

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103758238

MID 039 - CID 1595 - FMI 05

SMCS - 5479-038-V4

Conditions Which Generate This Code:

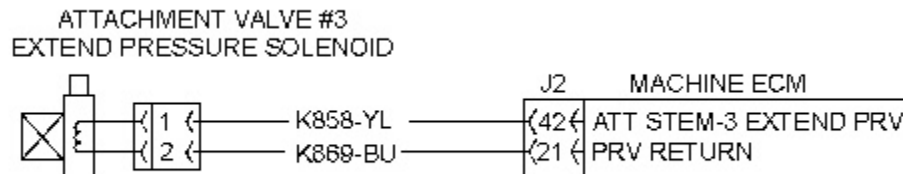


Illustration 1

g02026953

Schematic of the "Attachment Valve #3 Extend Pressure" Solenoid

This diagnostic code is associated with the "Attachment Valve #3 Extend Pressure" Solenoid. The FMI 05 diagnostic code means that the Machine ECM has determined that the current is below normal.

The possible causes of this diagnostic code are listed below:

- The energizer circuit of the solenoid for the modulating valve is open.
- The return circuit of the modulating valve is open.

- The solenoid has failed.
- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1595 FMI 05 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

When this diagnostic code is active, the Machine ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID

- A. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- B. Disconnect the solenoid with the active diagnostic code from the machine harness.
- C. At the machine harness connector for the solenoid, place a jumper wire from contact 1 (wire K858-YL) to contact 2 (wire K869-BU).
- D. Observe the status of the CID 1595 FMI 05 diagnostic code.

Expected Result:

The CID 1595 FMI 05 diagnostic code remains active.

Results:

- **YES** - The diagnostic code remains active. The jumper wire does not affect the diagnostic code. Proceed to Test Step 2.
- **NO** - The diagnostic is no longer active. The solenoid has failed.

Repair: The solenoid has failed. Repeat this Test Step "CHECK THE SOLENOID" in order to verify the solenoid failure. Replace the solenoid. Verify that the new solenoid corrects the problem.

STOP

Test Step 2. CHECK THE HARNESS FOR AN OPEN

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connector(s) from the Machine ECM.
- C. The jumper wire that was installed in the previous test remains in place.
- D. At the machine harness connector, measure the resistance from signal contact J2-42 (wire K858-YL) to contact J2-21 (wire K869-BU).

Expected Result:

Both resistances are less than 5.0 ohms.

Results:

- **OK** - Both resistances are less than 5.0 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - Either resistance is greater than 5000 ohms. The resistance measurement is not correct. There is an open circuit in the machine harness.

Repair: The open is in wire K858-YL or in wire K869-BU of the machine harness. Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS

- A. Inspect the contacts of the harness connectors and clean the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 1595 FMI 05 diagnostic code.

Expected Result:

The CID 1595 FMI 05 diagnostic code is active.

Results:

- **YES** - The CID 1595 FMI 05 diagnostic code is active. The diagnostic code has not been corrected. The Machine ECM may have failed.

Repair: It is unlikely that the Machine ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1595 FMI 05 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:44:37 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103758305

MID 039 - CID 1595 - FMI 06

SMCS - 5479-038-V4

Conditions Which Generate This Code:

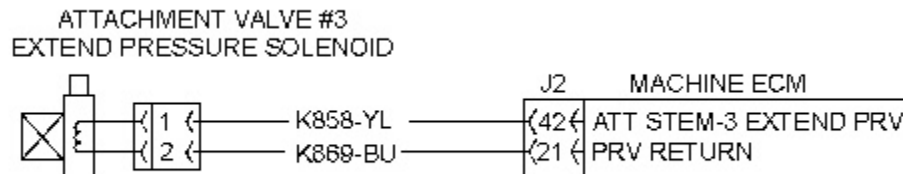


Illustration 1

g02026953

Schematic of the "Attachment Valve #3 Extend Pressure" Solenoid

This diagnostic code is associated with the "Attachment Valve #3 Extend Pressure" Solenoid. The FMI 06 diagnostic code means that the Machine ECM has determined that the current of the solenoid is above normal.

The possible causes of this diagnostic code are listed below:

- The energizer circuit of the solenoid for the modulating valve is shorted to ground.
- The solenoid has failed.

- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1595 FMI 06 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

When this diagnostic code is active, the Machine ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID

- A. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- B. Observe the status of the diagnostic code.
- C. Disconnect the solenoid with the active diagnostic code from the machine harness.

Expected Result:

The CID 1595 FMI 06 diagnostic code changes to a CID 1595 FMI 05 diagnostic code when the solenoid is disconnected.

Results:

- **YES** - The CID 1595 FMI 06 diagnostic code changes to a CID 1595 FMI 05 diagnostic code when the solenoid is disconnected. The circuit is correct.

Repair: The solenoid has failed. Repeat this test "CHECK THE SOLENOID" in order to verify the solenoid failure. Replace the solenoid.

STOP

- **NO** - The CID 1595 FMI 06 diagnostic code remains active. Proceed to Test Step 2.

Test Step 2. CHECK THE SOLENOID ENERGIZER CIRCUIT FOR A SHORT TO GROUND

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The solenoid remains disconnected from the machine harness.
- C. Disconnect the machine harness connector(s) from the Machine ECM.
- D. At the machine harness connector, measure the resistance from the signal contact J2-42 (wire K858-YL) to all contacts that are used in the machine harness connectors for the Machine ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between J2-42 (wire K858-YL) and the circuit with the low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS

- A. Inspect the harness connectors. Clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 1595 FMI 06 diagnostic code.

Expected Result:

The CID 1595 FMI 06 diagnostic code is active.

Results:

- **YES** - The CID 1595 FMI 06 diagnostic code is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the Machine ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1595 FMI 06 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

105434667

MID 039 - CID 1596 - FMI 03

SMCS - 5479-038-V4

Conditions Which Generate This Code:

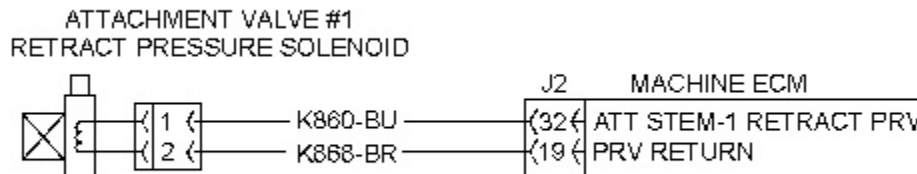


Illustration 1

g02027013

Schematic of the Attachment Valve #1 Retract Pressure Solenoid

This diagnostic code is associated with the "Attachment Valve #1 Retract Pressure" Solenoid. The FMI 03 diagnostic code means that the Machine ECM has determined that the voltage is above normal.

For machines equipped with the E-Fence feature, reference Troubleshooting, " E-Ceiling and Cab Avoidance - Troubleshoot"

The possible causes of the diagnostic code are listed below:

- The solenoid has failed.
- The solenoid energize circuit for the "Attachment Valve #1 Retract Pressure" is shorted to the +battery circuit.
- The Machine ECM may have failed (unlikely).

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1596 FMI 03 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

When this diagnostic code is active, the Machine ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID ENERGIZER CIRCUIT FOR A SHORT TO THE +BATTERY CIRCUIT

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connectors from the solenoid and the Machine ECM.
- C. At the machine harness connector for the ECM, measure the resistance from contact J2-32 (wire K860-BU) to all contacts that are used in the machine harness connectors for the Machine ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 2.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between J2-32 (K860-BU) and the circuit that has a low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 2. CHECK IF THE DIAGNOSTIC CODE IS STILL ACTIVE

- A. Inspect the contacts and clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.

D. Operate the machine.

E. Determine if the CID 1596 FMI 03 diagnostic code is active.

Expected Result:

The CID 1596 FMI 03 diagnostic code is active.

Results:

- **YES** - The CID 1596 FMI 03 diagnostic code is active. The problem has not been corrected. The Machine ECM may have failed.

Repair: A failure of the Machine ECM is unlikely. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1596 FMI 03 diagnostic code is not active. The problem does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the disconnected and reconnected harness connectors. Resume normal machine operation.

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

105434677

MID 039 - CID 1596 - FMI 05

SMCS - 5479-038-V4

Conditions Which Generate This Code:

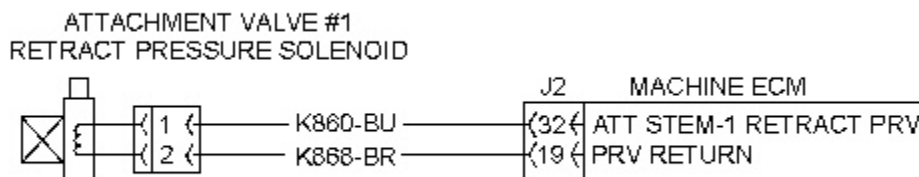


Illustration 1

g02027013

Schematic of the "Attachment Valve #1 Retract Pressure" Solenoid

This diagnostic code is associated with the "Attachment Valve #1 Retract Pressure" Solenoid. The FMI 05 diagnostic code means that the Machine ECM has determined that the current is below normal.

For machines equipped with the E-Fence feature, reference Troubleshooting, " E-Ceiling and Cab Avoidance - Troubleshoot"

The possible causes of this diagnostic code are listed below:

- The solenoid energize circuit for the "Attachment Valve #1 Retract Pressure" solenoid is open.
- The return circuit of the "Attachment Valve #1 Retract Pressure" solenoid is open.
- The "Attachment Valve #1 Retract Pressure" solenoid has failed.
- The Machine ECM may have failed (unlikely).

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1596 FMI 05 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

When this diagnostic code is active, the Machine ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID

- A. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- B. Disconnect the solenoid with the active diagnostic code from the machine harness.
- C. At the machine harness connector for the solenoid, place a jumper wire from contact 1 (wire K860-BU) to contact 2 (wire K868-BR).
- D. Observe the status of the CID 1596 FMI 05 diagnostic code.

Expected Result:

The CID 1596 FMI 05 diagnostic code remains active.

Results:

- **YES** - The diagnostic code remains active. The jumper wire does not affect the diagnostic code. Proceed to Test Step 2.
- **NO** - The diagnostic is no longer active. The solenoid has failed.

Repair: The solenoid has failed. Repeat this Test Step "CHECK THE SOLENOID" to verify the solenoid failure. Replace the solenoid. Verify that the new solenoid corrects the problem.

STOP

Test Step 2. CHECK THE HARNESS FOR AN OPEN

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connectors from the Machine ECM.
- C. The jumper wire that was installed in the previous test remains in place.

- D. At the machine harness connector, measure the resistance from signal contact J2-32 (wire K860-BU) to contact J2-19 (wire K868-BR).

Expected Result:

Both resistances are less than 5.0 ohms.

Results:

- **OK** - Both resistances are less than 5.0 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - Either resistance is greater than 5000 ohms. The resistance measurement is not correct. There is an open circuit in the machine harness.

Repair: The open is in wire K860-BU or in wire K868-BR of the machine harness. Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS

- A. Inspect the contacts of the harness connectors and clean the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 1596 FMI 05 diagnostic code.

Expected Result:

The CID 1596 FMI 05 diagnostic code is active.

Results:

- **YES** - The CID 1596 FMI 05 diagnostic code is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: A failure of the Machine ECM is unlikely. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1596 FMI 05 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The diagnostic code was probably caused by a poor electrical connection that was resolved when a harness connector was disconnected and reconnected. Resume normal machine operation.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:45:26 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

105434686

MID 039 - CID 1596 - FMI 06

SMCS - 5479-038-V4

Conditions Which Generate This Code:

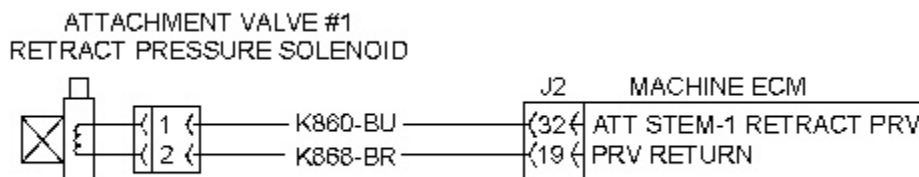


Illustration 1

g02027013

Schematic of the Attachment Valve #1 Retract Pressure Solenoid

This diagnostic code is associated with the "Attachment Valve #1 Retract Pressure" Solenoid. The FMI 06 diagnostic code means that the Machine ECM has determined that the current of the solenoid is above normal.

For machines equipped with the E-Fence feature, reference Troubleshooting, " E-Ceiling and Cab Avoidance - Troubleshoot"

The possible causes of this diagnostic code are listed below:

- The solenoid energize circuit for the "Attachment Valve #1 Retract Pressure" solenoid is shorted to ground.
- The "Attachment Valve #1 Retract Pressure" solenoid has failed.
- The Machine ECM may have failed (unlikely).

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1596 FMI 06 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

When this diagnostic code is active, the ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID

- A. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- B. Observe the status of the diagnostic code.
- C. Disconnect the solenoid with the active diagnostic code from the machine harness.

Expected Result:

The CID 1596 FMI 06 diagnostic code changes to a CID 1596 FMI 05 diagnostic code when the solenoid is disconnected.

Results:

- **YES** - The CID 1596 FMI 06 diagnostic code changes to a CID 1596 FMI 05 diagnostic code when the solenoid is disconnected. The circuit is correct.

Repair: The solenoid has failed. Repeat this test "CHECK THE SOLENOID" in order to verify the solenoid failure. Replace the solenoid.

STOP

- **NO** - The CID 1596 FMI 06 diagnostic code remains active. Proceed to Test Step 2.

Test Step 2. CHECK THE SOLENOID ENERGIZER CIRCUIT FOR A SHORT TO GROUND

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The solenoid remains disconnected from the machine harness.
- C. Disconnect the machine harness connectors from the Machine ECM.

- D. At the machine harness connector, measure the resistance from the signal contact J2-32 (wire K860-BU) to all contacts that are used in the machine harness connectors for the Machine ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between J2-32 (wire K860-BU) and the circuit with the low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS

- A. Inspect the harness connectors. Clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 1596 FMI 06 diagnostic code.

Expected Result:

The CID 1596 FMI 06 diagnostic code is active.

Results:

- **YES** - The CID 1596 FMI 06 diagnostic code is active. The diagnostic code has not been corrected. The Machine ECM may have failed.

Repair: Is unlikely that the Machine ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1596 FMI 06 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The diagnostic code was probably caused by a poor electrical connection that was resolved when a harness connector was disconnected and reconnected. Resume normal machine operation.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:45:40 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)



Service Information System

Shutdown SIS

Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I02413102

Electrical Component and Connector Locations

SMCS - 1408-546-CY; 7553-546

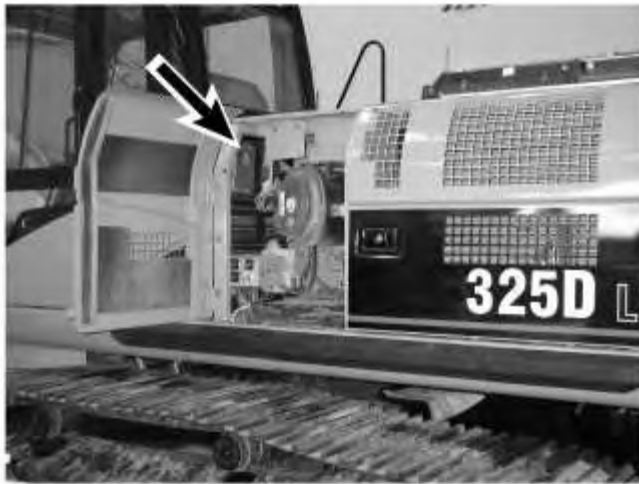


Illustration 1

g01207600

Compartment for the Machine ECM (Typical)

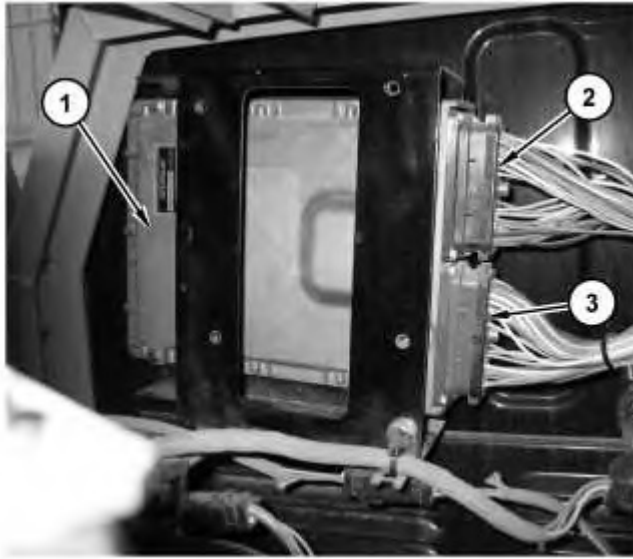


Illustration 2

g01207601

Machine ECM

(Located in the Compartment to the Rear of the Cab on the left side of the machine)

- (1) Controller
- (2) J1 Connector
- (3) J2 Connector

The electronic controls can communicate with each other through the Cat Data Link. Information from these electronic controls can be accessed through the machine monitor or by using the Caterpillar Electronic Technician (Cat ET) on a laptop computer.

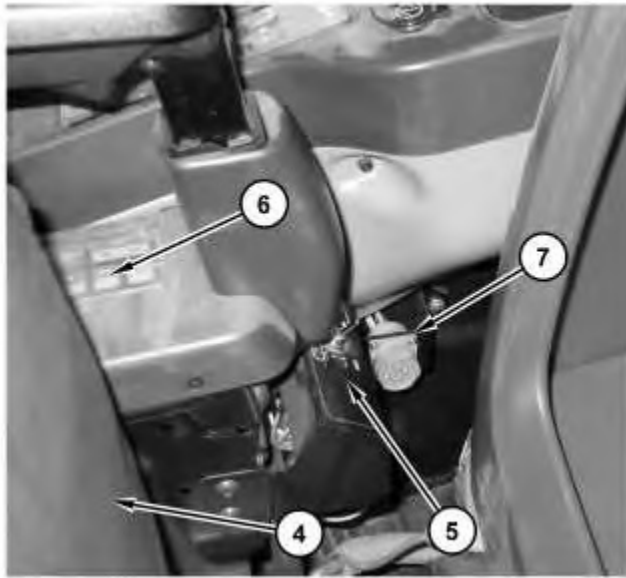


Illustration 3

g01207656

Cat ET Service Connector

(located behind the operator's seat, under the Right Side Switch Console)

(4) Back of Operator seat (shifted forward for access)

(5) Backup Switches

(6) Right Side Switch Console

(7) Cat ET Service Connector

The service connector for the Cat ET is located in the operators compartment. The connector is located behind the seat on the right side of the cab.

[Copyright 1993 - 2017 Caterpillar Inc.](#)

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

Sun Apr 23 08:16:53 UTC+0700 2017



Service Information System

Shutdown SIS

Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103928549

Diagnostic Capabilities

SMCS - 1400

Monitoring System

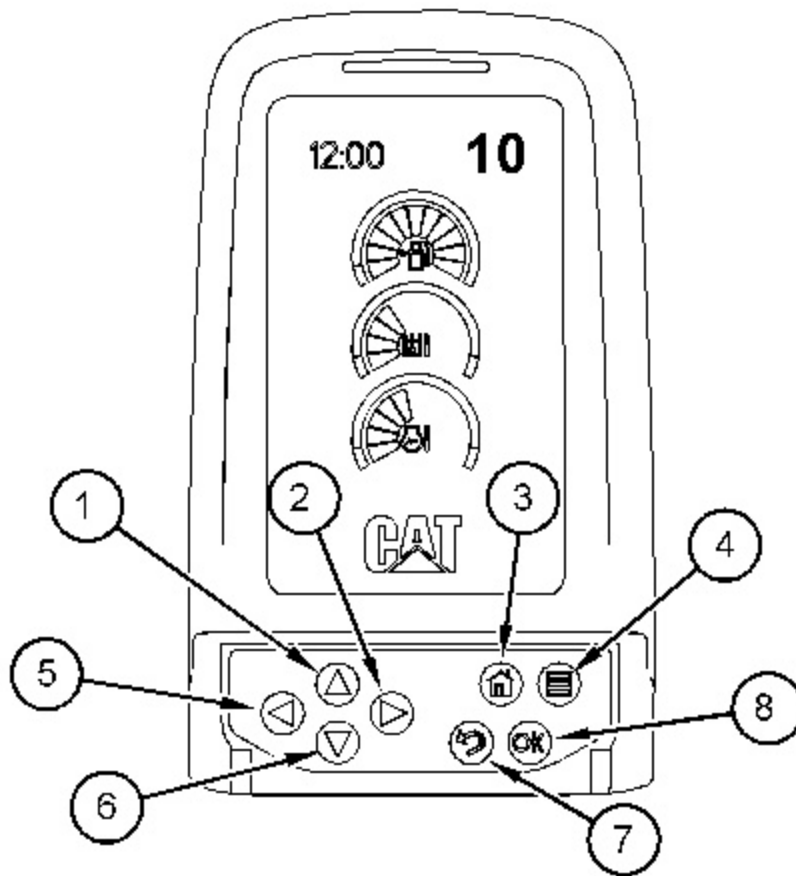


Illustration 1

g01143406

- (1) Up key
- (2) Right key
- (3) Home key
- (4) Main menu key
- (5) Left key
- (6) Down key
- (7) Back key
- (8) OK key

The ECM uses the main display module on the Monitoring System for showing diagnostic information to service personnel. Diagnostic information concerning the ECM is sent on the Cat Data Link to the Monitoring System. Service personnel must be familiar with the Monitoring System in order to troubleshoot the ECM.

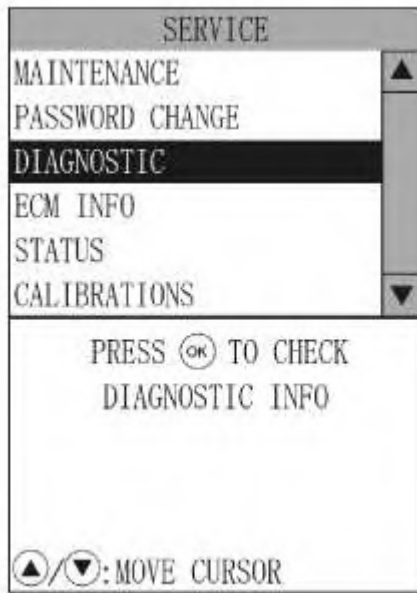


Illustration 2

g02153474

"Service" screen

For troubleshooting the ECM, access the "Service" screen of the Monitoring System. Select the "Diagnostic" option. See Illustration 2.

See Troubleshooting, "Using the Operator Monitor to Determine Diagnostic Codes".

The Caterpillar Electronic Technician (ET)



Illustration 3

g00777826

The Caterpillar Electronic Technician (ET) is a software program that is used to access data. The service technician can use the Caterpillar Electronic Technician in order to perform maintenance work on the machine. Some of the options that are available with the Caterpillar Electronic Technician are listed:

- View Diagnostic codes. See Troubleshooting, "Using the Caterpillar Electronic Technician to Determine Diagnostic Codes".
- View the status of parameters.
- Clear active diagnostic codes and clear logged diagnostic codes
- Perform calibration of machine systems.
- Program the ECM (Flash). This is done with the "WINflash" program. See Testing and Adjusting, "Electronic Control Module (ECM) - Flash Program".
- Print reports.

The following list contains some of the diagnostic functions and programming functions that are performed by the service tools.

- The failures of the ECM system are displayed.
- The status of most of the inputs and the outputs are displayed.
- The settings for the ECM are displayed.

- Display the status of the input and output parameters in real time.
- Display the clock hour of the internal diagnostic clock.
- The number of occurrences and the clock hour of the first occurrence and the last occurrence is displayed for each logged diagnostic code.
- The definition for each logged diagnostic code and each event is displayed.
- Load new FLASH software.

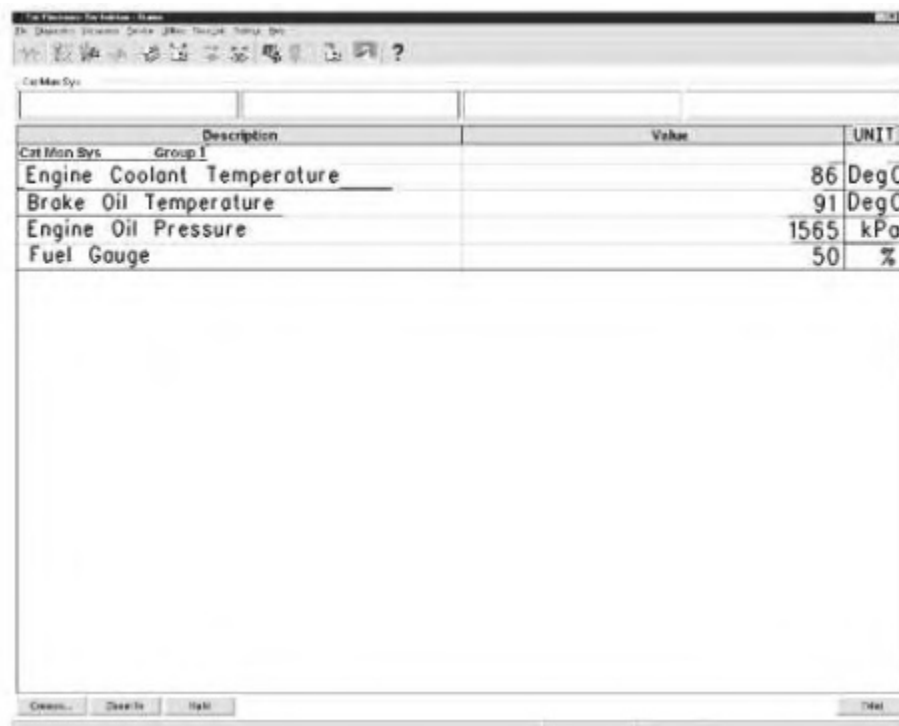
See Troubleshooting, "Diagnostic Code List" for the list of diagnostic codes for the ECM.

See Troubleshooting, "Using the Caterpillar Electronic Technician to Determine Diagnostic Codes". Diagnostic information is accessed with the following drop-down menus:

- Active diagnostic codes
- Logged diagnostic codes

Status Groups For The Electronic Technician

The Status groups are lists of machine parameters. The status of the parameters are shown in real time.



The screenshot shows the Caterpillar Electronic Technician (ET) software interface. At the top, there is a title bar and a menu bar. Below the menu bar, there is a section labeled "Cat Man Sys" with a dropdown menu set to "Group 1". The main area of the interface is a table with the following data:

Description	Value	UNIT
Engine Coolant Temperature	86	DegC
Broke Oil Temperature	91	DegC
Engine Oil Pressure	1565	kPa
Fuel Gauge	50	%

At the bottom of the interface, there are buttons for "Clear", "Data In", "Data Out", and "Help".

Illustration 4

g00867289

Typical ET Status Screen

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:20:00 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

**Service Information System**

Shutdown SIS

Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

102796794

Diagnostic Code List

SMCS - 7569

The following table lists the diagnostic codes for the Machine Control (MID 039). When a diagnostic code becomes active, refer to the Troubleshooting section of this manual for a specific troubleshooting procedure.

Component Identifier (CID)

Table 1

Component Identifier (CID) Machine ECM (MID 039)	
For troubleshooting, see the procedure with the same diagnostic code.	
CID / FMI	Description
CID 0041 8 Volt DC Supply	
FMI 06	Current Above Normal
CID 0096 Fuel Level Sensor	
FMI 04	Voltage Below Normal
FMI 05	Current Below Normal
CID 0110 Engine Coolant Temperature Sensor	
FMI 04	Voltage Below Normal

FMI 09	Abnormal Update Rate
CID 0167 Alternator Charging Voltage Sensor	
FMI 12	Bad Device or Component
CID 0168 Electrical System Voltage	
FMI 05	Current Below Normal
CID 0171 Ambient Air Temperature Sensor	
FMI 03	Voltage Above Normal
FMI 04	Voltage Below Normal
CID 0190 Engine Speed Sensor	
FMI 08	Abnormal Frequency, Pulse Width or Period
CID 0246 Proprietary CAN Data Link	
FMI 12	Bad Device or Component
CID 0247 SAE J1939 Data Link	
FMI 12	Bad Device or Component
CID 0254 Electronic Control Module	
FMI 12	Bad Device or Component
CID 0262 5 Volt DC Sensor Power Supply	
FMI 06	Current Above Normal
CID 0271 Action Alarm	
FMI 06	Current Above Normal
CID 0362 Engine Fan Speed Control Solenoid	
FMI 03	Voltage Above Normal
FMI 05	Current Below Normal
FMI 06	Current Above Normal
CID 0374 Swing Brake Solenoid	
FMI 03	Voltage Above Normal
FMI 05	Current Below Normal
FMI 06	Current Above Normal

CID 0581 Power Shift Solenoid	
FMI 03	Voltage Above Normal
FMI 05	Current Below Normal
FMI 06	Current Above Normal
CID 0586 Engine Speed Dial Switch	
FMI 05	Current Below Normal
FMI 12	Bad Device or Component
CID 0588 Monitoring System Display	
FMI 09	Abnormal Update Rate
CID 0590 Engine Control Module	
FMI 09	Abnormal Update
CID 0598 Travel Speed Solenoid	
FMI 03	Voltage Above Normal
FMI 05	Current Below Normal
FMI 06	Current Above Normal
CID 0600 Hydraulic Oil Temperature Sensor	
FMI 04	Voltage Below Normal
CID 0735 Heavy Lift Solenoid	
FMI 03	Voltage Above Normal
FMI 05	Current Below Normal
FMI 06	Current Above Normal
CID 1129 Right Side Attachment Pedal Sensor	
FMI 03	Voltage Above Normal
FMI 04	Voltage Below Normal
FMI 08	Abnormal Frequency
CID 1130 Left Attachment Pedal Position Sensor	
FMI 03	Voltage Above Normal
FMI 04	Voltage Below Normal

FMI 08	Abnormal Frequency, Pulse Width or Period
CID 1160 Hydraulic Lock Solenoid	
FMI 03	Voltage Above Normal
FMI 05	Current Below Normal
FMI 06	Current Above Normal
CID 1178 Machine Overload Warning Pressure Sensor	
FMI 03	Voltage Above Normal
FMI 04	Voltage Below Normal
FMI 08	Abnormal Frequency, Pulse Width or Period
CID 1522 Relief Valve #2 Check Valve Solenoid	
FMI 03	Voltage Above Normal
FMI 05	Current Below Normal
FMI 06	Current Above Normal
CID 1523 Relief Valve #1 Check Valve Solenoid	
FMI 03	Voltage Above Normal
FMI 05	Current Below Normal
FMI 06	Current Above Normal
CID 1525 Straight Travel Solenoid	
FMI 03	Voltage Above Normal
FMI 05	Current Below Normal
FMI 06	Current Above Normal
CID 1590 Main Pump Flow Limitation Pressure Solenoid	
FMI 03	Voltage Above Normal
FMI 05	Current Below Normal
FMI 06	Current Above Normal
CID 1593 Attachment Valve #1 Extend Pressure Solenoid	
FMI 03	Voltage Above Normal
FMI 05	Current Below Normal

FMI 06	Current Above Normal
CID 1594 Attachment Valve #2 Extend Pressure Solenoid	
FMI 03	Voltage Above Normal
FMI 05	Current Below Normal
FMI 06	Current Above Normal
CID 1595 Attachment Valve #3 Extend Pressure Solenoid	
FMI 03	Voltage Above Normal
FMI 05	Current Below Normal
FMI 06	Current Above Normal
CID 1596 Attachment Valve #1 Retract Pressure Solenoid	
FMI 03	Voltage Above Normal
FMI 05	Current Below Normal
FMI 06	Current Above Normal
CID 1597 Attachment Valve #2 Retract Pressure Solenoid	
FMI 03	Voltage Above Normal
FMI 05	Current Below Normal
FMI 06	Current Above Normal
CID 1598 Attachment Valve #3 Retract Pressure Solenoid	
FMI 03	Voltage Above Normal
FMI 05	Current Below Normal
FMI 06	Current Above Normal
CID 1609 F2 Type Valve Load Sense Pressure Sensor	
FMI 03	Voltage Above Normal
FMI 04	Voltage Below Normal
FMI 08	Abnormal Frequency, Pulse Width or Period
CID 1657 Left Joystick Thumbwheel	
FMI 03	Voltage Above Normal
FMI 04	Voltage Below Normal

FMI 08	Abnormal Frequency, Pulse Width or Period
CID 1658 Right Joystick Thumbwheel	
FMI 03	Voltage Above Normal
FMI 04	Voltage Below Normal
FMI 08	Abnormal Frequency, Pulse Width or Period
CID 1665 Variable Relief Valve #1 Pressure Solenoid	
FMI 03	Voltage Above Normal
FMI 05	Current Below Normal
FMI 06	Current Above Normal
CID 1666 Variable Relief Valve #2 Pressure Solenoid	
FMI 03	Voltage Above Normal
FMI 05	Current Below Normal
FMI 06	Current Above Normal
CID 1931 Auxiliary Circuit Flow Combining Solenoid	
FMI 03	Voltage Above Normal
FMI 05	Current Below Normal
FMI 06	Current Above Normal
CID 2265 Hydraulic Pump #1 Outlet Pressure Sensor	
FMI 03	Voltage Above Normal
FMI 04	Voltage Below Normal
FMI 08	Abnormal Frequency, Pulse Width or Period
CID 2266 Hydraulic Pump #2 Outlet Pressure Sensor	
FMI 03	Voltage Above Normal
FMI 04	Voltage Below Normal
FMI 08	Abnormal Frequency, Pulse Width or Period
CID 2275 Hammer Return to Tank Solenoid	
FMI 03	Voltage Above Normal
FMI 06	Current Above Normal

CID 2280 Travel Alarm Relay	
FMI 03	Voltage Above Normal
CID 2300 Switch Panel	
FMI 09	Abnormal Update Rate

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:20:47 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)



Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103928529

Using the Operator Monitor to Determine Diagnostic Codes

SMCS - 7490

Use the following illustration to operate the monitor.

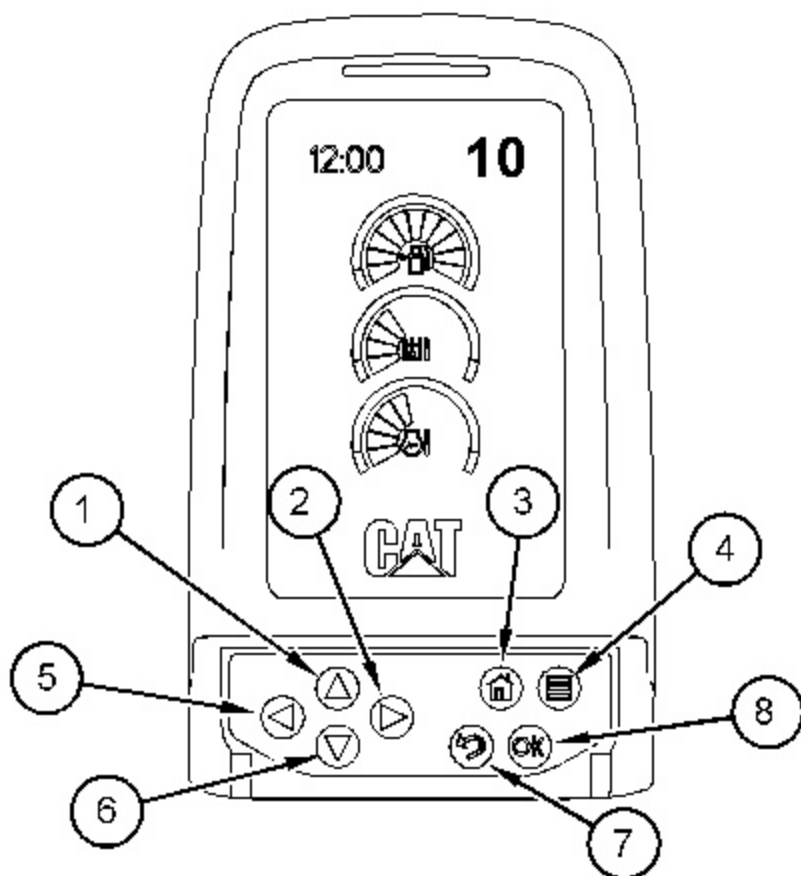


Illustration 1

g01143406

- (1) Up key
- (2) Right key
- (3) Home key
- (4) Main menu key
- (5) Left key
- (6) Down key
- (7) Back key
- (8) OK key

The "DIAGNOSTIC" menu option is entered by selecting "DIAGNOSTIC" from the "SERVICE" menu. Press the up key (1) or down key (6) until "DIAGNOSTIC" is highlighted in order to select this option. Then press the "OK" key (8). Refer to Illustration 1.

Note: Refer to Systems Operation, RENR8068, "Service Mode" for instructions to get to the "SERVICE" menu.

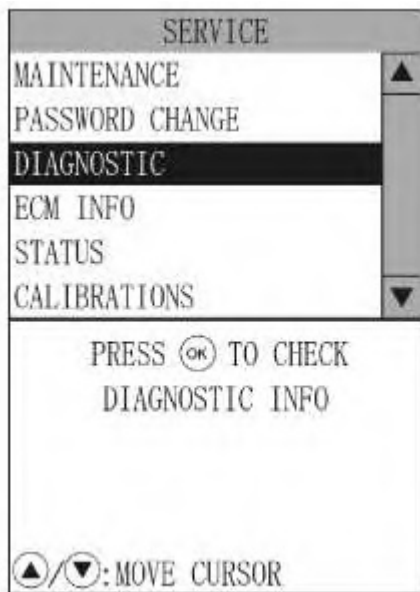


Illustration 2

g02153474

When "DIAGNOSTIC" is selected, the diagnostic information can be checked. The "DIAGNOSTIC" menu has the following options:

- ACTIVE ERROR
- LOGGED ERROR
- LOGGED EVENT



Illustration 3

g02153478

The "ACTIVE ERROR" menu displays active errors in the MID: CID - FMI format. Press the up key (1) or down key (6) in order to scroll through the active errors.

The "LOGGED ERROR" menu displays logged errors in the MID: CID - FMI format. Press the up key (1) or down key (6) in order to highlight the desired item. Press the "OK" key (8) in order to see the detail of the logged error. The detail of a logged error will display the following items:

MID - Control module ID of the ECM that detected the error.

CID - Component ID that is in error status.

FMI - Failure mode ID

OCC - The number of times the error occurred.

FIRST - The first time the error occurred.

LAST - The last time the error occurred.

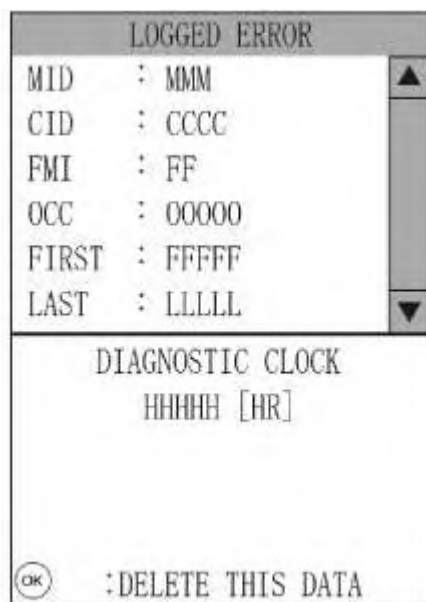


Illustration 4

g02153480

When the detailed view of the "LOGGED ERROR" view is displayed as in Illustration 4, the logged errors can be deleted. Press the "OK" key (8) in order to delete the logged error. The delete confirmation screen will appear. To confirm the delete request move the cursor to the "YES" option and press the "OK" key (8). Refer to Illustration 5.



Illustration 5

g02153482

The "LOGGED EVENT" menu displays logged events in the MID: EID - LEVEL format. Press the up key (1) or down key (6) in order to highlight the desired item. Press the "OK" key (8) in order to see the detail of the logged event. The detail of a logged event will display the following items:

MID - Control module ID of the ECM that detected the error.

EID - Event ID

LEVEL - Warning Level

OCC - The number of times the error occurred.

FIRST - The first time the error occurred.

LAST - The last time the error occurred.

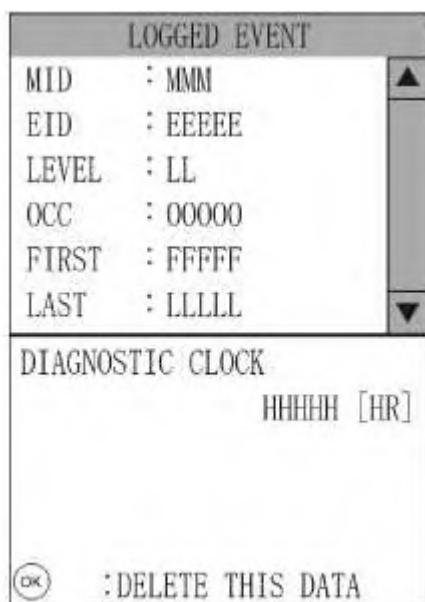


Illustration 6

g02153485

When the detailed view of the "LOGGED EVENT" menu is displayed as in Illustration 6, the logged events can be deleted. Press the "OK" key (8) in order to delete the logged error. The delete confirmation screen will appear. To confirm the delete request move the cursor to the "YES" option and press the "OK" key (8). Refer to Illustration 7

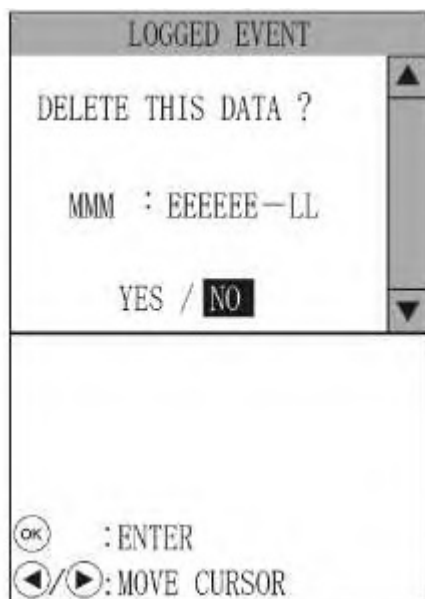


Illustration 7

g02153487

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:21:12 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I04000853

Using Caterpillar Electronic Technician to Determine Diagnostic Codes

SMCS - 0785-UE; 7569

Connect the Caterpillar ET to the machine. Turn the key switch to the RUN position. Start the Cat ET. The Cat ET will initiate communications with the Electronic Control Modules on the machine. After communication has been established, the Cat ET will list the Electronic Control Modules. Choose the desired Electronic Control Module. After the diagnostic codes have been determined with the Cat ET, see the test procedure for the corresponding diagnostic code.

Reference Troubleshooting, "Service Tools"**Active Diagnostic Codes**



Illustration 1

g00859671

Typical Cat ET screen for active diagnostic codes

The following procedures may cause new diagnostic codes to be logged. Therefore, before any procedures that are performed, make a list of all the active diagnostic codes in order to determine the system problems. Clear the diagnostic codes that were caused by the procedure, when each procedure is complete.

Note: Before performing a procedure, always check all the circuit breakers. Repair the cause of any circuit breaker that is tripped.

A screen is provided in Cat ET for active diagnostic codes. The screen will display the diagnostic codes that are active. Active diagnostic information shall include a component identifier (CID), a failure mode identifier (FMI) and a text description of the problem.

Logged Diagnostic Codes

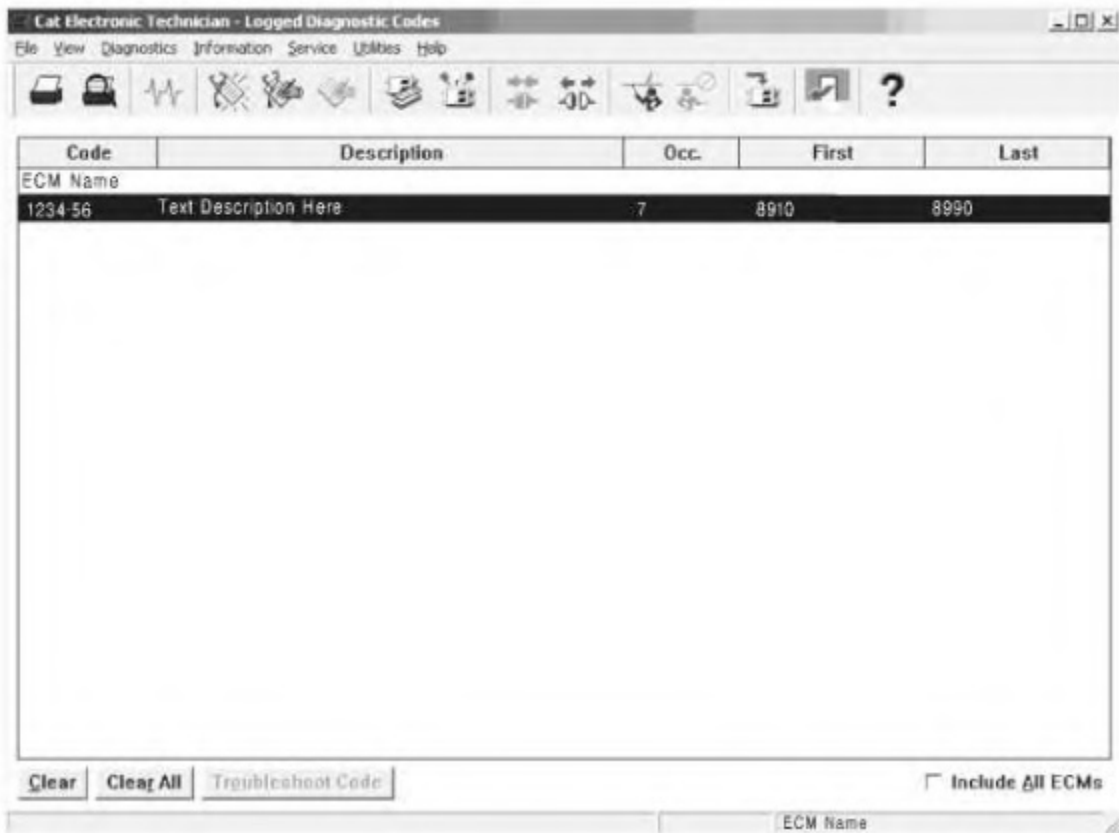


Illustration 2

g00859762

Typical Cat ET screen for logged diagnostic codes

A screen is provided in Cat ET for logged diagnostic codes. The screen will display diagnostic codes that are logged. The Cat ET will log diagnostic codes that are intermittent. The logged diagnostic data shall include a component identifier (CID), a failure mode identifier (FMI), and a text description of the problem. Also, the logged diagnostic data shall include the number of occurrences of the problem and two time stamps. The time stamp displays the first occurrence of the problem and the time stamp displays the most recent occurrence of the problem.

