

OWNER'S MANUAL

BGS-25 SELF-PROPELLED STRADDLE LIFT TRUCK



ACTUAL PRODUCT MAY NOT APPEAR EXACTLY AS SHOWN



WARNING

Do not operate or service this product unless you have read and fully understand the entire contents of this manual. Failure to do so may result in property damage, bodily injury or death.

BLUE GIANT[®]

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1.1 OWNER’S PURCHASE RECORD

OWNER’S PURCHASE RECORD Please record information for future inquiries and to validate warranty. (See Section 2.1 for warranty validation)	
Dealer:	Date in Service:
	Number of Units:
Owner’s Name:	Order Number:
Serial Number:	Year of Construction:

The manufacturer offers a full line of dock levelers, dock safety equipment, accessories, ergonomic and scissor lift equipment, seals and shelters, and industrial trucks. Concurrent with a continuing product improvement program, specifications are subject to change without notice (see section 2.2 of this manual). Please contact the manufacturer for latest information. Some features illustrated may be optional in certain market areas.

1.2 SAFETY PROCEDURES

1. Do not operate this truck unless you have been authorized and trained to do so, and have read all warnings and instructions in Operator’s Manual and on this truck.
2. Do not operate this truck until you have checked its condition. Give special attention to tires, horn, battery, controller, lift system (including forks or attachments, chains, cables and limit switches), brakes, steering mechanism, guards and safety devices.
3. 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 and wear foot protection.
4. Observe applicable traffic regulations. Yield right of way to pedestrians. Slow down and sound horn at cross aisles and wherever vision is obstructed.
5. Start, stop, travel, steer and brake smoothly. Slow down for turns and on uneven or slippery surfaces that could cause truck to slide or overturn. Use special care when traveling without load as the risk of overturn may be greater.
6. 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 trailing.
7. Use special care when operating on ramps travel slowly, and do not angle or turn. Travel with load downhill.
8. Do not overload truck. Check nameplate for capacity and load center information.
9. 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.
10. 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.
11. 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.
12. Elevate forks or other lifting mechanism only to pick up or stack a load. Watch out for obstructions, especially overhead.
13. 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.
14. Do not allow anyone to stand or pass under load or lifting mechanism.
15. When leaving truck, neutralize travel control, fully lower lifting mechanism and set brake. When leaving truck unattended, also shut off power.

2.0 INTRODUCTION

The following is a quick reference to important procedures that must be followed while using the dock equipment. It is not intended to cover, or suggest that it does cover, all procedures necessary to ensure safe operation. All operators should be aware of and abide by all workplace safety regulations applicable to the operation of the dock equipment. These laws and regulations include but are not limited to:

- The Occupational Safety and Health Act (USA)
- Occupational Safety and Health Acts for Individual States (USA)
- Canadian Material Handling Regulations

For additional information on these regulations as well as industry standards that may apply to this product, please contact:

American National Standards Institute (ANSI)



1430 Broadway
New York, NY 10018
Telephone: (212) 642-4900

Also a member of:



Loading Dock Equipment Manufacturers
A Product Section of Material Handling Industry of America
A Division of Material Handling Industry
8720 Red Oak Blvd, Suite 201
Charlotte, NC, 28217-3992
Telephone: (704) 676-1190

2.1 WARRANTY INFORMATION

Thank you for purchasing Blue Giant products. We appreciate your business, and are confident that our product will serve you for many years to come. In the event that you experience a problem with our product, our Warranty Center is here to support the Blue Giant product(s) that you have purchased.

To validate warranty on recently purchased equipment, please complete and submit your information with our online Warranty Registration at www.BlueGiant.com.

DEALER INFORMATION

Name:

Contact:

Telephone:

For more information about Blue Giant Warranty Support, please contact your local Blue Giant Equipment dealer, representative or authorized partner near you. You may also visit www.BlueGiant.com or phone 1.905.457.3900.

* Note that failure to validate warranty at the time of receipt can seriously affect the outcome of any claim.

2.2 EXCLUSION OF LIABILITY

The manufacturer assumes no liability for damage or injury to persons or property which occur as a result of defects or faults in or incorrect use of dock equipment. The manufacturer also assumes no liability for lost profits, operating downtimes, or similar indirect losses incurred by the purchaser. Injury to third parties, irrespective of its nature, is not subject to compensation.

The manufacturer reserves the right to make changes at any time to the modules, components, and accessories, concurrent with its continuing product development program. Specifications, operating instructions, and illustrations included in this manual are subject to change without notice. Please contact manufacturer for the latest information.

2.3 MANUFACTURER'S NOTE

This industrial truck has been carefully inspected and tested at the manufacturer's plant prior to shipment, but should be checked upon receipt for transport damage. Any observed transport damage is to be listed on the signed copy of the freight document. Notify the freight forwarder of any damage WITHIN 48 HOURS.

3.1 INTRODUCTION

This publication describes the 24 volt transistor The self-propelled BGS-25 lift truck distributed by Blue Giant Equipment Corporation. Included are operating instructions, planned maintenance instructions, lubrication procedures, corrective maintenance procedures and a complete parts list with part location illustrations.

Users shall comply with all requirements indicated in applicable OSHA standards and current edition of A.N.S.I. B56.1 Part II. By following these requirements and the recommendations contained in this manual, you will receive many years of dependable service from your BGS-25 lift truck.

3.2 GENERAL DESCRIPTION

The self-propelled BGS-25 truck, **Figure 1-2**, lifts and transports payloads up to 2000 pounds on either rigid or adjustable forks.

The self-propelled BGS-25 truck, **Figure 1-2**, lifts and transports payloads up to 2500 pounds on either rigid or adjustable forks.

The BGS-25 telescopic truck has either a 106, 130, 142, or 153 inch lift. The BGS-25 TRIMAST truck has a 157 inch lift. The lift carriage will freelift the first 4 feet without changing the overall lift height. Then the mast will start to rise. However, if the truck has an optional load backrest, the backrest will raise above the mast before the end of the full freelift.

The forward and reverse motion is controlled by either of two controller levers mounted on the control head. Stopping and turning is controlled by the steering arm. Lift and Lower is controlled by pushbuttons on the control head. The battery powered lift truck is quiet and without exhaust fumes.

The reversible AC motor propels the lift truck in forward or reverse direction throughout the available speed range. The BGS-25 lift truck can be driven with forks raised or lowered; however, the speed is restricted when the forks is raised above a preset limit.

The model number will be found on the name plate (**Figure 1-1**) along with the serial number, lifting capacity, and load center. **Figure 1-2** shows the locations

FIGURE 1 NAME PLATE

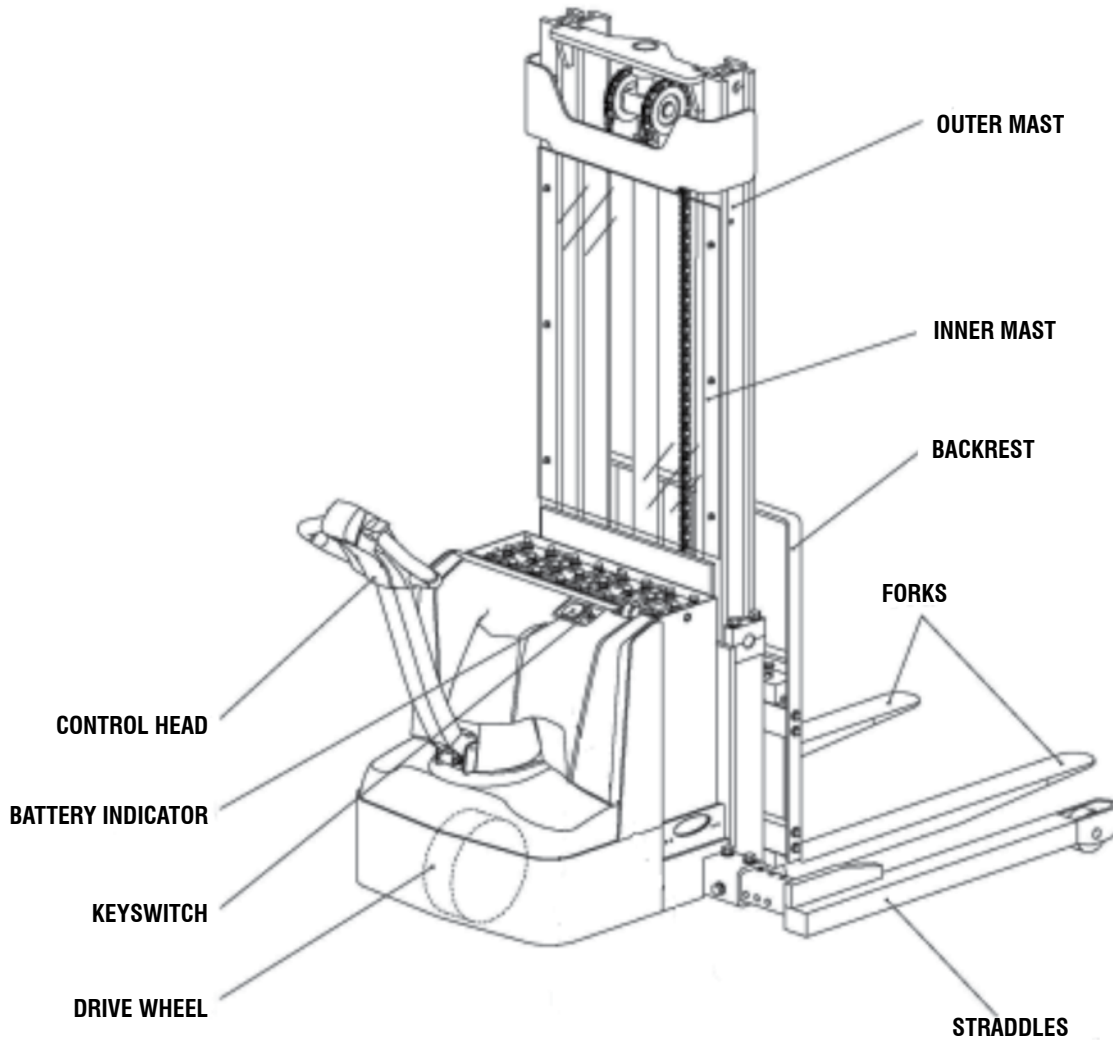
MODEL NO.		SERIAL NO.	
MAX CAP LB/ KG	LOAD CTR IN/ MM	LIFT HGT IN/ MM	
ALT CAP LB/ KG	LOAD CTR IN/ MM	LIFT HGT IN/ MM	
TRUCK WT LESS BATTERY LB/ KG	BATTERY MIN WT LB/ KG		
TRUCK WT WITH BATTERY LB/ KG	BATTERY MAX WT LB/ KG		
TRUCK TYPE <input type="checkbox"/>	BATTERY TYPE <input type="checkbox"/>	CERTIFIED <input type="checkbox"/>	VOLTAGE <input type="checkbox"/>
COMPLIES WITH THE APPLICABLE REQUIREMENTS OF ANBI B56.1 AND OSHA STANDARDS U.S. PATENT NO. 4,444,284 AUSTRALIAN PATENT NO. 537,987			

3.3 SAFETY FEATURES

The BGS-25 is designed engineered to provide maximum safety for operator and payload. Some of the safety features incorporated into the design are:

- Dead-man brake to apply the brake and cut off drive power when the steering arm is released
- Belly-button switch to reverse truck should the operator accidentally pin himself against a wall or obstruction when backing up in slow speed
- High speed limit switch to restrict speed when lift carriage is raised above the preset limit.
- All control functions automatically return to "OFF" when released.
- Externally accessible quick-disconnect battery plug within operator's reach
- Separately fused control circuits and power circuits
- Readily accessible horn button
- Lift carriage backrest to help stabilize the load
- Handle to provide a firm hand hold for operator
- Flow control valve regulates maximum lowering speed within prescribed limits
- Relief valve maintains hydraulic pressure within prescribed limits
- High visibility color scheme of truck provides visual alert of truck's presence
- Battery Indicator
- Skid bars

FIGURE 1-2 BGS-25 LIFT TRUCK



4.0 OPERATION

4.1 GENERAL

This section gives detailed operating instructions for the BGS-25 lift truck. The instructions are divided into the various phases of operations, such as operating lift, driving, and stopping. Routine precautions are included for safe operation.

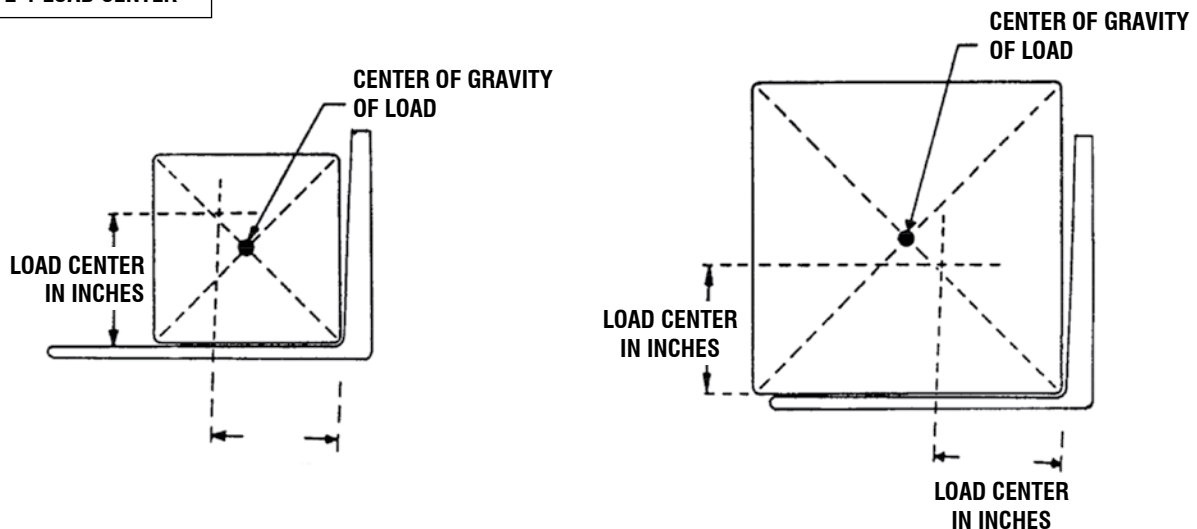
! WARNING

Improper operation of the lift truck may result in operator injury, or load and / or lift truck damage.
Observe the following precautions when operating the BGS-25 lift truck.

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

1. Do not operate this truck unless you have been trained and authorized to do so.
2. All warnings and instructions must be read and understood before using the equipment.
3. Equipment must not be altered in any way.
4. Equipment must be inspected by a qualified person on a regular basis.
5. Do not exceed the rated capacity. Overloading may result in damage to the hydraulic system and structural components.
6. Be certain that the lifting mechanism is operating smoothly throughout its entire height, both empty and loaded.
7. Be sure that mast is vertical - do not operate on a side slope.
8. Be sure the truck has a firm and level footing.
9. Avoid overhead wires and obstructions.
10. Check for obstructions when raising or lowering the lift carriage.
11. Do not handle unstable or loosely stacked loads.
12. Center and carry the load as far back as possible toward the lift carriage back rest. The center-of-gravity of the load must not exceed the load center listed.
13. on the nameplate. See **Figure 2-1** for load center limitations.
14. Pick up loads on both forks. Do not pick up on only one fork.
15. When traveling, always lower the load as far as possible.
16. When stacking pallets in racks and it is necessary to move the load in a raised position, use caution.
17. Operate truck smoothly.
18. Observe applicable traffic regulations. Yield right of way to pedestrians. Slow down and sound horn at cross aisles and wherever vision is obstructed.
19. Operate truck only from designated operation position.
20. Never place any part of your body between the mast uprights. Do not carry passengers.
21. Do not allow anyone to stand or pass under load or lifting mechanism.
22. When leaving truck, neutralize travel control. Fully lower lifting mechanism and set brake. When leaving truck unattended, turn off key switch, remove key and disconnect battery.

FIGURE 2-1 LOAD CENTER



4.2 OPERATING INSTRUCTIONS

Table 2-1 covers important inspection points on the BGS-25 lift truck which should be checked prior to operation. Depending on use, some trucks may require additional checks.

WARNING

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

CAUTION

A QUALIFIED SERVICE TECHNICIAN should check the truck monthly for proper lubrication, proper fluid levels, brake maintenance, motor maintenance and other areas specified in the SECTION 5.

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.

TABLE 2-1 OPERATOR CHECKS

ITEM	DESCRIPTION
Transmission and Hydraulic Systems	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, secured correctly, functioning properly and free of binding or damage.
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.
Horn	Check that horn sounds when operated.
Steering	Check for binding or looseness in steering arm when steering.
Travel Controls	Check that speed controls on control head operate in all speed ranges in forward and reverse and that belly button switch functions.
Wheels	Check drive wheel for cracks or damage. Move truck to check load for freedom of rotation.
Hydraulic Controls	Check operation of lift and lower to their maximum positions.
Brakes	Check that brakes actuate when steering arm is raised to upright position, and when lowered to horizontal position.
Deadman / Parking Brake	Check that steering arm raises to upright position when released and brake applies.
Battery Disconnect	Check that battery can be disconnected and reconnected. Check for connector damage.
Battery Charge	Check the battery indicator.
High Speed Limit Switch	Allow for enough space to operate truck in high speed. Elevate forks approximately two feet, then test drive truck to check if high speed is cut out.

FIGURE 2-2 SAMPLE OF OPERATOR CHECK LIST

BLUE GIANT[®]

**Electric Truck
Daily Operator Check List**

DATE: _____ OPERATOR: _____

VEHICLE NUMBER: _____ MODEL NUMBER: _____

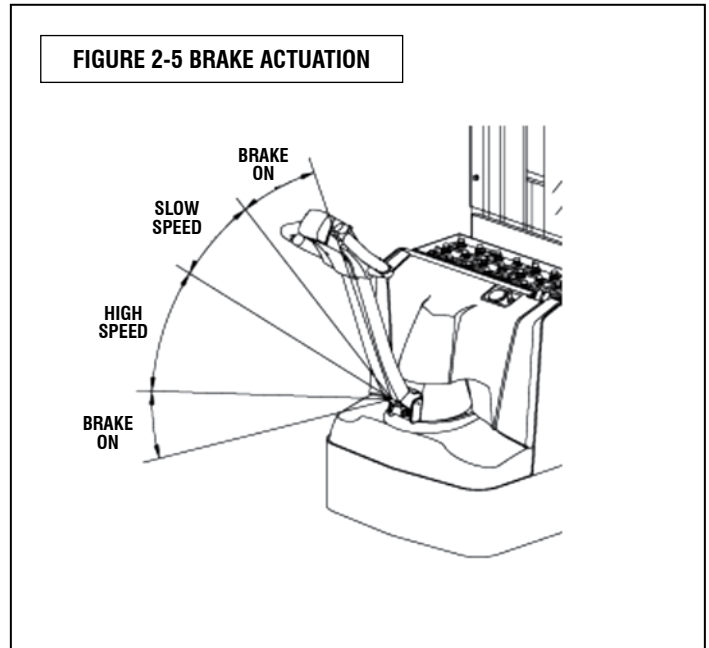
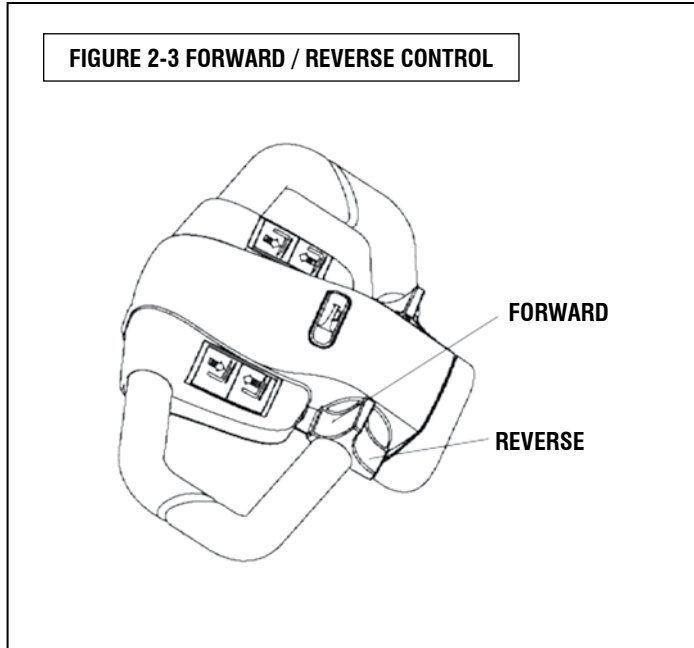
DEPARTMENT: _____ SHIFT: _____

CHECK	O.K. ✓	NEED MAINTENANCE
Load Wheels		
Horn		
Lift - Lower Control		
Attachment Operation		
Forward and Reverse Controls		
Steering		
Brakes		
Hydraulic Leaks, Cylinders, Valves, Hoses, etc.		

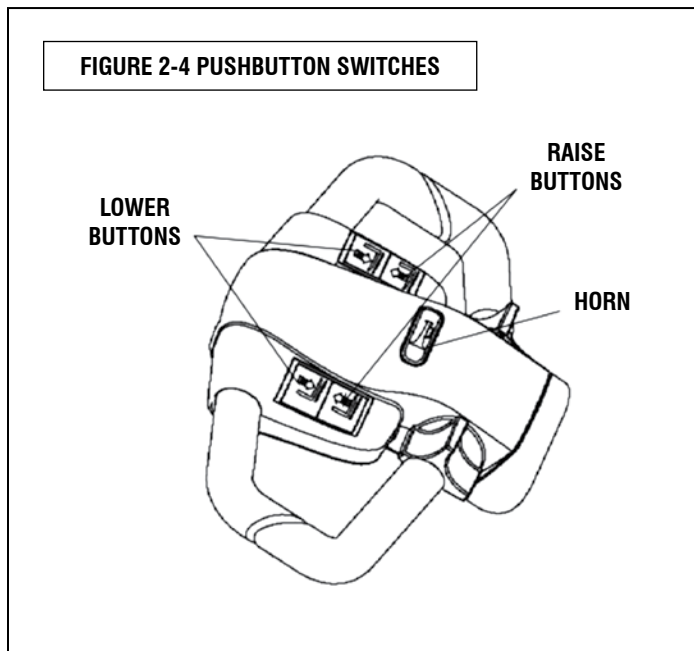
April 1, 2017

4.3 GENERAL CONTROL OPERATION

The speed control (See **Figure 2-3**) located on each side of the control head provides fingertip control for driving the truck. Rotate the control in the direction you want to travel. The farther you rotate the control from the neutral position, the faster the truck will travel.



The pushbutton switches (See **Figure 2-4**), located on the front of the control head activate the lift-lower controls and the horn. Trucks with 2-speed lowering use the two lowering buttons for different speeds.

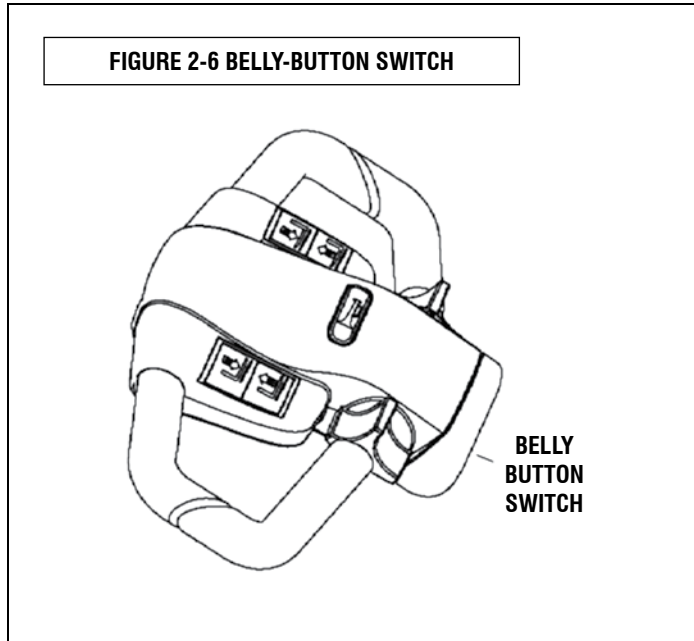


4.4 DRIVING AND STOPPING PROCEDURES

1. Connect the batteries and turn on the key switch (make sure that the steering arm is in upright position for a few seconds before lowering it). Grasp the grips of the steering head so that the speed control can be comfortably operated by either thumb.
2. Lower the steering arm to a comfortable position above horizontal to disengage the brake and to energize the electrical circuits. If the truck is not moved, the electrical circuits will time out and will deenergize. See **Figure 2-5**.
3. To move forward (with load in front), slowly press the speed control forward. See **Figure 2-3**. Press the forward speed control farther to increase speed.
4. To slow down or stop, release the speed control and lower or raise the steering arm to the horizontal or vertical position. See **Figure 2-5**. In those positions, the brake engages, slowing or stopping the truck.
5. Procedures for movement in reverse are the same as in the forward direction except slowly press the speed control backward. See **Figure 2-3**.

4.5 BELLY-BUTTON SWITCH

The belly-button switch (**Figure 2-6**) minimizes the possibility of the driver being pinned by the steering arm while driving the lift truck in slow speed. If the switch presses against the operator while the lift truck is being driven toward the operator, the switch changes the direction of the lift truck.



4.9 STEERING ARM GAS SPRING

The steering arm gas spring automatically raises the steering arm to the upright position when the steering arm is released. If the steering arm does not return fully, the steering arm gas spring requires replacement. Return truck to maintenance for repair.

5.0 PLANNED MAINTENANCE

5.1 GENERAL

Planned maintenance consists of periodic visual and operational checks, parts inspection, lubrication, and scheduled maintenance designed to prevent or discover malfunctions and defective parts. The operator performs the checks in SECTION 4, and refers any required servicing to a qualified maintenance technician who performs the scheduled maintenance and any required servicing.

5.2 MONTHLY AND QUARTERLY CHECKS

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

4.6 LIFT AND LOWER CONTROLS

Lift / Lower Control buttons are located on the steering control head. (**Figure 2-4**)

To lift forks, push in either LIFT button and hold until forks reach desired height. To lower forks, push in either LOWER button and hold until forks descend to desired height.

4.7 LOADING AND UNLOADING

1. Move truck to location where load is to be picked up.
2. Move the truck into position so forks are within pallet or skid, and the load is centered over the forks and as far back as possible.
3. Raise forks to lift load.
4. Drive to area where load is to be placed.
5. Move truck to align load with its new position.
6. Lower the load until it rests squarely in place and the forks are free.
7. Slowly move the truck out from under the load.

4.8 PARKING

When finished with moving loads, return the truck to its maintenance or storage area. Turn off the key switch and disconnect the batteries. Charge batteries as necessary. Refer to battery care instructions, SECTION 5.

5.3 BATTERY CARE

5.3.1 GENERAL

The BGS-25 may be equipped with maintenance free or industrial wet cell batteries. The care and maintenance of the battery is very important to obtain efficient truck operation and maximum battery life.

CAUTION

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

CAUTION

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

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

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

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

TABLE 3-1 MONTHLY AND QUARTERLY INSPECTION AND SERVICE CHART

INTERVAL	VISUAL CHECKS - INSPECTION OR SERVICE
Monthly	Check mechanical brake for proper operation
Monthly	Check load wheels for wear. A poly load wheel must be replaced if worn to within 1/16 inch of hub. Check for separation from hub
Monthly	Check drive wheel for wear. A poly drive wheel must be replaced if worn to within 3/4 inch of hub. Check for separation from hub
Monthly	Inspect wiring for loose connections and damaged insulation
Monthly	Inspect contactors for proper operation
Monthly	Check deadman brake switch for proper operation
Monthly	check lift chain tension, lubrication and operation (see paragraph 3-6.)
Quarterly	Check lift cylinder for leakage
Quarterly	Check for excessive jerking of steering arm when stopping or starting
Semi-annually	Inspect for chain wear (See SECTION 10)

5.3.2 SAFETY RULES

- Wear protective clothing, such as rubber apron, gloves, boots and goggles when performing any maintenance on batteries. Do not allow electrolyte to come in contact with eyes, skin, clothing or floor. If electrolyte comes in contact with eyes, flush immediately and thoroughly with clean water. Obtain medical attention immediately. Should electrolyte be spilled on skin, rinse promptly with clean water and wash with soap. A baking soda solution (one pound to one gallon of water) will neutralize acid spilled on clothing, floor or any other surface. Apply solution until bubbling stops and rinse with clean water.
- If truck is equipped with wet cell batteries, keep vent plugs firmly in place at all times except when adding water or taking hydrometer readings. Do not allow dirt, cleaning solution or other foreign material to enter cells. Impurities in electrolyte has a neutralizing effect reducing available charge.
- Do not bring any type of flame, spark, etc., near the battery. Gas formed while the battery is charging, is highly explosive. This gas remains in cell long after charging has stopped.
- Do not lay metallic or conductive objects on battery. Arcing will result.
- Do not touch non-insulated parts of DC output connector or battery terminals to avoid possible electrical shock.
- De-energize all AC and DC power connections before servicing battery.
- Do not charge a frozen battery.
- Do not use charger if it has been dropped or otherwise damaged.

5.3.3 BATTERY CARE AND CHARGING



CAUTION

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

1. Charge the battery only in areas designated for that use.
2. Make certain the charger being used matches the voltage and amperage of the truck battery.
3. Before disconnecting or connecting batteries to a charger, make sure the charger is "OFF". If an attempt is made to do this while the charger is "ON", serious injury to you, the battery and the charger could result.
4. Before connecting the battery cable to the trucks receptacle, make sure the key switch is off. The battery cable must be fully connected before the truck is used. If the plug is not making good contact, heat will weld the two parts of the battery connector together, making it difficult to remove and necessary to replace.
5. Battery terminals should be checked and cleaned of corrosion regularly. Good battery terminal contact is essential not only for operation, but also for proper charging of the battery.
6. The charging requirements will vary depending on the use of the truck. The battery should be given as equalizing charge on a weekly basis. This charge should normally be an additional three hours at the finish rate.
7. Make certain battery used meets weight and size requirements of truck. NEVER operate truck with an undersized battery.

5.3.4 BATTERY CLEANING

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

5.3.5 MAINTENANCE FREE BATTERIES

Some trucks may be equipped with maintenance free batteries. These batteries are completely sealed, will not require any watering and have a full 80% discharge available.

Sealed Maintenance Free batteries contain a pressure release valve and under normal operating

⚠ CAUTION

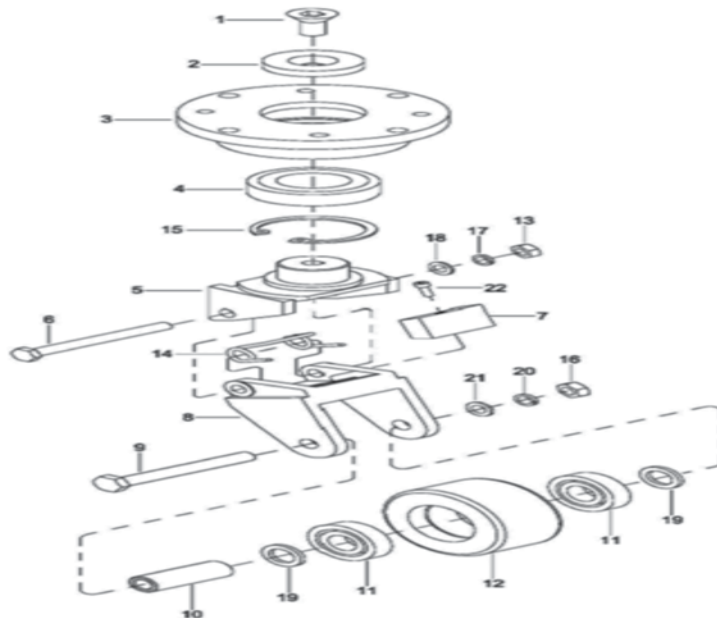
Do not try to open this battery or remove the pressure release valve.

Only under severe overcharging, such as connected to an improperly sized charger, will any significant amount of gasses be released from the battery. Also, being a valve regulated battery, it never requires watering.

5.4 CHARGING BATTERIES

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

1. Park truck at charging station with carriage lowered and turn the key switch off.
2. Check the condition of the AC cord, the battery connector and battery cables. If there are any cuts in the cable, any exposed wires, loose plugs or connectors, DO NOT attempt to charge the batteries. Contact appropriate personnel for repairs to be made.
3. Disconnect the batteries from the truck and connect the batteries to the charger. Make sure connectors are mated properly.
4. Connect the charger to the appropriate power supply.
5. Follow the instructions for the charger being used.

BATTERY ASSEMBLY

5.5 LUBRICATION

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

5.6 LIFT CHAIN MAINTENANCE

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

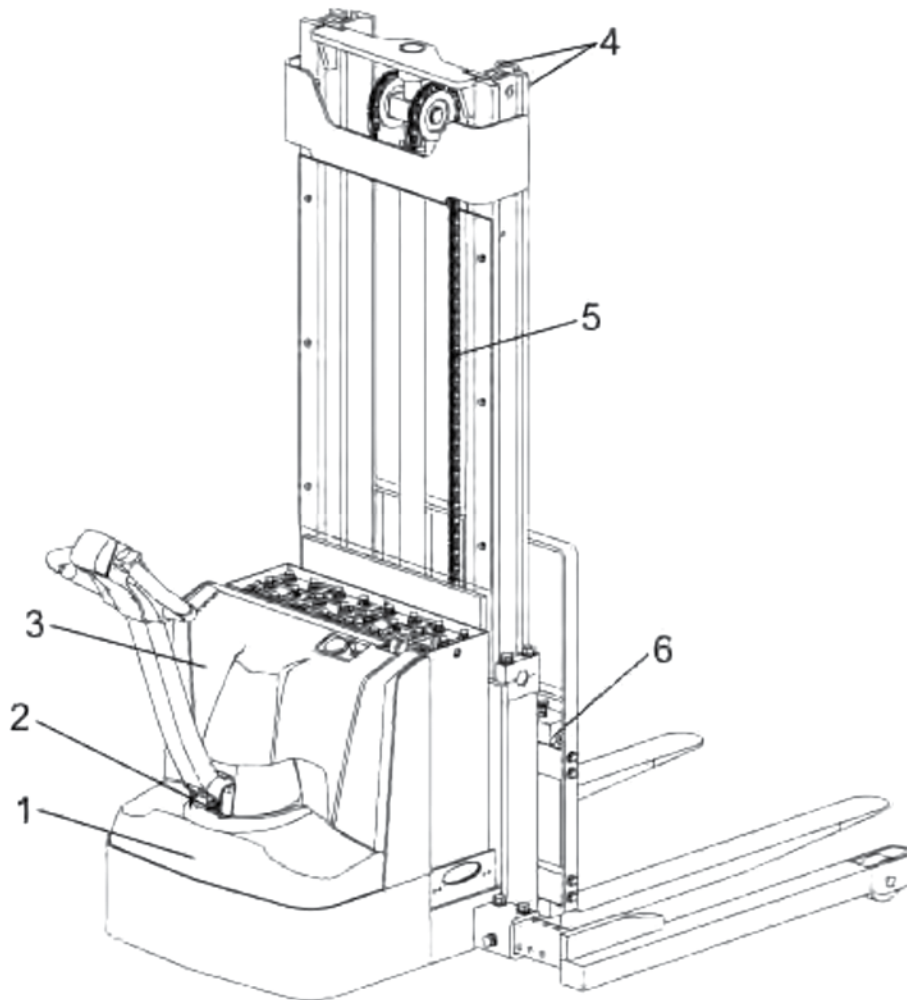
**TABLE 3-2: RECOMMENDED LUBRICANTS
SEE TABLE 3-3 FOR APPLICATION**

No. 1	Transmission oil—EP SAE 80W-90
	Transmission oil—EP SAE 10W-30 (Note)
No. 2	Grease—Lithium base, general purpose.
No. 3	Hydraulic oil-Heavy duty with a viscosity of 150 SUS foam suppressing agent and rust and oxidation inhibitors
	Hydraulic oil-Heavy duty with a viscosity of 100 SUS foam suppressing agent and rust and oxidation inhibitors (Note)
No. 4	SAE 30 or 40 Engine lubricating oil

TABLE 3-3 LUBRICATION CHART

FIG 3-2 INDEX NO.	LOCATION	METHOD OF APPLICATION	TYPE (TABLE 3-2)	APPLICATION OF LUBRICANT
1	Transmission, Capacity 2 pints	Can	No. 1	Fill to level plug opening
2	Pivot Tube Fitting	Can	No. 2	Pressure lubricate
3	Hydraulic Reservoir Capacity-1 quarts	Can	No. 3	With lift carriage fully lowered, fill reservoir with hydraulic oil to 1 inch below opening
4	Inner and Outer Mast	Brush	No. 2	Full length of channel where rollers operate
5	Lift Chain	Brush or Spray	No. 4	See Paragraph 3-6
6	Lift Carriage	Brush	No. 2	Light coating where forks slide

FIGURE 3-1: LUBRICATION DIAGRAM



6.0 TROUBLESHOOTING

6.1 GENERAL

Use **Table 4-1** as a guide to determine possible causes of trouble. The table is divided into five main categories: Truck and Hydraulic System Will Not Operate, Truck Does Not Operate Forward or Reverse, Trouble With Braking, Trouble With Lifting Or Lowering, and Miscellaneous malfunctions.

TABLE 4-1 TROUBLESHOOTING CHART

MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
TRUCK AND HYDRAULIC SYSTEM WILL NOT OPERATE Truck will not travel nor will lift system operate	a. Fuse (16, Figure 12-29) blown	Check fuse and replace if necessary
	b. Battery dead or disconnected	Check battery quick-disconnect plug and check battery voltage
	c. Keyswitch (6, Figure 12-28) defective	Bypass keyswitch to determine if it is malfunctioning
	d. Defective wiring	Check for open circuit. Repair as required
TRUCK DOES NOT OPERATE FORWARD OR REVERSE Truck does not travel forward or reverse. All other functions operate normally	a. Check all wiring. A loose connection may be the cause of malfunction	Tighten all loose connections before further troubleshooting
	b. Defective dead man switch (29, Figure 12-1)	Check and replace switch if defective
	c. Defective main contactor (10, Figure 12-29)	Check for proper operation and replace if necessary
	d. Defective potentiometer (21, Figure 12-2)	Check and replace potentiometer if defective
TRUCK TRAVELS FORWARD BUT NOT IN REVERSE	Defective potentiometer (21, Figure 12-2) in control head	Check and replace potentiometer if defective
TRUCK TRAVELS REVERSE BUT NOT IN FORWARD		
TRUCK TRAVELS FORWARD AND IN REVERSE AT LOWER SPEEDS; WILL NOT TRAVEL AT HIGH SPEED		
TROUBLE WITH BRAKING Truck does not slow with brake, or brake does not engage	a. Defective dead man switch (29, Figure 12-1)	Check deadman switch for continuity. If none found when the control arm is in the brake position, replace switch
	b. Defective electric brake (1, Figure 12-5)	Adjust or replace brake
Brake will not release	a. Air gap more than 0.01 in (0.25mm)	Adjust
	b. Brake temperature above 281 F (140 C)	Allow to cool and check air gap
	b. Open brake circuitry or wiring	Make voltage checks
Brake drags	b. Air gap less than 0.01 in (0.25mm).	Adjust
	b. Defective electric brake (1, Figure 12-5)	Replace
Brake grabs	a. Incorrect stopping distance adjustment.	Adjust
	b. Defective electric brake (1, Figure 12-5)	Replace
Abnormal noise and chatter when brake is applied	Defective electric brake (1, Figure 12-5)	Replace

TABLE 4-1 TROUBLESHOOTING CHART (continued)

MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
TROUBLE WITH LIFTING OR LOWERING Oil sprays or flows from the top of the lift cylinder.	Defective packing in lift cylinder	Repair lift cylinder
Squealing sounds when lifting forks	a. Oil level too low	Identify oil leak
	b. Dry channels in mast	Apply grease
	c. Defective mast or carriage rollers	Replace rollers
Forks do not lift to top	a. Oil level too low	Add oil to reservoir
	b. Load larger than capacity	Refer to I.D. plate for capacity
Weak, slow or uneven action of hydraulic system	a. Defective pump or relief valve (0.25mm).	Check pressure. Adjust as necessary
	b. Worn lift cylinder	Replace cylinder
	c. Load larger than capacity (0.25mm).	Refer to I.D. plate for capacity
	d. Defective lift motor solenoid	Replace relay (18, Figure 12-22 or 2, Figure 12-23) on pump motor
	e. Battery charge low	Charge battery
Forks do not lift, pump motor does not run	a. Battery is dead or disconnected adjustment.	Check and recharge if required
	b. Defective wiring 12-5).	Check and repair as required
	c. Defect in electrical system for operating pump motor	Check lift switch in control head, as well as the relay (18, Figure 12-22 or 2, Figure 12-23)
Forks do not lift, motor runs	Defect in hydraulic system	Check the oil level in the reservoir and the oil lines to the lift cylinder, and repair as required. If normal, check the hydraulic pump, and relief valve. Repair, or adjust
Forks lift, but will not go down		Check lowering control switch in control head and lowering solenoid on valve assembly. Replace as required
Load will not hold	a. Oil bypassing internally in control valve	Replace valve assembly (Figure 12-22 or Figure 12-23)
	b. Worn lift cylinder or packing	Repack cylinder
Platform does not lift to top. Pump motor runs	a. Oil level too low	Add oil to reservoir
	b. Load larger than capacity	Refer to nameplate on side of mast for maximum load capacity.
	c. Batteries need charging	Change batteries
Forks creep downward under load when in a raised position	Leak in hydraulic system, lift cylinder or lowering valve	Check for leaking fitting in hydraulic line and repair as required. Repack lift cylinder or replace valve assembly (Figure 12-22 or Figure 12-23)

TABLE 4-1 TROUBLESHOOTING CHART (continued)

MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
MISCELLANEOUS Steering arm does not return to the upright position	a. Weak return spring	Replace spring
	b. Binding	Check and free the binding item. Verify that the cable has not been damaged. Repair or replace as needed
Truck moves forward when arm is pulled down	a. Belly-button switch defective	Check for short, and repair or replace as necessary
	b. Short in control head	Check wiring and repair as required
Steering arm jerks excessively starting or stopping the truck	Drive wheel worn	Replace drive wheel if worn to within 3/4 inch of hub
Drive motor is jerky	Motor internally damaged or worn	Replace motor

6.2 CONTROLLER TROUBLESHOOTING

6.2.1 ZAPI HANDSET

A Zapi Handset is available that is designed specifically for use with the Zapi controller. It serves multiple functions of reading diagnostic data, testing truck operation, setting options, adjustments and parameter changes of the controller. The Zapi Handset is available through your Blue Giant dealer. If you require dealer location information, contact Blue Giant.

