Manual Price $25.00

IBH ELECTRIC SERIES

MANUALLY PROPELLED IN-BETWEEN-HANDLING LIFT TRUCK

Serial Number 341649 and Higher

Operation

Maintenance

Repair Parts List

Big Joe Manufacturing Company • Des Plaines, IL 60018

MANUAL NO. 901351
Revision D 08/03/06

⚠ WARNING

Do not operate this truck unless you have been trained and authorized 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, cables and limit switches), brakes, steering mechanism, guards and safety devices.

Operate truck only from designated operating position. Never 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.

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

Start, stop, travel, and steer 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 interferes with visibility, travel with load or lifting mechanism trailing.

Do not operate on ramps.

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

When using forks, space forks as far 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 or load backrest extension unless load is secured so that no part of it could fall backward.

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

Do not lift personnel except on a securely attached specially designed work platform. **Use extreme care when lifting personnel.** Make sure mast is vertical. Place truck controls in neutral and apply brakes. Lift and lower smoothly. Remain in operating position or immediate vicinity as long as personnel are on the work platform. Never transport personnel on forks or work platform.

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

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

IBH 056589 A

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OPERATOR INSTRUCTIONS

WARNING

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Do not operate on ramps.

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

When using forks, space forks as far 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.

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Do not lift personnel except on a securely attached specially designed work platform. **Use extreme care when lifting personnel.** Make sure mast is vertical. Place truck controls in neutral and apply brakes. Lift and lower smoothly. Remain in operating position or immediate vicinity as long as personnel are on the work platform. Never transport personnel on forks or work platform.

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

When leaving truck, fully lower lifting mechanism and set floor lock (brake). When leaving truck unattended, also shut off power.

PREPARATION FOR USE

Upon receipt, visually inspect the lift truck. If any damage is noted, report it immediately to the carrier and to your Big Joe dealer.

Remove cardboard that is banded to the forks. Check the entire truck for scratches and dents. Check to make sure the lift chains are free of slack. Inspect for oil leaks and loose wiring connections. Make certain that you received all accessories and attachments that were ordered.

Before the lift truck is moved the battery must be checked, recharged (if necessary), and connected. Refer to battery care instructions in SECTION 3.

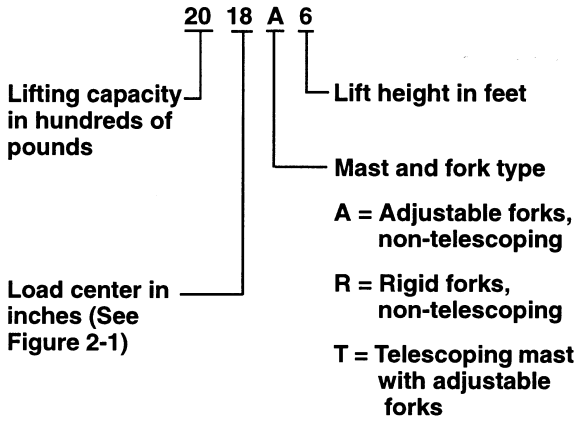
Refer to SECTION 2, Operation, to test the floor lock and lift control.

If you do not obtain the proper results or if improper operation occurs, refer to SECTION 4, Troubleshooting.

SECTION 1
DESCRIPTION

1-1. INTRODUCTION.

This manual describes the IBH Electric Lift Trucks manufactured by Big Joe Manufacturing, Des Plaines, Illinois 60018. The lift truck is identified by a model number. The model number shows truck capacity, fork and mast type, and lift height. A typical model number is explained below.



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 your Big Joe lift truck.

The model number will be found on the name plate along with the serial number, lifting capacity, and load center. The name plate (Figure 1-1) is located on the right side of the outer mast.

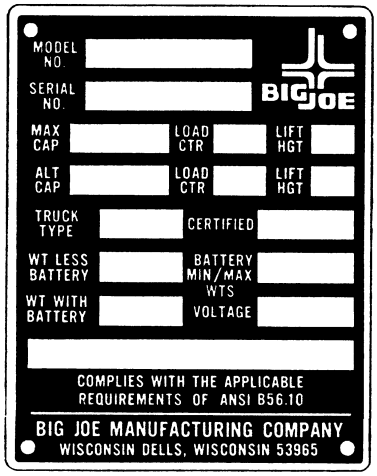


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Figure 1-1 Name Plate

1-2. GENERAL DESCRIPTION. (Figure 1-2)

A horizontal pushbar is used to propel and steer the IBH electric lift truck. A simple lever is used to actuate the lift mechanism. A handle is provided for actuating the floor lock (brake). Raising the handle to the horizontal position engages the floor lock (brake).

1-3. OPERATING FEATURES.

The IBH lift truck is available in several combinations of features to efficiently match the needs of differing specific work situations. These combinations include battery operation, 110-, 220-, or 440-volt AC operation, adjustable or rigid forks, adjustable straddle, telescopic masts, and a remote control feature. Information in this manual covers operation and maintenance of each of these equipment types except AC equipped models.

1-4. PAINT AND DECALS.

Table 1-1 and Table 1-2 list the decals and paint used.

Table 1-1 Decal Part Number

Description	New Decal P/N
Door Decal	056631
Small Mast Decal	056632
Large Mast Decal	056633
Complete Set	900597

Table 1-2 Paint Part Number

Description	New Decal P/N
Yellow Spray	901201
Black Spray	901202
Yellow Galleon	901204
Black Galleon	901205

1-5. OPTIONS.

Big Joe offers many options and accessories for the IBH lift trucks such as:

Larger capacity battery
Battery charger with timer
Remote control
Operator safety platform
Removable load platform
Boom with hook (for carriage shaft)
Ram (for carriage shaft)
Drum tilter
Paper roll rotator
Drum toter
Roller bed
Die puller
Fifth wheel attachment
Compressed air powered motor operation
AC motor operation
Adjustable straddle

The most commonly used options are described in SECTION 9.

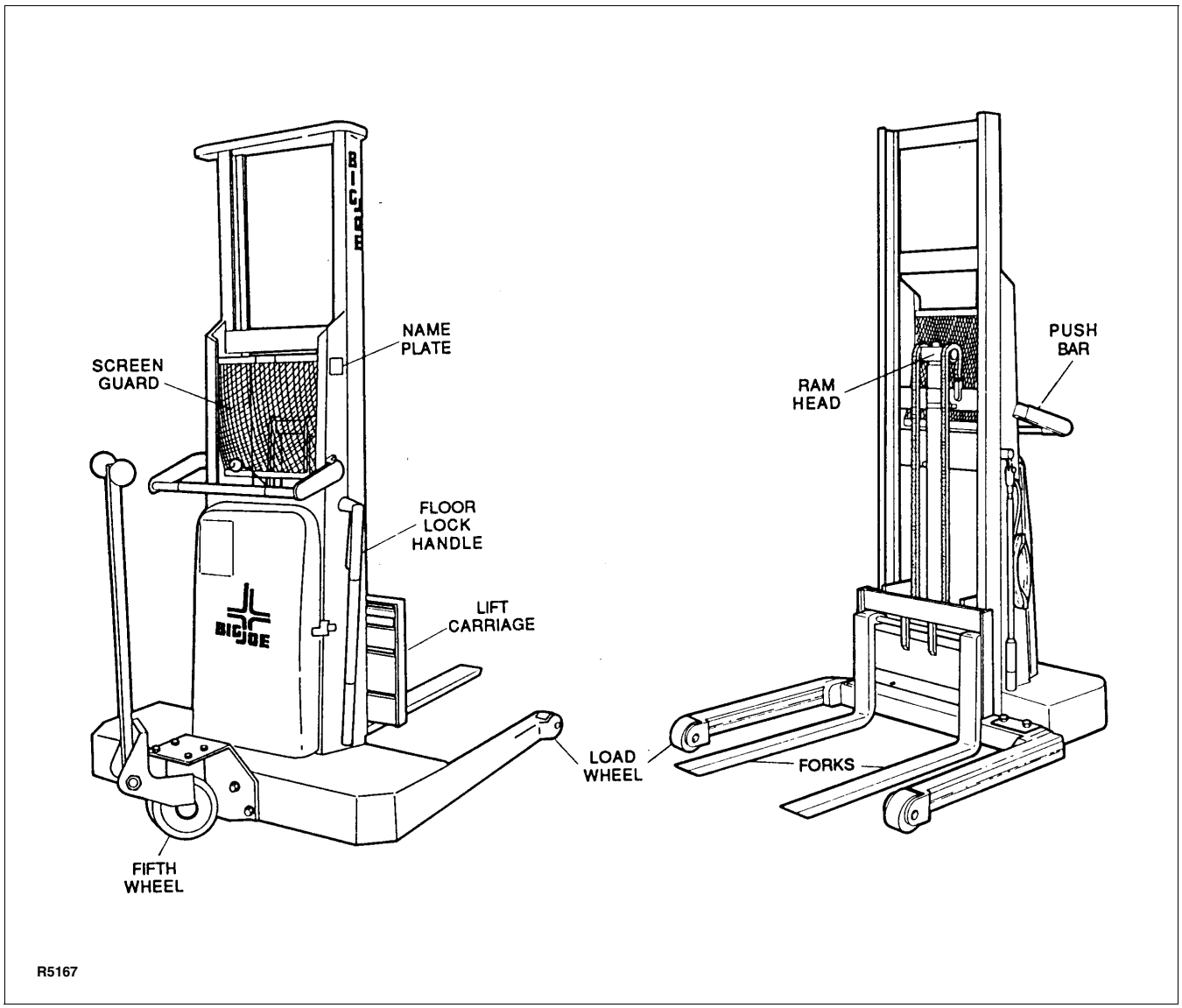


Figure 1-2 Typical IBH Lift Trucks

SECTION 2
OPERATION

2-1. GENERAL.

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

2-2. OPERATING PRECAUTIONS.

WARNING: Improper use of the lift truck can cause injury to persons and damage to the load. Always observe the following precautions when operating the lift truck.

1. Turn off the key switch (1, Figure 2-3) and remove the key when leaving the lift truck.
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 IBH lift trucks which should be checked prior to operation. Depending on use some trucks may require additional checks.

Figure 2-2 shows a sample format for a Operator Checklist, which can be modified as necessary to fit your operation.

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 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 restored to a safe operating condition. Do not make any unauthorized repairs or adjustments. All service must be performed by a qualified maintenance technician.

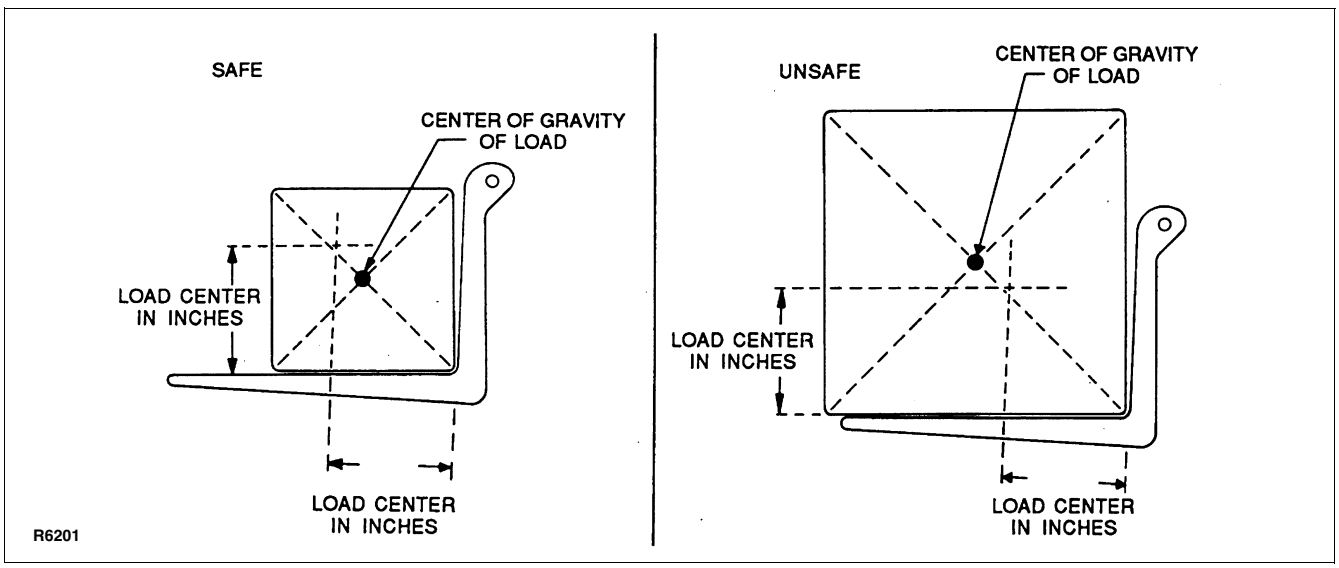


Figure 2-1 Load Center

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 and load backrest	Check that safety guards are in place, properly secured and not damaged.
Safety signs	Check that warning labels, nameplate, etc., 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 and 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.

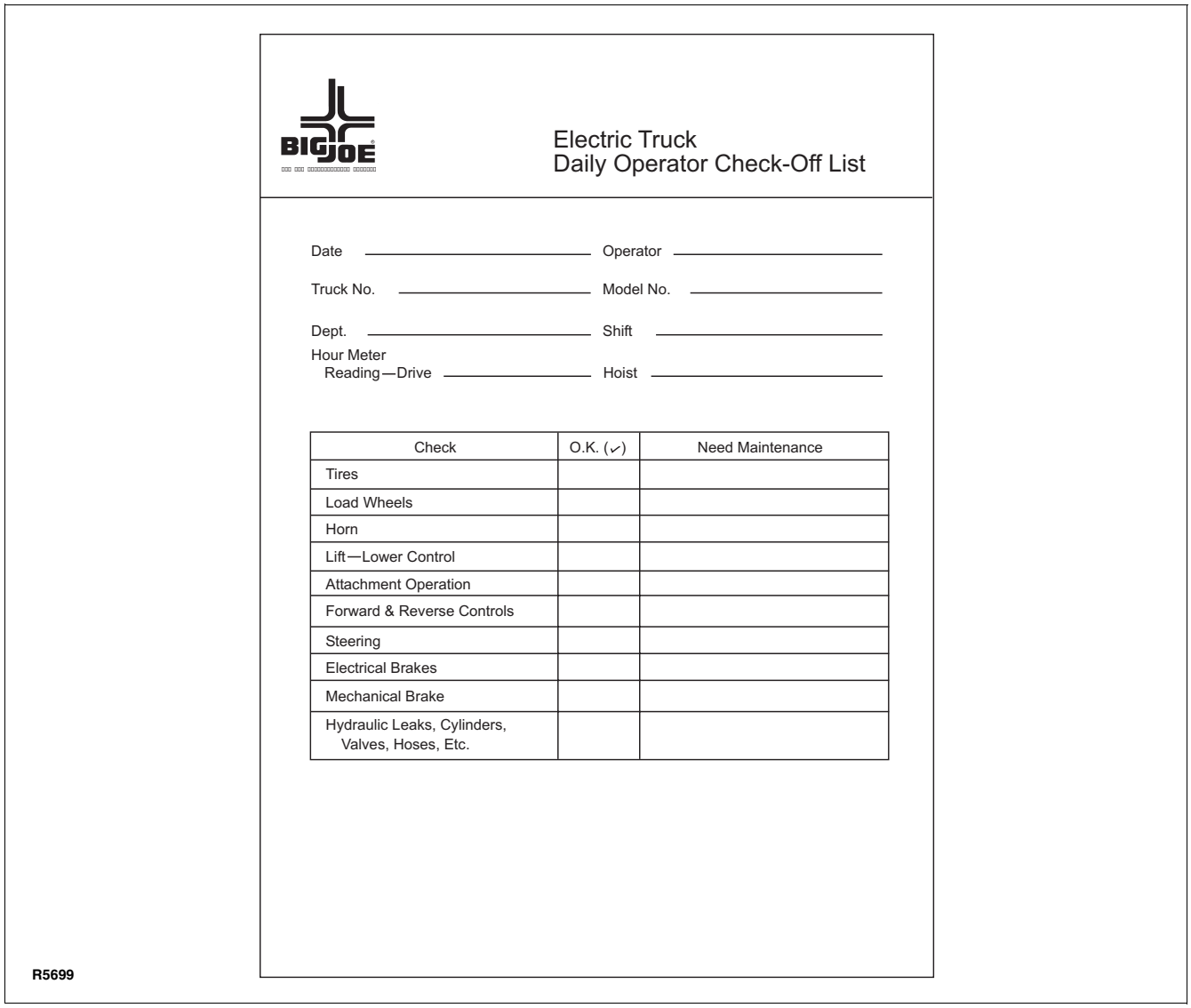


Figure 2-2 Sample of Operator Check List

2-4. INSTRUMENTS AND CONTROLS.

2-4.1. Instrument Panel

The instrument panel contains the keyswitch (1, Figure 2-3), lift/lower control lever (3), and ammeter (4). An optional lift speed control can also be mounted on the instrument panel.

2-4.2. Floor Lock

The floor lock lever located on the right side of the truck, (See Figure 2-4), is used to hold the truck stationary.

2-4.3. Push Bar

The push bar, (See Figure 2-4), is used to push the truck forward or pull the truck backward.

2-4.4. Optional Fifth Wheel

The optional fifth wheel is used to help control steering.

2-4.5. Optional Remote Lift/Lower Control

The optional remote lift/lower control allows the operator to raise and lower the forks while standing away from the control panel. See Figure 2-5.

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 by lowering the floor lock handle.
3. Apply pressure to the pushbar, pushing evenly with both hands to move the truck forward. Pull evenly with both hands to move the truck backward.
4. To stop the lift truck, hand restraint against the pushbar is usually adequate. If hand restraint is not effective, use the floor lock.

NOTE: For normal stopping with the floor lock, pull up slowly on the floor lock handle. For emergency or abrupt stops, pull up sharply on the handle.

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 by lowering the floor lock handle.

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 pushbar to cause the caster wheels to swivel.

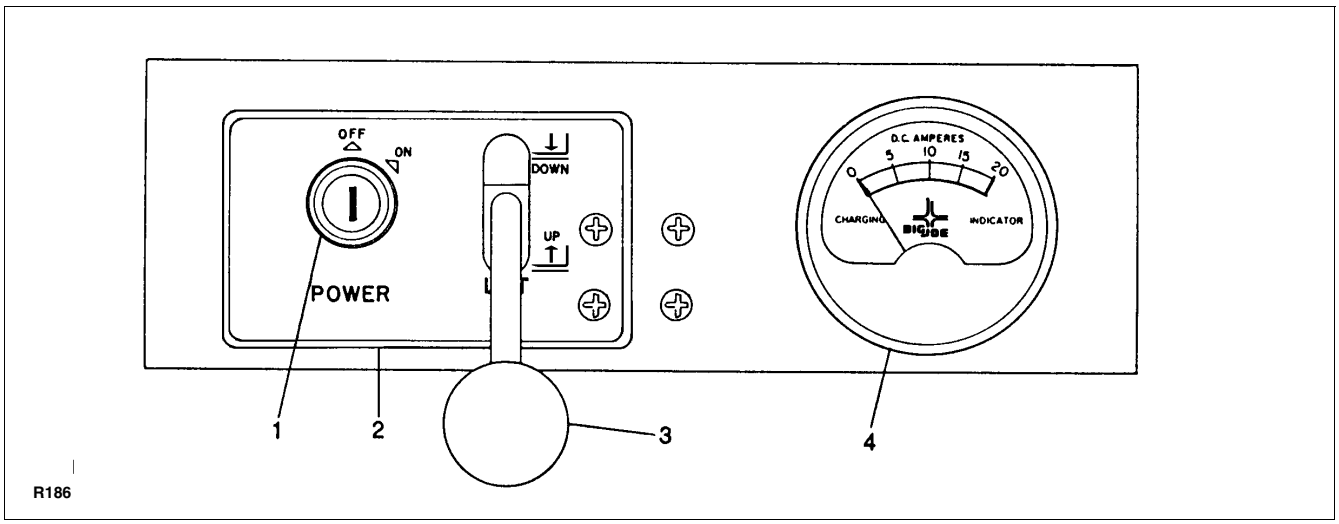


Figure 2-3 Instrument Panel

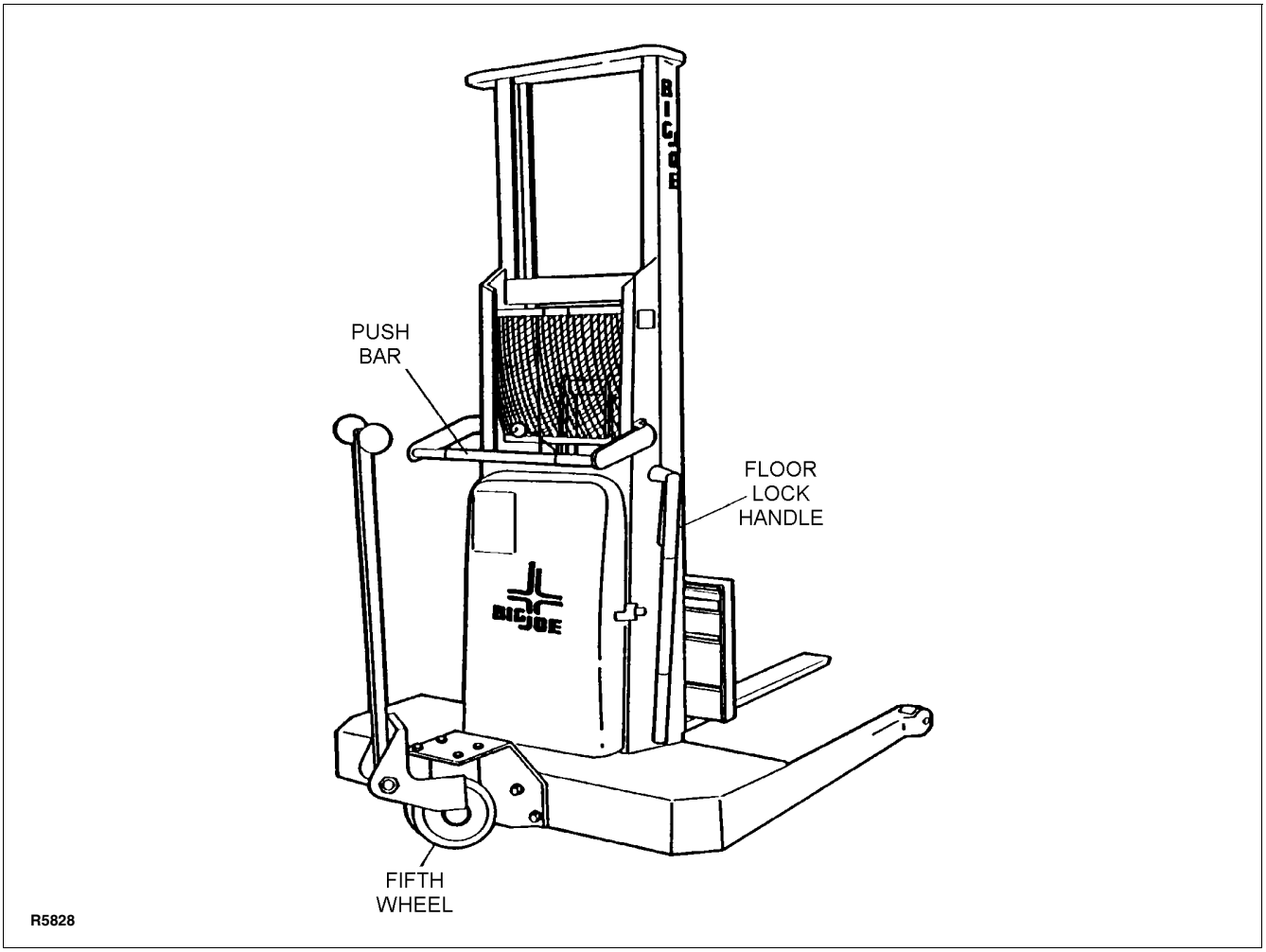


Figure 2-4 Floor Lock and Optional Fifth Wheel

2-6. OPERATING THE LIFT.

2-6.1. Conventional Operation

The lift control (3, Figure 2-3 regulates raising and lowering of the forks.

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 (1) to ON.
2. To raise the forks, pull the lift control (3) back and hold until the forks reach the desired height. 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. Return the lift control to the neutral position.

2-6.2. Remote Operation of Lift with Remote Control Option

The remote lift control regulates raising and lowering of the forks from a distance. When not in use, the remote lift control is attached to the side of the mast with a powerful magnet.

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

1. Engage the floor lock by pulling upon the handle.
2. Turn the key switch (1, Figure 2-3) to ON.
3. Remove the remote control unit from the side of the mast and check that its plug is in the remote control receptacle.

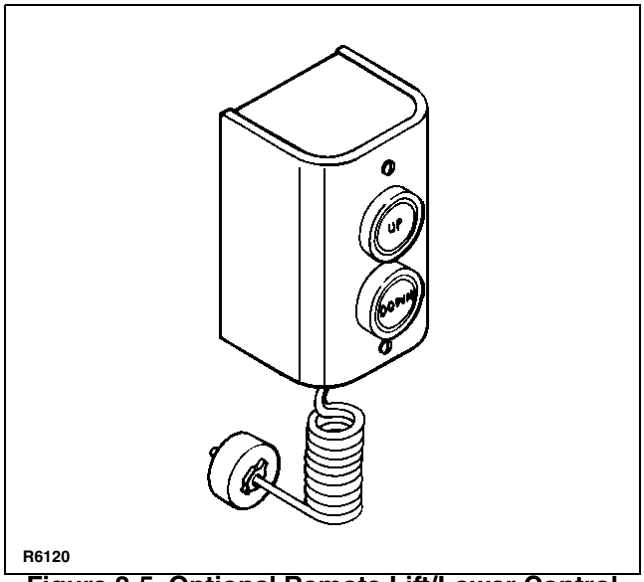


Figure 2-5. Optional Remote Lift/Lower Control

4. To raise forks, press the UP button on the remote control unit. Hold until the forks reach the desired height and release the button.
5. To lower the forks, press the DOWN button and hold until the forks reach the desired level and release the button.

2-7. LOADING AND UNLOADING.

1. Move the truck to the location where the load is to be picked up.
2. If the lift truck has adjustable forks, adjust the forks to the maximum practical width to support the load. If the lift truck has rigid forks, position, the load so that the forks will give maximum support or, if required, place the load on a pallet or skid.
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 lift 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 rests 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 instructions in SECTION 3.

NOTES

SECTION 3
PLANNED MAINTENANCE

3-1. GENERAL.

Preventive 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.

3-2. MONTHLY AND QUARTERLY CHECKS.

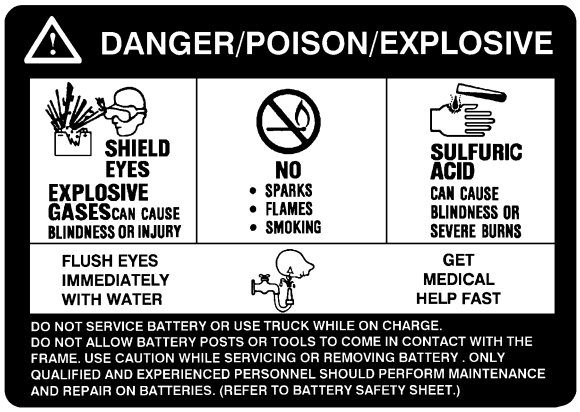
Table 3-1 is an inspection and service chart based on normal usage of the truck eight hours a day, five days a week. If the lift truck is used in excess of forty hours per week, the frequency of inspection and service should be increased. These procedures must be performed by a qualified service technician or your Big Joe service representative.

3-3. BATTERY CARE

3-3.1. General

The life of the battery will be extended if it is given proper care. Perform a daily check of the battery whether or not the truck is in daily use. DO NOT allow the battery to completely discharge (specific gravity 1.150 or less). This will also greatly shorten battery life.

CAUTION: Observe and adhere to battery safety and maintenance supplement (Document 245) and battery warning decal when servicing battery charger.



After charging, check water level in each cell. Water level must cover plates but not be higher than the base of the battery cell filler neck.

Table 3-1 Inspection and Service

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.
Monthly	Lubricate as required.
Weekly	Check floor lock adjustment.
Monthly	Inspect hoses and fittings for leaks.
Monthly	Check lift chain tension.
Monthly	Check wiring for loose connections and damaged insulation.
Monthly	Check load wheels for wear.
Monthly	Check caster wheels for wear.
Quarterly	Check lift cylinder wiper ring and packing.
Semi-annually	Replace hydraulic oil filter.

3-3.2. Charger Operation (8 Amp)

Proper battery care requires that batteries be maintained at full charge.

NOTE: Generally, a lift truck battery should be recharged at the end of each work day. Big Joe "Smart" chargers incorporate computer logic circuits to provide fully automatic recharging and shut off operation for convenient overnight service.

The operation of this charger is completely automatic:

1. Turn key switch off, if equipped.
2. Check battery fluid levels (See Supplement Battery Safety and Maintenance, Document 245).
3. Plug line cord into proper source current.
4. When amp meter reads 0, charge cycle is complete (charger may be left plugged into AC input without damaging battery).
5. Disconnect charger from AC input to use lift truck.

CAUTION: Do not operate lift truck with charger plugged into AC line.

3-3.3. Charger Operation ("Smart" 15 Amp)

1. Turn key switch off, if equipped.
2. Check battery fluid levels (See Supplement Battery Safety and Maintenance, Document 245).
3. Plug AC cord into proper AC power source. After a short delay, the charger will start. When charger cycle is complete, the charger will automatically shut-off.

CAUTION: Do not use truck with charger plugged into AC line.

4. When charger light is off, charge cycle is complete.
5. Disconnect AC cord, wind up cord on cord winder.

3-4. LUBRICATION

Table 3-2 lists the recommended types of grease and oil for lubricating the IBH lift truck. Table 3-3 gives hydraulic system capacity information. Table 3-4 lists the items that require lubrication, identifies the type of lubricant, and specifies the method of application. Table 3-4 is keyed to Figure 3-1 which shows the location of all lubrication points.

3-5. LIFT CHAIN MAINTENANCE.

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

Table 3-2 Recommended Lubricants

No. 1	Hydraulic oil-Heavy duty with a viscosity of 150 SUS (in temperatures below 32 °F use 100 SUS) foam suppressing agent and rust and oxidation inhibitors. Big Joe Part No. 900855 (1 gallon) 900893 (1 quart)
No. 2	Grease—Lithium base, general purpose. For use in temperatures below +20 degrees F, use silicon base general purpose grease.

Table 3-3 Hydraulic System Capacities (Approximate)

LIFT HEIGHT	SYSTEM CAPACITY (GALS)	
	MODELS 1018/1518/ 2018	MODELS 1524/2024/ 2524
60	1	1
72	1	1
84	1	1
96	1	1
106	1	1
120	1	2
130	1	2
144	1	2

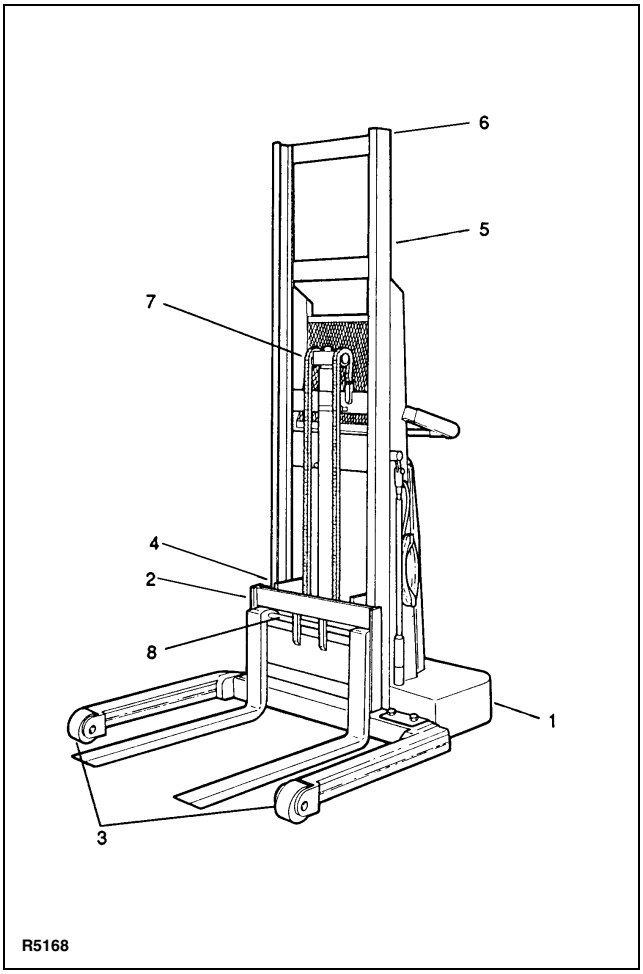


Figure 3-1 Lubrication Points

Table 3-4 Lubrication Chart

Figure 3-1 REF	ITEM	METHOD OF APPLICATION	TYPE (Table 3-2)	NOTES
1	Caster Wheels	Gun	No. 2	Pressure lube.
—	Hydraulic System	—	No. 1	Lower lift carriage fully. Fill reservoir with fluid. Leave 1 inch air space above fluid.
2	Lift Carriage Rollers	Gun	No. 2	Pressure lube.
3	Load Wheels	Hand/Gun	No. 2	Repack or pressure lube.
4	Lower Inner Mast Rollers	Gun	No.2	Use point adapter (Female Fitting).
5	Outer And Inner Mast	Brush	No. 2	Grease full length of channel where rollers operate.
6	Upper Mast Rollers	Can	No. 2	Use point adapter (Female fitting).
7	Ram Head Sheaves	Gun	No. 2	Pressure lube.
8	Fork shaft	Brush	N0. 2	Apply a light coating.

