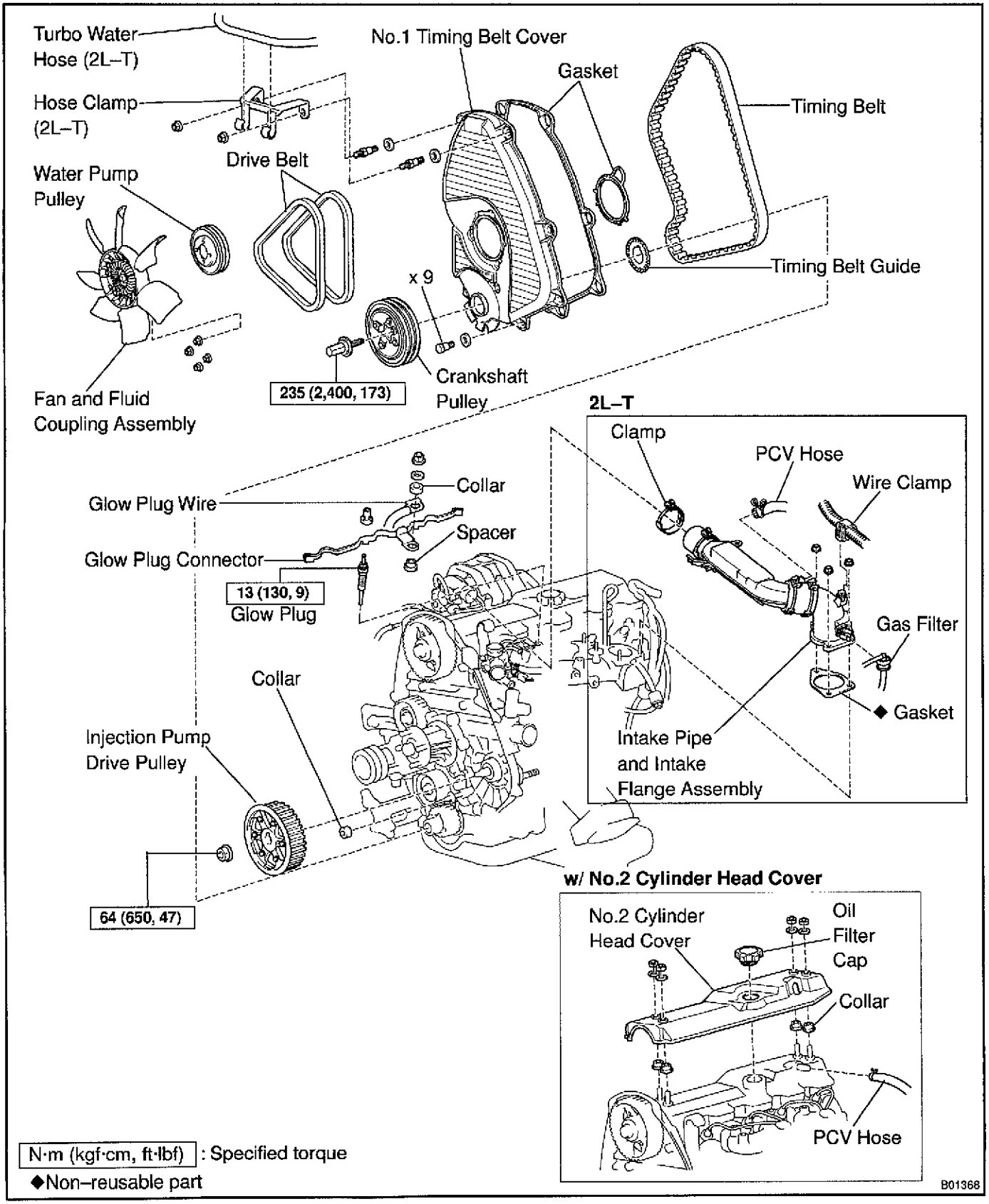
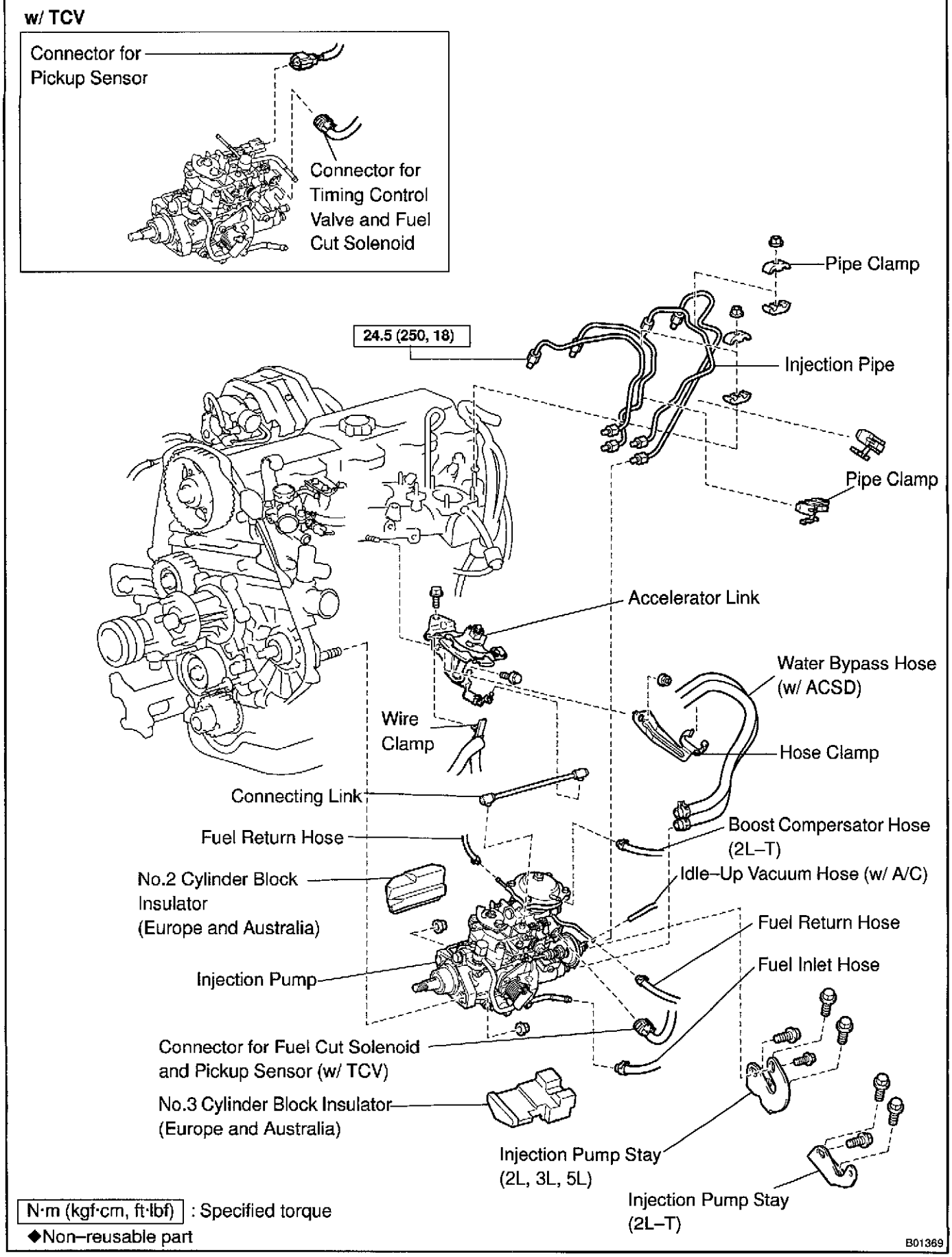
# INJECTION PUMP

## COMPONENTS

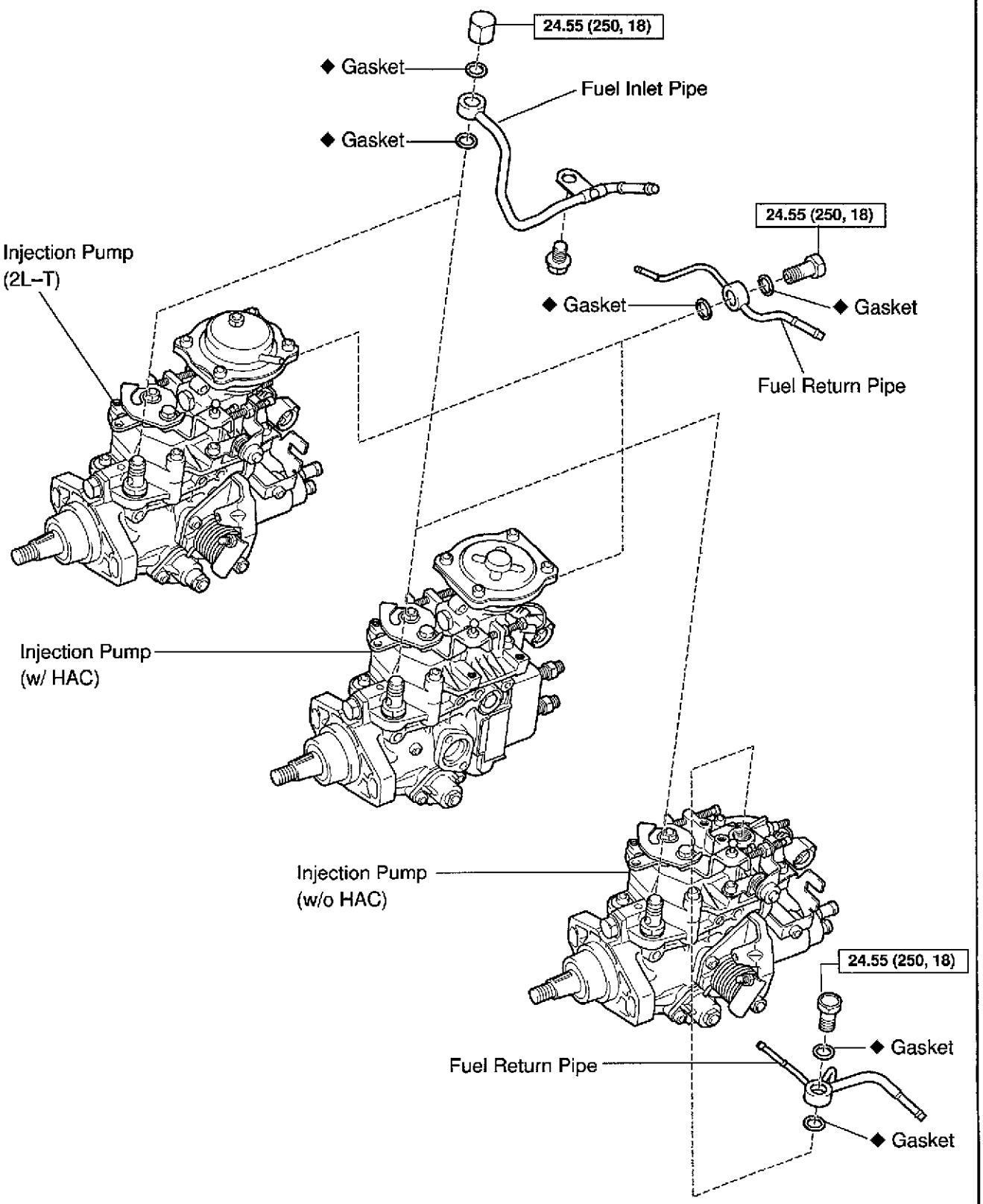
FU00G-01




w/ TCV
Connector for Pickup Sensor
Connector for Timing Control Valve and Fuel Cut Solenoid
Pipe Clamp
24.5 (250, 18)
Injection Pipe
Pipe Clamp
Accelerator Link
Water Bypass Hose (w/ ACSD)
Wire Clamp
Hose Clamp
Connecting Link
Boost Compersator Hose (2L–T)
Fuel Return Hose
Idle–Up Vacuum Hose (w/ A/C)
No.2 Cylinder Block Insulator (Europe and Australia)
Fuel Return Hose
Fuel Inlet Hose
Injection Pump
Connector for Fuel Cut Solenoid and Pickup Sensor (w/ TCV)
No.3 Cylinder Block Insulator (Europe and Australia)
Injection Pump Stay (2L, 3L, 5L)
Injection Pump Stay (2L–T)
N·m (kgf·cm, ft·lbf) : Specified torque
◆Non–reusable part
B01369

