

IGNITION SYSTEM
(EJ-VE)

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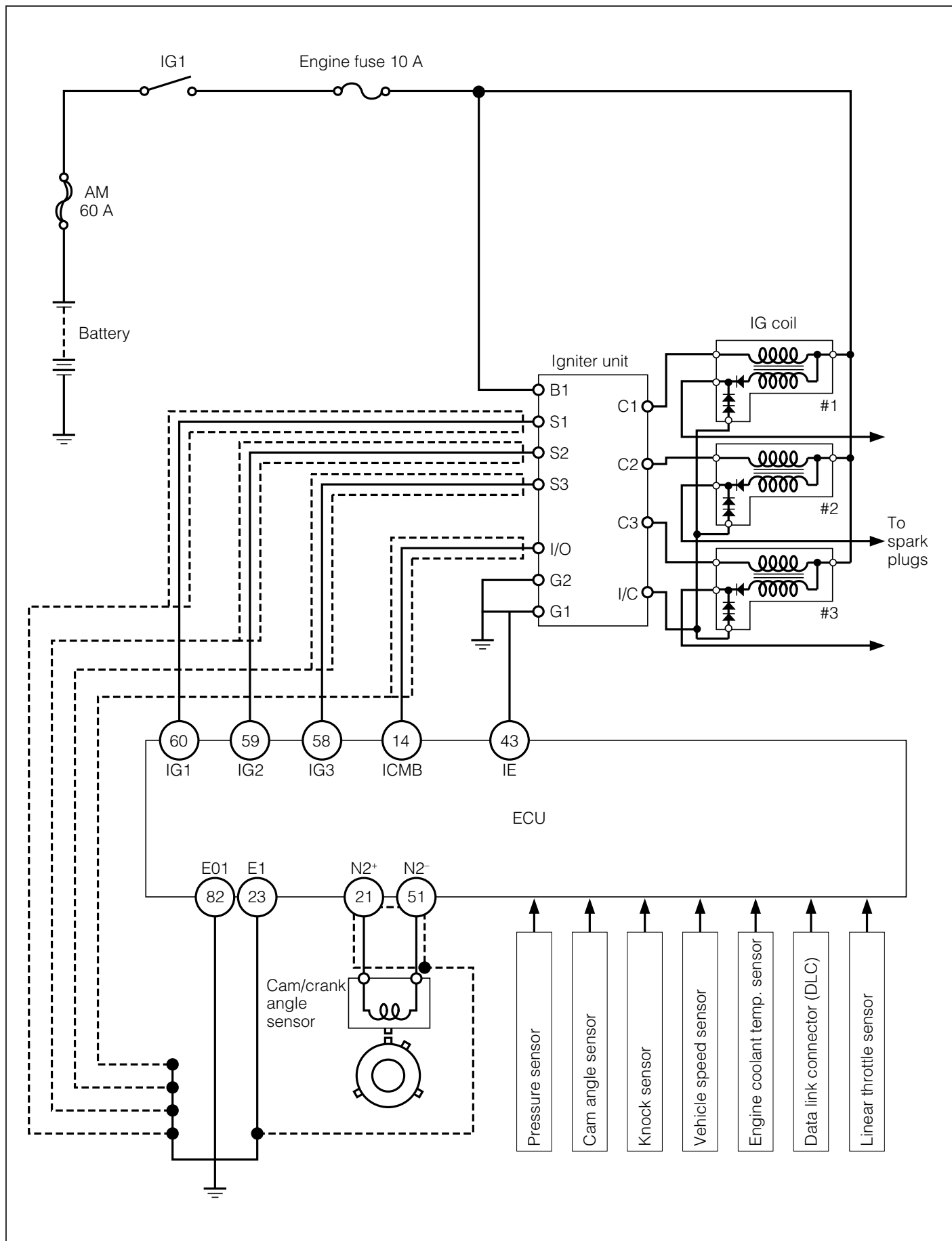
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IG-2

IGNITION SYSTEM CIRCUIT



SPARK TEST

SPARK PLUG

1. Connect a timing light to the timing light connection wire.
NOTE:
 - Use a timing light which is capable of detecting the primary voltage.

