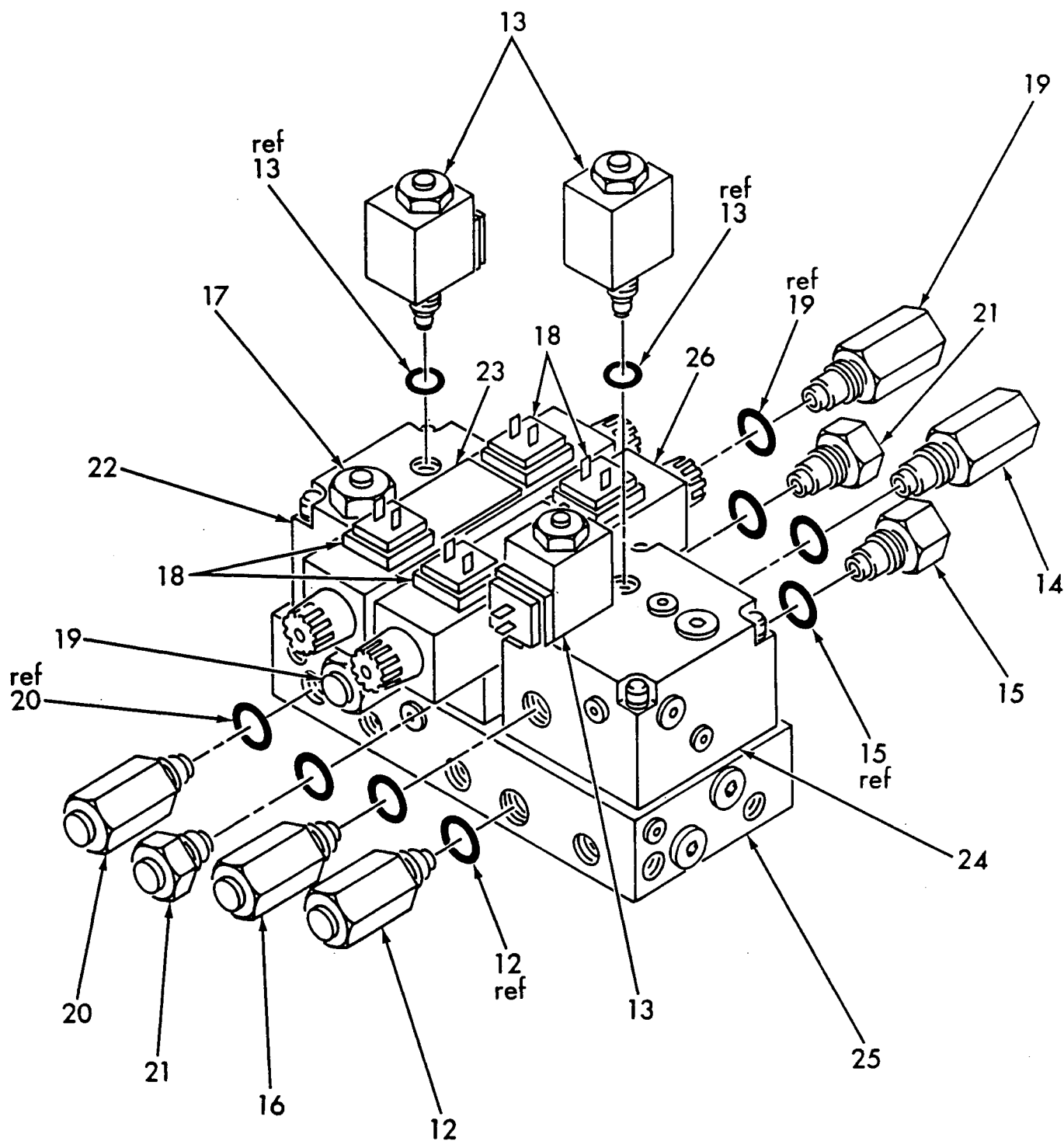
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PARTS CATALOG

VALVE PACKAGE ASSEMBLY
(RT-31G) (RT-31E) (AFT. JUL. '86)

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FIG.28B
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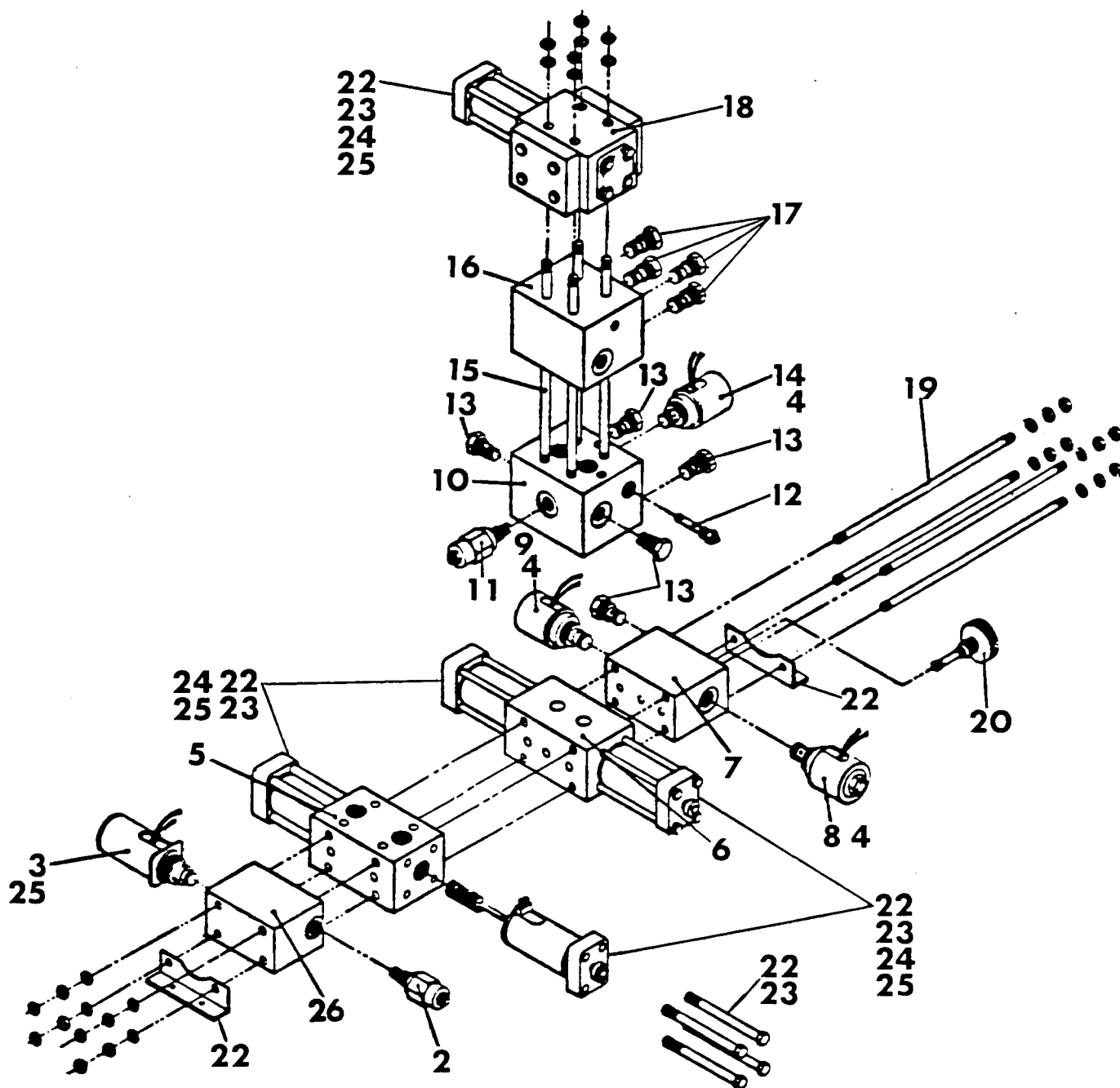
REV.



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ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32411	ASSEMBLY, VALVE PACKAGE (See Sect. 3, Fig. 24B OR 25B for NHA)	REF
2	81149	.ADAPTER, O-RING (S1, S2)	2
3	845	.CAP, QUICK DISCONNECT	2
4	2527	.COUPLING, QUICK DISCONNECT	2
5	80022-03	.ELBOW, MALE PIPE (G1, G2)	2
6	51903	.ADAPTER	2
8	80012-16	.ELBOW, STRAIGHT THREAD (P1, P3)	2
9	80004-11	.CONNECTOR, STRAIGHT THREAD (P2, LIFT)	2
10	80004-16	.CONNECTOR, STRAIGHT THREAD (TANK)	1
-11	81142	.ASSEMBLY, VALVE PACKAGE	1
12	66919	..VALVE, RELIEF	1
13	66920	..SOLENOID, 2 WAY N.O.	3
14	66867	..DIVIDER, FLOW	1
15	66674	..VALVE, CHECK	1
16	66922	..VALVE, RELIEF	1
17	67004	..REGULATOR, FLOW	1
18	66925	..VALVE, DOI	4
19	66926	..VALVE, RELIEF	2
20	66927	..VALVE, RELIEF	1
21	67054	..VALVE, CHECK	2
22	66899	..SECTION, INLET	1
23	66930	..RELIEF, CROSS	1
24	67021	..CONTROL, DRIVE	1
25	66898	..SUB, PLATE	1
26	81162	..CHECK, DUAL P.O.	1





ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	9390	SUB-ASSEMBLY, MANIFOLD PACKAGE (See Sect. 3, Fig. 23 for NHA)	REF
2	3044	.VALVE, RELIEF	1
3	3045	.VALVE, DUMP	1
4	4074	.COIL, 6 VOLT SHORT	3
5	3019-2	.VALVE, STEERING	1
6	3019-3	.ASSEMBLY, DRIVE VALVE	1
7	3019-5	.ASSEMBLY, LIFT/LOWER VALVE	1
8	3051	.VALVE, LIFT	1
9	3051	.VALVE, LOWERING	1
10	3020	.ASSEMBLY, LOW SPEED/CREEP VALVE	1
11	3044	.VALVE, CUSHION RELIEF	1
12	3050	.ORIFICE, CONTROL (CREEP ADJUSTMENT)	1
13	3048	.VALVE, CHECK	5
14	3047	.VALVE, CREEP/LOW SPEED	1
15	3056	.BOLT, TIE ROD WITH NUT AND WASHER	4
16	66820	.ASSEMBLY, FLOW REGULATOR VALVE	1
17	3057	.VALVE, FLOW REGULATOR	4
18	66821	.ASSEMBLY, HIGH SPEED VALVE	1
19	3055	.BOLT, TIE ROD WITH NUT AND WASHER	4
20	3053	.VALVE, EMERGENCY LOWERING	1
21	66012	.FOOT	2
22	66056	.SCREW, HEX HEAD CAP	28
23	63301	.WASHER, LOCK	28
24	66055	.ASSEMBLY, MANUAL RELEASE	7
25	4073	.COIL, 6 VOLT LONG	8
26	3019-1	.ASSEMBLY, DUMP/RELIEF VALVE	1

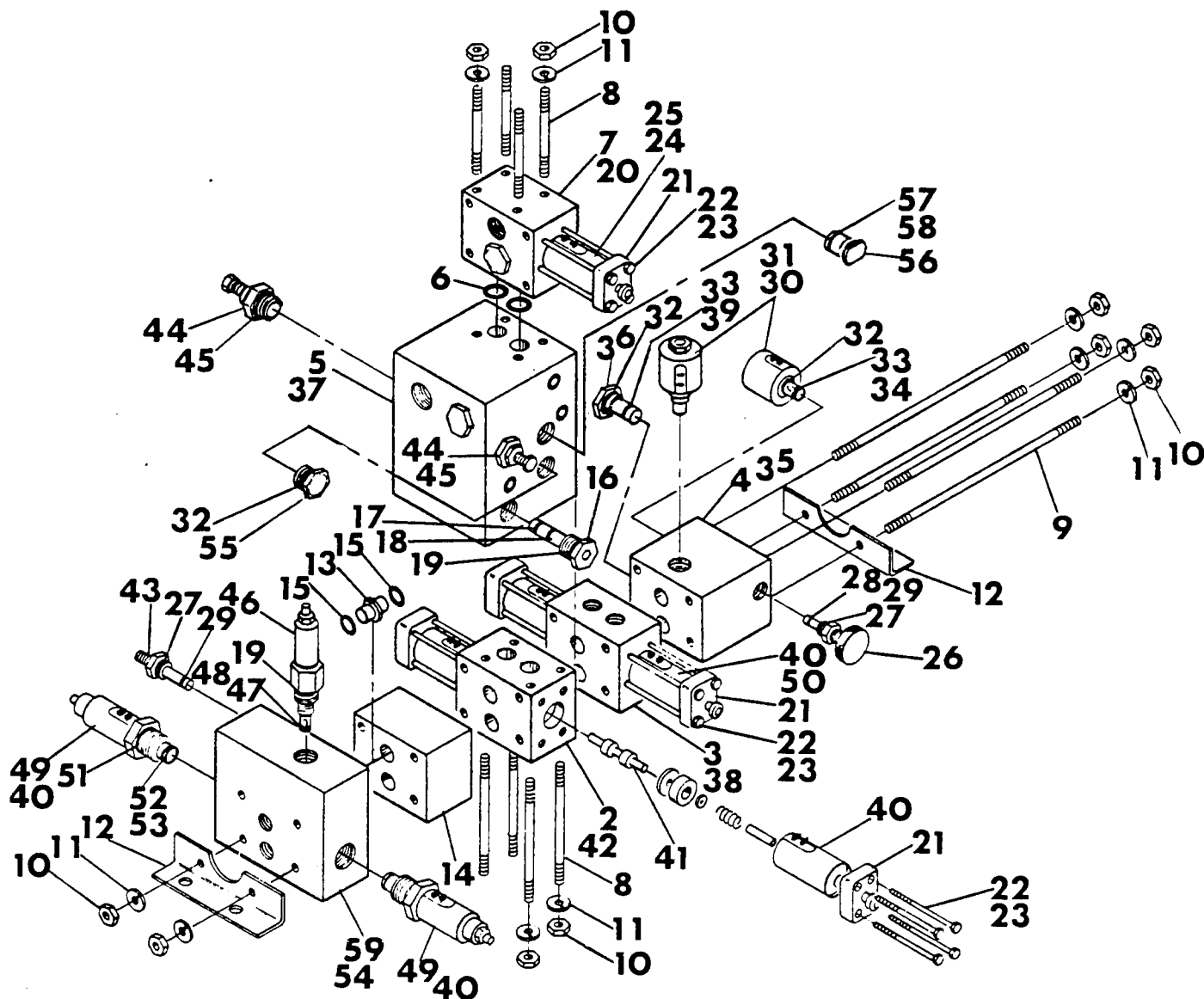


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PARTS CATALOG

**MANIFOLD PACKAGE SUB-ASSEMBLY
(RT-31G) (RT-31E) (AFT. MAR. '80)**

PARTS
SECT. 3
FIG. 29B
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REV.



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	3100	SUB-ASSEMBLY, MANIFOLD PACKAGE (See Sect. 3, Fig. 28A for NHA)	REF
2	66002	.VALVE, SOLENOID (DRIVE)	1
3	66003	.VALVE, SOLENOID (STEERING)	1
4	66004	.ASSEMBLY, LIFT CONTROL	1
5	66005	.PACKAGE, DRIVE	1
6	66006	.O-RING	4
7	66007	.VALVE, SOLENOID (HI-SPEED)	1
8	66008	.BOLT, TIE ROD	8
9	66009	.BOLT, TIE ROD	4
10	66010	.NUT, HEX JAM	16
11	66011	.WASHER, LOCK	16
12	66012	.FOOT	2
13	66013	.SEAL, BANKING	8
14	66014	.BLOCK, SPACER	1
15	66016	.O-RING	16
16	66050	.VALVE, SHUTTLE	1
17	66051	.O-RING	1
18	66052	.O-RING	1
19	66053	.O-RING	2
20	66054	.BLOCK	1
21	66055	.ASSEMBLY, MANUAL RELEASE	5
22	66056	.SCREW, HEX HEAD CAP	20
23	63301	.WASHER, LOCK	20
24	66057	.COIL	1
25	66058	.ASSEMBLY, SPOOL	1

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PARTS CATALOG

**MANIFOLD PACKAGE SUB-ASSEMBLY
(RT-31G) (RT-31E) (AFT. MAR. '80)**

(continued)

PARTS
SECT. 3
FIG.29B
PAGE 3

ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
26	66059	.VALVE, NEEDLE (EMERGENCY LOWERING)	1
27	66060	.O-RING	2
28	66061	.RING, BACK-UP	2
29	66062	.O-RING	2
30	3051	.VALVE, SOLENOID (LIFT/LOWERING)	2
31	4074	.COIL, SHORT	2
32	66065	.O-RING	5
33	66066	.O-RING	3
34	66067	.RING, BACK-UP	2
35	66068	.BLOCK	1
36	3048	.VALVE, CHECK	1
37	66070	.BLOCK	1
38	66071	.BLOCK	1
39	66072	.RING, BACK-UP	1
40	4073	.COIL, LONG	6
41	66074	.SPOOL (DRIVE)	1
42	66075	.BLOCK	1
43	66076	.VALVE, NEEDLE	1
44	66077	.BRAKE, ADJUSTMENT HOUSING	2
45	66078	.O-RING	2
46	66079	.VALVE, RELIEF (MAIN SYS. PRESS. ADJ.)	1
47	66080	.O-RING	1
48	66081	.RING, BACK-UP	1
49	66082	.VALVE, SOLENOID (DUMP/CREEP)	2
50	66083	.SPOOL	1
51	66084	.O-RING	2

REV.

- ITEM NOT ILLUSTRATED

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PARTS CATALOG

MANIFOLD PACKAGE SUB-ASSEMBLY
(RT-31G) (RT-31E) (AFT. MAR. '80)

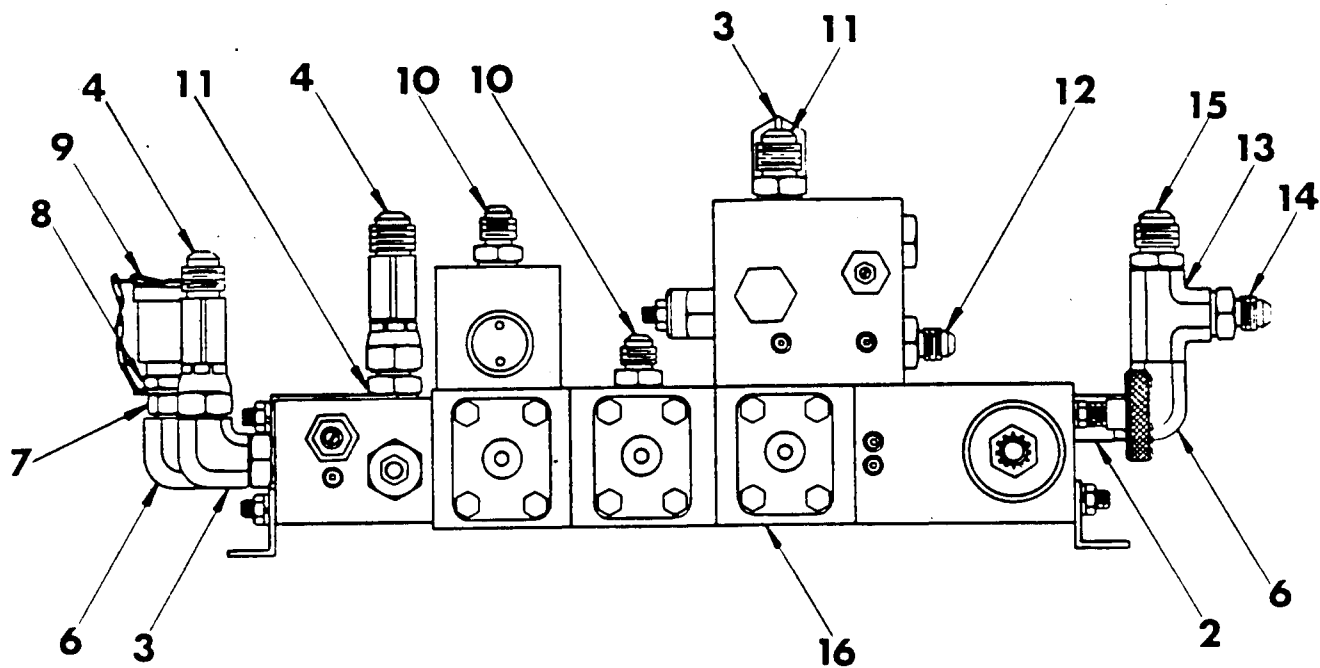
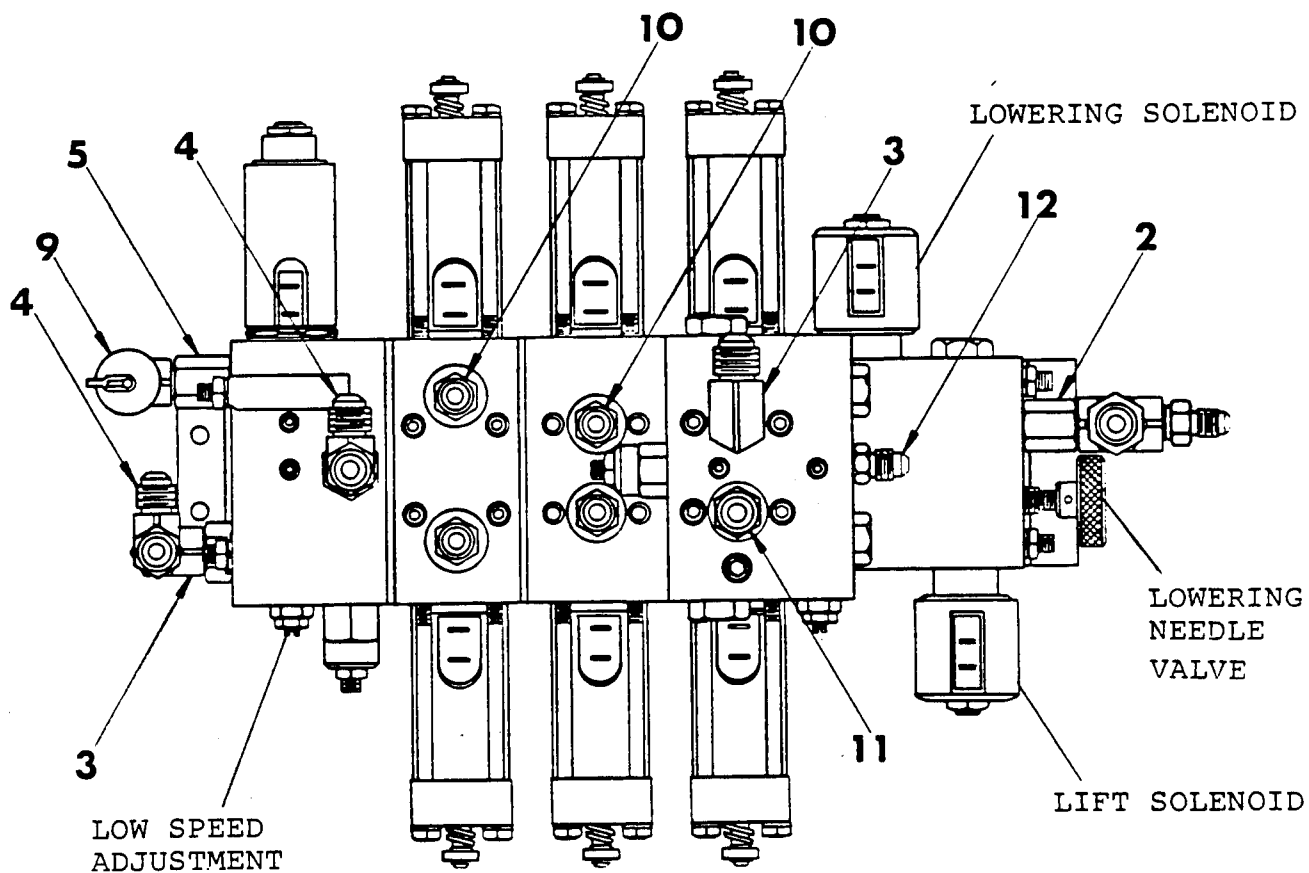
(continued)

PARTS
SECT. 3
FIG. 29B
PAGE 4

ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
52	66085	.O-RING	2
53	66086	.RING, BACK-UP	2
54	66087	.BLOCK	1
55	66088	.PLUG, TUBE	2
56	66089	.PLUG	2
57	66090	.O-RING	2
58	66091	.RING, BACK-UP	2
59	66001	.ASSEMBLY, DUMP VALVE	1

REV.

- ITEM NOT ILLUSTRATED





ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30711	ASSEMBLY, MANIFOLD (See Sect. 3, Fig. 26A or 26B for NHA)	REF
2	80058-03	.ADAPTER, FEMALE PIPE	1
3	80012-12	.ELBOW, STRAIGHT THREAD	2
4	80028-05	.TEE, SWIVEL NUT RUN	2
5	80002-04	.CONNECTOR, FEMALE	1
6	80021-03	.ELBOW, STREET	2
7	80052-04	.NIPPLE, PIPE	1
8	80040-03	.DISCONNECT, MALE QUICK	1
9	845	.CAP	1
10	80004-08	.CONNECTOR, STRAIGHT THREAD	4
11	80004-12	.CONNECTOR, STRAIGHT THREAD	1
12	80004-03	.CONNECTOR, STRAIGHT THREAD	1
13	80041-03	.TEE, STREET	1
14	80001-08	.CONNECTOR, MALE	1
15	80001-13	.CONNECTOR, MALE	1
16		.SUB-ASSEMBLY, MANIFOLD PACKAGE (See Sect. 3, Fig. 31B for Details)	1

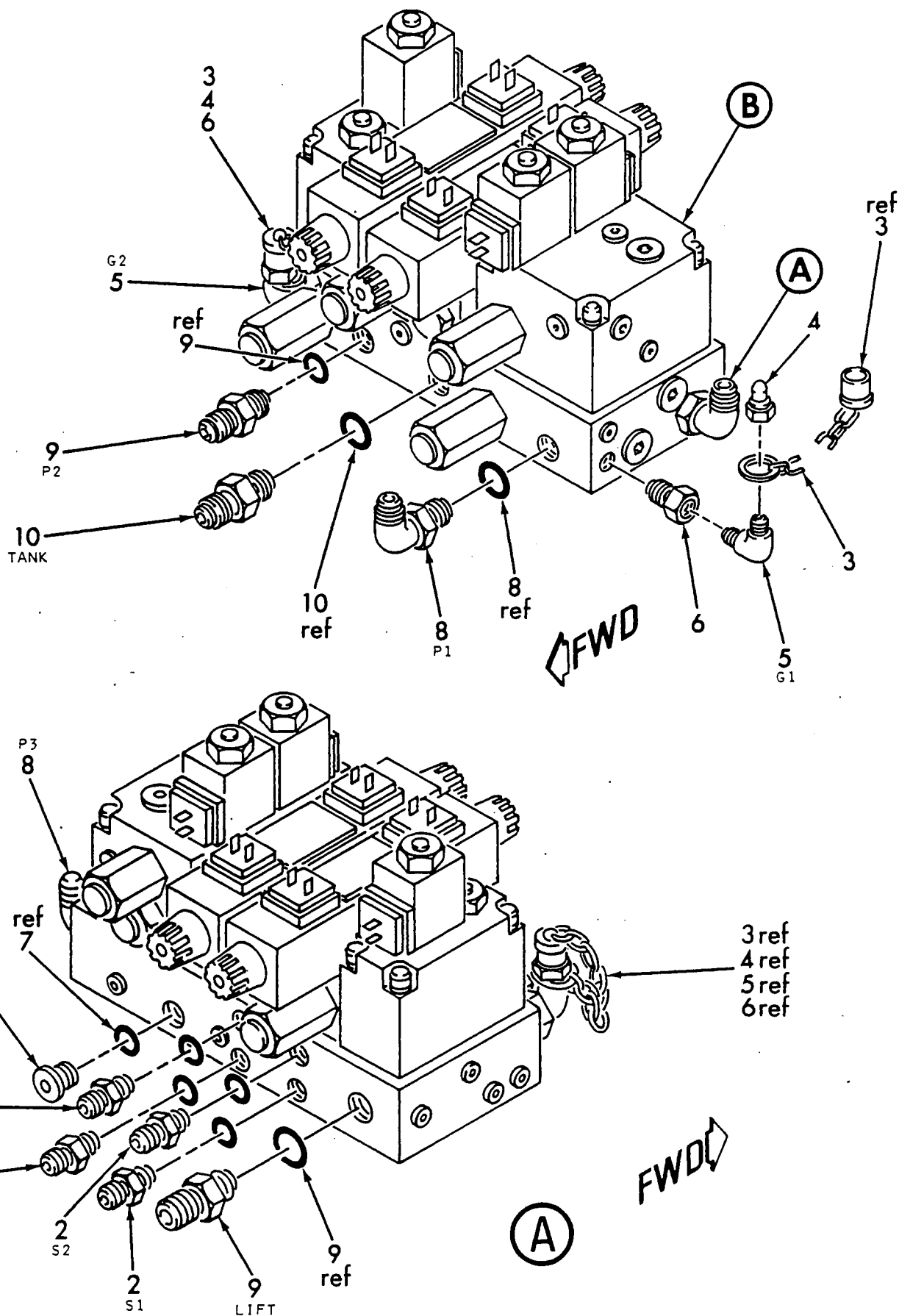


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VALVE PACKAGE ASSEMBLY
(SRT-31G) (AFT. JUL. '86)

PARTS
SECT. 3
FIG. 30B
PAGE 1



REV.



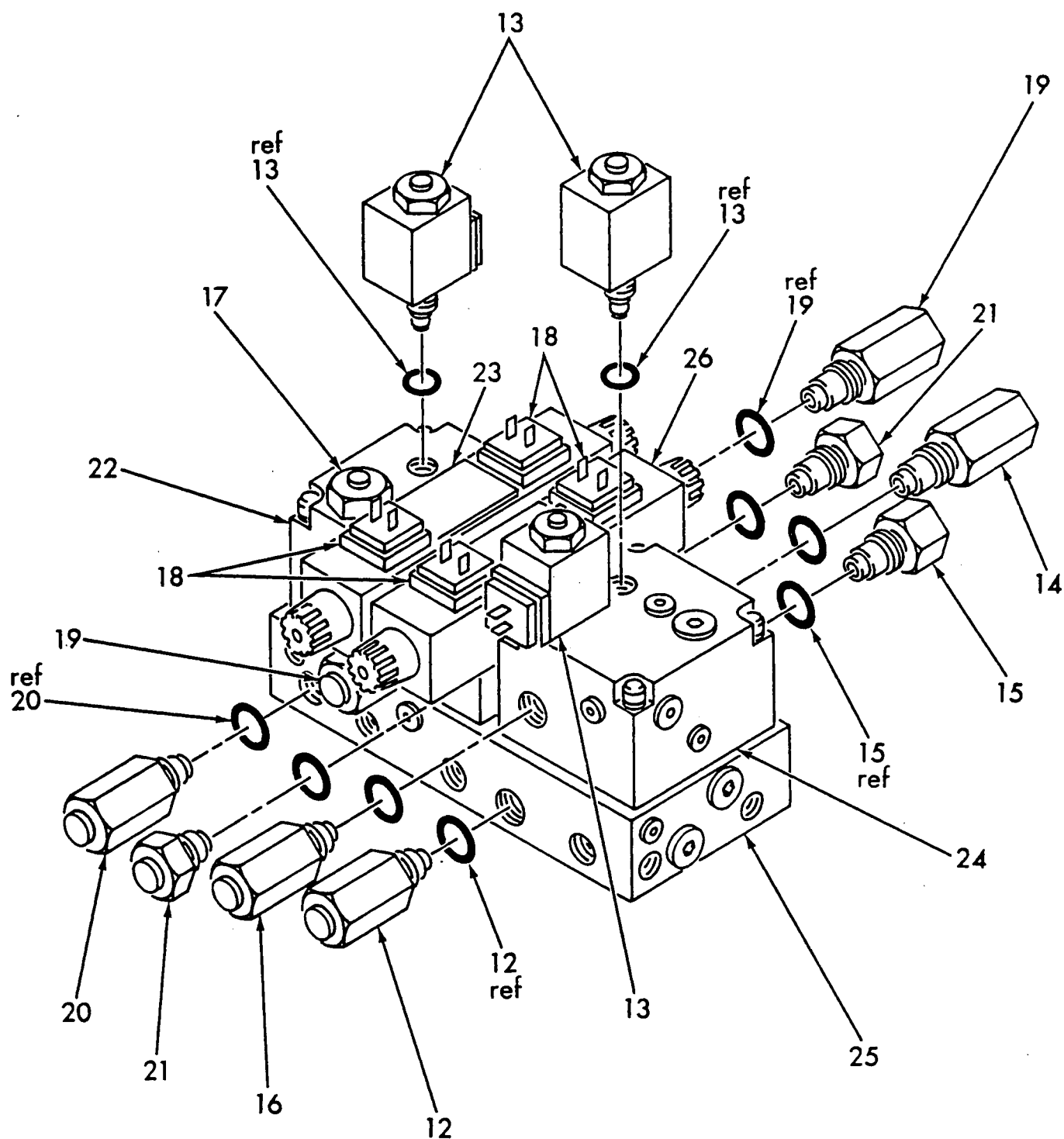
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PARTS CATALOG

**VALVE PACKAGE ASSEMBLY
(SRT-31G) (AFT. JUL. '86)**

(continued)

PARTS
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FIG.301
PAGE 2



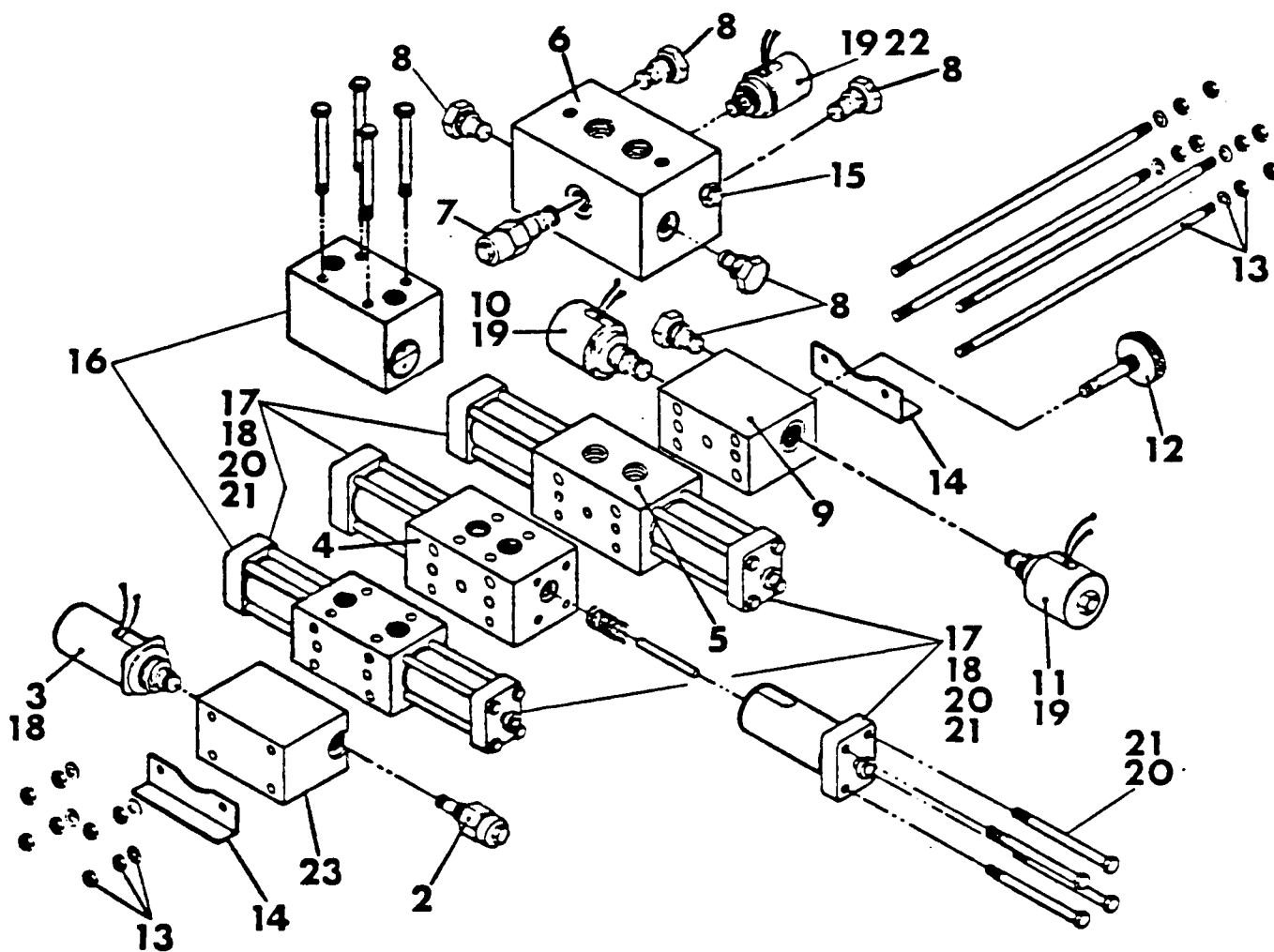
(B)



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32356	ASSEMBLY, VALVE PACKAGE (See Sect. 3, Fig. 26C for NHA)	REF
2	81149	.ADAPTER, O-RING (S1, S2, T1, T2)	4
3	845	.CAP, QUICK DISCONNECT	2
4	2527	.COUPLING, QUICK DISCONNECT	2
5	80022-03	.ELBOW, MALE PIPE (G1, G2)	2
6	51903	.ADAPTER	2
7	80051-06	.PLUG, HEX SOCKET (PBP)	1
8	80012-16	.ELBOW, STRAIGHT THREAD (P1, P3)	2
9	80004-11	.CONNECTOR, STRAIGHT THREAD (P2, LIFT)	2
10	80004-16	.CONNECTOR, STRAIGHT THREAD (TANK)	1
-11	81143	.ASSEMBLY, VALVE PACKAGE	1
12	66919	..VALVE, RELIEF	1
13	66920	..SOLENOID, 2 WAY N.O.	3
14	66867	..DIVIDER, FLOW	1
15	66674	..VALVE, CHECK	1
16	66922	..VALVE, RELIEF	1
17	67004	..REGULATOR, FLOW	1
18	66925	..VALVE, DO1	4
19	66926	..VALVE, RELIEF	2
20	66927	..VALVE, RELIEF	1
21	67054	..VALVE, CHECK	2
22	66899	..SECTION, INLET	1
23	66930	..RELIEF, CROSS	1
24	67021	..CONTROL, DRIVE	1
25	66898	..SUB PLATE	1
26	81162	..CHECK, DUAL P.O.	1

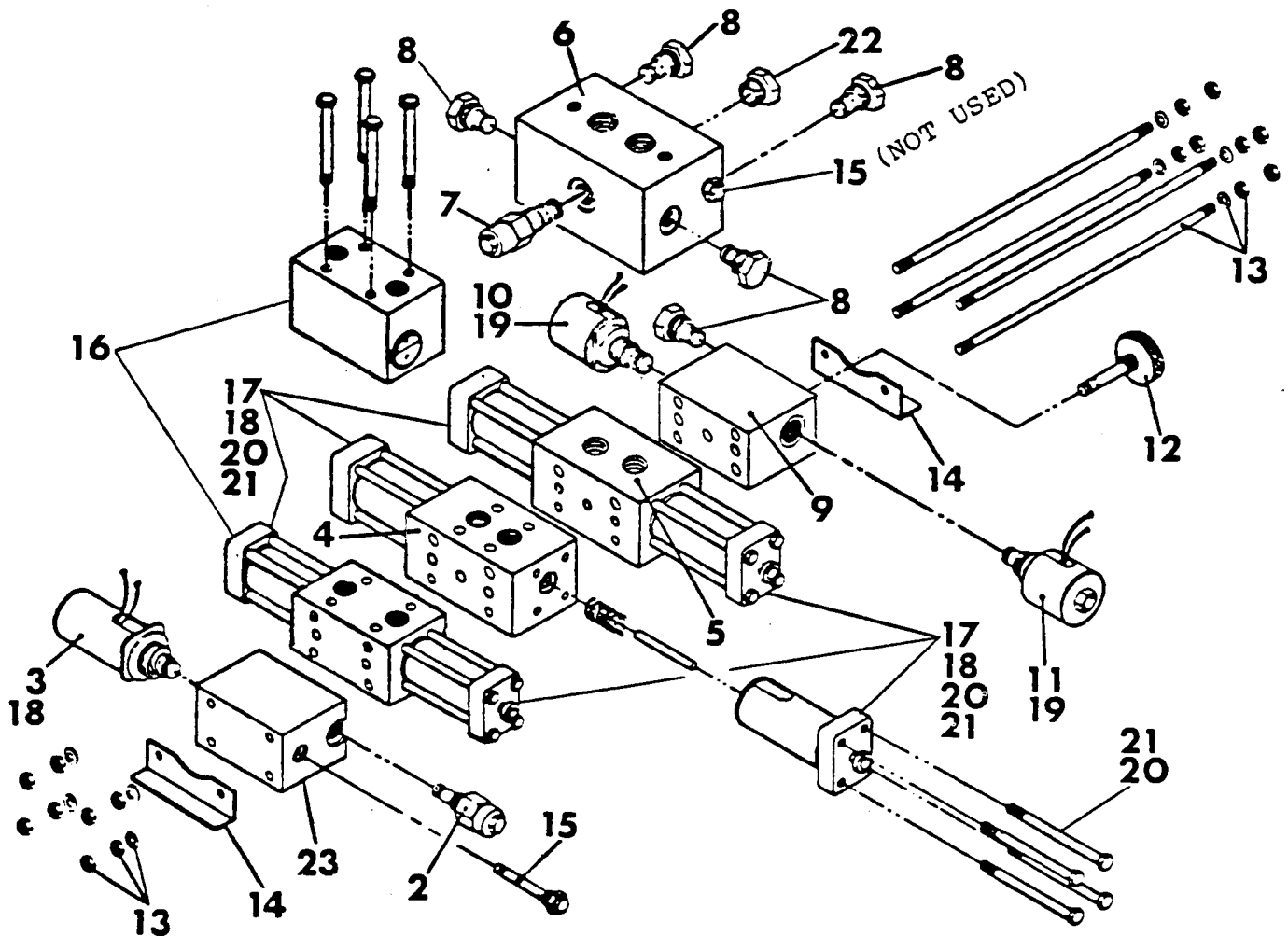


MANIFOLD PACKAGE SUB-ASSEMBLY
(SRT-31G) (BEF. MAR. '80)





ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	3019-3043	SUB-ASSEMBLY, MANIFOLD PACKAGE (See Sect. 3, Fig. 23 for NHA)	REF
2	3044	.VALVE, RELIEF	1
3	3045	.VALVE, HIGH SPEED	1
4	3019-2	.VALVE, STEERING	1
5	3019-3	.VALVE, DRIVE	1
6	3019-4	.VALVE, LOW SPEED	1
7	3046	.VALVE, CUSHION RELIEF	1
8	3048	.VALVE, CHECK	5
9	3019-5	.ASSEMBLY, LIFT/LOWER VALVE BLOCK	1
10	3051	.VALVE, LOWERING	1
11	3051	.VALVE, LIFT	1
12	3053	.VALVE, EMERGENCY, LOWERING	1
13	66093	.BOLT, TIE ROD WITH WASHER AND NUT	4
14	3019-6	.FOOT	2
15	3050	.ORIFICE, CONTROL (LOW SPEED)	1
16	3043	.ASSEMBLY, OUTRIGGER VALVE	1
17	66055	.END CAP, OVER RIDE	6
18	4073	.COIL, 6 VOLT LONG	7
19	4074	.COIL, 6 VOLT SHORT	3
20	66056	.SCREW, HEX HEAD CAP	24
21	63301	.WASHER, LOCK	24
22	3047	.VALVE, CREEP/LOW SPEED	1
23	3064	.BLOCK, DUMP/RELIEF	1





ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1		SUB-ASSEMBLY, MANIFOLD PACKAGE (See Sect. 3, Fig. 30A for NHA)	REF
-2	3044	.VALVE, RELIEF	1
-3	3045	.VALVE, HIGH SPEED	1
-4	3019-2	.VALVE, STEERING	1
-5	3019-3	.VALVE, DRIVE	1
-6	3019-4	.VALVE, CUSHION WITH PLUG	1
-7	3046	.VALVE, CUSHION RELIEF	1
-8	3048	.VALVE, CHECK	5
-9	3019-5	.ASSEMBLY, LIFT/LOWER VALVE BLOCK	1
-10	3051	.VALVE, LOWERING	1
-11	3051	.VALVE, LIFT	1
12	3053	.VALVE, EMERGENCY, LOWERING	1
13	66093	.BOLT, TIE ROD WITH WASHER AND NUT	4
14	3019-6	.FOOT	2
15	3050	.ORIFICE, CONTROL (LOW SPEED)	1
16	3043	.ASSEMBLY, OUTRIGGER VALVE	1
17	66055	.END CAP, OVER RIDE	6
18	4073	.COIL, 6 VOLT LONG	7
19	4074	.COIL, 6 VOLT SHORT	2
20	66056	.SCREW, HEX HEAD CAP	24
21	63301	.WASHER, LOCK	24
22		.PLUG	1
23	3064	.BLOCK, HIGH SPEED/RELIEF	1

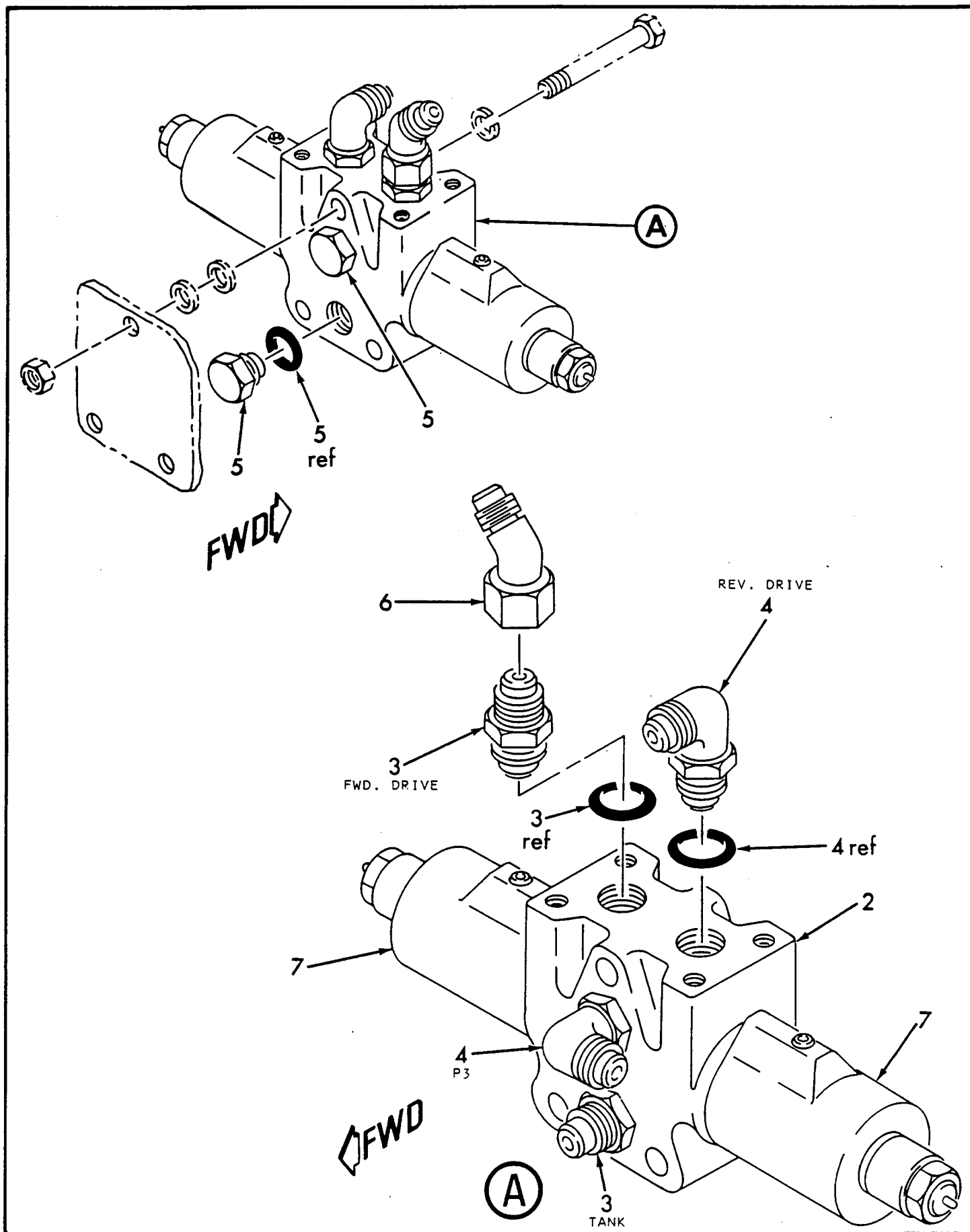


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PARTS CATALOG

DRIVE SOLENOID VALVE ASSEMBLY (AFT. JUL. '86)

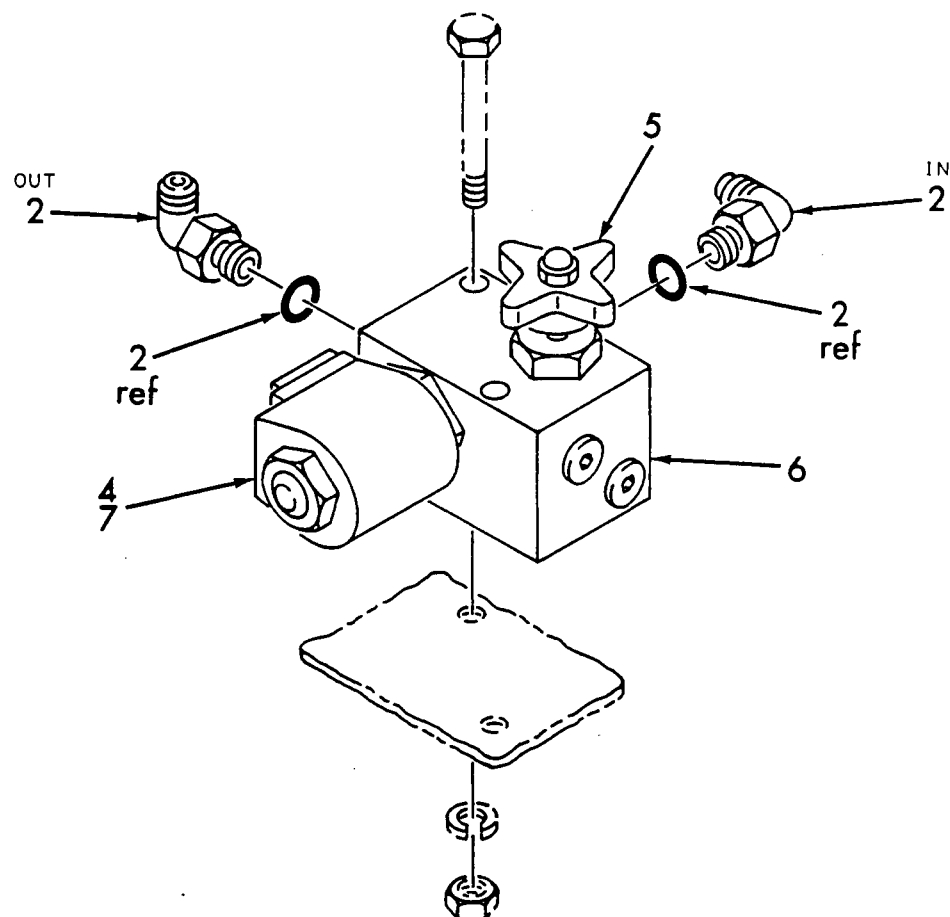
PARTS
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FIG. 32
PAGE 1



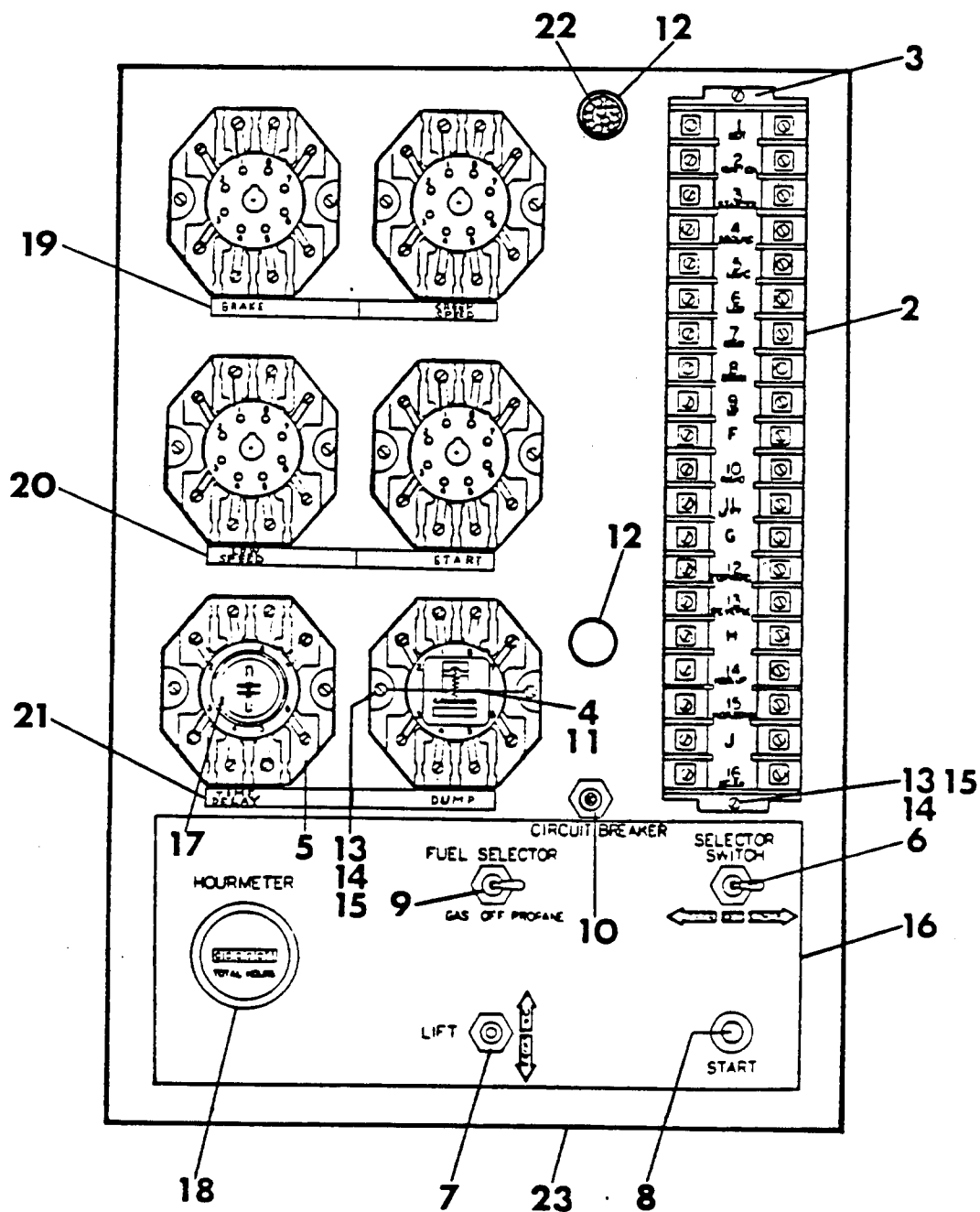
REV.



