

OPERATOR'S MANUAL

SEPJ-33 SEMI-ELECTRIC PALLET JACK



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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WARNING

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

Do not operate this truck until you have checked its condition. Give special attention to wheels, horn, battery, controller, lift system, brakes, steering mechanism, guards and safety devices.

Operate truck only from designated operating position. Do not carry passengers. Keep feet clear of truck and wear foot protection.

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

Start, stop, travel, steer and brake smoothly. Slow down for turns and on uneven or slippery surfaces that could cause truck to slide or overturn. Use special

care when traveling without load as the risk of overturn may be greater.

Always look in direction of travel. Keep a clear view, and when load interferes with visibility, travel with load trailing.

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

Do not handle loads which are higher than the chassis unless load is secured so that no part of it could fall backward. Before lifting, be sure load is centered, forks are completely under the chassis backrest.

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

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SECTION 1 DESCRIPTION

1-1. INTRODUCTION.

This publication describes the 24 volt P33 lift truck distributed by Big Lift LLC. 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 P33 lift truck.

1-2. GENERAL DESCRIPTION.

The self-propelled P33 truck, [Figure 1-2](#), lifts and transports payloads up to 3300 pounds on rigid forks. The fork frame is either 22 or 27 inches wide with forks either 45 or 48 inches long.

The forward and reverse motion is controlled by two buttons mounted on the control head. The control handle is used to control stopping and turning. Lift and Lower are controlled by the control handle and the control lever. 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 P33 lift truck can be driven with forks raised or lowered. The lift truck must be protected from the elements.

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 of the truck's main components and controls.

1-3. SAFETY FEATURES.

The P33 is designed and engineered to provide maximum safety for operator and payload. Some of the safety features incorporated into the design are:

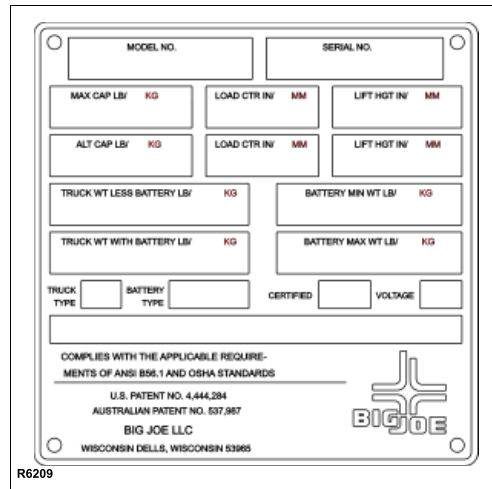


Figure 1-1 Name Plate

- 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.
- All control functions automatically return to "OFF" when released.
- Emergency Disconnect within operator's reach.
- Readily accessible horn button.
- Handle to provide a firm hand hold for operator.
- High visibility color scheme of truck provides visual alert of truck's presence.
- Battery Indicator

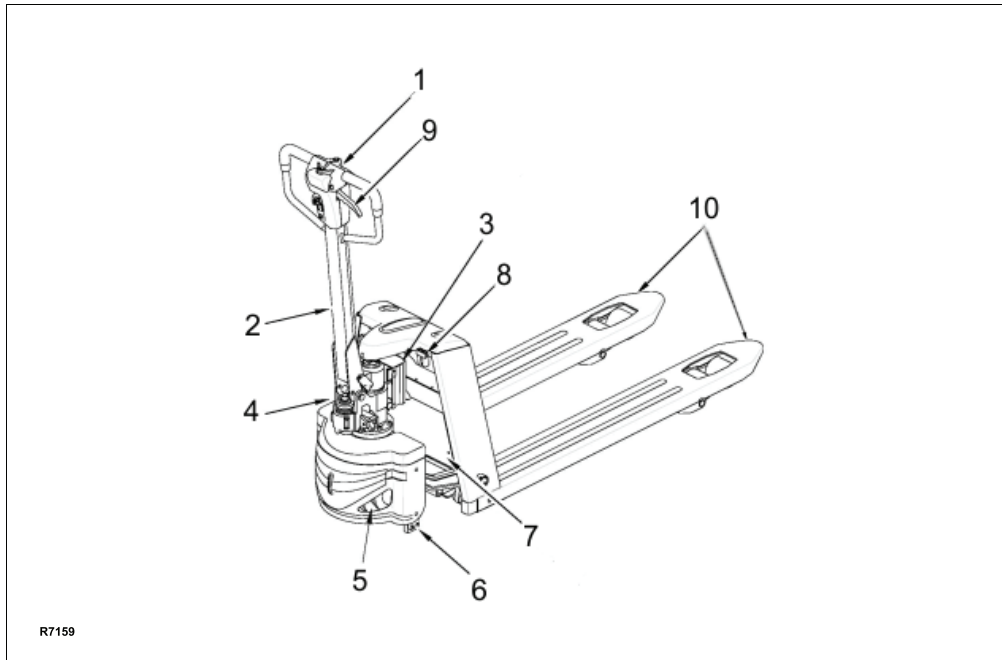


Figure -2 P33 Pallet Lift Truck

| ITEM | COMPONENT | ITEM | COMPONENT |
|------|------------------|------|--------------------|
| 1 | Control Head | 6 | Balance Block |
| 2 | Control Handle | 7 | Batteries |
| 3 | Controller Cover | 8 | Battery Disconnect |
| 4 | Pump | 9 | Control Lever |
| 5 | Drive Wheel | 10 | Forks |

SECTION 2 OPERATION

2-1. GENERAL.

This section gives detailed operating instructions for the P33 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.

2-2. OPERATING PRECAUTIONS.

WARNING: Improper operation of the lift truck may result in operator injury, or load and/or lift truck damage. Observe the following precautions when operating the P33 lift truck.

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

- Do not operate this truck unless you have been trained and authorized to do so and have read all warnings and instructions in this manual and on the truck.
- All warnings and instructions must be read and understood before using the equipment.
- Equipment must be inspected by a qualified person on a regular basis.
- Do not operate this truck until you have checked its condition. Give special attention to Wheels, Horn, Batteries, Controller, Lift System, Brakes, Steering Mechanism, Guards and Safety Devices
- Operate truck only from designated operation position. Wear foot protection. Do not carry passengers.
- Observe applicable traffic regulations. Yield right of way to pedestrians. Slow down and sound horn at cross aisles and wherever vision is obstructed.
- Start, stop, travel, steer and brake smoothly. Slow down for turns and on uneven or slippery surfaces that could cause truck to slide or overturn. Use special care when traveling without load as the risk of overturn may be greater.
- Always look in direction of travel. Keep a clear view, and when load interferes with visibility, travel with load or lifting mechanism trailing.
- Do not overload truck. Check nameplate for load weight and load center information.
- Before lifting, be sure load is centered, forks are completely under load, and load is as far back as possible against the chassis.
- Do not handle loads which are higher than the chassis unless load is secured so that no part of it could fall backward.
- When leaving truck, neutralize travel control. Fully lower lifting mechanism and set brake. When leaving truck unattended, turn off power switch or optional key switch and remove key.

2-3. BEFORE OPERATION

Table 2-1 covers important inspection points on the P33 lift truck which should be checked prior to operation. Depending on use, some trucks may require additional checks.

Figure 2-1 shows a sample format for an Operator Checklist, which can be modified as necessary to fit your operation.

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

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

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

2-4. DURING BREAK-IN

During the first 100 hours of operation, operate the truck under light load conditions:

- Prevent the new battery from over discharging.
- Perform specified preventive maintenance services carefully and completely.

- Avoid sudden stop, starts or turns.
- Perform oil changes and lubrication earlier than specified.
- Limit load to 70-80% of the rated load.

Table 2-1 Operator Checks

| ITEM | PROCEDURE | ITEM | PROCEDURE |
|-------------------------------------|--|---------------------------|---|
| Transmission and hydraulic systems. | Check for signs of fluid leakage. | Wheels | Check drive wheel for cracks or damage. Move truck to check load for freedom of rotation. |
| Forks | Check for cracks and damage. | Hydraulic controls | Check operation of lift and lower to their maximum positions. |
| Safety signs | Check that warning labels, nameplate, etc., are in good condition and legible. | Brake | Check that brake actuates when steering arm is raised to upright position. |
| Horn | Check that horn sounds when operated. | Deadman/ Parking brake | Check that steering arm raises to upright position when released and brake applies. |
| Steering | Check for binding or looseness in steering arm when steering. | Battery disconnect | Check that battery can be disconnected and reconnected. Check for connector damage. |
| Travel controls | Check that speed controls on control head operate in all speed ranges in forward and reverse and that belly button switch functions. | Battery charge | Check the battery indicator. |

BLUE GIANT®

Electric Truck
Daily Operator Check-Off List

Date _____ Operator _____

Truck No. _____ Model No. _____

Dept. _____ Shift _____

Hour Meter
Reading—Drive _____ Hoist _____

| Check | O.K. (✓) | Need Maintenance |
|--|----------|------------------|
| Tires | | |
| Load Wheels | | |
| Horn | | |
| Lift—Lower Control | | |
| Attachment Operation | | |
| Forward & Reverse Controls | | |
| Steering | | |
| Brakes | | |
| Hydraulic Leaks, Cylinders, Valves, Hoses, Etc. | | |

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Figure 2-1 Sample of Operator Check List

2-5. CONTROLS

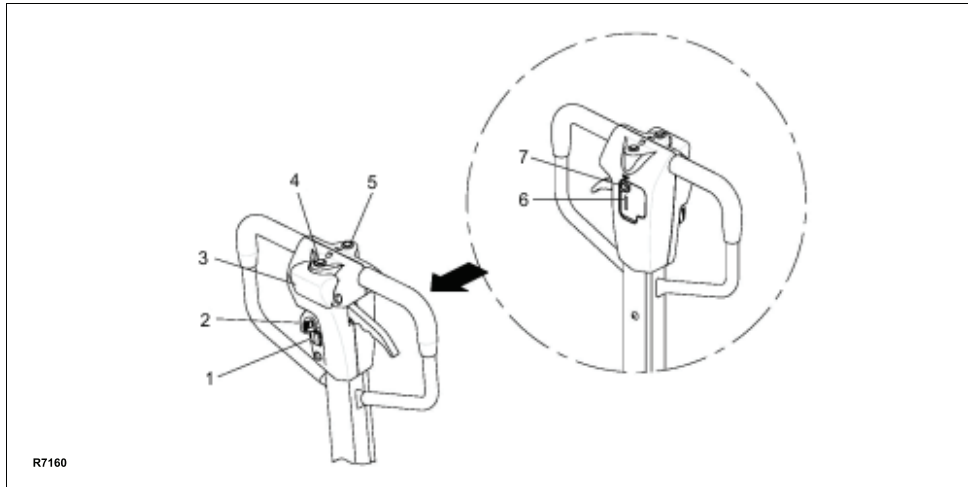


Figure 2-2 P33 Pallet Lift Truck

2-5.1. Power Button

The power button (1, [Figure 2-2](#)) is used to switch control current on and off.

2-5.2. Key Switch (Optional)

The optional key switch is (2, [Figure 2-2](#)) has two positions, ON and OFF. Removing the key prevents use by unauthorized personnel.

2-5.3. Belly-Button Button

The belly-button button (3, [Figure 2-2](#)) minimizes the possibility of the driver being pinned by the steering arm. 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.

2-5.4. Forward and Reverse Buttons

The forward button (5, [Figure 2-2](#)) and the reverse button (4, [Figure 2-2](#)) provide fingertip control for driving the truck.

2-5.5. Battery Indicator

When the key switch is turned on the battery charge indicator (6, [Figure 2-2](#)) displays the battery status. The colors of the LED represent the following conditions [Figure 2-3](#):

- The first LED lights when the battery is properly charged. As the battery charge decreases, additional LEDs will light.
- When the second to the last LED flashes, the battery is 70% discharged.
- When the last two LEDs flash alternately, the battery is 80% discharged and needs to be recharged.

The battery indicator has a memory function, it can remember the battery power after the power is shut down. The next time the power is turned on, it will show the last level of discharge

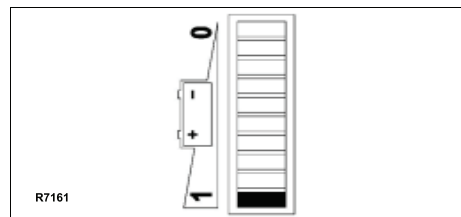


Figure 2-3 Battery Indicator

2-5.6. Horn Button

The horn button (7, [Figure 2-2](#)) located on the front of the control head activates the horn.

2-6. OPERATION

2-6.1. Forward and Reverse Travel.

1. Turn on the power switch (1, [Figure 2-2](#)) and the optional key switch (2). Grasp the grips of the steering head so that the forward and reverse controls can be comfortably operated by either thumb.
2. Lower the steering arm to a comfortable position to disengage the brake and to energize the electrical circuits.
3. To move forward (with load in front), slowly press the forward button (5, [Figure 2-2](#)).
4. To change directions or to stop the truck, press the reverse button (4, [Figure 2-2](#)). The truck will come to a stop and then, unless the button is released, accelerate in the opposition direction.

2-6.2. Braking.

Emergency Stop

Pull out the battery disconnect (8, [Figure 2-4](#)). All electrical functions are cut out and the brake is applied.

Automatic Braking

When the control handle (2, [Figure 2-4](#)) is released, it will automatically return to the vertical position and the brake will apply.

Regenerative Braking

When the travel button (4 or 5, [Figure 2-2](#)) is released, the truck automatically brakes regeneratively. Once the truck slows down the brake then fully applies.

Inversion Braking

Press the opposite direction travel button (4 or 5, [Figure 2-2](#)). The truck brake regeneratively until it starts to move in the opposite direction.

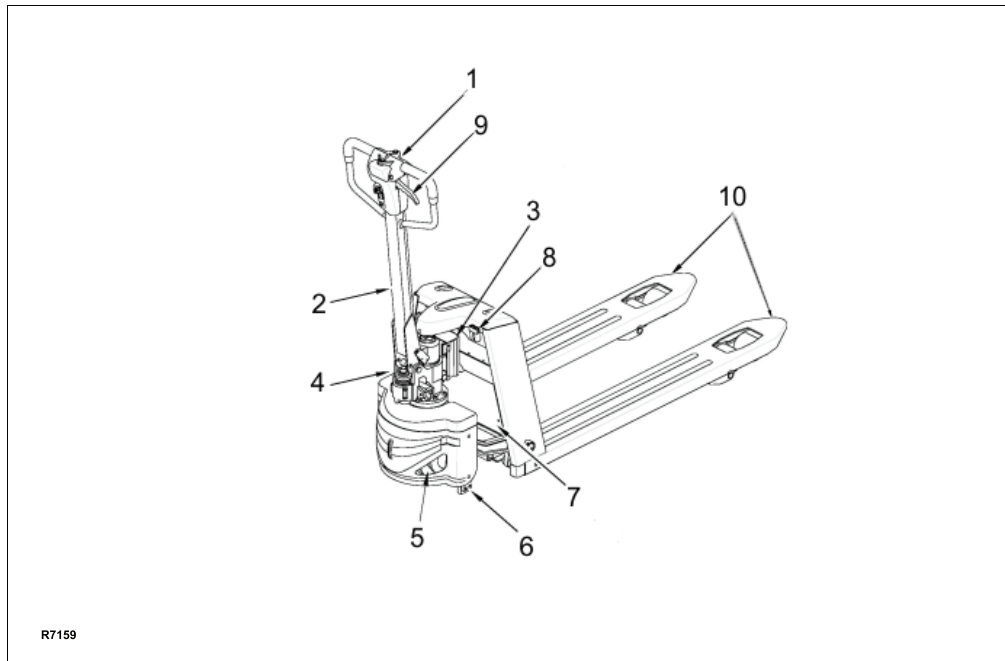


Figure 2-4 P33 Pallet Lift Truck

2-6.3. LIFT AND LOWER.

Lift

Push down on control lever (2, [Figure 2-5](#)) and move control handle (1) up and down until the desired lifting height is achieved. Reset lever (2) to the neutral position.

Lower

Pull up on control lever (2, [Figure 2-5](#)) until the desired lower height is achieved. Reset lever (2) to the neutral position.

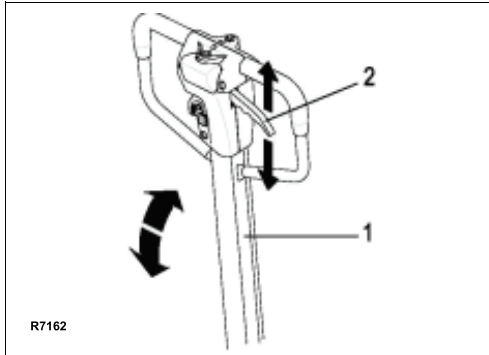


Figure 2-5 Lift Controls

2-7. 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.

2-8. PARKING.

When finished with moving loads, return the truck to its maintenance or storage area. Turn off the power switch (1, [Figure 2-2](#)) and optional key switch (2) and remove the key. Disengage the battery disconnect (8, [Figure 2-4](#)). Charge batteries as necessary. Refer to battery care instructions, [SECTION 3](#).

**SECTION 3
PLANNED MAINTENANCE**

3-1. GENERAL.

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

3-2. MONTHLY AND QUARTERLY CHECKS.

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

3-3. BATTERY CARE.

3-3.1. General

The P33 may be equipped with maintenance free 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's electrical system. Since components of the truck's 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.

Table 3-1 Monthly and Quarterly Inspection and Service Chart

| VISUAL CHECKS | |
|---------------|---|
| INTERVAL | INSPECTION OR SERVICE |
| Monthly | Check electrical 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. |
| Quarterly | Check lift for leakage. |
| Quarterly | Check for excessive jerking of steering arm when stopping or starting. |

3-3.2. Safety Rules

- Wear protective clothing, such as rubber apron, gloves, boots and goggles when performing any maintenance on batteries. Do not allow electrolyte to come in contact with eyes, skin, clothing or floor. If electrolyte comes in contact with eyes, flush immediately and thoroughly with clean water. Obtain medi-

cal attention immediately. Should electrolyte be spilled on skin, rinse promptly with clean water and wash with soap. A baking soda solution (one pound to one gallon of water) will neutralize acid spilled on clothing, floor or any other surface. Apply solution until bubbling stops and rinse with clean water.

- Do not bring any type of flame, spark, 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.

3-3.3. Battery Care and Charging

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

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

4. Make certain battery used meets weight and size requirements of truck. NEVER operate truck with an undersized battery.

3-3.4. Battery Cleaning

Always keep vent plugs tightly in place when cleaning battery. When properly watered and charged, the battery will remain clean and dry. All that is necessary is to brush or blow 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.

3-3.5. MAINTENANCE FREE BATTERIES

Maintenance free 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 conditions do not require any special ventilation.

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.

3-4. CHARGING BATTERIES

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

Proceed as follows:

1. Park truck at charging station with forks lowered and turn the key switch off.
2. Check the condition of the AC cord and battery cables. If there are any cuts in the cable, any exposed wires, loose plugs or connectors, DO NOT attempt to charge the batteries. Contact appropriate personnel for repairs to be made.
3. Pull out charger cord (1, [Figure 3-1](#)) and connect to the appropriate power supply. The LED (2) will indicate the charge status as follows:
 - a. Flashing red indicates the battery is charging.
 - b. Green light indicates the battery is fully charged.
 - c. Flashing yellow indicates that the charging circuit needs to be checked.

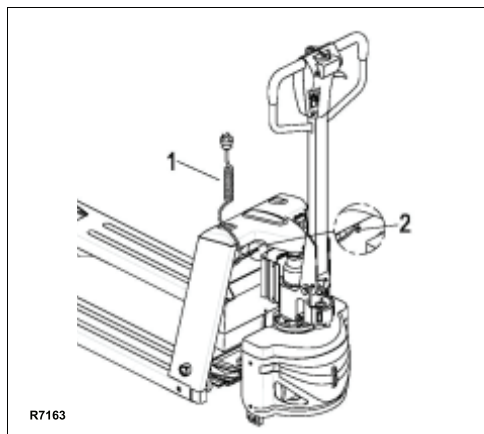






Figure 3-1 Battery Charging

| BATTERY HAZARD | | ⚠ DANGER | |
|--|---|-----------------|--|
|      | <p>EXPLOSIVE/POISON/CAUSTIC NO SPARKS, FLAMES, SMOKING BATTERY ACID can cause blindness and severe burns</p> <p>SHIELD EYES, AVOID SKIN CONTACT IF SPLASHED flush immediately with water, get medical help fast.</p> <p>Do not service battery while on charge. Do not connect or disconnect battery from charger while charger is on. Only qualified and experienced personnel should perform maintenance and repair on batteries. Use caution while servicing or removing battery. (Refer to Battery Safety Sheet).</p> | | |

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3-5. BATTERIES REPLACEMENT

1. Park the truck and turn off the power.
2. Lift the forks to the highest position by moving control handle (1, [Figure 3-2](#)) up and down and rotate handle (1) a few degrees to the left or right.
3. Remove two screws (2) and remove cover (3).
4. Tag and disconnect the battery cables.
5. Replace batteries.
6. Install in the reverse order of removal.

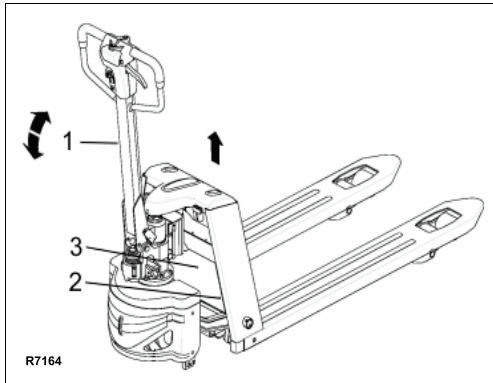


Figure 3-2 Battery Replacement

3-6. LUBRICATION.

Refer to [Table 3-2](#) for the recommended types of grease and oil. [Table 3-3](#) in conjunction with [Figure 3-3](#) identifies the items requiring lubrication.

**Table 3-2 Recommended Lubricants
(See [Table 3-3](#) for Application)**

| | |
|-------|--------------------------------------|
| No. 1 | Hydraulic oil-HM32 |
| No. 2 | Grease—Containing Mus ₂ . |

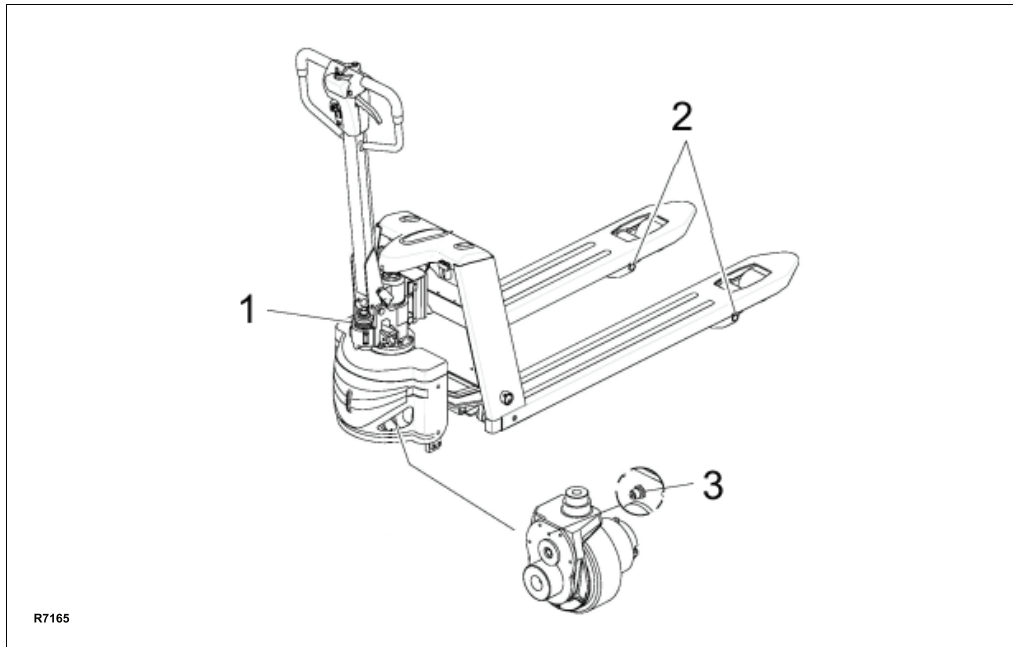


Figure 3-3 Lubrication Diagram

Table 3-3 Lubrication Chart

| IG 3-2 INDEX NO. | LOCATION | METHOD OF APPLICATION | TYPE (Table 3-3) | APPLICATION OF LUBRICANT |
|------------------|------------------------------|-----------------------|------------------|---|
| 1 | Hydraulic oil filler neck | Can | No. 1 | With lift carriage fully lowered, fill with hydraulic oil |
| 2 | Lift Linkage Fittings* | Brush | No. 2 | Lubricate contact surfaces |
| 3 | Transmission oil filler neck | Can | No. 2 | Fill with grease. |

* Raise lift carriage to gain access to grease fittings.

