

# MPC080VG (A283), MPC060VG (A372), MTR005-F (C902), MTR007-F (C903) SERVICE MANUAL CONTENTS

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AC MOTOR REPAIR * (WITH EPAS).....	524274699	0620 YRM 1283	10/13
A/C MOTOR REPAIR S/N A474N03000L=> S/N A497N03000L=> S/N D801N02161L=> S/N E826N01917L=>.....	550073166	0620 YRM 1621	02/14
MASTER DRIVE UNIT * (WITH EPAS).....	524164715	0630 YRM 0961	10/13
MASTER DRIVE UNIT S/N D801N03000L=> S/N A474N03000L=> S/N A497N030000L=> S/N E826N03000L=>.....	550073167	0630 YRM 1609	06/14
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8KHD (A283), 6KHD (A372), 10K (C902), 15K (C903)

PART NO. 550090933 (09/14)

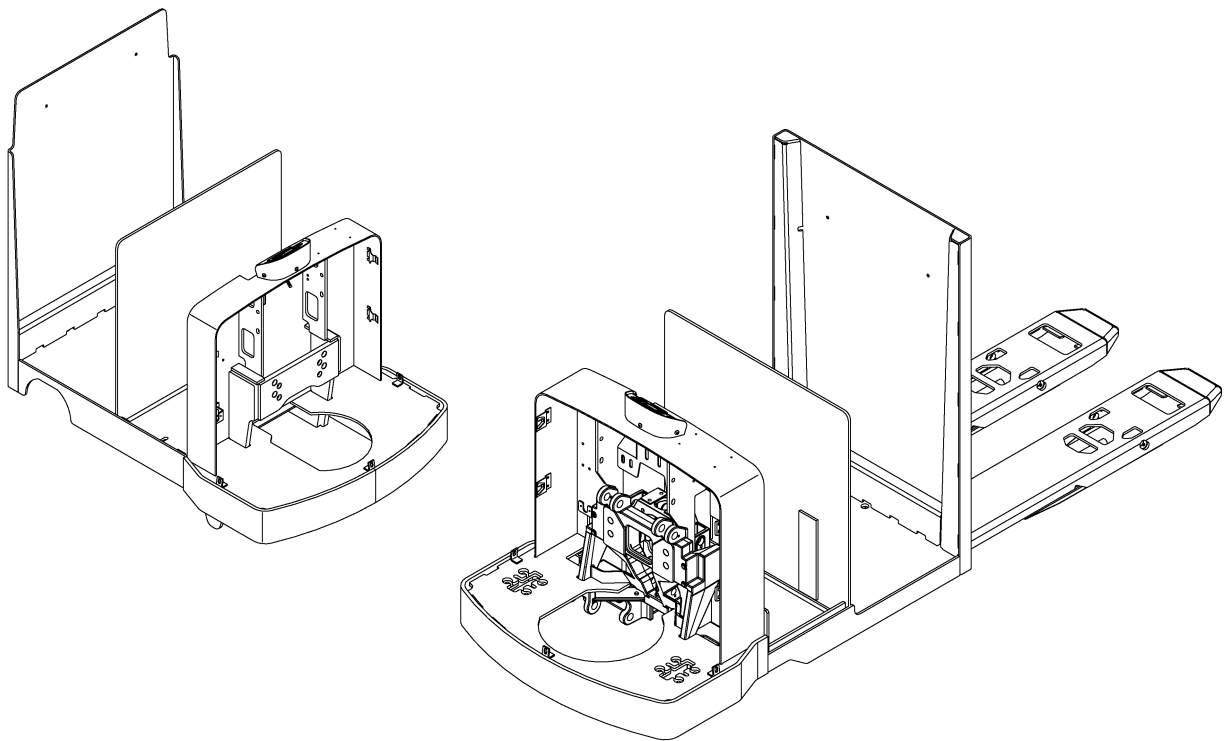
# FRAME

MPC080-VG [A283];

MPC060-VG [A372];

MTR005-F [C902];

MTR007-F [C903]



