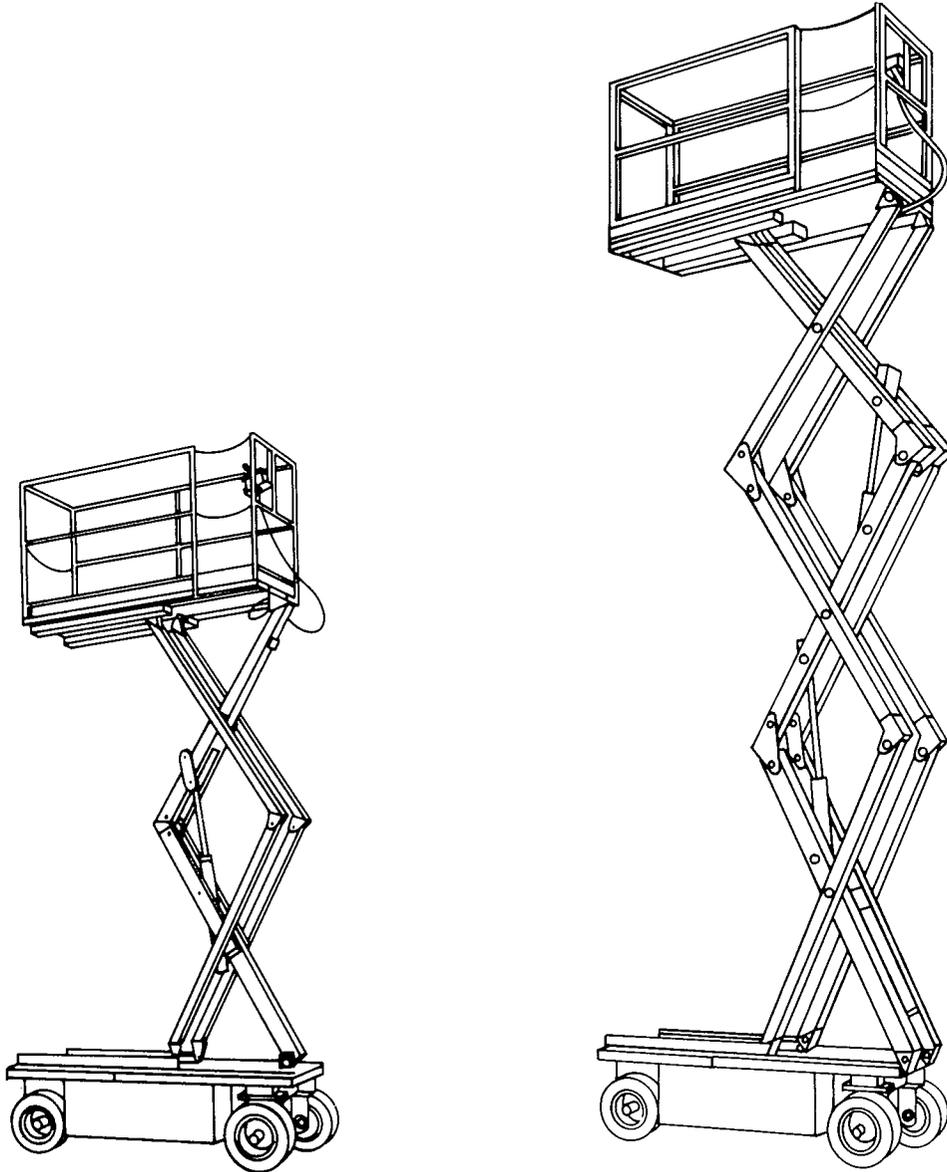


# **UP-*R*IGHT INC.**

**XL-14 & XL-19**



# **SERVICE & PARTS MANUAL**

FOR XL-14 MODELS WITH SERIAL NUMBERS 1247 to CURRENT  
FOR XL-19 MODELS WITH SERIAL NUMBERS 1111 to CURRENT

Information herein, subject to change without notice. When contacting Up-Right for service or parts information, be sure to include the MODEL and SERIAL NUMBERS from the equipment name plate.

**UP-*R*IGHT**  
AERIAL PLATFORMS

Call toll free

**(800) 437-0770**

California only (800) 442-0770  
1775 Park St., Selma, CA 93662

Canada (416) 668-7701

108 Industrial Dr., Whitby, Ontario, Can. L1N5Z8

DECEMBER 15, 1984

60594-000

Part No. 60594-000-000

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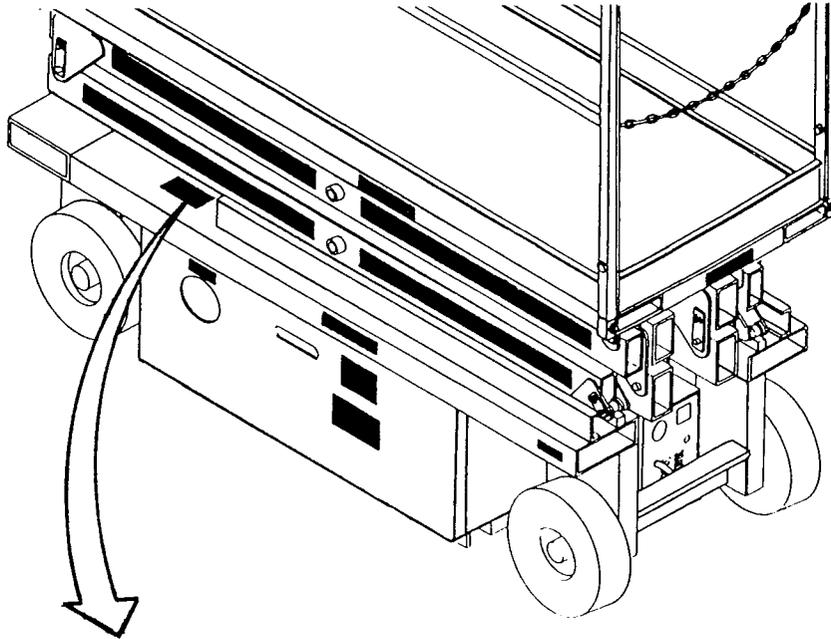
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## SECTION I

### 1-1. INTRODUCTION.

1-2. **PURPOSE.** This manual provides illustrations and instructions for the operation and maintenance of the UP-RIGHT XL-14 and XL-19 Work Platforms manufactured by Up-Right, Inc., Selma Operations, of Selma, California. (See Figures 1-1 and 1-2).

1-3. **SCOPE.** The operating instructions include both operation and maintenance responsibilities concerning the XL-14 and XI-19 Work Platforms' readiness. The functions cover scheduled maintenance, trouble-shooting, repair, replacement and adjustment.

### 1-4. GENERAL INFORMATION.

1-5. **ITEM DESCRIPTION.** The UP-RIGHT XL-14 and XL-19 Work Platform is a self-propelled scissor lift designed to be used as a means of elevating maintenance personnel and equipment and to provide a mobile work scaffold. It is designed to provide mobility with the platform in a raised or lowered position. Travel with the platform raised more than one foot is limited to the lowest speed range.

1-6. **PURPOSE AND LIMITATIONS.** The XL-14 and XL-19 Work Platforms' objective is to provide a quickly deployable, self-propelled, variable height work platform. The elevating function shall only be used when the work platform is on a level paved or reinforced work area. The machine is intended to be self-propelled when in relatively close proximity to the work area.

### 1-7. SPECIFICATIONS. Refer to Table 1-1.

**Table 1-1. Specifications**

Item	XL-14	XL-19
Platform Size	29" x 77"	29" x 77"
Maximum Platform Capacity	750 lbs.	550 lbs.
Max. Cantilever Cage Capacity	250 lbs. (Combined Platform and Cage Capacity Not To Exceed 750 lbs.)	250 lbs. (Combined Platform and Cage Capacity Not To Exceed 550 lbs.)
Working Height	19 Ft. 8 In.	25 Ft.
Maximum Platform Height	13 Ft. 8 In.	19 Ft.
Minimum Platform Height	39 In.	44 In.
Energy Source	24 Volt Battery Pack 2¼ H.P.D.C. Electric Motor, Four 250 Ampere-hour Batteries	Same as XL-14
Battery Charger	25 AMP Battery Charger	Same as XL-14
Battery Duty Cycle	25% for 8 Hours	Same as XL-14
Lift System	One Single Stage Lifting Cylinder	Two Single Stage Lifting Cylinders
Driveable Height	14' Standard 14' w/Cage	19' Standard 15' w/Cage

Table 1-1. Specifications (Cont'd)

Item	XL-14	XL-19
Surface Speed Platform Lowered Platform Raised	0 To 2 MPH 0 to .6 MPH	Same as XL-14 Same as XL-14
Hydraulic Tank Capacity	4 Gallons	Same as XL-14
Dimensions Weight Overall Width Overall Height Overall Length	2,360 lbs. 30 in. 79 in. 79 in.	3,200 lbs. Same as XL-14 86 in. 80 in.
Control System	2 Speed – 2 Range Forward and Reverse	3 Speed – 2 Range Forward and Reverse
Drive Control	Control Handle For Direction and Speed. Toggle Switch For Steering and Speed Range.	Same as XL-14
Horizontal Drive	Dual Front Wheel Hydraulic Motors	Same as XL-14
Wheels	16 In. Diameter Solid Rubber	Same as XL-14
Braking	Spring Applied, Hydraulic Release Parking Brake	Same as XL-14
Toeboard	4 In. High	Same as XL-14
Guardrails	40 In. High	40 In. High (Optional Fold-down Guardrails 42 In. High)*
Turning Radius	85 In. Outside	Same as XL-14
Gradeability	20%	17%
Wheel Base	62 In.	62 In.

\*Optional XL-19 guardrails fold down to 70" for passage through 80" height door.

1.8 POWER MODULE. The power module, located on the left side of the chassis, contains the electric motor, hydraulic pump and the hydraulic control valves. The electric motor drives the two section hydraulic pump providing hydraulic power to operate all functions of the XL-14 and XL-19 through electrical activation of the control valves.

1.9 ENERGY MODULE. The energy module contains the 24-volt battery pack and the hydraulic reservoir.

- 1. PLATFORM
- 2. SCISSOR MECHANISM
- 3. CHASSIS
- 4. ENERGY AND POWER MODULE
- 5. CONTROL CONSOLE

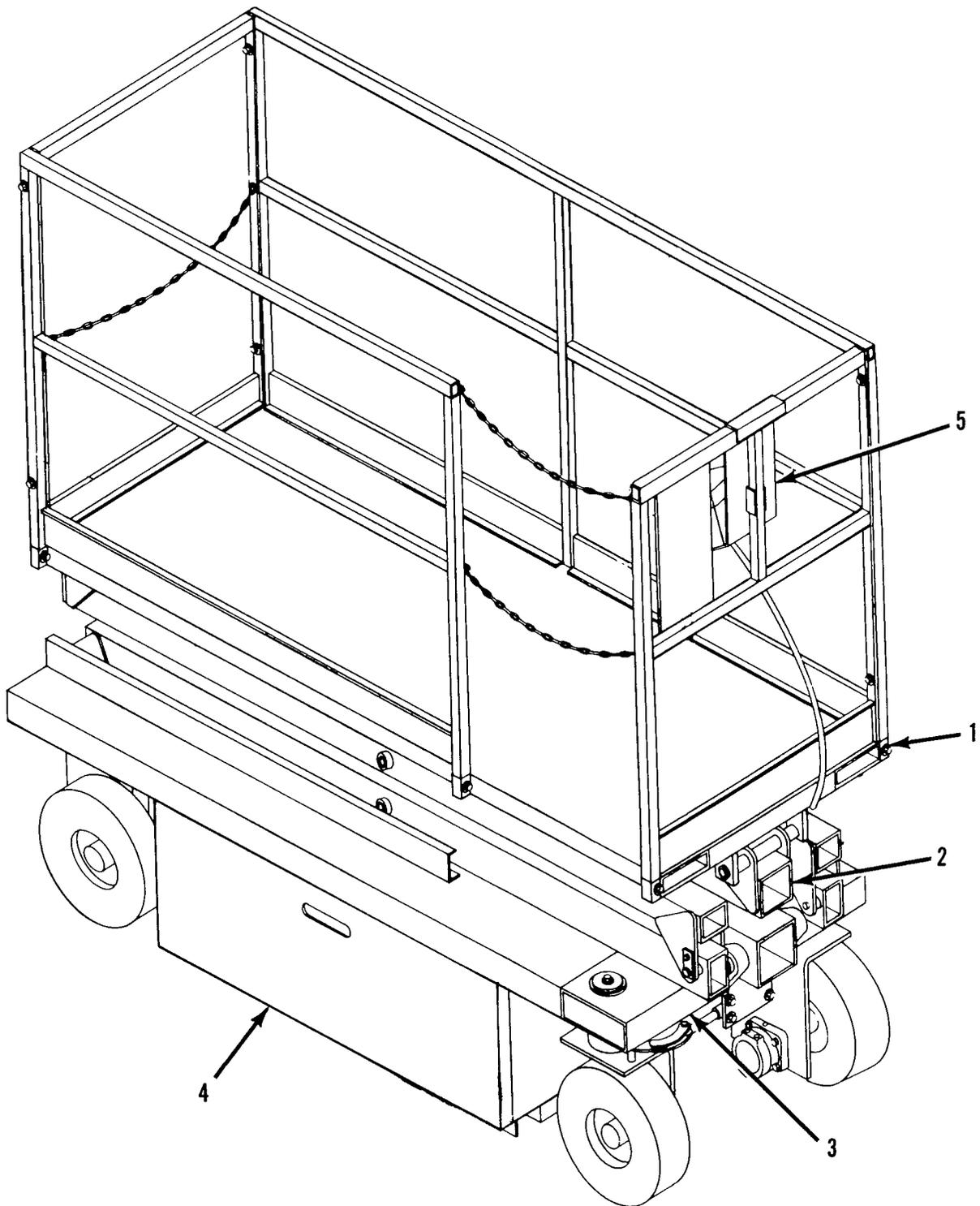


Figure 1-1. XL-14 Work Platform

1. PLATFORM
2. SCISSOR MECHANISM
3. CHASSIS
4. ENERGY AND POWER MODULE
5. CONTROL CONSOLE

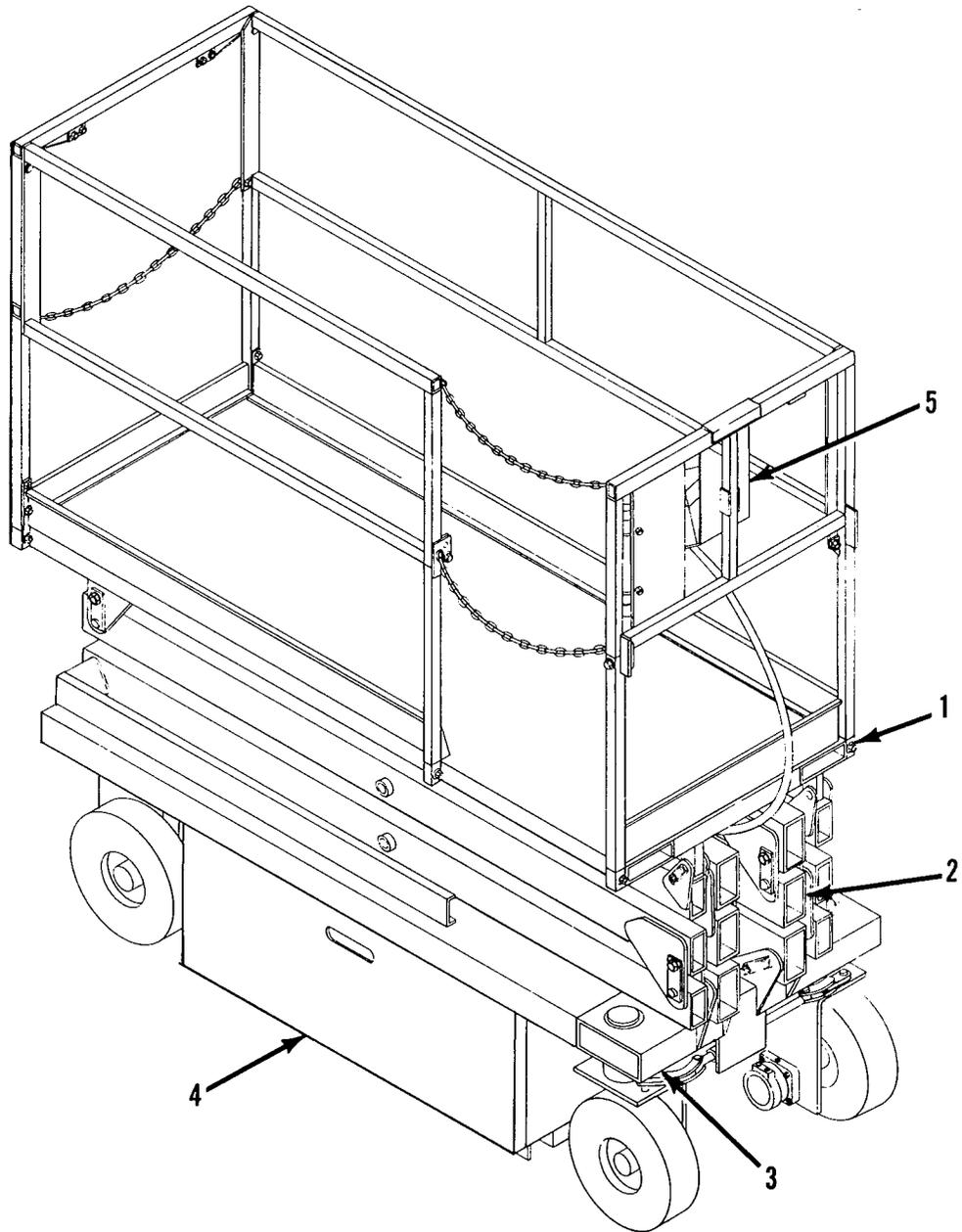


Figure 1-2. XL-19 Work Platform

## SECTION II

### SAFETY

#### 2-1. RULES AND PRECAUTIONS. BEFORE USING THE UP-RIGHT XL-14/XL-19:

- a. Thoroughly INSPECT the machine for cracked welds, loose hardware, hydraulic leaks damaged control cable, loose wire connections and tire damage.
- b. DISTRIBUTE all loads evenly on the platform. Do not exceed maximum platform load specifications.
- c. SURVEY the work area for surface hazards such as holes, drop-offs, bumps and debris before operating machine.
- d. LOOK up, down & around for over head obstructions and electrical conductors.
- e. HOOK chains across entrance after mounting platform.
- f. CHECK that all guardrails are in place and secured with all fasteners in place.
- g. DO NOT use damaged equipment. (Contact nearest UP-RIGHT Service Center for instructions.)
- h. DO NOT change operating or safety systems.
- i. DO NOT operate the machine within ten feet of power lines. THIS MACHINE IS NOT INSULATED.
- j. DO NOT elevate the platform or drive the machine while elevated unless the machine is on firm level surface (less than 1° slope).
- k. DO NOT attach overhanging loads or increase platform size.
- l. DO NOT use ladders or scaffolding on the platform.
- m. DO NOT sit, stand or climb on guardrail or midrail.
- n. DO NOT climb down scissors with the platform elevated.
- o. DO NOT recharge batteries near sparks or open flame; batteries that are being charged emit highly explosive hydrogen gas.
- p. DO NOT perform service on machine while platform is elevated without blocking the scissors.
- q. DO NOT operate the XL-19 without proper weighting.



## SECTION III

### PREPARATION FOR USE, SHIPMENT AND STORAGE

#### 3-1. PREPARATION FOR USE

#### WARNING

Stand clear when cutting the metal banding to avoid being cut when the banding snaps back.

- a. Remove the metal banding from the module covers and scissor linkage.
- b. Unpack the control console and plug the cable into the receptacle on the left side of the work platform.

#### 3-2. PREPARATION FOR SHIPMENT.

- a. Grease all the grease fittings as per the lubrication chart (Figures 5-4 and 5-5).
- b. Fully lower the platform.
- c. Disconnect the battery leads from the batteries and secure them to the chassis.
- d. Unplug and package the control console.
- e. Band the scissor linkage to the frame just behind the front wheels and at the rear wheels.
- f. Position the railings flat on the platform and band them together.
- g. For sea shipment, perform preservation per extended storage paragraph 3-4 a.
- h. Place the packaging container on the platform and band into place.

#### 3-3. TRANSPORT

- a. Maneuver the unit into transport position and chock wheels.

#### NOTE

If forklifting is required, lift from rear of the machine.

- b. Secure the machine to the transport vehicle with chains or straps of adequate load capacity attached to the chassis tie down lugs.

**3-4. STORAGE.** No preparation for storage is required for normal usage. Regular maintenance per Table 5-1 and Figure 5-1 should be performed. If the unit is to be placed in long term storage (dead storage) use the following preservation procedure.

a. Preservation.

- (1) Clean painted surfaces. If the paint surface is damaged, repaint.
- (2) Fill the hydraulic tank to operating level.

NOTE

This hydraulic system is filled to the operating level with approved fluid required for operation. Do not drain.

- (3) Coat exposed portions of extended cylinder rods with an approved preservative and wrap with barrier material.
- (4) Coat all exposed unpainted metal surfaces with preservative.

b. Batteries.

- (1) Disconnect all the battery leads and secure to the chassis. Tape the connectors on the ends of the leads to the chassis.
- (2) Remove the batteries and place in alternate service.

## SECTION IV

### OPERATION INSTRUCTIONS

#### 4-1. THEORY OF OPERATION.

4-1. **GENERAL FUNCTIONING.** The electric motor directly drives a two-section hydraulic pump to operate all functions. The oil flow is directed through the use of electrically activated solenoid valves and pressure actuated hydraulic switches.

4-3. **DRIVING.** When the emergency switch (1, Figure 4-1) is turned "On", it activates the mode switch (2, Figure 4-1) circuit. The mode switch (2, Figure 4-1) is set to "Drive" to render the drive controller (8, Figure 4-1) operative. Moving the drive controller toward "forward" energizes the dump valve solenoid (4, Figure 4-1) which causes the dump valve (15, Figure 4-3) to close blocking the oil flow. At the same time that circuit energizes forward solenoid (3, Figure 4-1) which moves the forward reverse valve (2, Figure 4-3) to the forward position. This allows oil to be pumped through the forward - reverse valve (2, Figure 4-3) to the shuttle valve (3, Figure 4-3) which blocks oil flow in one direction sending oil to the drive motors (4, Figure 4-3) in only one direction and at the same time retracts the brake cylinder (5, Figure 4-3). The flow of oil is divided prior to driving the hydraulic motors (4, Figure 4-3) so that each motor receives half the flow. Not all the oil is flowing through the hydraulic motors. Part of the flow bypasses the motor circuit by flowing through a flow restricting needle valve (12, Figure 4-3) to the bypass valve (6, Figure 4-3). This needle valve (12, Figure 4-3) is used to control the creep speed of the unit by limiting the amount of flow permitted to bypass the hydraulic motors (4, Figure 4-3). The "creep speed limit switch" (12, Figure 4-1) is activated while the platform is raised more than one foot. This switch opens the bypass switch circuit preventing the bypass valve (6, Figure 4-3) from closing and blocking flow, therefore limiting the unit to creep speed while the platform is elevated.

Pressure supplied to the motors is also transmitted through a sensing line to shift a counterbalance valve Figure 4-3) which allows a flow back through the forward - reverse valve (2, Figure 4-3) to the return filter (9, Figure 4-3) and into the hydraulic reservoir (10, Figure 4-3). As the drive controller is moved further forward a second circuit is energized activating the bypass solenoid (5, Figure 4-1) which closes the bypass valve (6, Figure 4-3). This causes more flow to be directed to the hydraulic motors which increases the speed of the unit. Setting the speed range switch (13, Figure 4-1) to "High" activates the "series" solenoid (6, Figure 4-1) causing the "series" valve (7, Figure 4-3) to change the flow route for the drive motor oil. Now ALL the flow passes through each drive motor doubling the previous flow rate to achieve the unit's highest speed. In REVERSE, the reverse solenoid (7, Figure 4-1) operates the forward - reverse valve (2, Figure 4-3) to the reverse mode thus causing the oil to flow through the drive motors in the opposite direction as before then to check valve (11, Figure 4-3), forward - reverse valve (2, Figure 4-3) and back to the reservoir (10, Figure 4-3). The bypass circuit works the same as in forward. The speed range switch (13, Figure 4-1) performs the same function as in forward but the oil flows in the opposite direction. When the drive controller is returned to the neutral position the oil flow to the brake cylinder (5, Figure 4-3) is blocked allowing the spring loaded cylinder to automatically apply the parking brake. The dump valve solenoid (4, Figure 4-1) is de-energized allowing the dump valve (15, Figure 4-3) to open.

To steer, the steering switch (9, Figure 4-1) is held to either "LEFT" or "RIGHT" thus energizing either the left or right steering solenoids (10 and 11, Figure 4-1). Activating the left solenoid operates the steering valve (13, Figure 4-3) to send the oil flow to the right side of the steering cylinder (14, Figure 4-3). As the oil enters the cylinder, that chamber expands causing the cylinder piston to force the oil from the opposing chamber and move the shaft assembly to the left. The oil forced from the steering cylinder passes through the steering valve (13, Figure 4-3) and back to the hydraulic reservoir (10, Figure 4-3).

Steering right sends the oil to left side of the steering cylinder (14, Figure 4-3) forcing the oil from the right side and back to the hydraulic reservoir (10, Figure 4-3).

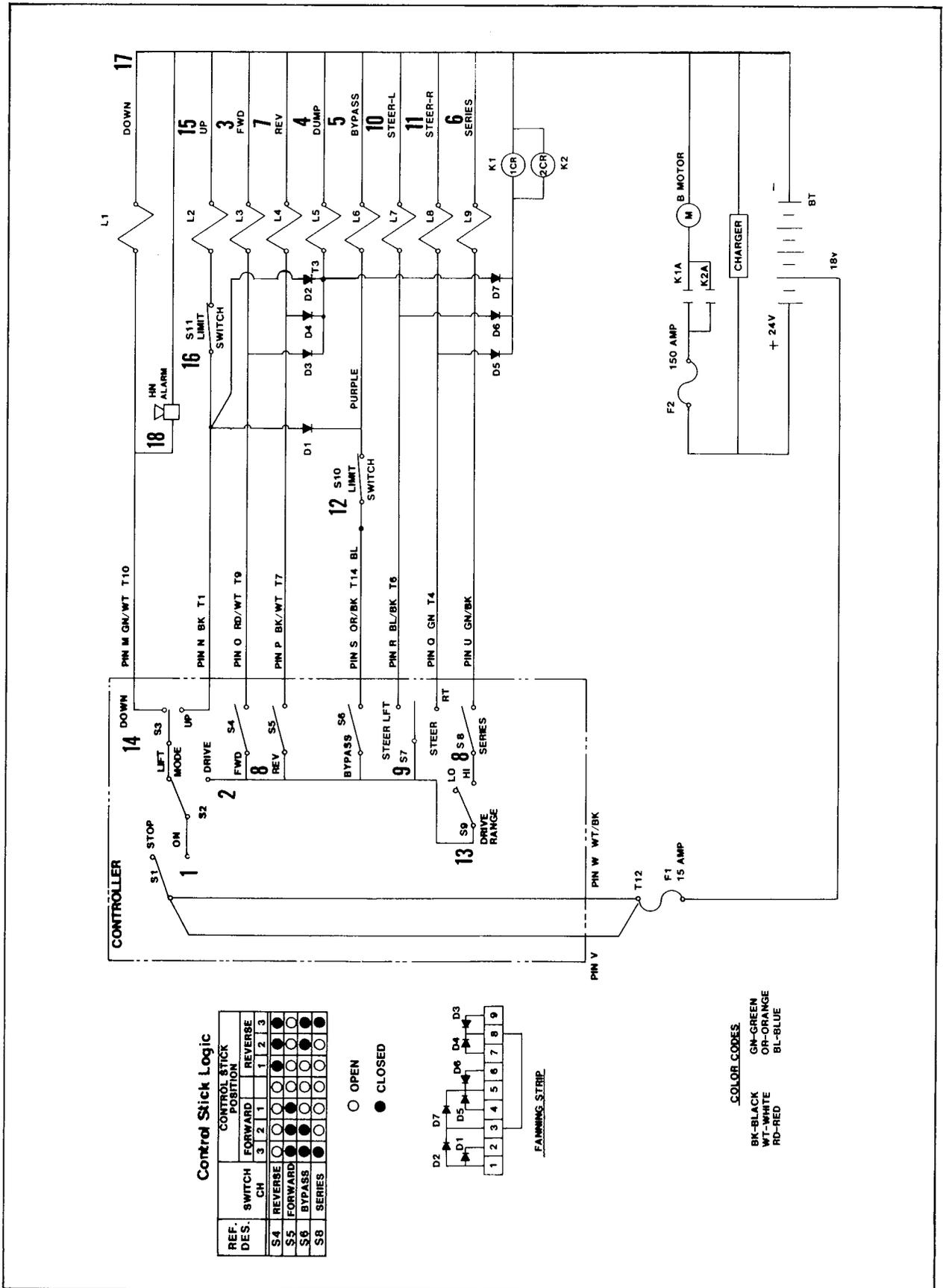


Figure 4-1. Electrical Schematic, XL-19, 18 Volt System



- |                              |                              |
|------------------------------|------------------------------|
| 1. EMERGENCY SHUT OFF SWITCH | 10. STEER LEFT SOLENOID      |
| 2. MODE SWITCH               | 11. STEER RIGHT SOLENOID     |
| 3. FORWARD SOLENOID          | 12. CREEP SPEED LIMIT SWITCH |
| 4. DUMP SOLENOID             | 13. SPEED RANGE              |
| 5. BYPASS SOLENOID           | 14. LIFT SWITCH              |
| 6. SERIES SOLENOID           | 15. UP SOLENOID              |
| 7. REVERSE SOLENOID          | 16. HEIGHT LIMIT SWITCH      |
| 8. FORWARD - REVERSE CONTROL | 17. DOWN SOLENOID            |
| 9. STEERING SWITCH           | 18. DOWN ALARM               |

Table 4-1. Legend for Figure 4-1 and 4-2

- |                                    |                                   |
|------------------------------------|-----------------------------------|
| 1. HYDRAULIC PUMP                  | 13. STEERING VALVE                |
| 2. FORWARD - REVERSE CONTROL VALVE | 14. STEERING CYLINDER             |
| 3. SHUTTLE VALVE                   | 15. DUMP VALVE                    |
| 4. HYDRAULIC DRIVE MOTORS          | 16. UP VALVE                      |
| 5. BRAKE CYLINDER                  | 17. LIFT CYLINDER                 |
| 6. BYPASS VALVE                    | 18. CHECK VALVE                   |
| 7. SERIES VALVE                    | 19. DOWN VALVE                    |
| 8. COUNTERBALANCE VALVE            | 20. FLOW RESTRICTING NEEDLE VALVE |
| 9. RETURN FILTER                   | 21. EMERGENCY LOWERING VALVE      |
| 10. HYDRAULIC RESERVOIR            | 22. VELOCITY FUSE                 |
| 11. CHECK VALVE                    | 23. STEERING RELIEF VALVE         |
| 12. FLOW RESTRICTING NEEDLE VALVE  | 24. DRIVE/LIFT RELIEF VALVE       |
|                                    | 25. LIFT RELIEF VALVE             |

Table 4-2. Legend for Figure 4-3 and 4-4

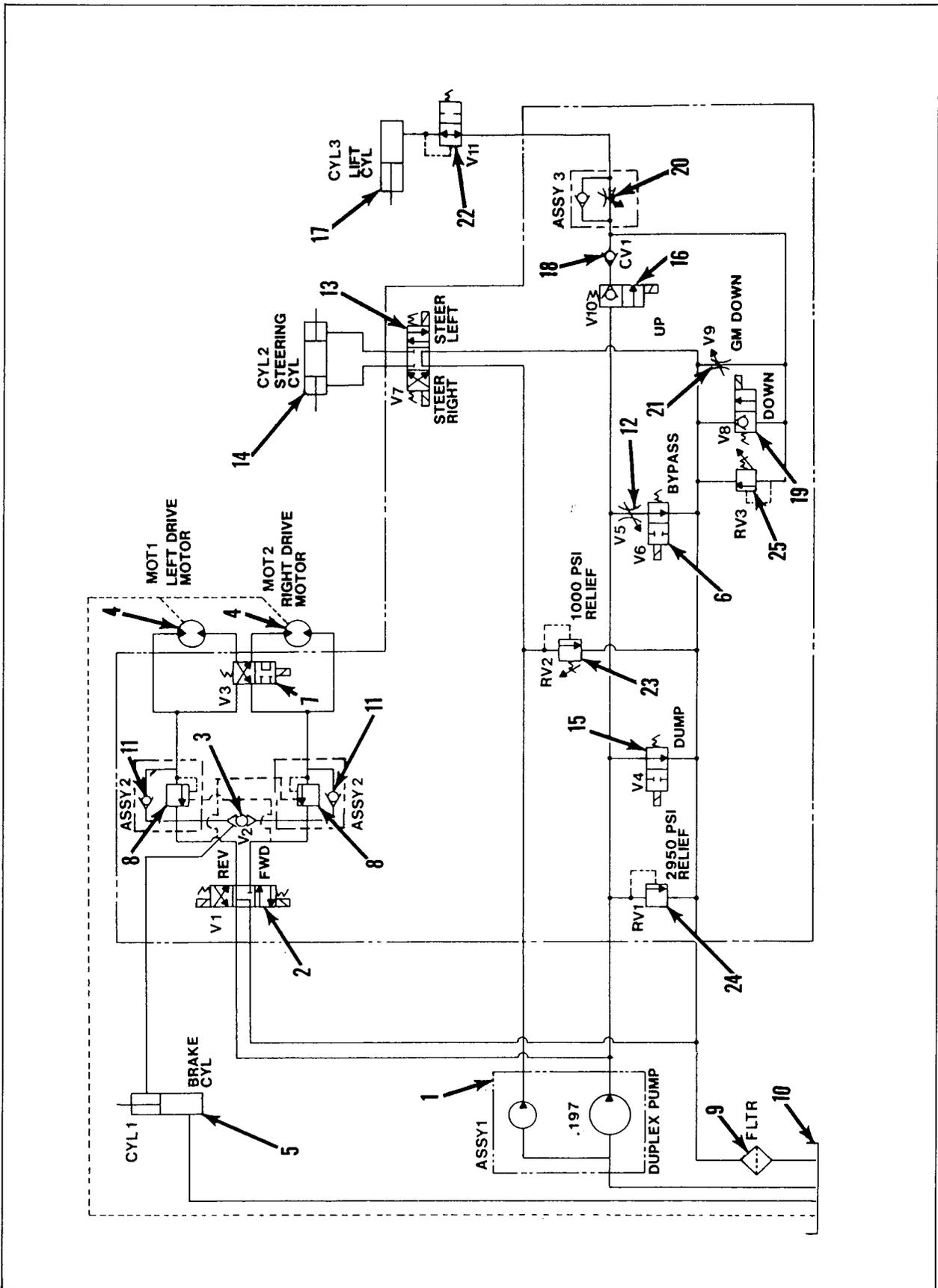


Figure 4-3. Hydraulic Schematic; XL-14

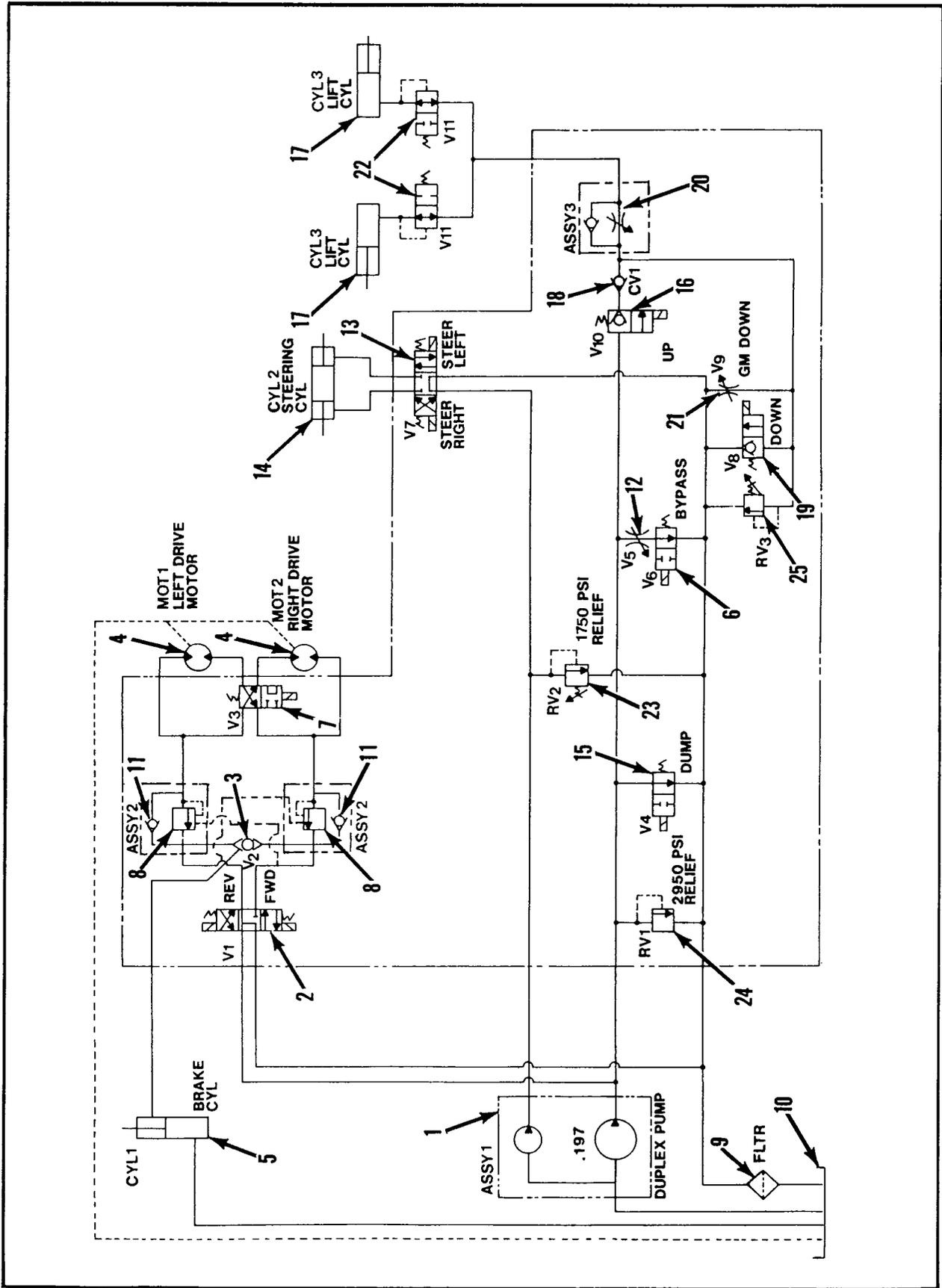


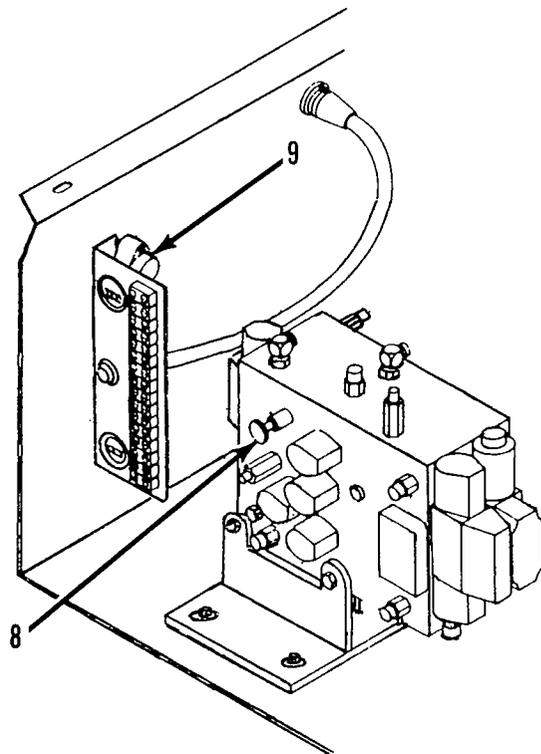
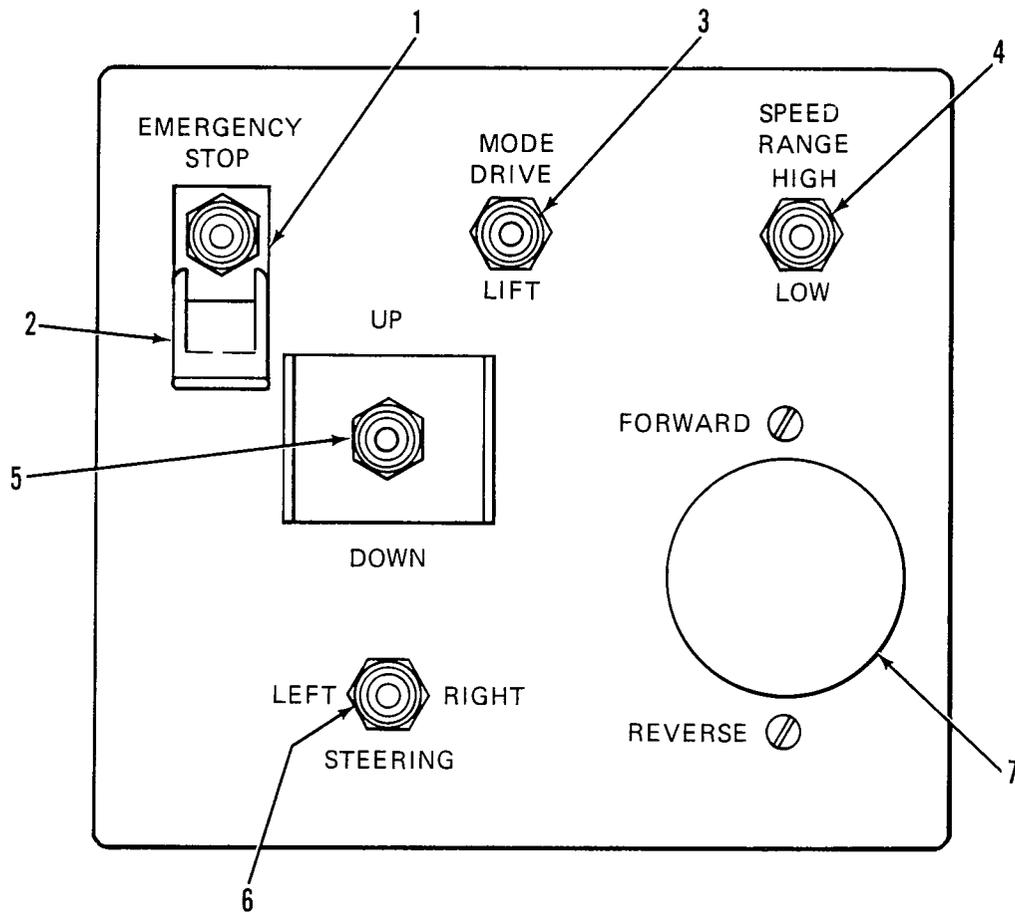
Figure 4-4. Hydraulic Schematic; XL-19

4-4. RAISING AND LOWERING PLATFORM. Positioning the mode switch (2, Figure 4-1) to "LIFT" energizes the lift switch (14, Figure 4-1). Positioning the lift switch to "UP" energizes the dump solenoid (4, Figure 4-1) closing the dump valve (15, Figure 4-3), and the bypass solenoid (5, Figure 4-1) closing the bypass valve (6, Figure 4-3). The up solenoid (15, Figure 4-1) is also energized operating the up valve (16, Figure 4-3) to open the passage for oil to enter the lift cylinder.

When the platform reaches its maximum height a limit switch (16, Figure 4-1) opens the electrical circuit de-energizing the up solenoid (15, Figure 4-1). Returning the lift switch to neutral, de-energizes the bypass and dump solenoids allowing the bypass and dump valves to open. The check valve (18, Figure 4-3) prevents the oil from flowing back out of the cylinder. Positioning the lift switch to "DOWN" energizes the down solenoid (17, Figure 4-1) which opens the down valve (19, Figure 4-3) allowing the oil to escape back to the reservoir (10, Figure 4-3). With the down solenoid circuit energized, the down alarm (18, Figure 4-1) is also energized. The rate of descent of the platform is regulated by a flow restricting needle valve (20, Figure 4-3). As a safety feature, the lift cylinder(s) has (have) a velocity fuse (22, Figure 4-3) which trips stopping the descent if the rate of descent is too fast. The emergency lowering valve (2, Figure 4-3) provides a means to bypass the check valve (18, Figure 4-3) and manually lower the platform. In addition, each hydraulic circuit has a preset hydraulic pressure relief valve. The steering system is limited by a 1300 psi relief valve (XL-14) and a 1750 psi relief valve (XL-19) (23, Figure 4-3). The drive circuit is limited by a 2950 psi relief valve (24, Figure 4-3). The lift circuit is limited to 2500 psi (XL-14) and 2000 psi (XL-19) by a relief valve (25, Figure 4-3).

4.5 SAFETY DESIGN. The XL-14/19 has certain features built in to prevent unsafe operation:

- a. The drive speed is limited to range whenever the deck is raised.
- b. The platform descent rate is controlled by an orifice. The lift cylinders are equipped with a velocity fuse to prevent descent if a hose fails.
- c. A holding brake is automatically engaged when the drive controller is released.
- d. The control box is equipped with an emergency-off type system switch.
- e. Controls are either guarded or latched to prevent inadvertent operating.
- f. An alarm is provided to signal when the platform is lowering.



060594-000  
Figure 4-5. Controls and Indicators

4-6. CONTROLS AND INDICATORS. The controls and indicators for operation of the Maintenance Work Platform are shown in Figure 4-5. The name and function of each control and indicator are listed in Table 4-3. The index numbers in the figure correspond to the index numbers in the table. The operator should know the location of each control and indicator and have a thorough knowledge of the function and operation of each before attempting to operate the unit.

Table 4-3. Controls and Indicators

INDEX NUMBER	NAME	FUNCTION
1	EMERGENCY STOP SWITCH	A two position toggle switch. Position the switch on (down) to energize the electrical circuits. Position the switch to off (up) to shut down all electrical circuits, except the lift switch DOWN function.
2	SWITCH GUARD (Emergency Stop)	Normally open. When closed, the switch guard automatically positions the EMERGENCY STOP switch to off (up).
3	MODE SWITCH	A two position toggle switch. DRIVE position sends electrical power to the drive controller (7) and the STEERING switch (6). LIFT position sends electrical power to the lift (UP, DOWN) switch (5).
4	SPEED RANGE SWITCH	A two position toggle switch. Provides the platform operator with two speed ranges, in forward or reverse.
5	UP/DOWN SWITCH	A three position toggle switch controls the lift function. Push the switch to UP to raise the platform to the desired height then release the switch. Push the switch to DOWN to lower the platform to the desired level then release the switch.
6	STEERING SWITCH	A three position toggle switch that is normally centered. Push the switch to LEFT to steer left, RIGHT to steer right. Although the switch is self-centering, the steering system is not. The wheels must be steered back to straight. Observe the tires while maneuvering the unit to assure proper direction.

INDEX NUMBER	NAME	FUNCTION
7	FORWARD - REVERSE control with locking collar	<p>Normally locked in neutral by the collar. A drive-controller. Pull up on the locking collar then push forward to move the unit forward. With the unit platform lowered, the further the drive-controller is moved away from neutral the higher the speed in either forward or reverse. Pull up on the locking collar and pull back to travel backward. The SPEED RANGE switch (4) position determines the platform's maximum speed as the drive-controller is operated through its range of travel. There are no detents felt as the drive-controller is operated. The difference in travel is the only indication that the speed range has shifted.</p> <p>When the platform is raised more than one foot, the unit will only travel as its slowest pace or "creep speed". When released, the drive-controller automatically returns to neutral.</p>
8	EMERGENCY DOWN VALVE	<p>Open the valve by turning the knob counterclockwise to lower the platform. Once the platform is down, close the valve by turning clockwise. The platform cannot be raised until the valve is closed.</p>
9	ALARM (Platform Lowering)	<p>Emits an audible alarm signal while the platform is lowering when the Lift switch on the control console is used to lower the platform. If the EMERGENCY LOWERING VALVE (8) is used to do the lowering, the alarm will not function.</p>

#### 4-7. OPERATING PROCEDURES.

#### 4-8. PRE-OPERATION CHECKOUT.

### WARNING

Do not perform service on machine with the platform elevated.

- a. Carefully inspect the entire machine for damage such as cracked welds or structural members, loose or missing parts, oil leaks, damaged cables or hoses, loose connections and tire damage.
- b. Before operating the machine, survey the work area for surface hazards such as holes, drop-offs, bumps and debris.
- c. Check in ALL directions for obstructions and electrical conductors.
- d. Remove the battery box and hydraulic manifold covers and inspect for damage and missing parts.
- e. Remove the cap from the hydraulic reservoir and check the level of the oil with the platform fully lowered. Oil should be visible in strainer.
- f. Check the fluid level in the batteries (See Figure 7-10.).
- g. Check state of battery charge (See Section V, Battery Maintenance).
- h. Check that A.C. extension cord has been disconnected from charger.
- i. For XL-19 check that weights are in place; one under module and one under electric motor in module.
- j. Open module cover and connect cable from control console to receptacle on front side of power module.

### WARNING

Look up and around for obstructions prior to operating the lift function.

### WARNING

DO NOT operate the machine within 10 feet of any electrical power lines.  
THIS MACHINE IS NOT INSULATED.

DO NOT elevate the platform unless the machine is on firm level ground.

DO NOT enter the scissor linkage while the platform is elevated.

- k. Raise the platform and visually inspect the scissor linkage, rollers, lift cylinder, cables and hoses for damage or erratic operation. Check for missing or loose parts.
- l. Lower the platform partially by pushing lift switch to "DOWN", and check operation of the audible lowering alarm.
- m. Reach through the access hole in the hydraulic manifold cover and open the emergency lowering valve to check for proper operation. Once the platform is fully lowered, close the valve.

- n. Check that all guardrails are in place and secured with all fasteners in place.
- o. After all the preceding checks have been completed, disconnect control console cable from module and close module covers.
- p. Connect control cable (from scissors) to receptacle on front side of power module.
- q. Hang control console on guardrail. Connect control cable to receptacle on underside of platform. Location for XL-14, front side. Location for XL-19, front center.

#### 4-9. OPERATION.

#### 4-10. TRAVEL WITH PLATFORM LOWERED (Figure 4-5).

- a. Turn the EMERGENCY STOP switch (1) on the control console to the "ON" position.
- b. Set the mode switch (3) to "DRIVE".
- c. Set the speed range switch (4) to "LOW" or "HIGH".
- d. Pull up the locking collar to release drive-controller (7) from the neutral position. SLOWLY move the drive-controller forward and backward to check for speed and directional control.
- e. Move the steering switch (6) to LEFT then RIGHT to check for steering control.

#### 4.11. LIFTING PLATFORM

### WARNING

Look up and around for obstructions before performing the lifting function.

DO NOT elevate the platform unless the machine is level.

DO NOT operate this machine within 10 feet of any electrical power lines. THIS MACHINE IS NOT INSULATED.

DO NOT perform service on the machine with the platform elevated, unless properly blocked.

- a. If necessary, drive the machine to an unobstructed area to allow for full platform elevation.
- b. Position the mode switch (3) to "LIFT".
- c. Push the lift switch (5) to "UP" and hold there to elevate the platform.

### WARNING

NEVER enter the scissor linkage while the platform is elevated.

- d. When the work task is completed, lower the platform by holding the lift switch (5) in the "DOWN" position until the platform is fully lowered.

4-12. TRAVEL WITH PLATFORM ELEVATED.

4-13. OPTIONAL XL-19 FOLD DOWN GUARDRAILS (See Figure 4-6).

a. Fold down procedure.

1. Remove the controller from the front guardrail and lay it on the deck floor.
2. Unlatch the left side guardrail by pushing out on the latches at the front and rear upper corners. Fold the rail inward.
3. Unlatch the right side guardrail by pushing out on the latch at the upper rear corner and by pulling the ring on the latch pin at the front of the rail. Fold the rail in.

**CAUTION**

The rear guardrail should be supported while folding in the side rails.

4. Fold in the rear guardrail so that it rests on the side rails.
5. Unlatch the front guardrail by pulling the ring on the latch pin at the right rail up-right. Fold in the front rail so that it rests on the side rails.

b. Erection Procedure.

1. Raise the rear guardrail and hold in a vertical position.
2. Raise the right side guardrail. Be certain that the front latch pin and rear latch are engaged. It may be necessary to pull the front latch pin to allow the rail assembly to pivot up.
3. Raise the front guardrail. Be certain that the latch pin engages.
4. Raise the left guardrail. Be certain that the front and rear pins are engaged and that the rails are latched.
5. Hook the controller on the front guardrail. Before operating the machine be certain that all pins and latches are properly engaged.

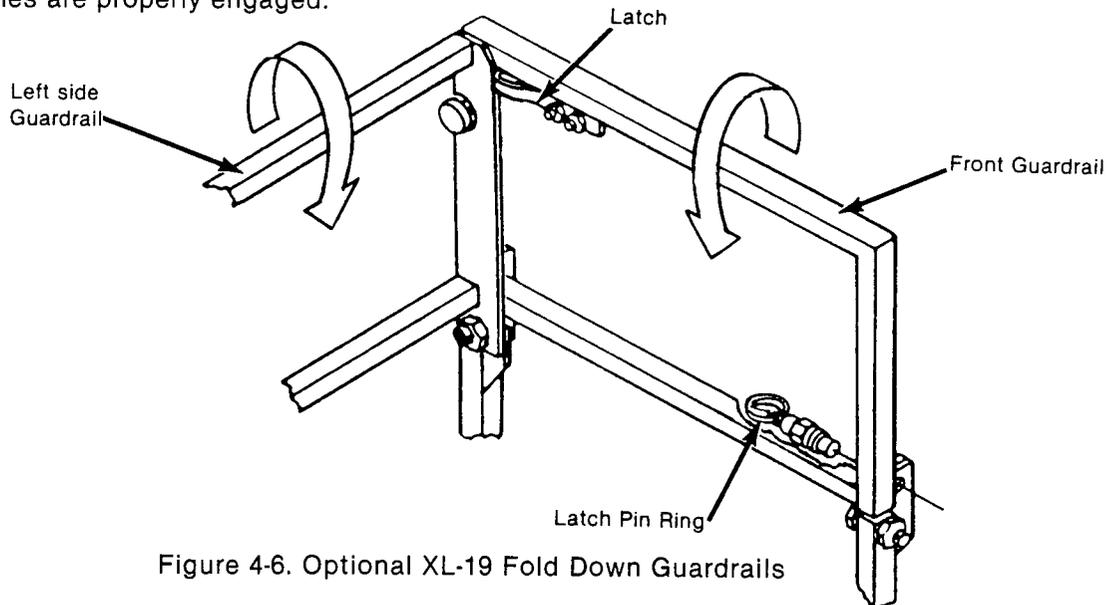


Figure 4-6. Optional XL-19 Fold Down Guardrails

## SECTION V

### MAINTENANCE INSTRUCTIONS

5-1. **SCOPE:** This section contains instructions for the maintenance of the XL-14/XL-19. Procedures for the operational checkout, adjustment, scheduled maintenance, troubleshooting, and repair/removal are included.

5.2 **LOCATION OF COMPONENTS.** Figure 5-1 shows components on complete unit. Figure 5-2 shows components mounted directly to chassis and located in the control valve.

5-3. **SCHEDULED INSPECTION AND MAINTENANCE.**

5-4. **GENERAL.** The complete inspection consists of periodic visual and operational checks, together with all necessary minor adjustments to assure proper performance.

5-6. **SCHEDULED INSPECTION.** Table 5-1 compiles those items that are to be visually inspected, checked or serviced on a periodic basis, and are arranged according to lapsed time between inspections. The inspection requirements are to be performed by operating and maintenance personnel.

