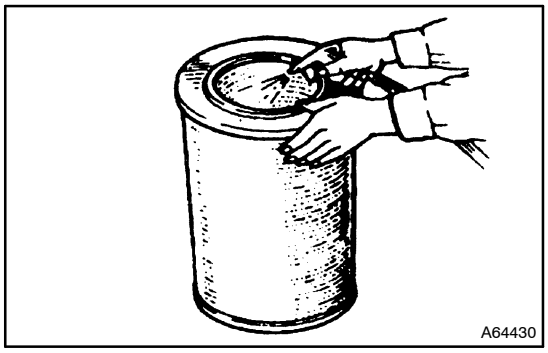
ENGINE (S05C–B)

1416Z–01

ADJUSTMENT

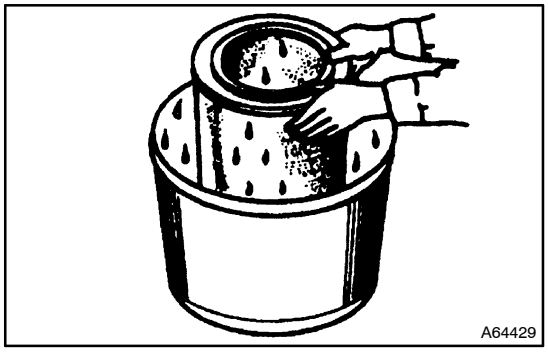
1. **INSPECT ENGINE COOLANT**
2. **INSPECT ENGINE OIL**
3. **INSPECT BATTERY**


A64430

4. Paper Filter type:
INSPECT AIR CLEANER FILTER ELEMENT SUB–ASSY

(a) Visually check that the filter is not excessively dirty or oily.
(b) To remove dry dirt or dust, use a compressed air gun (Air pressure: lower than 690 kPa (7.0 kgf/cm^2, 100 psi)). Always blow off from the inside of the element to the outside. Never strike or bang the filter to remove dirt or dust.

HINT:
If the compressed air is too high and the element has deformation, the engine will be in trouble.

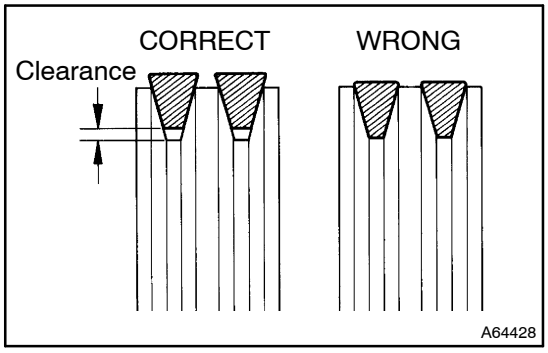

A64429

5. Washable type:
INSPECT AIR CLEANER FILTER ELEMENT SUB–ASSY

(a) Wash the element by soaking it in a non–sudsy detergent solution for approx. 30 minutes.
(b) Rinse the element with clean water and dry it completely with compressed air.

HINT:
- Check to see that the inside of the element is not soiled with dust etc.
- If drying the element in an oven, drying should be done at below 80˚C (176˚F).
- Never reinstall the element until it is completely dry.
- Make sure that the dried element is not broken and that the packing is not broken nor deformed.

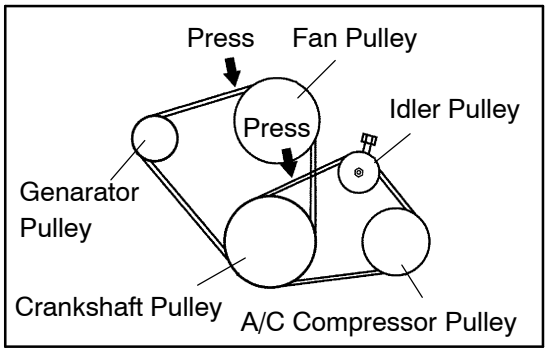
NOTICE:
Never use kerosene, gasoline or other solvents to clean the elements. Use of these could cause the engine to overrunning of the engine and damage the engine.



6. INSPECT V BELT

(a) Visually check the belt for cracks, oiliness or wear. Check that the belt does not touch the bottom of the pulley groove.

If necessary, replace the belts as a set.