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32532	ASSEMBLY, DRIVE SOLENOID VALVE (See Sect. 3, Fig. 24B, 25B or 26C for NHA)	REF
2	81138	.SUB-ASSEMBLY, DRIVE SOLENOID VALVE	1
3	80004-16	.CONNECTOR, STRAIGHT THREAD (TANK, FWD. DRIVE)	2
4	80012-16	.ELBOW, STRAIGHT THREAD (P3, REV. DRIVE)	2
5	80051-06	.PLUG, HOLLOW HEXAGON	2
6	80016-07	.ELBOW, 45° SWIVEL NUT	1
7	67012	.COIL ONLY	2

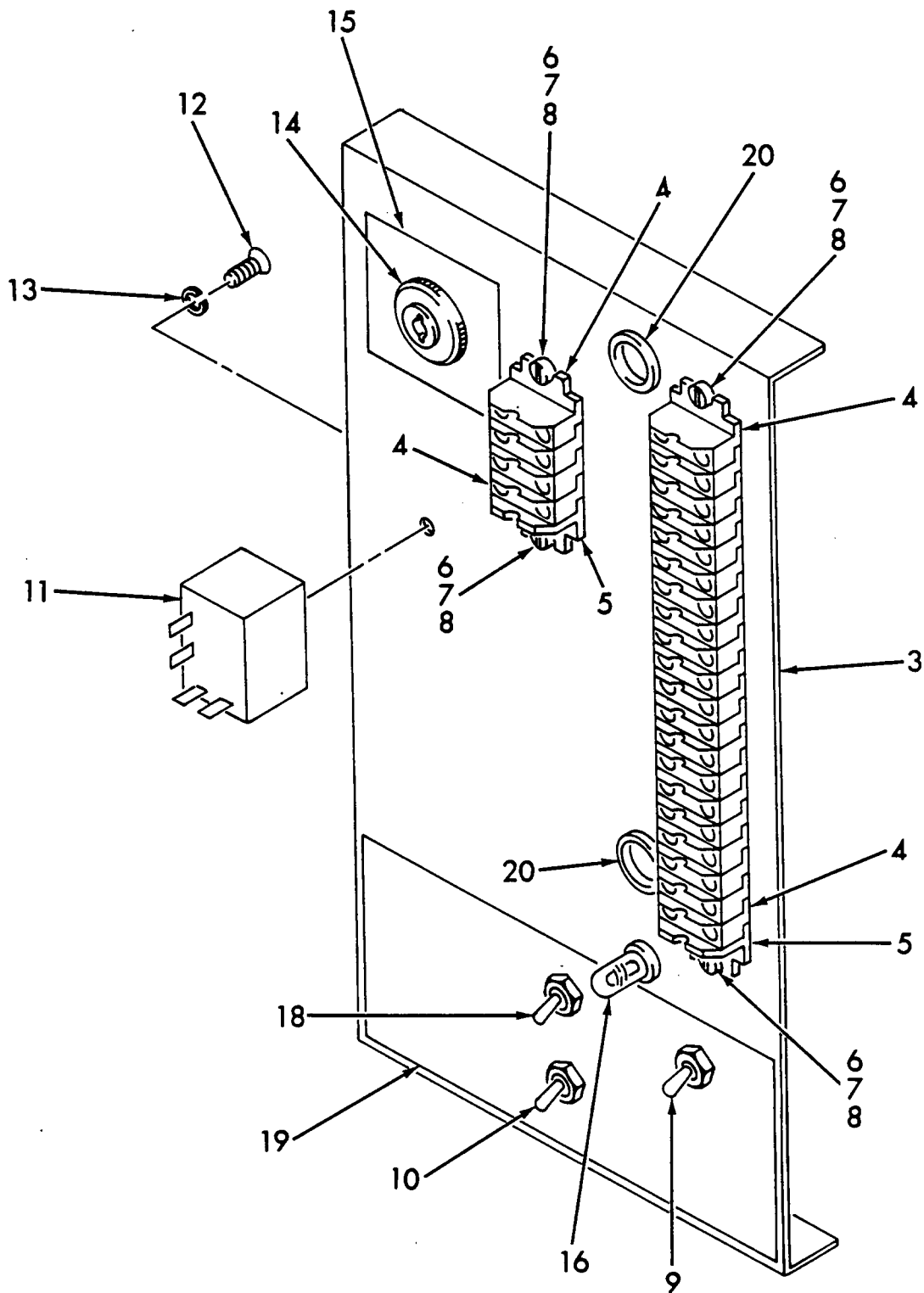


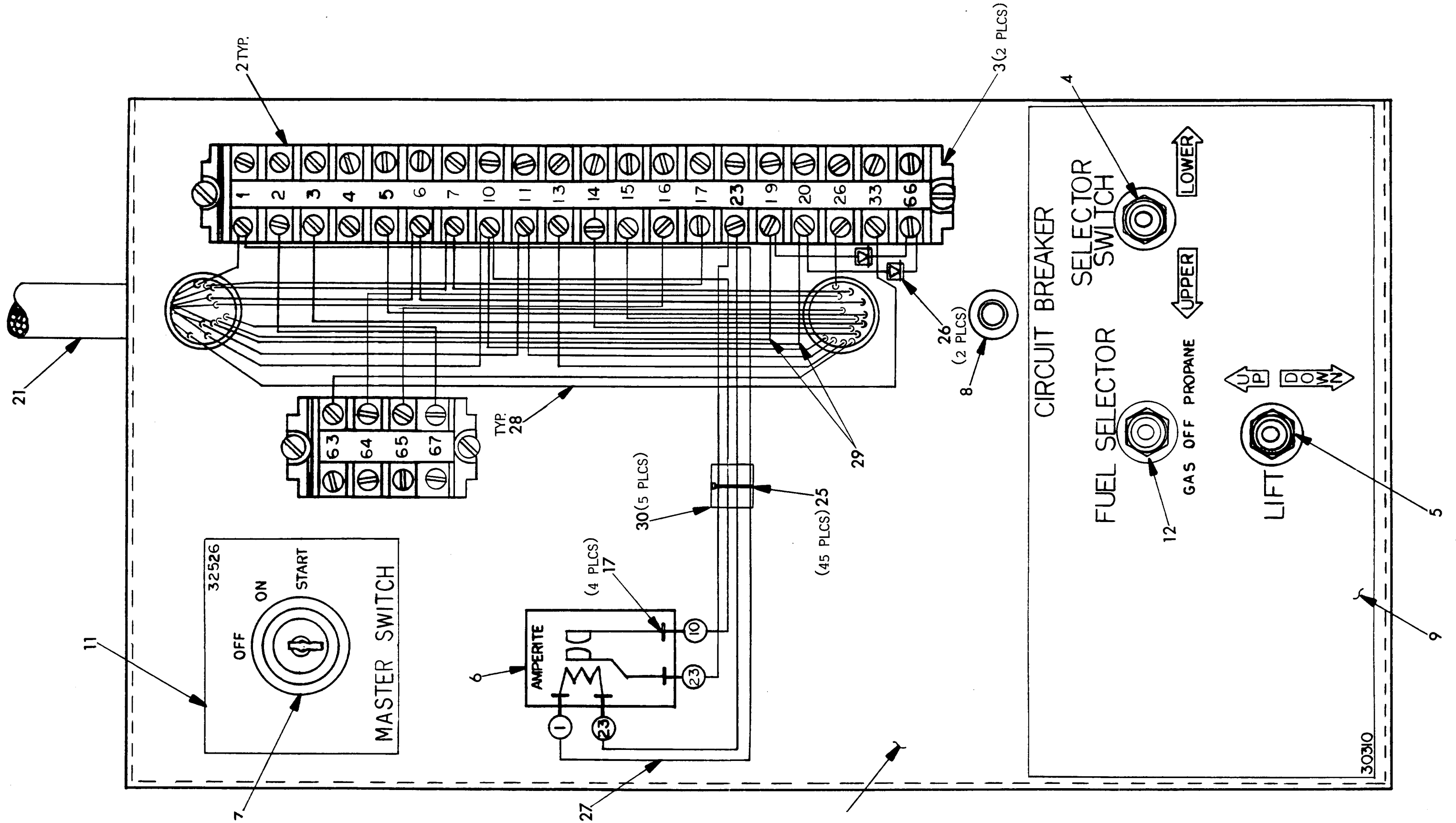
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32531	ASSEMBLY, LOWERING CONTROL VALVE (See Sect. 3, Fig. 23, 24A, 25A, 26A or 26B for NHA)	REF
2	80012-11	.ELBOW, STRAIGHT THREAD (IN, OUT)	2
-3	81145	.VALVE, LOWERING CONTROL	1
4	67011	..VALVE, SOLENOID	1
5	67009	..HANDLE (ONLY) (only)	1
6	67010	..VALVE, NEEDLE (WITH HANDLE)	1
7	66914	..COIL (ONLY)	1
-8	67013	..KIT, SEAL	1





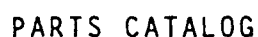
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30651	ASSEMBLY, ELECTRIC PANEL (See Sect.3, Fig. 24A or Sect. 6, Fig. 9 for NHA)	REF
2	4027	.BLOCK, TERMINAL	
3	117-A	.END, TERMINAL BLOCK	1
4	4032	.RELAY	5
5	784-A	.SOCKET	6
6	4019	.SWITCH, SELECTOR	1
7	20481	.SWITCH, LIFT	1
8	4020	.SWITCH, START	1
9	70015	.SWITCH, FUEL SELECTOR	1
10	20562	.BREAKER, CIRCUIT	1
11	30215	.RELAY, CLIP	5
12	70016	.GROMMET	2
13	62623	.SCREW, SLOTTED ROUND HEAD	15
14	61502	.NUT, HEX	15
15	63312	.WASHER, LOCK	15
16	30310	.DECAL, PANEL SWITCHES	1
17	70306	.RELAY, TIME DELAY	1
18	20571	.METER, HOUR (OPTION)	1
19	30572	.DECAL, BRAKE - CREEP SPEED	1
20	30314	.DECAL, LOW SPEED - START	1
21	30315	.DECAL, TIME DELAY - DUMP	1
22	30633	.ASSEMBLY, MANIFOLD HARNESS	1
23	30312	.BRACKET, RELAY MOUNTING	1







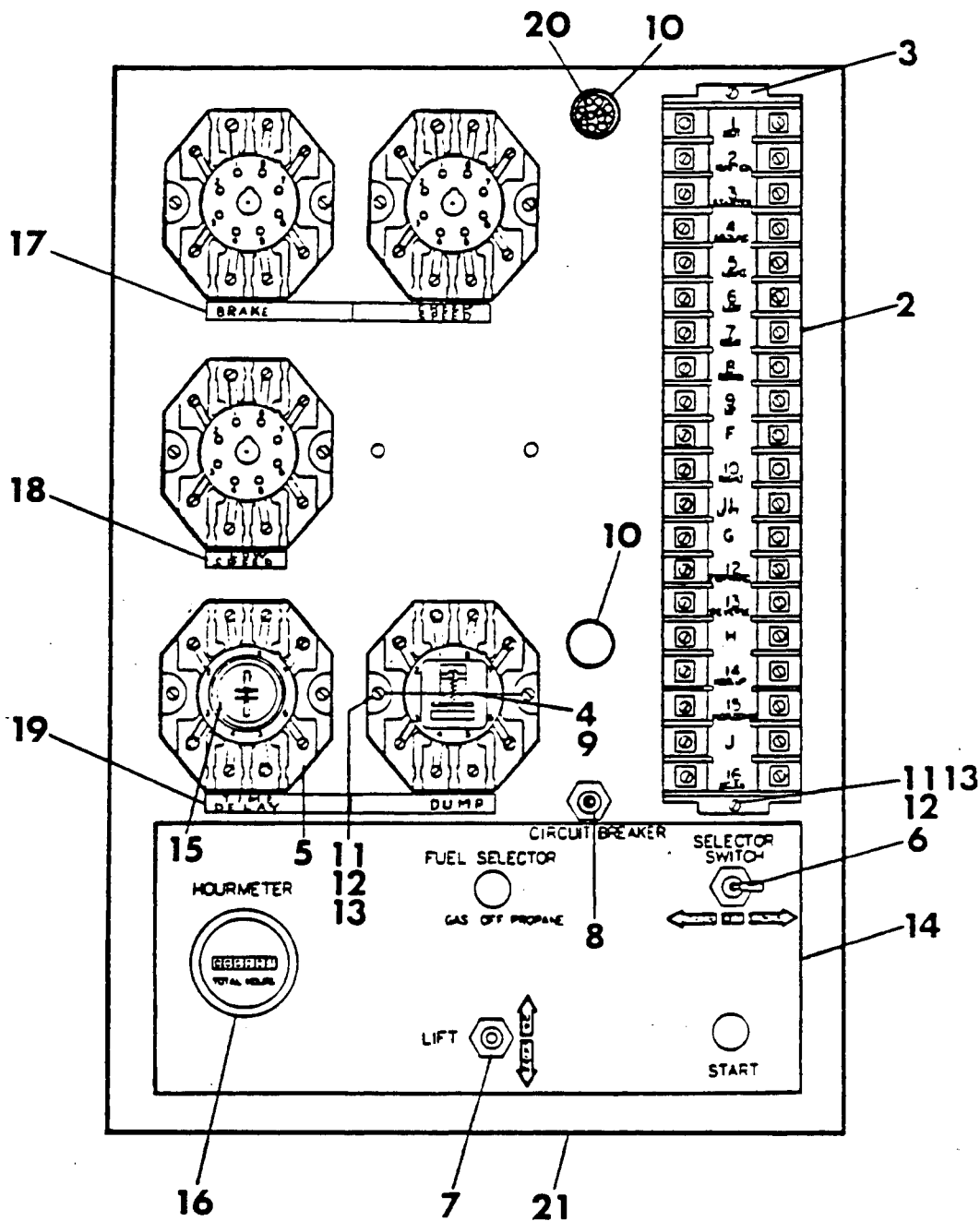
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32395	ASSEMBLY, ELECTRICAL PANEL (See Sect. 3, Fig. 24B for NHA)	REF
-2	30312	.PANEL	1
3	35718	..SHEET	1
4	4027	.BLOCK, TERMINAL	24
5	117-A	.BLOCK, TERMINAL END	2
6	62623	.SCREW, CAP (attaching part)	5
7	63312	.WASHER, LOCK (attaching part)	5
8	61502	.NUT, HEXAGON (attaching part)	5
9	16260	.SWITCH, TOGGLE	1
10	4021	.SWITCH, TOGGLE	1
11	70306	.RELAY, TIME DELAY	1
12	61728	.SCREW, SELF TAPPING (attaching part)	1
13	63322	.WASHER, LOCK (attaching part)	1
14	2717	.SWITCH, IGNITION	1
15	32526	.DECAL, POWER ON/OFF/START	1
16	20562	.BREAKER, CIRCUIT	1
17	496-A	.TERMINAL, PUSH-ON	4
18	70015	.SWITCH, FUEL SELECTOR	1
19	30310	.DECAL, SWITCHES	1
20	70016	.GROMMET	2
21	130600	.CONDUCTOR, 7 FT. CABLE	AR
22	70029	.CONNECTOR (BLUE)	8
23	70271	.CONNECTOR (YELLOW)	8
24	117-C	.CONNECTOR, RING	28
25	256	.CABLE, TIE	45



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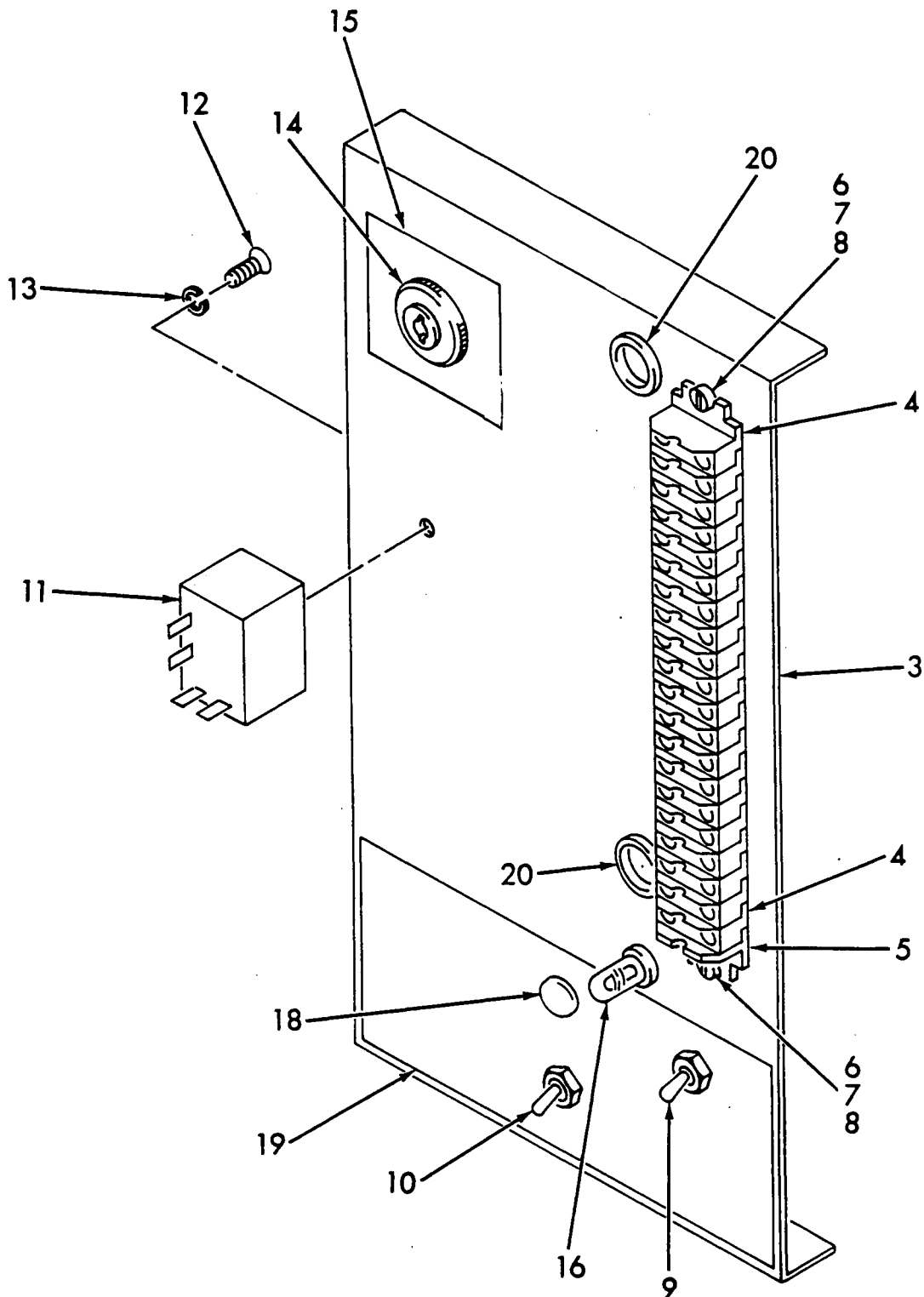
PARTS
SECT. 3
FIG. 34B
PAGE 5

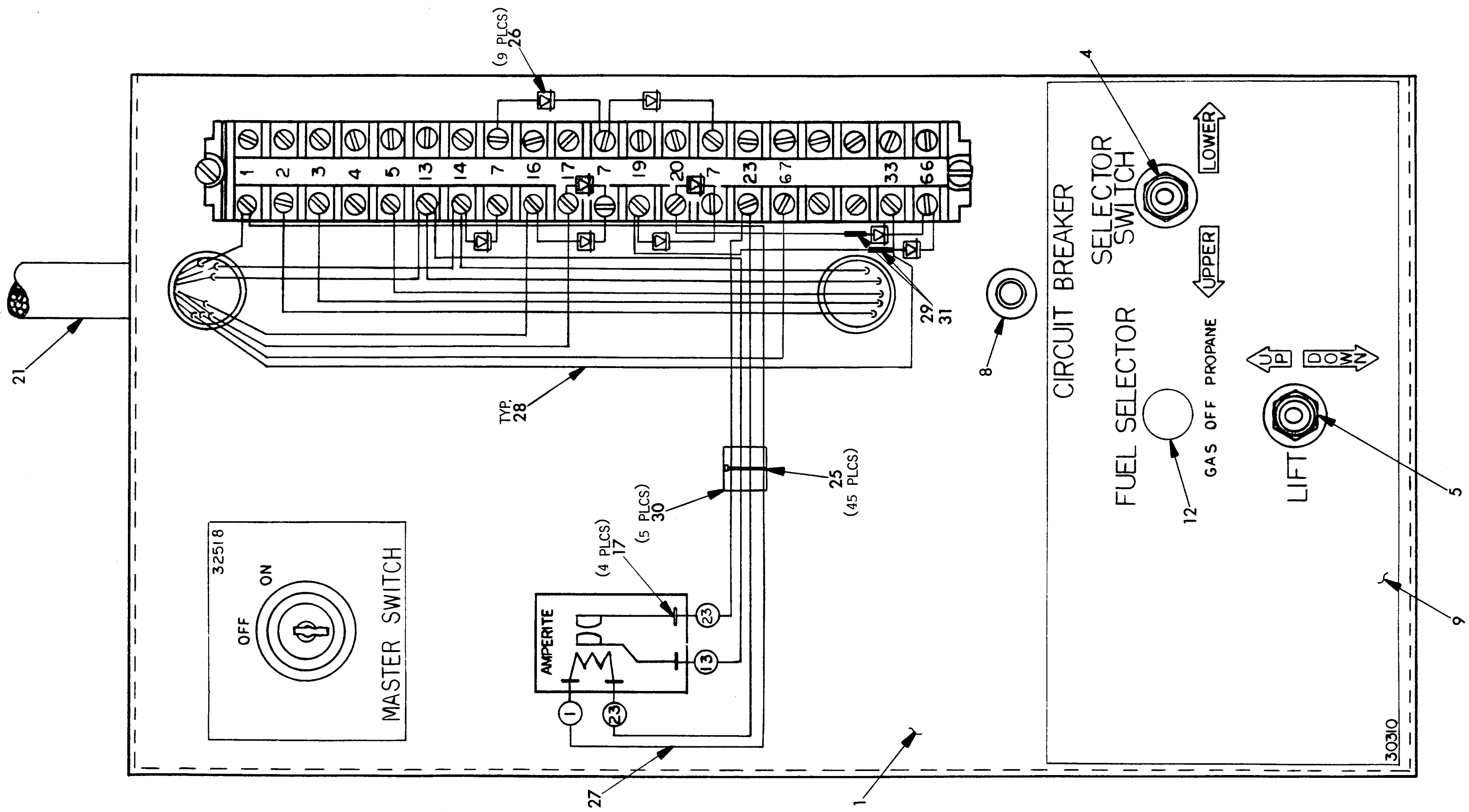
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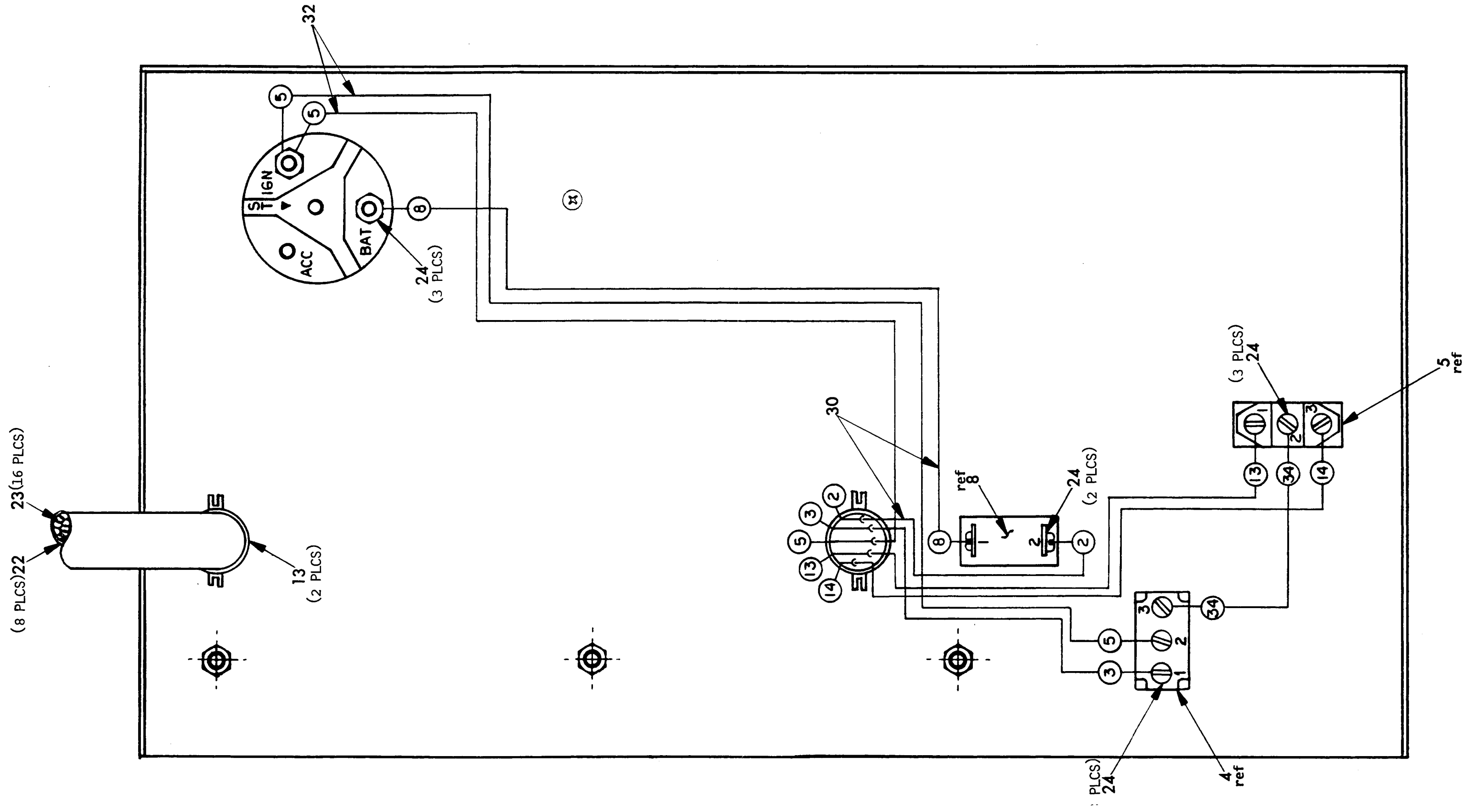




ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30652	ASSEMBLY, ELECTRIC PANEL (See Sect. 3, Fig. 25A, or Sect. 6, Fig. 10 for NHA)	REF
2	4027	.BLOCK, TERMINAL BLOCK	20
3	117-A	.END, TERMINAL BLOCK	1
4	4032	.RELAY	4
5	784-A	.SOCKET	5
6	4019	.SWITCH, SELECTOR	1
7	20481	.SWITCH, LIFT	1
8	20562	.BREAKER, CIRCUIT	1
9	30215	.RELAY, CLIP	4
10	70016	.GROMMET	2
11	62623	.SCREW, SLOTTED ROUND HEAD	13
12	61502	.NUT, HEX	13
13	63312	.WASHER, LOCK	13
14	30310	.DECAL, PANEL SWITCHES	1
15	70306	.RELAY, TIME DELAY	1
16	20571	.METER, HOUR (OPTION)	1
17	30572	.DECAL, BRAKE - CREEP SPEED	1
18	30314	.DECAL, LOW SPEED	1
19	30315	.DECAL, TIME DELAY - DUMP	1
20	30632	.ASSEMBLY, MANIFOLD HARNESS	1
21	30312	.BRACKET, RELAY MOUNTING	1









ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32394	ASSEMBLY, ELECTRICAL PANEL (See Sect. 3, Fig. 25B for NHA)	REF
-2	30312	.PANEL	1
3	35718	..SHEET	1
4	4027	.BLOCK, TERMINAL	20
5	117-A	.BLOCK, TERMINAL END	1
6	62623	.SCREW, CAP (attaching part)	3
7	63312	.WASHER, LOCK (attaching part)	3
8	61502	.NUT, HEXAGON (attaching part)	3
9	70313	.SWITCH, TOGGLE	1
10	4021	.SWITCH, TOGGLE	1
11	70306	.RELAY, TIME DELAY	1
12	61728	.SCREW, SELF TAPPING (attaching part)	1
13	63322	.WASHER, LOCK (attaching part)	1
14	2717	.SWITCH, IGNITION	1
15	32518	.DECAL, POWER ON/OFF	1
16	20562	.BREAKER, CIRCUIT	1
17	496-A	.TERMINAL, PUSH-ON	4
18	771	.PLUG	1
19	30310	.DECAL, SWITCHES	1
20	70016	.GROMMET	2
21	130600	.CONDUCTOR, 7 FT. CABLE	AR
22	70029	.CONNECTOR (BLUE)	8
23	70271	.CONNECTOR (YELLOW)	5
24	117-C	.CONNECTOR, RING	11
25	256	.CABLE, TIE	45
26	4045	.DIODE	9



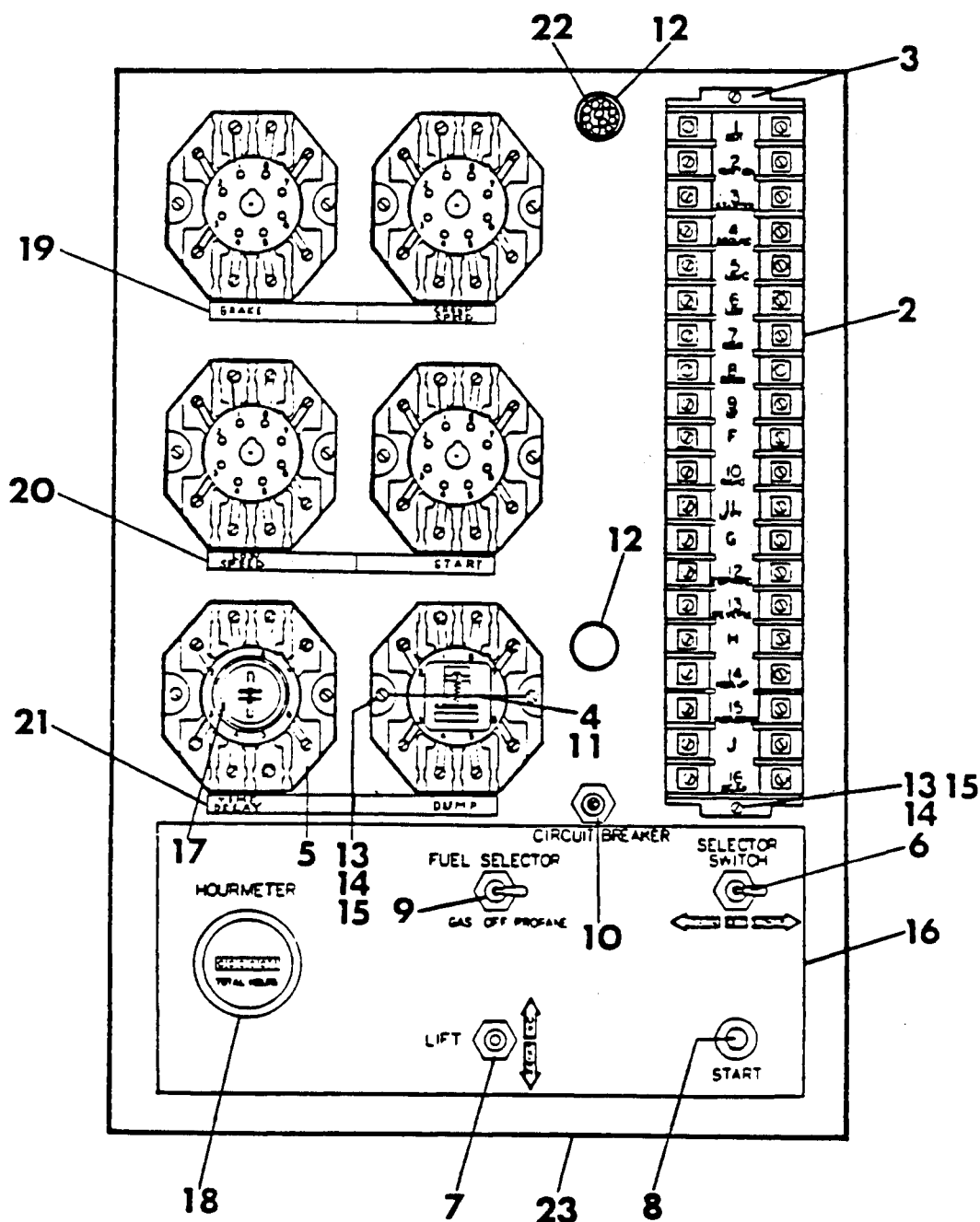
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PARTS CATALOG

ELECTRIC PANEL ASSEMBLY (RT-31E) (AFT. JUL. '86)
(continued)

PARTS
SECT. 3
FIG.35B
PAGE 5

- ITEM NOT ILLUSTRATED





ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30653	ASSEMBLY, ELECTRIC PANEL (See Sect. 3, Fig. 24A for NHA)	REF
2	4027	.BLOCK, TERMINAL	
3	117-A	.END, TERMINAL BLOCK	1
4	4032	.RELAY	5
5	784-A	.SOCKET, 8 PIN	6
6	4019	.SWITCH, SELECTOR	1
7	20481	.SWITCH, LIFT	1
8	4020	.SWITCH, START	1
9	70015	.SWITCH, FUEL SELECTOR	1
10	20562	.BREAKER, CIRCUIT	1
11	30215	.RELAY, HOLD DOWN	5
12	70016	.GROMMET	2
13	62623	.SCREW, SLOTTED ROUND HEAD	15
14	61502	.NUT, HEX	15
15	63312	.WASHER, LOCK	15
16	30310	.DECAL, PANEL SWITCHES	1
17	70306	.RELAY, TIME DELAY	1
18	20571	.METER, HOUR	1
19	30572	.DECAL, BRAKE - CREEP SPEED	1
20	30314	.DECAL, LOW SPEED - START	1
21	30315	.DECAL, TIME DELAY - DUMP	1
22	30794	.ASSEMBLY, MANIFOLD HARNESS	1
23	30312	.BRACKET, RELAY MOUNTING	1

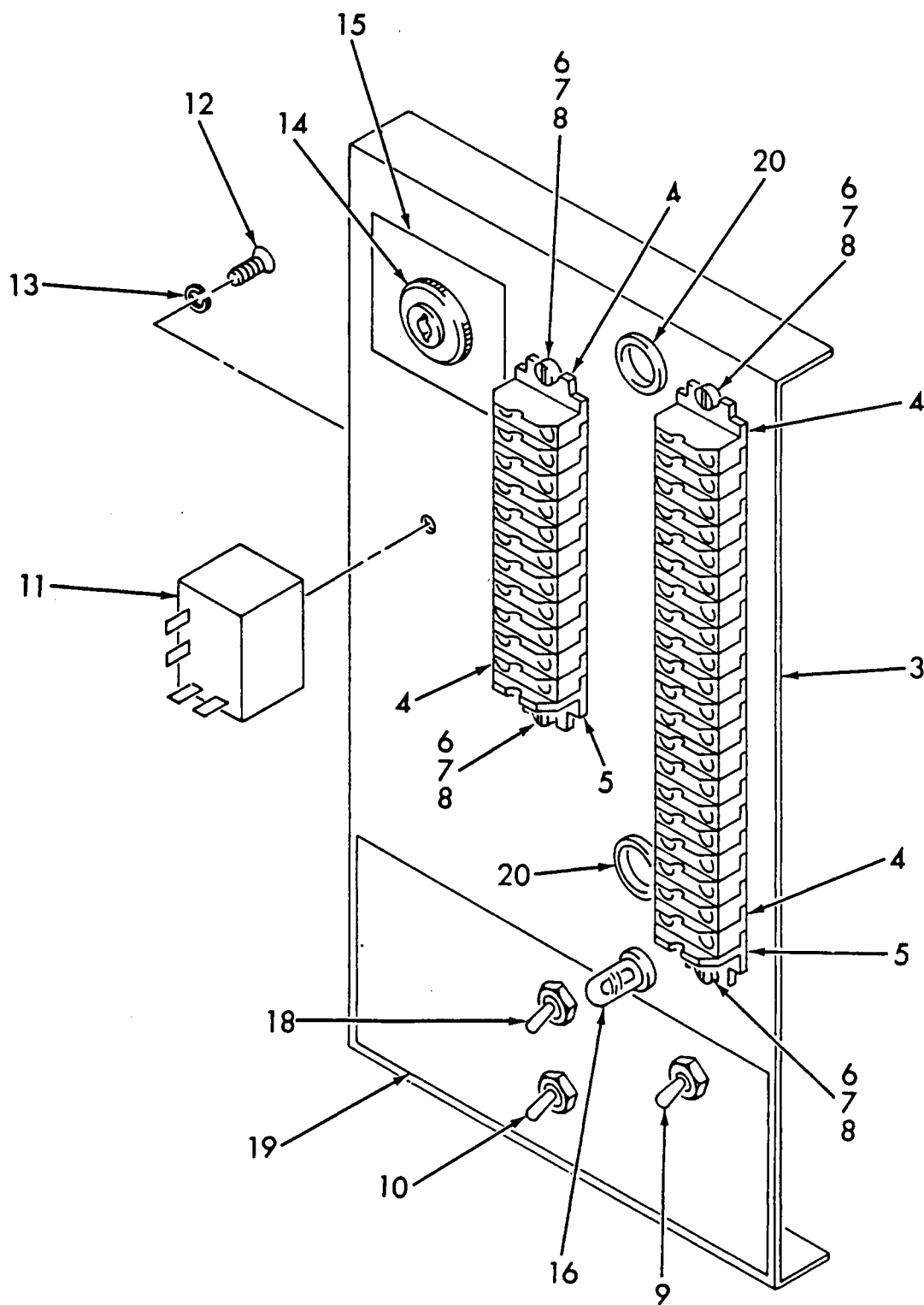


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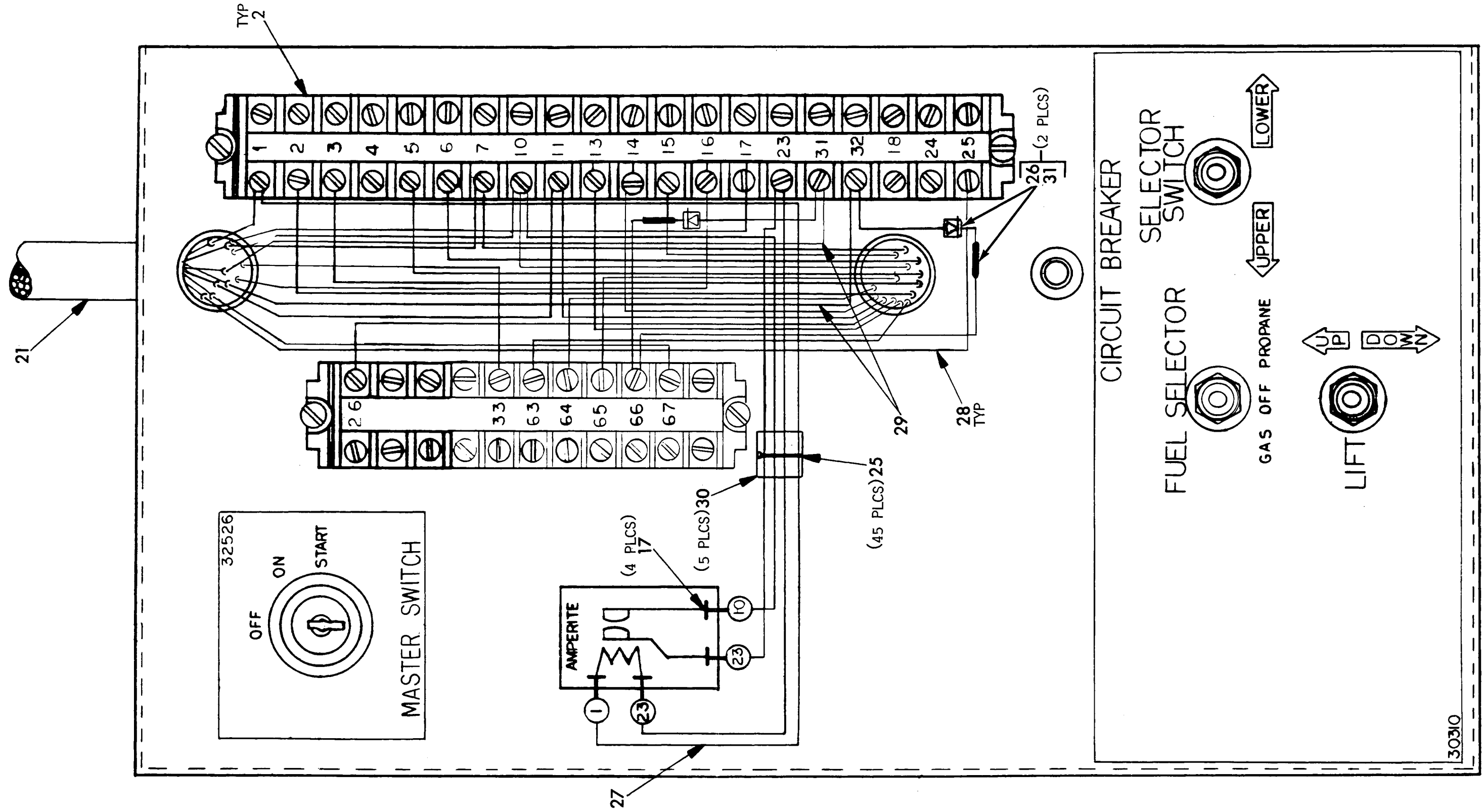
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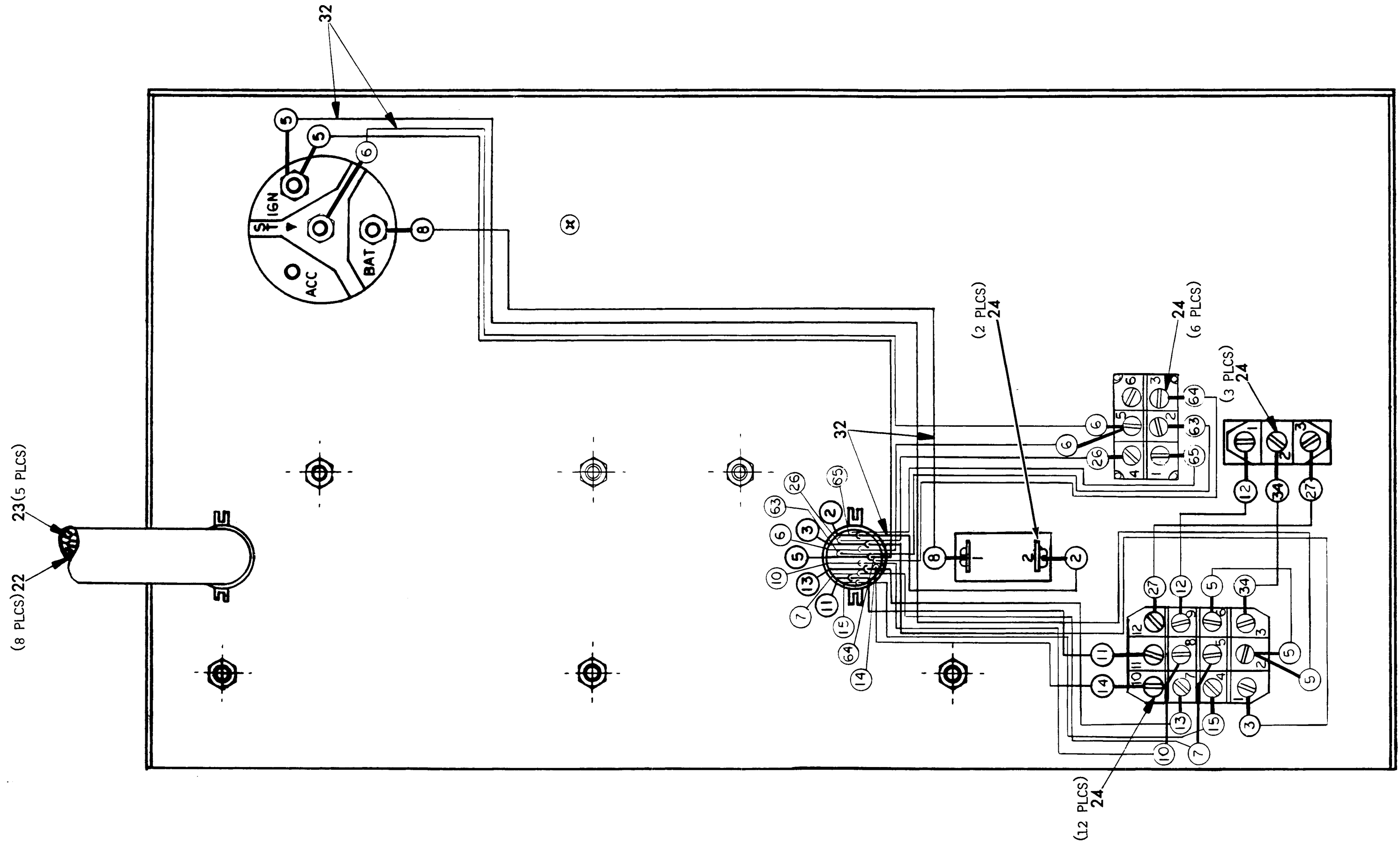
ELECTRIC PANEL ASSEMBLY (SRT-31G) (AFT. JUL. '86)

PARTS
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FIG. 36B
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REV.







ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32483	ASSEMBLY, ELECTRICAL PANEL (See Sect. 3, Fig. 26C for NHA)	REF
-2	30312	.PANEL	1
3	35718	..SHEET	1
4	4027	.BLOCK, TERMINAL	31
5	117-A	.BLOCK, TERMINAL END	2
6	62623	.SCREW, CAP (attaching part)	6
7	63312	.WASHER, LOCK (attaching part)	6
8	61502	.NUT, HEXAGON (attaching part)	6
9	16260	.SWITCH, TOGGLE	1
10	4021	.SWITCH, TOGGLE	1
11	70306	.RELAY, TIME DELAY	1
12	61728	.SCREW, SELF TAPPING (attaching part)	1
13	63322	.WASHER, LOCK (attaching part)	1
14	2717	.SWITCH, IGNITION	1
15	32526	.DECAL, POWER ON/OFF/START	1
16	20562	.BREAKER, CIRCUIT	1
17	496-A	.TERMINAL, PUSH-ON	4
18	70015	.SWITCH, FUEL SELECTOR	1
19	30310	.DECAL, SWITCHES	1
20	70016	.GROMMET	2
21	130600	.CONDUCTOR, 7 FT. CABLE	AR
22	70029	.CONNECTOR, (BLUE)	7
23	70271	.CONNECTOR (YELLOW)	7
24	117-C	.CONNECTOR, RING	27
25	256	.CABLE, TIE	45

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ELECTRIC PANEL ASSEMBLY (SRT-31G) (AFT. JUL. '86)

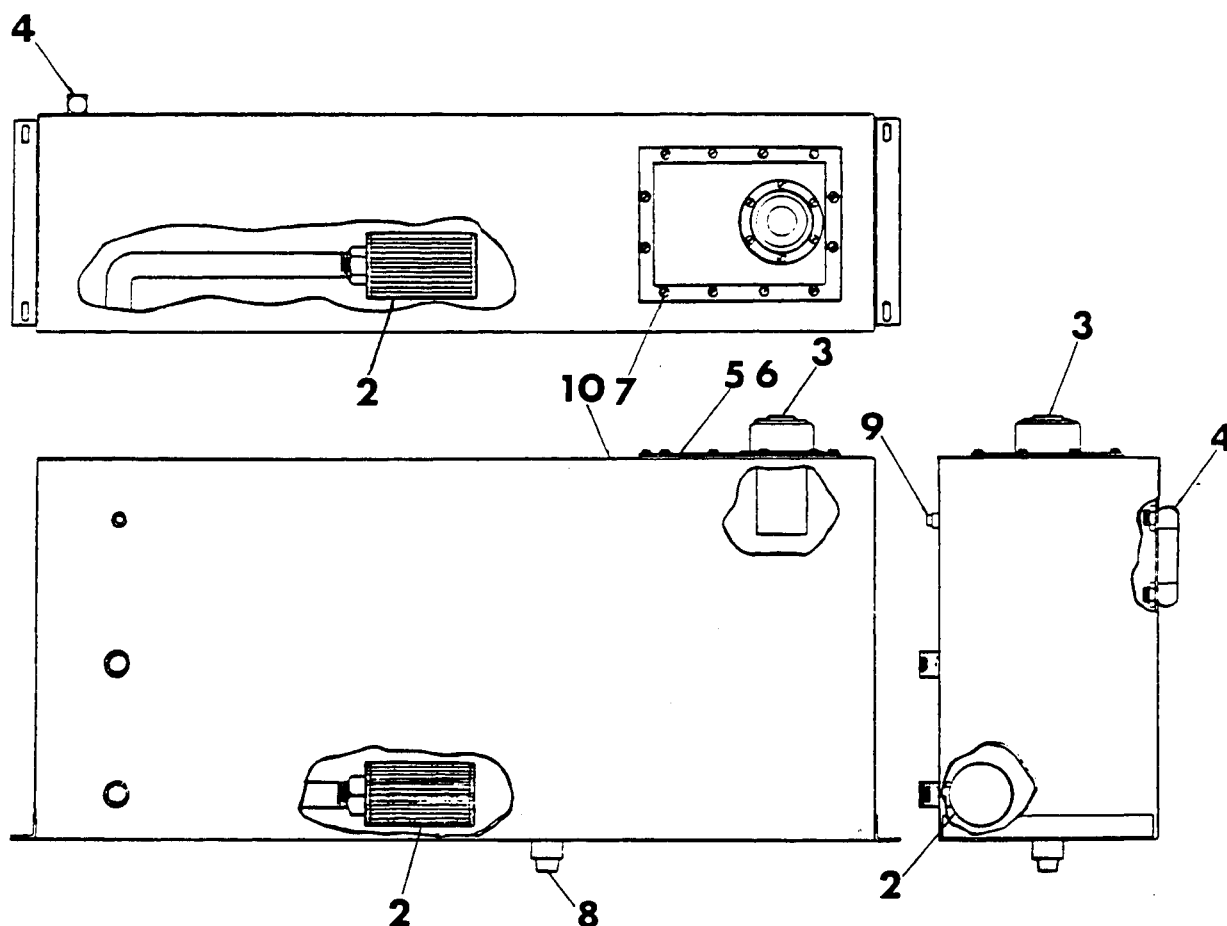
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PARTS
SECT. 3
FIG.36B
PAGE 5

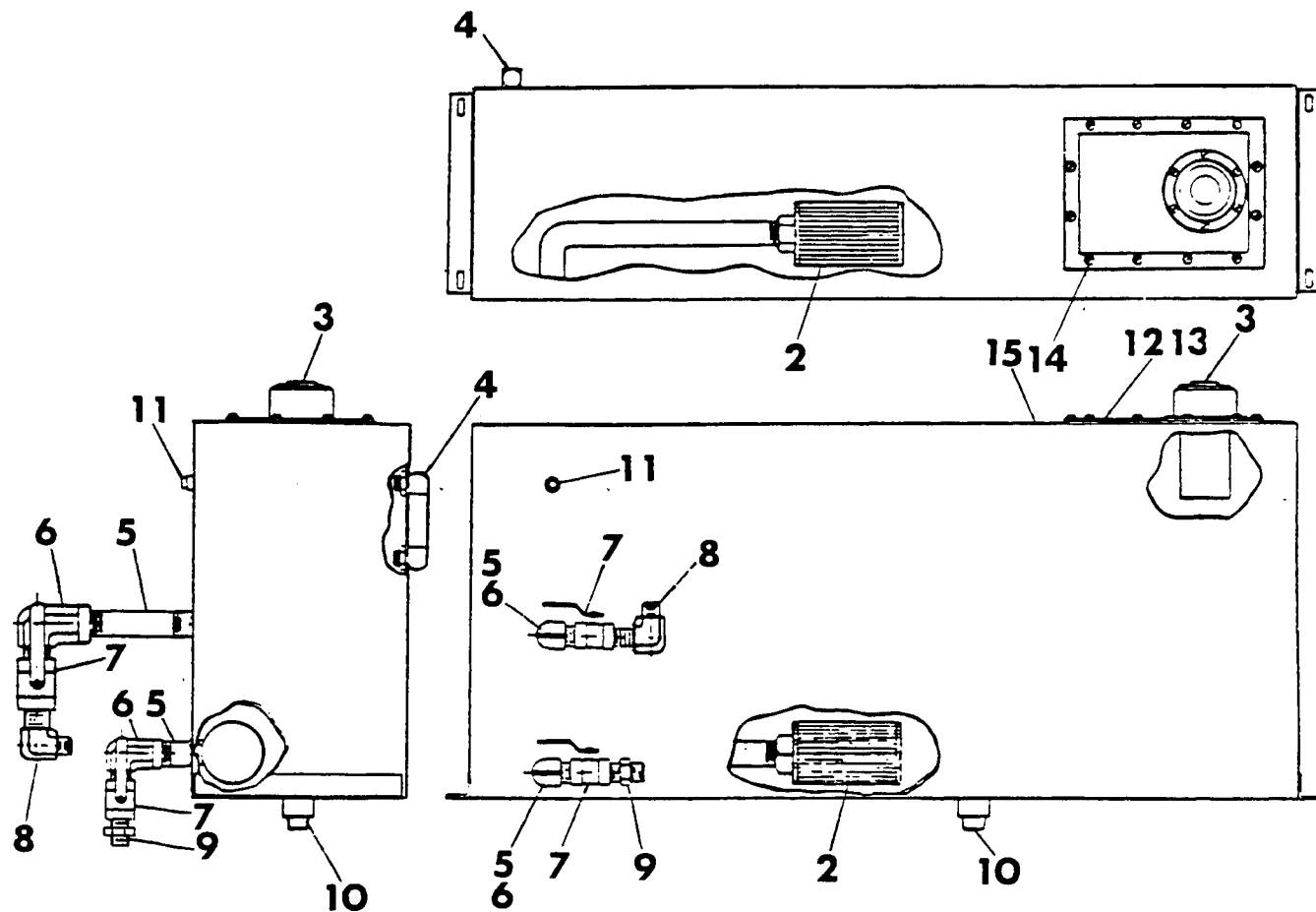
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
26	4045	.DIODE	2
27	70008	.WIRE, (YELLOW/GREEN) 2 FT.	AR
28	70232	.WIRE, (WHITE) 7 FT.	AR
29	70233	.WIRE, (WHITE) 15 FT.	AR
30	16214	.MOUNT	5
31	70069	.CONNECTOR, BUTT	2
32	2991	.WIRE, (WHITE) 4 FT.	AR

REV.

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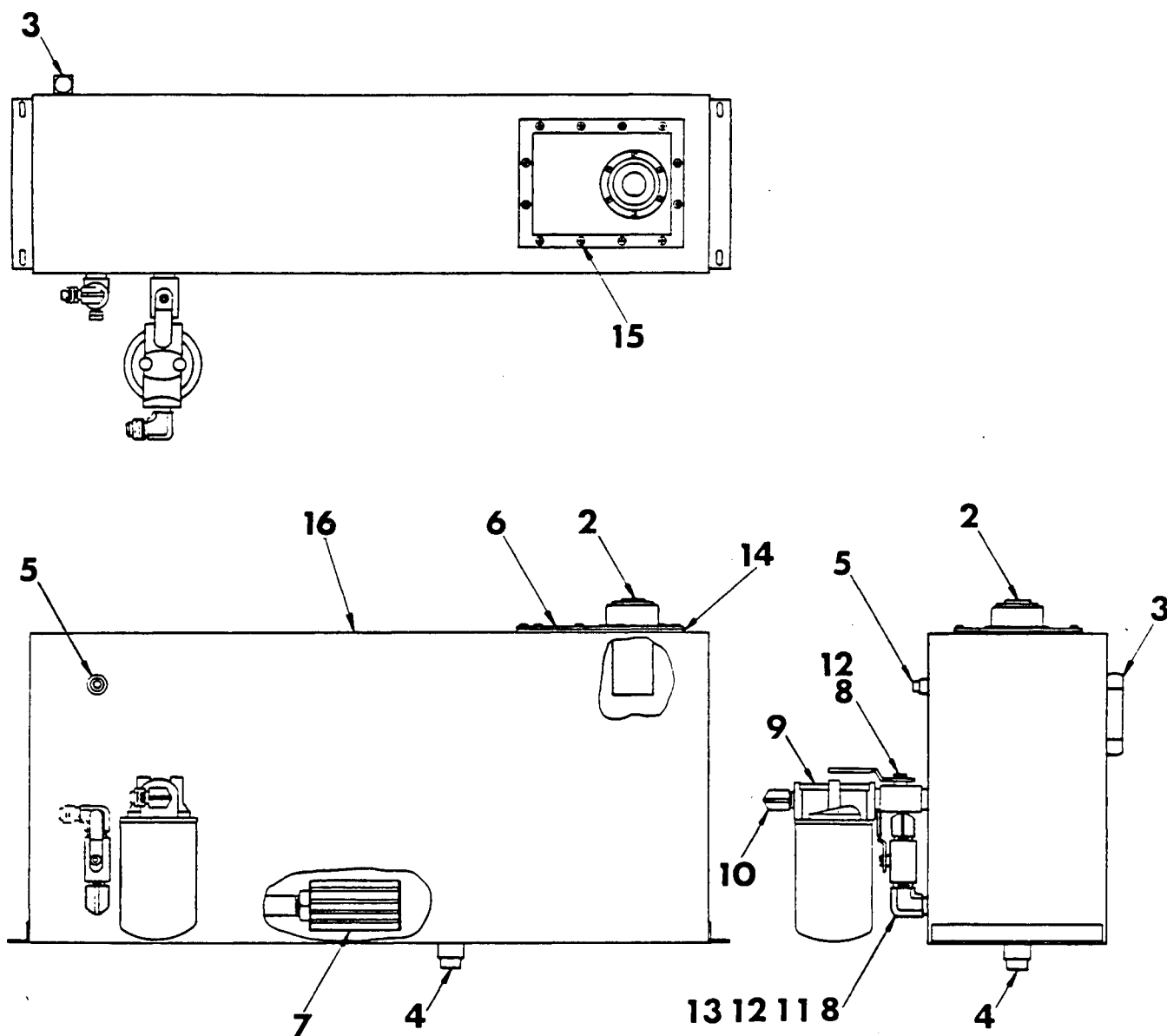


ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	8318-2	ASSEMBLY, HYDRAULIC TANK (See Sect. 3, Fig. 1A or 1B for NHA)	REF
2	3004	.FILTER, SUCTION	1
3	3005	.CAP	1
4	3018	.GAUGE, SIGHT	1
5	8319	.COVER, HYDRAULIC TANK	1
6	8320	.GASKET	1
7		.SCREW, SELF TAPPING	12
8	3027	.PLUG, DRAIN	1
9		.PLUG, ALLEN	1
10	8318-1	.TANK	1



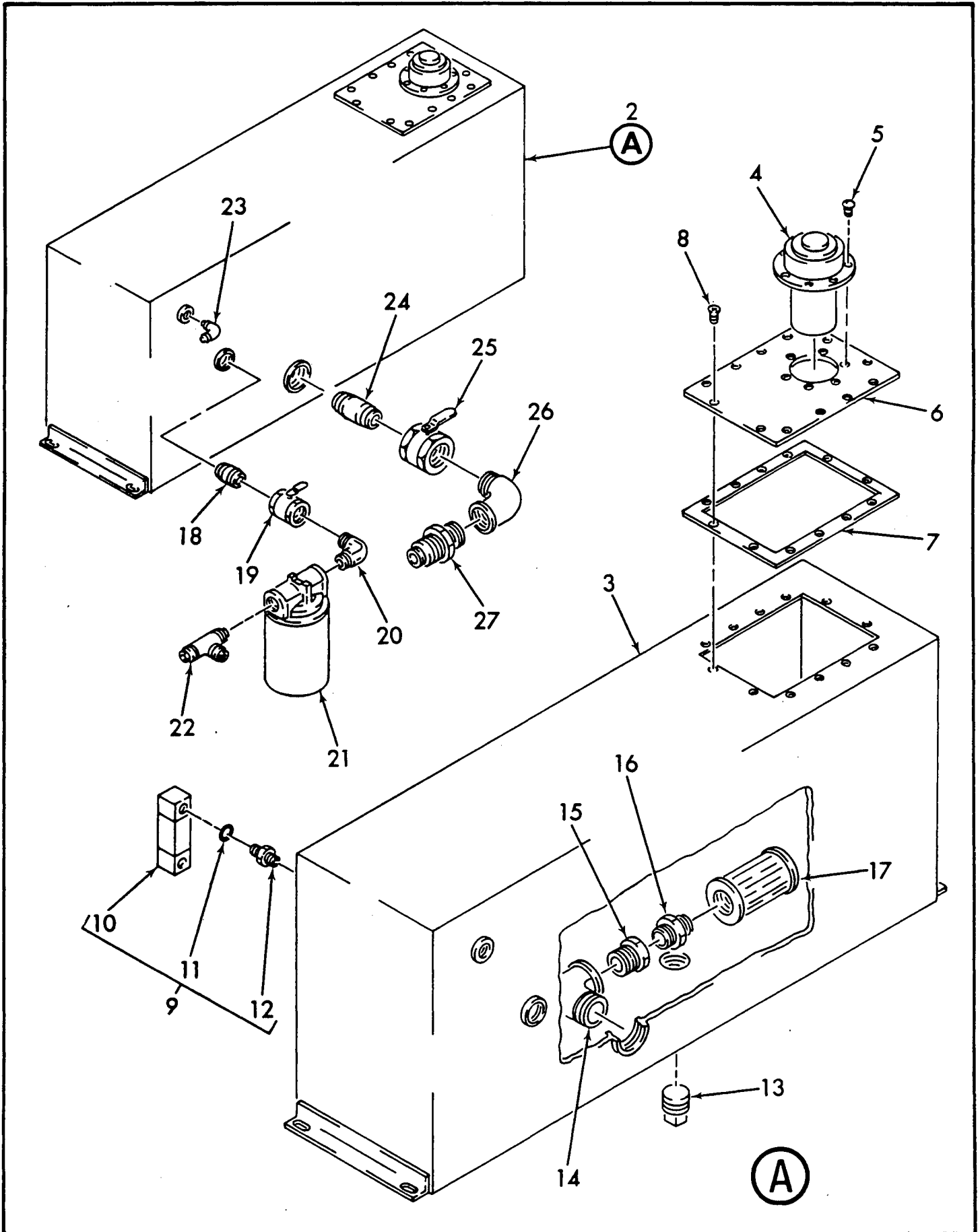


ITEM	PART NUMBER	DESCRIPTION		UNIT PER ASSY.
		1234567		
-1	8318-2	.ASSEMBLY, HYDRAULIC TANK (See Sect. 3, Fig. 2A, 3A or 4A for NHA)		REF
2	3004	.FILTER, SUMP		1
3	3005	.CAP, BREATHER		1
4	3018	.GAUGE, SIGHT		1
5	2494	.NIPPLE		2
6	80021-14	.ELBOW		2
7	3033	.VALVE		2
8	80008-15	.ELBOW		1
9	80001-19	.CONNECTOR, MALE		1
10	3027	.PLUG, MAGNETIC		1
11	16703	.PLUG, ALLEN		1
12	8319	.COVER, INSPECTION		1
13	8320	.GASKET		1
14	61703	.SCREW, SELF TAPPING		12
15	8318-1	.TANK, HYDRAULIC		1





ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30583	ASSEMBLY, HYDRAULIC TANK (See Sect. 3, Fig. 2B or 3B for NHA)	REF
2	3005	.CAP, BREATHER	1
3	3018	.GAUGE, SIGHT	1
4	3027	.PLUG, MAGNETIC DRAIN	1
5	16703	.PLUG, ALLEN	1
6	8319	.COVER, HYDRAULIC TANK	1
7	3004	.FILTER, SUCTION	1
8	3033	.VALVE	2
9	30306	.FILTER	1
10	80008-15	.ELBOW	1
11	80021-14	.ELBOW	1
12	2493	.NIPPLE	2
13	80009-14	.ELBOW	1
14	8320	.GASKET, HYDRAULIC TANK	1
15	61718	.SCREW, CAP	12
16	30582	.TANK, HYDRAULIC	1





ITEM	PART NUMBER	DESCRIPTION		UNIT PER ASSY.
		1234567		
-1	32431	ASSEMBLY, HYDRAULIC TANK (See Sect. 3, Fig. 2C, 3B or 4B for NHA)		REF
2	32424	.SUB-ASSEMBLY, HYDRAULIC TANK		1
3	32426	..WELDMENT, HYDRAULIC TANK		1
4	3005	..CAP, BREATHER		1
5		...SCREW, SELF TAPPING (attaching part)		6
6	8319	..COVER, HYDRAULIC TANK		1
7	8320	..GASKET, HYDRAULIC TANK		1
8	61718	..SCREW, CAP (attaching part)		10
9	3018	..ASSEMBLY, SIGHT GAGE		1
10		...GAGE, SIGHT		1
11		...O-RING		2
12		...VALVE		2
13	3027	...PLUG, MAGNETIC DRAIN		1
14	52307	..ELBOW, STREET		1
15	80057-22	..REDUCER, PIPE THREAD		1
16	80052-12	..NIPPLE, PIPE		1
17	81084	..STRAINER		1
18	2493	.NIPPLE, CLOSE		1
19	3033	.VALVE, BALL		1
20	80022-11	.ELBOW, MALE		1



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PARTS CATALOG

HYDRAULIC TANK ASSEMBLY (AFT. JUL. '86)

(continued)

PARTS

SECT. 3

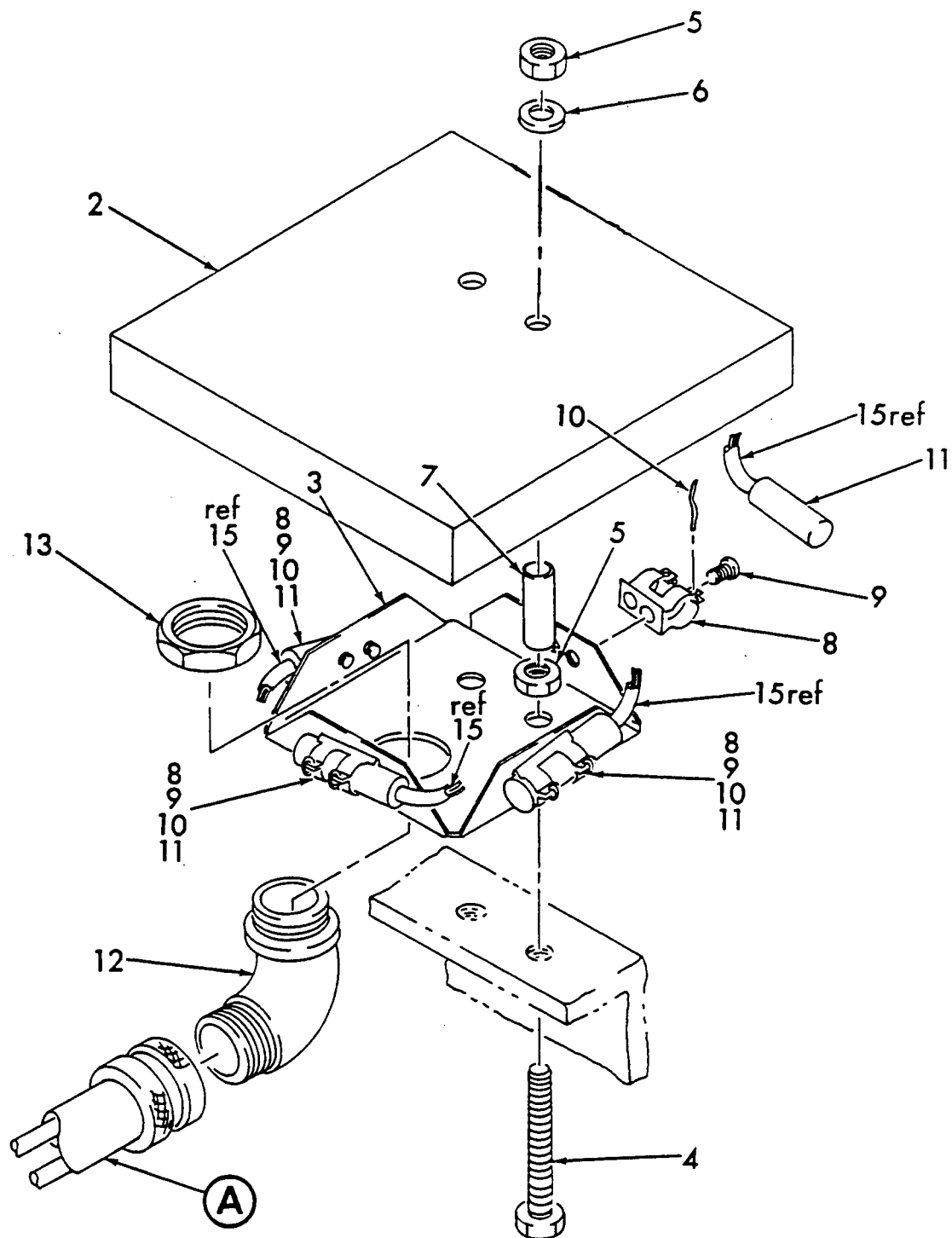
FIG.37D

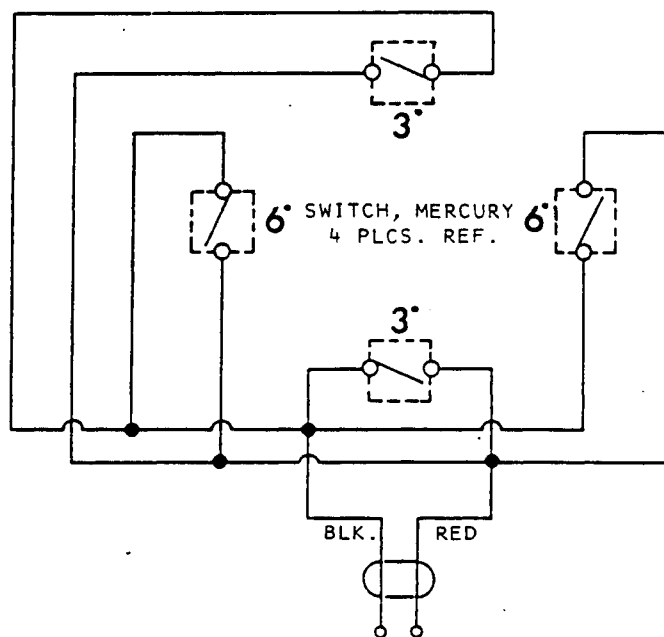
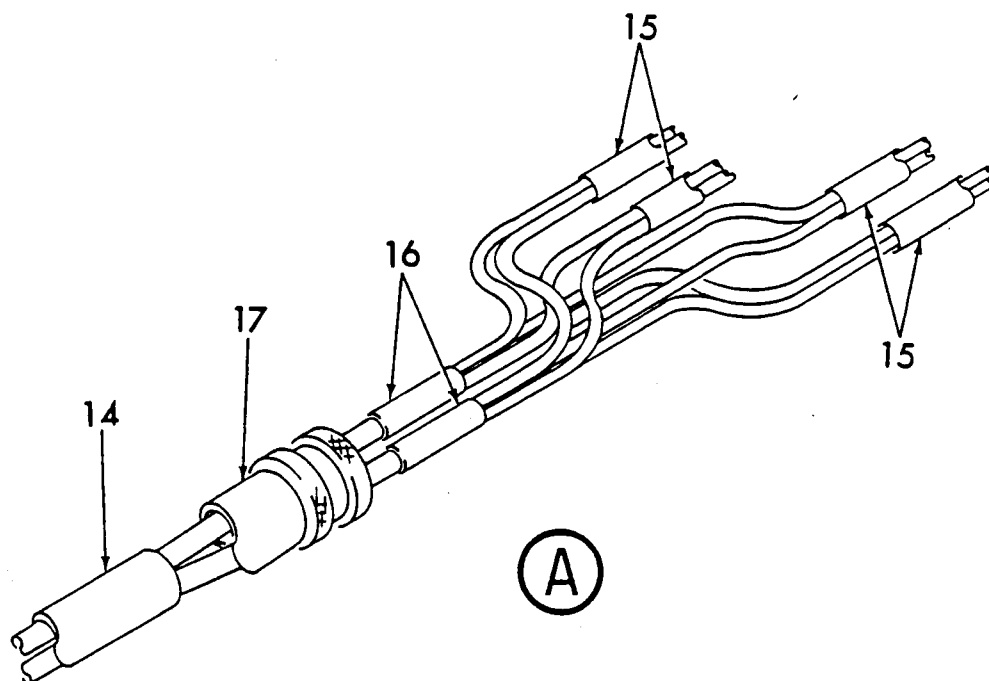
PAGE 3

ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
21	30306	.FILTER	1
22	80037-18	.TEE, MALE RUN	1
23	80008-03	.ELBOW, MALE	1
24	54712	.NIPPLE	1
25	20050	.VALVE, BUTTERFLY	1
26	52307	.ELBOW, STREET	1
27	2968	.CONNECTOR, MALE	1

REV.