2. Ensure that the timing light flashes while the engine is being cranked by the starter.

NOTE:

- If the timing light will not flash, perform the following inspection.

3. Remove the fuel pump relay from the relay box.
4. Remove the ignition coil cover from the cylinder head cover.
5. Disconnect the connector of the ignition coil.

6. Remove the ignition coil and spark plugs.
7. Connect a spark plug and connector to the ignition coil.

8. Check ignition sparks while the engine is being cranked by the starter.

WARNING:

- Before performing this operation, check that no fuel is spilled inside the engine compartment. Remove any spilled fuel. Also, be sure to perform this operation at a well-ventilated place where no volatile liquid, gas, etc. exist nearby.

NOTE:

- If no ignition sparks occur, check power supply.

9. Remove the spark plug from the ignition coil.

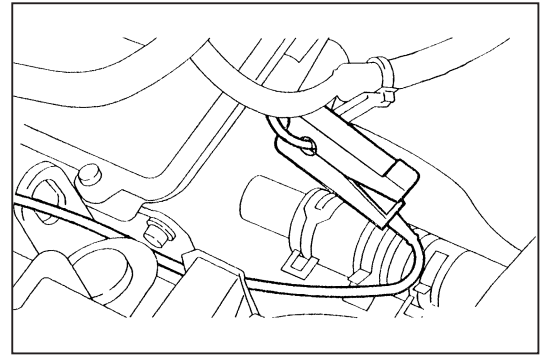
CAUTION:

- Care must be exercised to avoid getting scalded, for the spark plugs may be still very hot.

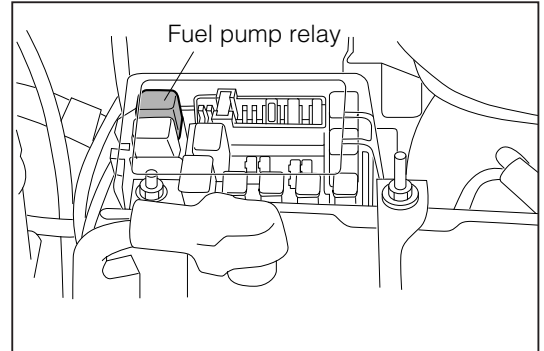
10. Visually inspect the spark plug for electrode wear, thread or insulator damage.

NOTE:

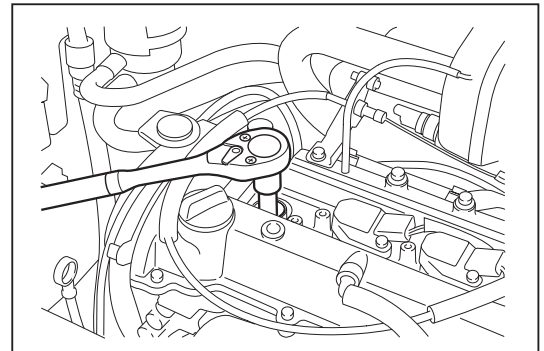
- Replace the spark plug if it exhibits damage.



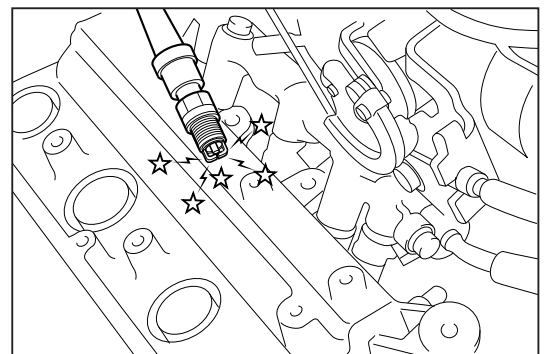
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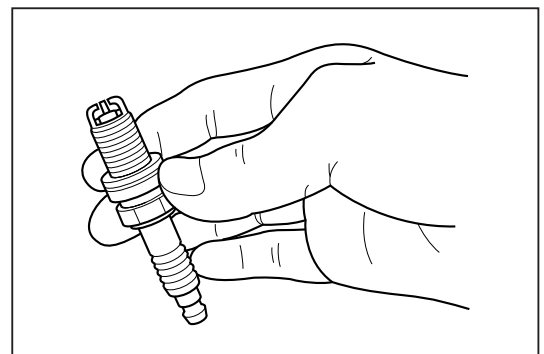
MIG00004-00003