Diagnostics are logged in non-volatile memory. On powerup, the ECM will clear any diagnostic codes that have not been detected or active within the last 150 hours of machine operation.



Service Information System

Shutdown SIS

Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I04161812

MID 039 - CID 0041 - FMI 06

SMCS - 1439-038

Conditions Which Generate This Code:

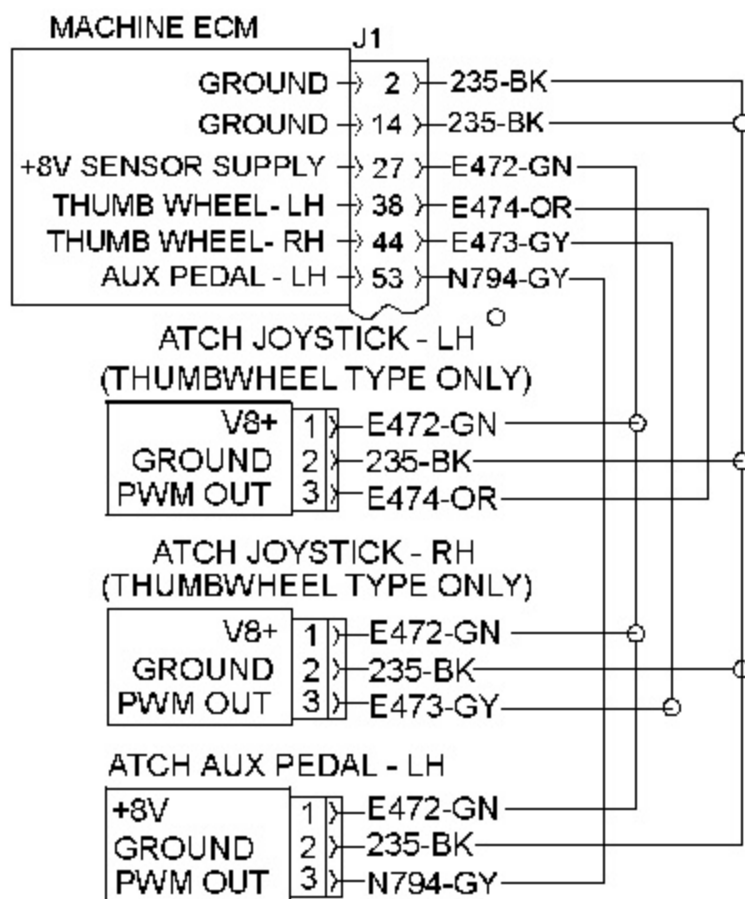


Illustration 1

g02364556

ECM 8VDC Sensor Supply circuit schematic

This diagnostic code is associated with the 8VDC Sensor Supply circuit. An FMI 06 diagnostic code means the ECM has determined the current of the sensor supply circuit is above normal.

- The sensor supply output is shorted to ground.
- A sensor in the 8VDC circuit has failed.
- The machine ECM may have failed, but is unlikely.

Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all of the harness connectors involved in the circuit. Verify that all of the connections in the circuit are clean, secure, and in good condition. If a problem is found with any of the connections: correct the problem and verify that diagnostic code CID 0041 FMI 06 is still active, before performing this procedure.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes now, but clear those codes after the original diagnostic code has been corrected.

Test Step 1. CHECK THE SENSORS VOLTAGE.

- A. Turn the disconnect switch and the key start switch to the ON position.
- B. Do not disconnect any of the machine harnesses at this time. Check for +8 VDC at the harness connector of every sensor supplied by the ECM +8 VDC power supply.

Note: An 8VDC Sensor Supply ground return is also found at contact J1-14 (235-BK). Always check these parallel ground wires. Make sure to repair or replace any that are found open.

Expected Result:

The voltage readings are 8.0 ± 0.5 DCV.

Results:

- **YES** - The voltages are 8.0 ± 0.5 DCV. Check if the diagnostic code is still active. If the code is still active, go to Test Step 2.
- **NO** - The voltage at one or more of the sensors is not 8.0 ± 0.5 DCV. There is a problem with the ECM +8 VDC voltage supply.

Repair: Refer to the complete electrical schematics for the machine. Investigate and repair the +8 VDC power supply problem.

After +8 DCV power supply problem is repaired, check if the 0041 FMI 06 diagnostic code is still active. If the diagnostic code is still active, go to Test Step 2.

Test Step 2. CHECK THE SENSORS.

- A. The disconnect switch and the key start switch remain in the ON position.
- B. One at a time, disconnect and reconnect each and every sensor supplied by this ECM 8 VDC Sensor Supply.
- C. While each sensor is disconnected, check the status of the CID 0041 FMI 06 diagnostic code.

Expected Result:

The CID 0041 FMI 06 diagnostic code remains active while each sensor is disconnected and reconnected.

Results:

- **YES** - None of the disconnected sensors causes the diagnostic code to change. None of the sensors are causing the problem. Go to Test Step 4.
- **NO** - While one sensor is disconnected, the CID 0041 FMI 06 diagnostic code becomes inactive. That sensor is causing the problem.

Repair: Replace that sensor.

Go to Test Step 4.

Test Step 3. CHECK FOR A SHORT TO GROUND.

- A. Turn the disconnect switch and the key start switch to the OFF position.
- B. Disconnect both the J1 and J2 harness connectors from the machine ECM.
- C. At the J1 machine harness connector for the ECM, measure the resistance from connector contact J1-27 (E472-GN), the ECM 8 VDC Sensor Supply, to all possible sources of ground in both the J1 and J2 ECM harness connectors.

Expected Result:

Each resistance is more than 5000 ohms.

Results:

- **YES** - Each resistance is more than 5000 ohms. Go to Test Step 4.
- **NO** - A resistance is not more than 5000 ohms. The 8 VDC Sensor Supply output is shorted to ground.

Repair: Repair or replace the harness.

Go to Test Step 4.

Test Step 4. CHECK THE DIAGNOSTIC CODE STATUS.

- A. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are securely fastened.
- B. Turn the disconnect switch and the key start switch to the ON position.
- C. Clear all inactive diagnostic codes.
- D. Operate the machine.
- E. Check the status of the CID 0041 FMI 06 diagnostic code.

Expected Result:

The CID 0041 FMI 06 diagnostic code is not active.

Results:

- **YES** - The CID 0041 FMI 06 diagnostic code is no longer active. The code does not exist at this time.

Repair: The cause for the diagnostic code appears to have been corrected. Return the machine back to normal operations.

STOP

- **NO** - The CID 0041 FMI 06 diagnostic code is still active. The problem has not been corrected.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the sensor circuit. Perform a "wiggle test" on the sensor circuit of the machine wiring harness, using the Caterpillar Electronic Technician service tool. The "wiggle test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened. Perform Test Step 4 again. If the problem has NOT been found, and the original code is still active, the ECM may have failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:21:52 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I04140751

MID 039 - CID 0096 - FMI 04

SMCS - 1273-038-UN

Conditions Which Generate This Code:

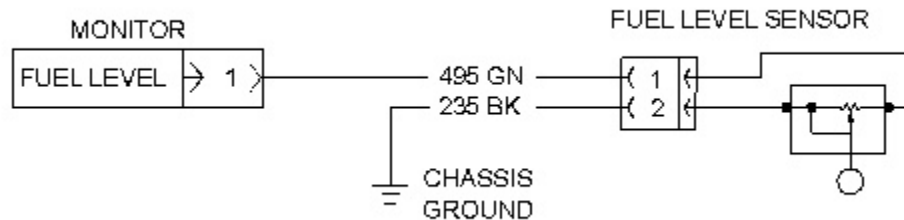


Illustration 1

g02025054

Schematic for the Fuel Level sensor

This diagnostic code is associated with the Fuel Level sensor. An FMI 04 diagnostic code means the machine ECM has determined the sensor circuit voltage is below normal.

Possible causes for this diagnostic code are:

- The sensor has failed.
- The sensor output signal wire is shorted to ground.

- The machine ECM has failed, but is unlikely.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all the machine harnesses and connectors involved in the circuit. Make sure to verify that all of the connections in the circuit are clean, secure, and in good condition. Correct any problems found with any of the connections. Verify the diagnostic code CID 0096 FMI 04 is still active, before continuing with this procedure.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes now, but clear those diagnostic codes when the original diagnostic code has been corrected.

Test Step 1. CHECK THE SENSOR

- A. Turn the disconnect switch and the key start switch to the OFF position.
- B. Disconnect the machine harness connector from the Fuel Level sensor.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Observe the status of the diagnostic code.

Expected Result:

The CID 0096 FMI 04 diagnostic code remains active.

Results:

- **YES** - The diagnostic code remains active. The sensor is correct. Go to Test Step 2.
- **NO** - The diagnostic code is no longer active. The sensor has failed.

Repair: Replace the sensor.

Go to Test Step 3.

Test Step 2. CHECK THE SENSOR CIRCUIT FOR A SHORT .

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The Fuel Level sensor remains disconnect from the harness connector.
- C. Disconnect the machine harness connector from the monitor.
- D. At the machine harness connector for the Monitor, measure the resistance from the contact for wire 495-GNof the Monitor harness connector to all possible sources of ground. Measure the resistance to all other contacts used in the Monitor harness connector.

Expected Result:

Each resistance measured is more than 5000 ohms.

Results:

- **YES** - The measurements all are more than 5000 ohms. The harness is correct. Go to Test Step 3.
- **NO** - A resistance measurement is not more than 5000 ohms. There is a short in the machine harness.

Repair: The short is between wire 495-GN and the wire with the low resistance. Repair or replace the machine harness.

Go to Test Step 3.

Test Step 3. CHECK THE DIAGNOSTIC CODE STATUS.

- Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips on each connector are securely fastened.
- Turn the disconnect switch and the key start switch to the ON position.
- Clear all inactive diagnostic codes.
- Operate the machine.
- Check the status of the CID 0096 FMI 04 diagnostic code.

Expected Result:

The CID CID 0096 FMI 04 diagnostic code is not active.

Results:

- **YES** - The CID 0096 FMI 04 diagnostic code is not active and does not exist at this time.

Repair: The cause for that problem has been repaired. Return the machine to normal operation.

STOP

- **NO** - The CID 0096 FMI 04 code is still active. The cause for the code has not been repaired.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the sensor circuit. Perform a "wiggle test" on the sensor circuit of the machine wiring harness, using the Caterpillar Electronic Technician service tool. The "wiggle test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are securely fastened. From Test Step 1, perform this procedure again. If the cause for this problem was not found this time, and the original diagnostic code is still active, the ECM may have failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:23:44 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I04140752

MID 039 - CID 0096 - FMI 05

SMCS - 1273-038-UN

Conditions Which Generate This Code:

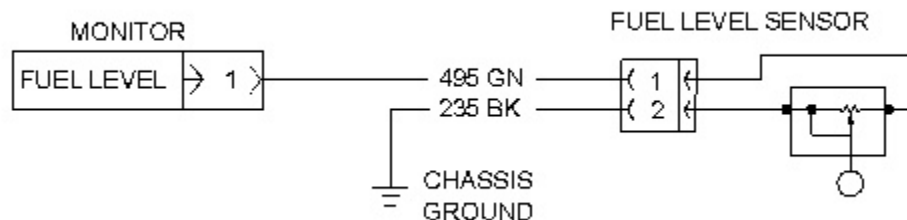


Illustration 1

g02025054

Schematic for the Fuel Level sensor

This diagnostic code is associated with the Fuel Level sensor. An FMI 05 diagnostic code means the machine ECM has determined the sensor circuit current is below normal.

Possible causes for this diagnostic code are:

- The sensor has failed.
- There is an open wire in the circuit.

- The attachment code is incorrect.
- The machine ECM has failed, but is unlikely.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all the machine harnesses and connectors involved in the circuit. Make sure to verify that all of the connections in the circuit are clean, secure, and in good condition. Correct any problems found with any of the connections. Verify the diagnostic code CID 0096 FMI 05 is still active, before continuing with this procedure.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes now, but clear those diagnostic codes when the original diagnostic code has been corrected.

Test Step 1. CHECK THE SENSOR.

- A. Turn the disconnect switch and the key start switch to the OFF position.
- B. Disconnect the machine harness connector from the Fuel Level sensor.
- C. At the Fuel Level sensor machine harness connector, place a jumper wire between the contact for wire 495-GN to the contact for wire 235-BK in the sensor harness connector.
- D. Turn the disconnect switch and the key start switch to the ON position.
- E. Observe the status of the CID 0096 FMI 05 diagnostic code.

Expected Result:

The CID 0096 FMI 05 diagnostic code remains active.

Results:

- **YES** - The diagnostic code remains active. The sensor is not the problem. Go to Test Step 2.
- **NO** - The diagnostic is no longer active. The sensor has failed.

Repair: Replace the sensor.

Go to Test Step 3.

Test Step 2. CHECK THE HARNESS FOR AN OPEN.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connecting the Fuel Level sensor to the Monitor module.
- C. The jumper wire in the harness connector remains in place.
- D. At the harness connector for the Monitor, measure the resistance from signal contact 1 (wire 495-GN) to 1 (wire 235-BK) in the Monitor harness connector.

Expected Result:

The resistance is less than 5.0 ohms.

Results:

- **YES** - The resistance is less than 5.0 ohms. The harness is correct. Go to Test Step 3.
- **NO** - A resistance is more than 5.0 ohms. There is an open circuit in the machine harness.

Repair: The open is in wire 495-GN or in wire 235-BK of the machine harness. Repair or replace the machine harness.

Go to Test Step 3.

Test Step 3. CHECK THE DIAGNOSTIC CODE STATUS.

- A. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips on each connector are securely fastened.
- B. Turn the disconnect switch and the key start switch to the ON position.
- C. Clear all inactive diagnostic codes.
- D. Operate the machine.
- E. Check the status of the CID 0096 FMI 05 diagnostic code.

Expected Result:

The CID 0096 FMI 05 diagnostic code is not active.

Results:

- **YES** - The CID 0096 FMI 05 diagnostic code is not active and does not exist at this time.

Repair: The cause for that problem has been repaired. Return the machine to normal operation.

STOP

- **NO** - The CID 0096 FMI 05 code is still active. The cause for the code has not been repaired.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the sensor circuit. Perform a "wobble test" on the sensor circuit of the machine wiring harness, using the Caterpillar Electronic Technician service tool. The "wobble test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are securely fastened. From Test Step 1, perform this procedure again. If the cause for this problem was not found this time, and the original diagnostic code is still active, the ECM may have failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. This consultation may greatly reduce repair time. If the

ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:24:11 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)



Service Information System

Shutdown SIS

Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I02488123

MID 039 - CID 0110 - FMI 04

SMCS - 1906-038

Conditions Which Generate This Code:

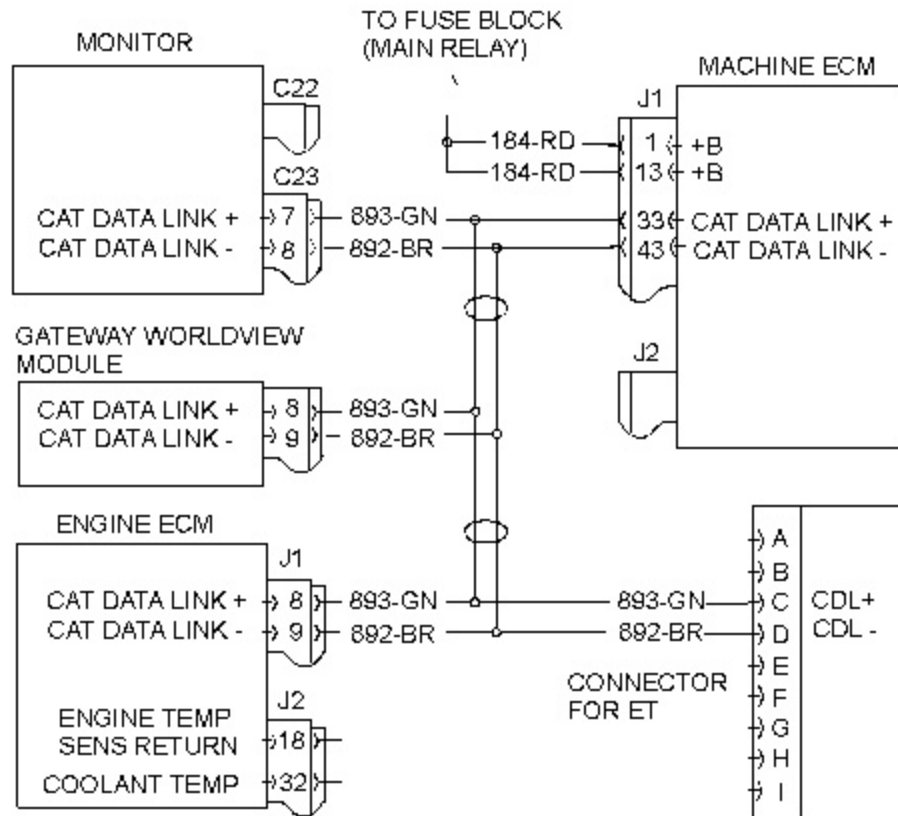


Illustration 1

g01242503

Schematic of the Cat Data Link circuit

This diagnostic code is associated with the Engine Coolant Temperature Sensor.

Note: This diagnostic code comes to the Machine ECM from the Engine ECM through the Cat Data Link. First check for an Engine ECM diagnostic code MID 036 CID 0110 FMI 04. Diagnose this or any other diagnostic code before attempting to diagnose the MID 039 CID 0110 FMI 04 diagnostic code from the Machine ECM. For additional Engine ECM information refer to Troubleshooting, RENR 5089, "MID 036 CID 0110 FMI 04".

This diagnostic code is recorded when the monitoring system reads a low sensor signal. When this diagnostic code occurs, the gauge indicates an abnormally high value. The following symptoms could cause the diagnostic code:

- The sensor has failed.
- The signal circuit in the machine harness is shorted to ground.
- The monitoring system has failed.

Note: The monitoring system is unable to determine when a sensor is open. Also, the monitoring system is unable to determine when a harness for the sensor signal is open. This condition is recognized when the gauge constantly indicates a value at the far left side of the scale.

Service Notes: Ensure that the desired diagnostic code is on hold. Ensure that the code is active. The schematic that is shown above represents a typical installation of the component. Verify the connector contact and wire numbers by using the Electrical System Schematic for the machine that is being serviced.

Test Step 1. CHECK THE MONITORING SYSTEM AND THE HARNESS.

- A. Turn the disconnect switch and the key start switch to the ON position.
- B. The diagnostic code is active.
- C. Disconnect the machine harness from the sensor that is causing the diagnostic code.
- D. Observe the diagnostic code indicator.

Expected Result:

The diagnostic code indicator is ON.

Results:

- **YES** - The diagnostic code indicator stays ON. The harness wiring or the monitoring system has failed. Proceed to test step 2.
- **NO** - The diagnostic code indicator turns OFF. The sensor has failed.

Repair: Replace the sensor.

STOP

Test Step 2. CHECK THE SIGNAL WIRE FOR A SHORT TO GROUND.

- A. The disconnect switch and the key start switch remain in the ON position.
- B. At the machine harness for the sensor, measure the voltage between the frame ground and the sensor signal wire.

Expected Result:

The voltage that is measured is within one of the following specifications.

Results:

- **6.0 ± 0.5 DCV** - The voltage is 6.0 ± 0.5 DCV. The voltage is correct. Verify that the diagnostic code remains.

Repair: It is unlikely that the monitoring system has failed. Exit this procedure and perform this procedure again. Also, recheck if the diagnostic code indicator is illuminated for this

diagnostic code. If the cause of the diagnostic code is not found, replace the monitoring system. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **LESS THAN 0.5 DCV** - The voltage is less than 0.5 DCV. The harness wiring has failed. There is an open circuit or a short to ground in the signal wire for the sensor.

Repair: Repair the harness or replace the harness. Exit this procedure and perform this procedure again. Also, recheck if the diagnostic code indicator is illuminated for this diagnostic code. It is unlikely that the monitoring system has failed. If the cause of the diagnostic code is not found, replace the monitoring system. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NOT 6.0 BUT ABOVE 0.5 DCV** - The voltage is less than 0.5 DCV. The harness wiring has failed. There is an open circuit or a short to ground in the signal wire for the sensor.

Repair: Repair the harness or replace the harness. Exit this procedure and perform this procedure again. Also, recheck if the diagnostic code indicator is illuminated for this diagnostic code. It is unlikely that the monitoring system has failed. If the cause of the diagnostic code is not found, replace the monitoring system. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:24:33 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)



Service Information System

Shutdown SIS

Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I03101426

MID 039 - CID 0110 - FMI 09

SMCS - 1906-038

Conditions Which Generate This Code:

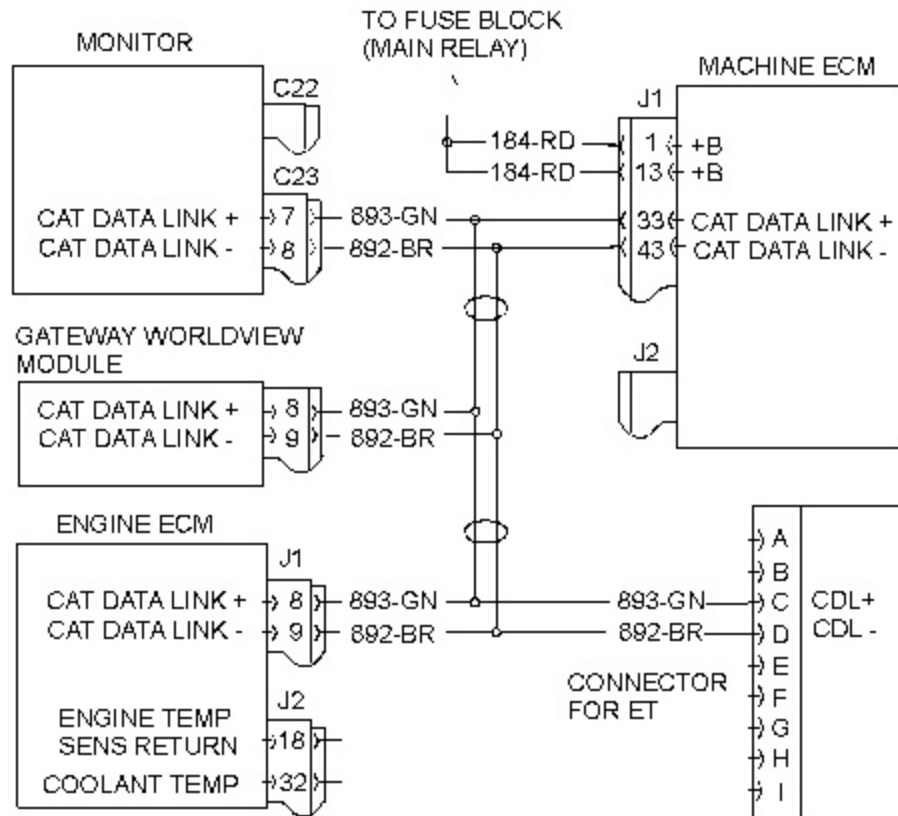


Illustration 1

g01242503

Schematic of the Cat Data Link Circuit

This diagnostic code is associated with the "Engine Coolant Temperature" sensor.

This diagnostic code is recorded when the Machine ECM does not receive expected information through the Cat Data Link from the Engine ECM. The possible causes of this diagnostic code are listed below:

- The wires for the Cat Data Link to the Engine ECM are open or the wires are shorted.
- The wrong software is installed on an ECM.

Test Step 1. VERIFY THE HARDWARE AND THE SOFTWARE PART NUMBERS.

A. Verify that the following information is correct:

- The part number of the flash software for the Engine ECM
- The part number of the flash software for the Machine ECM
- The part number of the Engine ECM

- The part number of the Machine ECM

Note: Consult your Caterpillar Dealer for the correct part numbers of the flash software.

Expected Result:

All of the part numbers are correct.

Results:

- **OK** - All of the part numbers are correct. Proceed to Test Step 2.
- **NOT OK** - All of the part numbers are not correct.

Repair: The installed Engine ECM or the Machine ECM have the wrong part number or the incorrect flash software is installed. Replace the Engine ECM or replace the Machine ECM that is incorrect. Replace the ECM with a module that has the correct part number. Flash the correct software. See Testing and Adjusting, "Electronic Control Module (ECM) - Flash Program" for additional information.

STOP

Test Step 2. INSPECT THE HARNESS CONNECTIONS.

- A. Turn the disconnect switch to the OFF position.
- B. Inspect all harness connections that are related to the Cat Data Link. Make sure that the connectors are clean and tight.
- C. Check the connectors for proper mating. Ensure that all the seals are present and in place.
- D. Check the harness for signs of damage or abrasion.
- E. Check the wires at the connector. Ensure that the wires are secured tightly into the connector.
Take care not to pull the wire out of the connector.
- F. Check the exposed wires at the connectors for nicks or signs of abrasion.
- G. Check for moisture inside the connector.
- H. Check the connectors for dirty contacts or corroded contacts.
- I. Check each pin and each socket of the machine harness connectors. Ensure that the contacts are properly installed. The contacts should mate correctly when the two pieces of the connector are placed together.

Expected Result:

The connectors of the machine harness are tight and free of corrosion.

Results:

- **OK** - The connectors of the machine harness are tight and free of corrosion. Proceed to Test Step 3.
- **NOT OK** - The connectors of the machine harness are in need of repair.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK FOR SHORTS

- A. The disconnect switch remains in the OFF position.
- B. Disconnect the connectors of the machine harness from all electronic control modules that use the Cat Data Link.
- C. At the machine harness connector for the Machine ECM, measure the resistance between connector contact J1-33 (wire 893-GN) and all of the contacts that are used in the machine harness connector for the ECM. Perform the same measurements for J1-43 (wire 892-BR).

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each of the resistance measurements is greater than 5000 ohms. The harness circuit resistance is correct. Proceed to Test Step 4.
- **NOT OK** - One of the resistance measurements is less than 5000 ohms. The machine harness has failed.

Repair: There is a short between the Cat contacts of the Data Link (wires 893-GN and 892-BR) of the Cat Data Link and the circuit with the low resistance measurement. Repair the machine harness or replace the machine harness.

STOP

Test Step 4. CHECK FOR OPEN HARNESS

- A. The disconnect switch remains in the OFF position.
- B. All related electronic control modules remain disconnected from the machine harness.
- C. Check the resistance of the Cat Data Link circuit in the machine harness:
 - Measure the resistance between connector contact J1-8 (wire 893-GN) of the Engine ECM and connector contact J1-33 (wire 893-GN) of the Machine ECM.
 - Measure the resistance between connector contact J1-9 (wire 892-BR) of the Engine ECM and connector contact J1-43 (wire 892-BR) of the Machine ECM.

Expected Result:

The resistance measures less than 5 ohms.

Results:

- **OK** - The resistance is less than 5 ohms. The Cat Data Link circuit in the machine harness is correct. Proceed to Test Step 5.
- **NOT OK** - The resistance is greater than 5 ohms. The machine harness has failed.

Repair: The Cat Data Link circuit is open in the machine harness. Repair the machine harness or replace the machine harness.

STOP

Test Step 5. CHECK IF THE DIAGNOSTIC CODE REMAINS

- A. Inspect the contacts of the harness connectors. Clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 0110 FMI 09 diagnostic code.

Expected Result:

The CID 0110 FMI 09 diagnostic code is active.

Results:

- **YES** - The CID 0110 FMI 09 diagnostic code is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 0110 FMI 09 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:24:57 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)



Service Information System

Shutdown SIS

Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I05455410

MID 039 - CID 0167 - FMI 12

SMCS - 1406-038

Conditions Which Generate This Code:

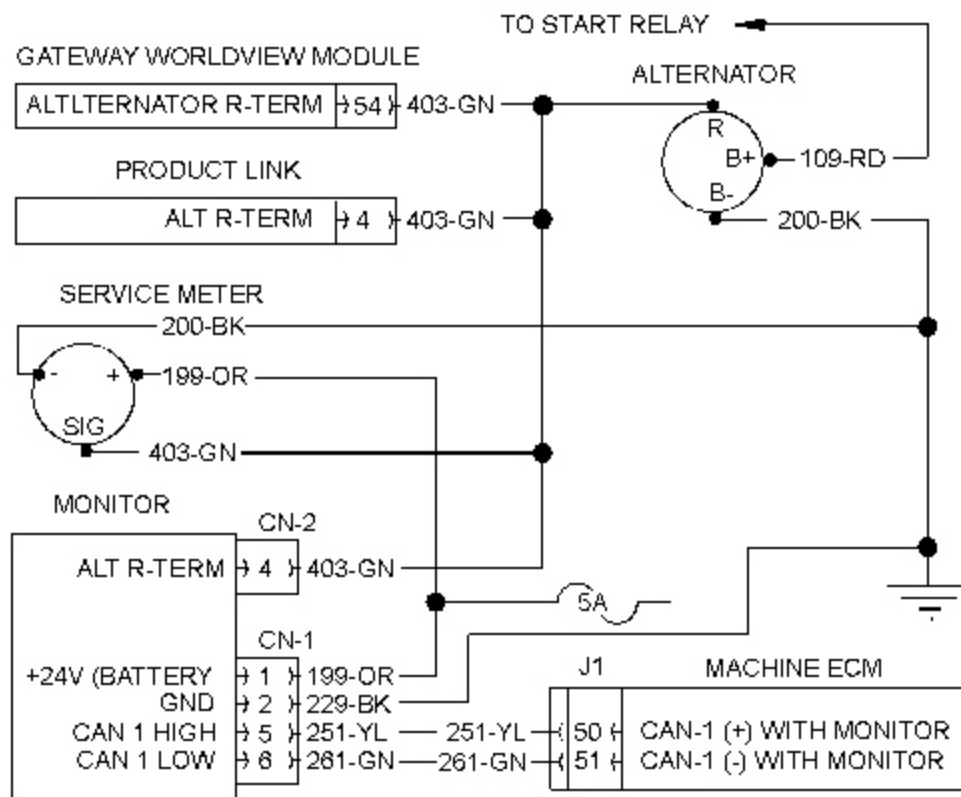


Illustration 1

g03445416

This diagnostic code is associated with the "Alternator Charging Voltage" sensor. The FMI 12 diagnostic code means that the ECM has determined that the signal (frequency) of the sensor is below the normal range.

This diagnostic code is recorded when the Machine ECM does not receive expected information from the "Monitor Display". The possible causes of this diagnostic code are listed below:

- Harness wires for the "CAN Data Link" to the Machine ECM are open or the wires are shorted.
- The wrong software is installed on an ECM.

Note: Check the "R" term voltage at the alternator and all of the ECM contacts with the wire 403-GN. All "R" term voltage checks should match. If one voltage is missing check for an open harness to that ECM, see Test Step 4.

Test Step 1. VERIFY THE HARDWARE AND THE SOFTWARE PART NUMBERS

A. Verify that the following information is correct:

- The part number of the flash software for the Machine ECM
- The part number of the Machine ECM

Note: Consult your Caterpillar dealer for the correct part numbers of the flash software.

Expected Result:

All of the part numbers are correct.

Results:

- **OK** - All of the part numbers are correct. Proceed to Test Step 2.
- **NOT OK** - All of the part numbers are not correct.

Repair: The installed Machine ECM has the wrong part number or the incorrect flash software is installed. Replace the Machine ECM that is incorrect. Replace the ECM with a module that has the correct part number. Flash the correct software. See Testing and Adjusting, "Electronic Control Module (ECM) - Flash Program" for additional information.

STOP

Test Step 2. INSPECT THE HARNESS CONNECTIONS

- A. Turn the disconnect switch to the OFF position.
- B. Inspect all harness connections that are related to the "CAN Data Link". Make sure that the connectors are clean and that the connectors are tight.
- C. Check the connectors for proper mating. Ensure that all the seals are present and in place.
- D. Check the harness for signs of damage or abrasion.
- E. Check the wires at the connector. Ensure that the wires are secured tightly into the connector.
Take care not to pull the wire out of the connector.
- F. Check the exposed wires at the connectors for nicks or signs of abrasion.
- G. Check for moisture inside the connector.
- H. Check the connectors for dirty contacts or corroded contacts.
- I. Check each pin and each socket of the machine harness connectors. Ensure that the contacts are properly installed. The contacts should mate correctly when the two pieces of the connector are placed together.

Expected Result:

The machine harness connectors are tight and free of corrosion.

Results:

- **OK** - The machine harness connectors are tight and free of corrosion. Proceed to Test Step 3.
- **NOT OK** - The machine harness connectors are in need of repair.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK FOR SHORTS

- A. The disconnect switch remains in the OFF position.
- B. Disconnect the machine harness connectors from all electronic control modules that use the "CAN Data Link".
- C. At the machine harness connector for the Machine ECM, measure the resistance between connector contact J2-50 (wire 251-YL) and all of the contacts that are used in the machine harness connector for the ECM. Perform the same measurements for J2-51 (wire 261-GN).

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each of the resistance measurements is greater than 5000 ohms. The harness circuit resistance is correct. Proceed to Test Step 4.
- **NOT OK** - One of the resistance measurements is less than 5000 ohms. The machine harness has failed.

Repair: There is a short between contacts J2-50 (wire 251-YL) or J2-51 (wire 261-GN) of the CAN Data Link and the circuit with the low resistance measurement. Repair the machine harness or replace the machine harness.

STOP

Test Step 4. CHECK FOR OPEN HARNESS

- A. The disconnect switch remains in the OFF position.
- B. All related electronic control modules remain disconnected from the machine harness.
- C. Check the resistance of the "CAN Data Link" circuit in the machine harness following the process below:
 - Measure the resistance between connector contact 5 in CN-1 connector (wire 251-YL) of the Monitor Display and connector contact J2-50 (wire 251-YL) of the Machine ECM.
 - Measure the resistance between connector contact 6 in CN-1 connector (wire 261-GN) of the Monitor Display and connector contact J2-51 (wire 261-GN) of the Machine ECM.

Expected Result:

The resistance measures less than 5 ohms.

Results:

- **OK** - The resistance is less than 5 ohms. The "CAN Data Link " circuit in the machine harness is correct. Proceed to Test Step 5.
- **NOT OK** - The resistance is greater than 5 ohms. The machine harness has failed.

Repair: The "CAN Data Link" circuit is open in the machine harness. Repair the machine harness or replace the machine harness.

STOP

Test Step 5. CHECK IF THE DIAGNOSTIC CODE REMAINS

- A. Inspect the contacts of the harness connectors and clean the contacts.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the starter keyswitch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 0167 FMI 12 diagnostic code.

Expected Result:

The CID 0167 FMI 12 diagnostic code is active.

Results:

- **YES** - The CID 0167 FMI 12 diagnostic code is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: ECM failure is unlikely. Perform this procedure again. If the cause of the diagnostic code is not found, contact your dealer Technical Communicator (TC) for possible consultation with Caterpillar. This consultation may greatly reduce repair time and expense. If the ECM must be replaced, refer to Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 0167 FMI 12 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP



Service Information System

Shutdown SIS

Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I03754249

MID 039 - CID 0168 - FMI 05

SMCS - 1406-038

Conditions Which Generate This Code:

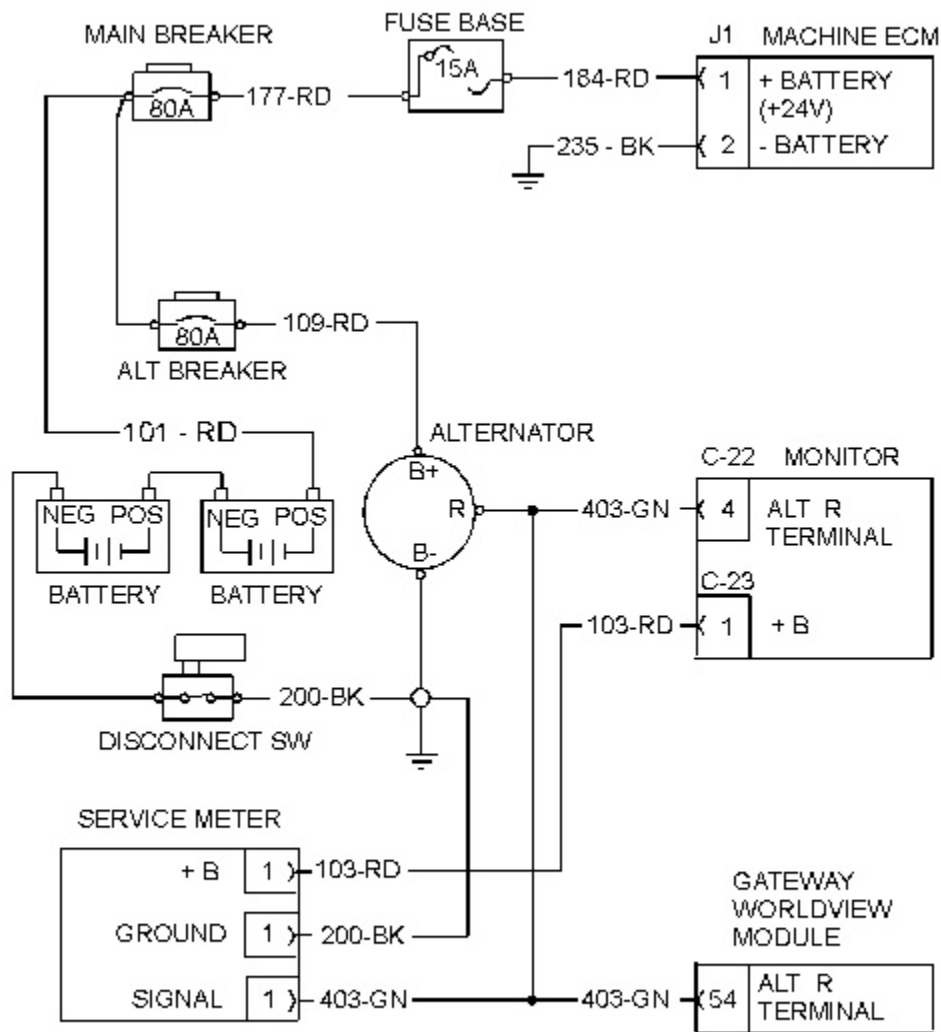


Illustration 1

g02025075

This diagnostic code is recorded when the ECM detects that the current output of the alternator is below the expected level.

The possible causes of this diagnostic code are listed below:

- A charging system component has failed.
- The machine harness is open.
- The ECM has failed. This is unlikely.

Test Step 1. CHECK THE CHARGING SYSTEM AT HIGH IDLE

- A. Start the engine. Run the engine at high idle.

B. Enter the diagnostic menu on the monitor. Observe the status of the diagnostic code.

Expected Result:

The diagnostic code is NO longer active.

Results:

- **YES** - The diagnostic code is NO longer active. Proceed to Test Step 2.
- **NO** - The diagnostic code remains active. Proceed to Test Step 3.

Test Step 2. CHECK THE CHARGING SYSTEM AT LOW IDLE

A. Start the engine. Run the engine at low idle.

B. Observe the status of the diagnostic code.

Expected Result:

The diagnostic code is NO longer active.

Results:

- **YES** - The diagnostic code is NO longer active. Watch for a recurrence.**STOP**
- **NO** - The diagnostic code is active. The charging system is not charging at the proper level.

Repair: If the engine low idle speed is too low, the alternator may not be producing the required output. Ensure that the engine low idle speed is correct and perform this test again. If the diagnostic code is still active, a charging system component may be defective. Check the charging system. See Special Instruction, REHS0354, "Charging System Troubleshooting" for more information.

STOP

Test Step 3. CHECK FOR AN OPEN CIRCUIT

A. Turn the disconnect switch and the key switch to the OFF position.

B. Disconnect the connector from the Gateway Worldview Module ECM. Disconnect wire 403-GN from the alternator "R" terminal.

C. Measure the resistance of wire 403-GN between the Gateway Worldview Module ECM harness connector contact 54 and the disconnected wire 403-GN at the alternator.

Expected Result:

The resistance should measure 5 ohms or less.

Results:

- **YES** - The resistance measures 5 ohms or less. The machine harness appears to be correct. Either the alternator is not working correctly or the ECM may be recording this diagnostic code incorrectly.

Repair: Check the charging system. See Special Instruction, REHS0354, "Charging System Troubleshooting" for more information. If the charging system checks are correct, the ECM may have failed. It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is NOT found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The resistance measurement is greater than 5 ohms. Wire 403-GN between the ECM and the alternator is open in the machine harness.

Repair: Refer to the machine electrical schematic and ensure that all harness connectors in the circuit are tight and in good condition. Repair the machine harness or replace the machine harness.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:25:28 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I04161813

MID 039 - CID 0171 - FMI 03

SMCS - 1928-038

Conditions Which Generate This Code:

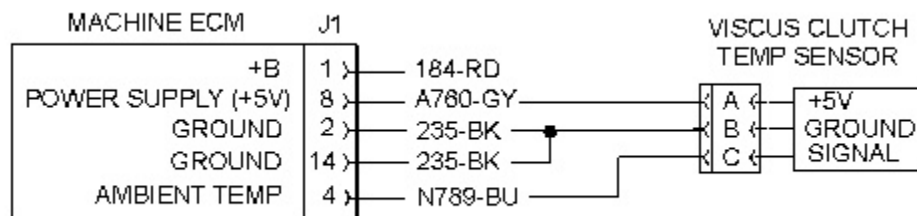


Illustration 1

g02025091

Ambient Air Temperature sensor circuit schematic

This diagnostic code is for the Ambient Air Temperature sensor. An FMI 03 diagnostic code means the machine ECM has determined the sensor output signal voltage is above the normal limit.

Possible causes of this diagnostic code are:

- Failed sensor power supply.
- Failed sensor.

- Open sensor circuit wire.
- Sensor signal output wire shorted to +battery.
- Failed machine ECM, but most unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes now, but clear those codes after the original diagnostic code has been corrected.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all of the harness connectors involved in the circuit. Verify that all of the connections in the circuit are clean, secure, and in good condition. If a problem is found with any of the connections: correct the problem and verify that diagnostic code CID 0171 FMI 03 is still active, before performing the following procedures.

System Response:

This failure may cause ambient air temperature to indicate the maximum temperature. The failure may also cause hydraulic oil temperature to indicate the maximum temperature, intermittently.

Test Step 1. VERIFY THE +8 DCVSUPPLY.

- A. Turn the disconnect switch and the key start switch to the "ON" position.
- B. Do not disconnect any of the machine harness connectors at this time.
- C. In the machine harness connector for the Ambient Air Temperature sensor, measure the voltage between the contact for terminal A (wire A760-GY) and the contact for terminal B (wire 235-BK) in the sensor connector.

Expected Result:

The voltage is 8.0 ± 0.5 DCV.

Results:

- **YES** - The voltage is 8.0 ± 0.5 DCV. The power supply is not the problem. Go to Test Step 2.
- **NO** - The voltage is not 8.0 ± 0.5 DCV. There is a problem with the +8 DCV power supply.

Repair: Refer to the complete electrical schematics for the machine. Investigate and repair the ECM +8 DCV power supply problem.

After +8 DCV power supply problem is repaired, check if the 0171 FMI 03 diagnostic code is still active. If the diagnostic code is still active, proceed to Test Step 2.

Test Step 2. CHECK THE SENSOR, THE ECM, AND THE MACHINE HARNESS.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connector from the Ambient Air Temperature sensor.

- C. In the harness connector for the sensor, place a jumper wire between the contact for terminal C (wire N789-BU) and the contact for terminal B (wire 235-BK) in the sensor connector.
- D. Turn the key start switch and the disconnect switch to the ON position.
- E. Observe the status of the diagnostic code.

Expected Result:

The 0171 FMI 03 diagnostic code remains active.

Results:

- **YES** - The CID 0171 FMI 03 diagnostic code remains active. The sensor is not the problem. Go to Test Step 3.
- **NO** - The CID 0171 FMI 03 diagnostic code is no longer active. The diagnostic code has been replaced by an active CID 0171 FMI 04 diagnostic code. The sensor has failed.

Repair: Replace the sensor.

Go to Test Step 5.

Test Step 3. CHECK THE SENSOR OUTPUT FOR AN OPEN CIRCUIT.

- A. Turn the disconnect switch and the key start switch to the OFF position.
- B. The sensor remain disconnected from the harness.
- C. The wire jumper remains in the sensor connector.
- D. Disconnect both the J1 and J2 harness connector from the machine ECM.
- E. At the ECM J1 harness connector, measure the resistance between contact J1-4 (N789-BU) and contact J1-2 (235-BK) in the J1 harness connector.

Note: An Ambient Air Temperature sensor Ground Return is also found at contact J1-14 (235-BK). Always check these parallel ground wires. Make sure to repair or replace any that are found open.

Expected Result:

The resistance is less than 5 ohms.

Results:

- **YES** - The resistance is less than 5 ohms. Go to Test Step 4.
- **NO** - The resistance is not less than 5 ohms.

