2003 S-TYPE - Fuel Charging and Controls - 2.5L/3.0L - 303-04A

Fuel Charging and Controls

Inspection and Verification

1. Verify the customer concern.

2. Confirm which, if any, warning lights and/or messages were displayed on the instrument cluster.

NOTE:
If any warning lights and/or messages were displayed when the fault occurred, refer to the Driver Information table for DTCs associated with the display, then to the DTC index table for possible sources and actions. Some warnings will appear to clear when the ignition is cycled. This is often because the warning has flagged as a result of one of the vehicle's on-board diagnostic routines having run to detect the fault. If the same routine is not run when the ignition is switched **ON**, the warning will not reflag until the routine does run. See the DTC summaries for drive cycle routines.

3. Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection Chart

Mechanical	Electrical
• Engine oil level	• Fuses
• Cooling system coolant level	• Wiring harness
• Fuel level	• Electrical connector(s)
• Fuel contamination/grade/quality	• Sensor(s)
• Throttle body	• Engine control module (ECM)
• Poly-vee belt	• Transmission control module

4. Verify the following systems are working correctly:

- Air intake system
- Cooling system
- Charging system
- Ignition system

5. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.

6. Where the Jaguar approved diagnostic system is available, complete the S93 report before clearing any or all fault codes from the vehicle.

NOTE:
If a DTC cannot be cleared, then there is a permanent fault present that flags again as soon as it is cleared. (The exception to this is P1260, which will only clear following an ignition **OFF/ON** cycle after rectification).

7. If the cause is not visually evident and the Jaguar approved diagnostic system is not available, use a fault code reader to retrieve the fault codes before proceeding to the Diagnostic Trouble Code (DTC) Index Chart, or the Symptom Chart if no DTCs are set.

8. Using the Jaguar approved diagnostic system where available, and a scan tool where not, check the freeze frame data for information on the conditions applicable when the fault was flagged. The format of this will vary, depending on the tool used, but can provide information useful to the technician in diagnosing the fault.

CAUTION:
When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00.

NOTE:
When performing electrical voltage or resistance tests, always use a digital multimeter (DMM) accurate to 3 decimal places, and with an up-to-date calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

NOTE:
Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

Symptom Chart

Symptom	Possible source	Action
Engine cranks, but does not fire	• Engine breather system disconnected/restricted • Ignition system • Fuel system • Harness • CKP sensor • ECM fault	Check engine breather system, **<<303-08>>** For ignition system, Check fuel pressure, **<<310-01>>** For CKP tests, Contact dealer technical support for advice on possible ECM failure.
Engine cranks and fires, but will not start	• Purge valve • Fuel pump • Engine coolant temperature (ECT) sensor • Spark plugs • HT short to ground (tracking) check rubber boots for cracks/damage • Ignition coil failure(s) • Harness	For evaporative emissions components, **<<303-13>>** Check fuel pressure, **<<310-01>>** For ECT sensor tests, For ignition system
Difficult to start cold	• Check coolant anti-freeze content • Battery • CKP sensor • EGR valve stuck open • Fuel pump • Engine coolant temperature (ECT) sensor • Purge valve	Check engine coolant level and condition. For battery information, **<<414-01>>** For CKP sensor tests, For EGR system information, **<<303-08>>** Check fuel pressure. **<<310-01>>** For ECT sensor tests, For evaporative emissions components, **<<303-13>>**

