

# NR35-40DA, NDR30DA (A295) SERVICE MANUAL CONTENTS

SECTION	PART NUMBER	YRM NUMBER	REV DATE
FRAME.....	524233333	0100 YRM 1185	03/11
AC MOTOR REPAIR.....	524233334	0620 YRM 1186	08/09
MASTER DRIVE UNIT.....	524166250	0630 YRM 1022	08/09
STEERING SYSTEM.....	524233332	1600 YRM 1187	09/09
BRAKE SYSTEM.....	524233335	1800 YRM 1188	07/13
HYDRAULIC SYSTEM.....	524287793	1900 YRM 1307	09/09
<b>TROUBLESHOOTING AND ADJUSTMENTS USING THE AC CONTROLS PROGRAM.....</b>			
	524183085	2200 YRM 1058	04/11
ELECTRICAL SYSTEM.....	524233338	2200 YRM 1191	11/08
SUPERVISOR INTERFACE - STANDARD.....	524233339	2200 YRM 1192	11/12
TECHNICIAN INTERFACE - STANDARD.....	524233340	2200 YRM 1193	11/12
SUPERVISOR INTERFACE - PREMIUM.....	524260263	2200 YRM 1240	11/08
TECHNICIAN INTERFACE - PREMIUM.....	524260264	2200 YRM 1241	11/08
AC MOTOR CONTROLLERS/DISPLAY PANEL.....	524287794	2200 YRM 1308	10/10
INDUSTRIAL BATTERY.....	524158040	2240 YRM 0001	09/14
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MAST DESCRIPTION.....	524233341	4000 YRM 1194	07/13
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Service information for Cummins diesel engines can be ordered through the Hyster Literature Distribution Center.

**PART NO. 524287792 (09/14)**

# 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 **YALE 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:

NDR035EA, NR045EA [C861];  
 NDR030EA, NR035/040EA [D815];  
 NDR030DA, NR035/040DA [A295]



## General



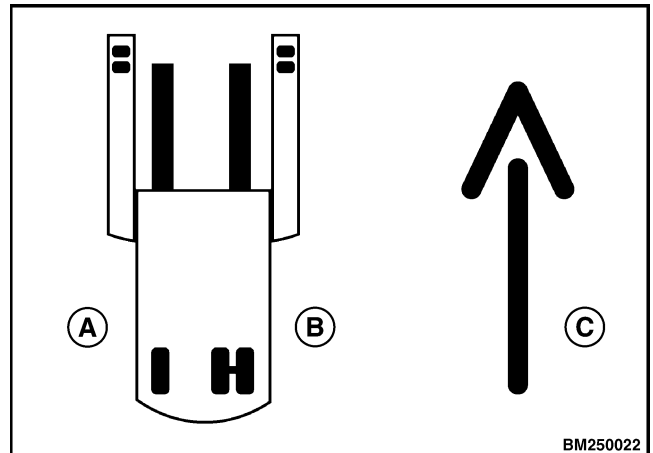
### WARNING

**DO NOT** make repairs or adjustments unless you have been properly trained and specifically 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, disconnect the battery and attach a **DO NOT OPERATE** tag to the control handle.

This section contains descriptions of the frame components, repair procedures, and assembly information. These components include the frame weldment, door, floor plate, and covers. The overhead guard and base arms are also covered in this section.

Throughout this section, forward will refer to travel in the direction of the forks, and left and right will be from the perspective of an operator in the operator compartment facing the forks. See Figure 1.



A. LEFT  
B. RIGHT

C. FORWARD

*Figure 1. Travel Orientation*

## Description

The frame is available in two sizes: small chassis and large chassis. The small chassis is used for the NDR030DA, NR035/040DA, NDR030EA, and NR035/040EA unit and uses a smaller drive unit. The small chassis frame is available with a 368.3 mm (14.5 in.) or 419.1 mm (16.5 in.) battery compartment width. The large chassis is used for the NDR035EA and NR045EA unit and uses a larger drive unit. The large chassis frame is available with a 419.1 mm (16.5 in.), 469.9 mm (18.5 in.), or 546.1 mm (21.5 in.) battery compartment width.

The frame has mounts for the following parts:

- Mast Assembly
- Steering System Parts

- Electrical System Parts
- Hydraulic System Parts
- Door, Floor Plate, Access Panels, and Covers

The overhead guard fastens to the mast. A rear operator guard leg provides protection for the operator and unobstructed operation of the lift truck. The operator guard leg fastens between the overhead guard and the frame. Repair procedures for major components that fasten to the frame are in separate sections. See each section for the system that has the part to be repaired.

## Repairs - General

Repair is seldom required on the frame unless the truck has been structurally damaged. Most truck repairs involve removing the system parts that attach to the frame. Refer to the appropriate section for the system that needs repair. To separate the mast from the frame, refer to the sections **Mast, Repair** 4000 YRM 1195 and **Reach Carriages** 4500 YRM 1196.

To replace the load wheels in the base arms, see the section **Periodic Maintenance** 8000 YRM 1197 or Load Wheels in this section.

The caster wheel assembly is part of the steering assembly. See the section **Steering System** 1600 YRM 1187 to replace the caster wheel assembly or the caster wheels.

To replace the drive wheels or tires, see the section **Periodic Maintenance** 8000 YRM 1197.