MIG00005-00004



MIG00006-00005



MIG00007-00006

11. Measure the electrode gap, using the plug gap gauge.

Electrode Gap:

Item	Engine type		
Type	DENSO	NGK	BOSCH
	K16TNR-S9	BKR5EKC	FR6DTCW
Electrode gap	0.8 - 0.9 mm		

If the electrode gap is not within the specifications, adjust the gap by bending the base of the ground electrode, being careful not to touch the tip.

NOTE:

- All three plugs should be the same heat range and be once manufactured by the same manufacturer.

12. Cleaning of spark plug

If the electrode has traces of wet carbon, dry the electrode and clean it with a spark plug cleaner.

13. Inspection of spark plug insulation resistance

More Than 20 MΩ

NOTE:

- If the insulation resistance is less than the specified value, replace the spark plug.

14. Install the spark plugs to the cylinder head.

Tightening Torque: 14.5 - 20.5 N·m

15. Install the ignition coil to the cylinder head cover.

Tightening Torque: 4.9 - 9.1 N·m

16. Connect the ignition wire to the ignition coil.

17. Install the ignition coil cover to the cylinder head cover.

Tightening Torque: 3.8 - 7.2 N·m

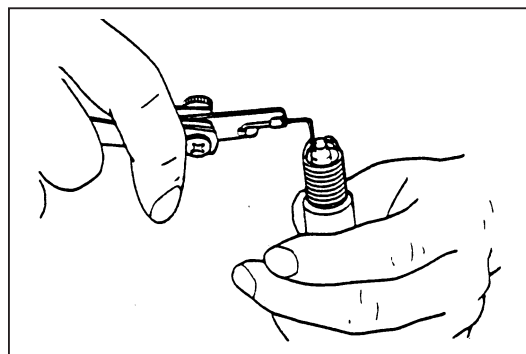
POWER SUPPLY

- Disconnect the connector of the ignition coil.
- Measure the voltage between the terminals ① (GND) and ③ (+B) of the wire harness connector side when the ignition switch is turned on.

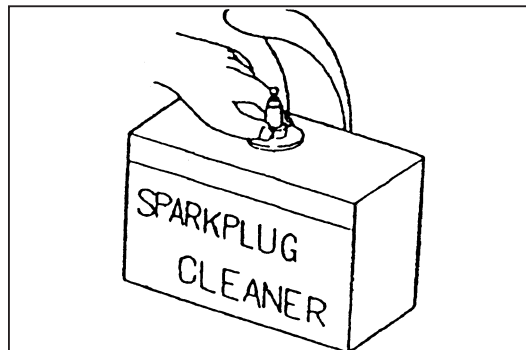
Specified Value: Battery voltage

NOTE:

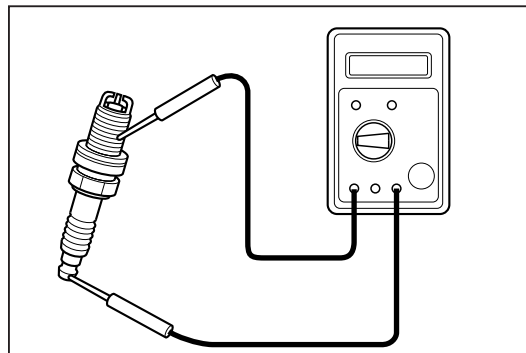
- If the voltage is not the specified value, check the fuse and wiring harness.