- ITEM NOT ILLUSTRATED

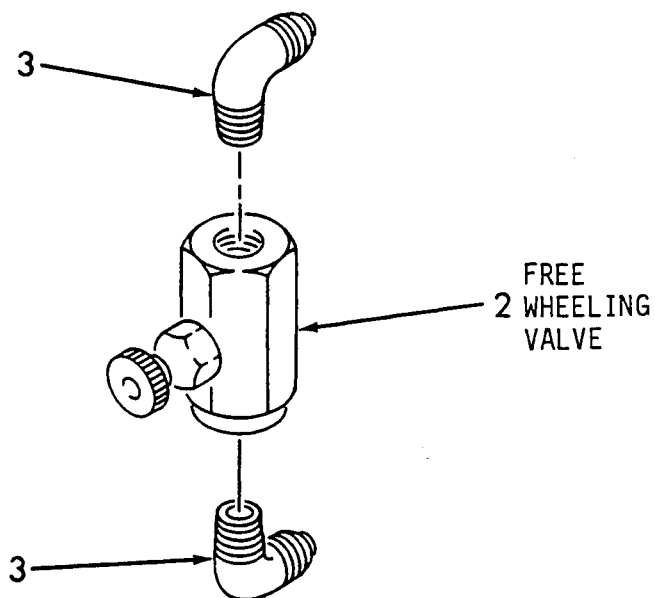




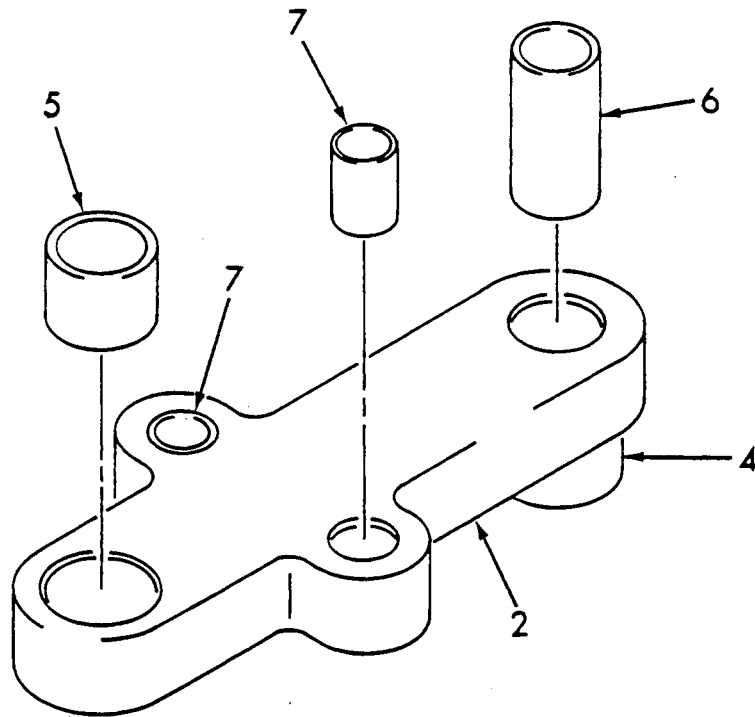
WIRING DIAGRAM



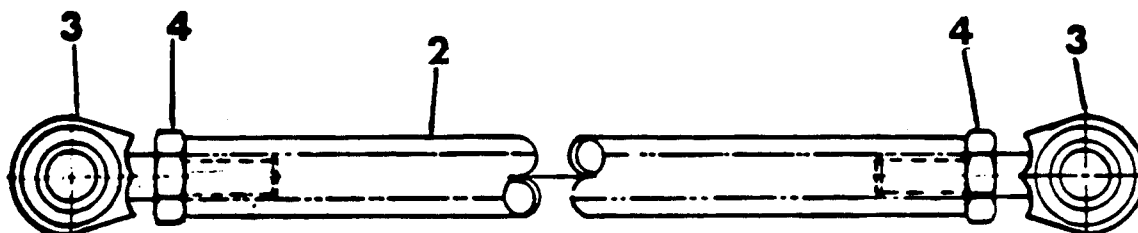
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30387	ASSEMBLY, TILT SWITCH (See Sect. 3, Fig. 2A, 2B, 2C, 3A, 3B, 4A or 4B for NHA)	REF
2	30386	.COVER, TILT SWITCH	1
3	30385	.BRACKET, TILT SWITCH	1
4	60319	.SCREW, CAP (attaching part)	2
5	60701	.NUT, HEX (attaching part)	4
6	63301	.WASHER, LOCK (attaching part)	2
7	35715	.TUBE, ROUND (attaching part)	2
8	199-A	.BRACKET, SWITCH	4
9	62605	.SCREW, ROUND HEAD (attaching part)	8
10	70225	.WIRE, SAFETY	8
11	4014	.SWITCH, MERCURY	4
12	70226	.CONNECTOR, 90 DEGREE	1
13	61317	.NUT (attaching part)	1
14	70036	.WIRE (9 FT)	AR
15	65898	.TUBE, HEAT SHRINK	4
16	117-D	.CONNECTOR, BUTT	2
17	65899	.TUBE, HEAT SHRINK	1



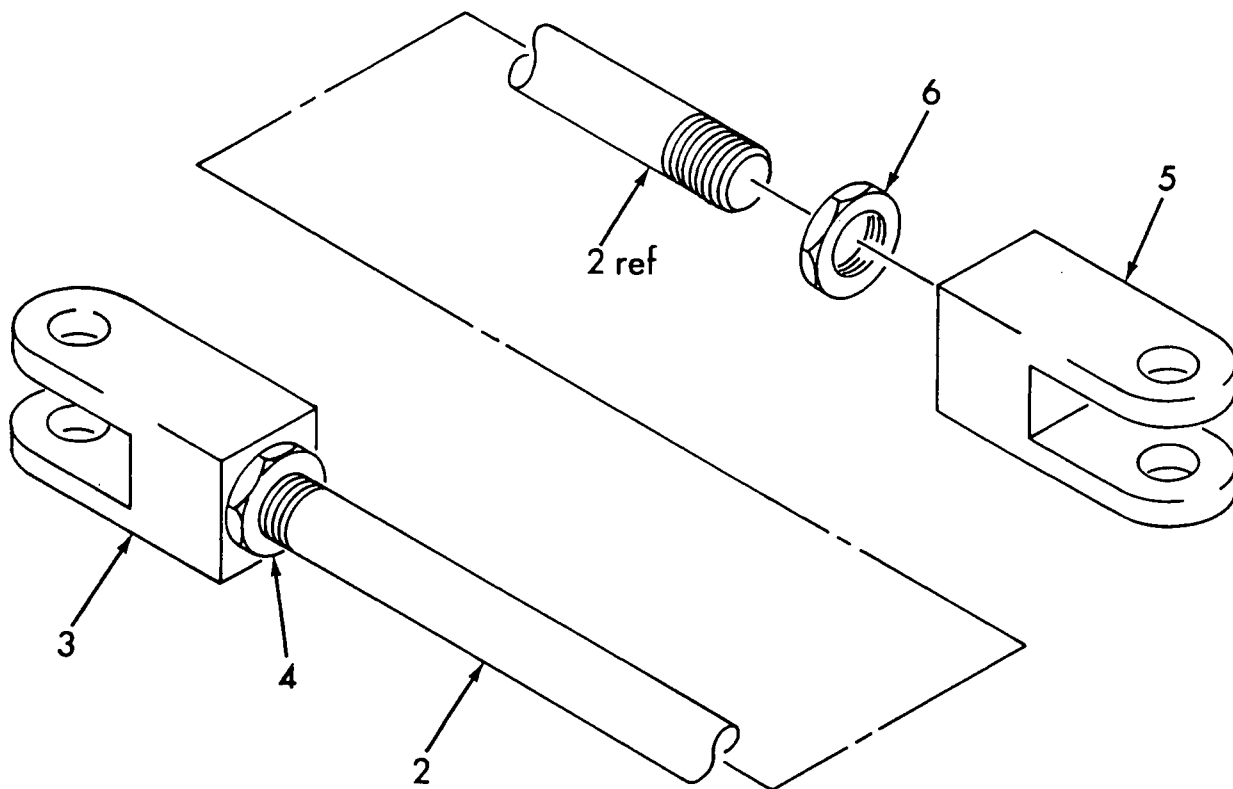
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32578	ASSEMBLY, NEEDLE VALVE (See Sect. 3, Fig. 2C for NHA)	REF
2	201	.VALVE, NEEDLE	1
3	80008-13	.ELBOW, MALE	2

**BELL CRANK ASSEMBLY**

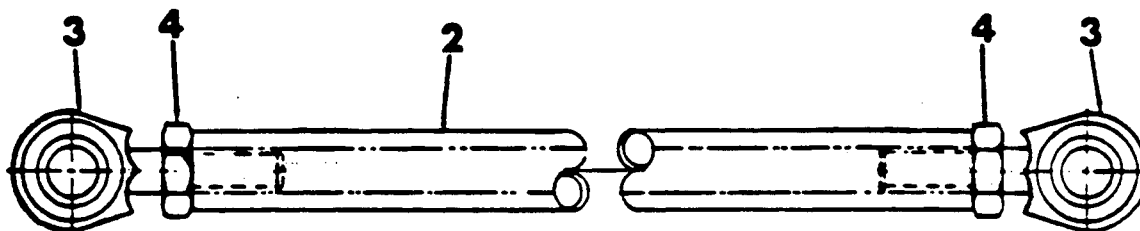
ITEM	PART NUMBER	1234567	DESCRIPTION	UNIT PER ASSY.
-1	8044		ASSEMBLY, BELL CRANK (See Sect. 3, Fig. 1A, 1B, 2A, 2B, 2C, 3A, 3B, or 4B for NHA)	REF
2	8040		.CRANK, BELL	1
-3	35817		..PLATE	1
4	35132		.TUBE, ROUND	1
5	2269		.BEARING, SLEEVE	1
6	2278		.BEARING, SLEEVE	1
7	8053		.BEARING, JOURNAL	2



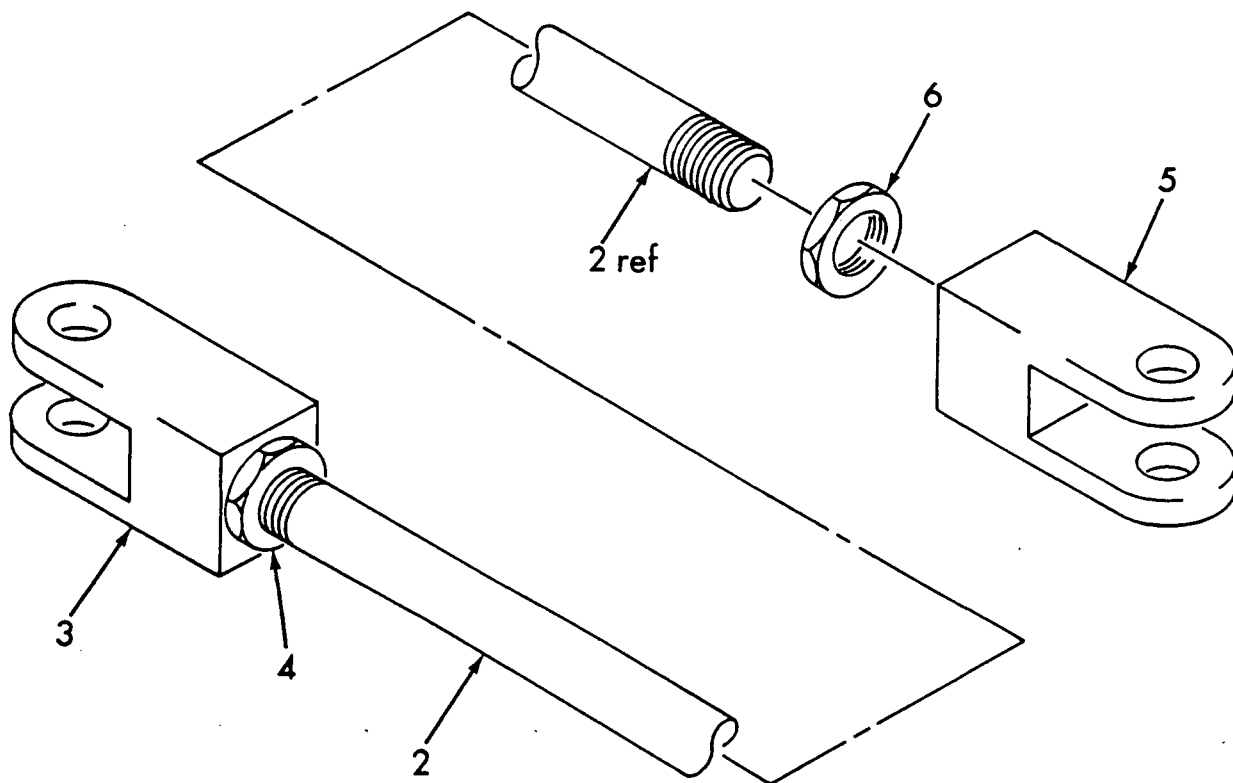
ITEM	PART NUMBER	DESCRIPTION		UNIT PER ASSY.
		1234567		
-1		ASSEMBLY, TIE ROD (See Sect. 3, Fig. 1A for NHA)		REF
2	6333-1	.TUBE (L.H.)		1
3	2275	.END, TIE ROD		2
4	60806	.NUT, JAM		2



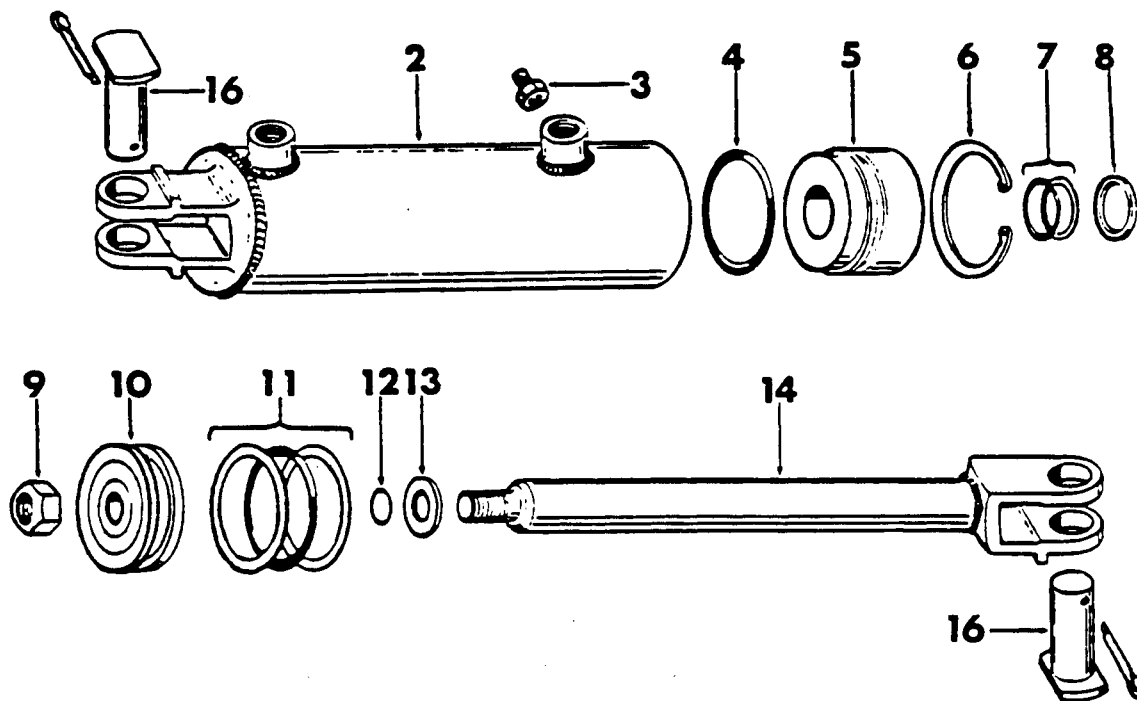
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		1234567	
-1	30302	ASSEMBLY, TIE ROD (See Sect. 3, Fig. 1B, 2A, 2B, 2C, 3A, 3B, 4A or 4B for NHA)	REF
2	30772	.ROD, TIE	1
3	30773	.YOKE, L.H.	1
4	60903	.NUT, JAM (attaching part)	1
5	30774	.YOKE, R.H.	1
6	60902	.NUT, JAM (attaching part)	1



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1		ASSEMBLY, TIE ROD (See Sect. 3, Fig. 1A for NHA)	REF
2	6333-2	.TUBE (R.H.)	1
3	2275	.END, TIE ROD	2
4	60806	.NUT, JAM	2



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30301	ASSEMBLY, TIE ROD (See Sect. 3, Fig. 1B, 2A, 2B, 2C, 3A, 3B, 4A or 4B for NHA)	REF
2	30771	.ROD, TIE	1
3	30773	.YOKE, L.H.	1
4	60903	.NUT, JAM (attaching part)	1
5	30774	.YOKE, R.H.	1
6	60902	.NUT, JAM (attaching part)	1



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
19-	3062	ASSEMBLY, STEERING CYLINDER (HPWR) (See Sect. 3, Fig. 1A for NHA)	REF
2	66771	.ASSEMBLY, TUBE	1
3		.SCREW, HEAD SET	1
4		.O-RING	1
5	16929	.HEAD	1
6	66452	.RING, LOCK	1
7		.SET, SHAFT PACKING	1
8		.WIPER, ROD	1

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PARTS CATALOG

STEERING CYLINDER ASSEMBLY (BEF. NOV. '79)

(continued)

PARTS

SECT. 3

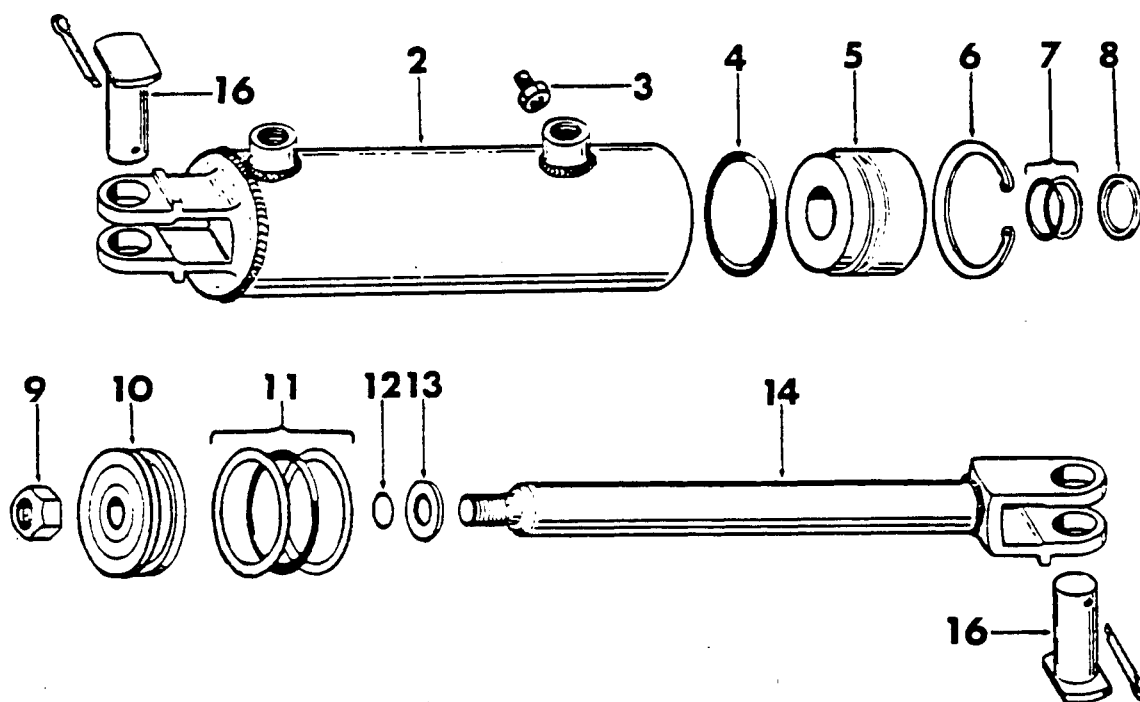
FIG.43A

PAGE 2

ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
9		.NUT, PISTON LOCK	1
10	16940	.PISTON	1
11		.KIT, PISTON O-RING	1
12		.O-RING	1
13		.WASHER, STEEL	1
14	66453	.SHAFT	1
-15	3062-1	.KIT, SEAL	1
16	3013-2	.PIN, CLEVIS	2

REV.

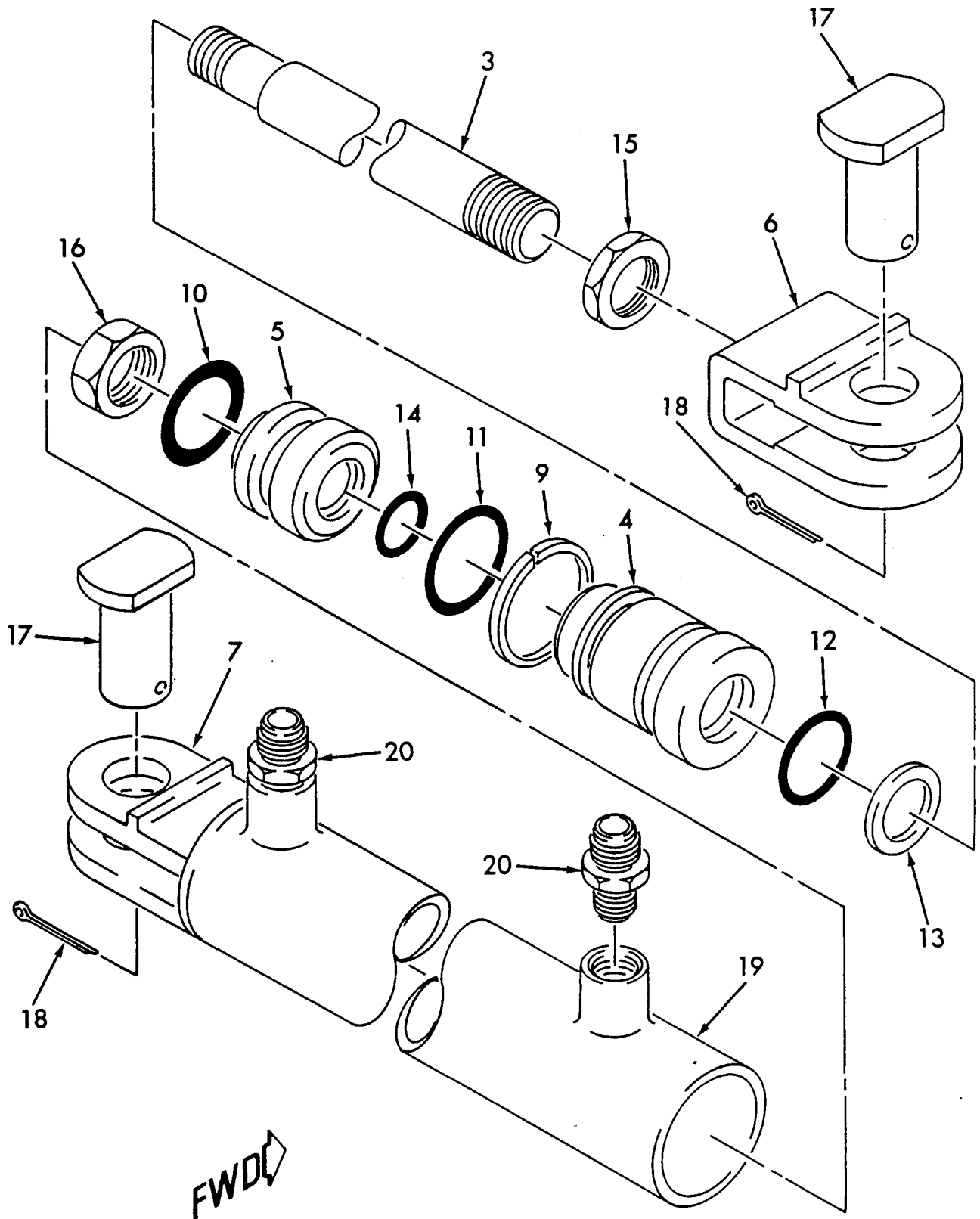
- ITEM NOT ILLUSTRATED



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
19A-	3013	STEERING CYLINDER (HPWR) 1.5 x 6 (See Sect. 3, Fig. 1A, 1B, 2A, 2B, 3A or 4A for NHA)	1
2		.ASSEMBLY, TUBE LC 1.5 x 6	1
3		.SCREW, HEAD SET	1
4		.O-RING	1
5	16941	.HEAD	1
6	66451	.RING, LOCK	1
7		.SET, SHAFT PACKING	1
8		.WIPER, ROD	1

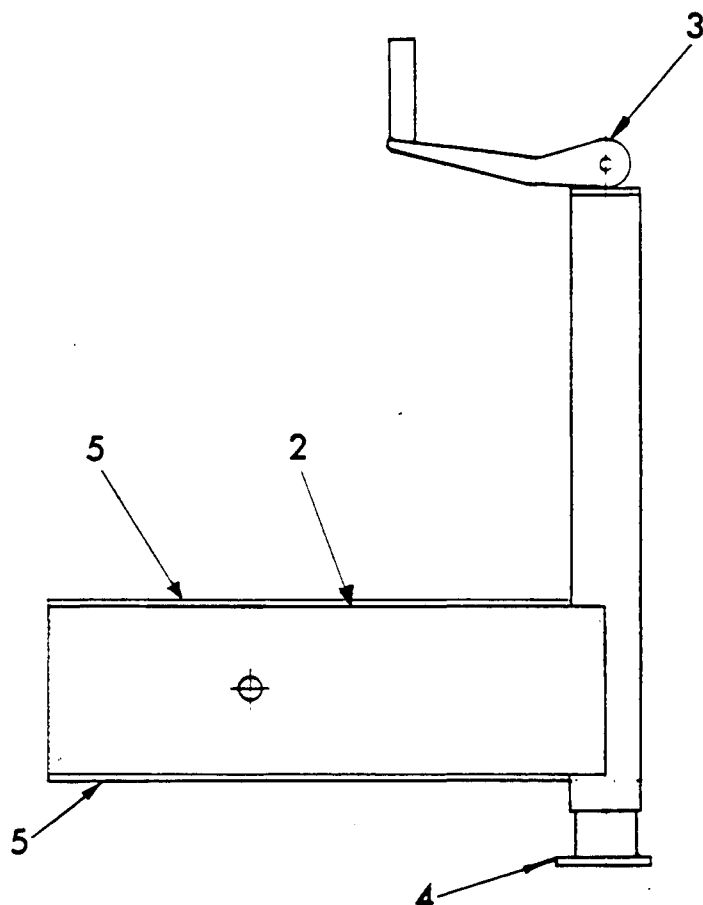


ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
9		.NUT, PISTON LOCK	1
10	16942	.PISTON	1
11		.KIT, PISTON)-RING	1
12		.O-RING	1
13		.WASHER, STEEL	1
14	66450	.SHAFT	1
-15	331-B	.KIT, SEAL (HY POWER)	1
16	3013-2	.PIN, CLEVIS	2
STEERING CYLINDER (AFT. JAN. '85)			
-17	3013	.CYLINDER, STEERING (R.A.) LC 2 x 6M	1
-18	66964	.KIT, SEAL (R.A.)	1

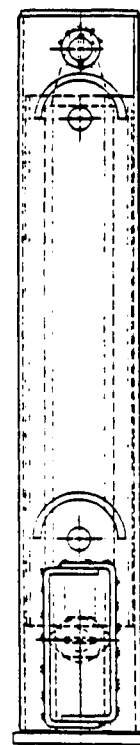
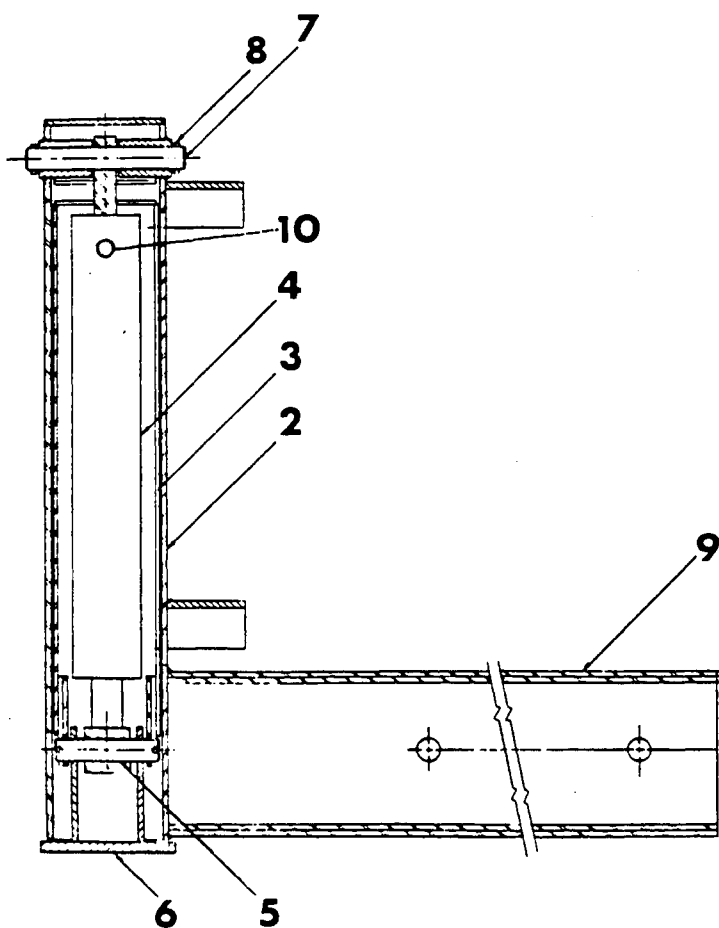
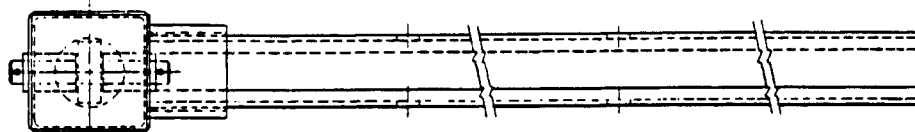




ITEM	PART NUMBER	DESCRIPTION		UNIT PER ASSY.
		1234567		
-1	32584	ASSEMBLY, STEERING CYLINDER (See Sect. 3, Fig. 2C or 3B or 4B for NHA)		REF
-2	30803	.CYLINDER, STEERING		1
3		..ROD		1
4		..GLAND		1
5		..PISTON		1
6		..END, ROD		1
7		..END, CYLINDER		1
-8	66548	..KIT, SEAL		1
9		...WIRE, SAFETY		1
10		...SEAL, PISTON		1
11		...SEAL, GLAND		1
12		...SEAL, ROD		1
13		...WIPER, ROD		1
14		...O-RING		1
15		..NUT, CLEVIS JAM		1
16		..NUT, PISTON LOCKING		1
17		..PIN, CLEVIS		2
18		..KEY, COTTER		2
19		..END, TUBE		1
20	80001-10	.CONNECTOR, MALE		2



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	31189	ASSEMBLY, MANUAL STABILIZER (See Sect. 3, Fig. 2A, 2B, 2C, 3A or 3B for NHA)	REF
2	31190	.TUBE	1
3	2215	.STABILIZER, MANUAL	1
4	31191	.PAD	1
5	35691	.BAR, FLAT	2





ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	3026	ASSEMBLY, HYDRAULIC OUTRIGGER (See Sect. 3, Fig. 4A, Sect. '6, Fig. 9 for NHA)	REF
2	3026-1	.HOUSING, HYDRAULIC OUTRIGGER	1
3	3026-2	.TUBE, SLIDING	1
4	3024-4	.CYLINDER, HYDRAULIC OUTRIGGER	1
-4A	244-A	..KIT, SEAL	1
5	3024-5	.PIN, LOWER	1
6	3024-6	.TUBE, SLIDING	1
7	3024-9	.PIN, UPPER	1
8	16220	.PIN, ROLL	4
9	3024-15	.SUPPORT, HYDRAULIC OUTRIGGER	1
10	80013-08	.ELBOW	3

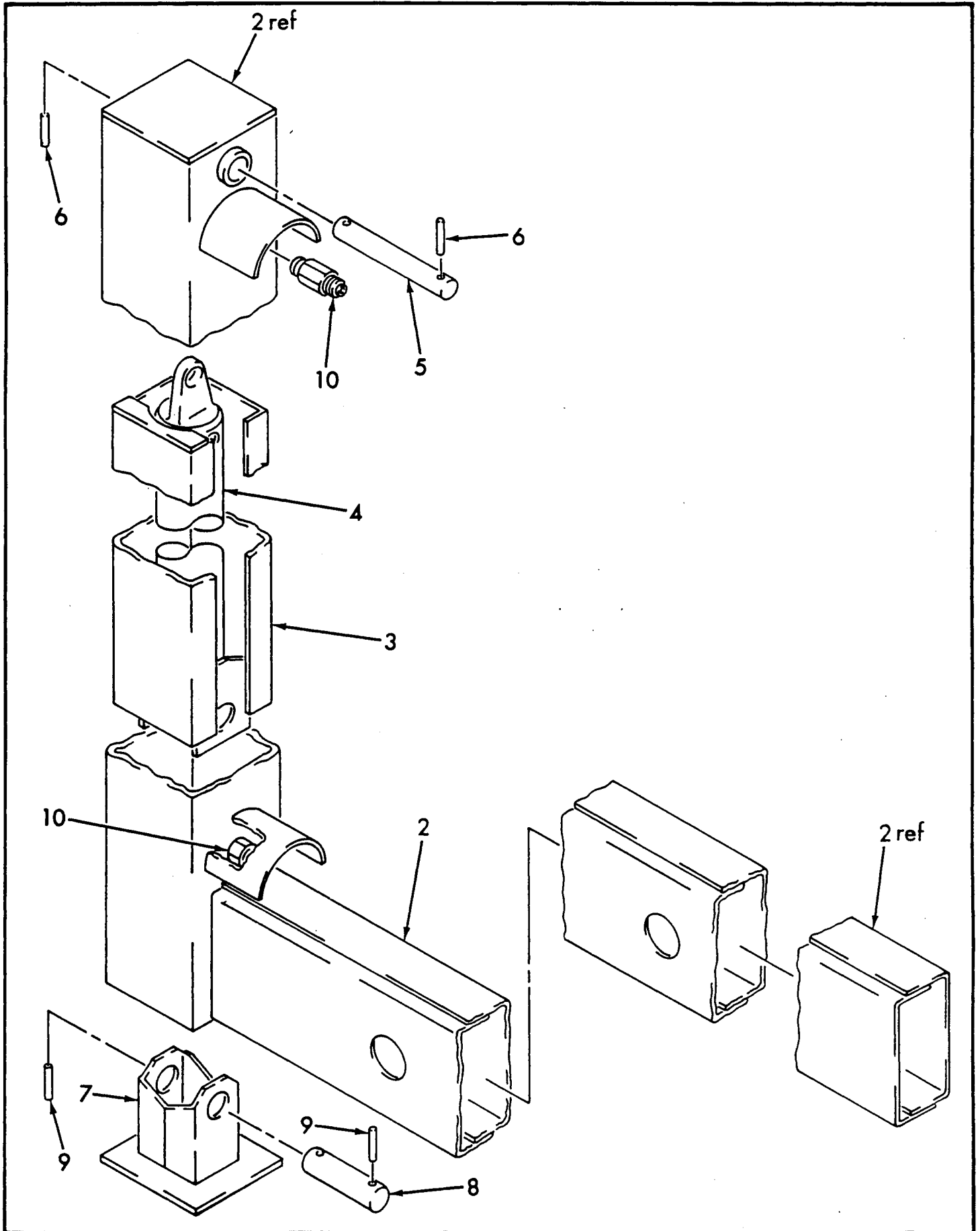


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PARTS CATALOG

HYDRAULIC OUTRIGGER ASSEMBLY (AFT. JUL. '86)

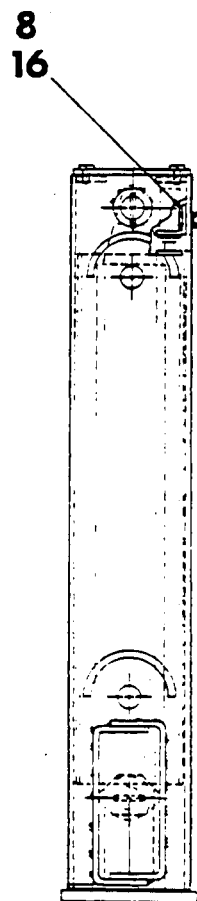
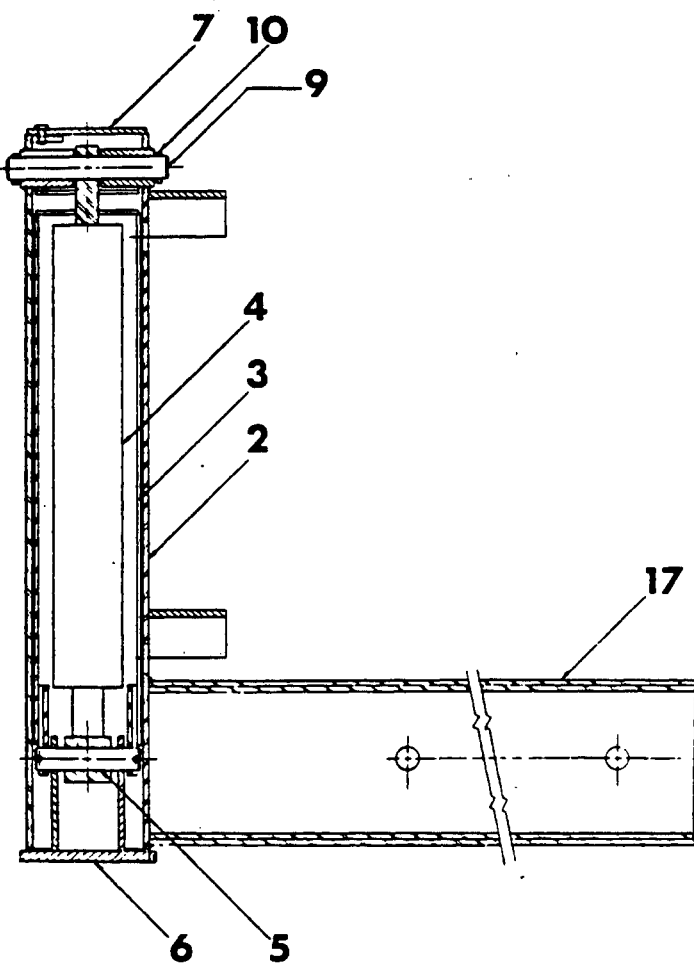
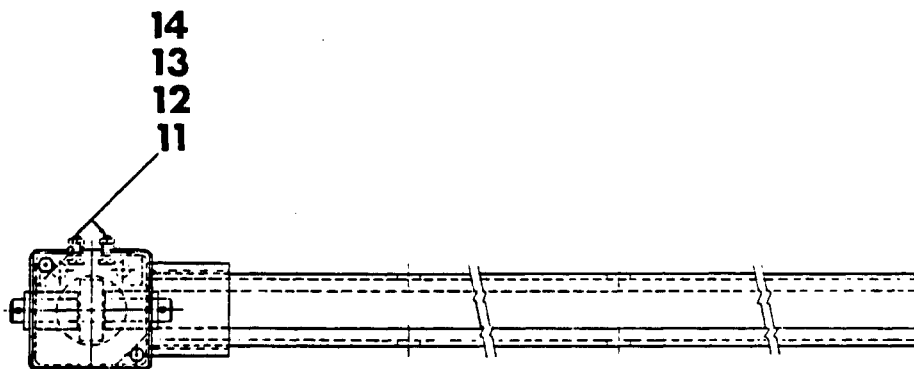
PARTS
SECT. 3
FIG.45B
PAGE 1



REV.

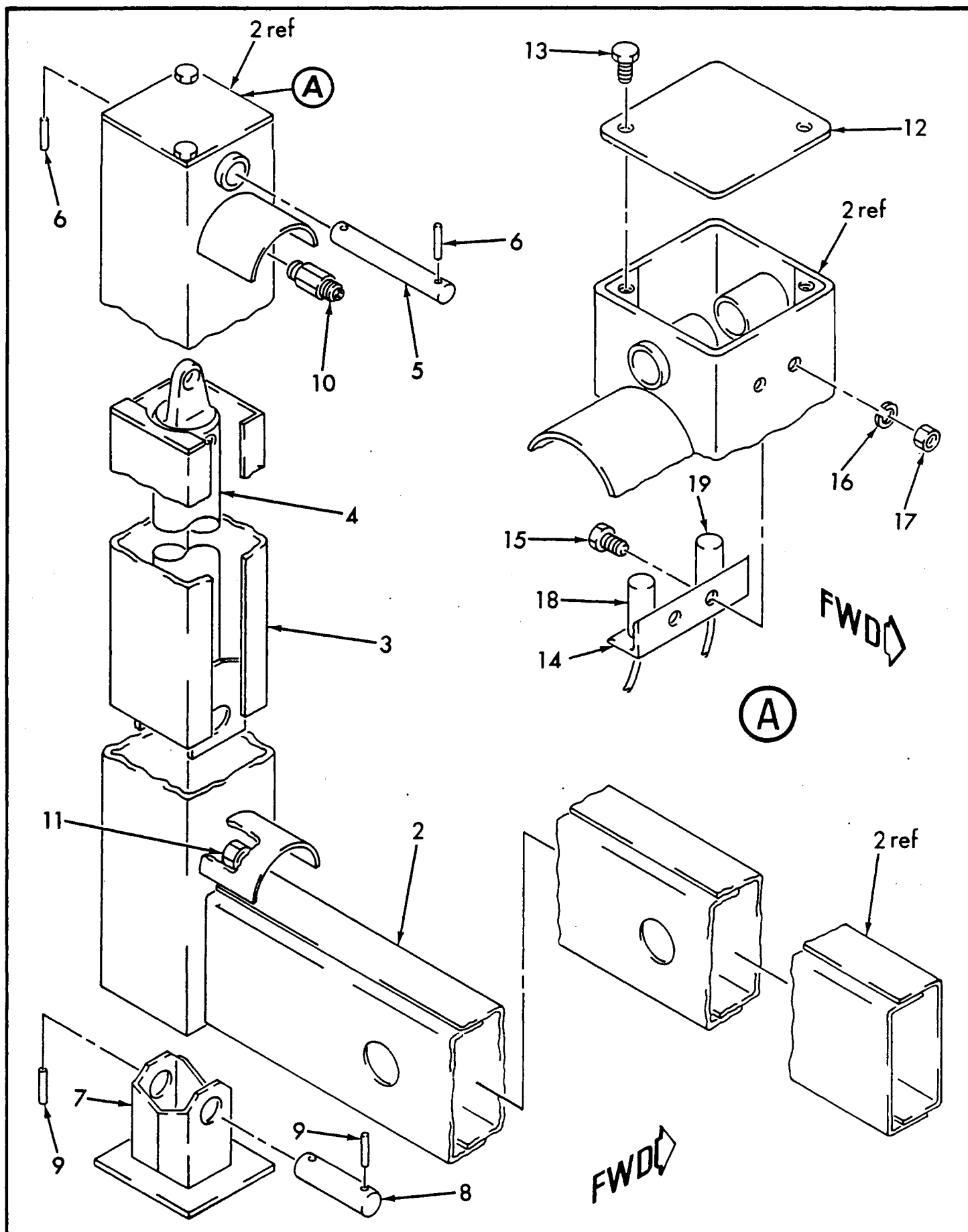


ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30916	ASSEMBLY, HYDRAULIC OUTRIGGER (See Sect. 3, Fig. 4B or Sect. 6, Fig. 9 for NHA)	REF
2	30911	.WELDMENT, HYDRAULIC OUTRIGGER	1
3	30748	.TUBE, SLIDING	1
4	30908	.CYLINDER, HYDRAULIC OUTRIGGER (See Sect. 3, Fig. 47 for Details)	1
5	30902	.PIN, UPPER	1
6	16220	.PIN, ROLL (attaching part)	2
7	30903	.SUPPORT, SLIDING TUBE	1
8	30904	.PIN, LOWER	1
9	16220	.PIN, ROLL (attaching part)	2
10	2487	.CONNECTOR	2



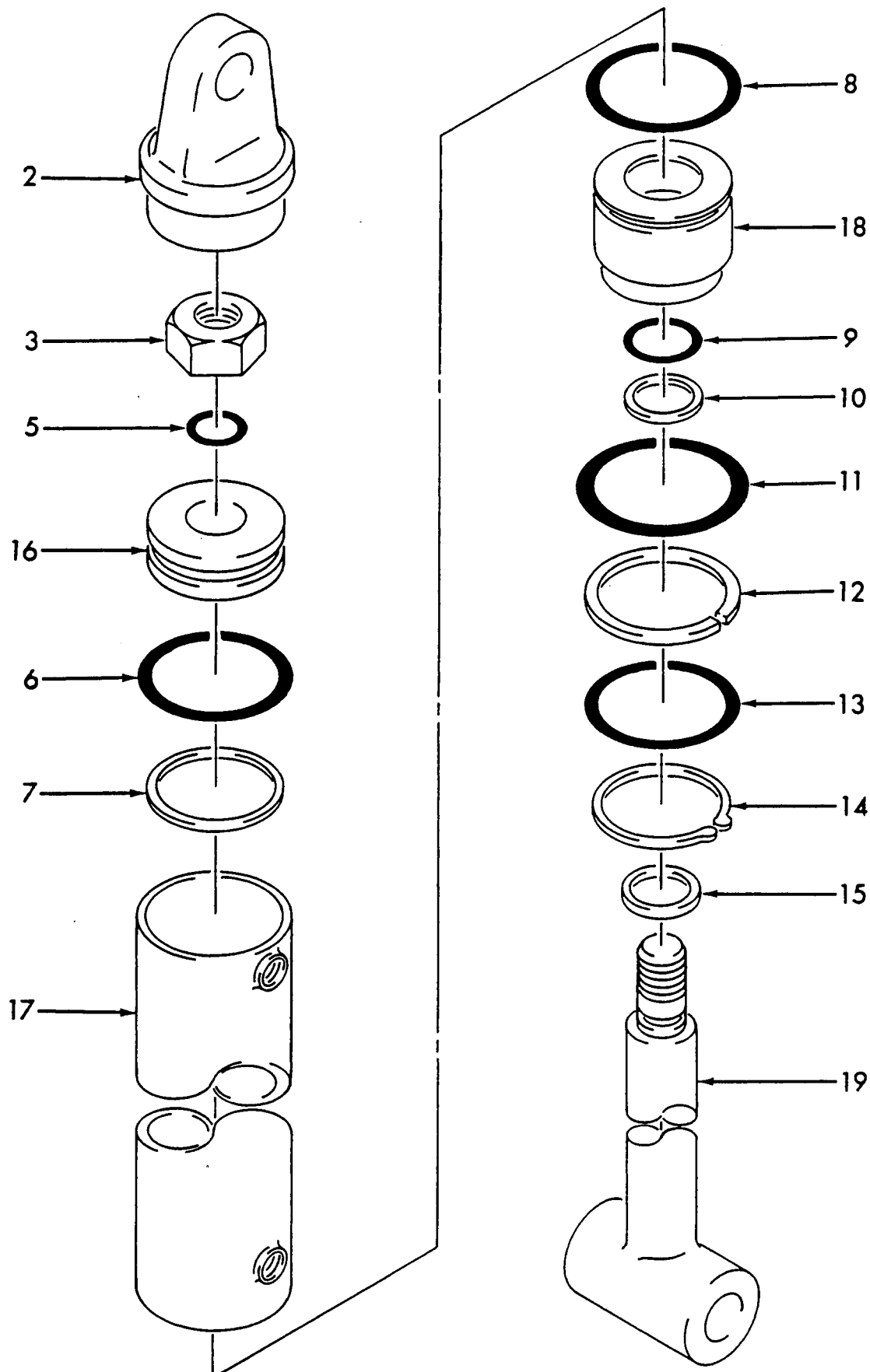


ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	3024-10	ASSEMBLY, HYDRAULIC OUTRIGGER SWITCH (See Sect. 3, Fig. 4A or Sect. 6, Fig. 10 for NHA)	REF
2	3024-2	.HOUSING HYDRAULIC OUTRIGGER	1
3	3024-3	.TUBE, SLIDING	1
4	3024-4	.CYLINDER, HYDRAULIC OUTRIGGER	1
-4A	244-A	..KIT, SEAL	1
5	3024-5	.PIN, LOWER	1
6	3024-6	.SUPPORT, SLIDING TUBE	1
7	3024-7	.CAP, END	1
8	3024-8	.BRACKET, SWITCH	1
9	3024-9	.PIN, UPPER	1
10	16220	.PIN, ROLL	4
11	60309	.SCREW, HEX HEAD CAP	4
12	63401	.WASHER, FLAT	2
13	63301	.WASHER, LOCK	2
14	60701	.NUT, HEX	2
15			
16	4011	.SWITCH, N.O. F	1
17	3024-15	.SUPPORT, HYDRAULIC OUTRIGGER	1
-18	2592	.CONNECTOR	1
-19	2487	.CONNECTOR	1



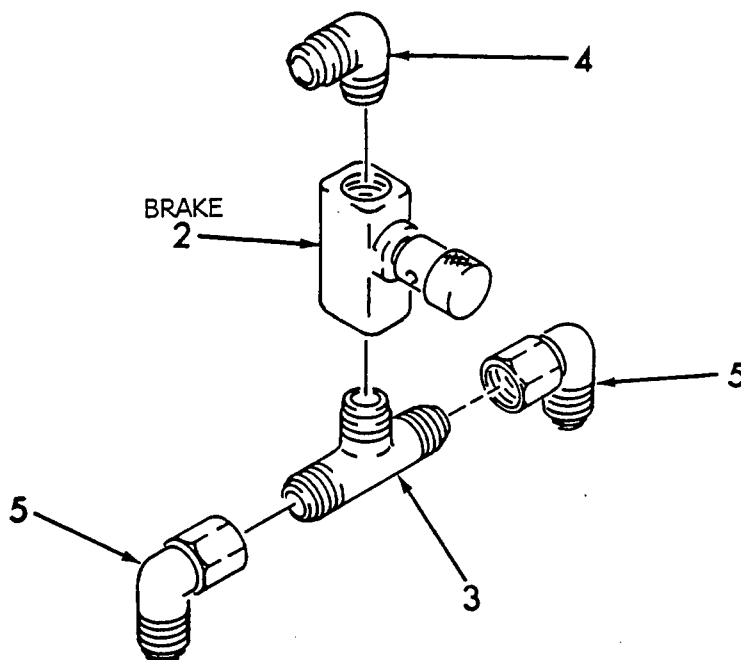


ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30909	ASSEMBLY, HYDRAULIC OUTRIGGER (See Sect. 3, Fig. 4B or Sect. 6, Fig. 10 for NHA)	REF
2	30919	.WELDMENT, HYDRAULIC OUTRIGGER	1
3	30917	.TUBE, SLIDING	1
4	30908	.CYLINDER, HYDRAULIC OUTRIGGER (See Sect. 3, Fig. 47 for Details)	1
5	30902	.PIN, UPPER	1
6	16220	.PIN, ROLL (attaching part)	2
7	30903	.SUPPORT, SLIDING TUBE	1
8	30904	.PIN, LOWER	1
9	16220	.PIN, ROLL (attaching part)	2
10	2592	.CONNECTOR	1
11	2487	.CONNECTOR	1
12	30909	.CAP, END	1
13	60309	.SCREW, CAP (attaching part)	2
14	30901	.BRACKET, SWITCH	1
15	60309	.SCREW, CAP (attaching part)	2
16	63301	.WASHER, LOCK (attaching part)	2
17	60701	.NUT, HEX (attaching part)	2
18	4011	.SWITCH, PUSH BUTTON	1
19	4012	.SWITCH, PUSH BUTTON	1

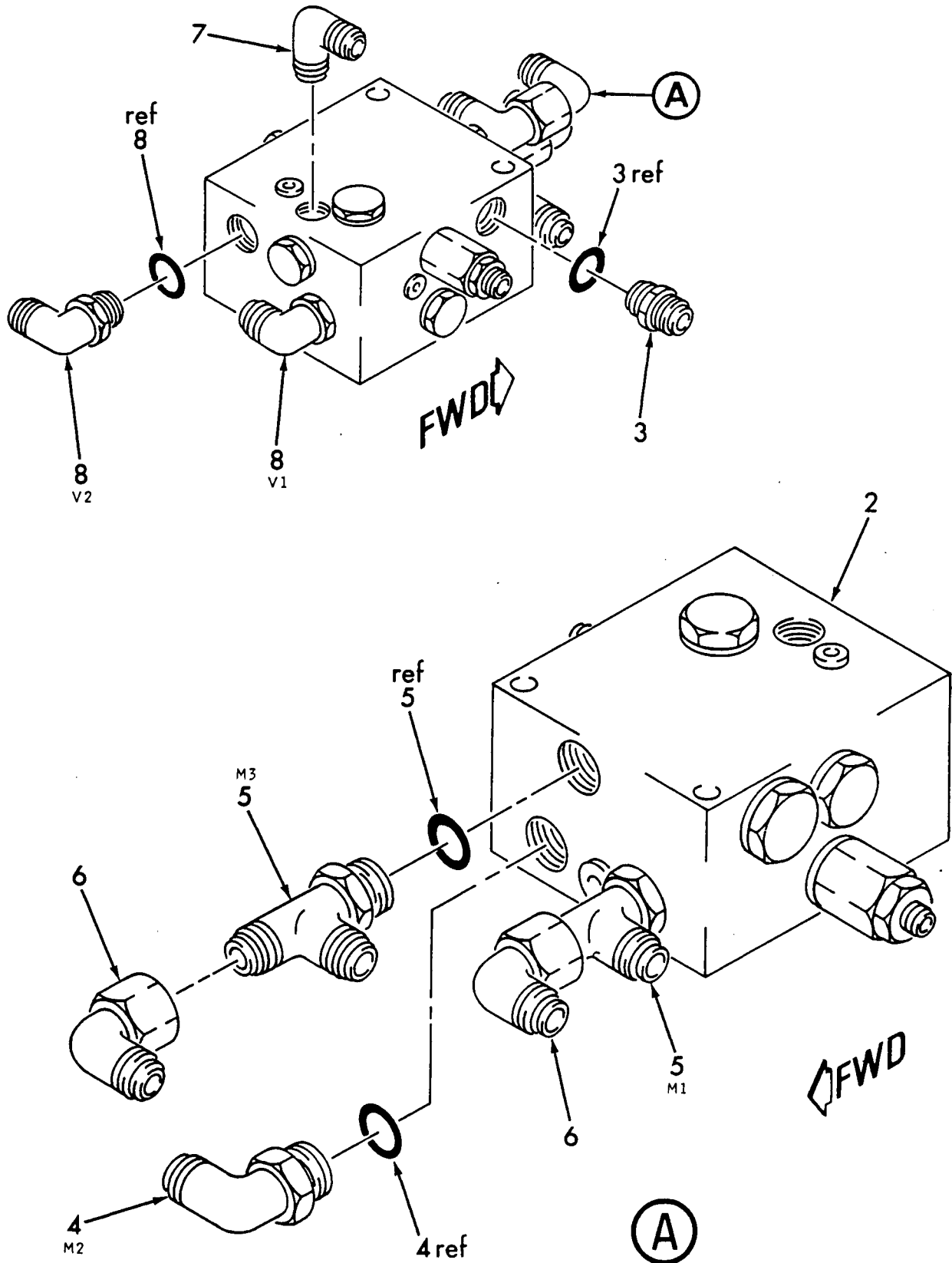




ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30908	CYLINDER, HYDRAULIC OUTRIGGER (See Sect. 3, Fig. 45B or 46B for NHA)	REF
2		.HEAD, CYLINDER	1
3		.NUT, LOCK	1
-4	244-A	.KIT, SEAL	1
5		..O-RING	1
6		..O-RING	1
7		..RING, SLIPPER	1
8		..O-RING	1
9		..O-RING	1
10		..WASHER	1
11		..O-RING	1
12		..WASHER, BACK-UP	1
13		..RING, LOCK	1
14		..RING, RETAINER	1
15		..SEAL, WIPER	1
16		.PISTON	1
17		.TUBE, CYLINDER	1
18		.BEARING	1
19		.ROD, CHROME PLATED	1

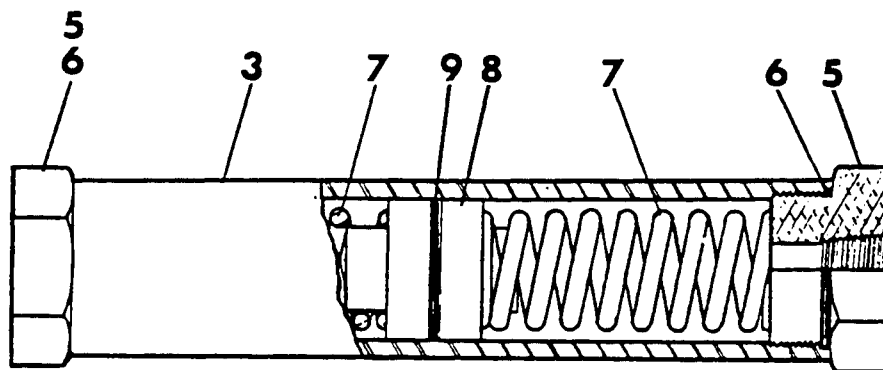
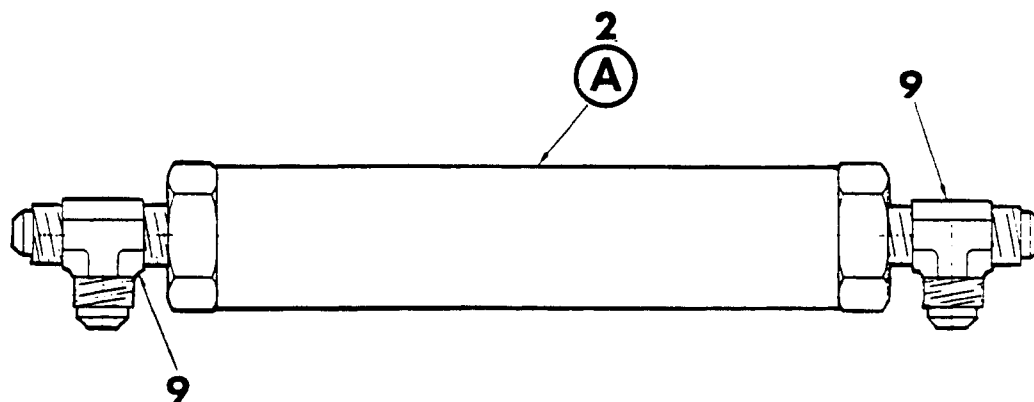


ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32579	ASSEMBLY, FLOW CONTROL PANEL (See Sect. 3, Fig. 2C or 4B for NHA)	REF
2	30884	.VALVE, FLOW CONTROL	1
3	80034-03	.TEE, MALE BRANCH	1
4	80008-03	.EELBOW, MALE	1
5	80015-03	.ELBOW, SWIVEL	2





