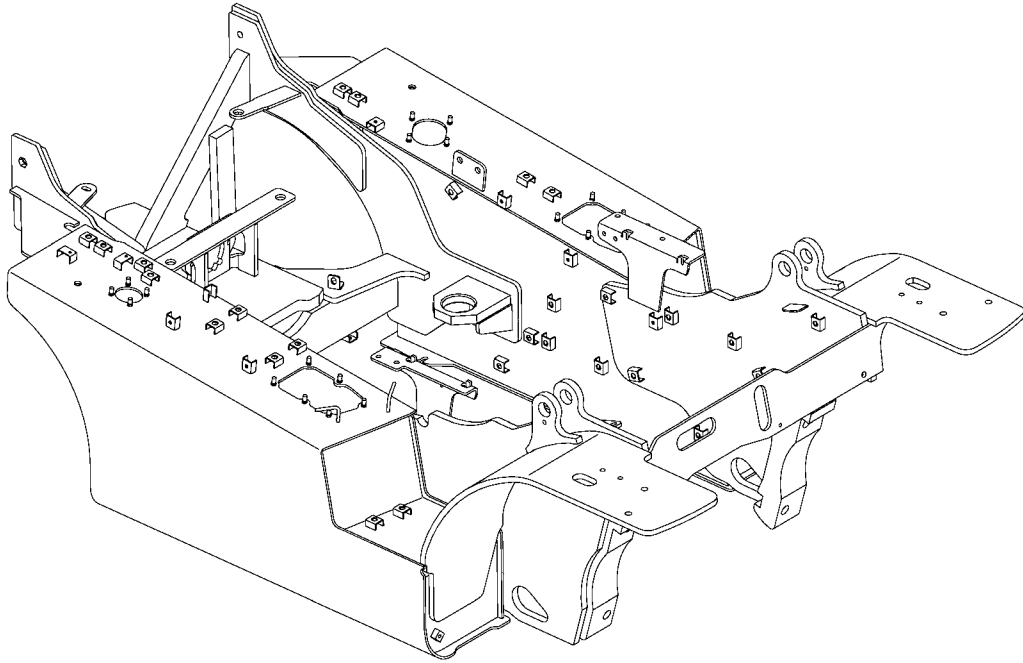


# FRAME

H3.0XT [A409]



# ***HYSTER***

# 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:

H3.0XT [A409]

## General



### WARNING

The lift truck must be put on blocks for some types of maintenance and repairs. 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 8000SRM2128.

**NOTE:** For exhaust system procedures, go to Exhaust System Repair in this manual.

This section contains a description of the frame and connected parts and procedures for removing and installing the counterweight, hood, overhead guard, engine, transmission, cooling system, and exhaust system (see above NOTES). Checks for the operator restraint system and procedures for the repair of tanks and installation of safety labels are also included.