FU

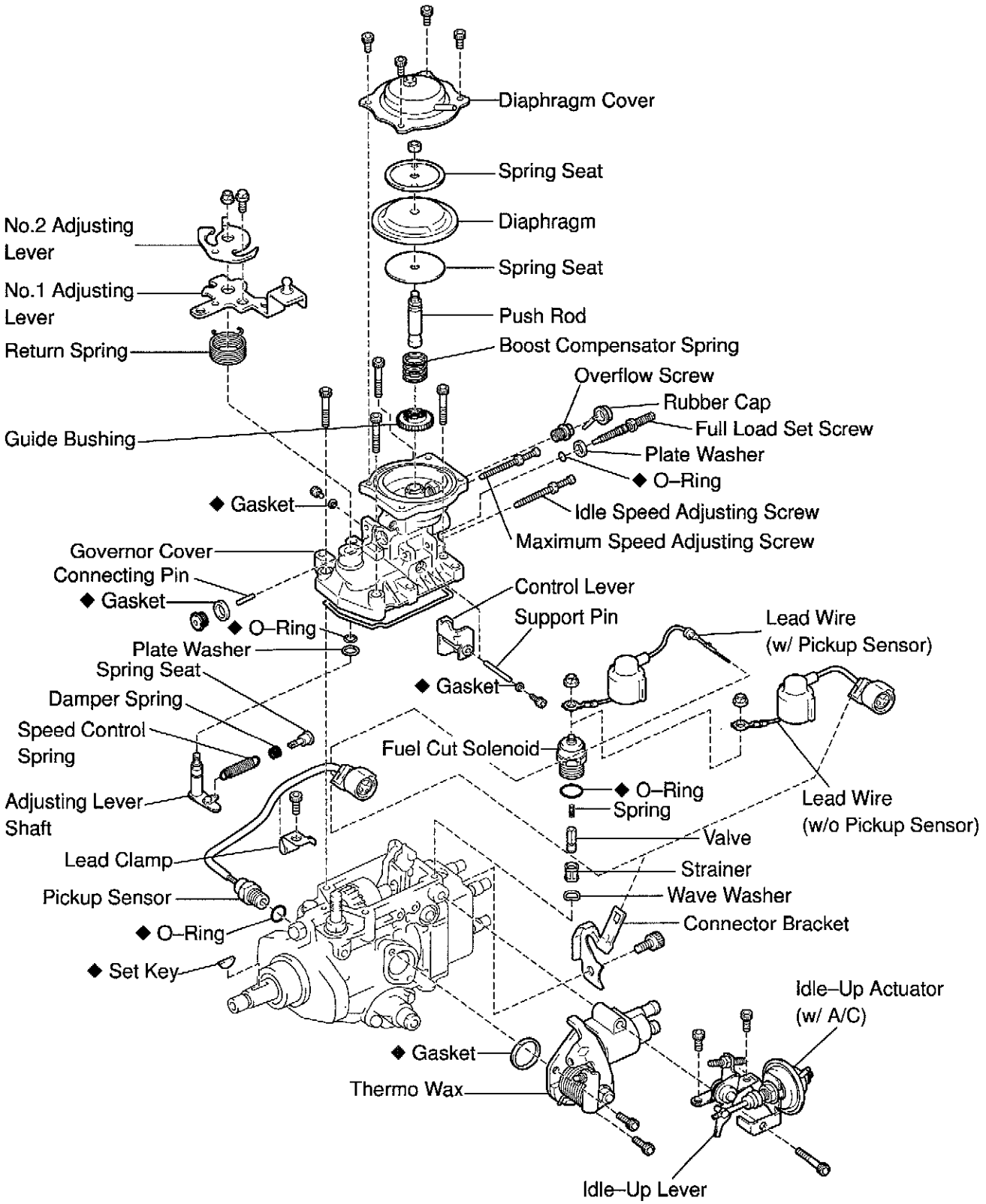
FU




N·m (kgf·cm, ft·lbf) : Specified torque
◆Non–reusable part

B01363

2L–T

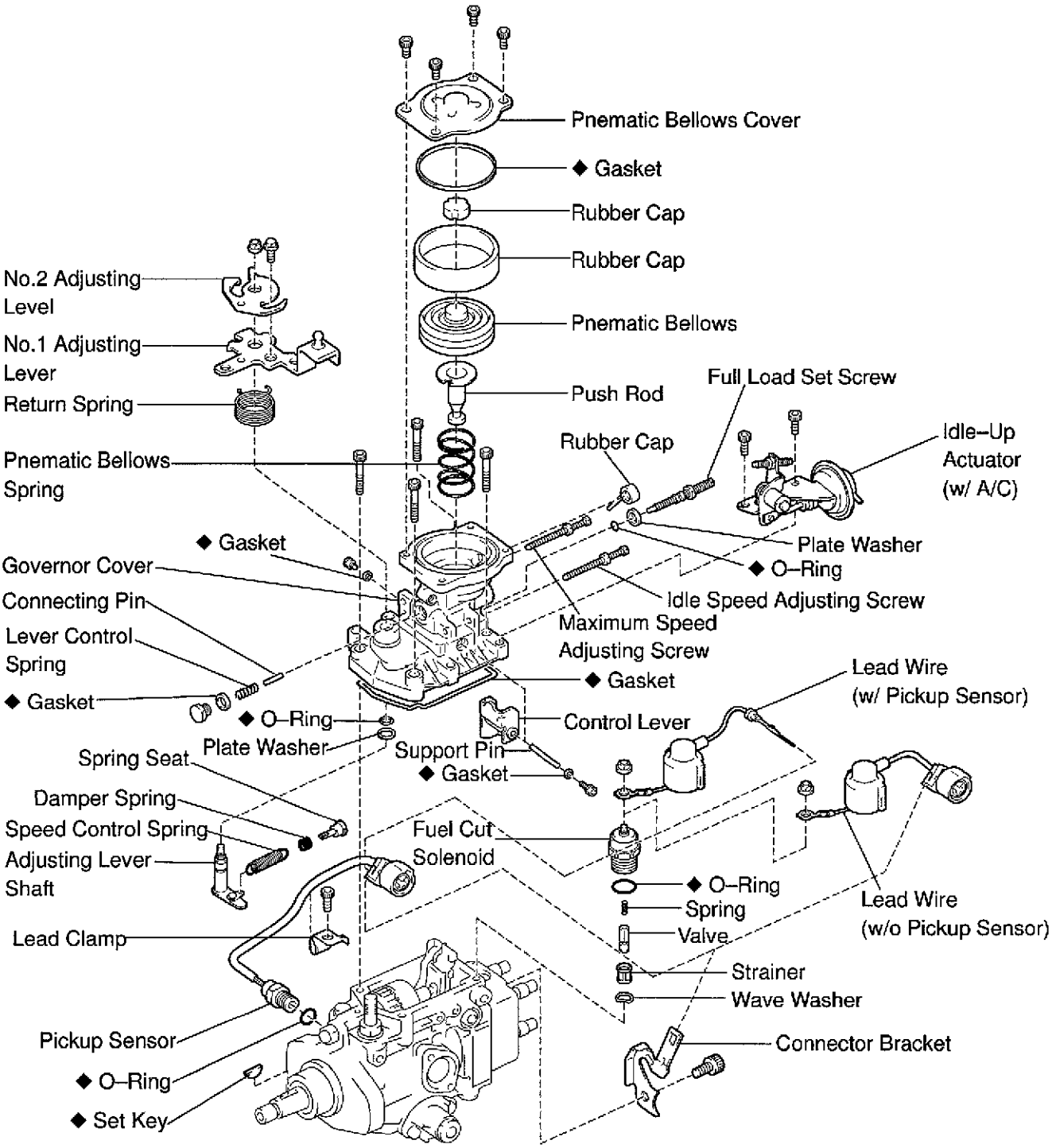



◆ Non–reusable part

B01359

FU

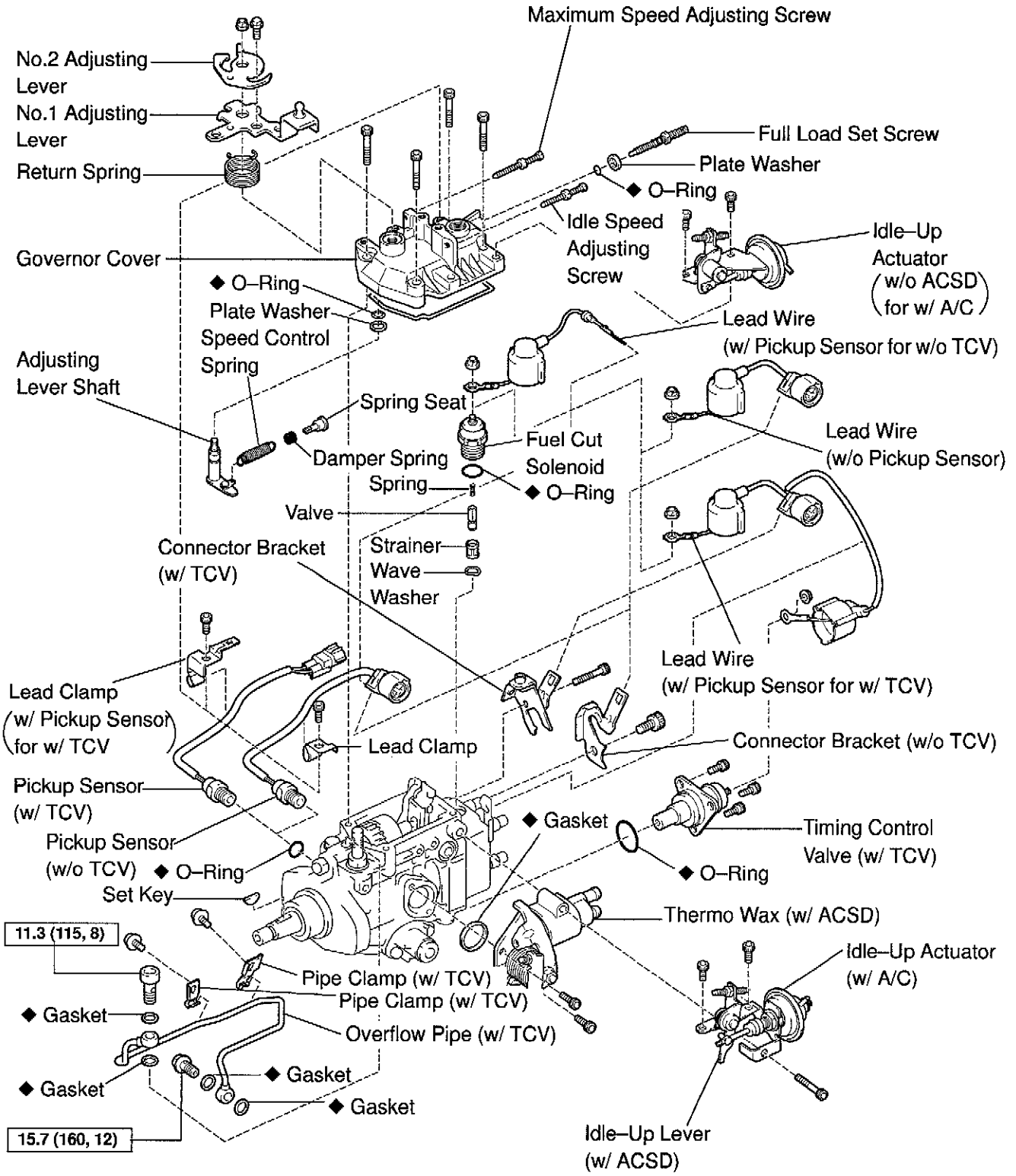
w/ HAC




◆ Non–reusable part

B01360

**w/o HAC**

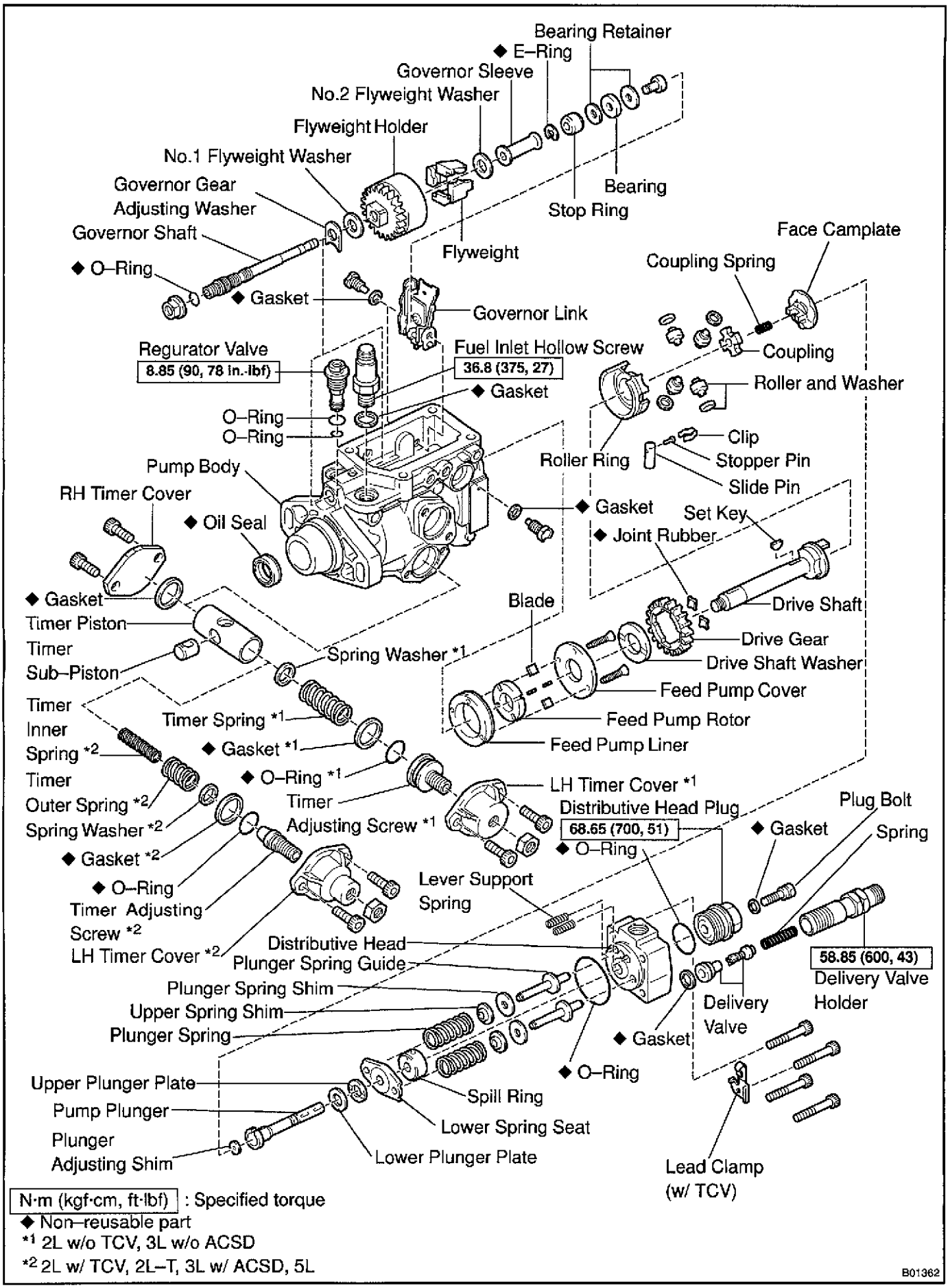



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part

B01361

FU

FU




N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
*1 2L w/o TCV, 3L w/o ACSD
*2 2L w/ TCV, 2L–T, 3L w/ ACSD, 5L

B01362

FU00H-01

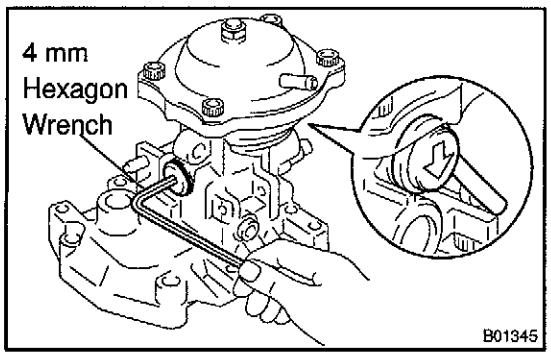
# DISASSEMBLY

## 2L–T:

### DISASSEMBLE BOOST COMPENSATOR

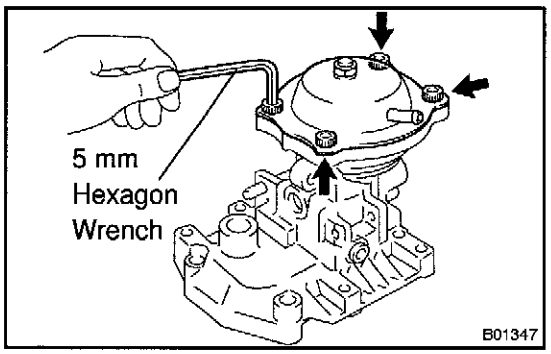
(a) Using a 4 mm hexagon wrench, remove the bolt and gasket.

(b) Remove the rubber cap and overflow screw.



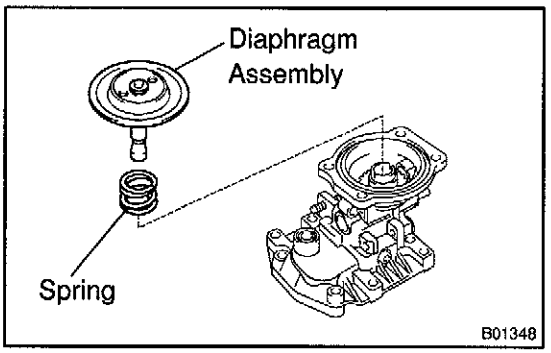

(c) Remove the boost compensator diaphragm.

(1) Using a 5 mm hexagon wrench, remove the 4 bolts and diaphragm cover.



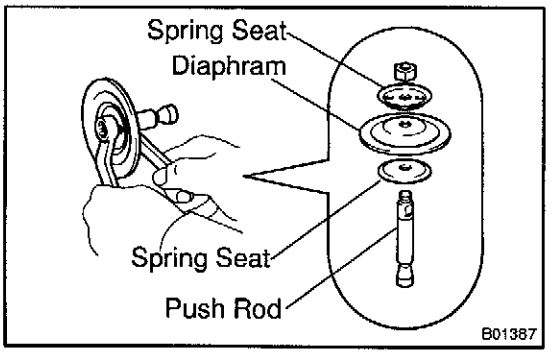

(2) Remove these parts:

- Diaphragm assembly
- Spring

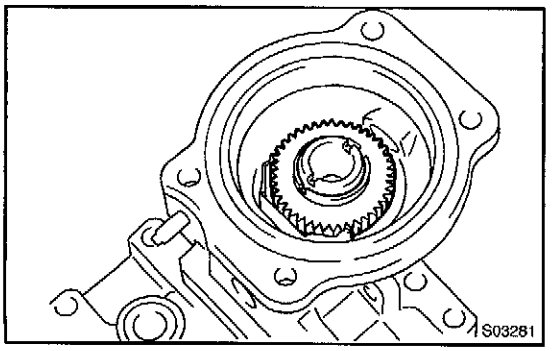


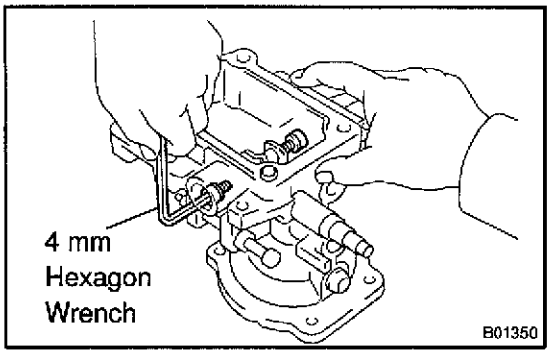

(3) Remove the nut, and disassemble these parts:

- 2 spring seats
- Diaphragm
- Push rod



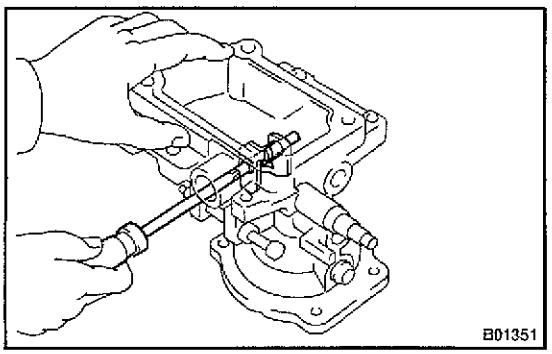

(d) Remove the guide bushing.



