

## Fuel Charging and Controls

1. Verify the customer concern by operating the system.
2. Visually inspect for obvious signs of mechanical or electrical damage.
3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. If the concern is not visually evident, use a fault code reader to retrieve fault codes before proceeding to the Symptom Chart.

### Symptom Chart

DTC	Condition	Possible Causes	Action
P0171	Right-Hand bank combustion too lean	<ul style="list-style-type: none"> <li>• Air intake leak between MAF sensor and throttle</li> <li>• Fuel injector restriction</li> <li>• Fuel filter / system restriction</li> <li>• Fuel pressure sensor failure (low fuel pressure)</li> <li>• Low fuel pump output</li> <li>• HO2S (1/1; 1/2) harness wiring condition fault</li> <li>• Exhaust leak (before catalyst)</li> <li>• ECM receiving incorrect signal from one or more of the following components; ECT sensor, MAF sensor, IAT sensor, fuel rail pressure sensor, fuel rail temperature sensor</li> </ul>	<<303-07A>><<303-07B>><<309-00>> Goto <<B>>
P0172	Right-Hand bank combustion too rich	<ul style="list-style-type: none"> <li>• Engine misfire</li> <li>• Restricted air filter</li> <li>• Leaking fuel injector(s)</li> <li>• Fuel pressure sensor failure (high fuel pressure)</li> <li>• ECM receiving incorrect signal from one or more of the following components; ECT sensor, MAF sensor, IAT sensor, fuel rail pressure sensor, fuel rail temperature sensor</li> </ul>	<<303-12A>><<303-12B>> Goto <<B>>

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P0174	Left-Hand bank combustion too lean	<ul style="list-style-type: none"> <li>• Air intake leak between MAF sensor and throttle</li> <li>• Fuel injector restriction</li> <li>• Fuel filter / system restriction</li> <li>• Fuel pressure sensor failure (low fuel pressure)</li> <li>• Low fuel pump output</li> <li>• HO2S (2/1; 2/2) harness wiring condition fault</li> <li>• Exhaust leak (before catalyst)</li> <li>• ECM receiving incorrect signal from one or more of the following components; ECT sensor, MAF sensor, IAT sensor, fuel rail pressure sensor, fuel rail temperature sensor</li> </ul>	<b>&lt;&lt;303-07A&gt;&gt;&lt;&lt;303-07B&gt;&gt;&lt;&lt;309-00&gt;&gt;</b> <b>Goto &lt;&lt;B&gt;&gt;</b>
P0175	Left-Hand bank combustion too rich	<ul style="list-style-type: none"> <li>• Engine misfire</li> <li>• Restricted air filter</li> <li>• Leaking fuel injector(s)</li> <li>• Fuel pressure sensor failure (high fuel pressure)</li> <li>• ECM receiving incorrect signal from one or more of the following components; ECT sensor, MAF sensor, IAT sensor, fuel rail pressure sensor, fuel rail temperature sensor</li> </ul>	<b>&lt;&lt;303-12A&gt;&gt;&lt;&lt;303-12B&gt;&gt;</b> <b>Goto &lt;&lt;B&gt;&gt;</b>
P1251, P1631, P1657, P1658	Concern with Throttle motor relay	<ul style="list-style-type: none"> <li>• Throttle motor relay</li> <li>• Throttle motor relay circuit</li> </ul>	<b>&lt;&lt;303-14A&gt;&gt;&lt;&lt;303-14B&gt;&gt;</b>

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P0112, P0113	Concern with IAT sensor	<ul style="list-style-type: none"> <li>• Engine faulty leading to overheating</li> <li>• Intake Air Temperature (IAT) sensor fault</li> <li>• Harness fault</li> <li>• ECM failure</li> </ul>	<<303-12A>><<303-12B>>
P0121, P0122, P0123, P0222, P0223	Concern with throttle position (TP) sensor	<ul style="list-style-type: none"> <li>• TP sensor fault</li> <li>• Harness fault</li> <li>• ECM failure</li> </ul>	Goto <<F>> <<303-14A>><<303-14B>>
P0116, P0117, P0118, P0125	Concern with engine coolant temperature	<ul style="list-style-type: none"> <li>• Engine coolant temperature sensor</li> <li>• Harness fault</li> <li>• ECM failure</li> </ul>	<<303-14A>><<303-14B>>
P0201, P0202, P0203, P0204, P0205, P0206, P0207, P0208	Concern with fuel injectors	<ul style="list-style-type: none"> <li>• Faulty injector(s)</li> <li>• Harness fault</li> <li>• ECM failure</li> </ul>	<<303-14A>><<303-14B>> Goto <<A>>

