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RAIL

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## SERVICE BULLETIN MAINTENANCE OF WAY EQUIPMENT

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**DATE:** 1-31-2013 **BULLETIN NO:** 13-001

**TITLE:** ELECTRICAL SYSTEM GROUNDING

**RATING:**  **DIRECTIVE** (Action Is Required)  **ALERT** (Potential Problem)  
 **INFORMATION** (Action Is Optional)  **PRODUCT IMPROVEMENT** (Enhance Product)

**PRODUCT SERIES / MODEL:** Component Failure Regarding Relay Grounding with Jupiter I or II Control Systems on the Following Equipment:

NTC - UTV - TGIV - Under Cutter - Track Stabilizer  
MKII - MKIII - MKIV - MKVI - Drone - Tiger Cub Tampers  
PGM96 Rail Grinder

**SERIAL NO:** All of the Above Models With Jupiter I or II Control Systems

**SUMMARY:** A potential problem has been discovered with the grounding of the Jupiter I or II Control System components (JAM, modules, cables, and other peripherals). The cables connected to the JAM could overheat causing a component failure or potential fire hazard.

**OPERATIONAL IMPACT:** Connecting wire #000 to wire #000W should reduce and/or eliminate the possibility of the grounding issue with the JAM and other peripheral devices. The isolation of wire #000W from wire #000 was intended to provide protection from welding and other electrical disturbances when the machine's electrical system was turned off. Recent changes and replacements for the JAM and other peripheral devices have proven to be incompatible with this isolation method. This leaves sensitive circuits and cables connected and subject to irreparable damage.

**ACTION:** Follow the instructions in this Service Bulletin to order the Electrical System Grounding Kit and to connect wire #000 to wire #000W.

**CONTACT:** If you have any questions or if we can be of any service, please contact:  
Harsco Rail Service Department  
Columbia, SC Facility  
(803) 822-7546

**ORDERING ELECTRICAL SYSTEM GROUNDING KIT**

1. **Important:** Verify how many Jupiter ground relays are on the machine. Some machines may have more than one Jupiter ground relay that switches the ground wire #000W to #000. If the machine has more than one ground relay, one Electrical System Grounding Kit is required for each ground relay.
2. Contact the Service Department at Harsco Rail to order the total quantity of the #5027556 Electrical System Grounding Kits needed.

Harsco Rail Service Department  
 Columbia, SC Facility  
 (803) 822-7546

3. Be able to provide the Model Number and Serial Number of the machine that the Electrical System Grounding Kit is being installed on.

**PARTS LIST**

ITEM	PART NO	DESCRIPTION	QTY
	5027556	ELECTRICAL SYSTEM GROUNDING KIT .....	1
1	F040090	Screw, 5/16"-18 x 3/4" Hex Flange Serrated .....	1
2	F040088	Nut, 5/16"-18 Hex Flange Serrated .....	1
3	151655-3	Heat Shrink Tubing, 1" Diameter .....	6"
4	151655-11	Heat Shrink Tubing, 1/2" Diameter .....	6"
5	F016578	Ty-Rap .....	2

**SAFETY INFORMATION**



- **FOLLOW APPLICABLE RAILROAD LOCKOUT - TAGOUT PROCEDURE TO REMOVE MACHINE FROM ALL ENERGY SOURCES. FAILURE TO COMPLY COULD RESULT IN SEVERE BODILY INJURY.**

**INSTALLING ELECTRICAL SYSTEM GROUNDING KIT**

1. Follow applicable Railroad Lockout - Tagout Procedure to remove the machine from all energy sources when performing maintenance, or making adjustments or repairs to the machine.
2. BE SURE the Jupiter Control System and the master disconnect switch are shut off on the machine before installing the Electrical System Grounding Kit.
3. **Important:** DO NOT apply the Electrical System Grounding Kit to any Jupiter power relays that switch positive voltage (ungrounded circuits).

## INSTALLING ELECTRICAL SYSTEM GROUNDING KIT

- See Figure 1. Locate the Jupiter ground relay that switches the ground wire #000W to #000.