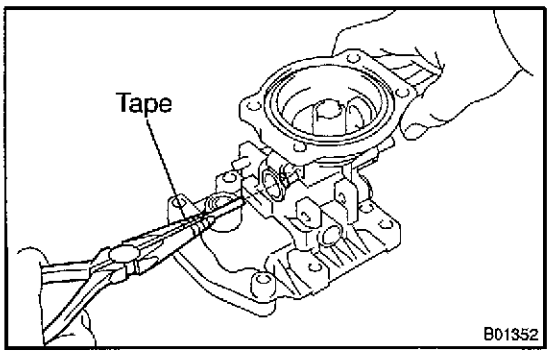



(e) Remove the control lever.

(1) Using a 4 mm hexagon wrench, remove the 2 bolts and gaskets.




(2) Using a small screwdriver, push out the support pin and remove the control lever.

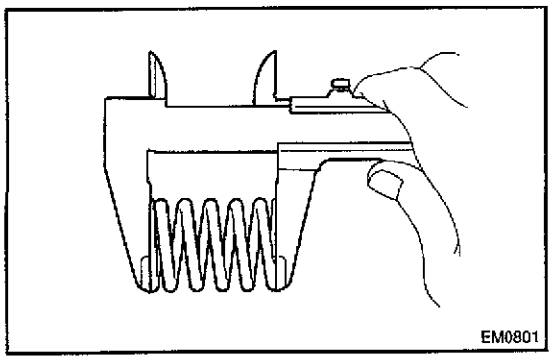



(3) Using needle nose pliers, remove the connecting pin.

**NOTICE:**

**Be careful not to damage the connecting pin. Tape the tip of the pliers.**

FU001-01




# INSPECTION

## INSPECT SPRING LENGTH

Using vernier calipers, measure the free length of each spring.

**Spring free length: mm (in.)**

| | |
|---|---|
| Delivery valve spring | 24.4 (0.961) |
| Plunger spring | 30.0 (1.181) |
| Coupling spring | 16.6 (0.654) |
| Pneumatic bellows spring (w/ HAC) | 30.0 (1.181) |
| Boost compensator spring (2L–T) | 19.4 (0.764) |

If the free length is not as specified, replace the spring(s).

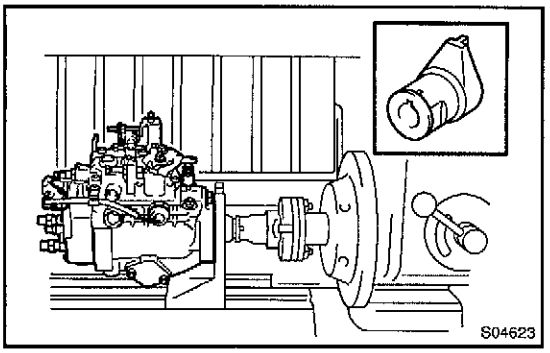
FU00J–01

# ADJUSTMENT

## 1. PRE–TEST CHECK AND PREPARATION

(a) The specifications for test nozzle and nozzle holders are as follows.
**Test nozzle: DN12SD12 (DENSO)**
**Test nozzle opening pressure:**
**14,220 – 15,200 kPa**
**(145 – 155 kgf/cm$^2$, 2,062 – 2,205 psi)**

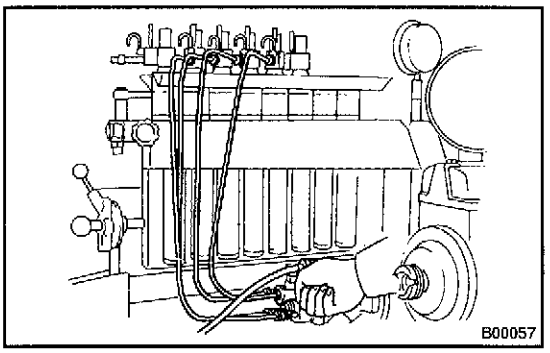
(b) Check the accuracy of the tachometer.
**Allowable error: ± 40 rpm**




(c) Install the angle gauge stand.

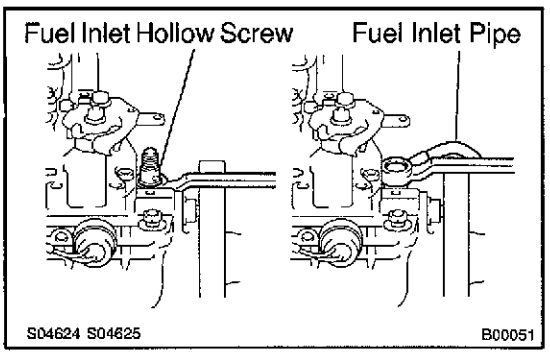
(d) Mount the injection pump body on the pump tester.

HINT:
Place a mark on the key groove portion of the coupling.



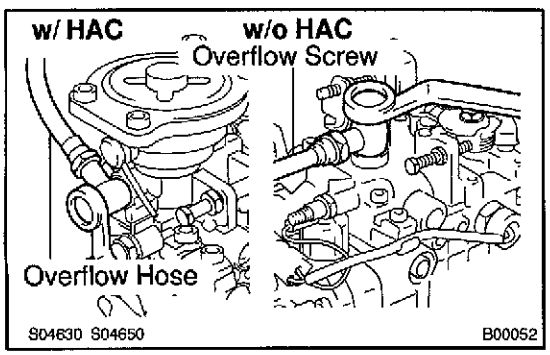

(e) Install an injection pipe with these specifications:

| | |
|---|---|
| Outer diameter | 6.0 mm (0.236 in.) |
| Inner diameter | 2.0 mm (0.079 in.) |
| Length | 840 mm (33.07 in.) |
| Minimum bending radius | 25 mm (0.98 in.) or more |




(f) Remove the fuel inlet hollow screw.

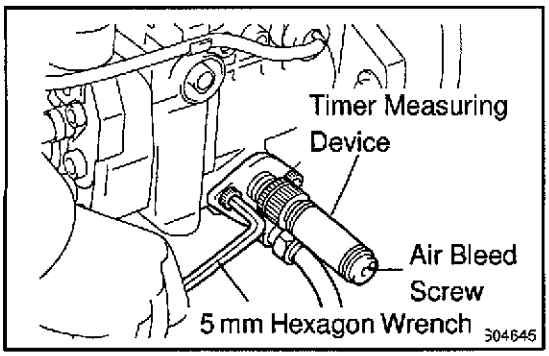
(g) Connect the fuel inlet pipe with an adapter.
**Torque: 24.55 N·m (250 kgf·cm, 18 ft·lbf)**




(h) Install an overflow hose with the 2 gaskets and an overflow screw.
**Torque: 24.55 N·m (250 kgf·cm, 18 ft·lbf)**

HINT:
Always use the overflow screw installed on the pump to be adjusted.

(i) Using a 5 mm hexagon wrench, remove the 2 bolts and RH timer cover.

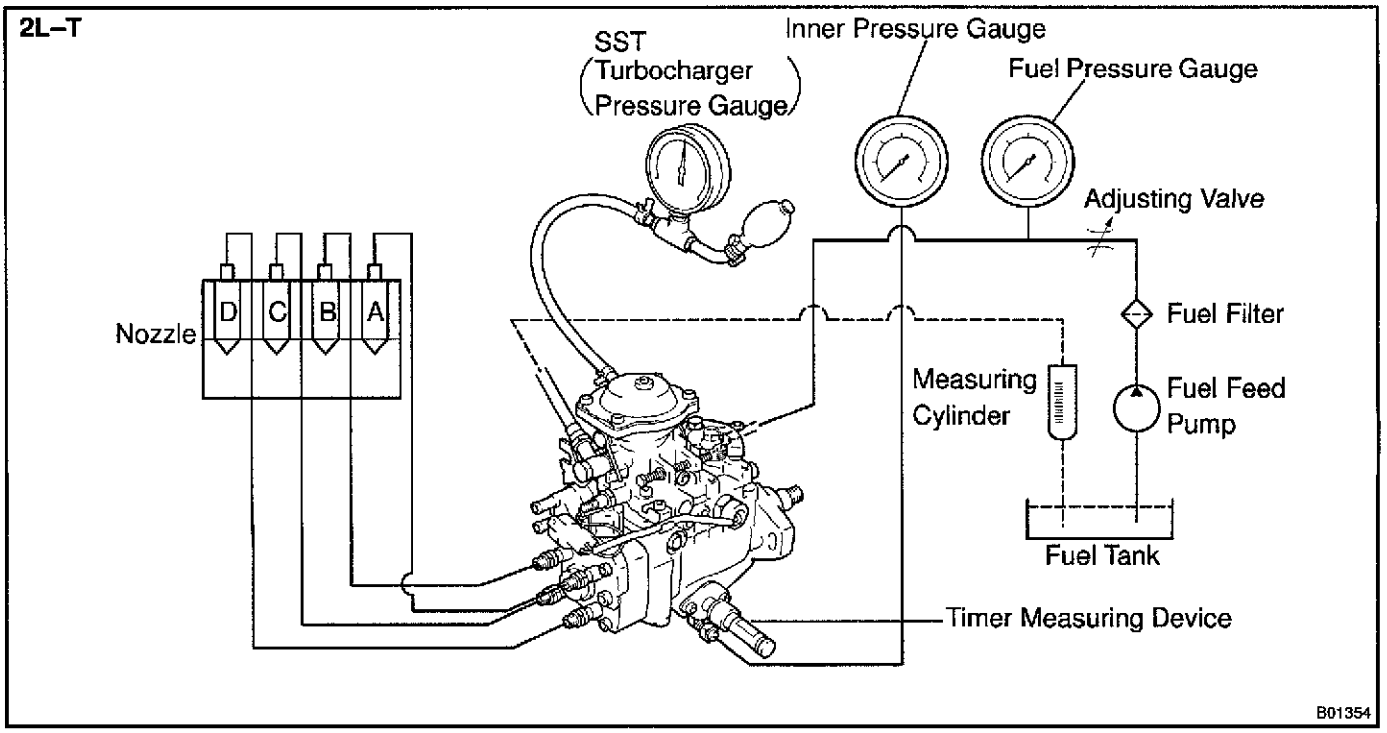



(j) Install the inner pressure gauge with the timer measuring device.
Part No. 95095–10231, 95095–10480 (DENSO)
**Torque: 8.35 N·m (85 kgf·cm, 74 in.·lbf)**

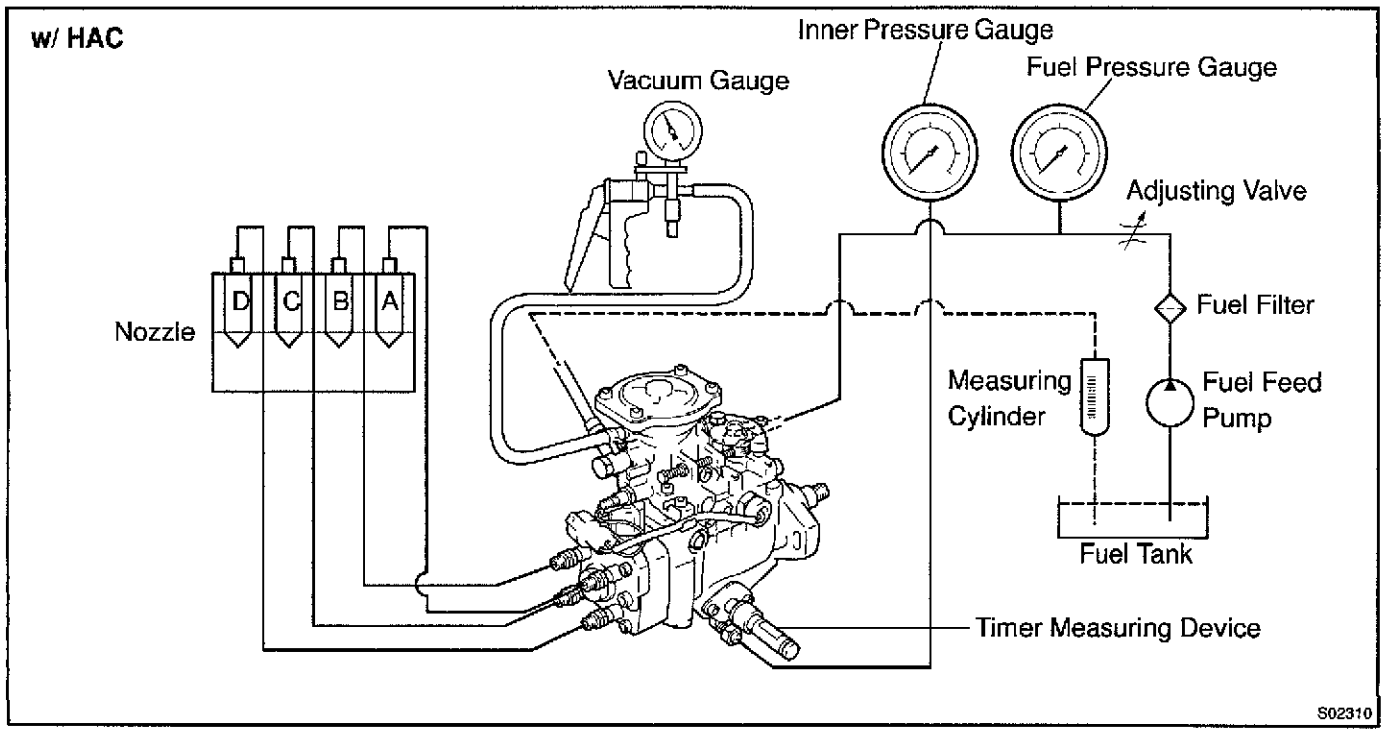
HINT:
Bleed the air by the air bleed screw.

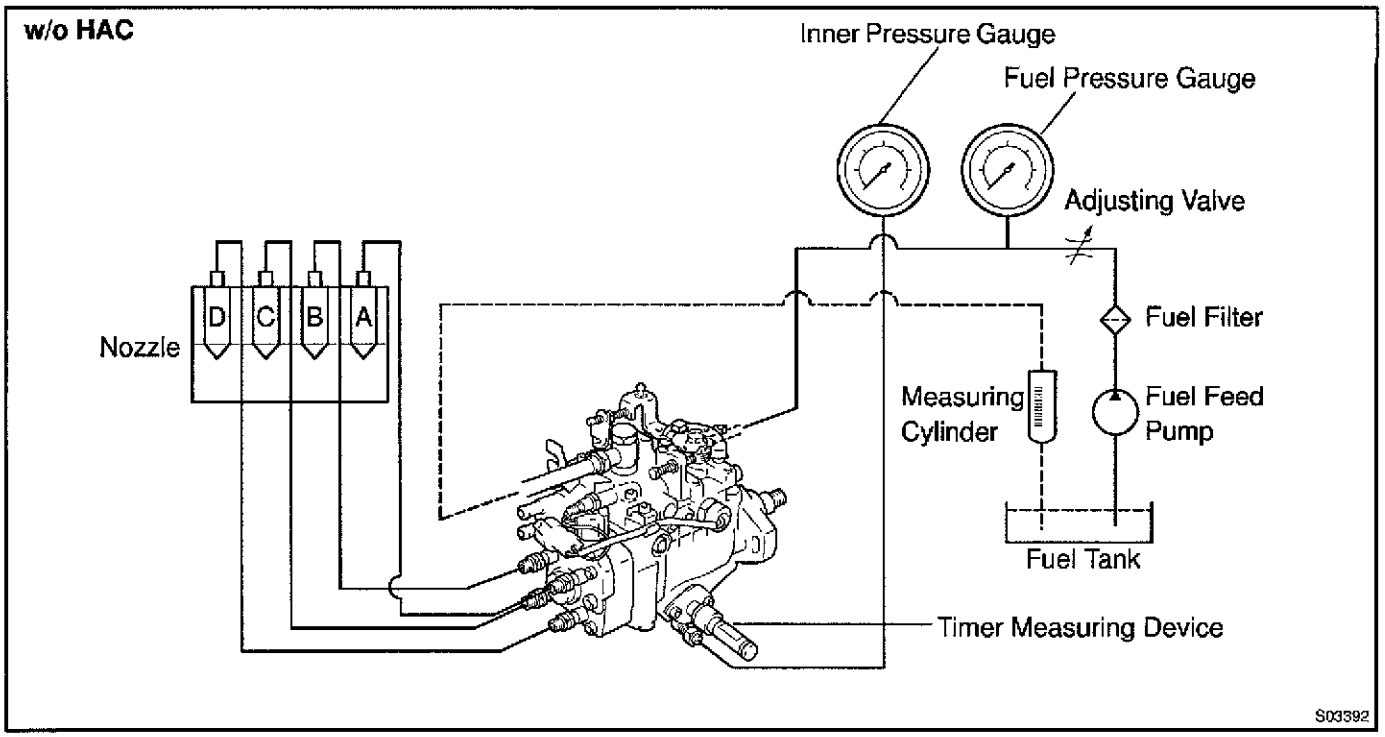
(k) Connect SST (turbocharger pressure gauge) to the boost compensator
SST 09992–00241

**2L–T**




**w/ HAC**






(l) Apply about 6 volts of DC power to the fuel cut solenoid.