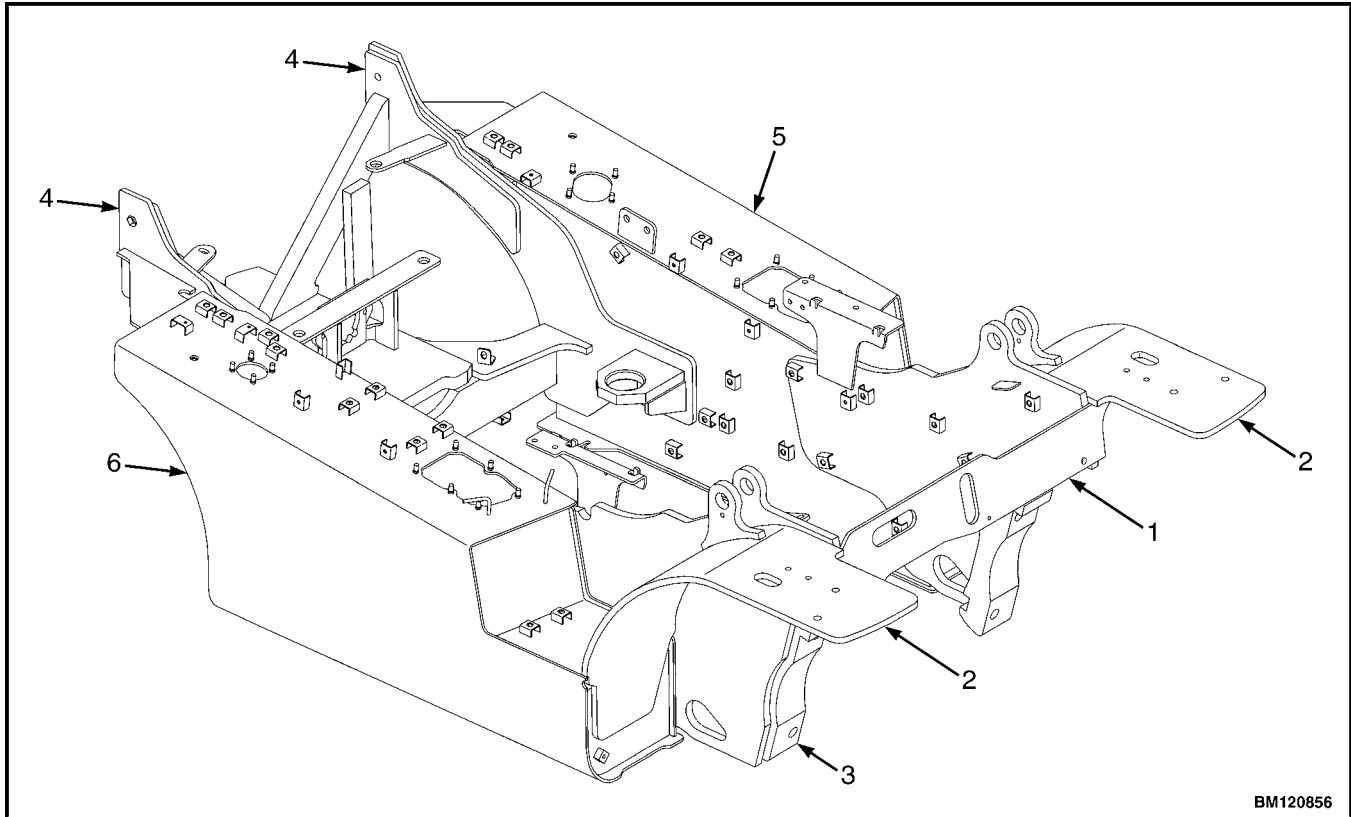
## Description

The frame is one weldment and includes the hydraulic tank and fuel tank for gasoline or diesel fuel. See Figure 1.

There is a counterweight for each capacity of lift truck. The counterweights are similar in appearance, but are different weights. See Table 1.

The muffler is fastened to the frame inside the counterweight.

The overhead guard, cowl, and hood are installed on the frame. The hood is connected to the frame with hinges. A single gas-controlled spring provides assistance when raising the hood and hold the hood in the open position. The floor plate and side covers can be removed for access to the engine, transmission, and other components.



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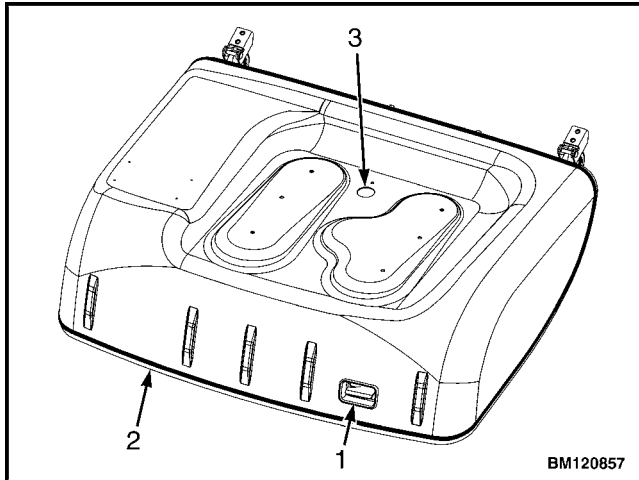
- 1. COWL PLATE
- 2. FENDERS
- 3. FRAME
- 4. COUNTERWEIGHT MOUNTS
- 5. FUEL TANK (GAS OR DIESEL)
- 6. HYDRAULIC TANK

