DAIHATSU

TERIOS

J100

TO INDEX

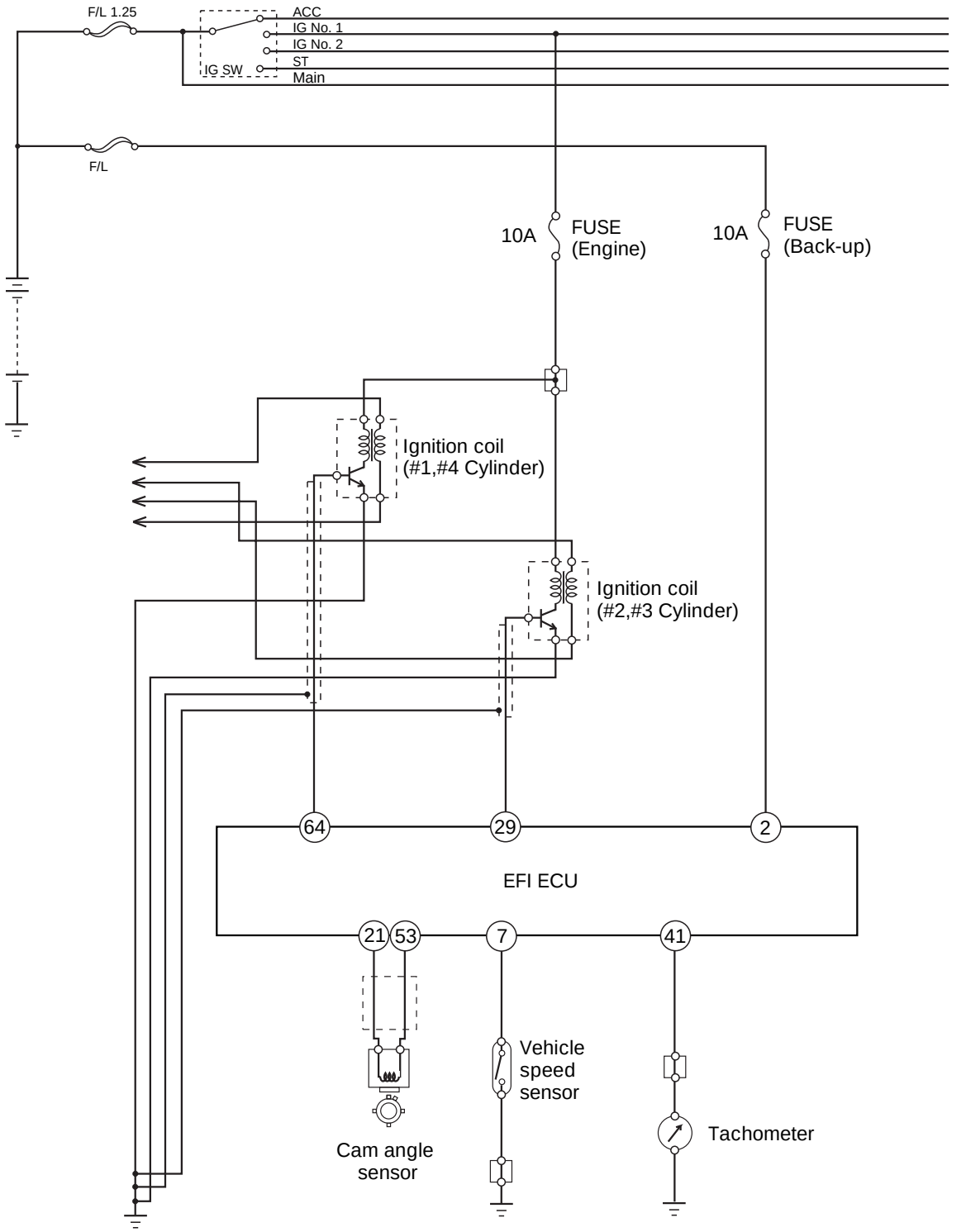
IG

IGNITION SYSTEM

JIG00001-00001

NO. 9710-JE

WIRING DIAGRAM

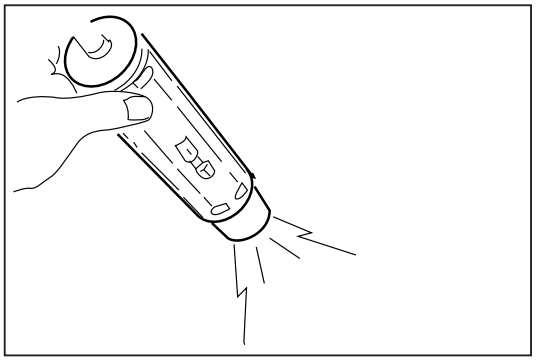


JIG00002-00011

SPARK TEST

SPARK PLUG

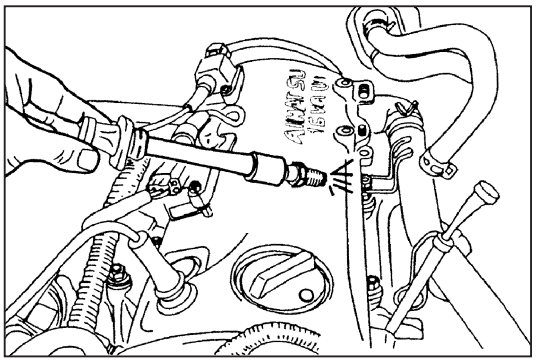
1. Remove the air cleaner case and relative parts.
2. Connect a timing light to the ignition wire of the No. 1 cylinder.
3. Ensure that the timing light flashes while the engine is being cranked by the starter motor.
   NOTE:
   - If the timing light will not flash, perform the following inspection.



JIG00003-00101

4. Remove the ignition wire from the spark plug at the cylinder No. 1.
5. Connect a spark plug to the ignition wire.
6. Check ignition sparks while the engine is being cranked by the starter motor.
   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.



JIG00004-00102

7. Remove the spark plug.
   CAUTION:
   - When the operation of the step 7 is performed, care must be exercised to avoid getting scalded, for the spark plugs may be still very hot.

8. Cleaning of spark plug
   NOTE:
