# SIDS

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6.1  DIAGNOSTIC CODES

The Society of Automotive Engineers (SAE) and the Maintenance Council (TMC) of the American Trucking Association have developed a standard data interchange format referred to as J1587. This format defines a standard data list, controller names and numbers, parameter names and numbers, and diagnostic fault code formats and numbers.

**Subsystem IDentifiers (SID)** are numbers and names used to identify field-repairable or replaceable subsystems with a failure (i.e. RAM, auxiliary output, timing actuator, oil filter, etc.).

**Failure Mode Identifiers (FMI)** describes the type of failure detected in the subsystem or part identified by the SID (i.e. shorted low, shorted high, etc.).

**Flash Code** provides a two-digit number to advise the operator of the general severity of the fault.
6.2 SID 21, FMI 0, FLASH CODE 41, TOO MANY SRS (MISSING TRS)

The Timing Reference Sensor (TRS) measures the amount of crankshaft rotation. The Synchronous Reference Sensor (SRS) indicates the position of No. 1 (front) cylinder. See Figure 6-1. The ECM then knows when to fuel each cylinder from position, rotation, and firing order.

![Figure 6-1 The TRS and SRS](image)

SID 21, FMI 0, Flash Code 41 indicates that the ECM has detected extra SRS pulses, or the ECM has detected missing TRS pulses due to an open wire or a short.

6.2.1 Troubleshooting SID 21, FMI 0, Flash Code 41

Troubleshoot as follows:
NOTICE:
To avoid damage to the harness and connectors when disconnecting harness connectors, ensure the pulling force is applied to the connectors and not to the wires extending from the connectors.

1. Check wire 109 [purple, TRS (-)] for continuity at cavity T-1 in the Engine Sensor Harness (ESH) 30–pin connector (see Figure 6-2) and pin A in the TRS connector (see Figure 6-1). Repair or replace wire if path is open.

2. Check wire 109 [purple, TRS (-)] for short to ground at cavity T-1 in the ESH 30–pin connector (see Figure 6-2) and pin A in the TRS connector (see Figure 6-1). If there is a short, repair or replace the wire.

   [a] If the code is still active, go to step 2.
   [b] If the code is no longer active, refer to section 6.2.2.

Figure 6-2  Engine Sensor Harness 30–pin Connector

   [a] If the code is still active, go to step 3.
   [b] If the code is no longer active, refer to section 6.2.2.
3. Check wire 109 [purple, TRS (-)] for short to wire 416 (gray, 5 VDC sensor supply) at cavities T-1 (wire 109) and W-1 (wire 416) in the ESH 30–pin connector (see Figure 6-2) and pin A in the TRS connector (see Figure 6-1). If there is a short, repair or replace the wire(s).

   [a] If the code is still active, go to step 4.
   [b] If the code is no longer active, refer to section 6.2.2.

4. Check wire 110 [dark green, TRS (+)] for continuity at cavity T-2 in the ESH 30–pin connector (see Figure 6-2) and pin B in the TRS connector (see Figure 6-1). Repair or replace wire if path is open.

   [a] If the code is still active, go to step 5.
   [b] If the code is no longer active, refer to section 6.2.2.

5. Check wire 110 [dark green, TRS (+)] for short to ground at cavity T-2 in the ESH 30–pin connector (see Figure 6-2) and pin B in the TRS connector (see Figure 6-1). If there is a short, repair or replace the wire.

   [a] If the code is still active, go to step 6.
   [b] If the code is no longer active, refer to section 6.2.2.

6. Check wire 110 [dark green, TRS (+)] for short to wire 416 (gray, 5 VDC sensor supply) at cavities T-2 (wire 110) and W-1 (wire 416) in the ESH 30–pin connector (see Figure 6-2) and pin B in the TRS connector (see Figure 6-1). If there is a short, repair or replace the wire(s).

   [a] If the code is still active, call Detroit Diesel Technical Service.
   [b] If the code is no longer active, refer to section 6.2.2.

6.2.2 Verification

Verify that troubleshooting was successful:

1. Check the DDR to see if SID 21, FMI 0, Flash Code 41 is still active.

   [a] If the code is still active, go to step 2.
   [b] If the code is not active, troubleshooting is complete.

2. If code is still active, call Detroit Diesel Technical Service.
6.3 SID 21, FMI 1, FLASH CODE 42, TOO FEW SRS (MISSING SRS)

The Synchronous Reference Sensor (SRS) indicates the position of No. 1 (front) cylinder. See Figure 6-3.