**Figure 1. Frame**

## Hood, Seat, and Side Covers Replacement

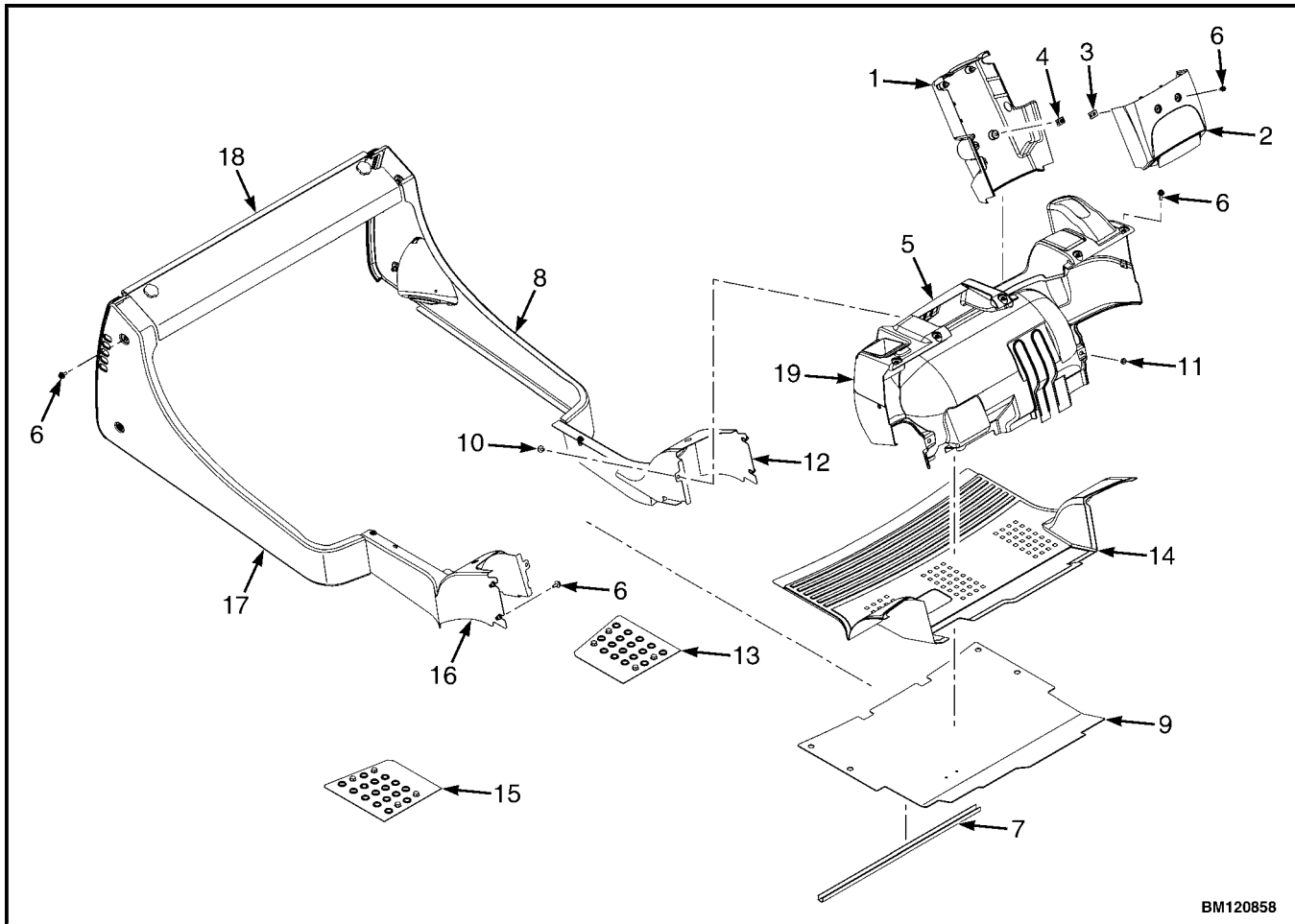
### REMOVE

1. Slide seat to the closest position to steering column.
2. Fully tilt steering column forward.
3. Raise latch on the left, front corner of the hood to unlatch and lift up hood. See Figure 2.
4. Remove floor mat and floor plate. See Figure 3.



1. HOOD LATCH
2. HOOD
3. HOLE - FOR SEAT WIRE HARNESS

**Figure 2. Hood Latch**



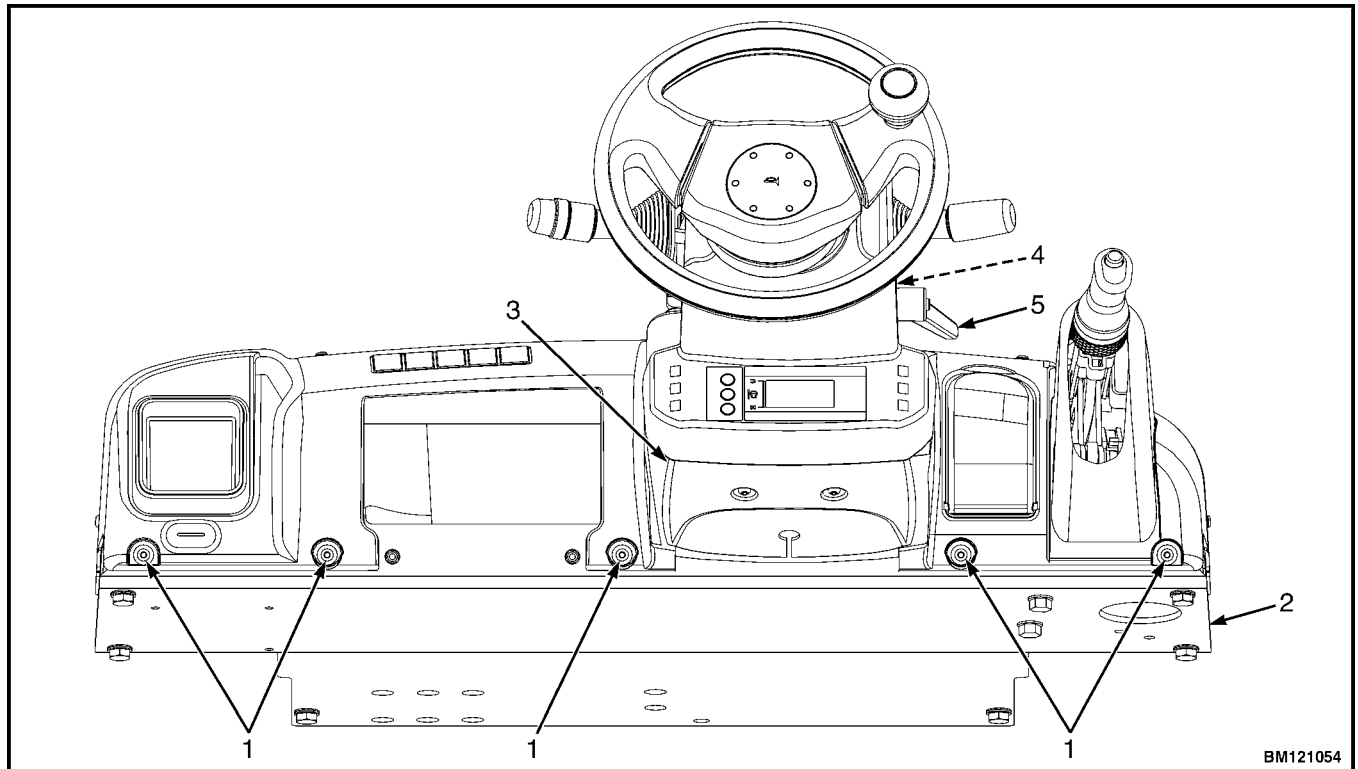
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- |                                |                            |
|--------------------------------|----------------------------|
| 1. LOWER STEERING COLUMN COVER | 11. NUT                    |
| 2. UPPER STEERING COLUMN COVER | 12. LEFT HAND FRONT PANEL  |
| 3. INSERT                      | 13. LEFT HAND TREAD PLATE  |
| 4. CLIP                        | 14. FLOOR MAT              |
| 5. DASHBOARD                   | 15. RIGHT HAND TREAD PLATE |
| 6. CAPSCREW                    | 16. RIGHT HAND FRONT PANEL |
| 7. SEAL                        | 17. RIGHT HAND REAR PANEL  |
| 8. LEFT HAND REAR PANEL        | 18. RADIATOR COVER         |
| 9. FLOOR PLATE                 | 19. KICK PANEL             |
| 10. SCREW                      |                            |