# 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 Yale® 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 **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:

(MPC080-VG) [A283];  
(MPC060-VG) [A372];  
(MTR005-F) [C902];  
(MTR007-F) [C903]



## General

### DESCRIPTION

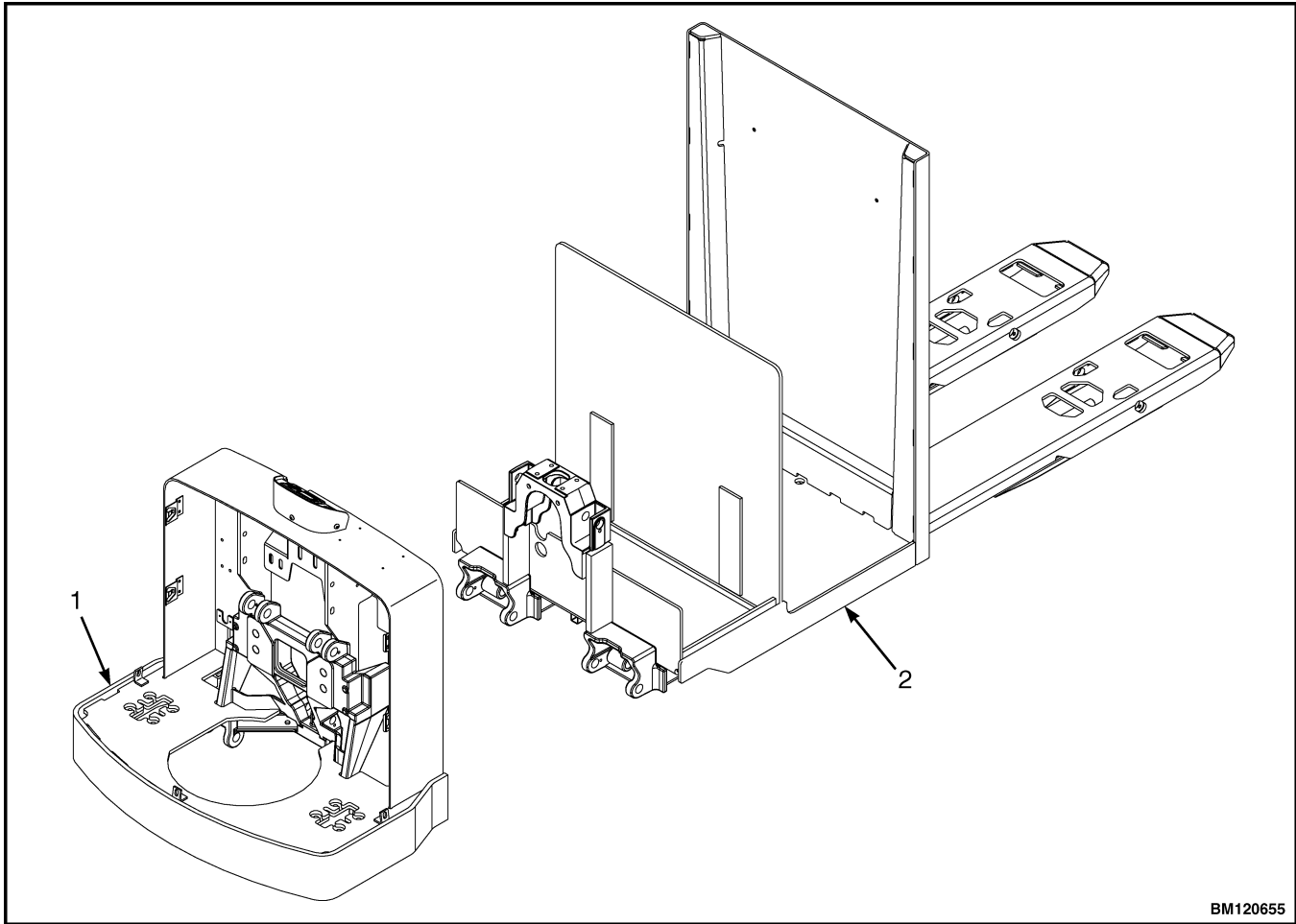
This section describes the frames for the MPC060-VG, MPC080-VG, MTR005-F, and MTR007-F trucks. Repair procedures for major systems/parts that fasten to the frame are found in separate YRM sections.

