

**DK1 CHECK FOR DTCS**

Are DTCs P060D, P1575, P2122, P2123, P2127, P2128 or P2138 present?

|            |                                                                                                                                             |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Yes</b> | GO to <a href="#">DK2</a> .                                                                                                                 |
| <b>No</b>  | For a lack/loss of power symptom, GO to <a href="#">DK2</a> .<br>For all others, RETURN to Section 3, Symptom Charts for further direction. |

**DK2 CHECK THE ACCELERATOR PEDAL FOR OBSTRUCTION**

- Ignition ON, engine OFF.
- Slowly press the accelerator pedal to the fully applied position and then slowly to the fully released position.

Does the pedal easily move to the fully applied position and back?

|            |                                                                                  |
|------------|----------------------------------------------------------------------------------|
| <b>Yes</b> | GO to <a href="#">DK3</a> .                                                      |
| <b>No</b>  | ISOLATE and REPAIR the obstruction.<br>Clear the PCM DTCs. REPEAT the self-test. |

**DK3 CHECK FOR INTERMITTENT APP SIGNAL**

- Ignition ON, engine OFF.
- Access the PCM and monitor the APP1 (VOLT) and APP2 (VOLT) PIDs.
- Set the scan tool PID voltage limit values using the following chart.

| PID  | Minimum Volts | Maximum Volts |
|------|---------------|---------------|
| APP1 | 0.61          | 4.6           |
| APP2 | 0.27          | 2.4           |

- Carry out a thorough wiggle test on the wiring harness from the PCM connector to the APP sensor connector while monitoring the scan tool.

Do both PID values stay within the chart ranges while wiggling the harness?

|            |                                                                                                                                      |
|------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <b>Yes</b> | For symptoms without DTCs, RETURN to Section 3, Symptom Charts for further direction.<br>For all others, GO to <a href="#">DK4</a> . |
| <b>No</b>  | REPAIR the harness or connections as necessary.<br>Clear the PCM DTCs. REPEAT the self-test.                                         |

**DK4 CHECK THE APPVREF VOLTAGE TO THE APP SENSOR**

**Note:** Check the connector pins for intermittent concerns.

- Ignition OFF.
- APP Sensor connector disconnected.
- Ignition ON, engine OFF.
- Measure the voltage between:

|                                          |                                          |
|------------------------------------------|------------------------------------------|
| ( + ) APP Sensor Connector, Harness Side | ( - ) APP Sensor Connector, Harness Side |
|------------------------------------------|------------------------------------------|

| ( + ) APP Sensor Connector, Harness Side | ( - ) APP Sensor Connector, Harness Side |
|------------------------------------------|------------------------------------------|
| APPVREF1 - Pin 1                         | APPRTN1 - Pin 3                          |
| APPVREF2 - Pin 6                         | APPRTN2 - Pin 4                          |

Are the voltages between 4.5 - 5.5 V?

|            |                                         |
|------------|-----------------------------------------|
| <b>Yes</b> | GO to <a href="#">DK5</a> .             |
| <b>No</b>  | GO to Pinpoint Test <a href="#">C</a> . |

#### DK5 CHECK THE APP CIRCUIT FOR AN OPEN

- Ignition OFF.
- PCM connector disconnected.
- Measure the resistance between:

| ( + ) APP Sensor Connector, Harness Side | ( - ) PCM Connector, Harness Side |
|------------------------------------------|-----------------------------------|
| APP1 - Pin 2                             | APP1                              |
| APP2 - Pin 5                             | APP2                              |

Are the resistances less than 5 ohms?

|            |                                                                    |
|------------|--------------------------------------------------------------------|
| <b>Yes</b> | GO to <a href="#">DK6</a> .                                        |
| <b>No</b>  | REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test. |

#### DK6 CHECK THE APP CIRCUIT FOR A SHORT TO GROUND

- Measure the resistance between:

| ( + ) APP Sensor Connector, Harness Side | ( - )  |
|------------------------------------------|--------|
| APP1 - Pin 2                             | Ground |
| APP2 - Pin 5                             | Ground |

Are the resistances greater than 10K ohms?

