SERVICE REPAIR

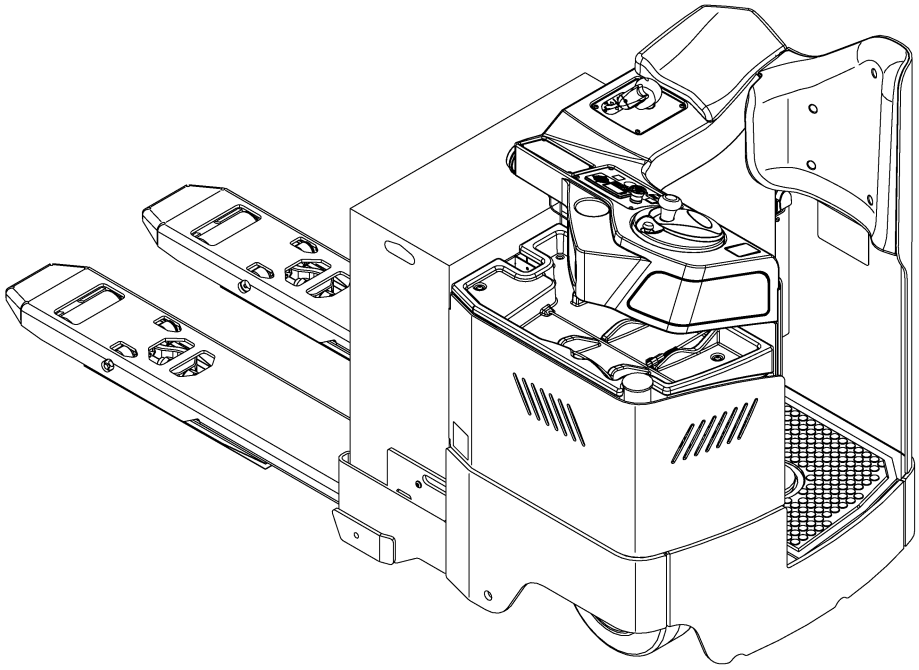
MANUAL

Hyster A244 (BE80ZHD, BE100ZHD) Forklift

HYSTER

PERIODIC MAINTENANCE

BE80ZHD, BE100ZHD [A244]



HYSTER

PART NO. 4110886

8000 SRM 1705

SAFETY PRECAUTIONS
MAINTENANCE AND REPAIR

- The Service Manuals are updated on a regular basis, but may not reflect recent design changes to the product. Updated technical service information may be available from your local authorized Hyster® dealer. Service Manuals provide general guidelines for maintenance and service and are intended for use by trained and experienced technicians. Failure to properly maintain equipment or to follow instructions contained in the Service Manual could result in damage to the products, personal injury, property damage or death.
- When lifting parts or assemblies, make sure all slings, chains, or cables are correctly fastened, and that the load being lifted is balanced. Make sure the crane, cables, and chains have the capacity to support the weight of the load.
- Do not lift heavy parts by hand, use a lifting mechanism.
- Wear safety glasses.
- DISCONNECT THE BATTERY CONNECTOR before doing any maintenance or repair on electric lift trucks. Disconnect the battery ground cable on internal combustion lift trucks.
- Always use correct blocks to prevent the unit from rolling or falling. See HOW TO PUT THE LIFT TRUCK ON BLOCKS in the **Operating Manual** or the **Periodic Maintenance** section.
- Keep the unit clean and the working area clean and orderly.
- Use the correct tools for the job.
- Keep the tools clean and in good condition.
- Always use **HYSTER APPROVED** parts when making repairs. Replacement parts must meet or exceed the specifications of the original equipment manufacturer.
- Make sure all nuts, bolts, snap rings, and other fastening devices are removed before using force to remove parts.
- Always fasten a DO NOT OPERATE tag to the controls of the unit when making repairs, or if the unit needs repairs.
- Be sure to follow the **WARNING** and **CAUTION** notes in the instructions.
- Gasoline, Liquid Petroleum Gas (LPG), Compressed Natural Gas (CNG), and Diesel fuel are flammable. Be sure to follow the necessary safety precautions when handling these fuels and when working on these fuel systems.
- Batteries generate flammable gas when they are being charged. Keep fire and sparks away from the area. Make sure the area is well ventilated.

NOTE: The following symbols and words indicate safety information in this manual:

WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury and property damage.

On the lift truck, the WARNING symbol and word are on orange background. The CAUTION symbol and word are on yellow background.

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This section is for the following models:

(BE80ZHD, BE100ZHD) [A244]

General

WARNING

DO NOT make repairs or adjustments unless you have been properly trained and authorized to do so. Repairs and adjustments that are incorrect can create dangerous operating conditions.

DO NOT operate a lift truck that needs repairs. Report the need for repairs to your supervisor immediately. If repair is necessary, attach a DO NOT OPERATE tag on the control handle. Remove the key from the key switch.

This section contains the instructions for periodic maintenance and inspection, and a Maintenance Schedule.

The Maintenance Schedule has time intervals for inspection, lubrication, and periodic maintenance. The time intervals are based on a normal operation. A normal operation is considered to be one 8-hour shift per day in a relatively clean environment on an improved surface. Multiple shifts, dirty operating conditions, etc., will require a reduction in the recommended time periods in the Maintenance Schedule.

NOTE: The front end of the lift truck is the control handle end. Forward travel is movement with the forks trailing. Rear travel is movement in the direction of the forks. The right-hand side of the lift truck is to the operator's right hand, facing the truck from the control handle end in the position for operating the controls.

Your Hyster lift truck dealer has the trained personnel and equipment to provide a complete program of inspection, lubrication, and maintenance. This complete program will help your lift truck operate properly over a longer period of time.

Some users have service personnel and facilities to do the items listed in the Maintenance Schedule. Service Manuals are available from your Hyster lift truck dealer to help users who do their own repairs.

OPERATOR'S COMPARTMENT COVERS/ CONSOLE

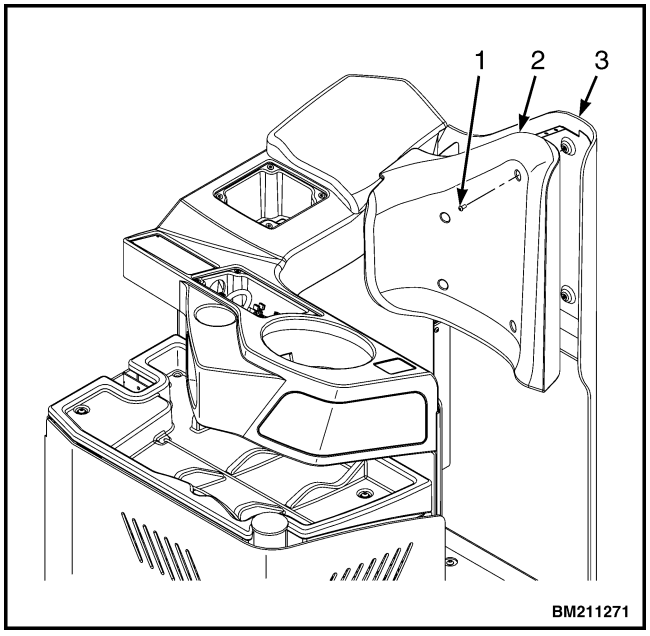
Operator's Compartment Covers

Remove

NOTE: There is an overlap from one pad to the next. They should be removed in sequence to prevent damage.

