

MXEM Manual Push/Electric Lift Stackers

Service Manual



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Model: MXEM-2200 Series (MXEM-2200-63, MXEM-2200-98, MXEM-2200-118)

MANUAL NO. BL-M22-1011

S/N _____

Customer _____

LIFT PRODUCTS, INC.

WARNING

Do not operate this truck unless you have been authorized and trained to do so, and have read all warnings and instructions in Operator's Manual and on this truck.

Do not operate this truck until you have checked its condition. Give special attention to wheels, battery, lift system (including forks or attachments, chains and cables), brake, steering mechanism, guards and safety devices.

Operate truck only from designated position. Do not place any part of your body into the mast structure or between the mast and the truck. Do not carry passengers. Keep feet clear of truck and wear foot protection.

Observe applicable traffic regulations. Yield right of way to pedestrians. Slow down at cross aisles and wherever vision is obstructed.

Start, stop, travel, steer and brake smoothly. Slow down for turns and on uneven or slippery surfaces that could cause truck to slide or overturn. Use special care when traveling without load as the risk of overturn may be greater.

Travel with lifting mechanism as low as possible. Always look in direction of travel. Keep a clear view, and when load interfered with visibility, travel with load trailing.

Use special care when operating on ramps travel slowly, and do not angle or turn. Travel with load downhill.

Do not overload truck. Check nameplate for capacity and load center information.

When using forks, space forks as far as apart as load will permit. Before lifting, be sure load is centered, forks are completely under load, and load is as far back as possible against load backrest.

Do not handle unstable or loosely stacked loads. Use special care when handling long, high or wide loads, to avoid losing the load, striking bystanders, or tipping the truck.

Do not handle loads which are higher than the load backrest unless load is secured so that no part of it could fall backward.

Elevate forks or other lifting mechanism only to pick up or stack a load. Watch out for obstructions especially overhead.

Do not allow anyone to stand or pass under load or lifting mechanism.

When leaving truck, neutralize travel control, fully lower lifting mechanism and set brake. When leaving truck unattended, also shut off power.

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SECTION 1 DESCRIPTION

1-1. INTRODUCTION

This publication describes the 12 volt MXEM lift truck distributed by Lift Products. Included are operating instructions, planned maintenance instructions, lubrication procedures, corrective maintenance procedures and a complete parts list with part location illustrations.

Users shall comply with all requirements indicated in applicable OSHA standards and current edition of A.N.S.I B56.1 Part II. By following these requirements and the recommendations contained in this manual, you will receive many years of dependable service from you MXEM Lift Truck.

1-2. GENERAL DESCRIPTION

The manually-propelled MXEM truck, Figure 1-2, lifts and transports payloads up to 2200 pounds on adjustable forks.

The mast handles are used to help control the lift truck. The control handle is used to propel and steer the lift truck. Lift and Lower are controlled by a lever located near the operator.

The model number will be found on the nameplate (Figure 1-1) along with the serial number, lifting capacity and load center. Figure 1-2 shows the locations of the truck's main components and controls.

1-3. SAFETY FEATURES

The MXEM is designed and engineered to provide maximum safety for operator and payload. Some of the safety features incorporated in to the design are:



Figure 1-1 Name Plate

- Foot actuated floor lock.
- Positive steer tracking caster.
- Lift control automatically returns to "OFF" when released.
- Mast handles and steering handle to provide a firm for operator.
- High visibility color scheme of truck provides visual alert of truck's presence.
- Volt meter.
- Key switch.

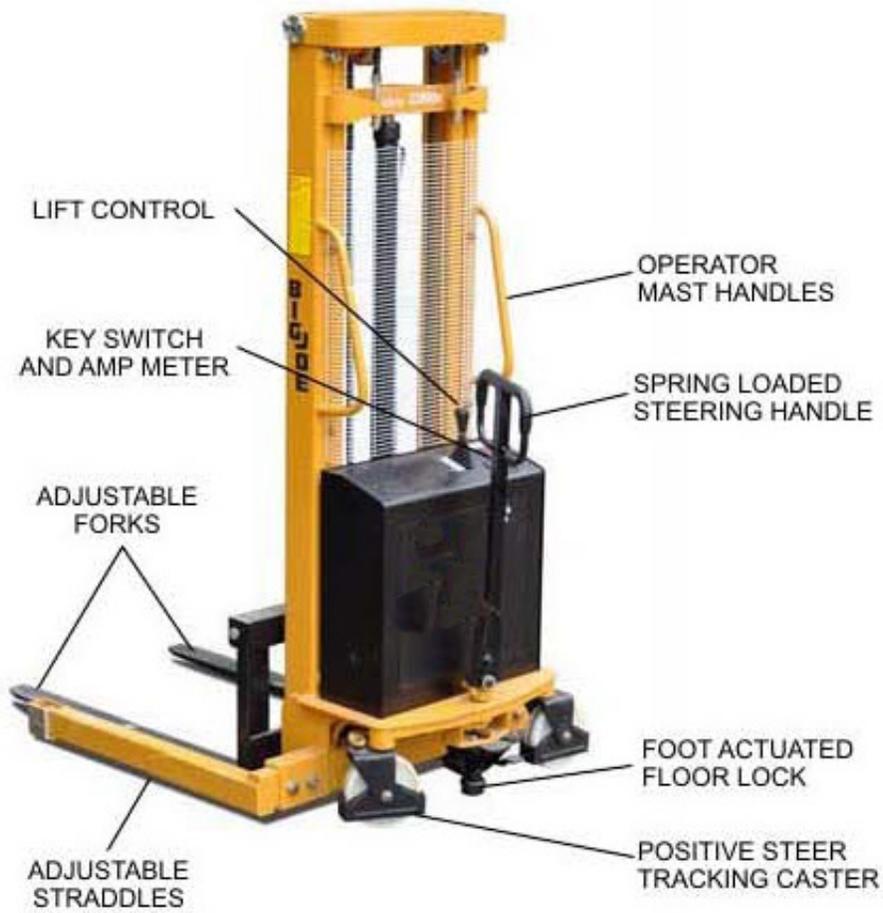


Figure 1-2. MXEM Lift Truck

SECTION 2 OPERATION

2-1. GENERAL

The following paragraphs describe the controls and various involved in proper operation of the lift truck.

2-2. OPERATING PRECAUTIONS

WARNING: Improper operation of the lift truck may result in operator injury, or load and/or lift truck damage. Observe the following precautions when operating the MXEM lift truck.

The following safety precautions must be adhered to at all times.

1. Turn off the key switch and remove the key when leaving the table.
2. Leave the load in the full down position for overnight storage.
3. Engage the floor lock before leaving the lift truck.
4. Center the load as far as possible toward the back rest. Never lift a load on the fork tips or on one fork blade.
5. Do not attempt to lift a load heavier than the rated capacity of the truck. Check that the center of gravity of the load is not beyond the load center listed on the name plate (Figure 1-1). See Figure 2-1 for an explanation of load center.
6. Check for obstructions before raising or lowering a load.

7. Lower the load before traveling. If it is necessary to move the load while raised, travel cautiously and use extra care when turning.

2-3. BEFORE OPERATION

Table 2-1 covers important inspection points on the MXEM lift truck which should be checked prior to operation. Depending on use some trucks may require additional checks.

Figure 2-2 shows a sample format for an Operator check list, which can be modified as necessary to fit your application.

WARNING: Periodic maintenance of this truck by a QUALIFIED TECHNICIAN is required.

CAUTION: A QUALIFIED SERVICE TECHNICIAN should check the truck monthly for proper lubrication, proper fluid levels, brake maintenance, motor maintenance and other areas specified in the SECTION 3.

WARNING: If the truck is found to be unsafe and in need of repair, or contributes to an unsafe condition, report it immediately to the designated authority. Do not operate it until it has been restore to a safe operating condition. Do not make any unauthorized repairs or adjustments. All service must be performed by a qualified maintenance technician.

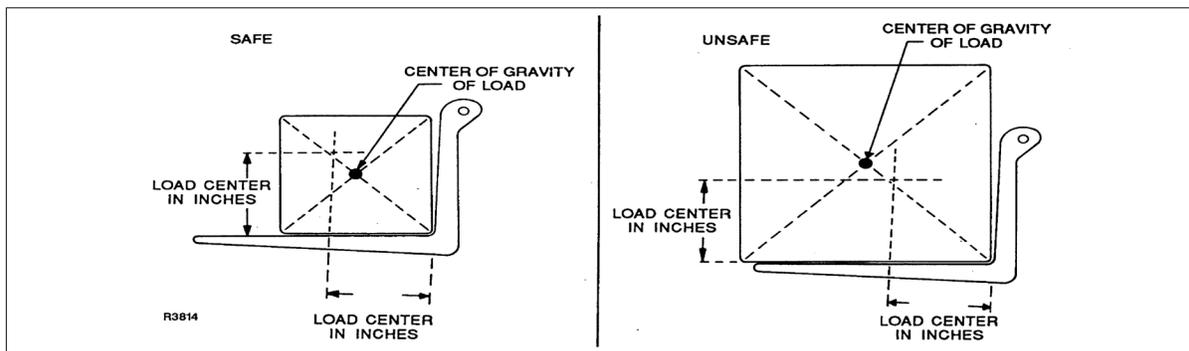


Figure 2-1 Load Center

Table 2-1 Operator Checks

ITEM	PROCEDURE
Hydraulic System	Check for signs of fluid leakage.
Forks	Check for cracks and damage and that they are properly secured.
Chains, cables and hoses	Check that they are in place, properly secured and not damaged.
Guards	Check that safety guards are in place, properly secured and not damaged.
Safety Signs	Check that warning labels, nameplates, ect. are in good condition and legible.
Wheels	Check wheels for cracks or damage. Move the truck to check load wheel and casters for freedom of rotation.
Lift & Lower	Check operation of lift and lower to their maximum positions.
Floor Lock	Check that the floor lock holds the truck stationary.
Lift Motor	Check for grinding or laboring sounds.



Electric Truck
Daily Operator Check-Off List

Date _____ Operator _____

Truck No. _____ Model No. _____

Dept. _____ Shift _____

Hour Meter
Reading—Drive _____ Hoist _____

Check	O.K. (✓)	Need Maintenance
Casters		
Load Wheels		
Lift - Lower Control		
Forward & Reverse		
Steering		
Floor Lock		
Hydraulic Leaks, Cylinder, Valve, Hoses, Etc.		

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Figure 2-2 Sample of Operator Check List

2-4. INSTRUMENTS AND CONTROLS

2-4.1. Instrument Panel

The instrument panel contains the key switch, lift/lower control lever, volt meter, and charging indicators.

2-4.2. Foot Actuated Floor Lock

The foot actuated floor lock is used to hold the truck stationary.

2-4.3. Operator Mast Handles

The operator mast handles located on each side of the mast are used to help control the truck.

2-4.4. Spring Loaded Steering Handle

The spring loaded steering handle is used to propel and steer the lift truck. Its is linked to the left caster to provide positive steer tracking.



Figure 2-3. MXEM Lift Truck

2-5. TRANSPORT

2-5.1. Moving, (Positioning) and Stopping

1. Check that the load is in the down position before traveling.
2. Release the floor lock.
3. Apply pressure to the steering handle and mast handles to move the truck forward. Pull evenly on the steering handle to move the truck backward.
4. To stop the lift truck, hand restraint against the steering handle and mast handles is usually adequate.
5. After the lift truck has stopped, always engage the floor lock before lifting or lowering and when parking.

2-5.2 Turning

1. Release the floor lock.

NOTE: Turning and maneuvering the lift truck is made easier if the truck is in motion.

2. Begin rolling the truck and simultaneously apply side pressure to the steering handle to cause the caster wheels to swivel.

2-6. OPERATING THE LIFT

WARNING: Check the space above the load on the forks to ensure that the load will not strike any obstruction while being raised.

1. Turn the key switch ON.
2. To raise the forks, pull the lift control back and hold until the forks reach the desired height. The forks will raise at a fixed speed. Return the lift control to the neutral position.
3. To lower the forks, push the lift control forward and hold until the forks reach the desired level. The lowering speed can be controlled by the lever. Return the lift control to the neutral position.

2-7. LOADING AND UNLOADING

1. Move the truck to the location where the load is to be picked up.
2. Adjust the forks to the maximum practical width to support the load.
3. Raise the forks to the desired height for entry under the load.
4. Move the lift truck into position so that the forks are centered under the load.
5. Move the lift truck forward to place the load as far back as possible toward the lift carriage. Raise the forks to the load.

CAUTION: To avoid spilling the load move slowly and use extra caution when turning.

6. Move the lift truck backward from the loading position.
7. When the load is clear of its rack, lower the load, leaving enough floor clearance to maneuver the truck.
8. Push or pull the truck carefully to the area where the load is to be placed.
9. Align the lift truck with its new position.
10. Raise the forks to the desired height and slowly move the lift truck into position for off-loading.

CAUTION: The load must rest squarely on its rack when it is lowered into position.

11. When the load is in position, lower the forks until the pallet rest on its rack and the forks are free.
12. Slowly move the lift truck backward, checking that the forks do not catch on the pallet or rack.
13. Lower the forks when they are clear.
14. Proceed to move the next load.

2-8. PARKING

When finished with moving loads, lower the forks and move the lift truck to its maintenance or storage area. Engage the floor lock. Turn off the key switch and charge the battery if required. Refer to battery care instruction in SECTION 3

SECTION 3 PLANNED MAINTENANCE

3-1. GENERAL

Planned maintenance consists of periodic visual and operational checks, parts inspection, lubrication, and scheduled maintenance designed to prevent or discover malfunctions and defective parts. The operator performs the checks in SECTION 2, and refers any required servicing to a qualified maintenance technician who performs the scheduled maintenance and any required servicing.

