

Description and Operation

The 2,0 DOHC 16V engine in the Escort RS 2000 is largely based on the familiar 2,0 DOHC engine from the Sierra and Scorpio model ranges.

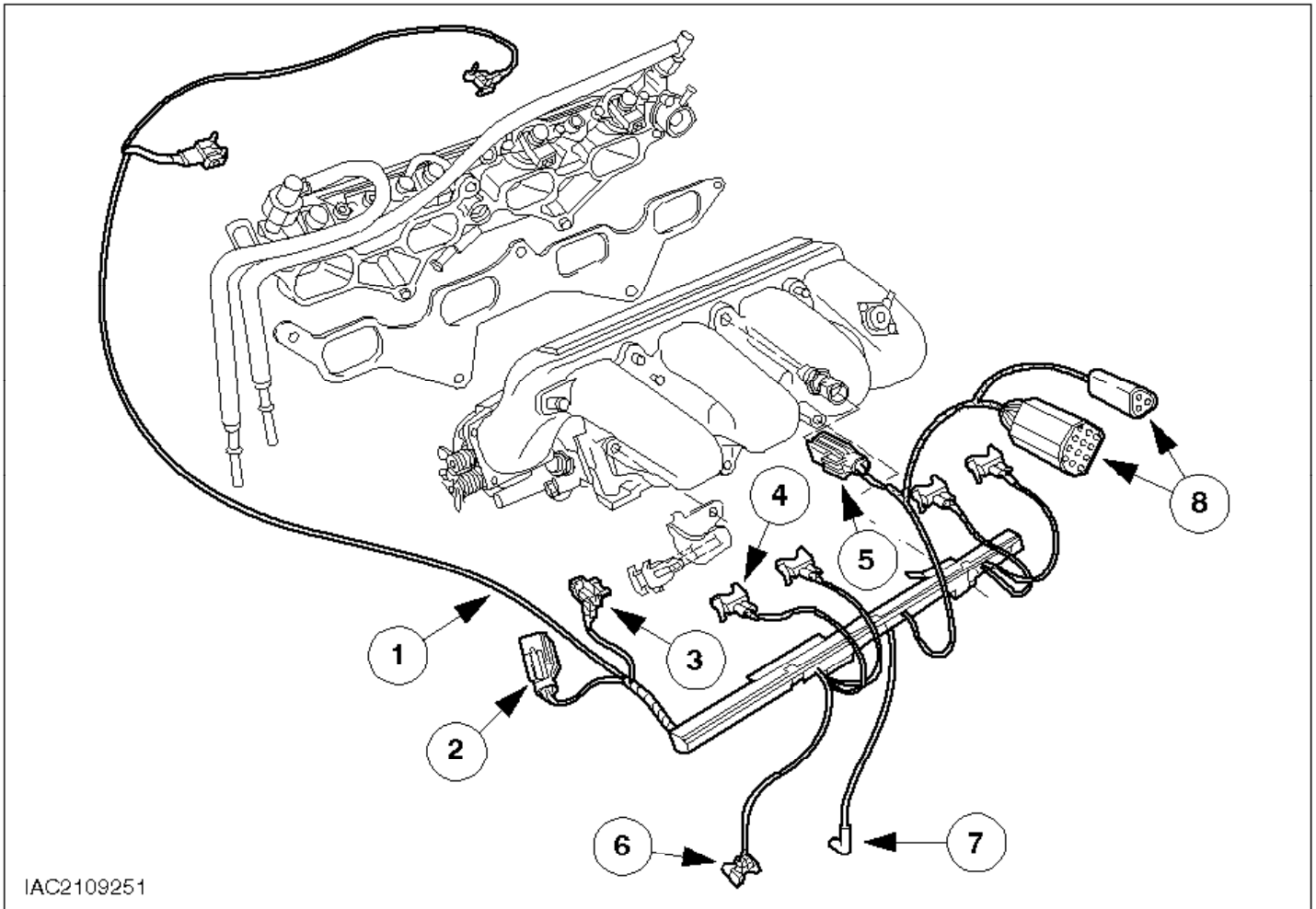
This powerful drive assembly with an output of 110 kW (150 PS) is also a 2,0 DOHC engine, but is equipped with 16 valves and an electronic ignition (EI) system.

