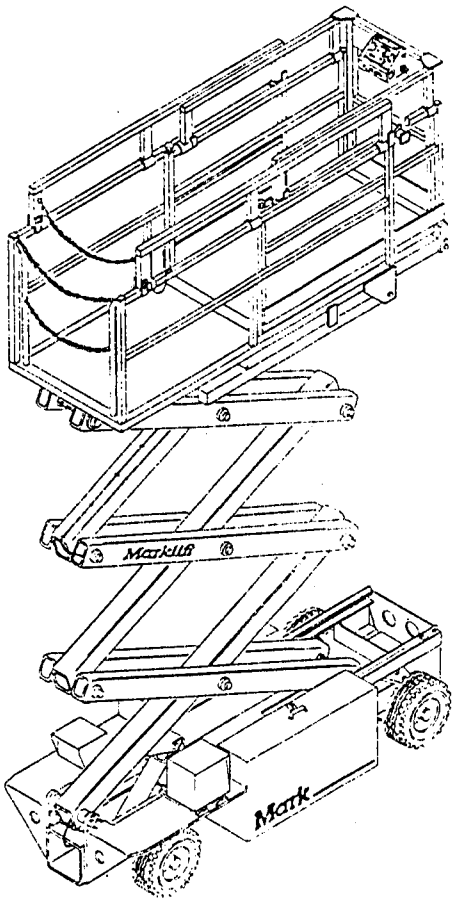
The Marklifts.®
A Product of Mark Industries

SELF-PROPELLED SCISSOR OPERATION MAINTENANCE AND PARTS MANUAL



Shown: J19EP

MODELS:
J14, J19 & J19EP

FIRST EDITION: October 1989

Mark Industries

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17218

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SERVICE BULLETINS

The purpose of this manual is to provide the customer with operation, safety, maintenance and parts information that will enhance the reliable performance of the **MARKLIFT.** Schematic and vendor information is also furnished. If additional information is needed, we urge the customer to contact the local dealer. If this is impossible, please contact the Mark Industries Service Engineering Department at (714) 879-6275.

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

The model, capacity, pressure settings and serial number can be found on the ID plate mounted on the rear of the frame assembly. The serial number must be furnished when ordering parts. This will help our parts department give prompt and accurate service.

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 into service. These are outlined in the **INSPECTION AND CHECKOUT** instructions in the operation section of this manual.

Description	Model J14	J19	J19EP
Height –			
Working (maximum)	20'2" (6.15m)	25'0" (7.62m)	25'0" (7.62m)
Platform (maximum)	14'2" (4.32m)	19'0" (5.79m)	19'0" (5.79m)
Platform (minimum)	33.5" (.85m)	40" (1.02m)	40" (1.02m)
Length (overall)	62" (1.57m)	84" (2.13m)	86" (2.18m)
Width (overall)	29.5" (.75m)	31.75" (.81m)	31.75" (.81m)
Platform –			
Dimenions (inside)	29" x 61" (.74m x 1.55m)	30" x 83" (.76m x 2.11m)	26" x 119"(.66m x 3.02m)
Safety Rail Height	42" (1.07m)	up 42" (1.07m)	up 42" (1.07m)
		down 34.75" (.88m)	down 34.75" (.88m)
Toeplate Height	4" (.10m)	4" (.10m)	4" (.10m)
Load Capacity (evenly distributed)	500 lbs. (227kg)	600lbs. (227kg)	500 lbs. (227kg)
Wheel Base	48" (1.22m)	60" (1.52m)	60" (1.52m)
Wheel Track	24.5" (.62m)	26.5" (.67m)	26.5" (.67m)
Turning Radius (inside)	4'8" (1.42m)	7'1" (2.16m)	7'1" (2.16m)
Drive Speed	1.0/2.4mph	1.0/2.4mph	1.0/2.4 mph
	(1.61/3.86km/h)	(1.61/3.86km/h)	(1.61/3.86km/h)
Lift/Lower Speed (maximum load)	20/22 sec	37/20 sec	37/20sec
Power System	12VDC	12VDC	12VDC
Battery Voltage	6VDC	6VDC	6VDC
Capacities			
Battery	250 amp/hr (4)	250 amp/hr (4)	250 amp/hr (4)
Hydraulic Tank	4.5 gal (17.03L)	6.45 gal (24.42L)	6.45 gal (24.42L)
Battery Charger	40 amp	40 amp	40 amp
Tire Size	5.30 x 6 (monofilled)	4.00 x 8 (solid)	4.00 x 8 (solid)
Shipping Weight	1700 lbs. (771kg)	2460 lbs. (1115kg)	2660 lbs. (1206kg)
Shipping cube	78.58 cu. ft. (2.23m^3)	125.08 cu. ft. (3.54m^3)	131.10 cu. ft. (3.71m^3)

Specifications are nominal and are subject to change without prior notice due to continuous design improvements.

MANUFACTURERS' LIMITED WARRANTY

Mark Industries makes no warranty, expressed or implied, on any product manufactured or sold by Mark Industries except for the following limited warranty against defect 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 one (1) year 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 on 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 on any product) manufactured by Mark Industries which, within one (1) year from the date of shipment, shall have been returned to the Mark Industries facility in Brea, California (or any other location within the United States as shall be designated by Mark Industries), at no expense to Mark Industries, and demonstrated to the satisfaction of Mark Industries as being defective in material or workmanship.

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

There are no other warranties, expressed or implied, in addition to this limited warranty. **This limited warranty is exclusive and in lieu of all other warranties, expressed 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, electrical components are specifically excluded from this limited warranty.

Mark Industries

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

WARRANTY REGISTRATION

Purchaser

Company Name

Address

Telephone

Date shipment received

Date of invoice

Date unit put into service

Unit will be used

Unit will be sold

Unit will be used for:

- ☐ Inspection
- ☐ Mining
- ☐ Welding
- ☐ Construction
- ☐ Scaffolding
- ☐ Mechanical
- ☐ General maintenance
- ☐ Heating/Air conditioning
- ☐ Carpentry
- ☐ Plumbing
- ☐ Electrical
- ☐ Sprinkler
- ☐ Painting/Sandblast
- ☐ Steel fabrication
- ☐ Rigging
- ☐ Roofing
- ☐ Glazing
- ☐ Other

Comments

Inspection completed by: Title:

Warranty will be void unless this inspection report is postmarked to Mark Industries not more than fourteen (14) days from the date shipment is received.

SCISSOR LIFT NEW EQUIPMENT CONDITION REPORT

Filling in the Warranty: Please refer to the applicable decals on your machine for the figures and quantities needed to fill in the blanks below (Items 1, 21, 25).

		YES	NO
1.	Platform capacity decal _____ lbs.	☐	☐
2.	All warning, caution and emergency decals installed	☐	☐
3.	Operation instructions properly installed	☐	☐
4.	Operation and safety handbook received	☐	☐
5.	Electrical schematic received	☐	☐
6.	All controls (aerial & ground) are identified and operate correctly	☐	☐
7.	Stop switches operate properly (aerial & ground)	☐	☐
8.	Platform guard rails, secure and undamaged	☐	☐
9.	Platform access gate works properly	☐	☐
10.	Horn and beacon operate properly (optional)	☐	☐
11	Brakes adjusted and operate correctly	☐	☐
12.	Circuit breakers operate properly	☐	☐
13.	All Hydraulic cylinders free of trapped air	☐	☐
14.	All hydraulic cylinder rods free of paint or scratches	☐	☐
15.	Hydraulic pump free of leaks	☐	☐
16.	Hydraulic hoses and fittings free of leaks	☐	☐
17.	Hydraulic oil level	☐	☐
18.	Hydraulic tank and fittings free of leaks	☐	☐
19.	Drive motors free of leaks	☐	☐
20.	Battery water level	☐	☐
21.	System pressure _____ PSI	☐	☐
22.	All electrical connections tight	☐	☐
23.	Manifold valve and fittings free of leaks	☐	☐
24.	110V generator operates properly (optional)	☐	☐
25.	Wheel lug nuts torqued to _____ lbs	☐	☐

MODEL	SERIAL NUMBER
INSPECTOR	OPTIONS

The **MARKLIFT** conforms to applicable ANSI and OSHA requirements. Since the safety requirements made by ANSI, OSHA and the various safety boards in your area are subject to change, it is the responsibility of the owner to instruct the operators about all such current requirements.

Every operator of the MARKLIFT must read, understand and follow the safety rules set forth herein. 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. The operation of any new and unfamiliar equipment can be hazardous in the hands of untrained operators.

1. Inspect the machine periodically as specified in the Inspection and Checkout, and Preventive Maintenance sections and as required by ANSI, OSHA, local safety boards and the owner. All unsafe items must be corrected by a qualified service technician before use of the machine.

2. 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.

4. Never exceed manufacturer's recommended platform load capacity. Remember, the load capacity of the **MARKLIFT** is the total combined weight of personnel and tools, fixtures, accessories, etc.

5. Always distribute the load evenly over the platform floor area.

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

7. **Do Not** change, vary, or alter the equipment in any way.

8. **Do Not** override any hydraulic, mechanical, or electrical safety devices.

9. **Do Not** store loose material in the work platform such as pipe, rope, extension cords, wire or miscellaneous boxes. If it is 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.

10. **Do Not** work on the platform if your physical condition is such that you feel dizzy or unsteady in any way.

11. The **MARKLIFT** is a non-insulated personnel carrier and must not be operated within 10 feet of a 50,000 volt line. (See Division Of Industrial Safety for required clearances from overhead high voltage lines.)

12. Under no circumstances should horse play be tolerated on the **MARKLIFT.**

13. **Do Not** drive on uneven, sloping or soft terrain that sets the unit in an out-of-level condition of more than 6 degrees fore and aft, or 3 degrees side to side.

14. **Do Not** drive the platform into objects.

15. **Do Not** lean over platform guard railings to perform work.

16. **Do Not** use ladders or scaffolding on the platform to obtain greater height.

17. **Do Not** raise or lower scissor into objects.

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

19. **Do Not** jump start other vehicles using the **MARKLIFT** battery.

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

21. When working under the elevated platform, always remember to raise the **Safety Support Arm** to prevent accidental platform descent.

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

Article 86. Provisions for Preventing Accidents
Article 86. Provision 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	-	750,0000	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."**

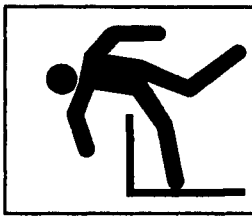
DANGER, WARNING AND CAUTION DECALS

LOAD CAPACITY 500 LBS.
(EVENLY DISTRIBUTED LOAD) 2022

J14 and J19EP

LOAD CAPACITY 600 LBS.
(EVENLY DISTRIBUTED LOAD) 20575

J19



WARNING

Fall hazard. Erect and secure fold-down rail after entering platform. Failure to do so could result in death or serious injury. 182304

ATTACH SAFETY CHAINS BEFORE RAISING PLATFORM 11064

WARNING: LIGHT INDICATES UNSTABLE CONDITION



PLATFORM WILL LOWER AUTOMATICALLY 2015

CAUTION UNLAWFUL TO OPERATE THIS EQUIPMENT WITHIN 10 FEET OF HIGH VOLTAGE LINES **CAUTION** 2014

CAUTION

Slope sensor or "LIFT/LOWER" control will not lower platform if platform is in extended position. To lower platform in case of an emergency hold "EMERGENCY" switch down and push "LIFT/LOWER" switch down. 182503

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

> It is the primary responsibility of the user and operator to be thoroughly knowledgeable of all decal information, definition and location.

The following page(s) illustrates a chart in which decals for the **MARKLIFT** can be replaced if the existing decal(s) is worn-out, torn, or illegible.





J19 and J19EP



J14

GENERAL DECALS
J14

DECAL P/N	DECAL DESCRIPTION J14	LOCATION	QTY
67798	All Standard Decals	Final Assy	1
2009	Control Box Operation	Final Assy	1
2015	Unstable Condition	Final Assy	1
2014	Caution High Voltage Lines	Final Assy	1
20661	Plate, ANSI A92	Final Assy	1
30520	Nameplate - Patent Numbers	Final Assy	1
20660	Nameplate - ID	Final Assy	1
31259	Marklift (Small Scissor Machines)	Final Assy	2
2003	Battery Water Level	Final Assy	2
130242	Side Stripe Jr., Jr. 7 & Jr. 14	Final Assy	2
2022	Load Capacity 500 lbs.	Final Assy	2
2017	Hydraulic System Fluid	Final Assy	1
22175	'Caution Monofilled Tires Only'	Final Assy	2
2016	'Do Not Work Under...'	Final Assy	1
130243	Operation Instructions Jr. 14 & Jr.19	Upper Control Panel	1
130606	Free Wheeling Valve	Final Assy	1

GENERAL DECALS
J19EP

DECAL P/N	DECAL DESCRIPTION J19EP	LOCATION	QTY
67800	All Standard Decals	Final Assy	1
130201	Ground Controls Box	Ground control panel	1
2009	Control Box Operation	Final Assy	1
2015	Warning - Unstable Condition	Final Assy	1
2014	Caution High Voltage Lines	Final Assy	1
20661	Plate ANSI A92	Final Assy	1
30520	Nameplate - Patent Numbers (Scissors)	Final Assy	1
20660	Nameplate, ID	Final Assy	1
31259	Marklift (Small Scissor Machines)	Final Assy	2
2003	Battery Water Level	Final Assy	2
130938	Mark	Final Assy	2
20575	Load Capacity 600 lbs.	Final Assy	3
2017	Hydraulic System Fluid	Final Assy	1
130937	J-Series	Final Assy	1
2016	'Do Not Work Under...'	Final Assy	2
130243	Operation Instructions Jr. 14 & Jr. 19 Scissors	Upper Control Panel	1
130596	'A Product of Mark Industries'	Final Assy	2
130606	Free Wheeling Valve	Final Assy	1
130949	'Danger, This Is A Solid Tire'	Final Assy	4
130820	Operation & Safety Handbook	Final Assy	1
131061	Blue Stripe	Final Assy	2
130937	J-Series	Final Assy	1
181726	J-EP	Final Assy	1
185707	Power to platform 110 VAC	Final Assy	1
185709	U. L. Circuit breaker 110 VAC	Final Assy	1

GENERAL DECALS
J19

DECAL P/N	DECAL DESCRIPTION J19	LOCATION	QTY
67799	All Standard Decals	Final Assy	1
2009	Control Box Operation	Final Assy	1
2015	Warning - Unstable Condition	Final Assy	1
2014	Caution High Voltage Lines	Final Assy	1
30520	Nameplate patent no.	Final Assy	1
20661	Plate, ANSI A92	Final Assy	1
20660	Nameplate, ID	Final Assy	1
31259	Marklift (Small Scissor Machines)	Final Assy	2
2003	Battery Water Level	Final Assy	2
130938	Mark	Final Assy	2
20575	Load Capacity 600 lbs.	Final Assy	3
2017	Hydraulic System Fluid	Final Assy	1
130937	J-Series	Final Assy	1
2016	'Do Not Work Under...'	Final Assy	2
130243	Operation Instructions Jr. 14 & Jr. 19 Scissors	Final Assy	1
130596	A Product of Mark Industries	Final Assy	2
130606	Free Wheeling Valve	Final Assy	1
130820	Operation & Safety Handbook	Final Assy	1
130949	'Danger, This Is A Solid Tire'	Final Assy	4
131061	Blue Stripe	Final Assy	2
130937	J-Series	Final Assy	1
185707	Power to platform 110 VAC	Final Assy	1
185709	U. L. Circuit Breaker 110 VAC	Final Assy	1

UNLOADING

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

When a loading dock is unavailable and a forklift must be used, make sure that the forklift used has forks sufficiently long for the unit. Lift the unit from the side only Unless the unit has the optional forklift boots, then the unit may be lifted from the front.

FREEWHEELING

The **MARKLIFT** may be freewheeled for loading, unloading and transporting for a very short distance (maximum of one (1) mile), at a speed no greater than five (5) mph. (See illustration on the following page.)

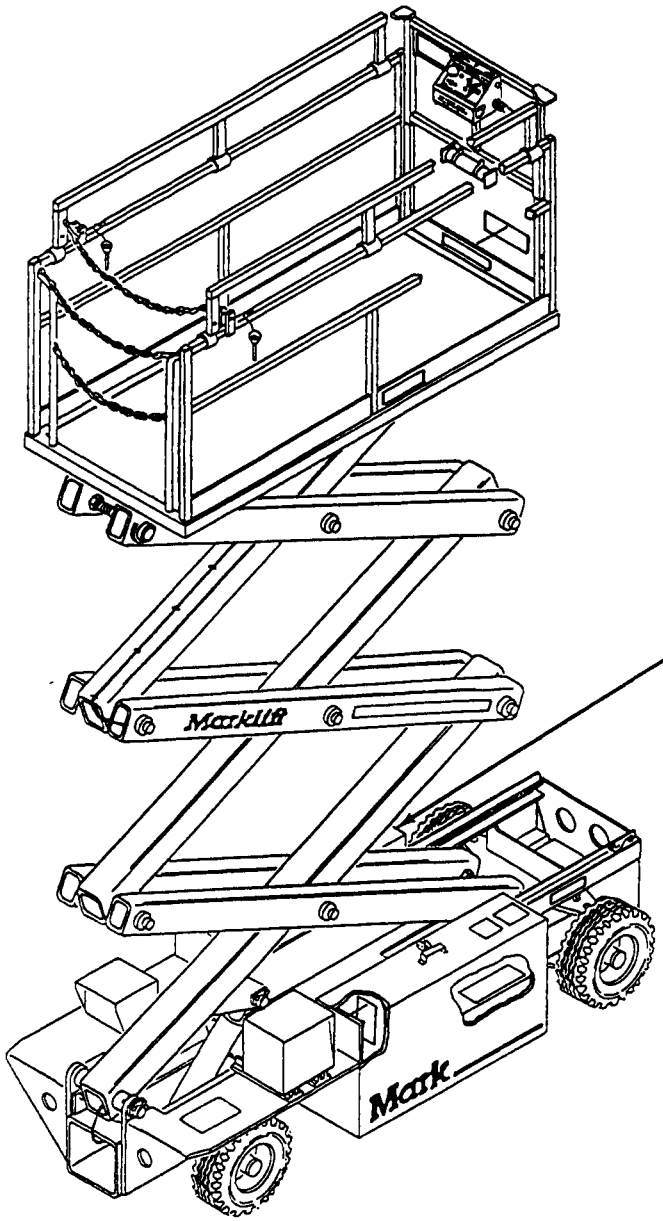
> **Make sure the unit is on a level surface before attempting to freewheel the MARKLIFT.**

To freewheel the **MARKLIFT** disengage the brake by closing the freewheeling valve and moving the drive switch. Use caution when the brakes are disengaged. **ALWAYS REMEMBER TO OPEN THE FREEWHEELING VALVE TO RESTORE BRAKING.**

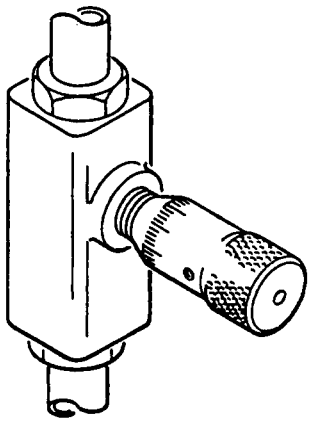
TRUCK TRANSPORTING

To transport the **MARKLIFT** over long distances, a truck or trailer must be used.
If a rollback truck with a winch is used, attach the winch cable to the tiedown brackets and pull the **MARKLIFT** onto the truck. Keep the winch cable taut at all times. Be sure to open the Freewheeling valve to set the brakes back into the normal mode.

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



Freewheeling Valve



Turn clockwise to disengage brakes and freewheel. Briefly activate drive.

Open valve to restore brakes. Turn counter-clockwise.

Shown: J19

After the unit is delivered and unloaded, some minor inspections must be made before putting the unit into service. The following must be checked:

1. Visually inspect all exposed parts of the **MARKLIFT**. Secure any loose bolts and nuts. Replace any damaged hydraulic lines or broken wires. Check for any structural damage, including cut or damaged tires.

2. Check the hydraulic oil level - sight gauge shows full when the scissor stack is fully lowered.

3. Check the battery for a 1200 ± 50 on the hydrometer. Charge the battery if its reading is below 1100. If the battery requires water, fill to the proper level **AFTER** charging. **Do Not** overfill. See page 25 for battery filling instructions.

4. Check the hydraulic valve manifold for leaks, loose fittings or loose electrical connections.

5. Check hoses for leaks.

6. Make sure that the brakes will hold the unit on an incline of up to 3 degrees.

7. Test switches: Position the selector switch to "ground", then raise the platform up and down. Position the selector switch to "aerial" and test the "drive", "steering", and "raise platform" switches.

1. **STARTING**

Turn power switch at ground control station to "ON". Position selector switch to "AERIAL". Enter the platform, **MAKE SURE ENTRY CHAIN OR BAR IS SECURE AFTER ENTERING PLATFORM.** Pull open the red emergency stop switch cover located on the top right of the aerial control box. Turn on power switch to activate aerial controls and warning devices.

2. **DRIVE**

Forward and reverse drive is done from the aerial control box only. The **MARKLIFT** is equipped with a high and low speed for both forward and reverse drive. Rotate the knob clockwise for reverse low or high speed. Rotate the knob counter clockwise for forward, low or high speed. Low speed will automatically cut in whenever the platform is raised over one half of its rated height.

3. **STEERING**

The unit may be steered from the aerial control panel only. Push the toggle switch to the left to turn the front wheels to the left. Pushing the switch to the right will cause the wheels to turn to the right. The toggle switch is a momentary switch which will automatically return to the off position when released. The wheels will remain at an angle until the toggle switch is moved in another direction.

4. **RAISE PLATFORM**

To raise or lower the platform from the ground control, set selector switch to the "Ground Control" position, then push the toggle switch up or down.

To operate from the aerial control box, position the selector switch to the "Aerial" position. Raise or lower the platform by operating the "Lift/Lower" toggle switch. The toggle switch is self centering. When it is released it will automatically set itself to center (the neutral position). The unit will remain stationary.

5. WARNING LIGHT AND BUZZER

As a special safety feature, the **MARKLIFT** is equipped with an "out-of- level" sensor that will disable the scissor functions whenever the **MARKLIFT** is in an unsafe out-of-level position.

An unsafe out-of-level situation is sensed by the slope sensor when the machine is tilted 3° or more on either side or 6° front or rear. The unsafe condition is indicated by a red warning light and buzzer, located on the top center of the aerial control box. When the warning light and buzzer are on, "LIFT: UP/DOWN will not operate but the drive and steer functions will. **The platform will lower automatically if not extended.** Should the warning signals come on, maneuver the **MARKLIFT** until it is on a safe operating surface and all functions will be restored.

6. ALL MOTION ALARM (OPTION)

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

There is also available a travel warning horn which sounds when the unit moves forward or reverse.

7. EXTENDING PLATFORM (J19EP)

The **MARKLIFT** J19EP may be manually extended from the aerial platform. Pull out the safety lock pins then push the platform outward until it is fully extended. Place the safety lock pins back in the holes to secure the platform. When the platform is extended, the unit is automatically placed into low speed drive. **If the slope sensor device is activated while the operator has the platform raised and extended, the extended platform will not descend without using the "Descent Override."**

8. **EMERGENCY DESCENT**

The platform may be lowered in emergency situations from the ground control box. If the operator has the platform extended and needs to descend, push down and hold the "Emergency Down" switch, then push the "Lift" switch down. The platform will be lowered with the deck extended.

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

IMPORTANT: The aerial start switch must be set at the "ON" position in order for the emergency hydraulics to function. Emergency functions also apply to the ground control station.

9. **Fold-Down Guardrails**

The J19 and J19EP scissor lifts have fold-down guardrails which enable them to to pass through doorways. Enter the platform then erect the guardrails. Secure them by passing the pins through the holes provided at the entry end of the rail. Attach the safety chain across the entry.

MARK INDUSTRIES recommends that the following items be checked periodically as stated below. Any machine not in safe operating condition must be removed from service until it is repaired by a qualified service person.

DAILY (BEFORE USE ON EACH WORK SHIFT)

1. Make sure that operation and safety decals are in place and easy to read.
2. Check hydraulic tank level.
3. Check the water level in the batteries
4. Check for loose or worn hardware. wire connections, etc..
5. Inspect the controls to make sure they operate correctly.
6. Check for and correct any hydraulic leaks.
7. Check for and correct any weld cracks or other structural defects.
8. Check overall performance.

WEEKLY

1. Check the condition of the tires. Make sure they are free of serious cuts or defects.
2. Check for proper brake operation.
3. Record hour meter reading. (If provided)
4. Clean unit by removing all dirt, oil, and grease. The machine may be washed with soap and water. (Stay away from electrical panels and charging units.)
5. Check for wear on electrical cables and hoses.

MONTHLY (or first 50 hours)

1. Check and lubricate, if necessary.
2. Check battery condition.
3. Change the hydraulic oil return filter.

EVERY SIX MONTHS (or 100 hours)

1. Check and lubricate, if necessary.
2. Change the hydraulic oil return filter

EVERY YEAR

1, Re-pack all wheel bearings.
2. Change the hydraulic oil.
3. Change the hydraulic oil return filter.

Battery Fill Instructions

Water or Acid Loss to Batteries

Water loss from the battery is mainly due to evaporation brought on by temperature rises during heavy charging cycles. A very small amount of water is lost due to hydrogen and oxygen formed during charging. Acid is lost if the case becomes cracked or if the battery is allowed to tip over. Therefore, acid is seldom needed.

Checking the Water Level

When checking the water level, don't allow dirt to enter into the battery cells once the caps have been removed. Take particular care to avoid setting the caps down on a dirty surface. Replace the caps immediately after checking the water level.

Materials and Equipment Required

1. Battery Filler Bottle
2. Distilled Water (if available)
3. Hydrometer

Filling the Battery

Electric Scissor Lifts

Use a hydrometer to see how much charge the battery has. A reading 1.260 and above in all cells indicates fully charged. (See chart on following page.) If the battery is fully charged, add water up to the level indicator.

If the battery's water level is far below the lead plates, add only enough water to barely cover the plates.

Either excessive overcharge or moderate undercharge can shorten battery life.With proper attention to water level and charging time, compared to hydrometer readings, the batteries should give a long useful life.

TEMPERATURE/SPECIFIC GRAVITY CORRECTION TABLE FOR BATTERIES

ACTUAL HYDROMETER READING AT ACTUAL TEMPERATURE°

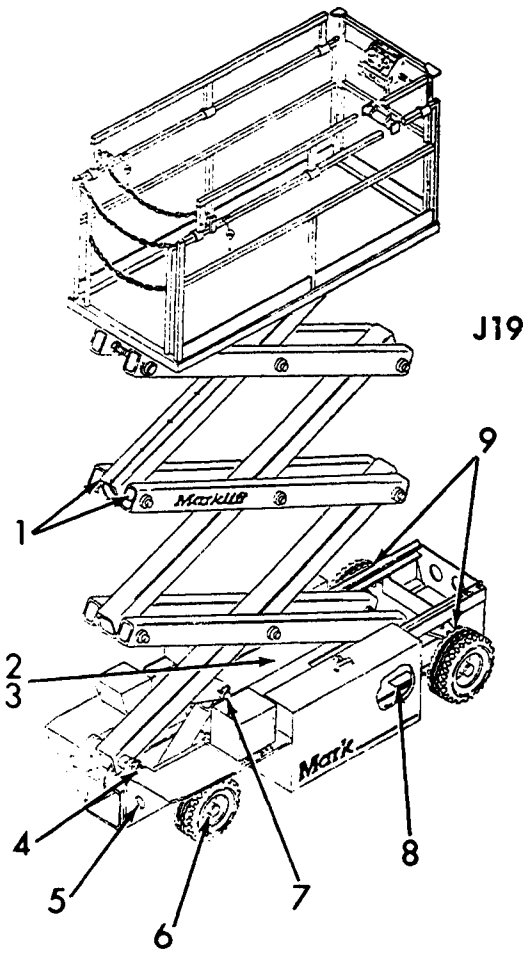
80°F (27°C)	0°F (-18°C)	-10°F (-23°C)	-20°F (-29°C)	-30°F (-34°C)	-45°F (-43°C)	-65°F (-54°C)	Approx. State of Charge In%
1.280	1.312	1.316	1.320	1.324	1.330	1.338	100
1.250	1.282	1.286	1.290	1.294	1.300	1.308	75
1.220	1.252	1.256	1.260	1.264	1.270	1.278	50
1.190	1.222	1.226	1.230	1.234	1.240	1.248	25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

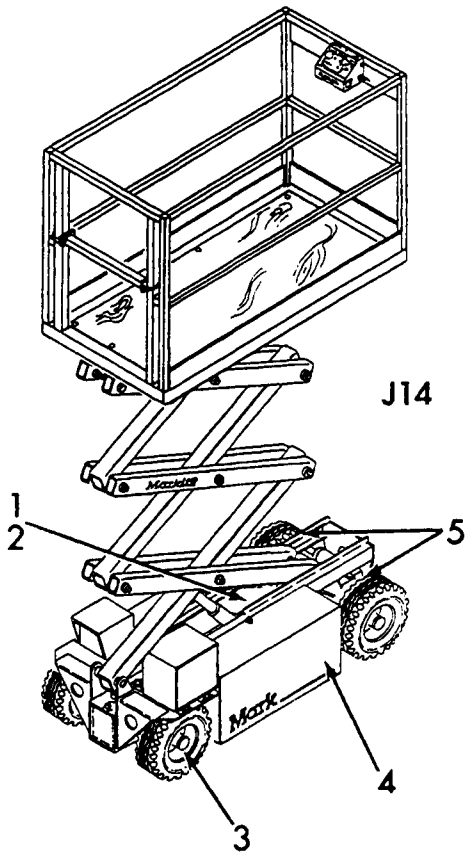
Specific Gravity

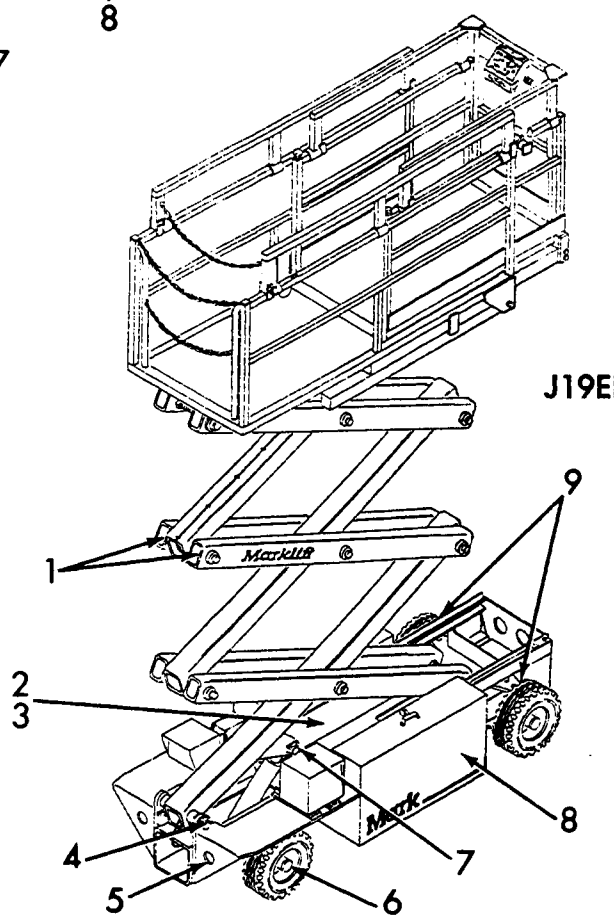
Corrected to 80°F (17°C)	Freezing Temperature	
1,280	-90°F	-68°C
1.250	-62°F	-52°C
1.200	-16°F	-27°C
1.150	+ 5°F	-15°C
1.000	+19°F	- 7°C

NOTE: Cold temperatures have a numbing effect on the electromechanical action of the battery, greatly reducing its capacity. Therefore it is highly recommended that the battery be kept in an almost fully charged condition during cold weather.

RECOMMENDED LUBRICATION CHART







J14

ITEM	DESCRIPTION	LUBRICANT	FREQUENCY
1.	Hydraulic Oil	ATF Dextron II	Change Yearly
2.	Inlet Strainer		Clean Yearly
3.	Wheel Bearings	Mobil (VA6L36AG)	GreaseYearly
4.	Batteries		Check Daily
5.	Steering Yoke King Pins	Mobil (VA6L36AG)	GreaseQuarterly

J19 and J19EP

ITEM	DESCRIPTION	LUBRICANT	FREQUENCY
1.	Grease Fittings	Mobil (VA6L36AG)	Grease Monthly
2.	Hydraulic Oil	ATF Dextron II	Change Yearly
3.	Inlet Strainer		Clean Yearly
4.	Wheel Bearings	Mobil (VA6L36AG)	Grease Yearly
5.	Batteries		Check Daily
6.	Arm Pivot Pin	Mobil (VA6L36AG)	Grease Monthly
7.	Lower Lift Cylinder Pin	Mobil (VA6L36AG)	Grease Monthly
8.	Upper Lift Cylinder Pin	Mobil (VA6L36AG)	Grease Monthly
9.	Steering Yoke King Pins	Mobil (VA6L36AG)	Grease Quarterly

1. ELECTRICAL

Whenever trouble shooting any problem, begin by checking the basics. This means checking to make sure that the batteries are in good shape and have at least a three quarter charge, determined by using a hydrometer and battery maintenance instructions. A large percentage of electrical problems are often due to poorly charged or defective batteries.

A. If a problem seems to be electrical, refer to the schematic, (see the SCHEMATIC section for more information) and use a test light to trace power flow (electrical current) starting at the battery and continuing through the system until the problem is located.

B. Keep in mind, if you **DO NOT** have a good ground to a valve coil, relay, etc., (even if you have a enough electrical power to operate the coil or relay), these 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.

D. The basic purpose of the relay is to remotely switch other electrical devices.

2. HYDRAULIC

A. The various hydraulic functions are controlled by elcetric solenoid valves. When a slower drive speed is needed, a portion of the hydraulic fluid is routed to the tank by the low speed priority valve, reducing the speed.

B. Directional valves (steering, drive etc.) have two electrical coils with a moveable spool between the coils.

C. One way valves (lift, descent,and dump) are opened or closed to prevent or permit passage of fluid when electrically energized.

DRIVE MOTOR

Will not run.

A. Check ground control box circuit breaker.
B. Check for low battery reading.
C. Refer to your local service facility.

Unit will not go into high speed.

A. Check for energizing hi speed solenoid valve.
B. Refer to your local service facility.

Dies under load.

A. Check hydraulic pressure.
B. Refer to your local service facility.

DRIVE

A. Make sure hydraulic system is up to recommended pressure.
B. Refer to your local service facility.

HYDRAULIC WHEEL DRIVE MOTOR

Turns wheel while unloaded, but slows down or stops when load is applied.

A. Check hydraulic high pressure port with 3000 PSI gauge.
B. Refer to your local service facility.

HYDRAULIC PUMP

Pump producing excessive noise.

A. Check suction hose from tank to pump for kinks.
B. Check hydraulic oil level (sight gauge on tank.)
C. Check suction line fittings for tightness.
D. Check oil. See hydraulic fluid table.
E. Refer to your local service facility.

LIFT

Functions will not operate from aerial control console.

A. Check "Aerial/Ground" selector switch.
B. Check for loose wire in aerial control box.
C. Solenoid dump valve.

Functions will not operate from ground control box.

A. Check position of "Aerial/Ground" box selector switch.
B. Check for loose wire in ground control box.
C. Refer to your local service facility.

NEW EQUIPMENT MAINTENANCE RECORD

MODEL	SERIAL NUMBER
DATE	EQUIPMENT NUMBER
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 assembly		
Choke			Tire pressure		
Engine RPM			Tire condition		
Charging system			Wheel nuts		
Fuel system LPG/gas			Wheel bearing		
Batteries			Nuts and bolts		
Battery terminals			Guard rails		
Motor brushes			Lubrication		
Hydraulic fluid			Warning decals		
Hydraulic oil filter			Operating inst.		
Hydraulic systems			General decals		
Hydraulic pressure			Paint		
Hydraulic hoses			All operations		
Cylinders			Lift		
Drive motors			Steering		
Brakes			Forward 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

Comments

REV.

Milestone			Hydraulic fluid			
Oil company			Chevron	Gulf	Shell	Union
Brand Name			ATF Dextron II	ATF Dextron II	Donaz-T6	ATF Dextron
Viscosity	SUS AT 100°F (37.8°C)		187.4	195	200	200
	SUS AT 210°F (98.9°C)		49.2	50.4	50	52.3
	Index	°F	153°	155°	160°	172°
		°C	67.2°	68.3°	71.1°	77.8°
Flash point		°F	400°	405°	390°	395°
		°C	204.4°	207.2°	198.9°	201.7°
Pour point		°F	-40°	-50°	-50°	-45°
		°C	-40°	-45.6°	-45.6°	-42.8°

MODEL NUMBER ____________ SERIAL NUMBER ____________ DATE SOLD ____________

DATE IN SERVICE ____________ OPTIONS ____________ WARRANTY PERIOD ____________

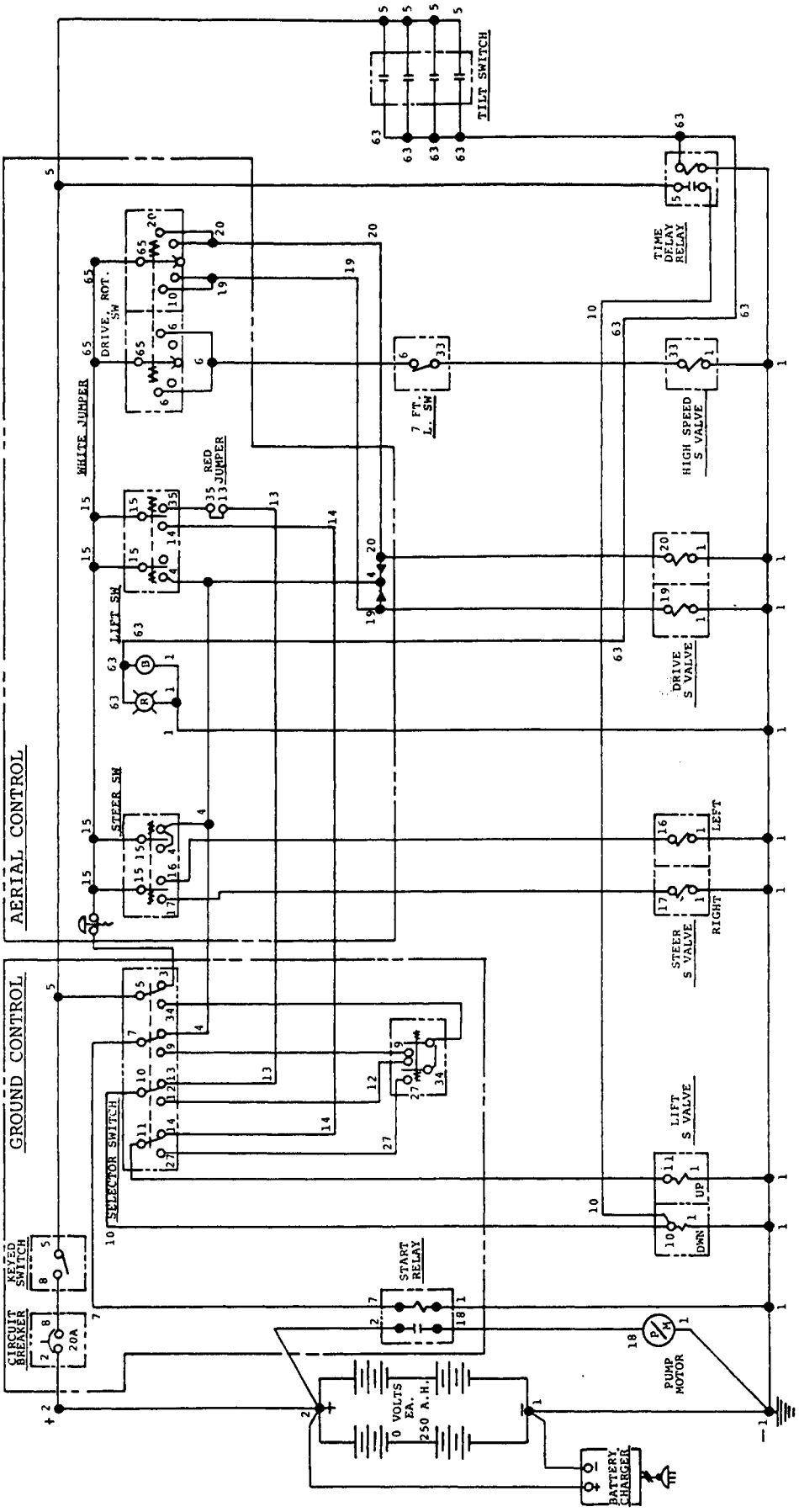
[shaded box] APPLIES TO MODELS WITH ENGINES ONLY

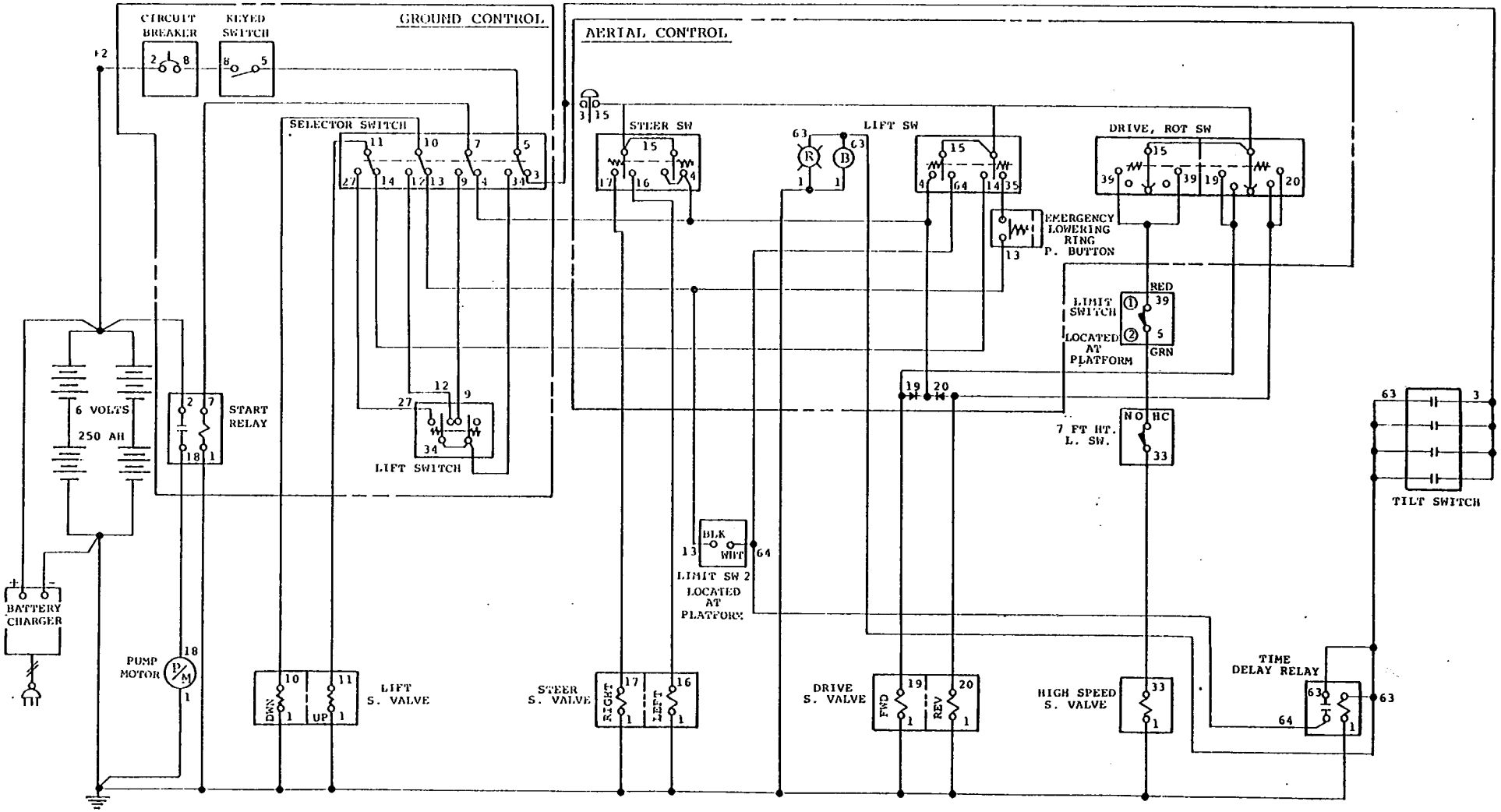
CODE:
C – CHECKED
A – ADJUSTED
R – REPAIRED
N – NEW PART
X – NEEDS REPAIR

Group	Items
PREVENTIVE MAINT.	OIL CHANGE, OIL FILTER, AIR FILTER, HYDRAULIC OIL CHANGE, HYDRAULIC OIL FILTER, WHEEL BEARING PACK, DRIVE MOTOR, PUMP MOTOR BRUSHES, ELECTRICAL CONTROLS, TRANS/DIFF OIL CHANGE
ELECTRICAL	TUNE UP SPARK PLUGS, GENERATOR, VOLTAGE REGULATOR, BATTERY, STARTER, POINTS / CONDENSER
HYDRAULIC	HYDRAULIC SYSTEM, LEV CYLINDER, LIFT CYLINDER SEALS, HYD CONTROL VALVE, HYDRAULIC PUMP, ROTARY MANIFOLD, LIFT ROLLERS, HYDRAULIC HOSES
	BRAKES
FUEL	FUEL SYSTEM, CARBURATOR, FUEL PUMP
STEER	STEERING, STEERING HOSES, STEER GEAR, STEER CYLINDER
TIRE	DRIVE TIRES, STEER TIRES
MAJ.	ENGINE OVERHAUL, DRIVE AXEL OVERHAUL
MISC.	

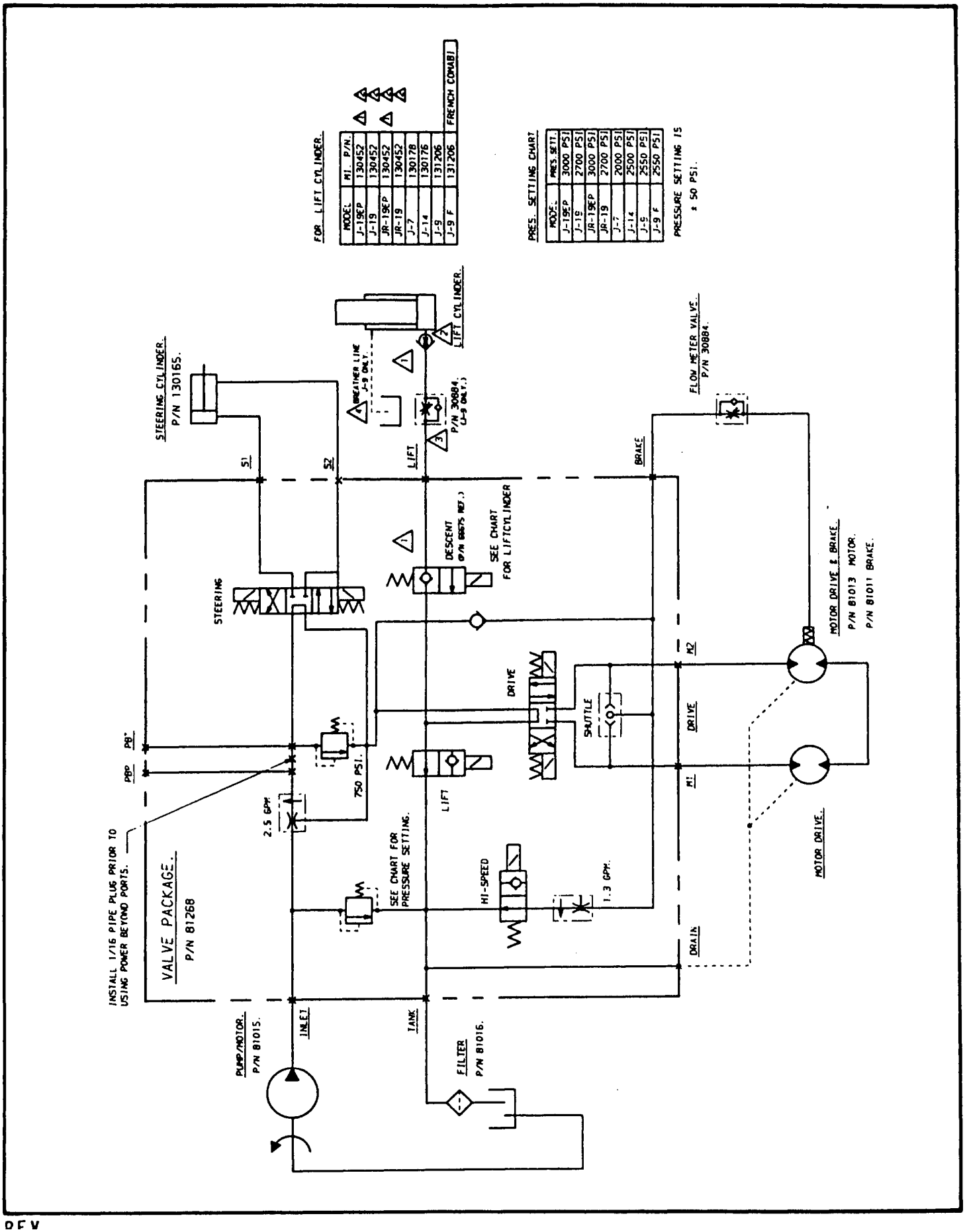
DATE	REMARKS	DATE	REMARKS	AGENCY

ELECTRICAL SCHEMATIC (J14, J19)



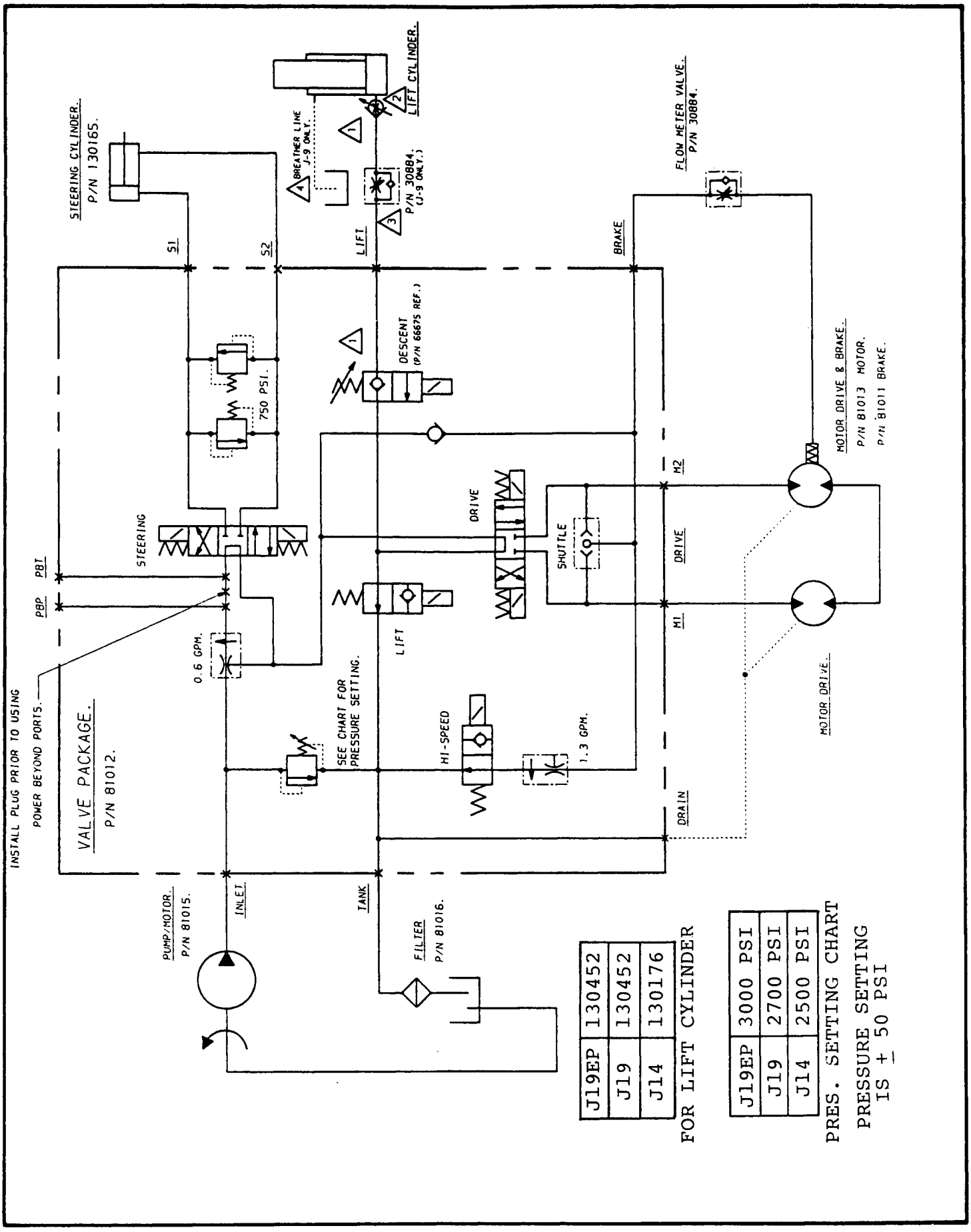

GROUND CONTROL
AERIAL CONTROL
CIRCUIT BREAKER
KEYED SWITCH
+2
SELECTOR SWITCH
STEER SW
LIFT SW
DRIVE, ROT SW
EMERGENCY LOWERING RING P. BUTTON
LIMIT SWITCH
LOCATED AT PLATFORM
RED
GRN
6 VOLTS
250 AH
START RELAY
LIFT SWITCH
7 FT HT. L. SW.
TILT SWITCH
BLK
WHT
LIMIT SW 2
LOCATED AT PLATFORM
BATTERY CHARGER
PUMP MOTOR
LIFT S. VALVE
STEER S. VALVE
DRIVE S. VALVE
HIGH SPEED S. VALVE
TIME DELAY RELAY
DWN
UP
RIGHT
LEFT
FWD
REV

HYDRAULIC SCHEMATIC (J14, J19, J19EP) AFTER FEB. 1989



REV

HYDRAULIC SCHEMATIC (J14, J19, J19EP) BEFORE FEB. 1989

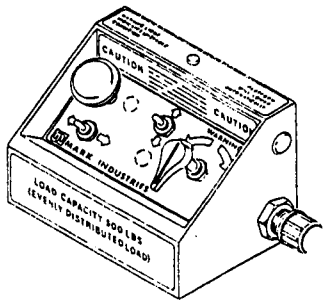


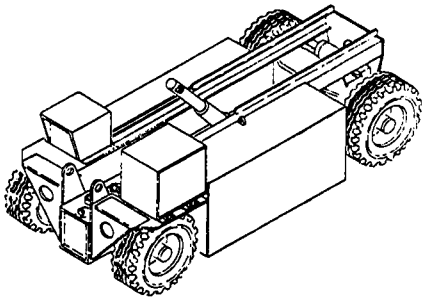
J19EP	130452
J19	130452
J14	130176

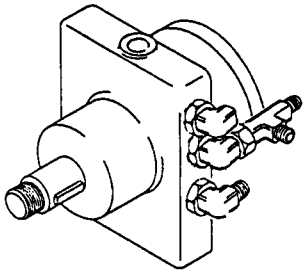
FOR LIFT CYLINDER

J19EP	3000 PSI
J19	2700 PSI
J14	2500 PSI

PRES. SETTING CHART
PRESSURE SETTING IS ± 50 PSI

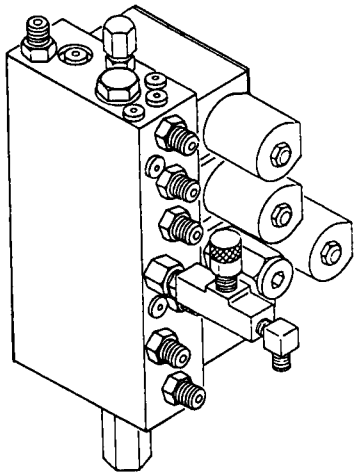


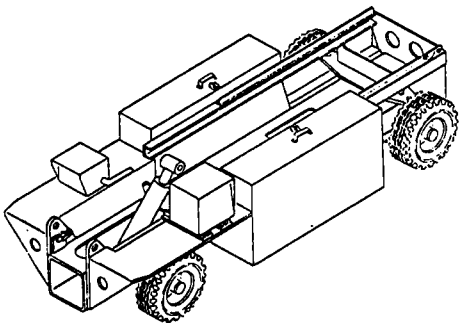


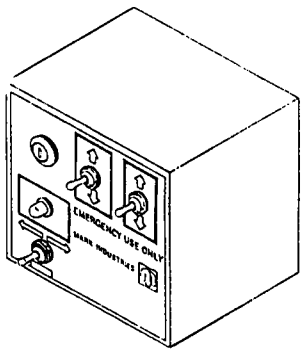


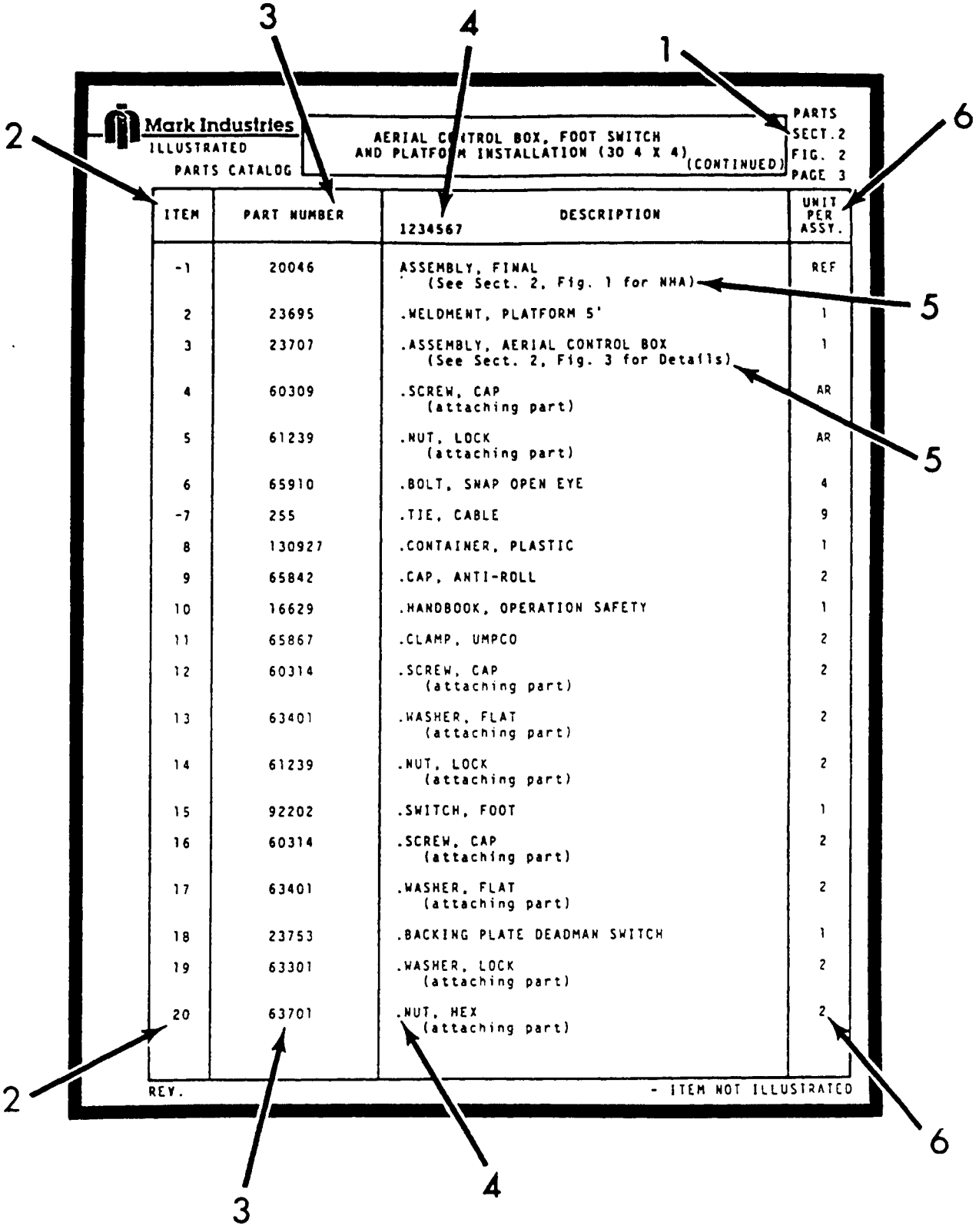
THIS SECTION 1 CONTAINS THE FOLLOWING FIGURES:

FIGURE NO.	TITLE
1	TABLE OF CONTENTS (PARTS ONLY)
2	HOW TO USE PARTS CATALOG
3	HOW TO ORDER PARTS









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

THIS PARTS CHAPTER CONTAINS:

SECTION 1	THE MARKLIFT PARTS CATALOG
PAGE NO.	TITLE
1	TABLE OF CONTENTS (PARTS ONLY)
4	HOW TO USE PARTS CATALOG
7	HOW TO ORDER PARTS

SECTION 2	FINAL ASSEMBLY
FIG. NO.	TITLE
1	FINAL ASSEMBLY J14
1A	FINAL ASSEMBLY J19
1B	FINAL ASSEMBLY J19EP
2	DECAL SET J14
2A	DECAL SET J19
2B	DECAL SET J19EP
3	UPPER CONTROL BOX ASSEMBLY J14
3A	UPPER CONTROL BOX ASSEMBLY J19
3B	UPPER CONTROL BOX ASSEMBLY J19EP

SECTION 3	FRAME ASSEMBLIES
FIG. NO.	TITLE
1	FRAME ASSEMBLY J14
1A	FRAME ASSEMBLY J19, J19EP
2	DRIVE TIRE AND WHEEL ASSEMBLY J14
2A	DRIVE TIRE AND WHEEL ASSEMBLY J19, J19EP
3	IDLER TIRE AND WHEEL ASSEMBLY J14
3A	IDLER TIRE AND WHEEL ASSEMBLY J19, J19EP
4	BATTERY CHARGER ASSEMBLY
5	GROUND CONTROL ASSEMBLY
6	MOTOR AND PUMP ASSEMBLY
7	CONTROL VALVE ASSEMBLY
8	MOTOR DRIVE ASSEMBLY
9	TIE ROD ASSEMBLY J14
9A	TIE ROD ASSEMBLY J19, J19EP

FRAME ASSEMBLIES CONT'D.