MPC060-VG and MPC080-VG trucks have a main frame weldment and a fork frame weldment. The main frame weldment has mounts for the master drive unit (MDU), the lift pump and motor assembly, and electrical system components. The mounting holes for the casters are in the main frame weldment. The fork frame weldment is fastened to the main frame weldment by the links of the lifting mechanism. The fork frame weldment is raised by a lift cylinder connected to the main frame weldment and fork frame

weldment. The lift cylinder raises the battery end of the fork frame weldment and the linkage mechanism moves the load wheels to raise the fork tips at the rear of the fork frame weldment. See Figure 1.

MTR005-F and MTR007-F trucks have a single-frame weldment composed of the operator's compartment, battery compartment, and master drive unit (MDU) compartment. The frame weldment has mounts for the MDU and electrical system components. See Figure 2.

Most truck repairs are performed on the individual components that are bolted to the frame weldment and not to the frame weldment itself.

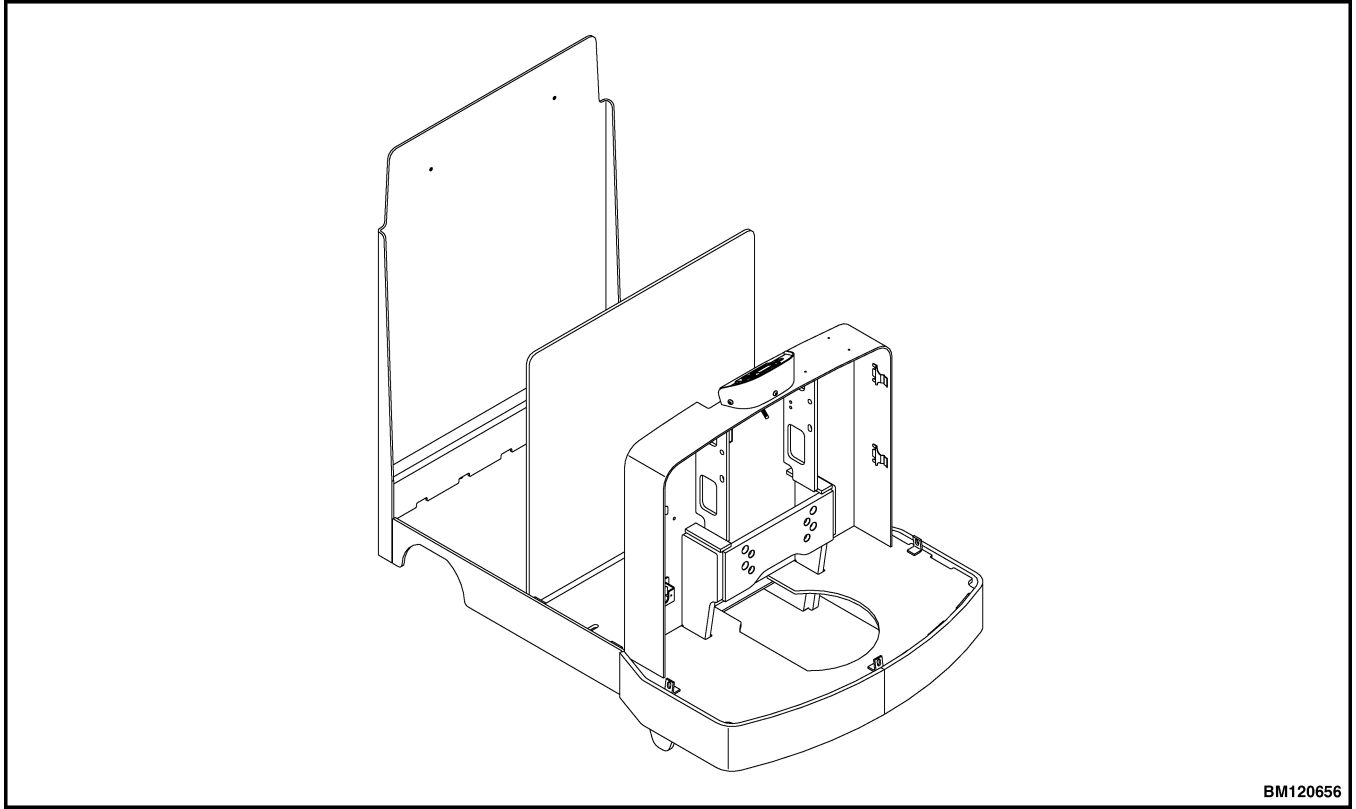


BM120655

1. MAIN FRAME WELDMENT

2. FORK FRAME WELDMENT

**Figure 1. Frame Weldments (MPC060/080-VG)**



BM120656

**Figure 2. Frame Weldment (MTR005/007-F)**



## FEATURES

### MPC060-VG and MPC080-VG

The MPC060-VG and MPC080-VG frames have mounts for:

- The Electrical System Parts
- The Lift Pump and Motor Assembly
- The Master Drive Unit
- Lift Cylinder
- Lift Linkage

### MTR005-F and MTR007-F

The MTR005-F and MTR007-F frames have mounts for:

- The Electrical System Parts
- The Master Drive Unit

## COVERS

The drive unit compartment is concealed behind a contoured, front cover which fits securely around the drive unit and steer support to the frame. A lower cover fits around the base of the drive unit platform and is secured in place with three screws after the front cover has been installed. See **Periodic Maintenance** 8000YRM1635 for remove/install procedures.

## Special Precautions



### WARNING

The capacitor in the transistor controller can hold an electrical charge after the battery is disconnected. To prevent an electrical shock and personal injury, discharge the capacitor before inspecting or repairing any component in the drive unit compartment. Wear safety glasses. Make certain that the battery has been disconnected.