NOTES

**SECTION 4
TROUBLESHOOTING**

4-1. 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 Oper-

ate: 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 |
|--|---|---|
| <p>TRUCK AND HYDRAULIC SYSTEM WILL NOT OPERATE Truck will not travel nor will lift system operate.</p> | <p>a. Battery dead or disconnected. b. Power switch (8, Figure 12-3) defective. c. Optional keyswitch (8, Figure 12-3) defective. d. Defective wiring.</p> | <p>Check battery connections and check battery voltage. Bypass power switch to determine if it is malfunctioning. Bypass keyswitch to determine if it is malfunctioning. Check for open circuit. Repair as required.</p> |
| <p>TRUCK DOES NOT OPERATE FORWARD OR REVERSE Truck does not travel forward or reverse. All other functions operate normally. Truck travels forward but not in reverse. Truck travels reverse but not in forward.</p> | <p>a. Check all wiring. A loose connection may be the cause of malfunction. b. Defective deadman switch (22, Figure 12-1). c. Defective controller (2, Figure 12-10). Defective reverse switch (5, Figure 12-3) in control head. Defective forward switch (5, Figure 12-3) in control head.</p> | <p>Tighten all loose connections before further troubleshooting. Check and replace switch if defective. Check for proper operation and replace if necessary. Check and replace switch if defective. Check and replace switch if defective.</p> |
| <p>TROUBLE WITH BRAKING Truck does not slow with brake, or brake does not engage. Brake will not release.</p> | <p>a. Defective deadman switch (22, Figure 12-1). b. Defective electric brake (2, Figure 12-5). a. Brake temperature above 281° F (140° C). b. Open brake circuitry or wiring.</p> | <p>Check deadman switch for continuity. If none found when the control arm is in the brake position, replace switch. Replace brake. Allow to cool. Make voltage checks.</p> |
| <p>Brake drags. Brake grabs. Abnormal noise and chatter when brake is applied.</p> | <p>Defective electric brake (2, Figure 12-5). Defective electric brake (2, Figure 12-5). Defective electric brake (2, Figure 12-5).</p> | <p>Replace. Replace. Replace.</p> |

Table 4-1 Troubleshooting Chart - Continued

| MALFUNCTION | PROBABLE CAUSE | CORRECTIVE ACTION |
|--|--|---|
| <p>TROUBLE WITH LIFTING OR LOWERING</p> <p>Oil sprays or flows from the top of the hydraulic assembly.</p> <p>Squealing sounds when lifting forks.</p> <p>Forks do not lift to top.</p> <p>Forks lift, but will not go down.</p> | <p>Defective hydraulic assembly</p> <p>a. Oil level too low.</p> <p>b. Lift linkage binding.</p> <p>Oil level too low.</p> <p>Control rod (19, Figure 12-1) out of adjustment.</p> | <p>Repair or replace hydraulic assembly.</p> <p>Identify oil leak.</p> <p>Apply grease.</p> <p>Add oil to reservoir.</p> <p>Loosen nut (21, Figure 12-1) and adjust nut (20) to allow lowering. Secure adjustment, tighten nut (21).</p> |
| <p>Load will not hold</p> | <p>a. Control rod (19, Figure 12-1) out of adjustment.</p> <p>b. Defective hydraulic assembly</p> | <p>Loosen nut (21, Figure 12-1) and adjust nut (20) to allow lever (10, Figure 12-9) to return to neutral position. Secure adjustment, tighten nut (21, Figure 12-1).</p> <p>Repair or replace hydraulic assembly.</p> |
| <p>MISCELLANEOUS</p> <p>Control handle does not return to the upright position.</p> <p>Truck moves forward when control handle is pulled down.</p> <p>Steering arm jerks excessively starting or stopping the truck.</p> <p>Drive motor is jerky.</p> | <p>a. Defective control handle.</p> <p>b. Binding.</p> <p>a. Belly-button switch defective.</p> <p>b. Short in control head.</p> <p>Drive wheel worn.</p> <p>Motor internally damaged or worn.</p> | <p>Replace control handle.</p> <p>Check and free the binding item. Repair or replace as needed.</p> <p>Check for short, and repair or replace as necessary.</p> <p>Check wiring and repair as required.</p> <p>Replace drive wheel if worn to within 3/4 inch of hub.</p> <p>Replace motor.</p> |

4-2. CONTROLLER TROUBLESHOOTING

4-2.1. Fault Detection.

The controller provides diagnostics information to assist technicians in troubleshooting drive system problems. When a fault is detected it is stored inside the controller.

4-2.2. Hand Held Programmer (Optional)

The hand held programmer is available that is designed specifically for use with the controller. The programmer is available through your Big Lift LLC dealer.

4-2.3. Fault Recording.

Fault events are recorded in the controller's memory. However, multiple occurrences of the same fault are recorded as one occurrence.

The fault event list can be loaded into the programmer for readout. The Special Diagnostics mode provides access to the controller's diagnostic history file. The history file contains the entire fault event list created since the diagnostic history file was last cleared. The standard Diagnostics mode provides information about only the currently active faults.

4-2.4. General Checkout.

Carefully complete the following checkout procedure. If you find a problem during the checkout, refer to paragraph 4-2.7. for further information.

CAUTION: Put the vehicle up on blocks to get the drive wheel off the ground before beginning these tests.

Turn the keyswitch off and make sure the brake is applied, the throttle is in neutral, and the forward/reverse switches are open.

Do not stand, or allow anyone else to stand directly in front of or behind the vehicle during the tests.

1. Disconnect the battery charger and connect the programmer to the 4-pin connector (Figure 4-1) on the controller.



Figure 4-1. Controller Terminals

2. Turn the lift truck key switch to the ON position. The programmer should "power up" with an initial display (2, Figure 4-2), and the controller's Status LED should begin steadily blinking a single flash. If neither happens, check for continuity in the key switch circuit and controller ground.

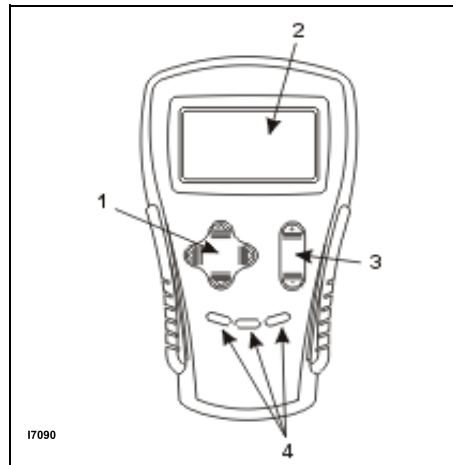


Figure 4-2. Hand Held Programmer

3. Put the controller into the diagnostic mode by pressing the "Menu Navigation Key" (1, [Figure 4-2](#)). Using the Navigation key, select the Faults menu. Display the Faults menu by pressing the Right side of the Navigation key. Press the Right side of the Navigation key again to display the list of System Faults. The display should indicate "No Known Faults."
4. With the brake released, select a direction and operate the throttle. The motor should begin to turn in the selected direction. If it does not, verify the wiring to the forward/reverse switches and motor. The motor should run proportionally faster with increasing throttle. If not, refer to [Paragraph 4-2.7](#).
5. Put the controller into the test mode by using the Navigation key (1) to select the "Monitor" menu. Select the Monitor mode by pressing the "Right" arrow on the Navigation key. Press the Navigation key "Down" arrow to scroll down to observe the status of the forward, reverse, brake, emergency reverse, and mode switches. Cycle each switch in turn, observing the programmer. Each input should show the correct state on the programmer.
6. Check the controller's fault detection circuitry as described in [Paragraph 4-2.5](#).
7. Take the vehicle off the blocks and drive it in a clear area. It should have smooth acceleration and good top speed.
8. Test the plug braking of the vehicle. The vehicle should smoothly slow to a stop and reverse direction, with the audible plugging tone.
9. Verify that all options, such as high pedal disable (HPD), static return to off (SRO), and anti-tie-down, are as desired.
10. Check to see whether the emergency reverse (belly button) feature is working correctly. Verify that the circuit is operational by momentarily disconnecting one of the emergency reverse wires. The vehicle should be disabled and a fault indicated.

4-2.5. Diagnostic History

The handheld programmer can be used to access the controller's diagnostic history file. When the programmer is connected to the unit, the error log file is automatically uploaded into the handheld programmer.

To see the present status of the unit, use the Menu Navigation Key (1, [Figure 4-2](#)) to select:

Faults->System Faults.

To access this log, use the Menu Navigation Key to select:

Faults->Fault History

The faults are shown as a code and descriptive text. If there are multiple faults, you have to scroll through the list using the Up and Down Buttons on the Menu Navigation Key

The faults may be intermittent faults, faults caused by loose wires, or faults caused by operator errors. Faults such as HPD or over-temperature may be caused by operator habits or by overloading.

After a problem has been diagnosed and corrected, clearing the diagnostic history file is recommended. This allows the controller to accumulate a new file of faults. By checking the new diagnostic history file at a later date, you can quickly determine whether the problem has been completely fixed.

To clear the diagnostic history file, select:

Faults->Clear Fault History.

You will be asked to confirm your actions. Use the "plus" arrow (+) for yes to clear the menu and the "minus" arrow (-) (3) to cancel your selection and not clear the Fault History.

4-2.6. Test the Fault Detection Circuitry

1. Put the vehicle up on blocks to get the drive wheel off the ground.
2. Turn off the key power switch (8, [Figure 12-3](#)) or key switch (8) depending what is on the truck.
3. Using an inline fuse holder fitted with a 10 amp fuse and alligator clips, connect the controller's M and B- terminals.
4. Turn on the power switch (9) and key switch (8). Release the brake and apply the throttle. The motor should not operate.
5. Leave the key switch on and remove the in-line fuse wire. The vehicle status should continue to remain off.
6. Cycle the key switch off and on. Release the brake and apply the throttle. The vehicle should now operate normally.

4-2.7. Diagnostics and Troubleshooting.

The motor controller provides diagnostics information to assist in troubleshooting drive system problems. The diagnostics information can be obtained in two ways:

- Reading the appropriate display on the programmer

SECTION 5 CONTROL HANDLE, CONTROL HEAD AND COMPARTMENT

5-1. CONTROL HEAD

5-1.1. Control Head Removal

1. Turn off the power switch (8, [Figure 5-1](#)) or key switch (8) depending what is on the truck.
2. Remove three screws (11) and separate cover (1) and cap (2) from control handle (1, [Figure 5-2](#)).
3. Tag and disconnect harness (1, [Figure 12-11](#)) from switches (5, 7 and 8, [Figure 5-1](#)).

5-1.2. Control Head Installation

1. Reconnect harness (1, [Figure 12-11](#)) to switches (5, 7 and 8, [Figure 5-1](#)).
2. Position cover (1) and cap (2) on control handle (1, [Figure 5-2](#)) and secure with three screws (11, [Figure 5-1](#)).
3. Turn on the power switch (8) or key switch (8) depending what is on the truck.

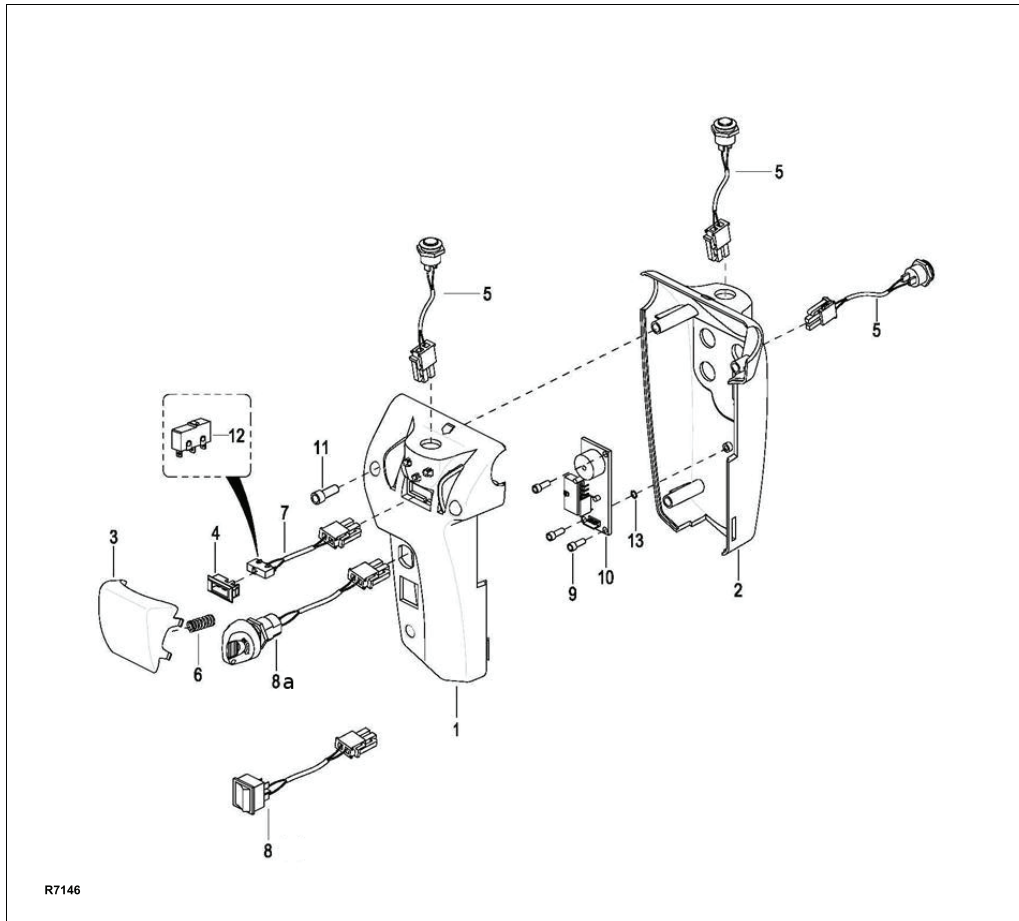


Figure 5-1 Control Head

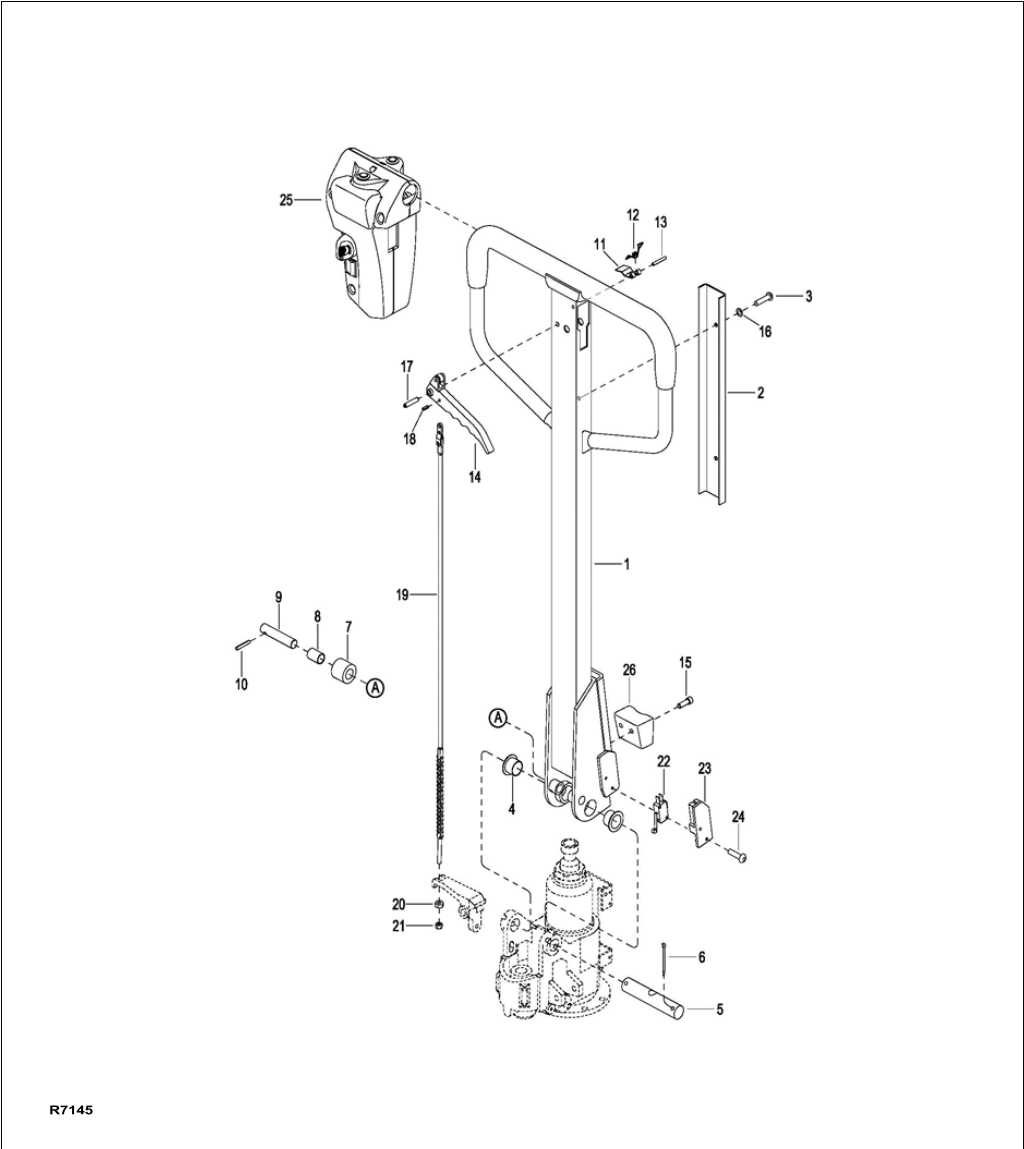


Figure 5-2 Control Handle

5-1.3. Belly-Button Switch Replacement.

1. Remove the control head as described in paragraph 5-1.1.
2. Remove button (3, [Figure 5-1](#)) and springs (6) from cover (1).
3. Remove bracket (4) from cover (1) and remove switch (7).
4. Unsolder harness from switch (12).
5. Solder harness to new switch (12).
6. Position new switch in bracket (4) and install in cover (1).
7. Install the control head as described in paragraph 5-1.2.

5-1.4. Reverse Switch Replacement.

1. Remove the control head as described in paragraph 5-1.1.
2. Remove reverse switch (5, [Figure 5-1](#)) from the top of cover (1).
3. Position new switch (5) in cover (1)
4. Install the control head as described in paragraph 5-1.2.

5-1.5. Key Switch Replacement.

1. Remove the control head as described in paragraph 5-1.1.
2. Remove optional key switch (8, [Figure 5-1](#)) from the back of cover (1).
3. Position new switch (8) in cover (1)

4. Install the control head as described in paragraph 5-1.2.

5-1.6. Power Switch Replacement.

1. Remove the control head as described in paragraph 5-1.1.
2. Remove power switch (8, [Figure 5-1](#)) from the back of cover (1).
3. Position new switch (8) in cover (1)
4. Install the control head as described in paragraph 5-1.2.

5-1.7. Horn Switch Replacement.

1. Remove the control head as described in paragraph 5-1.1.
2. Remove horn switch (5, [Figure 5-1](#)) from the front of cap (2).
3. Position new switch (5) in cap (2)
4. Install the control head as described in paragraph 5-1.2.

5-1.8. Forward Switch Replacement.

1. Remove the control head as described in paragraph 5-1.1.
2. Remove forward switch (5, [Figure 5-1](#)) from the top of cap (2).
3. Position new switch (5) in cap (2)
4. Install the control head as described in paragraph 5-1.2.

5-2. TRANSMISSION COVERS

5-2.1. Removal.

1. Turn off the power switch (8, [Figure 5-1](#)) or key switch (8) depending what is on the truck.
2. Remove cover (2, [Figure 5-3](#)).
3. Remove four screws (5), four lock washers (6) and four flat washers (7)

4. Remove cover (1).

5-2.2. Installation.

1. Place cover (1, [Figure 5-3](#)) into position.
2. Secure with four screws (5), four lock washers (6) and four flat washers (7).
3. Turn on the power switch (8, [Figure 5-1](#)) or key switch (8) depending what is on the truck.

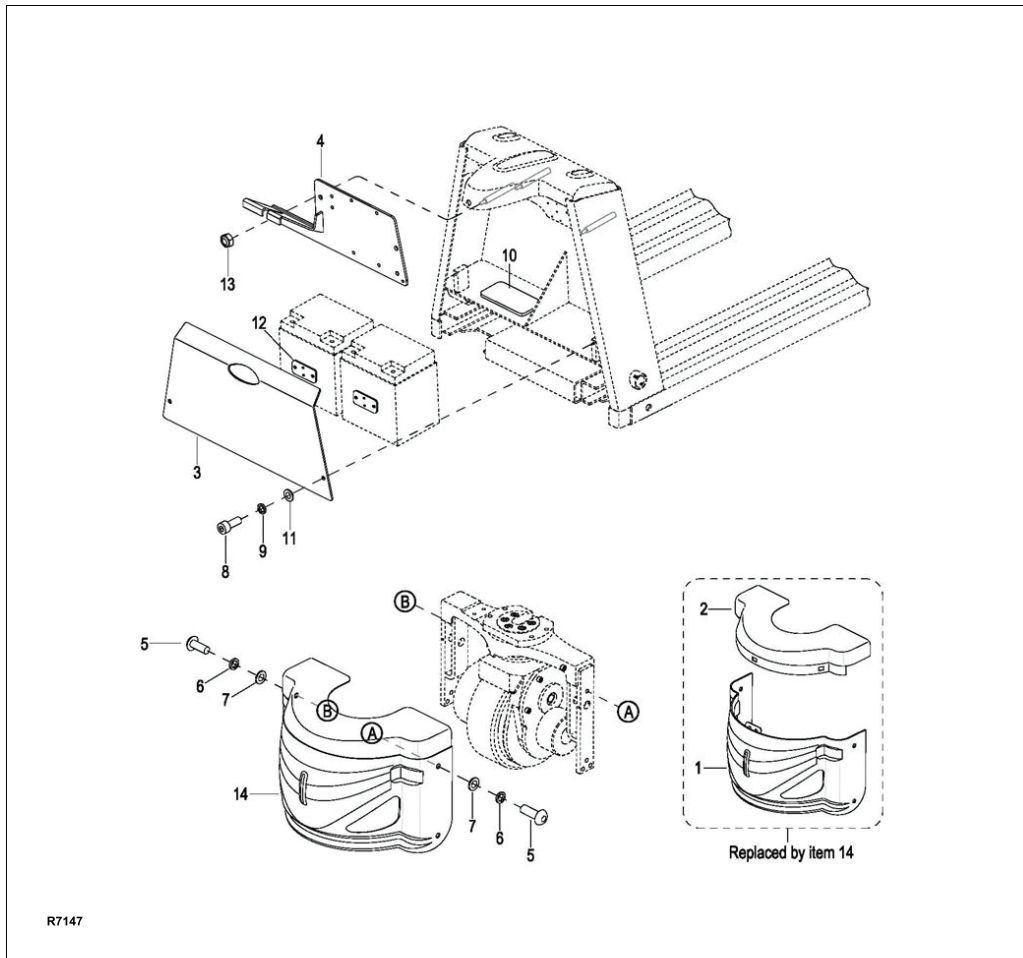


Figure 5-3 Compartment Cover

5-3. CONTROL HANDLE

5-3.1. Control Rod Removal.

