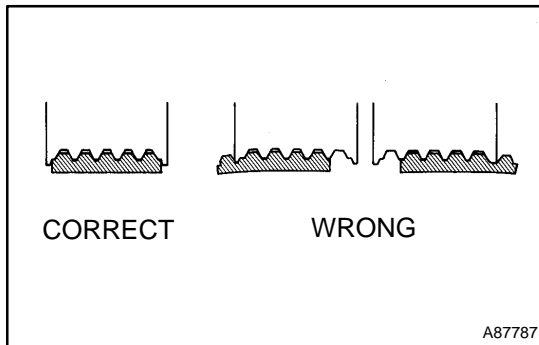


ENGINE (2AZ-FE)(From July, 2003)

14116-03

INSPECTION

1. INSPECT ENGINE COOLANT (See page 16-1)
2. INSPECT ENGINE OIL (See page 17-1)
3. INSPECT BATTERY (See page 19-14)
4. INSPECT AIR CLEANER FILTER ELEMENT SUB-ASSY (See page 99-5)
5. INSPECT SPARK PLUG (See page 18-3)



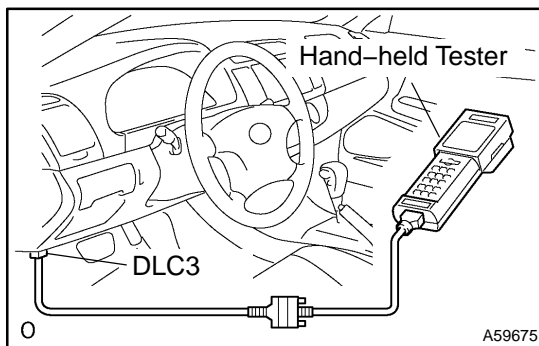
6. INSPECT V-RIBBED BELT

HINT:

- After installing the drive belt, check that it fits properly in the ribbed grooves. Check with your hand to confirm that the belt has not slipped out of the groove on the bottom of the crank pulley.
- "New belt" is a belt which has been used less than 5 minutes on a running engine.
- "Used belt" is a belt which has been used on a running engine for 5 minutes or more.
- After installing a new belt, run the engine for approximately 5 minutes and then recheck the tension.

7. INSPECT IGNITION TIMING

(a) Warm up the engine.



(b) When using the hand-held tester:

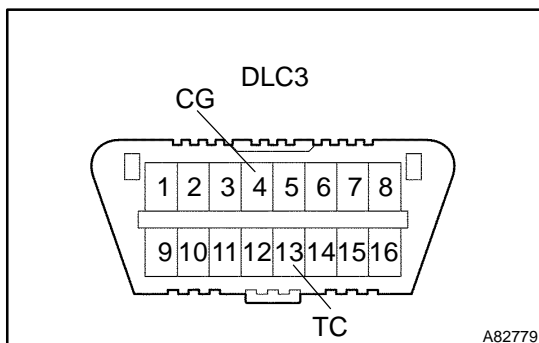
Check the ignition timing.

- (1) Connect the hand-held tester to the DLC3.
- (2) Enter DATA LIST MODE on the hand-held tester.

Ignition timing: 8 to 12° BTDC @ idle

HINT:

Please refer to the hand-held tester operator's manual for help on selecting the DATA LIST.



(c) When not using the hand-held tester:

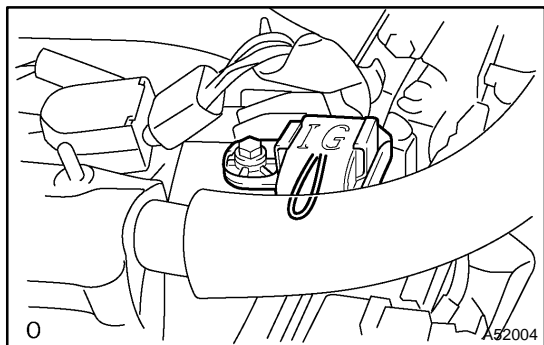
Check the ignition timing.

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

SST 09843-18040

NOTICE:

- **Confirm the terminal numbers before connecting them. Connection with a wrong terminal can damage the engine.**
- **Turn off all electrical systems before connecting the terminals.**
- **Perform this inspection after the cooling fan motor is turned off.**



- (2) Remove the cylinder head cover No. 2.
- (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 can detect the first signal.
 - After checking, be sure to tape the wire harness.
- (4) Check the ignition timing at idle.
Ignition timing: 8 to 12° BTDC @ idle

NOTICE:

When checking the ignition timing, the transmission should be in the neutral position.

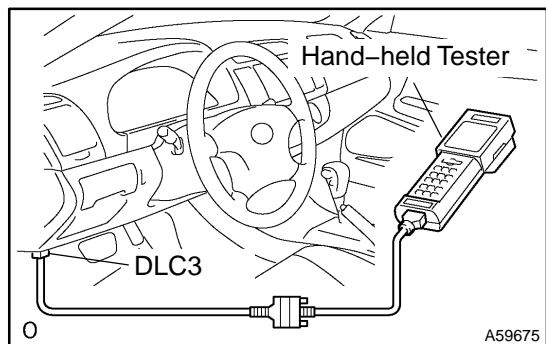
HINT:

After engine rpm is kept at 1,000 to 1,300 rpm for 5 seconds, check that it returns to idle speed.