NOTE: Please note the order of removal to aid in installation.

1. Remove four capscrews and backrest pad from frame. See Figure 1.
2. The hip pad is held in place by four capscrews that attach to the back of the pad and then align with four slots in the frame. Remove hip pad from frame by pushing upward and pulling outward. See Figure 2.



1. CAPSCREW
2. BACKREST PAD
3. FRAME

Figure 1. Backrest Pad

3. Remove four capscrews and front pad from frame. See Figure 3.

Install

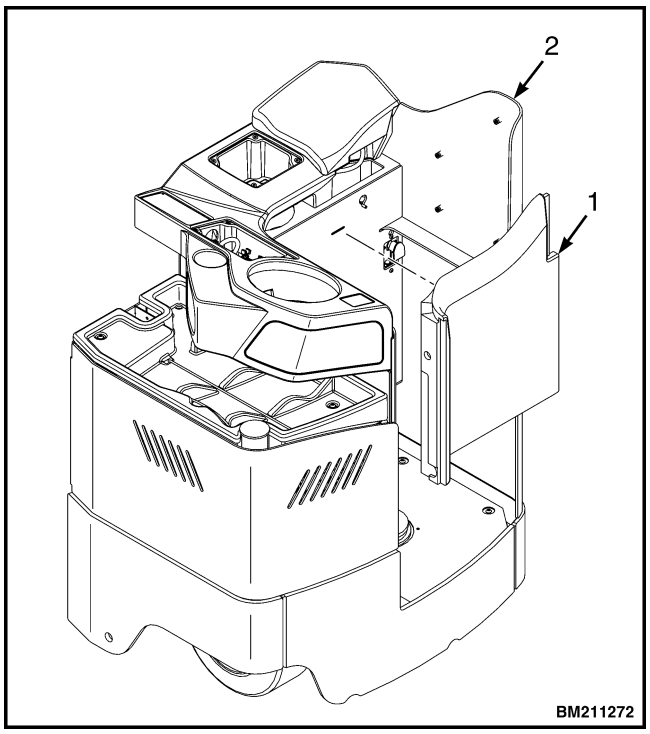
NOTE: Install pads in reverse order that they were removed.

1. Using four capscrews, install front pad onto frame. See Figure 3.

NOTE: Prior to installing hip pad, make sure capscrews are finger tight to prevent them from coming out during install and operation of lift truck.

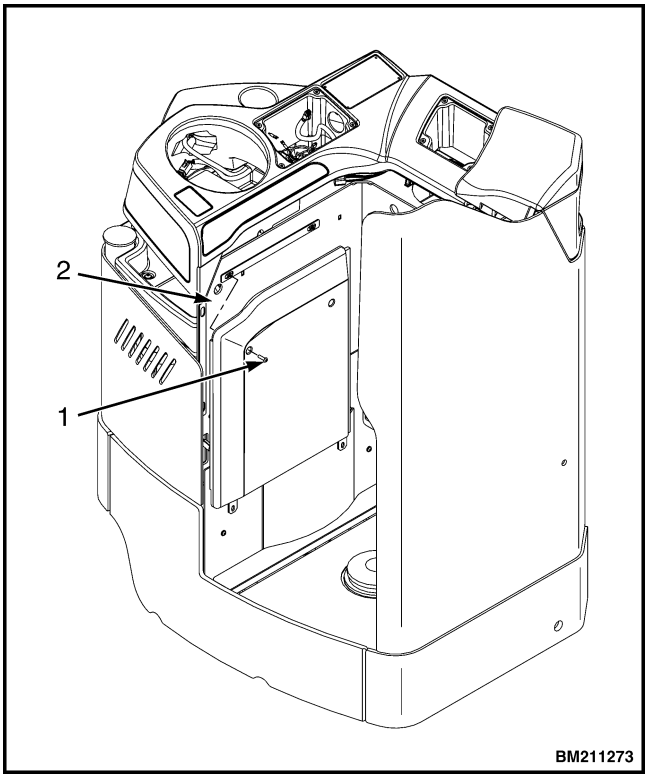
2. Install hip pad onto frame by aligning capscrews on back of pad with slots in frame. Push inward and downward. See Figure 2 .

