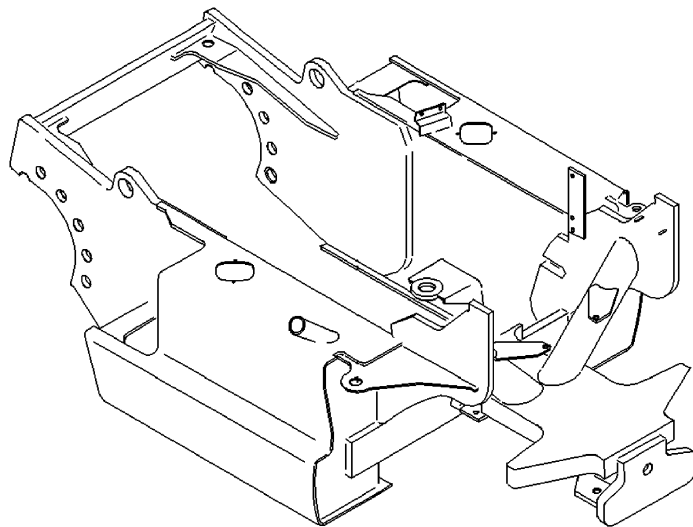


# FRAME

**S2.00-3.20XM (S40-65XM) [D187];  
H2.00-3.20XM (H45-65XM) [H177]**



HM120000

# ***HYSTER***

# SAFETY PRECAUTIONS

## MAINTENANCE AND REPAIR

- 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 condition that can cause immediate death or injury!**



### **CAUTION**

**Indicates a condition that can cause property damage!**

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This section is for the following models:

S2.00-3.20XM (S40-65XM) [D187];  
H2.00-3.20XM (H45-65XM) [H177]

**"THE  
QUALITY  
KEEPERS"**

**HYSTER  
APPROVED  
PARTS**

## General



### WARNING

The lift truck must be put on blocks for some types of maintenance and repair. The removal of the following assemblies will cause large changes in the center of gravity: mast, drive axle, engine and transmission, and counterweight. When the lift truck is put on blocks, put additional blocks in the following positions to maintain stability:

- Before removing the mast and drive axle, put blocks under the counterweight so the lift truck cannot fall backward.
- Before removing the counterweight, put blocks under the mast assembly so the lift truck cannot fall forward.

**The surface must be solid, even, and level when the lift truck is put on blocks. Make sure that any blocks used to support the lift truck are solid, one-piece units. See the Operating Manual or Periodic Maintenance 8000 SRM 707.**

This section has the description of the frame and some connected parts. See Figure 1. Procedures for the removal and installation of the counterweight, hood, overhead guard, and engine (including the transmission) are found in this section. Checks for the operator restraint system and procedures for the repair of tanks and installation of safety labels are also included.

## Description

The frame is one weldment and includes the hydraulic tank and the fuel tank for gasoline or diesel fuel.

There is a counterweight for each capacity of lift truck. The counterweights are similar, but are different weights. The muffler is fastened to the frame inside the counterweight.

An operator module is installed on the frame with rubber mounts. The overhead guard, steering controls, instrument panel, hood, and seat are installed on the operator module.

The hood is connected to the operator module with hinges. Two gas-controlled springs give assistance when raising the hood and hold the hood in the open position. The floor plates and side covers can be removed for access to the engine, transmission, and other components.

## Operator Module Repair

### REMOVE

1. Remove the hood and side covers. See Figure 1.
2. Remove the steering housing and instrument cluster from the cowl. Remove the capscrews that hold the parking brake lever to the cowl.
3. Remove the crossmember that is the mount for the hood.
4. Remove the nuts and bolts at the mounts for the operator module.
5. Connect a lifting device to the overhead guard. The overhead guard and module weigh approximately 385 kg (850 lb). Lift the operator module from the frame.

### INSTALL

**NOTE:** If the overhead guard was removed from the operator module, tighten the rear leg mount capscrews to 53 N•m (39 lbf ft). On H2.00-3.20XM (H45-65XM) units, tighten the capscrews that fasten the module cowl side plate to the front legs to 66 N•m (49 lbf ft).