**Figure 3. Side Cover, Floor Plate, and Cowl Components**

- |   |  |
|---|--|
| 5. Remove two capscrews holding left and right rear side covers to the frame. Remove rear side covers from frame. See Figure 3. | 8. Fully lower steering column.  |
| 6. Remove three capscrews holding left and right fender covers to front overhead guard leg. Remove covers. See Figure 3.        | 9. Remove two capscrews holding upper and lower steering column cover together. See Figure 3.                                    |
| 7. Remove four capscrews holding left and right front side covers to frame. Remove covers.                                      | 10. Remove upper steering column cover by pulling up on upper steering column cover and away from steering column. See Figure 4. |





**NOTE:** TOP VIEW OF DASH SHOWN.

A. INDICATES TO PULL UP TO UNLATCH

- |                                |                                     |
|--------------------------------|-------------------------------------|
| 1. SOCKET HEAD BOLT            | 4. LOWER STEERING COLUMN COVER      |
| 2. COWL                        | 5. STEERING COLUMN ADJUSTMENT LEVER |
| 3. UPPER STEERING COLUMN COVER |                                     |

**Figure 4. Remove Dash From Cowl**

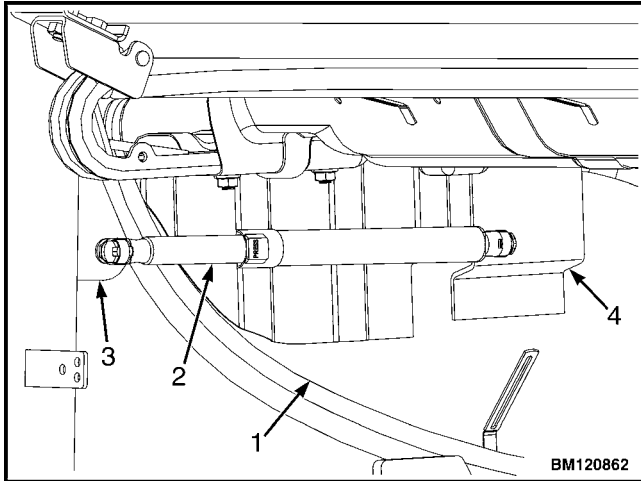
- |   |   |
|---|---|
| <p><b>11.</b> Lift the kick panel and remove from truck. See Figure 3.</p> <p><b>12.</b> Remove five socket head bolts (see Figure 4) from dash and cowl. Lift to remove dash.</p> <p><b>13.</b> Remove two capscrews and washers from cover plate and remove cover plate from seat box. See Figure 6.</p> <p><b>14.</b> Remove two nuts from bottom of cover plate. Remove cover plate for better access to seat wire harness connector. See Figure 6.</p> | <p><b>15.</b> Disconnect seat wire harness from right chassis harness. Pull right chassis harness through hole in hood. See Figure 6.</p> <p><b>CAUTION</b><br/>When removing the seat from the hood, <b>DO NOT</b> use an impact wrench to remove the capscrews. Damage can be caused to the threads on the screws and in the holes.</p> <p><b>NOTE:</b> Before removing seat from hood, tag or mark holes that mount seat to hood. This will aid in correctly installing seat to hood.</p> <p><b>16.</b> Remove four nuts and washers holding the seat to hood. Lift seat off the hood. Pull seat wire harness through hole in hood. See Figure 2.</p> <p><b>17.</b> Remove radiator cover. See Figure 3.</p> |
|---|---|