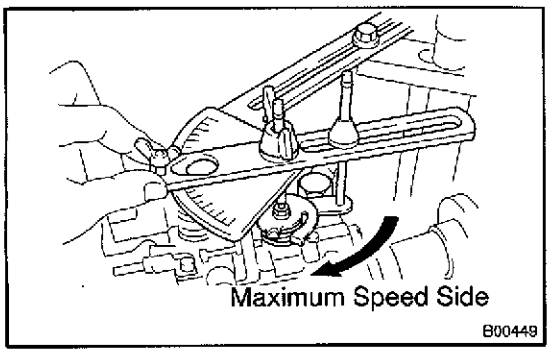
**NOTICE:**

- **When applying voltage to the solenoid, position the battery as far away from the solenoid as possible so that a spark does not occur.**
- **When connecting the battery cable, connect the solenoid side first.**

HINT:

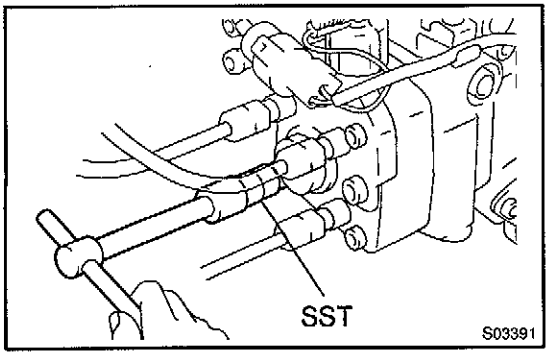
Connect the battery through a 10 W bulb.

(m) The pressure for feeding fuel to the injection pump should be 20 kPa (0.2 kgf/cm$^2$, 2.8 psi). The fuel temperature for pump testing should be 40 – 45°C (104 – 113°F).

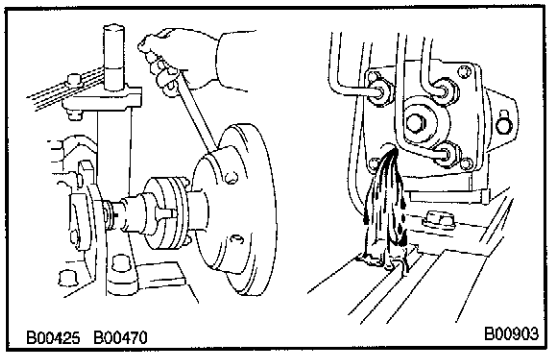



(n) Install an angle gauge to the stand, and set it to the adjusting lever.
Part No. 95095 – 10360 (Stand w/ angle gauge)

(o) Secure the adjusting lever fully on the maximum speed side.




(p) Check the installation direction of the camplate as follows:
(1) Disconnect the injection pipe from the position marked "C" on the distributive head.
(2) Using SST, remove the delivery valve holder.
SST 09260–54012 (09269–54020)

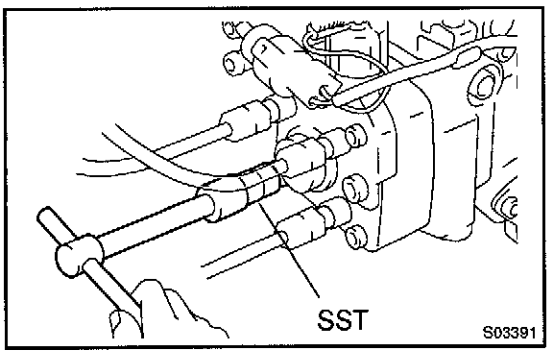



(3) Check that fuel is flowing out when the mark is in the position shown in the illustration.

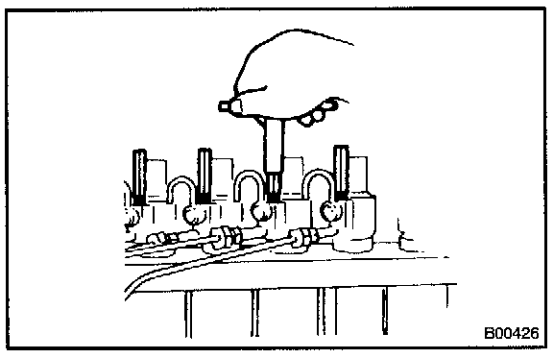
If not, it is improperly assembled.

(4) Disassemble and change the camplate position 180° in the opposite direction.

HINT:
At this time, disconnect the fuel cut solenoid wire harness.



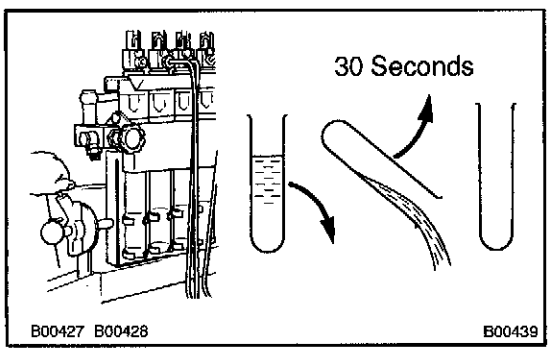

(5) Using SST, install the delivery valve holder.
SST 09260–54012 (09269–54020)
**Torque: 58.85 N·m (600 kgf·cm, 43 ft·lbf)**
(6) Connect the injection pipe.




(q) Bleed the air from the injection pipes.
(r) Race the injection pump for 5 minutes at 2,000 rpm.

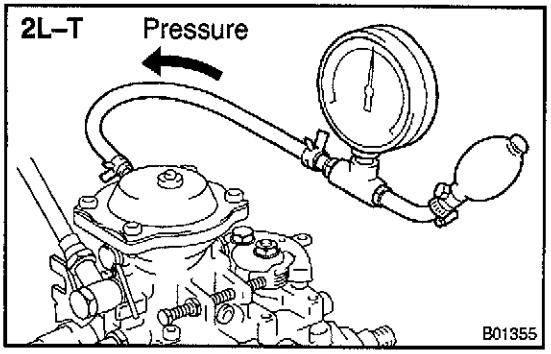
HINT:
Do this operation by replacing the overflow screw to a hollow screw.

**NOTICE:**
**Check that there is no fuel leakage or abnormal noise.**




HINT:

- Measure the volume of each injection cylinder with a measuring cylinder.
- Before measuring the injection volume, first hold the cylinder tilted for at least 30 seconds to discard all the fuel.

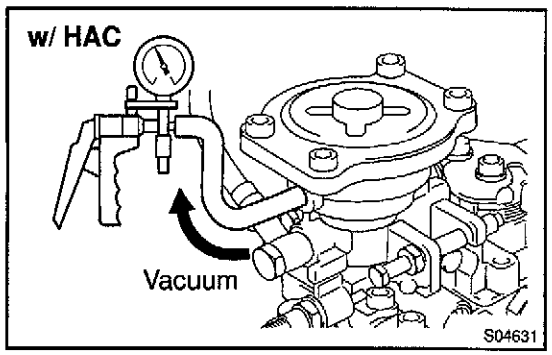



2. **2L–T:**
**CHECK BOOST COMPENSATOR FOR AIR TIGHTNESS**

(a) Operate the boost compensator with 0 kPa (0 kgf/cm$^2$, 0 psi) to 120 ± 6.7 kPa (1.22 ± 0.07 kgf/cm$^2$, 17.4 ± 1.0 psi) of pressure for 10 seconds for each and repeat this operation 4 times.

(b) Apply 133 kPa (1.36 kgf/cm$^2$, 19.3 psi) of pressure to the boost compensator.

(c) Measure the time it takes for pressure to drop to 131 kPa (1.34 kgf/cm$^2$, 19.1 psi).
**Pressure drop: 10 seconds or more**




3. **w/ HAC:**
**CHECK HIGH ALTITUDE COMPENSATOR FOR AIR TIGHTNESS**

(a) Apply 73 kPa (548 mmHg, 21.56 in.Hg) of vacuum to the high altitude compensator.

(b) Measure the time it takes for vacuum to drop to 72 kPa (540 mmHg, 21.26 in.Hg).
**Vacuum drop: 5 seconds or more**

4. **PRE–SET FULL LOAD INJECTION VOLUME**

(a) Set the adjusting lever to maximum position.

(b) 2L–T:
Apply 62.7 kPa (0.64 kgf/cm$^2$, 9.1 psi) of pressure to the boost compensator.

(c) w/ HAC:
Apply 101 kPa (760 mmHg, 29.83 in.Hg) of vacuum to the high altitude compensator.

(d) Measure the injection volume.
**2L w/ ACSD:**
**(Part No. 22100–5B320, 5B360)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,200 | 200 | 11.04 – 11.36 (0.67 – 0.69) |

**2L w/o ACSD:**
**(Part No. 22100–54770, 54780, 54800, 54810)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,200 | 200 | 10.42 – 10.74 (0.64 – 0.66) |

**2L–T:**
**(Part No. 22100–5B460, 5B670)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,000 | 200 | 13.70 – 14.02 (0.84 – 0.86) |

**3L:**
**(Part No. 22100–54850, 54860, 54870, 54880)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,200 | 200 | 11.56 – 11.88 (0.71 – 0.72) |

**3L:**
**(Part No. 22100–54710, 5B510)**

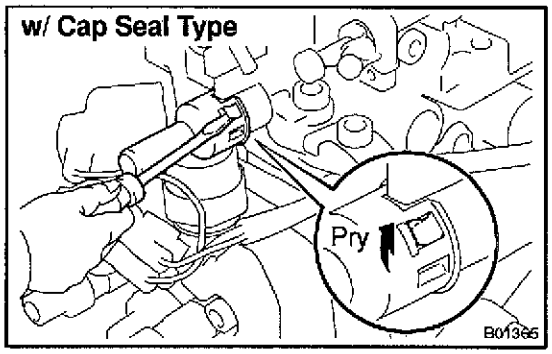
| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,200 | 200 | 10.96 – 11.28 (0.67 – 0.69) |

**5L w/ HAC:**
**(Part No. 22100–5B720)**

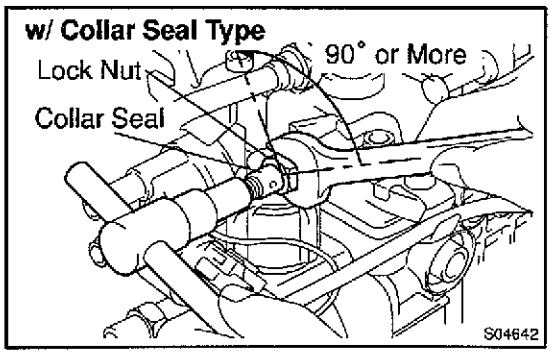
| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,600 | 200 | 12.82 – 13.14 (0.78 – 0.80) |

**5L w/o HAC:**
**(Part No. 22100–5B710)**

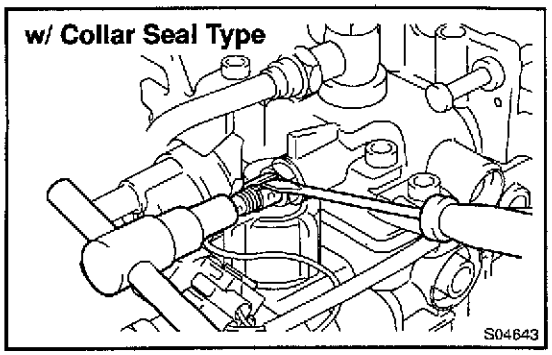
| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,200 | 200 | 12.18 – 12.50 (0.74 – 0.76) |




(e) w/ Cap Seal Type:
(1) Disconnect the dust cover from the fuel cut solenoid.
(2) Using a small screwdriver, pry the 4 claws.
(3) Remove the cap seal.

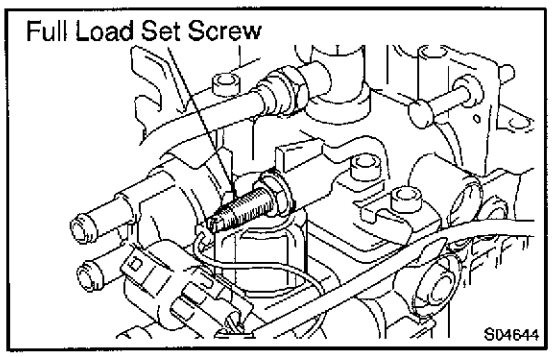



(f) w/ Collar Seal Type:
Remove the collar seal as follows:
(1) Hold the full load set screw, and release the collar seal from the spot weld by turning the lock nut counterclockwise by 90° or more.



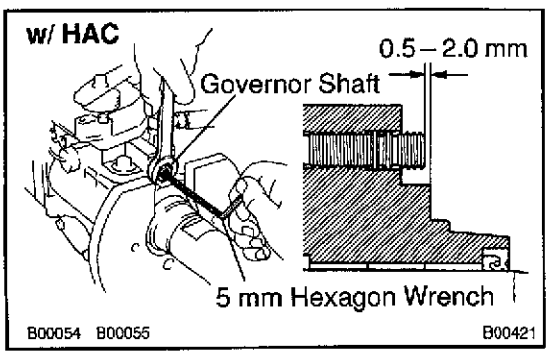

(2) Using a screwdriver, pry out the collar seal.

(g) w/ Wire Seal Type:
Cut off the wire seal.




(h) Adjust by turning the full load set screw.

HINT:
The injection volume will increase about 3 cc (0.18 cu in.) with each 1/2 turn of the screw.




**5. w/o HAC:**

**PRE–SET LOAD SENSING TIMER**

Using a 5 mm hexagon wrench, adjust the protrusion of the governor shaft.

**Protrusion: 0.5 – 2.0 mm (0.020 – 0.079 in.)**

**6. PRE–SET MAXIMUM SPEED**

(a) Set the adjusting lever to maximum position.

(b) 2L–T:
Apply 62.7 kPa (0.64 kgf/cm$^2$, 9.1 psi) of pressure to the boost compensator.

(c) w/ HAC:
Apply 101 kPa (760 mmHg, 29.83 in.Hg) of vacuum to the high altitude compensator.

(d) Measure the injection volume.

