

SERVICE REPAIR

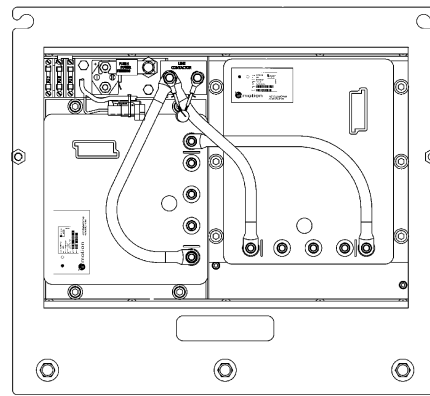
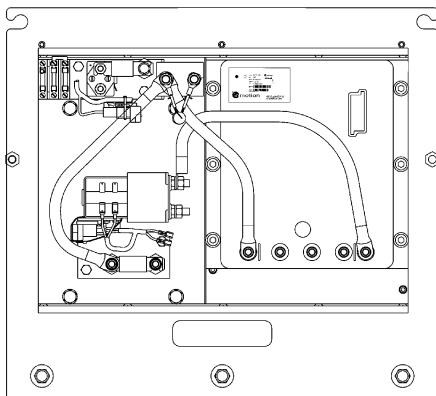
MANUAL

Hyster D210 (V30ZMD) Forklift

HYSTER

ELECTRICAL SYSTEM (TRUCKS WITH AC CONTROLLERS)

**J2.00-3.20XM (J40-65Z) [A416/B416];
V30ZMD [D210/E210];
E1.50-2.00XM (E25-35Z, E40ZS) [E114/F114];
E2.00-3.20XM (E45-65Z) [G108];
E3.50-5.50XL, E4.50XLS
(E70-120Z, E100ZS) [D098/E098]**



HYSTER

SAFETY PRECAUTIONS

MAINTENANCE AND REPAIR

- When lifting parts or assemblies, make sure all slings, chains, or cables are correctly fastened, and that the load being lifted is balanced. Make sure the crane, cables, and chains have the capacity to support the weight of the load.
- Do not lift heavy parts by hand, use a lifting mechanism.
- Wear safety glasses.
- DISCONNECT THE BATTERY CONNECTOR before doing any maintenance or repair on electric lift trucks. Disconnect the battery ground cable on internal combustion lift trucks.
- Always use correct blocks to prevent the unit from rolling or falling. See HOW TO PUT THE LIFT TRUCK ON BLOCKS in the **Operating Manual** or the **Periodic Maintenance** section.
- Keep the unit clean and the working area clean and orderly.
- Use the correct tools for the job.
- Keep the tools clean and in good condition.
- Always use **HYSTER APPROVED** parts when making repairs. Replacement parts must meet or exceed the specifications of the original equipment manufacturer.
- Make sure all nuts, bolts, snap rings, and other fastening devices are removed before using force to remove parts.
- Always fasten a DO NOT OPERATE tag to the controls of the unit when making repairs, or if the unit needs repairs.
- Be sure to follow the **WARNING** and **CAUTION** notes in the instructions.
- Gasoline, Liquid Petroleum Gas (LPG), Compressed Natural Gas (CNG), and Diesel fuel are flammable. Be sure to follow the necessary safety precautions when handling these fuels and when working on these fuel systems.
- Batteries generate flammable gas when they are being charged. Keep fire and sparks away from the area. Make sure the area is well ventilated.

NOTE: The following symbols and words indicate safety information in this manual:



WARNING

Indicates a 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.

TABLE OF CONTENTS

General	1
Description	2
Features of the Display Panels	2
Other Control Components	3
Display Panel and Key Switch Replacement	4
Display Panel, Replace	4
Key Switch, Replace	6
Controller Replacement.....	6
Traction and Pump Motor Controller Replacement.....	6
Master Controller, Replace.....	12
Master Controller, Remove J2.00-3.20XM (J40-60Z) (A416/B416).....	12
Master Controller, Install J2.00-3.20XM (J40-60Z) (A416/B416).....	12
Master Controller, Remove E1.50-2.00XM (E25-35Z, E40ZS) (E114/F114); E2.00-3.20XM (E45-65Z) (G108); and (V30ZMD) (D210/E210).....	14
Master Controller, Install E1.50-2.00XM (E25-35Z, E40ZS) (E114/F114); E2.00-3.20XM (E45-65Z) (G108); and (V30ZMD) (D210/E210).....	14
Master Controller, Remove E3.50-5.50XL E4.50XLS (E70-120Z,E100ZS) (D098/E098)	16
Master Controller, Install E3.50-5.50XL E4.50XLS (E70-120Z,E100ZS) (D098/E098)	16
Control Components Replacement.....	17
General.....	17
Start Switch, Replace	17
Brake Light Switch, Replace.....	18
Seat Switch, Replace	18
Parking Brake Switch, Replace	19
MONOTROL Pedal Direction Switches, Replace	21
Steering Column Direction Control Switches, Replace	24
Remove.....	24
Install.....	24
Brake Fluid Switch, Replace.....	25
Brush Wear and Over Temperature Sensors (DC Pump Motor Only).....	25
Rocker Switches for Lights, Replace	27
Accelerator Position Sensor, Replace.....	28
On-Demand Steering Sensor, Replace.....	28
Lights, Converter, Relay, and Reverse Alarm	29
Brake, Tail, and Reverse Light Assembly, Replace	29
Incandescent Assembly.....	29
LED Assembly - Remove	33
LED Assembly - Install.....	34
Strobe Light Assembly, Replace	34
Wire Harness Repair	35
Del-City Crimp-Solder-Shrink Splice	35
Front, Rear Driving Light or Spot Light Assemblies, Replace	36
Converter, Replace	37
Remove, Lift Truck Models J2.00-3.20XM (J40-65Z) (A416/B416)	37
Install, Lift Truck Models J2.00-3.20XM (J40-65Z) (A416/B416)	37
Remove, Lift Truck Models E2.00-3.20XM (E45-65Z) (G108); V30ZMD (D210/E210); and E1.50-2.00XM (E25-35Z, E40ZS) (E114/F114)	39
Install, Lift Truck Models E2.00-3.20XM (E45-65Z) (G108); V30ZMD (D210/E210); and E1.50-2.00XM (E25-35Z, E40ZS) (E114/F114)	39
Remove, Lift Truck Models E3.50-5.50XL, E4.50XLS (E70-120Z, E100ZS) (D098/E098)	41
Install, Lift Truck Models E3.50-5.50XL, E4.50XLS (E70-120Z, E100ZS) (D098/E098)	41

TABLE OF CONTENTS (Continued)

Reverse Relay, Replace..... 42
 Lift Truck Models J2.00-3.20XM (J40-65Z) (A416/B416); V30ZMD (D210/E210);
 E1.50-2.00XM (E25-35Z, E40ZS) (E114/F114); and E2.00-3.20XM (E45-65Z) (G108)..... 42
 Lift Truck Models E3.50-5.50XL, E4.50XLS (E70-120Z, E100ZS) (D098/E098)..... 44
 Backup Alarm, Replace..... 44
 Horn and Horn Button, Replace 44
 Horn Replacement for Lift Trucks J2.0-3.20XM (J40-65Z) (A416/B416), V30ZMD (D210/E210),
 E1.5-2.0XM (E25.35Z, E40ZS) (E114/F114), and E2.00-3.20XM (E45-65Z) (G108) 44
 Horn Replacement for Lift Trucks E3.50-5.50XL, E4.50XLS (E70-120Z, E100ZS) (D098/E098)..... 47
 Horn Switch and Cover, Replace 48
 Hydraulic Pump Switches..... 49
 Fan Power Supply, Replace 49
 Remove, Lift Truck Models E3.50-5.50XL (E70-120Z, E100ZS) (D098/E098) 49
 Install, Lift Truck Models E3.50-5.50XL (E70-120Z, E100ZS) (D098/E098) 49
 Remove, Lift Truck Models J2.00-3.20XM (J40-65Z) (A416/B416)..... 50
 Install, Lift Truck Models J2.00-3.20XM (J40-65Z) (A416/B416)..... 50
 Remove, Lift Truck Models E2.00-3.20XM (E45-65Z) (G108)..... 52
 Install, Lift Truck Models E2.00-3.20XM (E45-65Z) (G108)..... 53
 Control and Power Fuse Check..... 53
 Fuse Locations 53
 Brake Light Switch Adjustment 59
 Seat Switch Check 60
 Seat Brake Adjustment 60
 Parking Brake Switch Adjustment 61
 Direction Switches Check..... 61
 MONOTROL Pedal..... 61
 Steering Column 62
 MONOTROL Pedal or Accelerator Pedal Adjustment..... 62
 Accelerator Position Sensor Adjustment and Start Switch Adjustment 63
 Acceleration Position Sensor, Adjust 63
 Start Switch, Adjust 65

This section is for the following models:

J2.00-3.20XM (J40-65Z) [A416/B416];
 V30ZMD [D210/E210];
 E1.50-2.00XM (E25-35Z, E40ZS) [E114/F114];
 E2.00-3.20XM (E45-65Z) [G108];
 E3.50-5.50XL, E4.50XLS (E70-120Z, E100ZS) [D098/E098]

**Thanks very much for your reading,
Want to get more information,
Please click here, Then get the complete
manual**

JustClickHere 

NOTE:

**If there is no response to click on the link above,
please download the PDF document first, and then
click on it.**

**Have any questions please write to me:
admin@servicemanualperfect.com**

General



WARNING

Do not operate a lift truck that needs adjustment or repairs. Report the need for adjustment or repairs immediately. If adjustment or repair is necessary, put a **DO NOT OPERATE** tag in the operator's area. Remove the key from the key switch.

Some of the checks and adjustments are done with the battery connected. Never have any metal on your fingers, arms, or neck. These metal items can accidentally make an electrical connection and cause an injury.