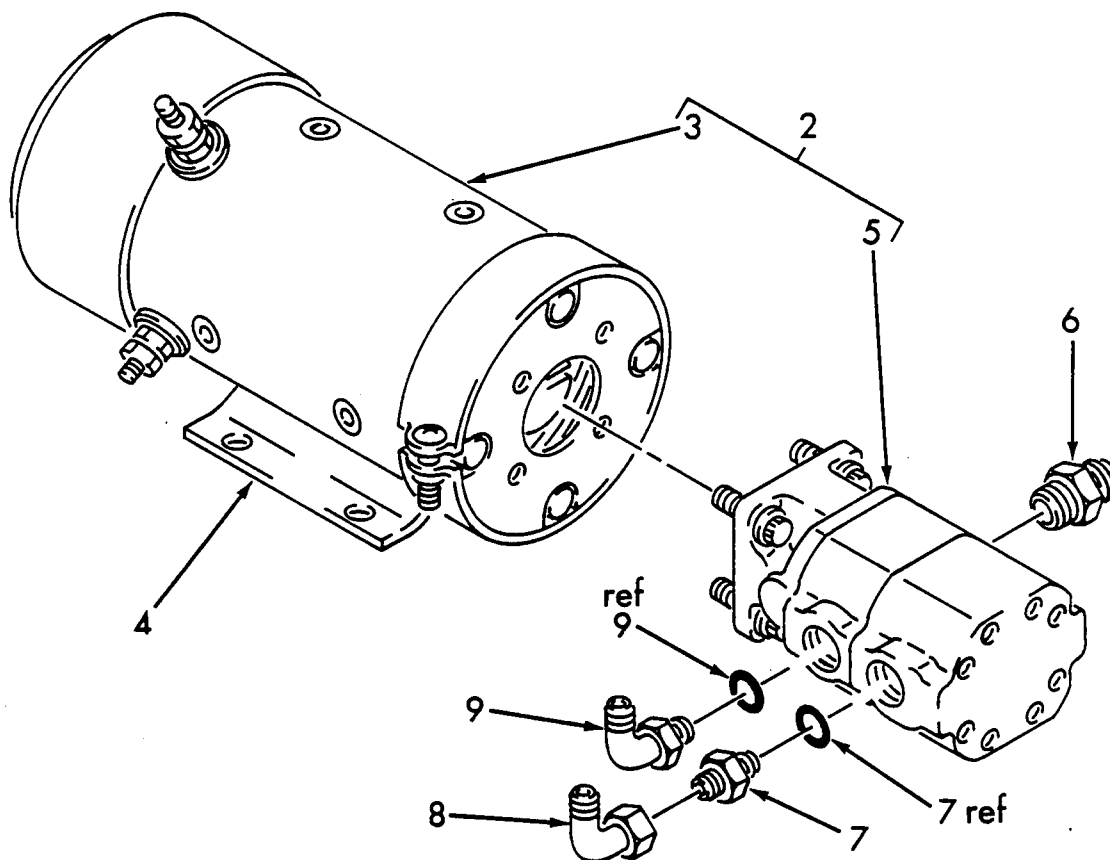
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32475	ASSEMBLY, DRIVE/BRAKE VALVE (See Sect. 3, Fig. 2C for NHA)	REF
2	21214	.VALVE, DRIVE/BRAKE	1
3	80004-11	.CONNECTOR	1
4	80012-11	.ELBOW (M2)	1
5	80033-11	.TEE (M1, M3)	2
6	80015-15	.ELBOW, SWIVEL NUT	2
7	80008-04	.ELBOW, MALE	1
8	80012-16	.ELBOW (V1, V2)	2



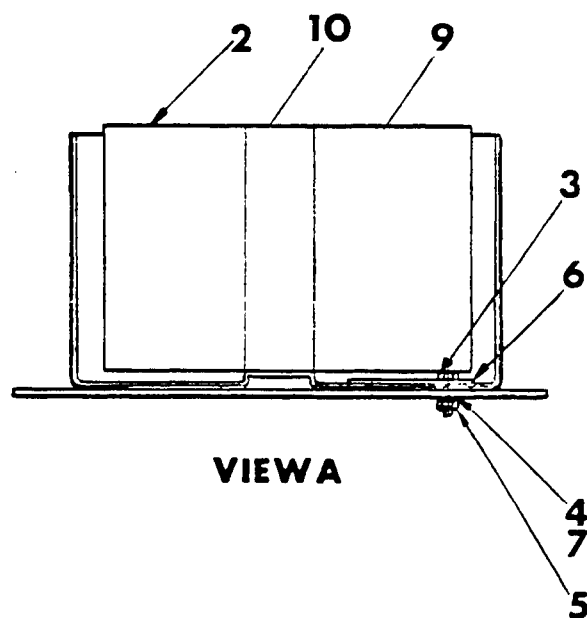
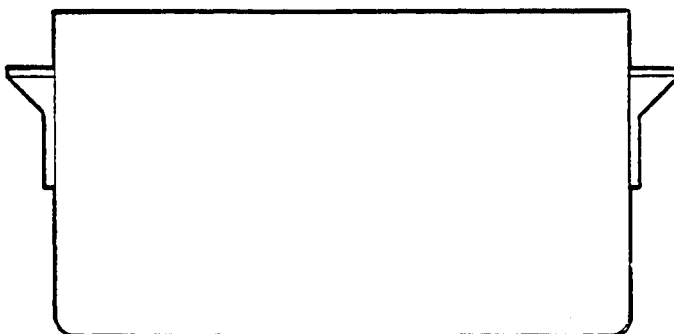
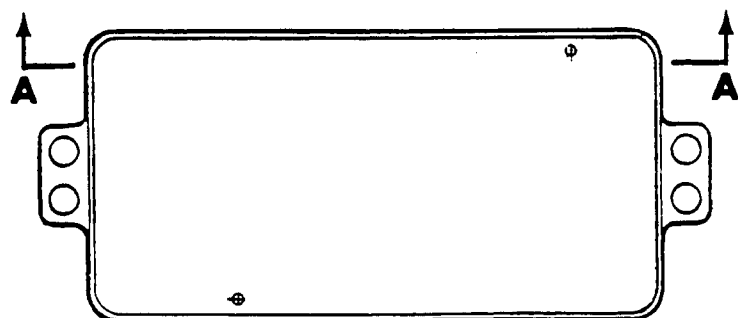
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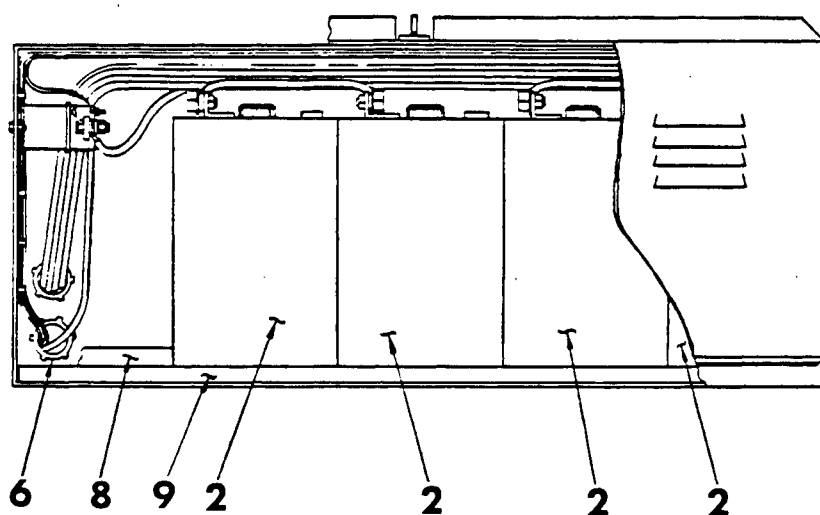
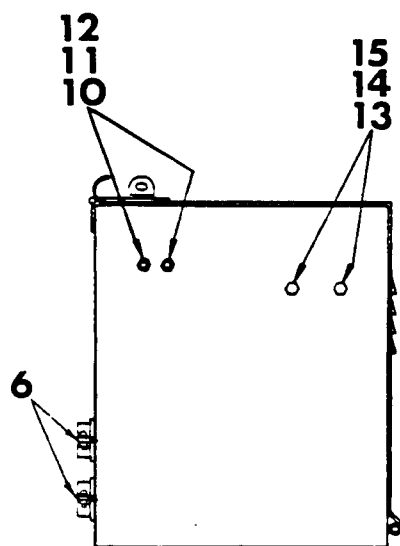
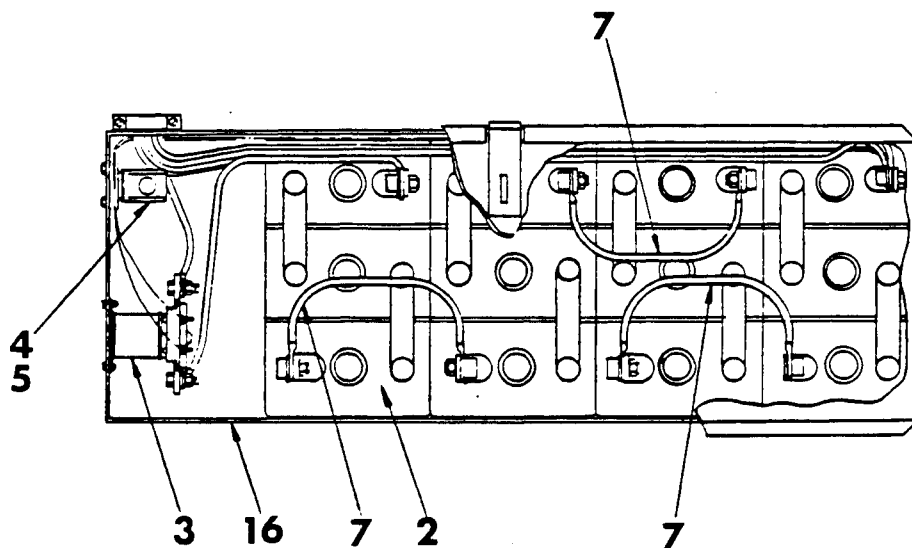
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30496	ASSEMBLY, CUSHION CYLINDER (See Sect. 3, Fig. 2A, 2B, 3A 3B, 4A or 4B for NHA)	REF
2	31211	.CYLINDER, CUSHION (NEW)	1
3		..CYLINDER	1
-4	66788	..KIT, SEAL	1
5		..PLUG, END	2
6		..PLUG, END	2
7	66893	..SPRING	2
8		..PISTON	1
9		..RING, QUAD	1
10	80037-12	.TEE, MALE RUN	2
-11	44	.CYLINDER, CUSHION (OLD)	1
-12	44-A	..KIT, SEAL	1
-13	44-B	..SPRING	2
-14	66757	..PLUG, END (7392-020P)	2
-15	80031-06	.TEE, MALE RUN	2



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32577	ASSEMBLY, HYDRAULIC MOTOR AND PUMP (See Sect. 3, Fig. 3B for NHA)	REF
2	81192	.MOTOR AND PUMP, HYDRAULIC	1
3	3015-2	..ASSEMBLY, MOTOR	1
-4	2793	...BRUSHES	1
5	81192-1	..ASSEMBLY, PUMP	1
6	80001-20	.CONNECTOR, MALE	1
7	80004-11	.CONNECTOR	1
8	80015-06	.ELBOW, SWIVEL NUT	1
9	80012-16	.ELBOW	1

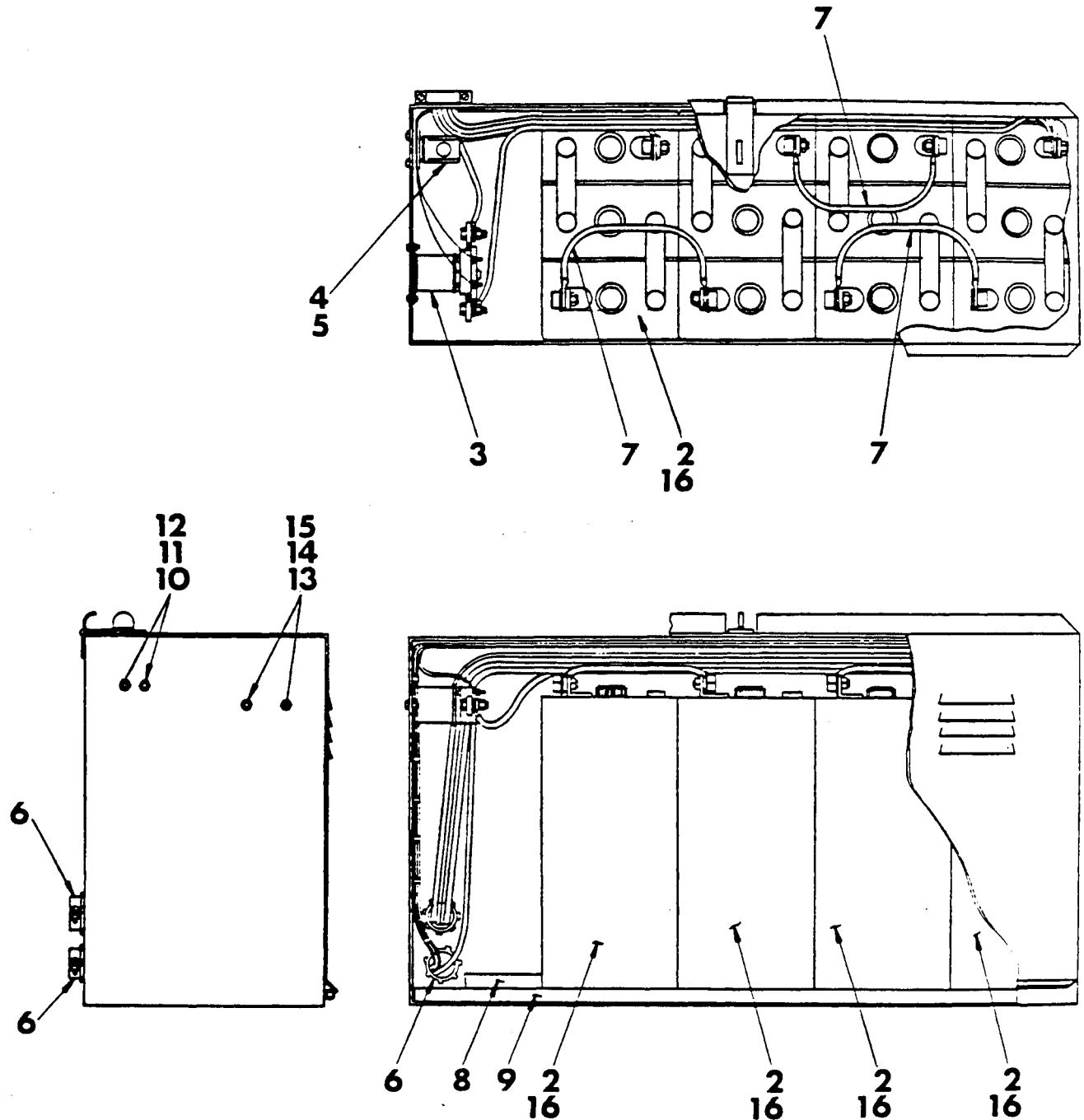


ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	9064	ASSEMBLY, BATTERY BOX (See Sect. 3, Fig. 2A or 4A for NHA)	REF
2	4030	.BATTERY (See Chapter Vendor for Details)	1
3	60131	.SCREW, HEX HEAD CAP	2
4	63301	.WASHER, LOCK	2
5	60701	.NUT, HEX	2
6	9080	.BAR, BATTERY BOX	2
7	63041	.WASHER, FLAT	4
-8	782	.ASSEMBLY, BATTERY BOX	1
9		..TOP, BATTERY BOX	1
10	16935	..STRAP, BATTERY BOX	1



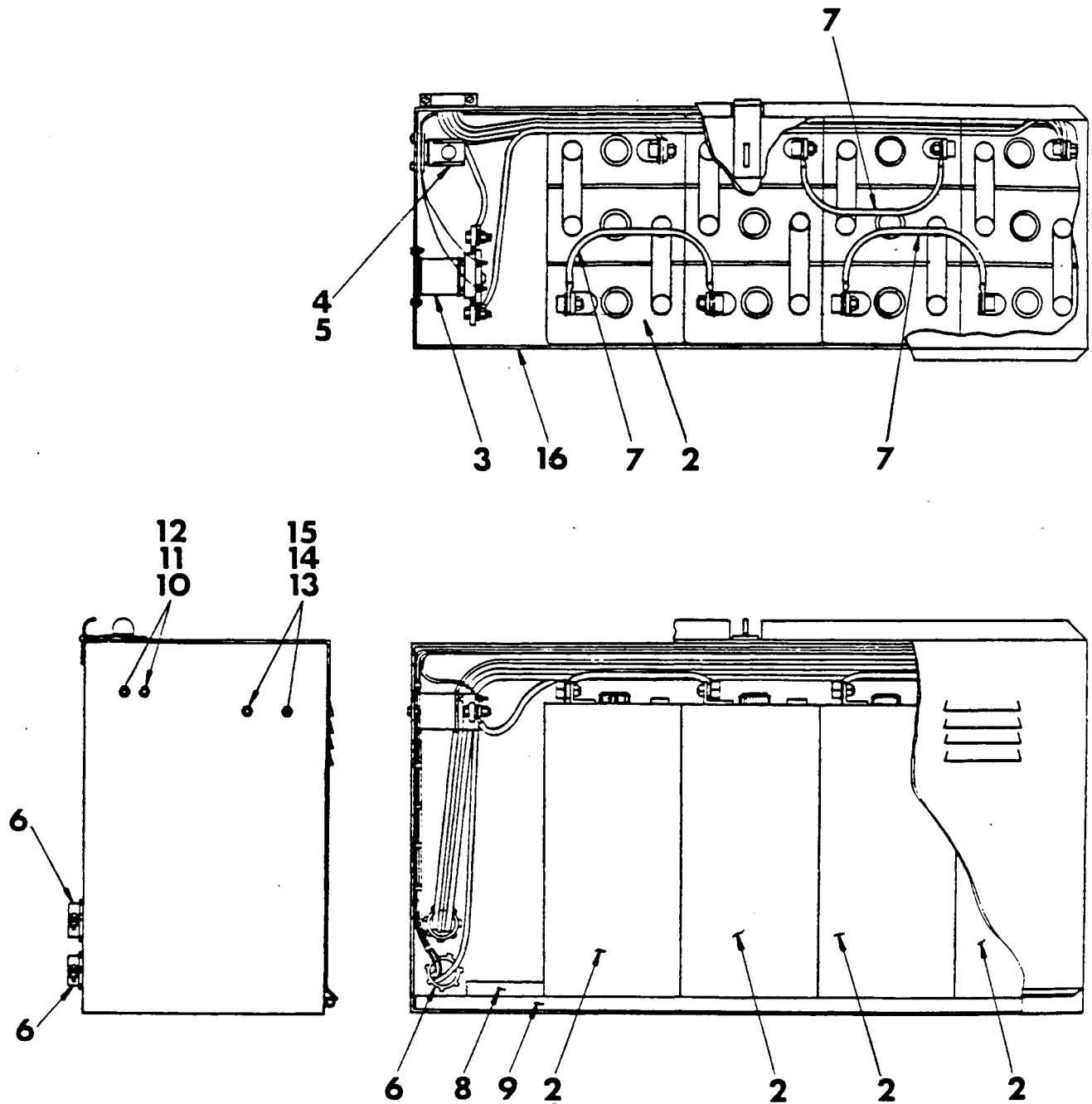


ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30861	ASSEMBLY, BATTERY BOX (See Sect. 3, Fig. 3A for NHA)	REF
2	4007	.BATTERY (See Chapter Vendor for Details)	4
3	4083	.RELAY	1
4	784-A	.SOCKET, RELAY	1
5	4032	.RELAY	1
6	213	.CONNECTOR, ROMEX	2
7	OR 63A	.CABLE, BATTERY	3
8	65139	.PLYWOOD	1
9	65277	.PLYWOOD	1
10	62609	.SCREW, SLOTTED ROUND HEAD	2
11	61501	.NUT, HEX	2
12	63311	.WASHER, LOCK	2
13	60158	.SCREW, HEX HEAD CAP	2
14	60701	.NUT, HEX	2
15	63301	.WASHER, LOCK	2
16	8317	.BOX, BATTERY	1



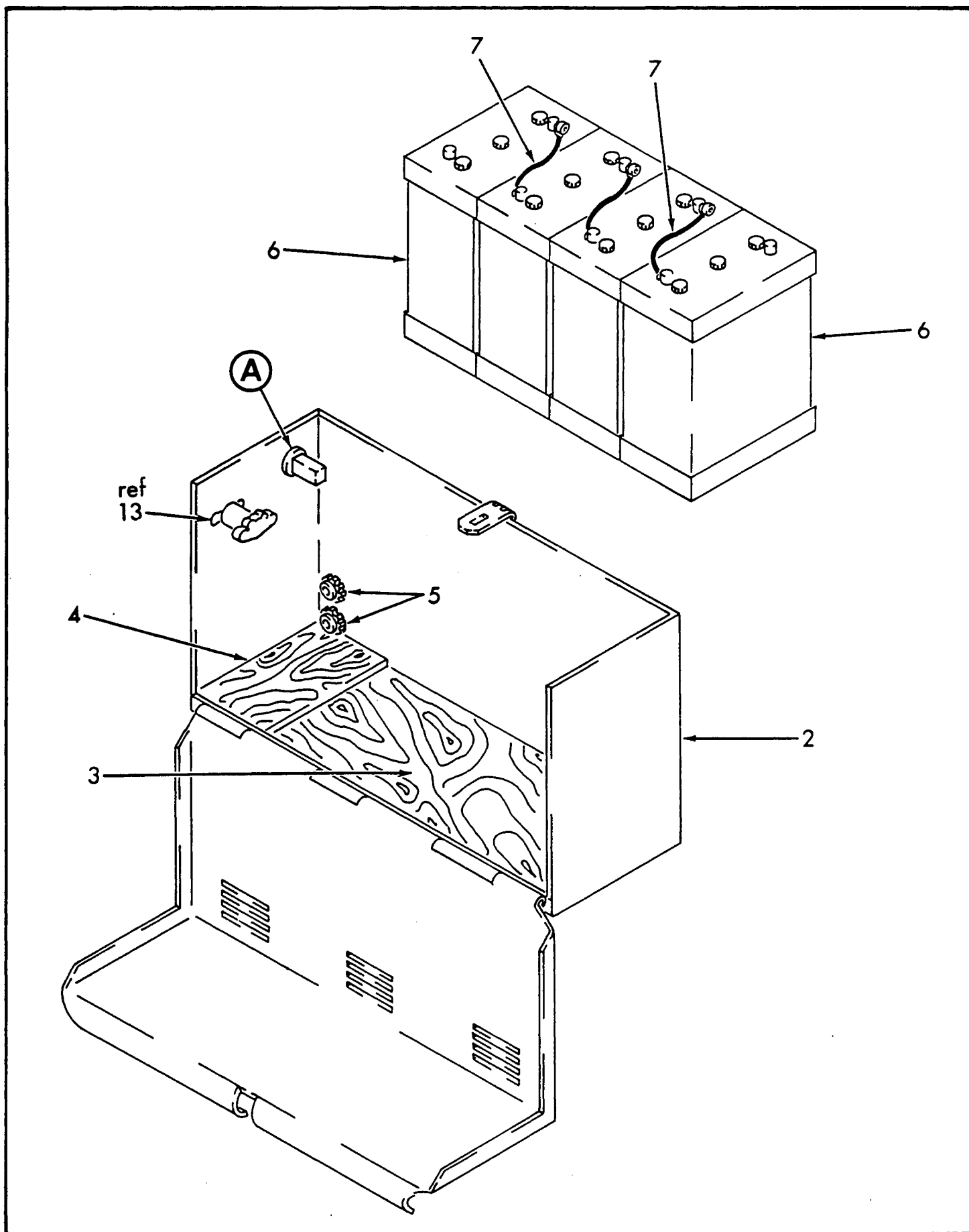


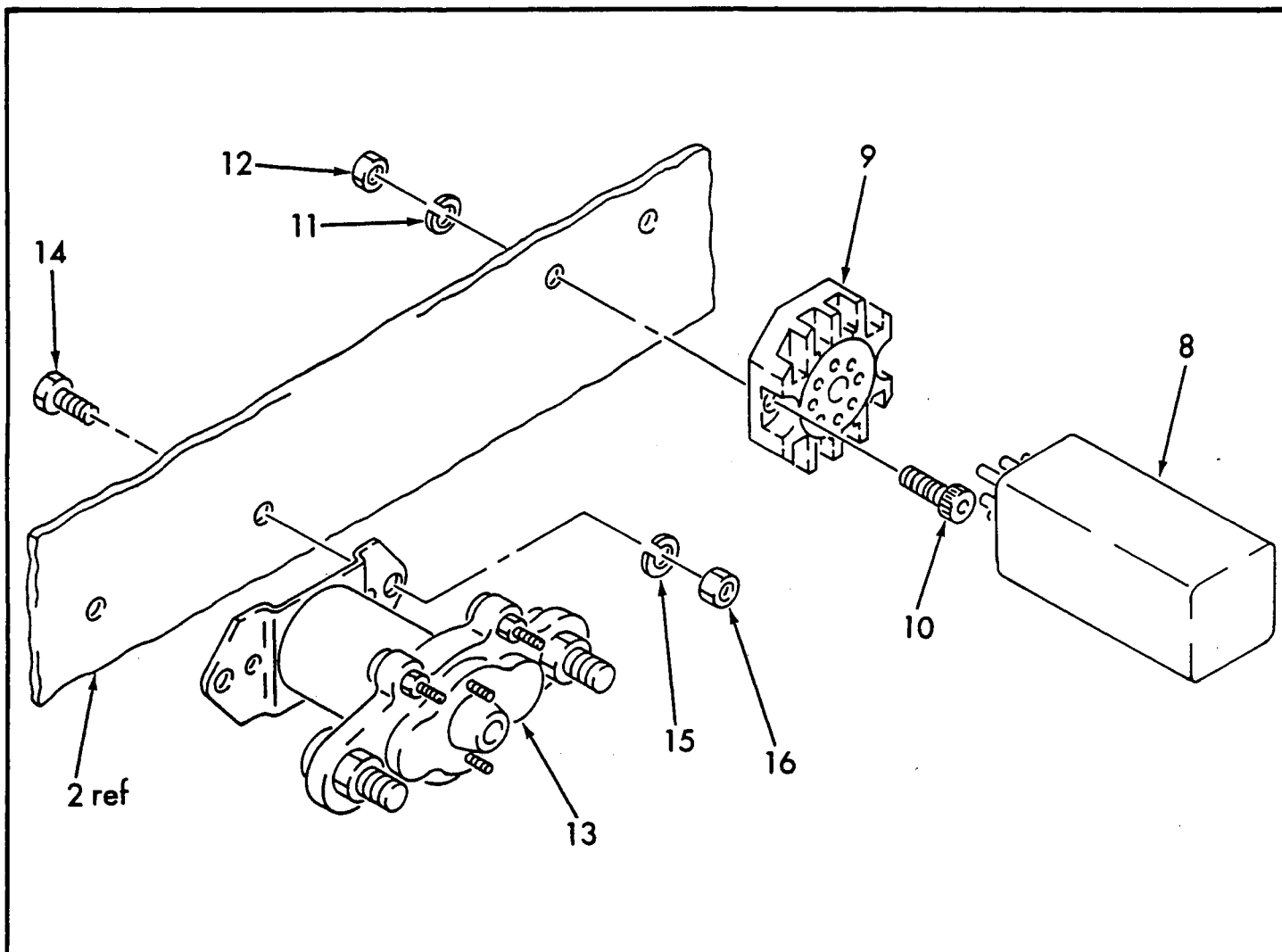
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	8317	ASSEMBLY, BATTERY BOX (See Sect. 3, Fig. 3A for NHA)	REF
2	4007	.BATTERY (See Chapter Vendor for Details)	4
3	4083	.RELAY	1
4	784-A	.SOCKET, RELAY	1
5	4032	.RELAY	1
6	213	.CONNECTOR, ROMEX	6
7	63A	.CABLE, BATTERY	9
8	65139	.PLYWOOD	3
9	4J	.PLYWOOD	3
10	62609	.SCREW, SLOTTED RD. HEAD	2
11	61501	.NUT, HEX	2
12	63311	.WASHER, LOCK	2
13	60158	.SCREW, HEX HEAD CAP	2
14	60701	.NUT, HEX	2
15	63301	.WASHER, LOCK	2





ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30466	ASSEMBLY, BATTERY BOX (See Sect. 3, Fig. 3A or 3B for NHA)	REF
2	30297	.BATTERY, 6 VOLT (See Vendor Chap. for more Information)	8
3	4083	.RELAY, 400 AMP	1
4	784-A	.SOCKET, RELAY	1
5	4032	.RELAY, 6 VOLT	1
6	213	.CONNECTOR, ROMEX	4
7	13226-0120	.CABLE, BATTERY (12")	6
8	65139	.PLYWOOD	2
9	65277	.PLYWOOD	2
10	62609	.SCREW, SLOTTED RD. HEAD	2
11	61501	.NUT, HEX	2
12	63311	.WASHER, LOCK	2
13	60158	.SCREW, HEX HEAD CAP	2
14	60701	.NUT, HEX	2
15	63301	.WASHER, LOCK	2
16	30287	.BOX, BATTERY	2





ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30466	ASSEMBLY, BATTERY BOX NO. 1 (See Sect. 3, Fig. 3B for NHA)	REF
2	30287	.BOX, BATTERY	1
3	65277	.PLYWOOD	1
4	65139	.PLYWOOD	1
5	213	.CONNECTOR	2
6	30297	.BATTERY (See Vendor Chap. for more Information)	4
7	13226-0120	.CABLE, BATTERY	3
8	4032	.RELAY	1



PARTS CATALOG

BATTERY BOX NO. 1 ASSEMBLY (AFT. JUL. '86)

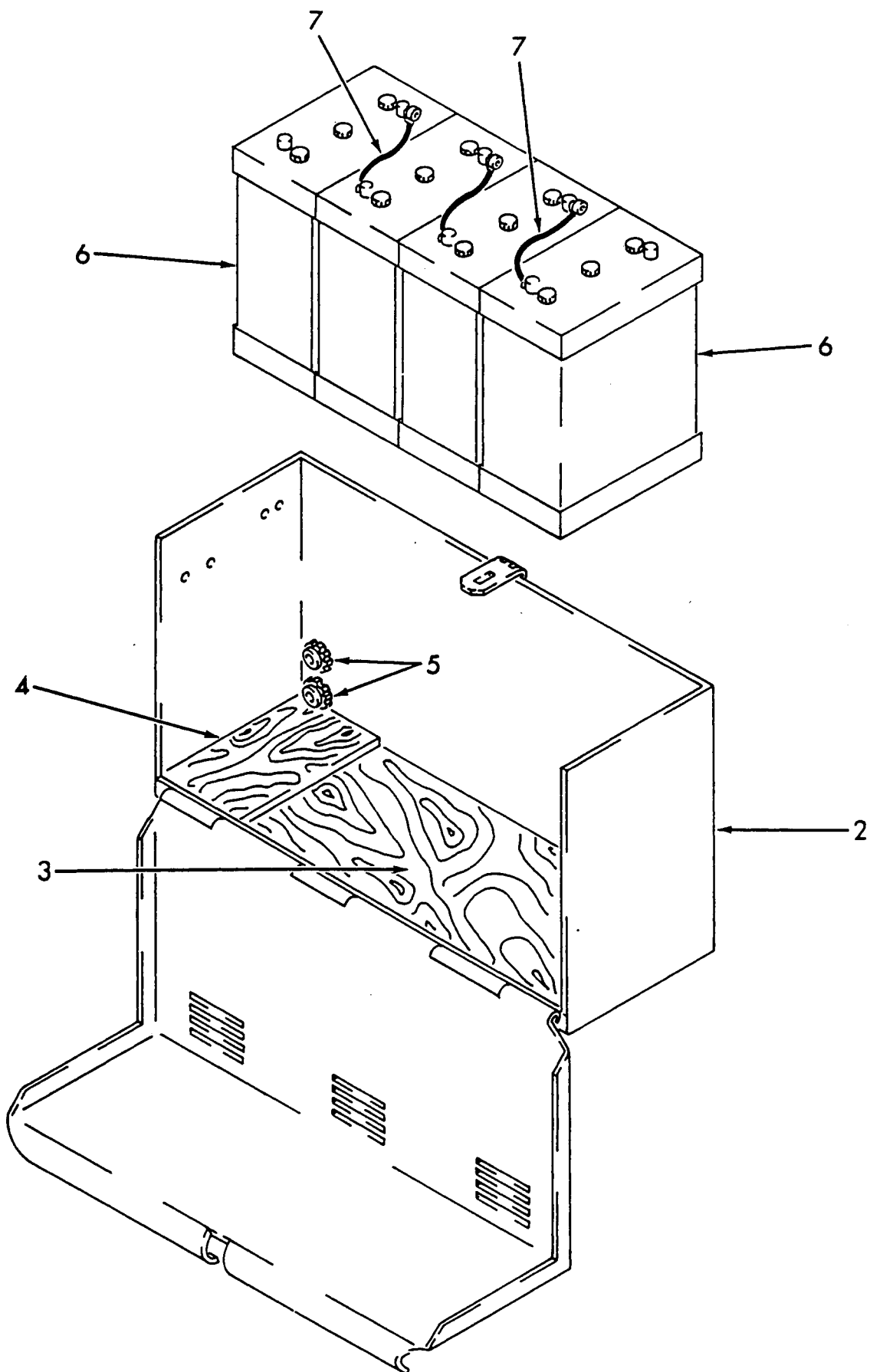
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PARTS
SECT. 3
FIG. 54
PAGE 3

ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
9	784-A	.SOCKET, 8 PIN	1
10	62609	.SCREW, MACHINE (attaching part)	2
11	63311	.WASHER, LOCK (attaching part)	2
12	61501	.NUT (attaching part)	2
13	4083	.RELAY	1
14	60353	.SCREW, CAP (attaching part)	2
15	63301	.WASHER, LOCK (attaching part)	2
16	60701	.NUT (attaching part)	2

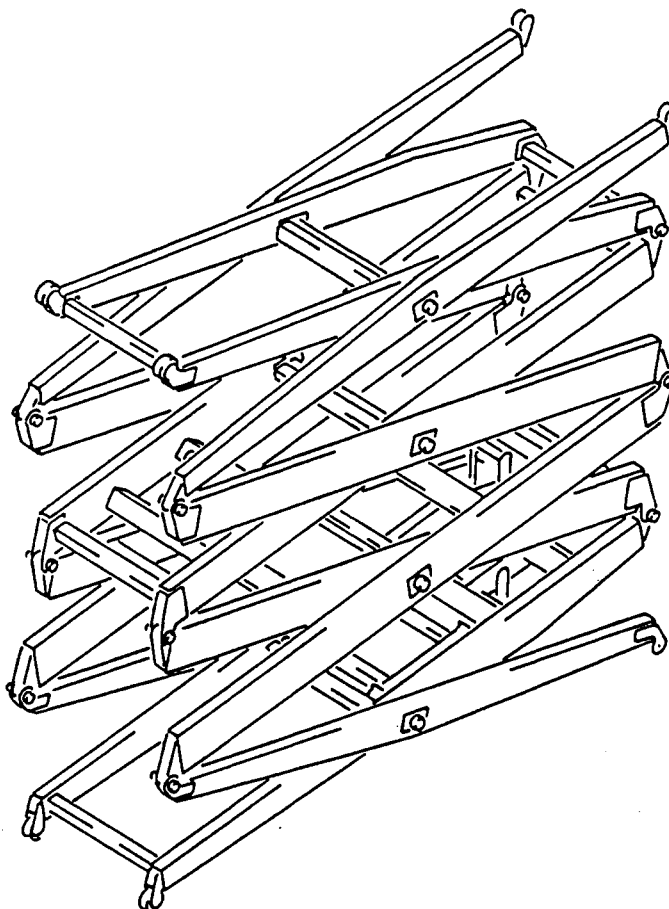
REV.

- ITEM NOT ILLUSTRATED





ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32586	ASSEMBLY, BATTERY BOX NO. 2 (See Sect. 3, Fig. 3C for NHA)	REF
2	30287	.BOX, BATTERY	1
3	65277	.PLYWOOD	1
4	65139	.PLYWOOD	1
5	213	.CONNECTOR	1
6	30297	.BATTERY (See Vendor Chap. for more Information)	4
7	13226-0120	.CABLE, BATTERY	3



THIS SECTION 4 IS ILLUSTRATED AS

FIGURE 1 SCISSOR ASSEMBLY

FIGURE 2A MAIN LIFT CYLINDER ASSEMBLY (BEF. NOV. '81)

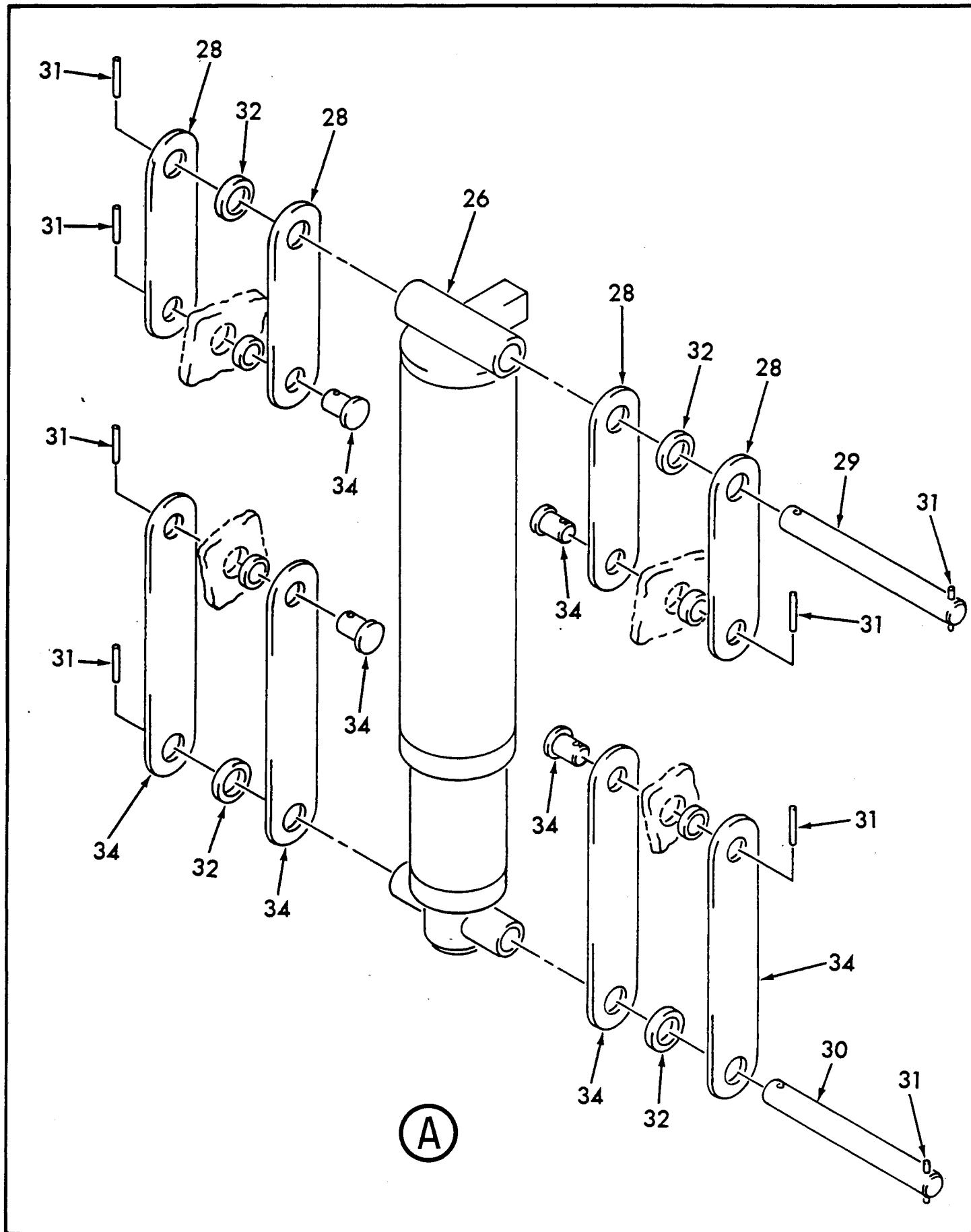
FIGURE 2B MAIN LIFT CYLINDER ASSEMBLY (AFT. NOV. '81)



SCISSOR ASSEMBLY

PARTS
SECT. 4
FIG. 1
PAGE 1



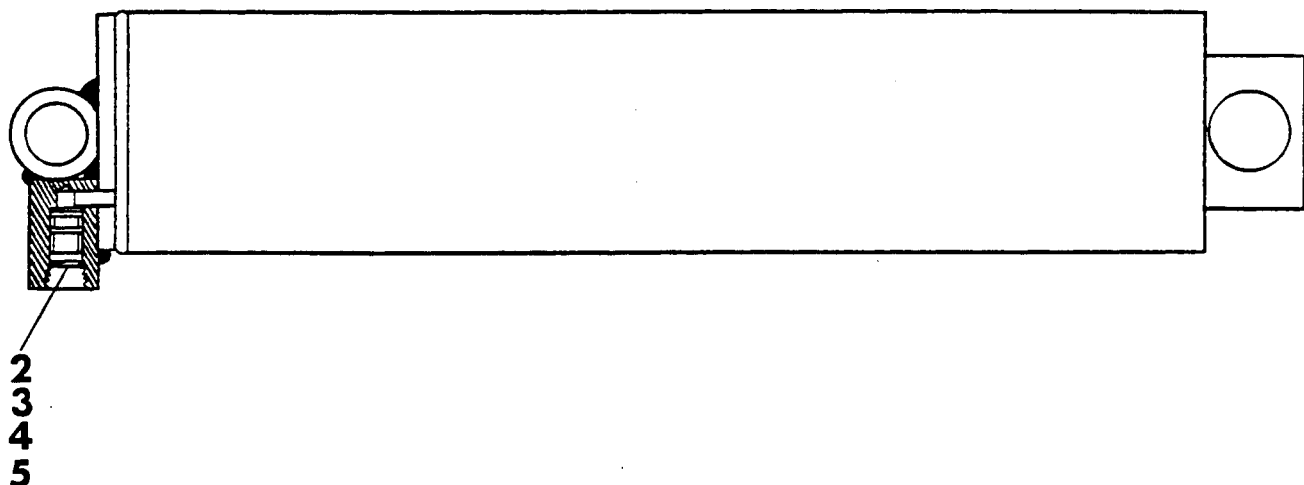




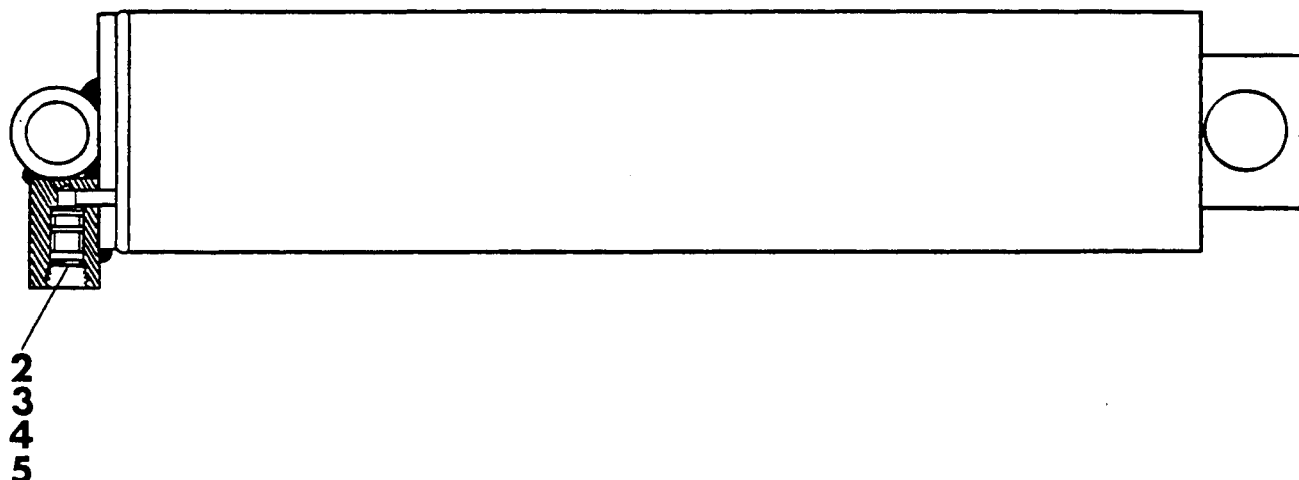
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	8115	ASSEMBLY, SCISSOR (See Sect. 2, Fig. 1A, 1B, 2, 3A or 3B for NHA)	REF
2	8023	.ASSEMBLY, LOWER INNER ARM	1
3	8027-1	.ASSEMBLY, LOWER OUTER ARM	1
4	8027-2	.ASSEMBLY, LOWER OUTER ARM	1
5	8026-1	.ASSEMBLY, MIDDLE OUTER ARM	1
6	8026-2	.ASSEMBLY, MIDDLE OUTER ARM	1
7	8022	.ASSEMBLY, MIDDLE INNER ARM	1
8	8025-1	.ASSEMBLY, UPPER OUTER ARM	1
9	8025-2	.ASSEMBLY, UPPER OUTER ARM	1
10	8021	.ASSEMBLY, UPPER INNER ARM	1
11	2361	.ROLLER, DECK	3
12	2362	.ROLLER, V DECK	1
13	35806	.PIN, ROLLER	4
14	63416	.WASHER, FLAT	4
15	35384	.SPACER	4
16	60336	.BOLT, EAR PIVOT	8
17	61310	.NUT, HEX LOCK	8
18	2284	.BEARING, SLEEVE	8
19	117-G	.CONNECTOR, STRAIN RELIEF	12
20	2214	.COLLAR, SHAFT	6
21	2283	.BEARING, FLANGED	12
22	2287	.BEARING, SLEEVE	4
23	62207	.SCREW, SHAFT COLLAR SET	6



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
24	30339	.ASSEMBLY, INNER ARM SUPPORT	1
25	30701	.PIN, QUICK RELEASE	1
26	3006	.ASSEMBLY, LIFT CYLINDER (BEF. NOV. '81) (See Sect. 4, Fig. 2A for Details)	2
-27	30809	.ASSEMBLY, LIFT CYLINDER (AFT. NOV. '81) (See Sect. 4, Fig. 2B for Details)	2
28	8304	.STRAP, CYLINDER	8
29	8303	.PIN, CYLINDER PIVOT	2
30	8302	.PIN, CYLINDER PIVOT	2
31	64206	.PIN, ROLL	16
32	8321	.SPACER	8
33	9033	.PIN, CYLINDER STRAP PIVOT	8
34	8305	.STRAP, CYLINDER	8
35	8077-3	.EAR, ARM END	4
36	8078	.EAR, ARM END	4
37	8076-3	.EAR, ARM END	6
38	8076-1	.EAR, ARM END	4
39	8098	.EAR, ARM END	8
40	8079-3	.EAR, ARM END	2
41	8076-1	.EAR, ARM END	2
42	8079-1	.EAR, ARM END	2
43	8077-1	.EAR, ARM END	4



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	3006	ASSEMBLY, MAIN LIFT CYLINDER (HCE) (See Sect. 2, Fig. 1A, 2, 3A, or Sect. 4, Fig. 1 for NHA)	REF
-2	3059(31091)	.CARTRIDGE, VALVE	1
3	31119	.SPACER	1
4	80004-14	.ADAPTER	1
5	3006-A	.KIT, SEAL	1

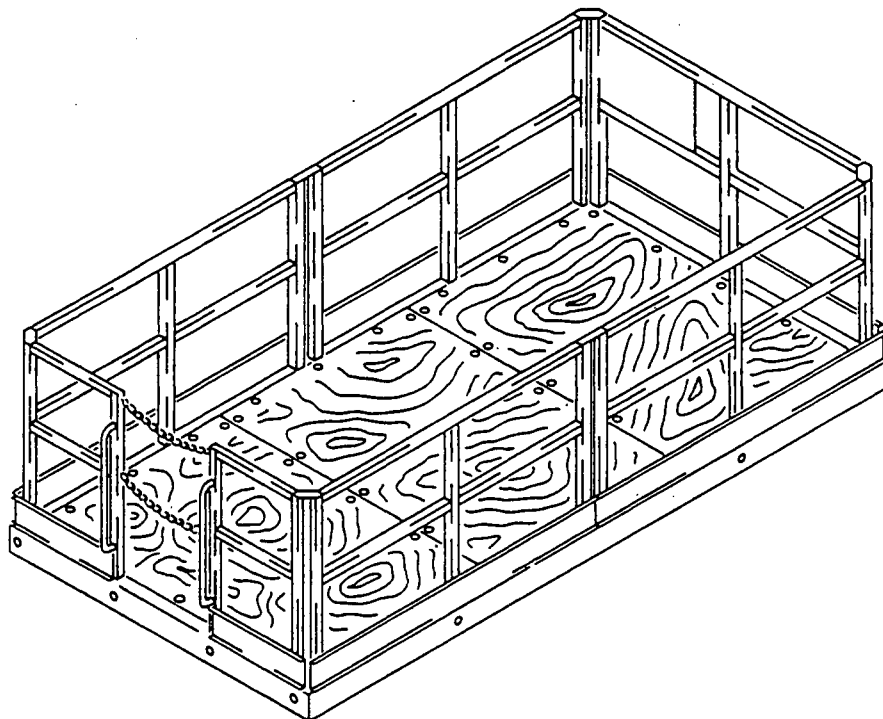


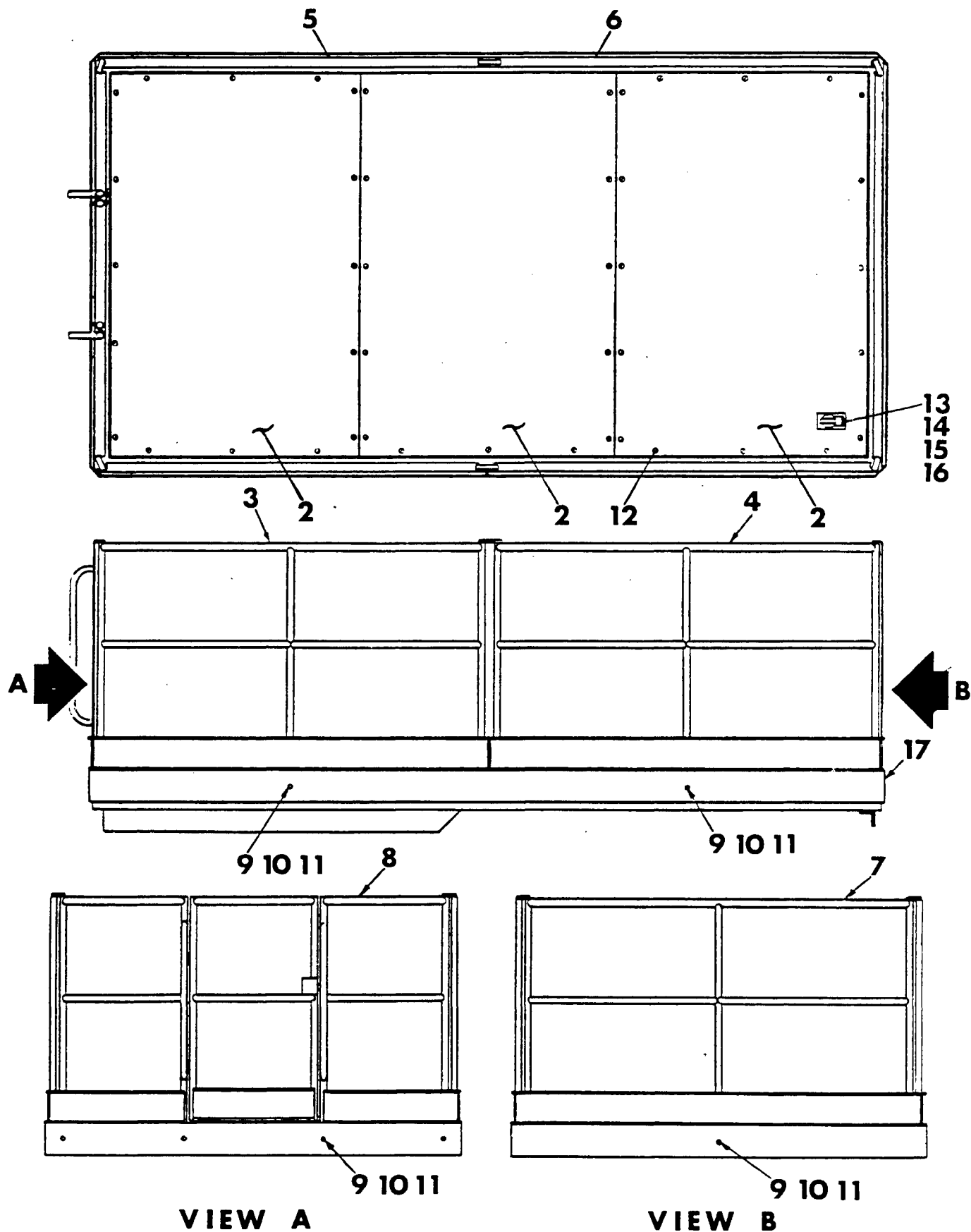
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30809	ASSEMBLY, MAIN LIFT CYLINDER (See Sect. 2, Fig. 1A, 2, 3A or Sect. 4, Fig. 1 for NHA)	REF
2	3059 (31091)	.CARTRIDGE, VALVE	1
3	31119	.SPACER	1
4	80004-11	.ADAPTER	1
5	66258	.KIT, SEAL (HYDRA-CYL.)	1
-6	66560	.KIT, SEAL (R.A.)	1
-7	67042	.KIT, SEAL (SIERRA - 5½ x 4½)	1
-8	67043	.KIT, SEAL (SIERRA - 5 x 4)	1



THIS SECTION 5 IS ILLUSTRATED AS

- FIGURE 1A DECK ASSEMBLY (BEF. JUL. '86)
- FIGURE 1B DECK ASSEMBLY (AFT. JUL. '86)
- FIGURE 2A HAND CONTROL BOX ASSEMBLY (RT-31G) (BEF. JUL. '86)
- FIGURE 2B UPPER CONTROL BOX ASSEMBLY (RT-31G) (AFT. JUL. '86)
- FIGURE 3 HAND CONTROL BOX ASSEMBLY (RT-31E)
- FIGURE 4A HAND CONTROL BOX ASSEMBLY (SRT-31G) (BEF. JUL. '86)
- FIGURE 4B UPPER CONTROL BOX ASSEMBLY (SRT-31G) (AFT. JUL. '86)





**Mark Industries**

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PARTS CATALOG

DECK ASSEMBLY (BEF. JUL. '86)

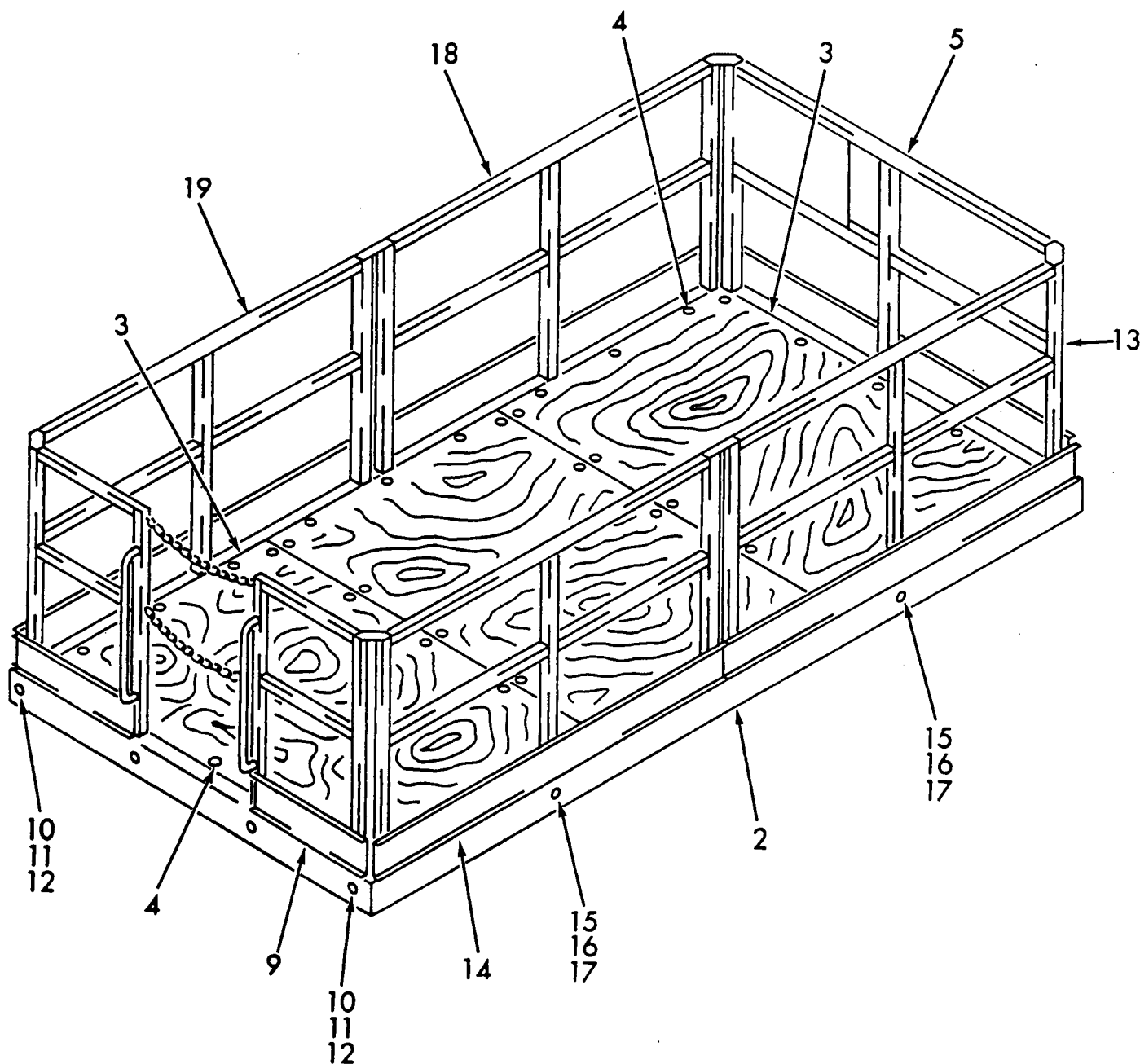
(continued)

PARTS
SECT. 5
FIG. 1A
PAGE 2

ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30556	ASSEMBLY, DECK (See Sect. 2, Fig. 1A, 2 or 3A for NHA)	REF
2	30553	.PLYWOOD	3
3	30568	.RAIL, GUARD	1
4	30569	.RAIL, GUARD	1
5	30566	.RAIL, GUARD	1
6	30567	.RAIL, GUARD	1
7	30541	.RAIL, GUARD	1
8	30561	.RAIL, GUARD	1
9	60154	.SCREW, HEX HEAD CAP	9
10	63301	.WASHER, LOCK	9
11	60701	.NUT, HEX	9
12	61706	.SCREW, SELF TAPPING	48
13	20515	.RECEPTACLE	1
14	356	.COVER, BELL BOX	1
15	355	.BOX, BELL	1
16	62614	.SCREW, ROUND HEAD MACHINE	2
17	30507	.WELDMENT, DECK	1

REV.