FIG. NO.	TITLE
10	STEERING CYLINDER ASSEMBLY J14
10A	STEERING CYLINDER ASSEMBLY J19, J19EP
11	DRIVE MOTOR AND PARKING BRAKE ASSEMBLY
12	LIFT CYLINDER ASSEMBLY
13	BATTERY CABLE KIT
14	HYDRAULIC HOSE DIAGRAM J14
14A	HYDRAULIC HOSE DIAGRAM J19, J19EP
15	TILT SWITCH ASSEMBLY

SECTION 4 SCISSOR ASSEMBLY

FIG. NO.	TITLE
1	SCISSOR ASSEMBLY J14
1A	SCISSOR ASSEMBLY J19, J19EP
2	INNER BOTTOM ARM WELDMENT J14
2A	INNER BOTTOM ARM WELDMENT J19, J19EP
3	INNER MIDDLE ARM WELDMENT J14
3A	INNER MIDDLE ARM WELDMENT J19, J19EP
4	INNER TOP ARM WELDMENT J14
4A	INNER TOP ARM WELDMENT J19, J19EP
5	OUTER TOP AND MIDDLE ARM WELDMENT J14
5A	OUTER TOP AND MIDDLE ARM WELDMENT J19, J19EP
6	OUTER BOTTOM ARM WELDMENT J14
6A	OUTER BOTTOM ARM WELDMENT (L.H.) J19, J19EP
7	OUTER BOTTOM ARM WELDMENT (R.H.) J19, J19EP

SECTION 5 PLATFORM ASSEMBLIES

FIG. NO.	TITLE
1	DECK ASSEMBLY J14
1A	PLATFORM ASSEMBLY J19
1B	PLATFORM SLIDE OUT ASSEMBLY J19EP

SECTION 6 FIG. NO.	OPTIONAL ASSEMBLIES TITLE
1	OPTIONAL ASSEMBLIES J14
1A	OPTIONAL ASSEMBLIES J19
1B	OPTIONAL ASSEMBLIES J19EP
2	WARNING HORN ASSEMBLY
3	HOURMETER
4	REMOTE CONTROL ASSEMBLY
5	WARNING BEACON ASSEMBLY
6	SWING GATE ASSEMBLY J14
6A	FOLD DOWN SWING GATE ASSEMBLY J19
6B	FOLD DOWN SWING GATE ASSEMBLY J19EP
7	12 VOLT PLATFORM WORK LIGHT*
8	ALL MOTION ALARM ASSEMBLY*
9	FEMALE PLUG FOR REMOTE DRIVE ASSEMBLY*
10	TUV PACKAGE*

*THIS FIGURE NOT AVAILABLE THIS REVISION

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, -7, etc.)

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

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

   1 2 3 4 5 6 7

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

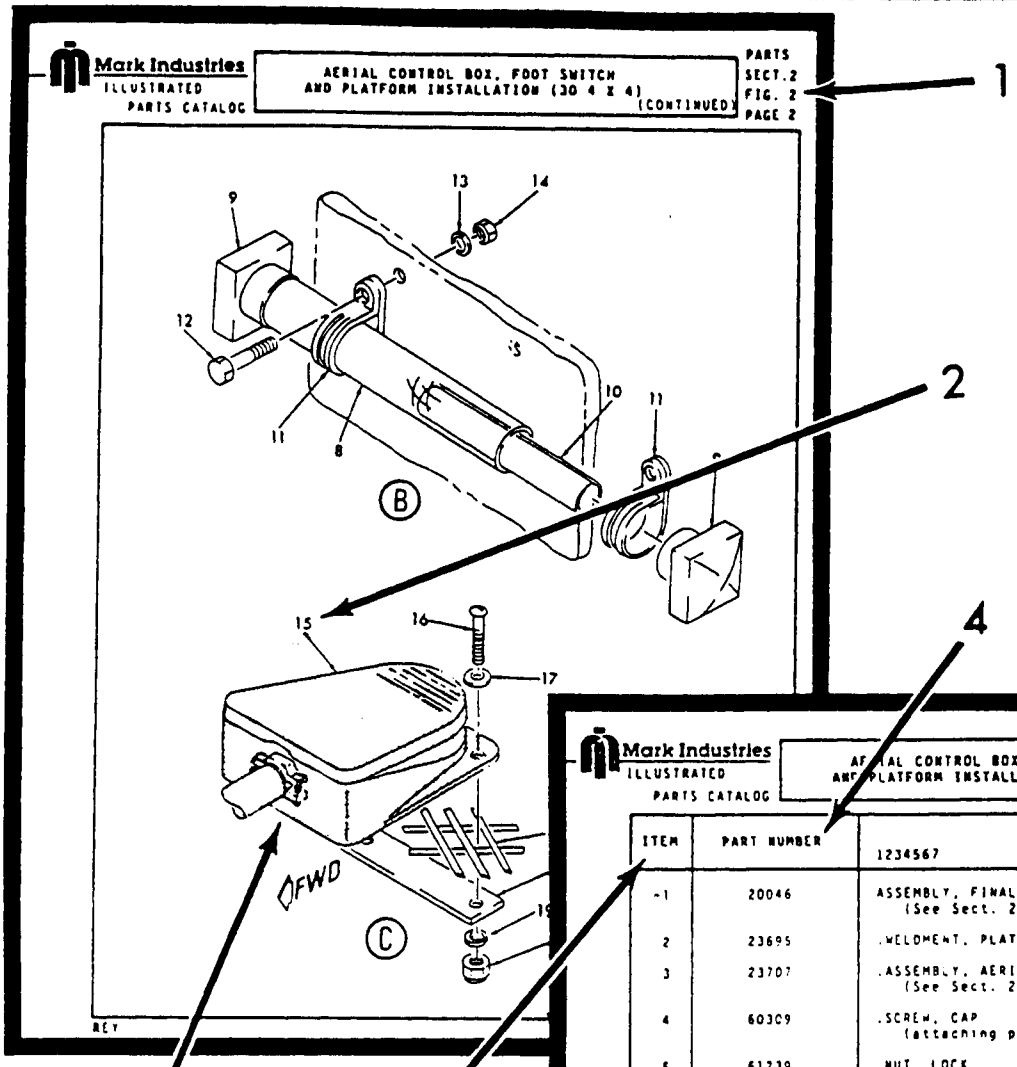
5. **NHA** (Next Higher Assembly) and **DETAILS** - Section and Figure reference catalog location indicates where the installation or assembly is listed under NHA and where illustrated for more detailed breakdown.

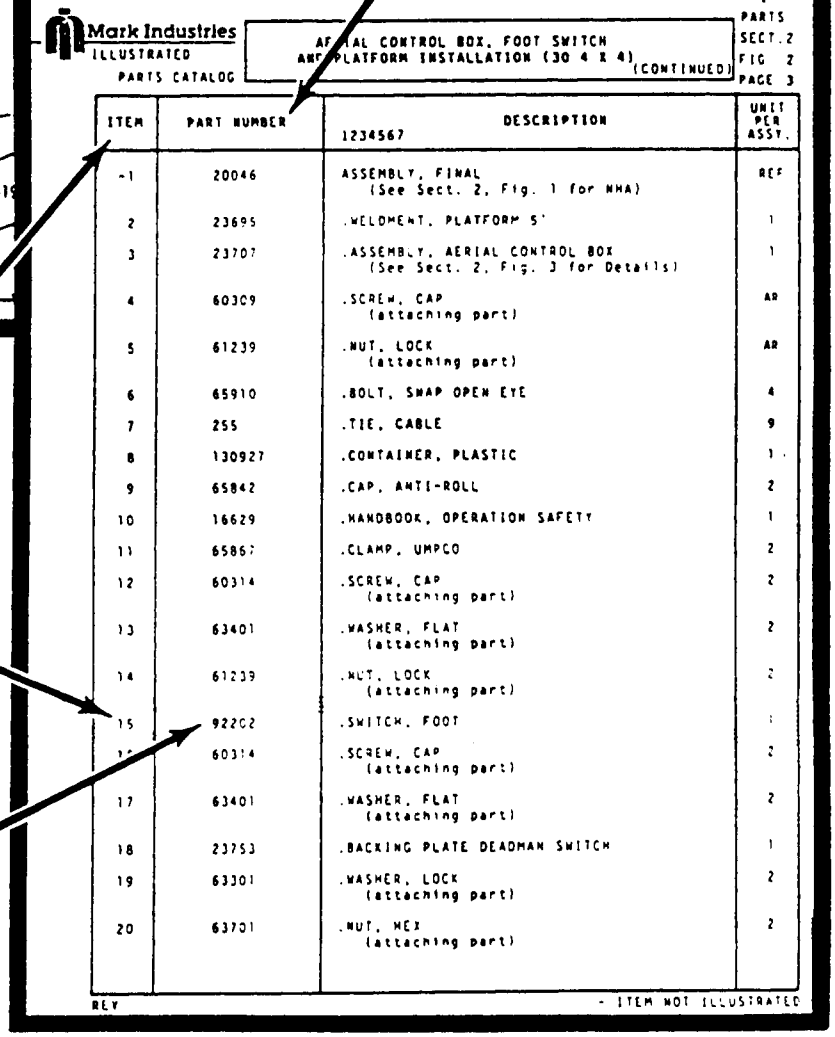
6. **UNIT PER ASSEMBLY** - Entries are as follows:

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

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

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





ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	20046	ASSEMBLY, FINAL (See Sect. 2, Fig. 1 for NHA)	REF
2	23695	.WELDMENT, PLATFORM 5'	1
3	23707	.ASSEMBLY, AERIAL CONTROL BOX (See Sect. 2, Fig. 3 for Details)	1
4	60309	.SCREW, CAP (attaching part)	AR
5	61239	.NUT, LOCK (attaching part)	AR
6	65910	.BOLT, SWAP 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

1. PART NUMBER

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

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

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

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

2. TO ORDER:

By Phone: Service Department

(800) 448-MARK

or

(714) 879-MARK

By Fax: (714) 879-8884

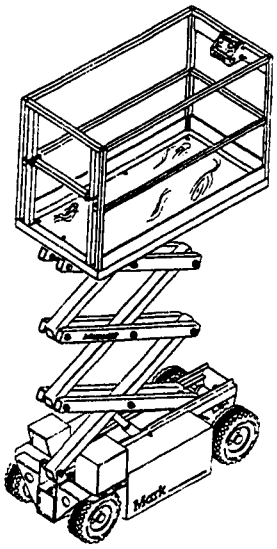
By Mail: Attention Service Department

MARK INDUSTRIES
Post Office Box 2255
Brea, California 92622

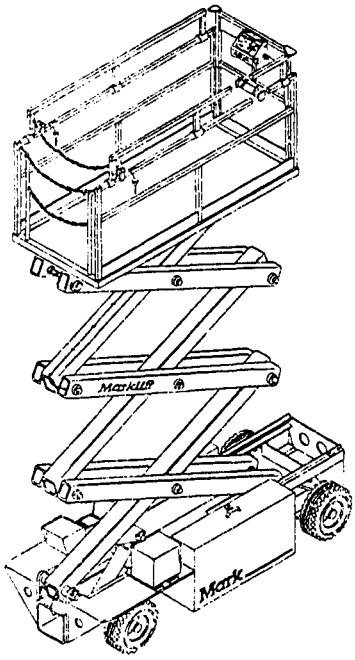
THE MARKLIFT FINAL ASSEMBLY

THIS SECTION 2 CONTAINS THE FOLLOWING FIGURES:

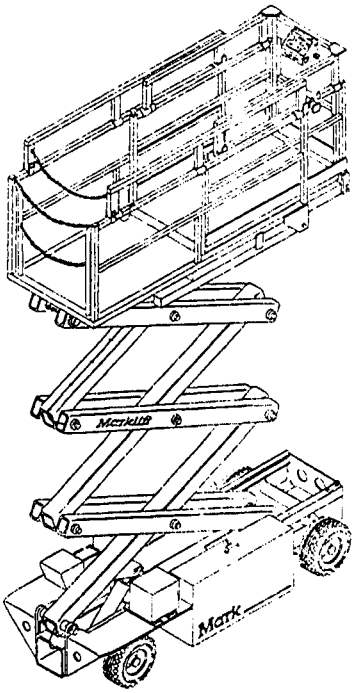
FIGURE NO.	TITLE
1	FINAL ASSEMBLY J14
1A	FINAL ASSEMBLY J19
1B	FINAL ASSEMBLY J19EP
2	DECAL SET J14
2A	DECAL SET J19
2B	DECAL SET J19EP
3	UPPER CONTROL BOX ASSEMBLY J14
3A	UPPER CONTROL BOX ASSEMBLY J19
3B	UPPER CONTROL BOX ASSEMBLY J19EP



J14

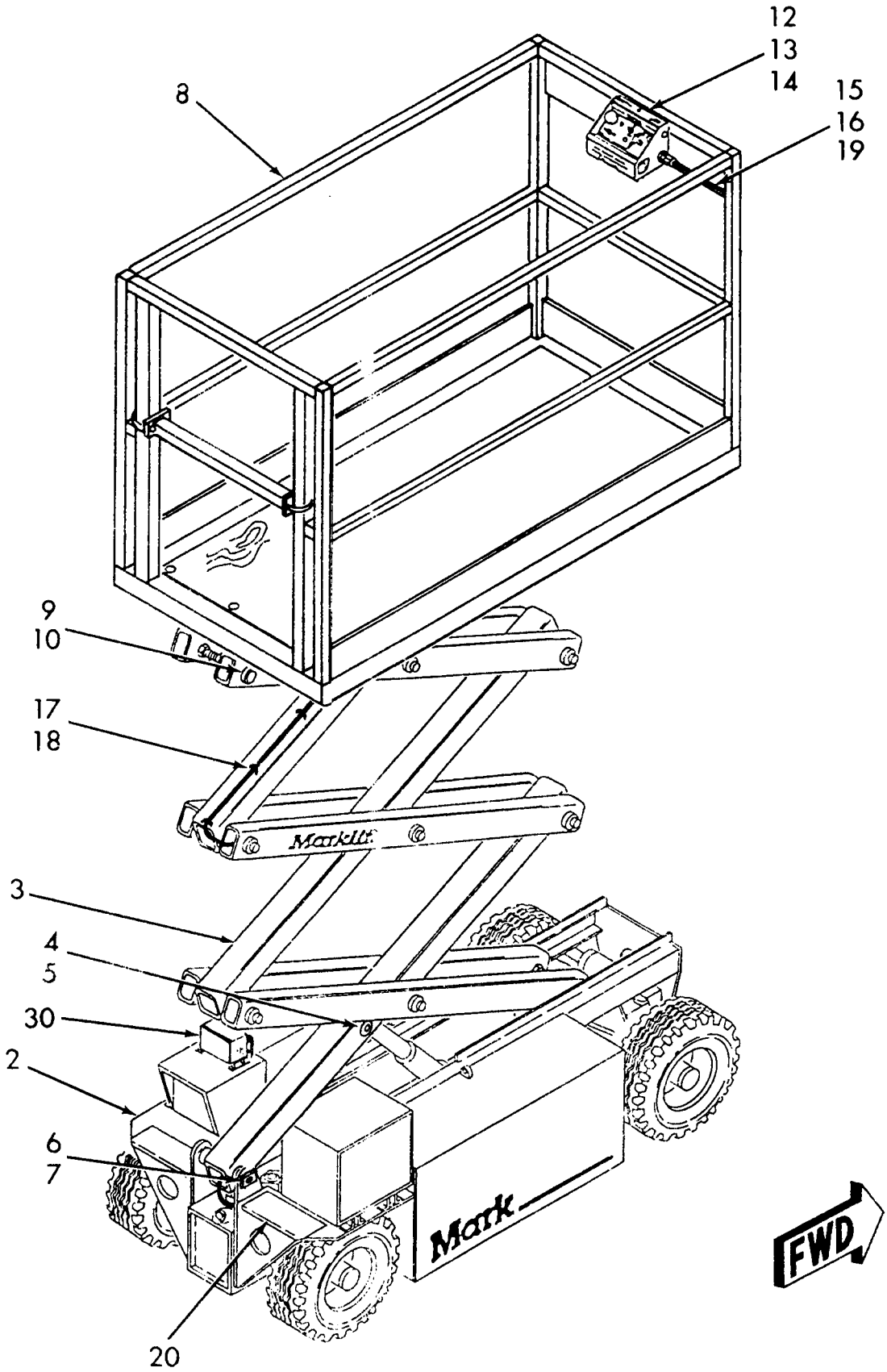


J19



J19EP

FINAL ASSEMBLY J14



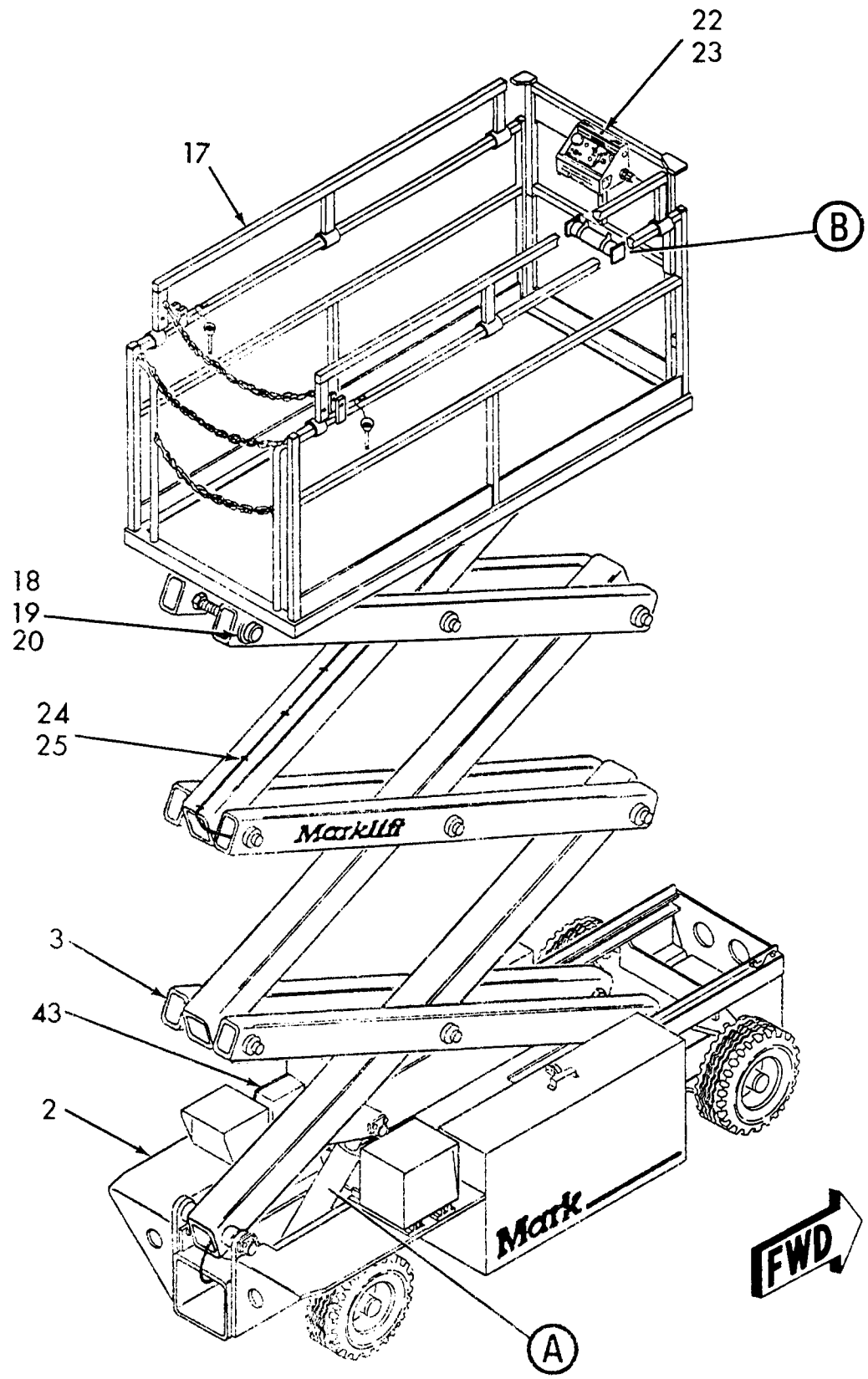
FINAL ASSEMBLY J14

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130000	ASSEMBLY, FINAL J14	REF
2	130101	.ASSEMBLY, FRAME (See Sect. 3, Fig. 1 for Details)	1
3	130141	.ASSEMBLY, SCISSOR (See Sect. 4, Fig. 1 for Details)	1
4	130233	.PIN	1
5	62203	.SCREW, SET SOCKET (attaching part)	1
6	130182	.PIN	1
7	64206	.PIN, ROLL	1
8	130105	.ASSEMBLY, DECK (See Sect. 5, Fig. 1 for Details)	1
9	130169	.PIN	1
10	64206	.PIN, ROLL	1
-11	67798	.DECAL SET (See Sect. 2, Fig. 2 for Details)	1
12	130186	.ASSEMBLY, UPPER CONTROL BOX (See Sect. 2, Fig. 3 for Details)	1
13	60353	.SCREW, CAP (attaching part)	4
14	60711	.NUT, LOCK (attaching part)	4
15	70248	.GROMMET	1
16	70016	.GROMMET	1
17	764	.CLAMP, RUBBER	7
18	60633	.SCREW, CAP (attaching part)	7
19	255	.CABLE TIE, LARGE	7
20	130331	.FOOT STEP, ANTI-SKID	2
-21	17034	.HANDBOOK	1
-22	65581	.DOCUMENT PLASTIC BAG	1
-23	130181	.HYDRAULIC SCHEMATIC (See Schematic Section for Details)	1

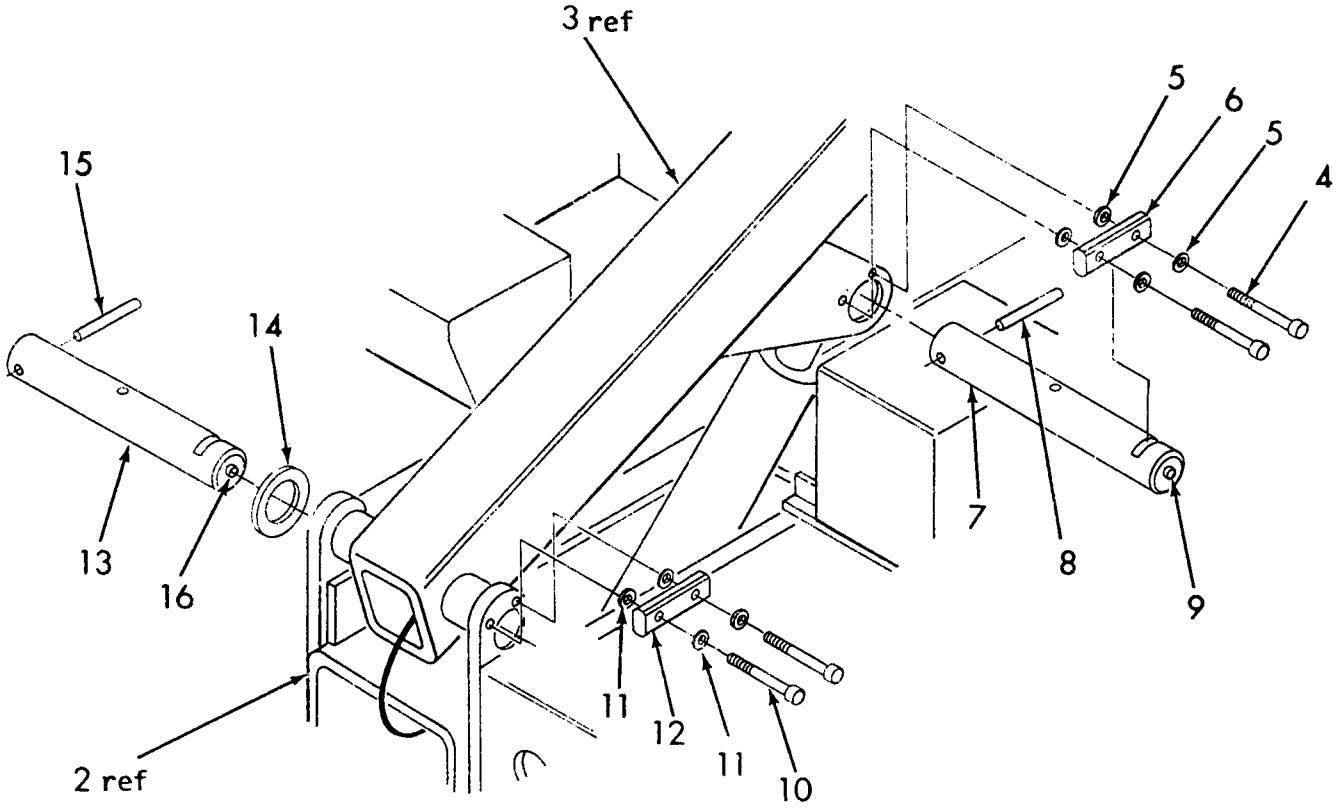
FINAL ASSEMBLY J14

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-24	130199	.ELECTRICAL SCHEMATIC (See Schematic Section for Details)	1
-25	2673	.PAINT, SPRAY WHITE KITKOTE	1
-26	65368	.PAINT, SPRAY TRUE BLUE	1
-27	16608	.PAINT, WHITE	2 GAL.
-28	65389	.PAINT, BLUE	½ GAL.
-29	65116	.HYDRAULIC OIL	4.3 GAL
30	131297	.ASSEMBLY, 110 VAC BOX (See Sec. 2, Fig. 4 For Details)	1

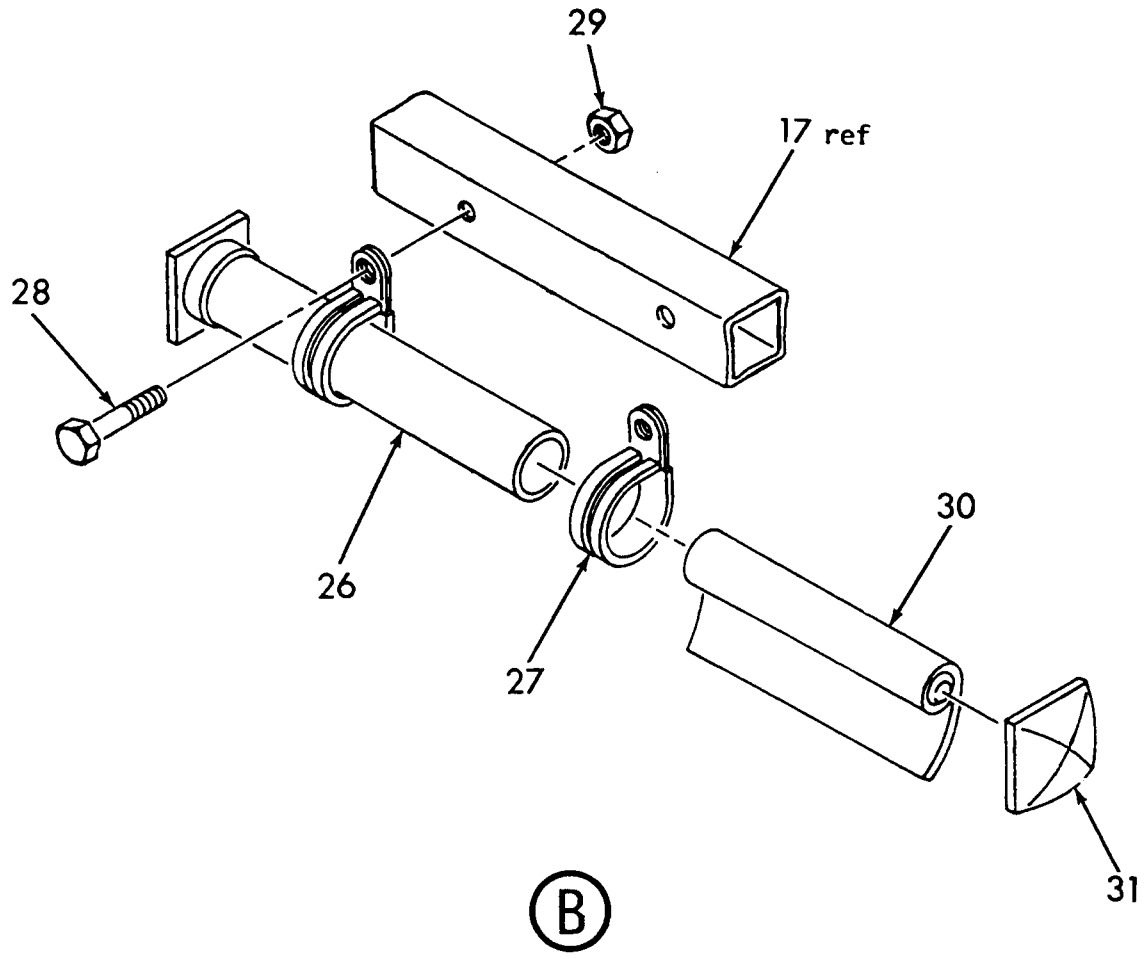
FINAL ASSEMBLY J19



FINAL ASSEMBLY J19



(A)


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17 ref
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B

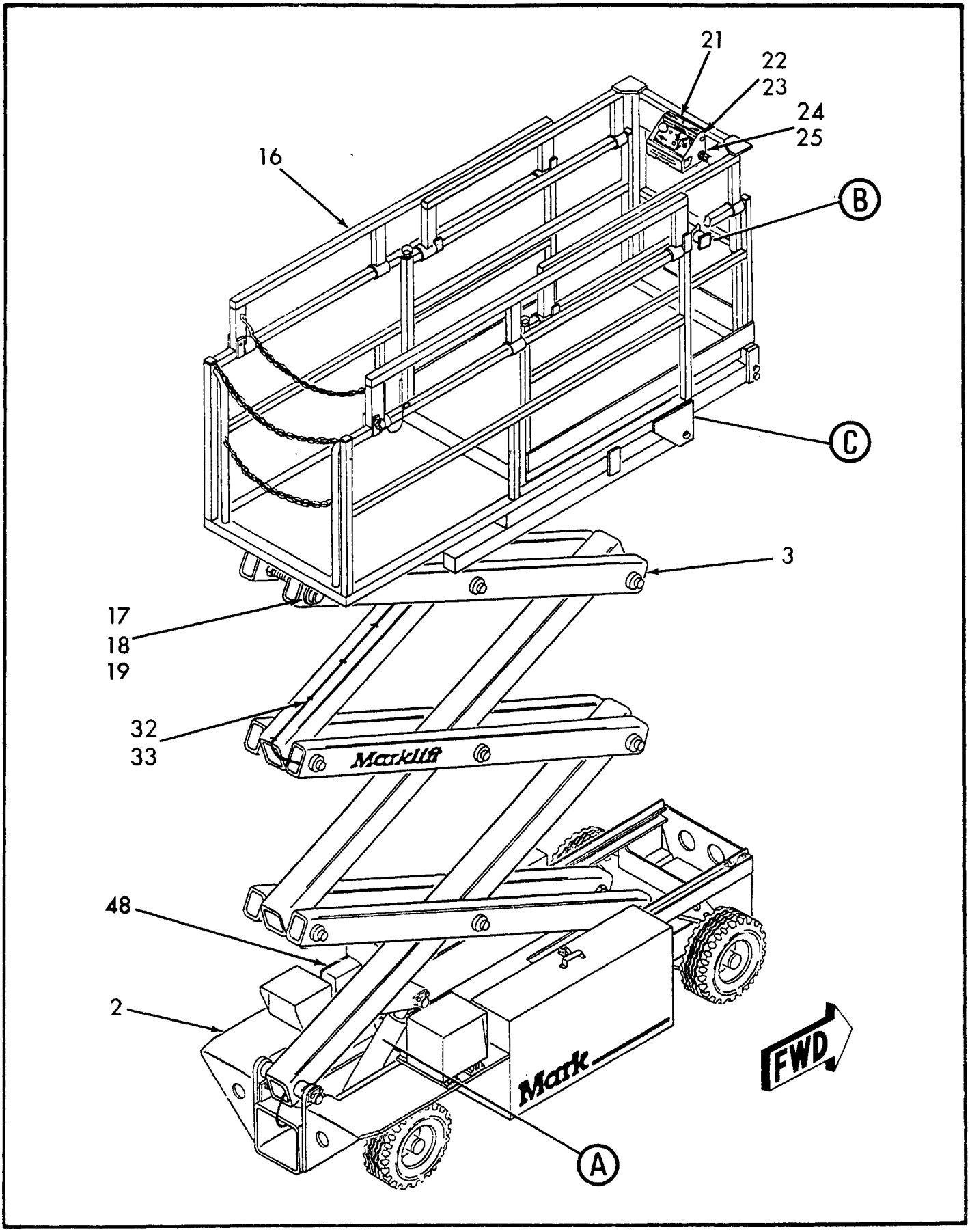
FINAL ASSEMBLY J19

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130030	ASSEMBLY, FINAL J19	REF
2	130844	.ASSEMBLY, FRAME (See Sect. 3, Fig. 1 for Details)	1
3	130526	.ASSEMBLY, SCISSORS (See Sect. 4, Fig. 1A for Details)	1
4	61950	.SCREW, SOCKET HEAD CAP (attaching part)	2
5	63302	.WASHER, LOCK (attaching part)	2
6	131094	.PLATE, LOCK	1
7	131097	.PIN, ARM	1
8	64206	.PIN, ROLL	1
9	65103	.GREASE FITTING	1
10	61950	.SCREW, SOCKET HEAD CAP (attaching part)	2
11	63302	.WASHER, LOCK (attaching part)	2
12	131094	.PLATE, LOCK	1
13	131092	.PIN FRAME AND ARM	1
14	130807	.SPACER, OUTER	1
15	64206	.PIN, ROLL	1
16	65103	.GREASE FITTING	1
17	130875	.ASSEMBLY, PLATFORM J19 (See Sect. 5, Fig. 1 for Details)	1
18	130584	.PIN, DECK	1
19	64206	.PIN, ROLL	1
20	130807	.SPACER, OUTER	1
-21	67799	.DECAL SET (See Sect. 2, Fig. 2A for Details)	1
22	130613	.ASSEMBLY, UPPER CONTROL BOX (See Sect. 2, Fig. 3A for Details)	1
23	60353	.SCREW, HEX HEAD CAP (attaching part)	4

- ITEM NOT ILLUSTRATED

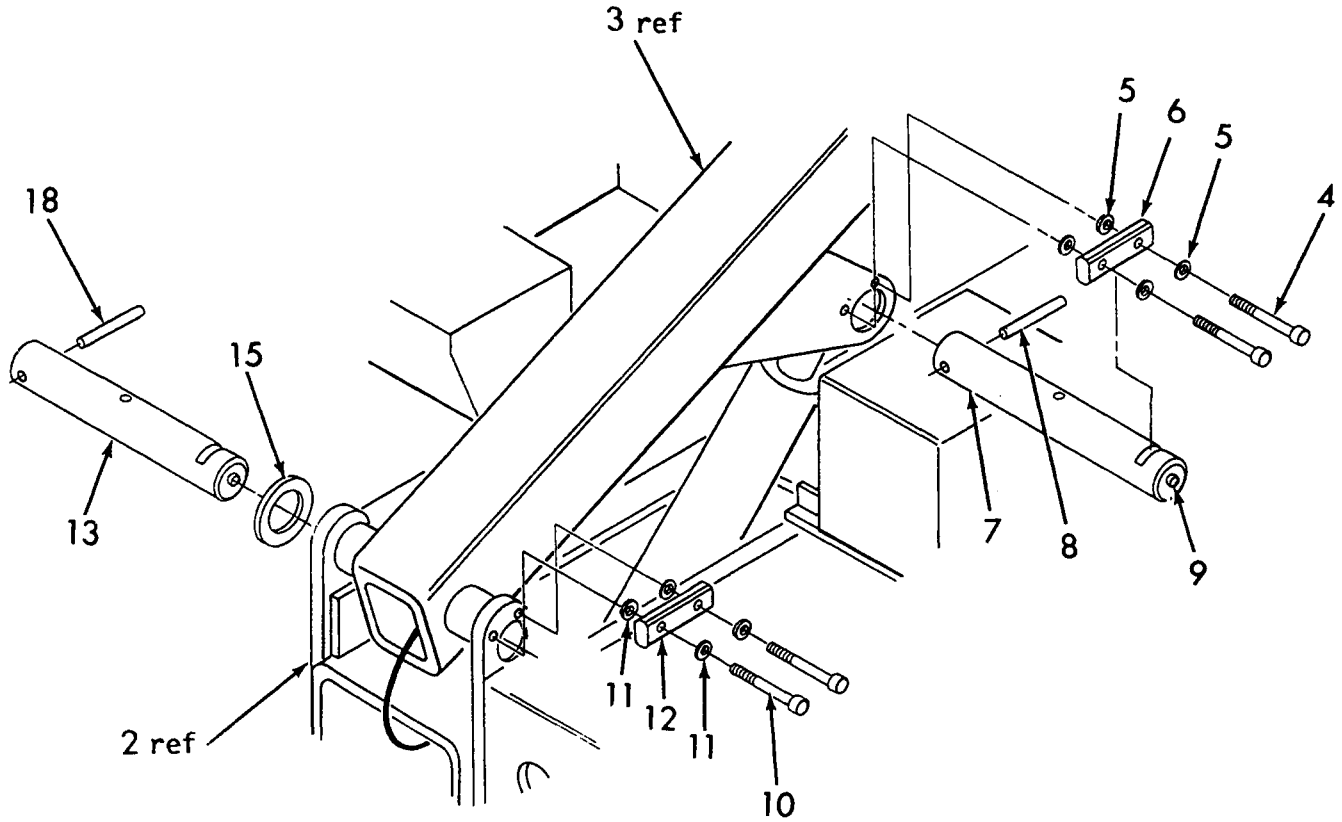
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
24	60353	.SCREW, HEX HEAD CAP (attaching part)	9
25	764	.CLAMP, RUBBER (attaching part)	9
26	130927	.CONTAINER, PLASTIC	1
27	65867	.CLAMP (attaching part)	2
28	60353	.SCREW, HEX HEAD CAP (attaching part)	2
29	60711	.NUT, HEX (attaching part)	2
30	17410	.OPERATION AND SAFETY HANDBOOK	1
31	65842	.CAP, ANTI-ROLL	2
-32	2673	.PAINT, SPRAY KITKOTE	1
-33	65368	.PAINT, SPRAY, TRUE BLUE	1
-34	16608	.PAINT, WHITE	2 GAL.
-35	65389	.PAINT, BLUE	½ GAL.
-36	130199	.ELECTRICAL SCHEMATIC (See Schematic Sect. for Details)	1
-37	130181	.HYDRAULIC SCHEMATIC (See Schematic Sect. for Details)	1
-38	255	.CABLE TIE, LARGE	7
-39	65116	.HYDRAULIC OIL	6.5
-40	130331	.FOOT STEP ANTI-SKID	2
-41	130595	.FOOT STEP ANTI-SKID	2
-42	70016	.GROMMET	1
43	131297	.ASSEMBLY, 110 VAC BOX (See Sec. 2 Fig. 4 For Details)	1

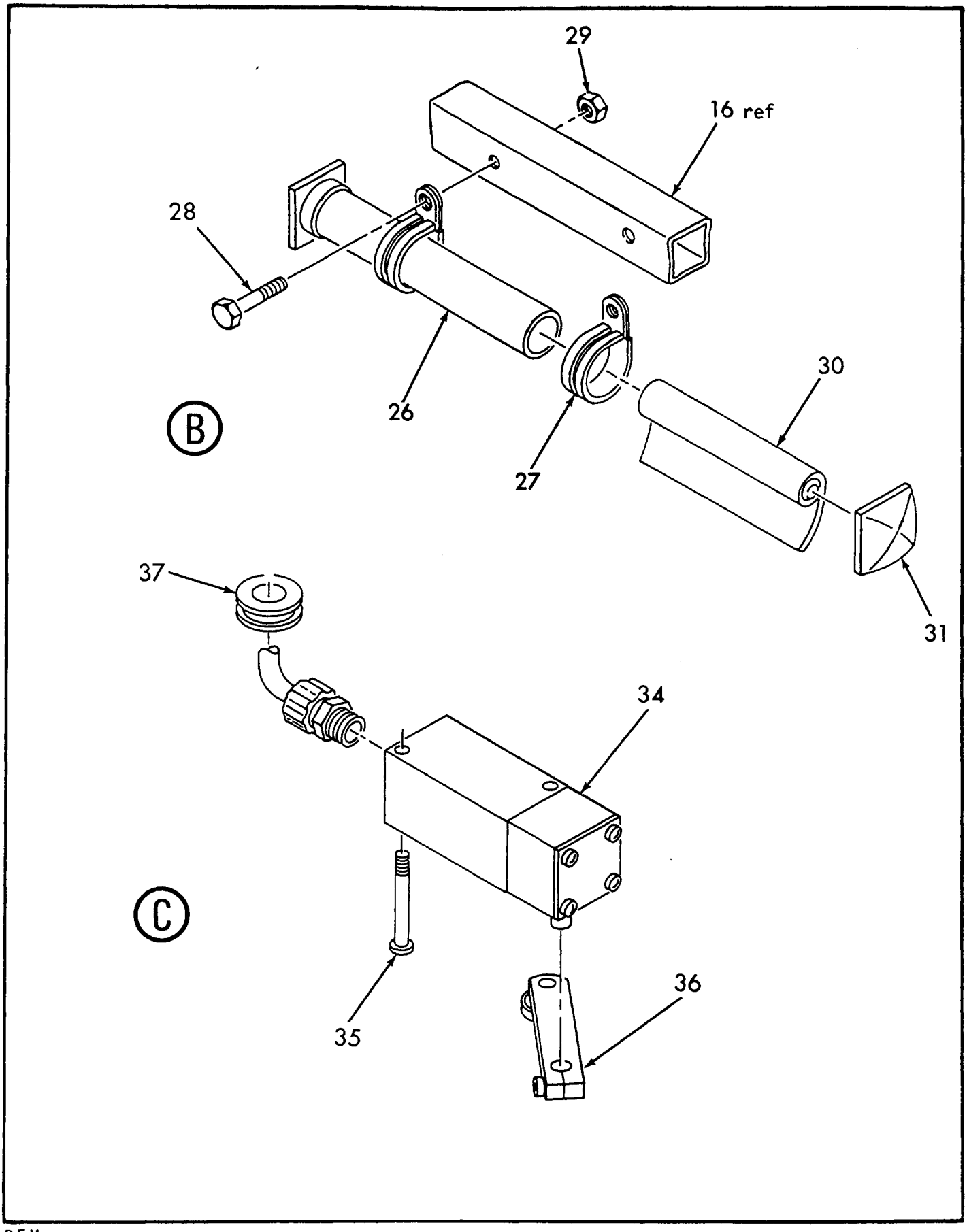
FINAL ASSEMBLY J19EP



REV.

FINAL ASSEMBLY J19EP




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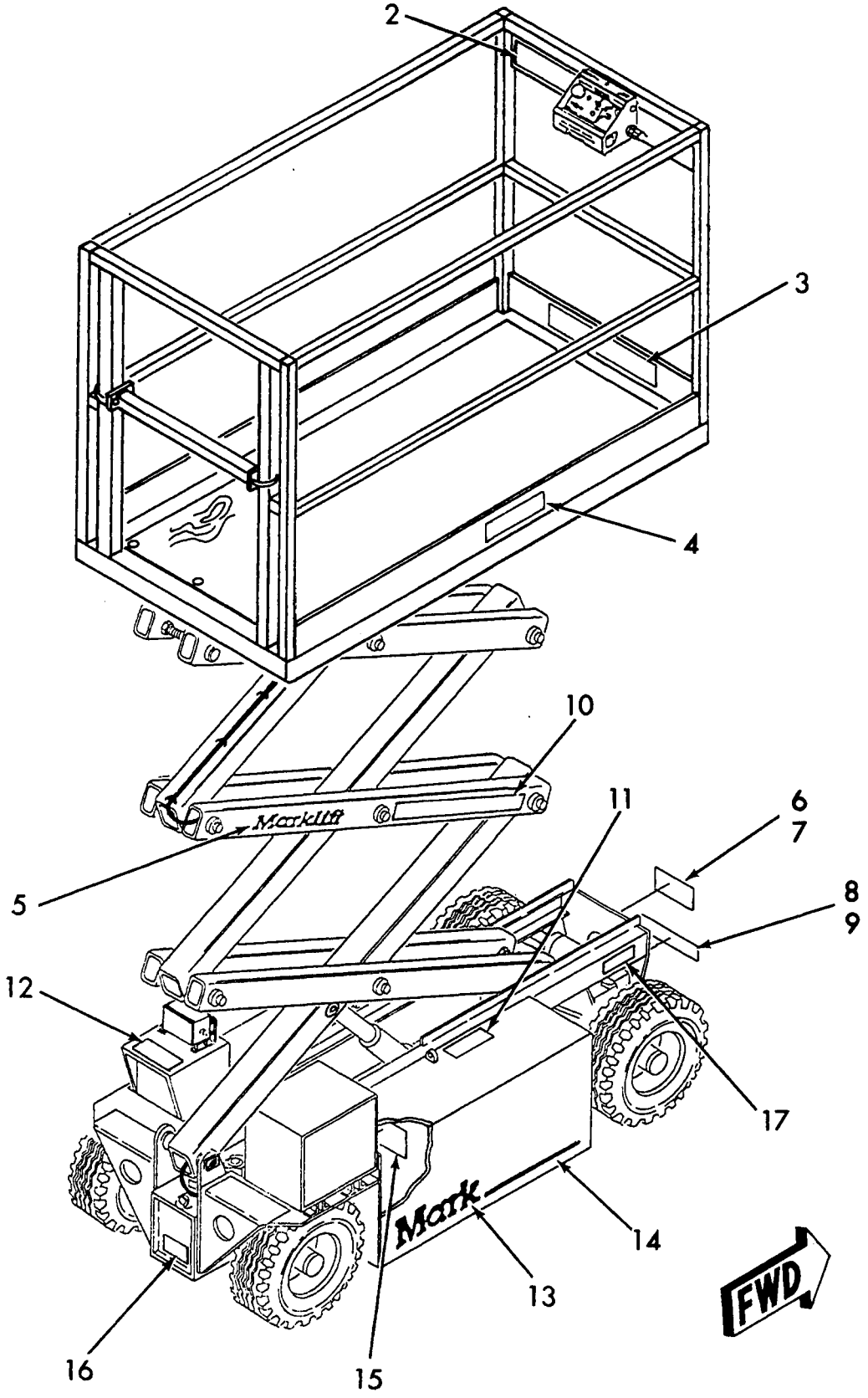
FINAL ASSEMBLY J19EP

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130031	ASSEMBLY, FINAL J19EP	REF
2	130844	.ASSEMBLY, FRAME (See Sect. 3, Fig. 1B for Details)	1
3	130526	.ASSEMBLY, SCISSORS (See Sect. 4, Fig. 1B for Details)	1
4	61950	.SCREW, SOCKET HEAD CAP (attaching part)	2
5	63302	.WASHER, LOCK (attaching part)	2
6	131094	.PLATE, LOCK	1
7	131097	.PIN, ARM	1
8	64206	.PIN, ROLL	1
9	65103	.GREASE FITTING	1
10	61950	.SCREW, SOCKET HEAD CAP (attaching part)	2
11	63302	.WASHER, LOCK (attaching part)	2
12	131094	.PLATE, LOCK	1
13	131092	.PIN, FRAME AND ARM	1
14	65103	.GREASE FITTING	1
15	130807	.SPACER, OUTER	1
16	130850	.ASSEMBLY, PLATFORM SLIDE OUT J19EP (See Sect. 5, Fig. 1B for Details)	1
17	130584	.PIN, DECK	1
18	64206	.PIN, ROLL	1
19	130807	.SPACER, OUTER	1
-20	67800	.DECAL SET (See Sect. 2, Fig. 2B for Details)	1
21	130657	.ASSEMBLY, UPPER CONTROL BOX (See Sect. 2, Fig. 3B for Details)	1
22	60711	.LOCKNUT (attaching part)	2
23	60315	.SCREW, HEX HEAD CAP (attaching part)	2

- ITEM NOT ILLUSTRATED

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
24	60353	.SCREW, HEX HEAD CAP (attaching part)	2
25	60711	.LOCKNUT (attaching part)	2
26	130927	.CONTAINER, PLASTIC	1
27	65867	.CLAMP (attaching part)	2
28	60353	.SCREW, HEX HEAD CAP (attaching part)	2
29	60711	.NUT, HEX (attaching part)	2
30	17410	.OPERATION AND SAFETY HANDBOOK	1
31	65842	.CAP, ANTI-ROLL	2
32	764	.CLAMP, RUBBER (attaching part)	9
33	60353	.SCREW, HEX HEAD CAP (attaching part)	9
34	70173	.SWITCH, LIMIT	1
35	62620	.SCREW, MACH.	2
36	70235	.LEVER, LIMIT SWITCH	1
37	70016	.GROMMET	1
-38	2673	.PAINT, STRAY KITKOTE	1
-39	65368	.PAINT, STRAY, TRUE BLUE	1
-40	16608	.PAINT, WHITE	2 GAL.
-41	65389	.PAINT, BLUE	½ GAL.
-42	130876	.ELECTRICAL SCHEMATIC (See Schematic Sect. for Details)	1
-43	130181	.HYDRAULIC SCHEMATIC (See Schematic Sect. for Details)	1
-44	65116	.HYDRAULIC OIL	6.5
-45	130331	.FOOT STEP, ANTI-SKID	2
-46	130595	.FOOT STEP, ANTI-SKID	2
-47	255	.CABLE TIE, LARGE	7
48	131297	.ASSEMBLY, 110 VAC BOX (See Sec. 2 Fig. 4 For Details)	1

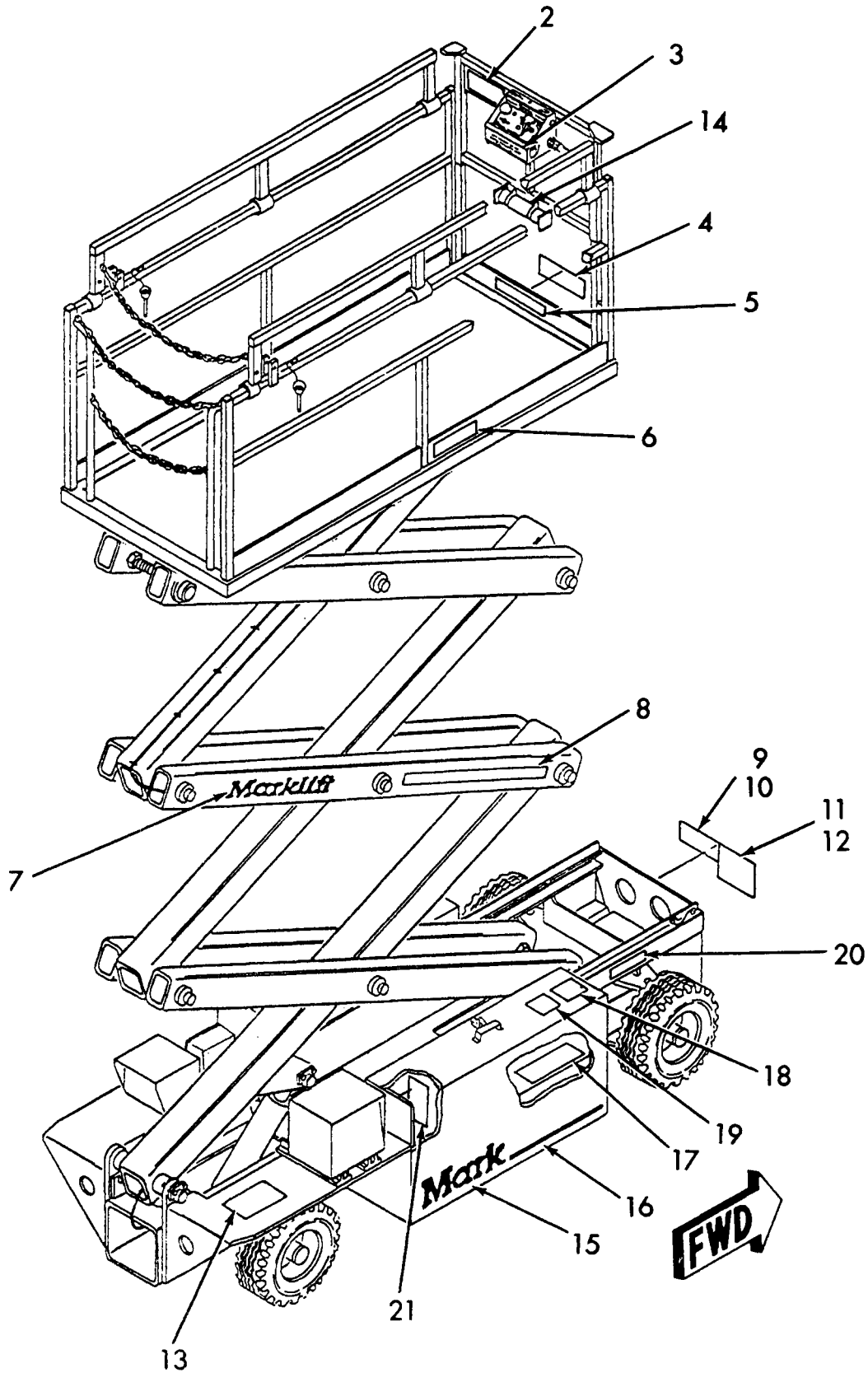
DECAL SET J14



DECAL SET J14

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	67798	DECAL SET J14	REF
2	~~130243~~	.DECAL, OPERATION INSTRUCTION	1
3	11064	.DECAL, SAFETY CHAIN	1
4	2022	.DECAL, LOAD CAPACITY	2
5	31259	.DECAL, MARKLIFT	2
6	20660	.DECAL PLATE, IDENTIFICATION	1
7	375	.RIVET, POP (attaching part)	4
8	20661	.PLATE, ANSI A92	1
9	375	.RIVET, POP (attaching part)	4
10	130596	.DECAL, A PRODUCT OF MARK INDUSTRIES	1
11	2003	.DECAL, BATTERY WATER LEVEL	2
12	2016	.DECAL, WARNING 'DO NOT WORK UNDER'	1
13	130242	.DECAL, 'JR' (BEFORE MID 1987)	2
	130938	.DECAL, MARK (AFTER MID 1987)	2
	181723	.DECAL, J14 (AFTER MARCH 1989)	2
14	131061	.DECAL, BLUE STRIPE (IF 130938 IS USED)	2
15	130606	.DECAL, FREE WHEELING	1
16	2017	.DECAL, HYDRAULIC SYSTEM FLUID	1
17	22175	.DECAL, MONOFILLED TIRES	2

DECAL SET J19



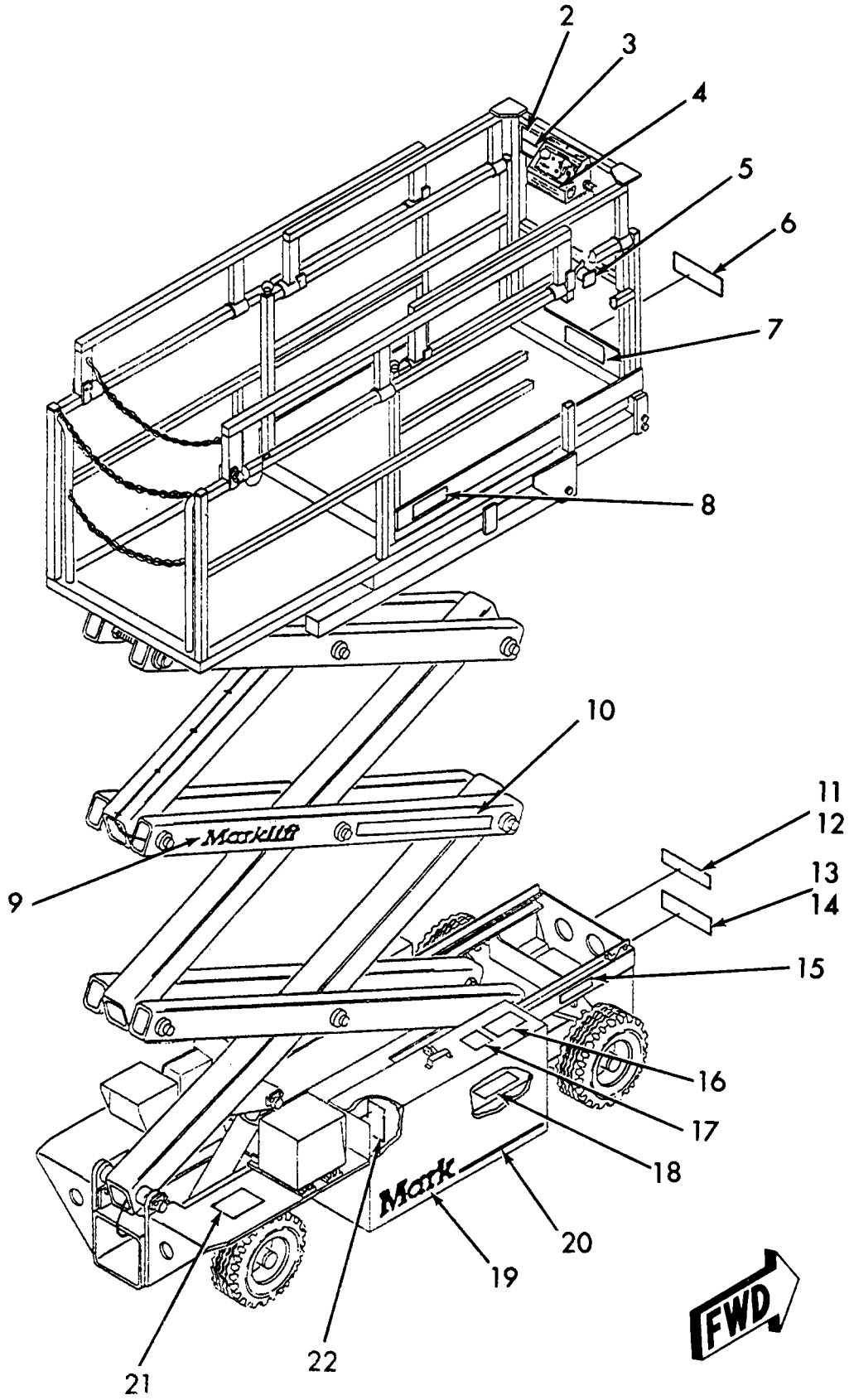
REV.