Table 5-1. Periodic Inspection and Maintenance

COMPONENT	INSPECTION or SERVICE	INTERVAL						
		EACH SHIFT	125 hr	250 hr	500 hr	1000 hr	2000 hr	Other
Battery System	Check electrolyte level	X						
	Check specific gravity	X						
	Clean exterior	X						
	Clean the terminals			X				
	Check battery cable condition	X						
	Charge batteries	X						
Hydraulic Oil	Check oil level	X						Climate Change
	Drain and replace oil					X		
Hydraulic Oil Filter	Change filter			X				
Hydraulic Control Valves	Check for leaks		X					
	Check hose connections		X					
Hydraulic Hoses	Check connections		X					
	Check for exterior wear		X					
Emergency Hyd System	Open the emergency down valve		X					
Control Console	Check switches operation		X					
	Check cable plug		X					

1. CONTROL CONSOLE
2. PLATFORM
3. SCISSOR LINKAGE
4. CHASSIS
5. ENERGY AND POWER MODULE

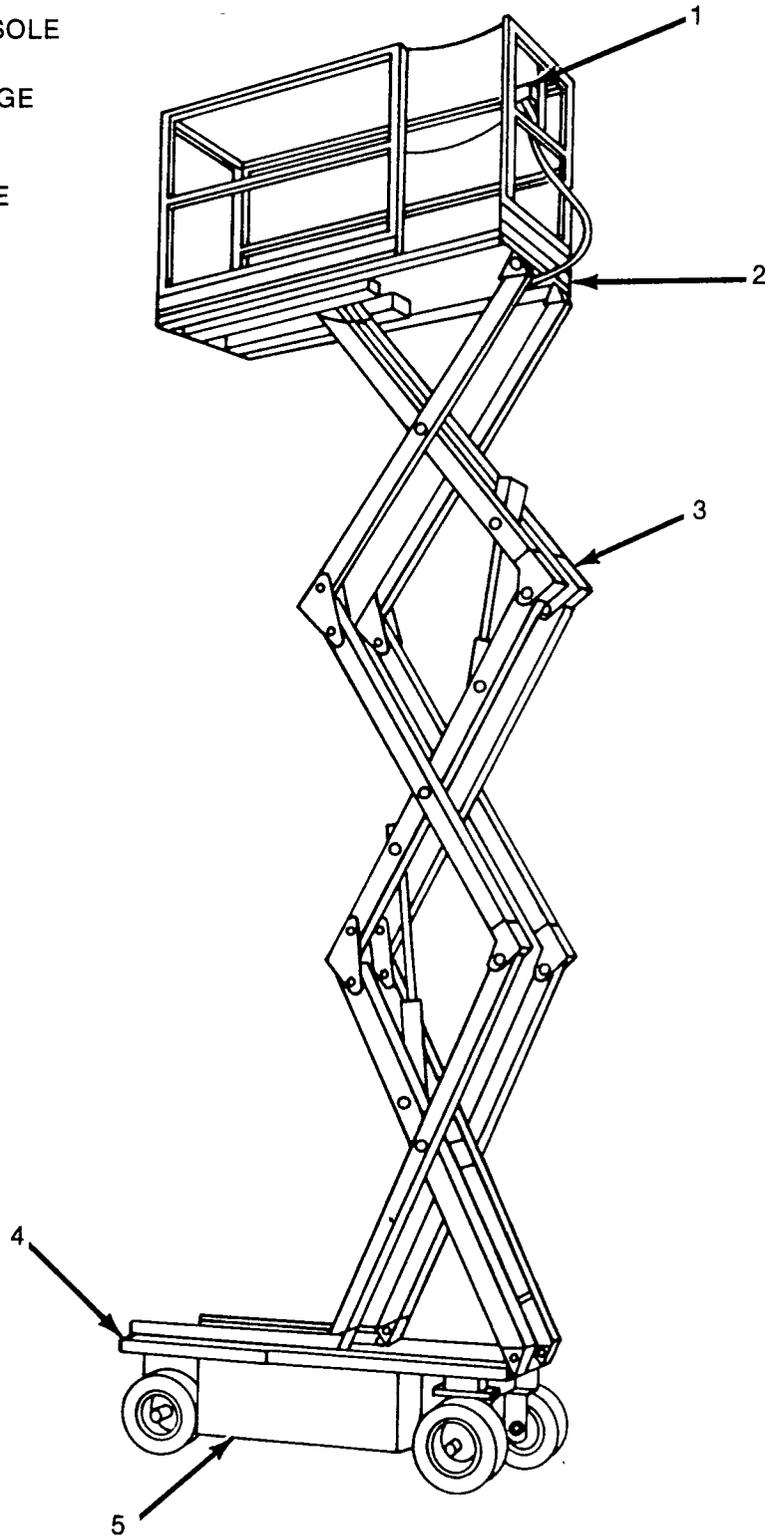


Figure 5-1. Location of Components

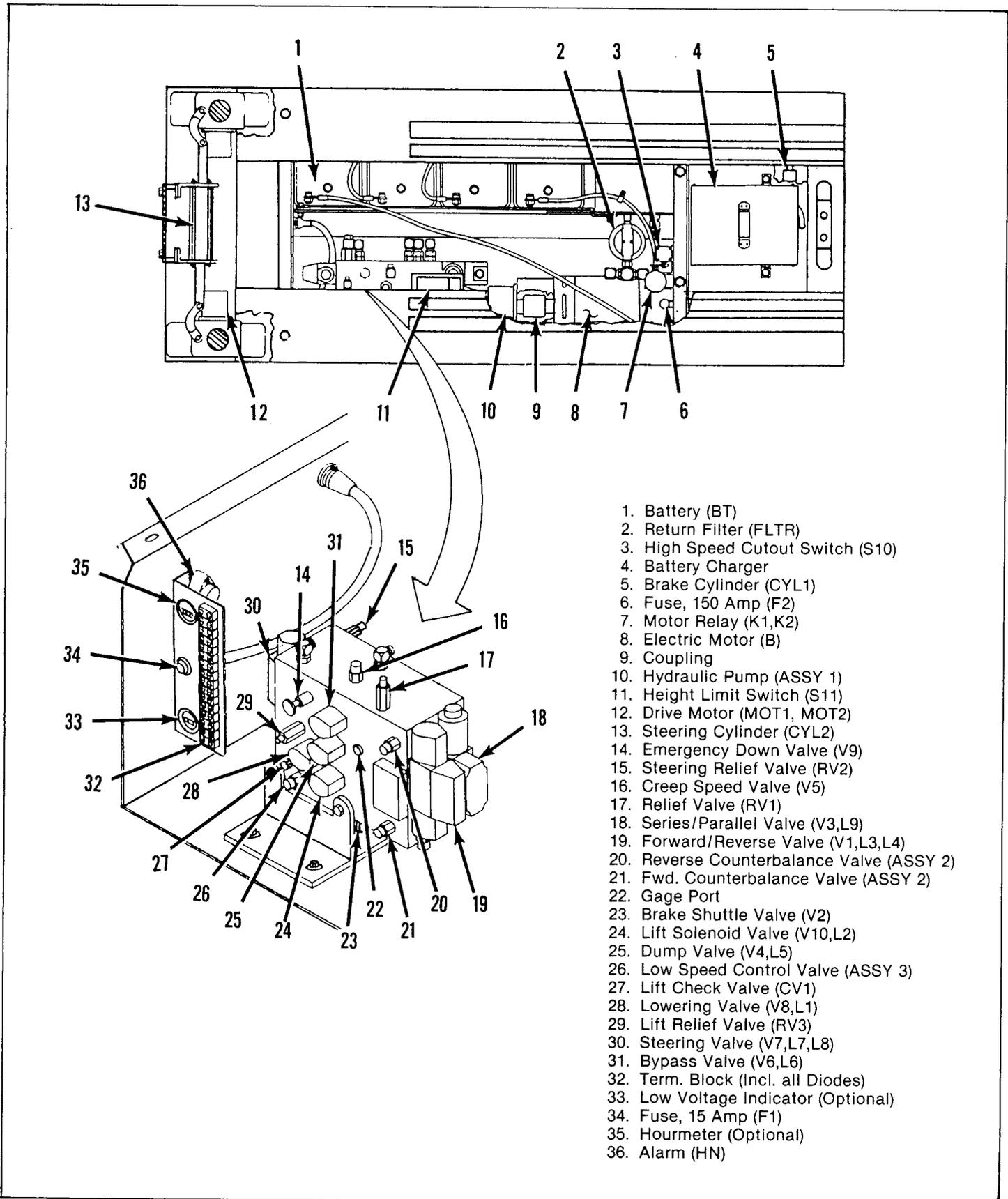


Figure 5-2. Location of Components, Chassis

Table 5-1. Periodic Inspection and Maintenance (Cont'd)

COMPONENT	INSPECTION or SERVICE	INTERVAL						
		EACH SHIFT	125 hr	250 hr	500 hr	1000 hr	2000 hr	Other
Control Cable and Linkage Cable	Check the connector plugs Check the exterior of the cable for pinching, binding or rubbing damage	X X						
Platform Deck and Rails	Check fasteners for tightness Check welds for cracks Check condition of deck	X X X						
Tires	Check for damage	X						
Hydraulic Pump	Wipe clean Check for leaks at mating surfaces Check for hose fitting leaks Check mounting bolts for tightness Check the drive coupling for tightness and proper alignment		X X X X	X				
Drive Motors	Check for operation and leaks		X					
Steering System	Check locknuts for security Grease pivot pins Check steering cylinder for leaks or looseness		X X	X				
Rear Wheel Bearings	Check wheel assembly for play Repack wheel bearings Replace wheel bearings and seals		X			X	X	
Scissor Linkage	Inspect for structural cracks Check pivot points for wear Check the pivot pin retainer bolts for tightness Check the roller tracks for wear and deformation Check scissor arms for bending	X	X	X X X				

Table 5-1. Periodic Inspection and Maintenance (Cont'd)

COMPONENT	INSPECTION or SERVICE	INTERVAL						
		EACH SHIFT	125 hr	250 hr	500 hr	1000 hr	2000 hr	Other
Chassis	Check component mountings for tightness Check welds for cracks Check hoses for pinch or rubbing points			X				
Lift Cylinder	Check the cylinder rod for gouges or scoring Check mounting pin pivot bolts for tightness Inspect for leaks Inspect the pivot points for wear		X					
Entire Unit	Check fasteners for tightness Check for corrosion, remove and repaint Check for and repair collision damage			X	X			

5-7. MAINTENANCE – DETAIL INSTRUCTIONS.

5-8. BATTERY MAINTENANCE. Electrical energy for the motor is supplied by four six volt batteries wired in series for 24 volts DC. Proper care and maintenance of the batteries and motor will ensure maximum performance from the machine

a. BATTERY INSPECTION AND CLEANING.

- (1) Check battery fluid level daily, especially if machine is being used in a warm, dry climate.

CAUTION

If battery water level is not maintained, batteries are not capable of full charge therefore creating a low discharge rate which will damage motor/pump unit and void warranty.

- (2) Batteries and cables should be inspected periodically for signs of cracks in the cases, electrolyte leakage and corrosion of the terminals. Inspect cables for worn spots or breaks in the insulation and for broken cable terminals.

- (3) Clean batteries which show signs of corrosion at the terminals, or onto which electrolyte has overflowed during charging. Use a baking soda or ammonia solution to clean the batteries, taking care not to get the solution inside the cells. Rinse thoroughly with clear water. Clean battery and cable contact surfaces to a bright metal finish whenever a cable is removed.

b. BATTERY CHARGING (See Figure 5-3).

- (1) Charge batteries at end of each work shift or sooner if batteries have been discharged.

CAUTION

Do not charge batteries when the work platform is in a hazardous area.

CAUTION

Permanent damage to batteries will result if batteries are not immediately recharged after discharging.

- (2) Do not charge unused vehicles regularly except during winter storage on a monthly basis.

(3) When night air temperatures fall below 65° F batteries charged in unheated areas should be placed on charge as soon after use as possible. Under such conditions a 4 hour equalize charge once a week in the early afternoon will improve state of charge and battery life.

(4) With timer knob (1) turned to "Off", connect A.C. cord (2) to a properly grounded 115 volt, 60Hz power supply.

(5) Set timer knob (1) to "7" for lightly discharged batteries and to "On" (12 hours) for well discharged batteries. Charger shuts off automatically at end of set period.

(6) Initial charge rate varies with state of discharge but finish rate should be in green area on Ammeter (3) when all cells are good.

(7) To determine approximate full charge at start of day's use, turn timer knob (1) to "1". Drop of Ammeter needle to green area in 15 minutes or less indicates full charge.

c. BATTERY CELL EQUALIZATION.

(1) The specific gravity of the electrolyte in the battery cells should be equalized monthly. To do this, charge batteries as outlined in BATTERY CHARGING. After this initial charge, check the electrolyte level in all cells and add water as necessary. Then, turn the charger on for additional eight hours. During this time, the charging current will be low (four amps) as cells are equalizing.

(2) After equalization, the specific gravity of all cells should be checked with a hydrometer. The temperature corrected specific gravity in this state should be 1.260. If any corrected readings are below 1.230, the batteries containing such cells should be replaced. At any rate, the specific gravity in all cells after equalization should not vary more than .020. If a wide variation exists, this is an indication for need of battery replacement.

(3) Do not check the specific gravity in a cell to which water has just been added. If there is not enough electrolyte in a fully charged cell to obtain a sample for the hydrometer, add water and continue charging for one to two hours to adequately mix the water and electrolyte.

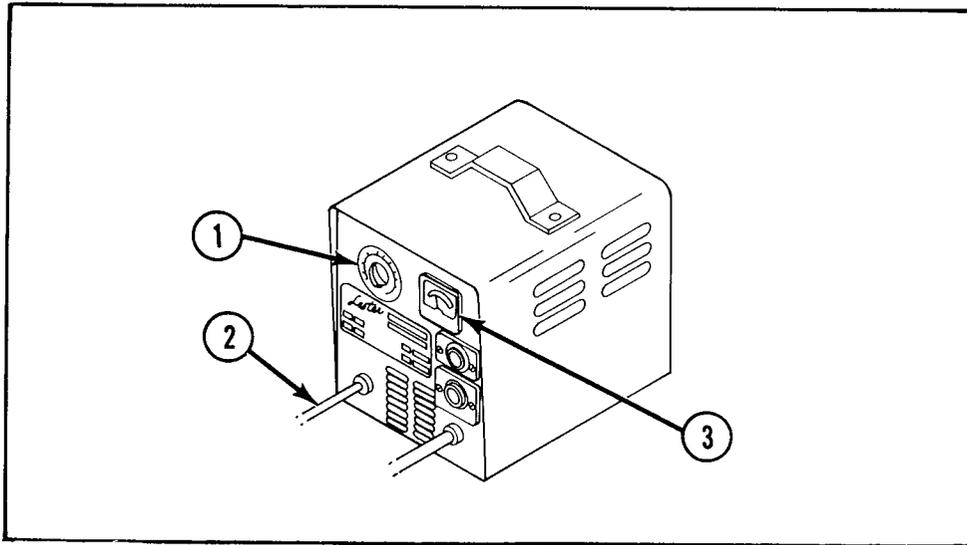


Figure 5-3. Battery Charger

5-9. LUBRICATION. Refer to the lubrication chart (Figure 5-4, and 5-5) for the location of items that require lubrication service. Refer to Table 5-2 for Legend and Type of Lubricant.

1. GREASE FITTINGS	□ Grease, (Multipurpose)
2. HYDRAULIC OIL RESERVOIR	△ Hydraulic Oil, (Mobil 426 or Equiv.)
3. REAR WHEEL HUBS	○ Motor Oil, (SAE 30W) Weekly
4. STEERING PIVOTS	
5. BATTERIES	
6. HYDRAULIC DRIVE MOTORS	
7. HYDRAULIC RESERVOIR DRAIN	
8. CONTROL VALVE BLOCK	
9. HYDRAULIC PUMP	
10. SCISSOR JOINTS	
11. TRACK WHEELS	

Table 5-2. Legend for Figures 5-4 and 5-5

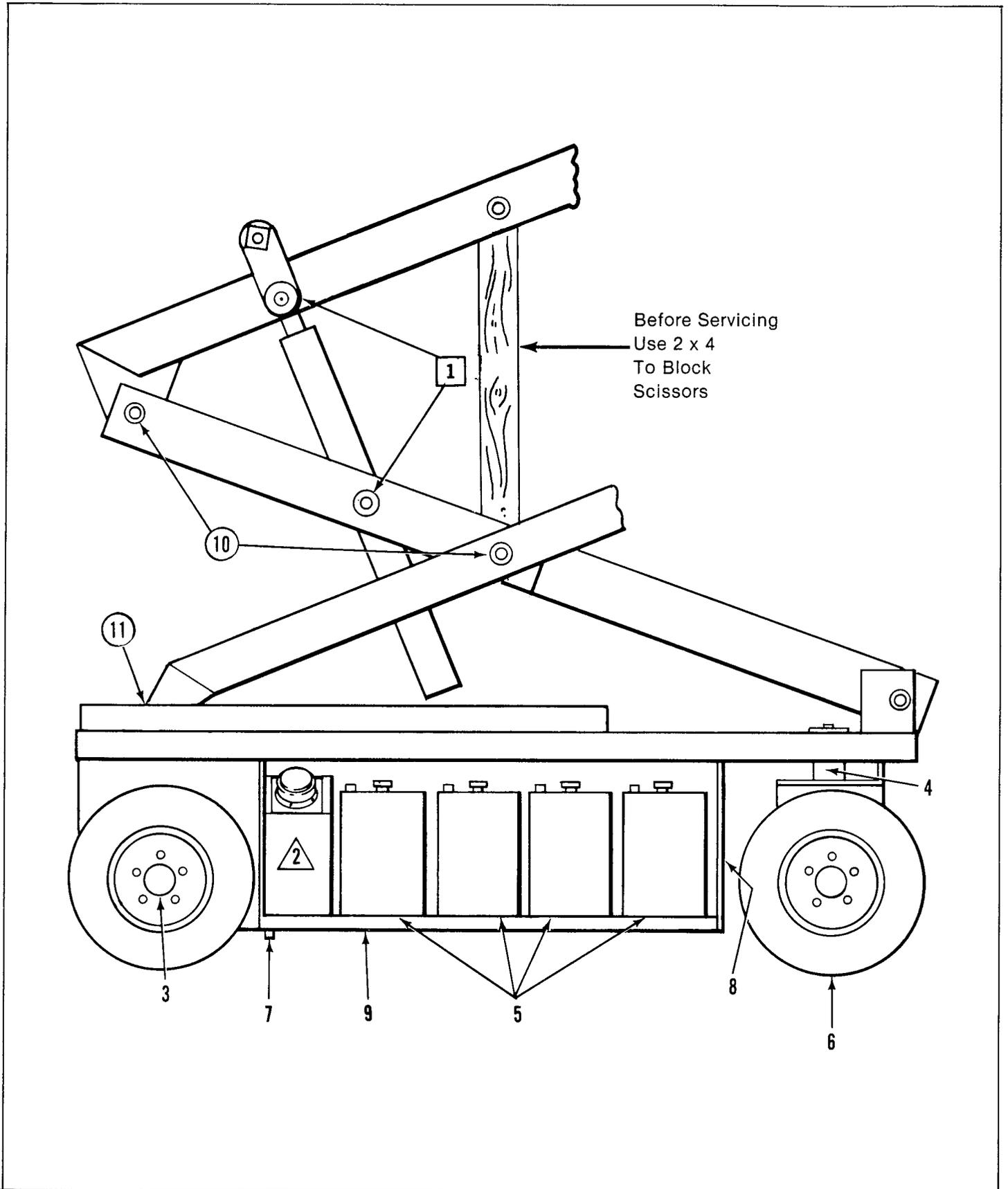


Figure 5-4. Periodic Service and Lubrication Chart: XL-14

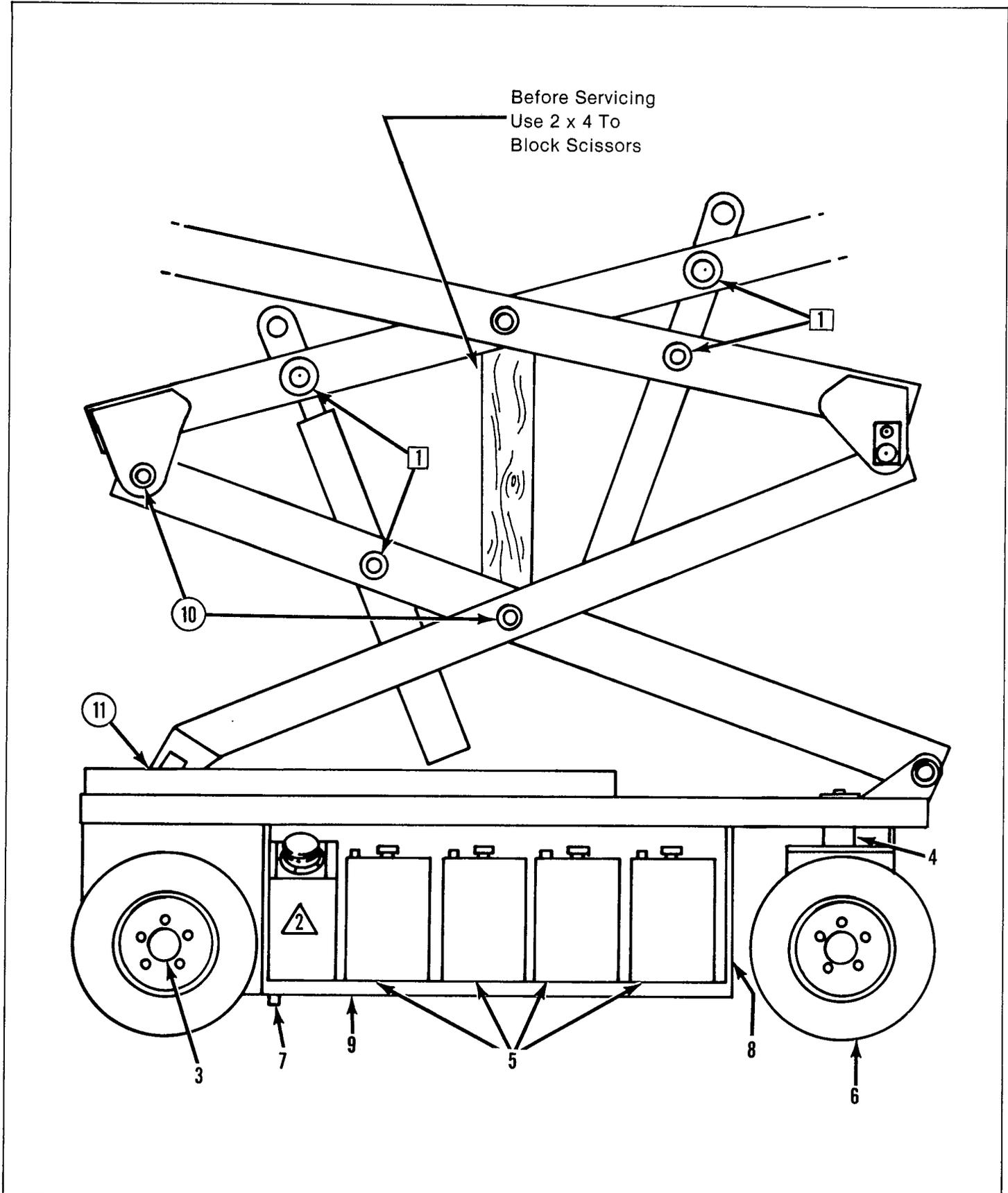


Figure 5-5. Periodic Service and Lubrication Chart: LX-19

5-10. HYDRAULIC OIL AND FILTER (Figure 5-6).

- a. Operate the work platform to bring the hydraulic oil up to normal operating temperature.
- b. Provide a suitable container to catch the drained oil.

**CAUTION**

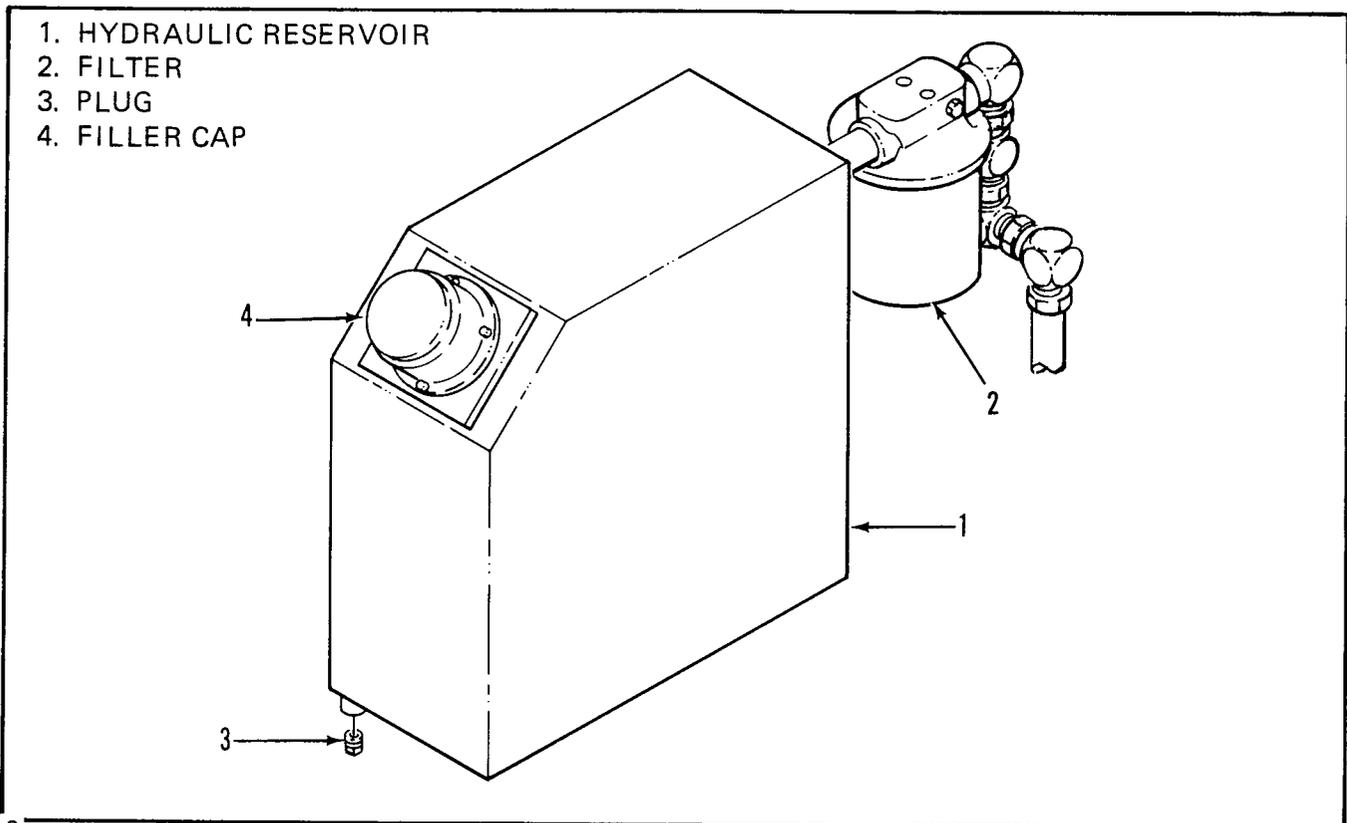
The hydraulic oil may be of sufficient temperature to cause burns. Wear leather or equivalent gloves when handling hot oil.

- c. Remove the drain plug (3) and allow all oil to drain.

**NOTE**

It may be necessary to remove the filler cap (4) to break any vacuum that may develop as the oil drains.

- d. Reinstall the drain plug (3).
- e. Unthread the filter (2) from the filter head.
- f. Apply a thin film of clean oil to the gasket of the replacement filter.
- g. Thread the replacement filter onto the filter head until the gasket makes contact then rotate the filter 3/4 of one turn further.
- h. Fill the hydraulic reservoir with the specified hydraulic oil.



5-11. TROUBLESHOOTING.

5-12. SCOPE. Table 5-3 provides a logical sequence of tests that are designed to isolate problems with the XL-14/XL-19. This table includes a list of probable causes and remedies.

5-13. SAFETY.

WARNING

When troubleshooting, make sure the machine is resting on a firm, level surface. When performing any service which requires the platform to be raised, be sure to block the scissors (Refer to Figures 5-4 and 5-5 for method of blocking). Disconnect the batteries when replacing or testing the continuity of any electrical component.

5-14. GENERAL PROCEDURE. In general, troubleshooting should be carried out by first thoroughly looking at the electrical circuits and components that could cause the problem. Loose terminal connections and short circuits are always a potential probable cause when troubleshooting. Only when electrical circuits and components have been found fault-free, should the hydraulic system be examined. Refer to Tables 6-1 and 6-2 for Reference Designations used in Table 5-3.

TABLE 5-3. Troubleshooting

TROUBLE	PROBABLE CAUSE	REMEDY
All functions inoperable, electric motor does not start.	1. Blown control circuit fuse.	Check 15 amp control circuit fuse (F1). Replace if blown.
	2. Blown motor circuit fuse.	Check 150 amp motor circuit fuse (F2). Replace if blown.
	3. Faulty battery charger.	Check the voltage output of the battery charger. If less than 24 VDC, repair or replace.
	4. Faulty battery(ies).	After completely charging the batteries, test each battery (BT). Replace as required.
	5. Defective motor relay.	While operating the steering, check voltage across the coil terminals of each motor relay (K1,K2). If no voltage is present, proceed with step 6. If 12 VDC or more, check continuity across the contact terminals of each motor relay (K1,K2) while still operating the steering function. If there is no continuity, replace the defective motor relay (K1,K2).
	6. Emergency stop switch failed open.	With the emergency stop switch (S1) in the ON position, check continuity across the contacts. If none, replace.
	7. Faulty electric motor.	While operating the steering function, check voltage across the electric motor (B) terminals. If 24 VDC or more is present, replace the motor (B).

TABLE 5-3. Troubleshooting (Cont'd)

TROUBLE	PROBABLE CAUSE	REMEDY
All functions inoperable. Electric motor starts when control is actuated.	<ol style="list-style-type: none"> <li>1. Hydraulic reservoir low.</li> <li>2. Damaged coupling.</li> <li>3. Defective hydraulic pump.</li> </ol>	<p>Check hydraulic fluid level, top off as required.</p> <p>Inspect coupling between the electric motor (B) and the hydraulic pump (ASSY1). If defective, replace.</p> <p>Check pressure and delivery of the hydraulic pump (ASSY1). Replace if required.</p>
Electric motor continues to run after controls are returned to the OFF position.	Motor relay contacts fused together.	With 0 voltage at the coil terminals of the motor relay (K1,K2) check continuity across the contact terminals. If there is continuity, replace the motor relay (K1,K2).
Lift and drive inoperable. Steering functions properly.	<ol style="list-style-type: none"> <li>1. Faulty diode.</li> <li>2. Faulty dump valve coil.</li> <li>3. Dump valve stuck.</li> <li>4. Relief valve out of adjustment or defective.</li> <li>5. Faulty hydraulic pump.</li> </ol>	<p>Test diode (D7). If defective, replace.</p> <p>Test dump valve coil (L5). If proper voltage is present and coil (L5) is not magnetized, replace.</p> <p>Replace dump valve (V4).</p> <p>Adjust the relief valve (RV1). If not adjustable, replace.</p> <p>Check pressure and delivery of the hydraulic pump (ASSY1). Replace if required.</p>
Unit will not drive or steer. Platform Up-Down functions properly.	Faulty mode selector switch.	With the mode selector switch (S2) in the DRIVE position, check continuity. Replace if defective.
Unit will not drive forward or reverse. Lift function operable.	<ol style="list-style-type: none"> <li>1. Control stick malfunction.</li> <li>2. Forward-reverse valve malfunction.</li> <li>3. Faulty brake shuttle valve.</li> <li>4. Mechanical failure.</li> <li>5. Worn drive motors.</li> </ol>	<p>Inspect forward-reverse control stick for mechanical failure. Also, check continuity of switches per control stick logic chart on electrical diagram. Replace if required.</p> <p>Check the forward reverse valve (V1). If the spool is not shifting, replace the valve.</p> <p>Observe the brake cylinder (CYL 1) while operating the drive. If the brake is not releasing, replace the brake shuttle valve (V2).</p> <p>Inspect drive motor shafts, hubs, and keys.</p> <p>Check hydraulic pressure being delivered to the drive motors (MOT1, MOT2). If sufficient, replace drive motors.</p>

TABLE 5-3. Troubleshooting (Cont'd)

TROUBLE	PROBABLE CAUSE	REMEDY
Unit drives too fast in low speed.	<ol style="list-style-type: none"> <li>1. Control stick malfunction.</li> <li>2. Creep speed control valve out of adjustment.</li> <li>3. Bypass valve stuck closed.</li> <li>4. Series valve stuck.</li> </ol>	<p>Inspect forward-reverse control stick for mechanical failure. Also check continuity of switches per control stick logic chart on electrical diagram. Replace if required.</p> <p>Adjust the creep speed valve (V5).</p> <p>Replace bypass valve (V6) cartridge.</p> <p>Inspect series valve (V3). If spool is sticking replace the valve.</p>
Unit will not drive full speed.	<ol style="list-style-type: none"> <li>1. Defective bypass coil.</li> <li>2. Defective series coil.</li> <li>3. Defective high speed cutout switch.</li> <li>4. Defective drive range switch.</li> <li>5. Control stick malfunction.</li> <li>6. Relief valve out of adjustment or defective.</li> <li>7. Drive counterbalance valve out of adjustment or defective.</li> <li>8. Bypass valve stuck in the open position.</li> <li>9. Series valve sticking.</li> <li>10. Defective hydraulic motors.</li> <li>11. Defective hydraulic pump.</li> </ol>	<p>Test bypass valve coil (L6). If proper voltage is present and coil is not magnetized, replace.</p> <p>Test series valve coil (L9). If proper voltage is present and coil is not magnetized, replace.</p> <p>With the platform completely lowered, check continuity in high speed cutout switch (S10). If the switch is open adjust or replace as required.</p> <p>Test drive range switch (S9) for continuity. Replace if defective.</p> <p>Inspect forward-reverse control stick for mechanical failure. Also, check continuity of switches per control stick logic chart on electrical diagram. Replace if required.</p> <p>Adjust the relief valve (RV1). If not adjustable, replace.</p> <p>Adjust counterbalance valves (ASSY2). If not adjustable, replace cartridges.</p> <p>Replace the bypass valve (V6) cartridge.</p> <p>Inspect the series valve (V3) to see if the spool shifts freely. If sticking, replace.</p> <p>Check hydraulic pressure being delivered to hydraulic drive motors (MOT1, MOT2). If sufficient, replace drive motors.</p> <p>Check pressure and delivery of hydraulic pump (ASSY1). Replace if required.</p>

TABLE 5-3. Troubleshooting (Cont'd)

TROUBLE	PROBABLE CAUSE	REMEDY
Unit will not drive forward	<ol style="list-style-type: none"> <li>1. Faulty diode.</li> <li>2. Faulty solenoid on drive valve.</li> <li>3. Control stick malfunction.</li> <li>4. Forward counterbalance valve cartridge out of adjustment or defective.</li> </ol>	<p>Test continuity of diode (D3). If defective, replace.</p> <p>Test the forward solenoid (L3) on the drive valve. If the proper voltage is present and the valve is not magnetized, replace.</p> <p>Inspect forward reverse control stick for mechanical failure. Also, check continuity of switches per control stick logic chart of electrical diagram. Replace if required.</p> <p>Adjust the forward counterbalance valve cartridge (ASSY2). If not adjustable, replace.</p>
Unit will not drive reverse.	<ol style="list-style-type: none"> <li>1. Faulty diode.</li> <li>2. Faulty solenoid on drive valve.</li> <li>3. Control stick malfunction.</li> <li>4. Forward counterbalance valve cartridge out of adjustment or defective.</li> <li>5. Defective shuttle valve.</li> </ol>	<p>Test continuity of diode (D4). If defective, replace.</p> <p>Test the forward solenoid (L4) on the drive valve. If the proper voltage is present and the valve is not magnetized, replace.</p> <p>Inspect forward-reverse control stick for mechanical failure. Also, check continuity of switches per control stick logic chart on electrical diagram. Replace if required.</p> <p>Adjust the forward counterbalance valve cartridge (ASSY 2). If not adjustable, replace.</p> <p>Remove and inspect shuttle valve (V2) cartridge. If defective, replace.</p>
Steering inoperable or functions sluggishly.	<ol style="list-style-type: none"> <li>1. Defective steering switch.</li> <li>2. Steering relief valve out of adjustment or defective.</li> <li>3. Mechanical damage.</li> <li>4. Steering valve stuck.</li> <li>5. Faulty hydraulic pump.</li> </ol>	<p>Test steering switch (S7) for continuity. Replace if defective.</p> <p>Adjust steering relief valve (RV2). If not adjustable, replace.</p> <p>Inspect all steering components. Replace damaged parts.</p> <p>Inspect steering valve (V7). If spool is sticking, replace.</p> <p>Check pressure and delivery of the hydraulic pump (ASSY1). Replace if required.</p>

TABLE 5-3. Troubleshooting (Cont'd)

TROUBLE	PROBABLE CAUSE	REMEDY
Unit will not steer right.	<ol style="list-style-type: none"> <li>1. Defective steering switch.</li> <li>2. Faulty diode.</li> <li>3. Faulty steer right solenoid.</li> </ol>	<p>Test steering switch (S7) for continuity. Replace if defective.</p> <p>Test diode (D5), replace if faulty.</p> <p>Test steer right solenoid (L8). If the proper voltage is present and the coil is not magnetic, replace.</p>
Unit will not steer left.	<ol style="list-style-type: none"> <li>1. Defective steering switch.</li> <li>2. Faulty diode.</li> <li>3. Faulty steer left solenoid.</li> </ol>	<p>Test steering switch (S7) for continuity. Replace if defective.</p> <p>Test diode (D6). Replace if faulty.</p> <p>Test steer left solenoid (L7). If the proper voltage is present and the coil is not magnetized, replace.</p>
Platform will not elevate.	<ol style="list-style-type: none"> <li>1. Emergency down valve open.</li> <li>2. Platform overloaded.</li> <li>3. Faulty diode.</li> <li>4. Faulty up valve coil.</li> <li>5. Faulty dump valve coil.</li> <li>6. Faulty bypass valve coil.</li> <li>7. Height limit switch malfunction.</li> <li>8. Faulty mode selector switch.</li> <li>9. Faulty lift switch.</li> <li>10. Relief valve out of adjustment or defective.</li> <li>11. Lift valve sticking.</li> <li>12. Lowering valve stuck in the open position.</li> <li>13. Dump valve sticking.</li> <li>14. Bypass valve sticking.</li> <li>15. Faulty hydraulic pump.</li> </ol>	<p>Close emergency down valve (V9).</p> <p>Observe maximum load rating.</p> <p>Test diodes (D1, D2). Replace if faulty.</p> <p>Test up valve coil (L2). If proper voltage is present and the coil is not magnetized, replace.</p> <p>Test dump valve coil (L5). If proper voltage is present and coil is not magnetized, replace.</p> <p>Test bypass valve coil (L6). If proper voltage is present and coil is not magnetized, replace.</p> <p>Test height limit switch (S11) for continuity. Replace if required.</p> <p>With the mode selector switch (S2) in the LIFT position, check continuity. Replace if defective.</p> <p>While holding the lift switch (S3) in the LIFT position, check continuity. Replace if defective.</p> <p>Adjust the lift relief valve (RV3). If not adjustable, replace.</p> <p>Replace the lift valve (V10).</p> <p>Replace the lowering valve (V8).</p> <p>Replace the dump valve (V4).</p> <p>Replace the bypass valve (V6).</p> <p>Check pressure and delivery of the hydraulic pump (ASSY1). Replace if required.</p>

TABLE 5-3. Troubleshooting (Cont'd)

TROUBLE	PROBABLE CAUSE	REMEDY
Platform drifts down after being elevated.	<ol style="list-style-type: none"> <li>1. Emergency down valve partly open or defective.</li> <li>2. Check valve leaking.</li> <li>3. Leaky down valve cartridge.</li> <li>4. Defective relief valve.</li> </ol>	<p>Ensure that the emergency down valve (V9) is completely closed. If the platform still drifts down, replace the emergency down valve (V9).</p> <p>Replace check valve (CV1).</p> <p>Replace the down valve (V8).</p> <p>Replace the lift relief valve (RV3).</p>
Platform will not lower.	<ol style="list-style-type: none"> <li>1. Faulty lowering valve coil (L1).</li> <li>2. Faulty mode selector switch.</li> <li>3. Faulty lift switch.</li> <li>4. Lowering valve stuck.</li> <li>5. Lowering speed control valve out of adjustment.</li> <li>6. Velocity fuse valve sticking.</li> </ol>	<p>Test lowering valve coil (L1). If proper voltage is present and coil is not magnetized, replace.</p> <p>With the mode selector switch (S2) in the LIFT position, check continuity. Replace if defective.</p> <p>While holding the lift switch (S3) in the DOWN position, check continuity. Replace if defective.</p> <p>Replace the lowering valve (V8).</p> <p>Adjust the lowering speed valve (ASSY3).</p> <p>Replace the velocity fuse valve (V11).</p>
Down alarm horn does not sound.	Faulty down alarm horn.	Check voltage to down alarm horn. If proper voltage is present, replace the down alarm horn (HN).

5-15. ADJUSTMENTS.

5-16. SETTING HYDRAULIC PRESSURES. (See Figure 5-7)

NOTE

Check the hydraulic pressures whenever the manifold, pump or relief valves have been serviced or replaced.

a. Main Pump Relief Valve.

(1) Operate the hydraulic system 10-15 minutes to warm the oil.

(2) Remove the plug (9, Figure 5-7) in the Gauge Port and install a 0-3000 psi gage.

(3) Disconnect one of the quick-disconnect connectors in the Lift Limit Switch wires (located between manifold and terminal).

(4) Loosen the locknut on the Main Pump Relief Valve (5, Figure 5-7) and unscrew the adjusting screw several turns.

(5) Position the Lift Switch to "UP" and hold it there.

(6) Slowly screw the adjusting screw in to increase the pressure to 2950 psi, then tighten the locknut.

(7) Reconnect the Lift Limit Switch wire.

b. Lift Circuit Relief Valve.

(1) Remove the Gauge Port Plug (9, Figure 5-7) and install a 3000 psi pressure gage, or if the main relief valve has just been adjusted leave the gage connected.

(2) Operate the hydraulic system 10 to 15 minutes to warm the hydraulic oil.

(3) Position a 750 lb. load (XL-14) or a 550 lb. load (LX-19) centered on the platform.

(4) Position the mode switch to LIFT.

(5) Position the lift switch to UP and hold it here and observe the pressure gage.

(6) Loosen the locknut on the lift circuit relief valve (4) and screw the adjusting screw OUT to lower the pressure setting to 2000 psi.

WARNING

If the platform starts to raise, backing the pressure to 2000 psi will cause the platform to lower.

(7) Observe the pressure gage as the adjustment screw of the relief valve (4) is screwed IN. As the pressure increases the platform should start to lift. Lock the adjustment screw with the locknut just as the platform starts to rise. This pressure setting limits the lifting capability of the unit to 750 lbs. on the XL-14 and 550 lbs. on the XL-19.

NOTE

The pressure setting may vary as much as 200 psi either way from 2950 psi.

(8) Release the lift switch.

(9) Remove the pressure gage from the gauge port and install plug.

(10) Operate the lift circuit again to expel air trapped in the system and check for leaks.

c. Steering Relief Valve.

(1) Disconnect the hydraulic hose to the steering cylinder and install a 0-5 GPM flow meter, 0-3000 psi pressure gage and needle valve test set. Attach the disconnected hose to the other end of the test set to complete the circuit.

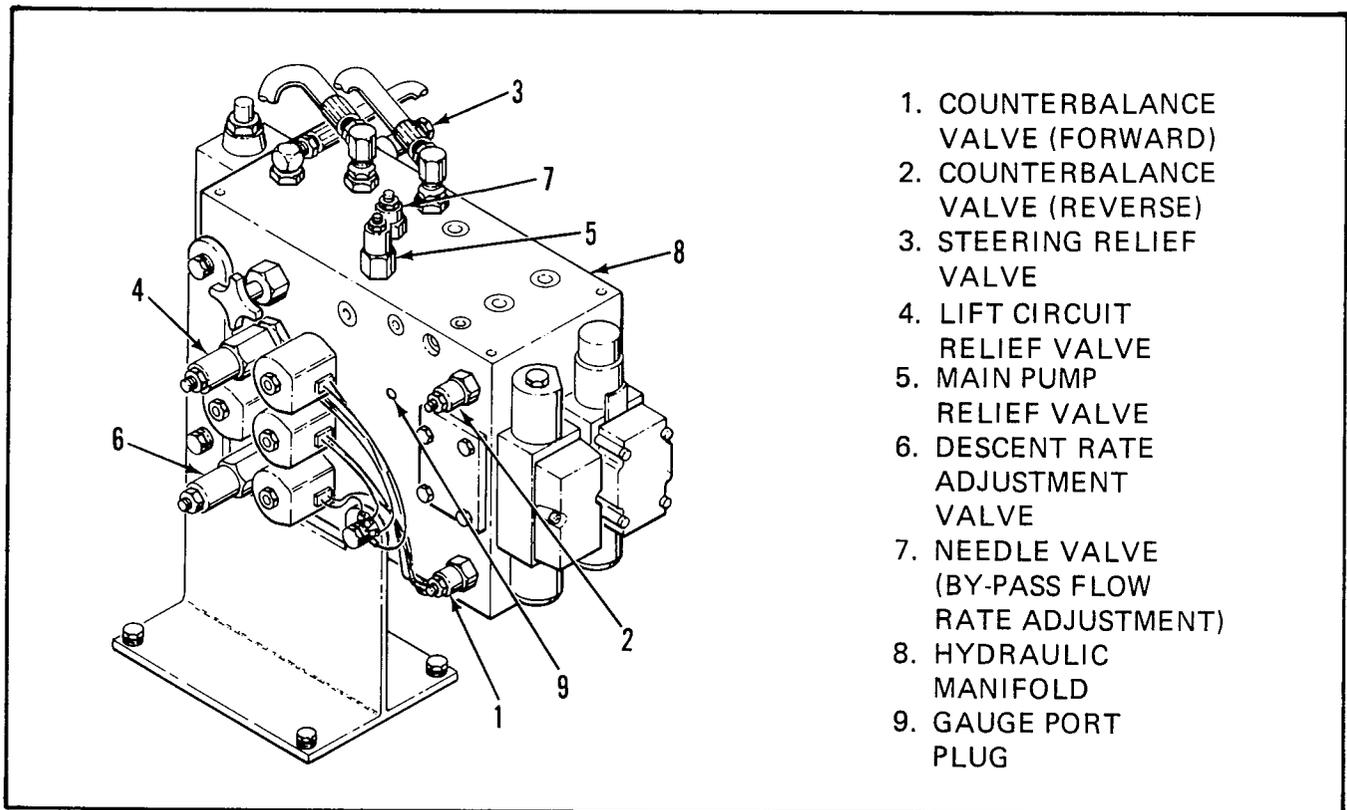


Figure 5-7. Hydraulic Pressure Adjustment

(2) Operate the hydraulic system 10 to 15 minutes to warm the hydraulic oil.

(3) Position the mode switch to DRIVE.

(4) Position the steer switch to LEFT and hold it there. Observe the pressure gage as the steer cylinder bottoms.

(5) The gage should read 1300 psi for the XL-14 and 1750 psi for the XL-19 with the cylinder bottomed. If not, loosen the locknut on the steering relieve valve (3, Figure 5-7).

(6) Back the adjustment screw OUT several turns and then slowly turn the screw IN until the appropriate pressure is reached.

(7) Release the steering switch and remove the test set from the steering circuit.

(8) Reconnect the steering cylinder hose and operate the steering system to expel trapped air and check for leaks.

d. Counterbalance Valve. (see Figures 5-8 and 5-9).

(1) Disconnect the hydraulic hose from the brake cylinder and connect a pressure gage and needle valve with a return line to the hydraulic tank (Figure 5-8).

(2) Disconnect the two hydraulic hoses to each drive motor and connect them together, thus bypassing the drive motors (Figure 5-9).

(3) Remove the adjusting caps from the counterbalance valves (1 and 2, Figure 5-7).

5-18 (4) Operate the hydraulic system 10 to 15 minutes to warm the hydraulic oil.

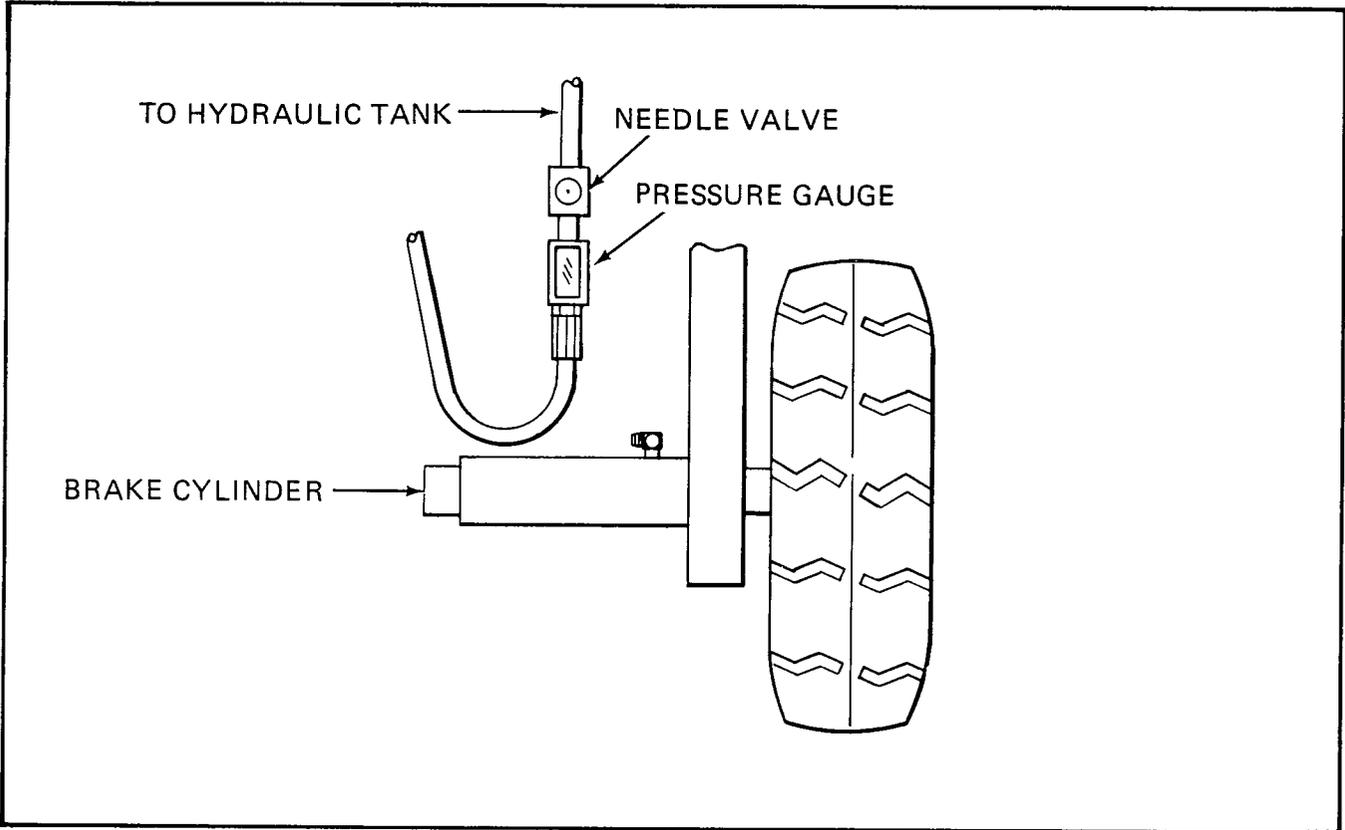


Figure 5-8. Counterbalance Valve Adjustment

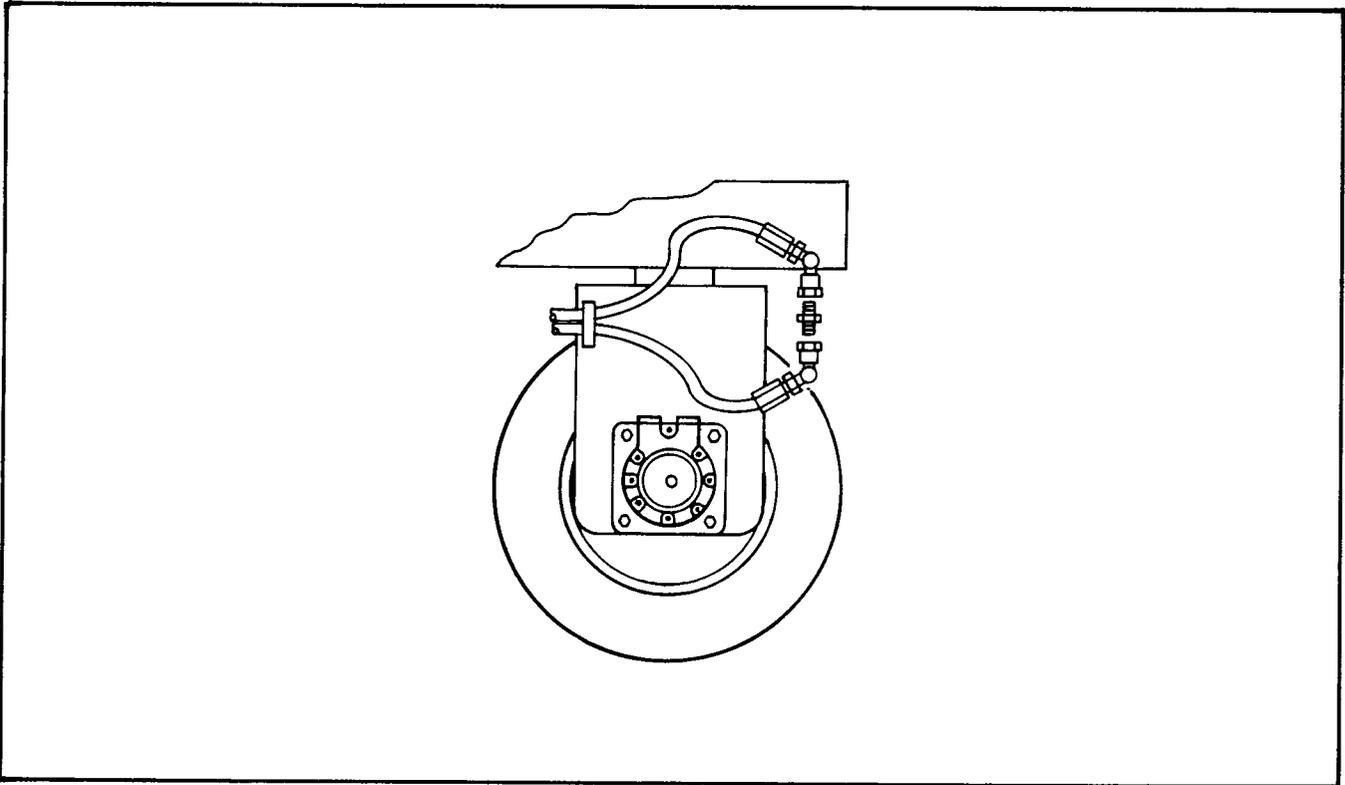


Figure 5-9. Counterbalance Valve Adjustment

(5) Position the mode switch to DRIVE.

(6) Position the drive controller to FORWARD.

(7) Close the needle valve on the brake hose.

(8) Adjust the REVERSE counterbalance valve (2, Figure 5-7) by turning the adjustment screw OUT until the pressure gage indicates 700 psi, then slowly turn the screw IN until the gage indicates 500 psi. Lock adjustment with locking cap.

(9) Position the drive controller to REVERSE.

(10) Adjust the FORWARD counterbalance valve by turning the adjustment screw OUT to achieve 700 psi, then slowly turning the screw IN to reach 500 psi. Lock the adjustment with the lock cap.

(11) Return the drive controller to NEUTRAL.

(12) Reconnect the hoses to the drive motors.

(13) Remove the gage and needle valve from the brake circuit and reconnect the hose to the brake cylinder. Bleed the brake cylinder of trapped air.

(14) Operate the drive system and check for leaks.

e. Descent Rate Adjustment Valve.

(1) Loosen the locknut on the descent rate adjustment valve (6, Figure 5-7).