CAUTION: Gases produced by a battery can be explosive. Do not smoke, use an open flame, create an arc or sparks in the vicinity of the battery. Ventilate an enclosed area well when charging.

CAUTION: Batteries contain sulfuric acid which may cause severe burns. Avoid contact with eyes, skin or clothing. In case of contact flush immediately and thoroughly with clean water. Obtain medical attention when eyes are affected. A baking soda solution (one pound to one gallon of water) applied to spilled acid until bubbling stops, neutralizes the acid for safe handling and disposal.

3-2. MONTHLY AND QUARTERLY CHECKS

Table 3-1 is a monthly and quarterly inspection and service chart based on normal usage of equipment eight hours per day, five days per week. If the lift truck is used in excess of forty hours per week, the frequency of inspection and service should be increased accordingly. These procedures must be performed by a qualified service technician or your Lift Products Service Representative.

Leakage voltage from battery terminals to battery case can cause misleading trouble symptoms with the truck's electrical system. Since components of the truck's electrical systems are insulated from truck frame, leakage voltage will not normally affect truck operation unless a short circuit or breakdown of circuit wire insulation to truck occurs.

3-3. BATTERY CARE

3-3.1 General

The care and maintenance of the battery is very important to obtain efficient truck operation and maximum battery life.

A voltage check from battery connector terminal to battery case should indicate near zero volts. Typically, however, the sum of the voltages at both terminals will equal battery volts. This leakage voltage will discharge the battery. As battery cleanliness deteriorates, the usable charge of the battery decreases due to this self discharge.

Table 3-1 Monthly and Quarterly Inspection and Service Chart

VISUAL CHECKS	
INTERVAL	INSPECTION OR SERVICE
Daily	Check battery condition. Check cables for good contact with terminal posts.
Daily	Observe performance of truck. Check any improper operation.
Weekly	Check floor lock.
Monthly	Inspect hoses and fitting for leaks.
Monthly	Check wiring for loose connections and damaged insulation.
Monthly	Check load wheels for wear.
Monthly	Check caster wheels for wear.
Monthly	Check lift tension, lubrication & operation (see paragraph 3-6).
Quarterly	Check lift cylinder for leakage.
Semi-annually	Inspect for chain wear (see SECTION 8)

Although a leakage voltage of zero volts may not be possible, a cleaner battery will have more usable charge for truck operation and not affect operation of electronic devices on the unit.

3-3.2. SAFETY RULES

- Wear protective clothing, such as rubber apron, gloves, boots and goggles when performing any maintenance on batteries. Do not allow electrolyte to come into contact with eyes, skin, clothing or floor. If electrolyte comes in contact with eyes, flush immediately and thoroughly with clean water. Obtain medical attention immediately. Should electrolyte be spilled on skin, rinse promptly with clean water and wash with soap. A baking soda solution (one pound to one gallon of water) will neutralize acid spilled on clothing, floor or any other surface. Apply solution until bubbling stops and rinse with clean water.
- Do not bring any type of flame, spark, ect., near the battery. Gas formed while the battery is charging, is highly explosive. This gas remains in the cells long after charging has stopped.
- Do not ay metallic or conductive objects on battery. Acing will result.
- Do not touch non-insulated parts of DC output connector or battery terminals to avoid possible electrical shock.
- Do not charge a frozen battery.

3-3.3 BATTERY CARE AND CHARGING

CAUTION: Never smoke or bring open flame near the battery. Gas formed during charging is highly explosive and can cause serious injury.

1. Charge the battery only in areas designated for that use.
2. Battery terminals should be checked and cleaned of corrosion regularly. Good battery terminal contact is essential not only for operation, but also for proper charging of the battery.

3. The charging requirements will vary depending on the use of the truck.
4. Make certain battery used meets weight and size requirements of truck. NEVER operate truck with an undersized battery.

3-3.4 BATTERY CLEANING

Always keep vent plugs tightly in place when cleaning battery. When properly watered and charged, the battery will remain clean and dry. All that is necessary is to brush or blow of any dust or dirt that may accumulate on them. However, if electrolyte is spilled or overflows from a cell, it should be neutralized with a solution of baking soda and water, brushing the soda solution beneath the connectors and removing grime from the covers. Then rinse the battery with cool water from a low pressure supply to remove the soda and loosen dirt. If batteries stay wet consistently, they may be either overcharged or over filled. This condition should be investigated and corrected.

3-4. CHARGING BATTERIES

3-4.1. BATTERY CHARGER AND INDICATORS

The battery charger is fully automatic changing from fast, trickle and float charge according to the battery voltage.

Three indicators on the control panel indicate battery and charger status. Red indicates low battery voltage. Yellow indicates charger is plugger in and operating correctly. Green indicator comes on a 90% charge state and indicates trickle charge mode. When the battery is fully charged, the charger will change to float charging, keeping the battery in optimum charging state.

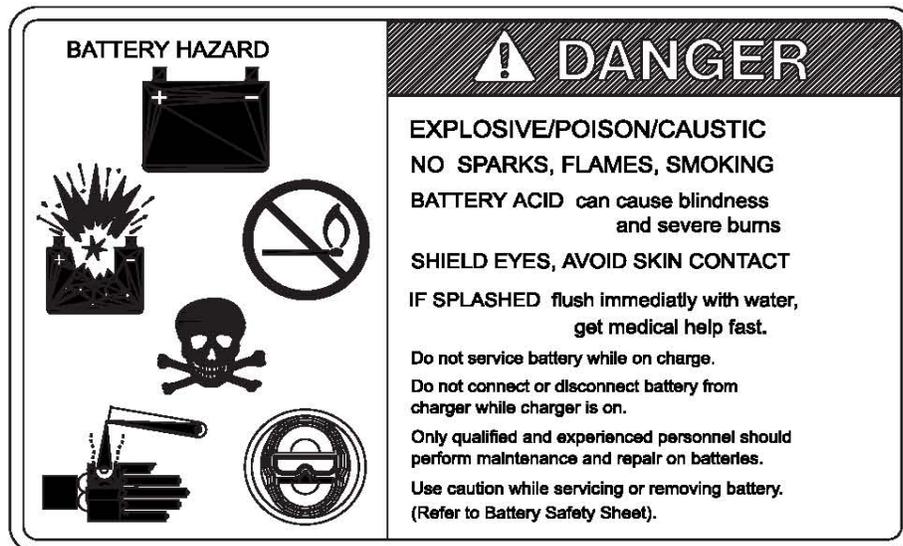
During normal operation, if the red indicator starts to flash, the battery voltage is too low and needs charging. Continued operation will eventually cut off power automatically.

3-4.2. CHARGING

Charging requirements will vary depending on depth of discharge and temperature. Follow safety rules when placing a battery on charge.

Proceed as follows:

1. Park truck at charging station with carriage lowered and turn the key switch off.
2. Check the condition of the AC cord and battery cables. If there are any cuts in the cable, any exposed wires, loose plugs or connectors, DO NOT attempt to charge the batteries. Contact appropriate personnel for repairs to be made.
3. Connect the charger AC cord to the appropriate power supply.
4. The yellow light indicates that power is connected.
5. The red light will flash while charging the battery.
6. When the battery reaches 90% charge, the charger will convert the trickle charge and the green indicator will come on.
7. Unplug the power cord when finished charging or keep it on to keep the battery in a float charge state.



3-5. LUBRICATION

Refer to Table 3-2 for the recommended types of grease and oil. Table 3-3 in conjunction with Figure 3-1 identifies with items requiring lubrication.

3-6. LIFT CHAIN MAINTENANCE

Fully raise and lower lift carriage while observing chains as they move over chain sheaves. Ensure chain is aligned and tracking properly and all links are pivoting freely. With lift carriage fully lowered, spray or brush on a film of SAE 30 or 40 engine oil.

**TABLE 3-2 Recommended Lubricants
(See Table 3-3 for Application)**

No.1	Grease-Lithium base, general purpose.
No.2	Hydraulic oil-Heavy duty with a viscosity of 150 SUS foam suppressing agent and rust and oxidation inhibitors. Hydraulic oil-Heavy duty with a viscosity of 100 SUS foam suppressing agent and rust and oxidation inhibitors (Note)
No.3	SAE 30 or 40 Engine lubricating oil

NOTE: USED ON COLD CONDITIONED TRUCKS



Figure 3-1 Lubrication Diagram

Table 3-3 Lubrication Chart

FIG. 3-2 INDEX NO.	LOCATION	METHOD OF APPLICATION	TYPE (TABLE 3-3)	APPLICATION OF LUBRICANT
1	Lift Carriage	Brush	No. 1	Light coating where forks slide.
2	Mast	Brush	No. 1	Full length of channel where rollers operate.
3	Lift Chain	Brush or Spray Can	No. 3	See paragraph 3-6.
4	Hydraulic Reservoir Capacity-1 quarts		No. 2	With lift carriage fully lowered, fill reservoir with hydraulic oil to 1 inch below opening.

SECTION 4 TROUBLESHOOTING

4-1. GENERAL

This section gives fixes for some common problems that may arise while operating the lift truck. Table 4-1 lists these malfunctions, their cases, probable and corrective action that will resolve the problem.

Table 4-1 Troubleshooting Chart

MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
Oils sprays or flows from the top of lift cylinder.	Defective packing in lift cylinder.	Overhaul lift cylinder and install new packing, seal, and wiper ring.
Oil splashes out of vent cap when lowering forks.	Oil level too high.	Drain, then refill reservoir leaving 1 inch air space when forks are in lowest position.
Squealing sound when lifting.	a. Oil level low. b. Dry mast channels. c. Defective mast or carriage bearings.	Check and add oil as necessary. Apply grease. Replace bearing
Forks do not lift to top.	Oil level low.	Add oil.
Oil leaks at hydraulic pump.	Defective pump.	Replace pump assembly.
Lift control does not return to neutral.	a. Foreign particles. b. Defective pump.	Clean system. Replace pump assembly.
Weak, slow or uneven action of hydraulic system.	a. Defective pump. b. Defective lift cylinder. c. Load exceeds capacity. d. Battery specific gravity low.	Replace pump assembly. Repair or replace. See data plate. Charge battery.
Forks do not lift, motor does not run.	a. Battery discharged. b. Defective wiring. c. Defective motor.	Check. Recharge if required. Check and repair as required. Replace pump assembly.
Forks do not lift, motor runs.	Defect in hydraulic system.	Check hydraulic oil level. Check oil lines to lift cylinder and repair as required.
Forks creep down with or without load.	a. Oil bypassing in pump or control valve. b. Work lift cylinder packing. c. Leak in hydraulic system.	Replace pump assembly. Replace worn parts. Check for leaky hose or fittings in hydraulic system.
Truck moves when floor lock is engaged.	Defective floor lock.	Replace.

NOTES

SECTION 5 LIFT SYSTEM SERVICING

5-1. GENERAL

This section covers maintenance and repair procedures for the lift system. The lift system consists of:

- Inner mast assembly
- Lift carriage
- Lift forks
- Lift chain

The lift cylinder is considered part of the hydraulic system and is covered in SECTION 6.

5-2 LIFT CHAIN WEAR INSPECTION

Both lift chains should be replaced when either chain is worn enough to increase its length by 3% or more. To make this determination proceed as follows.

Using a section of chain that sees the most frequent operation over the chain sheaves, isolate a vertical portion under tension from the weight of carriage and forks.

Measure the distance between pin centers on 20 vertical links. If the section measures 12.88" or more, the chain should be replaced.

New chain anchor pins should be installed when chains are replaced. Never replace a partial section of chain and never repair a damaged chain. Refer to paragraph 5-4. when installing new chain.

5-3. LIFT CHAINS ADJUSTMENT

5-3.1. 63 Inch Lift

1. Lower the carriage fully, then disconnect battery.

CAUTION: At least 3 full treads must be present below bottom hex nut (58, Figure 5-1) after completion of adjustment.

2. Loosen the top jam nuts (58) on the adjusting bolts (59).

WARNING: Before attempting any adjustment, make certain power is disconnected.

3. Take up slack in both chains by turning the button nuts (58) on adjusting bolts (59). Try to get equal tension on both chains.

4. Align adjusting bolts (59) so that they are parallel to the mast.

5. Tighten the jam nuts (58) while maintaining alignment of the adjusting bolts.

5-3.3. 98 and 118 Inch Lift

1. Lower the carriage fully, then disconnect battery.

CAUTION: At least 3 full treads must be present below bottom hex nut (62, Figure 5-2) after completion of adjustment.

2. Loosen the top jam nuts (62) on the adjusting bolts (72).

WARNING: Before attempting any adjustment, make certain power is disconnected.

3. Take up slack in both chains by turning the tom nuts (62) on adjusting bolts (72). Try to get equal tension on both chains.

4. Align adjusting bolts (72) so that they are parallel to the mast.

5. Tighten the jam nuts (62) while maintaining alignment of the adjusting bolts.

5-4. LIFT CHAINS REPLACEMENT

5-4.1. 63 Inch Lift

1. Place a solid support on the floor under the vertical members nearest the center of lift carriage.

2. Lower the carriage until it is supported by the support and the chains are slack, then disconnect battery.

WARNING: Before attempting any adjustment, make certain power is disconnected.