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P0191	Concern with fuel rail pressure sensor	<ul style="list-style-type: none"> <li>• Fuel rail pressure sensor</li> <li>• Harness fault</li> <li>• Fuel filter/system restriction</li> <li>• Fuel system leak</li> <li>• Incorrect fuel pump output</li> <li>• Fuel rail pressure sensor to ECM sensing circuit; high resistance, open circuit, short circuit to high voltage</li> <li>• Fuel rail pressure sensor to splice in sensor supply circuit; high resistance, open circuit</li> <li>• Fuel rail pressure sensor to splice in sensor ground circuit; high resistance, open circuit</li> <li>• Fuel rail pressure sensor to splice in sensor ground circuit; high resistance, open circuit, short circuit to ground, short circuit to high voltage</li> <li>• Fuel rail pressure sensor failure</li> </ul>	<<303-14A>><<303-14B>> Goto <<B>>
P0192	Concern with fuel rail pressure sensor (low voltage/low pressure)	<ul style="list-style-type: none"> <li>• Fuel rail pressure sensor disconnected</li> <li>• Fuel rail pressure sensor to ECM sensing circuit; open circuit or short circuit to ground</li> <li>• Fuel rail pressure sensor to splice in sensor supply circuit; high resistance, open circuit</li> <li>• Fuel rail pressure sensor failure</li> </ul>	Goto <<B>>
P0193	Concern with fuel rail pressure sensor (high voltage/high pressure)	<ul style="list-style-type: none"> <li>• Fuel rail pressure sensor to ECM wiring (supply/sense) short circuit to each other</li> <li>• Fuel rail pressure sensor to ECM sense circuit; short circuit to high voltage</li> <li>• Fuel rail pressure sensor to splice in sensor ground circuit; open circuit</li> <li>• Fuel rail pressure sensor failure</li> </ul>	Goto <<B>>

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P0460	Concern with fuel level sensors	<ul style="list-style-type: none"> <li>• Fuel level sensor to instrument cluster circuit(s); intermittent short circuit, open circuit, high resistance</li> <li>• Fuel level sensor failure</li> <li>• Instrument cluster fault</li> </ul>	Goto <<C>>
P1236	Concern with fuel pump commands (fuel pump not activated when requested by ECM)	<ul style="list-style-type: none"> <li>• ECM to REM input wire open circuit, short circuit, high resistance</li> <li>• REM to fuel pump circuits open circuit</li> <li>• REM failure</li> </ul>	Goto <<D>>
P1229	Concern with throttle motor control circuit	<ul style="list-style-type: none"> <li>• Throttle motor disconnected</li> <li>• Throttle motor to ECM drive circuits; short circuit or open circuit</li> <li>• Throttle motor failure</li> </ul>	Goto <<E>> <<303-14A>><<303-14B>>

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P1224	Concern with throttle control position	<ul style="list-style-type: none"> <li>• Throttle adaptations not performed after battery disconnect</li> <li>• TP sensor disconnected</li> <li>• TP sensor to ECM sense circuits; open circuit, high resistance</li> <li>• Throttle motor relay failure</li> <li>• Throttle motor relay to ECM circuit fault</li> <li>• Throttle motor relay power supply open circuit</li> <li>• ECM ground circuit fault (relay coil drive)</li> <li>• Throttle motor to ECM drive circuits; open circuit, short circuit, high resistance</li> <li>• Throttle motor failure</li> <li>• Throttle body failure</li> </ul>	Goto <<G>> <<303-14A>><<303-14B>> Individual Pinpoint tests for components and circuits listed
P1250, P1254	Concern with throttle valve return spring and 'limp-home' spring	Throttle body	These DTCs can only be accurately diagnosed using the Jaguar Approved Diagnostic System. If this is not available, INSTALL a new throttle body. CLEAR the DTC, TEST the system for normal operation.
P1656	Concern with TP sensor amplifier circuit	ECM	<<303-14A>><<303-14B>>
P1233	Concern with secondary fuel pump (S/C only)	<ul style="list-style-type: none"> <li>• Secondary fuel pump</li> <li>• Secondary fuel pump module</li> <li>• Secondary fuel pump driver input circuit</li> </ul>	Goto <<H>>
P3705	Concern with secondary fuel pump (S/C only)	<ul style="list-style-type: none"> <li>• Secondary fuel pump</li> <li>• Secondary fuel pump module</li> <li>• Secondary fuel pump driver output circuit</li> </ul>	Goto <<I>>
P1339	Concern with secondary fuel pump (S/C only)	<ul style="list-style-type: none"> <li>• Secondary fuel pump</li> <li>• Secondary fuel pump module</li> <li>• Secondary fuel pump driver circuit, low/high input</li> </ul>	Goto <<J>>
P1611	Sub CPU failure	ECM	INSTALL a new ECM. <<303-14A>><<303-14B>> Before replacing a ECM, contact Dealer technical support.