Figure 6-3 The TRS and SRS

SID 21, FMI 1, Flash Code 42 indicates that the ECM has not detected the required SRS pulses.

6.3.1 Troubleshooting SID 21, FMI 1, Flash Code 42

Troubleshoot as follows:
NOTICE:

To avoid damage to the harness and connectors when disconnecting harness connectors, ensure the pulling force is applied to the connectors and not to the wires extending from the connectors.

1. Check wire 111 [light blue, SRS (+)] for continuity at cavity S-2 in the Engine Sensor Harness (ESH) 30–pin connector (see Figure 6-4) and pin B in the SRS connector (see Figure 6-3). Repair or replace wire if path is open.

2. Check wire 111 [light blue, SRS (+)] for short to ground at cavity S-2 in the ESH 30–pin connector (see Figure 6-4) and pin B in the SRS connector (see Figure 6-3). If there is a short, repair or replace the wire.

   [a] If the code is still active, go to step 3.
   [b] If the code is no longer active, refer to section 6.3.2.

All information subject to change without notice.
3. Check wire 111 [light blue, SRS (+)] for short to wire 416 (gray, 5 VDC sensor supply) at cavities S-2 (wire 111) and W-1 (wire 416) in the ESH 30-pin connector (see Figure 6-4) and pin B in the SRS connector (see Figure 6-3). If there is a short, repair or replace the wire(s).
   
   [a] If the code is still active, go to step 4.
   
   [b] If the code is no longer active, refer to section 6.3.2.

4. Check wire 112 [white, SRS (-)] for continuity at cavity S-1 in the ESH 30-pin connector (see Figure 6-4) and pin A in the SRS connector (see Figure 6-3). Repair or replace wire if path is open.
   
   [a] If the code is still active, go to step 5.
   
   [b] If the code is no longer active, refer to section 6.3.2.

5. Check wire 112 [white, SRS (-)] for short to ground at cavity S-1 in the ESH 30-pin connector (see Figure 6-4) and pin A in the SRS connector (see Figure 6-3). If there is a short, repair or replace the wire.
   
   [a] If the code is still active, go to step 6.
   
   [b] If the code is no longer active, refer to section 6.3.2.

6. Check wire 112 [white, SRS (-)] for short to wire 416 (gray, 5 VDC sensor supply) at cavities S-1 (wire 112) and W-1 (wire 416) in the ESH 30-pin connector (see Figure 6-4) and pin A in the SRS connector (see Figure 6-3). If there is a short, repair or replace the wire(s).
   
   [a] If the code is still active, call Detroit Diesel Technical Service.
   
   [b] If the code is no longer active, refer to section 6.3.2.

6.3.2 Verification

Verify that troubleshooting was successful:

1. Check the DDR to see if SID 21, FMI 1, Flash Code 42 is still active.
   
   [a] If the code is still active, go to step 2.
   
   [b] If the code is not active, troubleshooting is complete.

2. If code is still active, call Detroit Diesel Technical Service.
6.4 SID 51, FMI 4, FLASH CODE 31, AUXILIARY OUTPUT NO. 3, SHORT TO GROUND (HIGH SIDE)

The auxiliary output No. 3 has a short to ground.

6.4.1 Troubleshooting SID 51, FMI 4, Flash Code 31

Troubleshoot as follows:

<table>
<thead>
<tr>
<th>NOTICE:</th>
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<tbody>
<tr>
<td>To avoid damage to the harness and connectors when disconnecting harness connectors, ensure the pulling force is applied to the connectors and not to the wires extending from the connectors.</td>
</tr>
</tbody>
</table>

1. Check wire 561 (red, throttle power relay) for a short to ground at cavity S-3 in the Engine Sensor Harness (ESH) 30–pin connector (see Figure 6-5) and pin A in the 5-way digital output harness connector (see Figure 6-6). If there is a short, repair or replace the wire(s), pins, and sockets.

![Figure 6-5 Engine Sensor Harness 30–pin Connector](image)
[a] If the code is still active, go to step 2.
[b] If the code is no longer active, refer to section 6.4.2.

2. Check wire 562 (orange, fuel solenoid relay) for a short to ground at cavity T-3 in the ESH 30-pin connector (see Figure 6-5) and pin B in the 5-way digital output harness connector (see Figure 6-6). If there is a short, repair or replace the wire(s), pins, and sockets.
   [a] If the code is still active, call Detroit Diesel Technical Service.
   [b] If the code is no longer active, refer to section 6.4.2.

