

ENGINE ASSEMBLY (2AZ-FE)

141S2-01

INSPECTION

1. INSPECT COOLANT (See page 16-1)

2. INSPECT ENGINE OIL (See page 17-1)

3. INSPECT BATTERY (See page 19-9)

Standard specific gravity: 1.25 to 1.29 at 20°C (68°F)

4. INSPECT AIR CLEANER FILTER ELEMENT SUB-ASSY

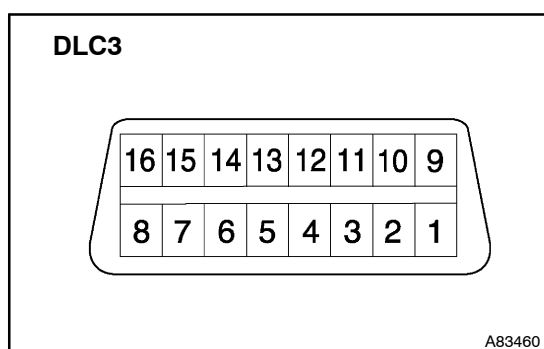
5. INSPECT SPARK PLUG (See page 18-1)

6. INSPECT V-RIBBED BELT

7. INSPECT IGNITION TIMING

(a) Warm up the engine.

(b) Remove the DLC3 cover from the DLC3 connector.



(c) When using the intelligent tester II.

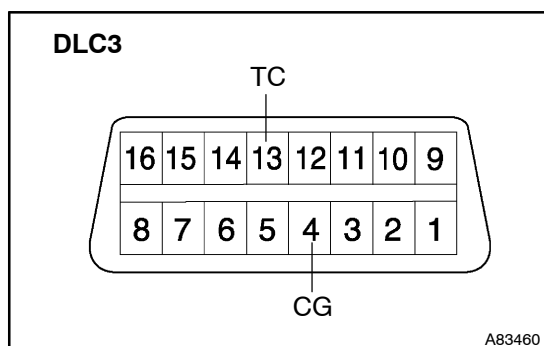
(1) Connect the intelligent tester II to the DLC3.

(2) Enter DATA LIST MODE on the intelligent tester II.

Ignition timing: 8 to 12°CA BTDC

HINT:

Please refer to the intelligent tester II operator's manual if you need help to select DATA LIST.



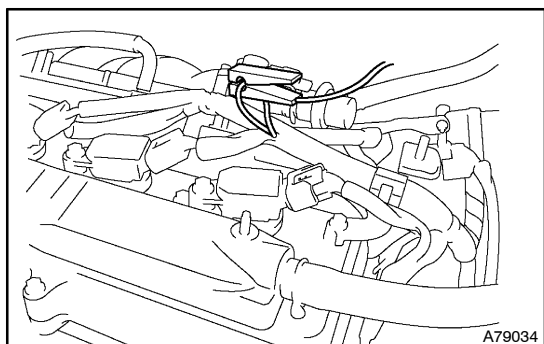
(d) When not using the intelligent tester II.

(1) Using SST, connect terminals 13 (TC) and 4 (CG) of DLC3.

SST 09843-18040, 09843-18020

NOTICE:

- **Be careful to connect the terminals correctly. It causes breakage of the engine.**
- **Turn all electrical systems OFF before connecting the terminals.**
- **Operate the inspection after the cooling fan motor is turned OFF**
- (2) Remove the engine cover No. 1.



(3) Pull out the wire harness as shown in the illustration. Connect the clip of the timing light to the engine.

NOTICE:

- **Use a timing light which detects the first signal.**
- **After checking, be sure to wrap the wire harness with tape.**

- (4) Inspect the ignition timing at idle.

Ignition timing: 8 to 12°CA BTDC

NOTICE:

When checking the ignition timing, shift the transmission to the neutral position.

HINT:

Run the engine speed at 1,000 to 1,300 rpm for 5 seconds, check that the engine speed returns to the idle speed.

- (5) Disconnect terminals 13 (TC) and 4 (CG) of the DLC3.

- (6) Inspect the ignition timing at idle.

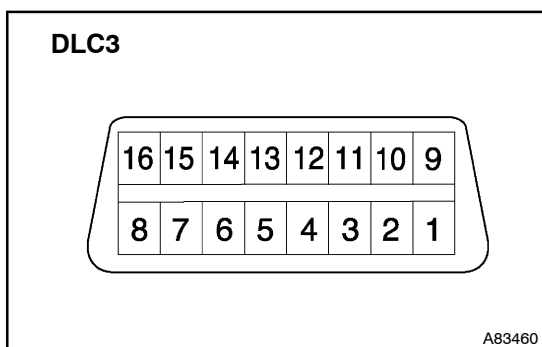
Ignition timing: 5 to 23°CA BTDC

- (7) Confirm that ignition timing moves to advanced angle when the engine speed is increased.

- (8) Remove the timing light.