   - If there are traces of oil, remove it with gasoline before the spark plug is cleaned by the spark plug cleaner.
   - If the electrode has traces of wet carbon, dry the electrode and clean it with a spark plug cleaner.
     Air Pressure: Not to exceed 588 kPa
     Duration: Less than 20 seconds

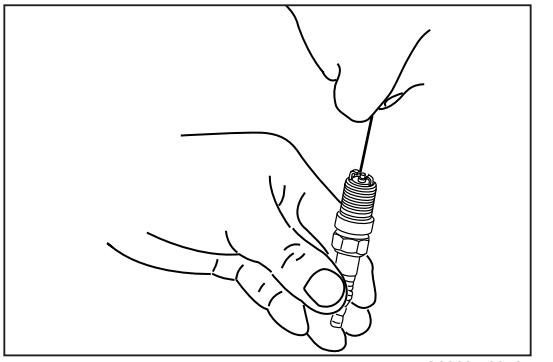
JIG00005-00103

9. Visually inspect the spark plug for electrode wear, thread or insulator damage.
   NOTE:
   - Replace the spark plug if it exhibits damage.

JIG00006-00104

10. Inspection of electrode gap
    Measure the electrode gap, using the plug gap gauge.
    Electrode Gap: See page IG–9

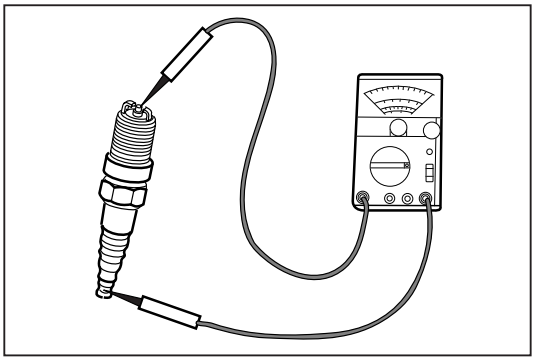
    NOTE:
    - If the electrode gap of a used spark plug is not within the specification, replace the spark plug with a new one.
    - If the electrode gap of a new spark plug is not within the specification, adjust the gap by bending the base of the ground electrode, being careful not to touch the tip.
    - All four plugs should be the same heat range and be ones manufactured by the same manufacturer.