Repair: The machine harness has failed. There is an open circuit in the machine harness. Repair or replace the harness.

Go to Test Step 5.

Test Step 4. CHECK THE SENSOR OUTPUT FOR A SHORT CIRCUIT.

- A. The disconnect switch and the key start switch remain in the OFF position.
- B. The sensor, and the ECM harness connectors, remain disconnected.
- C. Remove the jumper wire from the sensor connector.
- D. At the J1 ECM harness connector measure resistance from contact J1-4 (wire N789-BU) to all the other contacts used in both the J1 and J2 ECM harness connectors.

Expected Result:

All measurements are more than 5000 ohms.

Results:

- **YES** - All measurements are more than 5000 ohms. Go to Test Step 5.
- **NO** - All measurements are not more than 5000 ohms. There is a short circuit in the machine harness.

Repair: Repair or replace the harness.

Go to Test Step 5.

Test Step 5. CHECK IF THE DIAGNOSTIC CODE IS STILL ACTIVE.

- A. Reconnect all disconnected machine harness connectors. Make sure that all the connectors are fully seated. Observe that the clips for each connector are securely fastened.
- B. Turn the key start switch and the disconnect switch to the ON position.
- C. Clear all inactive diagnostic codes.
- D. Operate the machine.
- E. Check the status of the CID 0171 FMI 03 diagnostic code.

Expected Result:

The CID 0171 FMI 03 diagnostic code is not active.

Results:

- **YES** - The CID 0171 FMI 03 diagnostic code is no longer active and does not exist at this time.

Repair: The cause for the diagnostic code has been corrected. Return the machine back to normal operations.

STOP

- **NO** - The CID 0171 FMI 03 diagnostic code is still active. The problem has not been corrected. The ECM may have failed.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the sensor circuit. Perform a "wiggle test" on the sensor circuit of the machine wiring harness, using the Caterpillar Electronic Technician service tool. The "wiggle test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened. Perform Test Step 5 again. If the problem was again not found, and the original code is still active, the machine ECM may have failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:25:45 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I04161814

MID 039 - CID 0171 - FMI 04

SMCS - 1928-038

Conditions Which Generate This Code:

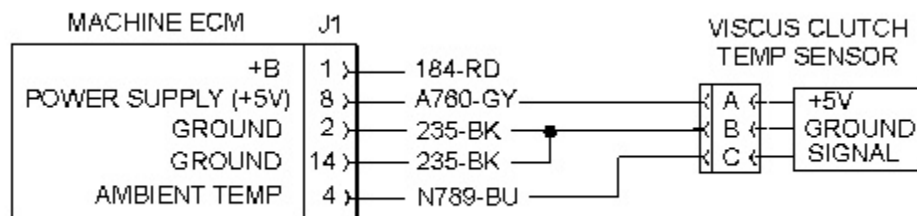


Illustration 1

g02025091

Ambient Air Temperature sensor schematic

This diagnostic code is for the Ambient Air Temperature sensor. An FMI 04 indicates the machine ECM has determined the sensor output signal voltage is below the normal limit.

Possible causes for this diagnostic code are:

- The sensor may have failed.
- The sensor output signal circuit may be shorted to ground.

- The machine ECM may have failed, but is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes now, but clear those codes after the original diagnostic code has been corrected.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all of the harness connectors involved in the circuit. Verify that all of the connections in the circuit are clean, secure, and in good condition. If a problem is found with any of the connections: correct the problem and verify that diagnostic code CID 0171 FMI 04 is still active, before performing the following procedures.

System Response:

This failure may cause the Ambient Air Temperature sensor to indicate a maximum temperature, either constantly, or intermittently.

Test Step 1. CHECK THE SENSOR THE ECM, AND THE MACHINE HARNESS.

- A. Turn the disconnect switch and the key start switch to the OFF position.
- B. Disconnect the machine harness connector from the Ambient Air Temperature sensor.
- C. Turn the key start switch and the disconnect switch to the ON position.
- D. Observe the status of the diagnostic code.

Expected Result:

The CID 0171 FMI 04 code remains active.

Results:

- **YES** - The CID 0171 FMI 04 code remains active. The sensor is not the problem. Go to Test Step 2.
- **NO** - The CID 0171 FMI 04 code is no longer active and has been replaced by an active CID 0171 FMI 04 diagnostic code. The sensor has failed.

Repair: Replace the sensor.

Go to Test Step 3.

Test Step 2. CHECK THE SENSOR OUTPUT WIRE FOR A GROUND SHORT.

- A. Turn the disconnect switch and the key start switch to the OFF position.
- B. The sensor remains disconnected from the harness connector.
- C. Disconnect both the J1 and J2 ECM harness connectors from the ECM.
- D. At the J1 harness connector for the ECM, measure the resistance from contact J1-4 (N789-BU) to all of the other contacts used in both the J1 and J2 ECM harness connectors.

Expected Result:

Each resistance is more than 5000 ohms.

STOP.

Results:

- **YES** - Each resistance is more than 5000 ohms. Go to Test Step 3.
- **NO** - A resistance is less than 5000 ohms. There is a short circuit in the machine harness.

Repair: Repair or replace the machine harness.

Go to Test Step 3.

Test Step 3. CHECK THE DIAGNOSTIC CODE STATUS.

- A. Reconnect all harness connectors. Make sure that all connectors are fully seated. Observe that the clips for each connector are securely fastened.
- B. Turn the disconnect switch and the key start switch to the ON position.
- C. Clear all inactive diagnostic codes.
- D. Operate the machine.
- E. Check the status of the CID 0171 FMI 04 diagnostic code.

Expected Result:

The CID 0171 FMI 04 code is not active.

Results:

- **YES** - The CID 0171 FMI 04 code is no longer active and does not exist at this time.

Repair: The cause for the diagnostic code has been corrected. Return the machine back to normal operations.

STOP

- **NO** - The CID 0171 FMI 04 diagnostic code is still active. The problem has not been corrected.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the solenoid circuit. Perform a "wiggle test" on the solenoid circuit of the machine wiring harness, using the Caterpillar Electronic Technician service tool. The "wiggle test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are securely fastened. Perform Test Step 3 again. If the problem has NOT been found, and this diagnostic code is still active, the ECM may have

failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:26:12 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I05259917

MID 039 - CID 0190 - FMI 08

SMCS - 1907-038

Conditions Which Generate This Code:

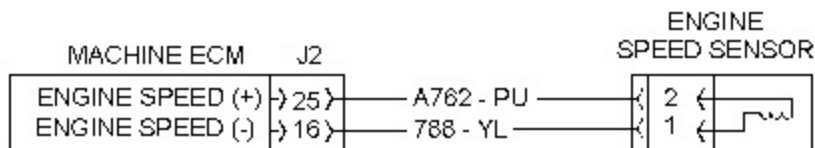
(Engine Speed Sensor - Abnormal Frequency, Pulse Width, or Period)

Illustration 1

g02025148

Engine Speed sensor circuit schematic

This diagnostic code is for the Engine Speed sensor. This sensor is located near the top of the flywheel housing.

The Machine ECM monitors the input signals from the speed sensor in order to determine the rotation speed of the flywheel. The frequency of the sensor output signal varies as the teeth on the flywheel pass the sensor. The frequency of the sensor output signal is proportional to the speed of the flywheel.

An FMI 8 diagnostic code indicates the machine ECM has determined the sensor output signal has an abnormal frequency, pulse width, or period.

Possible causes of this diagnostic code are:

- Speed sensor air gap is out of adjustment
- Failed or damaged speed sensor
- Open wire connections or intermittent open connections in the speed sensor circuit
- Shorted wire connections or intermittent shorted connections in the speed sensor circuit
- Failed machine ECM. ECM failure is most unlikely

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes now, but clear those codes after the original diagnostic code has been corrected.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all of the harness connectors involved in the circuit. Verify that all of the connections in the circuit are clean, secure, and in good condition. If a problem is found with any of the connections: correct the problem and verify that the 190-8 diagnostic code is still active, before performing the following procedures.

Note: The engine must be running in order for this diagnostic code to be active.

Test Step 1. CHECK THE SENSOR CIRCUIT FOR AN OPEN WIRE

- A. Turn the key start switch to the OFF position.
- B. Disconnect the machine harness connector from the Engine Speed sensor.
- C. In the harness connector for the sensor, place a jumper wire between the contact for terminal 1 (wire 788-YL) and the contact for terminal 2 (wire A762-PU) in the sensor connector.
- D. Disconnect both the J1 and J2 harness connectors from the machine ECM.
- E. At the J2 ECM harness connector, measure the resistance between contact J2-16 (wire 788-YL) and contact J2-25 (wire A762-PU) of the J2 ECM harness connector.

Expected Result:

The resistance is 5 ohms or less.

Results:

- **YES** - The resistance is 5 ohms or less. Go to Test Step 2.
- **NO** - The resistance is not less than 5 ohms. There is an open wire in the sensor circuit.

Repair: Repair or replace the machine harness.

Go to Test Step 4.

Test Step 2. CHECK THE SENSOR OUTPUT FOR A SHORT CIRCUIT

- A. The disconnect switch and the key start switch remain in the OFF position.
- B. The sensor, and both ECM harness connectors, remain disconnected.
- C. Remove the jumper wire from the connector.
- D. At the J2 ECM harness connector, measure resistance from contact J2-16 (wire 788-YL) to all the other contacts used in both the J1 and J2 ECM harness connectors.
- E. Again at the J2 ECM harness connector, measure resistance from contact J2-25 (wire A762-PU) to all the other contacts used in both the J1 and J2 ECM harness connectors.

Expected Result:

All measurements are more than 5000 ohms.

Results:

- **YES** - All measurements are more than 5000 ohms. Go to Test Step 4.
- **NO** - All measurements are not more than 5000 ohms. There is a short circuit in the harness.

Repair: Repair or replace the machine harness.

Go to Test Step 3.

Test Step 3. CHECK THE SENSOR

- A. The keyswitch and the disconnect switch remain in the OFF position.
- B. Remove and inspect the sensor. Perform the adjustment procedure . See Testing and Adjusting, "Speed Sensor - Adjust" and follow the inspection and adjustment steps.

Note: Replace the sensor if the magnetic pickup tip looks damaged or has metal embedded into the tip. If damage can be seen to the gear teeth, remove the pump for further inspection of the flywheel and rear gear train. Refer to Disassembly and Assembly, "Pump Drive Group - Remove".

- C. If suspect, replace the sensor and perform the adjustment for the replacement sensor.
- D. Turn the keyswitch and the disconnect switch to the ON position.
- E. Start the engine.
- F. Monitor the status of the diagnostic code.

Expected Result:

The diagnostic code moves from active to logged.

Results:

- **OK** - The diagnostic code moves from active to logged. Sensor failure / incorrect adjustment was the cause of the fault.

Repair: Leave the replacement sensor installed.

STOP

- **NOT OK** - The diagnostic code remains active.

Repair: Reinstall the original sensor. Refer to Testing and Adjusting, "Speed Sensor - Adjust" to repeat the procedure.

Proceed to test step 4

Test Step 4. CHECK THE DIAGNOSTIC CODE STATUS.

- A. Reconnect all disconnected machine harness connectors. Make sure that all the connectors are fully seated. Observe that the clips for each connector are securely fastened.
- B. Turn the key start switch and the disconnect switch to the ON position.
- C. Clear all inactive diagnostic codes.
- D. Operate the machine.
- E. Check the status of the 190-8 diagnostic code.

Expected Result:

The 190-8 diagnostic code is not active.

Results:

- **YES** - The 190-8 diagnostic code is no longer active and does not exist at this time.

Repair: The cause for the diagnostic code has been corrected. Return the machine back to normal operations.

STOP

- **NO** - The 190-8 diagnostic code is still active. The problem has not been corrected. The ECM may have failed.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Refer to Testing and Adjusting , "Electrical Connector - Inspect ".Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the sensor circuit. Perform a "wobble test" on the sensor circuit of the machine wiring harness, using the Caterpillar Electronic Technician service tool. The "wobble test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened. Perform Test Step 5 again. If the problem was again not found, and the original code is still active, the machine ECM may have failed.Prior to replacing an ECM,

always contact your Dealership Technical Communicator for possible consultation with Caterpillar®. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)
[All Rights Reserved.](#)
[Private Network For SIS Licensees.](#)

Sun Apr 23 08:26:29 UTC+0700 2017



Service Information System

Shutdown SIS

Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103996494

MID 039 - CID 0246 - FMI 12

SMCS - 7610-038-MCH

Conditions Which Generate This Code:

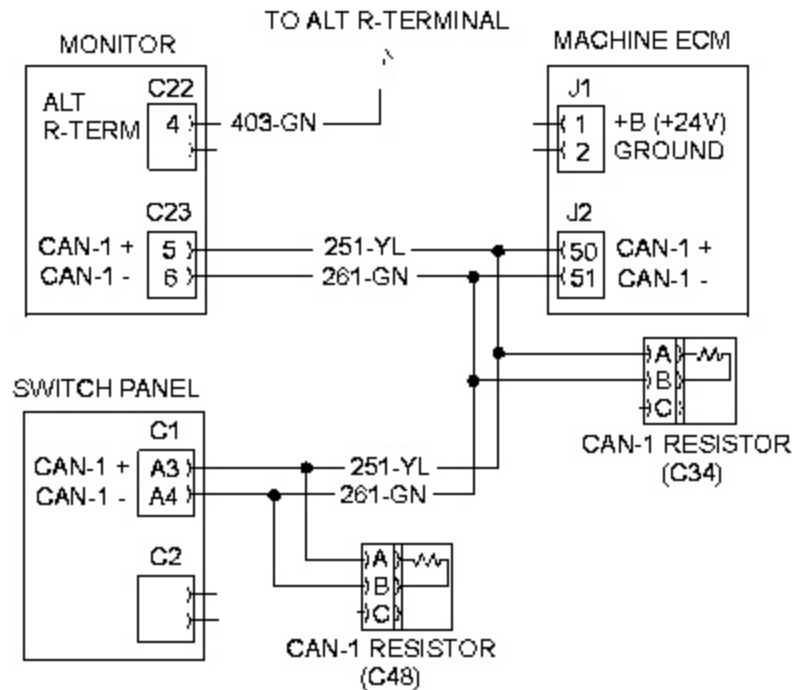


Illustration 1

g01242599

Schematic of the CAN Data Link Circuit

This diagnostic code is recorded when the Monitor does not receive expected information from the machine ECM for more than 5 seconds.

For machines equipped with the E-Fence feature, reference Troubleshooting, "E-Ceiling and Cab Avoidance - Troubleshoot"

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes now, but clear those codes after the original diagnostic code has been corrected.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all of the harness connectors involved in the circuit. Verify that all of the connections in the circuit are clean, secure, and in good condition. If a problem is found with any of the connections: correct the problem and verify that diagnostic code CID 1130 FMI 04 is still active, before performing the following procedures.

System Response:

This failure results in events that are logged against an ECM that cannot be explained directly. The Monitor cannot communicate with the Machine ECM, or the ECM appears to communicate intermittently with the Monitor.

Test Step 1. CHECK THE HARNESS FOR A SHORT TO GROUND.

- A. The key start switch and the disconnect switch remain in the OFF position.
- B. Disconnect the machine harness from all electronic control modules that use the CAN Data Link.
- C. At the machine harness connector for the ECM, measure the resistance between the frame ground and the CAN Data Link circuits (contacts J2-50 and J2-51).

Expected Result:

The resistance measurement should be greater than 5000 ohms.

Results:

- **YES** - The resistance is greater than 5000 ohms. The harness circuit resistance is correct. Proceed to Test Step 2.
- **NO** - The resistance is less than 5000 ohms.

Repair: The machine harness has failed. There is a short between the CAN Data Link circuit and frame ground in the machine harness. Repair, or replace, the machine harness.

STOP

Test Step 2. CHECK THE HARNESS FOR A SHORT TO A VOLTAGE SOURCE.

- A. The key start switch and the disconnect switch remain in the OFF position.
- B. All related control modules remain disconnected from the machine harness.
- C. At the harness for the ECM, measure the resistance between the +battery circuit (contact J1-1) and the CAN Data Link (contacts J2-50 and J2-51).

Expected Result:

The resistance is greater than 5000 ohms.

Results:

- **OK** - The resistance is greater than 5000 ohms. The harness circuit resistance is correct. Proceed to Test Step 3.
- **NOT OK** - The resistance is less than 5000 ohms.

Repair: The harness has failed. There is a short between the +battery contact and the CAN Data Link circuit in the machine harness. Repair, or replace, the machine harness.

STOP**Test Step 3. CHECK FOR AN OPEN IN THE HARNESS.**

- A. The key start switch and the disconnect switch remain in the OFF position.
- B. All related control modules remain disconnected from the machine harness.
- C. Check the continuity of the CAN Data Link circuit in the machine harness.
- D. Measure the resistance between the contact J2-50 of the Machine ECM (wire 251-YL) and the corresponding connection (wire 251-YL) of the switch panel. Measure the resistance between the Machine ECM and the connection of the Monitor.
- E. Measure the resistance from contact J2-51 (wire 261-GN) and the corresponding connection (wire 261-GN) of the switch panel and the "Monitor".

Expected Result:

Each resistance measurement is less than 5 ohms.

Results:

- **YES** - Each resistance measurement is less than 5 ohms.

Repair: The CAN Data Link circuit in the machine harness is correct. The ECM has failed. Is unlikely that the ECM has failed. If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the solenoid circuit. Perform a "wiggle test" on the solenoid circuit of the machine wiring harness, using the Caterpillar Electronic Technician service tool. The "wiggle test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are securely fastened. Perform Test Step 4 again. If the problem has NOT been found, and this diagnostic code is still active, the ECM may have failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - Any resistance measurement is greater than 5 ohms.

Repair: The machine harness has failed. The CAN Data Link circuit is open in the machine harness. Repair, or replace, the machine harness.

STOP

**Service Information System**

Shutdown SIS

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I02414869

MID 039 - CID 0247 - FMI 12

SMCS - 7610-038-MCH

Conditions Which Generate This Code:

- The Electronic Control Module (ECM) detects an unexpected loss of a continuous J1939 speed signal on the J1939 data link.
- The expected continuous speed signal has never been received on the J1939 data link.

Check the configuration of the ECM. If the ECM for the engine has been incorrectly configured to expect a continuous J1939 speed signal, remove "Continuous" for the J1939 speed signal on the main "J1939" screen on the electronic service tool.

Test Step 1. Perform the following diagnostic procedure: "

Use the OEM information to determine the machine ECM that provides the continuous speed signal. Refer to the troubleshooting procedures from the OEM to diagnose the faulty speed signal."

Results:

- **OK - STOP**

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:27:11 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)



Service Information System

Shutdown SIS

Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I03917813

MID 039 - CID 0248 - FMI 12

SMCS - 7610-038-MCH

Conditions Which Generate This Code:

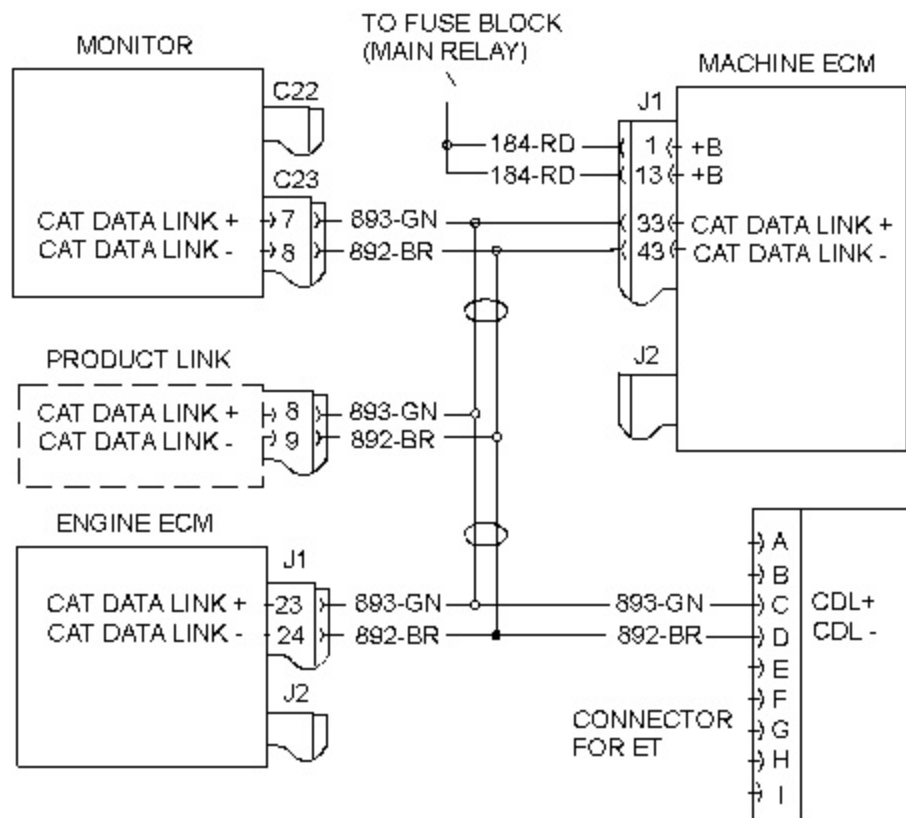


Illustration 1

g01599614

Schematic of the Cat Data Link Circuit

This diagnostic code is recorded when the ECM does not receive expected information. The information from the Cat Data Link indicates the abnormal values in the readout. The possible causes of this diagnostic code are listed below. The causes are listed in order of probability:

For machines equipped with the E-Fence feature, reference Troubleshooting, "E-Ceiling and Cab Avoidance - Troubleshoot"

- Poor electrical connection at a machine harness connector
- The circuit for the Cat Data Link in the machine harness is shorted to ground.
- The circuit for the Cat Data Link in the machine harness is shorted to a power supply source.
- The circuit for the Cat Data Link in the machine harness is open.

System Response:

The machine response is listed:

- The service tool cannot detect the ECM.

- The communication that is related to the codes is indicated by another ECM.

Note: The Machine ECM is equipped with LED indicators that serve as a self-diagnostic check. With the key start switch in the ON position, the technician can observe the status of the indicator lights. If the technician observes that all of the LED lights are OFF, power is not being supplied to the Machine ECM. The technician should proceed to check the power supply to the Machine ECM. If the technician observes that the yellow LED is ON, a communication error exists at the "CAN1" circuit. The Machine ECM may not be loaded with software if the yellow LED is flashing. The Machine ECM must be replaced if the red LED is flashing.

Note: Ensure that the diagnostic code is active.

Test Step 1. CHECK FOR OTHER CODES.

- A. Check for other diagnostic codes that are related to the Cat Data Link.

Expected Result:

There are other diagnostic codes that are showing.

Results:

- **YES** - Exit this procedure and perform the other procedures for the diagnostic codes that are shown **STOP**
- **NO** - There are not any other diagnostic codes that are shown. Proceed to Test Step 2.

Test Step 2. INSPECT THE HARNESS CONNECTORS.

- A. Turn the disconnect switch to the OFF position.
- B. Inspect the connections for the machine harness that are related to the Cat Data Link.
- C. Make sure that connectors are clean and tight.

Expected Result:

The machine harness is correct.

Results:

- **OK** - The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - The machine harness is not correct.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK FOR A SHORT TO GROUND.

- A. The disconnect switch remains in the OFF position.

- B. Disconnect the machine harness from all the electronic control modules that use the Cat Data Link.
- C. At the machine harness connector for the ECM, measure the resistance between frame ground and the circuits of the Cat Data Link, contacts J1-33 (wire 893-GN) and J1-43 (wire 892-BR).

Expected Result:

The resistance is greater than 5000 ohms.

Results:

- **YES** - The resistance is greater than 5000 ohms. The harness circuit resistance is correct. Proceed to Test Step 4.
- **NO** - The resistance is less than 5000 ohms. The machine harness has failed. There is a short between the frame ground and the Cat Data Link circuit in the machine harness.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 4. CHECK FOR A SHORT TO A POWER SUPPLY SOURCE.

- A. The disconnect switch remains in the OFF position.
- B. All related control modules remain disconnected from the machine harness.
- C. At the machine harness connector for the ECM, measure the resistance between the +battery circuit J1-1 and J1-13 (wire 184-RD) and the circuits of the Cat Data Link, contacts J1-33 (wire 893-GN) and J1-43 (wire 892-BR).

Expected Result:

The resistance is greater than 5000 ohms.

Results:

- **OK** - The resistance is greater than 5000 ohms. The harness circuit resistance is correct. Proceed to Test Step 5.
- **NOT OK** - The resistance is less than 5000 ohms. The machine harness has failed. There is a short circuit. The short circuit is between the +battery and the circuit for the "Cat Data Link" in the machine harness.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 5. CHECK FOR AN OPEN HARNESS.

- A. The disconnect switch remains in the OFF position.

- B. All related control modules remain disconnected from the machine harness.
- C. Check the continuity of the Cat Data Link circuit in the machine harness.
- D. Measure the resistance from the connector contacts J1-33 (wire 893-GN) and J1-43 (wire 892-BR) of the ECM to the connector for each of the related circuits for the other electronic control modules.

Expected Result:

The resistance is less than 5 ohms.

Results:

- **YES** - The resistance is less than 5 ohms. The Cat Data Link circuit in the machine harness is correct.

Repair: Is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. Also, recheck if the diagnostic code is active. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The resistance is greater than 5 ohms. The machine harness has failed. The Cat Data Link circuit is open in the machine harness.

Repair: Repair the machine harness or replace the machine harness.

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I03917949

MID 039 - CID 0254 - FMI 12

SMCS - 7610-038-MCH

Conditions Which Generate This Code:

This diagnostic code is for the Machine ECM.

This diagnostic code is recorded when the ECM reads a problem that is internal to the ECM.

For machines equipped with the E-Fence feature, reference Troubleshooting, "E-Ceiling and Cab Avoidance - Troubleshoot"

Test Step 1.

Results:

- **OK** - This diagnostic code can only be caused if the ECM is faulty.

Repair: Replace the Machine ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I04161815

MID 039 - CID 0262 - FMI 06

SMCS - 1439-038

Conditions Which Generate This Code:

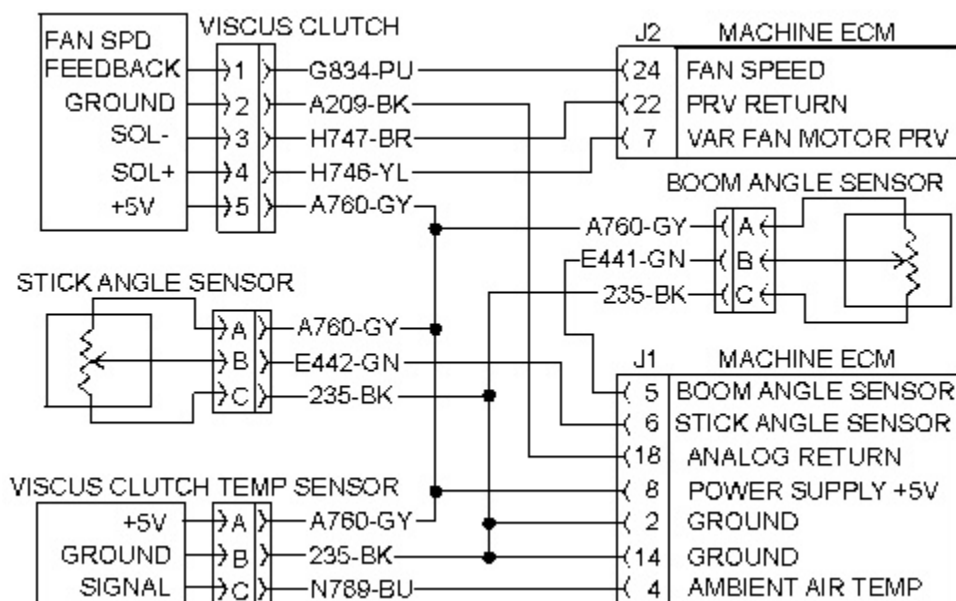


Illustration 1

g02356600

ECM +5 VDC sensor supply circuit schematic

This diagnostic code is for the ECM +5 VDC sensor supply. An FMI 06 indicates the ECM has determined the current of the ECM +5 VDC Sensor supply circuit is above normal.

Possible causes for this diagnostic code are:

- The +5 VDC supply output shorted to ground.
- A failed sensor in the +5 VDC supply circuit.
- A failed machine ECM, but is most unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes now, but clear those codes after the original diagnostic code has been corrected.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all of the harness connectors involved in the circuit. Verify that all of the connections in the circuit are clean, secure, and in good condition. If a problem is found with any of the connections: correct the problem and verify that diagnostic code CID 0262 FMI 06 is still active, before performing the following procedures.

System Response:

Components that receive power from the +5 VDC sensor supply will not be available.

Test Step 1. CHECK THE SENSOR VOLTAGE.

- A. Turn the disconnect switch and the key start switch to the ON position.
- B. Do not disconnect any of the machine harnesses at this time. Check for +5 VDC at the harness connector of every sensor supplied by the ECM +5 VDC power supply.

Expected Result:

The voltage at each sensor is 5.0 ± 0.5 DCV.

Results:

- **YES** - The voltage at each sensor is 5.0 ± 0.5 DCV. Check if the diagnostic code is still active. If the code is still active, go to Test Step 2.
- **NO** - The voltage at one or more of the sensors is not 5.0 ± 0.5 DCV. There is a problem with the ECM +5 VDC voltage supply.

Repair: Refer to the complete electrical schematics for the machine. Investigate and repair the +5 VDC power supply problem.

After +5 DCV power supply problem is repaired, check if the 0262 FMI 06 diagnostic code is still active. If the diagnostic code is still active, go to Test Step 2.

Test Step 2. CHECK THE SENSORS.

- A. Turn the disconnect switch and the key start switch to the ON position.

- B. One at a time disconnect and reconnect each and every sensor supplied by the ECM +5 VDC sensor power supply.
- C. While each sensor is disconnected, check the status of the CID 0262 FMI 06 diagnostic code.

Expected Result:

The CID 0262 FMI 06 diagnostic code remains active while each sensor is disconnected and reconnected.

Results:

- **YES** - The CID 0262 FMI 06 diagnostic code remains active while each sensor is disconnected and reconnected. None of the sensors are causing the problem. Go to Test Step 3.
- **NO** - While one of the sensors is disconnected, the CID 0262 FMI 06 diagnostic code becomes inactive. That sensor is causing the problem.

Repair: Replace that sensor.

Go to Test Step 4.

Test Step 3. CHECK FOR A SHORT TO GROUND.

- A. Turn the disconnect switch and the key start switch to the OFF position.
- B. Disconnect both the J1 and J2 ECM harness connectors from the machine ECM.
- C. At the J1 machine harness connector for the ECM, measure resistance from contact J1-5 (sensor supply) A760-GY to all possible sources of ground in both the J1 and J2 ECM harness connectors.

Expected Result:

Each measurement is more than 5000 ohms.

Results:

- **YES** - Each resistance measurement is greater than 5000 ohms. Go to Test Step 4.
- **NO** - A resistance measurement is less than 5000 ohms. There is a short circuit in the machine harness.

Repair: Repair or replace the machine harness.

Go to Test Step 4.

Test Step 4. CHECK THE DIAGNOSTIC CODE STATUS.

- A. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are securely fastened.
- B. Turn the disconnect switch and the key start switch to the ON position.

- C. Clear all inactive diagnostic codes.
- D. Operate the machine.
- E. Check the status of the CID 0262 FMI 06 diagnostic code.

Expected Result:

The CID 0262 FMI 06 diagnostic code is not active.

Results:

- **YES** - The CID 0262 FMI 06 diagnostic code is no longer active. The code does not exist at this time.

Repair: The cause for the diagnostic code has been corrected. Return the machine back to normal operations.

STOP

- **NO** - The CID 0262 FMI 06 diagnostic code is still active. The problem has not been corrected.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the sensor circuit. Perform a "wiggle test" on the sensor circuit of the machine wiring harness, using the Caterpillar Electronic Technician service tool. The "wiggle test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened. Perform Test Step 4 again. If the problem has again not been found, and the original code is still active, the ECM may have failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

**Service Information System**

Shutdown SIS

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I03755057

MID 039 - CID 0271 - FMI 06

SMCS - 7407-038

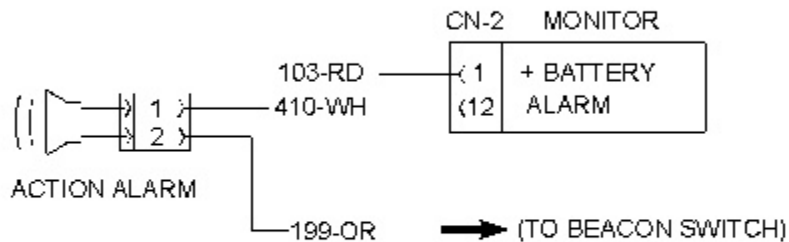
Conditions Which Generate This Code:

Illustration 1

g02025266

Schematic of Action alarm and "Monitor" module

This diagnostic code is recorded when the "Monitor" module determines that the current of the action alarm is above normal. The "Monitor" module indicates the fault to the Machine ECM over the CAN Data Link.

The possible causes of this diagnostic code are listed below:

- The energize circuit of the action alarm is shorted to ground.
- The action alarm has failed.
- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 0271 FMI 06 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

Test Step 1. CHECK THE ACTION ALARM.

- A. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- B. Observe the status of the diagnostic code.
- C. Disconnect the action alarm with the active diagnostic code from the machine harness.

Expected Result:

The status of CID 0271 FMI 06 diagnostic code changes when the action alarm is disconnected.

Results:

- **YES** - The status of CID 0271 FMI 06 diagnostic code changes when the action alarm is disconnected. The circuit is correct.

Repair: The action alarm has failed. Repeat this test "CHECK THE ACTION ALARM" in order to verify the failure of the action alarm. Replace the action alarm.

STOP

- **NO** - The CID 0271 FMI 06 diagnostic code remains active. Proceed to Test Step 2.

Test Step 2. CHECK THE ENERGIZE CIRCUIT OF THE ACTION ALARM FOR A SHORT TO GROUND.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The action alarm remains disconnected from the machine harness.
- C. Disconnect the machine harness connector(s) from the ECM.
- D. At the machine harness connector, measure the resistance from the signal contact 12 (wire 410-WH) to all contacts that are used in the connectors of the machine harness for the ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between contact 12 (wire 410-WH) and the circuit with the low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS.

- A. Inspect the harness connectors. Clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 0271 FMI 06 diagnostic code.

Expected Result:

The CID 0271 FMI 06 diagnostic code is active.

Results:

- **YES** - The CID 0271 FMI 06 diagnostic code is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: It is unlikely that the "Monitor" module has failed. Exit this procedure and perform this procedure again. Refer to the Electrical System Schematic for this machine and check all involved wiring harness connectors and wiring. Ensure that the connector contacts are clean and that the connector contacts are in good condition. Ensure that all wiring of the machine harness is intact and that all wiring of the machine harness is in good condition. If the cause of this diagnostic code is not found, replace the "Monitor" module.

STOP

- **NO** - The CID 0271 FMI 06 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:28:18 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I04450529

MID 039 - CID 0291 - FMI 03

SMCS - 1359-038-OD

Conditions Which Generate This Code:

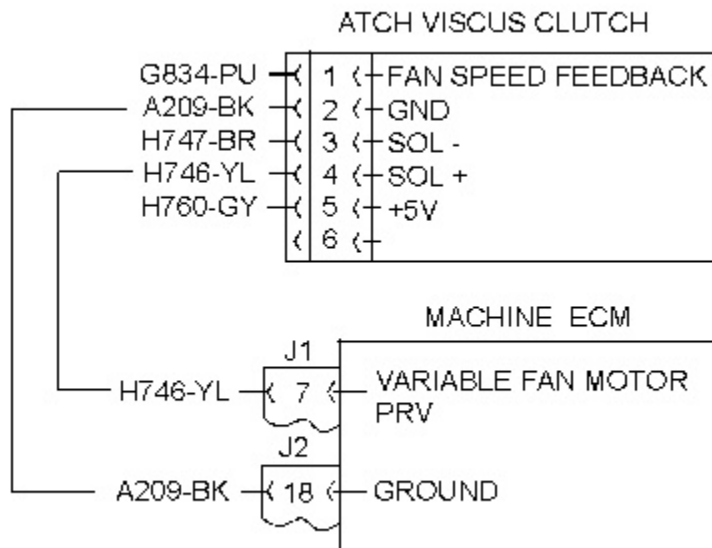


Illustration 1

g02638020

Schematic of the "Variable Fan Speed Control" Solenoid

This diagnostic code is associated with the "Variable Fan Speed Control" Solenoid. The FMI 03 means that the ECM has determined that the voltage of the solenoid circuit is above normal. The solenoid is within the "ATCH Viscus Clutch".

The possible causes of this diagnostic code are listed below:

- The energize circuit of the solenoid is shorted to the +battery circuit.
- The ECM has failed. This is unlikely.

Note: The Machine ECM is equipped with LED indicators that serve as a self-diagnostic check. With the key start switch in the ON position, the technician can observe the status of the indicator lights. If the technician observes that all of the LED lights are OFF, power is not being supplied to the Machine ECM. The technician should proceed to check the power supply to the Machine ECM. If the technician observes that the yellow LED is ON, a communication error exists at the "CAN1" circuit. The Machine ECM may not be loaded with software if the yellow LED is flashing. The Machine ECM must be replaced if the red LED is flashing.

Before performing this procedure, inspect the harness connectors that are involved in the circuit. Poor connections can often be the cause of a problem in an electrical circuit. Verify that all connections in the circuit are clean, that all connections are secure and that all connections are in good condition. If a problem with a connection is found, correct the problem and verify that this diagnostic code is active before performing this procedure.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 0291 FMI 03 is active before performing this procedure.**

Note: Use a Digital Multimeter for the measurements in the procedure.

System Response:

A level 1 warning will be generated.

Test Step 1. CHECK THE ENERGIZE CIRCUIT OF THE SOLENOID FOR A SHORT TO THE +BATTERY CIRCUIT.

- A. Turn the key start switch and the disconnect switch to the ON position.

Note: Use a wire removal tool to remove the appropriate wires from the machine harness connector for the ECM.

- B. Remove the wire for the solenoid signal (H746-YL) of the connector contact J1-7 for the Machine ECM.
- C. Measure the voltage from the wire for the solenoid signal (H746-YL) to frame ground.
- D. Remove the wire for the solenoid return (A209-BK) of the connector contact J2-18 for the Machine ECM.
- E. Measure the voltage from the wire for the solenoid return (A209-BK) to frame ground.

Expected Result:

The voltage is 0 VDC.

Results:

- **OK** - The voltage is 0 VDC. There are no shorts in the wires. Proceed to Test Step 2.
- **NOT OK** - There is the presence of a voltage in a wire. The short is in the wire with a measured voltage. The machine harness has failed.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 2. CHECK IF THE DIAGNOSTIC CODE REMAINS.

- A. Inspect the contacts of the harness connectors. Clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Determine if the CID 0291 FMI 03 is active.

Expected Result:

The CID 0291 FMI 03 is active.

Results:

- **YES** - The CID 0291 FMI 03 is active. The problem has not been corrected. The ECM may have failed.

Repair: If the cause of the problem is not found, contact the Technical Communicator for your dealership for possible consultation with Caterpillar. This consultation may greatly reduce repair time. If the ECM requires replacement, see Troubleshooting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 0291 FMI 03 is not active. The problem does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I04450549

MID 039 - CID 0291 - FMI 05

SMCS - 1359-038-OD

Conditions Which Generate This Code:

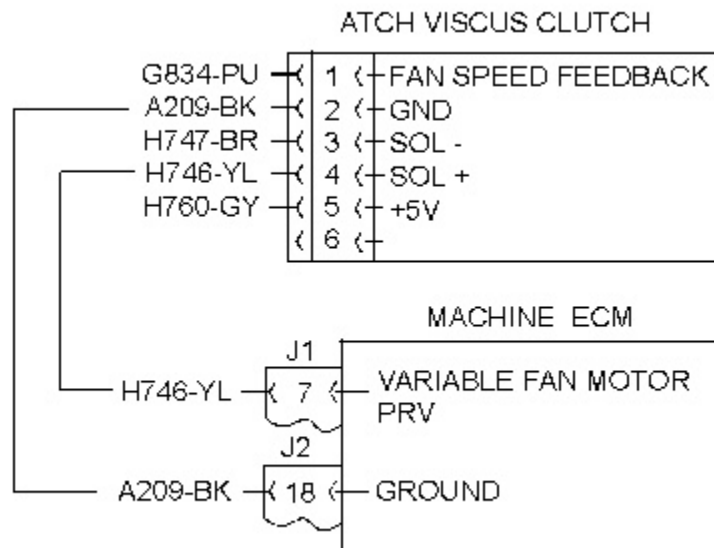


Illustration 1

g02638020

Schematic of the "Variable Fan Speed Control" Solenoid

This diagnostic code is associated with the "Variable Fan Speed Control" Solenoid. The FMI 05 indicates that the ECM has determined that an open connection exists in the circuit for the solenoid. This solenoid is located within the "ATCH Viscus Clutch".

The possible causes of this diagnostic code are listed below:

- The energize circuit of the solenoid is open.
- The return circuit of the solenoid is open.
- The solenoid has failed.
- The ECM has failed. This is unlikely.

Note: The Machine ECM is equipped with LED indicators that serve as a self-diagnostic check. With the key start switch in the ON position, the technician can observe the status of the indicator lights. If the technician observes that all of the LED lights are OFF, power is not being supplied to the Machine ECM. The technician should proceed to check the power supply to the Machine ECM. If the technician observes that the yellow LED is ON, a communication error exists at the "CAN1" circuit. The Machine ECM may not be loaded with software if the yellow LED is flashing. The Machine ECM must be replaced if the red LED is flashing.

Before performing this procedure, inspect the harness connectors that are involved in the circuit. Poor connections can often be the cause of a problem in an electrical circuit. Verify that all connections in the circuit are clean, that all connections are secure and that all connections are in good condition. If a problem with a connection is found, correct the problem and verify that this diagnostic code is active before performing this procedure.

Note: The following procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 0291 FMI 05 is active before performing this procedure.**

Note: Use a Digital Multimeter for the measurements in this procedure.

System Response:

A level 1 warning will be generated.

Test Step 1. CHECK THE SOLENOID.

- A. Turn the disconnect switch and the key start switch to the ON position. DO NOT start the engine.
- B. Disconnect the solenoid with the active diagnostic code from the machine harness.
- C. At the machine harness connector for the "ATCH Viscus Clutch", place a jumper wire from contact 3 (wire H746-YL) to contact 2 (wire A209-BK).
- D. Observe the status of the CID 0291 FMI 05.

Expected Result:

The CID 0291 FMI 05 remains active when the jumper wire is installed.

Results:

- **YES** - The diagnostic code of FMI 05 is active. The jumper wire does not affect the diagnostic code. Proceed to Test Step 2.
- **NO** - The diagnostic code changes from FMI 05 to FMI 06.

Repair: The solenoid has failed. Replace the solenoid. Verify that the new solenoid corrects the problem.

STOP

Test Step 2. CHECK THE HARNESS FOR AN OPEN.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connector(s) from the ECM.
- C. The jumper wire that was installed in the previous Test Step remains.
- D. At the machine harness connector for the ECM, measure the resistance from signal contact J1-7 (wire H746-YL) to contact J2-18 (wire A209-BK).

Expected Result:

The resistance should be less than 5.0 ohms.

Results:

- **OK** - The resistance is less than 5.0 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - The resistance is greater than 5000 ohms. The resistance measurement is not correct. There is an open circuit in the machine harness.

Repair: The open connection is in the wire with the resistance that is measured at more than 5000 ohms. The open is in either signal wire (H746-YL) or return wire (A209-BK) of the machine harness. Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS.

- A. Inspect the contacts of the harness connectors and clean the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 0291 FMI 05.

Expected Result:

The CID 0291 FMI 05 is active.

Results:

- **YES** - The CID 0291 FMI 05 is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: If the cause of the problem is not found, contact the Technical Communicator for your dealership for possible consultation with Caterpillar. This consultation may greatly reduce repair time. If the ECM requires replacement, see Troubleshooting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 0291 FMI 05 is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:28:56 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I04450551

MID 039 - CID 0291 - FMI 06

SMCS - 1359-038-OD

Conditions Which Generate This Code:

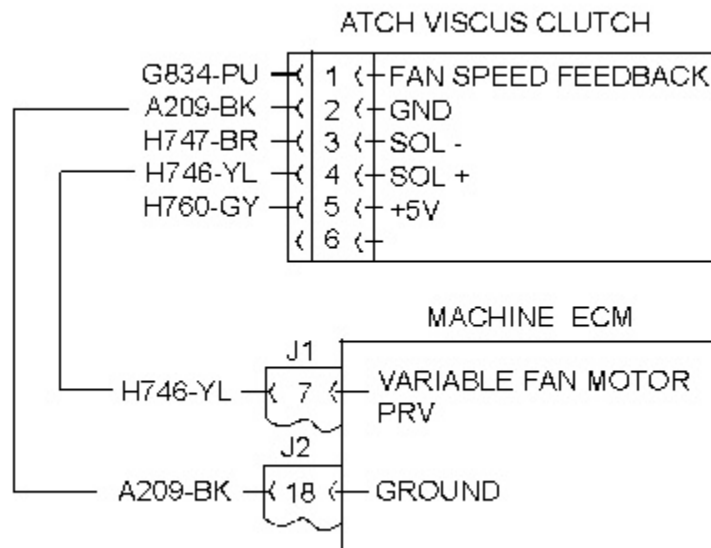


Illustration 1

g02638020

Schematic of the "Variable Fan Speed Control" solenoid

This diagnostic code is associated with the "Variable Fan Speed Control" solenoid. The FMI 06 means that the ECM has determined that there is a short to ground in the solenoid circuit. This solenoid is located within the "ATCH Viscus Clutch".