The 22 KW (30 PS) power increase was achieved primarily by means of the following technical modifications:

- New light metal cylinder head with 16 valves and new camshafts with revised valve timings.
- Revised pistons.
- New intake assembly (air plenum chamber and manifold).
- New exhaust manifold (sectional manifold).
- Revised calibration of EEC IV engine management.
- Optimised electronic fuel injection.
- Electronic ignition (EI) system with two separate ignition coils.

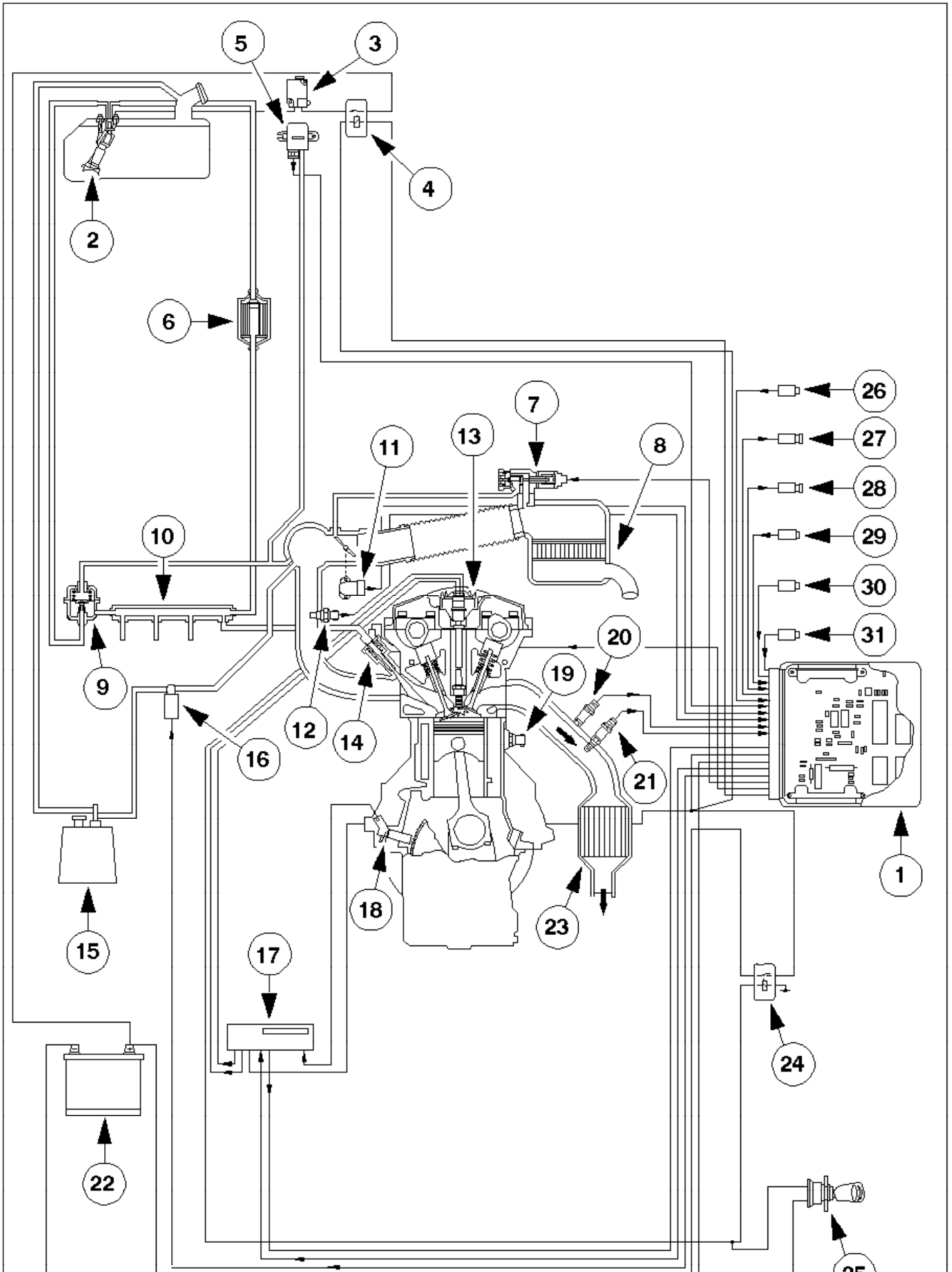
Other changes, which do not have a direct effect on the engine power output, have been made to the following components:

- Two heated oxygen sensors for cylinders nos. 1-4 and 2-3
- Power steering pressure switch (PSP switch) for stabilisation at idle speed
- Cylinder block
- Transversely mounted sump
- Cylinder head gasket
- Flywheel
- Lubricant circuit
- Coolant circuit