6.4.2 Verification

Verify that troubleshooting was successful:

1. Check the DDR to see if SID 51, FMI 4, Flash Code 31 is still active.
   [a] If the code is still active, go to step 2.
   [b] If the code is not active, troubleshooting is complete.

2. If code is still active, call Detroit Diesel Technical Service.
6.5 **SID 58, FMI 4, FLASH CODE 63, PWM NO. 2 OPEN CIRCUIT**

The PWM No. 2 has an open circuit.

6.5.1 **Troubleshooting SID 58, FMI 4, Flash Code 63**

Troubleshoot as follows:

<table>
<thead>
<tr>
<th>NOTICE:</th>
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<tbody>
<tr>
<td>To avoid damage to the harness and connectors when disconnecting harness connectors, ensure the pulling force is applied to the connectors and not to the wires extending from the connectors.</td>
</tr>
</tbody>
</table>

1. Check wire 909 (light green, PWM No. 2 out) for continuity at cavity Y-1 in the Engine Sensor Harness (ESH) 30-pin connector (see Figure 6-7) and pin E in the throttle actuator connector (see Figure 6-8). If there is an open path, repair or replace the wire, pins, and sockets.

![Figure 6-7 Engine Sensor Harness 30-pin Connector](image)
Figure 6-8  Throttle Actuator Connector

[a] If the code is still active, go to step 2.
[b] If the code is no longer active, refer to section 6.5.2.

2. Check wire 909 (light green, PWM No. 2 out) for short to wire 956 (black, throttle actuator ground) at cavity Y-1 in the ESH 30–pin connector (see Figure 6-7) and pins E (wire 909) and B (wire 956) in the throttle actuator connector (see Figure 6-8). If there is a short, repair or replace the wire(s), pins, and sockets.

[a] If the code is still active, go to step 3.
[b] If the code is no longer active, refer to section 6.5.2.

3. Check wire 909 (light green, PWM No. 2 out) for short to wire 416 (gray, 5 VDC sensor supply) at cavities Y-1 (wire 909) and W-1 (wire 416) in the ESH 30–pin connector (see Figure 6-7) and pins C (wire 416) and E (wire 909) in the throttle actuator connector (see Figure 6-8). If there is a short, repair or replace the wire(s), pins, and sockets.

[a] If the code is still active, call Detroit Diesel Technical Service.
[b] If the code is no longer active, refer to section 6.5.2.

6.5.2  Verification

Verify that troubleshooting was successful:

1. Check the DDR to see if SID 58, FMI 4, Flash Code 63 is still active.
   [a] If the code is still active, go to step 2.
   [b] If the code is not active, troubleshooting is complete.

2. If code is still active, call Detroit Diesel Technical Service.
6.6   SID 59, FMI 3, FLASH CODE 63, PWM NO. 3 SHORT TO BATTERY

The PWM No. 3 has a short to the battery.

6.6.1   Troubleshooting SID 59, FMI 3, Flash Code 63

Troubleshoot as follows:

<table>
<thead>
<tr>
<th>NOTICE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>To avoid damage to the harness and connectors when disconnecting harness connectors, ensure the pulling force is applied to the connectors and not to the wires extending from the connectors.</td>
</tr>
</tbody>
</table>

1. Check wire 910 (orange, PWM No. 3 out) for short to battery (+12/24 VDC) at cavity W-2 in the Engine Sensor Harness (ESH) 30–pin connector (see Figure 6-9) and pin H in the PSV connector (see Figure 6-10). If there is a short, repair or replace the wire, pins, and sockets.

Figure 6-9    Engine Sensor Harness 30–pin Connector
If code is still active, call Detroit Diesel Technical Service.

If the code is no longer active, refer to section 6.6.2.

6.6.2 Verification

Verify that troubleshooting was successful:

1. Check the DDR to see if SID 59, FMI 3, Flash Code 63 is still active.
   [a] If the code is still active, go to step 2.
   [b] If the code is not active, troubleshooting is complete.

2. If code is still active, call Detroit Diesel Technical Service.
6.7 SID 59, FMI 4, FLASH CODE 63, PWM NO. 3 OPEN CIRCUIT

The PWM No. 3 is an open circuit.