Difficult to start hot	• Injector leak • Fuel temperature sensor • IAT sensor • MAF sensor • Purge valve • Fuel pump • Ignition system • Engine coolant temperature (ECT) sensor • EGR valve stuck open	For fuel injector information, **<<Fuel Injectors - >>** For fuel temperature sensor, IAT sensor and MAF sensor tests, **<<303-14A>><<303-14B>>** For evaporative emissions components, **<<303-13>>** Check fuel pressure. **<<310-01>>** For ignition system, For ECT sensor tests, For EGR information, **<<303-08>>**
Difficult to start after hot soak (vehicle standing after engine has reached operating temperature)	• Injector leak • Fuel temperature sensor • IAT sensor • MAF sensor • Purge valve • Fuel pump • Ignition system • Engine coolant temperature (ECT) sensor • EGR valve stuck open	For fuel injector information, For fuel temperature sensor, IAT sensor and MAF sensor tests, **<<303-14A>><<303-14B>>** For evaporative emissions components, **<<303-13>>** Check fuel pressure. **<<310-01>>** For ignition system, For ECT sensor tests, For EGR information, **<<303-08>>**

Engine stalls soon after start	• Breather system disconnected/restricted • ECM relay • Harness • MAF sensor • Engine coolant temperature (ECT) sensor • Ignition system • Air filter restricted • Fuel lines • Fuel rail pressure sensor • Air leakage	For breather system information, **<<303-08>>** For ECM relay, MAF sensor and ECT sensor tests, For ignition system, For air filter information, For fuel line information, **<<310-01>>** For fuel rail pressure sensor tests, Goto **<<B>>** . For intake system information,
Engine hesitates/poor acceleration	• Fuel pump • Injector leak • Fuel pressure • Fuel lines • Air leakage • Throttle sensors • Throttle motor • Ignition system • Exhaust gas recirculation • HO2 sensors • Transmission malfunction • Restricted pedal travel (carpet, etc) • APP sensor	Check fuel pressure. **<<310-01>>** For fuel rail pressure sensor tests, Goto **<<B>>** . For fuel line information, **<<310-01>>** For intake system, For throttle position sensor and throttle motor tests, For ignition system, For exhaust gas recirculation, **<<303-08>>** Check for DTCs indicating a faulty HO2 sensor. Refer to the DTC index. For transmission information, **<<307-01>>** Check accelerator pedal travel. For APP sensor tests,

Engine backfires	• Fuel pump • Fuel lines • Air leakage • MAF sensor • Oxygen sensors • Ignition system • Sticking VCT hub • APP sensor	Check fuel pressure. **<<310-01>>** For fuel line information, **<<310-01>>** For intake system, For MAF sensor tests, Check for DTCs indicating a faulty HO2 sensor. Refer to the DTC index. For ignition system, Check DTCs for VCT range/performance fault. For VCT information, For APP sensor tests,
Engine surges	• Fuel pump • Fuel lines • MAF sensor • Harness • Throttle sensors • Throttle motor • Ignition system	Check fuel pressure. **<<310-01>>** For fuel line information, **<<310-01>>** For MAF sensor, throttle sensor, and throttle motor relay tests, For ignition system,
Engine detonates/knocks	• KS/circuit malfunction • Fuel pump • Fuel lines • FRP sensor • MAF sensor • Oxygen sensors • Air leakage • Sticking VCT hub • BARO sensor malfunction	For KS circuit tests, **<<303-14A>><<303-14B>>** Check fuel pressure. **<<310-01>>** For fuel line information, **<<310-01>>** For fuel rail pressure sensor tests, Goto **<<B>>** . For MAF sensor and oxygen sensor tests, For intake system, Check DTCs for VCT range/performance fault. For VCT information, For BARO sensor, contact dealer technical support for advice on possible ECM failure
No throttle response	• APP sensor malfunction • Throttle sensors • Throttle motor	For APP sensor, throttle position sensor and throttle motor relay tests, **<<303-14A>><<303-14B>>**
Poor throttle response	• APP sensor malfunction • Throttle sensors • Engine coolant temperature (ECT) sensor • MAF sensor • Transmission malfunction • Traction control event • Air leakage • Breather system disconnected/restricted	For APP sensor, throttle position sensor, ECT sensor and MAF sensor tests, **<<303-14A>><<303-14B>>** For transmission information, **<<307-01>>** For intake system, For breather system information, **<<303-08>>**

Driver Information Chart

NOTE:

Use this table to identify DTCs associated with the message centre display, then refer to the DTC index for possible sources and actions. For a list of all DTCs flagged by the ECM, **<<303-14A>><<303-14B>>**

NOTE:

For definitions of Default Modes, see the foot of this table.