Some adjustments in this section must be done with the battery connected and power applied to the controller. When making these adjustments, make sure the drive wheels are raised from the floor. See the **Operating Manual** or the section **Periodic Maintenance 8000 SRM 1060** for lift truck models **J2.00-3.20XM (J40-65Z) (A416)**; **V30ZMD (D210/E210)**; **E1.50-2.00XM (E25-35Z, E40ZS) (E114/F114)**; and **E2.00-3.20XM (E45-65Z) (G108)**, the section **Periodic Maintenance 8000 SRM 1226** for lift truck model **J2.00-3.20XM (J40-65Z) (B416)**, or the section **Periodic Maintenance 8000 SRM 1201** for lift truck models **E3.50-5.50XL, E4.50XLS (E70-120Z, E100ZS) (D098/E098)** to raise the drive wheels.

This section has the checks, adjustments, and repair procedures for the parts of the electrical system that are NOT part of the master controller or AC motor controllers. This section also does NOT include the electrical components covered in other sections such as AC motors and Electro-Hydraulic Control Valve:

- If lift truck is equipped with an Electro-Hydraulic Control Valve, see **Electro-Hydraulic Control Valve 2000 SRM 1224** for replacement procedures on the Electro-Hydraulic Valve Driver Module.
- See **AC Motor Controller Parameter Table** in the **AC Motor Controllers/Display Panel, Description, Checks, Adjustments, and Troubleshooting 2200 SRM 1056** for more information.

See the section **AC Motor Repair 620 SRM 1098** for lift truck models **V30ZMD (D210/E210)**; **E1.50-2.00XM (E25-35Z, E40ZS) (E114/F114)**; **E2.00-3.20XM (E45-65Z) (G108)**; and **E3.50-5.50XL, E4.50XLS (E70-120Z, E100ZS) (D098/E098)** or **AC**

Motor Repair 620 SRM 1053 for lift truck models **J2.00-3.20XM (J40-65Z) (A416/B416)** for maintenance of the AC motor. See the section **Industrial Battery 2240 SRM 1** for information on the battery.

See the section **Troubleshooting and Adjustments Using the AC Controls Program (ETACC) 2200 SRM 1058** for information on troubleshooting with a computer.

Some components that have inputs to the controller have installation adjustments. This section has the correct procedures for replacement, checks, and adjustments of these components. These components include the following:

- Key Switch
- Start Switch
- Brake Light Switch
- Seat Switch
- Parking Brake Switch
- Direction (FWD REV) Switches
MONOTROL™ Pedal
Direction Control (on Steering Column)
- Brake Fluid Switch (All models except E1.50-2.00XM (E25-35Z, E40ZS) (E114/F114))
- Rocker Switches for Lights
- Accelerator Position Sensor
- Lights, Converter, Relay, and Reverse Alarm
- Horn and Horn Button
- Fan Power Supply

NOTE: Some checks and adjustments are easier to do if another person can operate the controls. If you are working alone, put a weight on the seat to close the seat switch. Put the voltmeter in a position so you can see it from the operator area. You can usually operate the controls with your hand and also make the voltage measurements.

NOTE: The adjustments of the switches on the linkage for the main control valve are in the section **Manual hydraulic Control Valve 2000 SRM 562** for lift truck models **J2.00-3.20XM (J40-65Z) (A416/B416)**; **V30ZMD (D210/E210)**; **E1.50-2.00XM (E25-35Z, E40ZS) (E114/F114)**; and **E2.00-3.20XM (E45-65Z) (G108)** or **Manual hydraulic Control Valve 2000 SRM 77** for lift truck models **E3.50-5.50XL, E4.50XLS (E70-120Z, E100ZS) (D098/E098)**. Following is a list of the switches:

- Lift - High Speed
- Lift - Medium Speed

- Tilt - Low Speed
- Third Auxiliary

- Fourth Auxiliary - Medium Speed
- Fourth Auxiliary - Low Speed

Description

FEATURES OF THE DISPLAY PANELS

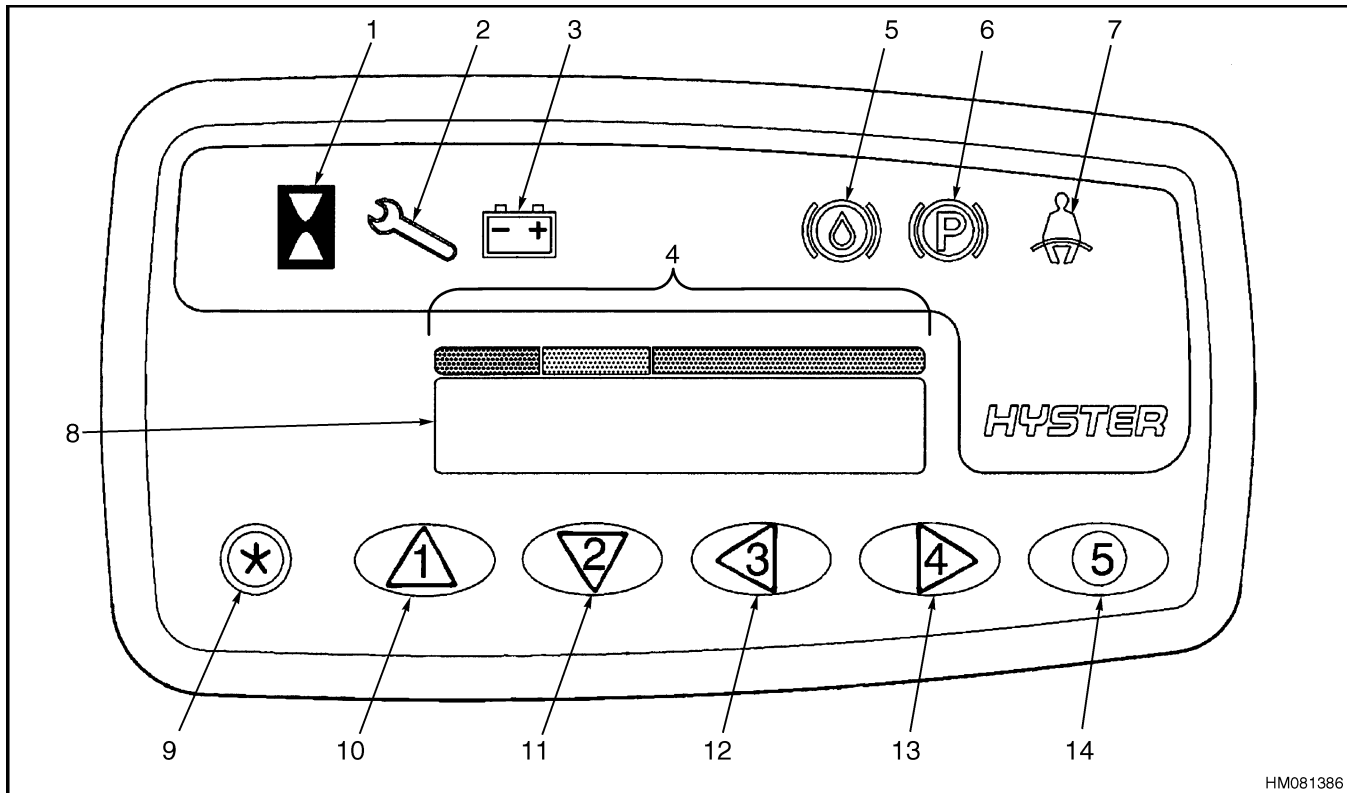
NOTE: There are two dash display options, Standard and Premium. Both displays look identical. The difference is in the display software and the resulting functionality. See **AC Motor Controllers/Display Panel, Description, Checks, Adjustments, and Troubleshooting** 2200 SRM 1056.

The following features are part of both the Standard and Premium Display Panels:

- LED (Light Emitting Diode) symbol indicators
- LCD (Liquid Crystal Display) screen

- Battery Discharge Indicator
- Service Reminder (if enabled)
- Status Codes
- Hourmeter of traction and lift pump times

These features are shown in the display panel features. See Figure 1. The symbol indicators are shown and described in the **Operating Manual**. Since the indicators are for common features, these indicators are also combined with the Premium Display Panel.



HM081386

- | | |
|--------------------------------|---------------------|
| 1. HOURMETER INDICATOR SYMBOL | 8. LCD SCREEN |
| 2. WRENCH INDICATOR SYMBOL | 9. STAR PUSH BUTTON |
| 3. BATTERY INDICATOR SYMBOL | 10. PUSH BUTTON #1 |
| 4. BATTERY DISCHARGE INDICATOR | 11. PUSH BUTTON #2 |
| 5. BRAKE FLUID SYMBOL | 12. PUSH BUTTON #3 |
| 6. PARKING BRAKE SYMBOL | 13. PUSH BUTTON #4 |
| 7. FASTEN SEAT BELT SYMBOL | 14. PUSH BUTTON #5 |

Figure 1. Standard and Premium Display Panels Features

OTHER CONTROL COMPONENTS

Following is a short description of the other control components and their function:

- Key switch is in the steering column housing and connects battery voltage to all of the control circuits except the horn.
- Start switch is actuated by the accelerator pedal and is part of the "Static Return to OFF" (SRO) circuit. The SRO circuit prevents travel of the lift truck if the starting sequence is not correct. See the **Operating Manual** for procedures on how to check the SRO circuit. If the start switch is closed before the seat switch, the controller will not permit the lift truck to move.
- Brake light switch is actuated by the brake pedal to energize the brake lights on the rear legs of the overhead guard.
- Seat switch is inside the seat and is open if the operator is not on the seat. The seat switch sends a signal to the master controller.
- Parking brake switch operates if the parking brake is applied. The parking brake switch is fastened near the linkage for applying the parking brake. The switch sends a signal to the master controller to illuminate the parking brake indicator on the display panel.
An alarm is also operated by the master controller if the operator leaves the truck without applying the parking brake. The master controller will activate the alarm after getting the signal from the parking brake switch. The alarm is activated if the operator leaves the seat of the lift truck when the key is in the **ON** position and the parking brake is not applied. The alarm is also activated if the key is moved to the **OFF** position when the brake is not applied.
- Direction control switches in the MONOTROL pedal or steering column send battery voltage to the master controller.
- Brake fluid switch sends voltage to the master controller. The LED in the display panel is displayed when the fluid in the brake master cylinder is low.