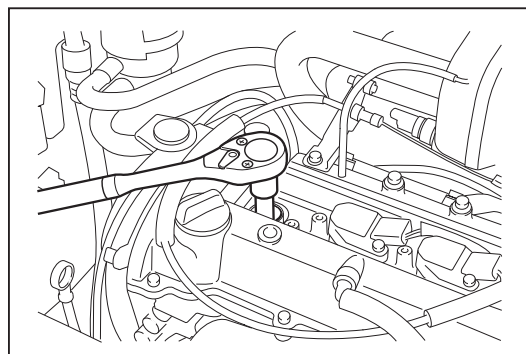
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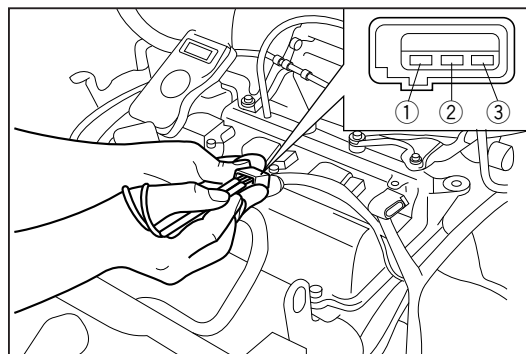
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MIG00010-00009



MIG00022-00016

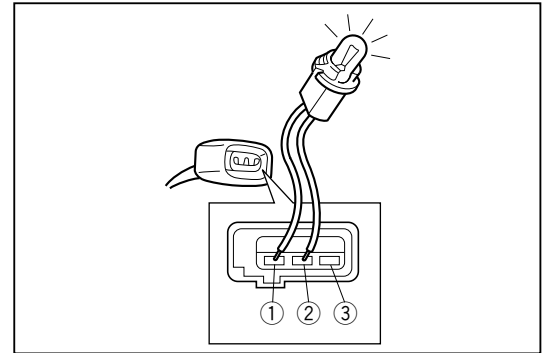


MIG00011-00010

3. Connect a test lamp (12 V / 6 W) between the terminals ① (GND) and ② (IGt) of the wire harness connector side. Check to see if the lamp will illuminate while the engine is being cranked.

NOTE:

- Under this condition, the test lamp flashes. If the test lamp will not flash, check the outputs of the cam/crank angle sensor and cam angle sensor.
- For details of the power supply check, refer to the EF section.



MIG00012-00011

CAM/CRANK ANGLE SENSOR

1. Disconnect the connector of the cam/crank angle sensor.
2. While cranking the engine, measure the output voltage between the connector terminals of the cam/crank angle sensor, using an oscilloscope.

NOTE:

- When the engine is cranked with the cam/crank angle sensor connector disconnected, the diagnosis code is detected. After completion of the check, cancel this code.

(For canceling of the diagnosis code, refer to the EF section.)

3. Measure the resistance between each terminals of the connector.

Specified Value: $1100 \pm 150 \Omega$

4. Remove the timing belt cover.
(Refer to the EM section.)

5. At all four points, check to see if the air gap between the signal rotor and the cam/crank angle sensor conforms to the specified value.

Specified Air Gap: $0.8 \pm 0.5 \text{ mm}$

NOTE:

- No air gap adjustment is required.