NOTES

SECTION 4
TROUBLESHOOTING

4-1. GENERAL

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

Table 4-1 Troubleshooting Chart

MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
Oil sprays or flows from top of lift cylinder.	Defective packing in lift cylinder.	Overhaul lift cylinder and install new packing, seal, and wiper ring.
Oil foams from vent cap on hydraulic reservoir.	Leak in suction line between pump and reservoir or oil level too low.	Check oil filter. Replace if necessary. Tighten fittings. Inspect line and replace if necessary.
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 bearing.	Add oil. Apply grease. Replace bearing.
Forks do not lift to top.	Oil level low.	Add oil.
Oil leaks at lift control valve release cam.	Defective O-ring in lift control valve body.	Replace O-ring on release cam shaft.
Lift control does not return to neutral	a. Broken return spring. b. Foreign particles. c.Misaligned valve clamp.	Replace spring. Clean system and valve. Adjust clamp.
Oil leaks at lift control valve release cam.	Defective O-ring in lift control valve body.	Replace O-ring on release cam shaft.
Weak, slow or uneven action of hydraulic system.	a. Defective pump. b. Defective lift cylinder c. Load exceeds capacity. d. Dirt or foreign particles between check ball and seat in control valve. e. Defective lift control valve. f. Battery specific gravity low.	Check pressure. Repair or replace. See data plate. Disassemble, clean, reassemble Adjust, repair, or replace. Charge battery.

Table 4-1 Troubleshooting Chart - Continued

MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
Forks do not lift. motor does not run.	a. Battery discharged.	Check. Recharge if required.
	b. Defective wiring.	Check and repair as required.
	c. Defect in electrical system for operating pump motor.	Check pump motor switch on lift control valve, as well as the solenoid relays. Repair or replace.
	d. Defective motor	Repair or replace motor.
Forks do not lift. Motor runs.	Defect in hydraulic system.	Check hydraulic oil level. Check oil lines to lift cylinder and repair as required. If okay, check hydraulic pump, oil filter, and lift control valve. Repair or replace.
Forks lift but will not lower.	Defect in hydraulic system.	Check lift control valve. Check flow control line. Look for obstruction in hydraulic line. Clean, repair, or adjust.
Forks creep down with or without load.	a. Oil bypassing between check ball and lift control valve body.	Disassemble, clean and reassemble.
	b. Worn lift cylinder packing.	Replace worn parts.
	c. Pump will not hold pressure.	Replace pump. Check for obstruction in lift control valve and check valve.
	d. Leak in hydraulic system, packing, or valve.	Check for leaky fittings in hydraulic line.
	e. Leak in hydraulic pump check valve	Check pump and suction line for leakage back to reservoir. Repair or replace.
Truck does not stop when floor lock is engage.	a. Floor lock misadjusted.	Adjust.
	b. Floor lock shoe pad friction surface is oily.	Clean.
	c. Floor lock shoe pad friction surface is worn.	Replace.

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 chains

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

5-2. INNER MAST ASSEMBLY (TELESCOPIC AND FULL FREE LIFT).

Maintenance of the inner mast assembly is limited to replacement of rollers and bearings sheaves, and lubrication of those parts. See Figure 5-2, Figure 5-3 and Figure 5-4 for parts identification and disassembly sequence.

Refer to SECTION 3 for lubrication information.

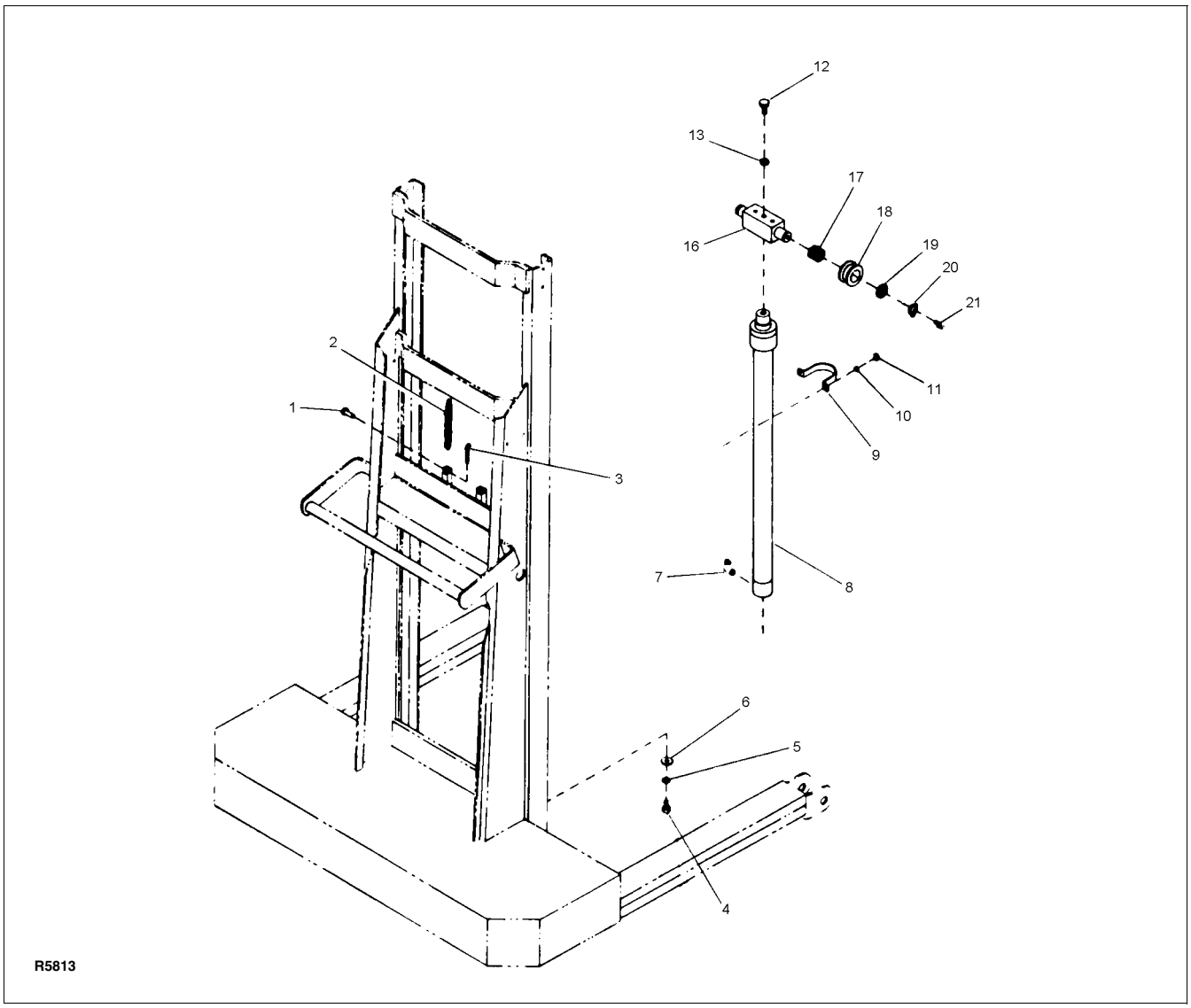


Figure 5-1 Inner Mast and Ram Head (NON-TEL)

USED ON 1518

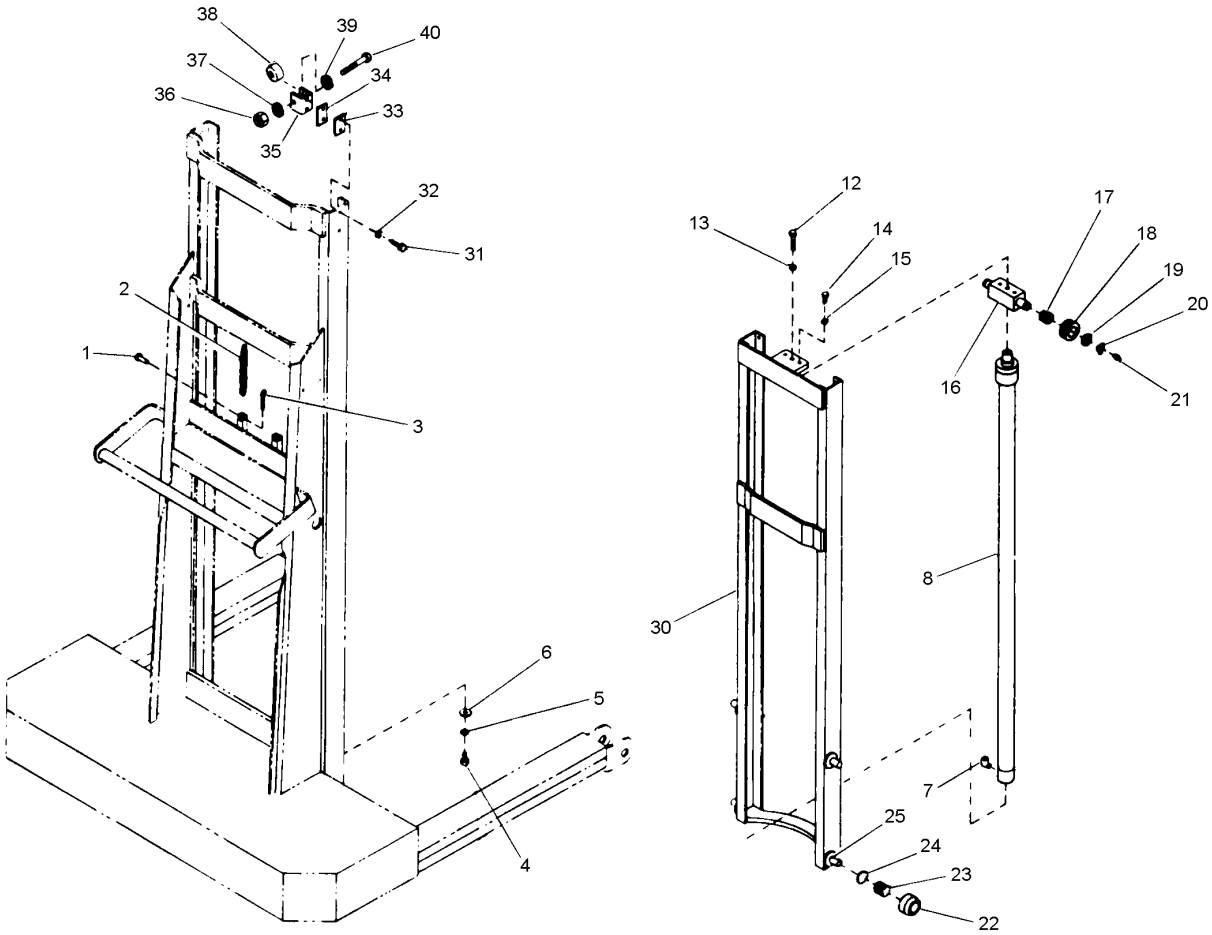


Figure 5-2 Inner Mast and Ram Head (TEL)

USED ON 1524 & 2018

USED ON 2024 & 2524

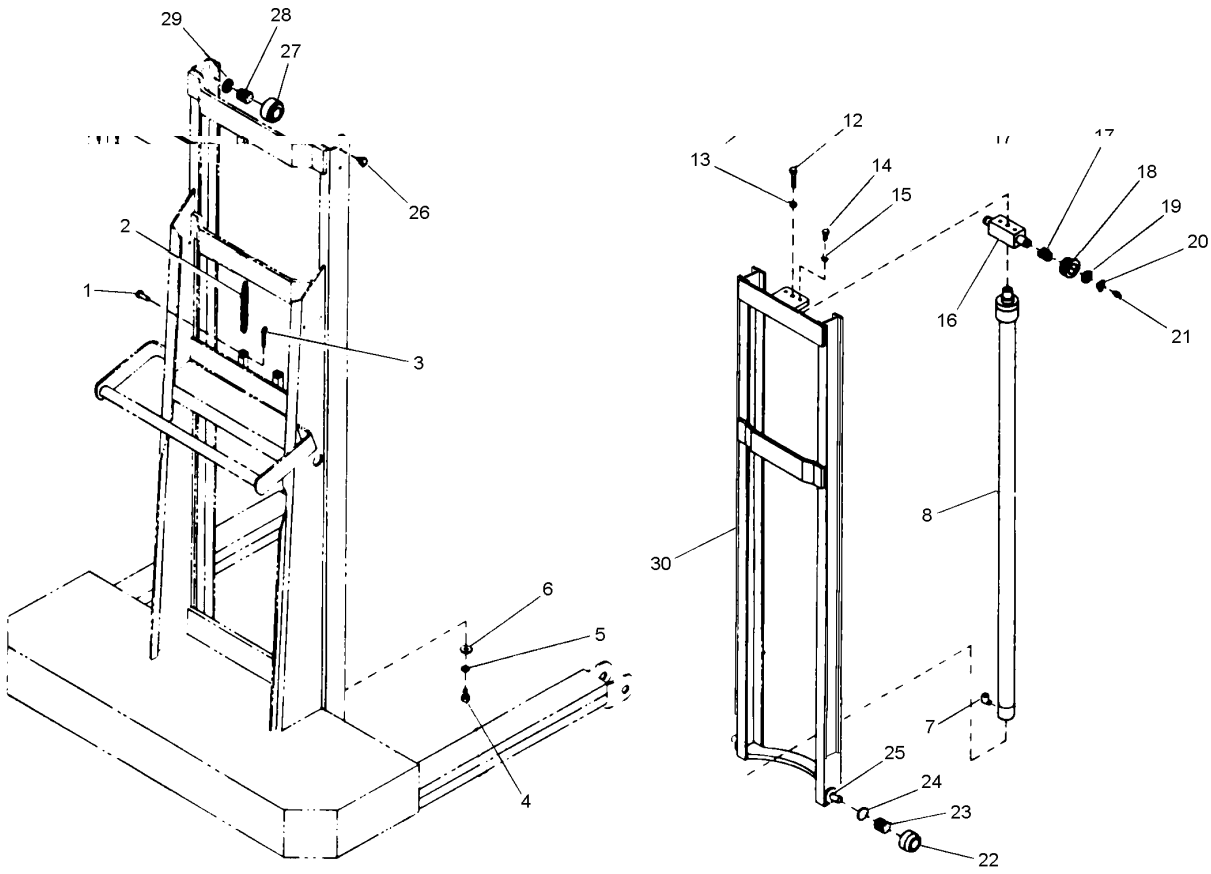


Figure 5-3 Inner Mast and Ram Head (TEL)

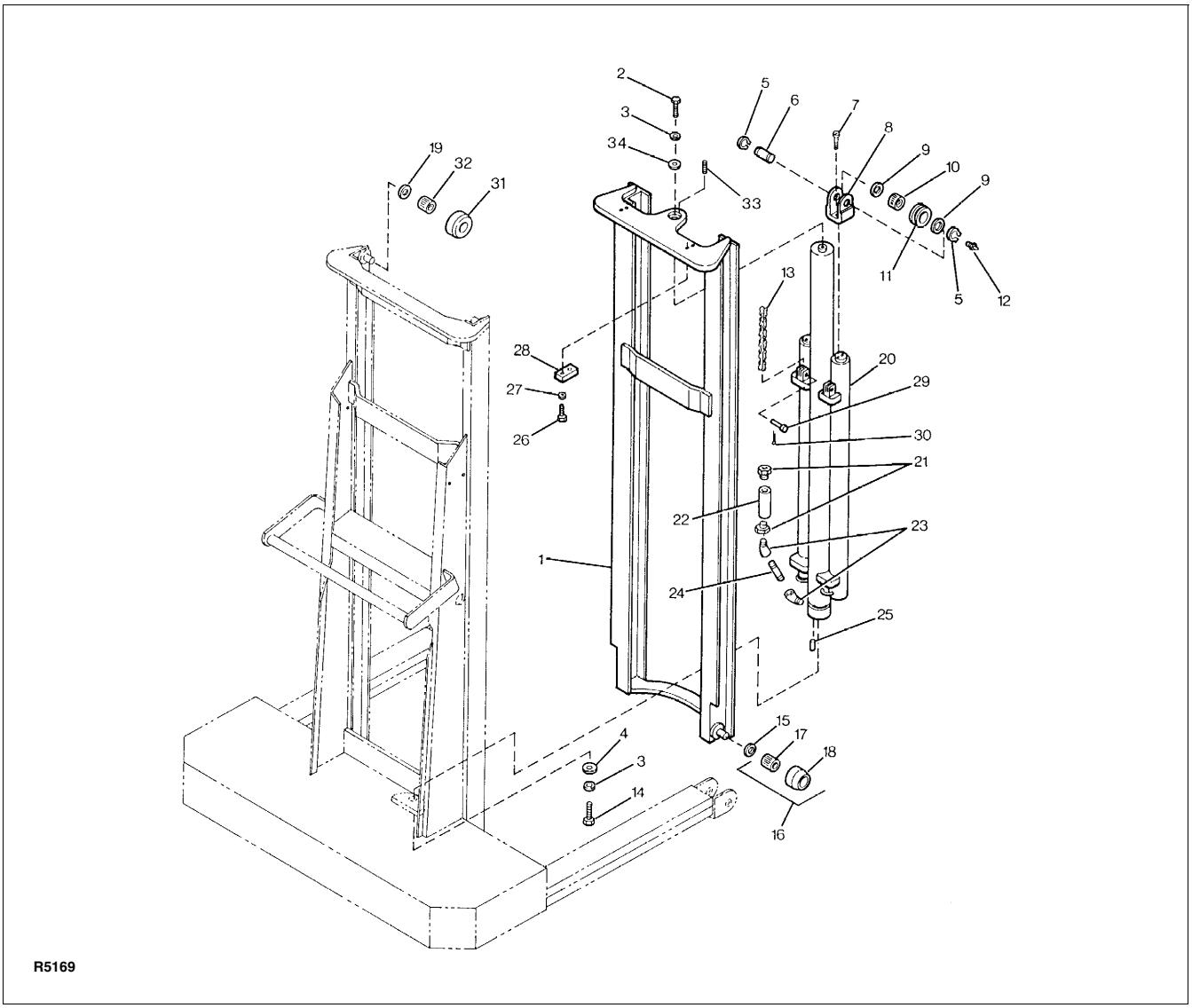


Figure 5-4 Inner Mast and Ram Head (Full Free Lift)

5-3. LIFT CHAIN WEAR INSPECTION

Both lift chains should be replace when either chain is worn enough to increase it's 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 5-5. when installing new chain.

5-4. LIFT CHAINS ADJUSTMENT.

1. Lower the carriage fully, then disconnect battery.

CAUTION: At least 3 full threads must be present below hex nut (10, Figure 5-5) after completion of adjustment.

2. Loosen the top jam nuts (11) on the adjusting bolts (14).

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

3. Take up slack in both chains by turning the hex nuts (10) on the adjusting bolts (14). Try to get equal tension on both chains.
4. Align adjusting bolts so that they are parallel to the ram head.
5. Tighten the jam nuts (11) while maintaining alignment of the adjusting bolts.

5-5. LIFT CHAINS REPLACEMENT.

5-5.1. Telescopic and Non-Telescopic

1. Place a solid support on the floor under the vertical members nearest the center of the 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 cotter pin (3, Figure 5-1, Figure 5-2 or Figure 5-3) and clevis pin (1) that secure the chain to the mast cross brace.
4. Remove cotter pin (13, Figure 5-5) and clevis pin (12) that secure the chain to adjusting bolt (14).
5. Remove the chains from sheaves (18, Figure 5-1, Figure 5-2 or Figure 5-3).
6. Position new chain in place on sheaves (18).
7. Install cotter pin (13, Figure 5-5) and clevis pin (12) on chain adjusting bolt.
8. Connect end of chain to mast cross brace with clevis pin (1, Figure 5-1, Figure 5-2 or Figure 5-3) and cotter pin (3).
9. Adjust chain according to paragraph 5-4.

5-5.2. Full Free Lift

1. Place a solid support on the floor under the vertical members nearest the center of the 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 cotter pin (30, Figure 5-4) and clevis pin (29) that secure the chain to the lift cylinder.
4. Remove cotter pin (13, Figure 5-5) and clevis pin (12) that secure the chain to adjusting bolt (14).
5. Remove the chains from sheaves (11, Figure 5-4).
6. Position new chain in place on sheaves (11).
7. Install cotter pin (13, Figure 5-5) and clevis pin (12) on chain adjusting bolt.
8. Connect end of chain to the lift cylinder with clevis pin (29, figure 5-4) and cotter pin (30).
9. Adjust chain according to paragraph 5-4.

5-6. LIFT CYLINDER REMOVAL.

5-6.1. Non-Telescopic

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.
4. Disconnect battery.

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

5. Hold the lift control handle forward while pressing down on the lift cylinder ram.
6. Remove the overflow tubing retainers from the side of the lift cylinder assembly.

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

7. Disconnect the hose assembly from the bottom and the overflow tubing from the top of the lift cylinder.

8. Lift chains from sheaves (18, Figure 5-1) and set them aside.
9. Remove screw (12) and lock washer (13) from the top of ram (16).
10. Lift ram (16) from the lift cylinder.
11. Remove clamp (9) that secures the lift cylinder and remove the cylinder.

5-6.2. Telescopic

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 onto the supports. Check that the supports are supporting the mast.
4. Disconnect battery.

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

5. Remove screws (12 and 14, Figure 5-2 or Figure 5-3) and lock washers (13 and 15) that secure ram head (16) to inner mast (30).
6. Hold the lift control handle forward while pressing down on the ram.
7. Remove the overflow tubing retainers from the side of the lift cylinder assembly.

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

8. Disconnect the hose assembly from the bottom and the overflow tubing from the top of the lift cylinder.
9. Lift chains from sheaves (18) and set them aside.
10. Remove screw (4) from underside of the cylinder.
11. Carefully tilt the lift cylinder forward from the truck.
12. Remove ram head (16) from the lift cylinder.
13. Raise the lift cylinder up and out of the truck.

5-6.3. Full Free Lift

1. Chock all wheels and engage the floor lock.
2. Fully lower the lift carriage.

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

3. Disconnect battery.

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

4. Disconnect the hose at the bottom of the lift cylinder.
5. Remove bushings (21, Figure 5-4), flow control valve (22), elbows (23) and nipple (24) at the bottom of the lift cylinder.
6. Using another lift truck or suitable jack, raise lift carriage far enough to remove chains from around sheaves (11). Lay chains aside and lower lift carriage.
7. Remove screw (2), lock washer (3) and flat washer (34) securing the top of lift cylinder (20) to the inner mast (1).
8. Remove screw (14), lock washer (3) and flat washer (4) securing the bottom of lift cylinder (20) to the outer mast.

WARNING: Lift cylinder must be supported during the next step.

9. Support lift cylinder and using another lift truck or suitable jack, raise inner mast (1) far enough to clear top of lift cylinder.
10. Lift cylinder up and out of truck.
11. Remove snap ring (5) and slide pin (6) out of sheave (11). sheave (11), bearing (10) and thrust washers (9) will fall free.
12. Bracket (8) can now be removed by removing screws (7).

5-7. LIFT CARRIAGE.

The only maintenance required for the lift carriage is lubrication of the rollers. Refer to SECTION 3 for lubrication information.

5-8. LIFT FORKS.

Check the lift forks periodically for cracks and other damage. Figure 5-5 illustrates the two styles of forks. See Table 10-1 for forks and their relationship to truck model numbers.

5-9. LOAD BACKRESTS.

Backrests of differing widths are available for use on lift trucks equipped with ITA type carriages. See Table 10-2 for load backrest part numbers. Figure 5-5 illustrates a load backrest.

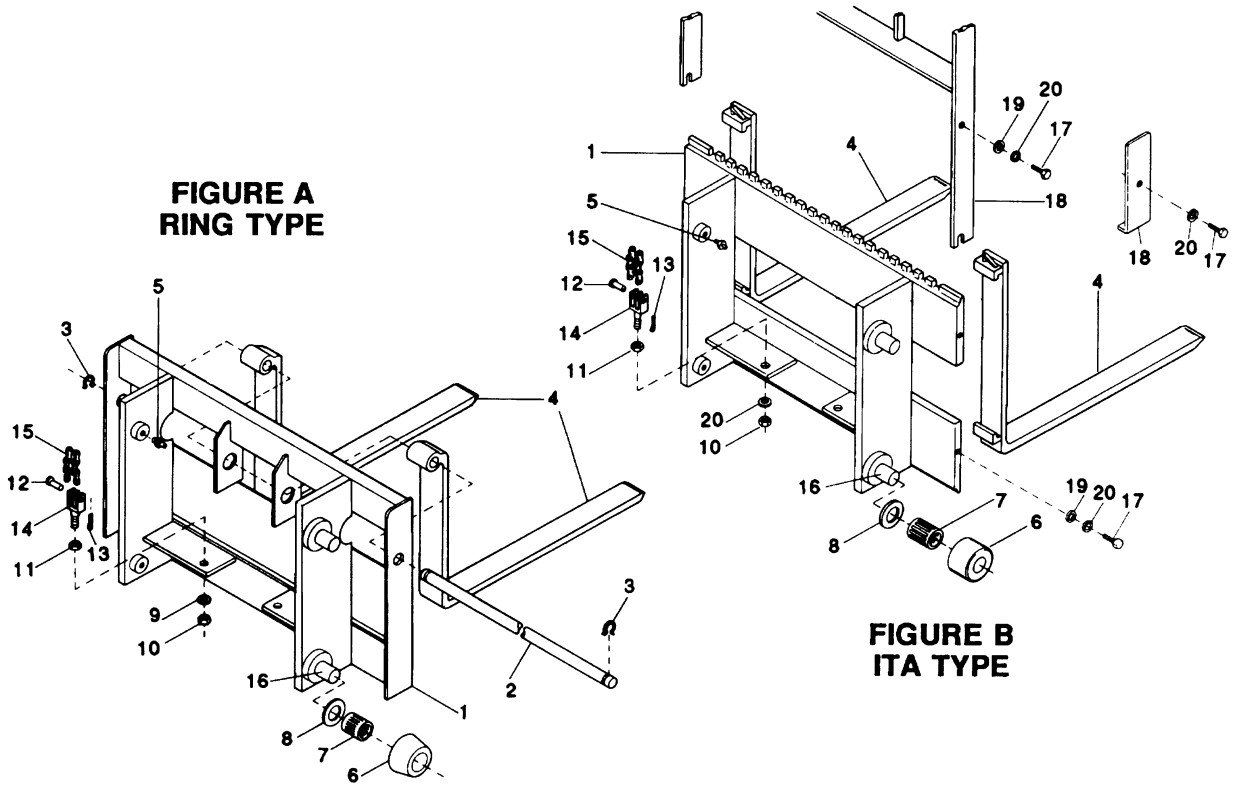


Figure 5-5 Lift Carriages and Forks

NOTES

SECTION 6
HYDRAULIC SYSTEM SERVICING

6-1. GENERAL.

This section covers maintenance and repair procedures for the battery powered lift truck hydraulic system. (Hydraulic systems for trucks powered by AC current are covered in Supplement 252.) The system consists of the following parts and subassemblies:

Hydraulic pump

Hydraulic oil reservoir

Hydraulic oil filter

Lift control valve

Flow control valve

Lift cylinder

Lift speed control (Optional)

Figure 6-1 is a schematic diagram of the hydraulic system in a battery powered truck.

Figure 6-2 shows the relationship of all components in the hydraulic system. Figure 6-3 shows components associated with FFL model trucks. Refer to this illustration when performing maintenance.

6-2. HYDRAULIC PUMP.

The hydraulic pump is not repairable. If it fails it must be removed from the pump/motor assembly and replaced. Remove the pump/motor assembly (23, Figure 6-2 or 12, Figure 6-3) as follows:

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

1. Drain the hydraulic oil from the system.
2. Disconnect the battery cable from the solenoid.
3. Label, then disconnect the ammeter and switch wires from the solenoid.
4. Label, then disconnect tubing and hoses from the pump.
5. Remove the pump/motor assembly by removing the two hex head screws that hold it to the truck.
6. Separate the pump from the motor by removing the four hex head screws that connect the two.
7. Reassemble in the reverse order of disassembly.

NOTE: Always use a new gasket when assembling the pump/motor assembly.

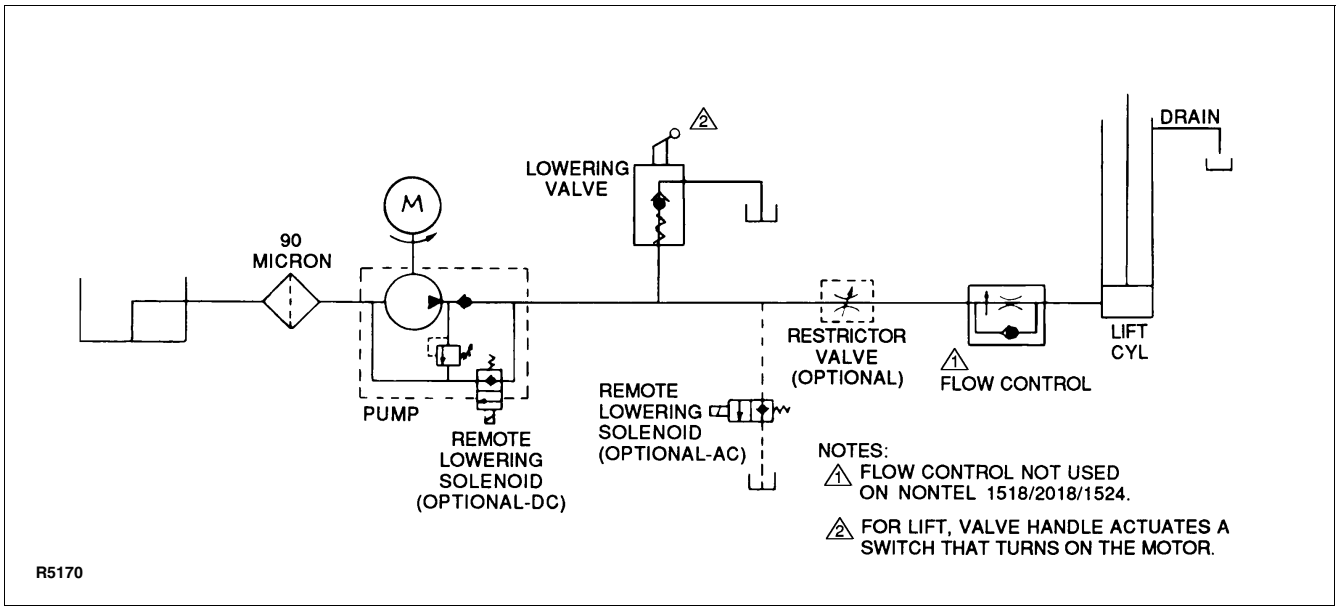


Figure 6-1 Hydraulic System Schematic, Battery Models

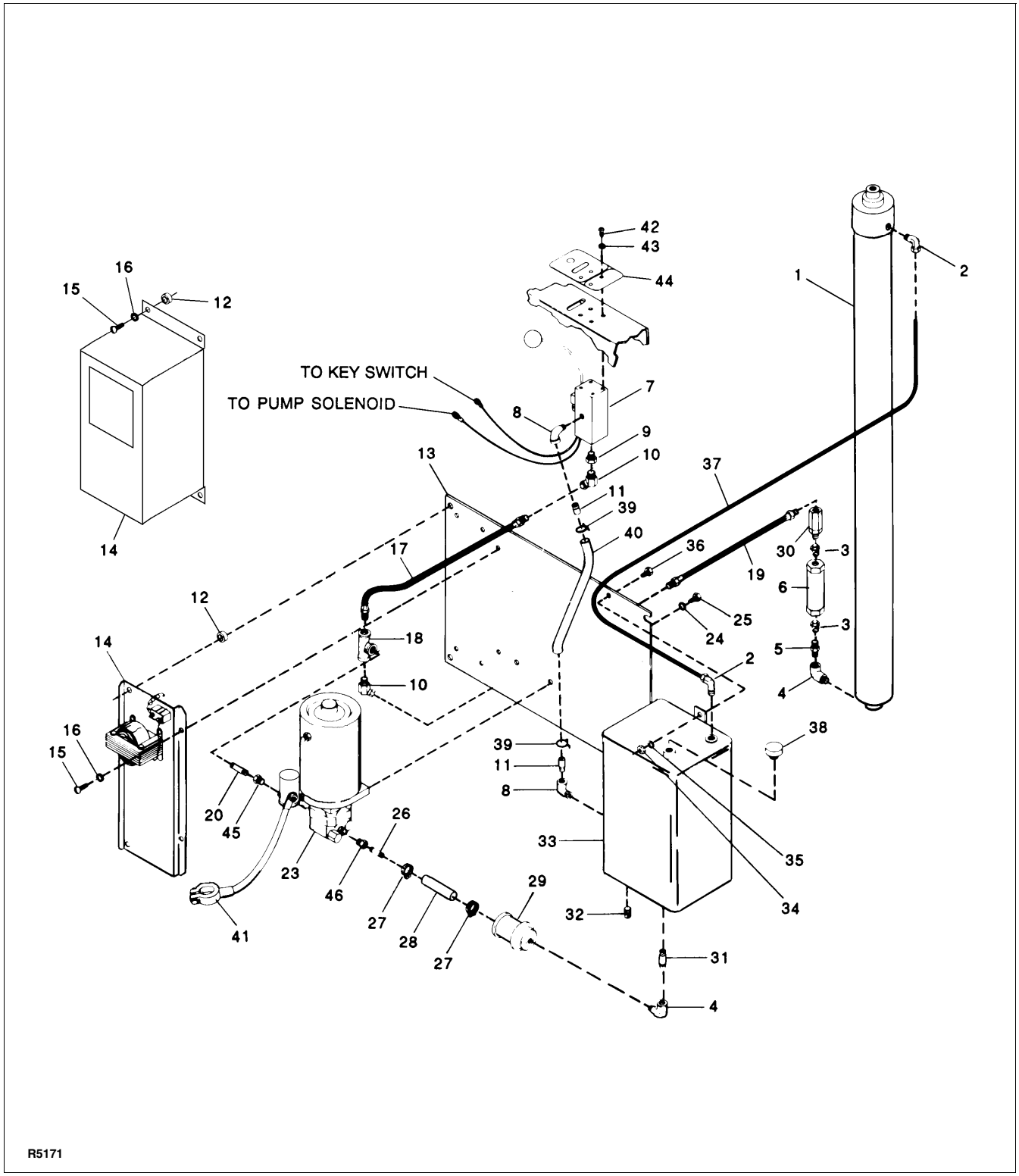


Figure 6-2 Hydraulic System (TEL & NON TEL)

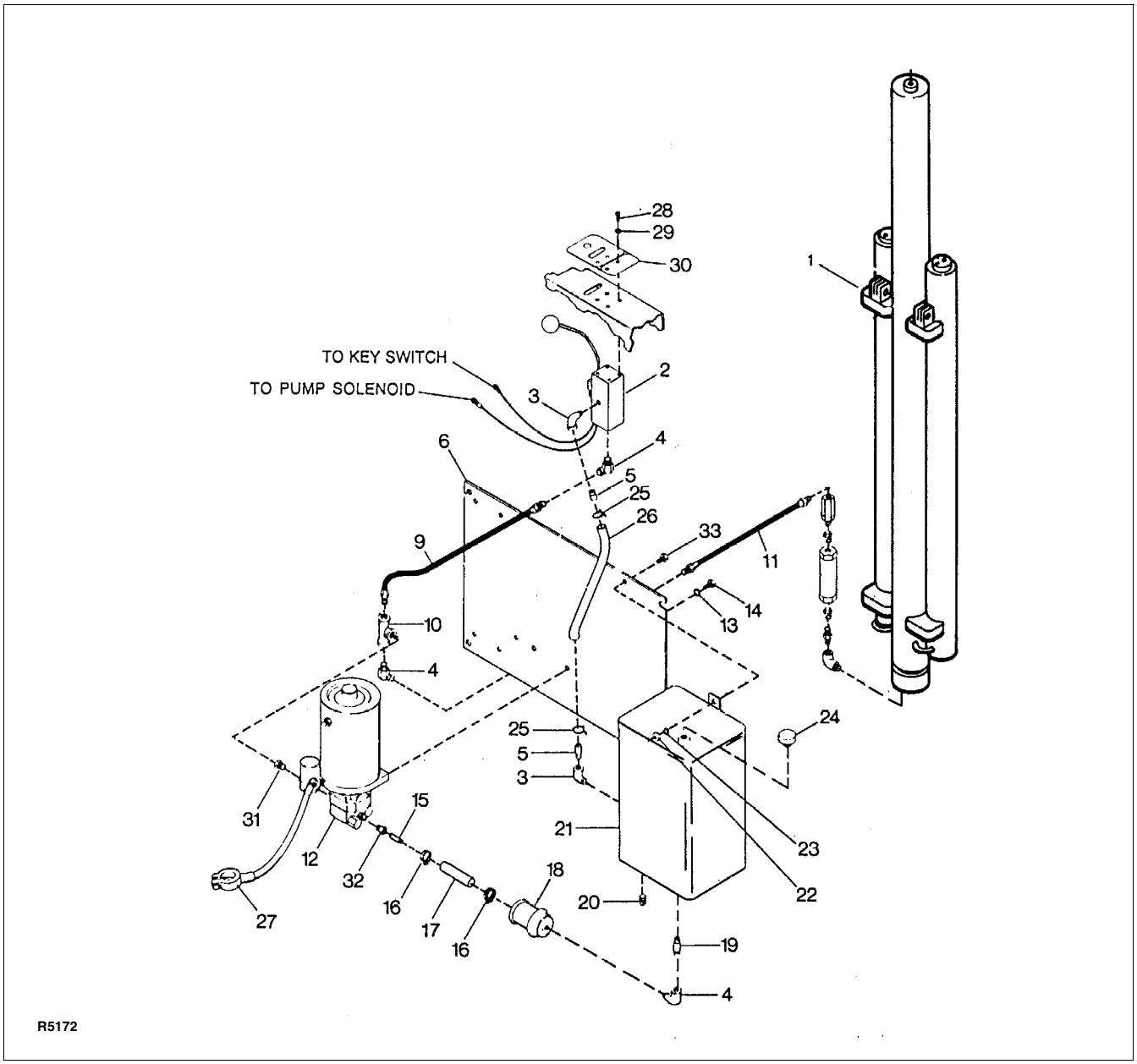


Figure 6-3 Hydraulic System (FFL)

6-3. HYDRAULIC OIL RESERVOIR.