- Rocker switches for lights control all the optional lights on the lift truck.
- The accelerator position sensor is the input to the master controller for speed control.
- The On-Demand steering components allow the steering pump to operate only when the steering wheel is moved.
- The rear lights on the legs of the overhead guard are similar to automobile rear lights. The brake lights come on when the brake pedal is depressed. The reverse lights come on when the truck is set for travel in reverse. If there are also driving lights installed, the tail lights come on with the driving lights. There can also be an operator compartment light. A flashing light can be located at the top or rear of the overhead guard and the reverse alarm.
- The horn switch at the center of the steering wheel operates the horn under the floor plates, for lift trucks J2.0-3.20XM (J40-65Z) (A416/B416), V30ZMD (D210/E210), E1.5-2.0XM (E25.35Z, E40ZS) (E114/F114), and E2.00-3.20XM (E45-65Z) (G108) or attached to the inside of the left-hand frame rail, for lift trucks E3.50-5.50XL, E4.50XLS (E70-120Z, E100ZS) (D098/E098).
- The AC control panel, located in the rear of the lift truck and accessed through a removable panel in the counterweight, has two fans that help keep it cool during operation. For lift trucks that are 72 or 80 volts, these fans have a separate power supply. For lift truck models J2.00-3.20XM (J40-65Z) (A416/B416) the power supply for the fans is located between the fans. See Figure 9. For lift truck models E2.00-3.20XM (E45-65Z) (G108) and V30ZMD (D210/E210) the power supply for the fans is located near the converter on the left fender weldment and towards the front of the lift truck. See Figure 29. For lift truck models E3.50-5.50XL, E4.50XLS (D098/E098) the power supply for the fans is under the floor plate and located on the same bracket the contains the master controller. See Figure 11.

Display Panel and Key Switch Replacement

DISPLAY PANEL, REPLACE



WARNING

Before replacing the Display Panels, fully lower all parts of the mast and tilt it forward until the tips of the forks touch the ground. This action will prevent the mast from lowering suddenly if the control lever is accidentally moved.

Never have any metal on your fingers, arms, or neck. These metal items can accidentally make an electrical connection and cause an injury.



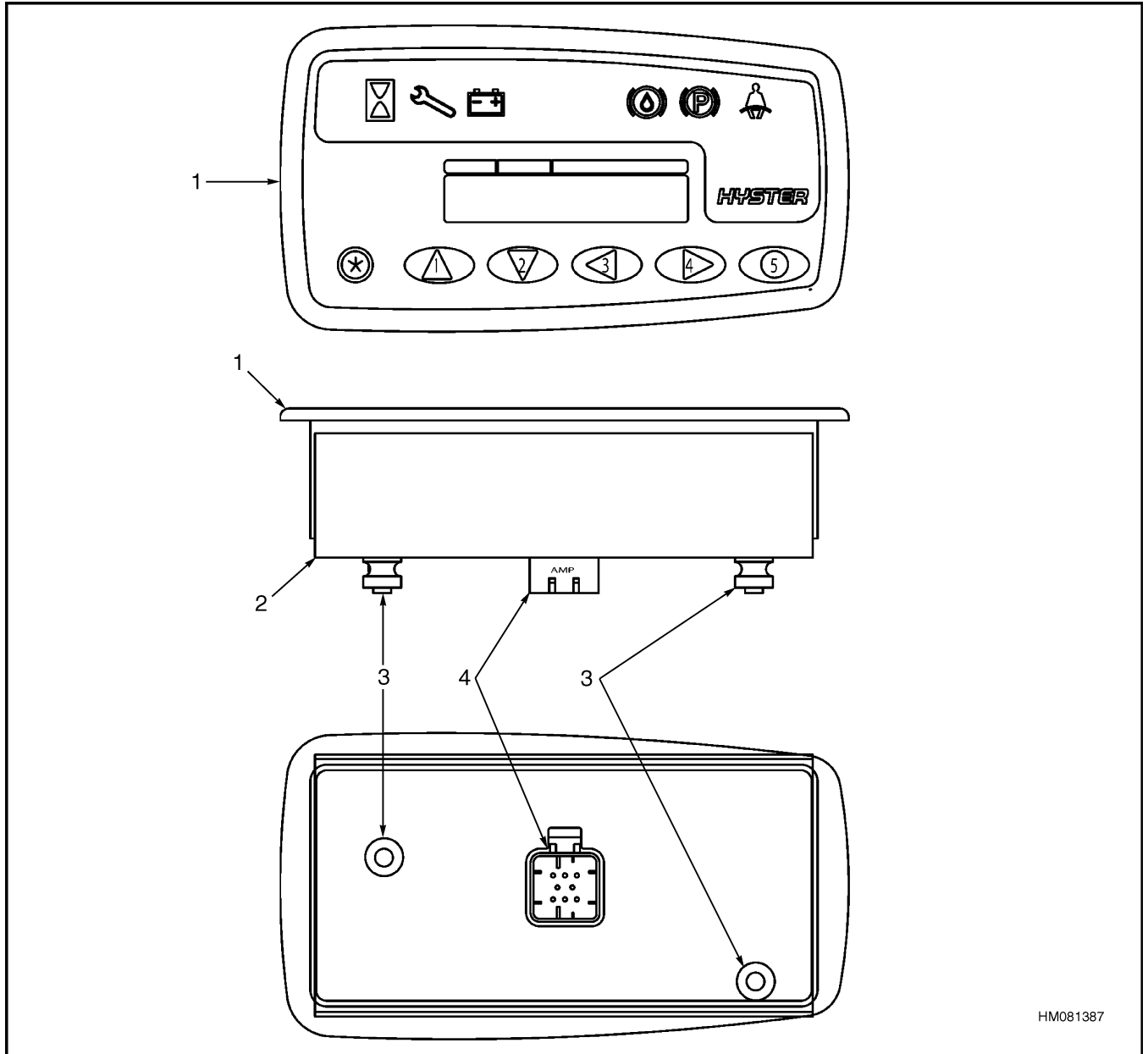
CAUTION

A short circuit and damage can occur if wires are not installed correctly. Make sure wire connectors do not touch the other meter terminals or wire connectors, metal brackets, or the bracket mounting nuts. Make sure the wires are not pulled tight and are not touching other parts to damage the insulation.

The Display Panel is in the dash cover. The Display Panel cannot be repaired and must be replaced if it

has a malfunction. These Display Panels must be replaced as a unit. See Figure 2.

1. Disconnect the battery and discharge the capacitors by holding the horn button down until the horn stops making a sound. Attach a tag to truck battery connector stating DO NOT CONNECT BATTERY. Remove the key.
2. Remove the two nuts that fasten the Display Panel and mount bracket. See Figure 2. Remove the nuts and bracket. Lift the Display Panel up and out of the instrument panel.
3. Disconnect the plug connector on the back of the Display Panel.
4. On the replacement Display Panel, install the plug connector on the back of the Display Panel.
5. Put the replacement Display Panel back into the instrument panel.
6. Install the mounting bracket and mounting nuts. Tighten the nuts that fasten the Display Panel in the instrument panel.



HM081387

- 1. DISPLAY PANEL
- 2. MOUNT BRACKET

- 3. MOUNT NUT
- 4. 8-PIN CONNECTOR

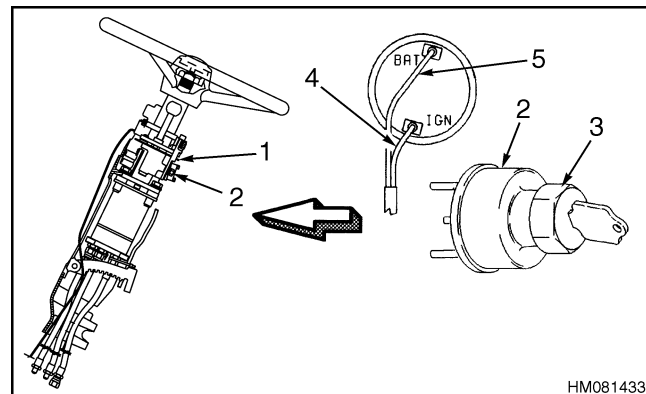
Figure 2. Mounting of Display Panel

KEY SWITCH, REPLACE

NOTE: The key switch is replaced as one of the components of the steering column. See the section Steering Wheel and Column Assembly Repair in the SRM **Steering System for AC Electric Lift Trucks** 1600 SRM 1054 for more information.

1. Disconnect the battery, discharge capacitors, and attach a tag to the truck battery connector stating **DO NOT CONNECT BATTERY**.
2. Remove the key switch from the housing of the steering column. See Figure 3. Make an identification of the electrical wires and disconnect them from the key switch.
3. Install the electrical wires on the key switch that were identified during removal. Install the new key switch into the housing of the steering column.

4. Remove the **DO NOT CONNECT BATTERY** tag from the truck battery connector and reconnect the battery.



- | | |
|--------------------|------------|
| 1. STEERING COLUMN | 3. NUT |
| 2. KEY SWITCH | 4. RED/BRN |
| | 5. BRN |

Figure 3. Key Switch

Controller Replacement

TRACTION AND PUMP MOTOR CONTROLLER REPLACEMENT

Before replacing any motor controllers, disconnect the battery and discharge the capacitors by holding the horn button down until the horn stops making a sound. Attach a tag to truck battery connector stating **DO NOT CONNECT BATTERY**. Remove the key.

Replace the motor controller as described in the following procedure. See Figure 4 through Figure 8.

