

GLP/GDP050LX (A974) SERVICE MANUAL CONTENTS

SECTION	PART NUMBER	YRM NUMBER	REV DATE
FRAME.....	550013974	0100 YRM 1423	03/12
MAZDA FE AND F2 ENGINES.....	524223756	0600 YRM 1122	03/12
YANMAR DIESEL ENGINES.....	524240453	0600 YRM 1205	12/14
COOLING SYSTEM.....	524223757	0700 YRM 1123	03/13
LPG FUEL SYSTEM MAZDA 2.0L AND 2.2L 2007 EMISSION COMPLIANT ENGINES.....	524289374	0900 YRM 1326	09/12
SINGLE SPEED POWERSHIFT ALUMINUM TRANSMISSION REPAIR.....	550010194	1300 YRM 1421	08/13
SINGLE SPEED POWERSHIFT ALUMINUM CHAIN DRIVE TRANSMISSION.....	550030170	1300 YRM 1447	08/13
DRIVE AXLE.....	550013975	1400 YRM 1426	07/11
STEERING AXLE.....	550013976	1600 YRM 1425	07/11
BRAKE SYSTEM.....	524223765	1800 YRM 1135	12/12
HYDRAULIC GEAR PUMP.....	524223766	1900 YRM 1136	04/14
HYDRAULIC CLEANLINESS PROCEDURES.....	550073240	1900 YRM 1620	12/14
MAIN CONTROL VALVE.....	524223767	2000 YRM 1137	04/14
CYLINDER REPAIR (MAST S/N A551, A555, A559, A661, A662, A663, A66, B507, B508, B509, B551, B555, B559, B562, B563, B564, B661, B662, B663, C515, C551, C555, C559, D507, D508, D509, D515, D562, D563, D564, E509, AND E564).....	524223768	2100 YRM 1139	02/14
WIRE HARNESS REPAIR.....	524223769	2200 YRM 1128	12/14
ELECTRICAL SYSTEM.....	550013977	2200 YRM 1427	03/12
ELECTRICAL SYSTEM MAZDA 2.0L AND 2.2L 2007 EMISSION COMPLIANT ENGINES.....	524289375	2200 YRM 1327	09/12
MAST REPAIR (S/N A698, A699, B551).....	550013978	4000 YRM 1431	02/14
METRIC AND INCH (SAE) FASTENERS.....	524150797	8000 YRM 0231	10/13
PERIODIC MAINTENANCE.....	550013979	8000 YRM 1424	08/13
CAPACITIES AND SPECIFICATIONS.....	550013980	8000 YRM 1428	11/13
SCHEMATICS/DIAGRAMS.....	550013981	8000 YRM 1429	04/14
DIAGNOSTIC TROUBLESHOOTING MANUAL.....	550022929	9000 YRM 1434	12/14

Service information for Cummins diesel engines can be ordered through the Hyster Literature Distribution Center.

PART NO. 550038069 (12/14)

General



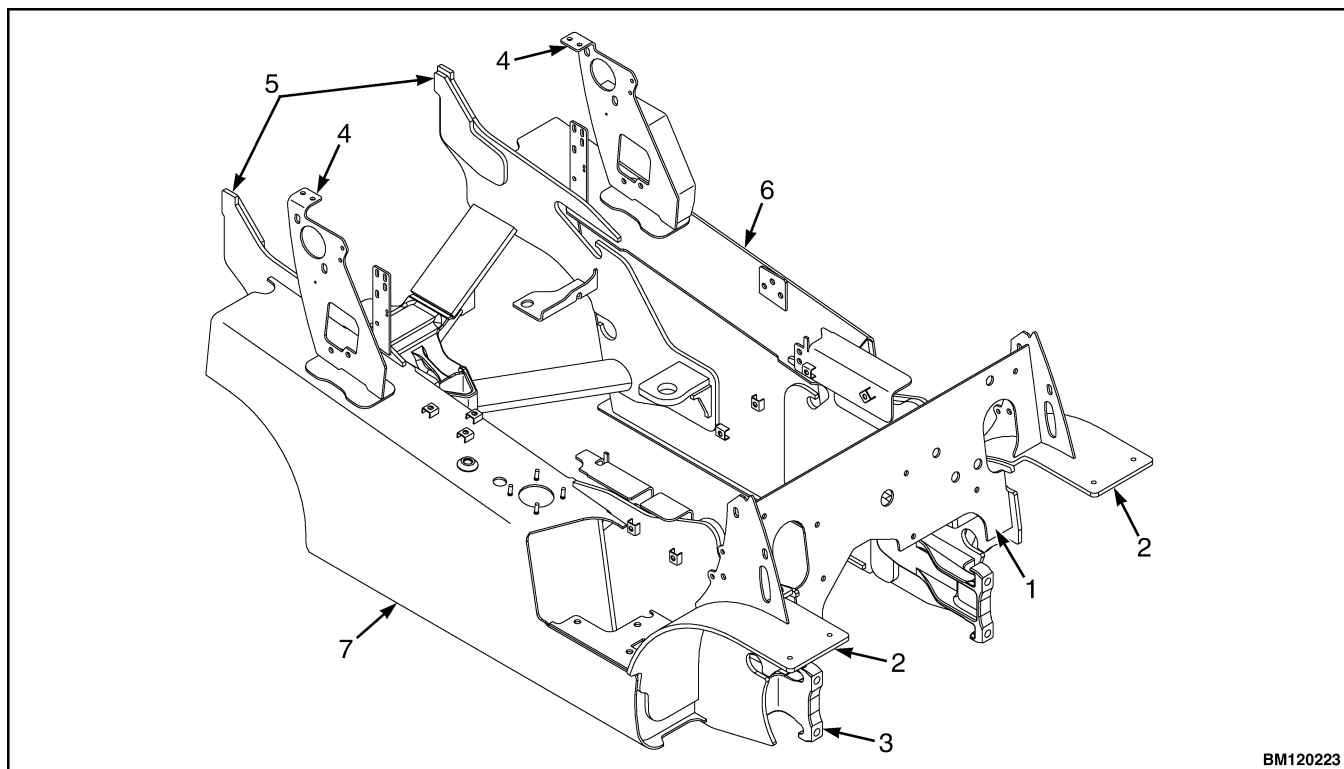
WARNING

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 the section Periodic Maintenance 8000 YRM 1424.

This section contains the description of the frame (see Figure 1) and connected parts. Procedures for removing and installing the counterweight, hood, overhead guard, engine, and cooling system are found in this section. Checks for the operator restraint system, adjustments for the throttle pedal stop, and procedures for the repair of tanks and installation of safety labels are also included.



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1. COWL PLATE
2. FENDER
3. FRAME
4. HOOD MOUNT

5. COUNTERWEIGHT SUPPORT
6. LEFT-HAND FRAME WELDMENT
7. HYDRAULIC TANK

Figure 1. Frame

Hood, Seat, and Side Covers Replacement

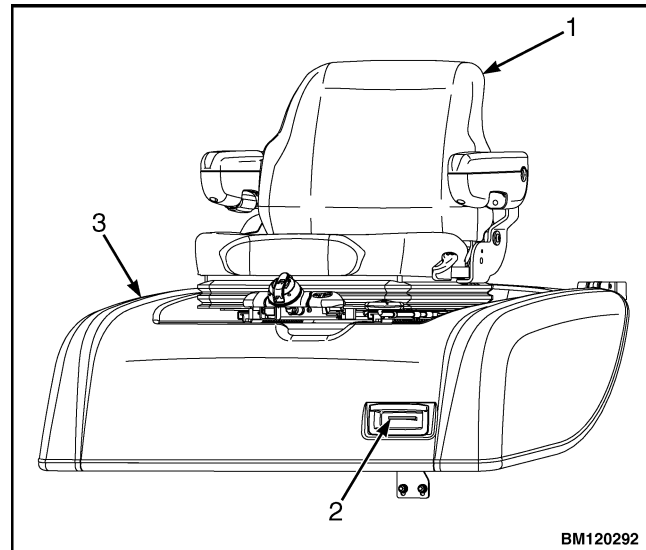
REMOVE

1. Slide the seat to the closest position to the steering column.
2. Fully tilt the steering column forward.

NOTE: Perform Step 3 for lift trucks equipped with LPG.

3. Swing LPG tank off to side. See **LPG Fuel System, Mazda FE and F2 Emission Compliant Engines** 900 YRM 1326 for procedures.
4. Raise the hood latch on the left, front corner of the hood to unlatch and lift up the hood. See Figure 2.
5. Remove the floor mat and floor plate. See Figure 3.
6. Remove the two capscrews holding the left and right rear side covers to the frame. Remove the rear side covers from the frame. See Figure 3.
7. Remove the four capscrews and clip nuts holding the left and right front side covers and left and right cowl plates to the frame. Remove front side covers and cowl plates.