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## Powertrain Control Module Harness Connector

Pin Number	Circuit Function	Circuit Color
120	Cyl 1 injector GROUND supply	BG
115	Cyl 2 injector GROUND supply	BR
114	Cyl 3 injector GROUND supply	BK
119	Cyl 4 injector GROUND supply	BO
113	Cyl 5 injector GROUND supply	BG
118	Cyl 6 injector GROUND supply	U
117	Cyl 7 injector GROUND supply	BW
112	Cyl 8 injector GROUND supply	UY



VUJ0002082

## Cyl 1 Injector Harness Connector

Pin Number	Circuit Function	Circuit Color
1	GROUND supply	BG
2	Voltage supply	NR



VUJ0002082

## Cyl 2 Injector Harness Connector

Pin Number	Circuit Function	Circuit Color
1	GROUND supply	BR
2	Voltage supply	NR



VUJ0002082

**Cyl 3 Injector Harness Connector**

Pin Number	Circuit Function	Circuit Color
1	GROUND supply	BK
2	Voltage supply	NR



VUJ0002082

**Cyl 4 Injector Harness Connector**

Pin Number	Circuit Function	Circuit Color
1	GROUND supply	BO
2	Voltage supply	NR



VUJ0002082

**Cyl 5 Injector Harness Connector**

Pin Number	Circuit Function	Circuit Color
1	GROUND supply	BG
2	Voltage supply	NR





VUJ0002082

**Cyl 6 Injector Harness Connector**

Pin Number	Circuit Function	Circuit Color
1	GROUND supply	U
2	Voltage supply	NR



VUJ0002082

**Cyl 7 Injector Harness Connector**

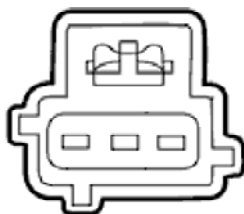
Pin Number	Circuit Function	Circuit Color
1	GROUND supply	BW
2	Voltage supply	NR



VUJ0002082

**Cyl 8 Injector Harness Connector**

Pin Number	Circuit Function	Circuit Color
1	GROUND supply	UY
2	Voltage supply	NR



VUJ0002081

## Injection Pressure Sensor Harness Connector

Pin number	Circuit Function	Circuit Color
1	Voltage reference supply	OY
2	GROUND supply	BG
3	Signal return	U

### A : FUEL INJECTORS: P0201, P0202, P0203, P0204, P0205, P0206, P0207, P0208

#### NOTE:

The DTC set will indicate which cylinder injector or circuit is faulty. Only in the event of multiple cylinder misfires will it be necessary to check more than one injector or circuit, in which case, multiple DTCs will be set.

### A1 : CHECK THE INJECTOR COIL RESISTANCE

1. Turn the ignition switch to the OFF position.
2. Disconnect the relevant injector electrical connector. (PI032 to PI039).
3. Measure the resistance between the injector pins.

•Is the resistance between 12 and 16 ohms?

-> Yes

Goto <<A2>>

-> No

INSTALL a new injector. CLEAR the DTC. TEST the system for normal operation.

### A2 : CHECK THE INJECTOR COIL INSULATION

1. Measure the resistance between the injector pin 001 and the injector body.
2. Measure the resistance between the injector pin 002 and the injector body.

•Are both resistances greater than 10,000 ohms?

-> Yes

Goto <<A3>>

-> No

INSTALL a new injector. CLEAR the DTC. TEST the system for normal operation.

## A3 : CHECK THE INJECTOR SUPPLY VOLTAGE

1. Turn the ignition switch to the ON position.
2. Disconnect the relevant injector harness electrical connector, (PI032 to PI039).
3. Measure the voltage between the relevant injector harness electrical connector, (PI032 to PI039) pin 002 and GROUND.

•Is the voltage greater than 12 Volts?