No maintenance is required. See SECTION 3 for capacity information.

6-4. HYDRAULIC OIL FILTER

The oil filter (29, Figure 6-2 or 18, Figure 6-3) is in the suction (inlet) line between the reservoir and pump. Replace the filter as follows:

1. Lower the forks fully to remove pressure from the system.
2. Remove the reservoir vent cap.
3. Remove the reservoir drain plug to drain the oil out and clean it.
4. Loosen the hose clamp that holds the tubing to the filter.
5. Unscrew the filter from the elbow at the base of the reservoir.
6. Install a new filter in the reverse order of removal.

6-5. LIFT CONTROL VALVE.

6-5.1. Adjustment

The lift control valve assembly contains a switch that turns on the pump motor and a valve that meters hydraulic oil under pressure to the lift cylinder. The assembly rarely requires adjustment. In case service is ever required, proceed as follows to set the valve and hydraulic pump switch:

1. With the ball seat assembly in place and the valve installed in the hydraulic system raise the lift carriage part way with a moderate load on the forks to build up pressure in the hydraulic system.

CAUTION: In the following procedure, prevent the lift control valve clamp (8, Figure 6-4) from slipping off of the release cam (3) or the handle return spring (7) will slip by the roll pins (6).

2. Loosen the upper nut (9) on the lift control valve clamp (8).

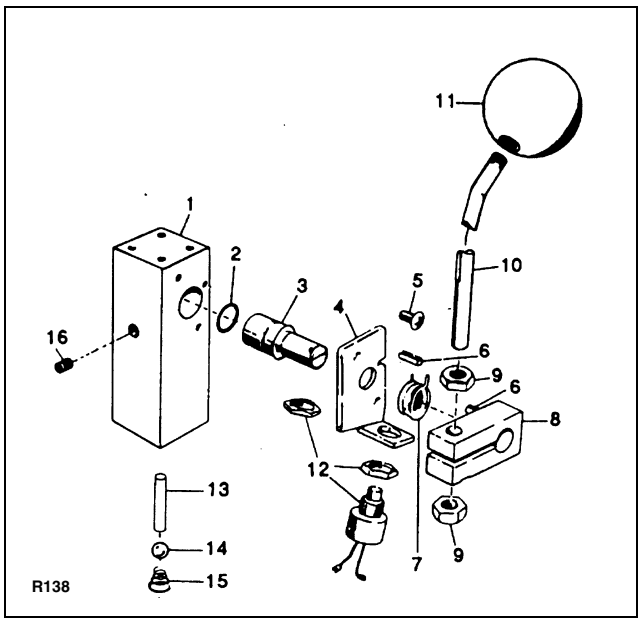


Figure 6-4 Lift Control Valve Assembly

3. Use the point where the lift control knob (11) and handle (10) meet as a reference point. Push the handle 3/4 inch from the neutral position. See Figure 6-5.

4. Place a screwdriver blade in the slot of the release cam (3) and rotate the cam 1/8 inch clockwise. This ensures that the check ball (14) is seated in the valve seat.

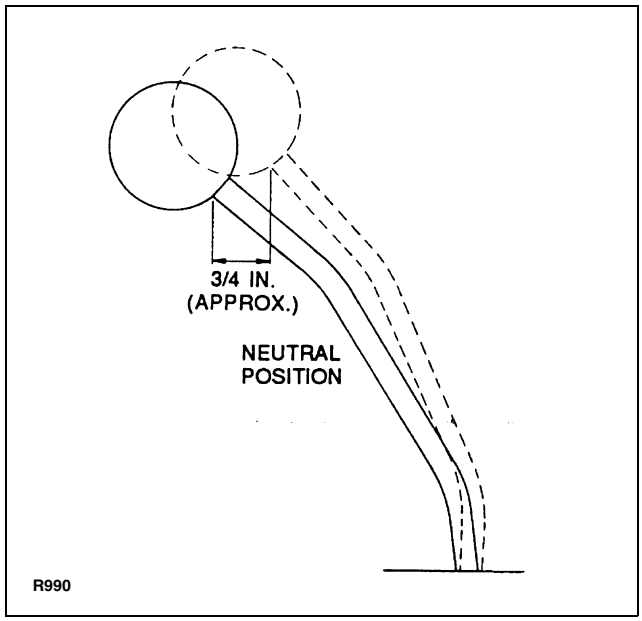


Figure 6-5 Lift Control Valve Adjustment Position

5. Turn the screwdriver counterclockwise until a definite resistance is felt.

6. Tighten the upper nut (9) on the lift control clamp.

6-5.2. Disassembly, Lift Control Valve

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

1. Lower the lift carriage fully. Disconnect all lines related to control valve.

2. Disconnect all electrical power.

3. Label, then disconnect all leads from the key switch.

4. Remove the knob (11, Figure 6-4) from the lift control handle.

5. Label, then disconnect tubing from the lift control valve and the wire leading to the solenoid.

6. Remove the four screws that hold the control valve to the instrument panel.

7. Separate the lift control valve from the instrument panel. Loosen the lower nut (9) that secures the lift control handle (10) to the valve clamp (8) and slide the handle and clamp from the release cam (3).

8. Remove the handle return spring (7).

9. If necessary, remove the pump motor switch (12) by removing the top nut.

10. Remove the switch bracket (4).
11. At the base of the valve, remove the reducer fitting and hollow set screw to release the compression spring, check ball, and pin (13, 14 and 15).
12. Pull the release cam (3) and O-ring (2) from the valve body.
13. Reassemble the lift control valve, using new parts as required, by performing steps 2. through 12. in reverse order.

6-6. FLOW CONTROL VALVE.

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

NOTE: A small amount of hydraulic oil will drain from the system when the hydraulic line is disconnected in this procedure. Use a cloth or suitable container to catch the oil.

1. Place chocks at 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 (telescopic models) or lift carriage (non-telescopic models). Keep the supports in place during the entire procedure.
3. Lower the inner mast or carriage onto the supports. Check that the supports are supporting the weight.
4. Disconnect all electrical power.
5. On telescopic models, remove the two cap screws and lock washers that secure the top of the inner mast to the ram head.
6. Hold the lift control handle forward while pushing down on the ram, lowering it as far as possible. The chains will become slack and need not be removed.

NOTE: A hose (19, Figure 6-2) connects directly to the flow control valve (6) on models 1018, 1518, and 2018 trucks. It connects through a reducer (30).

7. Disconnect hose (19) from flow control valve (5) and swivel connector or reducer (30) as applicable.
8. Remove the flow control valve.
9. Install the new flow control valve with the arrow on the valve pointing toward the lift cylinder.
10. Reconnect the hose (19).
11. On telescopic models, resecure the ram head with the two cap screws and lock washers.
12. Connect the battery.
13. Raise the forks and carefully remove the supports.
14. Check for hydraulic oil leaks. Top off the oil reservoir if needed.

6-7. LIFT CYLINDER REPAIR.

6-7.1. Non-Telescopic (Model 1018)

NOTE: Removal procedures are covered in SECTION 5.

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

1. Secure the lift cylinder in the vise and remove the packing nut (3, Figure 6-6) and dust seal (2).
2. Pull shaft (4) out of barrel (1).
3. Remove the lift cylinder from the vise.

CAUTION: Use a vise clamp with non-marring jaws to prevent damaging the shaft.

4. Secure shaft (4) in the vise.
5. Remove the nut (11) from the bottom of shaft (4) and pull off piston (8).
6. Remove O-ring (6), steel ring (7), O-ring (10), and back up ring (9) from piston (8).
7. Install O-ring (6), steel ring (7), O-ring (10), and back up ring (9) on piston (8).
8. Install piston (8) on shaft (4) and secure with nut (11).
9. Remove shaft (4) from the vise.

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

10. Secure barrel (1) in the vise.
11. Install shaft (4) in barrel (1).
12. Install packing nut (3) with new dust seal (2).
13. Remove lift cylinder assembly from vise.

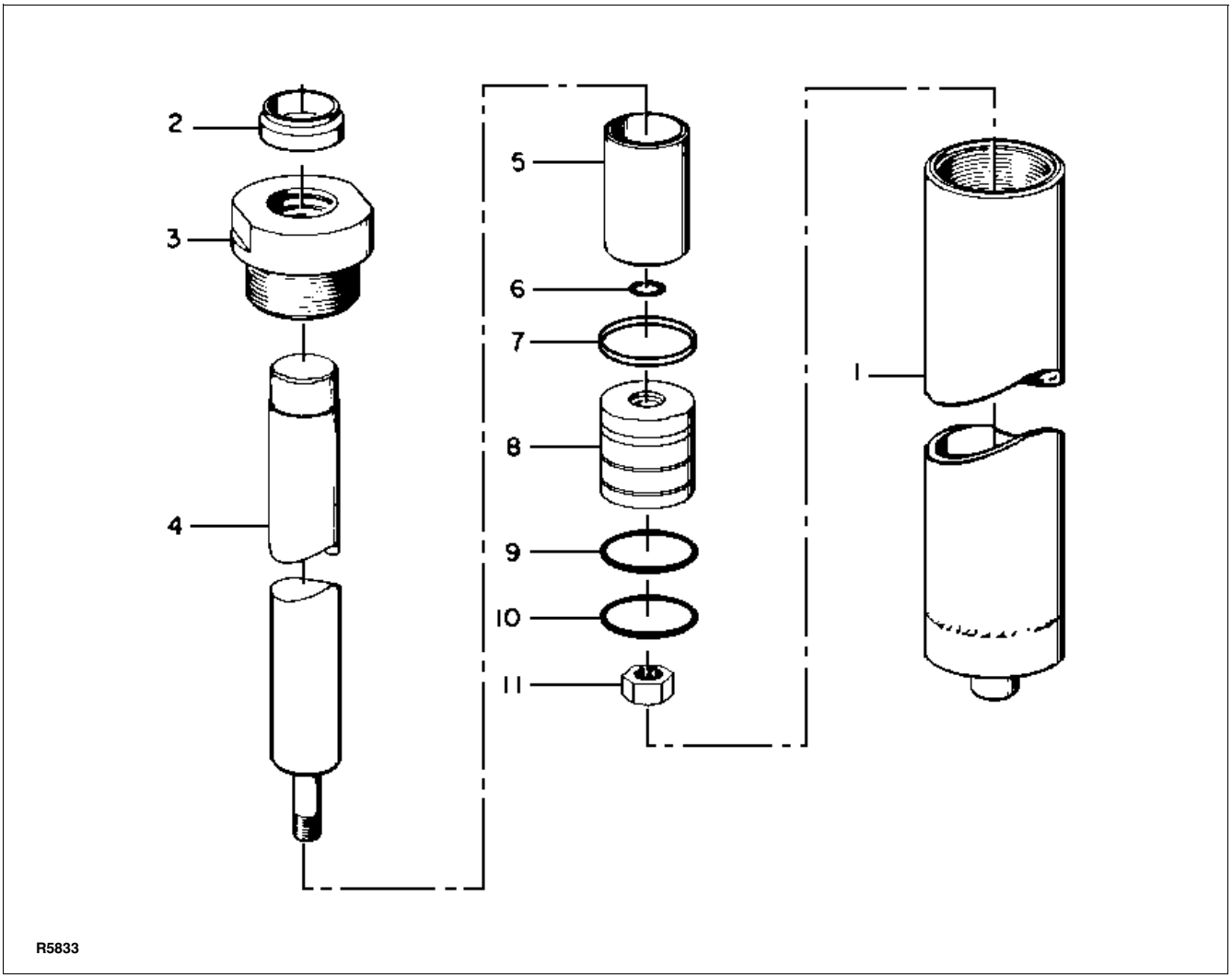


Figure 6-6 Lift Cylinder (Non-Tel) (Model 1018)

6-7.2. Non-Telescopic (Model 1518, 1524, 2018, 2024, 2524)

NOTE: Removal procedures are covered in SECTION 5.

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

1. Secure the lift cylinder in the vise and remove the gland nut (3, figure 6-7), wiper ring (2), and O-ring (4).
2. Pull the cylinder ram (5) out of the lift cylinder.
3. Remove the lift cylinder from the vise.

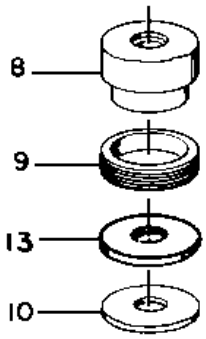
CAUTION: Use a vise clamp with non-marring jaws to prevent damaging the ram.

4. Secure the ram in the vise.
5. **Trucks Serial Number 341649 to 351487:** Remove the nut (11) from the bottom of the ram and pull off the washers (10 and 13), packing assembly (9), piston (8), and O-ring (7).

   Trucks Serial Number 35148 and Higher: Remove the nut (11) from the bottom of the ram and pull off the piston (14), and O-ring (7). Remove PSP seal (15) from piston (14).

NOTE: Trucks Serial Number 341649 to 351487:
1518, 1524, 2018: Install **Retrofit Kit 900124**
2024, 2524: Install **Retrofit Kit 900122**

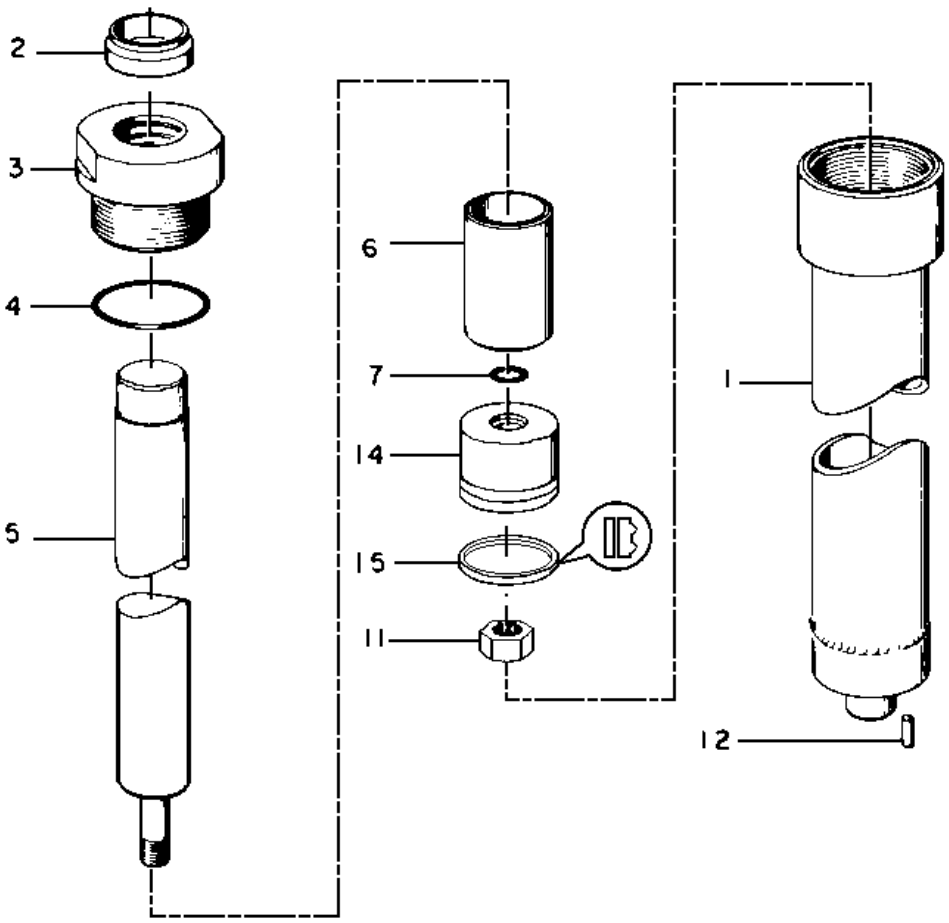
NOTE: Trucks Serial Number 351488 and Higher:
1518, 1524, 2018: Install **Packing Kit 900123**
2024, 2524: Install **Packing Kit 900121**



USED ON TRUCKS
SERIAL NUMBERS
341649 TO 351487

RETROFIT KIT PART NUMBER 900124 CONTAINS:	
ITEM	QTY
2	1
4	1
7	1
11	1
14	1
15	1

PACKING KIT PART NUMBER 900123 CONTAINS:	
ITEM	QTY
2	1
4	1
7	1
11	1
15	1



R6106

Figure 6-7 Lift Cylinder (Non-Tel) (Model 1518, 1524, 2018, 2024, 2524)

NOTE: **Model** Install new PSP seal (15) on piston (14),

6. Install new seal (7), piston (14) and nut (11) on cylinder ram (5).
7. Remove cylinder ram (5) from the vise.

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

8. Secure tube (1) in the vise.
9. Install ram (5) in tube (1).
10. Install new O-ring (4), and gland nut (3) with new wiper ring (2).
11. Remove lift cylinder assembly from vise.

6-7.3. Telescopic

NOTE: Removal procedures are covered in SECTION 5.

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

1. Secure the lift cylinder in the vise and remove the gland nut (3, Figure 6-8), wiper ring (2), and O-ring (4).
2. Pull the cylinder ram (5) out of the lift cylinder.
3. Remove the lift cylinder from the vise.

CAUTION: Use a vise clamp with non-marring jaws to prevent damaging the ram.

4. Secure the ram in the vise.
5. Remove nut (11) from ram (5).
6. **Trucks Serial Number 341649 to 353212:** Pull off the washers (10 and 13), packing assembly (9), piston (8), and O-ring (7).

   Trucks Serial Number 353213 and Higher: remove piston (14). Remove O-ring (7) and U-cup (15) from piston (14).

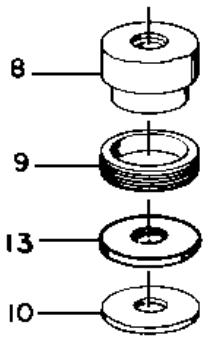
NOTE: **Trucks Serial Number 341649 to 353212**, install **retrofit kit 907139**.

NOTE: **Trucks Serial Number 353213 and Higher**, install **packing kit 907138**.

7. Install new U-cup (15) on piston (14).
8. Install new O-ring (7), piston (14), and nut (11) onto cylinder ram (5).
9. Remove cylinder ram (5) from vise.

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

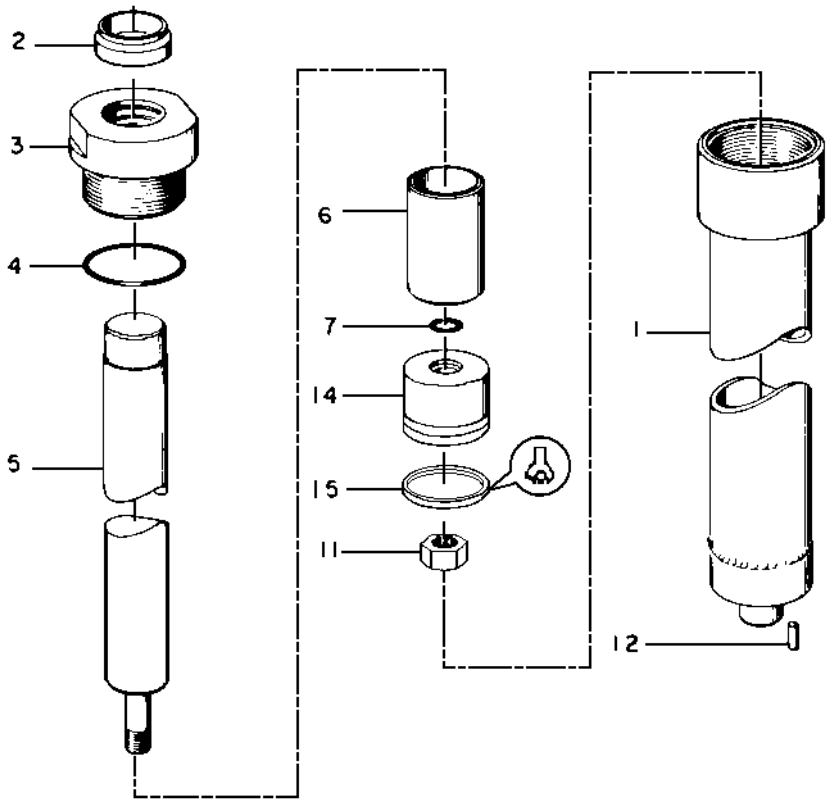
10. Secure tube (1) in the vise.
11. Install ram (5) in tube (1).
12. Install new O-ring (4) and wiper (4) on gland nut (3).
13. Install gland nut (3) in cylinder tube (1).
14. Remove lift cylinder assembly from vise.



USED ON TRUCKS
SERIAL NUMBERS
341649 TO 353212

RETROFIT KIT PART NUMBER 907139 CONTAINS:	
ITEM	QTY
2	1
4	1
7	1
11	1
14	1
15	1

PACKING KIT PART NUMBER 907138 CONTAINS:	
ITEM	QTY
2	1
4	1
7	1
11	1
15	1



R5812

Figure 6-8 Lift Cylinder (Tel)

6-7.4. Full Free Lift

NOTE: Removal procedures are covered in SECTION 5.

Refer to Figure 6-9 and disassemble the FFL lift cylinder as follows:

CAUTION: Use proper pipe clamp-type vise to grip the central cylinder of the cylinder assembly. The cylinder will be distorted if too much force is applied.

1. Secure FFL cylinder weldment (1) in vise and remove the snap ring retainer (3) and square head pipe plug (2).
2. Pull outward on the cylinder base (9) until wear ring (14) contacts the cylinder base. Continued pulling will bring the cylinder head (4) out of the tube.
3. Use a strap wrench to hold the cylinder rod (13) and unscrew cylinder base (9) from cylinder rod. Remove cylinder head (4) from cylinder rod.

CAUTION: As cylinder rod (13) is pulled out of cylinder tube, catch the two halves of wear ring (14) which will be freed and may fall and be damaged.

4. The cylinder rod (13) may now be pulled out of the tube. Support it carefully and catch the two halves of the war ring (14) as they are freed. Continue to pull on the cylinder rod until the piston (12) is out of the tube.
5. If piston is worn or damaged hold the cylinder rod (13) with a strap wrench and take off Flexlock lock nut (11). Pull piston free of the rod.
6. Examine bore of center cylinder tube of the cylinder assembly (1), and surfaces of the cylinder rod (13), piston (12), and wear ring halves (14). Replace all unsatisfactory parts and proceed with the following steps:
   a. Remove hydraulic cylinder wiper ring (7) and U-cup rod seal (8) from inside of cylinder head (4), and O-ring (5) and back-up ring (6) from outside of cylinder head.
   b. Clean and dry all parts.
   c. Discard all used O-rings and seals and replace them with new ones during reassembly.
   d. Coat all new O-rings and seals with hydraulic fluid during reassembly.
7. Assemble FFL center cylinder by reversing the disassembly procedure. For ease of assembly when assembling threaded, parts, apply a coating of white lead replacement to the threads, except for the threads of the cylinder base (9) which are to be coated with Loctite 222 adhesive.
8. If either or both of the outer cylinders of FFL cylinder assembly must be repaired, proceed as follows:

CAUTION: As cylinder rod of either outer cylinder is pulled out of cylinder tube, the two halves of the wear ring (22) may fall free and be damaged hitting the floor. Be sure to catch these pieces.

   a. Remove snap ring retainer (15).
   b. Pull outward on the cylinder rod (23) until wear ring (22) pushes cylinder head (16 or 25) out of cylinder tube.
   c. A little more pulling will release the halves of the wear ring.
   d. Catch these pieces for raceway if in good condition.
   e. Carefully support cylinder rod (23) and pull it outward to free it and piston (20) from the tube. If the piston is worn or damaged, or to replace O-ring (21), hold the rod with a strap wrench and remove Flexlock lock nut (11) and pull piston free of rod.
   f. Examine bore of cylinder tube being repaired, surface of cylinder rod (23) and wear ring halves (22) for scoring, scratching, or other damage.
   g. Replace all unsatisfactory parts and proceed with the following steps:
      (1). Remove and discard O-ring (21) and U-cup seal (19).
      (2). Clean all parts and replace all O-rings and seals during reassembly.

CAUTION: Reassembly of the lift cylinder requires the use of special tool, Part Number 900931, to prevent damage to cylinder packing.

      (3). Insert special tool, part number 900931, into the end of the cylinder, as shown in Figure 6-9 (Inset).

(4). Coat rings and seals with hydraulic fluid during replacement.

(5). Assemble FFL outer cylinder(s) by reversing the disassembly procedure. For ease of assembly, when assembling threaded parts, apply a coating of while lead replacement to the threads.

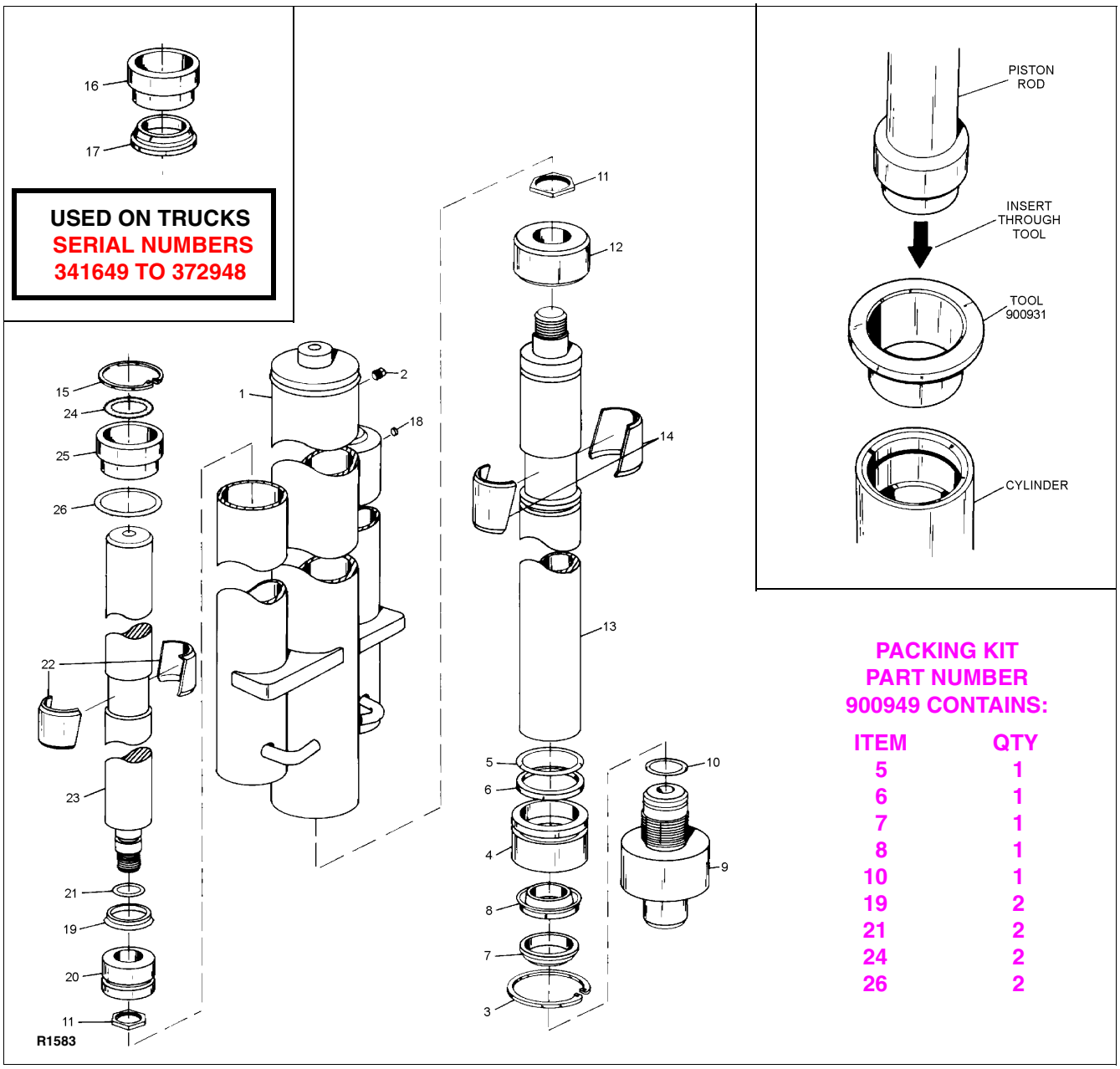


Figure 6-9 Lift Cylinder (FFL)

6-8. LIFT SPEED CONTROL MODULE.

The optional lift speed control module provides a needle valve for control of the rate of flow of the hydraulic fluid. See paragraph 9-3.

6-9. HYDRAULIC LINES AND FITTINGS.

NOTE: Leaks at hydraulic fittings can sometimes be remedied by simply tightening the fittings. If this does not remedy the leak, the fitting or line must be replaced.

1. Obtain a container large enough to contain all of the hydraulic oil in the reservoir.
2. Lower the carriage fully.

CAUTION: Hydraulic oil is capable of damaging the battery case. Wipe up any spills immediately.

3. Remove the reservoir drain plug and drain the hydraulic fluid into a container.
4. Clean the drain plug thoroughly.
5. Remove the leaking line or fitting and replace it with a new one.
6. Re-install the drain plug.

NOTE: Refill only with Big Joe hydraulic oil. Refill only while the carriage is fully lowered. Refill until oil is within one inch of the top of the reservoir.

7. Remove the reservoir vent cap, fill the reservoir to within one inch of the top, and replace the vent cap.

6-10.HYDRAULIC PRESSURE ADJUSTMENT.

The hydraulic pump is set at the factory to produce sufficient force to lift a load of the rated capacity of the truck. The pressure relief valve should rarely need adjustment. If the truck fails to lift a load that is within the truck capacity rating, adjust as follows:

1. Remove the cap nut from the hydraulic pump.
2. Insert a screwdriver blade in the screw slot.

CAUTION: Do not set pressure any higher than that required to lift a load of the rated capacity of the truck.