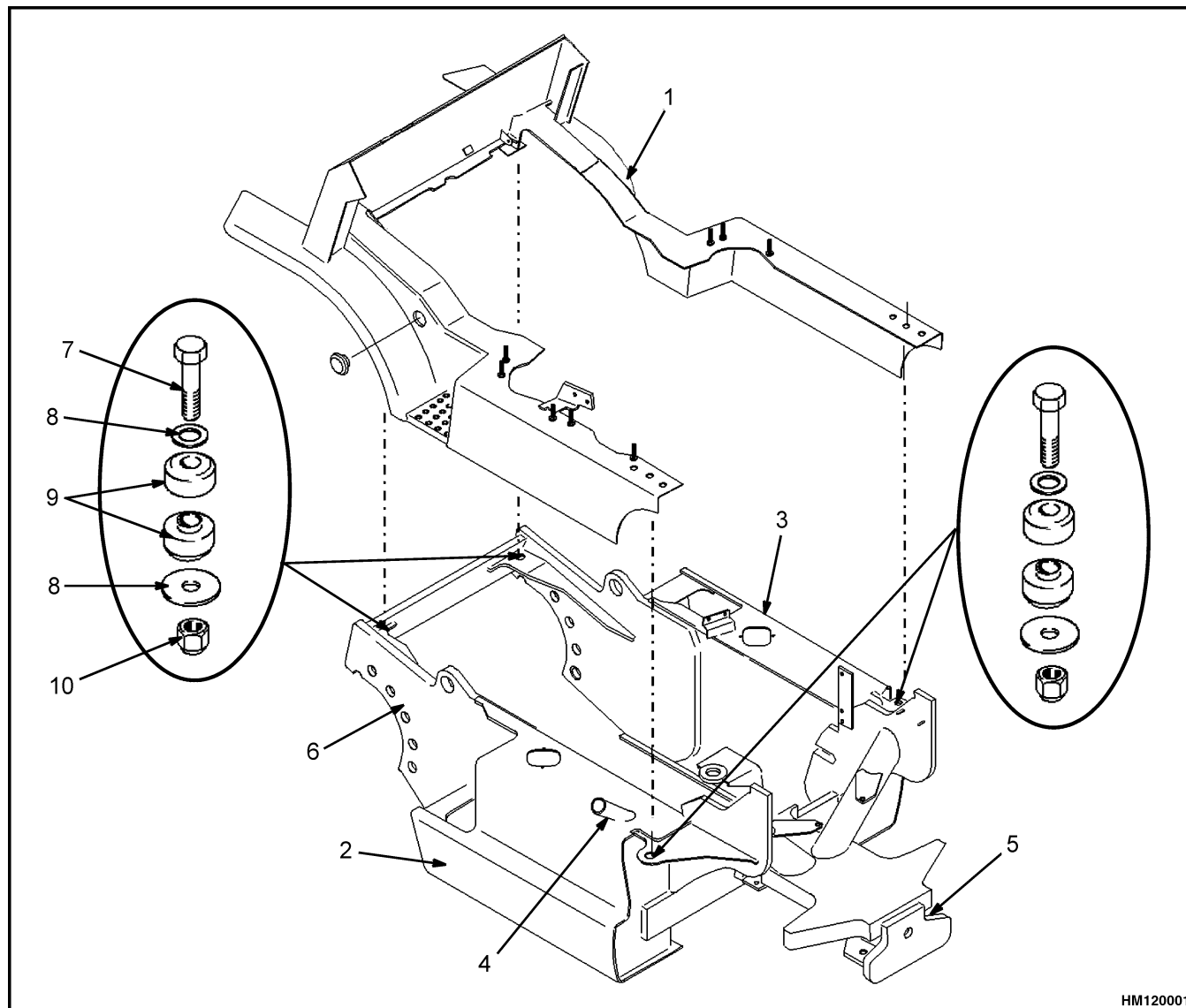
1. Connect a lifting device to the overhead guard. The overhead guard and module weigh approximately 385 kg (850 lb). Lift the operator module onto the frame.
2. Make sure the rubber mounts are installed in the frame. Install the large washer and nut on the

bottom of the mount. Tighten the nuts to 53 N•m (39 lbf ft).