Warning light	Message	Default Mode	DTC
Red	Engine systems fault	Engine shut-down (all cylinders fuel cut)	P1224
Red	Engine systems fault	Limp-Home	P1229
Red	Engine systems fault	Limp-Home	P0121, P0122, P0123, P0222, P0223
Red	Engine systems fault	Limp-Home	P1251, P1631
Red	Engine systems fault	Limp-Home	P1611
Red	Engine systems fault	Limp-Home	P1633
Red	Engine systems fault	High idle	P1344, P1122, P1123, P1215, P1216
Red	Restricted Performance	Limp-Home unavailable	P1254
Red	Restricted Performance	Limp-Home unavailable	P1250
Red	Restricted Performance	Safety redundancy	P1657, P1658
Red	Restricted Performance	Safety redundancy	P16634
Amber	Restricted Performance	Engine speed limited	P0116, P0117, P0118, P0125
Amber	Restricted Performance	Engine speed limited	P0101, P0102, P0103, P0104
Amber	Restricted Performance	Engine speed limited	P0300, P0301, p0302, P0303, P0304, P0305, P0306, P0307, P0308, P1313, P1314
Amber	Restricted Performance	Engine speed limited	P0327, P0328, P0332, P0333, P1648
Amber	Restricted Performance	Engine speed limited	P0351, P0352, P0353, P0354, P0355, P0356, P0357, P0358, P1367, P1368
Amber	Restricted Performance	Engine speed limited	P0171, P0172, P0174, P0175
Amber	Restricted Performance	Engine speed limited	P0201, P0202, P0203, P0204, P0205, P0206, P0207, P0208
Amber	Restricted Performance	Engine speed limited	P0335, P0336

Amber	Restricted Performance	Engine speed limited, Reverse throttle progression enabled	P1642
Amber	Restricted Performance	Engine speed limited, Reverse throttle progression enabled	P1643
Amber	Restricted Performance	Engine speed limited, Reverse throttle progression enabled	P0096, P0097, P0098
Amber	Restricted Performance	Engine speed limited, Reverse throttle progression enabled	P1474
Amber	Restricted Performance	Engine speed limited	P1234, P1236, P1338
Amber	None	None	P0506, P0507
Amber	None	None	P1656
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0725
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P1796
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0701
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P1603
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0605
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P1719
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0720
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0715
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0705
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0610
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0606
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0750
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0753
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0755
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0758
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0760

Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0763
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0765
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0768
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0770
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0773
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0740
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0743
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0787
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0788
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0730
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0731
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0732
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0733
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0734
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0735
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0729
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0781
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0782
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0783
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0784
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0829
Amber	Gearbox fault/Restricted performance	Engine speed limited, reverse throttle progression enabled	P1797

Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0641
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0651
Amber	Gearbox fault/Restricted performance	Gearbox default to set gear	P0860
Amber	Gearbox fault/Restricted performance	Limp-home	P1783

Default mode Definitions

LIMP-HOME MODE

- Throttle motor off
- Throttle motor relay off
- Throttle motor circuit off
- Fuel intervention
- Cruise control inhibited

LIMP-HOME UNAVAILABLE

- Power limitation
- Vehicle speed limited to 120 kph
- Reverse throttle progression enabled
- Cruise control Inhibited

REVERSE THROTTLE PROGRESSION

- Throttle opening limited to maximum 30%

NOTE:
The throttle operation uses the same map as for reverse gear.