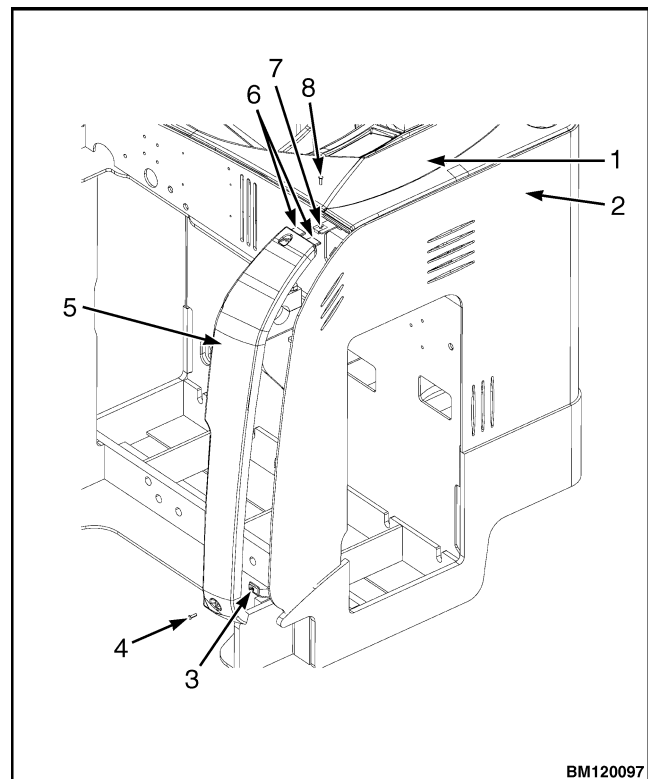
## Covers, Panels, and Plates

### FRONT FRAME PANEL (LEFT AND RIGHT)

Remove the screws from the upper and lower ends of the front frame panel. Pull the lower end of the panel away from the frame of the lift truck and gently work up the side of the panel to pull it from the retainer clips securing the panel to the frame. Pull the top end tabs out of the operator compartment cover. Repeat for opposite side as necessary. See Figure 2.

**NOTE:** On right-side, front frame panels, ensure the diagnostic connector cap is positioned correctly to allow the cover to seat properly.

To install the panel, position the upper end of the panel partially into the retaining clip on the frame. Insert the tabs on the upper end of the panel into the slots in the operator compartment cover. Work the sides of the panel into the retaining clips until all areas of the panel are aligned with the frame. Align the holes in the panel with the mounting brackets on the frame and loosely install the screws into the upper end and lower end of the panel. Make certain the panel is seated correctly against the frame and tighten the screws to secure in place. See Figure 2.

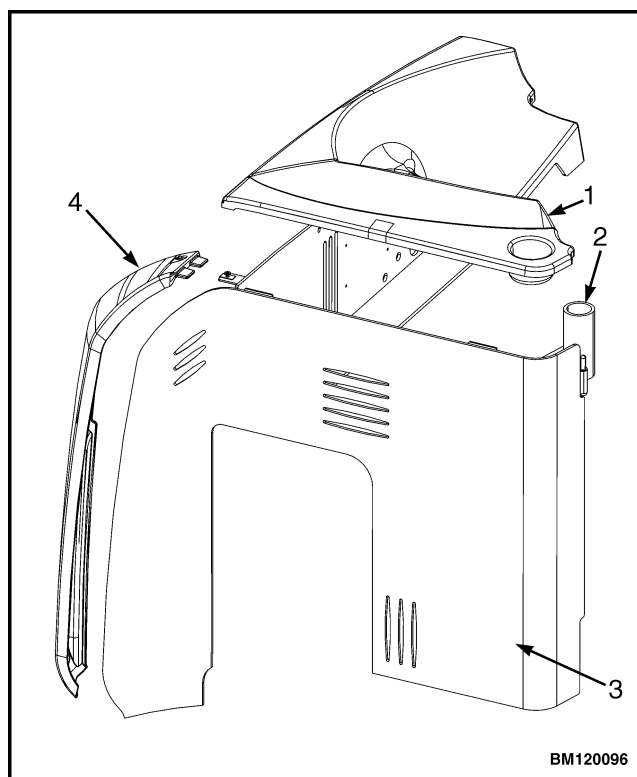


1. OPERATOR COMPARTMENT COVER
2. FRAME
3. LOWER BRACKET
4. LOWER SCREW
5. FRONT COVER PANEL (LEFT)
6. TABS
7. UPPER BRACKET
8. UPPER SCREW

**Figure 2. Front Frame Panel (Left Side)**

## OPERATOR COMPARTMENT COVER

Remove the front frame panels from the lift truck. See Front Frame Panel (Left and Right). Remove the two screws securing the operator cover to the frame brackets. One is located on the lower right side of the operator compartment above the operator presence switch. The other is located beside the overhead guard post mount, at the bottom of the cup holder. Pull the operator compartment cover up from the front right corner. Continue pulling the cover up along the edge of the frame in both directions until the cover is free from the retaining clips. See Figure 3. To install, position the cover over the electrical compartment. Align the lip of the cover to the retaining clips. Press the lip of the cover into the retaining clips starting at the overhead guard post and continue around until completely seated. Align the holes in cover with the mounting brackets and install retaining screws as removed. Install the front frame panels to complete assembly. Refer to Front Frame Panel (Left and Right).



1. OPERATOR COMPARTMENT COVER
2. RETAINING SCREW
3. FRAME
4. FRONT COVER PANEL (LEFT)

**Figure 3. Operator Compartment Cover**

## DRIVE UNIT COMPARTMENT DOOR

Completely loosen the two socket head capscrews securing the drive unit compartment door closed. The screws are spring-loaded and are retained to the door by clips. Pull the door open on its hinges. To close, push the door closed and start both socket head capscrews loosely into the mounting holes. When both screws are started, verify that the door seats properly against the frame and tighten the screws.

## DOOR PAD

Open compartment door and remove the seven capscrews holding the pad to the door. Lift the pad over the steering mechanism and remove.

To install the pad, lower it over the steering mechanism and position it onto the door. Install the seven socket head capscrews as removed.

## OPERATOR BACK PAD

### Side-Stance Models

Remove the five socket head capscrews retaining pad to the adjuster mechanism and remove the pad.

To install, position the back pad onto the adjuster mechanism and loosely install the five socket head capscrews as removed. Verify that the back pad seats properly to the adjuster mechanism and tighten to secure as removed.