|            |                                                                     |
|------------|---------------------------------------------------------------------|
| <b>Yes</b> | GO to <a href="#">DK7</a> .                                         |
| <b>No</b>  | REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test. |

#### DK7 CHECK THE APP CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition ON, engine OFF.
- Measure the voltage between:

| ( + ) APP Sensor Connector, Harness Side | ( - )  |
|------------------------------------------|--------|
| APP1 - Pin 2                             | Ground |
| APP2 - Pin 5                             | Ground |

**Is any voltage present?**

|            |                                                                     |
|------------|---------------------------------------------------------------------|
| <b>Yes</b> | REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test. |
| <b>No</b>  | GO to <a href="#">DK8</a> .                                         |

**DK8 CHECK THE APP SENSOR CIRCUITS FOR A SHORT**

- Ignition OFF.
- Measure the resistance between:

| ( + ) APP Sensor Connector, Harness Side | ( - ) APP Sensor Connector, Harness Side |
|------------------------------------------|------------------------------------------|
| APP1 - Pin 2                             | APP2 - Pin 5                             |
| APP1 - Pin 2                             | APPVREF1 - Pin 1                         |
| APP1 - Pin 2                             | APPVREF2 - Pin 6                         |
| APP1 - Pin 2                             | APPRTN1 - Pin 3                          |
| APP1 - Pin 2                             | APPRTN2 - Pin 4                          |
| APP2 - Pin 5                             | APPVREF1 - Pin 1                         |
| APP2 - Pin 5                             | APPVREF2 - Pin 6                         |
| APP2 - Pin 5                             | APPRTN1 - Pin 3                          |
| APP2 - Pin 5                             | APPRTN2 - Pin 4                          |

**Are the resistances greater than 10K ohms?**

|            |                                                                     |
|------------|---------------------------------------------------------------------|
| <b>Yes</b> | GO to <a href="#">DK9</a> .                                         |
| <b>No</b>  | REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test. |

**DK9 SIMULATE THE OPPOSITE SIGNAL**

- Ignition OFF.
- PCM connector connected.
- Ignition ON, engine OFF.
- Access the PCM and monitor the APP1 (VOLT) and APP2 (VOLT) PIDs.
- Record the APP1 and APP2 PID values.
- Connect a 5 amp fused jumper wire between the following:

| Point A APP Sensor Connector, Harness Side | Point B APP Sensor Connector, Harness Side |
|--------------------------------------------|--------------------------------------------|
| APP1 - Pin 2                               | APPVREF1 - Pin 1                           |
| APP2 - Pin 5                               | APPVREF2 - Pin 6                           |

**Are the voltages between 4.5 - 5.5 V?**

|            |                              |
|------------|------------------------------|
| <b>Yes</b> | GO to <a href="#">DK10</a> . |
| <b>No</b>  | GO to <a href="#">DK11</a> . |

**DK10 CHECK THE APP SENSOR**

**Note:** Take 10 seconds to carry out a full sweep of the accelerator pedal from fully released to fully applied to fully released.

- Ignition OFF.
- PCM connector connected.
- APP Sensor connector connected.
- Ignition ON, engine OFF.
- Access the PCM and monitor the APP1 (VOLT) and APP2 (VOLT) PIDs.
- Slowly press the accelerator pedal to the fully applied position and then slowly to the fully released position.

| Accelerator Pedal Position | APP1        | APP2        |
|----------------------------|-------------|-------------|
| Pedal fully released       | 0.61 - 0.97 | 0.27 - 0.53 |
| Pedal fully applied        | 3.59 - 4.6  | 1.72 - 2.4  |

Do both PID values stay within the chart ranges while pressing the pedal.

|            |                                                                                                                                                                              |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Yes</b> | Unable to duplicate the concern at this time.<br>GO to Pinpoint Test <a href="#">Z</a> .                                                                                     |
| <b>No</b>  | INSTALL a new APP sensor. REFER to the Workshop Manual Section 310-02, Acceleration Control to INSTALL a new accelerator pedal.<br>Clear the PCM DTCs. REPEAT the self-test. |

**DK11 CHECK FOR CORRECT PCM OPERATION**

- Disconnect all the PCM connectors.
- Visually inspect for:
  - pushed out pins
  - corrosion
- Connect all the PCM connectors and make sure they seat correctly.
- Carry out the PCM self-test.
- Verify the concern is still present.