-> Yes

Goto <<A4>>

-> No

REPAIR the circuit between the relevant injector harness electrical connector, (PI032 to PI039) pin 002 and battery. This circuit includes the power distribution fuse box, fuse 41, and the EMS control relay. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

## A4 : CHECK THE INJECTOR GROUND CIRCUIT

1. Turn the ignition switch to the OFF position.
2. Disconnect the ECM electrical connector, PI001.
3. Measure the resistance between the relevant injector harness electrical connector, (PI032 to PI039) pin 001 and PI001, pins as follows -

- Injector Cyl 1 pin 001 (BG) and ECM pin 120.
- Injector Cyl 2 pin 001 (BR) and ECM pin 115.
- Injector Cyl 3 pin 001 (BK) and ECM pin 114.
- Injector Cyl 4 pin 001 (BO) and ECM pin 115.
- Injector Cyl 5 pin 001 (BG) and ECM pin 113.
- Injector Cyl 6 pin 001 (U) and ECM pin 118.
- Injector Cyl 7 pin 001 (BW) and ECM pin 117.
- Injector Cyl 8 pin 001 (UY) and ECM pin 112.

•Is the resistance less than 5 ohms?

-> Yes

Goto <<A5>>

-> No

REPAIR the circuit between the relevant injector harness electrical connector pin 001 and the powertrain control module electrical connector. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

## A5 : CHECK THE INJECTOR GROUND CIRCUIT FOR SHORT CIRCUIT TO BATTERY

1. Measure the voltage between the relevant injector harness electrical connector, (PI032 to PI039) pin 001 and GROUND.

•Is the voltage greater than 1 volt?

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-> **Yes**

REPAIR the short circuit. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

Goto <<A6>>

### A6 : CHECK THE INJECTOR GROUND CIRCUIT FOR SHORT CIRCUIT TO GROUND

1. Measure the resistance between the relevant injector harness electrical connector, (PI032 to PI039) pin 001 and GROUND.

•Is the resistance less than 10,000 ohms?

-> **Yes**

REPAIR the short circuit. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

INSTALL a new ECM. <<303-14A>><<303-14B>> Before replacing a ECM, contact Dealer technical support.

### B : FUEL RAIL PRESSURE SENSOR: P0190, P0192, P0193

#### B1 : CHECK THE FUEL RAIL PRESSURE SENSOR SUPPLY VOLTAGE

1. Turn the ignition switch to the OFF position.

2. Disconnect the fuel rail pressure sensor electrical connector, PI028.

3. Turn the ignition switch to the ON position.

4. Measure the supply voltage to the fuel rail pressure sensor electrical connector, PI028 pin 001, (OY) and GROUND.

•Is the supply voltage between 4.5 and 5.5 volts?

-> **Yes**

Goto <<B2>>

-> **No**

REPAIR the circuit between PI028, pin 001, (OY) and ECM electrical connector, PI001, pin 012. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

The fault could be in any of the components or sensors in the 5 volt supply circuit, or the ECM

If the DTC is repeated, INSTALL a new ECM. <<303-14A>><<303-14B>> Before replacing a ECM, contact Dealer technical support

#### B2 : CHECK THE FUEL RAIL PRESSURE SENSOR GROUND CIRCUIT FOR OPEN CIRCUIT

1. Turn the ignition switch to the OFF position.

2. Measure the resistance between the fuel rail pressure sensor electrical connector PI028, pin 002, (BG) and GROUND.

•Is the resistance greater than 10,000 ohms?

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-> **Yes**

REPAIR the circuit between PI028, pin 002, (BG) and ECM electrical connector, PI001, pin 019. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

The fault could be in any of the components or sensors in the 5 volt supply circuit, or the ECM

If the DTC is repeated, INSTALL a new ECM. <<303-14A>><<303-14B>> Before replacing a ECM, contact Dealer technical support

-> **No**

Goto <<B3>>

### **B3 : CHECK THE FUEL RAIL PRESSURE SENSOR SIGNAL CIRCUIT FOR OPEN CIRCUIT**

1. Disconnect the ECM electrical connector, PI001.

2. Measure the resistance between the fuel rail pressure sensor electrical connector PI028, pin 003, (U) and PI001, pin 073.

•Is the resistance greater than 5 ohms?

-> **Yes**

REPAIR the circuit between PI028, pin 003, (U) and PI001, pin, 073 (U). For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

Goto <<B4>>

### **B4 : CHECK THE FUEL RAIL PRESSURE SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND**

1. Measure the resistance between the fuel rail pressure sensor electrical connector PI028, pin 003 (U) and GROUND.

•Is the resistance less than 10,000 ohms?

-> **Yes**

REPAIR the circuit between PI028, pin 003 (U) and PI001 pin 073, (U). For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> **No**

Goto <<B5>>

### **B5 : CHECK THE FUEL RAIL PRESSURE SENSOR CIRCUIT RESISTANCE**

1. Disconnect the fuel rail pressure sensor electrical connector PI028.

2. Measure the resistance between the fuel rail pressure sensor pins 001 and 002.

•Is the resistance between 10,000 and 12,000 ohms?