Electrical connections - engine wiring loom

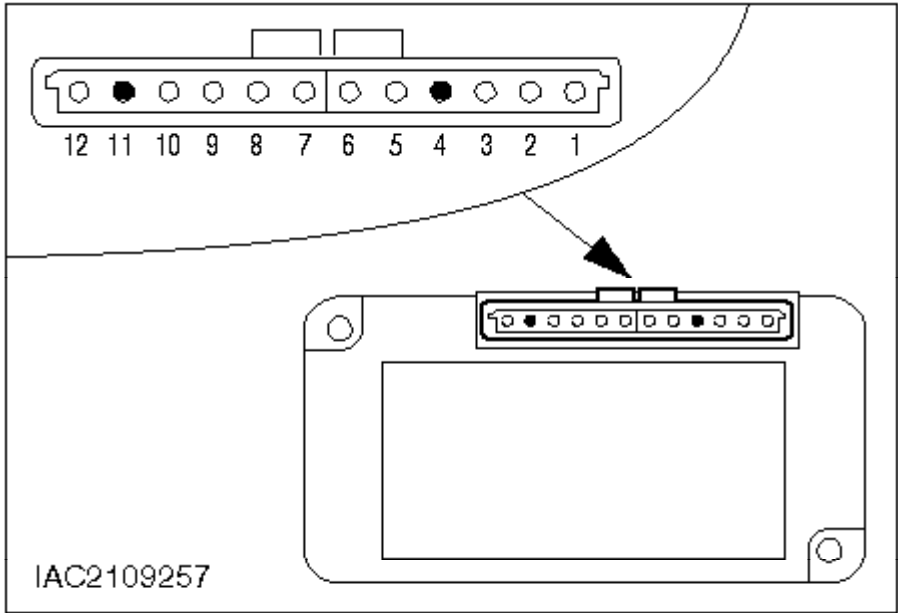
Item	Description
1	EI ignition coils
2	Engine coolant temperature sensor (ECT sensor)
3	Throttle position sensor (TP sensor)
4	Injectors
5	Intake air temperature sensor (IAT sensor)
6	Crankshaft position sensor (CKP sensor)
7	Oil pressure switch
8	Power steering pressure switch (PSP switch)



Engine management overview

Item	Description
1	Powertrain control module (PCM)
2	Fuel pump
3	Inertia switch
4	Fuel pump relay
5	Manifold absolute pressure sensor (MAP sensor)
6	Fuel filter
7	Idle air control valve (IAC valve)
8	Air cleaner
9	Pressure regulator
10	Fuel rail
11	Throttle position sensor (TP sensor)
12	Intake air temperature sensor (IAT sensor)
13	EI ignition coil
14	Injector
15	Carbon canister
16	EVAP canister purge valve
17	EI 4 module
18	Crankshaft position sensor (CKP sensor)
19	Oil pressure switch
20	Heated oxygen sensor 1 (HO2S)
21	Heated oxygen sensor 2 (HO2S)
22	Battery
23	Catalytic converter
24	Power supply relay
25	Ignition switch

26	Engine coolant temperature sensor (ECT sensor)
27	Diagnostic plug
28	Wide-open throttle air conditioning cut-off
29	Fuel octane adjustment plug
30	Idle adjust plug
31	Power steering pressure switch (PSP switch)



Pin configuration - fully electronic ignition system

Item	Description
1	PIP signal - ICM to PCM
2	Tachometer
3	SAW signal - PCM to ICM
4	Not used
5	CKP (-)
6	CKP (+)
7	Shield
8	Battery (15)
9	Module to earth
10	EI ignition coil (cylinder nos. 1-4)