The possible causes of this diagnostic code are listed below:

- The energize circuit of the solenoid is shorted to ground.
- The solenoid has failed.
- The ECM has failed. This is unlikely.

Note: The Machine ECM is equipped with LED indicators that serve as a self-diagnostic check. With the key start switch in the ON position, the technician can observe the status of the indicator lights. If the technician observes that all of the LED lights are OFF, power is not being supplied to the Machine ECM. The technician should proceed to check the power supply to the Machine ECM. If the technician observes that the yellow LED is ON, a communication error exists at the "CAN1" circuit. The Machine ECM may not be loaded with software if the yellow LED is flashing. The Machine ECM must be replaced if the red LED is flashing.

Before performing this procedure, inspect the harness connectors that are involved in the circuit. Poor connections can often be the cause of a problem in an electrical circuit. Verify that all connections in the circuit are clean, that all connections are secure and that all connections are in good condition. If a problem with a connection is found, correct the problem and verify that this diagnostic code is active before performing this procedure.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 0291 FMI 06 is active before performing this procedure.**

Note: Use a Digital Multimeter for the measurements in this procedure.

System Response:

A level 1 warning will be generated.

Test Step 1. CHECK THE SOLENOID.

- A. Turn the disconnect switch and the key start switch to the ON position. DO NOT start the engine.
- B. Disconnect the solenoid with the active diagnostic code from the machine harness.
- C. Observe the status of the diagnostic code.

Expected Result:

CID 0291 FMI 06 changes to CID 0291 FMI 05 when the solenoid is disconnected.

Results:

- **YES** - CID 0291 FMI 06 changes to CID 0291 FMI 05 when the solenoid is disconnected. The circuit is correct.

Repair: The solenoid has failed. Replace the solenoid. Verify that the new solenoid corrects the problem.

STOP

- **NO** - The CID 0291 FMI 06 remains active. Proceed to Test Step 2.

Test Step 2. CHECK THE ENERGIZE CIRCUIT OF THE SOLENOID FOR A SHORT TO GROUND.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The solenoid remains disconnected from the machine harness.
- C. Disconnect the machine harness connectors from the ECM.
- D. At the machine harness connector, measure the resistance from the signal contact J1-7 (wire H746-YL) to all contacts that are used in the machine harness connectors for the ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between contact J1-7 (wire H746-YL) and the circuit with the low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS.

- A. Inspect the harness connectors. Clean the contacts of the harness connectors. Check the wires for damage to the insulation that is caused by excessive heat, corrosion, or chafing.
- B. Perform a 45 N (10 lb) pull test on each of the wires that are associated with the circuit.
- C. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are completely fastened.
- D. Turn the disconnect switch and the key start switch to the ON position.
- E. Operate the machine.
- F. Check the status of CID 0291 FMI 06.

Expected Result:

The CID 0291 FMI 06 is active.

Results:

- **YES** - The CID 0291 FMI 06 is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: If the cause of the problem is not found, contact the Technical Communicator for your dealership for possible consultation with Caterpillar. This consultation may greatly reduce repair time. If the ECM requires replacement, see Troubleshooting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The diagnostic code has not been corrected.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:29:08 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)



Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103755083

MID 039 - CID 0362 - FMI 03

SMCS - 1359-038; 5479-038

Conditions Which Generate This Code:

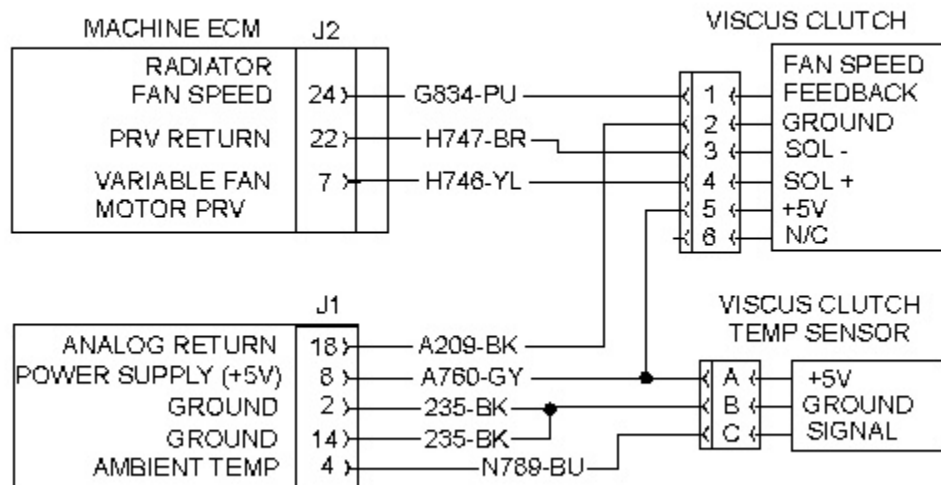


Illustration 1

g02025271

Schematic of the "Radiator Fan Speed Viscus" clutch

This diagnostic code is associated with the "Radiator Fan Speed Viscus" clutch. The FMI 03 diagnostic code means that the ECM has determined that the voltage of the clutch circuit is above normal.

The possible causes of the diagnostic code are listed below:

- The clutch has failed.
- The energize circuit of the clutch is shorted to the +battery circuit.
- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 0362 FMI 03 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

The diagnostic code of CID 0362 FMI 03 will be logged in the internal memory of the Machine ECM.

Test Step 1. CHECK THE ENERGIZE CIRCUIT OF THE CLUTCH FOR A SHORT TO THE +BATTERY CIRCUIT.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connectors from the solenoid and the ECM.
- C. At the machine harness connector for the ECM, measure the resistance from contact J2-24 (wire G834-PU) to all contacts that are used in the machine harness connectors for the Machine ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 2.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between J2-24 (G834-PU) and the circuit that has a low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 2. CHECK IF THE DIAGNOSTIC CODE IS STILL ACTIVE.

- A. Inspect the contacts of the harness connectors. Clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Determine if the CID 0362 FMI 03 diagnostic code is active.

Expected Result:

The CID 0362 FMI 03 diagnostic code is active.

Results:

- **YES** - The CID 0362 FMI 03 diagnostic code is active. The problem has not been corrected. The ECM may have failed.

Repair: It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 0362 FMI 03 diagnostic code is not active. The problem does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103755194

MID 039 - CID 0362 - FMI 05

SMCS - 1359-038; 5479-038

Conditions Which Generate This Code:

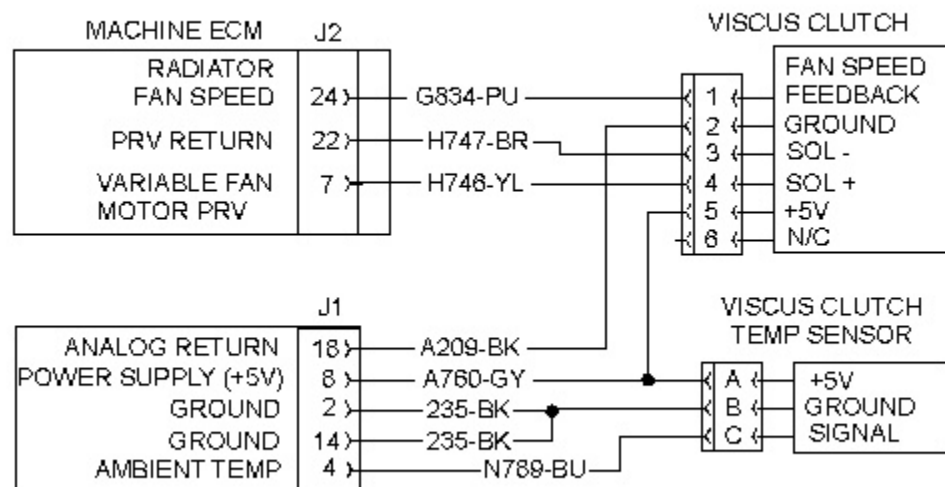


Illustration 1

g02025271

Schematic of the "Radiator Fan Speed Viscus" clutch

This diagnostic code is associated with the "Radiator Fan Speed Viscus" clutch. The FMI 05 diagnostic code means that the ECM has determined that an open in the circuit exists.

The possible causes of this diagnostic code are listed below:

- The energize circuit of the clutch is open.
- The return circuit of the clutch is open.
- The clutch has failed.
- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 0362 FMI 05 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

Test Step 1. CHECK THE CLUTCH.

- A. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- B. Disconnect the clutch with the active diagnostic code from the machine harness.
- C. At the machine harness connector for the clutch, place a jumper wire from contact 1 (wire G834-PU) to contact 2 (wire H747-BR).
- D. Observe the status of the CID 0362 FMI 05 diagnostic code.

Expected Result:

The CID 0362 FMI 05 diagnostic code remains active.

Results:

- **YES** - The diagnostic code remains active. The jumper wire does not affect the diagnostic code. Proceed to Test Step 2.
- **NO** - The diagnostic is no longer active. The clutch has failed.

Repair: The clutch has failed. Repeat this Test Step "CHECK THE CLUTCH" in order to verify the clutch failure. Replace the clutch. Verify that the new clutch corrects the problem.

STOP

Test Step 2. CHECK THE HARNESS FOR AN OPEN.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connector(s) from the Machine ECM.
- C. The jumper wire that was installed in the previous Test Step remains in place.

- D. At the machine harness connector, measure the resistance from signal contact J2-24 (wire G834-PU) to contact J2-22 (wire H747-BR).

Expected Result:

The resistance is less than 5 ohms.

Results:

- **OK** - The resistance is less than 5 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - The resistance is greater than 5 ohms. The resistance measurement is not correct. There is an open circuit in the machine harness.

Repair: The open is in wire G834-PU or in wire H747-BR of the machine harness. Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS.

- A. Inspect the contacts of the harness connectors. Clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 0362 FMI 05 diagnostic code.

Expected Result:

The CID 0362 FMI 05 diagnostic code is active.

Results:

- **YES** - The CID 0362 FMI 05 diagnostic code is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 0362 FMI 05 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:29:49 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103755202

MID 039 - CID 0362 - FMI 06

SMCS - 1359-038; 5479-038

Conditions Which Generate This Code:

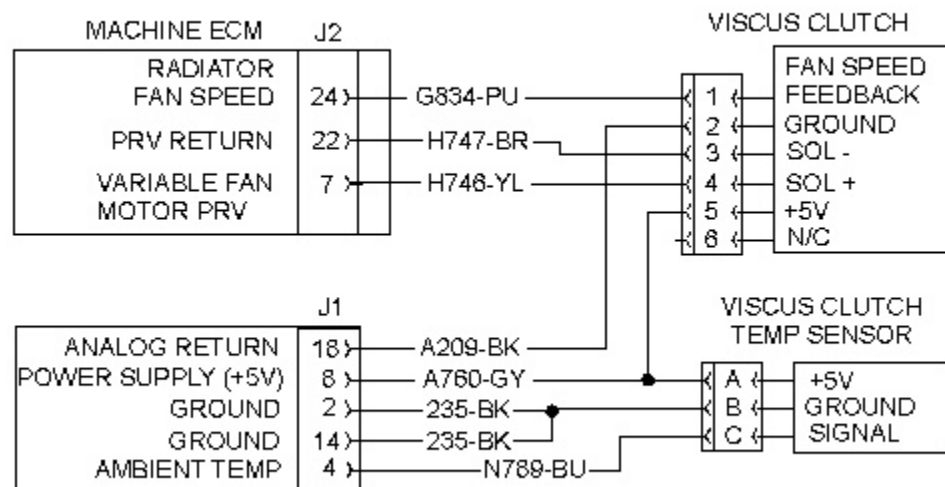


Illustration 1

g02025271

Schematic of the "Radiator Fan Speed Viscus" clutch

This diagnostic code is associated with the "Radiator Fan Speed Viscus" clutch. The FMI 06 diagnostic code means that the ECM has determined that there is a short to ground in the circuit.

The possible causes of this diagnostic code are listed below:

- The energize circuit of the clutch is shorted to ground.
- The clutch has failed.
- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 0362 FMI 06 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

Test Step 1. CHECK THE CLUTCH.

- A. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- B. Observe the status of the diagnostic code.
- C. Disconnect the "Fan Speed Viscus" clutch from the machine harness.

Expected Result:

The CID 0362 FMI 06 diagnostic code changes to a CID 0362 FMI 05 diagnostic code when the clutch is disconnected.

Results:

- **YES** - The CID 0362 FMI 06 diagnostic code changes to a CID 0362 FMI 05 diagnostic code when the clutch is disconnected. The circuit is correct.

Repair: The clutch has failed. Repeat this test "CHECK THE CLUTCH" in order to verify the clutch failure. Replace the clutch.

STOP

- **NO** - The CID 0362 FMI 06 diagnostic code remains active. Proceed to Test Step 2.

Test Step 2. CHECK THE ENERGIZE CIRCUIT OF THE CLUTCH FOR A SHORT TO GROUND.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The clutch remains disconnected from the machine harness.
- C. Disconnect the machine harness connector(s) from the ECM.
- D. At the machine harness connector, measure the resistance from the signal contact J2-24 (wire G834-PU) to all contacts that are used in the machine harness connectors for the ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between J2-24 (wire G834-PU) and the circuit with the low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS.

- A. Inspect the harness connectors and clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 0362 FMI 06 diagnostic code.

Expected Result:

The CID 0362 FMI 06 diagnostic code is active.

Results:

- **YES** - The CID 0362 FMI 06 diagnostic code is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the Machine ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 0362 FMI 06 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:30:03 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I05422816

MID 039 - CID 0374 - FMI 03

SMCS - 5059-038-ZWB; 5479-038-ZWB

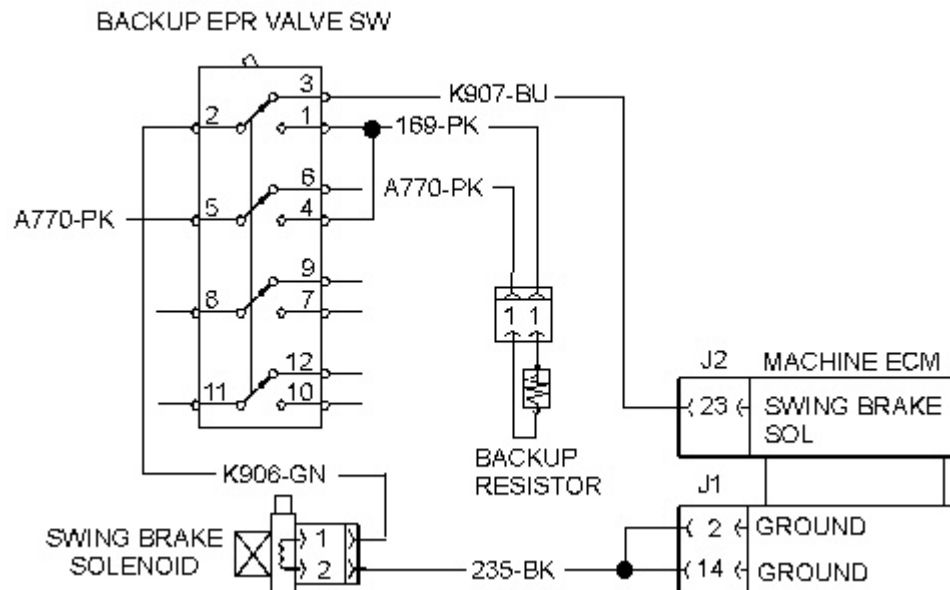
Conditions Which Generate This Code:


Illustration 1

g02166735

Schematic of the Swing Brake solenoid for machine models 311D, 312D, 314D, 315D, and 319D.

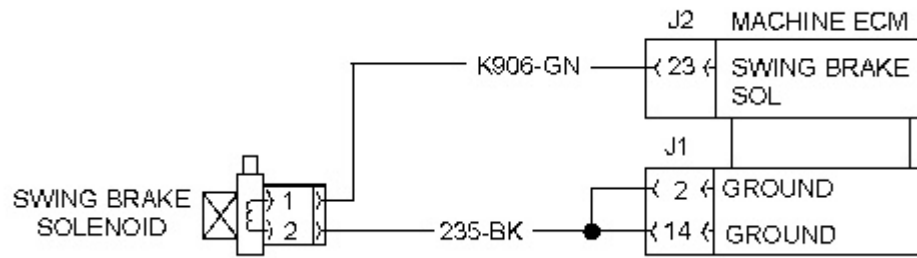


Illustration 2

g03422237

Schematic of the Swing Brake Cancel solenoid for machine models 312D2, 313D2, and 318D2. (Note change in signal wire for this schematic.)

This diagnostic code is associated with the Swing Brake solenoid. An FMI 03 diagnostic code means the ECM has determined the voltage of the solenoid circuit is above normal.

Possible causes for this diagnostic code are:

- The Swing Brake solenoid energize circuit has shorted to a voltage source.
- The Machine ECM may have failed, but this situation is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes now, but clear those codes after the original diagnostic code has been corrected.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all of the harness connectors involved in the circuit. Verify that all of the connections in the circuit are clean, secure, and in good condition. If a problem is found with any of the connections: correct the problem, and verify that diagnostic code CID 0374 FMI 03 is still active, before performing the following procedures.

System Response:

Diagnostic code CID 0374 FMI 03 will be logged in the internal memory of the Machine ECM.

Test Step 1. CHECK THE SOLENOID, THE ECM, AND THE CIRCUIT CONNECTIONS IN THE MACHINE HARNESS.

- Turn the disconnect switch and the key start switch to the OFF position.
- The Backup EPR Valve switch is in the OFF position, if applicable.
- Disconnect the machine harness connector from the Swing Brake solenoid.
- At the harness connector for the solenoid, place a jumper wire from contact 1 (K906-GN) to contact 2 (235-BK) in the connector.
- Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.

F. Observe the status of the CID 0374 FMI 03 diagnostic code.

Expected Result:

The CID 0374 FMI 03 diagnostic code remains active.

Results:

- **YES** - The CID 0374 FMI 03 diagnostic code remains active. The jumper wire did not change the code. The solenoid is NOT the cause of the problem

Repair: The machine harness has failed, or the ECM may have failed.

Go to Test Step 2.

- **NO** - The CID 0374 FMI 03 diagnostic code is no longer active, and has been replaced by an active CID 0374 FMI 05 diagnostic code. The ECM has detected a valid diagnostic code.

Repair: The ECM, and the harness connections, are correct. The solenoid has failed. Perform Test Step 1 again, to verify the solenoid failure. Replace the solenoid.

Go to Test Step 3

Test Step 2. CHECK THE SOLENOID ENERGIZE CIRCUIT FOR A SHORT TO A VOLTAGE SOURCE.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The harness connector remains disconnected from the Swing Brake solenoid.
- C. The Backup EPR Valve switch is in the OFF position, if applicable.
- D. Disconnect the J1 and J2 machine harness connectors from the Machine ECM.
- E. At the ECM J2 harness connector, measure the resistance from contact J2-23 (K907-BU or K906-GN) to all of the other contacts used in the ECM machine harness connectors.

Expected Result:

Each resistance is more than 5000 ohms.

Results:

- **YES** - Each resistance is more than 5000 ohms. The machine harness is correct. Go to Test Step 3.
- **NO** - Each resistance is NOT more than 5000 ohms. There is a short in the harness. The short is between J2-23 (K907-BU or K906-GN) and the circuit with the low resistance measurement.

Repair: Repair, or replace, the harness.

Go to Test Step 3.

Test Step 3. CHECK IF THE DIAGNOSTIC CODE IS STILL ACTIVE.

- A. Remove any jumper wires still inserted.
- B. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are securely fastened.
- C. The Backup EPR Valve switch is in the OFF position, if applicable.
- D. Turn the disconnect switch and the key start switch to the ON position.
- E. Clear all inactive diagnostic codes.
- F. Operate the machine.
- G. Check the status of the CID 0374 FMI 03 diagnostic code.

Expected Result:

The CID 0374 FMI 03 diagnostic code is not active.

Results:

- **YES** - The CID 0374 FMI 03 code is not active. The code does not exist at this time.

Repair: The cause for the diagnostic code appears to have been corrected. Return the machine back to normal operations.

STOP

- **NO** - The CID 0374 FMI 03 diagnostic code is still active. The problem has NOT been corrected.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the solenoid circuit. Perform a "wiggle test" on the solenoid circuit of the machine wiring harness, using the Caterpillar Electronic Technician service tool. The "wiggle test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened. Perform Test Step 3 again. If the problem has NOT been found, and this diagnostic code is still active, the ECM may have failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I05422904

MID 039 - CID 0374 - FMI 05

SMCS - 5059-038-ZWB; 5479-038-ZWB

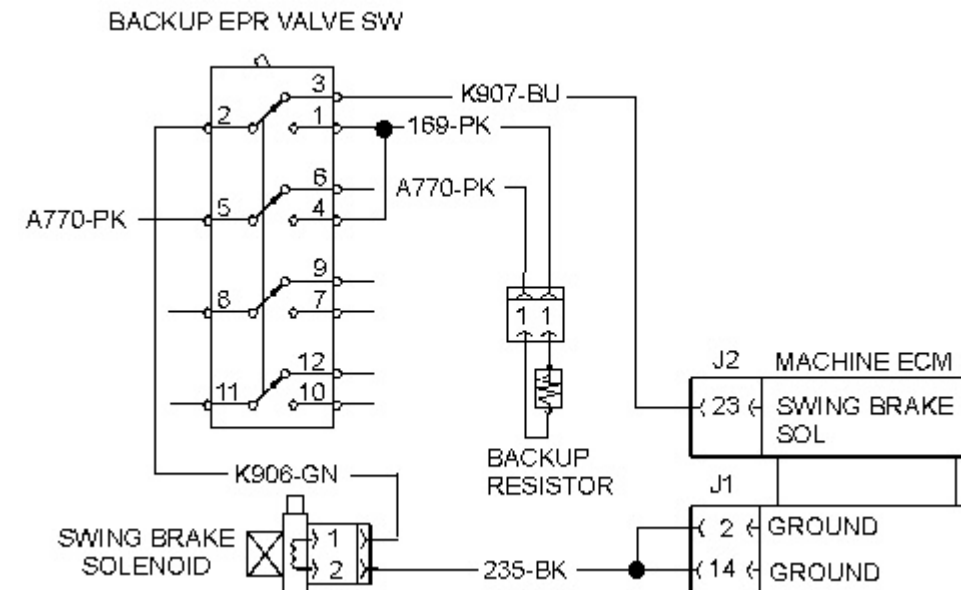
Conditions Which Generate This Code:


Illustration 1

g02166735

Schematic of the Swing Brake solenoid for sales models 311D, 312D, 314D, 315D, and 319D.

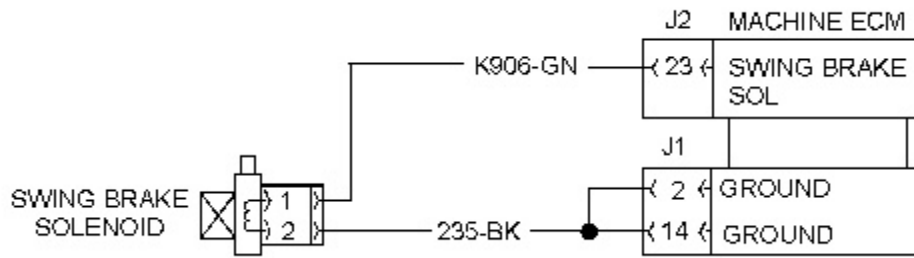


Illustration 2

g03422237

Schematic of the Swing Brake solenoid for machine models 312D2, 313D2, and 318D2.

This diagnostic code is associated with the Swing Brake solenoid. An FMI 05 diagnostic code means the ECM has determined the current of the solenoid circuit is below normal.

Possible causes of this diagnostic code are:

- The Swing Brake solenoid has failed.
- An open wire in the Swing Brake solenoid circuits.
- The Backup EPR Valve switch has failed, if applicable.
- The Machine ECM may have failed, but this situation is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes now, but clear those codes after the original diagnostic code has been corrected.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all of the harness connectors involved in the circuit. Verify that all of the connections in the circuit are clean, secure, and in good condition. If a problem is found with any of the connections: correct the problem and verify that diagnostic code CID 0374 FMI 05 is still active, before performing the following procedures.

System Response:

Diagnostic code CID 0374 FMI 05 will be logged in the internal memory of the Machine ECM.

Test Step 1. CHECK THE SOLENOID, THE ECM, AND THE CIRCUIT CONNECTIONS IN THE MACHINE HARNESS.

- Turn the disconnect switch and the key start switch to the OFF position.
- The Backup EPR Valve switch is in the OFF position, if applicable.
- Disconnect the machine harness connector from the Swing Brake solenoid.

- D. At the harness connector for the solenoid, place a jumper wire from contact 1 (K906-GN) to contact 2 (235-BK) on the connector.
- E. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- F. Observe the status of the CID 0374 FMI 05 diagnostic code.

Expected Result:

The CID 0374 FMI 05 diagnostic code remains active.

Results:

- **YES** - The CID 0374 FMI 05 diagnostic code remains active. The jumper wire did not change the code. The solenoid is NOT the cause of the problem.

Repair: The machine harness has failed, the Backup EPR Valve switch has failed (if applicable), or the ECM may have failed.

Go to Test Step 2.

- **NO** - The CID 0374 FMI 05 diagnostic code is no longer active, and has been replaced by an active CID 0374 FMI 06 diagnostic code. The ECM has detected a valid diagnostic code.

Repair: The ECM, and the harness connections, are correct. The solenoid has failed. Perform Test Step 1 again, to verify the solenoid failure. Replace the solenoid.

Go to Test Step 5.

Test Step 2. CHECK THE SOLENOID CIRCUITS FOR AN OPEN CONNECTION.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The harness connector remains disconnected from the Swing Brake solenoid.
- C. The jumper wire that was placed into the Swing Brake solenoid harness connector during Test Step 1 remains in place.
- D. The Backup EPR Valve switch is in the OFF position, if applicable.
- E. Disconnect the J1 and the J2 machine harness connectors from the Machine ECM.
- F. At the ECM harness connectors, measure the resistance from contact J2-23 (K907-BU or K906-GN) to contact J1-2 (235-BK).

Note: A Swing Brake solenoid Ground Return is also found at contact J1-14 (235-BK). Always check these parallel ground wires. Make sure to repair or replace any that are found open.

Expected Result:

The resistance is less than 5 ohms.

Results:

- **YES** - The resistance is less than 5 ohms. The machine harness, and the Backup EPR Valve switch, are correct. Go to Test Step 5.
- **NO** - The resistance is NOT less than 5 ohms. There is an open in the harness, or the Backup EPR Valve switch has failed, if applicable. Go to Test Step 3

Test Step 3. CHECK THE MACHINE HARNESS FOR AN OPEN CONNECTION (NOT APPLICABLE FOR MODELS 312D2, 313D2, OR 318D2).

- A. The key start switch and the disconnect switch remain in the OFF position.
- B. Disconnect the machine harness connector from the Backup EPR Valve switch. The harness connector remains disconnected from the Swing Brake solenoid. Remove the jumper wire inserted during Test Step 1.
- C. At the ECM J2 harness connector, measure the resistance from contact J2-23 (K907-BU) to contact 3 (K907-BU) on the Backup EPR Valve switch harness connector.
- D. At the Backup EPR Valve switch harness connector, measure the resistance from contact 2 (K906-GN) to contact 1 (K906-GN) on the Swing Brake solenoid harness connector.
- E. At the Swing Brake solenoid harness connector, measure the resistance from contact 2 (235-BK) to contact 10 (235-BK) on the Backup EPR Valve switch harness connector.
- F. At the Backup EPR Valve switch harness connector, measure the resistance from contact 10 (235-BK) to contact J1-2 (235 -BK) on the ECM J2 harness connector.

Note: A Swing Brake solenoid Ground Return is also found at contact J1-14 (235-BK). Always check these parallel ground wires. Make sure to repair or replace any that are found open.

Expected Result:

Each measurement is less than 5 ohms.

Results:

- **YES** - Each measurement is less than 5 ohms. The machine harness connections are correct. The Backup EPR Valve switch may have failed. Go to Test Step 4.
- **NO** - Each measurement is NOT less than 5 ohms. There is an open circuit in the harness connections for the solenoid circuit. The open is on the connection with the high resistance measurement.

Repair: Repair, or replace, the harness.

Go to Test Step 5.

Test Step 4. CHECK FOR A FAILURE IN THE SWITCH .

Table 1

Switch Position	Contacts	Results
OFF	2 to 3	Less than 5 ohms
ON	2 to 3	More than 5000 ohms

- A. The starter key switch and the disconnect switch remain in the OFF position.
- B. Disconnect the Backup EPR Valve switch from the panel.
- C. The Backup EPR Valve switch is in the OFF position.
- D. Measure the resistance between contact 2 and contact 3 of the switch.
- E. Place the Backup EPR Valve switch in the ON position.
- F. Again measure the resistance between contact 2 and contact 3 of the switch.

Expected Result:

Each measurement agrees with Table 1.

Results:

- **YES** - Each measurement agrees with Table 1. The switch is correct. Go to Test Step 5.
- **NO** - Each measurement does NOT agree with Table 1. The switch has failed.

Repair: Replace the switch.

Go to Test Step 5.

Test Step 5. CHECK IF THE DIAGNOSTIC CODE IS STILL ACTIVE.

- A. Remove any jumper wires still inserted.
- B. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened securely.
- C. The Backup EPR Valve switch is in the OFF position.
- D. Turn the disconnect switch and the key start switch to the ON position.
- E. Clear all inactive diagnostic codes.
- F. Operate the machine.
- G. Check the status of the CID 0374 FMI 05 diagnostic code.

Expected Result:

The CID 0374 FMI 05 diagnostic code is NOT active.

Results:

- **YES** - The CID 0374 FMI 05 diagnostic code is not active. The code does not exist at this time.

Repair: The cause for the diagnostic code appears to have been corrected. Return the machine back to normal operations.

STOP

- **NO** - The CID 0374 FMI 05 diagnostic code is still active. The problem has NOT been corrected.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the solenoid circuit. Perform a "wiggle test" on the solenoid circuit of the machine wiring harness, using the Caterpillar Electronic Technician service tool. The "wiggle test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened. Perform Test Step 6 again. If the problem has NOT been found, and this diagnostic code is still active, the ECM may have failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:30:46 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)



Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I05422914

MID 039 - CID 0374 - FMI 06

SMCS - 5059-038-ZWB; 5479-038-ZWB

Conditions Which Generate This Code:

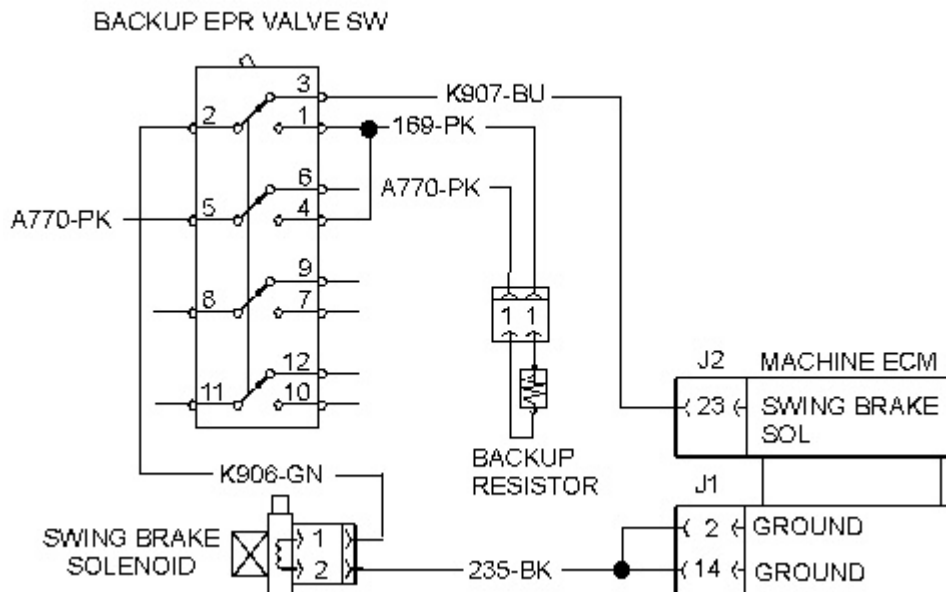


Illustration 1

g02166735

Schematic of the Swing Brake solenoid for sales models 311D, 312D, 314D, 315D, and 319D.

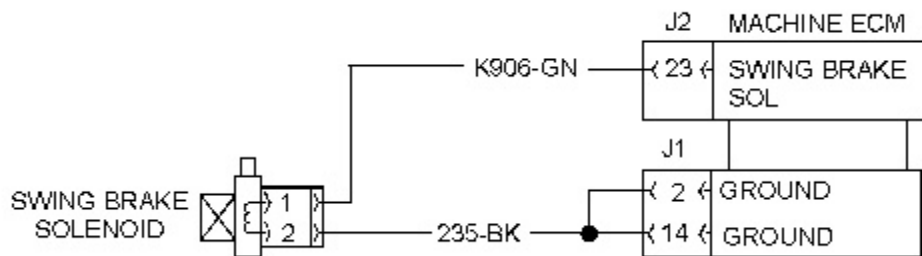


Illustration 2

g03422237

Schematic of the Swing Brake solenoid for models 312D2, 313D2, and 318D2.

This diagnostic code is associated with the Swing Brake solenoid. An FMI 06 diagnostic code means the ECM has determined the current of the solenoid circuit is above normal.

Possible causes for this diagnostic code are:

- The Swing Brake solenoid has failed.
- The Swing Brake solenoid energize circuit is shorted to ground.
- The Machine ECM may have failed. A failure of the Machine ECM is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes now, but clear those codes after the original diagnostic code has been corrected.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all of the harness connectors involved in the circuit. Verify that all of the connections in the circuit are clean, secure, and in good condition. If a problem is found with any of the connections: correct the problem, and verify that diagnostic code CID 0374 FMI 06 is still active, before performing the following procedures.

System Response:

Diagnostic code CID 0374 FMI 06 will be logged in the internal memory of the Machine ECM.

Test Step 1. CHECK THE SOLENOID, THE ECM, AND THE CIRCUIT CONNECTIONS IN THE MACHINE HARNESS.

- A. Turn the disconnect switch and the key start switch to the OFF position.
- B. The Backup EPR Valve switch is in the OFF position, if applicable.
- C. Disconnect the machine harness connector from the Swing Brake solenoid.
- D. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- E. Observe the status of the CID 0374 FMI 06 diagnostic code.

Expected Result:

The CID 0374 FMI 06 diagnostic code remains active.

Results:

- **YES** - The CID 0374 FMI 06 diagnostic code remains active. Disconnecting the solenoid did not change the code. The solenoid is NOT the cause of the problem.

Repair: The machine harness has failed, or the ECM may have failed.

Go to Test Step 2.

- **NO** - The CID 0374 FMI 06 diagnostic code is no longer active, and has been replaced by an active CID 0374 FMI 05 diagnostic code. The ECM has detected a valid diagnostic code.

Repair: The ECM, and the harness connections, are correct. The solenoid has failed. Perform Test Step 1 again, to verify the solenoid failure. Replace the solenoid.

Go to Test Step 3

Test Step 2. CHECK THE ENERGIZE CIRCUIT OF THE SOLENOID FOR A SHORT TO GROUND.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The harness connector remains disconnected from the Swing Brake solenoid.
- C. The Backup EPR Valve switch is in the OFF position, if applicable.
- D. Disconnect the J1 and the J2 machine harness connectors from the Machine ECM.
- E. At the ECM J2 harness connector, measure the resistance from contact J2-23 (K907-BU of K906-GN) to all of the other contacts of the ECM harness connectors.

Expected Result:

Each resistance is more than 5000 ohms.

Results:

- **YES** - Each resistance is more than 5000 ohms. The harness is correct. Go to Test Step 3.
- **NO** - Each resistance is NOT more than 5000 ohms. There is a short in the harness. The short is between J2-23 (K907-BU or K906-GN) and the circuit with the low resistance measurement.

Repair: Repair, or replace, the harness.

Go to Test Step 3.

Test Step 3. CHECK IF THE DIAGNOSTIC CODE IS STILL ACTIVE.

- A. Remove any jumper wires still inserted.

- B. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened securely.
- C. The Backup EPR Valve switch is in the OFF position, if applicable.
- D. Turn the disconnect switch and the key start switch to the ON position.
- E. Clear all inactive diagnostic codes.
- F. Operate the machine.
- G. Check the status of the CID 0374 FMI 06 diagnostic code.

Expected Result:

The CID 0374 FMI 06 diagnostic code is not active.

Results:

- **YES** - The CID 0374 FMI 06 diagnostic code is not active. The code does not exist at this time.

Repair: The cause for the diagnostic code appears to have been corrected. Return the machine back to normal operations.

STOP

- **NO** - The CID 0374 FMI 06 diagnostic code is still active. The problem has NOT been corrected.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the solenoid circuit. Perform a "wiggle test" on the solenoid circuit of the machine wiring harness, using the Cat[®] Electronic Technician service tool. The "wiggle test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened. Perform Test Step 3 again. If the problem has NOT been found, and the original code is still active, the ECM may have failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I05264022

MID 039 - CID 0544 - FMI 08

SMCS - 1359-038; 1439-038-FM

Conditions Which Generate This Code:

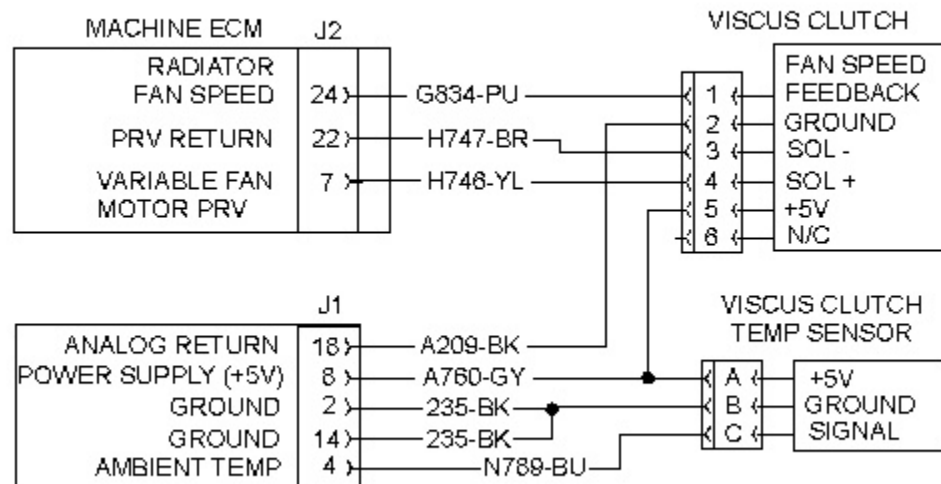
(Engine Cooling Fan Speed Sensor - Abnormal Frequency, Pulse Width, or Period)

Illustration 1

g02025271

Radiator Fan Speed sensor circuit schematic

This diagnostic code is recorded when the ECM receives intermittent signals from the engine cooling fan speed sensor (CID 0544) while the engine is running. An FMI 08 diagnostic code indicates the machine ECM has determined the sensor output signal voltage has an abnormal frequency, pulse width, or period.

This Hall-effect type fan speed sensor is mounted near the center of the viscous fan drive clutch. The fan speed sensor is not separately serviceable from the fan drive clutch assembly.

The ECM fan speed map uses actual fan speed, coolant temperature, and engine rpm inputs to determine the targeted fan speed. For more information, refer to Special Instruction, REHS4721, "Operation, Troubleshooting and Testing of the Viscous Coupling".

Possible causes for this active diagnostic code are:

- Sensor output wire is open
- Sensor output wire is short to +battery
- Sensor output wire is short to ground
- Failed sensor
- Failed viscous clutch
- Failed machine ECM (most unlikely)

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes now, but clear those codes after the original diagnostic code has been corrected.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all of the harness connectors involved in the circuit. Verify that all of the connections in the circuit are clean, secure, and in good condition. If a problem is found with any of the connections: correct the problem and verify that the 544-8 diagnostic code is still active, before performing the following procedures.

Note: Check for other related diagnostic codes before performing the following diagnostic code procedure. If a 248-12 diagnostic code for the data link exists, correct the data link problem. Then view the status of the other diagnostic codes and correct the other active codes.

System Response:

If a fan speed signal is not supplied to the machine ECM, the fan will default to maximum fan speed.

Test Step 1. CHECK THE SENSOR OUTPUT FOR AN OPEN CIRCUIT

- A. Turn the key start switch and the disconnect switch to the OFF position.

Note: The engine cooling fan speed sensor circuit wires are routed through the viscous fan drive clutch harness connector.

- B. Disconnect the machine harness connector from the Viscous Clutch.

- C. In the harness connector for the Viscus Clutch, place a jumper wire between the contact for terminal 1 (wire G834-PU) and the contact for terminal 2 (wire A209-BK) in the Viscus Clutch harness connector.
- D. Disconnect both the J1 and J2 harness connector from the machine ECM.
- E. At the ECM harness connectors, measure resistance between contact J1-18 (wire A209-BK) and contact J2-24 (wire G834-PU) in the ECM harness connectors.

Expected Result:

The resistance is less than 5 ohms.

Results:

- **YES** - The resistance is less than 5 ohms. Go to Test Step 2.
- **NO** - The resistance is not less than 5 ohms. There is an open circuit in the harness.

Repair: Repair or replace the machine harness.

Go to Test Step 3.

Test Step 2. CHECK THE SENSOR OUTPUT FOR A SHORT CIRCUIT

- A. The disconnect switch and the key start switch remain in the OFF position.
- B. The Viscus Clutch, and both ECM harness connectors, remain disconnected.
- C. Remove the jumper wire from the Viscus Clutch harness connector.
- D. At the J2 ECM harness connector, measure resistance from contact J2-24 (wire G834-PU) to all the other contacts used in both the J1 and J2 ECM harness connectors.

Expected Result:

All measurements are more than 5000 ohms.

Results:

- **YES** - All measurements are more than 5000 ohms. Go to Test Step 3.
- **NO** - All measurements are not more than 5000 ohms. There is a short circuit in the harness.

Repair: Repair or replace the machine harness.

Go to Test Step 3.

Test Step 3. CHECK IF THE DIAGNOSTIC CODE IS STILL ACTIVE.

- A. Reconnect all disconnected machine harness connectors. Make sure that all the connectors are fully seated. Observe that the clips for each connector are securely fastened.

- B. Turn the key start switch and the disconnect switch to the ON position.
- C. Clear all inactive diagnostic codes.
- D. Operate the machine.
- E. Check the status of the 544-8 diagnostic code.

Expected Result:

The 544-8 diagnostic code is not active.

Results:

- **YES** - The 544-8 diagnostic code is no longer active and does not exist at this time.

Repair: The cause for the diagnostic code has been corrected. Return the machine back to normal operations.

STOP

- **NO** - The 544-8 diagnostic code is still active. The problem has not been corrected. The fan speed sensor, viscous clutch, or machine ECM, may have failed.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the sensor circuit. Perform a "wiggle test" on the sensor circuit of the machine wiring harness, using the Caterpillar Electronic Technician service tool. The "wiggle test" can be used to detect open or shorted connections in the machine wiring harness. Refer to Testing and Adjusting, "Electrical Connector - Inspect " in this manual.Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened. Perform Test Step 3 again. If the problem was not found, and the original code is still active, the fan speed sensor, viscous clutch, or machine ECM, may have failed. **Is highly recommended that you replace the Fan Drive Assembly first, and then perform Test Step 3 again.** Refer to Special Instruction, REHS4721, "Operation, Troubleshooting and Testing of the Viscous Coupling". Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP



Service Information System

Shutdown SIS

Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I04165709

MID 039 - CID 0581 - FMI 03

SMCS - 5479-038-QY

Conditions Which Generate This Code:

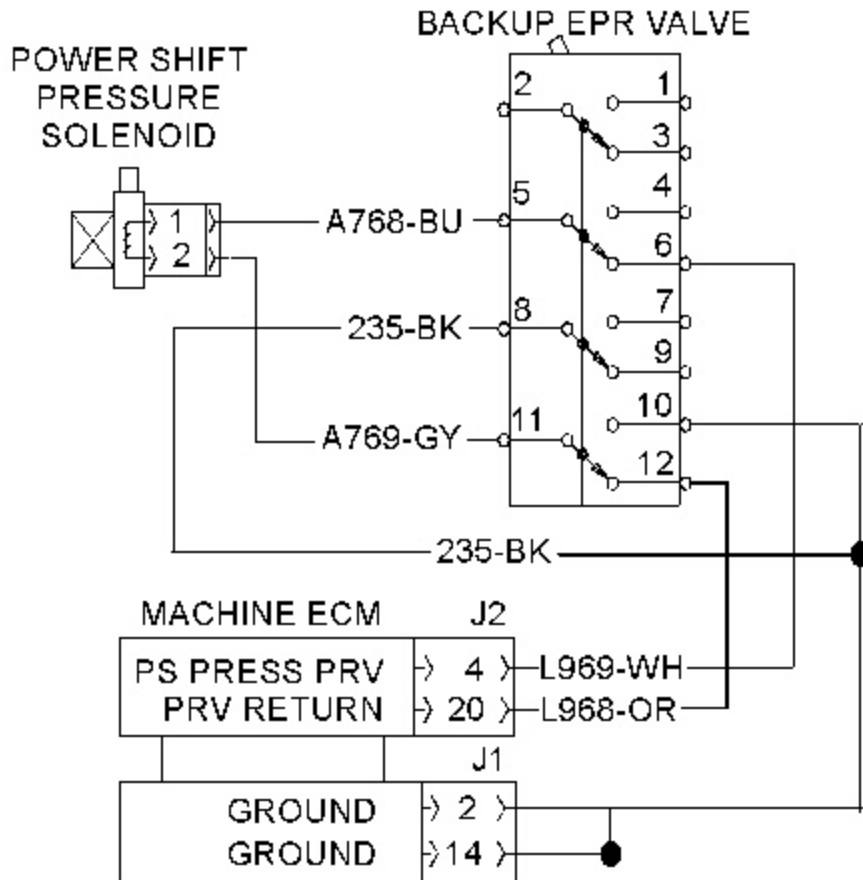


Illustration 1

g02357696

Power Shift Pressuresolenoid circuit schematic

This diagnostic code is for the Power Shift Pressure solenoid. An FMI 03 diagnostic code indicates the machine ECM has determined the solenoid circuit voltage is above the normal limit.