-> **Yes**

Goto <<B6>>

-> **No**

Install a new fuel rail pressure sensor. <<Fuel Pressure Regulator>> CLEAR the DTC. TEST the system for normal operation.

## **B6 : CHECK THE FUEL RAIL PRESSURE SENSOR CIRCUIT RESISTANCE**

1. Measure the resistance between the fuel rail pressure sensor pins 002 and 003.

•Is the resistance between 22,000 and 33,000 ohms?

-> **Yes**

Goto <<B7>>

-> **No**

Install a new fuel rail pressure sensor. <<Fuel Pressure Regulator>> CLEAR the DTC. TEST the system for normal operation.

## **B7 : CHECK THE FUEL RAIL PRESSURE SENSOR CIRCUIT RESISTANCE**

1. Measure the resistance between the fuel rail pressure sensor pins 001 and 003.

•Is the resistance between 22,000 and 33,000 ohms?

-> **Yes**

Install a new ECM.<<303-14A>><<303-14B>> Before replacing a ECM, contact Dealer technical support.

-> **No**

Install a new fuel rail pressure sensor. <<Fuel Pressure Regulator>> CLEAR the DTC. TEST the system for normal operation.

## **C : FUEL LEVEL SENSORS: P0460**

### **C1 : CHECK THE FUEL LEVEL SENSOR (1) GROUND CIRCUIT**

1. Disconnect the fuel level sensor electrical connector, FP004.

2. Turn the ignition switch to the ON position.

3. Measure the resistance between electrical connector FP004, pin 003 (KO) and GROUND.

•Is the resistance less than 5 ohms?

-> **Yes**

Goto <<C2>>

-> **No**

REPAIR the circuit between electrical connector FP004, pin 003 (KO) and GROUND. For additional information, refer to wiring diagrams.CLEAR the DTC. TEST the system for normal operation.

### **C2 : CHECK THE FUEL LEVEL SENSOR (1) SIGNAL CIRCUIT**

1. Disconnect the REM electrical connector, CA101.

2. Measure the resistance between CA101, pin 015 (WR) and FP004, pin 001 (WR).

•Is the resistance less than 5 ohms?

-> **Yes**

Goto <<C3>>

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-> **No**

REPAIR the circuit between CA101, pin 015 (WR) and FP004, pin 001 (WR). For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

### **C3 : CHECK THE FUEL LEVEL SENSOR (1) RHEOSTAT (EMPTY)**

1. Empty the fuel tank.
2. Measure the resistance between pins 001 and 003 of the fuel level sensor.

•Is the resistance 20 ohms?

-> **Yes**

Goto <<C4>>

-> **No**

INSTALL a new fuel level sensor. <<310-01>> CLEAR the DTC. TEST the system for normal operation.

### **C4 : CHECK THE FUEL LEVEL SENSOR (1) RHEOSTAT. (FULL)**

1. Fill the fuel tank.
2. Measure the resistance between pins 001 and 003 of the fuel level sensor.

•Is the resistance 160 ohms?

-> **Yes**

Goto <<C5>>

-> **No**

INSTALL a new fuel level sensor. <<310-01>> CLEAR the DTC. TEST the system for normal operation.

### **C5 : CHECK THE FUEL LEVEL SENSOR (2) GROUND CIRCUIT**

1. Disconnect the fuel level sensor electrical connector, FP003.
2. Turn the ignition switch to the ON position.
3. Measure the resistance between electrical connector FP003, pin 003 (KO) and GROUND.

•Is the resistance less than 5 ohms?

-> **Yes**

Goto <<C6>>

-> **No**

REPAIR the circuit between FP003, pin 003 (KO) and ground. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

### **C6 : CHECK THE FUEL LEVEL SENSOR (2) SIGNAL CIRCUIT**

1. Disconnect the REM electrical connector, CA101.
2. Measure the resistance between FP003, pin 001 (WU) and CA101, pin 016 (WU).

•Is the resistance less than 5 ohms?

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-> **Yes**  
Goto <<C7>>

-> **No**  
REPAIR the circuit between FP003, pin 001 (WU) and CA101, pin 016 (WU) For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

### **C7 : CHECK THE FUEL LEVEL SENSOR (2) RHEOSTAT. (EMPTY)**

1. Empty the fuel tank.
2. Measure the resistance between pins 001 and 003 of the fuel level sensor.

•Is the resistance 20 ohms?

-> **Yes**  
Goto <<C8>>

-> **No**  
INSTALL a new fuel level sensor. <<310-01>> CLEAR the DTC. TEST the system for normal operation.