### Forward-Stance Models

**NOTE:** On models with Aft Travel controls, guide the aft travel control handle wiring harness into/out of the frame when installing/removing the operator back pad.

Remove the operator compartment cover to access the screw securing the front of the operator back pad to the frame. Remove the two screws securing the operator back pad to the frame and remove the pad from the frame.

To install, position the back pad against the frame as removed. Install the two screws securing pad to frame as removed, and reinstall the operator compartment cover.

### OPERATOR FRONT PAD

Remove the operator compartment cover from the lift truck. See Operator Compartment Cover. Remove the screws securing the pad brackets to the frame. Pull the top of the pad away from the frame and then lift the pad from the lower retaining clips.

To install, position the lower pad brackets into the retaining clips. Position the upper end of the pad to the frame. Align the pad bracket holes and install the screws to secure the pad in place. Install the operator compartment cover in place.

### CASTER WHEEL COVER

Remove the two socket head capscrews on top of the caster wheel cover and lift cover from the clips securing it to the frame.

To replace, fit the bottom of the cover into the clips inside the opening and slide the cover into place. Install two socket head capscrews to secure the top of the cover in place.

## Load Wheels

### REMOVE

Slightly raise the base arms and support on blocks as described in the **Periodic Maintenance 8000 YRM 1197**. Make sure the base arms and load wheels do not support any weight.

1. Remove the nut, washers, and axle bolt. See Figure 4.
2. Remove the load wheels from the hanger brackets.

3. Remove the axle sleeves and bearings from the load wheels. Check for wear or roughness as the bearings are rotated. Replace both bearings if wear or roughness is noted. Inspect the load wheels for damage or wear. Replace as necessary.

 **CAUTION**

Use a hammer and a soft punch when removing bearings to avoid damage to bearings and/or load wheel.

4. Remove the hanger bracket from the base arms and inspect thoroughly. Inspect the base arms thoroughly for damage.

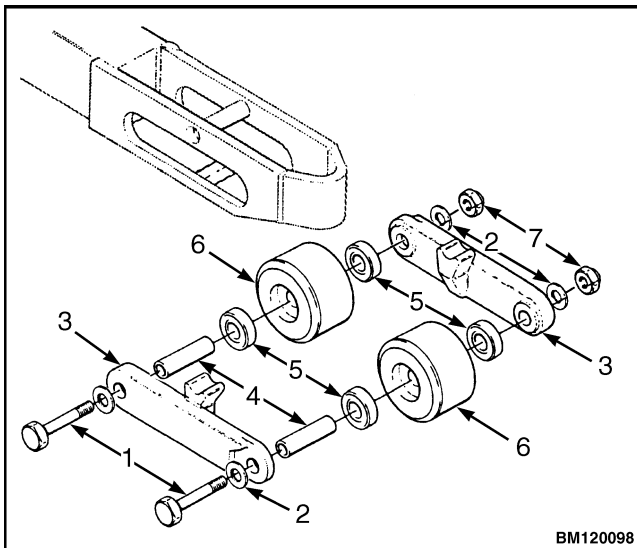
### INSTALL

 **WARNING**

Cleaning solvents can be flammable and toxic and can cause skin irritation. Wear protection when handling solvents and always follow the recommendations of the manufacturer.

 **CAUTION**

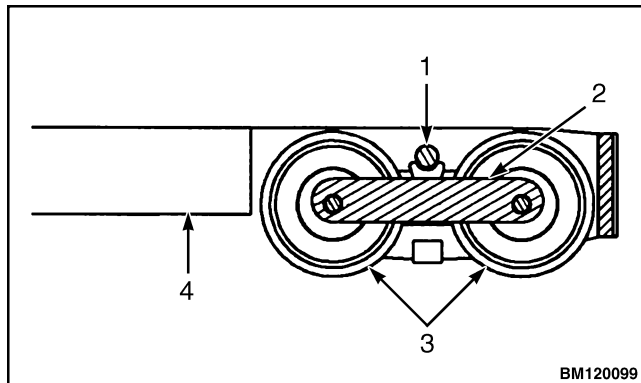
1. Clean all parts with solvent and inspect thoroughly. Replace damaged parts as necessary.
2. Apply lithium grease to the pivot contact on the hanger brackets. Position the hanger brackets into the base arms and install the load wheels and axle sleeves into the hanger brackets. See Figure 5.



- |                    |                |
|--------------------|----------------|
| 1. AXLE BOLT       | 4. AXLE SLEEVE |
| 2. WASHER          | 5. BEARING     |
| 3. HANGER BRACKETS | 6. LOAD WHEEL  |
|                    | 7. NUT         |

**Figure 4. Load Wheels**





1. PIVOT CONTACT
2. HANGER BRACKET
3. LOAD WHEELS
4. BASE ARM

*Figure 5. Hanger Bracket Pivots*



### CAUTION

The bearings are replaced by pressing on the outer race of the bearing only. Pressing or tapping on the inner race will damage the bearing. Use a suitable driver when installing bearings to avoid damage to bearings and/or load wheel.

Replace bearings in sets to maintain proper wheel loading and operation.

**NOTE:** Load wheel assemblies that have axle bolts equipped with lube fittings use side-shielded bearings and must be greased. Assemblies with axle bolts not

equipped with lube fittings use sealed bearings and cannot be greased.

3. Install the bearings into the load wheels.
  - a. **Sealed Bearings** - Install the bearings into the load wheel assemblies. Position the axle sleeve into the assembly. Apply antiseize lubricant to the axle bolt.
  - b. **Side-Shielded Bearings** - Install one bearing into the load wheel with the shielded side facing out. Fill the cavity inside of the load wheel with grease. Install the other bearing into the load wheel with the shielded side facing out. Position the axle sleeve into the assembly.
4. Apply grease to the pivot contact on the hanger brackets. Position the hanger brackets into the base arms and install the load wheels and axle sleeves into the hanger brackets.
5. Install a washer onto the axle bolt. Install the axle bolt through the hanger brackets, bearings, and axle sleeve with the threads to the inside of the base arms.
6. Install washers and nuts to the axle bolts. Torque to 68 N•m (50 lbf ft).

