

TO INDEX

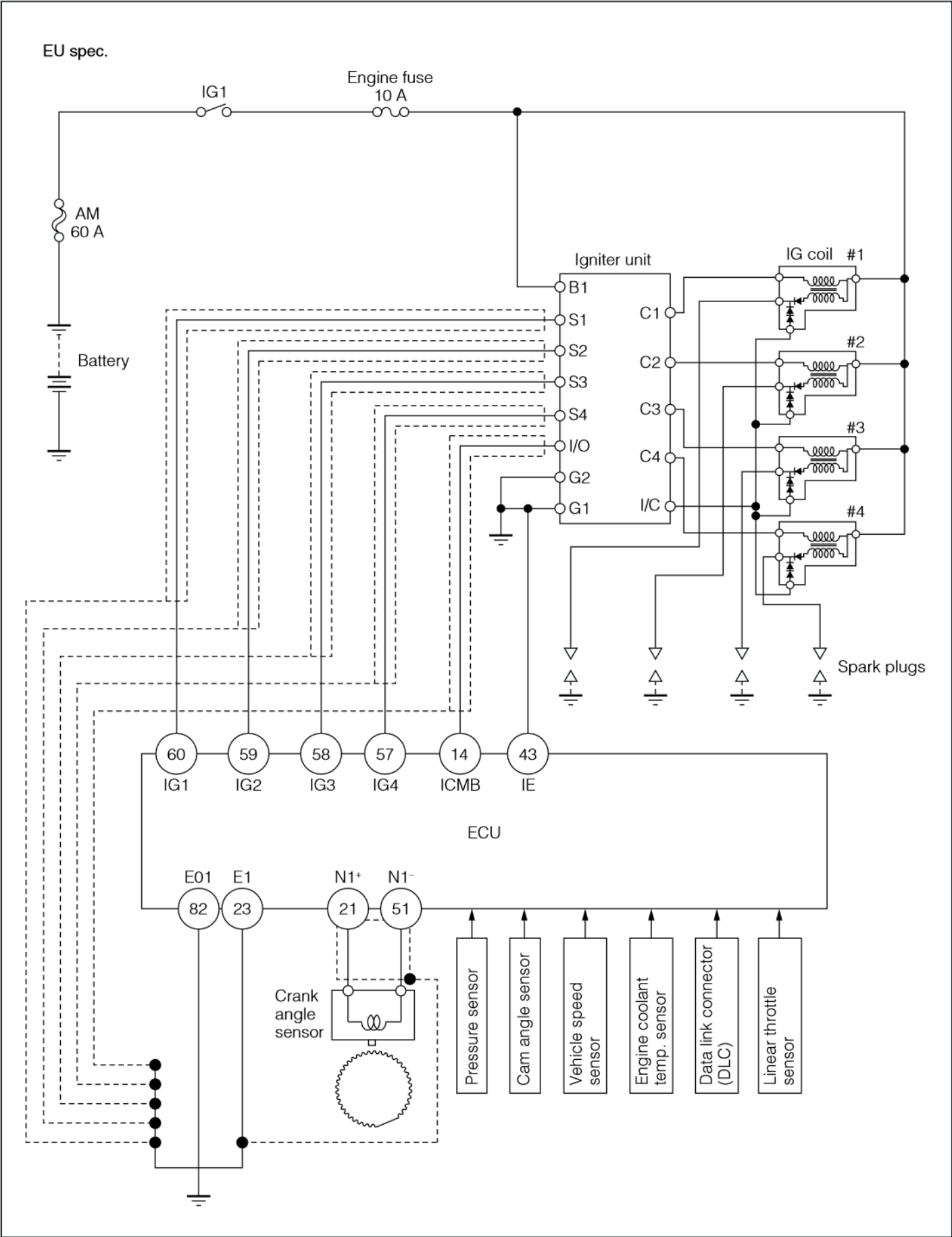
IG

IGNITION SYSTEM

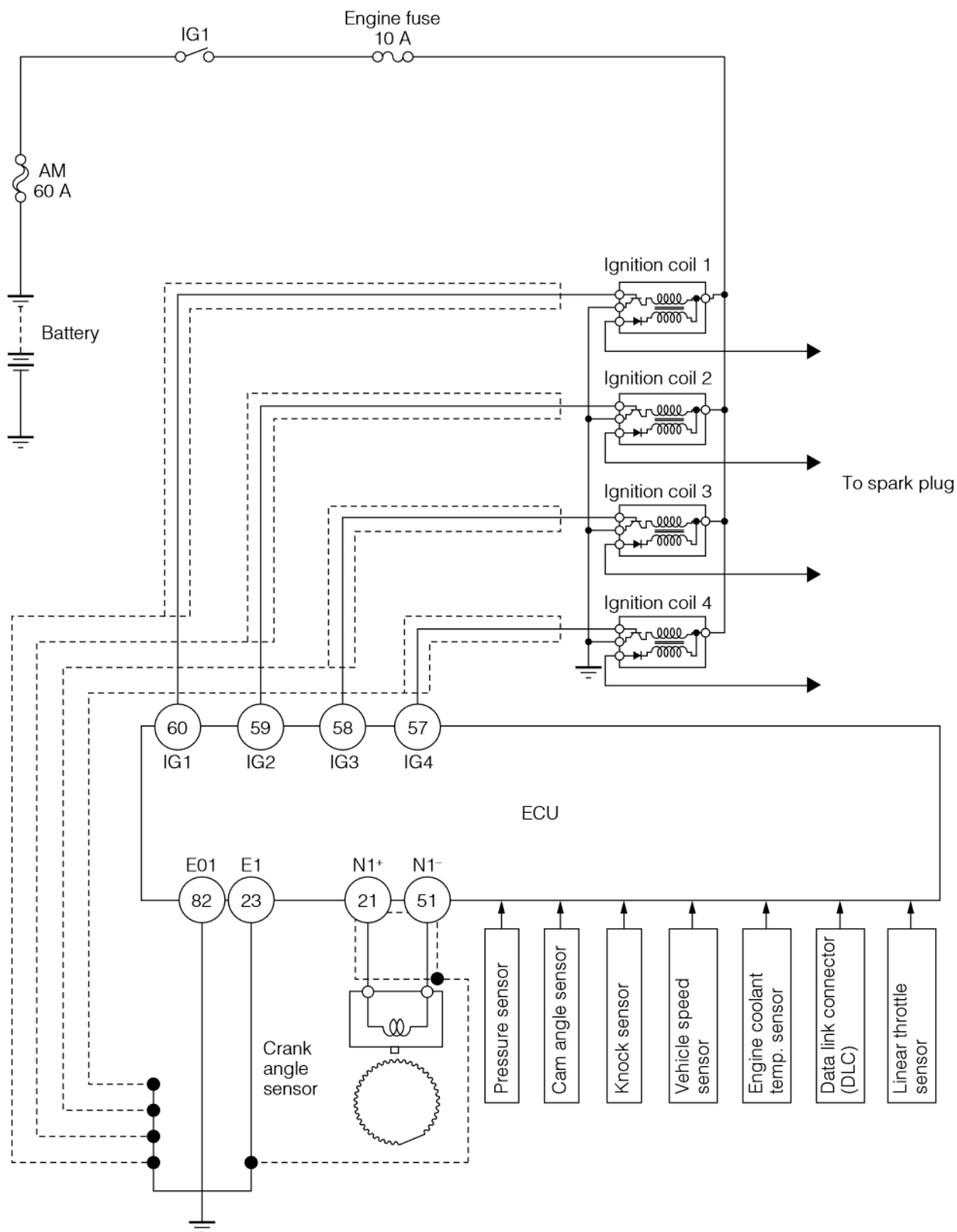
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JIG00001-00000

IGNITION SYSTEM CIRCUIT



GEN, AUS spec.



SPARK TEST

SPARK PLUG

1. Connect a timing light to the timing 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. Disconnect the connector of the ignition coil.
5. Remove the ignition coil and spark plugs.
6. Connect a spark plug and connector to the ignition coil.