3. Using four capscrews, install backrest onto frame. See Figure 1.



1. HIP PAD 2. FRAME

Figure 2. Hip Pad



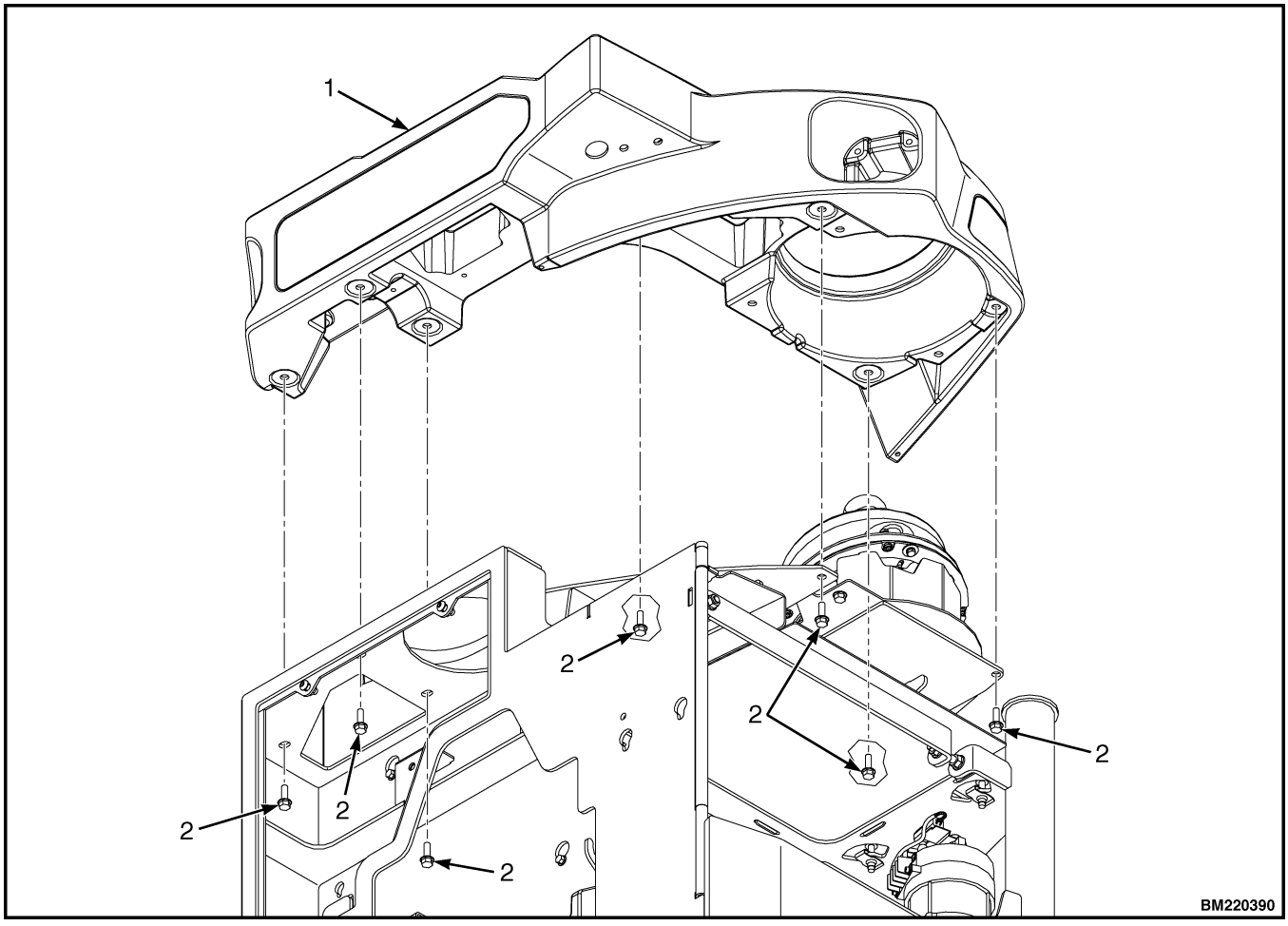
1. CAPSCREW 2. FRONT PAD

Figure 3. Front Pad

Operator's Compartment Console

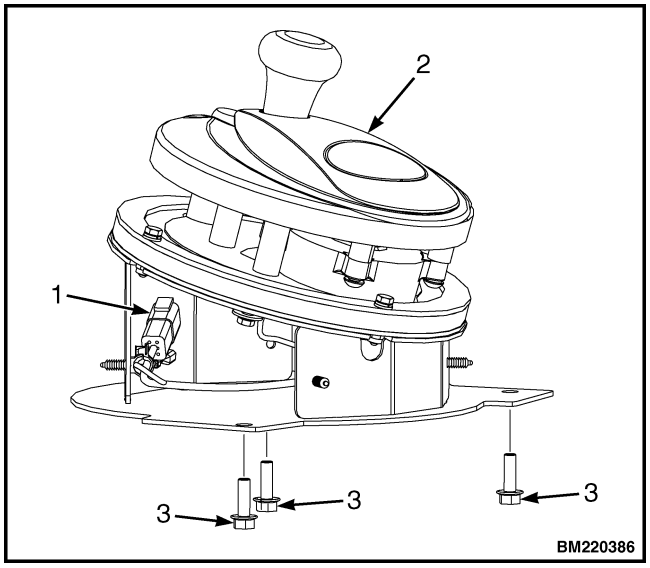
Remove

1. Turn key to the **OFF** position.
2. Disconnect battery from lift truck at battery connector .
3. Open drive unit compartment door.
4. Remove seven capscews that secure console cover to lift truck. See Figure 4.
5. Disconnect all electrical wiring from under console cover. Tag wiring to assist when reinstalling steering handle assembly.
6. Remove console cover from lift truck. See Figure 4.
7. Disconnect wiring for steering handle assembly at the harness connector. See Figure 5.



1. CONSOLE COVER
2. CAPSCREW

Figure 4. Upper Console Cover



1. HARNESS CONNECTOR
2. STEERING HANDLE
3. CAPSCREW

Figure 5. Steering Handle

8. Remove three capscrews that hold steering handle assembly to lift truck. See Figure 5.

9. Remove steering handle assembly from lift truck and place assembly on a clean work surface.

Install

1. Connect harness for steering handle assembly to connector on main truck harness. See Figure 5.

2. Using three capscrews, install steering handle assembly onto lift truck. See Figure 5.

3. Position console cover onto lift truck. See Figure 4.

4. Connect wiring to console cover as noted and tagged during removal.

5. Install seven capscrews that secure console cover to lift truck. See Figure 4.

6. Close drive unit compartment door.

7. Connect battery to lift truck.

8. Turn key switch to the **ON** position and test for proper operation.

Console Tray

Remove

1. Remove four capscrews and four washers from console tray. See Figure 6.

2. Remove console tray from heat shield and frame assembly. See Figure 6.

3. Remove heat shield from frame assembly. See Figure 6.

Install

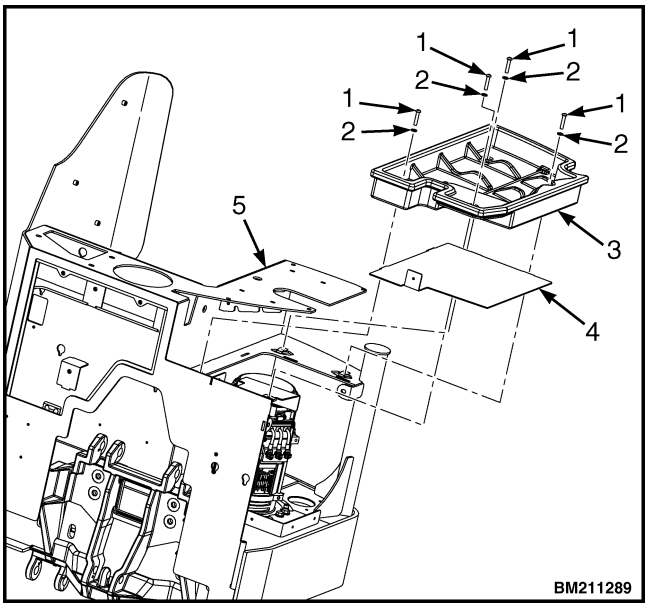
NOTE: Align tabs on heat shield with slots in frame.

1. Install heat shield onto frame. See Figure 6.

2. Install console tray into heat shield and frame assembly. See Figure 6.

NOTE: Align holes in console tray with clips on frame to aid in installation.

3. Install four washers and four capscrews into console tray and frame. See Figure 6.



1. CAPSCREW
2. WASHER
3. CONSOLE TRAY
4. HEAT SHIELD
5. FRAME ASSEMBLY

Figure 6. Console Tray

DRIVE UNIT COMPARTMENT DOOR

Open the drive unit compartment door by lifting up on latch handle. Pull the door open on its hinges. To close, push the door closed until latch catches. Verify that the door seats properly against the frame. See Figure 7.

CASTER WHEEL COVER

Lift floor mat out of operator compartment. Remove floorplate by pivoting plate upward to about 45° angle pull straight out.

To replace, insert alignment tabs into openings on frame and drop plate into place. Install floormat onto floorplate.

HOW TO MOVE A DISABLED TRUCK

This lift truck is not normally towed. If the traction system will not operate, make repairs at the location if possible. If the lift truck must be towed, refer to How to Tow the Lift Truck in this section.