ENGINE SPEED LIMITED

- Engine runs normally, up to 3000 rpm
- Engine speed restricted to 3000 rpm maximum, by fuel cut-off

HIGH IDLE

- Throttle valve kept in fixed position by motor
- Cruise control Inhibited

SAFETY REDUNDANCY

- Power limitation
- Vehicle speed limited to 120 kph
- Reverse throttle progression enabled
- Cruise Control Inhibited

Diagnostic Trouble Code (DTC) index

DTC	Condition	Possible Causes	Action
P0171	Right-hand cylinders combustion too lean	• Air intake leak between mass air flow (MAF) sensor and cylinder head • Fuel filter/system restriction • Fuel injector restriction • Fuel rail pressure (FRP) sensor fault (low fuel pressure) • Low fuel pump output • HO2S/catalyst monitor sensor harness wiring condition fault • EFT sensor fault (low fuel temperature) • Mass air flow (MAF) sensor fault (low intake air flow) • Exhaust leak (before catalyst) • ECM receiving incorrect signal from one or more of the following sensors; ECT, MAF*, IAT, fuel rail temperature	For intake system, **<<303-12A>><<303-12B>>** For fuel injector, **<<Fuel Injectors -** For fuel filter and pump, **<<310-01>>** For FRP sensor circuit tests, Goto **<<B>>** . For HO2S/Catalyst monitor sensor tests, For exhaust syster **<<309-00>>** For sensor tests, * this DTC is flagged, pay particul attention to the MAF sensor.
P0172	Right-hand cylinders combustion too rich	• Engine misfire • Restricted air filter • Leaking fuel injector(s) • FRP sensor failure (high fuel pressure) • EFT sensor fault (high fuel temperature) • MAF sensor fault (high intake air flow) • HO2S/catalyst monitor sensor harness wiring condition fault • ECM receiving incorrect signal from one or more of the following sensors; ECT, MAF, IAT, FRP, EFT.	Check for 'misfire detected' DT in this section; For intake systen **<<303-12A>><<303-12B>>** For fuel injector, **<<Fuel Injectors -** For FRP sensor circuit tests, Goto **<<B>>** . For other sensor tests,

P0174	Left-hand cylinders combustion too lean	• Air intake leak between MAF sensor and cylinder head • Fuel filter/system restriction • Fuel injector restriction • FRP sensor failure (low fuel pressure) • Low fuel pump output • HO2S/catalyst monitor sensor harness wiring condition fault • EFT sensor fault (low fuel temperature) • Mass air flow (MAF) sensor fault (low intake air flow) • Exhaust leak (before catalyst) • ECM receiving incorrect signal from one or more of the following sensors; ECT, MAF*, IAT, FRP, EFT, TP.	For intake system, **<<303-12A>><<303-12B>>** For fuel injectors, **<<Fuel Injectors >>** For fuel filter, pump and lines **<<310-01>>** For HO2S/catalyst monitor sensor tests, For exhaus system, **<<309-00>>** For FRP sensor tests, Goto **<<B>>** . For other sensor tests, * If this DTC is flagged, pay particular attention to the MAF sensor.
P0175	Left-hand cylinders combustion too rich	• Engine misfire • Restricted air filter • Leaking fuel injector(s) • FRP sensor failure (high fuel pressure) • ECM receiving incorrect signal from one or more of the following sensors; ECT, MAF, IAT, fuel rail pressure, fuel rail temperature	Check for 'misfire detected' DTC in this section. For intake system **<<303-12A>><<303-12B>>** For fuel injectors, **<<Fuel Injectors >>** For FRP sensor tests, Goto **<<B>>** . For other sensor tests,