**2L w/ ACSD:**
**(Part No. 22100–5B320, 5B360)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 2,575 | 200 | 4.0 – 5.6 (0.24 – 0.34) |

**2L w/o ACSD:**
**(Part No. 22100–54770, 54780, 54800, 54810)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 2,450 | 200 | 4.0 – 5.6 (0.24 – 0.34) |

**2L–T:**
**(Part No. 22100–5B460, 5B670)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 2,400 | 200 | 4.3 – 6.3 (0.26 – 0.38) |

**3L:**
**(Part No. 22100–54710, 5B510)**

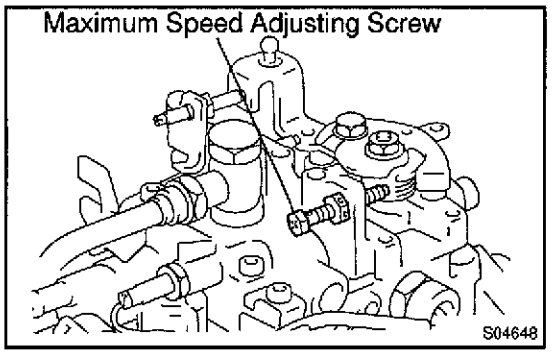
| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 2,200 | 200 | 4.6 – 6.2 (0.28 – 0.38) |

**3L:**
**(Part No. 22100–54850, 54860, 54870, 54880)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 2,300 | 200 | 4.6 – 6.2 (0.28 – 0.38) |

**5L:**
**(Part No. 22100–5B710, 5B720)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 2,300 | 200 | 4.6 – 6.2 (0.28 – 0.38) |




(e) Cut off the seal wire.
(f) Adjust the injection volume with the maximum speed adjusting screw.

**7. ADJUST PUMP INNER PRESSURE**

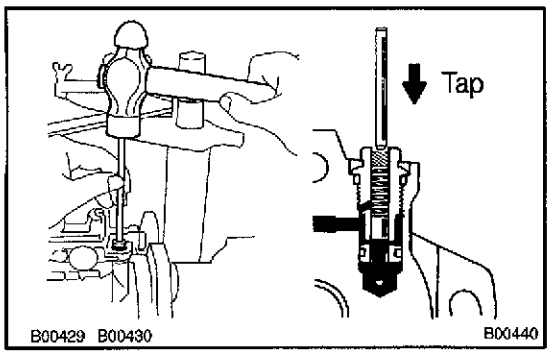
(a) Set the adjusting lever to maximum position.
(b) 2L–T:
Apply 62.7 kPa (0.64 kgf/cm$^2$, 9.1 psi) of pressure to the boost compensator.
(c) w/ HAC:
Apply 101 kPa (760 mmHg, 29.83 in.Hg) of vacuum to the high altitude compensator.
(d) Measure the pump inner pressure at the below listed rpm.

**2L, 3L, 5L:**

| Pump rpm | Inner pressure kpa (kgf/cm$^2$, psi) |
|---|---|
| 500 | 314 – 372 (3.2 – 3.8, 46 – 54) |
| 2,100 | 648 – 706 (6.6 – 7.2, 94 – 102) |

**2L–T:**

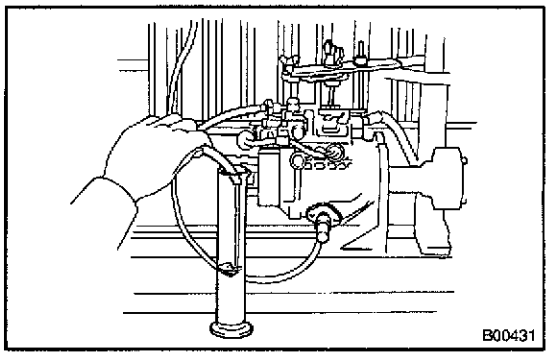
| Pump rpm | Inner pressure kpa (kgf/cm$^2$, psi) |
|---|---|
| 500 | 353 – 411 (3.6 – 4.2, 51 – 60) |
| 2,100 | 687 – 745 (7.0 – 7.6, 100 – 108) |




If the pressure is low, adjust by lightly tapping the regulator valve piston while watching the pressure gauge.
HINT:
If the pressure is too high or if the regulator valve was tapped in too far, the regulator valve must be replaced.

**8. CHECK OVERFLOW VOLUME**

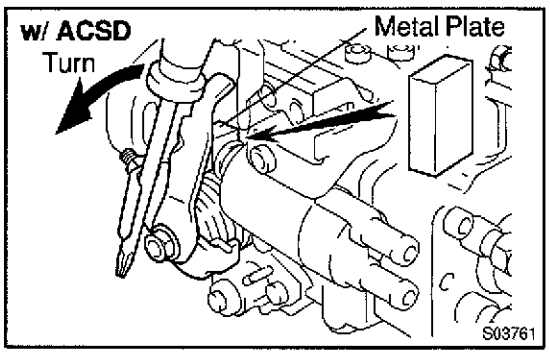
(a) Set adjusting lever to maximum position.
(b) 2L–T:
Apply 62.7 kPa (0.64 kgf/cm$^2$, 9.1 psi) of pressure to the boost compensator.
(c) w/ HAC:
Apply 101 kPa (760 mmHg, 29.83 in.Hg) of vacuum to the high altitude compensator.




(d) Measure the overflow volume at the below listed rpm.

| Pump rpm | Overflow volume cc/min. (cu in./min.) |
|---|---|
| 2,200 | 367 – 800 (22.4 – 48.8) |

HINT:
Always use the overflow screw installed on the pump to the adjusted.

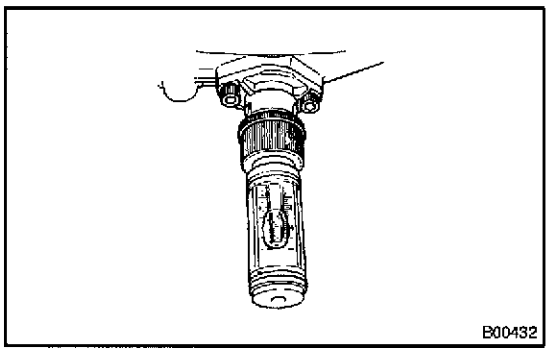



**9. w/ ACSD:**
**RELEASE COLD STARING SYSTEM**

(a) Using a screwdriver, turn the cold starting lever counterclockwise approx. 20°.

(b) Put a metal plate (thickness of 8.5 – 10.0 mm (0.335 – 0.394 in.)) between the cold starting lever and thermo wax plunger.

HINT:
Keep the cold starting system released until all measurements and adjustments are finished.




**10. ADJUST TIMER**

(a) Set the timer measuring device at zero.

(b) 2L–T:
Apply 62.7 kPa (0.64 kgf/cm$^2$, 9.1 psi) of pressure to the boost compensator.

(c) w/ HAC:
Apply 101 kPa (760 mmHg, 29.83 in.Hg) of vacuum to the high altitude compensator.

(d) Measure the timer piston stroke at the below listed rpm.

**2L w/ ACSD:**
**(Part No. 22100–5B320, 5B360)**

| Pump rpm | Piston stroke mm (in.) |
|---|---|
| 600 | w/ TCV OFF<br>1.00 – 1.80 (0.0394 – 0.0709) |
| 1,200 | w/ TCV OFF<br>4.00 – 4.80 (0.1575 – 0.1890)<br>w/ TCV ON<br>3.70 – 5.10 (0.1457 – 0.2008) |
| 2,000 | w/ TCV OFF<br>8.00 – 8.80 (0.3150 – 0.3465) |
| 2,300 | w/ TCV OFF<br>8.76 – 9.24 (0.3449 – 0.3638) |

**2L w/o ACSD:**
**(Part No. 22100–54770, 54780, 54800, 54810)**

| Pump rpm | Piston stroke mm (in.) |
|---|---|
| 800 | 0.70 – 1.50 (0.0276 – 0.0591) |
| 1,200 | 2.10 – 2.90 (0.0827 – 0.1142) |
| 2,000 | 4.90 – 5.70 (0.1929 – 0.2244) |
| 2,300 | 5.86 – 6.34 (0.2307 – 0.2496) |

**2L–T:**
**(Part No. 22100–5B460, 5B670)**

| Pump rpm | Piston stroke mm (in.) |
|---|---|
| 800 | 1.20 – 2.00 (0.0472 – 0.0787) |
| 1,200 | 2.80 – 3.60 (0.1102 – 0.1417) |
| 2,000 | 6.70 – 7.50 (0.2638 – 0.2953) |
| 2,300 | 7.26 – 7.74 (0.2858 – 0.3047) |

**3L w/ ACSD:**
**(Part No. 22100–5B510)**

| Pump rpm | Piston stroke mm (in.) |
|---|---|
| 800 | 2.10 – 2.90 (0.0827 – 0.1142) |
| 1,200 | 3.50 – 4.30 (0.1378 – 0.1693) |
| 2,000 | 6.40 – 7.20 (0.2520 – 0.2835) |
| 2,300 | 7.06 – 7.54 (0.2780 – 0.2968) |

**3L w/o ACSD:**
**(Part No. 22100–54710, 54850, 54860, 54870, 54880)**

| Pump rpm | Piston stroke mm (in.) |
|---|---|
| 800 | 0.60 – 1.40 (0.0236 – 0.0551) |
| 1,200 | 1.80 – 2.60 (0.0709 – 0.1024) |
| 2,000 | 4.40 – 5.20 (0.1732 – 0.2047) |
| 2,300 | 4.86 – 5.34 (0.1913 – 0.2102) |

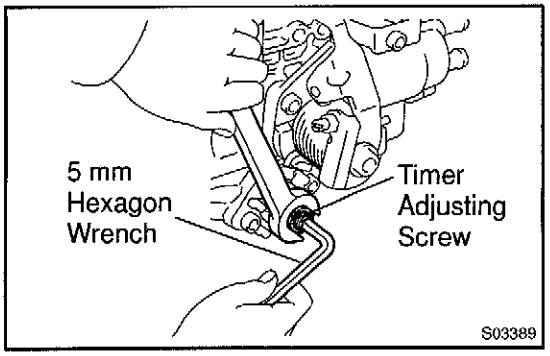
**5L w/ ACSD:**
**(Part No. 22100–5B710)**

| Pump rpm | Piston stroke mm (in.) |
|---|---|
| 800 | 1.65 – 2.45 (0.0650 – 0.0965) |
| 1,200 | 3.41 – 4.21 (0.1343 – 0.1657) |
| 1,900 | 6.49 – 7.29 (0.2555 – 0.2870) |
| 2,200 | 6.96 – 7.44 (0.2740 – 0.2929) |

**5L w/o ACSD:**
**(Part No. 22100–5B720)**

| Pump rpm | Piston stroke mm (in.) |
|---|---|
| 850 | 0.23 – 1.03 (0.0091 – 0.0406) |
| 1,200 | 1.77 – 2.57 (0.0697 – 0.1012) |
| 2,000 | 5.30 – 6.10 (0.2087 – 0.2402) |
| 2,300 | 6.36 – 6.84 (0.2504 – 0.2693) |

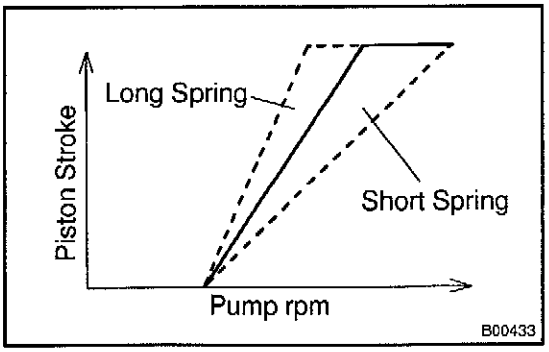
HINT:
Check that the hysteresis is within 0.3 mm (0.012 in.).



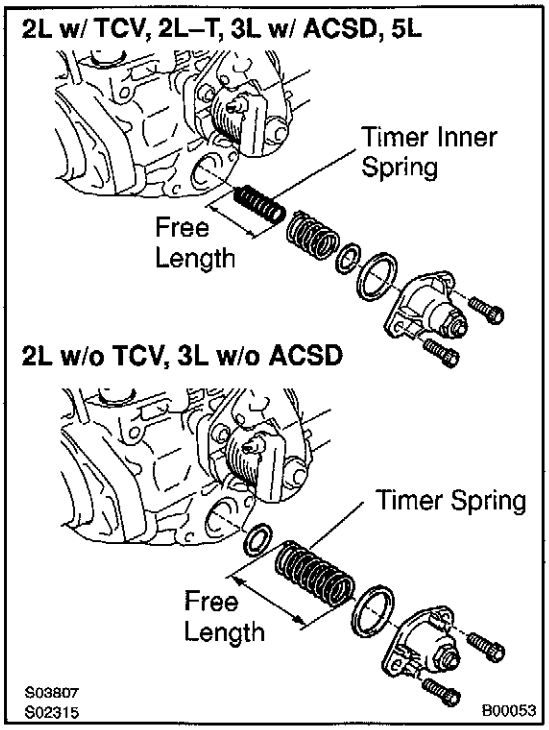

(e) Using a 5 mm hexagon wrench, adjust by turning the timer adjusting screw.

HINT:

Turn clockwise to reduce the stroke, turn counterclockwise to increase the stroke.



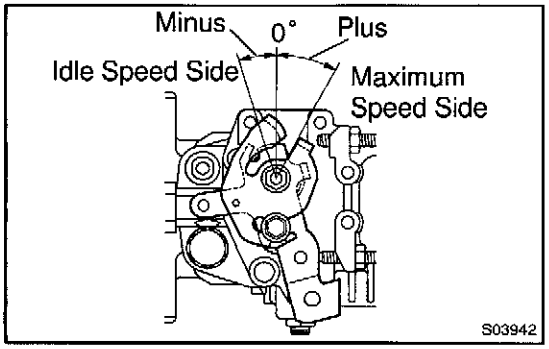

(f) Check the timer stroke for characteristic tendency.




If tendency is not as specified, select and replace the timer (inner) spring.

HINT:

The timer stroke will increase with a long spring and decrease with a short spring.




## 11. ADJUST FULL LOAD INJECTION VOLUME

(a) The adjusting lever angle for the adjustment below should be as shown in the illustration.

**Adjusting lever angle:**

| A (Maximum speed side) | B (Idle speed side) | |
|---|---|---|
| Plus 23.5 – 33.5° | 2L, 3L, 5L | Minus 12.5 – 22.5° |
| | 2L–T | Minus 9.5 – 19.5° |

(b) 2L–T:
Apply 62.7 kPa (0.64 kgf/cm$^2$, 9.1 psi) of pressure to the boost compensator.

(c) w/ HAC:
Apply 101 kPa (760 mmHg, 29.83 in.Hg) of vacuum to the high altitude compensator.

(d) Measure the full load injection volume.

**2L w/ ACSD:**
**(Part No. 22100–5B320, 5B360)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,200 | 200 | 11.04 – 11.36 (0.67 – 0.69) |

**2L w/o ACSD:**
**(Part No. 22100–54770, 54780, 54800, 54810)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,200 | 200 | 10.42 – 10.74 (0.64 – 0.66) |

**2L–T:**
**(Part No. 22100–5B460, 5B670)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,000 | 200 | 13.70 – 14.02 (0.84 – 0.86) |

**3L:**
**(Part No. 22100–54850, 54860, 54870, 54880)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,200 | 200 | 11.56 – 11.88 (0.71 – 0.72) |

**3L:**
**(Part No. 22100–54710, 5B510)**

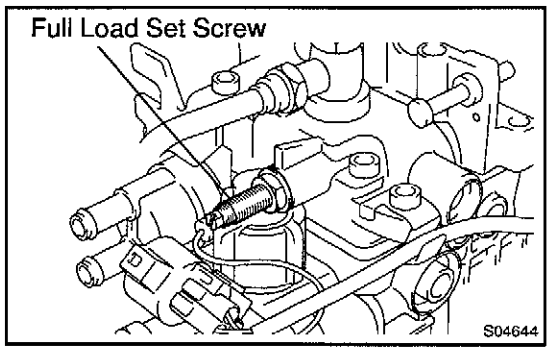
| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,200 | 200 | 10.96 – 11.28 (0.67 – 0.69) |

**5L w/ HAC:**
**(Part No. 22100–5B720)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,600 | 200 | 12.82 – 13.14 (0.78 – 0.80) |

**5L w/o HAC:**
**(Part No. 22100–5B710)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,200 | 200 | 12.18 – 12.50 (0.74 – 0.76) |




(e) Adjust by turning the full load set screw.

HINT:

The injection volume will increase about 3 cc (0.18 cu in.) with each 1/2 turn of the screw.

**12. ADJUST MAXIMUM SPEED**

(a) w/ HAC:

Apply 101 kPa (760 mmHg, 29.83 in.Hg) of vacuum to the high altitude compensator.