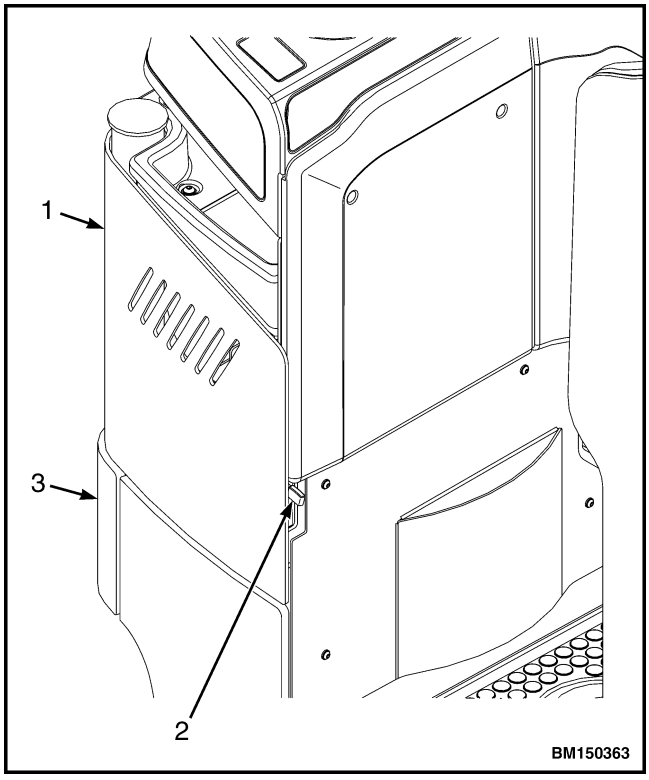


Figure 7. Drive Unit Compartment Door

Legend for Figure 7

1. DRIVE UNIT COMPARTMENT DOOR
2. LATCH
3. FRAME

WARNING

Never carry a disabled lift truck unless the lift truck MUST be moved. The lift truck used to lift the disabled lift truck MUST have a rated capacity equal to or greater than the weight of the disabled lift truck. The capacity must be for a load center equal to half the width of the disabled lift truck. See the capacity plate on the disabled lift truck for the approximate total weight. The forks must extend the full width of the disabled lift truck. Put the weight of the disabled lift truck at the center of the forks and be careful not to damage the under side of the disabled lift truck. Tilt the mast back and travel slowly.

Make sure no one except the driver is near the lift trucks during towing. Both the tow truck and the disabled truck can cause a personal injury during towing.

To avoid personal injury, use extra care when moving a lift truck during the following conditions:

- **Brake does not operate correctly**
- **Steering does not operate correctly**
- **Tire is damaged**
- **Traction conditions are bad**

CAUTION

Never carry the lift truck faster than the speed of a person walking. Steering can be difficult and motor damage can occur at higher speeds. Always travel smoothly without sudden starts.

The electric brake must be released before the lift truck can be moved. If there is not sufficient battery power, placing the control handle in the operating position will not release the electric brake. Refer to the How to Tow the Lift Truck section of the Maintenance Manual. Use the control handle to steer the lift truck while it is being towed. Use one hand and walk to one side of the lift truck. **DO NOT** walk or stand between the towing vehicle and the lift truck.

How to Tow the Lift Truck

WARNING

Stay clear of the tow chain, towing vehicle, and the lift truck during the towing operation to prevent personal injury.

Make sure no one, except the driver, is near the lift trucks during towing. Both the tow truck and the disabled truck can cause personal injury during towing.

CAUTION

Travel slowly and DO NOT tow on grades. NEVER tow the lift truck faster than a normal walking speed. Always tow smoothly, without sudden starts or stops.

Until repairs are complete, keep a tag on the control handle stating DO NOT OPERATE. Remove the key.

1. Disconnect the battery, and fasten the chain to the lift truck. Make sure the tow chain has the capacity to tow the weight. Carefully fasten the tow chain completely around the drive unit compartment and battery compartment over top of the forks. The chain must not cause damage to either lift truck.

2. The electric brake must be released before the lift truck can be towed.

   When there is no alternative, the brake assembly may be removed from the traction motor to allow towing. For brake removal procedures see **Brake System** 1800SRM1697.

3. Tow the lift truck slowly.

4. If counterbalanced style, lift truck configured with the drive wheels nearest to the forks is used to tow the disabled lift truck. The lift truck must have weight added to the forks. The total weight of the lift truck and load must be equal to or greater than the weight of the disabled lift truck. Install a load of approximately half the maximum capacity on the forks of the lift truck that is used for towing. This load will increase the traction of the lift truck. Keep the load on the forks lowered as much as possible.

   If counterbalanced style, lift truck configured with the drive wheel(s) furthest from the forks is used to tow the disabled lift truck. **DO NOT** add weight to the forks. Additional weight on the forks may DECREASE the traction of the drive wheel(s). Make sure that the lift truck used has a total weight equal to or greater than the weight of the disabled lift truck.

HOW TO PUT A LIFT TRUCK ON BLOCKS

WARNING

DO NOT put the lift truck on blocks unless the surface is solid, even, and level. Make sure that any blocks used to support the lift truck are solid, one-piece units. Put a block in front and back of the tires touching the ground to prevent movement of the lift truck.

DO NOT raise the lift truck by attaching an overhead crane to areas that will be damaged. Some of these points are not designed to support the weight of the lift truck. The lift truck can be damaged or it can fall, causing serious personal injury. Attach the chain or sling to a support structure of the lift truck frame.

See Figure 8

How to Raise Drive/Steer Tire

1. Put blocks on each side (front and back) of the load wheels to prevent movement of the lift truck.

2. Use a special low clearance hydraulic jack, crane, or another lift truck to raise the drive tire. Make sure that the jack, crane, or other lift truck has the correct capacity rating. The capacity must equal to 2/3 the weight of the lift truck, including the battery. See the capacity plate.

3. Raise the lift truck only enough to suspend the drive tire. Install additional blocks under the frame near the drive tire.

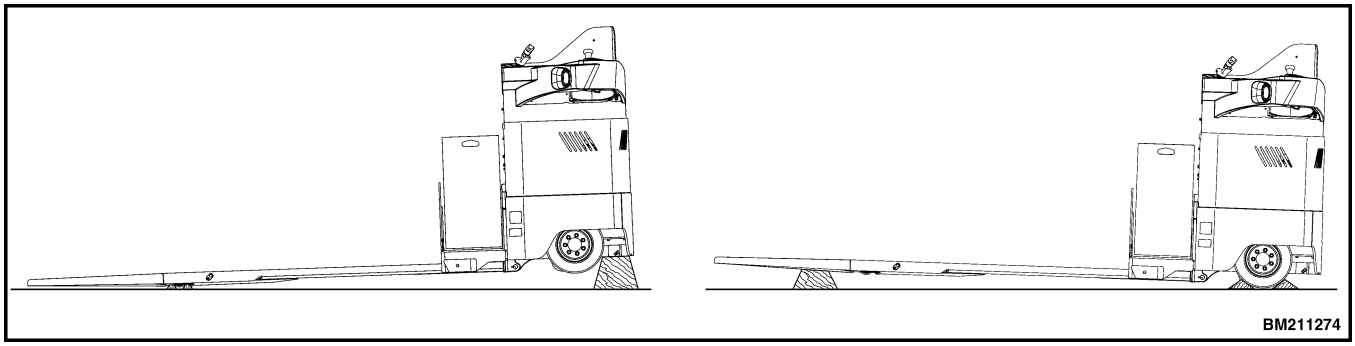


Figure 8. Putting Lift Truck on Blocks

How to Raise Load Wheels

WARNING

Never raise the forks any higher than necessary to change the load wheels. Always raise both forks at the same time. Raising the forks too high can make the lift truck tip over and cause property damage or personal injury.

1. Put blocks on both sides (front and back) of the drive tire to prevent movement of the lift truck.
2. Use an overhead crane and web sling under the forks to raise the load wheels. Another lift truck can also be used to raise the forks. Make sure that the crane and sling or other lift truck has a capacity of at least 2/3 the total weight of the lift truck, as shown on the capacity plate.
3. Raise the forks only enough to suspend the wheels. Install blocks under the forks at the rear of the wheels to support the lift truck.