3. Install the crossmember for the hood and pedal mounts. Install the hood and side covers.

4. Install the steering controls and the parking brake lever.

5. Install the floor plates.



HM120001

1. OPERATOR MODULE
2. FRAME
3. HYDRAULIC TANK
4. FUEL TANK
5. STEERING AXLE MOUNT

6. DRIVE AXLE MOUNT
7. CAPSCREW
8. WASHER
9. RUBBER MOUNT
10. NUT

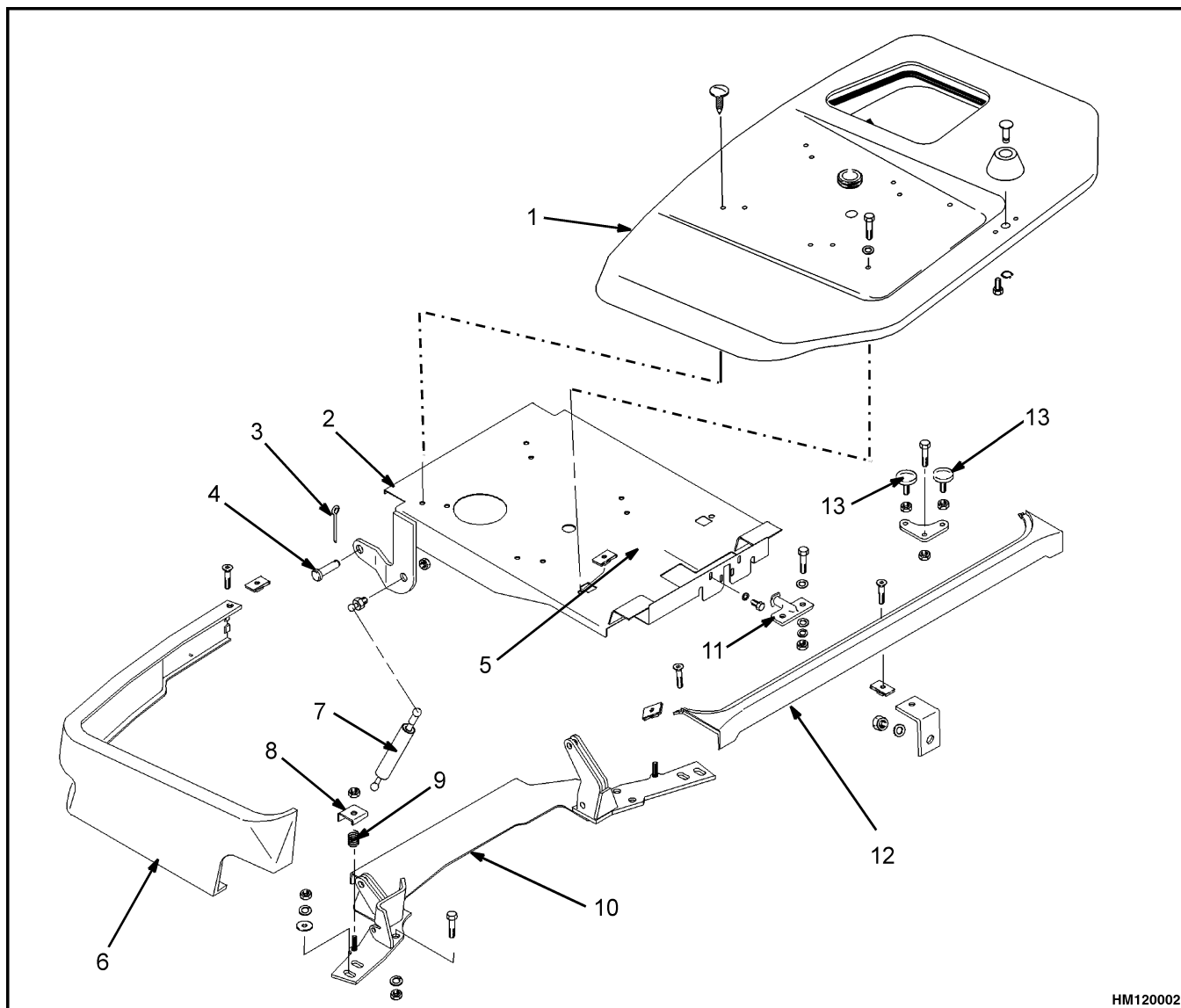
**Figure 1. Frame and Operator Module**

## Hood and Side Covers Repair

### REMOVE

**NOTE:** The combined weight of the hood and seat is approximately 45 kg (100 lb). Have a helper or use a lifting device to remove the hood and seat.

1. Raise the hood. Hold the hood so that it does not fall and disconnect the gas-controlled spring at the hood. See Figure 2.
2. Remove the rod end pins and pivot pins from the hood hinges. Remove the hood.



HM120002

**NOTE:** H2.00-3.20XM (H45-65XM) SHOWN. S2.00-3.20XM (S40-65XM) SIMILAR.

- |                |                   |
|----------------|-------------------|
| 1. HOOD        | 8. CLAMP          |
| 2. SEAT PAN    | 9. SPRING         |
| 3. ROD END PIN | 10. CROSSMEMBER   |
| 4. PIVOT PIN   | 11. LATCH STRIKER |
| 5. HOOD LATCH  | 12. PANEL         |
| 6. SIDE COVER  | 13. HOOD BUMPER   |
| 7. GAS SPRING  |                   |

*Figure 2. Hood and Side Covers*

**INSTALL**

1. Install the hood in position on the lift truck. See Figure 2 and Figure 3. Install the pivot pins and rod end pins at the hood hinges. Connect the gas-controlled spring to the hood. Adjust the hood latch as follows:

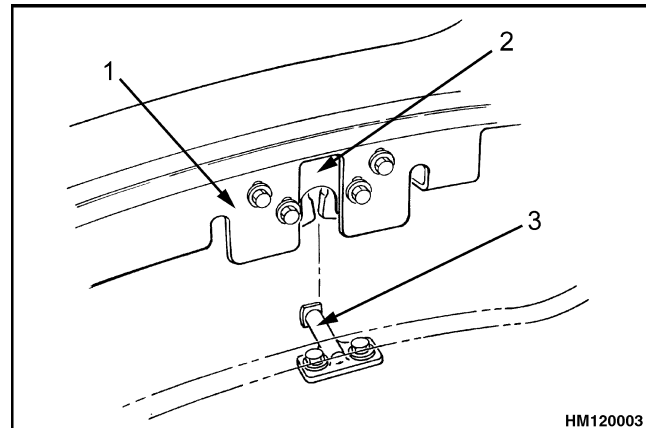
**WARNING**

**The hood, hood latch, and latch striker must be correctly adjusted for the correct operation of the operator restraint system.**

- a. Install the hood latch in the lowest slot position on the frame of the hood. Tighten the capscrews so the hood latch can still move when the hood is closed.
- b. Install the latch striker. Check that the latch striker is in the center of the jaws of the hood latch when the hood closes.
- c. Carefully close the hood to the fully closed position. The hood latch has two positions. The hood is fully closed after two clicks of the latch.
- d. Push the hood down until the hood just touches the rubber bumpers. Make sure

the latch striker is still in the center of the hood latch. Open the hood and tighten the capscrews for the latch.