1. Make an identification for correct connection of the power cables on the power terminals of the motor controller. Disconnect the power cables and the connector plug for the control wires.

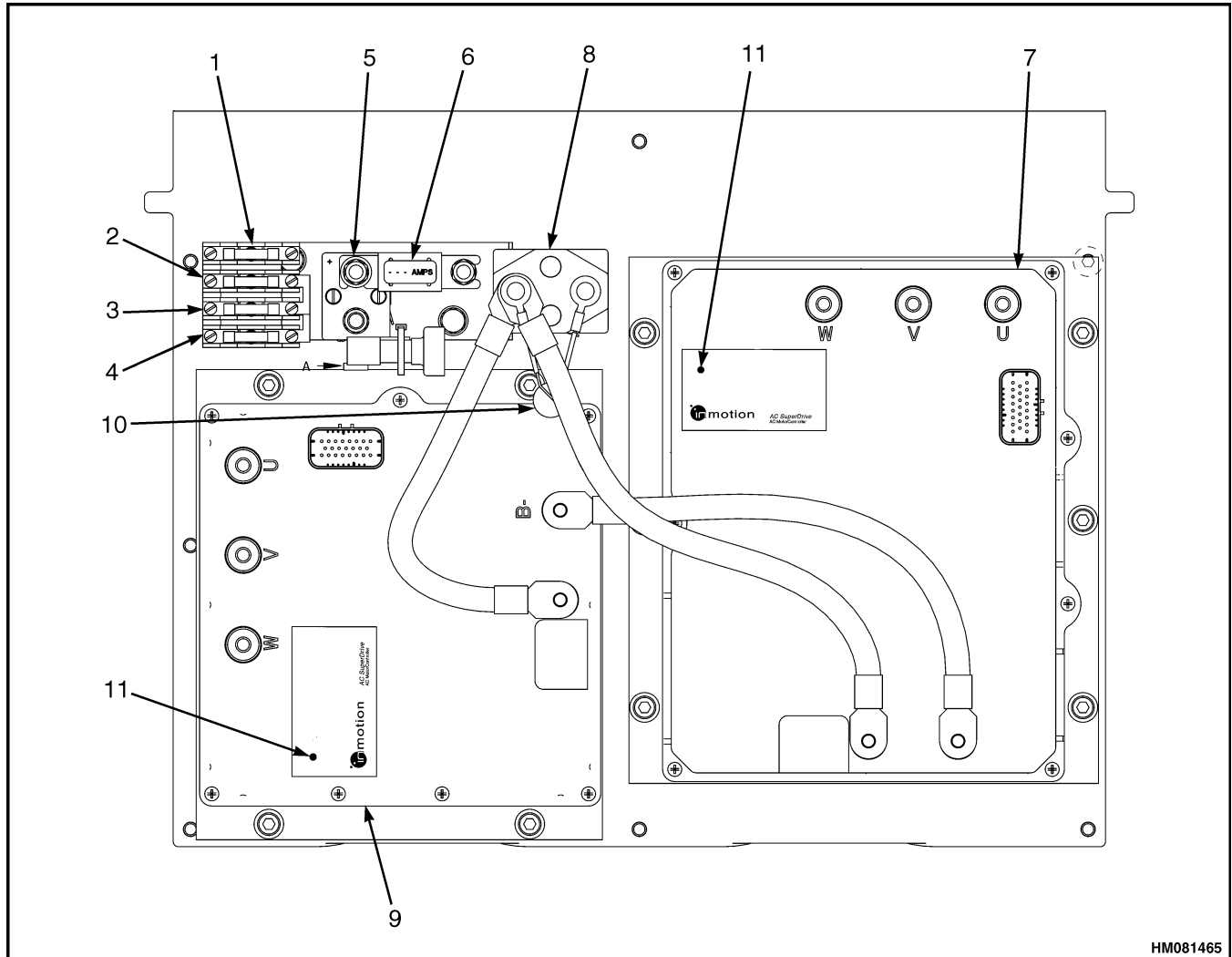
CAUTION

Do not remove the small screws that fasten the cover of the motor controller.

Make sure there is no dirt between the plate of the motor controller and the mount surface of the lift truck frame.

2. Remove the traction or pump mounting screws that fasten the motor controller to the lift truck heat sink. Carefully remove the motor controller.

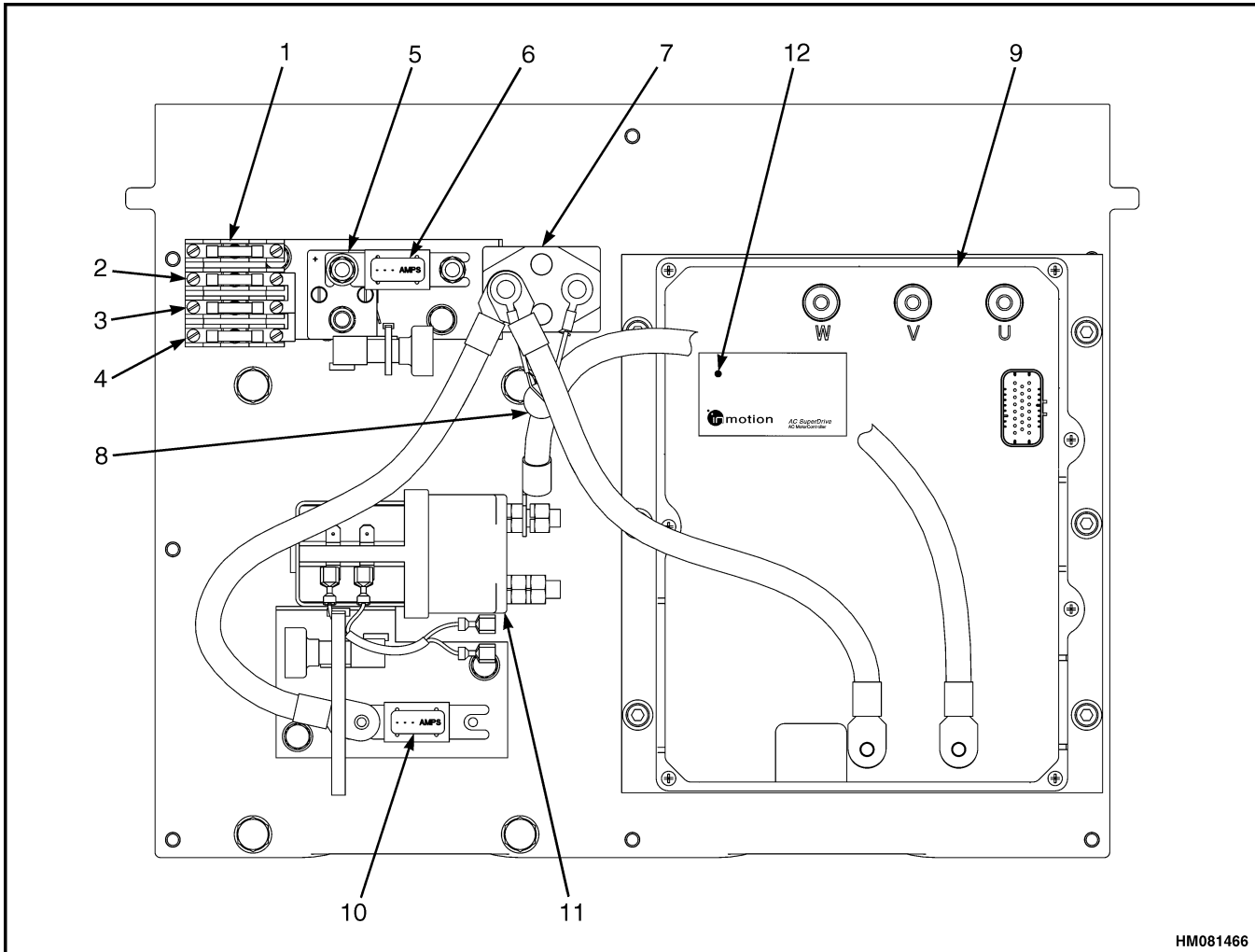
3. Put an even coat of the silicone compound (Hyster Part No. 1198757) or equivalent on the plate of the motor controller. Make sure there are no air spaces between the plate and mount surface of the lift truck frame. The motor controller must make full contact with the lift truck heatsink. Install the mount screws that fasten the motor controller to the lift truck heatsink.
4. Install the power cables at the power terminals of the motor controller as identified during removal. Tighten electrical connections as listed below:
 - a. Traction and Pump Controls 18 to 21 N•m (13 to 15 lbf ft)
 - b. Power Steering Contactor and Fuses 18 to 21 N•m (13 to 15 lbf ft)
 - c. Line and Pump Contactors 15 to 18 N•m (11 to 13 lbf ft)
5. Install the connector plug for the control wires on the connector of the motor controller.
6. Remove the **DO NOT CONNECT BATTERY** tag from truck battery connector and reconnect the battery.