JIG00007-00105

11. 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.



JIG00008-00106

12. Install the spark plugs. Tighten them to the specified torque.
    Tightening Torque: 14.7 - 21.6 N·m

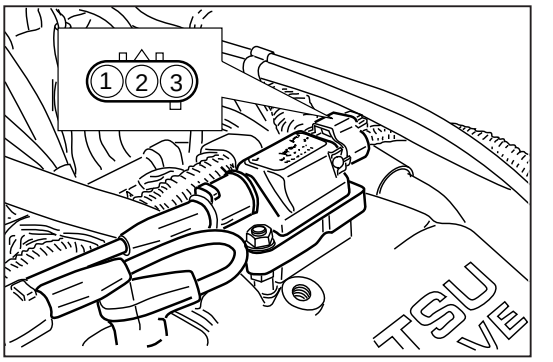
13. Install the ignition coil with ignition wire to the cylinder head cover.
14. Connect the ignition wire to the spark plug.
15. Install the air cleaner case and relative parts.

JIG00009-00107

POWER SUPPLY

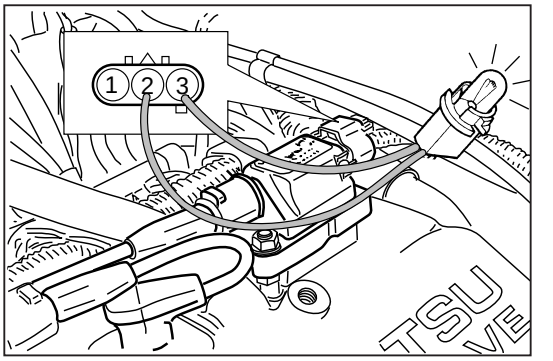
1. Remove the air cleaner case and relative parts.
2. Disconnect the connector of the ignition coil.
3. Measure the voltage between the terminals 1 and 3 of the wire harness connector side when the ignition switch is turned on.
    Specified Value: Battery voltage

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



JIG00010-00201

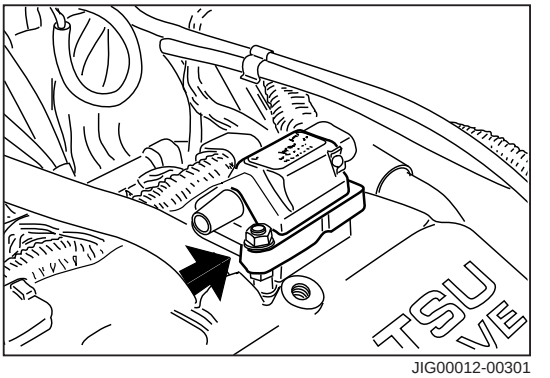
4. Connect a test lamp (12 V, 6 W) between the terminals 2 and 3 of the wire harness connector side. Check to see if the lamp will illuminate while the engine is being cranked.
    NOTE:
    - Under this condition, the test lamp flashes. If the test lamp will not flash, check the outputs of the cam angle sensor and EFI ECU. (Refer to the EF section of the service manual.)



JIG00011-00202

IGNITION WIRE

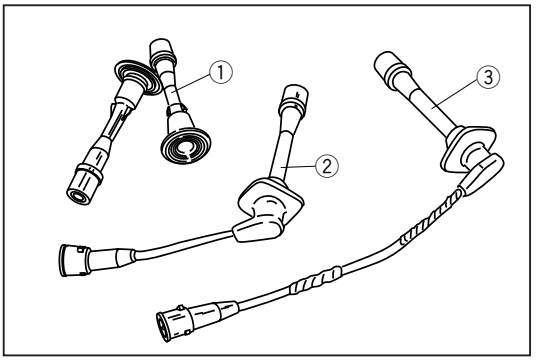
1. Remove the air cleaner case and relative parts.
2. Disconnect the connector of the ignition coil.
3. Remove the ignition coil by removing the attaching nuts.
4. Disconnect the spark plug distance piece and the ignition wire from the ignition coil.
   NOTE:
   - Carefully remove the ignition wire from the spark plugs and ignition coil by holding their rubber boots.