8. Fully lower the steering column.

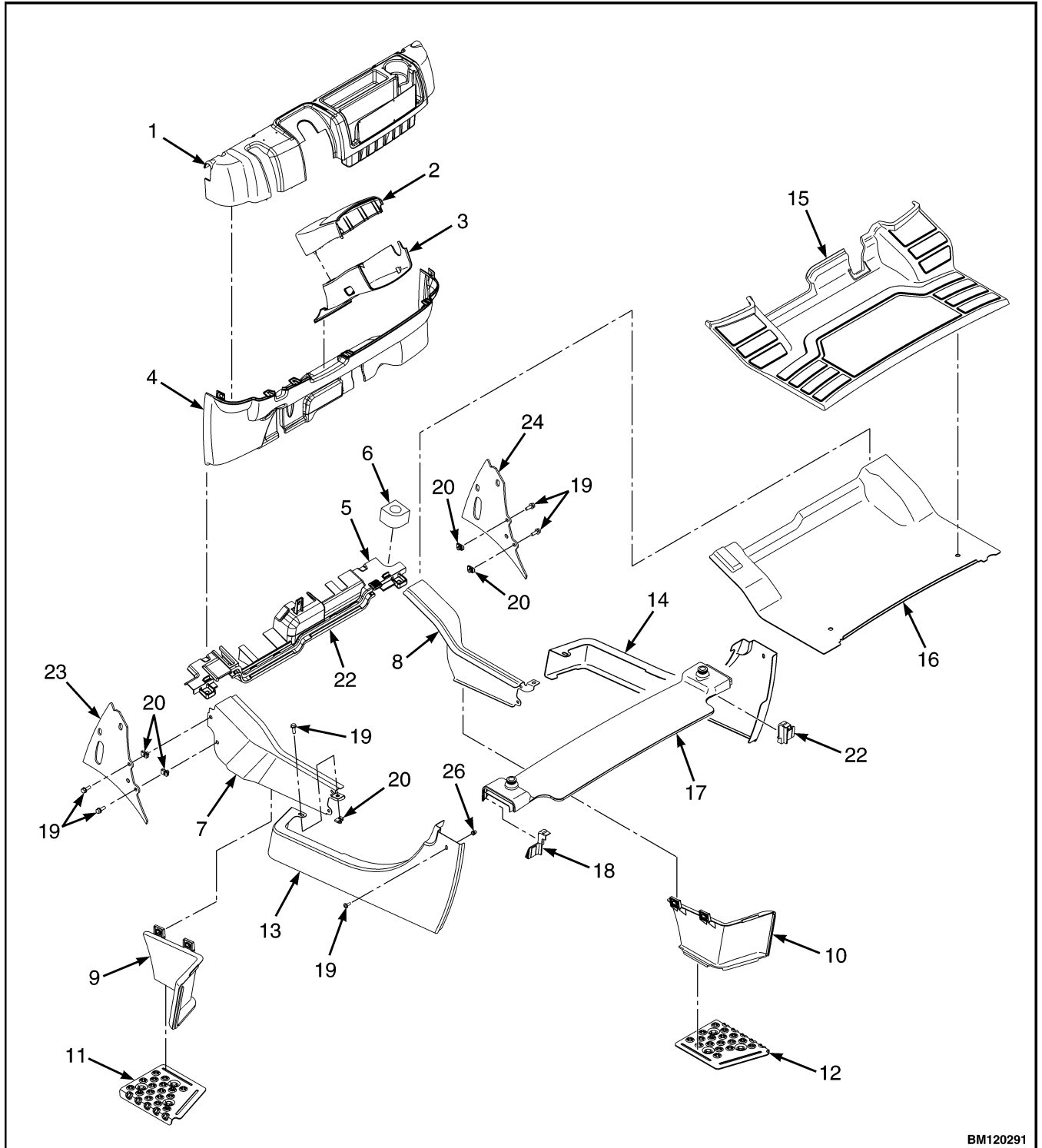


- | | |
|---------------|---------|
| 1. HOOD LATCH | 3. HOOD |
| 2. SEAT | |

Figure 2. Hood Latch

Legend for Figure 3

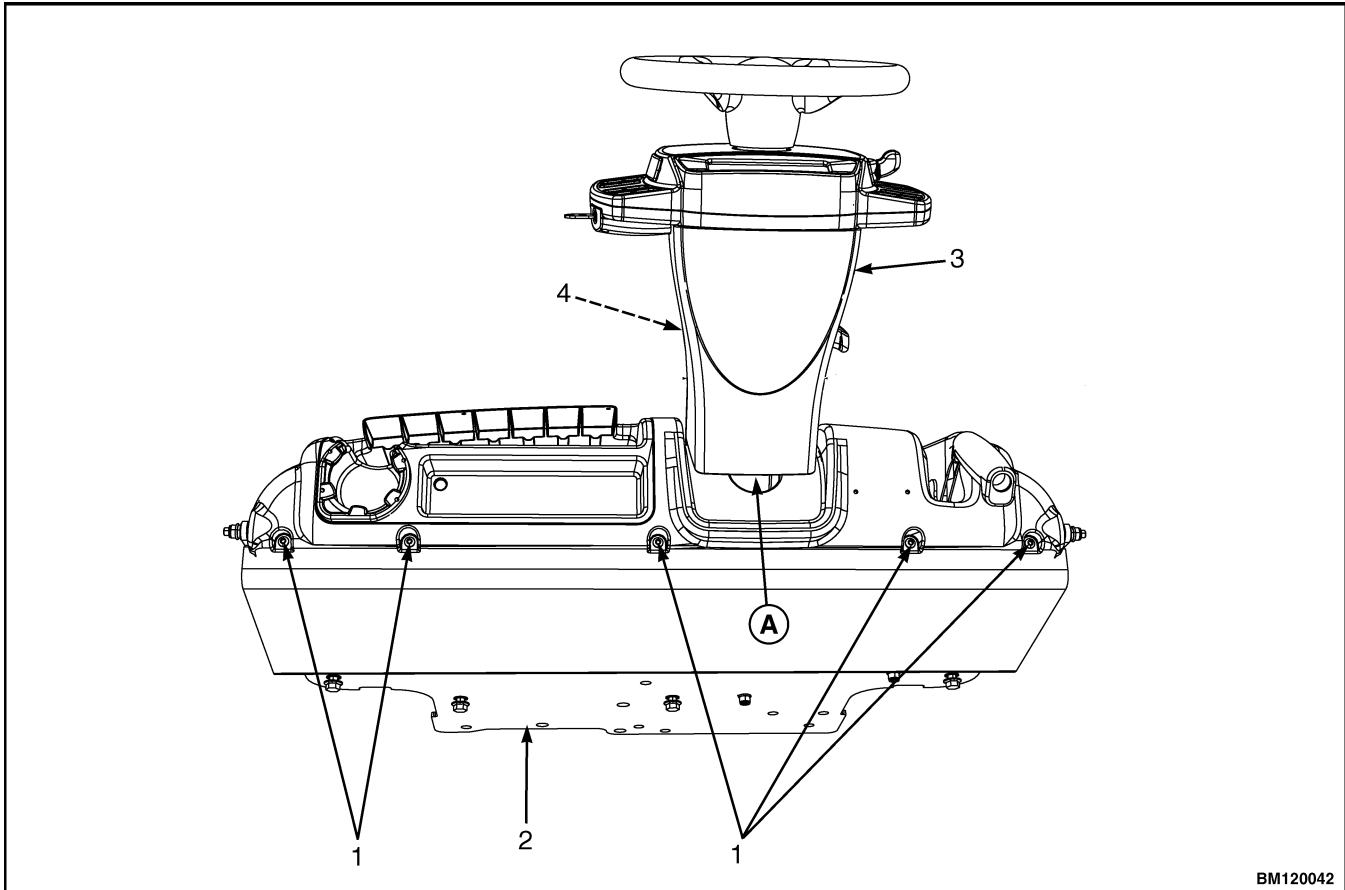
- | | |
|--------------------------------|---------------------------|
| 1. DASH ASSEMBLY | 13. LEFT REAR SIDE COVER |
| 2. UPPER STEERING COLUMN COVER | 14. RIGHT REAR SIDE COVER |
| 3. LOWER STEERING COLUMN COVER | 15. FLOOR MAT |
| 4. KICK PANEL | 16. FLOOR PLATE |
| 5. PLATE ASSEMBLY | 17. RADIATOR COVER |
| 6. GROMMET | 18. SEALS |
| 7. LEFT FRONT SIDE COVER | 19. CAPSCREW |
| 8. RIGHT FRONT SIDE COVER | 20. CLIP NUT |
| 9. LEFT STEP PANEL | 21. INSERT |
| 10. RIGHT STEP PANEL | 22. PLATE ASSEMBLY SEAL |
| 11. LEFT STEP PLATE | 23. LEFT COWL PLATE |
| 12. RIGHT STEP PLATE | 24. RIGHT COWL PLATE |



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

9. Remove upper steering column cover by pulling up on the base of the upper steering column cover to release the latches (one on either side), and pulling cover away from steering column. See Figure 4.
10. Remove the five Allen Head screws (see Figure 4) securing the dash to top of cowl.
11. Pull kick panel up from bottom and out to remove kick panel from seal plate and clips on dash panel.
12. Remove dash panel from cowl. See Figure 5.
13. Remove three capscrews holding the seal plate. Remove seal plate. See Figure 5.



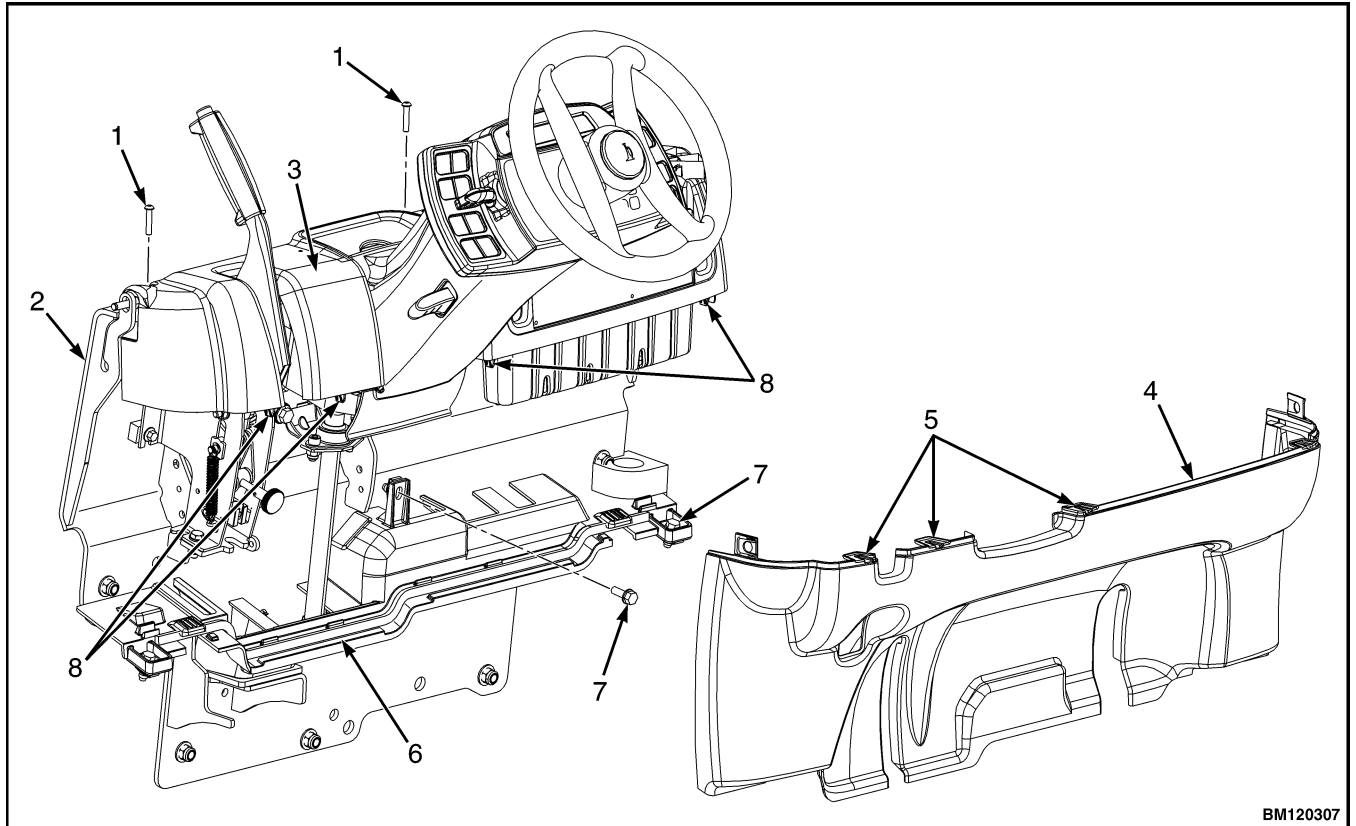
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NOTE: TOP VIEW OF DASH PANEL SHOWN