Remove the rubber plug from the CNC connector of the controller and plug in the Zapi Handset connector as shown in **Figure 4-1**.

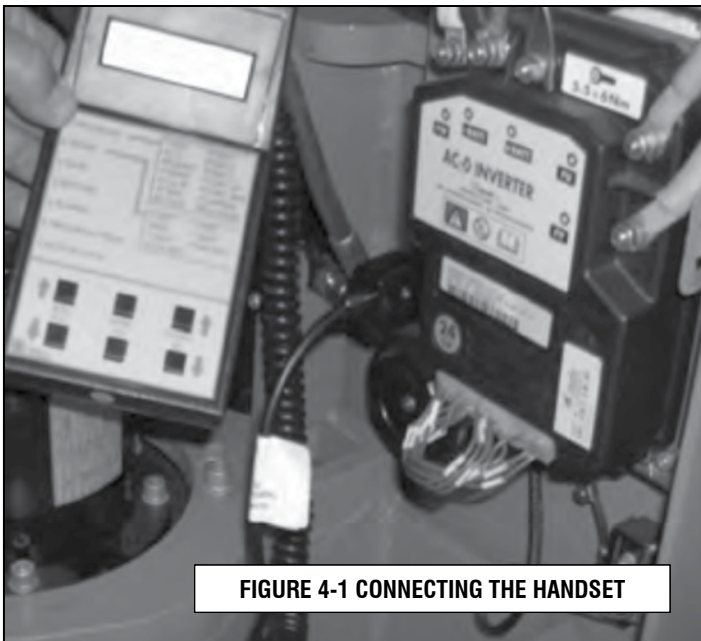


FIGURE 4-1 CONNECTING THE HANDSET

6.2.2 FAULT DETECTION

6.2.2.1 GENERAL

The controller provides diagnostics information to assist technicians in troubleshooting problems. When a fault is detected, an alarm is recorded in the logbook. It has a FIFO (First Input First Output) structure that means the oldest alarm is lost when the database is full and a new alarm occurs. The logbook is composed of alarms with the following information:

- The alarm code
- The times that each alarm occurs consecutively
- The Hour Meter value when the latest event of every alarm occurred
- The invert temperature when the latest event of every alarm occurred.

6.2.2.2 LOGBOOK ACCESS

To view the alarm logbook proceed as follows:

1. Connect the Zapi Handset, refer to paragraph 4-2.1.
2. Press the ROLL down button (1, **Figure 4-2**) and the ENTER button (3) at the same time to enter the MAIN MENU.
3. Press the ROLL down button (2) or the ROLL up button (1) to find the ALARMS display.
4. Press the ENTER button (3) to view the alarms.
5. Press the OUT button (6) to exit the alarms.

NOTE: Refer to www.bluegiant.com for the Zapi supplement containing detailed information on alarm codes. There are two versions shown. The BGS-25 uses the Standard version which lists the error by: Alarm Name, Repetitions, Temperature and Hour Meter reading.

6.2.3 TESTING TRUCK OPERATION

The Zapi Handset can be used to test certain truck operations as follows:

1. Connect the Zapi Handset, refer to paragraph 4-2.1.
2. Press the ROLL down button (1, **Figure 4-2**) and the ENTER button (3) at the same time to enter the MAIN MENU.
3. Press the ROLL down button (2) or the ROLL up button (1) to find the TESTER display.
4. Press the ENTER button (3) to view the tests.
5. To verify various switch functions, locate the switch on the display and then operate that function to verify operation.
6. Press the OUT button (6) to exit the tests.

6.2.4 SETTINGS AND ADJUSTMENTS

6.2.4.1 SET OPTIONS

To set options proceed as follows and refer to **Table 4-2**:

1. Connect the Zapi Handset, refer to paragraph 4-2.1.
2. Press the ROLL up button (1, **Figure 4-2**) and the SET up button (5) at the same time to enter the CONFIG MENU.
3. Press the ROLL down button (1) or the ROLL up button (2) to find the SET OPTIONS display.
4. Press the ENTER button (3) to view the options.
5. Press the ROLL down (2) or the ROLL up button (1) to find the option to be changed.
6. Press the SET up button (5) or the SET down button (6) until the desired value setting is reached. The option is now set at the desired value.
7. Press the OUT button (4) to exit the options.

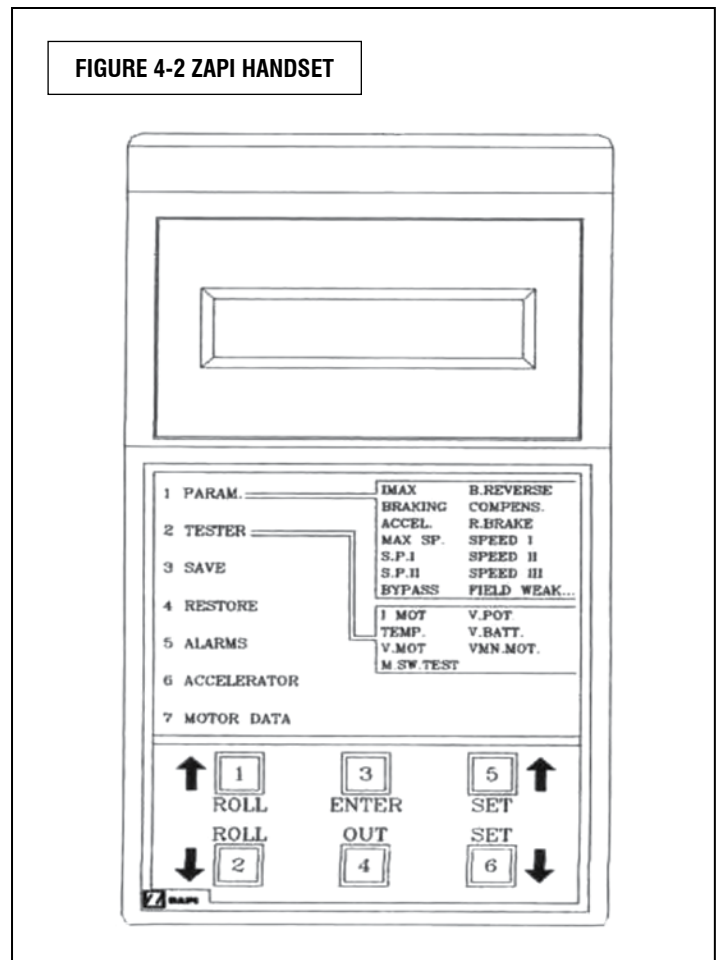


TABLE 4-2 SET OPTIONS

PARAMETER	FACTORY SETTING	DESCRIPTION
TILLER switch	HANDLE	This option handles the input CNB#3 (Table 4-5). This input opens when the operator leaves the truck (released). It is connected to a Keyswitch controlled voltage when the operator is present.
SET INPUT #1	OPTION #1	<p>Standard Version only This option handles the digital input CNA#15. It can be can be set as:</p> <ul style="list-style-type: none"> OPTION #1: CNA is managed as a cutback speed input (SR#1). OPTION #2: CNA is managed as a digital handbrake input. OPTION #3: CNA is managed as an inching backward. <p>The input CNA#15 (Table 4-5) can only be used as Aux Lowering request when the MDIPRC is PRESENT.</p> <p>This input must be connected to a Keyswitch controlled voltage. The SR#1 becomes active when CNA#15 (Table 4-5) is open. The inching backward becomes active when the CNA#15 (Table 4-5) is closed to a Keyswitch controlled voltage.</p>
SET INPUT #2	PRESENT	<p>It can be can be set as:</p> <ul style="list-style-type: none"> PRESENT: CNA#14 (Table 4-5) is managed as a cutback speed input (SR#2). OPTION #1: CNA#14 (Table 4-5) is managed as an inching backward. <p>The input CNA#14 (Table 4-5) can only be used as Aux Lifting request when the MDIPRC is PRESENT. This input must be connected to a Keyswitch controlled voltage. The SR#2 becomes active when CNA#14 (Table 4-5) is open. The inching backward becomes active when the CNA#14 (Table 4-5) is closed to a Keyswitch controlled voltage.</p>
SET INPUT #4	OPTION #1	<p>This option handles the digital input CNB#7 (Table 4-5). It can be can be set as:</p> <ul style="list-style-type: none"> BELLY CNB#7 (Table 4-5) is managed as a Belly Switch input BRAKE CNB#7 (Table 4-5) is managed as service brake input. This information can be used also to recognize when the operator is driving with a pressed pedal braking. EX.HYDRO: CNB#7 (Table 4-5) is managed as Exclusive Hydro <p>This input must be connected to a Keyswitch controlled voltage. The Belly switch active level is specified on the QUICK INV LOGIC below. The service brake of the exclusive hydro becomes active when CNB#7 is opened.</p>
HOUR COUNTER	RUNNING	<p>This option specifies the hour counter mode. It can be set as:</p> <ul style="list-style-type: none"> RUNNING: The counter registers travel time only. key on: The counter registers when the keyswitch is closed.

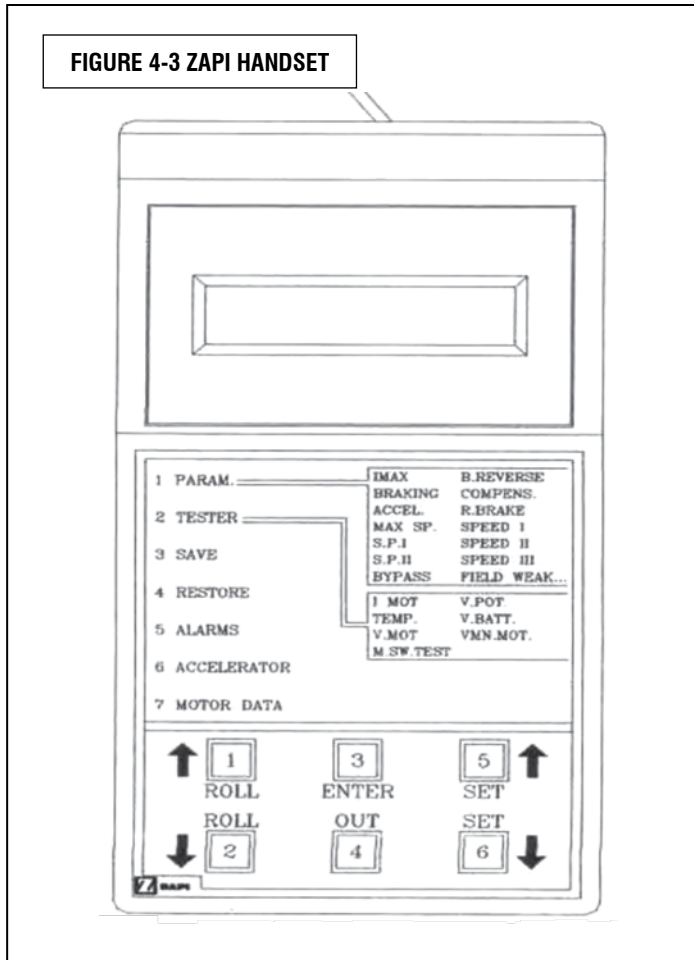
TABLE 4-2 SET OPTIONS (continued)

PARAMETER	FACTORY SETTING	DESCRIPTION
BATTERY CHECK	Level = 1	<p>This option specifies the handling of the low battery charge detection. It can be set as:</p> <ul style="list-style-type: none"> Level 0: Nothing happens, the battery charge level is ignored. Level 1: A BATTERY LOW alarm is raised when the battery level is calculated being less than 10% of the full charge. A BATTERY LOW alarm inhibits the Lifting function. Level 2: A BATTERY LOW alarm is raised when the battery level is calculated being less than 10% of the full charge. A BATTERY LOW alarm reduces the maximum truck speed down to 24% of the full truck speed then, if the MDI-PRC is absent, inhibits the Lifting function. Level 3 Equivalent to Level 1; a BATTERY LOW alarm is raised when the battery level is calculated being less than 10% of the full charge. A BATTERY LOW alarm inhibits the Lifting function.
HYDRO KEY ON	OFF	ON / OFF: If this options is programmed ON the traction Inverter manages a hydraulic steering function when the keyswitch is switched ON (only if the AUX OUTPUT #1 option is programmed as HYDRO CONTACT or as WXCLUSIVE HYDRO).
STOP ON RAMP	OFF	Not used.
AUX OUTPUT #1	BRAKE	<p>This option handles output CNA#3 (Table 4-5). It can be used as:</p> <ul style="list-style-type: none"> BRAKE: CNA#3 (Table 4-5) drives an electromechanical Brake. HYDROCOMNT: CNA#3 (Table 4-5) drives the contractor for a hydraulic steering function when the direction input or brake pedal input are active or a movement of the truck is detected. EX.HYDRO: CNA#3 (Table 4-5) drives the contractor for a hydraulic steering function when the exclusive hydro input is active. FREE: CNA#3 (Table 4-5) is not used. The current this output can sink is up to 3Adc.
PEDAL BRAKING	NONE	<p>The analog input CNA#18 (Table 4-5) has one of two functions:</p> <ul style="list-style-type: none"> Pedal Braking input. Command input for lifting / lowering proportional valves in MDIPRC version. To turn from the first to the second function is just enough to set PEDAL BRAKING to HNONE. <p>This option handles the analog input CNA#18 (Table 4-5) when used as pedal braking input:</p> <ul style="list-style-type: none"> ANALOG: With this setting it is possible to modulate the strength of the braking when the accelerator is released. The strength of the braking is proportional to the brake pedal potentiometer connected to this input. When the pedal potentiometer voltage is equal / less than the SET POT BRK MIN, the minimum release braking strength is applied (following the RELEASE BRAKING setting). When the pedal potentiometer voltage is equal / higher than the SET POT BRK MAX, the maximum release braking strength is applied (following the PEDAL BRAKING setting). In the intermediate position, the electrical braking strength is a linear function between the minimum (RELEASED BRAKING) and maximum (PEDAL BRAKING) intensity. When there is also a switch connected to the pedal braking (i.e. SET INPUT #4 to level BRAKE), it must be closed, otherwise the release braking is stuck to the minimum strength disregarding the pedal potentiometer position. DIGITAL: No pedal potentiometer is expected. Only when both the SET INPUT #4 is Level BRAKE and the brake switch connected to CNB#4 (Table 4-5) is closed, the release electrical braking follows the PEDAL BRAKING setting (maximum strength); in all of the other conditions the release electrical braking follows the RELEASE BRAKING setting (minimum strength). NONE: The analog input CNA#18 (Table 4-5) is not used for the release braking modulation.

TABLE 4-2 SET OPTIONS (continued)

PARAMETER	FACTORY SETTING	DESCRIPTION
QUICK INVERSION	BELLY	<p>This option specifies the quick inversion mode when the SET INPUT #4 is set BELLY. It can be set as:</p> <ul style="list-style-type: none"> • NONE: The quick inversion function is not managed (no effect when CNB#7 (Table 4-5) switches over). • TIMED: The quick inversion function is timed. • BELLY: The quick inversion function is managed but not timed.
AUX VOLTAGE #1	100%	<p>This option specifies the percentage of the keyswitch controlled voltage to be applied to the loads on CNA#1 (Table 4-5) (main contactor coil) and CNA#3 (Table 4-5) (electromechanical brake). The voltage modulation is set with a PWM at 1 kHz frequency. After an initial delay of about 1 sec in which the entire keyswitch controlled voltage is applied to the loads, the PWM reduces the voltage at the loads down to the specified percentage.</p>
PERFORMANCE	OPTION #1	<p>This option can be set:</p> <ul style="list-style-type: none"> • OPTION #1 • OPTION #2
QUICK INV. LOGIC	OPTION #1	<p>This option specifies the active level for the Belly switch input (CNB#7):</p> <ul style="list-style-type: none"> • OPTION#1: The quick inversion is executed when CNB#7 (Table 4-5) is closed to a Keyswitch controlled voltage. • OPTION#2: The quick inversion is executed when CNB#7 (Table 4-5) is opened from a Keyswitch controlled voltage.
MDI-PRC	ABSENT	<p>This option specifies:</p> <ul style="list-style-type: none"> • PRESENT: The MDI-PRC is connected to the ACO via the CAN • BUS: the handling of the Hydraulics is specified on the TRUCK TYPE setting. • ABSENT: The MDI-PRC is not connected to the ACO: the TRUCK • TYPE: disappears from the SET OPTIONS function list.
MOT SET-UP	OFF	Not used

6.2.4.2 ADJUSTMENTS



To change an adjustment proceed as follows and refer to **Table 4-3**:

1. Connect the Zapi Handset, refer to paragraph 4-2.1.
2. Press the ROLL up button (1, **Figure 4-3**) and the SET up button (5) at the same time to enter the CONFIG MENU.
3. Press the ROLL down button (1) or the ROLL up button (2) to find the ADJUSTMENTS display.
4. Press the ENTER button (3) to view the adjustments.
5. Press the ROLL down button (2) or the ROLL up button (1) to find the adjustment to be changed.
6. Press the SET up button (5) or the SET down button (6) until the desired value setting is reached. The adjustment is now set at the desired value.
7. Press the OUT button (4) to exit the adjustments.

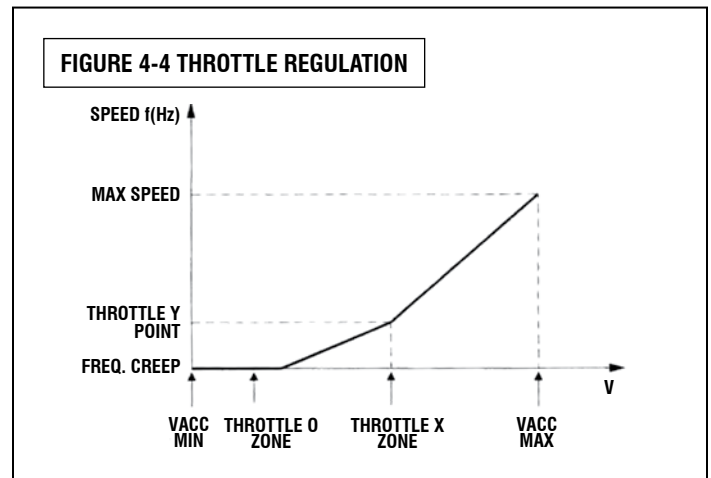


TABLE 4-3 ADJUSTMENTS

PARAMETER	FACTORY SETTING	DESCRIPTION
SET POT BRK MIN	0.5 V	This setting records the minimum value of braking pedal potentiometer when the braking pedal switch is closed; the procedure is similar to the PROGRAM VACC function. This procedure must be carried out only if the PEDAL BRAKING option is programmed as ANALOG. No adjustment is necessary when PEDAL BRAKING options is programmed as NONE.
SET POT BRK MAX	4.5 V	This setting records the maximum value of braking pedal potentiometer when the braking pedal is fully pressed; the procedure is similar to the PROGRAM VACC function. This procedure must be carried out only if the PEDAL BRAKING option is programmed as ANALOG. No adjustment is necessary when PEDAL BRAKING options is programmed as NONE.
SET BATTERY TYPE	24V	Selects the nominal battery voltage.
ADJUST BATTERY	XX V	Do not modify - Factory adjusted (Fine adjustment of the battery voltage measured by the controller).
THROTTLE 0 ZONE	9%	Establishes a deadband in the accelerator input curve.

6.2.4.3 PARAMETER CHANGE

To change a parameter proceed as follows and refer to **Table 4-4**:

1. Connect the Zapi Handset, refer to paragraph 4-2.1.
2. Press the ROLL down button (1, **Figure 4-5**) and the ENTER button (3) at the same time to enter the MAIN MENU.
3. Press the ROLL down button (1) or the ROLL up button (2) to find the PARAMETER CHANGE display.
4. Press the ENTER button (3) to view the parameters.
5. Press the ROLL down button (2) or the ROLL up button (1) to find the parameter to be changed.
6. Press the SET up button (5) or the SET down button (6) until the desired value setting is reached. The parameter is now set at the desired value.
7. Press the OUT button (4) to exit the parameters.

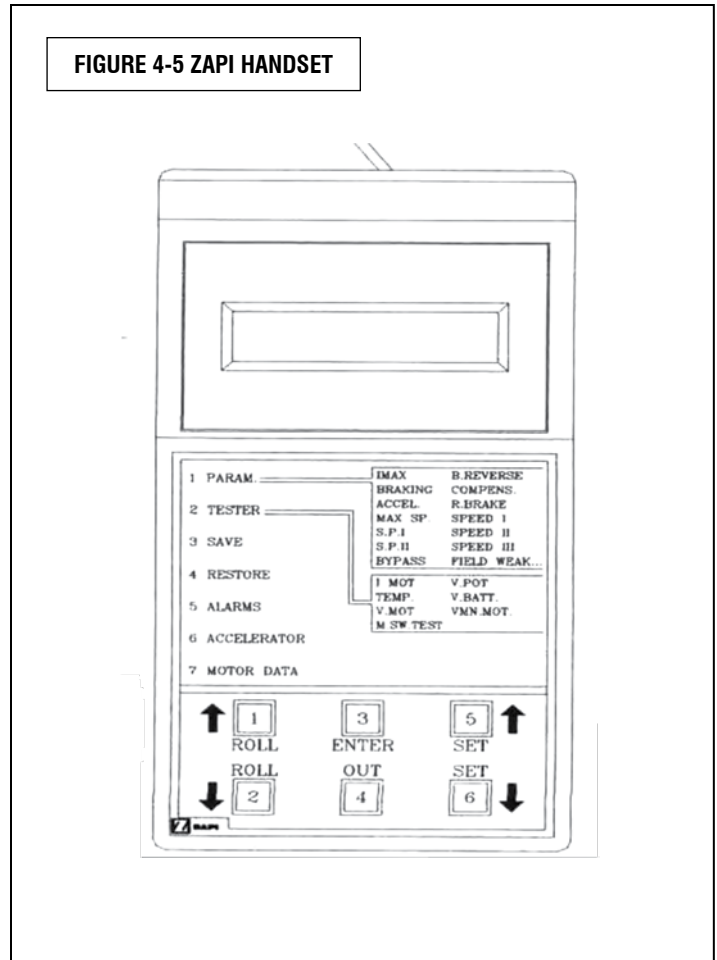


TABLE 4-4 PARAMETER ADJUSTMENTS

PARAMETER	FACTORY SETTING	DESCRIPTION
ACCELER. DELAY	LEVEL = 8	Level 0 to 9. It determines the acceleration ramp. At Level 9 the truck takes a long time to accelerate.
RELEASE BRAKING	LEVEL = 5	Level 0 to 9. It controls the deceleration ramp when the travel request is released. At Level 9 the truck brakes abruptly.
INVERS. BRAKING	LEVEL = 4	Level 0 to 9. It controls the deceleration ramp when the direction switch is inverted during travel. At Level 9 the truck brakes abruptly.
PEDAL BRAKING	LEVEL = 9	Level 0 to 9. It controls the deceleration ramp when the travel request is released and the brake pedal switch is pressed to its maximum. At Level 9 the truck brakes abruptly.

TABLE 4-4 PARAMETER ADJUSTMENTS (continued)

PARAMETER	FACTORY SETTING	DESCRIPTION
SPEED LIMIT BRK	LEVEL = 1	Level 0 to 9. It controls the deceleration ramp when the accelerator has turned down but not completely released. At Level 9 the truck decelerates abruptly.
BRAKE CUTBACK	LEVEL = 5	Level 0 to 9. It controls the deceleration ramp when the a speed reduction input becomes active and the motor slows down. At Level 9 the truck decelerates abruptly.
MAX SPEED FORW	100 Hz	Typically from 90 Hz to 160 Hz. It determines the maximum speed in forward direction.
CUTBACK SPEED	100%	Typically from 10% to 100%. It determines the percentage of the max speed applied when the cutback switch 1 (SR#1 on CNA#15 (Table 4-5) is active. When set to 100% the speed reduction is ineffective.
CUTBACK SPEED 2	37%	Typically from 10% to 100%. It determines the percentage of the max speed applied when the cutback switch 2 (SR#2 on CNA#14 (Table 4-5) is active. When set to 100% the speed reduction is ineffective.
HS CUTBACK	100%	Typically from 10% to 100%. It determine the percentage of the max speed applied when the Hard and Soft function (H&S switch on CNB#4 (Table 4-5) is active. When set to 100% the speed reduction is ineffective.
FREQUENCY CREEP	5.00 Hz	Hz value. This is the minimum speed applied when the forward or reverse switch is closed, but the accelerator at its minimum. In the ACO sense Coils this setting is higher equal than 5 Hz. is ineffective.
RPM CREEP	100%	A Percentage value. Set to 100% and not Used.
MAXIMUM CURRENT	96%	It specifies the percentage of the absolute current (150A) at which the current will be limited. Normally MAXIMUM CURRENT is 100%. DO NOT CHANGE.is ineffective.
INCHING SPEED	0 Hz	Hz value. It determines the speed when the “Inching function” is active.
INCHING TIME	LEVEL = 0	Level 0 to 9. It determines the duration time when the “Inching function” is active.
AUXILIARY TIME	1	Time units value (seconds). For the encoder version, it determines the time duration (in seconds) in which the the frequency was arrived to zero. 100%. DO NOT CHANGE.is ineffective.
AUXILIARY TIME	1	A Percentage of the Maximum Current. This setting increases the phase current when low frequency during starting operation. It is used to push up, in feedforward way, the torque when it is not possible to control the flux, in feedback way, because of the low frequency.

FIGURE 4-6 ZAPI CONTROLLER CONNECTORS

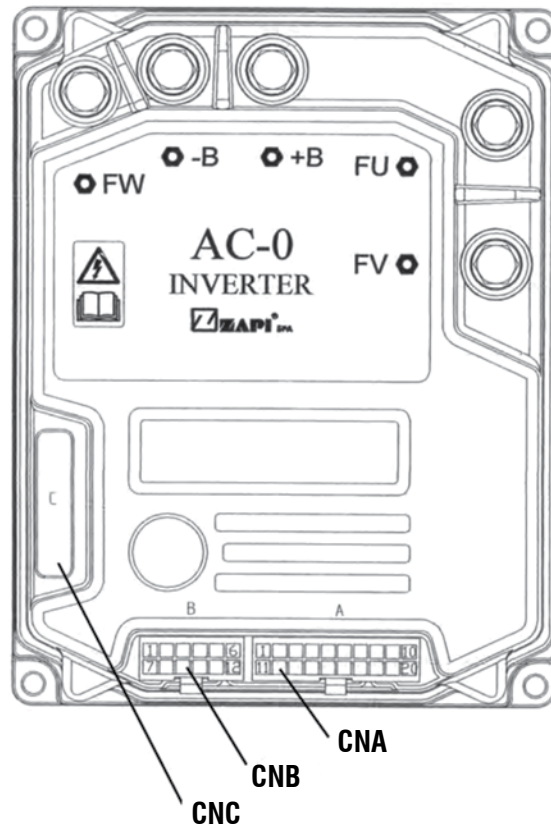


TABLE 4-5 ZAPI CONTROLLER CONNECTOR PINS, CNA CONNECTOR

PIN	ABBREVIATION	DESCRIPTION
CNA#1	NMC	Negative of main contactor coil.
CNA#2	PMC	Positive of main contactor coil.
CNA#3	NEB	Output for driving the electromechanical brake coil; drives the load to -Batt. Maximum current: 3 A.
CNA#4	NPC	Negative of pump contactor soil.
CNA#5	PPC / PEV	Positive of pump contactor coil and lowering electrovalve coil.
CNA#6	NEV	Negative of the lowering electrovalve coil.
CNA#7	CAN LOW	Low level CAN-BUS voltage I/O.
CNA#8	-BAT	-Bat.

TABLE 4-5 ZAPI CONTROLLER CONNECTOR PINS, CNA CONNECTOR (CONTINUED)

PIN	ABBREVIATION	DESCRIPTION
CNA#9	ENC+	Encoder Positive Supply (+5 or +12 Vdc)
CNA#10	ENC-	Encoder Negative Supply (GND to minus battery)
CNA#11	HM(+B)	Output for driving an hourmeter; when the hourmeter is active this output provides a + Batt signal; 3 maximum current.
CNA#12	-BATT	-Batt
CNA#13	MOT TH	Motor thermal sensor input. The internal pull-up is a fixed 2mA (Max 5V) source current.
CNA#14	SR2	Speed reduction 2 input. Active low (switch opened).
CNA#15	SR1	Speed reduction 1 input. Active low (switch opened).
CNA#16	+12V	This output provides a +12V signal for the MDI PRC, it present; mA maximum current.
CNA#17	CAN HIGH	High level CAN-BUS voltage I/O
CNA#16	CPOTB	Brake potentiometer wiper
CNA#19	ENC A	Encoder Channel A
CNA#20	ENC B	Encoder Channel B

TABLE 4-5 ZAPI CONTROLLER CONNECTOR PINS, CNB CONNECTOR

CONNECTOR PIN	ABBREVIATION	DESCRIPTION
CNB#1	KEY SW	Connected to the power supply through a microswitch (KEY) with a 6.3-10 A fuse in series (this could be mounted on the AC-0 cover).
CNB#2	CM	Common for FW / BW / SR1 / SR2 / TILLER / H&S / BELLY / LIFTING / LOWERING microswitches. This connection supplies a keyswitch voltage level.
CNB#3	TILLER SW	Tiller request input. Must be connected to the tiller microswitch, active high.
CNB#4	H&S SW	Hard and Soft request input. Must be connected to the Hard and Soft microswitch, active high.
CNB#5	BACKWARD SW	Backward direction request input. Must be connected to the backward direction microswitch, active high.
CNB#6	FORWARD SW	Forward direction request input. Must be connected to the forward direction microswitch, active high.
CNB#7	BELLY SW	Quick inversion function input; must be connected to the Belly microswitch; it is active high.

TABLE 4-5 ZAPI CONTROLLER CONNECTOR PINS, CNB CONNECTOR (CONTINUED)

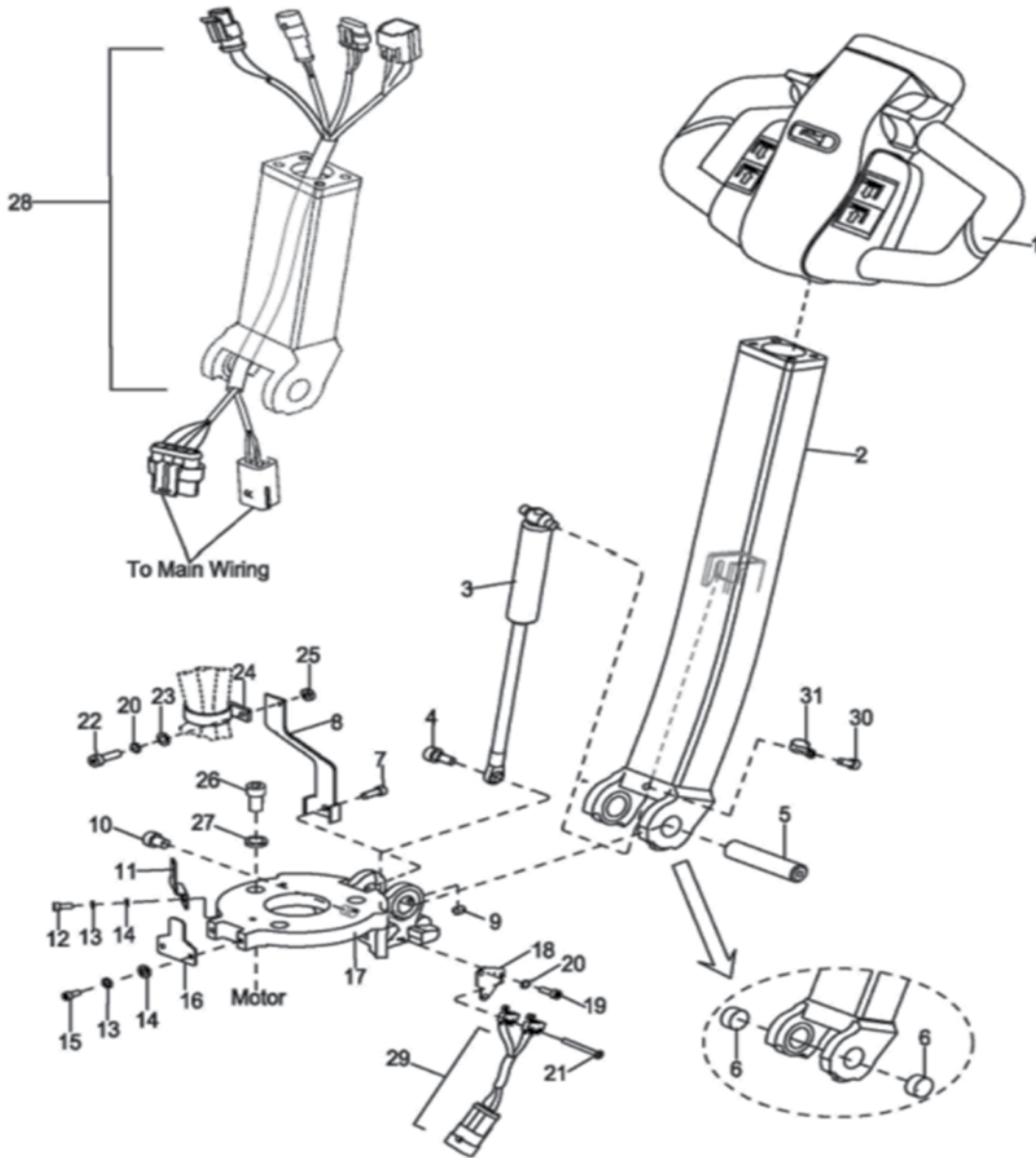
CONNECTOR PIN	ABBREVIATION	DESCRIPTION
CNB#8	LOWERING SW	Lowering request input, active high.
CNB#9	LIFTING SW	Lifting request input, active high.voltage level.
CNB#10	CPOT	Lifting request input, active high.
CNB#11	NPOT	Negative of accelerator unit, tested for wire disconnection diagnosis.
CNB#12	PPOT	Potentiometer positive: 10V output; keep load > 1k

TABLE 4-5 ZAPI CONTROLLER CONNECTOR PINS, CNC CONNECTOR

CONNECTOR PIN	ABBREVIATION	DESCRIPTION
CNC#1	PCLRxD	Positive serial reception
CNC#2	NCLRxD	Negative serial reception
CNC#3	PCLTXD	Positive serial transmission.
CNC#4	NCLTXD	Negative serial transmission
CNC#5	GND	Negative console power supply
CNC#6	+12V	Positive console power supply
CNC#7	FLASH	Must be connected to C8 for the Flash memory programming (if used)
CNC#8	FLASH	Must be connected to C7 for the Flash memory programming (If used)

7.0 STEERING ARM, CONTROL HEAD AND COMPARTMENT

FIGURE 5-1 STEERING ARM



7.1 CONTROL HEAD

7.1.1 CONTROL HEAD REMOVAL

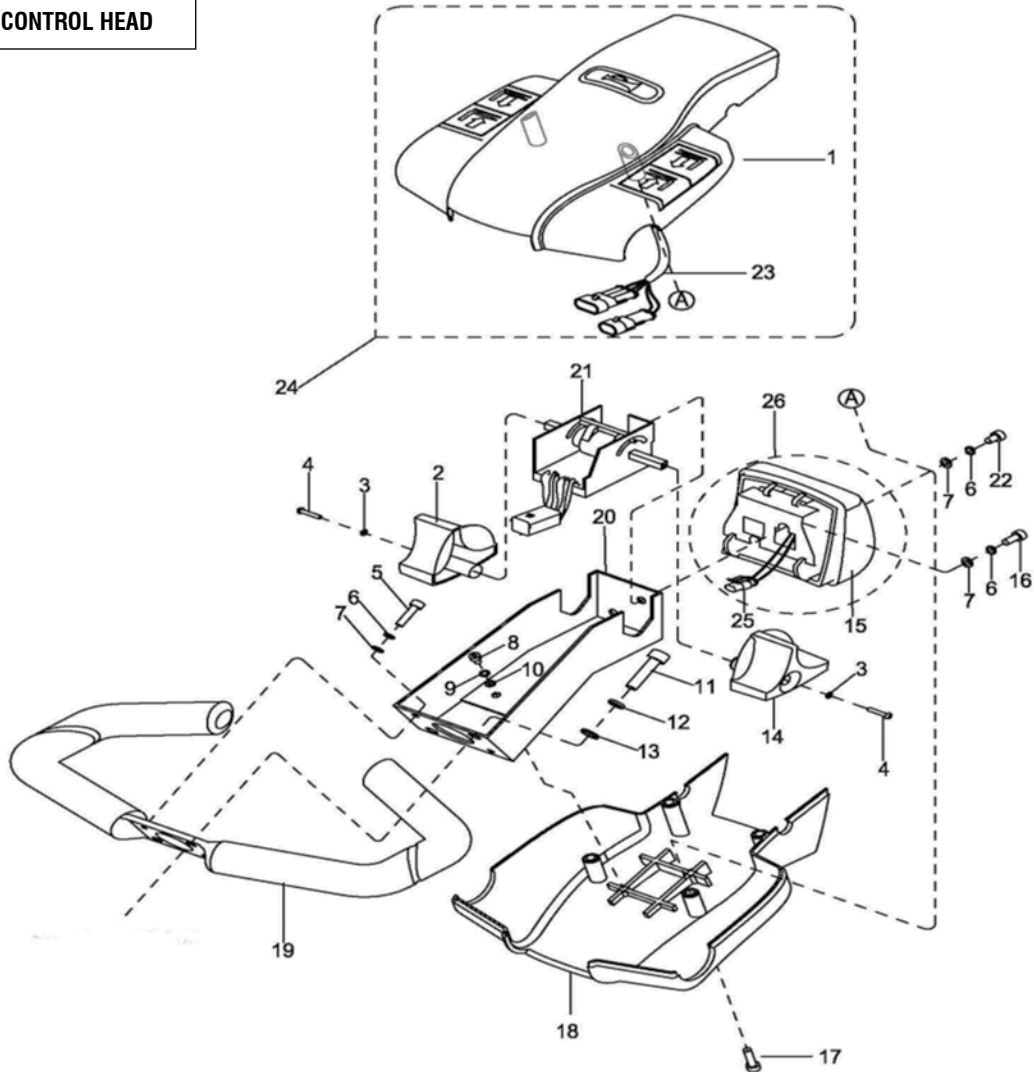
1. Turn off the key switch (6, Figure 12-28) and disconnect the batteries.
2. Remove the cap assembly as described in paragraph 5-1.3.
3. Disconnect harness (28, Figure 5-1) from potentiometer (21, Figure 5-2).
4. Disconnect harness (28, Figure 5-1) from emergency reverse switch (15, Figure 5-2).
5. Remove two screws (5), two lock washers (6) and two flat washers (7).
6. Remove two screws (11), two lock washers (12) and two flat washers (13).
7. Remove the control head and handle (19).



WARNING

When removing the control head in the following steps, be sure to hold it in place until the control harness is disconnected.

FIGURE 5-2 CONTROL HEAD



7.1.2 CONTROL HEAD INSTALLATION

1. Secure control head and handle (**19, Figure 5-2**) with two screws (11), two lock washers (12) and two flat washers (13).
2. Install two screws (5), two lock washers (6) and two flat washers (7).
3. Reconnect harness (**28, Figure 5-1**) to emergency reverse switch (**15, Figure 5-2**).
4. Reconnect harness (**28, Figure 5-1**) to potentiometer (**21, Figure 5-2**).
5. Install the cap assembly as described in paragraph 5-1.4.
6. Reconnect the batteries and turn on the key switch (**6, Figure 12-28**), 5-1.3.

7.1.3 CAP ASSEMBLY REMOVAL

1. Turn off the key switch (**6, Figure 12-28**) and disconnect the batteries.
2. Remove four screws (**17, Figure 5-2**) and lift up cap assembly (1).
3. Disconnect harness (**13, Figure 5-4**) from harness (**28, Figure 5-1**).

7.1.4 CAP ASSEMBLY INSTALLATION

1. Hold cap assembly (**1, Figure 5-2**) in place and connect harness (**13, Figure 5-4**) to harness (**28, Figure 5-1**).
2. Position cap assembly (**1, Figure 5-2**) on control head and secure with four screws (17).
3. Reconnect the batteries and turn on the key switch (**6, Figure 12-28**).

7.1.5 SPEED POTENTIOMETER REPLACEMENT

1. Remove the cap assembly as described in paragraph 5-1.3.
2. Disconnect harness (**28, Figure 5-1**) from potentiometer (**21, Figure 5-2**).
3. Remove screw (4), washer (3) and control knob (2) from potentiometer (21).
4. Remove screw (4), washer (3) and control knob (14) from other side of potentiometer (21).
5. Remove the cap assembly as described in paragraph 5-1.3.
6. Disconnect harness (**28, Figure 5-1**) from potentiometer (**21, Figure 5-2**).
7. Remove screw (4), washer (3) and control knob (2) from potentiometer (21).
8. Remove screw (4), washer (3) and control knob (14) from other side of potentiometer (21).
9. Remove two screws (16), two lock washers (6), two flat washers (7) and remove potentiometer (21) from bracket (20).
10. Position new potentiometer (21) in bracket (20) and secure with two screws (16), two lock washers (6) and two flat washers (7).
11. Install control knob (2) on potentiometer (21) and secure with screw (4), and washer (3).
12. Install control knob (14) on the other side of potentiometer (21) and secure with screw (4), and washer (3).
13. Connect harness (**28, Figure 5-1**) to potentiometer (**21, Figure 5-2**).
14. Install the cap assembly as described in paragraph 5-1.4.

7.1.6 BELLY-BUTTON SWITCH REPLACEMENT

1. Remove the cap assembly as described in paragraph 5-1.3.
2. Disconnect harness (**28, Figure 5-1**) from emergency reverse switch (15).
3. Remove two screws (16), two lock washers (6), two flat washers (7) and remove switch assembly (15) from bracket (20).
4. Remove pin (**5, Figure 5-3**), bracket (4), and spring (2) from button (1).
5. Remove two pins (3) and switch (6) from bracket (4).
6. Position the new switch in bracket (4) and secure with two pins (3).
7. Position bracket (4) in button (1) and install pin (5).
8. Position switch assembly (**15, Figure 5-2**) on bracket (20) and secure with two screws (16), two lock washers (6) and two flat washers (7).
9. Connect harness (**28, Figure 12-1**) to emergency reverse switch (15).
10. Install the cap assembly as described in paragraph 5-1.4.

7.1.7 HORN SWITCH REPLACEMENT

Remove the cap assembly as described in paragraph 5-1.3.