**CAUTION**

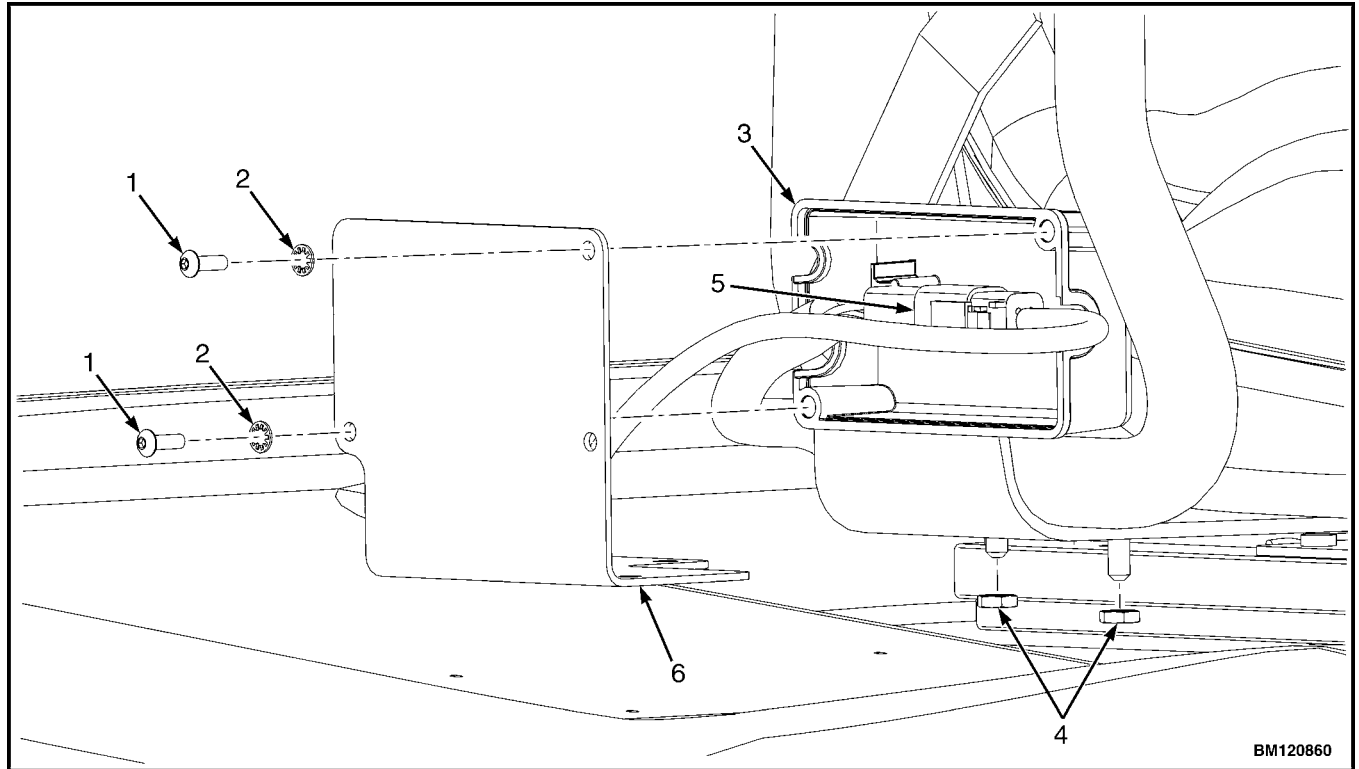
When pulling chassis harness through hood, pull slowly. The harness might get caught on items under the hood and be damaged if pulled to hard.

- 18. Remove two capscrews, two nuts, and latch striker from hood. See Figure 7.
- 19. Unclip gas spring from ball stud on hood bracket and overhead guard. Remove gas spring from hood. See Figure 5.
- 20. Remove hinge screws, located in the rear of the hood.
- 21. Lift hood from the truck. See Figure 2.