(b) Measure the V belt deflection by pressing on the belt at the points indicated in the illustration with 98 N (10 kgf, 22 lbf) of pressure.

Deflection:

Generator belt	New belt	5.5 – 6.5 mm (0.217 – 0.256 in.)
	Used belt	6.5 – 7.5 mm (0.256 – 0.295 in.)
A/C belt	New belt	7.0 – 8.5 mm (0.276 – 0.335 in.)
	Used belt	8.5 – 10.0 mm (0.335 – 0.394 in.)

(c) Reference:

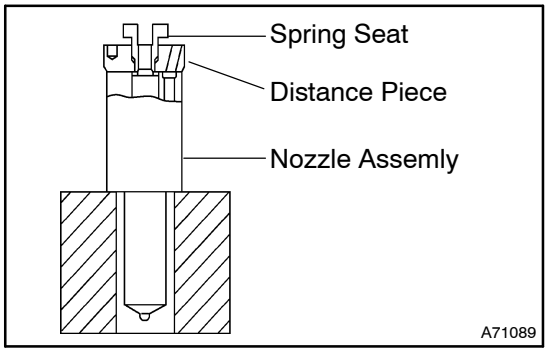
Using a belt tension gauge, measure the belt tension.

Tension:

New belt	374 – 471 N (38 – 48 kg, 84 – 106 lb)
Used belt	275 – 373 N (28 – 38 kg, 62 – 84 lb)

HINT:

- ”New belt” refers to a belt which has been used for less than 5 minutes on a running engine.
- ”Used belt” refers to a belt which has been used on a running engine for 5 minutes or more.
- After installing a new belt, run the engine for about 5 minutes and recheck the belt tension.



7. ADJUST NOZZLE HOLDER AND NOZZLE SET

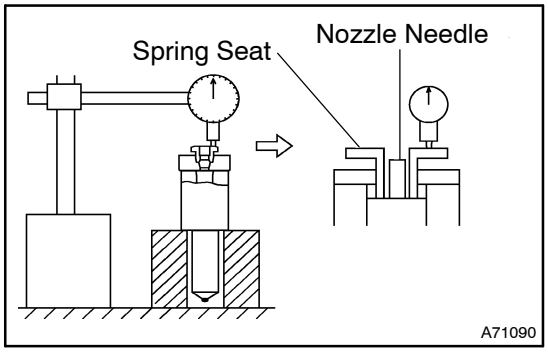
(a) Disassemble the nozzle holder and nozzle set.

(b) Adjust the pre–lift.

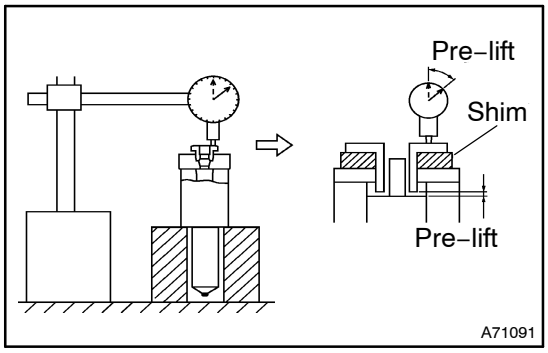
(1) The nozzle assembly, distance piece, and spring seat are attached.

NOTICE:

Each part must be washed carefully to eliminate any debris.



(2) The hole in the pin on the distance piece are lined up and the dial gauge is pushed down until it contacts the distance piece. Next, set the dial gauge to ”0”.



(3) Install the pre–lift adjusting shim.
(4) Measure the pre–lift.

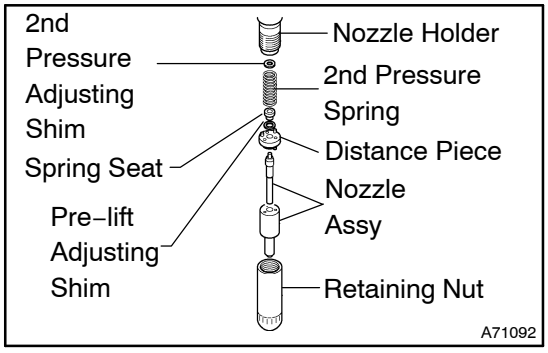
If the pre–lift out of the assembly standard, suitable shims are then used to adjust this pre–lift value to a standard value.