3. Remove master link lock (60, Figure 5-1), plate (61) and link (62) that secure chain (68) to the lift carriage.

4. Remove master link lock (60), plate (61) and link (62) that secure the chain (68) to adjusting bolt (59).

5. Remove the chain from sheave (70).

6. Position new chain in place on sheave (70).

7. Connect chain (68) to adjusting bolt (59) with master link lock (60), plate (61) and link (62).
8. Connect the opposite end chain (68) to the carriage with master link lock (60), plate (61) and link (62).
9. Replace the remaining chain in the same manner.
10. Adjust chains according to paragraph 5-3.

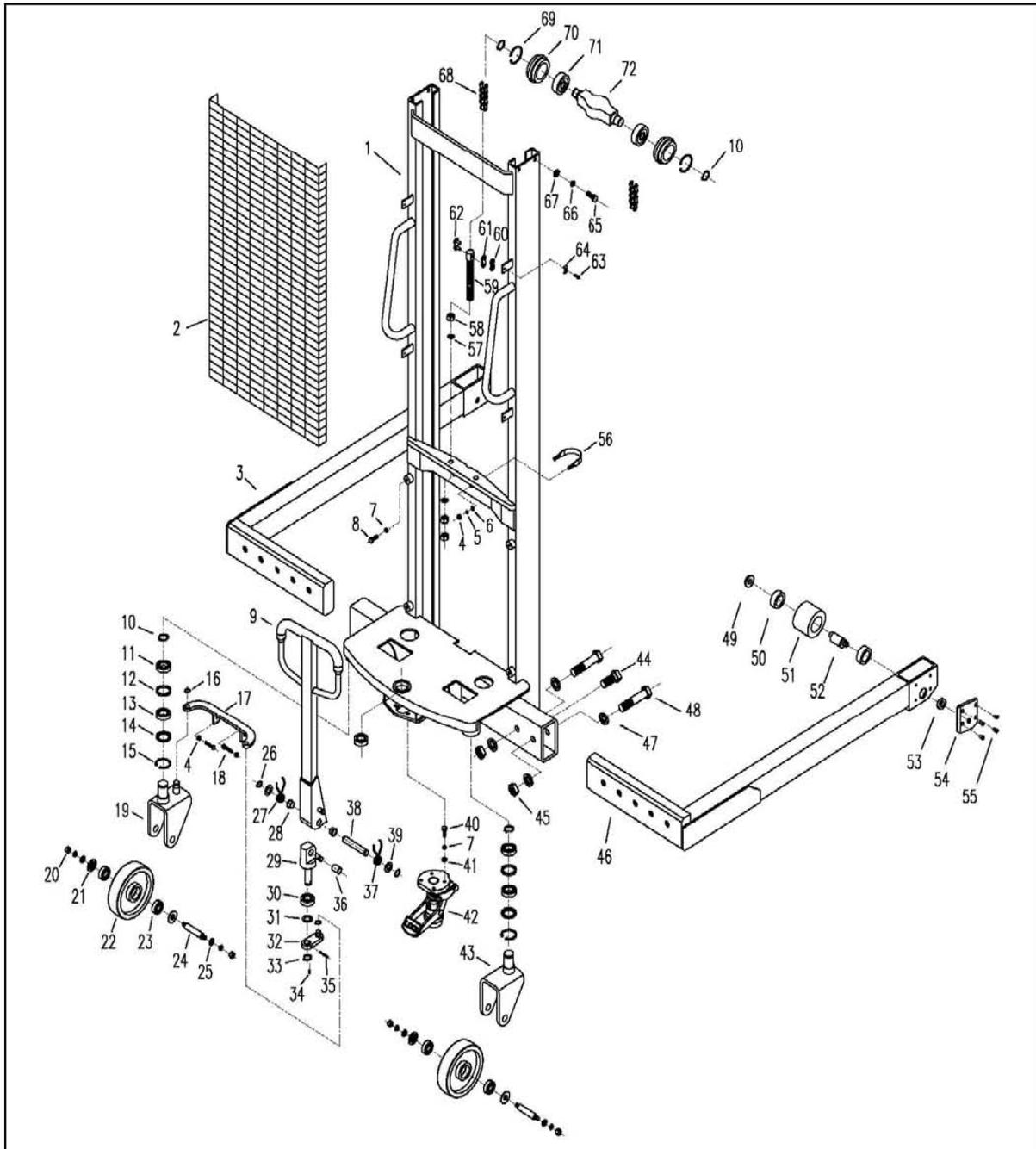


Figure 5-1. Frame (63 Inch Lift)

5-4.2. 98 and 118 Inch Lift

1. Place a solid support on the floor under the vertical members nearest the center of the lift carriage.
2. Lower the carriage until it is supported by the support and the chains are slack, then disconnect the battery.

WARNING: Before attempting any adjustment, make certain power is disconnected.

3. Remove cotter pin (73) and clevis pin (74) that secure chain (75) to the lift carriage.

4. Remove cotter pin (73) and clevis pin (74) that secure chain (75) to adjusting bolt (72).
5. Remove the chain from sheave (76).
6. Position new chain in place on sheave (76).
7. Connect chain (75) to adjusting bolt (72) with clevis pin (74) and cotter pin (73).
8. Connect the opposite end of chain (75) to the lift carriage with clevis pin (74) and cotter pin (73).
9. Replace the remaining chain in the same manner.
10. Adjust chains according to paragraph 5-3.

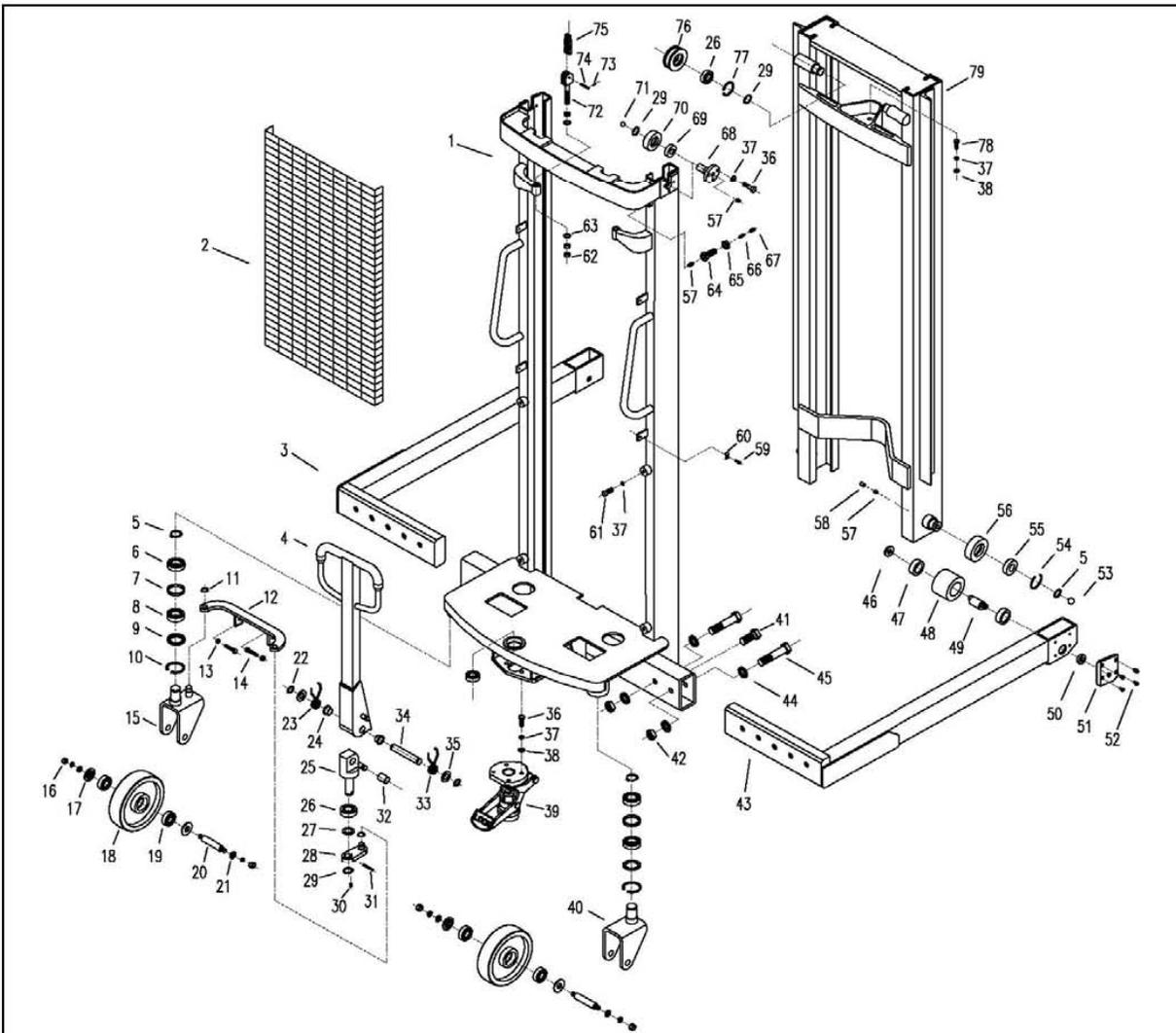


Figure 5-2. Frame (98 and 118 Inch Lift)

5-5. LIFT FORKS

Check the lift forks periodically for cracks and other damage.

5-5.1. REMOVAL

1. Completely lower the carriage until the chains are slack then disconnect battery.
2. Remove snap ring. (7, Figure 5-3 or Figure 5-4)
3. While supporting the forks (2), remove shaft (5).
4. Remove bolts (5), wear plates (4) and shims (5).

5-5.2. INSTALLATION

1. Install wear plates (4, Figure 5-3 or Figure 5-4), shims (5) and bolts (5).
2. Position the forks (2) in carriage (1).
3. Install shaft (5) through carriage (1) while aligning the mounting holes of forks (2).
4. Install snap ring (7).
5. If necessary, adjust the amount of shims (5) the align the forks.

5-6. LIFT CARRIAGE

5-6.1. 63 Inch Lift

1. Completely lower the carriage until the chains are slack, then disconnect battery.
2. Remove the lift chains as described in paragraph 5-4.
3. Using a suitable lifting device attached to the lift carriage, slowly raise the carriage out of the mast.
4. Remove snap ring (8, Figure 5-3), axle (9) and guide wheel (10) from bracket (11).
5. Remove snap ring (7) and roller (14) from carriage (1).
6. Remove snap ring (12) and bearing (13 from roller (14).
7. Install the lift carriage in the reverse order of removal.

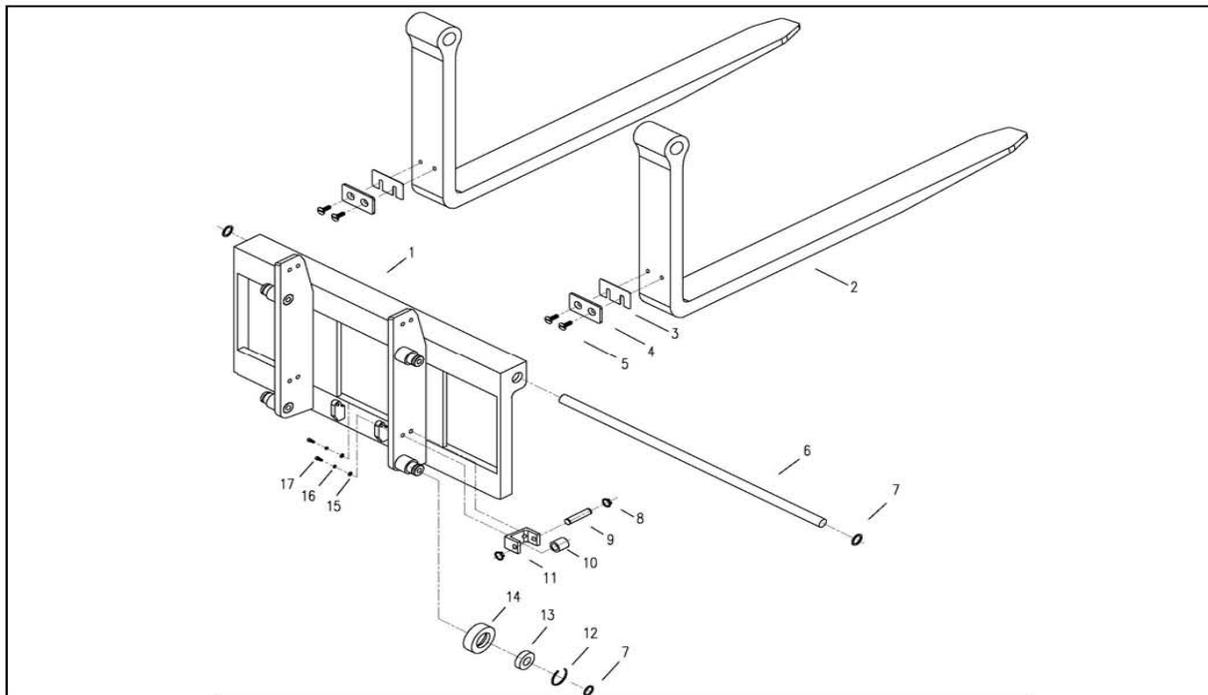


Figure 5-3. Lift Carriage (63 Inch Lift)

5-6.2. 98 and 118 Inch Lift

1. Place a solid support on the floor under the vertical members nearest the center of the lift carriage.
2. Lower the carriage until it is supported by the support and the chains are slack, then disconnect the battery.
3. Remove the lift chains as described in paragraph 5-4.
4. Remove the lift cylinder as described in paragraph 5-8.
5. Using a suitable lifting device attached to the inner mast (79, Figure 5-2), slowly raise the inner mast until the lift carriage is free.
6. Remove snap ring (8, Figure 5-4), axle (9) and guide wheel (10) from bracket (11).
7. Remove snap ring (7) and roller (14) from carriage (1).
8. Remove snap ring (12) and bearing (13) from roller (14).
9. Install the lift carriage in the reverse order of removal.