JIG00012-00301

5. Check that the ignition wire resistance is about same as the specification.
   Ignition Wire 3: 5.6 kΩ

   NOTE:
   - Spark plug distance piece 1: 0.3 Ω (Cylinder No. 2 and No. 4)
     Ignition wire 2: 3.8 kΩ (Cylinder No. 3)
   - If the above inspection will conform to the specification, perform the following procedure.

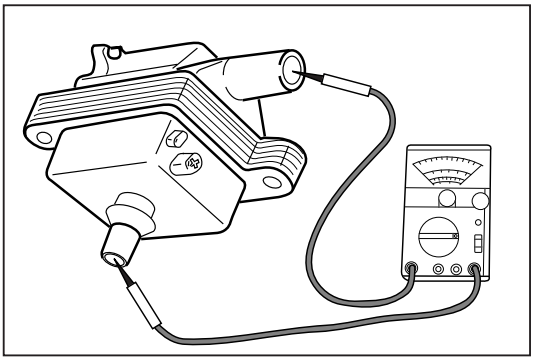


JIG00013-00302

IGNITION COIL

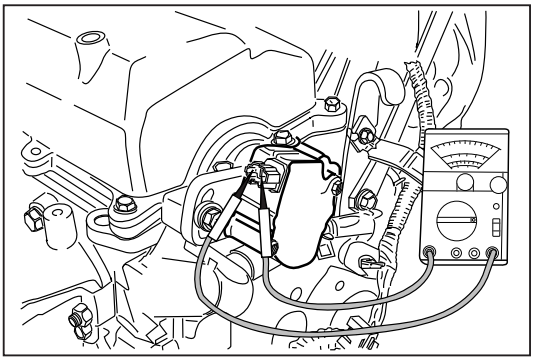
1. Remove the air cleaner case and relative parts.
2. Disconnect the connector of the ignition coil.
3. Remove the ignition coil by removing the attaching nuts.
4. Disconnect the spark plug distance piece and the ignition wire from the ignition coil.
5. Check that the ignition coil resistance is within the specification.
   Secondary Coil: 13.6 ± 2.0 kΩ

   NOTE:
   - For the primary coil, it is impossible to check the resistance because it incorporates electronic parts.

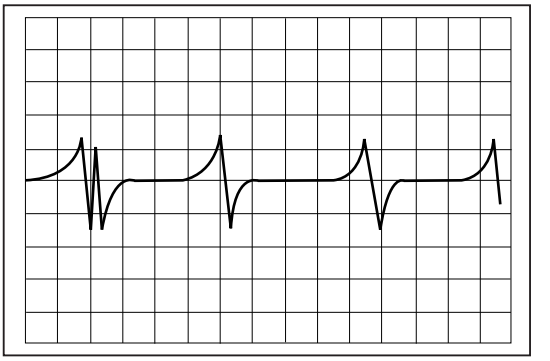

JIG00014-00401

CAM ANGLE SENSOR

1. Remove the air cleaner case and relative parts.
2. Disconnect the connector of the cam angle sensor.
3. Measure the resistance between each terminal of the connectors.
   Specified Value: 230 ± 25 Ω (at 20°C)


JIG00015-00501

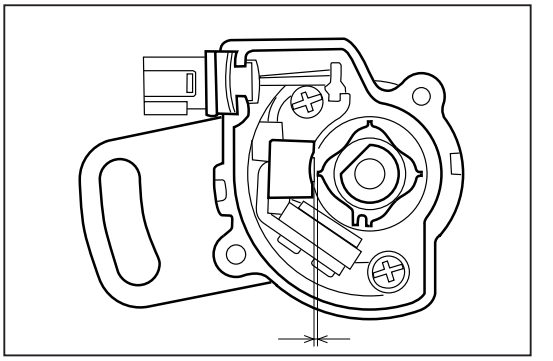
4. Check to see if a signal shown in the graph appears at the terminals when the engine is being cranked by the starter motor.
   NOTE:
   - When the voltage across the connector terminals is measured during the engine cranking period, using an oscilloscope, you will get wave forms as indicated in the illustration, if the signal generator is functioning normally.