**NOTE:** If axle shafts are equipped with lube fittings, grease to fill load wheel cavity. Refer to **Periodic Maintenance** 8000 YRM 1197 for regularly scheduled maintenance procedures.

## Overhead Guard Replacement



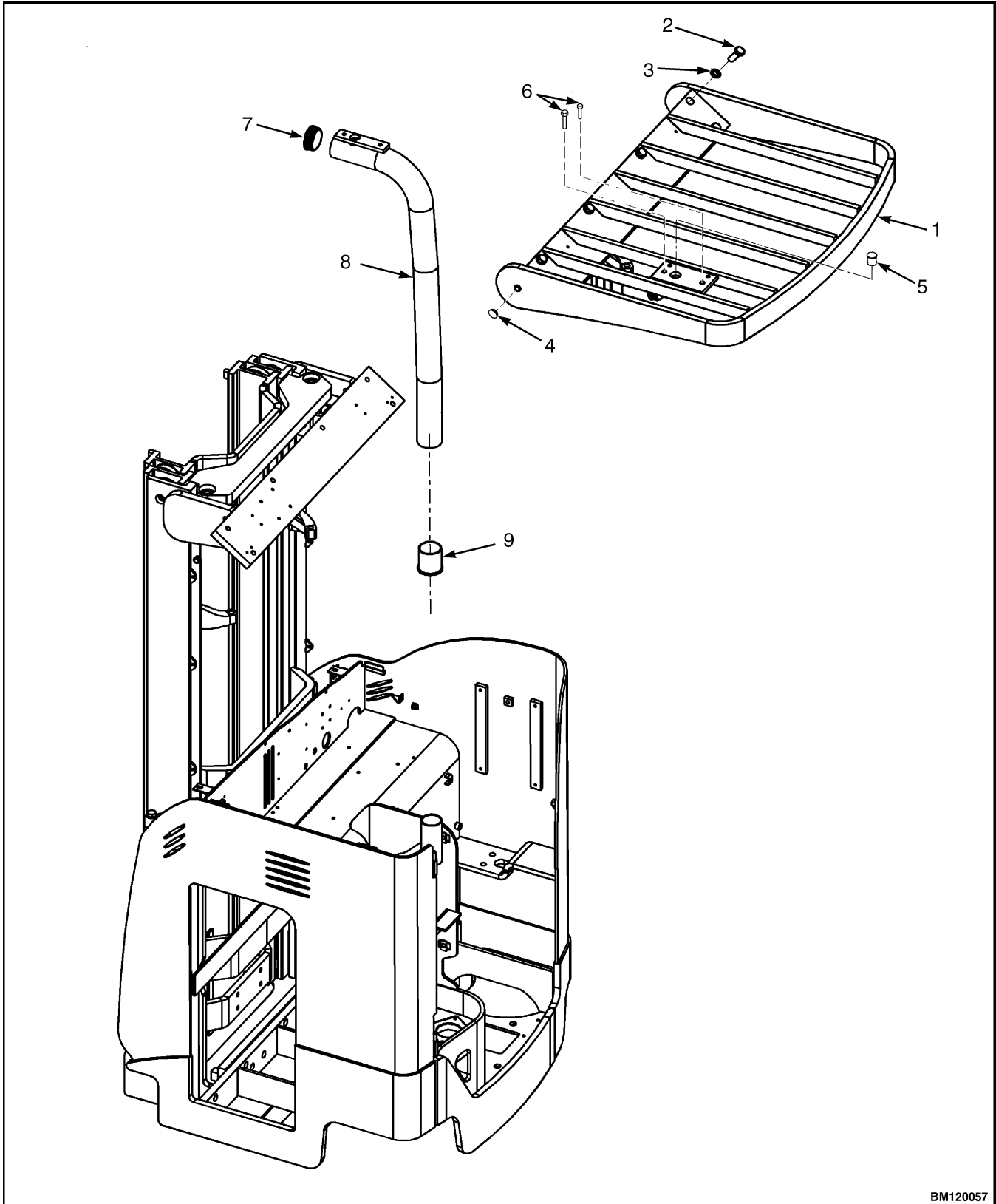
### WARNING

DO NOT weld mounts for lights or accessories to the overhead guard. The strength of the overhead guard can be reduced by welding or heating.

Install lights and accessories or their mounts with clamps. The strength of the overhead guard can be reduced if holes are drilled in the wrong location or are too large. Contact your lift truck dealer before welding or drilling holes in any part of the overhead guard.

The overhead guard assembly is heavy. Be sure that all lifting devices (hoists, cables, chains, slings, etc.) are suitable and of adequate capacity to lift the overhead guard.

The overhead guard assembly consists of the overhead guard and a support post. See Figure 6 and Figure 7. The overhead guard is attached to the mast with six capscrews (2) and lockwashers (3). The top of the support post is bolted to the overhead guard. The bottom of the post fits into a retainer in the drive unit compartment.