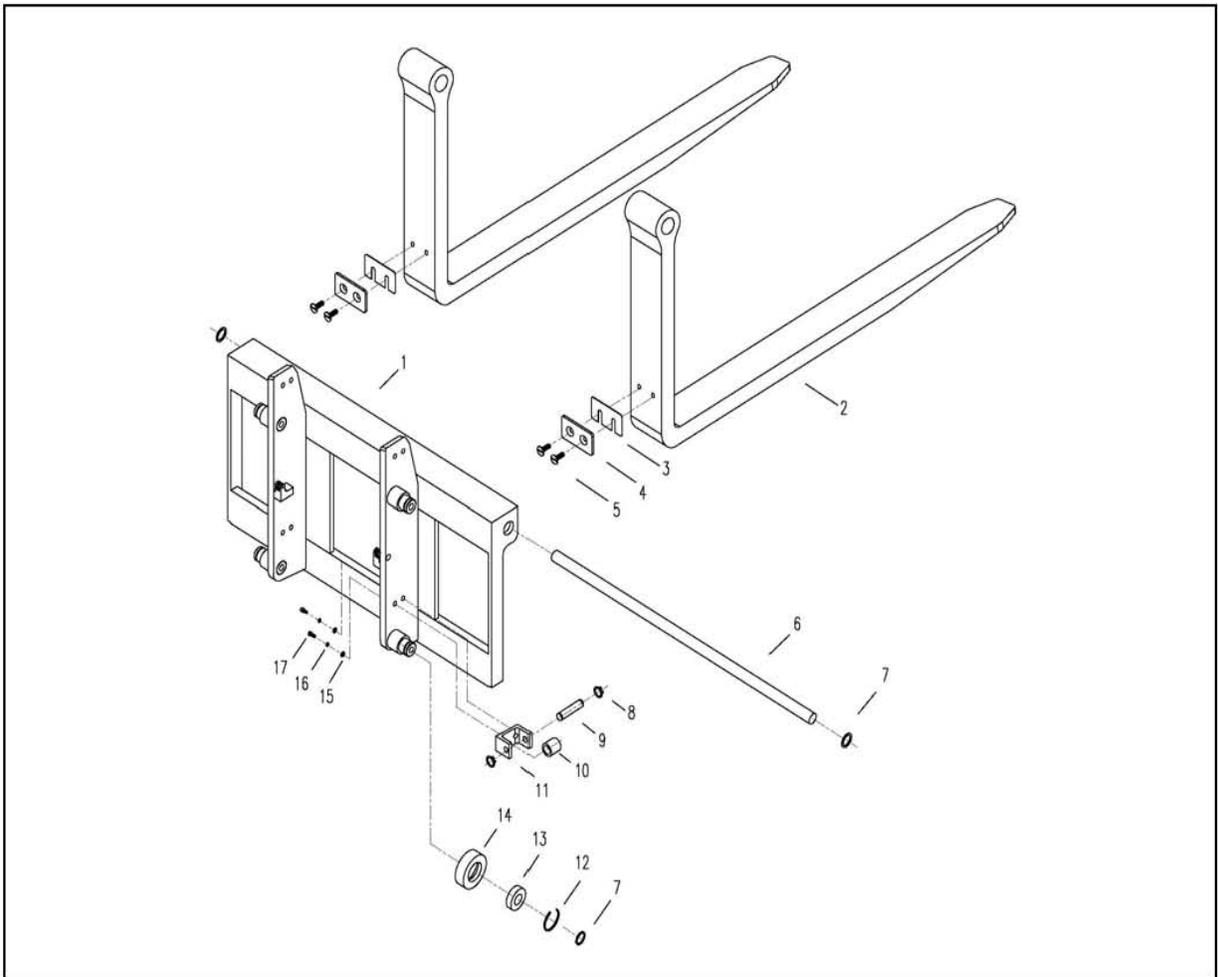


Figure 5-4. Lift Carriage (98 and 118 Inch Lift)

5-7. LIFT CYLINDER (63 INCH LIFT)

5-7.1. REMOVAL

1. Chock all wheels and engage the floor lock.
2. Raise the forks approximately three feet from the floor and position blocks or other strong supports under the lift carriage. Keep supports in place during the entire procedure.
3. Lower the carriage onto the supports. Check that the supports are supporting the carriage.

WARNING: Before attempting any repair, make certain power is disconnected.

4. Turn the two thumb screws on cover (2) and remove the cover.
5. Disconnect battery.

WARNING: Before disconnecting any hydraulic lines, check that the system is not under pressure.

6. Remove return hose (14, Figure 5-5) from the top of cylinder.
7. Loosen pressure hose (10) at the bottom of lift cylinder (35) and manually push the ram down as far as possible. The chains will become slack and need not be removed.
8. Disconnect pressure hose (10) from the bottom cylinder (35)
9. Remove O-ring (11), connector (21) and washer (6) from cylinder (35).
10. Lift chains from sheaves (70, Figure 5-1) and set them aside.
11. Lift ram head (72) from cylinder (35)
12. Remove nuts (4), lock washers (5), flat washers (6) and clevis bolt (56) that secure the lift cylinder and remove the cylinder.

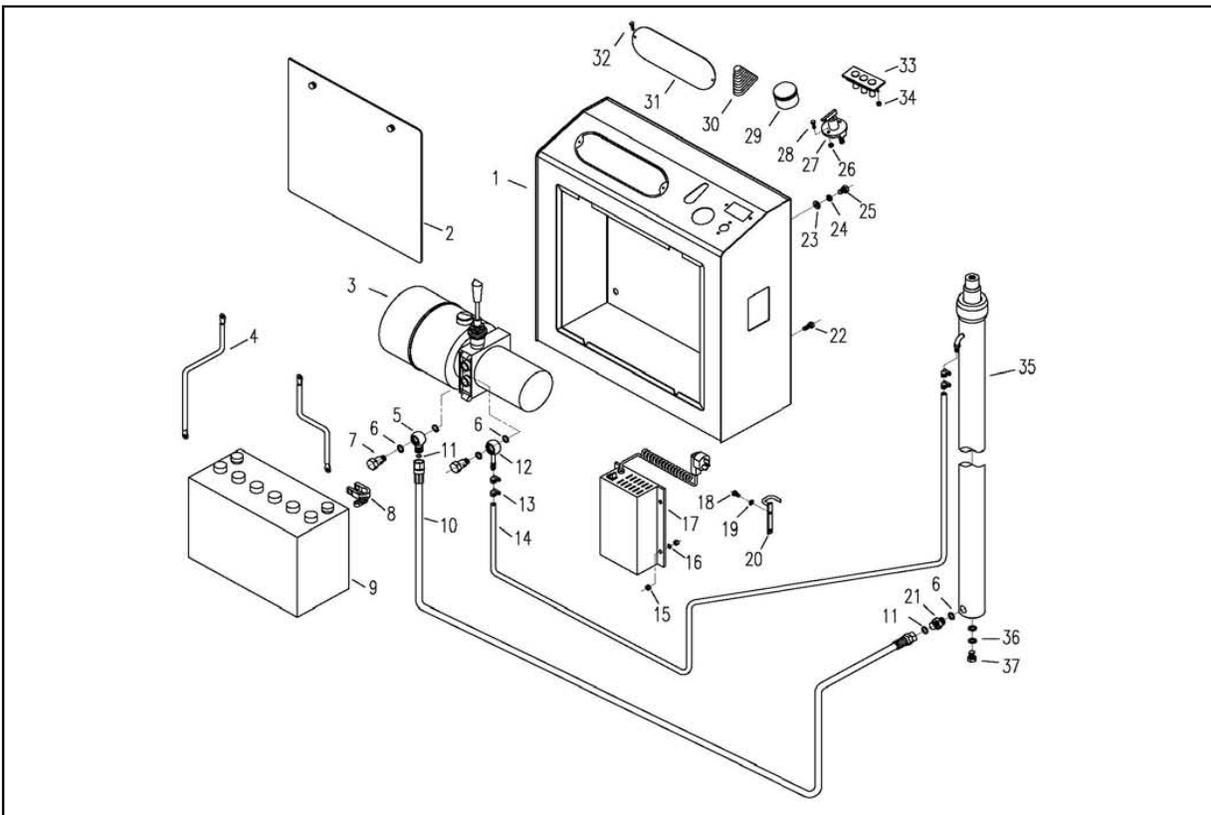


Figure 5-5. Electrical and Hydraulic System

5-7.2. INSTALLATION

1. Position the lift cylinder on the mast and secure with clevis bolt (56, Figure 5-1), flat washers (6), lock washers (5) and nuts (4).
2. Position ram head (72) on the lift cylinder.
3. Position lift chains (68) on sheaves (70).
4. Install O-ring (11, figure 5-5), connector (21) and washer (6) on cylinder (35).
5. Connect pressure hose (10) on the bottom of cylinder (35).
6. Connect return hose (14) to the top of cylinder (35).
7. Fill the hydraulic reservoir. Use hydraulic oil listed in Table 3-2.
8. Reconnect the battery and turn on the keyswitch.
9. Operate the lift and lower to refill the cylinder and lines with hydraulic oil.
10. Check level of hydraulic oil to bring to proper level. Use hydraulic oil listed in Table 5-3.
11. Install cover (2) and secure with the two thumb screws.
12. Adjust the lift chains according to paragraph 5-3.

5-8. LIFT CYLINDER (98 AND 118 INCH LIFT)

5-8.1. REMOVAL

1. Chock all wheels and engage the floor lock.
2. Raise the forks approximately three feet from the floor and position blocks or other strong supports under the inner mast. Keep supports in place during the entire procedure.
3. Lower the inner mast into the supports. Check that the supports are supporting the mast.

WARNING: Before attempting any repair, make certain power is disconnected.

4. Turn the two thumb screws on cover (2) and remove the cover.
5. Disconnect the battery.
6. Remove bolt (78, Figure 5-2), lock washer (37) and flat washer (38) securing the lift cylinder to inner mast.

WARNING: Before disconnecting any hydraulic lines, check that the system is not under pressure.

7. Remove return hose (14, Figure 5-5) from the top of cylinder (35).
8. Loosen pressure hose (10) at the bottom of lift cylinder (35) and manually push the ram down as far as possible. The chains will become slack and need not be removed.
9. Disconnect pressure hose (10) from the bottom cylinder (35)
10. Remove the cylinder.
11. Remove O-ring (11), connector (21) and washer (6) from cylinder (35).

5-8.2. INSTALLATION

1. Position the lift cylinder on the outer mast.
2. Using a suitable lifting device, support the inner mast (79, Figure 5-2) and remove the supports.
3. Slowly lower the inner mast while lining up the lift cylinder with the inner mast cross member.
4. Secure the top of the cylinder with screw (78), lock washer (37) and flat washer (38).
5. Install O-ring (11, Figure 5-5), connector (21) and washer (6) on cylinder (35).
6. Connect pressure hose (14) to the top of cylinder (35).
7. Connect return hose (14) to the top of cylinder (35).
8. Fill the hydraulic reservoir. Use hydraulic oil listed in Table 3-2.
9. Reconnect the battery and turn on the keyswitch.
10. Operated the lift and lower to refill the cylinder and lines with hydraulic oil.
11. Check level of hydraulic oil to bring to proper level. Use hydraulic oil listed in Table 3-2.
12. Install cover (2) and secure with the two thumb screws.
13. Adjust the lift chains according to paragraph 5-3.

NOTES

SECTION 6 HYDRAULIC SYSTEM SERVICING

6-1. HYDRAULIC PUMP

6-1.1. REMOVAL

WARNING: Before disconnecting any hydraulic line, make sure the forks are lowered completely and the system is not under pressure.

1. Fully lower the lift carriage.
2. Turn the two thumb screws on cover (2, Figure 6-1) and remove the cover.
3. Disconnect battery.
4. Free the rubber boot for the control lever and push it down into box (1).

WARNING: Before disconnecting any hydraulic lines check that the system is not under pressure.

5. Remove bolt (7, Figure 6-1) and washers (6) and disconnect pressure hose (10) from pump assembly (3).
6. Remove bolt (7, Figure 6-1) and washers (6) and disconnect fitting (12) from pump assembly (3).
7. Label, then disconnect cables and wires from pump assembly (3).
8. Remove two bolts (25), lock washers (24) and flat washers (23). Lower pump assembly (3) out of truck.