*Note: Some machines may have more than one Jupiter ground relay that switches the ground wire #000W to #000. If the machine has more than one ground relay, an Electrical System Grounding Kit is required for each ground relay.*

- See Figure 1. Disconnect wires #000 and #000W from the larger contact terminals (A) of the Jupiter ground relay.
- See Figure 2. Cut the smaller 1/2" x 6" heat shrink tubing (4) in half to obtain two 3" long pieces. Slide one of the pieces onto the #000 wire and the other piece onto the #000W wire.
- See Figure 2. Slide the larger 1" x 6" heat shrink tubing (3) onto one of the two wires.

FIGURE 1

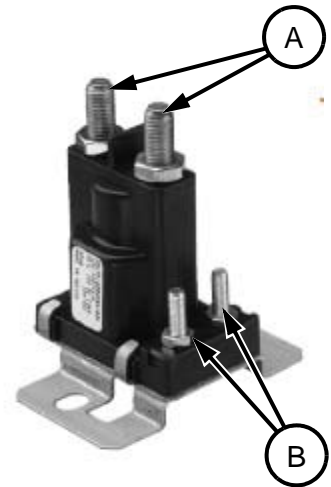
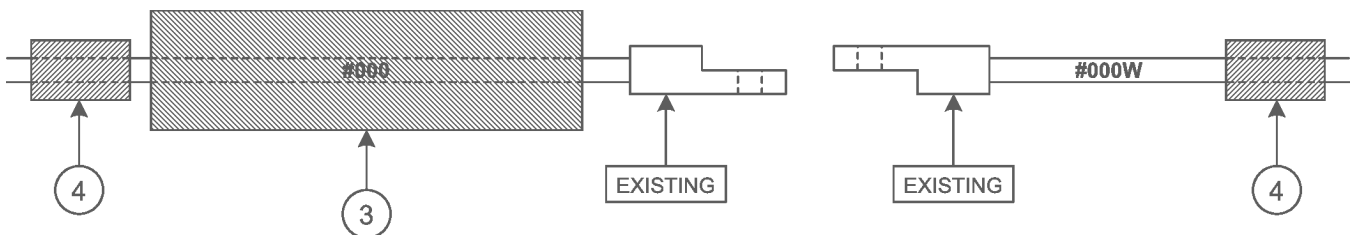
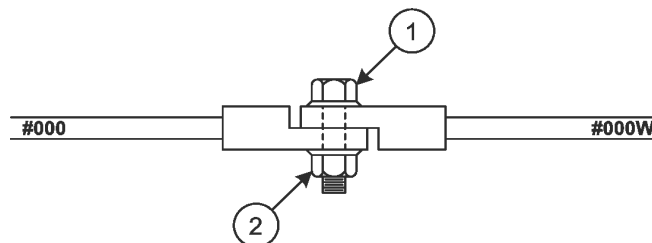


FIGURE 2



- See Figure 3. Thoroughly clean the terminals on the ends of wire #000 and wire #000W of all corrosion and debris. Connect the terminals on the ends of wire #000 and wire #000W together using the 5/16" x 3/4" hex cap screw (1) and hex nut (2). Torque the cap screw and nut to 20 lb-ft.

FIGURE 3



- See Figures 4 and 5. Slide the larger 1" x 6" heat shrink tubing (3) over the cap screw (1) and nut (2) so it is centered. Then apply heat to shrink the tubing.

**INSTALLING ELECTRICAL SYSTEM GROUNDING KIT**

FIGURE 4

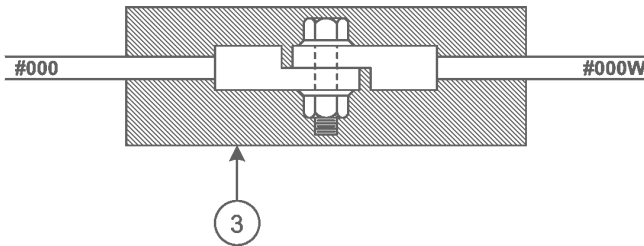
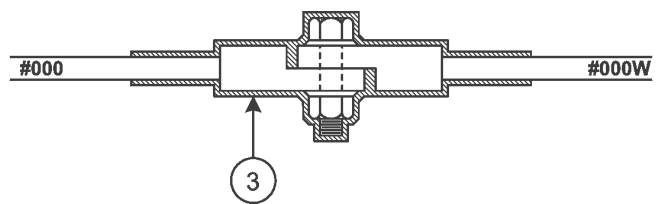


FIGURE 5



10. See Figures 6 and 7. Slide both of the smaller 1/2" x 3" heat shrink tubings (4) over both ends of the larger 1" x 6" heat shrink tubing (3) so they overlap the ends of the larger heat shrink tubing (3) by 1-1/2 inches. Then apply heat to shrink both of the tubings.