- ITEM NOT ILLUSTRATED





ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32049	ASSEMBLY, DECK (See Sect. 2, Fig. 1B, 2 or 3B for NHA)	REF
2	32051	.WELDMENT, DECK	1
3	30553	.PLYWOOD, DECK	3
4	61706	.SCREW, CAP (attaching part)	48
5	32052	.WELDMENT, GUARD	1
-6	60341	.SCREW, CAP (attaching part)	1
-7	63301	.WASHER, LOCK (attaching part)	1
-8	60701	.NUT, HEX (attaching part)	1
9	32055	.WELDMENT, GUARD	1
10	60341	.SCREW, CAP (attaching part)	4
11	63301	.WASHER, LOCK (attaching part)	4
12	60701	.NUT, HEX (attaching part)	4
13	32053	.WELDMENT, GUARD	1
14	32054	.WELDMENT, GUARD	1
15	60341	.SCREW, CAP (attaching part)	2
16	63301	.WASHER, LOCK (attaching part)	2
17	60701	.NUT, HEX (attaching part)	2
18	32057	.WELDMENT, GUARD	1
19	32056	.WELDMENT, GUARD	1
-20	60341	.SCREW, CAP (attaching part)	2
-21	63301	.WASHER, LOCK (attaching part)	2
-22	60701	.NUT, HEX (attaching part)	2

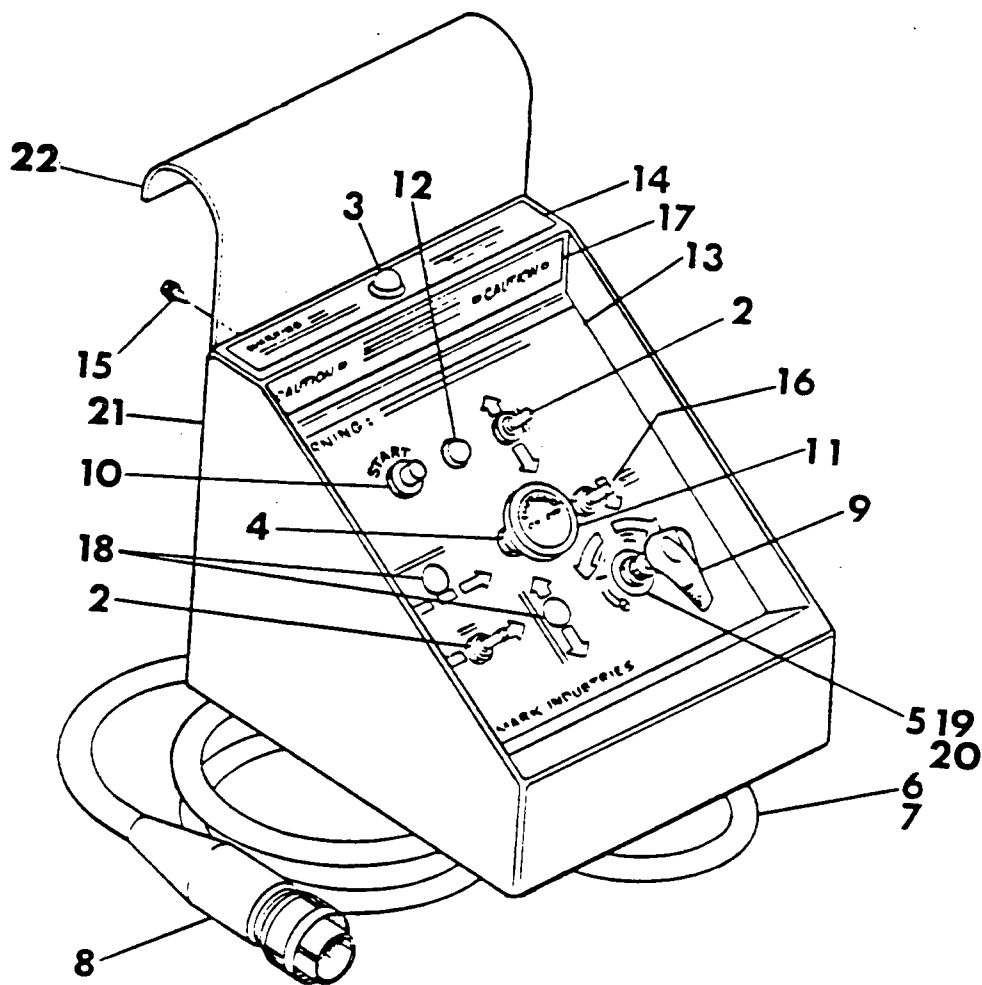


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ILLUSTRATED
PARTS CATALOG

**HAND CONTROL BOX ASSEMBLY
(RT-31G) (BEF. JUL. '86)**

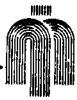
PARTS
SECT. 5
FIG. 2A
PAGE J



**HAND CONTROL BOX ASSEMBLY
(RT-31G) (BEF. JUL. '86)**

(continued)

ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	4068-1	ASSEMBLY, HAND CONTROL BOX (See Sect. 2, Fig. 1A for NHA)	REF
2	4021	.SWITCH, MOMENTARY	2
3	4031	.LIGHT, WARNING	1
4	4018	.SWITCH, EMERGENCY ON-OFF	1
5	67098	.ASSEMBLY, 5 POSITION SWITCH (DRIVE)	1
6	2730	.ASSEMBLY, CONTROL CABLE	1
7	117-G	.RELIEF, STRAIN	1
8	67101	.PLUG, CANNON	1
9	65151	.KNOB	1
10	4020	.SWITCH, PUSH BUTTON START	1
11	31080	.KNOB, EMERGENCY ON-OFF	1
12	4107	.LIGHT, POWER-ON	1
13	2008	.DECAL, CONTROL BOX	1
14	2015	.DECAL, WARNING UNSTABLE CONDITION	1
15	2720	.SCREW, HEX HEAD SELF TAPPING	6
16	4017	.SWITCH, TOGGLE (CREEP SPEED)	1
17	2014	.DECAL, WARNING HIGH VOLTAGE	1
18	772	.PLUG, HOLE	2
19	65189	.O-RING	1
20	65131	.NUT, SEALING	1
21	31106	.BOX, CONTROL	1
22	31107	.COVER, BOX	1

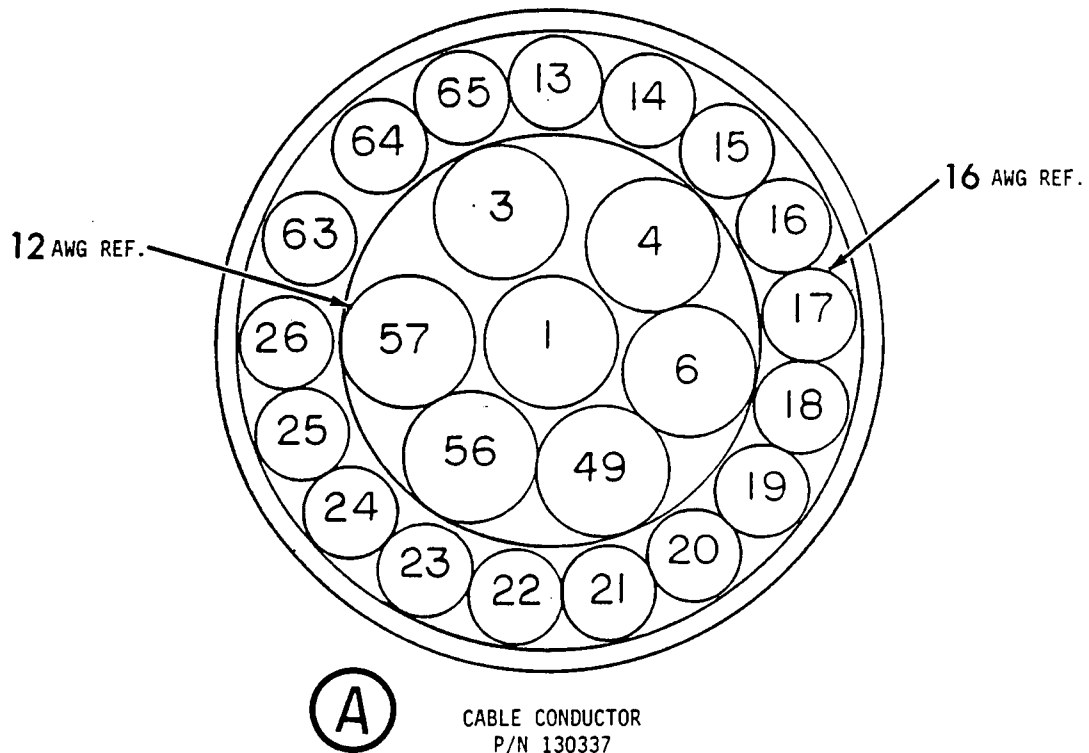
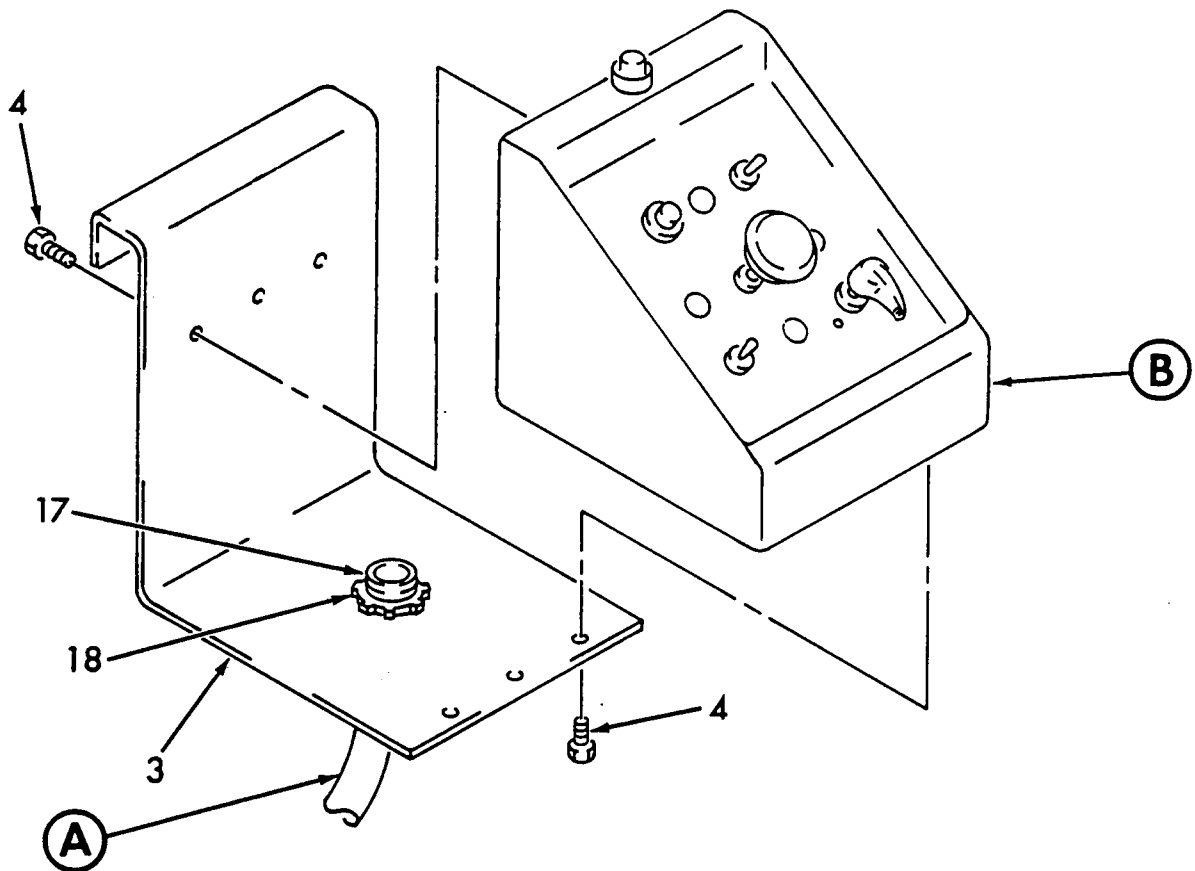


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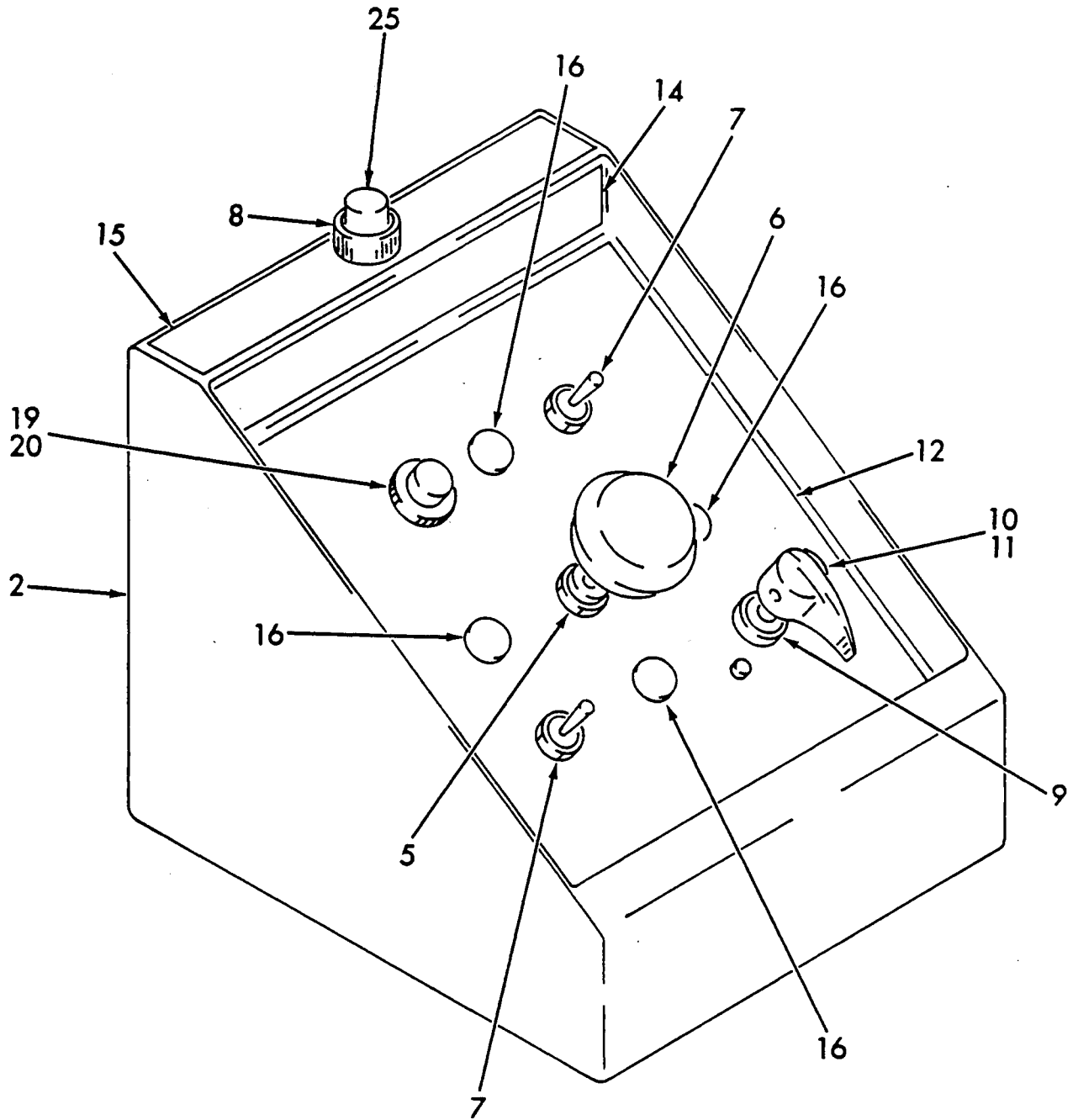
ILLUSTRATED
PARTS CATALOG

UPPER CONTROL BOX ASSEMBLY
(RT-31G) (AFT. JUL. '86)

PARTS
SECT. 5
FIG. 2B
PAGE 1



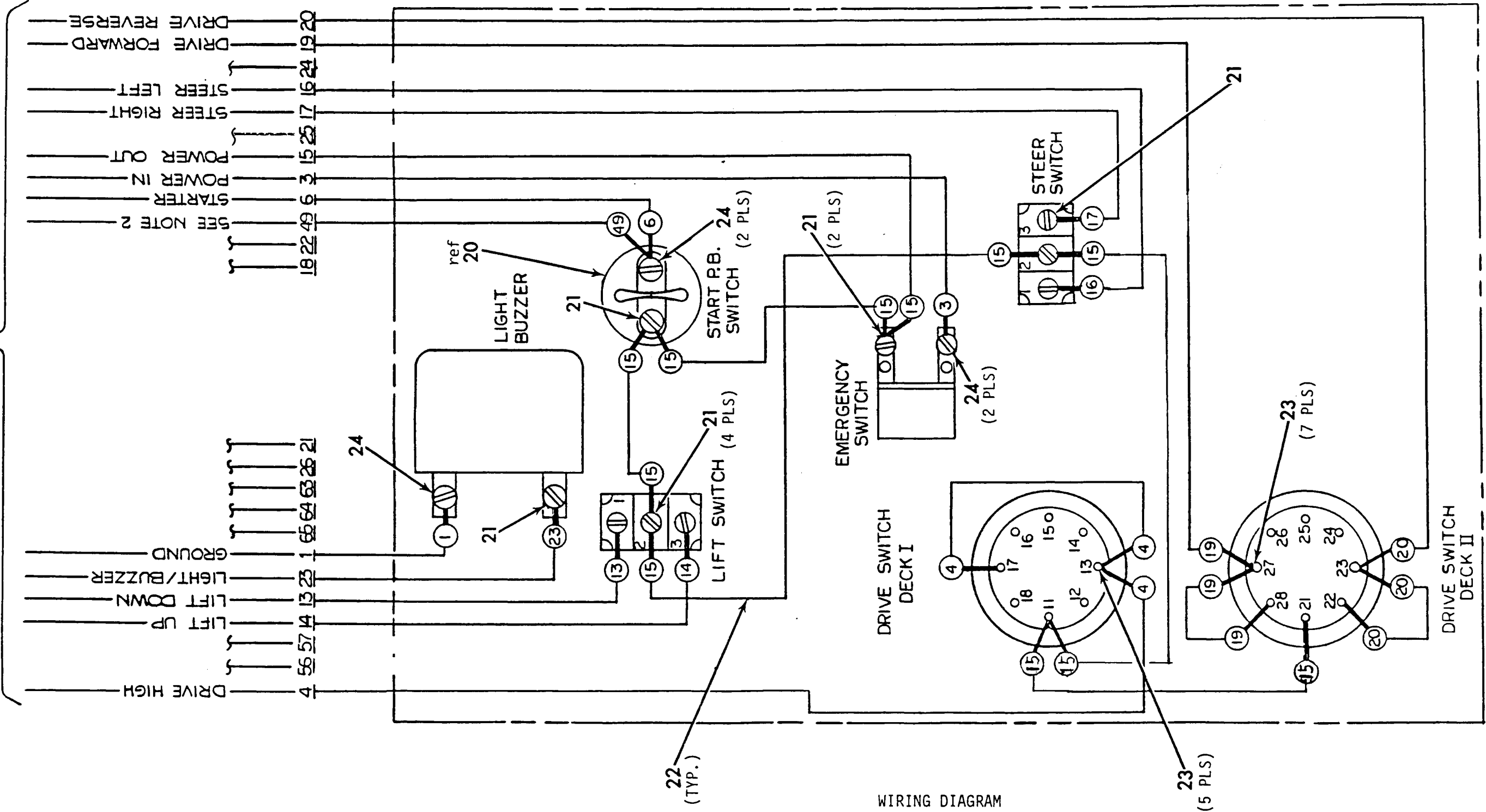
REV.



(B)

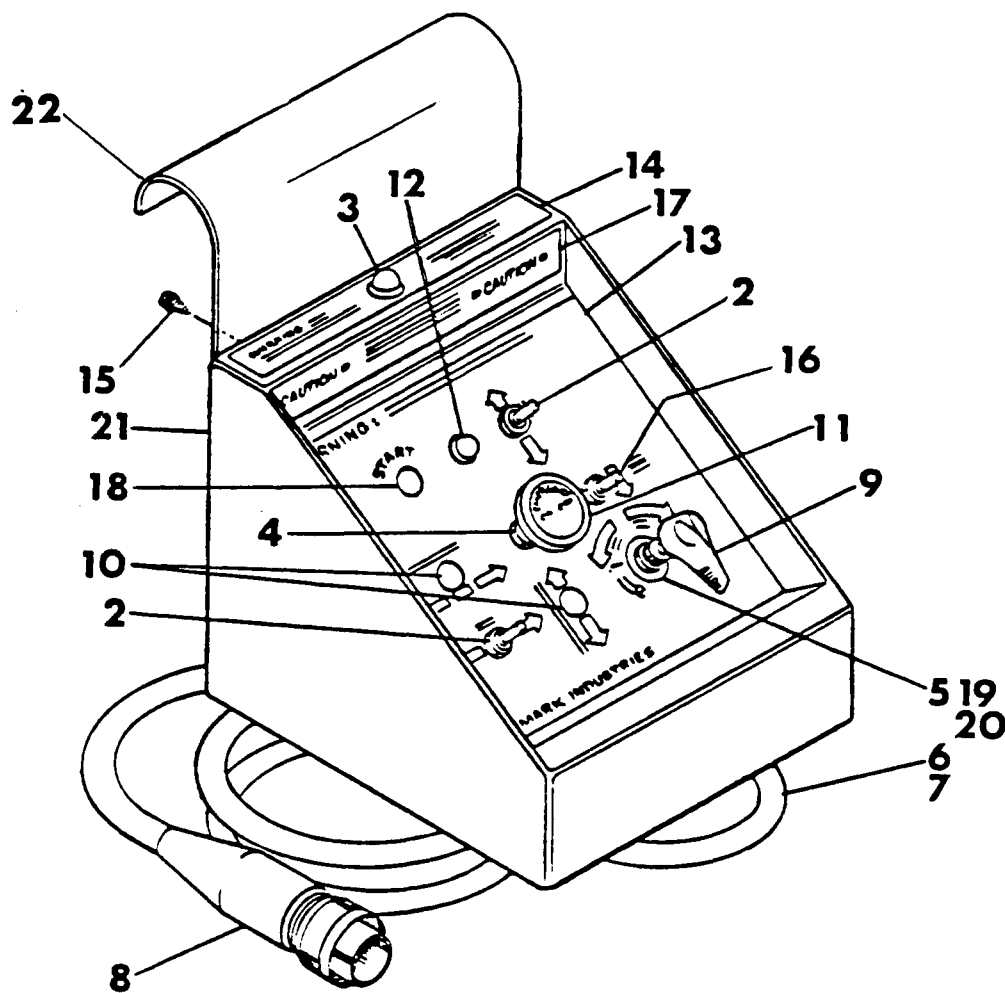
TO ELECTRICAL PANEL/COMPONENT BOX

UPPER CONTROL BOX





ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32409	ASSEMBLY, UPPER CONTROL PANEL (See Sect. 2, Fig. 1B for NHA)	REF
2	31106	.MACHINING, CONTROL BOX	1
3	31107	.COVER	1
4	61724	.SCREW, SELF-TAPPING (attaching part)	6
5	4018	.SWITCH, PUSH AND PULL	1
6	31080	.KNOB, EMERGENCY ON/OFF	1
7	4021	.SWITCH, TOGGLE (LIFT, STEERING)	3
8	20805	.ALARM, BUZZER	1
9	67098	.ASSEMBLY, 5 POSITION SWITCH	1
10	65151	.KNOB, DRIVE SWITCH	1
11	62209	.SCREW, SET (attaching part)	1
12	2008	.DECAL, CONTROL BOX	1
14	2014	.DECAL, CAUTION	1
15	2015	.DECAL, WARNING	1
16	771	.PLUG	4
17	2807	.RELIEF, STRAIN	1
18	2809	.NUT, LOCK (attaching part)	1
19	4020	.SWITCH, PUSH BUTTON	1
20	2271	.WASHER, THRUST (attaching part)	1
21	117-C	.CONNECTOR, RING	12
22	70009	.WIRE, RED 2 FT.	AR
23	16228	.CONNECTOR, RING	12
24	70198	.CONNECTOR, RING	5
25	67005	.LENS, AMBER	1

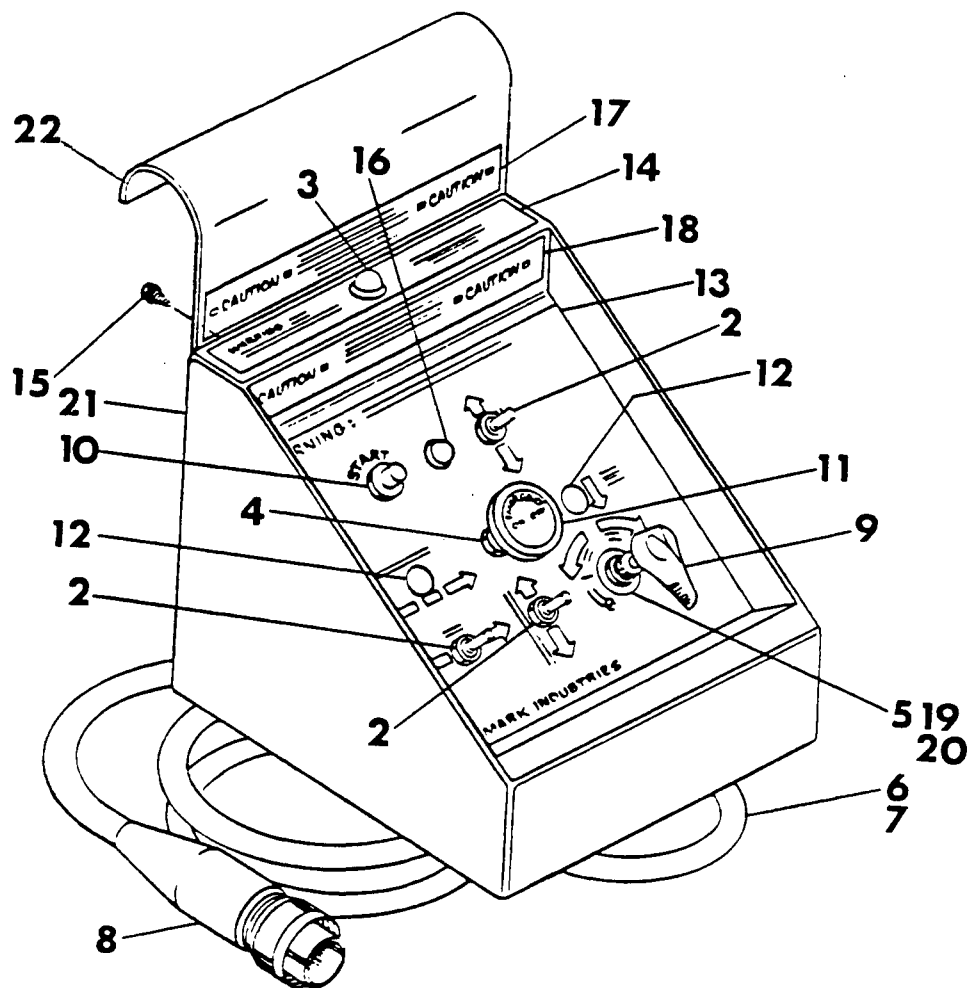




ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	4069-1	ASSEMBLY, HAND CONTROL BOX (See Sect. 2, Fig. 2 for NHA)	REF
2	4021	.SWITCH, MOMENTARY	2
3	4031	.LIGHT, WARNING	1
4	4018	.SWITCH, EMERGENCY ON-OFF	1
5	67098	.ASSEMBLY, 5 POSITION SWITCH (DRIVE)	1
6	2730	.ASSEMBLY, CONTROL CABLE	1
7	117-G	.RELIEF, STRAIN	1
8	67101	.PLUG, CANNON	1
9	65151	.KNOB	1
10	772	.PLUG, HOLE	2
11	31080	.KNOB, EMERGENCY ON-OFF	1
12	4107	.LIGHT, POWER-ON	1
13	2008	.DECAL, CONTROL BOX	1
14	2015	.DECAL, WARNING UNSTABLE CONDITION	1
15	2720	.SCREW, HEX HEAD SELF TAPPING	6
16	4017	.SWITCH, TOGGLE (CREEP SPEED)	1
17	2014	.DECAL, WARNING HIGH VOLTAGE	1
18	775	.PLUG, HOLE	1
19	65189	.O-RING	1
20	65131	.NUT, SEALING	1
21	31106	.BOX, CONTROL	1
22	31107	.COVER, BOX	1



HAND CONTROL BOX ASSEMBLY
(SRT-31G) (BEF. JUL. '86)



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ILLUSTRATED

PARTS CATALOG

**HAND CONTROL BOX ASSEMBLY
(SRT-31G) (BEF. JUL. '86)**PARTS
SECT. 5
FIG. 4A
PAGE 2

ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	8325-5	ASSEMBLY, HAND CONTROL BOX (See Sect. 2, Fig. 3A for NHA)	REF
2	4021	.SWITCH, MOMENTARY	3
3	4031	.LIGHT, WARNING	1
4	4018	.SWITCH, EMERGENCY ON-OFF	1
5	67098	.ASSEMBLY, 5 POSITION SWITCH (DRIVE)	1
6	2730	.ASSEMBLY, CONTROL CABLE	1
7	117-G	.RELIEF, STRAIN	1
8	67101	.PLUG, CANNON	1
9	65151	.KNOB	1
10	4020	.SWITCH, PUSH BUTTON START	1
11	31080	.KNOB, EMERGENCY ON-OFF	1
12	772	.PLUG, HOLE	2
13	2008	.DECAL, CONTROL BOX	1
14	2015	.DECAL, WARNING UNSTABLE CONDITION	1
15	2720	.SCREW, HEX HEAD SELF TAPPING	6
16	4107	.LIGHT, POWER - ON	1
17	2013	.DECAL, HYDRAULIC OUTRIGGER CAUTION	1
18	2014	.DECAL, WARNING HIGH VOLTAGE	1
19	65189	.O-RING	1
20	65131	.NUT, SEALING	1
21	31106	.BOX, CONTROL	1
22	31107	.COVER, BOX	1

REV.

- ITEM NOT ILLUSTRATED

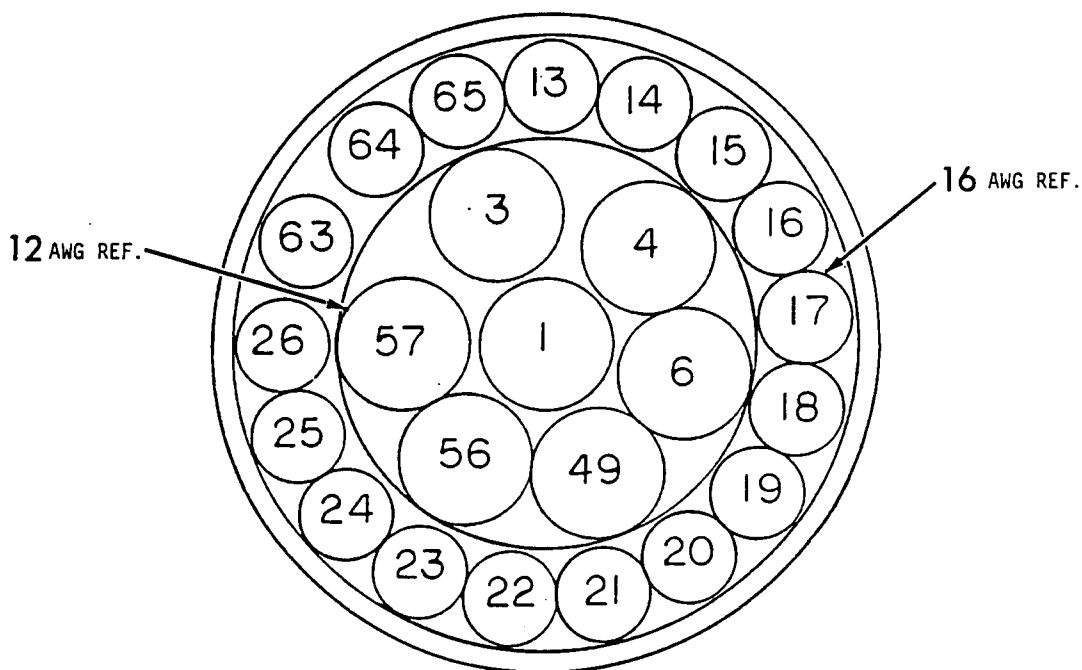
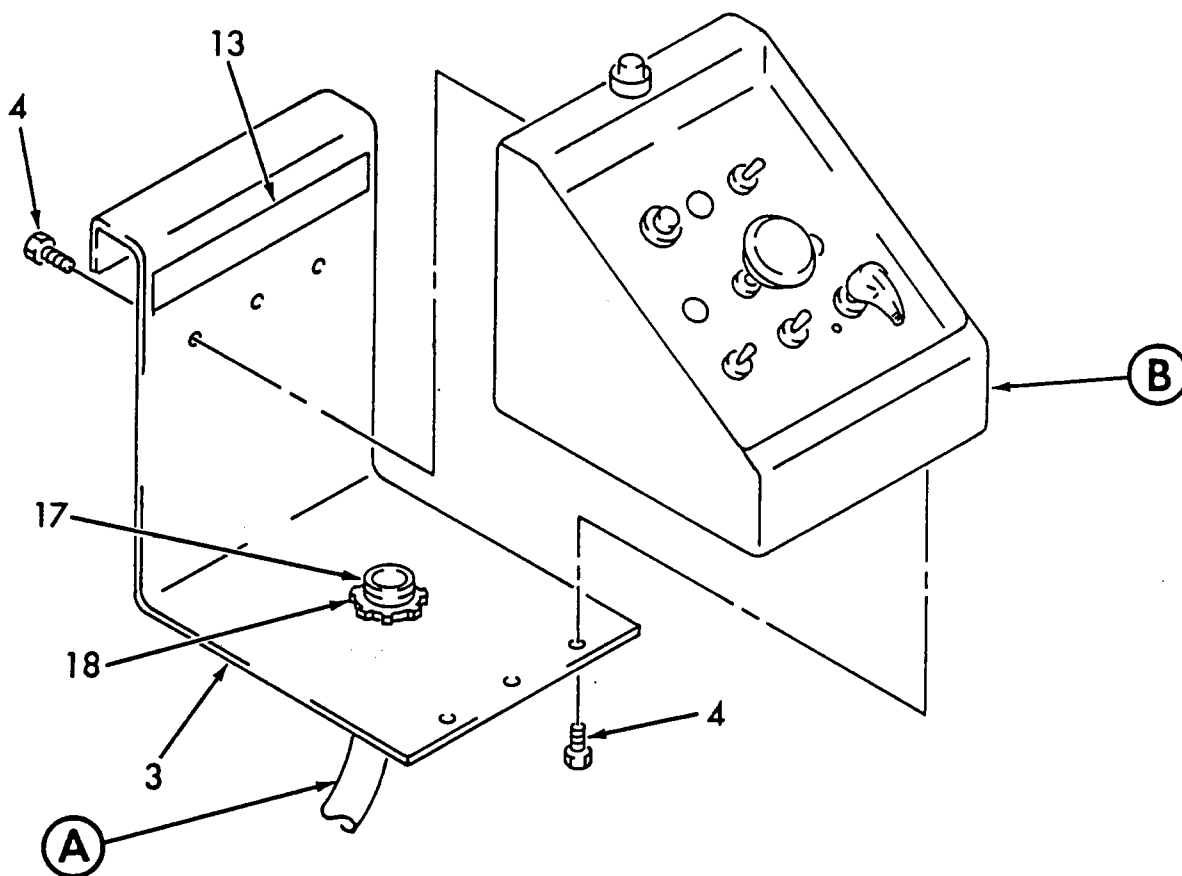


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ILLUSTRATED
PARTS CATALOG

UPPER CONTROL BOX ASSEMBLY
(SRT-31G) (AFT. JUL. '86)

PARTS
SECT. 5
FIG. 4B
PAGE 1



CABLE CONDUCTOR
P/N 130337



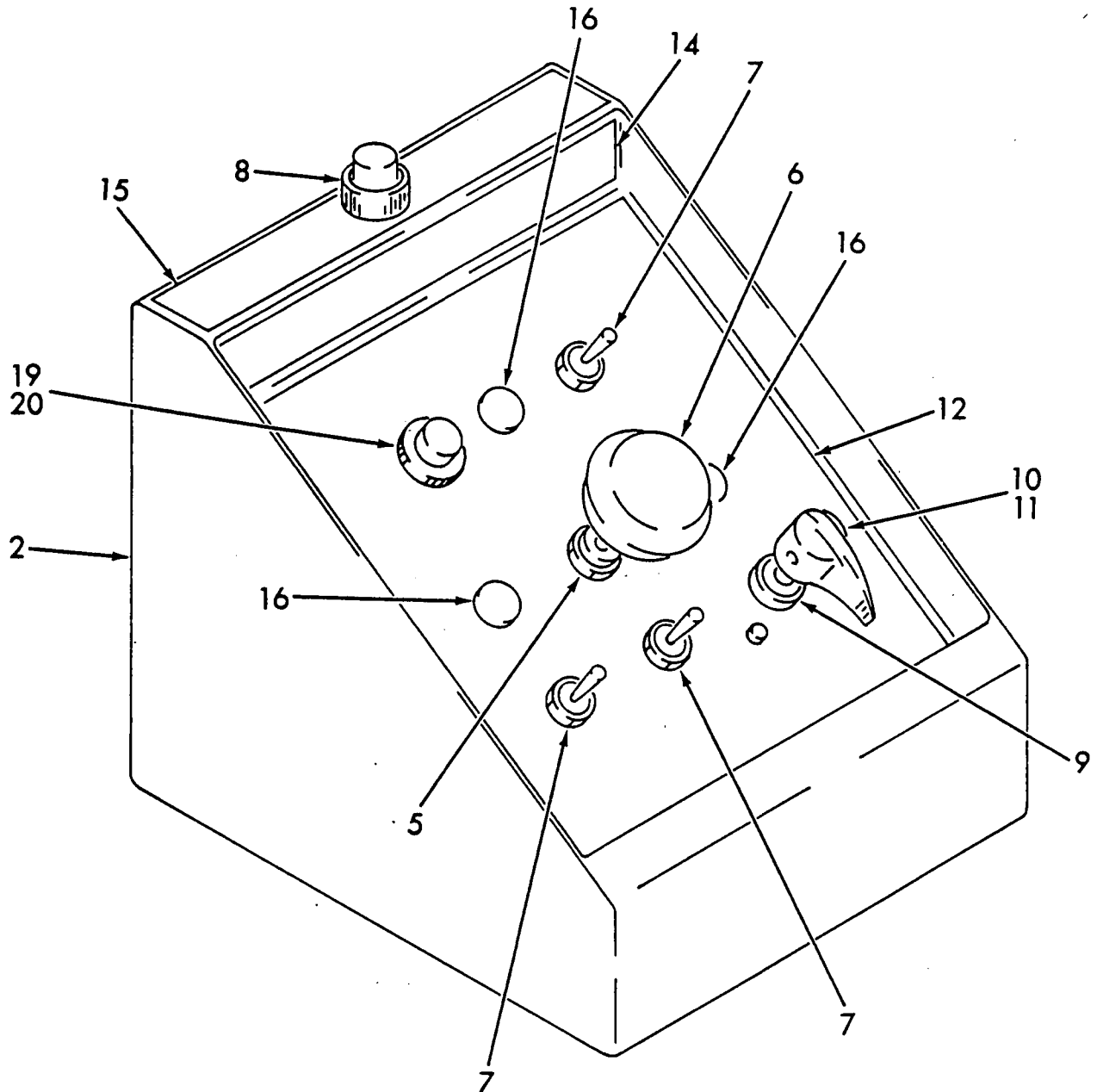
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PARTS CATALOG

UPPER CONTROL BOX ASSEMBLY
(SRT-31G) (AFT. JUL. '86)

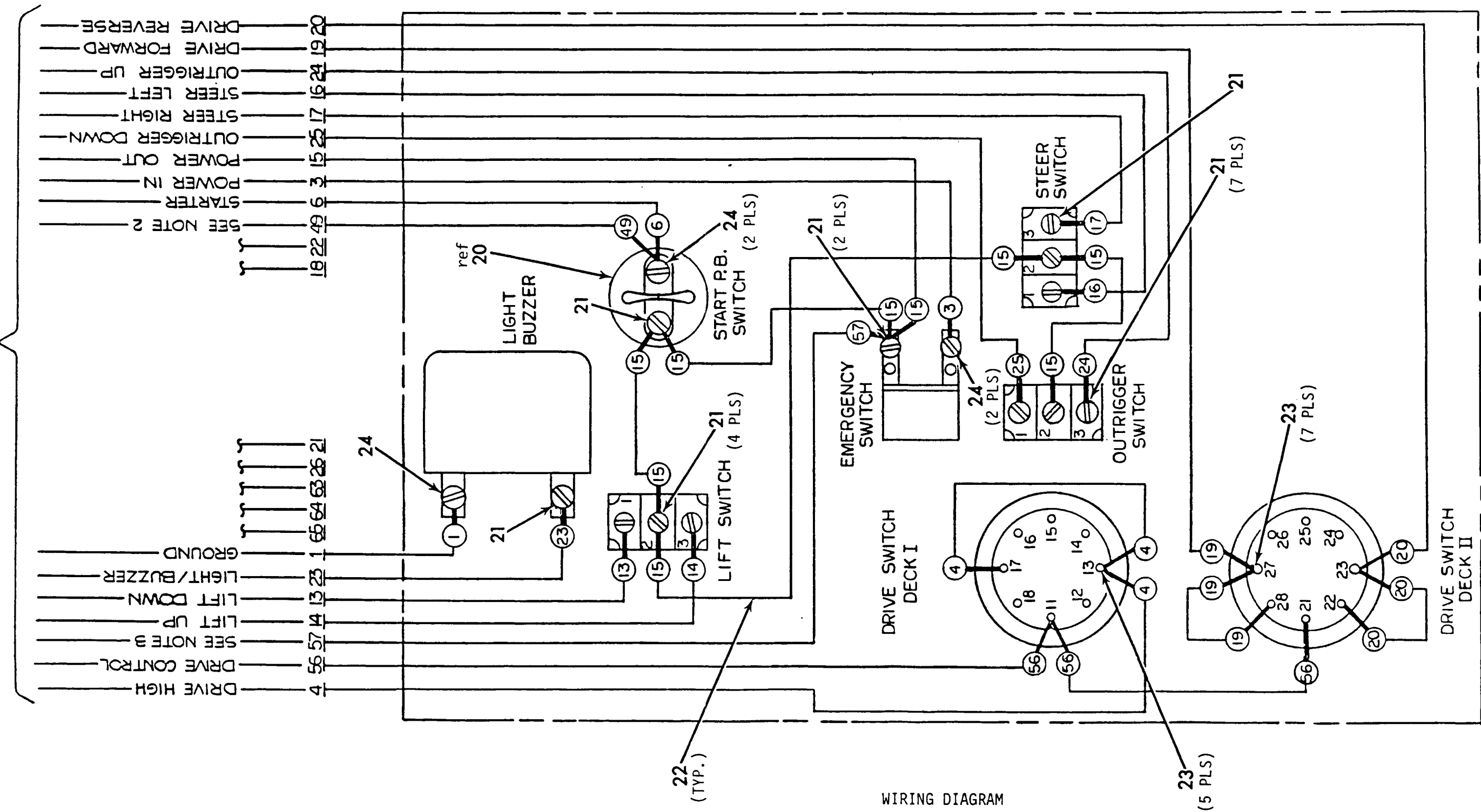
(continued)

PARTS
SECT. 5
FIG. 4B
PAGE 2



(B)

TO ELECTRICAL PANEL/COMPONENT BOX



WIRING DIAGRAM

UPPER CONTROL BOX



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ILLUSTRATED

PARTS CATALOG

**UPPER CONTROL BOX ASSEMBLY
(SRT-31G) (AFT. JUL. '86)**

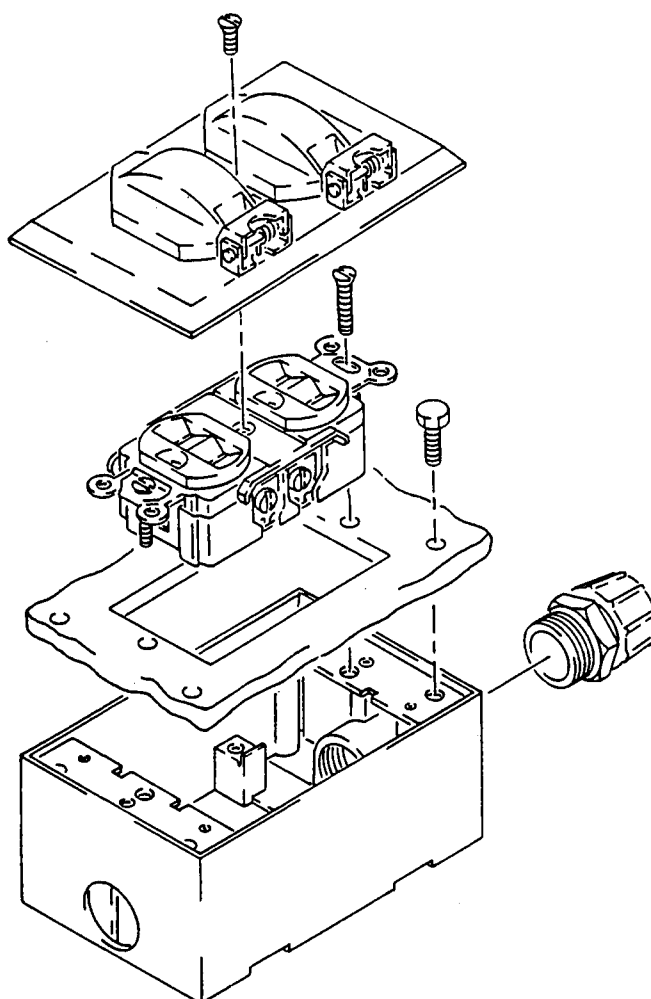
(continued)

PARTS
SECT. 5
FIG. 4B
PAGE 4

ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32410	ASSEMBLY, UPPER CONTROL PANEL (See Sect. 2, Fig. 3B for NHA)	REF
2	31106	.MACHINING, CONTROL BOX	1
3	32534	.COVER	1
4	61724	.SCREW, SELF-TAPPING (attaching part)	6
5	4018	.SWITCH, PUSH AND PULL	1
6	31080	.KNOB, EMERGENCY ON/OFF	1
7	4021	.SWITCH, TOGGLE	3
8	20805	.ALARM, BUZZER	1
9	67098	.ASSEMBLY, 5 POSITION SWITCH	1
10	65151	.KNOB, DRIVE SWITCH	1
11	62209	.SCREW, SET (attaching part)	1
12	2008	.DECAL, CONTROL BOX	1
13	2013	.DECAL, CAUTION	1
14	2014	.DECAL, CAUTION	1
15	2015	.DECAL, WARNING	1
16	771	.PLUG	3
17	2807	.RELIEF, STRAIN	1
18	2809	.NUT, LOCK (attaching part)	1
19	4020	.SWITCH, PUSH BUTTON	1
20	2271	.WASHER, THRUST (attaching part)	1
21	117-C	.CONNECTOR, RING	16
22	70009	.WIRE, RED 2FT.	AR
23	16228	.CONNECTOR, RING	12
24	70198	.CONNECTOR, RING	5

REV.

- ITEM NOT ILLUSTRATED



THIS SECTION 6 IS ILLUSTRATED AS

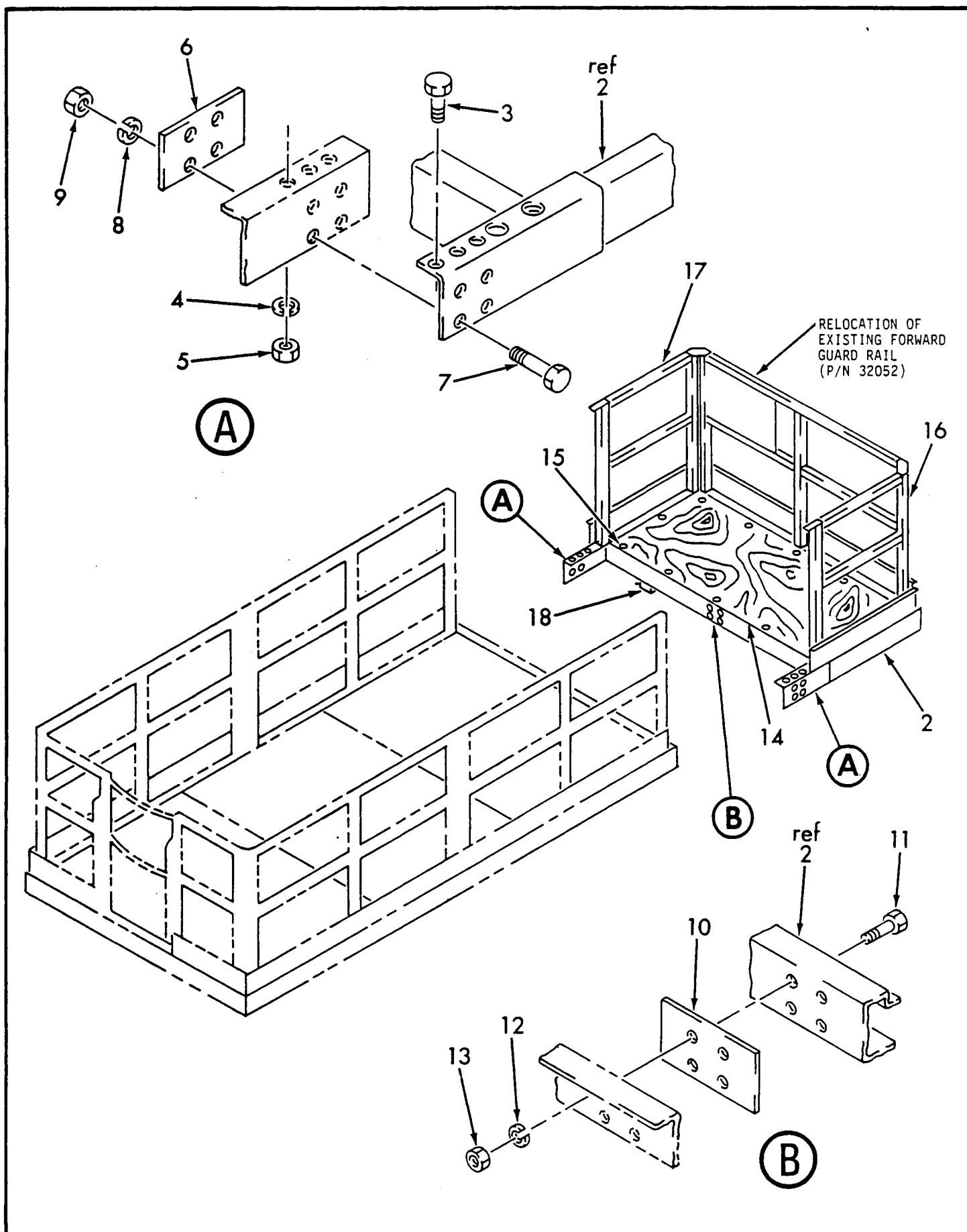
- FIGURE 1 TRAVEL WARNING HORN ASSEMBLY
- FIGURE 2 HOURMETER ASSEMBLY
- FIGURE 3 2 FEET EXTENSION DECK ASSEMBLY
- FIGURE 4 SWING DECK ASSEMBLY
- FIGURE 5 LIFTING LUGS ASSEMBLY
- FIGURE 6 110 VAC TO PLATFORM ASSEMBLY
- FIGURE 7A A.C. OPTION BOX ASSEMBLY (BEF. SEP. '87)
- FIGURE 7B A.C. OPTION BOX ASSEMBLY (AFT. SEP. '87)
- FIGURE 8 ROTATING BEACON ASSEMBLY
- FIGURE 9 HYDRAULIC OUTRIGGER COMPONENT BOX ASSEMBLY
(RT-31G) (AFT. MAR. '80)
- FIGURE 10 HYDRAULIC OUTRIGGER COMPONENT BOX ASSEMBLY
(RT-31E) (AFT. MAR. '80)
- FIGURE 11 MANIFOLD OPTION ASSEMBLY
- FIGURE 12A MANIFOLD OPTION SUB-ASSEMBLY (BEF. MAR. '80)
- FIGURE 12B MANIFOLD OPTION SUB-ASSEMBLY (AFT. MAR. '80)



THIS PARTS SECTION 6 FIGURE 1 TRAVEL
WARNING HORN ASSEMBLY (PART NUMBER;
SKP-0550A) IS NOT AVAILABLE THIS REVISION.



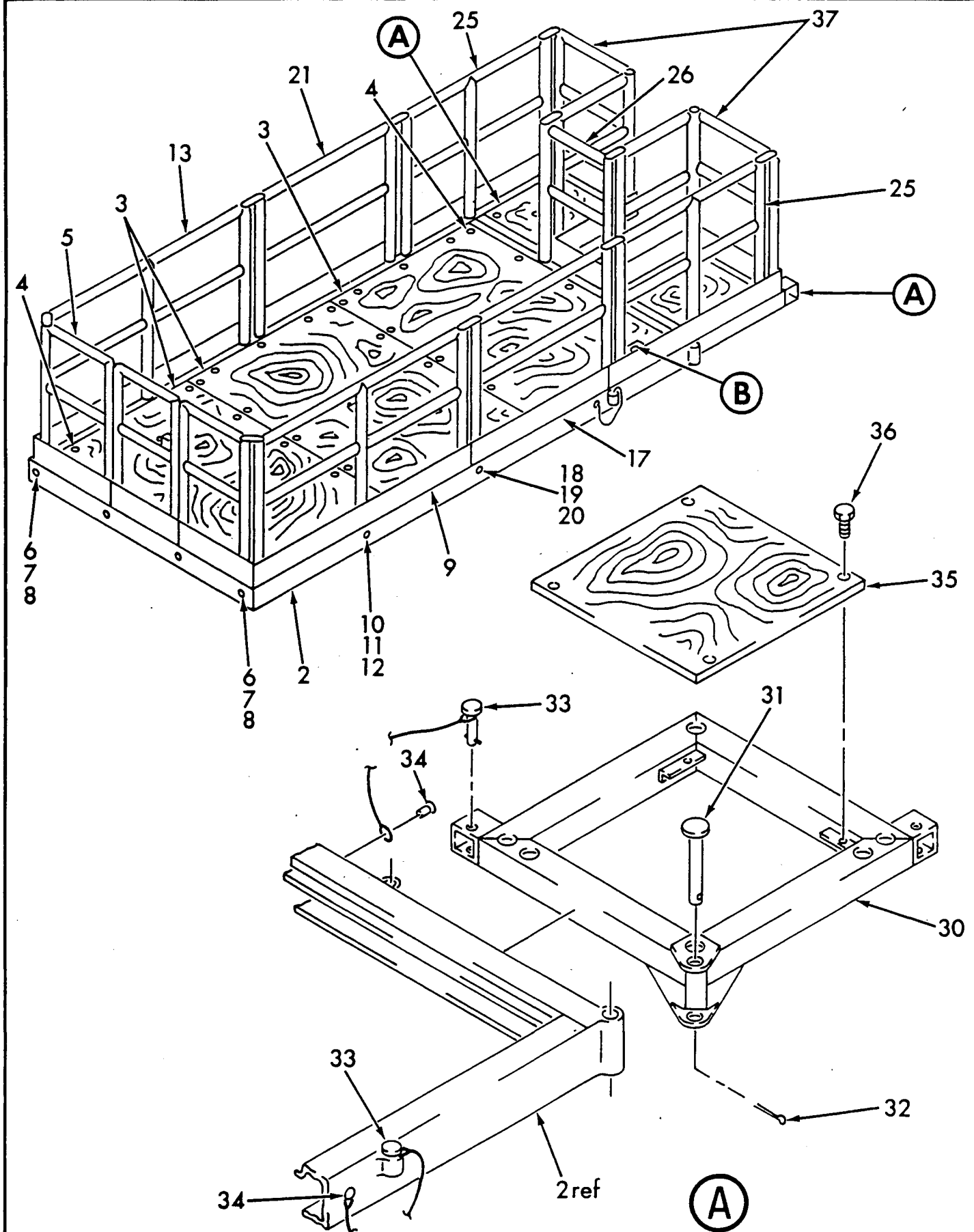
THIS PARTS SECTION 6 FIGURE 2 HOUR METER ASSEMBLY
(PART NUMBER 20571) IS NOT AVAILABLE THIS REVISION.

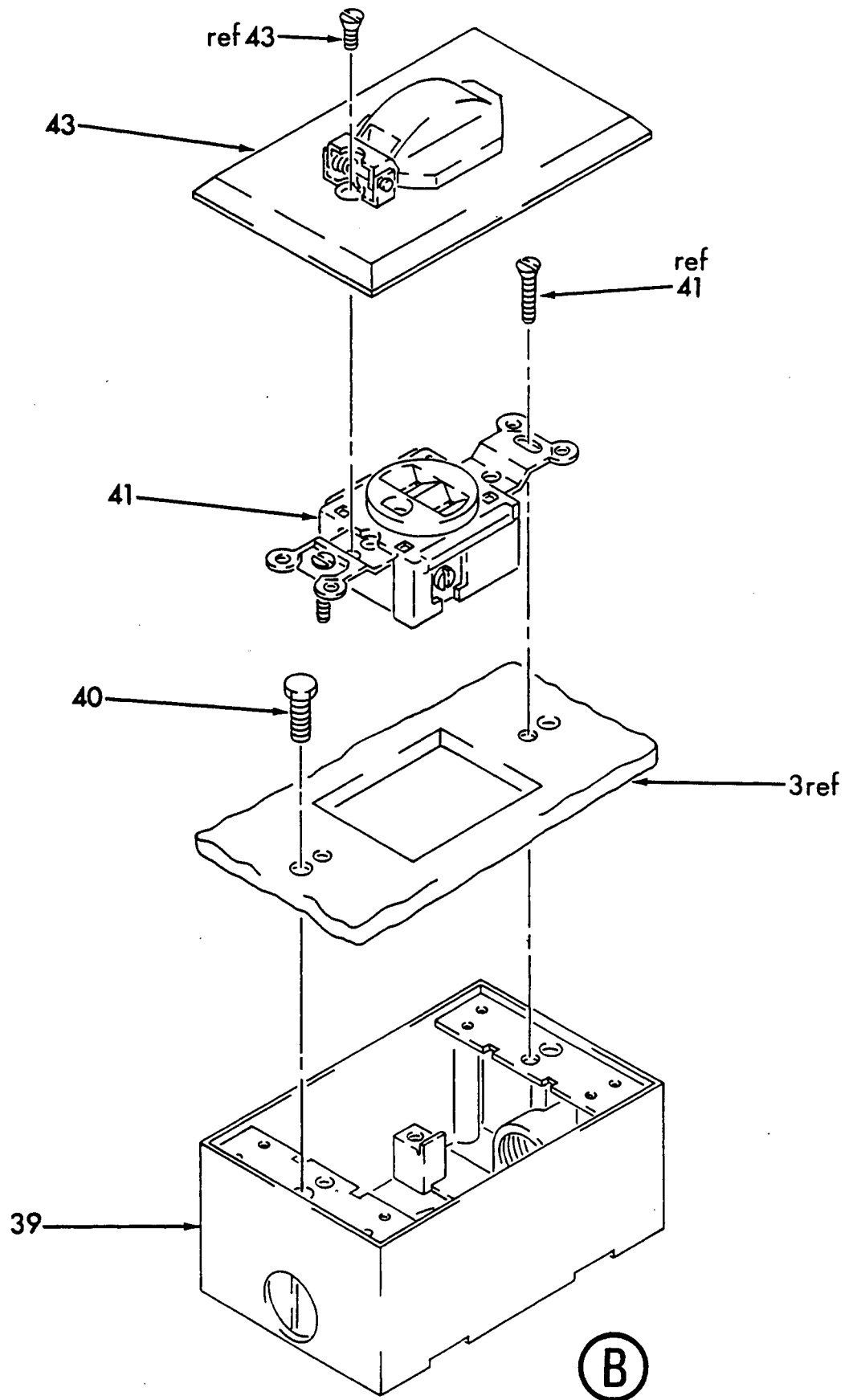
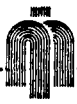




ITEM	PART NUMBER	DESCRIPTION		UNIT PER ASSY.
		1234567		
-1	30050	ASSEMBLY, 2 FT EXTENSION DECK		REF
2	30490	.WELDMENT, DECK		1
3	60402	.SCREW, CAP (attaching part)		6
4	63305	.WASHER, LOCK (attaching part)		6
5	60801	.NUT, HEX (attaching part)		6
6	30488	.PLATE, DOUBLER		2
7	60401	.SCREW, CAP (attaching part)		8
8	63305	.WASHER, LOCK (attaching part)		8
9	60801	.NUT, HEX (attaching part)		8
10	30487	.PLATE, DOUBLER		1
11	60401	.SCREW, CAP (attaching part)		4
12	63305	.WASHER, LOCK (attaching part)		4
13	60801	.NUT, HEX (attaching part)		4
14	30491	.FLOOR, DECK		1
15	61706	.SCREW (attaching part)		12
16	30489	.RAIL, GUARD		1
17	30538	.RAIL, GUARD		1
18	813	.CABLE, EXTENSION		1
-19	62613	.SCREW, CAP (attaching part)		8
-20	61502	.NUT, HEX (attaching part)		8

SWING DECK ASSEMBLY







ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30052	ASSEMBLY, SWING DECK	REF
2	30508	.WELDMENT, DECK	1
3	30553	.PLYWOOD, DECK	3
4	61706	.SCREW, CAP (attaching part)	48
5	30561	.ASSEMBLY, SPRING LOADED GATE	1
6	60154	.SCREW, CAP (attaching part)	4
7	63301	.WASHER, LOCK (attaching part)	4
8	60701	.NUT, HEX (attaching part)	4
9	30568	.GUARD, RAIL	1
10	60154	.SCREW, CAP (attaching part)	1
11	63301	..WASHER, LOCK (attaching part)	1
12	60701	.NUT, HEX (attaching part)	1
13	30566	.GUARD, RAIL	
-14	60154	.SCREW, CAP (attaching part)	1
-15	63301	.WASHER, LOCK (attaching part)	1
-16	60701	.NUT, HEX (attaching part)	1
17	30544	.GUARD, RAUL	1
18	60154	.SCREW, CAP (attaching part)	1
19	63301	.WASHER, LOCK (attaching part)	1
20	60701	.NUT, HEX (attaching part)	1
21	30543	.GUARD, RAIL	1
-22	60154	.SCREW, CAP (attaching part)	1
-23	63301	.WASHER, LOCK 9attaching part)	1
-24	60701	.NUT, HEX (attaching part)	1
25	30545	.GUARD, RAIL	2
26	30546	.GUARD, RAIL	1

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PARTS CATALOG

SWING DECK ASSEMBLY

(continued)

PARTS
SECT. 6
FIG. 4
PAGE 4

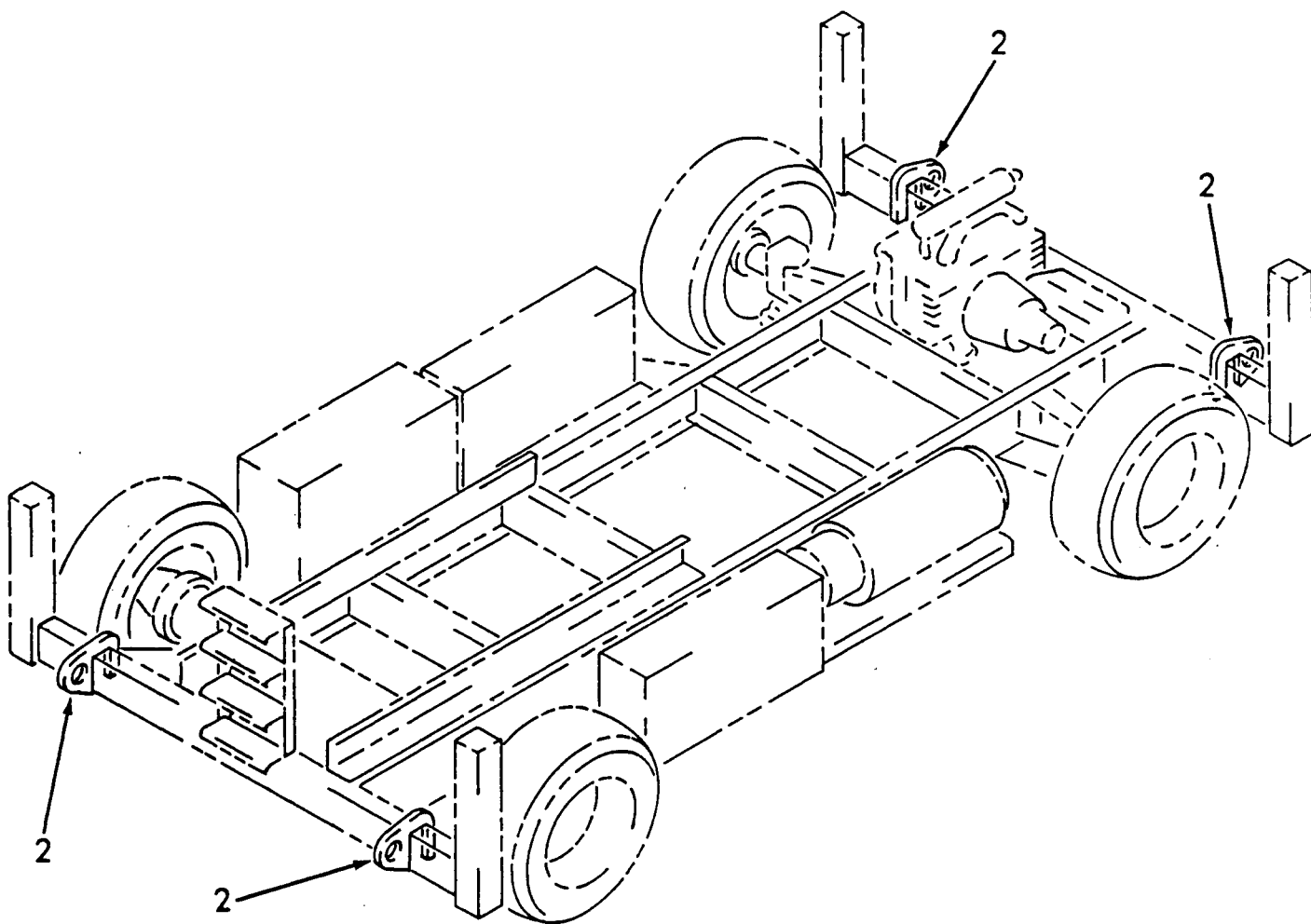
ITEM	PART NUMBER	DESCRIPTION		UNIT PER ASSY.
		1234567		
-27	60154	.SCREW, CAP (attaching part)		2
-28	63301	.WASHER, LOCK (attaching part)		2
-29	60701	.NUT, HEX (attaching part)		2
30	30510	.WELDMENT, DECK		1
31	30575	.PIN, (attaching part)		2
32	64307	.PIN, COTTER (attaching part)		2
33	30559	.PIN, BALL LOCK (attaching part)		4
34	63652	.RIVET, POP (attaching part)		4
35	30554	.PLYWOOD, DECK		2
36	61706	.SCREW, CAP (attaching part)		8
37	30547	.GUARD, RAIL		2
-38	60154	.SCREW, CAP (attaching part)		2
-39	63301	.WASHER, LOCK (attaching part)		2
-40	60701	.NUT, HEX (attaching part)		2
39	355	.BOX, BELL		1
40	62614	.SCREW, MACHINE (attaching part)		2
41	20512	.RECEPTACLE		1
-42	117-G	.CONNECTOR, ROMEX		1
43	356	.COVER, BELL BOX		1
-44	65119	.OIL, LINDSEED		AR

REV.