3. Turn the screwdriver clockwise to increase hydraulic pressure; counterclockwise to decrease pressure.
4. Install the cap nut on the hydraulic pump.

SECTION 7
ELECTRICAL SYSTEM SERVICING

7-1. GENERAL.

This section provides maintenance and repair procedures for battery powered lift trucks. The differences associated with trucks powered by AC current are covered in Supplement No. 252.

The electrical system consists of the battery, battery charger, ammeter, hydraulic pump motor, solenoid, key switch, and circuit breaker. Figure 7-1 shows the general layout of the electrical system.

7-2. HYDRAULIC PUMP MOTOR.

The hydraulic pump motor is part of an assembly consisting of it and the hydraulic pump. The motor brushes may be replaced without disassembling the motor from the pump. The motor may be separated from the pump for maintenance or repair. Any time the two are separated, the gasket between them must be replaced. Refer to paragraph 6-2. for removal procedure.

7-2.1. Hydraulic Pump Motor (Model 2524) Serial Number 341649 thru 344124.

Refer to Figure 10-16 for motor disassembly.

If motor 905070 is to be replaced, order the new pump and motor assembly 016938. The electrical wiring is different. Motor 905070 used a lift motor solenoid which was negatively actuated, Figure 7-2. The new pump and motor assembly 016938 uses a lift motor solenoid that is positively actuated, Figure 7-3. Each replacement pump and motor assembly 016938 is supplied with a wire to accommodate the wiring change. Change the wiring as follows:

1. Remove and discard the wire from the key to negative ground. (See Figure 7-2).
2. Install the new coiled wire supplied with the unit (Item 16, Figure 10-17) from key switch to the battery positive solenoid post. (See Figure 7-3).
3. For trucks with remote lowering solenoid valve (Item 15, Figure 10-17), there is an additional wiring change. Disconnect the wire leading from the battery positive post on the motor solenoid to the remote lowering solenoid. Install a wire from the solenoid valve to the frame ground.

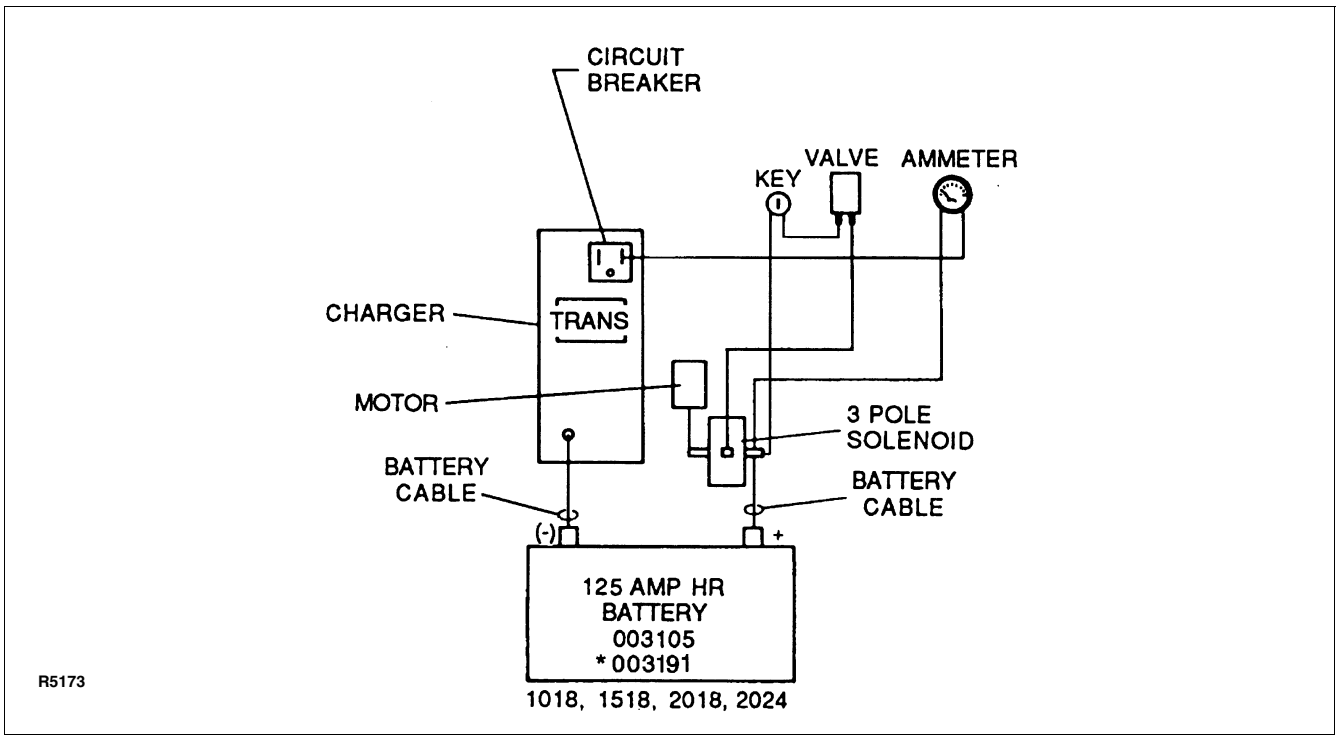


Figure 7-1 Electrical System

7-2.2. Hydraulic Pump Motor (Model 2524) Serial Number 344125 to 377757.

Refer to Figure 10-17 for motor disassembly.

7-2.3. Hydraulic Pump Motor (Model 2524) Serial Number 377758 and Higher.

Refer to Figure 10-18 for motor replacement.

7-2.4. Hydraulic Pump Motor (Models 1018, 1518, 1524, 2018, 2024) Serial Number 341649 thru 375921.

Refer to Figure 10-17 for motor disassembly.

7-2.5. Hydraulic Pump Motor (Models 1018, 1518, 1524, 2018, 2024) Serial Number 375922 and Higher.

Refer to Figure 10-18 for motor replacement.

7-3. BATTERY CHARGER.

Your battery powered IBH 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 operate, check the circuit breaker before attempting any maintenance. Refer to Figure 10-26 and Figure 10-27.

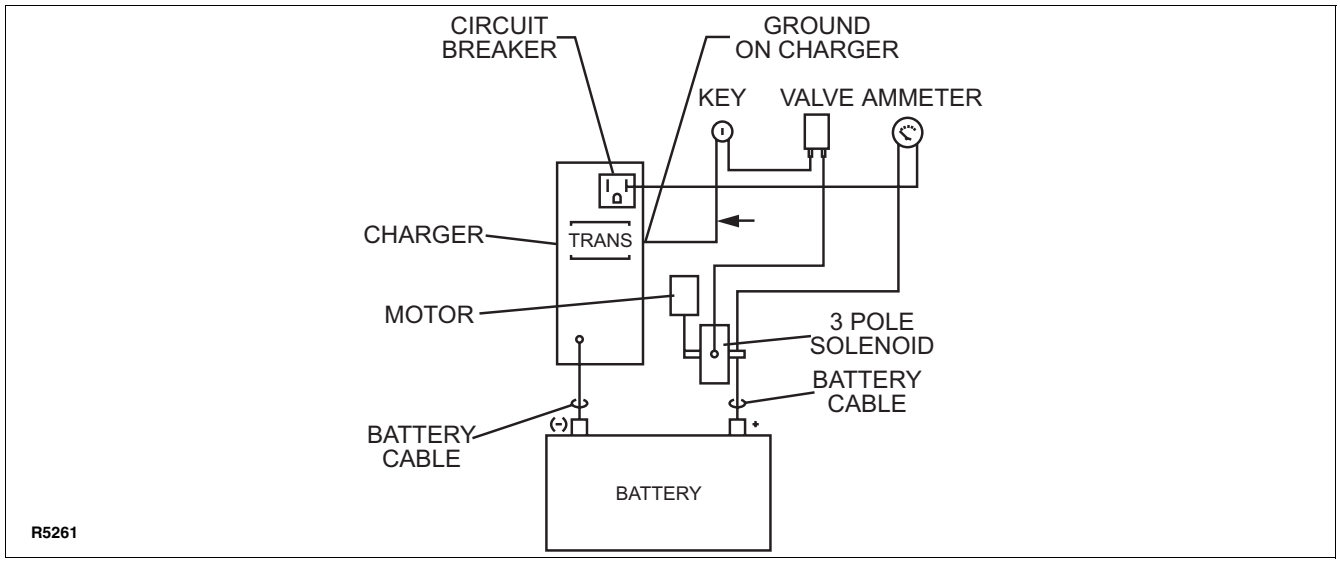


Figure 7-2 Model 2524 Original Wiring

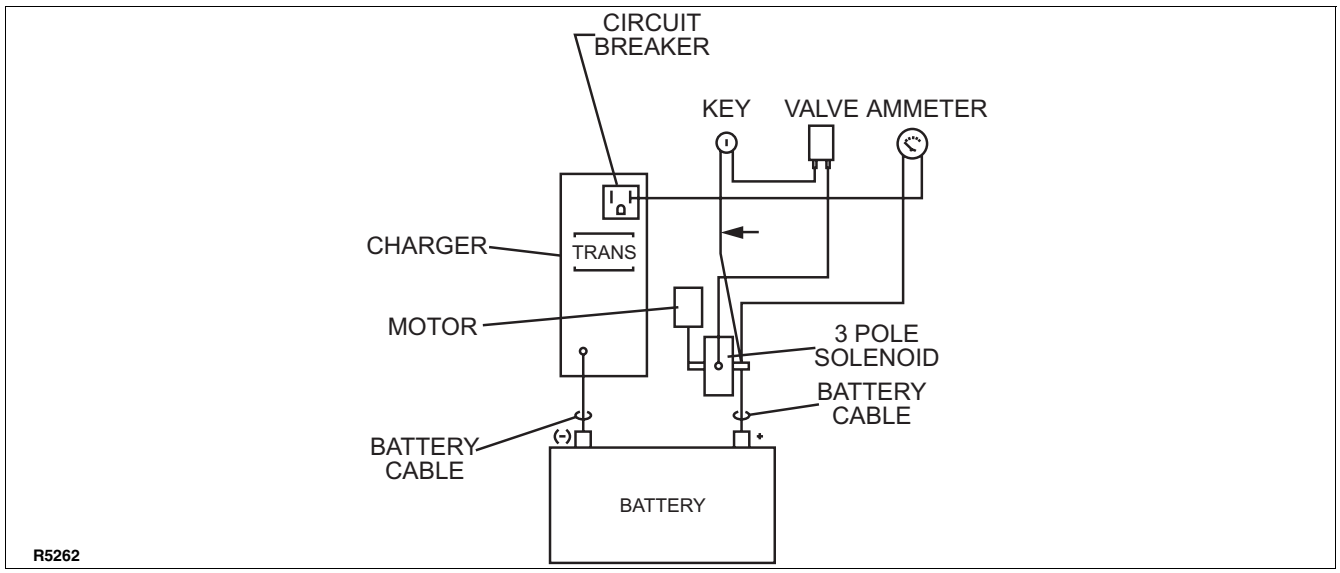


Figure 7-3 Model 2524 Reworked Wiring

SECTION 8
FRAME AND RELATED PARTS SERVICING

8-1. GENERAL.

This section covers load wheel and caster wheel replacement, floor lock replacement and adjustment.

8-2. LOAD WHEEL REPLACEMENT.

1. Chock both caster wheels and the load wheel that is not being replaced. Engage the floor lock.
2. 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.
3. Remove one of the two snap rings (1, Figure 8-1 or Figure 8-2) from the load wheel axle (3).
4. Remove the axle. The load wheel and spacers (2) will drop free.
5. Install a new load wheel in the reverse order of removal.

NOTE: When ordering replacement wheels, it is important that the face size be given, refer to Figure 8-3. Face size is the width of the part of the wheel that contacts the floor.

8-3. CASTER WHEEL REPLACEMENT.

1. Lower the carriage fully and chock the load wheels.
2. 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 wheel to be replaced.
3. Lower the lift truck so that the body of the truck is resting on the supports. Remove the jack.
4. Check that the caster wheel is not touching the floor and is free to turn.

WARNING: Double check that the truck is resting squarely on the supports and that the truck will not move.

5. Remove the nut (2, Figure 8-4) pull out the axle (3), axle bushing (6). The wheel (5) will fall free.
6. Install a new caster wheel in the reverse order of removal.

NOTE: When ordering replacement wheels, it is important that the face size and diameter be given. Face size is the width of the part of the wheel that contacts the floor.

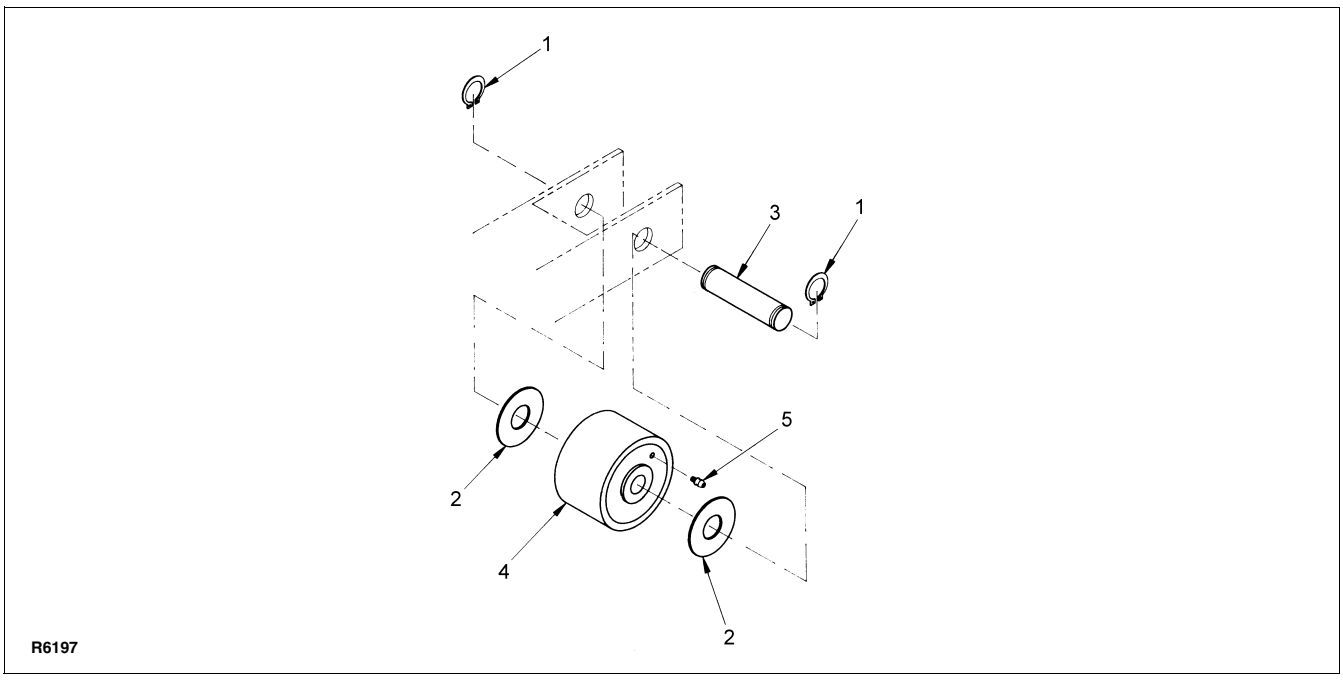


Figure 8-1 Load Wheels (Model 1018)

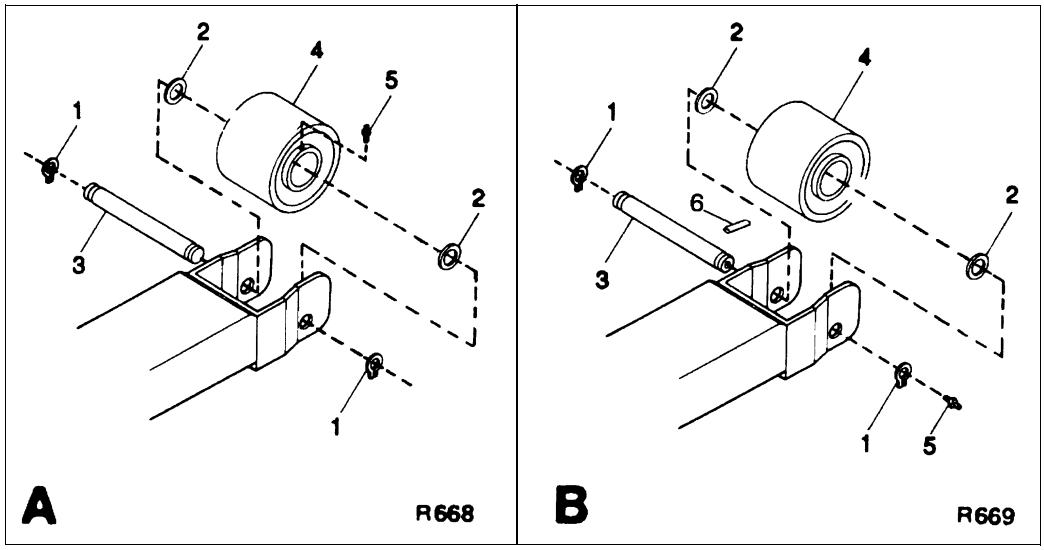


Figure 8-2 Load Wheels
(Models 15158, 1524, 2018, 2024, 2524)

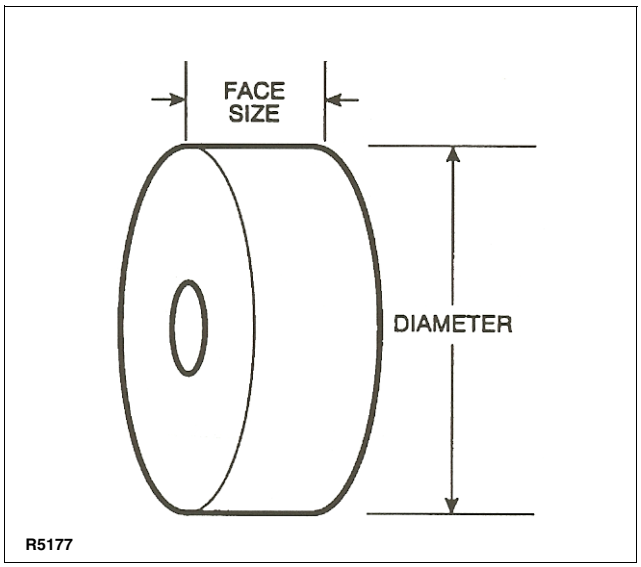


Figure 8-3 Wheel Dimensions

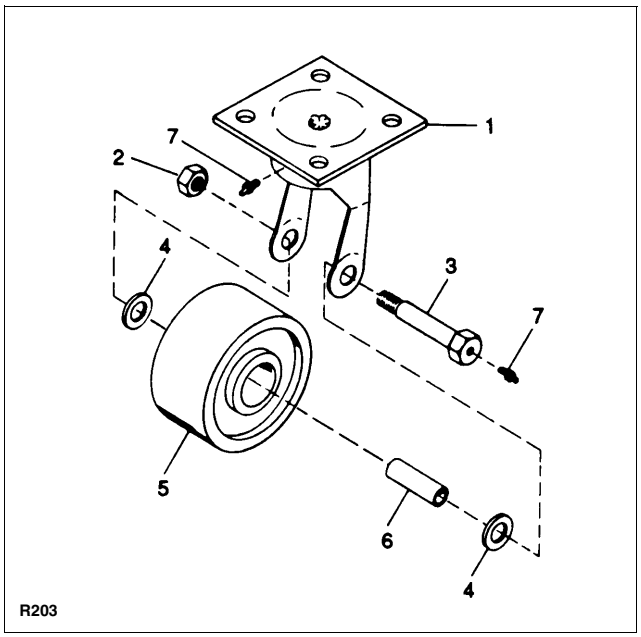


Figure 8-4 Caster Wheel with Axle Bushing

8-4. FLOOR LOCKS.

8-4.1. Floor Lock Adjustment

1. Release the floor locks by lowering the handle.
2. Measure the clearance between the floor lock pads and the floor. If the clearance is more or less than 1-3/16 inches, adjust the brakes as follows.
3. If the clearance is too great, loosen the hex nut (17, Figure 8-5) and turn floor lock rod (12) clockwise to expose more thread at the clevis (9).
4. If the clearance is too little, loosen the hex nut and turn the rod counterclockwise.
5. Adjust the opposite side floor lock.
6. Tighten the hex nut on both floor lock rods.

8-4.2. Floor Lock Plunger Replacement

1. Release the floor locks by lowering the handle.
2. Remove cotter pins (11, Figure 8-5) and clevis pins (10) from both sides of the floor lock assembly.
3. Swing the clevis (9) clear of the floor lock handle (1) or arm (4) and lift off the floor lock rod (12).
4. Lift off both floor lock rod springs (13) and remove cotter pins (14).
5. Remove the two lift springs (15).
6. Use a suitable jack or another lift truck so that the floor lock plungers (16) can be removed.
7. Install new plungers in the reverse order of removal.

8-4.3. Floor Lock Handle Replacement For trucks with Serial Number 341649 to 345200.

A new floor lock handle kit Part Number 901605 is being used on IBH lift trucks. Old floor lock handle Part Number 500573 is no longer available. Order the floor lock handle kit Part Number 901605 and replace as described below.

1. Unload the truck and block the wheels.
2. Release the floor locks by lowering the handle.
3. On the left-hand side of the truck (the side opposite the brake handle), loosen the set screw (6, Figure 8-5) in the floor lock arm (4).
4. Pull arm (4) clear of handle (1) and remove the Woodruff key (5).
5. Remove cotter pin (11) and clevis pin (10) from the right side of the truck. Discard old spacer (8).
6. Swing clevis (9) clear of floor lock handle (1).
7. Work the floor lock handle out of the lift truck, removing spacers (7) as the handle comes free.
8. Install replacement handle (1) with spacers (7) and new washers (2).
9. Install woodruff key (5) and arm (4) on handle (1).
10. Position clevis (9) on floor lock handle (1) and install clevis pin (10) and cotter pin (11).
11. Secure arm (4) with set screw (6).
12. Remove blocks from wheels.
13. Adjust floor lock as described in paragraph 8-4.1.

8-4.4. Floor Lock Handle Replacement For Trucks with Serial Number 345201 and Higher

1. Unload the truck and block the wheels.
2. Release the floor locks by lowering the handle.
3. On the left-hand side of the truck (the side opposite the brake handle), loosen the set screw (6, Figure 8-5) in arm (4).
4. Pull the arm (4) clear of handle (1) and remove the Woodruff key (5).
5. Remove cotter pin (11) and clevis pin (10) from the right side of the truck.
6. Swing clevis (9) clear of handle (1).
7. Work handle (1) out of the lift truck, removing spacers (7) and washes (2) as the handle comes free.
8. Install replacement handle (1) with spacers (7) and washers (2).
9. Install Woodruff key (5) and arm (4) on handle (1).
10. Position clevis (9) on floor lock handle (1) and install clevis pin (10) and cotter pin (11).
11. Secure arm (4) with the set screw (6).
12. Remove blocks from wheels.
13. Adjust floor lock as described in paragraph 8-4.1.

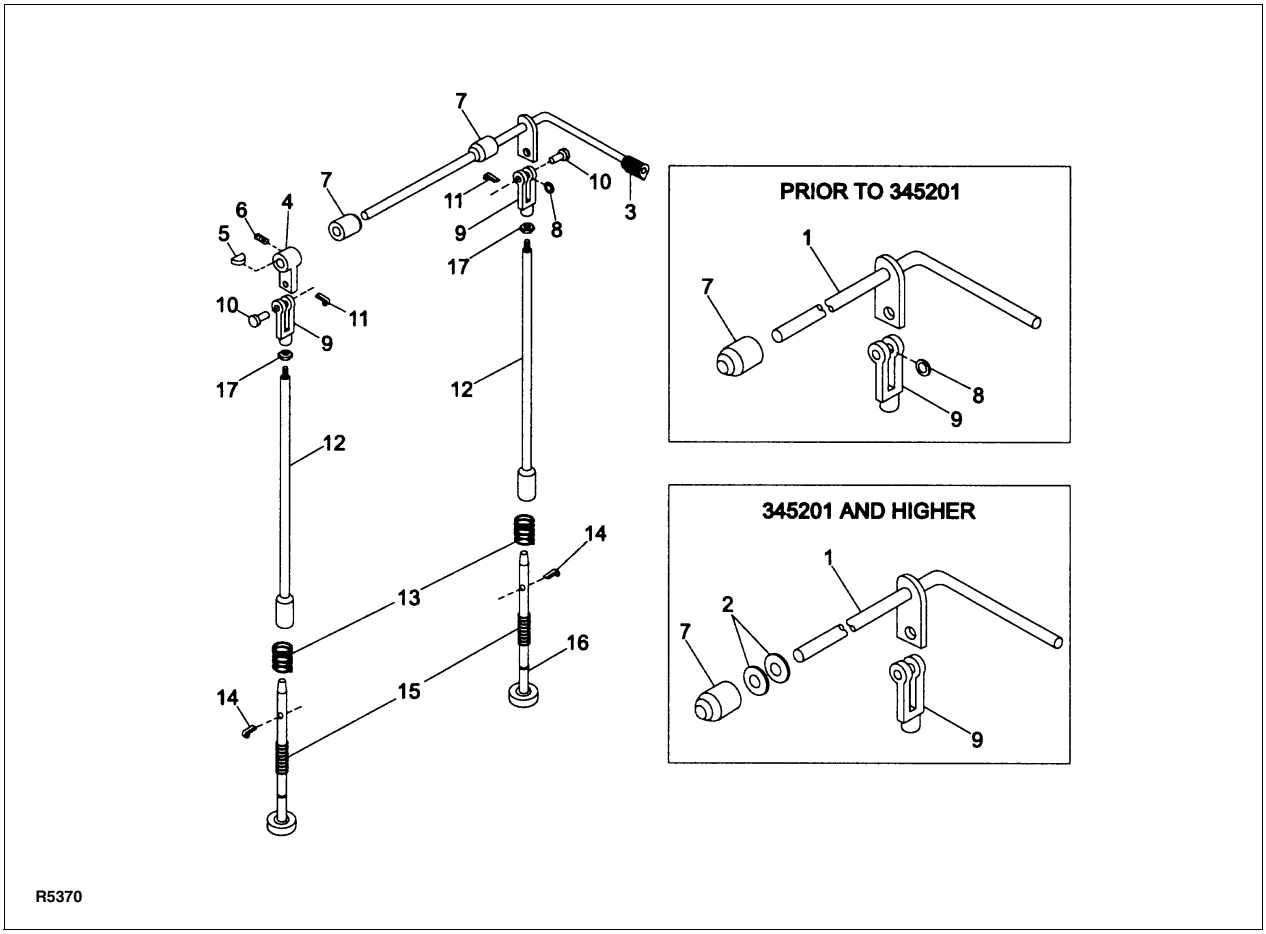


Figure 8-5 Floor Lock Assembly

SECTION 9
HYDRAULIC SYSTEM SERVICING

9-1. GENERAL.

This section covers the various options that are offered with IBH lift trucks. Maintenance and repair procedures are included where applicable. Options covered in this section are:

Remote Control

Lift Speed Control Module

Fifth Wheel

Adjustable Straddles

9-2. REMOTE CONTROL. (Figure 9-1)

The hand-held remote control permits raising and lowering of the carriage while the operator is standing away from the truck control panel. Two pushbuttons, UP and DOWN, are used to operate the carriage. The plug on the remote control cord is mated with a three or four hole receptacle on the frame of the truck. The three hole receptacle serves battery and single phase trucks. Three phase trucks have the four hole receptacle. A magnet attached to the rear of the control box holds the box to the truck frame when not in use.

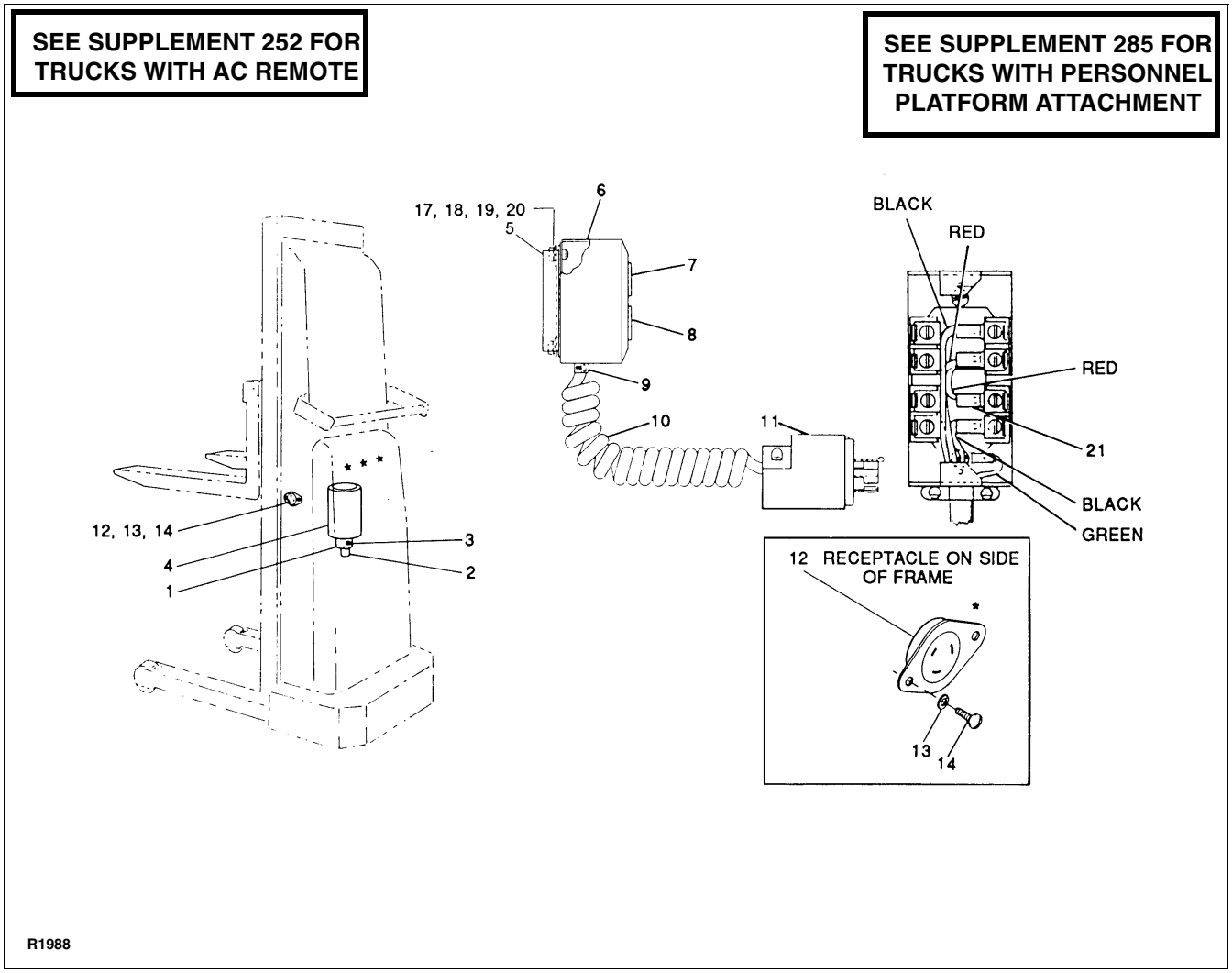


Figure 9-1 Remote Control

9-3. LIFT SPEED CONTROL MODULE.

The lift speed control module option provides adjustable restriction of the rate of flow of hydraulic fluid to limit the speed of raising of the carriage. Figure 9-2 illustrates the module and its plumbing.

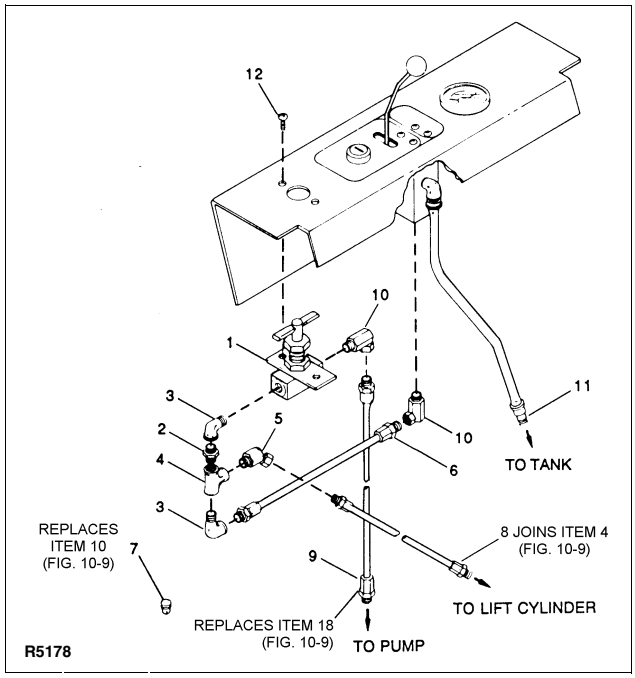


Figure 9-2 Lift Speed Control Module

9-4. FIFTH WHEEL.

The fifth wheel is an option that aids in moving the lift truck. It provides maximum effectiveness in pulling the truck across a rough floor with a heavy load. Figure 9-3 shows the fifth wheel in place.

9-4.1. Disassembly

To replace parts, disassemble the fifth wheel to the extent necessary according to the following procedure.

1. Knock out the two roll pins (5, Figure 9-4) from the shaft (6).
2. Remove the two outer washers (8) from the shaft.

WARNING: The handle will create a hazard by falling unless it is restrained before the next step is performed.

3. Tie the handle (2) against the truck frame.
4. Use pry bars to force springs (7) away from their stop and off of the shaft. Remove two washers (8).
5. Remove the set screw (4) from the base of the handle (2).