(2) Raise the platform to the full "UP" position.

(3) Actuate the lower switch and measure the time it takes for the platform to lower. It should take 40-45 seconds.

(4) Adjust the valve clockwise to decrease, or counterclockwise to increase the descent rate.

(5) Raise the platform and measure the lowering time.

(6) Repeat steps 4 and 5 until proper cycle time is achieved. Re-tighten locknut.

f. Drive Speed (Creep) Valve.

(1) Loosen locknut on By-pass flow rate needle valve (7, Figure 5-7).

(2) Raise the platform approximately 2 feet.

(3) Position the mode switch to "Drive", the range switch to "High", and actuate the drive control lever to the third speed position and measure the time it takes to drive 20 feet.

(4) Adjust the needle valve (7, Figure 5-7) so that it takes 20-24 seconds to drive 20 feet.

(5) Tighten the locknut.

5-17. REPAIR. The following procedures are to handle replacement of components that are damaged or worn beyond acceptable performance specifications.

5-18. HYDRAULIC MANIFOLD (Figure 5-10).

a. General. It is not necessary to remove the manifold to perform all maintenance procedures. A determination should be made prior to beginning maintenance as to whether or not the manifold should be removed.

b. Disassembly.

#### NOTE

Mark all components as they are removed so as not to confuse their location during assembly.

(1) Unscrew the needle valve (2), relief valve (3), check valve (4), counterbalance valves (8) and the shuttle valve (7).

(2) Tag and disconnect the electrical leads to the solenoid valves (5) then unscrew them from the manifold.

(3) Remove the capscrews (13) to remove the covers (12) to allow access to the capscrews (14) and lockwashers (15).

(4) Tag and disconnect the electrical leads to the directional control valves (11) then remove the capscrews and lockwashers (14 and 15), the valve (11) and o-rings (18).

(5) Tag and disconnect the hydraulic hoses (6) then unscrew the male fittings (19).

(6) Unscrew any remaining valves and hydraulic hoses, and disconnect any remaining electrical connections.

(7) Remove the capscrews (16), lockwashers (17), adapter block (9) and o-rings (10).

c. Removal.

(1) Remove the nuts (20), lockwashers (21), capscrews (22), and flat washers (23) to release the manifold (1) from the mounting bracket (28).

(2) Remove the nuts (24), lockwashers (25), capscrews (26), and flat washers (27) to release the mounting bracket (28) from the power module.

d. Cleaning and Inspection.

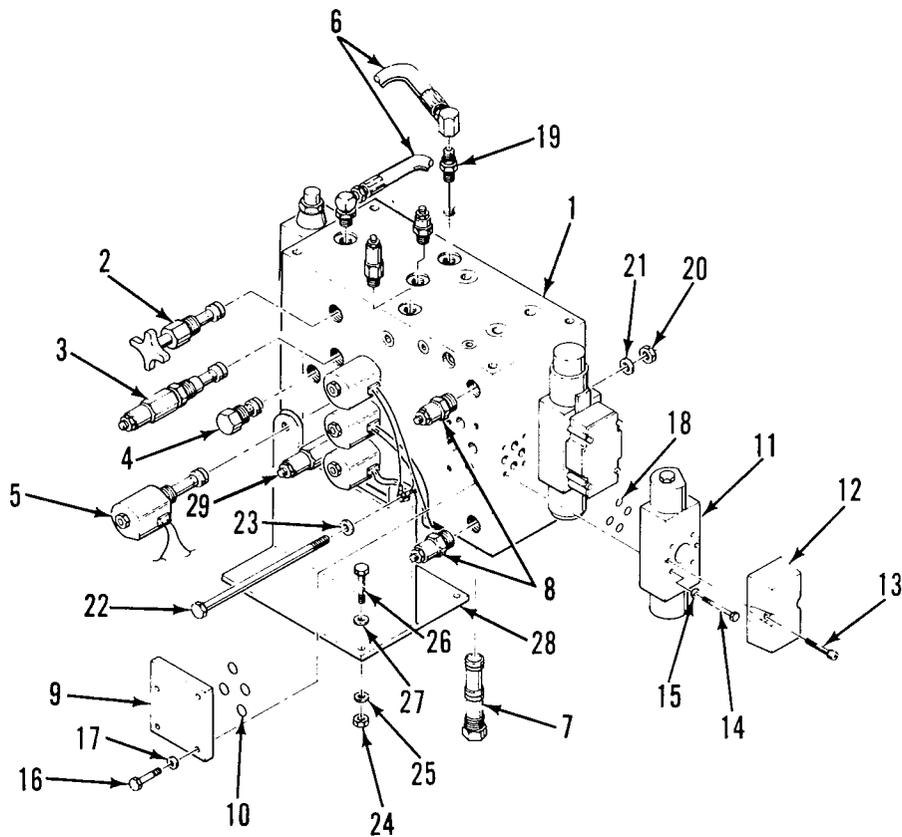
(1) Mark the location of each plug then remove the plugs.

(2) Wash the manifold in degreaser to eliminate all contaminant build-up then blow out all passages with filtered compressed air.

(3) Check the manifold for cracks, thread damage and scoring where valve mechanisms slide against internal surfaces.

(4) Check each valve mechanism for thread damage, torn or cracked o-rings and proper operation.

(5) Check the mounting bracket (28) for stress cracks.



- |                               |                      |
|-------------------------------|----------------------|
| 1. MANIFOLD                   | 16. CAPSCREW         |
| 2. NEEDLE VALVE               | 17. LOCKWASHER       |
| 3. RELIEF VALVE               | 18. O-RING           |
| 4. CHECK VALVE                | 19. MALE FITTING     |
| 5. SOLENOID VALVE             | 20. NUT              |
| 6. HYDRAULIC HOSES            | 21. LOCKWASHER       |
| 7. SHUTTLE VALVE              | 22. CAPSCREW         |
| 8. COUNTERBALANCE VALVE       | 23. FLATWASHER       |
| 9. ADAPTER BLOCK              | 24. NUT              |
| 10. O-RING                    | 25. LOCKWASHER       |
| 11. DIRECTIONAL CONTROL VALVE | 26. CAPSCREW         |
| 12. COVER                     | 27. FLATWASHER       |
| 13. CAPSCREW                  | 28. BRACKET          |
| 14. CAPSCREW                  | 29. RESTRICTOR VALVE |
| 15. LOCKWASHER                |                      |

Figure 5-10. Hydraulic Manifold

(6) Replace parts found not serviceable.

(7) Replace o-rings (10 and 18).

e. Installation and Assembly.

(1) Position the mounting bracket (28) in place on the manifold (1) and secure with capscrews (22), flat washers (23), lockwashers (21) and nuts (20) then install any plugs that were removed for cleaning.

(2) Position the manifold and mounting bracket assembly on the power module and install the capscrews (26), flat washers (27), lockwashers (25) and nuts (24).

(3) Install the solenoid valves (5) and connect their electrical leads.

(4) Position the replacement o-rings (18) in place and install the directional control valves (11). Secure with capscrews (14) and lockwashers (15), then install the covers (12) and capscrews (13). Connect their electrical leads.

(5) Position replacement o-rings (10) in place and install the adapter block (9). Secure with capscrews (16) and lockwashers (17).

(6) Install the shuttle valve (7), check valve (4), relief valve (3) and needle valve (2).

(7) Install the male fittings (19) then connect the hydraulic hoses (6).

(8) Connect any remaining hydraulic hoses.

(9) Operate each hydraulic function through its entire range of travel several times to expel any air trapped in the system.

(10) Check for proper operation and leaks.

## 5-19. HYDRAULIC PUMP

a. Removal (See Figure 5-11).

### NOTE

If the hydraulic tank has not been drained, provide a means of plugging hose assembly (1) to prevent fluid loss.

(1) Disconnect the hose assemblies (1, 2 and 3) and plug them.

(2) Loosen the setscrews (4 and 5) then slide the three piece coupling (6) toward the motor as far as possible.

(3) Remove the nuts (7) and lockwashers (8) to free the pump (9) from the mount.

(4) As the pump (9) is maneuvered away from the mount, slide the coupling off the pump shaft. Take care to retain the key (10).

b. Disassembly and Inspection (Figure 5-12).

#### NOTE

Prepare a clean work surface on which to disassemble the hydraulic pump.  
(A clean sheet of paper makes an excellent disposable top.)

(1) Remove the eight hex bolts (2) in an alternating pattern from side to side.

(2) Separate the rear gear housing (3) from the rest of the pump assembly taking care not to damage the gasket (4).

(3) Withdraw the idler shaft (5), and examine the shaft for pitting, discoloration or other signs of excessive wear. Check the teeth of the gear (7) for surface irregularities or cracks, check the sides for scoring.

#### NOTE

If worn, the gears (7 and 10) must be replaced as a set.

(4) If the idler shaft (9) is worn, remove the bearings (23) from the gear housings (3 and 26) using a suitable puller and install replacements.

(5) Remove the snap rings (6) from the idler shaft (9) and slide the gear (7) off the shaft taking care to retain the pin (8).

(6) Slide the gear (10) off the shaft (19) and remove the key (13).

(7) Separate the gear housing (26) from the stator (11) taking care not to damage the gasket (12).

(8) Withdraw the idler shaft assembly (14) and examine the shaft (18) for surface irregularities, discoloration or scoring. Check the gears (16 and 21) for pitting, discoloration, scoring or other signs of excessive wear.

#### NOTE

If worn, the gears (16 and 21) must be replaced as a set.

(9) Remove the snap rings (15) from the idler shaft (18) then slide the gear (16) from the shaft taking care to retain the pin (17).

(10) If the shaft ends are worn, remove the bearings (23) from the stator (11) and gear housing (26) using a suitable puller and install replacements.

(11) Remove the snap rings (20) from the shaft (19) and slide the gear (21) off the shaft taking care to retain the pin (22).

(12) If the seal (24) requires replacement, use a puller to remove it and press in replacement.

#### c. Assembly.

(1) Press seal (24) into the stator (11) then lubricate the seal with grease.

(2) Install the bearings (23) with the stator (11), the gear housings (26) and (3) and lubricate with clean hydraulic oil.

(3) Assemble the shaft (19), pin (22), gear (21) and snap rings (20).

(4) Wrap the key slot end of the shaft (19) with cellophane to protect the seal (24) then slide the shaft assembly through the stator (11).

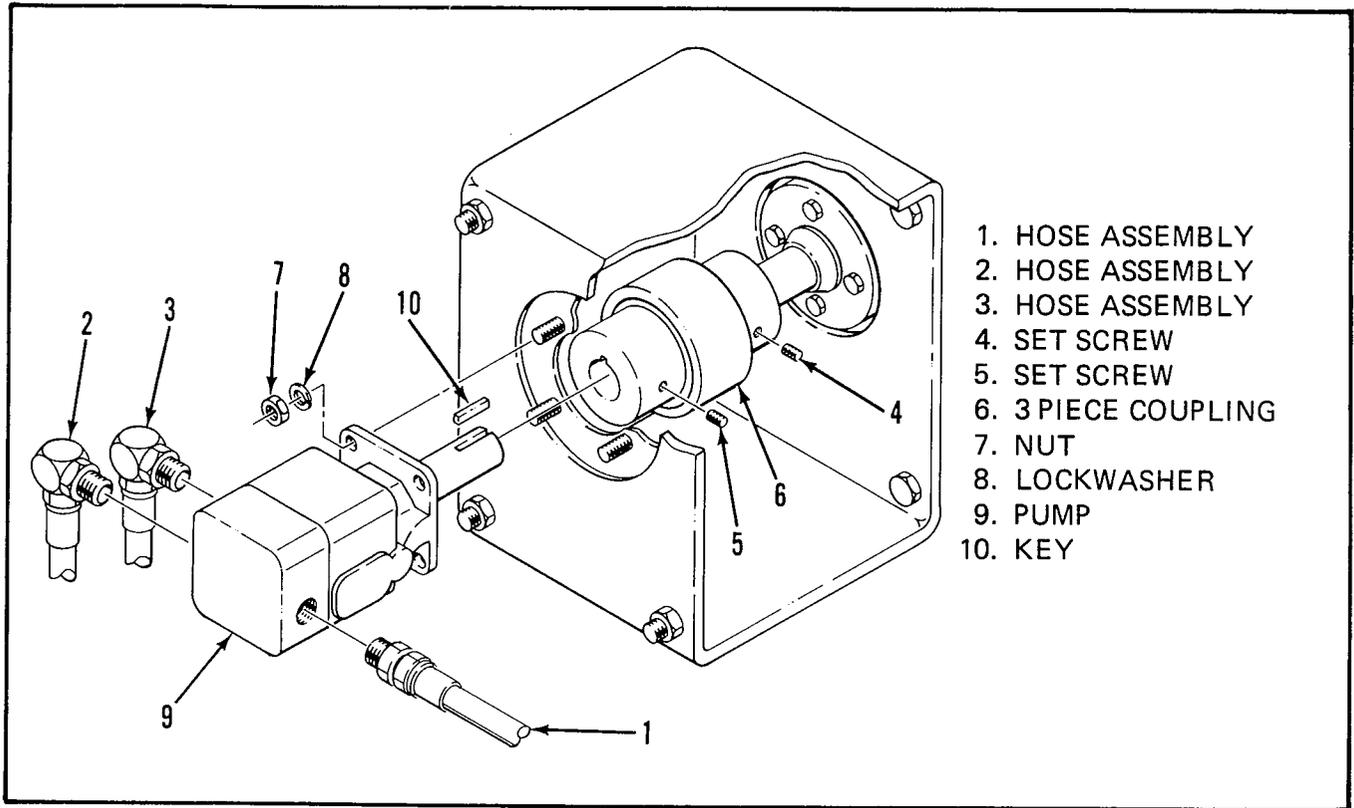


Figure 5-11. Hydraulic Pump Removal

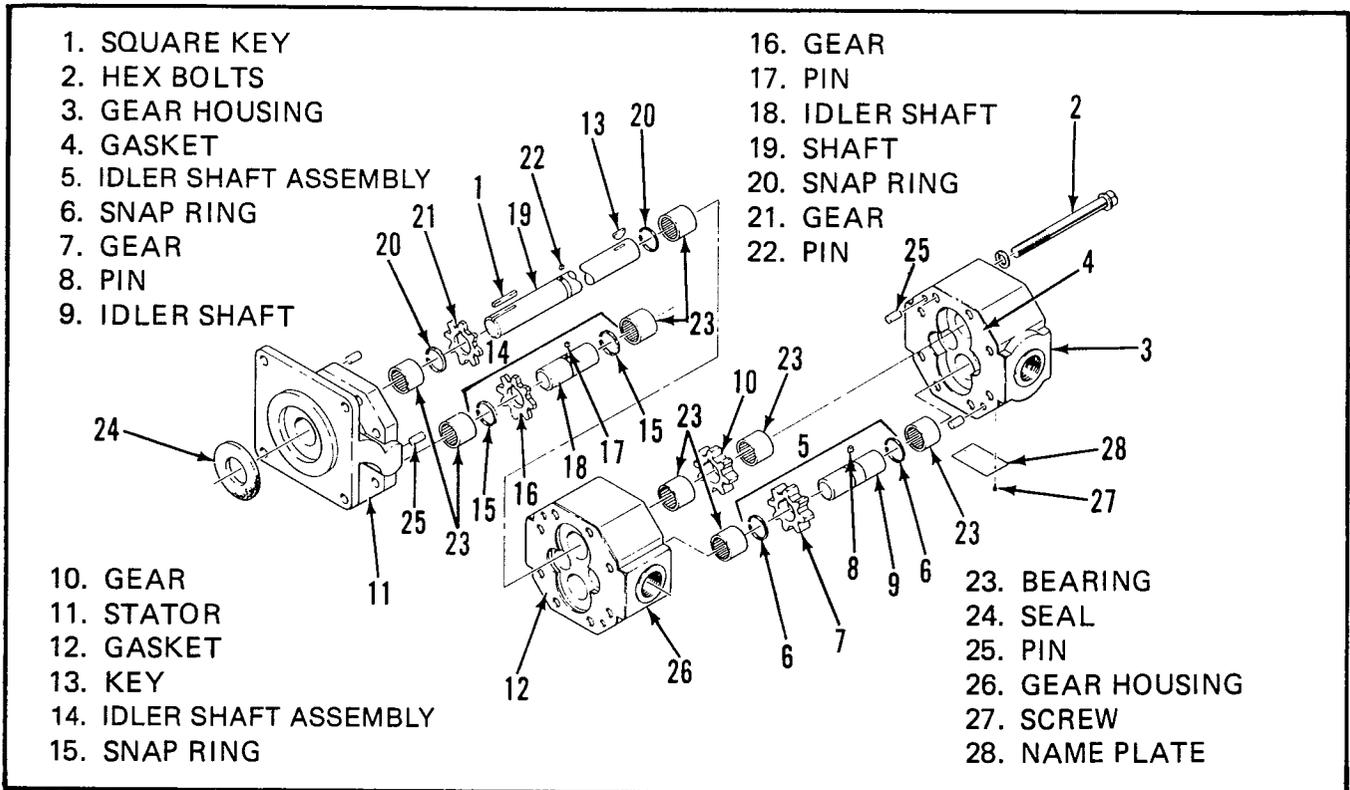


Figure 5-12. Hydraulic Pump Disassembly

- (5) Assemble the idler shaft (18), pin (17), gear (16) and snap rings (15).
- (6) Position the idler shaft assembly (14) in the stator (11).
- (7) Position a gasket (12) on the face of the stator (11) using the pins (25) to locate the gasket.
- (8) Assemble the gear housing (26) onto the stator assembly.

(9) Install the key (24) in the shaft (19) then slide the gear (10) onto the shaft, over the key (24), against the face of the gear housing (26).

(10) Assemble the idler shaft (9), pin (8), gear (7) and snap rings (6), then position the assembly on the gear housing (26) with the gears (7 and 10) meshed.

(11) Position a gasket (4) on the face of the gear housing (3) using the pins (25) as locators.

(12) Install the gear housing (3) onto the rest of the pump assembly and secure with hex bolts (2), tightening them in small increments and alternating from side to side.

## 5-20. HYDRAULIC DRIVE MOTORS AND HUBS.

### a. Removal (Figure 5-13).

- (1) Park the machine on firm level ground then block the wheels to prevent the machine from rolling.
- (2) Loosen the wheel capscrews (9) on the front corner to be raised.
- (3) Use a 1.5 ton capacity jack to raise the desired front corner.

### WARNING

Position blocks under the raised corner to prevent the machine from falling if the jack fails.

- (4) Remove the wheel capscrews (9) and wheel (8).
- (5) Remove the cotter pin (10), locknut (7), hub (6) and the shaft key (4).

### NOTE

Before disconnecting hoses, thoroughly clean off all outside dirt around fittings. (After disconnecting hoses and before removing from vehicle, IMMEDIATELY plug port holes.) Finish cleaning and drying assembly before placing on work bench.

- (6) Tag, disconnect and plug the hose assemblies to prevent foreign material from entering.
- (7) Remove the locknuts (2), capscrews (5) and drive motor (3) from the mounting plate (1).

### b. Disassembly, Inspection and Assembly.

1. SPINDLE
2. LOCKNUT
3. DRIVE MOTOR
4. SHAFT KEY
5. CAPSCREW
6. HUB
7. HUB NUT
8. WHEEL
9. CAPSCREWS
10. COTTER PIN

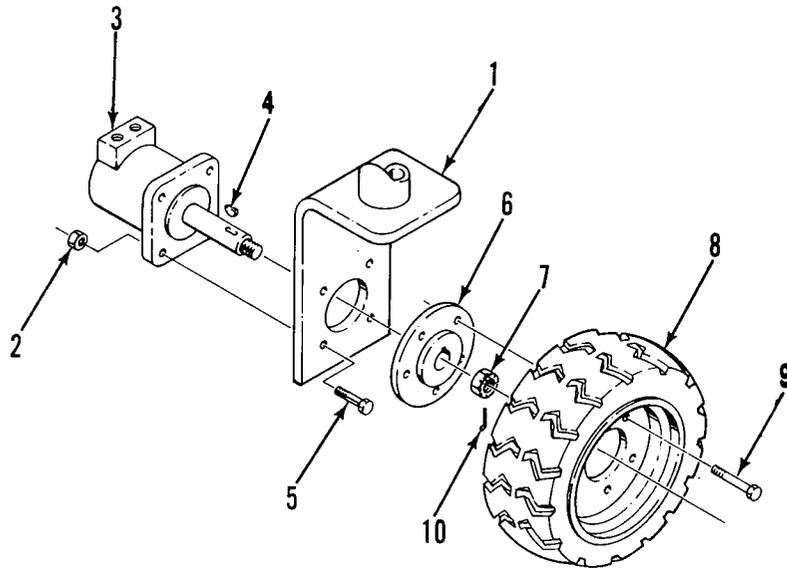


Figure 5-13. Drive Motor Removal

**NOTE**

Make sure that a clean work bench or table is used. (A piece of clean paper makes an excellent disposable top.) All parts should be cleaned separately in clean solvent and blown dry with air to avoid nicks and burrs.

- (1) Refer to Figure 5-14. Place the drive motor on a clean, flat surface with the cover (15) face down.
- (2) Remove the seal retainer snap ring (1).
- (3) Using two screwdrivers, remove the seal retainer (3) using the slot provided.
- (4) Remove the dust seal (2), quad ring (5) and back-up ring (4) and discard.
- (5) Remove the seal ring (6) from the groove in the body bore and discard.

**CAUTION**

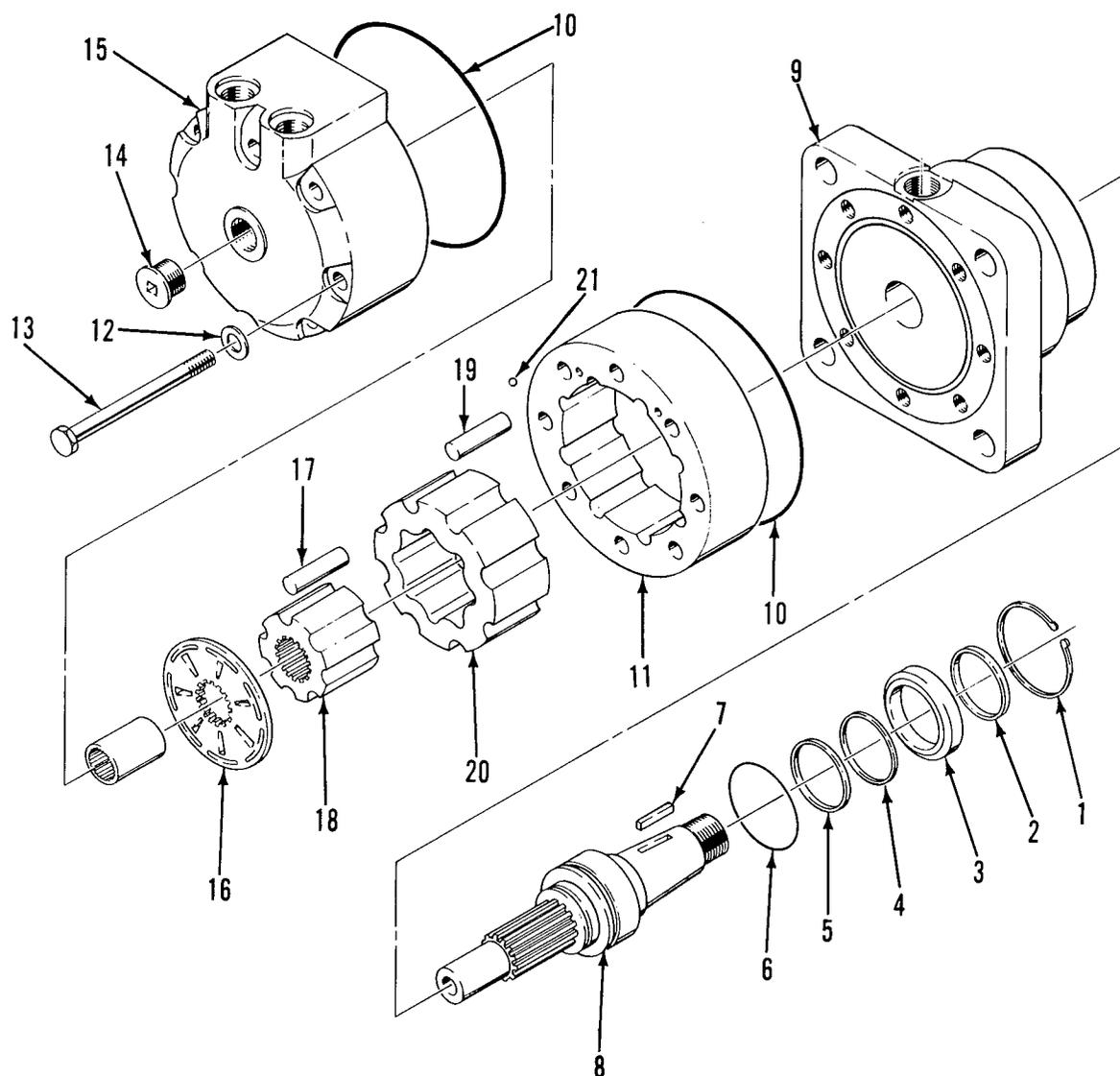
When pulling the shaft vertically, DO NOT rotate the shaft or move the motor. The internal timing can be altered if the parts are disturbed.

- (6) Remove the shaft assembly (8).

**NOTE**

If the shaft assembly cannot be removed easily, vise grips can be clamped to the shaft end and, by tapping on the grips, the shaft assembly will come out.

- (7) Check the shaft assembly (8) for wear at the cover bearing and seal areas. If excessive wear is apparent, replace the shaft assembly.



- |                   |                             |
|-------------------|-----------------------------|
| 1. SNAP RING      | 13. CAPSCREW                |
| 2. SEAL           | 14. PLUG                    |
| 3. SEAL RETAINER  | 15. COVER                   |
| 4. BACK-UP RING   | 16. ROTARY VALVE            |
| 5. QUAD RING      | 17. INNER ROLLER            |
| 6. SEAL RING      | 18. INNER MEMBER            |
| 7. KEY            | 19. LOCATING RING<br>ROLLER |
| 8. SHAFT ASSEMBLY | 20. OUTER CONTOUR<br>MEMBER |
| 9. MOTOR BODY     | 21. CHECK BALL              |
| 10. SEAL RING     |                             |
| 11. LOCATING RING |                             |
| 12. WASHER        |                             |

Figure 5-14. Drive Motor

## WARNING

DO NOT attempt to remove the heavy duty snap rings which hold the tapered bearings on the shaft. The bearing assembly cannot be serviced in the field.

- (8) SLOWLY lower the small end of the shaft assembly (8) into the motor body (9).

## NOTE

If the shaft stops without going all the way in, pull the shaft out 1/4 inch and rotate one or two degrees to engage the external shaft spline with the internal spline. This will allow the shaft to enter easily.

- (9) Lubricate and install a replacement seal ring (6) into the motor body (9) bore groove.

- (10) Install a replacement back-up ring (4) and quad ring (5) in the seal retainer (3).

- (11) Install dust seal (2) into seal retainer (3) with rubber lip facing outward.

- (12) Install seal retainer (3) in the motor body (9) and the seal retainer snap ring (1).

- (13) Clamp the motor body (9) in a vise with the shaft assembly (8) facing down.

- (14) Remove the eight capscrews (13) and seal washers (12).

- (15) Remove the cover (15), the cover seal ring (10), rotary valve (16), check balls (21), IGR assembly (17 thru 21) and square ring seal (10). Discard the seal ring and square ring seal.

## CAUTION

DO NOT drop these parts while handling.

- (16) Remove the eight locating ring rollers (19), the outer contour member (20), the seven inner rollers (17) and the inner member (18) from the locating ring (11). Inspect for pits and wear marks. If wear is evident, replace the IGR assembly (17 thru 21).

- (17) Lubricate the square ring seal (10) with oil and install in the motor body (9).

- (18) Install the inner member (18) on the shaft assembly (8).

- (19) Install the outer contour member (20) over the inner member (18).

- (20) Install the seven inner rollers (17) between the inner member (18) and the outer contour member (20).

- (21) Install the locating ring (11) on the motor body (9) with the check ball holes facing upward. Align the eight capscrew holes in the locating ring (11) with the capscrew holes in the motor body (9). The holes will align in one position only.

## CAUTION

DO NOT dislodge the body square ring seal (10) while aligning the locating ring (11) to the motor body (9).

(22) Install the eight locating ring rollers (19) between the locating ring (11) and the outer contour member (20).

(23) Check that the clearance between the inner rollers (17) and the outer contour member (20) does not exceed .015 inches.

(24) Install the rotary valve (16) on the shaft assembly (8) such that the seven inner rollers (17) cannot be seen through the slots on the rotary valve (16).

(25) Install the two check balls (21) in the locating ring (11).

(26) Lubricate the cover seal ring (10) with hydraulic oil and install in the cover (15).

(27) Install the cover (15) on the shaft end and align the capscrew holes.

(28) Install the eight capscrews (13) with seal washers (12) in the capscrew holes. Torque the capscrews to 30 ft. lb.

### c. Installation.

(1) Refer to Figure 5-13 and position the drive motor (3) on the spindle (1) and secure with capscrews (5) and locknuts (2).

(2) Remove the plugs from the hose assemblies and connect to the drive motor (3).

(3) Install the shaft key (4), hub (6) and locknut (7). Torque the locknut to 350 to 400 ft. lb. Install the cotter pin (10).

(4) Install the wheel (8) with capscrews (9) onto the hub (6). Torque to 40 ft. lb.

(5) Lower the jack and remove. Operate the drive system and check for leaks.

## 5-21. REAR WHEEL BEARINGS (Figure 5-15).

### a. Removal.

## NOTE

The following applies to both rear wheels except the brake cylinder must be removed on the right side. (See 5-22a.)

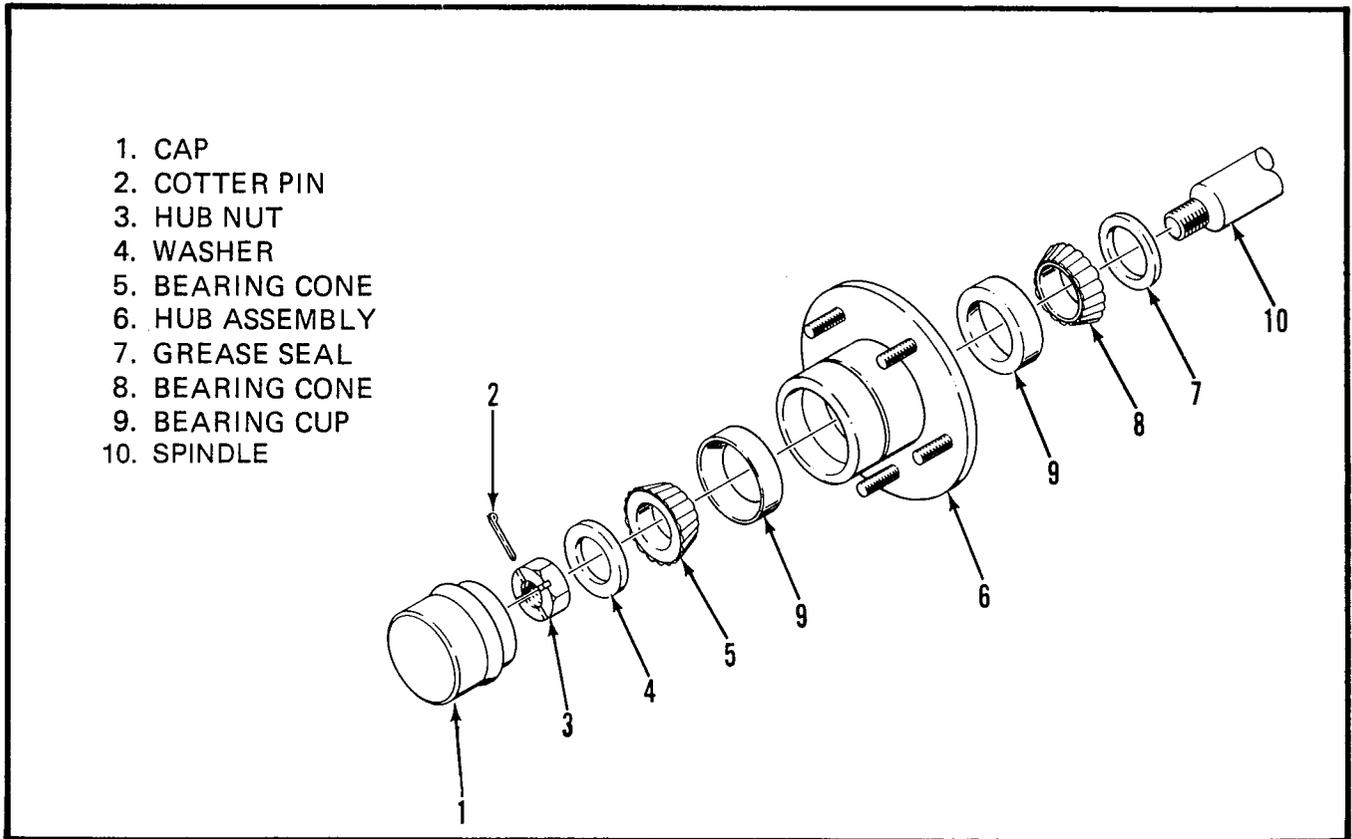


Figure 5-15. Rear Wheel Bearings.

- (1) Loosen the wheel lug nuts then raise the rear of the unit until the rear tires are off the ground.
- (2) Install support blocks to prevent the unit from falling if the jack fails.
- (3) Remove the wheel lug nuts and the rear wheels.
- (4) Remove the cap (1).
- (5) Straighten the cotter pin (2) then withdraw it from the spindle (10) and hub nut (3).
- (6) Remove the hub nut (3) and washer (4).
- (7) Slide the entire hub assembly (6) from the spindle (10) and place on clean surface.
- (8) Remove the bearing cone (5) and place on clean surface.
- (9) Remove the grease seal (7) thus allowing the bearing cone (8) to be removed.

**NOTE**

At this point, examine the bearing cups (9). If they are smooth, shiny and free of pits or any surface irregularities, DO NOT remove them.

(10) If the cups (9) replacement, remove them by tapping around the circumference of the inside surface of the cups from the opposite side using a long drift.

b. Installation.

(1) Position the replacement bearing cup (9) over the opening in the hub assembly (6) then position the worn cup over the replacement so that the bearing surfaces face each other. Use the old cup as a drift to work the replacement into position by tapping evenly around the circumference.

(2) Apply a liberal coating of grease to the bearing surface of each cup.

(3) Pack the bearing cone (8) with the recommended grease and position it within the rear bearing cup (9) in the hub assembly (6) then install the grease seal (7) again using the worn bearing cup as a drift.

(4) Apply a thin film of grease to the spindle (10) to protect the grease seal (7) then slide the hub assembly (6) onto the spindle (10).

(5) Pack the bearing cone (5) with the recommended grease and slide it onto the spindle (10) until it seats in the outer bearing cup (9).

(6) Install the washer (4) and hub nut (3). Tighten the hub nut (3), while rotating the hub assembly (6), until the hub drags then back the nut to the first slot that aligns with the cotter pin hole in the spindle (10).

(7) Install the cotter pin (2) and bend the end up over the hub nut (3) and spindle (10).

(8). Install the cap (1) and wheel/tire assemblies. Torque the lug nuts to 40 ft. lbs.

## 5-22. BRAKE CYLINDER (Figure 5-16).

a. Removal.

(1) Block the wheels to prevent the unit from rolling once the brake is removed.

(2) Disconnect the hose assemblies (1 and 17) and cap the opening to prevent foreign material from entering.

(3) Remove the capscrews (2) and lockwashers (3) to remove the cylinder from the chassis.

b. Disassembly.

### NOTE

Prepare a clean work area on which to service the internal parts.

(1) Remove the snap ring (5) and withdraw the shaft (11) and all attached components from the cylinder barrel (4).

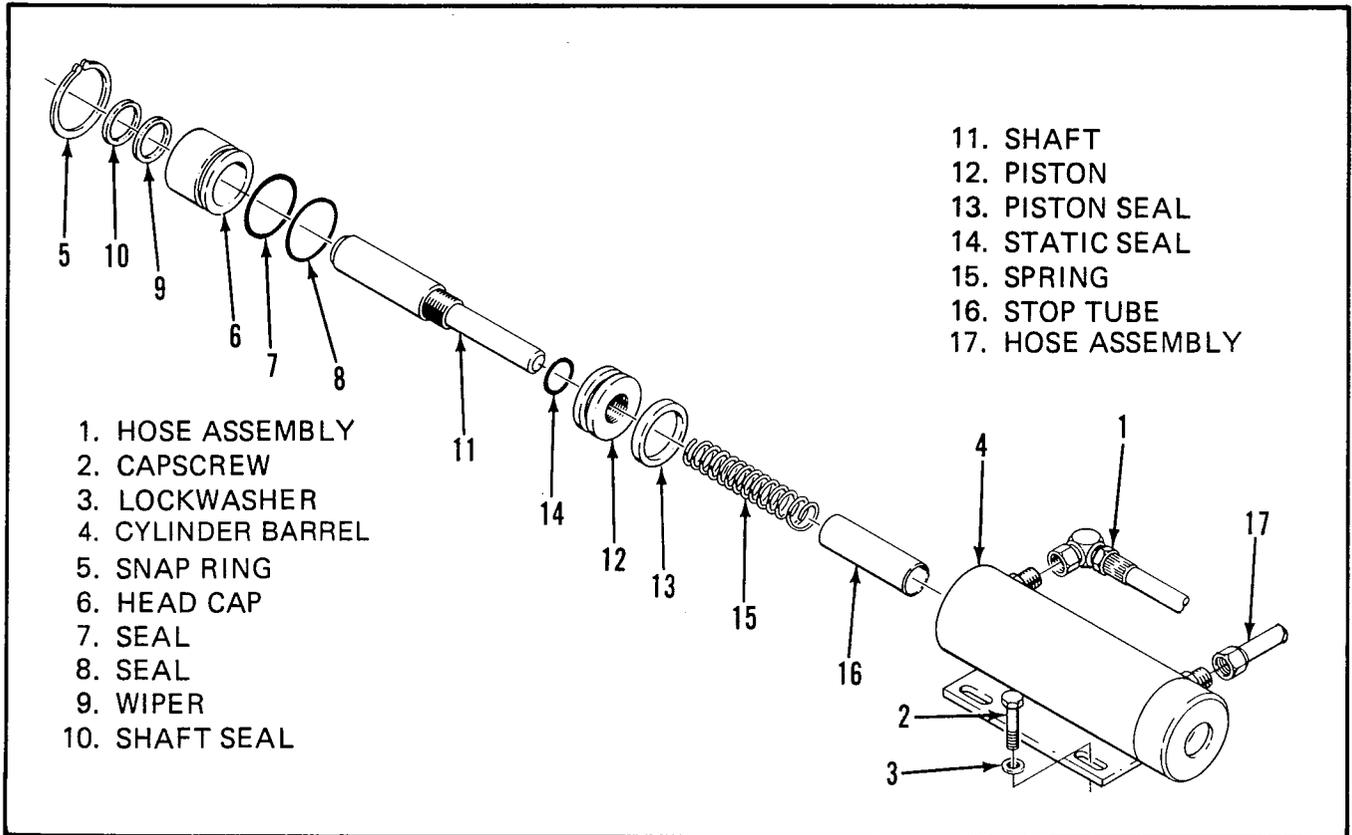


Figure 5-16. Brake Cylinder

(2) Remove the head cap (6) from the shaft (11) then remove the wiper (9), shaft seal (10) and seals (7 and 8) from the head cap (6).

(3) Unscrew the piston (12) from the shaft (11) and remove the static seal (14). Remove the piston seal (13) from the piston (12).

(4) Remove the spring (15) and stop tube (16) from the cylinder barrel (4).

c. Cleaning and Inspection.

(1) Clean all metal parts in solvent and blow dry with filtered compressed air.

(2) Check all thread parts for stripped or damaged threads.

(3) Check the bearing surfaces; inside of the head cap (6), outer edge surface of the piston (12), inside of the cylinder barrel (4) and the shaft (11) for signs of scoring or excessive wear.

(4) Check the spring for cracks.

(5) Replace any parts found not serviceable.

(6) Replace all seals.

d. Assembly and Installation.

- (1) Install the piston seal (13) on the piston (12) then assemble the static seal (14), shaft (11) and piston (12).
- (2) Position the spring (15) and stop tube (16) on the shaft assembly.
- (3) Lubricate the piston seal (13) with clean hydraulic fluid, then install the shaft assembly in the cylinder barrel (4).
- (4) Install the seals (7 and 8) on the head cap (6).
- (5) Install the shaft seal (10) and wiper (9) within the head cap (6).
- (6) Lubricate both the seals (7 and 8) and the shaft seal and wiper (10 and 9) with clean hydraulic fluid then install the head cap (6) onto the shaft (11) and into the cylinder barrel (4).
- (7) Secure with snap ring (5).
- (8) Position the brake cylinder assembly on the chassis so that the shaft (11) fully engages the brake disc yet the shaft must clear the brake disc once retracted. Secure with capscrews (2) and lockwashers (3).
- (9) Connect the hose assemblies (1 and 17).
- (10) Operate the brake retract circuit and check that the shaft clears the brake disc and check for leaks.

5-23. STEERING CYLINDER (Figure 5-17).

a. Removal.

- (1) Disconnect the hose assemblies from the fittings and immediately cap the openings to prevent foreign material from entering.
- (2) Remove the cotter pins and clevis pins.
- (3) Remove the locknuts (14) and capscrews (15) to remove the cylinder assembly.

b. Disassembly.

- (1) Remove the tie rod nuts (6), tie rods (7) and the end plates (8).
- (2) Remove the headcaps (9) from the barrel tube (13).
- (3) Withdraw the entire shaft assembly from either end of the barrel tube (13).
- (4) Remove the rod wipers (1), rod seals (2) and static o-rings (3) from the headcaps (9).

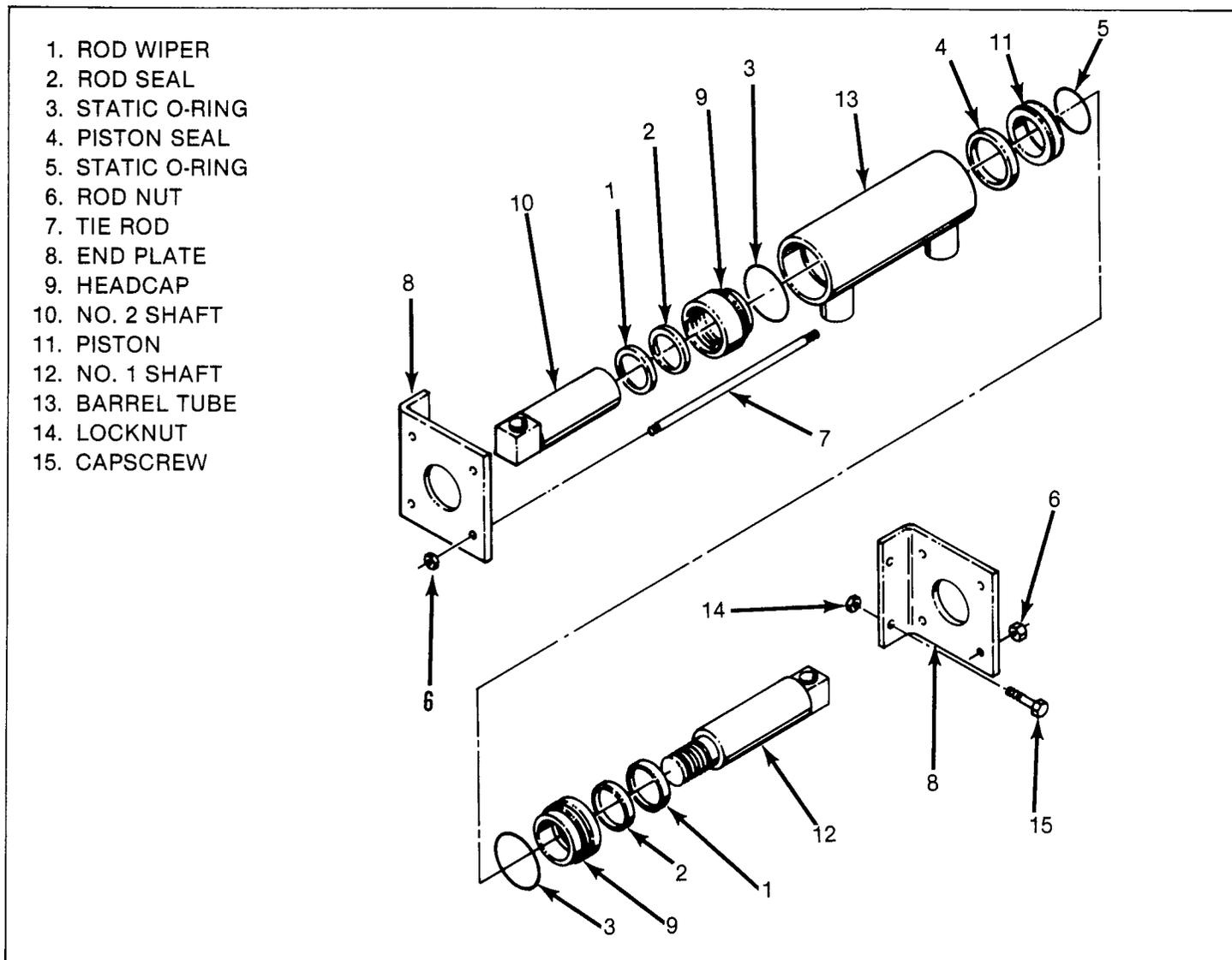


Figure 5-17. Steering Cylinder

- (5) Discard all the seals.
  - (6) Unscrew the No. 1 shaft (12) from the No. 2 shaft (10) and remove the piston (11).
  - (7) Remove the piston seal (4) and static o-ring (5) from the piston (11).
  - (8) Discard the static o-ring (5) and piston seal (4).
- c. Cleaning and Inspection.
- (1) Wash all the metal parts in clean solvent and blow dry with filtered compressed air.
  - (2) Inspect all the threaded components for stripped or damaged threads.

- (3) Check the inside surface of the barrel tube (13) for scoring or excessive wear.
- (4) Check the piston (11) and head caps (9) for scoring or excessive wear.
- (5) Inspect the surface of both shafts (10 and 12) for scoring or excessive wear.
- (6) Replace any parts found not serviceable.
- (7) Replace all seals and o-rings.

d. Assembly and Installation.

- (1) Install a replacement piston seal (4) and static o-rings (5) on the piston (11).
- (2) Install the piston (11) on the No. 1 shaft (12).
- (3) Thread the No. 2 shaft (10) onto the No. 1 shaft (12) and tighten securely.
- (4) Lubricate the piston seal (4) and install the shaft assembly in the barrel tube (13).
- (5) Lubricate and install replacement rod seals (2) and static o-rings (3) on the headcaps (9).
- (6) Lubricate and install replacement rod wipers (1) in the headcaps (9).
- (7) Install the headcaps (9) in the barrel tube (13).
- (8) Install the end plates (8), tie rods (7) and tie rod nuts (6) and tighten securely.
- (9) Position the cylinder assembly on the chassis and secure with capscrews (15) and locknuts (14).
- (10) Install the clevis pins and cotter pins.
- (11) Connect the hose assemblies to the fittings.
- (12) Operate the steering circuit several times throughout its entire range of travel to expel trapped air and check for leaks.

5-24. LIFT CYLINDER, XL-14 (Figure 5-18).

a. Removal.

- (1) Remove the platform floorboard.
- (2) Refer to Figure 5-18 and remove the nuts (7) and washer (8).
- (3) Slip the threaded rod (9) and cylinder pin (10) to one side to allow plate (2) to swing free. Lower the plate (2) and repeat same procedure for opposite side.

(4) Provide a suitable container to catch the draining hydraulic fluid then, disconnect the hydraulic hose (7) and fitting from the base of the lift cylinder (3) and plug hose to prevent foreign material from entering.

(5) Attach a suitable hoisting device and sling to the top of the lift cylinder (3).

(6) Remove drive pins (13), cylinder collar pins (14), and lift cylinder (3) from the collar (12) to a prepared work area.

b. Disassembly of Cylinder.

(1) Refer to Figure 20, unscrew and withdraw the barrel tube (2) from the mount tube (6).

(2) Unscrew the clevis rod (13) from the rod tube (4).

(3) Withdraw the rod tube (4) from the mount tube (6).

(4) Remove the bleeder screw (12) from the clevis rod (13).

(5) Remove the static o-ring (8) from the clevis rod (13) and discard.

(6) Remove the piston wear ring (1) and stop ring (5) from the rod tube (4) and discard.

(7) Remove the static o-ring (7), rod wear ring (9), rod seal (10) and rod wiper (11) from the mount tube (6) and discard.

(8) Do not remove the velocity fuse (3) unless replacement is necessary.

c. Cleaning and Inspection of Cylinder.

(1) Clean all the metal parts in clean solvent and blow dry with filtered compressed air.

(2) Check all threaded parts for stripped or damaged threads.

(3) Check the mating surfaces of the mount tube (6), barrel tube (2) and rod tube (4) for excessive wear or scoring.

(4) Replace all parts found not serviceable.

(5) Replace all seals and o-rings.

d. Reassembly of Cylinder.

(1) Lubricate and install the static o-ring (7), rod wear ring (9), rod seal (10) and rod wiper (11) in the mount tube (6).

(2) Install the piston wear ring (1) and stop ring (5) on the rod tube (4).

(3) Lubricate and insert the rod tube (4) through the bottom of the mount tube (6).

1. HYDRAULIC HOSE
2. PLATE
3. LIFT CYLINDER
4. PIVOT PIN
5. BEARING
6. SNAP RING
7. NUT
8. WASHER
9. THREADED ROD
10. CYLINDER PIN
11. SPACERS
12. COLLAR
13. DRIVE PIN
14. CYL. COLLAR PIN

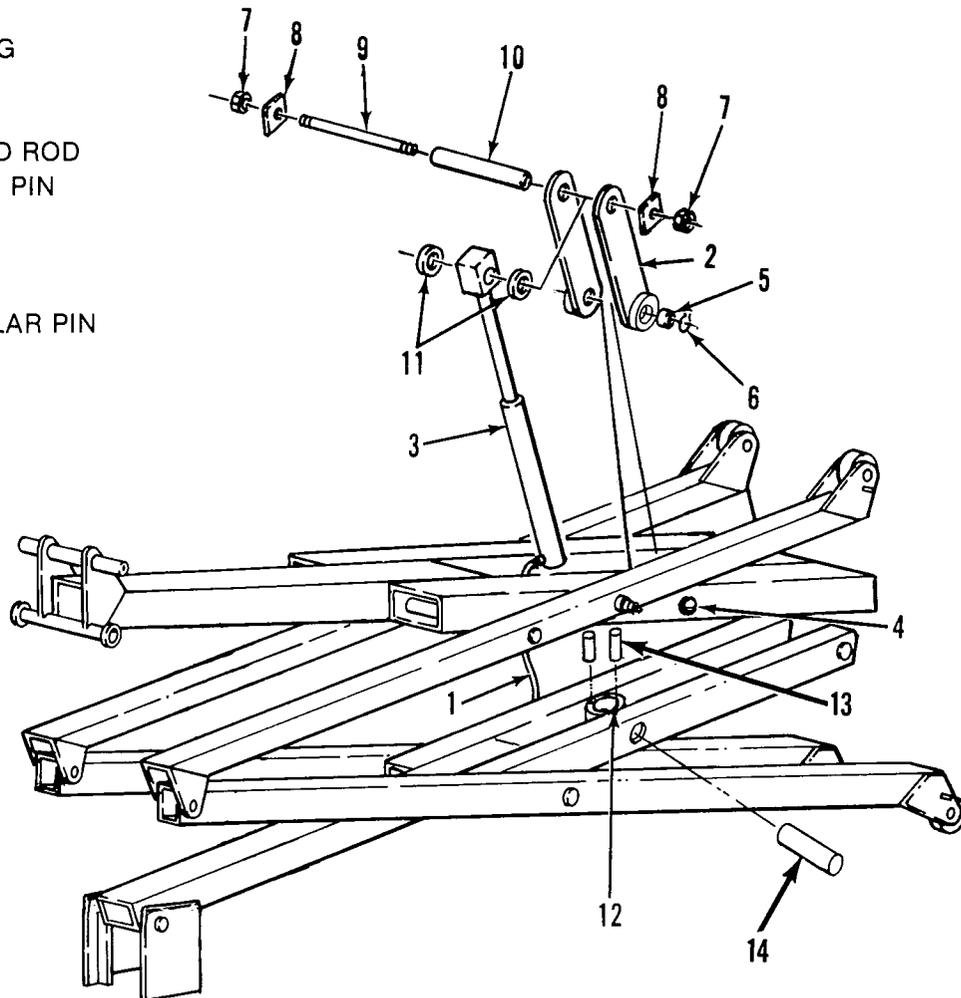


Figure 5-18. Lift Cylinder Removal, XL-14

(4) Lubricate and install the static o-ring (8) on the clevis rod (13).

(5) Thread the clevis rod (13) into the rod tube (4) and tighten securely.

(6) Lubricate the inside surface of the barrel tube (2) and slide over the rod tube (4). Thread the barrel tube (2) into the mount tube (6) and tighten securely.

(7) Install the bleeder screw (12). Do not tighten the bleeder screw.

e. Installation.

NOTE

Lubricate the cylinder pin (10) prior to installation.

(1) Refer to Figure 5-18 and assemble the lift cylinder (3), cylinder pin (10), spacers (11), and threaded rod (9).

(2) Attach a suitable hoisting device and sling to the top of the lift cylinder assembly, and position the cylinder over the collar (12) then, lower the lift cylinder through the collar.

(3) Replace cylinder collar pin (14) and drive pins (13) to secure lift cylinder in collar.

(4) Connect the hydraulic hose (1).

(5) Slide the cylinder pin (1) and threaded rod (9) to one side. Raise the plate (2), of the opposite side, into position. Slide the cylinder pin (10) and rod (9) threaded through the plate (2) a sufficient distance to allow the other plate (2) to be raised into place. Center the cylinder pin (10) and threaded rod (9) then install the washers (8) and nuts (7).

(6) Operate the hydraulic lift circuit with the bleeder screw (12, Figure 5-20) loose to allow trapped air to escape the lift cylinder. Once hydraulic fluid flows continuously from bleed port, tighten the bleeder screw. Check for leaks.

(7) Install the platform floorboard.

(8) Test with weight at rated platform load to check system operation.

5-25. LIFT CYLINDER, XL-19, (Figure 5-19).