Pre–lift: 0.095 – 0.115 mm (0.0038 – 0.0045 in.)

HINT:

- Thick shims = increase the pre–lift
- Thin shims = decrease the pre–lift

Pre–lift adjusting shim line–up
Shim size:
1.30 – 1.42 mm (0.052 – 0.055 in.) (Jump at 0.02)
1.44 – 1.70 mm (0.057 – 0.066 in.) (Jump at 0.02)



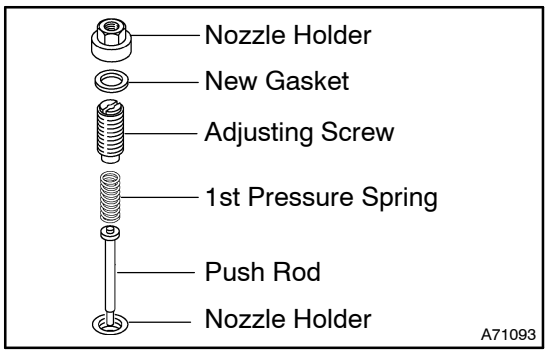
(c) Adjust the 1st opening pressure.
(1) Attach the 2nd opening pressure adjusting shim, 2nd pressure spring and adjusted parts to the bottom of the nozzle holder.
(2) Using a wrench, tighten the retaining nut.

NOTICE:

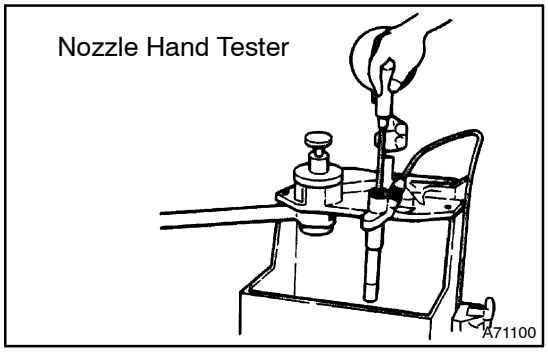
- **Adjust the first opening pressure. Then the 2nd opening pressure is adjusted at the same time.**
- **Exchange parts is nozzle assy and opening pressure adjusting shim. Do not exchange other parts.**

Torque: 63.7 N·m (650 kgf·cm, 47 ft·lbf)

(3) Insert the push rod and 1st pressure spring to the nozzle holder body. Tighten the adjusting screw.



(4) Assemble the new gasket, tighten temporarily the cap nut.



(5) Mount the above stated nozzle holder on the nozzle hand tester to determine the pressure at the start of injection.
This value is used as the 1st opening pressure. The adjusting screw is tightened or loosened to keep this value within a set range.

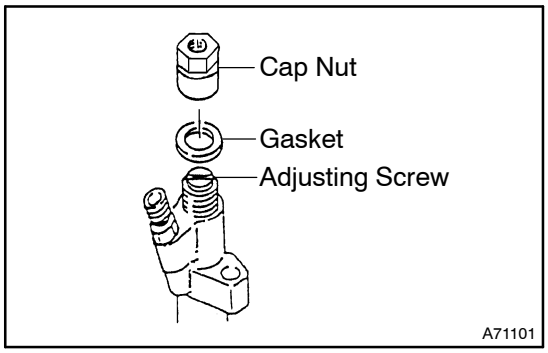
1st opening pressure (with new parts):
16.67 – 17.45 MPa
(170 – 178 kgf/cm^2, 2,418 – 2,532 psi)
1st opening pressure (with reused parts):
16.18 – 16.97 MPa
(165 – 173 kgf/cm^2, 2,347 – 2,461 psi)

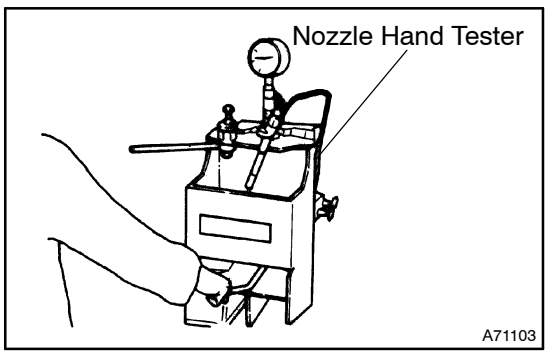
HINT:
- Tighten the adjusting screw ..... increases pressure.
- Loosening adjusting screw ..... decreases pressure.