A. INDICATES TO PULL UP TO UNLATCH

- | | |
|----------------------|--------------------------------|
| 1. ALLEN HEAD SCREWS | 3. UPPER STEERING COLUMN COVER |
| 2. COWL | 4. LOWER STEERING COLUMN COVER |

Figure 4. Dash Panel and Upper Steering Column Cover Removal



- | | |
|----------------------|-----------------------|
| 1. ALLEN HEAD SCREWS | 5. KICK PANEL NOTCHES |
| 2. COWL | 6. SEAL PLATE |
| 3. DASH PANEL | 7. CAPSCREWS |
| 4. KICK PANEL | 8. CLIPS |

Figure 5. Dash Panel, Kick Panel, and Seal Plate Removal

14. Remove two capscrews and washers from cover plate and remove electrical cover. Disconnect seat harness from chassis harness. See Figure 6.

CAUTION

When removing the seat from the hood, do not use an impact wrench to remove the capscrews. Damage can be caused to the threads on the capscrews and in the holes.

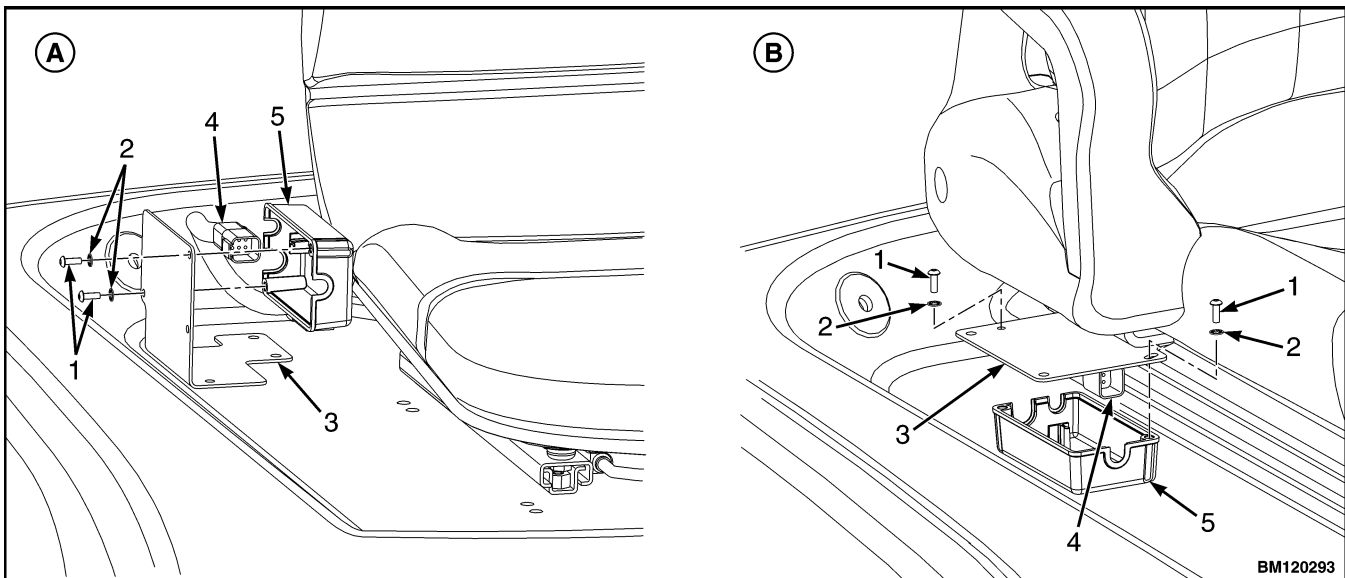
15. Open hood and pull chassis harness through hole in hood. See Figure 7. Remove the four capscrews

and nuts holding the seat to the hood. Lift the seat off the hood. See Figure 7. Close hood.

16. Remove the nuts from ball studs on gas springs. Remove gas springs from the hood. See Figure 8.

17. Remove the hinge capscrews and nuts, located in the rear of the hood. See Figure 8.

18. Lift the hood from the truck.



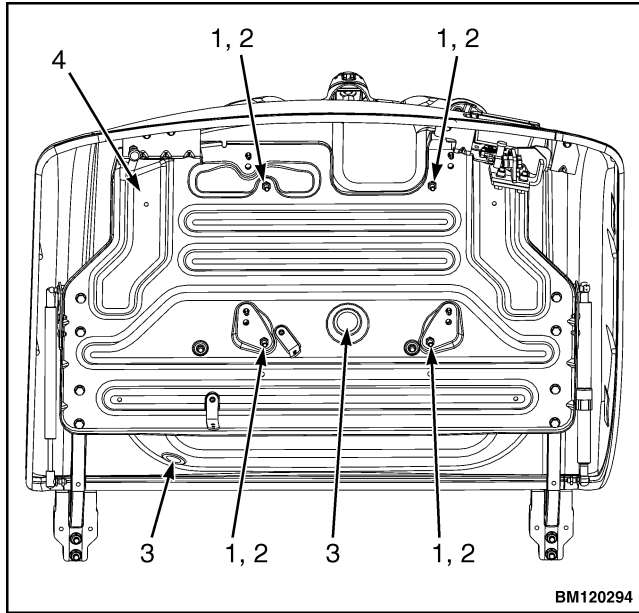
A. NON-SUSPENSION SEAT

- 1. CAPSCREWS
- 2. WASHER
- 3. COVER PLATE

B. FULL SUSPENSION SEAT

- 4. ELECTRICAL CONNECTOR (SEAT HARNESS)
- 5. ELECTRICAL COVER

Figure 6. Disconnect Seat Wire Harness

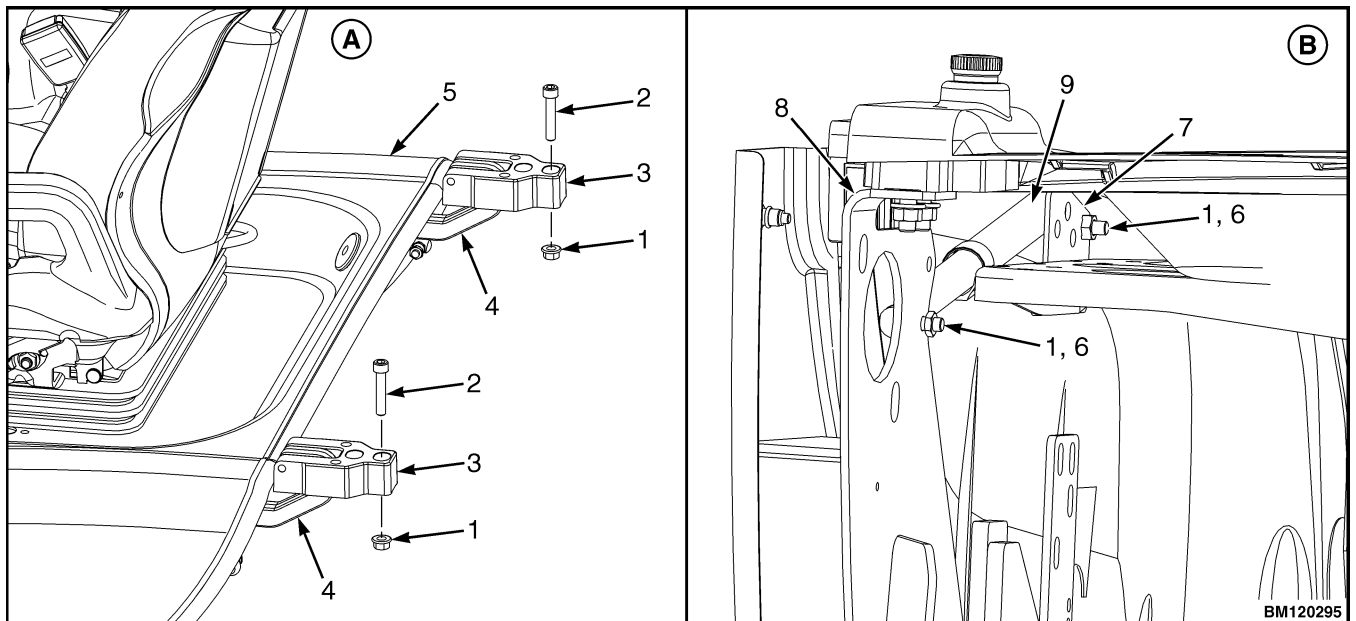


Legend for Figure 7

NOTE: MOUNTING HOLES FOR FULL SUSPENSION SEAT SHOWN. MOUNTING HOLES FOR NON-SUSPENSION SEAT ARE THE SAME.