### CAUTION

To avoid controller damage, always disconnect the battery, discharge the capacitor, and never put power to the controller while any power wires

are disconnected. Never short any controller terminal or motor terminal to the battery. Make sure to use proper procedure when servicing the controller.

1. Verify that the key switch is in the **OFF** position and the battery connector is completely disconnected.

## Frame Separation and Assembly

### MPC060-VG AND MPC080-VG

#### Frame Separation



### WARNING

Forklift truck frames and components may have polyurethane paint. Welding, burning, or other heat sufficient to cause thermal decomposition of the paint, may release isocyanates. These chemicals are allergic sensitizers to the skin and respi-

ratory tract and overexposure may occur without odor warning. Should work be performed, utilize good industrial hygiene practices, including removal of all paint (prime and finish coats) to the metal around the area to be welded, local ventilation, and/or supplied air respiratory protection.

**DO NOT make repairs or adjustments unless you have been properly trained and authorized to do so. Improper repairs and adjustments 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, turn the key switch to the OFF position, disconnect the battery connector, and attach a DO NOT OPERATE tag to the control handle.**

In some cases a main frame weldment or a fork frame weldment may be damaged, while the rest of the truck is still usable. The two frames may be separated from each other.

The main frame weldment is connected to the fork frame weldment by the lift cylinder, upper links, and rocker arms. Disconnect/connect these components to separate/assemble the frames.

See the section **Lifting Mechanism** 4000YRM1589. Refer to Upper Link - Remove/Install, and Rocker Arm - Remove/Install.

See the section **Walkie Hydraulic System** 1900YRM1629. Refer to Lift Cylinder - Remove/Install.

## Painting Instructions



### WARNING

**Always use solvents and paints in an area with ventilation. DO NOT use solvents or paints near heat or fire.**

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

1. Remove all dirt from the surface to be painted. Clean the area to be painted using a solvent for painted surfaces. Remove all oil and grease.