P0191	Fuel rail pressure (FRP) sensor circuit range/performance	• Fuel filter/system restriction • Fuel system leak • Incorrect fuel pump output • FRP sensor to ECM sensing circuit; high resistance, open circuit, short circuit to high voltage • FRP sensor to splice in sensor supply circuit; high resistance, open circuit • FRP sensor to splice in sensor ground circuit; high resistance, open circuit, short circuit to ground, short circuit to high voltage • FRP sensor failure	For fuel filter, pump and lines, **<<310-01>>** For FRP sensor tes Goto **<<B>>** .
P0192	Fuel rail pressure (FRP) sensor circuit low voltage (low pressure)	• FRP sensor disconnected • FRP sensor to ECM sensing circuit; open circuit or short circuit to ground • FRP sensor to splice in sensor supply circuit; high resistance, open circuit • FRP sensor failure	For FRP sensor tests, Goto **<<B>>** .
P0193	Fuel rail pressure (FRP) sensor circuit high voltage (high pressure)	• FRP sensor to ECM wiring (supply/sense); short circuit to each other • FRP sensor to ECM sense circuit; short circuit to high voltage • FRP sensor to splice in sensor ground circuit; open circuit • FRP sensor failure	For FRP sensor tests, Goto **<<B>>** .

P0201	Fuel injector circuit malfunction, Cyl 1	• Injector disconnected • Injector wiring open or short circuit • Injector failure	For fuel injectors, **<<Fuel Injectors - >>** For fuel injector circuit tests, Goto **<<A>>** .
P0202	Fuel injector circuit malfunction, Cyl 2	• Injector disconnected • Injector wiring open or short circuit • Injector failure	For fuel injectors, **<<Fuel Injectors - >>** For fuel injector circuit tests, Goto **<<A>>** .
P0203	Fuel injector circuit malfunction, Cyl 3	• Injector disconnected • Injector wiring open or short circuit • Injector failure	For fuel injectors, **<<Fuel Injectors - >>** For fuel injector circuit tests, Goto **<<A>>** .
P0204	Fuel injector circuit malfunction, Cyl 4	• Injector disconnected • Injector wiring open or short circuit • Injector failure	For fuel injectors, **<<Fuel Injectors - >>** For fuel injector circuit tests, Goto **<<A>>** .
P0205	Fuel injector circuit malfunction, Cyl 5	• Injector disconnected • Injector wiring open or short circuit • Injector failure	For fuel injectors, **<<Fuel Injectors - >>** For fuel injector circuit tests, Goto **<<A>>** .
P0206	Fuel injector circuit malfunction, Cyl 6	• Injector disconnected • Injector wiring open or short circuit • Injector failure	For fuel injectors, **<<Fuel Injectors - >>** For fuel injector circuit tests, Goto **<<A>>** .

P0300	Random misfire detected	• ECM to ignition coil primary circuit fault (cylinder misfire detected DTC also flagged) • Ignition coil failure • Spark plug failure/fouled/incorrect gap • Fuel injector circuit fault(s) (injector DTCs also flagged) • Fuel delivery pressure high/low • Fuel injectors restricted/leaking • Fuel injectors continuously open • Fuel contamination • Worn camshaft/broken valve springs	For ignition system, **<<303-07A>><<303-07B>>** For injector circuit tests, Goto **<<A>>** . Check fuel pressure, **<<310-01** For fuel injectors, **<<Fuel Injectors - >>** For engine information,
P0301	Misfire detected, cylinder 1	• ECM to ignition coil primary circuit fault (cylinder misfire detected DTC also flagged) • Ignition coil failure • Spark plug failure/fouled/incorrect gap • Fuel injector circuit fault(s) (injector DTCs also flagged) • Fuel delivery pressure high/low • Fuel injectors restricted/leaking • Fuel injectors continuously open • Fuel contamination • Worn camshaft/broken valve springs	For ignition system, **<<303-07A>><<303-07B>>** For injector circuit tests, Goto **<<A>>** . Check fuel pressure, **<<310-01** For fuel injectors, **<<Fuel Injectors - >>** For engine information,