DECAL SET J19

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	67799	DECAL SET J19	REF
2	130243	.DECAL, OPERATION INSTRUCTION	1
3	20575	.DECAL, LOAD CAPACITY	1
4	130937	.DECAL, J-SERIES	1
5	11064	.DECAL, SAFETY CHAIN	1
6	20575	.DECAL, LOAD CAPACITY	2
7	31259	.DECAL, MARKLIFT	2
8	130596	.DECAL, A PRODUCT OF MARK INDUSTRIES	2
9	20661	.PLATE, ANSI A92	1
10	375	.RIVET, POP (attaching part)	4
11	20660	.PLATE, IDENTIFICATION NUMBER	1
12	375	.RIVET, POP (attaching part)	4
13	130949	.DECAL, DANGER	2
14	130820	.DECAL, OPERATION AND SAFETY HANDBOOK	1
15	130938	.DECAL, MARK	2
16	131061	.DECAL, BLUE STRIPE	2
17	2017	.DECAL, HYDRAULIC SYSTEM FLUID	1
18	2016	.DECAL, WARNING: DO NOT WORK UNDER	2
19	2003	.DECAL, BATTERY WATER LEVEL	2
20	130949	.DECAL, DANGER	2
21	130606	.DECAL, FREE WHEELING	1

- ITEM NOT ILLUSTRATED

DECAL SET J19EP

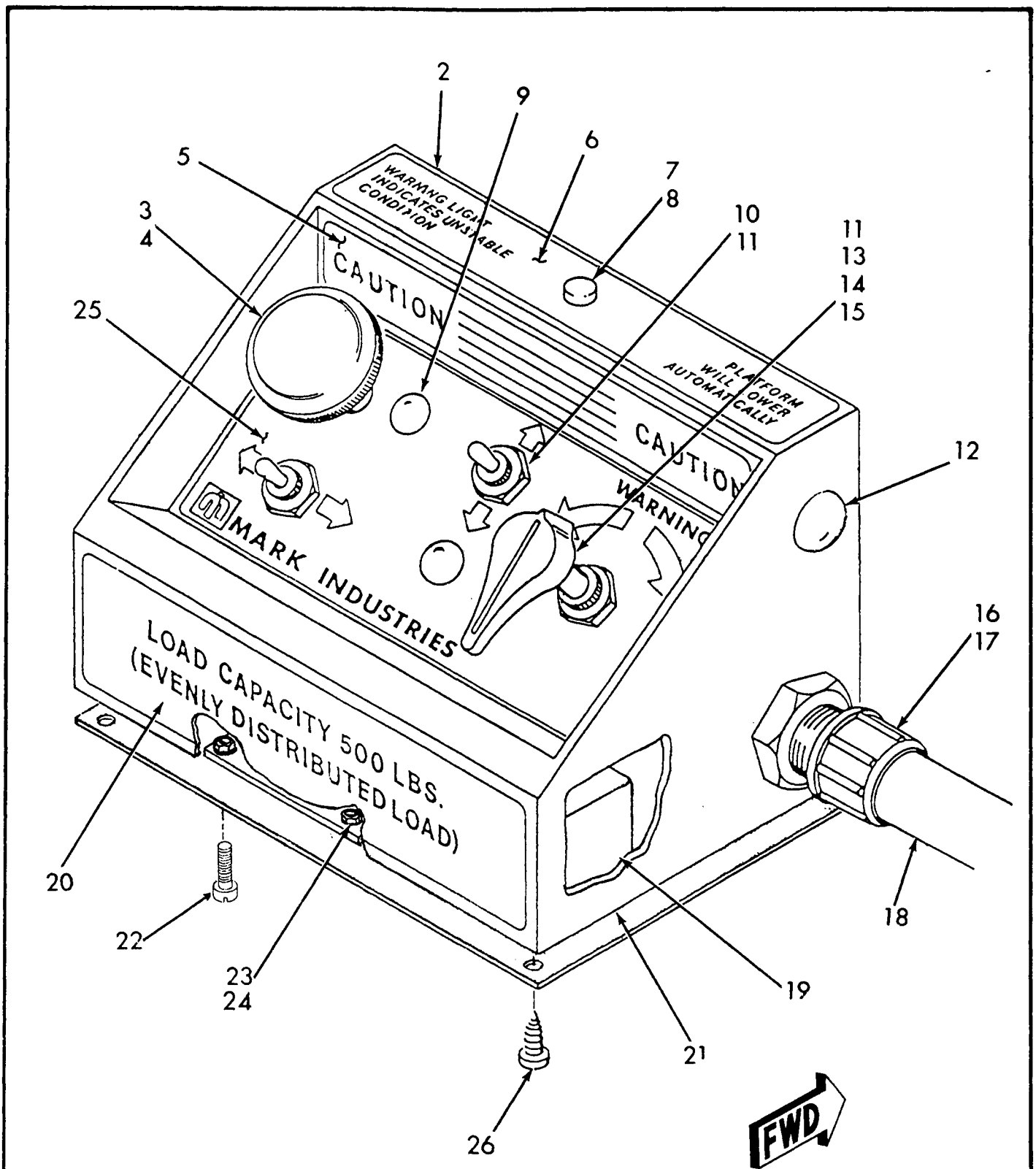


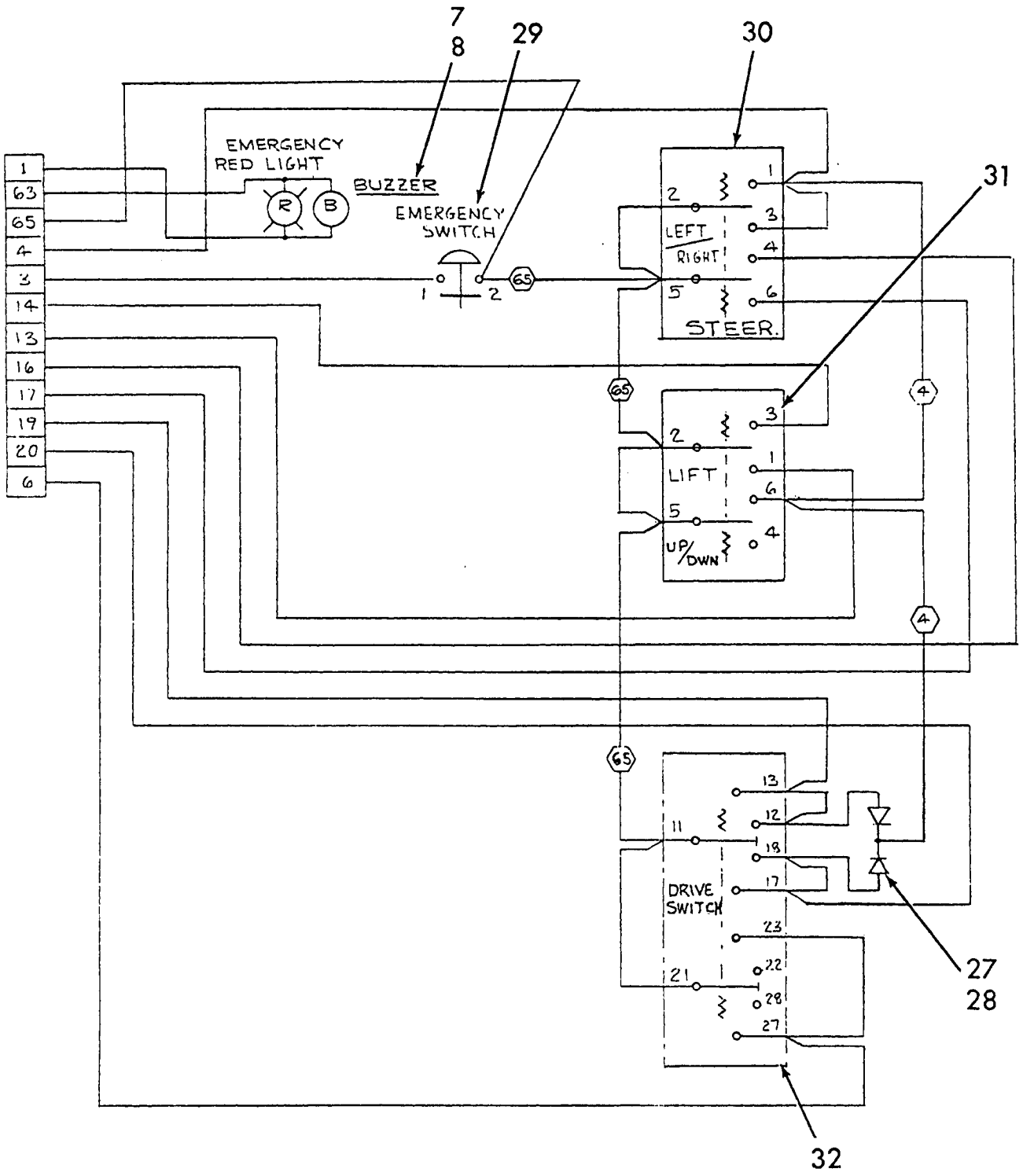
DECAL SET J19EP

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	67800	DECAL SET J19EP	REF
2	130243	.DECAL, OPERATION INSTRUCTION	1
3	31033	.DECAL, CAUTION THIS MACHINE	1
4	2022	.DECAL, LOAD CAPACITY	2
5	130820	.DECAL, OPERATION AND SAFETY HANDBOOK	1
6	130937	.DECAL, J-SERIES	1
7	11064	.DECAL, SAFETY CHAIN	1
8	2022	.DECAL, LOAD CAPACITY	1
9	31259	.DECAL, MARKLIFT	2
10	130596	.DECAL, A PRODUCT OF MARK INDUSTRIES	2
11	20661	.PLATE, ANSI A92	1
12	375	.RIVET, POP (attaching part)	4
13	20660	.DECAL, IDENTIFICATION NUMBER	1
14	375	.RIVET, POP (attaching part)	4
15	130949	.DECAL, DANGER	2
16	2003	.DECAL, BATTERY WATER LEVEL	2
17	2016	.DECAL, WARNING: DO NOT WORK UNDER	2
18	2017	.DECAL, HYDRAULIC SYSTEM FLUID	1
19	130938	.DECAL, MARK (BEFORE MARCH 1989)	2
	181726	.DECAL, J19EP (AFTER MARCH 1989)	2
20	131061	.DECAL, BLUE STRIPE	2
21	130949	.DECAL, DANGER	2
22	130606	.DECAL, FREE WHEELING	1

- ITEM NOT ILLUSTRATED

UPPER CONTROL BOX ASSEMBLY J14





ELECTRICAL DIAGRAM

UPPER CONTROL BOX ASSEMBLY J14

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130186	ASSEMBLY, UPPER CONTROL BOX J14 (See Sect. 2, Fig. 1 for NHA)	REF
2	130188	.BOX, UPPER CONTROL	1
3	4018	.SWITCH, PUSH-PULL	1
4	31080	.KNOB	1
5	2014	.DECAL, CAUTION HIGH VOLTAGE	1
6	2015	.DECAL, WARNING	1
7	4031	.LIGHT, PILOT (RED)	1
8	117-D	.CONNECTOR, BUTT (attaching part)	2
9	771	.PLUG, HOLE	2
10	20481	.SWITCH TOGGLE	2
11	65131	.NUT, RUBBER COATED	3
12	777	.PLUG, HOLE	1
13	65151	.KNOB, DRIVE SWITCH	1
14	4106	.SWITCH, 5 POSITION	1
15	62209	.SCREW, SET	1
16	65197	.STRAIN RELIEF	1
17	61115	.NUT, CONDUIT	1
18	130228-30	.CABLE	1
19	70259	.BUZZER	1
20	2022	.DECAL, LOAD CAPACITY	1
21	130227	.BOX, UPPER CONTROL COVER	1
22	62703	.SCREW, SLOT ROUND HEAD	2
23	60802	.NUT, HEX	2
24	63413	.WASHER, FLAT	2
25	2009	.DECAL, CONTROL BOX	1

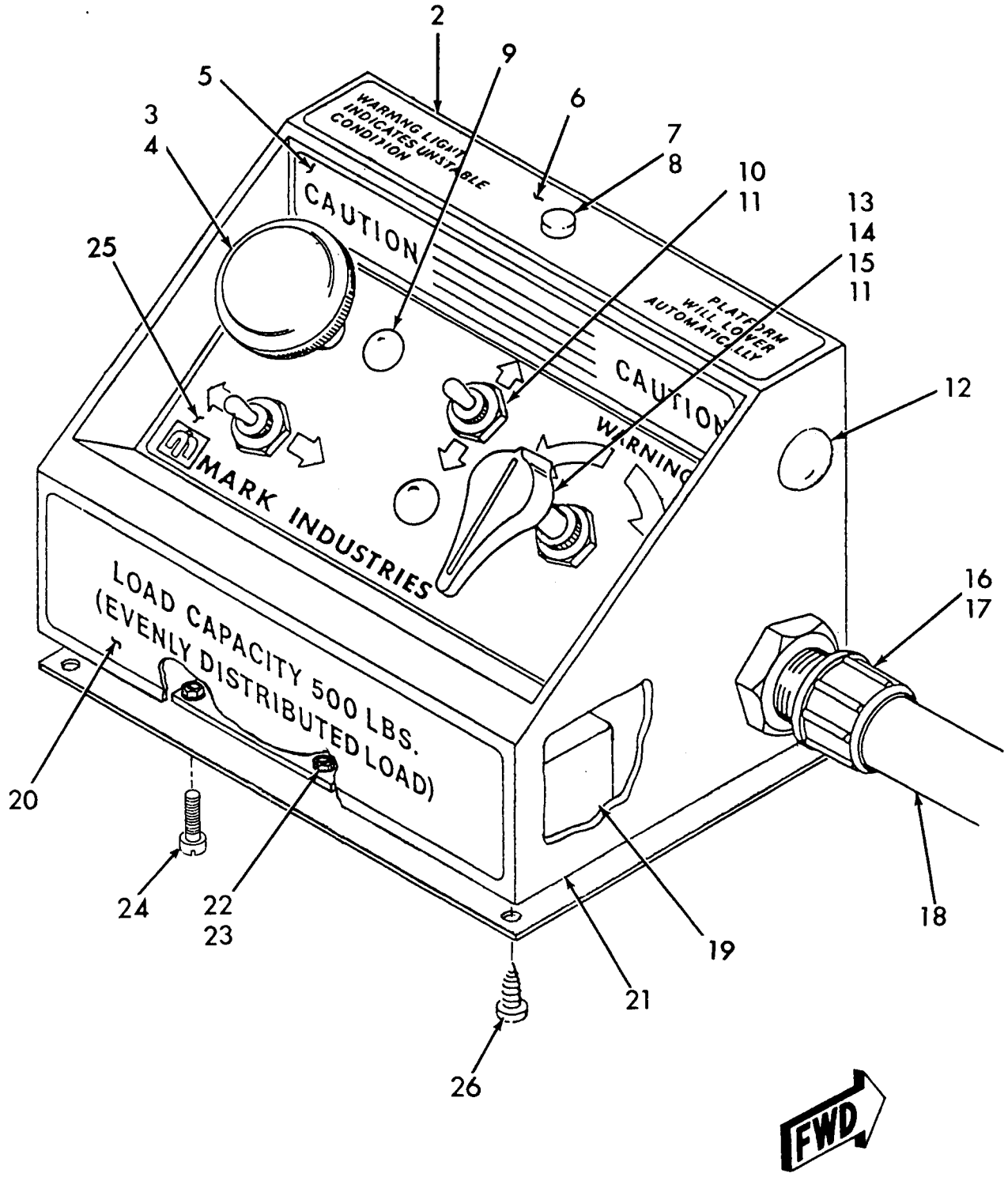
- ITEM NOT ILLUSTRATED

UPPER CONTROL BOX ASSEMBLY J14

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
26	61711	.SCREW, SELF TAPPING	4
27	4045	.DIODE	2
28	117-D	.CONNECTOR, BUTT	1
29	117-C	.TERMINAL, RING	2
30	117-C	.TERMINAL, RING	10
31	117-C	.TERMINAL, RING	8
32	16228-1	.TERMINAL, RING	14
-33	70233	.WIRE	5 FT.
-34	255	.CABLE TIE, LARGE	2
-35	256	.CABLE TIE, SMALL	10

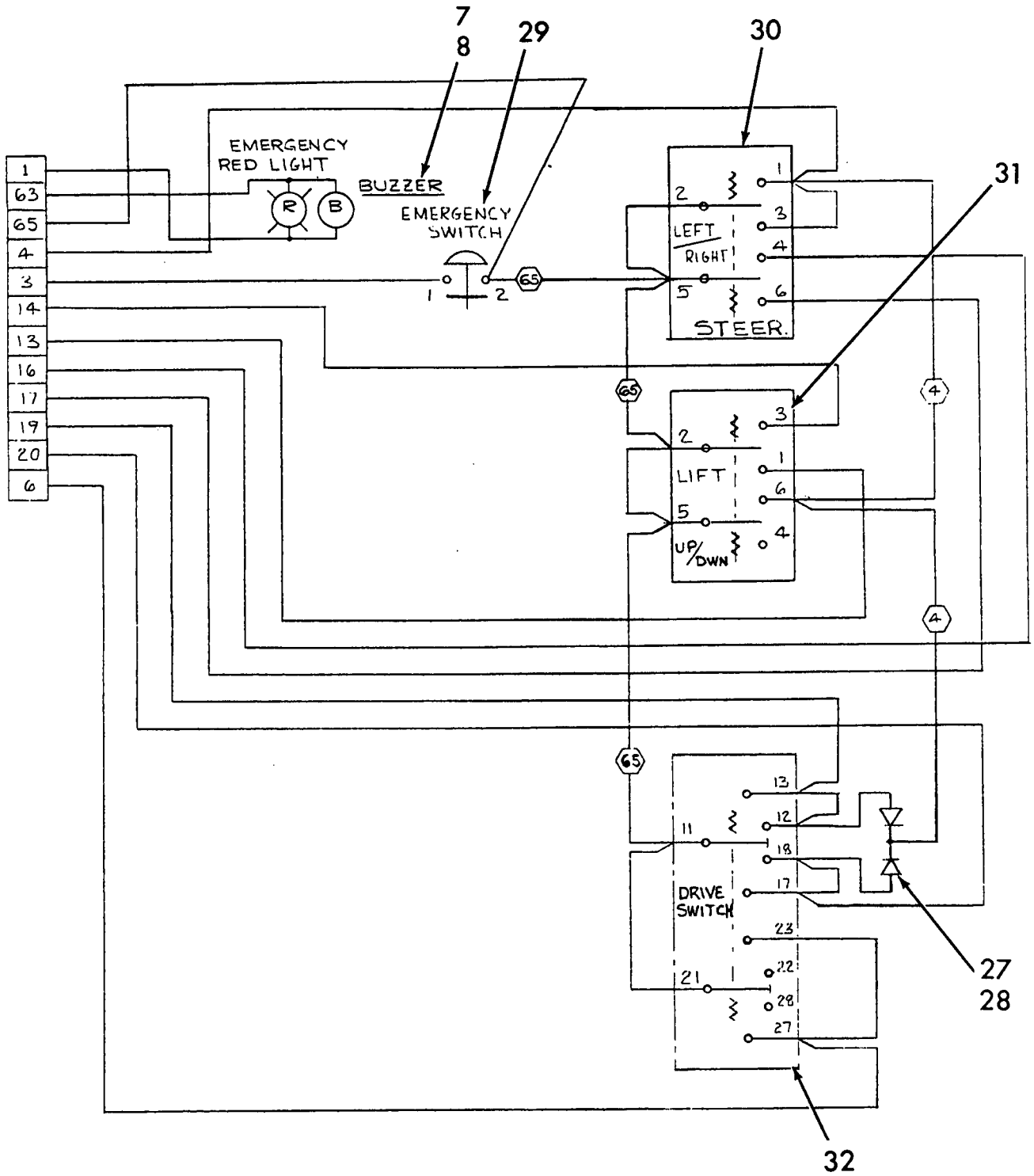
- ITEM NOT ILLUSTRATED

UPPER CONTROL BOX ASSEMBLY J19



REV.

UPPER CONTROL BOX ASSEMBLY J19



ELECTRICAL DIAGRAM

REV.

UPPER CONTROL BOX ASSEMBLY J19

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130613	ASSEMBLY, UPPER CONTROL BOX (See Sect. 2, Fig. 1 for NHA)	REF
2	130188	.BOX, UPPER CONTROL	1
3	4018	.SWITCH, PUSH-PULL	1
4	31080	.KNOB	1
5	2014	.DECAL, CAUTION HIGH VOLTAGE	1
6	2015	.DECAL, WARNING	1
7	4031	.LIGHT, PILOT (RED)	1
8	117-D	.CONNECTOR, BUTT (attaching part)	2
9	771	.PLUG, HOLE	2
10	20481	.SWITCH, TOGGLE	2
11	65131	.NUT, RUBBER COATED	3
12	777	.PLUG, HOLE	1
13	65151	.KNOB, DRIVE SWITCH	1
14	4106	.SWITCH, 5 POSITION	1
15	62209	.SCREW, SET	1
16	65197	.STRAIN RELIEF	1
17	61115	.NUT, CONDUIT	1
18	130228-40	.CABLE	1
19	70259	.BUZZER	1
20	2022	.DECAL, LOAD CAPACITY	1
21	130227	.BOX, UPPER CONTROL COVER	1
22	63413	.WASHER, FLAT	2
23	60802	.NUT, HEX	2
24	62703	.SCREW, SLOT ROUND HEAD	2
25	2009	.DECAL, CONTROL BOX	1

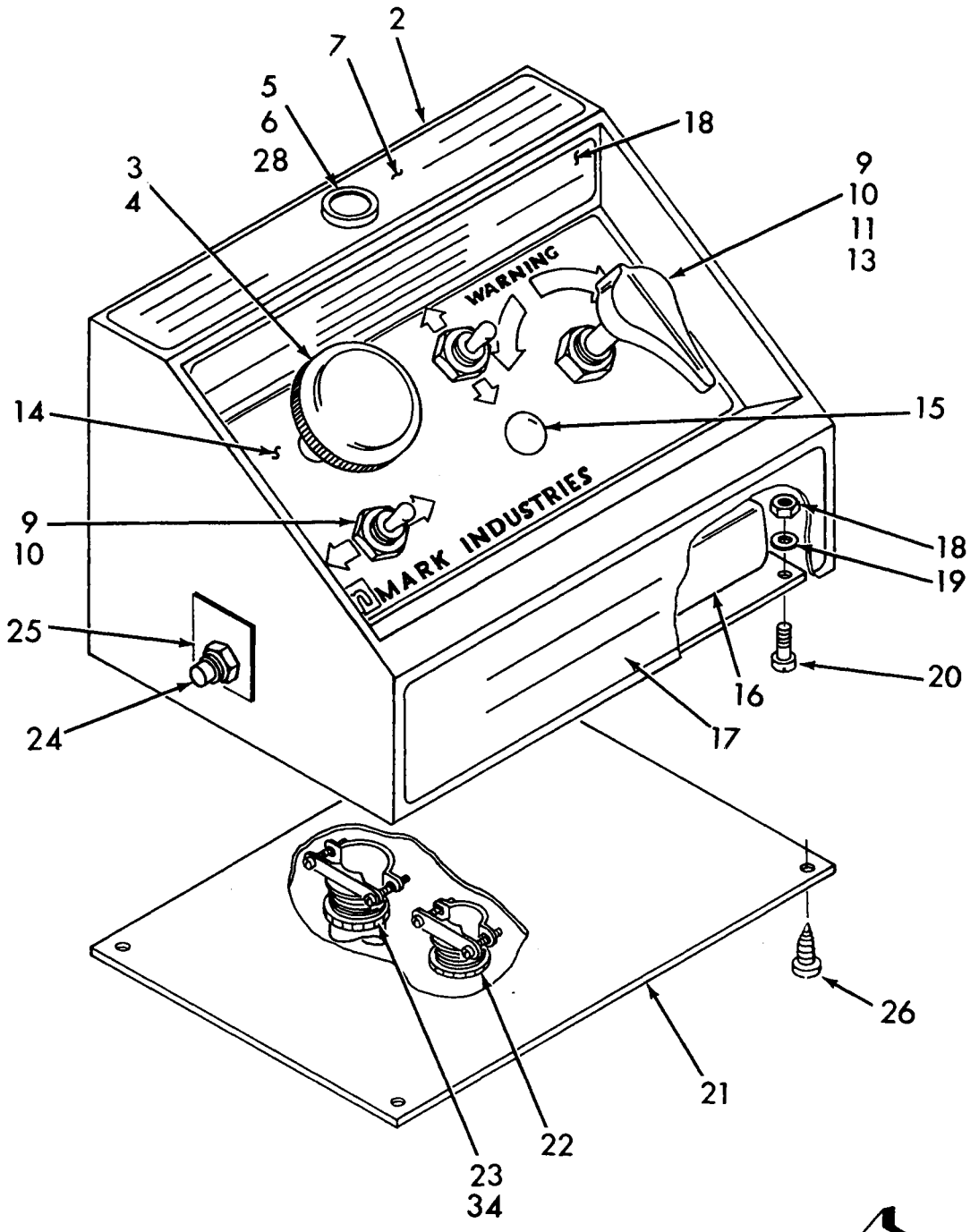
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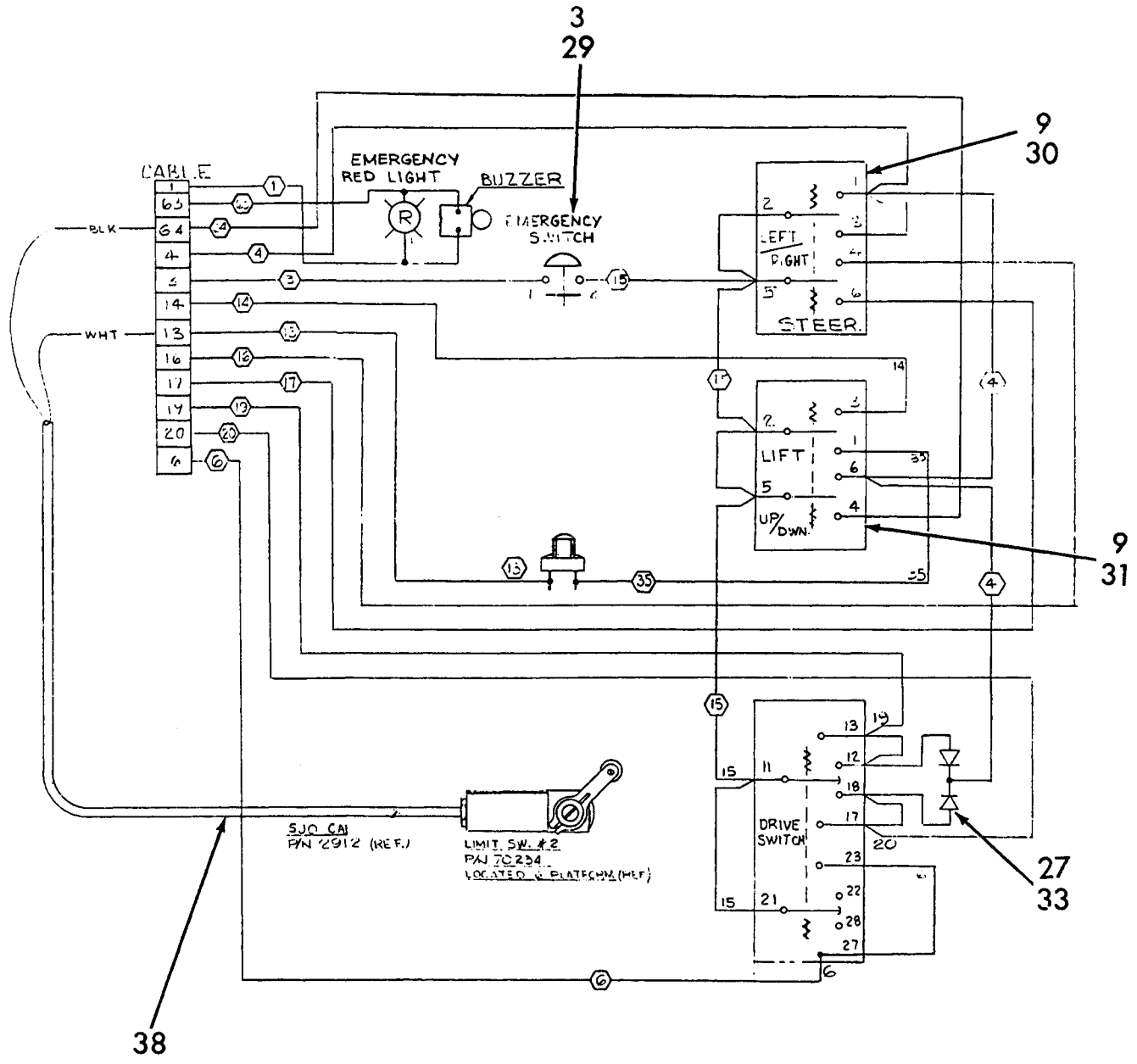
UPPER CONTROL BOX ASSEMBLY J19

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
26	61711	.SCREW, SELF-TAPPING	4
27	70749	.DIODE	2
28	117-D	.CONNECTOR, BUTT	1
29	117-C	.TERMINAL, RING	2
30	117-C	.TERMINAL, RING	10
31	117-C	.TERMINAL, RING	8
32	16228-1	.TERMINAL, RING	14
-33	70233	.WIRE	5 ft.
-34	255	.CABLE TIE, LARGE	2
-35	256	.CABLE TIE, SMALL	10

- ITEM NOT ILLUSTRATED

UPPER CONTROL BOX ASSEMBLY J19EP





ELECTRICAL DIAGRAM

UPPER CONTROL BOX ASSEMBLY J19EP

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130657	ASSEMBLY, UPPER CONTROL BOX (See Sect. 3, Fig. 1 for NHA)	REF
2	130188	.BOX, UPPER CONTROL	1
3	4018	.SWITCH, PUSH-PULL	1
4	31080	.KNOB	1
5	4031	.LIGHT, PILOT (RED)	1
6	117-D	.CONNECTOR, BUTT	2
7	2015	.DECAL, WARNING	1
8	2014	.DECAL, CAUTION HIGH VOLTAGE	1
9	20481	.SWITCH, TOGGLE	2
10	65131	.NUT, RUBBER COATED	3
11	65151	.KNOB, DRIVE SWITCH	1
12	4106	.SWITCH, 5 POSITION	1
13	62209	.SCREW, SET	1
14	2009	.DECAL, CONTROL BOX	1
15	771	.HOLE, PLUG	2
16	70259	.BUZZER	1
17	2022	.DECAL, LOAD CAPACITY	1
18	60802	.NUT, HEX	2
19	63413	.WASHER, FLAT	2
20	62703	.SCREW, SLOT ROUND HEAD	2
21	130227	.BOX, UPPER CONTROL COVER	1
22	117-E	.STRAIN RELIEF	1
23	117-G	.STRAIN RELIEF	1
24	4011	.SWITCH, PUSH BUTTON	1
25	130713	.DECAL, DESCENT OVERRIDE	1

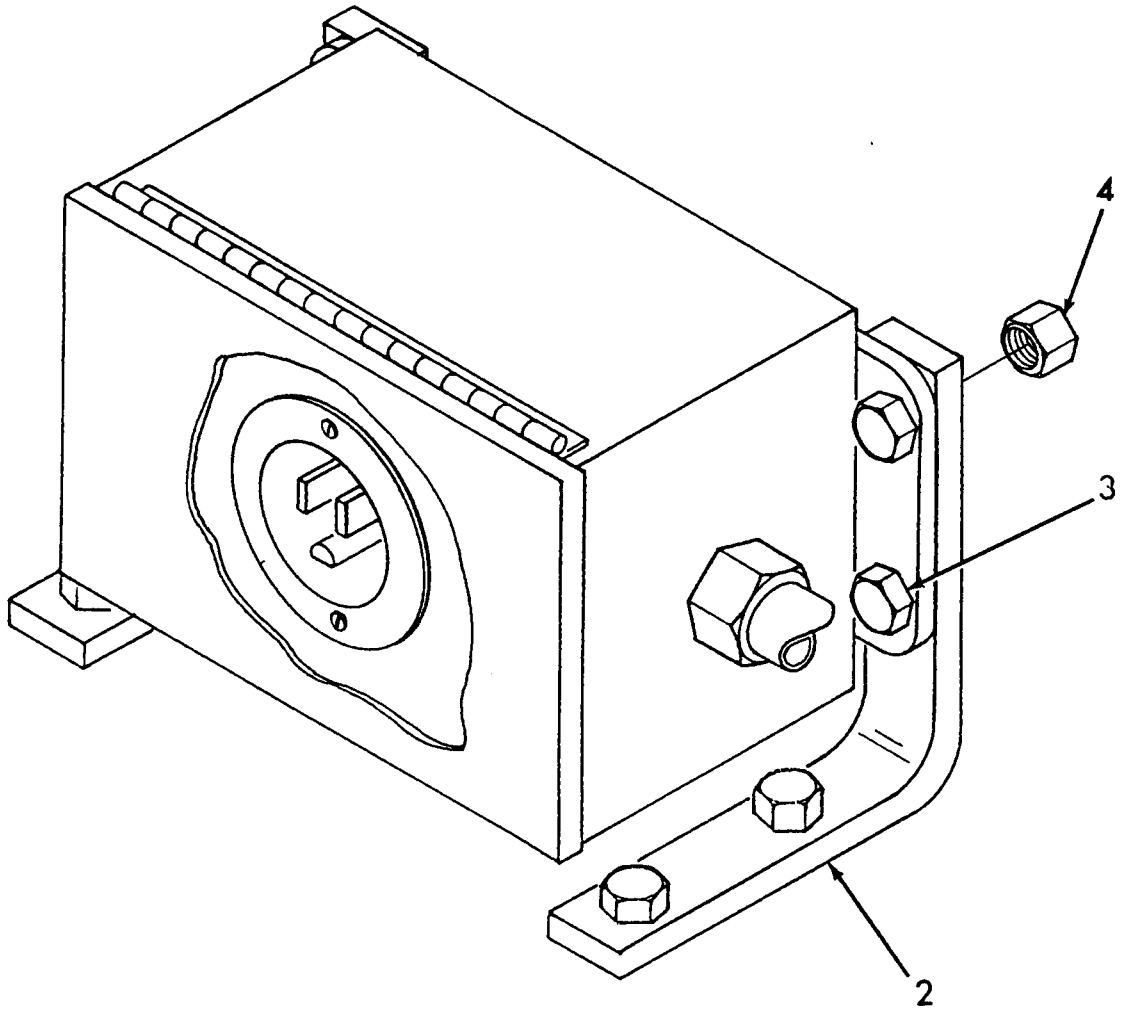
- ITEM NOT ILLUSTRATED

UPPER CONTROL BOX ASSEMBLY J19EP

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
26	61711	.SCREW, SELF-TAPPING	4
27	4045	.DIODE	2
28	117-D	.CONNECTOR, BUTT	1
29	117-C	.TERMINAL, RING	2
30	117-C	.TERMINAL, RING	10
31	117-C	.TERMINAL, RING	8
-32	70162	.TERMINAL, BUTT	1
33	16228-1	.TERMINAL, RING	14
34	130228-50	.CABLE	1
-35	70232	.WIRE	5 ft
-36	255	.CABLE TIE, LARGE	2
-37	256	.CABLE TIE, SMALL	10
38	2912	.CABLE, COND.	6 ft

- ITEM NOT ILLUSTRATED

ASSEMBLY, 110 VAC BOX



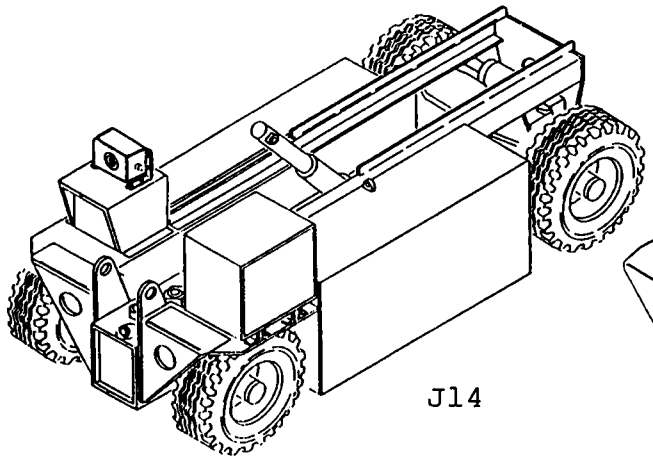
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	131297	ASSEMBLY, 110 VAC BOX (See Sect. 2, Fig. 1,1A For NHA)	REF
2		.MOUNTING BRACKET, 110 VAC BOX	1
3	60309	.HEX HEAD CAP SCREW	8
4	60711	.HEX NUT	8

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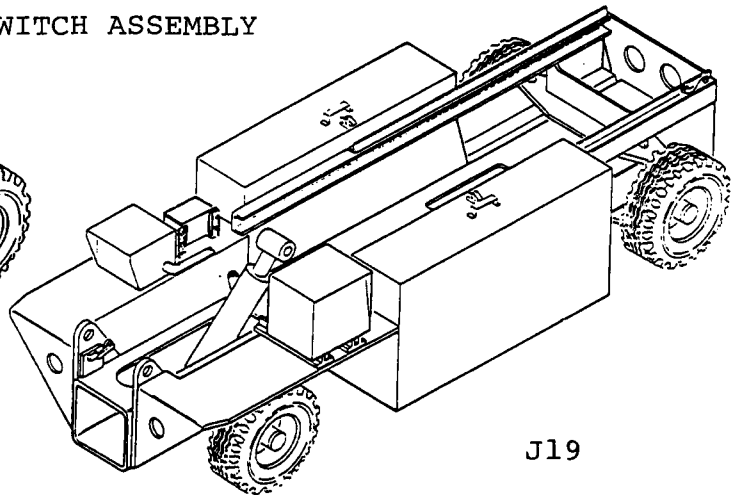
THE MARKLIFT FRAME ASSEMBLY

THIS SECTION 3 CONTAINS THE FOLLOWING FIGURES:

FIGURE NO.	TITLE
1	FRAME ASSEMBLY J14
1A	FRAME ASSEMBLY J19, J19EP
2	DRIVE TIRE AND WHEEL ASSEMBLY J14
2A	DRIVE TIRE AND WHEEL ASSEMBLY J19, J19EP
3	IDLER TIRE AND WHEEL ASSEMBLY J14
3A	IDLER TIRE AND WHEEL ASSEMBLY J19, J19EP
4	BATTERY CHARGER ASSEMBLY
5	GROUND CONTROL BOX ASSEMBLY
6	MOTOR AND PUMP ASSEMBLY
7	CONTROL VALVE ASSEMBLY
8	MOTOR DRIVE ASSEMBLY
9	TIE ROD ASSEMBLY J14
9A	TIE ROD ASSEMBLY J19, J19EP
10	STEERING CYLINDER ASSEMBLY J14
10A	STEERING CYLINDER ASSEMBLY J19, J19EP
11	DRIVE MOTOR AND PARKING BRAKE ASSEMBLY
12	LIFT CYLINDER ASSEMBLY
13	BATTERY CABLE KIT
14	HYDRAULIC HOSE DIAGRAM J14
14A	HYDRAULIC HOSE DIAGRAM J19, J19EP
15	110 VAC BOX ASSEMBLY
16	TILT SWITCH ASSEMBLY

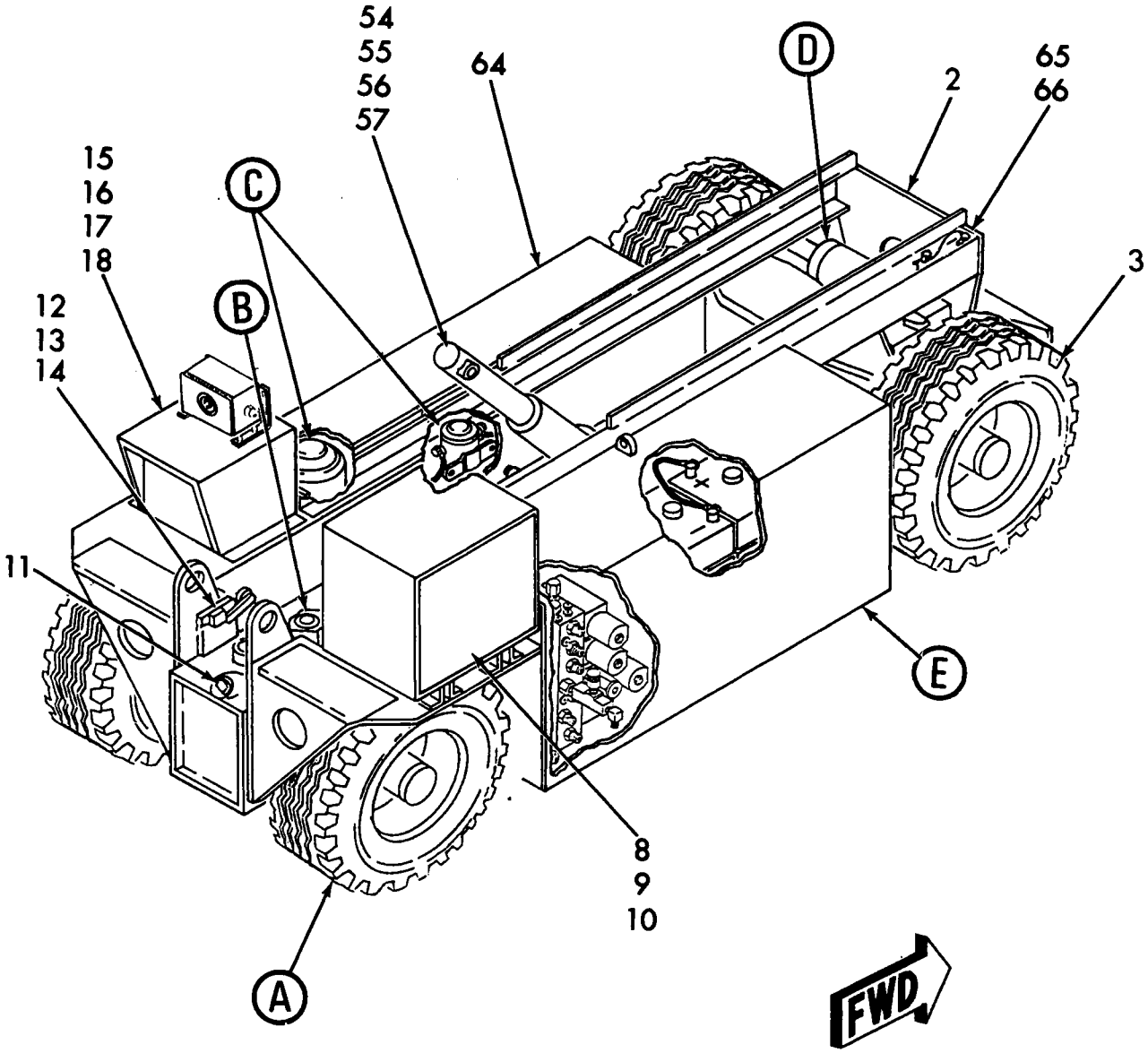


J14

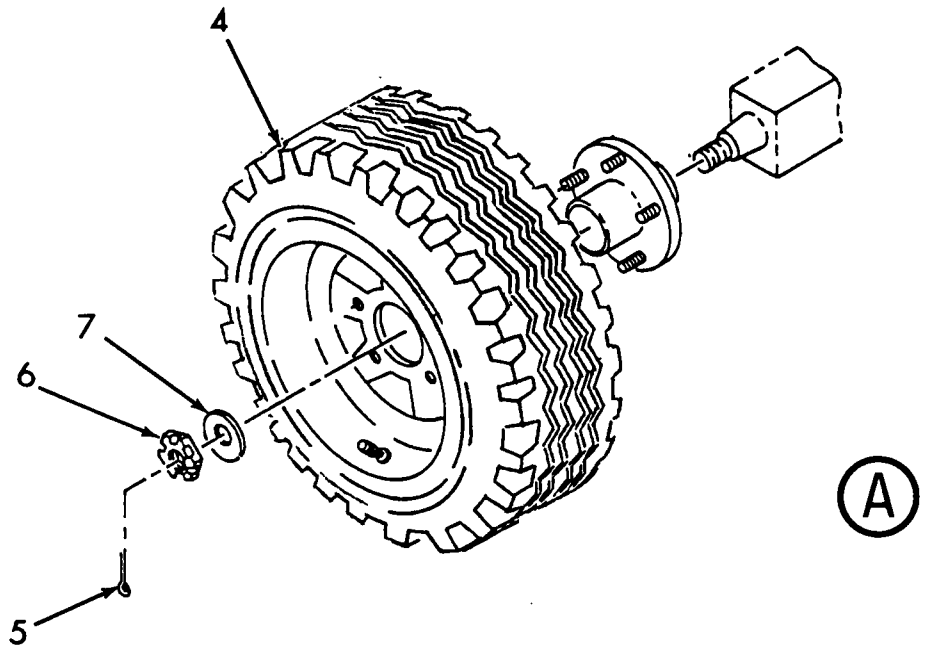


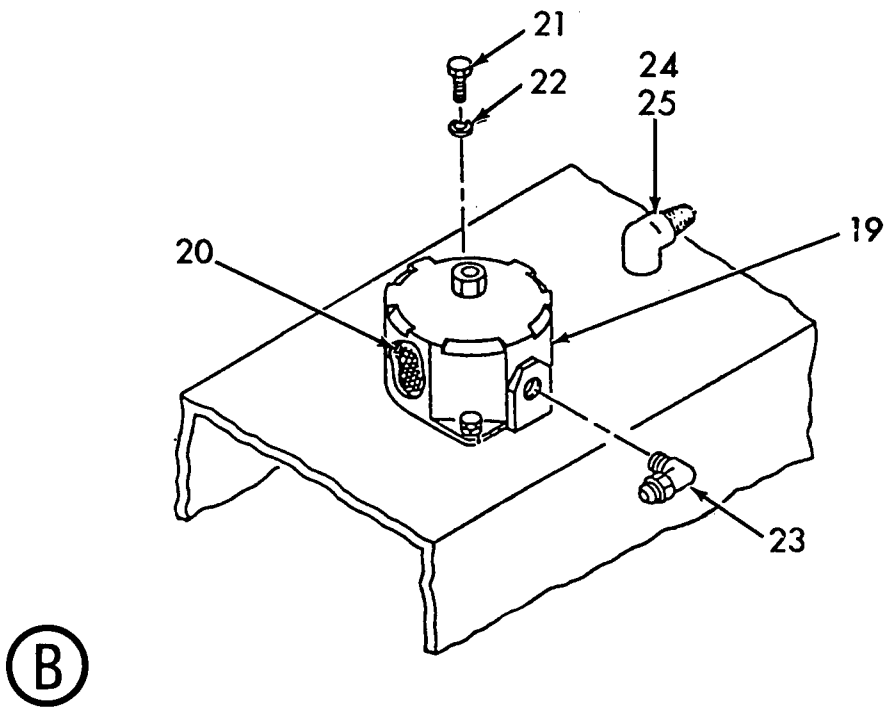
J19

FRAME ASSEMBLY J14

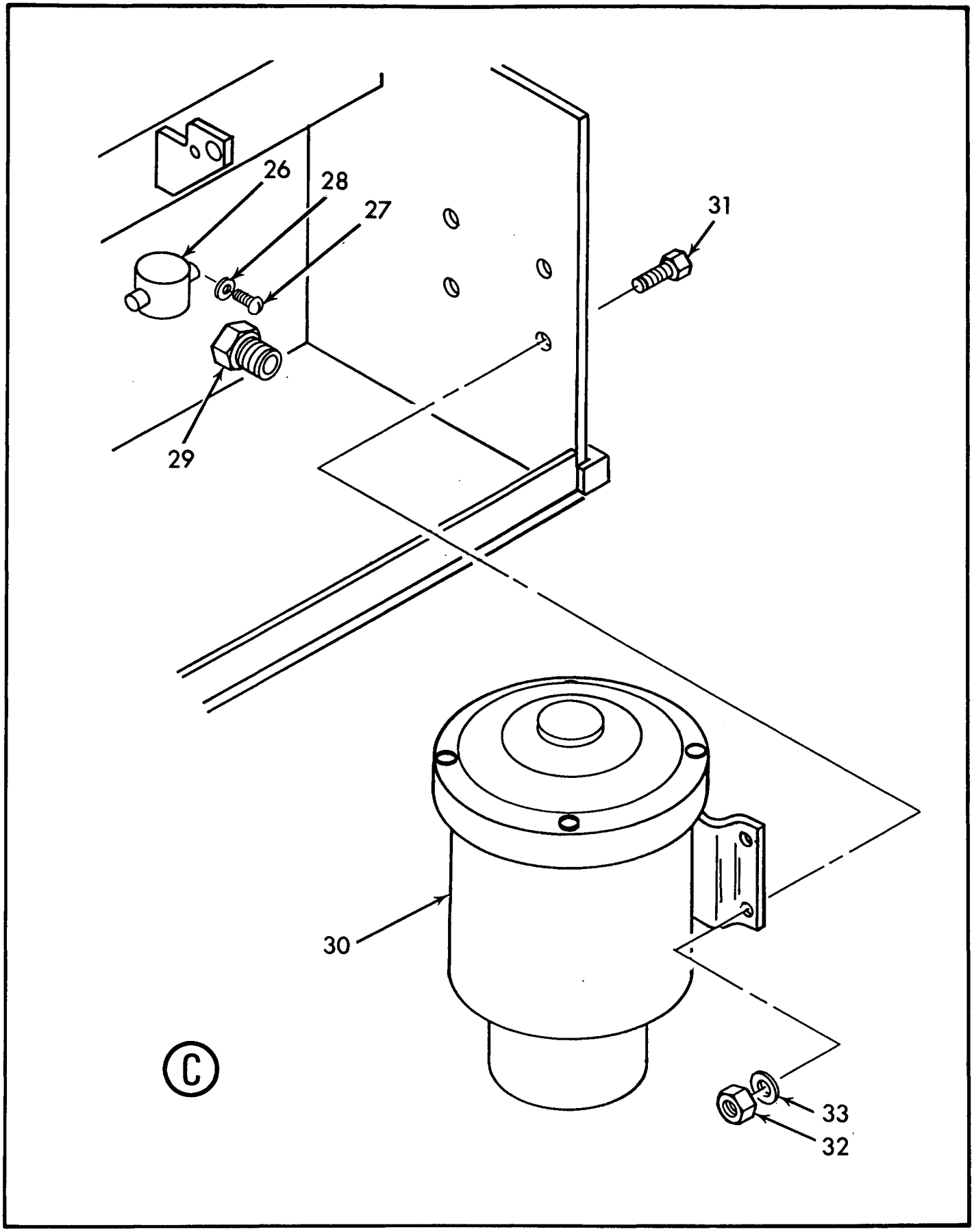


FRAME ASSEMBLY J14



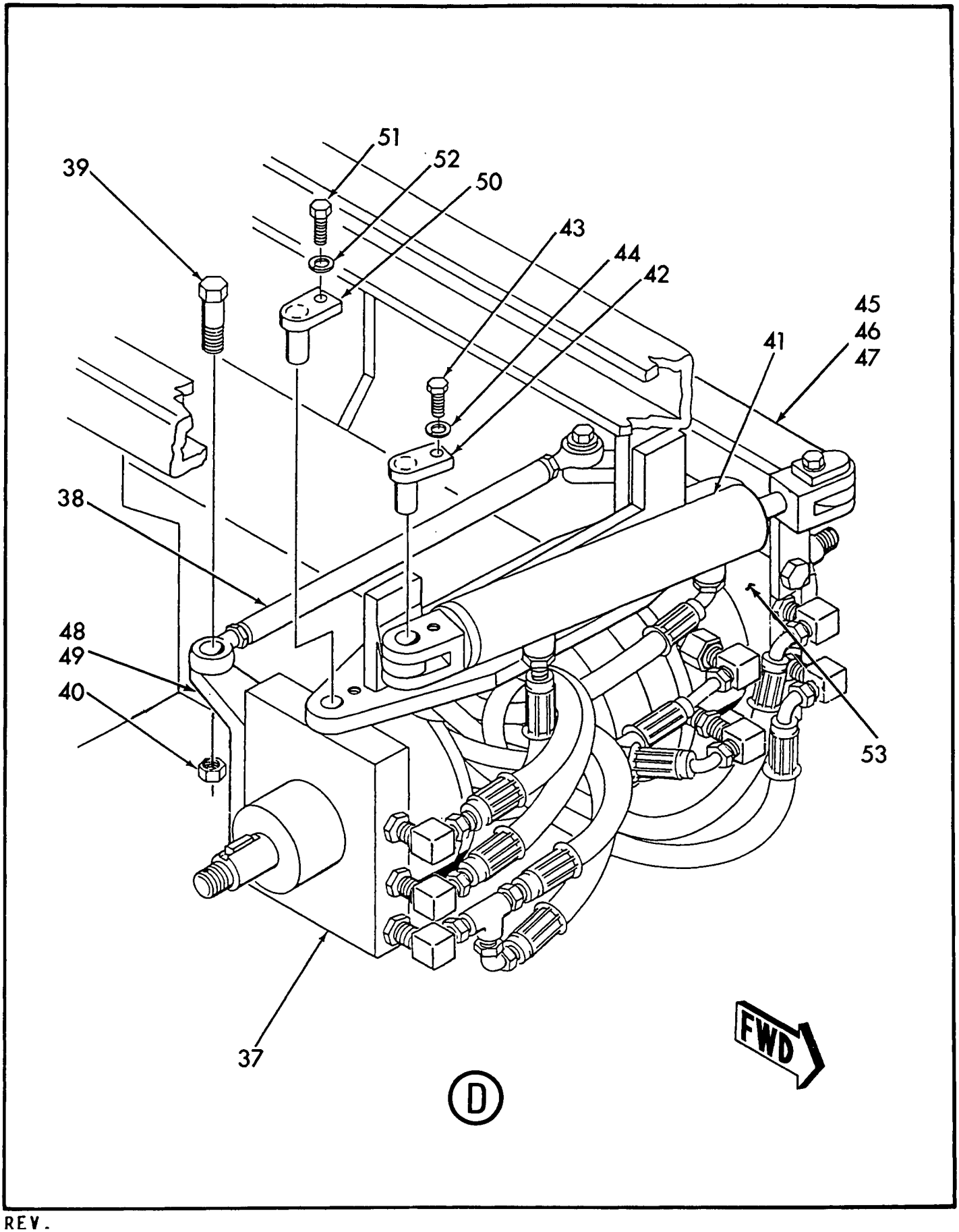


FRAME ASSEMBLY J14



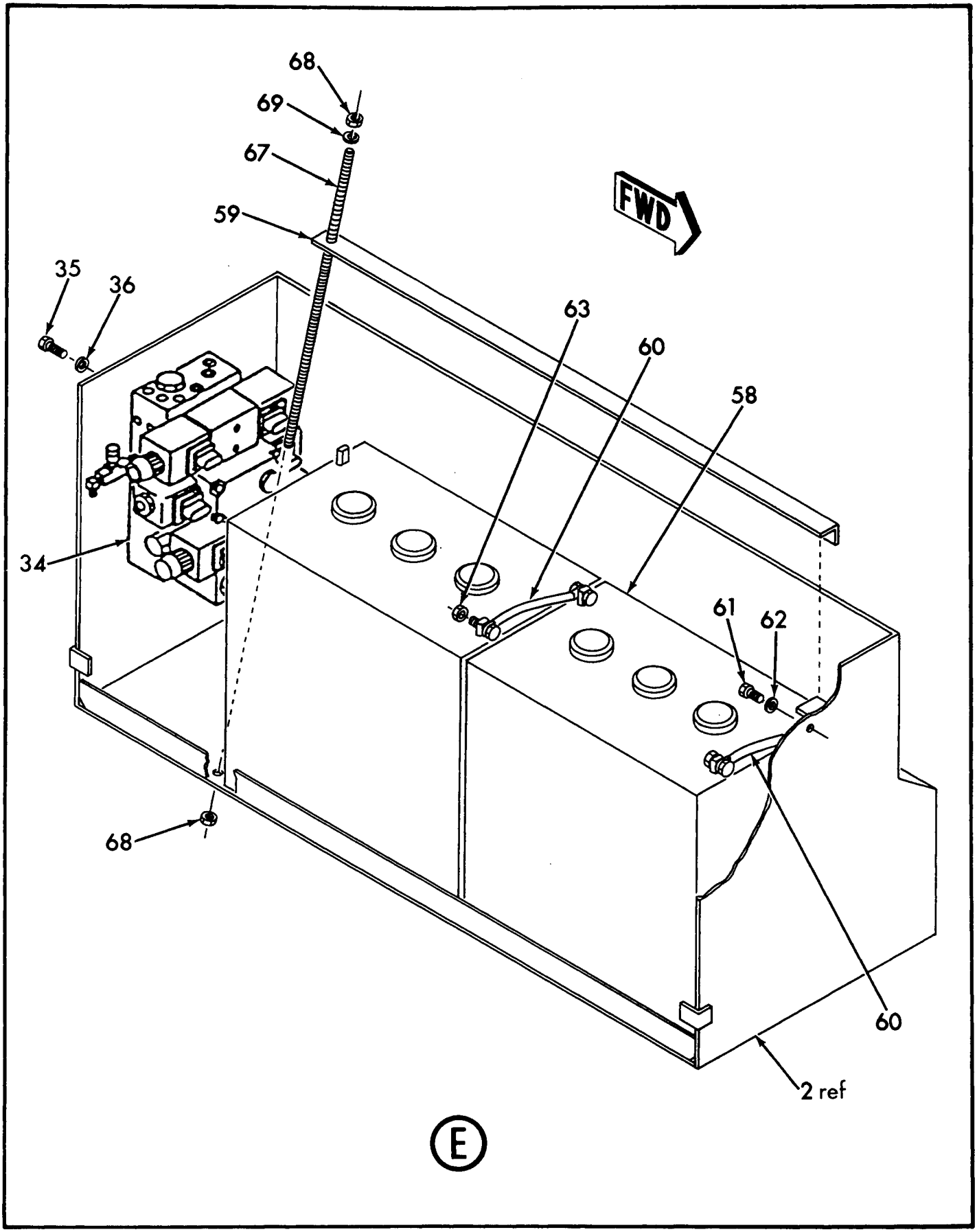
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FRAME ASSEMBLY J14



REV.