2. Remove the top surface of paint and all rust from the metal using sandpaper. Paint all metal surfaces where the paint is completely removed using primer. Apply the primer before applying the color paint.
3. Protect all surfaces that will not be painted. **DO NOT** paint cylinder rods, cables, labels, plates, or controls.
4. Paint all the surfaces the original color, using Yale® paint. Follow the directions on the container.

## Label Replacement



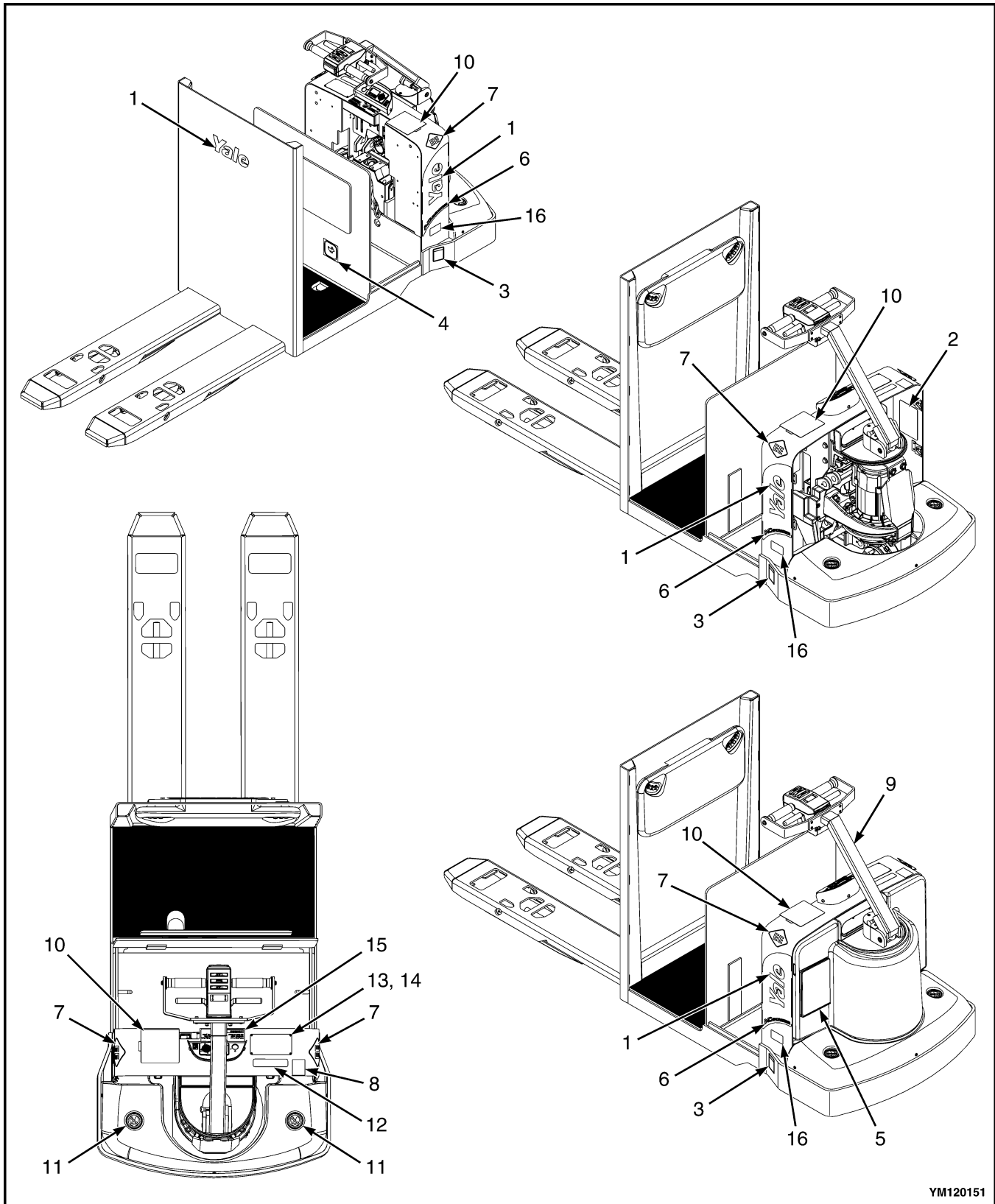
### WARNING

**Replace damaged WARNING or CAUTION labels immediately.**

If labels or information plates are missing or damaged, they must be replaced. See Figure 3.