6.7.1 Troubleshooting SID 59, FMI 4, Flash Code 63

Troubleshoot as follows:

<table>
<thead>
<tr>
<th>NOTICE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>To avoid damage to the harness and connectors when disconnecting harness connectors, ensure the pulling force is applied to the connectors and not to the wires extending from the connectors.</td>
</tr>
</tbody>
</table>

1. Check wire 910 (orange, PWM No. 3 out) for continuity at cavity W-2 in the Engine Sensor Harness (ESH) 30-pin connector (see Figure 6-11) and pin H in the PSV connector (see Figure 6-12). If there is an open path, repair or replace the wire, pins, and sockets.

![Engine Sensor Harness 30-pin Connector](image)

Figure 6-11 Engine Sensor Harness 30–pin Connector
6.7.2 Verification

Verify that troubleshooting was successful:

1. Check the DDR to see if SID 59, FMI 4, Flash Code 63 is still active.
   [a] If the code is still active, go to step 2.
   [b] If the code is not active, troubleshooting is complete.
2. If code is still active, call Detroit Diesel Technical Service.

Figure 6-12  PSV Connector

[a] If code is still active, call Detroit Diesel Technical Service.
[b] If the code is no longer active, refer to section 6.7.2.
6.8  SID 76, FMI 0, FLASH CODE 66, ENGINE KNOCK LEVEL ABOVE NORMAL RANGE

The engine knock level is above normal range.

6.8.1  Troubleshooting SID 76, FMI 0, Flash Code 66

Refer to section 4 to troubleshoot the knock level above normal range.
6.9 SID 76, FMI 3, FLASH CODE 66, ENGINE KNOCK LEVEL SENSOR INPUT VOLTAGE HIGH

The engine knock level sensor input voltage is above normal range.

6.9.1 Troubleshooting SID 76, FMI 3, Flash Code 66

Troubleshoot as follows:

<table>
<thead>
<tr>
<th>NOTICE:</th>
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<tbody>
<tr>
<td>To avoid damage to the harness and connectors when disconnecting harness connectors, ensure the pulling force is applied to the connectors and not to the wires extending from the connectors.</td>
</tr>
</tbody>
</table>

1. Check wire 976 (dark green, knock sensor) for continuity at cavity L-2 in the Engine Sensor Harness (ESH) 30-pin connector (see Figure 6-13), pin E in the SNEF module connector, and the knock sensor connector (see Figure 6-14). If there is an open path, repair or replace the wire(s), pins, and sockets.

![Figure 6-13 Engine Sensor Harness 30-pin Connector](image)
6.9 SID 76, FMI 3, FLASH CODE 66, ENGINE KNOCK LEVEL SENSOR INPUT VOLTAGE HIGH

Figure 6-14  SNEF Module and Knock Sensor Connectors

[a] If code is still active, go to step 2.
[b] If the code is no longer active, refer to section 6.9.2.

2. Check wire 976 (dark green, knock sensor) for a short to wire 416 (gray, 5 VDC sensor supply) at cavities L-2 (wire 976) and W-1 (wire 416) in the ESH 30-pin connector (see Figure 6-13), pin E in the SNEF module connector, and the knock sensor connector (see Figure 6-14). If there is a short, repair or replace the wire(s), pins, and sockets.
[a] If code is still active, go to step 3.
[b] If the code is no longer active, refer to section 6.9.2.

3. Check wire 976 (dark green, knock sensor) for short to wire 443 (red, 12 VDC SNEF power supply) at cavity L-2 in the ESH 30-pin connector (see Figure 6-13), pins B (wire 443) and E (wire 976) in the SNEF module connector, and the knock sensor connector (see Figure 6-14). If there is a short, repair or replace the wire(s), pins, and sockets.
[a] If code is still active, go to step 4.
[b] If the code is no longer active, refer to section 6.9.2.

4. Check wire 573 (brown, auxiliary timed input) for continuity at cavity X-1 in the ESH 30-pin connector (see Figure 6-13) and pin C in the SNEF module connector (see Figure 6-14). If there is an open path, repair or replace the wire, pins, and sockets.
[a] If code is still active, go to step 5.
[b] If the code is no longer active, refer to section 6.9.2.