1. Remove the cap assembly as described in paragraph 5-1.3.
2. Remove three screws (**14, Figure 5-4**), bracket (13) and spring (12).
3. Remove two pins (11) and switch from bracket (13).
4. Position the new switch in bracket (13) and secure with two pins (11).
5. Position bracket (13) in cover (1) and secure with three screws (14).
6. Install the cap assembly as described in paragraph 5-1.4.

7.1.8 LIFT AND LOWER SWITCH REPLACEMENT

1. Remove the cap assembly as described in paragraph 5-1.3.
2. Remove pin (**6, Figure 5-5**) and switch assembly (**16 or 17, Figure 5-4**) from the cap (1).
3. Remove two pins (**6, Figure 5-5**), two switches and four springs (**4, Figure 5-5**) from bracket (5 or 9).
4. Disconnect the harness with switches from the switch assembly (**16 or 17, Figure 5-5**).
5. Position the new switches and four springs (4) in bracket (5 or 9) and secure with two pins (6).
6. Position switch assembly (**16 or 17, Figure 5-4**) in cover (1) and secure with pin (**6, Figure 5-5**).
7. 7. Install the cap assembly as described in paragraph 5-1.4.

FIGURE 5-3 EMERGENCY REVERSE SWITCH ASSEMBLY

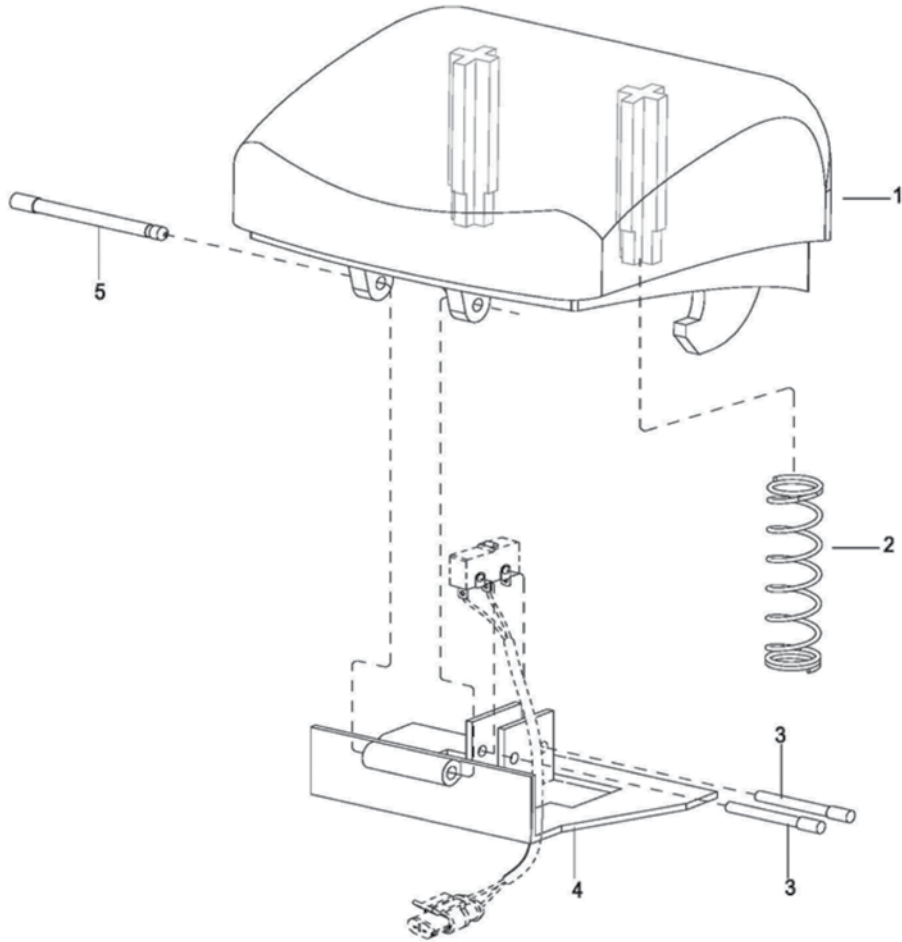


FIGURE 5-4 CAP ASSEMBLY

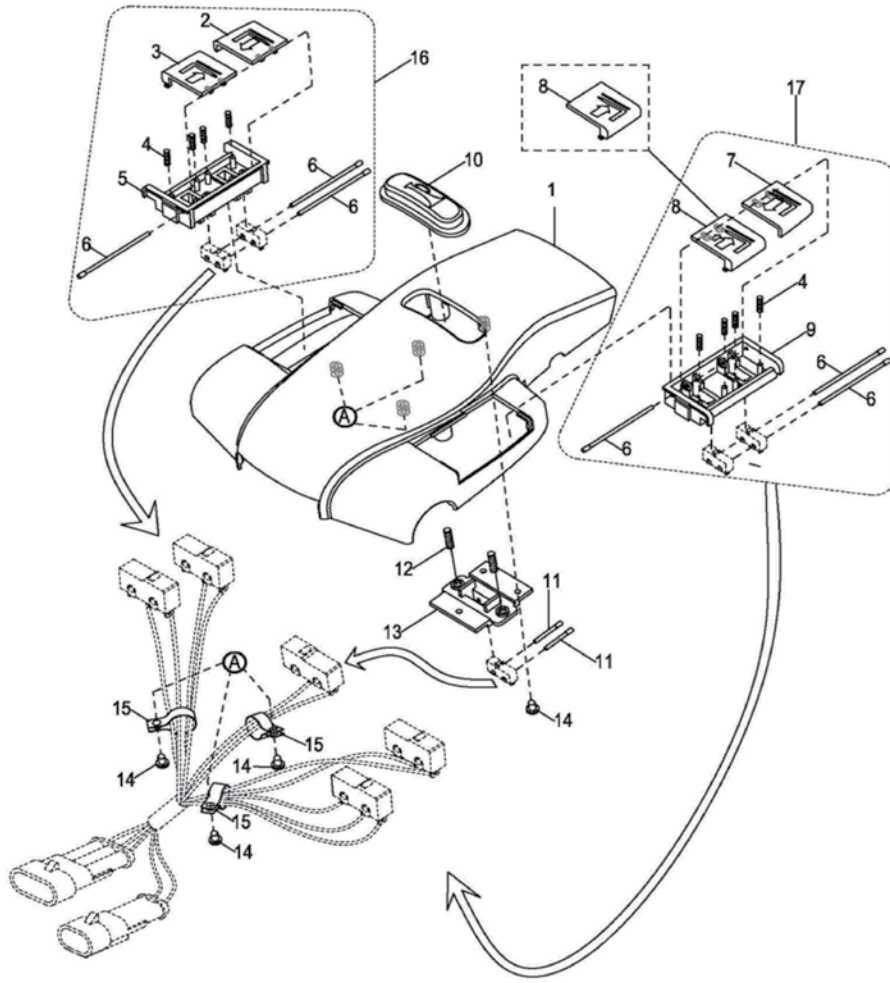


FIGURE 5-5 LEFT LIFT / LOWER SWITCH ASSEMBLY (RIGHT SIMILAR)

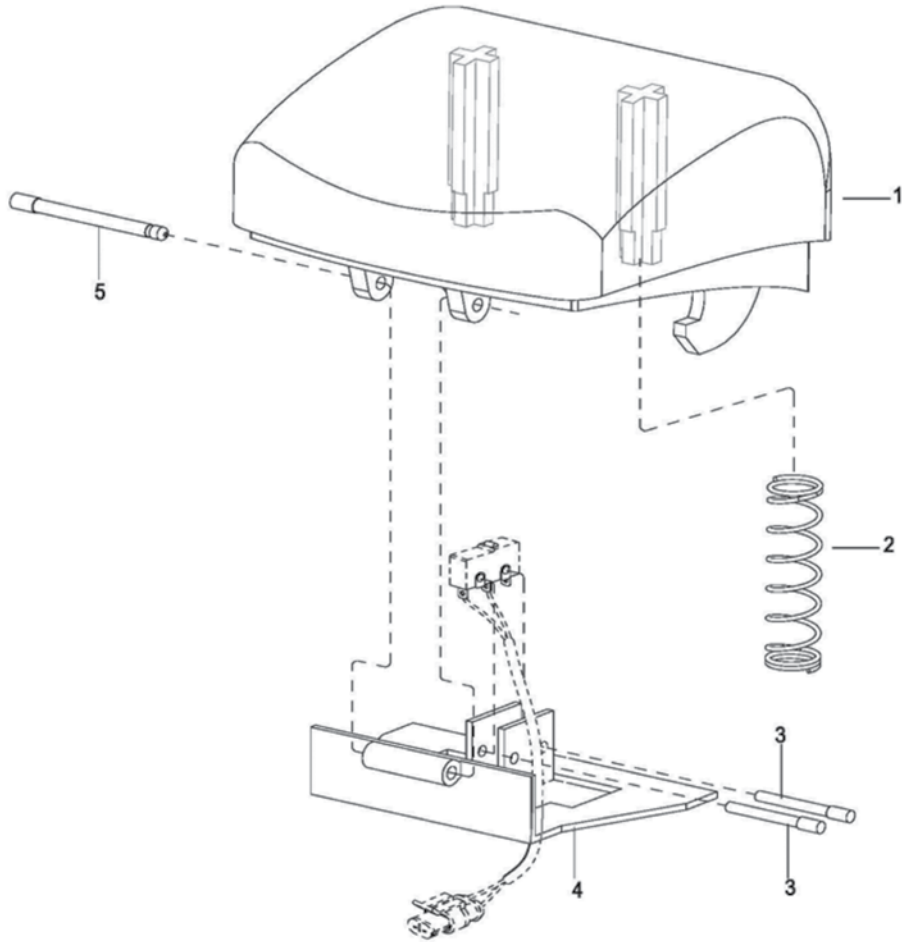
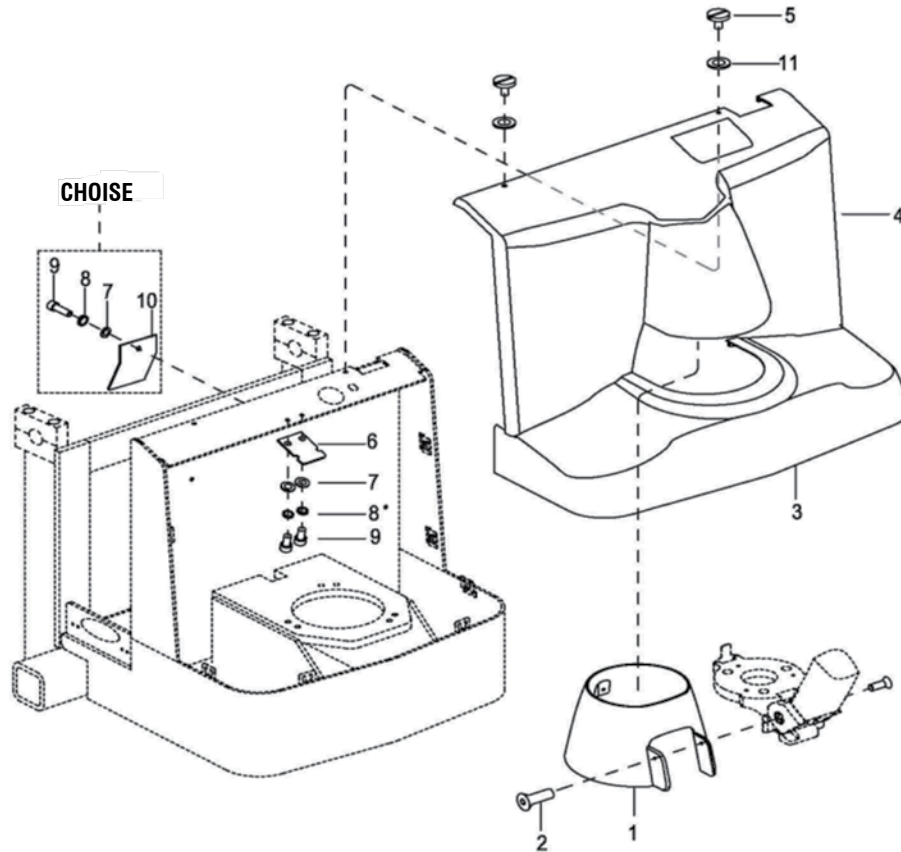


FIGURE 5-6 COMPARTMENT



7.2 COMPARTMENT COVERS

7.2.1 REMOVAL

1. Turn off the key switch (6, Figure 12-28) and disconnect the batteries.
2. Remove two screws (5, Figure 5-6) and upper cover (4).
3. Remove two screws (2).
4. Remove middle cover (1).
5. Pull the lower cover (3) from the frame.

7.2.2 INSTALLATION

1. Position the lower cover (3, Figure 5-6) on the frame.
 2. Place middle cover (1) around the brake and secure with two screws (2).
 3. Slide the center portion of middle cover into place.
 4. Install upper cover (4) and secure with two screws (5).
 5. Reconnect the batteries and turn on the key switch (6, Figure 12-28).
- Figure 5-6** Compartment R6631A

7.3 STEERING ARM

7.3.1 RETURN SPRING REPLACEMENT

The steering arm gas return spring (3, **Figure 5-1**) is replaced while the steering arm (2) is in the upright position.

1. Remove the compartment covers as described in paragraph 5-2.
2. Secure the steering arm (2) in the upright position.
3. Remove screw (4) and free the gas return spring (3) from brake plate (17).
4. Pull downward on the gas return spring (3) to free it from its seat inside steering arm (2).
5. Position the new gas return spring (3) inside the steering arm being sure it fully engages its seat.
6. Position the opposite end of the gas return spring (3) on brake plate (17) and install screw (4).
7. Install the compartment covers as described in paragraph 5-2.

7.3.2 STEERING ARM REMOVAL

1. Remove the compartment covers as described in paragraph 5-2.
2. Disconnect harness (28, **Figure 5-1**) from harness (1, **Figure 12-31**).
3. Attach a hoist to steering arm (2, **Figure 5-1**).
4. Remove shaft (5) and the steering arm (2).

7.3.3 STEERING ARM INSTALLATION

1. Position steering arm (2, **Figure 5-1**) over bracket (17) and secure with shaft (5).
2. Reconnect harness (28, **Figure 5-1**) to harness (1, **Figure 12-31**).
3. Install the compartment covers as described in paragraph 5-2.

8.0 BRAKE SERVICING

8.1 BRAKES

The brake system consists of a drive motor mounted brake. This brake is spring applied and electrically released. Should it become necessary to move a dead truck, the brake is equipped with an adjusting nut (**Figure 6-1**) that may be manually loosened to release the brake.

WARNING

Before returning the truck to operation, be sure to return the brake adjusting nut to its original position and check for proper braking function. Failure to return adjusting nut to its original position results in truck having no braking ability.

8.1.1. AIR GAP ADJUSTMENT

The “air gap” is the distance between the magnet body and the rotor plate with the brake applied. As the brake pads and rotor wear normally, the air gap will increase and should be readjusted when it measures more than 0.25 mm.

NOTE: If the air gap measures more than 0.25 mm, the brake may not release properly. Air gap adjustment can be performed as long as the brake pads and rotor function properly or until the adjustable spacer threads are fully engaged (adjustment limit reached).

1. Block load wheels.
2. Remove the compartment covers as described in paragraph 5-2.
3. Using low pressure air, remove any dirt between armatures and magnet body.
4. Using standard feeler gauges, check the gap between the magnet body and the rotor plate. The gap should be 0.25 mm.

5. If necessary, refer to **Figure 6-1** and adjust the gap as follows:
 - a. Loosen the three mounting screws by half a turn.
 - f. The threaded air gap adjusting nuts can then be screwed into Magnet Body by turning counterclockwise.
 - g. Turn the three mounting screws clockwise until the gap measures 0.012" (0.25 mm).
 - h. The threaded air gap adjusting nuts are then screwed clockwise until they bottom.
 - i. Finally tighten the three mounting screws to 52 in-lb (6 Nm).
 - j. Recheck the gap.
6. Remove load wheel blocks and check operation.
7. Install the compartment covers as described in paragraph 5-2.

8.1.2 STOPPING DISTANCE ADJUSTMENT

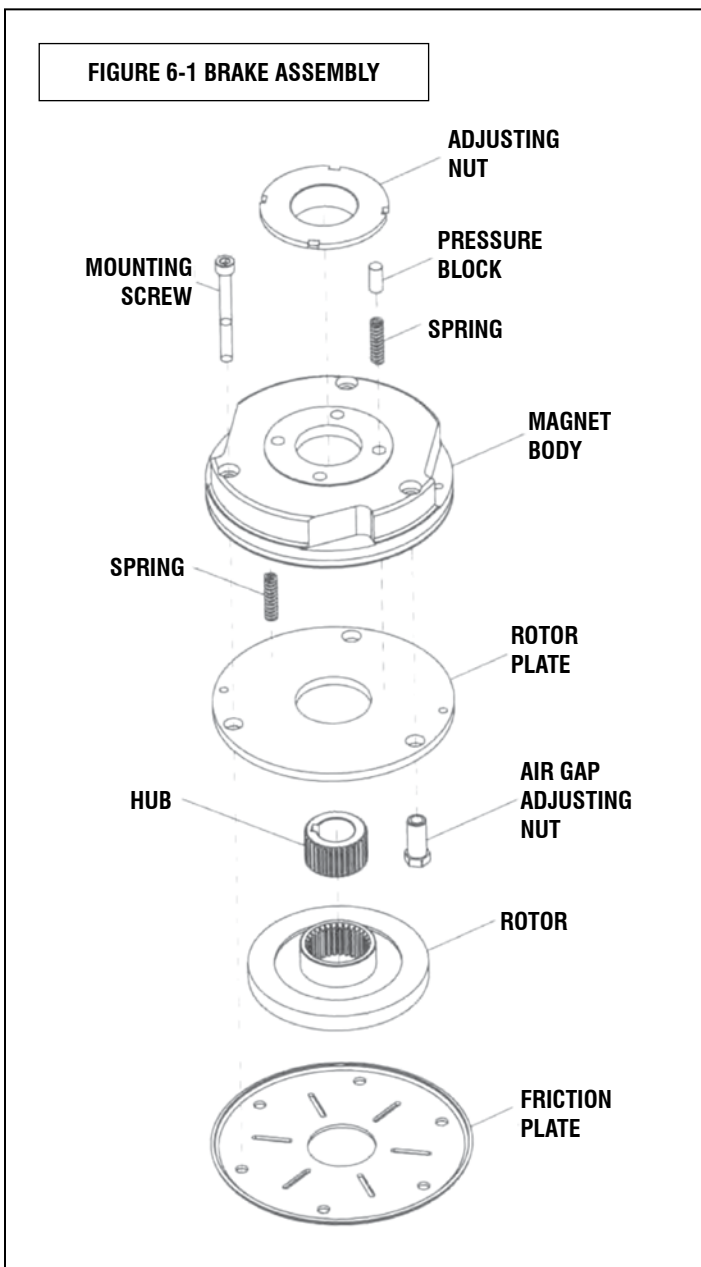
The stopping distance of the truck should require minimal adjustment. However, this distance should be checked with each planned maintenance. Using an unloaded truck, run truck to its top speed on an even dry concrete surface. Move control handle into the lower braking position. Measure length of braking path from the actuation point of the brakes until the truck has stopped. The actual length of the braking path should be between approximately 1.5 - 2.5 ft (0.5-0.7 m).

To adjust stopping distance, proceed as follows:

1. Block load wheels.
2. Remove the compartment covers as described in paragraph 5-2.
3. Rotate the adjusting nut (**Figure 6-1**) clockwise to SHORTEN the stopping distance or counterclockwise to LENGTHEN the stopping distance.
4. Remove load wheel blocks and check operation.
5. Install the compartment covers as described in paragraph 5-2.

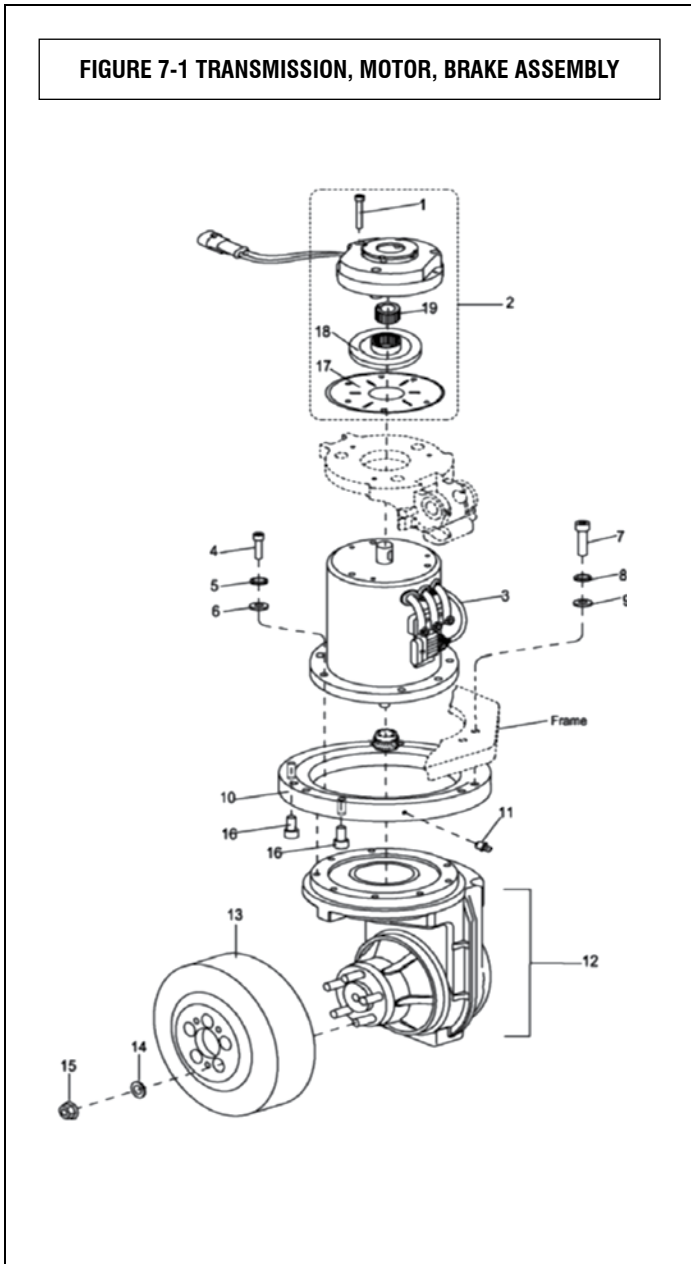
8.1.3 BRAKE ASSEMBLY REPLACEMENT

1. Block load wheels.
2. Remove the compartment covers as described in paragraph 5-2.
3. Disconnect electric brake from harness (**1, Figure 12-31**).
4. Remove the three mounting screws (**Figure 6-1**) and the brake.
5. Place the new brake into position and secure with the three mounting screws.
6. Finally tighten the three mounting screws to 52 inlb (6 Nm).
7. Reconnect electric brake from harness (**1, Figure 12-31**).
8. Remove load wheel blocks and check operation.
9. Install the compartment covers as described in paragraph 5-2.



9.0 TRANSMISSION, DRIVE WHEEL, LOAD WHEEL

FIGURE 7-1 TRANSMISSION, MOTOR, BRAKE ASSEMBLY



9.1 DRIVE WHEEL

1. Turn off the key switch (6, **Figure 12-28**) and disconnect the batteries.
2. Remove the compartment covers as described in paragraph 5-2.
3. Loosen but do not remove the five nuts (15, **Figure 7-1**).
4. Jack up the truck so the drive wheel is off the ground; then securely block the truck to prevent movement.
5. Remove the five nuts (15) five washers (14) and drive wheel (13) from the transmission (12).
6. Install new drive wheel in reverse order of removal.
7. Install the compartment covers as described in paragraph 5-2.
8. Reconnect the batteries and turn on the keyswitch (6, **Figure 12-28**).

9.2 TRANSMISSION

1. Turn off the key switch (6, **Figure 12-28**) and disconnect the batteries.
2. Remove the compartment covers as described in paragraph 5-2.
3. Remove the drive wheel (13) as described in paragraph 7-1.
4. Support the transmission (12, **Figure 7-1**) and remove the eight screws (4), eight lock washers (5) and eight flat washers (6).
5. Slowly lower the transmission out the bottom of the frame.
6. Install new transmission by reversing the steps above.

9.3 LOAD WHEEL

NOTE: The BGS-25 has single load wheels (**Figure 7-2**). The BGS-25 has dual load wheels (**Figure 7-3**).

9.3.1 REMOVAL

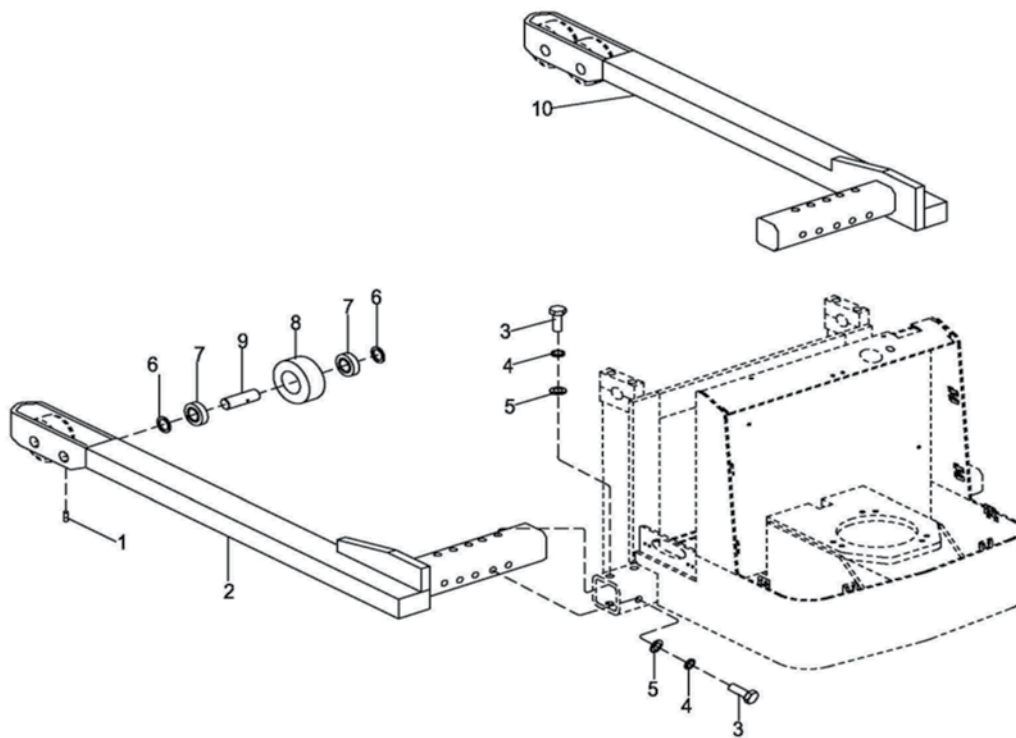
1. Raise forks.
2. Turn off the key switch (6, **Figure 12-28**) and disconnect the batteries.
3. Block the drive wheel to prevent the truck from rolling.
4. Jack up the forks to raise the load wheels off the floor. Securely block the forks in the raised position by positioning supports under both fork tips

NOTE: When shaft (9, **Figure 7-2** or **Figure 7-3**) is removed, load wheel assembly (8) will drop free.

5. Remove screw (1) securing shaft (9) and remove shaft (9) and load wheel assembly (8).

NOTE: Inspect the load wheel assembly. If the load wheel is worn within 1/8" of the metal sleeve, or is cracked or damaged, replace the entire load wheel and bearing assembly. Blue Giant recommends that both load wheel assemblies be replaced at the same time. This ensures level and safe operation of the lift truck.

FIGURE 7-2 ADJUSTABLE STRADDLE (BGS-25)



10.3 LIFT CHAIN WEAR INSPECTION

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

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

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

New chain anchor, clevis pins and cotter pins should be installed when chains are replaced. Never replace a partial section of chain and never repair chain. Refer to paragraph 8-4. when installing new chain.

10.4 LIFT CHAIN REPLACEMENT

10.4.1 TELESCOPIC

1. With the lift truck wheels securely blocked, raise the forks approximately three feet from floor and position blocks or strong supports under inner mast (**7, Figure 8-2**).
2. Lower inner mast onto the support. Check that arrangement is secure before proceeding.
3. Turn off the key switch (**6, Figure 12-28**) and disconnect the batteries. make certain power is disconnected.
4. Remove cotter pin (**3, Figure 8-1**) and clevis pin (4) connecting chain (5) to chain anchor (6) at the lift carriage.
5. Remove cotter pin (3) and clevis pin (4) connecting chain (5) to chain anchor (1) at the outer mast.

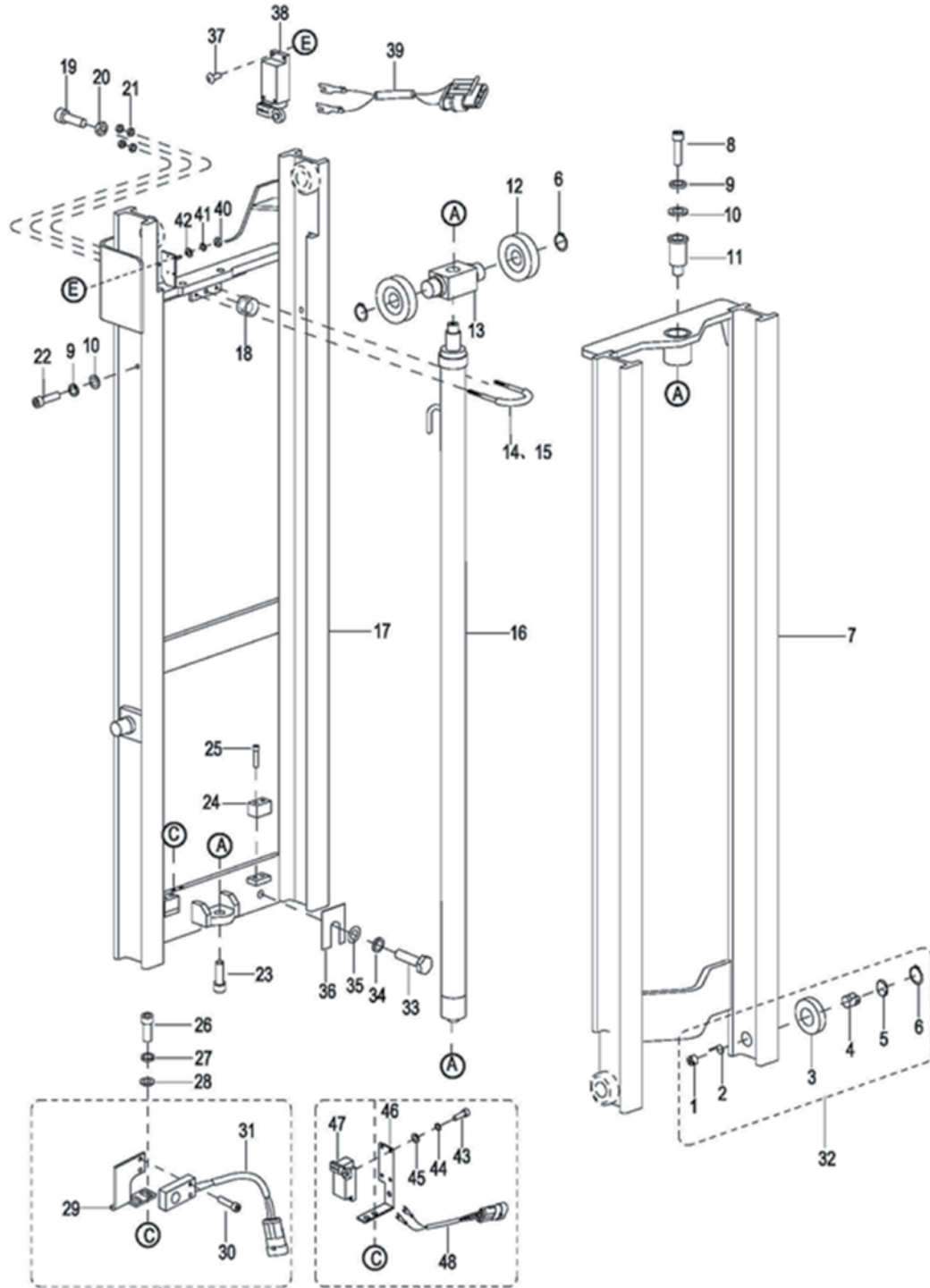


WARNING

Before returning the truck to operation, be sure to return the brake adjusting nut to its original position and check for proper braking function. Failure to return adjusting nut to its original position results in truck having no braking ability.

6. Remove chain from sheave (**12, Figure 8-2**).
7. Position new chain on sheave (12).
8. Secure new chain to new chain anchor (1) at the outer mast with new clevis pin (4) and new cotter pin (3).
9. Connect the opposite end of new chain to new chain anchor (6) at the lift carriage with new clevis pin (4) and new cotter pin (3).
10. Adjust the chains according to paragraph 8-2.
11. Reconnect the batteries and turn on the keyswitch (**6, Figure 12-28**).

FIGURE 8-2 MAST (TELESCOPIC)



10.4.2 TRIMAST FREE LIFT CHAIN

1. With the lift truck wheels securely blocked, raise the forks approximately three feet from floor and position blocks or strong supports under the lift carriage.
2. Lower the lift carriage onto the support. Check that arrangement is secure before proceeding.
3. Turn off the key switch (**6, Figure 12-28**) and disconnect the batteries.

WARNING

Before attempting any replacement, make certain power is disconnected.

4. Remove cotter pin (**3, Figure 8-1**) and clevis pin (4) connecting chain (5) to chain anchor (1) at the lift carriage.
5. Remove cotter pin (3) and clevis pin (1) connecting chain (5) to chain anchor (6) at free lift cylinder.
6. Remove chain from sheave (**7, Figure 8-3**).
7. Position new chain on sheave (7).
8. Secure new chain to new chain anchor (**6, Figure 8-1**) at free lift cylinder with new clevis pin (4) and new cotter pin (3).
9. Connect the opposite end of new chain to new chain anchor (1) at the lift carriage with new clevis pin (4) and new cotter pin (3).
10. Adjust the chains according to paragraph 8-2.
11. Reconnect the batteries and turn on the keyswitch (**6, Figure 12-28**).

10.4.3 TRIMAST SECONDARY LIFT CHAIN

1. With the lift truck wheels securely blocked, raise the forks approximately five feet from floor and position blocks or strong supports under masts (**22 and 14, Figure 8-3**).
2. Lower the masts onto the support. Check that arrangement is secure before proceeding.
3. Turn off the key switch (**6, Figure 12-28**) and disconnect the batteries.

WARNING

Before attempting any replacement, make certain power is disconnected.

4. Remove cotter pin (**3, Figure 8-1**) and clevis pin (4) connecting chain (5) to chain anchor (1) at the inner mast.
5. Remove cotter pin (3) and clevis pin (4) connecting chain (5) to chain anchor (6) at the outer mast.
6. Remove chain from sheave (**7, Figure 8-3**).
7. Position new chain on sheave (7).
8. Secure new chain to new chain anchor (6) at the outer mast with new clevis pin (4) and new cotter pin (3).
9. Connect the opposite end of new chain to new chain anchor (1) at the inner mast with new clevis pin (4) and new cotter pin (3).
10. Adjust the chains according to paragraph 8-2.
11. Reconnect the batteries and turn on the keyswitch (**6, Figure 12-28**).

10.5 LIFT CYLINDERS

NOTE: Removal and repair of lift cylinders are covered in SECTION 11.

FIGURE 8-3 MAST (TRIMAST)

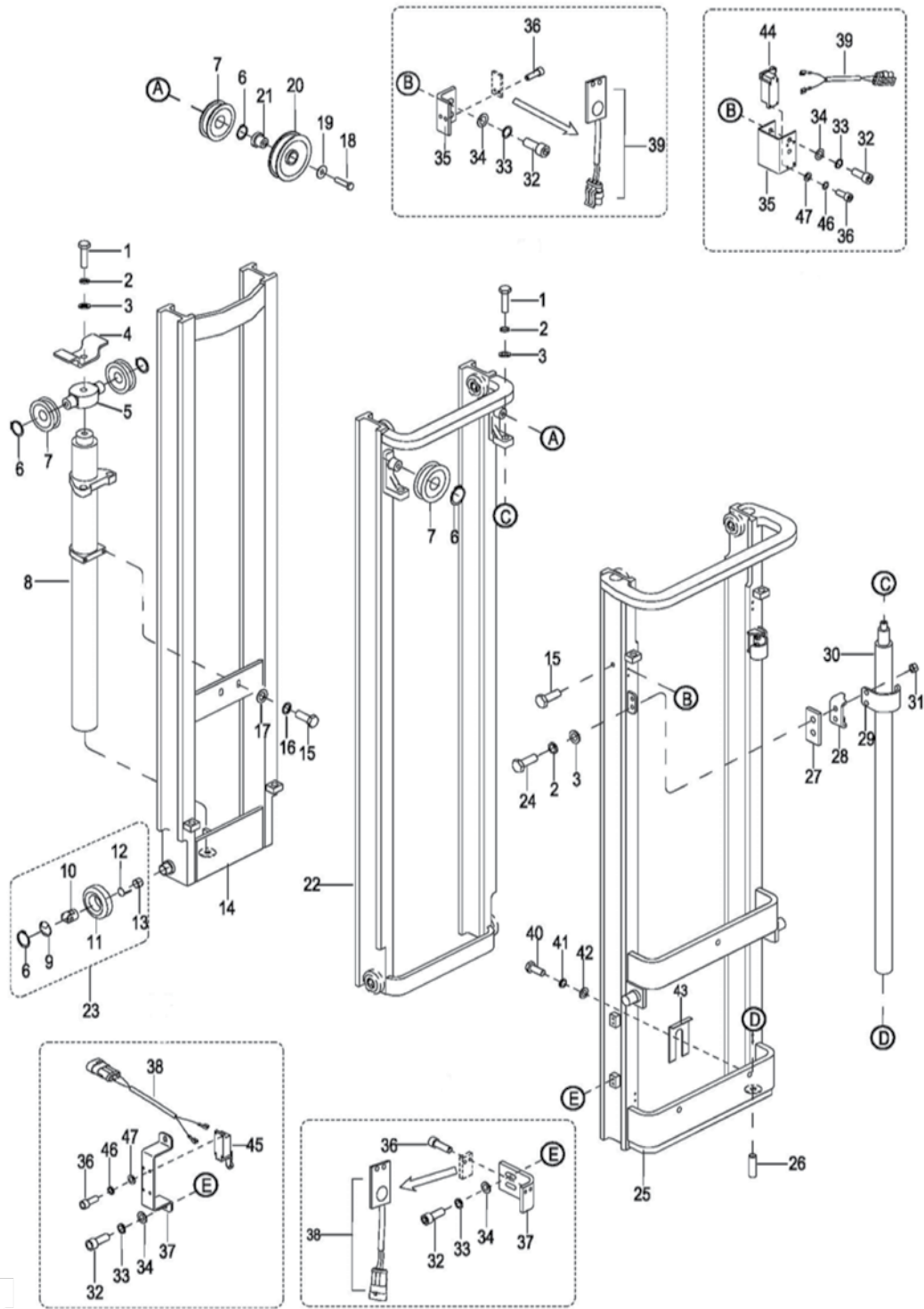
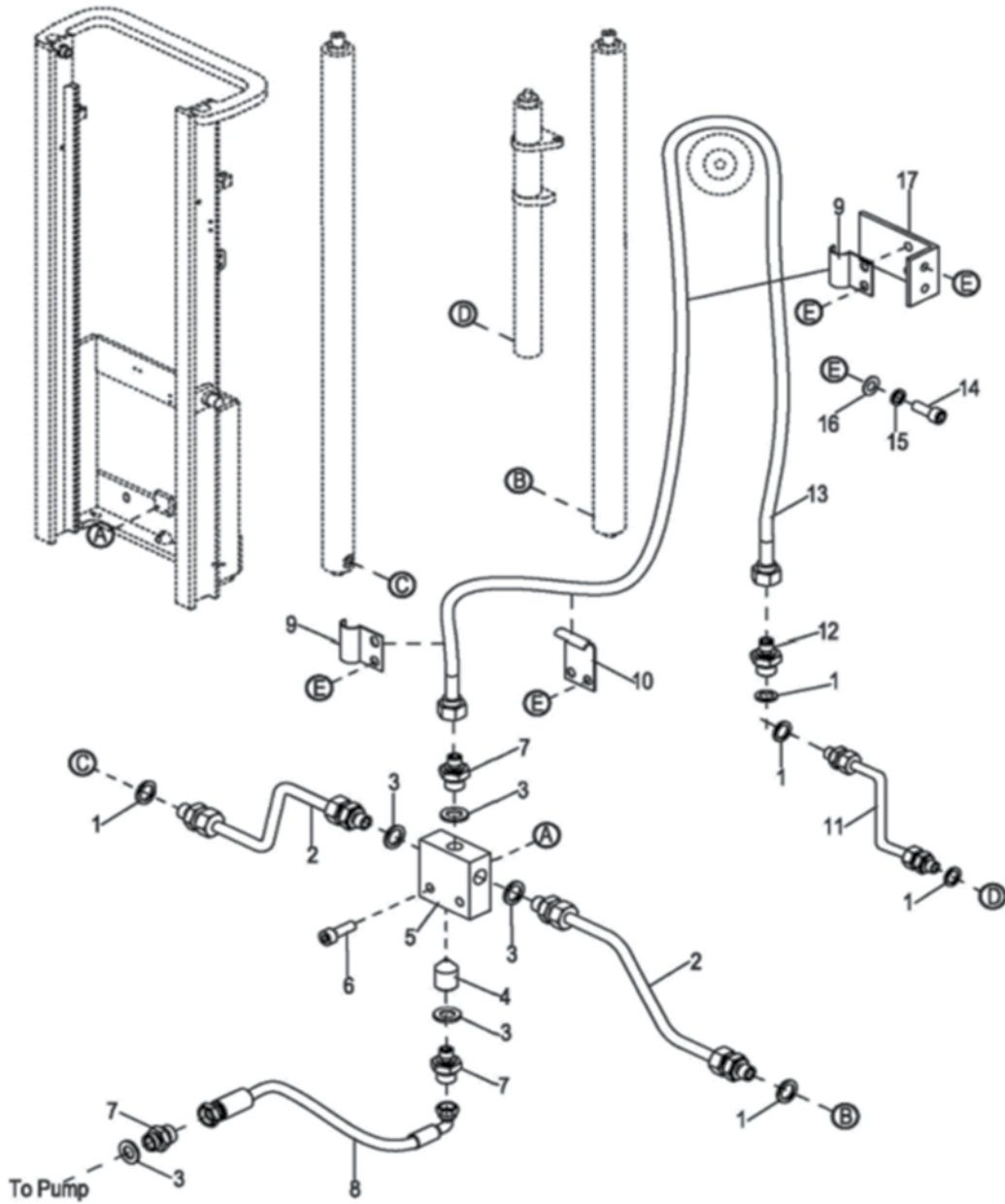
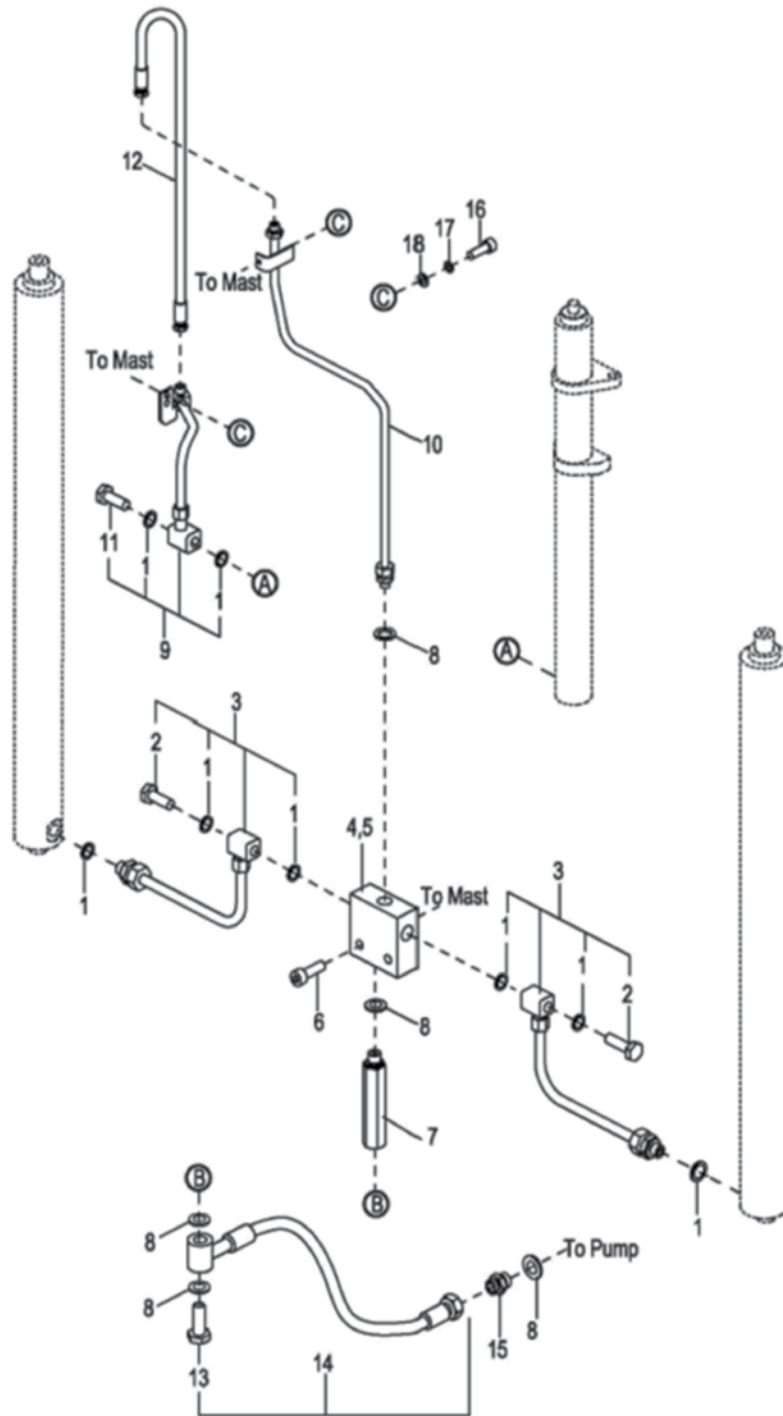