P0302	Misfire detected, cylinder 2	• ECM to ignition coil primary circuit fault (cylinder misfire detected DTC also flagged) • Ignition coil failure • Spark plug failure/fouled/incorrect gap • Fuel injector circuit fault(s) (injector DTCs also flagged) • Fuel delivery pressure high/low • Fuel injectors restricted/leaking • Fuel injectors continuously open • Fuel contamination • Worn camshaft/broken valve springs	For ignition system, **<<303-07A>><<303-07B>>** For injector circuit tests, Goto **<<A>>** . Check fuel pressure, **<<310-01** For fuel injectors, **<<Fuel Injectors - >>** For engine information,
P0303	Misfire detected, cylinder 3	• ECM to ignition coil primary circuit fault (cylinder misfire detected DTC also flagged) • Ignition coil failure • Spark plug failure/fouled/incorrect gap • Fuel injector circuit fault(s) (injector DTCs also flagged) • Fuel delivery pressure high/low • Fuel injectors restricted/leaking • Fuel injectors continuously open • Fuel contamination • Worn camshaft/broken valve springs	For ignition system, **<<303-07A>><<303-07B>>** For injector circuit tests, Goto **<<A>>** . Check fuel pressure, **<<310-01** For fuel injectors, **<<Fuel Injectors - >>** For engine information,

P0304	Misfire detected, cylinder 4	• ECM to ignition coil primary circuit fault (cylinder misfire detected DTC also flagged) • Ignition coil failure • Spark plug failure/fouled/incorrect gap • Fuel injector circuit fault(s) (injector DTCs also flagged) • Fuel delivery pressure high/low • Fuel injectors restricted/leaking • Fuel injectors continuously open • Fuel contamination • Worn camshaft/broken valve springs	For ignition system, **<<303-07A>><<303-07B>>** For injector circuit tests, Goto **<<A>>** . Check fuel pressure, **<<310-01** For fuel injectors, **<<Fuel Injectors - >>** For engine information,
P0305	Misfire detected, cylinder 5	• ECM to ignition coil primary circuit fault (cylinder misfire detected DTC also flagged) • Ignition coil failure • Spark plug failure/fouled/incorrect gap • Fuel injector circuit fault(s) (injector DTCs also flagged) • Fuel delivery pressure high/low • Fuel injectors restricted/leaking • Fuel injectors continuously open • Fuel contamination • Worn camshaft/broken valve springs	For ignition system, **<<303-07A>><<303-07B>>** For injector circuit tests, Goto **<<A>>** . Check fuel pressure, **<<310-01** For fuel injectors, **<<Fuel Injectors - >>** For engine information,

P0306	Misfire detected, cylinder 6	• ECM to ignition coil primary circuit fault (cylinder misfire detected DTC also flagged) • Ignition coil failure • Spark plug failure/fouled/incorrect gap • Fuel injector circuit fault(s) (injector DTCs also flagged) • Fuel delivery pressure high/low • Fuel injectors restricted/leaking • Fuel injectors continuously open • Fuel contamination • Worn camshaft/broken valve springs	For ignition system, **<<303-07A>><<303-07B>>** For injector circuit tests, Goto **<<A>>** . Check fuel pressure, **<<310-01** For fuel injectors, **<<Fuel Injectors - >>** For engine information,
P0460	Fuel level sensor circuit range/performance	• Fuel level sensor to rear electronic control module circuit(s); intermittent short circuit, open circuit, high resistance • Fuel level sensor failure • Rear electronic control module fault (incorrect fuel level data)	For fuel level sensor and circuit tests, **<<310-01>>**
P1224	Throttle control position error	• Throttle motor failure • Throttle body failure	This DTC can only be accurately diagnosed using the Jaguar approved diagnostic system. If tl is not available, INSTALL a new throttle body. **<<Throttle Body - >>** CLEAR the DTC, TEST the system for normal operation.