5. Check wire 573 (brown, auxiliary timed input) for a short to wire 416 (gray, 5 VDC sensor supply) at cavities X-1 (wire 573) and W-1 (wire 416) in the ESH 30-pin connector (see Figure 6-13) and pin C in the SNEF module connector (see Figure 6-14). If there is a short, repair or replace the wire(s), pins, and sockets.
[a] If code is still active, go to step 6.
[b] If the code is no longer active, refer to section 6.9.2.
6. Check wire 573 (brown, auxiliary timed input) for a short to wire 443 (red, 12 VDC SNEF power supply) at cavity X-1 in the ESH 30-pin connector (see Figure 6-13) and pins B (wire 443) and C (wire 573) in the SNEF module connector (see Figure 6-14). If there is a short, repair or replace the wire(s), pins, and sockets.

[a] If code is still active, call Detroit Diesel Technical Service.

[b] If the code is no longer active, refer to section 6.9.2.

6.9.2 Verification

Verify that troubleshooting was successful:

1. Check the DDR to see if SID 76, FMI 3, Flash Code 66 is still active.
   [a] If the code is still active, go to step 2.
   [b] If the code is not active, troubleshooting is complete.

2. If code is still active, call Detroit Diesel Technical Service.
6.10 SID 76, FMI 4, FLASH CODE 66, ENGINE KNOCK LEVEL SENSOR INPUT VOLTAGE LOW

The engine knock level sensor input voltage is below normal range.

6.10.1 Troubleshooting SID 76, FMI 4, Flash Code 66

Troubleshoot as follows:

<table>
<thead>
<tr>
<th>NOTICE:</th>
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<tbody>
<tr>
<td>To avoid damage to the harness and connectors when disconnecting harness connectors, ensure the pulling force is applied to the connectors and not to the wires extending from the connectors.</td>
</tr>
</tbody>
</table>

1. Check wire 976 (dark green, knock sensor) for short to ground at cavity L-2 in the Engine Sensor Harness (ESH) 30–pin connector (see Figure 6-15), pin E in the SNEF module connector, and the knock sensor connector (see Figure 6-16). If there is a short, repair or replace the wire(s), pins, and sockets.

![Figure 6-15 Engine Sensor Harness 30–pin Connector](image-url)
[a] If code is still active, go to step 2.

[b] If the code is no longer active, refer to section 6.10.2.

2. Check wire 573 (brown, auxiliary timed input) for a short to ground at cavities X-1 in the ESH 30-pin connector (see Figure 6-15) and pin C in the SNEF module connector (see Figure 6-16). If there is a short, repair or replace the wire(s), pins, and sockets.

   [a] If code is still active, call Detroit Diesel Technical Service.

   [b] If the code is no longer active, refer to section 6.10.2.

6.10.2 Verification

Verify that troubleshooting was successful:

1. Check the DDR to see if SID 76, FMI 4, Flash Code 66 is still active.

   [a] If the code is still active, go to step 2.

   [b] If the code is not active, troubleshooting is complete.

2. If code is still active, call Detroit Diesel Technical Service.
6.11 SID 76, FMI 7, FLASH CODE 66, ENGINE KNOCK LEVEL TORQUE REDUCTION

The engine knock level is too high and requires torque reduction.

6.11.1 Troubleshooting SID 76, FMI 7, Flash Code 66

Refer to section 4 to troubleshoot the knock level requiring torque reduction.
6.12 SID 77, FMI 3, FLASH CODE 73, GAS VALVE POSITION INPUT VOLTAGE HIGH

The gas valve position input voltage is above normal range.

6.12.1 Troubleshooting SID 77, FMI 3, Flash Code 73

Troubleshoot as follows:

<table>
<thead>
<tr>
<th>NOTICE:</th>
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<tbody>
<tr>
<td>To avoid damage to the harness and connectors when disconnecting harness connectors, ensure the pulling force is applied to the connectors and not to the wires extending from the connectors.</td>
</tr>
</tbody>
</table>

1. Check wire 958 (orange and black, PSV position) for short to wire 416 (gray, 5 VDC sensor supply) at cavities M-2 (wire 958) and W-1 (wire 416) in the Engine Sensor Harness (ESH) 30-pin connector (see Figure 6-17) and pin E in the PSV connector (see Figure 6-18). If there is a short, repair or replace the wire(s), pins, and sockets.

![Engine Sensor Harness 30-pin Connector](image-url)
6.12 SID 77, FMI 3, FLASH CODE 73, GAS VALVE POSITION INPUT VOLTAGE HIGH

Figure 6-18 PSV Connector

[a] If code is still active, go to step 2.
[b] If the code is no longer active, refer to section 6.12.2.