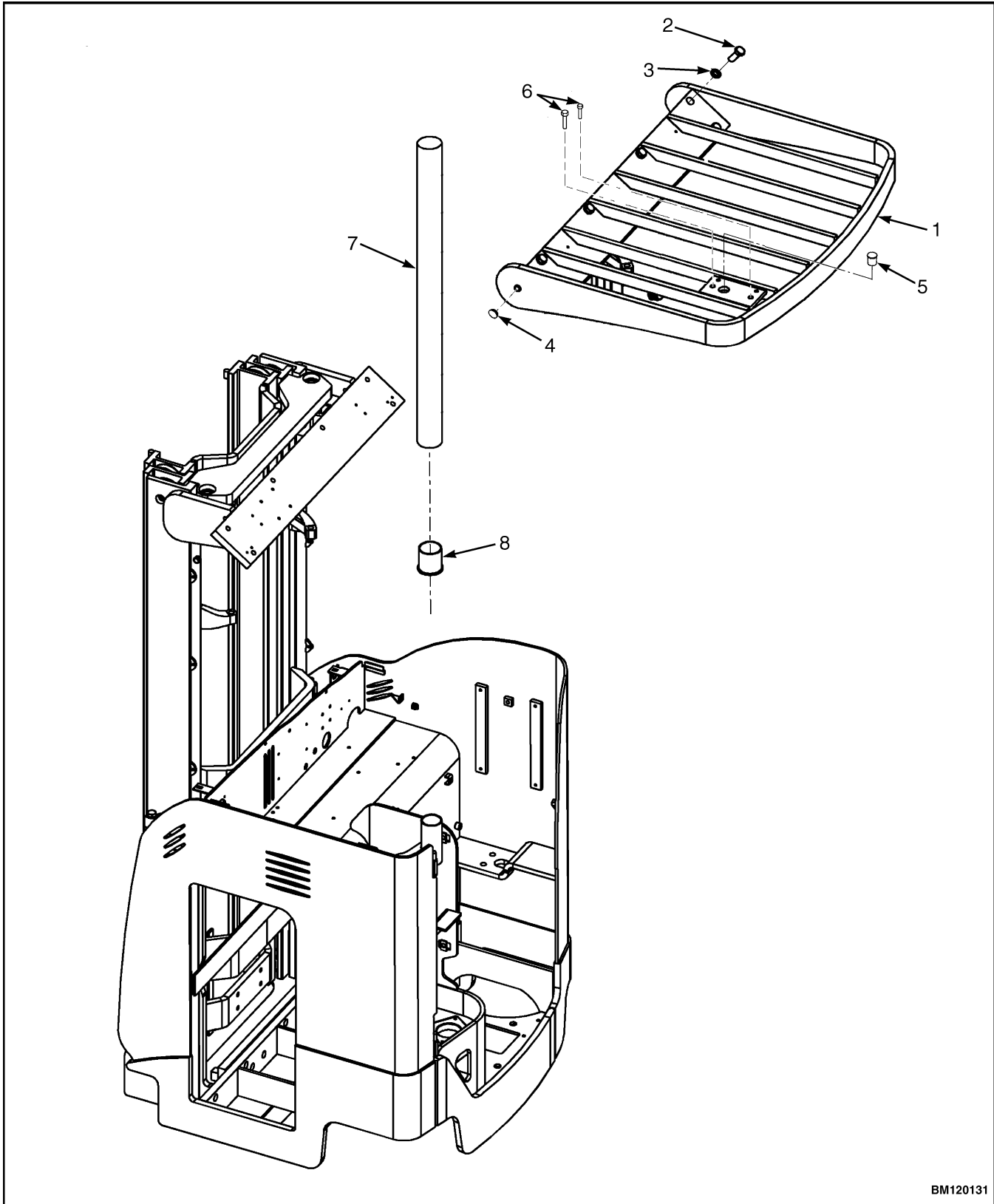


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Figure 6. Overhead Guard (NDR035EA, NR045EA, NDR030EA, NR035/040EA)

***Legend for Figure 6***

- |                          |                 |
|--------------------------|-----------------|
| 1. OVERHEAD GUARD        | 6. CAPSCREW     |
| 2. CAPSCREW              | 7. PLUG         |
| 3. LOCKWASHER            | 8. SUPPORT POST |
| 4. PLUG (W/O HEAD LAMPS) | 9. BUSHING      |
| 5. CAPSCREW              |                 |



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Figure 7. Overhead Guard (NDR030DA, NR035/040DA)

**Legend for Figure 7**

1. OVERHEAD GUARD
2. CAPSCREW
3. LOCKWASHER
4. PLUG (W/O HEAD LAMPS)

The size of the overhead guard varies depending upon the battery compartment size.

**REMOVE**

Refer to **WARNING** (above) before performing service to any overhead guard components.

1. Attach a suitable lifting device to the overhead guard.
2. Remove the two capscrews (6) retaining the support post to the overhead guard. See Figure 6. Pull the support post out of the retainer in the lift truck frame. Remove the support post.
3. Remove the six capscrews (2) and lockwashers (3) retaining the overhead guard to the mast. Lower the overhead guard to the floor.

**INSTALL**

Refer to **WARNING** (above) before performing service to any overhead guard components.

1. Attach a suitable lifting device to the overhead guard.
2. Align the overhead guard with the top of the mast and install the six capscrews (2) and lockwashers (3). See Figure 6. Torque the capscrews to 149 N•m (110 lbf ft).
3. Slide the support post into the retainer in the lift truck frame. Install the two capscrews (6) retaining the support post to the overhead guard.

**FRONT LIGHTS**

Two front (head) lights are mounted by their brackets to the front of the overhead guard.

**Bulb Replacement**

1. Remove the four screws securing the lens retainer and lens to the assembly. Hold the lens in place

5. CAPSCREW
6. CAPSCREW
7. SUPPORT POST
8. BUSHING

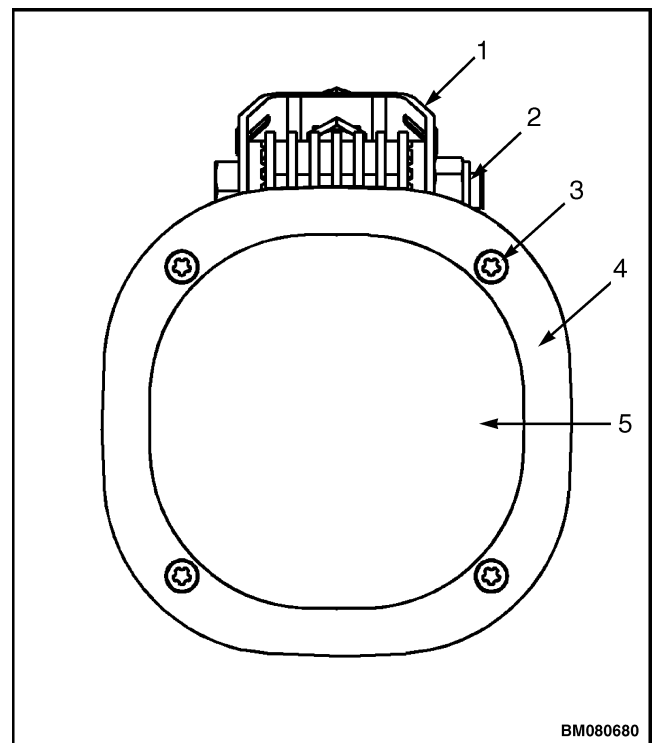
until all screws have been removed then remove the lens and retainer. Replace as required. See Figure 8.