### **C8 : CHECK THE FUEL LEVEL SENSOR (2) RHEOSTAT. (FULL)**

1. Fill the fuel tank.
2. Measure the resistance between pins 001 and 003 of the fuel level sensor.

•Is the resistance 160 ohms?

-> **Yes**  
INSTALL a new REM. <<419-10>> If the DTC is repeated, INSTALL a new instrument cluster. <<413-01>> CLEAR the DTC. TEST the system for normal operation.

-> **No**  
INSTALL a new fuel level sensor. <<310-01>> CLEAR the DTC. TEST the system for normal operation.

### **D : FUEL PUMP NOT ACTIVATED WHEN REQUESTED BY ECM: P1236**

#### **D1 : CHECK THE POWER SUPPLY TO THE REM**

1. Disconnect the REM electrical connector, CA103.
2. Turn the ignition switch to the ON position.
3. Measure the voltage between CA103, pin 001 (GR) and GROUND.

•Is the voltage greater than 10 volts?

-> **Yes**  
Goto <<D2>>

-> **No**  
REPAIR the supply circuit to the REM. This circuit includes the rear power distribution box, fuse 47, the fuel pump relay, and fuse 23. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.



### D2 : CHECK THE REM + OUTPUT TO THE FUEL PUMP

1. Reconnect CA103.
2. Disconnect the fuel pump electrical connector, FP004.
3. Turn the ignition switch to the CRANK position.
4. Measure the voltage between FP004, pin 002 (R) and GROUND.

•Is the voltage greater than 10 volts?

-> **Yes**  
Goto <<D4>>

-> **No**  
Goto <<D3>>

### D3 : CHECK THE REM - OUTPUT TO THE FUEL PUMP

1. Turn the ignition switch to the CRANK position.
2. Measure the resistance between FP004, pin 004 (B) and GROUND.

•Is the resistance less than 10 ohms?

-> **Yes**  
INSTALL a new fuel pump. <<310-01>> CLEAR the DTC. TEST the system for normal operation.

-> **No**  
Goto <<D4>>

### D4 : CHECK THE ECM OUTPUT WIRE TO THE REM FOR CONTINUITY

1. Disconnect the battery negative terminal.
2. Disconnect the REM electrical connector, CA103.
3. Disconnect the ECM electrical connector, PI001.
4. Measure the resistance between PI001, pin 027 (WR) and CA103, pin 019 (WR)

•Is the resistance less than 5 ohms?

-> **Yes**  
INSTALL a new REM. <<419-10>> CLEAR the DTC. TEST the system for normal operation. If the DTC is repeated, INSTALL a new ECM. Before replacing a ECM, contact Dealer technical support.

-> **No**  
REPAIR the circuit between the ECM and the REM. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

### E : THROTTLE CONTROL POSITION ERROR: P1224

#### NOTE:

For further diagnosis on this DTC, <<303-14A>><<303-14B>>

## E1 : CHECK THROTTLE CONTROL - CIRCUIT FOR CONTINUITY

1. Disconnect the throttle motor electrical connector, PI018.
2. Disconnect the ECM electrical connector, PI001.
3. Measure the resistance between PI001, pin 106 (RW) and throttle motor electrical connector PI018, pin 002 (RW)

•Is the resistance less than 5 ohms?

-> Yes

Goto <<E2>>

-> No

REPAIR the circuit between ECM electrical connector PI001, pin 106 (RW) and throttle motor electrical connector PI018, pin 002 (RW) For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

## E2 : CHECK THROTTLE CONTROL + CIRCUIT FOR CONTINUITY

1. Measure the resistance between ECM electrical connector PI001, pin 080 (GW) and throttle motor electrical connector PI018, pin 001 (GW)

•Is the resistance less than 5 ohms?

-> Yes

INSTALL a new ECM. <<303-14A>><<303-14B>> CLEAR the DTC. TEST the system for normal operation.

-> No

REPAIR the circuit between ECM electrical connector PI001, pin 080 (GW) and throttle motor electrical connector PI018, pin 001 (GW) For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

## F : CHECK THROTTLE POSITION (TP) SENSOR: P0121, P0122, P0123, P0222, P0223

### NOTE:

Check sensor supply and ground circuits before commencing this test. <<303-14A>><<303-14B>>

## F1 : CHECK THROTTLE POSITION SENSOR RESISTANCE. SENSOR 1

1. Disconnect the throttle position sensor electrical connector, PI026.
2. Measure the resistance between pins 001 and 003 of the TP sensor.

•Is the resistance 500 to 900 ohms?

-> Yes

Goto <<F2>>

-> No

INSTALL a new throttle body. CLEAR the DTC. TEST the system for normal operation.