HM081465

- | | |
|---|---|
| 1. FUSE 1 (15A) AUXILIARY TERMINAL STRIP | 7. AC TRACTION MOTOR CONTROLLER |
| 2. FUSE 2 (15A) (SLOW BLOW) SEAT BRAKE SOLENOID | 8. LINE CONTACTOR |
| 3. FUSE 3 (15A) LIGHTS | 9. AC PUMP MOTOR CONTROLLER |
| 4. FUSE 4 (5A) KEYSWITCH | 10. POSITIVE TEMPERATURE COEFFICIENT RESISTOR (PTC) |
| 5. POWER STEERING CONTACTOR | 11. LED INDICATOR |
| 6. FUSE 5 (40A) POWER STEERING | |

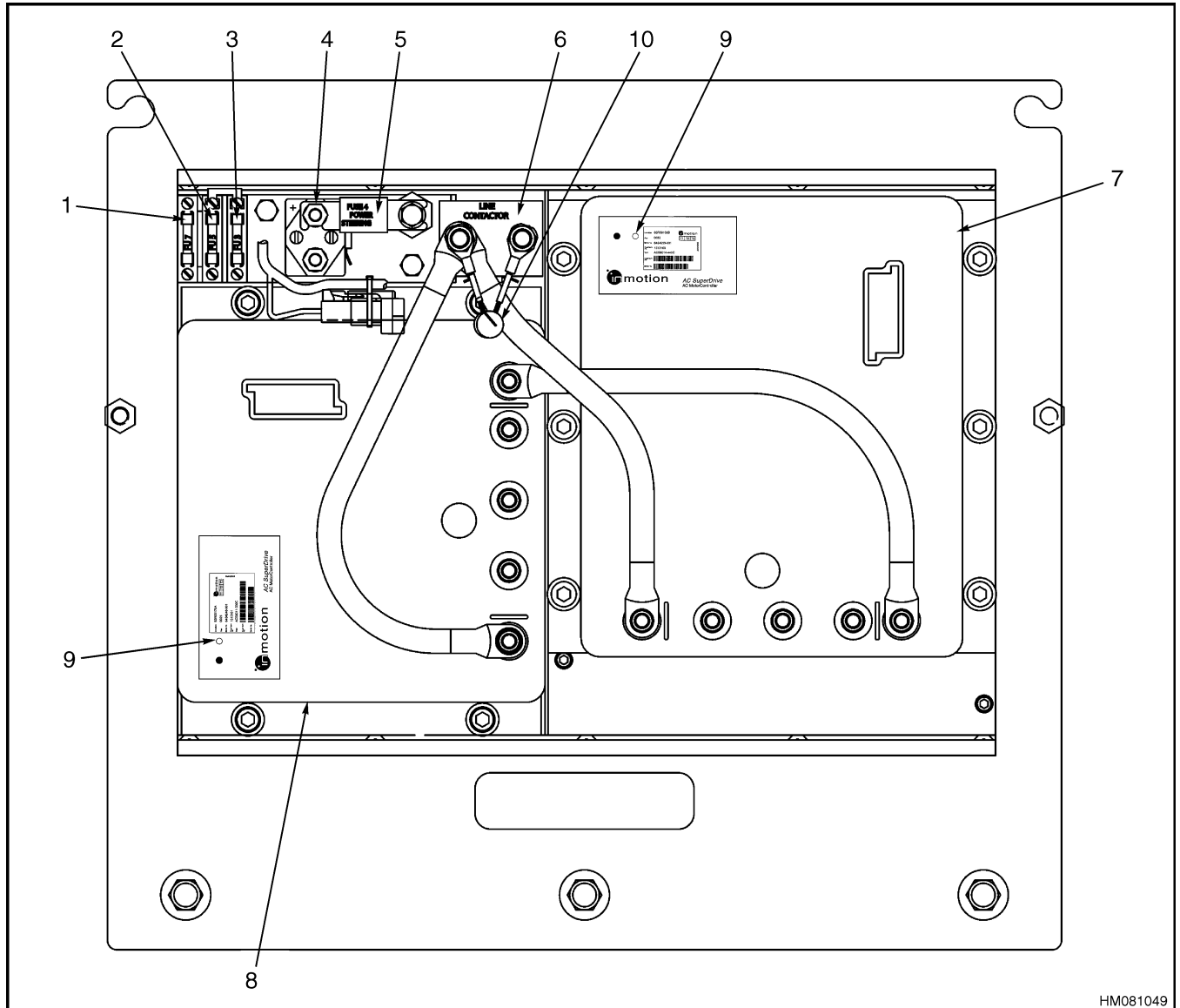
Figure 4. AC Traction and Pump Motor Controllers (Gen V) (36v/48v or 72v/80v) for J2.00-3.20XM (J40-65Z) (A416) and E2.00-3.20XM (E45-65Z) (G108), Later Models Only and for J2.00-3.20XM (J40-65Z) (B416); E1.50-2.00XM (E25-35Z, E40ZS) (E114/F114); and V30ZMD (D210/E210) Lift Truck Models



HM081466

- | | |
|--|--|
| 1. FUSE 1 (15A) AUXILIARY TERMINAL STRIP | 8. POSITIVE TEMPERATURE COEFFICIENT RESISTOR (PTC) |
| 2. FUSE 2 (15A) (SLOW BLOW) SEAT BRAKE | 9. AC TRACTION MOTOR CONTROLLER |
| 3. FUSE 3 (15A) LIGHTS | 10. FUSE (PUMP) (325A) |
| 4. FUSE 4 (5A) KEYSWITCH | 11. CONTACTOR FOR DC PUMP MOTOR |
| 5. POWER STEERING CONTACTOR | 12. LED INDICATOR |
| 6. FUSE 5 (40A) POWER STEERING | |
| 7. LINE CONTACTOR | |

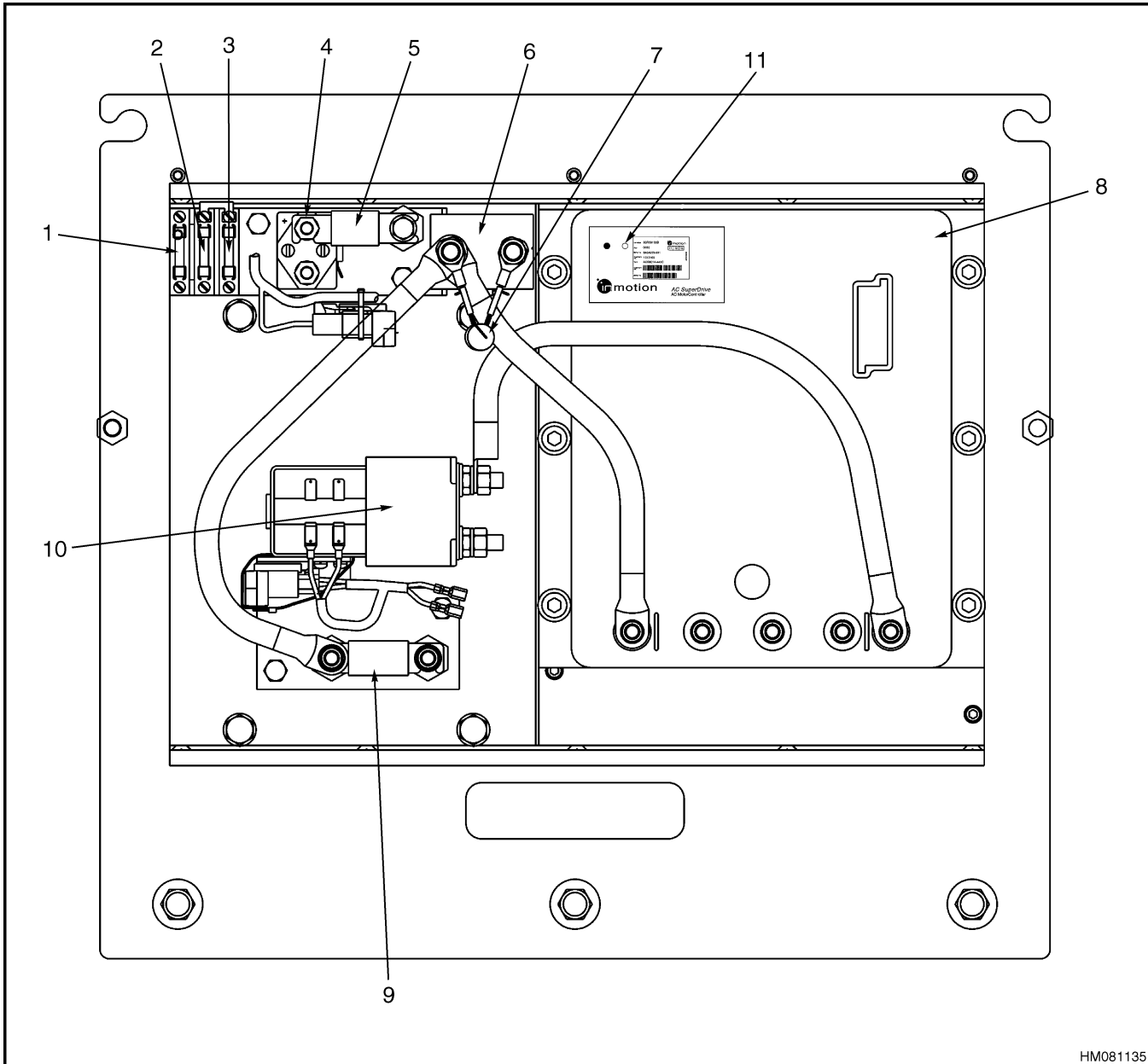
Figure 5. AC Traction Motor Controller and Contactor Control for DC Pump Motor (Gen V) (36v/48v or 72v/80v) for J2.00-3.20XM (J40-65Z) (A416) and E2.00-3.20XM (E45-65Z) (G108), Later Models Only and for J2.00-3.20XM (J40-65Z) (B416); E1.50-2.00XM (E25-35Z, E40ZS) (E114/F114); and V30ZMD (D210/E210) Lift Truck Models



HM081049

- | | |
|--|---|
| 1. FUSE 7 (15A) AUXILIARY TERMINAL STRIP | 7. AC TRACTION MOTOR CONTROLLER |
| 2. FUSE 5 (15A) LIGHTS | 8. AC PUMP MOTOR CONTROLLER |
| 3. FUSE 3 (5A) KEYSWITCH | 9. LED INDICATOR |
| 4. POWER STEERING CONTACTOR | 10. POSITIVE TEMPERATURE COEFFICIENT RESISTOR (PTC) |
| 5. FUSE 4 (40A) POWER STEERING | |
| 6. LINE CONTACTOR | |