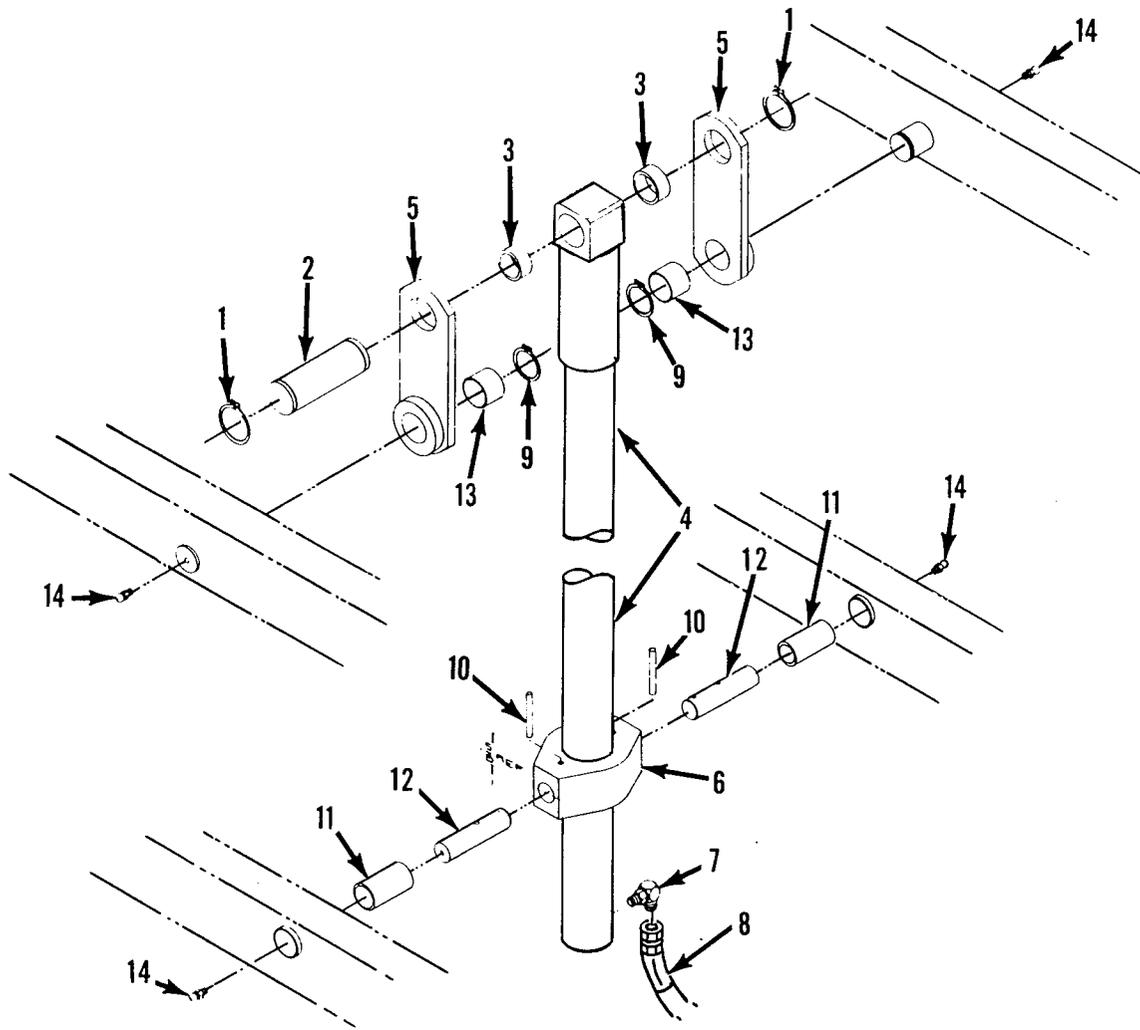
a. Removal

(1) Block scissor linkage as shown in Figure 5-5.

(2) Remove platform floodboard.

(3) Remove snaprings (1) from cylinder pin (2).

(4) Remove cylinder pins (2) and spacers (3) from cylinder (4) and plate (5).



- |                      |                     |
|----------------------|---------------------|
| 1. SNAP RING         | 8. HYDRAULIC HOSE   |
| 2. CYLINDER PIN      | 9. RETAINING RING   |
| 3. SPACER            | 10. DRIVE PIN       |
| 4. CYLINDER          | 11. BEARING         |
| 5. PLATE             | 12. CYL. COLLAR PIN |
| 6. CYLINDER COLLAR   | 13. BEARING         |
| 7. HYDRAULIC FITTING | 14. GREASE FITTING  |

Figure 5-19. Lift Cylinder Removal, XL-19

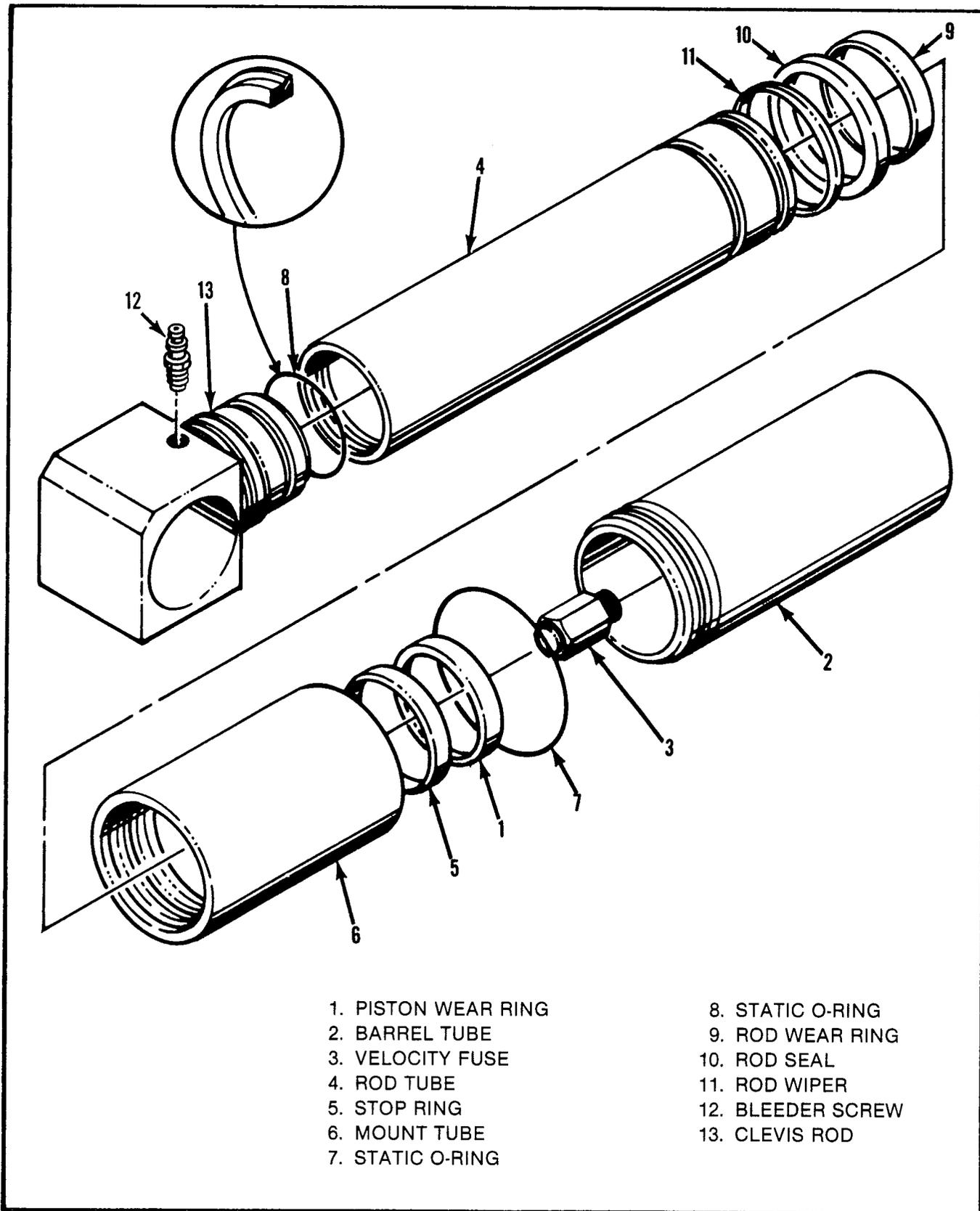


Figure 5-20. Lift Cylinder, XL-14 and XL-19

(5) Provide a suitable container to catch the draining hydraulic fluid, then disconnect the hydraulic hose (8) and fitting (7) from the base of the cylinder (4) and plug hose to prevent foreign material from entering.

(6) Attach a suitable hoisting device and sling to the top of the cylinder (4).

(7) Remove cylinder from collar (6) to a prepared work area.

b. For disassembly, cleaning and inspection, and reassembly of Lift Cylinder, See 5-24, b, c, & d.

c. Installation

#### NOTE

Lubricate the cylinder pin (2) prior to installation.

(1) Refer to Figure 5-19. Attach a suitable hoisting device to the top of the lift cylinder (4) and position cylinder (4) over the collar (6). Then lower the lift cylinder into the collar.

(2) Connect the hydraulic fitting (7) and the hydraulic hose (8).

(3) Raise the plates (5) to align with the cylinder (4) and install the cylinder pin (2).

(4) Install the snap rings (1) to each end of the cylinder pin (2).

(5) Operate the hydraulic lift circuit with the bleeder screw (12, Figure 5-20) loose to allow trapped air to escape the lift cylinder. Once hydraulic fluid flows continuously from bleed port, tighten the bleeder screw. Check for leaks.

(6) Install the platform floorboard.

(7) Test with weight at rated platform load to check system operation.

#### 5-26. ELECTRIC MOTOR. (Figure 5-21)

#### NOTE

Brush replacement is necessary if brush is damaged or worn to a length less than 5/8 inches, measures on the short side of brush. When replacement is required, replace all brushes.

a. Removal.

(1) Refer to Figure 5-21 and remove the brush access cover (1).

(2) Lift the brush spring (2) end upwards to slide brush (3) out of the holder (4).

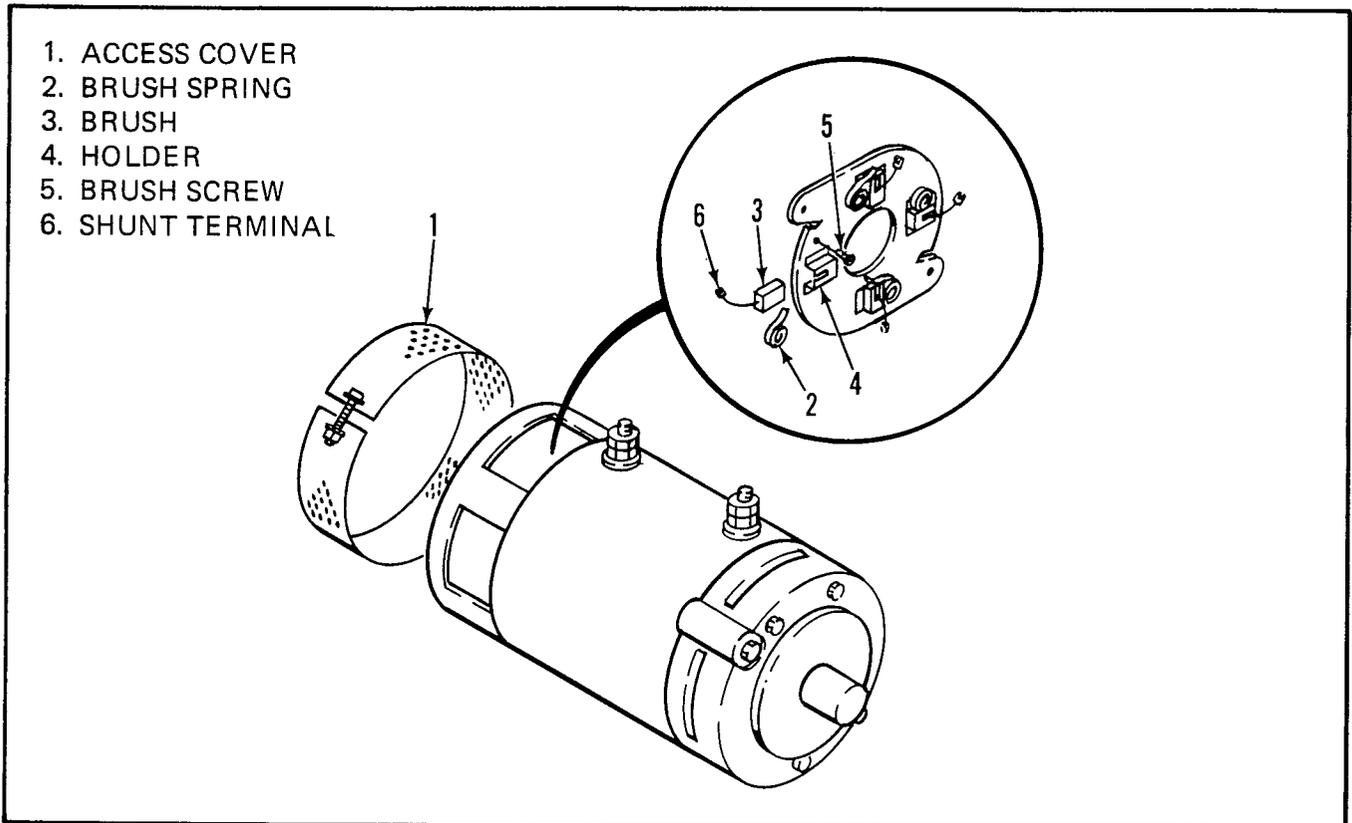


Figure 5-21. Electric Motor

(3) Loosen the brush screw (5) to remove the brush shunt terminal (6) and brush (3).

b. Installation.

(1) Lift the brush spring (2) end upwards and slide the replacement brush (3) into the holder.

(2) Reconnect the brush shunt terminal (6) and tighten the brush screw (5).

(3) Check the position of the brush (3) to ensure that the brush shunt terminal (6) will travel down the holder (4) slot as the brush wears.

NOTE

Motor failure will occur if the brush shunt cannot travel freely in the brush holder (4) slot. Adjust if necessary.

Ensure that only the insulated portion of the brush shunt terminal (6) contacts the motor end shield or brush access cover (1) when reinstalled.

(4) Install the brush access cover (1).



## SECTION VI

### DIAGRAMS

6-1. **CONTENT.** This section contains electrical diagrams, hydraulic power diagrams, and associated information for maintenance purposes.

6-2. **USE.** The diagrams are to be used in conjunction with Table 5-3 "Troubleshooting". They allow understanding of the make-up and functions of the systems for checking, tracing, and fault-finding during trouble analysis.

6-3. **INDEX OF DIAGRAMS.** The diagrams appear in the following order:

Figure 6-1. Electrical Diagram, XL-14/XL-19, 24 Volt System

Figure 6-2. Electrical Diagram, XL-19, 18 Volt System

Figure 6-3 Hydraulic Diagram, XL-14

Figure 6-4 Hydraulic Diagram, XL-19

6-4. **DIAGRAM LEGENDS.** The components that comprise the electrical and hydraulic systems are given a reference designation and are explained as to location and function in the following tables:

Table 6-1. Electrical Diagram Legend, XL-14/XL-19

Table 6-2. Hydraulic Diagram Legend, XL-14/XL-19

TABLE 6-1. Electrical Diagram Legend, XL-14/XL-19

Reference Designation	Name	Function	Location
B	Motor, Electric	Provides power to drive hydraulic pump.	L.H. rear of Module
BT	Battery, 6 Volt	To store energy to power unit.	R.H. side of Module
D1	Diode	Provide power to Bypass Valve Solenoid when lift switch is actuated.	Between T <sub>1</sub> & T <sub>2</sub> on Fanning Strip
D2	Diode	Provides power to Dump Valve Solenoid when lift switch is actuated.	Between T <sub>1</sub> & T <sub>3</sub> on Fanning Strip
D3	Diode	Provides power to Dump Valve Solenoid when drive forward switch is actuated.	Between T <sub>8</sub> & T <sub>9</sub> on Fanning Strip
D4	Diode	Provides power to Dump Valve Solenoid when Drive Reverse Switch is actuated.	Between T <sub>7</sub> & T <sub>8</sub> on Fanning Strip

TABLE 6-1. Electrical Diagram Legend, XL-14/XL-19 (Cont'd)

Reference Designation	Name	Function	Location
D5	Diode	Provides power to Motor Contact Coils when Steer Right switch is actuated.	Between T <sub>4</sub> & T <sub>5</sub> on Fanning Strip
D6	Diode	Provides power to Motor Contact Coils when Steer Left switch is actuated.	Between T <sub>5</sub> & T <sub>6</sub> on Fanning Strip
D7	Diode	Provides power to Motor Contact Coils when Lift, Drive Forward or Drive Reverse Switches are actuated.	Between T <sub>3</sub> & T <sub>5</sub> on Fanning Strip
F1	Fuse, 15 Amp.	Provides overload protection for the Control Circuit.	Terminal Board Panel
F2	Fuse, 150 Amp.	Provides overload protection for Electric Motor (B).	Left rear side of Module
HN	Alarm w/18 volt system	Provides warning sound when deck is lowering	Back side of Terminal Strip
HN	Alarm w/24 volt system	Provides warning sound when deck is lowering.	Back side of Terminal Strip
K1	Motor Relay	Provides power to Motor.	Center rear of Module
K2	Motor Relay	Provides power to Motor.	Center rear of Module
L1	Solenoid	Opens Lowering Valve.	Lower left of outer face of Valve Module
L2	Solenoid	Opens Lift Valve	Lower center of front face of Valve Module
L3	Solenoid	Shifts Drive Valve to Forward position.	Upper end of outer Spool Valve mounted on rear surface of Valve Module
L4	Solenoid	Shifts Drive Valve to Reverse position.	Lower end of outer Spool Valve mounted on rear surface of Valve Module
L5	Solenoid	Closes Dump Valve.	Upper center of outer face of Valve Module

TABLE 6-1. Electrical Diagram Legend, XL-14/XL-19 (Cont'd)

Reference Designation	Name	Function	Location
L6	Solenoid	Closes Bypass Valve.	Center of outer face of Valve Module
L7	Solenoid	Shifts Steer Valve to Left Turn position.	Upper end of Spool front surface of Valve Module
L8	Solenoid	Shifts Steer Valve to Right Turn position.	Lower end of Spool Valve mounted on front surface of Valve Module
L9	Solenoid	Shifts Series Parallel Valve to to Series position.	Upper end of inner Spool Valve mounted on rear surface of Valve Module.
S1	Switch, Emerg. Stop	Control Circuit shut off.	On Control Box Assembly
S2	Switch, Mode	Supplies power to to Lift Lower Switch or Drive Controller and Steer Switch.	Control Box Assembly
S3	Switch Lift	Supplies power to Lift Valve Solenoid or Lowering Valve Solenoid	Control Box Assembly
S4	Switch, Drive Forward	Supplies power to Drive Forward Valve Solenoid, Dump Valve Solenoid and Motor Relay.	On Drive Control Lever Assembly in Control Box Assembly
S5	Switch, Drive Reverse	Supplies power to Drive Reverse Valve Solenoid, Dump Valve Solenoid and Motor Relay.	On Drive Control Lever Assembly in Control Box Assembly
S6	Switch, Bypass	Provides power to Bypass Valve Solenoid in Second and Third Speeds.	On Drive Control Lever Assembly in Control Box Assembly
S7	Switch, Steering	Provides power to Steer Valve Solenoids and Motor Relay.	On Control Box Assembly
S8	Switch, Series	Provides power to Series Valve Solenoid.	On Drive Control Lever Assembly in Control Box Assembly
S9	Switch, Drive Range	Provides power to the Series Switch	On Control Box Assembly

TABLE 6-1. Electrical Diagram Legend, XL-14/XL-19 (Cont'd)

Reference Designation	Name	Function	Location
S10	Switch, High Speed Cut-out	Cuts out High Speed Drive when deck is raised	Center rear of Module Assembly
S11	Switch, Height Limit	Cuts out power to the Lift Valve when deck is at full elevation.	Near L.H. roller track at center of machine

TABLE 6-2. Hydraulic Diagram Legend, XL-14/XL-19

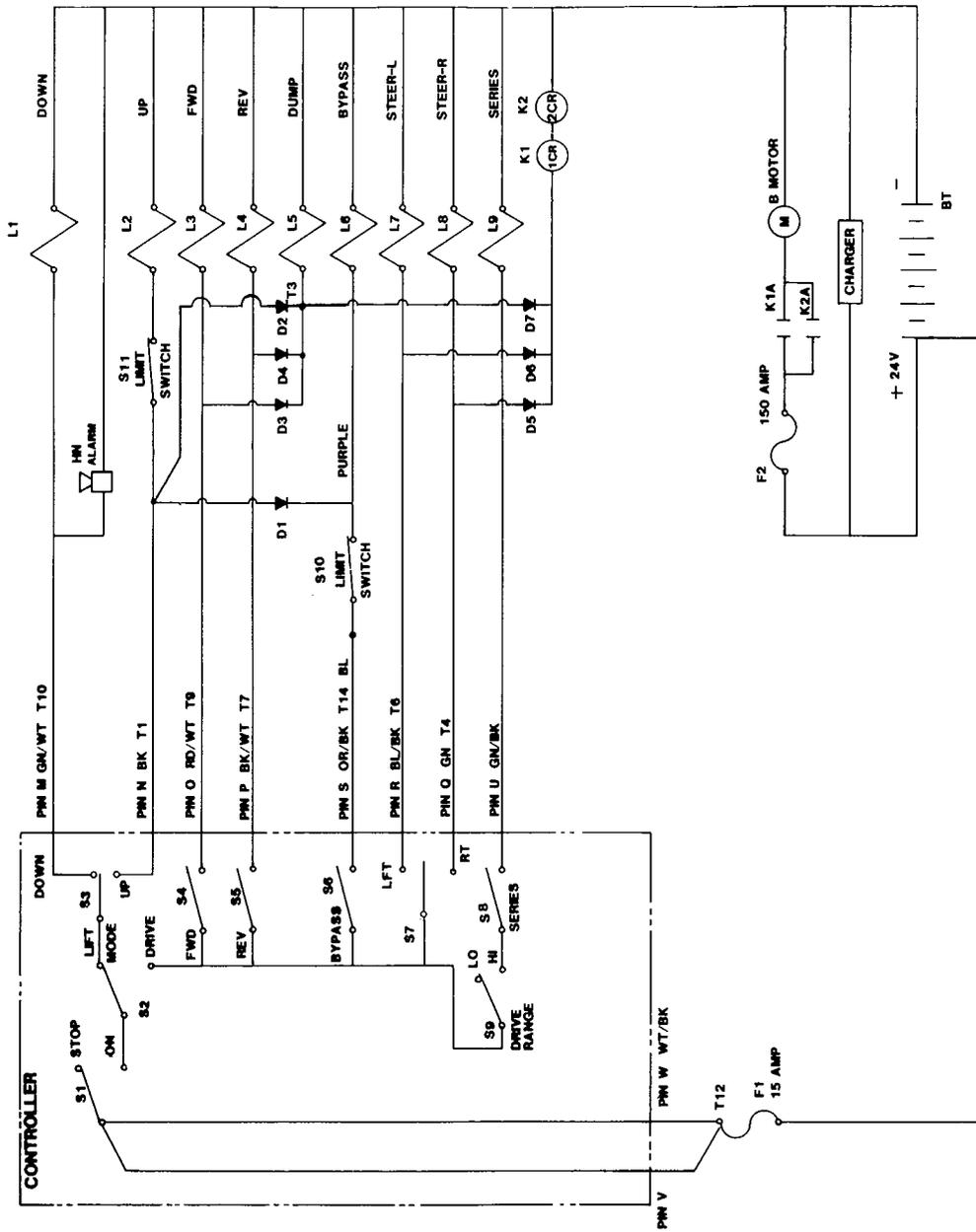
Reference Designation	Name	Function	Location
ASSY1	Duplex Pump Assembly	One section supplies hydraulic oil flow for the Lift & Drive Circuit. The other provides oil to the steering circuit.	Left side of machine just behind the Valve Module
ASSY2	Counterbalance Valve Assembly	Prevents machine from running away, going down slopes.	Forward Valve, upper rear corner of outside surface of Valve Module. Reverse Valve, Lower rear corner of outside surface of Valve Module
ASSY3	Lowering Speed Control Valve	Controls the lowering speed of the platform.	Lower front corner of outside surface of Valve Module
CV1	Check Valve, Lift	Prevents oil from flowing back thru Lift Valve when it is not actuated.	Lower front corner of outside surface of Valve Module
CYL1	Cylinder, Brake	Disengage brake disc when a drive function is actuated.	Inside right rear Wheel
CYL2	Cylinder, Steering	Provides force to turn front wheels.	Center front of Chassis
CYL3	Cylinder, Lift	Provides force to lift platform	Inside the inner Scissors Frame Weldment
FLTR	Filter, Return	Filters the oils as it returns to the tank.	Mounted on Tank

TABLE 6-2. Hydraulic Diagram Legend, XL-14/XL-19 (Cont'd)

Reference Designation	Name	Function	Location
MOT1	Motor, Left Drive	Provides drive torque to the left front wheel	On left front Steering Knuckle
MOT2	Motor, Right Drive	Provides drive torque Steering Knuckle wheel	On right front
RV1	Relief Valve, 2950 Psi	Provides over pressure protection for the Drive & Lift Circuit.	Near center of top surface of Valve Module
RV2	Relieve Valve, Steering, 1750 Psi	Provides over pressure protection for the Steering Circuit.	Upper front of inner surface of Valve Module
RV3	Relief Valve, Lift 2500 Psi	Limits load that machine can lift.	Front center of outer surface of Valve Module
V1	Valve, Forward/Reverse	Provides directional control of oil for drive functions.	Outer valve on rear surface of Valve Module
V2	Valve, Shuttle	Directs oil to the Brake Cylinder when the Drive Valve is actuated.	Rear of underside of Valve Manifold
V3	Valve, Series Parallel	Connects the Drive Motors either in parallel or series.	Inner valve on rear surface of Valve Module
V4	Valve, Dump	Allows oil to flow freely to tank when no functions are actuated.	Top center of outer surface of Valve Module
V5	Valve, Needle, Creep Speed Control	Provides means of adjusting Low Speed.	Center of top surface of Valve Module.
V6	Valve, Bypass	Blocks flow thru Creep Speed Control Valve providing Second Speed.	Center of outer surface of Valve Module
V7	Valve, Steering Right/Left	Provides directional control for Steering Cylinder.	Front surface of Valve Module

TABLE 6-2. Hydraulic Diagram Legend, XL-14/XL-19 (Cont'd)

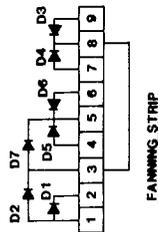
Reference Designation	Name	Function	Location
V8	Valve, Lowering	Allows oil to flow from Lift Cylinders to Tank.	Front lower corner of outer surface of Valve Module
V9	Valve, Needle Emergency Down	Provides mechanical means to allow oil to flow from Lift Cylinder to Tank.	Top front of outer surface of valve Module
V10	Valve, Lift	Supplies oil to Lift Cylinders.	Lower center of outer surface of Valve Module
V11	Valve, Velocity Fuse	Locks Cylinder if a hose breaks.	Inside each Lift Cylinder



**Control Stick Logic**

REF. DES.	SWITCH CH	CONTROL STICK POSITION		
		FORWARD	REVERSE	
S4	REVERSE	○	○	○
S5	FORWARD	●	●	●
S6	BYPASS	○	○	○
S8	SERIES	○	○	○

○ OPEN  
● CLOSED



**COLOR CODES**  
BK-BLACK  
GN-GREEN  
WT-WHITE  
OR-ORANGE  
RD-RED  
BL-BLUE

Figure 6-1. Electrical Diagram, XL-14/XL-19, 24 Volt System  
060594-000

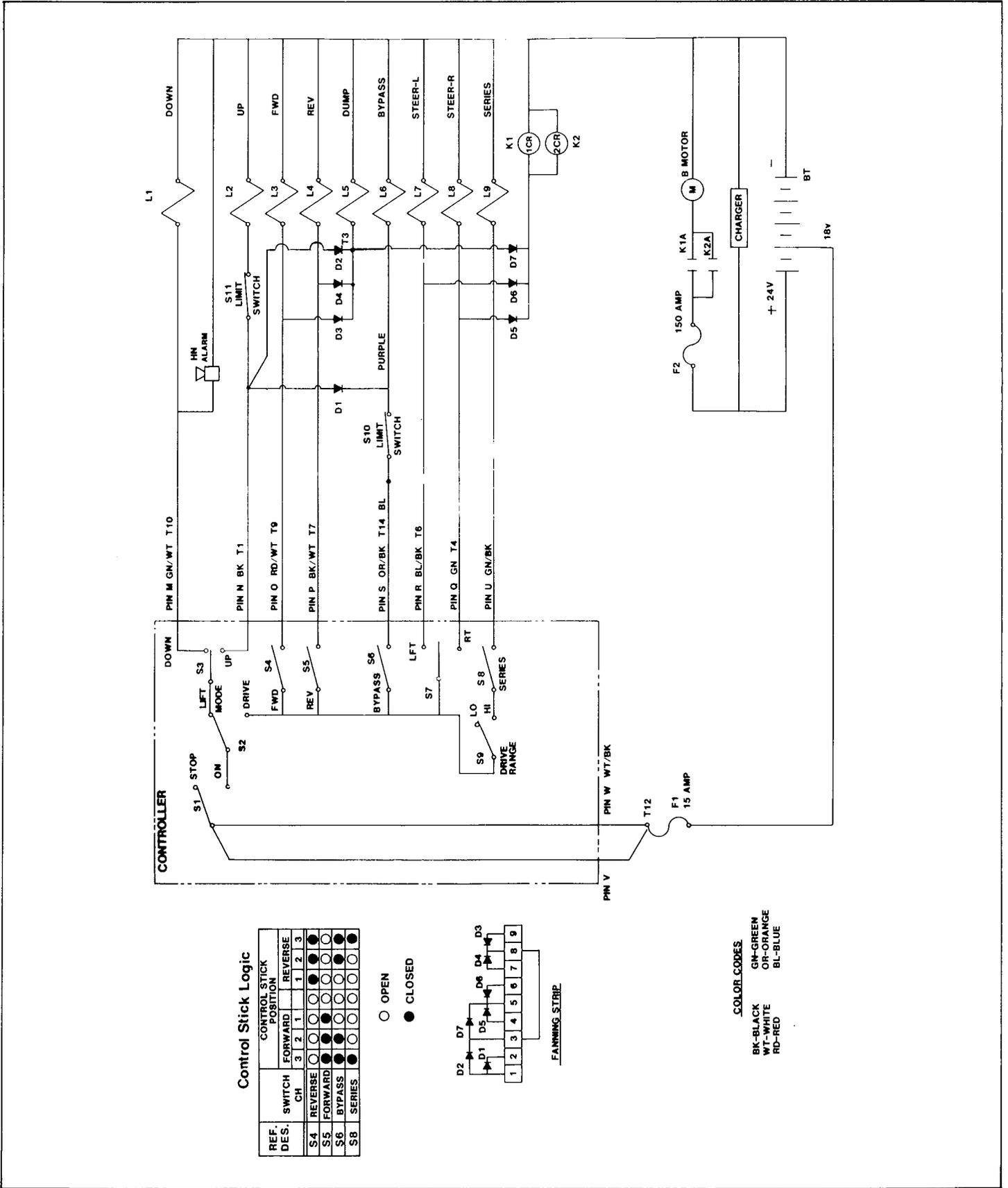


Figure 6-2. Electrical Diagram, XL-19, 18 Volt System

060594-000

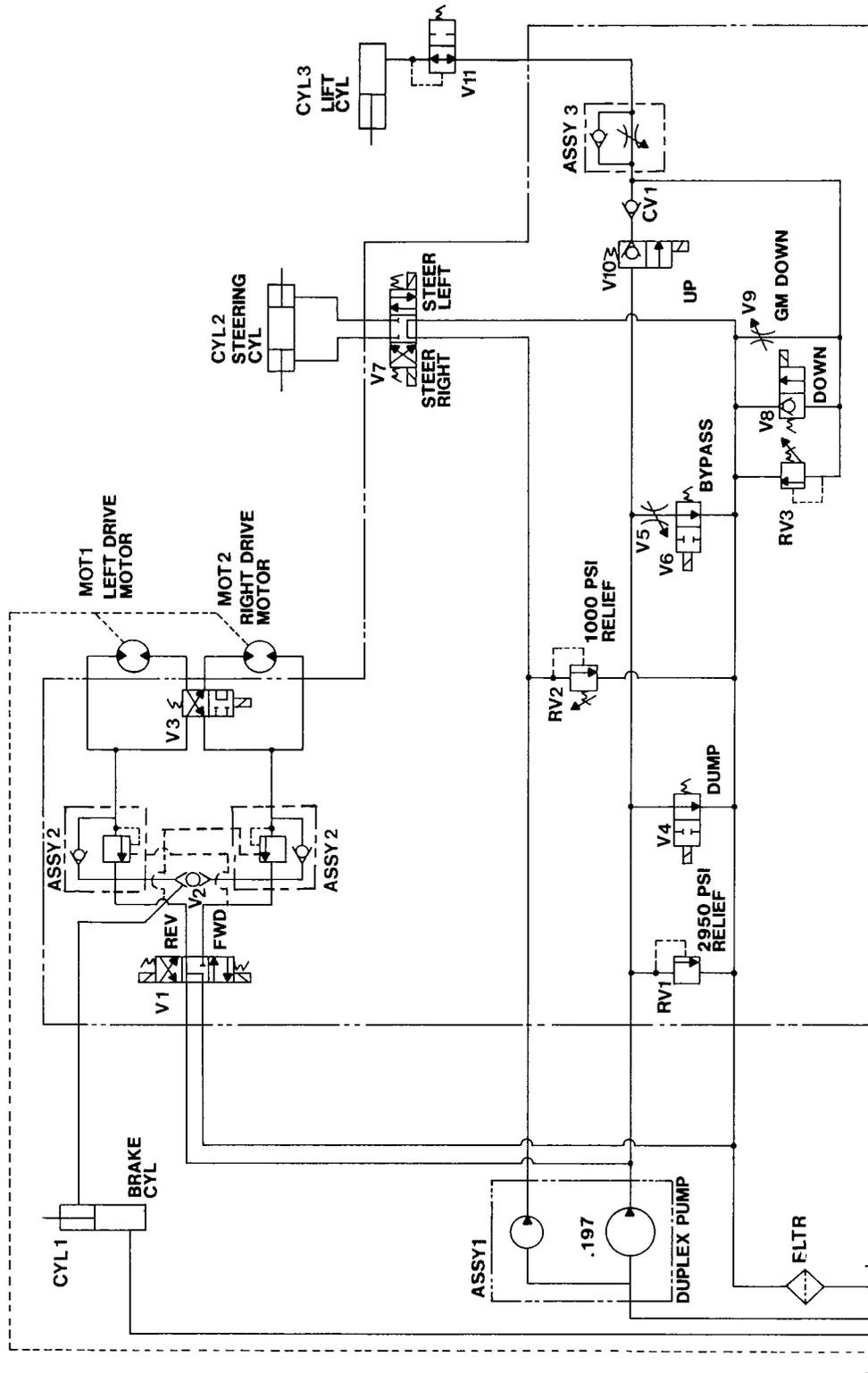


Figure 6-3 Hydraulic Diagram, XL-14  
060594-000

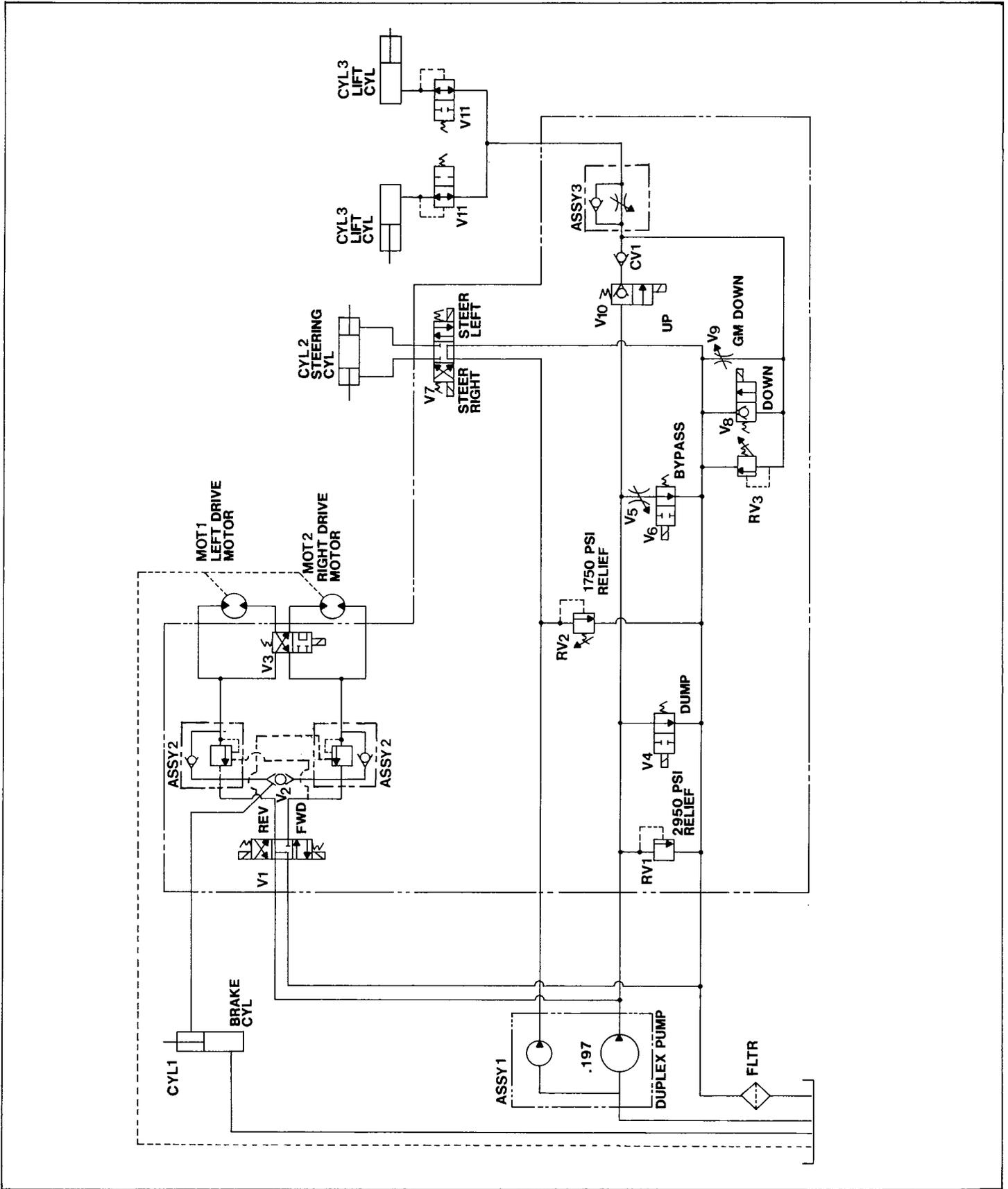


Figure 6-4 Hydraulic Diagram, XL-19

## SECTION VII

### ILLUSTRATED PARTS BREAKDOWN

7.1 INTRODUCTION. This section lists and illustrates the replaceable assemblies and parts of the XL-14 and XL-19 Work Platforms, as manufactured by UP-RIGHT INC., Selma, California, 93662. Each assembly is followed by its components parts indented to show their relationship to the assembly.

7-2. EXPLANATION OF COLUMNS IN ILLUSTRATED PARTS BREAKDOWN.

7-3. FIGURE AND INDEX NUMBER COLUMN. The figure and index numbers correlate each parts list to its appropriate illustration. The first number in this column on each page of listings indicates the figure number of the associated illustration. The following numbers, preceded by a dash, correspond to the index numbers of each part on the illustration.

7-4. PART NUMBER COLUMN. This column contains the manufacturer's part number for each item listed.

7-5. DESCRIPTION COLUMN. This column contains the manufacturer's nomenclature for each assembly or part. Each part description is indented to show relationship. Reference to next higher assembly or detail parts breakdown follow the description where applicable.

7-6. QUANTITY REQUIRED COLUMN. This column contains the quantity required for each assembly in the higher assembly and for each detail part in an assembly.

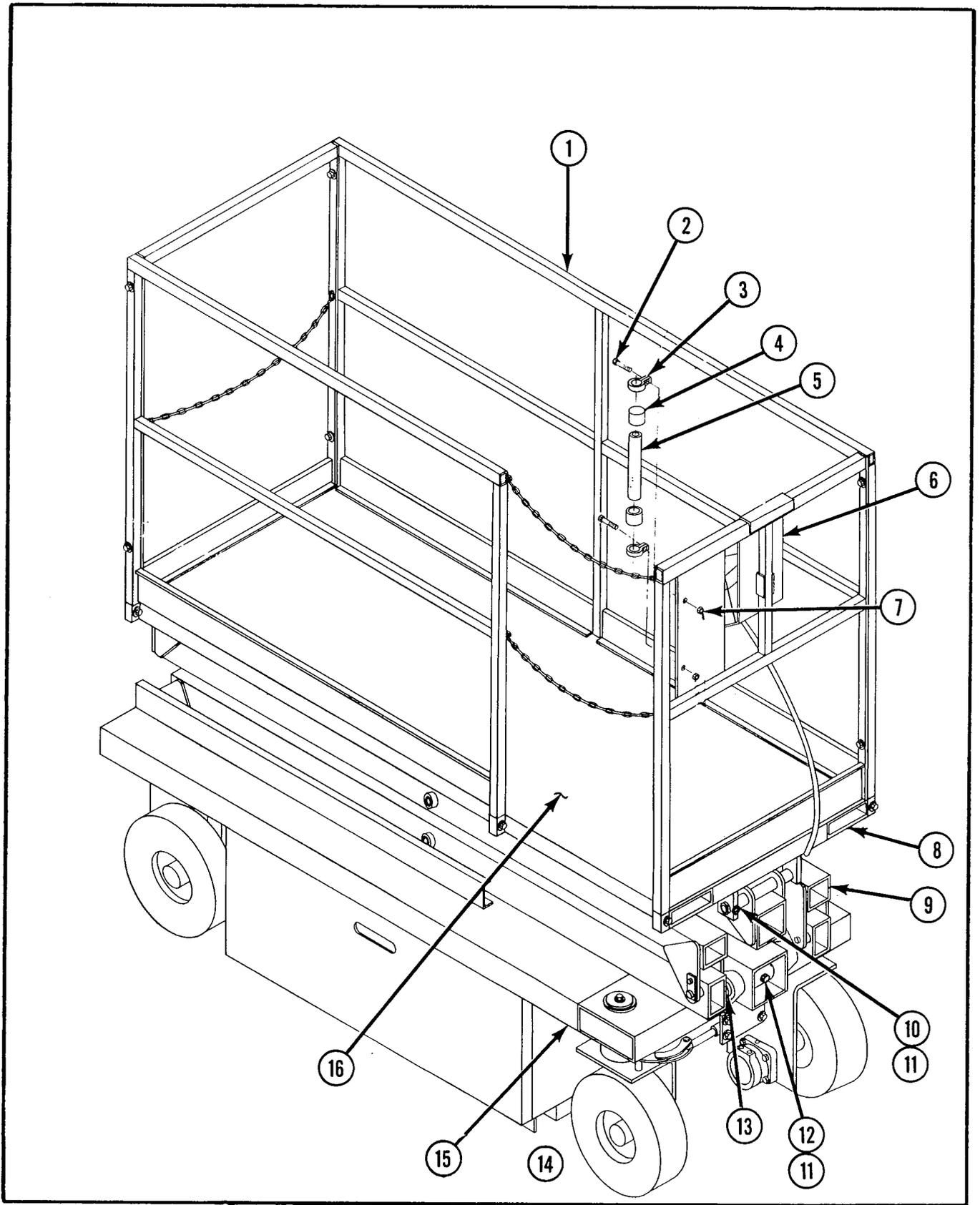


Figure 7-1. XL-14 Work Platform

ITEM	PART	DESCRIPTION	QTY
7-1	61550-000-00	XL-14 WORK PLATFORM ASSEMBLY .....	REF
-1	61413-000-00	• GUARD RAIL INSTALLATION - FIXED .....	1
		(See Figure 7-29)	
-2	11252-006-00	• SCREW 1/4-20 UNC GR. 5 HHC X 3/4 .....	2
-3	20398-012-00	• CLAMP .....	2
-4	03612-000-00	• CAP .....	2
-5	03613-002-00	• TUBE .....	2
-6	60704-000-00	• CONTROLLER ASSEMBLY .....	1
		(See Figure 7-31)	
-7	11248-004-00	• LOCKNUT, 1/4-20 UNC .....	2
-8	60811-000-00	• PLATFORM WELDMENT .....	1
-9	60702-000-00	• XL-14 SCISSORS ASSEMBLY .....	1
		(See Figure 7-22)	
-10	11254-026-00	• SCREW, 3/8-16 UNC GR. 5 HHC X 3 1/4 .....	1
-11	11248-006-00	• LOCKNUT, 3/8-16 UNC .....	2
-12	11254-020-00	• SCREW, 3/8-16 UNC GR. 5 HHC X 2 1/2 .....	1
-13	60773-000-00	• PIN .....	1
-14	60772-000-00	• PIN .....	1
-15	61551-000-00	• XL-14 CHASSIS ASSEMBLY .....	1
		(See Figure 7-3)	
-16	20824-003-00	• PLYWOOD .....	1

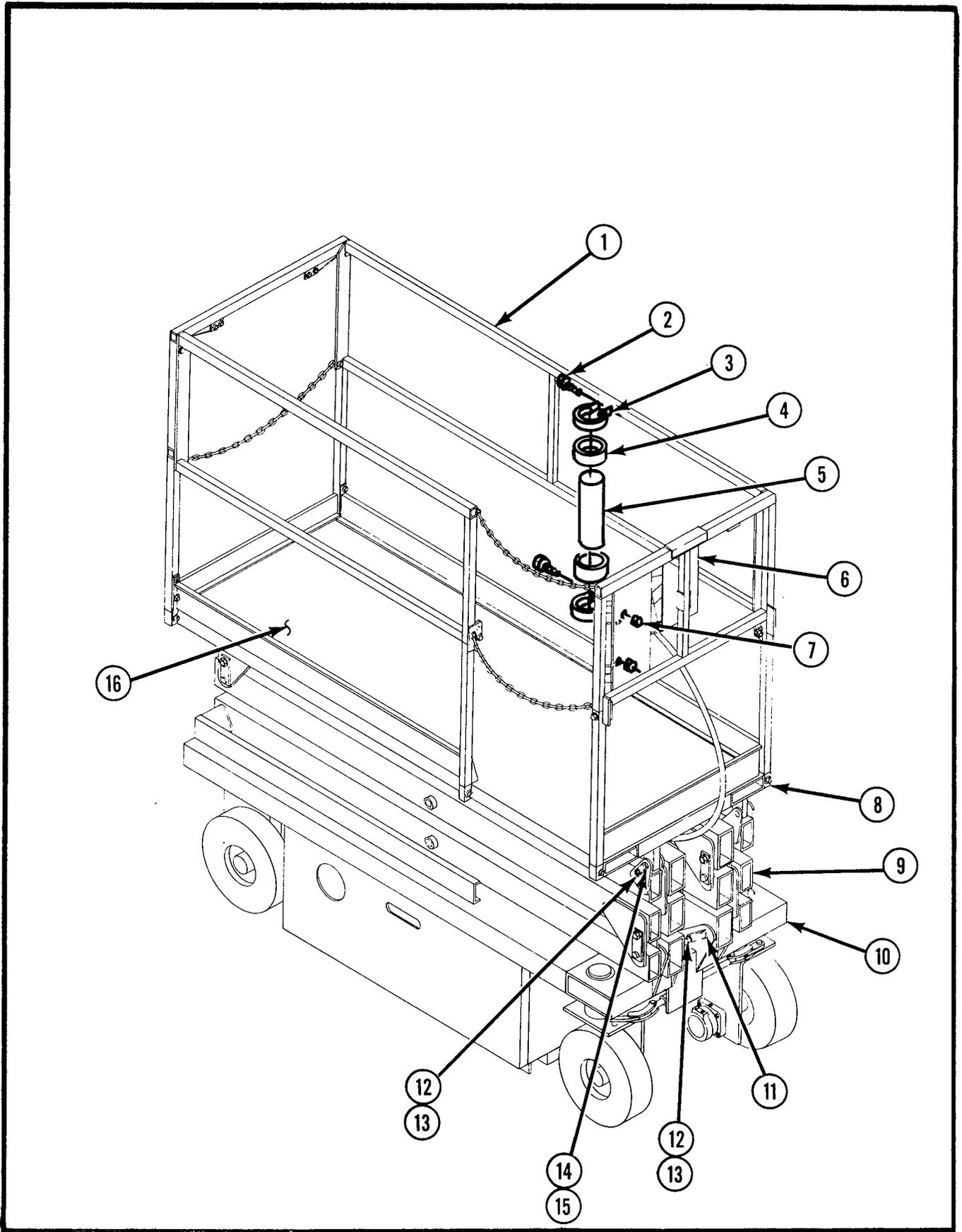


Figure 7-2. XL-19 Work Platform Assembly

ITEM	PART	DESCRIPTION	QTY
7-2	61400-000-00	XL-19 WORK PLATFORM ASSEMBLY .....	REF
1	61413-000-00	• GUARDRAIL INSTALLATION - FIXED .....	1
		(See Figure 7-29)	
	61412-000-00	• OPTIONAL GUARDRAIL INSTALLATION - FOLD DOWN ..	-1
		(See Figure 7-30)	
-2	11252-005-00	• SCREW, 1/4-10 UNC GR. 5 HHC X 5/8 .....	2
-3	20398-012-00	• CLAMP .....	2
-4	03612-000-00	• CAP .....	2
-5	03613-002-00	• TUBE .....	1
-6	60704-000-00	• CONTROLLER ASSEMBLY .....	1
		(See Figure 7-31)	
-7	11248-004-00	• LOCKNUT, 1/4-20 UNC .....	2
-8	61502-000-00	• PLATFORM WELDMENT .....	1
-9	61402-000-00	• XL-19 SCISSORS ASSEMBLY .....	1
		(See Figure 7-23)	
-10	61401-000-00	• XL-19 CHASSIS ASSEMBLY .....	1
		(See Figure 7-4)	
-11	61464-000-00	• PIN WELDMENT .....	2
-12	11248-006-00	• LOCKNUT, 3/8-16 UNC .....	4
-13	11240-006-00	• WASHER, 3/8 DIA STD FLAT .....	4
-14	61506-000-00	• PIN WELDMENT .....	2
-15	27931-012-00	• BEARING .....	2
-16	20824-003-00	• PLYWOOD .....	1

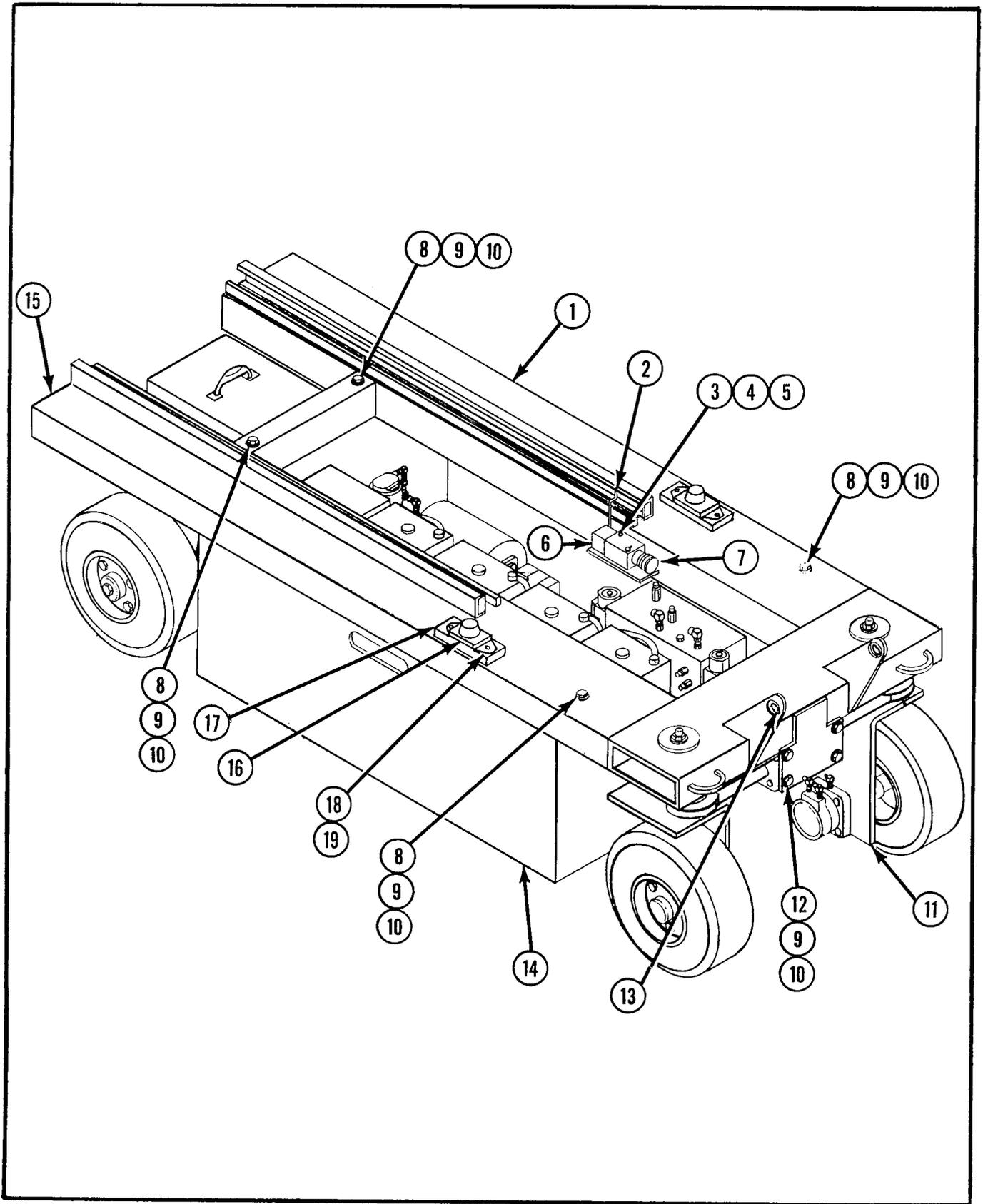


Figure 7-3. XL-14 Chassis Assembly

ITEM	PART	DESCRIPTION	QTY
7-3	61551-000-00	XL-14 CHASSIS ASSEMBLY .....	REF
-1	61555-000-00	• FRAME WELDMENT .....	1
-2	61533-000-00	• ARM, ACTUATOR .....	1
-3	11709-018-00	• SCREW, #10-24 UNC RD HD MACH X 2 1/4 .....	2
-4	11240-003-00	• WASHER, #10 DIA STD FLAT .....	2
-5	11248-003-00	• LOCKNUT, #10-24 UNC .....	2
-6	29859-001-00	• SWITCH, LIMIT .....	1
-7	29925-000-00	• CONNECTOR, CABLE .....	1
-8	11254-032-00	• SCREW, 3/8-16 UNC GR. 5 .....	4
-9	11240-006-00	• WASHER, 3/8 DIA STD FLAT .....	8
-10	11248-006-00	• LOCKNUT, 3/8-16 UNC .....	8
-11	NO NUMBER	• FRONT STEERING AND DRIVE MOTOR ASSEMBLY .....	2
		(See Figure 7-5)	
-12	11254-012-00	• SCREW, 3/8-16 UNC GR. 5 HHC X 1 1/2 .....	4
-13	11780-030-00	• BEARING .....	2
-14	61552-000-00	• XL-14 MODULE ASSEMBLY .....	1
		(See Figure 7-10)	
-15	NO NUMBER	• REAR CHASSIS ASSEMBLY .....	1
		(See Figure 7-6)	
-16	12848-000-00	OPTIONAL LIGHT, FLASHING .....	2
-17	61541-000-00	MOUNT, LIGHT .....	2
-18	11826-004-00	SCREW, #10-32 UNF RD HD MACH X 1/2 .....	4
-19	11249-003-00	LOCKNUT, #10-32 UNF .....	4