Is the concern still present?

|            |                                                                                                                                                                              |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Yes</b> | INSTALL a new PCM. REFER to Section 2, <a href="#">Flash Electrically Erasable Programmable Read Only Memory (EEPROM)</a> , Programming the VID Block for a Replacement PCM. |
| <b>No</b>  | The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.                                                           |

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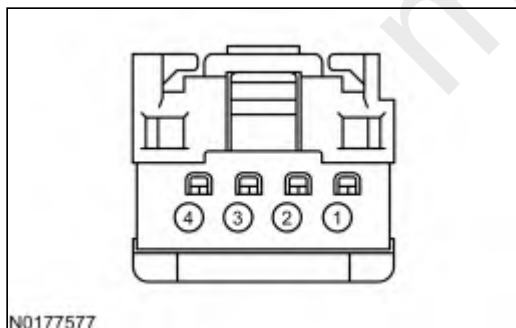
**FA: Ambient Air Temperature (AAT) Sensor**

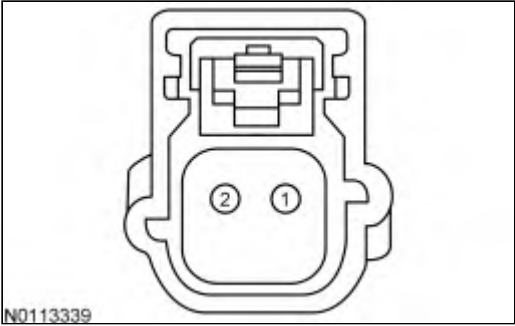
This pinpoint test is intended to diagnose the following:

- AAT sensor
- harness circuits: AAT and SIGRTN

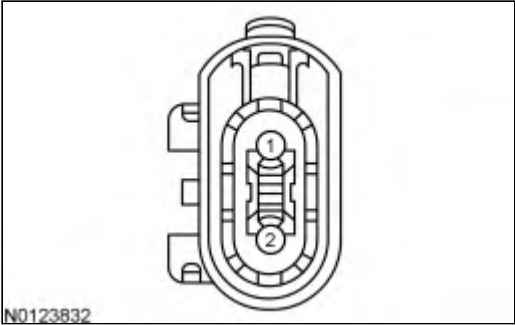
**Ambient Air Temperature (AAT) Sensor Expected Values**

| Temperature  |            | AAT Sensor Values   |
|--------------|------------|---------------------|
| °C           | °F         | Resistance (K ohms) |
| -1.1 to 4.4  | 30 to 40   | 27.49 to 33.47      |
| 4.4 to 10    | 40 to 50   | 22.06 to 28.86      |
| 10 to 15.6   | 50 to 60   | 16.63 to 23.10      |
| 15.6 to 21.1 | 60 to 70   | 11.74 to 17.32      |
| 21.1 to 26.7 | 70 to 80   | 9.34 to 12.14       |
| 26.7 to 32.2 | 80 to 90   | 8.49 to 9.62        |
| 32.2 to 37.8 | 90 to 100  | 5.93 to 7.87        |
| 37.8 to 43.3 | 100 to 110 | 4.78 to 6.11        |

**Ambient Air Temperature (AAT) Sensor Connector****A****B**



C



| Vehicle             | Connector | Pin    | Circuit       |
|---------------------|-----------|--------|---------------|
| F-Series Super Duty | A         | 3<br>1 | SIGRTN<br>AAT |
| Ranger 2.5L         | B         | 1<br>2 | SIGRTN<br>AAT |
| Transit GTDI 3.5L   | C         | 2<br>1 | SIGRTN<br>AAT |
| All other vehicles  | B         | 2<br>1 | SIGRTN<br>AAT |

Powertrain Control Module (PCM) Connector

For PCM connector views or reference values, refer to Section 6, Reference Values.

| Vehicle | Connector | Pin | Circuit |
|---------|-----------|-----|---------|
|         |           |     |         |