2. Remove the bulb from the fixture and replace with new.

**CAUTION**

**Overtightening the screws can break the lens.**

3. Position the lens and the retainer to the fixture and install the four screws.

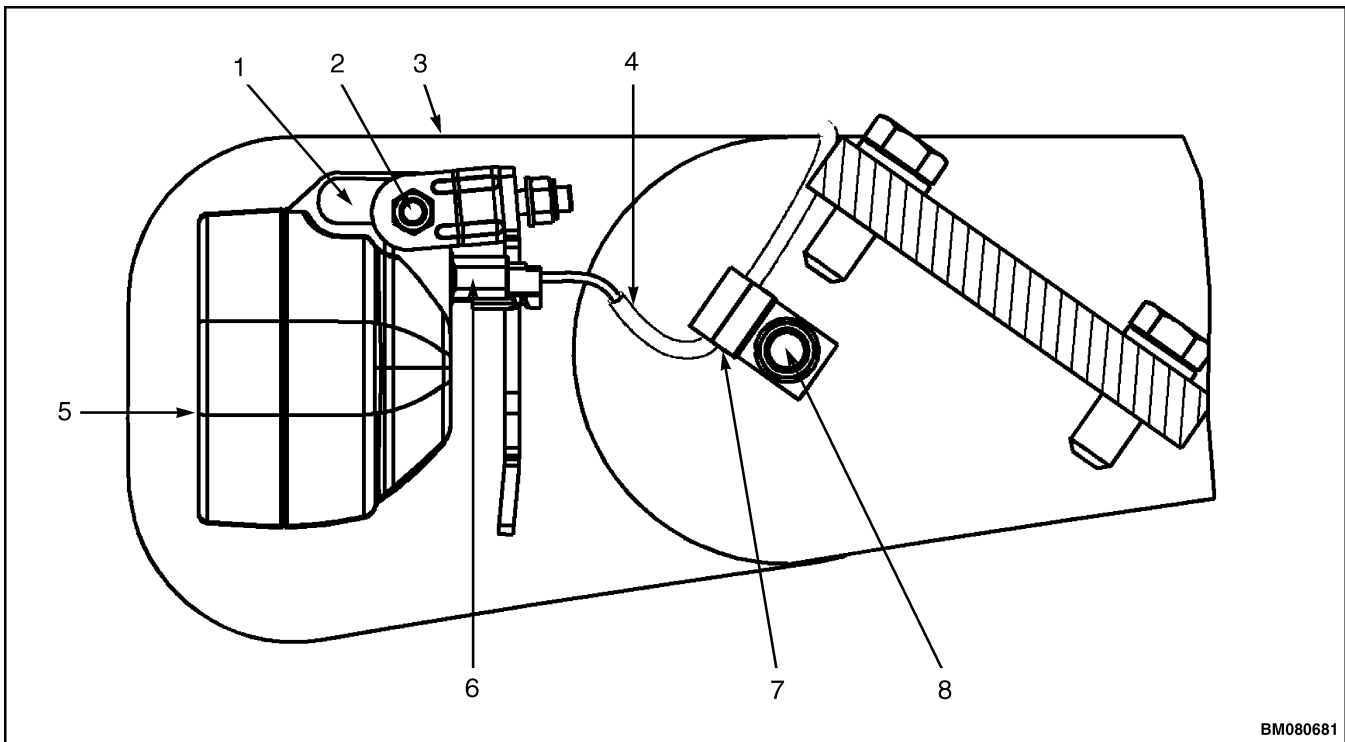


1. BRACKET
2. RETAINING CAPSCREW AND NUT
3. SCREW
4. LENS RETAINER
5. LENS

**Figure 8. Lens Removal**

**Assembly Replacement**

1. Disconnect the wiring harness from the light assembly connector.
2. Remove the nut and washers from the capscrew securing the headlight assembly to the bracket. Slide the capscrew from the bracket and remove the headlight. See Figure 9.
3. Remove the bracket from the overhead guard and replace, if necessary.
4. Install bracket to overhead guard, if removed.
5. Position the light assembly to the bracket and install capscrew and attaching hardware. Tighten slightly to allow for adjustment.



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- |                    |                       |
|--------------------|-----------------------|
| 1. ADJUSTMENT SLOT | 5. HEADLIGHT          |
| 2. ADJUSTMENT BOLT | 6. CONNECTOR          |
| 3. OVERHEAD GUARD  | 7. WIRE CLAMP         |
| 4. WIRING HARNESS  | 8. ATTACHING HARDWARE |