- 1. HOOD
- 2. GAS SPRING
- 3. OVERHEAD GUARD
- 4. HOOD BRACKET

**Figure 5. Hood Gas Spring**



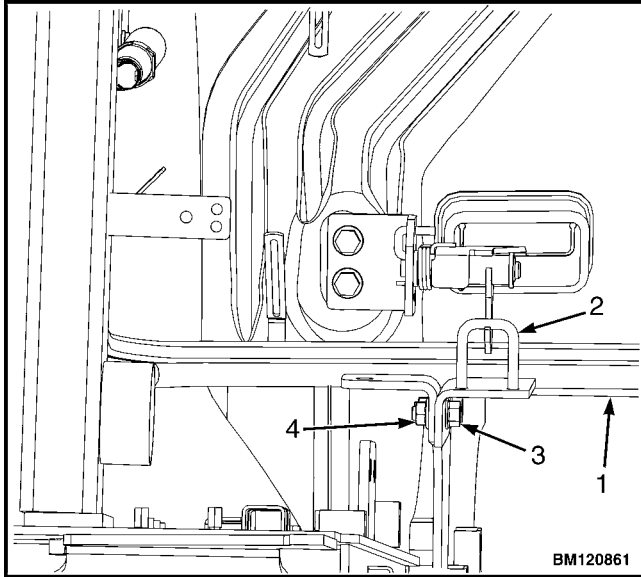
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- |              |                                |
|--------------|--------------------------------|
| 1. CAPSCREWS | 4. NUT                         |
| 2. WASHERS   | 5. SEAT WIRE HARNESS CONNECTOR |
| 3. SEAT BOX  | 6. COVER PLATE                 |

**Figure 6. Seat Wire Harness Connector**

## INSTALL

1. Place hood onto the lift truck frame.
2. Install hinge screws, located in the rear of the hood, and tighten to 15 to 18 N·m (133 to 159 lbf in). See Figure 2.
3. Align gas spring with ball studs on hood and overhead guard. Install gas spring onto hood. See Figure 5.
4. Install latch striker, two nuts, and two cap screws onto frame. Torque nuts to 15 to 18 N·m (133 to 159 lbf in). See Figure 7.



1. HOOD
2. HOOD LATCH
3. CAPSCREW
4. NUT

**Figure 7. Hood Latch Adjustment**

5. Make sure latch striker is still in center of hood latch. Open hood and tighten capscrews for latch.
6. Install radiator cover. See Figure 3.

**CAUTION**

When installing the seat to the hood, **DO NOT** use an impact wrench to install the capscrews. Damage can be caused to the threads on the screws and in the holes.

7. Place seat on the hood and thread seat wire harness through the hole in the hood. See Figure 2.
8. Align studs in the seat with the holes in hood. Install washers and nuts. Tighten nuts to 18 N·m (159 lbf in).

**CAUTION**

When installing chassis harness, secure harness securely to bottom side of hood to ensure the harness is not damaged.

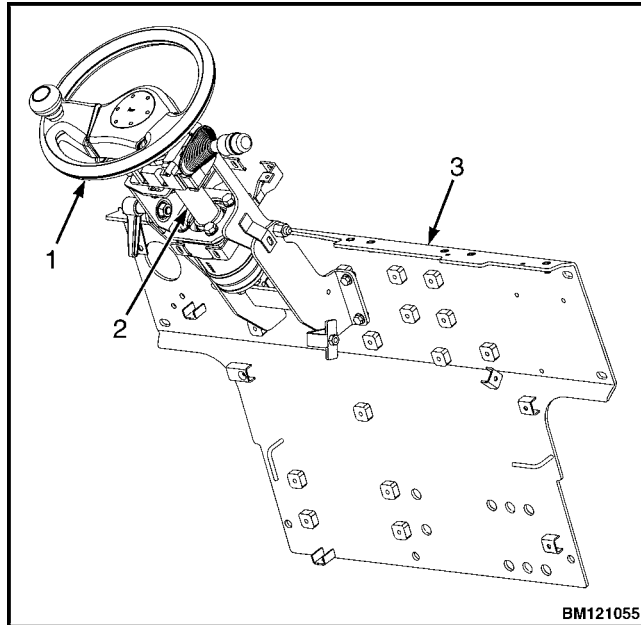
**NOTE:** See **Parts Manual** for wire harness placement.

9. Insert right chassis wire harness through hole in hood and connect to seat wire harness. See Figure 2. Install seat box to cover plate with two capscrews and washers. Tighten capscrews to 1.2 N·m (10.6 lbf in). See Figure 6.
10. Install kick panel onto truck. See Figure 3.
11. Using five socket head bolts, install dash to top of cowl. See Figure 4.
12. Install upper steering column cover to dash.
13. Using four capscrews, install left and right front side covers to frame. See Figure 3.
14. Using two capscrews, install left and right rear side covers to frame. See Figure 3.
15. Install floor plate and floor mat.
16. Adjust the steering column and seat positions.

## Steering Column

### DESCRIPTION

This section describes the repair procedures for the steering column. The steering column assembly mounts to the cowl inside the operator compartment and is the mechanical connection between the steering wheel and the steering control unit. The steering column includes the steering wheel, housing, and bracket. See Figure 8.