1. Remove control head as described in paragraph 5-1.1.
2. Remove cover (2, [Figure 5-2](#)) from control handle (1).
3. Remove nuts (21 and 20) from rod (19).
4. Remove pin (17) and remove control lever (14) with rod (19).
5. Remove pin (13) to remove spring (12) and leaf spring (11) from control handle (1).
6. Remove pin (18) to free rod (19) from lever (14).

5-3.2. Control Rod Installation.

1. Position rod (19, [Figure 5-2](#)) and lever (14) together and install pin (18).
2. Position spring (12) and leaf spring (11) in control handle (1) and secure with pin (13).
3. Position control lever (14) with rod (19) in control handle (1) and secure with pin (17).
4. Position rod (19) in lever (10, [Figure 12-9](#)) and install nut (20, [Figure 5-2](#)) on rod (19).
5. Adjust nut (20) to obtain proper operation of lever (10, [Figure 12-9](#)).
6. Install nut (21, [Figure 5-2](#)) and jam against nut (20) to secure the adjustment.
7. Install cover (2) on control handle (1).
8. Install control head as described in paragraph 5-1.2.

5-3.3. Control Handle Removal.

1. Remove switch (22, [Figure 5-2](#)) as described in paragraph 10-3.
2. Remove control rod as described in paragraph 5-3.1.
3. Attach a hoist to control handle (1).
4. Remove pins (6) from shaft (5).
5. Remove shaft (5) from control handle (1) and lift the handle from the hydraulic assembly.
6. Remove bushings (4) from control handle (1).
7. Remove pin (10) remove shaft (9), roller (7) and bushing (8) from control handle (1).
8. Remove two screws (27) and remove bumper (26) from handle (1).

5-3.4. Control Handle Installation.

1. Install bumper (26, [Figure 5-2](#)) on handle (1) and secure with two screws (27).
2. Install shaft (9), roller (7) and bushing (8) in control handle (1) and secure with pin (10).
3. Install bushings (4) in control handle (1).
4. Position control handle (1) over the hydraulic assembly and secure with shaft (5) and pins (6).
5. Install control rod as described in paragraph 10-3.5-3.2.
6. Install switch (22) as described in paragraph 10-3.

SECTION 6 BRAKE SERVICING

6-1. BRAKES.

The brake system consists of a transmission mounted brake. This brake is spring applied and electrically released.

6-1.1. Brake Assembly Replacement

1. Block load wheels.
2. Remove transmission covers as described in paragraph 5-2.
3. Disconnect electric brake (2, [Figure 6-1](#)) from harness (1, [Figure 12-11](#)).
4. Remove the three mounting screws (29, [Figure 6-1](#)) and the brake.
5. Place the new brake into position and secure with the three mounting screws.
6. Reconnect electric brake (1) to harness (1, [Figure 12-11](#)).
7. Remove load wheel blocks and check operation.
8. Install the transmission covers as described in paragraph 5-2.

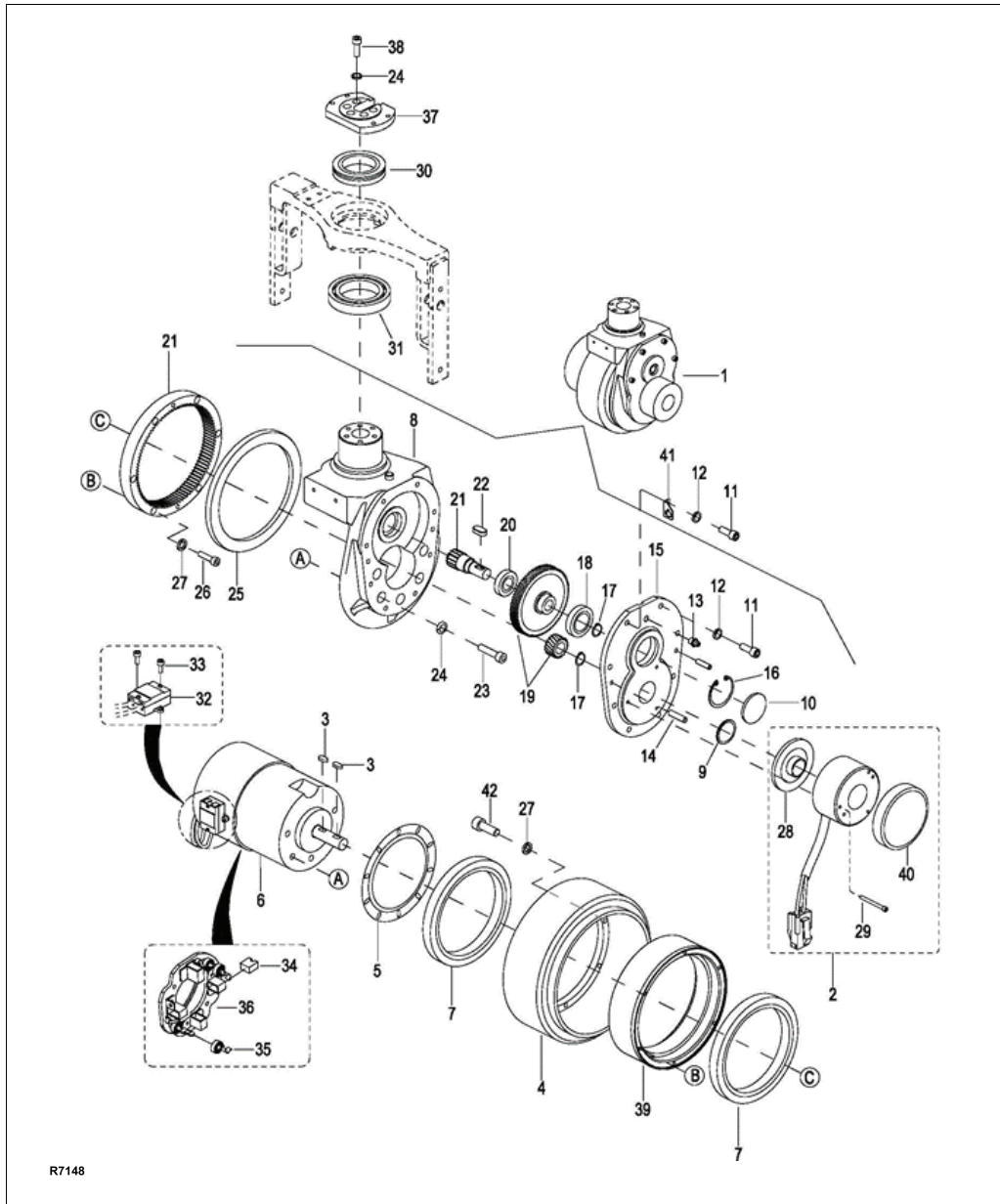


Figure 6-1 Transmission, Motor, Brake Mounting

SECTION 7 TRANSMISSION, DRIVE WHEEL, LOAD WHEEL

7-1. DRIVE WHEEL.

1. Turn off the power switch (8, [Figure 12-3](#)) or key switch (8) depending what is on the truck.
2. Remove transmission covers as described in paragraph 5-2.
3. Jack up the truck so the drive wheel is off the ground; then securely block the truck to prevent movement.
4. Disconnect cables (3 and 4, [Figure 12-12](#)) from drive motor.
5. Remove five screws (23, [Figure 7-1](#)), lock washers (24), and free motor (6) with drive wheel (4) from housing (8).
6. Remove the six screws (26), six lock washers (27) and gear (21).
7. Remove drive wheel (4) from motor (6).
8. Remove bearings (7) from wheel (4).
9. Install new drive wheel in reverse order of removal.
10. Install the transmission covers as described in paragraph 5-2.

11. Turn on the power switch (8, [Figure 12-3](#)) or key switch (8) depending what is on the truck.

7-2. TRANSMISSION.

1. Turn off the power switch (8, [Figure 12-3](#)) or key switch (8) depending what is on the truck.
2. Remove transmission covers as described in paragraph 5-2.
3. Remove the brake (2, [Figure 7-1](#)) as described in paragraph 6-1.1.
4. Remove the control handle as described in paragraph 5-3.
5. Remove four screws (2, [Figure 12-9](#)), four lock washers (3), four flat washers (4) and remove hydraulic assembly (1).
6. Support the housing (8, [Figure 7-1](#)) and remove five screws (38), five lock washers (24) and plate (37)
7. Free housing (8) from frame (2, [Figure 12-6](#) or [Figure 12-6](#)).
8. Install new transmission by reversing the steps above.

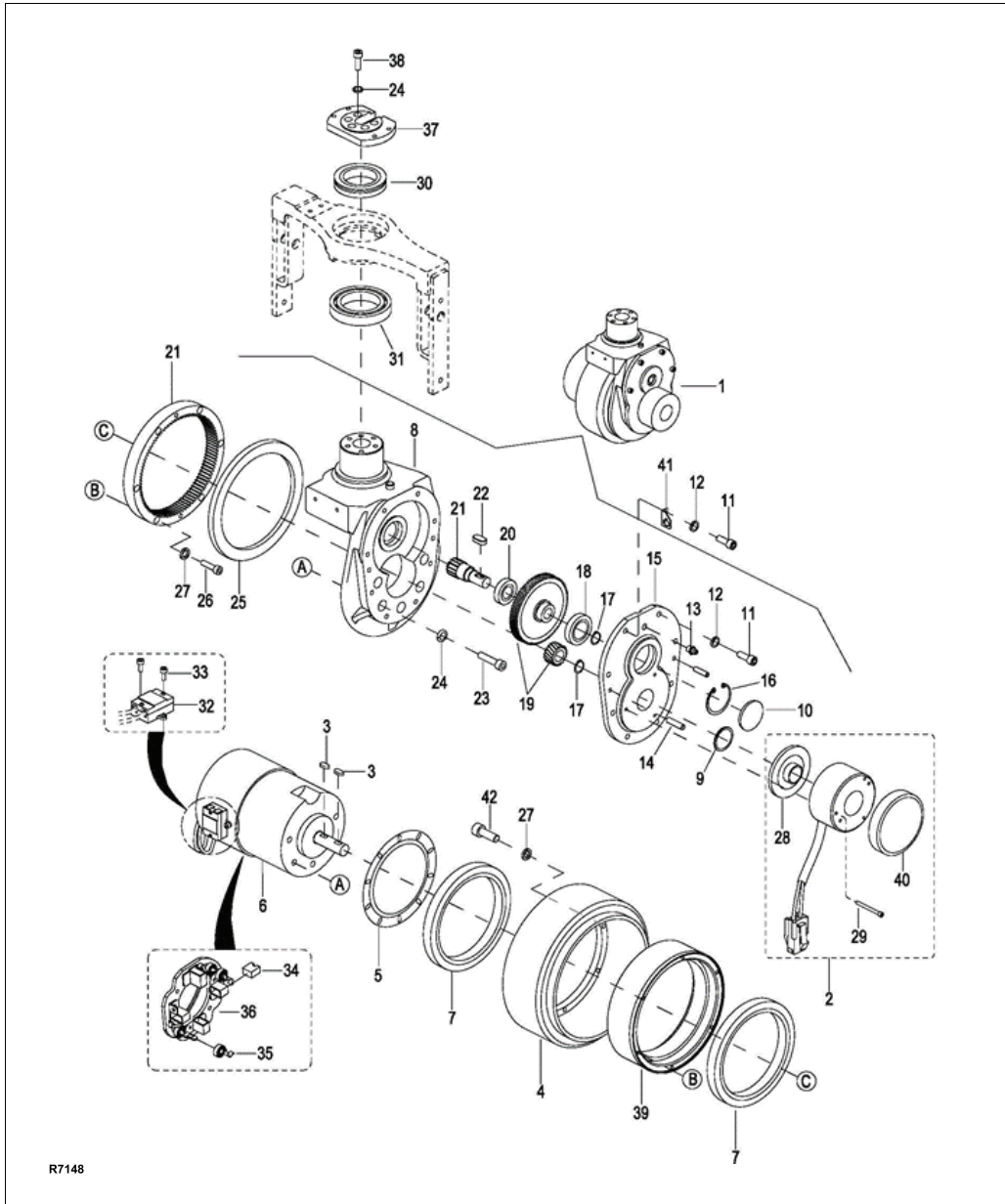


Figure 7-1 Transmission, Motor, Brake Mounting

7-3. LOAD WHEEL (SINGLE WHEEL).

7-3.1. Removal

1. Raise forks.
2. Turn off the power switch (8, [Figure 12-3](#)) or key switch (8) depending what is on the truck.
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 (12, [Figure 12-7](#)) is removed, load wheel assembly (14) will drop free.

5. Remove pin (11) securing shaft (12) and remove shaft (12) and load wheel assembly (14).

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. Big Lift LLC recommends that both load wheel assemblies be replaced at the same time. This ensures level and safe operation of the lift truck.

7-3.2. Repair

1. Remove bearings (1, [Figure 7-2](#)) from wheels (2).
2. Inspect bearings (1) and replace if necessary.
3. Reassemble bearings (1) in wheels (2).

7-3.3. Load Wheel Installation

1. Position load wheel assembly (14, [Figure 12-7](#)) in wheel bracket (8).
2. Install shaft (12) and secure with pin (11).
3. Remove blocking from under the truck.
4. Lower the forks.
5. Turn on the power switch (8, [Figure 12-3](#)) or key switch (8) depending what is on the truck.

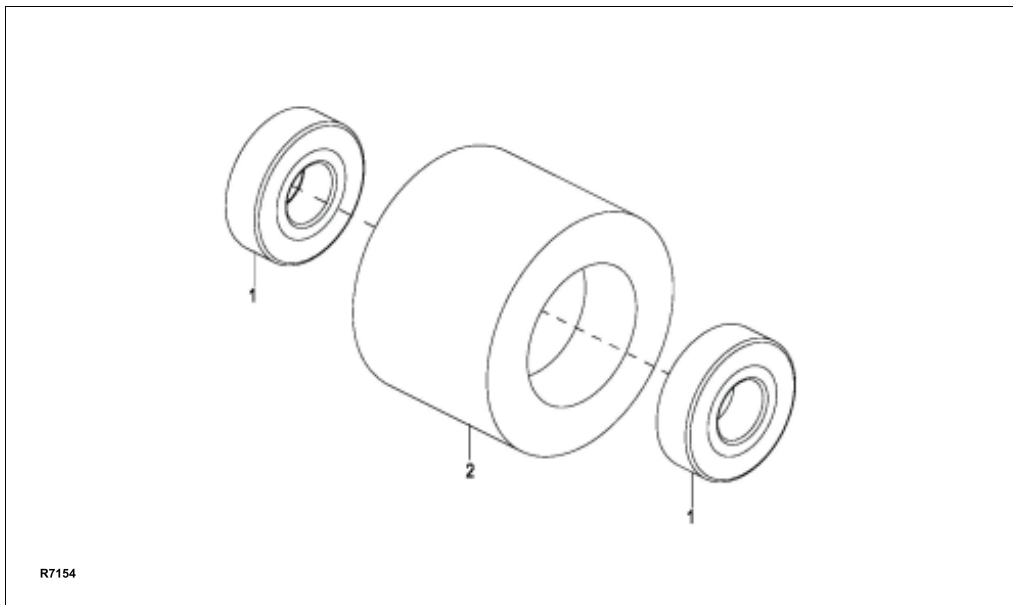


Figure 7-2 Wheel Assembly (Single Wheel)

SECTION 8 ELEVATION SYSTEM SERVICING

8-1. Lift Linkage (SINGLE WHEEL)

8-1.1. Removal

1. Lift complete truck to height sufficient to permit access to lift linkage under forks. Provide blocking under frame (1, [Figure 8-1](#)), transmission and at tips of the forks.
2. Turn off power switch (8, [Figure 12-3](#)) or key switch (8) depending what is on the truck.
3. Remove pins (3, [Figure 8-1](#)) and remove shafts (5).
4. Remove pins (3) from each side of frame (1). Support link assembly and remove shaft (4).
5. Remove pins (3) and remove shafts (6) and washers (2, [Figure 8-2](#)).
6. Lower link assembly to the floor.

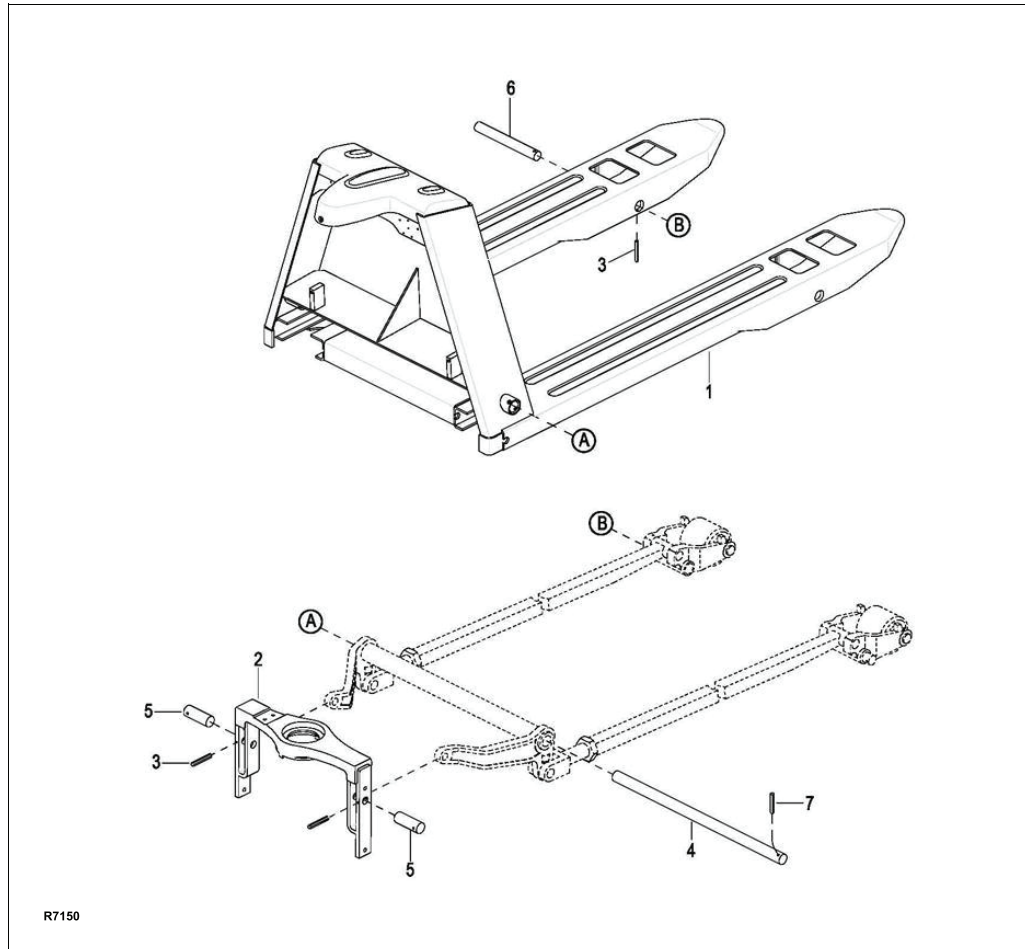


Figure 8-1 Frame (Single Wheel)

2. Repair

Remove pins (11, [Figure 8-2](#)), shafts (12) and load wheels (14) from brackets (8).

Remove pins (11) and shafts (10). Free brackets (8) from tension bars (6).

Remove bushings (9) from brackets (8) if replacement is necessary,

Remove pins (11) from tension bars (6) and free tension bars from link (1).

Loosen nuts (4) and remove clevises (5) from tension bars (13).

Install reassemble by reversing the steps above.

8-1.3. Installation

1. Position link assembly under frame (1, [Figure 8-1](#)).
2. Raise link assembly into position and install shaft (4) through frame (1). Secure shaft (4) with pins (3).
3. Position wheel brackets (8, [Figure 8-2](#)) in frame (1, [Figure 8-1](#)) and install shafts (6). Secure shafts (6) with pins (3).
4. Position link assembly and install shafts (5). Secure shafts (3) with pins (2),
5. Remove blocking and lower the truck to the ground.
6. Turn on power switch (8, [Figure 12-3](#)) or key switch (8) depending what is on the truck.

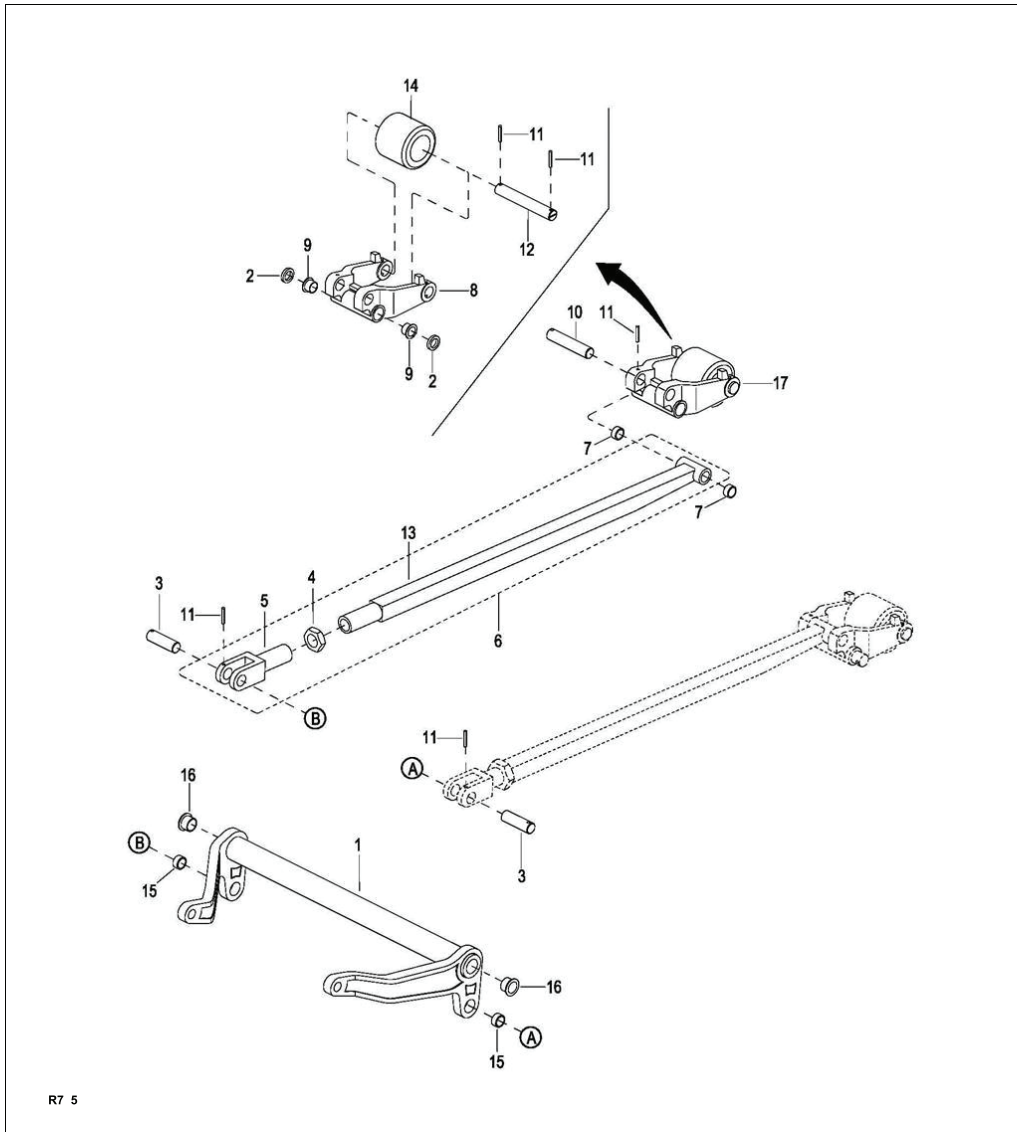


Figure 8-2 Lift Linkage Assembly (Single Wheel)

SECTION 9 HYDRAULIC SYSTEM SERVICING

9-1. HYDRAULIC ASSEMBLY REMOVAL

The hydraulic system and electrical system can be removed as an assembly to provide additional clearance for various maintenance procedures.