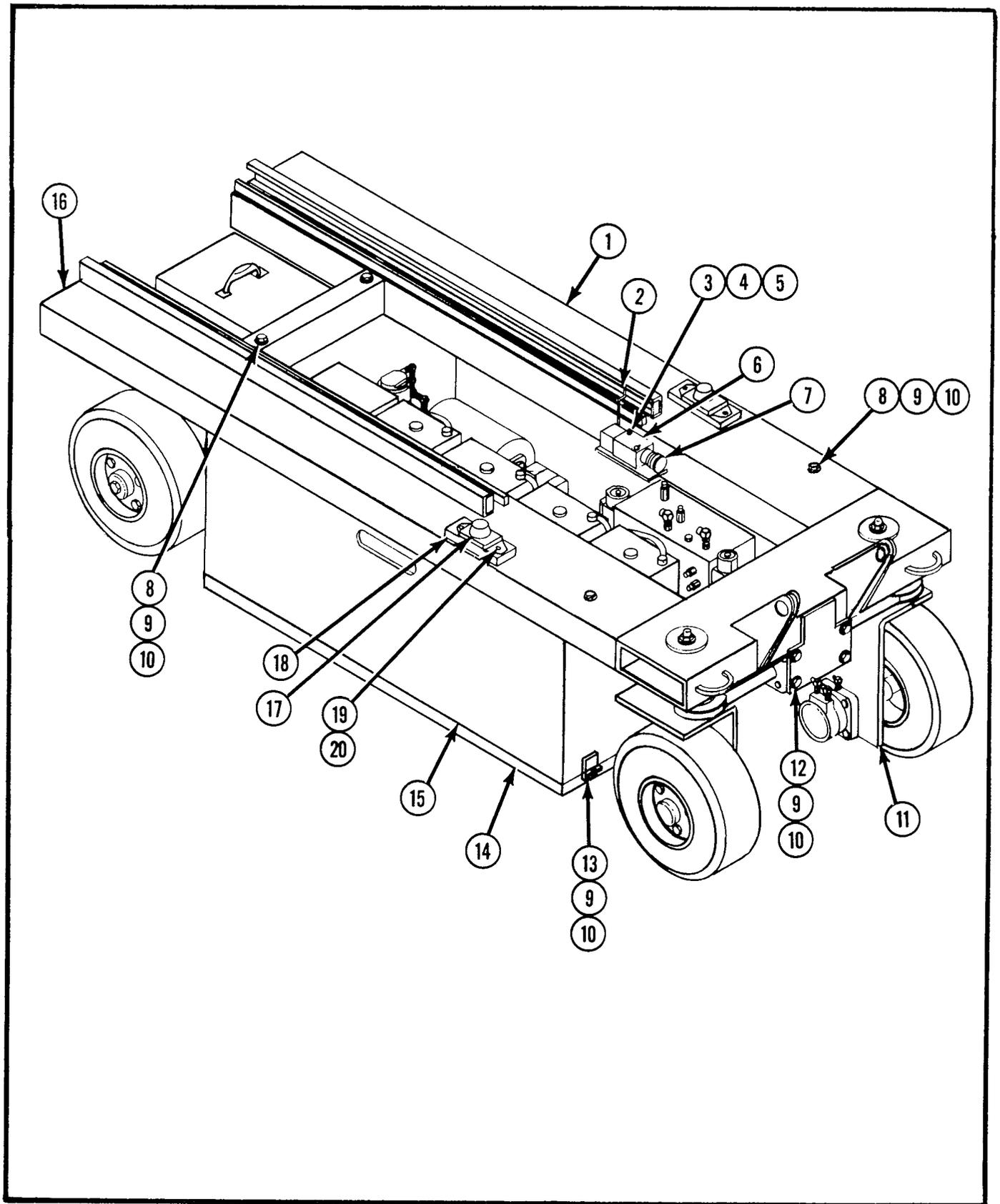


Figure 7-4. XL-19 Chassis Assembly

ITEM	PART	DESCRIPTION	QTY
7-4	61401-000-00	XL-19 CHASSIS ASSEMBLY .....	REF
-1	61415-000-00	• FRAME WELDMENT .....	1
-2	61533-000-00	• ARM, ACTUATOR .....	1
-3	11709-018-00	• SCREW, #10-24 UNC RD HD MACH X 2 1/4 .....	2
-4	11240-003-00	• WASHER, #10 DIA STD FLAT .....	2
-5	11248-003-00	• LOCKNUT, #10-24 UNC .....	2
-6	29859-001-00	• SWITCH, LIMIT .....	1
-7	29925-000-00	• CONNECTOR, CABLE .....	1
-8	11254-032-00	• SCREW, 3/8-16 UNC GR. 5 HHC X 4 .....	4
-9	11240-006-00	• WASHER, 3/8 DIA STD FLAT .....	12
-10	11248-006-00	• LOCKNUT, 3/8-16 UNC .....	12
-11	NO NUMBER	• FRONT STEERING AND DRIVE MOTOR ASSEMBLY .....	2
		(See Figure 7-5)	
-12	11254-012-00	• SCREW, 3/8-16 UNC GR. 5 HHC X 1 1/2 .....	4
-13	11254-010-00	• SCREW, 3/8-16 UNC GR. 5 .....	4
-14	61431-000-00	• COUNTERWEIGHT .....	1
-15	61403-000-00	• XL-19 MODULE ASSEMBLY .....	1
		(See Figure 7-10)	
-16	NO NUMBER	• REAR CHASSIS ASSEMBLY .....	1
		(See Figure 7-6)	
-17	12848-000-00	OPTIONAL LIGHT, FLASHING .....	2
-18	61541-000-00	MOUNT, LIGHT .....	2
-19	11826-004-00	SCREW, #10-32 UNF RD HD MACH. X 1/2 .....	4
-20	11249-003-00	LOCKNUT, #10-32 UNF .....	4



ITEM	PART	DESCRIPTION	QTY
7-5	NO NUMBER	FRONT STEERING AND DRIVE MOTOR ASSEMBLY .....	REF
-1	11246-006-00	• LOCKNUT, 3/8-16 UNC THIN .....	1
-2	11239-006-00	• WASHER, 3/8 DIA ASTM FLAT .....	2
-3	61555-000-00	• XL-14 FRAME WELDMENT .....	1
-4	61415-000-00	• XL-19 FRAME WELDMENT .....	1
-5	11782-008-00	• BEARING, THRUST .....	1
-6	27931-032-00	• BEARING .....	1
-7	61416-000-00	• SPINDLE WELDMENT, LH .....	1
-8	61417-000-00	• SPINDLE WELDMENT, RH (Not Shown) .....	1
-9	60737-000-00	• HUB .....	1
-10	05107-000-00	• WHEEL ASSEMBLY .....	1
-11	11468-000-00	• BOLT, STUD .....	5
-12	11753-012-00	• PIN, COTTOR .....	3
-13	11254-056-00	• SCREW, 3/8-16 UNC GR. 5 HHC X 7 .....	1
-14	11256-018-00	• SCREW, 1/2-13 UNC GR. 5 HHC X 2 1/4 .....	4
-15	12795-000-00	• MOTOR, HYDRAULIC .....	1
	12795-001-00	•• KEY .....	1
	12795-002-00	•• NUT, SLOTTED .....	1
	12795-003-00	•• SEAL KIT .....	1
-16	11248-008-00	• LOCKNUT, 1/2-13 UNC .....	4
-17	11941-001-00	• FITTING, STRAIGHT .....	1
-18	11941-013-00	• FITTING, STRAIGHT .....	2
-19	11932-003-00	• FITTING, ELBOW .....	2
-20	11940-006-00	• FITTING, ELBOW .....	2
-21	12802-000-00	• CYLINDER, STEERING .....	1
	12802-099-00	•• SEAL KIT .....	1
-22	60741-000-00	• PIN .....	1
-23	27931-029-00	• BEARING .....	1
-24	60738-000-00	• LINK, STEERING, WELDMENT .....	1
-25	11932-001-00	• FITTING, ELBOW .....	1

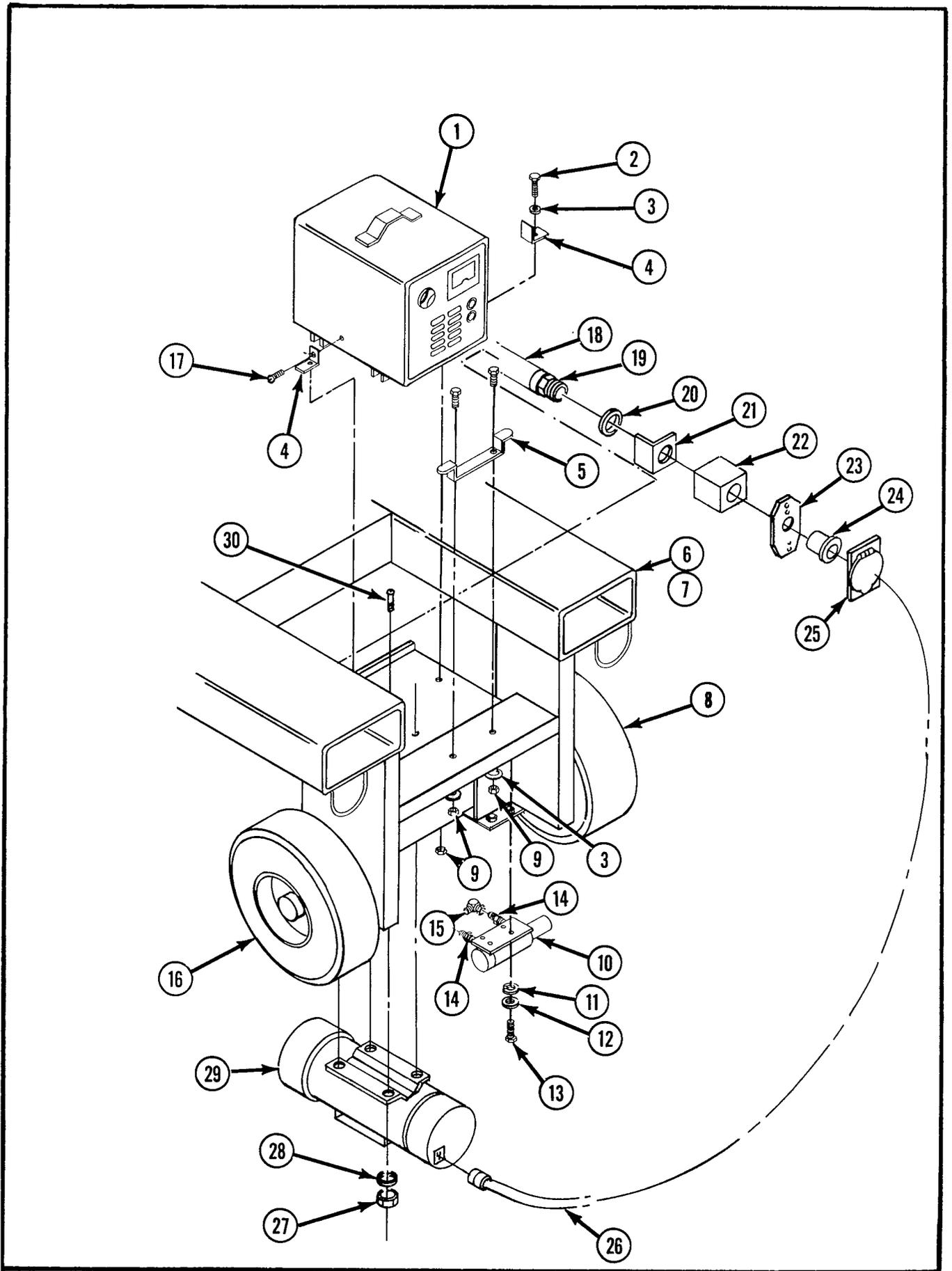


Figure 7-6. Rear Chassis Assembly

ITEM	PART	DESCRIPTION	QTY
7-6	NO NUMBER	REAR CHASSIS ASSEMBLY .....	REF
-1	10112-000-00	• BATTERY CHARGER .....	1
		(With 16 Hour Timer) (See Figure 7-7)	
	12749-000-00	• BATTERY CHARGER .....	1
		(With 12 Hour Timer) (See Figure 7-7)	
	61398-000-00	OPTIONAL BATTERY .....	1
		CHARGER, 50 CYCLE	
-2	11252-008-00	• SCREW, 1/4-20 UNC GR. 5 HHC X 1 .....	4
-3	11240-004-00	• WASHER 1/4 DIA. STD. FLAT .....	4
-4	60825-000-00	• ANGLE .....	2
-5	61537-000-00	• BRACKET .....	2
-6	61555-000-00	• XL-14 FRAME WELDMENT .....	REF
-7	61415-000-00	• XL-19 FRAME WELDMENT .....	REF
-8	NO NUMBER	• RH REAR WHEEL/HUB ASSEMBLY .....	1
		(See Figure 7-8)	
-9	11248-004-00	• LOCKNUT, 1/4-20 UNC .....	4
-10	60479-000-00	• CYLINDER, BRAKE .....	1
	60211-014-00	• SEAL KIT .....	1
-11	11238-006-00	• LOCKWASHER, 3/8 DIA. SPLIT .....	4
-12	11240-006-00	• WASHER, 3/8 DIA. STD. FLAT .....	4
-13	11254-010-00	• SCREW, 3/8-16 UNC GR. 5 HHC X 1 1/4 .....	4
-14	11939-010-00	• FITTING, STRAIGHT .....	2
-15	11937-003-00	• FITTING, STRAIGHT .....	1
-16	NO NUMBER	• LH REAR WHEEL/HUB ASSEMBLY .....	1
		(See Figure 7-9)	
-17	26526-006-00	• SCREW, #10 AB SELF TAPPING SLOT HD X 3/4 .....	2
	60875-000-00	OPTIONAL XL-14 POWER TO PLATFORM .....	REF
	61391-000-00	OPTIONAL XL-19 POWER TO PLATFORM .....	REF
-18	29495-099-00	• CABLE, 3 COND., 14 GA. ....	AR
-19	29925-003-00	• CONNECTOR, CABLE .....	1
-20	11240-014-00	• WASHER, 7/8 DIA. STD. FLAT .....	1
-21	L8098-1A	• BRACKET .....	1
-22	08941-000-00	• BOX ELECTRICAL .....	1
-23	L8098-1B	• SUB-PLATE .....	1
-24	29961-000-00	• INLET .....	1
-25	29962-000-00	• COVER .....	1
	61387-000-00	OPTIONAL XL-14 POWER TO PLATFORM .....	REF
		WITH GENERATOR	
	61392-000-00	OPTIONAL XL-19 POWER TO PLATFORM .....	REF
		WITH GENERATOR	
-18	29495-099-00	• CABLE, 3 COND., 14 GA .....	AR
-19	29925-003-00	• CONNECTOR, CABLE .....	1
-20	11240-014-00	• WASHER, 7/8 DIA. STD. FLAT .....	1
-21	L8098-1A	• BRACKET .....	1
-22	08941-000-00	• BOX, ELECTRICAL .....	1
-23	L8098-1B	• SUB PLATE .....	1
-24	29961-000-00	• INLET .....	1

ITEM	PART	DESCRIPTION	QTY
7-6-25	29962-000-00	• COVER .....	1
-26	61364-000-00	• CORD, EXTENSION .....	1
-27	11248-004-00	• LOCKNUT, 1/4-20 UNC .....	4
-28	11240-004-00	• WASHER, 1/4 DIA. STD. FLAT .....	4
-29	26461-000-00	• GENERATOR .....	1
-30	11252-008-00	• SCREW, 1/4-20 UNC GR. 5 HHC X 1 .....	4

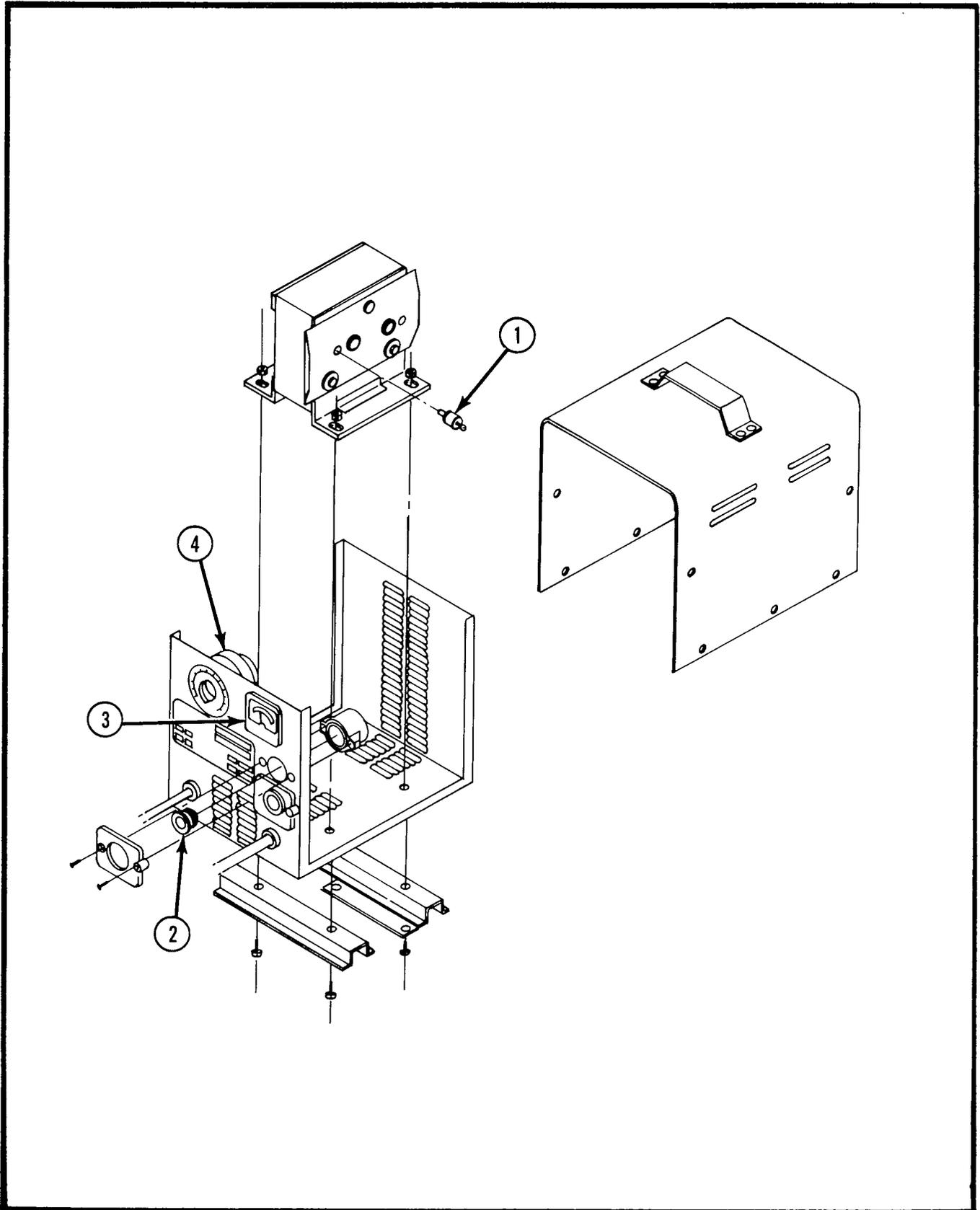


Figure 7-7. Battery Charger

ITEM	PART	DESCRIPTION	QTY
7-7	10112-000-00	BATTERY CHARGER ..... (With 16 Hour Timer)	REF
-1	27877-005-00	• DIODE ASSEMBLY .....	1
-2	27877-006-00	• FUSE ASSEMBLY, 30 AMP .....	1
-3	27877-007-00	• AMMETER .....	1
	27877-023-00	•• LENS .....	1
-4	10112-001-00	• TIMER, 16 HOUR .....	1
	12749-000-00	BATTERY CHARGER ..... (With 12 Hour Timer)	REF
-1	12749-002-00	• DIODE, STUD TYPE .....	2
-2	29705-003-00	• FUSE, 30 AMP .....	2
-3	27877-007-00	• AMMETER .....	1
	27877-023-00	•• LENS .....	1
-4	12749-003-00	• TIMER, 12 HOUR .....	1

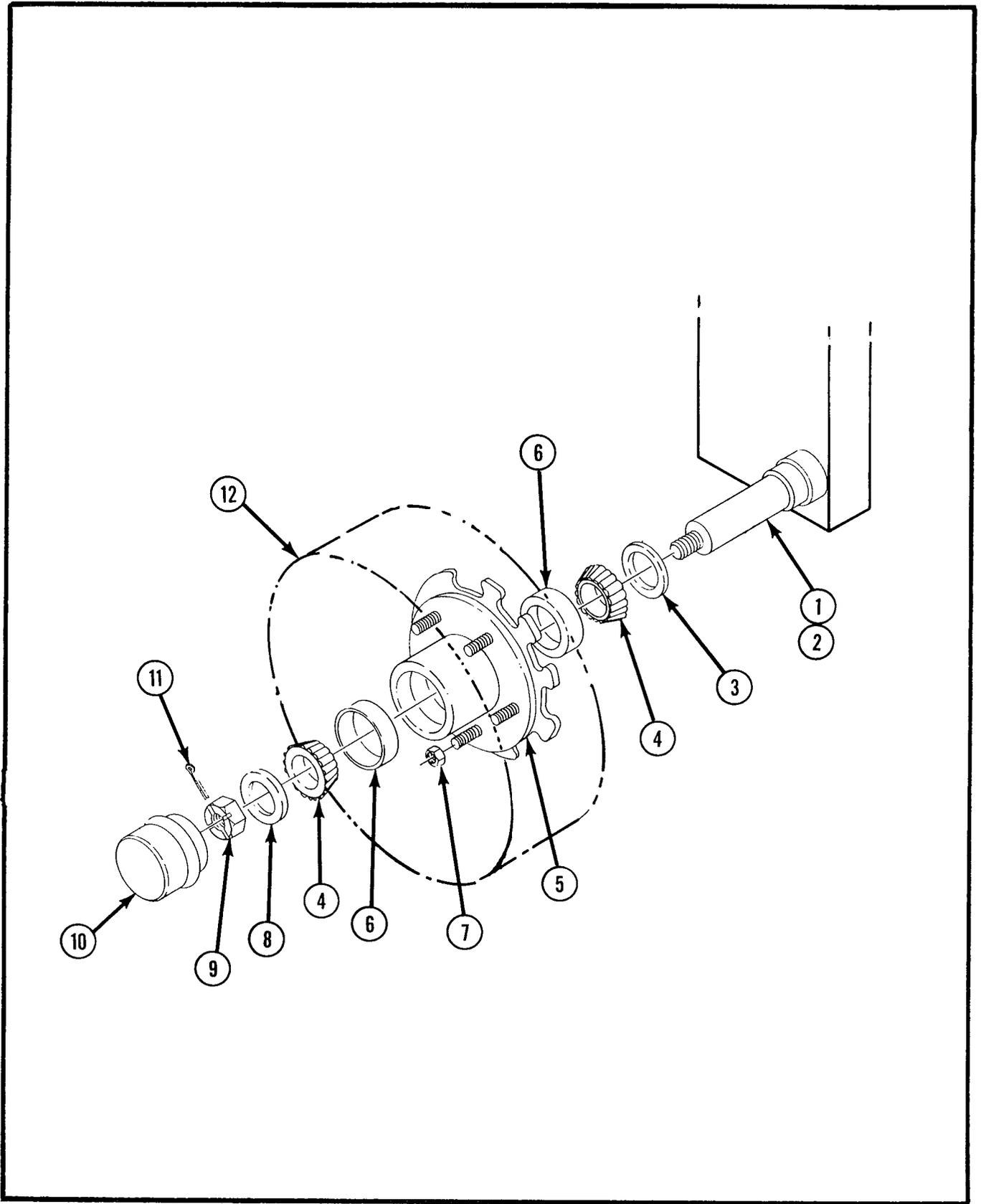


Figure 7-8. RH Rear Wheel/Hub Assembly

ITEM	PART	DESCRIPTION	QTY
7-8	NO NUMBER	RH REAR WHEEL/HUB ASSEMBLY .....	REF
-1	61555-000-00	• XL-14 FRAME WELDMENT .....	REF
-2	61415-000-00	• XL-19 FRAME WELDMENT .....	REF
-3	05104-000-00	• SEAL, GREASE .....	1
-4	11775-011-00	• CONE, BEARING .....	2
-5	60742-000-00	• HUB AND ROTOR WELDMENT .....	1
-6	11776-004-00	•• CUP, BEARING .....	2
-7	05105-000-00	• NUT, WHEEL .....	5
-8	11239-016-00	• WASHER, 1 DIA ASTM FLAT .....	1
-9	11274-016-00	• NUT, 1-14 UNF CASTLE .....	1
-10	05078-000-00	• CAP, DUST .....	1
-11	11753-012-00	• PIN, COTTOR .....	1
-12	05107-000-00	• WHEEL ASSEMBLY .....	1

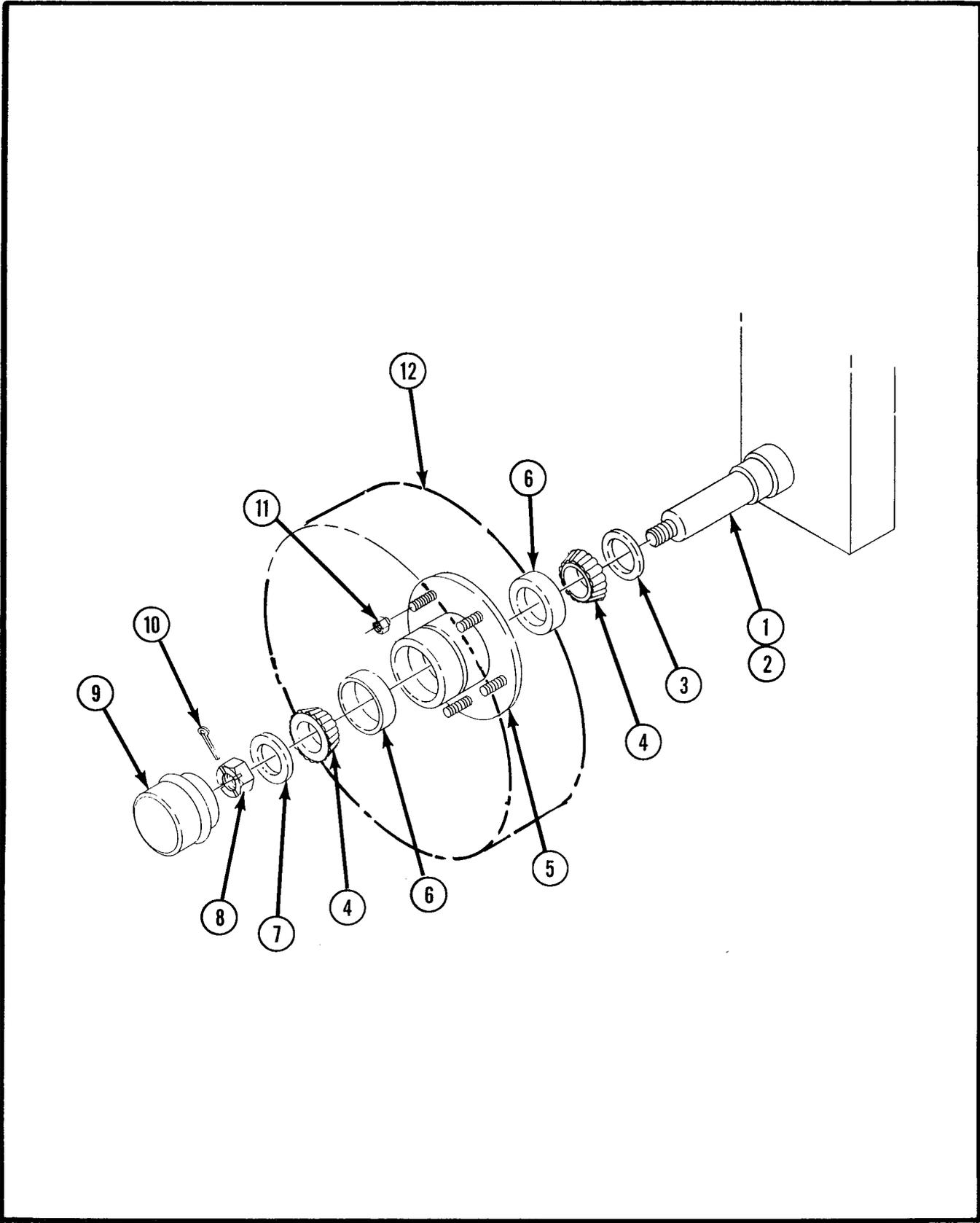


Figure 7-9. LH Rear Wheel/Hub Assembly

ITEM	PART	DESCRIPTION	QTY
7-9	NO NUMBER	LH REAR WHEEL/HUB .....	REF
-1	61555-000-00	• XL-14 FRAME WELDMENT .....	REF
-2	61415-000-00	• XL-19 FRAME WELDMENT .....	REF
-3	05104-000-00	• SEAL, GREASE .....	1
-4	11775-011-00	• CONE, BEARING .....	2
-5	05100-001-00	• HUB .....	1
-6	11776-004-00	•• CUP, BEARING .....	2
-7	11239-016-00	• WASHER, 1 DIA ASTM FLAT .....	1
-8	11274-016-00	• NUT, 1-14 UNF CASTLE .....	1
-9	05078-000-00	• CAP, DUST .....	1
-10	11753-012-00	• PIN, COTTOR .....	1
-11	05105-000-00	• NUT, WHEEL .....	5
-12	05107-000-00	• WHEEL ASSEMBLY .....	1

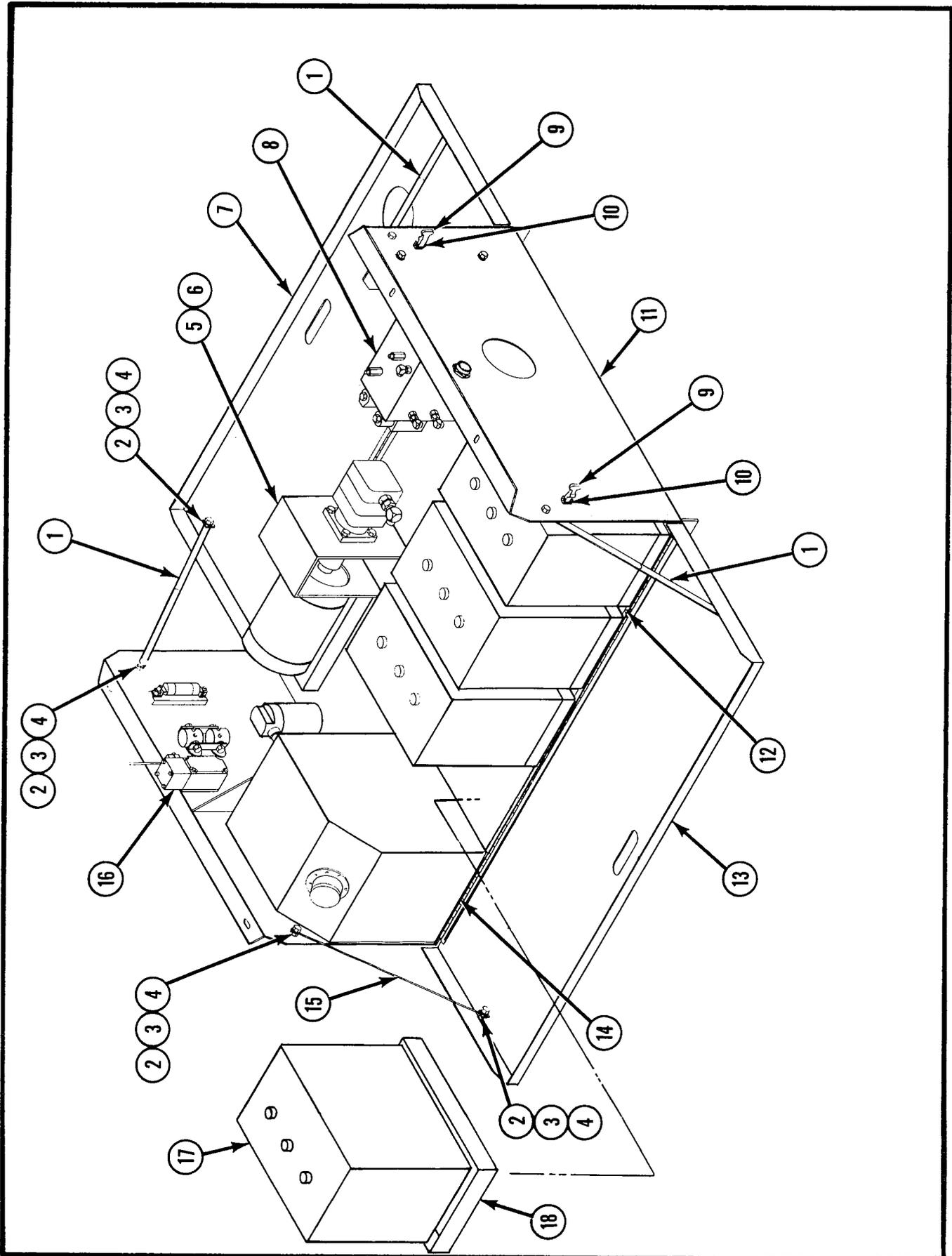


Figure 7-10. Module Assembly

ITEM	PART	DESCRIPTION	QTY
7-10	61552-000-00	XL-14 MODULE ASSEMBLY .....	REF
	61403-000-00	XL-19 MODULE ASSEMBLY .....	REF
-1	08710-000-00	• BRACE ASSY .....	3
-2	11252-008-00	• SCREW, 1/4-20 UNC GR. 5 .....	8
-3	11240-004-00	• WASHER, 1/4 DIA. STD. FLAT .....	12
-4	11248-004-00	• LOCKNUT, 1/4-20 UNC .....	12
-5	NO NUMBER	• XL-14 PUMP AND MOTOR ASSEMBLY .....	1
		(See Figure 7-11)	
-6	NO NUMBER	• XL-19 PUMP AND MOTOR ASSEMBLY .....	1
		(See Figure 7-12)	
-7	60808-000-00	• COVER WELDMENT, LH .....	1
-8	NO NUMBER	• CONTROL VALVE AND ELECTRICAL PANEL ASSEMBLY .....	1
		(See Figure 7-14)	
-9	08783-002-00	• LATCH .....	4
-10	26553-002-00	• POP RIVET, 3/16 DIA .....	8
-11	61428-000-00	• MODULE WELDMENT .....	1
-12	26554-002-00	• POP RIVET, 1/4 DIA .....	10
-13	60802-000-00	• COVER WELDMENT, RH .....	1
-14	NO NUMBER	• HYDRAULIC TANK ASSEMBLY .....	1
		(See Figure 7-18)	
-15	60840-000-00	• LANDYARD .....	
-16	NO NUMBER	• LIMIT SWITCH, SOLENOID AND FUSE ASSEMBLY .....	1
		(See Figure 7-19)	
-17	11674-003-00	• BATTERY, 6V 250A .....	4
-18	61357-000-00	TRAY, BATTERY .....	4

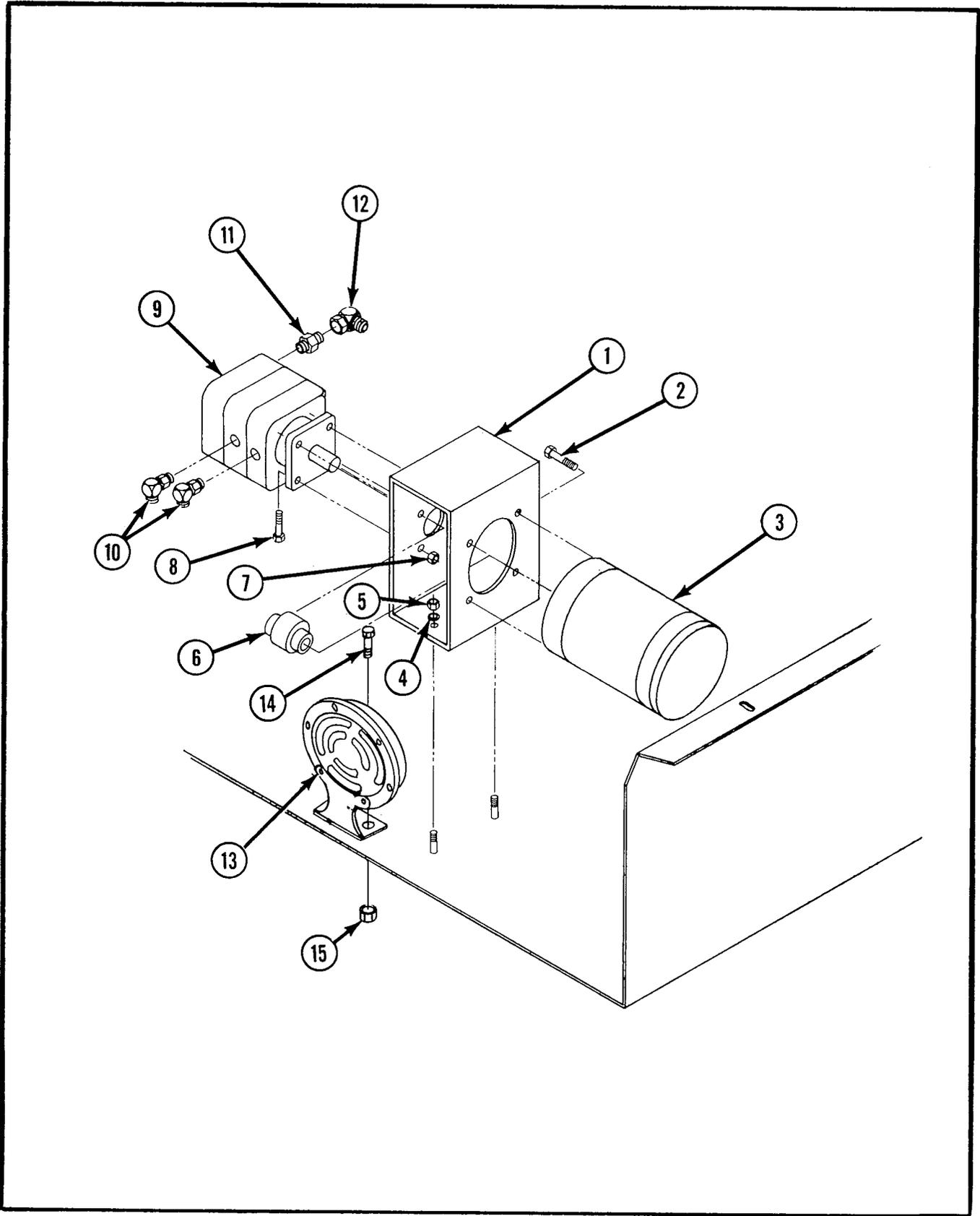


Figure 7-11. XL-14 Pump and Motor Assembly

ITEM	PART	DESCRIPTION	QTY
7-11	NO NUMBER	XL-14 PUMP AND MOTOR ASSEMBLY .....	REF
-1	60251-000-00	• MOUNT, MOTOR .....	1
-2	11254-008-00	• SCREW, 3/8-16 UNC GR. 5 HHC X 1 .....	4
-3	05975-000-00	• MOTOR, ELECTRIC .....	1
		(See Figure 7-13)	
-4	11240-006-00	• WASHER, 3/8 DIA. STD. FLAT .....	2
-5	11248-006-00	• LOCKNUT, 3/8-16 UNC .....	2
-6	60205-002-00	• COUPLING .....	1
	27940-003-00	•• CENTER, COUPLING .....	1
-7	11248-005-00	• LOCKNUT, 5/16-18 UNC .....	4
-8	11253-008-00	• SCREW, 5/16-18 UNC GR. 5 HHC X 1 .....	4
-9	60104-000-00	• PUMP, HYDRAULIC .....	1
	60104-010-00	•• KEY .....	1
	60104-023-00	•• SEAL KIT .....	1
-10	11934-004-00	• FITTING, ELBOW .....	2
-11	11941-012-00	• FITTING, STRAIGHT .....	1
-12	11937-007-00	• FITTING, ELBOW .....	1
-13	29958-000-00	OPTIONAL HORN, 24 VDC .....	1
-14	11254-008-00	SCREW, 3/8-16 UNC GR. 5 HHC X 1 .....	1
-15	11248-006-00	LOCKNUT, 3/8-16 UNC .....	1

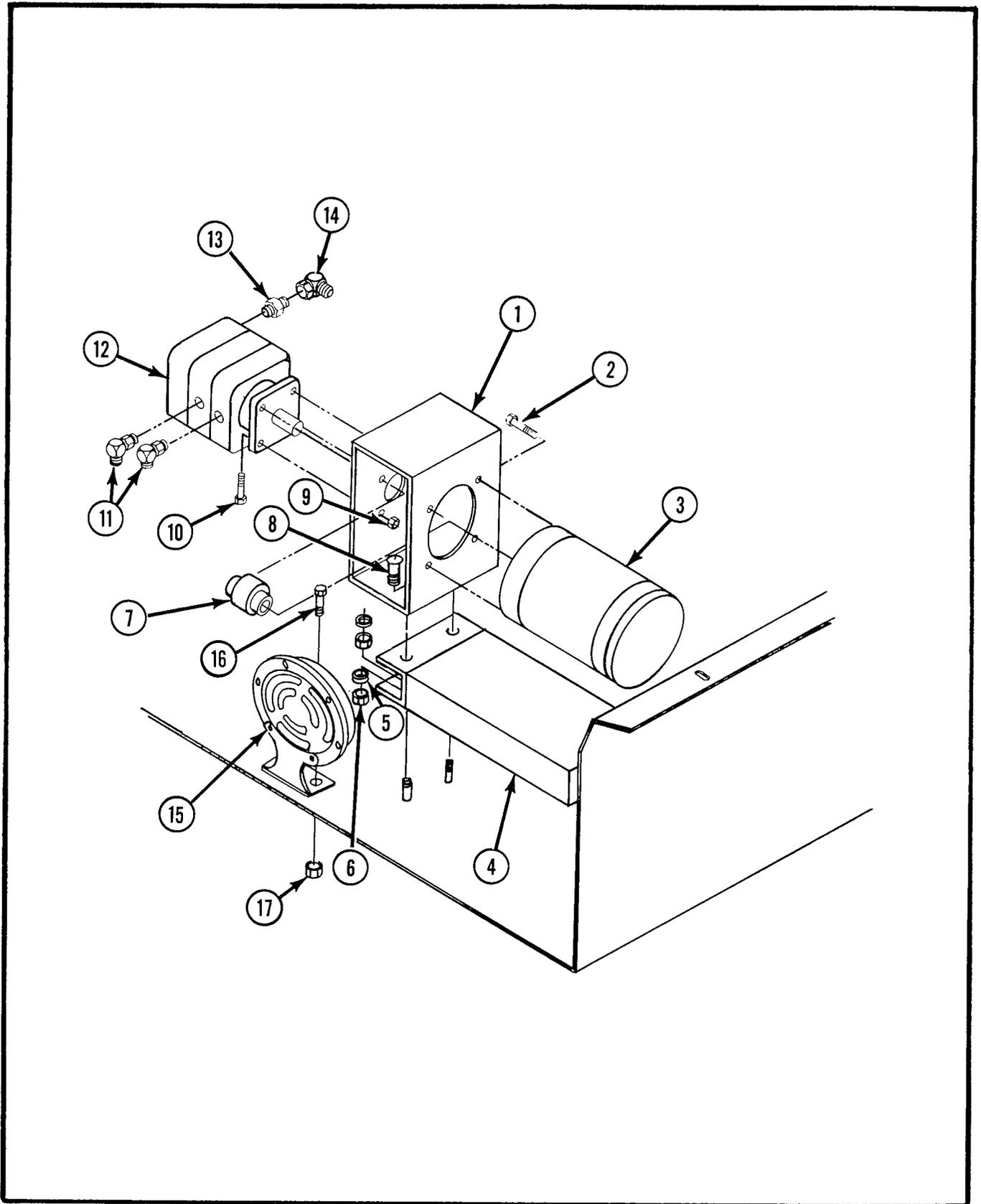


Figure 7-12. XL-19 Pump and Motor Assembly

ITEM	PART	DESCRIPTION	QTY
7-12	NO NUMBER	XL-19 PUMP AND MOTOR ASSEMBLY .....	REF
-1	60251-000-00	• MOUNT, MOTOR .....	1
-2	11254-008-00	• SCREW, 3/8-16 UNC GR. 5 HHC X 1 .....	4
-3	05975-000-00	• MOTOR, ELECTRIC .....	1
		(See Figure 7-13)	
-4	61518-000-00	• WEIGHT .....	1
-5	11240-006-00	• WASHER, 3/8 DIA. STD. FLAT .....	4
-6	11248-006-00	• LOCKNUT, 3/8-16 UNC .....	4
-7	60205-002-00	• COUPLING .....	1
-8	11254-010-00	• SCREW, 3/8-16 UNC .....	2
-9	11248-005-00	• LOCKNUT, 5/16-18 UNC .....	4
-10	11253-008-00	• SCREW, 5/16-18 UNC GR. 5 .....	4
-11	11934-004-00	• FITTING, ELBOW .....	2
-12	60104-000-00	• PUMP, HYDRAULIC .....	1
	60104-010-00	•• KEY .....	1
	60104-023-00	•• SEAL KIT .....	1
-13	11941-012-00	• FITTING, STRAIGHT .....	1
-14	11937-007-00	• FITTING, ELBOW .....	1
-15	29958-000-00	• OPTIONAL HORN, 24 VDC .....	1
-16	11254-008-00	SCREW, 3/8-16 UNC GR. 5 HHC X 1 .....	1
-17	11248-006-00	LOCKNUT, 3/8-16 UNC .....	1

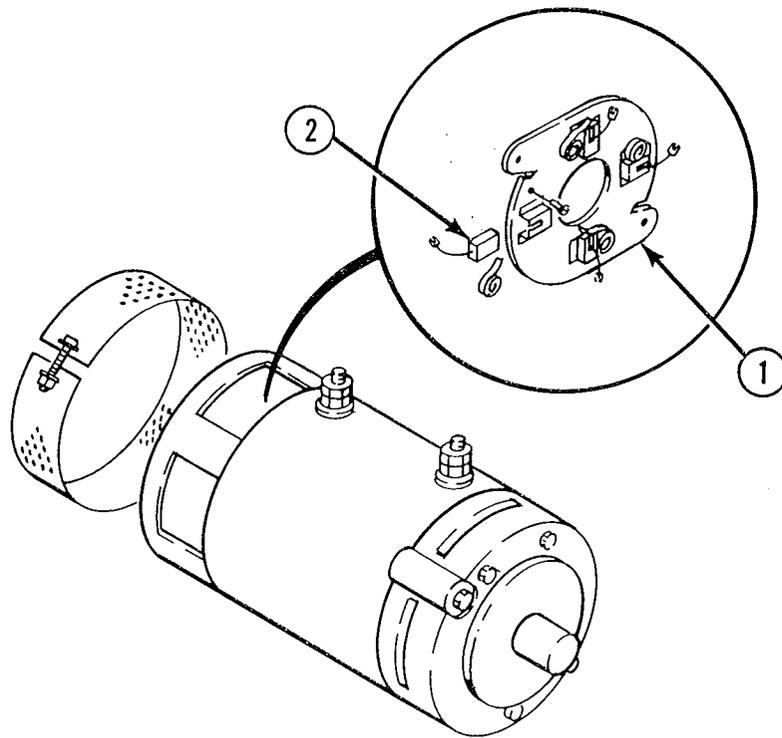


Figure 7-13. Electric Motor

ITEM	PART	DESCRIPTION	QTY
7-13 -1 -2	05975-000-00 05975-001-00 26539-001-00	ELECTRIC MOTOR ..... • RIGGING, BRUSH ..... •• BRUSH .....	REF 1 4

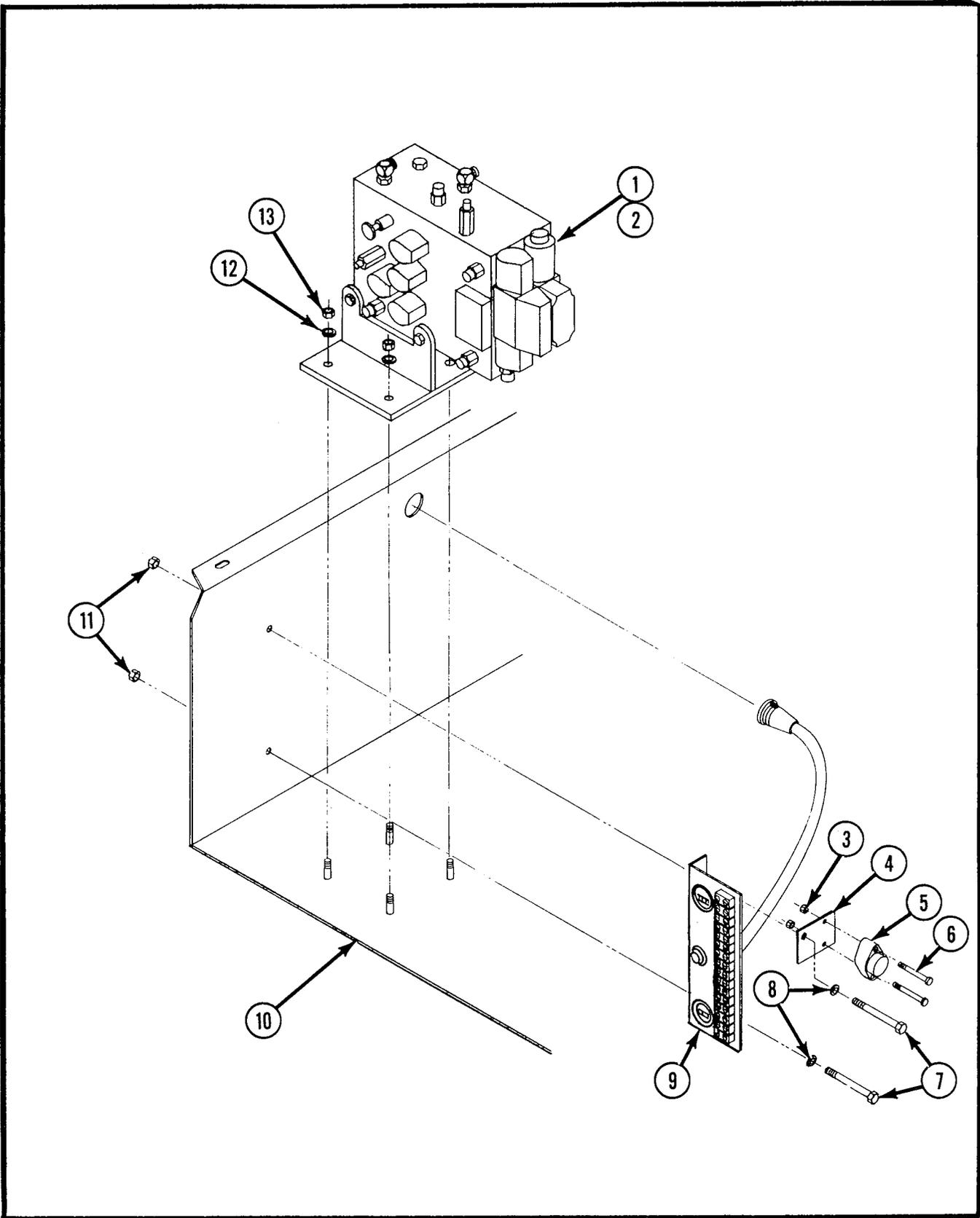


Figure 7-14. Control Valve and Electrical Panel Assembly

ITEM	PART	DESCRIPTION	QTY
7-14	NO NUMBER	CONTROL VALVE AND ELECTRICAL PANEL .....	REF
-1	61558-000-00	ASSEMBLY • XL-14 CONTROL VALVE ASSEMBLY .....	1
-2	61410-000-00	(See Figure 7-15) • XL-19 CONTROL VALVE ASSEMBLY .....	1
-3	11250-018-00	(See Figure 7-15) • NUT, #4-40 UNC STD. HEX .....	2
-4	05869-000-00	• BOARD, PANEL .....	1
-5	15765-000-00	• BUZZER, 24 VDC .....	1
	05409-000-00	(24 Volt System) •BUZZER, 12 VDC .....	1
-6	11721-006-00	(18 Volt System) • SCREW, #4-40 UNC RD. HD. MACH. X 3/4 .....	2
-7	11252-008-00	• SCREW, 1/4-20 UNC GR. 5 HHC X 1 .....	2
-8	11240-004-00	• WASHER, 1/4 DIA. STD FLAT .....	2
-9	60712-000-00	• ELECTRICAL PANEL ASSEMBLY .....	1
-10	61428-000-00	(See Figure 7-17) • MODULE WELDMENT .....	REF
-11	11248-004-00	• LOCKNUT, 1/4-20 UNC .....	2
-12	11240-006-00	• WASHER, 3/8 DIA. STD FLAT .....	4
-13	11248-006-00	• LOCKNUT, 3/8-16 UNC .....	4

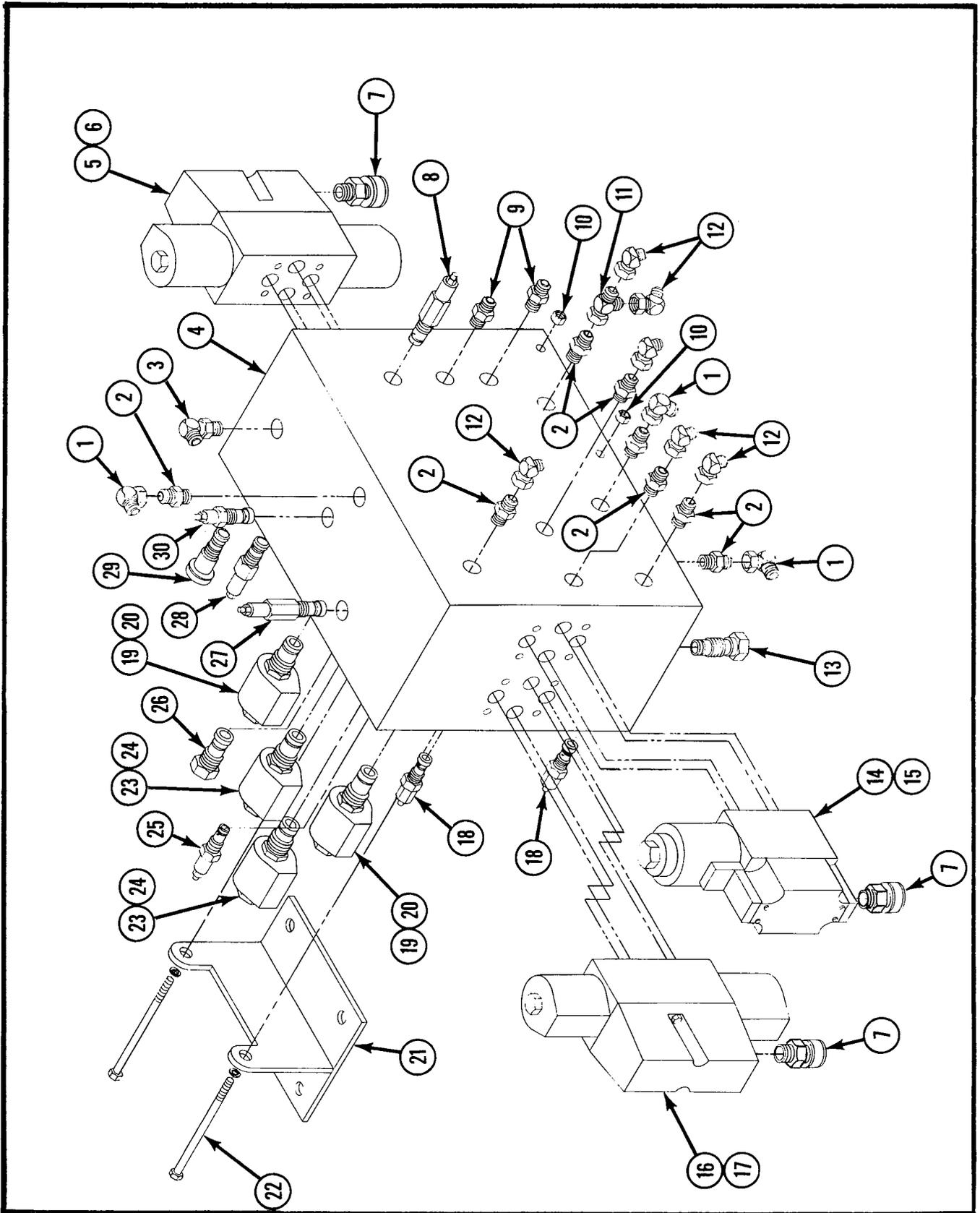


Figure 7-15. Control Valve Assembly

ITEM	PART	DESCRIPTION	QTY
7-15	61558-000-00	XL-14 CONTROL VALVE ASSEMBLY .....	REF
	61410-000-00	XL-19 CONTROL VALVE ASSEMBLY .....	REF
-1	11937-003-00	• FITTING, ELBOW .....	3
-2	11941-009-00	• FITTING, STRAIGHT .....	7
-3	11934-004-00	• FITTING, ELBOW .....	1
-4	61540-000-00	• VALVE, MANIFORLD ASSEMBLY .....	1
		(See Figure 7-16)	
-5	15763-000-00	• VALVE, SOLENOID .....	1
	15760-001-00	•• COIL, 24 VDC .....	2
		(24 Volt System)	
-6	60389-000-00	• VALVE, SOLENOID .....	1
	60284-001-00	•• COIL, 12 VDC .....	2
-7	29925-000-00	• CONNECTOR, CABLE .....	3
-8	60391-000-00	CARTRIDGE .....	1
-9	11941-005-00	• FITTING, STRAIGHT .....	2
-10	11248-006-00	• LOCKNUT, 3/8-16 UNC .....	2
-11	20733-002-00	• FITTING, TEE .....	1
		(XL-19 Only)	
-12	11932-003-00	FITTING, ELBOW .....	5
		(XL-14 Only)	
-12	11932-003-00	• FITTING ELBOW .....	6
		(XL-19 Only)	
-13	60198-000-00	• CARTRIDGE .....	1
-14	15761-000-00	• VALVE .....	1
	15761-001-00	•• COIL, 14 VDC .....	1
		(24 Volt System)	
-15	60286-000-00	• VALVE .....	1
	60286-001-00	•• COIL, 12 VDC .....	1
		(18 Volt System)	
-16	15760-000-00	• VALVE, SOLENOID .....	1
	15760-001-00	•• COIL, 24 VDC .....	2
		(24 Volt System)	
-17	60284-000-00	• VALVE, SOLENOID .....	1
	60284-001-00	•• COIL, 12 VDC .....	2
		(18 Volt System)	
-18	60289-000-00	• VALVE, OVERCENTER .....	2
-19	15764-000-00	• VALVE, SOLENOID .....	2
	15760-001-00	•• COIL, 24 VDC .....	1
	15764-002-00	•• POPPET .....	1
		(24 Volt System)	
-20	60291-000-00	• VALVE, SOLENOID .....	2
	60284-001-00	•• COIL, 12 VDC .....	1
	15764-002-00	•• POPPET .....	1
		(18 Volt System)	
-21	60858-000-00	• VALVE MOUNT WELDMENT .....	1
-22	11254-040-00	• SCREW, 3/8-16 UNC GR 5 HHC X 5 .....	2
-23	15762-000-00	• VALVE, SOLENOID .....	2
	15760-001-00	•• COIL, 24 VDC .....	2
	15762-001-00	•• POPPET .....	1
		(24 Volt System)	

