

Engine (03.00)

Ignition System (03.07)

Description

There is an ignition coil attached to each spark-plug. Each cylinder has one spark-plug and ignition coil assembly.

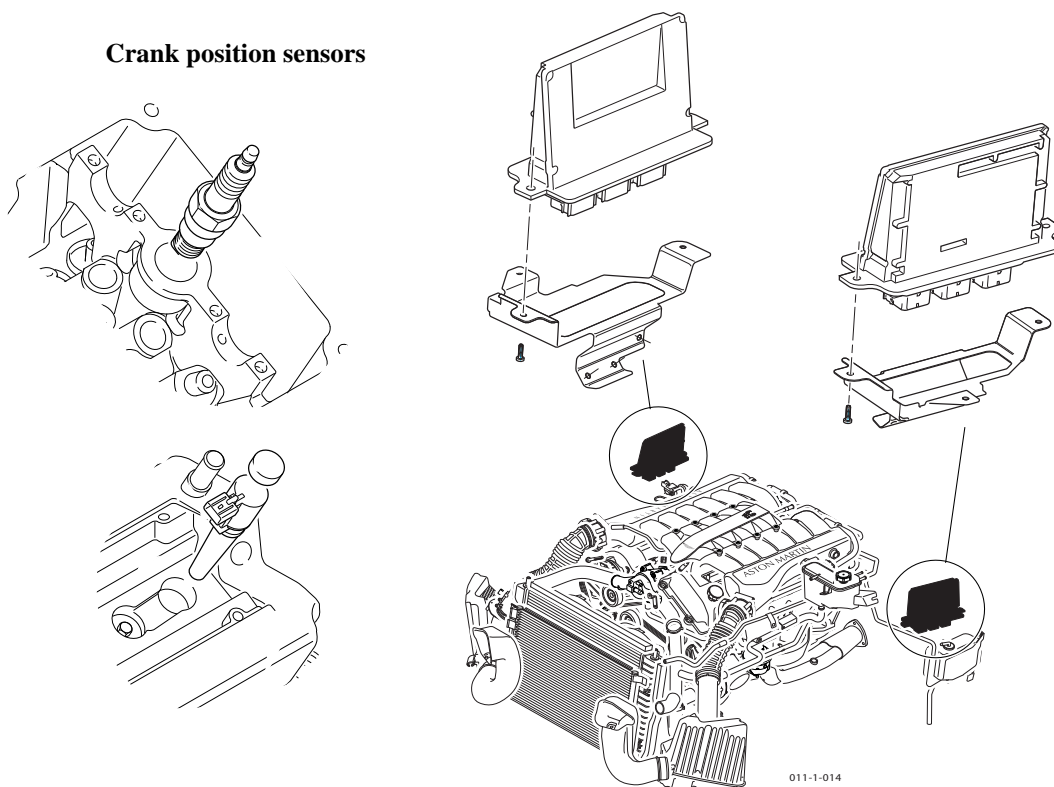
There are two crankshaft sensors installed on the front of the engine - only the right sensor is used. The second crankshaft sensor is installed on the left side of the flywheel housing.

The Powertrain Control Modules (PCMs) convert the alternating voltage signal from the two Crankshaft Position Sensors (CPS) into a digital signal. This digital signal is then used to set the 'On' and 'Off' time of the primary circuit of the ignition coil. The range for control of the ignition timing is increased because there are no parts that rotate. The PCMs refer to the engine speed and load inputs to give the correct ignition timing. This function also uses other inputs. For example:- The engine temperature, the throttle position and the transmission control module (TCM) inputs.

- A short circuit to ground between the fusebox and the coil, or the coil and the PCM will cause the fuse to blow. This will cause all of the ignition coils on that bank to stop.
- If an ignition coil has an internal short-circuit, the ignition coil will fail and not its fuse. This will let the remaining ignition coils continue to operate.
- If the wiring harness fails between the PCM and the ignition coil, the ignition coil will fail and not its fuse. This will let the remaining ignition coils continue to operate.

The twelve spark plugs are fired in sequence by the two PCMs. The Ignition timing can vary from 55 degrees before TDC to 10 degrees after TDC.

Crank position sensors



Specifications

Spark Plugs

Firing order	1 - 7 - 5 - 11 - 3 - 9 - 6 - 12 - 2 - 8 - 4 - 10.
Type	Dual Platinum Fine Wire
Gap	1.2 - 1.3 mm
Torque	16-20 Nm

Camshaft Sensors

Air Gap	1 ±0.5 mm
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Torque Figures

Description	Nm	lb./ft.
Spark plugs	16-20	12-15
Ignition coils	5-7	4-5.5
Spark plug cover	2.5-3.5	2-3



Maintenance

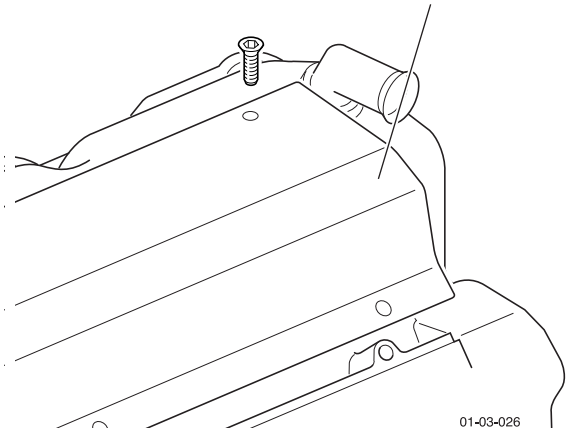
Spark Plugs

Repair Operation Time (ROT)		
Item	Code	
Spark Plug Renew	All	03.07.DB
	LH Bank	03.07.EB
	RH Bank	03.07.FB

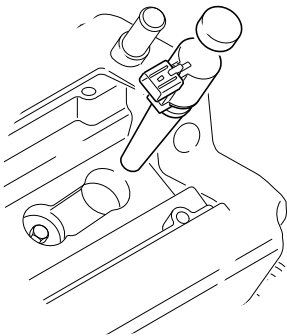
Remove

1. Remove the inlet manifold (Refer to 'Inlet Manifold', page 3-1-7).
2. Remove the spark plug cover.

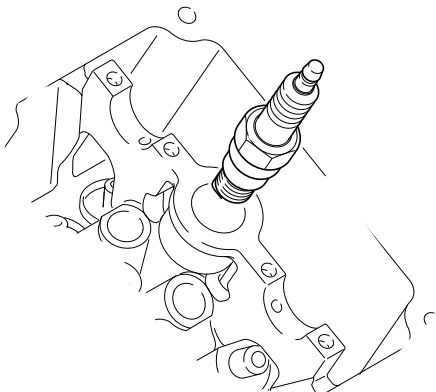
Remove Spark Cover



3. Disconnect the ignition coils.
4. Remove the ignition coils.



5. Remove the spark plugs.



Install

1. Install the spark plugs. Torque to **16-20 Nm**.
2. Install the ignition coils. Torque the bolts to **5-7 Nm**.
3. Connect the wiring harness plugs to ignition coils.
4. Install the spark plug cover. Torque the bolts to **2.5-3.5 Nm**.
5. Install the inlet manifold (Refer to 'Inlet Manifold', page 3-1-7).