## F2 : CHECK THROTTLE POSITION SENSOR RESISTANCE. SENSOR 2

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1. Measure the resistance between pins 001 and 002 of the TP sensor.

•Is the resistance 1200 to 1600 ohms?

-> Yes

Goto <<G>>

-> No

INSTALL a new throttle body. CLEAR the DTC. TEST the system for normal operation.

### G : CHECK THROTTLE MOTOR RELAY: P1251, P1631, P1657, P1658

#### G1 : CHECK THROTTLE MOTOR RELAY CONSTANT SUPPLY

1. Remove the throttle motor relay.

2. Measure the voltage between the throttle motor relay base, pin 003 and GROUND.

•Is the voltage greater than 10 volts?

-> Yes

Goto <<G2>>

-> No

REPAIR the circuit between the throttle motor relay base, pin 003 and the battery. This circuit includes the power distribution fuse box, fuse 18. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

#### G2 : CHECK THROTTLE MOTOR RELAY EMS SWITCHED SUPPLY

1. Turn the ignition switch to the ON position.

2. Measure the voltage between the throttle motor relay base, pin 001 and GROUND.

•Is the voltage greater than 10 volts?

-> Yes

Goto <<G3>>

-> No

REPAIR the circuit between the throttle motor relay base, pin 001 and the battery. This circuit includes the power distribution fuse box, fuses 36, 9, and 31, and the EMS control relay. CLEAR the DTC. TEST the system for normal operation.

#### G3 : CHECK THROTTLE MOTOR RELAY TO ECM CIRCUIT FOR CONTINUITY

1. Remove the throttle motor relay.

2. Disconnect the ECM electrical connector, PI001.

3. Measure the resistance between PI001, pin 052 (GR) and throttle motor relay base, pin 002.

•Is the resistance less than 5 ohms?

-> Yes

Goto <<G4>>

-> No

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REPAIR the circuit between PI001, pin 052 (GR) and throttle motor relay base, pin 002. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

### G4 : CHECK THROTTLE MOTOR RELAY OUTPUT TO ECM

1. INSTALL the throttle motor relay.
2. Turn the ignition switch to the ON position.
3. Measure the voltage between PI001, pin 134, (GU) and GROUND.

•Is the voltage greater than 10 volts?

-> Yes

INSTALL a new ECM. <<303-14A>><<303-14B>> Before replacing a ECM, contact Dealer technical support.

-> No

INSTALL a new throttle motor relay. For additional information, refer to the electrical guide. CLEAR the DTC. TEST the system for normal operation.

### H : CHECK SECONDARY FUEL PUMP DRIVER INPUT CIRCUITS (S/C ONLY): P1233

#### H1 : CHECK POWER SUPPLY TO THE SECONDARY FUEL PUMP MODULE

1. Disconnect the secondary fuel pump module electrical connector, CA283.
2. Turn the ignition switch to the ON position.
3. Measure the voltage between CA283, pin 029 (UY) and GROUND.

•Is the voltage greater than 10 volts?

-> Yes

Goto <<H2>>

-> No

REPAIR the circuit between the fuel pump and the battery. This circuit includes fuse 49, the fuel pump relay, and fuse 23. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

#### H2 : CHECK POWER SUPPLY TO THE SECONDARY FUEL PUMP

1. Reconnect the secondary fuel pump module electrical connector, CA283.
2. Disconnect the secondary fuel pump electrical connector, FP003.
3. Turn the ignition switch to the ON position.
4. Measure the voltage between FP003, pin 002 (R) and GROUND.

•Is the voltage greater than 10 volts?

-> Yes

Goto <<H4>>

-> No

Goto <<H3>>

### H3 : CHECK POWER SUPPLY CIRCUIT TO THE SECONDARY FUEL PUMP FOR OPEN CIRCUIT

1. Disconnect the secondary fuel pump module electrical connector, CA283.
2. Measure the resistance between CA283, pin 010 (R) and FP003, pin 002 (R).

•Is the resistance greater than 5 ohms?

-> Yes

REPAIR the circuit between CA283, pin 010 (R) and FP003, pin 002 (R). For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> No

INSTALL a new secondary fuel pump module. CLEAR the DTC. TEST the system for normal operation.

### H4 : CHECK THE GROUND CIRCUIT TO THE SECONDARY FUEL PUMP MODULE

1. Measure the resistance between secondary fuel pump module electrical connector, CA283, pin 002 (B) and GROUND.

•Is the resistance greater than 5 ohms?

