

U: IDM Electronic Feedback (EF)

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U1 DIAGNOSTIC TROUBLE CODE (DTC) P1670 and P1668

- DTC P1668 and P1670 indicates that a communication error has occurred between the PCM and the IDM.
- Possible causes:
 - open fuse
 - IDM relay
 - open or shorted IDM enable circuit
 - open/short in EF circuit
 - open/short in FDCS circuit
 - IDM powering circuits
 - PCM
- Check for other codes.
- Key on, engine off.
- Perform KOEO On-Demand Self Test and retrieve continuous DTCs.

Was DTC P1668 present?

Yes	No
<p>If DTC P1668 is present, GO to U2.</p>	<p>If DTCs P1667 and P1663 are set together with or without DTC P1668, GO to U6.</p> <p>If DTC P1298 is also present, REPLACE the IDM.</p> <p>If DTC P1667 is also present, GO to V1.</p> <p>If DTC P1663 is also present, GO to T1.</p> <p>If DTC P1662 is also present, GO to W1.</p> <p>If P1670 was set without any other DTC, GO to U10.</p>

U2 CHECK CIRCUIT 818 (GY/W) FOR OPEN

- Install breakout box. Leave PCM disconnected.
- Disconnect the IDM harness connector.
- Measure resistance on Circuit 818 (GY/W) between PCM Test Pin 48 and IDM harness connector Pin 4.

Is resistance less than 5 ohms?

Yes	No
<p>GO to U3.</p>	<p>REPAIR open in Circuit 818 (GY/W). RESTORE system. CLEAR DTCs and RETEST.</p>

U3 CHECK CIRCUIT 818 (GY/W) FOR SHORT TO GROUND

- Measure resistance between IDM relay Circuit 818 (GY/W) and battery.

Is resistance greater than 10,000 ohms?

Yes	No
GO to U4 .	REPAIR ground short in Circuit 818 (GY/W). RESTORE system. CLEAR DTCs and RETEST.

U4 CHECK CIRCUIT 818 (GY/W) FOR SHORT TO POWER

- Key on, engine off.
- Measure for voltage on Circuit 818 (GY/W) between PCM Test Pin 48 and battery ground.

Is voltage present?

Yes	No
REPAIR short to power on Circuit 818 (GY/W). RESTORE system. CLEAR DTCs and RETEST.	GO to U5 .

U5 CHECK SIGNAL RETURN CIRCUIT 359 (GY/R)

- Measure resistance on Circuit 359 (GY/R) between PCM Test Pin 91 and IDM connector Pin 2.

Is resistance less than 5 ohms?

Yes	No
GO to U6 .	REPAIR open in signal return Circuit 359 (GY/R). RESTORE system. CLEAR DTCs and RETEST.

U6 CHECK IDM POWER

- PCM connected, IDM disconnected.
- Key on, engine off.
- Measure voltage between IDM connector Pin 14 and battery ground.

Is B+ present?

Yes	No
GO to U7 .	GO to W6 .

U7 CHECK IDM GROUND

- Key off.
- Measure resistance between IDM connector Pin 26 and battery ground.

Is resistance less than 5 ohms?

Yes	No
GO to U8 .	REPAIR open in IDM ground Circuit 574 (BK/PK). RESTORE system. CLEAR DTCs and RETEST.

U8 MEASURE FREQUENCY ON THE EF LINE

- Connect PCM to breakout box
- IDM connected to harness
- Set up NGS Scan tool as follows:
 - Connect NGS tester to the DLC.
 - Connect test probe between NGS common and breakout box Pin 77 (ground).
 - Connect second test probe between NGS signal and breakout box Pin 48 (EF line).
 - Select VEHICLE and ENGINE.
 - Select DIGITAL MEASUREMENT SYSTEM.
 - Change level to 4 VOLT DC.
 - Press the link button to choose a PID.
 - Select PID/DATA MONITOR.
 - Select RPM PID.
 - Press START.
- Key on, engine running.
- Measure frequency at 3 different RPMs.

rpm	Frequency (Hz)
1000	66
2000	133
3000	200

For each rpm value, does the corresponding frequency match closely to the table?