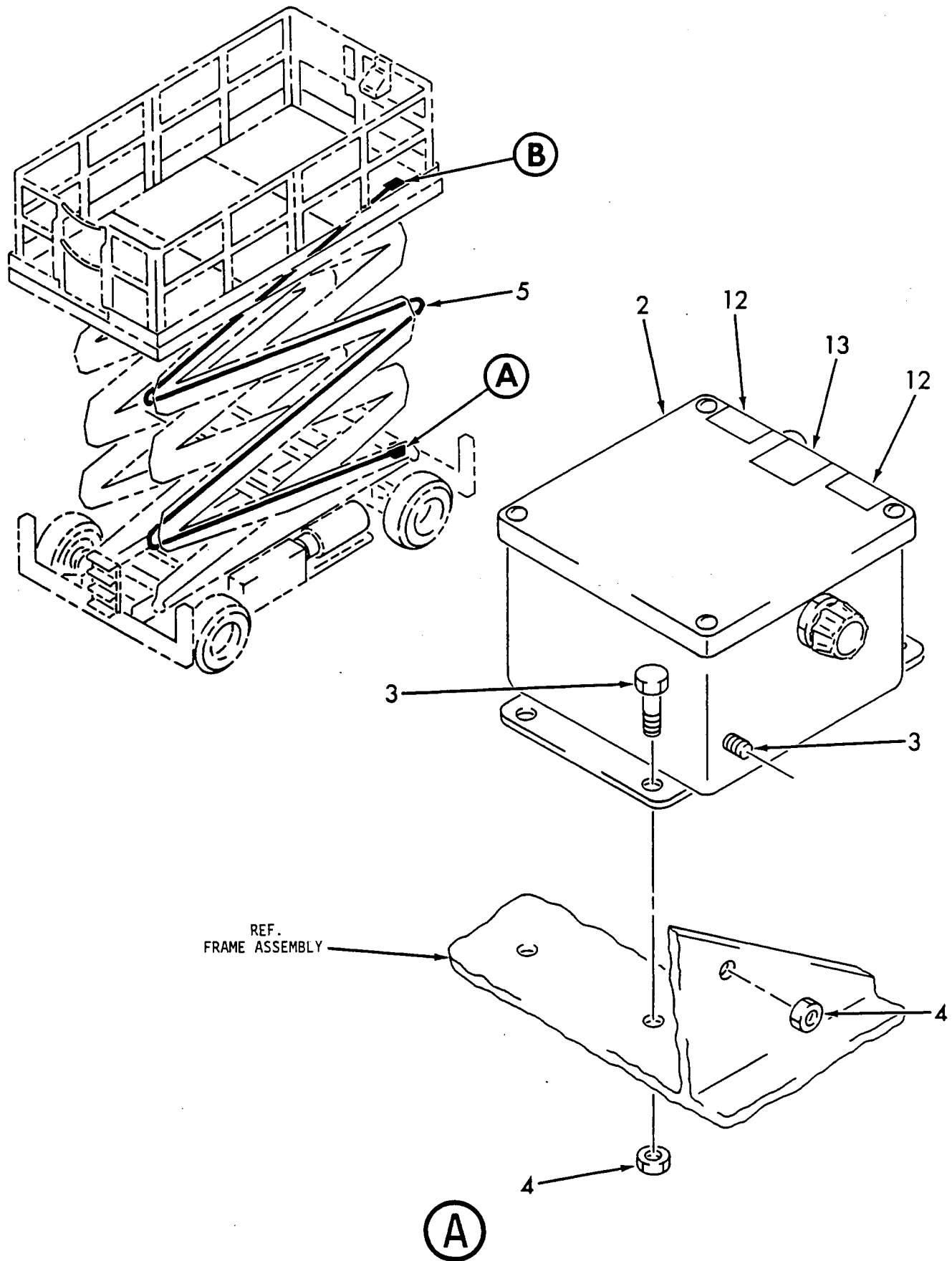
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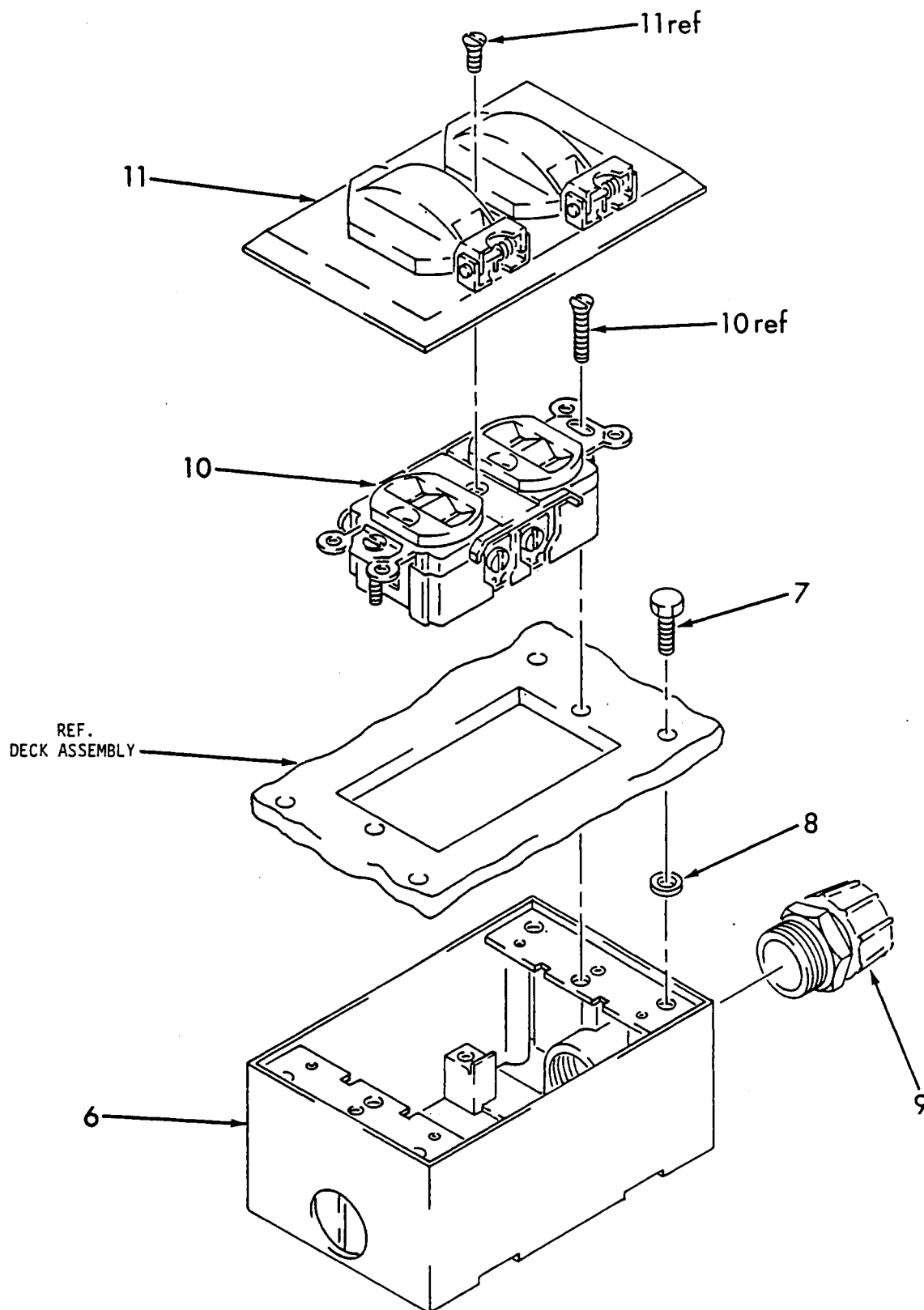


LIFTING LUGS ASSEMBLY



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	31009	ASSEMBLY, LIFTING LUGS	REF
2	30920	.LUG, LIFTING	4

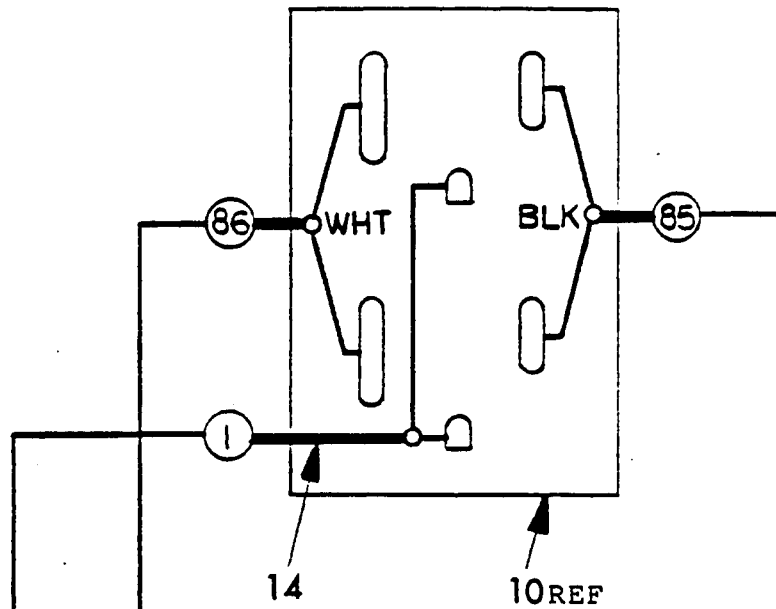




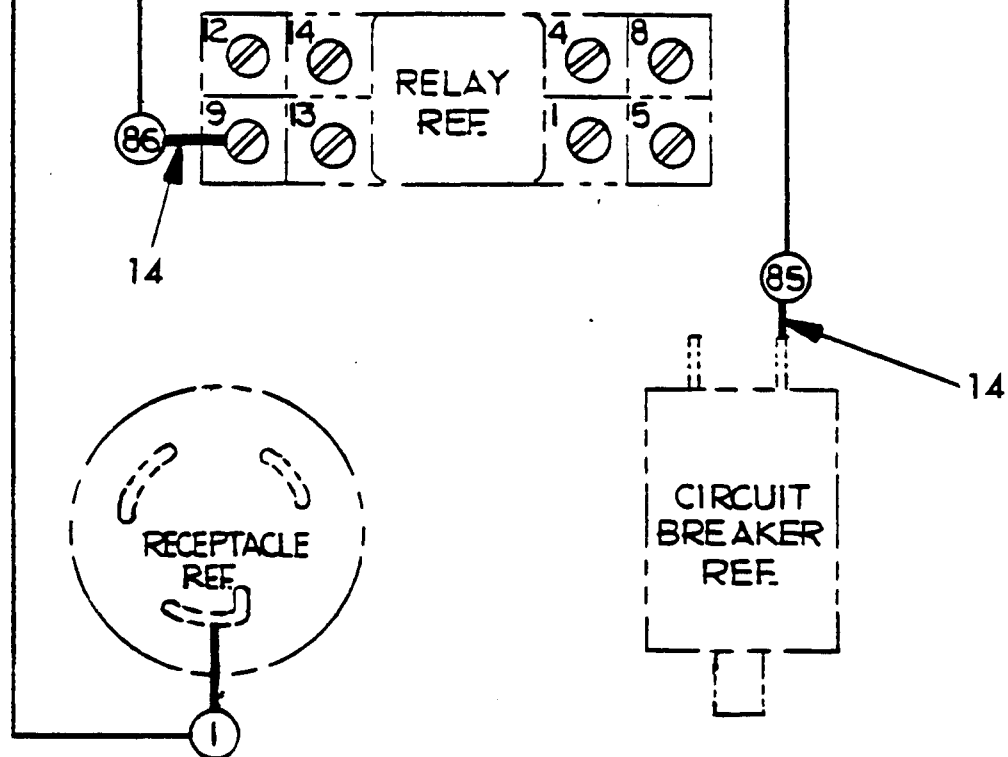
(B)



LOCATION-DECK

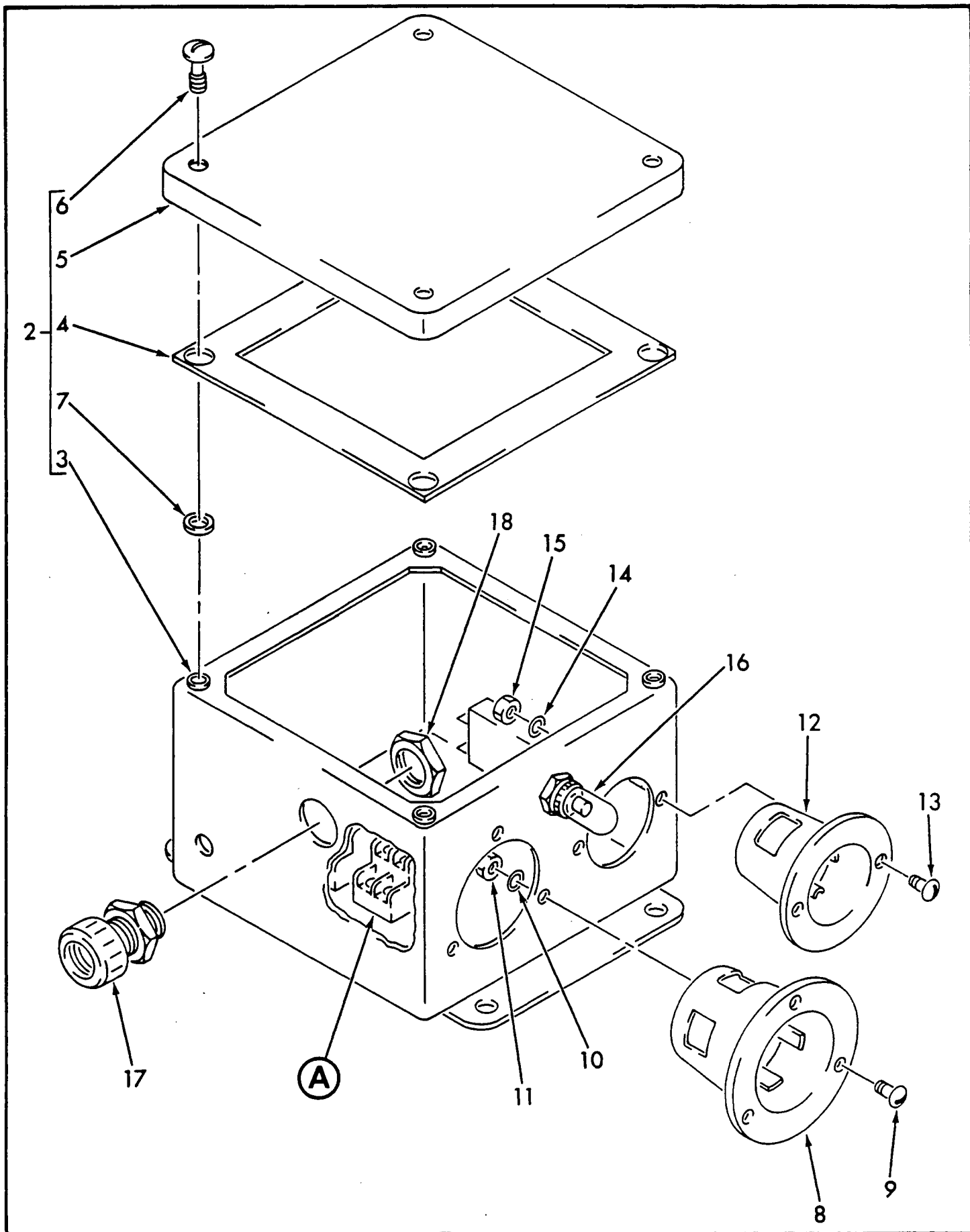


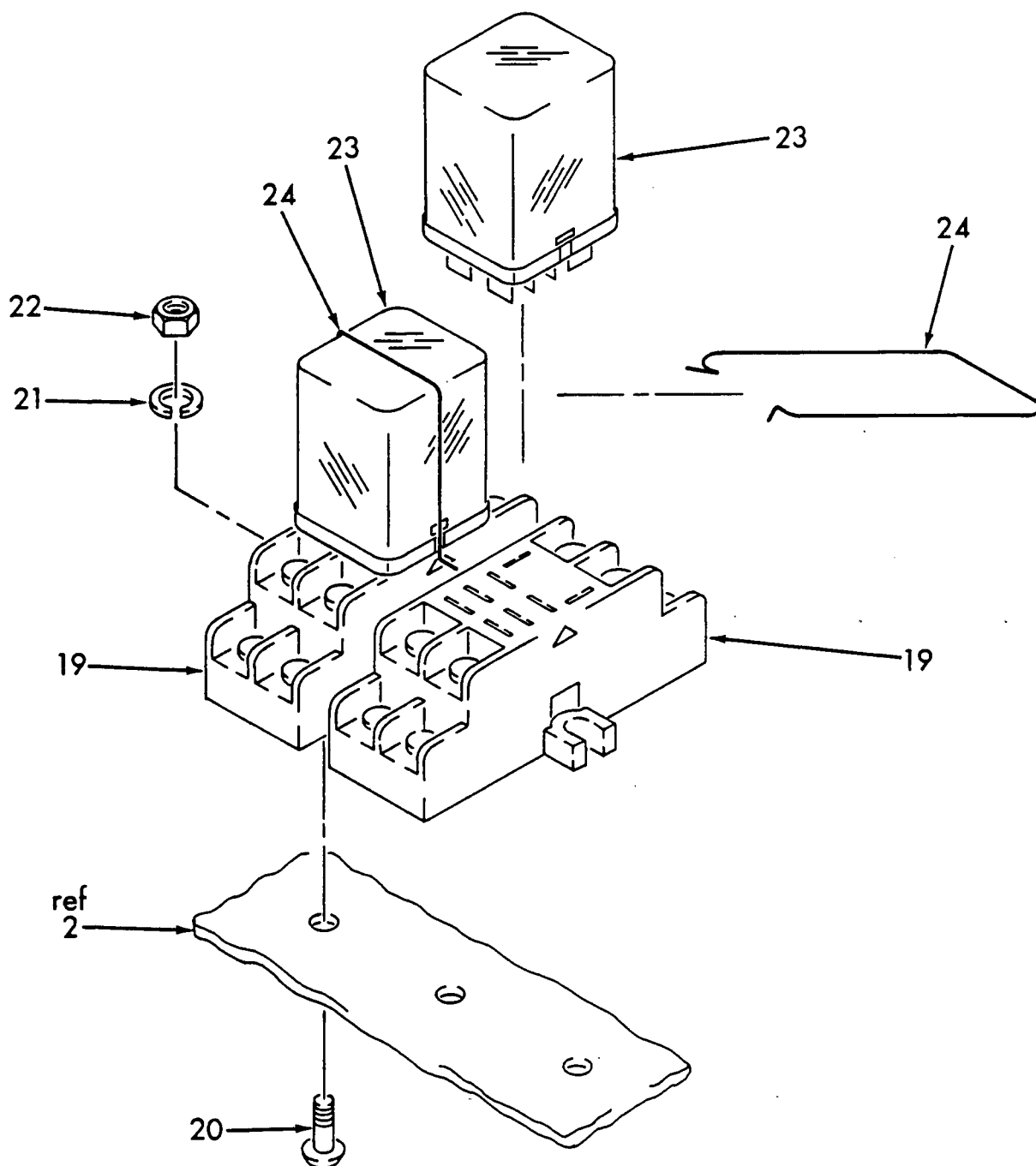
LOCATION-AC. OPTION BOX



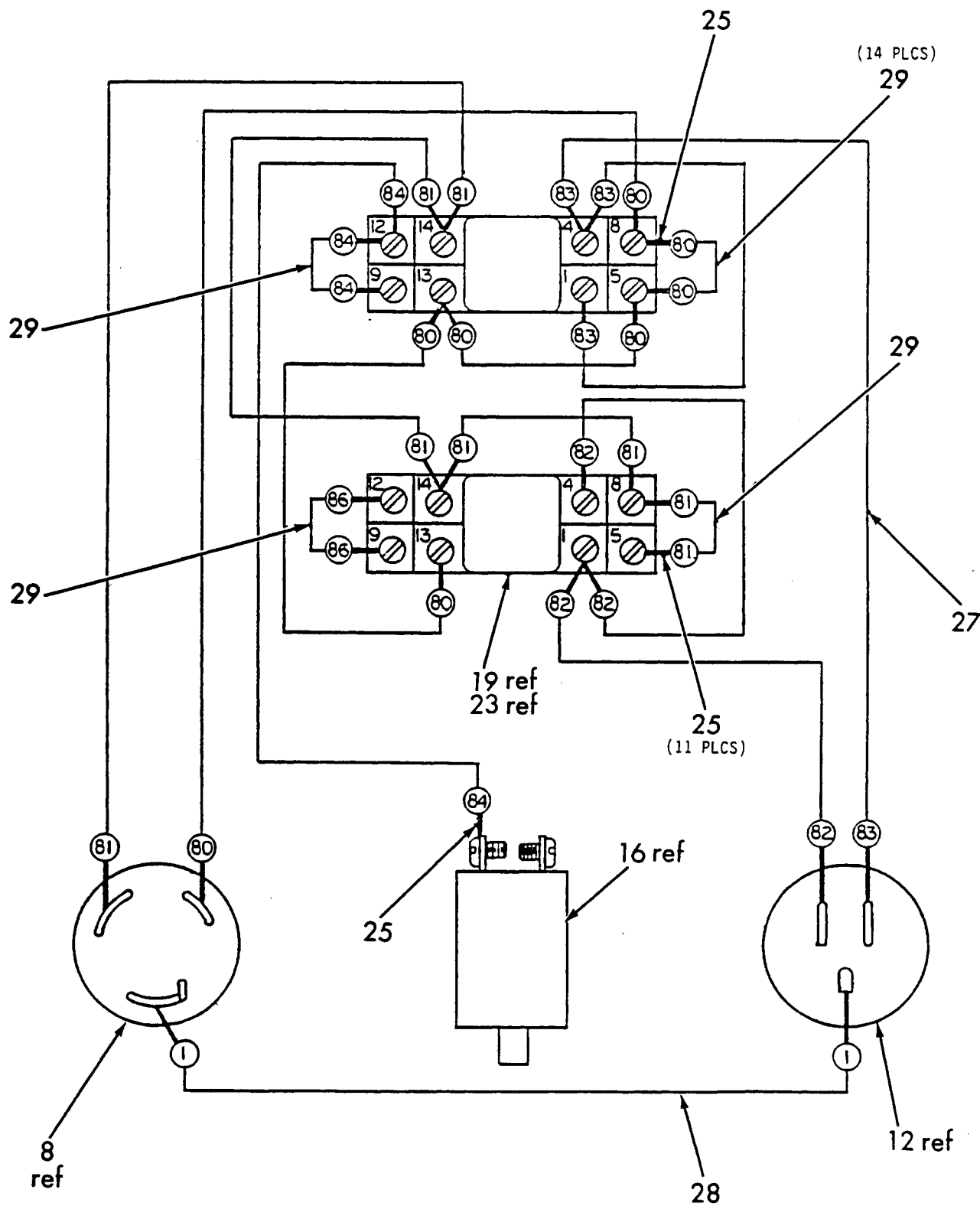


ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32905	ASSEMBLY, 110 VAC TO PLATFORM	REF
2	32587	.ASSEMBLY, A.C. BOX (See Sect. 6, Fig. 7A or 7B for Details)	1
3	60309	.SCREW, CAP (attaching part)	3
4	60711	.NUT, LOCK (attaching part)	3
5	4034	.CABLE, 64 FT.	AR
6	70262	.BOX, UNIVERSAL	1
7	62611	.SCREW, MACHINE (attaching part)	4
8	63313	.WASHER, LOCK (attaching part)	4
9	2806	.RELIEF, STRAIN	1
10	70126	.RECEPTACLE, DUPLEX	1
11	288	.PLATE, COVER SNAP	1
12	32589	.DECAL, 110 VAC	2
13	32588	.DECAL, CIRCUIT BREAKER	1
14	117-C	.CONNECTOR, RING	3





(A)



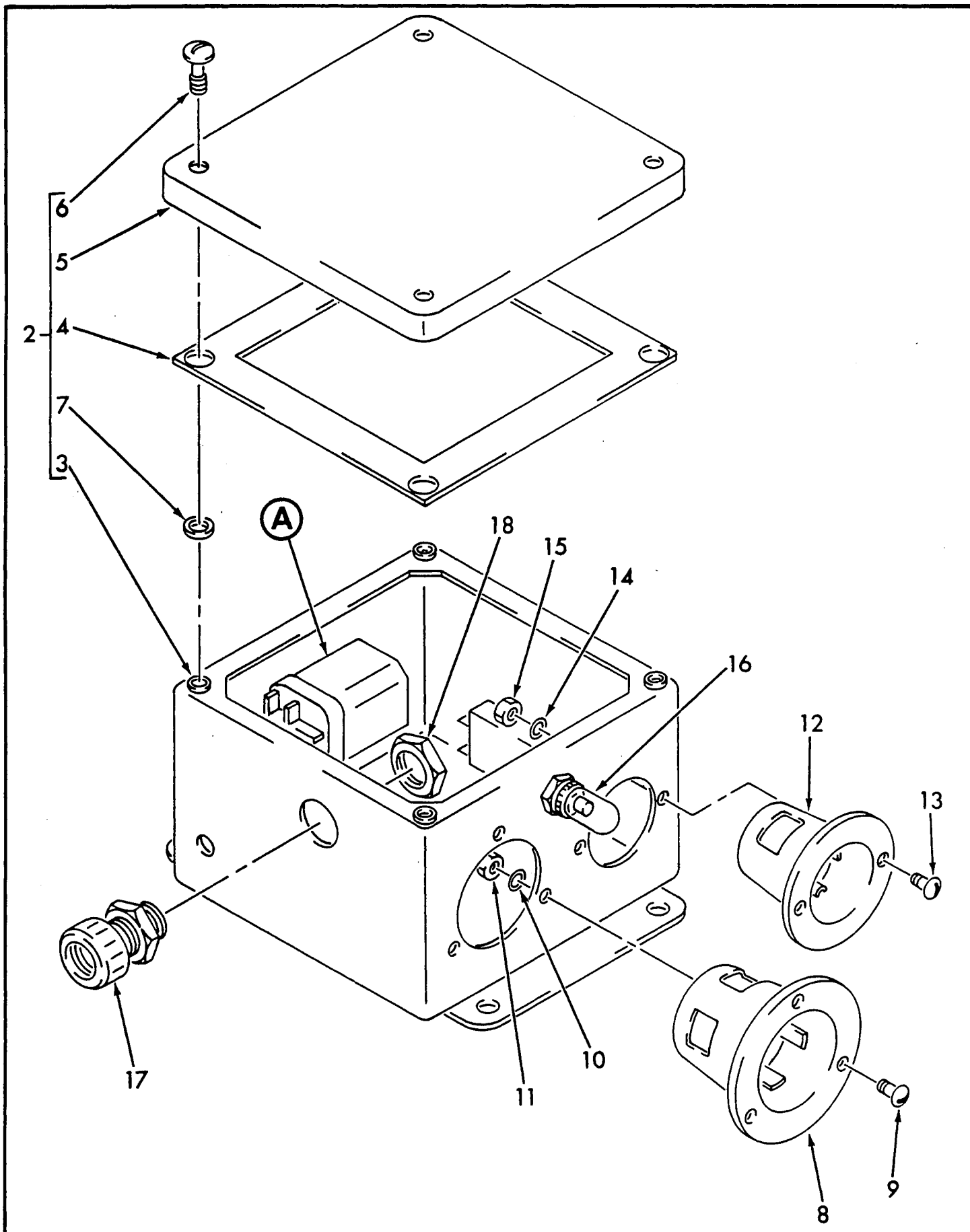
WIRING DIAGRAM

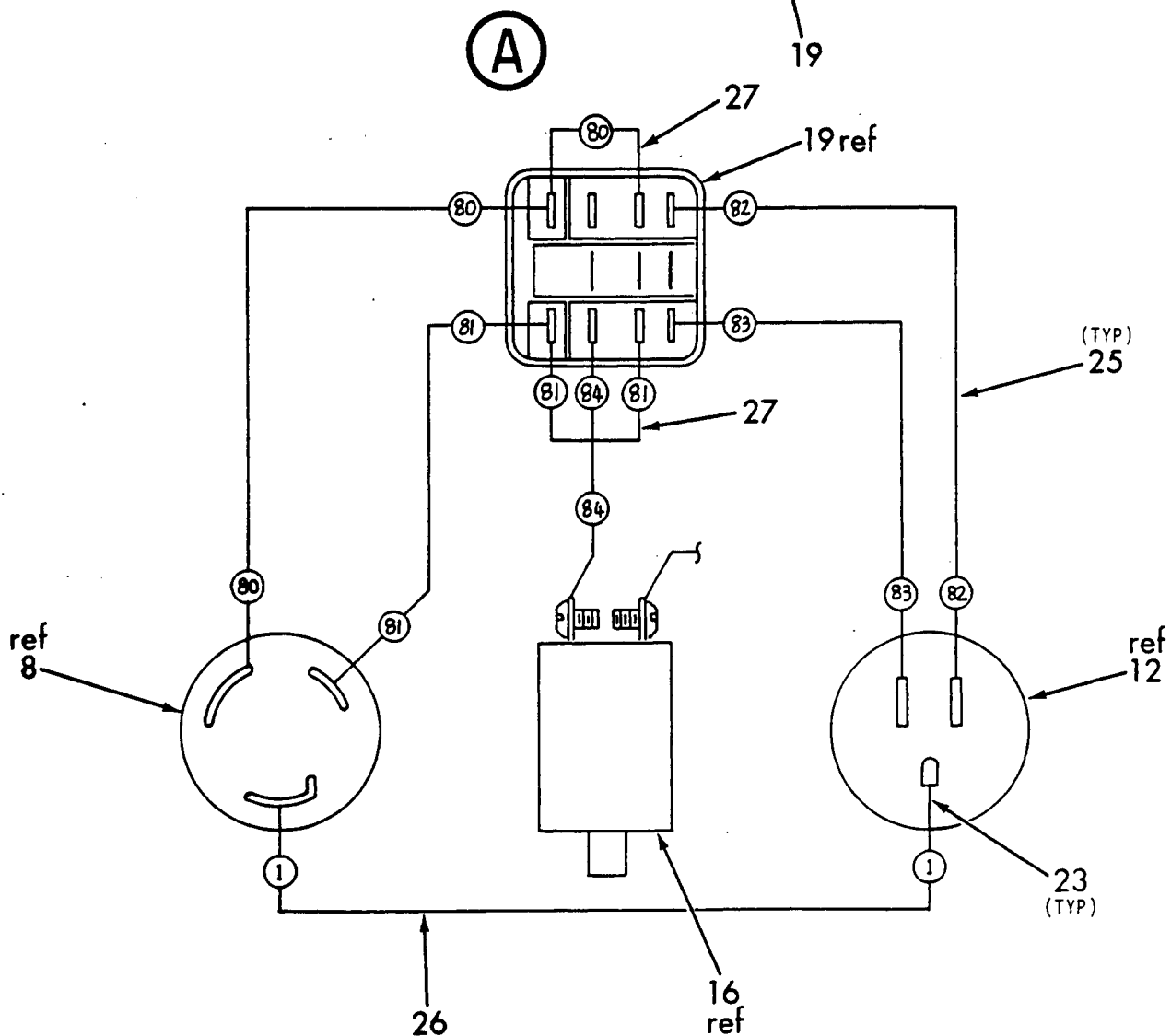
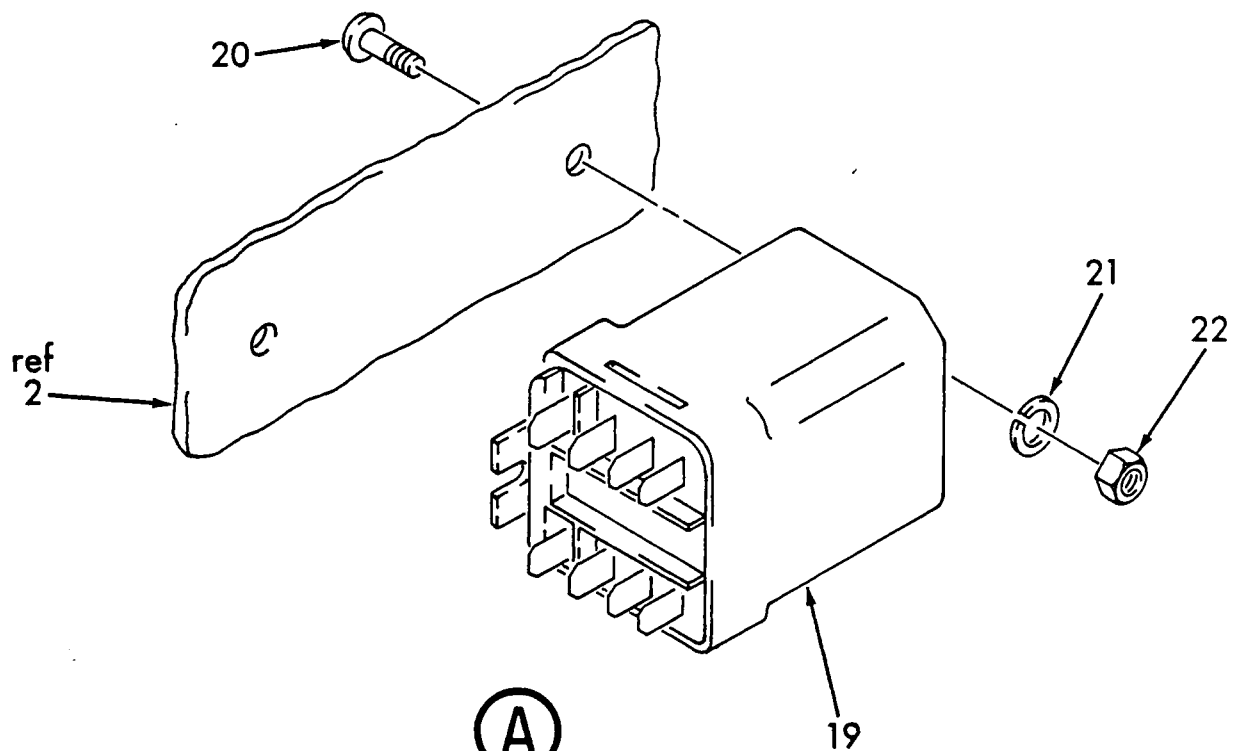


ITEM	PART NUMBER	DESCRIPTION		UNIT PER ASSY.
		1234567		
-1	32587	ASSEMBLY, A.C. OPTION BOX (See Sect. 6, Fig. 6 for NHA)		REF
2	131912	.ASSEMBLY, BOX		1
3	70360	..BOX, JIG		1
4		..GASKET		1
5		..CAP, BOX		1
6		..SCREW (attaching part)		4
7		..WASHER (attaching part)		4
8	70254	.RECEPTACLE		1
9	62636	.SCREW, MACHINE (attaching part)		3
10	63312	.WASHER, LOCK (attaching part)		3
11	61502	.NUT, HEX (attaching part)		3
12	66734	.RECEPTACLE		1
13	62636	.SCREW, MACHINE (attaching part)		2
14	63312	.WASHER, LOCK (attaching part)		2
15	61502	.NUT, HEX (attaching part)		2
16	20562	.BREAKER, CIRCUIT		1
17	2806	.RELIEF, STRAIN		1
18	2808	.NUT, LOCK (attaching part)		1
19	70351	.RELAY		2
20	62623	.SCREW, MACHINE (attaching part)		3
21	63312	.WASHER, LOCK (attaching part)		3



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
22	61502	.NUT, HEX (attaching part)	3
23	70352	.SOCKET, RELAY SCREW TERMINAL	2
24	70359	.SPRING, HOLD DOWN	2
25	117-C	.CONNECTOR, RING	26
-26	256	.CABLE, TIE	5
27	2991	.WIRE, WHITE 12 AWG (4 FT)	AR
28	70098	.WIRE, YELLOW WITH GREEN (1 FT)	AR
29	70233	.WIRE, WHITE 14 AWG (1 FT)	AR







ITEM	PART NUMBER	DESCRIPTION		UNIT PER ASSY.
		1234567		
-1	32587	ASSEMBLY, A.C. OPTION BOX (See Sect. 3, Fig. 6 for NHA)		REF
2	131912	.ASSEMBLY, BOX		1
3	70360	..BOX, JIG		1
4		..GASKET		1
5		..CAP, BOX		1
6		..SCREW (attaching part)		4
7		..WASHER (attaching part)		4
8	70254	.RECEPTACLE		1
9	62636	.SCREW, MACHINE (attaching part)		3
10	63312	.WASHER, LOCK (attaching part)		3
11	61502	.NUT, HEX (attaching part)		3
12	66734	.RECEPTACLE		1
13	62636	.SCREW, MACHINE (attaching part)		2
14	63312	.WASHER, LOCK (attaching part)		2
15	61502	.NUT, HEX (attaching part)		2
16	20562	.BREAKER, CIRCUIT		1
17	2806	.RELIEF, STRAIN		1
18	2808	.NUT, LOCK (attaching part)		1
19	70365	.RELAY		1
20	62636	.SCREW, MACHINE (attaching part)		2

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PARTS CATALOG

A.C. OPTION BOX ASSEMBLY (AFT. SEP. '87)

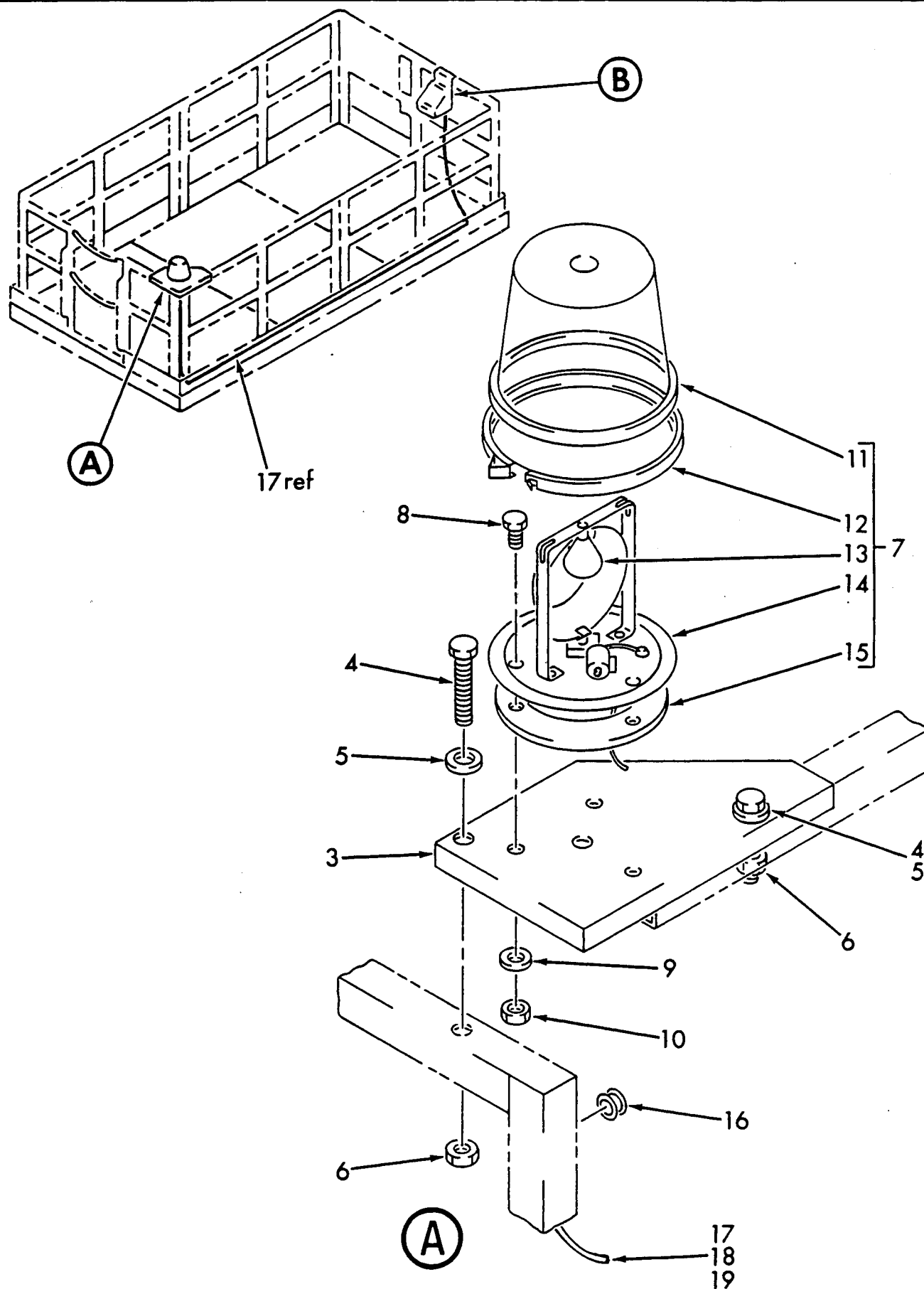
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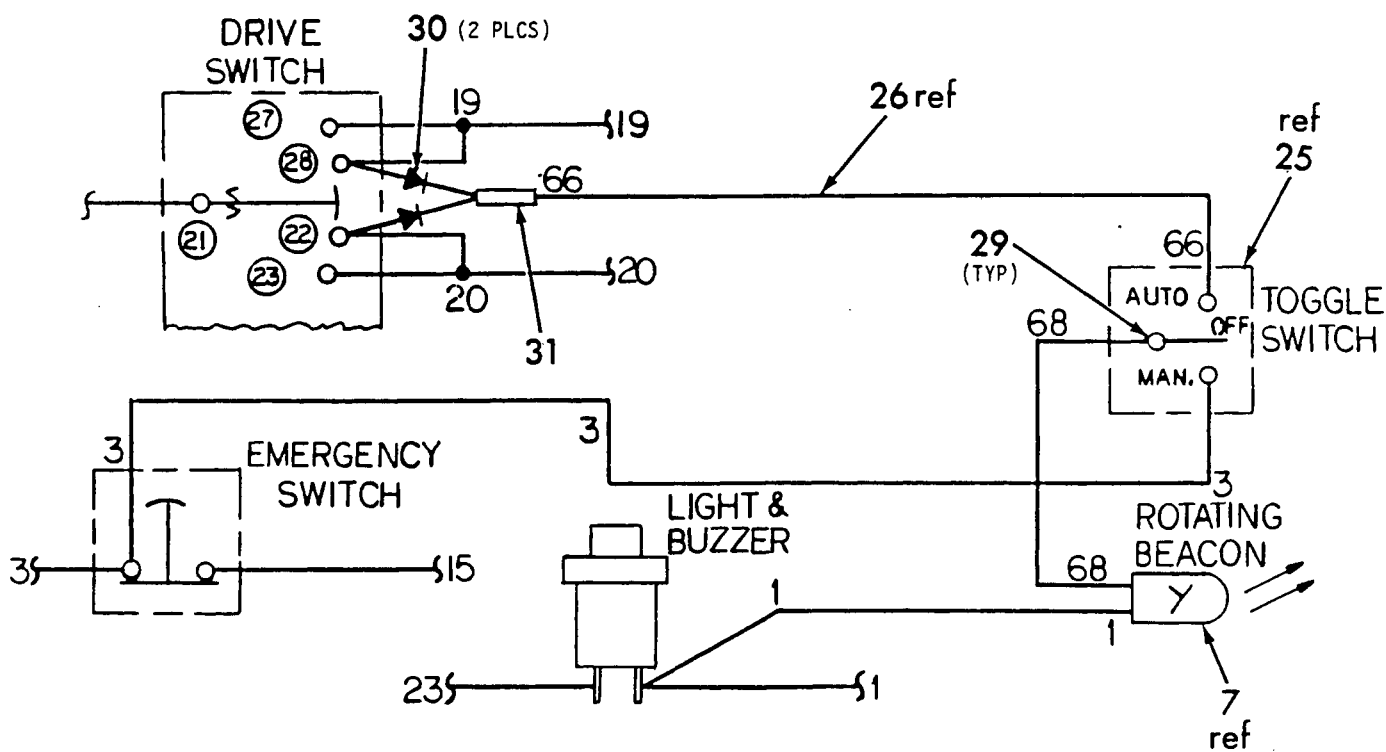
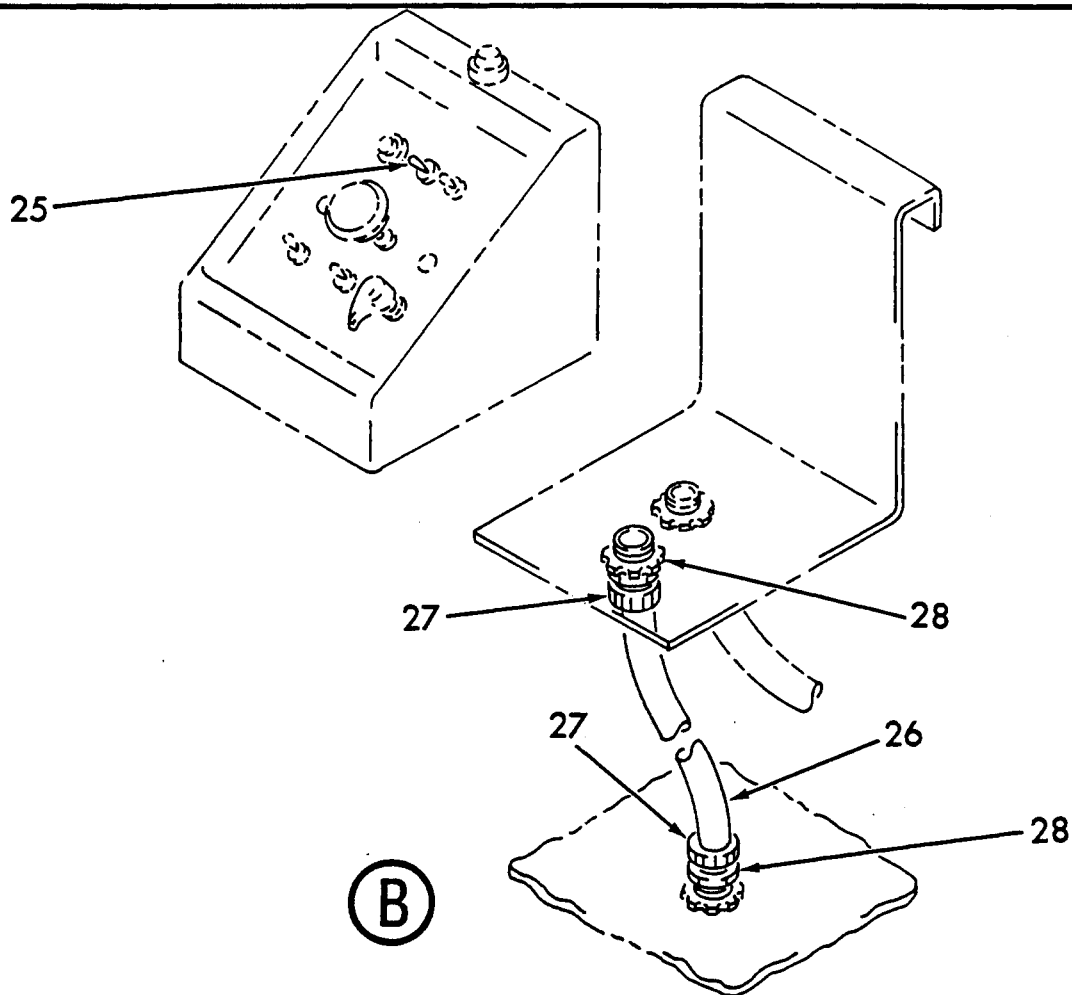
PARTS
SECT. 6
FIG. 7B
PAGE 4

ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
21	63312	.WASHER, LOCK (attaching part)	2
22	61502	.NUT, HEX (attaching part)	2
23	117-C	.CONNECTOR, RING	18
-24	256	.CABLE, TIE	3
25	2991	.WIRE, WHITE 12 AWG (3 FT)	AR
26	70098	.WIRE, YELLOW WITH GREEN (1 FT)	AR
27	70233	.WIRE, WHITE 14 AWG (1 FT)	AR

REV.

- ITEM NOT ILLUSTRATED





WIRING DIAGRAM



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	32907	ASSEMBLY, ROTATING BEACON	REF
-2	32058	.ASSEMBLY, DECK (See Sect. 5, Fig. 1B for Details)	1
3	11068	.BRACKET, BEACON MOUNTING	1
4	60319	.SCREW, CAP (attaching part)	2
5	63401	.WASHER, FLAT (attaching part)	2
6	60711	.NUT, LOCK (attaching part)	2
7	20586	.BEACON, ROTATING	1
8	60396	.SCREW, CAP (attaching part)	3
9	63413	.WASHER, FLAT (attaching part)	3
10	61247	.NUT, LOCK (attaching part)	3
11		..CAP	1
12		..CLAMP	1
13		..BULB	1
14		..BODY	1
15		..GASKET	1
16	729	.BUSHING	1
17	70036	.CABLE (16 FT)	AR
18	66356	.TERMINAL, FEMALE (attaching part)	2
19	66357	.TERMINAL, MALE (attaching part)	2
-20	4068-1	.ASSEMBLY, HAND CONTROL BOX (See Sect. 5, Fig. 2A for Details)	REF
-21	32409	.ASSEMBLY, UPPER CONTROL BOX (See Sect. 5, Fig. 2B for Details)	REF
-22	4069-1	.ASSEMBLY, HAND CONTROL BOX (See Sect. 5, Fig. 3 for Details)	REF
-23	8325-5	.ASSEMBLY, HAND CONTROL BOX (See Sect. 5, Fig. 4A for Details)	REF



ITEM	PART NUMBER	DESCRIPTION		UNIT PER ASSY.
		1234567		
-24	32410	.ASSEMBLY, UPPER CONTROL BOX (See Sect. 5, Fig. 4B for Details)		REF
25	4019	.SWITCH, TOGGLE		1
26	70232	.WIRE (4 FT)		AR
27	2807	.RELIEF, STRAIN		2
28	2808	.NUT, LOCK (attaching part)		2
29	117-C	.CONNECTOR, RING		5
30	4045	.DIODE		2
31	70069	.CONNECTOR, BUTT		1

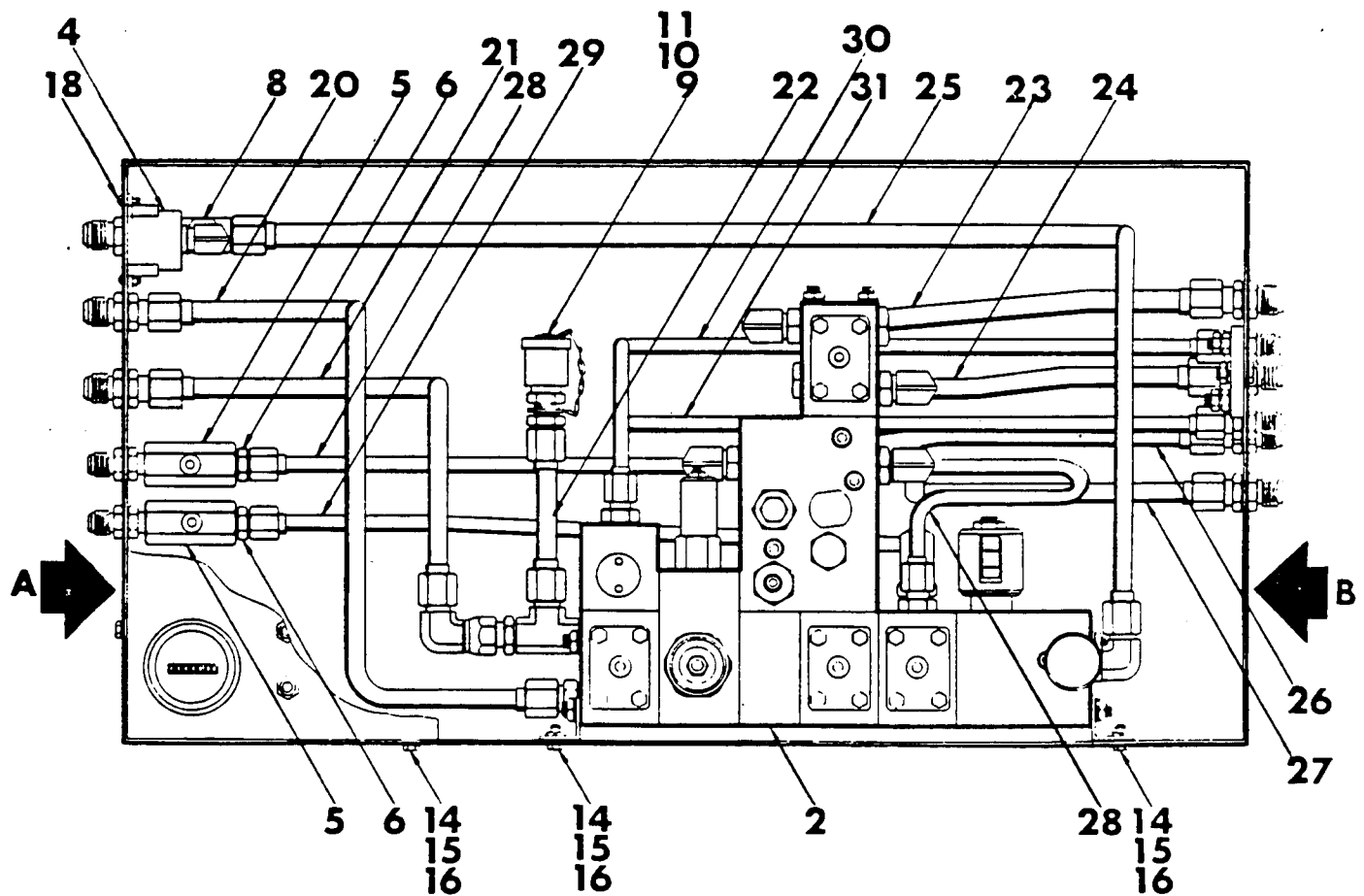
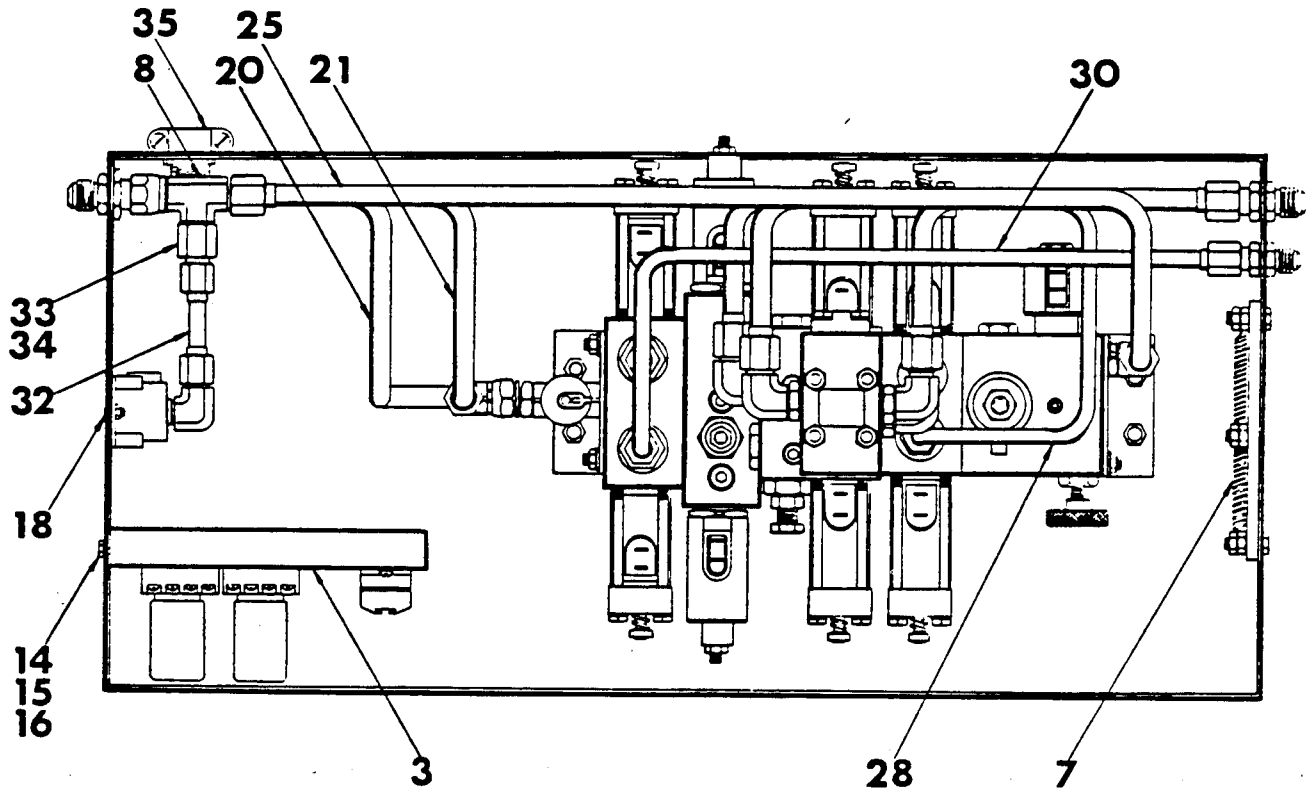


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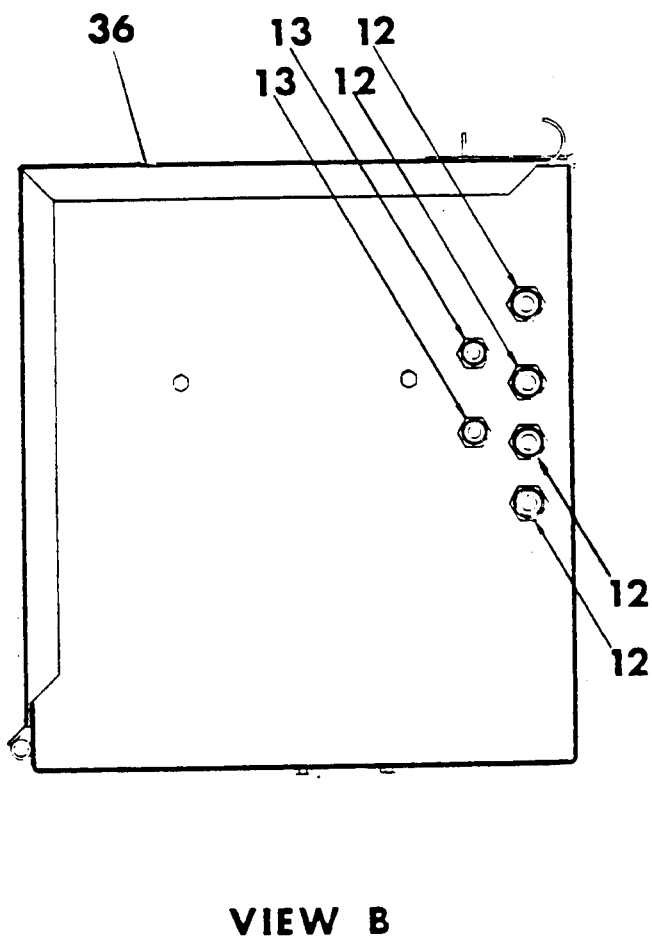
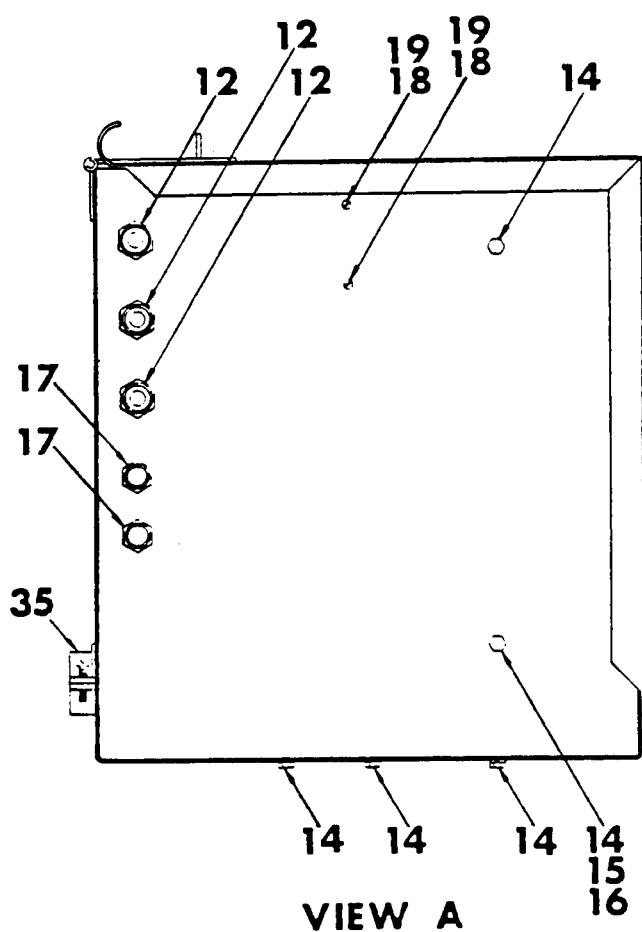
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PARTS CATALOG

**HYDRAULIC OUTRIGGER COMPONENT BOX ASSEMBLY
(RT-31G) (AFT. MAR. '80)**

PARTS
SECT. 6
FIG. 9
PAGE 1



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ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30722	ASSEMBLY, HYDRAULIC OUTRIGGER COMPONENT BOX	REF
2	30712	.ASSEMBLY, MANIFOLD (See Sect. 6, Fig. 11 for Details)	1
3	30651	.ASSEMBLY, CONTROL PANEL (See Sect. 3, Fig. 34A for Details)	1
4	30495	.ASSEMBLY, PRESSURE LIMIT SWITCH (See Sect. 3, Fig. 27 for Details)	1
5	20370	.VALVE, NEEDLE	2
6	80001-08	.CONNECTOR	2
7	4050	.RESISTOR, BRAKE	1
8	80028-06	.TEE, SWIVEL NUT RUN	1
9	845	.CAP	1
10	2527	.DISCONNECT, QUICK	1
11	80001-13	.FITTING, MALE	1
12	80045-06	.UNION, BULKHEAD	7
13	80045-05	.UNION, BULKHEAD	2
14	60123	.SCREW, HEX HEAD	8
15	63301	.WASHER, LOCK	9
16	60701	.NUT, HEX	9
17	50207	.UNION, BULKHEAD	2
18	62612	.SCREW, ROUND HEAD CAP	2
19	61502	.NUT, HEX	2
20		.ASSEMBLY, TUBE (1/2)	1
21		.ASSEMBLY, TUBE (1/2)	1
22		.ASSEMBLY, TUBE (1/2)	1
23		.ASSEMBLY, TUBE (1/2)	1
24		.ASSEMBLY, TUBE (1/2)	1
25		.ASSEMBLY, TUBE (1/2)	1

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PARTS CATALOG

**HYDRAULIC OUTRIGGER COMPONENT BOX ASSEMBLY
(RT-31G) (AFT. MAR. '80)**

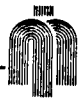
(continued)

PARTS
SECT. 6
FIG. 9
PAGE 4

ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
26		.ASSEMBLY, TUBE (1/2)	1
27		.ASSEMBLY, TUBE (1/2)	1
28		.ASSEMBLY, TUBE (3/8)	1
29		.ASSEMBLY, TUBE (3/8)	1
30		.ASSEMBLY, TUBE (3/8)	1
31		.ASSEMBLY, TUBE (3/8)	1
32		.ASSEMBLY, TUBE (3/8)	1
33	80060-06	."B" NUT	1
34	80056-03	.REDUCER, TUBE END	1
35	213	.CONNECTOR, ROMEX	1
36	8315	.BOX, COMPONENT	1
-37	3026-3	.ASSEMBLY, HYDRAULIC OUTRIGGER (AFT. MAR. '80) (See Sect. 3, Fig. 45A for Details)	1
-38	30916	.ASSEMBLY, HYDRAULIC OUTRIGGER (AFT. JUL. '86) (See Sect. 3, Fig. 45B for Details)	1

REV.