- e. Check the operation of the hood latch. Have an operator sit in the seat. Make sure the hood is fully closed (two clicks). Also check that the hood touches the rubber bumpers. If necessary, repeat Step d.



1. HOOD FRAME  
2. HOOD LATCH

3. LATCH STRIKER

**Figure 3. Hood Latch Check**

**Overhead Guard Repair****REMOVE AND INSTALL****WARNING**

**Do not operate the lift truck without the overhead guard correctly fastened to the lift truck.**

**Changes that are made by welding, or by drilling holes that are too big or in the wrong location, can reduce the strength of the overhead guard. See the instructions for Changes to the Overhead Guard in Periodic Maintenance 8000 SRM 707 section for your lift truck.**

1. Connect a crane or lifting device to remove or install the overhead guard. Disconnect the air intake at the overhead guard leg.
2. Disconnect any wires between the frame and the overhead guard. When the overhead guard is lifted from the frame, make sure that any electrical wires are moved through the holes in the frame so that they are not damaged.

3. There are two capscrews at each corner of the left-hand leg of the overhead guard. Remove and install the capscrews for the overhead guard as follows:

- a. Access to the bolts at the front of the overhead guard is under the dash panel. Remove the plastic box from the right-hand side of the dash panel.
- b. Access to the bolts at the rear of the overhead guard is under the rear fender wells.
- c. Tighten the rear leg mount capscrews to 53 N•m (39 lbf ft). On H2.00-3.20XM (H45-65XM) units, tighten the capscrews that fasten the module cowl side plate to the front legs to 66 N•m (49 lbf ft).

**NOTE:** The air inlet for the air filter is installed in the left-hand leg of the overhead guard. Make sure the grill is installed with the louvers pointed downward.



## Counterweight Repair



### WARNING

The lift truck must be put on blocks for some types of maintenance and repair. The removal of the following assemblies will cause large changes in the center of gravity: mast, drive axle, engine and transmission, and counterweight. When the lift truck is put on blocks, put additional blocks in the following positions to maintain stability:

- Before removing the mast and drive axle, put blocks under the counterweight so the lift truck cannot fall backward.
- Before removing the counterweight, put blocks under the mast assembly so the lift truck cannot fall forward.

The surface must be solid, even, and level when the lift truck is put on blocks. Make sure that any blocks used to support the lift truck are solid, one-piece units. See the Operating Manual or Periodic Maintenance 8000 SRM 707 for your lift truck.

The counterweight is held in position on the frame by two hooks that are part of the frame. One M24 × 3 capscrew holds the counterweight to the lower part of the frame.

### REMOVE



### WARNING

Do not operate the lift truck if the capscrew for the counterweight is not installed. When the capscrew is removed, the counterweight can fall from the lift truck.



### WARNING

LPG can cause an explosion. Do not cause sparks or permit flammable material near the LPG system. LPG fuel systems can be disconnected indoors only if the lift truck is at least 8 m (26 ft) from any open flame, motor vehicles, electrical equipment, or ignition source.

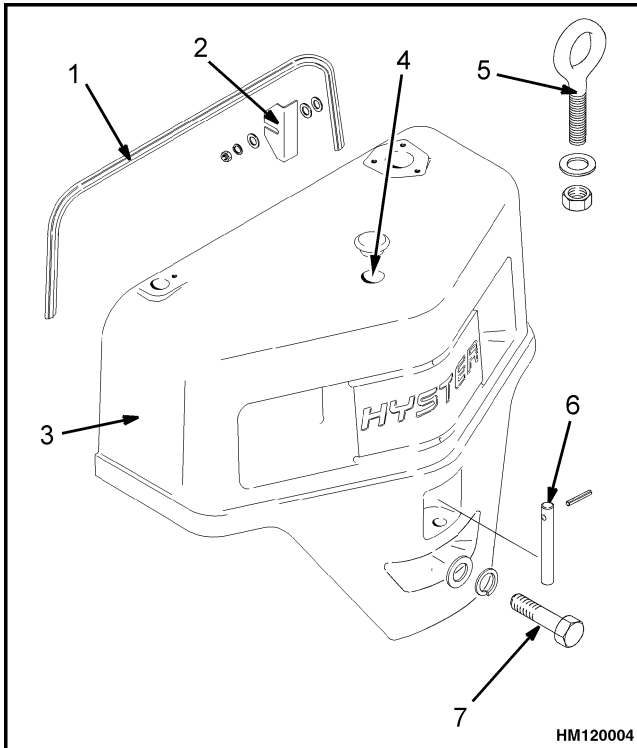
Close the shutoff valve on the LPG tank before any part of the engine fuel system is disconnected. Run the engine until the fuel in the system is used and the engine stops.