Possible causes for this diagnostic code are:

- The solenoid energize circuit is shorted to +battery.
- The machine ECM has failed, but is most unlikely.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all the machine harnesses and connectors involved in the circuit. Make sure to verify that all of the connections in the circuit are clean, secure, and in good condition. Correct any problems found with any of the connections. Verify the diagnostic code CID 0581 FMI 03 is still active, before continuing with this procedure.

Note: The following test procedure may create other diagnostic codes. Ignore all the created diagnostic codes now, but clear all those codes after the cause for the original diagnostic code has been corrected.

Test Step 1. CHECK THE SIGNAL CIRCUIT FOR A SHORT.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness from the Power Shift Pressure solenoid.
- C. Disconnect both the J1 and J2 harness connectors from the machine ECM.
- D. At J2 ECM harness connector, measure resistance from contact J2-4 (wire L969-WH) to all the other contacts used in both the J1 and J2 ECM Harness connectors.

Expected Result:

Each resistance is greater than 5000 ohms.

Results:

- **YES** - Each resistance is greater than 5000 ohms. Go to Test Step 2.
- **NO** - Each resistance is not greater than 5000 ohms. There is a short circuit in the machine harness.

Repair: Repair or replace the harness.

Go to Test Step 2.

Test Step 2. CHECK THE DIAGNOSTIC CODE STATUS.

- A. Reconnect all disconnected machine harness connectors. Make sure that all the connectors are fully seated. Observe that the clips for each connector are securely fastened.
- B. Turn the key start switch and the disconnect switch to the ON position.
- C. Clear all inactive diagnostic codes.
- D. Operate the machine.
- E. Check the status of the CID 0581 FMI 03 diagnostic code.

Expected Result:

The CID 0581 FMI 03 diagnostic code is not active.

Results:

- **YES** - The CID 0581 FMI 03 diagnostic code is no longer active and does not exist at this time.

Repair: The cause for the diagnostic code has been corrected. Return the machine back to normal operations.

STOP

- **NO** - The CID 0581 FMI 03 diagnostic code is still active. The problem has not been corrected. The ECM may have failed.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the sensor circuit. Perform a "wiggle test" on the sensor circuit of the machine wiring harness, using the Caterpillar Electronic Technician service tool. The "wiggle test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened. Perform Test Step 2 again. If the problem is not found, and the original code is still active, the machine ECM may have failed. Prior to replacing an ECM, contact your Dealership Technical Communicator for consultation with Caterpillar, or the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:31:54 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)



Service Information System

Shutdown SIS

Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I04161820

MID 039 - CID 0581 - FMI 05

SMCS - 5479-038-QY

Conditions Which Generate This Code:

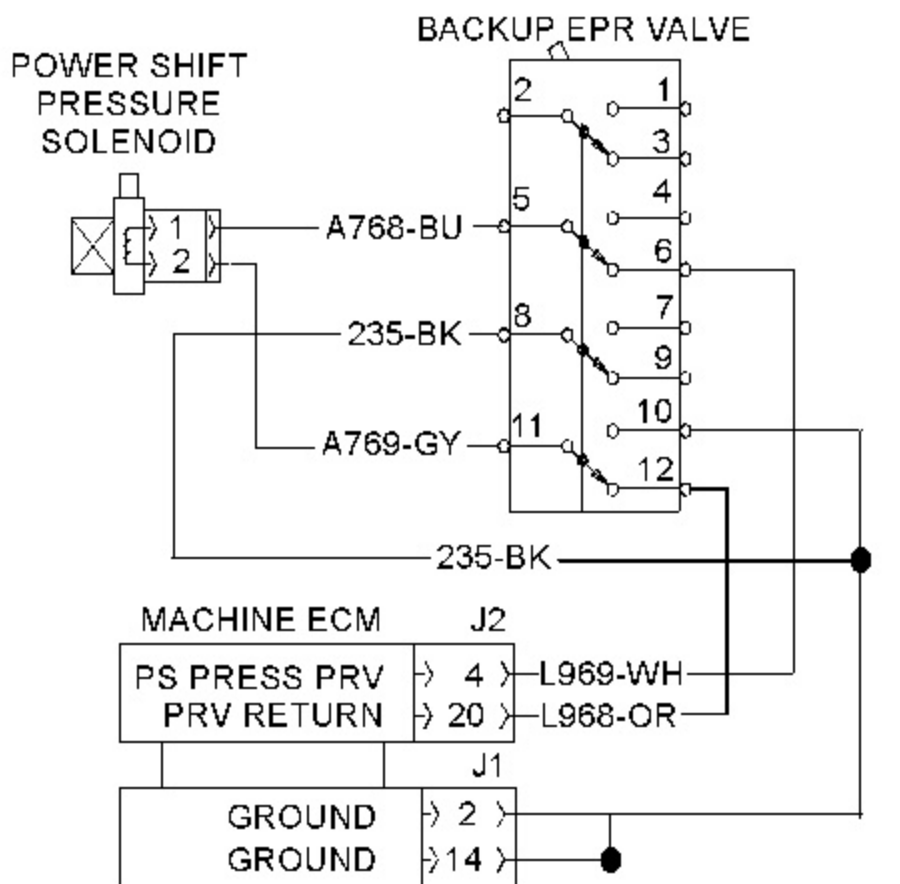


Illustration 1

g02357696

Power Shift Pressure solenoid circuit schematic

This diagnostic code is for the Power Shift Pressure solenoid. An FMI 05 diagnostic code indicates the machine ECM has determined the solenoid circuit current is below normal.

Possible causes for this diagnostic code are:

- The Backup Switch has failed.
- The solenoid has failed.
- There is an open in the solenoid circuit.
- The machine ECM has failed, but is most unlikely.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all the machine harnesses and connectors involved in the circuit. Make sure to verify that all of the connections in the circuit are clean, secure, and in good condition. Correct any problems found with any of the connections. Verify the diagnostic code CID 0581 FMI 05 is still active, before continuing with this procedure.

Note: The following test procedure may create other diagnostic codes. Ignore all the created diagnostic codes now, but clear all those codes after the cause for the original diagnostic code has been corrected.

Test Step 1. CHECK THE SWITCH.

Table 1

Switch State	Switch Contacts	Status
Active	Contacts 5 & 6 and 11 & 12	Closed
Active	Contacts 5 & 4 and 11 & 10	Open
Inactive	Contacts 5 & 6 and 11 & 12	Open
Inactive	Contacts 5 & 4 and 11 & 10	Closed

- A. Turn the starter keyswitch and the disconnect switch to the OFF position.
- B. Disconnect the Backup Switch from the panel.
- C. Toggle the switch from one state to the other. On each of the switch two states, check for continuity on the switch pins listed on Table 1.

Expected Result:

Both states of the switch continuity agree with table 1.

Results:

- **YES** - The switch continuity is correct. Go to Test Step 2.
- **NO** - The switch continuity is not correct. The Backup Switch has failed.

Repair: Replace the switch.

Go to Test Step 4.

Test Step 2. CHECK THE SOLENOID.

- A. The disconnect switch and the starter keyswitch remain in the the OFF position.
- B. Reconnect the backup switch.
- C. Disconnect the machine harness from the Power Shift Pressure solenoid.
- D. In the machine harness connector for the solenoid, place a jumper wire from the contact for terminal 1 (wire A768-BU) to the contact for terminal 2 (wire A769-GY) in the solenoid harness connector.
- E. Turn the starter keyswitch and the disconnect switch to the ON position.
- F. Observe the status of the CID 0581 FMI 05diagnostic code.

Expected Result:

The CID 0581 FMI 05 diagnostic code is active.

Results:

- **YES** - The diagnostic code is active. The solenoid is not the problem. Go to Test Step 3.
- **NO** - The CID 0581 FMI 05 diagnostic code is not active and has been replaced by an active CID 0581 FMI 05 diagnostic code. The solenoid has failed.

Repair: Replace the solenoid.

Go to Test Step 4.

Test Step 3. CHECK THE SOLENOID CIRCUIT FOR AN OPEN.

- A. Turn the starter keyswitch and the disconnect switch to the OFF position.
- B. The harness connector remains disconnected from the solenoid.
- C. The jumper wire remains in the solenoid harness connector.
- D. Disconnect the J2 harness connectors from the machine ECM.
- E. At the J2 harness connector, measure resistance from contact J2-4 (wire L969-WH) to J2-20 (wire L968-OR) in the J2 ECM harness connector.

Expected Result:

The resistance is less than 5 ohms.

Results:

- **YES** - The resistance is less than 5 ohms. Go to Test Step 4.
- **NO** - The resistance is more than 5 ohms. There is an open circuit in the machine harness.

Repair: Repair or replace the harness.

Go to Test Step 4.

Test Step 4. CHECK THE DIAGNOSTIC CODE STATUS.

- A. Reconnect all disconnected machine harness connectors. Make sure that all the connectors are fully seated. Observe that the clips for each connector are securely fastened.
- B. Turn the key start switch and the disconnect switch to the ON position.
- C. Clear all inactive diagnostic codes.
- D. Operate the machine.

E. Check the status of the CID 0581 FMI 05 diagnostic code.

Expected Result:

The CID 0581 FMI 05 diagnostic code is not active.

Results:

- **YES** - The CID 0581 FMI 05 diagnostic code is no longer active and does not exist at this time.

Repair: The cause for the diagnostic code has been corrected. Return the machine back to normal operations.

STOP

- **NO** - The CID 0581 FMI 05 diagnostic code is still active. The problem has not been corrected. The ECM may have failed.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the sensor circuit. Perform a "wiggle test" on the sensor circuit of the machine wiring harness, using the Caterpillar Electronic Technician service tool. The "wiggle test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened. Perform Test Step 4 again. If the problem is not found, and the original code is still active, the machine ECM may have failed. Prior to replacing an ECM, contact your Dealership Technical Communicator for consultation with Caterpillar, or the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP



Service Information System

Shutdown SIS

Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I04161821

MID 039 - CID 0581 - FMI 06

SMCS - 5479-038-QY

Conditions Which Generate This Code:

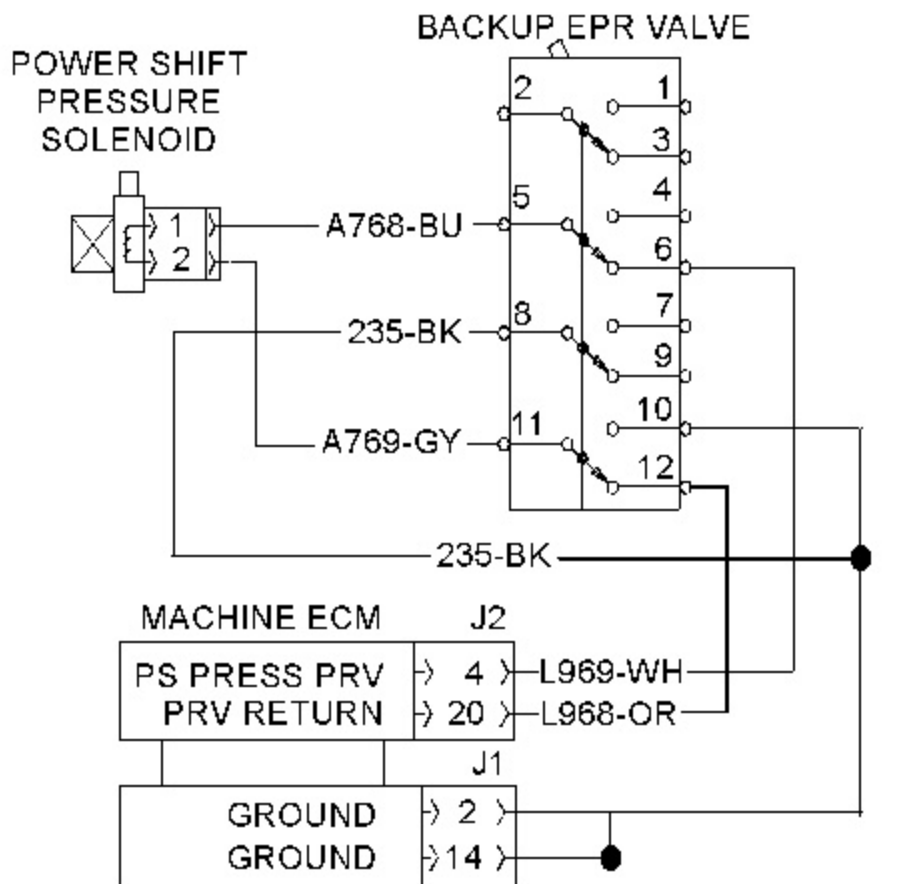


Illustration 1

g02357696

Power Shift Pressure solenoid circuit schematic

This diagnostic code is for the Power Shift Pressure solenoid. An FMI 06 indicates the machine ECM has determined that the solenoid circuit current is above normal.

Possible causes for this diagnostic code are:

- The solenoid has failed.
- The solenoid energize circuit is shorted to ground.
- The ECM may have failed, but is unlikely.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all the machine harnesses and connectors involved in the circuit. Make sure to verify that all of the connections in the circuit are clean, secure, and in good condition. Correct any problems found with any of the connections. Verify the diagnostic code CID 0581 FMI 06 is still active, before continuing with this procedure.

Note: The following test procedure may create other diagnostic codes. Ignore all the created diagnostic codes now, but clear all those codes after the cause for the original diagnostic code has been corrected.

Test Step 1. CHECK THE SWITCH.

Table 1

Switch State	Switch Contacts	Status
Active	Contacts 5 & 6 and 11 & 12	Closed
Active	Contacts 5 & 4 and 11 & 10	Open
Inactive	Contacts 5 & 6 and 11 & 12	Open
Inactive	Contacts 5 & 4 and 11 & 10	Closed

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the Backup Switch from the panel.
- C. Toggle the switch from one state to the other. On each of the switch two states, check for continuity on the switch pins listed on Table 1.

Expected Result:

The switch continuity agrees with table 1.

Results:

- **YES** - The switch continuity is correct. Go to Test Step 2.
- **NO** - The switch continuity is not correct. The Backup Switch has failed.

Repair: Replace the switch.

Go to Test Step 4.

Test Step 2. CHECK THE SOLENOID.

- A. The disconnect switch and the starter keyswitch remain in the OFF position.
- B. Reconnect the backup switch.
- C. Disconnect the machine harness from the Power Shift Pressure solenoid.
- D. Turn the disconnect switch and the key start switch to the ON position.
- E. Observe the status of the diagnostic code.

Expected Result:

The CID 0581 FMI 06 diagnostic code is active.

Results:

- **YES** - The diagnostic code is still active. The solenoid is not causing the problem. Go to Test Step 3.
- **NO** - The CID 0581 FMI 06 diagnostic code is not active and has been replaced by an active CID 0581 FMI 05 diagnostic code. The solenoid has failed.

Repair: Replace the solenoid.

Go to Test Step 4.

Test Step 3. CHECK THE SOLENOID CIRCUIT FOR A SHORT TO GROUND.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The harness connector remains disconnected from the solenoid.
- C. Disconnect both the J1 and J2 harness connector from the machine ECM.
- D. At the J2 machine harness connector, measure for resistance from contact J2-4 (wire L969-WH) to all possible sources of ground in both the J1 and J2 ECM harness connectors.

Expected Result:

Each resistance measurement is more than 5000 ohms.

Results:

- **YES** - Each resistance measurement is more than 5000 ohms. Go to Test Step 4.
- **NO** - Each resistance measurement is not more than 5000 ohms. There is a short circuit in the machine harness.

Repair: Repair or replace the harness.

Go to Test Step 4.

Test Step 4. CHECK THE DIAGNOSTIC CODE STATUS.

- A. Reconnect all disconnected machine harness connectors. Make sure that all the connectors are fully seated. Observe that the clips for each connector are securely fastened.
- B. Turn the key start switch and the disconnect switch to the ON position.
- C. Clear all inactive diagnostic codes.
- D. Operate the machine.
- E. Check the status of the CID 0581 FMI 06 diagnostic code.

Expected Result:

The CID 0581 FMI 06 diagnostic code is not active.

Results:

- **YES** - The CID 0581 FMI 06 diagnostic code is no longer active and does not exist at this time.

Repair: The cause for the diagnostic code has been corrected. Return the machine back to normal operations.

STOP

- **NO** - The CID 0581 FMI 06 diagnostic code is still active. The problem has not been corrected. The ECM may have failed.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the sensor circuit. Perform a "wobble test" on the sensor circuit of the machine wiring harness, using the Caterpillar Electronic Technician service tool. The "wobble test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened. Perform Test Step 4 again. If the problem was again not found, and the original code is still active, the machine ECM may have failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP



Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

105428865

MID 039 - CID 0586 - FMI 05

SMCS - 7332-038

Conditions Which Generate This Code:

THROTTLE POSITION SWITCH

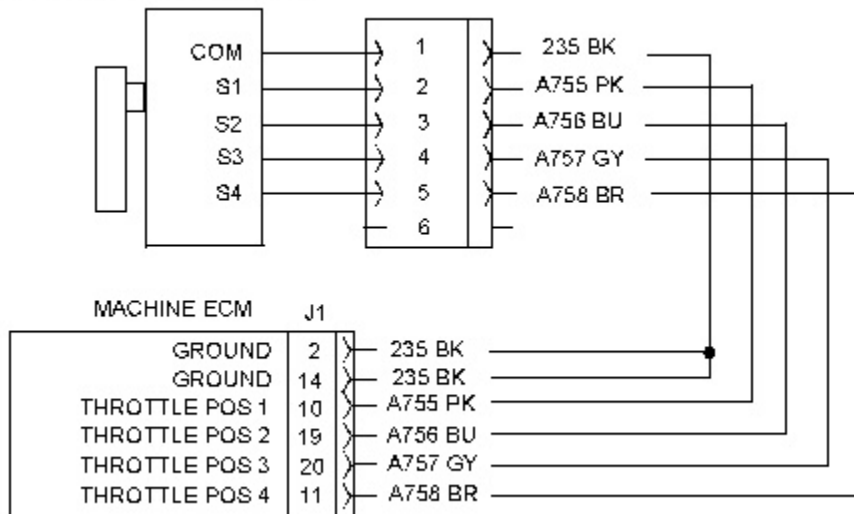


Illustration 1

g03426166

Schematic of the "Engine Speed Dial" switch

This diagnostic code is associated with the "engine speed dial" switch. The FMI 05 diagnostic code means that the ECM has determined that the current of the switch is below normal.

The possible causes of this diagnostic code are listed below:

- The circuit of the switch is open.
- The switch has failed.
- The ECM has failed, but is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 0586 FMI 05 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

Test Step 1. CHECK THE SWITCH.

- A. Turn the disconnect switch and the key start switch to the OFF position. Do not start the engine.
- B. Disconnect the "engine speed dial" switch from the machine harness.
- C. Use the following table for the position of the rotary dial and check the corresponding resistance for the switch.

Table 1

Rotary Dial Position	Check the Resistance Between the Following Contacts on the Switch.
1	Contact (1) to Contact (2)
3	Contact (1) to Contact (3)
7	Contact (1) to Contact (4)
10	Contact (1) to Contact (5)

Expected Result:

The resistance is less than 5 ohms.

Results:

- **OK** - The resistance is less than 5 ohms. The switch is correct. Proceed to Test Step 2.
- **NOT OK** - The resistance is greater than 5 ohms. The resistance measurement is not correct. There is an open circuit in the switch.

Repair: Replace the switch.

STOP

Test Step 2. CHECK THE HARNESS FOR AN OPEN.

- Turn the key start switch and the disconnect switch to the OFF position.
- Disconnect the machine harness connectors from the ECM.
- Use the following table for the placement of a jumper wire to the connector for the switch. Check the corresponding resistance for the contacts of the machine harness connectors.

Table 2

Jumper Location on the Connector for the Switch	Connections on the Machine Harness
Contact (1) to Contact (2)	Contact J1-10 (wire A755-PK) and contact J1-2 or J1-14 (wire 235-BK) of the machine harness.
Contact (1) to Contact (3)	Contact J1-19 (wire A756-BU) and contact J1-2 or J1-14 (wire 235-BK) of the machine harness.
Contact (1) to Contact (4)	Contact J1-20 (wire A757-GY) and contact J1-2 or J1-14 (wire 235-BK) of the machine harness.
Contact (1) to Contact (5)	Contact J1-11 (wire A758-BR) and contact J1-2 or J1-14 (wire 235-BK) of the machine harness.

Expected Result:

The resistance is less than 5 ohms.

Results:

- **OK** - The resistance is less than 5 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - The resistance is greater than 5 ohms. The resistance measurement is not correct. There is an open circuit in the machine harness.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS.

- A. Inspect the contacts of the harness connectors. Clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 0586 FMI 05 diagnostic code.

Expected Result:

The CID 0586 FMI 05 diagnostic code is active.

Results:

- **YES** - The CID 0586 FMI 05 diagnostic code is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: A failure of the Machine ECM is unlikely. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 0586 FMI 05 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

105428871

MID 039 - CID 0586 - FMI 12

SMCS - 7332-038

Conditions Which Generate This Code:

THROTTLE POSITION SWITCH

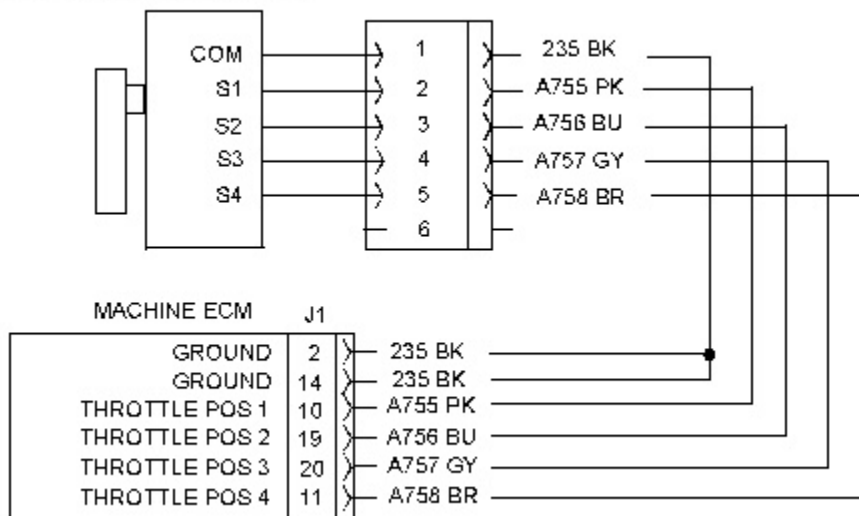


Illustration 1

g03426166

Schematic of the Engine Speed Dial switch

This diagnostic code is recorded when the ECM cannot communicate with the Engine Speed Dial switch.

Possible causes of this diagnostic code are:

- The switch has failed.
- The machine harness has failed.
- The Machine ECM may have failed, but this situation is unlikely.

Test Step 1. CHECK THE SWITCH.

- A. Turn the disconnect switch and the key start switch to the OFF position.
- B. Disconnect the Engine Speed Dial switch from the machine harness.
- C. Use Table 1 to check resistance on the rotary switch for each position listed on the table.

Table 1

Rotary Dial Position	Check the Resistance Between the Following Contacts on the Switch.
1	Contact (1) to Contact (2)
3	Contact (1) to Contact (3)
7	Contact (1) to Contact (4)
10	Contact (1) to Contact (5)

Expected Result:

Each resistance measurement is less than 5 ohms.

Results:

- **OK** - Each resistance measurement is less than 5 ohms. The switch is correct. Proceed to Test Step 3.
- **NOT OK** - A resistance measurement is greater than 5 ohms. The resistance measurement is not correct. There is an open circuit in the switch.

Repair: Replace the switch.

STOP

Test Step 2. INSPECT THE HARNESS CONNECTIONS.

- A. The disconnect switch and the key start switch remain in the OFF position.
- B. Inspect the harness connections. Make sure that the connectors are clean and that the connectors are tight.

- C. Check the mating of the harness connectors.
- D. Check wires at the connector.
- E. Check each wire for nicks or signs of abrasion in the insulation.
- F. Check for moisture at the connector.
- G. Check for dirty contacts or corroded contacts.
- H. Check each pin and each socket.

Expected Result:

The machine harness connectors are tight and free of corrosion.

Results:

- **OK** - The machine harness connectors are tight and free of corrosion. Proceed to Test Step 4.
- **NOT OK** - The machine harness connectors are NOT tight or NOT free of corrosion.

Repair: Repair or replace the machine harness.

STOP**Test Step 3. CHECK THE HARNESS FOR AN OPEN CIRCUIT.**

- A. The disconnect switch and the key start switch remain in the OFF position.
- B. Disconnect the J1 and J2 machine harness connectors from the Machine ECM.
- C. Use the following table for the placement of a jumper wire to the connector for the switch. Check the corresponding resistance for the contacts of the machine harness connectors.

Table 2

Jumper Location on the Connector for the Switch	Connectors on the Machine Harness
Contact (1) to Contact (2)	Contact J1-10 (wire A755-PK) and contact J1-2 or J1-14 (wire 235-BK) of the machine harness.
Contact (1) to Contact (3)	Contact J1-19 (wire A756-BU) and contact J1-2 or J1-14 (wire 235-BK) of the machine harness.
Contact (1) to Contact (4)	Contact J1-20 (wire A757-GY) and contact J1-2 or J1-14 (wire 235-BK) of the machine harness.

Contact (1) to Contact (5)	Contact J1-11 (wire A758-BR) and contact J1-2 or J1-14 (wire 235-BK) of the machine harness.
----------------------------------	---

Expected Result:

The resistance measurements are all less than 5 ohms.

Results:

- **OK** - The resistance measurements are all less than 5 ohms. The machine harness is correct. Proceed to Test Step 4.
- **NOT OK** - A resistance measurement is greater than 5 ohms. The resistance measurement is not correct. There is an open circuit in the machine harness.

Repair: Repair, or replace, the machine harness.

STOP**Test Step 4. CHECK FOR A SHORT TO GROUND**

- A. The disconnect switch and the key start switch remain in the OFF position.
- B. The ECM and the Engine Speed Dial switch remain disconnected from the machine harness.
- C. At the machine harness connector for the ECM, measure the resistance between frame ground and the following connector contacts: J1-10 (wire A755-PK), J1-19 (wire A756-BU), J1-20 (wire A757-GY) and J1-11 (wire A758-BR).

Expected Result:

The resistance measurements are all greater than 5000 ohms.

Results:

- **OK** - The resistance measurements are all greater than 5000 ohms. The resistance of the circuits is correct. Proceed to Test Step 5.
- **NOT OK** - A resistance measurement is less than 5000 ohms. The resistance of the circuit is not correct.

Repair: There is a short between the frame ground and the circuits that measured less than 5000 ohms in the machine harness. Replace, or repair, the machine harness.

STOP**Test Step 5. CHECK IF THE DIAGNOSTIC CODE REMAINS**

- A. Inspect the contacts of the harness connectors. Clean the contacts.
- B. Reconnect all harness connectors.

- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Clear all of the inactive diagnostic codes.
- E. Operate the machine.
- F. Check for an active diagnostic code of CID 0586 FMI 12.

Expected Result:

The diagnostic code of CID 0586 FMI 12 is not active.

Results:

- **OK** - The diagnostic code of CID 0586 FMI 12 is not active. The code does not exist at this time.

Repair: The cause for the diagnostic code appears to have been corrected. Return the machine back to normal machine operations.

STOP

- **NO** - The CID 0586 FMI 12 diagnostic code is still active. The problem has NOT been corrected.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the solenoid circuit. Perform a "wobble test" on the solenoid circuit of the machine wiring harness, using the Cat[®] Electronic Technician service tool. The "wobble test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened. Perform Test Step 3 again. If the problem has NOT been found, and this diagnostic code is still active, the ECM may have failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP



Service Information System

Shutdown SIS

Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

105428894

MID 039 - CID 0588 - FMI 09

SMCS - 7490-038

Conditions Which Generate This Code:

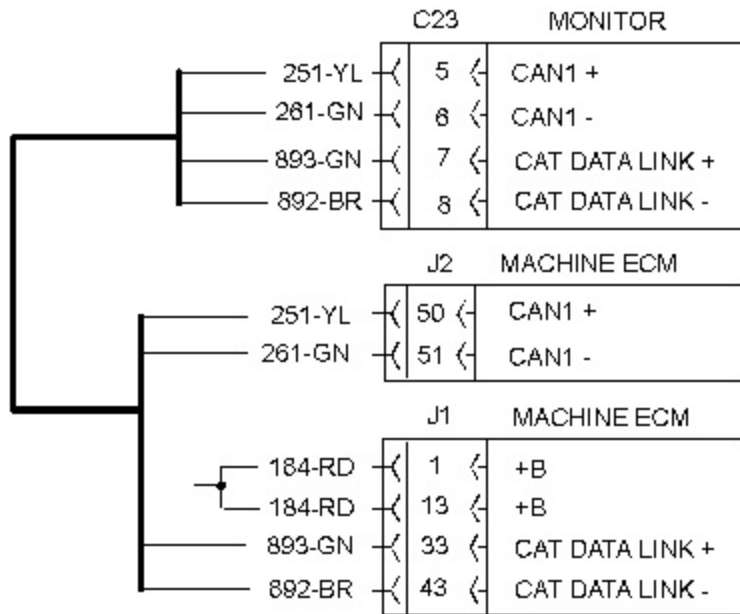


Illustration 1

g03426211

Schematic of the Cat Data Link

This diagnostic code is caused by abnormal communications between the Machine ECM and the Monitor Display module through the Data Link. The update rate is not correct. Check for diagnostic codes that are related to the data link circuits. Check in the "Machine ECM" and in the Monitor Display module. If diagnostic codes are present, correct the related diagnostic codes first.

For machines equipped with the E-Fence feature, reference Troubleshooting, "E-Ceiling and Cab Avoidance - Troubleshoot"

A possible cause of this diagnostic code is that the Machine ECM is operating intermittently.

The Data Link is an input and output of all electronic control modules. The Data Link is designed to carry communications between the electronic control modules. The Data Link is not a visible component. The Data Link consists of internal control circuits and the connecting harness wiring between the components.

System Response:

This failure results in events that are logged against a Machine ECM that cannot be explained directly. The Machine ECM cannot communicate with the Monitor Display module or the Machine ECM appears to communicate intermittently with the Monitor Display module.

Test Step 1. VERIFY THE HARDWARE AND THE SOFTWARE PART NUMBERS.

A. Verify that the following information is correct:

- The part number of the flash software for the Machine ECM.
- The part number of the flash software for the Monitor Display ECM.
- The part number of the Machine ECM.
- The part number of the Monitor Display ECM.

Note: Consult your Caterpillar Dealer for the correct part numbers of the flash software.

Expected Result:

All of the part numbers are correct.

Results:

- **OK** - All of the part numbers are correct. Proceed to Test Step 2.
- **NOT OK** - All of the part numbers are not correct.

Repair: The installed Machine ECM or the Monitor Display ECM have the wrong part number or the incorrect flash software is installed. Replace the incorrect Machine ECM or the Monitor Display ECM with a module that has the correct part number. Flash the correct software. See the Testing and Adjusting, "Electronic Control Module (ECM) - Flash Program" section for additional information.

STOP

Test Step 2. INSPECT THE HARNESS CONNECTIONS.

- A. Turn the disconnect switch to the OFF position.
- B. Inspect all harness connections that are related to the Cat Data Link. Make sure that the connectors are clean and tight.
- C. Check the connectors for proper mating. Ensure that all the seals are present and in place.
- D. Check the harness for signs of damage or abrasion.
- E. Check the wires at the connector. Ensure that the wires are secured tightly into the connector.
Take care not to pull the wire out of the connector.
- F. Check the exposed wires at the connectors for nicks or signs of abrasion.
- G. Check for moisture inside the connector.

- H. Check the connectors for dirty contacts or corroded contacts.
- I. Check each pin and each socket of the machine harness connectors. Ensure that the contacts are properly installed. The contacts should mate correctly when the two pieces of the connector are placed together.

Expected Result:

The machine harness connectors are tight and free of corrosion.

Results:

- **OK** - The machine harness connectors are tight and free of corrosion. Proceed to Test Step 3.
- **NOT OK** - The machine harness connectors are in need of repair.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK FOR SHORTS TO GROUND

- A. The disconnect switch remains in the OFF position.
- B. Disconnect the machine harness connectors from all electronic control modules that use the Cat Data Link.
- C. At the machine harness for the Machine ECM, measure the resistance between frame ground and connector contacts J1-33 (wire 893-GN) and J1-43 (wire 892-BR) of the Cat Data Link circuit.

Expected Result:

The resistance is greater than 5000 ohms.

Results:

- **OK** - The resistance is greater than 5000 ohms. The harness circuit resistance is correct. Proceed to Test Step 4.
- **NOT OK** - The resistance is less than 5000 ohms. The machine harness has failed.

Repair: There is a short between frame ground and contacts J1-33 (wire 893-GN) and J1-43 (wire 892-BR) of the Cat Data Link circuit in the machine harness. Repair the machine harness or replace the machine harness.

STOP

Test Step 4. CHECK FOR SHORT TO THE +BATTERY CIRCUIT

- A. The disconnect switch remains in the OFF position.
- B. All related electronic control modules remain disconnected from the machine harness.

C. At the machine harness connector for the Machine ECM, perform the checks that are listed here:

- Measure the resistance between the connector contact J1-1 (wire 184-RD) and connector contact J1-33 (wire 893-GN).
- Measure the resistance between connector contact J1-1 (wire 184-RD) and connector contact J1-43 (wire 892-BR).

Expected Result:

The resistance is greater than 5000 ohms.

Results:

- **OK** - The harness circuit resistance is correct. Proceed to Test Step 5.
- **NOT OK** - The resistance is less than 5000 ohms. The machine harness has failed.

Repair: There is a short between the +battery circuit and contacts J1-33 (wire 893-GN) and J1-43 (wire 892-BR) of the Cat Data Link circuit in the machine harness. Repair the machine harness or replace the machine harness.

STOP

Test Step 5. CHECK FOR AN OPEN HARNESS

- A. The disconnect switch remains in the OFF position.
- B. All related electronic control modules remain disconnected from the machine harness.
- C. Check the resistance of the Cat[®] Data Link circuit in the machine harness:
- Measure the resistance between connector contact J1-33 (wire 893-GN) of the Machine ECM and connector contact 7 (wire 893-GN) of the Monitor Display ECM.
 - Measure the resistance between connector contact 43 (wire 892-BR) of the Machine ECM and connector contact 8 (wire 892-BR) of the Monitor Display ECM.

Expected Result:

The resistance measures less than 5 ohms.

Results:

- **OK** - The resistance is less than 5 ohms. The Cat Data Link circuit in the machine harness is correct. Proceed to Test Step 6.
- **NOT OK** - The resistance is greater than 5 ohms. The machine harness has failed.

Repair: The Cat Data Link circuit is open in the machine harness. Repair the machine harness or replace the machine harness.

STOP

Test Step 6. CHECK FOR ADDITIONAL DIAGNOSTIC CODES FOR THE OTHER ELECTRONIC CONTROL MODULES.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. One at a time, reconnect the electronic control modules that use the Cat Data Link.
- C. Turn the disconnect switch and the key start switch to the ON position after reconnecting each module.
- D. After each of the electronic control modules has been reconnected, check for diagnostic codes that are logged against that electronic control module.

Make sure to turn the key start switch and the disconnect switch to the OFF position before each control module is reconnected.

Expected Result:

Diagnostic codes are not present for the other electronic control modules.

Results:

- **OK** - Diagnostic codes are not present for the other electronic control modules. The Monitor Display module has failed.

Repair: Is unlikely that the Monitor Display module has failed. Exit this procedure and perform this procedure again. If the failure is not found, replace the Monitor Display module.

STOP

- **NOT OK** - Diagnostic codes are present for the other electronic control modules. The "Machine ECM" has failed.

Repair: A failure of the "Machine ECM" is unlikely. Exit this procedure. Perform this procedure again. If the failure is not found, contact your Dealership Technical Communicator for possible consultation with Caterpillar. If the "Machine ECM" needs to be replaced, reference Testing and Adjusting, "Electronic Control Module (ECM) - Replace" section.

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103755740

MID 039 - CID 0590 - FMI 09

SMCS - 1901-038

Conditions Which Generate This Code:

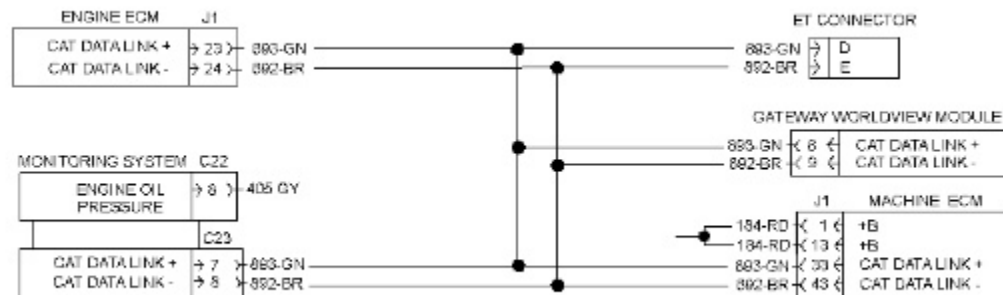


Illustration 1

g02025733

Schematic of the Cat Data Link Circuit

This diagnostic code is recorded when the Machine ECM does not receive expected information from the Engine ECM. The possible causes of this diagnostic code are listed below:

- The wires for the Cat Data Link to the Engine ECM are open or the wires are shorted.
- The wrong software is installed on an ECM.

Test Step 1. VERIFY THE HARDWARE AND THE SOFTWARE PART NUMBERS.

A. Verify that the following information is correct:

- The part number of the flash software for the Engine ECM
- The part number of the flash software for the Machine ECM
- The part number of the Engine ECM
- The part number of the Machine ECM

Note: Consult your Caterpillar Dealer for the correct part numbers of the flash software.

Expected Result:

All of the part numbers are correct.

Results:

- **OK** - All of the part numbers are correct. Proceed to Test Step 2.
- **NOT OK** - All of the part numbers are not correct.

Repair: The installed Engine ECM or the Machine ECM have the wrong part number or the incorrect flash software is installed. Replace the Engine ECM or replace the Machine ECM that is incorrect. Replace the ECM with a module that has the correct part number. Flash the correct software. See Testing and Adjusting, "Electronic Control Module (ECM) - Flash Program" for additional information.

STOP

Test Step 2. INSPECT THE HARNESS CONNECTIONS.

- A. Turn the disconnect switch to the OFF position.
- B. Inspect all harness connections that are related to the Cat Data Link. Make sure that the connectors are clean and tight.
- C. Check the connectors for proper mating. Ensure that all the seals are present and in place.
- D. Check the harness for signs of damage or abrasion.
- E. Check the wires at the connector. Ensure that the wires are secured tightly into the connector.
Take care not to pull the wire out of the connector.
- F. Check the exposed wires at the connectors for nicks or signs of abrasion.
- G. Check for moisture inside the connector.
- H. Check the connectors for dirty contacts or corroded contacts.

- I. Check each pin and each socket of the machine harness connectors. Ensure that the contacts are properly installed. The contacts should mate correctly when the two pieces of the connector are placed together.

Expected Result:

The machine harness connectors are tight and free of corrosion.

Results:

- **OK** - The machine harness connectors are tight and free of corrosion. Proceed to Test Step 3.
- **NOT OK** - The machine harness connectors are in need of repair.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK FOR SHORTS

- A. The disconnect switch remains in the OFF position.
- B. Disconnect the machine harness connectors from all electronic control modules that use the Cat Data Link.
- C. At the machine harness connector for the Machine ECM, measure the resistance between connector contact J1-33 (wire 893-GN) and all of the contacts that are used in the machine harness connector for the ECM. Perform the same measurements for J1-43 (wire 892-BR).

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each of the resistance measurements is greater than 5000 ohms. The harness circuit resistance is correct. Proceed to Test Step 4.
- **NOT OK** - One of the resistance measurements is less than 5000 ohms. The machine harness has failed.

Repair: There is a short between contacts J1-33 (wire 893-GN) or J1-43 (wire 892-BR) of the Cat Data Link and the circuit with the low resistance measurement. Repair the machine harness or replace the machine harness.

STOP

Test Step 4. CHECK FOR OPEN HARNESS

- A. The disconnect switch remains in the OFF position.
- B. All related electronic control modules remain disconnected from the machine harness.

C. Check the resistance of the Cat Data Link circuit in the machine harness:

- Measure the resistance between connector contact J1-23 (wire 893-GN) of the Engine ECM and connector contact J1-33 (wire 893-GN) of the Machine ECM.
- Measure the resistance between connector contact J1-24 (wire 892-BR) of the Engine ECM and connector contact J1-43 (wire 892-BR) of the Machine ECM.

Expected Result:

The resistance measures less than 5 ohms.

Results:

- **OK** - The resistance is less than 5 ohms. The Cat Data Link circuit in the machine harness is correct. Proceed to Test Step 5.
- **NOT OK** - The resistance is greater than 5 ohms. The machine harness has failed.

Repair: The Cat Data Link circuit is open in the machine harness. Repair the machine harness or replace the machine harness.

STOP

Test Step 5. CHECK IF THE DIAGNOSTIC CODE REMAINS

- A. Inspect the contacts of the harness connectors and clean the contacts.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 0590 FMI 09 diagnostic code.

Expected Result:

The CID 0590 FMI 09 diagnostic code is active.

Results:

- **YES** - The CID 0590 FMI 09 diagnostic code is active. The diagnostic code has not been corrected. The Machine ECM may have failed.

Repair: It is unlikely that the Machine ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 0590 FMI 09 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:33:31 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)


[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I03755872

MID 039 - CID 0598 - FMI 03

SMCS - 5051-038-MV; 5479-038-V6

Conditions Which Generate This Code:

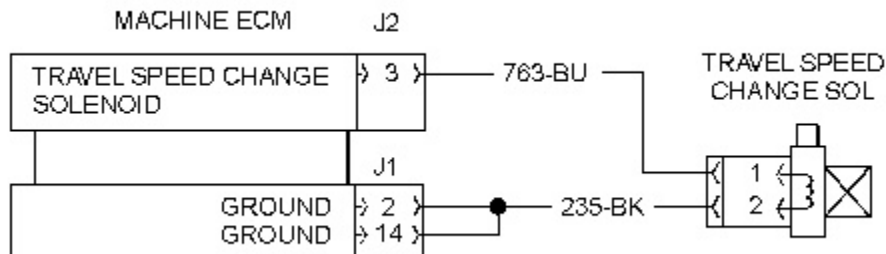


Illustration 1

g02025837

Schematic of the "Travel Speed Solenoid" valve

This diagnostic code is associated with the "Travel Speed Solenoid" valve. The FMI 03 diagnostic code means that the Machine ECM has determined that the voltage of the solenoid circuit is above normal.

The possible causes of the diagnostic code are listed below:

- The solenoid has failed.
- The energize circuit of the solenoid is shorted to the +battery circuit.

- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 0598 FMI 03 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

Test Step 1. CHECK THE ENERGIZE CIRCUIT OF THE SOLENOID FOR A SHORT TO THE +BATTERY CIRCUIT.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connectors from the solenoid and the Machine ECM.
- C. At the machine harness connector for the ECM, measure the resistance from contact J2-3 (wire 763-BU) to all contacts that are used in the machine harness connectors for the Machine ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 2.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between J2-3 (763-BU) and the circuit that has a low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 2. CHECK IF THE DIAGNOSTIC CODE IS STILL ACTIVE.

- A. Inspect the contacts of the harness connectors. Clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Determine if the CID 0598 FMI 03 diagnostic code is active.

Expected Result:

The CID 0598 FMI 03 diagnostic code is active.

Results:

- **YES** - The CID 0598 FMI 03 diagnostic code is active. The problem has not been corrected. The Machine ECM may have failed.

Repair: It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 0598 FMI 03 diagnostic code is not active. The problem does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I03755892

MID 039 - CID 0598 - FMI 05

SMCS - 5051-038-MV; 5479-038-V6

Conditions Which Generate This Code:

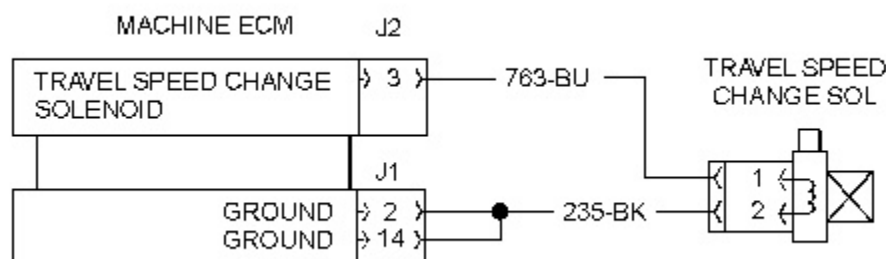


Illustration 1

g02025837

Schematic of the "Travel Speed Solenoid" valve

This diagnostic code is associated with the "Travel Speed Solenoid" valve. The FMI 05 diagnostic code means that the Machine ECM has determined that the current of the solenoid is below normal.

The possible causes of this diagnostic code are listed below:

- The energize circuit of the solenoid is open.
- The ground circuit of the solenoid is open.