**Figure 9. Head Light Mounting**

## Rear Work and Caution Light

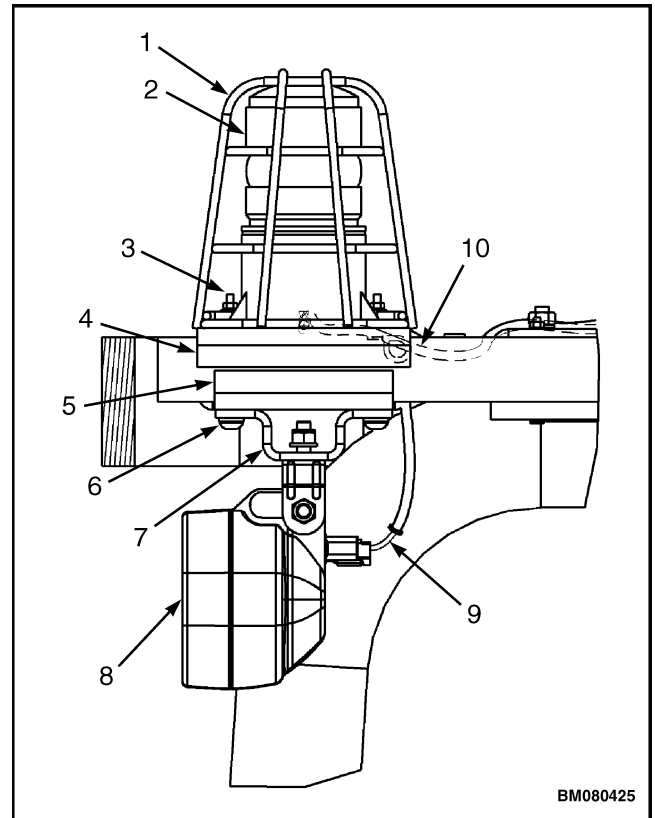
The rear work and caution lights are options that mount to the overhead guard near the rear of the truck. Several configurations of these assemblies are available and connect to the options harness. To repair the light assemblies, perform the following procedures. Some repairs may not require total disassembly. Perform only the steps necessary to safely complete the required service. See Figure 10.

The work light is very similar to the front light, except for its mounting platform and location. To repair or replace the work light, refer to the instructions for repairing or replacing the front lights. See Front Lights.

### Caution Light

1. Move the lift truck to a safe, level area and completely lower the mast. Turn the key switch to the **OFF** position and attach a **DO NOT OPERATE** tag to the control handle. Block the drive wheel to prevent unexpected movement.
2. Disconnect the battery power cable connector from the truck connector located on the right side of the frame. Pull the battery cable connector handle to separate the battery connector from the truck connector.
3. Remove the nuts securing the cage to the light assembly. Remove the cage.
4. Remove the screws and washers securing the lens globe to the light assembly. Remove the lens globe.
5. Remove the bulb from the fixture and replace if necessary.
6. Connect the battery and turn the key switch to the **ON** position. Test for proper operation.
7. Position the lens globe to the light assembly. Install screws to secure.
8. Position the cage onto the studs of the light assembly. Install nuts and washers onto studs.

9. Remove blocks from the wheel and return to service.



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1. CAGE
2. GLOBE
3. STUDS AND NUTS
4. UPPER MOUNTING FLANGE
5. LOWER MOUNTING FLANGE
6. SCREW
7. MOUNTING BRACKET
8. WORK LIGHT WITH ADJUSTABLE BRACKET
9. WORK LIGHT WIRING HARNESS
10. STROBE WIRING HARNESS

**Figure 10. Rear and Caution Light**

## Painting Instructions



### WARNING

Some frames and components are painted with polyurethane paint. Welding, burning, or other heat sufficient to cause thermal decomposition of the paint may release isocyanates. These chemicals are allergic sensitizers to the skin and respiratory tract irritants. Overexposure may occur without odor warning. When heat must be applied, use good industrial hygiene practices, including removal of all paint (prime and finish coats) to the metal around the area to be heated. Use local ventilation, and/or supplied, air-respiratory protection.

Cleaning solvents may be flammable and/or toxic and may cause skin irritation. Always wear proper eye and skin protection.

Always use solvents and paints in an area with adequate ventilation. **DO NOT** use solvents or paints near heat, fire, or electrical equipment that can make sparks. Follow the paint manufacturer's instructions and precautions.



### CAUTION

**DO NOT** put tape on cylinder rods to protect from paint. Use a thick layer of multipurpose grease to protect cylinder rods. Cylinders can be damaged if operated with tape on the cylinder rod.

1. Clean the surface to be painted. Use a solvent on surfaces to be painted to remove grease and oil before sanding. **DO NOT** use solvent to clean new paint. Make sure all oil and grease is removed.

2. Use sandpaper to remove the top surface of paint and rust from the metal. All metal surfaces where the paint has been removed to the bare metal must be primed. Apply primer **BEFORE** applying the paint.
3. Protect all surfaces that will not be painted. **DO NOT** paint:
  - All Plastic Covers
  - Steering Handle
  - Dash Display
  - Control Handles
  - Labels and Information Plates
  - Operator Pads
  - Tires and Load Wheels
  - Chains and Hoses
  - Battery Connectors
  - All Switches
  - Cylinder Rods
  - Pumps and Motors
  - Wiring Harnesses or Connectors



### CAUTION

**Protect electrical components, wiring, and electrical contacts from overspray.**

4. Paint the surfaces using Yale approved paints. Follow the proper paint scheme for your lift truck model (refer to the **Parts Manual** for specific information on paint for your lift truck).
5. Install new safety labels. See Safety Labels Replacement.