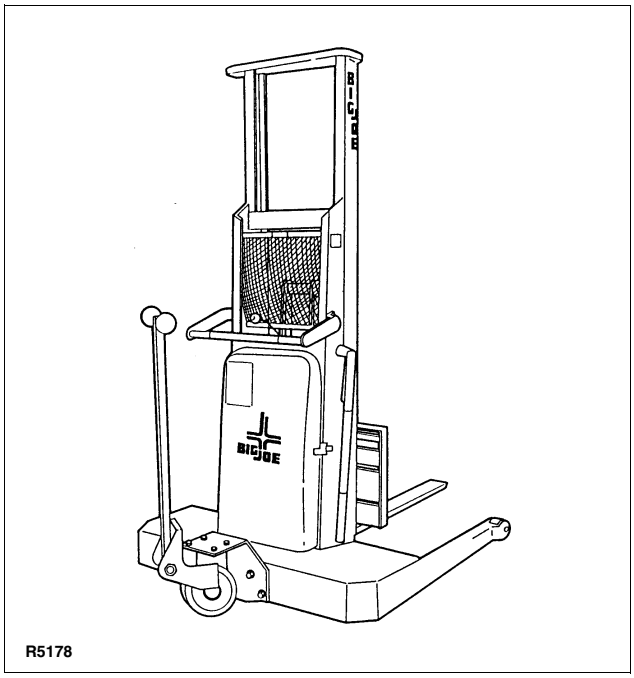


Figure 9-3 Fifth Wheel in Place

6. Pull the shaft (6) out of the handle and yoke (13).
7. Remove the handle and replace grips (1) and rubber bumper (3) if required.
8. Remove four cap screws (24), nuts (27) and lock washers (26). Detach the yoke assembly from the housing and remove the shim plate (38) if installed.

NOTE: Older assemblies may not contain a shim plate. If none is present, none is required.

9. Rest the wheels of the yoke assembly on a supporting surface. Remove the nut (18) and withdraw the axle bolt (23) and washers (19).
10. Separate the wheels (22) from the yoke.
11. Remove the wheel bearings (21) and bushings (20) from the wheels.
12. Position the yoke with the nut (17) facing up.
13. While holding the stud (9) in place, remove the nut.
14. Lift off the bearing race (16) and remove the bearing balls (15).
15. Turn the yoke over so that the stud (9) is facing up.
16. Lift off the stud and the caster plate (10).
17. Remove the bearing balls (12) and washer (11).
18. Clean the shaft (6) and yoke assembly parts with clean solvent.

19. Inspect parts for wear. Replace any worn or damaged parts.

NOTE: Lubricate the wheel bearings (21), bearing balls (12 and 15), and the ends of the axle (6) with general purpose lithium grease during reassembly.

20. Reassemble the fifth wheel assembly in the reverse order of disassembly.

9-4.2. Lubrication

Apply general purpose lithium grease through the grease fitting (14, Figure 9-4) at weekly intervals.

9-5. ADJUSTABLE STRADDLE RE-POSITIONING.

Parts on the adjustable straddle lift truck are identical to those on the fixed straddle truck except that the straddles and attaching hardware are removable. Perform the following procedure to adjust the straddles to the desired width.

1. Engage the floor lock by raising the handle.

WARNING: Do not raise the truck any higher than necessary to raise the load wheel clear of the floor. The truck can tip over if raised too high.

2. Use a suitable jack or another lift truck to lift one side of the frame only enough to raise the load wheel from the floor.
3. Remove two bolts and washers (3 and 4, Figure 9-5) from the raised straddle.
4. Slide the straddle to the desired position.

NOTE: The minimum spread between straddle legs is 38 inches. Maximum is 50 inches.

5. Lubricate and replace the two bolts and washers. Tighten both bolts to 200 ft. lbs. torque.

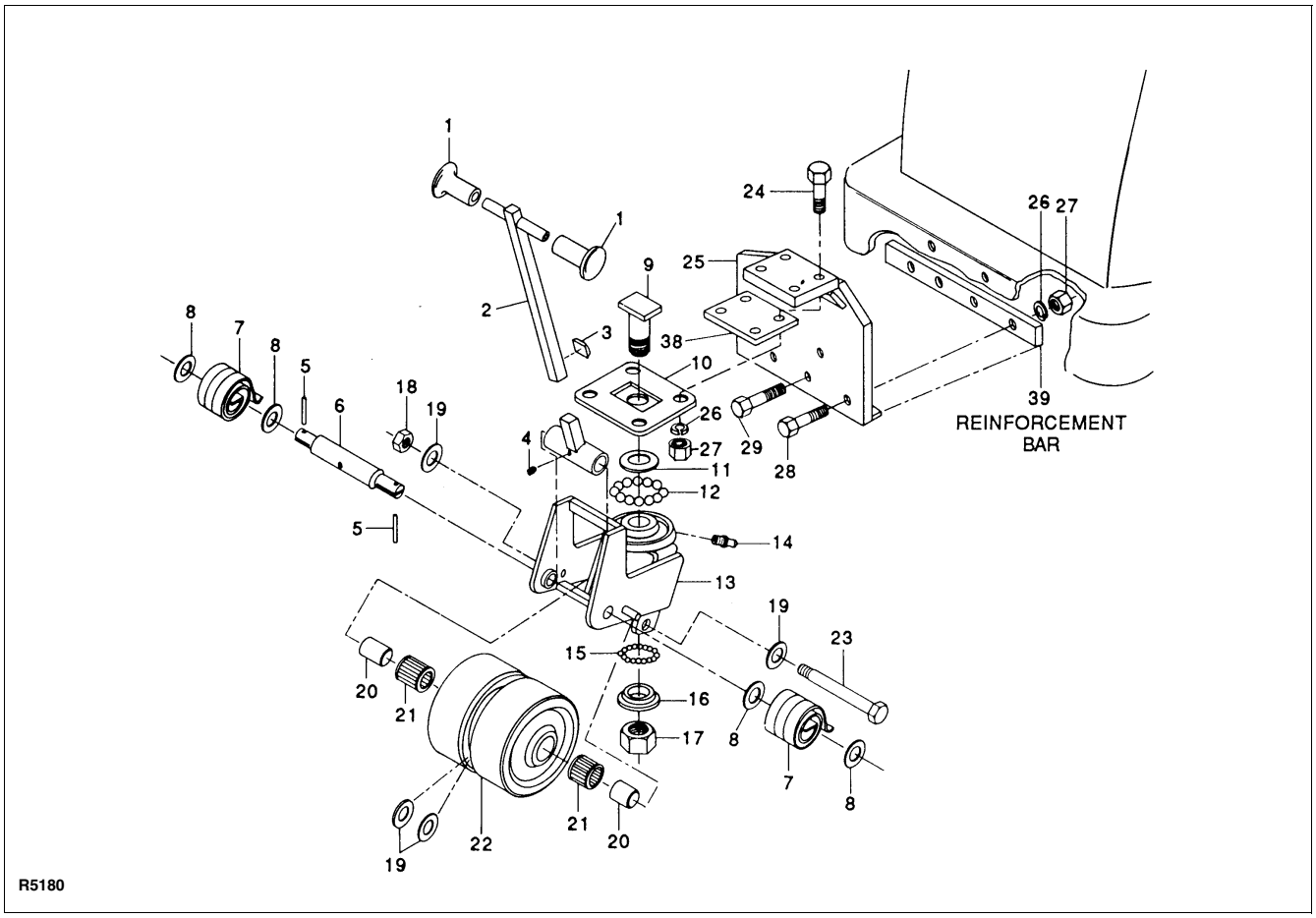


Figure 9-4 Fifth Wheel Assembly

CAUTION: All bolts must engage the straddles, and both straddles must be adjusted so that an equal number of holes are exposed on each side.

6. Lower the truck and raise the other side just enough to raise the load wheel from the floor.
7. Perform steps 3 through 5.
8. Lower the truck.
9. Check that both straddles have an equal number of holes exposed on each side.

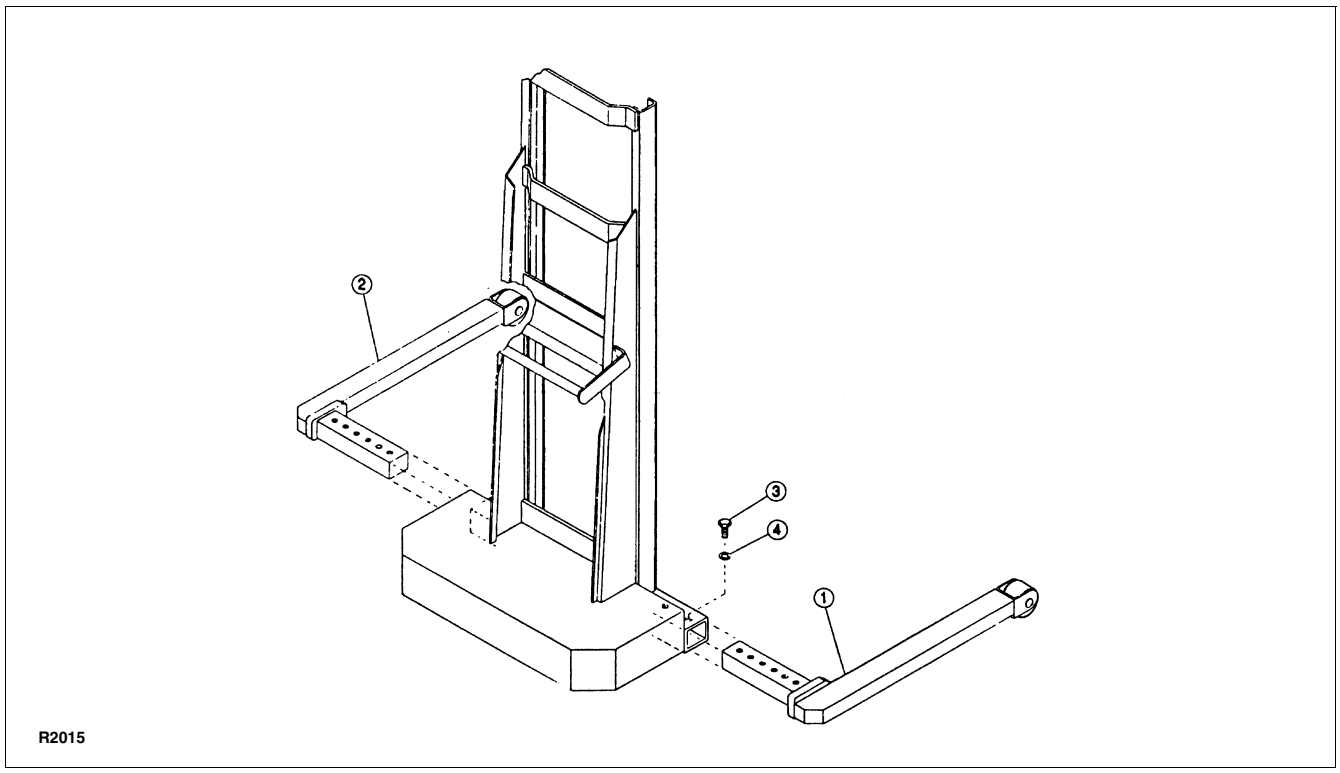


Figure 9-5 Adjustable Straddle

SECTION 10
ILLUSTRATED PARTS BREAKDOWN

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

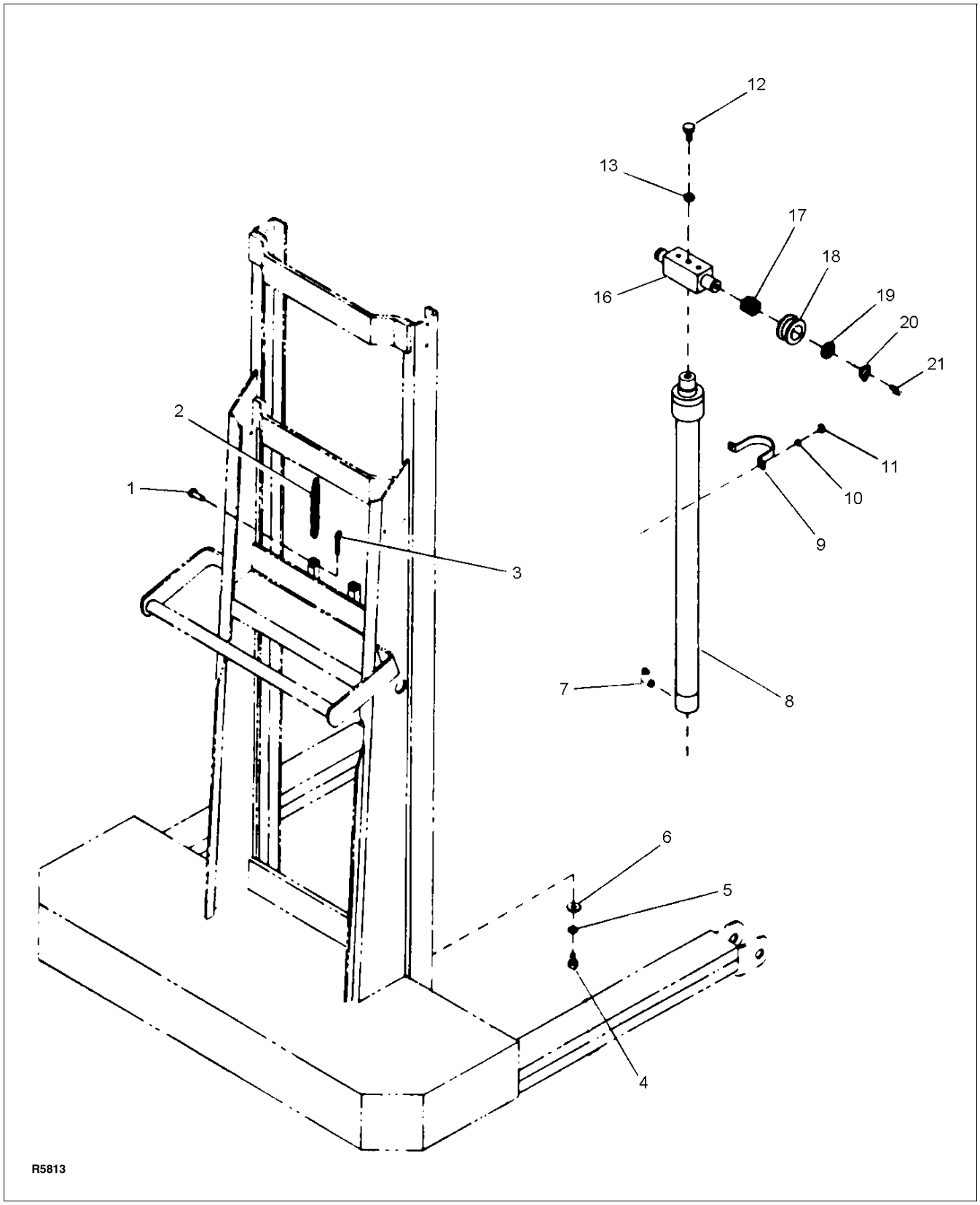


Figure 10-1 Inner Mast and Ram Head (NON-TEL)

INDEX NO.	PART NAME	1018	1518 1524 2018	2024 2524	NO. REQD.
1	CLEVIS	402055	402055	402055	2
2	CHAIN	402034	402034	402034	A/R
3	COTTER PIN	060402	060402	060402	2
4	HEX HD CAP SCREW	063603	063603	063605	1
5	LOCKWASHER, 3/8	077211	077211	077211	1
6	FLAT WASHER, 1-3/8 X 13/32	077076	077076	077076	1
7	ELBOW, STREET, 1/4 (FIGURE 10-14)	—	—	—	REF
8	LIFT CYLINDER (FIGURE 10-6, FIGURE 10-7 AND FIGURE 10-8)	—	—	—	REF
9	LIFT CYLINDER CLAMP	403631	101071	101098	1
10	LOCKWASHER, 3/8	077211	077211	077211	2
11	HEX NUT, 3/8-16	059429	059429	059429	2
12	HEX HD CAP SCREW, 1/2-13 X 1-1/2	064711	064711	064711	1
13	LOCKWASHER, 1/2	077213	077213	077213	1
14	NOT USED	—	—	—	
15	NOT USED	—	—	—	
—	RAM HEAD ASSY	505807	505807	505807	1
16	. RAM HEAD	057761	057761	057761	1
17	. BEARING	051120	051120	051120	2
18	. SHEAVE	074251	074251	074251	2
19	. WASHER	077022	077022	077022	2
20	. SNAP RING, EXT.	061728	061728	061728	2
21	. GREASE FITTING	025712	025712	025712	2

USED ON 1518

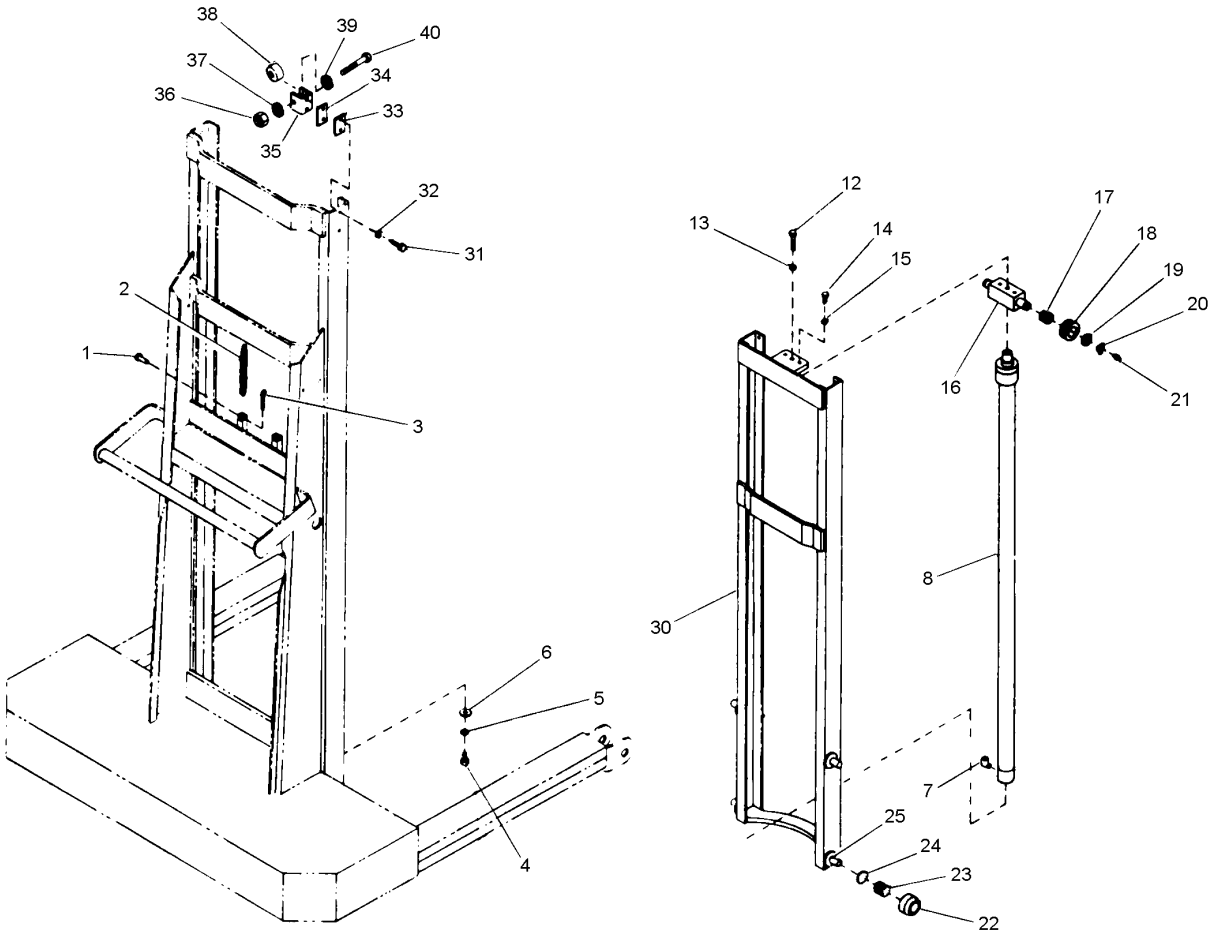


Figure 10-2 Inner Mast and Ram Head (TEL)

INDEX NO.	PART NAME	1518	1524 2018	NO. REQD.
1	CLEVIS	402055	402055	2
2	CHAIN	402034	402034	A/R
3	COTTER PIN	060402	060402	2
4	HEX HD CAP SCREW	063603	063603	1
5	LOCKWASHER, 3/8	077211	077211	1
6	FLAT WASHER, 1-3/8 X 13/32	077076	077076	1
7	ELBOW, STREET, 1/4 (FIGURE 10-14)	—	—	REF
8	LIFT CYLINDER (FIGURE 10-9)	—	—	REF
9	NOT USED	—	—	
10	NOT USED	—	—	
11	NOT USED	—	—	
12	HEX HD CAP SCREW, 1/2-13 X 2-1/4	063717	063717	1
13	LOCKWASHER, 1/2	077213	077213	1
14	HEX HD CAP SCREW, 3/8-16 X 1-1/4	064607	064607	2
15	LOCKWASHER, 3/8	077211	077211	2
—	RAM HEAD ASSY	505807	505807	1
16	. RAM HEAD	057761	057761	1
17	. BEARING	051120	051120	2
18	. SHEAVE	074251	074251	2
19	. WASHER	077022	077022	2
20	. SNAP RING, EXT.	061728	061728	2
21	. GREASE FITTING	025712	025712	2
—	ROLLER AND BEARING ASSY	500876	500170	4
22	. ROLLER	062319	062300	4
23	. BEARING	051102	051102	4
24	WASHER, 3/32 IN.	053000	053000	A/R
24	WASHER, 1/8 IN.	053001	053001	A/R
24	WASHER, 5/32 IN.	053002	053002	A/R
24	WASHER, 3/16 IN.	053003	053003	A/R
25	SPINDLE	500512	500512	4
26	NOT USED	—	—	
27	NOT USED	—	—	
28	NOT USED	—	—	
29	NOT USED	—	—	
30	INNER MAST ASSY	VAR	VAR	1
31	SCREW, HEX CAP, 3/8-16 X 1	064605	064605	4
32	LOCKWASHER, 3/8	077410	077410	4
33	PLATE, SPACER	245736	245736	A/R
33	PLATE, SPACER	250747	250747	A/R
33	PLATE, SPACER	403644-01	403644-01	A/R
34	SPACER, GUARD ROLLER	100021	100021	A/R
—	ROLLER ASSY	501297	501297	2
35	. BRACKET	161079	161079	2
36	. NUT, HEX	059429	059429	2
37	. LOCKWASHER	077211	077211	2
38	. BEARING ASSY	051100	051100	2
39	. WASHER	077009	077009	2
40	. SHOULDER BOLT	052756	052756	2

USED ON 1524 & 2018

USED ON 2024 & 2524

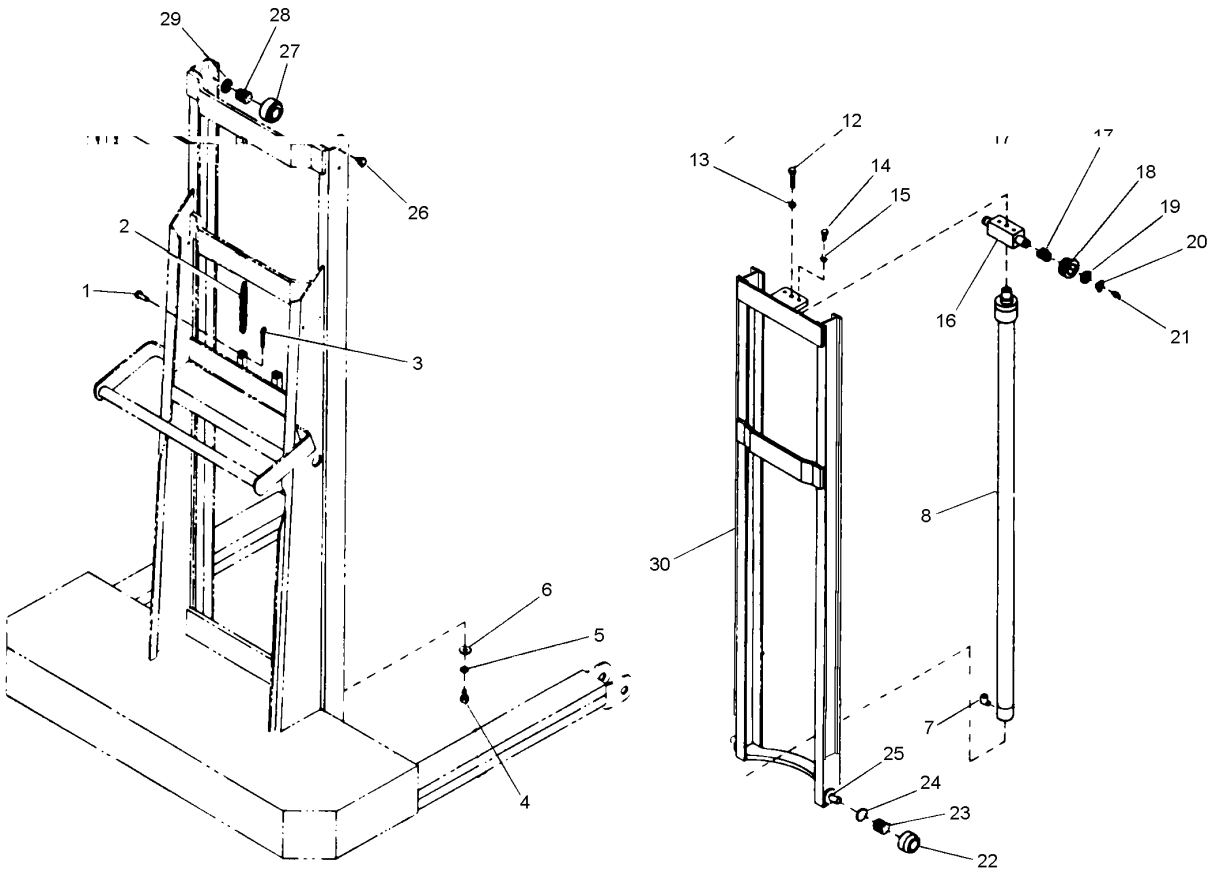


Figure 10-3 Inner Mast and Ram Head (TEL)

INDEX NO.	PART NAME	1524 2018	2024 2524	NO. REQD.
1	CLEVIS	402055	402055	2
2	CHAIN	402034	402034	A/R
3	COTTER PIN	060402	060402	2
4	HEX HD CAP SCREW	063603	063605	1
5	LOCKWASHER, 3/8	077211	077211	1
6	FLAT WASHER, 1-3/8 X 13/32	077076	077076	1
7	ELBOW, STREET, 1/4 (FIGURE 10-14)	—	—	REF
8	LIFT CYLINDER (FIGURE 10-9)	—	—	REF
9	NOT USED	—	—	
10	NOT USED	—	—	
11	NOT USED	—	—	
12	HEX HD CAP SCREW, 1/2-13 X 2-1/4	063717	063717	1
13	LOCKWASHER, 1/2	077213	077213	1
14	HEX HD CAP SCREW, 3/8-16 X 1-1/4	064607	064607	2
15	LOCKWASHER, 3/8	077211	077211	2
—	RAM HEAD ASSY	505807	505807	1
16	. RAM HEAD	057761	057761	1
17	. BEARING	051120	051120	2
18	. SHEAVE	074251	074251	2
19	. WASHER	077022	077022	2
20	. SNAP RING, EXT.	061728	061728	2
21	. GREASE FITTING	025712	025712	2
—	ROLLER AND BEARING ASSY	901365	500166	2
22	. ROLLER	063325	243401	2
23	. BEARING	051102	051145	2
24	WASHER, 3/32 IN.	053000	053012	A/R
24	WASHER, 1/8 IN.	053001	053013	A/R
24	WASHER, 5/32 IN.	053002	053014	A/R
24	WASHER, 3/16 IN.	053003	053015	A/R
25	SPINDLE	—	500126	2
26	GREASE FITTING	025712	025712	2
—	ROLLER AND BEARING ASSY	901366	500167	2
27	. MAST ROLLER	062326	401046	2
28	. BEARING	051102	051145	2
29	WASHER, 3/32 IN.	053000	053012	A/R
29	WASHER, 1/8 IN.	053001	053013	A/R
29	WASHER, 5/32 IN.	053002	053014	A/R
29	WASHER, 3/16 IN.	053003	053015	A/R
30	INNER MAST ASSY	VAR	VAR	1

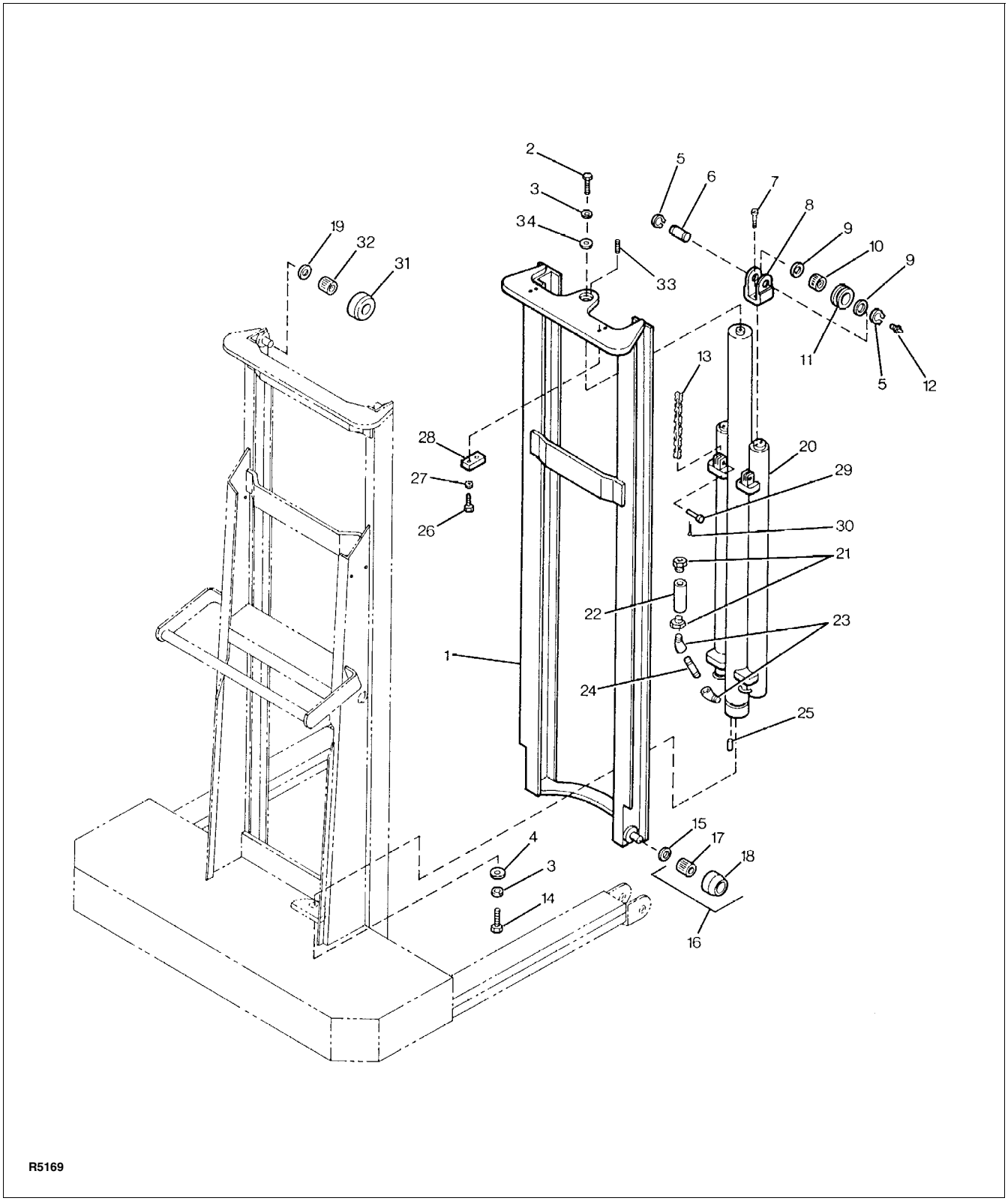


Figure 10-4 Inner Mast and Ram Head (FFL)

INDEX NO.	PART NAME	1524	2018	2024	2524	NO. REQD.
1	INNER MAST ASSY 106”	505370-01	505370-01	504026-01	504026-01	1
1	INNER MAST ASSY 130”	505370-02	505370-02	504026-02	504026-02	1
2	HEX HD CAP SCREW	064603	064603	064603	064603	2
3	LOCKWASHER, 3/8	077211	077211	077211	077211	2
4	FLAT WASHER	077076	077076	077076	077076	1
5	SNAP RING	061729	061729	061729	061729	4
6	SHAFT	401639	401639	401639	401639	2
7	SCREW	065555	065555	065555	065555	4
8	BRACKET	800246	800246	800246	800246	2
9	FLAT WASHER	053012	053012	053012	053012	4
10	BEARING	051145	051145	051145	051145	2
11	SHEAVE	289205	289205	289205	289205	2
12	GREASE FITTING	025712	025712	025712	025712	2
13	CHAIN	402034	402034	402034	402034	A/R
14	HEX HD CAP SCREW	063603	063603	063603	063603	1
15	WASHER, 3/32 IN.	053000	053000	053012	053012	A/R
15	WASHER, 1/8 IN.	053001	053001	053013	053013	A/R
15	WASHER, 5/32 IN.	053002	053002	053014	053014	A/R
15	WASHER, 3/16 IN.	053003	053003	053015	053015	A/R
16	ROLLER & BEARING ASSY	901365	901365	500166	500166	4
17	. BEARING	051102	051102	051145	051145	4
18	. ROLLER	062625	062325	243401	243401	2
19	WASHER, 3/32 IN.	053000	053000	053012	053012	A/R
19	WASHER, 1/8 IN.	053001	053001	053013	053013	A/R
19	WASHER, 5/32 IN.	053002	053002	053014	053014	A/R
19	WASHER, 3/16 IN.	053003	053003	053015	053015	A/R
20	LIFT CYLINDER (FIGURE 10-10)	—	—	—	—	REF
21	BUSHING	N/A	N/A	026504	0265004	2
22	FLOW CONTROL VALVE	047123	047123	047107	047107	1
23	ELBOW 45°, STREET	026711	026711	026711	026711	2
24	NIPPLE	026322	026322	026321	026321	1
25	ROLL PIN 5/16 X 3/4	061023	061023	061023	061023	1
26	HEX HD CAP SCREW	063482	063482	063482	063482	4
27	LOCKWASHER	077209	077209	077209	077209	4
28	PLATE	403339	403339	403339	403339	2
29	CLEVIS PIN	402055	402055	402055	402055	2
30	COTTER PIN	060402	060402	060402	060402	2
—	MAST ROLLER	901366	901366	500167	500167	2
31	. ROLLER	062326	062326	401046	401046	2
32	. BEARING	051102	051102	051145	051145	2
33	SETSCREW, #10-24 X 1/4	073460	073460	073460	073460	1
34	FLAT WASHER	800297	800297	800297	800297	1

