SMCS - 7431

i09547412

Use this procedure under the following circumstances:

- The lamps are not receiving battery voltage.
- The lamps are not operating correctly.

The following diagnostic lamps are available:

- Power Take Off (PTO) lamp
- Stop lamp
- Warning lamp
- Cold start (wait to start lamp)
- Low oil pressure lamp

The electronic service tool can be used as a diagnostic aid to switch the individual lamps ON and OFF.

Note: The diagnostic aid that switches the lamps is contained in the "Override" section in the "diagnostics" menu of the electronic service tool.

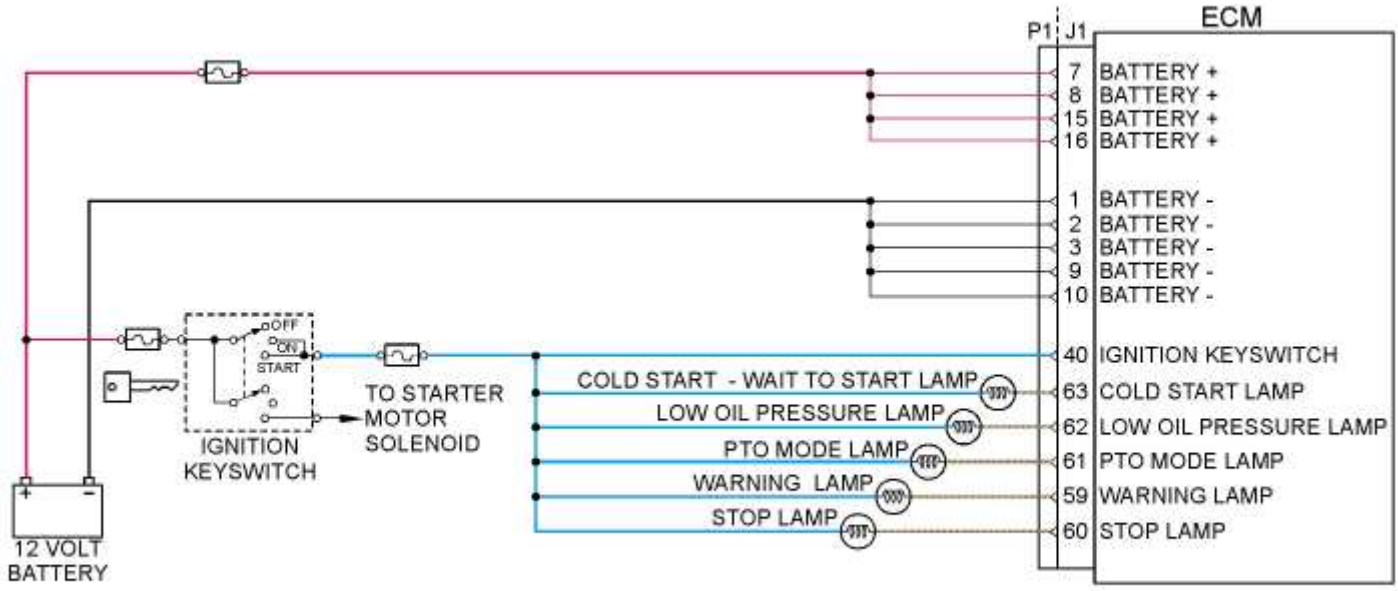

Illustration 1

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Typical schematic of the circuit for the indicator lamps