2. Check wire 958 (orange and black, PSV position) for a short to battery (+12/24 VDC) at cavities M-2 in the ESH 30–pin connector (see Figure 6-17) and pin E in the PSV connector (see Figure 6-18). If there is a short, repair or replace the wire(s), pins, and sockets.

[a] If code is still active, call Detroit Diesel Technical Service.
[b] If the code is no longer active, refer to section 6.12.2.

6.12.2 Verification

Verify that troubleshooting was successful:

1. Check the DDR to see if SID 77, FMI 3, Flash Code 73 is still active.
   [a] If the code is still active, go to step 2.
   [b] If the code is not active, troubleshooting is complete.

2. If code is still active, call Detroit Diesel Technical Service.
6.13 SID 77, FMI 4, FLASH CODE 73, GAS VALVE POSITION INPUT VOLTAGE LOW

The gas valve position input voltage is below normal range.

6.13.1 Troubleshooting for SID 77, FMI 3, Flash Code 73

Troubleshoot as follows:

**NOTICE:**

To avoid damage to the harness and connectors when disconnecting harness connectors, ensure the pulling force is applied to the connectors and not to the wires extending from the connectors.

1. Check wire 958 (orange and black, PSV position) for continuity at cavity M-2 in the Engine Sensor Harness (ESH) 30–pin connector (see Figure 6-19) and pin E in the PSV connector (see Figure 6-20). If there is an open path, repair or replace the wire, pins, and sockets.

![Figure 6-19 Engine Sensor Harness 30–pin Connector](image-url)
6.13 SID 77, FMI 4, FLASH CODE 73, GAS VALVE POSITION INPUT VOLTAGE LOW

Figure 6-20 PSV Connector

[a] If code is still active, go to step 2.
[b] If the code is no longer active, refer to section 6.13.2.

2. Check wire 958 (orange and black, PSV position) for a short to battery (+12/24 VDC) at cavities M-2 in the ESH 30–pin connector (see Figure 6-19) and pin E in the PSV connector (see Figure 6-20). If there is a short, repair or replace the wire(s), pins, and sockets.
   [a] If code is still active, go to step 3.
   [b] If the code is no longer active, refer to section 6.13.2.

3. Check wire 910 (orange, PWM out No. 3) for continuity at cavity W-2 in the ESH 30–pin connector (see Figure 6-19) and pin H in the PSV connector (see Figure 6-20). If there is an open path, repair or replace the wire, pins, and sockets.
   [a] If code is still active, go to step 4.
   [b] If the code is no longer active, refer to section 6.13.2.

4. Check wire 910 (orange, PWM out No. 3) for a short to ground at cavity W-2 in the ESH 30–pin connector (see Figure 6-19) and pin H in the PSV connector (see Figure 6-20). If there is a short, repair or replace the wire, pins, and sockets.
   [a] If code is still active, go to step 5.
   [b] If the code is no longer active, refer to section 6.13.2.

5. Check wire 446 (red, 12 VDC PSV power supply) for continuity at pins A in the PSV connector (see Figure 6-20) and A in the OEM power harness connector (see Figure 6-21). If there is an open path, repair or replace the wire, pins, and sockets.

Figure 6-21 OEM Power Harness Connector

[a] If code is still active, go to step 6.
If the code is no longer active, refer to section 6.13.2.

6. Check wire 150-A (black, PSV ground) for a short to ground at pins B in the PSV connector (see Figure 6-20) and A in the OEM ground harness connector (see Figure 6-22). If there is a short, repair or replace the wire(s), pins, and sockets.

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[b] If the code is still active, call Detroit Diesel Technical Service.
[a] If code is still active, call Detroit Diesel Technical Service.
[b] If the code is no longer active, refer to section 6.13.2.

**6.13.2 Verification**

Verify that troubleshooting was successful:

1. Check the DDR to see if SID 77, FMI 4, Flash Code 73 is still active.
   - [a] If the code is still active, go to step 2.
   - [b] If the code is not active, troubleshooting is complete.

2. If code is still active, call Detroit Diesel Technical Service.
6.14 SID 232, FMI 0, FLASH CODE 75, SENSOR SUPPLY VOLTAGE HIGH

The sensor supply voltage is above normal range.