FRAME ASSEMBLY J14



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FRAME ASSEMBLY J14

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130101	ASSEMBLY, FRAME J14 (See Sect. 2, Fig. 1 for NHA)	REF
2	130103	.WELDMENT, FRAME J14	1
3	130843	.ASSEMBLY, TIRE AND WHEEL/DRIVE (See Sect. 3, Fig. 2 for Details)	2
4	130203	.ASSEMBLY, TIRE AND WHEEL IDLER (See Sect. 3, Fig. 3 for Details)	2
5	64308	.PIN, COTTER (attaching part)	4
6	61004	.NUT, SLOTTED (attaching part)	2
7	63421	.WASHER, FLAT (attaching part)	4
8	70223	.ASSEMBLY, BATTERY CHARGER (See Sect. 3, Fig. 4 for Details) (See Vendor Sect. for more info.)	1
9	60701	.NUT, HEX (attaching part)	4
10	63301	.WASHER, LOCK (attaching part)	4
11	130230	.WELDMENT, DIPSTICK	1
12	70235	.LEVER, LIMIT SWITCH	1
13	70234	.MINI-SWITCH	1
14	62620	.SCREW, MACH (attaching part)	2
15	130187	.ASSEMBLY, GROUND CONTROL (See Sect. 3, Fig. 5 for Details)	1
16	60309	.SCREW, CAP (attaching part)	2
17	60701	.NUT, HEX (attaching part)	2
18	63301	.WASHER, LOCK (attaching part)	2
19	81016	.FILTER, HYDRAULIC	1
20	66807	..ELEMENT	1
21	60309	.SCREW, CAP (attaching part)	2
22	63301	.WASHER, LOCK (attaching part)	2
23	80018-11	.ELBOW, MALE	1

- ITEM NOT ILLUSTRATED

FRAME ASSEMBLY J14

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
24	65213	.BREATHER	1
25	80021-03	.ELBOW, STRAIGHT (attaching part)	1
26	70209	.SOLENOID	1
27	60309	.SCREW, CAP (attaching part)	2
28	63301	.WASHER, LOCK (attaching part)	2
29	80001-15	.CONNECTOR, MALE	1
30	130241	.ASSEMBLY, MOTOR AND PUMP (See Sect. 3, Fig. 6 for Details)	1
31	60331	.SCREW, CAP (attaching part)	4
32	60703	.NUT, HEX (attaching part)	4
33	63303	.WASHER, LOCK (attaching part)	4
34	130234	.ASSEMBLY, CONTROL VALVE (BEFORE EARLY 1989) (See Sect. 3, Fig. 7 for Details)	1
	131123	.ASSEMBLY, CONTROL VALVE (AFTER EARLY 1989) (See Sect. 3, Fig. 7 for Details)	1
35	60732	.SCREW, CAP (attaching part)	2
36	63303	.WASHER, LOCK (attaching part)	2
37	130238	.ASSEMBLY, MOTOR DRIVE (See Sect. 3, Fig. 8 for Details)	1
38	130163	.ASSEMBLY, TIE ROD (See Sect. 3, Fig. 9 for Details)	1
39	60393	.SCREW, CAP (attaching part)	2
40	61242	.NUT, LOCK (attaching part)	2
41	130237	.ASSEMBLY, STEERING CYLINDER (See Sect. 3, Fig. 10 for Details)	1
42	20252	.PIN, STEERING CYLINDER ANCHOR	2
43	60353	.SCREW, CAP (attaching part)	2
44	63301	.WASHER, LOCK (attaching part)	2

- ITEM NOT ILLUSTRATED

FRAME ASSEMBLY J14

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
45	130167	.STEERING LEVER (L.H.)	1
46	60610	.SCREW, CAP (attaching part)	1
47	60602	.SCREW, CAP (attaching part)	2
48	130166	.STEERING LEVER (R.H.)	1
49	60602	.SCREW, CAP (attaching part)	2
50	130192	.STEERING PIN	4
51	60338	.SCREW, CAP (attaching part)	4
52	63302	.WASHER, LOCK (attaching part)	4
53	130239	.ASSEMBLY, MOTOR AND PARKING BRAKE (See Sect. 3, Fig. 11 for Details)	1
54	130236	.ASSEMBLY, LIFT CYLINDER (See Sect. 3, Fig. 12 for Details)	1
55	130171	.PIN	1
56	60322	.SCREW, CAP (attaching part)	1
57	63302	.WASHER, LOCK (attaching part)	1
58	4007	.BATTERY	4
59	130699	.HOLD-DOWN, BATTERY	2
60	130231	.KIT, BATTERY CABLE (See Sect. 3, Fig. 13 for Details)	1
61	60324	.SCREW, CAP (attaching part)	1
62	63302	.WASHER, LOCK (attaching part)	1
63	61246	.NUT, LOCK (attaching part)	8
64	130214	.WELDMENT, COVER	2
65	130690	.PIN, BALL-LOK DETENT	2
66	375	.RIVET, POP (attaching part)	2
67	63670	.ROD, THREADED	2
68	61302	.NUT, LOCK (attaching part)	4

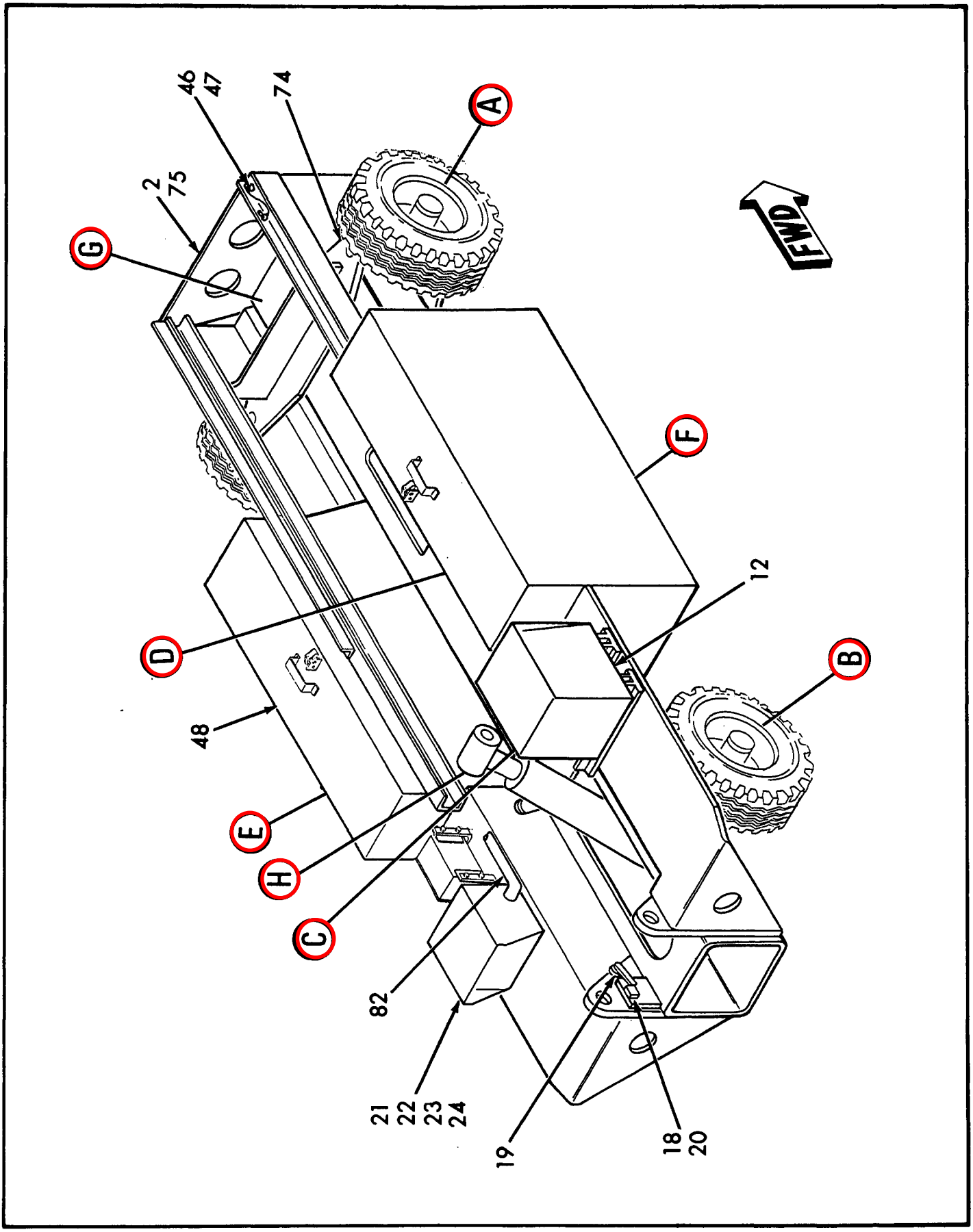
- ITEM NOT ILLUSTRATED

FRAME ASSEMBLY J14

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
69	63403	.WASHER, FLAT (attaching part)	2
-70	130229	.DIAGRAM, HYDRAULIC HOSE (See Sect. 3, Fig. 14 for Details)	1
-71	255	.CABLE TIE, LARGE (attaching part)	24
-72	256	.CABLE TIE, SMALL (attaching part)	3
-73	411-28	.MOLDING, RUBBER	2
-74	130600-08	.CABLE, CONDUCTOR	1

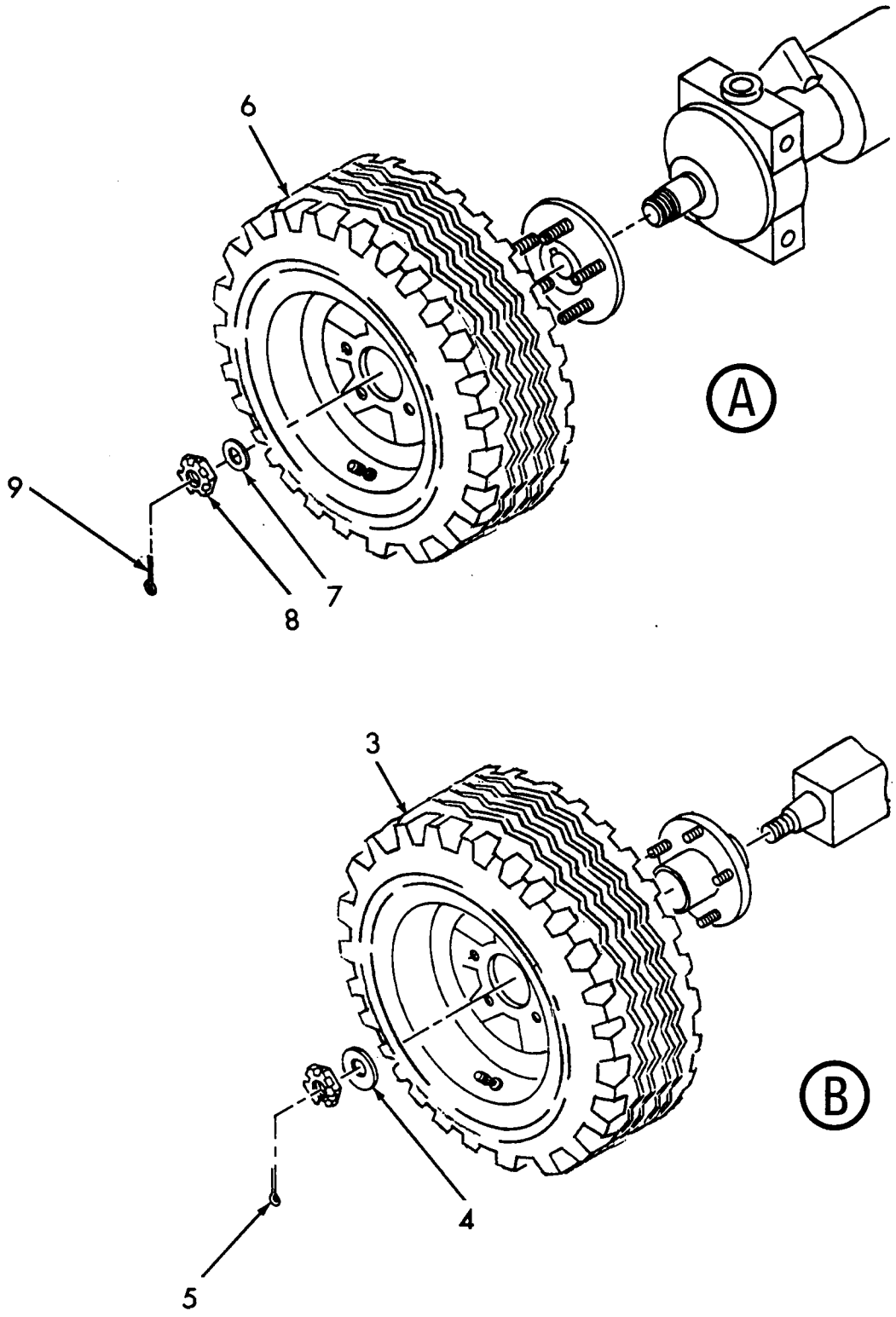
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FRAME ASSEMBLY J19, J19EP



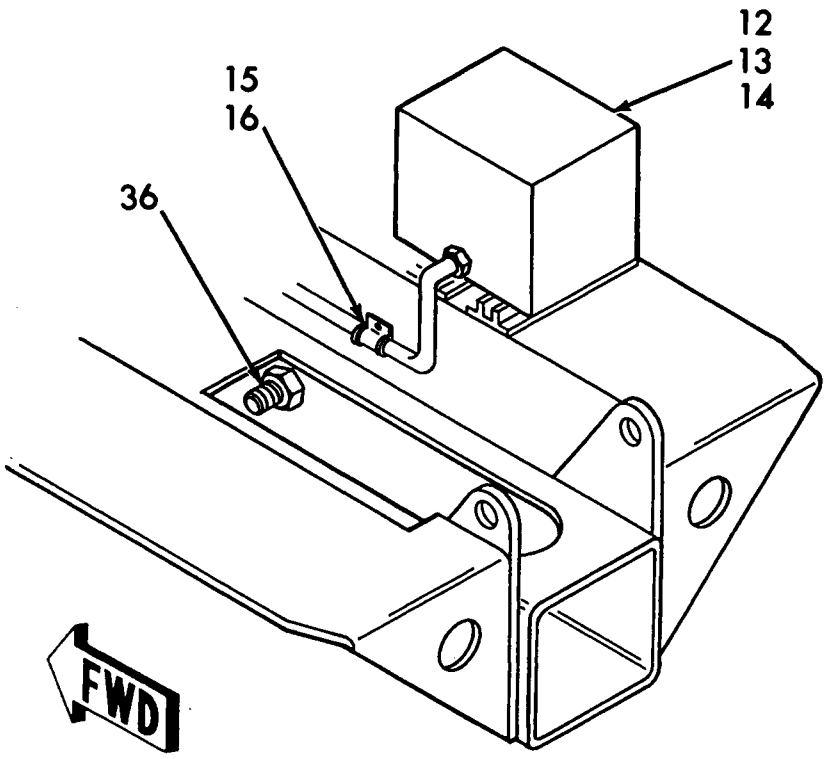
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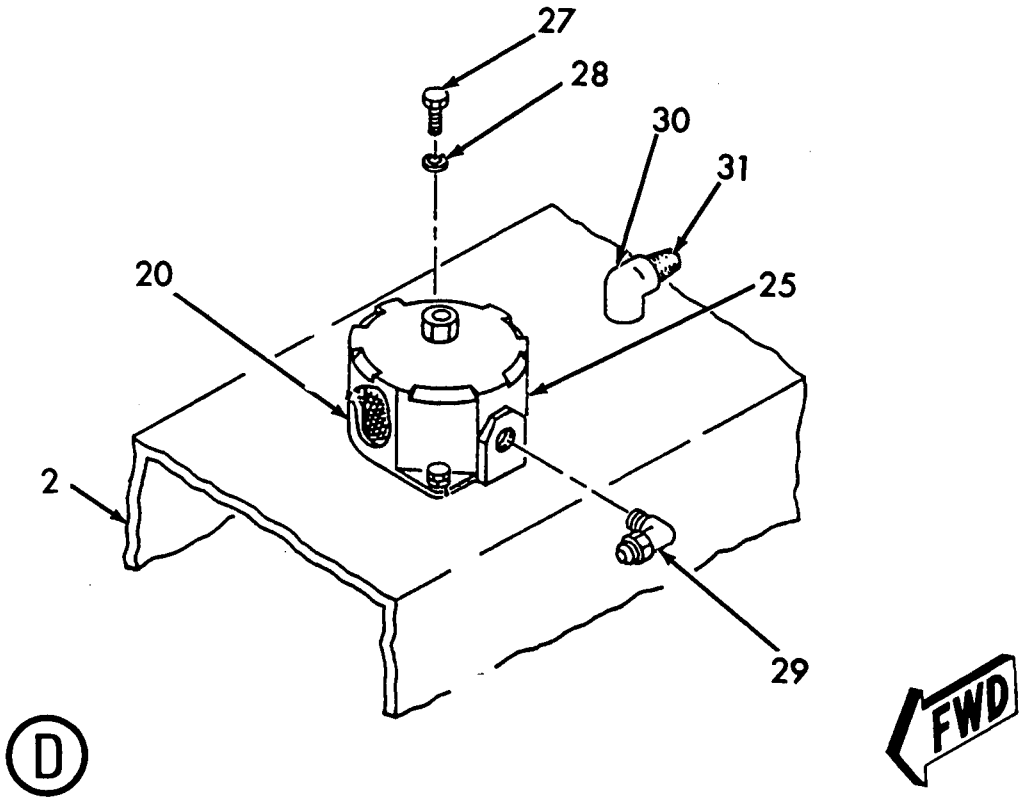
FRAME ASSEMBLY J19, J19EP



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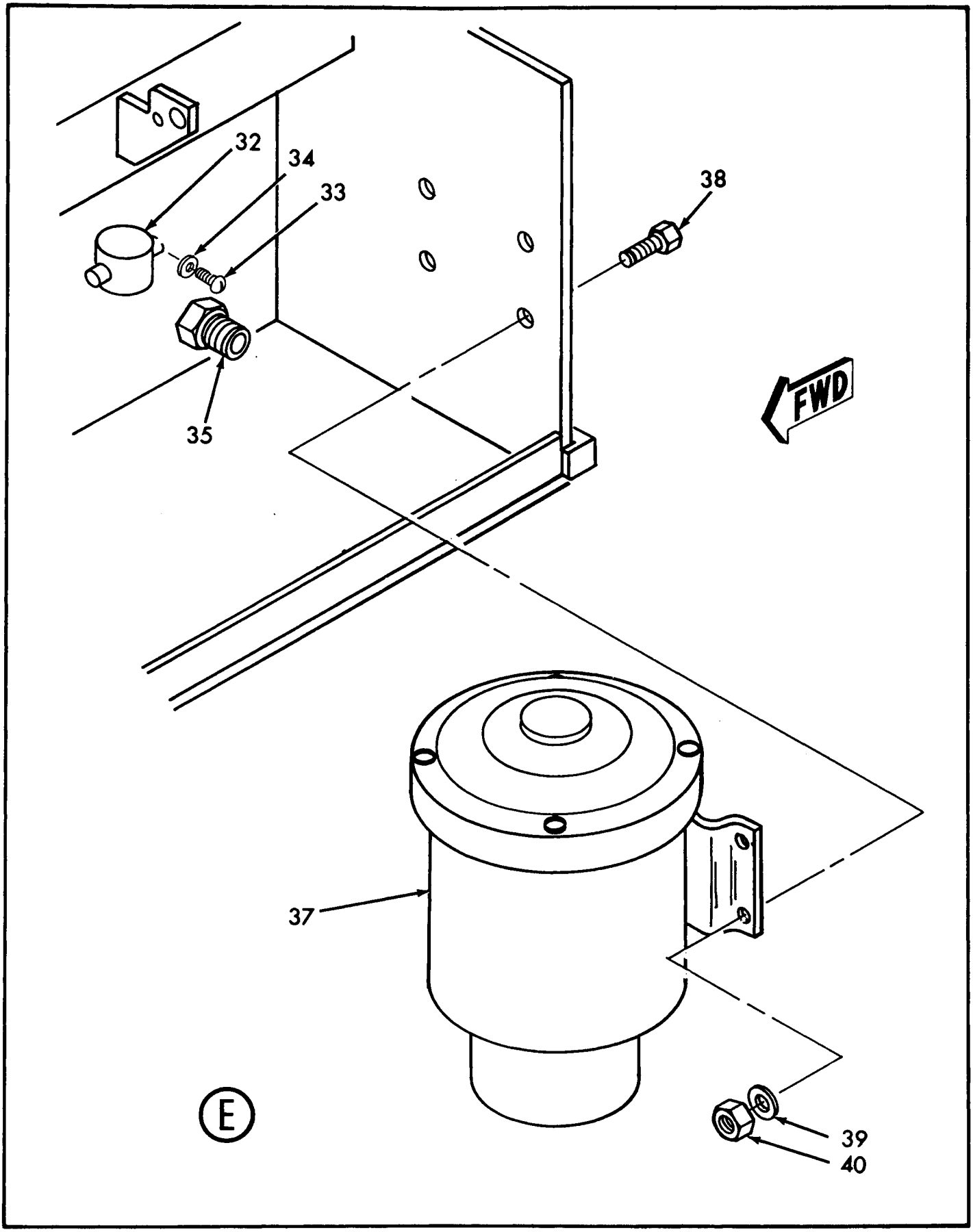
FRAME ASSEMBLY J19, J19EP





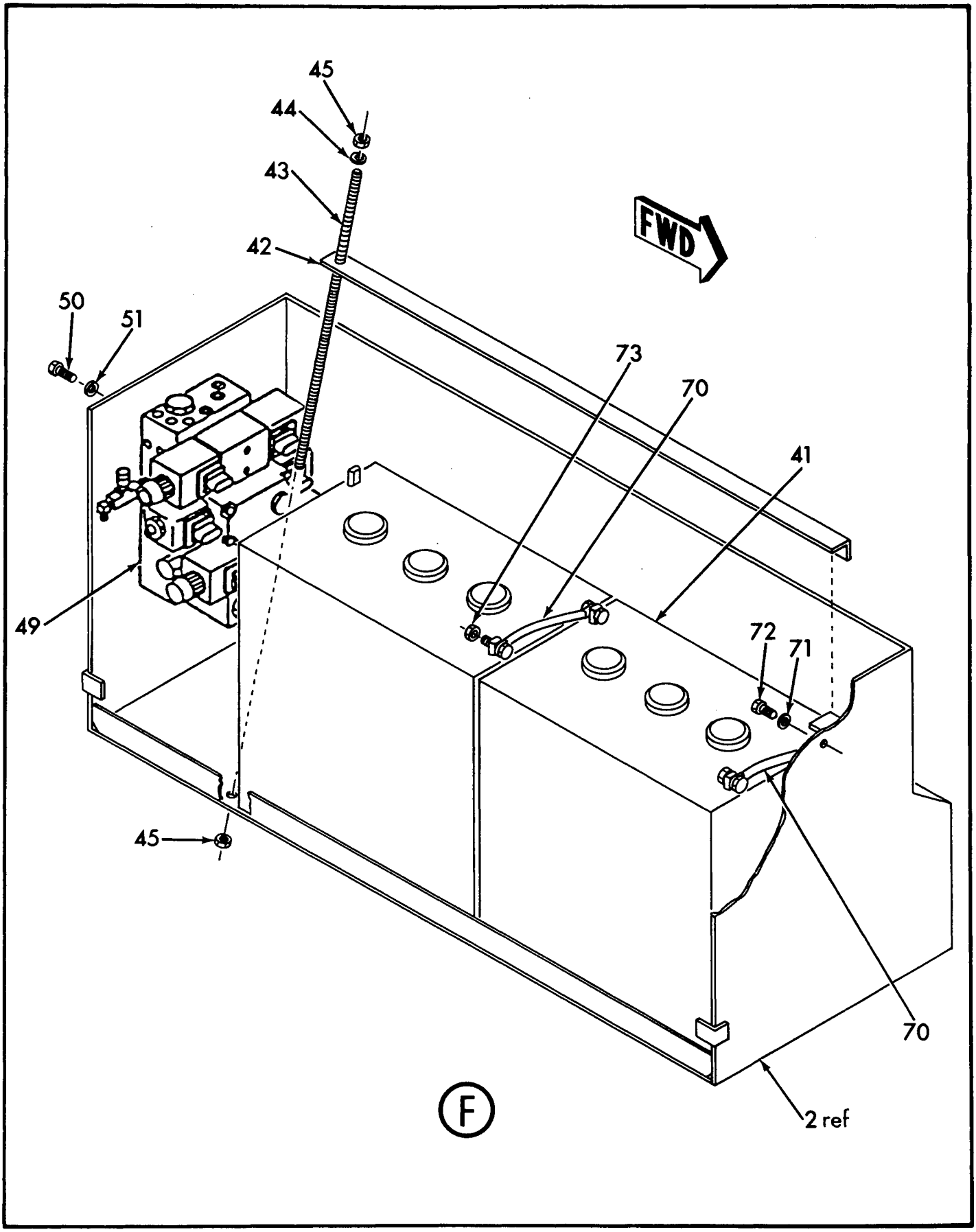
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FRAME ASSEMBLY J19, J19EP



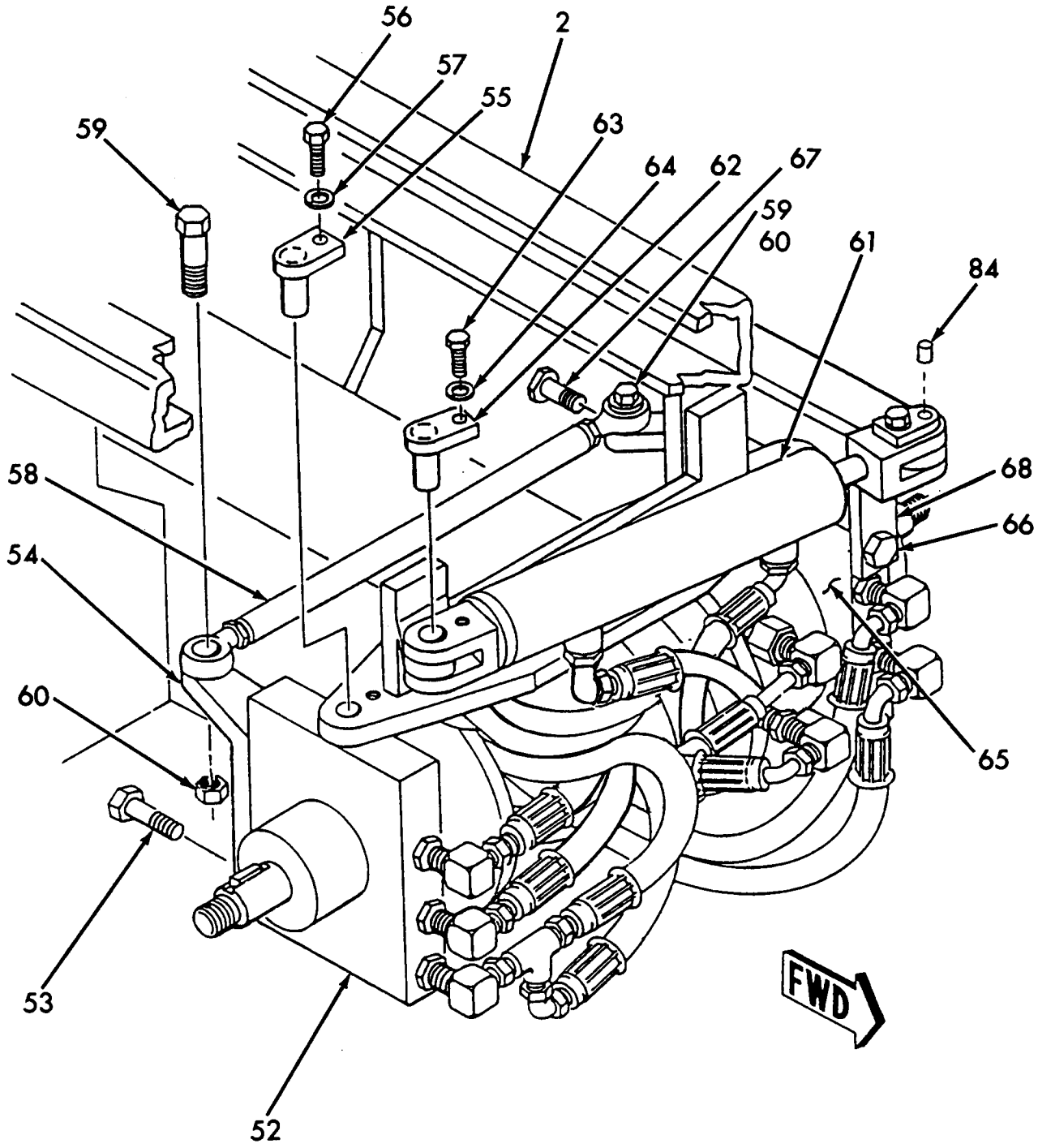
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FRAME ASSEMBLY J19, J19EP



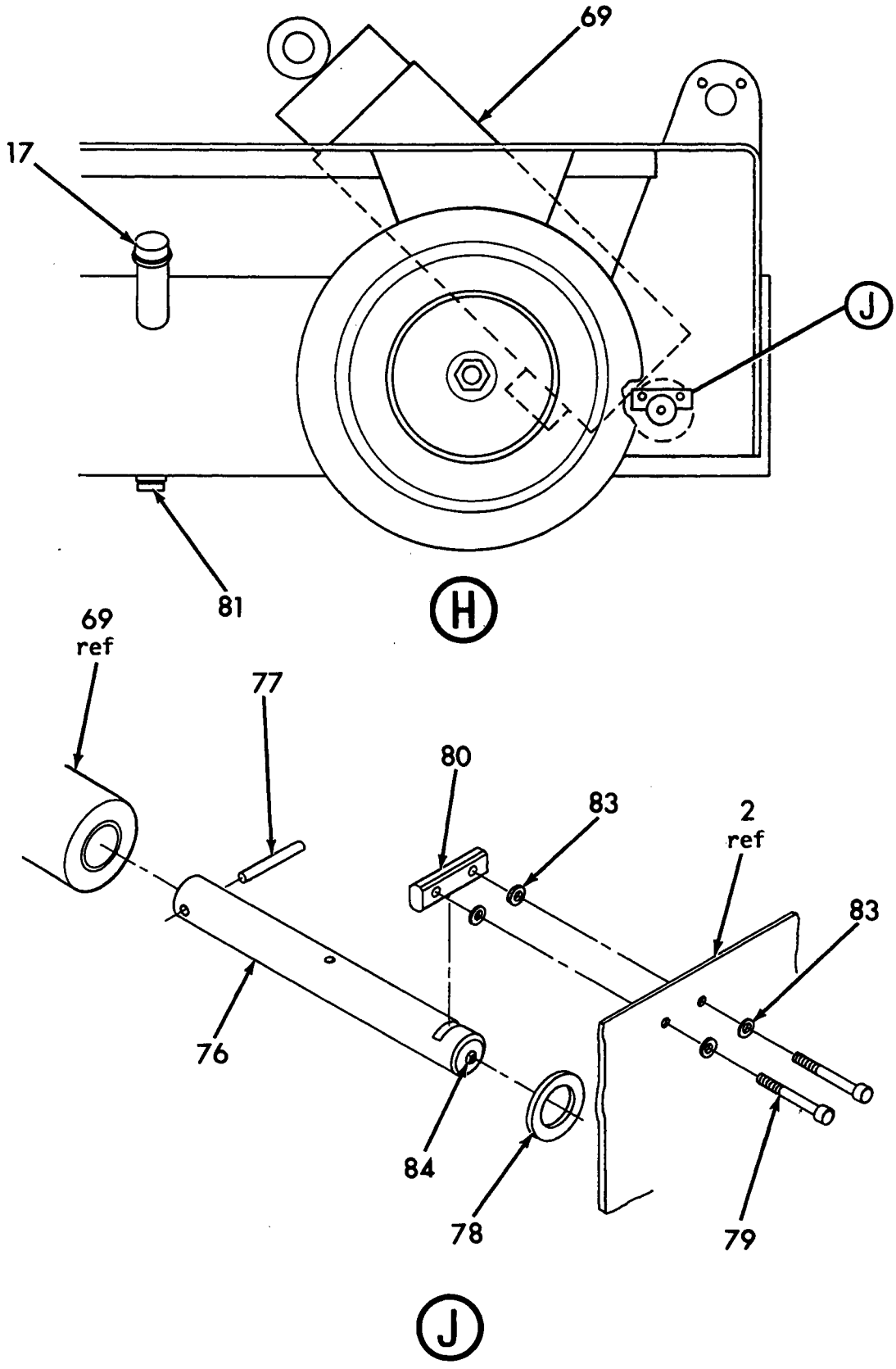
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FRAME ASSEMBLY J19, J19EP



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FRAME ASSEMBLY J19, J19EP



REV.

FRAME ASSEMBLY J19, J19EP

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130844	ASSEMBLY, FRAME J19 J19EP (See Sect. 2, Fig. 1 for NHA)	REF
2	130846	.WELDMENT, FRAME J19	1
3	130947	.ASSEMBLY, DRIVE TIRE AND WHEEL (See Sect. 3, Fig. 2A for Details)	2
4	63421	.WASHER, FLAT (attaching part)	2
5	64308	.PIN, COTTER (attaching part)	2
6	130948	.ASSEMBLY, IDLER TIRE AND WHEEL (See Sect. 3, Fig. 3A for Details)	2
7	63421	.WASHER, FLAT (attaching part)	2
8	61001	.NUT, JAM (attaching part)	2
9	64308	.PIN, COTTER (attaching part)	2
-10	255	.CABLE TIE, LARGE	24
-11	256	.CABLE TIE, SMALL	3
12	70223	.ASSEMBLY, BATTERY CHARGER (See Sect. 3, Fig. 4 for Details) (See Vendor for more Information)	1
13	63301	.WASHER, LOCK (attaching part)	4
14	60701	.NUT, HEX (attaching part)	4
15	65665	.CLAMP, CUSHIONED	1
16	63654	.RIVET, POP	1
17	130931	.DIPSTICK, WELDMENT	1
18	70234	.SWITCH, MINI	1
19	70235	.LEVER, SWITCH	1
20	62620	.SCREW, MACHINE (attaching part)	2
21	130187	.ASSEMBLY, GROUND CONTROL (See Sect. 3, Fig. 5 for Details)	1
22	60309	.SCREW, CAP (attaching part)	2
23	60701	.NUT, HEX (attaching part)	2

- ITEM NOT ILLUSTRATED

FRAME ASSEMBLY J19, J19EP

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
24	63301	.WASHER, LOCK (attaching part)	2
25	81016	.FILTER, HYDRAULIC	1
26	~~66807~~ 66739	..ELEMENT	1
27	60309	.SCREW, CAP (attaching part)	2
28	63301	.WASHER, LOCK (attaching part)	2
29	80008-11	.ELBOW, MALE	1
30	80021-03	.ELBOW, STREET	1
31	65213	.BREATHER	1
32	70209	.SOLENOID	1
33	60309	.SCREW, CAP (attaching part)	2
34	63301	.WASHER, LOCK (attaching part)	2
35	80001-15	.CONNECTOR, MALE	1
36	80045-03	.UNION, BULKHEAD	1
37	130241	.ASSEMBLY, MOTOR AND PUMP (See Sect. 3, Fig. 6 for Details)	1
38	60331	.SCREW, CAP (attaching part)	4
39	63303	.WASHER, LOCK (attaching part)	4
40	60703	.NUT, HEX (attaching part)	4
41	4007	.BATTERY (See Vendor for more Information)	4
42	130699	.HOLD-DOWN, BATTERY	2
43	63676	.ROD, THREADED	2
44	63403	.WASHER, FLAT (attaching part)	2
45	61302	.NUT, LOCK (attaching part)	2
46	130690	.PIN, BALL LOK DETENT	2
47	375	.RIVET, POP (attaching part)	2
48	130862	.WELDMENT, COVER	2

- ITEM NOT ILLUSTRATED

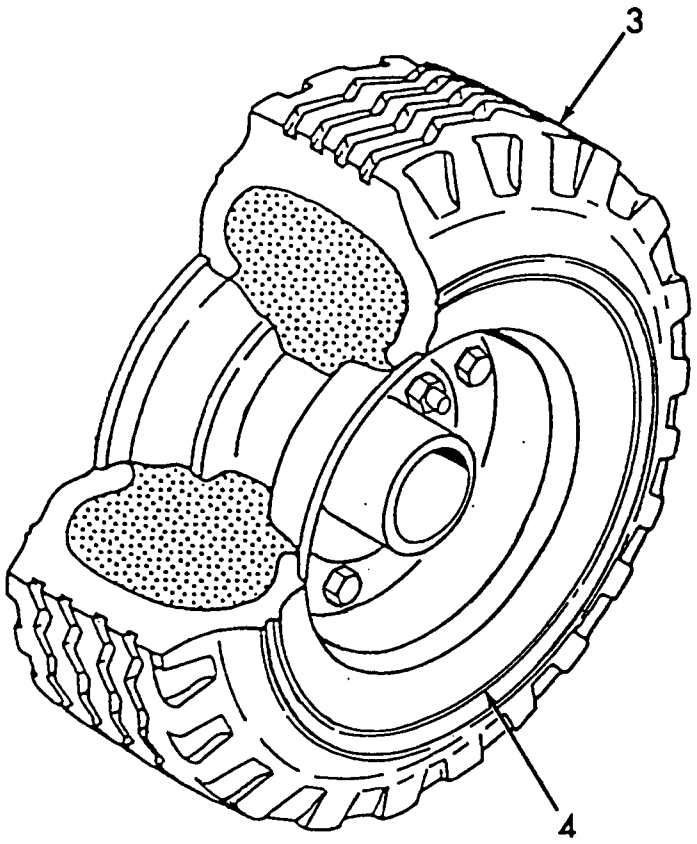
FRAME ASSEMBLY J19, J19EP

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
49	130234	.ASSEMBLY, CONTROL VALVE (BEFORE EARLY 1989) (See Sect. 3, Fig. 7 for Details)	1
	131123	.ASSEMBLY, CONTROL VALVE (AFTER EARLY 1989) (See Sect. 3, Fig. 7 for Details)	1
50	60372	.SCREW, CAP (attaching part)	2
51	63303	.WASHER, LOCK (attaching part)	2
52	130238	.ASSEMBLY, MOTOR DRIVE (See Sect. 3, Fig. 8 for Details)	1
53	60602	.SCREW, CAP (attaching part)	2
54	130166	.LEVER, STEERING (R.H.)	1
55	130192	.PIN, STEERING	4
56	60338	.SCREW, CAP (attaching part)	
57	63302	.WASHER, LOCK (attaching part)	4
58	130863	.ASSEMBLY, TIE ROD (See Sect. 3, Fig. 9A for Details)	1
59	60393	.SCREW, CAP (attaching part)	2
60	61242	.NUT, LOCK (attaching part)	2
61	130675	.ASSEMBLY, STEERING CYLINDER (See Sect. 3, Fig. 10A for Details)	1
62	20252	.PIN, STEERING CYLINDER ANCHOR	2
63	60353	.SCREW, CAP (attaching part)	2
64	63301	.WASHER, LOCK (attaching part)	2
65	130239	.ASSEMBLY, DRIVE MOTOR & PARKING BRAKE (L.H.) (See Sect. 3, Fig. 11 for Details)	1
66	60610	.SCREW, CAP (attaching part)	1
67	60602	.SCREW, CAP (attaching part)	2
68	130167	.LEVER, STEERING (L.H.)	1

- ITEM NOT ILLUSTRATED

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
69	130583	.ASSEMBLY, LIFT CYLINDER (See Sect. 3, Fig. 12A for Details)	1
70	130231	.KIT, BATTERY CABLE (See Sect. 3, Fig. 13 for Details)	1
71	63302	.WASHER, LOCK (attaching part)	1
72	60324	.SCREW, CAP (attaching part)	1
73	61246	.NUT, LOCK (attaching part)	8
74	411-25	.RUBBER, MOLDING	2
75	130588	.DIAGRAM, HYDRAULIC HOSE (See Sect. 3, Fig. 14A for Details)	1
76	131092	.PIN, FRAME AND ARM	1
77	64206	.PIN, ROLL	1
78	130807	.SPACER, OUTER	1
79	61950	.SCREW, CAP (attaching part)	2
80	131094	.PLATE, LOCK	1
81	54200	.PLUG, MAGNETIC	1
82	130600-10	.CABLE, CONDUCTOR	1
83	63302	.WASHER, LOCK (attaching part)	2
84	65103	.FITTING, GREASE	1

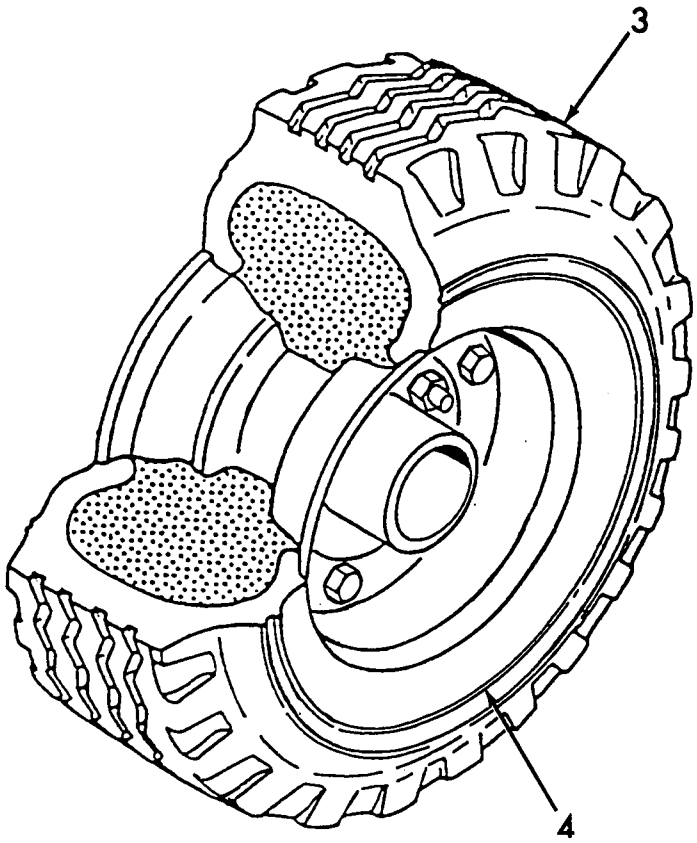
DRIVE, TIRE & WHEEL ASSEMBLY J14



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130843	ASSEMBLY, TIRE & WHEEL DRIVE (See Sect. 3, Fig. 1 for NHA)	REF
-2	130842	.SUB-ASSEMBLY, TIRE & WHEEL DRIVE	1
3	130244	..TIRE	1
4	130841	..WHEEL	1

REV.

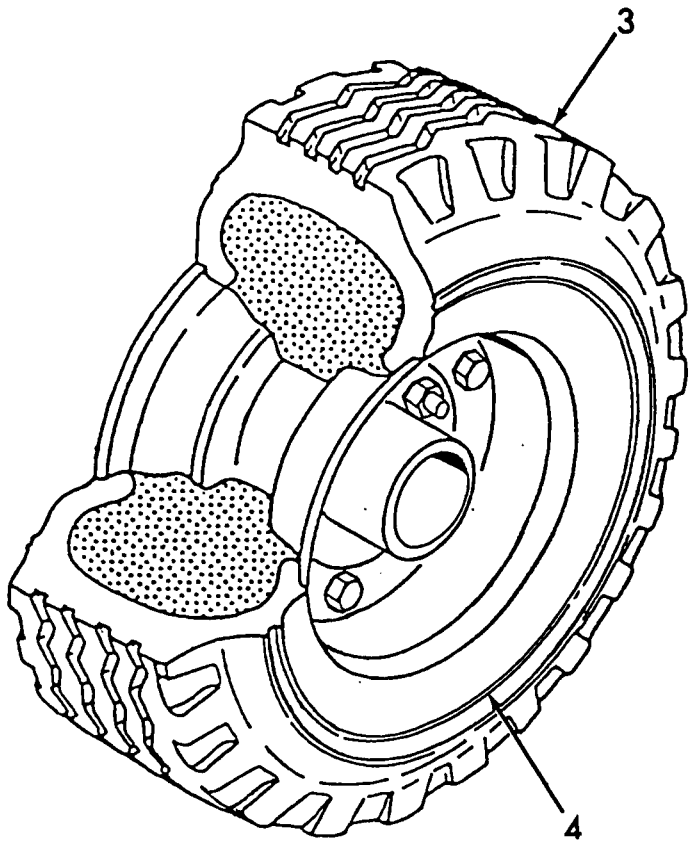
DRIVE, TIRE & WHEEL WELDMENT J19, J19EP



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130947	WELDMENT, DRIVE, TIRE & WHEEL (See Sect. 3, Fig. 1A for NHA)	REF
-2	130945	.ASSEMBLY, TIRE AND WHEEL	2
3	130946	..TIRE	2
4	30927	..WHEEL	2
-5	130944	.HUB, DRIVE	2

REV.

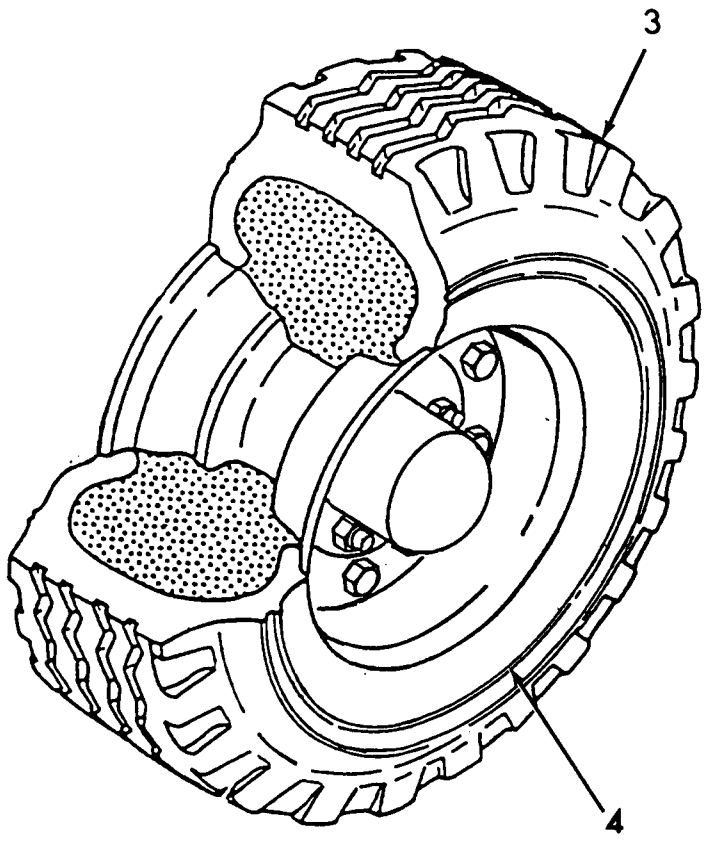
IDLER TIRE & WHEEL ASSEMBLY J14



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130203	ASSEMBLY, TIRE & WHEEL IDLER (See Sect. 3, Fig. 1 for NHA)	REF
-2	130180	.SUB-ASSEMBLY, TIRE & WHEEL IDLER	1
3	130244	.TIRE	1
4	130245	.WHEEL	1

REV.

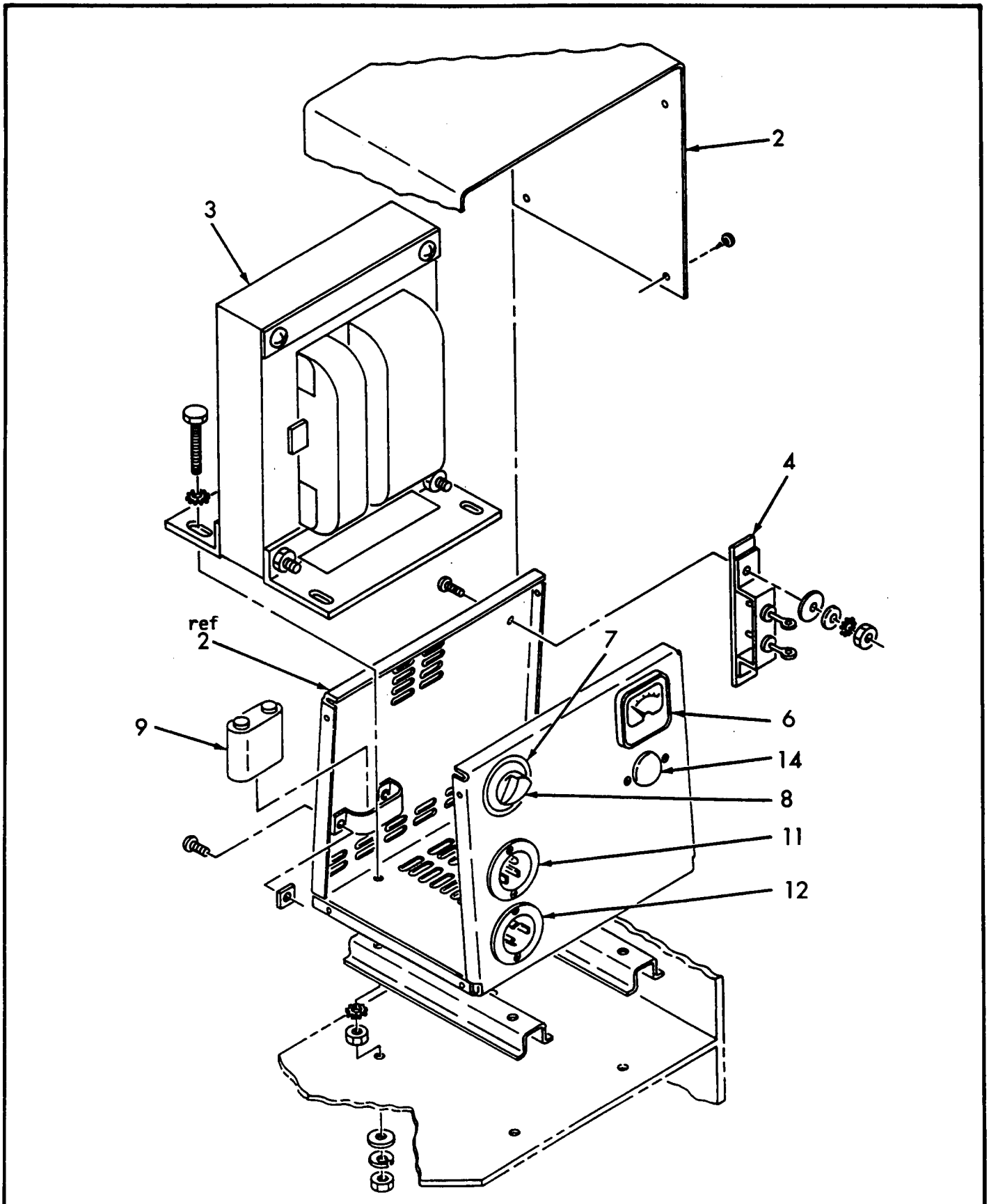
IDLER TIRE & WHEEL WELDMENT J19, J19EP



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130948	WELDMENT, IDLER TIRE & WHEEL (See Sect. 3, Fig. 1A for NHA)	REF
-2	130945	.ASSEMBLY, TIRE & WHEEL	2
3	130946	..TIRE	2
4	30927	..WHEEL	2
-5	130943	.HUB, IDLER	2

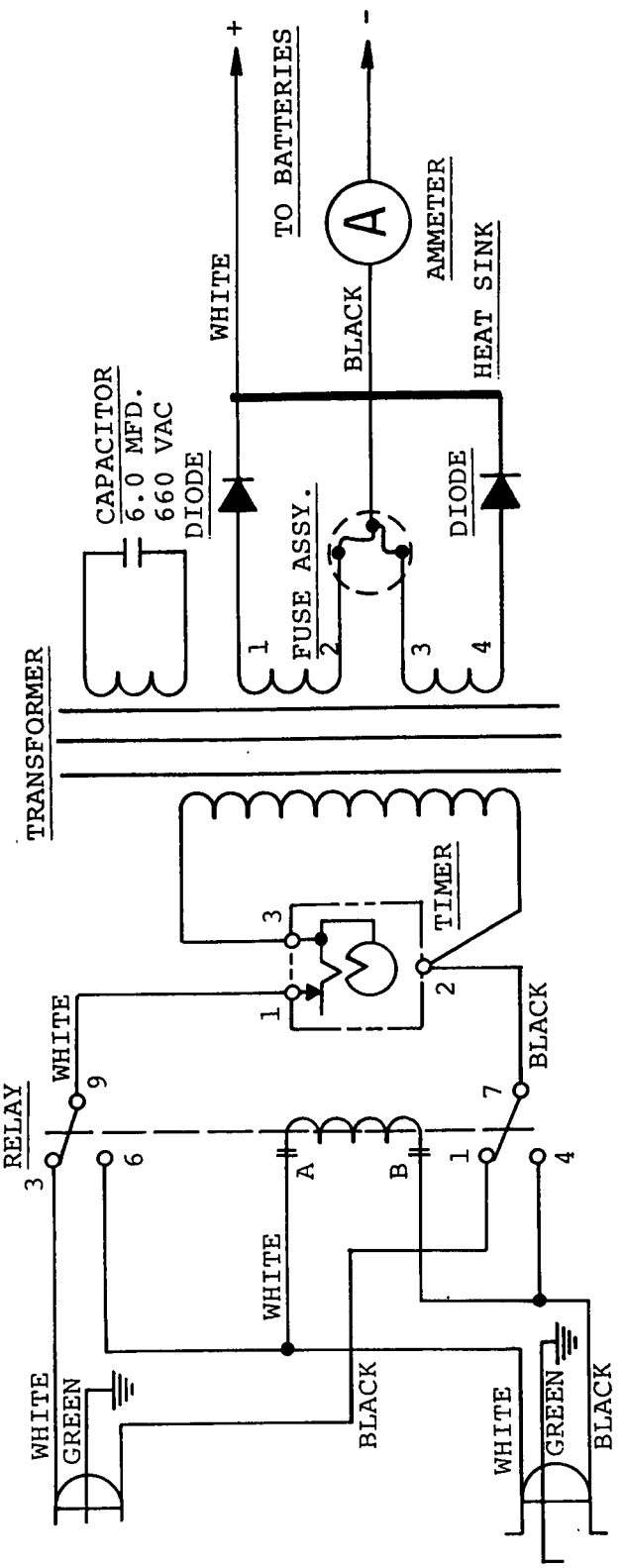
REV.

BATTERY CHARGER ASSEMBLY



REV.

BATTERY CHARGER ASSEMBLY



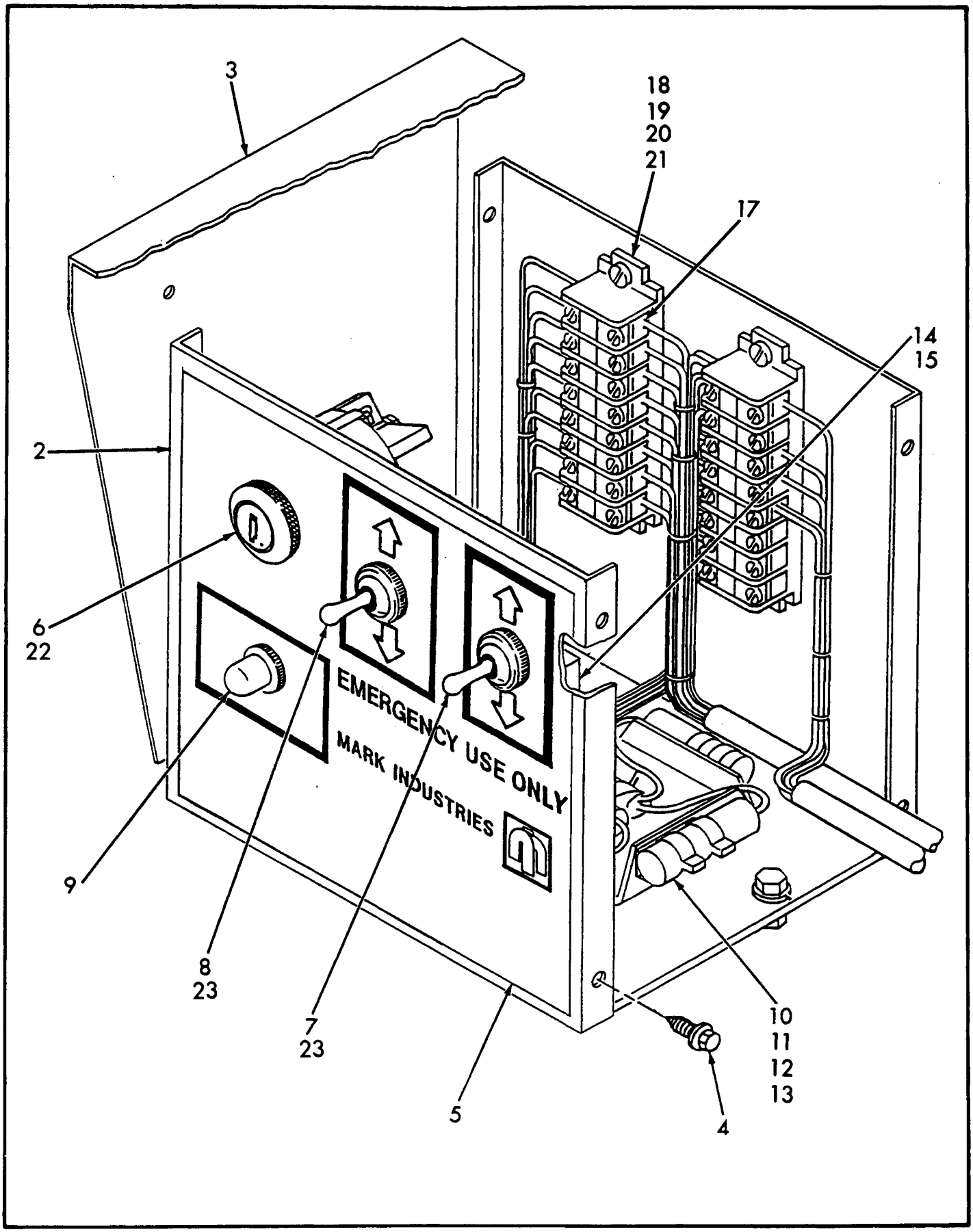
REV.

BATTERY CHARGER ASSEMBLY

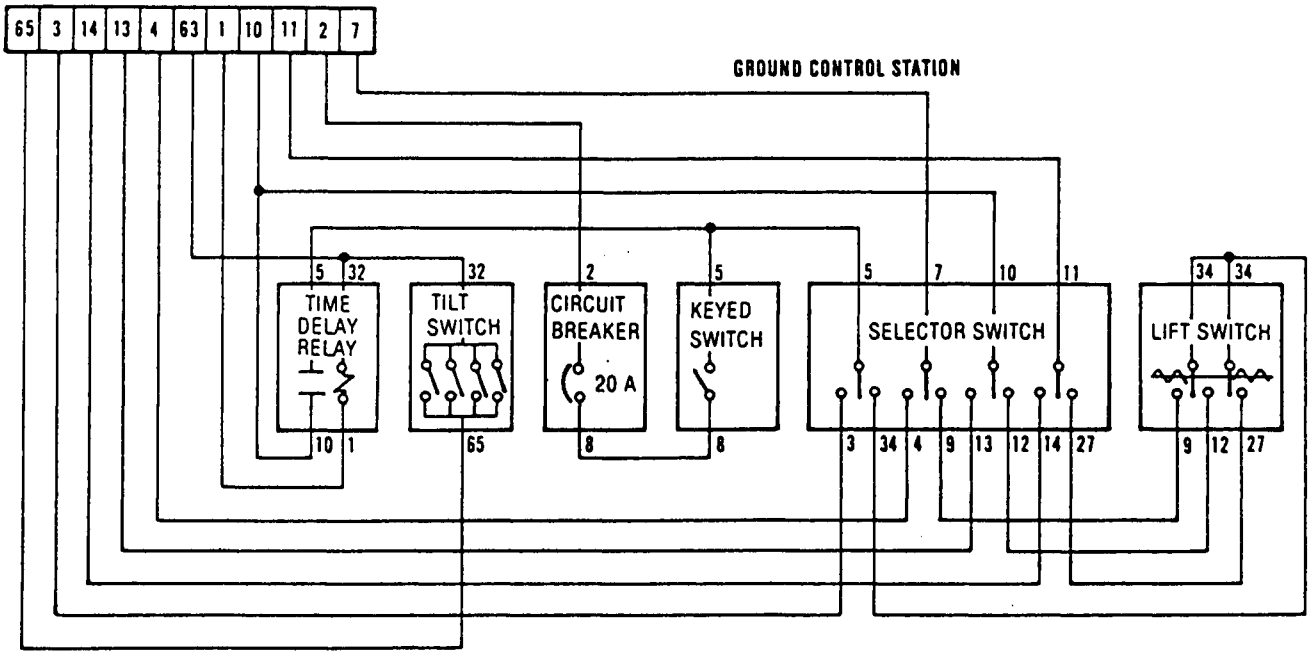
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	70223	ASSEMBLY, BATTERY CHARGER (See Sect. 3, Fig. 1 or 1A for NHA)	REF
2		.ASSEMBLY, CASE	1
3	66786	.ASSEMBLY, TRANSFORMER	1
4		.ASSEMBLY, HEATSINK W/DIODES	1
5	66730	.ASSEMBLY, DIODE	2
6	66747	.AMMETER	1
7	66732	.TIMER, 12 HOUR	1
8	66733	.KNOB, TIMER	1
9	66750	.CAPACITOR	1
-10		.BUSHING, INSULATOR FOR DC CORD 7W-2	1
11	66734	.RECEPTACLE, 125/15, STRAIGHT BLADE	1
12	66736	.RECEPTACLE, 125/20, TWIST BLADE	1
-13		.CORD SET, DC NO PLUG	
14	66726	.ASSEMBLY, FUSE	
15	66728	.RELAY, 120 VAC, 15 AMPS	

- ITEM NOT ILLUSTRATED

GROUND CONTROL BOX ASSEMBLY



GROUND CONTROL BOX ASSEMBLY



GROUND CONTROL BOX ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130187	ASSEMBLY, GROUND CONTROL (See Sect. 3, Fig. 1 or 1A for NHA)	REF
2	130129	.MACHINING, GROUND CONTROL BOX	1
3	130128	.COVER	1
4	61711	.SCREW (attaching part)	8
5	130201	.DECAL, GROUND CONTROL BOX	1
6	2717	.SWITCH, IGNITION	1
7	20481	.SWITCH, TOGGLE	1
8	16260	.SWITCH, TOGGLE	1
9	20562	.BREAKER, CIRCUIT	1
10	130193	.ASSEMBLY, TILT SWITCH (See Sect. 3, Fig. 16 for Details)	1
11	60319	.SCREW, CAP (attaching part)	2
12	63301	.WASHER, LOCK (attaching part)	4
13	60701	.NUT, HEX (attaching part)	6
14	70306	.RELAY, DELAY	1
15	61728	.SCREW, SELF-TAPPING (attaching part)	1
16	496-A	.TERMINAL, PUSH-ON	4
17	4027	.BLOCK, TERMINAL	16
18	117-A	.END, TERMINAL BLOCK	2
19	62612	.SCREW, RD HD SLOTTED MACH. (attach. part)	3
20	61502	.NUT (attaching part)	4
21	63312	.WASHER, LOCK (attaching part)	4
22	117-K	.CONNECTOR, RING	4
23	117-C	.CONNECTOR, RING	21
-24	70233	.WIRE, WHITE (9 FT)	AR

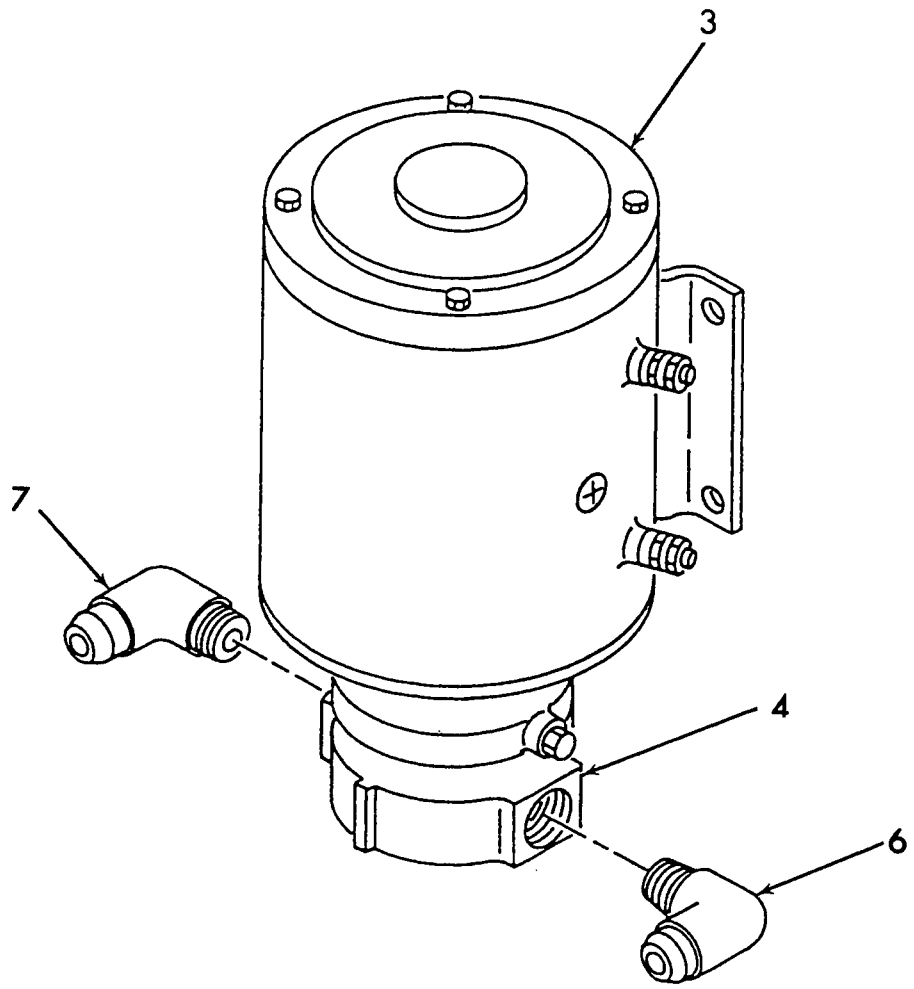
- ITEM NOT ILLUSTRATED

GROUND CONTROL BOX ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-25	70232	.WIRE, WHITE (13 FT)	AR
-26	70009	.WIRE, RED (3 FT)	AR
-27	255	.CABLE TIE, LARGE	2
-28	256	.CABLE TIE, SMALL	13

- ITEM NOT ILLUSTRATED

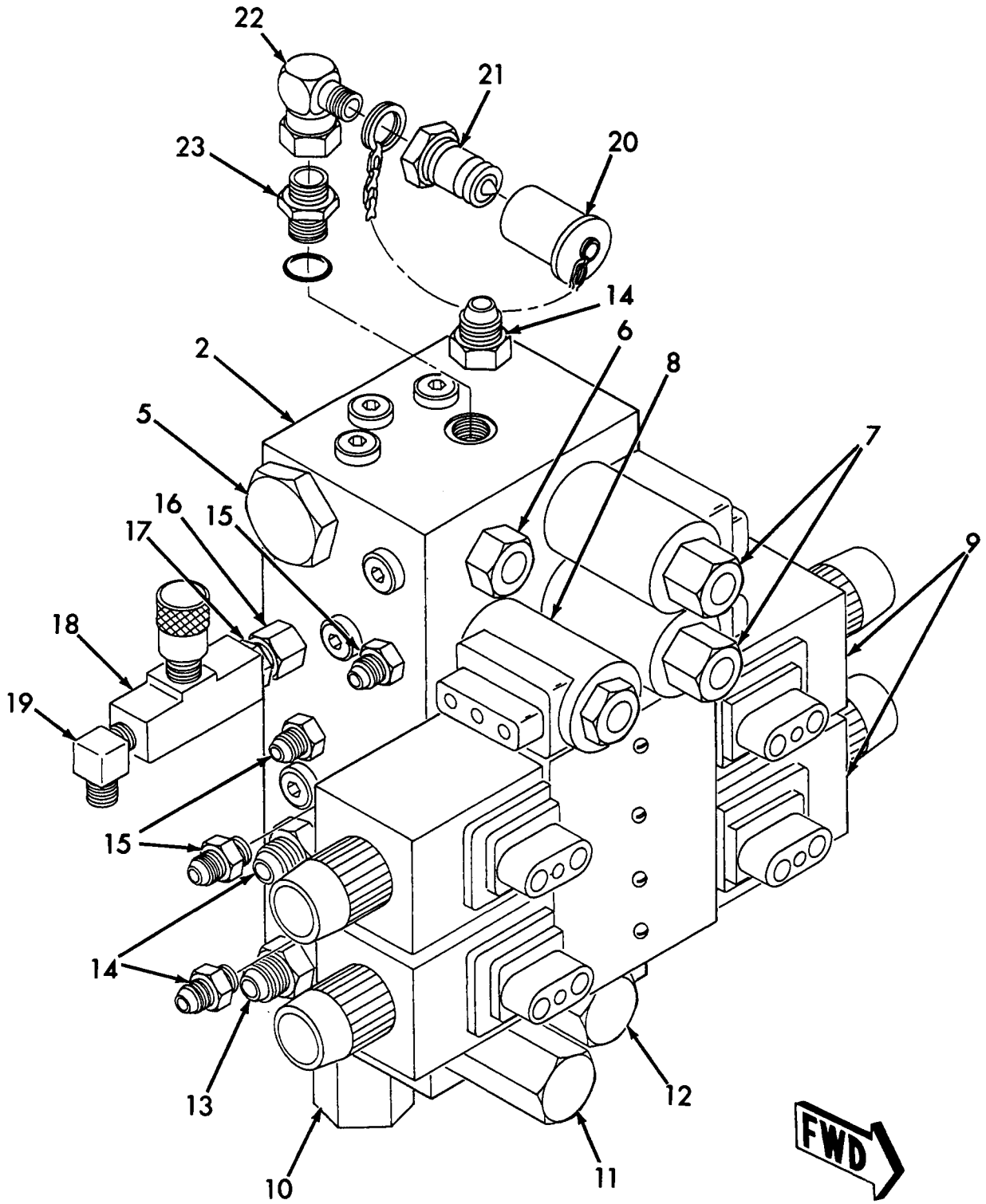
MOTOR AND PUMP ASSEMBLY



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130241	ASSEMBLY, MOTOR AND PUMP (See Sect. 3, Fig. 1 or 1A for NHA)	REF
-2	81282	.MOTOR AND PUMP ASSEMBLY	1
3	67941	..ASSEMBLY, MOTOR	1
4	67938	..ASSEMBLY, PUMP	1
-5	67935	...KIT, SEAL	1
6	80012-08	.ELBOW, MALE	1
7	80012-11	.ELBOW, MALE	1

REV.