JIG00016-00502

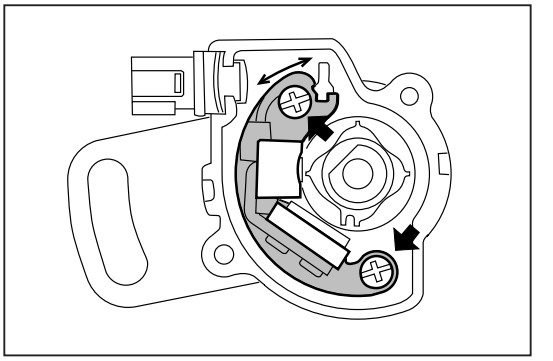
5. Remove the cam angle sensor from the cylinder head by removing the attaching bolt.
6. Remove the cam angle sensor cover.
7. Turn the shaft of the rotor, until the signal rotor faces toward the signal generator.
8. At all four points, check to see if the air gap between the signal generator and the signal rotor conforms to the specified value.
   Specified Air Gap: 0.2 - 0.4 mm

   NOTE:
   - If the air gap fails to conform to the specified value, adjust the air gap.

9. Adjustment of air gap.
   (1) Loosen the attaching screws of the signal generator.
   (2) Adjust the air gap between the signal generator and the signal rotor to specified value.
   (3) Tighten the attaching screws of the signal generator.

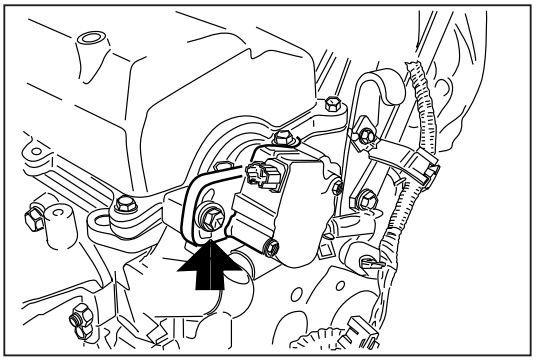


JIG00017-00503



JIG00018-00504

10. Install the cam angle sensor cover.
11. Install the cam angle sensor to the cylinder head. tighten the attaching bolt.
    Tightening Torque: 14.7 - 21.6 N·m



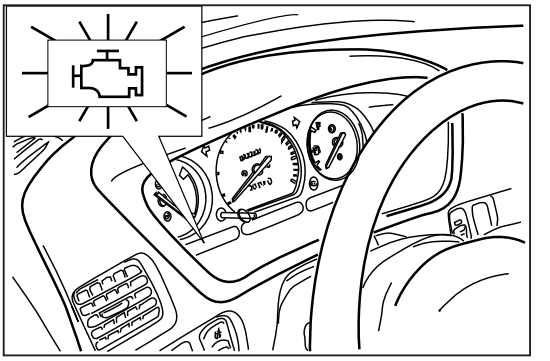
JIG00019-00505

12. Check the ignition timing and adjust it, as required.
    (See page IG–9)

JIG00020-00506

EFI ECU

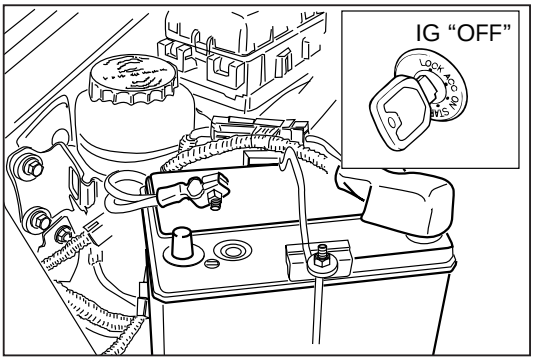
1. Check to see if diagnosis detect malfunction code.
   (Refer to EF section of the service manual)



