EMM.I - A EMM SECTIONS EXPLAINED

Introduction - EMM.I

This section starts with a general description of the fuel injection and engine management system to provide an overview of the system and its components. The operation of the malfunction indicator lamp is explained, together with the concept of the fault codes. The 'Tech 1' scanner tool is introduced, and its operation explained, together with other special tools required to service and diagnose the system.

Description of Operation - EMM.2

This section explains the function of each individual component and where it is fitted, in order that the operation of the system may be thoroughly understood.

Individual Component Diagnosis & Replacement - EMM.3

This section contains the circuit diagrams, fault finding charts and test procedures necessary to diagnose faults in each component. Replacement procedures and torque figures are also included.

Fault Diagnosis - EMM.4

Individual component diagnosis and replacement procedures.

EMM.I - B GENERAL DESCRIPTION

The engine management system used on the Lotus Esprit V8 is a Lotus designed fully electronic microprocessor based system controlling the fuel injection, ignition and emission control systems. Individual fuel injectors are used in the inlet tracts of all eight cylinders, and are operated sequentially for optimum efficiency, with a further pair of 'secondary' injectors mounted in the intake plenum to supply extra fuel only under conditions of maximum demand. The injectors are supplied with fuel at constant pressure (relative to inlet manifold pressure) from a common fuel rail, with the quantity of fuel delivered to the engine being controlled by the length of time (pulse width) for which the solenoid operated injectors are opened. The eight port injectors are normally pulsed once during each cylinder's complete cycle (sequential injection), with the main fuel delivery into the inlet port timed to occur just after the inlet valve closes, in order to cool the valve, and ensure full atdmisation of the fuel/air mixture. A second, shorter period of injection at the non-firing TDC, is used to top up the fuelling requirement wtien necessary.

The injectors are controlled by a processor called an Electronic Control Module (ECM) which calculates the amount of fuel required by the engine under the operating conditions at any particular time. Information is fed into the ECM by a series of sensors measuring air and coolant temperature, barometric and intake plenum gas pressure, engine and vehicle speed, throttle position and any detected combustion knock. This data is used by the ECM to calculate the quantity of fuel required, the ignition timing, allowable turbocharger boost pressure and idle speed. Various systems are used to minimise noxious combustion and evaporative emissions. Catalytic converters are used in the exhaust system for each cylinder bank, with oxygen feedback to

Key to Schematic Diagram

1. Primary fuel pump.
2. Secondary fuel pump.
3. Fuel filter.
4. Port fuel injector (x 8).
5. Plenum (secondary) fuel injector (x 2).
6. Fuel Pressure Regulator Valve (PRV).
7. Manifold Absolute Pressure (MAP) sensor.
8. Exhaust Gas Recirculation (EGR) valve.
9. Idle Air Control (IAC) valve.
10. Throttle body.
11. Throttle Position (TP) sensor.
12. Coolant Temperature Sensor (TPS).
13. Intake Air Temperature (IAT) sensor,
14. Air cleaner (x 2).
15. Turbocharger (x 2).
16. Wastegate capsule (x 2).
17. Camshaft sensor.
18. Ignition high tension coilpacks (x 2).
19. H.T. lead/plug cap/spark plug (x 8).
20. Knock sensor.
21. Crankshaft sensor.
22. Air injection (AIR) control valve.
23. Air pump.
24. Pre cat. oxygen (O_2) sensor (x 2).
25. Starter catalytic converter.
26. Post cat. oxygen (O_2) sensor (x 2).
27. Main catalytic converter (x 2).
28. Exhaust muffler.