11	Not used
12	EI ignition coil (cylinder nos. 2-3)

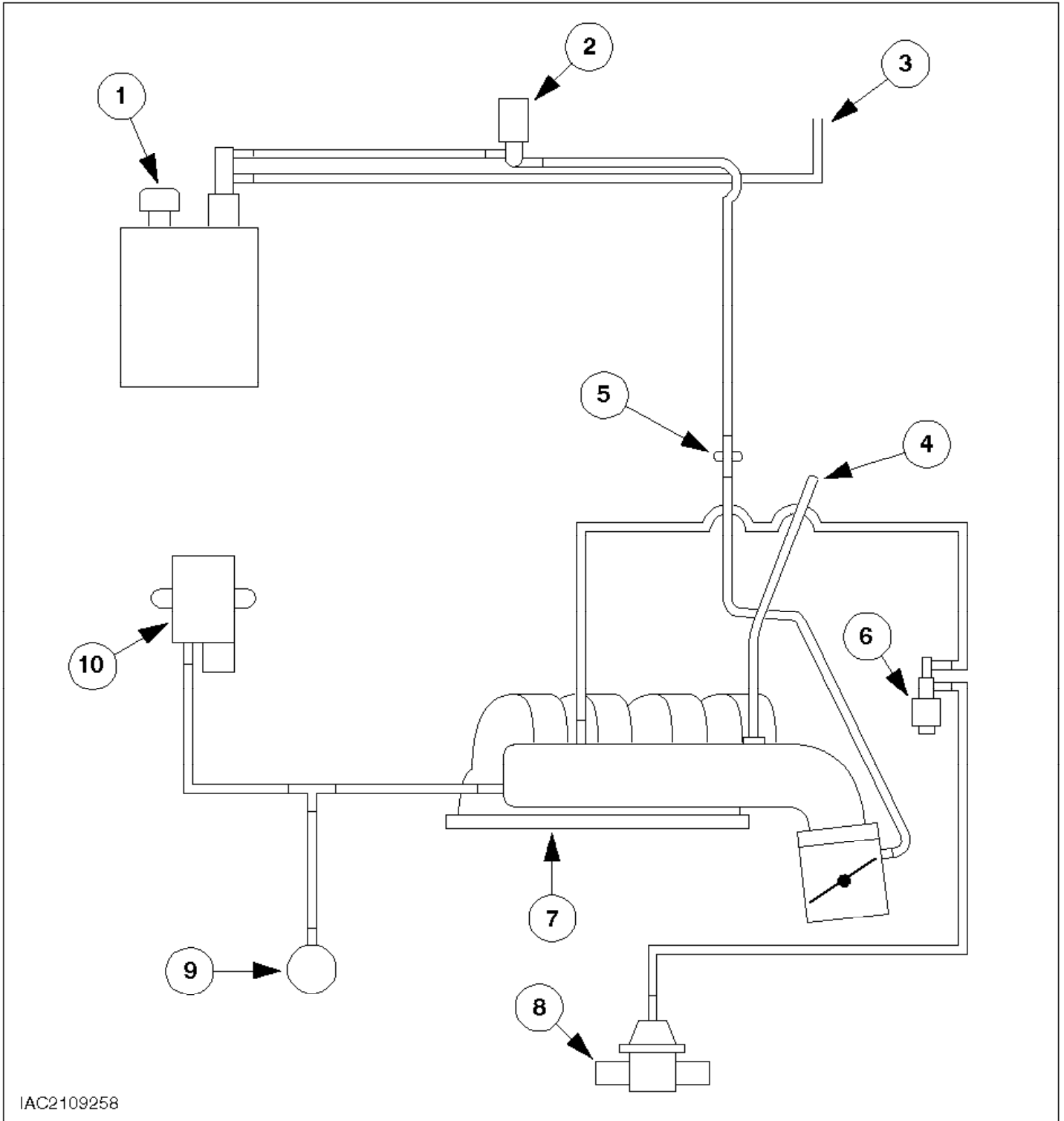
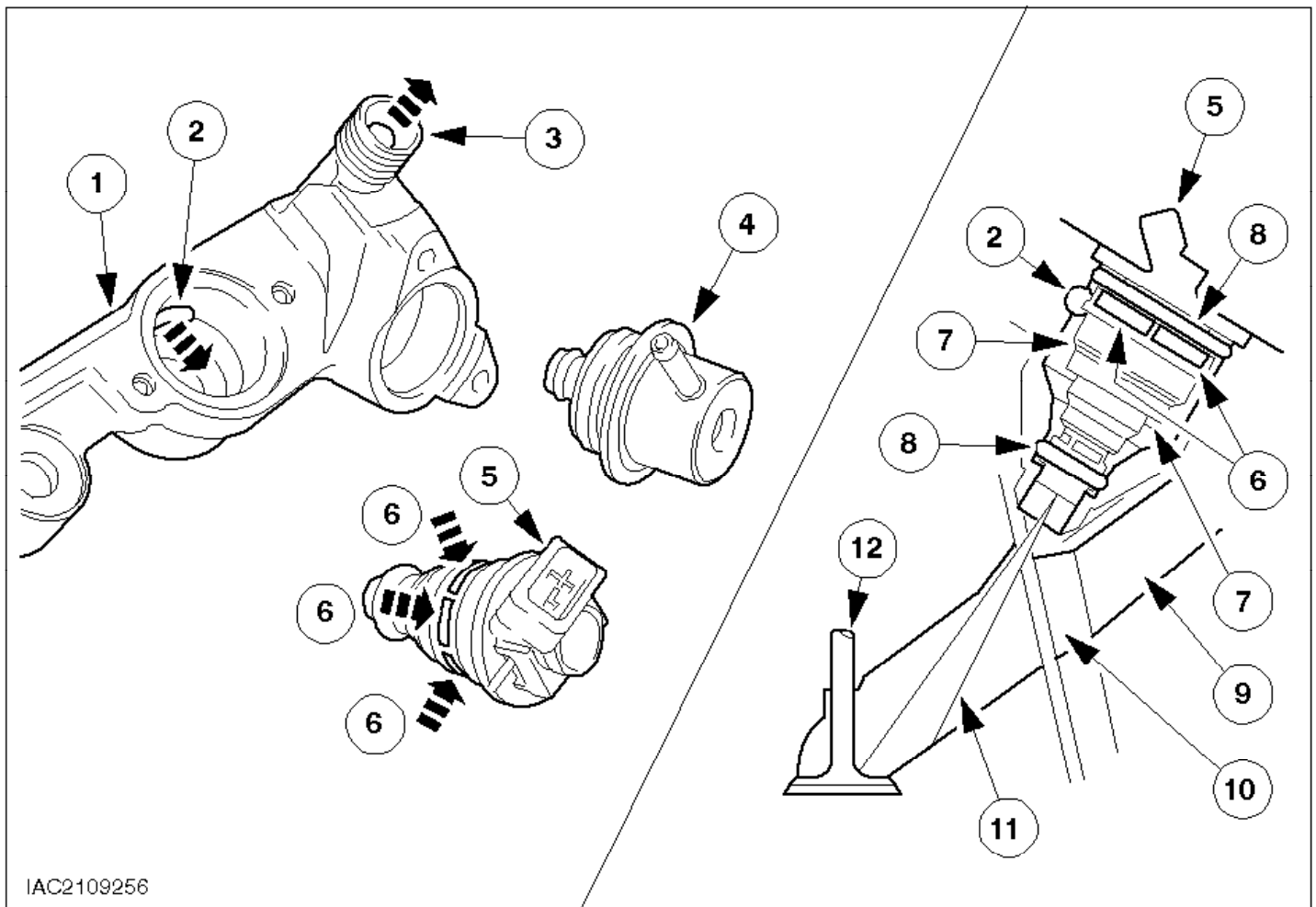