P1229	Throttle motor control circuit malfunction	• Throttle motor disconnected • Throttle motor to ECM drive circuits; short circuit or open circuit • ECM ground circuit fault(s) (EM80-04, 05, 54) • Throttle motor failure • Throttle body failure	For throttle motor and circuit tes and for ECM ground tests, **<<303-14A>><<303-14B>>** For throttle body, **<<Throttle Body - >>**
P1234	No fuel pump commands received by ECM	• ECM to fuel pump module drive circuit; open circuit, short circuit, high resistance • Fuel pump module failure	For fuel pump module circuit tes **<<310-01>>**
P1236	Fuel pump not activated when requested by ECM	• ECM to fuel pump module drive circuit; open circuit, short circuit, high resistance • Fuel pump module failure	For fuel pump module circuit tes **<<310-01>>**
P1250	Throttle return spring failure malfunction	Throttle return spring failure (throttle body failure)	This DTC can only be accurately diagnosed using the Jaguar approved diagnostic system. If tl is not available, INSTALL a new throttle body. **<<Throttle Body - >>** CLEAR the DTC, TEST the system for normal operation.
P1251	Throttle motor relay **OFF** failure	• Throttle motor relay coil power supply circuit; open circuit • Throttle motor relay failure • Throttle motor relay coil to ECM circuit; open circuit • ECM ground circuit fault (relay coil drive)	For throttle motor relay tests, **<<303-14A>><<303-14B>>**
P1254	Throttle limp-home spring malfunction	Throttle body	This DTC can only be accurately diagnosed using the Jaguar approved diagnostic system. If tl is not available, INSTALL a new throttle body. **<<Throttle Body - >>** CLEAR the DTC, TEST the system for normal operation.

P1313	Right-hand cylinders misfire rate catalyst damage (this DTC will flag only when accompanied by an individual cylinder misfire DTC; P0300-P0306)	Refer to P0300 possible sources	Refer to P0300 Actions
P1314	Left-hand cylinders misfire rate catalyst damage (this DTC will flag only when accompanied by an individual cylinder misfire DTC; P0300-P0306)	Refer to P0300 possible sources	Refer to P0300 Actions
P1316	Misfire excess emission (Note: This DTC will flag only when accompanied by an individual cylinder misfire DTC; P0300 to P0306)	Refer to P0300 possible sources	Refer to P0300 Actions
P1338	Fuel pump drive circuit low/high voltage	• Fuel pump module to fuel pump drive circuit; open circuit, short circuit, high resistance • Fuel pump module failure • Fuel pump failure	For fuel pump module circuit tes **<<310-01>>**
P1631	Throttle motor power relay coil activation circuit failure	• Throttle motor relay coil to ECM circuit; open circuit • Throttle motor relay failure • Throttle motor relay coil to ECM drive circuit; open circuit, short circuit to ground	For throttle motor relay tests, **<<303-14A>><<303-14B>>**
P1634	Throttle watchdog circuit malfunction	• ECM failure	Contact dealer technical support for advice on possible ECM failu
P1656	Throttle position (TP) sensor amplifier circuit malfunction	• ECM failure	Contact dealer technical support for advice on possible ECM failu
P1657	Throttle motor relay coil drive circuit **ON** failure	• Throttle motor relay failure • Throttle motor relay coil to ECM drive circuit; short circuit to B+ voltage	For throttle motor relay tests, **<<303-14A>><<303-14B>>**
P1658	Throttle motor relay **ON** failure	• Throttle motor relay failure • Throttle motor relay coil to ECM drive circuit; short circuit to B+ voltage	For throttle motor relay tests, **<<303-14A>><<303-14B>>**

Pinpoint Tests

A : DTC P0201, P0202, P0203, P0204, P0205, P0206; FUEL INJECTORS

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 battery negative terminal.
3. Disconnect the relevant injector electrical connector (IL03 to IL08).
4. Measure the resistance between the injector pins.

- **Is the resistance between 12 and 16 ohms?**

-> Yes
Goto **<<A2>>**

-> No
INSTALL a new injector. **<<Fuel Injectors - >>** CLEAR the DTC. TEST the system for normal operation.

A2 : CHECK THE INJECTOR COIL INSULATION

1. Measure the resistance between the injector pin 01 and the injector body.
2. Measure the resistance between the injector pin 02 and the injector body.