8. INSPECT ENGINE IDLE SPEED

- (a) Warm up the engine.
(b) Remove the DLC3 cover from the DLC3 connector.



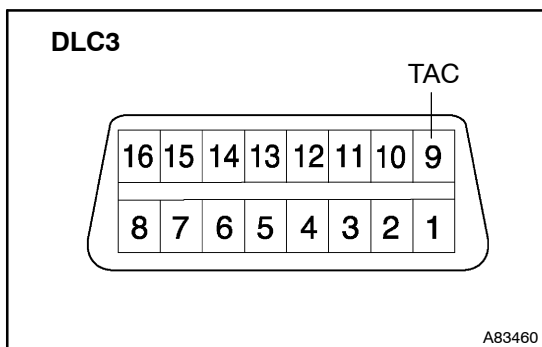
- (c) When using the intelligent tester II:
(1) Connect the intelligent tester II to the DLC3.
Idle speed: 625 to 725 rpm

NOTICE:

- Check idle speed with the cooling fan OFF.
- Switch off all accessories and air conditioning.

HINT:

Please refer to the intelligent tester II operator's manual if you need help to select DATA LIST.



- (d) When not using intelligent tester II:
(1) Using SST, connect the tachometer test probe to terminal 9 (TAC) of DLC3.

SST 09843-18040

- (2) Check the idle speed.

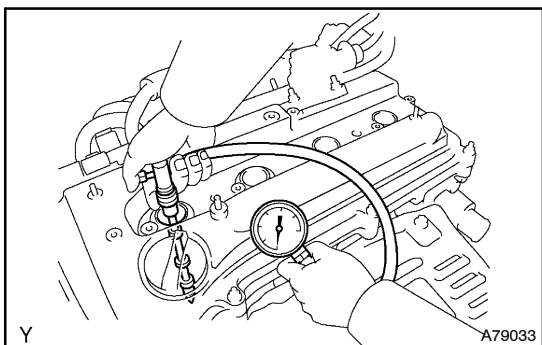
Idle speed: 625 to 725 rpm

NOTICE:

- Check the idle speed with the cooling fan OFF.
- Switch OFF all accessories and air conditioning.

9. INSPECT COMPRESSION

- (a) Stop a warm engine.
(b) Disconnect the injector connectors.
(c) Remove all ignition coils.
(d) Remove all spark plugs.



- (e) Inspect the cylinder compression pressure.
SST 09992-00500
- (1) Insert a compression gauge into the spark plug hole.
 - (2) Fully open the throttle with hand.
 - (3) While cranking the engine, measure the compression pressure.

Compression pressure:

1.3 MPa (13.3 kgf/cm², 189 psi)

Minimum pressure:

1.0 MPa (10.2 kgf/cm², 145 psi)

Difference between each cylinder:

0.1 MPa (1.0 kgf/cm², 14 psi)

NOTICE:

- **Always use a fully-charged battery to obtain engine speed of 250 rpm or more.**
 - **Check the other cylinder's compression pressure in the same way.**
 - **This measurement must be done quickly as possible.**
- (4) If the cylinder compression is low, pour a light coat of engine oil into the cylinder through the spark plug hole, then inspect it again.

HINT:

- If adding oil increases the compression, it is likely that the piston rings and/or cylinder bore may be worn or damaged.
- If pressure stays low, the valve may be stuck or seated improperly, or there may be leakage past the gasket.

10. INSPECT CO/HC

- (a) Start the engine.
- (b) Race the engine at 2,500 rpm for approximately 180 seconds.
- (c) Insert the CO/HC meter testing probe at least 40 cm (1.3 ft) into the tailpipe while idling.
- (d) Check the CO/HC concentration at idle and/or 2,500 rpm.

HINT:

When performing the 2 modes test (2,500 rpm and idle), follow the measurement order prescribed by the applicable local regulations.

If the CO/HC concentration does not comply with regulations, troubleshoot in the order given below.

- (1) Check the A/F sensor and heated oxygen sensor operation.
- (2) See the table below for possible causes, then inspect and repair the applicable causes if necessary.

CO	HC	Problems	Causes
Normal	High	Rough idle	1. Faulty ignitions: <ul style="list-style-type: none"> • Incorrect timing • Fouled, shorted or improperly gapped plugs 2. Incorrect valve clearance 3. Leakage in intake and exhaust valves 4. Leakage in cylinders
Low	High	Rough idle (Fluctuating HC reading)	1. Vacuum leaks: <ul style="list-style-type: none"> • PCV hoses • Intake manifold • Throttle body • Brake booster line 2. Lean mixture causing misfire
High	High	Rough idle (Black smoke from exhaust)	1. Restricted air filter 2. Plugged PCV valve 3. Faulty SFI systems: <ul style="list-style-type: none"> • Faulty pressure regulator • Defective engine coolant temperature sensor • Faulty ECM • Faulty injectors • Faulty throttle position sensor • Faulty MAF meter