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.

9-1.1. Removal

1. Fully lower forks.
2. Turn off power switch (8, [Figure 12-3](#)) or key switch (8) depending what is on the truck.
3. Remove screw (5, [Figure 9-1](#)).
4. Lift the fork frame high enough to free piston rod (7) from the frame. Provide blocking under forks.
5. Remove the controller (2, [Figure 12-10](#)) as described in paragraph [SECTION 10](#)
6. Remove the transmission covers as described in paragraph [5-2](#).

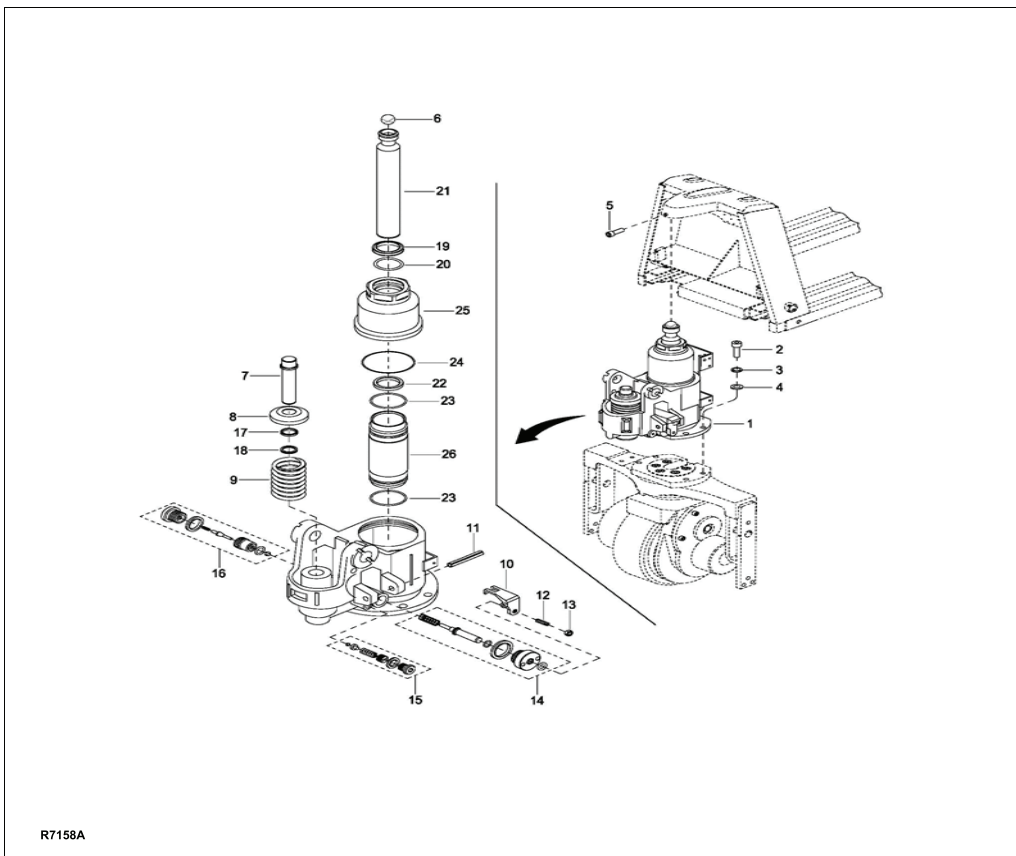


Figure 9-1 Hydraulic System

7. Remove the control handle as described in paragraph 5-3.3.
8. Remove four screws (2, [Figure 9-1](#)), four lock washers (3), four flat washers (4) and assembly (1).

9-1.2. Installation

1. Position assembly (1, [Figure 9-1](#)) on the frame and secure with four screws (2), four lock washers (3), four flat washers (4).
2. Lift the fork frame and remove blocking from under forks. Slowly lower the fork frame inserting piston rod (7) in position in the fork frame.
3. Install screw (5).
4. Install the control handle as described in paragraph 5-3.4.
5. Install the transmission covers as described in paragraph 5-2.
6. Install controller (2, [Figure 12-10](#)) as described in paragraph [SECTION 10](#)
7. Turn on power switch (8, [Figure 12-3](#)) or key switch (8) depending what is on the truck.

9-2. HYDRAULIC PUMP SPRING REPLACEMENT

1. Fully lower forks.
2. Turn off power switch (8, [Figure 12-3](#)) or key switch (8) depending what is on the truck.
3. Remove the control handle as described in paragraph 5-3.3.
4. Remove piston rod (7), seat (8), wiper (17), seal (18) and spring (9).
5. Replace the spring and reassembly in reverse order.

9-3. HYDRAULIC ASSEMBLY REPAIR

1. Fully lower forks.
2. Turn off power switch (8, [Figure 12-3](#)) or key switch (8) depending what is on the truck.
3. Remove the control handle as described in paragraph 5-3.3.
4. Refer to [Figure 9-1](#) for disassembly.
5. Reassembly in reverse order.

SECTION 10 ELECTRICAL COMPONENTS

10-1.ELECTRICAL CONTROL PANEL

10-1.1.Maintenance

NOTE: Erratic operation of the truck may be caused by defective controller components. Before removing the electrical panel, perform troubleshooting procedures per SECTION 4, 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 pre-programmed unit to assure proper performance settings intended for that particular truck. See Figure 12-10 for the preprogrammed controller number.

It is recommended that the controller exterior be cleaned periodically, and if a Curtis 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.

10-1.2.Controller Removal.

1. Turn off power switch (8, Figure 12-3) or key switch (8) depending what is on the truck.
2. Remove screw (5), lock washer (6) and clamp (7) securing the wiring to the cover.
3. Remove remaining four screws (5), lock washers (6) and cover (1) and free the cover from the hydraulic assembly.
4. Tag and disconnect harness (2 and 3, Figure 12-11) from controller (2, Figure 10-1).
5. Tag and disconnect cables (2, 3, 4 and 6, Figure 12-12) from controller (2, Figure 10-1).
6. Remove two nuts (8), two lock washers (6), two screws (3) and separate controller (2) from cover (1).

10-1.3.Controller Installation.

1. Position controller (2, Figure 10-1) in cover (1) and secure with two screws (3), two nuts (8) and two lock washers (6).
2. Reconnect harness (2 and 3, Figure 12-11) to controller (2, Figure 10-1).
3. Reconnect cables (2, 3, 4 and 6, Figure 12-12) from controller (2, Figure 10-1).
4. Secure cover with controller to the hydraulic assembly with four screws (5) and cover (1).
5. Secure wiring to cover (1) with clamp (7), lock washer (6) and screw (5).
6. Turn on power switch (8, Figure 12-3) or key switch (8) depending what is on the truck.

10-1.4.Charger Removal.

1. Turn off power switch (8, Figure 12-3) or key switch (8) depending what is on the truck.
2. Remove cap (25, Figure 10-1). Tag and disconnect cable (21) from charger (20).
3. Tag and disconnect charger lead from LED lamp (18).
4. Tag and disconnect remaining two charger leads.
5. Remove four nuts (24), four screws (23) and two brackets (22). Remove charger (20).

10-1.5.Charger Installation.

1. Reposition charger (20, Figure 10-1) and secure with two brackets (22), four screws (23) and four nuts (24).
2. Reconnect charger lead to LED lamp (18).
3. Reconnect the two remaining charger leads.
4. Reconnect cable (21) to charger (20) and install cap (25).
5. Turn on power switch (8, Figure 12-3) or key switch (8) depending what is on the truck.

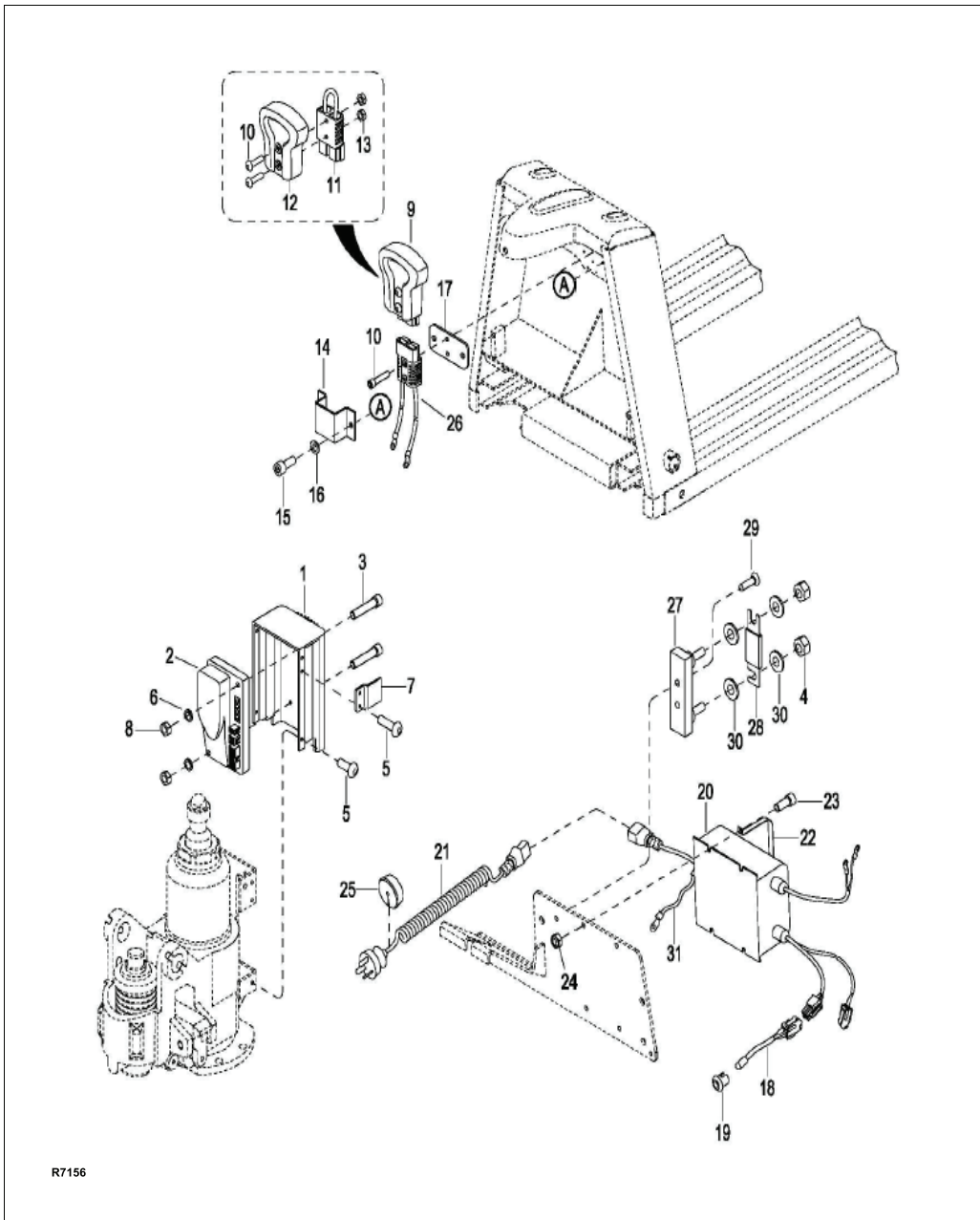


Figure 10-1 Electrical System

10-1.6. Battery Disconnect Removal.

1. Turn off power switch (8, [Figure 12-3](#)) or key switch (8) depending what is on the truck.
2. Remove battery disconnect (9, [Figure 10-1](#)) from connector (26).
3. Tag and disconnect connector (26) from the battery and controller (2).
4. Remove two screws (15), two flat washers (16) and bracket (14).
5. Remove two screws (10) and remove battery disconnect (28) from the frame.

10-1.7. Emergency Disconnect Installation.

1. Position connector (28, [Figure 10-1](#)) on the frame and secure with two screws (10).
2. Install bracket (14) and secure with two screws (15) and two flat washers (16).
3. Reconnect connector (26) to the battery and controller (2).
4. Reinstall battery disconnect (9) to connector (26).
5. Turn on power switch (8, [Figure 12-3](#)) or key switch (8) depending what is on the truck.

10-2. 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.

The drive motor is replaceable but not repairable. Refer to paragraph 7-1.

10-3. DEADMAN SWITCH**10-3.1. Replacement**

1. Turn off power switch (8, [Figure 12-3](#)) or key switch (8) depending what is on the truck.
1. Disconnect wiring from the deadman switch (22, [Figure 12-1](#)).
2. Remove the two screws (24), bracket (23) and switch (22).
3. Position the new switch (22), bracket (23) and secure with the two screws (24).
4. Turn on power switch (8, [Figure 12-3](#)) or key switch (8) depending what is on the truck.

**SECTION 11
OPTIONAL EQUIPMENT**

SECTION 12
ILLUSTRATED PARTS BREAKDOWN

Following is an illustrated parts breakdown of assemblies and parts associated with the P33 Lift Truck.

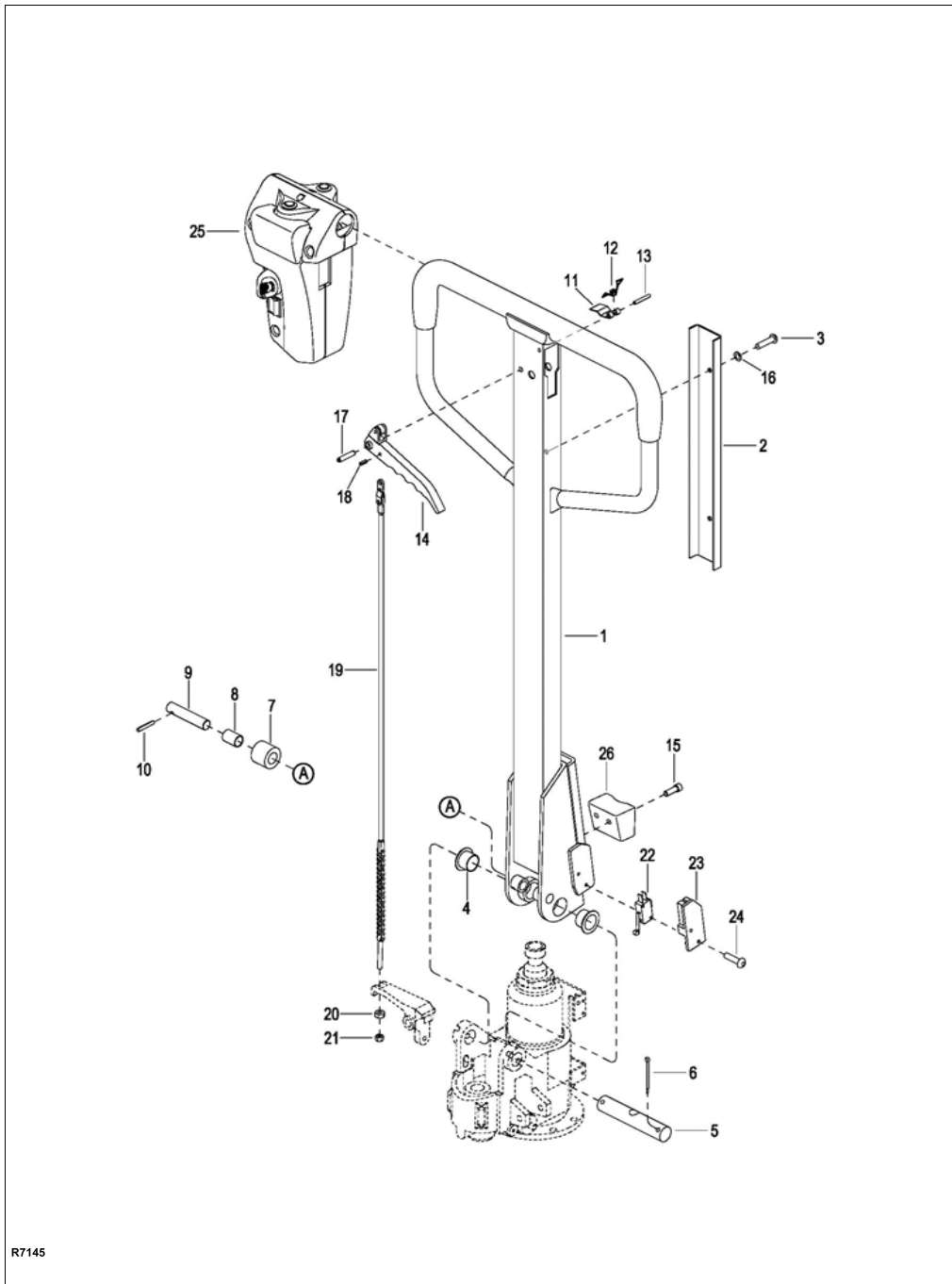


Figure 12-1 Steering Arm

STEERING ARM

| Pos. | Part Number | Description | Qty. Reqd. | Notes |
|------|------------------|----------------------------|------------|---|
| 1 | 1121-320000-00 | CONTROL HANDLE | 1 | |
| 2 | 1121-300001-00 | COVER | 1 | |
| 3 | 0000-000179-00 | SCREW | 2 | |
| 4 | 0000-000908-00 | BUSHING | 2 | |
| 5 | 1121-300004-00 | SHAFT | 1 | |
| 6 | 0000-001232-10 | COTTER PIN, M4 X 50 | 2 | |
| 7 | 1121-300003-00 | ROLLER | 1 | |
| 8 | 0000-001242-10 | BUSHING, 1220 | 1 | |
| 9 | 1121-300002-00 | SHAFT | 1 | |
| 10 | 0000-001233-10 | PIN, M4 X 20 | 1 | |
| 11 | 1121-330001-00 | LEAF SPRING | 1 | |
| 12 | 1121-330002-00 | TORSIONAL SPRING | 1 | |
| 13 | 0000-000679-00 | PIN, M4 X 30 | 1 | |
| 14 | 1121-330004-00 | CONTROL LEVER | 1 | Used up to serial number E2410609 |
| 14a | 1121-330003-00 | ROLLER | 1 | NOT PICTURED - Used up to Serial # E2410609 |
| 14b | 0000-001234-10 | ROUND PIN Ø4×18 | 1 | NOT PICTURED - Used up to Serial # E2410609 |
| 14c | 1121-330004-00-B | CONTROL LEVER | 1 | Used from serial number E2410610 |
| 15 | 0000-000077-00 | SCREW M6×12 | 2 | |
| 16 | 0000-000380-00 | FLATWASHER Ø6 | 2 | |
| 17 | 0000-001235-10 | PIN, M6 X 30 | 1 | |
| 18 | 0000-001236-10 | PIN, M4 X 12 | 1 | |
| 19 | 1121-330006-00-B | PULL ROD | 1 | |
| 20 | 0000-000108-00 | NUT | 1 | |
| 21 | 0000-000923-00 | NUT | 1 | |
| 22 | 1115-500017-00 | LIFT LIMIT SWITCH ASSEMBLY | 1 | |

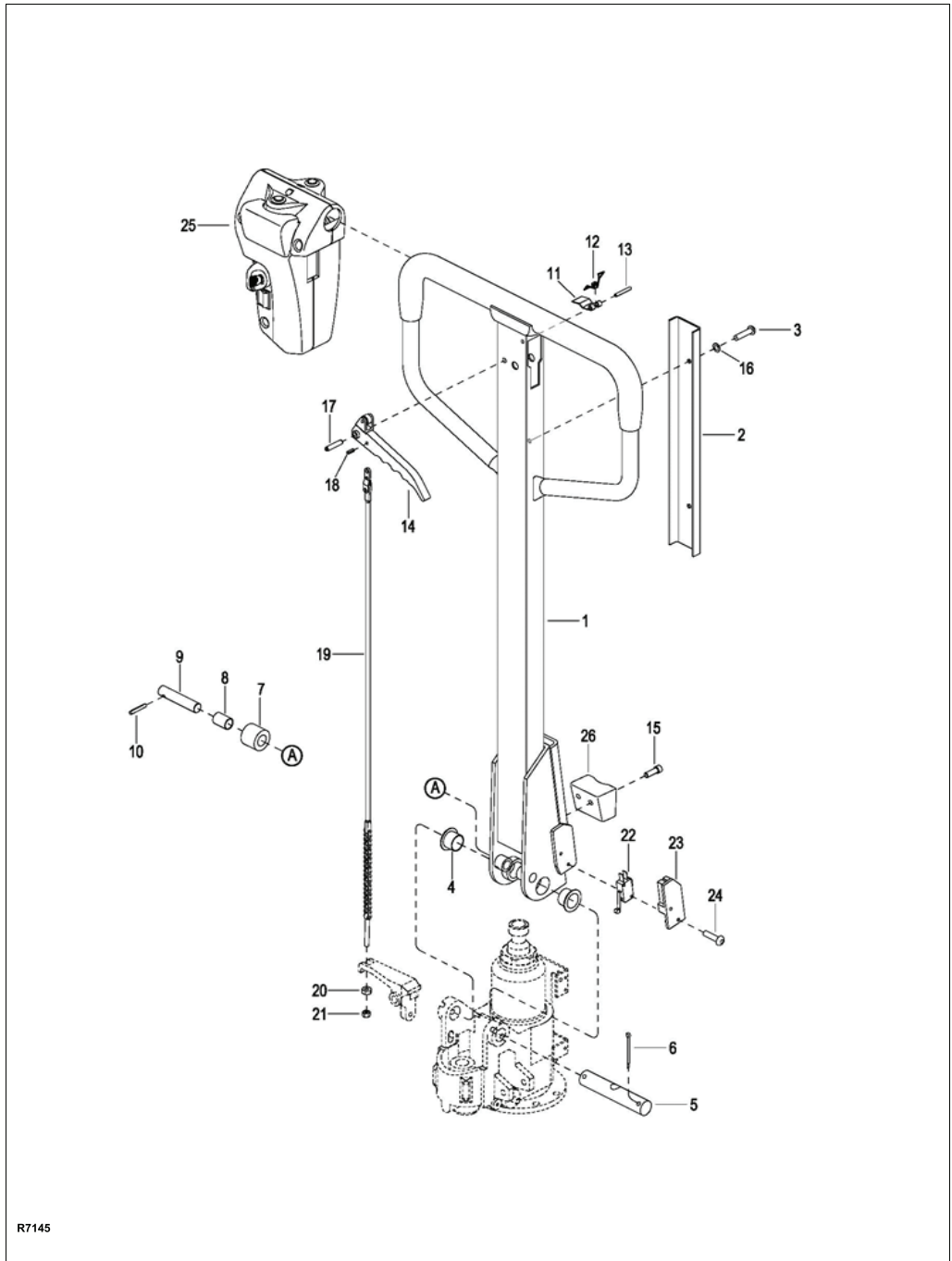


Figure 12-1 Steering Arm - Continued

STEERING ARM - CONTINUED

| Pos. | Part Number | Description | Qty. Reqd. | Notes |
|------|------------------|----------------|------------|------------------------------------|
| 23 | 1115-500014-00 | BRACKET | 1 | |
| 24 | 0000-001238-00 | SCREW, M3 X 16 | 2 | |
| 25 | 1121-310000-00-B | CONTROL HEAD | 1 | Used up to serial number E2410609 |
| 25a | 1121-310000-0A-B | CONTROL HEAD | 1 | Used from serial number E2410610 |
| 26 | 2107-300001-00 | BUMPER | 1 | Used up to serial number 424170700 |
| 26a | 1121-300005-00 | BUMPER | 1 | Used from serial number 424170701 |