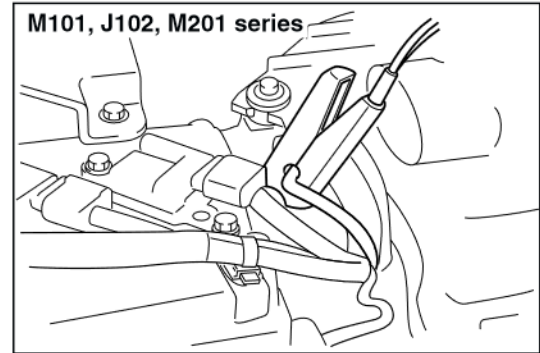
7. Check ignition sparks while the engine is being cranked by the starter.

WARNING:

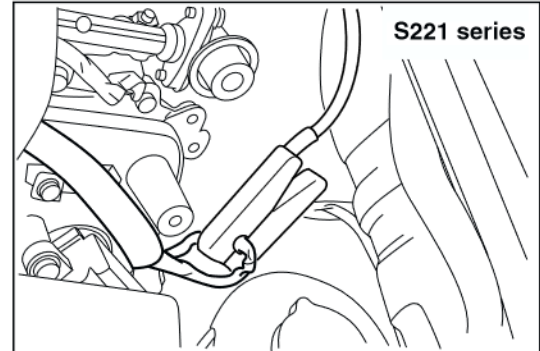
- Before performing this operation, check that no fuel is spilled inside the engine compartment. Remove any spilled fuel. Also, be sure to perform this operation at a well-ventilated place where no volatile liquid, gas, etc. exist nearby.

NOTE:

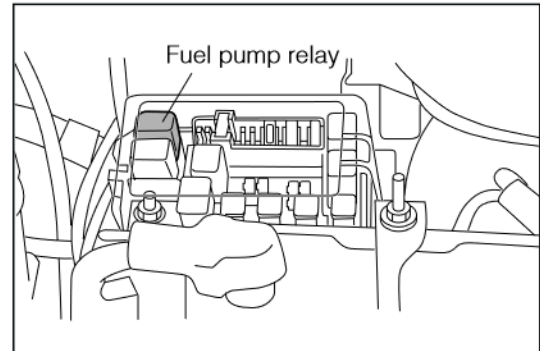
- If no ignition sparks occur, check power supply.



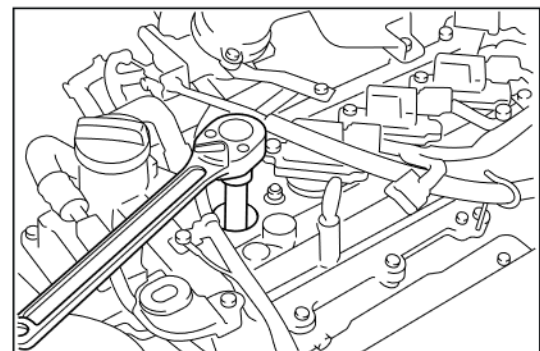
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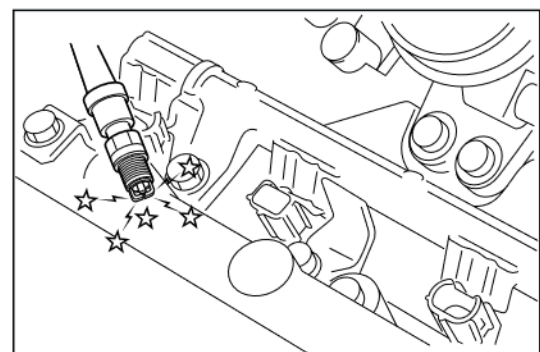
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YIG00016-00014



YIG00017-00015



YIG00005-00003

8. 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.
9. Visually inspect the spark plug for electrode wear, thread or insulator damage.
NOTE:
 - Replace the spark plug if it exhibits damage.
10. Measure the electrode gap, using the plug gap gauge.

Electrode Gap:

Item \ Spec.	EU		GEN, AUS	
Type	DENSO	NGK	DENSO	NGK
	K20BR-S10	BKUR6ETB-10	K20R-U11	BKR6EY-11
	K16BR-S10	BKUR5ETB-10	K16R-U11	BKR5EY-11
Electrode gap	0.9 - 1.0 mm		1.0 - 1.1 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 four plugs should be the same heat range and be once manufactured by the same manufacturer.