(6) After adjustment, a gasket is installed and the cap nut is tightened down to anchor the adjusting screw.

NOTICE:
Make sure that the adjusting screw does not turn at the same time.

Torque: 53.9 N·m (550 kgf·cm, 40 ft·lbf)





(7) The nozzle holder is mounted on the nozzle hand tester and a check is made to determine if the pressure at the start of injection (1st opening pressure) is within the standard range.

1st opening pressure (with new parts):
16.67 MPa (170 kgf/cm^2, 2,414 psi)
1st opening pressure (with reused parts):
16.18 MPa (165 kgf/cm^2, 2,343 psi)

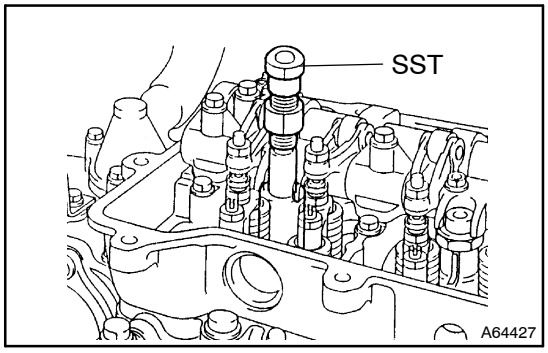
The opening pressure is not as specified, readjust with the adjusting screw.

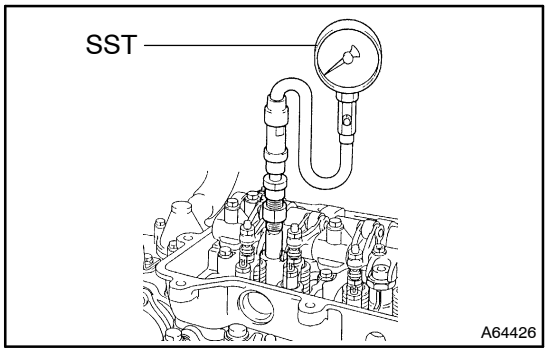
8. INSPECT DIESEL SMOKE

9. INSPECT CYLINDER COMPRESSION PRESSURE

HINT:
If the power is short, the oil consumption is excessive, and the fuel economy is poor, measure the compression pressure.

(a) Allow the engine to warm up to the normal operating temperature.
(b) Remove the intake air connector.
(c) Remove the cylinder head cover.
(d) Remove the injection pipes.





(e) Check the compression pressure.

NOTICE:

When measuring each compression pressure, the other 3 injectors must be installed in the cylinder head.

(1) Remove the injector.

(2) Install the gasket and SST (attachment) to the injection nozzle hole with the holder clamp and bolt.

SST S0955–21060, S0955–21090

Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)

(3) Connect SST (compression gauge) to the SST (attachment).

SST 09992–00025 (09992–00211)

(4) While cranking the engine, measure the compression pressure.

HINT:

Always use a fully charged battery to obtain the engine revolution of 280 rpm or more.

(5) Repeat steps (2) through (4) for each cylinder.

NOTICE:

This measurement must be done as short a time as possible.

Compression pressure:
3,400 – 3,700 kPa (35 – 38 kgf/cm², 498 – 540 psi)
Minimum pressure: 2,700 kPa (28 kgf/cm², 398 psi)
Difference between each cylinder:
290 kPa (3.0 kgf/cm², 43 psi) or less

(6) If the cylinder compression in one or more cylinders is low, pour a small amount of engine oil into the cylinder through the injector hole and repeat steps (2) through (4) for the cylinder with low compression.

- If the compression becomes high by adding oil, it shows that the piston rings and/or cylinder bore are worn or damaged.
- If the pressure remains low, a valve may be sticking or seating improperly, or there may be leakage throught the gasket.

(7) Remove the SST.

SST 09992–00025 (09992–00211), S0955–21060, S0955–21090

(8) Reinstall the injector or injection nozzle (See page 11–74).

(f) Reinstall the injection pipes.

(g) Reinstall the cylinder head cover.

(h) Reinstall the intake air connector.

(i) Start the engine and check for leaks.