**NOTE:** The nameplate is installed using rivets. Remove old rivets before installing a new nameplate. See your Yale® lift truck dealer to make sure the nameplate information is correct and complete before installing a new nameplate. Fasten the nameplate with the rivet heads outside.

1. Make sure the surface is dry and has no oil or grease. **DO NOT** use solvent on new paint. Clean the surface of old paint using a cleaning solvent.
  2. Remove the paper from the back of the label. **DO NOT** touch the adhesive surface.
- NOTE:** The label cannot be moved after it touches the surface.
3. Carefully hold the label in the correct position above the surface. Put the label in the correct position on the surface. Make sure all air is removed from under the label and the corners and edges are tight.



YM120151

Figure 3. Labels and Decals Location on MTR005-F, MTR007-F, MPC060-VG, and MPC080-VG

**Legend for Figure 3**

- |  |                                     |
|--|-------------------------------------|
| 1. LABEL - YALE                          | 9. STRAP                            |
| 2. LABEL - PATENTS AND TRADEMARKS        | 10. LABEL - WARNING/OPERATION       |
| 3. LABEL - MANUFACTURER                  | 11. DECAL - NO STEP                 |
| 4. LABEL - FAST SPEED                    | 12. UL INSPECTION PLATE             |
| 5. OPERATING MANUAL                      | 13. NAMEPLATE                       |
| 6. LABEL - AC POWER                      | 14. NAMEPLATE - NON-UL              |
| 7. LABEL - FREEZER, ARCTIC, OR EE OPTION | 15. LABEL - POWER AND PARKING BRAKE |
| 8. LABEL - BATTERY DISCHARGE NOTICE      | 16. LABEL - PINCH WARNING           |

**Battery Compartment****WARNING**

**Batteries are heavy. Use care to avoid injury. Always use a battery roller stand or tray when trucks are equipped with optional battery rollers or slide. Always wear protective clothing and eye protection when working with or near the battery.**

The battery compartment must be kept clean to ensure proper operation and safety. Any fluids on or around the battery is an indication that electrolyte is spilling or leaking out.

Leaking batteries must be repaired or replaced and the battery compartment must be cleaned. Spacers are available to secure batteries that fit loosely in the battery compartment.

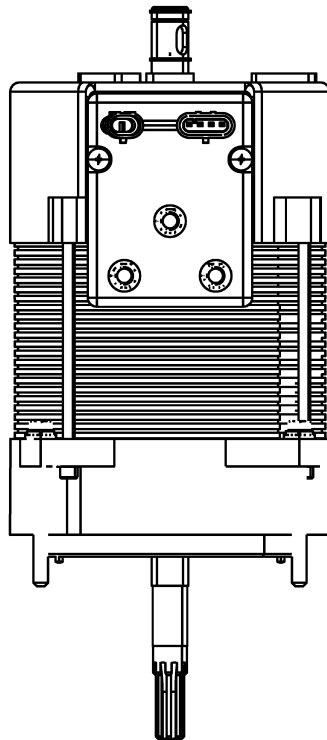
For instructions on changing the battery or adjusting the battery spacers, see the section **Periodic Maintenance** 8000YRM1635- Battery Maintenance.