6.14.1

Troubleshoot as follows:

<table>
<thead>
<tr>
<th>NOTICE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>To avoid damage to the harness and connectors when disconnecting harness connectors, ensure the pulling force is applied to the connectors and not to the wires extending from the connectors.</td>
</tr>
</tbody>
</table>

1. Check wire 916 (red and black, 5 VDC sensor supply) for a short to battery (+12/24 VDC) at cavity A-3 in the Vehicle Interface Harness (VIH) 30-pin connector (see Figure 6-23). If there is a short, repair or replace the wire, pins, and sockets.

Figure 6-23   Vehicle Interface Harness 30-pin Connector

[a] If code is still active, go to step 2.
[b] If the code is no longer active, refer to section 6.14.2.
2. Check wire 416 (gray, 5 VDC sensor supply) for a short to battery (+12/24 VDC) at cavity W-1 in the Engine Sensor Harness (ESH) 30-pin connector (see Figure 6-24). If there is a short, repair or replace the wire, pins, and sockets.

Figure 6-24  Engine Sensor Harness 30-pin Connector

[a] If code is still active, call Detroit Diesel Technical Service.
[b] If the code is no longer active, refer to section 6.14.2.

6.14.2 Verification

Verify that troubleshooting was successful:

1. Check the DDR to see if SID 232, FMI 0, Flash Code 75 is still active.
   [a] If the code is still active, go to step 2.
   [b] If the code is not active, troubleshooting is complete.

2. If code is still active, call Detroit Diesel Technical Service.
6.15 SID 232, FMI 1, FLASH CODE 46, SENSOR SUPPLY VOLTAGE LOW

The sensor supply voltage is below normal range.

6.15.1 Troubleshooting

Troubleshoot as follows:

**NOTICE:**

To avoid damage to the harness and connectors when disconnecting harness connectors, ensure the pulling force is applied to the connectors and not to the wires extending from the connectors.

1. Check wire 916 (red and black, 5 VDC sensor supply) and T-splice wire 749 (yellow, sensor supply diagnostic) for a faulty 51 kΩ resistor at cavities A-3 (wire 916) and D-3 (wire 749) in the Vehicle Interface Harness (VIH) 30-pin connector (see Figure 6-25). Ensure the resistor is a metal film (not carbon) precision resistor with 0 to 1% accuracy and 0.5 Watt or higher rating. If not, replace with proper resistor and repair the wires.

![Vehicle Interface Harness 30-pin Connector](image)

Figure 6-25 Vehicle Interface Harness 30–pin Connector

[a] If code is still active, go to step 2.
2. Check wire 909 (light green, PWM No. 2) for a short to wire 416 (gray, 5 VDC sensor supply) at cavities Y-1 (wire 909) and W-1 (wire 416) in the Engine Sensor Harness (ESH) 30-pin connector (see Figure 6-26) and pin E (wire 909) in the throttle actuator connector (see Figure 6-27). If there is a short, repair or replace the wire(s), pins, and sockets.

   [b] If the code is no longer active, refer to section 6.15.2.

   If code is still active, go to step 3.

   [b] If the code is no longer active, refer to section 6.15.2.

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Figure 6-26  Engine Sensor Harness 30-pin Connector

Figure 6-27  Throttle Actuator Connector
3. Unplug the Electronic Foot Pedal Assembly (EFPA) connector. See Figure 6-28. Using a digital voltmeter, insert the positive (+) lead into pin C (wire 916, red and black) and the negative (-) lead into pin A (wire 952, black) of the TPS 6–pin connector (see Figure 6-29).

![Figure 6-28 Typical Electronic Foot Pedal Assembly Device (Shown with TPS 6–pin Connector)](image)

![Figure 6-29 Typical Electronic Foot Pedal Assembly Connector (Shown for TPS 6–pin Connection)](image)

4. Turn the ignition on and monitor the voltage at the EFPA connector (see Figure 6-29).
   [a] If the voltage is less than 4.9 volts, then go to step 5.
   [b] If the voltage is between 4.9 to 5.1 volts recheck the 51 kΩ resistor. Go to step 1.
   [c] If the code is no longer active, refer to section 6.15.2.
5. Verify the proper operation of the Manifold Absolute Pressure (MAP) sensor. Unplug the MAP sensor (see Figure 6-30). Turn the ignition on and monitor the voltage at the EFPA connector.

[a] If the voltage is between 4.9 to 5.1 volts, then check the MAP sensor connector for damage and repair as required. If there is no damage to the connector, then replace the MAP sensor. Refer to section 5.20.1.1.

[b] If the voltage is less than 4.9 volts, then go to step 6.