Diagram of vacuum hoses and connections

Item	Description
1	Carbon canister

2	EVAP canister purge valve
3	To fuel tank
4	To brake servo
5	Flow restrictor
6	Pulse air solenoid
7	Inlet manifold
8	Pulse air valve (pulse air system)
9	Pressure regulator
10	MAP sensor



Operating principle of the injectors

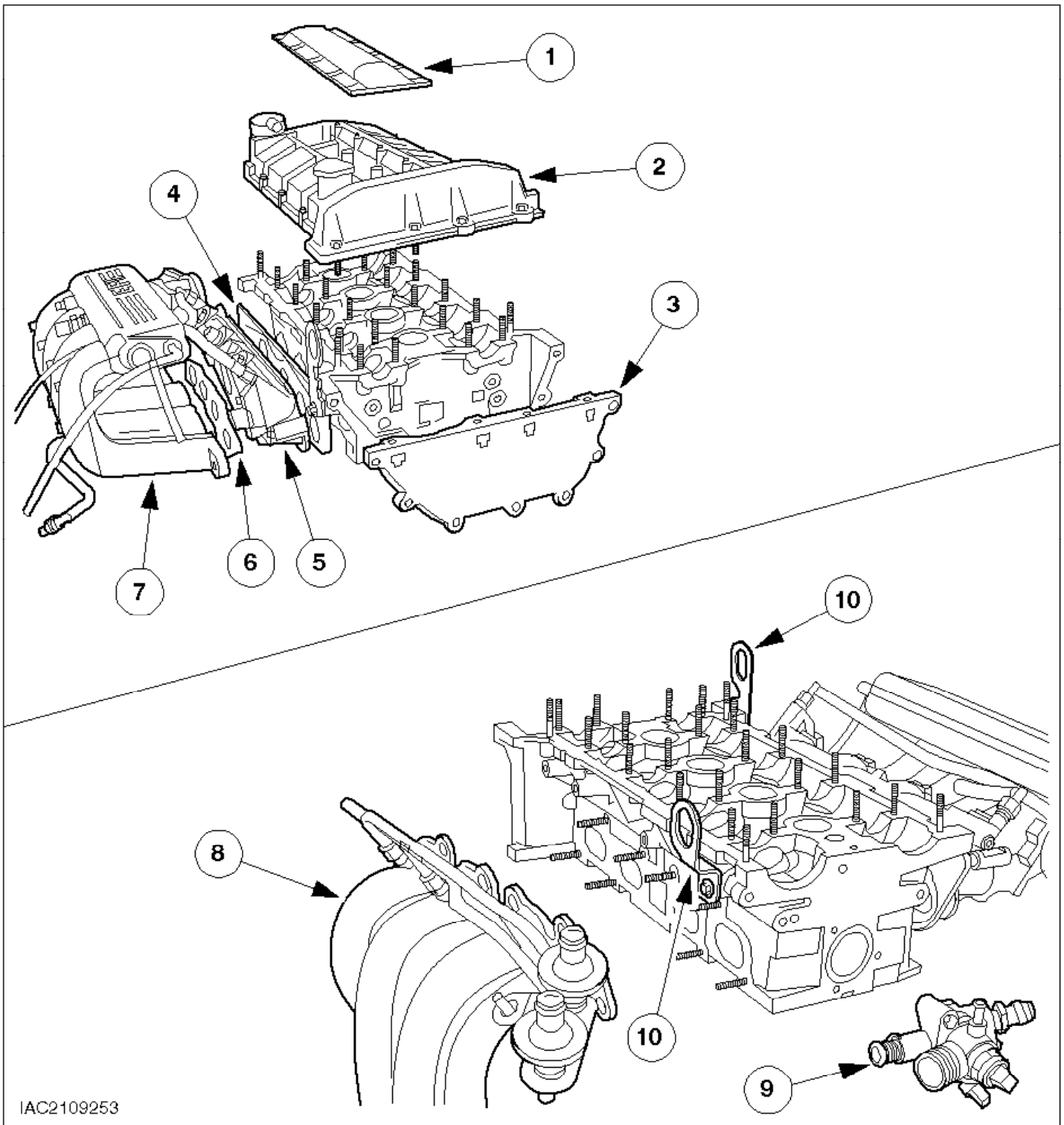
Item	Description
1	Fuel rail
2	Fuel supply

3	Return to fuel tank
4	Fuel pressure regulator
5	Injector
6	Lateral slots for fuel supply
7	Valve chamber, filled with fuel
8	O-rings
9	Inlet manifold
10	Intermediate flange
11	Cylinder head intake port
12	Inlet valve

The injectors are fitted in a fuel rail and are supplied via a central fuel feed. As a result, the injectors are constantly immersed in and cooled with fresh fuel. Vapour bubbles which form after the engine is switched off are flushed with the flow of fuel via the pressure regulator into the fuel tank when the engine is switched on again. Problems with starting the engine when warm due to bubble formation are therefore largely eliminated. In addition, the intake pipe and the fuel rail are separated from the cylinder head by a heat-insulating plate (see diagram on next page). This reduces the amount of engine heat which is transferred.

The injectors seal the fuel-filled valve chamber towards the outside by means of two O-rings. Lateral slots on the injector form the fuel supply.

The injectors are actuated in pairs in a parallel process. In other words, cylinders 1 and 4 and cylinders 2 and 3 are in each case regulated together.