- **Is either resistance less than 10,000 ohms?**

-> Yes
INSTALL a new injector. **<<Fuel Injectors - >>** CLEAR the DTC. TEST the system for normal operation.

-> No
Goto **<<A3>>**

A3 : CHECK THE INJECTOR SUPPLY VOLTAGE

1. Reconnect the battery negative terminal.
2. Turn the ignition switch to the **ON** position.
3. Disconnect the relevant injector harness electrical connector (IL03 to IL08).
4. Measure the voltage between the relevant injector harness electrical connector (IL03 to IL08) pin 02 and GROUND.

- **Is the voltage less than 10 Volts?**

-> Yes
REPAIR the circuit between the relevant injector harness electrical connector (IL03 to IL08) pin 02 and battery. This circuit includes the front power distribution box, fuse 13, and the EMS relay. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> No
Goto **<<A4>>**

A4 : CHECK THE INJECTOR GROUND CIRCUIT

1. Turn the ignition switch to the **OFF** position.
2. Disconnect the battery negative terminal.

3. Disconnect the ECM electrical connector PI01.

4. Measure the resistance between the relevant injector harness electrical connector (IL03 to IL08) pin 01 and PI01 pins as follows:

- Injector Cyl 1 pin 01 (BG) and PI01, pin 115 (BG).
- Injector Cyl 2 pin 01 (BR) and PI01, pin 120 (BR).
- Injector Cyl 3 pin 01 (BK) and PI01, pin 114 (BK).
- Injector Cyl 4 pin 01 (BO) and PI01, pin 119 (BO).
- Injector Cyl 5 pin 01 (BG) and PI01, pin 113 (BG).
- Injector Cyl 6 pin 01 (U) and PI01, pin 118 (U).

•Is the resistance greater than 5 ohms?

-> Yes

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

-> No

Goto **<<A5>>**

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

1. Reconnect the battery negative terminal.

2. Turn the ignition switch to the **ON** position.

3. Measure the voltage between the relevant injector harness electrical connector (IL03 to IL08) pin 01 and GROUND.

•Is the voltage greater than 3 volts?

-> Yes

REPAIR the short circuit. For additional information, refer to the 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 (IL03 to IL08) pin 01 and GROUND.

•Is the resistance less than 10,000 ohms?

-> Yes

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

-> No

Contact dealer technical support for advice on possible ECM failure.

B : DTC P0190, P0192, P0193; FUEL RAIL PRESSURE (FRP) SENSOR

NOTE:
For sensor supply tests, **<<303-14A>><<303-14B>>**

NOTE:
For sensor ground tests, **<<303-14A>><<303-14B>>**

B1 : CHECK THE FRP SENSOR SIGNAL CIRCUIT FOR HIGH RESISTANCE

1. Turn the ignition switch to the **OFF** position.
2. Disconnect the battery negative terminal.
3. Disconnect the FRP sensor electrical connector, IL12.
4. Measure the resistance between IL12 pin 03 (U) and PI01 pin 73 (U).

- **Is the resistance greater than 5 ohms?**

-> Yes
REPAIR the high resistance circuit. For additional information, refer to the wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> No
Goto **<<B2>>**

B2 : CHECK THE FRP SENSOR SIGNAL CIRCUIT FOR SHORT TO HIGH VOLTAGE

1. Reconnect the battery negative terminal.
2. Turn the ignition switch to the **ON** position.
3. Measure the voltage between IL12 pin 03 (U) and GROUND.

- **Is the voltage greater than 3 volts?**

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

-> No
Goto **<<B3>>**

B3 : CHECK THE FRP SENSOR SIGNAL CIRCUIT FOR SHORT TO GROUND

1. Turn the ignition switch to the **OFF** position.
2. Measure the resistance between the FRP sensor electrical connector IL12 pin 03 (U) and GROUND.

- **Is the resistance less than 10,000 ohms?**

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

-> No
<<303-14A>><<303-14B>>