-> Yes

REPAIR the circuit between secondary fuel pump module electrical connector, CA283, pin 002 (B) and GROUND. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> No

Goto <<H5>>

### H5 : CHECK THE SECONDARY FUEL PUMP RESISTANCE

1. Measure the resistance between pins 002 and 004 of the secondary fuel pump.

•Is the resistance less than 2 ohms?

-> Yes

Goto <<H6>>

-> No

INSTALL a new secondary fuel pump. <<310-01>> CLEAR the DTC. TEST the system for normal operation.

### H6 : CHECK MONITOR CIRCUITS FOR OPEN CIRCUIT/HIGH RESISTANCE

1. Disconnect the secondary fuel pump module electrical connector, CA283
2. Disconnect the ECM electrical connector, PI001.
3. Measure the resistance between PI001, pin 011 (Y) and CA283, pin 007 (Y).

•Is the resistance greater than 5 ohms?

-> Yes

REPAIR the circuit between PI001, pin 011 (Y) and CA283, pin 007 (Y). For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

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-> **No**

INSTALL a new secondary fuel pump module. If the DTC is repeated, INSTALL a new ECM.  
<<303-14A>><<303-14B>> Before replacing a ECM, contact Dealer technical support.

### I : CHECK SECONDARY FUEL PUMP DRIVER OUTPUT CIRCUITS (S/C ONLY): P3705

#### I1 : CHECK POWER SUPPLY TO THE SECONDARY FUEL PUMP

1. Disconnect the secondary fuel pump electrical connector, FP003.
2. Turn the ignition switch to the ON position.
3. Measure the voltage between FP003, pin 002 (R) and GROUND.

•Is the voltage greater than 10 volts?

-> **Yes**

Goto <<I4>>

-> **No**

Goto <<I2>>

#### I2 : CHECK POWER SUPPLY TO THE SECONDARY FUEL PUMP MODULE

1. Disconnect the secondary fuel pump module electrical connector, CA283.
2. Turn the ignition switch to the ON position.
3. Measure the voltage between CA283, pin 029 (UY) and GROUND.

•Is the voltage greater than 10 volts?

-> **Yes**

Goto <<I4>>

-> **No**

REPAIR the circuit between the fuel pump and the battery. This circuit includes fuse 49, the fuel pump relay, and fuse 23. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

#### I3 : CHECK THE SECONDARY FUEL PUMP RESISTANCE

1. Measure the resistance between pins 002 and 004 of the secondary fuel pump.

•Is the resistance less than 2 ohms?

-> **Yes**

Goto <<I4>>

-> **No**

INSTALL a new secondary fuel pump. <<310-01>> CLEAR the DTC. TEST the system for normal operation.

#### I4 : CHECK SIGNAL CIRCUIT TO THE SECONDARY FUEL PUMP FOR OPEN CIRCUIT

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1. Measure the resistance between CA283, pin 003 (Y) and FP003, pin 004 (Y).

•Is the resistance greater than 5 ohms?

-> Yes

REPAIR the circuit between CA283, pin 003 (Y) and FP003, pin 004 (Y). For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> No

INSTALL a new secondary fuel pump module. CLEAR the DTC. TEST the system for normal operation.

### J : CHECK SECONDARY FUEL PUMP DRIVER INPUT CIRCUITS FOR SHORT TO HIGH/LOW (S/C ONLY): P1339

#### J1 : CHECK SECONDARY FUEL PUMP DRIVER INPUT CIRCUIT FOR SHORT TO BATTERY

1. Disconnect the ECM electrical connector, PI001.

2. Measure the voltage between PI001, pin 011 (Y) and GROUND.

•Is the voltage greater than 1 volt?

-> Yes

REPAIR the short circuit. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> No

Goto <<J2>>

#### J2 : CHECK SECONDARY FUEL PUMP DRIVER INPUT CIRCUIT FOR SHORT TO GROUND

1. Measure the resistance between PI001, pin 011 (Y) and GROUND.

•Is the resistance less than 10,000 ohms?

-> Yes

REPAIR the short circuit. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> No

Goto <<J3>>

#### J3 : CHECK SECONDARY FUEL PUMP DRIVER INPUT CIRCUIT FOR CONTINUITY

1. Disconnect the secondary fuel pump module electrical connector, CA283.

2. Measure the resistance between CA283, pin 007 (Y) and PI001, pin 011 (Y).

•Is the resistance greater than 5 ohms?

-> Yes

REPAIR the circuit between CA283, pin 007 (Y) and PI001, pin 011 (Y). For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> No

INSTALL a new secondary fuel pump module. If the DTC is repeated, INSTALL a new ECM. <<303-14A>><<303-14B>> Before replacing a ECM, contact Dealer technical support.