If the engine will not run, close the shutoff valve on the LPG tank. Loosen the fitting on the supply hose from the LPG tank where it enters the filter unit. Permit the pressure in the fuel system to decrease slowly. Fuel leaving the fitting removes heat. Use a cloth to protect your hands from the cold fitting.

1. If the lift truck has an LPG fuel system, use the following procedure to remove the LPG tank and bracket so that the counterweight can be removed: See Figure 4.

Additional information on the LPG fuel system can be found in the following sections **LPG Fuel System** 900 SRM 498, 900 SRM 523 or **LPG and Gasoline Fuel Systems GM3.0L and GM4.3L** 900 SRM 1088

- a. LPG tanks can be removed and replaced indoors only if the lift truck is at least 8 m (26 ft) from any flame or ignition source.
  - b. Move the lift truck to the area where tanks are changed.
  - c. Turn the shutoff valve clockwise until the valve is completely closed.
  - d. Run the engine until it stops, then turn the key switch to the **OFF** position.
  - e. Disconnect the quick-disconnect fitting.
  - f. Release the LPG tank latch and remove the tank from the bracket.
2. If an overhead exhaust is installed, remove it as shown in Figure 6.



**NOTE:** H2.00-3.20XM (H45-65XM) SHOWN. S2.00-3.20XM (S40-65XM) SIMILAR.

- |                     |             |
|---------------------|-------------|
| 1. SEAL             | 5. EYEBOLT  |
| 2. SPACER           | 6. TOW PIN  |
| 3. COUNTERWEIGHT    | 7. CAPSCREW |
| 4. HOLE FOR EYEBOLT |             |

**Figure 4. Counterweight**



## WARNING

The counterweight is heavy. Make sure that the eyebolt and lifting devices have enough capacity to lift the weight. The approximate weights of the counterweight castings are shown in Table 1.

3. Install a lifting eye in the lifting hole of the counterweight. See Figure 4. Connect a crane to the lifting eye and raise the crane until it holds part of the weight of the counterweight. Remove the cap screw that holds the counterweight to the frame. Use the crane to lift the counterweight

from the lift truck. Put the counterweight on the floor so that it has stability and will not fall over. Remove the spacers from the mounts.