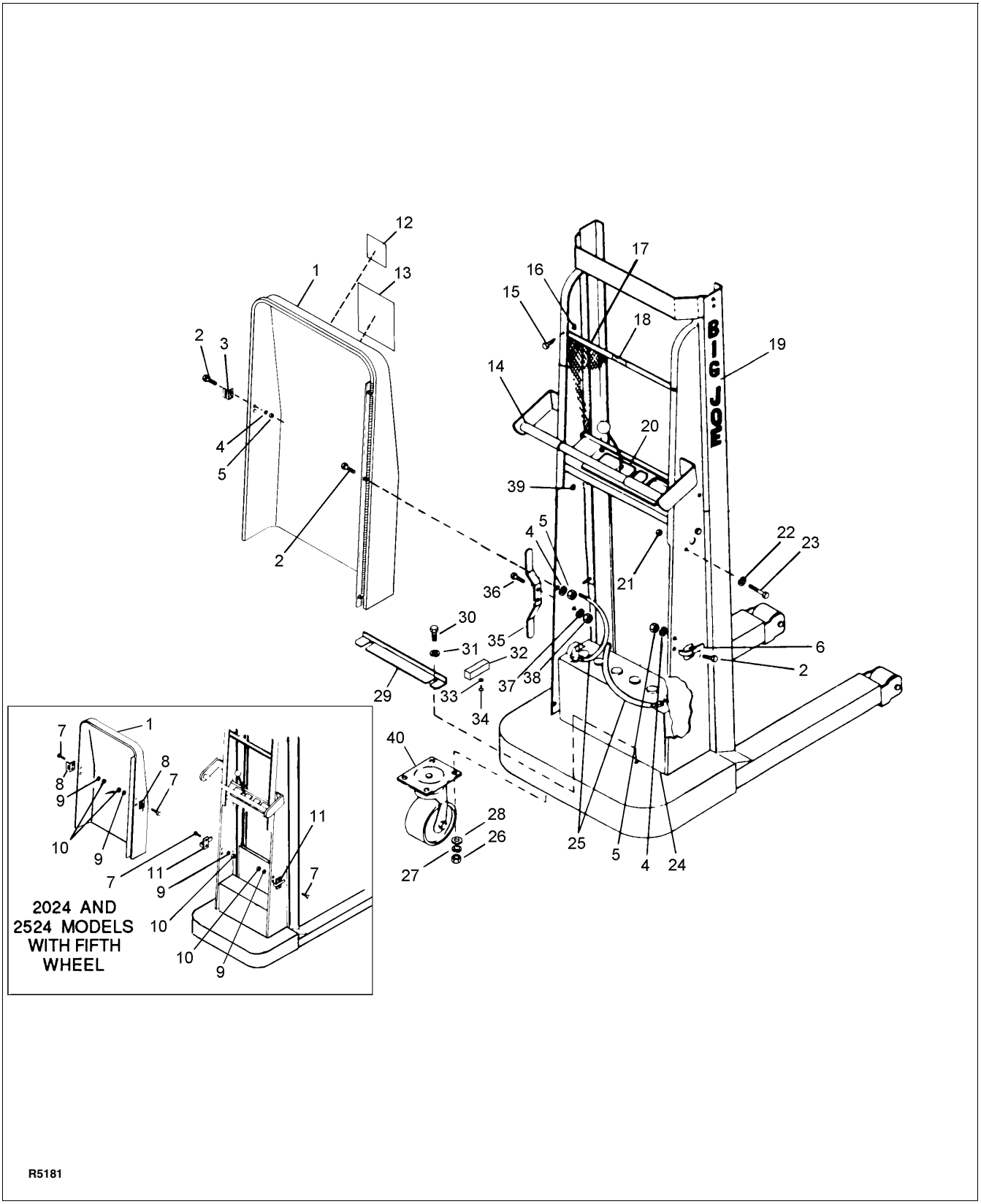


Figure 10-5 Base and Frame

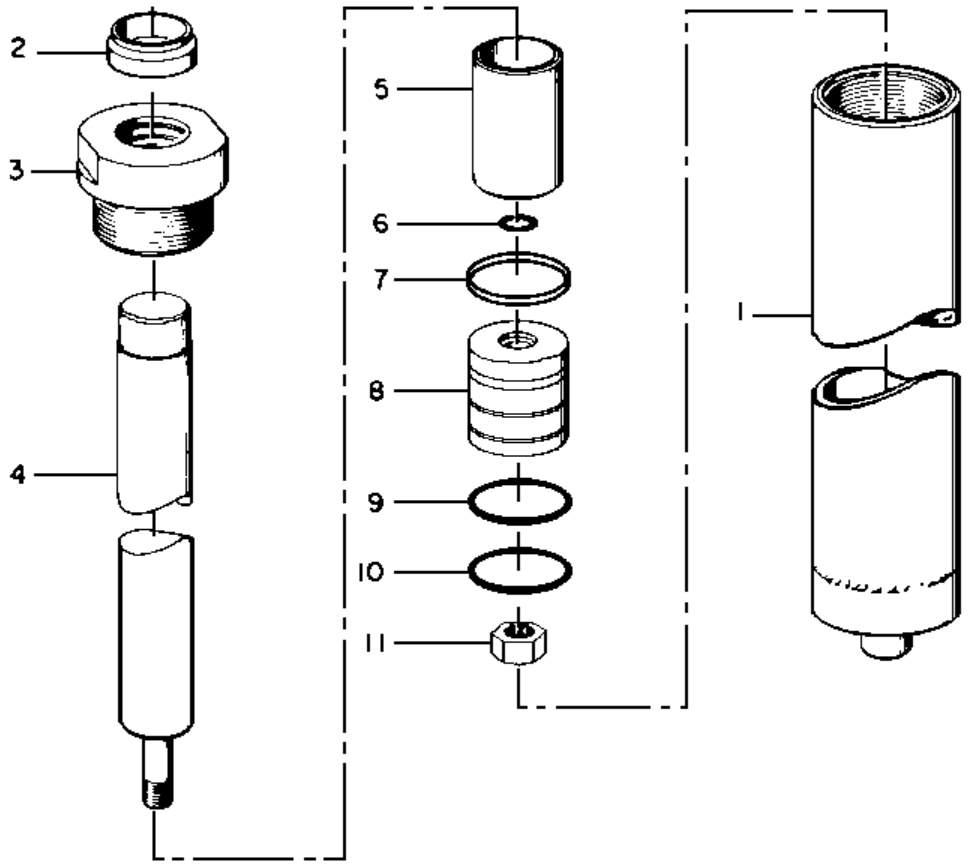
INDEX NO.	PART NO.	PART NAME	NO. REQD.
1	056554	DOOR	1
2	071376	SCREW, 10-32 X 1/2	7
3	055500	CATCH	1
4	077207	LOCKWASHER	7
5	059416	HEX NUT, 10-32	7
6	058100	DOOR LATCH	1
7	071376	SCREW, 10-32 X 1/2	8
8	055500	CATCH	2
9	077207	LOCKWASHER	8
10	059416	HEX NUT, 10-32	8
11	058100	DOOR LATCH	2
12	056589	DECAL, OPERATING WARNING	1
13	056631	DECAL, DOOR	1
14	057501	GRIP	2
15	072407	SCREW, SELF TAPPING 10-32 X 3/4	4
16	059930	SPEED NUT	4
17	502521	SCREEN ASSY	1
18	056494	DECAL	1
19	056632	MAST DECAL (MODELS 1018, 1518, 2018, AND 1524)	2
19	056633	MAST DECAL (MODELS 2024 AND 2524)	2
20	—	DASH DECAL (FIGURE 10-14 AND FIGURE 10-15)	REF
21	059246	HEX NUT, 5/16-18	2
22	077210	LOCKWASHER, 5/16	6
23	063552	SCREW, 5/16-18	2
24	003128 *	BATTERY, 150 AMP-HR	1
24	003193 **	BATTERY, 105 AMP-HR (STANDARD ON 1018)	1
24	003191 **	BATTERY, 125 AMP-HR (STANDARD ON 1518 AND 2018)	1
24	003192 **	BATTERY, 155 AMP-HR (STANDARD ON 2024 & 2524) (OPTIONAL ON 1518 & 2018)	1
24	003149 **	BATTERY, 200 AMP-HR (OPTIONAL ON 2024 AND 2524)	1
25	004500	BATTERY CABLE	2
26	059429	NUT, 3/8-16	8
27	077211	LOCKWASHER, 3/8	8
28	077011	WASHER	8
29	101021	BATTERY RETAINER (120 AND 150 AMP-HR)	1
29	505608-01	BATTERY RETAINER (125 AMP-HR)	1
29	505608-02	BATTERY RETAINER (155 AMP-HR)	1
30	063522	SCREW, 5/16-18 X 5/8 (120, 125, 150, 155 AMP-HR)	2
31	077210	LOCKWASHER, 5/16 (120, 125, 150, 155 AMP-HR)	2
32	401724	BATTERY SPACER (200 AMP-HR)	2
33	077211	LOCKWASHER, 3/8 (200 AMP-HR)	2
34	064605	SCREW, 3/8-16 X 1 (200 AMP-HR)	2
35	101020	CORD WINDER	1
36	061376	SCREW, #10-32 x 1/2	2
37	077208	LOCKWASHER, 3/16	2
38	059416	NUT, 10-32	2
39	052905	STRAIN RELIEF	1
40	—	CASTER (FIGURE 10-22)	REF

*** USED ON TRUCKS SERIAL NUMBER 341649 TO 342391**

**** USED ON TRUCKS SERIAL NUMBER 342392 AND HIGHER**

PACKING KIT
PART NUMBER
901774 CONTAINS:

ITEM	QTY
2	1
6	1
9	1
10	1



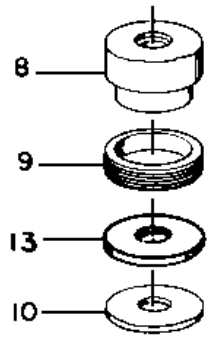
R5833

Figure 10-6 Lift Cylinder Assembly (NON-TEL)
(Model 1018)

INDEX NO.	PART NAME	1018		NO. REQD.
		60" LIFT	72" LIFT	
—	HYD. LIFT CYLINDER ASSY	901487	901488	1
1	. BARREL	—	—	1
2	. DUST SEAL	— *	— *	1
3	. PACKING NUT	904867	904867	1
4	. SHAFT	—	—	1
5	. SPACER	904868	904868	1
6	. O-RING	— *	— *	1
7	. STEEL RING	904869	904869	1
8	. PISTON	904870	904870	1
9	. BACKUP RING	— *	— *	1
10	. O-RING	— *	— *	1
11	. NUT	904871	904871	1

* INCLUDED IN PACKING KIT PART NUMBER 901492

NOTES



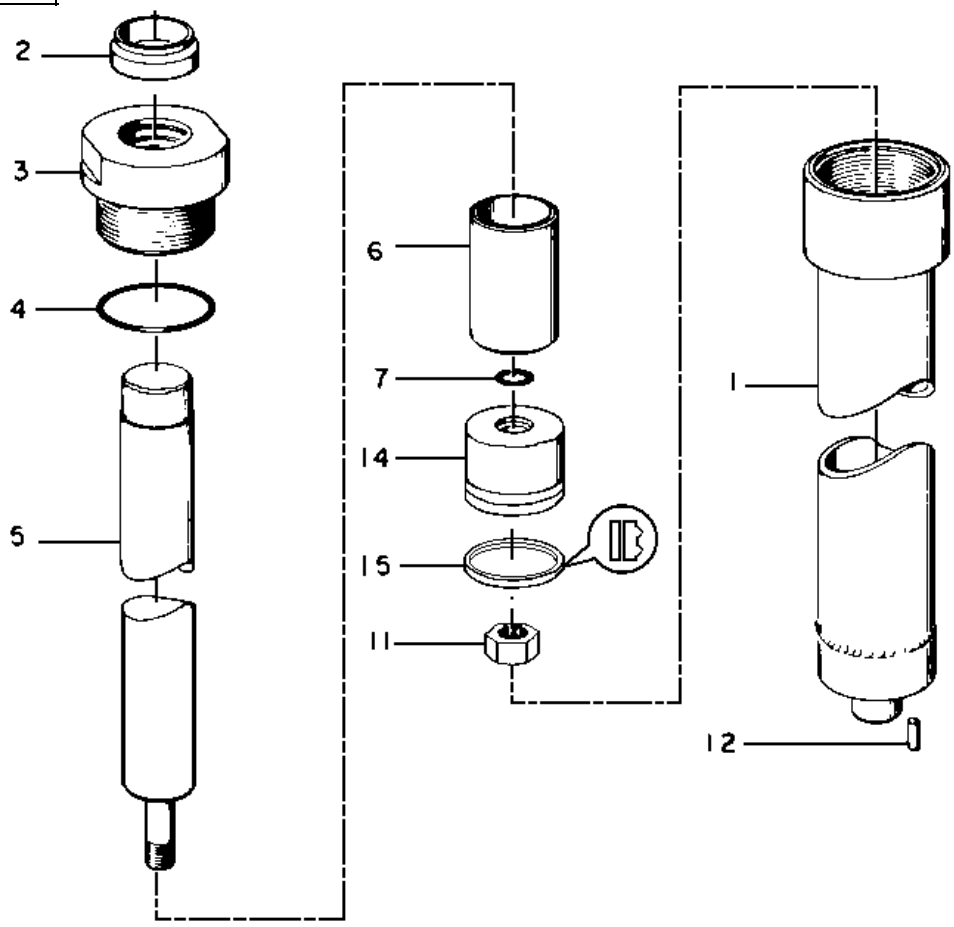
USED ON TRUCKS
SERIAL NUMBERS
341649 TO 351487

RETROFIT KIT PART NUMBER 900124 CONTAINS:

ITEM	QTY
2	1
4	1
7	1
11	1
14	1
15	1

PACKING KIT PART NUMBER 900123 CONTAINS:

ITEM	QTY
2	1
4	1
7	1
11	1
15	1



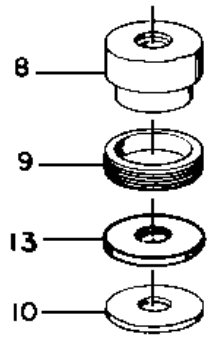
R6106

Figure 10-7 Lift Cylinder Assembly (NON-TEL)
(Model 1518, 1524, 2018)

INDEX NO.	PART NAME	1518, 1524, 2018			NO. REQD.
		60" LIFT	72" LIFT	84" LIFT	
—	HYD. LIFT CYLINDER ASSY	500773	500774	500775	1
1	. TUBE	—	—	—	1
2	. WIPER RING	049508 *	049508 *	049508 *	1
3	. GLAND NUT	800023	800023	800023	1
4	. TOP O-RING	042122 *	042122 *	042122 *	1
5	. RAM	—	—	—	1
6	. RAM STOP	296001	296001	296001	1
7	. BOTTOM O-RING	042105 *	042105 *	042105 *	1
8	. PISTON	045101 **	045101 **	045101 **	1
9	. PACKING ASSY	043106 **	043106 **	043106 **	1
10	. FLAT WASHER	077004 **	077004 **	077004 **	1
11	. JAM NUT, 3/4-16	800293 *	800293 *	800293 *	1
12	. ROLL PIN, 5/16 X 3/4	061023	061023	061023	1
13	. FLAT WASHER	077093 **	077093 **	077093 **	1
14	. PISTON	403863	403863	403863	1
15	. PSP SEAL	042205-01	042205-01	042205-01	1

*** 907123 PACKING KIT INCLUDES 2, 4, 7, 11 AND 15**

**** CYLINDERS EQUIPPED WITH PISTON, ITEM 8, ORDER RETROFIT KIT 907124.**
907124 RETROFIT KIT INCLUDES 2, 4, 7, 11, 14 AND 15



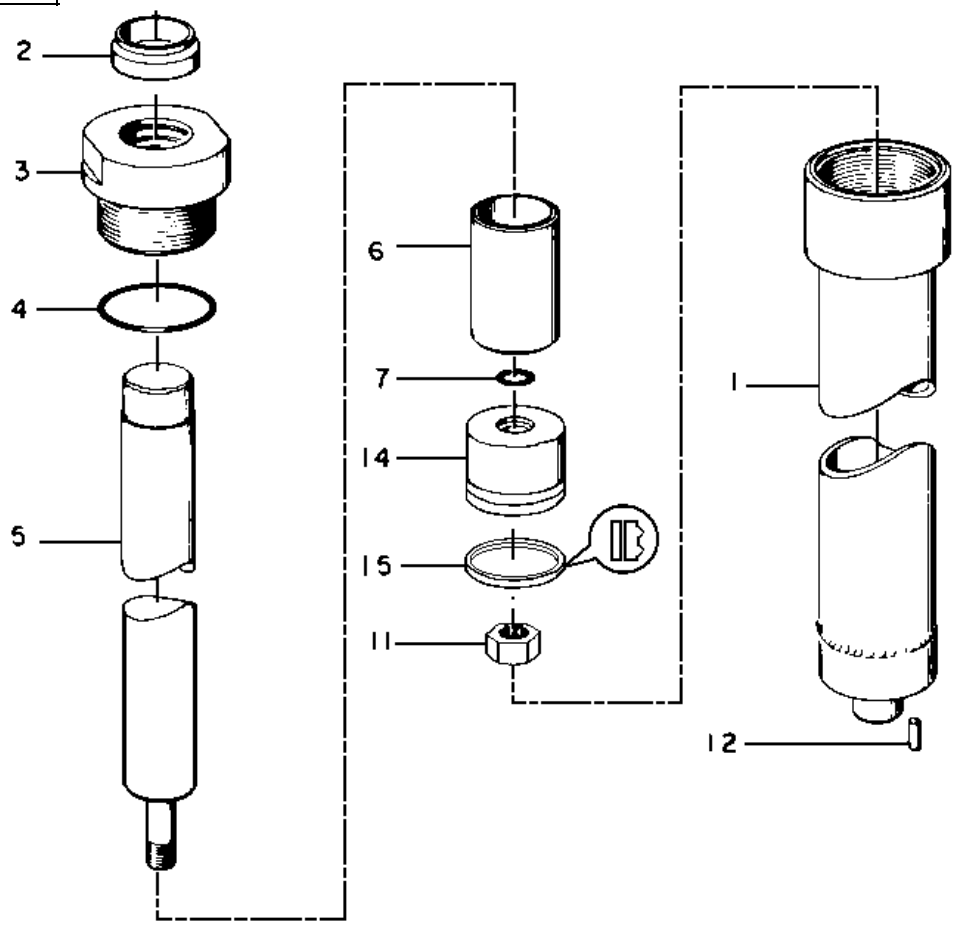
USED ON TRUCKS
SERIAL NUMBERS
341649 TO 351487

RETROFIT KIT PART NUMBER 900122 CONTAINS:

ITEM	QTY
2	1
4	1
7	1
11	1
14	1
15	1

PACKING KIT PART NUMBER 900121 CONTAINS:

ITEM	QTY
2	1
4	1
7	1
11	1
15	1



R6106

Figure 10-8 Lift Cylinder Assembly (NON-TEL)
(Model 2024, 2524)

INDEX NO.	PART NAME	2024 & 2524				NO. REQD.
		60" LIFT	72" LIFT	84" LIFT	96" LIFT	
—	HYD. LIFT CYLINDER ASSY	503568-01	503568-02	503568-03	503568-04	1
1	. TUBE	—	—	—	—	1
2	. WIPER RING	049509 *	049509 *	049509 *	049509 *	1
3	. GLAND NUT	800024	800024	800024	800024	1
4	. TOP O-RING	042113 *	042113 *	042113 *	042113 *	1
5	. RAM	—	—	—	—	1
6	. RAM STOP	400866	400865	400865	300509	1
7	. BOTTOM O-RING	042105 *	042105 *	042105 *	042105 *	1
8	. PISTON	— **	— **	— **	— **	1
9	. PACKING ASSY	— **	— **	— **	— **	1
10	. FLAT WASHER	077005 **	077005 **	077005 **	077005 **	1
11	. JAM NUT, 3/4-16	800293 *	800293 *	800293 *	800293 *	1
12	. ROLL PIN, 5/16 X 9/16	061023	061023	061023	061023	1
13	. WASHER	— **	— **	— **	— **	1
14	. PISTON	403864	403864	403864	403864	1
15	. PSP SEAL	042205-02	042205-02	042205-02	042205-02	1

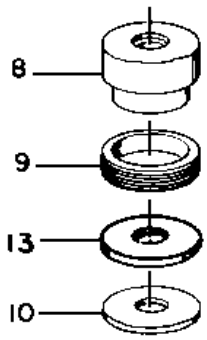
*** 907121 PACKING KIT INCLUDES 2, 4, 7, 11 AND 15**

**** CYLINDERS EQUIPPED WITH PISTON, ITEM 8, ORDER RETROFIT KIT 907122.**
907122 RETROFIT KIT INCLUDES 2, 4, 7, 11, 14 AND 15

INDEX NO.	PART NAME	2024 & 2524				NO. REQD.
		106" LIFT	120" LIFT	130" LIFT	144" LIFT	
—	HYD. LIFT CYLINDER ASSY	503568-05	503568-06	503568-07	503568-08	1
1	. TUBE	—	—	—	—	1
2	. WIPER RING	049509 *	049509 *	049509 *	049509 *	1
3	. GLAND NUT	800024	800024	800024	800024	1
4	. TOP O-RING	042113 *	042113 *	042113 *	042113 *	1
5	. RAM	—	—	—	—	1
6	. RAM STOP	300509	300509	300509	300509	1
7	. BOTTOM O-RING	042105 *	042105 *	042105 *	042105 *	1
8	. PISTON	— **	— **	— **	— **	1
9	. PACKING ASSY	— **	— **	— **	— **	1
10	. FLAT WASHER	077005 **	077005 **	077005 **	077005 **	1
11	. JAM NUT, 3/4-16	800293 *	800293 *	800293 *	800293 *	1
12	. ROLL PIN, 5/16 X 9/16	061023	061023	061023	061023	1
13	. WASHER	— **	— **	— **	— **	1
14	. PISTON	403864	403864	403864	403864	1
15	. PSP SEAL	042205-02	042205-02	042205-02	042205-02	1

*** 907121 PACKING KIT INCLUDES 2, 4, 7, 11 AND 15**

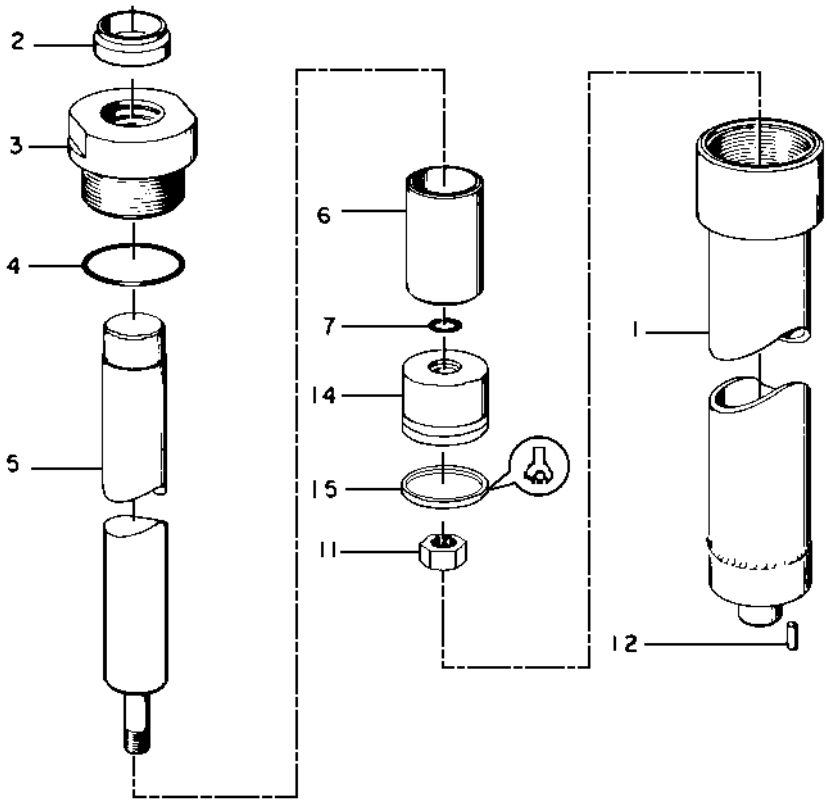
**** CYLINDERS EQUIPPED WITH PISTON, ITEM 8, ORDER RETROFIT KIT 907122.**
907122 RETROFIT KIT INCLUDES 2, 4, 7, 11, 14 AND 15



USED ON TRUCKS
SERIAL NUMBERS
341649 TO 353212

RETROFIT KIT PART NUMBER 907139 CONTAINS:	
ITEM	QTY
2	1
4	1
7	1
11	1
14	1
15	1

PACKING KIT PART NUMBER 907138 CONTAINS:	
ITEM	QTY
2	1
4	1
7	1
11	1
15	1



R5812

Figure 10-9 Lift Cylinder Assembly (Telescopic)
(Model 1518, 1524, 2018)

INDEX NO.	PART NAME	1518, 1524, 2018					NO. REQD.
		96" LIFT	108" LIFT	120" LIFT	132" LIFT	144" LIFT	
—	HYD. LIFT CYLINDER ASSY	503600	503601	503602	503603	503604	1
1	. TUBE	—	—	—	—	—	1
2	. WIPER RING	049508 *	049508 *	049508 *	049508 *	049508 *	1
3	. GLAND NUT	800023	800023	800023	800023	800023	1
4	. TOP O-RING	042122 *	042122 *	042122 *	042122 *	042122 *	1
5	. RAM	—	—	—	—	—	1
6	. RAM STOP	400860	400860	400860	400860	400860	1
7	. BOTTOM O-RING	042105 *	042105 *	042105 *	042105 *	042105 *	1
8	. PISTON	— **	— **	— **	— **	— **	1
9	. PACKING ASSY	— **	— **	— **	— **	— **	1
10	. FLAT WASHER	077004 **	077004 **	077004 **	077004 **	077004 **	1
11	. JAM NUT, 3/4-16	800293 *	800293 *	800293 *	800293 *	800293 *	1
12	. ROLL PIN, 5/16 X 9/16	061023	061023	061023	061023	061023	1
13	. WASHER	— **	— **	— **	— **	— **	1
14	. PISTON	403717	403717	403717	403717	403717	1
15	. PSP SEAL	043130	043130	043130	043130	043130	1

*** 907138 PACKING KIT INCLUDES 2, 4, 7, 11 AND 15**

**** CYLINDERS EQUIPPED WITH PISTON, ITEM 8, ORDER RETROFIT KIT 907139.**
907139 RETROFIT KIT INCLUDES 2, 4, 7, 11, 14 AND 15

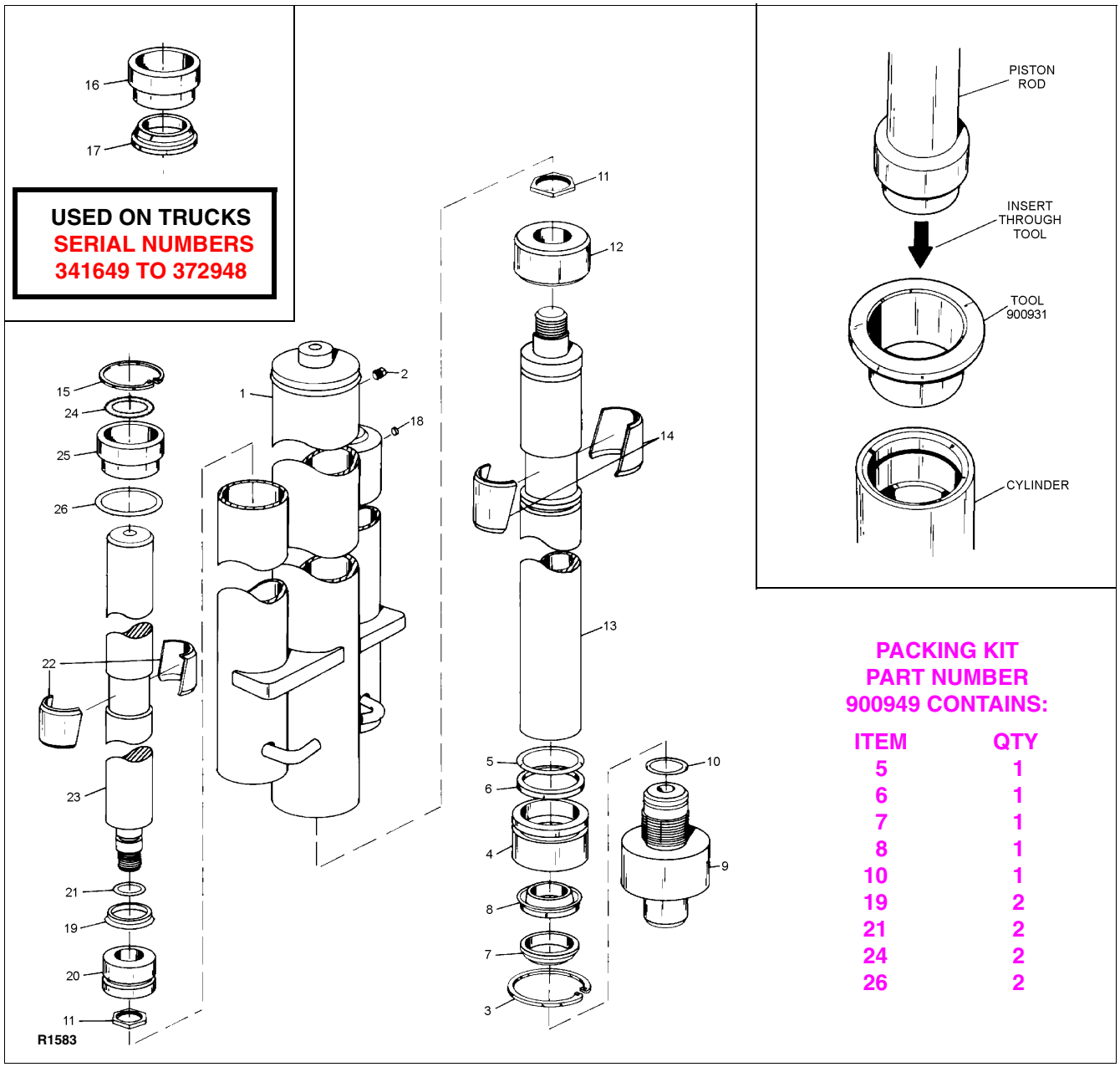


Figure 10-10 Lift Cylinders (Full Free Lift)

INDEX NO.	PART NO.	PART NAME	NO. REQD.
—	503996-01	FFL CYLINDER ASSEMBLY 106 IN. LIFT HEIGHT	1
—	503996-02	FFL CYLINDER ASSEMBLY 130 IN. LIFT HEIGHT	1
1	503995-01	. FFL CYLINDER WELDMENT 106 IN. LIFT HEIGHT	1
1	503995-02	. FFL CYLINDER WELDMENT 130 IN. LIFT HEIGHT	1
2	026308	. SQUARE HD PLUG, 1/4 NPT	1
3	061825	. SNAP RING RETAINER	1
4	401645	. CYLINDER HEAD, 2.50 DIA.	1
5	042150 †	. "O" RING	1
6	042151 †	. BACK-UP RING	1
7	049517-02 †	. HYDRAULIC CYLINDER WIPER RING	1
8	043132 †	. "U" CUP ROD SEAL	1
9	401652	. CYLINDER BASE, 2.50 DIA	1
10	042149 †	. "O" RING	1
11	059128	. FLEXLOC LOCK NUT	3
12	401647	. PISTON, 2.5 DIA.	1
13	503992-01	. CYLINDER ROD, 106 LIFT HT	1
13	503992-02	. CYLINDER ROD, 130 LIFT HT	1
14	401641	. WEAR RING	1
15	061824	. SNAP RING RETAINER	2
16	401584*	. CYLINDER HEAD, 2.00 DIA.	2
17	049517-01 *†	. CYLINDER HD WIPER RING	2
18	029103	. BREATHER PLUG	2
19	043130 †	. "U" CUP SEAL	2
20	401384	. PISTON, 2.00 DIA.	2
21	042136 †	. "O" RING	2
22	401646	. WEAR RING	2
23	401642-01	. CYLINDER ROD, 106 LIFT HT	2
23	401642-02	. CYLINDER ROD, 130 LIFT HT	2
24	043136 **†	. SEAL	2
25	404174 **	. GLAND	2
26	043152 **†	. O-RING	2
—	055706	LOCTITE 222 ADHESIVE	A/R
—	900893	HYDRAULIC OIL (QUART)	AR
—	900855	HYDRAULIC OIL (GALLON)	AR

A/R - AS REQUIRED

† **INCLUDED IN PACKING KIT PART NUMBER 900949**

* **USED ON TRUCKS SERIAL NUMBER 341649 TO 372947**

** **USED ON TRUCKS SERIAL NUMBER 372948 AND HIGHER**

SPECIFY TRUCK MODEL NUMBER, LIFT HEIGHT, AND SERIAL NUMBER WHEN ORDERING LIFT CYLINDER PARTS.