11. Cleaning of spark plug
 If the electrode has traces of wet carbon, dry the electrode and clean it with a spark plug cleaner.
12. 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.

13. Install the spark plugs to the cylinder head.
 Tightening Torque: 14.7 - 21.6 N·m
14. Install the ignition coil to the cylinder head cover.
 Tightening Torque: 6.0 - 9.0 N·m

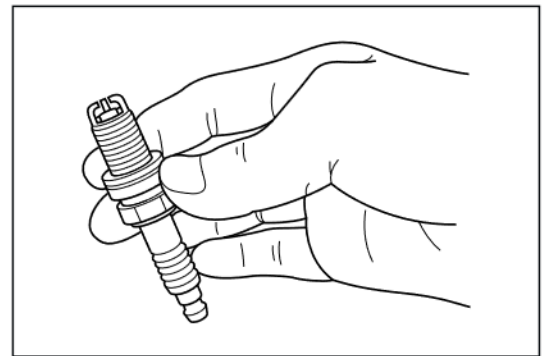
15. Connect the ignition wire to the ignition coil.

POWER SUPPLY

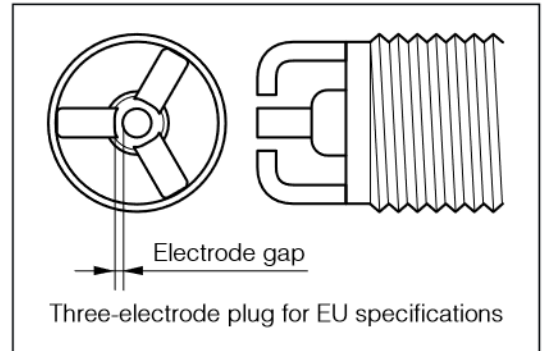
1. Disconnect the connector of the ignition coil.
2. Measure the voltage between the terminals ① (GND) and ③ (+B) of the wire harness connector side when the ignition switch is turned on.
 Specified Value: Battery voltage

NOTE:

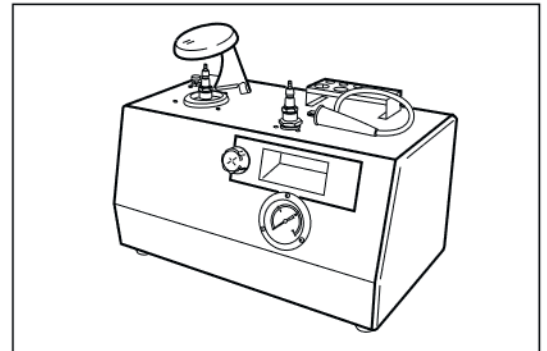
- If the voltage is not the specified value, check the fuse and wiring harness.



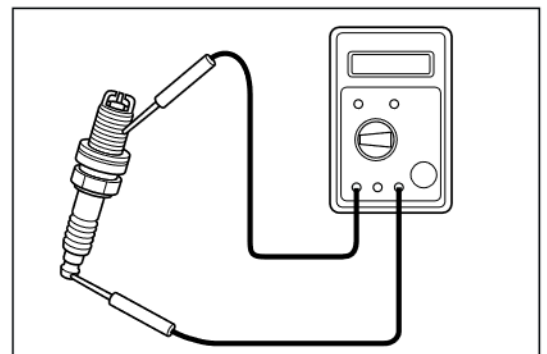
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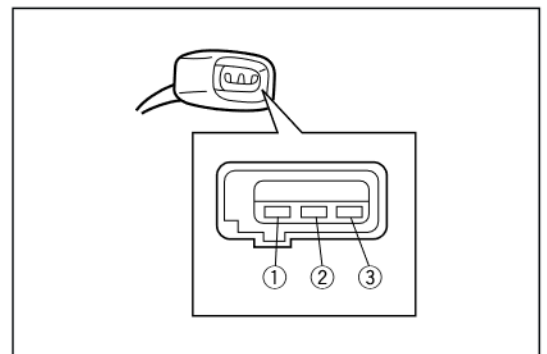
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slG00008-00006