ITEM	PART	DESCRIPTION	QTY
7-15-24	60296-000-00 60284-001-00 15762-001-00	<ul style="list-style-type: none"> <li>• VALVE, SOLENOID .....</li> <li>•• COIL, 12 VDC .....</li> <li>•• POPPET .....</li> <li>(18 Volt System)</li> </ul>	2 1 1
-25	60199-000-00	<ul style="list-style-type: none"> <li>• CARTRIDGE .....</li> </ul>	1
-26	60290-000-00	<ul style="list-style-type: none"> <li>• VALVE, CHECK .....</li> </ul>	1
-27	60294-000-00	<ul style="list-style-type: none"> <li>• VALVE, RELIEF .....</li> </ul>	1
-28	60390-000-00	<ul style="list-style-type: none"> <li>• CARTRIDGE .....</li> </ul>	1
-29	60388-000-00	<ul style="list-style-type: none"> <li>• CARTRIDGE .....</li> </ul>	1
-30	60387-000-00	<ul style="list-style-type: none"> <li>• CARTRIDGE .....</li> </ul>	1

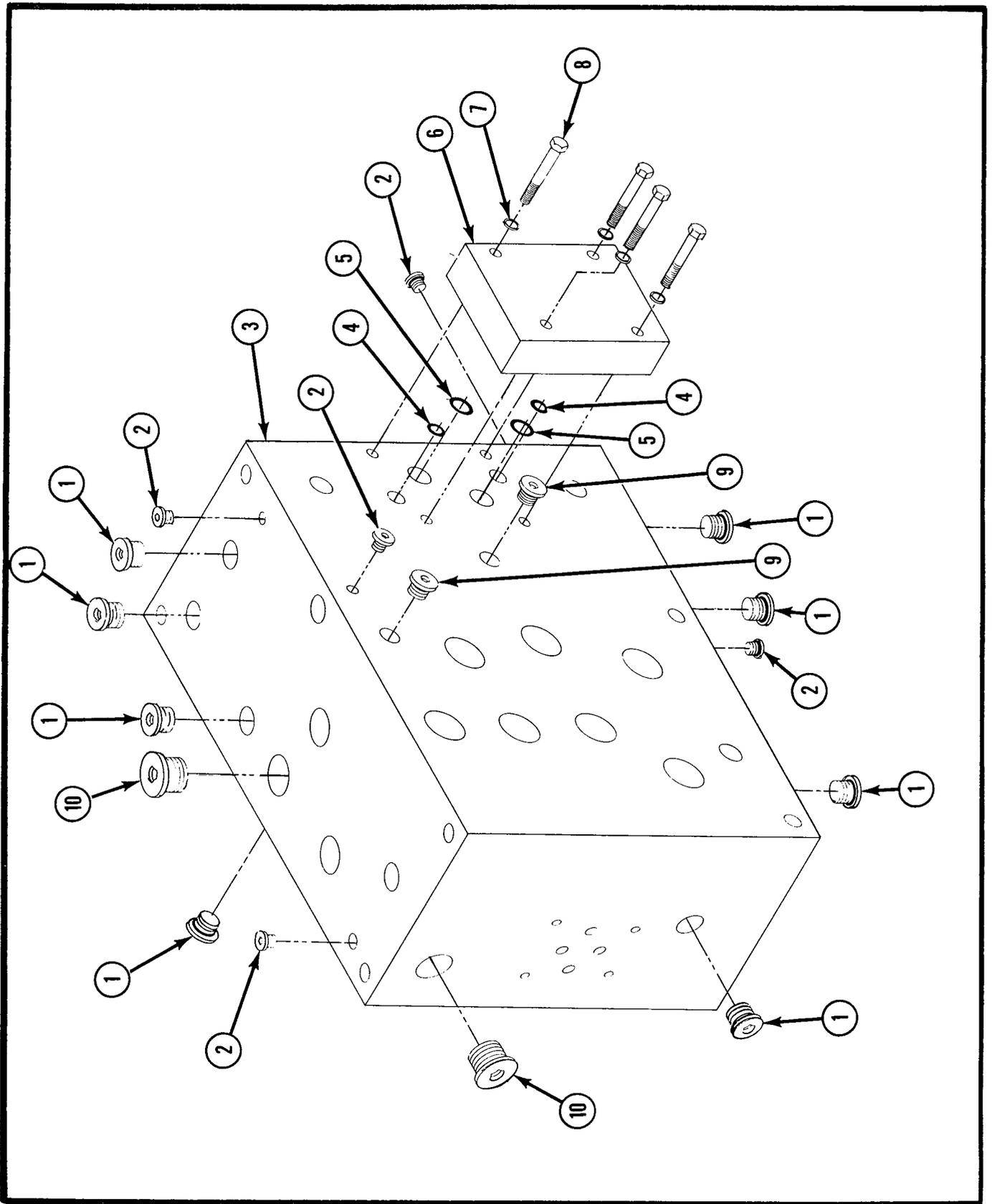


Figure 7-16. Valve Manifold Assembly

ITEM	PART	DESCRIPTION	QTY
7-16	61540-000-00	VALVE MANIFOLD ASSEMBLY .....	REF
-1	12004-006-00	• PLUG .....	8
-2	12004-002-00	• PLUG .....	5
-3	61539-000-00	• MANIFOLD, VALUE .....	1
-4	13888-007-00	• O-RING .....	2
-5	13888-032-00	• O-RING .....	2
-6	61538-000-00	• BLOCK, VALVE .....	1
-7	11238-004-00	• LOCKWASHER, 1/4 DIA. SPLIT .....	4
-8	11252-010-00	• SCREW, 1/4-20 UNC GR. 5 HHC X 1 1/4 .....	4
-9	12004-004-00	• PLUG .....	2
-10	12004-008-00	• PLUG .....	2

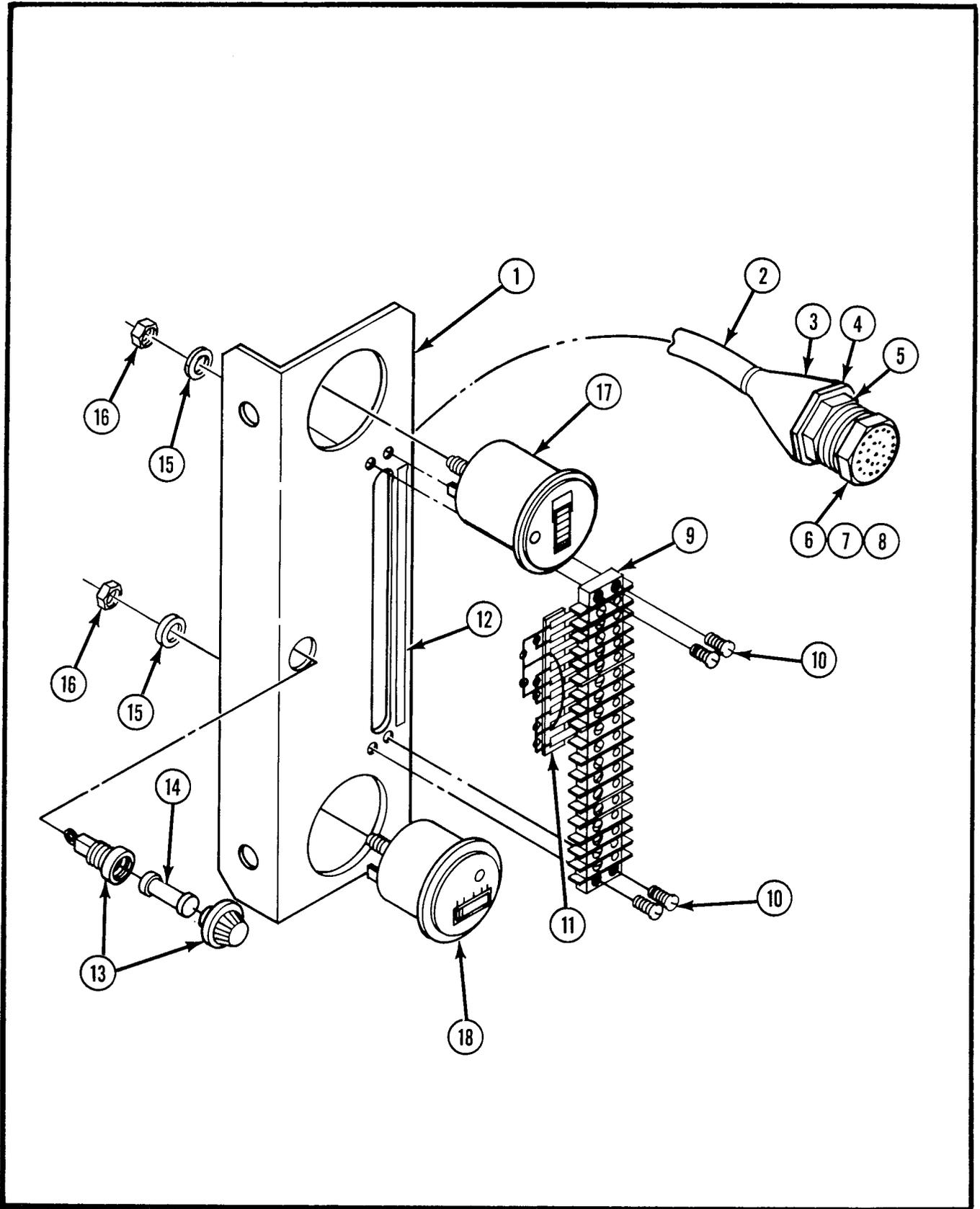


Figure 7-17. Electrical Panel Assembly

ITEM	PART	DESCRIPTION	QTY
7-17	60712-000-00	ELECTRICAL PANEL ASSEMBLY .....	REF
-1	61542-000-00	• PANEL .....	1
-2	60214-099-00	• CABLE, 15 COND., 16 GA .....	3 FT
-3	28800-007-00	• RELIEF, STRAIN .....	1
-4	28800-014-00	• LOCKWASHER .....	1
-5	28800-013-00	• NUT, PANEL .....	1
-6	28800-002-00	• RECEPTICAL .....	1
-7	28800-005-00	• SOCKET, CONTACT .....	15
-8	28800-015-00	• SEALING PLUG .....	8
-9	12796-018-00	• STRIP, TERMINAL .....	1:
-10	11715-006-00	• SCREW, #6-32 UNC RD HD MACH X 3/4 .....	4
-11	60879-000-00	• FANNING STRIP ASSEMBLY .....	1
	29825-002-00	•• DIODE, 3 AMP .....	7
-12	60856-000-00	• DECAL – TERM. STRIP .....	1
-13	29701-000-00	• HOLDER, FUSE .....	1
-14	29704-000-00	• FUSE, 15 AMP .....	1
-15	11238-026-00	• LOCK WASHER, #6 DIA. SPLIT .....	4
-16	11250-001-00	• NUT, #6-32 UNC STD. HEX .....	4
-17	15752-000-00	OPTIONAL HOURMETER .....	1
-18	15746-000-00	OPTIONAL LOW VOLTAGE METER .....	1

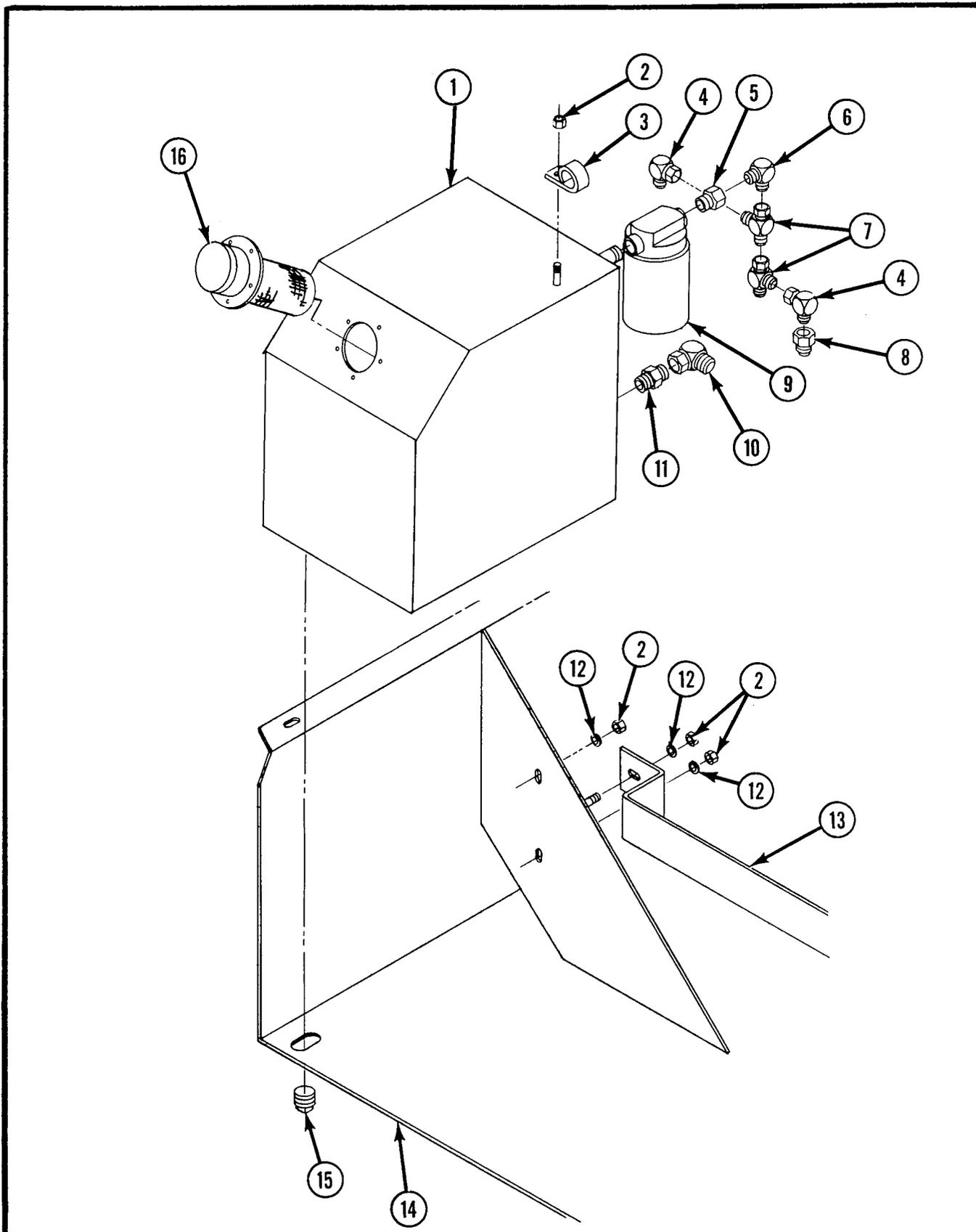


Figure 7-18. Hydraulic Tank Assembly

ITEM	PART	DESCRIPTION	QTY
7-18	NO NUMBER	HYDRAULIC TANK ASSEMBLY .....	REF
-1	61424-000-00	• TANK WELDMENT, HYDRAULIC .....	1
-2	11248-004-00	• LOCKNUT, 1/4-20 UNC .....	5
-3	13919-006-00	• CLAMP, HOSE .....	1
-4	11937-003-00	• FITTING, ELBOW .....	2
-5	11923-009-00	• FITTING, REDUCER .....	1
-6	11940-014-00	• FITTING, ELBOW .....	1
-7	20733-002-00	• FITTING, TEE .....	2
-8	14693-001-00	• FITTING, REDUCER .....	1
-9	05154-001-00	• FILTER .....	1
	05154-002-00	•• ELEMENT, FILTER SPIN-ON .....	1
-10	11937-007-00	• FITTING, ELBOW .....	1
-11	11939-021-00	• FITTING, STRAIGHT .....	1
-12	11240-004-00	• WASHER, 1/4 DIA. STD. FLAT .....	4
-13	61435-000-00	• BATTERY STRAP .....	1
-14	61428-000-00	• MODULE WELDMENT .....	REF
-15	21305-006-00	• PLUG, MAGNETIC .....	1
-16	05963-000-00	• FILLER/BREATHER .....	1

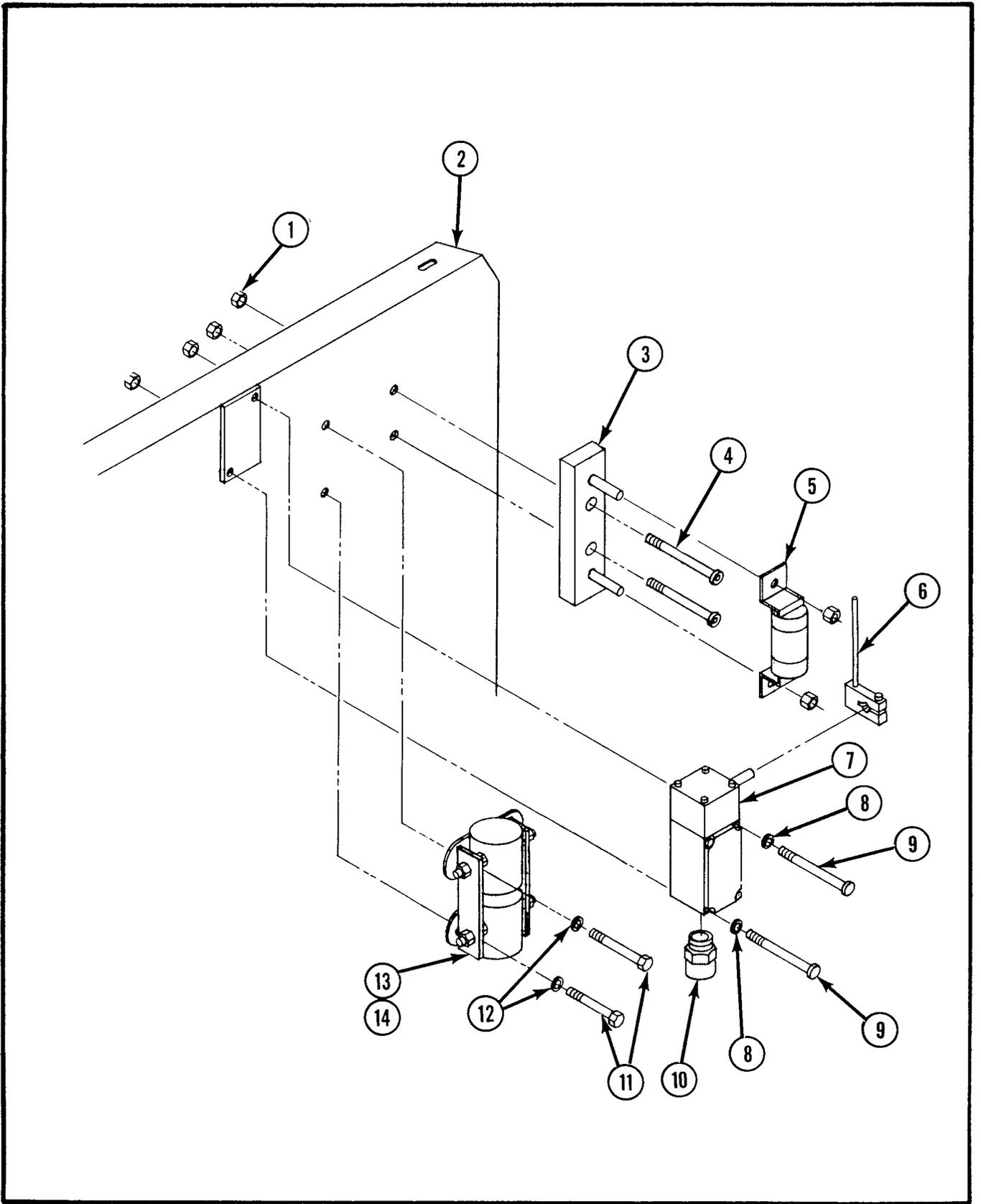


Figure 7-19. Limit Switch Solenoid and Fuse Assembly

ITEM	PART	DESCRIPTION	QTY
7-19	NO NUMBER	LIMIT SWITCH, SOLENOID AND FUSE ASSEMBLY .....	REF
-1	11248-004-00	• LOCKNUT, 1/4-20 UNC .....	4
-2	61428-000-00	• MODULE WELDMENT .....	REF
-3	12751-000-00	• HOLDER, FUSE .....	1
-4	11828-010-00	• SCREW, 1/4-20 UNC GR. 5 FLAT HD. SOC. X 1 1/4 .....	2
-5	12750-000-00	• FUSE, 150 AMP .....	1
-6	29860-000-00	• ARM, ACTUATOR .....	1
-7	29859-001-00	• SWITCH, LIMIT .....	1
-8	11238-002-00	• LOCKWASHER, #10 DIA SPLIT .....	2
-9	11709-014-00	• SCREW, #10-24 UNC GR. 5 RD. HD. MACH. X 1 3/4 .....	2
-10	29925-000-00	• CONNECTOR, CABLE .....	1
-11	11252-006-00	• SCREW, 1/4-20 UNC GR. 5 HHC X 3/4 .....	2
-12	11240-004-00	• WASHER, 1/4 DIA. STD. FLAT .....	2
-13	61556-000-00	• SOLENOID ASSEMBLY – 24 VOLT SYSTEM .....	1
		(See Figure 7-20)	
-14	60711-000-00	• SOLENOID ASSEMBLY – 18 VOLT SYSTEM .....	1
		(See Figure 7-21)	

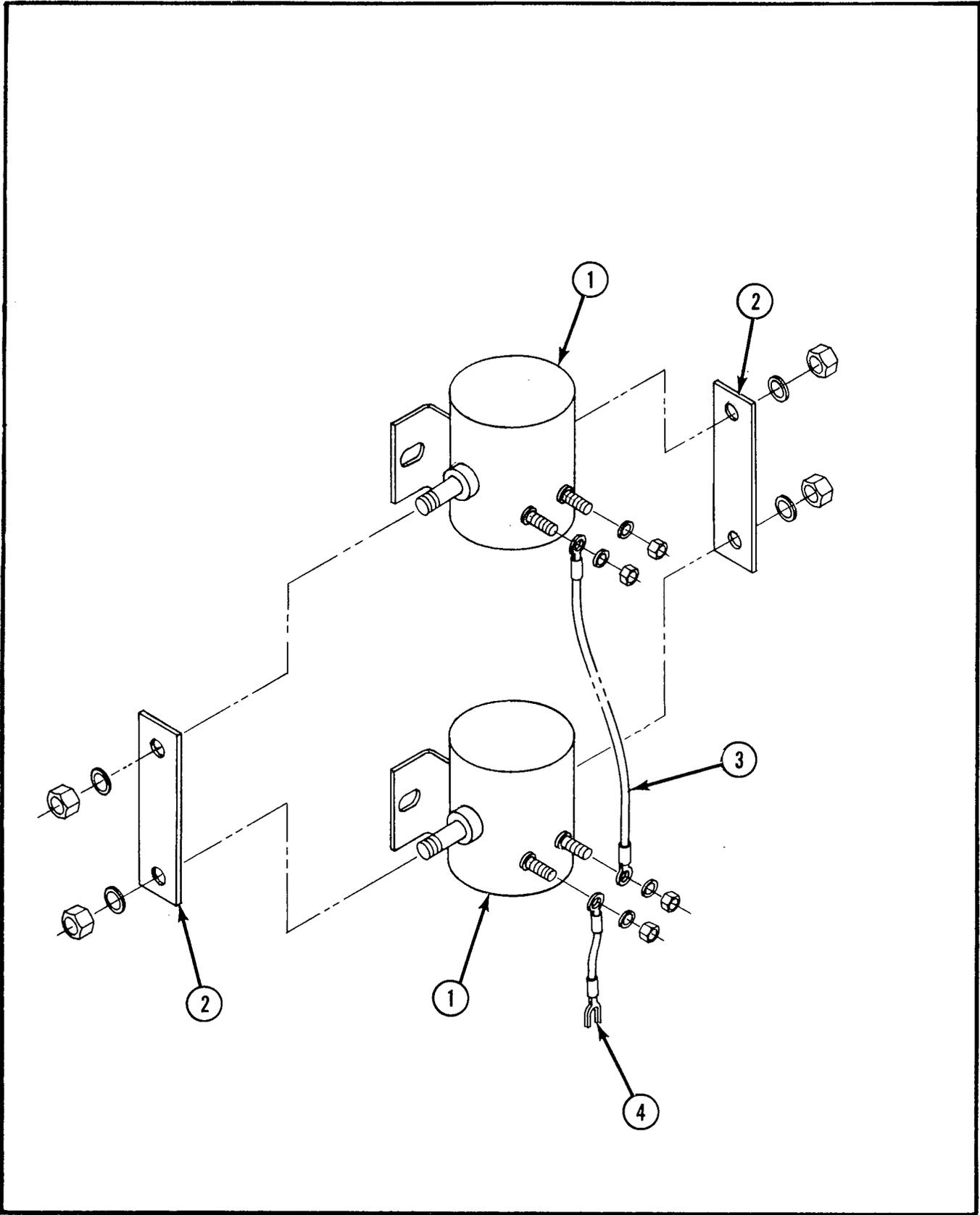


Figure 7-20. Solenoid Assembly 24 Volt System

ITEM	PART	DESCRIPTION	QTY
7-20	61556-000-00	SOLENOID ASSEMBLY – 24 Volt System .....	REF
-1	29944-001-00	• SOLENOID, 12 VDC .....	2
-2	05872-000-00	• BAR, BUSS .....	2
-3	05457-018-00	• WIRE ASSEMBLY .....	1
-4	05457-015-00	• WIRE ASSEMBLY .....	1

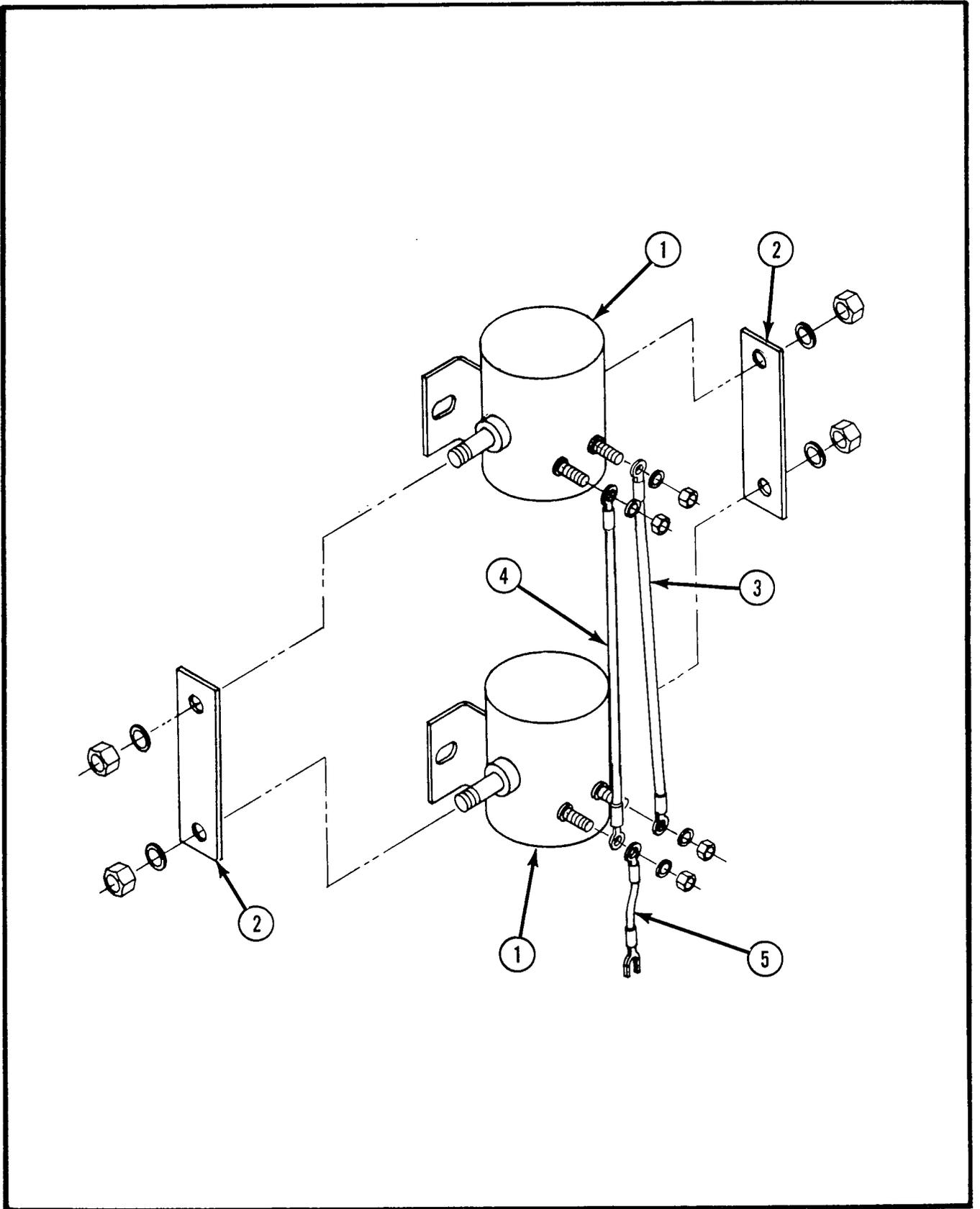


Figure 7-21. Solenoid Assembly 18 Volt System

ITEM	PART	DESCRIPTION	QTY
7-21	60711-000-00	SOLENOID ASSEMBLY – 18 Volt System .....	REF
-1	29944-001-00	• SOLENOID, 12 VDC .....	2
-2	05872-000-00	• BAR, BUSS .....	2
-3	05457-016-00	• WIRE ASSEMBLY .....	1
-4	05457-018-00	• WIRE ASSEMBLY .....	1
-5	05457-015-00	• WIRE ASSEMBLY .....	1

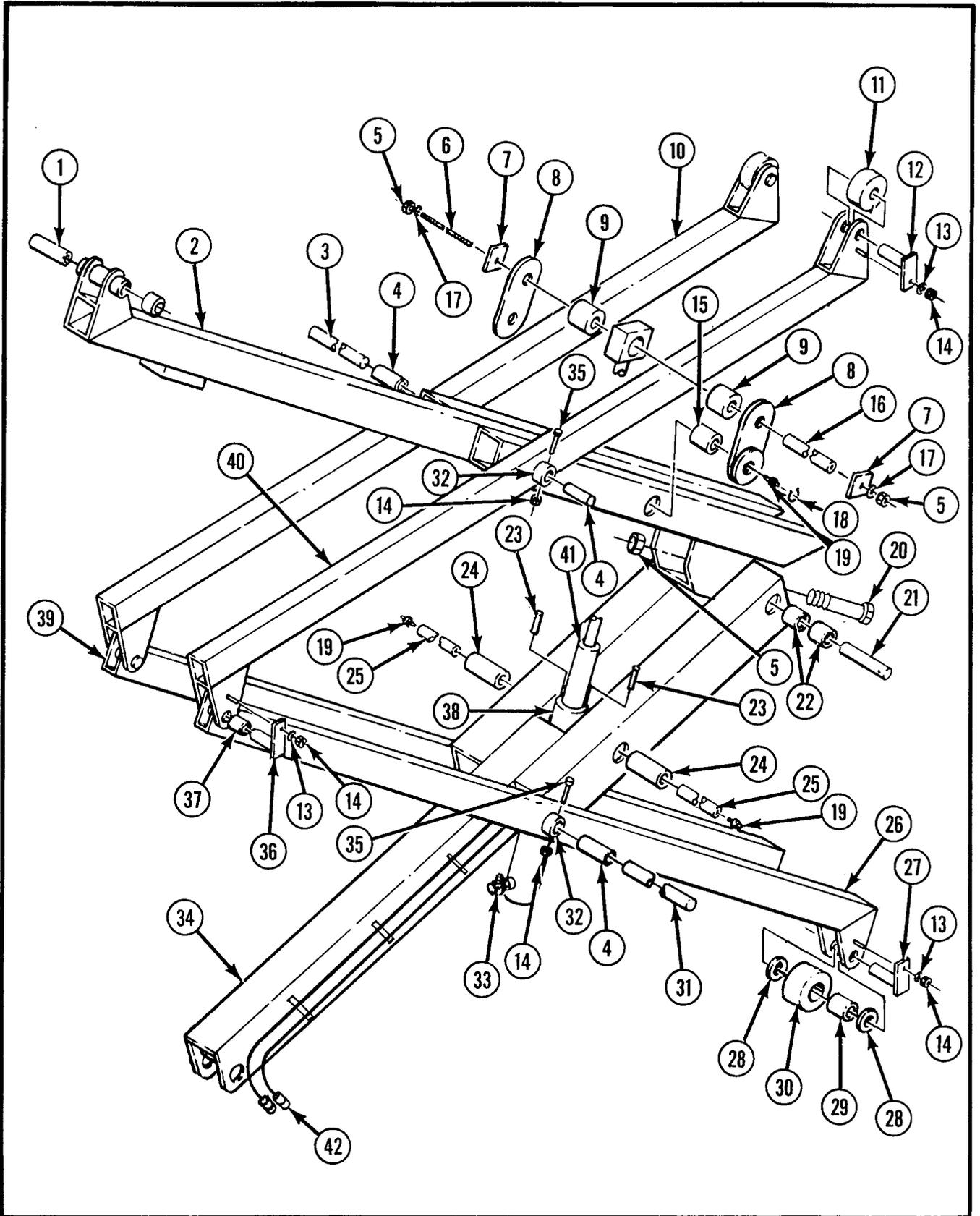


Figure 7-22. XL-14 Scissors Assembly

ITEM	PART	DESCRIPTION	QTY
7-22	60702-000-00	XL-14 SCISSORS ASSEMBLY .....	REF
-1	27931-033-00	• BEARING .....	2
-2	60744-000-00	• FRAME-TOP WELDMENT .....	1
-3	60774-000-00	• PIN .....	1
-4	27931-031-00	• BEARING .....	4
-5	11248-008-00	• LOCKNUT, 1/2-13 UNC .....	2
-6	16755-011-00	• ROD, THREADED .....	1
-7	60006-000-00	• WASHER .....	1
-8	60844-000-00	• PLATE WELDMENT .....	2
-9	18407-002-00	• TUBE .....	2
-10	60764-000-00	• ARM WELDMENT – UPPER RIGHT .....	2
-11	60832-000-00	• WHEEL ASSY .....	2
-12	60854-000-00	• PIN WELDMENT .....	2
-13	11240-006-00	• WASHER, 3/8 DIA. STD. FLAT .....	6
-14	11248-006-00	• LOCKNUT, 3/8-16 UNC .....	11
-15	60845-000-00	• BEARING .....	2
-16	60781-000-00	• PIN, CYLINDER .....	1
-17	11240-008-00	• WASHER, 1/2 DIA. STD. FLAT .....	2
-18	11764-027-00	• RING, RETAINING .....	2
-19	13336-011-00	• FITTING, GREASE .....	4
-20	11254-020-00	• SCREW, 3/8-16 UNC GR. 5 HHC X 2 1/2 .....	1
-21	60773-000-00	• PIN .....	1
-22	27931-030-00	• BEARING .....	4
-23	60431-001-00	• PIN, DRIVE – LOCK .....	2
-24	60890-000-00	• BEARING .....	2
-25	60846-000-00	• PIN .....	2
-26	60767-000-00	• ARM WELDMENT – LOWER LEFT .....	1
-27	60788-000-00	• PIN WELDMENT .....	2
-28	61536-000-00	• WASHER .....	4
-29	27931-012-00	• BEARING .....	2
-30	60880-000-00	• WHEEL, LOWER .....	2
-31	60775-000-00	• PIN .....	1
-32	60782-000-00	• RETAINER .....	2
-33	11934-007-00	• FITTING, ELBOW .....	1
-34	60753-000-00	• FRAME-BOTTOM WELDMENT .....	1
-35	11254-018-00	• SCREW, 3/8-16 UNC GR. 5 HHC X 2 1/4 .....	4
-36	60340-000-00	• PIN WELDMENT .....	2
-37	27931-013-00	• BEARING .....	2
-38	60780-000-00	• COLLAR .....	1
-39	60766-000-00	• ARM WELDMENT – LOWER RIGHT .....	1
-40	60761-000-00	• ARM WELDMENT – UPPER LEFT .....	1
-41	12794-000-00	• XL-14 CYLINDER, LIFT .....	1
		(See Figure 7-25)	
-42	NO NUMBER	XL-14 LINKAGE CABLE INSTALLATION .....	1
		(See Figure 7-26)	

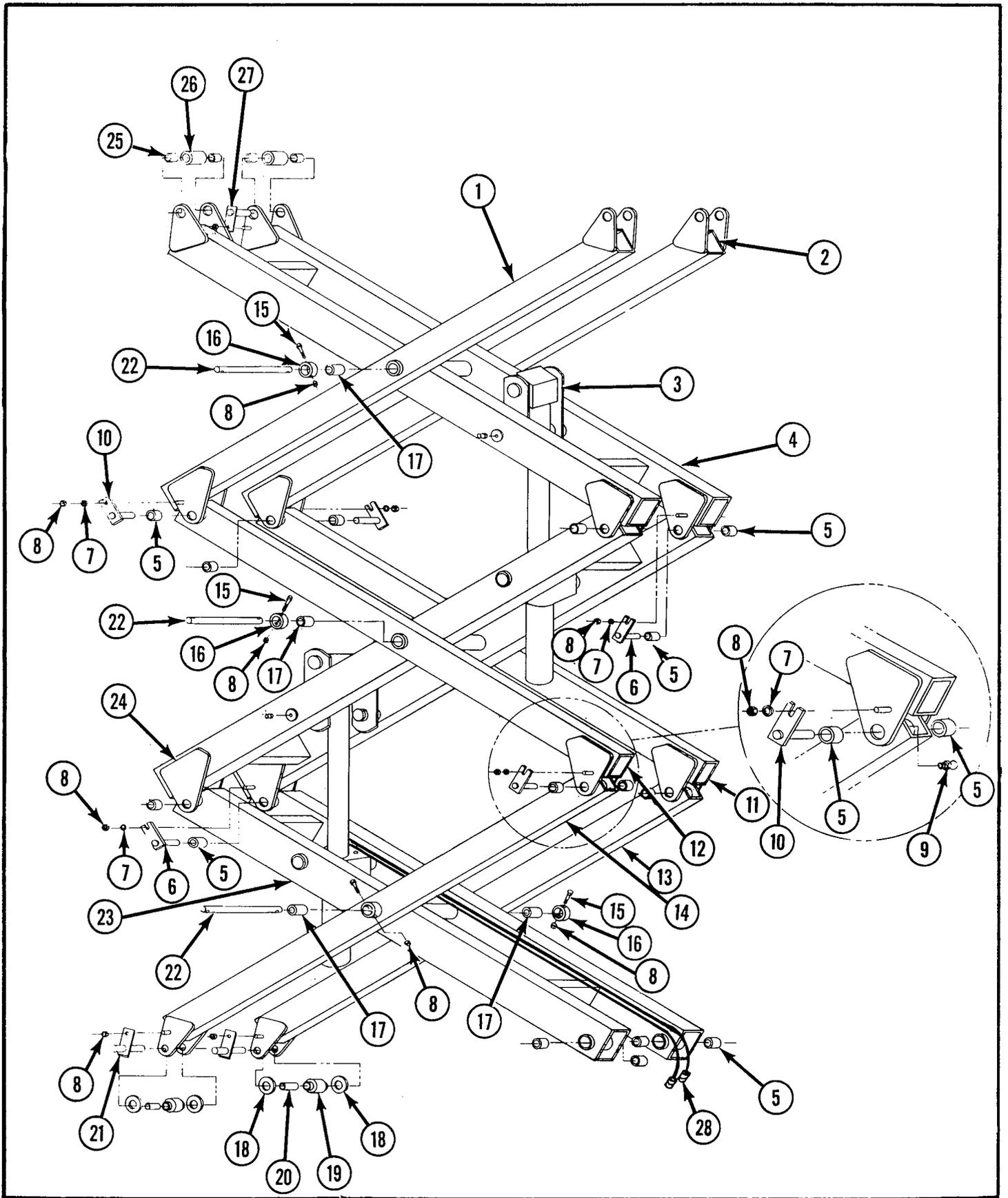


Figure 7-23. XL-19 Scissors Assembly

ITEM	PART	DESCRIPTION	QTY
7-23	61402-000-00	XL-19 SCISSORS ASSEMBLY .....	REF
-1	61455-000-00	• ARM WELDMENT – UPPER OUTER, RH .....	1
-2	61458-000-00	• ARM WELDMENT – UPPER OUTER, LH .....	1
-3	NO NUMBER	• XL-19 LIFT CYLINDER ASSEMBLY .....	2
		(See Figure 7-24)	
-4	61438-000-00	• FRAME WELDMENT – UPPER INNER .....	1
-5	27931-042-00	• BEARING .....	20
-6	61504-000-00	• PIN WELDMENT .....	4
-7	11240-006-00	• WASHER, 3/8 DIA. STD. FLAT .....	8
-8	11248-006-00	• LOCKNUT, 3/8-16 UNC .....	18
-9	13336-011-00	• FITTING, GREASE, 1/4-28 UNF .....	6
-10	61462-000-00	• PIN WELDMENT .....	4
-11	61454-000-00	• ARM WELDMENT – CENTER OUTER, LH .....	1
-12	61450-000-00	• ARM WELDMENT – OUTER LOWER, RH .....	1
-13	61459-000-00	• ARM WELDMENT – OUTER LOWER, LH .....	1
-14	61469-000-00	• ARM WELDMENT – OUTER LOWER, RH .....	1
-15	11254-022-00	• SCREW, 3/8-16 UNC GR. 5 HHC X 2 3/4 .....	6
-16	61471-000-00	• COLLAR .....	3
-17	27931-006-00	• BEARING .....	4
-18	61536-000-00	• WASHER .....	4
-19	60880-000-00	• WHEEL, LOWER .....	2
-20	27931-012-00	• BEARING .....	2
-21	60788-000-00	• PIN WELDMENT .....	2
-22	61470-000-00	• PIN – CENTER PIVOT .....	3
-23	61446-000-00	• FRAME WELDMENT – LOWER INNER .....	1
-24	61441-000-00	• FRAME WELDMENT – CENTER INNER .....	1
-25	27931-011-00	• BEARING .....	4
-26	61473-000-00	• ROLLER .....	2
-27	61472-000-00	• PIN WELDMENT .....	4
-28	NO NUMBER	XL-19 LINKAGE CABLE INSTALLATION .....	REF
		(See Figure 7-27)	

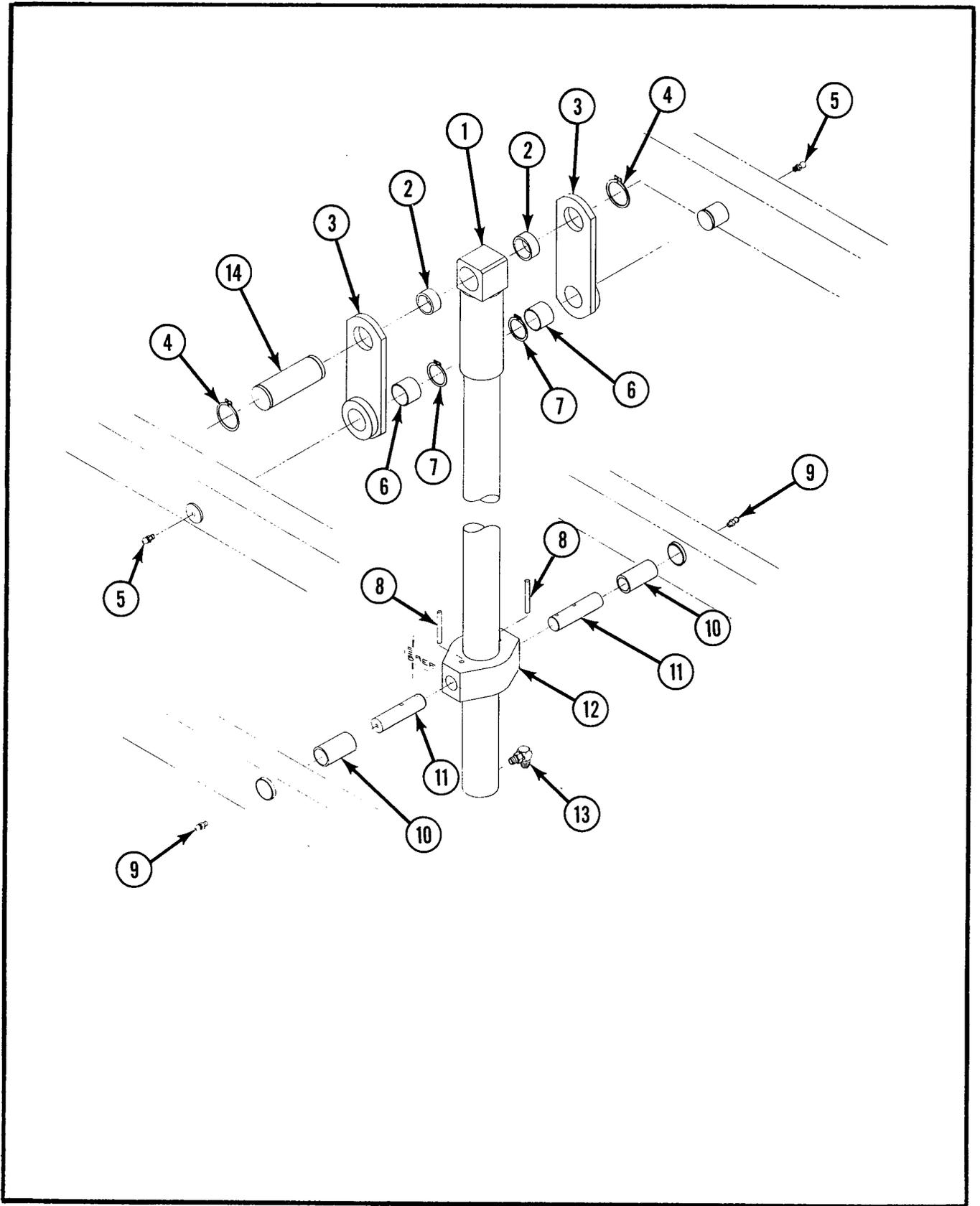


Figure 7-24. XL-19 Lift Cylinder Assembly

ITEM	PART	DESCRIPTION	QTY
7-24	NO NUMBER	XL-19 LIFT CYLINDER ASSEMBLY .....	REF
-1	12794-000-00	• CYLINDER, LIFT .....	1
		(See Figure 7-25)	
-2	18407-001-00	• SPACER .....	2
-3	60844-000-00	• PLATE WELDMENT .....	2
-4	11764-034-00	• RETAINING RING .....	2
-5	13336-001-00	• FITTING, GREASE, 1/8-27 NPT .....	2
-6	60845-000-00	• BEARING .....	2
-7	11764-027-00	• RING, RETAINING .....	2
-8	60431-001-00	• PIN, DRIVE .....	2
-9	13336-011-00	• FITTING, GREASE, 1/4-28 UNF .....	2
-10	60890-000-00	• BEARING .....	2
-11	61468-000-00	• PIN, CYLINDER COLLAR PIVOT .....	2
-12	61474-000-00	• COLLAR, CYLINDER .....	1
-13	11934-007-00	• FITTING, ELBOW .....	1
-14	61467-000-00	• PIN, CYLINDER .....	1

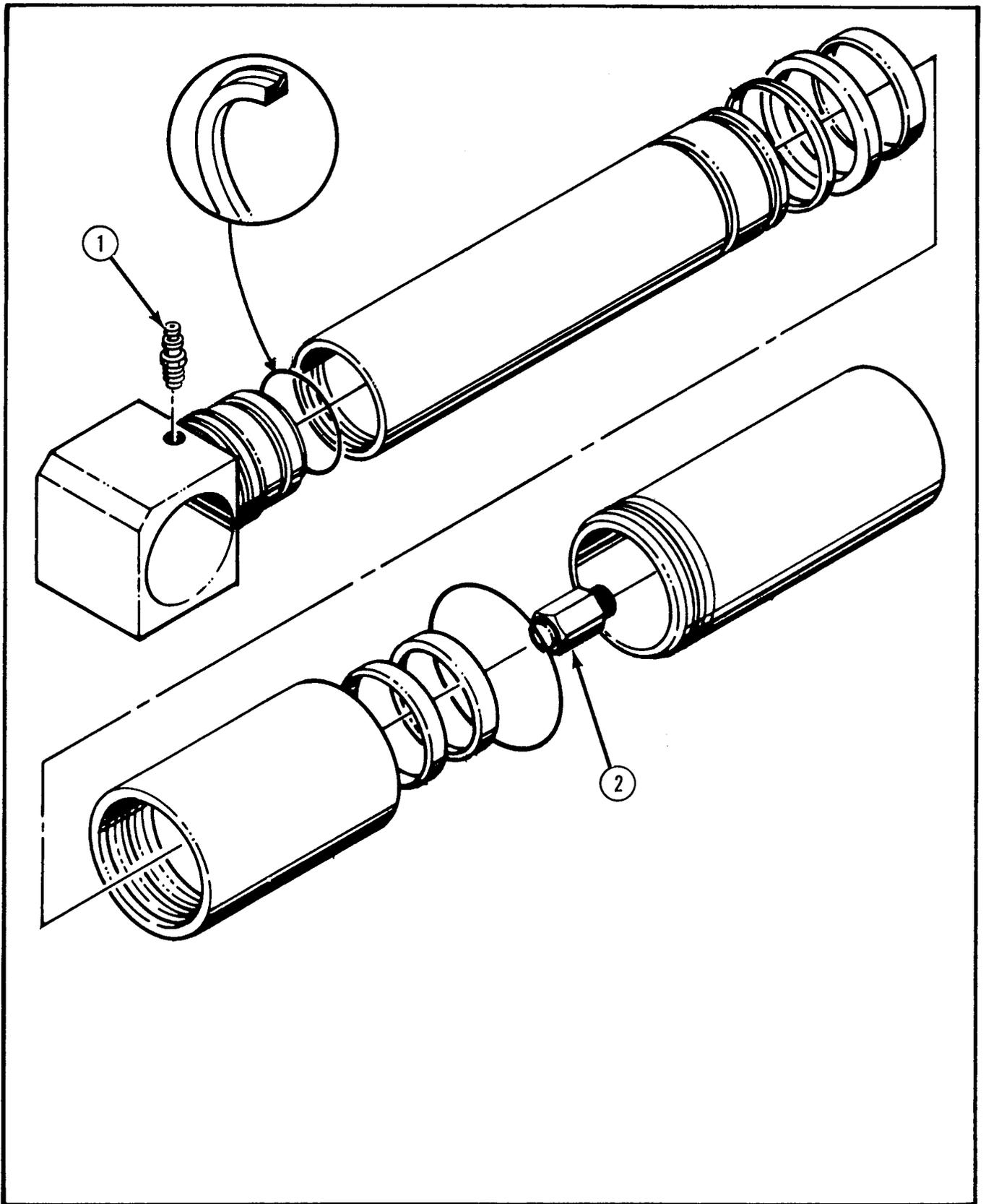


Figure 7-25. Lift Cylinder

ITEM	PART	DESCRIPTION	QTY
7-25	12794-000-00	LIFT CYLINDER .....	REF
-1	12794-014-00	• SCREW, BLEEDER .....	1
-2	14413-001-00	• FUSE, VELOCITY .....	1
-3	12794-099-00	• SEAL KIT .....	1

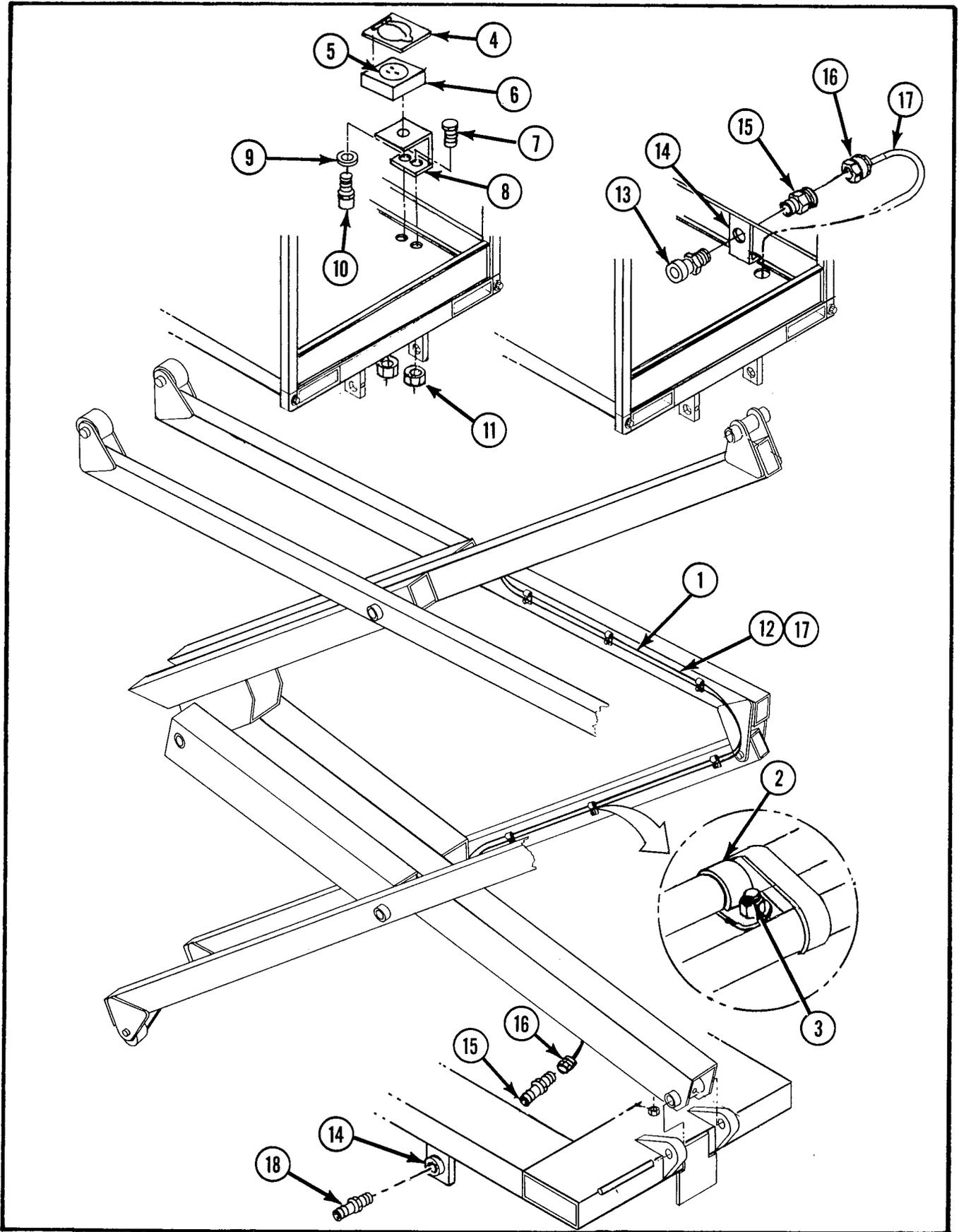


Figure 7-26. XL-14 Linkage Cable Installation

ITEM	PART	DESCRIPTION	QTY
7-26	NO NUMBER	XL-14 LINKAGE CABLE INSTALLATION .....	REF
-1	60866-000-00	• XL-14 LINKAGE CABLE ASSEMBLY .....	1
		(See Figure 7-28)	
-2	13919-006-00	• CLAMP, HOSE .....	12
-3	11248-004-00	• LOCKNUT, 1/4-20 UNC .....	12
	61387-000-00	OPTIONAL XL-14 POWER TO PLATFORM WITH .....	REF
		GENERATOR	
	60875-000-00	OPTIONAL XL-14 POWER TO PLATFORM .....	REF
-4	26611-002-00	• COVER, BOX, ELECTRICAL .....	1
-5	08942-000-00	• RECEPTABLE .....	1
-6	08941-000-00	• BOX, ELECTRICAL .....	1
-7	11252-008-00	• SCREW, 1/4-20 UNC GR. 5 HHC X 1 .....	2
-8	61411-000-00	• BRACKET .....	1
-9	11240-014-00	• WASHER, 7/8 DIA. STD. FLAT .....	1
-10	29925-003-00	• CONNECTOR, CABLE .....	1
-11	11248-004-00	• LOCKNUT, 1/4-20 UNC .....	2
-12	29495-099-00	• CABLE .....	AR
	61543-000-00	OPTIONAL XL-14 AIR LINE TO PLATFORM .....	REF
-13	12729-000-00	• COUPLING, FEMALE .....	1
-14	L8053-1AC	• BRACKET .....	2
-15	15749-012-00	• FITTING, STRAIGHT .....	2
-16	15771-003-00	• END, HOSE .....	2
-17	15770-099-00	• HOSE .....	AR
-18	12728-000-00	• COUPLING, MALE .....	1