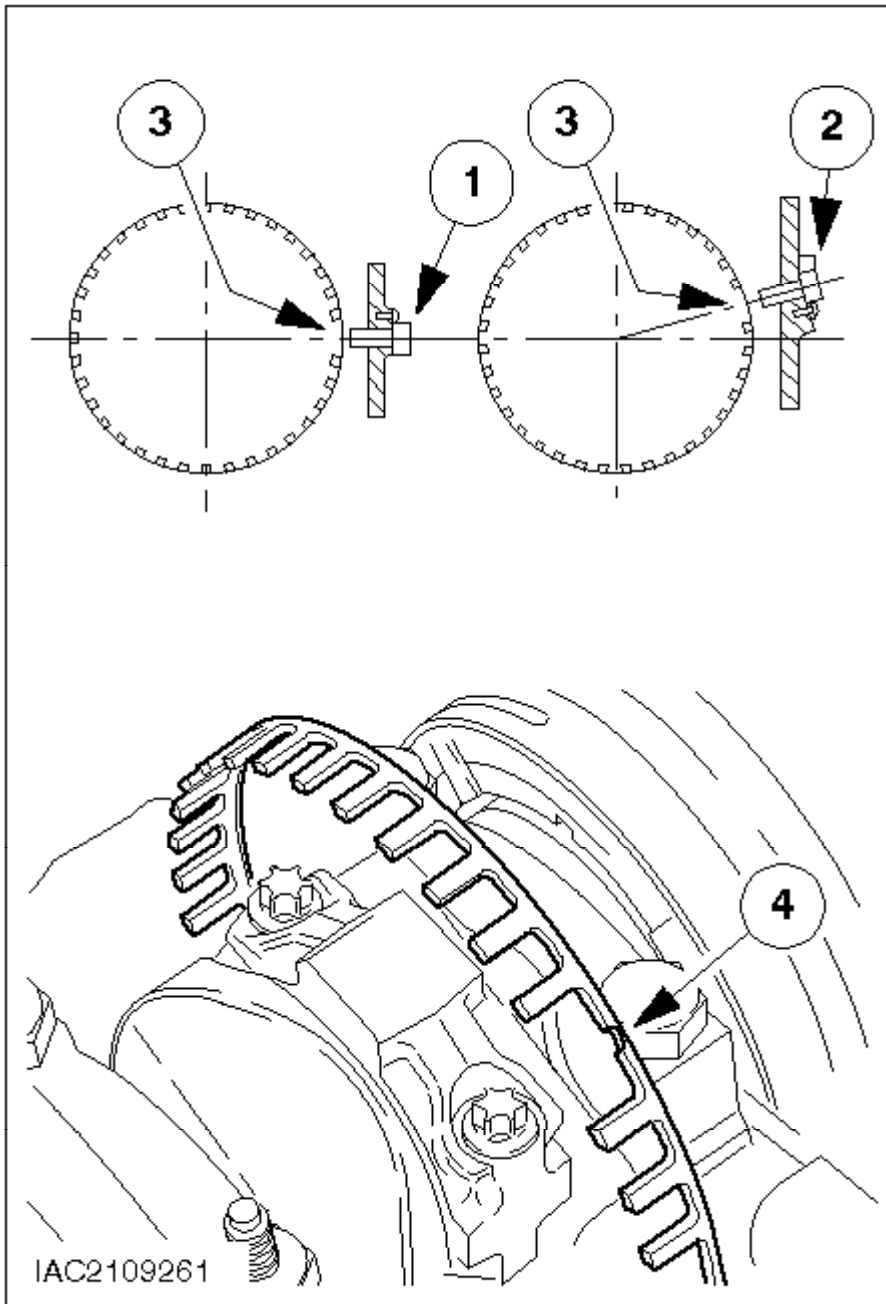
Cylinder head ancillary components

Item	Description
1	Cover to cylinder head cover
2	Cylinder head cover
3	Upper timing chain cover

4	Heat-insulating plate
5	Intermediate flange and fuel rail with integrated injectors and pressure regulator
6	Inlet manifold gasket
7	Intake pipe with air plenum chamber
8	Exhaust manifold
9	Thermostat housing
10	Engine lifting eye

The cylinder head of the 2,0 DOHC 16V engine has been completely redeveloped and has a number of special design features.

- The camshaft cams trail eccentrically onto the hydraulic valve tappets, thereby ensuring that the tappets are constantly rotated.
- The single valve springs have a larger coil diameter in the middle and, as a result, are virtually free of resonance across the entire engine speed range.
- The arrangement of the inlet and exhaust valves inclined at 20° to the vertical enables the combustion chamber to have a compact, roof-shaped design.