FIGURE 9-2 HYDRAULIC SYSTEM



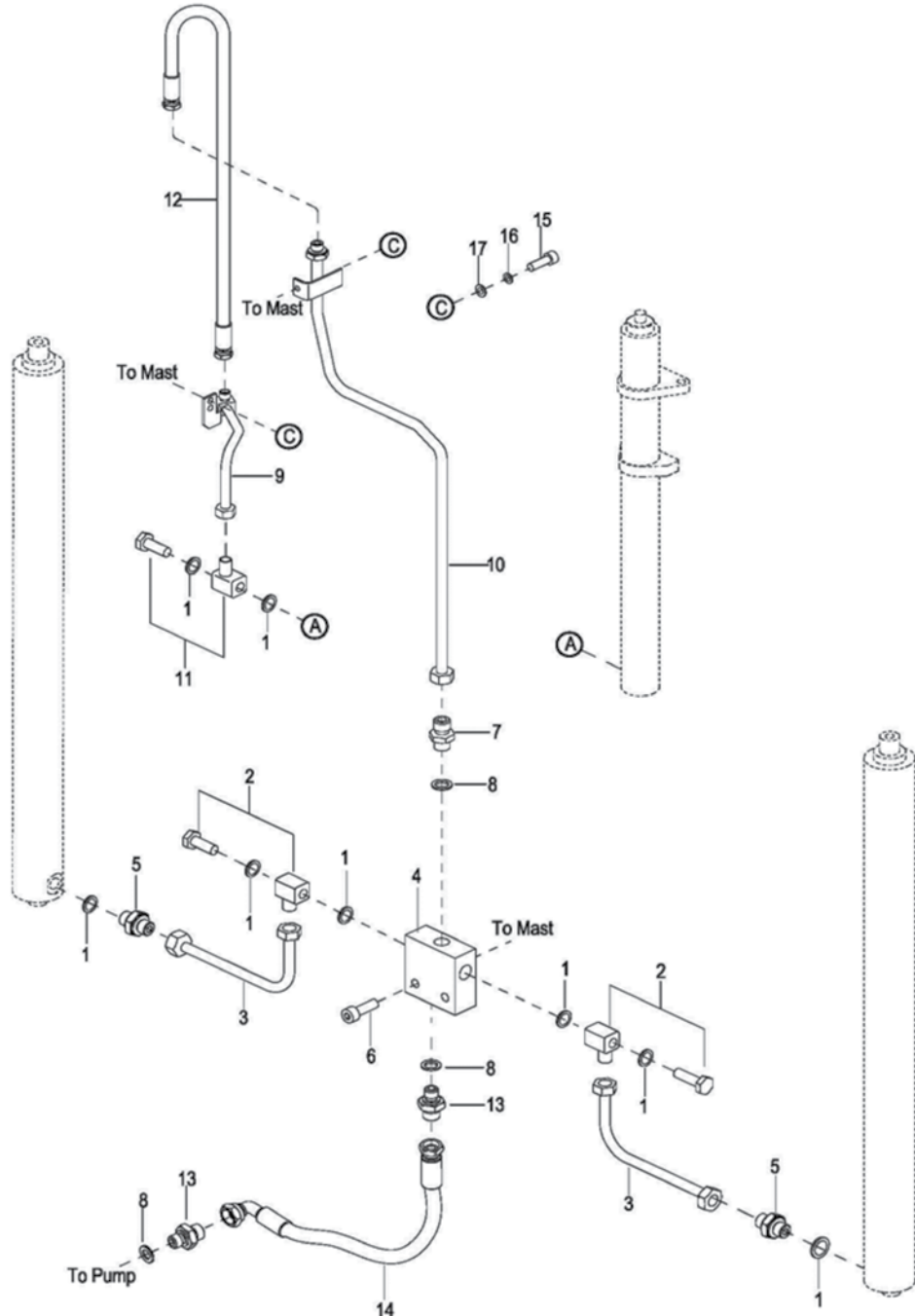
TRIMAST WITH HOSES - USED UP TO SERIAL # S2014055)

FIGURE 9-3 HYDRAULIC SYSTEM



TRIMAST WITH TUBES - USED FROM SERIAL # S2014056 TO S2119119

FIGURE 9-4 HYDRAULIC SYSTEM



11.2 HYDRAULIC PUMP, MOTOR, AND RESERVOIR ASSEMBLY

The hydraulic pump / motor assembly can be disassembled and repaired. However, a defective pump, valve or motor requires replacement of that component.



WARNING

When forks are raised, pressure exists in the hydraulic system lines and fittings. To ensure release of pressure, forks must be fully lowered and the batteries disconnected before performing any maintenance on the hydraulic system. on the hydraulic system.

11.2.1 REMOVAL

1. Lower forks fully.
2. Turn off the key switch (**6, Figure 12-28**) and disconnect the batteries.
3. Remove the compartment covers as described in paragraph 5-2.
4. Tag and disconnect electrical leads from motor and solenoid. Refer to **Figure 12-31** and **Figure 12-32**.

NOTE: The reservoir and hose will be filled with hydraulic oil. Place a container under the pump assembly to catch any hydraulic oil.

Telescopic: Disconnect hose (**9, Figure 9-1**) from pump / motor assembly.

Trimast: Disconnect hose (**8, Figure 9-2, 14, Figure 9-3 or 14, Figure 9-4**) from pump / motor assembly.

Single Speed: While supporting the pump / motor assembly (**4, Figure 12-21**), remove four screws (**16, Figure 9-5**) and four lock washers (17).

Dual Speed Up to Serial # S2313064: While supporting the pump / motor assembly (**4, Figure 12-21**), remove four screws (**16, Figure 9-6**) four lock washers (17) and four flat washers (18).

Dual Speed From Serial # S2313065: While supporting the pump / motor assembly (**4, Figure 12-21**), remove four screws (**10, Figure 9-7**) four lock washers (11).

5. Remove the pump / motor assembly.

11.2.2 DISASSEMBLY AND REASSEMBLY

1. Remove the hydraulic pump / motor assembly as described in paragraph 9-2.1.
2. Refer to **Figure 9-5, Figure 9-6** or **Figure 9-7** for disassembly and reassembly.

11.2.3 INSTALLATION

Single Speed: While supporting the pump / motor assembly (**4, Figure 12-21**), install four screws (**16, Figure 9-5**) and four lock washers (17).

Dual Speed Up to Serial # S2313064: While supporting the pump / motor assembly (**4, Figure 12-21**), remove four screws (**16, Figure 9-6**) four lock washers (17) and four flat washers (18).

Dual Speed From Serial # S2313065: While supporting the pump / motor assembly (**4, Figure 12-21**), remove four screws (**10, Figure 9-7**) four lock washers (11).

Telescopic: Reconnect hose (9, Figure 9-1) to pump / motor assembly.

Trimast: Reconnect hose (**8, Figure 9-2, 14, Figure 9-3 or 14, Figure 9-4**) to pump / motor assembly.

1. Connect electrical leads to motor and solenoid.
2. Refer to **Figure 12-31** and **Figure 12-32**.
3. Fill the hydraulic reservoir. Use hydraulic oil listed in **Table 3-2**.
4. Reconnect the batteries and turn on the keyswitch (**6, Figure 12-28**).
5. Operate the lift and lower buttons to refill the cylinder and lines with hydraulic oil.
6. Check level of hydraulic oil. If required, add hydraulic oil to bring to proper level. Use hydraulic oil listed in **Table 3-2**.
7. Install the compartment covers as described in paragraph 5-2.

FIGURE 9-5 PUMP AND MOTOR ASSEMBLY (SINGLE SPEED)

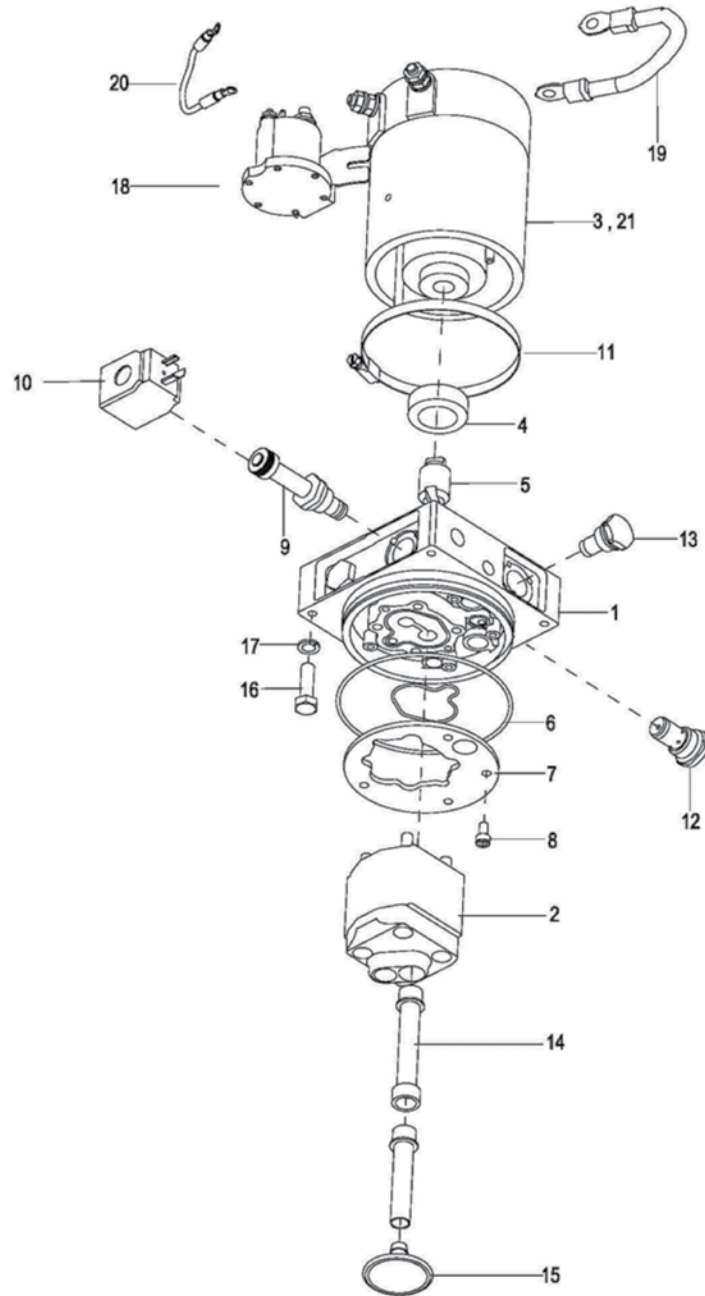
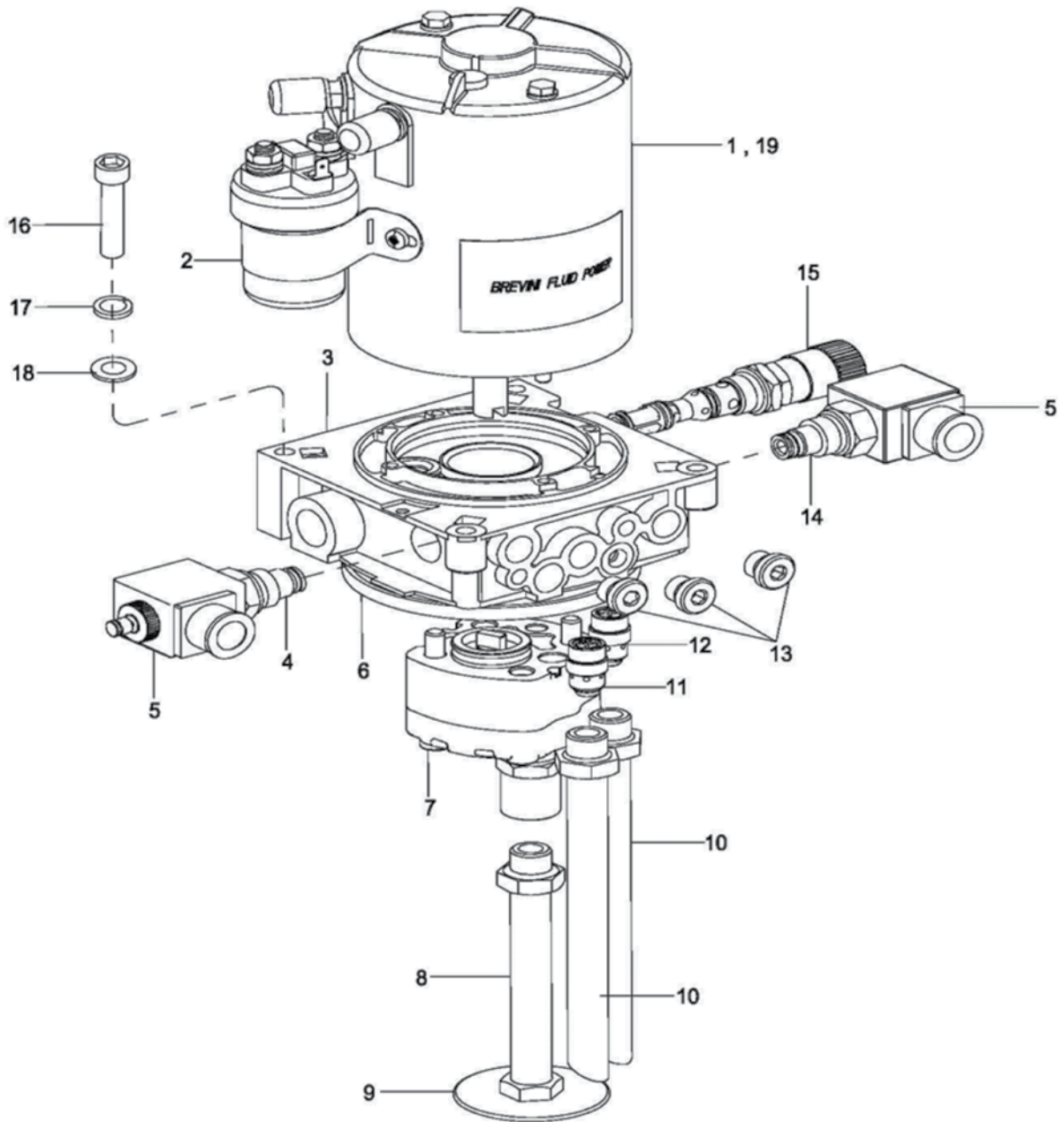
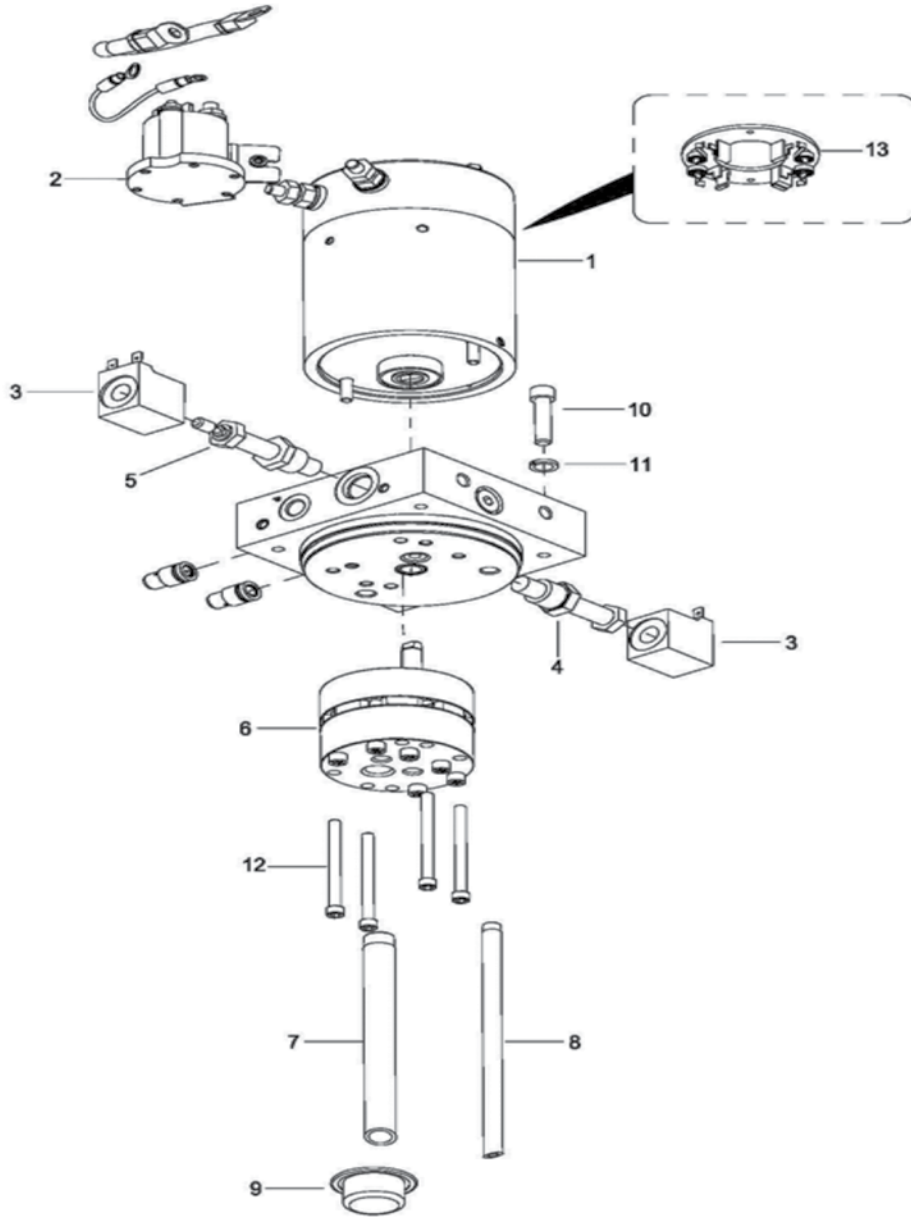


FIGURE 9-6 PUMP AND MOTOR ASSEMBLY



(Two Speed - Used Up to Serial # S2313064)

FIGURE 9-7 PUMP AND MOTOR ASSEMBLY



TWO SPEED - USED FROM SERIAL # S2313065)

11.2.4 LIFT CYLINDER (TELESCOPIC)**11.2.4.1 REMOVAL**

1. With the lift truck wheels securely blocked, raise the forks approximately three feet from floor and position blocks or strong supports under inner mast
2. Lower inner mast onto the support. Check that arrangement is secure before proceeding.
3. Turn off the key switch (**6, Figure 12-28**) and disconnect the batteries. make certain power is disconnected.

**WARNING**

Before attempting any replacement, make certain power is disconnected.

4. Remove screw (**8, Figure 9-9**), lock washer (9) and flat washer (10).
5. Remove screw (23). any oil immediately. Provide a container under the line or fitting before disconnecting.

**CAUTION**

Hydraulic oil can damage parts. Wipe off any oil immediately. Provide a container under the line or fitting before disconnecting.

6. Loosen hose (**9, Figure 9-1**) at the bottom of lift cylinder and manually push the ram down as far as possible. The chains will become slack and need not be removed.
7. Disconnect the hose from the bottom of lift cylinder.
8. Lift chains clear of sheaves (**12, Figure 9-9**) and lay them aside.

**WARNING**

Support lift cylinder before performing the following steps to prevent cylinder from falling.

9. Tilt lift cylinder (16) and ram head (13) forward from their position in the lift truck.
10. Lift ram head from lift cylinder.
11. Raise lift cylinder assembly up and out of truck.

11.2.4.2 REPAIR**CAUTION**

To prevent damage, use proper pipe clamp vise. The cylinder will be distorted if the vise is tightened too much.

1. Secure the lift cylinder in a vise, clamping lightly at the base of the cylinder.
2. Remove gland nut (**7, Figure 9-8**).
3. Remove wiper ring (8). and O-ring (9) from gland nut (4).
4. Pull out piston rod (1).
5. Remove piston (2) and O-ring (3) from rod (1).
6. Remove guide ring (10) and seal (11) from piston (2).
7. Coat all parts with hydraulic oil (**Table 3-2**).
8. Install guide ring (10) and new seal (11) on piston(2).
9. Install new O-ring (3) on rod (1).
10. Install piston (2) on rod (1).
11. Insert rod (1) in cylinder tube (6).
12. Install new O-ring (9) and new wiper ring (8) on gland nut (7).
13. Install gland nut (7) in cylinder tube (6).

11.2.4.3 INSTALLATION

1. Position the cylinder on outer mast (17, **Figure 9-9**).
2. With the cylinder tilted slightly forward, position ram head (13) on top of cylinder (16). Then tilt the cylinder back into position.
3. Lift up the lift chains and position them on sheaves (12).
4. Using a suitable lifting device, support the inner mast and remove the supports.
5. Slowly lower the inner mast while lining up the lift cylinder with positioner (11).
6. Secure the top of the cylinder with screw (8), lock washer (9) and flat washer (10).
7. Secure the bottom of the cylinder with screw (23).
8. Reconnect the hose (9, **Figure 9-1**) to the bottom of lift cylinder.
9. Adjust the chains according to paragraph 8-2.
10. Fill the hydraulic reservoir. Use hydraulic oil listed in **Table 3-2**.
11. Reconnect the batteries and turn on the keyswitch (6, **Figure 12-28**).
12. Operate the lift and lower buttons to refill the cylinder and lines with hydraulic oil.
13. Check level of hydraulic oil. If required, add hydraulic oil to bring to proper level. Use hydraulic oil listed in **Table 3-2**.
14. Install the compartment covers as described in paragraph 5-2.

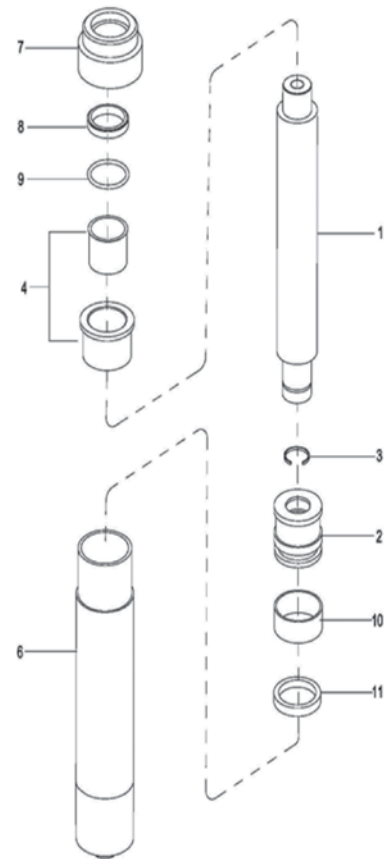
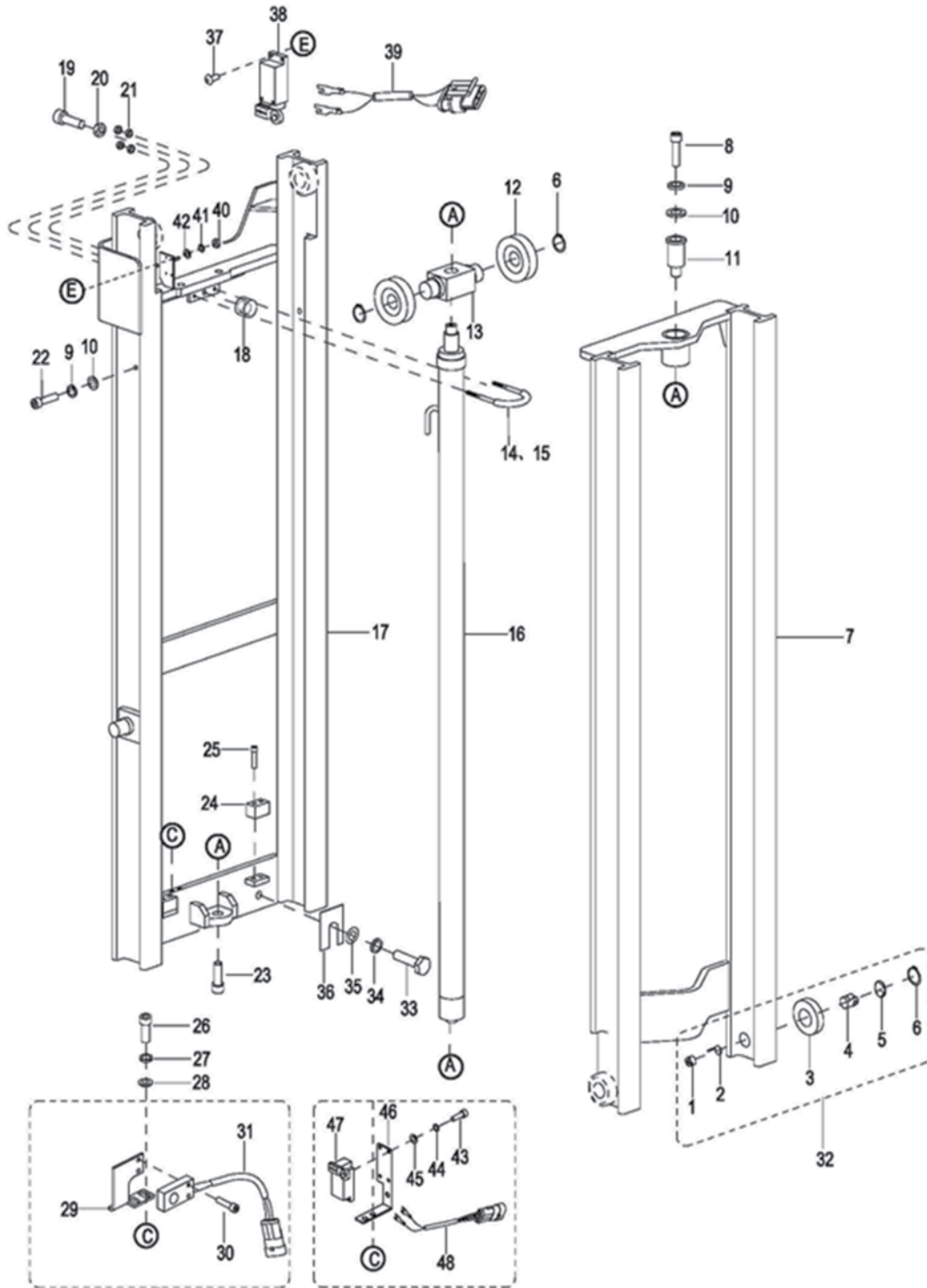
FIGURE 9-8 LIFT CYLINDER (TELESCOPIC)

FIGURE 9-9 MAST (TELESCOPIC)



11.2.5 LIFT CYLINDER (TRIMAST FREE LIFT)

11.2.5.1 REMOVAL

1. Fully lower the lift carriage.
2. Turn off the key switch (6, **Figure 12-28**) and disconnect the batteries.

WARNING

Before attempting any replacement, make certain power is disconnected.

3. Using another lift truck or suitable jack, raise lift carriage far enough to remove pressure on the free lift cylinder
4. Remove cotter pin (3, **Figure 12-16**) and clevis pin (4) connecting chain (5) to chain anchor (6) at free lift cylinder.
5. Remove chains from sheaves (7, **Figure 9-10**).
6. Remove screw (1), lock washer (2), flat washer (3), bracket (4) and ram head (5) from cylinder (8).

CAUTION

Hydraulic oil can damage parts. Wipe off any oil immediately. Provide a container under the line or fitting before disconnecting.

7. Disconnect the tube from the bottom of lift cylinder.
8. Support cylinder (8) and remove two screws (15), two lock washers (16) and two flat washers (17).
9. Raise lift cylinder assembly up and out of truck.

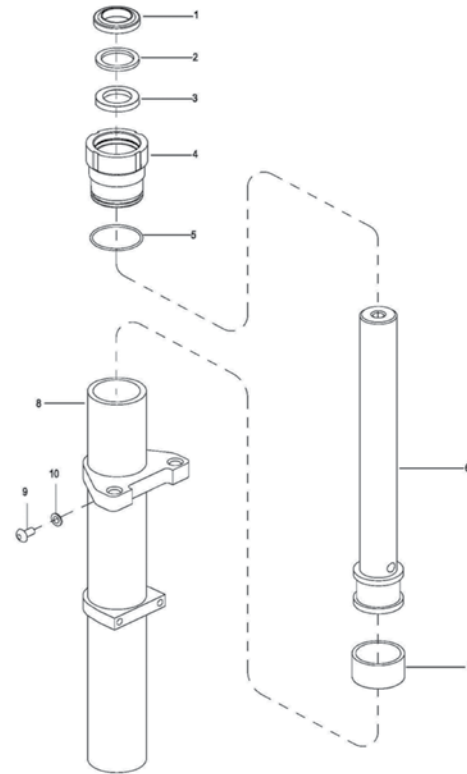
11.2.4.2 REPAIR

CAUTION

To prevent damage, use proper pipe clamp vise. The cylinder will be distorted if the vise is tightened too much.

1. Secure the lift cylinder in a vise, clamping lightly at the base of the cylinder.
2. Remove gland nut (4, **Figure 9-11**).
3. Remove wiper (1), backup ring (2), seal (3) and O-ring (5) from gland nut (4).
4. Pull out piston rod (6).
5. Remove guide ring (7) from piston rod (6).
6. Coat all parts with hydraulic oil (**Table 3-2**).
7. Install guide ring (7) on piston rod (6).
8. Insert rod (6) in cylinder tube (8).
9. Install O-ring (5), seal (3), backup ring (2) and wiper (1) on gland nut (4).
10. Install gland nut (4) in cylinder tube (8).

FIGURE 9-11 FREE LIFT CYLINDER (TRIMAST)



11.2.5.3 INSTALLATION

1. Position cylinder (4, **Figure 9-10**) on inner mast (40) and secure with two screws (15), two lock washers (16) and two flat washers (17).
2. Reconnect the tube to the bottom of the cylinder.
3. Position ram head (5) on cylinder (8) and secure with bracket (4), screw (1), lock washer (2), and flat washer (3).
4. Position lift chains over sheave, (7) and secure with clevis pin (4) and cotter pin (3).
5. Adjust the chains according to paragraph 8-2.
6. Reconnect the batteries and turn on the keyswitch (6, **Figure 12-28**). R6681A BL-BGS-25-0714 - 12-13-2016 9-13
7. Operate the lift and lower buttons to refill the cylinder and lines with hydraulic oil.
8. Check level of hydraulic oil. If required, add hydraulic oil to bring to proper level. Use hydraulic oil listed in **Table 3-2**.
9. Install the compartment covers as described in paragraph 5-2.

11.2.6 LIFT CYLINDER (TRIMAST SECONDARY)

11.2.6.1 REMOVAL

1. Fully lower the lift carriage.
2. Turn off the key switch (6, **Figure 12-28**) and disconnect the batteries.
3. Remove screw (1, **Figure 9-10**), lock washer (2) and flat washer (3) securing the top of cylinder (30) to mast (22).
4. Using another lift truck or suitable jack, raise middle mast (22) far enough to remove pressure on the secondary lift cylinder (30).
5. Disconnect the tube from the bottom of lift cylinder.
6. Support cylinder (30) and remove two nuts (31), two bolts (24), two lock washers (2), two flat washers (3), block (27), support (28) and clamp (29).
7. Raise lift cylinder assembly up and out of truck



WARNING

Before attempting any replacement, make certain power is disconnected.



CAUTION

Hydraulic oil can damage parts. Wipe off any oil immediately. Provide a container under the line or fitting before disconnecting.

11.2.6.2 REPAIR

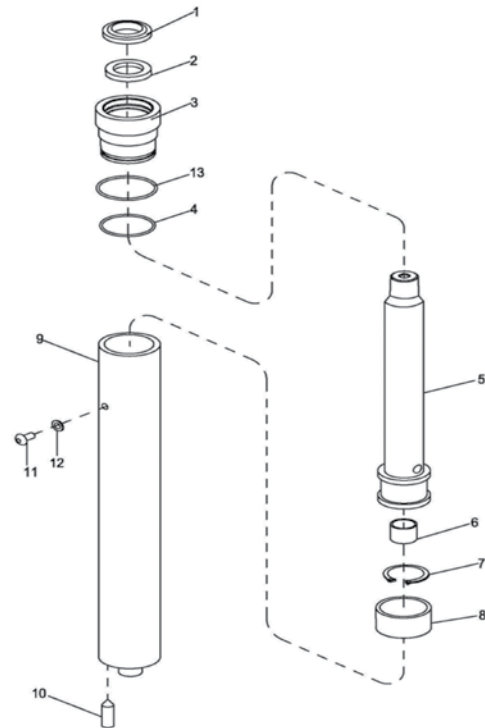


CAUTION

To prevent damage, use proper pipe clamp vise. The cylinder will be distorted if the vise is tightened too much.

1. Secure the lift cylinder in a vise, clamping lightly at the base of the cylinder.
2. Remove gland nut (3, **Figure 9-12**).
3. Remove wiper (1), seal (2), O-ring (13), and O-ring (4) from gland nut (3).
4. Pull out piston rod (5).
5. Remove ring (8), inner collar (7) and bushing (6) from piston rod (5).
6. Coat all parts with hydraulic oil (**Table 3-2**).
7. Install bushing (6), inner collar (7), and ring (8) on piston rod (5).
8. Insert rod (5) in cylinder tube (9).
9. Install O-ring (4), O-ring (13), seal (2), and wiper (1) on gland nut (3).
10. Install gland nut (3) in cylinder tube (9).

FIGURE 9-12 SECONDARY LIFT CYLINDER (TRIMAST)



11.2.6.3 INSTALLATION

1. Using another lift truck or suitable jack, raise middle mast (22, **Figure 9-10**) far enough to allow installation of the secondary lift cylinder (30).
2. Slowly lower mast (22) while aligning cylinder (30) with the top on mast (22).
3. Secure the top of cylinder (30) with flat washer (3), lock washer (2) and screw (1)
4. Install clamp (29), support (28), block (27), two flat washers (2) two lock washers (2), two bolts (24) and two nuts (31).
5. Reconnect the tube to the bottom of the lift cylinder.
6. 6. Fill the hydraulic reservoir. Use hydraulic oil listed in **Table 3-2**.
7. 7. Reconnect the batteries and turn on the keyswitch (6, **Figure 12-28**).
8. 8. Operate the lift and lower buttons to refill the cylinders and lines with hydraulic oil.
9. 9. Check level of hydraulic oil. If required, add hydraulic oil to bring to proper level. Use hydraulic oil listed in **Table 3-2**.
10. 10. Install the compartment covers as described in paragraph 5-2.

12.0 ELECTRICAL COMPONENTS

12.1 ELECTRICAL CONTROL PANEL

12.1.1 MAINTENANCE

NOTE: Erratic operation of the truck may be caused by defective controller components. Before removing the electrical panel, perform troubleshooting procedures per SECTION 6, to determine corrective action to be taken.

There are no user-serviceable parts inside the controller. No attempt should be made to open the controller. Opening the controller may damage it and will void the warranty.

The controller is programmed at the factory specifically for the truck model on which it is equipped. It is important to replace the controller with the correct preprogrammed unit to assure proper performance settings intended for that particular truck. See **Figure 12-29** for the preprogrammed controller number.

It is recommended that the controller exterior be cleaned periodically, and if a Zapi Handset is available, this periodic cleaning provides a good opportunity to check the controller's diagnostic history file. It is also recommended that the controller's fault detection circuitry be checked whenever the vehicle is serviced.

12.1.2 CLEANING

1. Turn off the key switch (**6, Figure 12-28**) and disconnect the batteries.
2. Remove the compartment covers as described in paragraph 5-2.
3. Remove any dirt or corrosion from the bus bar area. The controller should be wiped clean with a moist rag. Allow it to dry before reconnecting the battery.
4. Make sure the connections to the buss bars are tight. Use two well insulated wrenches for this task in order to avoid steering the buss bars.

12.1.3 PANEL REMOVAL

1. Turn off the key switch (**6, Figure 12-28**) and disconnect the batteries.
2. Remove the compartment covers as described in paragraph 5-2.
3. Tag and disconnect all electrical cables which connect to the control panel (**5, Figure 10-1**).
4. Remove horn (4) as described in paragraph 10-2.
5. Remove two screws (1), two lock washers (2), two flat washers (3) and control panel (5).

12.1.4 PANEL DISASSEMBLY

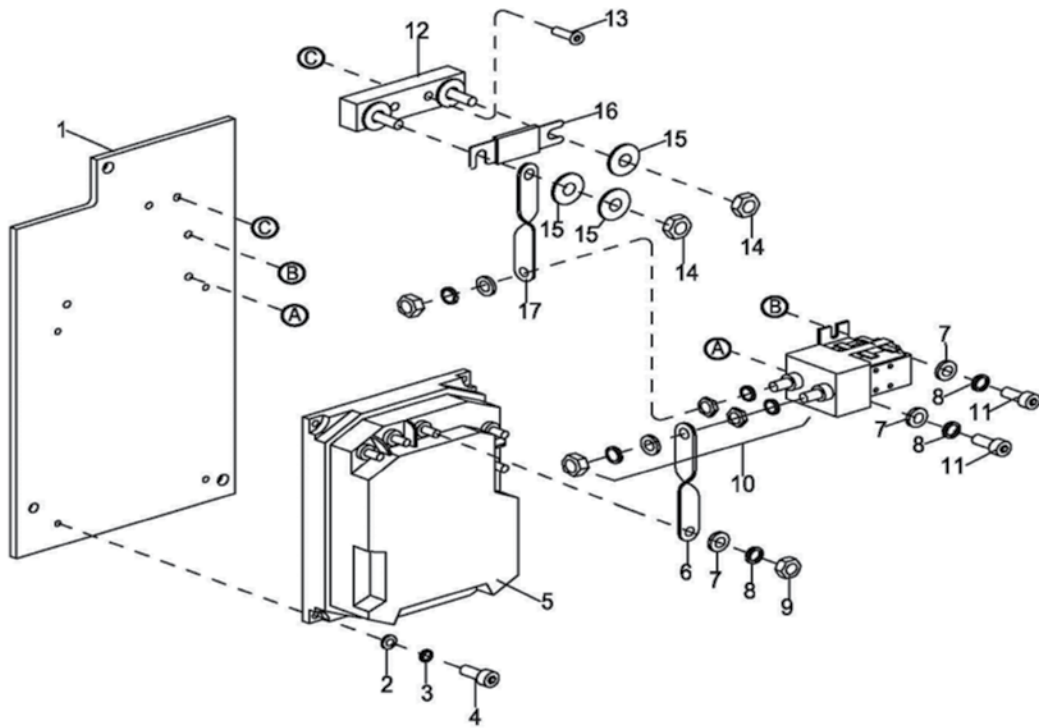
Refer to **Figure 10-2** for location and identity of the major replacement components mounted on the panel and remove defective parts.

NOTE: Contactor (10) is not repairable and must be replaced if defective. 10-1.5.Panel Installation.

12.1.5 PANEL DISASSEMBLY

1. Install the control panel (**5, Figure 10-1**) and secure with two screws (1), two lock washers (2) and two flat washers (3).
2. Install horn (4) as described in paragraph 10-2.
3. Refer to **Figure 12-31** and **Figure 12-32**, connect all electrical cables to the control panel as noted during removal.
4. Install the compartment covers as described in paragraph 5-2.
5. Reconnect the batteries and turn on the keyswitch (**6, Figure 12-28**).