6. Remove the cam/crank angle sensor.
(Refer to the EM section for the removal procedure.)

7. Visually check the cam/crank angle sensor for external damage and so forth.

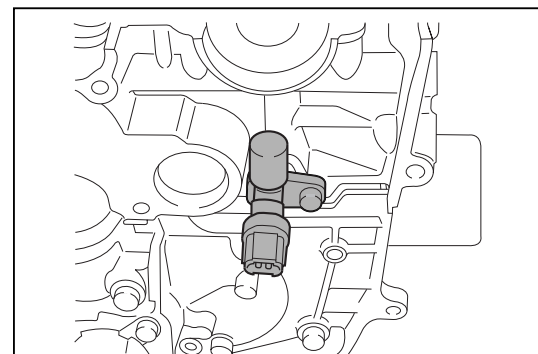
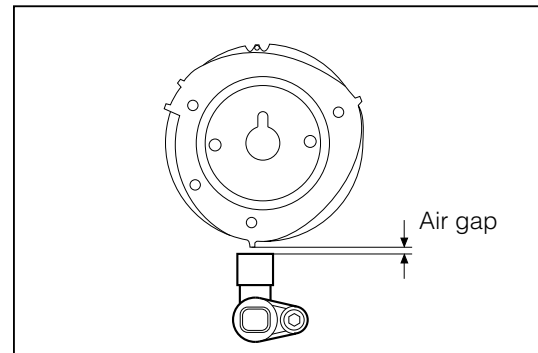
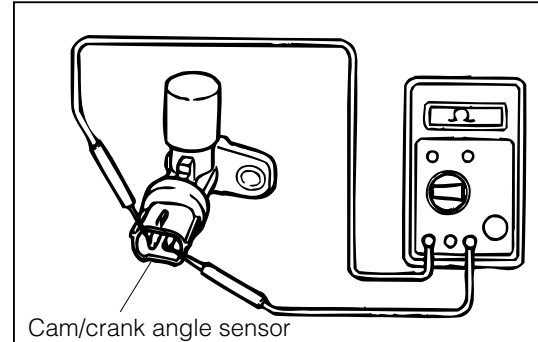
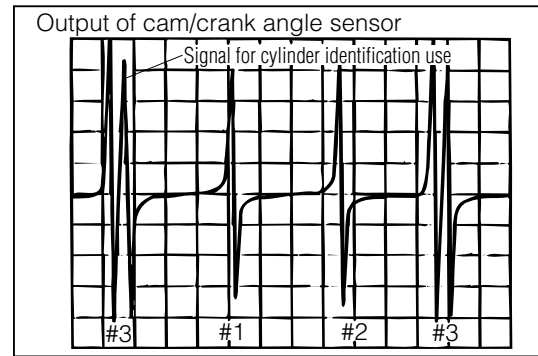
If any abnormality exists, replace the sensor.

8. Install the cam/crank angle sensor by tightening the attaching bolt to the specified tightening torque.

Tightening Torque: $6.4 - 9.6 \text{ N}\cdot\text{m}$

9. Install the timing belt cover. (Refer to the EM section.)

10. Connect the connector of cam/crank angle sensor.



CAM ANGLE SENSOR

Refer to the EF section.

MIG00023-00000

EFI ECU

While referring to the EF section, check that the output from the EFI ECU is normal.

MIG00017-00000

IGNITION TIMING

1. With the ignition switch turned OFF, connect the following SST to the data link connector (DLC) located at the lower section of the instrument panel on the driver's seat side.

SST: 09991-87404-000

2. Connect an engine tachometer to the terminal REV, using the following SST.

SST: 09991-87402-000

3. Warm up the engine.

4. Attach the timing light clip to the timing light connection wire.

NOTE:

- Use a timing light which is capable of detecting the primary voltage.

5. Short the terminals T and E of the SST connector, using the following SST.

SST: 09991-87403-000

NOTE:

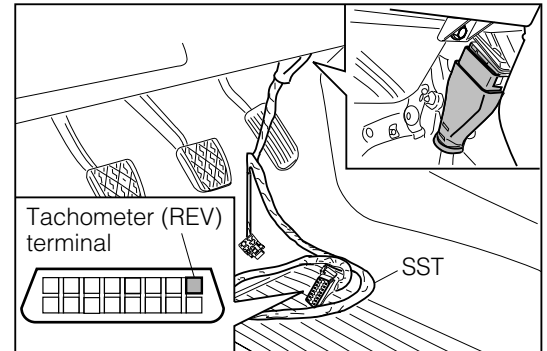
- Be very careful not to mistake the shorting position. If a wrong position is shorted, it may cause troubles.

6. Check to see if the ignition timing mark of the crankshaft pulley is aligned with the indicator of the timing belt cover, using the timing light.