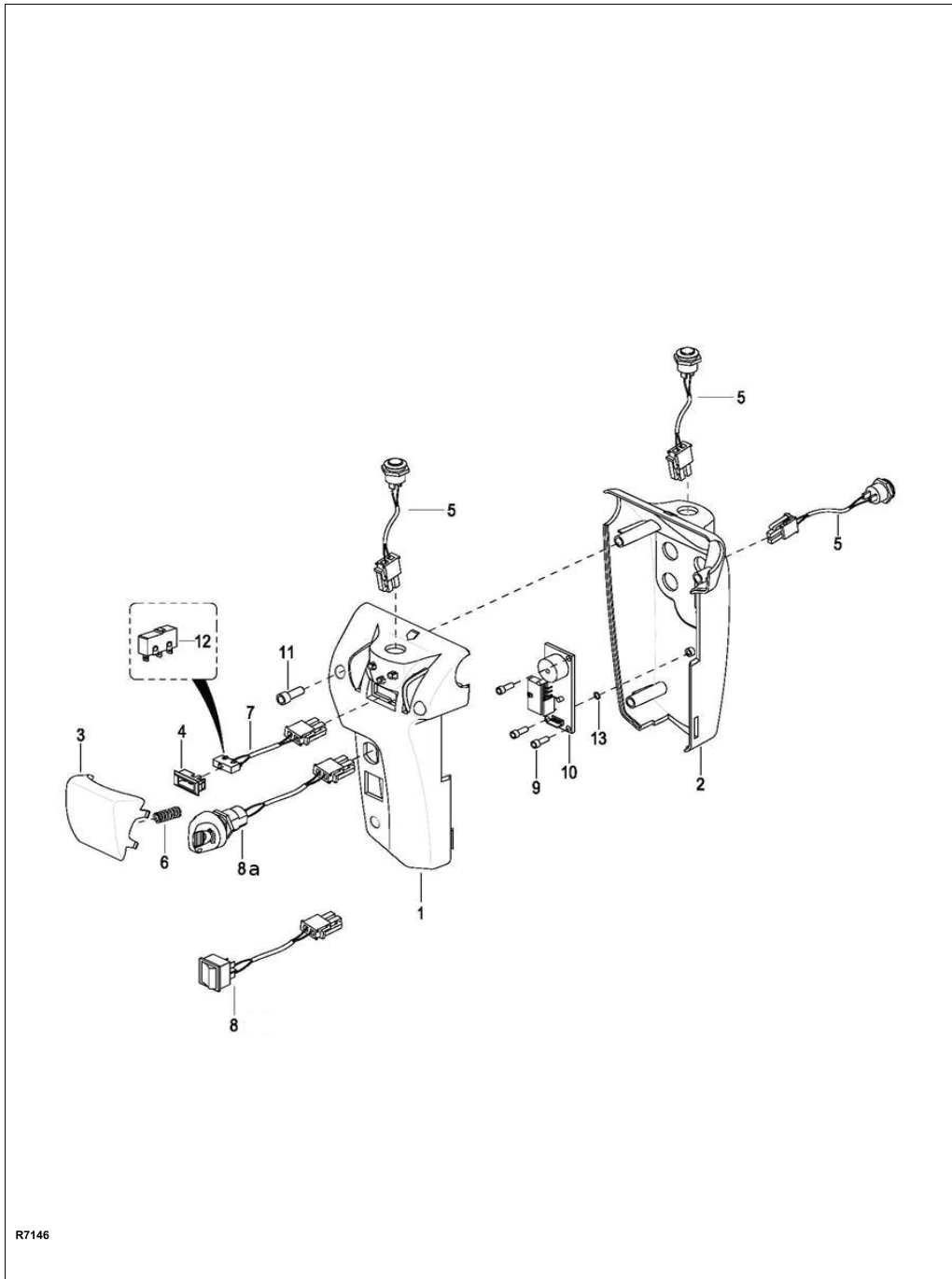


Figure 12-2 Control Head - Used up to Serial # E2410609

CONTROL HEAD - Used up to Seri I # E 4 0609

| Pos. | Part Number | Description | Qty. Reqd. | Notes |
|------|------------------|--------------------------------------|------------|---|
| — | 1121-310000-00-B | CONTROL HEAD | 1 | |
| 1 | 1121-310002-00 | COVER | 1 | |
| 2 | 1121-310001-00 | CAP | 1 | |
| 3 | 1121-310003-00 | BUTTON, REVERSE | 1 | |
| 4 | 1280-360013-00 | BUTTON BRACKET | 1 | |
| 5 | 1121-522000-00 | FOR, REV & HORN SWITCHES | 3 | |
| 6 | 1121-310004-00 | SPRING | 1 | |
| 7 | 1121-521000-00 | BELLY-BUTTON SWITCH ASSY | 1 | |
| 8 | 1121-523000-00 | POWER SWITCH | 1 | Used up to serial number E2319422 |
| 8a | 1115-520019-0A | KEY SWITCH | 1 | Std. as of serial number E2319423, before that it was Optional. |
| 9 | 0000-001243-00 | SCREW, M3 X 6 | 3 | |
| 10 | 1121-520005-00 | BATTERY DISCHARGE | 1 | |
| 11 | 0000-000004-00 | SCREW | 3 | |
| 12 | 1220-560002-00 | BELLY-BUTTON SWITCH | 1 | |
| 13 | 0000-001133-00 | O-RING $\varnothing 3.15 \times 1.8$ | 3 | |

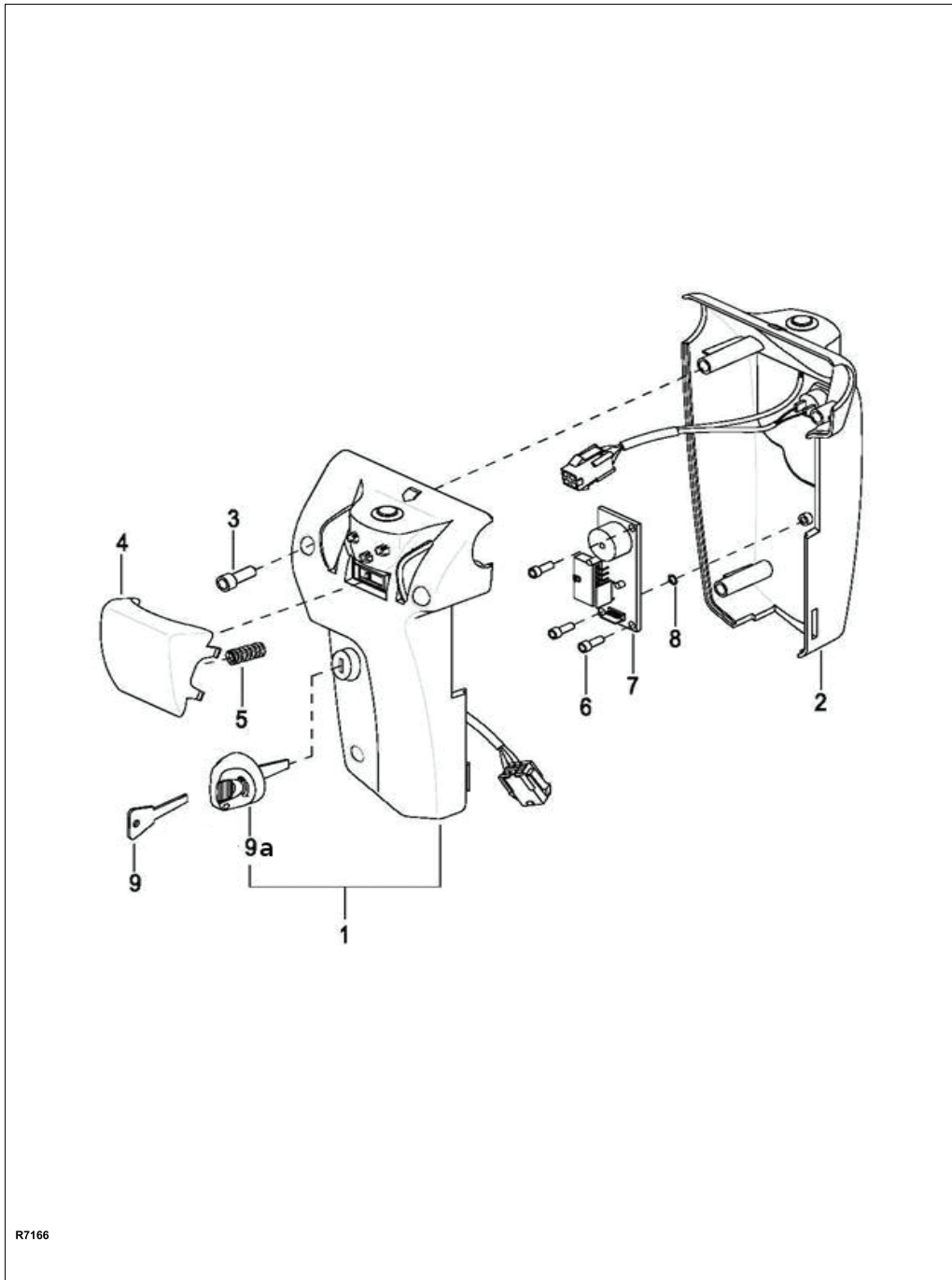


Figure 12-3 Control Head - Used from Serial # E2410610

CONTROL HEAD - Used from Serial E 4 06 0

| Pos. | Part Number | Description | Qty. Reqd. | Notes |
|------|------------------|-----------------------|------------|-----------------------------------|
| — | 1121-310000-0A-B | CONTROL HEAD | 1 | |
| 1 | 1121-310002-0A-B | COVER | 1 | |
| 2 | 1121-310001-0A-B | CAP | 1 | |
| 3 | 0000-000004-00 | SCREW M5×12 | 3 | |
| 4 | 1121-310003-00 | BUTTON REVERSER COVER | 1 | |
| 5 | 1121-310004-00 | SPRING | 1 | |
| 6 | 0000-001243-00 | SCREW M3×6 | 3 | |
| 7 | 1121-520013-00 | INTEGRATED MODULE | 1 | |
| 8 | 0000-001133-00 | O-RING Ø3.15×1.8 | 3 | |
| 9 | 1120-500016-10 | KEY | 1 | One set of keys (2) - Without Cap |
| 9a | 1115-500016-00 | KEY | 1 | One set of keys (2) - With Cap |

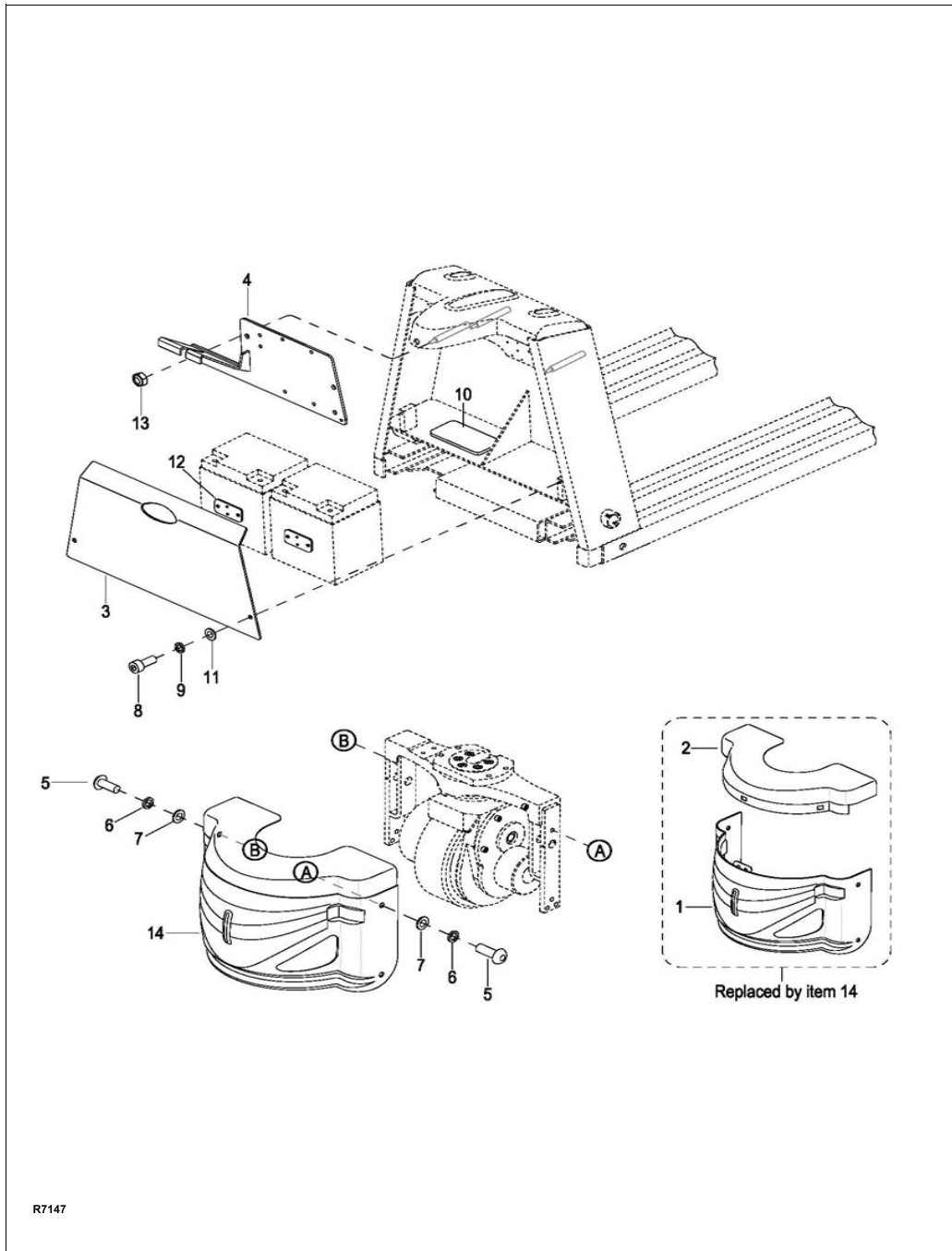
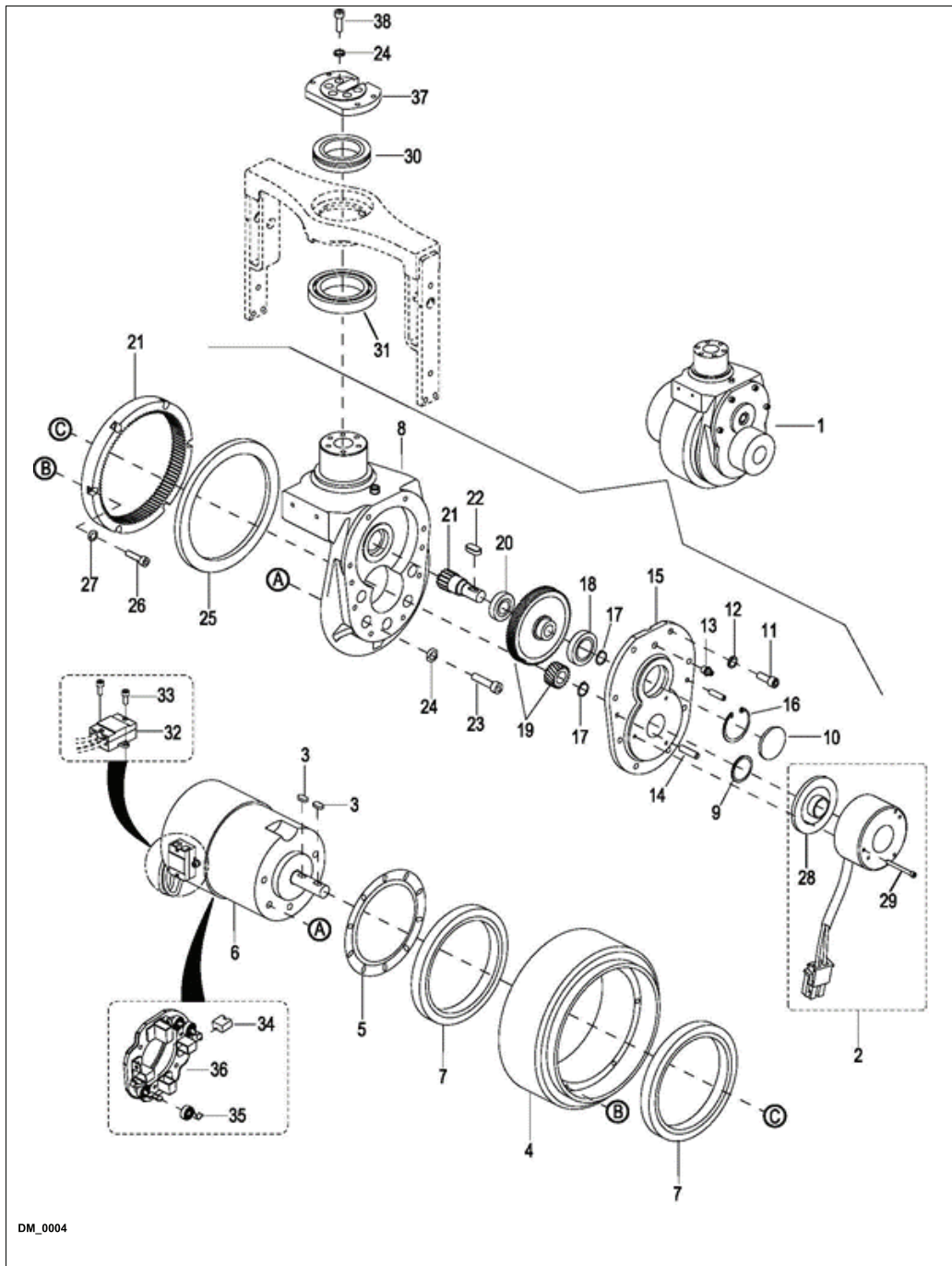


Figure 12-4 Compartment Cover

COMPARTMENT COVER

| Pos. | Part Number | Description | Qty. Reqd. | Notes |
|------|----------------|--|------------|---|
| 1 | 1121-141000-00 | LOWER COVER | 1 | Used up to serial number 424210520 - After that replaced by Pos. # 14 |
| 2 | 1121-140001-00 | UPPER COVER | 1 | Used up to serial number 424210520 - After that Replaced by Pos. # 14 |
| 3 | 1121-100002-10 | BATTERY COVER, FRAME WIDTH 27" (685MM) | 1 | Frame Width 27" (685mm) |
| 4 | 1121-100001-0A | CHARGER BRACKET | 1 | Used up to serial number E2320233 |
| 4a | 1121-510000-00 | CHARGER BRACKET | 1 | Used from serial number E2320234 |
| 5 | 0000-000109-00 | SCREW | 4 | |
| 6 | 0000-000159-00 | LOCK WASHER | 4 | |
| 7 | 0000-000176-00 | WASHER | 4 | |
| 8 | 0000-000077-00 | SCREW | 2 | |
| 9 | 0000-000056-00 | WASHER | 2 | |
| 10 | 2112-410005-00 | RUBBER CUSHION | 2 | |
| 11 | 0000-000380-00 | FLAT WASHER | 2 | |
| 12 | 1121-100004-00 | RUBBER CUSHION | 2 | |
| 13 | 0000-000923-00 | NUT | 3 | |
| 14 | 1121-143000-00 | COVER | 1 | Used between serial number 424210521 - 4281501872 |
| 14a | 1121-143000-0A | COVER | 1 | Used from serial number 4281501873 |



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Figure 12-5 Transmiss on Motor, Brake Mountin - Used up to serial number 426150000

TRANSMISSION MOTOR, BRAKE MOUNTING - USED UP TO SERIAL NUMBER 426150000

| Pos. | Part Number | Description | Qty. Reqd. | Notes |
|-------------|--------------------|----------------------|-------------------|---------------------------------|
| 1 | 1121-200000-00 | DRIVE UNIT | 1 | Includes 2 - 27 |
| 2 | 1115-520012-00 | BRAKE ASSEMBLY | 1 | |
| 3 | 0000-000662-00 | KEYWAY | 2 | |
| 4 | 1115-220000-00 | DRIVE WHEEL | 1 | |
| 5 | 1115-200010-00 | DRIVE BAFFLE | 1 | |
| 6 | 1115-250000-00 | MOTOR | 1 | |
| 7 | 0000-000663-00 | BEARING | 2 | |
| 8 | 1121-210001-00 | TRANSMISSION HOUSING | 1 | |
| 9 | 0000-000671-00 | OIL SEAL | 1 | |
| 10 | 1115-200007-00 | TRANSMISSION CAP | 1 | |
| 11 | 0000-000386-00 | SCREW | 8 | |
| 12 | 0000-000056-00 | WASHER | 8 | |
| 13 | 0000-000013-00 | GREASE FITTING | 1 | |
| 14 | 0000-000704-00 | PIN | 2 | |
| 15 | 1115-200001-00 | GEAR BOX CAP | 1 | |
| 16 | 0000-000658-00 | CLIP | 1 | |
| 17 | 0000-000659-00 | CLIP | 2 | |
| 18 | 0000-000667-00 | BEARING | 1 | |
| 19 | 1115-GSX-10 | SPIRAL GEAR SET | 1 | Includes two gears pos. # 19 |
| 20 | 0000-000680-00 | BEARING | 1 | |
| 21 | 1115-GSX-20 | GEAR RING SET | 1 | Includes two gears pos. # 21 |
| 22 | 0000-000660-00 | KEY | 1 | |
| 23 | 0000-000026-00 | SCREW | 5 | |
| 24 | 0000-000159-00 | LOCK WASHER | 10 | |
| 25 | 0000-000670-00 | OIL SEAL | 1 | |
| 26 | 0000-000661-00 | SCREW | 6 | |

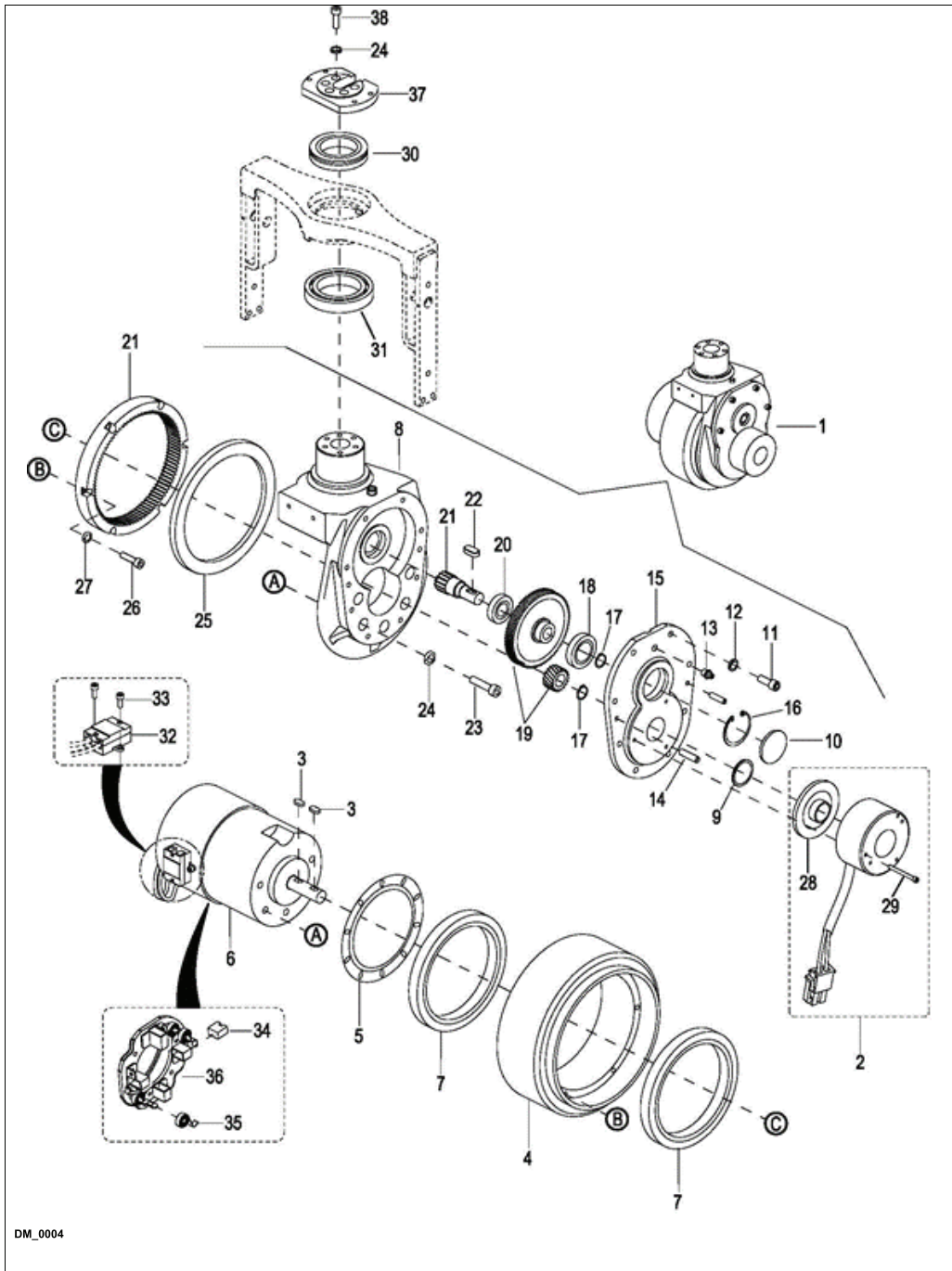


Figure 12-5 Transmission Motor, Brake Mounting - Continued - Used up to serial number 426150000