- 1. CAPSCREW
- 2. NUT
- 3. HOLE FOR CHASSIS HARNESS
- 4. HOOD LINER

Figure 7. Remove Seat From Hood



A. HOOD HINGE ARRANGEMENT

- 1. NUT
- 2. CAPSCREW
- 3. HOOD HINGE MOUNT
- 4. HOOD HINGE ARM
- 5. HOOD

B. GAS SPRING ARRANGEMENT (LEFT SIDE SHOWN)

- 6. BALL STUD
- 7. GAS SPRING MOUNTING BRACKET
- 8. HOOD MOUNT
- 9. GAS SPRING

Figure 8. Gas Spring and Hood Removal

INSTALL

1. Place the hood onto the lift truck frame.
2. Install the hood hinge mount screws and nuts, located in the rear of the hood, and tighten to 38 N•m (28 lbf ft). See Figure 8.
3. Align the ball studs in the gas springs with holes in the gas spring mounting bracket and hood mount. See Figure 9 for holes to use depending on type of seat being installed. Install nuts on ball studs to attach gas springs to the hood. Tighten nuts to 19.2 N•m (170 lbf in).
4. Install latch striker in highest slot position. Check that latch striker is in center of jaws of hood latch when hood closes. Open and close the hood to ensure that the center pin strikes the hood latch properly and that the stop screw contacts the frame. A properly closed hood **MUST** click twice on the hood latch. If the hood latch does not close properly, loosen the capscrews on the back of the center pin and adjust the center pin up or down as required for correct alignment. See Figure 10.
5. Push down until hood just touches rubber bumper. Make sure latch striker is still in center of hood latch. Open hood and tighten capscrews for latch.
6. Check operation of hood latch. Have an operator sit in the seat. Make sure hood is fully closed

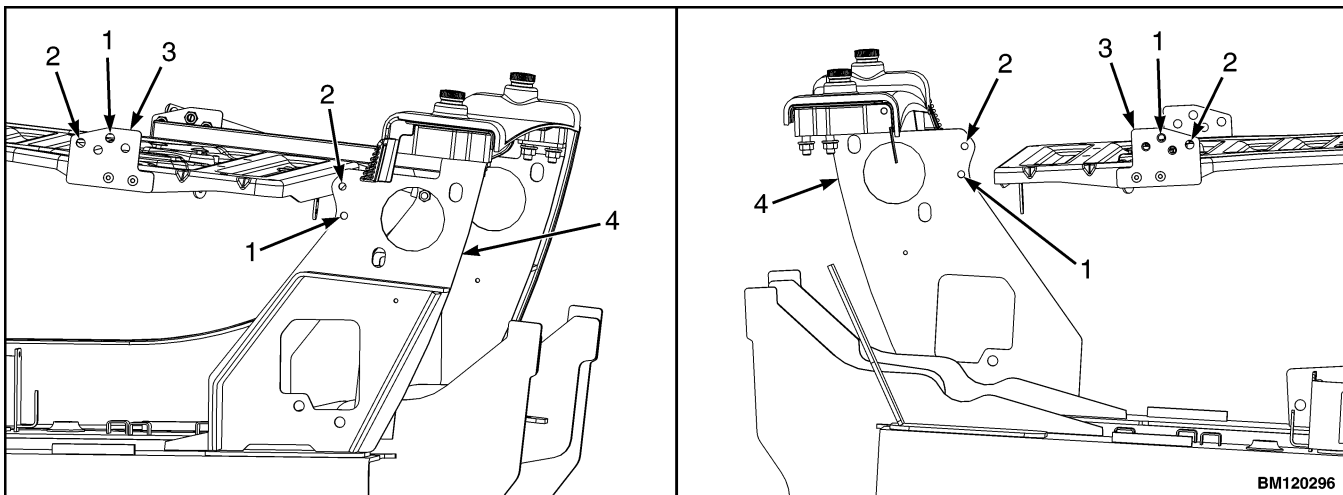
(two clicks). Also check that hood touches rubber bumper. If necessary, repeat Step 4 and Step 5.



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 the seat on the hood and thread the chassis harness through the holes in the hood. See Figure 7.
8. Align the holes in the seat with the holes in the hood. See Figure 7. Insert capscrews and nuts. Tighten capscrews to 18 N•m (159 lbf in).
9. Connect seat harness to chassis harness. Install cover plate to electrical cover using two capscrews and washers. See Figure 6.
10. Using three capscrews, install seal plate. See Figure 5. Tighten capscrews to 10.8 N•m (95.6 lbf in).
11. Place dash panel on cowl and secure dash panel to cowl using five Allen Head screws. Tighten Allen Head screws to 3.5 N•m (31 lbf in). See Figure 4.
12. Align notches on kick panel to clips on dash panel and push kick panel into place on seal plate. See Figure 5.



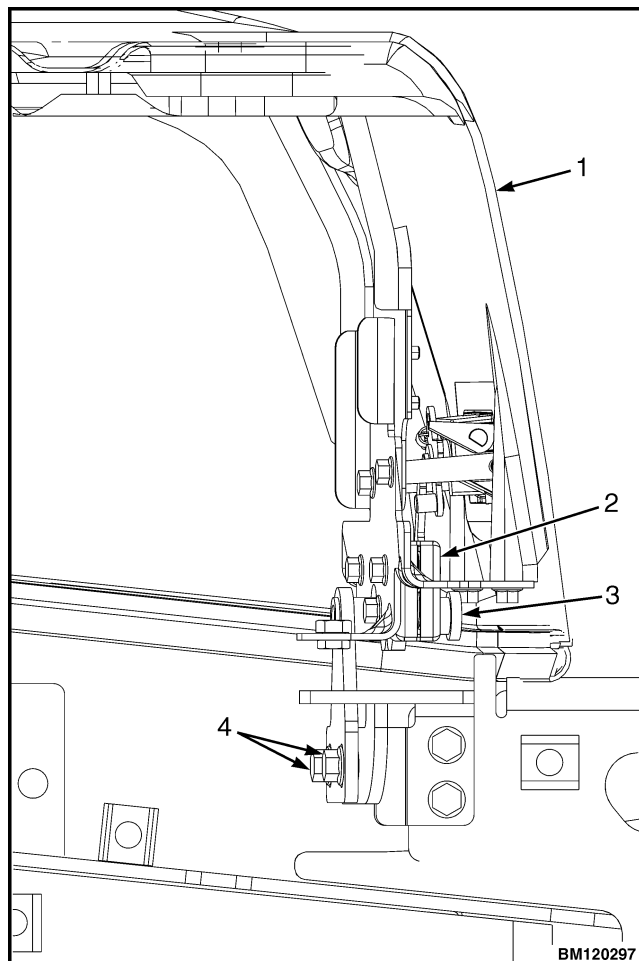
A. LEFT SIDE

1. FULL SUSPENSION SEAT
2. NON-SUSPENSION SEAT

B. RIGHT SIDE

3. GAS SPRING MOUNTING BRACKET
4. HOOD MOUNT

Figure 9. Gas Spring and Seat Hole Alignment



- 1. HOOD
- 2. HOOD LATCH
- 3. CENTER PIN
- 4. CAPSCREW

Figure 10. Hood Latch Adjustment

- 13. Raise steering column to highest position and install upper steering column cover by aligning the two latches and pushing down until latched. See Figure 4.
- 14. Using four capscrews and clip nuts, install the left and right front side covers and left and right cowl plates to the frame. See Figure 3.
- 15. Using two capscrews, install the left and right rear side covers to the frame. See Figure 3.
- 16. Install the floor mat and floor plate.

NOTE: Perform Step 17 for lift trucks equipped with LPG.

- 17. Swing the LPG tank into position on back of counterweight. See **LPG Fuel System, Mazda FE and F2 Emission Compliant Engines 900 YRM 1326** for procedures.

- 18. Adjust the steering column and seat positions.

BELLY PAN (OPTIONAL)

Remove

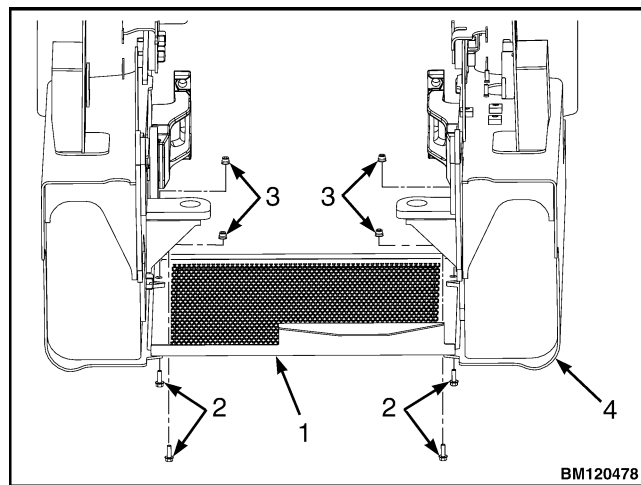
- 1. Remove four capscrews and four nuts from belly pan and frame. See Figure 11.
- 2. Remove belly pan from frame. See Figure 11.

Clean and Inspect

Remove debris from belly pan and inspect for damage. Replace if necessary.

Install

- 1. Slide belly pan into position on frame. See Figure 11.
- 2. Install four capscrews and four nuts onto belly pan and frame. See Figure 11.



- 1. BELLY PAN
- 2. CAPSCREW
- 3. NUT
- 4. FRAME

Figure 11. Belly Pan

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, bracket and lower shaft. For lift trucks with gas and LPG engines, bolts and bushings attach the steering column to the cowl standoffs. For lift trucks with diesel engines, bolts, bushings and isolators attach the steering column to the cowl standoffs See Figure 12.

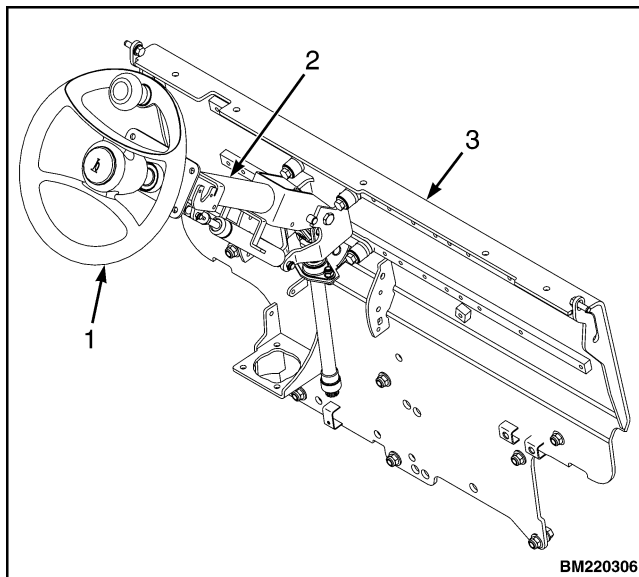
STEERING COLUMN REPAIR

Remove

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

CAUTION

Disconnect the negative battery cable on internal combustion trucks. Disconnect the battery before removing any covers.



NOTE: DIESEL SHOWN, LPG AND GAS SIMILAR.

1. STEERING WHEEL
2. STEERING COLUMN
3. COWL

Figure 12. Steering Column and Cowl

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

CAUTION

If a puller tool is used to remove steering wheel from steering column, be careful not to damage horn wires.