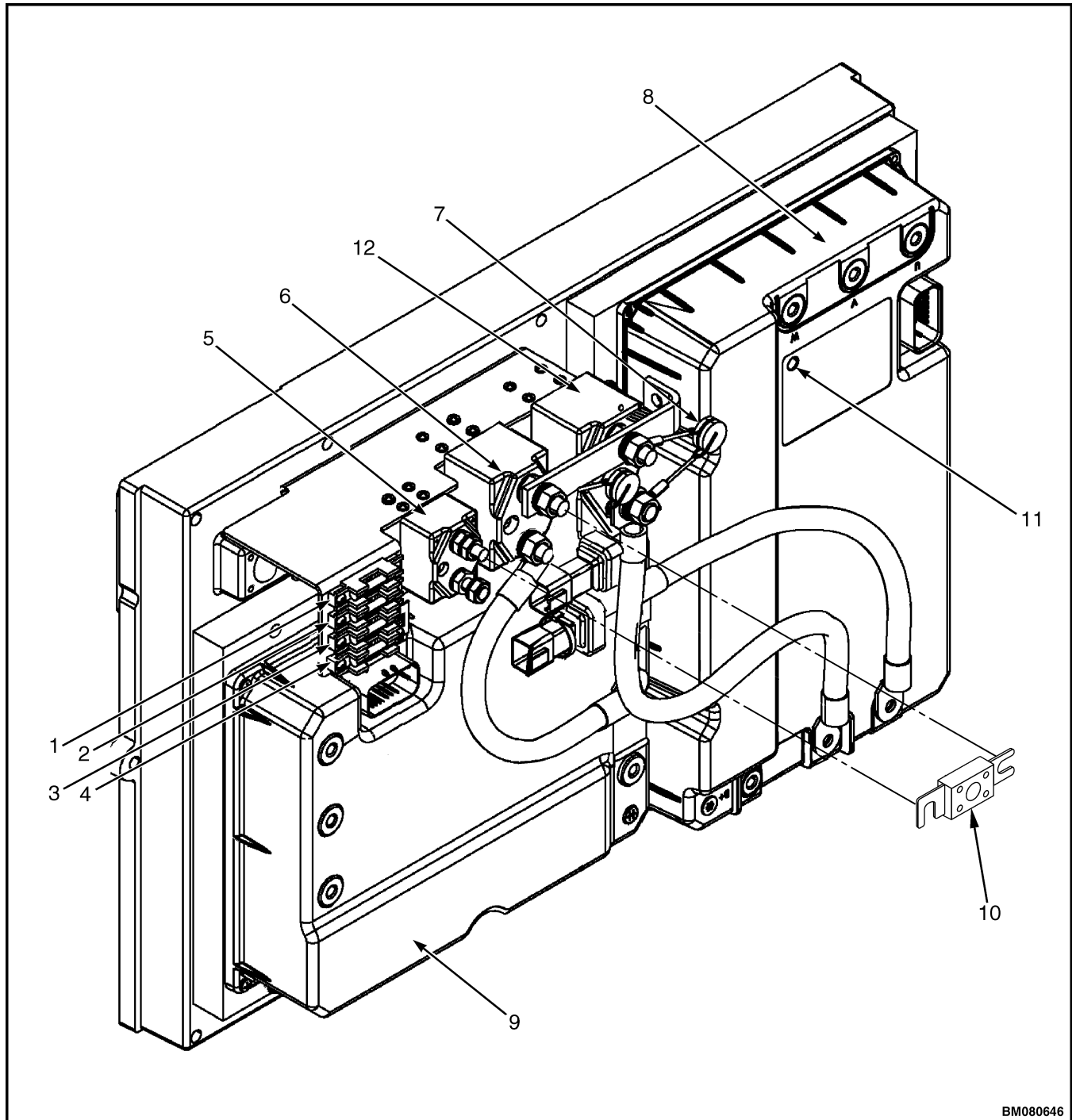
Figure 6. AC Traction and Pump Motor Controllers (72v/80v) (Gen IV) for Early Model J2.00-3.20XM (J40-65Z) (A416) and E2.00-3.20XM (E45-65Z) (G108) Lift Trucks



HM081135

- | | |
|--|--|
| 1. FUSE 7 (15A) AUXILIARY TERMINAL STRIP | 7. POSITIVE TEMPERATURE COEFFICIENT RESISTOR (PTC) |
| 2. FUSE 5 (15A) LIGHTS | 8. AC TRACTION MOTOR CONTROLLER |
| 3. FUSE 3 (5A) KEYSWITCH | 9. FUSE 2 (325A) PUMP |
| 4. POWER STEERING CONTACTOR | 10. CONTACTOR FOR DC PUMP MOTOR |
| 5. FUSE 4 (40A) POWER STEERING) | 11. LED INDICATOR |
| 6. LINE CONTACTOR | |

Figure 7. AC Traction Motor Controller and Contactor Control for DC Pump Motor (72v/80v) (Gen IV) for Early Model J2.00-3.20XM (J40-65Z) (A416) and E2.00-3.20XM (E45-65Z) (G108) Lift Trucks



BM080646

- | | |
|--|--|
| 1. FUSE 1 (15A) AUXILIARY TERMINAL STRIP | 7. POSITIVE TEMPERATURE COEFFICIENT RESISTOR (PTC) |
| 2. FUSE 2 (15A) (SLOW BLOW) SEAT BRAKE | 8. AC TRACTION MOTOR CONTROLLER |
| 3. FUSE 3 (15A) LIGHTS | 9. AC PUMP MOTOR CONTROLLER |
| 4. FUSE 4 (5A) KEYSWITCH | 10. POWER STEERING FUSE (40A) |
| 5. POWER STEERING CONTACTOR | 11. LED INDICATOR |
| 6. LINE TRACTION CONTACTOR | 12. LINE PUMP CONTACTOR |

Figure 8. AC Traction and Pump Motor Controllers for E3.50-5.50XL, E4.50XLS (E70-120Z, E100ZS) (D098/E098) Lift Trucks Only

MASTER CONTROLLER, REPLACE

NOTE: If your lift truck is equipped with an Electro-Hydraulic control valve, see **Electro-Hydraulic Control Valve** 2000 SRM 1224 for the location and procedures to replace the Electro-Hydraulic Valve Driver Module.

Master Controller, Remove J2.00-3.20XM (J40-60Z) (A416/B416)

NOTE: The master controller is located behind the battery and can be removed by performing the steps below. See Figure 9.

1. Disconnect the battery and discharge the capacitors by holding the horn button down until the horn stops making a sound. Attach a tag to truck battery connector stating DO NOT CONNECT BATTERY. Remove the key.
2. Remove the counterweight cover located between the hood and counterweight.
3. Loosen capscrews and remove fan cover.
4. Remove fan plate assembly.

NOTE: Perform Step 5 if a fan is to be replaced.

5. Remove the four capscrews and fan from fan plate assembly.

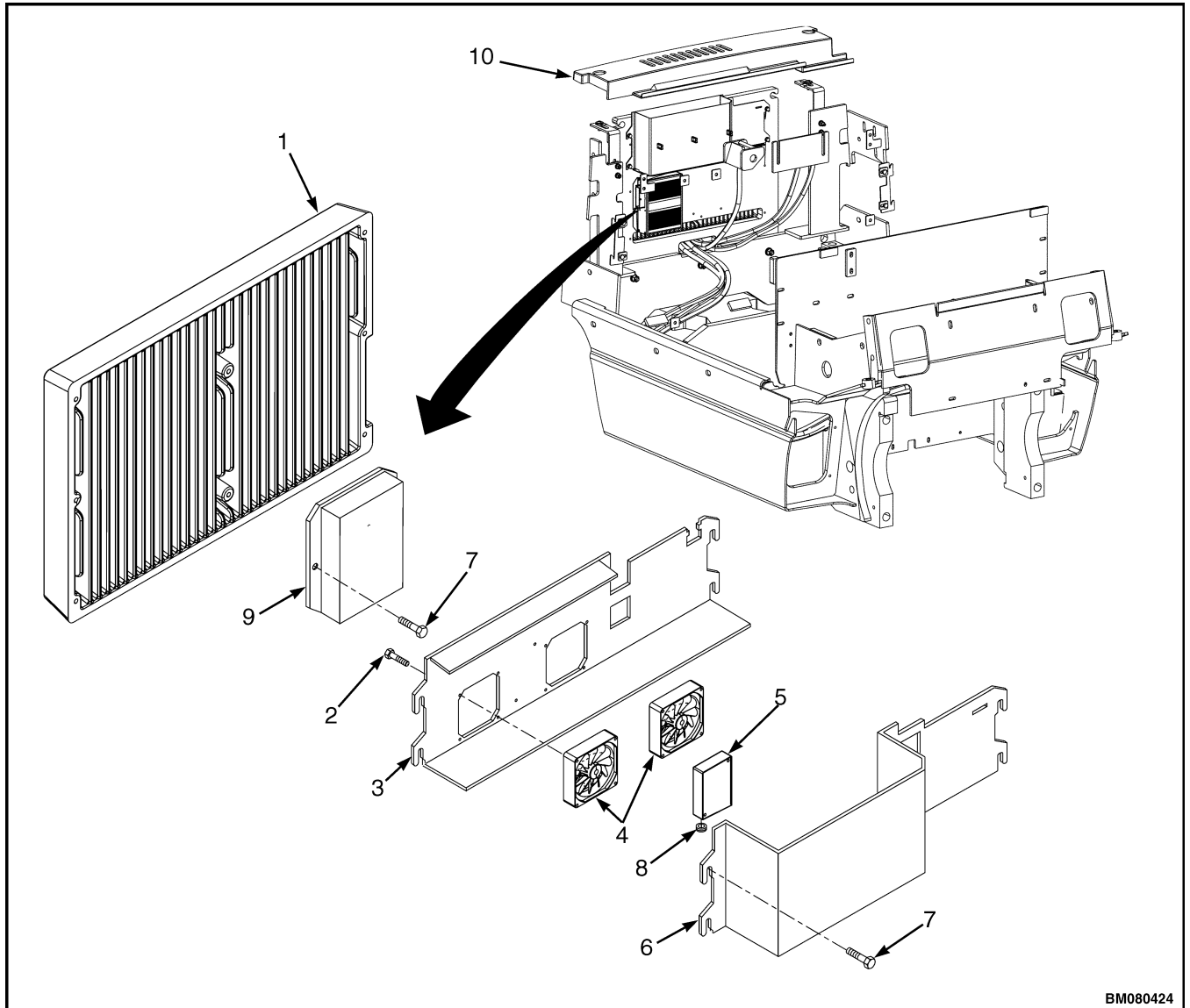
6. Disconnect the power supply cable from master controller.
7. Remove three capscrews and master controller from mounting plate.

