

# DIAGNOSTIC PROCEDURES

## GENERAL

Here is the basic order suggested to diagnose a suspected engine management or fuel injection related problem.

- Check the chart in TROUBLESHOOTING section to have an overview of problems and suggested solutions.
- Check if there is a blinking check engine light or a message displayed by the vehicle information center. If so, use the VCK (Vehicle Communication Kit) and look for fault codes to diagnose the trouble.
- Check all fuses.
- Check fuel rail pressure.
- Check spark plugs condition.
- Check fuel pump pressure.
- Check all connections of the wiring harness.
- Refer to COMPONENT INSPECTION, REPLACEMENT AND ADJUSTMENT section for procedures.

## ENGINE MANAGEMENT SYSTEM FAULT CODES

### General

The faults registered in the ECM are kept when the battery is disconnected.

**IMPORTANT:** After a problem has been solved, ensure to clear the fault(s) in the ECM using the VCK. This will properly reset the appropriate counter(s). This will also record that the problem has been fixed in the ECM memory.

Many fault codes at the same time is likely to be burnt fuse(s).

For more information pertaining to the code faults (state, count, first, etc.) and report, refer to B.U.D.S. online help.

When using the service action suggested in the Fault section of B.U.D.S., the system circuits are referred as 5-32 for instance. It means connector no. 5 and the circuit wire no. 32 as found in the wiring diagram.

When they are referred as A-41, it means connector "A" on the ECM and the circuit 41.

## TPS (Throttle Position Sensor) Faults

Faults which are reported in B.U.D.S. fall into two groups: TPS faults and adaptation faults. These are displayed on the B.U.D.S. system as TPS OUT OF RANGE and TPS ADAPTATION FAILURE.

### TPS "OUT OF RANGE" Fault

It is caused by the sensor reading going out of its allowable range. This fault can occur during the whole range of movement of the throttle.

To diagnose this fully, it is recommended to operate the throttle through its full range. It is also recommended to release the throttle quickly as this may also show up a fault that is intermittent.

POSSIBLE CAUSES	ACTION
Check if connector is disconnected from TPS.	<ul style="list-style-type: none"> <li>• Fix.</li> </ul>
Check if sensor is loose.	<ul style="list-style-type: none"> <li>• Fix and reset <b>Closed Throttle</b>.</li> </ul>
Inspect sensor for damage or corrosion.	<ul style="list-style-type: none"> <li>• Replace and reset <b>Closed Throttle</b>.</li> </ul>
Inspect wiring (voltage test).	<ul style="list-style-type: none"> <li>• Repair.</li> </ul>
Inspect wiring and sensor(resistance test).	<ul style="list-style-type: none"> <li>• If bad wiring, repair.</li> <li>• If bad TPS, replace and reset <b>Closed Throttle</b>.</li> </ul>
Test sensor operation (wear test).	<ul style="list-style-type: none"> <li>• Replace and reset <b>Closed Throttle</b>.</li> </ul>

### TPS "ADAPTATION FAILURE" Fault

It is caused by the idle position moving out of an acceptable range.

Following failures can be affected by a TPS "Adaptation Failure":

- Idle speed is out of range.
- Engine stops, when throttle is released quickly.
- Engine runs inconsistent in low partload or low RPM.

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## Section 06 ENGINE MANAGEMENT (RFI)

### Subsection 02 (DIAGNOSTIC PROCEDURES)

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POSSIBLE CAUSES	ACTION
Sensor has been replaced and TPS closed position not reset.	<ul style="list-style-type: none"><li>• Reset Closed Throttle.</li></ul>
Throttle body has been replaced and TPS closed position not reset.	<ul style="list-style-type: none"><li>• Reset Closed Throttle.</li></ul>
ECM has been replaced and TPS closed position not reset.	<ul style="list-style-type: none"><li>• Reset Closed Throttle.</li></ul>
Throttle cable too tight.	<ul style="list-style-type: none"><li>• Fix and reset Closed Throttle.</li></ul>
Sensor is loose.	<ul style="list-style-type: none"><li>• Fix and reset Closed Throttle.</li></ul>
Throttle bracket is loose.	<ul style="list-style-type: none"><li>• Fix and reset Closed Throttle.</li></ul>
Adjustment screw worn or loose.	<ul style="list-style-type: none"><li>• Change throttle body.</li></ul>

### Burnt Fuse and Related Fault Code

FUSE NO	FUSE CAPACITY AND FUNCTION	CODE
Main	5 A Accessories	None
1	10 A Fuel pump	None
2	5 A RAVE solenoid	P-0231
3	10 A Ignition coil and starter solenoid	P-0079
4	3 A Injector 1 (MAG)	P-0616, P0351, P-0352
5	3 A Injector 2 (PTO)	P-261, P-262
6	N	P-264, P-265