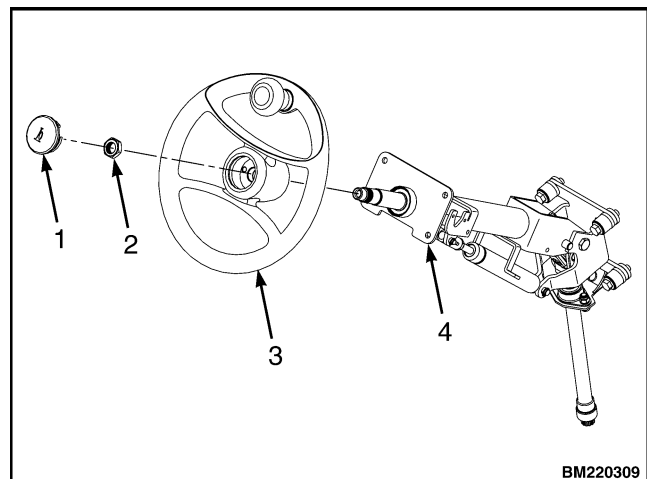
NOTE: This procedure is for the removal of all components of the steering column assembly. All components are not often removed for a repair procedure. Do only those steps of the procedure necessary to remove the required component.

NOTE: Tag wires prior to disconnect

3. Remove the horn button assembly and disconnect electrical wires. Remove large hex nut and steering wheel from steering column. See Figure 13.
4. Remove steering column covers. Remove floor mats and floor plate. See section Hood, Seat, and Side Covers Replacement.

NOTE: Perform Step 5 for lift trucks equipped with gas or LPG engines.

5. Remove four capscrews, four bushings and steering column from cowl standoffs. See Figure 14.



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

Figure 13. Steering Wheel Remove/Install

NOTE: Perform Step 6 for lift trucks equipped with diesel engines.

6. Remove four capscrews, four bushings, four isolators, steering column and four isolators from cowl standoffs. See Figure 14.

Disassemble

NOTE: Remove and discard snap rings if installed.

1. Remove two pins and gas spring from housing.

See Figure 15

- For lift trucks manufactured before January, 2012

See Figure 16

- For lift trucks manufactured after January, 2012

2. Remove two pivot bolts, two bushings, two nuts and bracket from housing.

See Figure 15

- For lift trucks manufactured before January, 2012

See Figure 16

- For lift trucks manufactured after January, 2012

3. Remove split pin and lower shaft from upper shaft.

See Figure 15

- For lift trucks manufactured before January, 2012

See Figure 16

- For lift trucks manufactured after January, 2012

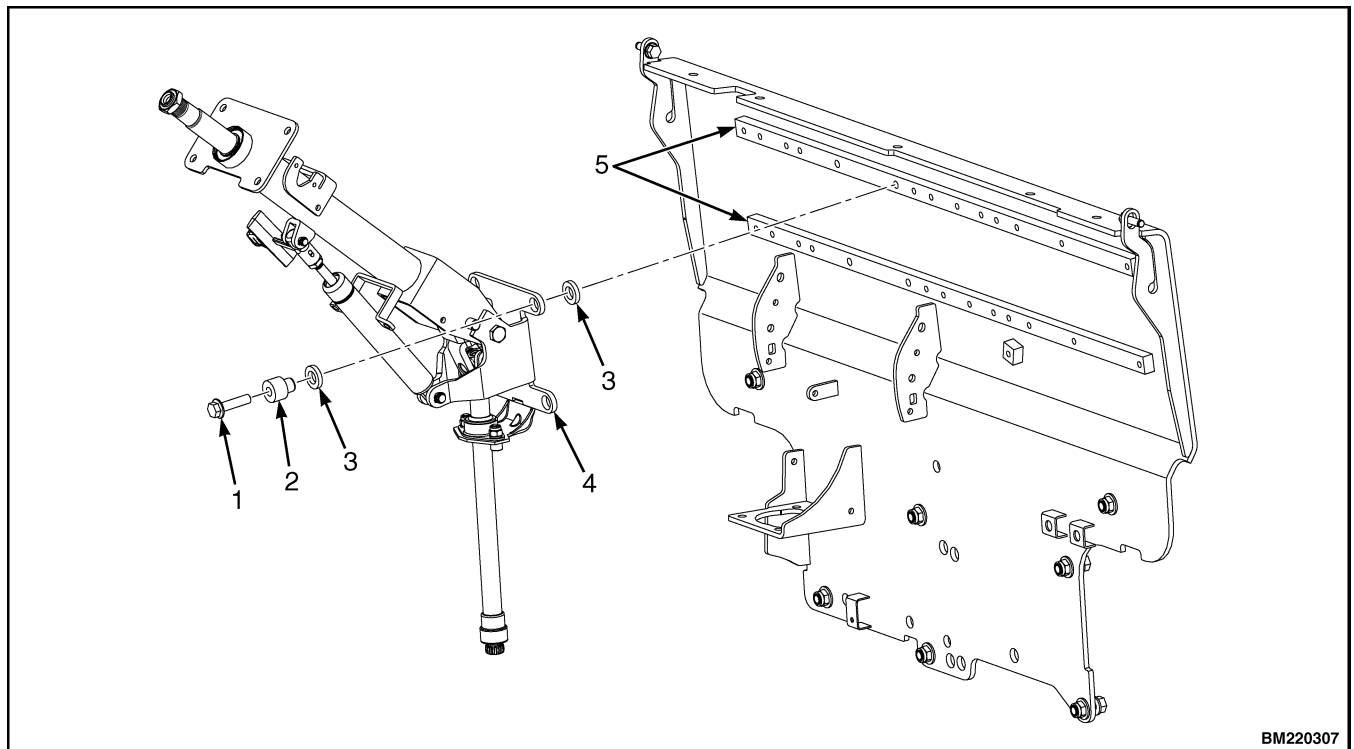
4. Remove connector from connector bracket. Remove connector bracket, fastener, four screws and two horn contacts from housing.

See Figure 15

- For lift trucks manufactured before January, 2012

See Figure 16

- For lift trucks manufactured after January, 2012

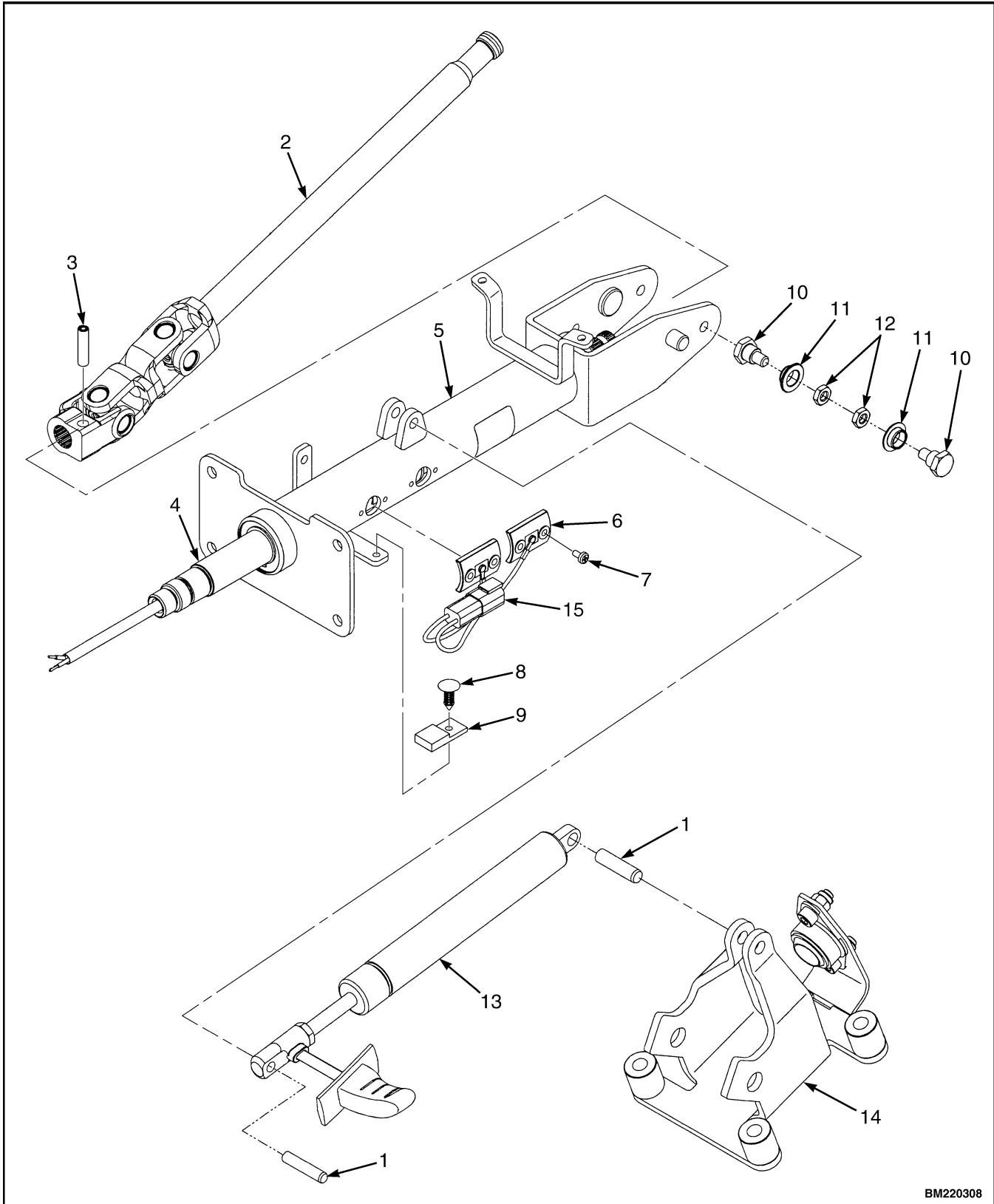


NOTE: DIESEL SHOWN, LPG AND GAS SIMILAR.