- The solenoid has failed.
- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 0598 FMI 05 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

Test Step 1. CHECK THE SOLENOID.

- A. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- B. Disconnect the solenoid with the active diagnostic code from the machine harness.
- C. At the machine harness connector for the solenoid, place a jumper wire from contact 1 (wire 763-BU) to contact 2 (wire 235-BK).
- D. Observe the status of the CID 0598 FMI 05 diagnostic code.

Expected Result:

The CID 0598 FMI 05 diagnostic code remains active.

Results:

- **YES** - The diagnostic code remains active. The jumper wire does not affect the diagnostic code. Proceed to Test Step 2.
- **NO** - The diagnostic is no longer active. The solenoid has failed.

Repair: The solenoid has failed. Repeat this Test Step "CHECK THE SOLENOID" in order to verify the solenoid failure. Replace the solenoid. Verify that the new solenoid corrects the problem.

STOP

Test Step 2. CHECK THE HARNESS FOR AN OPEN.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connector(s) from the ECM.
- C. The jumper wire that was installed in the previous Test Step remains in place.
- D. At the machine harness connector, measure the resistance from signal contact J2-3 (wire 763-BU) to ground (wire 235-BK).

Expected Result:

The resistance is less than 5.0 ohms.

Results:

- **OK** - The resistance is less than 5.0 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - The resistance is greater than 5000 ohms. The resistance measurement is not correct. There is an open circuit in the machine harness.

Repair: The open is in wire 763-BU or in wire 235-BK of the machine harness. Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS.

- A. Inspect the contacts of the harness connectors. Clean the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 0598 FMI 05 diagnostic code.

Expected Result:

The CID 0598 FMI 05 diagnostic code is active.

Results:

- **YES** - The CID 0598 FMI 05 diagnostic code is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 0598 FMI 05 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103755896

MID 039 - CID 0598 - FMI 06

SMCS - 5051-038-MV; 5479-038-V6

Conditions Which Generate This Code:

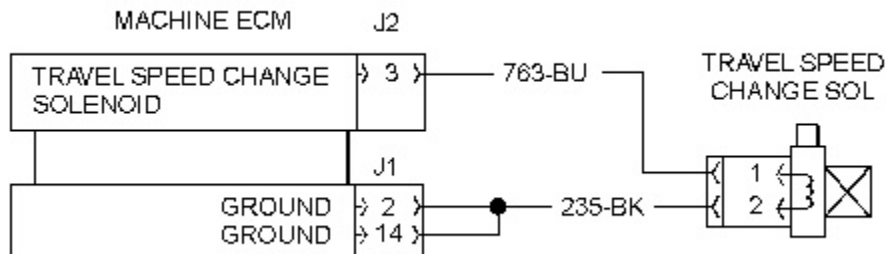


Illustration 1

g02025837

Schematic of the "Travel Speed Solenoid" valve

This diagnostic code is associated with the "Travel Speed Solenoid" valve. The FMI 06 diagnostic code means that the ECM has determined that the current of the solenoid is above normal.

The possible causes of this diagnostic code are listed below:

- The energize circuit of the solenoid is shorted to ground.
- The solenoid has failed.

- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 0598 FMI 06 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

Test Step 1. CHECK THE SOLENOID.

- A. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- B. Observe the status of the diagnostic code.
- C. Disconnect the solenoid with the active diagnostic code from the machine harness.

Expected Result:

The CID 0598 FMI 06 diagnostic code changes to a CID 0598 FMI 05 diagnostic code when the solenoid is disconnected.

Results:

- **YES** - The CID 0598 FMI 06 diagnostic code changes to a CID 0598 FMI 05 diagnostic code when the solenoid is disconnected. The circuit is correct.

Repair: The solenoid has failed. Repeat this test "CHECK THE SOLENOID" in order to verify the solenoid failure. Replace the solenoid.

STOP

- **NO** - The CID 0598 FMI 06 diagnostic code remains active. Proceed to Test Step 2.

Test Step 2. CHECK THE ENERGIZE CIRCUIT OF THE SOLENOID FOR A SHORT TO GROUND.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The solenoid remains disconnected from the machine harness.
- C. Disconnect the machine harness connector(s) from the ECM.
- D. At the machine harness connector, measure the resistance from the signal contact J2-3 (wire 763-BU) to all contacts that are used in the machine harness connectors for the ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 3.

- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between J2-3 (wire 763-BU) and the circuit with the low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS.

- A. Inspect the harness connectors. Clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 0598 FMI 06 diagnostic code.

Expected Result:

The CID 0598 FMI 06 diagnostic code is active.

Results:

- **YES** - The CID 0598 FMI 06 diagnostic code is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 0598 FMI 06 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

105434373

MID 039 - CID 0600 - FMI 04

SMCS - 509T-038

Conditions Which Generate This Code:

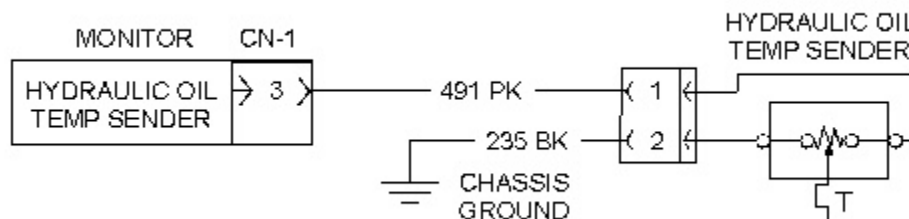


Illustration 1

g02025857

Schematic of the Hydraulic Oil Temperature sensor

This diagnostic code is associated with the Hydraulic Oil Temperature sensor. An FMI 04 diagnostic code means that the Monitor ECM has determined the voltage of the sensor is below normal. The ECM records this diagnostic code from information received from the Monitoring System through the Cat[®] Data Link.

Possible causes of this diagnostic code are listed below:

- The sensor has failed.

- The sensor output signal circuit is shorted to ground.
- The Monitor ECM may have failed (unlikely).

System Response:

Diagnostic code CID 0600 FMI 04 will be logged in the internal memory of the Machine ECM.

Test Step 1. CHECK THE SENSOR, AND THE MONITOR ECM.

- A. Turn the engine OFF. Turn the disconnect switch and the key start switch to the OFF position.
- B. Disconnect the machine harness from the sender.
- C. Turn the disconnect switch and the key start switch to the ON position. Turn the engine back ON.
- D. Observe the status of the CID 0600 FMI 04 diagnostic code.

Expected Result:

The CID 0600 FMI 04 diagnostic code is no longer present.

Results:

- **YES** - The CID 0600 FMI 04 diagnostic code is no longer active. The sensor has failed.

Repair: Replace the sender.

STOP

- **NO** - The CID 0600 FMI 04 diagnostic code remains active. The sensor is not the cause of the code. Proceed to Test Step 2.

Test Step 2. CHECK THE HARNESS FOR A SHORT TO GROUND.

- A. The sensor remains disconnected from the machine harness.
- B. Turn the engine OFF. Turn the disconnect switch and the key start switch to the OFF position.
- C. At the machine harness connector for the sensor, measure the resistance between the sensor output signal, contact (wire 491-PK), and frame ground.

Expected Result:

The resistance is greater than 5000 ohms.

Results:

- **OK** - The resistance is greater than 5000 ohms. The harness circuit resistance is correct.

Repair: A failure of the Monitor ECM is unlikely. Perform Test Step 2 again. If the problem has NOT been found, and the diagnostic code is still active, the Monitor ECM may have

failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. If the Monitor ECM needs to be replaced, see Testing and Adjusting , "Electronic Control Module (ECM) - Replace".

STOP

- **NOT OK** - The resistance is less than 5000 ohms. The machine harness has failed. There is a short between frame ground and the sensor output signal circuit in the machine harness.

Repair: Repair, or replace, the machine harness.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:34:46 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I03755921

MID 039 - CID 0735 - FMI 03

SMCS - 5479-038-LQ

Conditions Which Generate This Code:

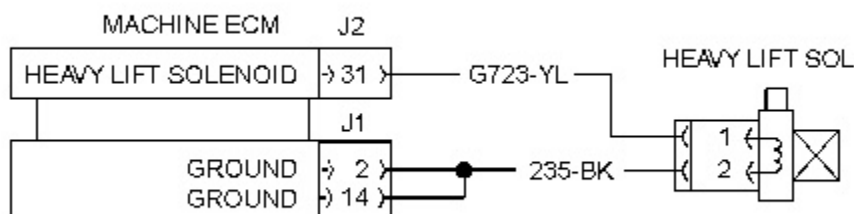


Illustration 1

g02025874

Schematic of the "Heavy Lift Solenoid" valve

This diagnostic code is associated with the "Heavy Lift Solenoid" valve. The FMI 03 diagnostic code means that the Machine ECM has determined that the voltage of the solenoid circuit is above normal.

The possible causes of the diagnostic code are listed below:

- The solenoid has failed.
- The energize circuit of the solenoid is shorted to the +battery circuit.

- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 0735 FMI 03 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

Test Step 1. CHECK THE ENERGIZE CIRCUIT OF THE SOLENOID FOR A SHORT TO THE +BATTERY CIRCUIT.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connectors from the solenoid and the Machine ECM.
- C. At the machine harness connector for the ECM, measure the resistance from contact J2-31 (wire G723-YL) to all contacts that are used in the machine harness connectors for the ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 2.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between J2-31 (G723-YL) and the circuit that has a low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 2. CHECK IF THE DIAGNOSTIC CODE IS STILL ACTIVE.

- A. Inspect the contacts of the harness connector. Clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Determine if the CID 0735 FMI 03 diagnostic code is active.

Expected Result:

The CID 0735 FMI 03 diagnostic code is active.

Results:

- **YES** - The CID 0735 FMI 03 diagnostic code is active. The problem has not been corrected. The ECM may have failed.

Repair: It is unlikely that the Machine ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the Machine ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 0735 FMI 03 diagnostic code is not active. The problem does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I03756021

MID 039 - CID 0735 - FMI 05

SMCS - 5479-038-LQ

Conditions Which Generate This Code:

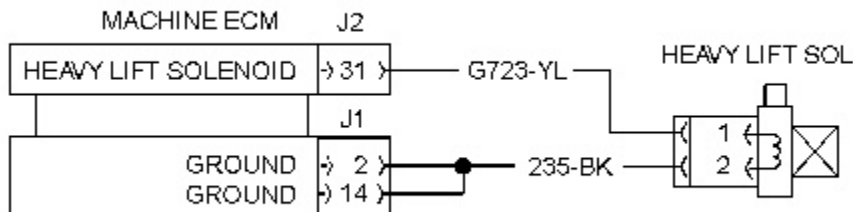


Illustration 1

g02025874

Schematic of the "Heavy Lift Solenoid" valve

This diagnostic code is associated with the "Heavy Lift Solenoid" valve. The FMI 05 diagnostic code means that the ECM has determined that the current of the solenoid is below normal.

The possible causes of this diagnostic code are listed below:

- The energize circuit of the solenoid is open.
- The ground circuit of the solenoid is open.

- The solenoid has failed.
- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 0735 FMI 05 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

Test Step 1. CHECK THE SOLENOID.

- A. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- B. Disconnect the solenoid with the active diagnostic code from the machine harness.
- C. At the machine harness connector for the solenoid, place a jumper wire from contact 1 (wire G723-YL) to contact 2 (wire 235-BK).
- D. Observe the status of the CID 0735 FMI 05 diagnostic code.

Expected Result:

The CID 0735 FMI 05 diagnostic code remains active.

Results:

- **YES** - The diagnostic code remains active. The jumper wire does not affect the diagnostic code. Proceed to Test Step 2.
- **NO** - The diagnostic is no longer active. The solenoid has failed.

Repair: The solenoid has failed. Repeat this Test Step "CHECK THE SOLENOID" in order to verify the solenoid failure. Replace the solenoid. Verify that the new solenoid corrects the problem.

STOP

Test Step 2. CHECK THE HARNESS FOR AN OPEN.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connector(s) from the ECM.
- C. The jumper wire that was installed in the previous Test Step remains in place.
- D. At the machine harness connector, measure the resistance from signal contact J2-31 (wire G723-YL) to ground (wire 235-BK).

Expected Result:

The resistance is less than 5.0 ohms.

Results:

- **OK** - The resistance is less than 5.0 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - The resistance is greater than 5000 ohms. The resistance measurement is not correct. There is an open circuit in the machine harness.

Repair: The open is in wire G723-YL or in wire 235-BK of the machine harness. Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS.

- A. Inspect the contacts of the harness connectors and clean the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 0735 FMI 05 diagnostic code.

Expected Result:

The CID 0735 FMI 05 diagnostic code is active.

Results:

- **YES** - The CID 0735 FMI 05 diagnostic code is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 0735 FMI 05 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I03756028

MID 039 - CID 0735 - FMI 06

SMCS - 5479-038-LQ

Conditions Which Generate This Code:

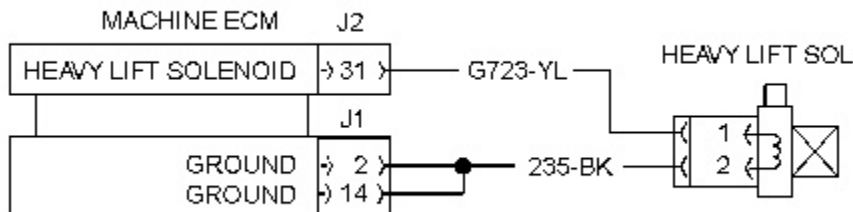


Illustration 1

g02025874

Schematic of the "Heavy Lift Solenoid" valve

This diagnostic code is associated with the "Heavy Lift Solenoid" valve. The FMI 06 diagnostic code means that the ECM has determined that the current of the solenoid is above normal.

The possible causes of this diagnostic code are listed below:

- The energize circuit of the solenoid is shorted to ground.
- The solenoid has failed.

- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 0735 FMI 06 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

Test Step 1. CHECK THE SOLENOID.

- A. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- B. Observe the status of the diagnostic code.
- C. Disconnect the solenoid with the active diagnostic code from the machine harness.

Expected Result:

The CID 0735 FMI 06 diagnostic code changes to a CID 0735 FMI 05 diagnostic code when the solenoid is disconnected.

Results:

- **YES** - The CID 0735 FMI 06 diagnostic code changes to a CID 0735 FMI 05 diagnostic code when the solenoid is disconnected. The circuit is correct.

Repair: The solenoid has failed. Repeat this test "CHECK THE SOLENOID" in order to verify the solenoid failure. Replace the solenoid.

STOP

- **NO** - The CID 0735 FMI 06 diagnostic code remains active. Proceed to Test Step 2.

Test Step 2. CHECK THE ENERGIZE CIRCUIT OF THE SOLENOID FOR A SHORT TO GROUND.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The solenoid remains disconnected from the machine harness.
- C. Disconnect the machine harness connector(s) from the Machine ECM.
- D. At the machine harness connector, measure the resistance from the signal contact J2-31 (wire G723-YL) to all contacts that are used in the machine harness connectors for the Machine ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between J2-31 (wire G723-YL) and the circuit with the low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS.

- A. Inspect the harness connectors. Clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 0735 FMI 06 diagnostic code.

Expected Result:

The CID 0735 FMI 06 diagnostic code is active.

Results:

- **YES** - The CID 0735 FMI 06 diagnostic code is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 0735 FMI 06 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I04162072

MID 039 - CID 1129 - FMI 03

SMCS - 1439-038-P9

Conditions Which Generate This Code:

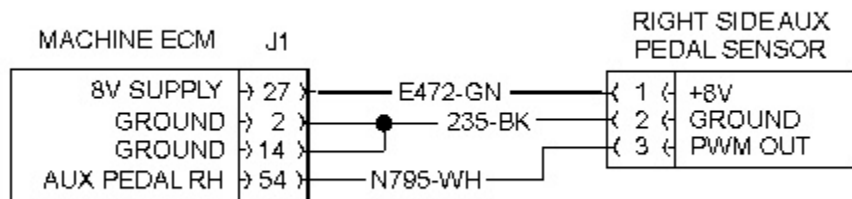


Illustration 1

g02025913

Right side "Auxiliary Pedal" pedal position sensor circuit schematic

This diagnostic code is for the right side Auxiliary Pedal position sensor. An FMI 03 diagnostic code means the machine ECM has determined the sensor output signal voltage is above the normal limit.

Possible causes for this diagnostic code are:

- Failed sensor power supply.
- Failed sensor.

- Open sensor signal output wire.
- Sensor signal output wire shorted to +battery.
- Failed machine ECM, but most unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes now, but clear those codes after the original diagnostic code has been corrected.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all of the harness connectors involved in the circuit. Verify that all of the connections in the circuit are clean, secure, and in good condition. If a problem is found with any of the connections: correct the problem and verify that diagnostic code CID 1129 FMI 03 is still active, before performing the following procedures.

Test Step 1. CHECK SENSOR POWER

- A. Turn the disconnect switch and the key start switch to the "ON" position.
- B. Do not disconnect any of the machine harness connectors at this time.
- C. At the machine harness connector for the right side Auxiliary Pedal position sensor, measure the voltage between the contact for terminal 1 (wire E472-GN) and contact 2 (wire 235-BK) on the sensor connector.

Expected Result:

The voltage is 8.0 ± 0.5 DCV.

Results:

- **YES** - The voltage is 8.0 ± 0.5 DCV. The power supply is not the problem. Go to Test Step 2.
- **NO** - The voltage is not 8.0 ± 0.5 DCV. There is a problem with the +8 DCV power supply.

Repair: Refer to the complete electrical schematics for the machine. Investigate the ECM +8 DCV power supply problem.

After +8 DCV power supply problem is repaired, check if the 1129 FMI 03 diagnostic code is still active. If the diagnostic code is still active, go to Test Step 2.

Test Step 2. CHECK THE SENSOR, THE ECM, AND THE MACHINE HARNESS.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connector from the right side Auxiliary Pedal position sensor.
- C. In the harness connector for the sensor, place a jumper wire between the contact for terminal 3 (wire N795-WH) and the contact for terminal 2 (wire 235-BK) in the sensor connector.
- D. Turn the key start switch and the disconnect switch to the ON position.
- E. Observe the status of the diagnostic code.

Expected Result:

The 1129 FMI 03 diagnostic code remains active.

Results:

- **YES** - The CID 1129 FMI 03 diagnostic code remains active. The sensor is not causing the problem. Go to Test Step 3.
- **NO** - The CID 1129 FMI 03 diagnostic code is no longer active. The diagnostic code has been replaced by an active CID 1129 with a different FMI code. The sensor has failed.

Repair: Replace the sensor.

Go to Test Step 5.

Test Step 3. CHECK THE SENSOR OUTPUT FOR AN OPEN CIRCUIT.

- A. Turn the disconnect switch and the key start switch to the OFF position.
- B. The sensor remains disconnected from the harness.
- C. The wire jumper remains in place.
- D. Disconnect both the J1 and J2 harness connector from the machine ECM.
- E. At the ECM J1 harness connector, measure the resistance between contact J1-54 (N795-WH) and contact J1-2 (235-BK) in the J1 harness connector.

Note: A Right Side Auxiliary Pedal sensor Ground Return is also found at contact J1-14 (235-BK). Always check these parallel ground wires. Make sure to repair or replace any that are found open.

Expected Result:

The resistance is less than 5 ohms.

Results:

- **YES** - The resistance is less than 5 ohms. Go to Test Step4.
- **NO** - The resistance is not less than 5 ohms. There is an open circuit in the machine harness.

Repair: Repair or replace the harness.

Go to Test Step 5.

Test Step 4. CHECK THE SENSOR OUTPUT FOR A SHORT CIRCUIT.

- A. The disconnect switch and the key start switch remain in the OFF position.
- B. The sensor and the ECM harness connectors remain disconnected.

- C. Remove the jumper wire from the sensor connector.
- D. Measure resistance from contact J1-54 (wire N795-WH) to all the other contacts used in both the J1 and the J2 ECM harness connectors.

Expected Result:

All measurements are more than 5000 ohms.

Results:

- **YES** - All measurements are more than 5000 ohms. Go to Test Step 5.
- **NO** - All measurements are not more than 5000 ohms. There is a short circuit in the machine harness.

Repair: Repair or replace the harness.

Go to Test Step 5.

Test Step 5. CHECK THE DIAGNOSTIC CODE STATUS.

- A. Reconnect all disconnected machine harness connectors. Make sure that all the connectors are fully seated. Observe that the clips for each connector are securely fastened.
- B. Turn the key start switch and the disconnect switch to the ON position.
- C. Clear all inactive diagnostic codes.
- D. Operate the machine.
- E. Check the status of the CID 1129 FMI 03 diagnostic code.

Expected Result:

The CID 1129 FMI 03 diagnostic code is not active.

Results:

- **YES** - The CID 1129 FMI 03 diagnostic code is no longer active and does not exist at this time.

Repair: The cause for the diagnostic code has been corrected. Return the machine back to normal operations.

STOP

- **NO** - The CID 1129 FMI 03 diagnostic code is still active. The problem has not been corrected. The ECM may have failed.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the sensor circuit. Perform a "wiggle test" on the sensor circuit

of the machine wiring harness, using the Caterpillar Electronic Technician service tool. The "wiggle test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened. Perform Test Step 5 again. If the problem was again not found, and the original code is still active, the machine ECM may have failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:36:27 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

**Service Information System**

Shutdown SIS

Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103756088

MID 039 - CID 1129 - FMI 04

SMCS - 1439-038-P9

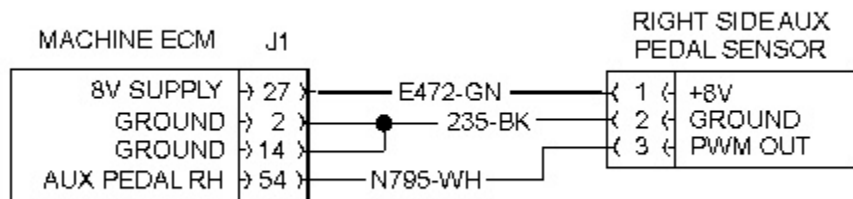
Conditions Which Generate This Code:

Illustration 1

g02025913

Schematic of the circuit for the "Right Side Auxiliary" pedal

This diagnostic code is associated with the sensor for the "Right Side Auxiliary" pedal. The FMI 04 diagnostic code means that the Machine ECM has determined that the voltage of the circuit for the position sensor is below normal.

The possible causes of this diagnostic code are listed below:

- The signal circuit for the sensor is shorted to ground.
- The sensor has failed.

- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear the diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1129 FMI 04 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

Test Step 1. CHECK THE SENSOR

- A. Turn the disconnect switch and the key start switch to the ON position.
- B. Ensure that the diagnostic code is active.
- C. Observe the status of the diagnostic code. Disconnect the sensor from the machine harness.

Expected Result:

The CID 1129 FMI 04 diagnostic code remains active.

Results:

- **OK** - The diagnostic code remains active. The sensor is correct. Proceed to Test Step 2.
- **NOT OK** - The diagnostic code is no longer active. The sensor has failed.

Repair: Replace the sensor.

STOP

Test Step 2. CHECK THE WIRING HARNESS OF THE SENSOR FOR A SHORT TO GROUND.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness from the sensor.
- C. Disconnect the machine harness connector(s) from the Machine ECM.
- D. At the machine harness connector for the Machine ECM, measure the resistance from the signal contact J1-54 (wire N795-WH) of the machine harness to all possible sources of ground. Measure the resistance to all contacts of the machine harness connectors for the ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 3.

- **NOT OK** - One or more resistance measurements is not correct. There is a short in the machine harness.

Repair: The short is between signal contact J1-54 (wire N795-WH) and the circuit with the low resistance measurement. Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS.

- A. Inspect the contacts of the harness connectors. Clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 1129 FMI 04 diagnostic code.

Expected Result:

The CID 1129 FMI 04 diagnostic code is active.

Results:

- **YES** - The CID 1129 FMI 04 diagnostic code is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1129 FMI 04 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

**Service Information System**

Shutdown SIS

Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I04170111

MID 039 - CID 1129 - FMI 08

SMCS - 1439-038-P9

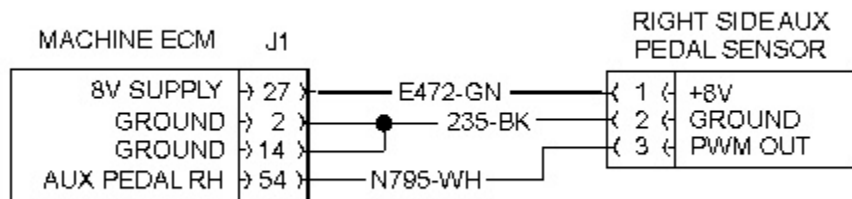
Conditions Which Generate This Code:

Illustration 1

g02025913

Right side "Auxiliary Pedal" pedal position sensor circuit schematic

This diagnostic code is for the right side Auxiliary Pedal position sensor. An FMI 08 diagnostic code means the machine ECM has determined the sensor output signal has an abnormal frequency, pulse width, or period.

Possible causes for this diagnostic code are:

- Failed sensor.
- Short circuit to the sensor output signal wire.

- Failed machine ECM, but most unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes now, but clear those codes after the original diagnostic code has been corrected.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all of the harness connectors involved in the circuit. Verify that all of the connections in the circuit are clean, secure, and in good condition. If a problem is found with any of the connections: correct the problem and verify that diagnostic code CID 1129 FMI 08 is still active, before performing the following procedures.

System Response:

This failure may result in erratic movement of the machine.

Test Step 1. CHECK THE SENSOR, THE ECM, AND THE MACHINE HARNESS.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connector from the right side Auxiliary Pedal position sensor.
- C. In the harness connector for the sensor, place a jumper wire between the contact for terminal 3 (wire N795-WH) and the contact for terminal 2 (wire 235-BK) in the sensor connector.
- D. Turn the key start switch and the disconnect switch to the ON position.
- E. Observe the status of the diagnostic code.

Expected Result:

The 1129 FMI 08 diagnostic code remains active.

Results:

- **YES** - The CID 1129 FMI 08 diagnostic code remains active. The sensor is not causing the problem. Go to Test Step 2.
- **NO** - The CID 1129 FMI 08 diagnostic code is no longer active. The diagnostic code has been replaced by an active CID 1129 with a different FMI code. The sensor has failed.

Repair: Replace the sensor.

Go to Test Step 3.

Test Step 2. CHECK THE MACHINE HARNESS FOR A SHORT CIRCUIT.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The sensor remains disconnected from the harness connector.
- C. Remove the jumper wire from the connector.
- D. Disconnect both the J1 and J1 harness connectors from the machine ECM.

- E. At the ECM J1 harness connector, measure the resistance between contact J1-54 (wire N795-WH) and frame ground.
- F. Again at the ECM J1 harness connector, measure the resistance between contact J1-54 (wire N795-WH) and all of the other contacts that are used in both the J1 and J2 ECM harness connectors.

Expected Result:

All resistance readings are greater than 5000 ohms.

Results:

- **YES** - All resistance readings are greater than 5000 ohms. Go to Test Step 3.
- **NO** - All resistance readings are not greater than 5000 ohms. There is a short circuit in the machine harness.

Repair: Repair or replace the harness.

Go to Test Step 3.

Test Step 3. CHECK THE DIAGNOSTIC CODE STATUS.

- A. Reconnect all disconnected machine harness connectors. Make sure that all the connectors are fully seated. Observe that the clips for each connector are securely fastened.
- B. Turn the key start switch and the disconnect switch to the ON position.
- C. Clear all inactive diagnostic codes.
- D. Operate the machine.
- E. Check the status of the CID 1129 FMI 08 diagnostic code.

Expected Result:

The CID 1129 FMI 08 diagnostic code is not active.

Results:

- **YES** - The CID 1129 FMI 08 diagnostic code is no longer active and does not exist at this time.

Repair: The cause for the diagnostic code has been corrected. Return the machine back to normal operations.

STOP

- **NO** - The CID 1129 FMI 08 diagnostic code is still active. The problem has not been corrected. The ECM may have failed.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation

caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the sensor circuit. Perform a "wobble test" on the sensor circuit of the machine wiring harness, using the Caterpillar Electronic Technician service tool. The "wobble test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened. Perform Test Step 3 again. If the problem was again not found, and the original code is still active, the machine ECM may have failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:36:58 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

**Service Information System**

Shutdown SIS

Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

105434448

MID 039 - CID 1130 - FMI 03

SMCS - 1439-038-P9

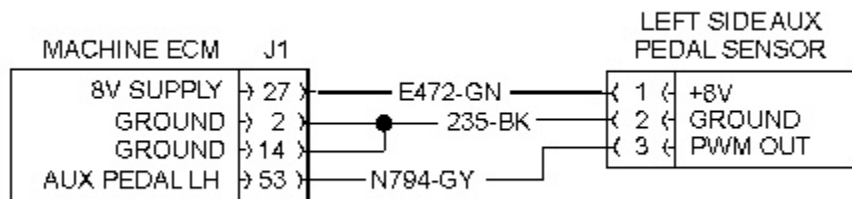
Conditions Which Generate This Code:

Illustration 1

g02157109

Schematic for the Left Side Auxiliary pedal sensor

This diagnostic code is associated with the Left Side Auxiliary pedal sensor. An FMI 03 diagnostic code means the Machine ECM has determined the signal output voltage of the sensor is above normal.

Possible causes of this diagnostic code are listed below:

- The sensor power supply may have failed.
- The sensor may have failed.

- The sensor output signal may be shorted to a voltage source.
- The sensor output signal may be open.
- The Machine ECM may have failed, but this situation is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes now, but clear those codes after the original diagnostic code has been corrected.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all of the harness connectors involved in the circuit. Verify that all of the connections in the circuit are clean, secure, and in good condition. If a problem is found with any of the connections: correct the problem and verify that diagnostic code CID 1130 FMI 03 is still active, before performing the following procedures.

Test Step 1. VERIFY THE +8 VDC SUPPLY.

- A. Turn the key start switch and the disconnect switch to the ON position. Do not start the engine.
- B. Do not disconnect any of the machine harness connectors at this time.
- C. At the back of the harness connector for the Left Side Auxiliary pedal sensor: insert the **7X-1710** Multimeter Probes along contact 1 (E472-GN), the sensor contact for the +8 VDC supply, and contact 2 (235-BK), the sensor ground return.
- D. Measure a DC voltage from contact 1 to contact 2.

Expected Result:

The voltage measurement is 8 ± 0.5 VDC.

Results:

- **YES** - The voltage measurement is 8 ± 0.5 VDC. The power supply is correct. Go to Test Step 2.
- **NO** - The voltage is NOT 8 VDC. The 8 VDC power supply in the machine ECM has failed, or the machine harness has failed. Go to Test Step 3

Test Step 2. CHECK THE SENSOR, THE ECM, AND THE CIRCUIT CONNECTIONS IN THE MACHINE HARNESS.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connector from the Left Side Auxiliary pedal sensor.
- C. At the harness connector for the Left Side Auxiliary pedal sensor, place a jumper wire between contact 3 (N794-GY) and contact 2 (235-BK) on the connector.
- D. Turn the key start switch and the disconnect switch to the ON position. Do not start the engine.
- E. Observe the status of the diagnostic code.

Expected Result:

The CID 1130 FMI 03 diagnostic code remains active.

Results:

- **YES** - The CID 1130 FMI 03 diagnostic code remains active. The jumper wire did not change the code. The sensor is NOT the cause of the problem.

Repair: The machine harness has failed, or the ECM may have failed.

Go to Test Step 3.

- **NO** - The CID 1130 FMI 03 diagnostic code is no longer active, and has been replaced by an active CID 1130 FMI 04 diagnostic code. The ECM has detected a valid diagnostic code.

Repair: The ECM, and the harness, are correct. The sensor has failed. Replace the sensor.

Go to Test Step 5

Test Step 3. CHECK THE SENSOR OUTPUT SIGNAL FOR AN OPEN.

- Turn the disconnect switch and the key start switch to the OFF position.
- Disconnect the machine harness connector from the Left Side Auxiliary pedal sensor.
- At the harness connector for the Left Side Auxiliary pedal sensor, place a jumper wire between contact 3 (N794-GY) and contact 2 (235-BK) on the connector.
- At the Machine ECM, disconnect the J1 and J2 machine harness connector from the ECM.
- At the ECM J1 harness connector, measure the resistance between the pin for contact J1-53 (N794-GY) and the pin for contact J1-2 (235-BK) on the harness connector.

Note: A Left Side Auxiliary sensor Ground Return is also found at contact J1-14 (235-BK). Always check these parallel ground wires. Make sure to repair or replace any that are found open.

Expected Result:

The resistance is less than 5 ohms.

Results:

- **YES** - The resistance is less than 5 ohms. The sensor output circuit is not open. Go to Test Step 4
- **NO** - The resistance is NOT less than 5 ohms. The sensor output signal is open.

Repair: The open is in wire N794-GY in the harness connector. Repair, or replace, the harness.

Go to Test Step 5.

Test Step 4. CHECK THE SENSOR OUTPUT SIGNAL FOR A SHORT TO A VOLTAGE SOURCE.

- A. The disconnect switch and the key start switch remain in the OFF position.
- B. Both the ECM harness connectors remain disconnected.
- C. The Left Side Auxiliary pedal sensor harness connector remains disconnected.
- D. Remove the jumper wire from the connector.
- E. At the J1 harness connector for the ECM, measure the resistance between contact J1-53 (N794-GY) and all of the other contacts used in the harness connectors for the ECM.

Expected Result:

Each resistance is more than 5000 ohms.

Results:

- **YES** - Each resistance is more than 5000 ohms. The sensor output signal is NOT shorted to a power supply. Proceed to Test Step 4.
- **NO** - One of the resistance measurements is NOT greater than 5000 ohms. There is a short in the harness. The short is between the sensor output signal wire and the wire with the low resistance measurement.

Repair: Repair, or replace, the harness.

Proceed to Test Step 5.

Test Step 5. CHECK IF THE DIAGNOSTIC CODE IS STILL ACTIVE.

- A. Remove the jumper wire from the connector.
- B. Reconnect all disconnected machine harness connectors. Make sure that all the connectors are fully seated. Observe that the clips for each connector are securely fastened.
- C. Turn the key start switch and the disconnect switch to the ON position.
- D. Clear all inactive diagnostic codes.
- E. Operate the machine.
- F. Check the status of the CID 1130 FMI 03 diagnostic code.

Expected Result:

The CID 1130 FMI 03 diagnostic code is not active.

Results:

- **YES** - The CID 1130 FMI 03 diagnostic code is no longer active. The code does not exist at this time.

Repair: The cause for the diagnostic code appears to have been corrected. Return the machine back to normal operations.

STOP

- **NO** - The CID 1130 FMI 03 diagnostic code is still active. The problem has NOT been corrected. The ECM may have failed.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the sensor circuit. Perform a "wiggle test" on the sensor circuit of the machine wiring harness, using the Cat[®] Electronic Technician service tool. The "wiggle test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened. Perform Test Step 5 again. If the problem has NOT been found, and the original code is still active, the ECM may have failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting , " Electronic Control Module (ECM) - Replace".

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103942796

MID 039 - CID 1130 - FMI 04

SMCS - 1439-038-P9

Conditions Which Generate This Code:

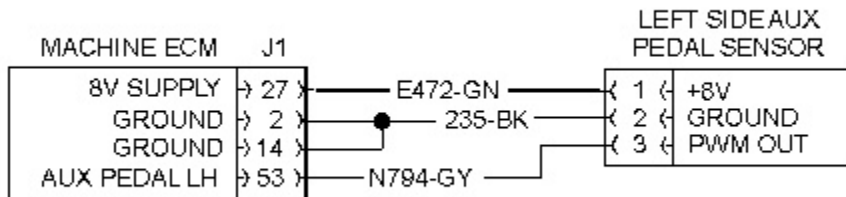


Illustration 1

g02157109

Schematic for the Left Side Auxiliary pedal sensor

This diagnostic code is associated with the Left Side Auxiliary pedal sensor. An FMI 04 diagnostic code means the machine ECM has determined the signal output voltage of the sensor is below normal.

Possible causes of this diagnostic code are:

- The sensor may have failed.
- The sensor output signal circuit may be shorted to ground.

- The machine ECM may have failed, but is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes now, but clear those codes after the original diagnostic code has been corrected.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all of the harness connectors involved in the circuit. Verify that all of the connections in the circuit are clean, secure, and in good condition. If a problem is found with any of the connections: correct the problem and verify that diagnostic code CID 1130 FMI 04 is still active, before performing the following procedures.

Test Step 1. CHECK THE SENSOR, THE ECM, AND THE CIRCUIT CONNECTIONS IN THE MACHINE HARNESS.

- Turn the key start switch and the disconnect switch to the OFF position.
- Disconnect the machine harness connector from the Left Side Auxiliary pedal sensor.
- Turn the key start switch and the disconnect switch to the ON position. Do not start the engine.
- Observe the status of the diagnostic code.

Expected Result:

The CID 1130 FMI 04 diagnostic code remains active.

Results:

- **YES** - The CID 1130 FMI 03 diagnostic code remains active. Disconnecting the sensor did not change the code. The sensor is NOT the cause of the problem.

Repair: The machine harness has failed, or the ECM may have failed.

Go to Test Step 2.

- **NO** - The CID 1130 FMI 04 diagnostic code is no longer active, and has been replaced by an active CID 1130 FMI 03 diagnostic code. The ECM has detected a valid diagnostic code.

Repair: The ECM, and the harness, are correct. The sensor has failed. Replace the sensor.

Go to Test Step 3.

Test Step 2. CHECK THE SENSOR OUTPUT SIGNAL FOR A SHORT TO GROUND.

- Turn the disconnect switch and the key start switch to the OFF position.
- At the machine ECM, disconnect the J1 and J2 machine harness connectors from the ECM.
- The harness connector remains disconnected from the Left Side Auxiliary pedal sensor.
- At the J1 harness connector for the ECM, measure the resistance between contact J1-53 (N794-GY) and all of the other contacts used in the ECM harness connectors.

Expected Result:

Each resistance is more than 5000 ohms.

Results:

- **YES** - Each resistance is more than 5000 ohms. The sensor output signal circuit is not shorted to ground. Go to Test Step 3.
- **NO** - One of the resistance measurements is NOT more than 5000 ohms. There is a short in the harness. The short is between the sensor output signal wire and the wire with the low resistance. Repair, or replace, the harness. Go to Test Step 3.

Test Step 3. CHECK IF THE DIAGNOSTIC CODE IS STILL ACTIVE

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Reconnect all disconnected machine harness connectors. Make sure that all the connectors are fully seated. Observe that the clips for each connector are securely fastened.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Clear all inactive diagnostic codes.
- E. Operate the machine.
- F. Check the status of the CID 1130 FMI 04 diagnostic code.

Expected Result:

The CID 1130 FMI 04 diagnostic code is not active.

Results:

- **YES** - The CID 1130 FMI 04 code is no longer active. The code does not exist at this time.

Repair: The cause for the diagnostic code appears to have been corrected. Return the machine back to normal operations.

STOP

- **NO** - The CID 1130 FMI 04 diagnostic code is still active. The problem has NOT been corrected.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the solenoid circuit. Perform a "wobble test" on the solenoid circuit of the machine wiring harness, using the Caterpillar Electronic Technician service tool. The "wobble test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are securely fastened. Perform Test Step 3 again. If the problem has NOT been found, and this diagnostic code is still active, the ECM may have

failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:37:39 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I04170112

MID 039 - CID 1130 - FMI 08

SMCS - 1439-038-P9

Conditions Which Generate This Code:

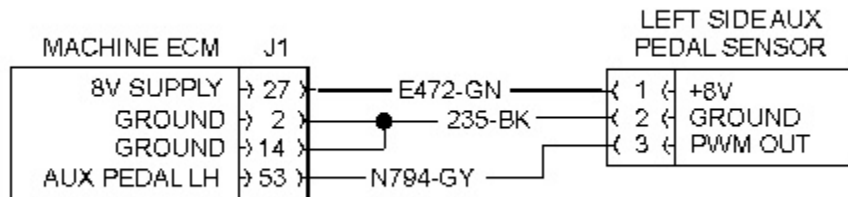


Illustration 1

g02025956

Left side "Auxiliary Pedal" position sensor circuit schematic

This diagnostic code is for the left side Auxiliary Pedal position sensor. An FMI 08 diagnostic code means the machine ECM has determined the sensor output signal has an abnormal frequency, pulse width, or period.

Possible causes for this diagnostic code are:

- Failed sensor.
- Short circuit to the sensor output signal wire.

- Failed machine ECM, but most unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes now, but clear those codes after the original diagnostic code has been corrected.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all of the harness connectors involved in the circuit. Verify that all of the connections in the circuit are clean, secure, and in good condition. If a problem is found with any of the connections: correct the problem and verify that diagnostic code CID 1130 FMI 08 is still active, before performing the following procedures.

System Response:

This failure may result in erratic movement of the machine.

Test Step 1. CHECK THE SENSOR, THE ECM, AND THE MACHINE HARNESS.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connector from the left side Auxiliary Pedal position sensor.
- C. In the harness connector for the sensor, place a jumper wire between the contact for terminal 3 (wire N794-GY) and the contact for terminal 2 (wire 235-BK) in the sensor connector.
- D. Turn the key start switch and the disconnect switch to the ON position.
- E. Observe the status of the diagnostic code.

Expected Result:

The 1130 FMI 08 diagnostic code remains active.

Results:

- **YES** - The CID 1130 FMI 08 diagnostic code remains active. The sensor is not causing the problem. Go to Test Step 2.
- **NO** - The CID 1130 FMI 08 diagnostic code is no longer active. The diagnostic code has been replaced by an active CID 1130 with a different FMI code. The sensor has failed.

Repair: Replace the sensor.

Go to Test Step 3.

Test Step 2. CHECK THE MACHINE HARNESS FOR A SHORT CIRCUIT.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The sensor remains disconnected from the harness connector.
- C. Remove the jumper wire from the connector.
- D. Disconnect both the J1 and J2 harness connectors from the machine ECM.

- E. At the ECM J1 harness connector, measure the resistance between contact J1-53 (wire N794-GY) and frame ground.
- F. Again at the ECM J1 harness connector, measure the resistance between contact J1-53 (wire N794-GY) and all of the other pins that are used in both the J1 and J2 ECM harness connectors.

Expected Result:

All resistance readings are greater than 5000 ohms.

Results:

- **YES** - All resistance readings are greater than 5000 ohms. Go to Test Step 3.
- **NO** - All resistance readings are not greater than 5000 ohms. There is a short circuit in the machine harness.

Repair: Repair or replace the harness.

Go to Test Step 3.

Test Step 3. CHECK THE DIAGNOSTIC CODE STATUS.

- A. Reconnect all disconnected machine harness connectors. Make sure that all the connectors are fully seated. Observe that the clips for each connector are securely fastened.
- B. Turn the key start switch and the disconnect switch to the ON position.
- C. Clear all inactive diagnostic codes.
- D. Operate the machine.
- E. Check the status of the CID 1130 FMI 08 diagnostic code.

Expected Result:

The CID 1130 FMI 08 diagnostic code is not active.

Results:

- **YES** - The CID 1130 FMI 08 diagnostic code is no longer active and does not exist at this time.

Repair: The cause for the diagnostic code has been corrected. Return the machine back to normal operations.

STOP

- **NO** - The CID 1130 FMI 08 diagnostic code is still active. The problem has not been corrected. The ECM may have failed.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of

the wires that are associated with the sensor circuit. Perform a "wiggle test" on the sensor circuit of the machine wiring harness, using the Caterpillar Electronic Technician service tool. The "wiggle test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened. Perform Test Step 3 again. If the problem was again not found, and the original code is still active, the machine ECM may have failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:37:50 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)



Service Information System

Shutdown SIS

Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I03756647

MID 039 - CID 1160 - FMI 03

SMCS - 5059-038-M9; 5479-038-HLK

Conditions Which Generate This Code:

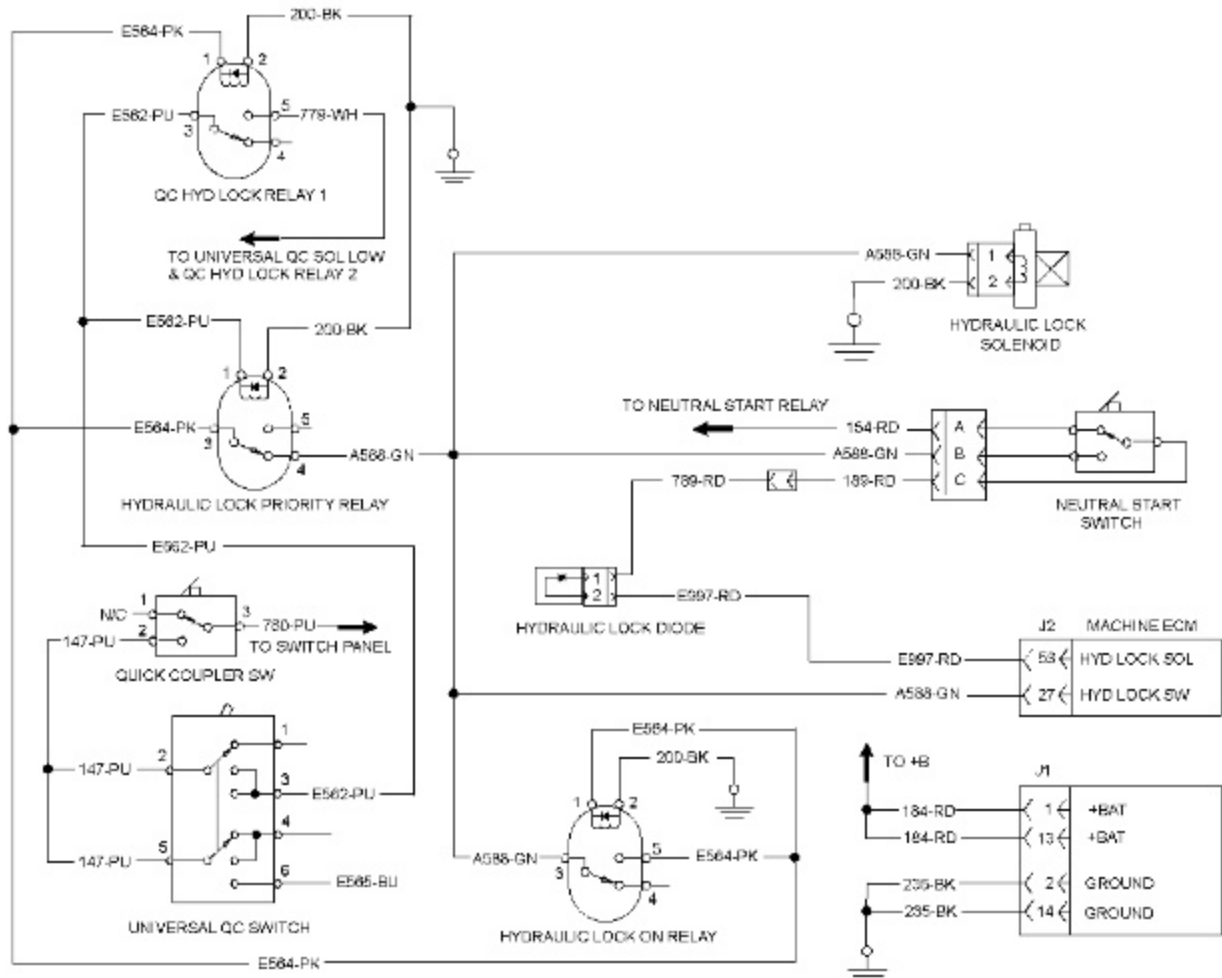


Illustration 1

g02026198

Schematic of the "Hydraulic Lock" solenoid

This diagnostic code is associated with the "Hydraulic Lock" solenoid. The FMI 03 diagnostic code means that the ECM has determined that the voltage of the solenoid circuit is above normal.