JIG00021-00701

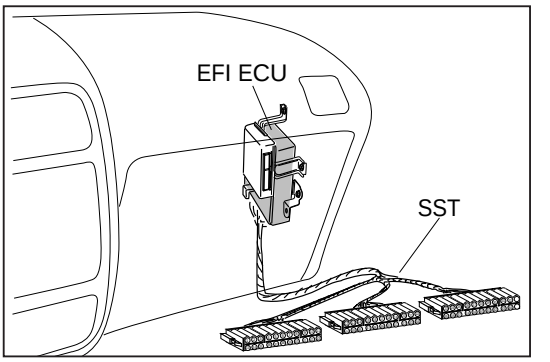
2. Connection of SST
   (Refer to EF section of the service manual)
   NOTE:
   - The EFI unit can be checked by measuring the resistance or voltage at the SST terminals.

   (1) Disconnect the battery ground cable from the negative (–) terminal of the battery.
   CAUTION:
   - Be sure to memorize the malfunction code before disconnecting the battery cable. Otherwise the malfunction code(s) is erased by disconnecting of the battery code.



JIG00022-00702

   (2) Disconnect the wire harness connectors from the EFI ECU connectors at the upper side of the glove compartment.
   (3) Connect the following SST between the wire harness connectors and the EFI ECU connectors.
   SST: 09842-87706-000



JIG00023-00703

   (4) Reconnect the battery ground cable to the negative (–) terminal of the battery.
   CAUTION:
   - When disconnecting or reconnecting the EFI ECU connectors, be sure to disconnect the battery ground cable from the negative (–) terminal of the battery when the ignition switch and all accessory switches are in the off state.
   - When installing new battery, care must be exercised not to mistake the battery polarity. Failure to observe this caution could cause ECU malfunction.
   - Before using the SST, be sure to check to see if short or open wire exists between the terminals of the SST.

JIG00024-00704

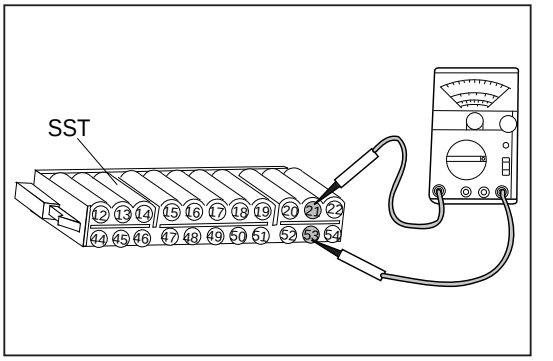
   NOTE:
   - Even when the replacement of the ECU is required in previous check, make sure that the ECU malfunction has not been caused by factors other than the ECU by carrying out the following checks. Then, proceed to replace the ECU.
   - The measurement of voltage should be conducted while all of the connectors are connected.

JIG00025-00705

CAUTION:
- In cases where the ECU is replaced with a new EFI ECU, be sure to use the master key and connect the test terminal with the earth terminal, to start the engine for the first time. The engine will not start with a key other than the master key.
  Refer to BE section of service manual. (Immobilizer system)
- In cases where the ECU is replaced with an EFI ECU other than a new one, the engine will not start even if the master key is used.
  For details, refer to the immobilizer manual.

3. Measurement of the voltage or resistance
   (1) Measure the voltage or resistance between each terminal.
   (2) Check that if the measured voltage or resistance conform to the specifications in accordance with the following table.

JIG00026-00706



JIG00027-00707

CHARACTERISTICS OF ECU OUT PUT
Followings are standard voltage or resistance at ECU.