CONTROL VALVE ASSEMBLY (AFTER EARLY 1989)

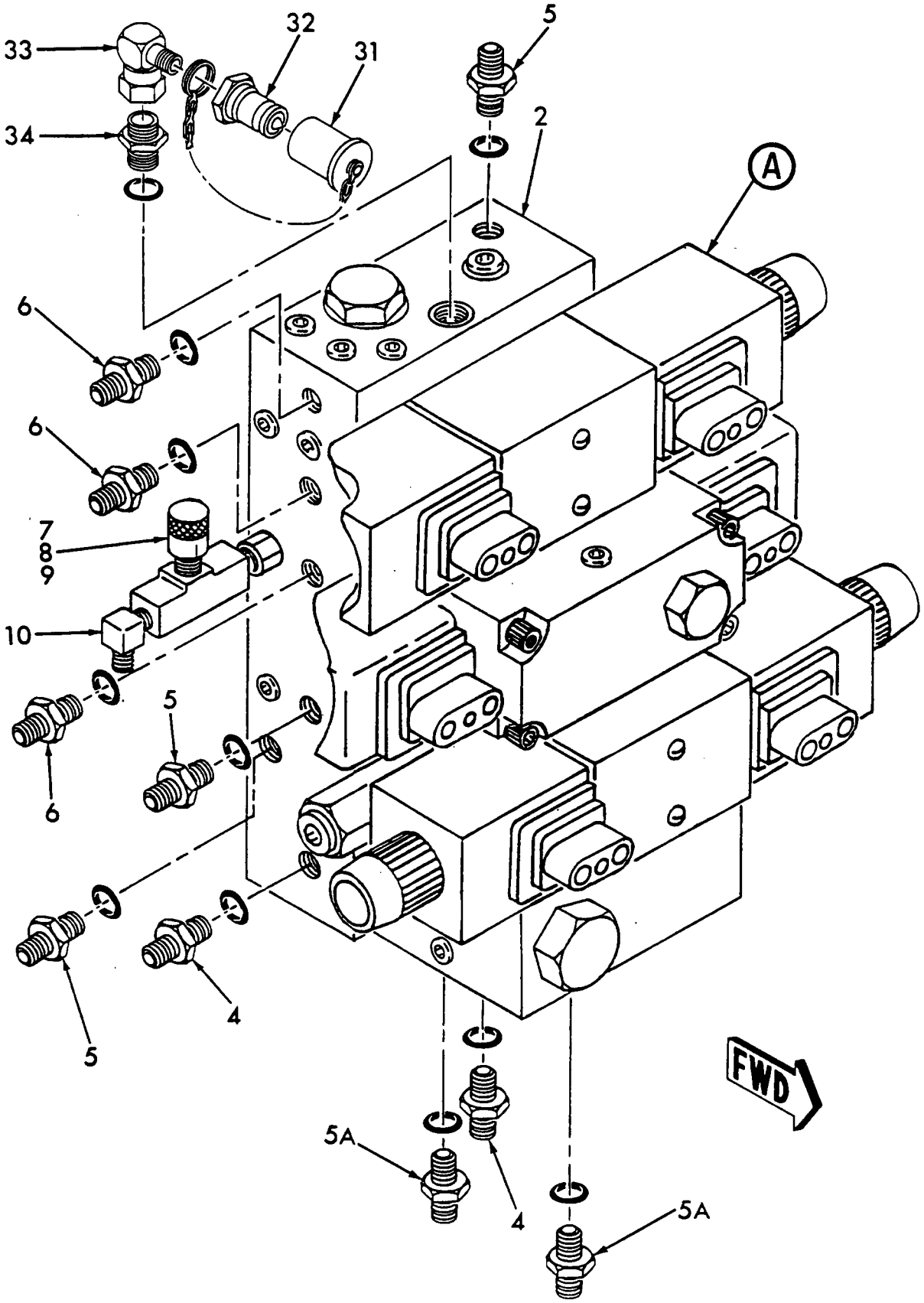


CONTROL VALVE ASSEMBLY (AFTER EARLY 1989)

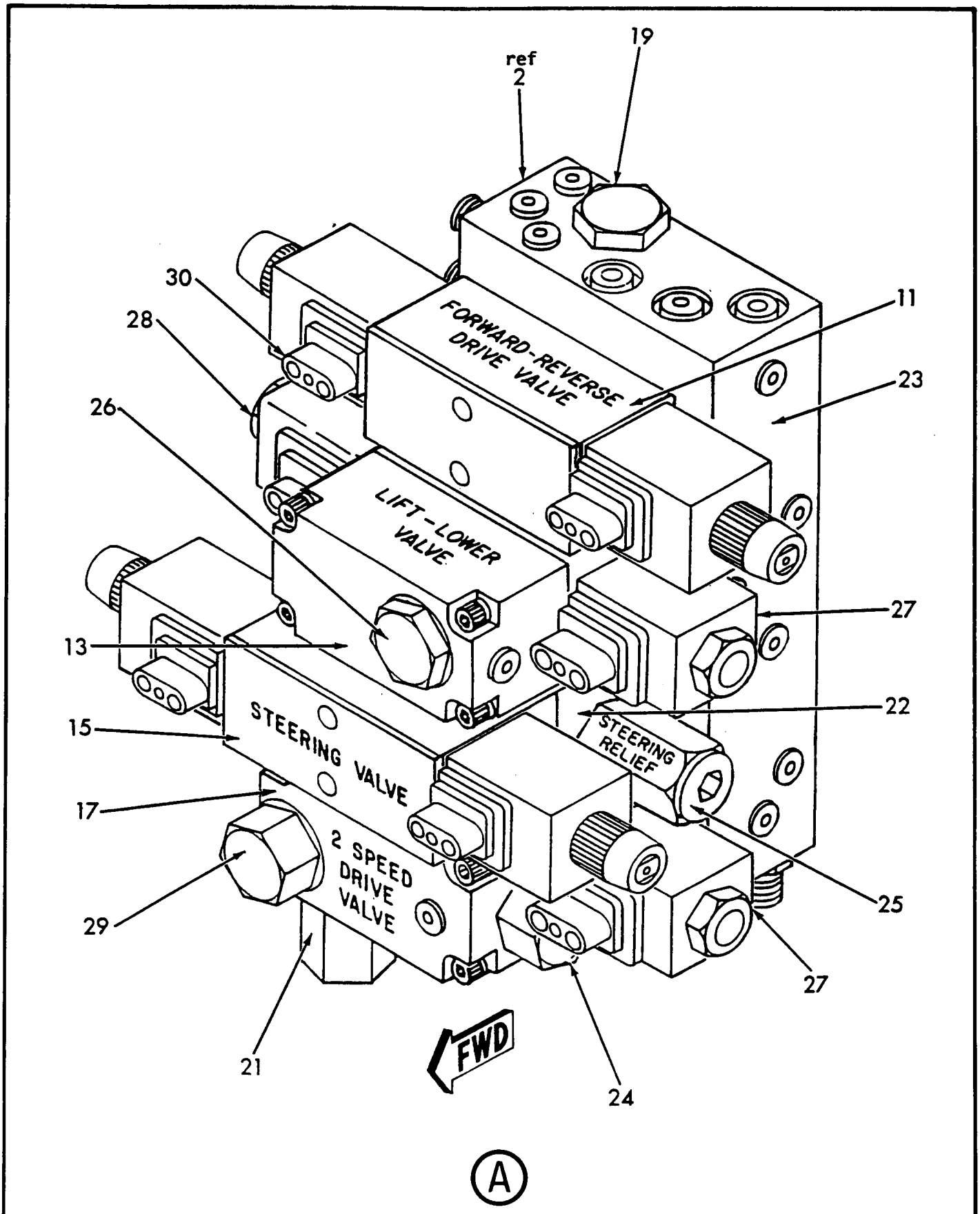
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	131123	ASSEMBLY, CONTROL VALVE (See Sect. 3, Fig. 1 or 1A for NHA)	REF
2	81268	.VALVE, CONTROL	1
-3	67942	..KIT, SEAL	1
-4	66674	..VALVE, DRIVE CHECK	1
5	66664	..VALVE, DRIVE BRAKE SHUTTLE	1
6	66678	..DIVIDER, LOW DRIVE FLOW	1
7	66676	..VALVE, LIFT	2
8	66675	..VALVE, LOWERING	1
9	66660	..VALVE, DO1 DRIVE	2
10	67003	..VALVE, MAIN RELIEF	1
11	66926	..VALVE, STEERING RELIEF	1
12	67004	..DIVIDER, STEERING FLOW	1
13	80004-08	.CONNECTOR, STRAIGHT THREAD	2
14	80004-03	.CONNECTOR, STRAIGHT THREAD	3
15	80004-05	.CONNECTOR, STRAIGHT THREAD	3
16	51903	.ADAPTER, PIPE FEMALE	1
17	80052-02	.NIPPLE, PIPE	1
18	30884	.VALVE, FLOW CONTROL	1
19	80008-03	.ELBOW, MALE	1
20	845	.CAP, QUICK DISCONNECT	1
21	2527	.COUPLING, QUICK DISCONNECT	1
22	81079	.ELBOW, PIPE TO SWIVEL	1
23	81078	.CONNECTOR, STRAIGHT THREAD	1

- ITEM NOT ILLUSTRATED

CONTROL VALVE ASSEMBLY (BEFORE EARLY 1989)



CONTROL VALVE ASSEMBLY (BEFORE EARLY 1989)



CONTROL VALVE ASSEMBLY (BEFORE EARLY 1989)

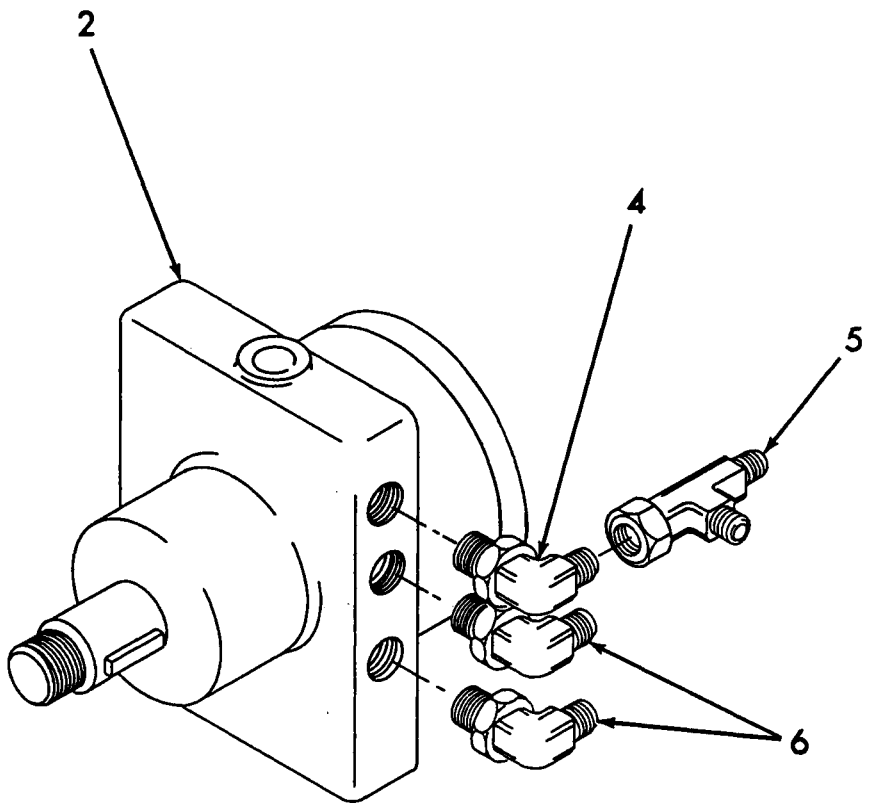
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130234	ASSEMBLY, CONTROL VALVE (See Sect. 3, Fig. 1 or 1A for NHA)	REF
2	81012	.VALVE, CONTROL	1
-3	66641	..KIT, SEAL	1
4	80004-08	.CONNECTOR, STRAIGHT THREAD	2
5	80004-03	.CONNECTOR, STRAIGHT THREAD	3
5A	80004-03	.CONNECTOR, STRAIGHT THREAD	2
6	80004-05	.CONNECTOR, STRAIGHT THREAD	3
7	51903	.ADAPTER, PIPE FEMALE	1
8	80052-02	.NIPPLE, PIPE	1
9	30884	.VALVE, FLOW CONTROL	1
10	80Q08-03	.ELBOW, MALE	1
11	66660	.VALVE, SOLENOID (FWD, REV)	1
-12	66685	..KIT, SEAL	1
13	66662	.VALVE, LIFT-LOWER SECTION	1
-14	66682	..KIT, SEAL	1
15	66660	.VALVE, STEERING	1
-16	66685	..KIT, SEAL	1
17	66659	.VALVE, 2 SPEED SECTION	1
-18	66681	..KIT, SEAL	1
19	66664	.VALVE, SHUTTLE	1
-20	66683	..KIT, SEAL	1
21	66658	.VALVE, RELIEF (SYSTEM PRESSURE ADJUST)	1
22	66661	.STEERING, CROSS RELIEF SECTION	1
23	66663	.SUB-PLATE, MANIFORLD BASE	1
24	66678	.REDUCER, FLOW 1.3	1

CONTROL VALVE ASSEMBLY (BEFORE EARLY 1989)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
25	66680	.VALVE, STEERING RELIEF	2
26	66674	.VALVE, CHECK (IN LIFT LOWER VALVE)	1
27	66863	.COIL, 10V DC (LIFT & HIGH SPEED DRIVE)	2
28	81059	.VALVE, CONTROL	1
29	66677	.REDUCER, FLOW 2.3	1
30	66862	.COIL, (ONLY) 10V DC	4
31	845	.CAP, QUICK DISCONNECT	1
32	2527	.COUPLING, Q.D.	1
33	81079	.ELBOW, PIPE TO SWIVEL	1
34	81078	.CONNECTOR, STRAIGHT THREAD	1

- ITEM NOT ILLUSTRATED

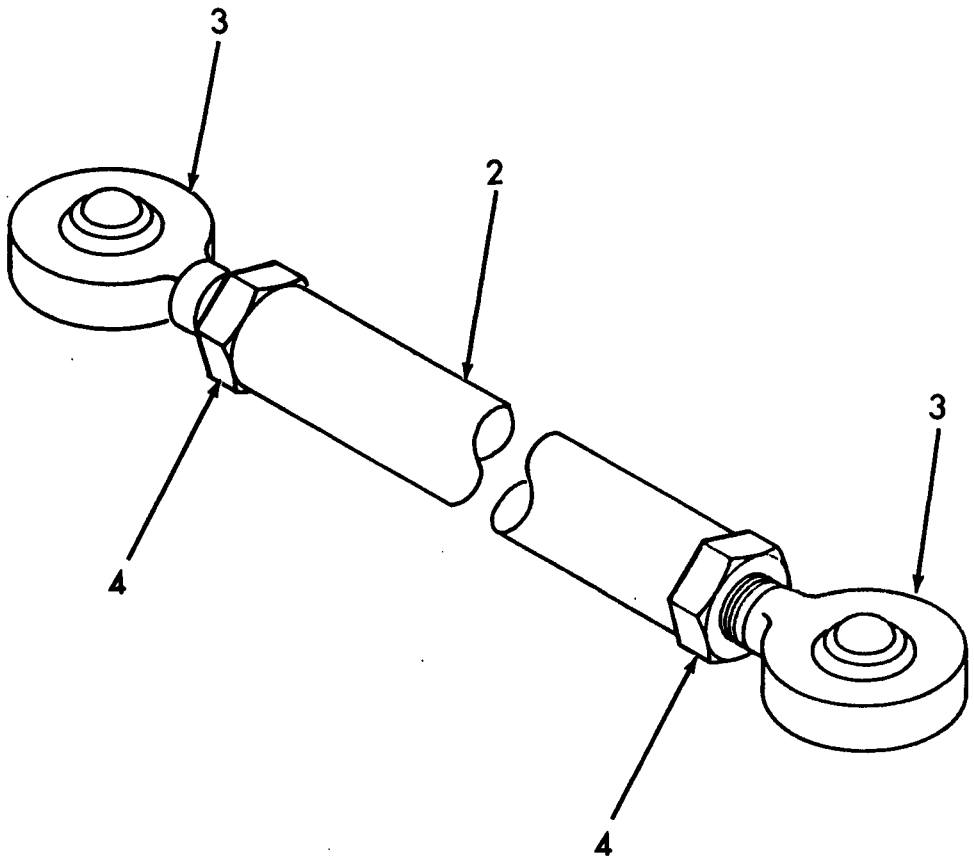
MOTOR DRIVE ASSEMBLY



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130238	ASSEMBLY, DRIVE MOTOR (R.H.) (See Sect. 3, Fig. 1 for NHA)	REF
2	81292	.MOTOR, DRIVE	1
-3	67772	..KIT, SEAL	1
4	80012-03	.ELBOW	1
5	80028-03	.NUT, TEE RUN SWIVEL	1
6	80012-05	.ELBOW	2

REV.

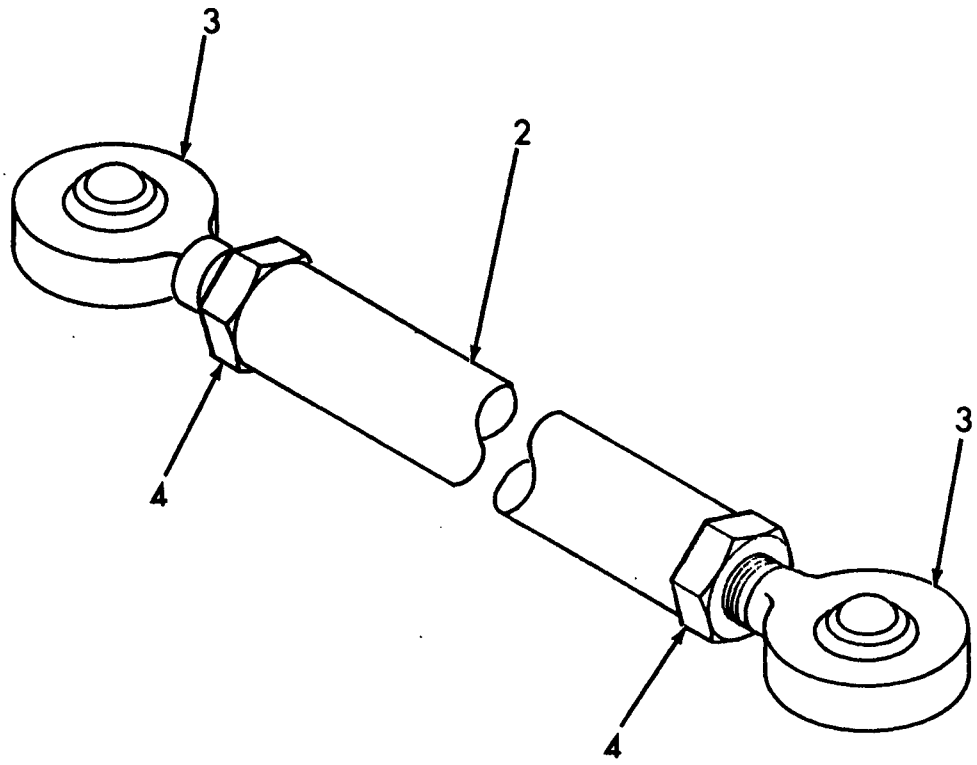
TIE ROD ASSEMBLY J14



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130163	ASSEMBLY, TIE ROD (See Sect. 3, Fig. 1 for NHA)	REF
2	130303	.ROD, TIE	1
3	2274	.END, ROD	2
4	60901	.NUT, JAM	2

REV.

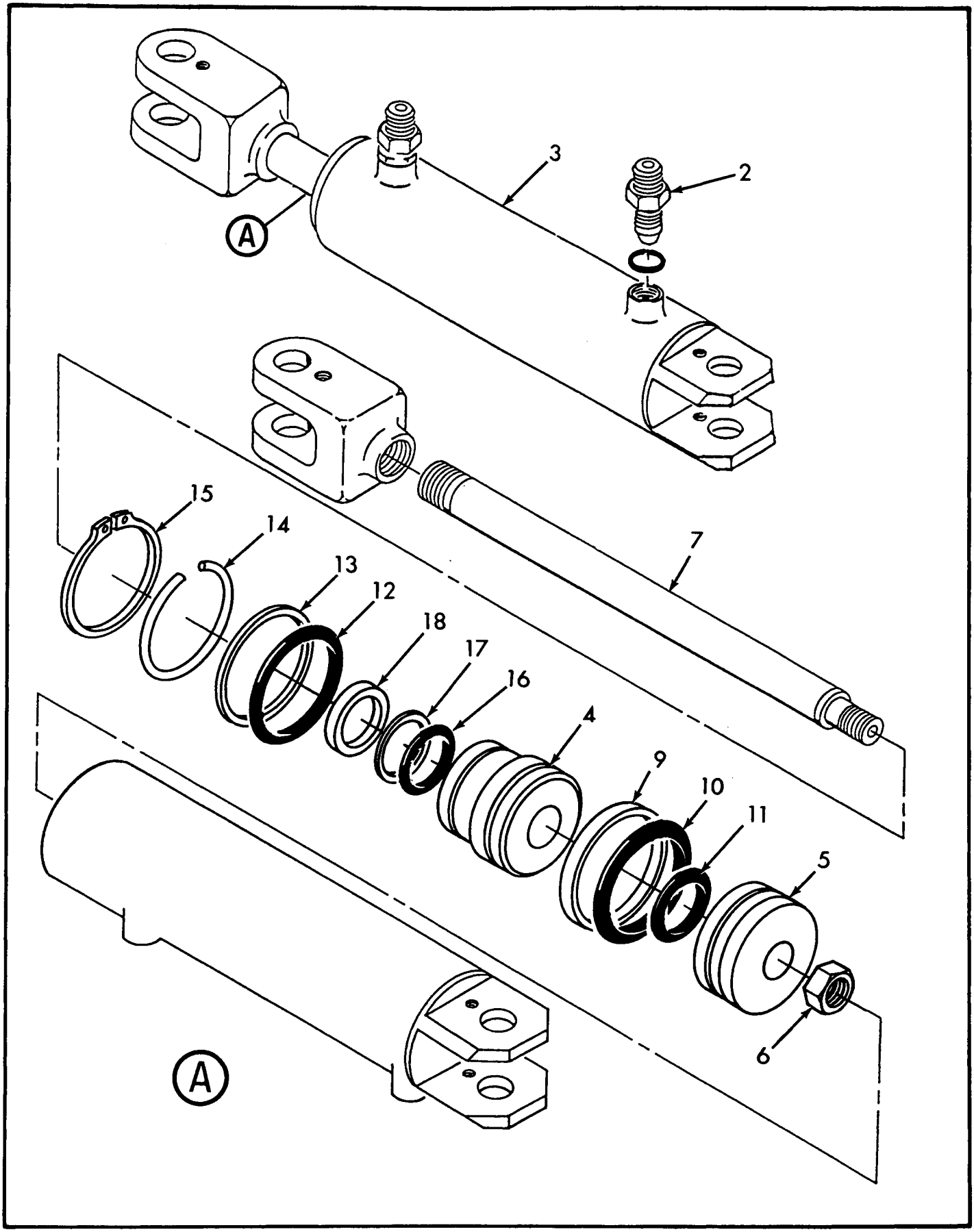
TIE ROD ASSEMBLY J19, J19EP



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130863	ASSEMBLY, TIE ROD (See Sect. 3, Fig. 1A for NHA)	REF
2	130930	.ROD, TIE	1
3	2274	.END, ROD	2
4	60901	.NUT, JAM	2

REV.

STEERING CYLINDER ASSEMBLY J14



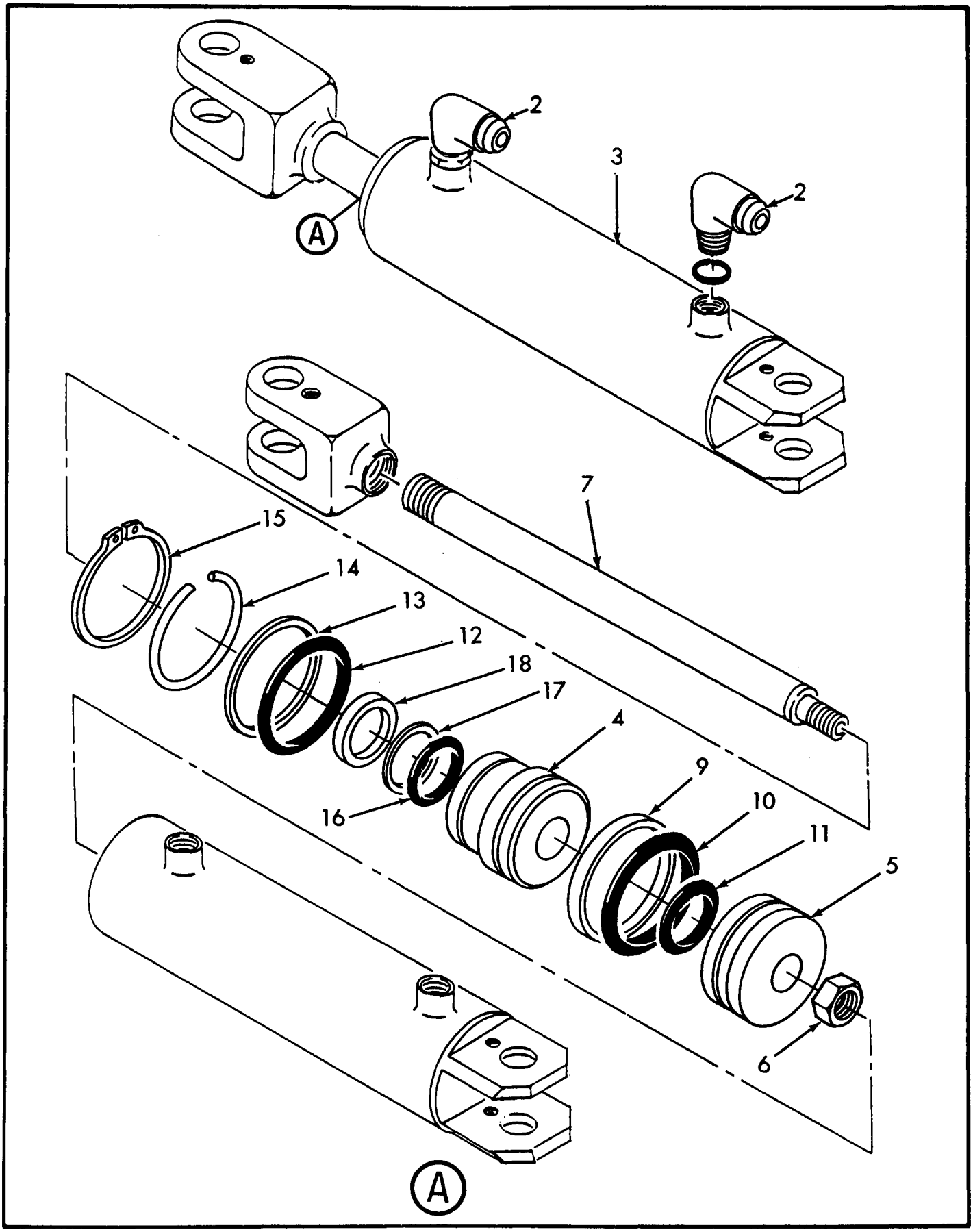
REV.

STEERING CYLINDER ASSEMBLY J14

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130237	ASSEMBLY, STEERING CYLINDER (See Sect. 3, Fig. 1 for NHA)	REF
2	80004-03	.CONNECTOR, STRAIGHT THREAD	2
3	130165	.CYLINDER, STEERING	1
4		..BEARING	1
5	67951	..PISTON	1
6		..NUT, LOCK	1
7	67950	..ROD, CHROME PLATED	1
-8	66640	..KIT, SEAL	1
9		...RING, SLIPPER	1
10		...O-RING	1
11		...O-RING	1
12		...O-RING	1
13		...WASHER, BACK-UP	1
14		...RING, LOCK	1
15		...RING, RETAINING	1
16		...O-RING	1
17		...WASHER, BACK-UP	1
18		...SEAL, WIPER	1

- ITEM NOT ILLUSTRATED

STEERING CYLINDER ASSEMBLY J19, J19EP

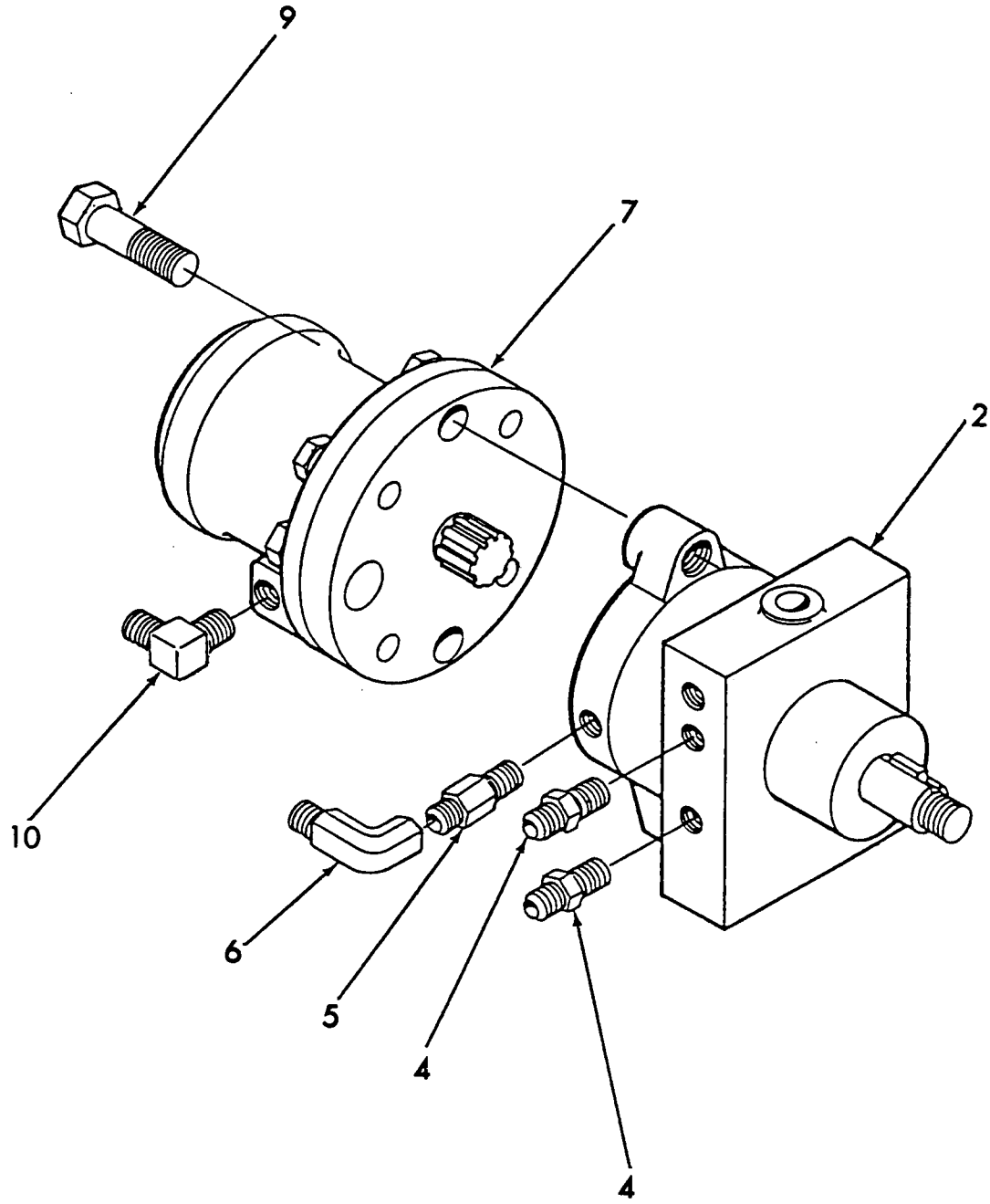


REV.

STEERING CYLINDER ASSEMBLY J19, J19EP

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130675	ASSEMBLY, STEERING CYLINDER (See Sect. 3, Fig. 1A for NHA)	REF
2	80012-03	.ELBOW, STRAIGHT THREAD	2
3	130165	.CYLINDER, STEERING	1
4		..BEARING	1
5	67951	..PISTON	1
6		..NUT, LOCK	1
7	67950	..ROD, CHROME PLATED	1
-8	66640	..KIT, SEAL	1
9		...RING, SLIPPER	1
10		...O-RING	1
11		...O-RING	1
12		...O-RING	1
13		...WASHER, BACKUP	1
14		...RING, LOCK	1
15		...RING, RETAINING	1
16		...O-RING	1
17		...WASHER, BACKUP	1
18		...SEAL, WIPER	1

DRIVE MOTOR AND PARKING BRAKE ASSEMBLY

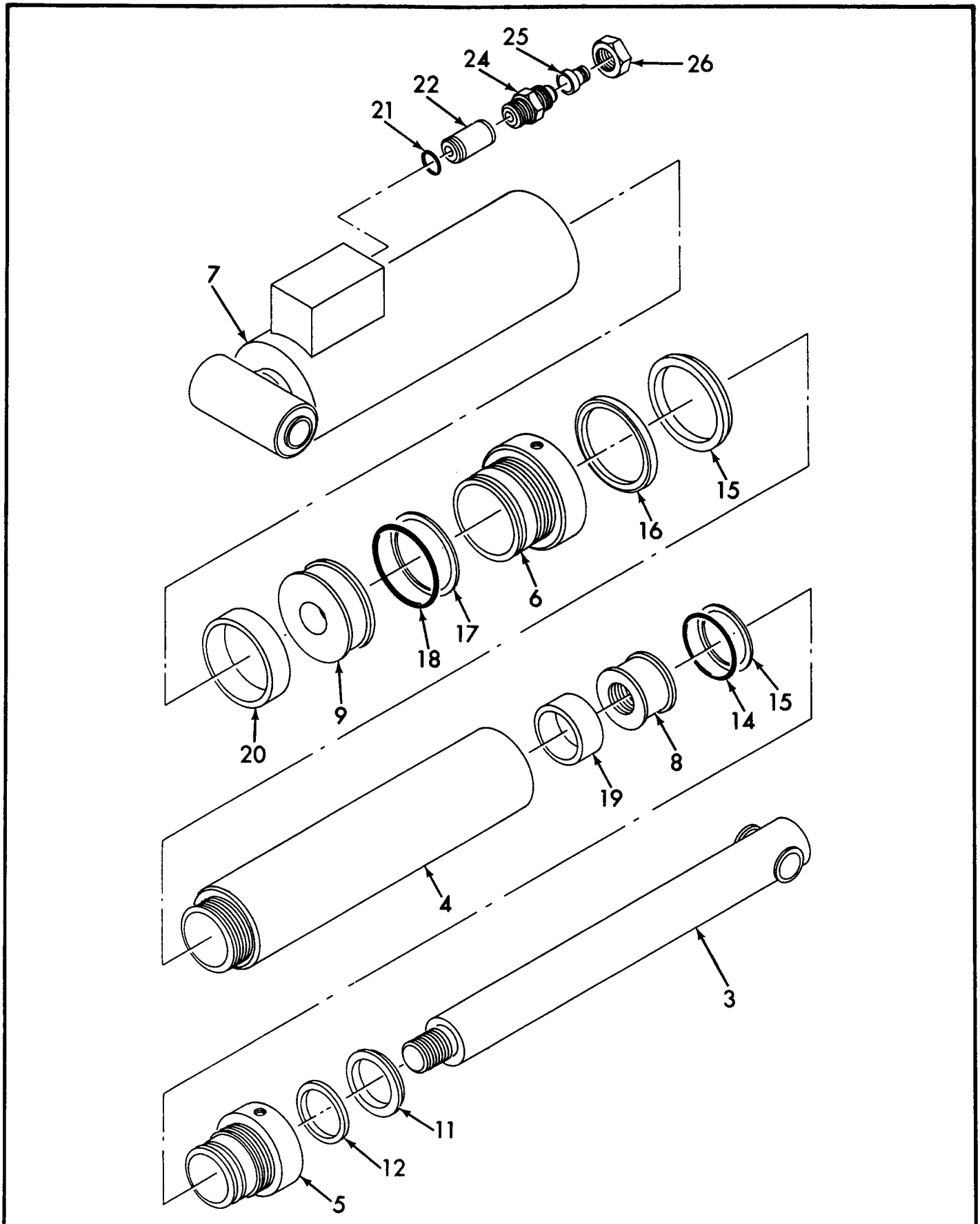


REV.

DRIVE MOTOR AND PARKING BRAKE ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130239	ASSEMBLY, DRIVE MOTOR AND PARKING BRAKE (L.H.) (See Sect. 3, Fig. 1 or 1A for NHA)	REF
2	81291	.MOTOR, DRIVE	1
-3	67771	..KIT, SEAL	1
4	80004-05	.CONNECTOR, STRAIGHT THREAD	2
5	80004-03	.CONNECTOR, STRAIGHT THREAD	1
6	80015-03	.ELBOW, NUT SWIVEL	1
7	81011	.BRAKE, PARKING	1
-8	66852	..KIT, SEAL	1
9	61935	.SCREW, CAP (attaching part)	2
10	80012-03	.ELBOW, STRAIGHT THREAD	1

LIFT CYLINDER ASSEMBLY J14



REV.

LIFT CYLINDER ASSEMBLY J14

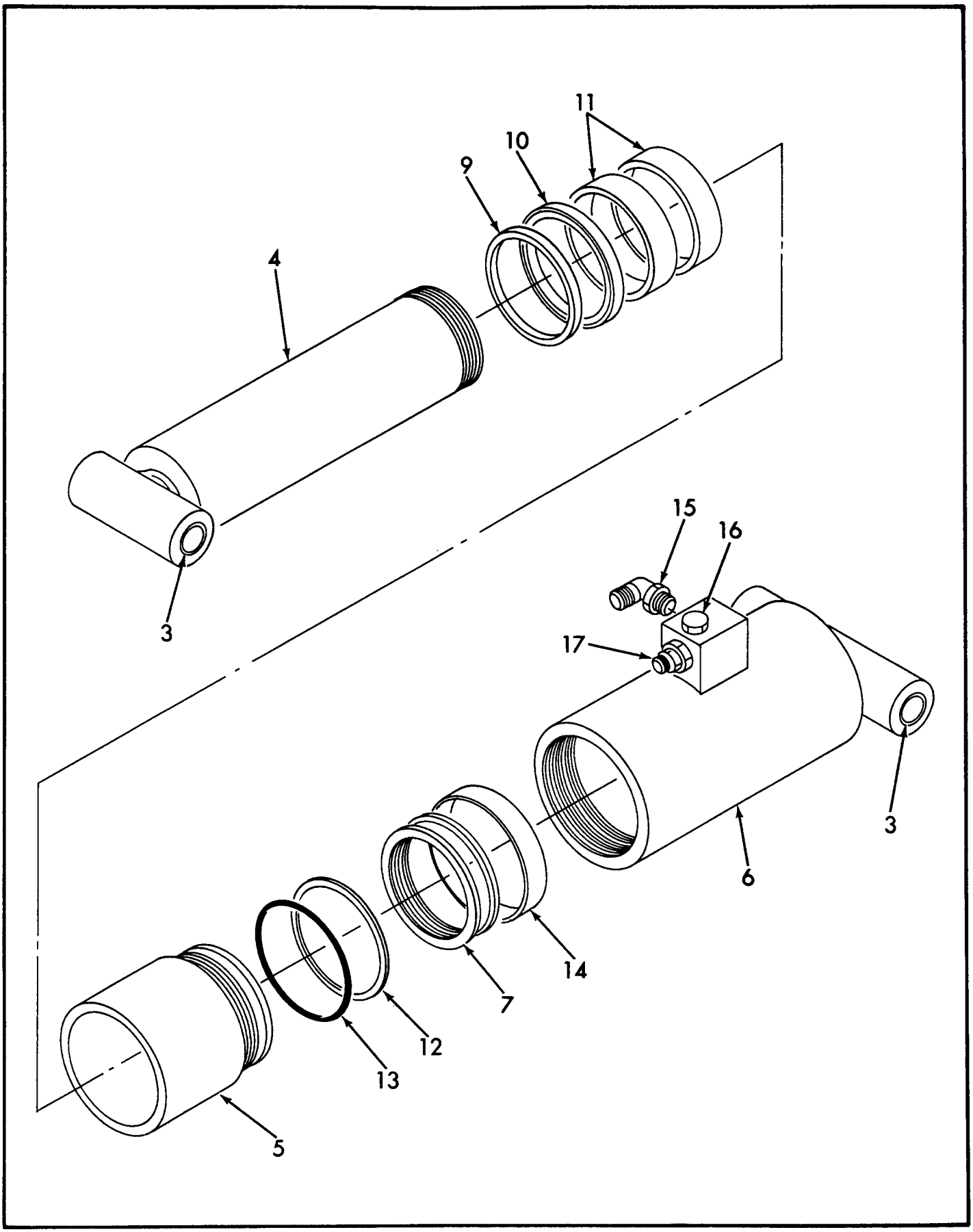
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130236	ASSEMBLY, LIFT CYLINDER	REF
-2	130176	.CYLINDER, LIFT (SE)	1
3		..ROD-INNER	1
4		..ROD-OUTER	1
5		..HEAD-INNER	1
6		..HEAD-OUTER	1
7		..BARREL	1
8		..PISTON-INNER	1
9		..PISTON-OUTER	1
-10	67245	..KIT, SEAL-(SE)(SHOWN) FROM APRIL 1987	1
	66639	..KIT, SEAL-(UH) TILL APRIL 1987	1
11		...WIPER, ROD-INNER	1
12		...SEAL, ROD-INNER	1
13		...B/U-RING, HEAD-INNER	1
14		...O-RING, HEAD-INNER	1
15		...WIPER, ROD-OUTER	1
16		...SEAL, ROD-OUTER	1
17		...B/U-RING, HEAD-OUTER	1
18		...O-RING, HEAD-OUTER	1
19		...RING, PISTON WEAR-INNER	1
20		...RING, PISTON WEAR-OUTER	1
21	880	.O-RING	1
22	130471	.VALVE, CHECK-MODIFICATION	1
-23	30455	..VALVE, FLOW	1
24	80004-14	.CONNECTOR, STRAIGHT THREAD	1

LIFT CYLINDER ASSEMBLY J14

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
25	80056-02	.REDUCER, TUBE END	1
26	80060-06	.NUT	1

- ITEM NOT ILLUSTRATED

LIFT CYLINDER ASSEMBLY J19, J19EP



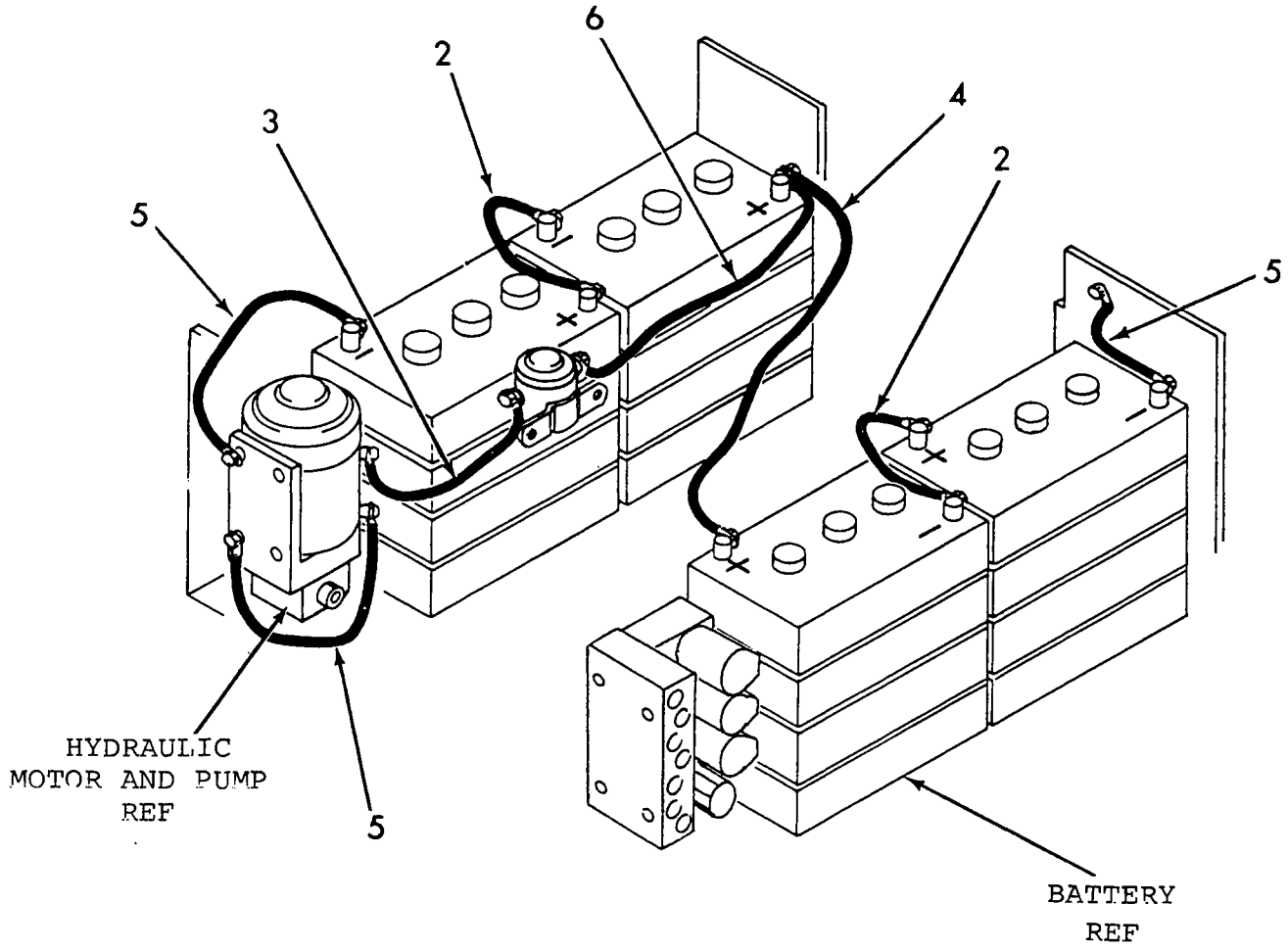
REV.

LIFT CYLINDER ASSEMBLY J19, J19EP

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130583	ASSEMBLY, LIFT CYLINDER	REF
-2	130452	.CYLINDER, LIFT (SE)	1
3		..BUSHING	4
4		..ROD	1
5		..HEAD	1
6		..BARREL	1
7		..PISTON	1
-8	67244	..KIT, SEAL (SE)(SHOWN) FROM JAN. 1988	1
	66657	..KIT, SEAL (C-W) TILL DEC.1987/JAN. 1988	1
9		...WIPER, TOD	1
10		...SEAL, ROD	1
11		...RING, WEAR-HEAD	2
12		...B/U-RING	1
13		...O-RING	1
14		...RING, WEAR-PISTON	1
15	80012-05	.ELBOW, STRAIGHT THREAD	1
16	80050-03	.PLUG, HEX HEAD	1
17	81059	.VALVE, FLOW CONTROL	1

- ITEM NOT ILLUSTRATED

BATTERY CABLE KIT

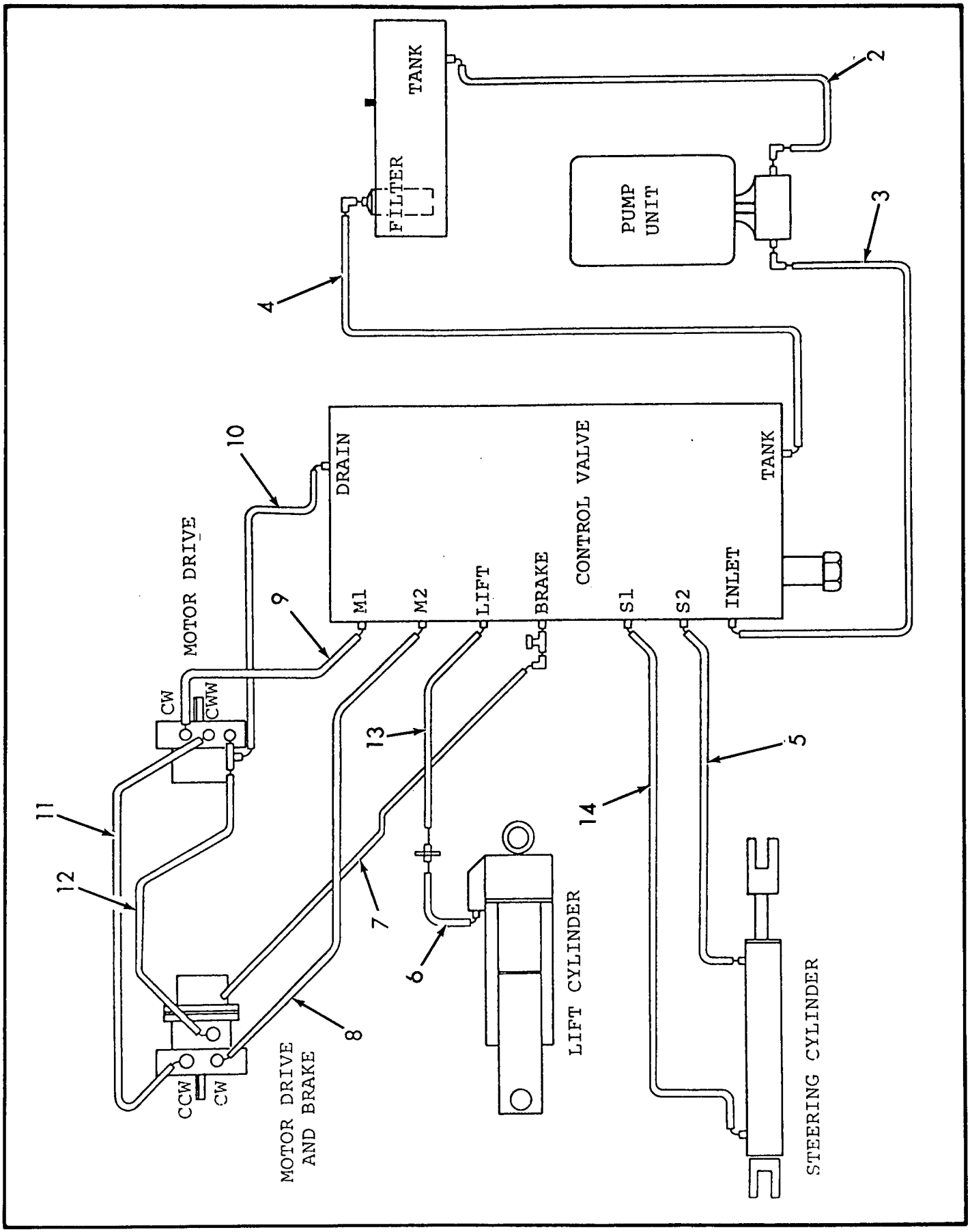


BATTERY CABLE KIT

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130231	KIT, BATTERY CABLE (See Sect. 3, Fig. 1 or 1A for NHA)	REF
2	13226-0060	.ASSEMBLY, ELECTRICAL CABLE	2
3	13226-0590	.ASSEMBLY, ELECTRICAL CABLE	1
4	13226-0300	.ASSEMBLY, ELECTRICAL CABLE	1
5	13226-0180	.ASSEMBLY, ELECTRICAL CABLE	2
6	13226-0090	.ASSEMBLY, ELECTRICAL CABLE	1

- ITEM NOT ILLUSTRATED

HYDRAULIC HOSE ASSEMBLY J14

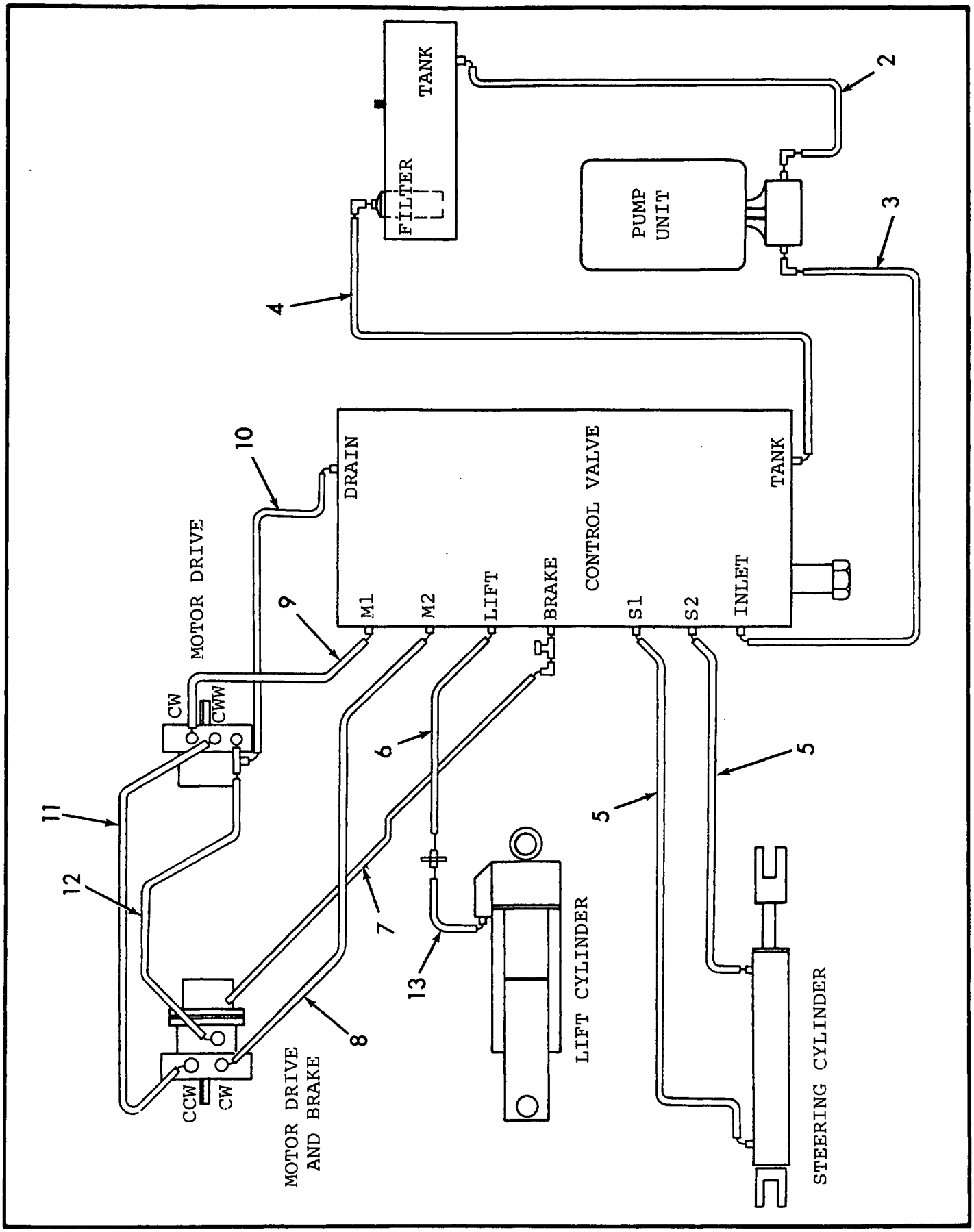


HYDRAULIC HOSE DIAGRAM J14

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130229	DIAGRAM, HYDRAULIC HOSE (See Sect. 3, Fig. 1 for NHA)	REF
2	13213-08-0230	.ASSEMBLY, HOSE	1
3	13213-06-0354	.ASSEMBLY, HOSE	1
4	13213-06-0144	.ASSEMBLY, HOSE	1
5	13214-04-0574	.ASSEMBLY, HOSE	1
6	13218-04-0276	.ASSEMBLY, HOSE	1
7	13211-04-0614	.ASSEMBLY, HOSE	1
8	13214-04-0654	.ASSEMBLY, HOSE	1
9	13213-04-0680	.ASSEMBLY, HOSE	1
10	13214-04-0700	.ASSEMBLY, HOSE	1
11	13213-04-0180	.ASSEMBLY, HOSE	1
12	13213-04-0160	.ASSEMBLY, HOSE	1
13	13219-04-0120	.ASSEMBLY, HOSE	1
14	13214-04-0576	.ASSEMBLY, HOSE	1

- ITEM NOT ILLUSTRATED

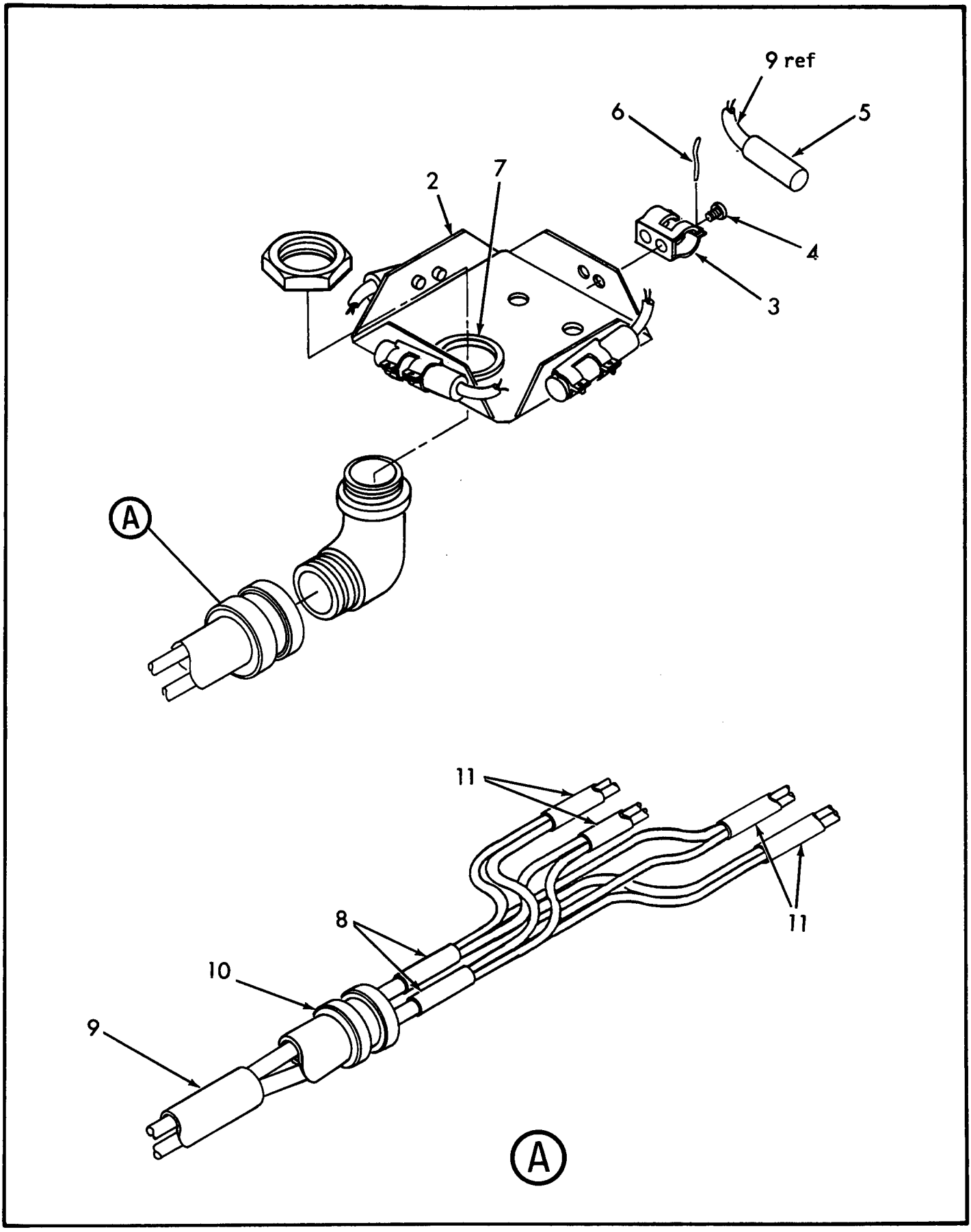
HYDRAULIC HOSE DIAGRAM J19, J19EP



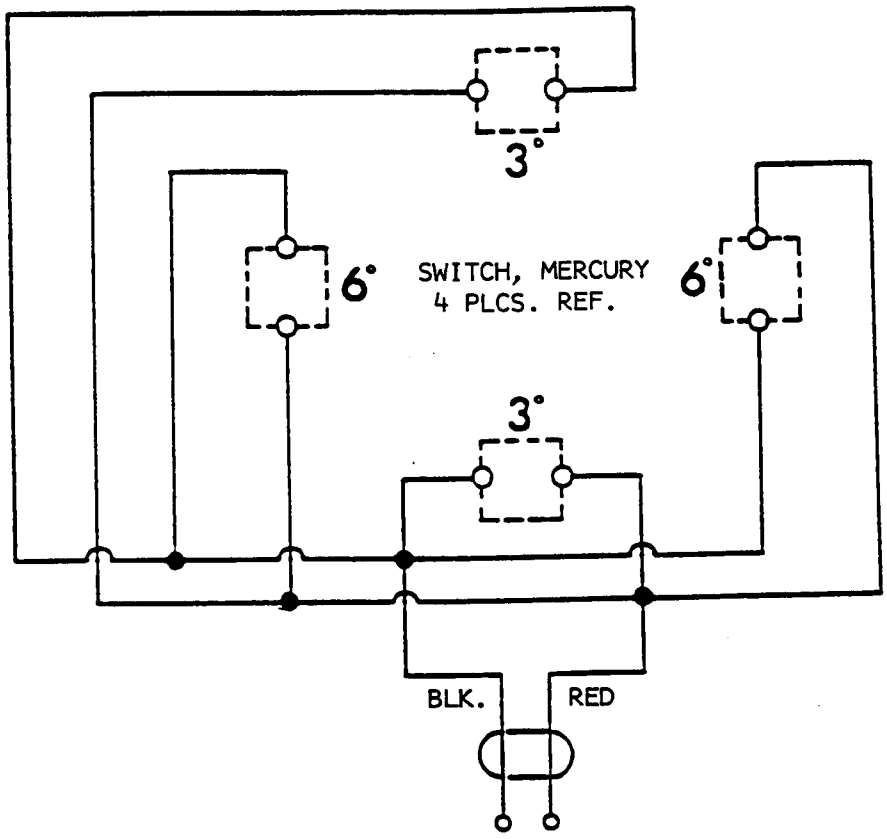
HYDRAULIC HOSE DIAGRAM J19, J19EP

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130588	DIAGRAM, HYDRAULIC HOSE (See Sect. 3, Fig. 1A for NHA)	REF
2	13203-08-0250	.ASSEMBLY, HOSE	1
3	13213-06-0624	.ASSEMBLY, HOSE	1
4	13215-06-0196-0	.ASSEMBLY, HOSE	1
5	13211-04-0694	.ASSEMBLY, HOSE	2
6	13216-04-0324	.ASSEMBLY, HOSE	1
7	13211-04-0654	.ASSEMBLY, HOSE	1
8	13216-04-0714	.ASSEMBLY, HOSE	1
9	13211-04-0674	.ASSEMBLY, HOSE	1
10	13213-04-0744	.ASSEMBLY, HOSE	1
11	13214-04-0244	.ASSEMBLY, HOSE	1
12	13213-04-0254	.ASSEMBLY, HOSE	1
13	13213-04-0284	.ASSEMBLY, HOSE	1

TILT SWITCH ASSEMBLY



REV.