- (5) Disconnect terminals 13 (TC) and 4 (CG) of the DLC3.
- (6) Check the ignition timing at idle.
Ignition timing: 5 to 15° BTDC @ idle
- (7) Confirm that ignition timing moves to the advanced angle side when the engine rpm is increased.
- (8) Remove the timing light.

8. INSPECT ENGINE IDLE SPEED

- (a) Warm up the engine.



- (b) When using the hand-held tester:
Check the idle speed.
- (1) Connect the hand-held tester to the DLC3.

HINT:

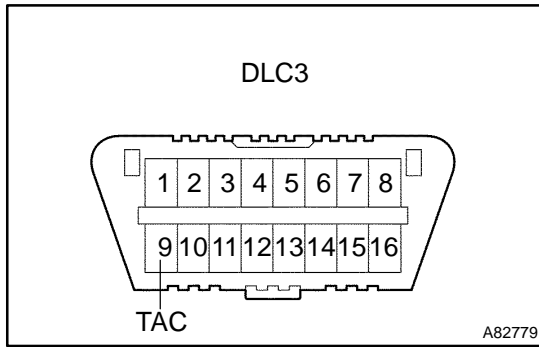
Please refer to the hand-held tester operator's manual for further details.

- (2) Enter DATA LIST MODE on the hand-held tester.
Idle speed:

Item	Specified Condition
M/T	650 to 750 rpm
A/T	610 to 710 rpm

NOTICE:

- When checking the idle speed, the transmission should be in the neutral position.
- Check idle speed with the cooling fan off.
- Switch off all accessories and air conditioning before connecting the hand-held tester.



- (c) When not using the hand-held tester:
Check the idle speed.
- (1) Using SST, connect tachometer tester probe to terminal 9 (TAC) of the DLC3.

SST 09843-18030

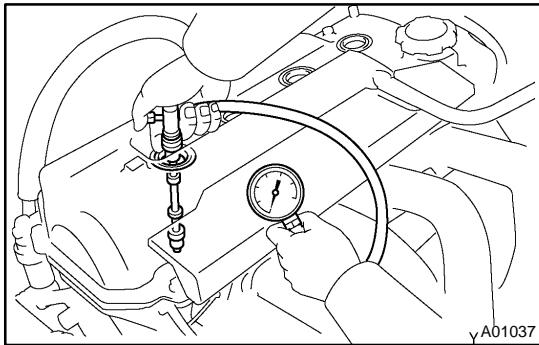
- (2) Check the idle speed.

Idle speed:

Item	Specified Condition
M/T	650 to 750 rpm
A/T	610 to 710 rpm

9. INSPECT COMPRESSION

- (a) Warm up and stop the engine.
- (b) Disconnect the injector connectors.
- (c) Remove the ignition coils.
- (d) Remove the spark plugs.



- (e) Check the cylinder compression pressure.
 - (1) Insert a compression gauge into the spark plug hole.
 - (2) Fully open the throttle.
 - (3) While cranking the engine, measure the compression pressure.

Compression pressure:

Item	Specified Condition
PZEV	1,300 kPa (13.3 kg/cm ² , 189 psi)
Except PZEV	1,360 kPa (13.9 kg/cm ² , 198 psi)

Minimum pressure:

Item	Specified Condition
PZEV	1,000 kPa (10.2 kg/cm ² , 145 psi)
Except PZEV	980 kPa (10.0 kg/cm ² , 142 psi)

Difference between each cylinder:

Item	Specified Condition
PZEV	29 kPa (0.3 kg/cm ² , 4.3 psi)
Except PZEV	100 kPa (1.0 kg/cm ² , 14 psi)

NOTICE:

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

HINT:

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

10. INSPECT CO/HC

- Start the engine.
- Rev the engine at 2,500 rpm for approximately 180 seconds.
- Insert CO/HC meter testing probe at least 40 cm (1.3 ft) into the tailpipe during idling.
- Immediately check CO/HC concentration at idle and/or 2,500 rpm.

HINT:

- Complete the measuring within 3 minutes.
 - Check regulations and restrictions in your area when performing 2 mode CO/HC concentration testing (engine check at both idle speed and at 2,500 rpm).
- If the CO/HC concentration does not comply with regulations, troubleshoot in the order given below.
 - Check A/F sensor operation (see page [05-288](#)).
 - See the table below for possible causes, and then inspect and repair.

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. Leaky intake and exhaust valves 4. Leaky 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 system: <ul style="list-style-type: none"> • Faulty pressure regulator • Defective ECT • Defective MAF meter • Faulty ECM • Faulty injectors • Faulty throttle position sensor