Family	Terminal	Condition	Standard voltage or resistance	Remedies
Power supply	2 - 62	All time	Battery voltage	Check back up fuse in the relay box
	11 - 62 43 - 62	Ignition switch is turned on	Battery voltage	Check main relay in the relay box
Earth group	20 52 62 63	All time	1 Ω or less	Check ground earth of wiring harness
Cam angle sensor	21 - 53	While the engine is being cranked by the starter motor.	0.1 - 0.3 V (AC range)	Check crank angle sensor
Ignition coil drive	63 - 29 63 - 64	Ignition switch is turned on.	3 V or less	Check ignition coil

JIG00028-00708

NOTE:
- If the measured voltage or resistance is not conform to the specified value, check the wiring harness.
- Even when the trouble has not been solved by the repair the wire harness or parts, replace the EFI ECU.

JIG00029-00709

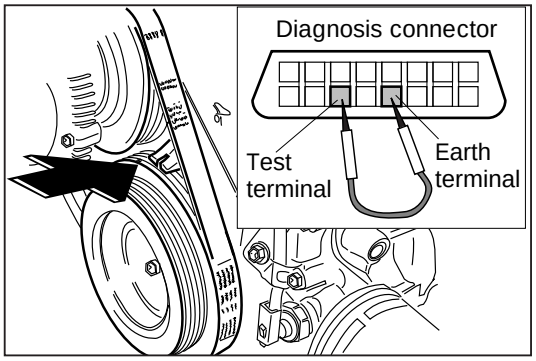
After completion of the inspection
1. Disconnect the ground cable terminal from negative (–) terminal of the battery.
2. Remove the SST by disconnecting its connectors from the ECU and engine wire connectors.
3. Connect the wire harness connectors to the ECU.
4. Reconnect the ground cable terminal to the negative (–) terminal of the battery.

JIG00030-00710

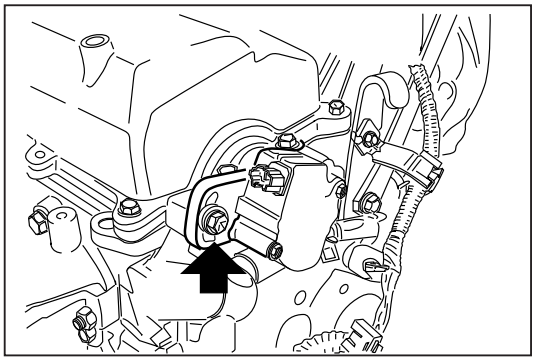
IGNITION TIMING

1. Connect the test terminal and the earth terminal with a jumper wire of the diagnosis connector.
2. Connect a timing light to the ignition wire of the No. 1 cylinder.
3. Start the engine.
4. 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.
5. Adjust the ignition timing by turning the cam angle sensor, if the ignition timing mark is not aligned with timing belt cover.
   Ignition Timing: B.T.D.C. 0° ± 2°/Idle speed

6. Adjustment of ignition timing
   (1) Loosen the cam angle sensor attaching bolts.
   (2) Adjust the cam angle sensor installation angle by turning the cam angle sensor, until the ignition timing mark of the crankshaft pulley is aligned with the indicator of the timing belt cover.



JIG00031-00801


JIG00032-00802

NOTE:
- If the cam angle sensor is turned clockwise, the timing will be advanced. Conversely, if the cam angle sensor is turned counterclockwise, the ignition timing will be retarded.

   (3) Tighten the cam angle sensor attaching bolts to the specified torque, making sure that the ignition timing is not disturbed.
   Tightening Torque: 14.7 - 21.6 N·m

JIG00033-00802

Recommended spark plug

Manufacturer	Type	Electrode air gap
NGK	BKUR6EK	0.9 - 1.0 mm
DENSO	K20TNR-S	0.9 - 1.0 mm

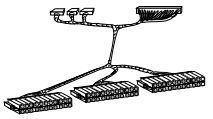
JIG00034-00803

TIGHTENING TORQUE

Tightening components	Tightening torque		Remarks
	N·m	kgf-m	
Cam angle censor × Cylinder head	14.7 - 21.6	1.5 - 2.2	
Spark plug × Cylinder head	14.7 - 21.6	1.5 - 2.2	

JIG00035-00901

SSTs

Shape	Part number	Part name	Remarks
	09842-87706-000 EFI computer check sub harness	Inspection of computer input/output voltage & resistance	

JIG00036-00902

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TO NEXT SECTION