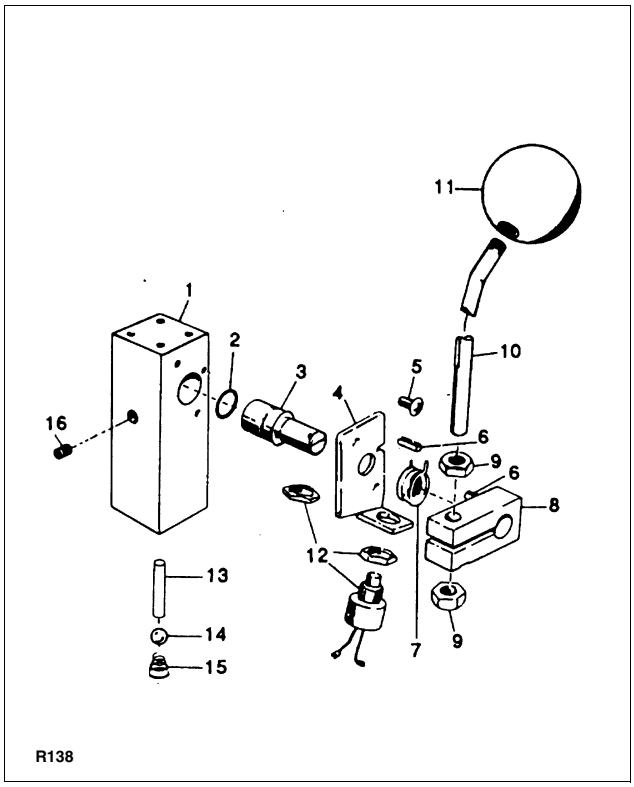


Figure 10-11 Lift Control Valve Assembly

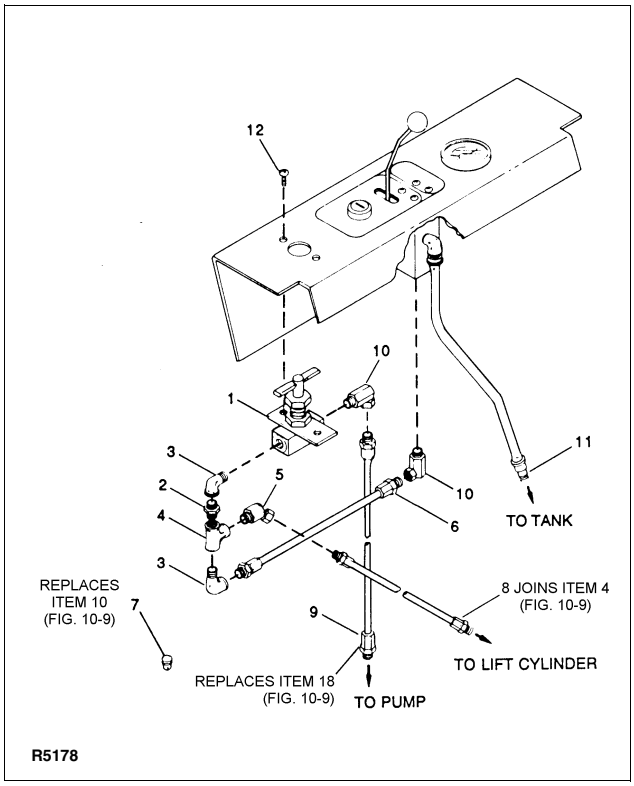


Figure 10-12 Lift Speed Control Module

INDEX NO.	PART NO.	PART NAME	NO. REQD.
—	504216-01	LIFT CONTROL VALVE	1
1	240501	. VALVE BODY	1
2	042104	. O-RING	1
3	304611	. RELEASE CAM	1
4	052803	. SWITCH BRACKET	1
5	070475	. PHILLIPS ROUND HD SCREW, 1/4-20 X 3/8	2
6	060937	. ROLL PIN, 1/8 X 5/8	2
7	075015	. HANDLE RETURN SPRING	1
8	257401	. LIFT CONTROL VALVE CLAMP	1
9	059529	. JAM NUT, 3/8-16	2
10	057702	. HANDLE	1
11	057952	. KNOB	1
12	500942	. PUMP MOTOR SWITCH	1
—	059675	. . NUT	2
13	060608 *	. PIN, 5/32 X 1-1/4	1
14	051404 *	. CHECK BALL	1
15	075052	. COMPRESSION SPRING	1
16	026310	. PLUG, 3/8	1

*** INCLUDED IN BALL CHECK KIT PART NUMBER 900132**

INDEX NO.	PART NO.	PART NAME	NO. REQD.
—	501186	LIFT SPEED CONTROL MODULE	1
1	800052	. NEEDLE VALVE ASSY	1
2	026110	. PIPE NIPPLE, 1/4	1
3	026708	. STREET ELBOW, 1/4	2
4	027102	. PIPE TEE, 1/4	1
5	025303	. SWIVEL ELBOW, 45°	1
6	501187	. HOSE ASSY	1
7	026303	. SQUARE-HD PLUG	1
8	501188	. HOSE ASSY	1
9	038107	. HOSE ASSY	1
10	025116	. SWIVEL ELBOW	2
11	026131	HOSE NIPPLE, 1/4 X 1	REF
12	070476	SCREW, 1/4-20	2

NOTES

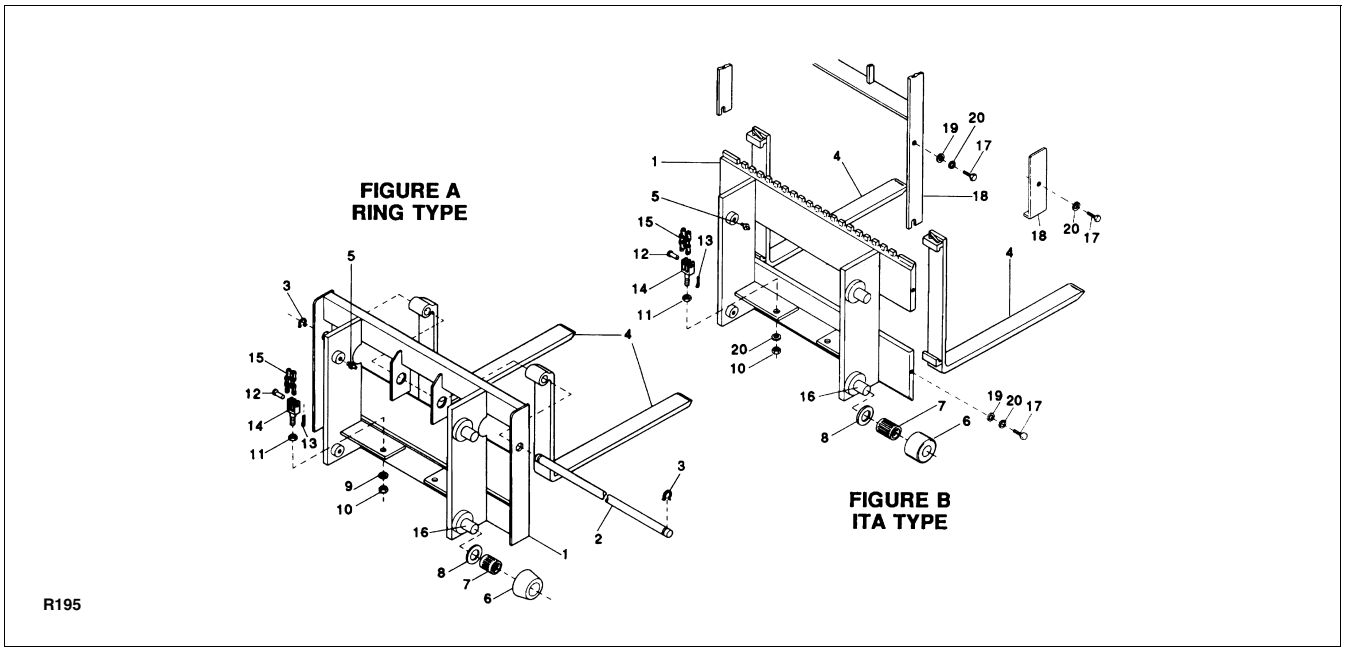


Figure 10-13 Lift Carriage and Fork

Table 10-1 Fork (Item 4)

TRUCK MODEL	ADJUSTABLE STRADDLE FORK DESCRIPTION
All 1018 And 1518 Non-Tel with carriages narrower than 28”	1-1/4” Thick Blade, 1-1/4” Dia. Ring P/N 500677 30” Long P/N 501878 36” Long P/N 501880 42” Long P/N 503277 48” Long
All 1518 Tel And 1518 Non-Tel with carriages wider than 28”	1-1/4” Thick Blade, 1-1/4” Dia. Ring P/N 503657 30” Long P/N 503658 36” Long P/N 503659 42” Long P/N 503660 48” Long
All 1524, 2018 Tel And 1524, 2018 Non-Tel with carriages wider than 28”	1-1/2” Thick Blade, 1-1/4” Dia. Ring P/N 500763 30” Long P/N 501413 36” Long P/N 501882 42” Long P/N 501883 48” Long
1524, 2018 Non-Tel with carriages narrower than 28”	1-1/2” Thick Blade, 1” Dia. Ring P/N 503612 30” Long P/N 503613 36” Long P/N 503614 42” Long P/N 503615 48” Long
2024, 2524 * (Earlier Models)	1-1/2” Thick Blade, 1-1/4” Dia. Ring P/N 504541-01 30” Long P/N 504541-02 36” Long P/N 504541-03 42” Long P/N 504541-04 48” Long
2024, 2524 * (Earlier Models)	1-1/4” Thick Blade, 1-1/4” Dia. Ring P/N 057119-01 30” Long P/N 057119-02 36” Long P/N 057119-03 42” Long P/N 057119-04 48” Long
All 1518 Tel And 1518 Non-Tel with carriages wider than 28”	1-1/4” Thick Blade, 1-1/4” Dia. Ring P/N 504833-01 30” Long P/N 504833-02 36” Long P/N 504833-03 42” Long P/N 504833-04 48” Long
1518 Non-Tel with carriages narrow than 28”	1-1/4” Thick Blade, 1” Dia. Ring P/N 504831-01 30” Long P/N 504831-02 36” Long P/N 504831-03 42” Long P/N 504831-04 48” Long
1524, 2018 Tel And 1524, 2018 Non-Tel with carriages wider than 28”	1-1/4” Thick Blade, 1-1/4” Dia. Ring P/N 504834-01 30” Long P/N 504834-02 36” Long P/N 504834-03 42” Long P/N 504834-04 48” Long
1524, 2018 Non-Tel with carriages narrower than 28”	1-1/4” Thick Blade, 1” Dia. Ring P/N 504832-01 30” Long P/N 504832-02 36” Long P/N 504832-03 42” Long P/N 504832-04 48” Long
2024, 2524 * with carriages narrower than 28”	1-1/4” Thick Blade, 1” Dia. Ring P/N 057121-01 30” Long P/N 057121-02 36” Long P/N 057121-03 42” Long P/N 057121-04 48” Long

*** 19” back height, 4” wide blades. All others have 11-3/4” back height and 3” wide blades.**

INDEX NO.	PART NAME	1018A 1518A	1018R 1518R	1518T	1524A 2018A	2018R	1524T 2018T	2024A 2524A	2024T 2524T	ITA TYPE 2024/ 2524	NO. REQD.
1	LIFT CARRIAGE ASSY	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR	VAR	REF
2	FORK SHAFT - 24”	206401	N.A.	N.A.	296401	N.A.	N.A.	N.A.	N.A.	N.A.	1
2	FORK SHAFT - 28”	N.A.	N.A.	276604	N.A.	N.A.	276604	276604	276604	276604	1
2	FORK SHAFT - 36”	276611	N.A.	276611	276611	N.A.	276611	276611	276611	N.A.	1
3	RETAINING RING - 24”	061725	N.A.	N.A.	061725	N.A.	N.A.	N.A.	N.A.	N.A.	2
3	RETAINING RING - 28”	061729	N.A.	061729	061729	N.A.	061729	061729	061729	N.A.	2
3	RETAINING RING - 36”	061729	N.A.	061729	061729	N.A.	061729	061729	061729	N.A.	2
4	FORK ASSY	SEE TABLE 10-1									2
5	GREASE FITTING	025712	025712	025712	025712	025712	025712	025712	025712	025712	4
—	ROLLER ASSY	500876	500876	500876	901365	901365	901366	500166	500167	—	4
6	. ROLLER	062319	062319	062319	062325	062325	062326	243401	401046	*	1
7	. BEARING	051102	051102	051102	051102	051102	051102	051145	051145	051145	1
8	SPACER THRUST BEARING, 3/32”	053000	053000	053000	053000	053000	053000	053012	053012	053012	A/R
8	SPACER THRUST BEARING, 1/8”	053001	053001	053001	053001	053001	053001	053013	053013	053013	A/R
8	SPACER THRUST BEARING, 5/32”	053002	053002	053002	053002	053002	053002	053014	053014	053014	A/R
8	SPACER THRUST BEARING, 3/16”	053003	053003	053003	053003	053003	053003	053015	053015	053015	A/R
9	LOCKWASHER, 5/8	077215	077215	077215	077215	077215	077215	077215	077215	N.A.	2
10	HEX NUT, 5/8-18	059445	059445	059445	059445	059445	059445	059445	059445	059445	2
11	JAM NUT, 5/8-18	059545	059545	059545	059545	059545	059545	059545	059545	059545	2
12	CLEVIS PIN	402055	402055	402055	402055	402055	402055	402055	402055	402055	2
13	COTTER PIN	060402	060402	060402	060402	060402	060402	060402	060402	060402	2
14	ADJUSTING BOLT	402051	402051	402051	402051	402051	402051	402051	402051	402051	2
15	LIFT CHAIN	402034	402034	402034	402034	402034	402034	402034	402034	402034	A/R
16	SPINDLE	500512	500512	500512	500512	500512	500126	500126	500126	500126	4
17	HEX HEAD CAP SCREW, 5/8-11 X 1-1/4	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	063820	6
18	LOAD BACKREST	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	SEE TABLE 10-2	1
—	FORK RETAINER BAR (FOR TRUCKS WITH NO BACKREST)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	401527	2
19	ROUND WASHER, 5/8	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	077066	6
20	LOCKWASHER, 5/8	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	077215	6

N.A. = NOT APPLICABLE

VAR = ORDER BY PART NAME, GIVING TRUCK MODEL AND SERIAL NUMBER, CAPACITY AND LIFT HEIGHT

Table 10-2 Load Backrest, Model 2024 & 2524 (Item 18)

WIDTH	PART NUMBER	QTY.
28 inches	503752	1
24 inches	503695	2
32 inches	503695	1
35 inches	503697	2
Fork Retainer Bar (for trucks without a load backrest)	401527	2

SEE SUPPLEMENT 285 FOR TRUCKS WITH PERSONNEL PLATFORM ATTACHMENT

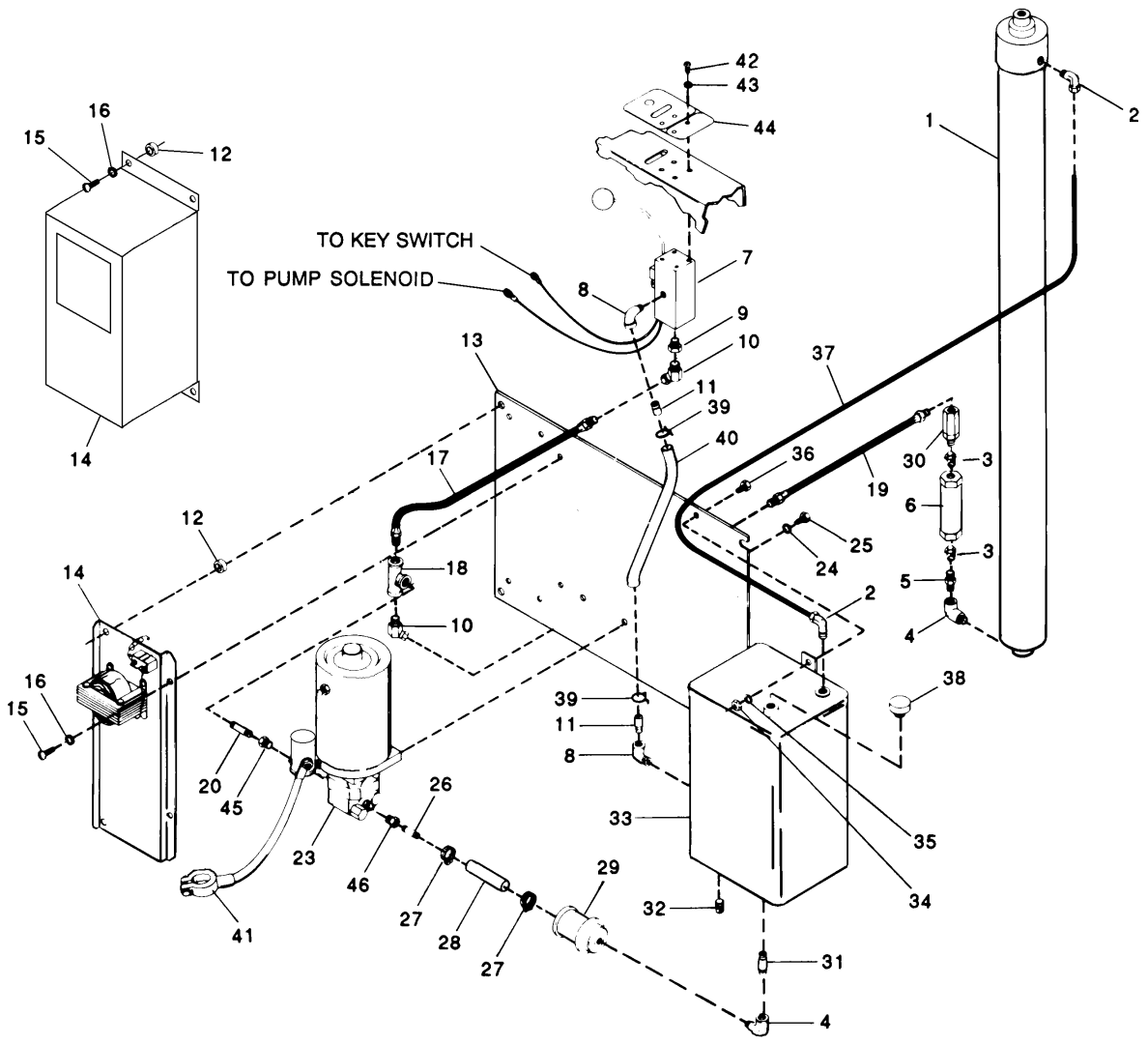


Figure 10-14 Hydraulic System (TEL and NON-TEL)

INDEX NO.	PART NO.	PART NAME	NO. REQD.
1	—	LIFT CYLINDER (FIGURE 10-6 THRU FIGURE 10-9)	REF
2	025501	ELBOW	2
3	026500	REDUCER, 3/8-1/4 (1018, 1518T AND ALL 2018, 2024, & 2524 MODELS)	1
4	026708	STREET ELBOW, 1/4	2
4	025538	ELBOW (2024 & 2524 MODELS)	1
5	026110	HEX NIPPLE, 1/4 (1018, 1518T, 2018T, AND 1524T)	1
6	047104 *	FLOW CONTROL VALVE	1
6	047110 **	FLOW CONTROL VALVE	1
7	—	LIFT CONTROL VALVE ASSY (FIGURE 10-11)	REF
8	026701	STREET ELBOW, 1/4	2
9	026500	REDUCER, 3/8-1/4	1
10	025303	HOSE ADAPTER, 45 DEGREE SWIVEL	1
11	026131	HOSE NIPPLE, 1/4 X 1	2
12	238510	CHARGER MOUNT SPACER	2 OR 4
—	504648-01	HYD PANEL ASSY WITHOUT REMOTE (1018)	1
—	504648-02	HYD PANEL ASSY WITH REMOTE (1018)	1
—	504222-01	HYD PANEL ASSY WITHOUT REMOTE (1518, 1524, 2018, & 2024)	1
—	504222-03	HYD PANEL ASSY WITH REMOTE (2524)	1
—	504222-04	HYD PANEL ASSY WITHOUT REMOTE (2524)	1
13	101069	PANEL (DC MODEL)	1
14	—	BATTERY CHARGER (FIGURE 10-26 AND FIGURE 10-27)	REF
15	070475	ROUND HD SCREW, 1/4-20 X 3/8	2 OR 4
16	077209	LOCKWASHER, 1/4	2 OR 4
17	038104	HOSE WITH FITTINGS	1
18	027118	PIPE TEE, 1/4	1
19	038174	HOSE ASSY, 1/4 X 8	1
19	038103	HOSE ASSY, 1/4 X 12	1
19	038173	HOSE ASSY, 1/4 X 13-3/4	1
19	038172	HOSE ASSY, 1/4 X 14-1/2	1
19	038105	HOSE ASSY, 1/4 X 15	1
19	038108	HOSE ASSY, 1/4 X 17-1/2	1
20	026136 +	PIPE NIPPLE, 1/4 (EARLY MODELS)	1
21	026500	REDUCER, 3/8-1/4 (DC REMOTE CONTROLLER 2018A, R, & T)	
22	—	NOT USED	
23	—	PUMP AND MOTOR ASSY (FIGURE 10-17 AND FIGURE 10-16)	REF
24	077211	LOCKWASHER, 3/8	2
25	063603	HEX HD CAP SCREW, 1/4-20 X 3/8	2
26	026139 ++	HOSE NIPPLE, 1/4 X 1-5/16	1
27	056110	HOSE CLAMP, SCREW TYPE	2
28	290000	SUCTION TUBING	A/R
29	035106	FILTER AND NIPPLE ASSY	1
30	025313	SWIVEL COUPLING (2024 & 2524)	1
31	026136	PIPE NIPPLE	1
32	026302	MAGNETIC DRAIN PLUG, 3/8	1
33	500929	RESERVOIR	1
34	059426	HEX NUT, 5/16-18	2
35	077210	LOCKWASHER, 5/16	2
36	063553	HEX HD CAP SCREW, 5/16-18	2
37	282500	OVER FLOW TUBING	A/R
38	505097	RESERVOIR BREATHER CAP AND DIP STICK	1
39	056108	HOSE CLAMP	2
40	278600	RETURN TUBING	A/R
41	004500	BATTERY CABLE	2
42	070476	ROUND HEAD SCREW, 1/4-20	4
43	077209	LOCKWASHER	4
44	056480	INSTRUMENT PANEL DECAL	1
45	025113	REDUCING ADAPTER, 9/16 TO 1/4	1
45	025124	REDUCING ADAPTER, 9/16 TO 1/4	1

*** Used on Model 2024 & 2524 non-tel trucks.**

*** Used on Model 1018, 1518, 1524, 2018, 2024 & 2524 tel trucks.**

+ Used only when Item 45 is not used.

++ Used 026131 when Item 46 is not used.

SEE SUPPLEMENT 285 FOR TRUCKS WITH PERSONNEL PLATFORM ATTACHMENT

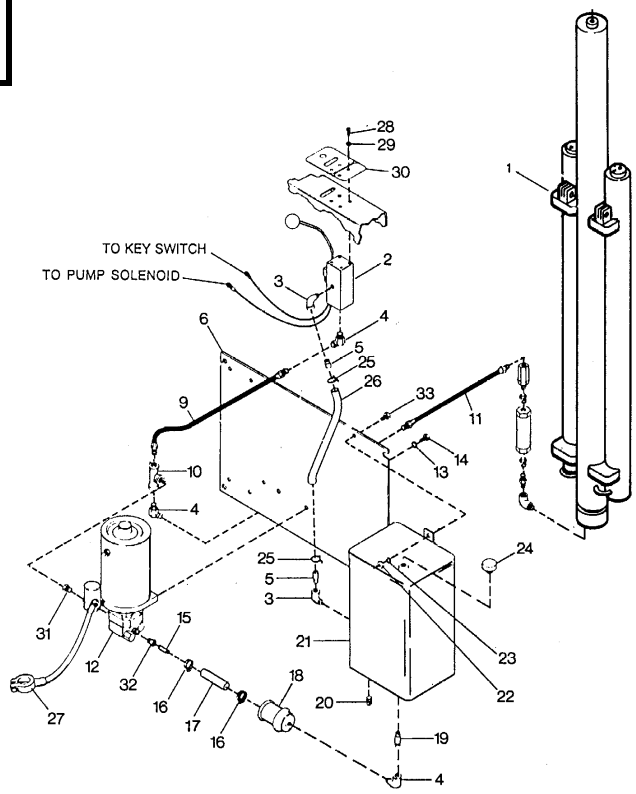


Figure 10-15 Hydraulic System (FFL)

INDEX NO.	PART NO.	PART NAME	NO. REQD.
1	—	LIFT CYLINDER, FFL (FIGURE 10-10)	REF
2	—	LIFT CONTRO VALVE ASSY (FIGURE 10-11)	REF
3	026701	STREET ELBOW, 1/4	2
4	025513	HOSE ADAPTER, 45° SWIVEL	2
5	026131	HOSE NIPPLE, 1/4 X 1	2
6	403346	PANEL (DC MODEL)	1
7	077011	LOCKWASHER	2
8	059429	HEX NUT	4
9	504199-01	HOSE W/FITTINGS	1
10	027120	PIPE TEE, 1/4	1
11	504199-09	HOSE W/FITTINGS	1
12	016937	PUMP & MOTOR ASSY	1
12	016938	PUMP & MOTOR ASSY (MODEL 2524 & ALL REMOTE MODELS)	1
13	077211	LOCKWASHER, 3/8	4
14	063603	HEX HD CAP SCREW, 1/4-20 X 3/8	2

INDEX NO.	PART NO.	PART NAME	NO. REQD.
15	026131	HOSE NIPPLE, 1/4 X 1-5/16	1
16	056110	HOSE CLAMP	2
17	290000	SUCTION TUBING	A/R
18	035106	FILTER & NIPPLE ASSY	1
19	026104	PIPE NIPPLE	1
20	026302	MAGNETIC DRAIN PLUG, 3/8	1
21	505435	RESERVOIR	1
22	059426	HEX NUT, 5/16-18	2
23	077210	LOCKWASHER, 5/16	2
24	505097	RESERVOIR CAP	1
25	056108	HOSE CLAMP	2
26	278600	RETURN TUBING	A/R
27	004500	BATTERY CABLE	2
28	070476	RD HD SCREW, 1/4-20 X 1/2	4
29	077209	LOCKWASHER	4
30	056480	INSTRUMENT PANEL DECAL	1
31	025124	REDUCING ADAPTER	1
32	025113	REDUCING ADAPTER	1
33	063553	HEX HD CAPSCREW	2

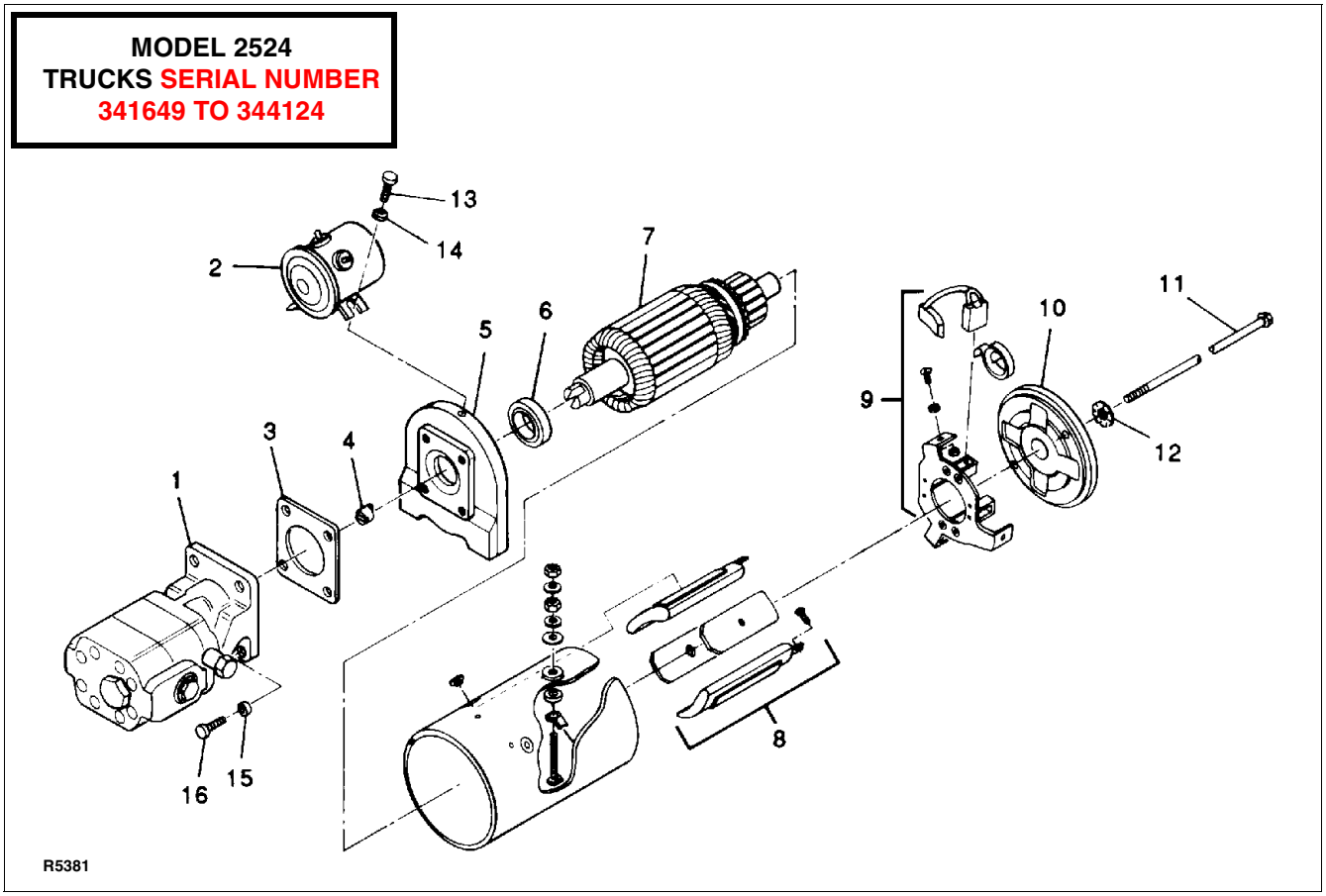


Figure 10-16 Hydraulic Pump and Motor without Remote Control
(Model 2524 only S/N 341649 To 344124)

INDEX NO.	PART NO.	PART NAME	NO. REQD.
—	016931	PUMP AND MOTOR ASSY	REF
1	900896-01	. PUMP, COMPLETE, 1/4" GEAR	1
1	900896-03	. PUMP, COMPLETE, 1/8" GEAR	1
2	020701	. SOLENOID	1
3	036107	. GASKET	1
4	056353	. COUPLING	1
—	905070	. MOTOR ASSY	1
5	900885	. . DRIVE END HOUSING	1
6	900495	. . DRIVE END BEARING	1
7	901287	. . ARMATURE	1

INDEX NO.	PART NO.	PART NAME	NO. REQD.
8	901286	. . FIELD COIL PACKAGE	1
9	901289	. . BRUSH PLATE ASSY	1
10	901288	. . COMMULATOR END HEAD	1
11	901290	. . THRU BOLT PACKAGE	1
12	077210	. . LOCKWASHER, STAR	2
13	070475	. SCREW, 1/4-20 X 3/8	2
14	077209	. LOCKWASHER, 1/4	2
15	077210	. LOCKWASHER, 5/8"	4
16	063553	. HEX HEAD CAP SCREW, 5/15 X 3/4	4