Yes	No
REPLACE PCM. RESTORE system. CLEAR DTCs and RETEST.	REPLACE IDM. RESTORE system. CLEAR DTCs and RETEST.

U9 DIAGNOSTIC TROUBLE CODE (DTC) P1316 INDICATES THAT CODES ARE STORED IN THE IDM

- Possible causes:
 - Injector(s) or circuit(s)
 - Open or shorted IDM enable circuit
 - Open/short in EF circuit
 - Open/short in FDCS circuit
 - IDM relay
 - IDM powering circuits
 - IDM
 - PCM
- Check for other codes.

- Key on, engine off.
- Perform KOEO On-Demand Self Test.

Are IDM or any other codes stored?

Yes	No
GO to the appropriate pinpoint test.	GO to U10 .

U10 DTC P1316 OR P1670, LOOKING FOR AN INTERMITTENT OPEN CIRCUIT

- Key off.
- Install breakout box, leave PCM disconnected.
- Disconnect IDM.
- Check for intermittent open in the following circuits:
 - Measure resistance on (FDGS) Circuit 821 (BR/O) between IDM connector Pin 17 and PCM Test Pin 95.
 - Measure resistance on (EF) Circuit 818 (GY/W) between IDM connector Pin 4 and PCM Test Pin 48.
- Grasp the harness close to the IDM connector. Wiggle and shake the harness while working your way back to the PCM, and while looking for a spike on the DVOM.

Do all readings remain below 5 ohms throughout procedure?

Yes	No
GO to U11 .	REPAIR open in the suspect circuit. RESTORE vehicle. CLEAR DTCs and RETEST.

U11 LOOKING FOR AN INTERMITTENT SHORT TO GROUND

- Check for intermittent short to ground on the following circuits:
 - Measure resistance on (FDGS) Circuit 821 (BR/O) between battery ground and PCM Test Pin 95.
 - Measure resistance on (EF) Circuit 818 (GY/W) between battery ground and PCM test Pin 48.
- Grasp the harness close to the IDM connector. Wiggle and shake the harness while working your way back to the PCM, and while looking for a spike on the DVOM.

Do all readings remain above 10,000 ohms throughout procedure?

Yes	No
GO to U12 .	REPAIR short to ground on the suspect circuit. RESTORE vehicle. CLEAR DTCs and RETEST.

U12 CHECK FOR AN INTERMITTENT SHORT TO POWER

- Key on, engine off.
- Check for intermittent short to power on the following circuits:
 - Measure voltage on (FDGS) Circuit 821 (BR/O) between battery ground and PCM Test Pin 95.
 - Measure voltage on (EF) Circuit 818 (GY/W) between battery ground and PCM Test Pin 48.
- Grasp the harness close to the IDM connector. Wiggle and shake the harness while working your way back to the PCM, and while looking for a spike on the DVOM.

Did voltage ever appear on any circuit throughout procedure?

Yes	No
REPAIR short to power on the suspect circuit. RESTORE vehicle. CLEAR DTCs and RETEST.	GO to U13 .

U13 VERIFY DTC P1316 AND/OR P1670

- Restore vehicle.
- Clear DTCs.
- Cycle key off, then start engine.
- Road test vehicle.
- Perform KOEO On-Demand Self Test and retrieve Continuous DTCs.

Was DTC P1316 and/or P1670 set in continuous without any codes in KOEO On-Demand?

Yes	No
GO to U14 .	REPAIR KOEO On-Demand DTCs. RESTORE vehicle. CLEAR DTCs and RETEST.

U14 ATTEMPT TO GENERATE IDM DTCS

- Key off.
- Disconnect one valve cover connector.
- Start engine to generate IDM codes.
- Perform KOEO Injector Electrical Self-Test and KOEO On-Demand Self-Test.

Are IDM codes retrieved?

Yes	No
REPLACE PCM. RESTORE vehicle. CLEAR DTCs and RETEST.	REPLACE IDM. RESTORE vehicle. CLEAR DTCs and RETEST.