Master Controller, Install J2.00-3.20XM (J40-60Z) (A416/B416)

1. Install master controller on mounting plate with three capscrews.
2. Connect power supply cable to master controller.

NOTE: Perform Step 3 only if fan is to be installed.

3. Install fan on fan bracket assembly with four capscrews.
4. Install fan plate assembly.
5. Install fan cover and tighten capscrews.
6. Install counterweight cover.
7. Remove the DO NOT CONNECT BATTERY tag from truck battery connector and reconnect the battery.



BM080424

- | | |
|-----------------------|-------------------------|
| 1. MOUNTING PLATE | 6. FAN COVER |
| 2. SCREW | 7. CAPSCREW |
| 3. PLATE | 8. GROMMET |
| 4. FAN PLATE ASSEMBLY | 9. MASTER CONTROLLER |
| 5. POWER SUPPLY | 10. COVER-COUNTERWEIGHT |

Figure 9. AC Master Controller for J2.00-3.20XM (J40-60Z) (A416/B416)

Master Controller, Remove E1.50-2.00XM (E25-35Z, E40ZS) (E114/F114); E2.00-3.20XM (E45-65Z) (G108); and (V30ZMD) (D210/E210)

NOTE: On the E1.50-2.00XM (E25-35Z, E40ZS) (E114/F114) lift truck model, the master controller is located on the right-hand side under the battery tray. See Figure 10.

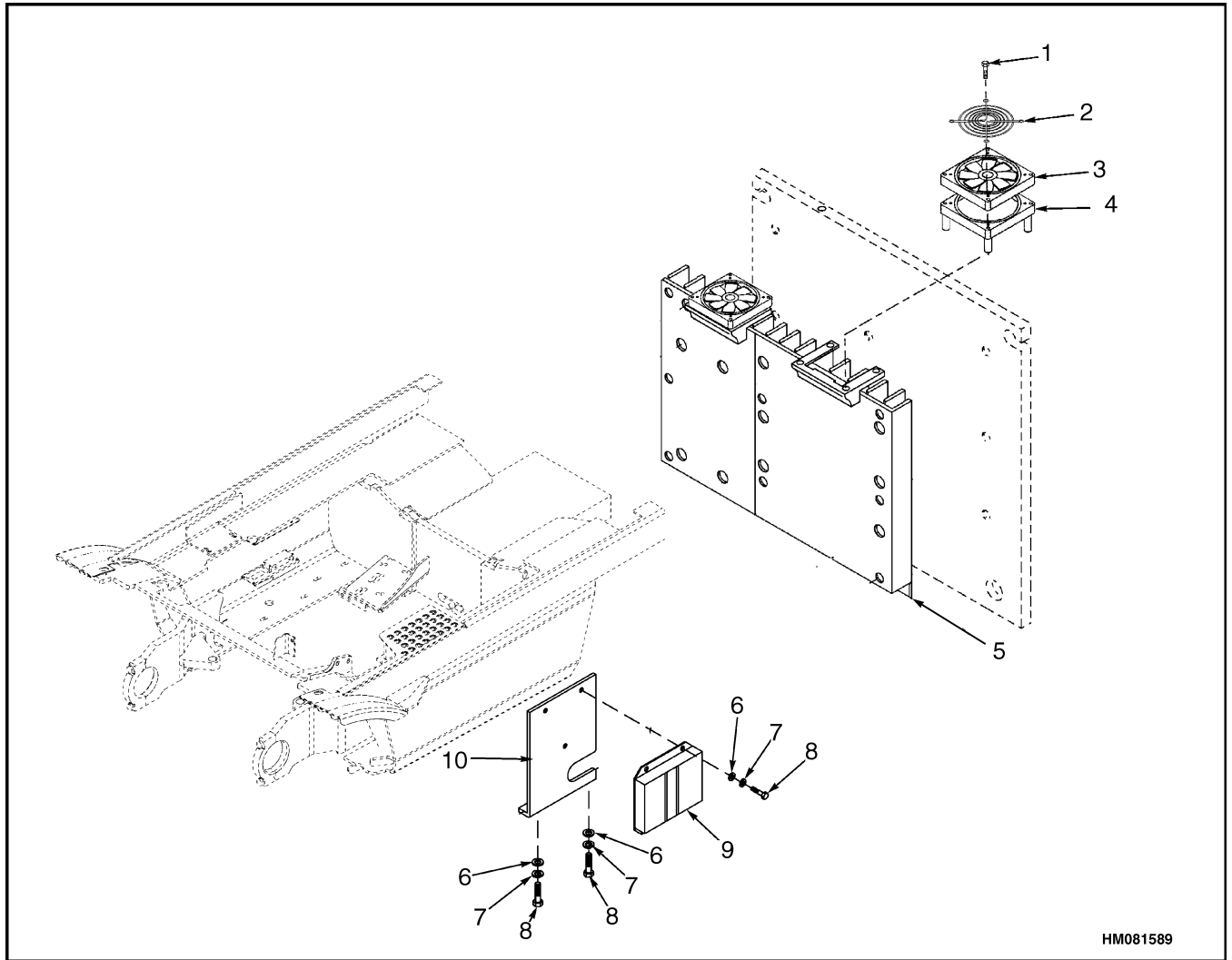
NOTE: On the E2.00-3.20XM (E45-65Z) (G108) and (V30ZMD) (D210/E210), the master controller is located on the left-hand side under the battery tray.

1. Disconnect the battery and discharge the capacitors by holding the horn button down until the horn stops making a sound. Attach a tag to truck battery connector stating **DO NOT CONNECT BATTERY**. Remove the key.
2. Remove battery, and battery tray.
3. Remove the two capscrews from bracket located under the frame.

4. Rotate master controller bracket and master controller assembly, and disconnect the power supply cable.
5. Remove three capscrews and bracket from master controller.

Master Controller, Install E1.50-2.00XM (E25-35Z, E40ZS) (E114/F114); E2.00-3.20XM (E45-65Z) (G108); and (V30ZMD) (D210/E210)

1. Install master controller on bracket with three capscrews.
2. Connect power supply cable to master controller.
3. Install two capscrews to the bracket located under the frame.
4. Install battery tray, and battery.
5. Remove the **DO NOT CONNECT BATTERY** tag from truck battery connector and reconnect the battery.



HM081589

- | | |
|--------------|----------------------|
| 1. SCREW | 6. WASHER |
| 2. GUARD | 7. LOCKWASHER |
| 3. FAN | 8. CAPSCREW |
| 4. SPACER | 9. MASTER CONTROLLER |
| 5. HEAT SINK | 10. BRACKET |

Figure 10. AC Master Controller for E1.50-2.00XM (E25-35Z, E40ZS) (E114/F114); E2.00-3.20XM (E45-65Z) (G108); and V30ZMD (D210/E210)

Master Controller, Remove E3.50-5.50XL E4.50XLS (E70-120Z,E100ZS) (D098/E098)

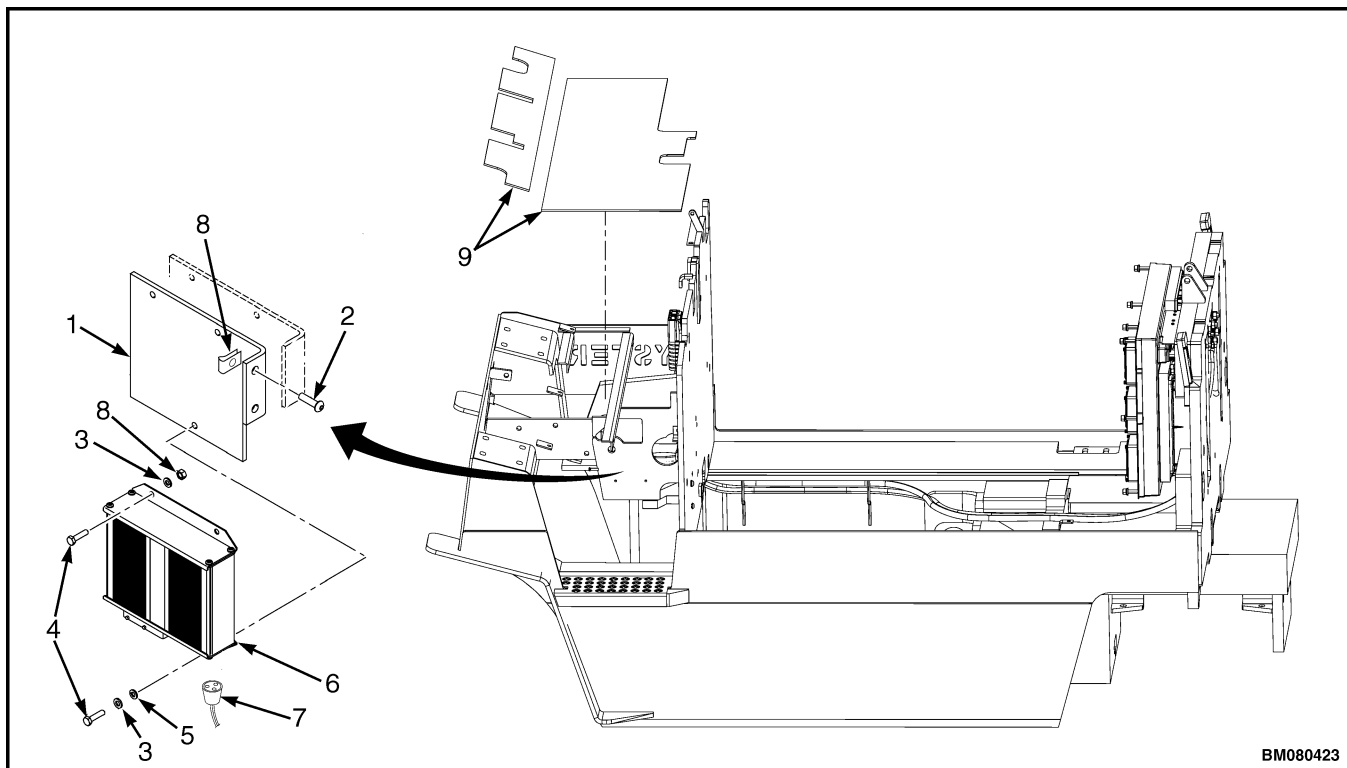
NOTE: On the E3.50-5.50XL E4.50XLS (E70-120Z,E100ZS) (D098/E098) lift truck model. The master controller is located on the left hand side, under the rear floor plate. See Figure 11.