WIRING DIAGRAM

TILT SWITCH ASSEMBLY

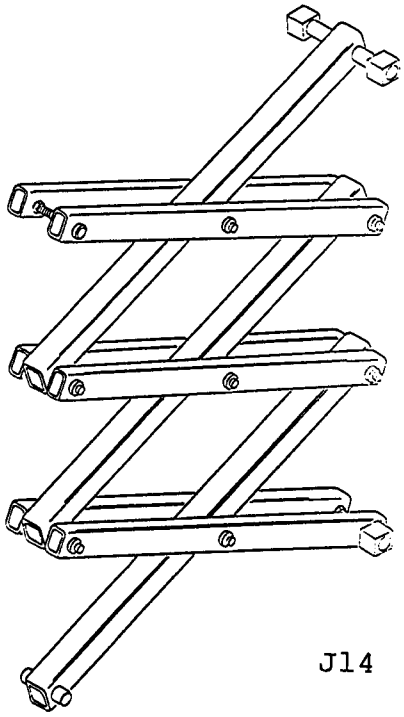
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130193	ASSEMBLY, TILT SWITCH (See Sect. 3, Fig. 5 for NHA)	REF
2	30385	.BRACKET, TILT SWITCH	1
3	199-A	.BRACKET, MICRO SWITCH	4
4	62605	.SCREW, MACHINE (attaching part)	8
5	4014	.SWITCH, MERCURY	4
6	2626	.WIRE, SAFETY	AR
7	70230	.GROMMET, RUBBER	1
8	117-D	.CONNECTOR, BUTT	2
9	229	.CABLE, ELECTRIC	1
10	16306	.TUBE, HEAT SHRINK	1
11	16307	.TUBE, HEAT SHRINK	1

- ITEM NOT ILLUSTRATED

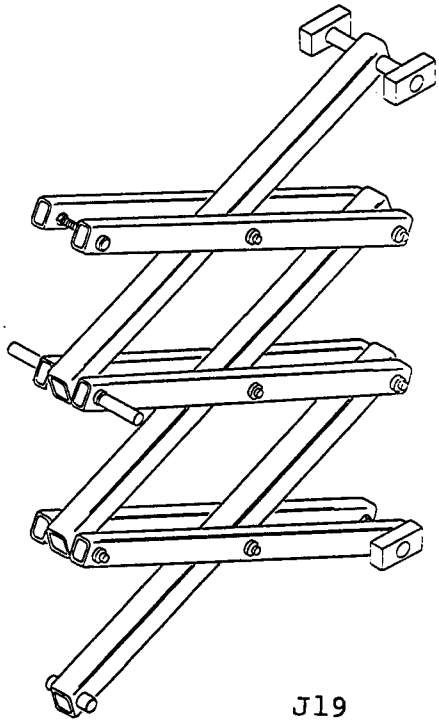
THE MARKLIFT SCISSOR ASSEMBLY

THIS SECTION 4 CONTAINS THE FOLLOWING FIGURES:

FIGURE NO.	TITLE
1	SCISSOR ASSEMBLY J14
1A	SCISSOR ASSEMBLY J19, J19EP
2	INNER BOTTOM ARM WELDMENT J14
2A	INNER BOTTOM ARM WELDMENT J19, J19EP
3	INNER MIDDLE ARM WELDMENT J14
3A	INNER MIDDLE ARM WELDMENT J19, J19EP
4	INNER TOP ARM WELDMENT J14
4A	INNER TOP ARM WELDMENT J19, J19EP
5	OUTER TOP AND MIDDLE ARM WELDMENT J14
5A	OUTER TOP AND MIDDLE ARM WELDMENT J19, J19EP
6	OUTER BOTTOM ARM WELDMENT J14
6A	OUTER BOTTOM ARM WELDMENT (L.H.) J19, J19EP
7	OUTER BOTTOM ARM WELDMENT (R.H.) J19, J19EP

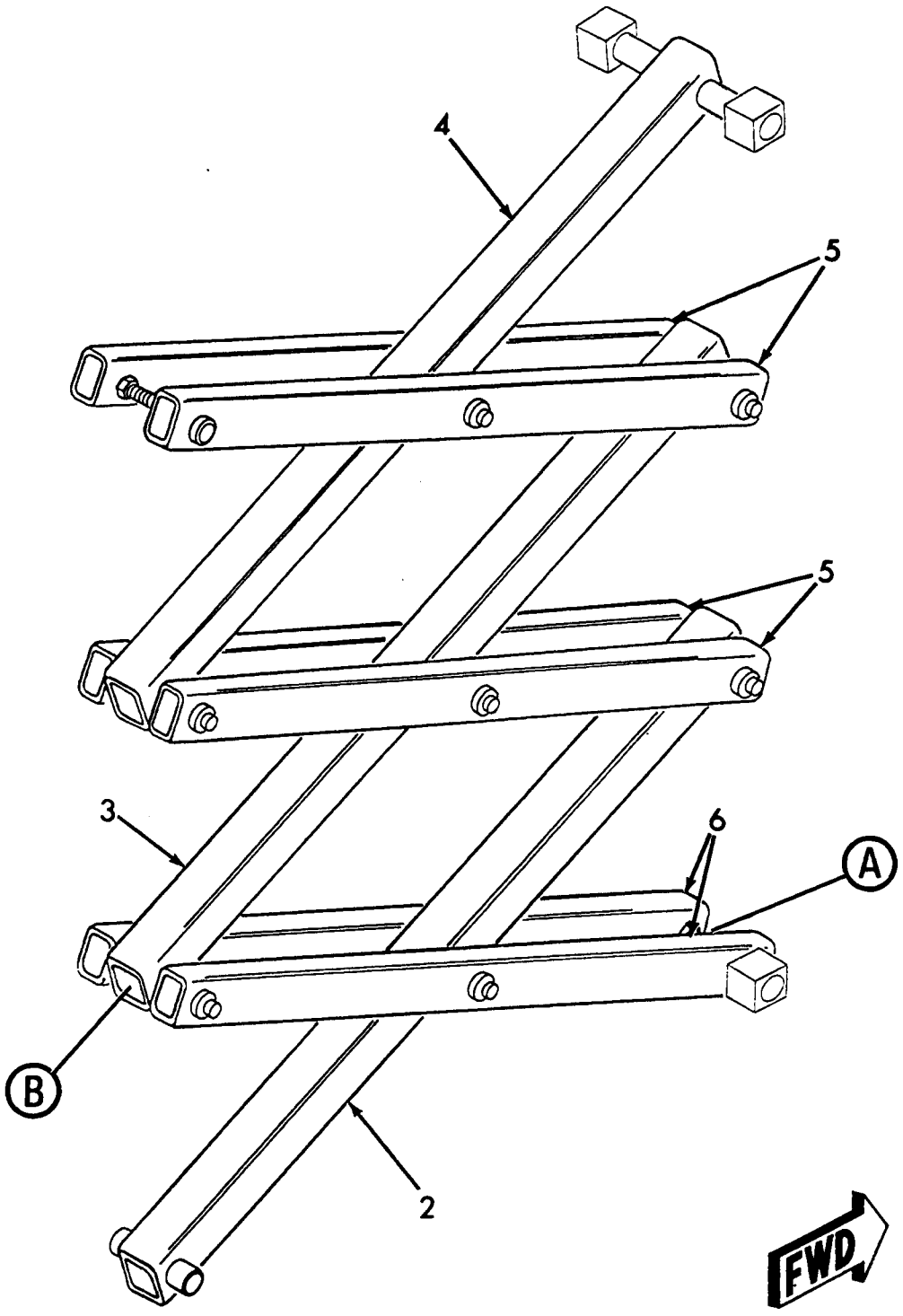


J14

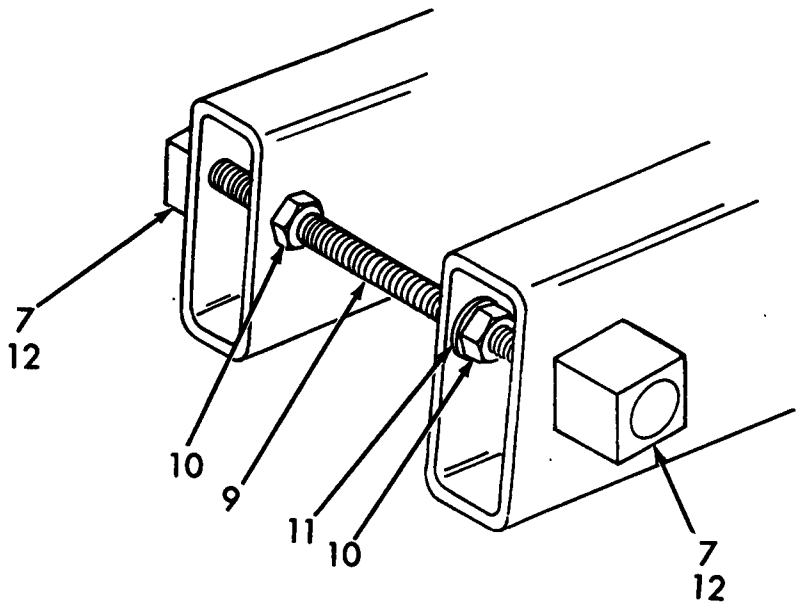


J19

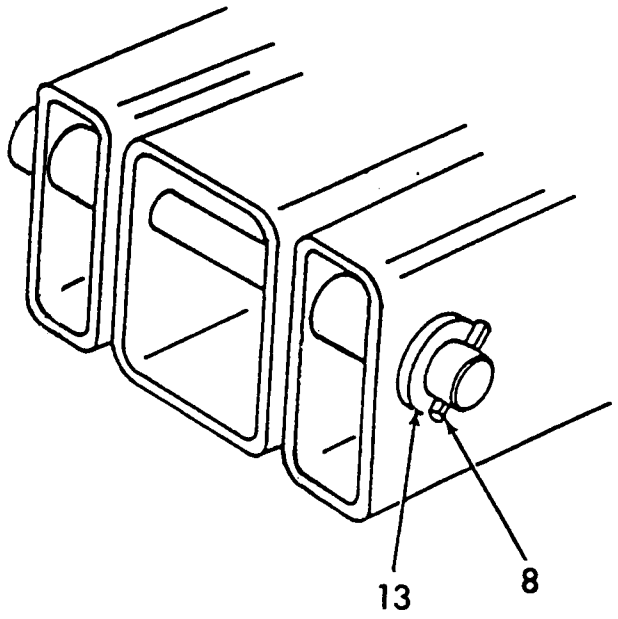
SCISSOR ASSEMBLY J14



SCISSOR ASSEMBLY J14



A



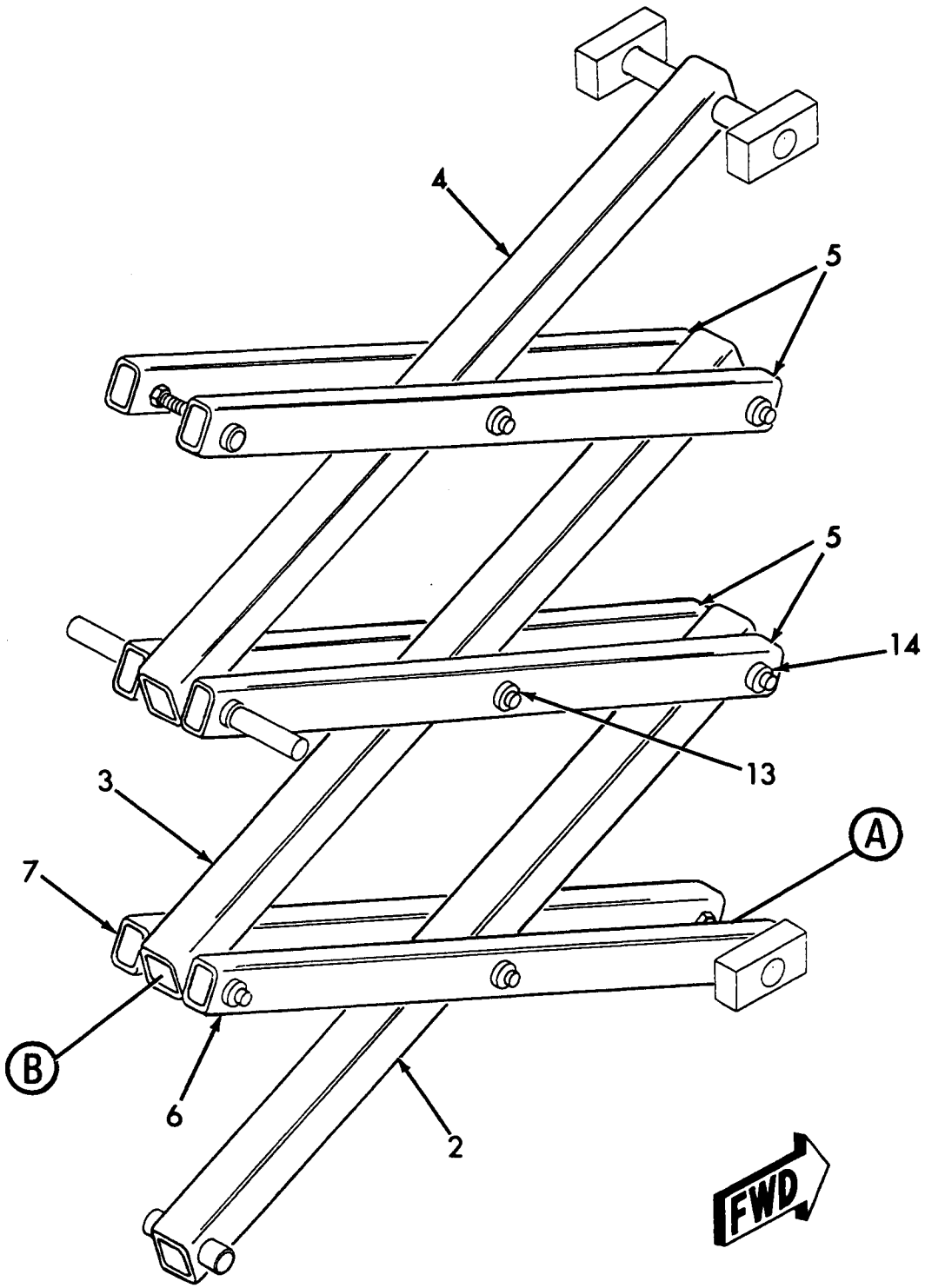
B

SCISSOR ASSEMBLY J14

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130141	ASSEMBLY, SCISSOR J14 (See Sect. 2, Fig. 1 for NHA)	REF
2	130160	.WELDMENT, INNER BOTTOM ARM (See Sect. 4, Fig. 2 for Details)	1
3	130159	.WELDMENT, INNER MIDDLE ARM (See Sect. 4, Fig. 3 for Details)	1
4	130158	.WELDMENT, INNER TOP ARM (See Sect. 4, Fig. 4 for Details)	1
5	130157	.WELDMENT, OUTER TOP & MIDDLE ARM (See Sect. 4, Fig. 5 for Details)	4
6	130161	.WELDMENT, OUTER BOTTOM ARM (See Sect. 4, Fig. 6 for Details)	2
7	130838	.SHAFT	4
8	64206	.PIN, ROLL	14
9	63665	.THREADER ROD	1
10	60705	.NUT, HEX	4
11	63305	.WASHER, LOCK SPLIT	2
12	130833	.WEAR PAD	4
13	130807	.SPACER, OUTER	14

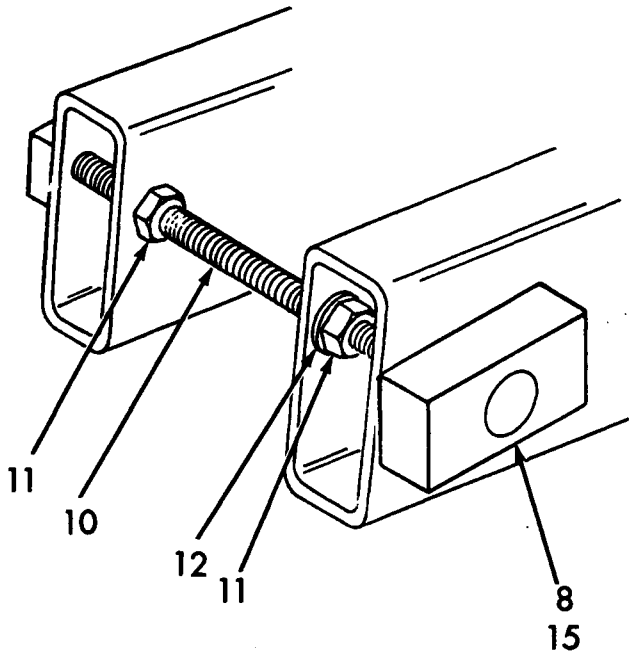
- ITEM NOT ILLUSTRATED

SCISSOR ASSEMBLY J19, J19EP

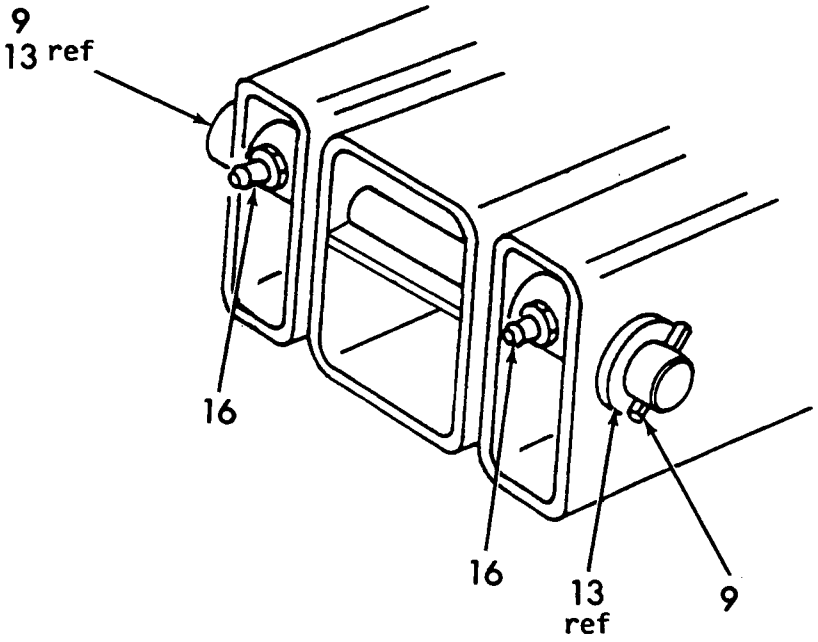


REV.

SCISSOR ASSEMBLY J19, J19EP



A



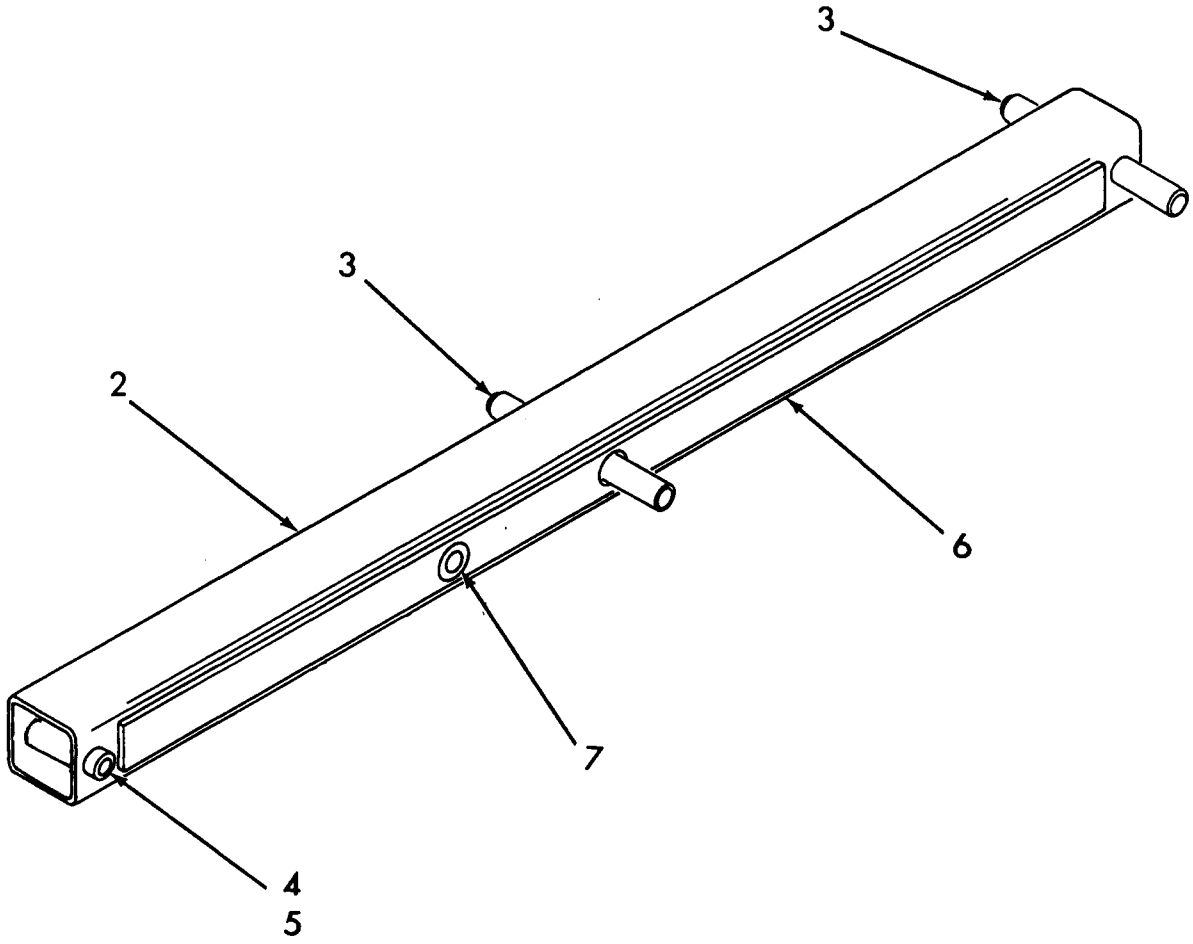
B

SCISSOR ASSEMBLY J19, J19EP

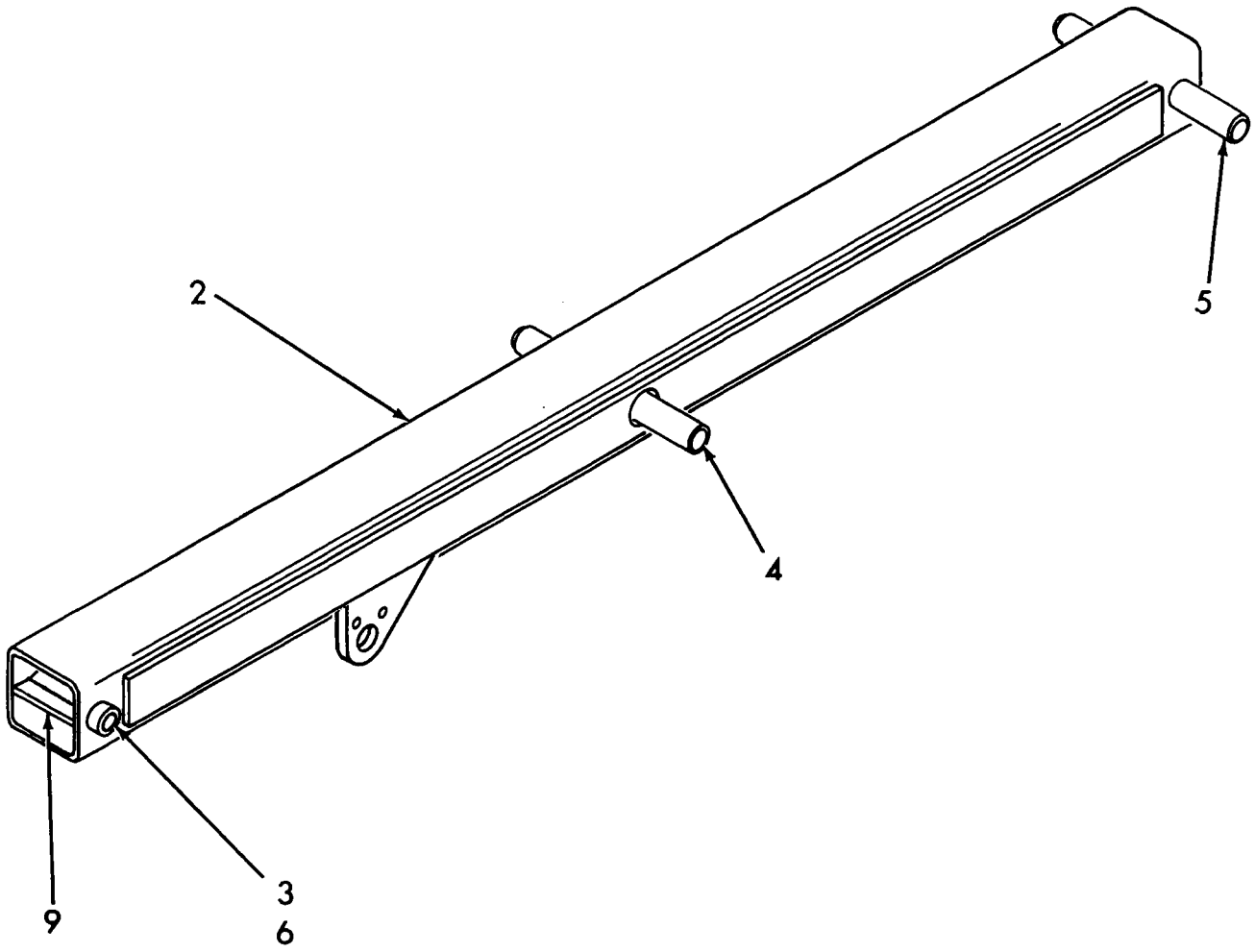
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130526	ASSEMBLY, SCISSOR (See Sect. 2, Fig. 1 for NHA)	REF
2	130529	.WELDMENT, INNER BOTTOM ARM (See Sect. 4, Fig. 2A for Details)	1
3	130532	.WELDMENT, INNER MIDDLE ARM (See Sect. 4, Fig. 3A for Details)	1
4	130534	.WELDMENT, INNER TOP ARM (See Sect. 4, Fig. 4A for Details)	1
5	130538	.WELDMENT, OUTER TOP AND MIDDLE ARM (See Sect. 4, Fig. 5A for Details)	4
6	130536	.WELDMENT, OUTER BOTTOM ARM (L.H.) (See Sect. 4, Fig. 6A for Details)	1
7	131113	.WELDMENT, OUTER BOTTOM ARM (R.H.) (See Sect. 4, Fig. 7 for Details)	1
8	130838	.SHAFT	4
9	64206	.PIN, ROLL	14
10	63634	.THREADED ROD	1
11	60705	.NUT, HEX	4
12	63305	.WASHER, LOCK SPLIT	2
13	130806	.SPACER, CENTER	6
14	130807	.SPACER, OUTER	8
15	130834	.WEAR PAD	4
16	65103	.GREASE FITTING	10

- ITEM NOT ILLUSTRATED

INNER BOTTOM ARM WELDMENT J14



INNER BOTTOM ARM WELDMENT J19, J19EP



REV.

INNER BOTTOM ARM WELDMENT J14

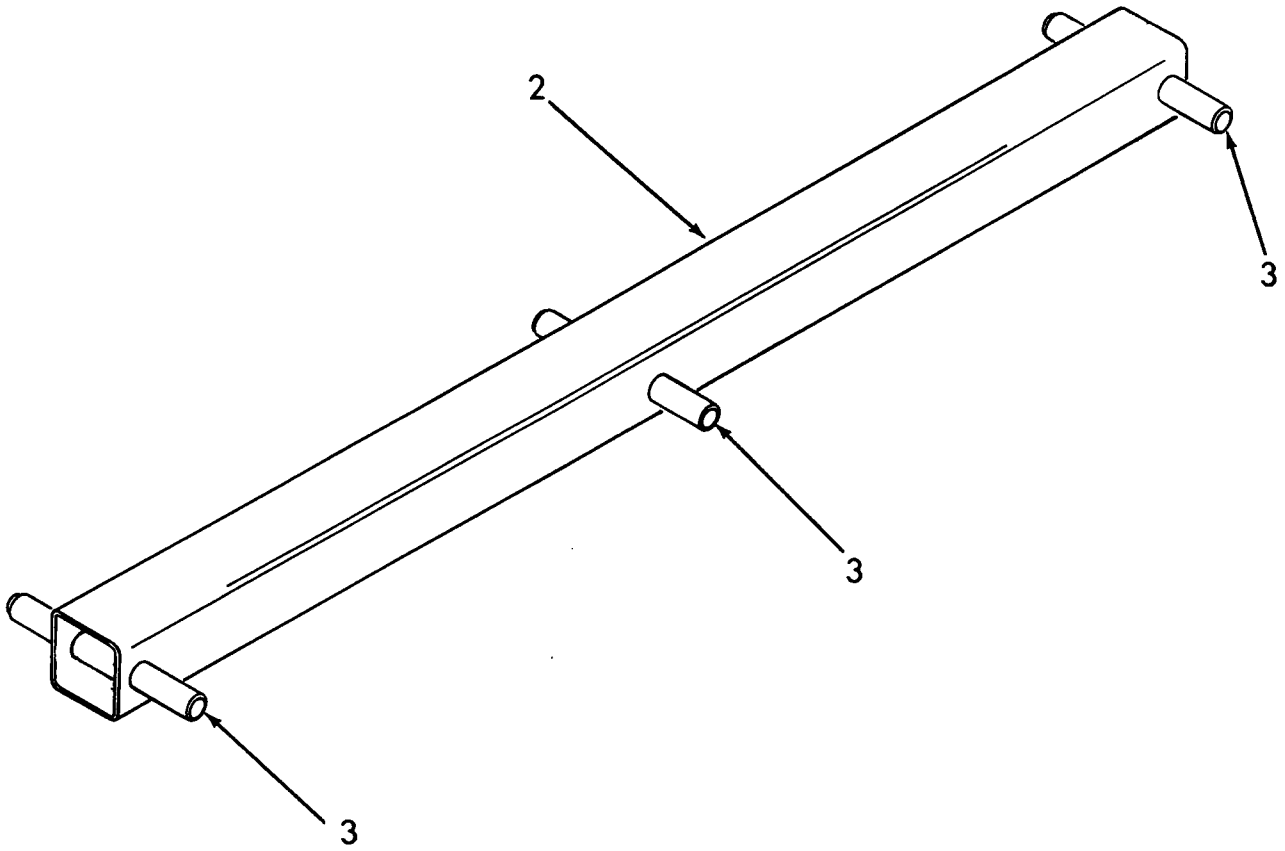
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130160	WELDMENT, INNER BOTTOM ARM (See Sect. 4, Fig. 1 for NHA)	REF
2	130155	.ARM, FABRICATION	1
3	130451	.PIN, ARM	2
4	35950	.TUBE, ROUND	1
5	64917	.BUSHING	2
6	130212	.ARM, STIFFENER	2
7	130226	.BOSS, CYLINDER MTG.	2

- ITEM NOT ILLUSTRATED

INNER BOTTOM ARM WELDMENT J19, J19EP

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130529	WELDMENT, INNER BOTTOM ARM (See Sect. 4, Fig. 1 for NHA)	REF
2	130530	.MACHINING, INNER BOTTOM ARM	1
3	130552	.SLEEVE	1
4	130540	.PIN, CENTER	1
5	130541	.PIN, END	1
6	131055	.BUSHING	2
-7	37033	.TUBE, ROUND	1
-8	131089	.STIFFENER	1
9	131088	.STIFFENER	1

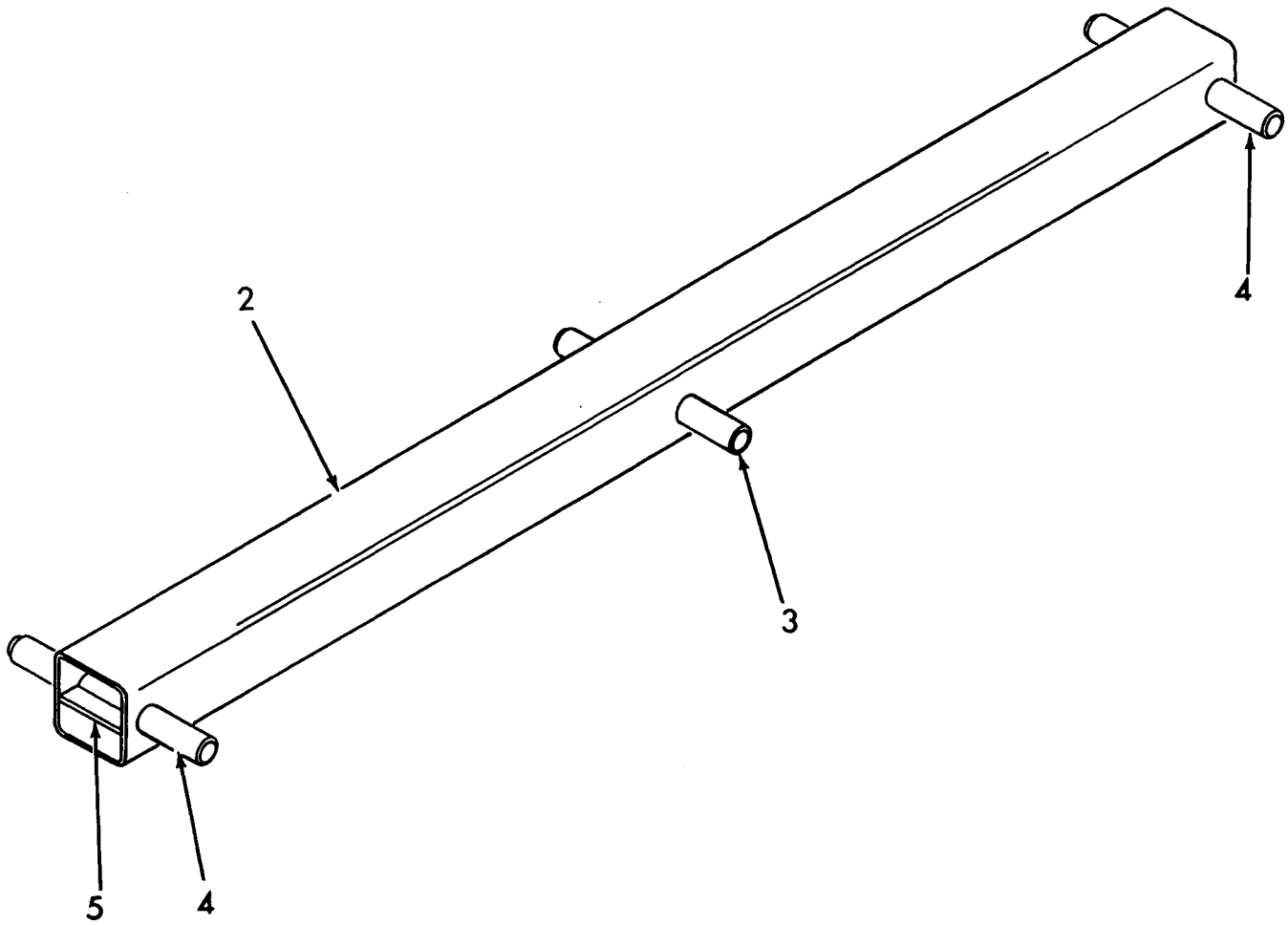
INNER MIDDLE ARM WELDMENT J14



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130159	WELDMENT, INNER MIDDLE (See Sect. 4, Fig. 1 for NHA)	REF
2	130154	.ARM, FABRICATION	1
3	130451	.PIN, ARM	3

REV.

INNER MIDDLE ARM WELDMENT J19, J19EP

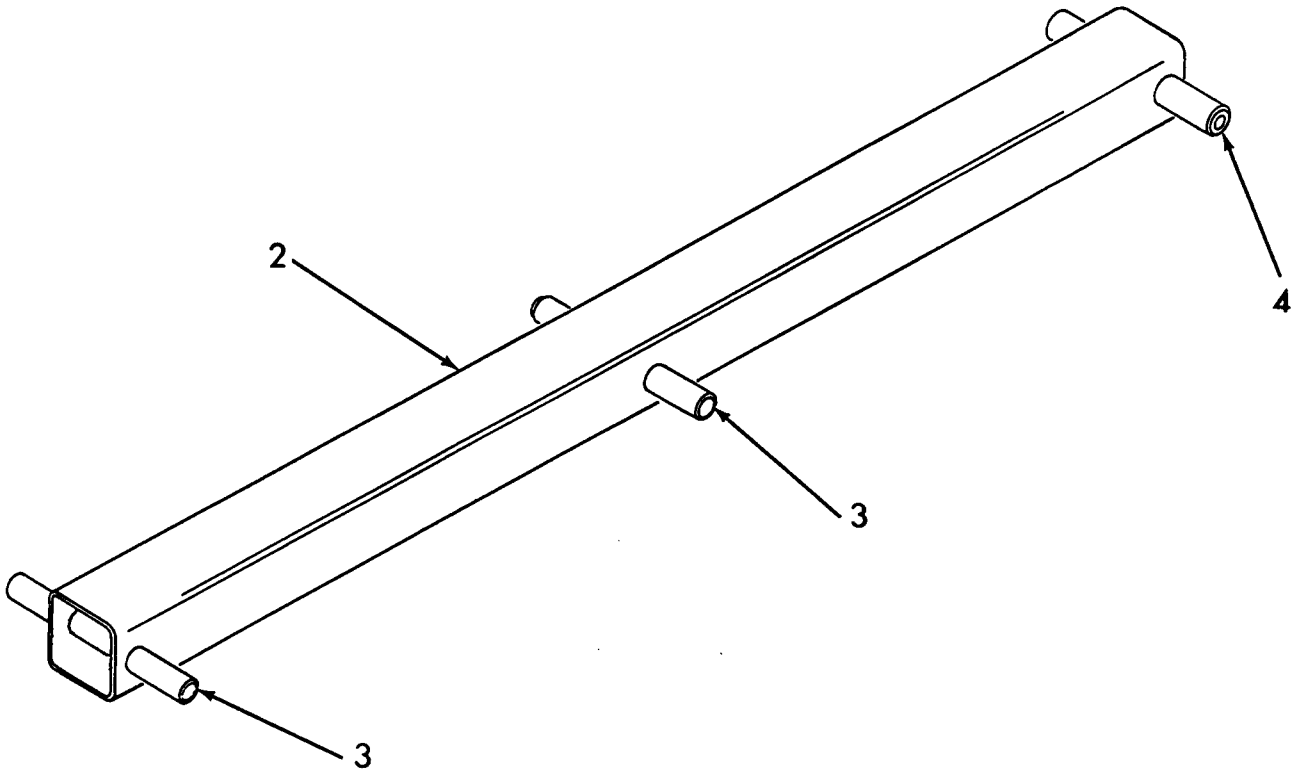


REV.

INNER MIDDLE ARM WELDMENT J19, J19EP

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130532	WELDMENT, INNER MIDDLE ARM (See Sect. 4, Fig. 1 for NHA)	REF
2	130533	.MACHINING, INNER MIDDLE ARM	1
3	130540	.PIN, CENTER	1
4	130541	.PIN, END	2
5	131089	.STIFFENER	2

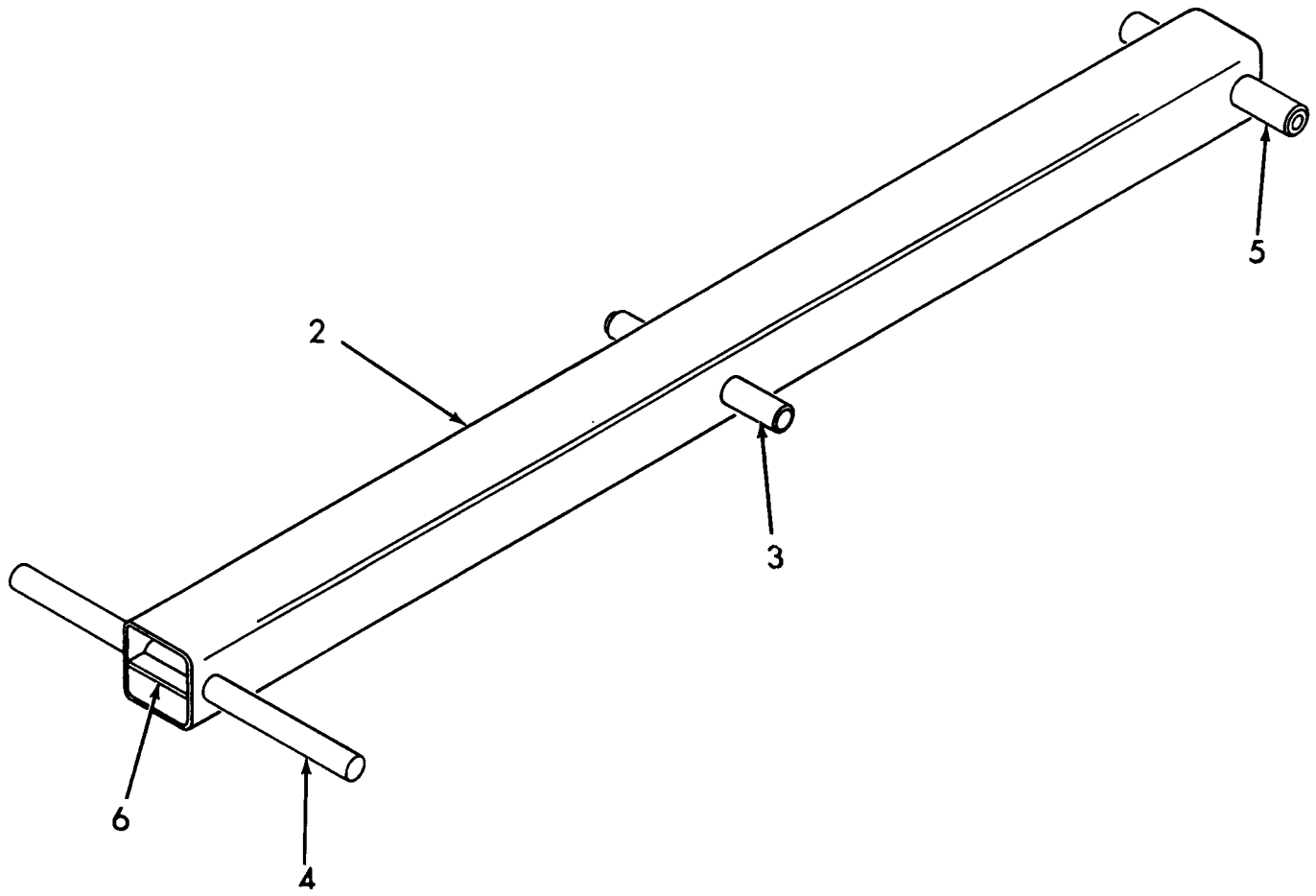
INNER TOP ARM WELDMENT J14



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130158	WELDMENT, INNER TOP ARM (See Sect. 4, Fig. 1 for NHA)	REF
2	130153	.ARM, FABRICATION	1
3	130451	.PIN, ARM	2
4	130146	.BRACKET, ROLLER SUPPORT	1

REV.

INNER TOP ARM WELDMENT J19, J19EP



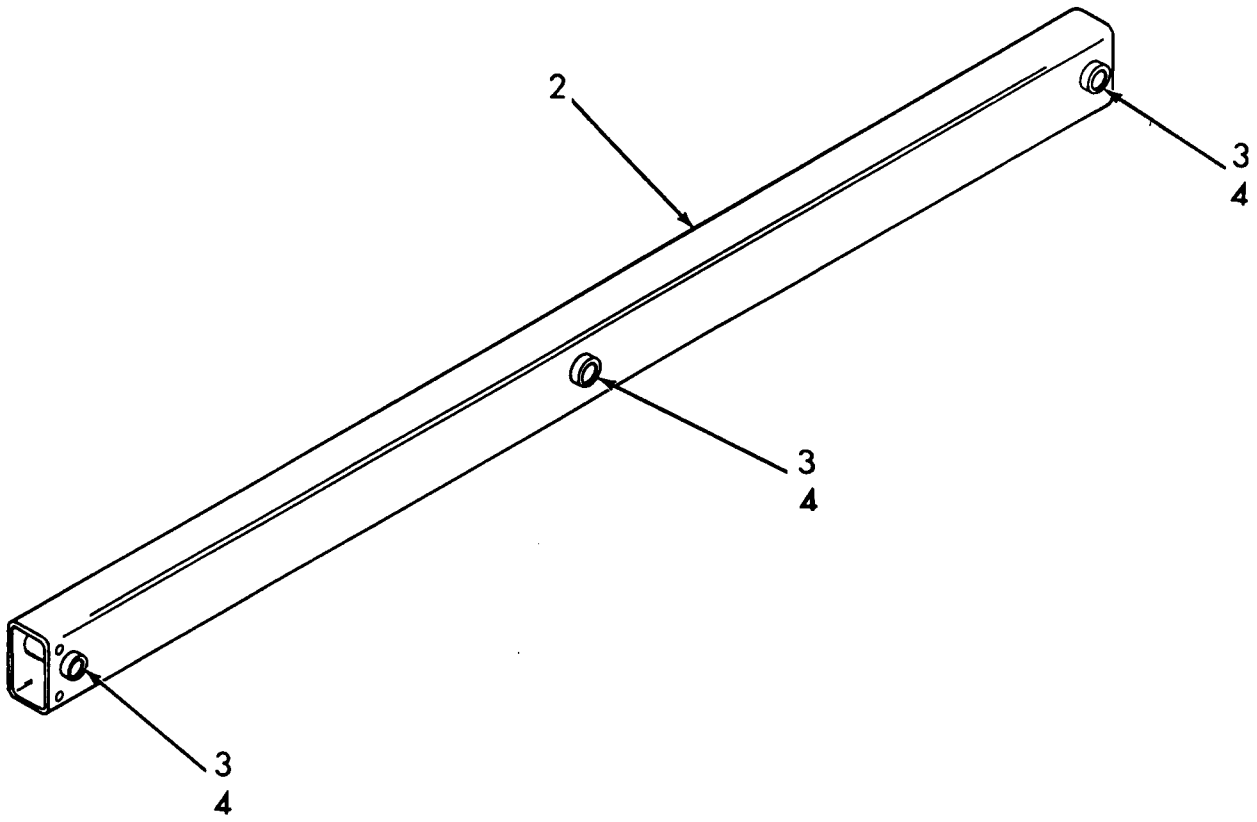
REV.

INNER TOP ARM WELDMENT J19, J19EP

ITEM	PART NUMBER	1234567 DESCRIPTION	UNIT PER ASSY.
-1	130534	WELDMENT, INNER TOP ARM (See Sect. 4, Fig. 1 for NHA)	REF
2	130535	.MACHINING, INNER TOP ARM	1
3	130540	.PIN, CENTER	1
4	130578	.PIN, STEP	1
5	130544	.BRACKET, ROLLER	1
6	131089	.STIFFENER	1

- ITEM NOT ILLUSTRATED

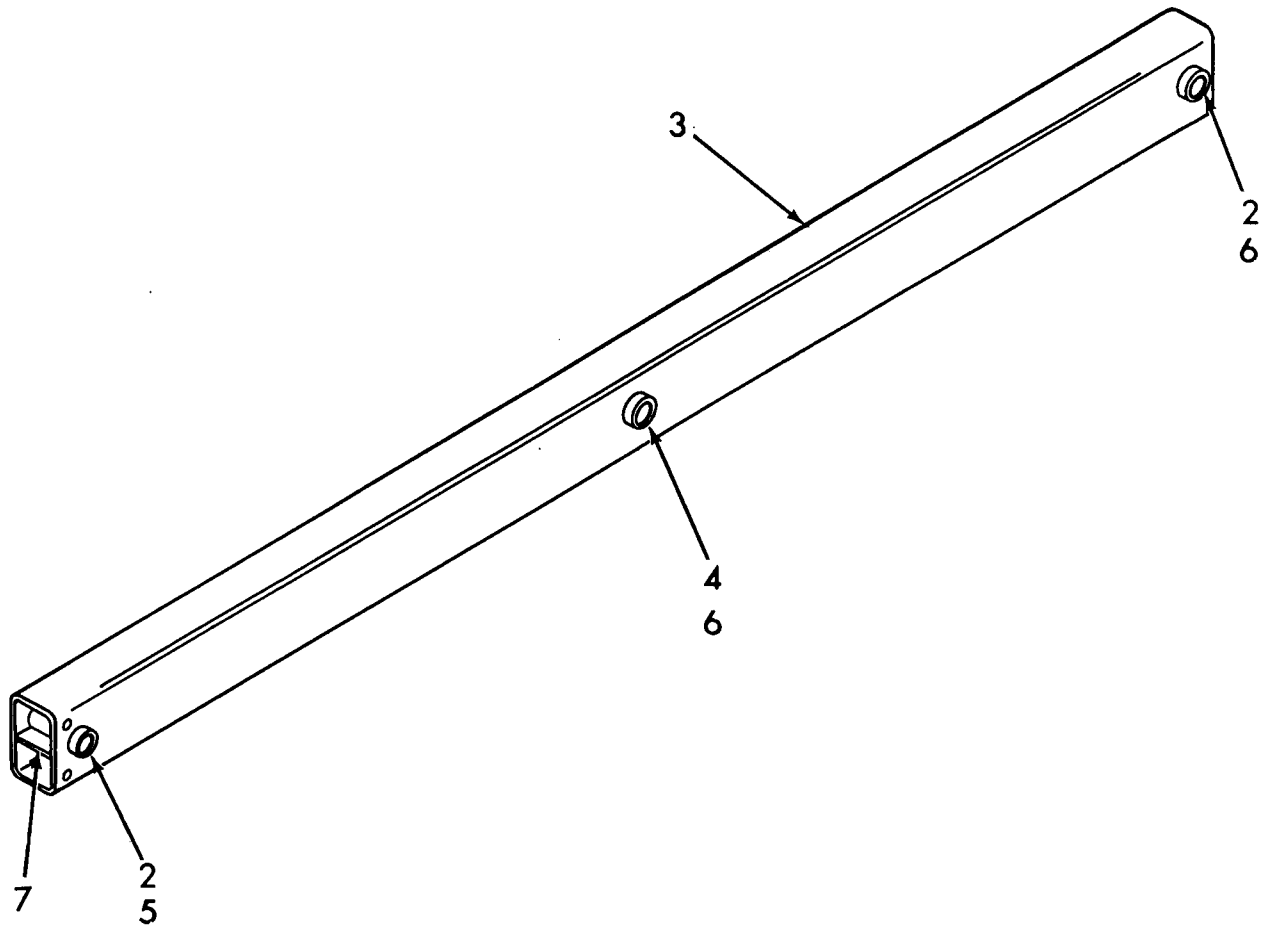
OUTER TOP & MIDDLE ARM WELDMENT J14



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130157	WELDMENT, OUTER TOP & MIDDLE (See Sect. 4, Fig. 1 for NHA)	REF
2	130152	.ARM, FABRICATION	1
3	35947	.TUBING, ROUND	3
4	64917	.BUSHING	3

REV.

OUTER TOP & MIDDLE ARM WELDMENT J19, J19EP

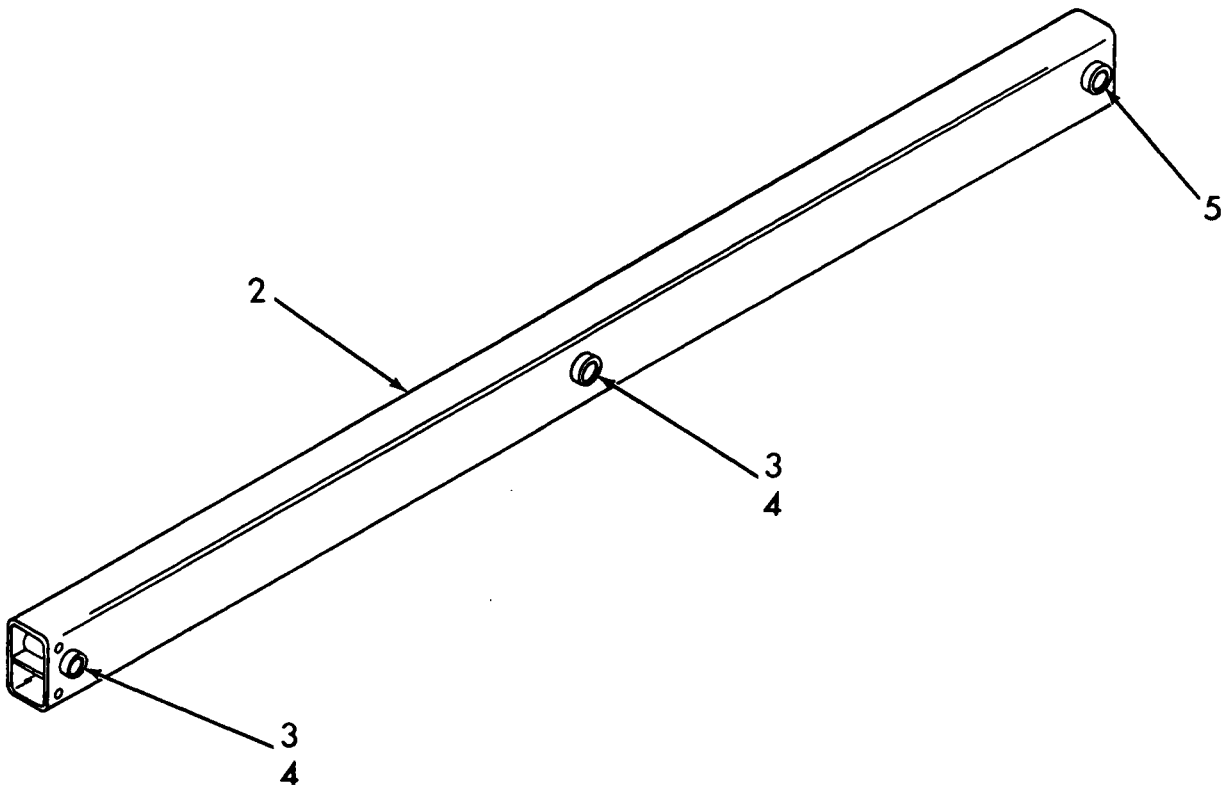


OUTER TOP & MIDDLE ARM WELDMENT J19, J19EP

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130538	WELDMENT, OUTER TOP AND MIDDLE ARM (See Sect. 4, Fig. 1 for NHA)	REF
2	130543	.SLEEVE, END	2
3	130539	.MACHINING, OUTER TOP AND MIDDLE	1
4	130542	.SLEEVE, CENTER	1
5	65614	.BUSHING	4
6	65613	.BUSHING	1
7	131087	.STIFFENER	2

- ITEM NOT ILLUSTRATED

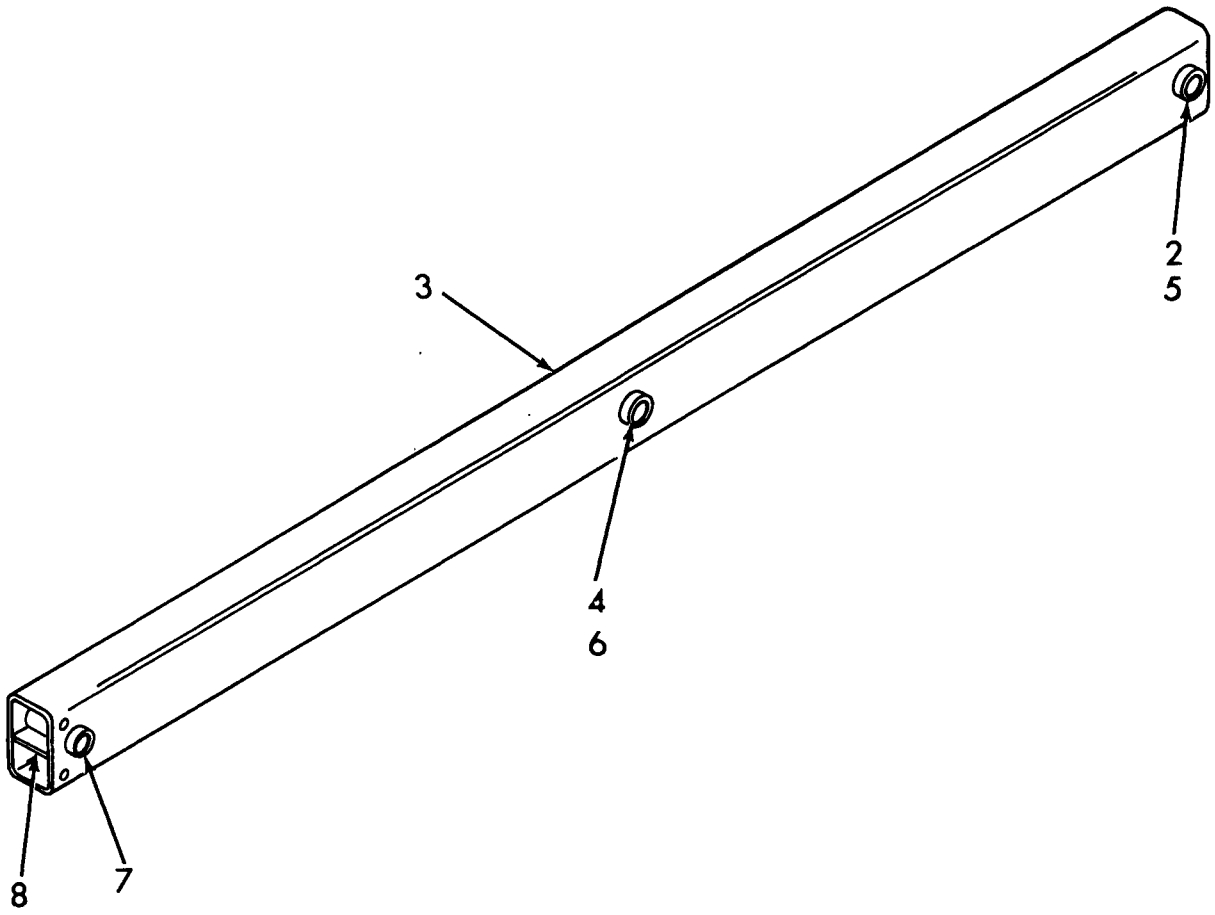
OUTER BOTTOM ARM WELDMENT J14



ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130161	WELDMENT, OUTER BOTTOM ARM (See Sect. 4, Fig. 1 for NHA)	REF
2	130156	.ARM, FABRICATION	1
3	35947	.SLEEVE	2
4	64917	.BUSHING	2
5	130168	.BRACKET, ROLLER SUPPORT	1

REV.