1. STEERING WHEEL
2. STEERING COLUMN
3. COWL

*Figure 8. Steering Column and Cowl*

## STEERING COLUMN REPAIR

### Remove

1. Put blocks on each side (front and back) of tires to prevent lift truck from moving.



### WARNING

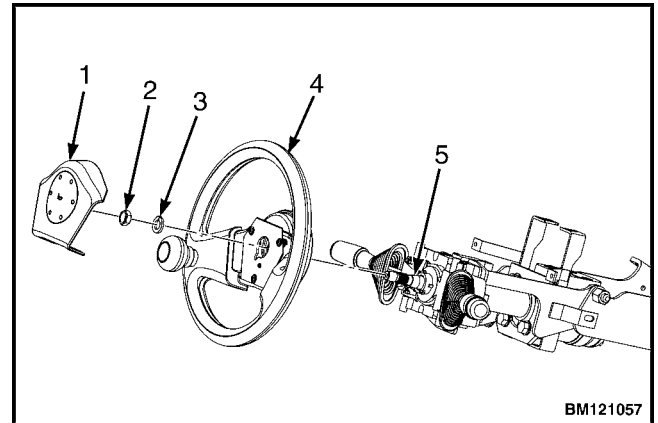
**Disconnect the battery before removing any covers to avoid injury to personnel.**

2. Attach a tag on battery connector or negative battery cable stating, **DO NOT CONNECT BATTERY**. Move steering column to most **FORWARD** position.

**NOTE:** This procedure is for removal of all components of steering column assembly. Not all components are removed for a repair procedure. Do only those steps of procedure necessary to remove required component.

**NOTE:** Tag wires prior to disconnect.

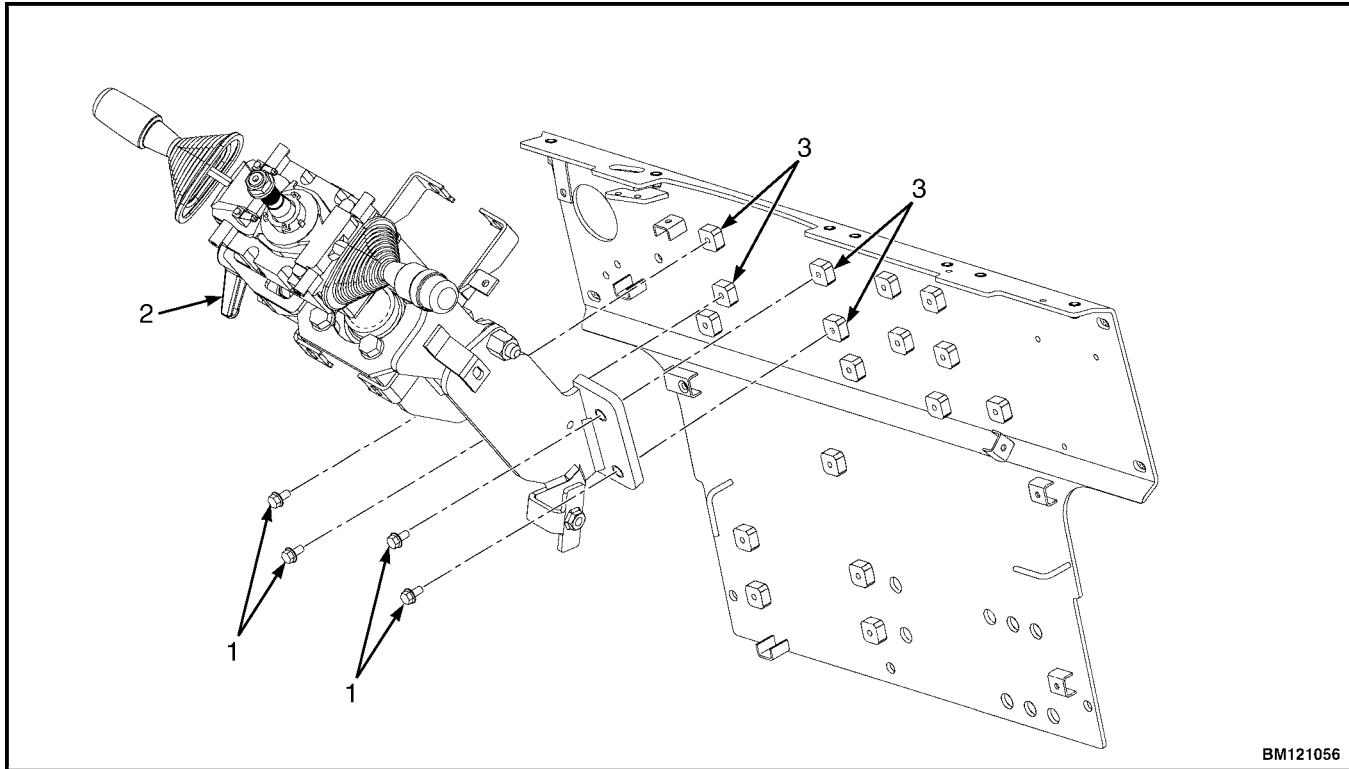
3. Remove horn button assembly and disconnect electrical wires. Remove large hex nut, washer, and steering wheel from steering column. See Figure 9.



1. HORN BUTTON
2. HEX NUT
3. WASHER
4. STEERING WHEEL
5. STEERING COLUMN

*Figure 9. Steering Wheel Remove/Install*

4. Remove steering column covers. Remove floor mats and floor plate. See section Hood, Seat, and Side Covers Replacement.
5. Remove four capscrews and steering column from cowl standoffs. See Figure 10.