Special Precautions

DISCHARGING THE CAPACITORS

WARNING

The capacitor in the transistor controller can hold an electrical charge even after the battery is disconnected. To prevent electrical shock and personal injury, discharge the capacitor before inspecting or repairing any component. Wear safety glasses. Make certain the battery has been disconnected. DO NOT use a screwdriver to discharge the traction motor controller.

WARNING

To avoid personal injury and prevent electrical shock, perform the following steps before performing any troubleshooting or adjustments.

CAUTION

To avoid controller damage, always disconnect the battery. Discharge the capacitor and never put power to the controller with any power wire disconnected. Never short any controller terminal or motor terminal to battery. Make sure to use proper procedures when servicing the controller.

1. Turn the key switch to the **OFF** position and disconnect the battery.
2. Open the drive unit compartment cover to access the controller. See Drive Unit Compartment Door.
3. Discharge the capacitors in the controllers by connecting a 200-ohm, 2-watt resistor across the controller's B+ and B− terminals using insulated jumper wires. See Figure 9. **DO NOT** attempt to discharge the capacitors by creating a short across the motor controller terminals with a screwdriver or jumper wire. Remove the 200-ohm, 2-watt resistor before reconnecting the battery.

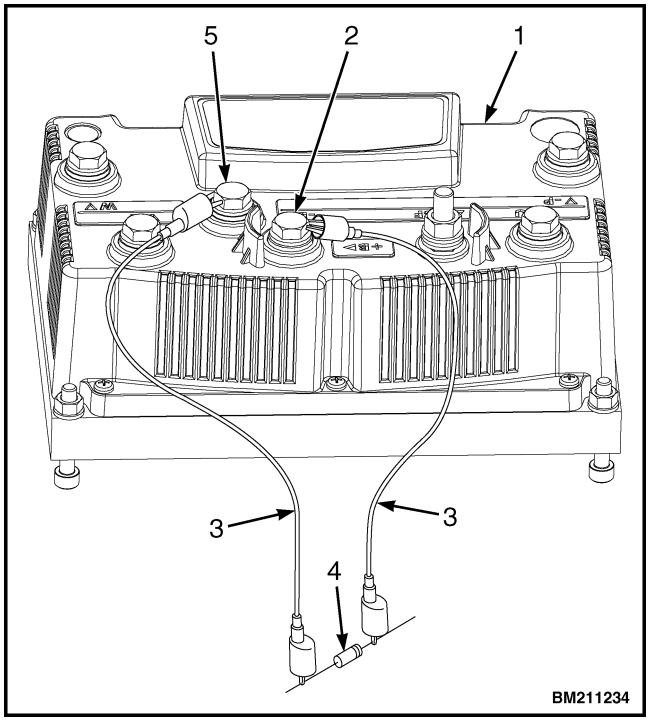


Figure 9. Discharging Capacitors

Legend for Figure 9

1. CONTROLLER
2. POSITIVE CONNECTION
3. INSULATED JUMPER WIRES
4. 200-OHM, 2-WATT RESISTOR
5. NEGATIVE CONNECTION

Welding Repairs

WARNING

Disconnect the battery connector and remove the battery before welding. Welding can cause a fire and/or an explosion. Make sure there is no fuel, oil, or grease near the weld area. Make sure the area is well ventilated.

Forklift truck frames and components may have polyurethane paint. Welding, burning, or other heat sufficient to cause thermal decomposition of the paint may release isocyanates. These chemicals are allergic sensitizers to skin and respiratory tract and overexposure may occur without odor warning. When performing work, utilize good industrial hygiene practices, including removal of all paint (prime and finish coats) to the metal around the area to be welded. Use local ventilation, and/or supplied-air respiratory protection.

CAUTION

All welding repairs must pre-approved by Hyster™ company Contact Management.

Always disconnect the battery connector to prevent damage to circuit components when welding. Connect the welding ground clamp as close to the weld area as possible to prevent welding current from damaging components.

Observe the previous **WARNING** and **CAUTION** before performing any welding repairs.

Maintenance Schedule

The Maintenance Schedule is divided into four time intervals which call for particular maintenance procedures to be performed. The intervals are 1 Day or 8 Hours, 6 Weeks or 250 Hours, 3 Months or 500 Hours, and 1 Year or 2000 Hours for normal operation (whichever comes first). **Normal** operation is considered one 8-hour shift per day, in a relatively clean environment, on an improved surface. Operating a lift truck for more than eight hours per day is considered **Heavy** operation and requires the 3-month/500-hour checks to be performed at 2 months/350 hours. Lift trucks operating in freezer environments or dirty conditions are considered **Severe** operation and require the 3-month/500-hour checks to be performed at 1 month/200 hours. The approximate locations of the items listed in the Maintenance Schedule are shown in Figure 10. Several lift truck configurations are available which enable the truck to function in different environments:

- Standard (0 to 49°C (32 to 120°F))
- Cooler/Freezer (−18 to 49°C (0 to 120°F))
- SubZero (−40 to 49°C (−40 to 120°F))
- Wash Down Pkg