TRANSMISSION MOTOR, BRAKE MOUNTING - CONTINUED - USED UP TO SERIAL NUMBER 426150000

| Pos. | Part Number | Description | Qty. Reqd. | Notes |
|-------------|--------------------|--------------------|-----------------------|--------------|
| 27 | 0000-000206-00 | WASHER | 6 | |
| 28 | 1115-240001-00 | BRAKE DISC | 1 | |
| 29 | 0000-000665-00 | SCREW | 3 | |
| 30 | 0000-001230-00 | BEARING | 1 | |
| 31 | 0000-001231-00 | BEARING | 1 | |
| 32 | 1115-231000-00 | TERMINAL BLOCK | 1 | |
| 33 | 0000-000004-00 | SCREW | 2 | |
| 34 | 1115-250001-00 | BRUSH | 4 | |
| 35 | 1115-250002-00 | BRUSH SPRING | 4 | |
| 36 | 1115-250003-00 | BRUSH HOLDER | 1 | |
| 37 | 1121-200001-00 | CONNECTING PLATE | 1 | |
| 38 | 0000-000151-00 | SCREW | 5 | |

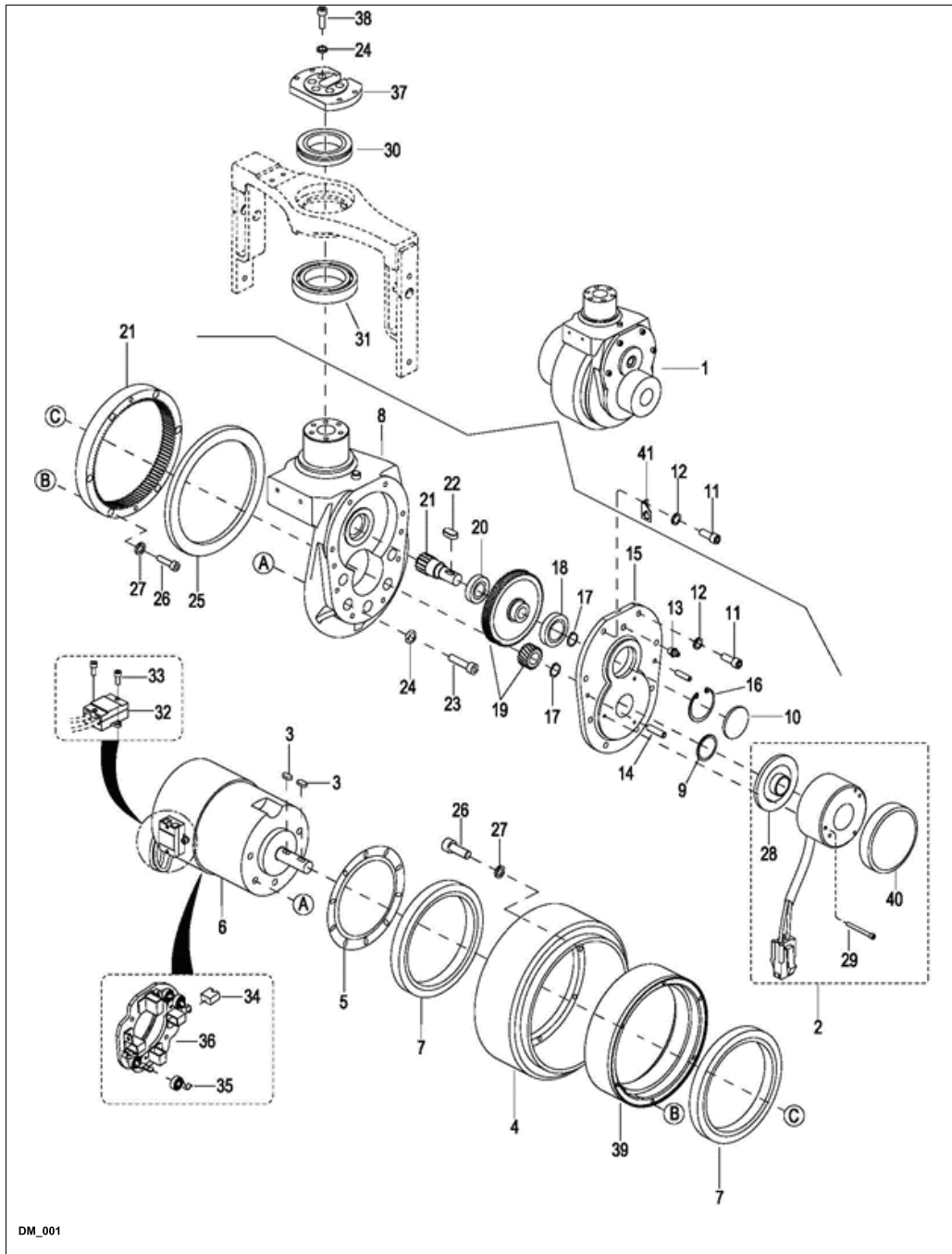
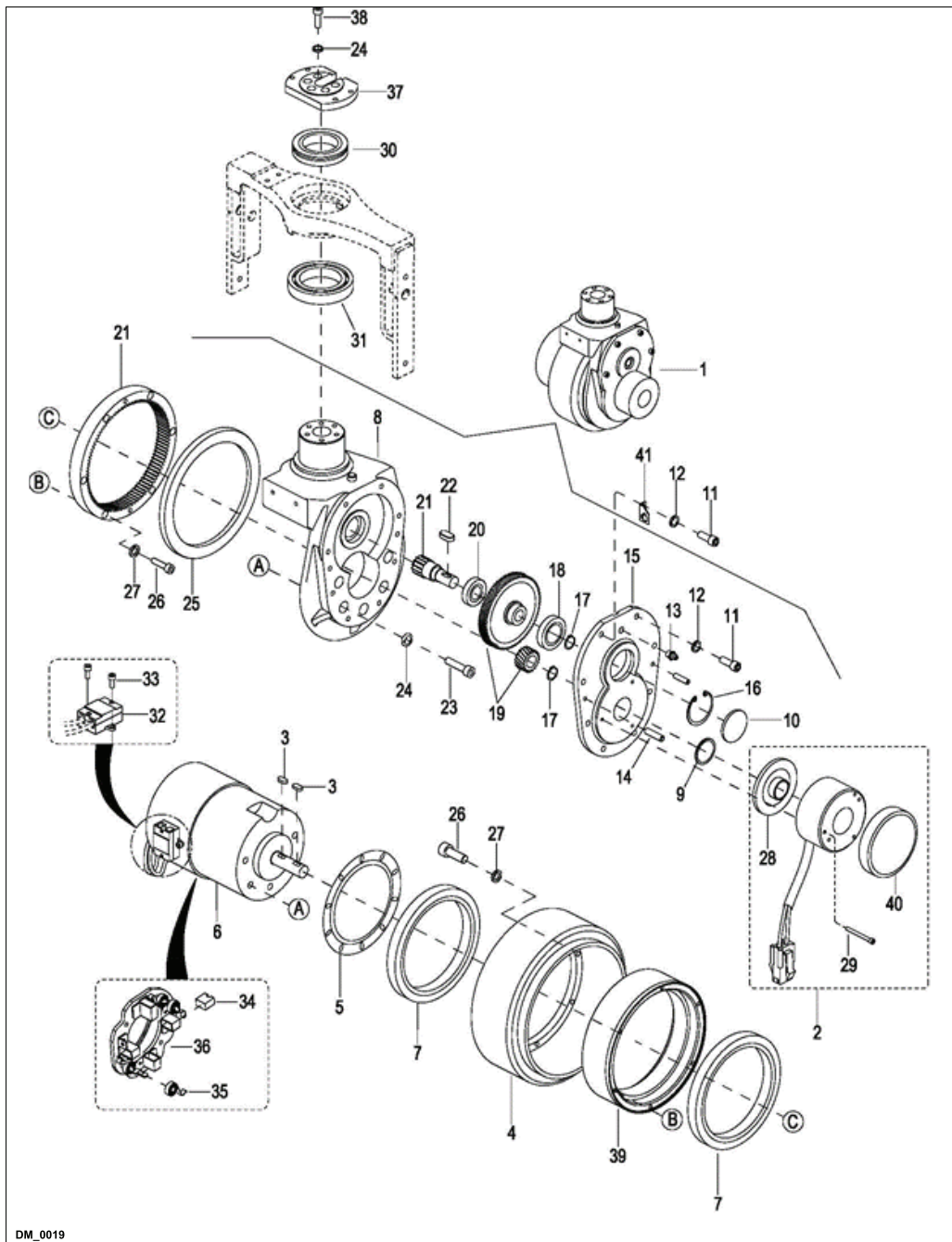


Figure 12-6 Transmission Motor, Brake Mounting
 Used between serial number 426150001 - 427202925

**TRANSMISSION MOTOR, BRAKE MOUNTING
USED BETWEEN SERIAL NUMBER 426150001 - 427202925**

| Pos. | Part Number | Description | Qty. Reqd. | Notes |
|-------------|--------------------|----------------------|-----------------------|---|
| 1 | 1121-200000-A0 | DRIVE UNIT | 1 | Includes pos. # 2 - 27 |
| 2 | 1115-520012-00 | BRAKE ASSEMBLY | 1 | Used up to serial number 426200143 |
| 2a | 1115-520012-0A | BRAKE ASSEMBLY | 1 | Used between serial number 426200144 - 427190826 |
| 2b | 1115-520012-10 | BRAKE ASSEMBLY | 1 | Used between serial number 427190827 - 427202925 |
| 3 | 0000-000662-00 | KEYWAY | 2 | |
| 4 | 1115-220000-A0 | DRIVE WHEEL | 1 | |
| 5 | 1115-200010-00 | DRIVE BAFFLE | 1 | |
| 6 | 1115-250000-00 | MOTOR | 1 | |
| 7 | 0000-000663-00 | BEARING | 2 | |
| 8 | 1121-210001-00 | TRANSMISSION HOUSING | 1 | |
| 9 | 0000-000671-00 | OIL SEAL | 1 | |
| 10 | 1115-200007-00 | TRANSMISSION CAP | 1 | |
| 11 | 0000-000386-00 | SCREW | 14 | |
| 12 | 0000-000056-00 | WASHER | 14 | |
| 13 | 0000-000013-00 | GREASE FITTING | 1 | |
| 14 | 0000-000704-00 | PIN | 2 | |
| 15 | 1115-200001-00 | GEAR BOX CAP | 1 | |
| 16 | 0000-000658-00 | CLIP | 1 | |
| 17 | 0000-000659-00 | CLIP | 2 | |
| 18 | 0000-000667-00 | BEARING | 1 | |
| 19 | 1115-GSX-10 | SPIRAL GEAR SET | 1 | Includes 2 gears. |
| 20 | 0000-000680-00 | BEARING | 1 | |
| 21 | 1115-GSX-20 | GEAR RING SET | 1 | Includes 2 gears. |

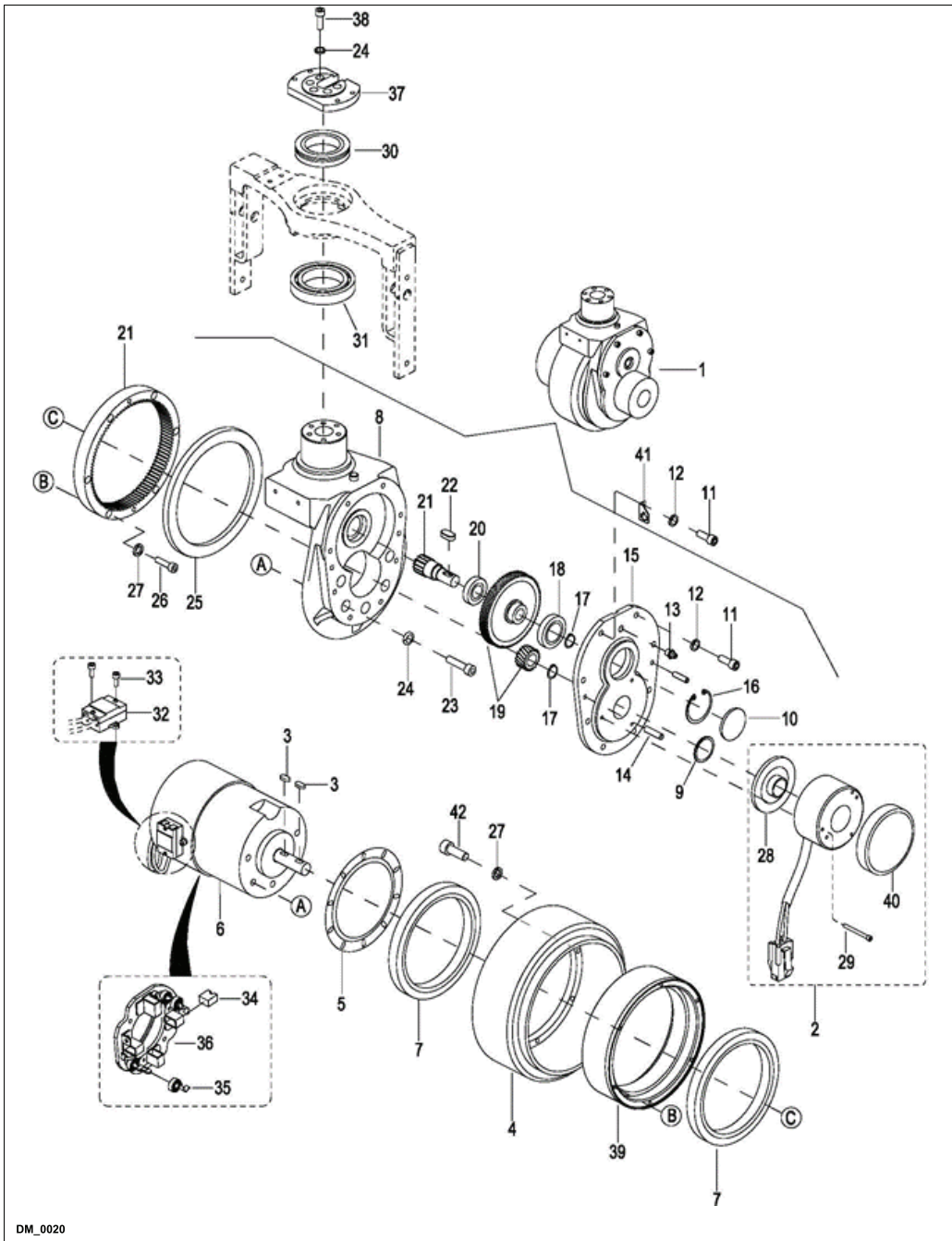


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Figure 12-6 Transmission Motor, Brake Mounting
 Used between serial number 426150001 - 427202925 - Continued

**TRANSMISSION MOTOR, BRAKE MOUNTING
USED BETWEEN SERIAL NUMBER 426150001 - 427202925 - CONTINUED**

| Pos. | Part Number | Description | Qty. Reqd. | Notes |
|-------------|--------------------|--------------------|-----------------------|---|
| 22 | 0000-000660-00 | KEY | 1 | |
| 23 | 0000-000026-00 | SCREW | 5 | |
| 24 | 0000-000159-00 | LOCK WASHER | 10 | |
| 25 | 0000-001788-00 | OIL SEAL | 1 | |
| 26 | 3020-010000-91 | SCREW | 6 | |
| 27 | 0000-000206-00 | WASHER | 6 | |
| 28 | 1115-240001-00 | BRAKE DISC | 1 | |
| 29 | 0000-000665-00 | SCREW M4×45 | 3 | Used up to serial number 426200143 |
| 29a | 1115-240003-0A | SCREW M4×40 | 3 | From serial number 426200144 |
| 30 | 0000-001230-00 | BEARING | 1 | |
| 31 | 0000-001231-00 | BEARING | 1 | |
| 32 | 1115-231000-00 | TERMINAL BLOCK | 1 | |
| 33 | 0000-000004-00 | SCREW | 2 | |
| 34 | 1115-250001-00 | BRUSH | 4 | |
| 35 | 1115-250002-00 | BRUSH SPRING | 4 | |
| 36 | 1115-250003-00 | BRUSH HOLDER | 1 | |
| 37 | 1121-200001-00 | CONNECTING PLATE | 1 | |
| 38 | 0000-000151-00 | SCREW | 5 | |
| 39 | 1115-200001-A0 | INNER RIM | 1 | |
| 40 | 1115-240002-0A | SCRAPER SEAL | 1 | Used from serial number 426200144 |
| 41 | 1115-200020-00 | PLATE | 1 | Used between serial number 427190827 - 427202925 |

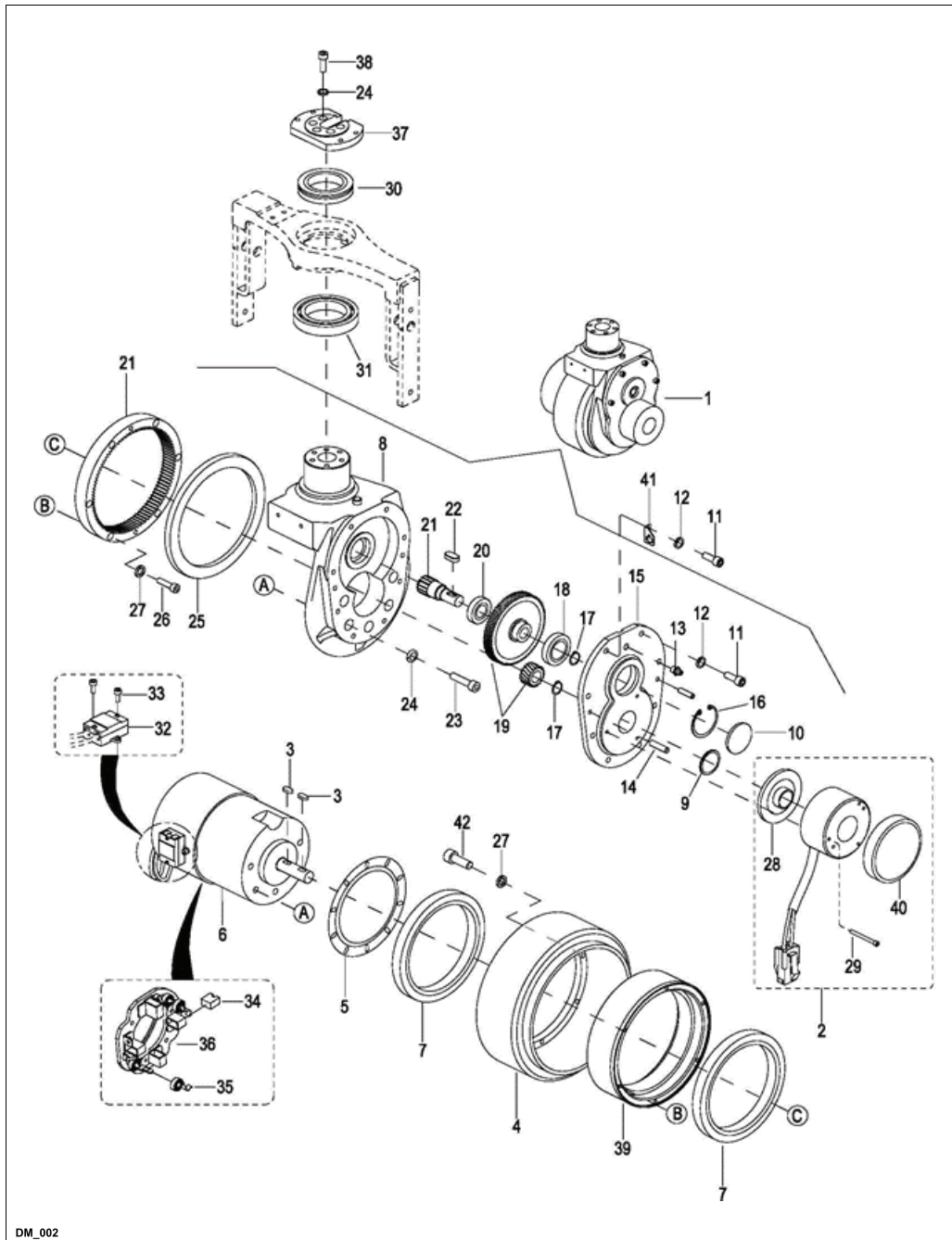


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Figure 12-7 Transmission Motor, Brake Mounting
Used from serial number 427202926

**TRANSMISSION MOTOR, BRAKE MOUNTING
USED FROM SERIAL NUMBER 427202926**

| Pos. | Part Number | Description | Qty. Reqd. | Notes |
|-------------|--------------------|----------------------|-----------------------|---|
| 1 | 1121-200000-03 | DRIVE UNIT | 1 | Includes pos. # 2 - 27 |
| 2 | 1115-520012-10 | BRAKE ASSEMBLY | 1 | |
| 3 | 0000-000662-00 | KEYWAY | 2 | |
| 4 | 1115-220000-A0 | DRIVE WHEEL | 1 | Used up to serial number 427211547 |
| 4a | 1115-220000-D0 | DRIVE WHEEL | 1 | Used from serial number 427211548 |
| 5 | 1115-200010-00 | DRIVE BAFFLE | 1 | |
| 6 | 1115-250000-00 | MOTOR | 1 | |
| 7 | 0000-000663-00 | BEARING | 2 | |
| 8 | 1121-210001-0E | TRANSMISSION HOUSING | 1 | |
| 9 | 0000-000671-00 | OIL SEAL | 1 | |
| 10 | 1115-200007-00 | TRANSMISSION CAP | 1 | |
| 11 | 0000-000386-00 | SCREW | 14 | |
| 12 | 0000-000056-00 | WASHER | 14 | |
| 13 | 0000-000013-00 | GREASE FITTING | 1 | |
| 14 | 0000-000704-00 | PIN | 2 | |
| 15 | 1115-200001-00 | GEAR BOX CAP | 1 | |
| 16 | 0000-000658-00 | CLIP | 1 | |
| 17 | 0000-000659-00 | CLIP | 2 | |
| 18 | 0000-000667-00 | BEARING | 1 | |
| 19 | 1121-GB03-00 | SPIRAL GEAR SET | 1 | Includes 2 gears. |
| 20 | 3090-010000-42 | BEARING | 1 | |
| 21 | 1121-GB03-10 | GEAR RING SET | 1 | Used between serial number 427202926-427211547, 2 gears. |
| 21a | 1121-GB03-1A | GEAR RING SET | 1 | Used from serial number 427211548, Includes 2 gears. |