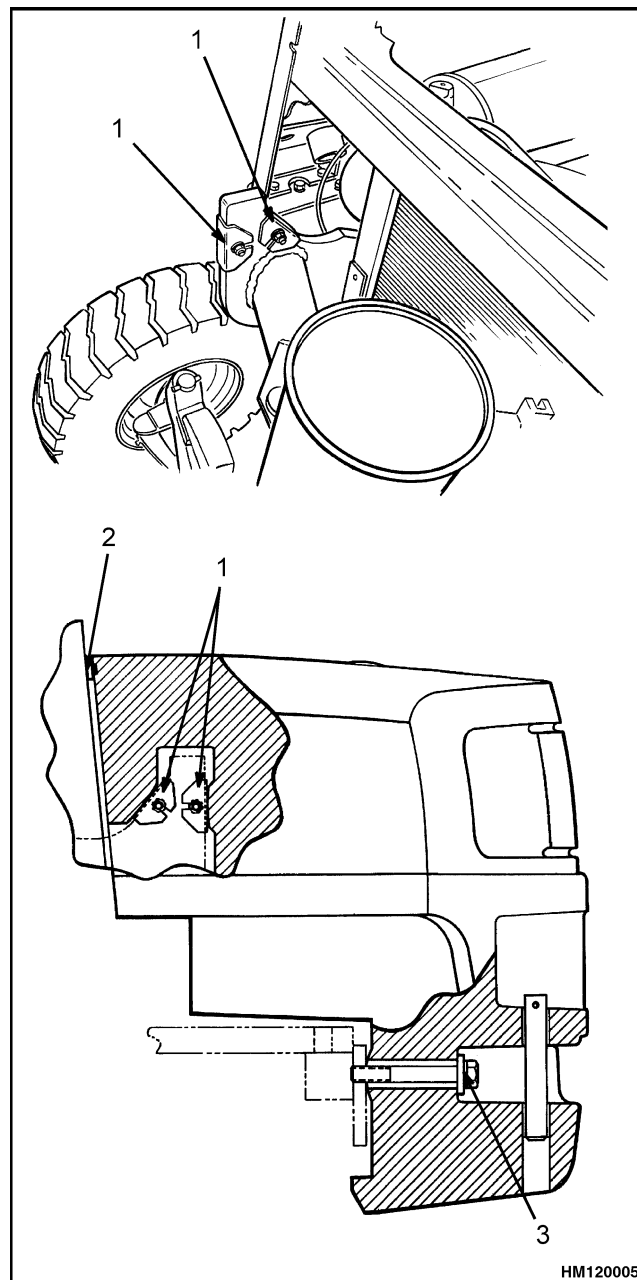
**Table 1. Weight of Counterweights**

Model	kg	lb
H2.00XM	1080 ±16	2380 ±35
H2.25XM (H45XM)	1231 ±18	2715 ±40
H2.50XM (H50XM) <sup>1</sup>	1354 ±20	2985 ±44
H50XM <sup>2</sup>	1406 ±21	3100 ±46
H2.75XM (H55XM)	1611 ±24	3550 ±53
H3.00XM (H60XM) <sup>1</sup>	1800 ±27	3970 ±60
H3.00XM (H60XM) <sup>2</sup>	1696 ±25	3740 ±55
H3.20XM (H65XM)	1770 ±27	3900 ±60
<b>NOTES:</b>		
<sup>1</sup> 1623 mm (63.9 in.) Wheelbase		
<sup>2</sup> 1700 mm (67.0 in.) Wheelbase		
S2.00XM (S40XM)	1070 ±15	2360 ±33
S2.25XM (S45XM)	1233 ±19	2720 ±42
S2.50XM (S50XM)	1433 ±21	3160 ±46
S2.75XM (S55XM)	1640 ±25	3615 ±55
S2.75XM (S55XM)	1710 ±25	3770 ±55
S3.00XM (S60XM)	1855 ±28	4090 ±62
S3.20XM (S65XM)	2018 ±30	4450 ±66

## INSTALL

1. Install the spacers on the mounts. See Figure 5. Use a crane to install the counterweight on the lift truck. When the counterweight is installed, make sure the hooks on the frame fully engage the counterweight so it is aligned with the parts of the frame. Use the spacers to obtain a gap of 8.5 to 11.5 mm (0.33 to 0.45 in.) between the counterweight and the overhead guard leg. Install and tighten the M24 × 3 cap screw to 555 N•m (409 lbf ft).

2. If the lift truck has an LPG fuel system, use the following procedure to install the bracket and LPG tank after the counterweight has been installed:
  - a. Before the LPG tank is installed on the lift truck, make sure the tank has fuel in it. Check the operation of the fuel gauge. Look at the fuel gauge and move the tank. If the gauge needle does not move, a new tank must be installed.
  - b. Put the tank in the tank bracket. Make sure the tank is aligned with the alignment pin.
  - c. Close the latch.
  - d. Connect the quick-disconnect fitting to the shutoff valve on the tank. Use your hand to tighten the fitting. Do not open the shut-off valve until the quick-disconnect fitting is completely tightened. Turn the shutoff valve counterclockwise to open the valve.
  - e. Inspect the fuel system for leaks when the shutoff valve is open. Frost on the surface of the tank, valves, or fittings or a strong odor indicates leakage.
3. If the lift truck has an overhead exhaust, install it as shown in Figure 6.



1. SPACER
2. RUBBER SEAL

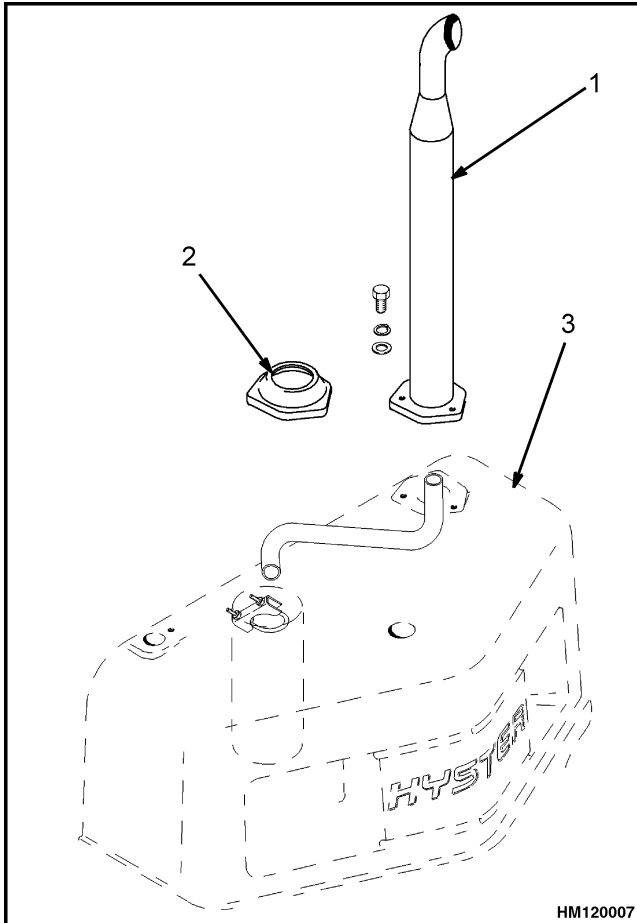
3. CAPSCREW

**Figure 5. Counterweight Installation**

## Exhaust System Repair

The muffler is installed inside the cavity of the counterweight. A short exhaust pipe sends the exhaust gases out of the lift truck through the grille in the counterweight.

The lift truck can have an overhead exhaust system. The exhaust pipe is fastened to the top of the counterweight. See Figure 6.