[c] If the code is no longer active, reconnect all connectors and refer to section 6.15.2.
6. Verify the proper operation of the Oil Pressure Sensor (OPS). Unplug the OPS (see Figure 6-31). Turn the ignition on and monitor the voltage at the EFPA connector.

![Figure 6-31](20411)

**Figure 6-31** Location of Oil Pressure and Temperature Sensors

[a] If the voltage is between 4.9 to 5.1 volts, then check the OPS connector for damage and repair as required. If there is no damage to the connector, then replace the OPS. Refer to section 5.14.1.1.

[b] If the voltage is less than 4.9 volts, then go to step 7.

[c] If the code is no longer active, reconnect all connectors and refer to section 6.15.2.
7. Verify the proper operation of the Fuel Pressure Sensor (FPS). Unplug the FPS (see Figure 6-32). Turn the ignition on and monitor the voltage at the EFPA connector.

![Fuel Pressure Sensor Location](image)

**Figure 6-32** Fuel Pressure Sensor Location

[a] If the voltage is between 4.9 to 5.1 volts, then check the FPS connector for damage and repair as required. If there is no damage to the connector, then replace the FPS. Refer to section 5.10.1.1.

[b] If the voltage is less than 4.9 volts, then go to step 8.

[c] If the code is no longer active, reconnect all connectors and refer to section 6.15.2.
8. Verify the proper operation of the Barometric Pressure Sensor (BARO sensor). Unplug the BARO sensor (see Figure 6-33). Turn the ignition on and monitor the voltage at the EFPA connector.

Figure 6-33 Barometric Pressure Sensor and Oxygen Sensor Interface Module Location

[a] If the voltage is between 4.9 to 5.1 volts, then check the BARO sensor connector for damage and repair as required. If there is no damage to the connector, then replace the BARO sensor.

[b] If the voltage is less than 4.9 volts, then go to step 9.

[c] If the code is no longer active, reconnect all connectors and refer to section 6.15.2.

9. Verify the proper operation of the oxygen sensor interface module. Unplug the oxygen sensor interface module (see Figure 6-33). Turn the ignition on and monitor the voltage at the EFPA connector.

[a] If the voltage is between 4.9 to 5.1 volts, then check the oxygen sensor interface module connector for damage and repair as required. If there is no damage to the connector, then replace the oxygen sensor interface module.

[b] If the voltage is less than 4.9 volts, then go to step 10.

[c] If the code is no longer active, reconnect all connectors and refer to section 6.15.2.
10. Verify the proper operation of the throttle actuator. Unplug the oxygen sensor interface module (see Figure 6-34). Turn the ignition on and monitor the voltage at the EFPA connector.

![Throttle Actuator for the Series 60G Engine](image)

**Figure 6-34** Throttle Actuator for the Series 60G Engine

[a] If the voltage is between 4.9 to 5.1 volts, then check the throttle actuator connector for damage and repair as required. If there is no damage to the connector, then replace the throttle actuator. Refer to section 5.7.3.1 and refer to section 5.7.3.2.

[b] If the voltage is less than 4.9 volts, then go to step 11.

[c] If the code is no longer active, reconnect all connectors and refer to section 6.15.2.
11. Check wire 416 (gray, 5 VDC sensor supply) for a short to ground at cavity W-1 in the Engine Sensor Harness (ESH) 30–pin connector (see Figure 6-35). If there is a short, repair or replace the wire, pins, and sockets.

Figure 6-35  Engine Sensor Harness 30–pin Connector

[a] If code is still active, go to step 12.
[b] If the code is no longer active, refer to section 6.15.2.
12. Check wire 916 (red and black, 5 VDC sensor supply) for a short to ground at cavity A-3) in the Vehicle Interface Harness (VIH) 30-pin connector (see Figure 6-36). If there is a short, repair or replace the wire, pins, and sockets.

![Vehicle Interface Harness 30-pin Connector](image)

**Figure 6-36** Vehicle Interface Harness 30-pin Connector

[a] If code is still active, call Detroit Diesel Technical Service.
[b] If the code is no longer active, refer to section 6.15.2.

### 6.15.2 Verification

Verify that troubleshooting was successful:

1. Check the DDR to see if SID 232, FMI 1, Flash Code 46 is still active.
   [a] If the code is still active, go to step 2.
   [b] If the code is not active, troubleshooting is complete.
2. If code is still active, call Detroit Diesel Technical Service.
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