FIGURE 6

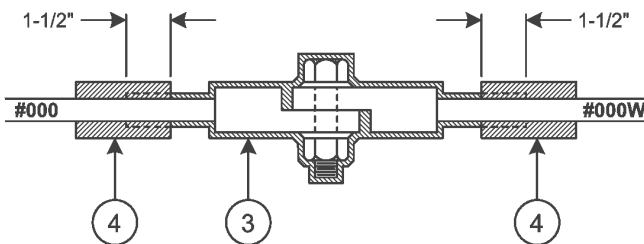
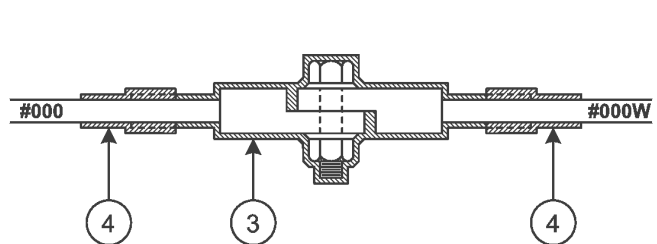


FIGURE 7



11. See Figure 1. Disconnect the wires from the smaller coil terminals (B) of the Jupiter ground relay. After disconnecting the coil wires, do one of the following:
- Apply electrical tape over the terminal ends of the disconnected wires.
  - Cut the terminals off the end of the disconnected wires. Then apply electrical tape to the ends of the cut wires.
  - Disconnect the other end of the wires and remove the wires completely.
12. See Figure 1. Remove the mounting hardware from the Jupiter ground relay and then remove the relay from the enclosure. Re-install the existing mounting hardware to plug the holes in the enclosure.
13. Use the ty-raps (5) to secure and clean up the wiring as needed.
14. If applicable, repeat procedure to install the Electrical System Grounding Kit on any other Jupiter ground relays that are on the machine.
15. After installing the Electrical System Grounding Kit, BE SURE all personnel are clear of the machine. Turn on the master disconnect switch. Boot-up the Jupiter Control System and verify all Jupiter components are properly functioning.

**WELDING PRECAUTIONS**

- **WHEN WELDING ON MACHINE:**
  - **APPLY PARKING BRAKES AND SHUT DOWN MACHINE'S ENGINE.**
  - **SHUT OFF JUPITER CONTROL SYSTEM.**
  - **ROTATE MASTER DISCONNECT SWITCH TO OFF POSITION TO TURN OFF MACHINE'S ELECTRICAL SYSTEM.**
  - **IF MACHINE IS EQUIPPED WITH BATTERY ISOLATION SWITCH, ROTATE SWITCH TO OFF POSITION TO DISCONNECT NEGATIVE (-) BATTERY CONNECTION FROM GROUND.**
  - **IF MACHINE IS NOT EQUIPPED WITH BATTERY ISOLATION SWITCH, THEN DISCONNECT NEGATIVE (-) CABLE FROM BATTERY TO DISCONNECT NEGATIVE (-) BATTERY CONNECTION FROM GROUND.**
  - **DISCONNECT ALL WIRE HARNESS CONNECTORS FROM ENGINE'S ECM (Electronic Control Module).**
  - **DO NOT CONNECT WELDER GROUND CABLE TO ANY PART OF ENGINE'S ECU (Electronic Control Unit).**