# AC MOTOR REPAIR \*

## (WITH EPAS)

MPE060-VG [A292/B292\*];  
MPE080-VG [A287/B287\*];  
MPE080-F [B890];  
MPE060-F [B896/C896];  
MTR005-F [B902];  
MTR007-F [B903];  
MPC060-F [B904];  
MPC080-F [B905];  
MTR005-F, MTR007-F [C902]



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This section is for the following models:

- (MPE060-VG) [A292/B292\*];
- (MPE080-VG) [A287/B287\*];
- (MPE080-F) [B890];
- (MPE060-F) [B896/C896];
- (MTR005-F) [B902];
- (MTR007-F) [B903];
- (MPC060-F) [B904];
- (MPC080-F) [B905];
- (MTR005-F, MTR007-F) [C902]



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## General

This section contains repair and maintenance procedures for the AC traction motor. Additional information concerning the traction motor may be included in other sections when the information is more closely related to other systems. Sections that may contain related information include:

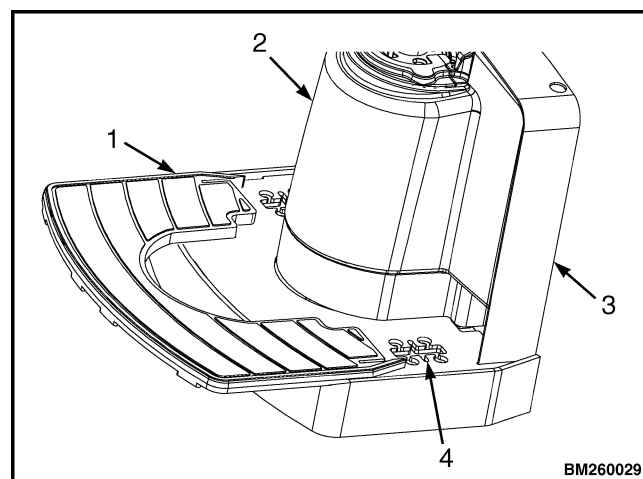
- **Periodic Maintenance** 8000YRM1298 for unit codes B890 and B896
- **Periodic Maintenance** 8000YRM1368 for unit codes B902, B903, B904, and B905
- **Periodic Maintenance** 8000YRM1453 for unit codes A287 and A292
- **Periodic Maintenance** 8000YRM1635 for unit codes C902 and C903
- **Periodic Maintenance** 8000YRM1644 for unit codes B287, B292, and C896
- **Steering Mechanism** 1600YRM1284 for unit codes B890 and B896
- **Steering Mechanism** 1600YRM1031 for unit codes B902, B903, B904, and B905
- **Steering Mechanism** 1600YRM1449 for unit codes A287 and A292
- **Steering Mechanism** 1600YRM1627 for unit codes C902 and C903
- **Steering Mechanism** 1600YRM1637 for unit codes B287, B292, and C896
- **Electrical System** 2200YRM1287 for unit codes B890 and B896
- **Electrical System** 2200YRM1357 for unit codes B902, B903, B904, and B905
- **Electrical System** 2200YRM1451 for unit codes A287 and A292
- **Electrical System** 2200YRM1632 for unit codes C902 and C903
- **Electrical System** 2200YRM1640 for lift truck models B287, B292, and C896
- **Master Drive Unit \* (With EPAS)** 0630YRM0961 for all models in this section
- **Master Drive Unit** 0630YRM1609 for unit codes B287, B292, and C896

## ACCESSING THE DRIVE UNIT COMPARTMENT

### MPE060/080-F, MPE060-VG, and MPE080-VG

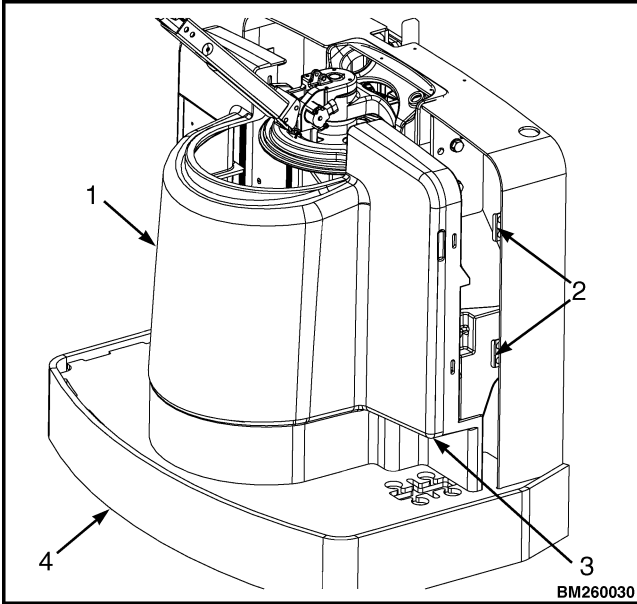
The drive unit compartment is concealed behind a molded cover which fits securely around the drive unit and steer support to the frame. The floor mat fits snugly in the operator platform after the drive unit cover is installed.