USED ON 1018, 1518, 1524, 2018, 2024
SERIAL NUMBERS 341649 TO 375921

USED ON 2524
SERIAL NUMBERS 344125 TO 377757

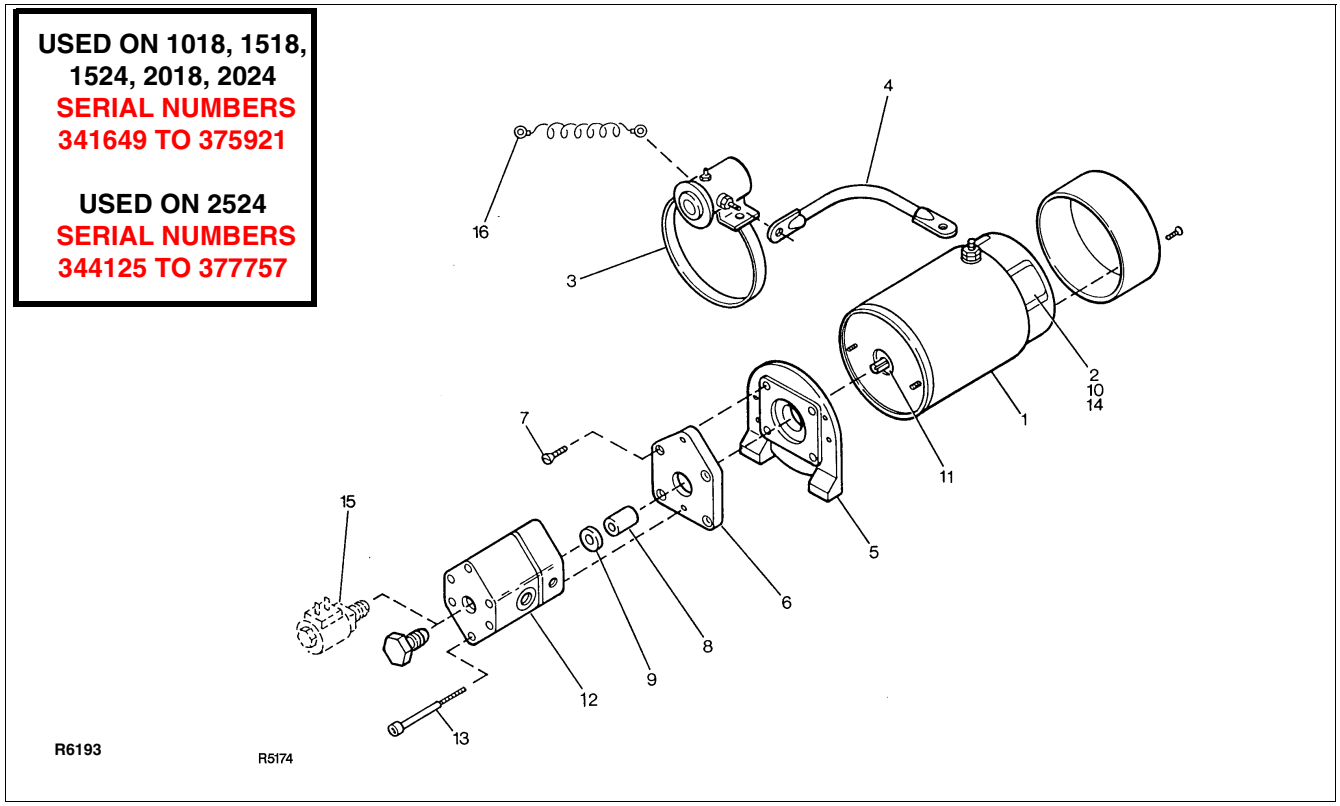


Figure 10-17 Hydraulic Pump and Motor

Pump and Motor Assembly 016937
Models 1018, 1518, 1524, 2018, 2024 with
Serial Number 341649 to 375921

INDEX NO.	PART NO.	PART NAME	NO. REQD.
—	016937	PUMP AND MOTOR ASSEMBLY.	1
1	901517	. DC MOTOR 12 V 1 TERM.	1
2	901518	. DC MOTOR BRUSH KIT	1
3	901519	. START SWITCH ASSEMBLY	1
4	901520	. MOTOR CABLE	1
5	901521	. MOTOR ADAPTER	1
6	901522	. PUMP ADAPTER	1
7	901523	. PUMP ADAPTER BOLTS	4
8	901524	. COUPLING	1
9	901525	. PUMP SHAFT SEAL	1
10	901531	. BRUSH SPRING SET	1
11	900495	. DRIVE END BEARING	1
12	901527	. PUMP	1
13	901526	. PUMP BOLTS	2
14	051165	. COMMUTATOR END BEARING	1
15	048132	. REMOTE VALVE (OPTIONAL)	1
16	901516	. WIRE ASSEMBLY	1

Pump and Motor Assembly 016938
Model 2524 Only
Serial Number 344125 to 377757

INDEX NO.	PART NO.	PART NAME	NO. REQD.
—	016938	PUMP AND MOTOR ASSEMBLY.	1
1	901517	. DC MOTOR 12 V 1 TERM.	1
2	901518	. DC MOTOR BRUSH KIT	1
3	901519	. START SWITCH ASSEMBLY	1
4	901520	. MOTOR CABLE	1
5	901521	. MOTOR ADAPTER	1
6	901522	. PUMP ADAPTER	1
7	901523	. PUMP ADAPTER BOLTS	4
8	901524	. COUPLING	1
9	901525	. PUMP SHAFT SEAL	1
10	901531	. BRUSH SPRING SET	1
11	900495	. DRIVE END BEARING	1
12	901530	. PUMP	1
13	901526	. PUMP BOLTS	2
14	051165	. COMMUTATOR END BEARING	1
15	048132	. REMOTE VALVE (OPTIONAL)	1
16	901516	. WIRE ASSEMBLY	1

USED ON 1018, 1518, 1524, 2018, 2024
SERIAL NUMBERS 375922 and Higher

USED ON 2524
SERIAL NUMBERS 377758 and Higher

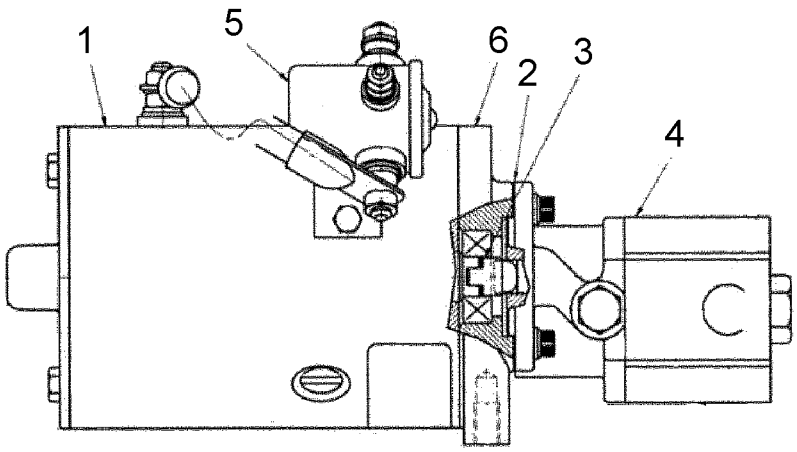


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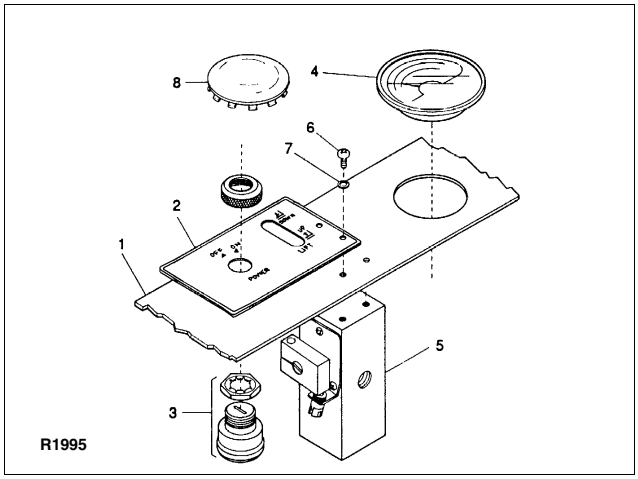
Figure 10-18 Hydraulic Pump and Motor

Pump and Motor Assembly 016948
Models 1018, 1518, 1524, 2018, 2024 with
Serial Number 375922 and Higher

INDEX NO.	PART NO.	PART NAME	NO. REQD.
—	016948	PUMP AND MOTOR ASSEMBLY.	1
1	901761	. DC MOTOR 12 V	1
2	036107	. GASKET	1
3	056353	. COUPLING	1
4	901762	. PUMP COMPLETE	1
5	901533	. SOLENOID	1
6	900885	. MOTOR ADAPTER	1

Pump and Motor Assembly 016949
Model 2524 Only
Serial Number 377758 and Higher

INDEX NO.	PART NO.	PART NAME	NO. REQD.
—	016949	PUMP AND MOTOR ASSEMBLY.	1
1	901761	. DC MOTOR 12 V	1
2	036107	. GASKET	1
3	056353	. COUPLING	1
4	901763	. PUMP COMPLETE	1
5	901533	. SOLENOID	1
6	900885	. MOTOR ADAPTER	1



INDEX NO.	PART NO.	PART NAME	NO. REQD.
1	—	TRUCK FRAME	REF
2	056480	DASH DECAL	1
3	020725	KEY SWITCH	1
4	015609	AMMETER	1
5	504216-01	THROTTLE VALVE ASSY	1
6	070476	ROUND HD SCREW, 1/4-20 X 1/2	4
7	077209	LOCKWASHER, 1/4	4
8	053203	BUTTON PLUG (FOR AC TRUCKS)	1

Figure 10-19 Instrument Panel

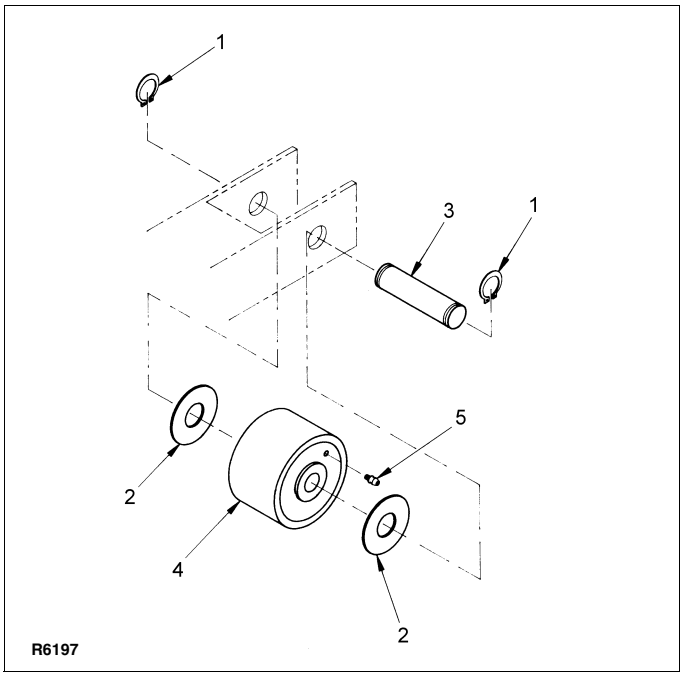


Figure 10-20 Load Wheels (Model 1018)

MATERIAL			STEEL		PHENOLIC	POLYURETHANE	
FACE SIZE (INCHES)			2		2	2	
AVAILABILITY			OPTL	STD	OPTL	OPTL	OPTL
WHEEL DIAMETER (INCHES)			3	4	4	3	4
INDEX NO.	PART NAME	QTY.	PART NO.	PART NO.	PART NO.	PART NO.	PART NO.
—	WHEEL AND AXLE ASSY	2	505647-05	505647-01	505647-03	505647-04	505647-02
1	. SNAP RING	2	061719	061719	061719	061719	061719
2	. SPACE WASHER	2	077010	077010	077010	077010	077010
3	. AXLE	1	094501	094501	094501	094501	094501
4	. LOAD WHEEL ASSY	1	078250	078400	078404	078251	078408
5	. GREASE FITTING	1	025712	025712	025712	025712	025712

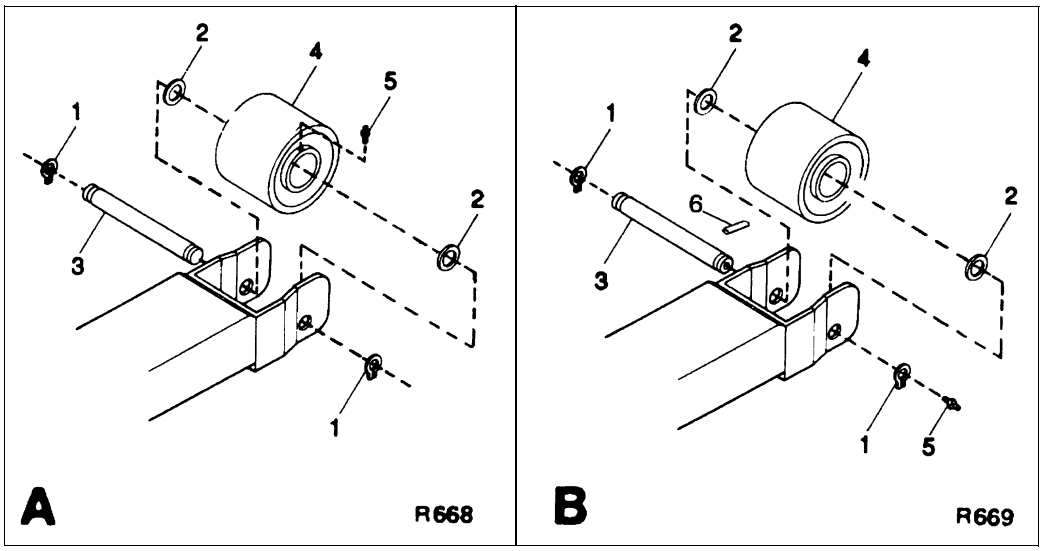


Figure 10-21 Load Wheels
(Models 1518, 1524, 2018, 2024, 2524)

MATERIAL			STEEL			PHENOLIC		POLYURETHANE		
FACE SIZE (INCHES)			2			2		2		
AVAILABILITY			OPTL	STD	OPTL	OPTIONAL		OPTIONAL		
WHEEL DIAMETER (INCHES)			3	4	6	4	6	3	4	6
FIGURE REFERENCE			B	A	A	B	A	B	B	A
INDEX NO.	PART NAME	QTY.	PART NO.	PART NO.	PART NO.	PART NO.	PART NO.	PART NO.	PART NO.	PART NO.
—	WHEEL AND AXLE ASSY	2	504209-04	504209-01	**504209**-06	504209-03	**504209**-08	**504209**-05	504209-02	**504209**-07
1	. SNAP RING	2	061725	061725	061725	061725	061725	061725	061725	061725
2	. SPACE WASHER	2	077033	077033	077033	077033	077033	077033	077033	077033
3	. AXLE	1	270306	270306	270306	270306	270306	270306	270306	270306
4	. LOAD WHEEL ASSY	1	078223	078451	078651	078440	078607	078256	078409	078614
5	. GREASE FITTING	1	025712	025712	025712	025712	025712	025712	025712	025712
6	. ROLL PIN	2	060974	060974	060974	060974	060974	060974	060974	060974

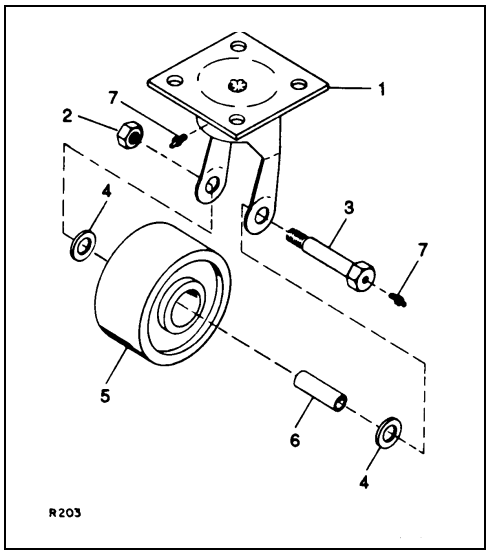


Figure 10-22 Caster Wheels

MATERIAL			STEEL	PHENOLIC	POLYURE-THANE
FACE SIZE (INCHES)			1-7/8	1-7/8	1-7/8
AVAILABILITY			OPTL	STD	OPTL
WHEEL DIAMETER (INCHES)			3	4	6
INDEX NO.	PART NAME	QTY.	PART NO.	PART NO.	PART NO.
—	CASTER AND WHEEL ASSY	2	054621	054624	054625
1	. SWIVEL CASTER	1	054619	054619	054619
2	. AXLE NUT, 1/2-20	1	059438	059438	059438
3	. AXLE	1	050698	050698	050698
4	. SPACER WASHER	2	077058	077058	077058
5	. WHEEL AND BEARING ASSY	1	078600	078652	078654
6	. AXLE FITTING		074500	074500	074500
6	GREASE FITTING	2	025712	025712	025712

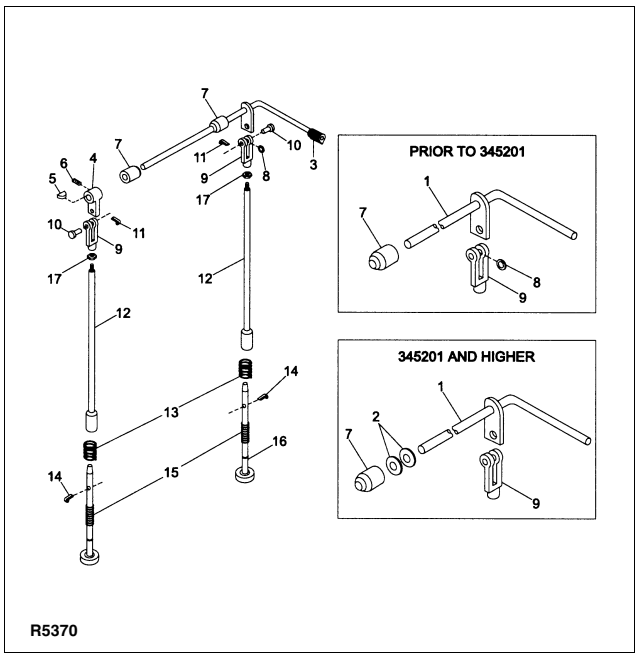


Figure 10-23 Floor Lock Assembly

INDEX NO.	PART NO.	PART NAME	NO. REQD.
—	501282 *	FLOOR LOCK ASSY	REF
1	505677	. FLOOR LOCK HANDLE	1
1	500573 *	. FLOOR LOCK HANDLE	1
2	077064	. WASHERS	2
3	057500	. HANDLE GRIP	1
4	050601	. FLOOR LOCK ARM	1
5	057901	. WOODRUFF KEY, NO. 9	1
6	073474	. SETSCREW, 1/4-20 X 1/4	1
7	053110	. FLOOR LOCK SPACER	2
8	077054	. SPACER (USED WITH HANDLE 500573)	2
9	056201	. CLEVIS	2
10	060302	. CLEVIS PIN, 7/16	2
11	060417	. COTTER PIN	2
12	500575	. FLOOR LOCK ROD	2
13	075005	. FLOOR LOCK ROD SPRING	2
14	060448	. COTTER PIN	2
15	075006	. LIFT SPRING	2
16	500474	. FLOOR LOCK PLUNGER ASSY	2
17	059433	. THIN HEX NUT, 1/16-2	2

* **USED ON TRUCKS SERIAL NUMBER 341649 TO 345200 ORDER KIT 901605.**

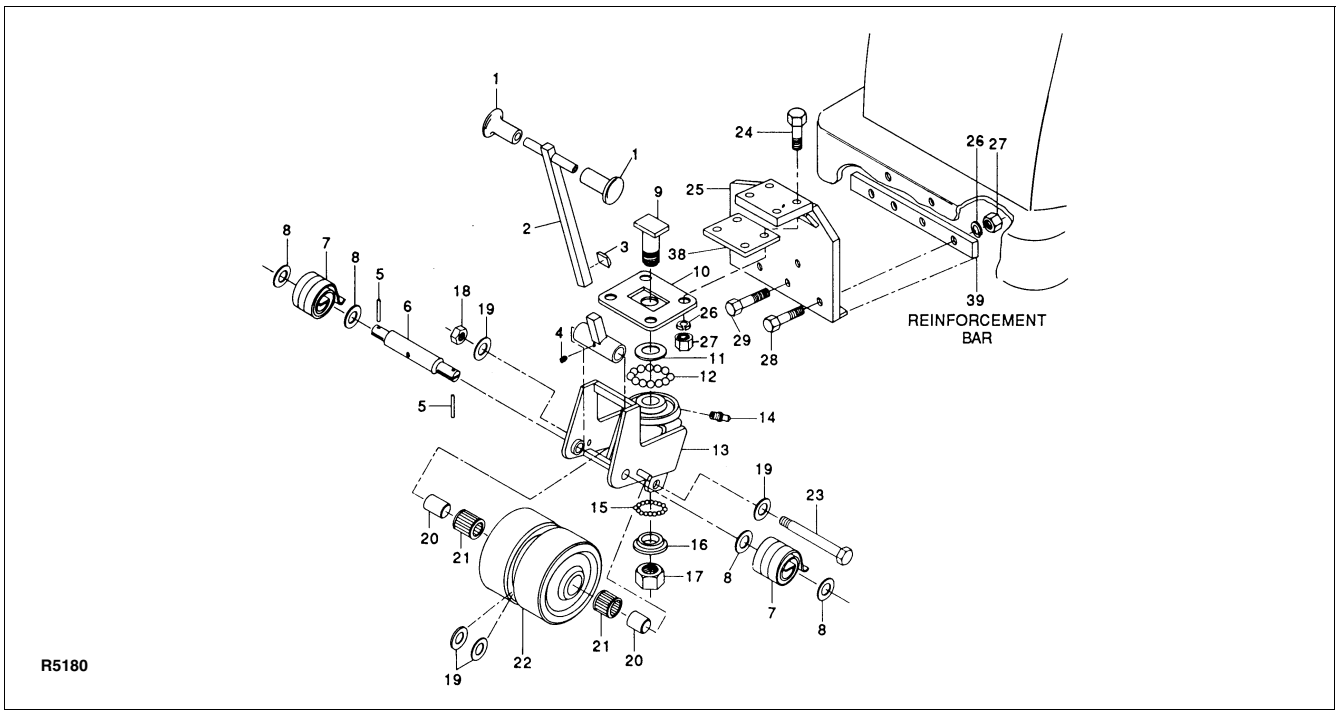


Figure 10-24 Fifth Wheel Assembly

INDEX NO.	PART NO.	PART NAME	NO. REQD.
—	503511	FIFTH WHEEL ASSY	REF
1	057502	. HANDLE GRIPS	2
2	503510	. HANDLE	1
3	052886	. RUBBER BUMPER	1
4	073490	. SET SCREW, 3/8-16 X 1/5	1
5	060946	. ROLL PIN, 1/8 X 1-5/8 LG.	2
6	400657	. SHAFT	1
7	075072	. SPRING	6
8	077036	. WASHER, 3/4 I.D.	4
—	503509	. YOKE ASSY	1
9	900639	. . STUD, 3/4-16	1
10	900627	. . CASTER PLATE	1
11	077058	. . WASHER, 49/64 I.D. X 1-1/4 O.D. X 26 GA	1
12	051232	. . BEARING BALLS, 7/16 DIA.	23
13	900630	. . YOKE	1
14	025712	. . GREASE FITTING	1
15	900036	. . BEARING BALLS, 5/16 DIA.	16
16	900632	. . BEARING RACE	1
17	059650	. . NUT, HEX, LOCKING, 3/4-16	1
18	059438	. . NUT	1
19	077058	. . WASHER, 49/64 I.D. X 1-5/8 O.D. X 14 GA.	4
20	074500	. . BUSHING, STEEL, 1/2 I.D. X 3/4 O.D.	2

INDEX NO.	PART NO.	PART NAME	NO. REQD.
21	051169	. . WASHER, BEARING, 3/4 I.D. X 1-3/16 O.D. X 2-1/4 LG.	2
22	900637	. . WHEEL, TEXTITLE AND BEARING ASSEMBLY 8-IN. DIA. X 2 IN. WIDE	2
23	900638	. . AXLE BOLT, 1/2-20 X 6-1/8	1
24	064711	. SCREW, 1/2-13 X 1-1/5 LG.	4
25	503508	. HOUSING	1
26	077213	. LOCKWASHER, 1/2	10
27	059437	. NUT, HEX, 1/2-13	10
28	063715 *	. SCREW, 1/5-13 X 2-1/4	—
29	064711 *	. SCREW, 1/2-13 X 3/4	—
30	071376	. ROUND HD SCREW, 10-32 X 1/2	4
31	055500	. DOOR LATCH	2
32	077208	. LOCKWASHER, 3/16	4
33	059416	. NUT, HEX, 10-32	4
34	058100	. DOOR LATHC	2
35	068177	. ROUND HD SCREW, 5-40 X 3/8	4
36	077204	. LOCKWASHER, 1/8	4
37	059410	. NUT, HEX, 5-40	4
38	401059	. SHIM PLATE	1
39	— *	. REINFORCEMENT BAR	1

*** When ordering assembly please provide model and serial number.**

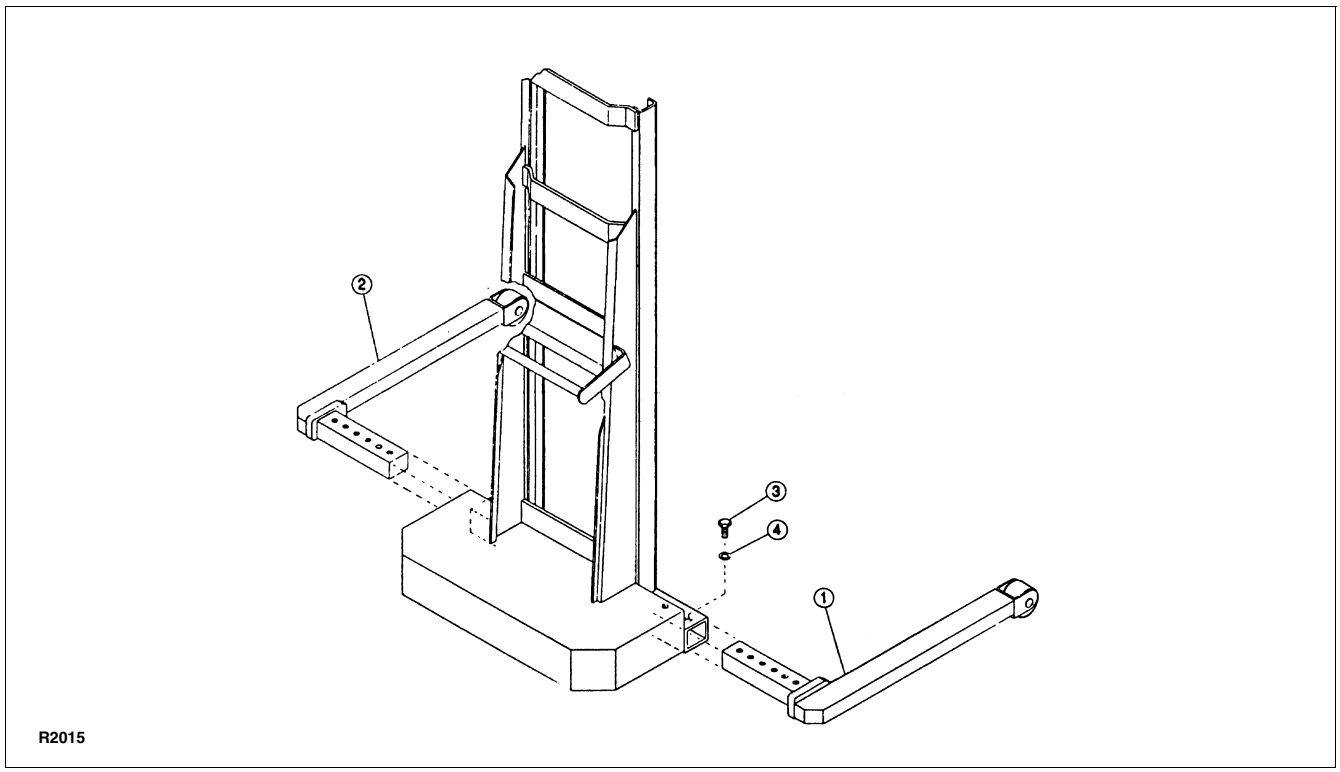
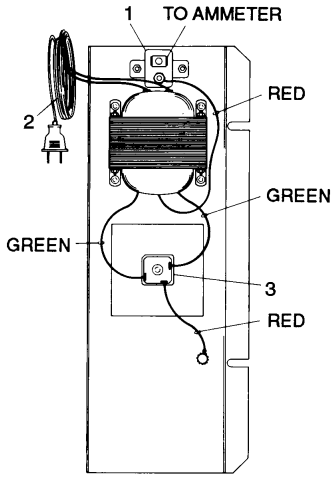


Figure 10-25 Adjustable Straddles

INDEX NO.	PART NAME	1518, 2018	1524	2024, 2524	NO. REQD.
1	STRADDLE RIGHT HAND”	504836-01	504836-02	504828-01	1
2	STRADDLE LEFT HAND”	504837-01	504837-02	504829-01	1
3	SCREW	063869	063869	063869	4
4	LOCKWASHER	077217	077217	077217	4

SEE SUPPLEMENT 285 FOR TRUCKS WITH PERSONNEL PLATFORM ATTACHMENT



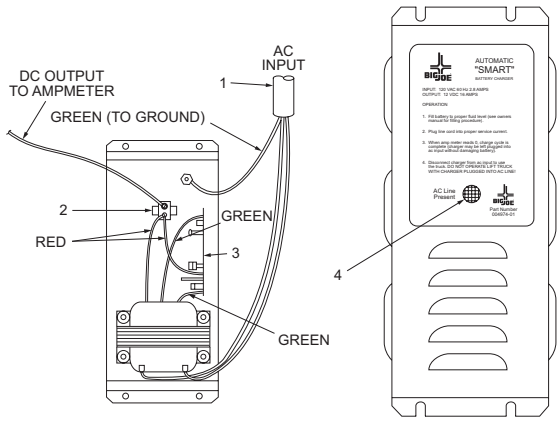
R5175

Figure 10-26 Battery Charger, 8 Amp

(Standard on Models 1018, 1518, 2018)

INDEX NO.	PART NO.	PART NAME	NO. REQD.
—	004902	BATTERY CHARGER, 8 AMP (STANDARD) 110V 1PH 60HZ	1
—	004903	BATTERY CHARGER, 8 AMP (OPTIONAL) 220V 1PH 50HZ	1
1	003401	. CIRCUIT BREAKER, 15 AMP	1
2	005802	. CORD	1
3	904019	. DIODE	1

SEE SUPPLEMENT 285 FOR TRUCKS WITH PERSONNEL PLATFORM ATTACHMENT



R5176

Figure 10-27 Battery Charger, "Smart" 15 Amp

(Standard on Models 1524, 2024, 2524)
(Optional on Models 1018, 1518, 2018)

INDEX NO.	PART NO.	PART NAME	NO. REQD.
—	004974-01	"SMART" CHARGER, 15 AMP (STANDARD) 120V 1PH 60HZ	1
—	004974-02	"SMART" CHARGER, 15 AMP (OPTIONAL) 240V 1PH 60HZ	1
1	005802	. CHARGER CORD	1
2	901544	. CIRCUIT BREAKER	1
3	901484	. CHARGER CARD	1
4	013812	. CHARGER LIGHT	1

SEE SUPPLEMENT 252 FOR TRUCKS WITH AC REMOTE

SEE SUPPLEMENT 285 FOR TRUCKS WITH PERSONNEL PLATFORM ATTACHMENT

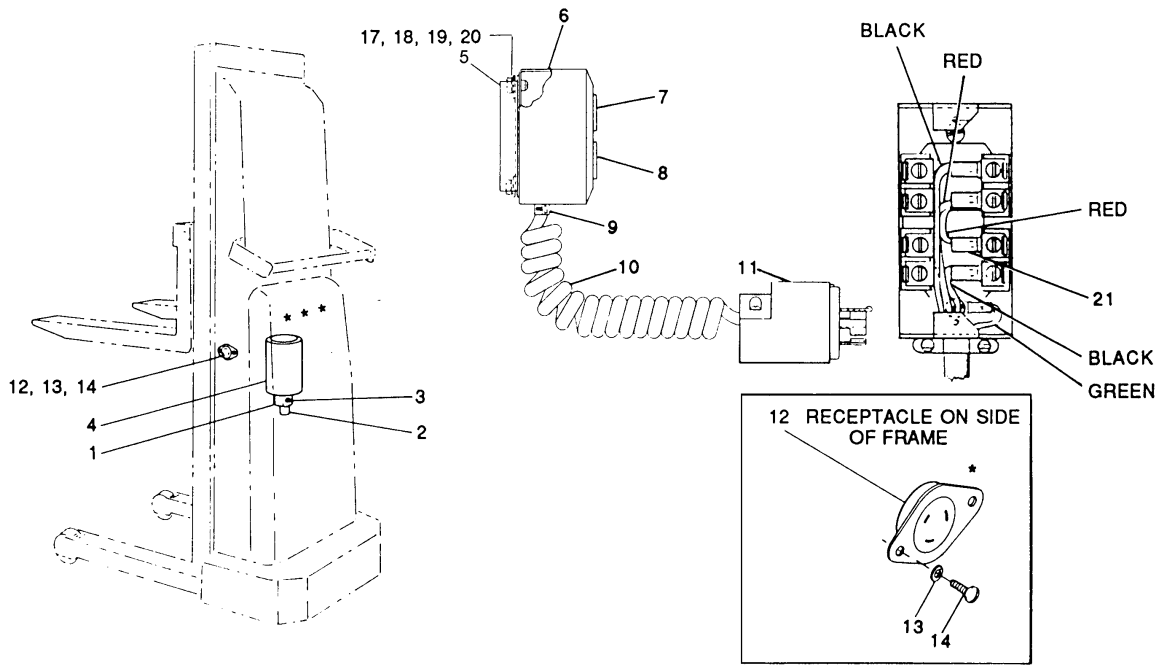


Figure 10-28 Remote Control

INDEX NO.	PART NO.	PART NAME	NO. REQD.
—	016051	PUMP AND MOTOR ASSY	1
1	900896-02	. PUMP ASSY	1
2	048132	. SOLENOID VALVE	1
3	059124	. CAP NUT	1
4	905070	. MOTOR ASSY (FIGURE 10-16)	REF
—	501736	REMOTE CONTROL, 36” ASSY	1
—	900622	REMOTE CONTROL, 10 FT ASSY	1
5	058501	. MAGNET	1
6	800130	. CONTROL BOX	1
7	400681	. PUSHBUTTON, UP	1
8	400682	. PUSHBUTTON, DOWN	1

INDEX NO.	PART NO.	PART NAME	NO. REQD.
9	052905	. STRAIN RELIEF	1
10	314003	. COILED CORD, 3 CONDUCTOR, 10 FT	1
11	017801	. MALE PLUG	1
12	017800	. FEMALE RECEPTACLE	1
13	077203	. LOCKWASHER, NO. 5	2
14	068177	. PAN HEAD SCREW, 5-40 X 3/8	2
17	067401	. FILLISTER HEAD SCREW, 10-32 X 1/2	2
18	077030	. WASHER	4
19	077407	. LOCKWASHER, #10-32	2
20	059416	. NUT, HEX #10-32	2
21	021210	. SPADE TERMINAL, 16/14 WIRE	6

Big Joe Manufacturing Company