1. CAPSCREW
2. BUSHING
3. ISOLATOR

4. STEERING COLUMN
5. COWL STANDOFF

Figure 14. Steering Column Remove/Install

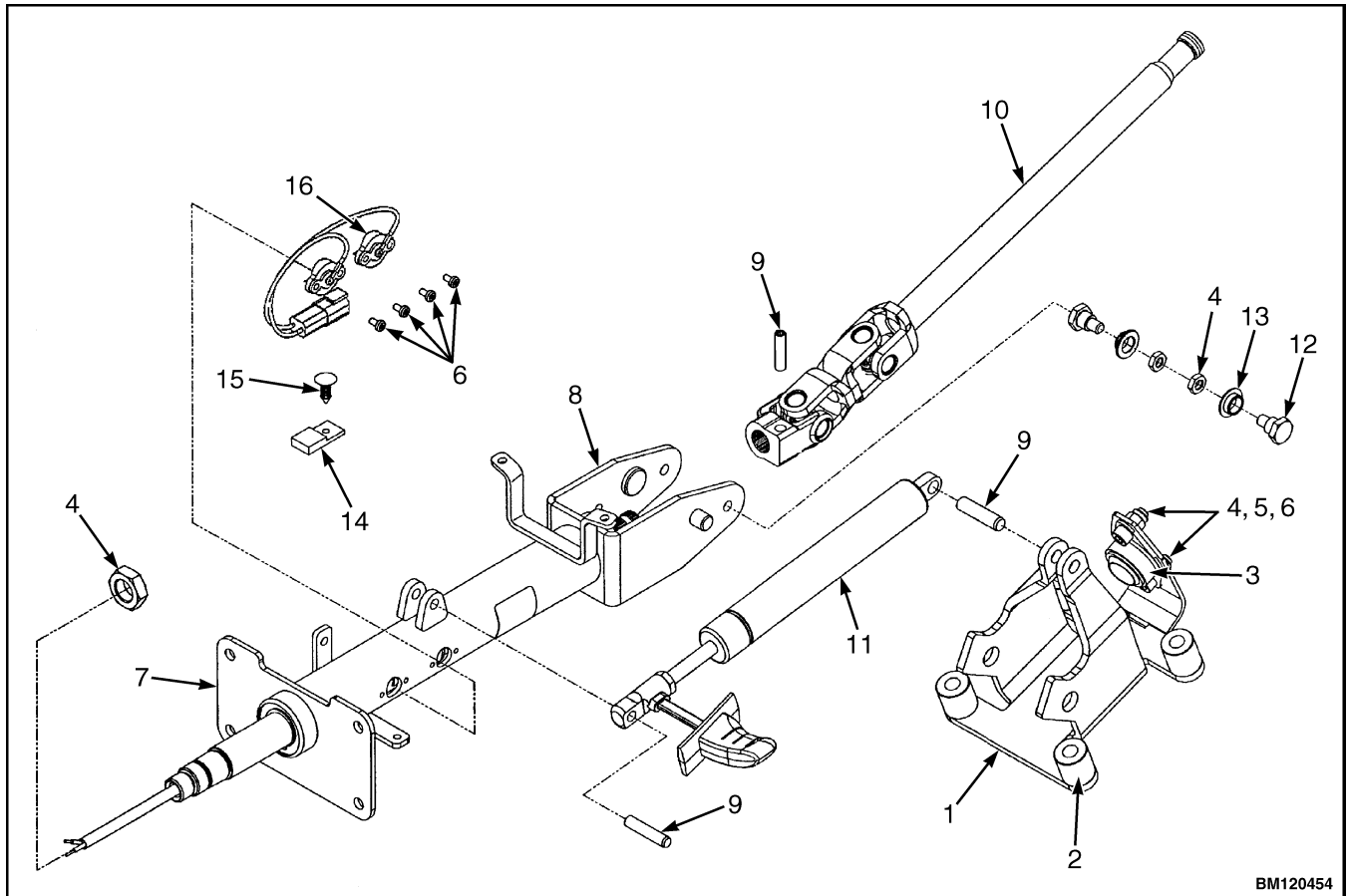


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Figure 15. Steering Column Assembly, Lift Trucks Manufactured Before January, 2012

Legend for Figure 15

- | | |
|-----------------|----------------------|
| 1. PIN | 9. CONNECTOR BRACKET |
| 2. LOWER SHAFT | 10. PIVOT BOLT |
| 3. SPLIT PIN | 11. BUSHING |
| 4. UPPER SHAFT | 12. NUT |
| 5. HOUSING | 13. GAS SPRING |
| 6. HORN CONTACT | 14. BRACKET |
| 7. SCREW | 15. CONNECTOR |
| 8. FASTENER | |



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- | | |
|----------------|------------------|
| 1. BRACKET | 9. PIN |
| 2. SPACER | 10. LOWER SHAFT |
| 3. JOINT | 11. GAS SPRING |
| 4. NUT | 12. BOLT |
| 5. WASHER | 13. BUSHING |
| 6. SCREW | 14. CONNECTOR |
| 7. UPPER SHAFT | 15. FASTENER |
| 8. HOUSING | 16. HORN CONTACT |

Figure 16. Steering Column Assembly, Lift Trucks Manufactured After January, 2012

Clean



WARNING

Cleaning solvents can be flammable and toxic and can cause skin irritation. When using cleaning solvents, always follow the solvent manufacturer's recommended safety precautions.



WARNING

Compressed air is used for cleaning and drying purposes, or for cleaning restrictions. wear protective clothing (goggles/shields, gloves, etc.). Make sure the path of the compressed air is away from all personnel to avoid injury.

1. Clean metal parts in solvent. Remove all traces of old lubricant and dirt. Clean nonmetal parts with warm soapy water and a lint free cloth.
2. After cleaning dry parts with compressed air. DO NOT dry parts with a cloth.

Inspect

1. Inspect for loose, burned, missing, cracked or damaged hardware.
2. Inspect all parts for dents, holes, bends, burrs, rust, corrosion or marred finishes.
3. Replace all defective or damaged parts.

Assemble

NOTE: This procedure is for the installation of all components of the steering column assembly. All components are not often removed for a repair procedure. Do only those steps of the procedure necessary to install the required component.

NOTE: Perform Step 1 only for lift trucks manufactured before January, 2012.

1. Lubricate the horn contact slip rings with a small amount of conductive grease Yale P/N 582014302. See Figure 15.
2. Install fastener, connector bracket and connector, two horn contacts and four screws.

See Figure 15

- For lift trucks manufactured before January, 2012

See Figure 16

- For lift trucks manufactured after January, 2012

3. Assemble lower shaft and upper shaft, secure with spit pin.

See Figure 15

- For lift trucks manufactured before January, 2012

See Figure 16

- For lift trucks manufactured after January, 2012

4. Install two pivot bolts, two bushings, two nuts and bracket onto housing.

See Figure 15

- For lift trucks manufactured before January, 2012

See Figure 16

- For lift trucks manufactured after January, 2012

5. Install gas spring and two pins on housing.

See Figure 15

- For lift trucks manufactured before January, 2012

See Figure 16

- For lift trucks manufactured after January, 2012

Install

NOTE: Lubricate spline end of lower shaft with multi purpose grease, see **Periodic Maintenance Manual** for your lift truck.

NOTE: Perform Step 1 for lift trucks equipped with gas or LPG engines.

1. Install steering column, four bushings and four bolts on cowl standoffs. Tighten bolts to 38 N•m (28 lbf ft). See Figure 14.

NOTE: Perform Step 2 for lift trucks equipped with diesel engines.

2. Install four isolators, steering column four isolators, four bushings and four bolts standoffs on cowl. Tighten bolts to 38 N•m (28 lbf ft). See Figure 14.

3. Install floor plate, floor mats and steering column covers. See section Hood, Seat, and Side Covers Replacement.

4. Install steering wheel and hex nut on steering column. Tighten hex nut to 40 to 54 N•m (30 to 40 lbf ft). Connect electrical wiring and install horn button. See Figure 13.

5. Remove tag from negative battery connector and connect to battery. Adjust steering column to neutral position.

- Remove blocks from each side of tires.

Counterweight Replacement

REMOVE



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 the section Periodic Maintenance 8000 SRM 1424.



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.

NOTE: The counterweight is held in position on the frame by two hooks that are part of the frame. One M24 × 3 × 110 capscrew holds the counterweight to the lower part of the frame on lift truck models See Figure 17.

NOTE: Perform Step 1 for lift trucks equipped with LPG.

1. Use the procedures in **LPG Fuel System, Mazda FE and F2 Emission Compliant Engines 900 YRM 1326** to remove the LPG tank and bracket so that the counterweight can be removed.

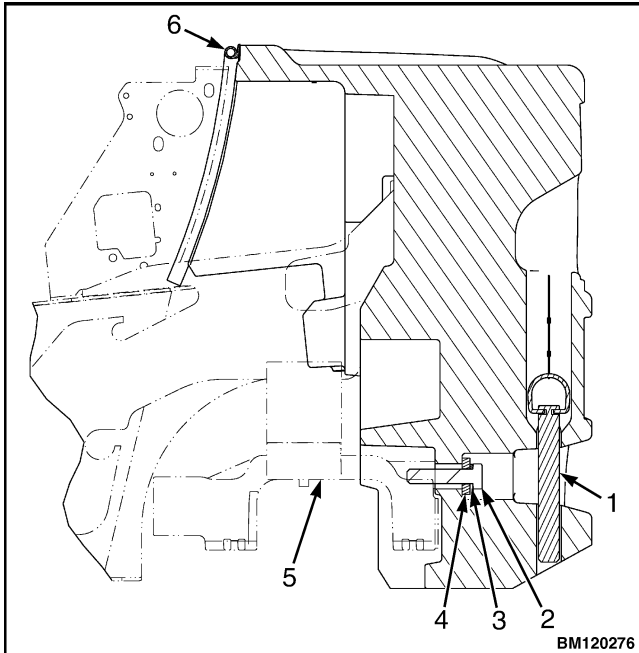
Additional information on the LPG fuel system can be found in **LPG Fuel System, Mazda FE and F2 Emission Compliant Engines 900 YRM 1326**.



WARNING

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

2. Install washers, lifting eyebolts, and nuts into lift holes of the counterweight. See Figure 18. Connect a crane to the lifting eyebolts and raise the crane until it holds part of the weight of the counterweight.
3. Remove the tow pin from counterweight.
4. Remove the capscrew from counterweight and frame. See Figure 17 and Figure 18. Use the crane to lift the counterweight from the lift truck. Put counterweight on the floor so that it has stability and will not fall over. Take care not to damage exhaust or cooling system components.