OUTER BOTTOM ARM WELDMENT (L.H.)



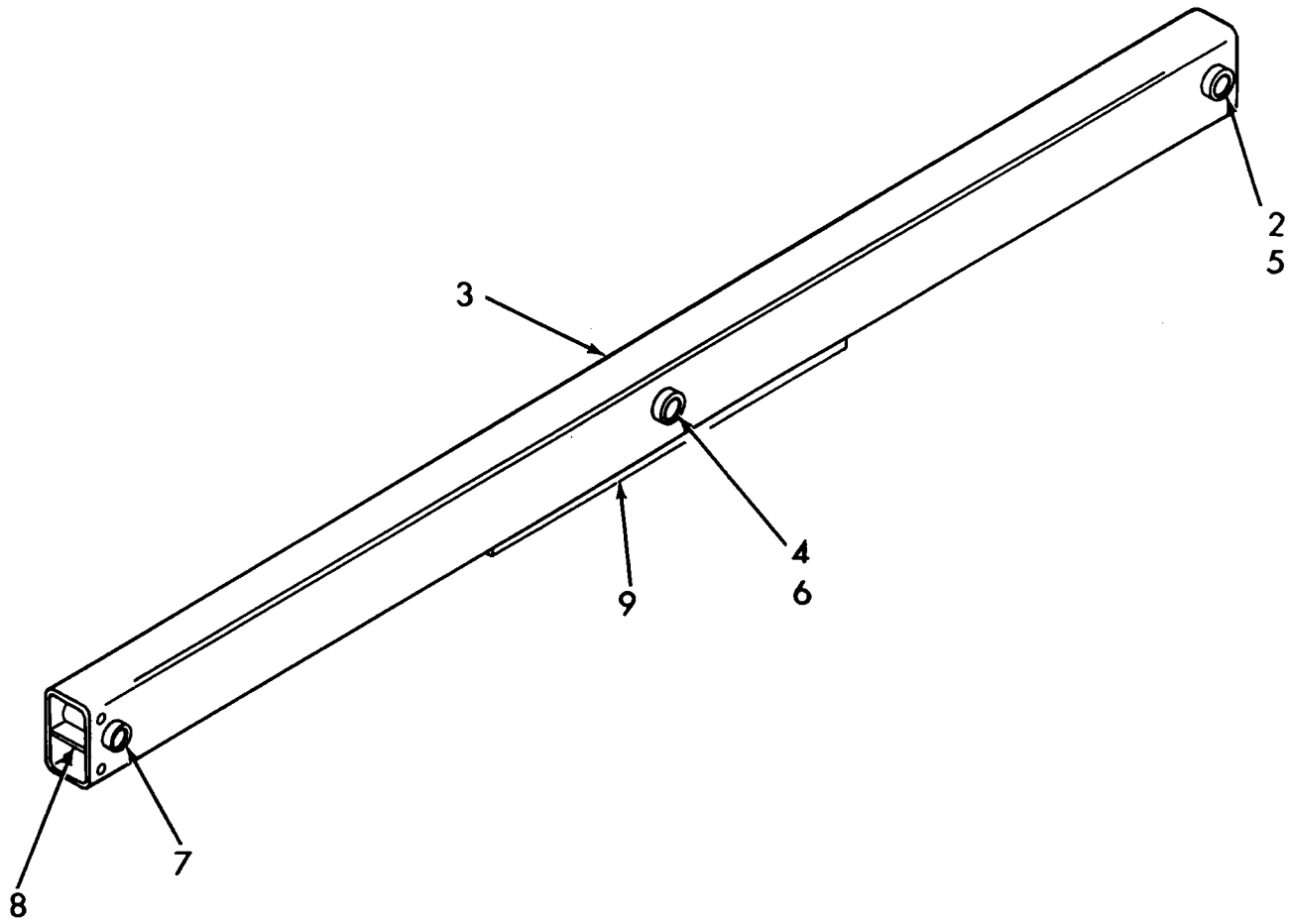
REV.

OUTER BOTTOM ARM WELDMENT (L.H.)

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130536	WELDMENT, OUTER BOTTOM ARM (L.H.) (See Sect. 4, Fig. 1 for NHA)	REF
2	130543	.SLEEVE, END	1
3	130537	.MACHINING, OUTER BOTTOM ARM	1
4	130542	.SLEEVE, CENTER	1
5	65614	.BUSHING	2
6	65613	.BUSHING	1
7	130545	.BRACKET, ROLLER SUPPORT	1
8	131087	.STIFFENER	1

- ITEM NOT ILLUSTRATED

OUTER BOTTOM ARM WELDMENT (R.H.)



REV.

OUTER BOTTOM ARM WELDMENT (R.H.)

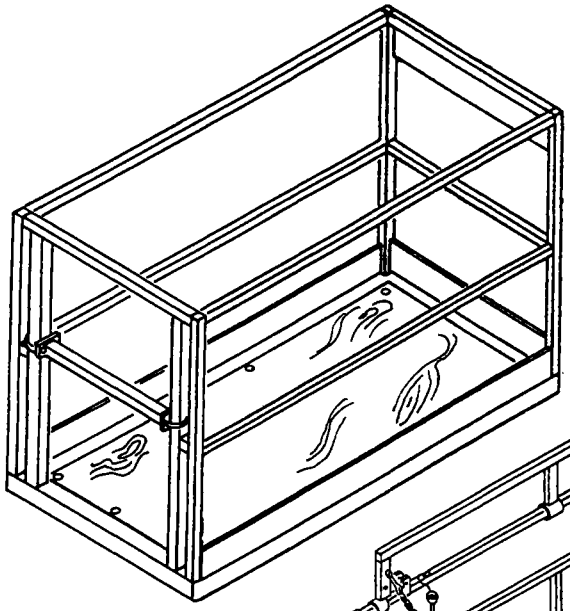
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	131113	WELDMENT, OUTER BOTTOM ARM (R.H.) (See Sect. 4, Fig. 1 for NHA)	REF
2	130537	.MACHINING, OUTER BOTTOM ARM	1
3	130543	.SLEEVE, END	1
4	130542	.SLEEVE, CENTER	1
5	65614	.BUSHING	2
6	65613	.BUSHING	1
7	130545	.BRACKET, ROLLER SUPPORT	1
8	131087	.STIFFENER	1
9	36257	.BAR, FLAT	1

- ITEM NOT ILLUSTRATED

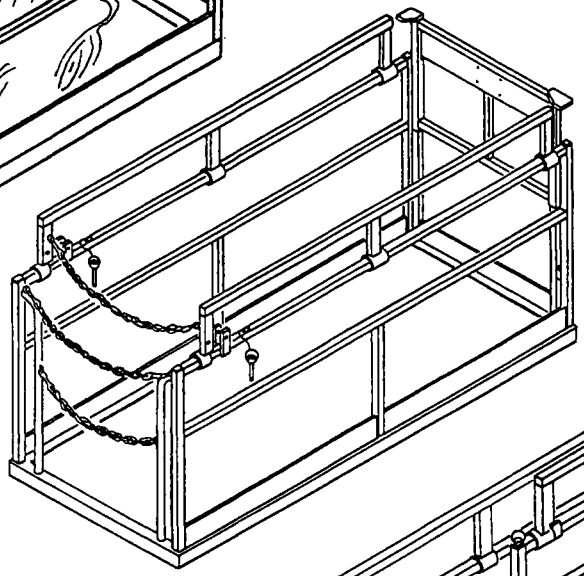
THE MARKLIFT FRAME ASSEMBLY

THIS SECTION 5 CONTAINS THE FOLLOWING FIGURES:

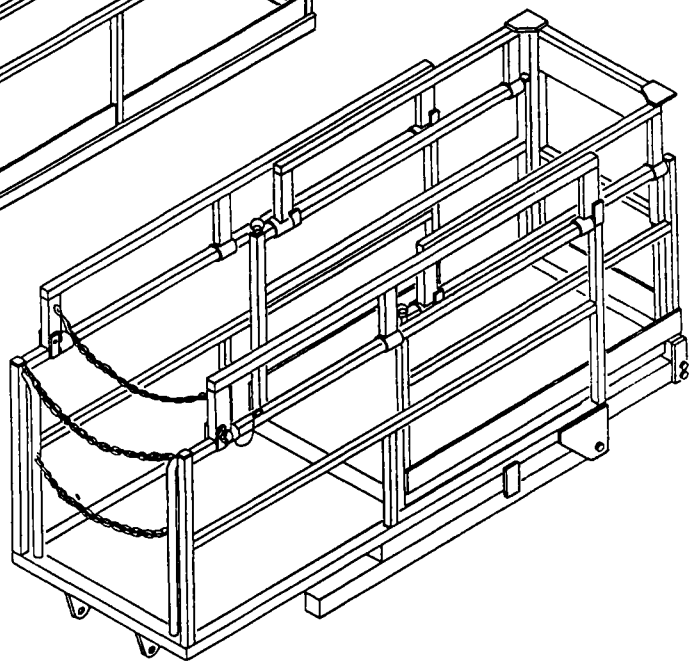
FIGURE NO.	TITLE
1	DECK ASSEMBLY J14
1A	PLATFORM ASSEMBLY J19
1B	PLATFORM SLIDE OUT ASSEMBLY J19EP



J14

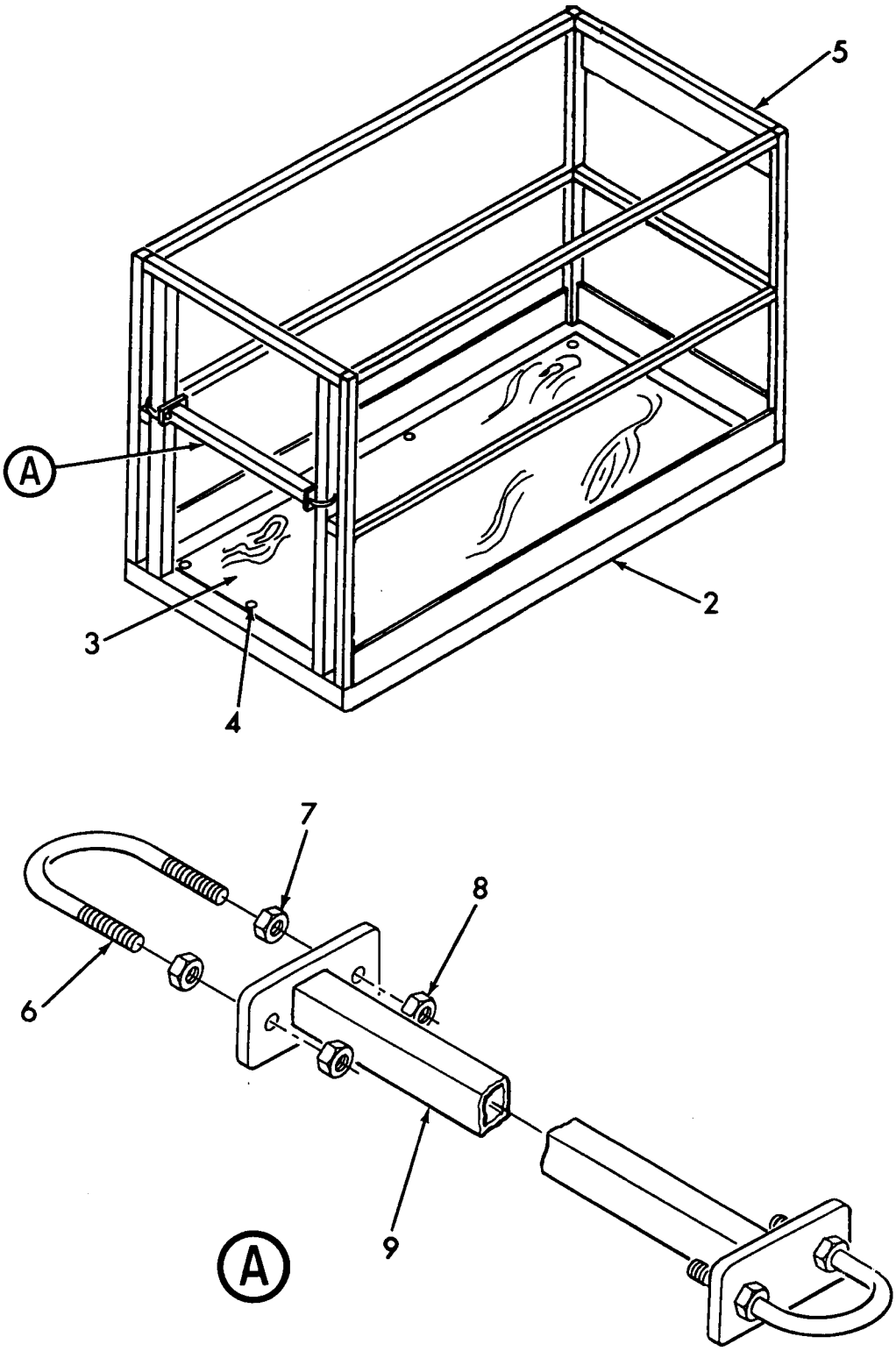


J19



J19EP

DECK ASSEMBLY J14

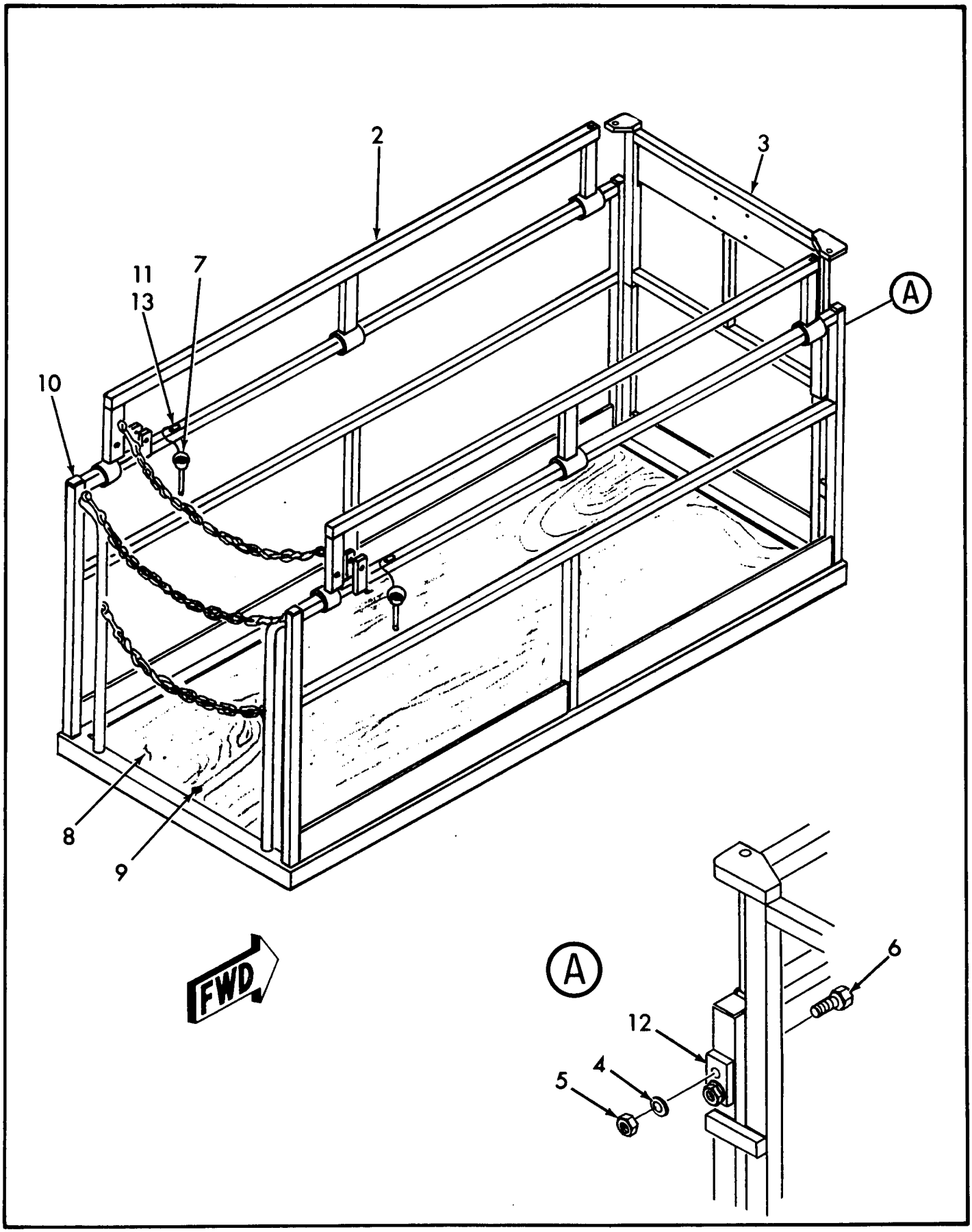


DECK ASSEMBLY J14

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130105	ASSEMBLY, DECK (See Sect. 2, Fig. 1 for NHA)	REF
2	130107	.WELDMENT, DECK	1
3	130217	.PLYWOOD	1
4	61713	.SCREW, SELF TAPPING (attaching part)	8
5	91541	.CAP, PLUG	4
6	160017	.U-BOLT	1
7	60703	.NUT, HEX	4
8	61318	.NUT, LOCK HEX	4
9	131810	.WELDMENT, SLIDE BAR	1

- ITEM NOT ILLUSTRATED

PLATFORM ASSEMBLY J19



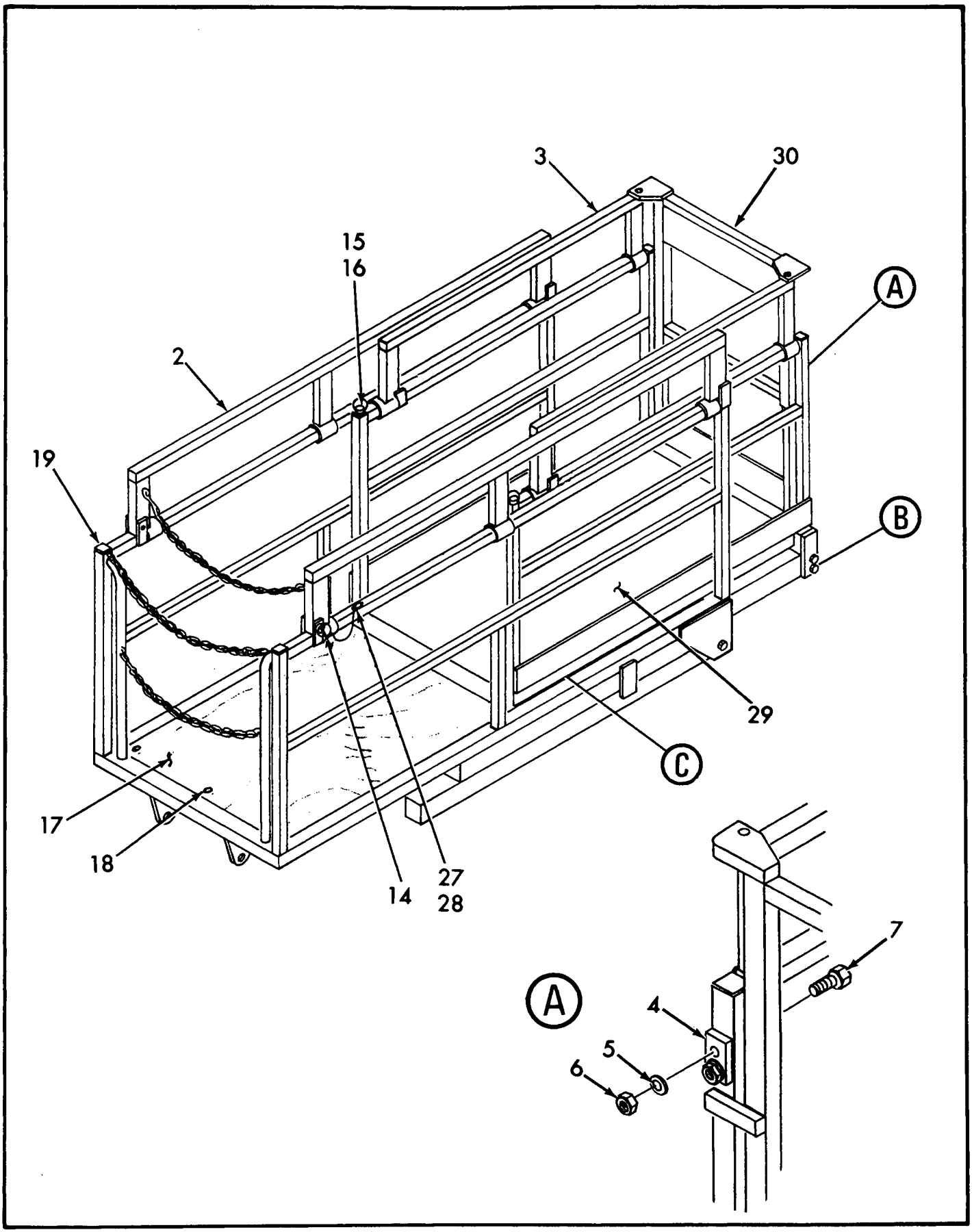
REV.

PLATFORM ASSEMBLY J19

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130875	ASSEMBLY, PLATFORM (See Sect. 2, Fig. 1 for NHA)	REF
2	130872	.WELDMENT, PLATFORM	1
3	130873	.WELDMENT, TOP END RAIL	1
4	63302	.WASHER, LOCK SPLIT	4
5	60702	.NUT, HEX	4
6	60360	.SCREW, CAP HEX HEAD	4
7	65124	.PIN, BALL LOK	2
8	130940	.FLOOR, PLYWOOD	1
9	61713	.SCREW, SELF-TAPPING	8
10	91541	.CAP, PLUG	4
11	65669	.ASSEMBLY, LANYARD	2
12	130926	.LOCK PLATE	2
13	63651	.RIVET, POP	2

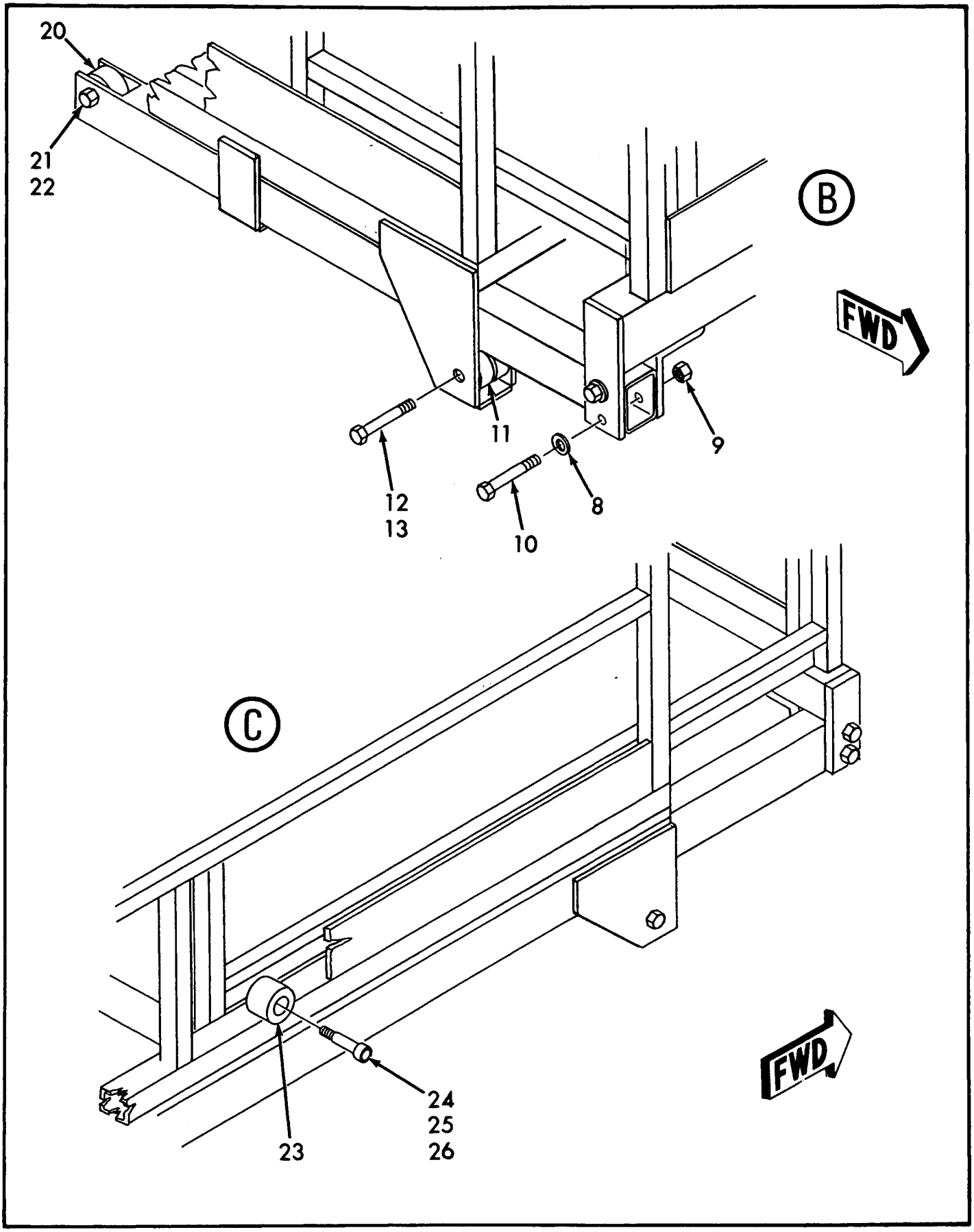
- ITEM NOT ILLUSTRATED

PLATFORM SLIDE OUT ASSEMBLY J19EP



REV.

PLATFORM SLIDE OUT ASSEMBLY J19EP



REV.

PLATFORM SLIDE OUT ASSEMBLY J19EP

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130850	ASSEMBLY, PLATFORM SLIDE OUT J19EP (See Sect. 2, Fig. 1 for NHA)	REF
2	130865	.WELDMENT, PLATFORM SLIDE OUT J19EP	1
3	130851	.WELDMENT, DECK PLATFORM	1
4	130926	.LOCK PLATE	2
5	63302	.WASHER, LOCK (attaching part)	4
6	60702	.NUT, HEX (attaching part)	4
7	60360	.SCREW, CAP (attaching part)	4
8	63302	.WASHER, LOCK (attaching part)	4
9	60702	.NUT, HEX (attaching part)	4
10	60339	.SCREW, CAP (attaching part)	4
11	130652	.ROLLER	4
12	60397	.SCREW, CAP (attaching part)	2
13	61305	.NUT, HEX (attaching part)	2
14	65124	.PIN, BALL-LOK	2
15	130825	.WELDMENT, LOCKPIN	2
16	65687	.RING, SPLIT	2
17	130940	.PLYWOOD FLOOR	1
18	61713	.SCREW, CAP SELF-TAPPING (attaching part)	8
19	91541	.CAP, PLUG	4
20	130652	.ROLLER	2
21	60363	.SCREW, CAP (attaching part)	2
22	61305	.NUT, HEX (attaching part)	2
23	31161	.ROLLER BATTERY TRAY	2
24	16050	.SCREW, SHOULDER SOCKET HEAD(attach. part)	2
25	60703	.NUT,HEX (attaching part)	2

PLATFORM SLIDE OUT ASSEMBLY J19EP

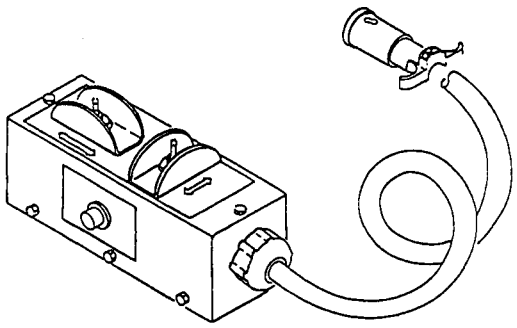
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
26	63319	.WASHER, LOCK (attaching part)	2
27	65669	.ASSEMBLY, LANYARD	2
28	63651	.RIVET, POP	2
29	131015	.ANTI-SLIP SURFACING	4
30	130871	.WELDMENT, PLATFORM TOP END RAIL	1

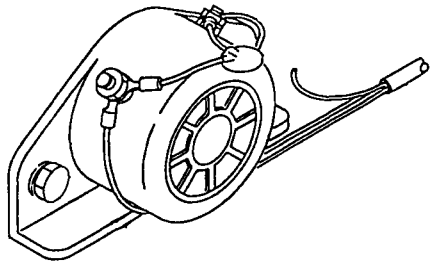
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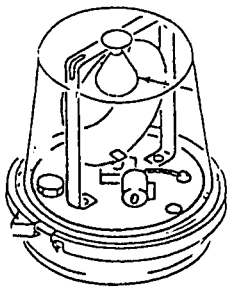
THE MARKLIFT OPTIONAL ASSEMBLIES

THIS SECTION 6 CONTAINS THE FOLLOWING FIGURES:

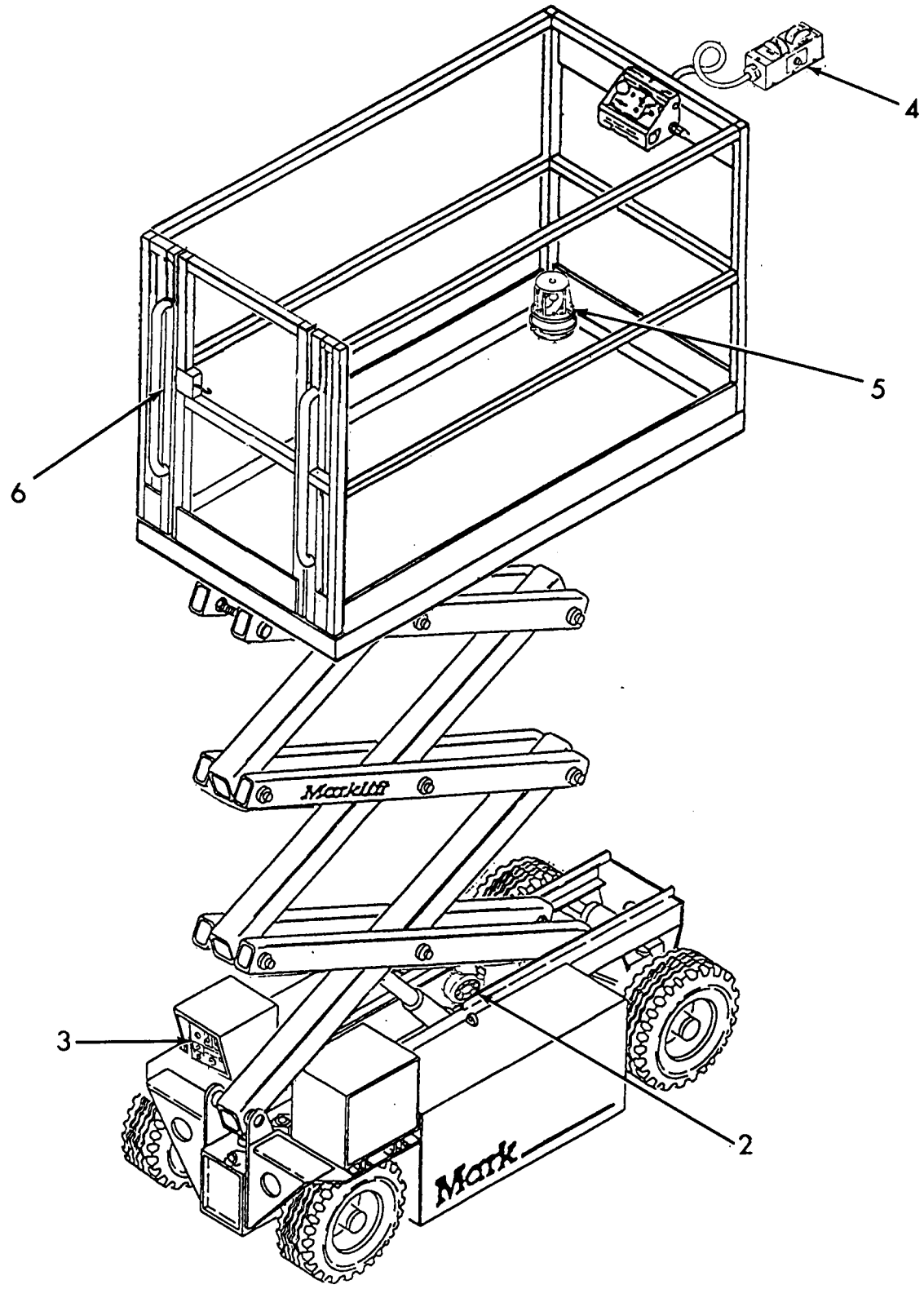
FIGURE NO.	TITLE
1	OPTIONAL ASSEMBLIES J14
1A	OPTIONAL ASSEMBLIES J19
1B	OPTIONAL ASSEMBLIES J19EP
2	WARNING HORN ASSEMBLY
3	HOURMETER
4	REMOTE CONTROL ASSEMBLY
5	WARNING BEACON ASSEMBLY
6	SWING GATE ASSEMBLY J14
6A	FOLD DOWN SWING GATE J19
6B	FOLD DOWN SWING GATE J19EP
7	12 VOLT PLATFORM WORK LIGHT ASSEMBLY*
8	ALL MOTION ALARM ASSEMBLY*
9	FEMALE PLUG FOR REMOTE DRIVE ASSEMBLY*
10	TUV PACKAGE*







*THIS FIGURE IS NOT AVAILABLE THIS REVISION

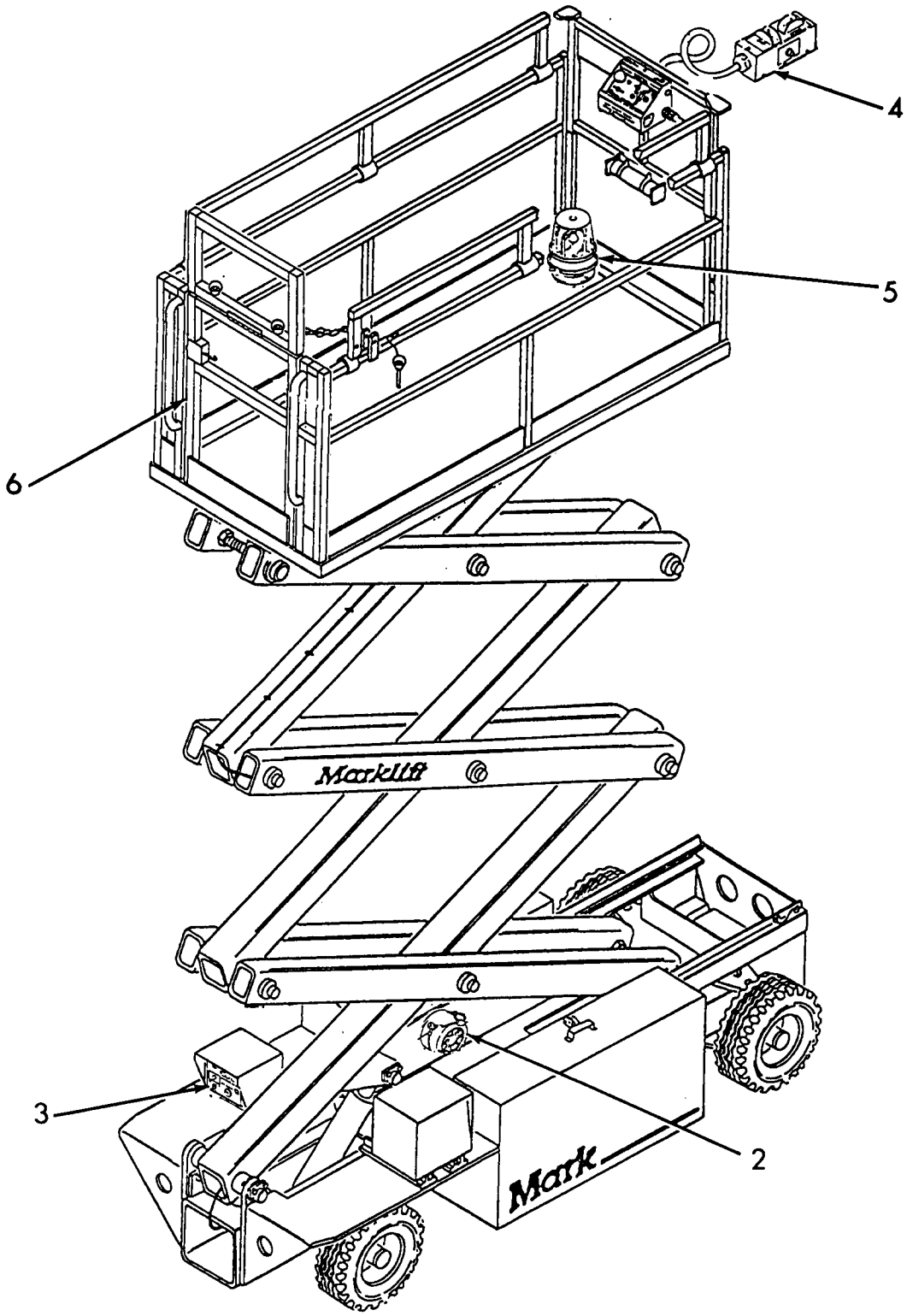

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OPTIONAL ASSEMBLIES J14

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1		ASSEMBLIES, OPTIONAL	REF
2	130912	.ASSEMBLY, WARNING HORN (See Sect. 6, Fig. 2 for Details)	1
3	131065	.ASSEMBLY, HOURMETER (See Sect. 6, Fig. 3 for Details)	1
4	130683	.ASSEMBLY, REMOTE CONTROL (See Sect. 6, Fig. 4 for Details)	1
5	131927	.ASSEMBLY, WARNING BEACON (See Sect. 6, Fig. 5 for Details)	1
6	131952	.ASSEMBLY, FOLD DOWN GATE J14 (See Sect. 6, Fig. 6 for Details)	1
-7	131928	.ASSEMBLY, 12 VOLT PLATFORM WORK LIGHT (See Sect. 6, Fig. 7 for Details)	1
-8	131900	.ASSEMBLY, ALL MOTION ALARM (See Sect. 6, Fig. 8 for Details)	1
-9	131955	.ASSEMBLY, FEMALE PLUG FOR REMOTE DRIVE (See Sect. 6, Fig. 9 for Details)	1
-10	131926	.ASSEMBLY, TUV PACKAGE (See Sect. 6, Fig. 10 for Details)	1

- ITEM NOT ILLUSTRATED

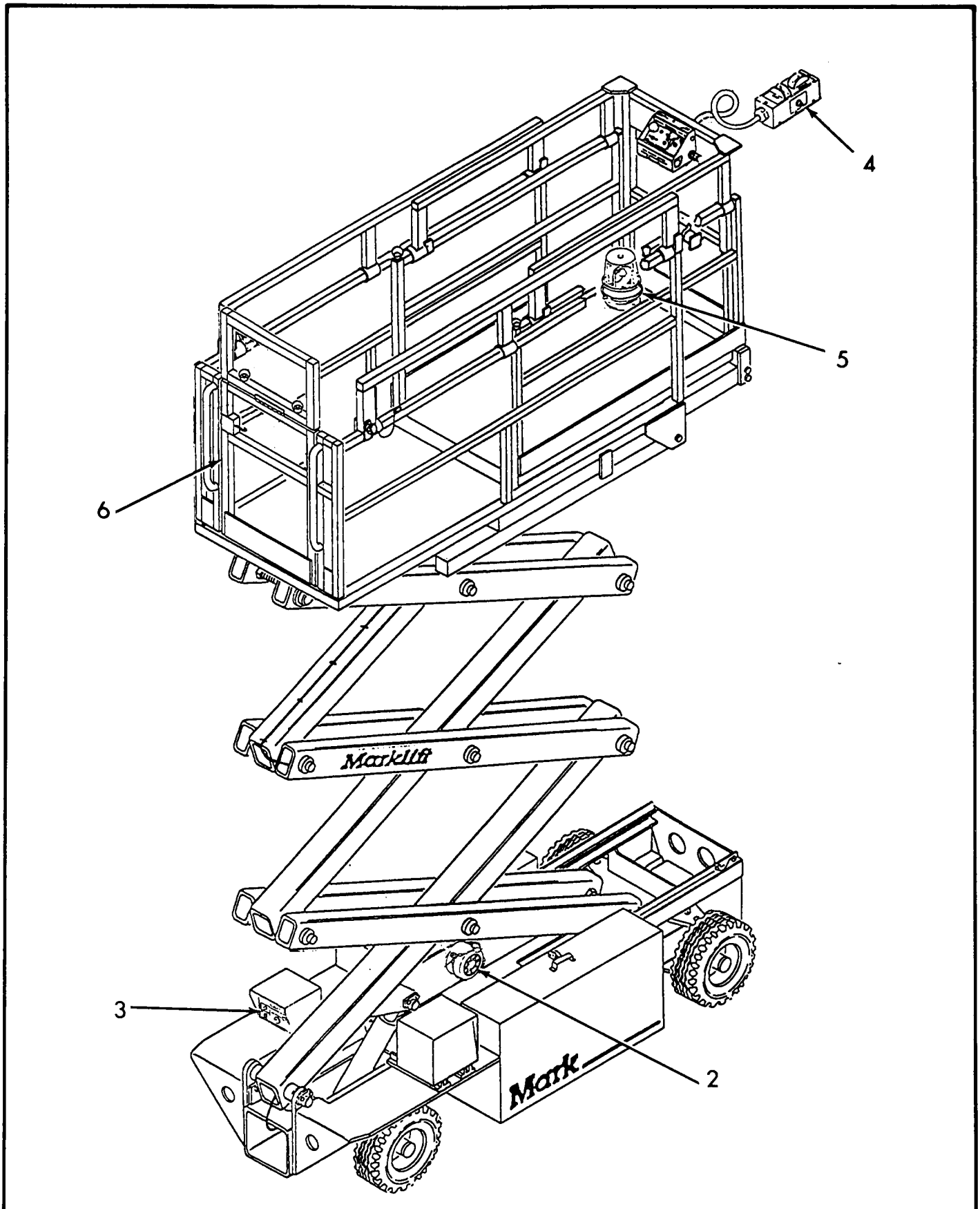
OPTIONAL ASSEMBLIES J19



REV.

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1		ASSEMBLIES, OPTIONAL	REF
2	130912	.ASSEMBLY, WARNING HORN (See Sect. 6, Fig. 2 for Details)	1
3	131065	.ASSEMBLY, HOURMETER (See Sect. 6, Fig. 3 for Details)	1
4	130683	.ASSEMBLY, REMOTE CONTROL (See Sect. 6, Fig. 4 for Details)	1
5	131927	.ASSEMBLY, WARNING BEACON (See Sect. 6, Fig. 5 for Details)	1
6	131976	.ASSEMBLY, FOLD DOWN SWING GATE J19 (See Sect. 6, Fig. 6A for Details)	1
-7	131928	.ASSEMBLY, 12 VOLT PLATFORM WORK LIGHT (See Sect. 6, Fig. 7 for Details)	1
-8	131900	.ASSEMBLY, ALL MOTION ALARM (See Sect. 6, Fig. 8 for Details)	1
-9	131955	.ASSEMBLY, FEMALE PLUG FOR REMOTE DRIVE (See Sect. 6, Fig. 9 for Details)	1
-10	131926	.ASSEMBLY, TUV PACKAGE (See Sect. 6, Fig. 10 for Details)	1

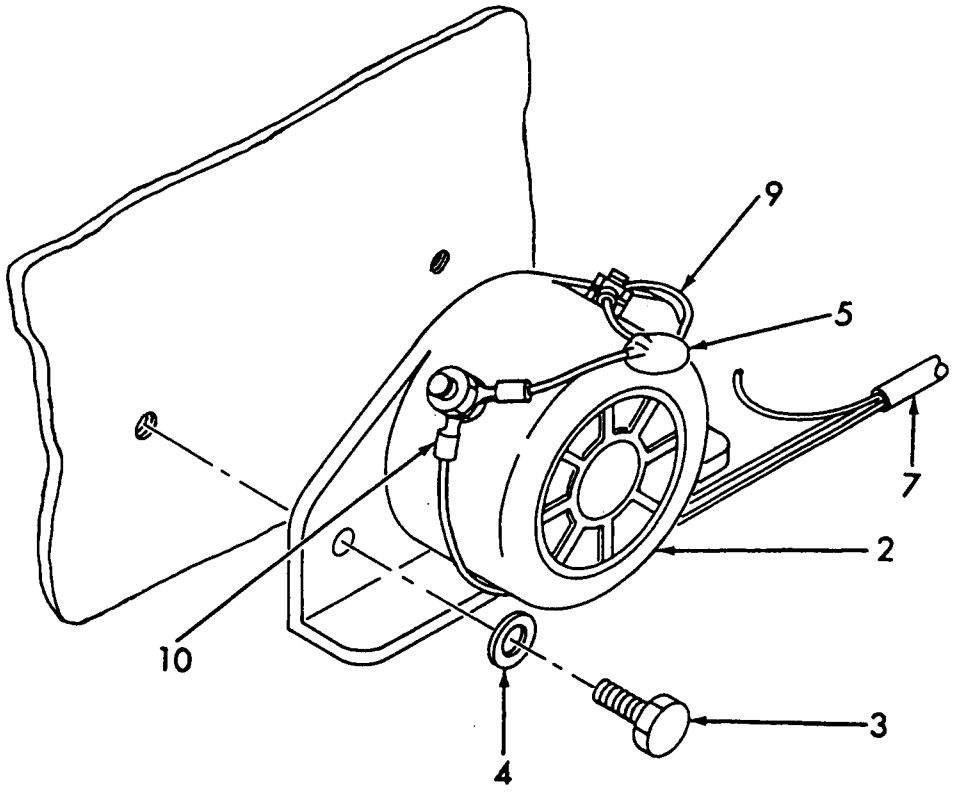
OPTIONAL ASSEMBLIES J19EP

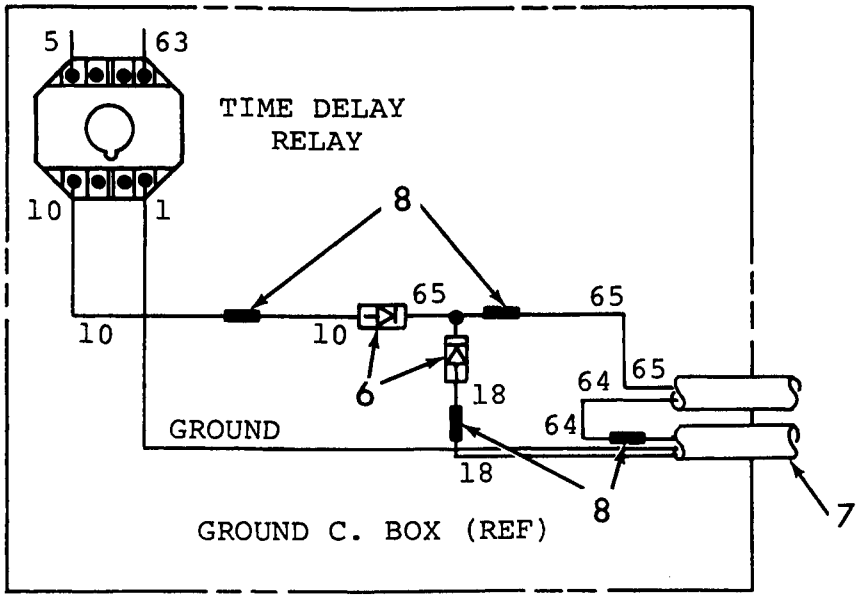


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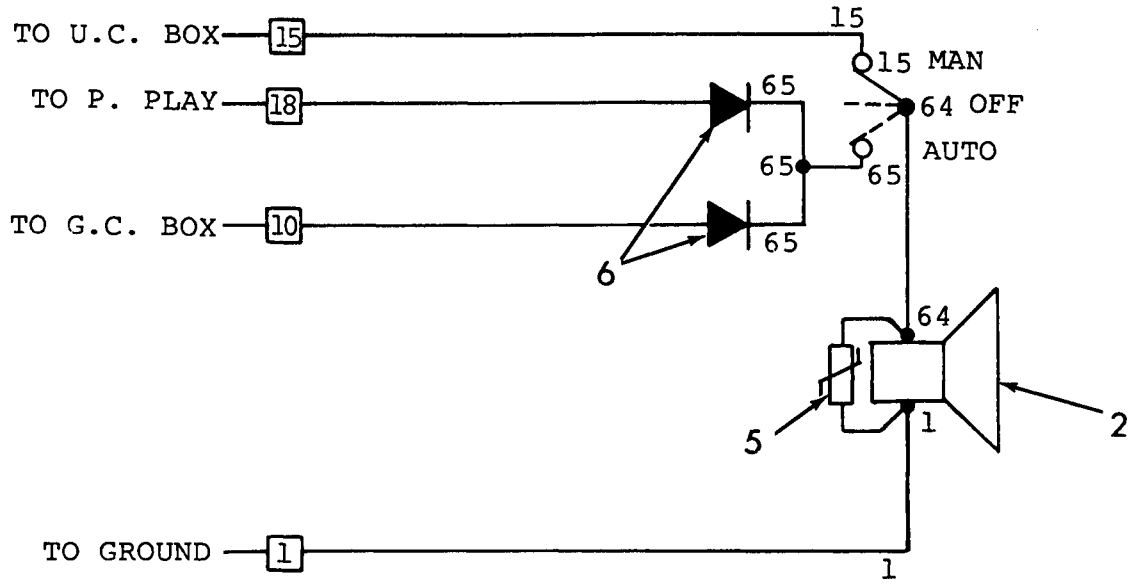
ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1		ASSEMBLIES, OPTIONAL	REF
2	130912	.ASSEMBLY, WARNING HORN (See Sect. 6, Fig. 2 for Details)	1
3	131065	.ASSEMBLY, HOURMETER (See Sect. 6, Fig. 3 for Details)	1
4	130683	.ASSEMBLY, REMOTE CONTROL (See Sect. 6, Fig. 4 for Details)	1
5	131927	.ASSEMBLY, WARNING BEACON (See Sect. 6, Fig. 5 for Details)	1
6	131975	.ASSEMBLY, FOLD DOWN SWING GATE J19EP (See Sect. 6, Fig. 6B for Details)	1
-7	131928	.ASSEMBLY, 12 VOLT PLATFORM WORK LIGHT (See Sect. 6, Fig. 7 for Details)	1
-8	131900	.ASSEMBLY, ALL MOTION ALARM (See Sect. 6, Fig. 8 for Details)	1
-9	131955	.ASSEMBLY, FEMALE PLUG FOR REMOTE DRIVE (See Sect. 6, Fig. 9 for Details)	1
-10	131926	.ASSEMBLY, TUV PACKAGE (See Sect. 6, Fig. 10 for Details)	1

WARNING HORN ASSEMBLY





WIRING DIAGRAM



ELECTRICAL SCHEMATIC

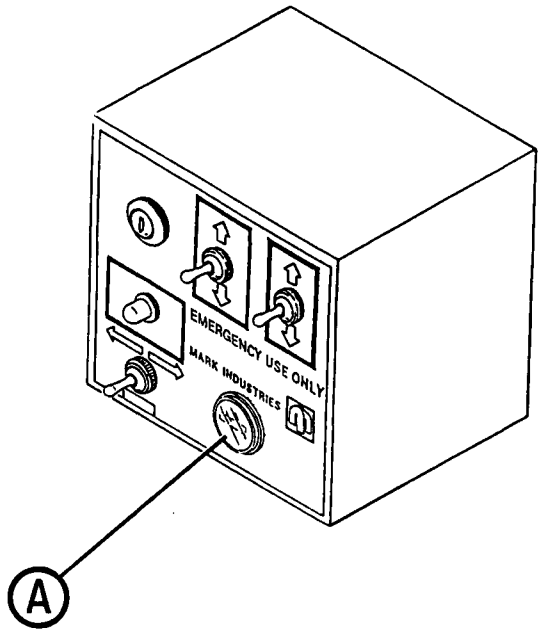
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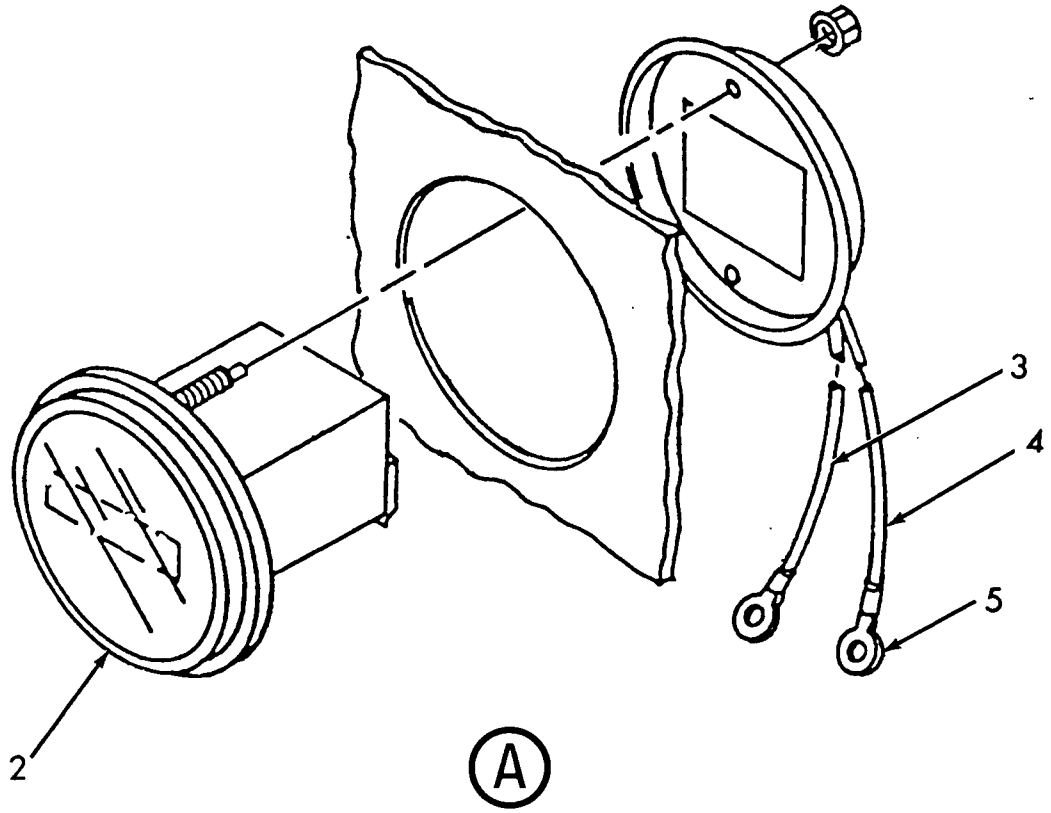
WARNING HORN ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130912	ASSEMBLY, WARNING HORN (See Sect. 6, Fig. 1 for NHA)	REF
2	70053	.HORN, WARNING	1
3	60903	.SCREW, CAP (attaching part)	2
4	63301	.WASHER, LOCK (attaching part)	2
5	130705	.ASSEMBLY, VARISTOR	1
6	4045	.DIODE	2
7	16201	.WIRE, 3 FEET	AR
8	117-D	.CONNECTOR, BUTT	4
9	70007	.WIRE, YELLOW .5 FEET	AR
10	117-C	.CONNECTOR, RING	10
11	70057	.SWITCH, TOGGLE (Located on Upper Control Box)	1