DM_002

Figure 12-7 Transmission Motor, Brake Mounting
Used from serial number 427202926 - Continued

**TRANSMISSION MOTOR, BRAKE MOUNTING
USED FROM SERIAL NUMBER 427202926 - CONTINUED**

| Pos. | Part Number | Description | Qty. Reqd. | Notes |
|-------------|--------------------|--------------------|-----------------------|---|
| 22 | 0000-000660-00 | KEY | 1 | |
| 23 | 0000-000026-00 | SCREW | 5 | |
| 24 | 0000-000159-00 | LOCK WASHER | 10 | |
| 25 | 0000-001788-00 | OIL SEAL | 1 | |
| 26 | 3020-010000-91 | SCREW | 6 | Used up to serial number 427211547 |
| 26a | 1115-200021-D0 | SCREW | 6 | Used from serial number 427211548 |
| 27 | 0000-000206-00 | WASHER | 6 | |
| 28 | 1115-240001-00 | BRAKE DISC | 1 | |
| 29 | 0000-000665-00 | SCREW M4×45 | 3 | Used up to serial number 426200143 |
| 29a | 1115-240003-0A | SCREW M4×40 | 3 | From serial number 426200144 |
| 30 | 0000-001230-00 | BEARING | 1 | |
| 31 | 0000-001231-00 | BEARING | 1 | |
| 32 | 1115-231000-00 | TERMINAL BLOCK | 1 | |
| 33 | 0000-000004-00 | SCREW | 2 | |
| 34 | 1115-250001-00 | BRUSH | 4 | |
| 35 | 1115-250002-00 | BRUSH SPRING | 4 | |
| 36 | 1115-250003-00 | BRUSH HOLDER | 1 | |
| 37 | 1121-200001-00 | CONNECTING PLATE | 1 | |
| 38 | 0000-000151-00 | SCREW | 5 | |
| 39 | 1115-200001-A0 | INNER RIM | 1 | Used up to serial number 427211547 |
| 39a | 1115-200001-D0 | INNER RIM | 1 | Used from serial number 427211548 |
| 40 | 1115-240002-0A | SCRAPER SEAL | 1 | Used from serial number 426200144 |
| 41 | 1115-200020-00 | PLATE | 1 | Used between serial number 427190827 - 427202925 |
| 42 | 0000-000386-00 | SCREW M6×25 | 6 | Used up to serial number 427211547 |
| 42a | 1115-200022-D0 | SCREW M6×25 | 6 | Used from serial number 427211548 |

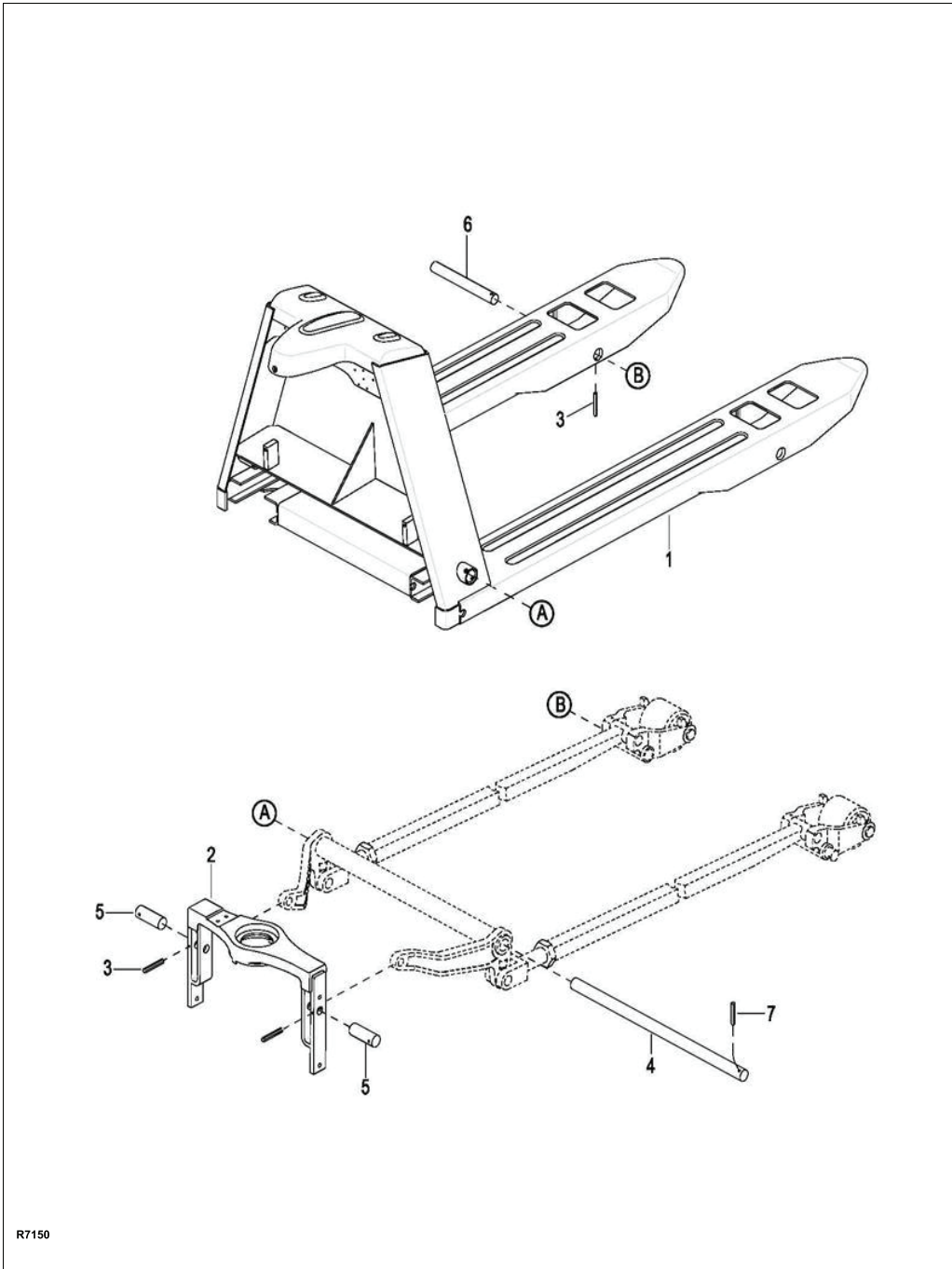


Figure 12-8 Frame (Single Wheel)

FRAME (SINGLE WHEEL)

| Pos. | Part Number | Description | Qty. Reqd. | Notes |
|------|-------------------|----------------------|------------|---|
| 1 | 1121-110000-1A-01 | FORK FRAME | 1 | Frame Width 27" (685mm) , Fork Length 45" (1150mm) |
| 2 | 1121-120000-00 | BACK FRAME | 1 | |
| 3 | 0000-000708-00 | ROLL PIN | 4 | Used up to serial number E24150468 and 424150330 |
| 3a | 0000-001456-00 | ROLL PIN | 4 | Used from serial number 424150331 |
| 4 | 1121-130001-10 | LONG SHAFT | 1 | |
| 5 | 1121-130002-00 | SHORT SHAFT | 2 | |
| 6 | 1115-130004-0A | FRONT PULL ROD SHAFT | 2 | |
| 7 | 0000-001333-00 | PIN Ø5×35 | 1 | |

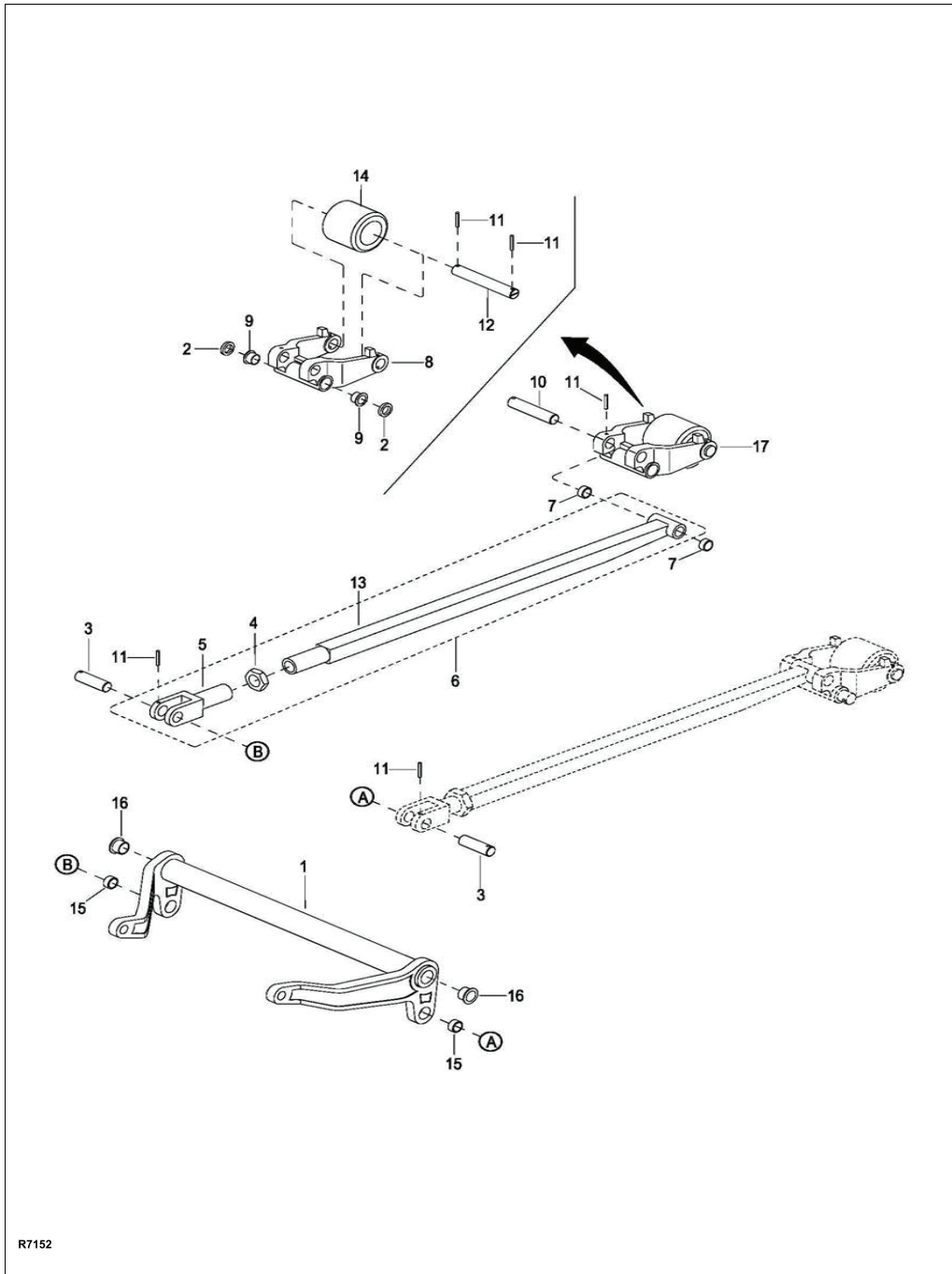


Figure 12-9 Lift Link Assembly (Single Wheel)

LIFT LINK ASSEMBLY (SINGLE WHEEL)

| Pos. | Part Number | Description | Qty. Reqd. | Notes |
|------|-------------------|----------------------------------|------------|--|
| 1 | 1121-131000-10 | DOWN LINK, FRAME WIDTH 27" | 1 | Frame Width 27" (685mm) |
| 2 | 1115-130008-00 | LOAD WHEEL SHAFT ROLLER | 4 | |
| 3 | 1121-130003-00 | SHAFT | 2 | |
| 4 | 1121-132010-00 | NUT M22×1.5 | 2 | |
| 5 | 1121-132001-00 | ROD END | 2 | |
| 6 | 1121-132000-00-01 | LONG LINK, FORK LENGTH 48" | 2 | Fork Length 48" (1220mm) |
| 7 | 0000-000907-00 | BUSHING | 4 | |
| 8 | 1115-130005-4A | WHEEL BRACKET | 2 | |
| 9 | 0000-000908-00 | BUSHING | 4 | |
| 10 | 1115-130003-00 | LOAD WHEEL BRACKET PIVOT SHAFT | 2 | |
| 11 | 0000-000708-00 | ROLL PIN | 8 | Used up to serial number E24150468 and 424150330 |
| 11a | 0000-001456-00 | ROLL PIN | 8 | Used from serial number 424150331 |
| 12 | 1115-130007-40 | LOAD WHEEL SHAFT | 2 | |
| 13 | 1121-132200-00-01 | LONG ROD FORK LENGTH 48" | 1 | Fork Length 48" (1220mm) |
| 14 | 1115-133000-40 | LOAD WHEEL ASSY. (WITH BEARINGS) | 2 | |
| 15 | 0000-000011-00 | BUSHING | 2 | |
| 16 | 0000-001241-00 | BUSHING | 2 | |
| 17 | 1115-130005-4A-B | WHEEL BRACKET ASSEMBLY | 2 | |

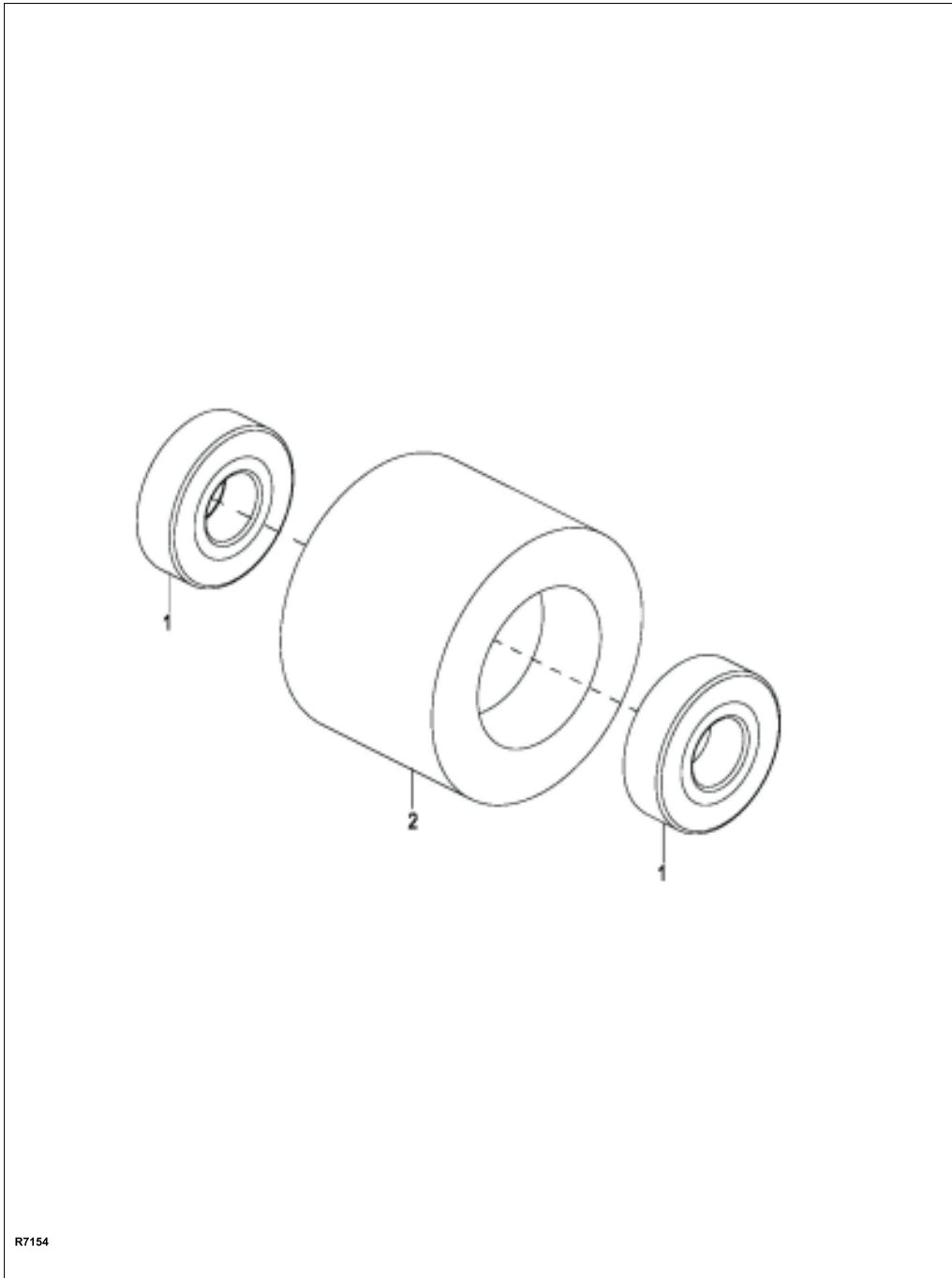
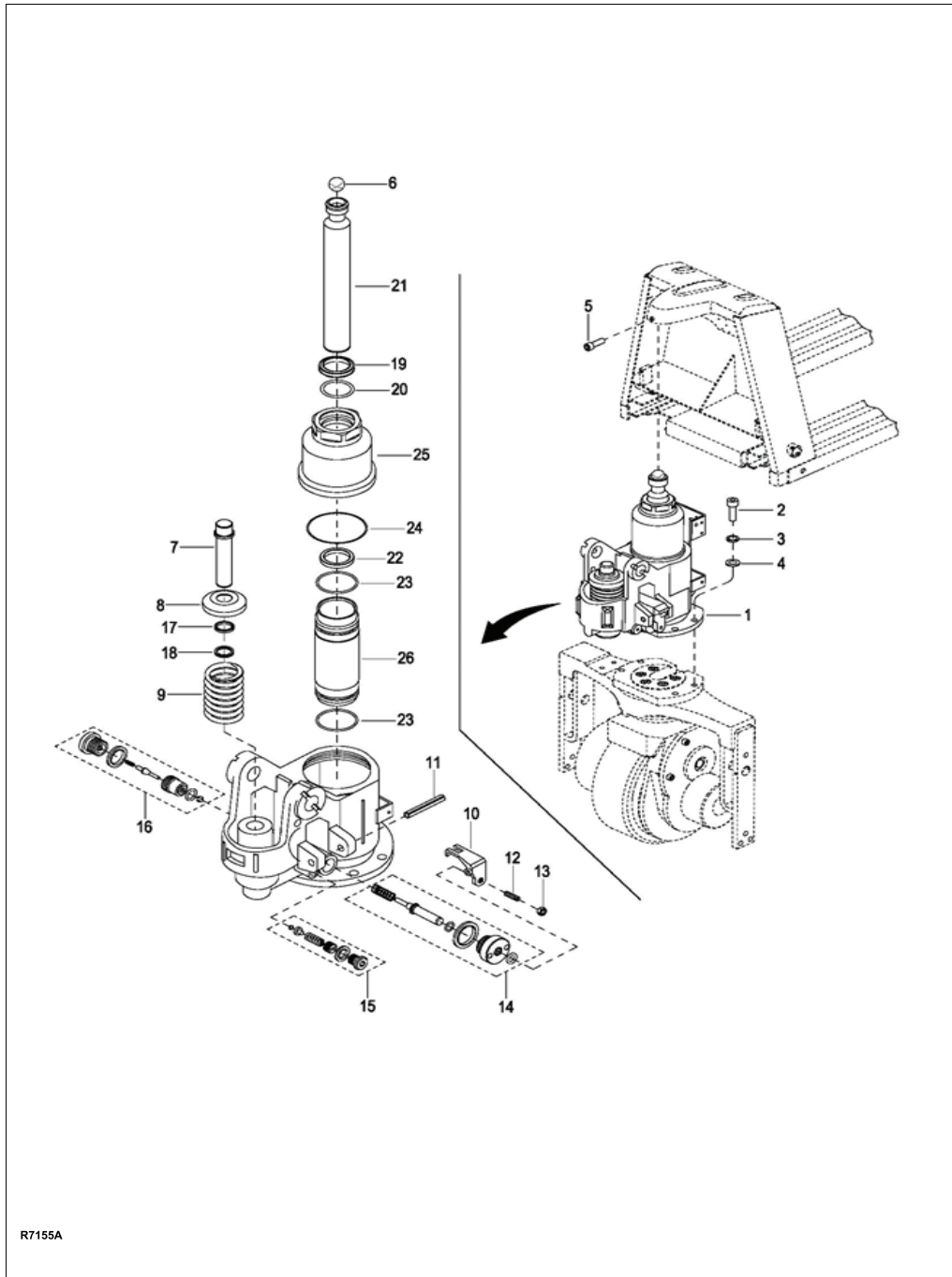


Figure 12-10 Load Wheel (Single Wheel)

LOAD WHEEL (SINGLE WHEEL)

| Pos. | Part Number | Description | Qty. Reqd. | Notes |
|-------------|--------------------|--------------------|-----------------------|---------------------------------------|
| — | 1115-133000-40 | LOAD WHEEL ASSY | 1 | |
| 1 | 0000-000020-00 | BEARING | 2 | Used up to serial number 427171687 |
| 1a | 3090-000000-04 | BEARING | 2 | Used from serial number 427171688 |
| 2 | 1115-133002-40 | LOAD WHEEL | 1 | |



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Figure 12-11 Hydraulic System

HYDRAULIC SYSTEM

| Pos. | Part Number | Description | Qty. Reqd. | Notes |
|------|----------------|-----------------------------|------------|------------------------|
| 1 | 1121-410000-00 | HYDRAULIC ASSEMBLY | 1 | Includes 6-26 |
| 2 | 0000-000151-00 | SCREW | 4 | |
| 3 | 0000-000159-00 | LOCK WASHER | 4 | |
| 4 | 0000-000176-00 | WASHER | 4 | |
| 5 | 0000-000077-00 | SCREW | 1 | |
| 6 | 1121-410001-00 | STEEL BALL | 1 | |
| 7 | 1121-410007-00 | PISTON ROD | 1 | |
| 8 | 1121-410008-00 | SPRING SEAT | 1 | |
| 9 | 1121-410009-00 | SPRING | 1 | |
| 10 | 1121-410010-00 | PRESSURE RELEASE LEVER | 1 | |
| 11 | 0000-001237-10 | PIN, M8 X 45 | 1 | |
| 12 | 1121-410011-00 | ROD | 1 | |
| 13 | 0000-000108-00 | NUT | 1 | |
| 14 | 1121-410012-00 | UNLOADING VALVE | 1 | |
| 15 | 1121-410013-00 | RELIEF VALVE | 1 | |
| 16 | 1121-410014-00 | CONTROL VALVE | 1 | |
| 17 | 1121-410015-00 | RING, WIPER 18 | 1 | |
| 18 | 1121-410016-00 | XY SEAL 18 | 1 | |
| 19 | 1121-410017-00 | RING, WIPER 32 | 1 | |
| 20 | 1121-410018-00 | O-RING 32 X 3.55 | 1 | |
| 21 | 1121-410002-00 | PISTON ROD | 1 | |
| 22 | 1121-410019-00 | SEAL 32 | 1 | |
| 23 | 1121-410020-00 | O-RING 37.5 X 2.65 | 2 | |
| 24 | 1121-410021-00 | O-RING 65 X 2.65 | 1 | |
| 25 | 1121-410022-00 | CAP | 1 | |
| 26 | 1121-410023-00 | CYLINDER | 1 | |
| -- | 1121-ZZG-0A | SEAL KIT FOR HYDRAULIC ASSY | 1 | Includes 17-20 & 22-24 |