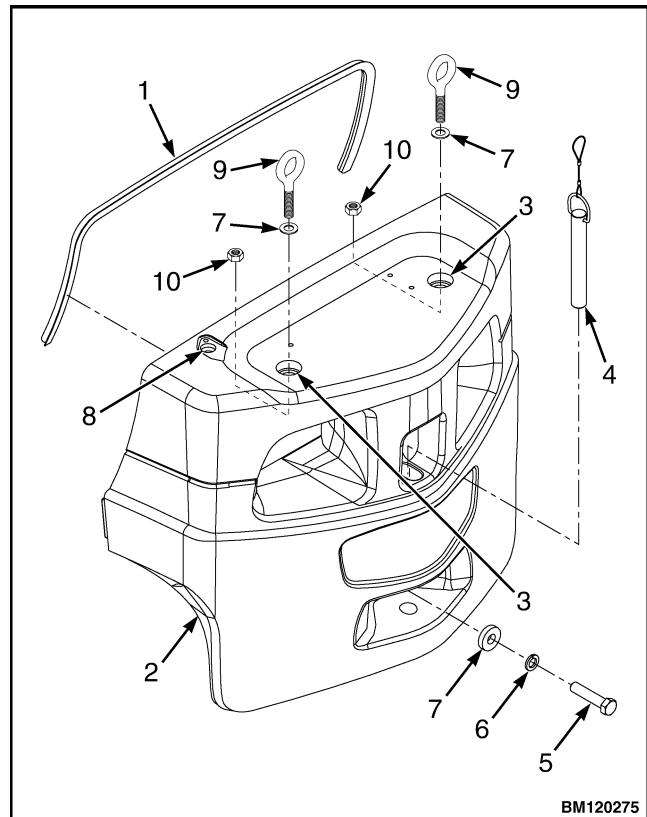


- 1. TOW PIN
- 2. CAPSCREW
- 3. LOCKWASHER
- 4. WASHER
- 5. FRAME
- 6. SEAL

Figure 17. Counterweight Installation

Table 1. Weight of Counterweights

Model	kg	lb
GLC050LX (A967)	1401	3088
GLP/GDP20LX (A974)	950	2094
GLP/GDP25LX (GLP/GDP050LX) (A974)	1230	2712
GLP/GDP25LX (GLP/GDP050LX) (A974)	1335	2943



- 1. SEAL
- 2. COUNTERWEIGHT
- 3. LIFT HOLE
- 4. TOW PIN
- 5. CAPSCREW
- 6. LOCKWASHER
- 7. WASHER
- 8. LPG ACCESS HOLE
- 9. LIFTING EYEBOLT
- 10. NUT

Figure 18. Counterweight With Lifting Eyebolts

INSTALL

1. Make sure the seals are on the counterweight. If lifting eyebolts were removed from counterweight, install washers, lifting eyebolts, and nuts into lift holes on counterweight. See Figure 18.
2. Connect a crane to the lifting eyebolts and place counterweight in position on lift truck frame. Make sure hooks on frame fully engage counterweight so it is aligned with the frame.

3. Install capscrew onto counterweight and frame. See Figure 17 and Figure 18. Tighten capscrew to 555 N•m (409 lbf ft).
4. Install tow pin onto counterweight.

NOTE: Perform Step 5 for lift trucks equipped with LPG.

5. Use the procedures in **LPG Fuel System, Mazda FE and F2 Emission Compliant Engines 900 YRM 1326** to install the LPG tank and bracket after the counterweight has been installed.

Overhead Guard Replacement**REMOVE****WARNING**

DO NOT operate the lift truck without the overhead guard correctly fastened to the lift truck.

**WARNING**

DO NOT weld mounts for lights or accessories to legs of the overhead guard. 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 your dealer for Yale lift trucks **BEFORE** performing any changes to the overhead guard.

NOTE: The lifting device can be connected to any number of positions on the overhead guard depending upon the lifting device available. The ideal choices are a four point sling connected to all four corners on the top of the overhead guard, or a two point sling connected to two opposite corners of the overhead guard. If a single point hoist is used, make sure that the lift point is as close to the center of the overhead guard as possible. If during the initial start of the lift, the overhead guard is off balance, lower immediately and move the hoist to a more centered point.

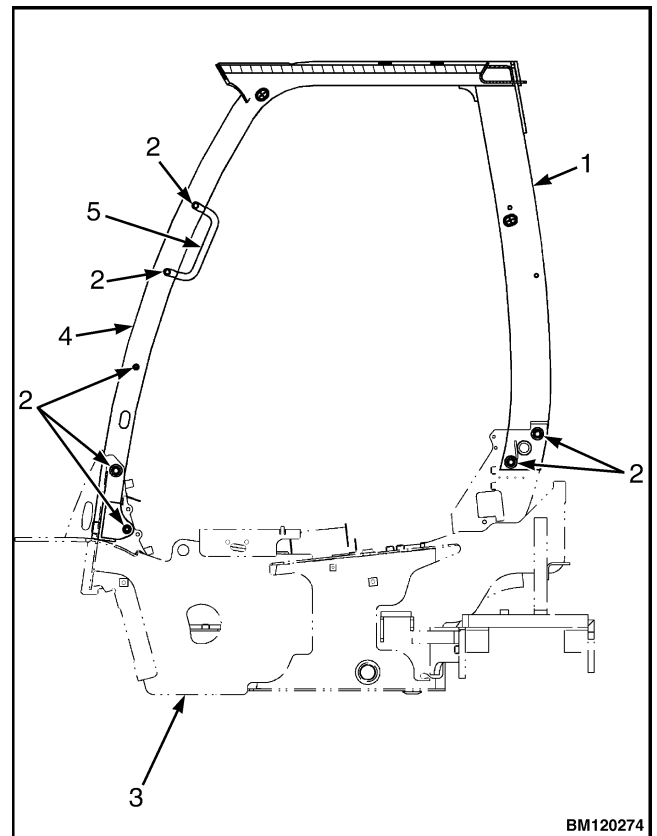
No welding or drilling on legs of overhead guard is permitted as per previous **WARNING**.

1. Connect a lifting device to overhead guard.

NOTE: Note routing of electrical wires prior to disconnecting. Tag electrical connectors during removal to aid in installation.

2. Disconnect wires between frame and overhead guard.

3. Remove capscrews from overhead guard rear legs and frame. See Figure 19.



1. OVERHEAD GUARD REAR LEG
2. CAPSCREW
3. FRAME
4. OVERHEAD GUARD FRONT LEG
5. HANDLE

Figure 19. Overhead Guard

4. Remove dash and kick panel from cowl. See Hood, Seat, and Side Covers Replacement for removal procedures.
5. Remove capscrews from overhead guard front legs and frame. See Figure 19.

NOTE: When 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.

6. Using lifting device, remove overhead guard from frame. See Figure 19.
7. Remove capscrews and handle from overhead guard. See Figure 19.

INSTALL

NOTE: Make sure electrical wires are routed as noted during removal to ensure that wires do not get pinched.

1. Using lifting device, install overhead guard onto frame.
2. Install capscrews onto overhead guard front legs and frame. See Figure 19. Tighten capscrews to 66 N•m (49 lbf ft).
3. Install kick panel and dash onto cowl. See for install procedures.
4. Install capscrews onto overhead guard rear legs and frame. See Figure 19. Tighten capscrews to 66 N•m (49 lbf ft).
5. Connect electrical wires as tagged during removal.
6. Install handle and capscrews onto overhead guard. See Figure 19.

Rain Top (Optional)

Remove

1. Remove two capscrews, two locknuts, two bushings and two washers from bracket and rain top at front center of overhead guard. See Figure 20.
2. Remove two capscrews, two locknuts, two bushings and two washers from bracket and rain top at front corners of overhead guard. See Figure 20.

3. Remove two capscrews, two wheel nuts and two brackets from front center of overhead guard. See Figure 20.
4. Remove two capscrews, two wheel nuts, right bracket and left bracket from front corner of overhead guard. See Figure 20.

NOTE: Note position of rain top on overhead guard before removal.

5. Remove rain top from overhead guard. See Figure 20.

Clean and Inspect

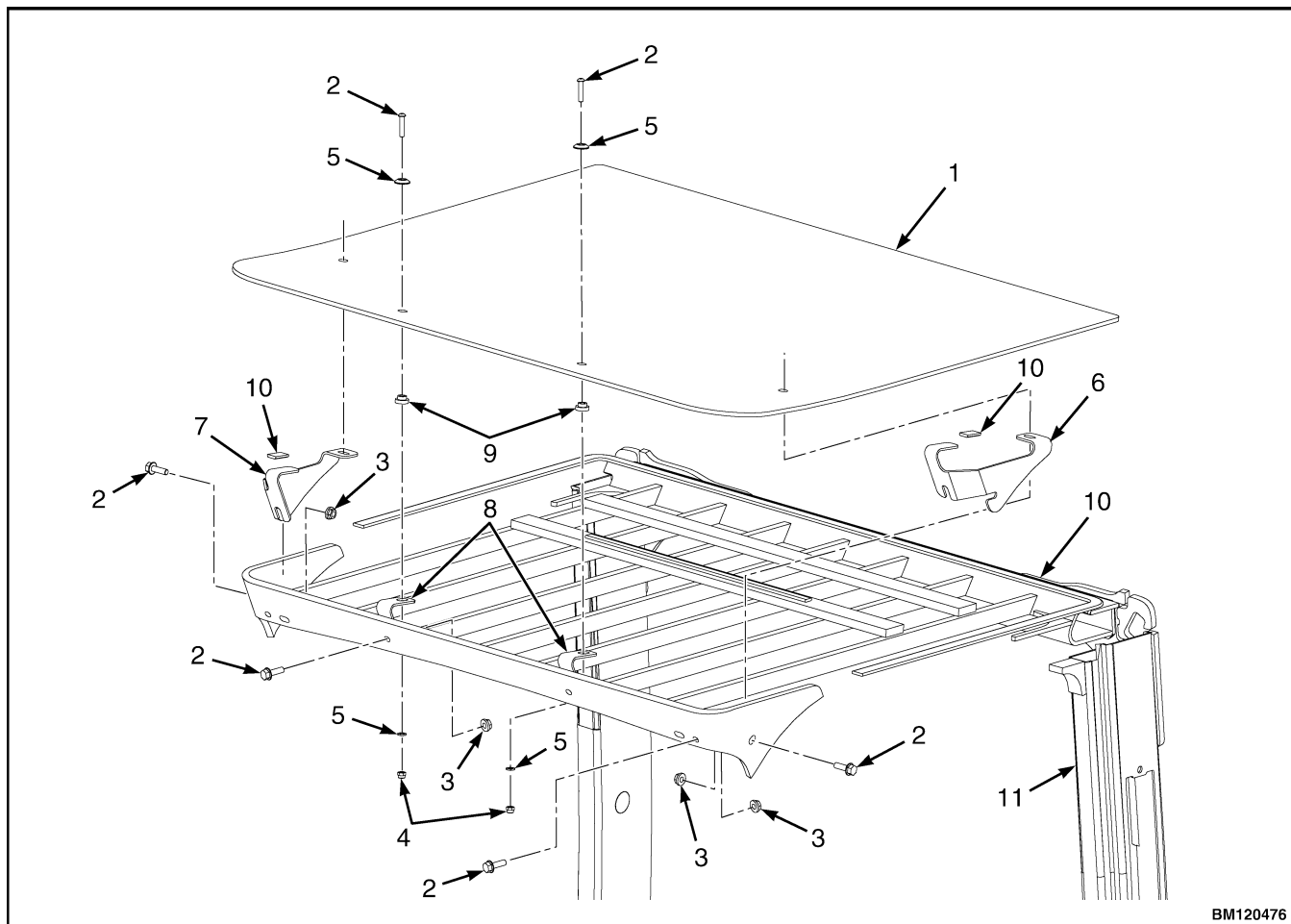
1. Clean all remaining sealer residue from rain top and overhead guard surfaces.
2. Inspect rain top and brackets for cracks. Replace if necessary.