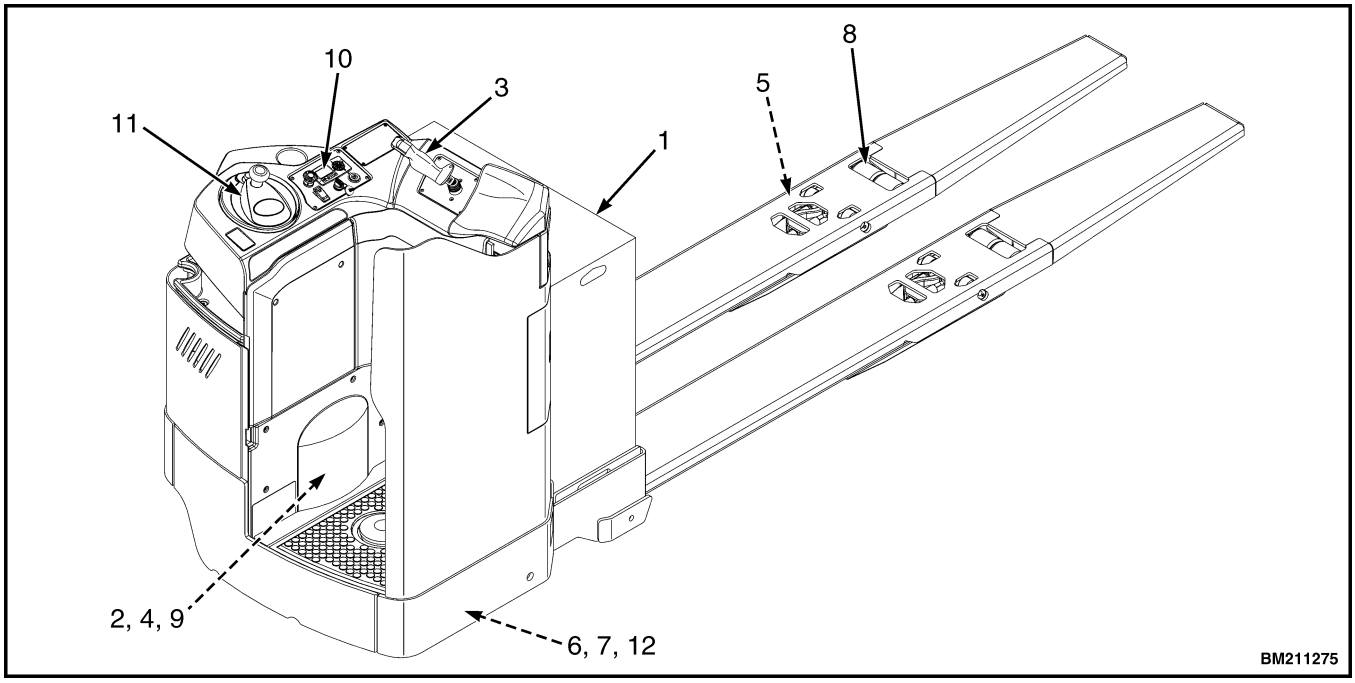


Figure 10. Maintenance Points

Table 1. Maintenance Schedule

Item No.	Item	1 day / 8 hr[8]	6 wk/ 250 hr[8]	3 mo/ 500 hr[8]	1 yr/ 2000 hr[8]	Procedure or Quantity	Specification
1	Battery	X[1]				Check Charge Status	Charge or Change Out
	Electrolyte	X				Check Level	Distilled Water
	Restraint Panels	X				Check Condition	Repair as Necessary
	Power Disconnect	X				Check Operation	Repair as Necessary
2	Parking Brake	X				Check Operation	Repair as Necessary
					X	Hold on Grade Test	Capacity Load on 10% Grade
3	Horn	X				Check Operation	No Binding. Operates Proper Function
	Lift/Lower Control	X				Check Operation	No Binding. Operates Proper Function
	Directional/Speed Control	X				Check Operation	No Binding. Operates Proper Function
4	Hydraulic System	X				Check for Leaks	Repair as Necessary
	Hydraulic Hoses and Fittings	X				Visually Inspect for Leaks	Repair as Necessary
				X		Check for Hose Damage and Loose Fittings	Repair or Replace as Necessary

X=Check C=Change L=Lubricate
NOTE: Never use steam to clean electrical parts.

Table 1. Maintenance Schedule (Continued)

Item No.	Item	1 day / 8 hr[8]	6 wk/ 250 hr[8]	3 mo/ 500 hr[8]	1 yr/ 2000 hr[8]	Procedure or Quantity	Specification
	Hydraulic Oil			X		Check Level (Full Mark on Tank)	Hydraulic Oil[2]
					C[3]	Change	
	Hydraulic Oil Strainer				X/C	Inspect / Replace as Necessary	See **Parts Manual**
5	Lift and Lower Linkage	X				Check Operation	Repair as Necessary
	Load Roller Linkage			L		Lube Fittings	Multipurpose Grease[4]
	Forks to Drive End Frame Linkage			L		Lube Fittings	Multipurpose Grease[4]
	Safety Labels and Operating Manual	X				Replace if Missing or Damaged	See **Parts Manual**
6	Frame	X				Visually Inspect	Repair as Necessary
7	Casters	X				Check Condition	Repair as Necessary
	Caster Adjustment		X			Check Adjustment Gap	Adjust as Necessary
	Caster Swivel (Greasable Option)	L[5]		L		Lube Fitting	Multipurpose Grease[4]
	Caster Wheel (Greasable Option)	L[5]		L		Lube Fitting	Multipurpose Grease[4]

X=Check C=Change L=Lubricate
NOTE: Never use steam to clean electrical parts.

Table 1. Maintenance Schedule (Continued)

Item No.	Item	1 day / 8 hr[8]	6 wk/ 250 hr[8]	3 mo/ 500 hr[8]	1 yr/ 2000 hr[8]	Procedure or Quantity	Specification
8	Load Wheels	X				Check Condition	Replace as Necessary
	Wheels and Bearings (Greasable Option)	L[5]		L		Lube Fitting	Multipurpose Grease[4]
	Axle (Greasable Option)	L[5]		L		Lube	Anti-seize Lubricant
9	Main Drive Unit	X				Check Operation	Listen for Abnormal Sounds
	Seals	X				Check for Leaks	Repair as Necessary
	Fluid Level			X		Fill to Bottom of Fill Hole	Gear Oil [6]
	Ring Gear and Pinion	X		L		Apply to Gears	Multipurpose Grease[4]
	Breather				X	Claen and Check Operation	Replace as Necessary
	Studs and Lugs			X		Visually Inspect	Loose or Missing Studs/Lug Nuts
10	Display	X				Check Operation	
11	Steering Operation	X				Check Operation	
13	Drive Wheel and Tire	X				Check Condition	Repair as Necessary
	Tire	X				Inspect for Damage	Smooth Edges/Remove Embedded Objects
	Axle Seal	X				Inspect for Oil Leaks	Remove Wrapped Debris
	Wheel Bolts Lug Nuts			X[7]		Tighten as Required	135 to 140 N•m (100 to 103 lbf ft)

[1] Equalization charge approximately each month, but not more than each week.

X=Check C=Change L=Lubricate
NOTE: Never use steam to clean electrical parts.

Table 1. Maintenance Schedule (Continued)

Item No.	Item	1 day / 8 hr[8]	6 wk/ 250 hr[8]	3 mo/ 500 hr[8]	1 yr/ 2000 hr[8]	Procedure or Quantity	Specification
[2] Use ISO VG 46 (conventional) antiwear (HCE-140) for Standard and Cooler/Freezer configurations. Use Exxon Univis® HVI 26 (synthetic) for Sub-Zero and Corrosion/Washdown configurations.							
[3]Replace after first 500 hours of service and check every 2000 hours or yearly thereafter.							
[4] Use Mobilgrease® 28 synthetic extra-protection grease (clay) for Standard and Cooler/Freezer configurations.							
[5]Lubricate every 8 hours only if using in a Corrosive/Washdown environment.							
[6]No change for the life of the unit.							
[7] Apply antiseize at installation and check every 2 to 5 hours until nuts/bolts stay tight for an entire 8-hour shift. Check tightness every 3 months or 500 hours thereafter.							
[8]Whichever comes first.							
X=Check C=Change L=Lubricate NOTE: Never use steam to clean electrical parts.							

Maintenance Procedures Every 8 Hours or Daily

WARNING

DO NOT operate a lift truck that needs repairs. If a repair is necessary, attach a DO NOT OPERATE tag to the control handle and disconnect the battery.

Inspect the lift truck every 8 hours or daily before use. Put the lift truck on a level surface. Lower the carriage and forks, and turn the key switch to **OFF**. If repair is required, attach a DO NOT OPERATE tag to the control handle and disconnect the battery. DO NOT operate a lift truck until the problems are corrected.

CHECKS WITH KEY SWITCH TURNED OFF

Make the following checks:

- Electrolyte and specific gravity of the battery
- Make sure the battery is clean and the correct size and weight for the lift truck
- Check that the battery restraint plates are in place
- Leaks in the hydraulic system
- Condition of the casters, load wheels, drive tire, and frame

Battery

WARNING

DO NOT lay tools on top of the battery.

The acid in the electrolyte can cause injury. If the electrolyte is spilled, use water to flush the area. Make the acid neutral with a solution of sodium bicarbonate (baking soda). Acid in the eyes must be flushed with water continuously for fifteen minutes then seek medical attention.