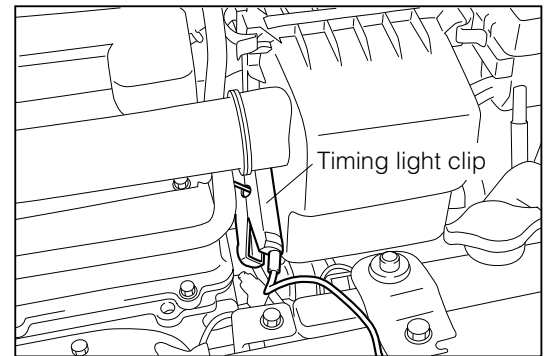
Ignition Timing: B.T.D.C. $5 \pm 2^\circ$ / Idle speed

NOTE:

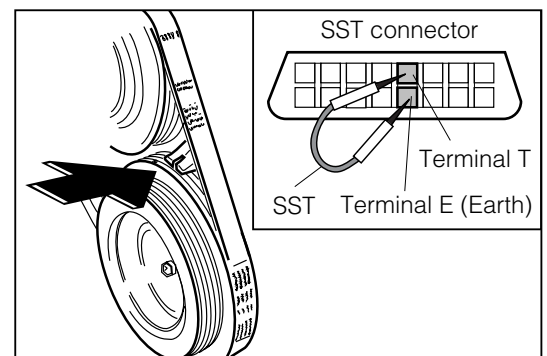
- No ignition timing adjustment is required.



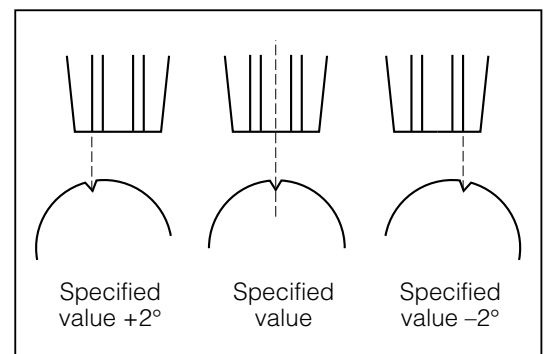
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MIG00025-00018



MIG00026-00019



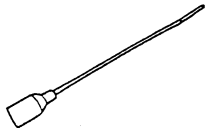
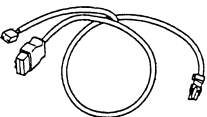
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SERVICE SPECIFICATIONS

Item			EJ-VE
Spark plug	DENSO	Type	K16TNR-S9
		Electrode gap	0.8 - 0.9 mm
	NGK	Type	BKR5EKC
		Electrode gap	0.8 - 0.9 mm
	BOSCH	Type	FR6DTCW
		Electrode gap	0.8 - 0.9 mm
	Insulation resistance		More than 20 M Ω
Cam/crank angle sensor	Air gap		0.8 $\pm$ 0.5 mm
	Insulation resistance		1100 $\pm$ 150 Ω
Ignition timing			B.T.D.C 5 $\pm$ 2° / Idle speed

MIG00019-00000

SSTs

Shape	Part number	Part name	Remarks
	09991-87402-000	Tachometer pulse pickup wire	Measurement of engine revolution speed
	09991-87404-000	Engine control system inspection wire	- Measurement of engine revolution speed - Shorting of terminal T
	09991-87403-000	Diagnosis check wire	Shorting of terminal T

MIG00020-00021

TIGHTENING TORQUE

Tightening components	Tightening torque		Remarks
	N·m	kgf·m	
Spark plug $\times$ Cylinder head	14.5 - 20.5	1.45 - 2.05	
Cam/crank angle sensor $\times$ Cylinder head	6.4 - 9.6	0.64 - 0.96	
Cam angle sensor $\times$ Cylinder head	6.4 - 9.6	0.64 - 0.96	
Ignition coil $\times$ Cylinder head cover	4.9 - 9.1	0.49 - 0.91	
Ignition coil cover $\times$ Cylinder head cover	3.8 - 7.2	0.38 - 0.72	

MIG00021-00000