(b) 2L–T:

Apply 62.7 kPa (0.64 kgf/cm$^2$, 9.1 psi) of pressure to the boost compensator.

(c) Measure the injection volume at each pump rpm.

**2L w/ ACSD:**
**(Part No. 22100–5B320, 5B360)**

| Adjusting lever angle | Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) | Remark |
|---|---|---|---|---|
| Plus 23.5 – 33.5° | 2,200 | 200 | 8.0 – 9.6 (0.49 – 0.59) | – |
| | 2,575 | | 4.0 – 5.6 (0.24 – 0.34) | Adjust |
| | 2,850 | | 1.3 (0.08) or less | – |

**2L w/o ACSD:**
**(Part No. 22100–54770, 54780, 54800, 54810)**

| Adjusting lever angle | Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) | Remark |
|---|---|---|---|---|
| Plus 23.5 – 33.5° | 2,250 | 200 | 7.66 – 9.26 (0.47 – 0.57) | – |
| | 2,450 | | 4.0 – 5.6 (0.24 – 0.34) | Adjust |
| | 2,700 | | 1.3 (0.08) or less | – |

**2L–T:**
**(Part No. 22100–5B460, 5B670)**

| Adjusting lever angle | Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) | Remark |
|---|---|---|---|---|
| Plus 23.5 – 33.5° | 2,250 | 200 | 6.72–8.92 (0.41–0.54) | – |
| | 2,400 | | 4.3 – 6.3 (0.26 – 0.38) | Adjust |
| | 2,750 | | 1.3 (0.08) or less | – |

**3L:**
**(Part No. 22100–54710, 5B510)**

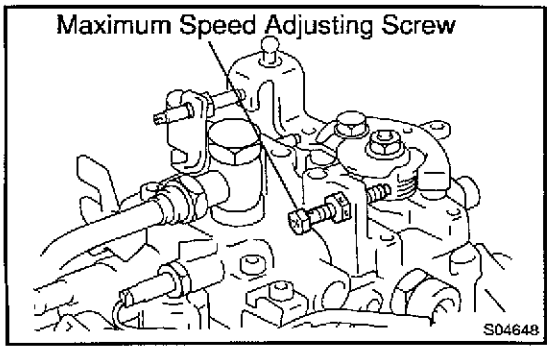
| Adjusting lever angle | Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) | Remark |
|---|---|---|---|---|
| Plus 23.5 – 33.5° | 2,000 | 200 | 8.44 – 10.44 (0.52 – 0.64) | – |
| | 2,200 | | 4.6 – 6.2 (0.28 – 0.38) | Adjust |
| | 2,450 | | 1.3 (0.08) or less | – |

**3L:**
**(Part No. 22100–54850, 54860, 54870, 54880)**

| Adjusting lever angle | Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) | Remark |
|---|---|---|---|---|
| Plus 23.5 – 33.5° | 2,100 | 200 | 9.08 – 11.08 (0.55 – 0.68) | – |
| | 2,300 | | 4.6 – 6.2 (0.28 – 0.38) | Adjust |
| | 2,550 | | 1.3 (0.08) or less | – |

**5L:**
**(Part No. 22100–5B710, 5B720)**

| Adjusting lever angle | Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) | Remark |
|---|---|---|---|---|
| Plus 23.5 – 33.5° | 2,100 | 200 | 9.4 – 11.4 (0.37 – 0.45) | – |
| | 2,300 | | 4.6 – 6.2 (0.28 – 0.38) | Adjust |
| | 2,550 | | 1.3 (0.08) or less | – |




(d) Adjust by turning the maximum speed adjusting screw.

## 13. CHECK IN INJECTION VOLUME

Measure the injection volume at each pump rpm, boost pressure (2L–T) and HAC vacuum (w/ HAC).

### 2L w/ HAC:
### (Part No. 22100–54800, 54810)

| Adjusting lever angle | Pump rpm | HAC vacuum kPa (mmHg, in.Hg) | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) | Variation limit cc (cu in.) | Remark |
|---|---|---|---|---|---|---|
| Plus 23.5 – 33.5° | 100 | 101 (760, 29.83) | 200 | 10.6 – 15.4 (0.65 – 0.94) | 1.2 (0.07) | Volume during starting |
| | 350 | 101 (760, 29.83) | | 11.2 – 13.8 (0.68 – 0.84) | – | – |
| | 500 | 101 (760, 29.83) | | 9.32 – 10.32 (0.57 – 0.63) | 0.5 (0.03) | – |
| | 1,200 | 101 (760, 29.83) | | 10.42 – 10.74 (0.64 – 0.66) | 0.4 (0.02) | Basic full load injection volume |
| | | 90.7 (680, 26.78) | | 9.88 – 10.48 (0.60 – 0.64) | – | – |
| | | 70.7 (530, 20.88) | | 8.38 – 8.98 (0.51 – 0.55) | – | – |
| | 2,100 | 101 (760, 29.83) | | 8.95 – 9.85 (0.55 – 0.60) | 0.5 (0.03) | – |

### 2L w/o HAC for w/ ACSD:
### (Part No. 22100–5B320, 5B360)

| Adjusting lever angle | Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) | Variation limit cc (cu in.) | Remark |
|---|---|---|---|---|---|
| Plus 23.5 – 33.5° | 100 | 200 | 10.6 – 15.4 (0.65 – 0.94) | 1.2 (0.07) | Volume during starting |
| | 500 | | 10.1 – 11.1 (0.62 – 0.68) | 0.5 (0.03) | – |
| | 1,200 | | 11.04 – 11.36 (0.67 – 0.69) | 0.4 (0.02) | Basic full load injection volume |
| | 2,000 | | 9.7 – 10.7 (0.59 – 0.65) | 0.5 (0.03) | – |

### 2L w/o HAC for w/o ACSD:
### (Part No. 22100–54770, 54780)

| Adjusting lever angle | Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) | Variation limit cc (cu in.) | Remark |
|---|---|---|---|---|---|
| Plus 23.5 – 33.5° | 100 | 200 | 10.6 – 15.4 (0.65 – 0.94) | 1.2 (0.07) | Volume during starting |
| | 350 | | 11.2 – 13.8 (0.65 – 0.84) | – | – |
| | 500 | | 9.32 – 10.32 (0.57 – 0.63) | 0.5 (0.03) | – |
| | 1,200 | | 10.42 – 10.74 (0.64 – 0.66) | 0.4 (0.02) | Basic full load injection volume |
| | 2,100 | | 8.95 – 9.85 (0.55 – 0.60) | 0.5 (0.03) | – |

## 2L–T:
## (Part No. 22100–5B460, 5B670)

| Adjusting lever angle | Pump rpm | Boost pressure kPa (kg/cm², psi) | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) | Variation limit cc (cu in.) | Remark |
|---|---|---|---|---|---|---|
| Plus 23.5 – 33.5° | 100 | 0 (0, 0) | 200 | 13.6 – 18.4 (0.83 – 1.12) | 1.2 (0.07) | Volume during starting |
| | 700 | 0 (0, 0) | | 10.94 – 11.74 (0.67 – 0.72) | 0.5 (0.03) | – |
| | 1,000 | 62.7 (0.64, 9.1) | | 13.70 – 14.02 (0.84 – 0.86) | 0.4 (0.02) | Basic full load injection volume |
| | 1,800 | 62.7 (0.64, 9.1) | | 11.48 – 12.48 (0.70 – 0.76) | 0.5 (0.03) | – |

## 3L w/ HAC:
## (Part No. 22100–54870, 54880)

| Adjusting lever angle | Pump rpm | HAC vacuum kPa (mmHg, in.Hg) | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) | Variation limit cc (cu in.) | Remark |
|---|---|---|---|---|---|---|
| Plus 23.5 – 33.5° | 100 | 101 (760, 29.83) | 200 | 11.6 – 16.4 (0.71 – 1.00) | 1.2 (0.07) | Volume during starting |
| | 350 | 101 (760, 29.83) | | 12.2 – 14.8 (0.74 – 0.90) | – | – |
| | 500 | 101 (760, 29.83) | | 10.44 – 11.44 (0.64 – 0.70) | 0.5 (0.03) | – |
| | 1,200 | 101 (760, 29.83) | | 11.56 – 11.88 (0.71 – 0.72) | 0.4 (0.02) | Basic full load injection volume |
| | | 70.7 (530, 20.88) | | 9.44 – 10.04 (0.58 – 0.61) | – | – |
| | 2,000 | 101 (760, 29.83) | | 10.19 – 11.09 (0.62 – 0.68) | 0.5 (0.03) | – |

## 3L w/o HAC:
## (Part No. 22100–54710, 5B510)

| Adjusting lever angle | Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) | Variation limit cc (cu in.) | Remark |
|---|---|---|---|---|---|
| Plus 23.5 – 33.5° | 100 | 200 | 11.6 – 16.4 (0.71 – 1.00) | 1.2 (0.07) | Volume during starting |
| | 350 | | 11.4 – 14.0 (0.70 – 0.85) | – | – |
| | 500 | | 9.64 – 11.04 (0.59 – 0.67) | 0.5 (0.03) | – |
| | 1,200 | | 10.96 – 11.28 (0.67 – 0.69) | 0.4 (0.02) | Basic full load injection volume |
| | 1,900 | | 9.39 – 10.69 (0.57 – 0.65) | 0.5 (0.03) | – |

### 3L w/o HAC:
### (Part No. 22100–54850, 54860)

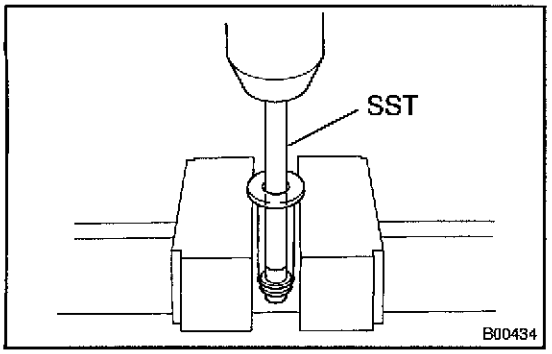
| Adjusting lever angle | Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) | Variation limit cc (cu in.) | Remark |
|---|---|---|---|---|---|
| Plus 23.5 – 33.5° | 100 | 200 | 11.6 – 16.4 (0.71 – 1.00) | 1.2 (0.07) | Volume during starting |
| | 350 | | 12.2 – 14.8 (0.74 – 0.90) | – | – |
| | 500 | | 10.44 – 11.44 (0.64 – 0.70) | 0.5 (0.03) | – |
| | 1,200 | | 11.56 – 11.88 (0.71 – 0.72) | 0.4 (0.02) | Basic full load injection volume |
| | 2,000 | | 10.19 – 11.09 (0.62 – 0.68) | 0.5 (0.03) | – |

### 5L w/ HAC:
### (Part No. 22100–5B720)

| Adjusting lever angle | Pump rpm | HAC vacuum kPa (mmHg, in.Hg) | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) | Variation limit cc (cu in.) | Remark |
|---|---|---|---|---|---|---|
| Plus 23.5 – 33.5° | 100 | 101 (760, 29.83) | 200 | 13.6 – 18.4 (0.83 – 1.12) | 1.2 (0.07) | Volume during starting |
| | 500 | 101 (760, 29.83) | | 10.92 – 12.32 (0.67 – 0.75) | 0.5 (0.03) | – |
| | 1,600 | 101 (760, 29.83) | | 12.82 – 13.14 (0.78 – 0.80) | 0.4 (0.02) | Basic full load injection volume |
| | | 85.3 (640, 25.19) | | 11.10 – 11.70 (0.68 – 0.71) | – | – |
| | 1,900 | 101 (760, 29.83) | | 12.30 – 12.98 (0.75 – 0.79) | 0.5 (0.03) | – |

### 5L w/o HAC:
### (Part No. 22100–5B710)

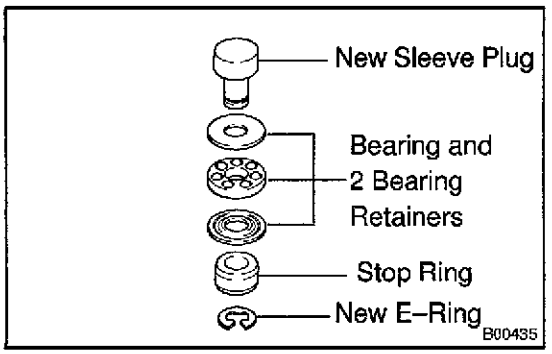
| Adjusting lever angle | Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) | Variation limit cc (cu in.) | Remark |
|---|---|---|---|---|---|
| Plus 23.5 – 33.5° | 100 | 200 | 13.6 – 18.4 (0.83 – 1.12) | 1.2 (0.07) | Volume during starting |
| | 500 | | 10.36 – 11.36 (0.63 – 0.69) | 0.5 (0.03) | – |
| | 1,200 | | 12.18 – 12.50 (0.74 – 0.76) | 0.4 (0.02) | Basic full load injection volume |
| | 2,000 | | 11.01 – 11.91 (0.67 – 0.73) | 0.5 (0.03) | – |



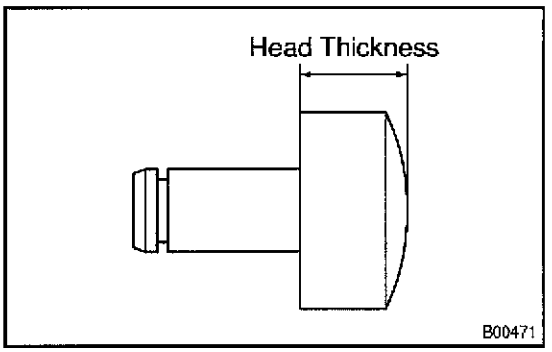

If the injection volume at 100 rpm is not as specified, replace the governor sleeve plus as follows:

(1) Using SST and a press, press out the sleeve plug assembly from the governor sleeve.

SST 09236–00101 (09237–00070)




(2) Remove the E–ring, stop ring, bearing and 2 bearing retainers from the sleeve plug.




(3) Measure the head thickness of the sleeve plug, and select a new sleeve plug.

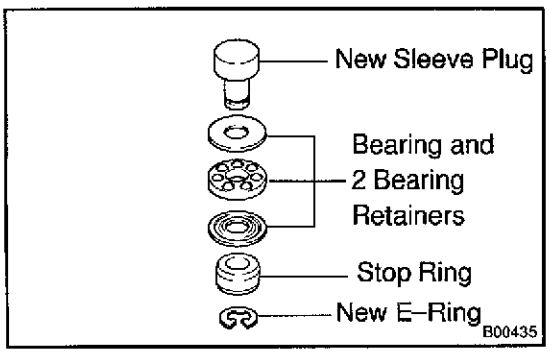
**Governor sleeve plug head thickness: mm (in.)**

| | | |
|---|---|---|
| 3.0 (0.118) | 3.5 (0.138) | 4.0 (0.157) |
| 3.1 (0.122) | 3.6 (0.142) | 4.1 (0.161) |
| 3.2 (0.126) | 3.7 (0.146) | 4.2 (0.165) |
| 3.3 (0.130) | 3.8 (0.150) | – |
| 3.4 (0.134) | 3.9 (0.154) | – |

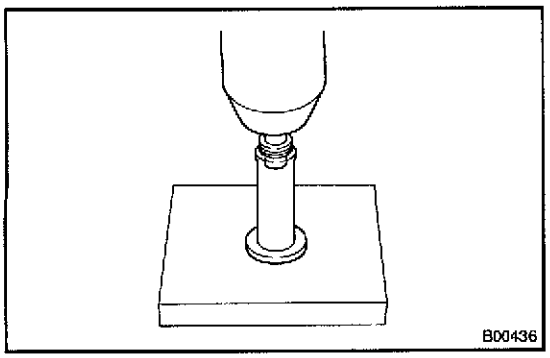
HINT:

Lengthening the plug by 0.1 mm (0.004 in.) will decrease injection volume by 0.6 cc (0.04 cu in.).

If the variation limit is greater than specified, replace the delivery valve.




(4) Install the bearing, 2 retainers and stop ring to the new sleeve plug with a new E–ring.




(5) Using a press, press in the sleeve plug assembly to the governor sleeve.