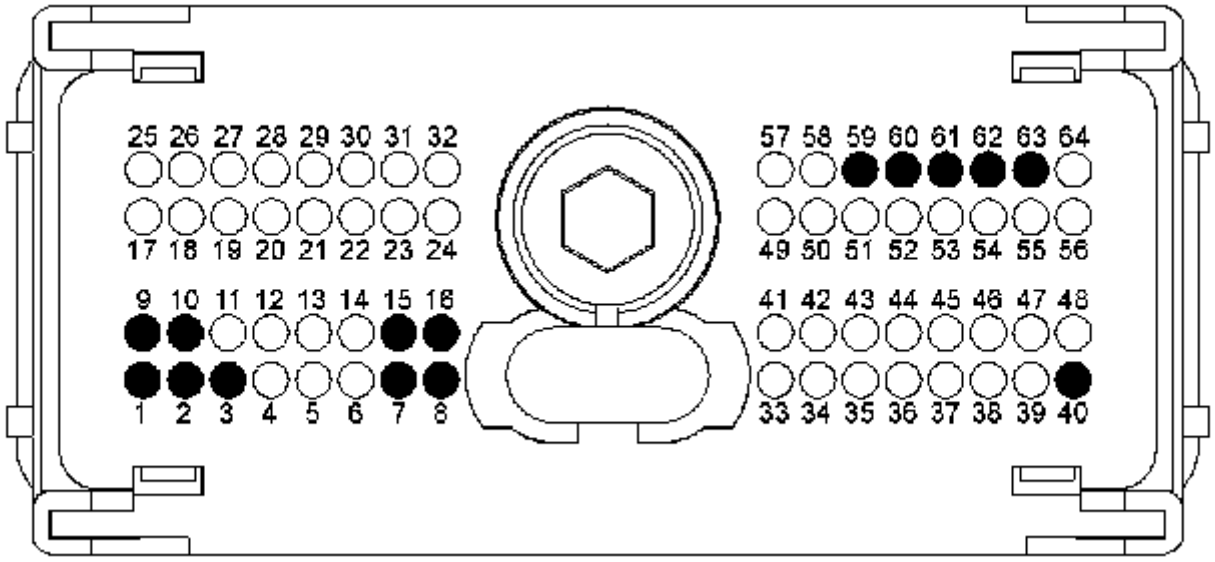

Illustration 2 g01804073
Typical example of the pin locations on the P1 connector for the indicator lamps
(1) Ground (GND)
(2) Ground (GND)
(3) Ground (GND)
(9) Ground (GND)
(10) Ground (GND)
(7) Battery (+)
(8) Battery (+)
(15) Battery (+)
(16) Battery (+)
(40) Keyswitch
(59) Warning lamp
(60) Stop lamp
(61) PTO lamp
(62) Low oil pressure lamp
(63) Cold start lamp

Table 1

Troubleshooting Test Steps	Values	Results
1. Inspect Electrical Connectors and Wiring **A.** Turn the keyswitch to the OFF position. **B.** horoughly inspect the P1 connector and the lamp connections. Refer to Troubleshooting, "Electrical Connectors - Inspect" for details. **C.** Perform a 45 N (10 lb) pull test on each of the wires in the P1 connector that are associated with the indicator lamps. **D.** Check the screw for the P1 connector for the correct torque of 5.0 N·m (44 lb in).	Loose connection or damaged wire	**Result:** There is a fault in a connector or the wiring. **Repair:**Repair the connectors or the harness and/or replace the connectors or the harness. Ensure that all of the seals are correctly in place and ensure that the connectors are completely coupled. Verify that the repair eliminates the fault. **Result:** All connectors, pins, and sockets are correctly coupled and/or inserted. The harness is free of corrosion, abrasion, and pinch points. The fuses are not blown. Proceed to Test Step 2.

E. Check the harness for abrasions and for pinch points from the battery to the ECM.		
2. Inspect the Lamp, the Fuse and the Power Supply **A.** Disconnect the lamp from the harness. Inspect the lamp to determine if the lamp has failed. **B.** Measure the resistance across the two terminals of the lamp.	Less than 2000 Ohms	**Result:** The lamp has greater than 2000 Ohms resistance. **Repair:** Replace the suspect lamp. Use the electronic service tool to verify that the repair eliminates the fault. **Result:** The lamp has less than 2000 Ohms resistance. Proceed to Test Step 3.
3. Measure the Input Voltage to the Lamp at the Lamp Socket **A.** Turn the keyswitch to the ON position. **B.** Use the electronic service tool to select the "override" function to switch individual lamps ON and OFF. **Note:** The "Override" function is contained in the "Diagnostics" menu of the electronic service tool. **C.** Measure the voltage at the lamp socket.	At least 10 VDC for a 12 V system. At least 22 VDC for a 24 V system.	**Result:** The voltage is not within the expected range - the fault is in the battery supply wiring to the lamp. **Repair:** Repair the faulty wiring or replace the faulty wiring. Use the electronic service tool to verify that the repair eliminates the fault. **Result:** The voltage is within the expected range. Proceed to Test Step 4.
4. Check the Wiring for an Open Circuit **A.** Turn the keyswitch to the OFF position. **B.** Disconnect the P1 connector. **C.** Remove the bulb from the suspect lamp. **D.** Use a multimeter to measure the resistance between the ground connection on the lamp holder and the applicable terminal on the P1 connector.	Less than 2 Ohms	**Result:** The measured resistance is greater than 2 Ohms - the fault is in the wiring between the lamp holder and the ECM. **Repair:** Repair the faulty wiring or replace the faulty wiring. Use the electronic service tool to verify that the repair eliminates the fault. **Result:** The measured resistance is less than 2 Ohms. Proceed to Test Step 5.

5. Check the Wiring for a Short Circuit **A.** Disconnect the P1 connector. Disconnect the suspect lamp. **B.** Use a multimeter to check the resistance between the lamp socket and a suitable ground.	Greater than 1k Ohm	**Result:** The measured resistance is less than 1k Ohm. There is a short in the wiring between the lamp holder and the ECM. **Repair:** Repair the faulty wiring or replace the faulty wiring. Use the electronic service tool to verify that the repair eliminates the fault. **Result:** The measured resistance is greater than 1k Ohm. Contact the Dealer Solutions Network (DSN).