Install

1. Apply a continuous bead of sealer to back corners of overhead guard. See (item 10) Figure 20.

NOTE: Apply even pressure to rain top to squeeze down sealer to a thickness of 3 to 5 mm (0.118 to 0.197 in.).

2. Install rain top onto overhead guard as noted during removal.
3. Install right bracket, left bracket two capscrews, two wheel nuts, onto front corner of overhead guard. See Figure 20.
4. Install two brackets, two capscrews, and two wheel nuts to front center of overhead guard. See Figure 20.
5. Install two capscrews, two bushings, two washers and two locknuts onto bracket and rain top at front corners of overhead guard. See Figure 20.
6. Install two capscrews, two bushings, two washers and two locknuts onto bracket and rain top at front center of overhead guard. See Figure 20.



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- 1. RAIN TOP
- 2. CAPSCREW
- 3. WHEEL NUT
- 4. LOCKNUT
- 5. WASHER
- 6. LEFT BRACKET

- 7. RIGHT BRACKET
- 8. CENTER BRACKET
- 9. BUSHING
- 10. SEALER
- 11. OVERHEAD GUARD

Figure 20. Overhead Guard Rain Top

Operator Restraint System Replacement

DESCRIPTION

The seat belt, hip restraint brackets, seat and mounting, hood, and latches are all part of the operator restraint system. Each item must be checked to make sure it is attached securely, functions correctly, and is in good condition. See Figure 21.

Emergency Locking Retractor (ELR)

When the ELR style seat belt is properly buckled across the operator, the belt will permit slight operator repositioning without activating the locking mechanism. If the truck tips over, travels off a dock, or comes to a sudden stop, the locking mechanism will be activated and hold the operator's lower torso in the seat.

A seat belt that is damaged worn or does not operate properly will not provide protection when it is needed. The end of the belt must fasten correctly in the latch.

The seat belt must be in good condition. Replace the seat belt if it is damaged or worn. See Figure 21.

NOTE: The following seat belt operation checks must be performed three times before replacing the seat belt assembly:

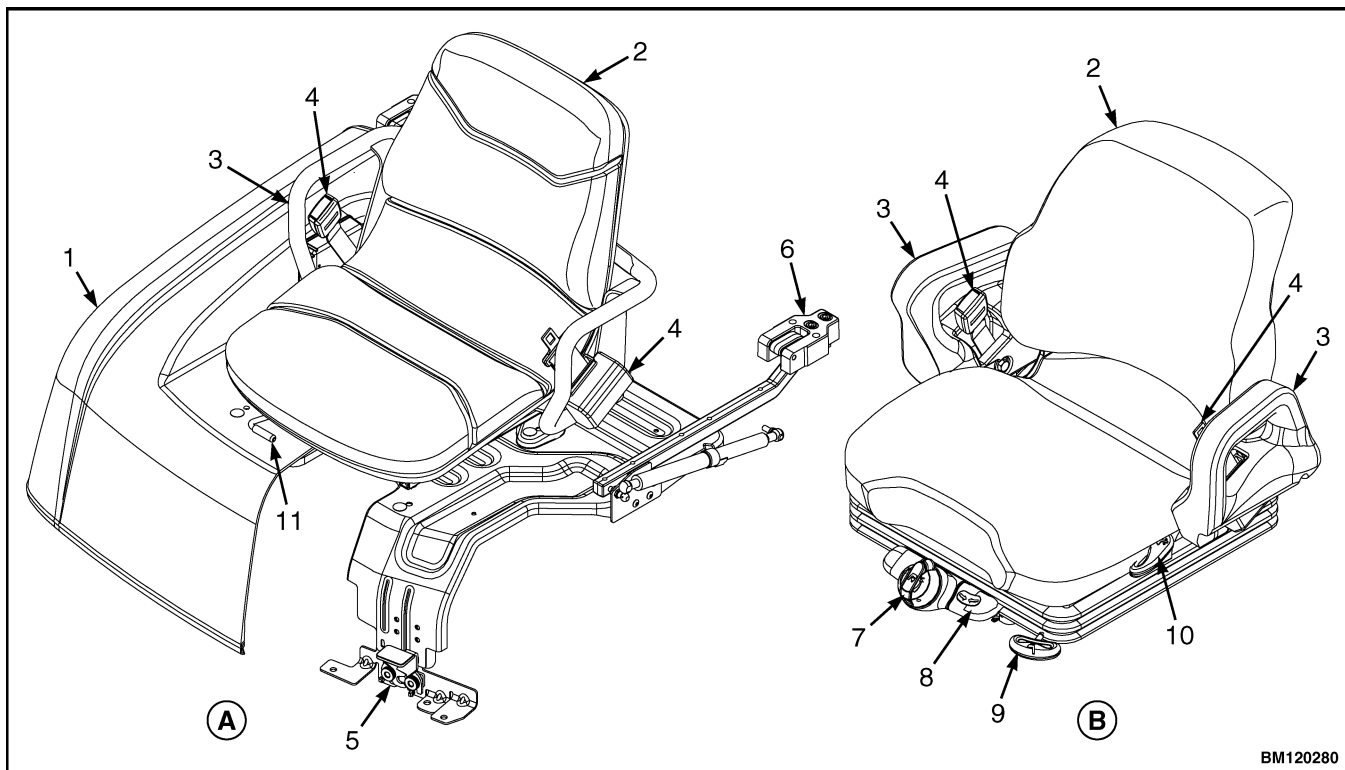
- With the hood closed and in the locked position, pull the seat belt slowly from the retractor assembly. Make sure the seat belt pulls out and retracts smoothly. If the seat belt does not pull out of the retractor assembly, the internal latch may be locked. Pull firmly on the seat belt and hold for a moment to remove slack from the belt in the retractor. Release the seat belt. Seat belt will retract and the internal latch will unlock. If the seat belt cannot be pulled from the retractor assembly or the belt will not retract, replace the seat belt assembly.
- With the hood closed and in the locked position, pull the seat belt with a sudden jerk. Make sure the seat belt will not pull from the retractor assembly. If the

seat belt can be pulled from the retractor, when it is pulled with a sudden jerk, replace the seat belt assembly.

- With the hood in the open position, make sure the seat belt will not pull from the retractor assembly. If the seat belt can be pulled from the retractor, with the hood in the open position, replace the seat belt assembly.

Make sure the seat rails and hood latch are not loose. The seat rails must lock securely in position but move freely when unlocked. The seat rails must be securely attached to the mounting surface. The hood must be fully closed. Lift the hood to make sure it is closed and will not move.

Adjust hood and hood latch when any of the parts of the operator restraint system are installed or replaced. See the section Hood, Seat, and Side Covers Replacement in this manual for the adjustment procedures for the hood.



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A. NON-SUSPENSION SEAT

1. HOOD
2. SEAT
3. HIP RESTRAINT
4. SEAT BELT
5. LATCH
6. HOOD HINGE

B. FULL-SUSPENSION SEAT

7. WEIGHT ADJUSTMENT KNOB
8. RIDE POSITION INDICATOR
9. FORWARD/BACKWARD ADJUSTMENT LEVER
10. BACKREST ADJUSTMENT LEVER
11. SEAT RAIL

Figure 21. Operator Restraint System

Engine Replacement

REMOVE

LPG Engine



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 the section Periodic Maintenance 8000 YRM 1424.



WARNING

Always disconnect the cables at the battery before you make repairs to the engine. Disconnect the cable at the negative terminal first.



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 equipments, or ignition source.

1. Close the shutoff valve on the LPG tank and run engine until all fuel is gone and engine stops.
2. For removal of the LPG Tank, see service manual **LPG Fuel System, Mazda FE and F2 Emission Compliant Engines** 900 YRM 1326 for the procedures.

3. Remove overhead guard. See section Overhead Guard Replacement for procedures.

4. Remove the floor mat and floor plate.



WARNING

DO NOT remove the radiator cap from the radiator when the engine is hot. When the radiator cap is removed, the pressure is released from the system. If the system is hot, the steam and boiling coolant can cause burns.

5. Let coolant cool to ambient temperature. Place a drain pan with a capacity greater than the capacity of the cooling system under radiator. Remove radiator cap.



CAUTION

Disposal of lubricants and fluids must meet local environmental regulations.

6. Open the drain plug or disconnect the bottom radiator hose to drain coolant from radiator and engine. See Figure 23.
7. Remove the hood and seat combination and rear side covers. See the section Hood, Seat, and Side Covers Replacement for procedures.
8. Disconnect the ground strap from the frame and remove the power distribution module (PDM) from the battery tray. See Figure 24.
9. Remove battery and battery tray from lift truck as described in the steps below:
 - a. Remove cap, flange nut, and lockwasher from battery lockdown bar. See Figure 24.
 - b. Disengage battery lockdown bars and remove bar from top of battery. See Figure 24.
 - c. Remove battery from battery tray. See Figure 24.
 - d. Remove three capscrews and battery tray from frame. See Figure 24.

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