Batteries generate explosive fumes. Keep the vents in the caps clean. Keep sparks or open flames away from the battery area. DO NOT make a spark from the battery connections. Disconnect the battery when doing maintenance.

The battery must fit the battery compartment so the battery restraint panels will operate correctly. Use spacers to prevent the battery from moving more than 13 mm (0.5 in.) in any direction.

CAUTION

Disposal of batteries must meet local environmental regulations.

Make sure the battery weight is within the maximum and minimum weight shown on the nameplate.

Keep the battery case, top cover, and the area for the battery clean and painted. Leakage and corrosion from the battery can cause a malfunction in the electric controls of the lift truck. Use a water and sodium bicarbonate solution (soda) to clean the battery and the battery area. Keep the top of the battery clean, dry, and free of corrosion.

Make sure the battery is charged and has the correct voltage and ampere hour rating for the lift truck. See the nameplate.

Inspect the battery case, connector, and cables for damage, cracks, or breaks. Contact your local battery dealer to discuss repair options for the battery case. Check the level of the electrolyte daily on a minimum of one cell. The correct level is halfway between the top of the plates and the bottom of the fill hole. Add only distilled water.

Make certain the battery restraint panels are properly installed.

WARNING

Make sure the key switch is OFF and the brake is set before connecting the battery.

If the lift truck was operated with a discharged battery, check the contactor for welded tips before a charged battery is connected.

The battery should have an equalization charge each month, but not more than each week.

Hydraulic Leaks

WARNING

Always wear the proper protective equipment including eye protection and petroleum-resistant gloves when handling hydraulic oil. Thoroughly wash oil from exposed areas of skin as soon as possible.

Completely lower forks to relieve hydraulic pressure before disassembling any part of the lift pump or disconnecting any hydraulic hoses.

The hydraulic oil is hot at normal operating temperatures. Be careful when draining the oil.

Never check for leaks by putting hands on hydraulic lines or components under pressure. Hydraulic oil under pressure can be injected into the skin.

CAUTION

Protect the hydraulic system from dirt and contaminants when servicing the hydraulic system.

Never operate the pump without the proper amount of oil in the hydraulic system. The operation of the hydraulic pump with low oil levels will damage the pump.

Check for leaks by looking for oil under the lift truck and where the lift truck has been parked. Visually inspect the hydraulic system and hoses. Small oil leaks may appear as wet, oily leaks or unusually dirty areas where dirt and dust sticks to oil that has slowly leaked out.

Drive Tire, Load Wheels, Casters, and Frame

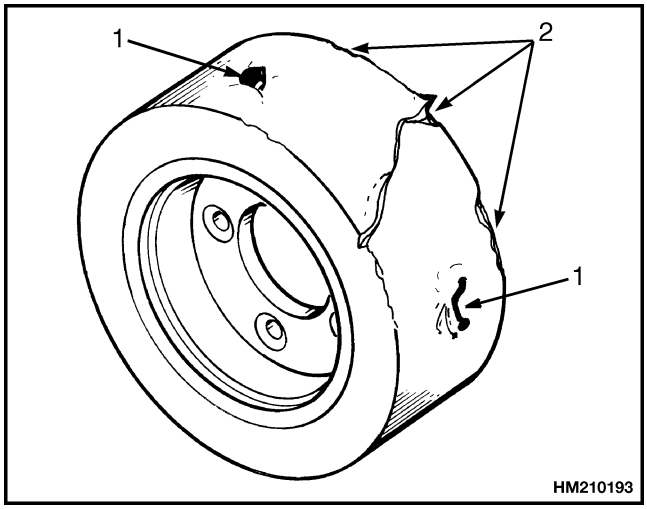
WARNING

When the drive tire has been installed, check all wheel nuts after 2 to 5 hours of operation. When the nuts stay tight after an 8-hour check, the interval for checking the torque can be extended to 500 hours. Refer to the Maintenance Schedule in this section.

If the drive tire has recently been installed, check to ensure the lug nuts are properly tightened to 140 N•m (103 lbf ft). When installing, snug all the nuts, then tighten to half the torque value, then tighten to the full torque value. Tighten the nuts in a cross pattern to properly seat the wheel to the hub.

Inspect the tire for embedded rocks, glass, wire, pieces of metal, holes, cuts, and other damage. See Figure 11. Remove any object that will cause damage. Check for loose or missing nuts and broken studs. Remove any wire strapping or other material that is wrapped around the axle to prevent damage to the axle seal.

Inspect the frame for structural damage and loose/missing hardware. Make certain all covers are in place and secured before operating the lift truck. Inspect the load wheels. Loose or crooked load wheels may indicate a bearing failure. If failure is suspected, raise the lift truck slightly and check that the load wheels are secure on the axles and rotate smoothly. See How to Put a Lift Truck on Blocks . Repair or replace as necessary.



1. REMOVE EMBEDDED OBJECTS
2. CHECK FOR CUTS, SPLITS, AND OTHER DAMAGE

Figure 11. Tire Check

WARNING

In normal operation, the casters should continuously contact the floor. As the drive tire wears, the frame will move closer to the floor and the casters will carry more of the load. If the caster shims are not periodically adjusted, they will bear too much of the lift truck weight and reduce the necessary load on the drive tire. This can interfere with the ability of the drive tire to control steering and stopping functions of the truck.

To check for proper adjustment see Caster Adjustment Check in this manual.

WARNING

Safety labels are installed on the lift truck to give information about possible hazards. It is important that all safety labels are installed on the lift truck and can be read.

Check that all safety labels are installed in the correct locations on the lift truck. See the **Parts Manual** or the section **Frame** 0100SRM1694 for the proper locations of the safety labels.

Check the load backrest extension for cracks and damage. Make sure the nuts and bolts for the load backrest extension are tight.

CHECKS WITH KEY SWITCH TURNED ON

Operation

WARNING

Make sure the area around the lift truck is clear before moving the lift truck. Always look in the direction that you intend to move the lift truck. Be careful when making checks or servicing the lift truck.

Make sure a properly charged battery of the correct voltage is installed and connected. Stand in the operator compartment and turn the key switch to the **ON** position. Stand on the brake switch, then move the control handle for forward or reverse travel.

WARNING

Use the battery power disconnect to shut down the truck only in an emergency.

The key switch (or toggle switch) is a two position switch located on the right side of the dash display. The first position is **OFF** (marked "O"). The second position is **ON** (marked "I"). The key switch should be used as the primary means of shutting down the truck.

WARNING

Always wear the proper protective equipment including eye protection and petroleum-resistant gloves when handling hydraulic oil. Thoroughly wash oil from exposed areas of skin as soon as possible.

Completely lower the forks to relieve hydraulic pressure before disassembling any part of the lift pump or disconnecting any hydraulic hoses.

The hydraulic oil is hot at normal operating temperatures. Be careful when draining the oil.

Never put your hands on pressurized hydraulic components. Highly pressurized hydraulic oil escaping through pin-hole leaks can be injected into the skin. Visually inspect to find hydraulic leaks.

CAUTION

Protect the hydraulic system from dirt and contaminants when servicing the hydraulic system.

Never operate the pump without the proper amount of oil in the hydraulic system. Operating the hydraulic pump with low oil levels will damage the pump.