To remove the drive unit cover, first lift the corners of the floor mat and pull it out away from the drive unit. See Figure 1. Next, reach under the side of the drive unit cover, near the bottom, and find the grip slot. With both hands, pull up and away from the truck until the bottom of the cover kicks out from the retaining clips. See Figure 2 or Figure 3. Repeat this for the other side of the cover. Work around the edge of the cover until free from the truck.



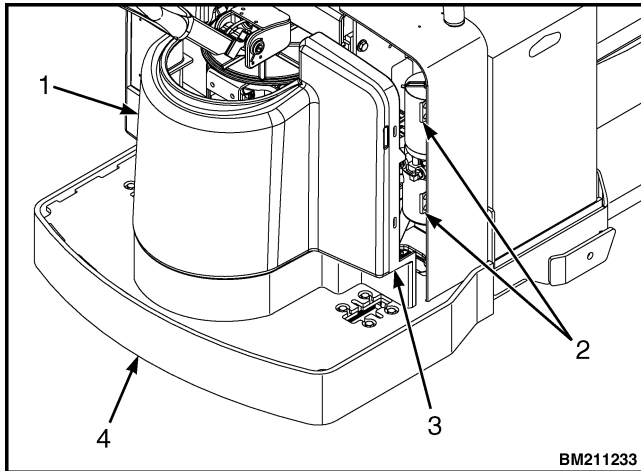
1. FLOOR MAT
2. DRIVE UNIT COMPARTMENT COVER
3. FRAME
4. CASTER ADJUSTMENT ACCESS

**Figure 1. Floor Mat**



1. DRIVE UNIT COMPARTMENT COVER
2. RETAINING CLIPS
3. GRIP SLOT
4. FRAME

**Figure 2. Drive Unit Compartment Cover for Unit Codes A287, A292, B890 and B896**



1. DRIVE UNIT COMPARTMENT COVER
2. RETAINING CLIPS
3. GRIP SLOT
4. FRAME

**Figure 3. Drive Unit Compartment Cover for Unit Codes B287, B292 and C896**

To install the drive unit cover, make sure the floor mat is pulled away from the drive unit and place the bottom of the drive unit cover onto the operator platform and position the lower edges partially into the lower retaining clips. Push the top of the cover partially into the upper retaining clips. Do not push either edge of the cover in completely in before starting all edges into the proper place. When the cover is aligned and started properly, press the cover completely into the retaining clips and place the floor mat into the operator platform around the cover.

**MPC060/080-F and MTR005/007-F**

The drive unit compartment is concealed behind a contoured, front cover which fits securely around the drive unit and steer support to the frame. A lower cover fits around the base of the drive unit platform and is secured in place with three screws after the front cover has been installed.

To remove the covers, first remove the three screws securing the lower cover and remove the lower cover from the lift truck. Next, reach under the side of the front cover, near the bottom, and find the grip slot. With both hands, pull up and away from the truck until the bottom of the cover kicks out from the retaining clips. Repeat this for the other side of the cover. Work around the edge of the cover until free from the truck. See Figure 4.

To install the covers, place the bottom of the front cover onto the operator platform and position the lower edges partially into the lower retaining clips. Push the top of the cover partially into the upper retaining clips. Do not push either edge of the cover in completely before starting all edges into the proper place. When the cover is aligned and started properly, press the cover completely into the retaining clips. Position the lower cover around the base of the front cover as removed. Make sure the spring nut clips and the lower cover mounting holes are aligned. Install the three screws to secure the lower cover in place.