The possible causes of the diagnostic code are listed below:

- The solenoid has failed.
- The energize circuit of the solenoid is shorted to the +battery circuit.
- The hydraulic lock relay has failed.
- The Machine ECM has failed. This is unlikely.

When this diagnostic code occurs, a warning is displayed on the Monitoring System and the Machine ECM disables the hydraulic system.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1160 FMI 03 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

The diagnostic code of CID 1160 FMI 03 will be logged in the internal memory of the Machine ECM.

Test Step 1. CHECK THE ENERGIZE CIRCUIT OF THE SOLENOID FOR A SHORT TO THE +BATTERY CIRCUIT.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connector J2 from the solenoid at the ECM.
- C. Place a jumper between contacts 3 (wire A588-GN) and 5 (wire E564-PK) of the hydraulic lock on relay.
- D. At the machine harness connector for the ECM, measure the resistance from contact J2-27 (wire A588-GN) to all contacts that are used in the machine harness connectors for the Machine ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 2.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between J2-27 (A588-GN) and the circuit that has a low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 2. CHECK IF THE DIAGNOSTIC CODE IS STILL ACTIVE.

- A. Inspect the contacts. Clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Remove the jumper that was placed in the previous test.

- D. Turn the disconnect switch and the key start switch to the ON position.
- E. Operate the machine.
- F. Determine if the CID 1160 FMI 03 diagnostic code is active.

Expected Result:

The CID 1160 FMI 03 diagnostic code is active.

Results:

- **YES** - The CID 1160 FMI 03 diagnostic code is active. The problem has not been corrected. The ECM may have failed.

Repair: It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1160 FMI 03 diagnostic code is not active. The problem does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP



Service Information System

Shutdown SIS

Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I05434522

MID 039 - CID 1160 - FMI 05

SMCS - 5059-038-M9; 5479-038-HLK

Conditions Which Generate This Code:

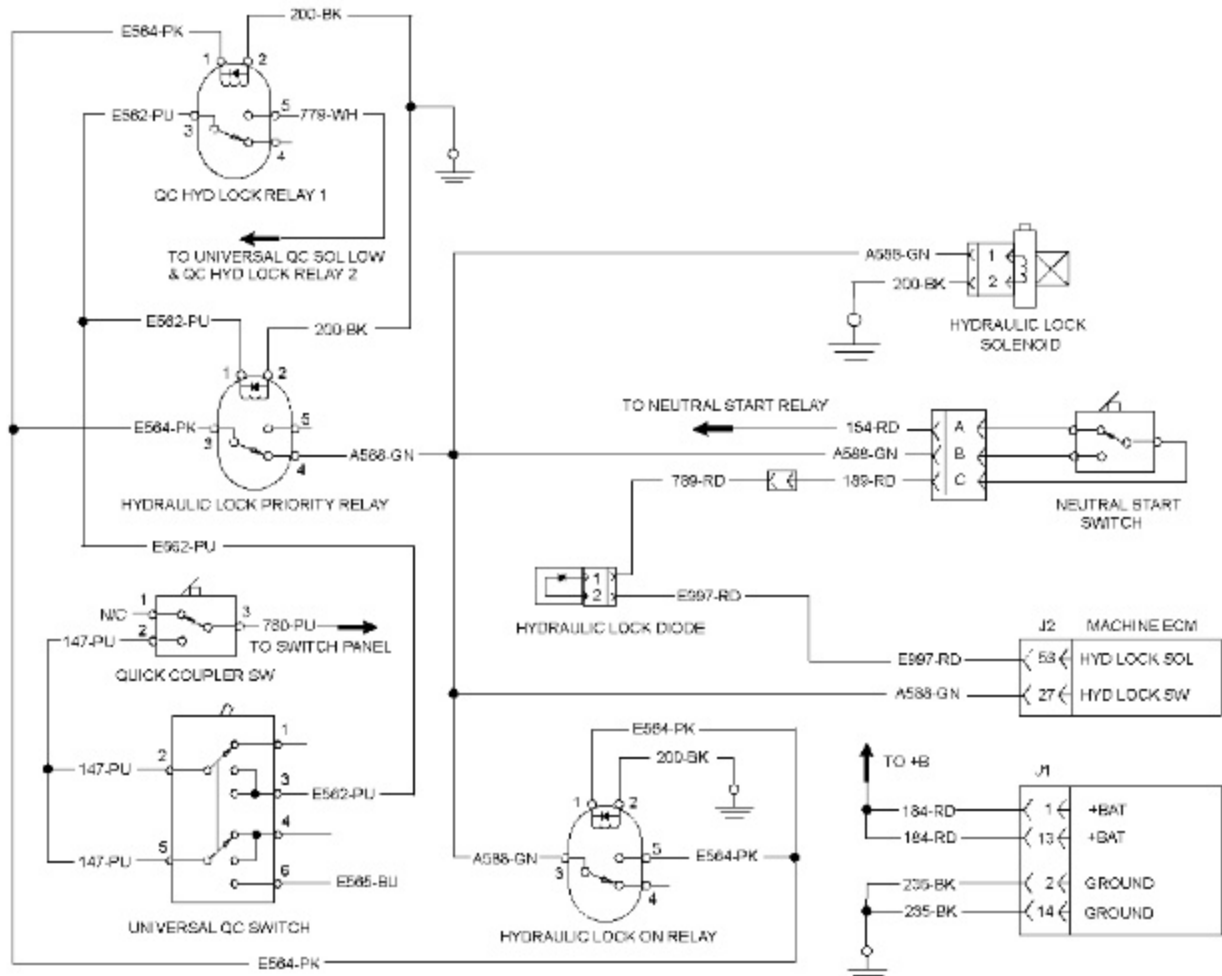


Illustration 1

g02026198

Schematic of the "Hydraulic Lock" solenoid

This diagnostic code is associated with the "Hydraulic Lock" solenoid.

The possible causes of this diagnostic code are listed below:

- The solenoid energizer circuit is open.
- The return circuit of the solenoid is open.
- The solenoid has failed.
- A hydraulic lock relay has failed.
- The neutral start switch has failed.

- The Machine ECM has failed. This situation is unlikely.

When this diagnostic code occurs, a warning is displayed on the Monitoring System and the Machine ECM disables the circuit.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear the diagnostic codes when the original diagnostic code is corrected.

Test Step 1. CHECK THE SOLENOID.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the suspect solenoid from the machine harness.
- C. At the machine harness connector of the solenoid, measure the resistance between contact 1 (wire A588-GN) and contact 2 (wire 200-BK).

Expected Result:

The resistance is between 25 and 39 ohms.

Results:

- **OK** - The resistance is between 25 and 39 ohms. The resistance is correct. The machine harness or the hydraulic lock relay has failed. Proceed to Test Step 2.
- **NOT OK** - The resistance is NOT between 25 and 39 ohms. The resistance is not correct.

Repair: The solenoid has failed. Replace the solenoid.

STOP

Test Step 2. CHECK THE HARNESS.

- A. Turn the disconnect switch and the key start switch to the ON position.
- B. The solenoid remains disconnected from the machine harness.
- C. At the machine harness connector for the solenoid, measure the voltage between contact 1 (wire A588-GN) and contact 2 (wire 200-BK) while the hydraulic lock lever is moved from the LOCKED position to the RELEASED position.

Expected Result:

The voltage measures 18 VDC to 28 VDC when the lever is in the RELEASED position. The voltage measures approximately 0.0 ± 0.5 VDC in the LOCKED position.

Results:

- **OK** - The voltage measures 18 VDC to 28 VDC when the lever is in the RELEASED position. The voltage measures approximately 0.0 ± 0.5 VDC in the LOCKED position. The voltage is correct. Proceed to Test Step 3.

- **NOT OK** - The voltage does not measure 18 VDC to 28 VDC when the lever is in the RELEASED position. The voltage does not measure approximately 0.0 ± 0.5 VDC in the LOCKED position. The voltage is not correct. The machine harness or the hydraulic lock relay may have failed. Proceed to Test Step 4.

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS.

- Inspect the connectors. Clean the contacts of the harness connectors.
- Reconnect all harness connectors.
- Turn the disconnect switch and the key start switch to the ON position.
- Clear all active diagnostic codes from the Monitoring System by pressing the "OK" key on the keypad.
- Operate the machine.
- Check the Monitoring System for an active diagnostic code. The diagnostic information may also be viewed with the Cat[®] Electronic Technician.

Expected Result:

The diagnostic code for the solenoid is not present.

Results:

- **OK** - The diagnostic code for the solenoid is not present. The diagnostic code was probably caused by a poor electrical connection or an open at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.**STOP**
- **NOT OK** - The diagnostic code is still present. The Machine ECM has failed. A failure of the Machine ECM is unlikely. Exit this test procedure and perform this procedure again.

Repair: If the cause of the diagnostic code is not found, replace the ECM. See Testing And Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

Test Step 4. CHECK THE HYDRAULIC LOCK CIRCUIT

- Turn the key start switch and the disconnect switch to the OFF position.
- Place a jumper between contacts 3 (wire A588-GN) and 5 (wire E564-PK) of the hydraulic lock on relay.
- Place a jumper between contacts 1 (wire A588-PK) and 2 (wire 200-BK) of the machine harness connector for the solenoid.
- Disconnect the machine harness connectors J1 and J2 from the Machine ECM.
- At the machine harness connector J2, measure the resistance between contact J2-27 (wire A588 -GN) and frame ground.

Expected Result:

The resistance measures less than 5 ohms.

Results:

- **OK** - The resistance measures less than 5 ohms. The resistance is correct. Proceed to Test Step 5.
- **NOT OK** - The resistance is greater than 5 ohms. The resistance is not correct. The machine harness has failed.

Repair: Repair the machine harness or replace the machine harness.

STOP**Test Step 5. CHECK THE HYDRAULIC LOCK RELAY.**

- Reconnect the machine harness connectors J1 and J2 to the Machine ECM.
- Turn the disconnect switch and the key start switch to the ON position.
- At the machine harness connector of the hydraulic lock on relay, measure the voltage between contact 1 (wire E564-PK) and frame ground while the hydraulic lock lever is moved from the LOCKED position to the RELEASED position.

Expected Result:

The voltage measures 18 VDC to 28 VDC when the lever is in the RELEASED position and the voltage measures approximately 0.0 ± 0.5 VDC in the LOCKED position.

Results:

- **OK** - The voltage measures 18 VDC to 28 VDC when the lever is in the RELEASED position and the voltage measures approximately 0.0 ± 0.5 VDC in the LOCKED position. The voltage is correct.

Repair: The relay has failed. Replace the hydraulic lock relay.

STOP

- **NOT OK** - The voltage does not measure 18 VDC to 28 VDC when the lever is in the RELEASED position and the voltage does not measure approximately 0.0 ± 0.5 VDC in the LOCKED position. The voltage is not correct. The machine harness or the neutral start switch has failed. Proceed to Test Step 6.

Test Step 6. CHECK THE "NEUTRAL START" SWITCH CIRCUIT.

- Turn the key start switch and the disconnect switch to the OFF position.
- Disconnect the machine harness connector from the "neutral start" switch.

- C. At the machine harness connector of the "neutral start" switch, measure the resistance between contacts B and C while the hydraulic lock lever is moved from the LOCKED position to the RELEASED position.

Expected Result:

The resistance is less than 5 ohms when the lever is in the RELEASED position. The resistance is greater than 5000 ohms when the lever is in the LOCKED position.

Results:

- **OK** - The resistance is less than 5 ohms when the lever is in the RELEASED position. The resistance is greater than 5000 ohms in the LOCKED position. The resistance is correct.

Repair: The machine harness is open. Repair the machine harness or replace the machine harness.

STOP

- **NOT OK** - The resistance does not measure less than 5 ohms when the lever is in the RELEASED position. The resistance is not greater than 5000 ohms in the LOCKED position. The resistance is not correct.

Repair: The neutral start switch has failed. Replace the neutral start switch.

STOP



Service Information System

Shutdown SIS

Previous Screen

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I02365054

MID 039 - CID 1160 - FMI 06

SMCS - 5059-038-M9; 5479-038-HLK

Conditions Which Generate This Code:

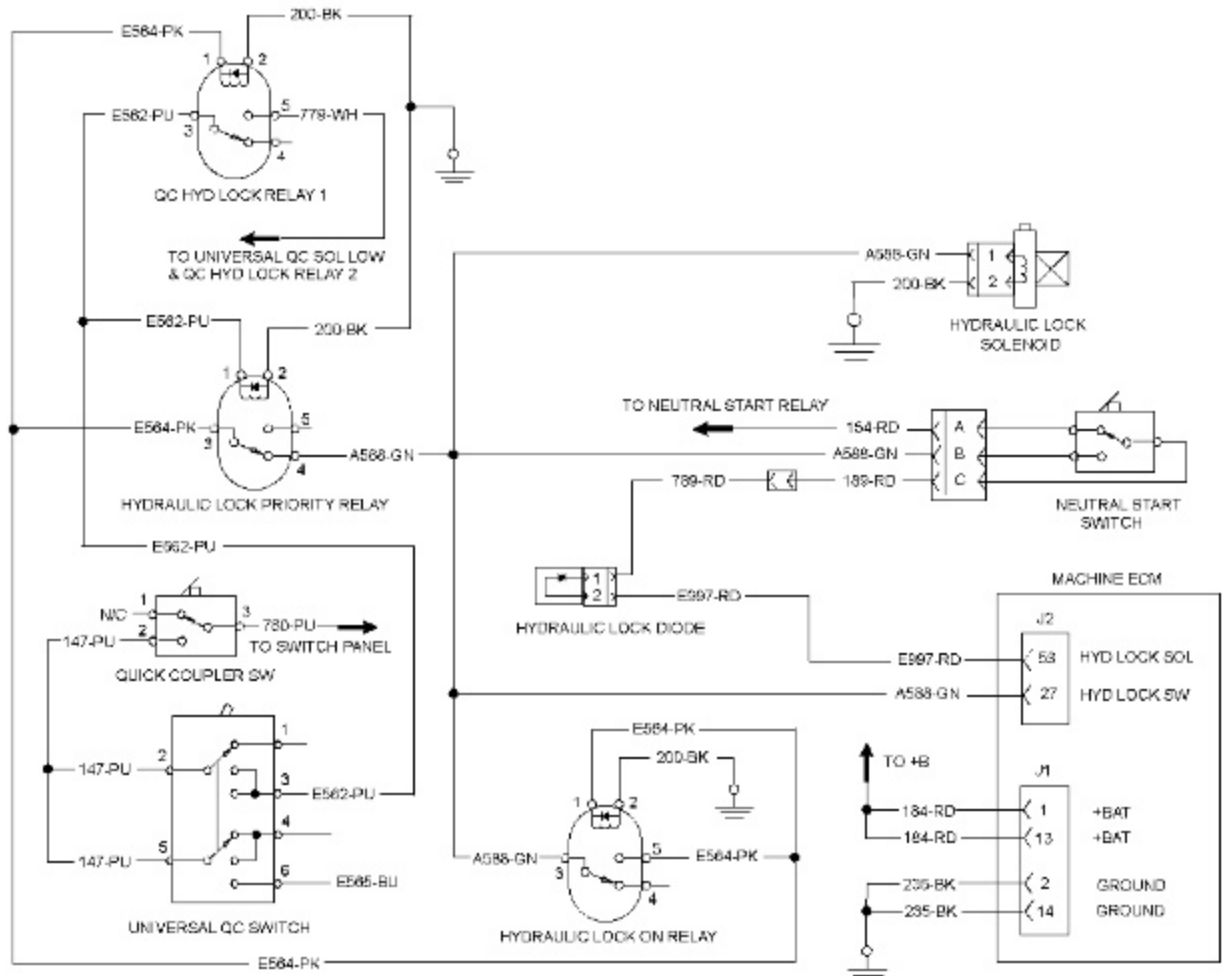


Illustration 1

g01210462

Schematic of the Hydraulic Lock Solenoid

This diagnostic code is associated with the Hydraulic Lock Solenoid. The FMI 06 means that the machine ECM determined that the current is above normal.

The possible causes of this diagnostic code are listed:

- The solenoid energizer circuit is shorted to ground.
- The hydraulic lock relay has failed.
- The machine ECM has failed. This is unlikely.

When this diagnostic code occurs, a warning is displayed on the Monitoring System and the machine ECM disables the hydraulic system.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear the diagnostic codes when the original diagnostic code has been corrected.

Test Step 1. CHECK THE SOLENOID.

- A. Ensure that the hydraulic lock lever is in the UP position.
- B. Turn the disconnect switch and the key start switch to the ON position. Do NOT start the engine.
- C. Ensure that the diagnostic code is active on the Monitoring System.
- D. Disconnect the suspect solenoid from the machine harness.
- E. Observe the Monitoring System.

Expected Result:

The diagnostic code changed on the Monitoring System.

Results:

- **OK** - The diagnostic code changed on the Monitoring System. The circuit is correct.

Repair: The solenoid has failed. Replace the solenoid.

STOP

- **NOT OK** - The diagnostic code did not change on the Monitoring System. The diagnostic code remains active. Proceed to Test Step 2.

Test Step 2. CHECK THE HYDRAULIC ACTIVATION CIRCUIT OF THE HARNESS.

- A. Turn the key start switch to the OFF position.
- B. Disconnect the machine harness connectors J1 and J2 from the machine ECM.
- C. The solenoid remains disconnected from the machine harness.
- D. Place a jumper between contacts 3 (wire A588-GN) and 5 (wire E564-PK) of the hydraulic lock on solenoid.
- E. Place the hydraulic lock lever in the locked position (the down position).
- F. At the machine harness connector J2 for the machine ECM, measure the resistance between contact J2-27 (wire E997-BR) and all sources of ground.

Expected Result:

The resistance measurements are greater than 5000 ohms.

Results:

- **OK** - The resistance measurements are greater than 5000 ohms. The resistance is correct. Proceed to Test Step 3.
- **NOT OK** - The resistance is less than 5000 ohms. The solenoid energizer circuit is shorted to +battery.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS.

- A. Reconnect all machine harness connectors.
- B. Remove the jumper that was placed in the previous test.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Clear all active diagnostic codes from the Monitoring System by pressing the OK key that is located on the keypad.
- E. Operate the machine.
- F. Check the Monitoring System for an active diagnostic code.

Expected Result:

The diagnostic code for the solenoid is not present. The diagnostic information may also be viewed with the ET.

Results:

- **OK** - The diagnostic code for the solenoid is not present. The diagnostic code was probably caused by a poor electrical connection or an open at one of the harness connectors that was disconnected and re connected. Resume normal machine operation.**STOP**
- **NOT OK** - The diagnostic code for the solenoid is still present. The diagnostic code has not been corrected. The machine ECM has failed. It is unlikely that the ECM has failed. Exit this procedure and perform this diagnostic code procedure again.

Repair: If the cause of this diagnostic code is not found, replace the machine ECM. See Testing And Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103756680

MID 039 - CID 1178 - FMI 03

SMCS - 1439-038-BM

Conditions Which Generate This Code:

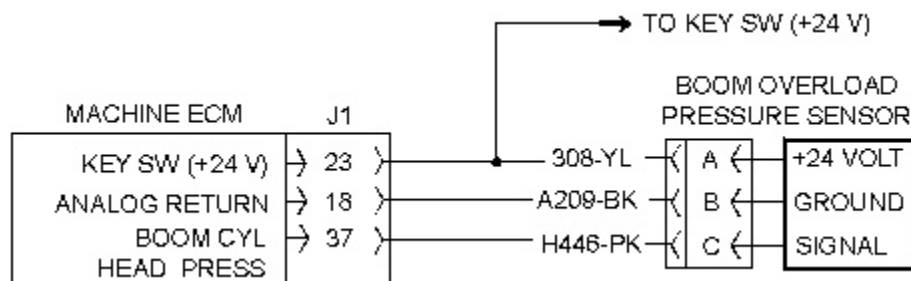


Illustration 1

g02026254

Schematic of the "Boom Overload Pressure" Sensor

This diagnostic code is recorded when the Machine ECM reads the signal voltage of the pressure sensor as being too high.

The possible causes of this diagnostic code are listed below:

- The sensor has failed.
- The sensor supply or the ground circuit in the machine harness is open.

- The signal circuit in the machine harness is open or the sensor is disconnected.
- The Machine ECM has failed. This is unlikely.

Test Step 1. CHECK THE SENSOR.

- A. Turn the disconnect switch and the key start switch to the ON position.
- B. Ensure that the diagnostic code is present.
- C. Observe the status of the diagnostic code. Then, disconnect the machine harness from the sensor.

Expected Result:

If the sensor is not the cause of the diagnostic code, the diagnostic code remains present. If the sensor has failed, the diagnostic code is NO longer present.

Results:

- **OK** - The diagnostic code remains present. The sensor has not failed. The machine harness or the Machine ECM may have failed. Proceed to Test Step 2.
- **NOT OK** - The diagnostic code is NO longer present. The machine harness is correct and the Machine ECM is operating properly. The sensor has failed.

Repair: Replace the sensor. Verify that the new sensor corrects the problem.

STOP

Test Step 2. CHECK THE SIGNAL CIRCUIT.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The machine harness remains disconnected from the sensor.
- C. Disconnect the J1 and J2 connector from the Machine ECM.
- D. At the J1 connector for the ECM, measure the resistance from contact J1-37 (wire H446-PK) to all other J1 and J2 contacts.

Expected Result:

The resistance should be greater than 5 ohms.

Results:

- **YES** - The resistance is greater than 5 ohms. The harness is correct. Proceed to Test Step 3.
- **NO** - The resistance is not greater than 5 ohms for each measurement. There is a short in the harness.

Repair: The short is in the wire with the low resistance measurement. Repair the harness or replace the harness.

STOP

Test Step 3. CHECK THE RETURN CIRCUIT FOR AN OPEN.

- A. The sensor remains disconnected.
- B. The disconnect switch and the key start switch remain in the OFF position.
- C. The machine harness connectors remain disconnected from the Machine ECM.
- D. At the J1 connector for the ECM, measure the resistance between the return contact J1-18 (wire A209-BK) and contact 2 (wire A209-BK) at the sensor.

Expected Result:

The resistance is less than 5 ohms.

Results:

- **YES** - The resistance is less than 5 ohms. The harness resistance is correct. Proceed to Test Step 4.
- **NO** - The resistance is greater than 5 ohms. The return circuit of the harness has failed.

Repair: There is an open in the return wire (A209-BK). Repair the machine harness or replace the machine harness.

STOP

Test Step 4. CHECK IF THE DIAGNOSTIC CODE REMAINS

- A. Inspect the contacts and clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check if the diagnostic code is active.

Expected Result:

The diagnostic code is NOT active.

Results:

- **YES** - The diagnostic code is NO longer active. The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.**STOP**

- **NO** - The diagnostic code remains active. The Machine ECM has failed.

Repair: It is unlikely that the Machine ECM has failed. Exit this procedure and perform this procedure again. Also, recheck if the indicator is illuminated for this diagnostic code. If the cause of the diagnostic code is not found, replace the Machine ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:38:59 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103756743

MID 039 - CID 1178 - FMI 04

SMCS - 1439-038-BM

Conditions Which Generate This Code:

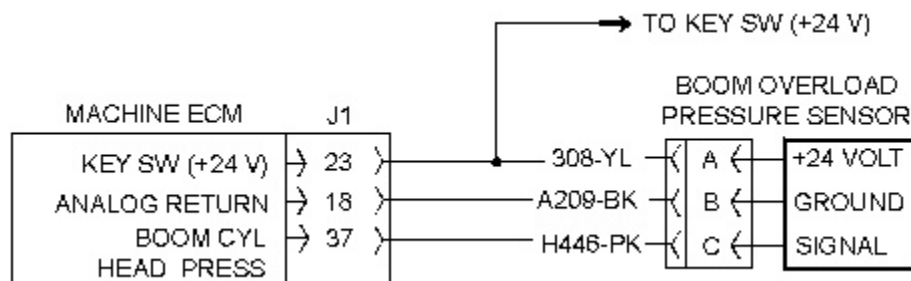


Illustration 1

g02026254

Schematic of the "Boom Overload Pressure" Sensor

This diagnostic code is recorded when the Machine ECM reads the signal voltage of the pressure sensor as being too low.

The possible causes of this diagnostic code are listed below:

- Wire H446-PK is shorted to ground.
- The sensor has failed.

- The ECM has failed. This is unlikely.

Test Step 1. CHECK THE SENSOR

- A. Turn the disconnect switch and the key start switch to the ON position.
- B. Ensure that the diagnostic code is active.
- C. Observe the status of the diagnostic code. Disconnect the machine harness from the sensor.

Expected Result:

The diagnostic code will remain active if the sensor is not the cause of the problem. The sensor is the cause of the problem if the diagnostic code is NO longer active.

Results:

- **OK** - The diagnostic code remains active. The sensor has not failed. The machine harness may have failed or the Machine ECM may have failed. Proceed to Test Step 2.
- **NOT OK** - The diagnostic code is NO longer active.

Repair: The machine harness and the Machine ECM are operating properly. The sensor has failed. Replace the sensor.

STOP

Test Step 2. CHECK THE SIGNAL CIRCUIT FOR A SHORT TO GROUND

- A. The sensor remains disconnected from the machine harness.
- B. Turn the key start switch and the disconnect switch to the OFF position.
- C. Disconnect the machine harness connector J1 and J2 from the Machine ECM.
- D. At the J1 machine harness connector, measure the resistance from contact J1-37 (H446-PK) to all source of ground.

Expected Result:

The resistance should be greater than 5 ohms.

Results:

- **OK** - The resistance is greater than 5 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - The resistance is less than 5 ohms.

Repair: There is a short in the machine harness. The short is between the signal circuit (wire H446-PK) and the circuit with the low resistance measurement. Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS.

- A. Clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Observe the status of the diagnostic code.
- D. Operate the machine.
- E. Observe the status of the diagnostic code.

Expected Result:

The diagnostic code is NO longer active.

Results:

- **YES** - The diagnostic code is NO longer active. The diagnostic code does not exist at this time. The initial diagnostic code was probably caused by a poor electrical connection and/or a short at one of the harness connectors that was disconnected and then reconnected. Resume normal machine operation.**STOP**
- **NO** - The diagnostic code has not been corrected. The Machine ECM has failed.

Repair: It is unlikely that the Machine ECM has failed. Exit this procedure and perform this diagnostic code procedure again. Replace the ECM if the cause of the diagnostic code is not found. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I04170113

MID 039 - CID 1178 - FMI 08

SMCS - 1439-038-BM

Conditions Which Generate This Code:

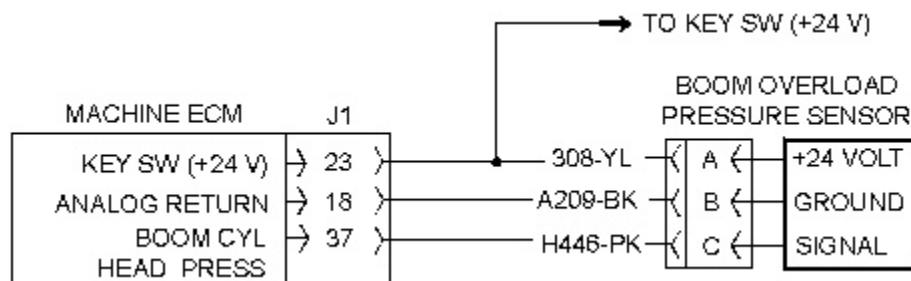


Illustration 1

g02026254

Boom"Overload Pressure" sensor circuit schematic

This diagnostic code is for the Boom"Overload Pressure" sensor. An FMI 08 diagnostic code means the machine ECM has determined the sensor output signal has an abnormal frequency, pulse width, or period.

Possible causes for this diagnostic code are:

- Failed sensor.
- Short circuit to the sensor output signal wire.

- Failed machine ECM, but most unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes now, but clear those codes after the original diagnostic code has been corrected.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all of the harness connectors involved in the circuit. Verify that all of the connections in the circuit are clean, secure, and in good condition. If a problem is found with any of the connections: correct the problem and verify that diagnostic code CID 1178 FMI 08 is still active, before performing the following procedures.

System Response:

This failure may result in erratic movement of the machine.

Test Step 1. CHECK THE SENSOR, THE ECM, AND THE MACHINE HARNESS.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connector from the Boom"Overload Pressure" sensor.
- C. In the harness connector for the sensor, place a jumper wire between the contact for terminal C (wire H446-PK) and the contact for terminal B (wire A209-BK) in the sensor connector.
- D. Turn the key start switch and the disconnect switch to the ON position.
- E. Observe the status of the diagnostic code.

Expected Result:

The 1178 FMI 08 diagnostic code remains active.

Results:

- **YES** - The CID 1178 FMI 08 diagnostic code remains active. The sensor is not causing the problem. Go to Test Step 2.
- **NO** - The CID 1178 FMI 08 diagnostic code is no longer active. The diagnostic code has been replaced by an active CID 1178 with a different FMI code. The sensor has failed.

Repair: Replace the sensor.

Go to Test Step 3.

Test Step 2. CHECK THE MACHINE HARNESS FOR A SHORT CIRCUIT.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The sensor remains disconnected from the harness connector.
- C. Remove the jumper wire from the connector.
- D. Disconnect both the J1 and J2 harness connector from the machine ECM.

- E. At the ECM J1 harness connector, measure the resistance between contact J1-37 (wire H446-PK) and frame ground.
- F. Again at the ECM J1 harness connector, measure the resistance between contact J1-37 (wire H446-PK) and all of the other contacts that are used in both the J1 and J1 ECM harness connectors.

Expected Result:

All resistance readings are greater than 5000 ohms.

Results:

- **YES** - All resistance readings are greater than 5000 ohms. Go to Test Step 3.
- **NO** - All resistance readings are not greater than 5000 ohms. There is a short circuit in the machine harness.

Repair: Repair or replace the harness.

Go to Test Step 3.

Test Step 3. CHECK THE DIAGNOSTIC CODE STATUS.

- A. Reconnect all disconnected machine harness connectors. Make sure that all the connectors are fully seated. Observe that the clips for each connector are securely fastened.
- B. Turn the key start switch and the disconnect switch to the ON position.
- C. Clear all inactive diagnostic codes.
- D. Operate the machine.
- E. Check the status of the CID 1178 FMI 08 diagnostic code.

Expected Result:

The CID 1178 FMI 08 diagnostic code is not active.

Results:

- **YES** - The CID 1178 FMI 08 diagnostic code is no longer active and does not exist at this time.

Repair: The cause for the diagnostic code has been corrected. Return the machine back to normal operations.

STOP

- **NO** - The CID 1178 FMI 08 diagnostic code is still active. The problem has not been corrected. The ECM may have failed.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation

caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the sensor circuit. Perform a "wobble test" on the sensor circuit of the machine wiring harness, using the Caterpillar Electronic Technician service tool. The "wobble test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened. Perform Test Step 3 again. If the problem was again not found, and the original code is still active, the machine ECM may have failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:39:29 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I03756751

MID 039 - CID 1522 - FMI 03

SMCS - 5479-038-CV

Conditions Which Generate This Code:

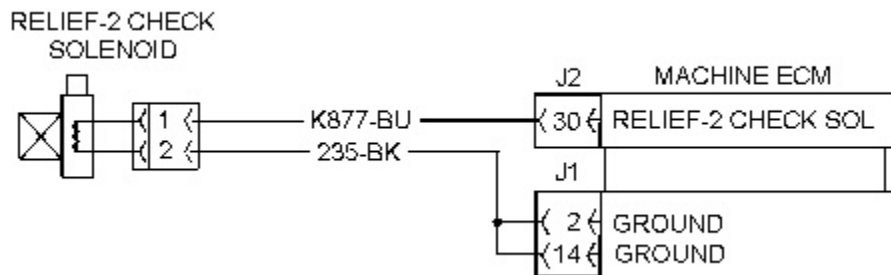


Illustration 1

g02026360

Schematic of the "Relief-2 Check Solenoid (attachment)"

This diagnostic code is associated with the "Relief-2 Check Solenoid (attachment)". The FMI 03 diagnostic code means that the Machine ECM has determined that the voltage is above normal.

The possible causes of the diagnostic code are listed:

- The solenoid has failed.
- The solenoid energizer circuit of the modulating valve is shorted to the +battery circuit.

- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1522 FMI 03 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

When this diagnostic code is active, the ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID ENERGIZER CIRCUIT FOR A SHORT TO THE +BATTERY CIRCUIT

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connectors from the solenoid and the Machine ECM.
- C. At the machine harness connector for the ECM, measure the resistance from contact J2-30 (wire K877-BU) to all contacts that are used in the machine harness connectors for the Machine ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 2.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between J2-30 (K877-BU) and the circuit that has a low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 2. CHECK IF THE DIAGNOSTIC CODE IS STILL ACTIVE

- A. Inspect the contacts and clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Determine if the CID 1522 FMI 03 diagnostic code is active.

Expected Result:

The CID 1522 FMI 03 diagnostic code is active.

Results:

- **YES** - The CID 1522 FMI 03 diagnostic code is active. The problem has not been corrected. The Machine ECM may have failed.

Repair: It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the Machine ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1522 FMI 03 diagnostic code is not active. The problem does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:39:45 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I03756769

MID 039 - CID 1522 - FMI 05

SMCS - 5479-038-CV

Conditions Which Generate This Code:

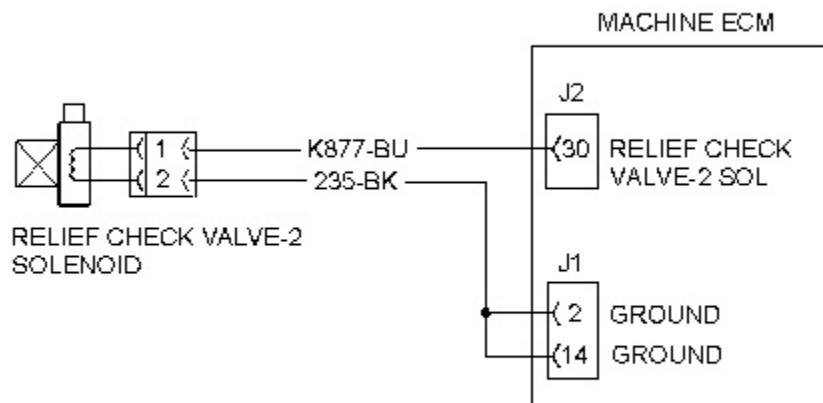


Illustration 1

g01247937

Schematic of the "Relief-2 Check Solenoid (attachment)"

This diagnostic code is associated with the "Relief-2 Check Solenoid (attachment)". The FMI 05 diagnostic code means that the Machine ECM has determined that the current is below normal.

The possible causes of this diagnostic code are listed below:

- The solenoid energizer circuit of the modulating valve is open.
- The return circuit of the modulating valve is open.
- The solenoid has failed.
- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1522 FMI 05 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

When this diagnostic code is active, the Machine ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID

- A. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- B. Disconnect the solenoid with the active diagnostic code from the machine harness.
- C. At the machine harness connector for the solenoid, place a jumper wire from contact 1 (wire K877-BU) to contact 2 (wire 235-BK).
- D. Observe the status of the CID 1522 FMI 05 diagnostic code.

Expected Result:

The CID 1522 FMI 05 diagnostic code remains active.

Results:

- **YES** - The diagnostic code remains active. The jumper wire does not affect the diagnostic code. Proceed to Test Step 2.
- **NO** - The diagnostic is no longer active. The solenoid has failed.

Repair: The solenoid has failed. Repeat this Test Step "CHECK THE SOLENOID" in order to verify the solenoid failure. Replace the solenoid. Verify that the new solenoid corrects the problem.

STOP

Test Step 2. CHECK THE HARNESS FOR AN OPEN

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connector(s) from the Machine ECM.
- C. The jumper wire that was installed in the previous test remains in place.
- D. At the machine harness connector, measure the resistance from signal contact J2-30 (wire K877-BU) to contact J1-2 (wire 235-BK).
- E. At the machine harness connector, measure the resistance from signal contact J2-30 (wire K877-BU) to contact J1-14 (wire 235-BK).

Expected Result:

Both resistances are less than 5.0 ohms.

Results:

- **OK** - Both resistances are less than 5.0 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - Either resistance is greater than 5000 ohms. The resistance measurement is not correct. There is an open circuit in the machine harness.

Repair: The open is in wire K877-BU or in wire 235-BK of the machine harness. Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS

- A. Inspect the contacts of the harness connectors and clean the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 1522 FMI 05 diagnostic code.

Expected Result:

The CID 1522 FMI 05 diagnostic code is active.

Results:

- **YES** - The CID 1522 FMI 05 diagnostic code is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the Machine ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1522 FMI 05 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:40:00 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103756775

MID 039 - CID 1522 - FMI 06

SMCS - 5479-038-CV

Conditions Which Generate This Code:

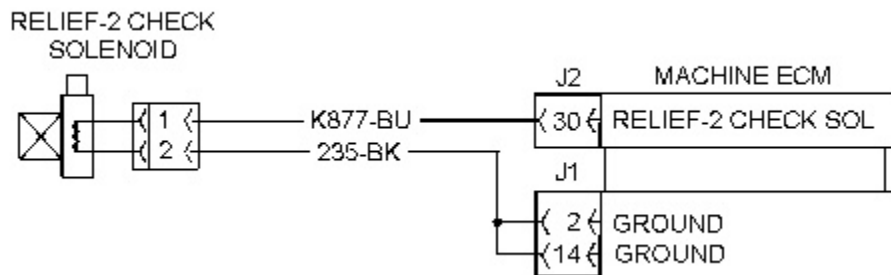


Illustration 1

g02026360

Schematic of the "Relief-2 Check Solenoid (attachment)"

This diagnostic code is associated with the "Relief-2 Check Solenoid (attachment)". The FMI 06 diagnostic code means that the Machine ECM has determined that the current of the solenoid is above normal.

The possible causes of this diagnostic code are listed below:

- The solenoid energizer circuit of the modulating valve is shorted to ground.
- The solenoid has failed.

- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1522 FMI 06 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

When this diagnostic code is active, the ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID

- A. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- B. Observe the status of the diagnostic code.
- C. Disconnect the solenoid with the active diagnostic code from the machine harness.

Expected Result:

The CID 1522 FMI 06 diagnostic code changes to a CID 1522 FMI 05 diagnostic code when the solenoid is disconnected.

Results:

- **YES** - The CID 1522 FMI 06 diagnostic code changes to a CID 1522 FMI 05 diagnostic code when the solenoid is disconnected. The circuit is correct.

Repair: The solenoid has failed. Repeat this test "CHECK THE SOLENOID" in order to verify the solenoid failure. Replace the solenoid.

STOP

- **NO** - The CID 1522 FMI 06 diagnostic code remains active. Proceed to Test Step 2.

Test Step 2. CHECK THE SOLENOID ENERGIZER CIRCUIT FOR A SHORT TO GROUND

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The solenoid remains disconnected from the machine harness.
- C. Disconnect the machine harness connector(s) from the Machine ECM.
- D. At the machine harness connector, measure the resistance from the signal contact J2-30 (wire K877-BU) to all contacts that are used in the machine harness connectors for the Machine ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between J2-30 (wire K877-BU) and the circuit with the low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP**Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS**

- A. Inspect the harness connectors and clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 1522 FMI 06 diagnostic code.

Expected Result:

The CID 1522 FMI 06 diagnostic code is active.

Results:

- **YES** - The CID 1522 FMI 06 diagnostic code is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: It is unlikely that the Machine ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1522 FMI 06 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103756786

MID 039 - CID 1523 - FMI 03

SMCS - 5479-038-CV

Conditions Which Generate This Code:

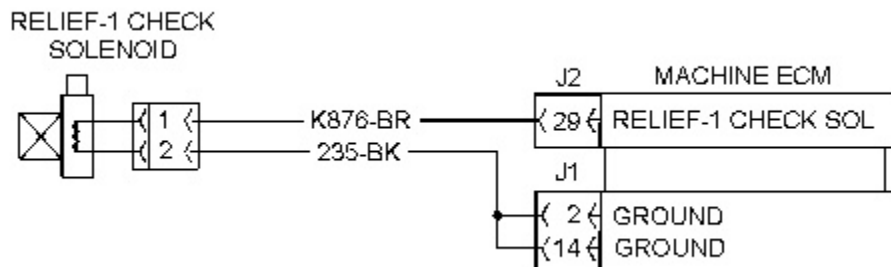


Illustration 1

g02026385

Schematic of the "Relief-1 Check Solenoid (attachment)"

This diagnostic code is associated with the "Relief-1 Check Solenoid (attachment)". The FMI 03 diagnostic code means that the Machine ECM has determined that the voltage is above normal.

The possible causes of the diagnostic code are listed below:

- The solenoid has failed.
- The energizer circuit of the solenoid for the modulating valve is shorted to the +battery circuit.

- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1523 FMI 03 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

When this diagnostic code is active, the ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID ENERGIZER CIRCUIT FOR A SHORT TO THE +BATTERY CIRCUIT

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connectors from the solenoid and the Machine ECM.
- C. At the machine harness connector for the Machine ECM, measure the resistance from contact J2-29 (wire K876-BR) to all contacts that are used in the machine harness connectors for the Machine ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 2.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between J2-29 (K876-BR) and the circuit that has a low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 2. CHECK IF THE DIAGNOSTIC CODE IS STILL ACTIVE

- A. Inspect the contacts and clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Determine if the CID 1523 FMI 03 diagnostic code is active.

Expected Result:

The CID 1523 FMI 03 diagnostic code is active.

Results:

- **YES** - The CID 1523 FMI 03 diagnostic code is active. The problem has not been corrected. The ECM may have failed.

Repair: It is unlikely that the Machine ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1523 FMI 03 diagnostic code is not active. The problem does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:40:29 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103756793

MID 039 - CID 1523 - FMI 05

SMCS - 5479-038-CV

Conditions Which Generate This Code:

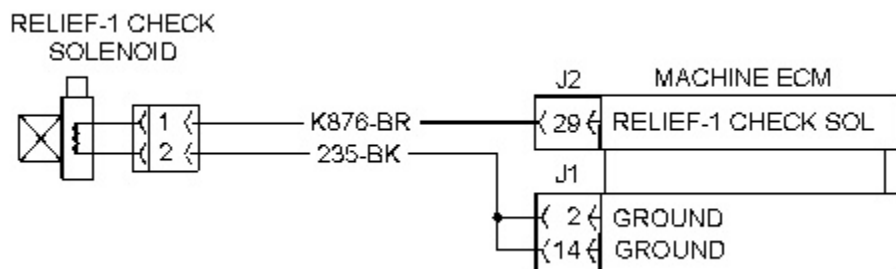


Illustration 1

g02026385

Schematic of the "Relief-1 Check Solenoid (attachment)"

This diagnostic code is associated with the "Relief-1 Check Solenoid (attachment)". The FMI 05 diagnostic code means that the Machine ECM has determined that the current is below normal.

The possible causes of this diagnostic code are listed below:

- The energizer circuit of the modulating valve for the solenoid is open.
- The return circuit of the modulating valve is open.

- The solenoid has failed.
- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1523 FMI 05 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

When this diagnostic code is active, the Machine ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID

- A. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- B. Disconnect the solenoid with the active diagnostic code from the machine harness.
- C. At the machine harness connector for the solenoid, place a jumper wire from contact 1 (wire K876-BR) to contact 2 (wire 235-BK).
- D. Observe the status of the CID 1523 FMI 05 diagnostic code.

Expected Result:

The CID 1523 FMI 05 diagnostic code remains active.

Results:

- **YES** - The diagnostic code remains active. The jumper wire does not affect the diagnostic code. Proceed to Test Step 2.
- **NO** - The diagnostic is no longer active. The solenoid has failed.

Repair: The solenoid has failed. Repeat this Test Step "CHECK THE SOLENOID" in order to verify the solenoid failure. Replace the solenoid. Verify that the new solenoid corrects the problem.