- ITEM NOT ILLUSTRATED

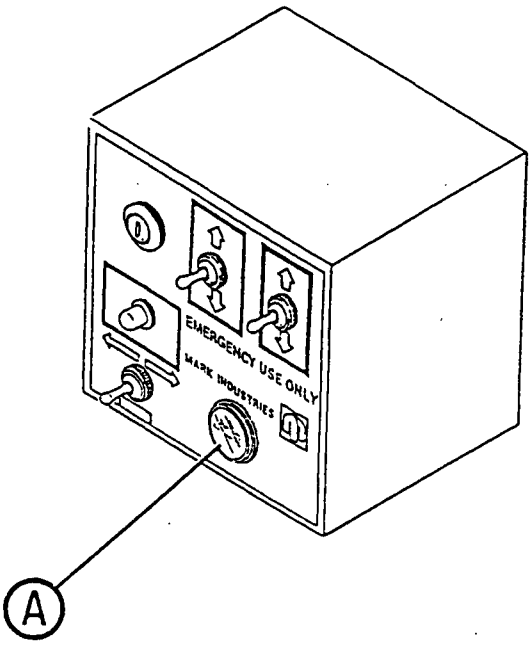
HOURMETER

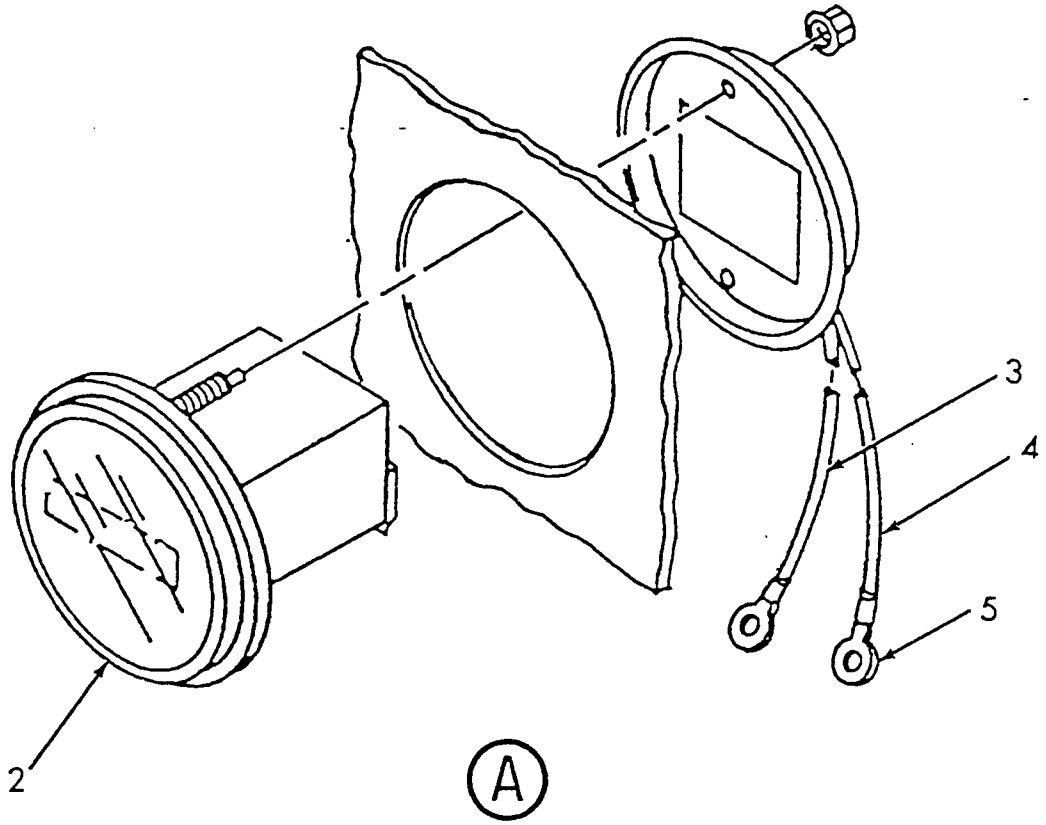




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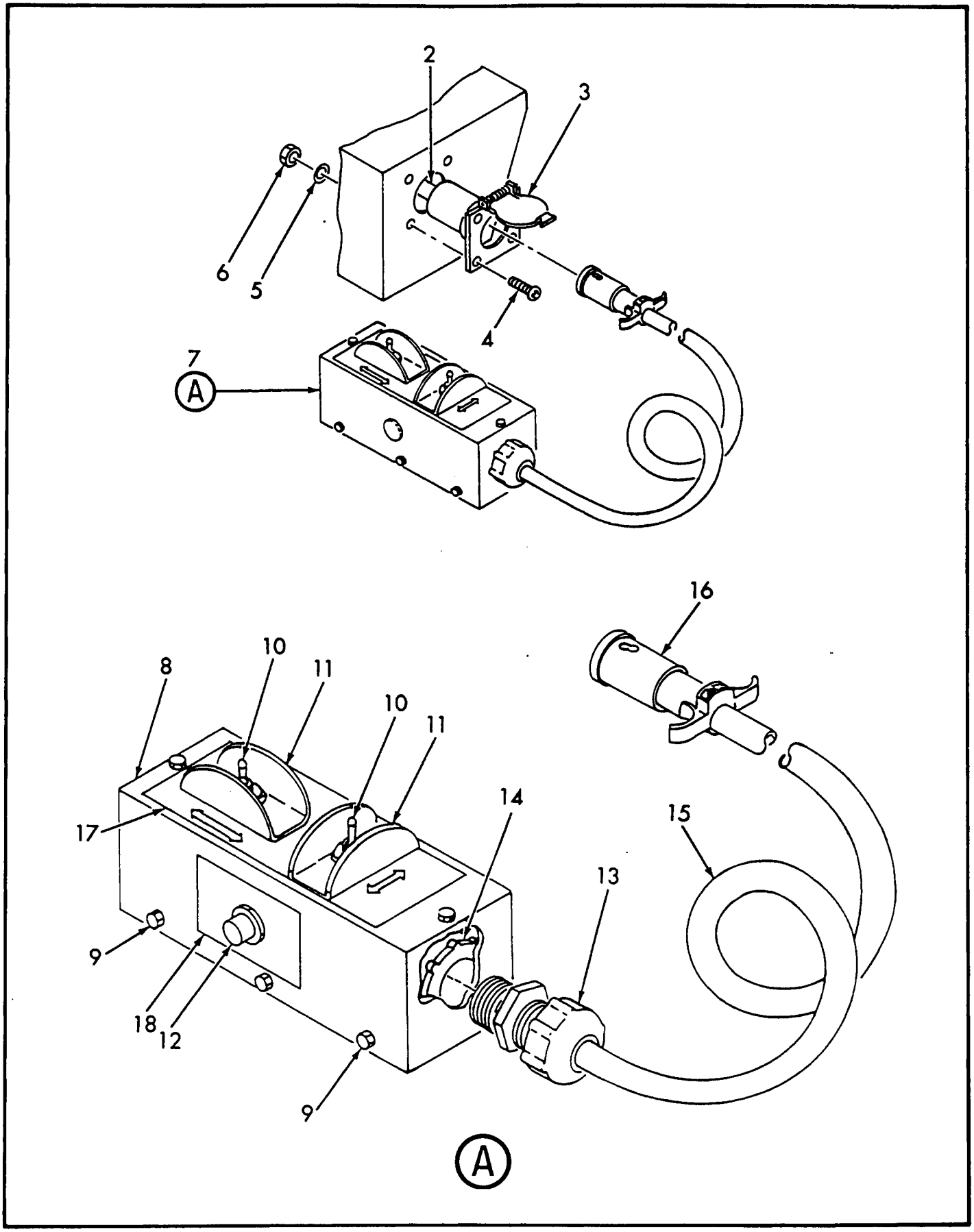
HOURMETER





ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	131065	HOURMETER (See Sect. 6, Fig. 1 for NHA)	REF
2	20571	.HOURMETER	1
3	70232	.WIRE, WHITE 1.5 FEET	AR
4	70008	.WIRE, YELLOW/GREEN 1.5 FEET	AR
5	117-C	.RING, CONNECTOR	2

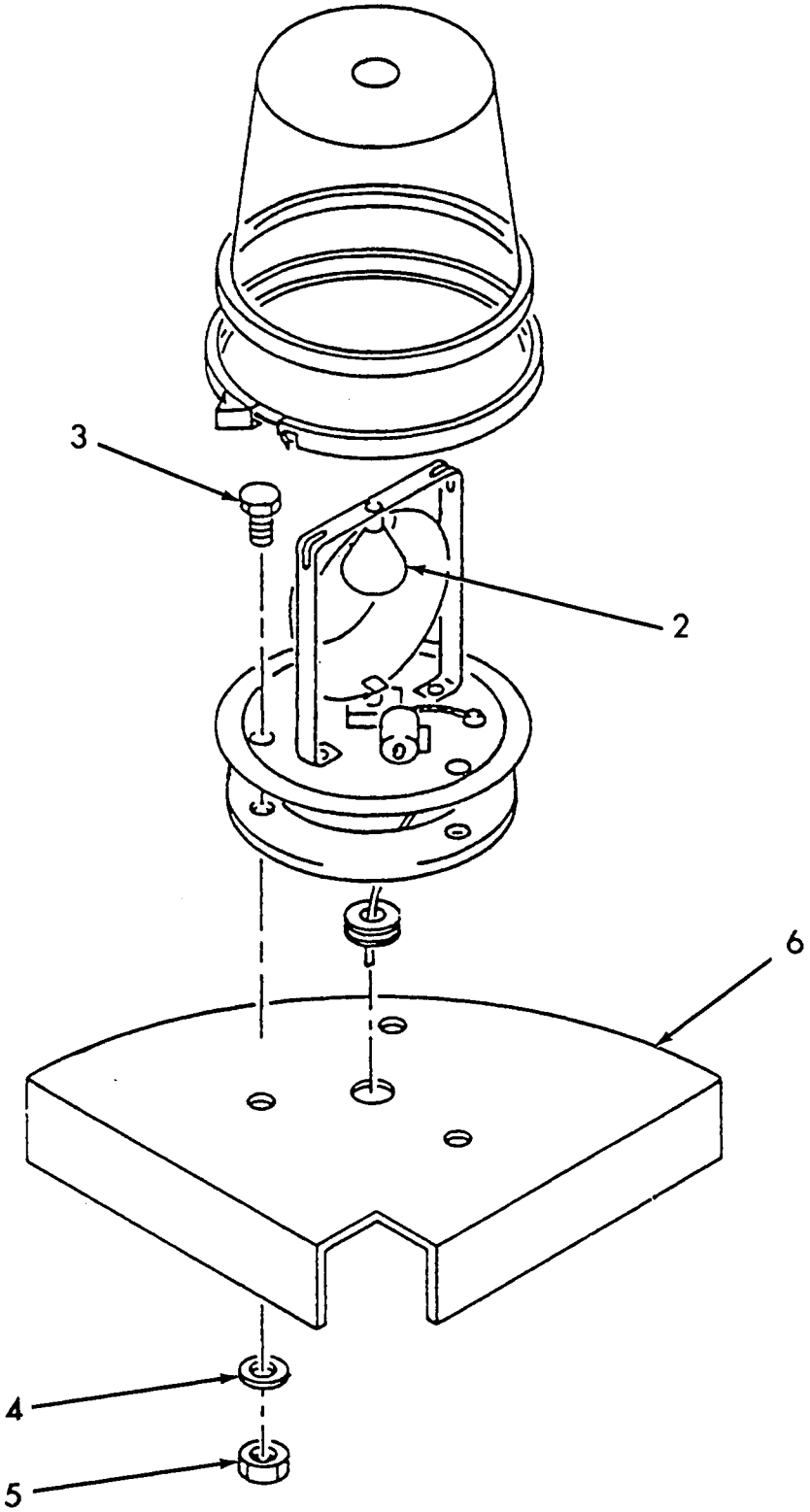
REMOTE CONTROL ASSEMBLY



REMOTE CONTROL ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	130683	ASSEMBLY, REMOTE CONTROL (See Sect. 6, Fig. 1 for NHA)	REF
2	130902-02	.CONDUCTOR, CABLE	1
3	70261	.SOCKET, 7-POLE	1
4	62623	.SCREW, MACHINE (attaching part)	4
5	63312	.WASHER, LOCK (attaching part)	4
6	61532	.NUT, HEX (attaching part)	4
7	130903	.ASSEMBLY, REMOTE CONTROL	1
8	130901	..CONTROL, REMOTE	1
9	61726	..SCREW, (attaching part)	6
10	20481	..SWITCH, TOGGLE	2
11	20884	..GUARD, SWITCH	2
12	4011	..BUTTON, PUSH	1
13	2806	..RELIEF, STRAIN	1
14	2808	..NUT, LOCK (attaching part)	1
15	130902-08	..CABLE, CONDUCTOR	1
16	70260	..PLUG, 7-POLE	1
17	130906	..DECAL, DRIVE AND STEER	1
18	130907	..DECAL, SPEED	1

WARNING BEACON ASSEMBLY



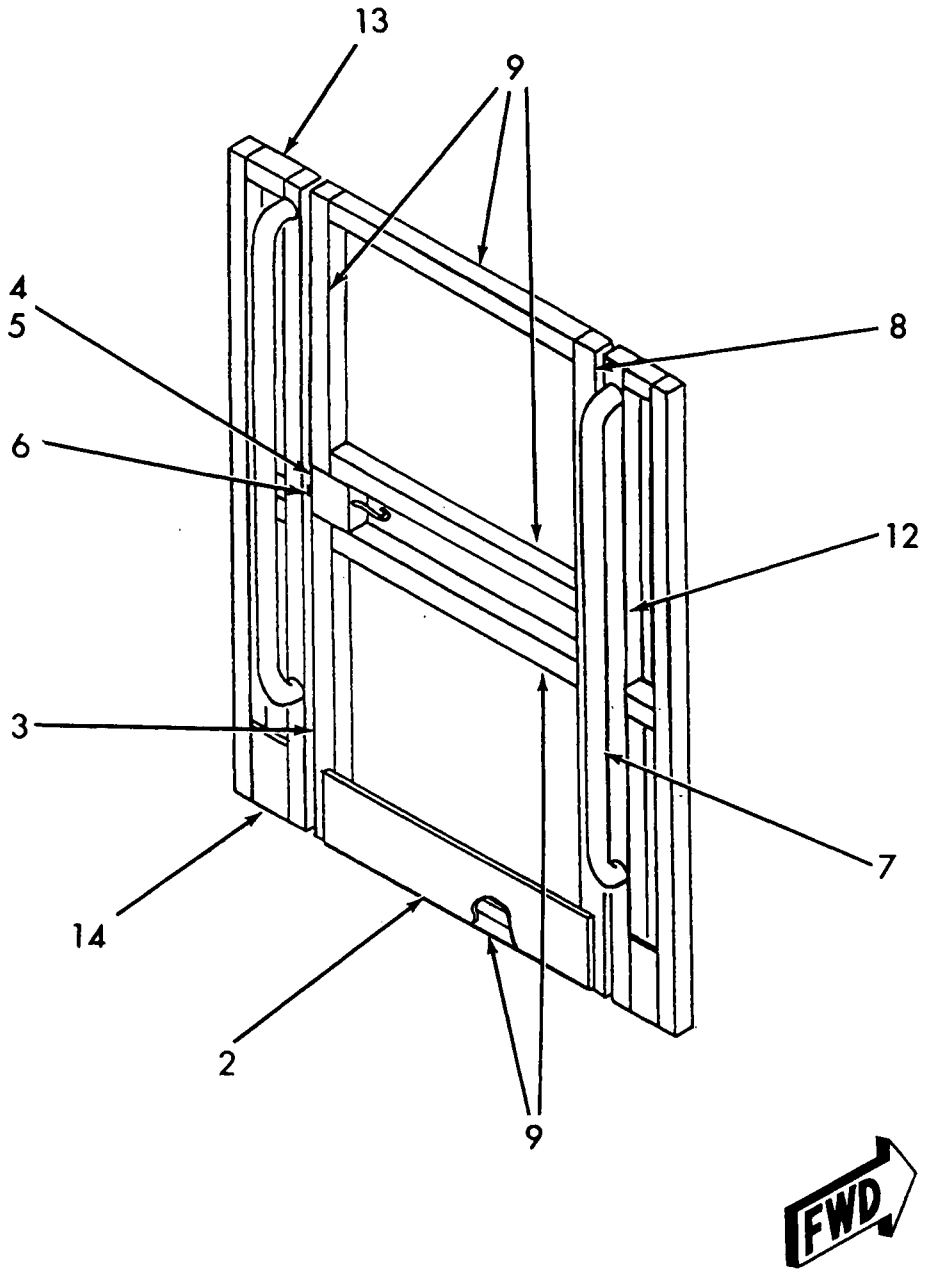
REV.

WARNING BEACON ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	131927	ASSEMBLY, WARNING BEACON (See Sect. 6, Fig. 1 for NHA)	REF
2	20586	.BEACON ROTATING AMBER	1
3	62714	.SCREW, MACHINING (attaching part)	4
4	63313	.WASHER, LOCK (attaching part)	4
5	60802	.NUT, HEX (attaching part)	4
6	skp-0417	.BRACKET, BEACON	1

- ITEM NOT ILLUSTRATED

SWING GATE ASSEMBLY J14

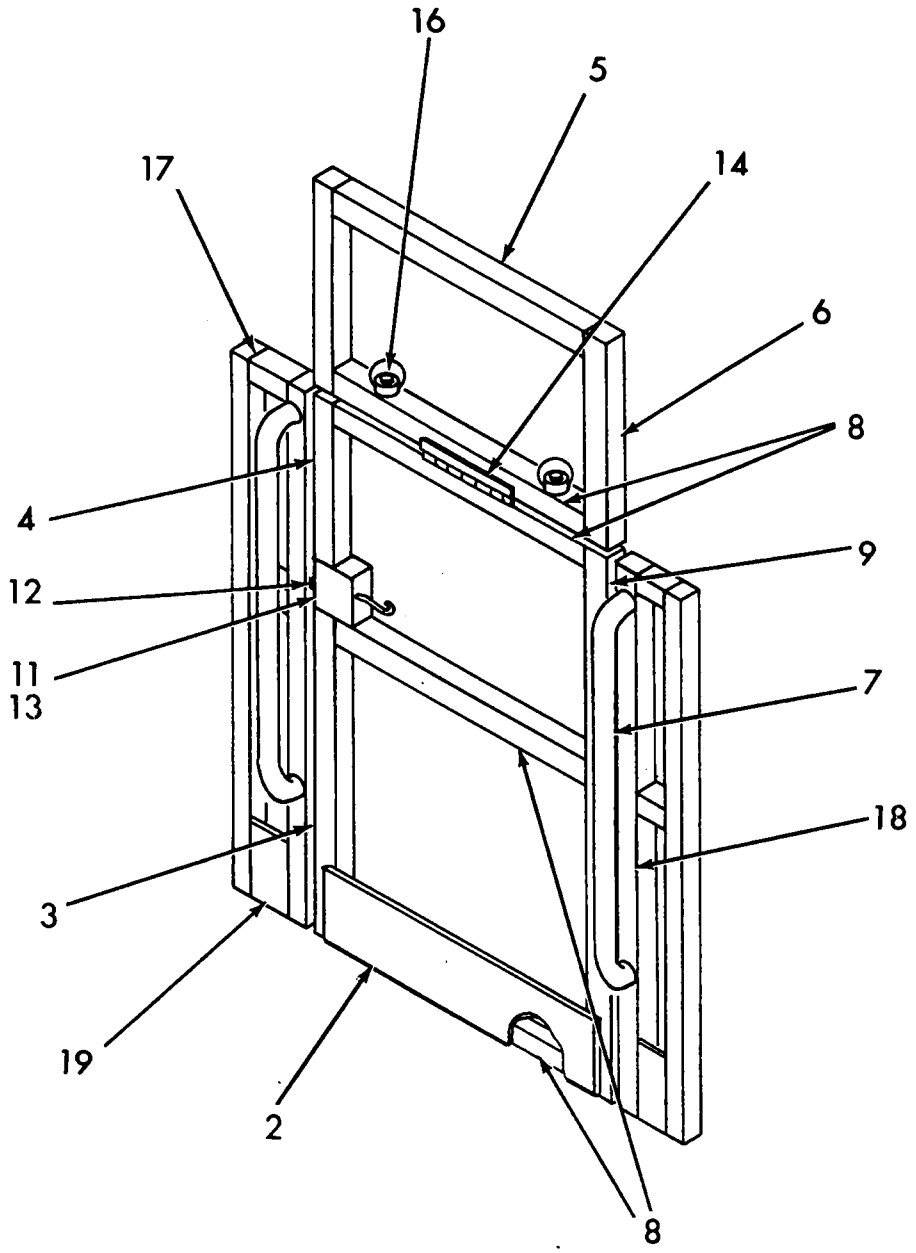


SWING GATE ASSEMBLY J14

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	131952	ASSEMBLY, SWING GATE (See Sect. 6, Fig. 1 for NHA)	REF
2	37169	.SHEET METAL	1
3	36309	.TUBE, SQUARE	1
4	16231	.LATCH BOLT	1
5	35015	.CHANNEL	1
6	35043	.KEY STOCK	1
7	32031	.HAND RAIL	2
-8	25379	.BAR, FLAT	1
9	36390	.TUBE, SQUARE	5
10	36247	.TUBE, SQUARE	1
-11	12005	.SPRING HINGE	2
12	37360	.TUBE, SQUARE	2
13	37381	.TUBE, SQUARE	4
14	37380	.SHEET METAL	2

- ITEM NOT ILLUSTRATED

FOLD DOWN SWING GATE ASSEMBLY J19



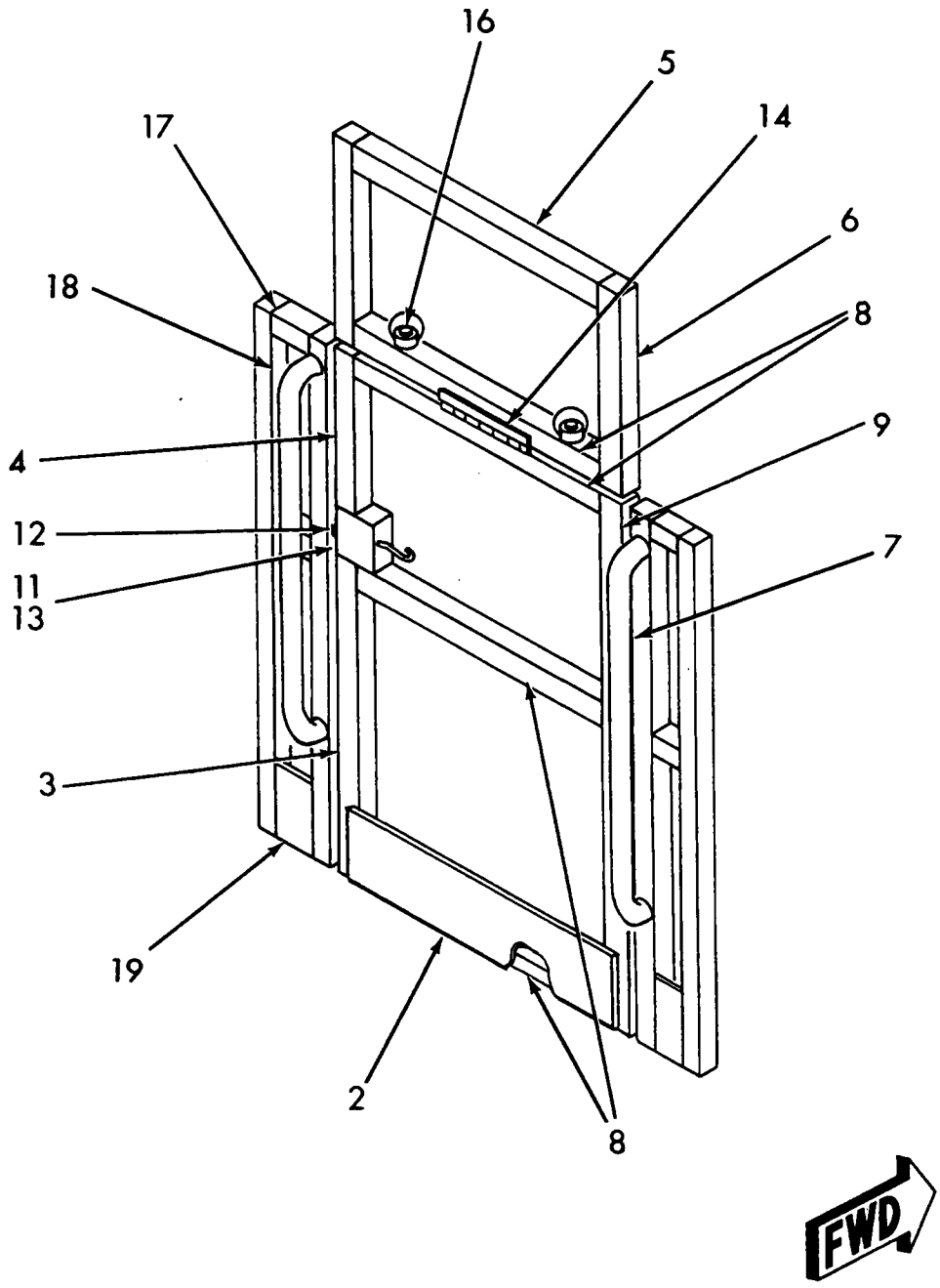
REV.

FOLD DOWN SWING GATE ASSEMBLY J19

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	131976	ASSEMBLY, FOLD DOWN SWING GATE (See Sect. 6, Fig. 1 for NHA)	REF
2	37169	.SHEET METAL	1
3	36763	.TUBE, SQUARE	1
4	37376	.TUBE, SQUARE	1
5	36389	.TUBE, SQUARE	1
6	37377	.TUBE, SQUARE	2
7	131930	.HAND RAIL	2
8	36390	.TUBE, SQUARE	1
9	37375	.TUBE, SQUARE	1
-10	12005	.SPRING HINGE	2
11	35015	.CHANNEL	1
12	35043	.KEY STOCK	1
13	16231	.LATCH, BOLT	1
14	12008	.CONTINUOUS HINGE	1
-15	25379	.BAR, FLAT	1
16	30701	.PIN, BALL LOK	2
17	37355	.TUBE, SQUARE	2
18	36410	.TUBE, SQUARE	2
19	37358	.SHEET METAL	2

- ITEM NOT ILLUSTRATED

FOLD DOWN SWING GATE ASSEMBLY J19EP



REV.

FOLD DOWN SWING GATE ASSEMBLY J19EP

ITEM	PART NUMBER	DESCRIPTION 1234567	UNIT PER ASSY.
-1	131975	ASSEMBLY, FOLD DOWN SWING GATE (See Sect. 6, Fig. 1A for NHA)	REF
2	37169	.SHEET METAL	1
3	36763	.TUBE, SQUARE	1
4	37376	.TUBE, SQUARE	1
5	36389	.TUBE, SQUARE	1
6	36735	.TUBE, SQUARE	2
7	131930	.HAND RAIL	2
8	36390	.TUBE, SQUARE	1
9	37375	.TUBE, SQUARE	1
-10	12005	.SPRING HINGE	2
11	35015	.CHANNEL	1
12	35043	.KEY STOCK	1
13	16231	.LATCH, BOLT	1
14	12008	.CONTINUOUS HINGE	1
-15	25379	.BAR, FLAT	1
16	30701	.PIN, BALL-LOK	2
17	37355	.TUBE, SQUARE	2
18	36410	.TUBE, SQUARE	2
19	37358	.SHEET METAL	2

- ITEM NOT ILLUSTRATED

12 VOLT PLATFORM WORK LIGHT ASSEMBLY

THIS SECT. 6, FIG. 7 PART NUMBER 131928
12 VOLT PLATFORM WORK LIGHT ASSEMBLY
IS NOT AVAILABLE THIS REVISION

ALL MOTION ALARM ASSEMBLY

THIS SECT. 6, FIG. 8 PART NUMBER 131900
ALL MOTION ALARM ASSEMBLY
IS NOT AVAILABLE THIS REVISION

FEMALE PLUG FOR REMOTE DRIVE ASSEMBLY

THIS SECT. 6, FIG. 9 PART NUMBER 131955
FEMALE PLUG FOR REMOTE DRIVE ASSEMBLY
IS NOT AVAILABLE THIS REVISION

TUV PACKAGE ASSEMBLY

THIS SECT. 6, FIG. 10 PART NUMBER 131926
TUV PACKAGE ASSEMBLY
IS NOT AVAILABLE THIS REVISION

PROPER CARE OF MOTIVE POWER BATTERIES

1. New batteries should be given a full charge before their first use because it is difficult to know how long the batteries have been in storage without a charge.

2. Limit use of new batteries between charges for the first 5 cycles. New batteries and older batteries which have been in storage are not capable of their rated output until they have been discharged and charged a number of times.

3. During the first month of use, particularly when temperatures are below 60°F, new batteries should be given an extra full charge once a week. The ampere-hours of energy that batteries can deliver and their charge acceptance varies directly with battery temperature.

4. As long as the charger tapers down to the specified finish charge rate near the end of the charge cycle, the batteries should be given a full charge. All cells in a set of batteries do not react identically to the same discharge and charge current. In a normal charge, the last 1 to 3 hours at the low finish charge rate equalize the cells for better battery life.

5. When batteries age to the point where the charge rate will no longer taper into the low finish rate area, reduce the hours of charge progressively. Reducing the charge period will prevent excessive battery heating and the resultant high water use rate.

6. Prior to each day's use, turn the charger on and check to see if charger ammeter needle jumps smartly upward and then tapers down to the finish rate area within 15 minutes. This will provide a very simple means of verifying that the batteries were charged.

7. Add water carefully to the proper level in cells as required after they have beenfully charged. Do not fill them so high that they bubble over while charging. New batteries require very little addition of water, whereas very old batteries may need additional water two or three times a week. Water (electrolyte) level in the cells settles when batteries are discharged and rises during charge. The probability of overfilling can be reduced by adding water when batteries are fully charged.

8. When the temperature falls below 65°F, batteries should be placed on charge as soon after use as possible. In these low temperatures a 4 hour equalizing charge once a week will improve state of charge and battery life.

9. Keep tops of batteries and battery hold-downs clean and dry at all times. This will reduce the amount of current leakage between batteries and the frame.

(b) A short circuit failure of one or both diodes. First disconnect one diode. Using a low voltage continuity tester check each diode. Then reverse the tester leads and check each diode again. If the diode conducts current in both directions the diode is shorted and must be replaced. Replace either the entire heat-sink assembly or the defective diode. When replacing a single diode be sure the new diode is pressed squarely into the hole and that it does not extend beyond the rear surface of the heat sink plate.

(c) If (a) and (b) fail to reveal the malfunction, check wiring of both charger and battery connections against their respective wiring diagrams. The charger wiring diagram is shown on the enclosed sheet along with the parts list.

CHARGER OUTPUT IS LOW

The most probable cause is one diode shorting and blowing one fuse. Refer to "Fuse Link Blowing" part (b) to check the diodes. If a diode is shorted, both the defective diode/heat sink and the defective fuse assembly must be replaced.

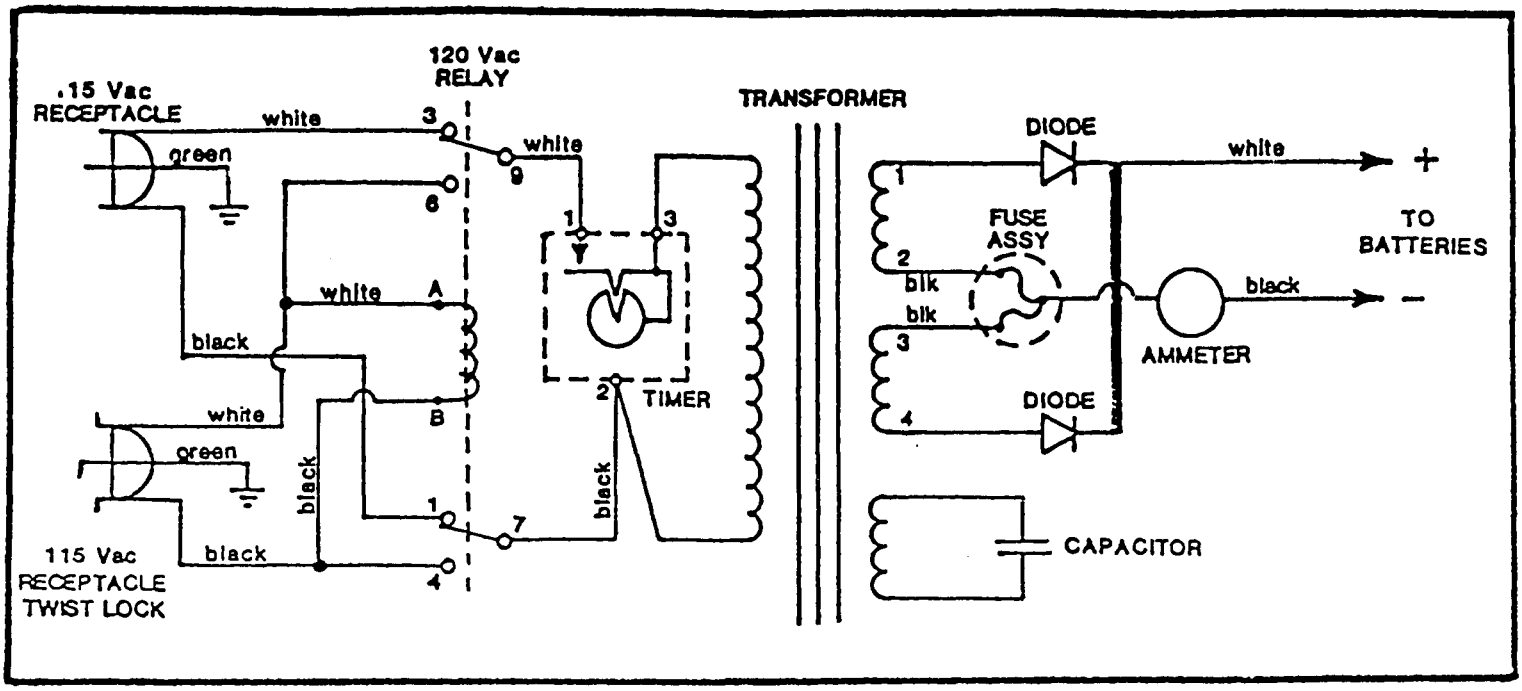
CHARGER DOES NOT TURN OFF

In models equipped with timers, this is due to an inoperative timer. In this case replace timer assembly.

AC LINE FUSE OR CIRCUIT BREAKER BLOWS

If this occurs when charger is turned on without being plugged into the vehicle, the AC cord, timer motor coil, or the transformer may be shorted. To check the AC cord, insure that the timer is "OFF" and connect the continuity tester across the AC plug prongs. If circuit is complete the LAC cord is shorted and must be replaced. To check the timer motor coil, disconnect one of the timer motor wires and connect continuity tester to the motor coil leads. If the lamp glows, the coil is shorted. To test the transformer, first disconnect all the secondary leads to the diodes. Then reconnect the AC cord and turn timer "ON". If the AC fuse or circuit breaker still blows, the transformer is probably shorted internally and must be replaced.

FORM 00823
REVISION _

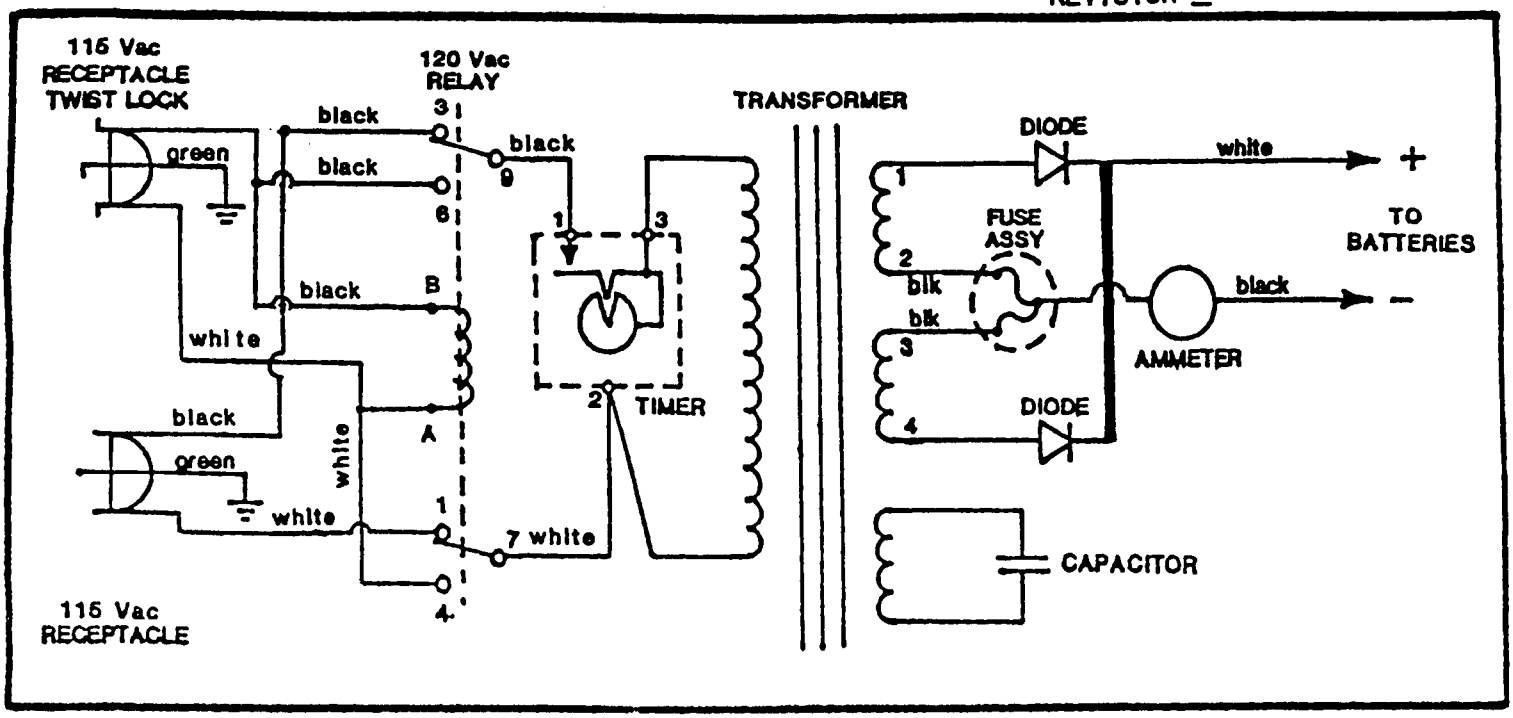


LESTER MATIC CHARGER
MODEL 11165 TYPE 12LC40-8T12

115VAC/60HZ,12VDC/40AMP
M.I. P/N 70223 (OLD)

MARK P/N	QTY	DESCRIPTION
	1	CASE ASSEMBLY
66786	1	TRANSFORMER ASSEMBLY
66730	2	DIODE ASSEMBLY
66747	1	AMMETER
66732	1	TIMER (12 HOUR)
66733	1	TIMER KNOB
66750	1	CAPACITOR
66726	1	FUSE ASSEMBLY
66728	1	RELAY (120VAC,15AMP)

FORM 00847
REVISION _

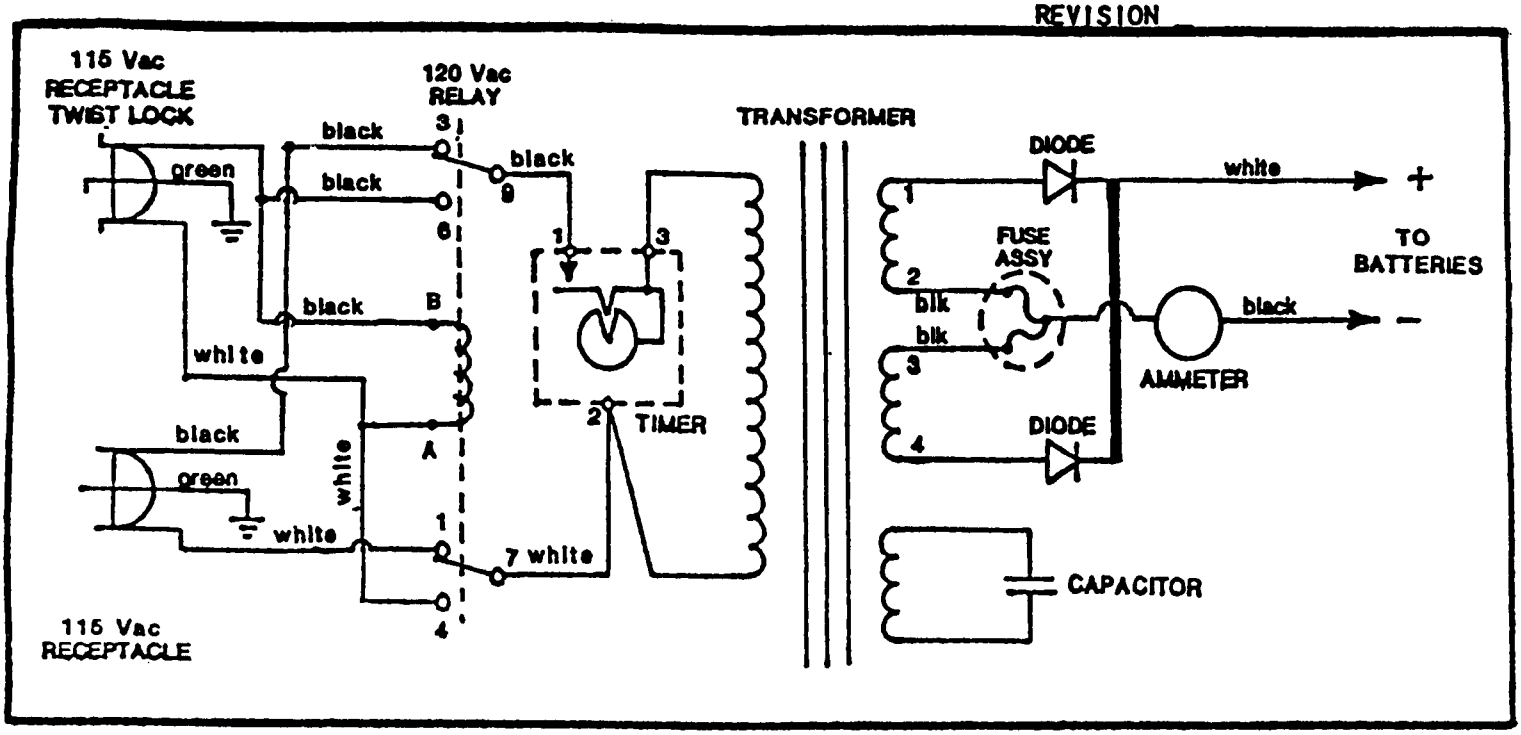


LESTER MATIC CHARGER
MODEL 11630 TYPE 12LC30-4T12

115VAC/60HZ,12VDC/30AMP
M.I. P/N 70224

MARK	P/N	QTY	DESCRIPTION
		1	CASE ASSEMBLY
	66983	1	TRANSFORMER ASSEMBLY
	66731	2	DIODE ASSEMBLY
	66747	1	AMMETER
	66732	1	TIMER (12 HOUR)
	66733	1	TIMER KNOB
	66750	1	CAPACITOR
	66727	1	FUSE ASSEMBLY
	66728	1	RELAY (120VAC,15AMP)

FORM 00848
REVISION



LESTER MATIC CHARGER
MODEL 11640 TYPE 12LC40-8T12

115VAC/60HZ,12VDC/40AMP
M.I. P/N 70223 (NEW)

MARK	P/N	QTY	DESCRIPTION
		1	CASE ASSEMBLY
	66786	1	TRANSFORMER ASSEMBLY
	66730	2	DIODE ASSEMBLY
	66747	1	AMMETER
	66732	1	TIMER (12 HOUR)
	66733	1	TIMER KNOB
	66750	1	CAPACITOR
	66726	1	FUSE ASSEMBLY
	66728	1	RELAY (120VAC,15AMP)

MANUAL BATTERY CHARGER OPERATION

INTRODUCTION

The Lester-Matic battery charger is a highly reliable, line compensating unit. When used according to instructions, the Lester-Matic will tend to lengthen battery life with less frequent additions of water.

INITIAL INSTALLATION

Provide adequate circuit breaker or fuse protection in the AC line to which the charger is to be plugged. Refer to electrical specifications on charger nameplate for input power requirements. When it is necessary to use an AC extension cord to the charger, use a three conductor No. 12 AWG cord with ground, and keep as short as possible. Instructions printed on the charger case are for daily reference.

NORMAL OPERATION

1. Provide adequate ventilation for both batteries and charger. The convection-cooled design requires an unobstructed flow of cooling air for proper operation.

2. Connect charger DC output cord to batteries.

3. Turn timer to "ON" for well discharged batteries or to "7" for lightly discharged batteries. Charger shuts off automatically at end of set period.

The state of discharge of the batteries will be slightly different each time they are put on charge, but the Lester-Matic varies automatically the initial charge rate, and taper of charge rate over the charge period. For well discharged batteries the charge rate at the start of the charge period should correspond to the "DC AMPS" rating on the charger nameplate. The rate should then taper gradually down to a lower finish rate. Normal charging at the low finish rate during the last 1-3 hours is necessary to achieve equalization of all battery cells. This equalization period allows the specific gravity of the battery electrolyte solution to rise to its full charge value. Since the taper of the charging rate (in amps, as indicated by the ammeter needle) is controlled by the rising voltage of the batteries being charged, proper performance of the charger and resulting good battery life is dependent upon the following factors:

a. An adequate AC line to handle the power required.

b. All cells of the batteries must be good, rising to approximately 2.5 DC volts per cell while still on charge or near the end of a charging period. When in doubt, check each cell with a single cell volt-meter while still on charge. If a low reading is obtained, check the low cells with a temperature corrected hydrometer. NOTE: Hydrometer float must be thoroughly clean to obtain accurate specific gravity readings.

c. Connections on the battery terminals and connector wiring must be clean and tight.

The necessity of adding water more frequently than two or three weeks, and/or hot battery cases at the end of the charging cycle, indicates the finish rate is

NORMAL OPERATION (CONTINUED)

too high, due to one or both of the following:

a. One or more bad cells in the batteries.

b. Batteries are starting to age to the point where hours of charge should be reduced gradually to obtain prolonged battery life.

4. To determine approximate full charge at start of day's use, turn timer knob to "1". Drop of ammeter needle to the low finish rate within 15 minutes indicates full charge.

5. Always turn timer to "OFF" before disconnection charger from batteries.

STORAGE

Charger may be left connected to the batteries and should be turned on for a full charge period once a month. In extremely cold conditions it may be necessary to charge more frequently. Check with your battery manufacturer. After each charge cycle the charger should be checked to insure that it has turned off. Severe overcharging and possible damage to the batteries could result if the charger remains on for prolonged periods of time.

CAUTION

THIS CHARGER IS FOR USE ONLY ON BATTERY SYSTEMS AS SPECIFIED ON THE CHARGER NAMEPLATE. USE OTHERWISE WILL DAMAGE CHARGER AND/OR BATTERIES.

Due to the electrical characteristics of this charger, it is possible to improperly hook up batteries and not blow the fuses when charging. When installing batteries, be sure polarity is correct. With a DC voltmeter, check terminal voltage and polarity at the battery connector.

When working near capacitor terminals be sure charger is turned off. With charger "on" transformer capacitor terminals provide a very high voltage. Care is to be shown.

MALFUNCTION SYMPTOMS AND THEIR REMEDIES

The Lester-Matic charger is designed with as few parts as possible making it a very reliable unit. Since each component can be tested individually, trouble shooting is a simple task. The following is a list of symptoms with their associated test procedures and remedies.

NO TRANSFORMER HUM AND AMMETER DOES NOT REGISTER

In the event no hum is detected from the transformer, check the AC cord to be sure it is securely plugged into a live AC outlet. When three-prong or two-prong adapters are used, they tend to work loose giving a poor connection. If the cord connection is secure and still no hum is noticed, a continuity test of the AC circuit is necessary. Turn the timer to "ON" and with a suitable continuity tester, check circuit across the AC plug prongs. CIRCUIT SHOULD BE COMPLETE. If not complete, individually check the AC cord, timer, primary transformer coil, and all connections.

TRANSFORMER HUMS BUT NO AMMETER INDICATION

Inspect the charger DC output connection to the batteries and also check to insure that the batteries are connected properly. If there is still no ammeter indication, a continuity test of the charger DC circuit must be performed. Turn the timer to "OFF" and disconnect the A.C. and D.C. plugs. Perform the following tests, using a low voltage test light, to check the continuity of the DC circuit.

(a) Connect tester clip to negative (-) blade and probe to positive (+) blade. CIRCUIT SHOULD BE COMPLETE. If not complete, first check the DC fuse link. If one or both fuses have blown, the link will be broken and usually the clear plastic fuse cover will be discolored. Refer to "Fuse Link Blowing" for test procedures. If fuses are good, individually check the fuse connections, DC cord, and diode connections (each may be checked with the continuity test light).

(b) If the circuit in (a) is complete, reverse test light leads. CIRCUIT SHOULD NOT BE COMPLETE. If circuit is complete, check DC cord for a "short" between the two wires. More probably, one or both diodes have "shorted". Refer to "Fuse Link Blowing" part (b) for continuity test of diodes.

(c) If (a) and (b) check good, assume the capacitor is shorted. Remove one wire from a capacitor terminal and place continuity tester clip to one terminal and probe to other. If circuit is complete, capacitor is "shorted" and must be replaced.

CHARGER DC FUSE LINK(S) BLOWS

This condition may be caused by:

(a) Reverse polarity between charger and batteries, such as incorrect installation of batteries, wiring of DC connector or charger plug.

ESKRIDGE
220 N. Mahaffie
Olathe, Kansas 66061
(913) 782-1238

THE ESKRIDGE BRAKE

Model: 93-110
Torque capacities: up to 4100 in-lbs
Fits: Nichols 100 and 110 series thru-shaft motors

The 93-110 series Eskridge brake is manufactured for two specific types of holding torque requirements. The standard "failsafe" requirement and the "slip protection" requirement. Both types are spring loaded (normally applied) with a hydraulic pressure required for release.

All brakes are individually tested at the factory for function, leaks and static breakaway torque. Failsafe type brakes are tested to be assured they are in excess of 110% of the failsafe torque rating for the unit. A failsafe brake should be used when the only requirement is a minimum static holding torque.

Of course, temperature, wear and contamination of the friction surfaces may affect the performance of the brake and should be taken into consideration when specifying a required torque rating. Care should be taken to avoid damaging the splines or mounting surfaces during installation.

INSTALLATION INSTRUCTIONS

1. Attach the motor to the input end of the brake with appropriate sized bolts through the brake and into the motor flange to give approximately 1/2" thread engagement. Torque 1/2" bolts to 75 ft-lbs.

2. Remove the plastic protective plug from the pressure port of the brake and attach a pressure line with 7/16-20 UNF-2B straight thread o-ring fitting.

3. Apply low pressure to the brake release port and bleed the air from the piston cavity through the bleeder port.

DISASSEMBLY PROCEDURE

1. Remove motor from brake.

2. Loosen four 12-point capscrews (11). Alternately unscrew the capscrews 1/2 turn at a time until all the internal spring force is relieved. Remove the cover (2).

3. Remove thrust race (10) from top of shaft (5).

4. Apply low air pressure (20-30 psi) to the brake release port while holding one hand on top of the piston (4) and springs (20). The air will force the piston out of the case (1).

5. Remove the shaft (5).

6. The friction discs (14), separator plates (15) and spacers (6) may now be removed from the case.

ALTERNATE DISASSEMBLY PROCEDURE

1. To replace the end cap bearing (9), or base gasket (8), alternately loosen capscrews (11) until all spring tension is off. It is not necessary to completely remove the capscrews or the cover. Invert the brake and remove the six end cap bolts (12). Remove the end cap (3). When reassembling, torque the #10-24 capscrews (12) to 60 in-lbs.

ASSEMBLY PROCEDURE

Assembly should be in order of disassembly with the following additional instructions.

1. Install the end cap bearing (9) and shaft (5).

2. The friction pack (spacer (6), friction disc (14), and separator plate (15)) must be installed in exactly the same order as it was removed. There must always be a stator (friction disc (14)) on the top and bottom ends of the stack of plates. If a separator plate (15) is placed next to the piston (4) or spacer (6) the unit will overheat and seize up. Be careful not to contaminate the friction surfaces with dirt, grease or fluid media* other than what is specified for your particular brake.

3. Pour approximately 1 tablespoon of fluid media* over the friction plates or until the fluid level is even with top friction plate.

4. If replacing the piston o-rings (16,17,18,19) be sure the two o-rings (18,19) are nearest each other with the two backup rings (16,17) to the outside of them. Gently slide the piston (4) until the large o-ring touches the case (1). Then press down firmly on the piston with the heel of both hands to squeeze the o-rings into the case and set the piston against the friction plates.

5. Insert the ten springs (20) into the piston (4).

6. Install the thrust race (10) on top of shaft (5).

7. Lay the cover gasket (7) on the case (1) and align the holes.

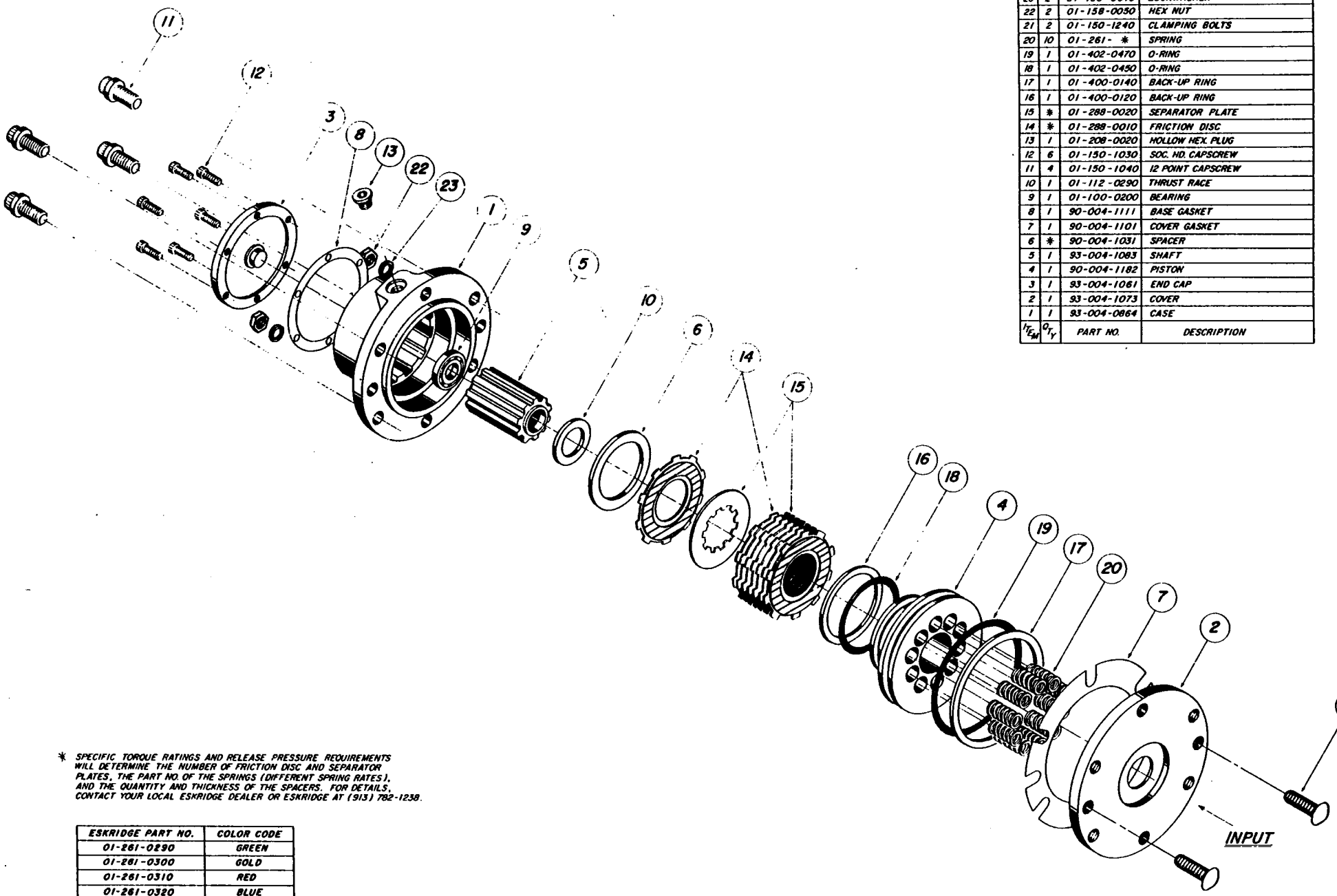
8. Set the cover (2) on top of piston springs (20) and align the holes. Start the four 12-point capscrews (11) through the case (1) and gasket (7) and into the cover (2) with your fingers. Alternately tighten the 12 point capscrews 1/2 turn at a time until cover is tight against the case. Torque capscrews (11) to 75 ft-lbs.

* Unless otherwise specified, series 93 brakes use automatic transmission fluid (ATF-type F) as a fluid media. ATF-Dexron will give somewhat differant torque characteristics. Some brakes are specifically designed to use hydraulic oil, gear lube or other fluid media.

NOTES:

1) Either bolt the motor to the brake or plug the input pilot in the cover before turning the upside down or the excess fluid media will run out.

2) Maximum operating pressure is 3,000 psi. Operation above this pressure is detrimental to the life of the brake and could be dangerous.



ITEM	QTY	PART NO.	DESCRIPTION
23	2	01-166-0010	LOCKWASHER
22	2	01-158-0050	HEX NUT
21	2	01-150-1240	CLAMPING BOLTS
20	10	01-261- *	SPRING
19	1	01-402-0470	O-RING
18	1	01-402-0450	O-RING
17	1	01-400-0140	BACK-UP RING
16	1	01-400-0120	BACK-UP RING
15	*	01-288-0020	SEPARATOR PLATE
14	*	01-288-0010	FRICTION DISC
13	1	01-208-0020	HOLLOW HEX PLUG
12	6	01-150-1030	SOC. HD. CAPSCREW
11	4	01-150-1040	12 POINT CAPSCREW
10	1	01-112-0290	THRUST RACE
9	1	01-100-0200	BEARING
8	1	90-004-1111	BASE GASKET
7	1	90-004-1101	COVER GASKET
6	*	90-004-1031	SPACER
5	1	93-004-1083	SHAFT
4	1	90-004-1182	PISTON
3	1	93-004-1061	END CAP
2	1	93-004-1073	COVER
1	1	93-004-0864	CASE

* SPECIFIC TORQUE RATINGS AND RELEASE PRESSURE REQUIREMENTS WILL DETERMINE THE NUMBER OF FRICTION DISC AND SEPARATOR PLATES, THE PART NO. OF THE SPRINGS (DIFFERENT SPRING RATES), AND THE QUANTITY AND THICKNESS OF THE SPACERS. FOR DETAILS, CONTACT YOUR LOCAL ESKRIDGE DEALER OR ESKRIDGE AT (913) 782-1238.

ESKRIDGE PART NO.	COLOR CODE
01-261-0290	GREEN
01-261-0300	GOLD
01-261-0310	RED
01-261-0320	BLUE
—— SPRINGS ——	

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Of course, temperature, wear and contamination of the friction surfaces may affect the performance of the brake and should be taken into consideration when specifying a required torque rating. Care should be taken to avoid damaging the splines or mounting surfaces during installation.

INSTALLATION INSTRUCTIONS

1. Attach the motor to the input end of the brake with appropriate sized bolts through the brake and into the motor flange to give approximately 1/2" thread engagement. Torque 1/2" bolts to 75 ft-lbs.

2. Remove the plastic protective plug from the pressure port of the brake and attach a pressure line with 7/16-20 UNF-2B straight thread o-ring fitting.

3. Apply low pressure to the brake release port and bleed the air from the piston cavity through the bleeder port.

DISASSEMBLY PROCEDURE

1. Remove motor from brake.

2. Loosen four 12-point capscrews (11). Alternately unscrew the capscrews 1/2 turn at a time until all the internal spring force is relieved. Remove the cover (2).

3. Remove thrust race (10) from top of shaft (5).

4. Apply low air pressure (20-30 psi) to the brake release port while holding one hand on top of the piston (4) and springs (20). The air will force the piston out of the case (1).

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6. The friction discs (14), separator plates (15) and spacers (6) may now be removed from the case.

ALTERNATE DISASSEMBLY PROCEDURE

1. To replace the end cap bearing (9), or base gasket (8), alternately loosen capscrews (11) until all spring tension is off. It is not necessary to completely remove the capscrews or the cover. Invert the brake and remove the six end cap bolts (12). Remove the end cap (3). When reassembling, torque the #10-24 capscrews (12) to 60 in-lbs.

ASSEMBLY PROCEDURE

Assembly should be in order of disassembly with the following additional instructions.

1. Install the end cap bearing (9) and shaft (5).

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3. Pour approximately 1 tablespoon of fluid media* over the friction plates or until the fluid level is even with top friction plate.

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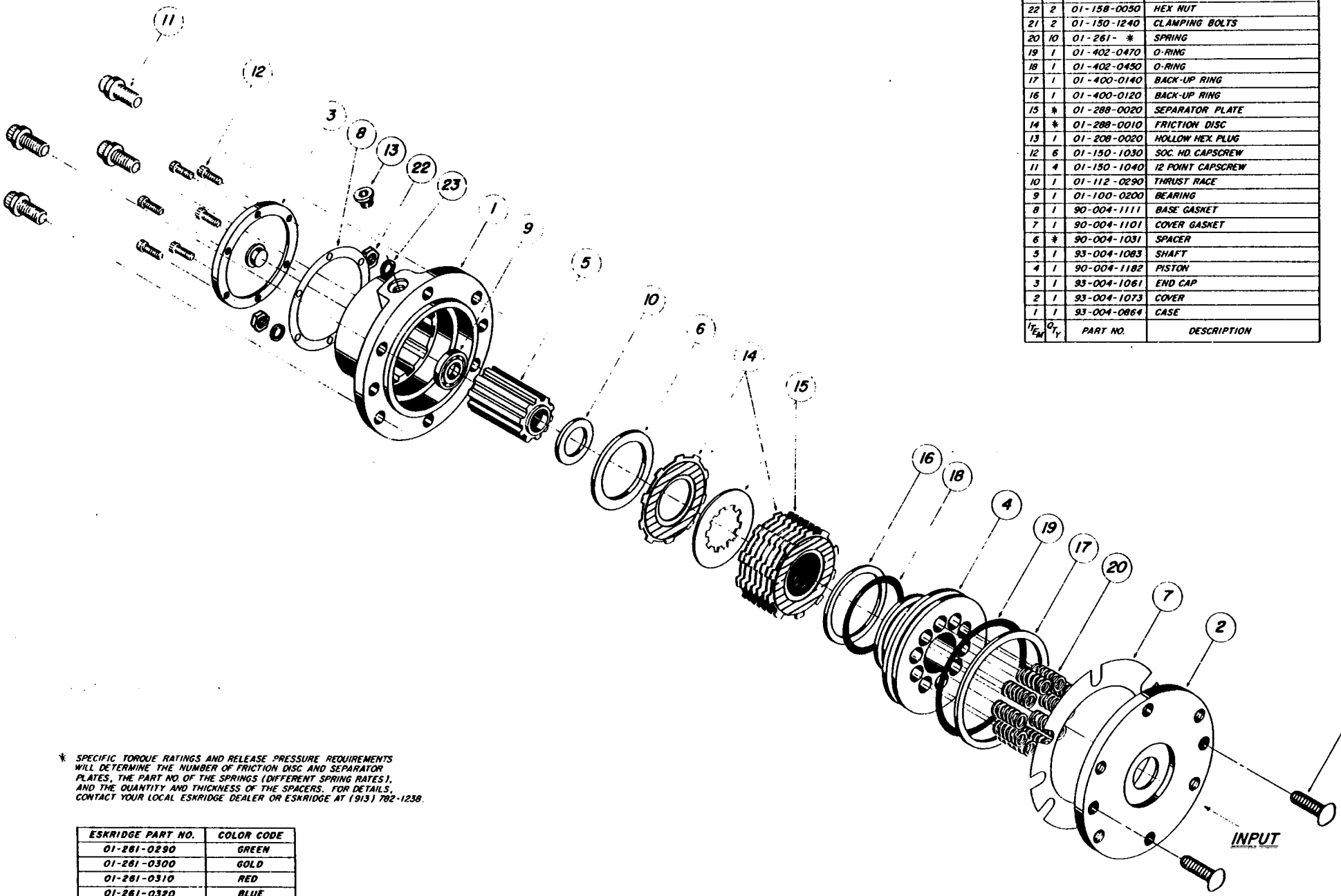
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NOTES:

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ESKRIDGE PART NO.	COLOR CODE
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01-261-0300	GOLD
01-261-0310	RED
01-261-0320	BLUE
—— SPRINGS ——	

SERVICE BULLETINS

As we make improvements to the **MARKLIFTS**, we like to supply you, the customer, with updated information which applies to your machine.

This section is provided as a place to store Service Bulletins as you receive them from MARK INDUSTRIES.