FIGURE 10-2 ELECTRICAL PANEL



12.2 HORN REPLACEMENT

1. Turn off the key switch (6, Figure 12-28) and disconnect the batteries.
2. Remove the compartment covers as described in paragraph 5-2.
3. Tag and disconnect all electrical connections from horn (4, Figure 10-1).
4. Remove screw (1), lock washer (2), flat washer (3) and horn (4).
5. Install horn (4) and secure with screw (1), lock washer (2), flat washer (3).
6. Install the compartment covers as described in paragraph 5-2.
7. Reconnect the batteries and turn on the keyswitch (6, Figure 12-28).

12.3 PUMP MOTOR

The pump motor is replaceable but not repairable Refer to paragraph 9-2.

12.4 DRIVE MOTOR

The drive motor exposed surfaces should be cleaned at least once a month to assure proper cooling of motor. Use an air hose to blow dust off of motor surfaces.

12.4.1 MOTOR REMOVAL

1. Remove the brake as described in paragraph 6-1.3.
2. Remove the steering arm as described in paragraph 5-3.2.
3. Note routing of cables to ensure proper installation.
4. Tag the cables connected to the drive motor; then disconnect these cables from the drive motor.
5. Remove the eight screws (4, Figure 10-3), eight lock washers (5) and eight flat washers (6).
6. Lift motor (3) from transmission (12).
7. Remove nut (11, Figure 10-4), gear, and key (9).

12.4.2 MOTOR REPAIR

Refer to **Figure 10-4** for location and identity of the components of the drive motor.

12.4.3 MOTOR INSTALLATION

1. Position key (9, Figure 10-4) and gear on the shaft of the motor and secure with nut (11).
2. Install drive motor onto transmission. Make sure to align gears.
3. Reinstall the eight screws (4, Figure 10-3), eight lock washers (5) and eight flat washers (6) to secure the motor to the transmission.
4. Position cables as noted in removal and reconnect cables to the drive motor. Make sure to match the cable label to the terminal.
5. Reinstall the steering arm as described in paragraph 5-3.3.
6. Reinstall the brake as described in paragraph 6-1.3.

12.5 HIGH SPEED LIMIT SWITCH

1. Disconnect the harness from the lift limit switch (31, Figure 12-12 or 38, Figure 12-14).
2. Remove the hardware securing switch and remove the switch.

NOTE: The switch must be positioned so that it is operated when the lift carriage is down.

3. Position the new switch and secure with the hardware previously removed.
4. Reconnect harness to the lift limit switch.

12.6 DEADMAN SWITCH

12.6.1 REPLACEMENT

1. Disconnect wiring from the deadman switch (29, Figure 12-1).
2. Remove the two screws (21), and switches (29) from bracket (18).
3. Position the new switches (29) on bracket (18) and secure with the two screws (21).

13.0 OPTIONAL EQUIPMENT

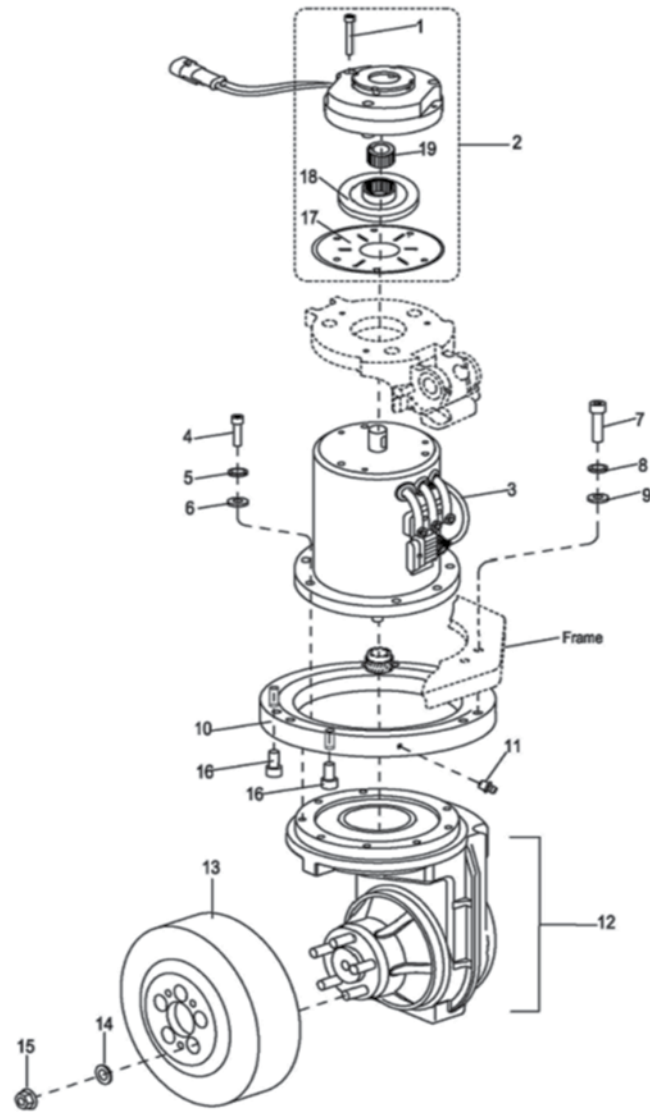
13.1 LOAD BACKREST

A load backrest is available for addition to the lift truck to allow handling of high loads.

13.2 SKID BARS

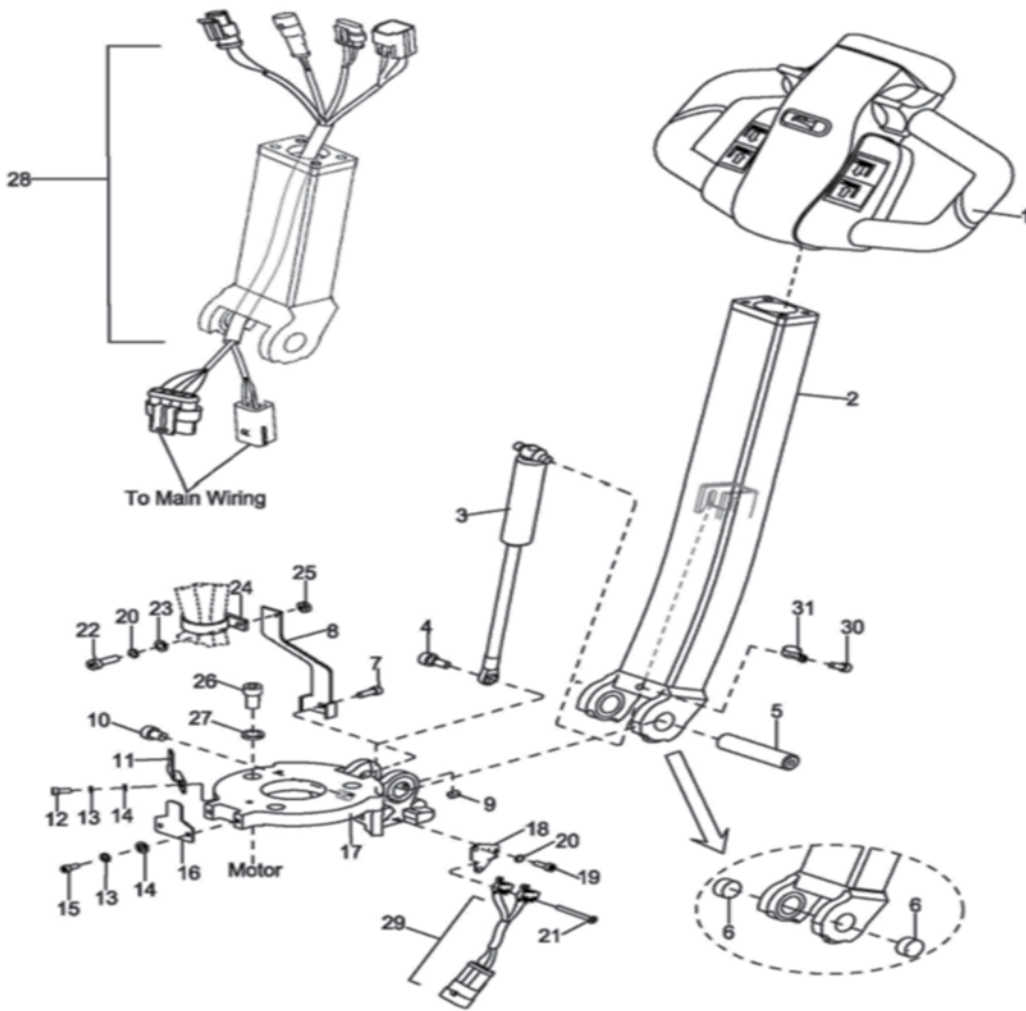
Skid bars for additional stability. Installation of the skid bars is shown in Figure 12-33.

FIGURE 10-3 TRANSMISSION, MOTOR, BRAKE ASSEMBLY



SECTION 12 ILLUSTRATED PARTS BREAKDOWN

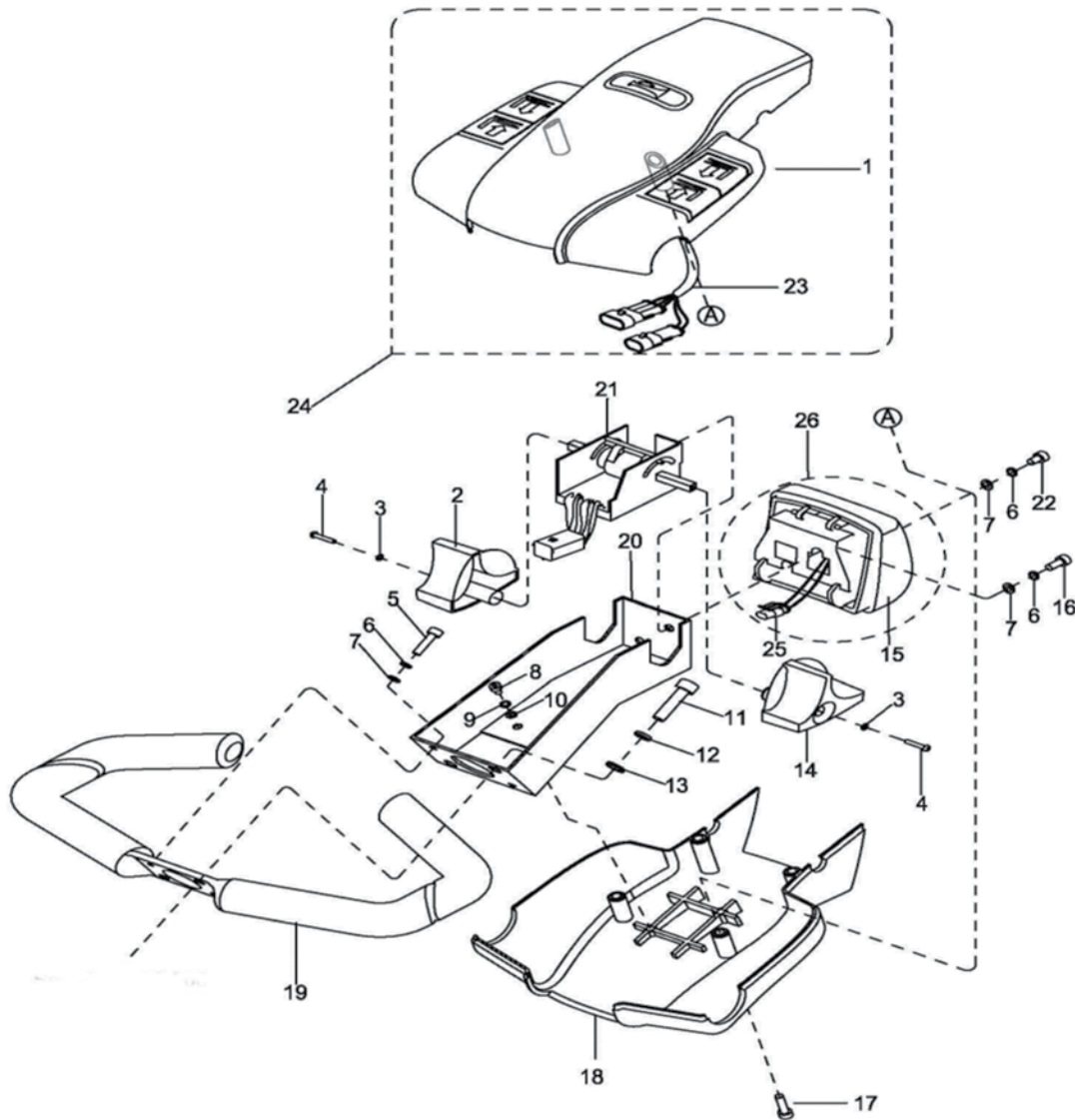
FIGURE 12-1 STEERING ARM



STEERING ARM

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES.
1	1120-340000-00-B	CONTROL HEAD ASSEMBLY -SINGLE SPEED LOWERING	1	Only used a a few trucks early on. (If your lowering button has 2 arrows on it chose Pos.# 1a.) - Used up to 07-31-2010
1a	2125-340000-10-B	CONTROL HEAD ASSEMBLY - SINGLE SPEED LOWERING	1	Only used a a few trucks early on. (If your lowering button has 2 arrows on it chose Pos.# 1a.) - Used from 08-01-2010
1b	1120-340000-10	CONTROL HEAD ASSEMBLY-2 SPEED LOWERING	1	Used on most trucks (if your lowering button has 2 arrows on it this is the correct part).
2	1120-330000-0A	STEER ARM SHAFT	1	
3	1120-320000-00	GAS SPRING	1	
4	0000-000322-00	SCREW	1	
5	1120-300003-00	SHAFT	1	
6	0000-000011-00	BUSHING	2	
7	0000-000032-00	SCREW	1	
8	1120-300005-00	BRACKET	1	
9	0000-000429-00	SCREW	1	
10	0000-000030-00	SCREW	1	
11	1120-300007-00	BRACKET	1	
12	0000-000117-00	SCREW	1	
13	0000-000206-00	WASHER	3	
14	0000-000390-00	FLAT WASHER	2	
15	0000-000004-00	SCREW	2	
16	1120-300004-00	FIXED PLATE	1	
17	1120-300001-0A	BRAKE BASE	1	
18	1120-300006-00	BRACKET	1	
19	0000-000088-00	SCREW	2	
20	0000-000122-00	LOCK WASHER	3	
21	0000-000377-00	SCREW	2	
22	0000-000378-00	SCREW	1	
23	0000-000702-00	FLAT WASHER	1	
24	0000-000491-00	PLASTIC RING	1	
25	0000-000209-00	NUT	1	
26	0000-000109-00	SCREW M8 x 16	3	
27	0000-000159-00	LOCK WASHER Ø8	3	
28	2125-520002-0C	WIRING HARNESS BGS-25	1	
29	2112-520003-0C	DEADMAN SWITCH ASSEMBLY	1	
30	0000-000010-00	SCREW	1	
31	0000-000490-00	LINE CLAMP	1	

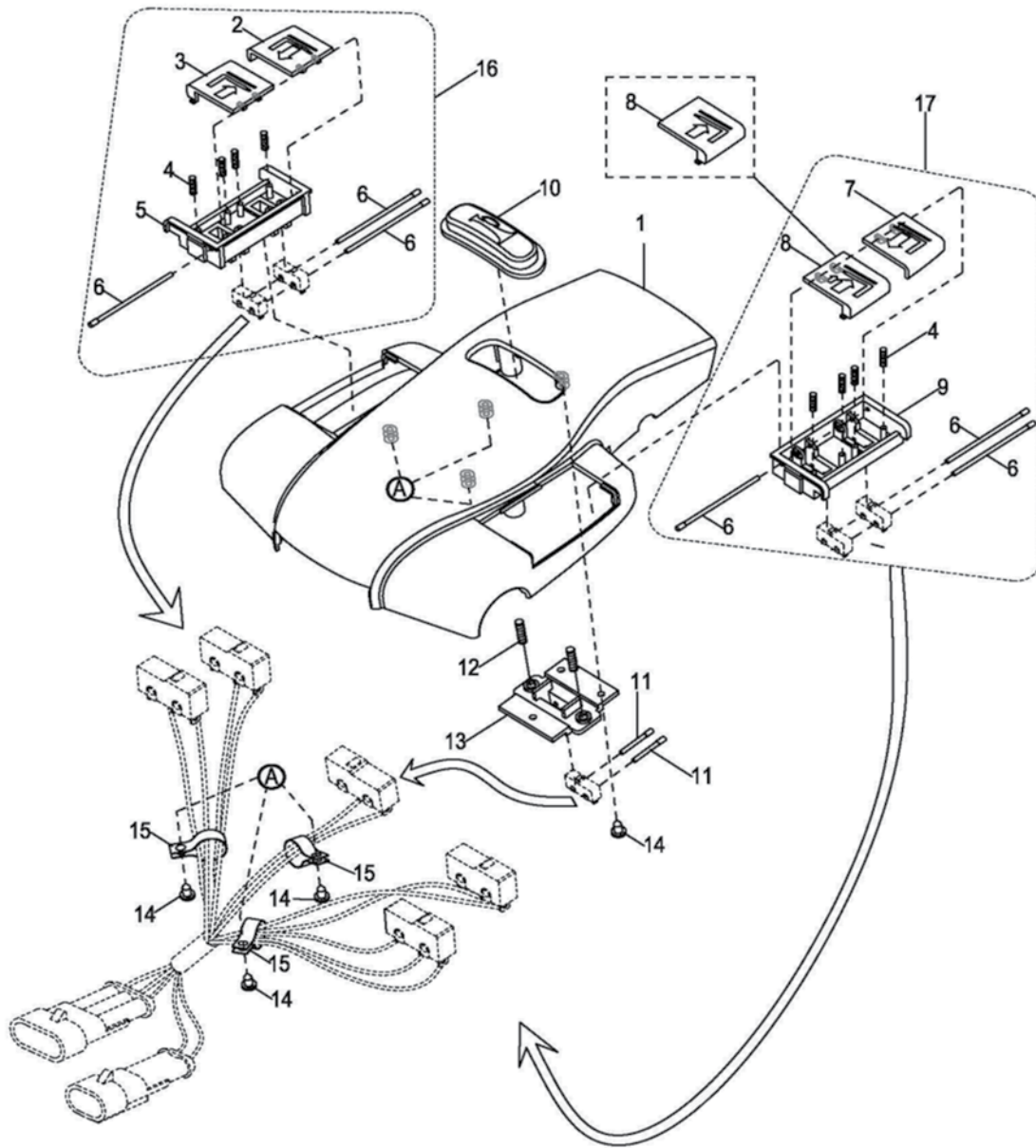
FIGURE 12-2 CONTROL HEAD



CONTROL HEAD

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	SEE POS. # 24 or 24a	CONTROL HEAD COVER	1	Single Speed version (Only a few trucks have this type, if your lowering button has two arrows you have a 2-Speed version)
1a	SEE POS. # 24b	CONTROL HEAD COVER	1	2-Speed Version (if your lowering button has two arrows you have a 2-Speed version)
2	1120-340005-00	CONTROL KNOB RIGHT SIDE	1	
3	0000-000038-00	LOCK WASHER ø3	2	
4	0000-000037-00	SCREW M3 x 12	2	
5	0000-000004-00	SCREW M5 x 12	2	
6	0000-000206-00	LOCK WASHER ø5	4	
7	0000-000390-00	FLAT WASHER ø5	4	
8	0000-000088-00	SCREW M4 x 8	2	
9	0000-000122-00	LOCK WASHER ø4	2	
10	0000-000702-00	FLAT WASHER ø4	2	
11	0000-000151-00	SCREW M8 x 25	2	
12	0000-000159-00	LOCK WASHER ø8	2	
13	0000-000176-00	FLAT WASHER ø8	2	
14	1120-340003-00	CONTROL KNOB LEFT SIDE	1	
15	1120-343000-00	EMERGENCY REVERSE BUTTON	1	
16	0000-000004-00	SCREW M5 x 12	2	
17	0000-000035-00	SCREW M5 x 20	4	
18	1120-340002-00	COVER	1	
19	1120-341000-00	HANDLE	1	
20	1120-340001-00	CONNECTOR BRACKET	1	
21	1220-520008-0C	ACCELERATOR ASSEMBLY	1	
22	0000-000010-00	SCREW M5 x 6	1	
23	1220-520006-0C	SINGLE SPEED WIRING HARNESS - BUTTONS	1	
23a	2125-520014-0C	2-SPEED WIRING HARNESS - BUTTONS	1	2-Speed Version (if your lowering button has two arrows you have a 2-Speed version)
24	1120-342000-00-B	CONTROL HEAD COVER ASSEMBLY WITH WIRING HARNESS - SINGLE SPEED LOWERING	1	Only used a a few trucks early on. (If your lowering button has 2 arrows on it chose Pos.# 24b.) - Used up to 07-31-2010 2-Speed version)
24a	2125-342000-10-B	CONTROL HEAD COVER ASSEMBLY WITH WIRING HARNESS - SINGLE SPEED LOWERING	1	Only used a a few trucks early on. (If your lowering button has 2 arrows on it chose Pos.# 24b.) - Used from 08-01-2010 2-Speed version)
24b	2125-342000-00-B	CONTROL HEAD COVER ASSEMBLY WITH WIRING HARNESS - 2-SPEED LOWERING	1	2-Speed Version (if your lowering button has two arrows you have a 2-Speed version)
25	1220-520005-00	REVERSING SWTICH HARNESS ASSEMBLY	1	
26	1120-343000-00-B	BELLY BUTTON COVER ASSEMBLY W/ WIRE HARNESS	1	2 Pln Connector trucks have this type, if your lowering button has two arrows you have a 2-Speed version)

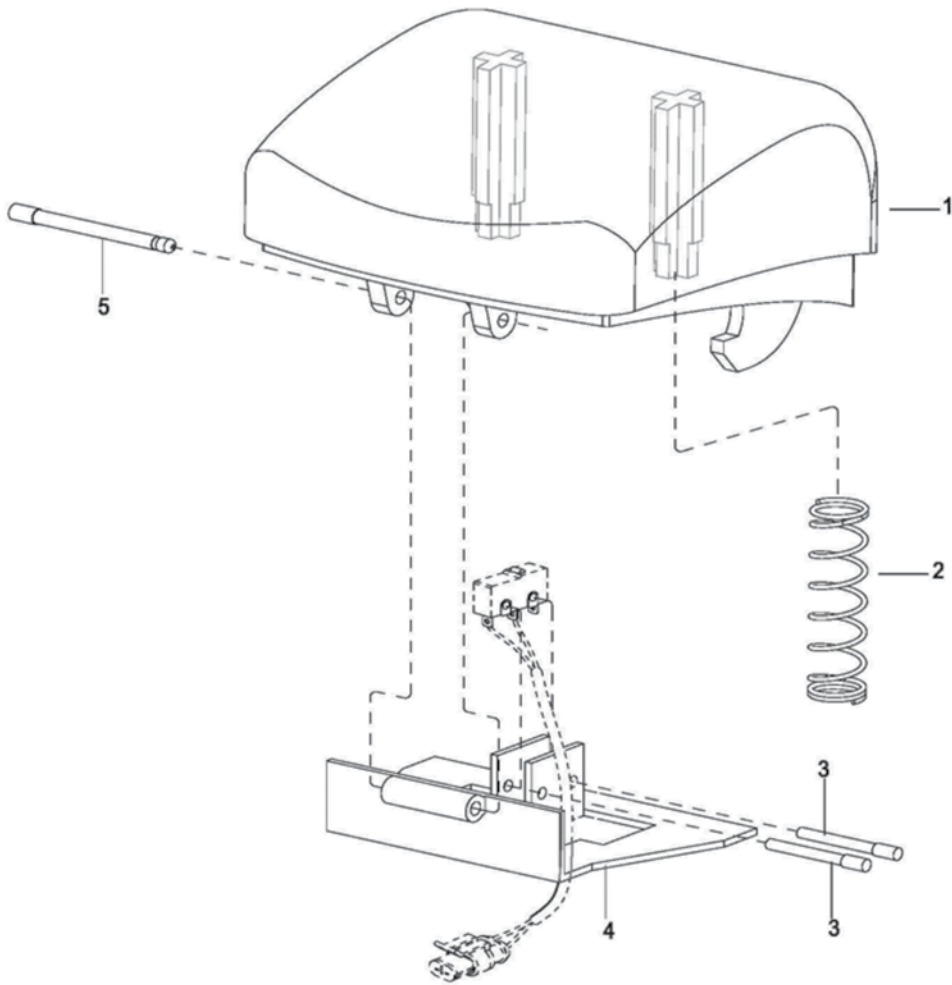
FIGURE 12-3 CAP ASSEMBLY



CAP ASSEMBLY

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	1120-342001-00	COVER	1	
2	1120-342203-00	LIFT BUTTON (R)	1	
3	1120-342202-00	LOWERING BUTTON (R)	1	
4	1120-342102-00	SPRING	8	
5	1120-342201-00	BUTTON BRACKET (R)	1	
6	1120-342105-00	PIN	6	
7	1120-342104-00	LIFT BUTTON (L)	1	
8	1120-342103-10	2 SPEED BUTTON FOR LOWERING	1	
8a	1120-342103-00	LOWERING BUTTON (L)	1	
9	1120-342101-00	BUTTON BRACKET (L)	1	
10	1120-342002-00	HORN BUTTON	1	
11	1120-342005-00	PIN	2	
12	1120-342003-00	SPRING	2	
13	1120-342004-00	BUTTON BRACKET	1	
14	0000-000039-00	SCREW ST3.5 x 9.5	6	
15	0000-000490-00	LINE CLAMP	3	
16	1120-342200-00	LIFT / LOWER SWITCH BOX RIGHT SIDE	1	Switches not included
17	2125-342100-00	2-SPEED LIFT AND LOWER BOX (L) ASSEMBLY	1	Switches not included
17a	1120-342100-00	LIFT / LOWER SWITCH BOX LEFT SIDE	1	Switches not included

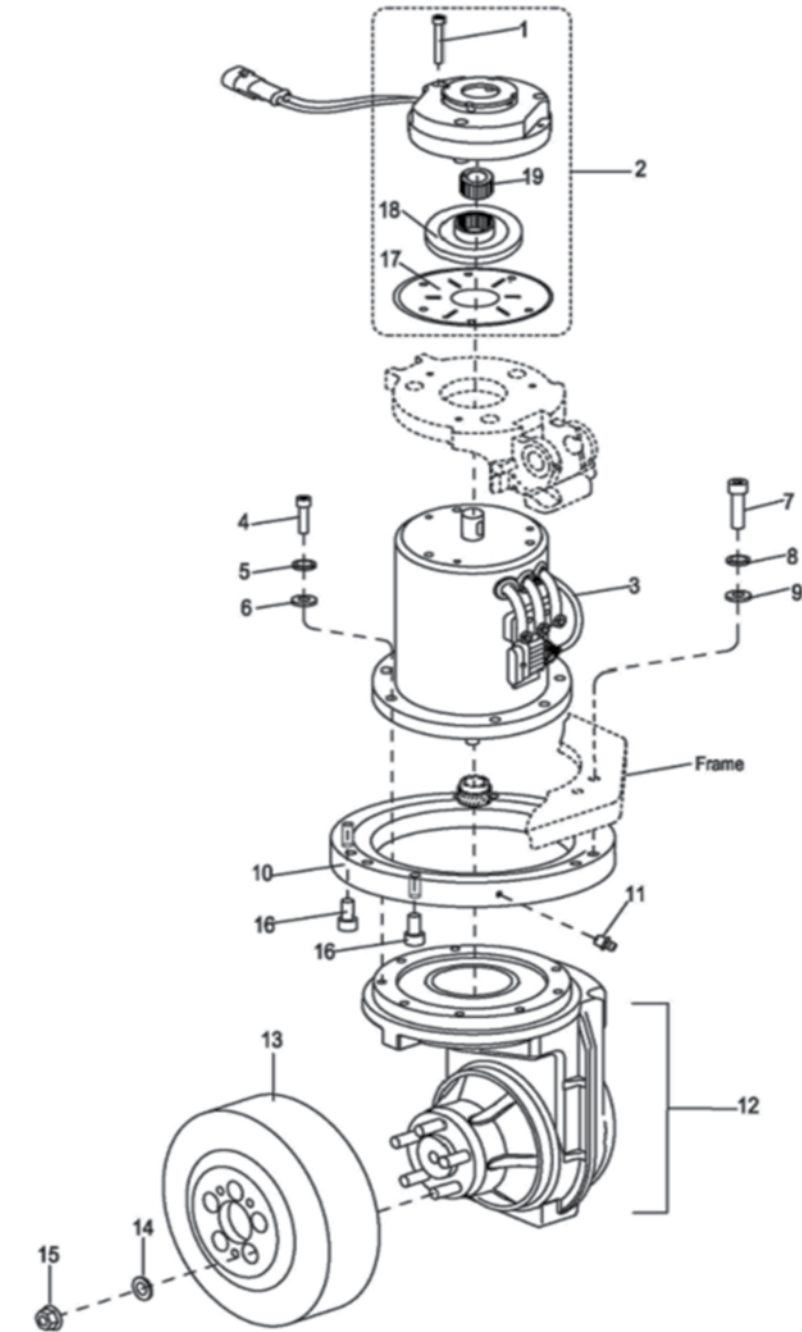
FIGURE 12-4 EMERGENCY REVERSE SWITCH ASSEMBLY



EMERGENCY REVERSE SWITCH ASSEMBLY

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	1120-343002-00	EMERGENCY REVERSE BUTTON	1	
2	1120-343003-00	SPRING	2	
3	1120-342005-00	PIN	2	
4	1120-343001-0A	BRACKET	1	
5	1120-343004-00	PIN	1	

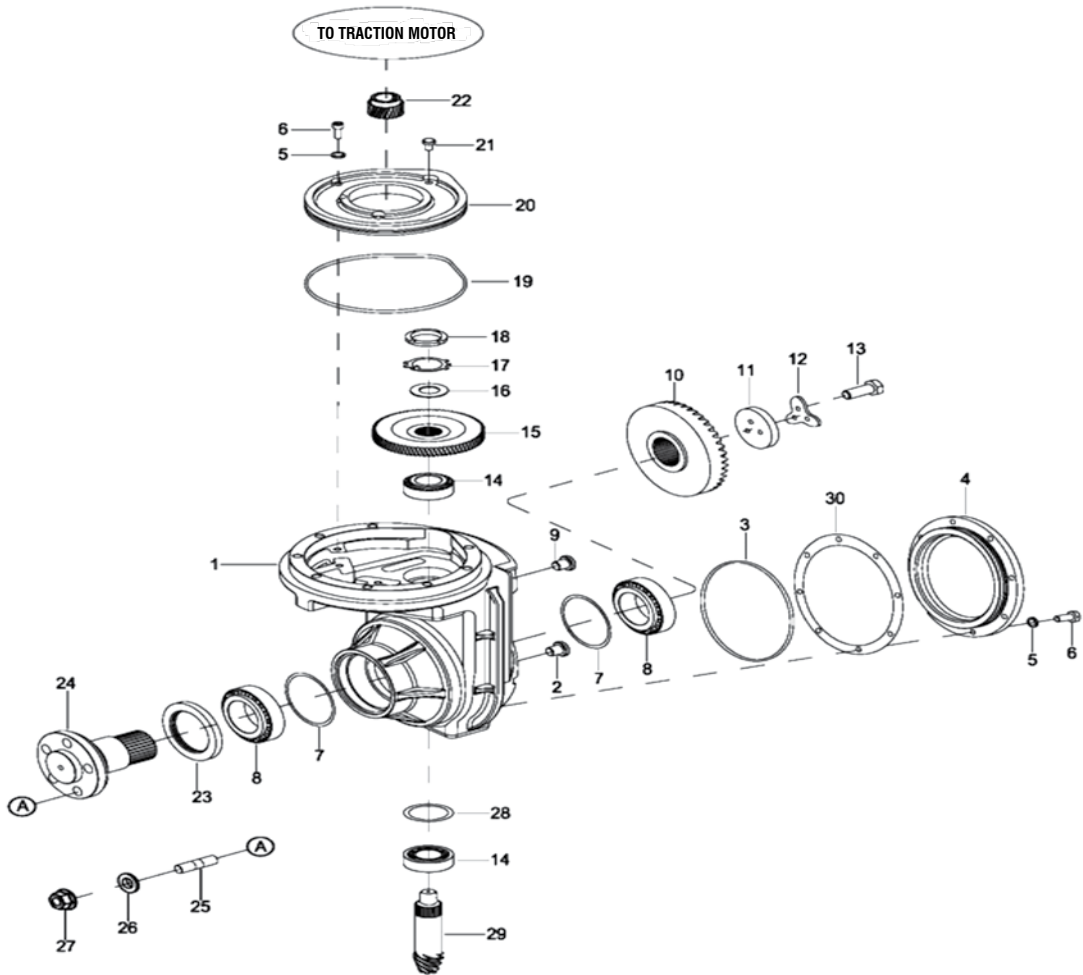
FIGURE 12-5 TRANSMISSION, MOTOR, BRAKE ASSEMBLY



TRANSMISSION, MOTOR, BRAKE ASSEMBLY

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	0000-000027-00	SCREW M6 x 55	3	
2	1120-210000-00	ELECTRIC BRAKE	1	
3	1120-220000-00	DRIVE MOTOR	1	
4	0000-000154-00	SCREW M8 x 35	8	
5	0000-000159-00	LOCK WASHER ø8	8	
6	0000-000176-00	FLAT WASHER ø8	8	
7	0000-000155-00	SCREW M10 x 40	6	
8	0000-000063-00	LOCK WASHER ø10	6	
9	0000-000007-00	FLAT WASHER ø10	6	
10	1120-230000-00	TRANS BEARING	1	
11	0000-000013-00	GREASE FITTING M8	1	
12	1120-240000-10	GEAR BOX II	1	USED ON ALL BGS-25-20 FOR BGS-25-25: Used up to Serial # S2214153. This is non serviceable. If replacing a complete gearbox to serviceable part # 1120-240000-30 you have to replace the gear part # 1120-240012-30
--	1120-240014-00	DRIVE MOTOR GEAR FOR GEARBOX ii	1	Pictured under the Drive Motor. This part # is only used on Gearbox II (Pos. # 12). For the Drive Motor Gear on Gearbox III (Pos. # 12a) see the parts break down page of the Gearbox (Transmission).
12a	1120-240000-30	GEAR BOX III	1	FOR BGS-25-25: Used from Serial # S2214154. This is a serviceable gearbox. NOT USED ON BGS-25-20.
13	1120-200001-00	DRIVE WHEEL	1	
14	0000-000025-00	LOCK WASHER Ø12	5	
15	0000-000157-00	NUT M12	5	Used BGS-25-25 from Serial # S2214154.
15a	0000-001131-10	NUT M12 x 1.5	5	This part # is only used on Gearbox II (Pos. # 12).
15b	0000-001131-10	DRIVE WHEEL STUD	5	This Drive Wheel Stud (not pictured) is only used on Gear Box part # 1120-240000-10. For trucks with new gear box see Transmission section.
16	0000-000070-00	SCREW M10 x 25	2	
17	1120-210001-00	PLATE	1	
18	1120-210002-00	BRAKE PLATE	1	
19	1120-210003-00	GEAR	1	

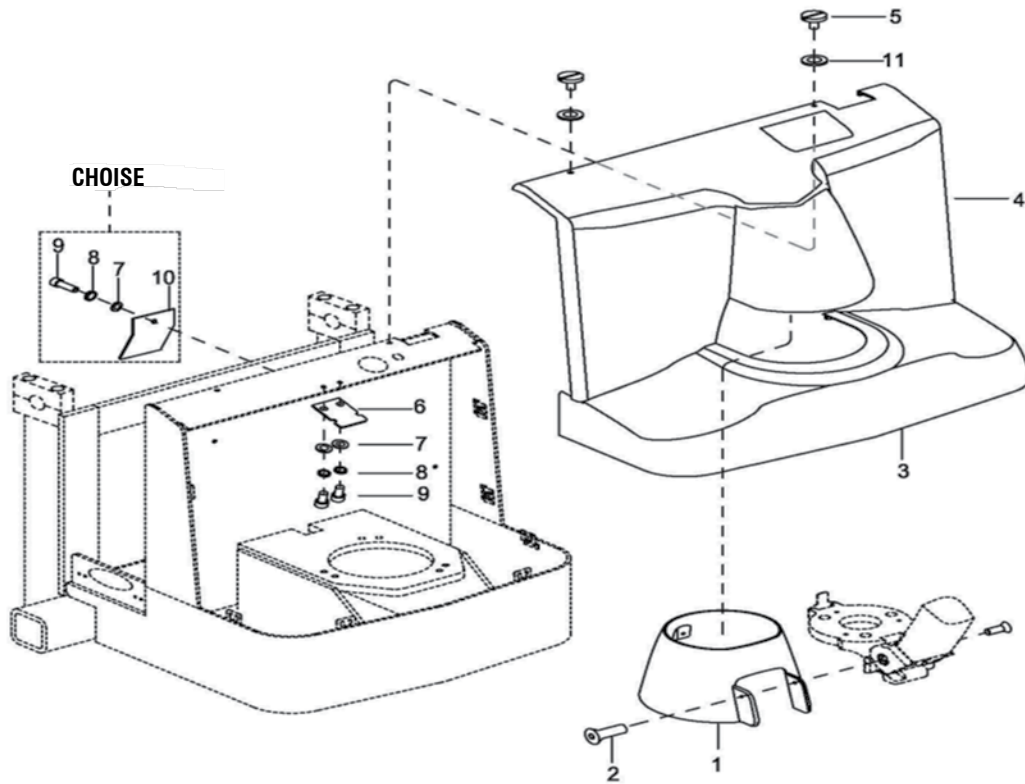
FIGURE 12-6 TRANSMISSION BGS-25-25



TRANSMISSION BGS-25-25 (USED FROM SERIAL # S2214154)

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	1120-240001-30	GEAR CASE	1	
2	1120-240002-30	PLUG	1	
3	0000-000214-00	O-RING 135 x 3.1	1	
4	1120-240003-30	COVER	1	
5	0000-000056-00	LOCK WASHER Ø6	12	
6	0000-000259-00	BOLT M6 x 16	8	
7	1120-240004-30	WASHER	A.R.	As Required
8	0000-000961-00	BEARING	2	
9	1120-240005-30	PLUG	1	
10	1120-240006-30	SPIRAL BEVEL GEAR	1	
11	1120-240007-30	WASHER	1	
12	1120-240008-30	LOCKING PLATE	1	
13	0000-000277-00	BOLT M8 x 25	3	
14	0000-001054-00	BEARING 30204	2	
15	1120-240009-30	GEAR	1	
16	0000-000379-00	FLAT WASHER Ø14	1	
17	0000-001055-00	WASHER Ø14	1	
18	0000-001056-00	NUT M14 x 1.5	1	
19	0000-000211-00	O-RING 150 x 3.1	1	
20	1120-240010-30	COVER	1	
21	1120-240011-30	GAS PLUG	1	
22	1120-240012-30	GEAR	1	
23	1120-240017-30	SEAL WASHER TC80 x 65 x 8	1	
24	1120-240013-30	OUTPUT SHAFT	1	
25	1120-240014-30	STUDS	5	
26	0000-000025-00	LOCK WASHER Ø12	5	
27	0000-000157-00	NUT M12	5	
28	1120-240015-30	WASHER	A.R.	As Required
29	1120-240016-30	GEAR	1	
30	1120-240018-30	WASHER	1	

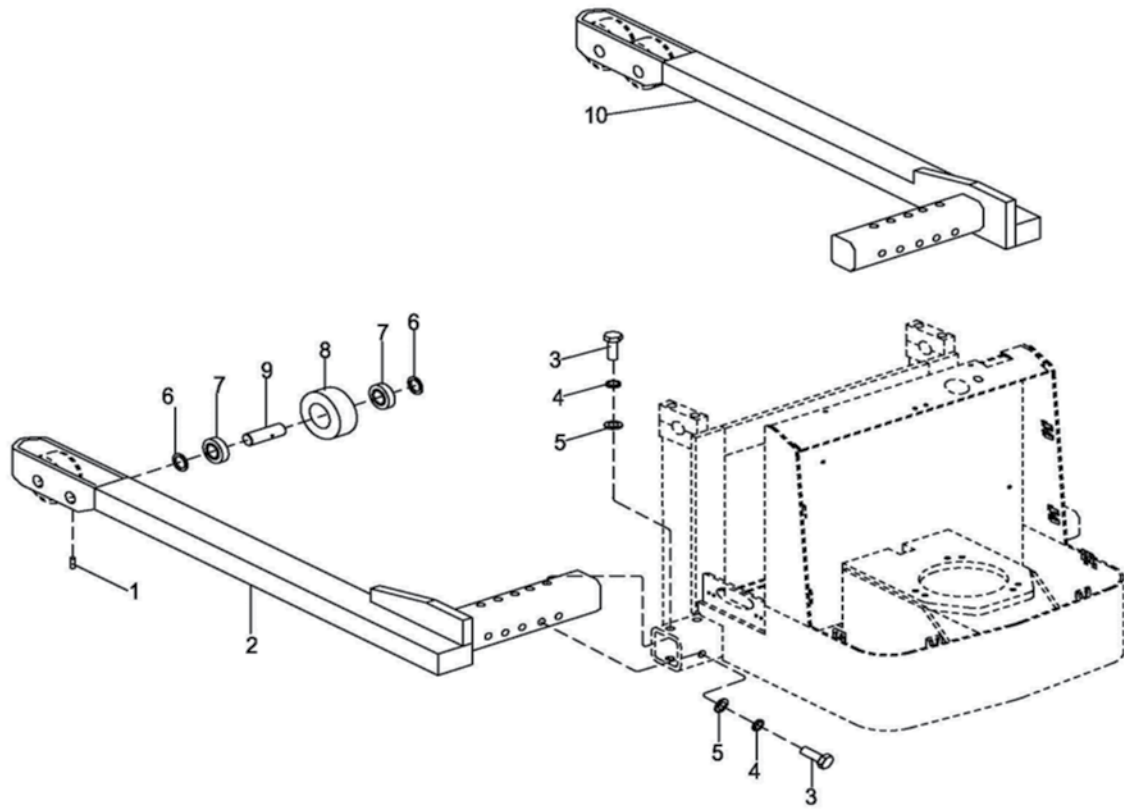
FIGURE 12-7 COMPARTMENT



COMPARTMENT

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	1120-150002-00	MIDDLE COVER	1	
2	0000-000126-00	SCREW	2	
3	2125-140001-00	LOWER COVER	1	
4	2125-140002-00	UPPER COVER	1	
5	0000-000368-00	SCREW	2	
6	2125-100001-00	FIXED PLATE	1	
7	0000-000176-00	FLAT WASHER Ø8	3	
8	0000-000159-00	LOCK WASHER Ø8	3	
9	0000-000109-00	SCREW M8 x 16	3	
10	2125-100002-00	PLATE	1	
11	2214-150002-00	WASHER	2	