slG00009-00007

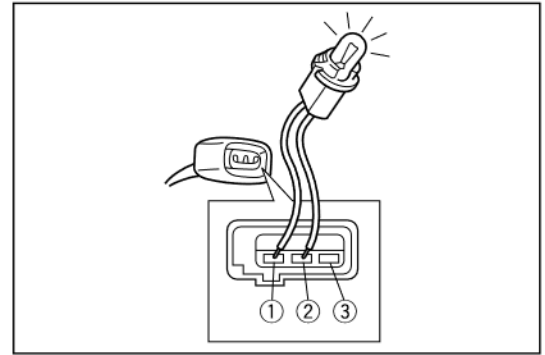


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3. Connect a test lamp (12 V/6 W) between the terminals ① (GND) and ② (IGt) of the wire harness connector side. Check to see if the lamp will illuminate while the engine is being cranked.

NOTE:

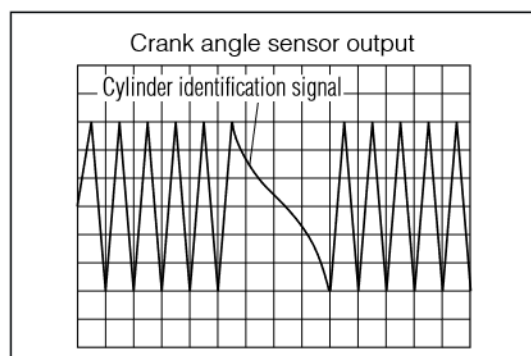
- Under this condition, the test lamp flashes. If the test lamp will not flash, check the outputs of the crank angle sensor and cam angle sensor.
- For details of the power supply check, refer to EF section.



JIG00013-00012

CRANK ANGLE SENSOR

1. Install the following SST to the EFI computer.
SST (Check Sub-Harness): 09842-97203-000
2. While cranking the engine, measure the output voltage between the connector terminals of the crank angle sensor, using an oscilloscope.

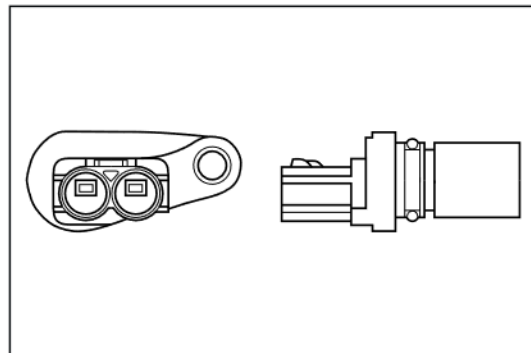


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3. Measure the resistance between the terminals of the crank angle sensor proper.
Specified Value: $2150 \pm 300 \Omega$ (at 20°C)

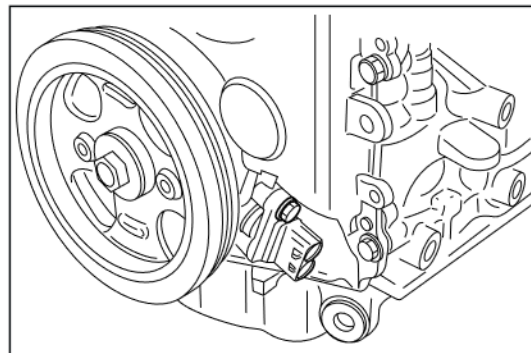
NOTE:

- For details of the crank angle sensor check, refer to EF section.



JIG00015-00014

4. Disconnect the connector of the crank angle sensor.
5. Remove the crank angle sensor.
(Refer to the EM section for the removal procedure.)
6. Visually check the crank angle sensor for external damage and so forth.
If any abnormality exists, replace the sensor.
7. Install the crank angle sensor by tightening the attaching bolt to the specified tightening torque.
Tightening Torque: 5.25 - 9.75 N·m