- ITEM NOT ILLUSTRATED

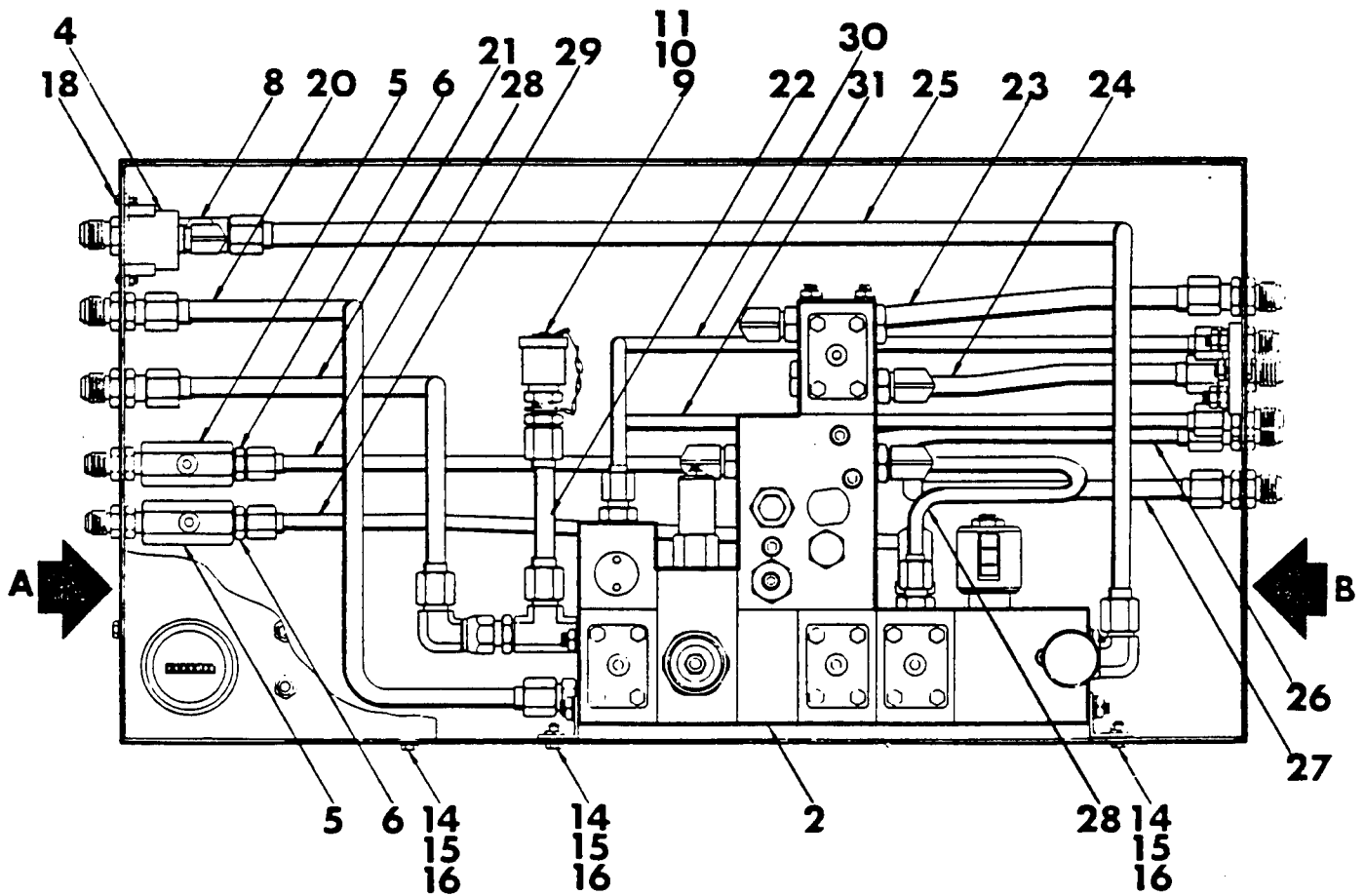
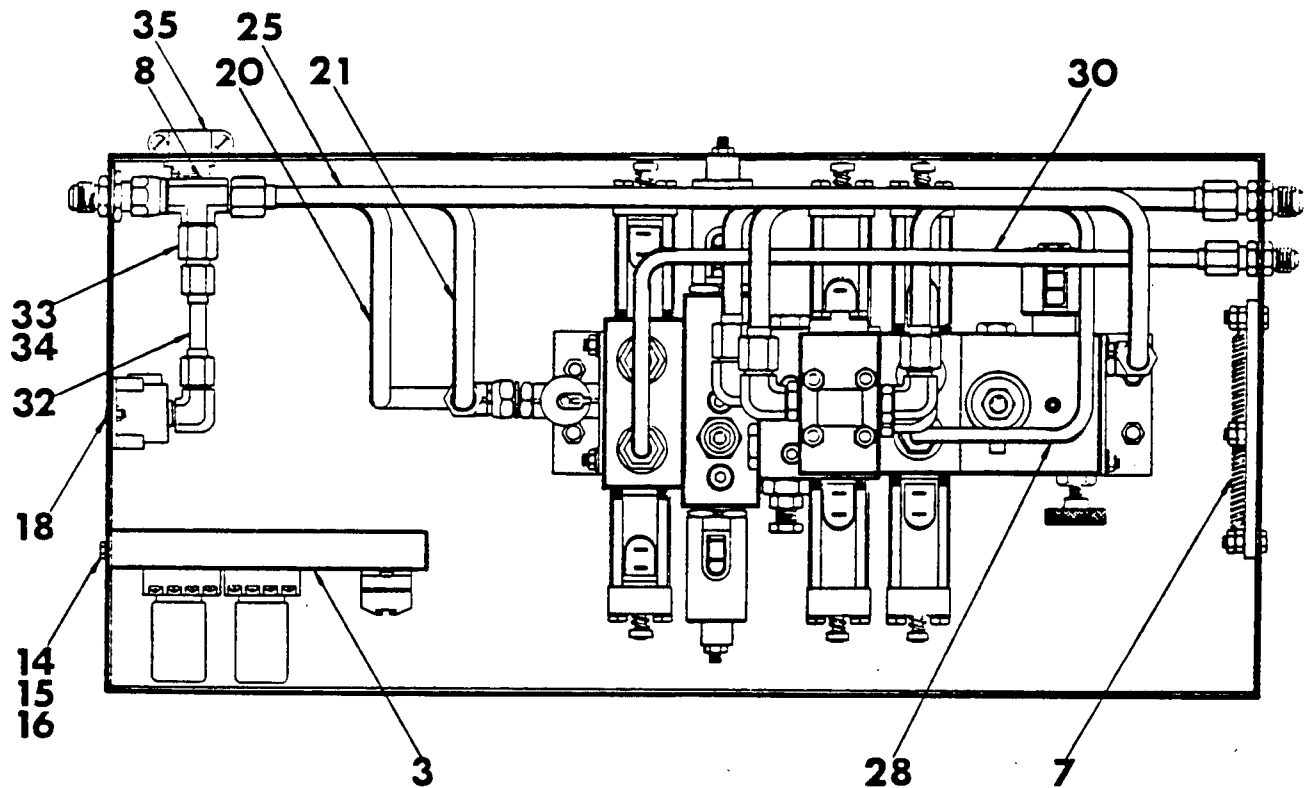


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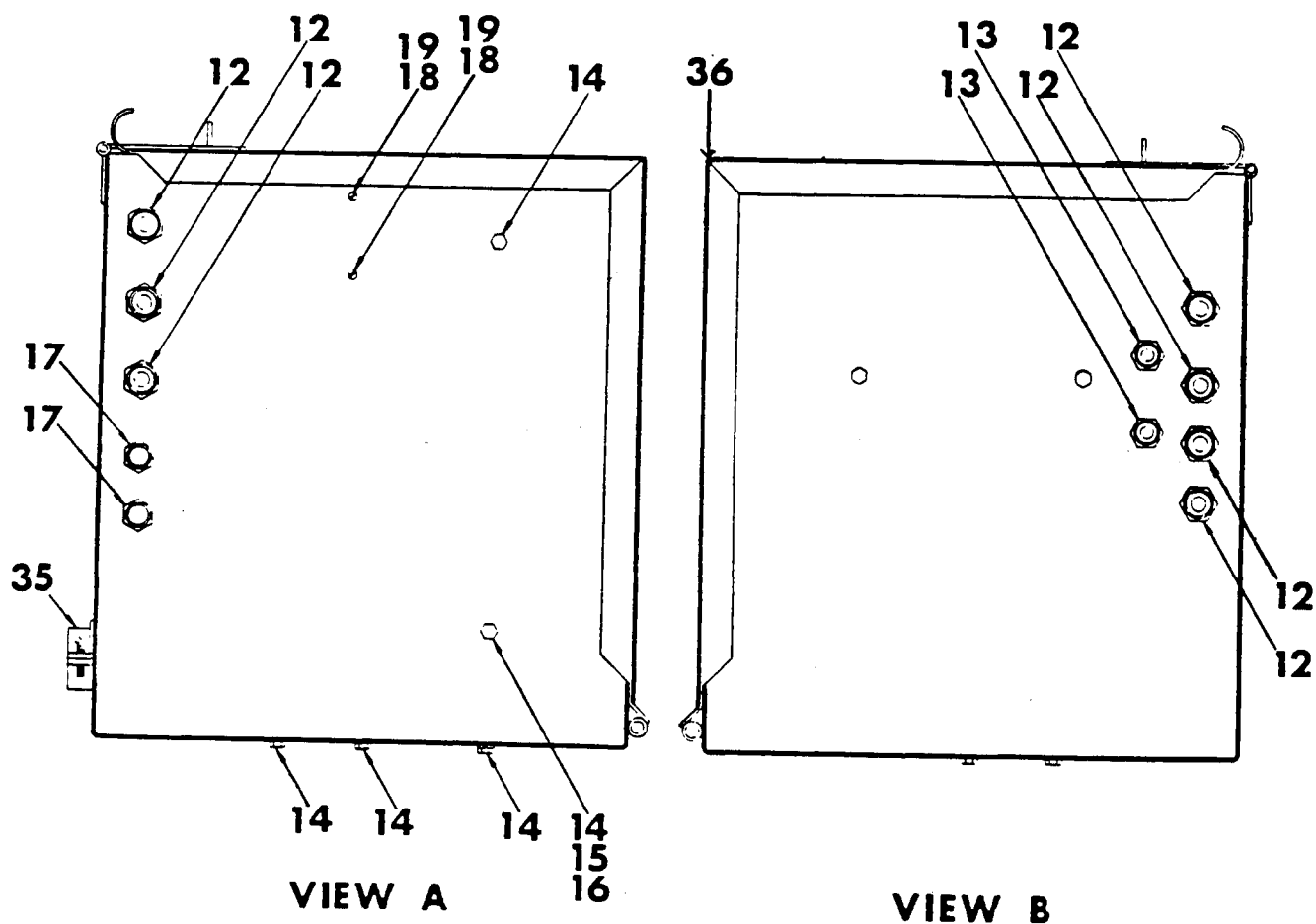
ILLUSTRATED
PARTS CATALOG

HYDRAULIC OUTRIGGER COMPONENT BOX ASSEMBLY
(RT-31E) (AFT. MAR. '80)

PARTS
SECT. 6
FIG. 10
PAGE 1



REV.





ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
-1	30765	ASSEMBLY, HYDRAULIC OUTRIGGER COMPONENT BOX	REF
2	30712	.ASSEMBLY, MANIFOLD (See Sect. 6, Fig. 11 for Details)	1
3	30652	.ASSEMBLY, CONTROL PANEL (See Sect. 3, Fig. 35A for Details)	1
4	30495	.ASSEMBLY, PRESSURE LIMIT SWITCH (See Sect. 3, Fig. 27 for Details)	1
5	20370	.VALVE, NEEDLE	2
6	80001-08	.CONNECTOR	2
7	4050	.RESISTOR, BRAKE	1
8	80028-06	.TEE, SWIVEL NUT RUN	1
9	845	.CAP	1
10	2527	.DISCONNECT, QUICK	1
11	80001-13	.FITTING, MALE	1
12	80045-06	.UNION, BULKHEAD	7
13	80045-05	.UNION, BULKHEAD	2
14	60123	.SCREW, HEX HEAD CAP	8
15	63301	.WASHER, LOCK	9
16	60701	.NUT, HEX	9
17	50207	.UNION, BULKHEAD	2
18	62612	.SCREW, ROUND HEAD CAP	2
19	61502	.NUT, HEX	2
20		.ASSEMBLY, TUBE (1/2)	1
21		.ASSEMBLY, TUBE (1/2)	1
22		.ASSEMBLY, TUBE (1/2)	1
23		.ASSEMBLY, TUBE (1/2)	1
24		.ASSEMBLY, TUBE (1/2)	1
25		.ASSEMBLY, TUBE (1/2)	1

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PARTS CATALOG

**HYDRAULIC OUTRIGGER COMPONENT BOX ASSEMBLY
(RT-31E) (AFT. MAR. '80)**

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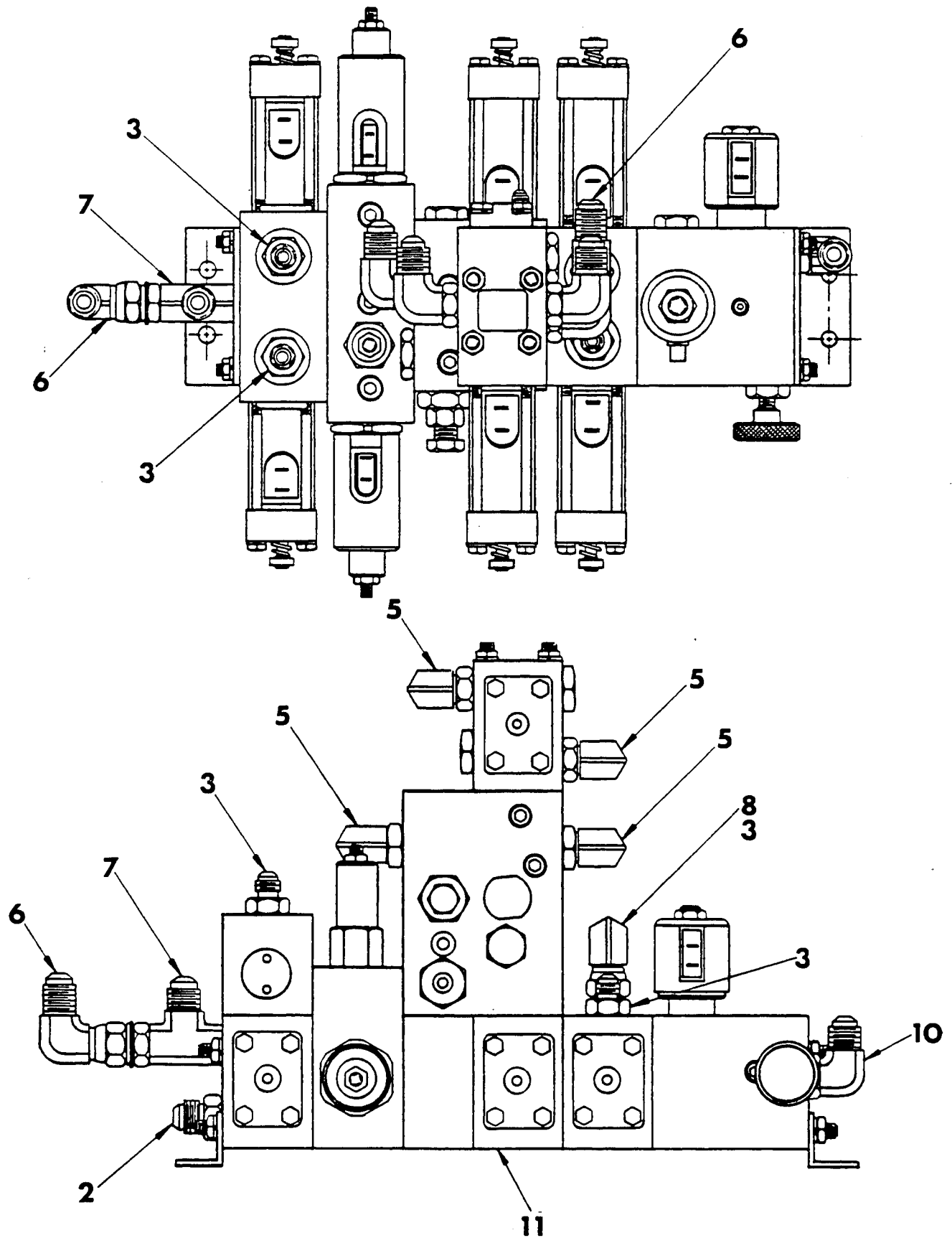
PARTS
SECT. 6
FIG. 10
PAGE 4

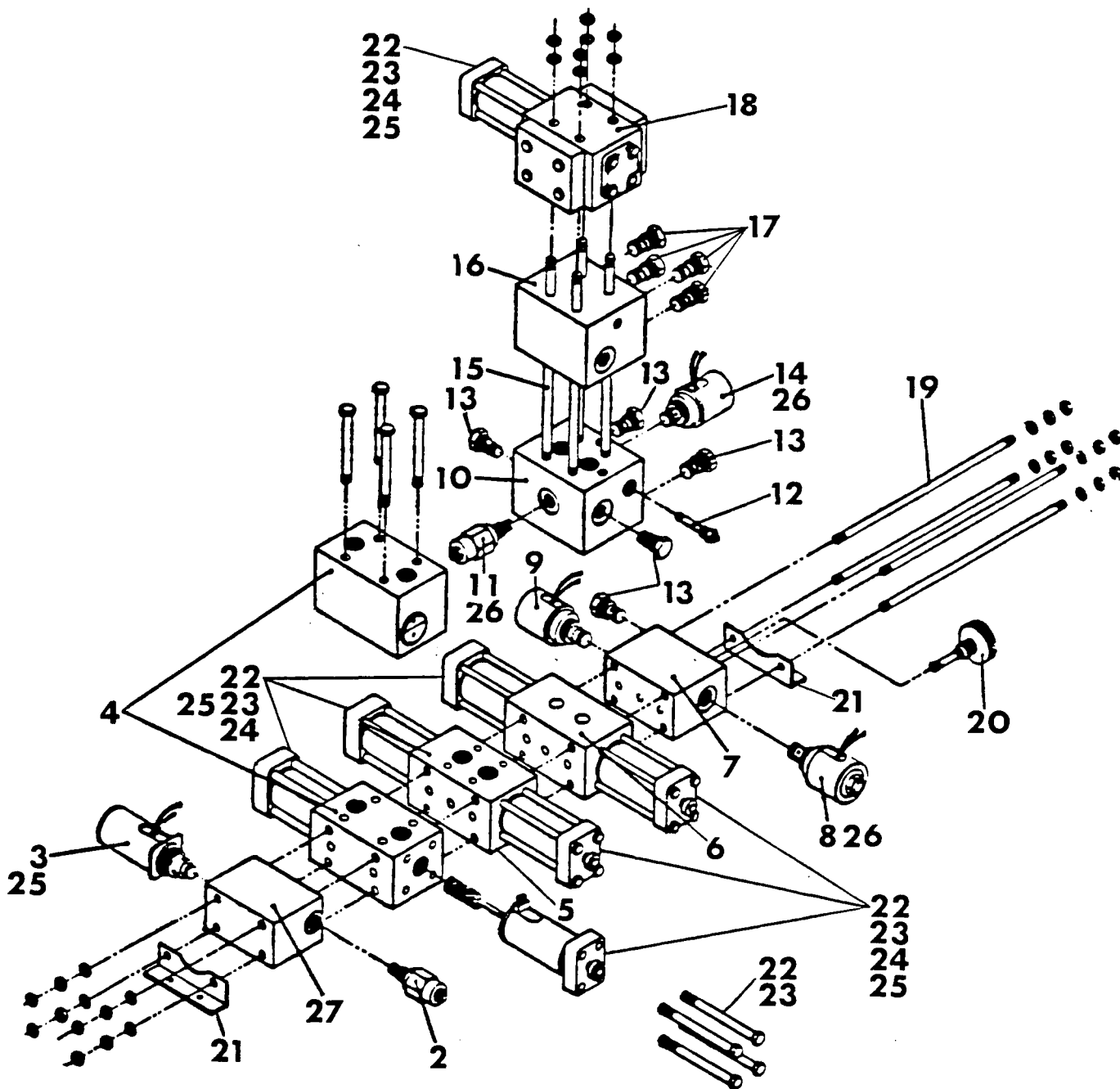
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
26		.ASSEMBLY, TUBE (1/2)	1
27		.ASSEMBLY, TUBE (1/2)	1
28		.ASSEMBLY, TUBE (3/8)	1
29		.ASSEMBLY, TUBE (3/8)	1
30		.ASSEMBLY, TUBE (3/8)	1
31		.ASSEMBLY, TUBE (3/8)	1
32		.ASSEMBLY, TUBE (3/8)	1
33	2501	."B" NUT	1
34	2578	.REDUCER, TUBE END	1
35	213	.CONNECTOR, ROMEX	1
36	8315	.BOX, COMPONENT	1
-37	3024-10	.ASSEMBLY, HYDRAULIC OUTRIGGER (AFT. MAR. '80) (See Sect. 3, Fig. 46A for Details)	1
-38	30909	.ASSEMBLY, HYDRAULIC OUTRIGGER (AFT. JUL. '86) (See Sect. 3, Fig. 46B for Details)	1

REV.

- ITEM NOT ILLUSTRATED

MANIFOLD OPTION ASSEMBLY

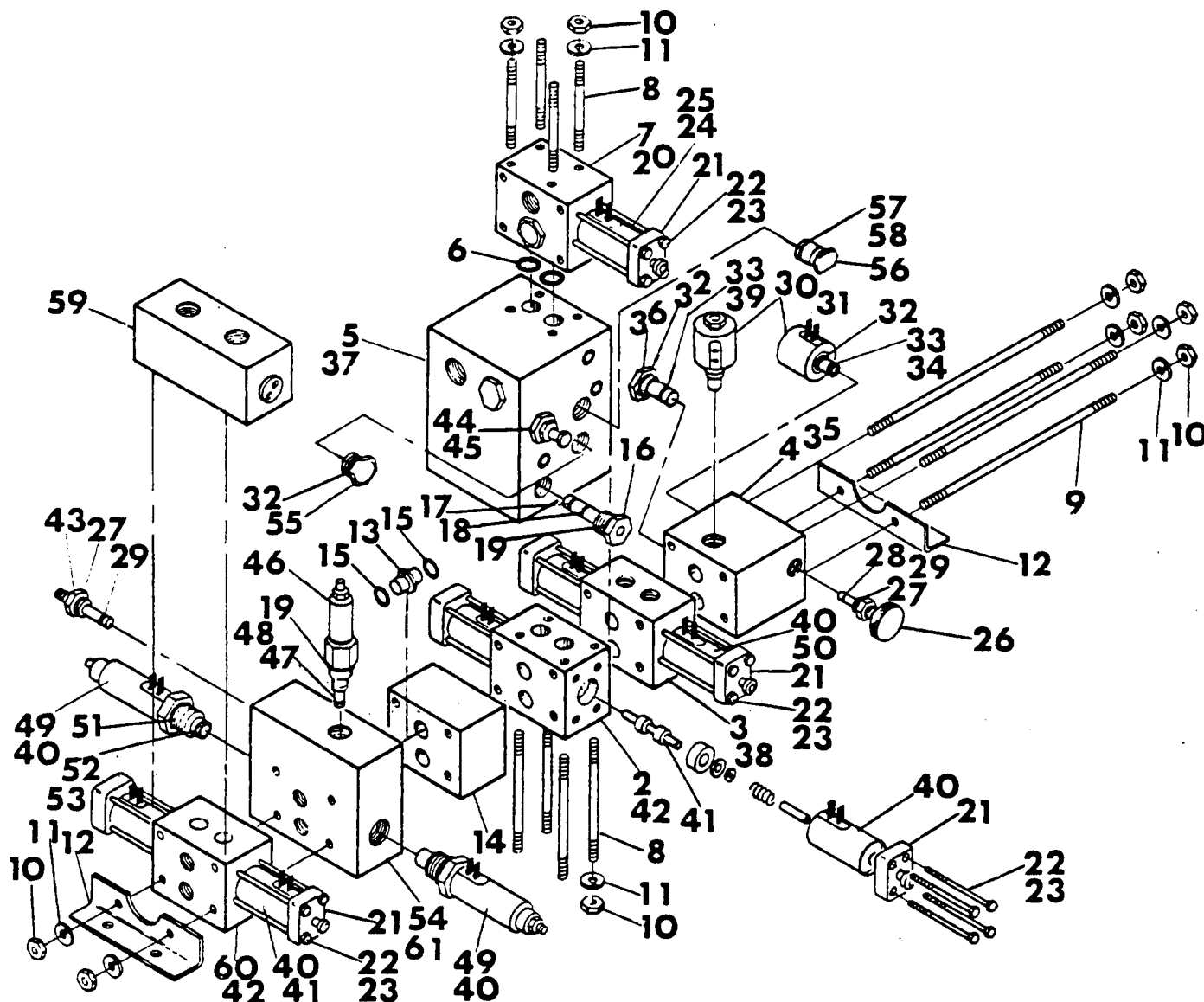




ITEM	PART NUMBER	1234567	DESCRIPTION	UNIT PER ASSY.
-1	3021		SUB-ASSEMBLY, MANIFOLD (See Sect. 6, Fig. 11 for NHA)	REF
2	3044		.VALVE, RELIEF	1
3	3045		.VALVE, DUMP	1



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
4	3043	.VALVE, OUTRIGGER	1
5	3019-2	.VALVE, STEERING	1
6	3019-3	.ASSEMBLY, DRIVE VALVE	1
7	3019-5	.ASSEMBLY, LIFT/LOWER VALVE	1
8	3051	.VALVE, LIFT	1
9	3051	.VALVE, LOWERING	1
10	66819	.ASSEMBLY, LOW SPEED/CREEP VALVE	1
11	3044	.VALVE, CUSHION RELIEF	1
12	3050	.ORIFICE, CONTROL (CREEP ADJUSTMENT)	1
13	3048	.VALVE, CHECK	5
14	3047	.VALVE, CREEP/LOW SPEED	1
15	3056	.BOLT, TIE ROD	4
16	66820	.ASSEMBLY, FLOW REGULATOR VALVE	1
17	3057	.VALVE, FLOW REGULATOR	4
18	66821	.ASSEMBLY, HIGH SPEED VALVE	1
19	3055	.BOLT, TIE ROD	4
20	3053	.VALVE, EMERGENCY LOWERING	1
21	66012	.FOOT	2
22	66056	.SCREW, HEX HEAD CAP	28
23	63301	.WASHER, LOCK	28
24	66055	.ASSEMBLY, MANUAL RELEASE	REF
25	4073	.COIL, 6 VOLT LONG	8
26	4074	.COIL, 6 VOLT SHORT	3
27	3019-1	.ASSEMBLY, DUMP AND RELIEF VALVE	1



ITEM	PART NUMBER	DESCRIPTION							UNIT PER ASSY.
		1	2	3	4	5	6	7	
-1	3101	SUB-ASSEMBLY, MANIFOLD (See Sect. 3, Fig. 11 for NHA)							REF
2	66002	.VALVE, SOLENOID (DRIVE)							1
3	66003	.VALVE, SOLENOID (STEERING)							1
4	66004	.ASSEMBLY, LIFT CONTROL							1
5	66005	.PACKAGE, DRIVE							1
6	66006	.O-RING							6
7	66007	.VALVE, SOLENOID (HI-SPEED)							1



ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
8	66008	.ROD, TIE	8
9	66093	.ROD, TIE	4
10	66010	.NUT, HEX JAM	20
11	66011	.WASHER, LOCK	20
12	66012	.FOOT	2
13	66013	.SEAL, BANKING	10
14	66014	.BLOCK, SPACER	1
15	66016	.O-RING	20
16	66050	.CARTRIDGE, SHUTTLE VALVE	1
17	66051	.O-RING	1
18	66052	.O-RING	1
19	66053	.O-RING	2
20	66054	.BLOCK	REF
21	66055	.ASSEMBLY, MANUAL RELEASE	REF
22	66056	.SCREW, HEX HEAD CAP	28
23	63301	.WASHER, LOCK	28
24	66057	.COIL	1
25	66058	.ASSEMBLY, SPOOL	REF
26	66059	.VALVE, NEEDLE (EMERGENCY LOWERING)	1
27	66060	.O-RING	2
28	66061	.RING, BACK-UP	2
29	66062	.O-RING	2
30	3051	.VALVE, CARTRIDGE (LIFT/LOWERING)	2
31	4074	.COIL	REF
32	66065	.O-RING	5
33	66066	.O-RING	3



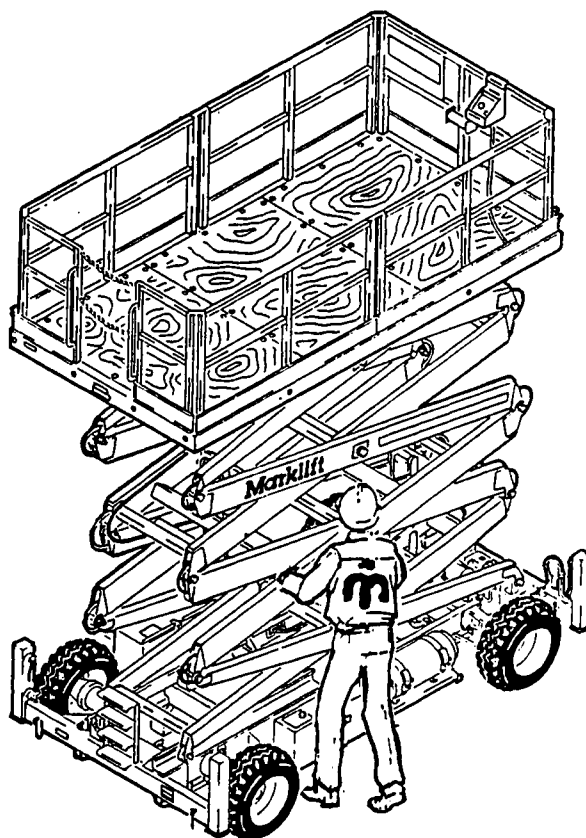
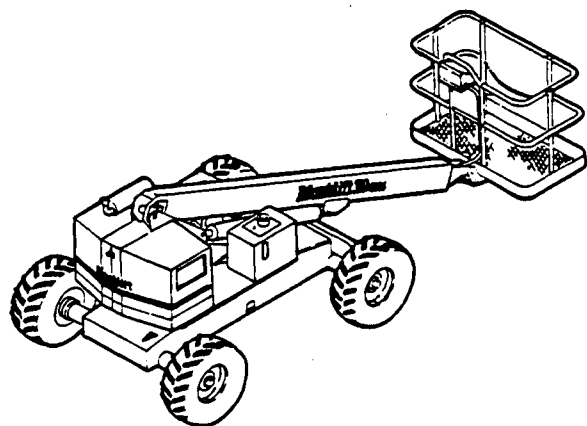
ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
34	66067	.RING, BACK-UP	2
35	66068	.BLOCK	1
36	3048	.VALVE, CHECK	1
37	66070	.BLOCK	1
38	66071	.BLOCK	REF
39	66072	.RING, BACK-UP	1
40	4073	.COIL	8
41	66074	.SPOOL (DRIVE)	REF
42	66075	.BLOCK	2
43	66076	.VALVE, NEEDLE	1
44	66077	.HOUSING, ADJUSTMENT	2
45	66078	.O-RING	2
46	66079	.VALVE, CARTRIDGE (MAIN SYS. PRESS. ADJ.)	1
47	66080	.O-RING	1
48	66081	.RING, BACK-UP	1
49	66082	.VALVE, SOLENOID (DUMP/CREEP)	2
50	66083	.SPOOL	REF
51	66084	.O-RING	2
52	66085	.O-RING	2
53	66086	.RING, BACK-UP	2
54	66087	.BLOCK	1
55	66088	.PLUG, TUBE	2
56	66089	.PLUG	2
57	66090	.O-RING	2
58	66091	.RING, BACK-UP	2
59	66094	.VALVE, LOCK	1

ITEM	PART NUMBER	DESCRIPTION	UNIT PER ASSY.
		1234567	
60	66095	.VALVE, SOLENOID (OUTRIGGER)	1
61	66001	.SUB-ASSEMBLY, DUMP VALVE	1



THIS VENDOR CHAPTER IS DESIGNED AS:

- | | |
|-----------|---------------------------|
| SECTION 1 | ONAN ENGINE |
| SECTION 2 | CHRISTIE BATTERY CHARGER |
| SECTION 3 | JOHN S. BARNES PUMP MOTOR |
| SECTION 4 | MICO DISC BRAKE |
| SECTION 5 | TROJAN BATTERY |
| SECTION 6 | ROSS GEAR DRIVE MOTOR |





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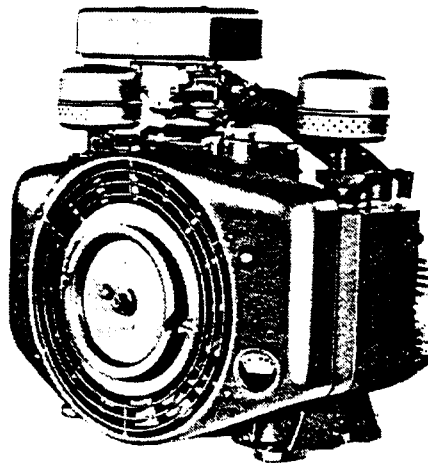
ONAN CCKB ENGINE

VENDOR

SECT. 1

PAGE 1

Onan Operators Manual



SERIES
CCKB
Engine

Onan Corporation
1400 73rd Avenue Northeast
Minneapolis Minnesota 55432

927-0151
9-80 (SPEC J)
Replaces 5-77 (Spec J)

REV.



ENGINE SAFETY PRECAUTIONS

It is recommended that you read your engine manual and become thoroughly acquainted with your equipment before you start the engine.

WARNING This symbol is used throughout this manual to warn of possible serious personal injury.

CAUTION This symbol refers to possible equipment damage.

Fuels, electrical equipment, batteries, exhaust gases and moving parts present potential hazards that could result in serious, personal injury. Take care in following these recommended procedures.

Safety Codes

- All local, state and federal codes should be consulted and complied with.

General

- Provide appropriate fire extinguishers and install them in convenient locations. Use an extinguisher rated ABC by NFPA.
- Make sure that all fasteners on the engine are secure. Tighten supports and clamps, keep guards in position over fans, driving belts, etc.
- If it is necessary to make adjustments while the engine is running, use extreme caution when close to hot exhausts, moving parts, etc.

Protect Against Moving Parts

- Do not wear loose clothing in the vicinity of moving parts, such as PTO shafts, flywheels, blowers, couplings, fans, belts, etc.
- Keep your hands away from moving parts.

Batteries

- Before starting work on the engine, disconnect batteries to prevent inadvertent starting of the engine.
- DO NOT SMOKE while servicing batteries. Lead acid batteries give off a highly explosive hydrogen gas which can be ignited by flame, electrical arcing or by smoking.
- Verify battery polarity before connecting battery cables. Connect negative cable last.

Fuel System

- DO NOT fill fuel tanks while engine is running, unless tanks are outside engine compartment.

- DO NOT smoke or use an open flame in the vicinity of the engine or fuel tank. Internal combustion engine fuels are highly flammable.
- Fuel lines must be of steel piping, adequately secured, and free from leaks. Piping at the engine should be approved flexible line. Do not use copper piping on flexible lines as copper will work harden and become brittle enough to break.
- Be sure all fuel supplies have a positive shutoff valve.

Exhaust System

- Exhaust products of any internal combustion engine are toxic and can cause injury, or death if inhaled. All engine installations, especially those within a confine, should be equipped with an exhaust system to discharge gases to the atmosphere.
- Do not use exhaust gases to heat a compartment.
- Make sure that your exhaust system is free of leaks. Ensure that exhaust manifolds are secure and are not warped by bolts unevenly torqued.

Engine Exhaust Gas (Carbon Monoxide) is Deadly!

Carbon monoxide is an odorless, colorless gas formed by incomplete combustion of hydrocarbon fuels. Carbon monoxide is a dangerous gas that can cause unconsciousness and is potentially lethal. Some of the symptoms or signs of carbon monoxide inhalation are:

- Dizziness
- Intense Headache
- Weakness and Sleepiness
- Vomiting
- Muscular Twitching
- Throbbing in Temples

If you experience any of the above symptoms, get out into fresh air immediately.

The best protection against carbon monoxide inhalation is a regular inspection of the complete exhaust system. If you notice a change in the sound or appearance of exhaust system, shut the unit down immediately and have it inspected and repaired at once by a competent mechanic.

Cooling System

- Coolants under pressure have a higher-boiling point than water. DO NOT open a radiator pressure cap while the engine is running. Bleed the system pressure first.

Keep the Unit and Surrounding Area Clean

- Make sure that oily rags are not left on or near the engine.
- Remove all oil deposits. Remove all unnecessary grease and oil from the unit. Accumulated grease and oil can cause overheating and subsequent engine damage and may present a potential fire hazard.



GENERAL INFORMATION

Read this manual carefully, observing all **WARNINGS** and **CAUTIONS**. Operating instructions, adjustments and periodic maintenance procedures are given so you . . . the owner, can keep your unit running like new and expect many years of dependable service from it. Remember . . . any machine, regardless of design or type, will perform only in relation to the service it receives. Regularly scheduled maintenance lowers operating costs.

CAUTION

This symbol refers to possible equipment damage.

WARNING

This symbol is used throughout this manual to warn of possible serious personal injury.

ENGINE MODEL REFERENCE

Identify your model by referring to the **MODEL** and **SPEC** (Specification) **NO.** as shown on the unit nameplate. Always use this number when making reference to your engine or when ordering repair parts.

Onan recommends that all major service be performed by qualified service personnel. An engine service manual and complete parts catalog are available at additional cost. Contact your nearest authorized dealer or Onan Parts and Service Center.

REFERENCE MANUALS

Parts Catalog 927-0404
Major Service Manual 927-0754

These instructions contain the SI metric equivalents following immediately in parentheses after the U.S. customary units of measure.

SPECIFICATIONS

Engine Design Opposed two cylinder,
four cycle, air cooled
Cylinder Bore 3-1/4 inch (82.6 mm)
Piston Stroke 3 inch (76.2 mm)
Displacement 50 cu inch (816.0 cm³)
Horsepower 20 at 3900 rpm
Oil Capacity with Filter Change 4 qts. (3.8 litre)
Oil Capacity without Filter Change 3.5 qts. (3.3 litre)
Fuel-Gaseous Fuel (Optional) Gasoline
Battery 12 Volt

TUNE-UP SPECIFICATIONS

Cylinder Head Torque 29-31 ft. lb. (39-42 N•m)
Spark Plug Gap - Gasoline 0.025 (0.635 mm)
Spark Plug Gap - Gas 0.018 (0.457 mm)
Breaker Point Gap 0.020 (0.51 mm)
Tappets (Cold) Intake 0.006 to 0.008 (0.152 to 0.203)
Exhaust 0.015 to 0.017 (0.381 to 0.432)

Ignition Timing:

Standard Electric Start
(Stopped or Running) 20° BTC
Manual Start with Spark Advance 1° ATDC (Stopped)
24° BTC (Running)
Electric Start with Magneto and
Spark Advance 5° BTC (Stopped)
24° BTC (Running)

OUT-OF-SERVICE PROTECTION

Protect an engine that will be out-of-service for more than 30 days as follows:

1. Run the engine until it reaches normal operating temperature.
2. Turn off the fuel supply and run the engine until it stops.
3. Drain oil from oil base while the engine is still warm. Refill with fresh crankcase oil and attach a tag stating viscosity used.
4. Remove spark plugs. Pour 1 ounce (3 tablespoons or 28 grams) of rust inhibitor or SAE #50 oil into the cylinders. Crank the engine over a few times. Reinstall spark plugs.
5. Service air cleaner as outlined in **MAINTENANCE** section.
6. Clean governor linkage and protect by wrapping with a clean cloth.
7. Plug exhaust outlet to prevent entrance of moisture, dirt, bugs, etc.
8. Wipe entire unit. Coat rustable parts with a light film of grease or oil.
9. Provide a suitable cover for the entire unit.
10. If battery equipped, disconnect and follow standard battery storage procedure.

RETURNING UNIT TO SERVICE

1. Remove cover and all protective wrapping. Remove plug from exhaust outlet.
2. Check tag on oil base and verify that oil viscosity is still correct for existing ambient temperatures.
3. Clean and check battery. Measure specific gravity (1.260 at 77° F [25° C]) and verify level to be at split ring. If specific gravity is low, charge until correct value is obtained. If the level is low, add distilled water and charge until specific gravity is correct. **DO NOT OVERCHARGE.**
4. Check that fuel filter and fuel lines are secure, with no leaks.
5. Check carburetor, adjust if necessary.
6. Connect battery.
7. Refer to **STARTING** section.

After engine has started, excessive blue smoke is exhausted until the rust inhibitor has burned away.



PRE-START INSTRUCTIONS

BEFORE STARTING

Be sure the engine is properly filled with oil and fuel.

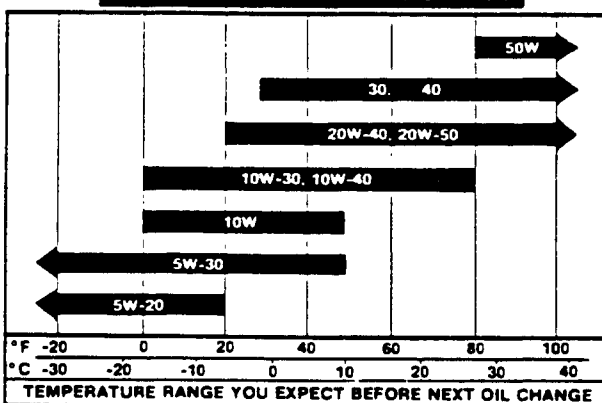
Inspection: Inspect the engine visually before starting. Check for loose or missing parts and any damage that may have occurred in shipment.

Crankcase Oil: Fill the crankcase with an oil that meets the API (American Petroleum Institute) service designation SE or SE/CC. Do not mix brands nor grades of motor oil. Recommended oil numbers for expected temperatures are listed in the oil chart.

CAUTION

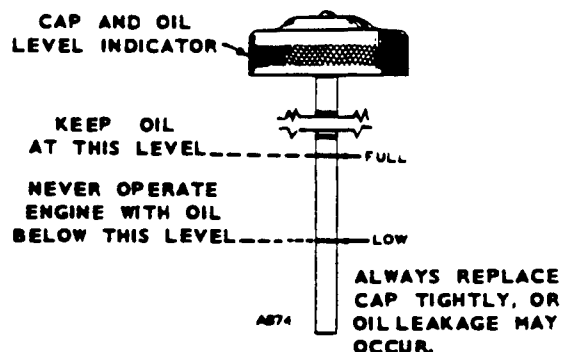
Do not overfill crankcase. Overfilling causes the oil to foam and enter the breather system. Do not use service DS oil or damage to the engine could occur.

USE THESE SAE VISCOSITY GRADES



WARNING

Never check oil level while engine is running. Hot oil discharged from the engine could cause personal injury.



Recommended Fuel: Use clean, fresh, unleaded or regular grade gasoline. Do not use highly leaded premium fuels. Using unleaded gasoline results in less maintenance.

Use regular gasoline for the first 25 hours to allow the rings to seat well for best performance. Then use unleaded or regular gasoline thereafter.

If regular gasoline is used continually, carbon and lead deposits must be removed from the cylinder heads as required because of engine power loss. Unleaded gasoline may be used safely after lead deposits have been removed.

WARNING

Never fill the fuel tank when the engine is running. Gasoline could ignite, causing a serious injury.

CAUTION

If lead deposits are not removed from engine before switching from leaded to nonleaded gasoline, preignition could occur, causing severe damage to the engine.

STARTING

Most engines are equipped with a start-stop switch and cable controlled choke and throttle.

1. Place the throttle control in the SLOW position and the choke into the FULL choke position.
2. Turn the ignition switch on and engage starter. If engine fails to start after 30 seconds determine the cause. Wait one minute before re cranking.

If the engine fails to start at first attempt, rust inhibitor oil used at the factory may have fouled the plugs. Remove the plugs, clean in a suitable solvent, dry thoroughly and reinstall. Heavy exhaust smoke when the engine is initially started is normal and usually caused by rust inhibitor oil.

3. When the engine starts, gradually push the choke lever in until the engine runs smoothly.
4. Black smoke from the exhaust and a rough running engine usually indicate over-choking.

5. To stop the engine, turn the ignition switch to the OFF position.

WARNING

ENGINE EXHAUST GAS (CARBON MONOXIDE) IS DEADLY!

Carbon monoxide is an odorless, colorless gas formed by incomplete combustion of hydrocarbon fuels. Carbon monoxide is a dangerous gas that can cause unconsciousness and is potentially lethal. Some of the symptoms or signs of carbon monoxide inhalation are:

- Dizziness
- Intense Headache
- Weakness and Sleepiness
- Vomiting
- Muscular Twitching
- Throbbing in Temples

If you experience any of the above symptoms, get out into fresh air immediately.

The best protection against carbon monoxide inhalation is a regular inspection of the complete exhaust system. If you notice a change in the sound or appearance of exhaust system, shut the unit down immediately and have it inspected and repaired at once by a competent mechanic.



OPERATION

VENTILATION

Good ventilation is needed to cool the engine and to support combustion. Avoid operating the engine in an enclosed area without suitable ventilation.

WARNING

EXHAUST GASES ARE DEADLY
POISONOUS!

BREAK-IN PROCEDURE

Controlled break-in is the ideal fitting of all internal moving metal parts. Using the proper oil and applying a conscientious maintenance program during this period helps assure satisfactory service from your Onan engine.

Maintain the proper cooling and lubrication during break-in. Run the engine at half load for the first three hours with intermittent periods of full load to control engine break-in.

CAUTION

Using the wrong grade and weight of oil and high engine operating temperature during break-in can cause engine damage.

Check the oil level at least every five operating hours. Add oil to keep it at the proper level, but never overfill as overfilling may cause the oil to foam and enter the breather system.

HOT WEATHER OPERATION

When operating the engine in temperatures above 75° F (24° C), pay particular attention to the following items to prevent damage:

1. Keep the engine cooling fins clean and free of

obstruction which could decrease air flow to and from the engine.

2. See that nothing obstructs air flow to and from the engine.
3. Ensure that you are using the proper grade and weight of oil for the temperature the engine is being used in. Check the oil level each time you fill the fuel tank.
4. Check the battery water level more frequently than every 50 hours which is recommended under normal conditions. High temperatures cause faster evaporation.

COLD WEATHER OPERATION

When the engine is being used in temperatures below 32° F (0° C), check the following items closely:

1. Use correct SAE No. oil for temperature conditions. Change oil only when engine is warm.
2. Use fresh fuel. Protect against moisture condensation.
3. Keep fuel system clean and batteries in a well charged condition.
4. Partially restrict cool air flow, but use care to avoid overheating.

DUST AND DIRT

1. Keep unit clean. Keep cooling system clean.
2. Service air cleaner as frequently as required.
3. Change crankcase oil and filter more often than recommended under normal conditions.

CAUTION

Plugged or clogged cooling fins can cause overheating and engine damage.

MAINTENANCE

Oil Level: Check oil level at least every 8 hours of operation. Check more frequently on a new or reconditioned engine as oil consumption is higher until the piston rings seat properly.

Oil Change: Change crankcase oil after the first 25 hours of operation. Engines without oil filter change oil every 50 hours after that. Engines with oil filter change every 100 hours after first change at 25 hours. If accumulated hours of operation do not total 100 hours (50 hours without filter) during a 12 month period change the oil and filter when used regardless.

Cooling System: Check and clean cooling fins at least every 50 hours. Remove any dust, dirt or oil which may have accumulated.

CAUTION

Plugged or clogged cooling fins can cause overheating and engine damage.

Exhaust System: Make regular inspections of the

exhaust system throughout the entire life of the engine. Locate leaks in muffler and piping while the engine is operating. Repair all leaks immediately after they are detected for personal safety.

WARNING

Leaky exhaust systems emit noxious carbon monoxide fumes which are a potential safety hazard in enclosed areas.

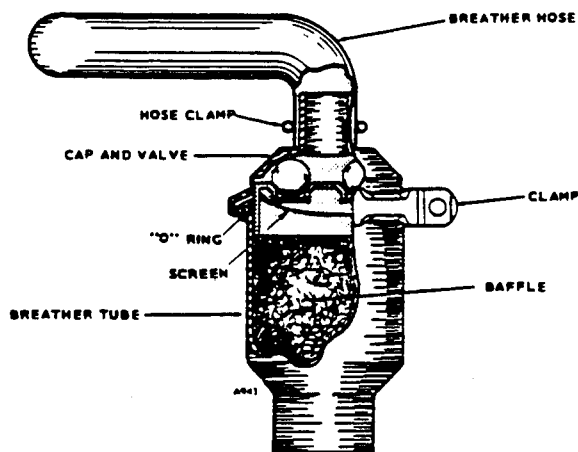
Battery: Check charge condition. Check electrolyte level. Add distilled water to keep electrolyte at its proper level. Immediately after adding water in freezing weather, operate engine until battery is fully charged.

Breaker Points: Check breaker points every 100 hours. Replace points every 200 operating hours. Replace points sooner if they are pitted or burned. See **ADJUSTMENTS** section.



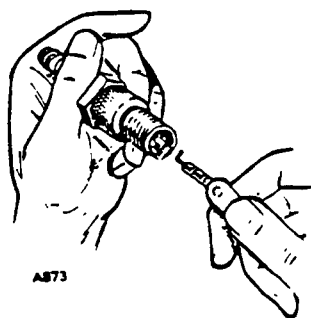
MAINTENANCE

Crankcase Breather: This engine uses a crankcase breather valve for maintaining crankcase vacuum. No maintenance is generally required. If the crankcase becomes pressurized as evidenced by oil leaks at the seals, clean the crankcase breather cap and valve assembly, and the breather tube baffle in suitable solvent. To remove breather cap and valve assembly, remove the breather hose clamp and breather tube clamp.



CRANKCASE BREATHER

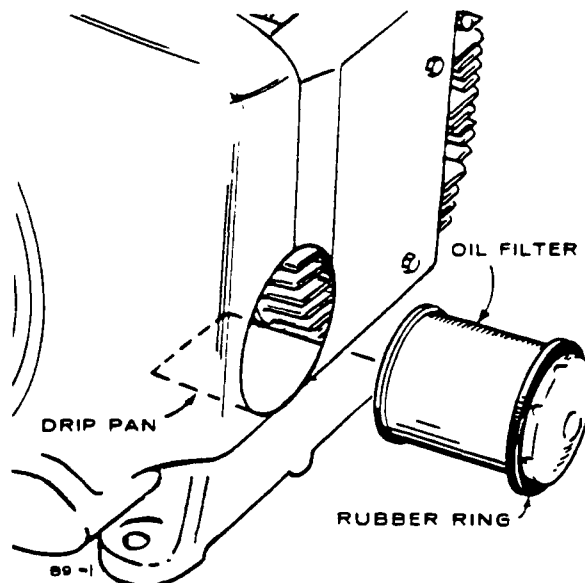
Spark Plugs: Check, clean and reset spark plugs every 100 operating hours. Replace spark plugs that show signs of fouling or electrode erosion.



SPARK PLUG GAP
0.025"

SPARK PLUG GAP

Oil Filter (Optional): Replace oil filter after the first 25 hours of operation, replace every 100 hours after that. Remove the filter by turning counterclockwise, using a filter wrench. Add the rubber ring to prevent air loss in the area indicated. It is advisable to wipe dry the drip pan located below the filter. Coat rubber gasket on filter with a film of oil before installing. Install the filter finger-tight plus 1/4 to 1/2 turn. If oil becomes so dirty that the markings on the oil level indicator cannot be seen, change the filter and shorten the filter service period.

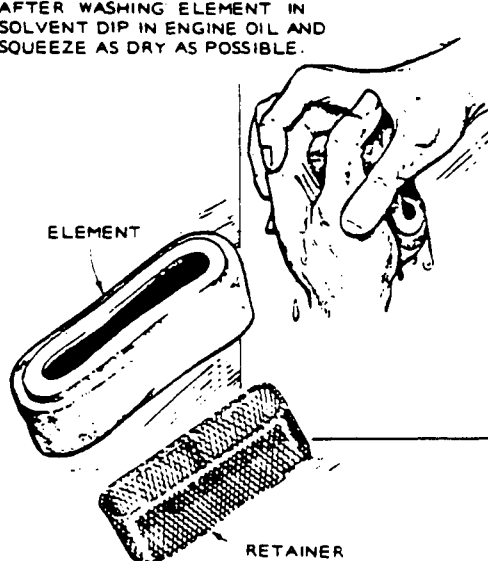


OIL FILTER

Moistened Foam Air Cleaner: This air cleaner consists of a synthetic sponge over a metal retainer. The base and cover are similar to those of the dry paper kind. Wash the sponge periodically, moisten in oil and squeeze dry.

CAUTION Do not run engine with air cleaner removed. Intake of dirty or solid materials could cause severe damage to engine parts.

AFTER WASHING ELEMENT IN SOLVENT DIP IN ENGINE OIL AND SQUEEZE AS DRY AS POSSIBLE.



AIR CLEANER



ADJUSTMENTS

CARBURETOR

The carburetor has an idle jet and a main jet. The idle jet which is adjustable, affects engine operation at low speed. The main jet usually affects operation under load (high speed). Under normal circumstances, factory carburetor adjustments should not be disturbed. If the idle adjustment has been disturbed, turn the needle (counterclockwise) off its seat 1 to 1-1/2 turns to permit starting the engine, then readjust as follows:

Carburetor Idle Adjustment

1. Allow the engine to run at least 10 minutes to warm it up.
2. Move engine speed control to SLOW position. The engine should run at about 1300 rpm.
3. Turn the idle needle out (counterclockwise) until engine begins to slow down or run unevenly. Remember this position.
4. Turn needle in (clockwise) past the position where the engine runs smoothly until it begins to slow down or run unevenly.

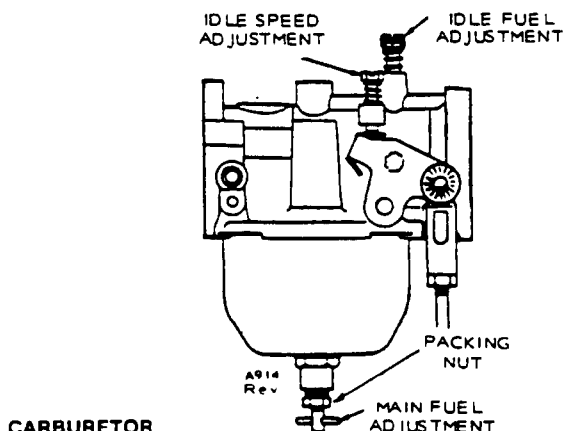
CAUTION

Do not force the needle against its seat; doing so will damage it.

5. Back the needle out to a position approximately halfway between the two positions. This should provide a smooth running idle.

CAUTION

Loosen the packing nut before making main fuel adjustment and then tighten the nut to a snug fit after the adjustment has been made. This procedure makes it easier to use the carburetor adjusting tool and prevents fuel leaks around the packing nut. Fuel leaks cause hard starting because the float level becomes lower than normal.



CARBURETOR ADJUSTMENTS

Carburetor Main (Load) Adjustment

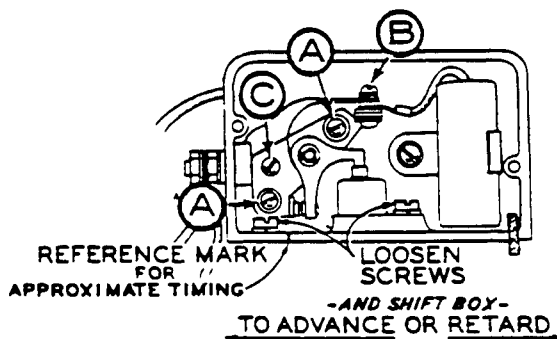
If engine runs unevenly at half or full load due to faulty carburetion, the main adjusting needle needs readjustment. For initial start-up, turn main adjustment 1 to 1-1/2 turns (counterclockwise) off its seat.

1. Start engine and allow it to warm up.
2. Push in on the governor mechanism to slow the unit down to about 400-500 rpm.
3. Set idle adjustment so engine runs smoothly.
4. Release governor mechanism to allow engine to accelerate. If engine accelerates evenly and without hesitation, main adjustment is correct. If not, turn needle outward about 1/2 turn and again slow the engine down and release the mechanism. Continue until the engine accelerates evenly and without hesitation after releasing the governor.
5. If engine tends to hunt (alternate increase and decrease of speed), open the main adjusting needle a little more. Do not open more than 1/2 turn beyond the maximum power point.

BREAKER POINTS

To maintain maximum efficiency from the engine, check condition of the breaker points every 100 hours of operation. Proceed as follows:

1. Remove the two screws and the cover on the breaker box.
2. Remove both spark plugs so engine can be easily rotated by hand. If plugs have not been changed within the last 100 hours, clean and regap or replace them with new ones after setting the breaker points.
3. Remove the two mounting screws (A) and pull the points out of the box just far enough so screw (B) can be removed. Replace points with a new set (if needed) but do not completely tighten mounting screws (A).
4. Rotate the engine clockwise (facing flywheel) by hand until TC mark on gear cover aligns with TC mark on flywheel. Turn screw (C) until point gap measures .020" (0.508 mm) with a flat thickness gauge.
5. Tighten mounting screws and recheck gap.



BREAKER POINT ADJUSTMENT



PERIODIC SERVICE GUIDE

Regularly scheduled maintenance is the key to lower operating costs and longer service life for the unit. The following schedule can be used as a guide. However, actual operating conditions under which a unit is run should be the determining factor in establishing a maintenance schedule. When operating in very dusty or dirty conditions, some of the service periods

may have to be reduced. Check the condition of the crankcase oil, the filters, cooling fins, etc., frequently until the proper service time periods can be established.

For any abnormalities in operation, unusual noises from engine or accessories, loss of power, overheating, etc., contact your nearest Onan Service Center.

PERIODIC MAINTENANCE SCHEDULE

SERVICE THESE ITEMS	AFTER EACH CYCLE OF INDICATED HOURS				
	8	25	50	100	200
Inspect Engine Generally	x ¹				
Check Oil Level	x				
Service Air Cleaner		x ²			
Change Crankcase Oil		x ³	x ⁵	x ²	
Check Battery Electrolyte Level			x		
Clean Cooling Fins			x		
Replace Oil Filter (if used)		x ³		x ²	
Replace Spark Plugs				x	
Check Breaker Points				x	
Clean Breather Valve					x ²
Replace Air Cleaner Element					x ²
Check Valve Clearance			x ³		x ⁴
Compression Check			x ³		x
Remove Carbon and Lead Deposits					x ⁴

x¹ - With engine running, visually and audibly check exhaust system for leaks.

x² - Perform more often in extremely dusty conditions.

x³ - Initial break-in check only.

x⁴ - For detailed maintenance, contact an Onan Service Center.

x⁵ - Engines without oil filter.

**FOR MAJOR SERVICE AND
OVERHAUL CONTACT YOUR
NEAREST ONAN SERVICE
CENTER.**



Mark Industries

ILLUSTRATED
PARTS CATALOG

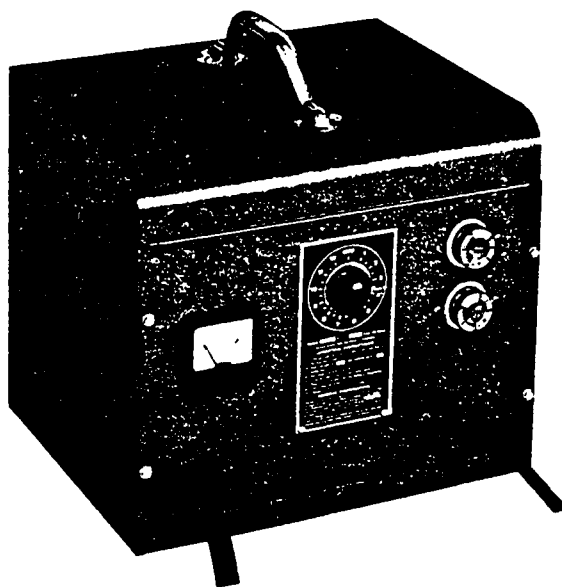
CHRISTIE BATTERY CHARGER

VENDOR

SECT. 2

PAGE 1

OPERATING & SERVICING HANDBOOK



SINCE 1929
CHRISTIE
ELECTRIC CORP.

SERIES "L" BATTERY CHARGERS



INTRODUCTION

This handbook describes the installation, operation, trouble shooting, and repair of the CHRISTIE Series L portable and built-in battery chargers. These units are self-contained, fully automatic, ruggedized, commercial battery chargers, designed for operation on the normal electrical service. The output of the Series L charger is regulated by use of a resonance transformer. The built-in model is permanently mounted on the battery powered vehicle.

SPECIFICATIONS

INPUT POWER	115 Volts; 60 Hz
OUTPUT VOLTAGE	12, 24 or 36 volts, DC
OUTPUT CURRENT	25 to 40 Amp
OUTPUT MONITOR	Ammeter
OUTPUT CONTROL	12 or 24 hour Automatic Timer
TRANSFORMER PROTECTION	D-C output fuses
PERSONNEL PROTECTION	Grounded cabinet (3rd wire)

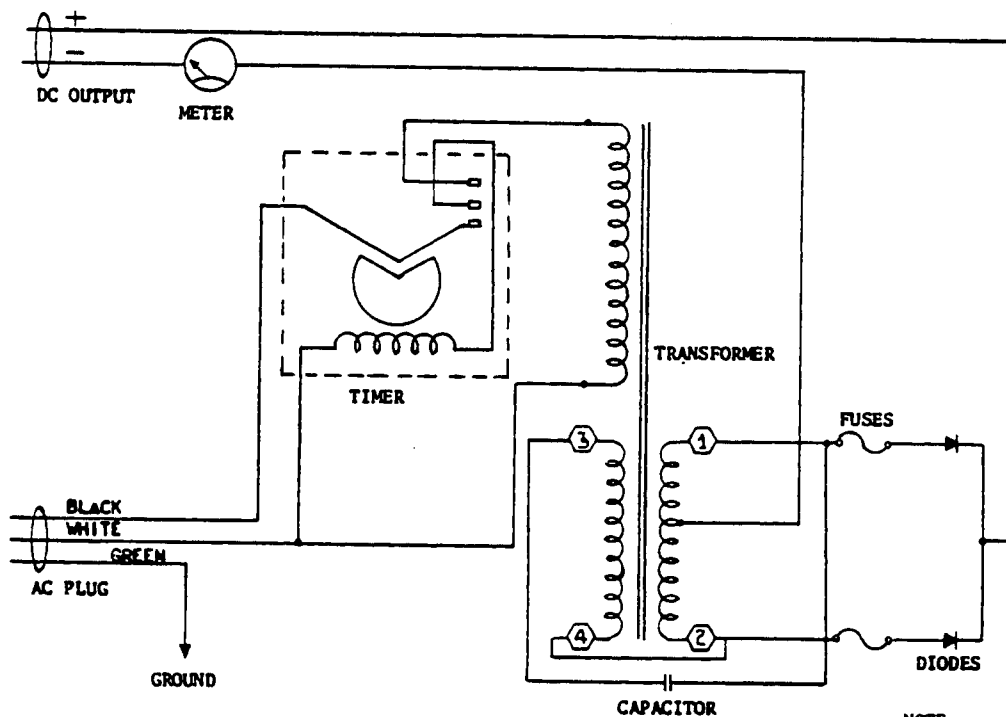
INSPECTION AND INSTALLATION

Inspect the exterior of the shipping container for visual signs of rough handling during shipment

Remove the charger from the shipping container and inspect the exterior of the unit for damage (broken glass, cracked knobs, etc.). CLAIMS FOR SHIPPING DAMAGE SHOULD BE FILED WITH THE CARRIER.