## Safety Labels Replacement



### WARNING

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

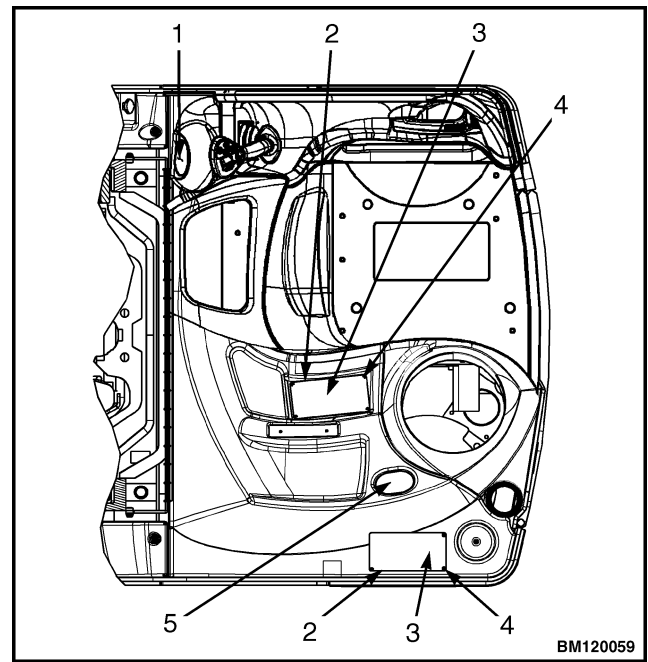
**DO NOT** add to or modify the lift truck. Any change to the lift truck, the tires, or its equipment can change the lifting capacity. The lift truck must be rated as equipped and the nameplate must show the new capacity rating. Contact your lift truck dealer for a replacement nameplate.

Cleaning solvents can be flammable and toxic and can cause skin irritation. When using cleaning solvents, always follow the recommendations of the manufacturer.

If an adhesive plate or label must be replaced, use the following procedure to install a new label or plate. See Figure 11 and Figure 12.

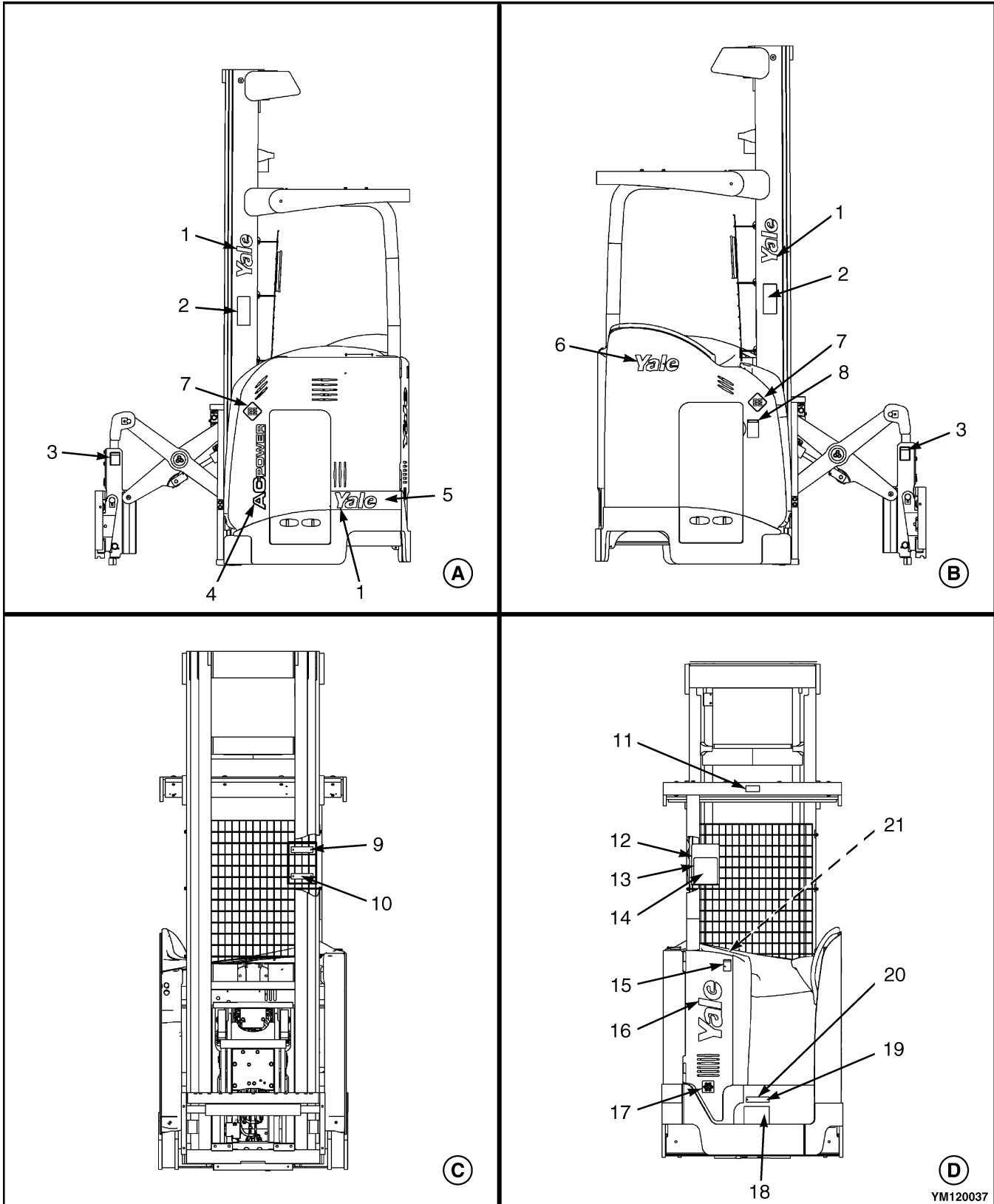
1. Clean area with an oil-free cleaner to remove all oil, grease, and foreign matter. Wipe until completely dry.
2. Carefully remove only the paper backing from adhesive. **DO NOT** touch adhesive surface with hands or remove front mask from label or plate face.
3. Exposed adhesive face must be free from all foreign matter before positioning label or plate on surface.
4. Press label or plate down firmly making sure that all corners are stuck down tight. Make sure that

all air is removed from under the label or plate and the corners and edges are tight. **DO NOT** attempt to move the label or plate once it has been stuck down.



1. MULTIFUNCTION CONTROL LABEL
2. NAMEPLATE
3. NAMEPLATE COVER
4. RIVET
5. HYDRAULIC FUNCTION DECAL

**Figure 11. Operator Compartment Label Placement**



YM120037

Figure 12. Label Placement

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