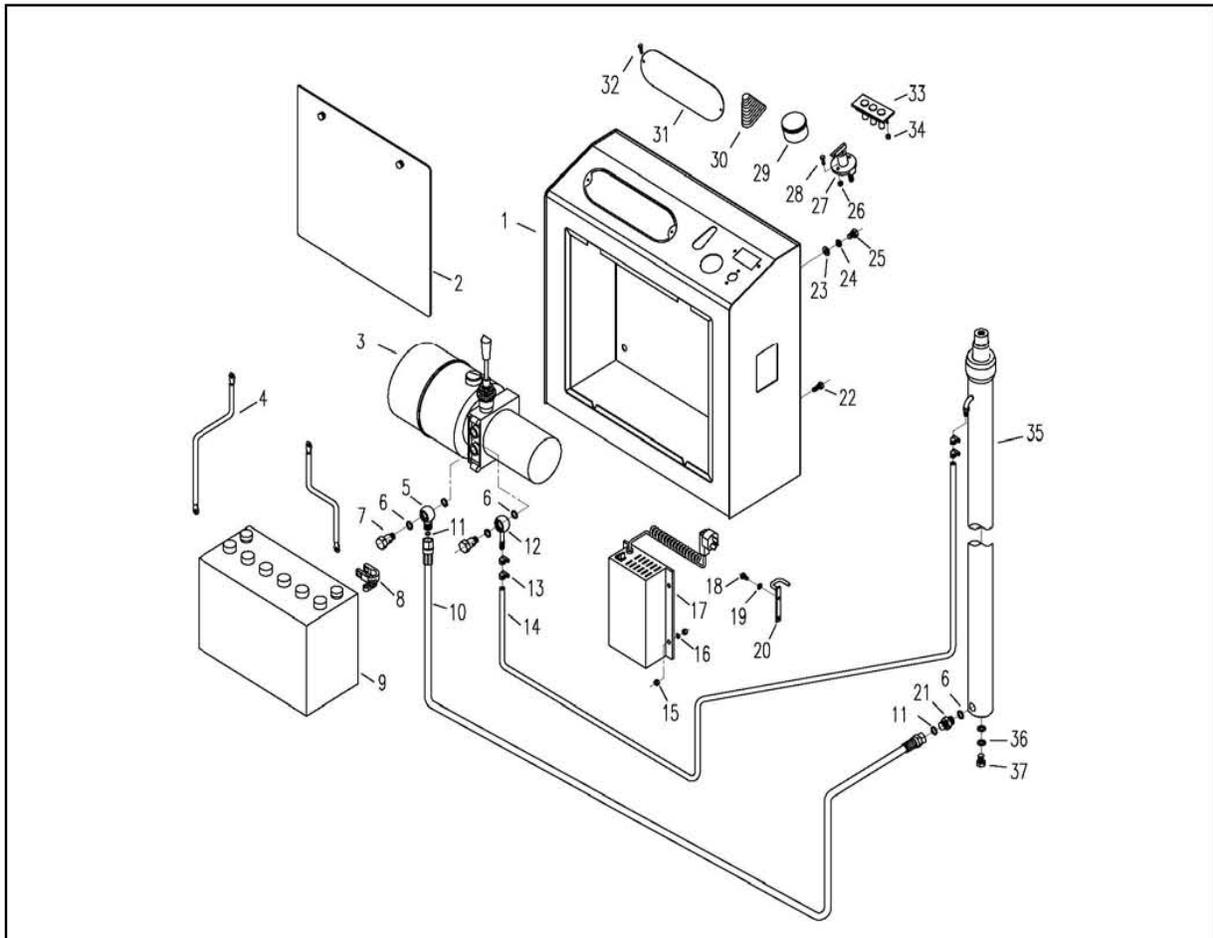


Figure 6-1. Electrical and Hydraulic System

6-1.2. DISASSEMBLY & REASSEMBLY

1. Remove the pump assembly as described in paragraph 6-1.1.
2. Refer to Figure 6-2 for disassembly and reassembly.

6-1.3. INSTALLATION

1. While supporting the pump assembly (3, Figure 6-1) install screws (25), lock washers (24) and flat washers (23).
2. Reconnect fitting (12) to pump assembly (3) with bolt (7) and washer (6).
3. Reconnect pressure hose (14) to pump assembly (3) with bolt (7) and washer (6).
4. Fill the hydraulic reservoir. Use hydraulic oil listed in Table 3-2.
5. Reconnect the battery and turn on the keyswitch.
6. Operate the lift and lower to refill the cylinder and lines with hydraulic oil.
7. Check level of hydraulic oil to bring to proper level. Use hydraulic oil listed in Table 3-2.
8. Install cover (2) and secure with the two thumb screws.

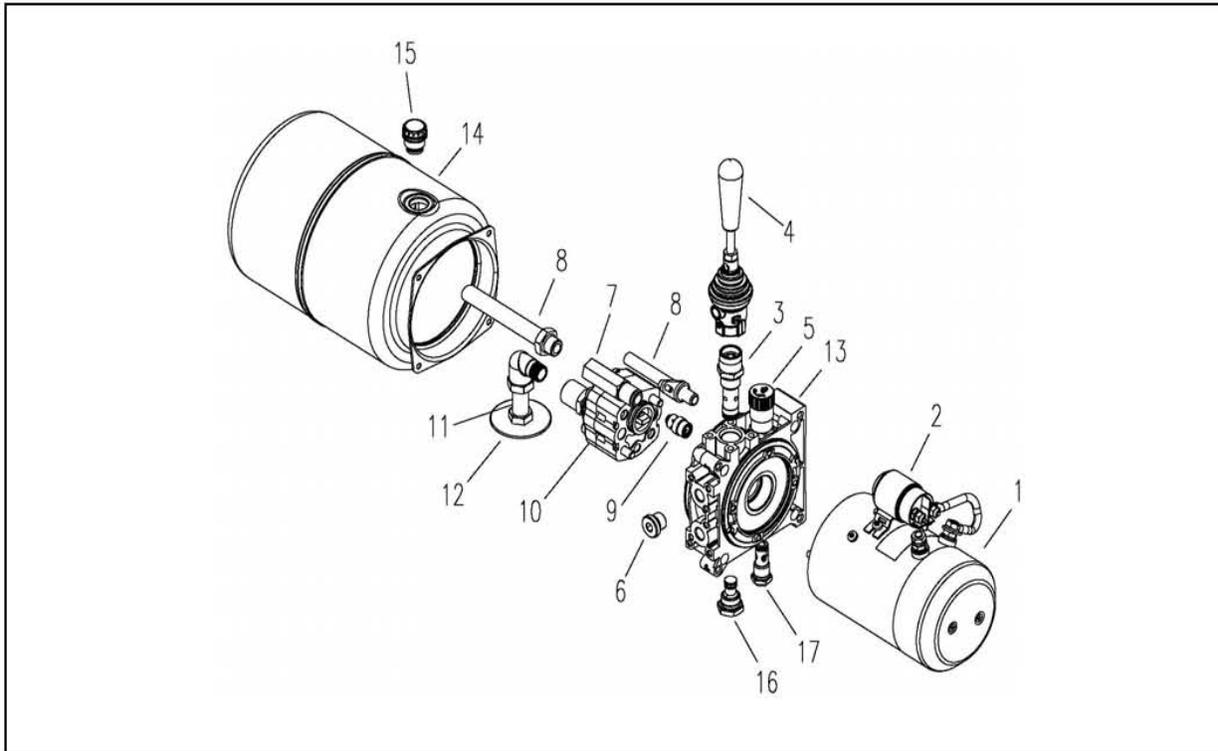


Figure 6-2 Hydraulic Pump

6-2. LIFT CYLINDER

NOTE: Removal procedures are covered in SECTION 5.

CAUTION: Use the proper tube pipe clamp vise in the following steps to prevent damage to the lift cylinder.

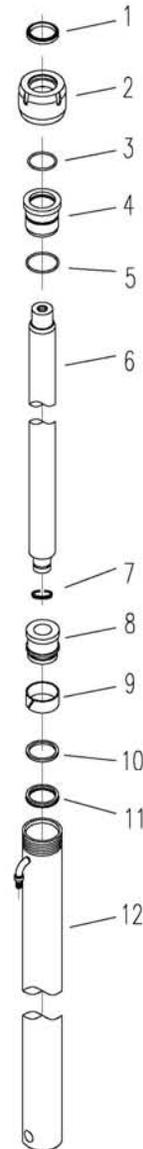
1. Secure the lift cylinder in the vise and remove gland nut (2, Figure 6-3).
2. Remove dust seal (1) and O-ring (3) from gland nut (2).
3. Pull piston rod (6) out of cylinder body (12).
4. Remove guide bushing (4) from piston rod (6)
5. Remove O-ring (5) from bushing (4).
6. Remove the lift cylinder from the vise.

CAUTION: Use a vise clamp with non-marring jaws to prevent damaging the piston rod (6).

7. Remove snap ring (10), piston (8) and O-ring (7).
8. Remove seal ring (11) and support ring (9) from piston (8).
9. Install seal ring (11) and support ring (9) on piston (8).
10. Install O-ring (7), piston (8) and snap ring (10) on piston rod (6).
11. Remove piston rod (6) from the vise.

CAUTION: Use the proper tube pipe clamp vise in the following steps to prevent damage to the lift cylinder.

12. Secure cylinder body (12) in the vise.
13. Install piston rod (6) in body (12).
14. Install O-ring (5) on bushing (4).
15. Install bushing (4) in body (12).
16. Install dust seal (1) and O-ring (3) on gland nut (2).
17. Install gland nut (2) on body (12).
18. Remove lift cylinder from vise.



NOTES

SECTION 7
ELECTRICAL SYSTEM SERVICING

7-1. HYDRAULIC PUMP MOTOR

The hydraulic pump motor is part of the hydraulic pump assembly. Refer to SECTION 6 for removal and disassembly.

7-2. BATTERY CHARGER

Your MXEM lift truck is supplied with a built in battery charger which makes it a complete, self-contained unit. If the battery charger should ever fail to operated, refer to Figure 9-5.

SECTION 8 FRAME AND RELATED PARTS SERVICING

8-1. GENERAL

This section covers load wheels, casters and floor lock replacement.

8-2. LOAD WHEEL REPLACEMENT

1. Fully lower the carriage.
2. Chock both caster wheels and the load wheel that is not being replaced. Engage the floor brake.
3. Raise the front of the lift truck with a suitable jack or another lift truck. Place strong supports under the straddle leg just in back of the wheel housing so that the load wheel being replaced is approximately one inch above the floor.
4. Remove screws (55, Figure 8-1) and plate (54).
5. Remove spacer (53), axle (52) and load wheel (51).
6. Remove bearings (50) from load wheel (51).
7. Install a new load wheel in the reverse order of removal.

8-3. CASTER WHEEL REPLACEMENT

1. Fully lower the carriage.
2. Chock the load wheels.
3. Raise the rear of the lift truck with a suitable jack or another lift truck. Place strong supports approximately six inches in front of the caster to be replaced.

4. Lower the lift truck so that the body of the truck is resting on the supports. Remove the jack.
5. Check that the caster wheel is not touching the floor and is free to turn.
6. Remove nut (20, Figure 8-1), washers (25) and thrust washers (21).
7. Remove axle (24) and caster wheel (22).
8. Remove bearings (23) from caster wheel (22).
9. Install a new caster wheel in the reverse order of removal.

8-4. BRAKE

1. Release the brake.
2. Remove bolts (40), lock washers (7) and flat washers (41).
3. Slide brake (42) out from under the truck frame.
4. Install the new brake in the reverse order of removal.

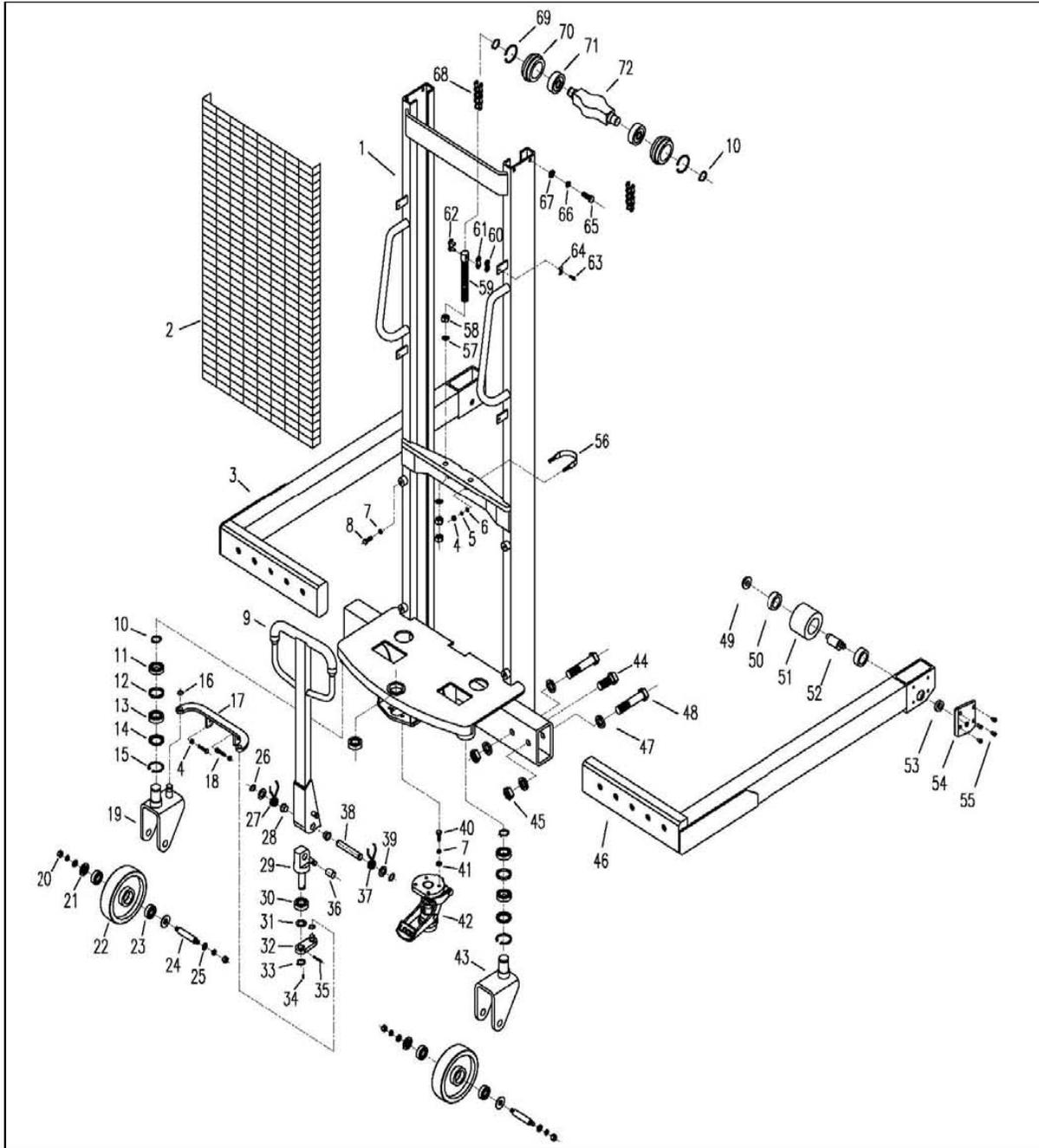


Figure 8-1 Frame (63 Inch Lift - 98 and 118 Inch Lift Similar)

SECTION 9
ILLUSTRATED PARTS BREAKDOWN

Following is an illustrated parts breakdown of assemblies and parts associated with the MXEM Lift Truck.