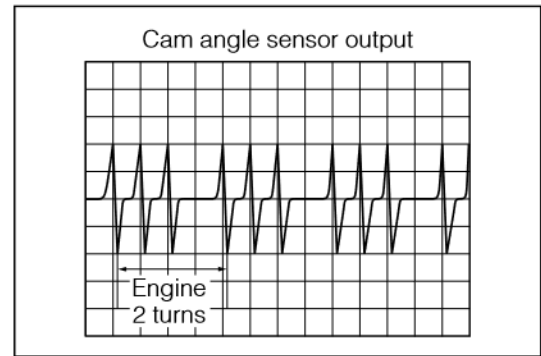


JIG00016-00015

8. Connect the connector of crank angle sensor.

CAM ANGLE SENSOR

1. Install the following SST to the EFI computer.
SST (Check Sub-Harness): 09842-97203-000
2. While cranking the engine, measure the output voltage between the connector terminals of the cam angle sensor, using an oscilloscope.



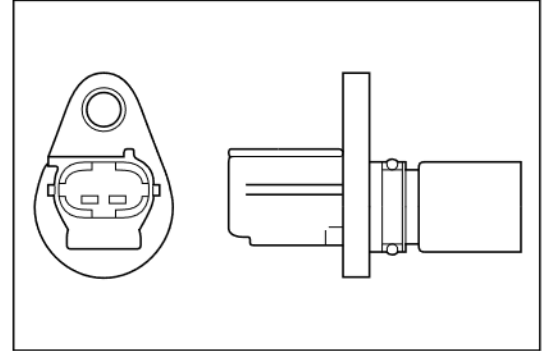
JIG00017-00016

3. Measure the resistance between the terminals of the cam angle sensor proper.

Specified Value: $2150 \pm 300 \Omega$ (at 20°C)

NOTE:

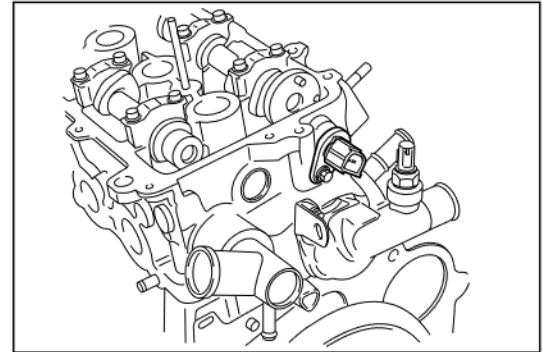
- For details of the cam angle sensor check, refer to EF section.



JIG00018-00017

4. Disconnect the connector of the cam angle sensor.
5. Remove the cam angle sensor.
(Refer to the EM section for the removal procedure.)
6. Visually check the cam angle sensor for external damage and so forth.
If any abnormality exists, replace the sensor.
7. Install the cam angle sensor by tightening the attaching bolt to the specified tightening torque.

Tightening Torque: 5.25 - 9.75 N·m



JIG00019-00018

8. Connect the connector of cam angle sensor.

EFI ECU

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

JIG00020-00019

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. Connect the clip of the timing light 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:

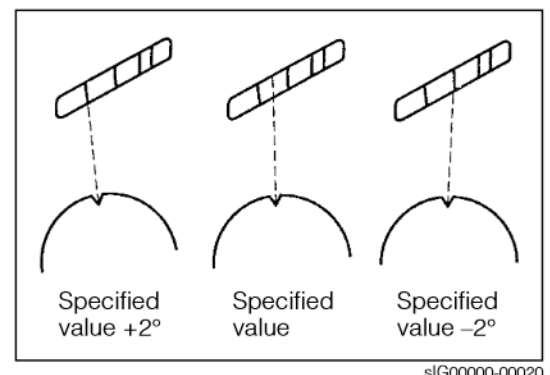
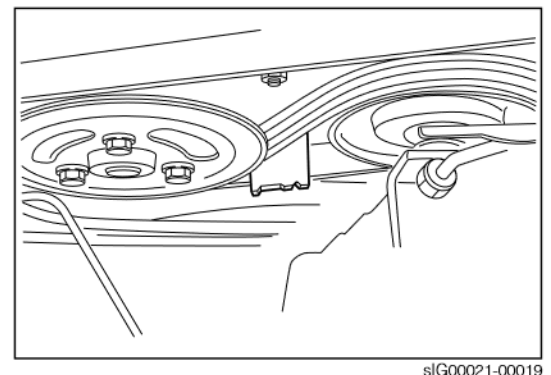
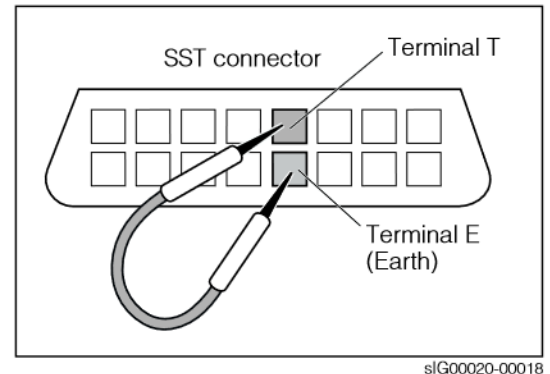
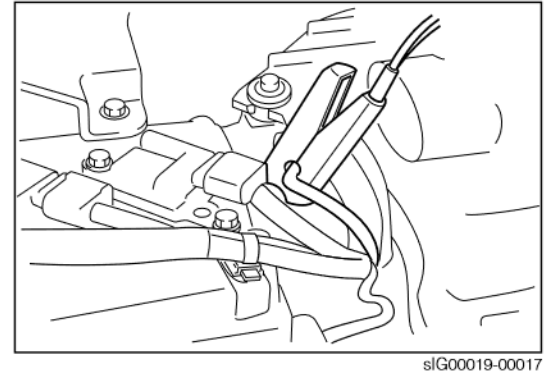
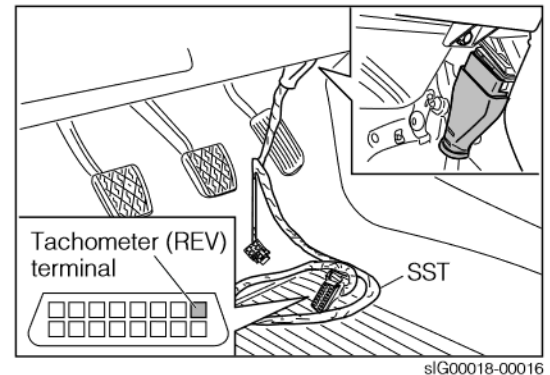
- Be very careful not to mistake the shorting position. If a wrong position is shorted, it may cause troubles.

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

Ignition Timing: B.T.D.C. $6 \pm 2^\circ$ /Idle speed

NOTE:

- No ignition timing adjustment is required.

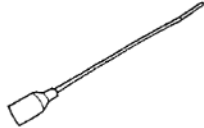
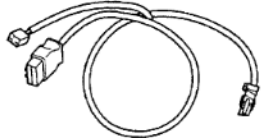
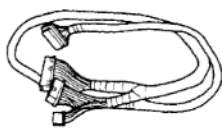


SERVICE SPECIFICATIONS

Item			EU spec.	GEN, AUS spec.
Spark plug	DENSO	Type	K20BR-S10 K16BR-S10	K20R-U11 K16R-U11
		Electrode gap	0.9 - 1.0 mm	1.0 - 1.1 mm
	NGK	Type	BKUR6ETB-10 BKUR5ETB-10	BKR6EY-11 BKR5EY-11
		Electrode gap	0.9 - 1.0 mm	1.0 - 1.1 mm
	Insulation resistance		More than 20 MΩ	
Crank angle sensor	Insulation resistance		2150 ± 300 Ω	
Cam angle sensor	Insulation resistance		2150 ± 300 Ω	
Ignition timing			B.T.D.C 6 ± 2°/Idle speed	

JIG00025-00000

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
	09842-97203-000	EFI computer check sub-harness	

JIG00026-00024

TIGHTENING TORQUE

Tightening components	Tightening torque		Remarks
	N·m	kgf·m	
Spark plug $\times$ Cylinder head	14.4 - 21.6	1.44 - 2.16	
Crank angle sensor $\times$ Timing chain cover	5.25 - 9.75	0.53 - 0.97	
Cam angle sensor $\times$ Cylinder head	5.25 - 9.75	0.53 - 0.97	
Ignition coil $\times$ Cylinder head cover	6.0 - 9.0	0.6 - 0.9	

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