**14. 2L–T:**

**ADJUST FULL LOAD MINIMUM INJECTION VOLUME**

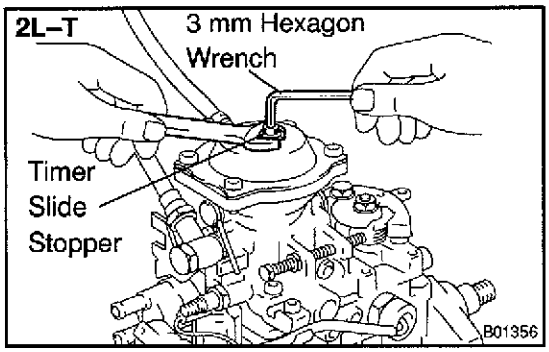
(a) Set the adjusting lever to maximum position.

(b) Release the pressure from the boost compensator.

(c) Measure the injeciton volume.

**(Part No. 22100–5B460, 5B670)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 700 | 200 | 10.94 – 11.74 (0.67 – 0.72) |




(d) Using a 3 mm hexagon wrench, adjust by turning the timer slide stopper.

**15. 2L–T:**

**ADJUST BOOST COMPENSATOR**

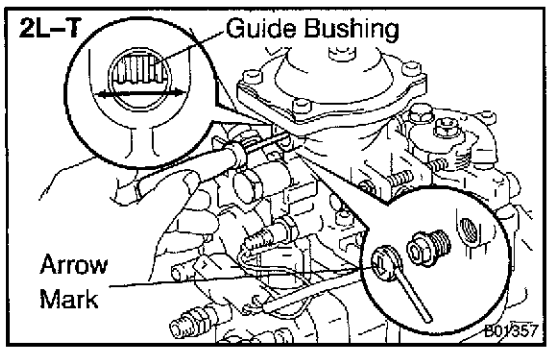
(a) Set the adjusting lever to maximum position.

(b) Apply 13.3 kPa (0.14 kPa (0.14 kgf/cm$^2$, 2.0 psi) of pressure to boost compensator.

(c) Measure the injeciton volume.

**(Part No. 22100–5B460, 5B670)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,000 | 200 | 10.76 – 11.56 (0.66 – 0.71) |




(d) Remove the rubber cap and overflow screw.

(e) Using a screwdriver, adjust the injection volume by the guide bushing.

HINT:

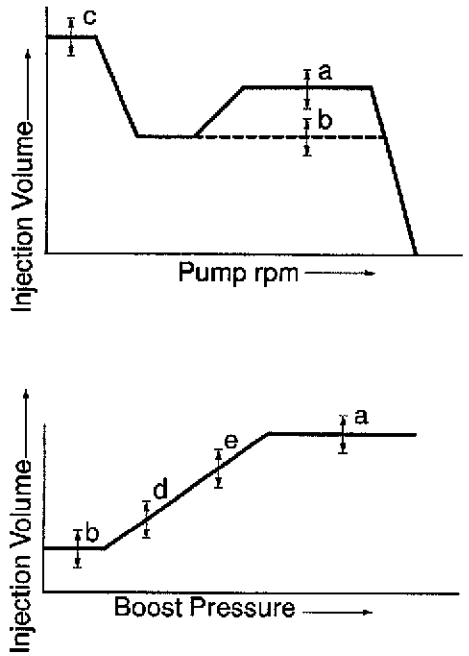
When the guuide bushing is turned clockwise, as seen from above, the injeciton volume will increase.

(f) Install the overflow screw.

**Torque: 24.55 N·m (250 kgf·cm, 18 ft·lbf)**

(g) Install the rubber cap with the arrow mark facing downward.

2L–T




(a) Adjust full–load injection volume
(b) Adjust full–load minimum injection volume
(c) Adjust cold starting injeciton volume
(d) Adjust boost compensator characteristic
(e) Adjust boost compensator characteristic tendency

B00473
B00472
B00904

**16. 2L–T:**
**CHECK FOR CHARACTERISTIC TENDENCY**

(a) Set the adjusting lever to maximum position.
(b) Apply 40.0 kPa (0.41 kgf/cm$^2$, 5.8 psi) of pressure to boost compensator.
(c) Measure the injeciton volume.
**(Part No. 22100–5B460, 5B670)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,000 | 200 | 12.54 – 13.14 (0.77 – 0.80) |

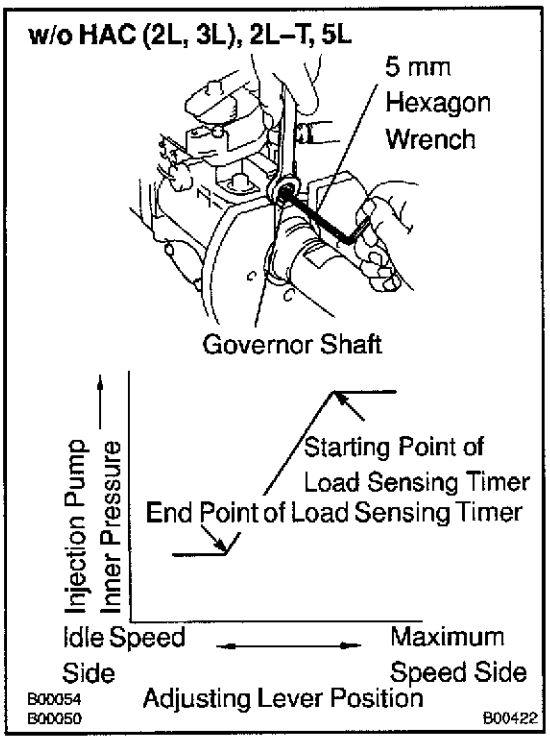
**17. 2L–T:**
**CHECK HYSTERESIS**

Compare the injection volume when the boost compensator pressure is lowered from 107.0 kPa (1.09 kgf/cm$^2$, 15.5 psi) to 13.3 kPa (0.14 khf/cm$^2$, 2.0 psi), and conversely, when it is raised from zero.
HINT:
Make measurements after moving the adjusting lever between idle and maximum 3 times for each lowering of the pressure.

**(Part No. 22100–5B460, 5B670)**

| Pump rpm | Boost pressure kPa (kg/cm$^2$, psi) | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) | Hysteresis cc (cu in.) |
|---|---|---|---|---|
| 1,000 | 107.0 (1.09, 15.5) | 200 | 13.5 (0.82) or less | 0.4 (0.02) or less |
| | 73.3 (0.75, 10.7) | | 13.60 – 14.12 (0.83 – 0.86) | |
| | 40.0 (0.41, 5.8) | | 12.54 – 13.14 (0.77 – 0.80) | |
| | 13.3 (0.14, 2.0) | | 10.76 – 11.56 (0.66 – 0.71) | |

If not within standard value, check each sliding part of the boost compensator and check whether or not there is any oil.




**18. w/o HAC (2L, 3L), 2L–T, 5L:**
**ADJUST LOAD SENSING TIMER**

(a) Using a 5 mm hexagon wrench, adjust the starting and end points of the load sensing timer by turning the governor shaft.

(b) Set the adjusting lever to maximum position.

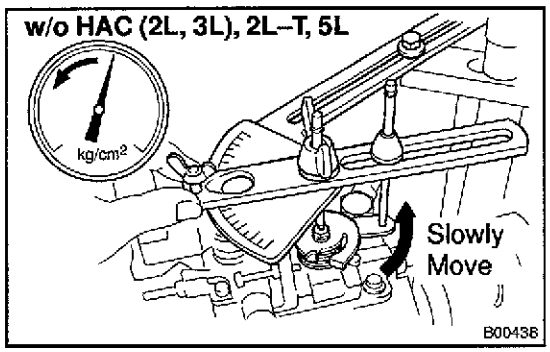
(c) Measure the injection volume.

**2L, 3L, 5L:**

| Adjusting lever position | Pump rpm | No, of measuring strokes |
|---|---|---|
| Maximum speed side | 1,200 | 200 |

**2L–T:**

| Adjusting lever position | Pump rpm | No, of measuring strokes |
|---|---|---|
| Maximum speed side | 1,000 | 200 |




(d) Slowly move the adjusting lever from the maximum speed side to the idle speed side, and secure it at the point where the pump inner pressure begins to drop.

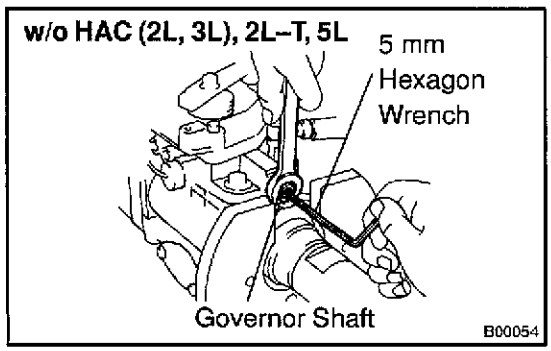
(e) Measure the injection volume at the drop point (starting point).

**2L, 3L, 5L:**

| Pump rpm | No of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,200 | 200 | Measured value at step (d) minus 1.0 (0.06) ± 0.4 (0.02) |

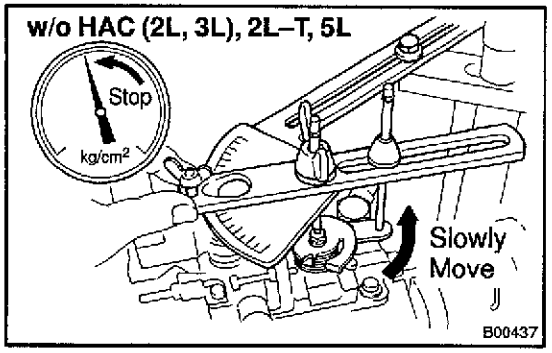
**2L–T:**

| Pump rpm | No of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,000 | 200 | Measured value at step (d) minus 0.6 (0.04) ± 0.4 (0.02) |




(f) Using a 5 mm hexagon wrench, adjust the load sensing timer by turning the governor shaft, and perform the measurement again as specified.

HINT:
The injection volume will increase approx. 3 cc (0.2 cu in.) with each 1/2 turn of the governor shaft.




(g) Check the end point injection volume by slowly moving the adjusting lever from the maximum speed side to the idle speed side, and secure it at the point where the pump inner pressure stops dropping.

**2L w/ ACSD:**
**(Part No. 22100–5B320, 5B360)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,200 | 200 | 9.0 – 9.4 (0.55 – 0.57) |

**2L w/o ACSD:**
**(Part No. 22100–54770, 54780)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,200 | 200 | 8.38 – 8.78 (0.51 – 0.54) |

**2L–T:**
**(Part No. 22100–5B460, 5B670)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,000 | 200 | 8.0 – 8.4 (0.49 – 0.51) |

**3L:**
**(Part No. 22100–54710, 5B510)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,200 | 200 | 8.12 – 8.52 (0.50 – 0.52) |

**3L:**
**(Part No. 22100–54850, 54860)**

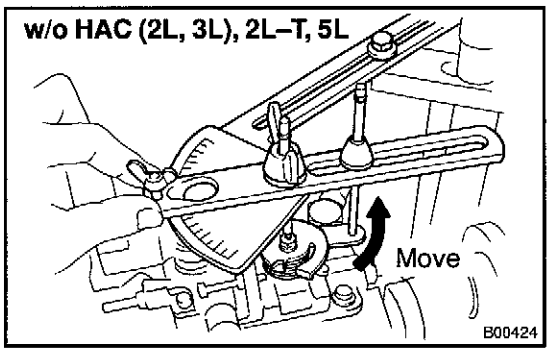
| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,200 | 200 | 8.72 – 9.12 (0.53 – 0.56) |

**5L w/ ACSD:**
**(Part No. 22100–5B710)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,200 | 200 | 9.5 – 9.9 (0.58 – 0.60) |

**5L w/o ACSD:**
**(Part No. 22100–5B720)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 1,200 | 200 | 9.58 – 9.98 (0.58 – 0.61) |




(h) Check the timer piston fluctuation when the adjusting lever is moved from the maximum speed side to the idle speed side.

**2L w/ ACSD:**
**(Part No. 22100–5B320, 5B360)**

| Pump rpm | Timer piston fluctuation mm (in.) |
|---|---|
| 1,200 | w/ TCV OFF 1.80 – 2.60 (0.0709 – 0.1024) |

**2L w/o ACSD:**
**(Part No. 22100–54770, 54780)**

| Pump rpm | Timer piston fluctuation mm (in.) |
|---|---|
| 1,200 | 0.62 – 1.02 (0.0244 – 0.0402) |

**2L–T:**
**(Part No. 22100–5B460, 5B670)**

| Pump rpm | Timer piston fluctuation mm (in.) |
|---|---|
| 1,000 | 1.40 – 1.80 (0.0551 – 0.0709) |

**3L w/ ACSD:**
**(Part No. 22100–5B510)**

| Pump rpm | Timer piston fluctuation mm (in.) |
|---|---|
| 1,200 | 1.44 – 1.84 (0.0567 – 0.0724) |

**3L w/o ACSD:**
**(Part No. 22100–54710, 54850, 54860)**

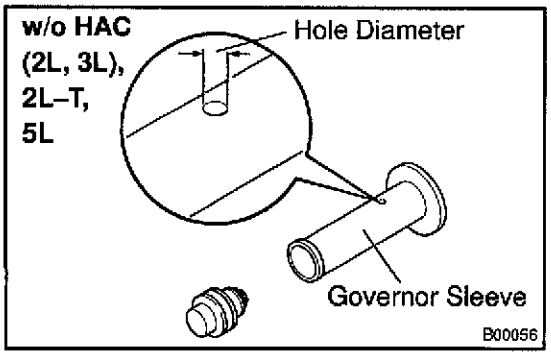
| Pump rpm | Timer piston fluctuation mm (in.) |
|---|---|
| 1,200 | 0.62 – 1.02 (0.0244 – 0.0402) |

**5L w/ ACSD:**
**(Part No. 22100–5B710)**

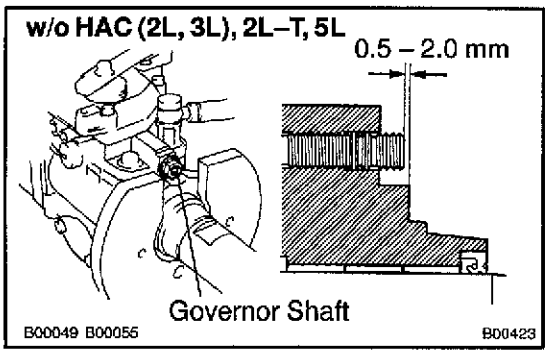
| Pump rpm | Timer piston fluctuation mm (in.) |
|---|---|
| 1,200 | 1.03 – 1.43 (0.0406 – 0.0563) |

**5L w/o ACSD:**
**(Part No. 22100–5B720)**

| Pump rpm | Timer piston fluctuation mm (in.) |
|---|---|
| 1,200 | 0.82 – 1.22 (0.0323 – 0.0480) |




If the timer stroke is not as specified when the load sensing is at maximum retard angle, select a new governor sleeve.
HINT:
A large hole diameter decreases the timer stroke and a smaller hole diameter increases the timer stroke.




(i) Check the protrusion of the governor shaft.
**Protrusion: 0.5 – 2.0 mm (0.020 – 0.079 in.)**

## 19. ADJUST IDLE SPEED

(a) Measure the injection volume for each pump rpm.