Install the charger on any suitable working surface so that there is free access to the front (control) panel and at least six (6) inches of free clearance on each side. There should be at least two (2) inches of clearance on the top of the charger. (The charger may be suspended overhead by the handle.) The clearance is required to allow proper flow of air through the side and top louvers for cooling.

There must be a separately fused, three-wire, single-phase, 115 volt, power receptacle sufficient rating (see A-C Amp in table on back page) within reach of the AC input cord of the charger.



NOTE
1) Make voltage checks with capacitor disconnected.

Test Voltages (tp 1 & 2)

Model	Vac
1225	22
2425	42

Test Voltages (tp 3 & 4)

Model	Vac
1225	180
2425	180

NOTE:
SCHEMATIC SHOWS DIAGRAM FOR TIMER MANUFACTURED BY MALLORY TIMERS AND USED ON CHGRS MANUFACTURED AFTER 4/1/76.

Wiring Diagram Models 1225L, 2425L and 3625L
(Separate appropriate diagram is furnished for other models)



OPERATING INSTRUCTION.

1. Connect the AC plug to a suitable power receptacle.
2. Connect the DC plug to the battery receptacle (permanently connected on built-in models).

NOTE

Check the output plug for the correct polarity.
The WHITE or RED lead must be connected to the POSITIVE terminal
The BLACK lead must be connected to the NEGATIVE terminal

3. Turn the charger ON by setting the timer to the desired charging time (See Charging Time Chart).
4. Verify that the OUTPUT METER indicates a charging current. (If it does not, see TROUBLE SHOOTING SECTION.)
5. The timer control will turn off the charger (positive turn-off feature) at the completion of the charge cycle.
6. Disconnect the battery from the charger (on built-in model disconnect the AC cord).
7. Using a hydrometer, verify that the battery has been properly charged.

TROUBLE SHOOTING & REPAIR INSTRUCTIONS

LOW OR NO CHARGING CURRENT

1. Verify that the battery being charged has no open or dead cells. Check jumper cables between batteries for tight and clean connections, and also verify that the battery is not already fully charged.
2. Check the output fuses of the charger.
3. Verify that the AC receptacle has power by plugging in an electrical appliance.
4. Turn the charger ON and verify that the transformer hums. If no hum is heard, proceed with step 4.1.
 - 4.1 Remove the cabinet cover to gain access to the interior of the charger.
 - 4.2 On larger chargers furnished with a power relay (see wiring diagram) verify that the relay actuates when charger is turned on. If relay does not close, check continuity across relay coil. Also check for burned or damaged relay contacts.
 - 4.3 Disconnect the transformer primary leads from the timer assembly or power relay. Check for continuity between the primary input leads of the transformer on the terminal board. If no continuity is found, replace the transformer. If continuity is found proceed as follows:
 - 4.4 With the timer switch ON, check for continuity across the switch. If the switch is open with the timer on, replace the timer assembly.
 - 4.5 If all of the foregoing checks indicate continuity, but the transformer does not hum, check for loose or broken leads between the AC plug, timer assembly, and terminal board.
5. If the transformer hums, proceed as follows:
 - 5.1 Check the output fuses to insure they are good. Inspect the fuse holders for damage or a blackened appearance. (If the fuse holder is blackened it indicates oxidation and should be replaced.)
 - 5.2 Remove the cabinet cover to gain access to the interior of the charger.
 - 5.3 Disconnect the capacitor or capacitors for the following test:
 - 5.4 Remove one of the output fuses. With the timer switch OFF, check for continuity across the DC output, connecting the continuity indicator first in one direction and then in the other. The indicator should show an open in one direction and continuity in the other.
 - 5.5 Repeat step 5.4 interchanging the condition of the two output fuses.
 - 5.6 If the indications obtained in steps 5.4 and 5.5 are normal, the secondary of the transformer is shorted, and it should be replaced. If a short is measured in both directions in either step 5.4 or 5.5, the diode associated with the installed fuse is defective and should be replaced. If the indications in both directions in either step 5.4 or 5.5 are open, then the diode or transformer secondary may be open.
 - 5.7 To isolate the defective part with one of the output fuses installed, check for continuity between its fuse holder and both terminals of the output ammeter. If continuity exists between the fuse holder and one of the meter terminals but not the other, the meter and the shunt are defective and must be replaced.
 - 5.8 If continuity exists, repeat step 5.7 by interchanging fuses and connecting the continuity meter to the other fuse holder.
 - 5.9 If continuity does not exist in either step 5.7 or 5.8, the transformer secondary may be open. Check for continuity directly across the transformer secondary with both output fuses removed.
 - 5.10 If all indications to this point are normal, test the entire DC output circuitry for continuity by progressing from the +DC output terminal to the -DC terminal in incremental test sections, checking for open circuits and poor connections.
 - 5.11 Test the resonance transformer for continuity between test points (3) and (4). If open replace transformer.
 - 5.12 Test the resonance transformer under operating conditions by making the voltage measurements noted in the schematic diagram. Replace the transformer if these voltages are not normal.
 - 5.13 Remove one lead from capacitor. Check across capacitor for continuity. If continuity exists, replace capacitor.

AC LINE FUSES BLOW

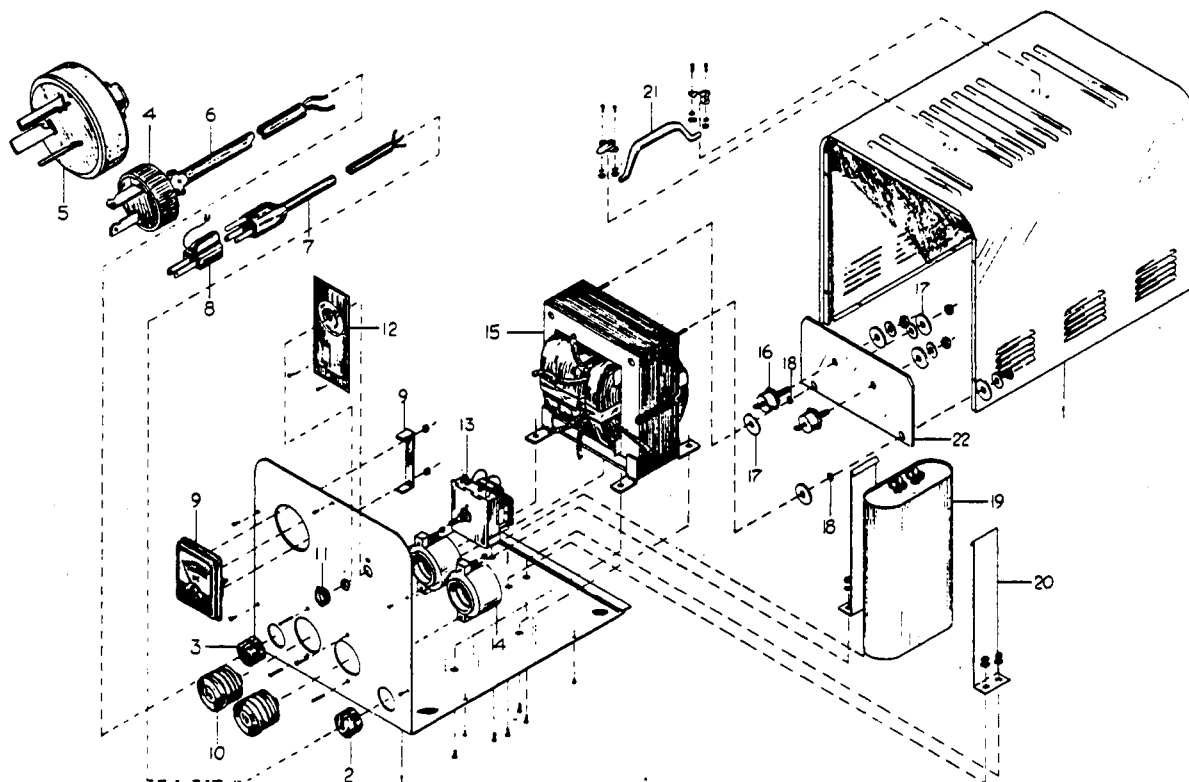
6. With unit unplugged and timer turned ON, check for continuity between each input prong of the AC plug and the ground prong. If all indications are open, the transformer or timer is shorted. Operate the timer with the transformer disconnected to isolate the faulty item. If continuity is found, a short circuit exists and must be found and removed.

**OUTPUT FUSES BLOW**

7. Verify that the circuit under charge is not shorted by disconnecting the charger and operating it disconnected.
8. If fuses continue to blow, test the charger as per steps 5.1 through 5.13.

TIMER DOES NOT TURN UNIT OFF

9. Indicates that timer motor or switch is faulty. Replace timer assembly.

EXPLODED DIAGRAM (Typical Charger)

Item	Item	Item
1 Portable Cabinet	9 Ammeter	18 Washer Assembly (3/8")
2 Bushing (AC)	10 Fuse	19 Capacitor
3 Bushing (DC)	11 Control knob	20 Bracket Set
4 DC Plug (2 prongs)	12 Timer Dial	21 Handle Assembly
5 DC Plug (3 prongs)	13 Timer Assembly (12 hr.)	22 Heat Sink
6 Output Cord	13 Timer Assembly (24 hr.)	
7 AC Cord and Plug (portable)	14 Fuse Holder	
7 Recessed Male Plug (built-in model)	15 Transformer	
8 Adaptor	16 Diode	
	17 Washer Assembly (3/4")	

When ordering parts, please specify both serial number and model.

PARTS LIST

**CHARGING TIME CHART**

The following chart provides useful information for determining the minimum charging time needed to restore a battery to a full charge condition. In addition to normal charging, the cells of the batteries should be equalized twice each month. This is done by charging the batteries an additional seven (7) hours after a normal charge cycle. The current indications of the ammeter will be low during cell equalization.

<u>Specific Gravity Reading</u>	<u>Condition of Battery</u>	<u>Hours Needed. to Charge</u>
1100	fully discharged	12
1125	10% charged	10
1150	20% charged	8
1175	30% charged	7
1200	60% charged	4
1225	75% charged	2
1250	95% charged	1/2
1260	fully charged	0

*Charging time will vary with the AH capacity of the battery.

INSPECTION OF BATTERIES AND ASSOCIATED CIRCUITS

An inspection of batteries and associated circuits is required often to assure that the batteries are capable of being fully charged. This inspection requires the use of a single-cell voltmeter, a hydrometer and a continuity tester.

1. Verify that all connections within the unit to be charged are clean and tight.
2. Check each battery for loose terminal posts.
3. Test for continuity between all battery terminals and the charging receptacle.
4. Verify that the top of each battery is free of moisture, grease and acid films which may cause a current leakage.
5. Test each individual cell in each battery after recharging with the hydrometer to verify that all specific gravity readings are within 10 points of one another.
6. Using the hydrometer, pull out acid from a cell and then vigorously expel the acid back into the cell to cause a violent stirring action. Immediately draw out another sample of acid and visually inspect it to see if it contains a brownish sediment (indicates positive plates are deteriorated).

IMPORTANT FACTS ON BATTERIES AND CHARGERS

Do not discard a good battery as being defective because its specific gravity does not show an increase immediately upon applying a charge. Many good batteries require a charging period as long as three (3) hours before they show any increase in the specific gravity.

Do not charge a battery if the electrolyte temperature could rise above 120°F. This could damage both battery and charger. As a rule of thumb, the electrolyte temperature during normal charging is about 25°F above the local air temperature.

There are only two test methods to determine if a discharged battery is defective without applying a charge. These tests are given in steps 5 and 6 of the INSPECTION OF BATTERIES AND ASSOCIATED CIRCUITS. Voltage testing methods without fully charging or made while charging have no relationship to battery defectiveness.

Failure to keep the battery electrolyte to the proper level will result in a crumbling (abnormal sulfation) of the plates and cause failure of the battery. Distilled water must be added to the battery regularly to make up for the loss due to evaporation, especially during periods of high charging rates. Add water only to fully charged batteries.

Both overcharging and undercharging can cause a premature failure of a battery. Overcharging destroys the positive plates. Consistent undercharging causes a buckling of the plates.



CHRISTIE BATTERY CHARGER REFERENCE CHART

Model		AC Volts	AC Amp	Battery* Amp Hours	DC Volts	DC Amp
Portable	Built-in					
1225L	1225LC	115	4	130/220	12	25
1240L	1240LC	115	5	170/250	12	40
2425L	2425LC 2425LB	115	7	130/220	24	25
2440L	2440LC	115	12	170/250	24	40
3625L	3625LC	115	12	130/220	36	25
3640L	3640LC	115	18	170/250	36	40

*Higher capacity batteries may be charged if longer than 12 hours recharge time is available. Some units are furnished with 24 hr. timers for this purpose.

WARRANTY

CHRISTIE ELECTRIC CORP. agrees to correct any defects in workmanship or material which may develop under proper and normal use by repair or replacement, F.O.B. Los Angeles, California, for a period of one year from date of purchase. The purchaser assumes full responsibility for proper installation and installation adjustments. Parts or equipment claimed defective must be returned to the factory, transportation prepaid, for inspection. If found defective, parts or equipment will be repaired or replaced and returned, transportation collect, to the purchaser. We undertake no responsibility for work done, or expense incurred in connection with repairs or replacements except on specific authority from Christie Electric Corp.

In no event does Christie Electric Corp. assume any liability for consequential damages, or for loss, damage or expense directly or indirectly arising from the use of these products. There are no warranties, either expressed or implied other than those provided herein.

SINCE 1929

CHRISTIE

ELECTRIC CORP.

3410 WEST 67TH STREET • LOS ANGELES, CALIFORNIA 90043 • (213) 750-1151

**JSB** hydraulic pumps and power units

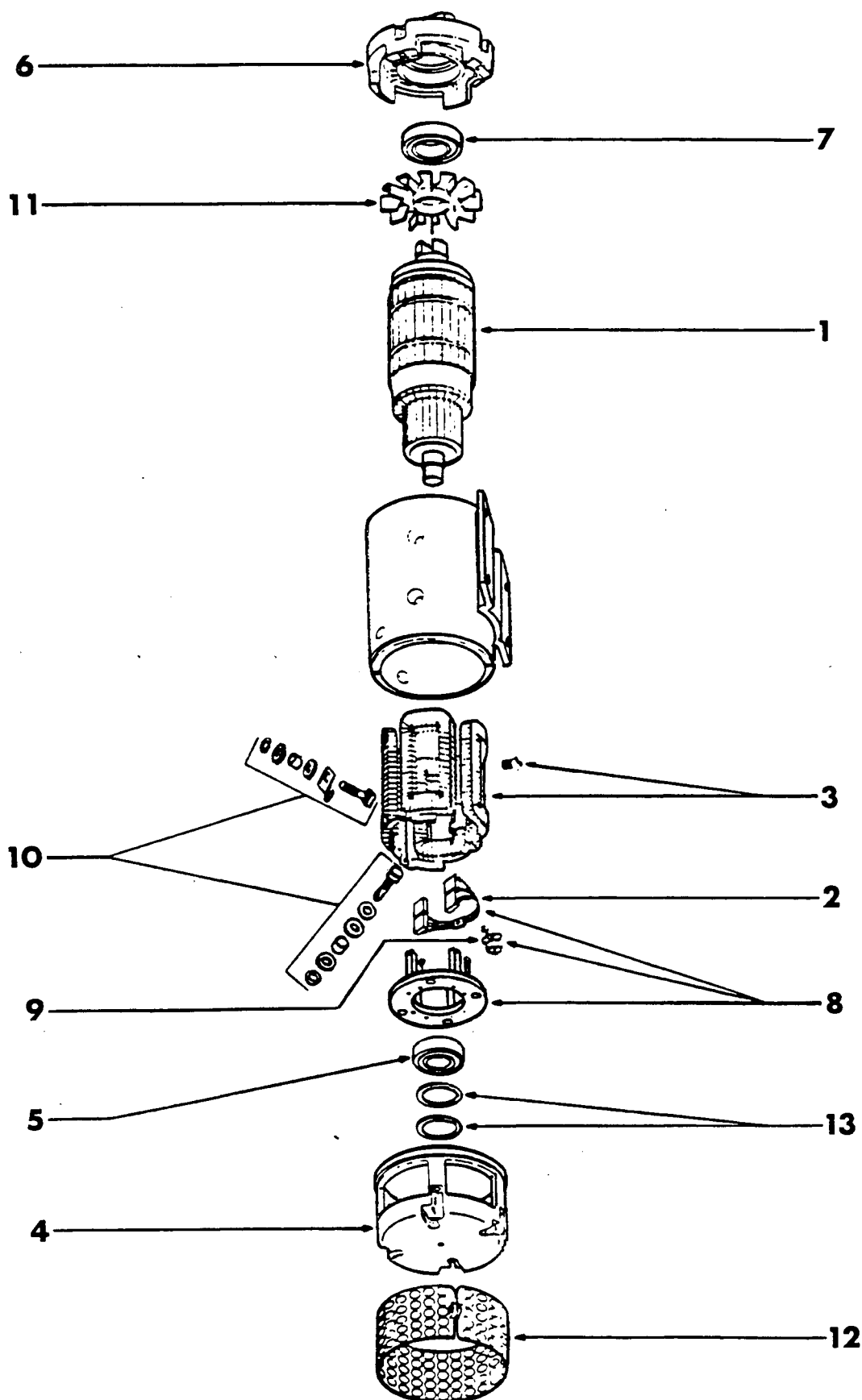
JOHN S. BARNES CORPORATION

**prestolite.**ASSY. NO. MBD-5007SERVICE PARTS LISTPUMP MOTOR
issued 1-8-79Application J.S. Barnes

<u>ITEM</u>	<u>SERVICE PART NO.</u>	<u>NO. USED</u>	<u>PART DESCRIPTION</u>
1	MBD-2525	1	ARMATURE
12	MBD-1468A	1	BAND, COVER
5	X-3991	1	BEARING, BALL, SEALED, #201, C.E.
7	X-3990	1	BEARING, BALL, SHIELDED, #203, D.E.
11	MBD-1427	1	FAN
3	MBD-1005PS	1	FIELD COIL PKG. (POLE SCREWS INCL.)
4	MBD-502	1	HEAD, COMM. END
6	MBD-423B	1	HEAD, DRIVE END
8	MBD-1564	1	PLATE ASSEMBLY, BRUSH
9	MBD-19S	1	SPRING SET, BRUSH
2	MBD-1512S	1	BRUSH SET, SERVICE
10	90-2591 +	1	TERMINAL STUD PKG. (HDWE. INCL.)
13	90-701	1	THRUST WASHER PACKAGE

+ Contains additional parts to service
other applications.

Note: This is a Ventilated Motor; for totally
enclosed version use SP-6058 (70-42) Enclosing Kit.





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ILLUSTRATED
PARTS CATALOG

MICO DISC BRAKE

VENDOR

SECT. 4

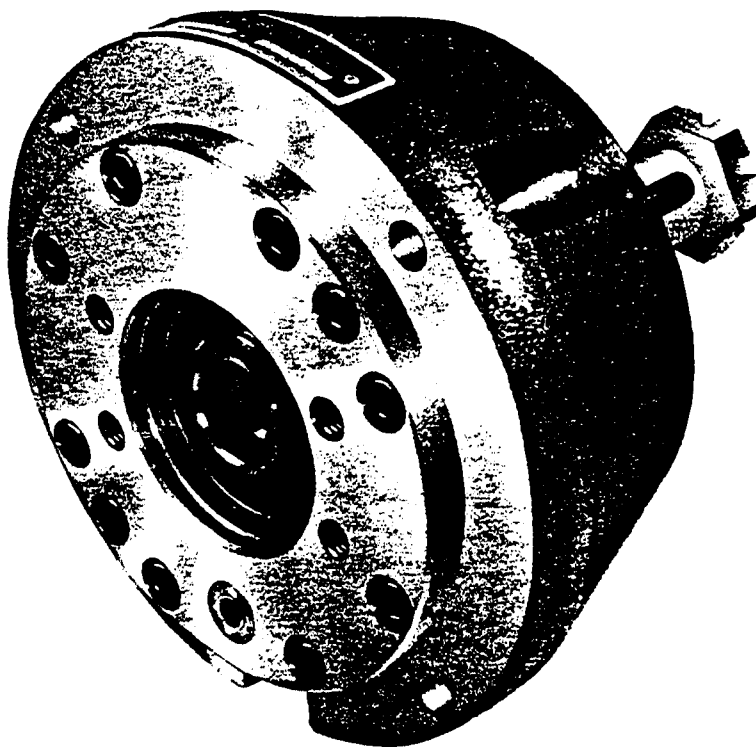
PAGE 1

SY•TEC SERIES

MULTIPLE DISC BRAKE

(wheel mount)

SERVICE MANUAL



mico west / sy•tec

MICO, INC.

1911 Lee Blvd., P.O. Box 2118, No. Mankato, MN U.S.A. 56002-2118
Phone. (507) 625-6426 / TELEX 910-565-2444

MICO WEST / SY•TEC

701 East Francis St., P.O. Box 9058, Ontario, CA U.S.A. 91762-9058
Phone. (714) 947-4077 / TELEX 510-600-0132

REV.



TYPICAL BRAKE

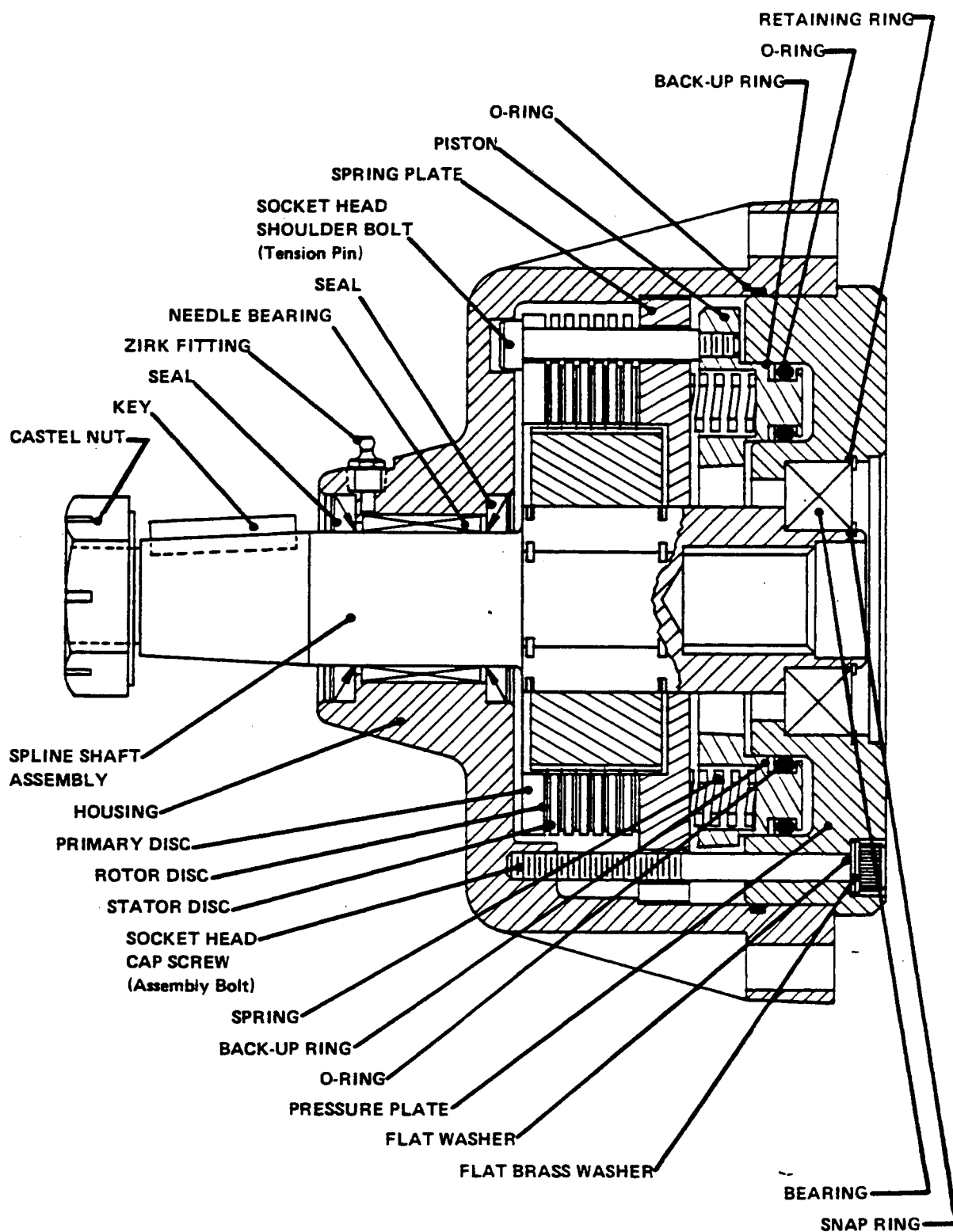


FIGURE 1



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.

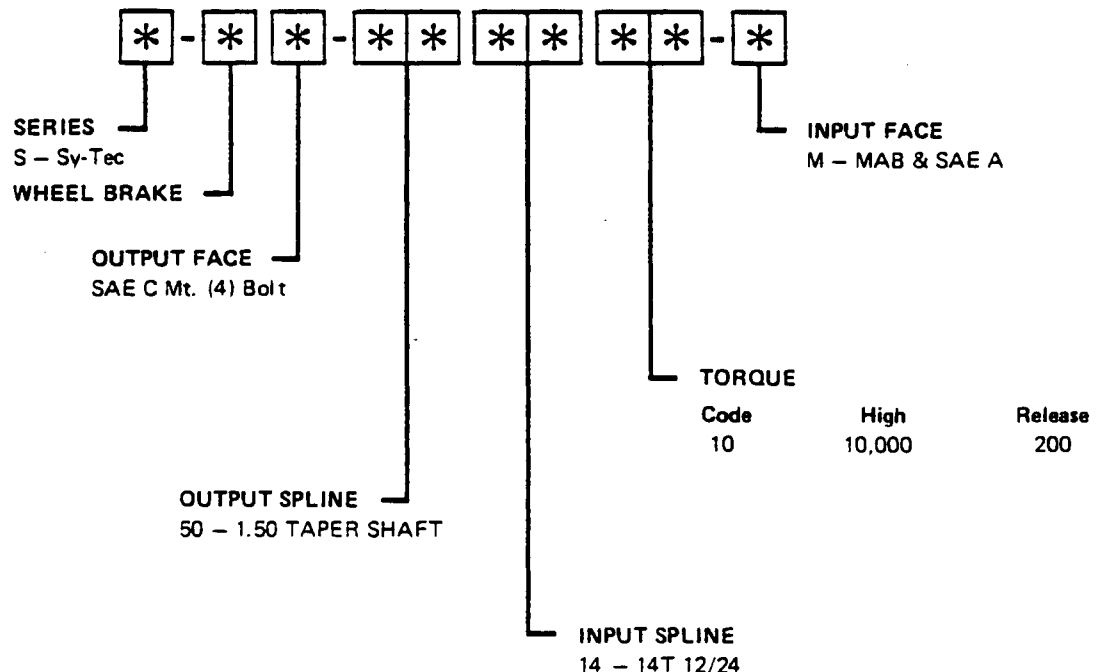
1. The brake has a release pressure of 200 psi. The actuation pressure is provided by a charge pump. During certain phases of the machine's operation, the charge pump pressure dips from 200 psi to 100 psi. At 200 psi, the brake runs free (zero torque) but at 100 psi the brake will generate slightly less 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 spline shaft assembly (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 out-

side 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

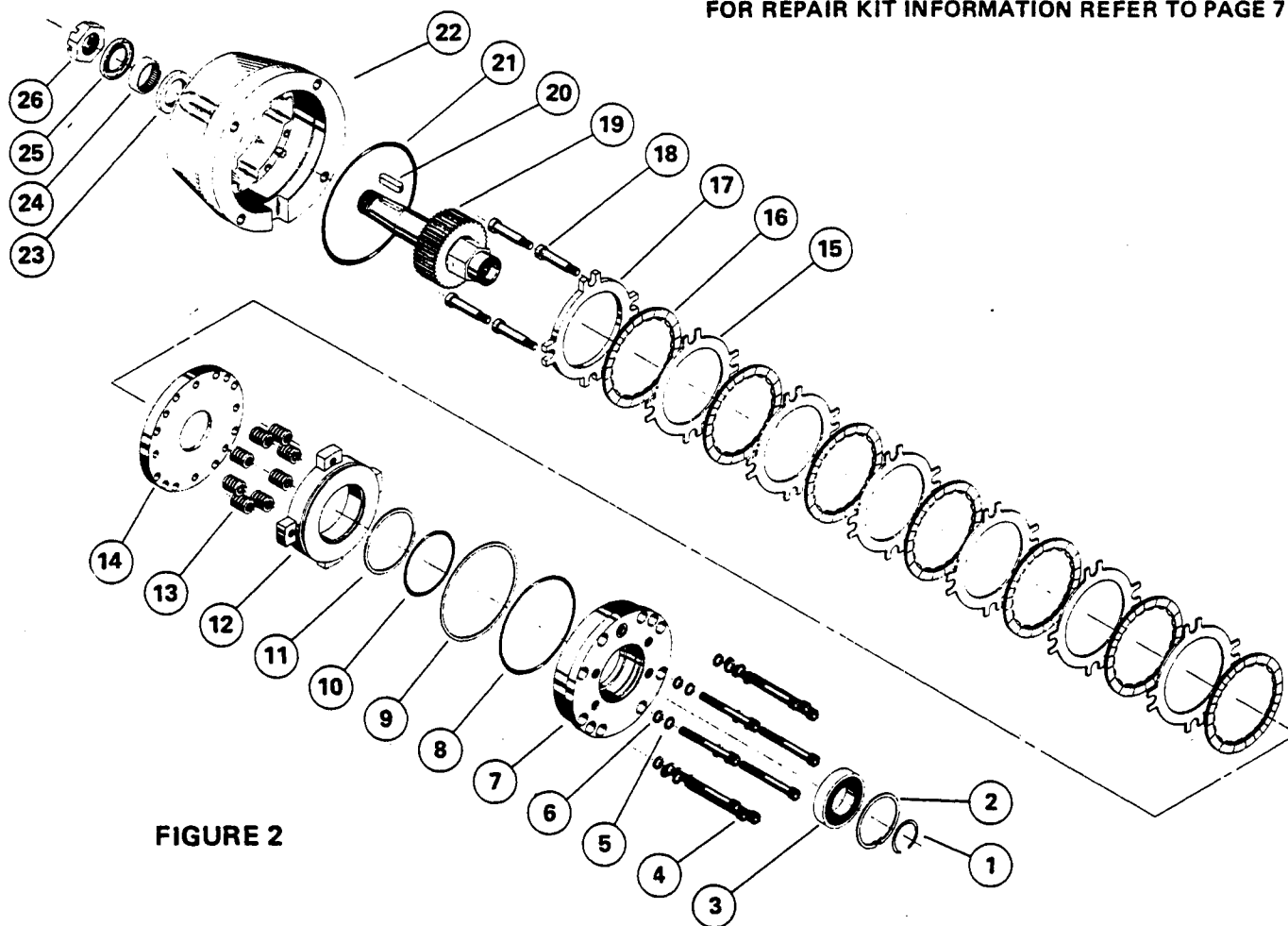


FIGURE 2

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 (8)

ITEM DESCRIPTION

- 14 SPRING PLATE
- 15 STATOR DISCS (8)
- 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.

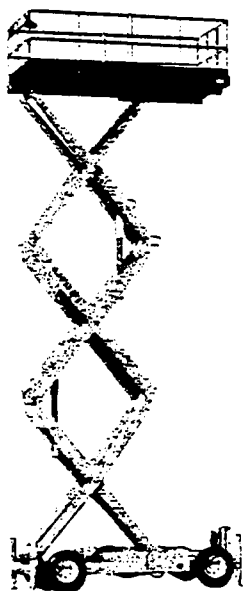
SERVICE DIAGNOSIS

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
12-501-110	Spring Kit	Flat Brass Washers (items 5) O-ring (item 21) Springs (items 13) Loctite



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ILLUSTRATED
PARTS CATALOG

TROJAN BATTERY

VENDOR

SECT. 5

PAGE 1

TROJAN MILEAGE MASTER BATTERIES



TROJAN BATTERY COMPANY

12380 CLARK STREET • SANTA FE SPRINGS, CA 90670

(213) 946-8381 • (714) 521-8215 Toll Free (Outside Calif.) (800) 423-6569 (Excluding Alaska and Hawaii)

REV.



proper care and maintenance of electric vehicle



1. Always inspect incoming shipments of batteries for damage. Look for and pay particular attention for damage to or wet spots on the shipping cartons, examine those batteries for signs of leakage.
2. If damaged batteries are found, secure acknowledgment of the damage from the carrier's representative and file a claim against the transportation company. Contact your supplier for battery replacement.
3. If batteries are received wet and not immediately placed in service, they must be charged at regular intervals as follows:

Storage Temperature	Charge
Below 40° F	None required
40° F to 60° F	Every 2 months
60° F and above	Once a month

4. Never stack one battery directly on top of another. Post damage and/or container damage can occur from improper stacking. If batteries are stored individually, place supporting boards between layers. Do not stack layers more than three (3) high and rotate stock so that the oldest batteries can be used first.
5. Dry charge batteries should be activated in accordance with instructions of the battery manufacturer.
6. Batteries should be installed in accordance with the vehicle manufacturer's instructions. Connections should be made tight enabling good contact between connector lugs and battery terminals. Always charge sets of batteries immediately after installation into the car.



1. Water batteries at least once a week.
 - a. Add only approved water to the cells. Distilled water is recommended, high mineral content water must not be used. Maximum allowable impurities in percent: iron (.003), chloride (.004), fixed residue (.078).
 - b. Remove vent caps and water batteries preferably after charging to prevent over flow of acid due to expansion.
 - c. Fill all cells to the proper level. Do not overfill cells. Fill to level indicator or 1/4 inch over the top of the separator if there is no level indicator. Do not use a hose to water batteries.
 - d. Spot check cells between weekly waterings to assure electrolyte is above separators. Excess water usage indicates the presence of any one or all of the following conditions which should be checked.
 1. Overcharging
 2. High temperature operation
 3. Nearing end of service life
 - e. Do not allow the electrolyte level to drop below the top of the separators since this will lead to shortened battery life.
2. Clean batteries after weekly watering or when washing cars.
 - a. Wash the tops of the batteries making sure the vent caps are in place. Do not allow water or other foreign matter to enter the cells.
 - b. Use a solution of bicarbonate of soda and water to wash batteries if there is an accumulation of acid.
3. Inspection to insure good conditions which will give better battery service.

- a. When watering batteries inspect battery and other terminal connections for:
 1. Corrosion — If any exists, clean connection and apply a non-metallic grease or protective spray to retard further corrosion.
 2. Loose Connections — Be sure all connections are tight and that good contact is made between terminals.
 3. Broken or Frayed Cables — Be sure all cable connections are good and that no loose or broken wires are exposed. Replace any which look suspicious.
- b. Once a week after the batteries have been charged, spot check two (2) or more cells for specific gravity reading. Gravity should be 1.250 - 1.280. If low readings are noted:
 1. Check charger to insure that proper charge is being returned to the batteries.
 2. Check connections as specified under inspection 3a.
 3. Check all cells to determine if batteries are near the end of life. This should be done to the same procedure as called for under Section IV covering "Trouble Shooting" of batteries.
- c. On a regular interval, check car as outlined in the instruction manual for:
 1. Brake drag
 2. Proper tire pressure
 3. Proper alignment
 4. Proper lubrication
 5. Proper operation of electrical system
 6. Proper operation of drive and transmission system
 7. Condition of charger plug and receptacle in car

Any of these conditions which are detrimental to car operation will shorten battery life.



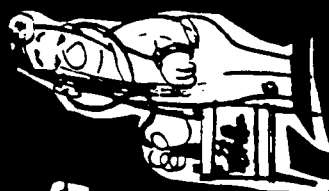
3. CHARGING PROCEDURE



1. Become familiar with instructions issued with the charger or car manual.
2. Batteries are to be charged after each day's use as soon as play has been completed. Charging between rounds is permissible if it is determined feasible to do so.

3. Do not charge batteries if car was not used that day.
4. Do not allow batteries to sit in discharged condition for prolonged periods of time.
5. Always be sure batteries are fully charged each day prior to starting play.

4. TROUBLE SHOOTING FOR WEAK OR BAD BATTERIES

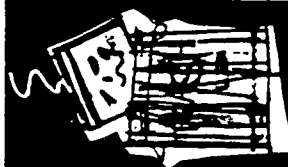


When a car fails to operate properly performing less than one round of golf, the car is to be brought into the shop and the batteries examined as follows:

1. Check terminal connections for corrosion, loose connections and broken or frayed cables.
2. If terminal connections appear to be in good condition, check all cells with a hydrometer for variation in specific gravity among cells. A variation of .030 points or more between cells of a battery is cause for suspect. Mark the low cells.
3. Recharge the batteries as recommended by the manufacturer.
4. Read all gravities again after recharge. Be sure that batteries are fully charged at gravities of 1.260 to 1.280. If cells vary by .030 points or more it is an indication of possible trouble within that battery.

5. Connect a load tester to the set of batteries and discharge the batteries at 75 Amps and record the time to a terminal voltage of 31.5 volts. Testers are now available having an automatic Shut-Off at this voltage. New batteries should run a minimum of 75 minutes on this test.
 - a. If the batteries run less than 40 minutes they have either reached the end of life or a defective battery is in the circuit. Battery replacement is then necessary.
 - b. If batteries run 40-50 minutes they have lost capacity and may be nearing the end of their useful life. In golf car service one round of golf may be expected on an average golf course.
 - c. If batteries run more than 50 minutes, they are in good condition and satisfactory for continued service. Prior to putting the car back in service it should be checked for the existence of other trouble as outlined in the instruction manual.

5. BATTERY REPLACEMENT



Defective Batteries (Premature Failures)

1. Defective battery can be determined either by observation of gravity variance at the end of the 75 Amp discharge (.030 or more points between cells of a battery) or by turning the discharge tester back on and determining the battery or cell which is defective by use of a voltmeter.
2. Mark the defective battery.
3. Recharge the batteries with the defective battery in the circuit.
4. Remove the defective battery and replace with new battery or battery of comparable age which is fully charged.

Worn Out Batteries

1. Remove old set of batteries.
2. Clean and recondition battery trays, holdowns and cables.
3. Inspect new batteries for broken containers and proper electrolyte level before installing in the car.
4. Install batteries in car being sure that they are properly held down, firm but not too tight.
5. Replace cables, being sure terminals and connectors are clean and connections are tight.
6. Apply a light coating of non-metallic grease or protective coating.

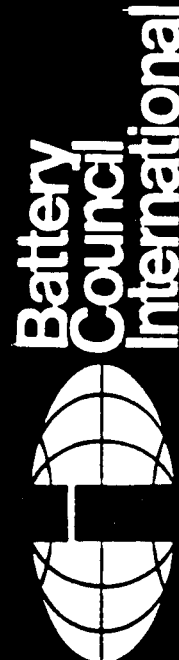
6. WINTER STORAGE OF WET BATTERIES



1. Prior to storing car, batteries should be cleaned, fully charged and properly leveled.
2. While in storage the batteries should be recharged to full charge at time intervals shown below:

Storage Temperature	Charge
Below 40° F	None required
40° F to 60° F	Every 2 months
60° F and above	Once a month

3. Check batteries after car has been removed from storage and before service begins. Follow inspection and trouble shooting procedures to determine the condition of the batteries.





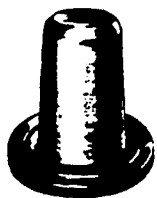
TROJAN MILEAGE MASTER BATTERIES

GROUP NUMBER	TYPE	VOLTS	REF.	75 AMPS TO 5.25 VOLTS		OVERALL DIMENSIONS			WEIGHT
			20 HOUR RATE A.H.	AT 80° F MINUTES		LENGTH	WIDTH	*HEIGHT	
GC-2	T-90	6	185	90		10-3/8	7-1/8	10-3/4	56
GC-2H	T-105	6	217	105		10-3/8	7-1/8	10-3/4	61
GC-2H	T-135	6	244	135		10-3/8	7-1/16	11-1/2	72

OTHER SPECIAL BATTERIES AVAILABLE FOR ELECTRIC VEHICLES.

*TYPE OR TERMINAL WILL VARY HEIGHT SLIGHTLY

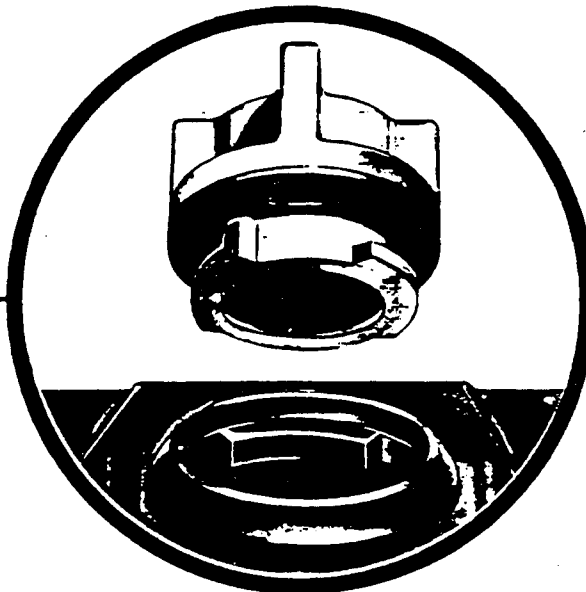
**TROJAN "MILEAGE MASTER" TYPES FEATURE QUARTER-TURN VENT CAPS
REDUCING SERVICE TIME 75%**



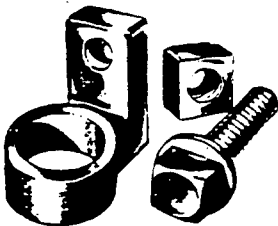
TYPE AP
STRAIGHT POST



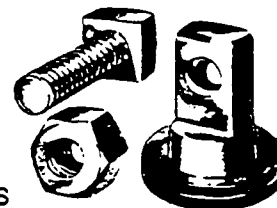
TYPE WT
WING NUT TERMINAL
 $\frac{3}{16}$ or $\frac{5}{16}$ Stud



TYPE LT
ANGLE TERMINAL
 $\frac{5}{16}$ Lead coated bolt



TYPE UT
UNIVERSAL TERMINAL



ALL BATTERIES COME WITH UNIVERSAL TERMINALS
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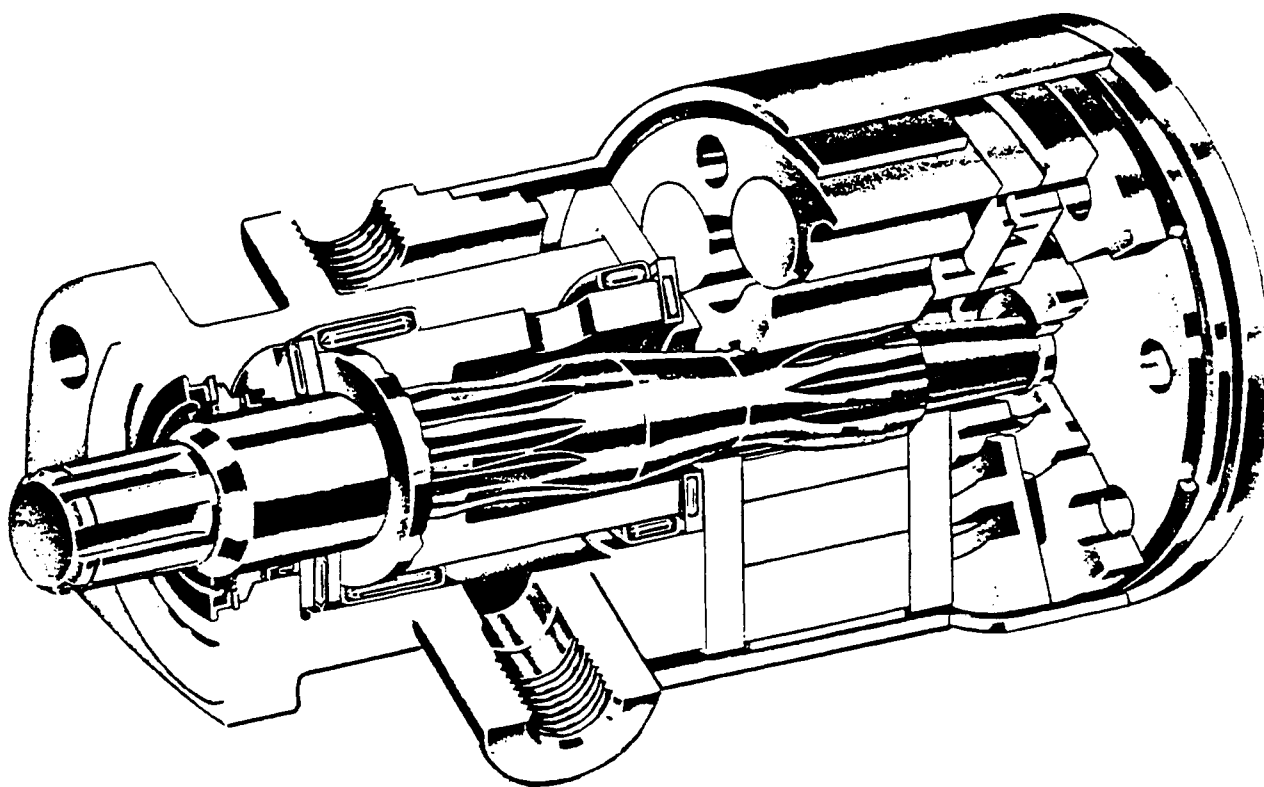
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TORQMOTOR®

SERVICE PROCEDURE MAB SERIES



TRW

ROSS GEAR DIVISION
LAFAYETTE, INDIANA 47902

The **MAB** TORQMOTOR

- Low Speed,
- High Torque
- Hydraulic Motor.

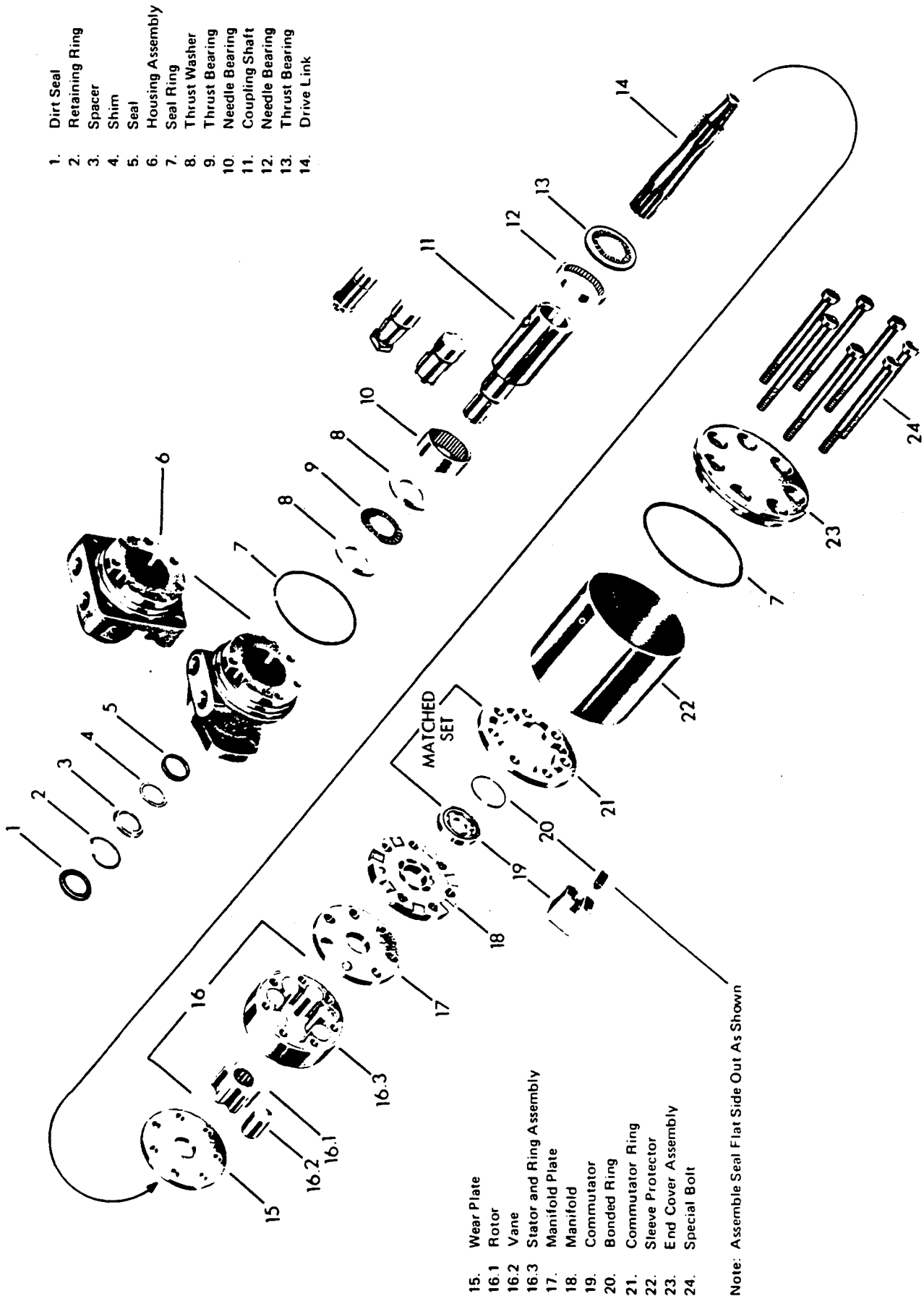


FIGURE MAB-200-2



SERVICE PROCEDURE

Preparation Before Disassembly

Remove port hole plugs before attempting to rotate shaft. Drain the motor assembly by turning the output shaft. Wash the complete motor in solvent and remove all particles of dirt from the exterior and blow dry before placing on work bench.

Clean Work Conditions

If it is necessary to disassemble the TORQMOTOR, make certain to use a clean work bench (a piece of clean wrapping paper makes an excellent and disposable top). The hands and tools of the repairman should be clean, and the operation should be carried out in a sheltered area free from drafts that may carry foreign material into the disassembled pieces. (Precision fits in the TORQMOTOR needs "white room" type care.)

Caution: Avoid wiping parts with a cloth, as lint and foreign particles may adhere to the working parts of the TORQMOTOR.

Handling

Care must be taken in handling the close fitting parts, as nicks and mutilations will result in serious damage.

REPLACEMENT OF HIGH PRESSURE SEAL (5) IN TORQMOTOR

(Reference Figure MAB-200-2)

1. Remove dirt seal (1) and retaining ring (2), if burr exists on retaining ring groove, remove with a scraping tool.
2. Set the motor with coupling shaft (11) down in a suitable clean can. Plug "A" port and connect "B" port to 120 psi air hose, or use a piston type hydraulic hand pump. **Note:** The air connection should be made with provisions for quick shut-off after the spacer (3), shim (4) and seal (5) have been ejected.
3. Apply clean grease to new seal (5) and assemble into housing assembly (6) with lip side inward.
4. Assemble shim (4), spacer (3) and retaining ring (2), be sure the rounded edge of the retaining ring is faced inward. Apply a small amount of clean grease to the back side of new dirt seal (1) and assemble into housing assembly (6).

TORQMOTOR DISASSEMBLY

(Reference Figure MAB-200-2)

1. In a vise, clamp down on the housing assembly (6) port bosses with the coupling shaft (11) pointed down.
2. Using wrench with a 12 point 9/16" socket, remove the seven special bolts (24) and place them on the work bench.

3. Remove the end cover assembly (23) and seal ring (7) by inserting screw driver between end cover assembly (23) and sleeve protector (22). Pry up end cover assembly (23) and lift from unit with seal ring (7) attached.
4. Remove seal ring (7) from end cover assembly (23) and discard.
5. Remove the commutator ring (21), commutator (19), bonded ring (20) and manifold (18) by using two of the special bolts (24) as a lifting tool, insert the two special bolts (24) into two holes and lift out the previously mentioned parts.
6. Remove bonded ring (20) from commutator (19) by using an air hose, blow air down into ring groove until bonded ring (20) is lifted out and discard.
7. Inspect manifold (18) for cracks and replace with new manifold if cracks are visible.
8. Remove manifold plate (17) by using the two special bolts (24) and method previously mentioned.
9. Remove rotor assembly (16), wear plate (15) and drive link (14) by using the two special bolts (24) and method previously mentioned.
10. Remove vanes (16.2) and rotor (16.1) from rotor assembly (16). Use caution not to drop these parts when handling.
11. Inspect rotor (16.1) outside lobes for pits and marks. If pits or wear marks are visible, discard rotor (16.1) and replace complete rotor assembly (16) with a new rotor assembly.
12. Remove thrust bearing (13).
13. Remove coupling shaft (11).
14. Remove sleeve protector (22) by inserting screw driver between sleeve protector (22) and housing assembly (6) and pry up. If rust exists on ends of sleeve protector (22), remove by sanding lightly.
15. Remove seal ring (7) from housing assembly (6) and discard.
16. Remove housing assembly (6) from vise, turn over and reclamp housing assembly in vise so that dirt seal (1) is pointed upward.
17. Remove dirt seal (1), retaining ring (2), spacer (3), shim (4) and seal (5) from housing assembly (6). Discard dirt seal (1) and seal (5). If burr exists on retaining ring groove, remove with a scraping tool.



18. Do not remove thrust washers (8), thrust bearing (9) and needle bearings (10) and (12) unless there is absolute evidence of damage. Needle bearings should be free to rotate and not show signs of surface breakdown. If needle bearing (10) requires replacement, use a 1.490 maximum diameter shaft and press out thrust washers (8), thrust bearing (9) and needle bearings (10) and (12). The housing assembly face should be placed on a block of wood during the pressing operation to protect it. Discard thrust washers, thrust bearing and needle bearings and replace with new parts as parts may have been damaged when being pressed out.

If needle bearing (12) needs replacement use a bearing puller to remove needle bearing, care should be taken to not damage the housing assembly (6) face with the bearing puller.

TORQMOTOR ASSEMBLY

(Reference Figure MAB-200-2)

Important: Before starting assembly, clean all parts with a clean petroleum base solvent and air dry. Do not wipe dry with rags. Be sure all dried paint lips have been removed from edges of lapped surfaces. Unless otherwise indicated, do not oil or grease parts before assembly. Note: Lubricate All Seals before assembly with SAE 10W-40 SD oil or clean grease.

1. In a vise, clamp down on the housing assembly (6) port bosses with the small bore end pointed up. Assemble new seal (5) with lip side inward, assemble shim (4), spacer (3) and retaining ring (2). Be sure the rounded edge of the retaining ring (2) is faced inward.
2. Apply a small amount of clean grease to the back side of new dirt seal (1) and assemble into housing assembly (6).
3. Remove housing assembly (6) from vise, turn over and reclamp in vise with large bore end up.
(*** See Note.)
4. Apply "Scotch" tape around splines or keyway on coupling shaft (11) to prevent damaging seal (5). Assemble coupling shaft (11).
5. Assemble thrust bearing (13).
6. Assemble drive link (14).
7. Assemble wear plate (15).
8. Assemble rotor assembly (16) with counterbore in rotor (16.1) down.
9. Assemble manifold plate (17), manifold (18) and commutator ring (21).

10. Assemble commutator (19) and new bonded ring (20).
11. Assemble new seal rings (7) on housing assembly (6) and end cover assembly (23).
12. Apply a generous amount of "STP" to both ends on sleeve protector (22) and assemble over unit and onto unit and onto housing assembly (6). Make sure sleeve protector is setting in a non-cocked position.
13. Assemble end cover assembly (23) onto sleeve protector (22) in a non-cocked position.
14. Assemble seven special bolts (24) and screw in finger tight. Alternately and progressively tighten the seven special bolts to pull end cover assembly (23) and sleeve protector (22) down into place. (Torque the seven special bolts to 50 ± 5 ft. lbs.)

*** NOTE

If it was necessary to remove thrust washers (8), thrust bearing (9), needle bearing (10) and needle bearing (12), the following assembly procedure must be followed.

1. Assemble new thrust washer (8), new thrust bearing (9), new thrust washer (8) in this order into housing assembly (6).
2. Press in new needle bearing (10) with suitable tools to a $2.365 \pm .030$ dimension into housing assembly (6). Note: Bearing should indicate which side to press against.
3. Press in new needle bearing (12) with suitable tools to a $.18 \pm .03$ dimension into housing assembly (6). Note: Bearing should indicate which side to press against.



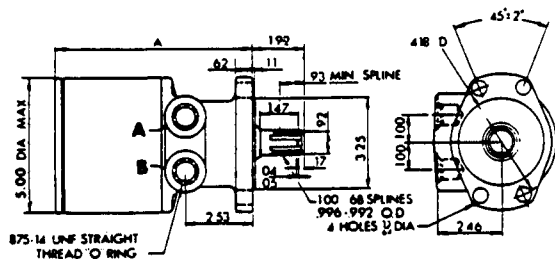
TROUBLE SHOOTING

<u>Trouble</u>	<u>Cause</u>	<u>Remedy</u>
Oil leakage	1. Hose fittings leaking	(a) Tighten fittings
		(b) Replace O ring in 7/8", 14 thread fitting
	2. Seal ring leak	(a) Replace seal ring by disassembling motor
	3. Special bolt leakage	(a) Tighten single bolt to 50 foot lbs.
	4. Faulty high pressure seal	Remove dirt seal, retaining ring and spacer. Blow out seal. Replace seal.
	5. Coupling shaft and high pressure seal	Replace coupling shaft and seal package.
High loss of speed, under load.	1. Lack of sufficient oil supply	(a) Adjust faulty pressure relief valve.
		(b) Repair worn pump.
		(c) Use correct oil for temperature of operation.
	2. High internal motor leakage.	(a) Replace worn rotor set with new rotor assembly
		(b) Replace worn commutator ring
		(c) Replace worn manifold
		(d) Replace worn wear plate.
Low mechanical efficiency or undue high pressure required to operate TORQMOTOR	1. Line blockage	(a) Replace blocked line.
	2. Internal Interference.	(a) Correct clearance of rotor set. (Replace rotor set)

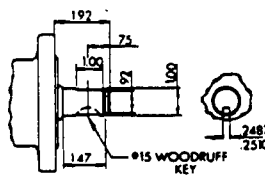


PROVISIONING DATA

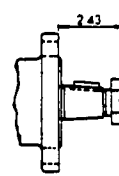
STANDARD MOUNT



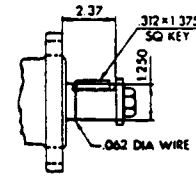
***6-B SHAFT**
(SAE J499 STANDARD)



***WOODRUFF KEY**



TAPERED SHAFT

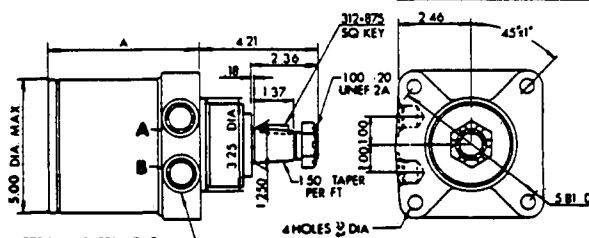


STRAIGHT KEY

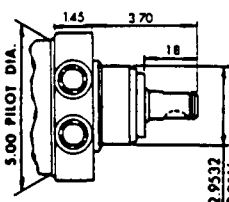
Use this design mounting when maximum side load is applied to the output shaft.

WHEEL MOUNT

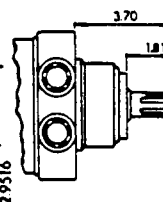
The Wheel Mount design (w/1-1/4 taper output shaft) can be used to apply power direct to and support small vehicle wheels.



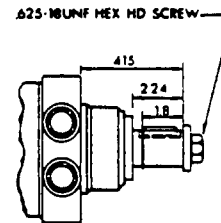
TAPERED SHAFT
(SAE J501 STANDARD)



***WOODRUFF KEY**



***6-B SHAFT**



STRAIGHT KEY

*The 6-B Spline shaft and Woodruff Key shaft are machined for a WALDES TRUARC Snap Ring No 5100-100 (or equivalent)

MOTOR SERIES	DISPLACEMENT CU. IN. / REV.	DIMENSION "A"		APPROX RPM WITH 10 GPM NO LOAD	APPROX. RPM WITH 10 GPM @ 1500 PSI	THEO. TORQUE IN. LBS/100 PSI	IN. LB TORQUE @ 1500 PSI	
		STD. MTG	WHL. MTG				STARTING	RUNNING
MAB 08	5.9	7.409	5.630	400	365	94	1,040	1,250
MAB 16	11.8	7.910	6.131	200	180	188	2,150	2,850
MAB 24	17.7	8.410	6.631	130	115	282	3,600	4,150
MAB 40	29.6	9.410	7.631	78	65	470	6,050	6,800

Dimensional Values Shown Are Reference

MAB TORQMOTOR

NOTE: System Relief Valve Setting from 2,000-3,000 PSI Require Prototyping and Evaluation by Sales Engineer.

SPECIFICATION & IDENTIFICATION TAG GUIDE

EXAMPLE: MAB 08 0 02

SERIES

ROTOR WIDTH IN $\frac{1}{16}$ 'S

08
16
24
40

MOUNTING & SHAFT

- 02 STD. MTG. 6-B SHAFT
- 03 WHL. MTG. TAPERED SHAFT
- 04 STD. MTG. TAPERED SHAFT
- 05 WHL. MTG. 6-B SHAFT
- 08 STD. MTG. WOODRUFF KEY
- 09 WHL. MTG. WOODRUFF KEY
- 10 STD. MTG. STRAIGHT KEY
- 11 WHL. MTG. STRAIGHT KEY



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