1. CAPSCREW
2. STEERING COLUMN

3. COWL STANDOFF

**Figure 10. Steering Column Remove/Install**

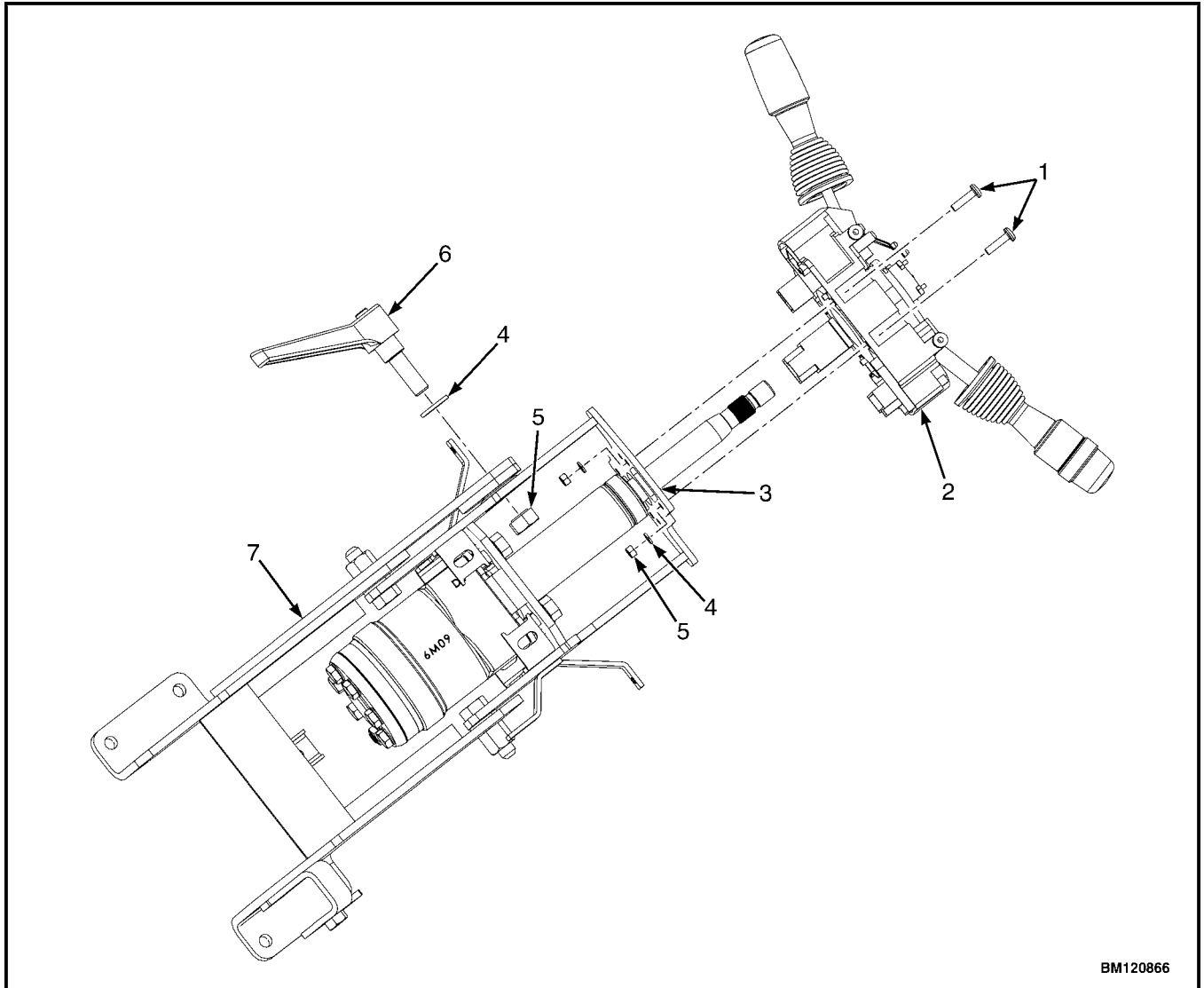
### Disassemble

**NOTE:** Tag steering hoses before removing to aid during assembly.

**NOTE:** Note position and clocking angles of steering hoses and fittings prior to removal. If fitting angles are not in proper clocking angle during installation, the steering column covers will not go back on correctly.

1. Remove steering hoses from steering control unit. See **Steer Axle 1600SRM2119** for procedures.

2. Remove nut, washer, and tilt lever assembly from steering column mounting bracket. See Figure 11.
3. Remove four cap screws, combination switch assembly, four washers, and four nuts from steering column assembly. See Figure 11.



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- |                             |                                     |
|-----------------------------|-------------------------------------|
| 1. CAPSCREW                 | 5. NUT                              |
| 2. COMBINATION SWITCH       | 6. TILT LEVER ASSEMBLY              |
| 3. STEERING COLUMN ASSEMBLY | 7. STEERING COLUMN MOUNTING BRACKET |
| 4. WASHER                   |                                     |

**Figure 11. Steering Column**

4. Remove four capscrews and steering control unit from steering column. See Figure 12

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