**NOTE:** Fuses are located on the vehicle control module (VCM). Refer to OVERVIEW for more details.

**Section 06 ENGINE MANAGEMENT (RFI)**  
Subsection 02 (DIAGNOSTIC PROCEDURES)

EMS Fault Code Table

COMMENT								
NORMAL OPERATION RESUMES WHEN...								
ENGINE SPEED LIMITATION								
DETECTED WHEN ENGINE RUNS								
DETECTED WHEN ENGINE STOPPED								
CHECK ENGINE LIGHT								
BEEPER CODE								
DESCRIPTION								
CODE								
P0079	Rave valve solenoid signal too low	15	Y	N	Y	(6300)	When the fault is recovered	The engine speed is limited due to the fact that the RAVE aren't opening.
P0080	Rave valve solenoid signal to high	15	Y	N	Y	(6300)	When the fault is recovered	The engine speed is limited due to the fact that the RAVE aren't opening.
P0106	Manifold atmospheric pressure sensor out of range	15	Y	N	Y	N	When the fault is recovered	
P0107	Manifold atmospheric pressure sensor shorted to ground	15	Y	N	Y	N	When the fault is recovered	
P0108	Manifold atmospheric pressure sensor shorted to 12 V or open circuit	15	Y	N	Y	N	When the fault is recovered	
P-0111	Intake manifold temperature sensor functional problem	15	Y	N	Y	N	When the fault is recovered	
P-0112	Intake manifold temperature sensor shorted to ground	15	Y	N	Y	N	When the fault is recovered	
P-0113	Intake manifold temperature sensor shorted to 12 V or open circuit	15	Y	N	Y	N	When the fault is recovered	
P-0116	Engine temperature functional problem	15	Y	N	Y	N	When the fault is recovered	
P-0117	Engine temperature sensor short circuit to ground	15	Y	N	Y	N	When the fault is recovered	
P-0118	Engine temperature sensor short circuit to 12 V	15	Y	N	Y	N	When the fault is recovered	
	Engine temperature sensor open circuit	15	Y	N	Y	N	When the fault is recovered	
P-0122	Throttle position sensor out of range	15	Y	Y	Y	N	When key is removed	
P-0122	Throttle position sensor short circuit to ground	15	Y	Y	Y	(3500)	When key is removed	3500 Because of the default value
P-0123	Throttle position sensor out of range - short-circuit to 12 V or open circuit	15	Y	N	Y	(3500)	When key is removed	3500 Because of the default value
P-0231	Fuel pump shorted to ground or open circuit	15	Y	Y	N	N	When the fault is recovered	
P-0232	Fuel pump shorted to 12 V	15	Y	N	Y	N	When the fault is recovered	

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COMMENT									
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DETECTED WHEN ENGINE STOPPED									
CHECK ENGINE LIGHT									
BEEPER CODE									
DESCRIPTION									
CODE									
P-0261	Inj #1 short-circuit to ground or open circuit	15	Y	N	Y	(3200)	When the fault is recovered	3200 because the engine runs on 1 cylinder only	
P-0262	Inj # 1 short-circuit to 12 V	15	Y	N	Y	(3200)	When the fault is recovered	3201 because the engine runs on 1 cylinder only	
P-0264	Inj #2 short-circuit to ground or open circuit	15	Y	N	Y	(3200)	When the fault is recovered	3202 because the engine runs on 1 cylinder only	
P-0265	Inj #2 short-circuit to 12 V	15	Y	N	Y	(3200)	When the fault is recovered	3203 because the engine runs on 1 cylinder only	
P-0336	Engine speed > [rpm] detected	15	Y			N			
P-0351	Ignition coil 1 open circuit or shorted to ground or to 12 V	15	Y	N	Y	N	When engine stop		
P-0352	Ignition coil 2 open circuit or shorted to ground or to 12 V	15	Y	N	Y	N	When engine stop		
P-0513	DESS incorrect key	15	N	Y	N/A	N/A	N/A		
P-0562	Battery voltage too low	15	N	N	Y	0	When the fault is recovered	At 10 V	
P-0563	Battery voltage too high	15	N	N	Y	5128	When the fault is recovered	At 18 V	
P-0601	TPS learns unlikely or checksum fault	15	Y						
P-0601	Module call monitoring	15	Y						
P-0602	ECM not coded	15	Y						
P-0604	RAM faulty	15	Y						
P-0605	EPROM faulty	15	Y						
P-0605	Checksum fault EEPROM	15	Y						
P-0605	Coding ID checksum fault	15	Y						
P-0605	Coding checksum fault	15	Y						
P-0605	Programming checksum fault	15	Y						
P-0608	Sensor 5 V power supply short to gnd	15	Y	Y	Y	N	When the key is removed		
P-0616	Starter relay shorted to ground	5		N(1)	Y	N	When the fault is recovered		
	Starter relay open circuit	5		Y	Y	N	When the key is removed		
P-0617	Starter relay shorted to 12 V	5	N	Y (2)	N	N	When the fault is recovered		
P-0650	Check engine circuit open circuit or shorted to ground	5	N	Y	Y	N	When the fault is recovered	3D Series and GTI LE RFI only	

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COMMENT							
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ENGINE SPEED LIMITATION							
DETECTED WHEN ENGINE RUNS							
DETECTED WHEN ENGINE STOPPED							
CHECK ENGINE LIGHT							
BEEPER CODE							
DESCRIPTION							
CODE							
P-1102	Throttle position sensor adaptation failure	15	Y	Y	N	N	When the fault is recovered
P-1104	Throttle position sensor adaptation canceled	15	Y	Y	N	N	When the fault is recovered
P-1148	Fuel injector 1, or 2 safety fuel cut off detected	15	Y	N	Y	N	When the fault is recovered
P-1611	Engine speed > [rpm] detected	15	N	Y	Y	N	When the fault is recovered
P-1655	DESS® line shorted to 12 V	15	Y	Y	N	N	When the fault is recovered
P-1656	DESS® line shorted to ground	15	Y	Y	N	N	When the fault is recovered
P-1670	Buzzer - Short to Battery Voltage	15	N	Y	Y	N	When the fault is recovered
P-1671	Buzzer short-circuit to ground or open	2	N	Y	Y	N	When the fault is recovered

(1) fault detected while cranking

(2) Sometimes when pressing the start/stop switch

### Beeper Codes

CODE	SIGNAL
2	Continuously beeps.
5	A 2 seconds beep every 1 minute intervals.
15	Off