STOP

Test Step 2. CHECK THE HARNESS FOR AN OPEN

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connector(s) from the Machine ECM.
- C. The jumper wire that was installed in the previous test remains in place.
- D. At the machine harness connector, measure the resistance from signal contact J2-29 (wire K876-BR) to contact J1-2 (wire 235-BK).

- E. At the machine harness connector, measure the resistance from signal contact J2-29 (wire K876-BR) to contact J1-14 (wire 235-BK).

Expected Result:

Both resistances are less than 5.0 ohms.

Results:

- **OK** - Both resistances are less than 5.0 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - Either resistance is greater than 5000 ohms. The resistance measurement is not correct. There is an open circuit in the machine harness.

Repair: The open is in wire K876-BR or in wire 235-BK of the machine harness. Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS

- A. Inspect the contacts of the harness connectors and clean the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 1523 FMI 05 diagnostic code.

Expected Result:

The CID 1523 FMI 05 diagnostic code is active.

Results:

- **YES** - The CID 1523 FMI 05 diagnostic code is active. The diagnostic code has not been corrected. The Machine ECM may have failed.

Repair: It is unlikely that the Machine ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1523 FMI 05 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:40:47 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103756795

MID 039 - CID 1523 - FMI 06

SMCS - 5479-038-CV

Conditions Which Generate This Code:

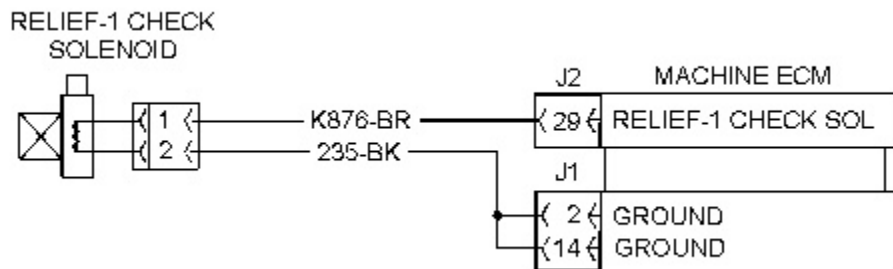


Illustration 1

g02026385

Schematic of the "Relief-1 Check Solenoid (attachment)"

This diagnostic code is associated with the "Relief-1 Check Solenoid (attachment)". The FMI 06 diagnostic code means that the Machine ECM has determined that the current of the solenoid is above normal.

The possible causes of this diagnostic code are listed below:

- The solenoid energizer circuit of the modulating valve is shorted to ground.
- The solenoid has failed.

- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1523 FMI 06 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

When this diagnostic code is active, the Machine ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID

- A. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- B. Observe the status of the diagnostic code.
- C. Disconnect the solenoid with the active diagnostic code from the machine harness.

Expected Result:

The CID 1523 FMI 06 diagnostic code changes to a CID 1523 FMI 05 diagnostic code when the solenoid is disconnected.

Results:

- **YES** - The CID 1523 FMI 06 diagnostic code changes to a CID 1523 FMI 05 diagnostic code when the solenoid is disconnected. The circuit is correct.

Repair: The solenoid has failed. Repeat this test "CHECK THE SOLENOID" in order to verify the solenoid failure. Replace the solenoid.

STOP

- **NO** - The CID 1523 FMI 06 diagnostic code remains active. Proceed to Test Step 2.

Test Step 2. CHECK THE SOLENOID ENERGIZER CIRCUIT FOR A SHORT TO GROUND

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The solenoid remains disconnected from the machine harness.
- C. Disconnect the machine harness connector(s) from the Machine ECM.
- D. At the machine harness connector, measure the resistance from the signal contact J2-29 (wire K876-BR) to all contacts that are used in the machine harness connectors for the Machine ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between J2-29 (wire K876-BR) and the circuit with the low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP**Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS**

- A. Inspect the harness connectors. Clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 1523 FMI 06 diagnostic code.

Expected Result:

The CID 1523 FMI 06 diagnostic code is active.

Results:

- **YES** - The CID 1523 FMI 06 diagnostic code is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the Machine ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1523 FMI 06 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103756796

MID 039 - CID 1525 - FMI 03

SMCS - 5479-038

Conditions Which Generate This Code:

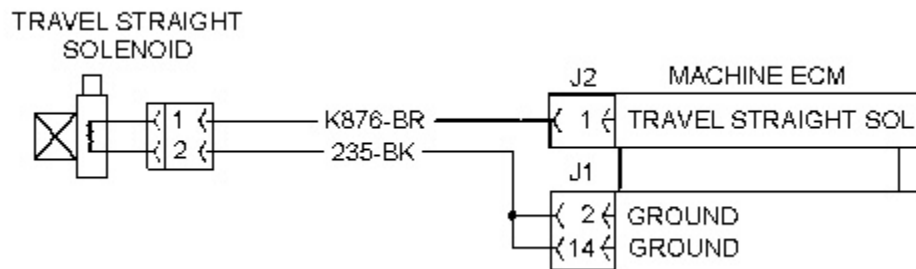


Illustration 1

g02026391

Schematic of the "Travel Straight" Solenoid

This diagnostic code is associated with the "Travel Straight" Solenoid. The FMI 03 diagnostic code means that the Machine ECM has determined that the voltage is above normal.

The possible causes of the diagnostic code are listed below:

- The solenoid has failed.
- The solenoid energizer circuit of the modulating valve is shorted to the +battery circuit.

- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1525 FMI 03 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

When this diagnostic code is active, the Machine ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID ENERGIZER CIRCUIT FOR A SHORT TO THE +BATTERY CIRCUIT

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connectors from the solenoid and the ECM.
- C. At the machine harness connector for the ECM, measure the resistance from contact J2-1 (wire M740-PK) to all contacts that are used in the machine harness connectors for the Machine ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 2.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between J2-1 (M740-PK) and the circuit that has a low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 2. CHECK IF THE DIAGNOSTIC CODE IS STILL ACTIVE

- A. Inspect the contacts and clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Determine if the CID 1525 FMI 03 diagnostic code is active.

Expected Result:

The CID 1525 FMI 03 diagnostic code is active.

Results:

- **YES** - The CID 1525 FMI 03 diagnostic code is active. The problem has not been corrected. The Machine ECM may have failed.

Repair: It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the Machine ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1525 FMI 03 diagnostic code is not active. The problem does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:41:20 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103756801

MID 039 - CID 1525 - FMI 05

SMCS - 5479-038

Conditions Which Generate This Code:

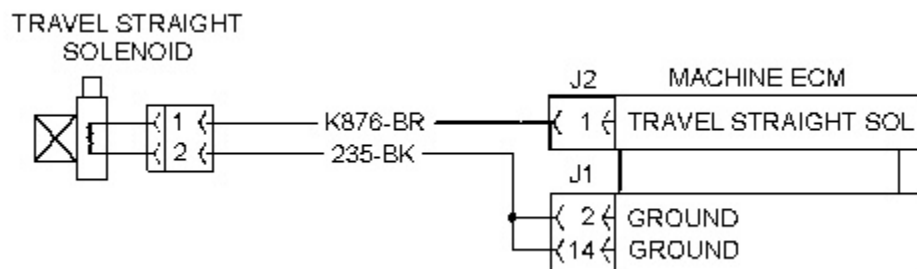


Illustration 1

g02026391

Schematic of the "Travel Straight" Solenoid

This diagnostic code is associated with the "Travel Straight" Solenoid. The FMI 05 diagnostic code means that the Machine ECM has determined that the current is below normal.

The possible causes of this diagnostic code are listed below:

- The solenoid energizer circuit of the modulating valve is open.
- The return circuit of the modulating valve is open.

- The solenoid has failed.
- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1525 FMI 05 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

When this diagnostic code is active, the Machine ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID

- A. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- B. Disconnect the solenoid with the active diagnostic code from the machine harness.
- C. At the machine harness connector for the solenoid, place a jumper wire from contact 1 (wire M740-PK) to contact 2 (wire 235-BK).
- D. Observe the status of the CID 1525 FMI 05 diagnostic code.

Expected Result:

The CID 1525 FMI 05 diagnostic code remains active.

Results:

- **YES** - The diagnostic code remains active. The jumper wire does not affect the diagnostic code. Proceed to Test Step 2.
- **NO** - The diagnostic is no longer active. The solenoid has failed.

Repair: The solenoid has failed. Repeat this Test Step "CHECK THE SOLENOID" in order to verify the solenoid failure. Replace the solenoid. Verify that the new solenoid corrects the problem.

STOP

Test Step 2. CHECK THE HARNESS FOR AN OPEN

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connector(s) from the Machine ECM.
- C. The jumper wire that was installed in the previous test remains in place.
- D. At the machine harness connector, measure the resistance from signal contact J2-1 (wire M740-PK) to contact J1-2 (wire 235-BK).

- E. At the machine harness connector, measure the resistance from signal contact J2-1 (wire M740-PK) to contact J1-14 (wire 235-BK).

Expected Result:

Both resistances are less than 5.0 ohms.

Results:

- **OK** - Both resistances are less than 5.0 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - Either resistance is greater than 5000 ohms. The resistance measurement is not correct. There is an open circuit in the machine harness.

Repair: The open is in wire M740-PK or in wire 235-BK of the machine harness. Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS

- A. Inspect the contacts of the harness connectors and clean the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 1525 FMI 05 diagnostic code.

Expected Result:

The CID 1525 FMI 05 diagnostic code is active.

Results:

- **YES** - The CID 1525 FMI 05 diagnostic code is active. The diagnostic code has not been corrected. The Machine ECM may have failed.

Repair: It is unlikely that the Machine ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1525 FMI 05 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:41:37 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103756804

MID 039 - CID 1525 - FMI 06

SMCS - 5479-038

Conditions Which Generate This Code:

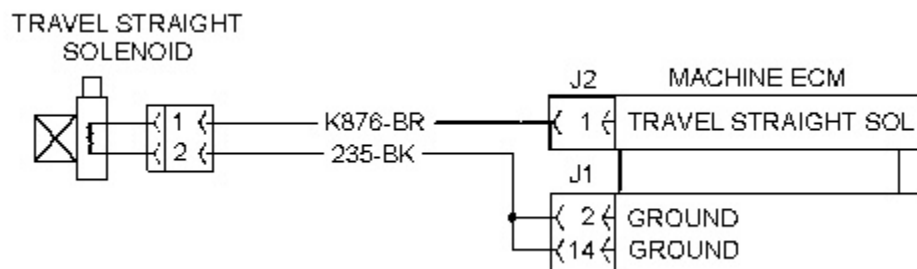


Illustration 1

g02026391

Schematic of the "Travel Straight" Solenoid

This diagnostic code is associated with the "Travel Straight" Solenoid. The FMI 06 diagnostic code means that the ECM has determined that the current of the solenoid is above normal.

The possible causes of this diagnostic code are listed below:

- The solenoid energizer circuit of the modulating valve is shorted to ground.
- The solenoid has failed.

- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1525 FMI 06 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

When this diagnostic code is active, the Machine ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID

- A. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- B. Observe the status of the diagnostic code.
- C. Disconnect the solenoid with the active diagnostic code from the machine harness.

Expected Result:

The CID 1525 FMI 06 diagnostic code changes to a CID 1525 FMI 05 diagnostic code when the solenoid is disconnected.

Results:

- **YES** - The CID 1525 FMI 06 diagnostic code changes to a CID 1525 FMI 05 diagnostic code when the solenoid is disconnected. The circuit is correct.

Repair: The solenoid has failed. Repeat this test "CHECK THE SOLENOID" in order to verify the solenoid failure. Replace the solenoid.

STOP

- **NO** - The CID 1525 FMI 06 diagnostic code remains active. Proceed to Test Step 2.

Test Step 2. CHECK THE SOLENOID ENERGIZER CIRCUIT FOR A SHORT TO GROUND

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The solenoid remains disconnected from the machine harness.
- C. Disconnect the machine harness connector(s) from the Machine ECM.
- D. At the machine harness connector, measure the resistance from the signal contact J2-1 (wire M740-PK) to all contacts that are used in the machine harness connectors for the Machine ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between J2-1 (wire M740-PK) and the circuit with the low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS

- A. Inspect the harness connectors and clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 1525 FMI 06 diagnostic code.

Expected Result:

The CID 1525 FMI 06 diagnostic code is active.

Results:

- **YES** - The CID 1525 FMI 06 diagnostic code is active. The diagnostic code has not been corrected. The Machine ECM may have failed.

Repair: It is unlikely that the Machine ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1525 FMI 06 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

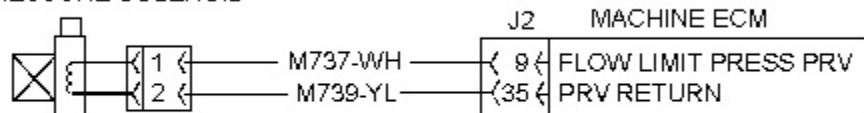
I05434610

MID 039 - CID 1590 - FMI 03

SMCS - 5479-038-FW

Conditions Which Generate This Code:

MAIN PUMP FLOW LIMITATION
PRESSURE SOLENOID



(ATCH NFC LIMIT SOLENOID)

Illustration 1

g02153156

Schematic of the Flow Limit Pressure solenoid

This diagnostic code is associated with the Flow Limit Pressure solenoid. An FMI 03 diagnostic code means that Machine ECM has determined the voltage in the solenoid circuit is above normal.

Possible causes for this diagnostic code are listed below:

- The Flow Limit Pressure solenoid energize circuit has shorted to a voltage source.
- The Machine ECM may have failed (unlikely).

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes now, but clear those codes after the original diagnostic code has been corrected.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all of the harness connectors involved in the circuit. Verify that all of the connections in the circuit are clean, secure, and in good condition. If a problem is found with any of the connections: correct the problem and verify that diagnostic code CID 1590 FMI 03 is still active, before performing the following procedures.

System Response:

When this diagnostic code is active, the Machine ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID, THE ECM, AND THE CIRCUIT CONNECTIONS IN THE MACHINE HARNESS.

- A. Turn the disconnect switch and the key start switch to the OFF position.
- B. Disconnect the machine harness connector from the Flow Limit Pressure solenoid.
- C. At the harness connector for the solenoid, place a jumper wire from contact 1 (M737-WH) to contact 2 (M739-YL) on the connector.
- D. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- E. Observe the status of the CID 1590 FMI 03 diagnostic code.

Expected Result:

The CID 1590 FMI 03 diagnostic code remains active.

Results:

- **YES** - The CID 1590 FMI 03 diagnostic code remains active. The jumper wire did not change the code. The solenoid is NOT the cause of the problem.

Repair: The machine harness has failed, or the ECM may have failed.

Go to Test Step 2.

- **NO** - The CID 1590 FMI 03 code is no longer active, and has been replaced by an active CID 1590 FMI 06 diagnostic code. The ECM has detected a valid diagnostic code.

Repair: The ECM, and the harness connections, are correct. The solenoid has failed. Perform Test Step 1 again, to verify the solenoid failure. Replace the solenoid.

Go to Test Step 3.

Test Step 2. CHECK THE SOLENOID ENERGIZE CIRCUIT FOR A SHORT TO A VOLTAGE SOURCE.

- A. Turn the key start switch and the disconnect switch to the OFF position.

- B. The harness connector remains disconnected from the Flow Limit Pressure solenoid.
- C. Remove the jumper wire inserted in Test Step 1.
- D. Disconnect the J1 and J2 machine harness connectors from the Machine ECM.
- E. At the ECM J2 harness connector, measure the resistance from contact J2-9 (M737-WH) to all of the other contacts that are used in the machine harness connectors for the ECM.

Expected Result:

Each resistance is more than 5000 ohms.

Results:

- **YES** - Each resistance is more than 5000 ohms. The machine harness is correct. Go to Test Step 3.
- **NO** - Each resistance is NOT more than 5000 ohms. There is a short in the harness. The short is between contact J2-9 (M737-WH) and the circuit with the low resistance.

Repair: Repair, or replace, the harness.

Go to Test Step 3.

Test Step 3. CHECK IF THE DIAGNOSTIC CODE IS STILL ACTIVE

- A. Remove any jumper wires still inserted.
- B. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened securely.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Clear all inactive diagnostic codes.
- E. Operate the machine.
- F. Check the status of the CID 1590 FMI 03 diagnostic code.

Expected Result:

The CID 1590 FMI 03 diagnostic code is no longer active.

Results:

- **YES** - The CID 1590 FMI 03 diagnostic code is no longer active. The code does not exist at this time.

Repair: The cause for the diagnostic code appears to have been corrected. Return the machine back to normal operations.

STOP

- **NO** - The CID 1590 FMI 03 diagnostic code is still active. The problem has NOT been corrected.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the solenoid circuit. Perform a "wiggle test" on the solenoid circuit of the machine wiring harness, using the Cat[®] Electronic Technician service tool. The "wiggle test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened. Perform Test Step 3 again. If the problem has NOT been found, and this diagnostic code is still active, the ECM may have failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:42:17 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

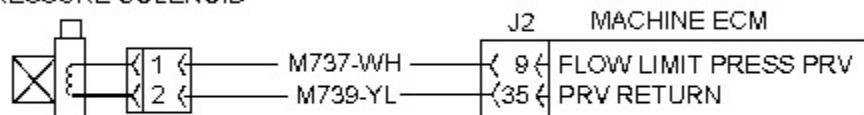
I05434616

MID 039 - CID 1590 - FMI 05

SMCS - 5479-038-FW

Conditions Which Generate This Code:

MAIN PUMP FLOW LIMITATION PRESSURE SOLENOID



(ATCH NFC LIMIT SOLENOID)

Illustration 1

g02153156

Schematic of the Flow Limit Pressure solenoid

This diagnostic code is associated with the Flow Limit Pressure solenoid. An FMI 05 diagnostic code means the ECM has determined the current of the solenoid circuit is below normal.

Possible causes of this diagnostic code are listed below:

- The Flow Limit Pressure solenoid has failed.
- An open wire in the Flow Limit Pressure solenoid circuits.

- The Machine ECM may have failed (unlikely).

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes now, but clear those codes after the original diagnostic code has been corrected.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all of the harness connectors involved in the circuit. Verify that all of the connections in the circuit are clean, secure, and in good condition. If a problem is found with any of the connections: correct the problem and verify that diagnostic code CID 1590 FMI 05 is still active, before performing the following procedures.

System Response:

When this diagnostic code is active, the ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID, THE ECM, AND THE CIRCUIT CONNECTIONS IN THE MACHINE HARNESS.

- Turn the disconnect switch and the key start switch to the OFF position.
- Disconnect the machine harness connector from the Flow Limit Pressure solenoid.
- At the harness connector for the solenoid, place a jumper wire from contact 1 (M737-WH) to contact 2 (M739-YL) on the connector.
- Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- Observe the status of the CID 1590 FMI 05 diagnostic code.

Expected Result:

The CID 1590 FMI 05 diagnostic code remains active.

Results:

- **YES** - The CID 1590 FMI 05 code remains active. The jumper wire did not change the code. The solenoid is NOT the cause of the problem.

Repair: The machine harness has failed, or the ECM may have failed.

Go to Test Step 2.

- **NO** - The CID 1590 FMI 05 code is NOT active, and has been replaced by an active CID 1590 FMI 06 diagnostic code. The ECM has detected a valid diagnostic code.

Repair: The ECM, and the harness connections, are correct. The solenoid has failed. Perform Test Step 1 again, to verify the solenoid failure. Replace the solenoid.

Go to Test Step 3.

Test Step 2. CHECK THE MACHINE HARNESS FOR AN OPEN CONNECTION.

- Turn the key start switch and the disconnect switch to the OFF position.

- B. The jumper wire that was placed into the Flow Limit Pressure solenoid harness connector during Test Step 1 remains in place.
- C. Disconnect the J2 machine harness connector from the machine ECM.
- D. At the ECM J2 harness connector, measure the resistance from contact J2-9 (M737-WH) to contact J2-35 (M739-YL) on the connector.

Expected Result:

The resistance is less than 5.0 ohms.

Results:

- **YES** - The resistance is less than 5.0 ohms. The machine harness is correct. Go to Test Step 3.
- **NO** - The resistance is NOT less than 5.0 ohms. There is an open in the harness.

Repair: The open is in wire M737-WH or in wire M739-YL of the machine harness. Repair, or replace, the harness.

Go to Test Step 3.

Test Step 3. CHECK IF THE DIAGNOSTIC CODE IS STILL ACTIVE.

- A. Remove any jumper wires still inserted.
- B. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are securely fastened.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Clear all inactive diagnostic codes.
- E. Operate the machine.
- F. Check the status of the CID 1590 FMI 05 diagnostic code.

Expected Result:

The CID 1590 FMI 05 diagnostic code is not active.

Results:

- **YES** - The CID 1590 FMI 05 diagnostic code is no longer active. The code does not exist at this time.

Repair: The cause for the diagnostic code appears to have been corrected. Return the machine back to normal operations.

STOP

- **NO** - The CID 1590 FMI 05 diagnostic code is still active. The problem has NOT been corrected.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of the wires that are associated with the solenoid circuit. Perform a "wiggle test" on the solenoid circuit of the machine wiring harness, using the Cat[®] Electronic Technician service tool. The "wiggle test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened. Perform Test Step 4 again. If the problem has NOT been found, and this diagnostic code is still active, the ECM may have failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:42:32 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

I05434619

MID 039 - CID 1590 - FMI 06

SMCS - 5479-038-FW

Conditions Which Generate This Code:

MAIN PUMP FLOW LIMITATION PRESSURE SOLENOID

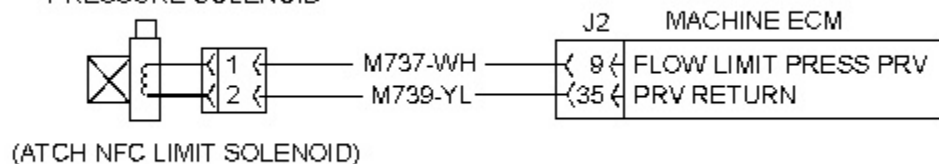


Illustration 1

g02153156

Schematic of the Flow Limit Pressure solenoid

This diagnostic code is associated with the Flow Limit Pressure solenoid. An FMI 06 diagnostic code means the ECM has determined the current of the solenoid circuit is above normal.

Possible causes for this diagnostic code are listed below:

- The Flow Limit Pressure solenoid has failed
- The Flow Limit Pressure solenoid energize circuit is shorted to ground.

- The Machine ECM may have failed (unlikely).

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes now, but clear those codes after the original diagnostic code has been corrected.

Note: Poor connections are often the cause of a problem in electrical circuits. Before performing this procedure, inspect all of the harness connectors involved in the circuit. Verify that all of the connections in the circuit are clean, secure, and in good condition. If a problem is found with any of the connections: correct the problem and verify that diagnostic code CID 1590 FMI 03 is still active, before performing the following procedures.

System Response:

When this diagnostic code is active, the ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID, THE ECM, AND THE CIRCUIT CONNECTIONS IN THE MACHINE HARNESS.

- A. Turn the disconnect switch and the key start switch to the OFF position.
- B. Disconnect the machine harness connector from the Flow Limit Pressure solenoid.
- C. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- D. Observe the status of the CID 1590 FMI 06 diagnostic code.

Expected Result:

The CID 1590 FMI 06 diagnostic code remains active.

Results:

- **YES** - The CID 1590 FMI 06 code remains active. Disconnecting the solenoid did not change the code. The solenoid is NOT the cause of the problem.

Repair: The machine harness has failed, or the ECM may have failed.

Go to Test Step 2.

- **NO** - The CID 1590 FMI 06 diagnostic code is no longer active, and has been replaced by an active CID 1590 FMI 05 diagnostic code. The ECM has detected a valid diagnostic code.

Repair: The ECM, and the harness connections, are correct. The solenoid has failed. Perform Test Step 1 again, to verify the solenoid failure. Replace the solenoid.

Go to Test Step 3

Test Step 2. CHECK THE ENERGIZE CIRCUIT OF THE SOLENOID FOR A SHORT TO GROUND.

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The harness connector remains disconnected from the Flow Limit Pressure solenoid.

- C. Disconnect the J1 and J2 machine harness connectors from the Machine ECM.
- D. At the ECM J2 harness connector, measure the resistance from the signal contact J2-9 (wire M737-WH) to all of the other contacts used in the machine harness connectors for the ECM.

Expected Result:

Each resistance is more than 5000 ohms.

Results:

- **YES** - Each resistance is more than 5000 ohms. The harness is correct. Go to Test Step 3.
- **NO** - Each resistance is NOT more than 5000 ohms. There is a short in the harness. The short is between J2-9 (M737-WH) and the circuit with the low resistance.

Repair: Repair, or replace, the harness.

Go to Test Step 3.

Test Step 3. CHECK IF THE DIAGNOSTIC CODE IS STILL ACTIVE.

- A. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are securely fastened.
- B. Turn the disconnect switch and the key start switch to the ON position.
- C. Clear all inactive diagnostic codes.
- D. Operate the machine.
- E. Check the status of the CID 1590 FMI 06 diagnostic code.

Expected Result:

The CID 1590 FMI 06 diagnostic code is not active.

Results:

- **YES** - The CID 1590 FMI 06 diagnostic code is no longer active. The code does not exist at this time.

Repair: The cause for the diagnostic code appears to have been corrected. Return the machine back to normal operations.

STOP

- **NO** - The CID 1590 FMI 06 diagnostic code is still active. The problem has NOT been corrected.

Repair: If you have not inspected the harness connectors in a previous Test Step, do that now. Clean the contacts of the harness connectors. Check the wires for damage to the insulation caused by excessive heat, battery acid, or chafing. Perform a 45 N (10 lb.) pull test on each of

the wires that are associated with the solenoid circuit. Perform a "wiggle test" on the solenoid circuit of the machine wiring harness, using the Cat[®] Electronic Technician service tool. The "wiggle test" can be used to detect open or shorted connections in the machine wiring harness. Reconnect all harness connectors. Make sure that the connectors are fully seated. Observe that the clips for each connector are fastened. Perform Test Step 3 again. If the problem has NOT been found, and the original code is still active, the ECM may have failed. Prior to replacing an ECM, always contact your Dealership Technical Communicator for possible consultation with Caterpillar, or with the Dealer Solutions Network. This consultation may greatly reduce repair time. If the ECM needs to be replaced, see Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:42:43 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103757890

MID 039 - CID 1593 - FMI 03

SMCS - 5479-038-V4

Conditions Which Generate This Code:

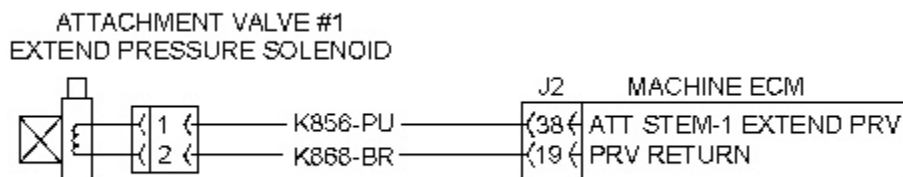


Illustration 1

g02026777

Schematic of the "Attachment Valve #1 Extend Pressure" Solenoid

This diagnostic code is associated with the "Attachment Valve #1 Extend Pressure" Solenoid. The FMI 03 diagnostic code means that the ECM has determined that the voltage is above normal.

The possible causes of the diagnostic code are listed below:

- The solenoid has failed.
- The energizer circuit of the solenoid for the modulating valve is shorted to the +battery circuit.

- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1593 FMI 03 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

When this diagnostic code is active, the ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID ENERGIZER CIRCUIT FOR A SHORT TO THE +BATTERY CIRCUIT

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connectors from the solenoid and the Machine ECM.
- C. At the machine harness connector for the Machine ECM, measure the resistance from contact J2-38 (wire K856-PU) to all contacts that are used in the machine harness connectors for the Machine ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 2.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between J2-38 (K856-PU) and the circuit that has a low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 2. CHECK IF THE DIAGNOSTIC CODE IS STILL ACTIVE

- A. Inspect the contacts and clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Determine if the CID 1593 FMI 03 diagnostic code is active.

Expected Result:

The CID 1593 FMI 03 diagnostic code is active.

Results:

- **YES** - The CID 1593 FMI 03 diagnostic code is active. The problem has not been corrected. The Machine ECM may have failed.

Repair: It is unlikely that the Machine ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1593 FMI 03 diagnostic code is not active. The problem does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:42:55 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103758049

MID 039 - CID 1593 - FMI 05

SMCS - 5479-038-V4

Conditions Which Generate This Code:

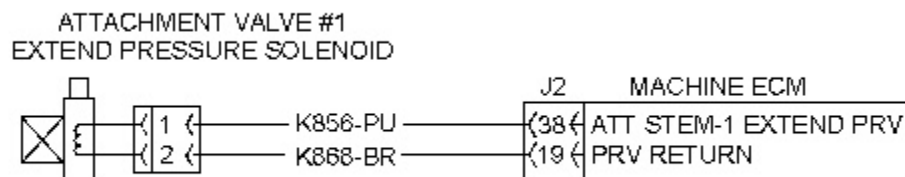


Illustration 1

g02026777

Schematic of the "Attachment Valve #1 Extend Pressure" Solenoid

This diagnostic code is associated with the "Attachment Valve #1 Extend Pressure" Solenoid. The FMI 05 diagnostic code means that the Machine ECM has determined that the current is below normal.

The possible causes of this diagnostic code are listed below:

- The energizer circuit of the solenoid for the modulating valve is open.
- The return circuit of the modulating valve is open.

- The solenoid has failed.
- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1593 FMI 05 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

When this diagnostic code is active, the ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID

- A. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- B. Disconnect the solenoid with the active diagnostic code from the machine harness.
- C. At the machine harness connector for the solenoid, place a jumper wire from contact 1 (wire K856-PU) to contact 2 (wire K868-BR).
- D. Observe the status of the CID 1593 FMI 05 diagnostic code.

Expected Result:

The CID 1593 FMI 05 diagnostic code remains active.

Results:

- **YES** - The diagnostic code remains active. The jumper wire does not affect the diagnostic code. Proceed to Test Step 2.
- **NO** - The diagnostic is no longer active. The solenoid has failed.

Repair: The solenoid has failed. Repeat this Test Step "CHECK THE SOLENOID" in order to verify the solenoid failure. Replace the solenoid. Verify that the new solenoid corrects the problem.

STOP

Test Step 2. CHECK THE HARNESS FOR AN OPEN

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connector(s) from the Machine ECM.
- C. The jumper wire that was installed in the previous test remains in place.
- D. At the machine harness connector, measure the resistance from signal contact J2-38 (wire K856-PU) to contact J2-19 (wire K868-BR).

Expected Result:

Both resistances are less than 5.0 ohms.

Results:

- **OK** - Both resistances are less than 5.0 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - Either resistance is greater than 5000 ohms. The resistance measurement is not correct. There is an open circuit in the machine harness.

Repair: The open is in wire K856-PU or in wire K868-BR of the machine harness. Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS

- A. Inspect the contacts of the harness connectors and clean the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 1593 FMI 05 diagnostic code.

Expected Result:

The CID 1593 FMI 05 diagnostic code is active.

Results:

- **YES** - The CID 1593 FMI 05 diagnostic code is active. The diagnostic code has not been corrected. The Machine ECM may have failed.

Repair: It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1593 FMI 05 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:43:09 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103758072

MID 039 - CID 1593 - FMI 06

SMCS - 5479-038-V4

Conditions Which Generate This Code:

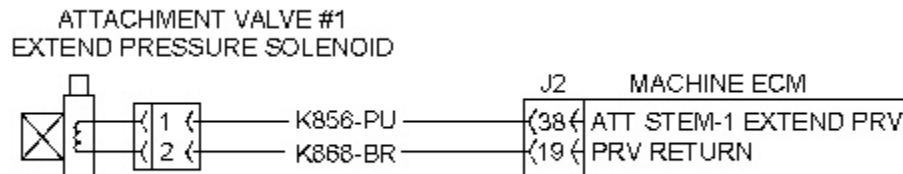


Illustration 1

g02026777

Schematic of the "Attachment Valve #1 Extend Pressure" solenoid

This diagnostic code is associated with the "Attachment Valve #1 Extend Pressure" solenoid. The FMI 06 diagnostic code means that the ECM has determined that the current of the solenoid is above normal.

The possible causes of this diagnostic code are listed below:

- The energizer circuit of the solenoid for the modulating valve is shorted to ground.
- The solenoid has failed.

- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1593 FMI 06 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

When this diagnostic code is active, the Machine ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID

- A. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- B. Observe the status of the diagnostic code.
- C. Disconnect the solenoid with the active diagnostic code from the machine harness.

Expected Result:

The CID 1593 FMI 06 diagnostic code changes to a CID 1593 FMI 05 diagnostic code when the solenoid is disconnected.

Results:

- **YES** - The CID 1593 FMI 06 diagnostic code changes to a CID 1593 FMI 05 diagnostic code when the solenoid is disconnected. The circuit is correct.

Repair: The solenoid has failed. Repeat this test "CHECK THE SOLENOID" in order to verify the solenoid failure. Replace the solenoid.

STOP

- **NO** - The CID 1593 FMI 06 diagnostic code remains active. Proceed to Test Step 2.

Test Step 2. CHECK THE SOLENOID ENERGIZER CIRCUIT FOR A SHORT TO GROUND

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The solenoid remains disconnected from the machine harness.
- C. Disconnect the machine harness connector(s) from the Machine ECM.
- D. At the machine harness connector, measure the resistance from the signal contact J2-38 (wire K856-PU) to all contacts that are used in the machine harness connectors for the Machine ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between J2-38 (wire K856-PU) and the circuit with the low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS

- A. Inspect the harness connectors. Clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 1593 FMI 06 diagnostic code.

Expected Result:

The CID 1593 FMI 06 diagnostic code is active.

Results:

- **YES** - The CID 1593 FMI 06 diagnostic code is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the Machine ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1593 FMI 06 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103758079

MID 039 - CID 1594 - FMI 03

SMCS - 5479-038-V4

Conditions Which Generate This Code:

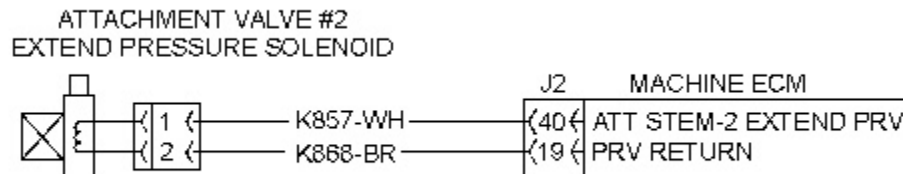


Illustration 1

g02026896

Schematic of the "Attachment Valve #2 Extend Pressure" Solenoid

This diagnostic code is associated with the "Attachment Valve #2 Extend Pressure" Solenoid. The FMI 03 diagnostic code means that the Machine ECM has determined that the voltage is above normal.

The possible causes of the diagnostic code are listed below:

- The solenoid has failed.
- The energizer circuit of the solenoid for the modulating valve is shorted to the +battery circuit.

- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1594 FMI 03 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

When this diagnostic code is active, the ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID ENERGIZER CIRCUIT FOR A SHORT TO THE +BATTERY CIRCUIT

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connectors from the solenoid and the Machine ECM.
- C. At the machine harness connector for the ECM, measure the resistance from contact J2-40 (wire K857-WH) to all contacts that are used in the machine harness connectors for the Machine ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 2.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between J2-40 (K857-WH) and the circuit that has a low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 2. CHECK IF THE DIAGNOSTIC CODE IS STILL ACTIVE

- A. Inspect the contacts and clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Determine if the CID 1594 FMI 03 diagnostic code is active.

Expected Result:

The CID 1594 FMI 03 diagnostic code is active.

Results:

- **YES** - The CID 1594 FMI 03 diagnostic code is active. The problem has not been corrected. The ECM may have failed.

Repair: It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the Machine ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1594 FMI 03 diagnostic code is not active. The problem does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:43:45 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103758092

MID 039 - CID 1594 - FMI 05

SMCS - 5479-038-V4

Conditions Which Generate This Code:

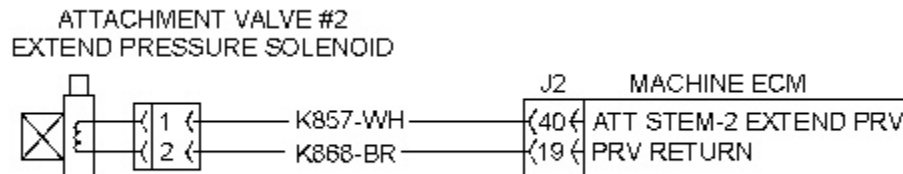


Illustration 1

g02026896

Schematic of the "Attachment Valve #2 Extend Pressure" Solenoid

This diagnostic code is associated with the "Attachment Valve #2 Extend Pressure" Solenoid. The FMI 05 diagnostic code means that the Machine ECM has determined that the current is below normal.

The possible causes of this diagnostic code are listed below:

- The energizer circuit of the solenoid for the modulating valve is open.
- The return circuit of the modulating valve is open.

- The solenoid has failed.
- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1594 FMI 05 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

When this diagnostic code is active, the Machine ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID

- A. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- B. Disconnect the solenoid with the active diagnostic code from the machine harness.
- C. At the machine harness connector for the solenoid, place a jumper wire from contact 1 (wire K857-WH) to contact 2 (wire K868-BR).
- D. Observe the status of the CID 1594 FMI 05 diagnostic code.

Expected Result:

The CID 1594 FMI 05 diagnostic code remains active.

Results:

- **YES** - The diagnostic code remains active. The jumper wire does not affect the diagnostic code. Proceed to Test Step 2.
- **NO** - The diagnostic is no longer active. The solenoid has failed.

Repair: The solenoid has failed. Repeat this Test Step "CHECK THE SOLENOID" in order to verify the solenoid failure. Replace the solenoid. Verify that the new solenoid corrects the problem.

STOP

Test Step 2. CHECK THE HARNESS FOR AN OPEN

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connector(s) from the Machine ECM.
- C. The jumper wire that was installed in the previous test remains in place.
- D. At the machine harness connector, measure the resistance from signal contact J2-40 (wire K857-WH) to contact J2-19 (wire K868-BR).

Expected Result:

Both resistances are less than 5.0 ohms.

Results:

- **OK** - Both resistances are less than 5.0 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - Either resistance is greater than 5000 ohms. The resistance measurement is not correct. There is an open circuit in the machine harness.

Repair: The open is in wire K857-WH or in wire K868-BR of the machine harness. Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS

- A. Inspect the contacts of the harness connectors and clean the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 1594 FMI 05 diagnostic code.

Expected Result:

The CID 1594 FMI 05 diagnostic code is active.

Results:

- **YES** - The CID 1594 FMI 05 diagnostic code is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the Machine ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1594 FMI 05 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:43:59 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103758115

MID 039 - CID 1594 - FMI 06

SMCS - 5479-038-V4

Conditions Which Generate This Code:

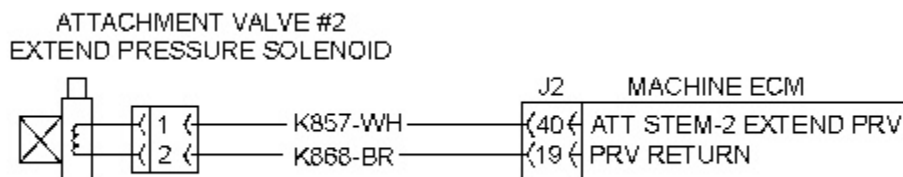


Illustration 1

g02026896

Schematic of the "Attachment Valve #2 Extend Pressure" solenoid

This diagnostic code is associated with the "Attachment Valve #2 Extend Pressure" solenoid. The FMI 06 diagnostic code means that the Machine ECM has determined that the current of the solenoid is above normal.

The possible causes of this diagnostic code are listed below:

- The solenoid energizer circuit of the modulating valve is shorted to ground.
- The solenoid has failed.

- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1594 FMI 06 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

When this diagnostic code is active, the Machine ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID

- A. Turn the disconnect switch and the key start switch to the ON position. Do not start the engine.
- B. Observe the status of the diagnostic code.
- C. Disconnect the solenoid with the active diagnostic code from the machine harness.

Expected Result:

The CID 1594 FMI 06 diagnostic code changes to a CID 1594 FMI 05 diagnostic code when the solenoid is disconnected.

Results:

- **YES** - The CID 1594 FMI 06 diagnostic code changes to a CID 1594 FMI 05 diagnostic code when the solenoid is disconnected. The circuit is correct.

Repair: The solenoid has failed. Repeat this test "CHECK THE SOLENOID" in order to verify the solenoid failure. Replace the solenoid.

STOP

- **NO** - The CID 1594 FMI 06 diagnostic code remains active. Proceed to Test Step 2.

Test Step 2. CHECK THE SOLENOID ENERGIZER CIRCUIT FOR A SHORT TO GROUND

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. The solenoid remains disconnected from the machine harness.
- C. Disconnect the machine harness connector(s) from the ECM.
- D. At the machine harness connector, measure the resistance from the signal contact J2-40 (wire K857-WH) to all contacts that are used in the machine harness connectors for the Machine ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 3.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between J2-40 (wire K857-WH) and the circuit with the low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 3. CHECK IF THE DIAGNOSTIC CODE REMAINS

- A. Inspect the harness connectors and clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Check the status of the CID 1594 FMI 06 diagnostic code.

Expected Result:

The CID 1594 FMI 06 diagnostic code is active.

Results:

- **YES** - The CID 1594 FMI 06 diagnostic code is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: It is unlikely that the Machine ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1594 FMI 06 diagnostic code is not active. The diagnostic code does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Previous Screen](#)

Product: EXCAVATOR

Model: 320D EXCAVATOR BZP

Configuration: 320D Excavator BZP00001-UP (MACHINE) POWERED BY C6.4 Engine

Troubleshooting

320D, 320D2, 321C, 321D, 323D, 324D, 325D, 326D, 328D, 329D, 330D, 336D, 336D2, 340D, 340D2 and 340D2 Excavators, 324D FM Forest Machine and 323D MHPU, 324D MHPU, 325D MHPU, 329D MHPU, 330D MHPU and 336D MHPU Mobile Hydraulic Power Units Machine Electronic Control System

Media Number -REN9848-24

Publication Date -01/04/2014

Date Updated -30/04/2014

103758181

MID 039 - CID 1595 - FMI 03

SMCS - 5479-038-V4

Conditions Which Generate This Code:

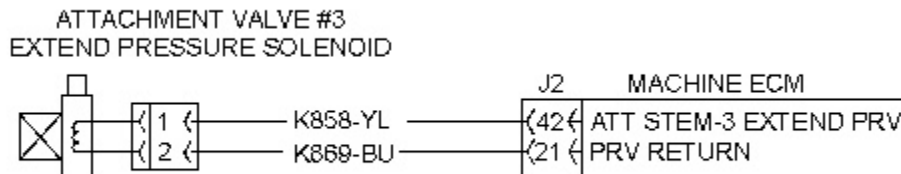


Illustration 1

g02026953

Schematic of the "Attachment Valve #3 Extend Pressure" Solenoid

This diagnostic code is associated with the "Attachment Valve #3 Extend Pressure" Solenoid. The FMI 03 diagnostic code means that the Machine ECM has determined that the voltage is above normal.

The possible causes of the diagnostic code are listed below:

- The solenoid has failed.
- The energizer circuit of the solenoid for the modulating valve is shorted to the +battery circuit.

- The ECM has failed. This is unlikely.

Note: The following test procedure may create other diagnostic codes. Ignore these created diagnostic codes and clear these diagnostic codes when the original diagnostic code has been corrected. **Ensure that the diagnostic code of CID 1595 FMI 03 is active before performing this procedure.**

Note: Use the **146-4080** Digital Multimeter for the measurements in this procedure.

System Response:

When this diagnostic code is active, the Machine ECM will turn off the current to the failed solenoid.

Test Step 1. CHECK THE SOLENOID ENERGIZER CIRCUIT FOR A SHORT TO THE +BATTERY CIRCUIT

- A. Turn the key start switch and the disconnect switch to the OFF position.
- B. Disconnect the machine harness connectors from the solenoid and the Machine ECM.
- C. At the machine harness connector for the ECM, measure the resistance from contact J2-42 (wire K858-YL) to all contacts that are used in the machine harness connectors for the Machine ECM.

Expected Result:

Each resistance measurement is greater than 5000 ohms.

Results:

- **OK** - Each resistance measurement is greater than 5000 ohms. The machine harness is correct. Proceed to Test Step 2.
- **NOT OK** - Each resistance measurement is not greater than 5000 ohms. There is a short in the machine harness. The short is between J2-42 (K858-YL) and the circuit that has a low resistance measurement.

Repair: Repair the machine harness or replace the machine harness.

STOP

Test Step 2. CHECK IF THE DIAGNOSTIC CODE IS STILL ACTIVE

- A. Inspect the contacts of the harness connectors. Clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Turn the disconnect switch and the key start switch to the ON position.
- D. Operate the machine.
- E. Determine if the CID 1595 FMI 03 diagnostic code is active.

Expected Result:

The CID 1595 FMI 03 diagnostic code is active.

Results:

- **YES** - The CID 1595 FMI 03 diagnostic code is active. The problem has not been corrected. The Machine ECM may have failed.

Repair: It is unlikely that the Machine ECM has failed. Exit this procedure and perform this procedure again. If the cause of the diagnostic code is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (ECM) - Replace".

STOP

- **NO** - The CID 1595 FMI 03 diagnostic code is not active. The problem does not exist at this time.

Repair: The initial diagnostic code was probably caused by a poor electrical connection or a short at one of the harness connectors that was disconnected and reconnected. Resume normal machine operation.

STOP

[Copyright 1993 - 2017 Caterpillar Inc.](#)

Sun Apr 23 08:44:24 UTC+0700 2017

[All Rights Reserved.](#)

[Private Network For SIS Licensees.](#)