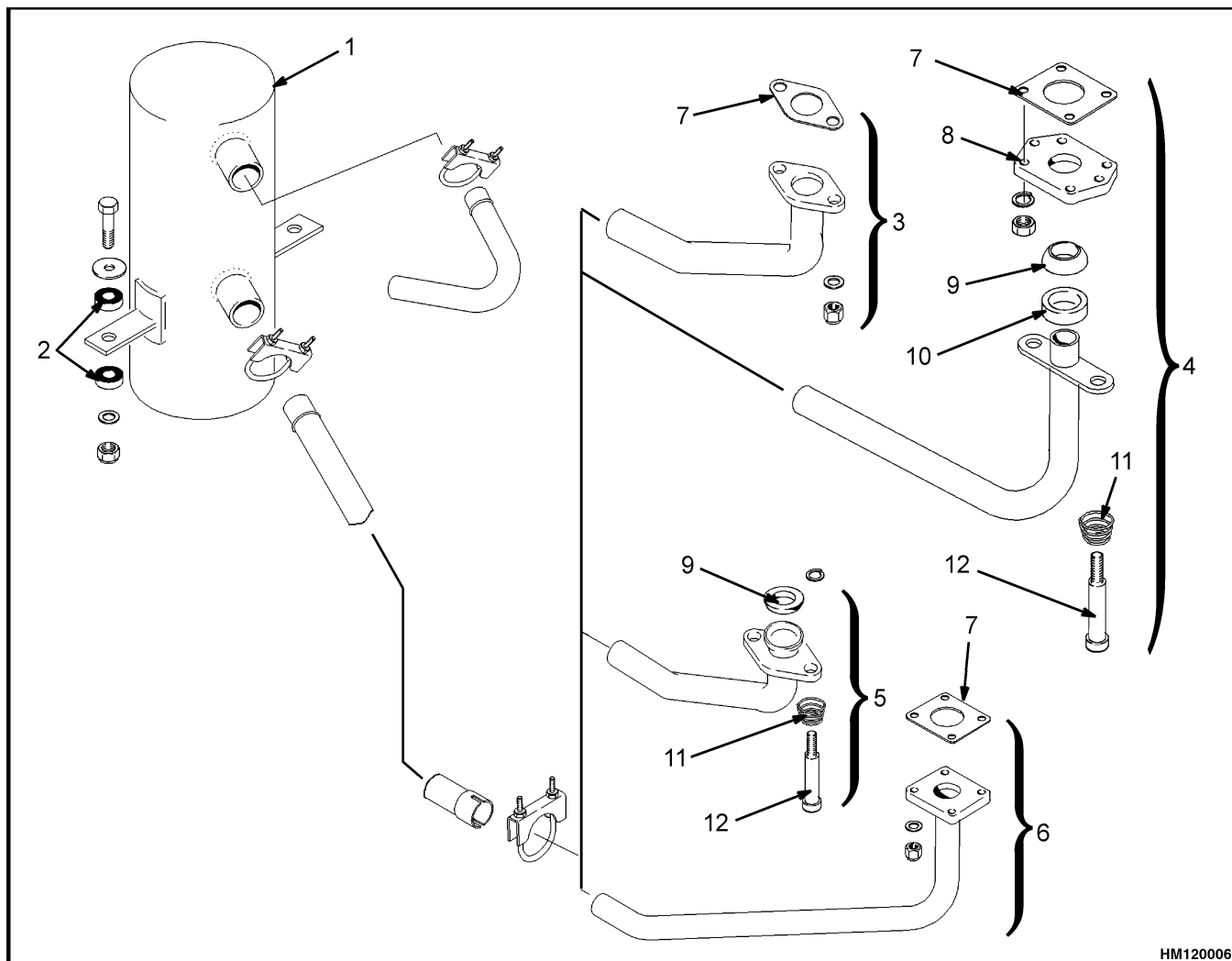
- |                        |                  |
|------------------------|------------------|
| 1. OVERHEAD<br>EXHAUST | 2. COVER         |
|                        | 3. COUNTERWEIGHT |

**Figure 6. Overhead Exhaust**

### MUFFLER, REPLACE

The counterweight must be removed to install the muffler. When replacing parts of a standard exhaust system, see Figure 7. When replacing parts of the GM3.0L EPA Compliant Exhaust System, see Figure 8. When replacing parts of a low-emissions exhaust system, see Figure 9. When replacing parts of the Mazda 2.0L and 2.2L EPA Compliant Exhaust Systems, see Figure 10. When connecting the exhaust pipe to the engine, do the following:

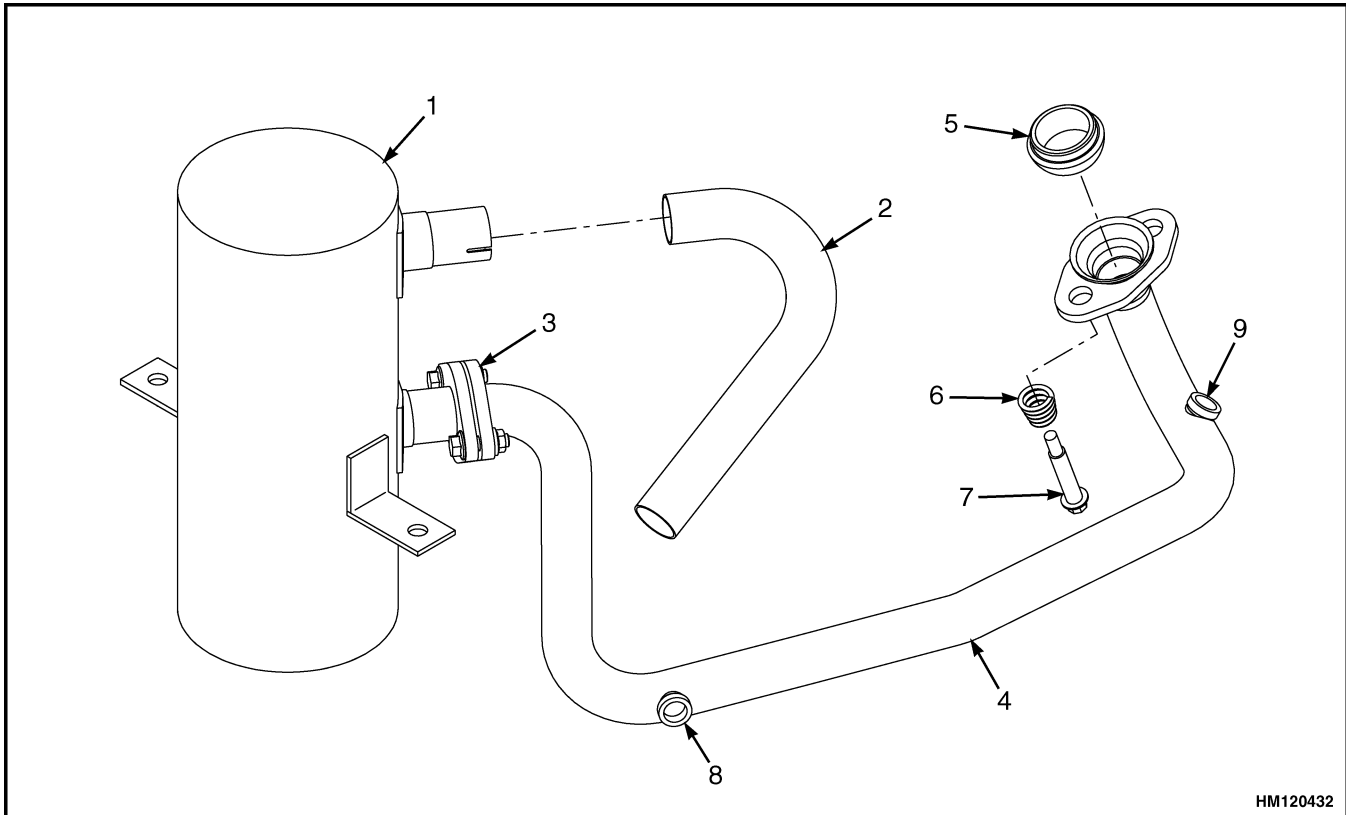
- 1. Isuzu 4JB1 and 4JG2 Engines/Low-Emissions Exhaust Systems:** Install the adapter on the exhaust manifold. Tighten the nuts for the adapter to 40 N•m (30 lbf ft). Install the exhaust seal, spacer, and exhaust pipe. Install the springs and special capscrews. Tighten the special capscrews to 38 N•m (28 lbf ft).
- 2. GM 2.2L and 3.0L Engines:** Install the exhaust seal and exhaust pipe. Install the spring, special capscrew, and lockwasher. Make sure the lockwasher is between the exhaust manifold and special capscrew.
- 3.** On units with an overhead exhaust, tighten the capscrews that hold the overhead exhaust to the counterweight to 38 N•m (28 lbf ft). Install the cover.



HM120006

- |                                 |                      |
|---------------------------------|----------------------|
| 1. MUFFLER                      | 7. GASKET            |
| 2. RUBBER MOUNT                 | 8. ADAPTER           |
| 3. ISUZU C240 ARRANGEMENT       | 9. SEAL              |
| 4. ISUZU 4JB1, 4JG2 ARRANGEMENT | 10. SPACER           |
| 5. GM 2.2L AND 3.0L ARRANGEMENT | 11. SPRING           |
| 6. MAZDA M4-2.0G ARRANGEMENT    | 12. SPECIAL CAPSCREW |

**Figure 7. Exhaust System**



1. MUFFLER
2. COUNTERWEIGHT EXHAUST PIPE
3. GASKET
4. EXHAUST PIPE
5. SEAL

6. SPRING
7. SPECIAL SCREW
8. OXYGEN SENSOR PORT
9. RAW GAS CHECK PORT

**Figure 8. Exhaust System, GM3.0L EPA Compliant**

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