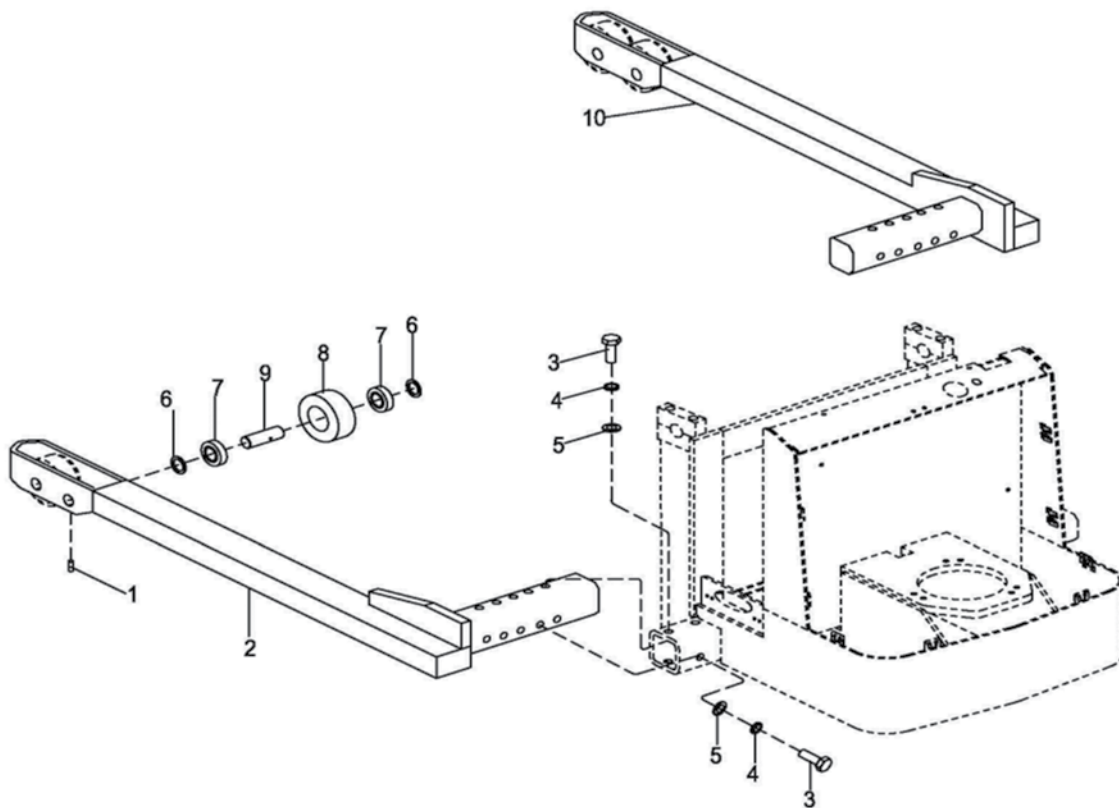
FIGURE 12-8 ADJUSTABLE STRADDLE (BGS-25)



ADJUSTABLE STRADDLE (BGS-25)

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	0000-000218-00	SCREW M6 x 16	2	
2	2125-110000-00	STRADDLE LEG - LEFT	1	
3	0000-000397-00	BOLT	6	
4	0000-000191-00	WASHER	6	
5	0000-000220-00	WASHER	6	
6	2125-101003-00	WASHER; SPACER	4	
7	0000-000100-00	BEARING	4	
8	800032	LOAD WHEEL	2	
9	2125-101002-00	SHAFT	2	
10	2125-130000-00	STRADDLE LEG - RIGHT	1	

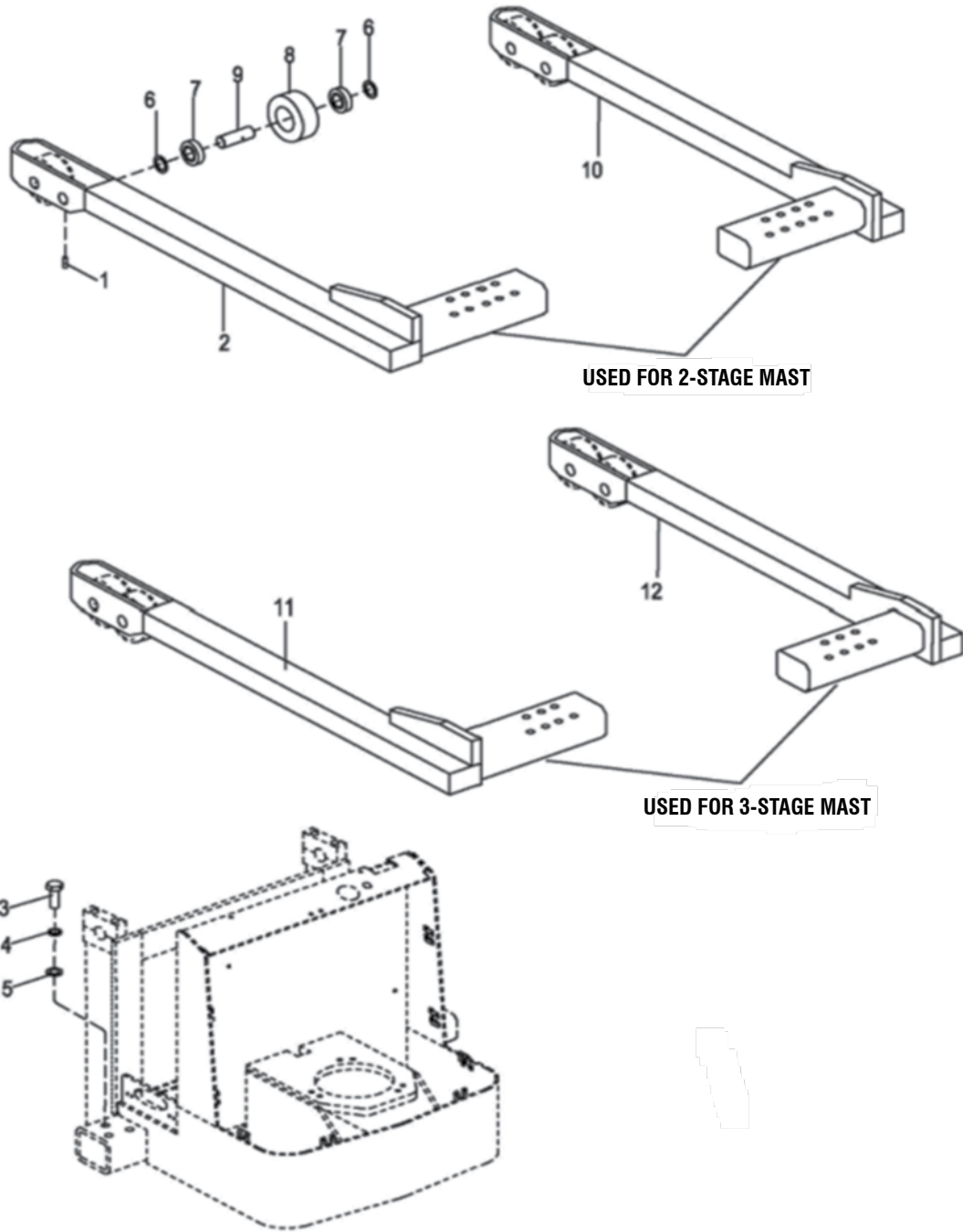
FIGURE 12-9 ADJUSTABLE STRADDLE



ADJUSTABLE STRADDLE (BGS-25 OLD STYLE - USED UP TO SERIAL # S2016059)

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	0000-000218-00	SCREW M6 x 16	2	2
2	2125-110000-00	STRADDLE LEG - LEFT	1	2 Stage and 3 Stage. Used up to Serial # S2016059
3	0000-000397-00	BOLT	6	2
4	0000-000191-00	WASHER	6	2
5	0000-000220-00	WASHER	6	2
6	2125-101003-00	WASHER; SPACER	4	2
7	0000-000100-00	BEARING	4	2
8	800032	LOAD WHEEL	2	2
9	2125-101002-00	SHAFT	2	2
10	2125-130000-00	STRADDLE LEG - RIGHT	1	2 Stage and 3 Stage. Used up to Serial # S2016059

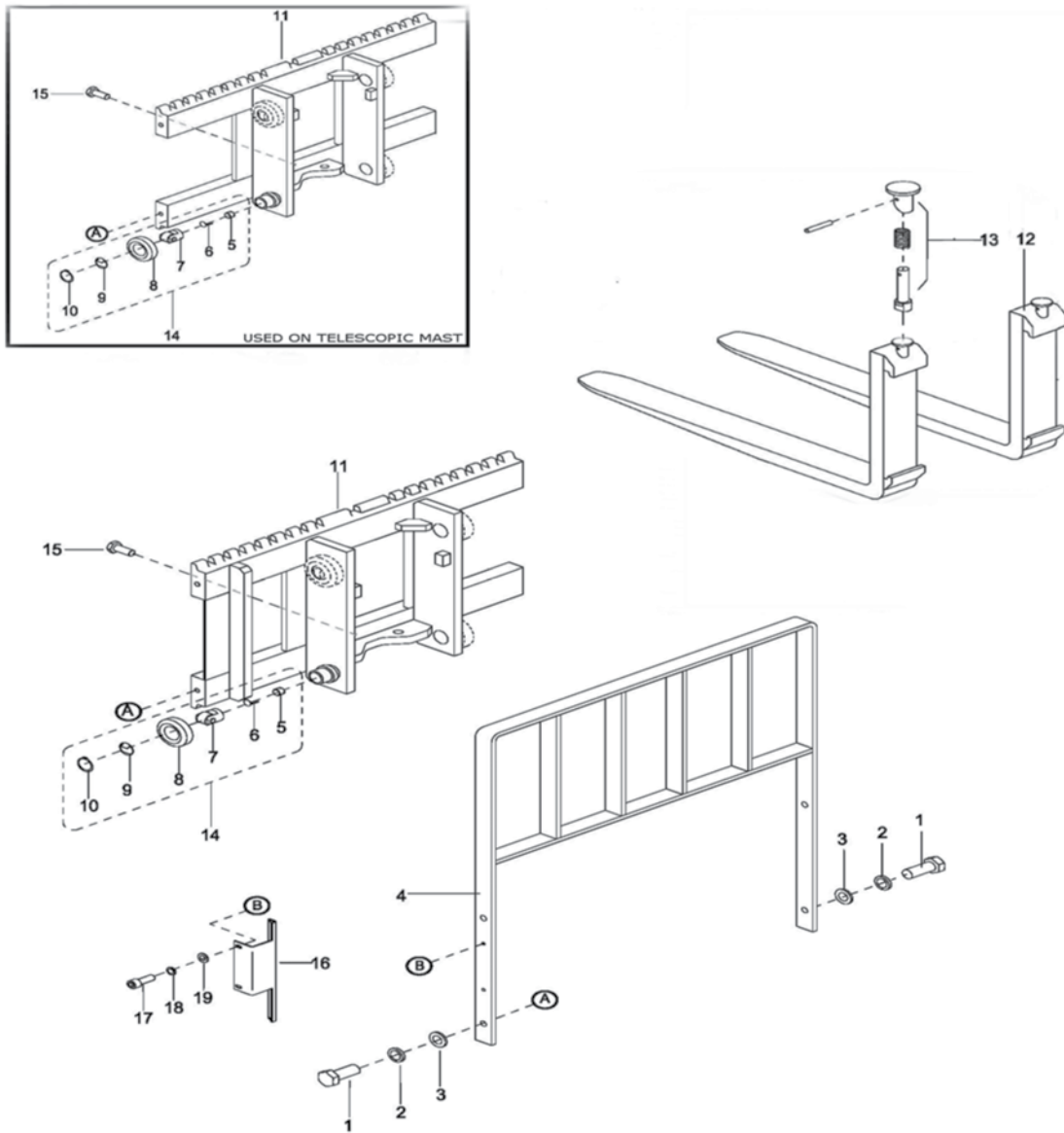
FIGURE 12-10 ADJUSTABLE STRADDLE



ADJUSTABLE STRADDLE (BGS-25 - USED FROM SERIAL # S2016060)

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	0000-000218-00	SCREW M6 x 16	2	
2	2126-110000-00	STRADDLE LEG - LEFT	2	2 Stage used from Serial # S2016060
3	0000-000703-00	BOLT M16 x 45	6	
4	0000-000191-00	WASHER	6	
5	0000-000220-00	WASHER	6	
6	2125-101003-00	WASHER; SPACER	4	
7	0000-000100-00	BEARING	4	
8	800032	LOAD WHEEL	2	
9	2125-101002-00	SHAFT	2	
10	2126-130000-00	STRADDLE LEG - RIGHT	2	2 Stage used from Serial # S2016060
11	2126-110000-30	STRADDLE LEG - LEFT	1	3 Stage used from Serial #S2016060
12	2126-130000-30	STRADDLE LEG - RIGHT	1	3 Stage used from Serial # S2016060

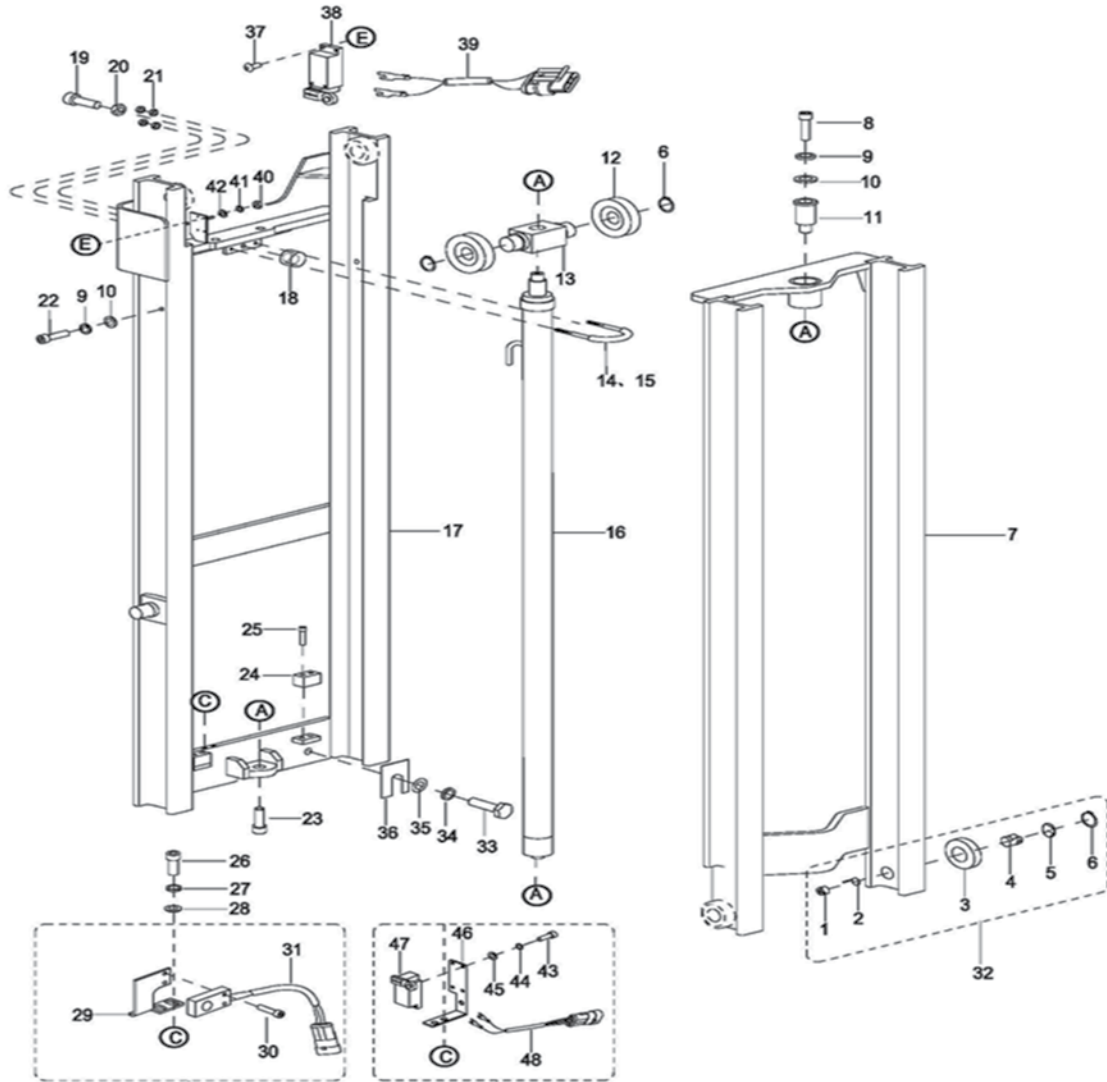
FIGURE 12-11 LIFT CARRIAGE



LIFT CARRIAGE

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	0000-000221-00	BOLT	4	
2	0000-000060-00	WASHER; LOCK, SPLIT	4	
3	0000-000373-00	FLAT WASHER	4	
4	2125-632000-00	LOAD GUARD	1	36" Load Guard Used on all 2 Stage Masts NOTE: On 3 Stage Mast Used up to serial number 324150316
4a	2125-632000-0A	LOAD GUARD	1	NOTE: Only for 3 Stage Mast 36" Load Guard - Used from serial number 324150317
4b	2125-632000-10	LOAD GUARD	1	48" Load Guard Used on all 2 Stage Masts NOTE: On 3 Stage Mast Used up to serial number 324150316
4c	2125-632000-1A	LOAD GUARD	1	NOTE: Only for 3 Stage Mast 48" Load Guard - Used from serial number 324150317
5	2125-631104-00	SCREW	4	
6	2125-612007-00	SNAP RING	4	
7	2125-612002-00	BRACKET ASSEMBLY	4	
8	2125-612001-00	ROLLER ASSEMBLY	4	
9	2125-612005-00	DUST SHIELD	4	
10	0000-000183-00	RETAINER RING	4	
11	2125-631000-00	FORK CARRIAGE	1	Used on BGS-25 and BGS-25 with 2 Stage mast
11a	2125-641000-30	FORK CARRIAGE	1	Used on BGS-25 with 3 Stage mast Up to serial number 324200418
11b	2125-641000-3A	FORK CARRIAGE	1	Used on BGS-25 with 3 Stage mast from serial number 324200419
12	2125-630001-00	FORK	2	
13	2125-630001-10	FORK PIN	2	
14	2125-631100-00	ROLLER ASSEMBLY	4	
15	0000-000030-00	SCREW M10 x 16	1	
16	2125-642000-30	PLATE	1	Used between serial number 324170317 and 324200418
17	0000-000109-00	SCREW M8 x 16	2	Used between serial number 324170317 and 324200418
18	0000-000159-00	LOCKWASHER Ø8	2	Used between serial number 324170317 and 324200418
19	0000-000176-00	FLATWASHER Ø8	2	Used between serial number 324170317 and 324200418

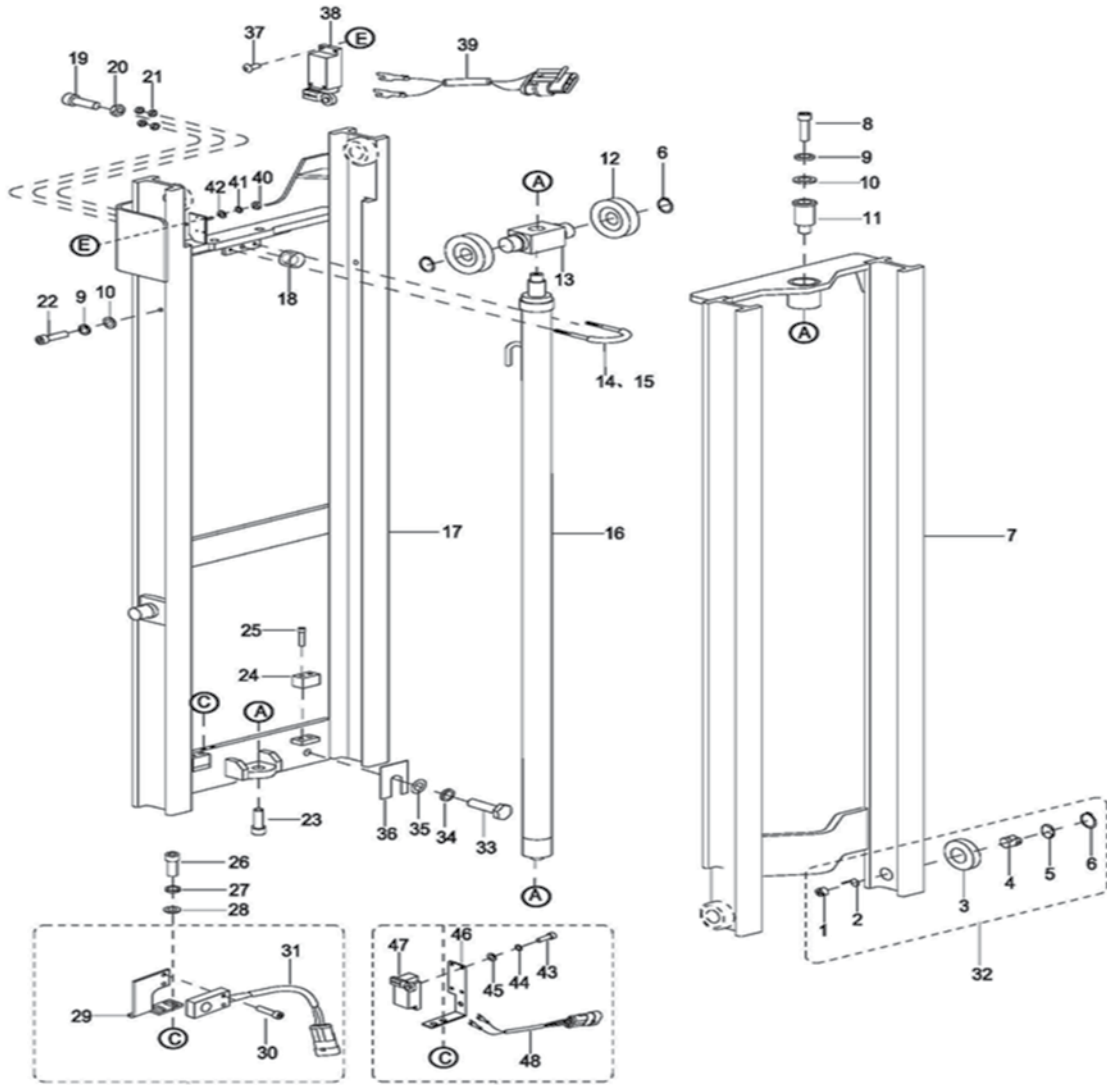
FIGURE 12-12 MAST (TELESCOPIC - 2 STAGE)



MAST (TELESCOPIC - 2 STAGE)

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	2125-612004-00	SCREW	4	
2	2125-612007-00	SNAP RING	4	
3	2125-612001-00	MAIN ROLLER ASSEMBLY	4	
4	2125-612002-00	BRACKET ASSEMBLY	4	
5	2125-612005-00	DUST RING	4	
6	0000-000183-00	RETAINER RING Ø35	6	
7	2125-620000-01	INNER MAST	1	Used for lift height 106"
7a	2125-620000-03	INNER MAST	1	Used for lift height 130"
7b	2125-620000-05	INNER MAST	1	Used for lift height 142"
7c	2125-620000-07	INNER MAST	1	Used for lift height 153"
8	0000-000184-00	SCREW M12 x 60	1	
9	0000-000060-00	LOCK WASHER Ø12	3	
10	0000-000373-00	FLAT WASHER Ø12	3	
11	2125-600003-00	POSITIONING HARNESS	1	
12	2125-600002-00	CHAIN ROLLER	2	
13	2125-600001-00	CHAIN WHEEL BRACKET	1	
14	2125-650001-00	CYLINDER HOOP	1	
15	2125-650003-00	HOOP BUSHING Ø8 x 150	1	
16	2125-410000-00-02	LIFT CYLINDER	1	Used for lift height 106"
16a	2125-410000-00-04	LIFT CYLINDER	1	Used for lift height 130"
16b	2125-410000-00-06	LIFT CYLINDER	1	Used for lift height 142"
16c	2125-410000-00-08	LIFT CYLINDER	1	Used for lift height 153"
17	2125-610000-01	OUTER MAST	1	Used for lift height 106"
17a	2125-610000-03	OUTER MAST	1	Used for lift height 130"
17b	2125-610000-05	OUTER MAST	1	Used for lift height 142"
17c	2125-610000-07	OUTER MAST	1	Used for lift height 153"
18	2125-650002-00	BOLT BUSHING	1	
19	0000-000075-00	SCREW M12 x 30	1	
20	0000-000630-00	NUT M12	1	
21	0000-000108-00	NUT M6	4	
22	0000-000374-00	SCREW M12 x 30	2	
23	0000-000372-00	SCREW M8 x 40	2	
24	2125-600005-00	BUFFER BLOCK	2	
25	0000-000001-00	SCREW M6 x 20	4	
26	0000-000109-00	SCREW M8 x 16	2	
27	0000-000159-00	LOCK WASHER Ø8	2	

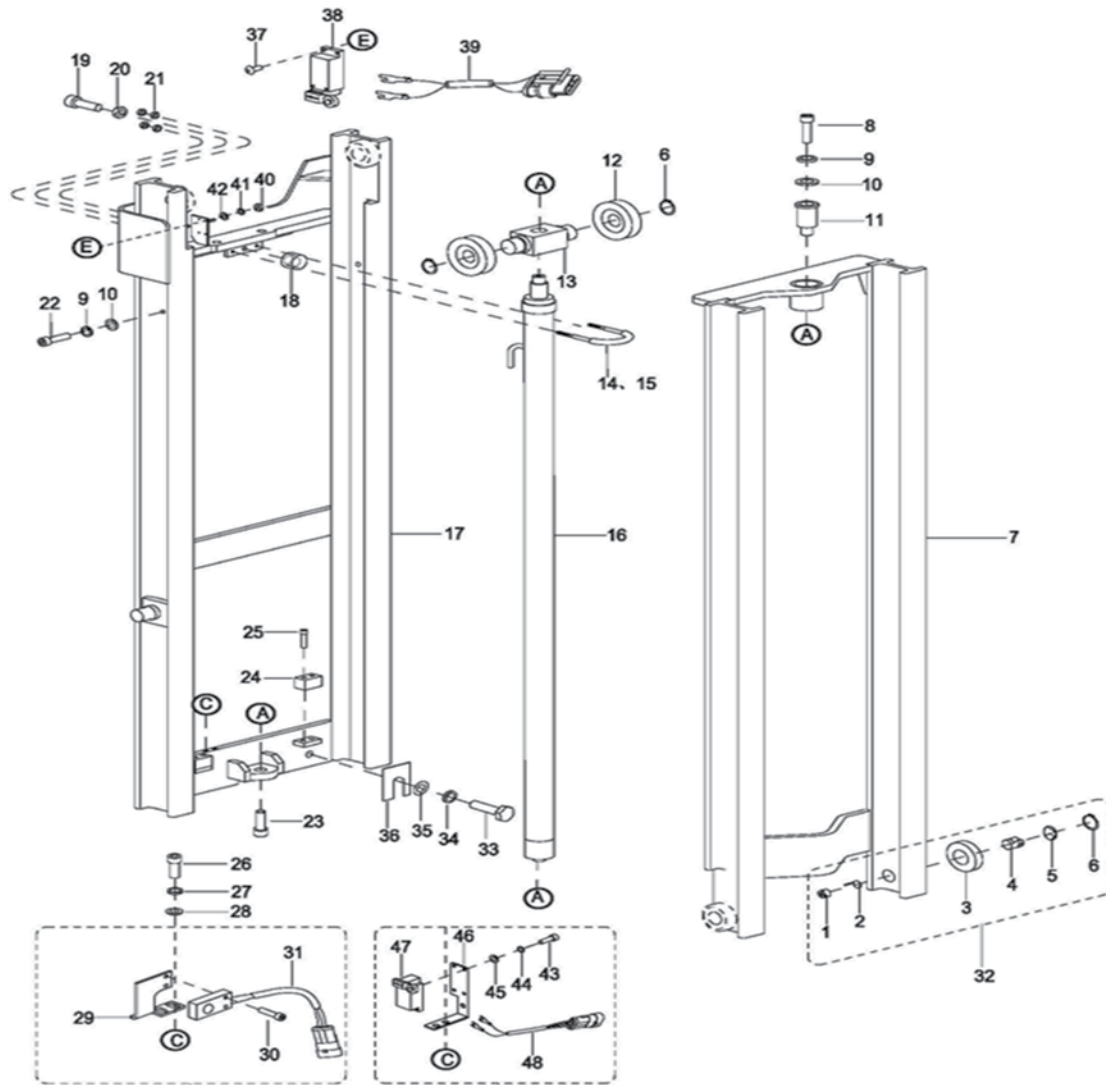
FIGURE 12-12 MAST (TELESCOPIC - 2 STAGE)



MAST (TELESCOPIC - 2 STAGE) - CONTINUED

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
28	0000-000176-00	FLAT WASHER Ø8	2	
29	2125-500001-00	SENSOR BRACKET	1	1 Used up to Serial # S2119169
30	0000-000378-00	SCREW M4 x 16	2	2 Used up to Serial # S2119169
31	2125-520003-0C	PROXIMITY SWITCHES WIRING	1	1 Used up to Serial # S2119169
32	2125-612000-00	ROLLER ASSEMBLY	4	
33	0000-000703-00	BOLT M16 x 45	2	
34	0000-000191-00	LOCK WASHER Ø16	2	
35	0000-000190-00	FLAT WASHER Ø16	2	
36	2214-600006-00	WASHER	A.R.	As required
37	0000-000518-00	SCREW M5 x 6	4	Not used after 05-15-2012
38	2125-500003-00	LIFT PROXIMITY SWITCH	1	Not used after 05-15-2012
39	2125-520009-26	WIRE FOR LIFT PROXIMITY SWITCH	1	Not used after 05-15-2012 LIFT HEIGHT: 106"
39a	2125-520009-29	WIRE FOR LIFT PROXIMITY SWITCH	1	Not used after 05-15-2012 LIFT HEIGHT: 130"
39b	2125-520009-31	WIRE FOR LIFT PROXIMITY SWITCH	1	Not used after 05-15-2012 LIFT HEIGHT: 142"
39c	2125-520009-33	WIRE FOR LIFT PROXIMITY SWITCH	1	Not used after 05-15-2012 LIFT HEIGHT: 153"
40	0000-000546-00	NUT M5	4	Not used after 05-15-2012
41	0000-000206-00	LOCK WASHER Ø5	4	Not used after 05-15-2012
42	0000-000390-00	FLAT WASHER Ø5	4	Not used after 05-15-2012
43	0000-000117-00	SCREW M5 x 10	4	Used from Serial # S2119170
44	0000-000206-00	LOCK WASHER Ø5	4	Used from Serial # S2119170
45	0000-000390-00	FLAT WASHER Ø5	4	Used from Serial # S2119170
46	2125-500004-00	SENSOR BRACKET	1	Used from Serial # S2119170
47	2125-500002-30	PROXIMITY SWITCH	1	Used from Serial # S2119170
48	2130-520003-0A	PROXIMITY SWITCH WIRING	1	Used from Serial # S2119170

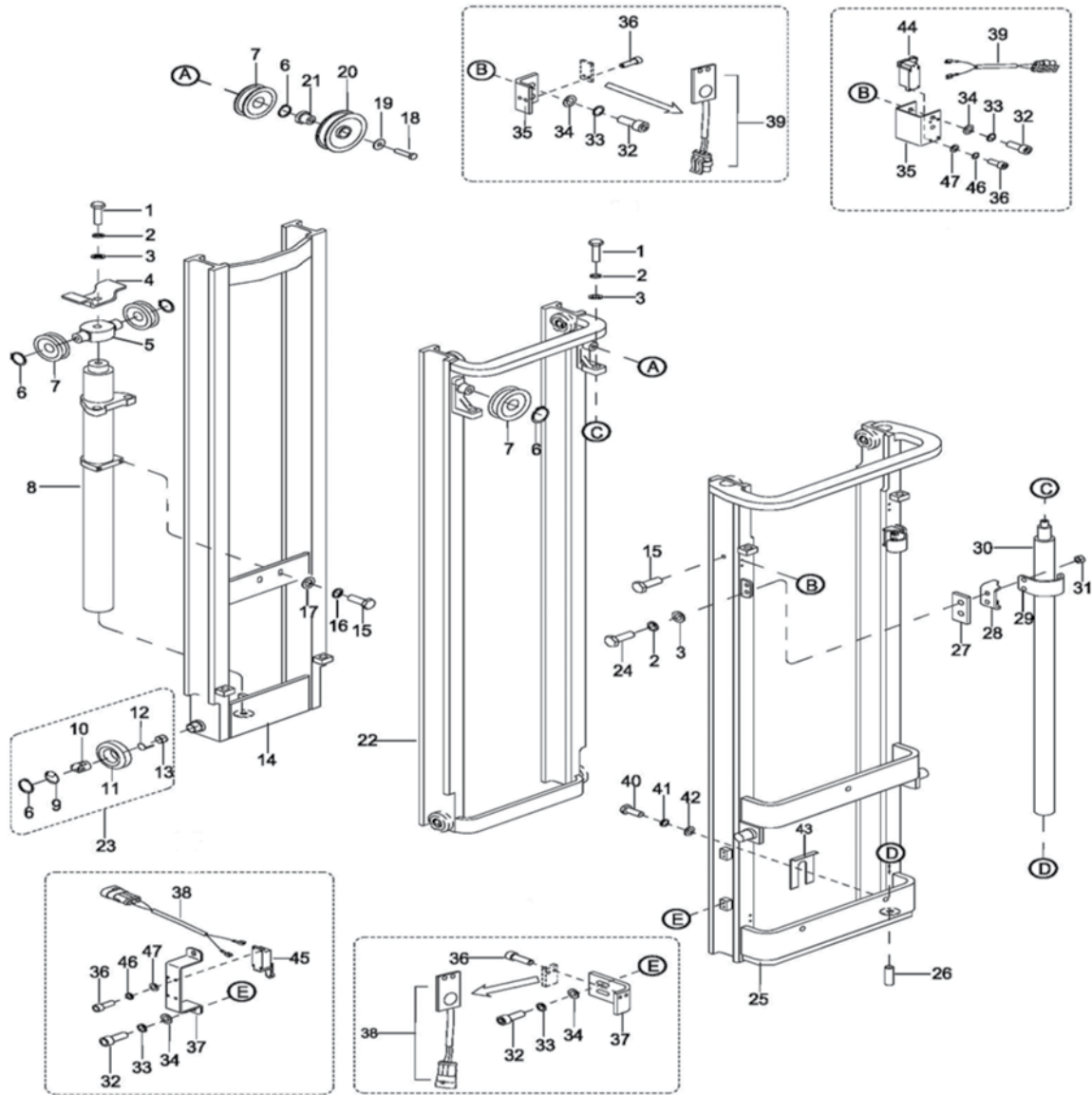
FIGURE 12-13 MAST



MAST (TRIMAST)

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	0000-000324-00	SCREW M10 x 30 3	3	
2	0000-000063-00	LOCK WASHER ø10 5	5	
3	0000-000551-00	FLAT WASHER ø10 3	3	
4	2125-600007-00	CHAIN BRACKET 1	1	
5	2125-600001-30	ROLLER BRACKET 1	1	
6	0000-000183-00	RETAINER RING ø35 12	12	
7	2214-600001-00	CHAIN ROLLER 4	4	
8	2125-420000-30	FREE LIFT CYLINDER 1 Used for Lift Height 157"	1	Used for Lift Height 157"
9	2125-612005-00	DUST RING 8	8	
10	2125-612002-00	BRACKET ASSEMBLY 8	8	
11	2125-612001-00	MAIN ROLLER ASSEMBLY 8	8	
12	2125-612007-00	SNAP RING 8	8	
13	2125-612004-00	SCREW 8	8	
14	2125-630000-30-01	INNER MAST 1 Used for Lift Height 157"	1	Used for Lift Height 157"
15	0000-000284-00	BOLTM12 x 30 4	4	
16	0000-000060-00	LOCK WASHER ø12 2	2	
17	0000-000373-00	FLAT WASHER ø12 2	2	
18	0000-000517-00	BOLT M12 x 50 1	1	
19	0000-000427-00	FLAT WASHER ø12 1	1	
20	2125-600002-30	CHAIN ROLLER 1	1	
21	2125-600003-30	BUSHING 1	1	
22	2125-620000-30-01	MIDDLE MAST 1 Used for Lift Height 157"	1	Used for Lift Height 157"
23	2125-612000-00	ROLLER ASSEMBLY 8	8	
24	0000-000244-00	BOLT M10 x 30 4	4	Used for Lift Height 157"
25	2125-610000-30-01	OUTER MAST 1 Used for Lift Height 157"	1	
26	0000-000026-00	SCREW M8 x 30 2	2	
27	2214-600005-00	BLOCK	A.R.	As Required
28	2125-600006-30	CYLINDER SUPPORT 2	2	
29	2125-600005-30	TUBING CLAMP 2	2	
30	2125-410000-30-01	OUTER LIFT CYLINDER 2 Used for Lift Height 157"	2	Used for Lift Height 157"
31	0000-000425-00	NUT M10 4	4	
32	0000-000109-00	SCREW M8 x 16 4	4	
33	0000-000159-00	LOCK WASHER Ø8 4	4	
34	0000-000176-00	FLAT WASHER Ø8 4	4	
35	2125-500002-30	LIFT PROXIMITY SENSOR BRACKET (ELECTRONIC)	1	
35a	2125-500002-3A	LIFT PROXIMITY SENSOR BRACKET (MECHANICAL)	1	

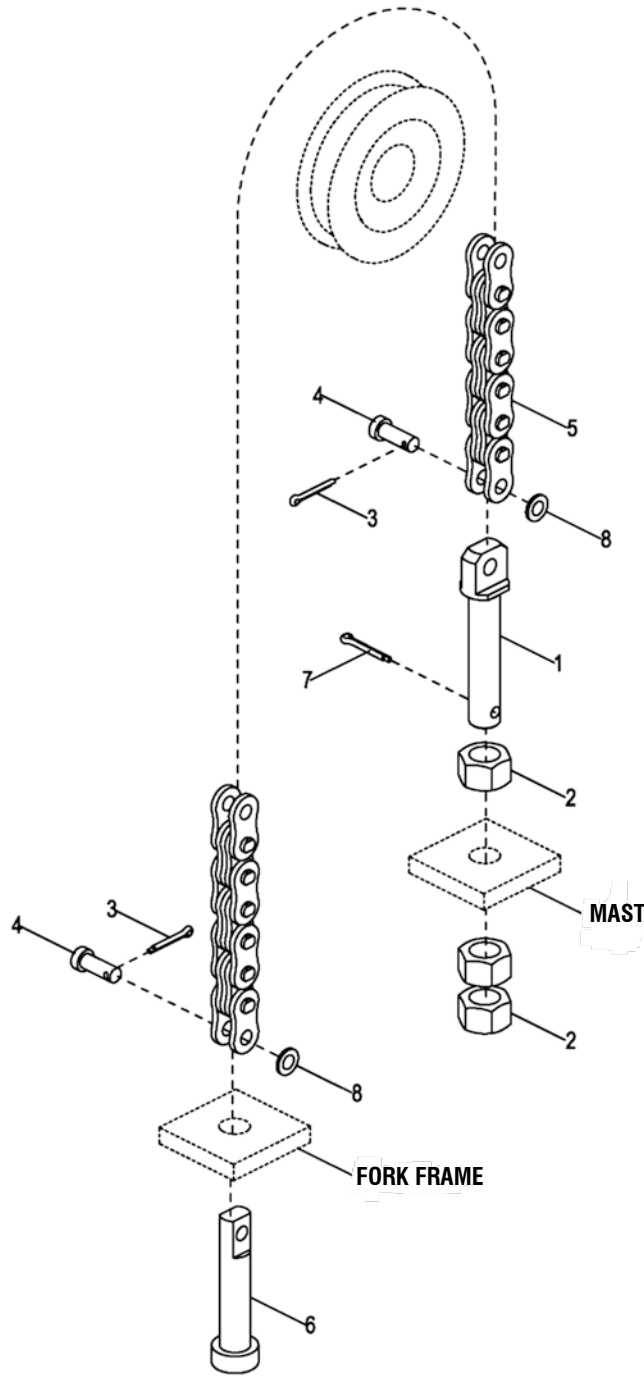
FIGURE 12-14 MAST (TRIMAST)



MAST (TRIMAST) CONTINUED

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
36	0000-000117-00	SCREW M5 x 10	8	
37	2214-500001-00	SPEED CUT OFF SENSOR BRACKET (ELECTRONIC)	1	Used up to Serial # S2119169
37a	2125-500001-3A	SPEED CUT OFF SENSOR BRACKET (MECHANICAL)	1	Used from Serial # S2119170 to 324150316
37b	2125-500003-30	SPEED CUT OFF SENSOR BRACKET (MECHANICAL)	1	Used from Serial # 324150317
38	2125-520003-30	LOWER PROXIMITY SWITCHES WIRING (ELECTRONIC)	1	Used up to Serial # S2119169
38a	2125-520003-3A	LOWER PROXIMITY SWITCH WIRING(MECHANICAL)	1	Used from Serial # S2119170
39	2125-520009-30-01	PROXIMITY SWITCH WIRING (ELECTRONIC)	1	Used up to Serial # S2119169 FOR LIFT HEIGHT: 157"
39a	2125-520009-22	PROXIMITY SWITCH WIRING (MECHANICAL)	1	Used from Serial # S2119170 FOR LIFT HEIGHT: 157"
40	0000-000622-00	BOLT M16 x 40	2	
41	0000-000191-00	LOCK WASHER Ø16	2	
42	0000-000190-00	FLAT WASHER Ø16	2	
43	2214-600006-00	WASHER A.R. As Required	A.R.	As Required
44	2125-500002-00	PROXIMITY SWITCH	2	
45	2125-500003-00	PROXIMITY SWITCH	1	
46	0000-000206-00	LOCK WASHER Ø5	8	
47	0000-000390-00	FLAT WASHER Ø5	8	

