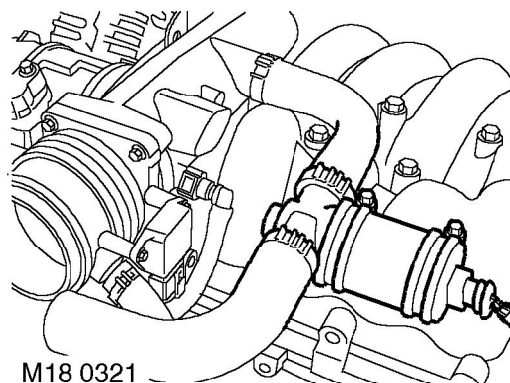


ENGINE MANAGEMENT SYSTEM - V8

Idle Air Control Valve (IACV) (C0641)



The IACV is located on the side of the air inlet pipe on top of the engine. The IACV is used to maintain good quality idle speed under all operating conditions.

When an engine is running at idle it is subject to a combination of internal and external loads that can affect idle speed. These loads include engine friction, water pump, alternator operation, and air conditioning.

The IACV acts as an air bypass valve. The ECM uses the IACV to enable the closed loop idle speed calculation to be made by the ECM. This calculation regulates the amount of air flow into the engine at idle, therefore compensating for any internal or external loads that may affect idle speed.

The IACV utilises two coils that use opposing PWM signals to control the position of opening/closing of a rotary valve. If one of the circuits that supply the PWM signal fails, the ECM closes down the remaining signal preventing the IACV from working at its maximum/ minimum setting. If this should occur, the IACV automatically resumes a default idle position. In this condition, the engine idle speed is raised and maintained at 1200 rev/min with no load placed on the engine.

The idle speed in cold start condition is held at 1200 rev/min in neutral for 20 seconds and ignition timing is retarded as a catalyst heating strategy. The cold start idle speed and the default idle position give the same engine speed 1200 rev/min, and although they are the same figure they must not be confused with each other as they are set separately by the ECM.

Note that the rotary valve must not be forced to move by mechanical means. The actuator can not be serviced; if defective, the entire IACV must be replaced.

Input/Output

The input to the IACV is a 12 volt signal from fuse 2 located in the engine compartment fuse box. The output earth signal to open and close the actuator is controlled by the ECM as follows:

- IACV (open signal) - via pin 42 of connector C0636 of the ECM
- IACV (closed signal) - via pin 43 of connector C0636 of the ECM

The IACV can fail the following ways or supply incorrect signal:

- Actuator faulty.
- Rotary valve seized.
- Wiring loom fault.
- Connector fault.
- Intake system air leak.
- Blocked actuator port or hoses.
- Restricted or crimped actuator port or hoses.

In the event of an IACV signal failure any of the following symptoms may be observed:

- Either low or high idle speed.
- Engine stalls.
- Difficult starting.
- Idle speed in default condition.



There are eight IACV diagnostic checks performed by the ECM:

- Output short circuit to earth – opening coil
- Output short circuit to battery supply – opening coil
- Output open circuit – opening coil
- Output short circuit to earth – closing coil
- Output short circuit to battery voltage – closing coil
- Output open circuit – closing coil
- Blocked IACV – rev/min error low (engine speed must be 100 rev/min less than the target speed, engine load less than 2.5 and the measured air flow more than 10 kg/h less than the expected air flow for a fault condition to be flagged).
- Blocked IACV – rev/min error high (the engine speed must be more than 180 rev/min greater than the target speed and the measured air flow more than 10 kg/h greater than the expected air flow for a fault condition to be flagged).

Should a malfunction of the component occur, the following fault codes may be evident and can be retrieved by TestBook.

P Code	J2012 Description	Land Rover Description
P1510	IACV opening coil malfunction	Short circuit to battery supply - opening winding
P1513	IACV opening coil malfunction	Short circuit to earth - opening winding
P1514	IACV opening coil malfunction	Open circuit - opening winding
P1553	IACV closing coil malfunction	Short circuit to battery supply - closing winding
P1552	IACV closing coil malfunction	Short circuit to earth - closing winding
P1551	IACV closing coil malfunction	Open circuit - closing winding
P0505	Idle control system malfunction	Blocked IACV - high or low rev/min error