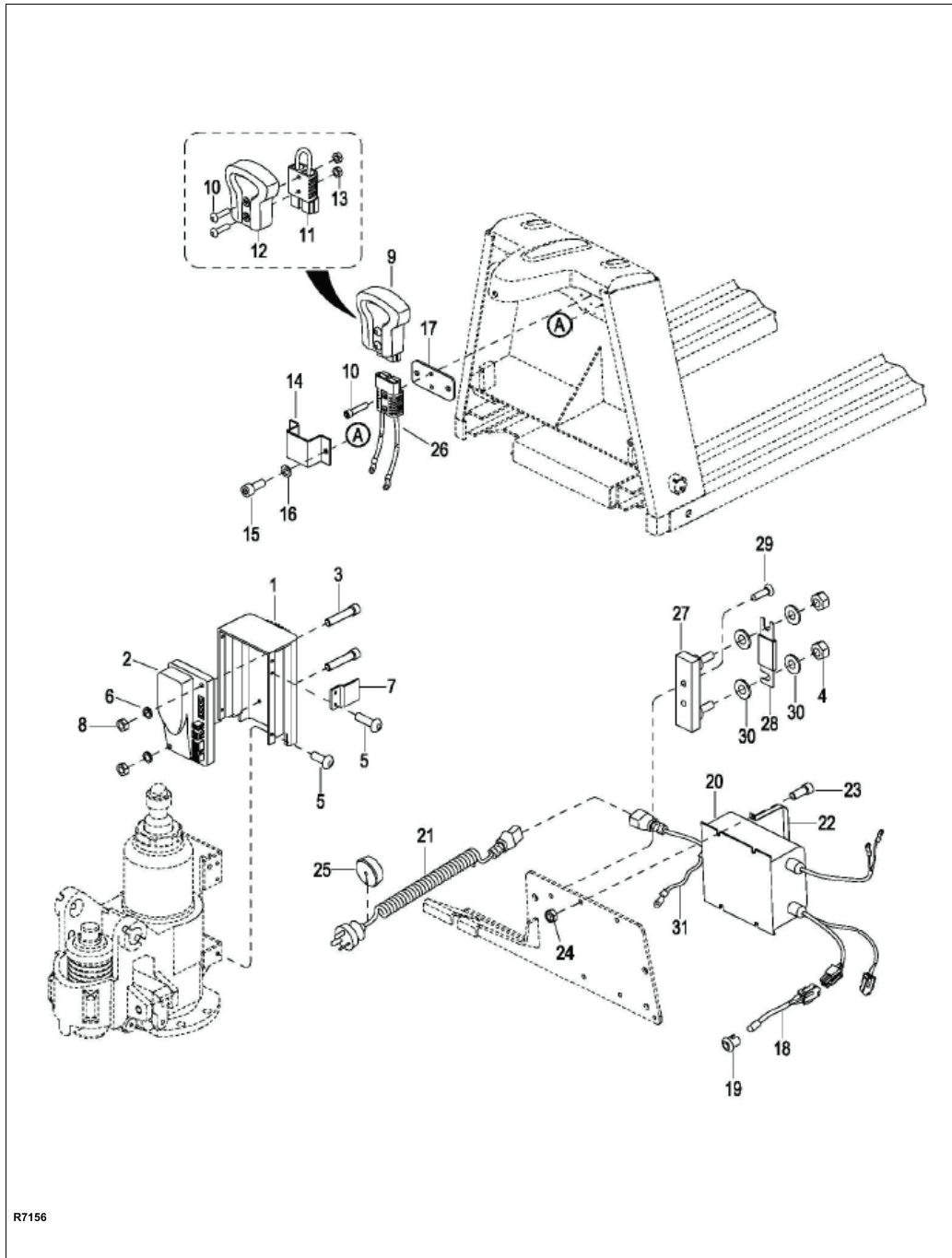


Figure 12-12 Electrical System

ELECTRICAL SYSTEM

| Pos. | Part Number | Description | Qty. Reqd. | Notes |
|------|-------------------|-------------------------|------------|-----------------------------------|
| 1 | 1121-142000-00 | CONTROLLER COVER | 1 | Used up to serial number E2321553 |
| 1a | 1121-142000-0A | CONTROLLER COVER | 1 | Used from serial number E2321554 |
| 2 | 1115-510004-00-90 | CONTROLLER | 1 | |
| 3 | 0000-000121-00 | SCREW | 2 | |
| 4 | 0000-000196-00 | NUT M8 | 2 | |
| 5 | 0000-000651-00 | SCREW | 5 | |
| 6 | 0000-000122-00 | LOCK WASHER | 7 | |
| 7 | 1121-500002-00 | CLAMP | 1 | |
| 8 | 0000-000139-00 | NUT M4 | 2 | |
| 9 | 1121-532000-00-B | BATTERY DISCONNECT ASSY | 1 | Used up to serial number E2320233 |
| 9a | 1121-500004-10-B | BATTERY DISCONNECT ASSY | 1 | Used from serial number E2320234 |
| 10 | 0000-000981-00 | SCREW, M3 X 20 | 4 | |
| 11 | 1121-532000-00 | BATTERY DISCONNECT | 1 | |
| 12 | 1121-500003-00 | T HANDLE | 1 | Used up to serial number E2320233 |
| 12a | 1121-500004-00 | T HANDLE | 1 | Used from serial number E2320234 |
| 13 | 0000-000982-00 | NUT, M3 | 2 | |
| 14 | 1115-100006-Z0 | MOUNTING BRACKET | 1 | |
| 15 | 0000-000077-00 | SCREW | 2 | |
| 16 | 0000-000380-00 | FLAT WASHER | 2 | |
| 17 | 1121-100004-00 | RUBBER CUSHION | 1 | |
| 18 | 1121-520007-00 | LED LAMP | 1 | |
| 19 | 1115-510009-00 | LED SOCKET | 1 | |
| 20 | 1121-520004-0A | CHARGER - 4A | 1 | |
| 21 | 1115-500006-10 | CHARGER CABLE | 1 | |

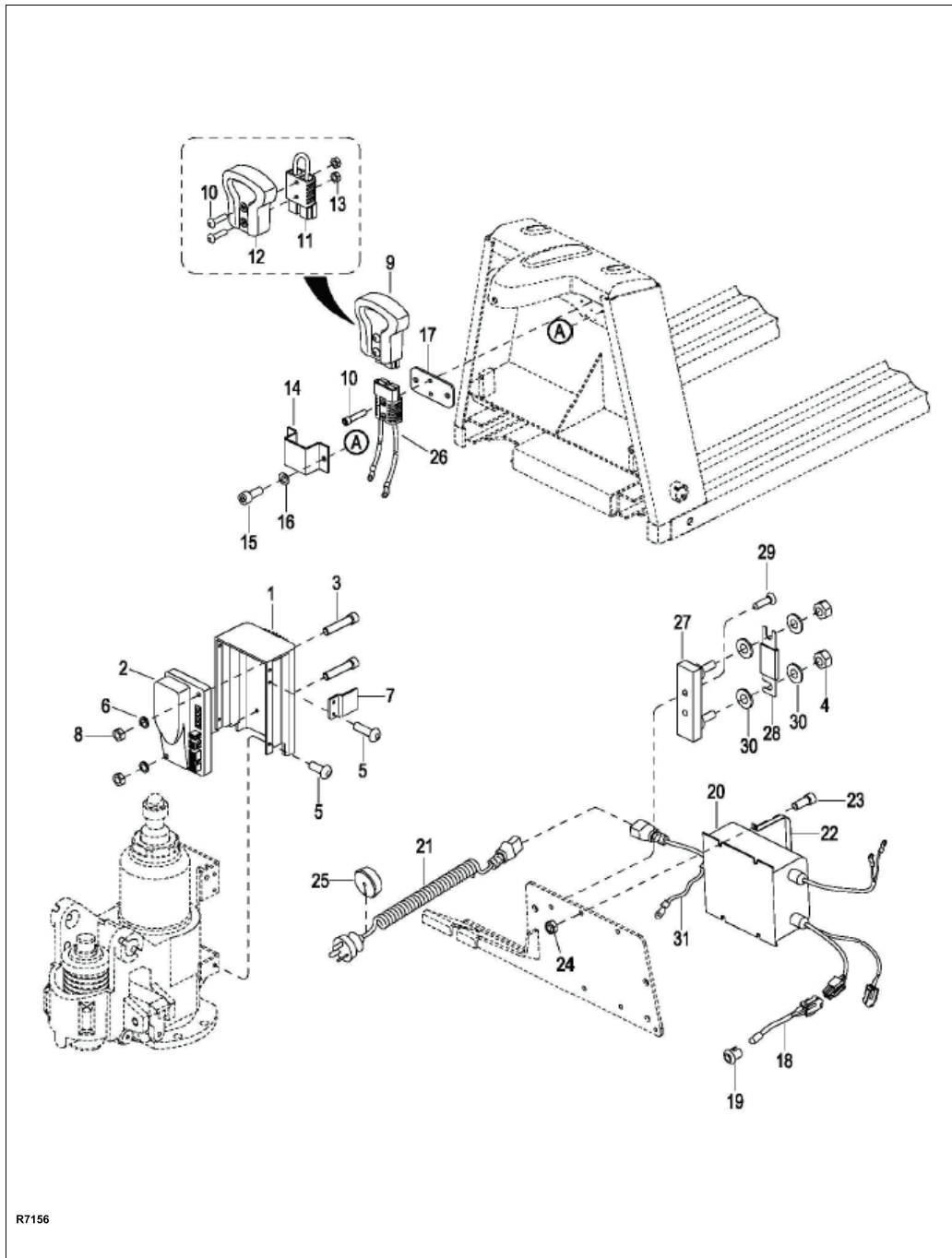


Figure 12-12 Electrical System - Continued

ELECTRICAL SYSTEM - CONTINUED

| Pos. | Part Number | Description | Qty. Reqd. | Notes |
|------|------------------|-------------------|---------------|--------------------------------------|
| 22 | 1115-500009-00 | CHARGER BRACKET | 2 | |
| 23 | 0000-000004-00 | SCREW | 4 | |
| 24 | 0000-001026-00 | NUT M5 | 4 | |
| 25 | 1115-120002-00 | CHARGER CAP | 1 | |
| 26 | 1121-531000-0A | BATTERY CONNECTOR | 1 | |
| 27 | 1120-540001-00-B | FUSE HOLDER | 1 | |
| 28 | 1115-510003-00 | FUSE 100A | 1 | |
| 29 | 0000-000126-00 | SCREW | 2 | |
| 30 | 0000-000176-00 | WASHER | 4 | |
| 31 | 1115-520021-00 | GROUND WIRE | 1 | Used from serial number 426191250 |

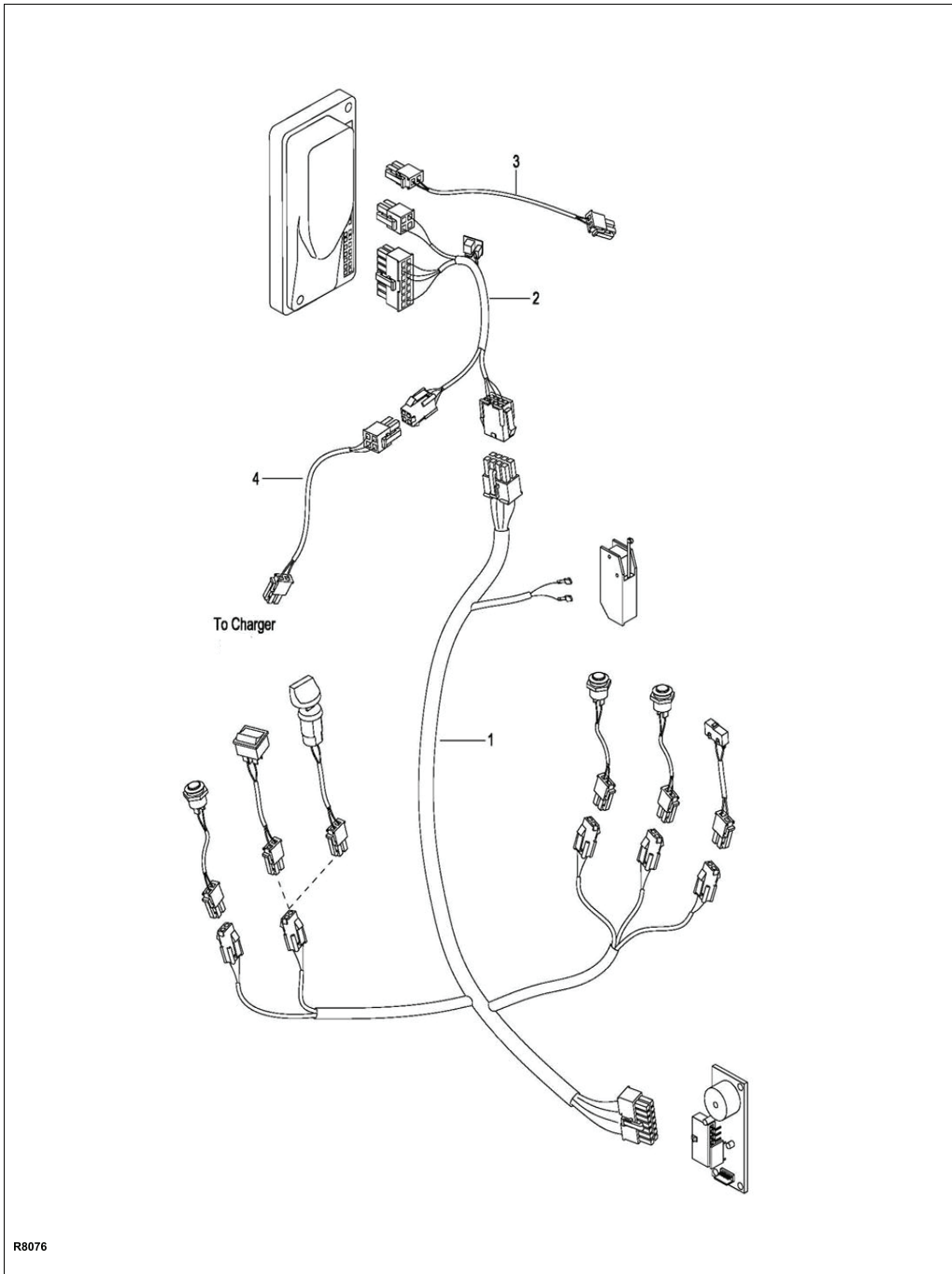
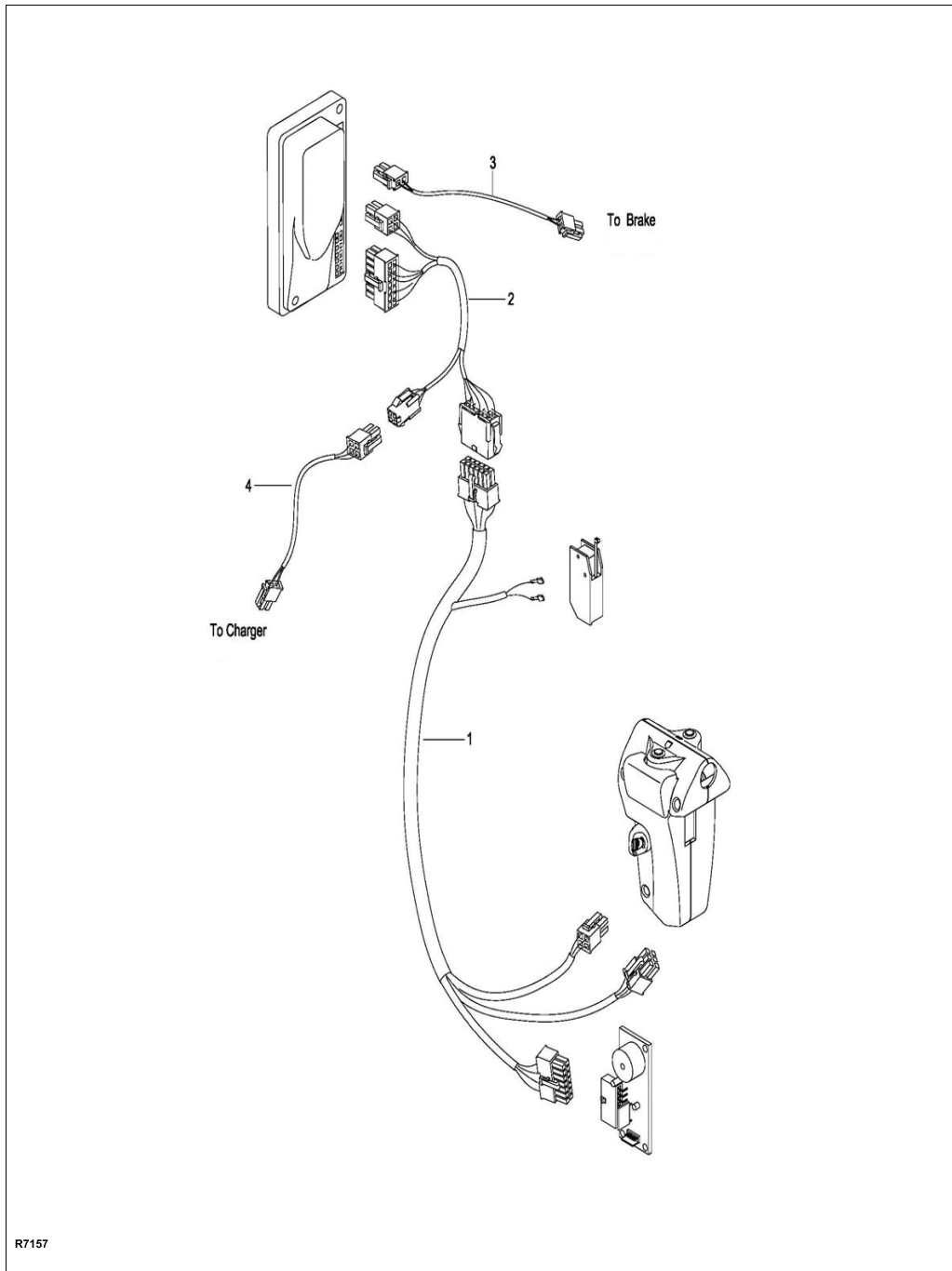


Figure 12-13 Wiring Harness - Used up to serial number E2410609

WIRING HARNESS - USED UP TO SERIAL NUMBER E2410609

| Pos. | Part Number | Description | Qty. Reqd. | Notes |
|-------------|--------------------|-------------------------|-----------------------|--------------|
| 1 | 1121-520001-00 | HARNESS, MASTER | 1 | |
| 2 | 1121-520002-00 | CONTROLLER WIRE HARNESS | 1 | |
| 3 | 1121-520006-0A | BRAKE WIRE HARNESS | 1 | |
| 4 | 1121-520008-00 | CHANGER WIRE HARNESS | 1 | |



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Figure 2-14 Wiring Harness - Used from serial number E2410610

WIRING HARNESS - USED FROM SERIAL NUMBER E2410610

| Pos. | Part Number | Description | Qty. Reqd. | Notes |
|-------------|--------------------|-------------------------|-----------------------|---------------------------------------|
| 1 | 1121-520011-00 | HARNESS, MASTER | 1 | |
| 2 | 1121-520012-00 | CONTROLLER WIRE HARNESS | 1 | |
| 3 | 1121-520006-0A | BRAKE WIRE HARNESS | 1 | Used up to serial number 427190826 |
| 3a | 1121-520006-0D | BRAKE WIRE HARNESS | 1 | Used from serial number 427190827 |
| 4 | 1121-520008-00 | CHANGER WIRE HARNESS | 1 | |

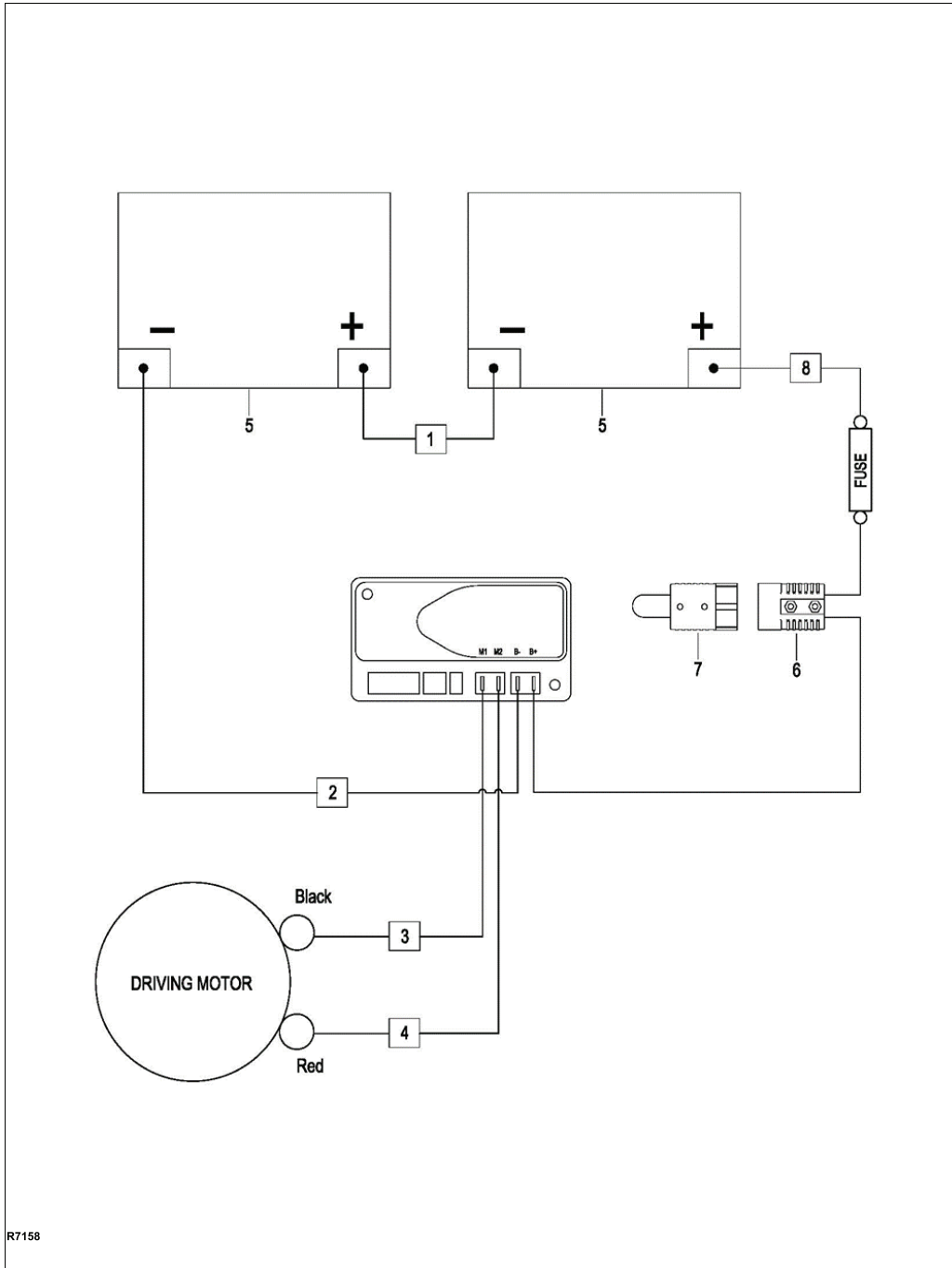


Figure 12-15 Wiring Cables

WIRING CABLES

| Pos. | Part Number | Description | Qty. Reqd. | Notes |
|------|----------------|--------------------------|------------|---|
| 1 | 1121-530002-00 | CABLE, BATTERY CONNECTOR | 1 | |
| 2 | 1121-530001-0A | CABLE, B- | 1 | |
| 3 | 1121-530003-00 | CABLE, M1 | 1 | |
| 4 | 1121-530004-00 | CABLE, M2 | 1 | |
| 5 | 1121-500001-00 | BATTERY | 2 | Used up to serial number 427153349 |
| 5a | 1121-500001-0A | BATTERY | 2 | Used from serial number 427153350. Battery has a strap. |
| 6 | 1121-531000-0A | BATTERY CONNECTOR | 1 | |
| 7 | 1121-532000-00 | BATTERY DISCONNECT | 1 | |
| 8 | 1121-530005-00 | FUSE-BATTERY CABLE | 1 | |

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