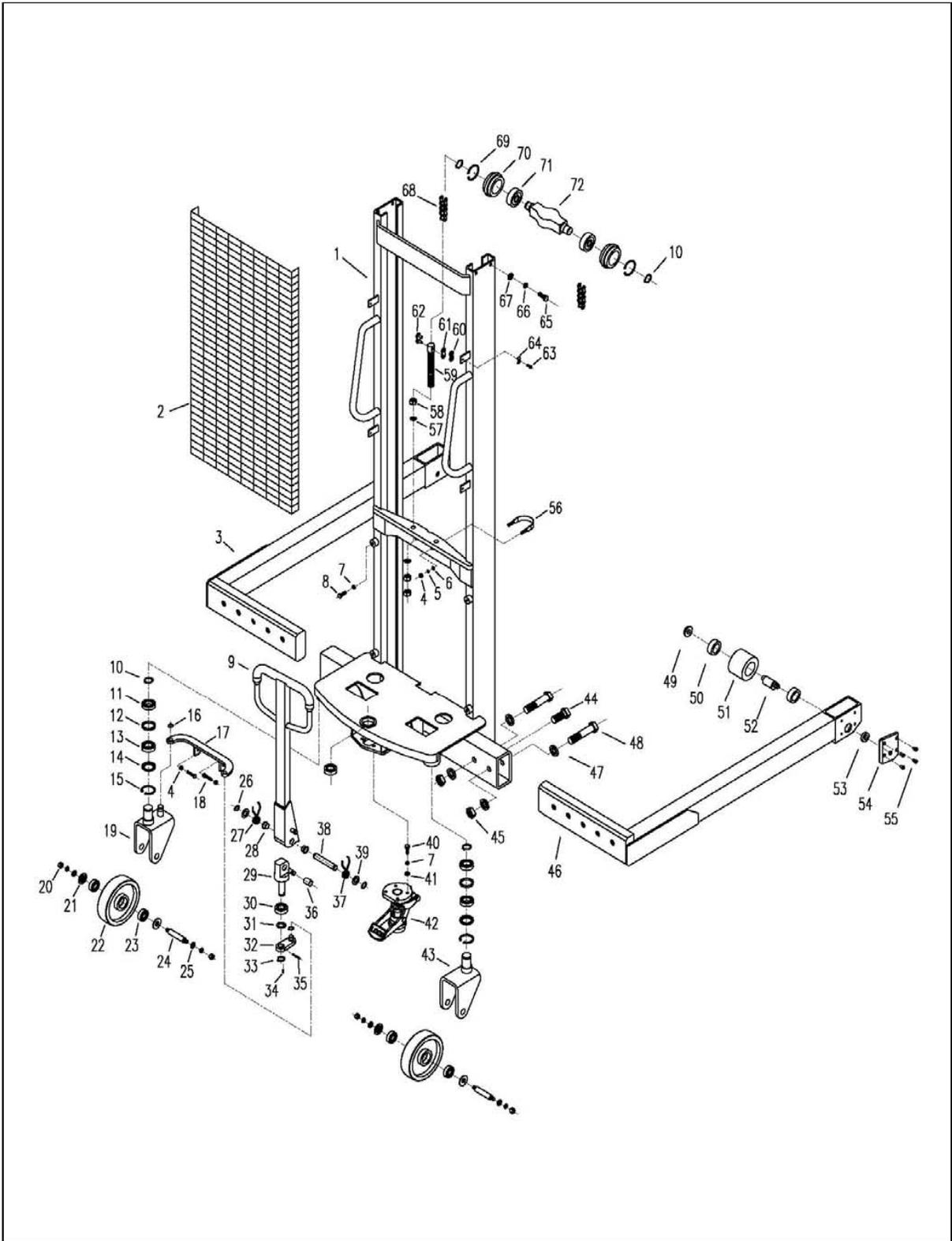


Figure 9-1 Frame (63 Inch Lift)

INDEX NO.	PART NO.	PART NAME	NO. REQD.
1	2310-61001	FRAME	1
2	2310-161002	SCREEN	1
3	2310-161003	LEFT LEG	1
4	2310-161004	NUT, M8	4
5	2310-161005	WASHER, LOCK M8	2
6	2310-161006	WASHER, FLAT M8	6
7	2310-161007	WASHER, LOCK M10	8
8	2310-161008	BOLT, M10 X 20	4
9	2310-161009	HANDLE	1
10	2310-161010	SNAP RING 30	4
11	2310-161011	BEARING 6006	2
12	2310-161012	SPACER BUSHING	2
13	2310-161013	BEARING 32006X2	2
14	2310-161014	WASHER, THRUST	2
15	2310-161015	SNAP RING 55	2
16	2310-161016	SNAP RING 16	2
17	2310-161017	LIFT ARM	1
18	2310-161018	BOLT, M8 X 40	2
19	2310-161019	LEFT WHEEL HOUSING	1
20	2310-161020	NUT, M12	4
21	2310-161021	WASHER, THRUST	4
22	2310-161022	WHEEL, REAR (NYLON)	2
22	2310-161073	WHEEL, REAR (POLYURETHANE)	2
23	2310-161023	BEARING 6204	4
24	2310-161024	AXLE	2
25	2310-161025	WASHER, PLANE M12	4
26	2310-161026	SNAP RING 20	2
27	2310-161027	SPRING, TORSION	1
28	2310-161028	BEARING	2
29	2310-161029	STEERING SHAFT	1
30	2310-161030	BEARING 6205	2
31	2310-161031	WASHER	1
32	2310-161032	LINK	1
33	2310-161033	SNAP RING 25	1
34	2310-161034	PIN	1
35	2310-161035	SHAFT	1

INDEX NO.	PART NO.	PART NAME	NO. REQD.
36	2310-161036	BEARING	1
37	2310-161037	SPRING, TORSION	1
38	2310-161038	SHAFT	1
39	2310-161039	WASHER, FLAT M20	2
40	2310-161040	BOLT, M10 X 30	4
41	2310-161041	WASHER, FLAT M10	4
42	2310-161042	BRAKE	1
43	2310-161043	RIGHT WHEEL HOUSING	1
44	2310-161044	BOLT, M20 X 1.5 X 45	2
45	2310-161045	NUT, M20	4
46	2310-161046	RIGHT LEG	1
47	2310-161047	WASHER, FLAT M20	8
48	2310-161048	BOLT, M20 X 100	4
49	2310-161049	SPACER BUSHING	2
50	2310-161050	BEARING 6005	4
51	2310-161051	LOAD WHEEL	2
52	2310-161052	AXLE	2
53	2310-161053	SPACER BUSHING	2
54	2310-161054	PLATE	2
55	2310-161055	BOLT, M6 X 10	8
56	2310-161056	CLEVIS BOLT	1
57	2310-161057	WASHER, FLAT, M16	4
58	2310-161058	NUT, M16 X 1.5	6
59	2310-161059	CHAIN ANCHOR	2
60	2310-161060	MASTER LINK, LOCK	4
61	2310-161061	MASTER LINK, PLATE	4
62	2310-161062	MASTER LINK	8
63	2310-161063	BOLT, M6 X 16	4
64	2310-161064	WASHER	4
65	2310-161065	BOLT, M12 X 35	4
66	2310-161066	WASHER, LOCK M12	4
67	2310-161067	WASHER, FLAT M12	4
68	2310-161068	CHAIN 12A-1 X 62	2
69	2310-161069	SNAP RING 62	6
70	2310-161070	ROLLER	2
71	2310-161071	BEARING 6206	2
72	2310-161072	RAM HEAD	1

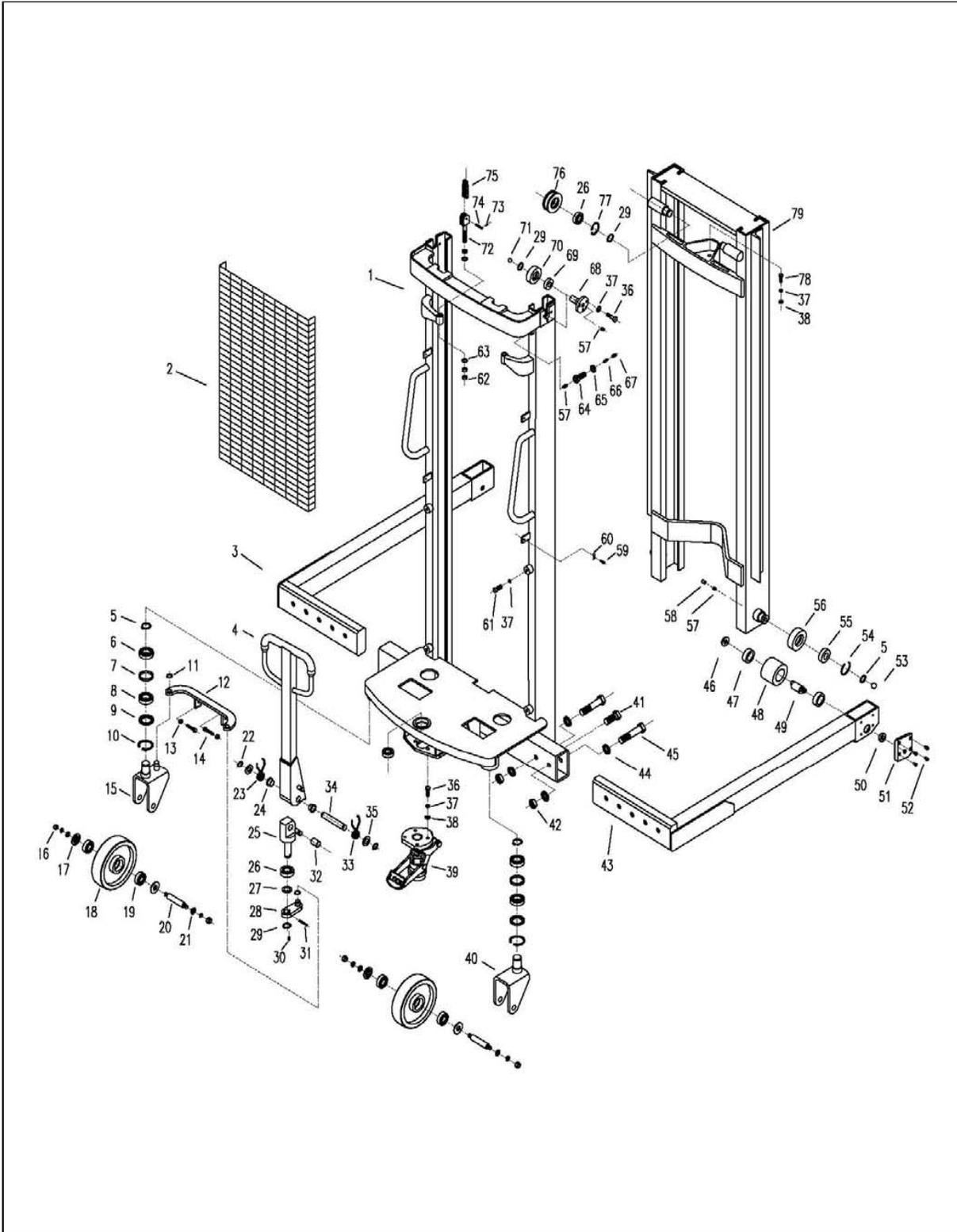


Figure 9-2 Frame (98 and 118 Inch Lift)