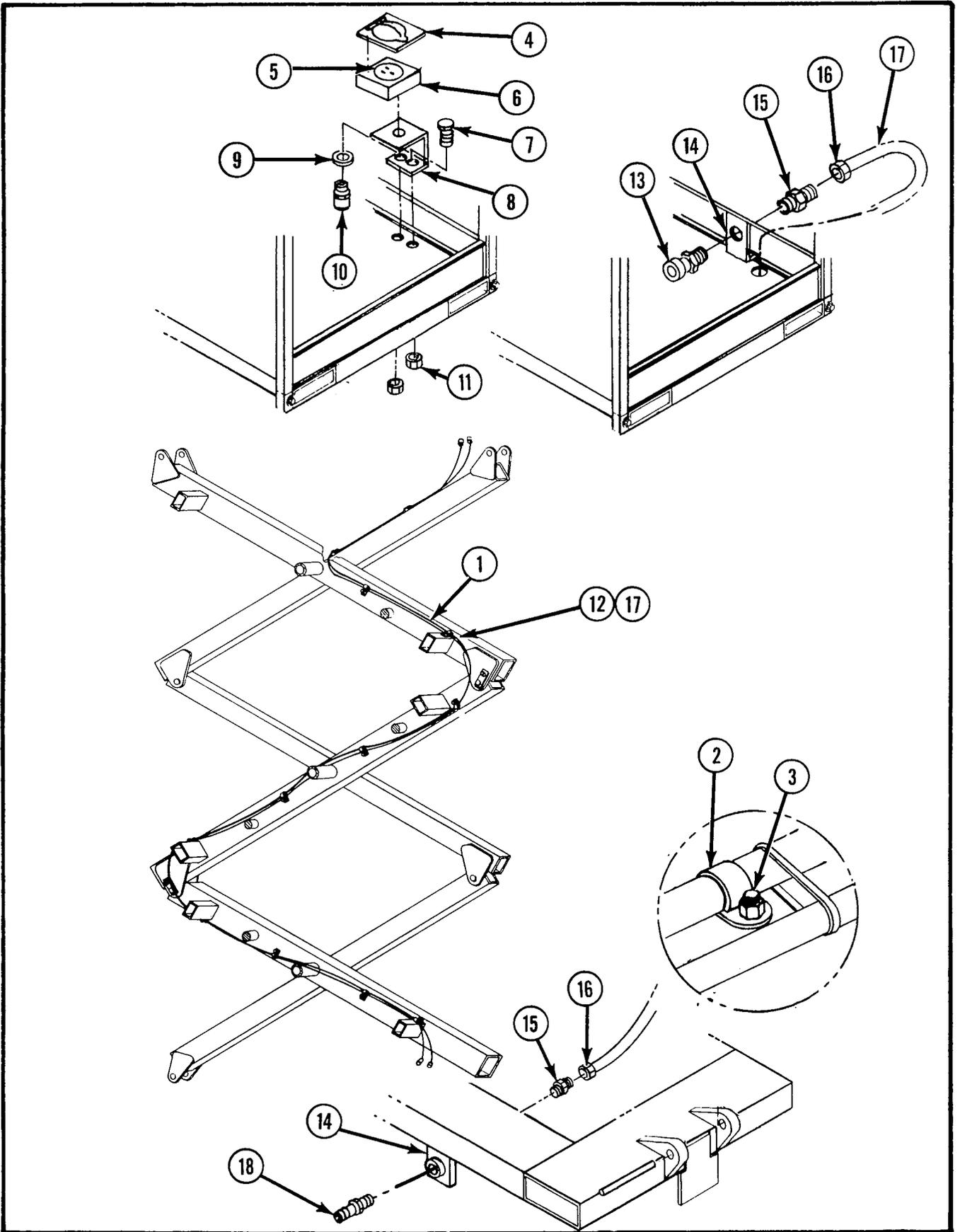


Figure 7-27. XL-19 Linkage Cable Installation

ITEM	PART	DESCRIPTION	QTY
7-27	NO NUMBER	XI-19 LINKAGE CABLE INSTALLATION .....	REF
-1	61409-000-00	• XL-19 LINKAGE CABLE .....	1
		(See Figure 7-28)	
-2	13919-006-00	• CLAMP, HOSE .....	12
-3	11248-004-00	• LOCKNUT, 1/4-20 UNC .....	12
	61392-000-00	OPTIONAL XL-19 POWER TO PLATFORM .....	REF
		WITH GENERATOR	
	61391-000-00	OPTIONAL XL-19 POWER TO PLATFORM .....	REF
-4	26611-002-00	• COVER, BOX, ELECTRICAL .....	1
-5	08942-000-00	• RECEPTABLE .....	1
-6	08941-000-00	• BOX, ELECTRICAL .....	1
-7	11252-008-00	• SCREW, 1/4-20 UNC GR. 5 HHC X 1 .....	2
-8	61411-000-00	• BRACKET .....	1
-9	11240-014-00	• WASHER, 7/8 DIA. STD. FLAT .....	1
-10	29925-003-00	• CONNECTOR, CABLE .....	2
-11	11248-004-00	• LOCKNUT, 1/4-20 UNC .....	2
-12	29495-099-00	• CABLE .....	AR
	61393-000-00	OPTIONAL XL-19 AIR LINE TO PLATFORM .....	REF
-13	12729-000-00	• COUPLING, FEMALE .....	1
-14	L8053-1AC	• BRACKET .....	2
-15	15749-012-00	• FITTING, STRAIGHT .....	2
-16	15771-003-00	• END, HOSE .....	2
-17	15771-003-00	• HOSE .....	AR
-18	12728-000-00	• COUPLING, MALE .....	1

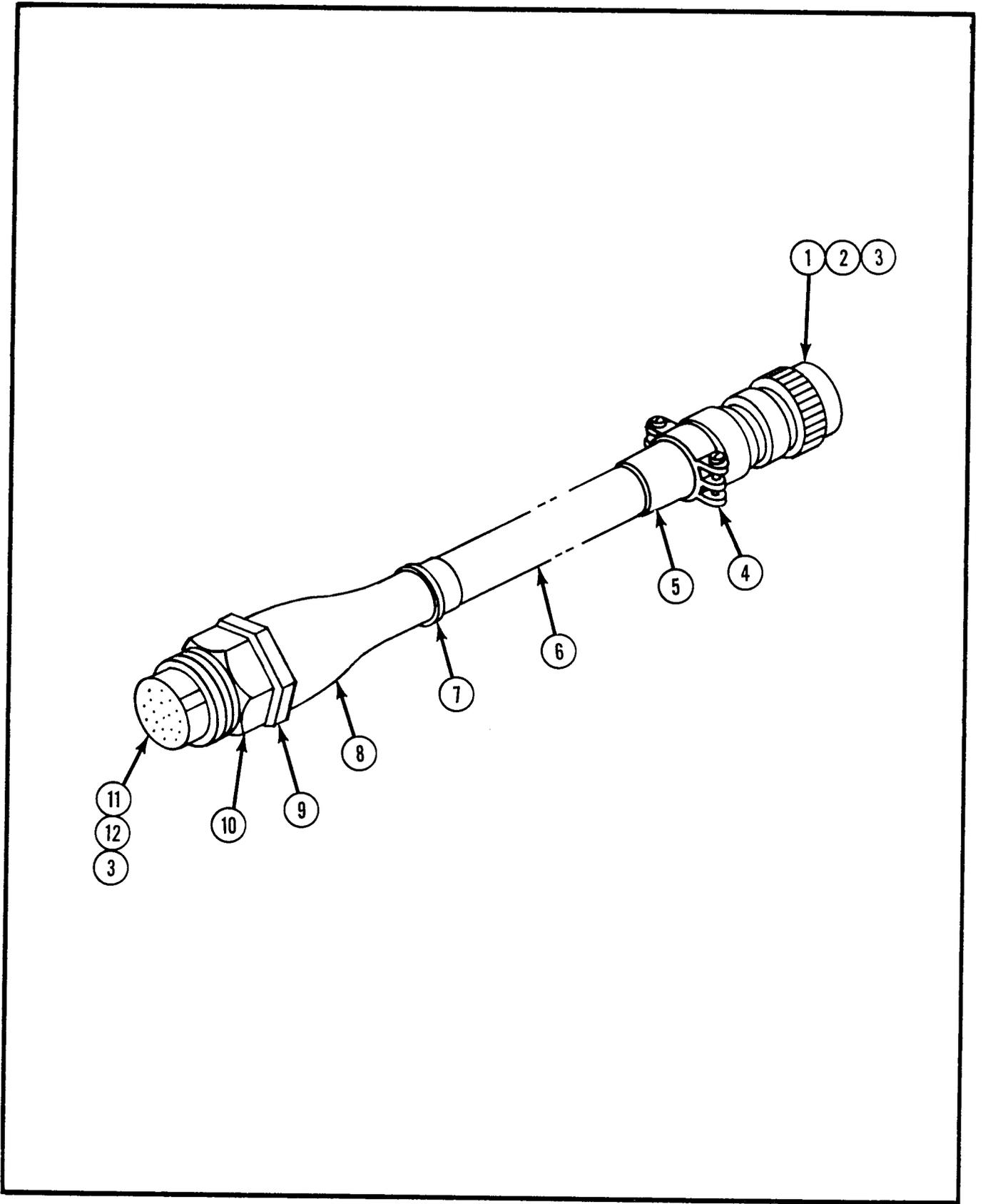


Figure 7-28. Linkage Cable Assembly

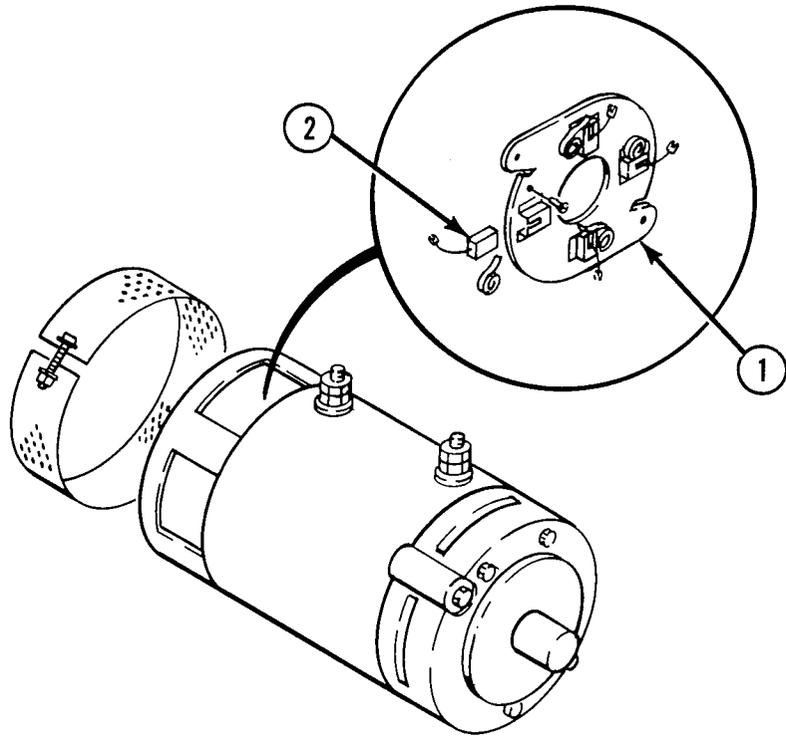


Figure 7-13. Electric Motor

ITEM	PART	DESCRIPTION	QTY
7-13 -1 -2	05975-000-00 05975-001-00 26539-001-00	ELECTRIC MOTOR ..... • RIGGING, BRUSH ..... •• BRUSH .....	REF 1 4

ITEM	PART	DESCRIPTION	QTY
7-28	60866-000-00	XL-14 LINKAGE CABLE ASSEMBLY .....	REF
	61409-000-000	XL-19 LINKAGE CABLE ASSEMBLY .....	REF
-1	28800-001-00	• CONNECTOR, PLUG .....	1
-2	28800-004-00	• CONTACT, PIN .....	15
-3	28800-015-00	• PLUG, SEALING .....	16
-4	29904-008-00	• CLAMP ASSEMBLY .....	1
-5	29904-010-00	•• BUSHING .....	1
-6	60214-099-00	• CABLE, 15 COND., 16GA .....	AR
-7	NO NUMBER	• WRAP, TIE .....	1
-8	28800-007-00	• RELIEF, STRAIN .....	1
-9	28800-014-00	• LOCKNUT .....	1
-10	28800-013-00	• NUT, PANEL .....	1
-11	28800-005-00	• CONTACT, SOCKET .....	15
-12	28800-002-00	• CONNECTOR, RECEPTACLE .....	1

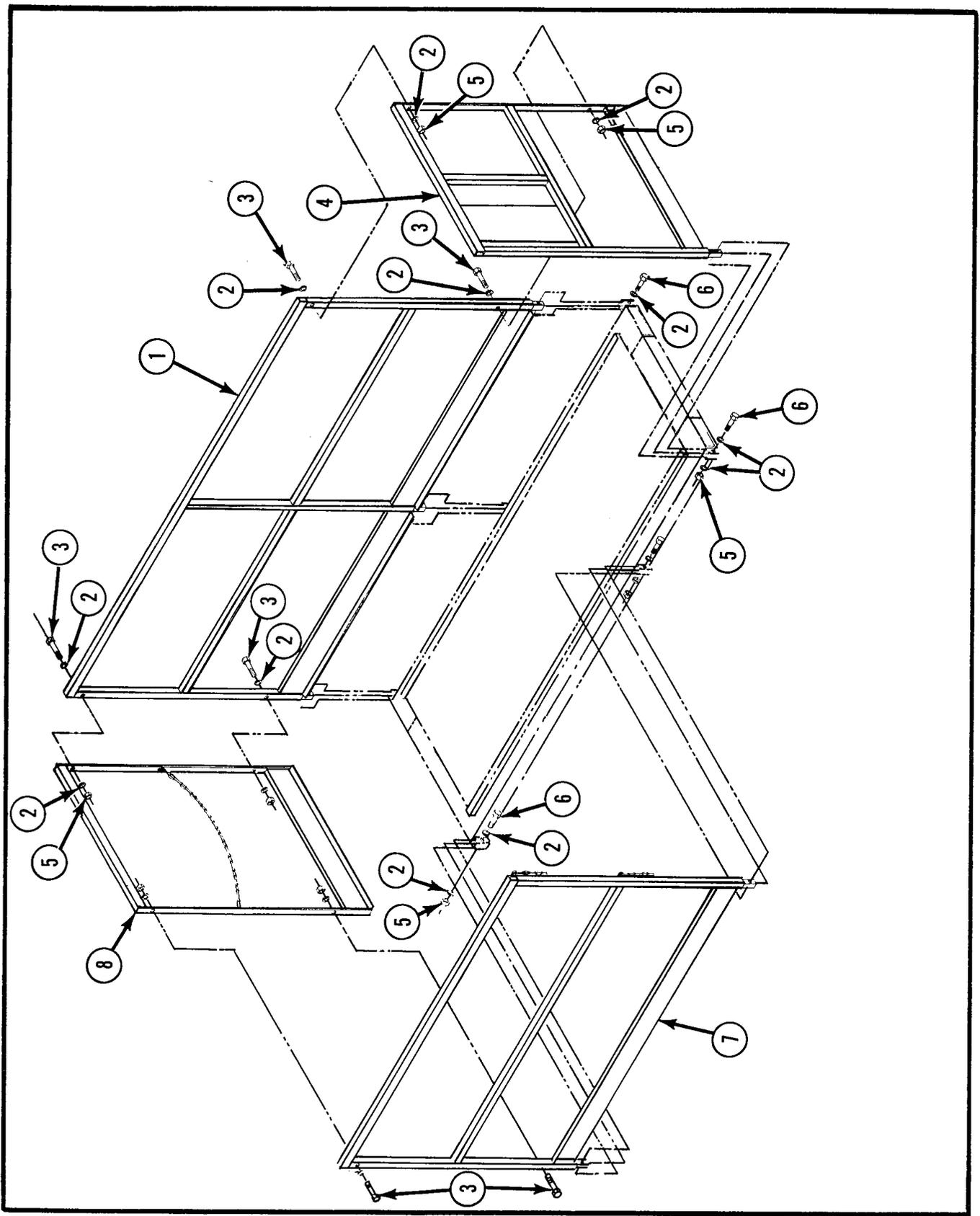


Figure 7-29. Guardrail Installation-Fixed

ITEM	PART	DESCRIPTION	QTY
7-29	61413-000-00	GUARDRAIL INSTALLATION-FIXED .....	REF
-1	60815-000-00	• GUARDRAIL WELDMENT, LH .....	1
-2	11240-006-00	• WASHER, 3/8 DIA. STD FLAT .....	24
-3	11254-016-00	• SCREW, 3/8-16 UNC GR. 5 HHC X 2 .....	6
-4	61346-000-00	• GUARDRAIL WELDMENT, FRONT .....	1
-5	11248-006-00	• LOCKNUT, 3/8-16 UNC .....	12
-6	11254-014-00	• SCREW, 3/8-16 UNC GR. 5 HHC X 1 3/4 .....	6
-7	61347-000-00	• GUARDRAIL WELDMENT, RH .....	1
-8	60899-000-00	• GUARDRAIL WELDMENT, REAR .....	1

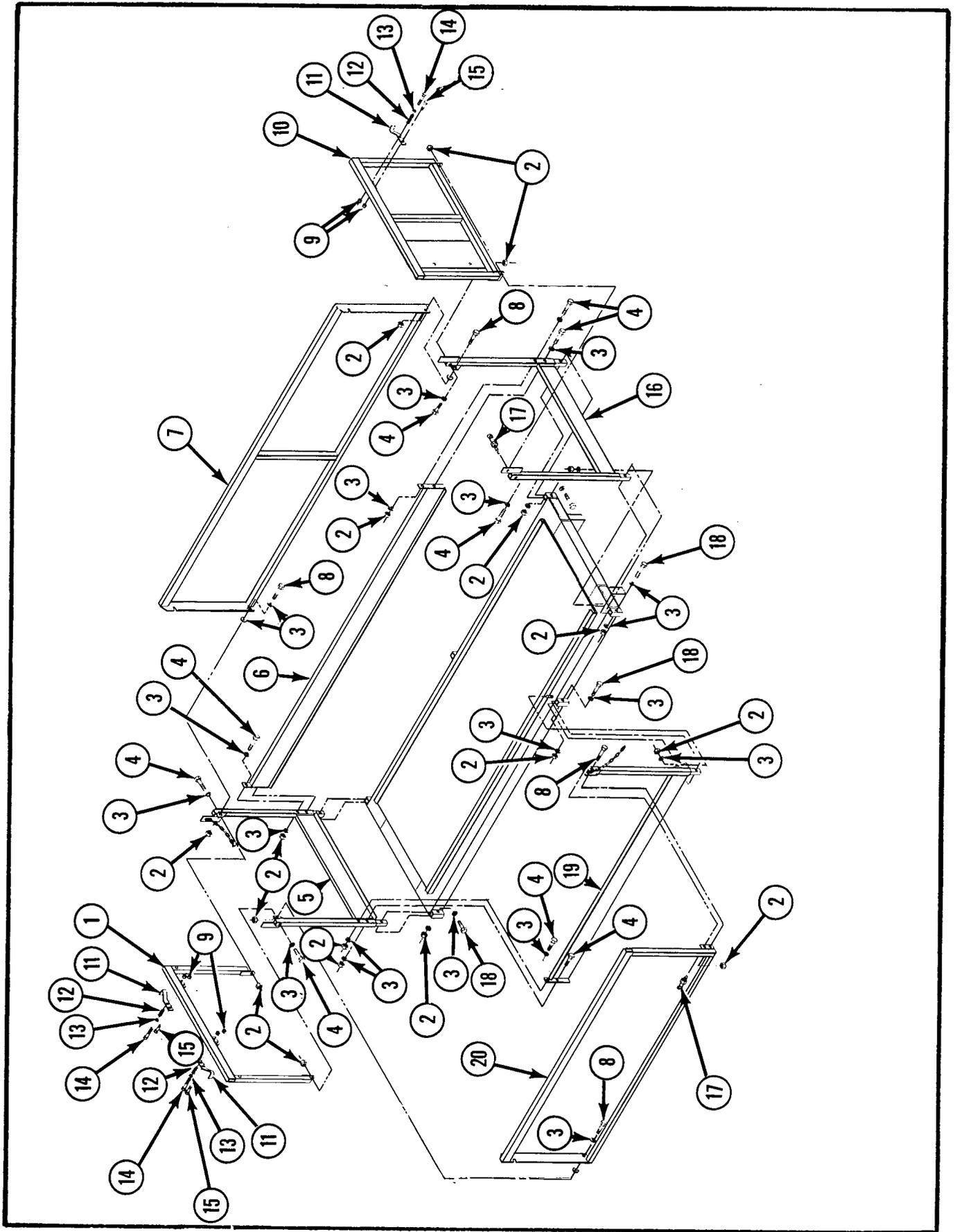


Figure 7-30. Optional Guardrail Installation — Fold-Down

ITEM	PART	DESCRIPTION	QTY
7-30	61412-000-00	OPTIONAL GUARDRAIL INSTALLATION – FOLD-DOWN ...	REF
-1	61481-000-00	• RAIL WELDMENT – UPPER REAR .....	1
-2	11248-006-00	• LOCKNUT, 3/8-16 UNC .....	17
-3	11240-006-00	• WASHER, 3/8 DIA. STD. FLAT .....	30
-4	11254-018-00	• SCREW, 3/8-16 UNC GR. 5 HHC X 2 1/4 .....	10
-5	61496-000-00	• RAIL WELDMENT – LOWER REAR .....	1
-6	61493-000-00	• KICK BOARD WELDMENT, LH .....	1
-7	61490-000-00	• RAIL WELDMENT, LH .....	1
-8	11254-012-00	• SCREW 3/8-16 UNC GR. 5 HHC X 1 1/2 .....	4
-9	11248-004-00	• LOCKNUT, 1/4-20 UNC .....	6
-10	61480-000-00	• RAIL WELDMENT, UPPER FRONT .....	1
-11	61528-000-00	• LATCH .....	3
-12	13913-006-00	• SPRING .....	3
-13	11240-004-00	• WASHER, 1/4 DIA. STD. FLAT .....	3
-14	11252-016-00	• SCREW 1/4-20 UNC GR. 5 HHC X 2 .....	3
-15	11252-006-00	• SCREW 1/4-20 UNC GR. 5 HHC X 3/4 .....	3
-16	61497-000-00	• RAIL WELDMENT, LOWER FRONT .....	1
-17	03570-000-00	• RETAINING PIN ASSEMBLY .....	2
-18	11254-016-00	• SCREW 3/8-16 UNC GR. 5 HHC X 2 .....	5
-19	61485-000-00	• KICKRAIL WELDMENT, RH .....	1
-20	61489-000-00	• RAIL WELDMENT, UPPER RIGHT .....	1

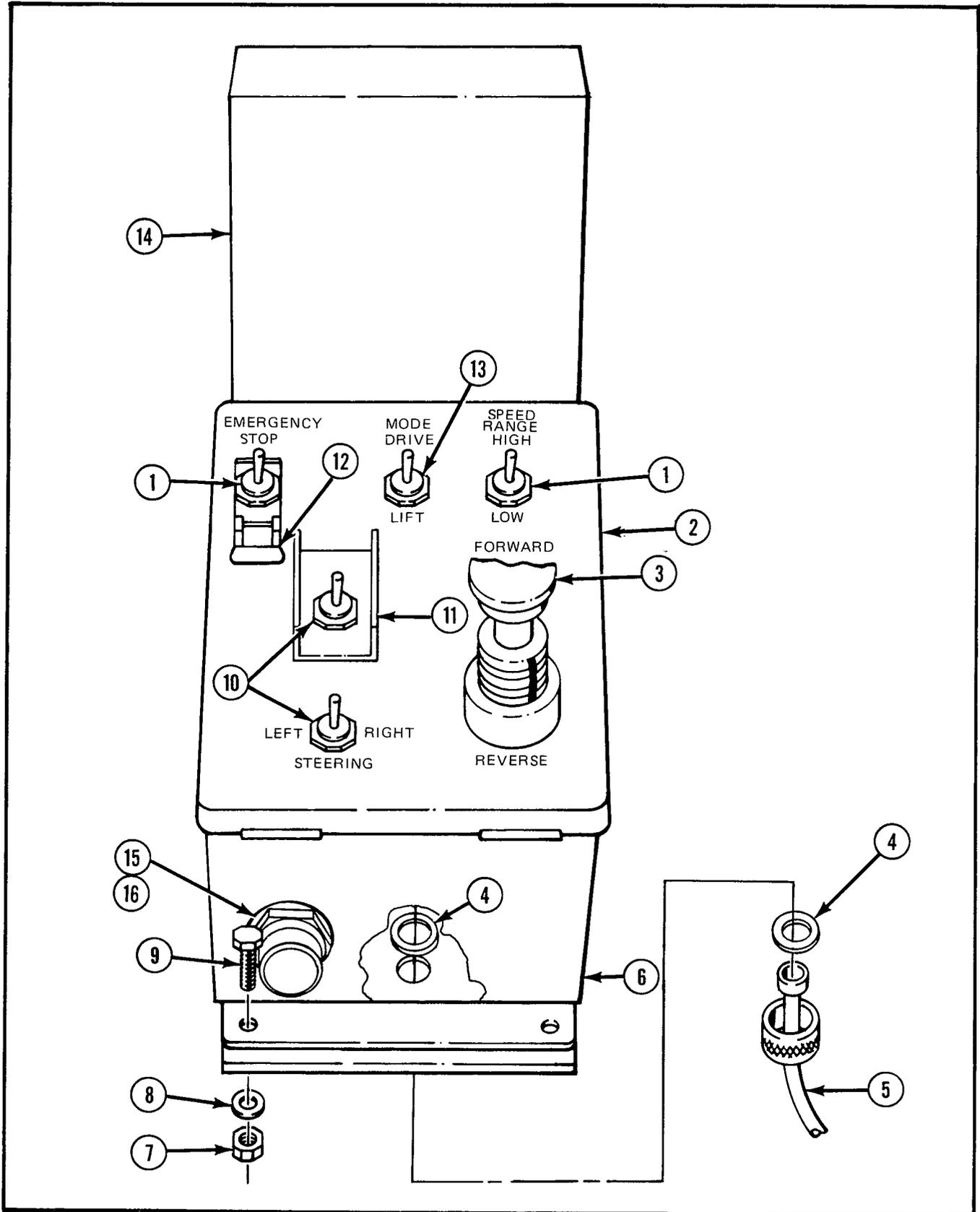


Figure 7-31. Controller Assembly

ITEM	PART	DESCRIPTION	QTY
7-31	60704-000-00	CONTROLLER ASSEMBLY .....	REF
-1	29871-000-00	• SWITCH, TOGGLE .....	2
-2	60834-000-00	• DECAL, CONTROLLER .....	1
-3	12799-000-00	• CONTROLLER .....	1
	15772-001-00	•• SWITCH, ROLLER LEVER .....	4
	12799-001-00	•• KNOB (OEM) .....	1
	12799-002-00	•• KNOB (PQ) .....	1
-4	29939-003-00	• LOCKNUT .....	2
-5	60707-000-00	• CABLE ASSEMBLY .....	1
		(See Figure 7-32) . . .	
-6	60807-000-00	• BOX, CONTROL .....	1
-7	11248-004-00	• LOCKNUT, 1/4-20 UNC .....	4
-8	11240-004-00	• WASHER, 1/4 DIA. STD. FLAT .....	4
-9	11252-008-00	• SCREW, 1/4-20 UNC GR. 5 HHC X 1 .....	4
-10	12798-000-00	• SWITCH, TOGGLE .....	2
-11	08271-000-00	• GUARD, SWITCH, TOGGLE .....	1
-12	29936-006-00	• GUARD, SWITCH, TOGGLE .....	1
-13	12797-000-00	• SWITCH, TOGGLE .....	1
-14	60809-000-00	• HANGER .....	1
-15	27958-000-00	OPTIONAL HORN PUSH BUTTON .....	1
-16	27960-000-00	OPTIONAL HORN CONTACT BLOCK .....	1

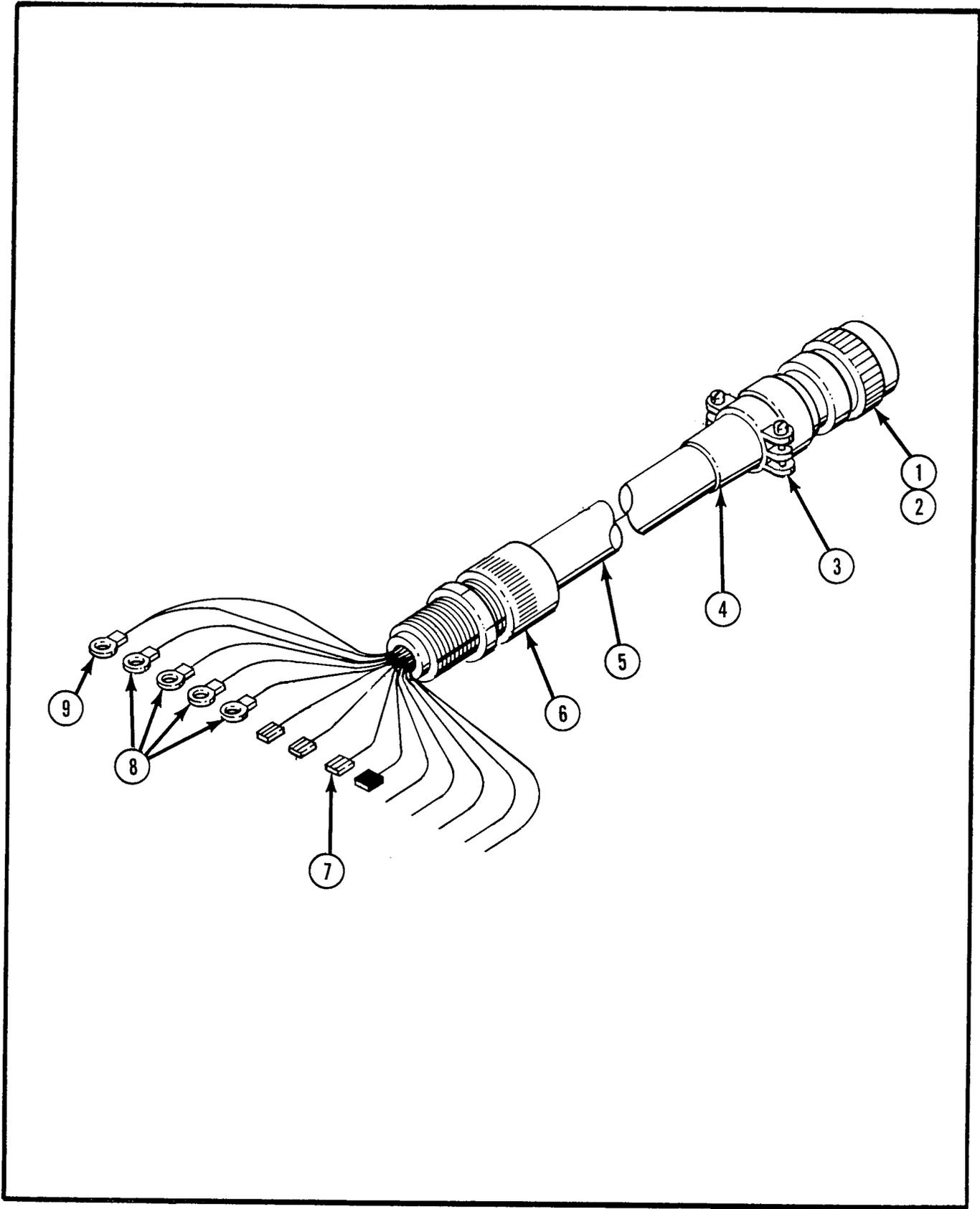


Figure 7-32. Cable Assembly

ITEM	PART	DESCRIPTION	QTY
7-32	60707-000-00	CABLE ASSEMBLY .....	REF
-1	28800-001-00	• CONNECTOR, PLUG .....	1
-2	28800-004-00	• PIN, CONTACT .....	15
-3	29904-008-00	• CLAMP ASSEMBLY .....	1
-4	29904-010-00	•• BUSHING .....	1
-5	60214-099-00	• CABLE, 15 COND., 16 GA .....	AR
-6	29925-003-00	• CONNECTOR, CABLE .....	1
-7	29615-002-00	• TERMINAL, PUSH .....	4
-8	29601-013-00	• TERMINAL, RING .....	4
-9	29601-019-00	• TERMINAL, RING .....	1

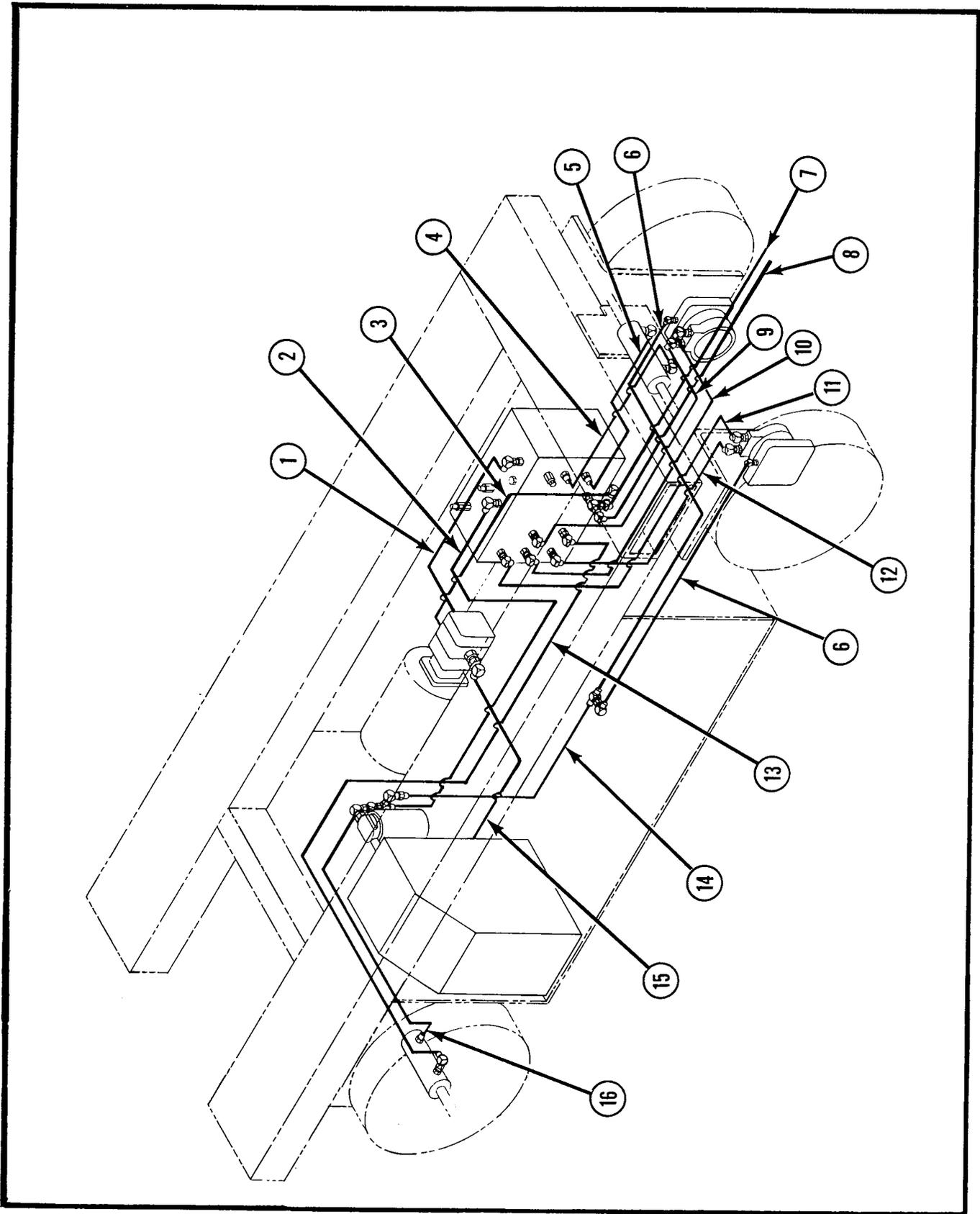


Figure 7-33. Chassis Hose Installation

ITEM	PART	DESCRIPTION	QTY
7-33	NO NUMBER	XL-14 CHASSIS HOSE INSTALLATION .....	REF
		XL-19 CHASSIS HOSE INSTALLATION .....	REF
-1	60861-014-00	• HOSE ASSEMBLY X 26 .....	1
-2	60861-009-00	• HOSE ASSEMBLY X 37 .....	1
-3	60861-013-00	• HOSE ASSEMBLY X 15 1/2 .....	1
-4	60861-008-00	• HOSE ASSEMBLY X 29 1/2 .....	1
-5	60861-007-00	• HOSE ASSEMBLY X 27 .....	1
-6	61351-002-00	• HOSE ASSEMBLY X 40 1/2 .....	2
-7	60861-012-00	• HOSE ASSEMBLY X 191 (XL-19 Only) .....	1
-8	60861-015-00	• HOSE ASSEMBLY X 112 1/2 .....	1
-9	60889-004-00	• HOSE ASSEMBLY X 38 1/2 .....	1
-10	60889-001-00	• HOSE ASSEMBLY X 41 1/2 .....	1
-11	60889-002-00	• HOSE ASSEMBLY X 42 1/2 .....	1
-12	60889-003-00	• HOSE ASSEMBLY X 39 1/2 .....	1
-13	60861-011-00	• HOSE ASSEMBLY X 46 .....	1
-14	61351-001-00	• HOSE ASSEMBLY X 25 .....	1
-15	60862-002-00	• HOSE ASSEMBLY X 18 1/2 .....	1
-16	60861-010-00	• HOSE ASSEMBLY X 20 LG .....	1

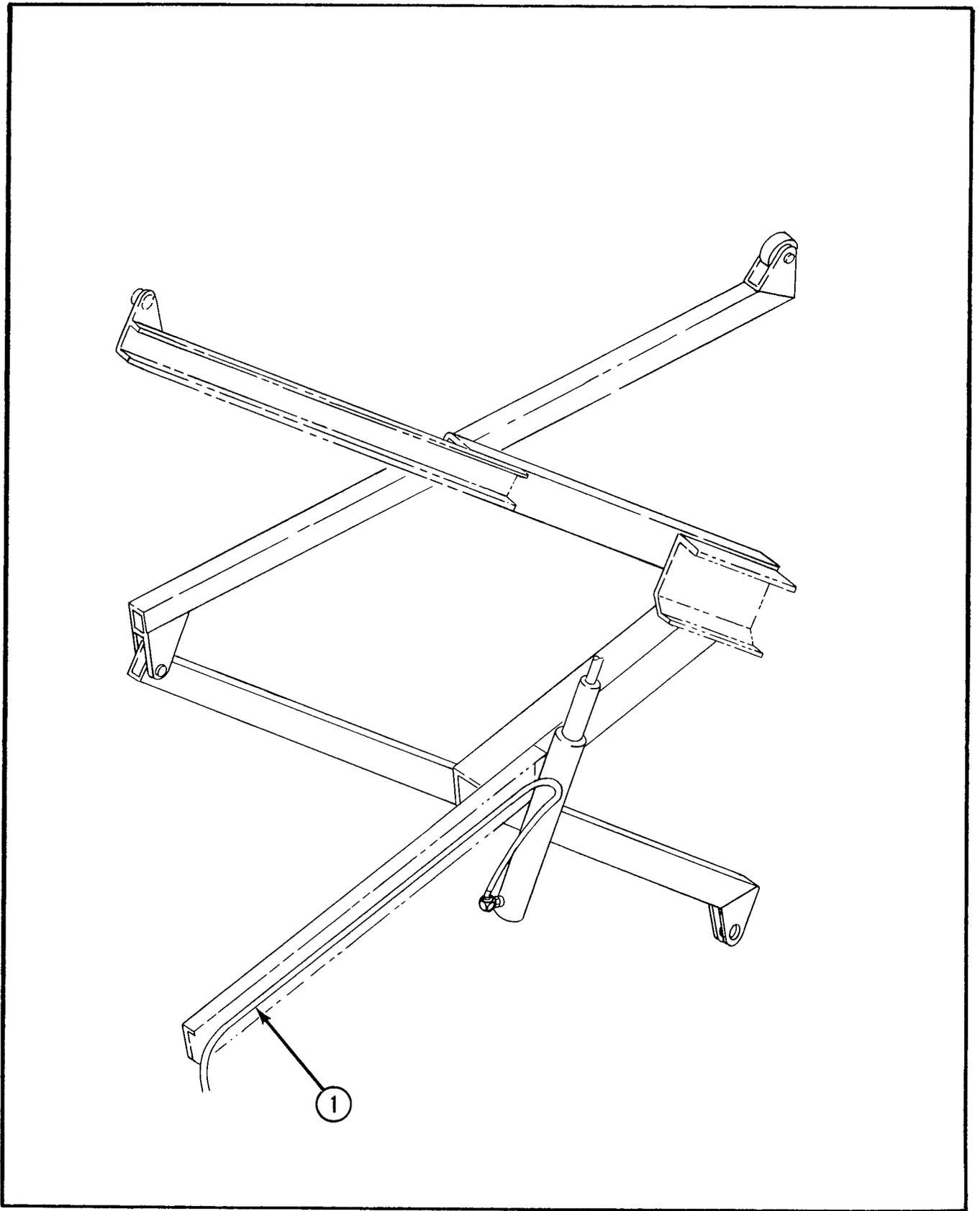


Figure 7-34. XL-14 Scissors Hose Installation

ITEM	PART	DESCRIPTION	QTY
7-34 -1	NO NUMBER 60861-015-00	XL-14 SCISSORS HOSE INSTALLATION ..... • HOSE ASSEMBLY X 112 1/2 .....	REF REF

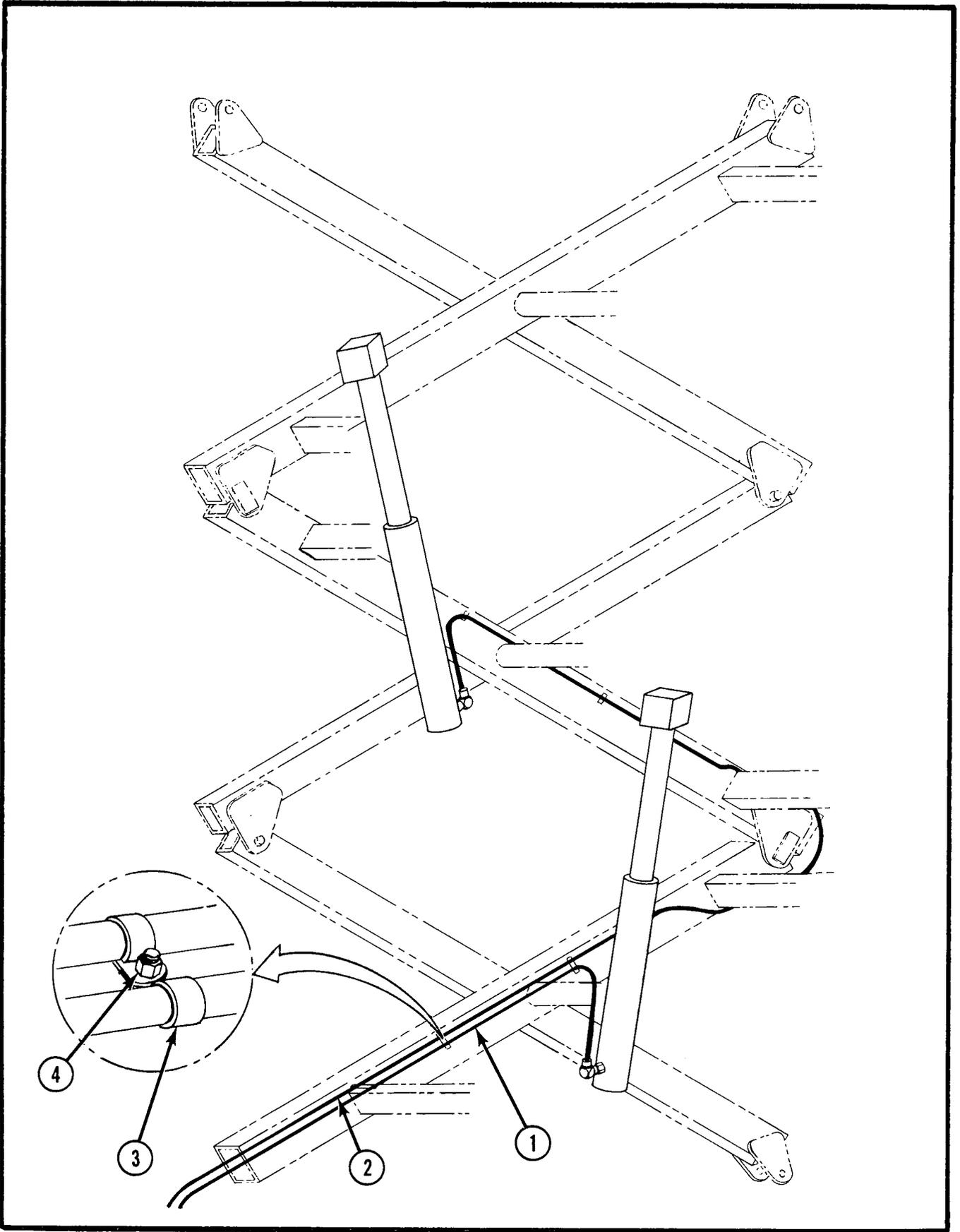


Figure 7-35. XL-19 Scissors Hose Installation

ITEM	PART	DESCRIPTION	QTY
7-35	NO NUMBER	XL-19 SCISSORS HOSE INSTALLATION.....	REF
-1	60861-015-00	• HOSE ASSEMBLY X 112 1/2 .....	REF
-2	60861-012-00	• HOSE ASSEMBLY X 191 .....	REF
-3	13919-006-00	• CLAMP, HOSE .....	10
-4	11248-004-00	• LOCKNUT, 1/4-20 UNC .....	7

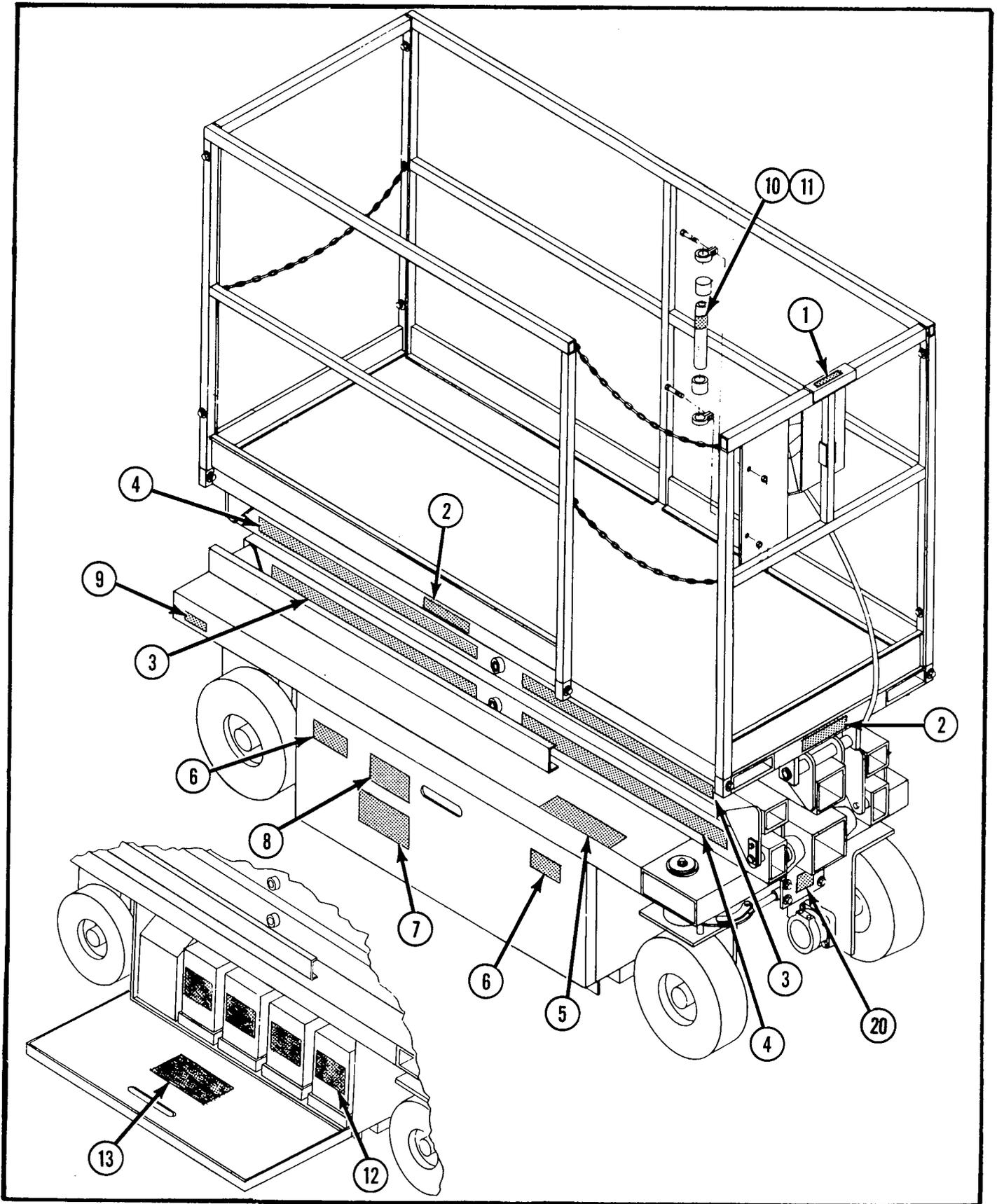


Figure 7-36a. XL-14 Decal Installation

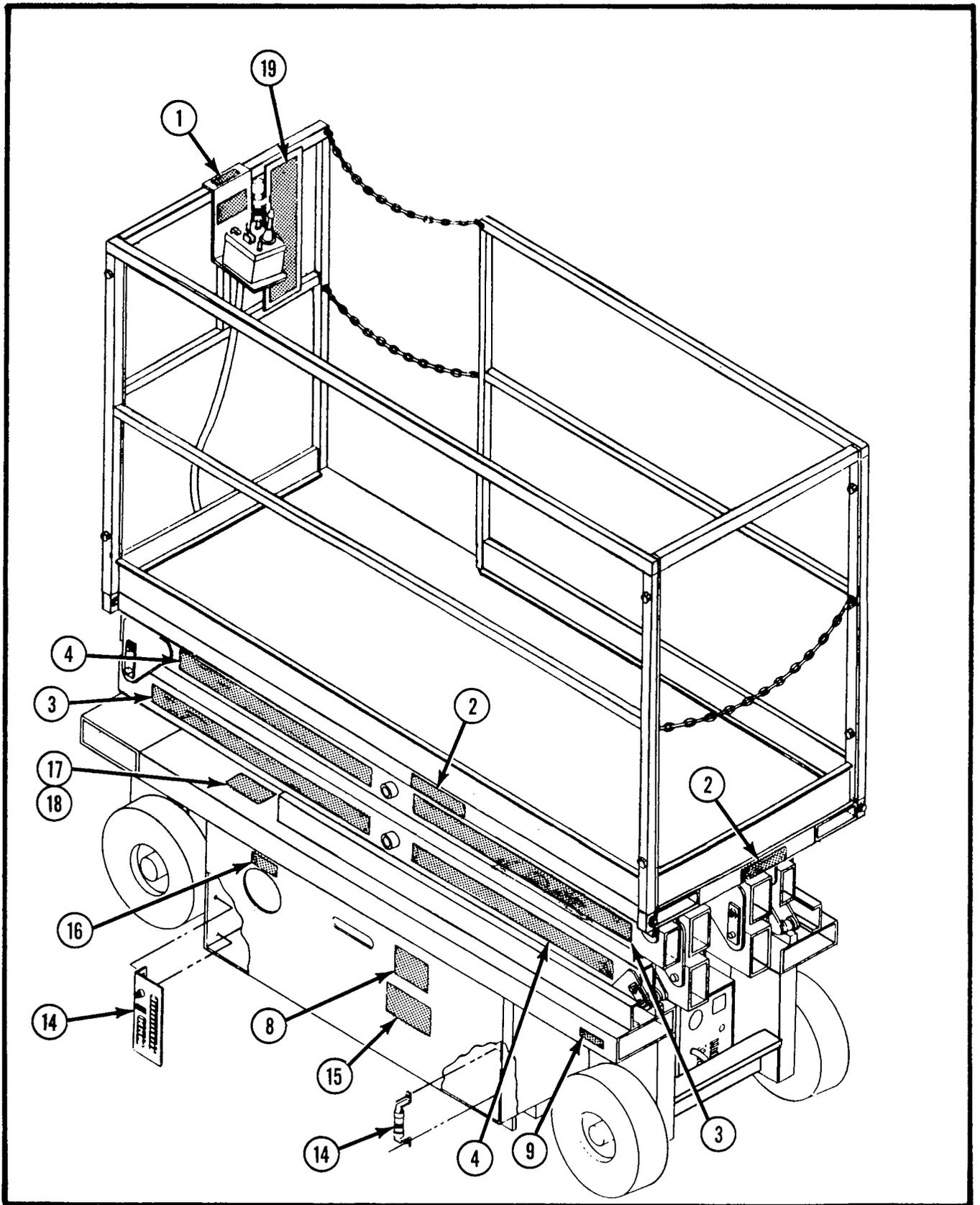


Figure 7-36b. XL-14 Decal Installation

ITEM	PART	DESCRIPTION	QTY
7-36	61554-000-00	XL-14 DECAL INSTALLATION .....	REF
-1	61515-000-00	• DECAL – LIFT HERE .....	1
-2	05651-003-00	• DECAL – MAX. PLATFORM LOAD .....	4
-3	60838-000-00	• DECAL – UP-RIGHT .....	4
-4	60839-000-00	• DECAL – XL-14 .....	4
-5	60830-000-00	• SAFETY WALK .....	1
-6	05221-000-00	• DECAL – BATTERY FLUID .....	2
-7	05225-000-00	• DECAL – DANGER HYDROGEN GAS .....	1
-8	27993-000-00	• DECAL – LOWER PLATFORM .....	2
-9	14222-003-99	• DECAL – FORK LIFT HERE .....	2
-10	03610-000-00	• DECAL – OPERATING INST. STORAGE .....	1
-11	60595-000-00	• USERS MANUAL .....	1
-12	08838-000-00	• DECAL – 6V, 250 AMP HRS .....	4
-13	61513-000-00	• DECAL – DANGER USE ONLY .....	1
-14	08176-000-00	• DECAL – FUSE .....	1
-15	27992-000-00	• DECAL – CAUTION DO NOT ADJUST .....	1
-16	05223-000-00	• DECAL – EMERGENCY DOWN VALVE .....	1
-17	61205-000-00	• PLATE, NAME .....	1
-18	26551-005-00	• RIVET, POP .....	1
-19	60864-000-00	• DECAL – DANGER .....	1
-20	61531-000-00	• DECAL – CAUTION ALWAYS BLOCK MACHINE .....	1