1. Disconnect the battery and discharge the capacitors by holding the horn button down until the horn stops making a sound. Attach a tag to truck battery connector stating DO NOT CONNECT BATTERY. Remove the key.
2. Remove battery
3. Remove floor plate.
4. Remove the two socket head screws, located on the inside wall of the battery compartment, mounting the master controller bracket.
5. Rotate master controller and bracket to disconnect the power supply cable from master controller.

6. Remove three nuts and bolt and master controller from the master controller bracket, and fan bracket.

Master Controller, Install E3.50-5.50XL E4.50XLS (E70-120Z,E100ZS) (D098/E098)

1. Install three nuts and bolts and master controller to the master controller bracket, and fan bracket.
2. Connect power supply cable to the master controller.
3. Install two socket head screws to mount the master controller and bracket to the wall of the battery compartment.
4. Install floor plate.
5. Install battery.
6. Remove the DO NOT CONNECT BATTERY tag from truck battery connector and reconnect the battery.



BM080423

- | | | |
|------------------------------|-----------------------|-----------------|
| 1. MASTER CONTROLLER BRACKET | 4. CAPSCREW | 8. NUT |
| 2. SOCKET HEAD SCREW | 5. LOCKWASHER | 9. FLOOR PLATES |
| 3. WASHER | 6. MASTER CONTROLLER | |
| | 7. CABLE-POWER SUPPLY | |

Figure 11. AC Master Controller for E3.50-5.50XL E4.50XLS (E70-120Z,E100ZS) (D098/E098)

Control Components Replacement

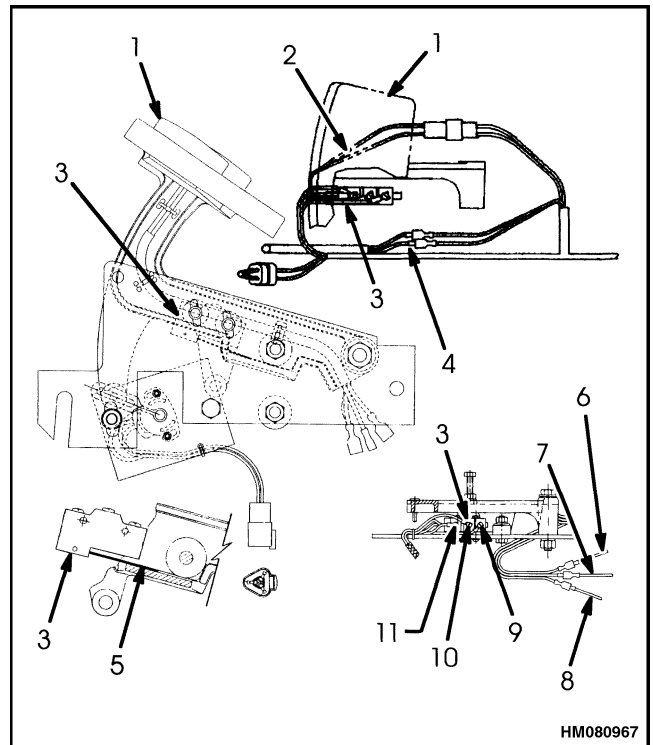
GENERAL

Prior to performing the replacement procedures in this section, it is advised that the technician perform adjustment procedures as appropriate if not already done. The various adjustment procedures may be found later in this manual.

START SWITCH, REPLACE

The start switch is a small switch fastened to the mount plate for the MONOTROL pedal or accelerator pedal. The switch operates as soon as the pedal starts to move, for an input to the master controller to energize the traction motor. Replace the start switch as follows:

1. Disconnect the battery and discharge the capacitors by holding the horn button down until the horn stops making a sound. Attach a tag to truck battery connector stating DO NOT CONNECT BATTERY. Remove the key.
2. Remove the floor plates. The start switch is under the accelerator or MONOTROL pedal. See Figure 12.
3. Install tags on the wires of the start switch for correct connection during installation. Remove the wires and the mount screws for the start switch.
4. Install the replacement start switch in the same position. Do not bend or damage the leaf of the switch during installation. Connect the wires as tagged during removal.
5. Adjust the start switch as described in Start Switch Adjustment. Install the floor plates.
6. Remove the DO NOT CONNECT BATTERY tag from truck battery connector and reconnect the battery.



1. MONOTROL PEDAL OR ACCELERATOR PEDAL
2. TO ACCELERATOR POSITION SENSOR
3. START SWITCH
4. TO DIRECTION CONTROL LEVER IF INSTALLED
5. ACTUATOR OF START SWITCH
6. RED/PINK
7. BLU-LT
8. WHT
9. GRN
10. WHT OR WHT/BLK
11. RED/YEL, RED/PINK

Figure 12. Start Switch

BRAKE LIGHT SWITCH, REPLACE

The brake light switch is a small switch fastened to the mount plate for the brake pedal assembly. This switch is normally open. The brake light switch is operated by the brake pedal to energize the brake lights on the rear legs of the overhead guard. For all models except E3.50-5.50XL, E4.50XLS (E70-120Z, E100ZS) (D098/E098), these lights are standard on U.S. units and optional on European units. On models E3.50-5.50XL, E4.50XLS (E70-120Z, E100ZS) (D098/E098), these lights are standard on both U.S. and European units. Replace the brake light switch as follows:

1. Disconnect the battery and discharge the capacitors by holding the horn button down until the horn stops making a sound. Attach a tag to truck battery connector stating **DO NOT CONNECT BATTERY**. Remove the key.
2. Remove the floor plates. The brake light switch is between the pedal arm and the mount for the brake pedal. See Figure 13.
3. Install tags on the wires of the brake light switch for correct connection during installation. Remove the wires and the mount screws for the switch.

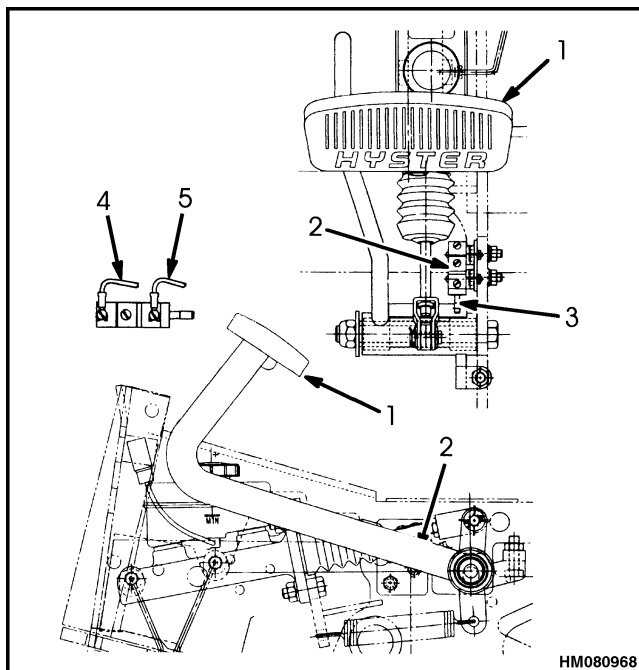


Figure 13. Brake Light Switch

Legend for Figure 13

1. BRAKE PEDAL
 2. BRAKE LIGHT SWITCH
 3. SWITCH ACTUATOR
 4. YEL/RED
 5. BRN/PUR
4. Install the replacement switch in the same position. Do not bend or damage the actuator arm and roller of the switch during installation. Connect the wires as tagged during removal.
 5. Adjust the brake light switch as described in Brake Light Switch Adjustment. Install the floor plates.
 6. Remove the **DO NOT CONNECT BATTERY** tag from truck battery connector and reconnect the battery.

SEAT SWITCH, REPLACE

NOTE: The seat brake is an optional feature on the models of lift trucks covered in this manual. There is a switch on the seat brake linkage that must be adjusted by moving it in slots of the mount bracket. See the **Brake System** manual for the adjustment procedures.

The seat switch has no adjustments. See Figure 14. The seat switch is inside the cushion of the operator seat and must be replaced if it is damaged. The switch is normally open. Replace the seat switch as follows:

1. Disconnect the battery and discharge the capacitors by holding the horn button down until the horn stops making a sound. Attach a tag to truck battery connector stating **DO NOT CONNECT BATTERY**. Remove the key.
2. Open the hood. Disconnect the connector for the seat switch wires near the rear of the hood frame. Push the connector through the grommet in the hood. It can be necessary to remove the grommet from the hole in the hood for enough clearance to get the connector through the grommet.
3. Remove the screws that fasten the seat to the hood and hood frame. Close and latch the hood and put the seat on its side for access to the seat switch.