1. Raise the forks slowly without a load. Check for smooth operation and mechanical interference. Mechanical interference is caused by damaged or worn linkage or shafts or by incorrect adjustment of the tension rods.
2. Check for damaged or worn linkage bushings or shafts.
3. Check for missing or loose shaft pins.
4. Check load wheels and support bearings, shafts, and shaft pins for wear, damage, or missing parts.

WARNING

If any function does not operate or operates incorrectly, remove the truck from operation and attach a DO NOT OPERATE tag to the control handle. Remove the key and disconnect the battery.

Test the lift truck operation in an area that is clear of personnel and equipment.

5. Check the operation of the key switch. Functions should not operate with the key in the **OFF** position. Turn the key to the **ON** position. Lower the control handle to the operating (BRAKE OFF) position. The horn, hydraulic functions, traction functions, and brake should be operational.

NOTE: The normal method of stopping the lift truck is through the use of "Plugging" using the control handle.

6. A spring-applied, electrically-released brake is mounted to the top of the traction motor to hold the lift truck stationary when the traction motor is not being operated. The brake is nonserviceable and nonadjustable. Check the brake for proper operation. If the brake will not release or fails to apply or will not hold the lift truck, the brake assembly must be replaced. When the controller senses the truck has come to a complete stop, the brake is applied and acts as a parking brake. When the operator removes his foot from the brake switch, the traction motor will begin neutral braking or "regen" mode (regenerate power to the battery using the motion of the truck) slowing the truck. The control handle can be pushed in the opposite direction of travel to "plug," slowing the truck as a means of braking. However the brake will not apply until the truck has come to a stop or unless the unit looses power due to a traction fault.

7. Check the operation of the lift and lower functions. Actuate the lift button and then the lower button. Check that the forks raise and lower smoothly.

8. When turning the key switch to the **ON** position, the controller will automatically center the drive tire. Check that the steering system operates smoothly with the turning of the handle and gives good steering control.

Maintenance Procedures Every 250 Hours or Every 6 Weeks

CASTER LUBRICATION

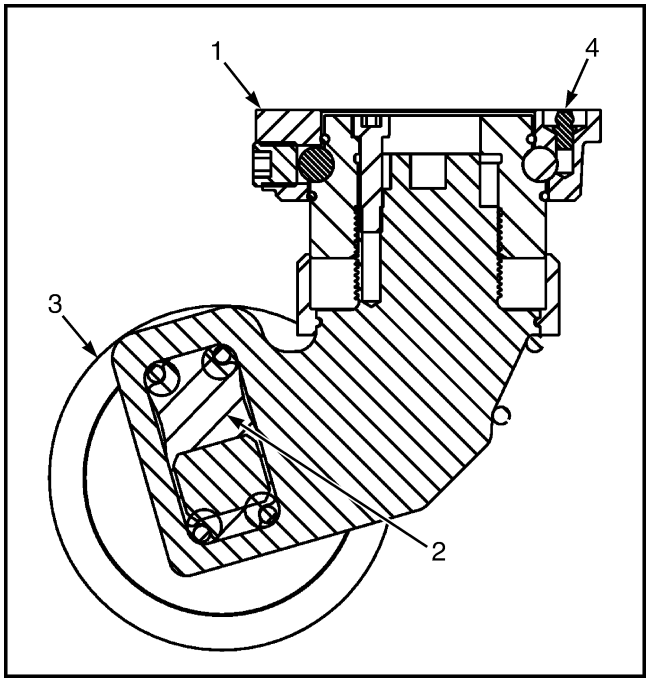
CAUTION

Use only the recommended lubricants for your application. Refer to Capacities and Specifications 8000SRM1703 for lubrication specifications for your lift truck.

Wipe grease fittings clean before greasing.

NOTE: Some optional packages may utilize sealed bearings or different grease fitting configurations. Contact your Hyster dealer for information on optional packages.

The casters should be lubricated every 250 hours or 6 weeks during normal operation. The caster assembly has one grease fitting in the top plate to lubricate the swivel bearing. See Figure 12.



1. SWIVEL MOUNT
2. ELASTOMERIC SPRING
3. CASTER WHEEL
4. GREASE FITTING

Figure 12. Caster Assembly

CASTERS

Caster Adjustment Check

NOTE: For trucks with 160" long forks, the height difference should be 7 to 9 mm (0.270 to 0.350 in.), measured on a level floor

As the drive tire wears, the caster should be periodically adjusted to maintain weight on the drive tire. The time period will vary depending on the application. Excess rocking is often a sign of under adjusted casters. This may occur when a new drive tire is installed. Loss of traction may be caused by over adjusted casters. This may occur when the drive tire diameter has decreased because of regular wear. The casters should ideally be preloaded 7 mm (0.270 in.) from the unloaded condition.

1. Select a smooth and level surface where the adjustment can be checked.
2. Using a square, measure the height difference between the two forks. The measurement should be taken at the outermost edge of the fork, near the battery box (see Figure 13). In this view, the caster side (left) should be lower than the drive tire side (right). Adjusting the caster counterclockwise will lower the caster side.
3. When the caster is properly adjusted, the truck should lean slightly towards the caster side of the truck. The truck should never lean more than 0.5° from vertical.

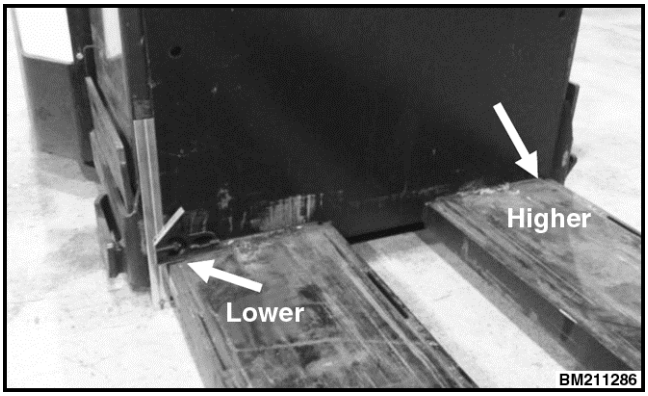


Figure 13. Fork Height Measurement

4. A truck that appears to be leaning more than the specified amount should be adjusted promptly.

5. Do not use the drive frame or operator compartment as a point of reference for measuring the height difference, as this may vary due to manufacturing tolerances. Only use the specified location on the forks.

6. Variations in the floor can greatly affect the adjustment. If you are unsure how level your floor is, move the truck to several different areas and recheck the adjustment.

7. For applications with reduced traction (wet, cold, dirty), an appropriate drive tire should be chosen to improve traction. Over-adjusting the caster is not a substitute for drive tire selection.

Caster Adjust Procedure

1. Perform Caster Adjustment Check procedure prior to adjusting caster.

2. Remove all weight from the forks and lower the forks completely.

3. Select a smooth and level surface where procedure can be performed.

4. Turn the key switch to the **OFF** position and disconnect the battery. (DO NOT remove the battery.)

5. Using a low clearence floor jack, raise the right-side of the truck so the caster is not touching the ground (about 6 to 13 mm (0.250 to 0.50 in.)). Install blocks under the frame to support the lift truck. See Figure 14.

6. Remove floor mat and raise the floor plate and ensure it is securely supported. See Figure 15.

Figure 14. Raise Lift Truck

Figure 15. Floor Plate