

# Electronic Engine Controls - Engine Control Module (ECM) Adaptation

General Procedures

## When to carry out adaptations

1. Whenever the battery is disconnected, the Engine Control Module (ECM) adaptations are reset to a "green" ECM condition. In this condition, certain functions of the ECM are inhibited, and the ECM must "relearn" these functions. To enable the ECM to do this, the vehicle will have to perform some manoeuvres which it may, or may not, do during a normal road test. The routine in this procedure should be carried out at Pre-Delivery Inspection, and after any emissions related rectification work involving the disconnection of the battery.

## DTCs P1000/P1111

2. When the DTCs relating to a rectified concern are cleared, P1000 (system checks not complete since last memory clear) will be flagged. This DTC does not indicate a failure, just that diagnostic drive cycles need to be performed. The vehicle's on-board diagnostic system will confirm that all the diagnostic drive cycles are complete by flagging P1111, (system checks complete since last memory clear)

## Conditions for adaptation

1. Make sure these conditions are checked and corrected, if necessary, before carrying out the adaptation procedure.

Mechanical	Electrical
<ul style="list-style-type: none"><li>• Engine oil level correct</li><li>• Coolant level correct</li><li>• Fuel level greater than 30%, less than 80%</li><li>• Fuel filler cap correctly fitted/secure, seal in good condition</li><li>• All rectification work relating to DTCs completed</li><li>• Fuel, ignition and cooling systems in good order</li></ul>	<ul style="list-style-type: none"><li>• All Diagnostic Trouble Codes (DTCs) cleared</li><li>• All rectification work relating to DTCs completed<ul style="list-style-type: none"><li>• Fuses</li><li>• Harnesses</li></ul></li><li>• Electrical connectors</li></ul>

## Fuelling Adaptations Drive Cycle

- NOTE: Make sure the engine is at normal operating temperature. (75°C, 167°F)

1. Either the Jaguar approved diagnostic system (where available), or a scan tool should be connected to measure the Mass Air Flow rate. Most generic scan tools should be capable of reading this parameter.

Site	Mass Air Flow (grams/second)	Driving Conditions
1	Up to 7 g/s	Idle in <b>P</b> for 2 minutes
2	10 to 14 g/s	Open throttle in <b>P</b> for 2 minutes
3	18 to 22 g/s	Open throttle in <b>P</b> or <b>D</b> with guidance * for 2 minutes
4	25 to 30 g/s	Drive with guidance * for 2 minutes

Depending on road conditions and dealer location, it may be difficult to achieve the road speeds necessary to reach the air flow indicated. It is possible to reach these air flow figures by inducing a load on the vehicle, (making use of hills, using a lower gear ratio, etc) or, if no alternative is possible, by restraining the vehicle and reaching the air flow figure

stationery in **D**.



**WARNING:** This should not be attempted without the vehicle being in a safe area and suitably chocked. Failure to follow this instruction may result in personal injury.

Without using the Jaguar approved diagnostic system or a scan tool with system readiness capability, it will not be possible to confirm when the adaptations are complete, unless P1111, (system checks complete since last memory clear) is flagged. If such equipment is not available, **ALL** the diagnostic monitors will have to run to enable DTC P1111 to be flagged. In some US states, this code is a requirement for annual emissions tests.

## Diagnostic Monitor Completion

1. The drive cycles detailed here will enable the monitors to run, but only **after** fuelling adaptations are complete.

### Entry Conditions

Diagnostic	Engine Speed	Vehicle Speed	Mass Air Flow (grams/second)	Time to Completion
Catalyst Monitor	1100 to 1600 rpm	50 to 72 kph (31 to 45 mph)	5 to 30 g/s	23 seconds
HO2S	600 to 2500 rpm	29 to 113 kph (18 to 70 mph)	4 to 16 g/s	Fuel cut for more than 10 seconds, but less than 30 seconds *
Catalyst Monitor Sensor	N/A	N/A	10 to 90 g/s	140 seconds
Fuel System	N/A	N/A	More than 6 g/s	33 seconds
AACV	N/A	61 to 121 kph (38 to 75 mph)	4 to 16 g/s	Fuel cut for 2 seconds *
P/N switch	1800 to 2200 rpm	80 to 101 kph (50 to 63 mph)	N/A	31 seconds
Evaporative emissions	N/A	48 to 89 kph (30 to 55 mph) and idle	Refer to drive cycles for leak tests in this section	Refer to drive cycles for leak tests in this section

2. During the drive cycle, drive gently, avoiding hard acceleration, braking or cornering and rough roads.

1. Drive at 84 to 97 kph (52 to 60 mph) for 40 seconds.
2. Accelerate to 113 kph (70 mph).
3. Close the throttle, (ideally at the start of a descent) continue with closed throttle for 10 seconds. (\* Fuel cut)
4. Drive at 56 to 64 kph (35 to 40 mph), holding the throttle as steady as possible, on a flat level road for 30 seconds minimum.

## **Drive Cycle for 40 thou leak test**

1. Make sure the "conditions for adaptation" detailed at the start of this section are met.
  1. Avoiding high engine loads, drive the vehicle steadily between 48 and 89 kph (30 and 55 mph) for 15 to 20 minutes after starting the engine. (Depending on the amount of fuel vapor generated, the test may take longer than this).
  2. Where possible, avoid body roll to minimise fuel movement.
  3. If the scan tool being used is able to read TIDs, check TID 08 in mode 6. If the test has not completed, this TID will display "0". Any other value indicates that the test has successfully completed.
  4. If the test has not completed, the drive cycle must be repeated.
  5. If the scan tool being used is not able to read TIDs, the only way to confirm that the test has run is to check for P1111 after running the 20 thou test, where applicable.

## **Drive Cycle for 20 thou leak test (2001 my on only)**

1. This test needs to be completed within 50 minutes of starting the engine from cold. It should be run following the 40 thou test.
  1. Continue driving the vehicle steadily between 48 and 89 kph, (30 and 55 mph) avoiding high engine loads for a further 15 minutes.
  2. Avoiding excessive fuel movement, bring the vehicle to rest.
  3. Allow to idle for two minutes.
  4. Provided the vapor conditions are suitable, the test will complete.
  5. If the scan tool being used is able to read TIDs, check TID 06 in mode 6. If the test has not completed, this TID will display "0". Any other value indicates that the test has successfully completed.
  6. If the test has not completed, the drive cycle must be repeated.
  7. Check for DTCs. P1111 will be flagged if all monitors have run.
  8. Leak check drive cycles will only normally be necessary if an Evaporative Emissions related DTC is flagged.
  9. Unless P1111 is required for the State inspection, fuelling adaptations will normally be all that is required for the vehicle to adapt itself and complete

diagnostic drive cycles in the course of it's normal use.