Modifications to the crankshaft position sensor (CKP sensor)

Item	Description
1	Position of CKP sensor in 8-valve engine
2	Position of CKP sensor in 16-valve engine
3	Missing tooth
4	Identification notch

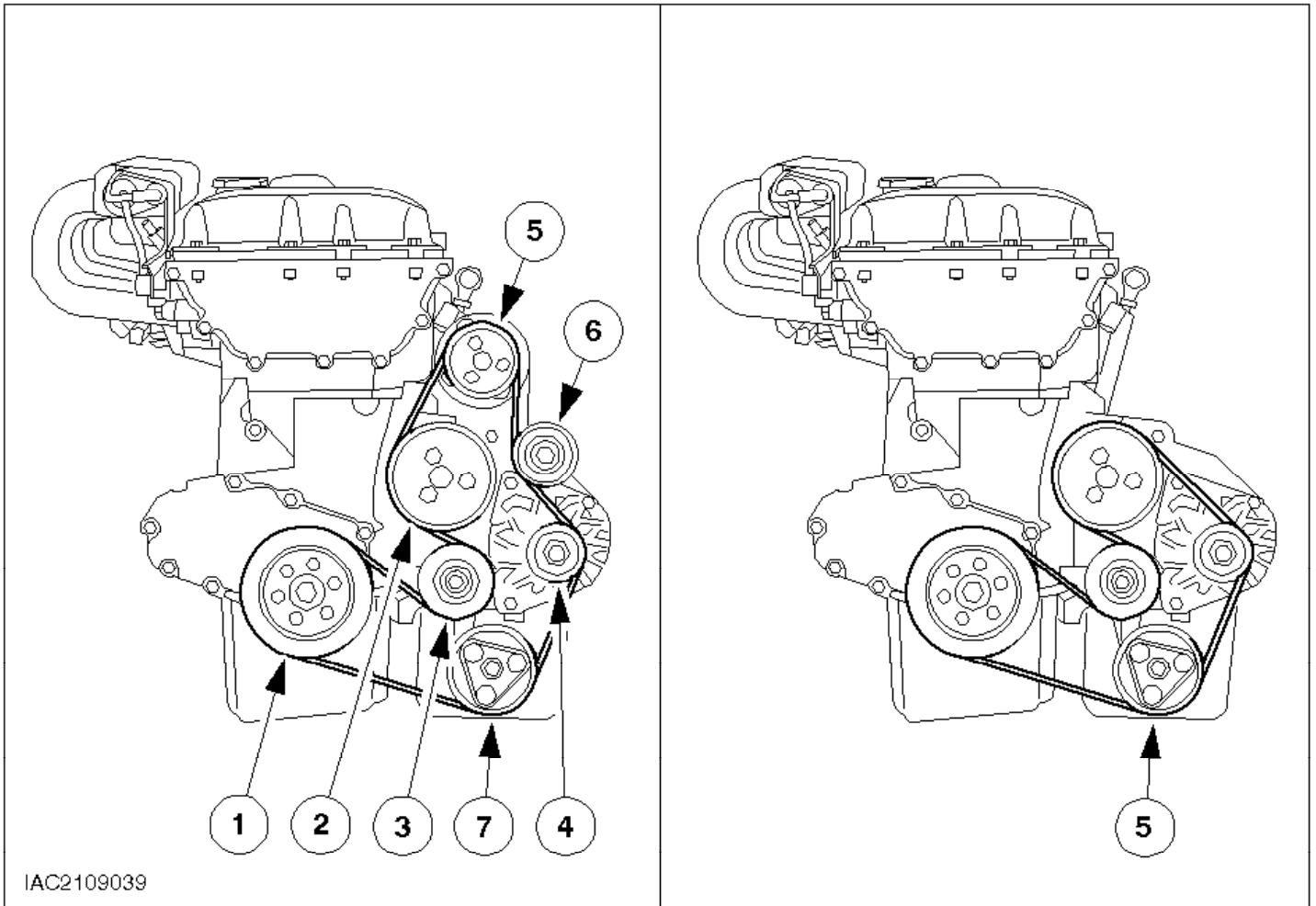
Because the engine is mounted transversely, the bore for the crankshaft position sensor (CKP sensor) and the missing tooth on the toothed wheel have been moved by 15° in the TDC direction.

The new crankshaft for the 16V engine is now also used in the 8V engine. The attachment holes for the

toothed wheel are therefore the same for both engines. To avoid mixing up the wheels, the wheel for the 16V engine has a notch next to the missing tooth and is also marked "16V".

Note:

If the wrong toothed wheel is fitted, this can cause serious damage both to the 16V engine and the 8V engine.



Belt routing with and without air conditioning

Item	Description
1	Vibration damper belt pulley
2	Coolant pump
3	Automatic belt tensioner
4	Alternator
5	Power steering pump
6	Idler pulley
7	Air conditioning compressor