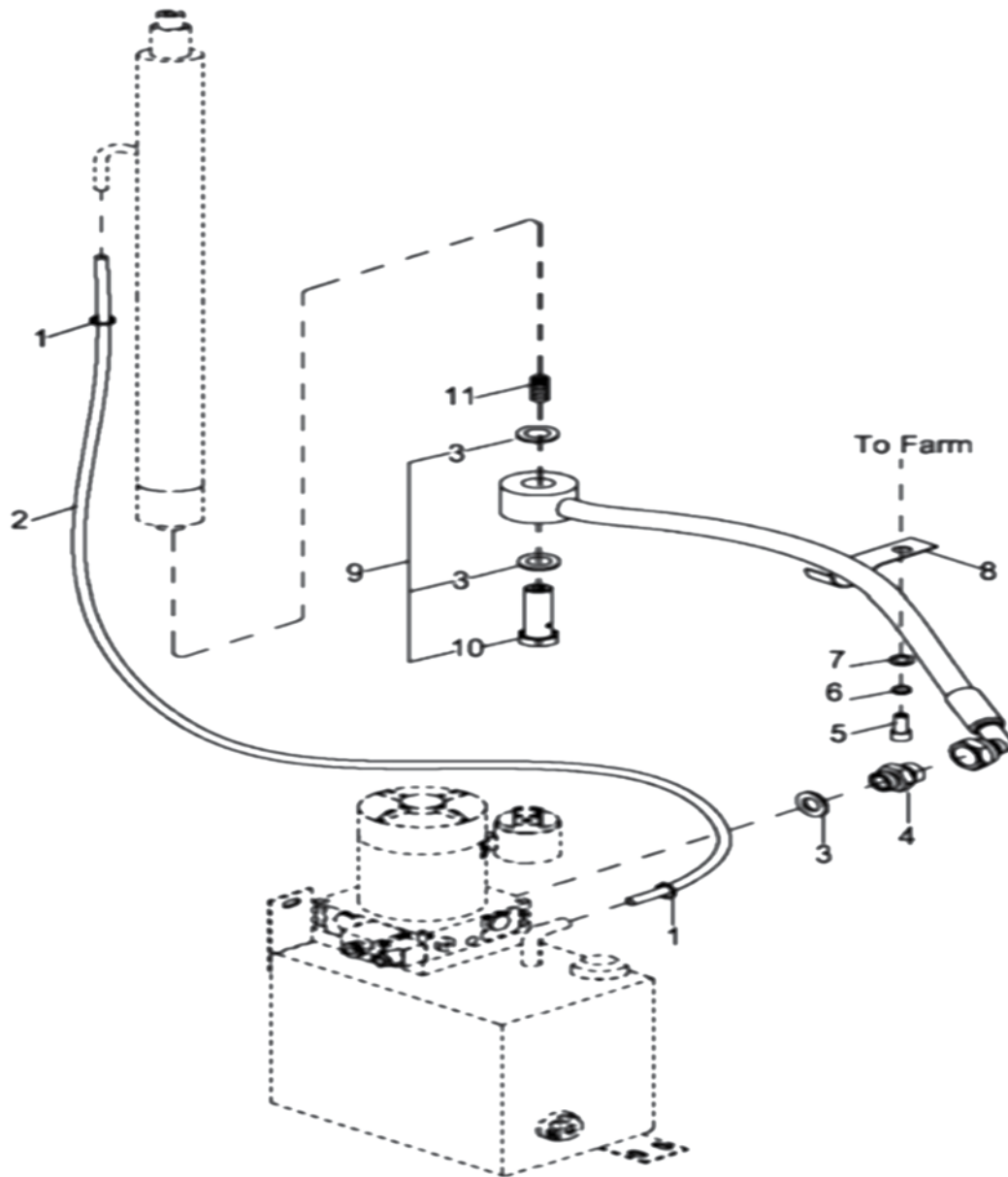
FIGURE 12-16 CHAIN



CHAIN

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	2125-640001-00	BOLT	1	
2	0000-000187-00	NUT M16 x 1.5	3	
3	0000-000188-00	PIN \varnothing 3.2 x 20	2	
4	2125-640002-00	PIN	2	
5	2125-640000-00-02	LIFT CHAIN	1	Used for lift height 106" (Two Stage)
5a	2125-640000-00-04	LIFT CHAIN	1	Used for lift height 130" (Two Stage)
5b	2125-640000-00-06	LIFT CHAIN	1	Used for lift height 142" (Two Stage)
5c	2125-640000-00-08	LIFT CHAIN	1	Used for lift height 153" (Two Stage)
5d	2125-651000-30-01	LIFT CHAIN	1	Used for Lift Height 157" (Trimast)
5e	2125-652000-30-01	LIFT CHAIN	1	Used for Lift Height 157" Free Lift Cylinder (Trimast)
6	2125-640003-00	CHAIN ANCHOR	1	
7	0000-000686-00	PIN 3.2 x 32	1	
8	0000-000176-00	FLAT WASHER \varnothing 8	2	

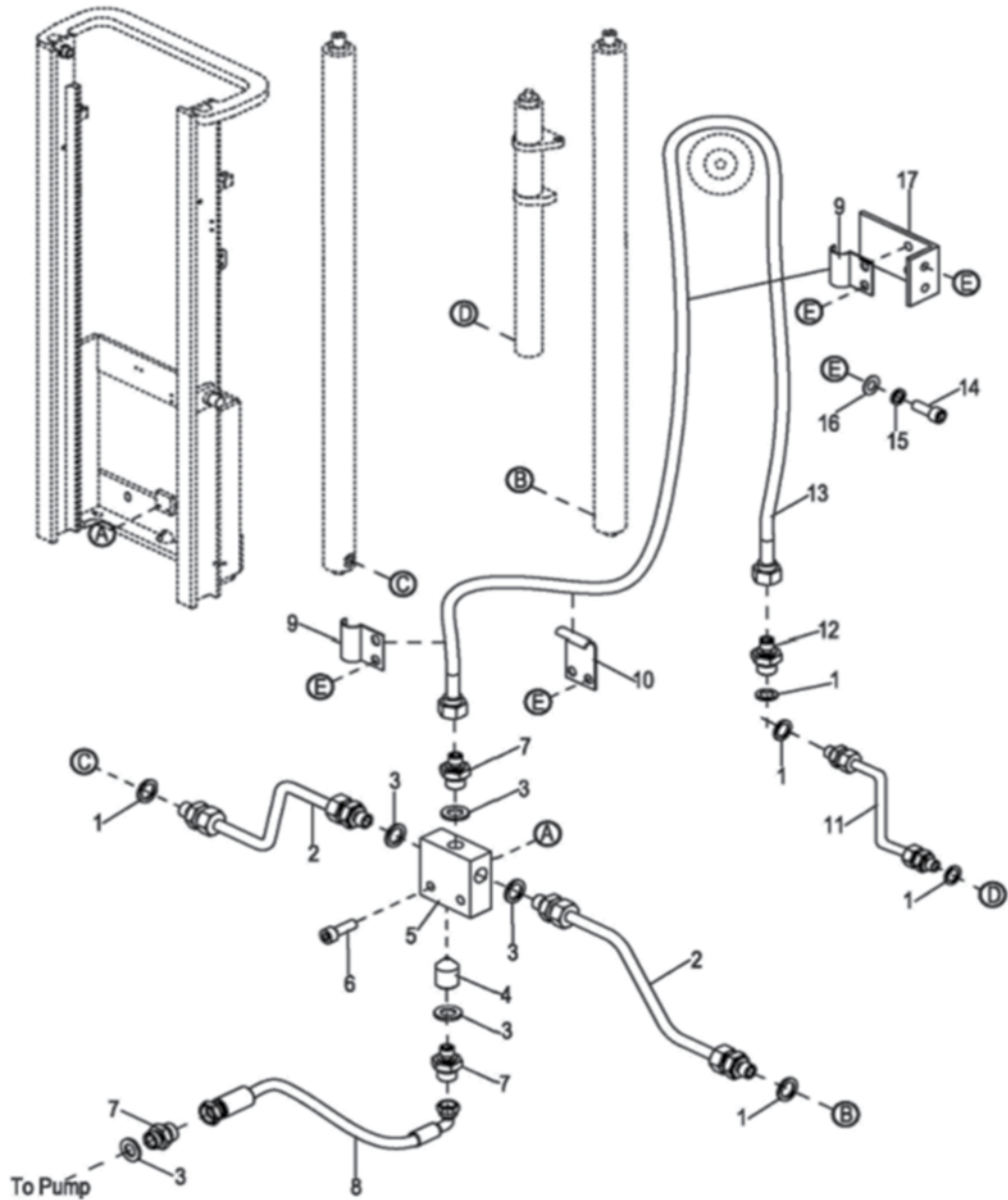
FIGURE 12-17 HYDRAULIC SYSTEM (TELESCOPIC)



HYDRAULIC SYSTEM (TELESCOPIC)

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	0000-000472-00	CLIP	1	
2	2125-400002-00-02	OIL RETURN PIPE	1	Used for lift height 106" (Two Stage)
2a	125-400002-00-04	OIL RETURN PIPE	1	Used for lift height 130" (Two Stage)
2b	2125-400002-00-06	OIL RETURN PIPE	1	Used for lift height 142" (Two Stage)
2c	2125-400002-00-08	OIL RETURN PIPE	1	Used for lift height 153" (Two Stage)
3	0000-000044-00	PACKING WASHER Ø14	3	
4	2705-141400-00	STRAIGHT CONNECTOR	1	
5	0000-000433-00	SCREW M8 x 12	1	
6	0000-000159-00	LOCK WASHER Ø8	1	
7	0000-000194-00	FLAT WASHER Ø8	1	
8	2112-400002-00	HOSE GUIDE	1	
9	2125-460000-00	HYDRAULIC HOSE	1	
10	2402-143500-00	BOLT G1/4 x 35	1	
11	2125-450000-00	EXPLOSION RELIEF VALVE	1	

FIGURE 12-18 HYDRAULIC SYSTEM



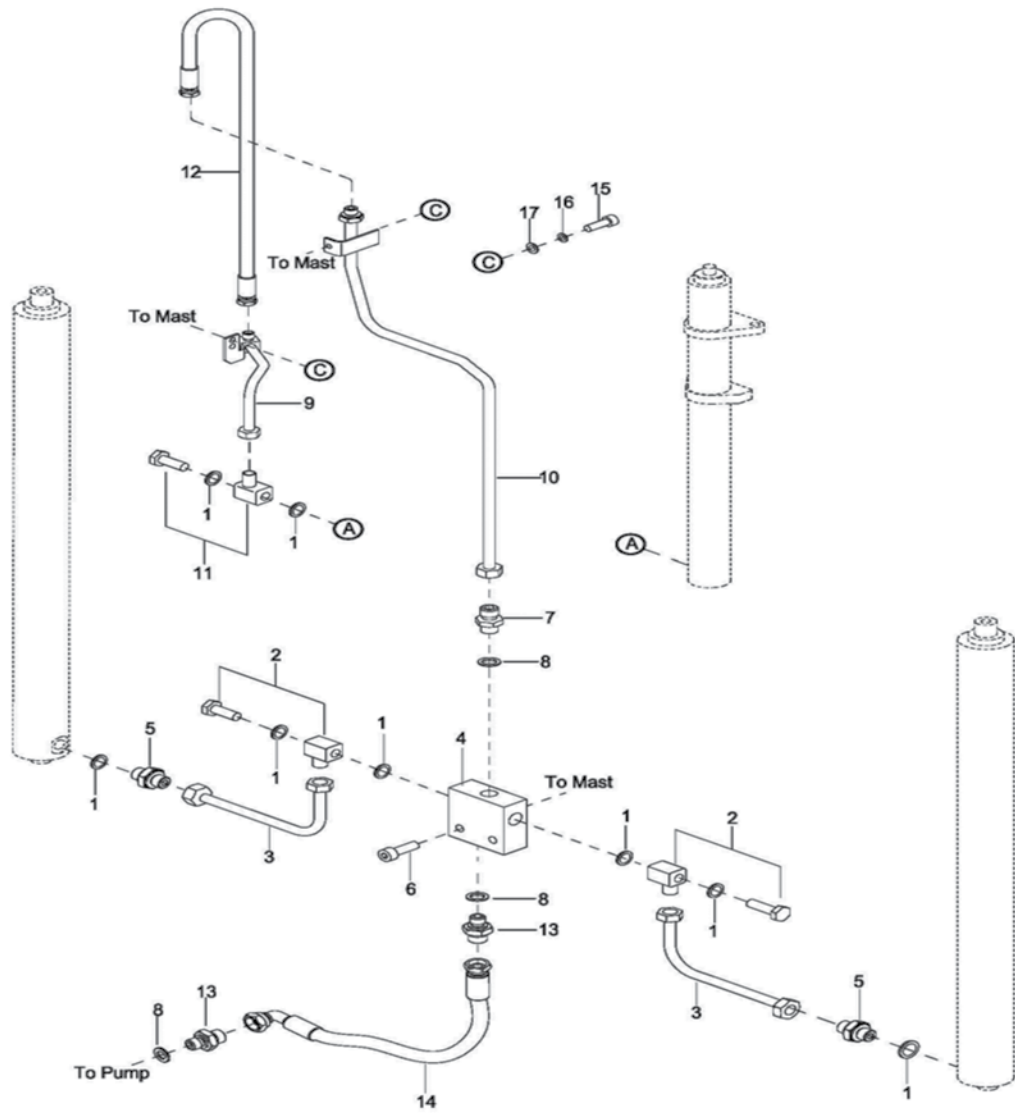
HYDRAULIC SYSTEM (TRIMAST WITH HOSES - USED UP TO SERIAL # S2014055)

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	0000-000069-00	PACKING WASHER Ø16	5	
2	2125-400001-30	METALLIC OIL PIPE ASSEMBLY	2	
3	0000-000044-00	PACKING WASHER Ø14	5	
4	2125-450000-00	EXPLOSION RELIEF VALVE	1	
5	2125-400002-30	BLOCK CROSS	1	
6	0000-000154-00	SCREW M8 x 35	2	
7	2702-141600-00	UNION	3	
8	2125-470000-30	HOSE	1	
9	2125-400003-30	PIPE CLAMP	2	
10	2125-400006-30	PIPE CLAMP	1	
11	2125-400007-30	METALLIC OIL PIPE ASSEMBLY	1	
12	2701-161600-00	UNION	1	
13	2125-440000-30-00	HYDRAULIC HOSE	1	Used for Lift Height 157" (Trimast)
14	0000-000109-00	SCREW M8 x 16	8	
15	0000-000159-00	LOCK WASHER Ø8	8	
16	0000-000176-00	FLAT WASHER Ø8	8	
17	2125-400004-30	CLAMP BRACKET	1	

HYDRAULIC SYSTEM (TRIMAST WITH TUBES - USED FROM SERIAL # S2014056 TO S2119119)

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	0000-000069-00	PACKING WASHER Ø16	8	
2	2805-160010-20	BOLT M16 x 1.5 2	2	
3	2125-400001-3A	METALLIC OIL PIPE ASSEMBLY	2	
4	2125-400002-3A	BLOCK CROSS	1	
5	2125-450000-00	EXPLOSION RELIEF VALVE	2	
6	0000-000154-00	SCREW M8 x 35	2	
7	2702-140000-0A	UNION	1	
8	0000-000044-00	PACKING WASHER Ø14	2	
9	2125-430000-3A	METALLIC OIL PIPE ASSEMBLY	1	
10	2125-420000-30	HYDRAULIC PIPE	1	
11	2805-160014-00	BOLT M16 x 1.5	1	
12	2125-440000-3A-01	HYDRAULIC PIPE	1	Used for Lift Height 157" (Trimast)
13	2402-145000-00	BOLT	1	
14	2125-470000-3A	HYDRAULIC HOSE	1	
15	2705-141400-00	UNION	1	
16	0000-000109-00	SCREW M8 x 16	3	
17	0000-000159-00	LOCK WASHER Ø8	3	
18	0000-000176-00	FLAT WASHER Ø8	3	

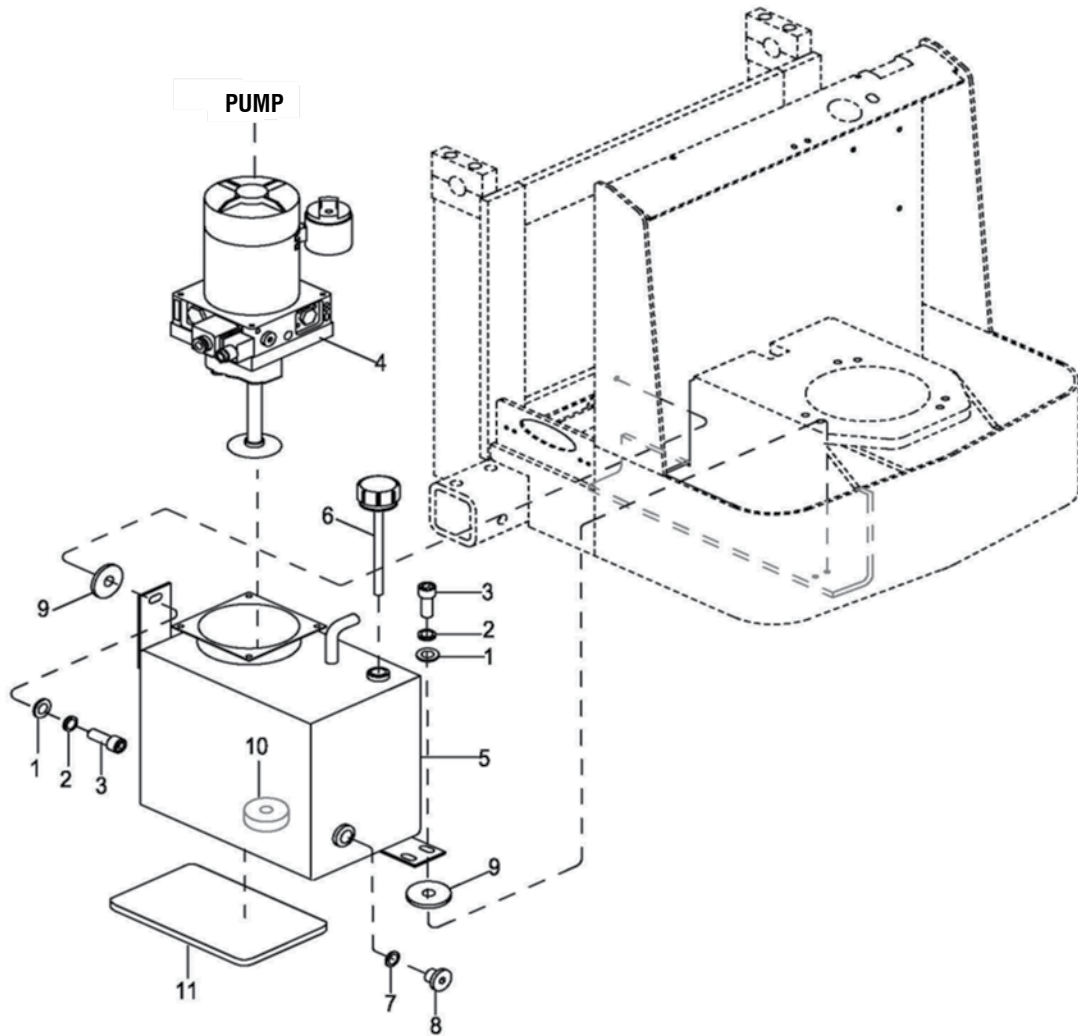
FIGURE 12-20 HYDRAULIC SYSTEM



HYDRAULIC SYSTEM (TRIMAST WITH TUBES - USED FROM SERIAL # S2119120)

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	0000-000069-00	PACKING WASHER Ø16	8	2
2	2706-161600-00	CONNECTOR M16 x 1.5 - M16 x 1.5	2	2
3	2125-480000-30	METALLIC OIL PIPE ASSEMBLY	2	2
4	2125-400002-3A	BLOCK CROSS	1	2
5	2701-161600-00	UNION	2	2
6	0000-000154-00	SCREW M8 x 35	2	2
7	2702-142000-00	CONNECTOR G1/4-M20 x 1.5	1	2
8	0000-000044-00	PACKING WASHER Ø14	3	2
9	2125-430000-3B	METALLIC PIPE ASSEMBLY	1	2
10	2125-450000-3A	METALLIC PIPE ASSEMBLY	1	2
11	2706-162000-10	CONNECTOR M16 x 1.5 - M20 x 1.5	1	2
12	2125-440000-3A-01	HYDRAULIC PIPE	1	Used for Lift Height 157" (Trimast)
13	2702-141600-00	UNION	2	2
14	2125-470000-30	HOSE	1	2
15	0000-000109-00	SCREW M8 x 16	3	2
16	0000-000159-00	LOCK WASHER Ø8	3	2
17	0000-000176-00	FLAT WASHER Ø8	3	2

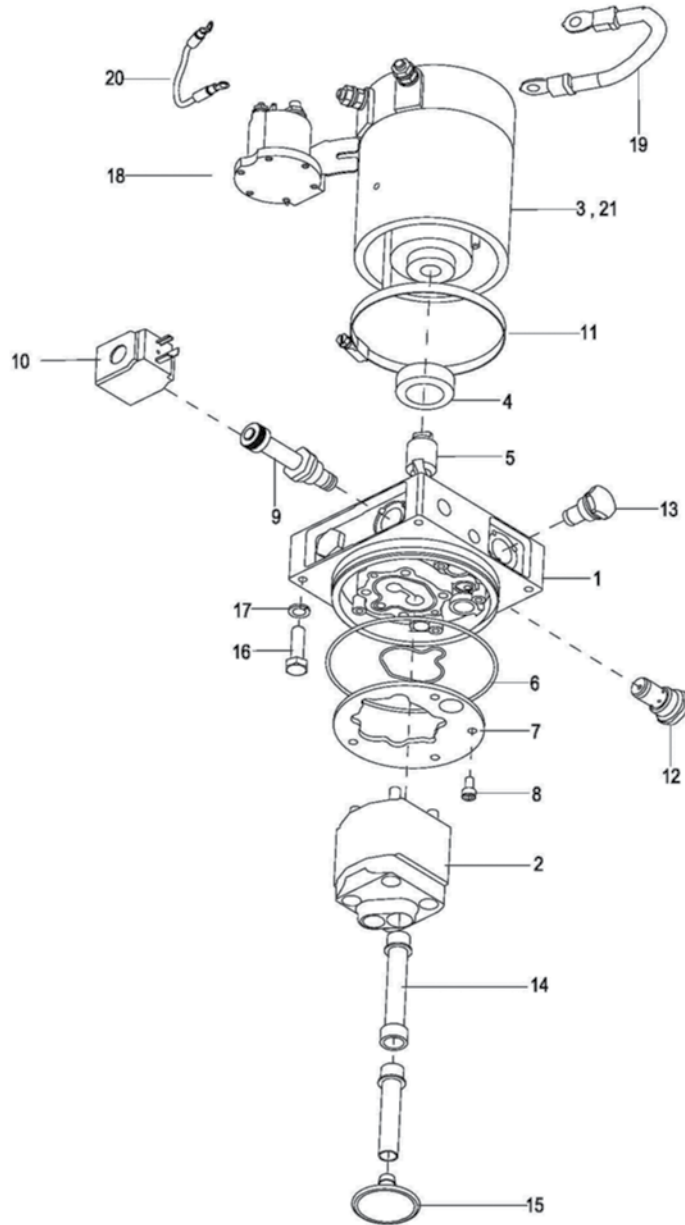
FIGURE 12-21 PUMP AND RESERVOIR



PUMP AND RESERVOIR

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	0000-000176-00	FLAT WASHER Ø8	4	
2	0000-000159-00	LOCK WASHER Ø8	4	
3	0000-000109-00	SCREW M8 x 16	4	
4	2125-430000-00	PUMP AND MOTOR ASSEMBLY	1	Used on BGS-25-25 (Single Speed Trucks)
4a	2125-430000-20	PUMP AND MOTOR ASSEMBLY	1	Used on BGS-25-25 Up to Serial # S2313064 (2 Speed Trucks).
4b	2125-401000-20	PUMP AND MOTOR ASSEMBLY	1	Used on BGS-25-25 From Serial # S2313065 (2 Speed Trucks)
4c	2120-430000-00	PUMP AND MOTOR ASSEMBLY	1	Used on BGS-25-20 (Single Speed Trucks)
5	2125-421000-00	OIL TANK 1 Used for Single Speed Trucks	1	Used for Single Speed Trucks
5a	2125-421000-10	OIL TANK 1 Used for 2 Speed Trucks	1	Used for 2 Speed Trucks
6	2125-423000-00	AIR FILTER	1	
7	0000-000634-00	WASHER	1	
8	0000-000635-00	PLUG	1	
9	2112-410004-00	WASHER	3	
10	2125-420001-00	MAGNET	1	
11	2112-410005-00	WASHER	1	

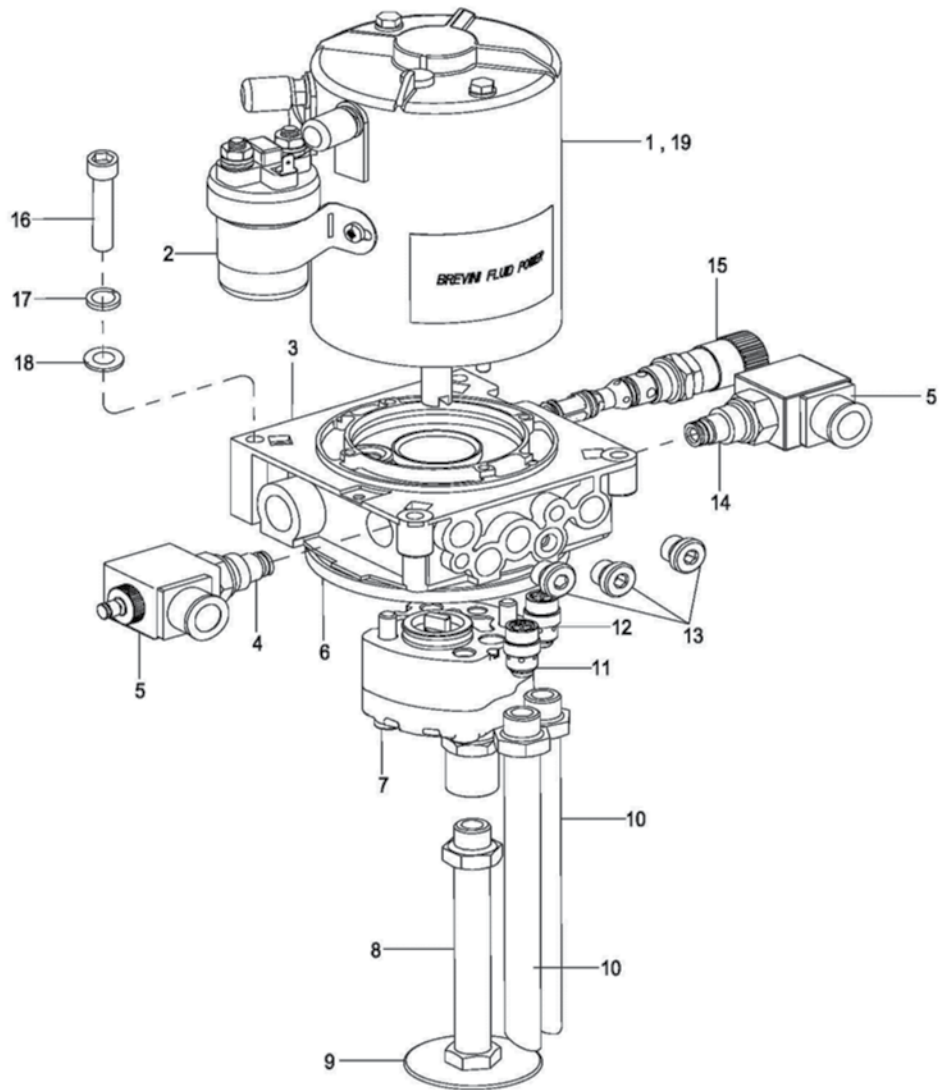
FIGURE 12-22 PUMP AND MOTOR ASSEMBLY



PUMP AND MOTOR ASSEMBLY (SINGLE SPEED)

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	2125-430001-00	BASE ASSEMBLY	1	
2	2125-430002-00	PUMP	1	Used on BGS-25-25
2a	2120-430002-00	PUMP	1	Used on BGS-25-20
3	2125-430003-00	MOTOR	1	
4	2125-430004-00	BUSHING	1	
5	2125-430005-00	COUPLING	1	
6	2125-430006-00	SEAL KIT	1	
7	2125-430007-00	FILTER SCREEN	1	
8	0000-000077-00	SCREW M6 x 12 4	1	
9	2125-430009-00	CARTRIDGE	1	
10	2125-430010-00	CARTRIDGE	1	
11	2125-430022-00	STEEL CLAMP	1	
12	2125-430012-00	VALVE	1	
13	2125-430013-00	VALVE CAVITY PLUG	2	
14	2125-430014-00	TUBE PLASTIC	1	
15	2125-430015-00	FILTER , STEEL	4	
16	0000-000242-00	BOLT M6 x 16	4	
17	0000-000056-00	LOCK WASHER Ø6	1	
18	1120-420017-00	RELAY	1	
19	2125-430020-00	CABLE INSULATED	1	
20	2125-430021-00	WIRE	1	
21	2125-430023-00	BRUSH SET	1	
21a	2125-430024-00	BRUSH HOLDER ASSEMBLY	1	Includes: Brushes, bracket and springs

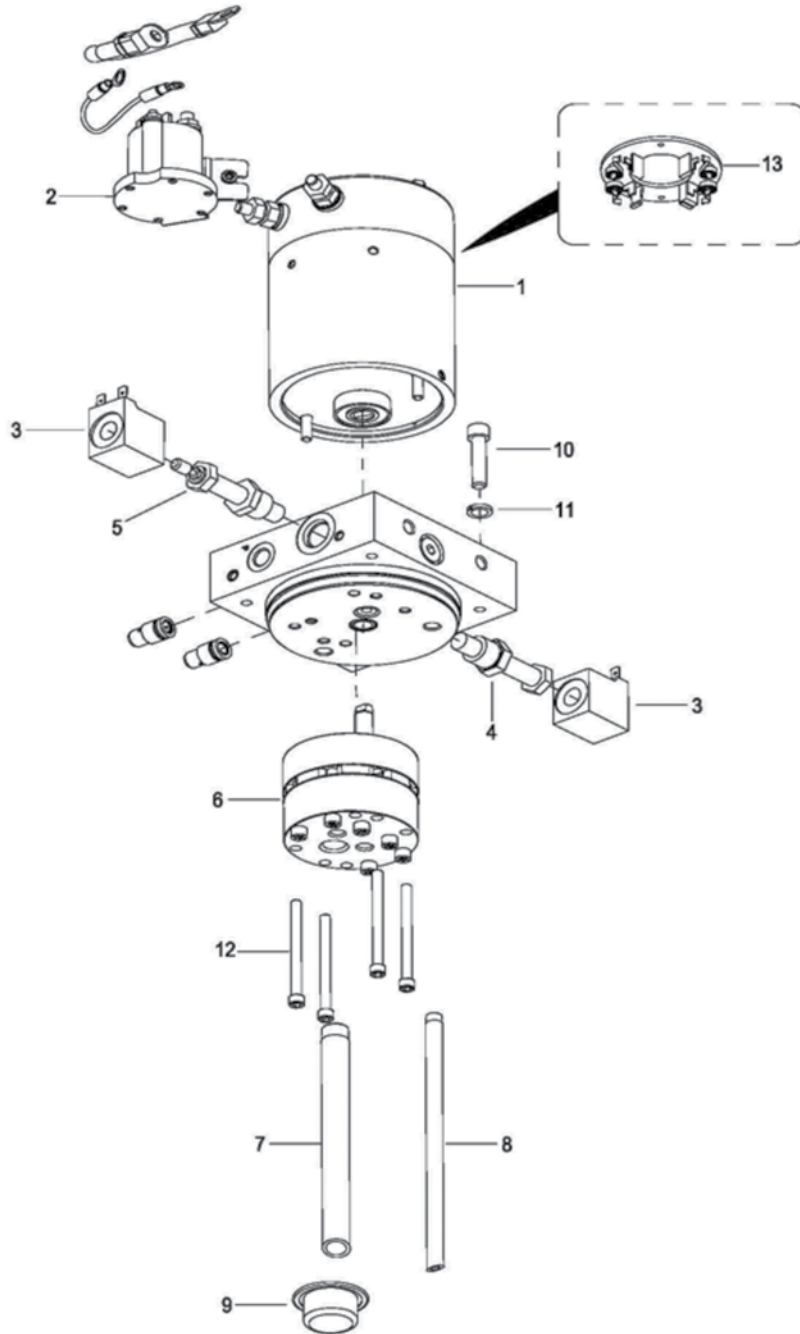
FIGURE 12-23 PUMP AND MOTOR ASSEMBLY



PUMP AND MOTOR ASSEMBLY (TWO SPEED - USED UP TO SERIAL # S2313064)

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	2125-430001-20	MOTOR	1	
2	2125-430002-20	SOLENOID	1	
3	2125-430003-20	FLANGE	1	
4	2125-430004-20	CARTRIDGE	1	
5	2125-430005-20	SOLENOID	2	
6	2125-430006-20	O-RING	1	
7	2125-430007-20	PUMP	1	Used on BGS-25-25
8	2125-430008-20	TUBE	1	
9	2125-430009-20	FILTER	1	
10	2125-430010-20	TUBE	2	
11	2125-430011-20	FLOW CONTROL VALVE	1	6L/MIN
12	2125-430012-20	FLOW CONTROL VALVE	1	12L/MIN
13	2125-430013-20	PLUG	3	
14	2125-430014-20	CARTRIDGE	1	
15	2125-430015-20	FILTER , STEEL	1	
16	0000-000027-00	SCREW M6 x 55	4	
17	0000-000056-00	LOCK WASHER Ø6	4	
18	0000-000023-00	FLAT WASHER Ø6	4	
19	2125-430016-20	BRUSH SET	1	

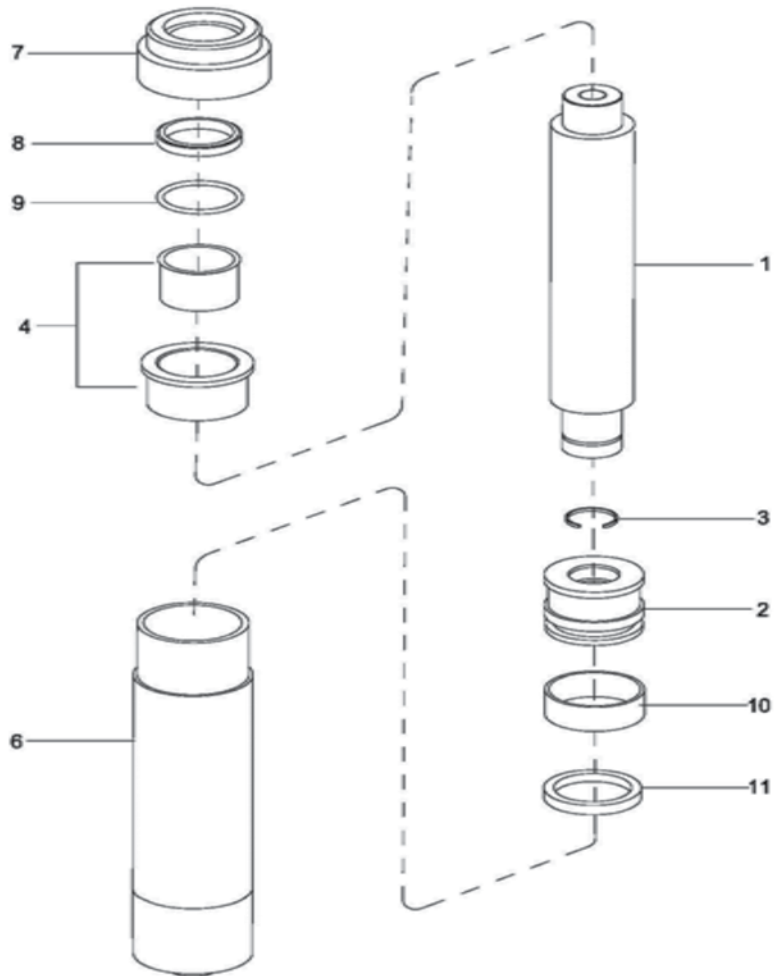
FIGURE 12-24 PUMP AND MOTOR ASSEMBLY



PUMP AND MOTOR ASSEMBLY (TWO SPEED - USED FROM SERIAL # S2313065)

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	2125-401002-20	MOTOR	1	
2	2125-401015-20	SOLENOID	1	
3	2125-401006-20	SOLENOID VALVE	2	
4	2125-401005-20	RELEASE VALVE	1	
5	2125-401007-20	RELEASE VALVE	1	
6	2125-401003-20	PUMP	1	
7	2125-401011-20	SUCTION HOSE	1	
8	2125-401012-20	RETURN HOSE	2	
9	2125-401013-20	FILTER	1	
10	0000-000320-00	SCREW M6 x 35	4	
11	0000-000056-00	LOCK WASHER Ø6	4	
12	2125-401004-20	SCREW	4	
13	2125-401017-20	BRUSH SET	1	
13a	2125-401018-20	BRUSH HOLDER ASSEMBLY	1	Includes: Brushes, bracket and springs

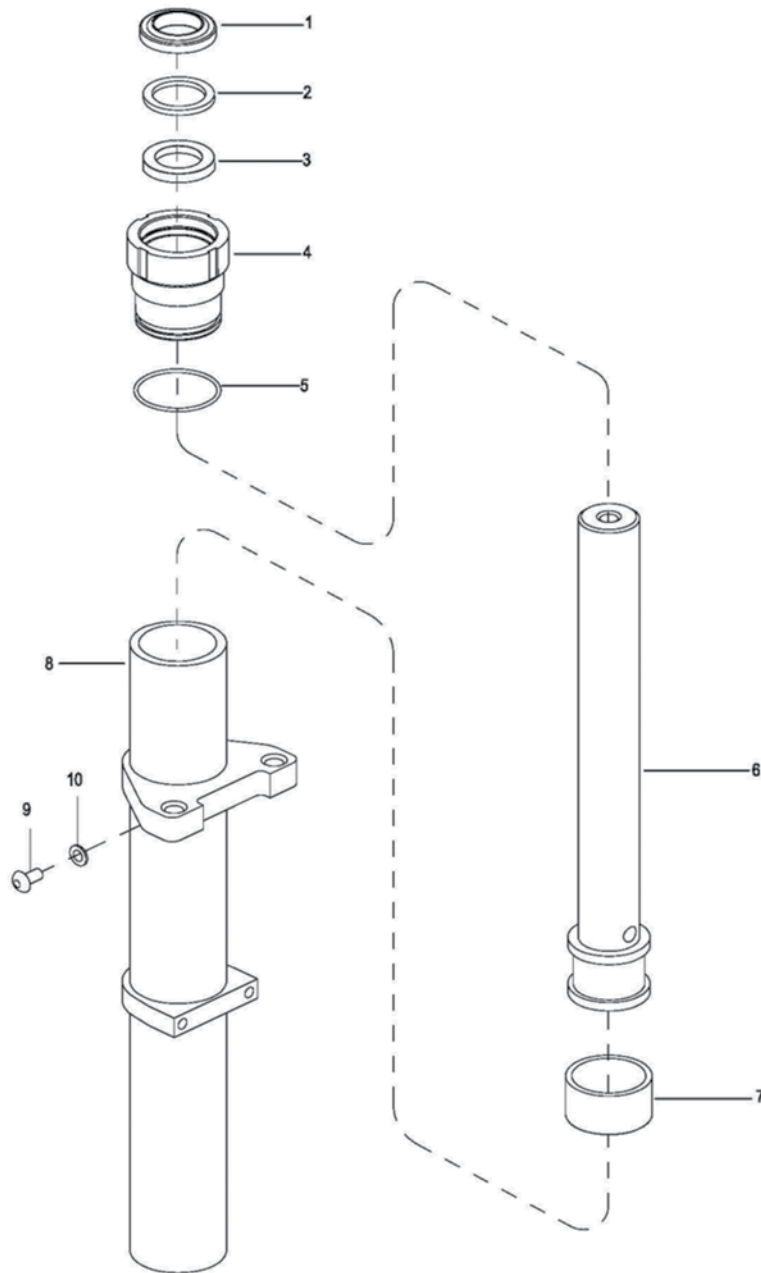
FIGURE 12-25 LIFT CYLINDER (TELESCOPIC)



LIFT CYLINDER (TELESCOPIC)

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
--	2125-410000-00-02	LIFT CYLINDER ASSEMBLY.	1	Used for lift height 106" (Two Stage)
--	2125-410000-00-04	LIFT CYLINDER ASSEMBLY.	1	Used for lift height 130" (Two Stage)
--	2125-410000-00-06	LIFT CYLINDER ASSEMBLY.	1	Used for lift height 142" (Two Stage)
--	2125-410000-00-08	LIFT CYLINDER ASSEMBLY.	1	Used for lift height 153" (Two Stage)
--	2125-2QS	SEAL KIT	1	Includes Pos. # 2, 3 and 5
1	2125-410001-00-02	PISTON ROD	1	Used for lift height 106" (Two Stage)
1a	2125-410001-00-04	PISTON ROD	1	Used for lift height 130" (Two Stage)
1b	2125-410001-00-06	PISTON ROD	1	Used for lift height 142" (Two Stage)
1c	2125-410001-00-08	PISTON ROD	1	Used for lift height 153" (Two Stage)
2	2125-410002-00	PISTON	1	
3	2125-410003-00	COLLAR	1	
4	2125-410006-00	BUSHING	1	
5	--	BEARING	1	
6	2125-411000-00-02	CYLINDER TUBE	1	Used up to 11/06/10 FOR LIFT HEIGHT: 106"
6a	2125-411000-0A-02	CYLINDER TUBE	1	Used from 11/07/10. FOR LIFT HEIGHT: 106"
6b	2125-411000-00-04	CYLINDER TUBE	1	Used up to 11/06/10 FOR LIFT HEIGHT: 130"
6c	2125-411000-0A-04	CYLINDER TUBE	1	Used from 11/07/10 FOR LIFT HEIGHT: 130"
6d	2125-411000-00-06	CYLINDER TUBE	1	Used up to 11/06/10 FOR LIFT HEIGHT: 142"
6e	2125-411000-0A-06	CYLINDER TUBE	1	Used from 11/07/10 FOR LIFT HEIGHT: 142"
6f	2125-411000-00-08	CYLINDER TUBE	1	Used up to 11/06/10 FOR LIFT HEIGHT: 153"
6g	2125-411000-0A-08	CYLINDER TUBE	1	Used from 11/07/10 FOR LIFT HEIGHT: 153"
7	2125-410004-00	CAP	1	Used up to 11/06/10
7a	2125-410004-0A	CAP	1	Used from 11/07/10
8	0000-000084-00	RING WIPER	1	
9	0000-000370-00	O-RING	1	
10	2125-410005-00	RING BACK UP 50X20X2.5	1	
11	0000-000512-00	ROD PACKING 40X50X6	1	