INDEX NO.	PART NO.	PART NAME	NO. REQD.
1	2310-251001	FRAME (98 INCH LIFT)	1
1	2310-301001	FRAME(118 INCH LIFT)	1
2	2310-251002	SCREEN (98 INCH LIFT)	1
2	2310-301002	SCREEN (118 INCH LIFT)	1
3	2310-161003	LEFT LEG	1
4	2310-161009	HANDLE	1
5	2310-161010	SNAP RING 30	4
6	2310-161011	BEARING 6006	2
7	2310-161012	SPACER BUSHING	2
8	2310-161013	BEARING 32006X2	2
9	2310-161014	WASHER, THRUST	2
10	2310-161015	SNAP RING 55	2
11	2310-161016	SNAP RING 16	2
12	2310-161017	LIFT ARM	1
13	2310-161004	NUT, M8	2
14	2310-161018	BOLT, M8 X 40	2
15	2310-161019	LEFT WHEEL HOUSING	1
16	2310-161020	NUT, M12	4
17	2310-161021	WASHER, THRUST	4
18	2310-161022	WHEEL, REAR (NYLON)	2
19	2310-161073	WHEEL, REAR POLYURETHANE)	2
20	2310-161023	BEARING 6204	4
21	2310-161024	AXLE	2
21	2310-161025	WASHER, LOCK M12	4
22	2310-161026	SNAP RING 20	2
23	2310-161027	SPRING, TORSION	1
24	2310-161028	BEARING	2
25	2310-161029	STEERING SHAFT	1
26	2310-161030	BEARING 6205	2
27	2310-161031	WASHER	1
28	2310-161032	LINK	1
29	2310-161033	SNAP RING 25	1
30	2310-161034	PIN	1
31	2310-161035	SHAFT	1
32	2310-161-036	BEARING	1
33	2310-161037	SPRING, TORSION	1
34	2310-161038	SHAFT	1
35	2310-161039	WASHER, FLAT M20	2
36	2310-161040	BOLT, M10 X 30	10
37	2310-161007	WASHER, LOCK M10	15
38	2310-161041	WASHER, FLAT M10	5
39	2310-161042	BRAKE	1

INDEX NO.	PART NO.	PART NAME	NO. REQD.
40	2310-161043	RIGHT WHEEL HOUSING	1
41	2310-161044	BOLT, M20 X 1.5 X 45	2
42	2310-161045	NUT, M20	4
43	2310-161046	RIGHT LEG	1
44	2310-16+1047	WASHER, FLAT M20	8
45	2310-161048	BOLT, M10 X 100	4
46	2310-161049	SPACER BUSHING	2
47	2310-161050	BEARING 6005	4
48	2310-161051	LOAD WHEEL	2
49	2310-161052	AXLE	2
50	2310-161053	SPACER BUSHING	2
51	2310-161054	PLATE	2
52	2310-161055	BOLT, M6 X 10	8
53	2310-251003	STEEL BALL 13.5	2
54	2310-251004	SNAP RING 62	6
55	2310-251005	BEARING 6206	6
56	2310-251006	ROLLER	2
57	2310-251007	SCREW, M12 X 20	10
58	2310-251008	PLUG	2
59	2310-161063	BOLT, M6 X 16	4
60	2310-161064	WASHER	4
61	2310161008	BOLT M10 X 20	4
62	2310-161058	NUT, M16 X 1.5	6
63	2310-161057	WASHER, FLAT M16	4
64	2310-251009	ADJUSTING BOLT	2
65	2310-251010	NUT, M20 X 1.5	2
66	2310-251011	SPRING	2
67	2310-251012	LIFT PIN	2
68	2310-251013	BEARING SEAT	2
69	2310-251014	BEARING 3205	2
70	2310-251015	ROLLER	2
71	2310-251016	STEEL BALL 12	2
72	2310-251017	CHAIN ANCHOR	2
73	2310-251018	CHAIN PIN	4
74	2310-251019	COTTER PIN 1.2 X 16	8
75	2310-251020	CHAIN (98 INCH LIFT)	2
75	2310-301020	CHAIN (118 INCH LIFT)	2
76	2310-251021	SHEAVE	2
77	2310-251022	SNAP RING 52	2
78	2310-251023	BOLT, M10 X 25	1
79	2310-251024	INNER MAST (98 IN LIFT)	1
79	2310-301024	INNER MASR (118 IN LIFT)	1

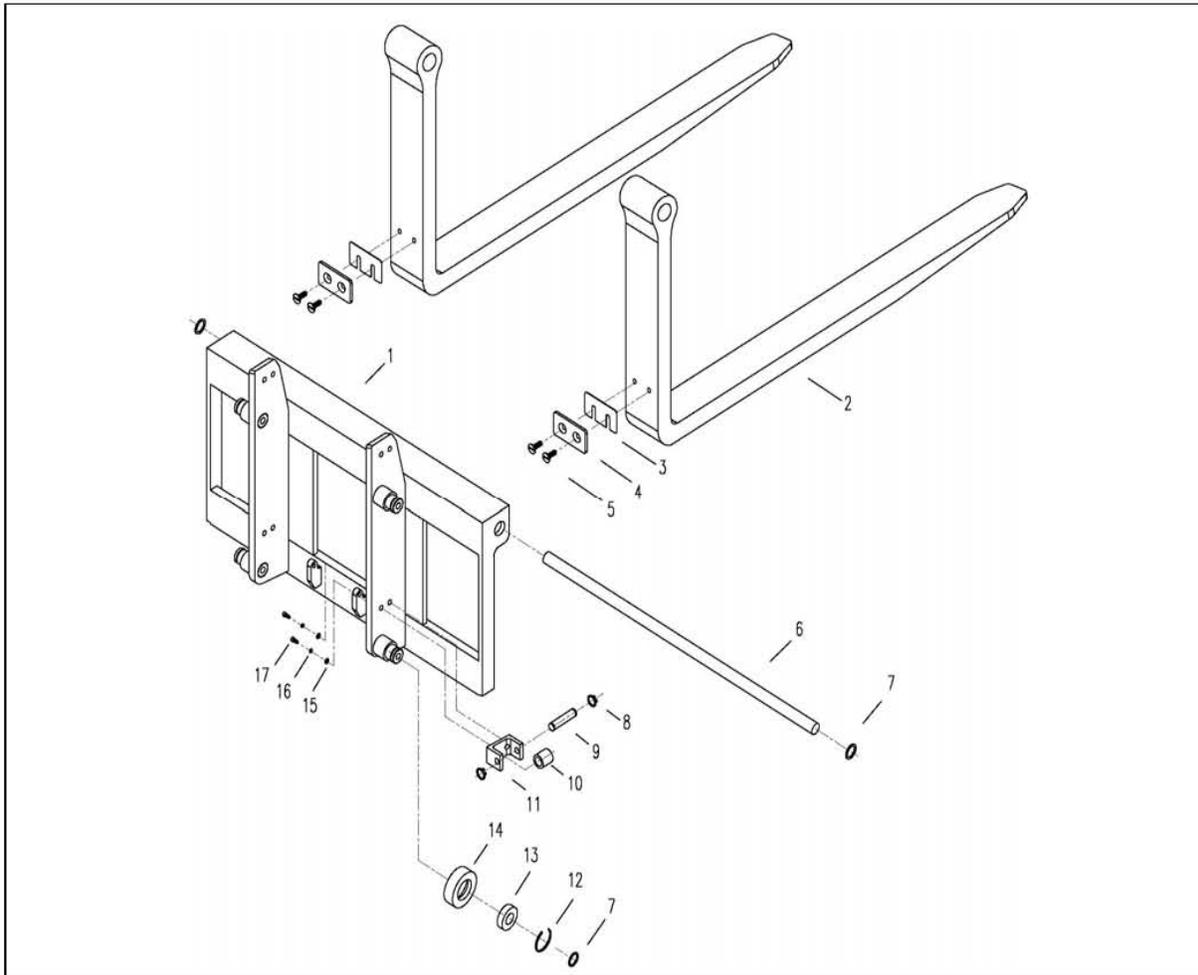


Figure 9-3 lift Carriage (63 Inch Lift)

INDEX NO.	PART NO.	PART NAME	NO. REQD.
1	2310-162001	LIFT CARRIAGE	1
2	2310-162002	FORK	2
3	2310-162003	SHIM	4
4	2310-162004	WEAR PLATE	2
5	2310-162005	BOLT, M8 X 30	4
6	2310-162006	CARRIAGE SHAFT	1
7	2310-161010	SNAP RING 30	2
8	2310-162007	SNAP RING 10	8
9	2310-162008	AXLE	4

INDEX NO.	PART NO.	PART NAME	NO. REQD.
10	2310-162009	GUIDE WHEEL	4
11	2310-162010	GUIDE WHEEL BRACKET	4
12	2310-161069	SNAP RING 62	4
13	2310-161071	BEARING 6206	4
14	2310-162011	ROLLER	4
15	2310-161005	WASHER, LOCK, M8	8
16	2310-161006	WASHER, FLAT, M8	8
17	2310-162012	BOLT, M8x 30	8

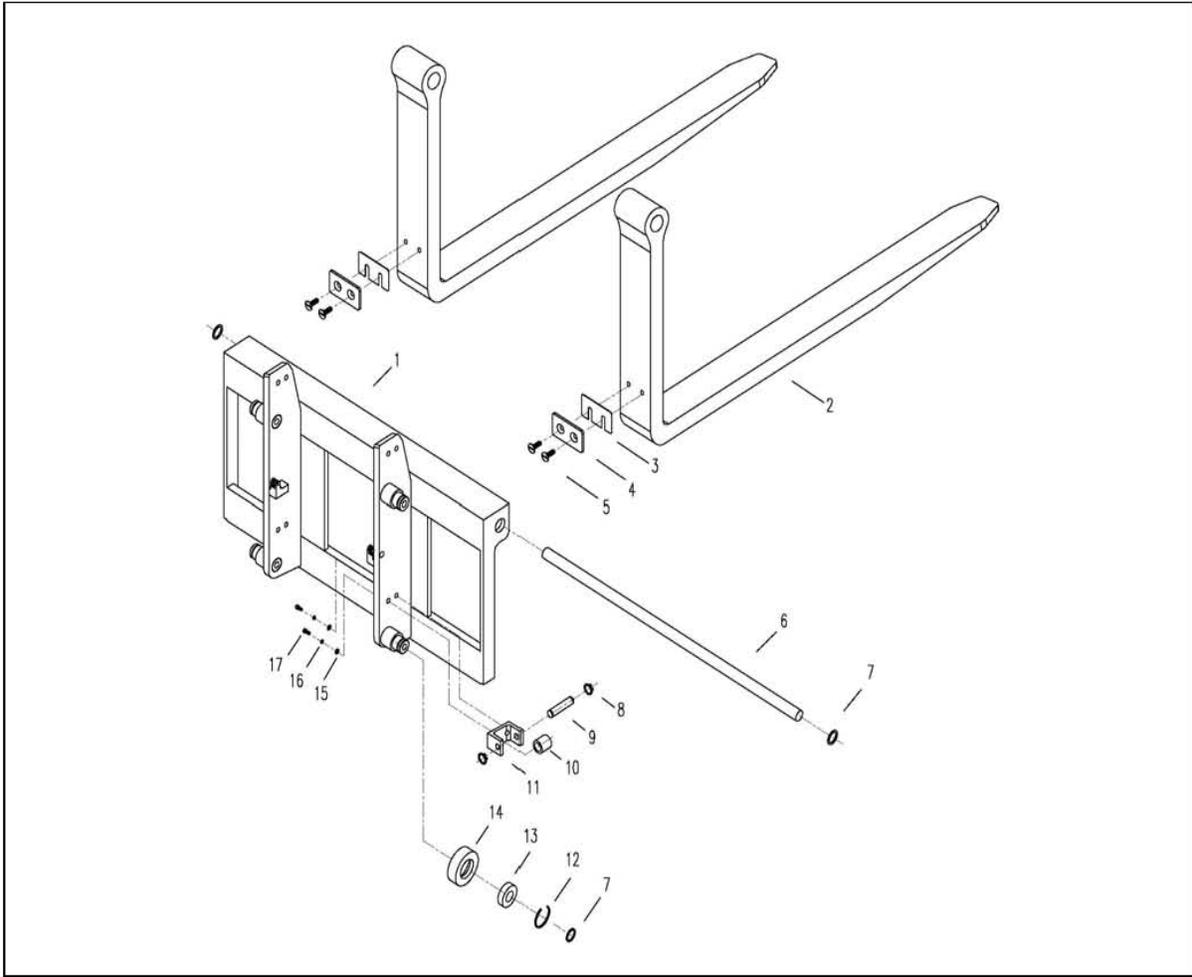


Figure 9-4 lift Carriage (98 and 118 Inch Lift)

INDEX NO.	PART NO.	PART NAME	NO. REQD.
1	2310-252001	LIFT CARRIAGE	1
2	2310-162002	FORK	2
3	2310-162003	SHIM	4
4	2310-162004	WEAR PLATE	2
5	2310-162005	BOLT, M8 X 30	4
6	2310-162006	CARRIAGE SHAFT	1
7	2310-161010	SNAP RING 30	2
8	2310-162007	SNAP RING 10	8
9	2310-162008	AXLE	4

INDEX NO.	PART NO.	PART NAME	NO. REQD.
10	2310-162009	GUIDE WHEEL	4
11	2310-162010	GUIDE WHEEL BRACKET	4
12	2310-161069	SNAP RING 62	4
13	2310-161071	BEARING 6206	4
14	2310-162011	ROLLER	4
15	2310-161005	WASHER, LOCK, M8	8
16	2310-161006	WASHER, FLAT, M8	8
17	2310-162012	BOLT, M8 x 30	8