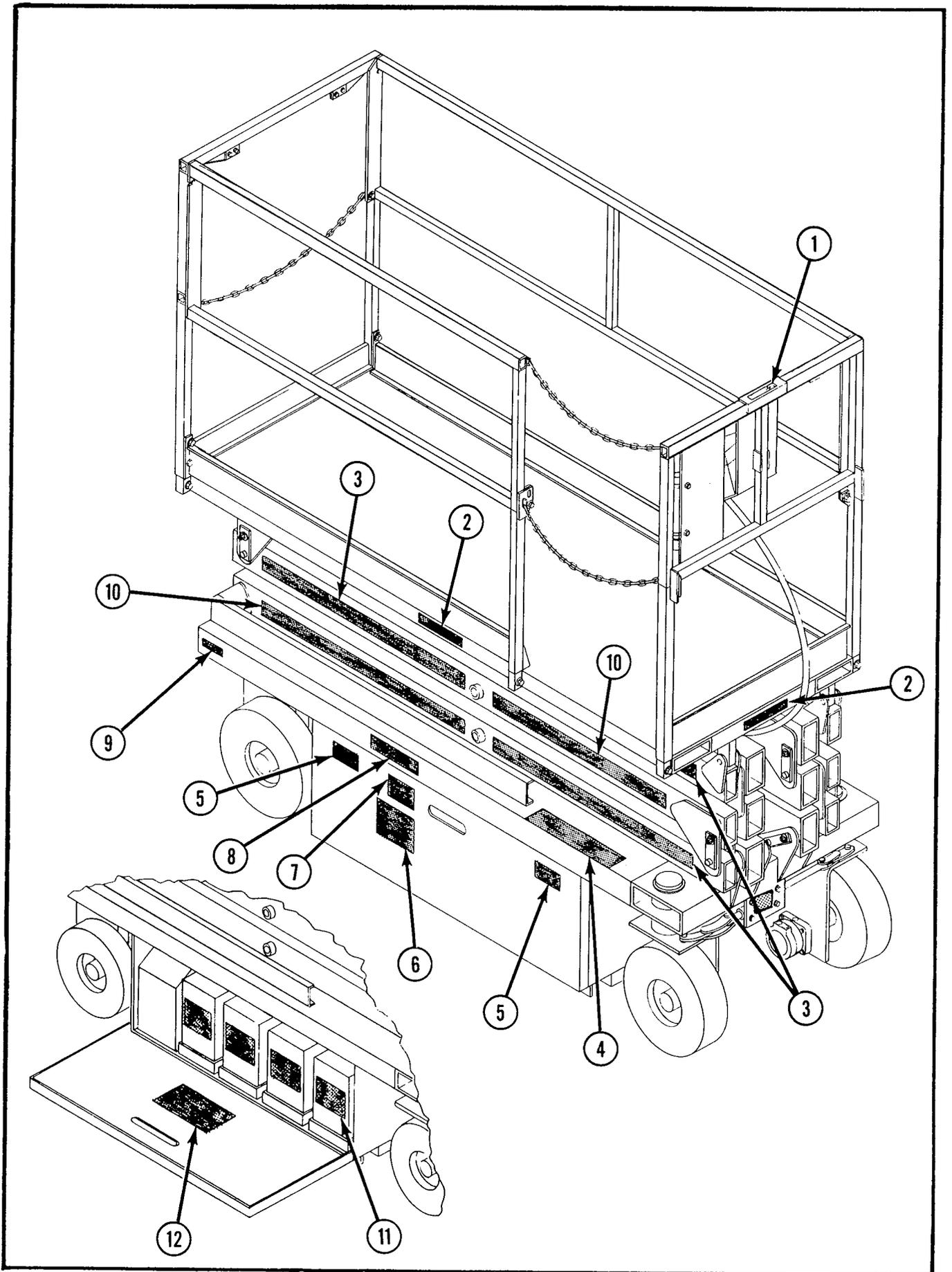


Figure 7-37a. XI-19 Decal Installation

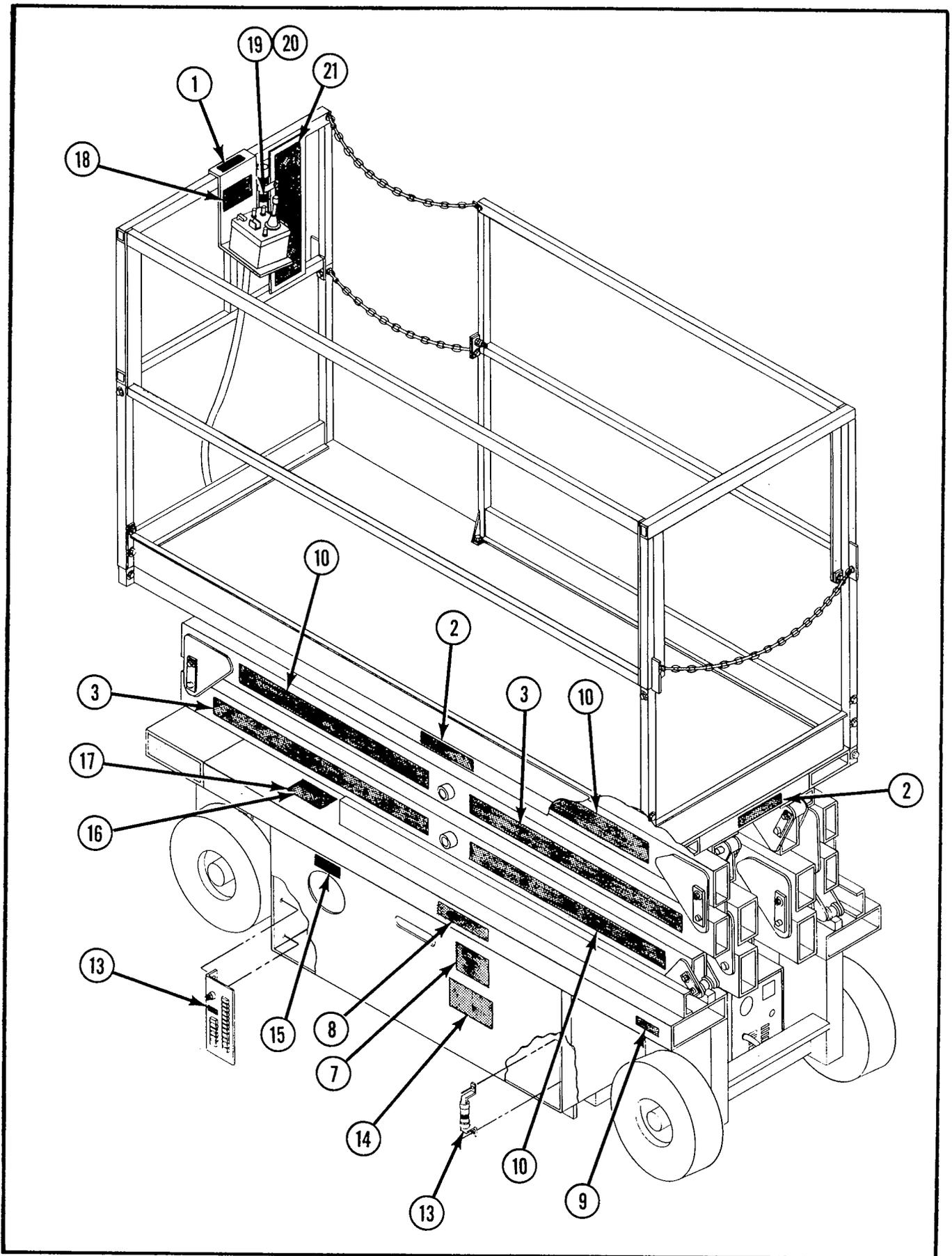


Figure 7-37b. XL-19 Decal Installation

ITEM	PART	DESCRIPTION	QTY
7-37	61405-000-00	XL-19 DECAL INSTALLATION .....	REF
-1	61515-000-00	• DECAL – LIFT HERE .....	1
-2	61520-000-00	• DECAL – MAX. DIST. LOAD 550 LBS.....	4
-3	61508-000-00	• DECAL – XL-19 .....	6
-4	60830-000-00	• SAFETY WALK .....	1
-5	05221-000-00	• DECAL – BATTERY FLUID .....	2
-6	05225-000-00	• DECAL – DANGER HYDROGEN GAS .....	1
-7	27993-000-00	• DECAL – LOWER PLATFORM .....	2
-8	61514-000-00	• DECAL – BEFORE OPERATING .....	2
-9	14222-003-99	• DECAL – FORK LIFT HERE .....	2
-10	61517-000-00	• DECAL – UP-RIGHT .....	6
-11	08838-000-00	• DECAL – 6V 250 AMP HRS .....	4
-12	61513-000-00	• DECAL – DANGER USE ONLY .....	1
-13	08176-000-00	• DECAL – FUSE.....	2
-14	27992-000-00	• DECAL – CAUTION DO NOT ADJUST .....	1
-15	05223-000-00	• DECAL – EMERGENCY DOWN VALVE .....	1
-16	61205-000-00	• PLATE, NAME .....	1
-17	26551-005-00	• RIVET, POP .....	4
-18	60865-000-00	• DECAL – BEFORE OPERATING .....	1
-19	03610-000-00	• DECAL – OPERATING INST. STORAGE .....	1
-20	60595-000-00	• USERS MANUAL .....	1
-21	61512-000-00	• DECAL – DANGER SAFETY INSTR.....	1
-22	61531-000-00	• DECAL – CAUTION ALWAYS BLOCK MACHINE .....	

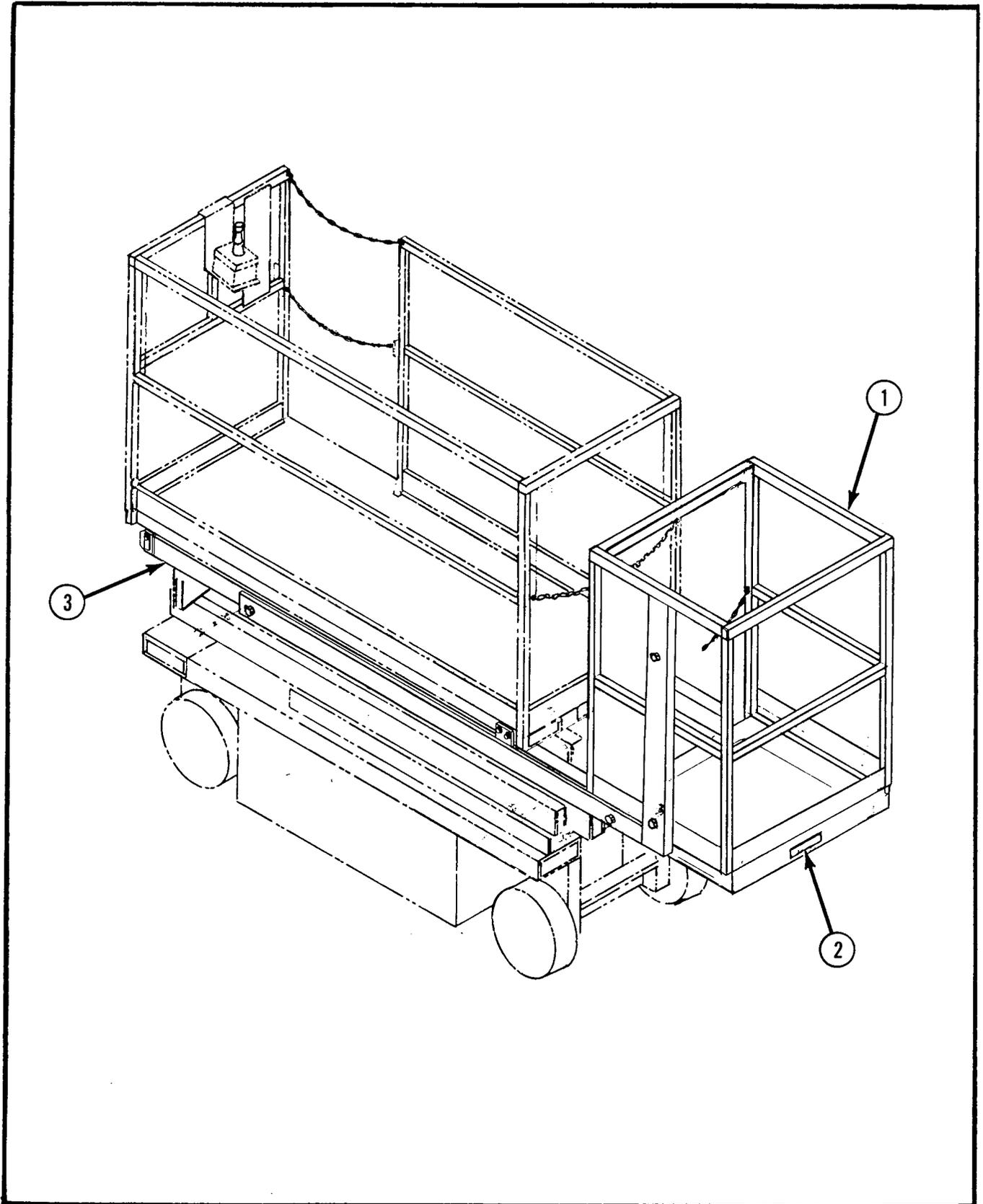


Figure 7-38a. Optional XL-14 Cantilever Cage Installation

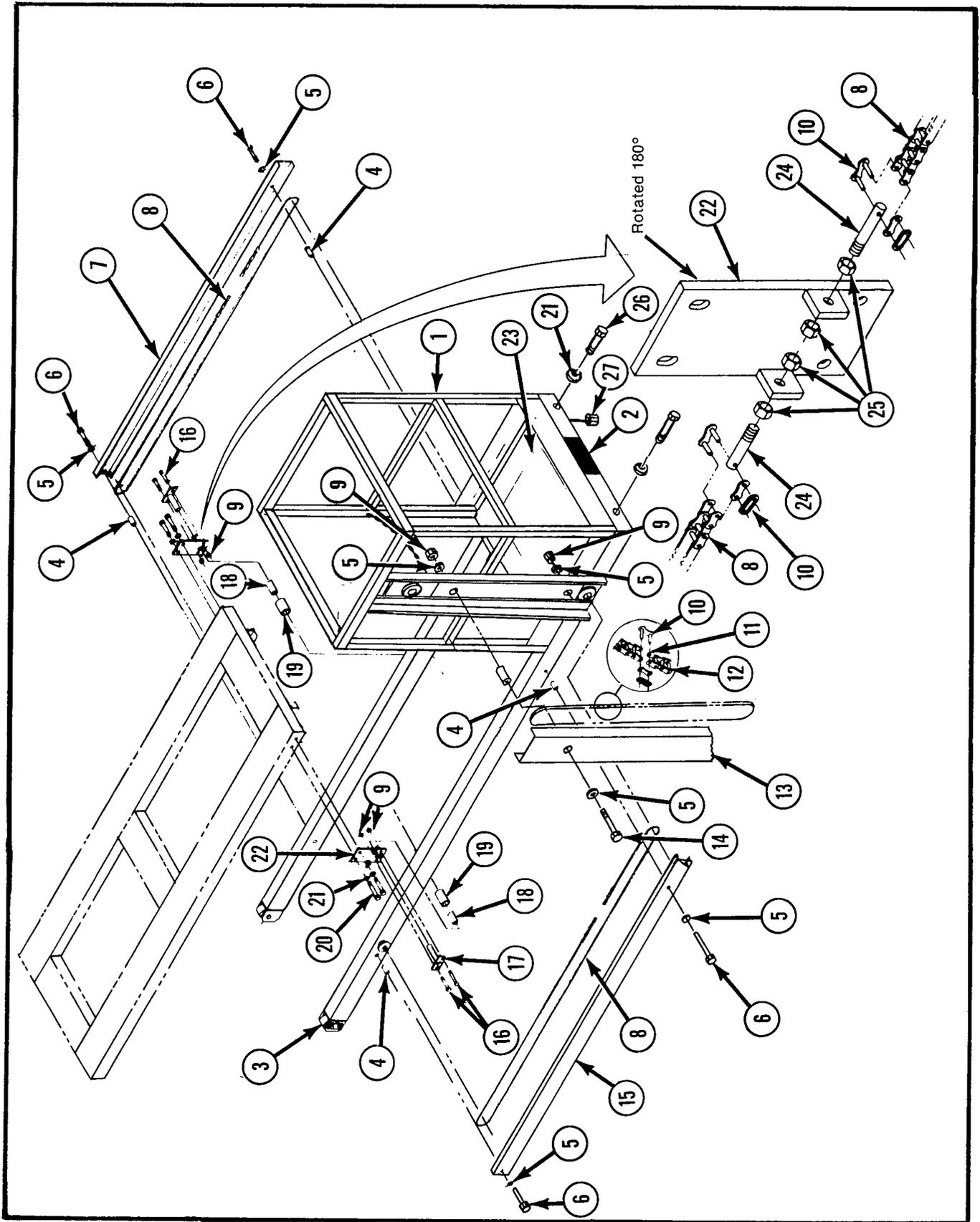


Figure 7-38b. Optional XL-14 Cantilever Cage Installation

ITEM	PART	DESCRIPTION	QTY
7-38	60874-000-00	OPTIONAL XL-14 CANTILEVER CAGE INSTALLATION . . . . .	REF
-1	61342-000-00	• XL-14 CAGE ASSEMBLY . . . . . (See Figure 7-39)	1
-2	05652-000-00	• DECAL-MAX LOAD 250 LBS . . . . .	3
-3	61341-000-00	• ROLLING FRAME ASSEMBLY, CANTILEVER CAGE . . . . . (See Figure 7-40)	1
-4	17404-002-00	• SPACER . . . . .	6
-5	11240-004-00	• WASHER, 1/4 DIA. STD. FLAT . . . . .	10
-6	11252-014-00	• SCREW, 1/4-20 UNC GR. 5 HHC X 1 3/4 . . . . .	4
-7	61361-000-00	• GUARD, RH . . . . .	1
-8	05641-009-00	• CHAIN, ROLLER . . . . .	2
-9	11248-004-00	• LOCKNUT, 1/4-20 UNC . . . . .	6
-10	11884-003-00	• LINK, CONNECTING . . . . .	5
-11	11886-003-00	• LINK, HALF . . . . .	1
-12	05641-010-00	• CHAIN, ROLLER . . . . .	1
-13	61362-000-00	• GUARD, VERTICAL . . . . .	1
-14	11252-016-00	• SCREW, 1/4-20 UNC GR. 5 HHC X 2 . . . . .	2
-15	61360-000-00	• GUARD, LH . . . . .	1
-16	11252-008-00	• SCREW, 1/4-20 UNC GR. 5 HHC X 1 . . . . .	4
-17	61301-000-00	• PIN WELDMENT . . . . .	2
-18	27931-010-00	• BEARING . . . . .	4
-19	61337-000-00	• ROLLER . . . . .	2
-20	11254-010-00	• SCREW, 3/8-16 UNC GR. 5 HHC X 1 1/4 . . . . .	4
-21	11240-006-00	• WASHER, 3/8 DIA. STD. FLAT . . . . .	8
-22	61318-000-00	• BRACKET . . . . .	2
-23	61355-000-00	• SAFETY WALK . . . . .	1
-24	61322-000-00	• SCREW, ADJUSTMENT . . . . .	2
-25	11250-004-00	• NUT, 1/4-20 STD HEX . . . . .	8
-26	11254-024-00	• SCREW, 3/8-16 UNC GR. 5 HHC X 3 . . . . .	4
-27	11248-006-00	• LOCKNUT, 3/8-16 UNC . . . . .	4

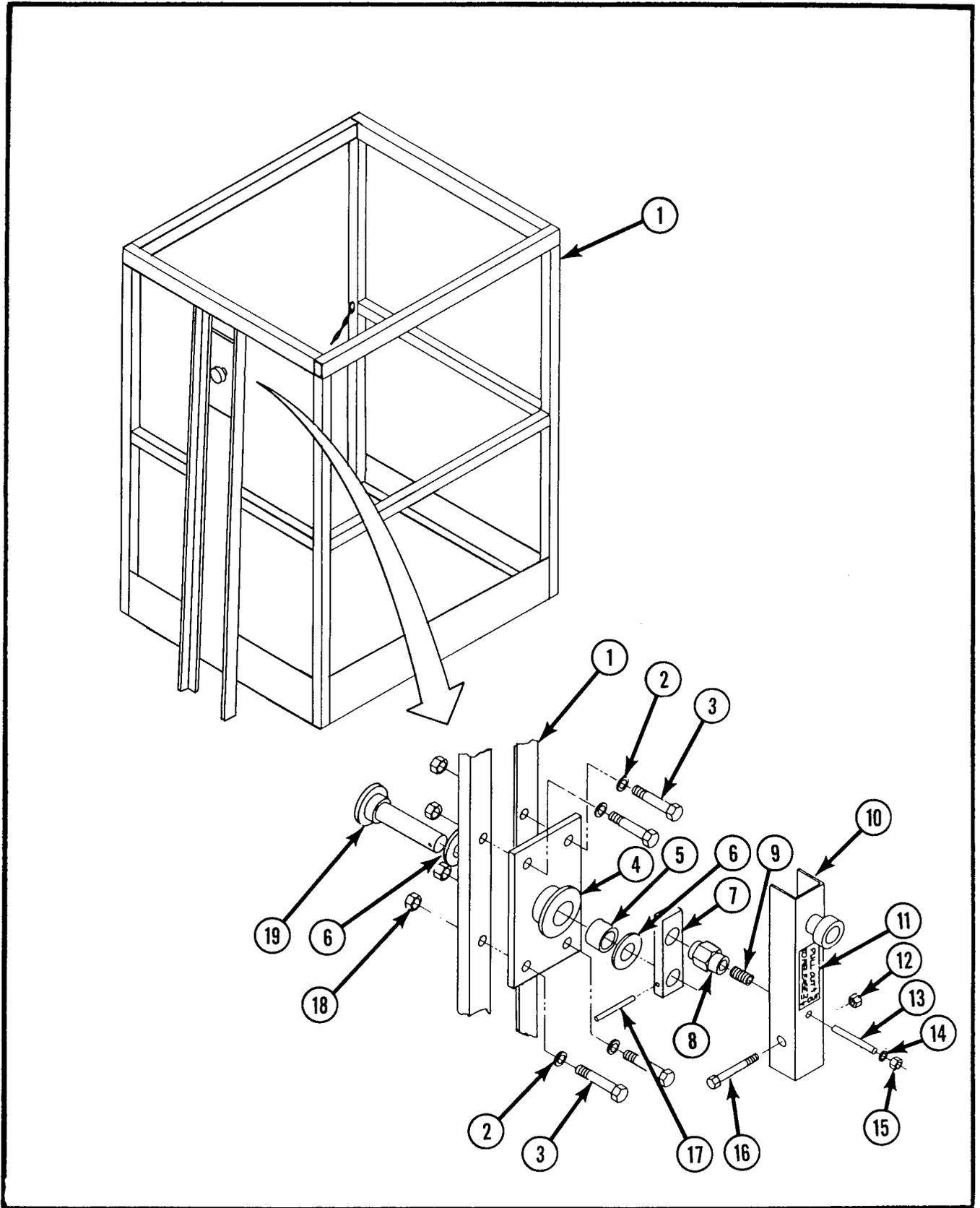


Figure 7-39. XL-14 Cage Assembly

ITEM	PART	DESCRIPTION	QTY
7-39	61342-000-00	XL-14 CAGE ASSEMBLY .....	REF
-1	61335-000-00	• CAGE WELDMENT .....	1
-2	11240-006-00	• WASHER, 3/8 DIA. STD. FLAT .....	4
-3	11254-008-00	• SCREW, 3/8-16 UNC GR. 5 HHC X 1 .....	4
-4	61316-000-00	• PLATE .....	1
-5	27931-018-00	• BEARING .....	1
-6	06452-000-00	• BEARING, THRUST .....	2
-7	05346-000-00	• ARM .....	1
-8	03443-001-00	• HOUSING .....	1
-9	05376-000-00	• SPRING .....	1
-10	61353-000-00	• HANDLE .....	1
-11	61352-000-00	• DECAL – PULL OUT .....	1
-12	11248-005-00	• LOCKNUT, 5/16-18 UNC .....	1
-13	05373-000-00	• PIN, RETAINING .....	1
-14	11240-004-00	• WASHER, 1/4 DIA. STD. FLAT .....	1
-15	11248-004-00	• LOCKNUT, 1/4-20 UNC .....	1
-16	11253-012-00	• SCREW, 5/16-18 UNC GR. 5 HHC X 1 1/2 .....	1
-17	11735-020-00	• PIN, ROLL .....	1
-18	11248-006-00	• LOCKNUT, 3/8-16 UNC .....	4
-19	61307-000-00	• SHAFT .....	1

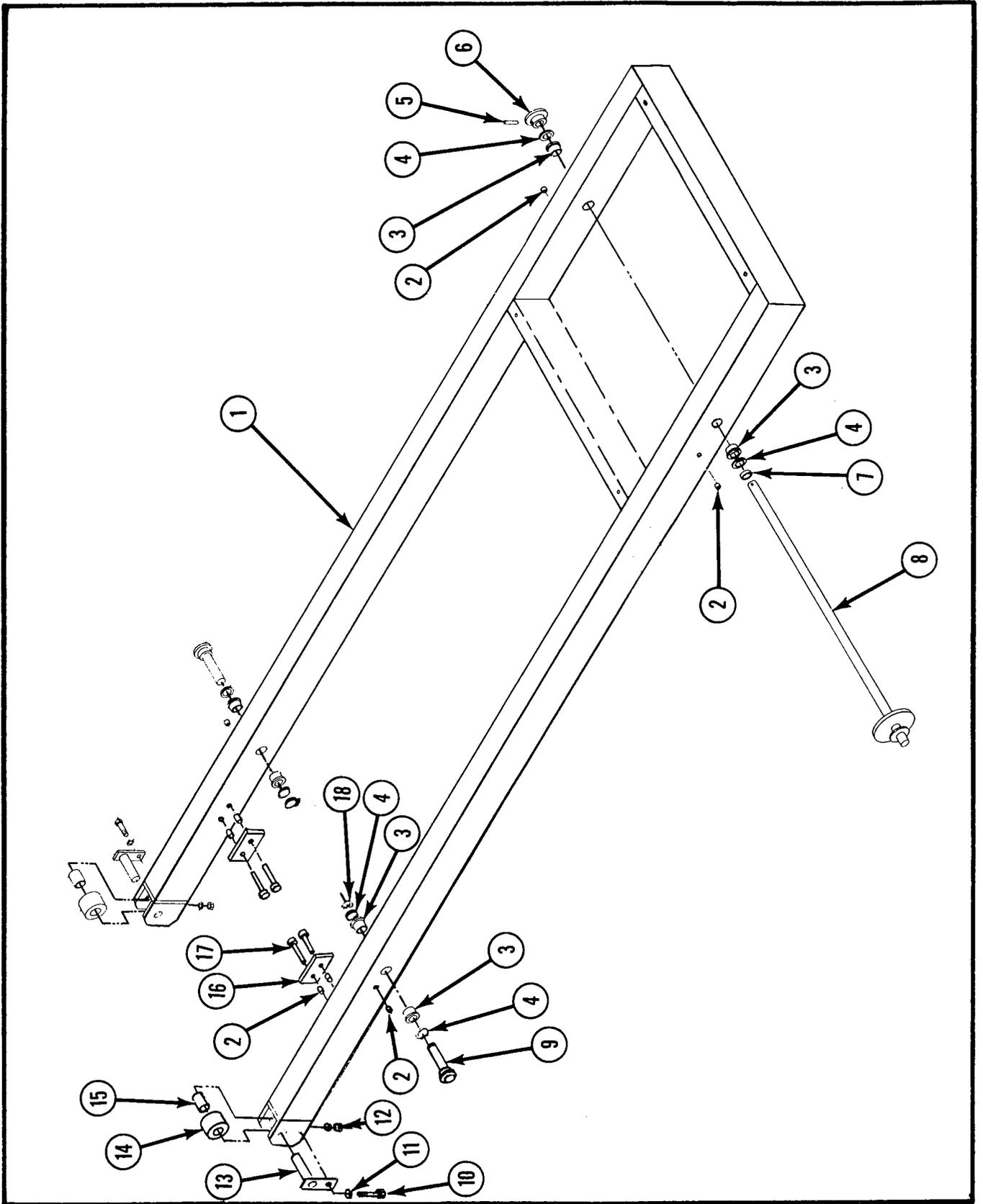


Figure 7-40. XL-14 Rolling Frame Assembly, Cantilever Cage

ITEM	PART	DESCRIPTION	QTY
7-40	61341-000-00	XL-14 ROLLING FRAME ASSEMBLY, ..... Cantilever Cage	REF
-1	61329-000-00	• ROLLING FRAME WELDMENT .....	1
-2	14252-004-00	• NUT SERT .....	8
-3	00173-000-00	• BUSHING .....	6
-4	06452-000-00	• WASHER, THRUST .....	6
-5	11735-020-00	• PIN, ROLL .....	1
-6	61359-000-00	• SPROCKET .....	1
-7	61340-000-00	• SPACER .....	1
-8	61313-000-00	• SHAFT WELDMENT .....	
-9	61310-000-00	• SHAFT WELDMENT .....	2
-10	11252-008-00	• SCREW, 1/4-20 UNC GR. 5 HHC X 1 .....	2
-11	11240-004-00	• WASHER, 1/4 DIA. STD. FLAT .....	4
-12	11248-004-00	• LOCKNUT, 1/4-20 UNC .....	2
-13	61304-000-00	• PIN WELDMENT .....	2
-14	61336-000-00	• ROLLER .....	2
-15	27931-010-00	• BEARING .....	2
-16	61323-000-00	• BLOCK, SLIDE .....	2
-17	11825-006-00	• SCREW, 1/4-20 UNC RD. HD. MACH X 3/4 .....	4
-18	11764-012-00	• RING, RETAINING .....	2

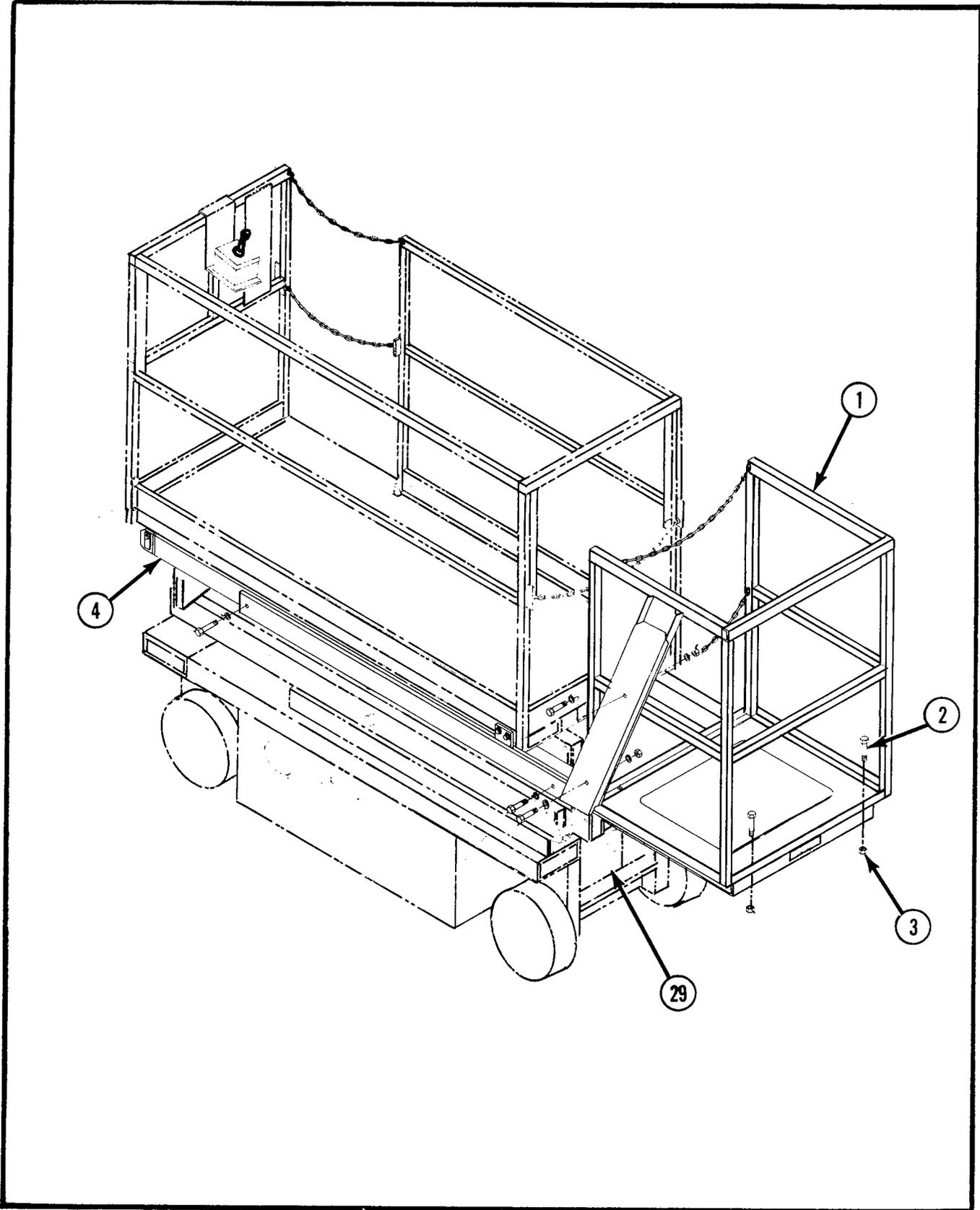


Figure 7-41a. Optional XL-19 Cantilever Cage Installation

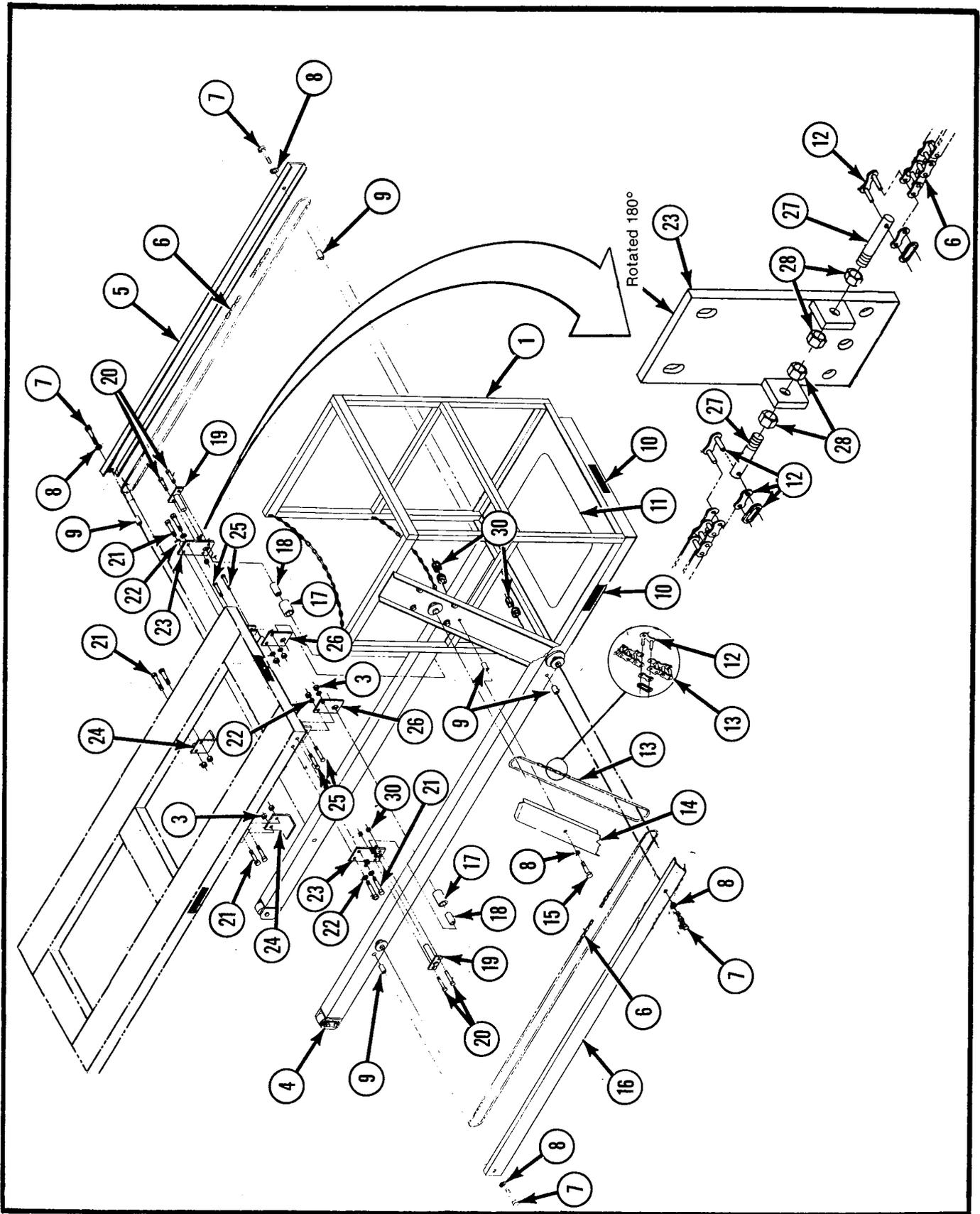


Figure 7-41b. Optional XI-19 Cantilever Cage Installation

ITEM	PART	DESCRIPTION	QTY
7-41	61600-000-00	OPTIONAL XL-19 CANTILEVER CAGE INSTALLATION . . . . .	REF
-1	61601-000-00	• XL-19 CAGE ASSEMBLY . . . . . (See Figure 7-43)	1
-2	11254-008-00	• SCREW, 3/8-16 UNC GR. 5 HHC X 1 . . . . .	4
-3	11248-006-00	• LOCKNUT, 3/8-16 UNC . . . . .	12
-4	61602-000-00	• ROLLING FRAME ASSEMBLY, CANTILEVER CAGE . . . . . (See Figure 7-44)	1
-5	61612-000-00	• GUARD, RH . . . . .	1
-6	05641-011-00	• CHAIN, ROLLER . . . . .	2
-7	11252-014-00	• SCREW, 1/4-20 UNC GR. 5 HHC 1 3/4 . . . . .	4
-8	11240-004-00	• WASHER, 1/4 DIA. STD. FLAT . . . . .	8
-9	17404-002-00	• SPACER . . . . .	6
-10	05652-000-00	• DECAL — MAX LOAD 250 LBS. . . . .	3
-11	61355-000-00	• SAFETY WALK . . . . .	1
-12	11884-003-00	• LINK, CONNECTING . . . . .	5
-13	05641-012-00	• CHAIN, ROLLER . . . . .	1
-14	61613-000-00	• GUARD . . . . .	1
-15	11252-016-00	• SCREW, 1/4-20 UNC GR. 5 HHC X 2 . . . . .	2
-16	61611-000-00	• GUARD, LH . . . . .	1
-17	61617-000-00	• ROLLER . . . . .	2
-18	27931-010-00	• BEARING . . . . .	4
-19	61615-000-00	• PIN WELDMENT . . . . .	2
-20	11252-008-00	• SCREW, 1/4-20 UNC GR. 5 HHC X 1 . . . . .	4
-21	11254-010-00	• SCREW, 3/8-16 UNC GR. 5 HHC X 1 1/4 . . . . .	8
-22	11240-006-00	• WASHER, 3/8 DIA. STD. FLAT . . . . .	4
-23	61318-000-00	• BRACKET WELDMENT . . . . .	2
-24	61610-000-00	• RETAINER . . . . .	2
-25	11741-010-00	• SCREW, 3/8-16 UNC GR. 5 FLAT HD SOC. X 1 1/4 . . . . .	4
-26	61609-000-00	• BRACKET . . . . .	2
-27	61322-000-00	• SCREW, ADJUSTMENT . . . . .	4
-28	11250-004-00	• NUT, 1/4-20 UNC STD. HEX . . . . .	8
-29	NO NUMBER	• XL-19 CANTILEVER CAGE CHASSIS COMPONENTS . . . . . (See Figure 7-42)	1
-30	11248-004-00	• LOCKNUT, 1/4-20 UNC . . . . .	6

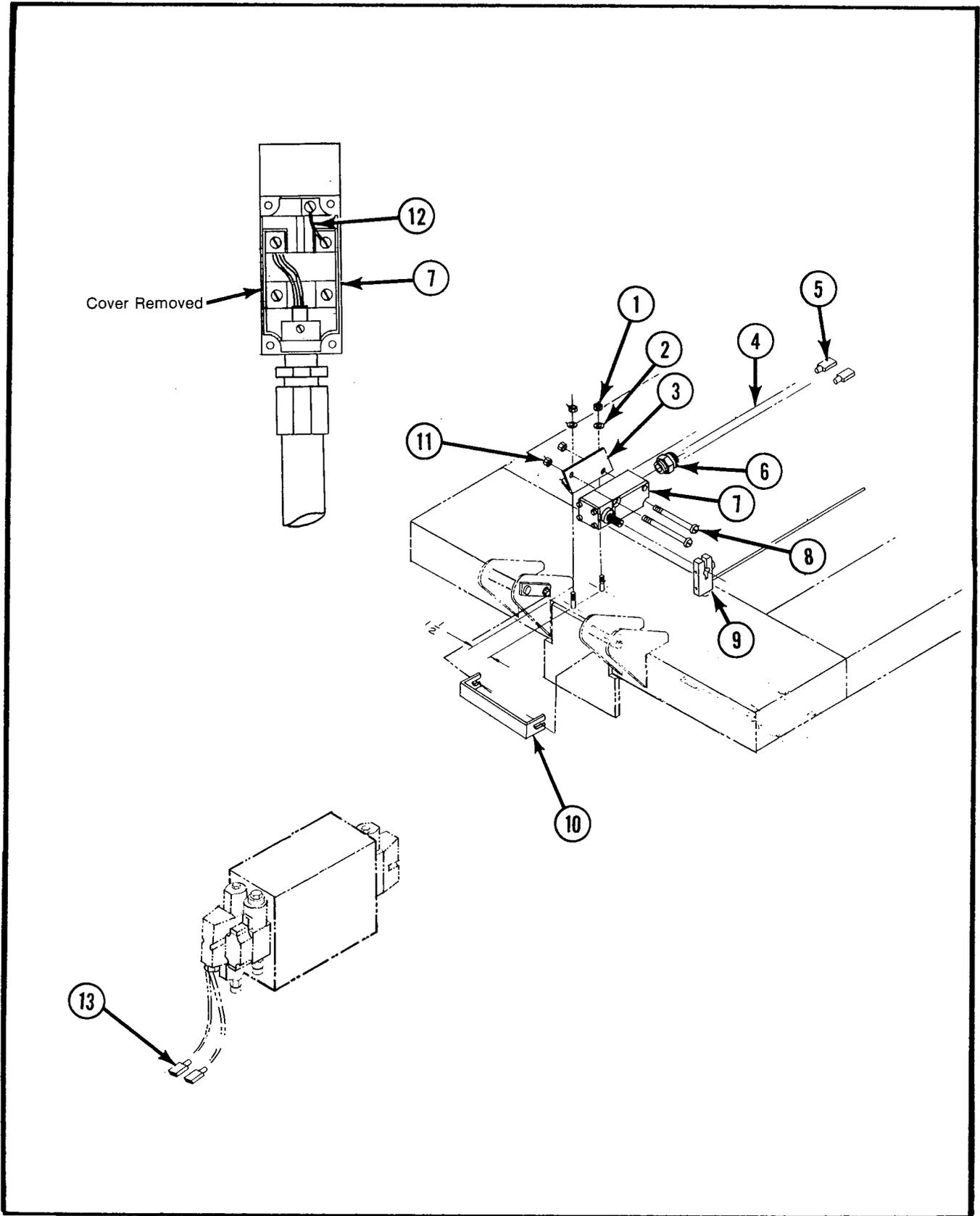


Figure 7-42. XL-19 Cantilever Cage Chassis Components

ITEM	PART	DESCRIPTION	QTY
7-42	NO NUMBER	XL-19 CANTILEVER CAGE CHASSIS COMPONENTS .....	REF
-1	11248-004-00	• LOCKNUT, 1/4-20 UNC .....	2
-2	11240-004-00	• WASHER, 1/4 DIA. STD. FLAT .....	2
-3	61614-000-00	• BRACKET .....	1
-4	29496-099-00	• CABLE .....	AR
-5	14914-001-00	• CONNECTOR, PUSH .....	2
-6	29925-000-00	• CONNECTOR, CABLE .....	1
-7	29859-001-00	• SWITCH, LIMIT .....	1
-8	11709-016-00	• SCREW, #10-24 UNC RD. HD. MACH. X 2 .....	2
-9	29860-000-00	• ACTUATOR .....	1
-10	61618-000-00	• GUARD, HOSE .....	1
-11	11248-003-00	• LOCKNUT, #10-24 UNC .....	2
-12	29452-099-00	• WIRE, 16 AWG BLACK .....	3 IN
-13	29931-003-00	• CONNECTOR, PUSH .....	2

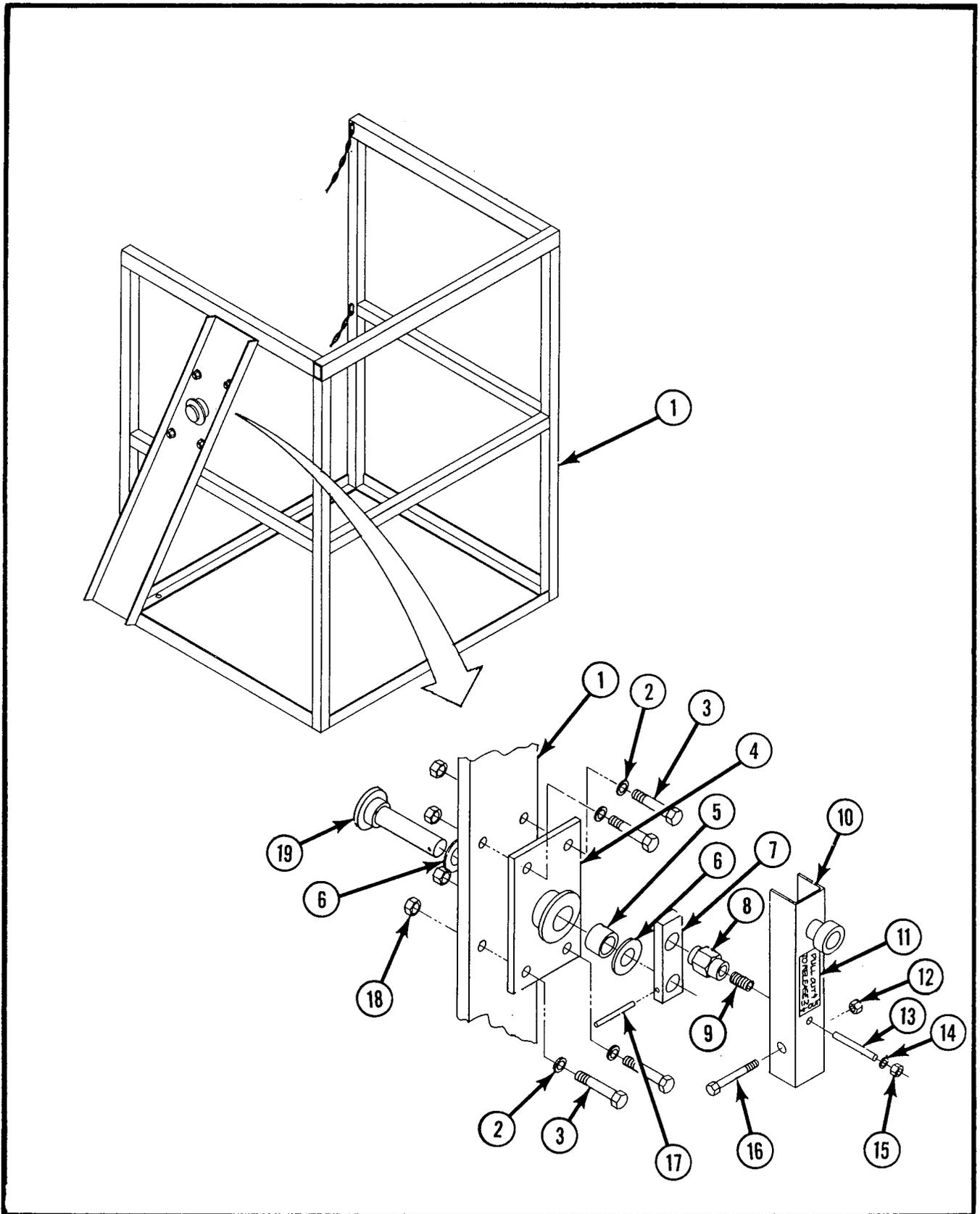


Figure 7-43. XL-19 Cage Assembly

ITEM	PART	DESCRIPTION	QTY
7-43	61601-000-00	XL-19 CAGE ASSEMBLY .....	REF
-1	61603-000-00	• CAGE WELDMENT .....	1
-2	11240-006-00	• WASHER, 3/8 DIA. STD. FLAT .....	4
-3	11254-008-00	• SCREW, 3/8-16 UNC GR. 5 HHC X 1 .....	4
-4	61316-000-00	• PLATE .....	1
-5	27931-018-00	• BEARING .....	1
-6	06452-000-00	• BEARING, THRUST .....	2
-7	05346-000-00	• ARM .....	1
-8	03443-001-00	• HOUSING .....	1
-9	05376-000-00	• SPRING .....	1
-10	61353-000-00	• HANDLE .....	1
-11	61352-000-00	• DECAL – PULL OUT .....	1
-12	11248-005-00	• LOCKNUT, 5/16-18 UNC .....	1
-13	05373-000-00	• PIN, RETAINING .....	1
-14	11240-004-00	• WASHER, 1/4 DIA. STD. FLAT .....	1
-15	11248-004-00	• LOCKNUT, 1/4-20 UNC .....	1
-16	11253-012-00	• SCREW, 5/16-18 UNC GR. 5 HHC X 1 1/2 .....	1
-17	11735-020-00	• PIN, ROLL .....	1
-18	11248-006-00	• LOCKNUT, 3/8-16 UNC .....	4
-19	61307-000-00	• SHAFT .....	1

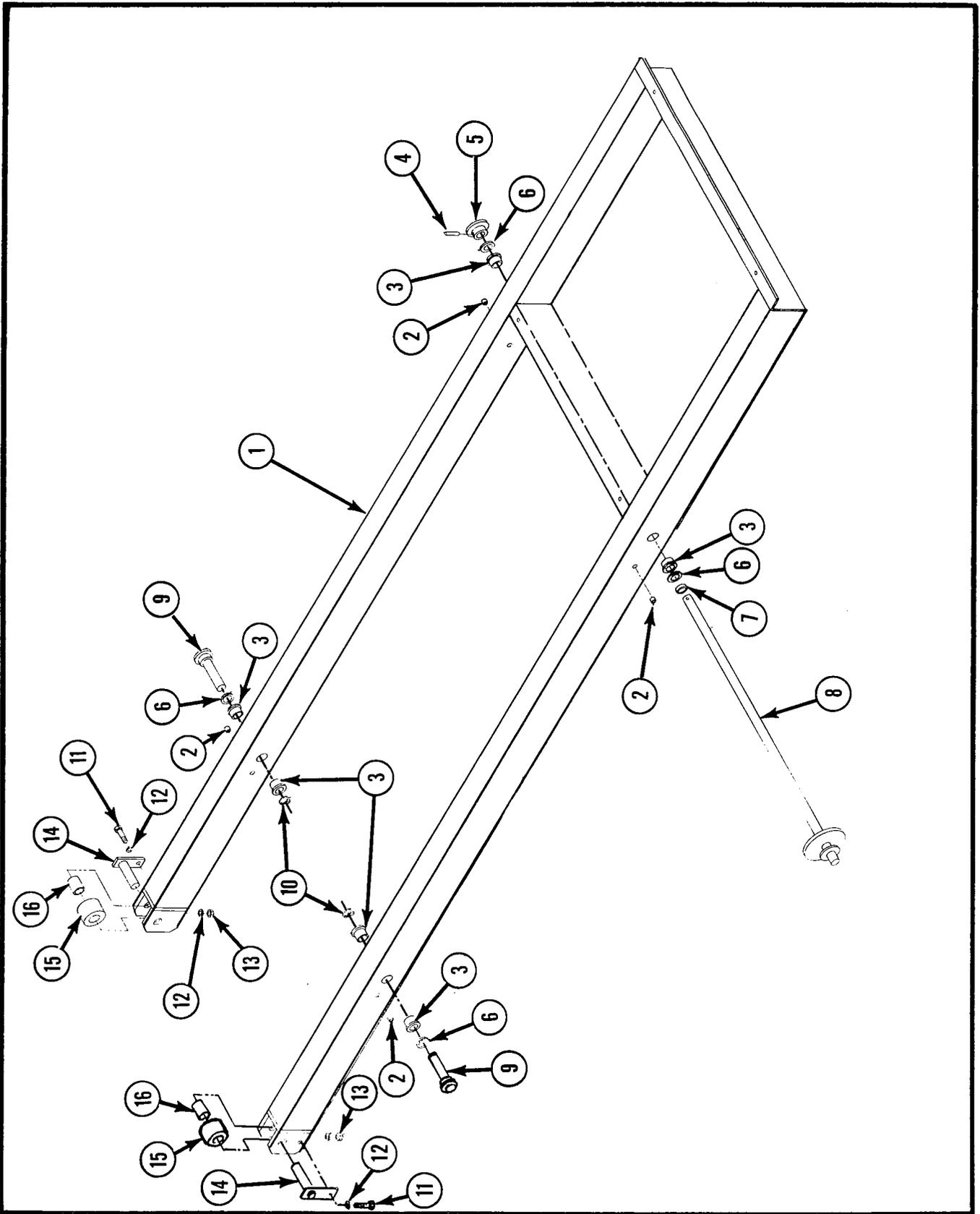


Figure 7-44. XL-19 Rolling Frame Assembly, Cantilever Cage

ITEM	PART	DESCRIPTION	QTY
7-44	61602-000-00	XL-19 ROLLING FRAME ASSEMBLY,..... Cantilever Cage	REF
-1	61604-000-00	• ROLLING FRAME .....	1
-2	14252-004-00	• NUT SERT .....	4
-3	00173-000-00	• BUSHING .....	6
-4	11735-020-00	• PIN, ROLL .....	1
-5	61359-000-00	• SPROCKET .....	1
-6	06452-000-00	• WASHER, THRUST .....	4
-7	61340-000-00	• SPACER .....	1
-8	61313-000-00	• SHAFT WELDMENT .....	1
-9	61310-000-00	• SHAFT WELDMENT .....	2
-10	11764-012-00	• RING, RETAINING .....	2
-11	11252-008-00	• SCREW, 1/4-20 UNC GR. 5 HHC X 1 .....	2
-12	11240-004-00	• WASHER, 1/4 DIA. STD. FLAT .....	4
-13	11248-004-00	• LOCKNUT, 1/4-20 UNC .....	2
-14	61304-000-00	• PIN WELDMENT .....	2
-15	61336-000-00	• ROLLER .....	2
-16	27931-010-00	• BEARING .....	2