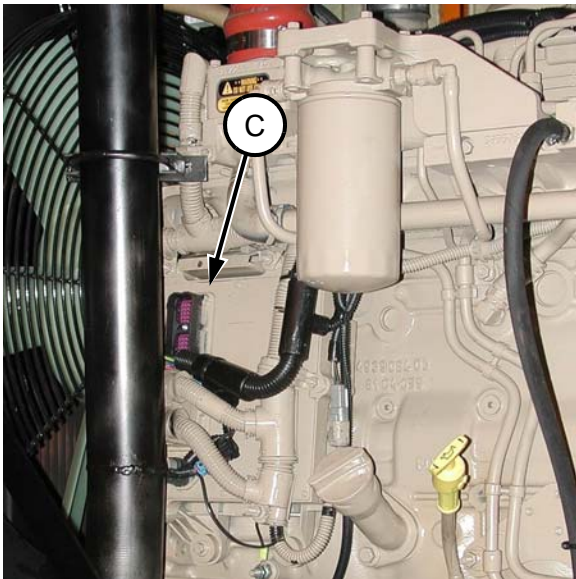
**FAILURE TO COMPLY COULD RESULT IN BODILY INJURY AND/OR PROPERTY DAMAGE.**

*Note: See the Engine Manual for the location of the engine ECM and any additional information on Welding Precautions.*

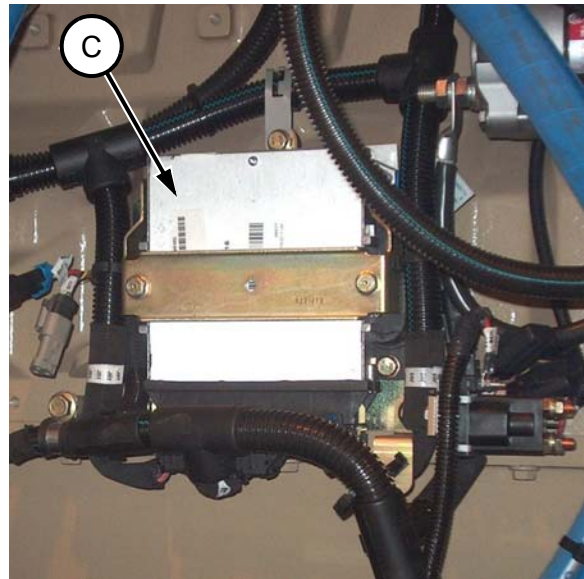
1. Make sure the parking brakes are applied and the machine's engine is shut down.
2. Shut Off the Jupiter Control System.
3. Rotate the master disconnect switch to the Off position to turn off the machine's electrical system.
4. If the machine is equipped with a battery isolation switch, rotate the switch to the Off position to disconnect the negative (-) battery connection from ground. If the machine is NOT equipped with a battery isolation switch, then disconnect the negative (-) cable from the battery to disconnect the negative (-) battery connection from ground.
5. See Figures 8, 9, and 10 for a typical engine ECM (Electronic Control Module). The engine's ECM (C) is usually located on the side of the engine. If the ECM can not be found on the engine, see the Engine Manual.
6. To protect the engine's ECM, disconnect all of the wiring harness connectors from the engine's ECM. DO NOT connect the welder ground cable to any part of the engine's ECM. Connect the welder ground cable as close as possible to the welding location to help prevent welding current from passing through sensitive electronic components. Welding on the engine or engine mounted components is NOT recommended.

**WELDING PRECAUTIONS**

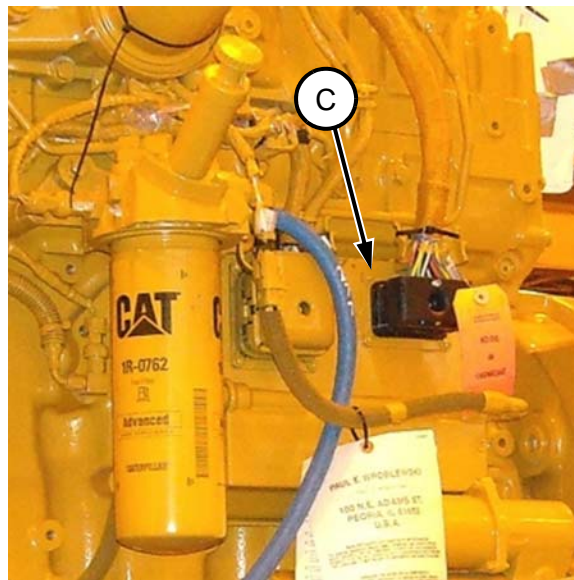
**FIGURE 8  
TYPICAL CUMMINS ECM**



**FIGURE 9  
TYPICAL JOHN DEERE ECM**



**FIGURE 10  
TYPICAL CATERPILLAR ECM**



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