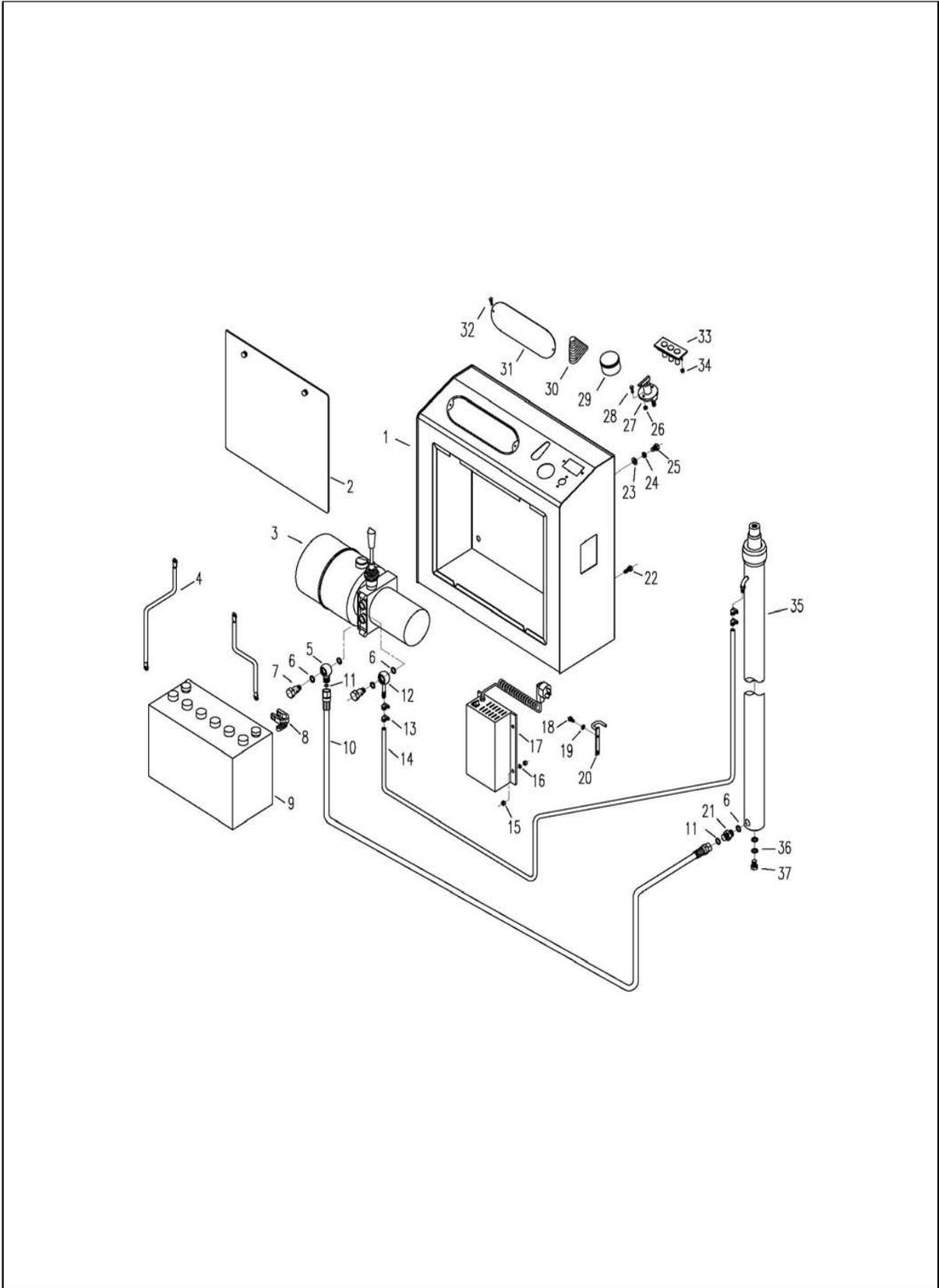


Figure 9-5 Electrical and Hydraulic System

INDEX NO.	PART NO.	PART NAME	NO. REQD.
1	2310-163001	ELECTRICAL BOX	1
2	2310-163002	COVER	1
3	—	HYDRAULIC PUMP (FIGURE 9-6)	REF
4	2310-163004	CABLE	2
5	2310-163005	ADJUSTABLE FITTING	1
6	2310-163006	WASHER, M18	5
7	2310-163007	BOLT	2
8	2310-163008	BATTERY CLIPS	2
9	003220	BATTERY, 12V 125AH WET	1
10	2310-163010	HOSE PRESSURE	1
11	2310-163011	O-RING, 8.8 X 1.9	2
12	2310-163012	ADJUSTABLE FITTING	1
13	2310-163013	CLAMP	4
14	2310-163014	HOSE, RETURN (63 INCH LIFT)	1
14	2310-253014	HOSE, RETURN (98 INCH LIFT)	1
14	2310-303014	HOSE, RETURN (118 INCH LIFT)	1
15	2310-163015	NUT, M6	8
16	2310-163016	WASHER, RUBBER, 6	4
17	2310-163017	CHARGER	1

INDEX NO.	PART NO.	PART NAME	NO. REQD.
18	2310-163018	BOLT, M5 X 8	2
19	2310-163019	WASHER, LOCK, M5	2
20	2310-163020	HOOK	1
21	2310-163021	CONNECTOR	1
22	2310-163022	BOLT, M6 X 30	4
23	2310-163023	WASHER, FLAT, M10	2
24	2310-161007	WASHER, FLAT, M8	2
25	2310-161008	BOLT, M10 X 20	2
26	2310-163024	NUT, M5	2
27	2310-163025	KEY	1
28	2310-163026	BOLT, M5 X 30	2
29	2310-163027	VOLT METER	1
30	2310-163028	BOOT	1
31	2310-163029	COVER	1
32	2310-163030	BOLT, M5 X 10	2
33	2310-163031	INDICATOR LIGHT	1
34	2310-163032	NUT, M4	2
35	—	CYLINDER (FIGURE 9-7)	REF
35	2310-253033	CYLINDER (98 INCH LIFT)	1
35	2310-303033	CYLINDER (118 INCH LIFT)	1
36	2310-161066	WASHER, LOCK, M12	2
37	2310-163034	BOLT, M12 X 30	1

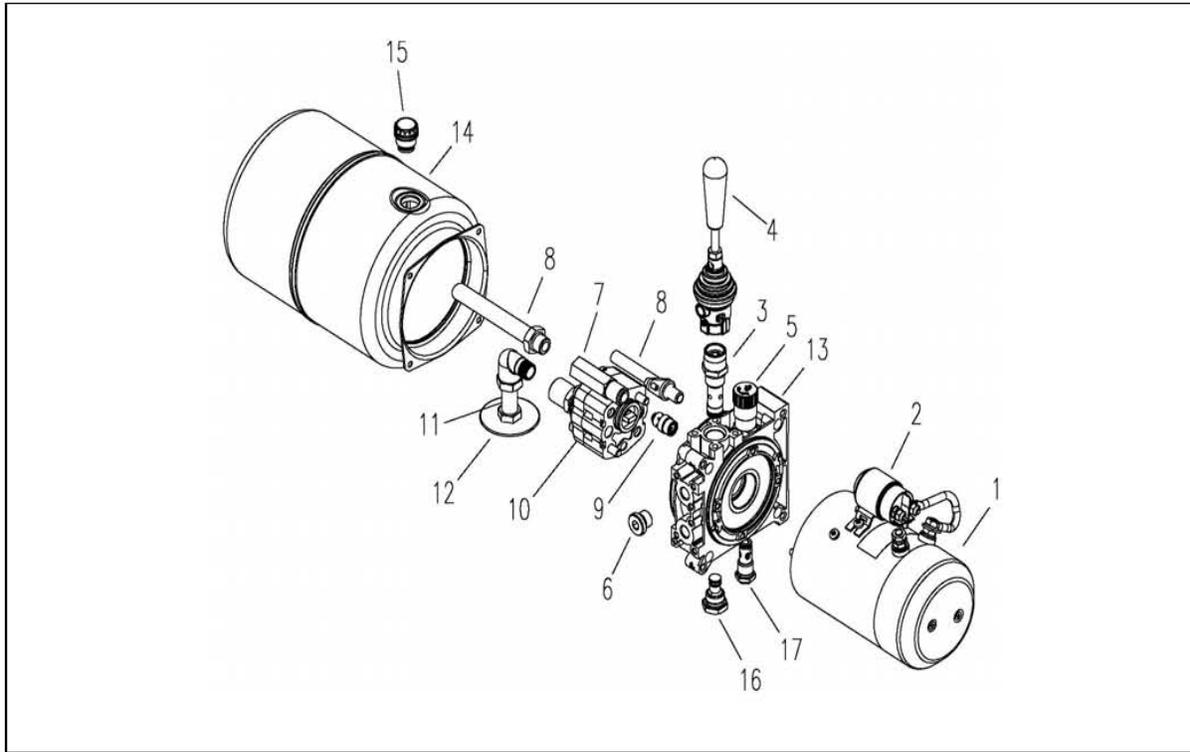


Figure 9-6 Hydraulic Pump

INDEX NO.	PART NO.	PART NAME	NO. REQD.
—	2310-163003	HYDRAULIC PUMP	1
1	2310-164001	• DC MOTOR	1
2	2310-164002	• SOLENOID	1
3	2310-164003	• MANUAL VALVE	1
4	2310-164004	• CONTROL HANDLE	1
5	2310-164005	• RELIEF VALVE	1
6	2310-164006	• PRESSURE PLUG	1
7	2310-164007	• SPACER	1
8	2310-164008	• OUTPUT OIL PIPE UNIT	1

INDEX NO.	PART NO.	PART NAME	NO. REQD.
9	2310-164009	• THROTTLE VALVE	1
10	2310-164010	• GEAR PUMP	1
11	2310-164011	• SUCTION ANGLE PIPE	1
12	2310-164012	• FILTER	1
13	2310-164013	• MANIFOLD	1
14	2310-164014	• TANK	1
15	2310-164015	• FILLER PLUG	1
16	2310-164016	• PLUG	1
17	2310-164017	• CHECK VALVE	1

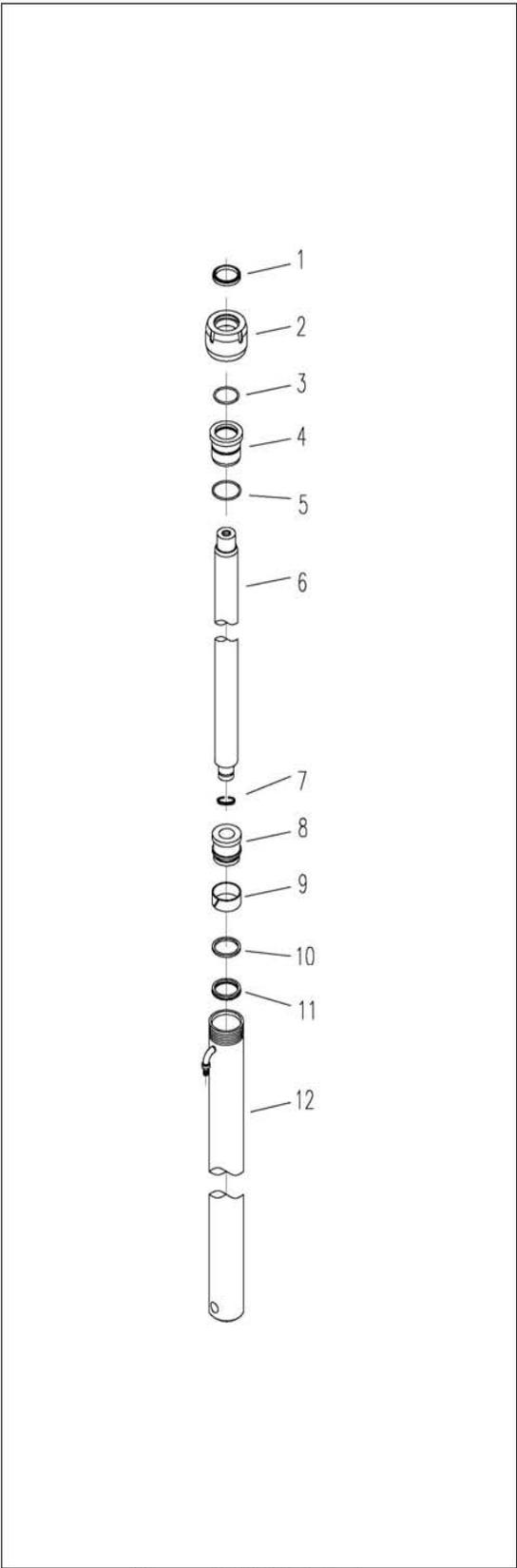


Figure 9-7 Lift Cylinder

INDEX NO.	PART NO.	PART NAME	NO. REQD.
—	2310-163033	CYLINDER (63 INCH LIFT)	1
—	2310-253033	CYLINDER (98 INCH LIFT)	1
—	2310-303033	CYLINDER (118 INCH LIFT)	1
1	2310-165001	• DUST SEAL	1
2	2310-165002	• GLAND NUT	1
3	2310-165003	• O-RING, 40 X 3.1	1
4	2310-165004	• GUIDE BUSHING	1
5	2310-165005	• O-RING, 50 X 3.1	1
6	2310-165006	• PISTON ROD (63 IN LIFT)	1
6	2310-255006	• PISTON ROD (98 IN LIFT)	1
6	2310-305006	• PISTON ROD (118 IN LIFT)	1
7	2310-165007	• SNAP RING	1
8	2310-165008	• PISTON	1
9	2310-165009	• SUPPORT RING	1
10	2310-165010	• SNAP RING, 40 X 50 X 2	1
11	2310-165011	• SEAL RING, 40 X 50 X 6	1
12	2310-165012	• CYLINDER BODY (63 IN LIFT)	1
12	2310-255012	• CYLINDER BODY (98 IN LIFT)	1
12	2310-305012	• CYLINDER BODY (118 IN LIFT)	1