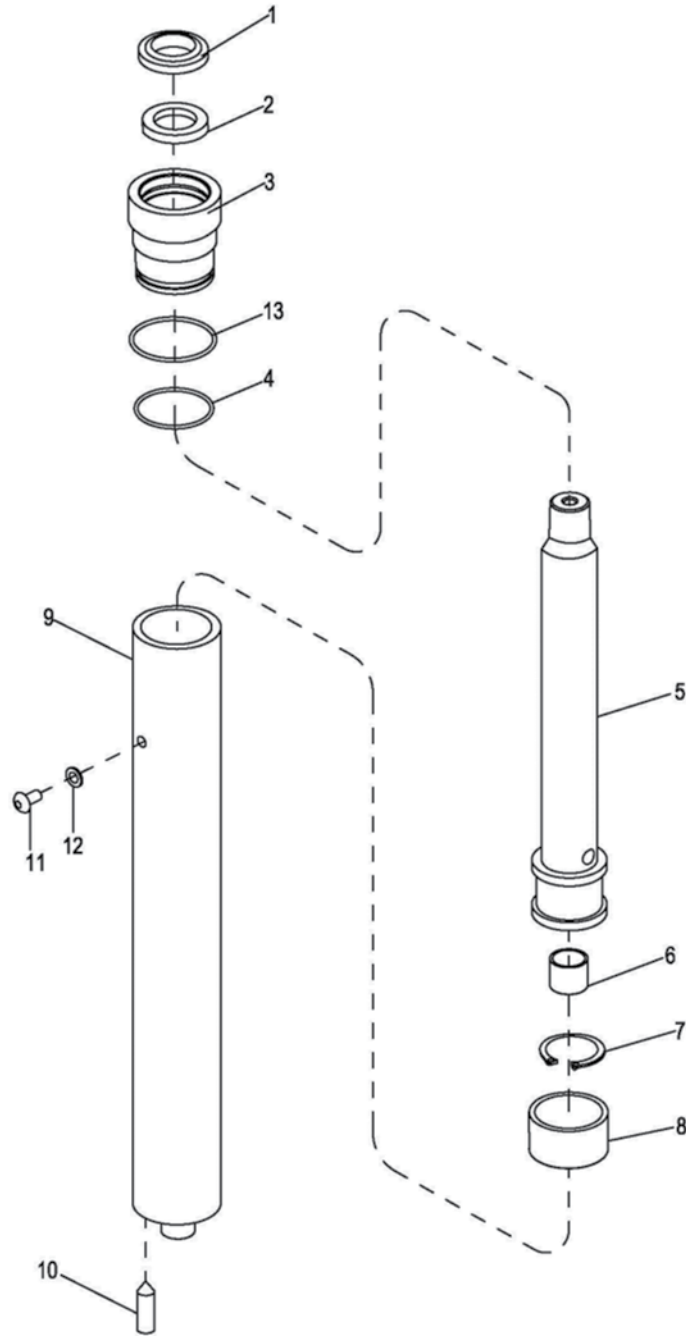
FIGURE 12-26 FREE LIFT CYLINDER



FREE LIFT CYLINDER (TRIMAST)

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
--	2125-420000-30-00	FREE LIFT CYLINDER ASSEMBLY.	1	Used for lift height 157" (Trimast)
--	2125-2ZG	SEAL KIT	1	Includes Pos. #1, 3 and 5
1	0000-000045-00	DUST RING	1	
2	0000-000684-00	INNER COLLAR	1	
3	0000-000046-00	YX-SEAL 55x65x6	1	
4	2125-420002-30	GUIDE RING	1	
5	0000-000685-00	O-RING 65x3.1	1	
6	2125-420001-30-00	PISTON ROD	1	Used for lift height 157" (Trimast)
7	7 2125-420003-30	SUPPORTING RING 70x65x25	1	
8	8 2125-421000-30-00	CYLINDER TUBE	1	Used for lift height 157" (Trimast)
9	9 0000-000518-00	SCREW M5x6	1	
10	10 2125-410003-30	WASHER	1	

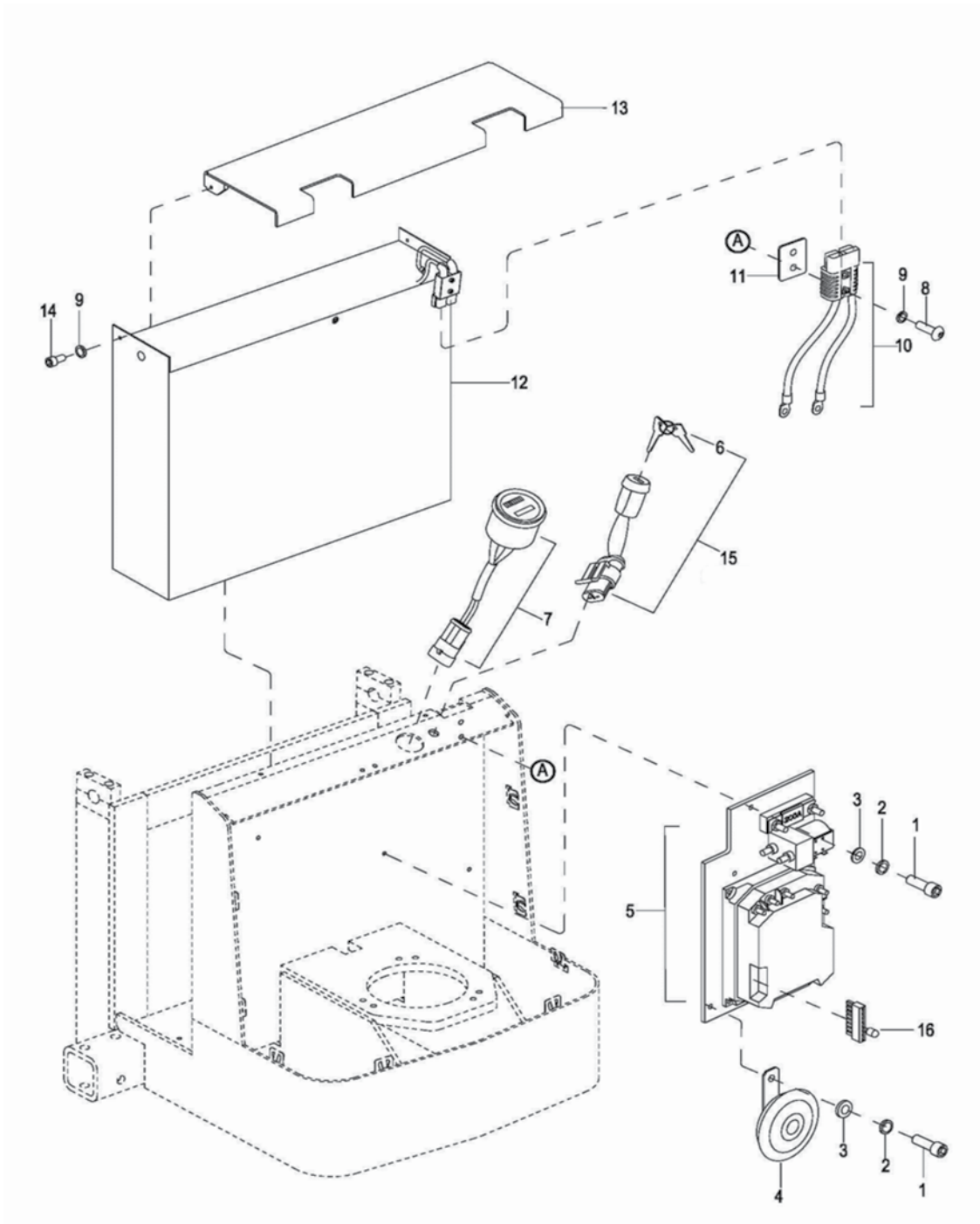
FIGURE 12-27 SECONDARY LIFT CYLINDER (TRIMAST)



SECONDARY LIFT CYLINDER (TRIMAST)

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
--	2125-410000-30-00	CYLINDER ASSEMBLY 1	1	Used for lift height 157" (Trimast)
--	2125-2BG	SEAL KIT	1	Includes Pos. # 1, 2 and 4
1	0000-000084-00	DUST RING	1	
2	0000-000085-00	YX-SEAL 35X45X6 1	1	
3	2125-410004-30	CYLINDER HEAD 1	1	
4	0000-000519-00	O-RING 48X3.1 1	1	
5	2125-410001-30-00	PISTON ROD 1	1	Used for lift height 157" (Trimast)
6	2125-410005-30	BUSHING 1	1	
7	0000-000520-00	INNER COLLAR Ø24 1	1	
8	2125-410002-30	SUPPORTING RING 1	1	
9	2125-411000-30-00	CYLINDER TUBE 1	1	Used for lift height 157" (Trimast)
10	2125-410006-30 PIN	PIN 1	1	
11	0000-000518-00	SCREW M5X6 1	1	
12	2125-410003-30	WASHER 1	1	
13	0000-000609-00	O-RING 52.5X3.1 1	1	

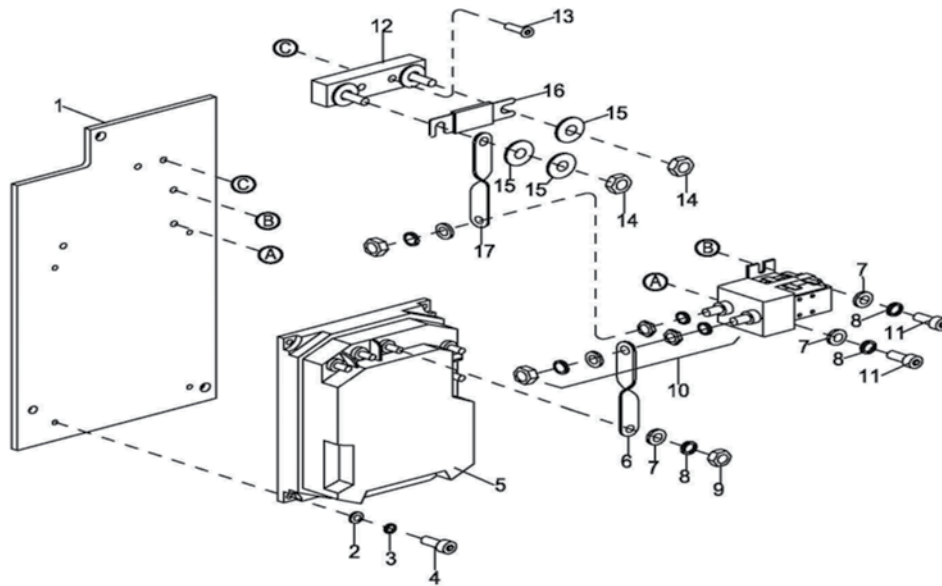
FIGURE 12-28 ELECTRICAL SYSTEM



ELECTRICAL SYSTEM

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	0000-000321-00	SCREW M8X20	3	
2	0000-000159-00	LOCK WASHER Ø8	3	
3	0000-000194-00	FLAT WASHER Ø8	3	
4	1120-500003-00	HORN	1	
5	2125-510000-00	ELECTRIC BOARD ASSEMBLY	1	
6	1115-500010-00	SWITCH KEY	1	Used up to Serial # S2119006
6a	1120-500016-10	2 WAY SWITCH KEY	2	Used from Serial # S2119007
7	1220-520007-0B	BATTERY INDICATOR (BDI) ASSEMBLY 4 PIN	1	Used up to Serial # S1914004 And for serial numbers: S1914022, S1914023, S1914025, S1914026, S1914028, S1905006, S1915001, S1915003, S1915004, S1916002, S1916023
7a	1115-510006-20	BATTERY INDICATOR (BDI) W. HOUR METER (3 PIN)	1	With hour meter
7b	1220-520007-0D	WRING HARNESS FOR BDI 1115-510006-20 (3 PIN)	2	For BDI 1115-510006-20 (3PIN)
8	0000-000170-00	SCREW M6X30	4	
9	0000-000056-00	LOCK WASHER Ø6	1	
10	2125-531000-00	CONNECTOR BATTERY GRAY	1	
11	1120-112008-00	PLATE	1	
12	1120-510000-00	BATTERY ASSEMBLY	1	
13	2125-561000-00	BATTERY TOP	2	
14	0000-000055-00	SCREW M6X16	1	
15	1220-520002-0C	KEY SWITCH HARNESS ASSEMBLY.	1	Used up to Serial # S2119006
15a	1220-520002-1C	2 WAY SWITCH ASSEMBLY	1	Used from Serial # S2119007
16	1120-540004-00	FAULT CODE INDICATOR	x	Used from May 2012

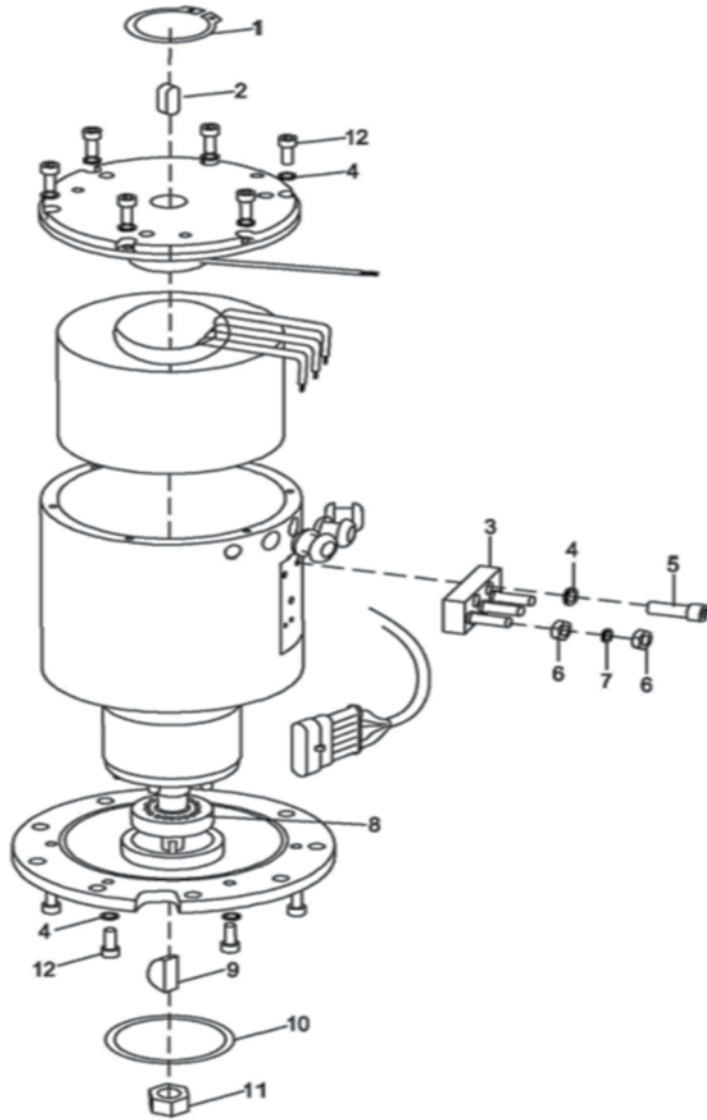
FIGURE 12-29 ELECTRICAL PANEL



ELECTRICAL PANEL

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	2125-510001-00	SETTING BOARD	1	
2	0000-000128-00	FLAT WASHER Ø5	5	
3	0000-000206-00	LOCK WASHER Ø5	5	
4	0000-000004-00	SCREW M5X12	4	
5	1120-500004-00-10	CONTROLLER	1	
6	1120-530007-00	COPPER CONDUCTOR ?	1	
7	0000-000123-00	FLAT WASHER Ø6	7	
8	0000-000056-00	LOCK WASHER Ø6	7	
9	0000-000166-00	NUT M6	5	
10	1120-500005-00	CONTACTOR	1	
11	0000-000077-00	SCREW M6X12	2	
12	1120-540001-00-B	STAND	1	
13	0000-000090-00	SCREW M6X12	2	
14	0000-000196-00	NUT M8	4	
15	0000-000210-00	FLAT WASHER Ø8	5	
16	1120-540002-00	FUSE	1	
17	1120-530006-00	COPPER CONDUCTOR	1	

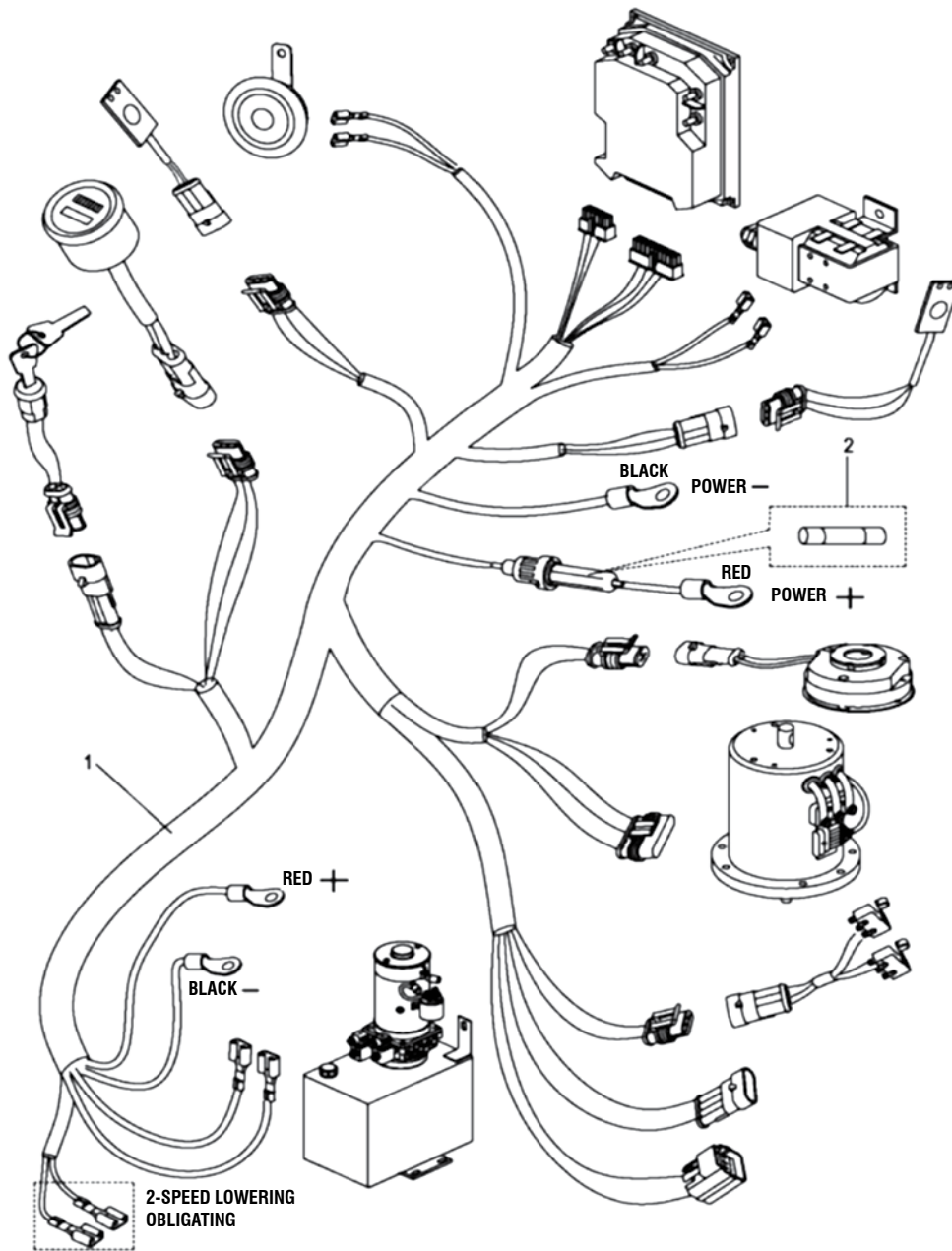
FIGURE 12-31 WIRING HARNESS



DRIVE MOTOR

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	0000-000293-00	RETAINING RING	2	
2	0000-000226-00	KEY 6X6X16	1	
3	1120-220001-00	TERMINAL BLOCK	1	
4	0000-000206-00	LOCK WASHER Ø5	17	
5	0000-000117-00	SCREW M5X10	2	
6	0000-000166-00	NUT M6	6	
7	0000-000056-00	LOCK WASHER Ø6	6	
8	1120-220002-00	BEARING	1	
9	0000-000204-00	KEY 3X5X13	1	
10	0000-000409-00	RING	1	
11	0000-000436-00	NUT M12X1.5	1	
12	0000-000323-00	SCREW M5X16	15	

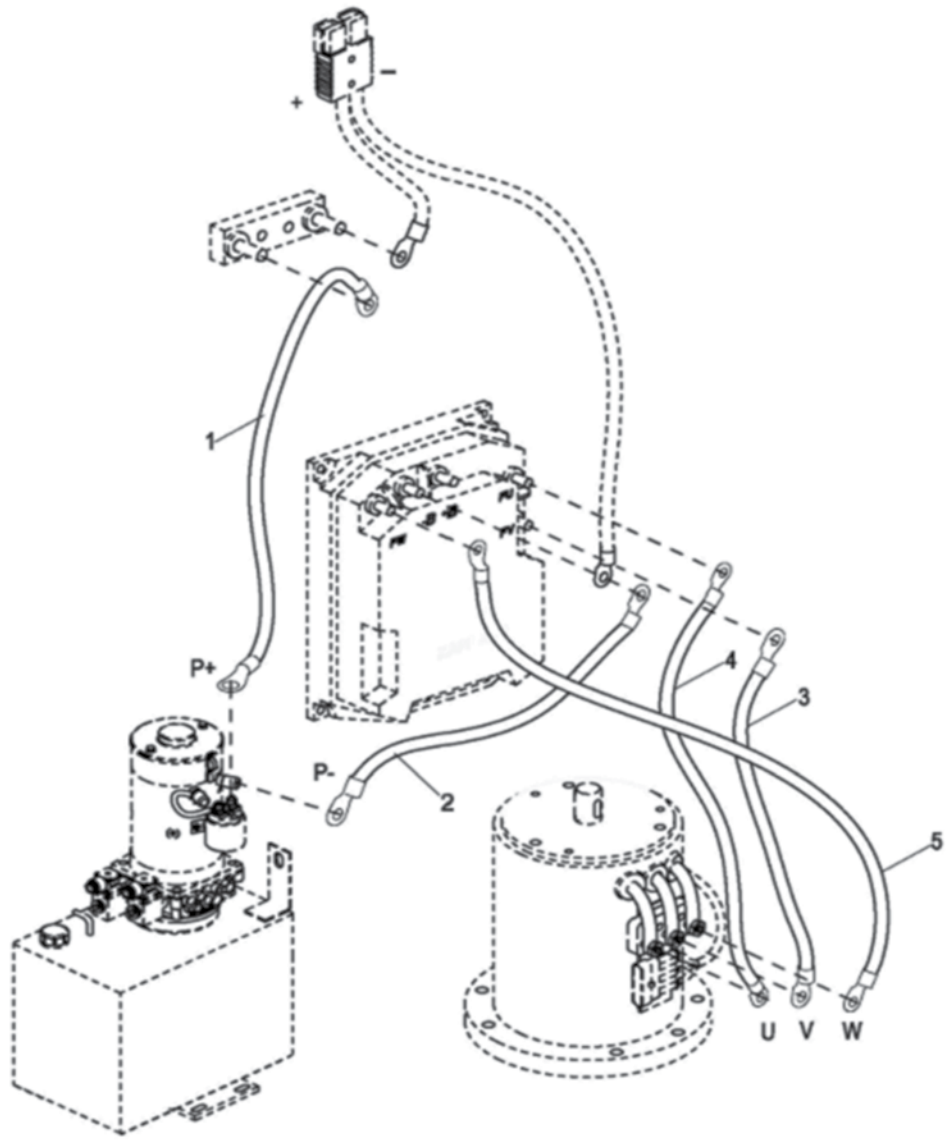
FIGURE 12-31 WIRING HARNESS



WIRING HARNESS

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	2125-520001-0B	WIRING HARNESS	1	Used on Single Speed Trucks
1a	2125-520001-0C	WIRING HARNESS	1	Used on 2 Speed Trucks
2	1120-500010-00	FUSE 10A	1	

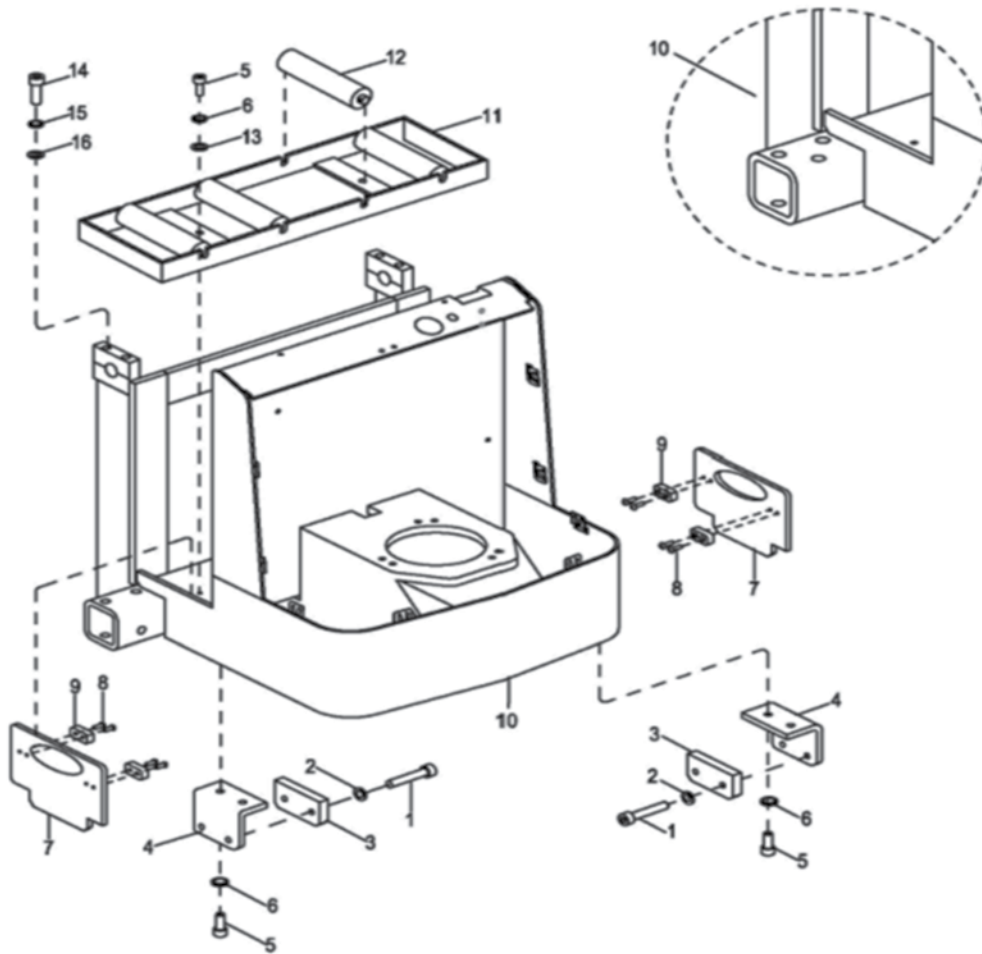
FIGURE 12-32 WIRING CABLES



WIRING CABLES

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	2125-530001-00	PUMP POWER LINE +	1	
2	2125-530002-00	PUMP POWER LINE -	1	
3	2125-530006-00	MOTOR LINE V	1	
4	2125-530007-00	MOTOR LINE U	1	
5	2125-530005-00	MOTOR LINE W	1	

FIGURE 12-33 BATTERY COMPARTMENT



BATTERY COMPARTMENT

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	0000-000917-00	SCREW M8X45	4	
2	0000-000176-00	FLAT WASHER Ø8	4	
3	2125-150002-00	SUPPORTING SHOE	2	
4	2125-150001-00	CONNECTOR BLOCK	2	
5	0000-000321-00	SCREW M8X20	6	
6	0000-000159-00	LOCK WASHER Ø8	6	
7	2125-103001-00	BATTERY STOP	2	Used up to Serial # S2016059
7a	2126-103001-00	BATTERY STOP	2	Used from Serial # S2016060
8	0000-000371-00	SCREW M6X16	8	
9	1120-100004-00	BLOCK 4	4	
10	2125-120000-00	FRAME	1	Used up to Serial # S2016059
10a	2126-120000-00	FRAME	1	Used from Serial # S2016060
11	2125-102100-00	SLIDEWAY FRAME	1	
12	2125-102200-0A	ROLLER	4	
13	0000-000194-00	FLAT WASHER Ø8	2	
14	0000-000432-00	SCREW M16X80	4	
15	0000-000191-00	LOCK WASHER Ø16	4	
16	0000-000220-00	FLAT WASHER Ø16	4	

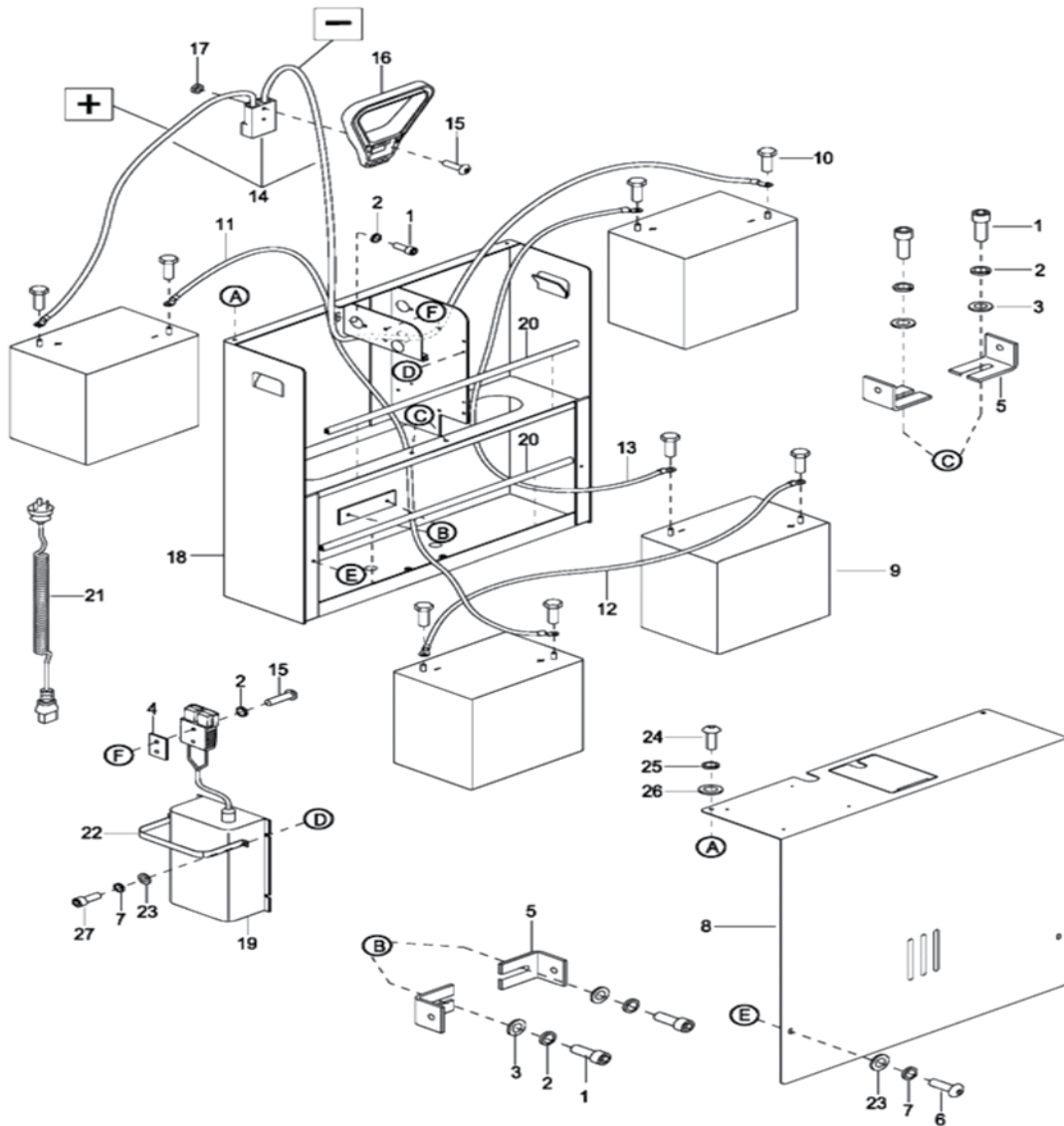
BATTERY PACK ASSEMBLY - FACTORY INSTALLED - USED FROM SERIAL # S2016023 TO S2410120

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	0000-000055-00	SCREW M6X16	6	
2	0000-000056-00	LOCK WASHER Ø6	6	
3	0000-000023-00	FLAT WASHER Ø6	4	
4	1145-550003-20	WASHER RUBBER	4	
5	1145-550001-20	BLOCK	4	
6	0000-000119-00	SCREW M5X8	4	
7	0000-000206-00	LOCK WASHER Ø5	4	
8	1145-552000-2C	BATTERY COVER	1	Used up to serial # S2310226
8a	1145-552000-2D	BATTERY COVER	1	Used from serial # S2310227 to S2410120
9	003232	BATTERY	4	2
10	0000-000550-00	NUT M8 8	8	Used up to 03-09-2013
10a	0000-000242-00	BOLT M8 x 16 8	8	Used from 03-10-2013
11	1145-553002-2L	M2 CABLE	1	
12	1145-553001-20	M1 CABLE	1	
13	1145-533003-2L	M3 CABLE	1	
14	1145-553100-20	CONNECTOR BATTERY GRAY ASSEMBLY	1	
15	0000-000102-00	SCREW M6X45	2	
16	005450	HANDLE UPPER	1	
17	0000-000166-00	NUT M6	2	
18	1145-551000-2C	BATTERY FRAME	1	Used up to serial # S2310226
18a	1145-551000-2D	BATTERY FRAME	1	Used from serial # S2310227 to S2410120
19	1120-560000-00	CHARGER 20A	1	No longer available: If replacing old charger you have to order Kit part # 1145-EP25-20, Charger 1120-560000-00-01 and Cord 1120-560002-00
20	1145-550002-20	SLUG	2	
21	1120-560001-00	CHARGER CABLE	1	
22	0000-000851-00	SCREW M8 x 12	2	
23	0000-000390-00	FLAT WASHER Ø5	2	
24	0000-000119-00	SCREW M5 x 12	2	Used up to serial # S2310226
24a	0000-000700-00	SCREW M8 x 16	2	Used from serial # S2310227 to S2410120
25	0000-000206-00	LOCK WASHER Ø5	2	Used up to serial # S2310226
25a	0000-000159-00	LOCK WASHER Ø8	2	Used from serial # S2310227 to S2410120
26	0000-000176-00	FLAT WASHER Ø8	2	Used from serial # S2310227 to S2410120

BATTERY PACK ASSEMBLY - FACTORY INSTALLED - USED FROM SERIAL # S2410121 TO D24140007

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	0000-000055-00	SCREW M6X16	6	
2	0000-000056-00	LOCKWASHER Ø6	8	
3	0000-000380-00	FLATWASHER Ø6	4	
4	1145-550011-00	PLATE	1	
5	1145-550001-20	BLOCK	4	
6	0000-000119-00	SCREW M5X12	2	
7	0000-000206-00	LOCKWASHER Ø5	6	
8	1145-552000-2D	BATTERY COVER	1	
9	003232	BATTERY	4	
10	0000-000242-00	BOLT M8X16	8	
11	1145-553002-2L	M2 CABLE	1	
12	1145-553001-20	M1 CABLE	1	
13	1145-553003-2L	M3 CABLE	1	
14	1145-553100-20	BATTERY CONNECTOR ASSEMBLY	1	
15	0000-000498-00	SCREW M6X30	4	
16	2125-560001-00	PULLER HANDLE	1	
17	0000-000166-00	NUT M6	2	
18	1145-551000-2D	BATTERY FRAME	1	
19	1120-560000-00	CHARGER, 25A	1	
20	1145-550002-20	INSERTION	2	
21	1120-560002-00	HARGER CABLE USA	1	
22	1115-500009-00	CHARGER HOOP	2	
23	0000-000390-00	FLATWASHER Ø5	6	
24	0000-000700-00	SCREW M8X16	4	
25	0000-000159-00	LOCKWASHER Ø8	4	
26	0000-000176-00	FLATWASHER Ø8	4	
27	0000-000117-00	SCREW M5X10	4	
28	1120-112008-00	PLATE 1	1	
KIT	1145-EP25-20	KIT FOR CHARGER INSTALLATION	1	Charger pos. # 19 is not included

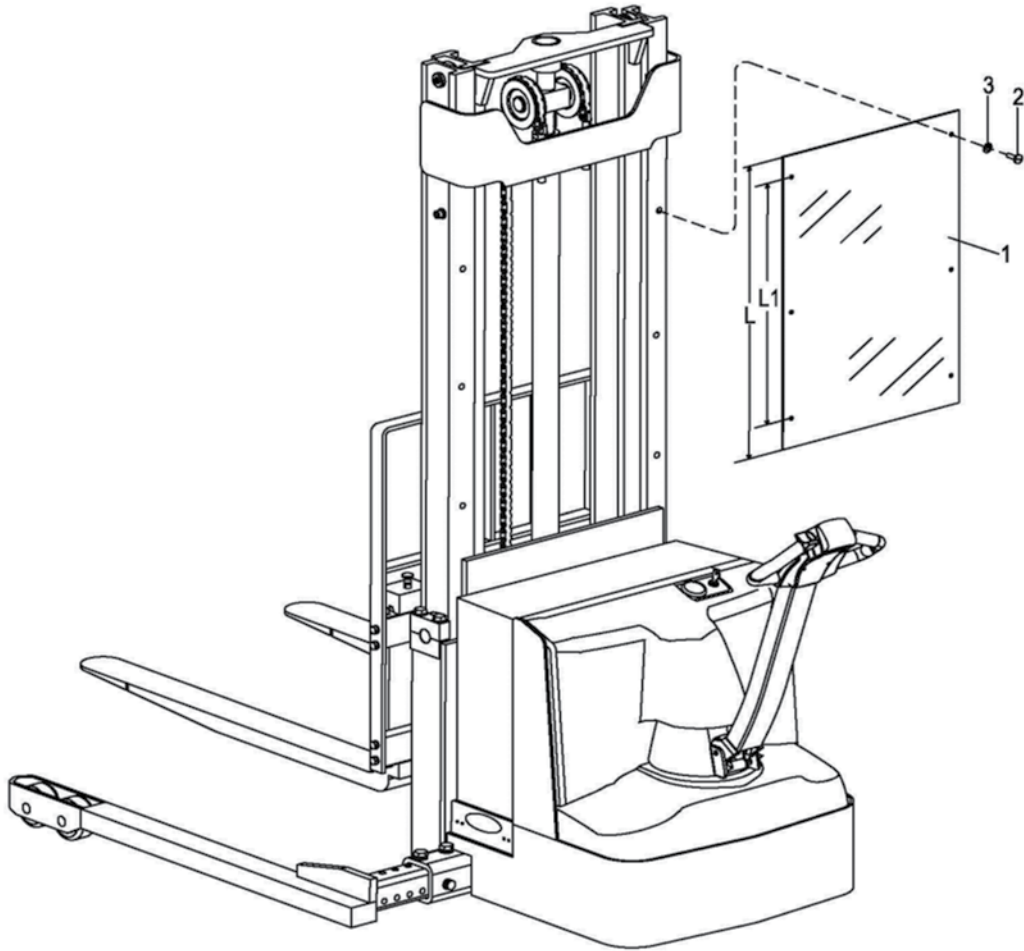
FIGURE 12-36 BATTERY PACK ASSEMBLY - FACTORY INSTALLED



BATTERY PACK ASSEMBLY - FACTORY INSTALLED - USED FROM SERIAL # D24140008

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	0000-000055-00	SCREW M6X16	6	
2	0000-000056-00	LOCKWASHER Ø6	8	
3	0000-000380-00	FLATWASHER Ø6	4	
4	1120-112008-00	PLATE	1	
5	1145-550001-20	BLOCK	4	
6	0000-000119-00	SCREW M5X12	2	
7	0000-000206-00	LOCKWASHER Ø5	6	
8	1145-552000-2D	BATTERY COVER	1	
9	003232	BATTERY	4	
10	0000-000242-00	BOLT M8X16	8	
11	1145-553002-2L	M2 CABLE	1	
12	1145-553001-20	M1 CABLE	1	
13	1145-553003-2L	M3 CABLE	1	
14	1145-553100-20	BATTERY CONNECTOR ASSEMBLY	1	
15	0000-000498-00	SCREW M6X30	4	
16	2125-560001-00	PULLER HANDLE	1	
17	0000-000166-00	NUT M6	2	
18	1145-551000-2E	BATTERY FRAME	1	
19	1120-560000-00-01	CHARGER, 25A 110V	1	
20	1145-550002-20	INSERTION	2	
21	1120-560002-00	CHARGER CABLE	1	
22	1115-500009-00	CHARGER HOOP	2	
23	0000-000390-00	FLATWASHER Ø5	6	
24	0000-000700-00	SCREW M8X16	4	
25	0000-000159-00	LOCKWASHER Ø8	4	
26	0000-000176-00	FLATWASHER Ø8	4	
27	0000-000117-00	SCREW M5X10	4	

FIGURE 12-37 WINDSHIELD



WINDSHIELD

INDEX NO.	PART NO.	PART NAME	NO. REQ.	NOTES
1	2125-600004-00-02	PLEXI GLAS - FINGER PROTECTION	1	1 Used for Lift Height: 106"
1a	2125-600004-00-04	PLEXI GLAS - FINGER PROTECTION	1	1 Used for Lift Height: 130"
1b	2125-600004-00-06	PLEXI GLAS - FINGER PROTECTION	1	1 Used for Lift Height: 142"
1c	2125-600004-00-08	PLEXI GLAS - FINGER PROTECTION	1	1 Used for Lift Height: 153"
1d	2125-600008-30-01	PLEXI GLAS - FINGER PROTECTION	1	1 Used for Lift Height: 157"
2	0000-000185-00	SCREW M8 X 16	6	
3	2214-150002-00	WASHER	6	

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BLUE GIANT EQUIPMENT CORPORATION

Corporate 410 Admiral Blvd
Mississauga ON L5T 2N6
t 905.457.3900 f 905.457.2313

USA 6350 Burnt Poplar Rd
Greensboro, NC 27409
www.BlueGiant.com