**2L:**
**(Part No. 22100–54770, 54780, 54800, 54810, 5B320, 5B360)**

| Adjusting lever angle | Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) | Variation limit cc (cu in.) | Remark |
|---|---|---|---|---|---|
| Minus 12.5 – 22.5° | 350 | 200 | 1.7 – 2.7 (0.10 – 0.16) | 0.34 (0.02) | Adjust |
| | 525 | | 1.2 (0.07) or less | – | – |

**2L–T:**
**(Part No. 22100–5B460, 5B670)**

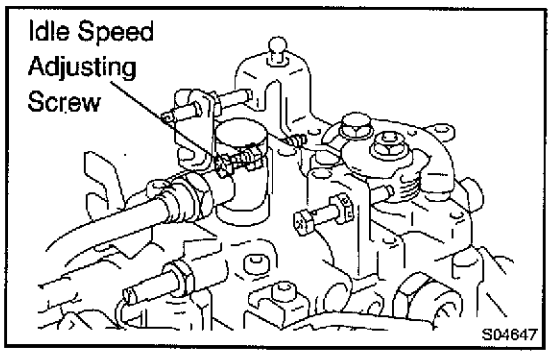
| Adjusting lever angle | Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) | Variation limit cc (cu in.) | Remark |
|---|---|---|---|---|---|
| Minus 9.5 – 19.5° | 350 | 200 | 3.18 – 4.18 (0.19 – 0.26) | 0.34 (0.02) | Adjust |

**3L:**
**(Part No. 22100–54710, 54850, 54860, 54870, 54880, 5B510)**

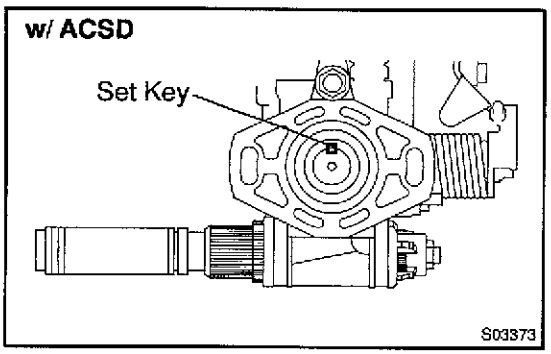
| Adjusting lever angle | Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) | Variation limit cc (cu in.) | Remark |
|---|---|---|---|---|---|
| Minus 12.5 – 22.5° | 350 | 200 | 1.8 – 2.8 (0.11 – 0.17) | 0.34 (0.02) | Adjust |
| | 525 | | 1.2 (0.07) or less | – | – |

**5L:**
**(Part No. 22100–5B710, 5B720)**

| Adjusting lever angle | Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) | Variation limit cc (cu in.) | Remark |
|---|---|---|---|---|---|
| Minus 12.5 – 22.5° | 350 | 200 | 2.54 – 3.54 (0.16 – 0.22) | 0.34 (0.02) | Adjust |
| | 575 | | 1.2 (0.07) or less | – | – |




(b) Adjust injection volume by turning the idle speed adjusting screw.

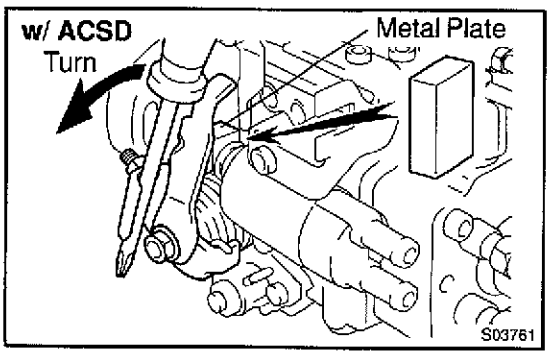



**20. w/ ACSD:**
**ADJUST COLD STARTING SYSTEM**

(a) Remove the overflow screw and check the fuel temperature in the fuel pump.
**Fuel temperature: 15 – 35°C (59 – 95°F)**

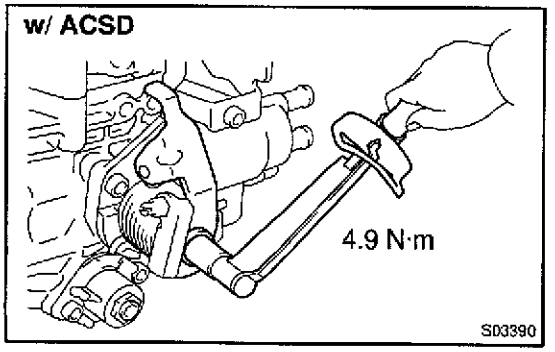
(b) Set the set key of the pump drive shaft in a vertical or horizontal position.

(c) Set the scale of the timer measuring device to zero.




(d) Check the adjusting lever opening angle and consider this angle as zero.

(e) Remove the metal plate between the cold starting lever and thermo wax plunger.




(f) Torque the cold starting lever clockwise to approx. 4.9 N·m (50 kgf·cm, 43 in.·lbf) and keep the lever tightened for about 10 seconds. Then release the torque.

(g) Measure the timer piston stroke.

**2L:**
**(Part No. 22100–5B320, 5B360)**

| Fuel temperature C (°F) | Pump rpm | Piston stroke mm (in.) |
|---|---|---|
| 25 (77) | 350 | 1.50 – 1.90 (0.0591 – 0.0748) |

**2L–T:**
**(Part No. 22100–5B460, 5B670)**

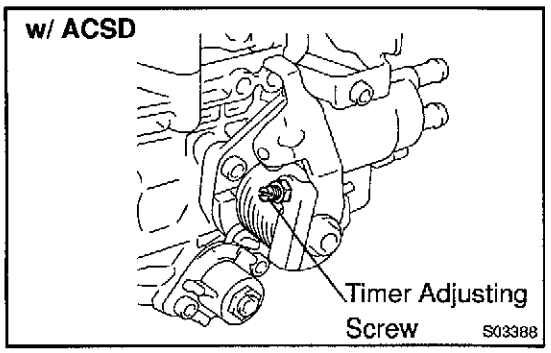
| Fuel temperature C (°F) | Pump rpm | Piston stroke mm (in.) |
|---|---|---|
| 25 (77) | 350 | 1.70 – 1.90 (0.0669 – 0.0748) |

**3L:**
**(Part No. 22100–5B510)**

| Fuel temperature C (°F) | Pump rpm | Piston stroke mm (in.) |
|---|---|---|
| 25 (77) | 350 | 0.85 – 1.05 (0.0335 – 0.0413) |

**5L:**
**(Part No. 22100–5B710)**

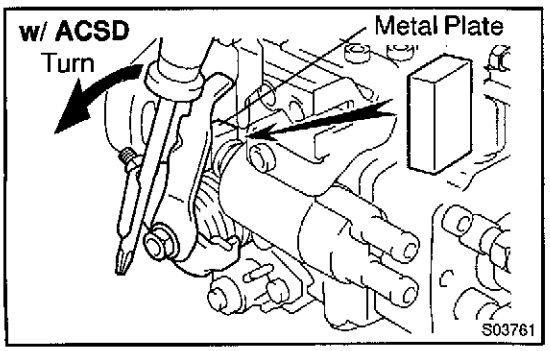
| Fuel temperature C (°F) | Pump rpm | Piston stroke mm (in.) |
|---|---|---|
| 25 (77) | 400 | 1.10 – 1.30 (0.0433 – 0.0512) |




(h) Adjust by turning the timer adjusting screw.

HINT:

Screw in for stroke decrease.




**21. w/ ACSD:**
**ADJUST FAST IDLE SPEED**

(a) Release the cold starting system.
  (1) Using a screwdriver, turn the cold starting lever counterclockwise approx. 20°.
  (2) Put a metal plate (thickness of 8.5 – 10.0 mm (0.335 – 0.394 in.)) between the cold starting lever and thermo wax plunger.

(b) Set the adjusting lever to idle position.

(c) Measure the injection volume.

**2L:**
**(Part No. 22100–5B320, 5B360)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 350 | 200 | q = 1.7 – 2.7 (0.10 – 0.16) |

**2L–T:**
**(Part No. 22100–5B460, 5B670)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 350 | 200 | q = 3.18 – 4.18 (0.19 – 0.26) |

**3L:**
**(Part No. 22100–5B510)**

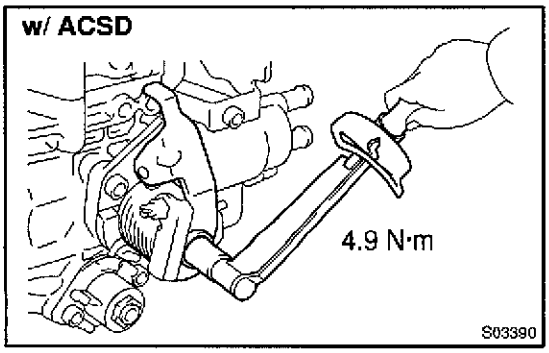
| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 350 | 200 | q = 1.8 – 2.8 (0.11 – 0.17) |

**5L:**
**(Part No. 22100–5B710)**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 400 | 200 | q = 2.54 – 3.54 (0.16 – 0.22) |

(d) Remove the metal plate between the cold starting lever and thermo wax plunger.

**w/ ACSD**




(e) Torque the cold starting lever clockwise to approx. 4.9 N·m (50 kgf·cm, 43 in.·lbf) and keep the lever tightened for about 10 seconds. Then release the torque.

(f) Measure the injection volume.

**2L, 3L:**

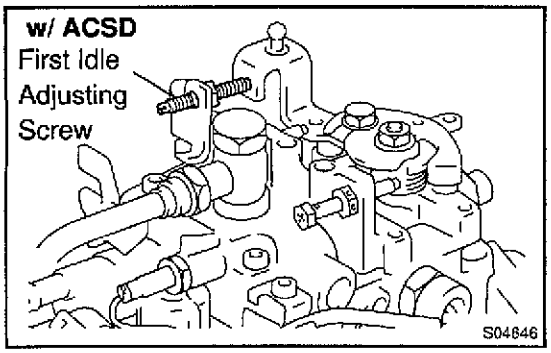
| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 350 | 200 | q plus 2.0 – 2.2 (0.12 – 0.13) |

**2L–T:**

| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 350 | 200 | q plus 0.22 – 0.42 (0.01 – 0.03) |

**5L:**

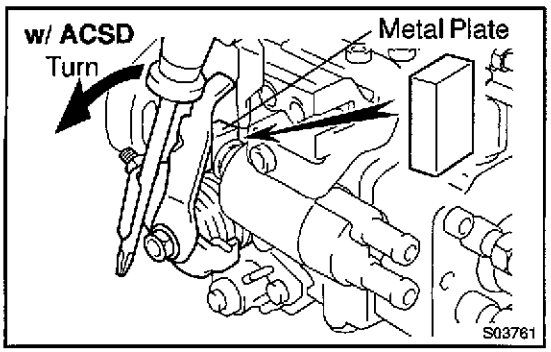
| Pump rpm | No. of measuring strokes | Injection volume of each cylinder cc (cu in.) |
|---|---|---|
| 400 | 200 | q plus 1.24 – 1.44 (0.08 – 0.09) |



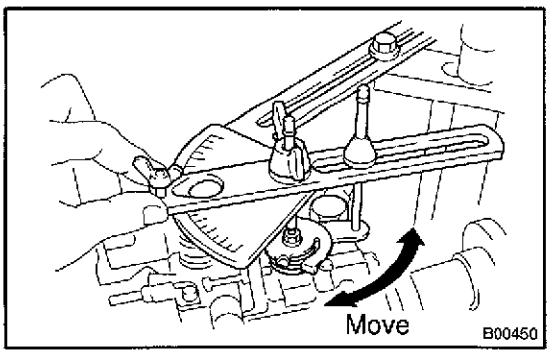

(g) Adjust the injection volume by turning the fast idle adjusting screw.

**22. POST ADJUSTMENT CHECK**

(a) Check the injection stops when the fuel cut solenoid harness is removed.
**Pump revolution: 100 rpm**




(b) w/ ACSD:
Release the cold starting system.
(1) Using a screwdriver, turn the cold starting lever counterclockwise approx. 20°.
(2) Put a metal plate (thickness of 8.5 – 10.0 mm (0.335 – 0.394 in.)) between the cold starting lever and thermo wax plunger.

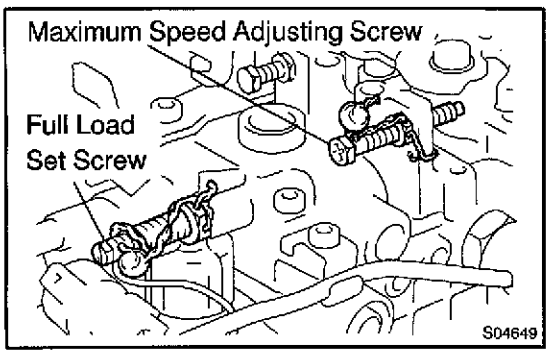



(c) Check the adjusting lever movement.
**Adjusting lever angle:**

| | |
|---|---|
| 2L, 3L, 5L | 43 – 49° |
| 2L–T | 41 – 51° |

(d) w/ ACSD:
Remove the metal plate between the cold starting lever and thermo wax plunger.

**23. REMOVE INJECTION PUMP FROM PUMP TESTER**




**24. SEAL PARTS**

Seal the full load set screw and maximum speed adjusting screw with new lead seals.

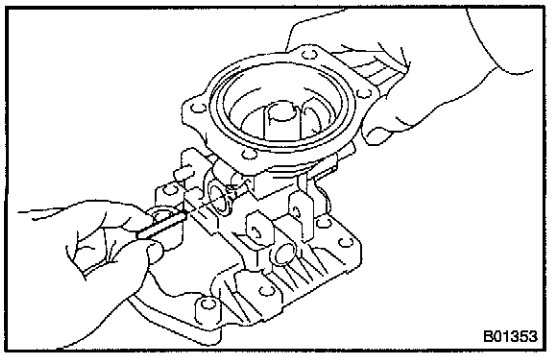
FU00K–01

# REASSEMBLY

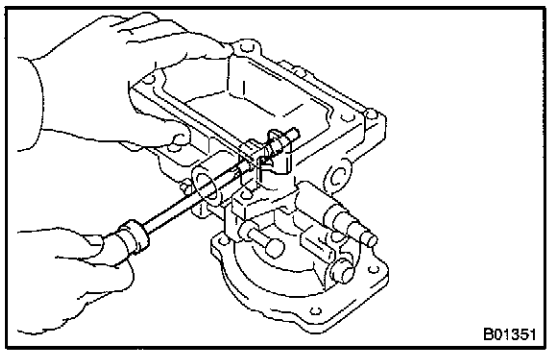
## 1. ASSEMBLE BOOST COMPENSATOR

(a) Install the control lever.

(1) Insert the connecting pin into the governor cover.

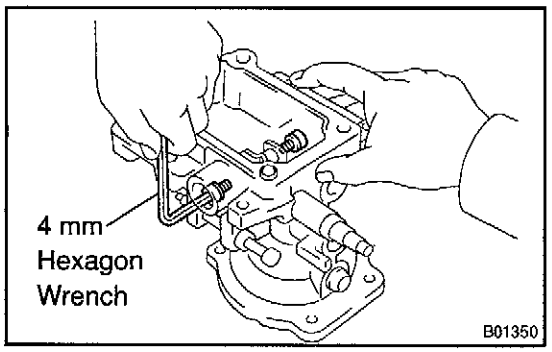



(2) Using a small screwdriver, install the control lever with the support pin.



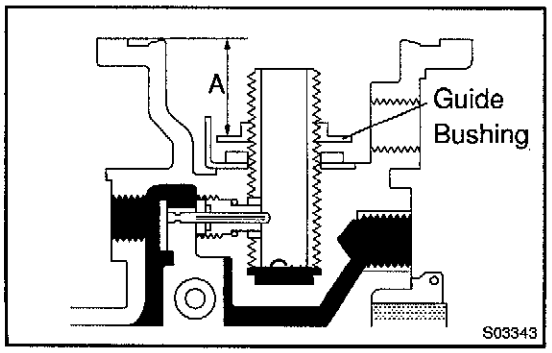

(3) Using a 4 mm hexagon wrench, install 2 new gaskets and the 2 bolts.

**Torque: 6.85 N·m (70 kgf·cm, 61 in.·lbf)**




(b) Install and adjust the guide bushing to the dimension A as shown in the illustration.

**Dimension A: 18.5 – 20.0 mm (0.728 – 0.787 in.)**




(c) Install the boost compensator diaphragm.

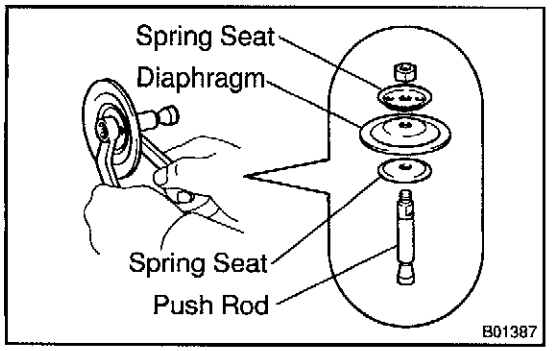
(1) Apply adhesive to the push rod threads.

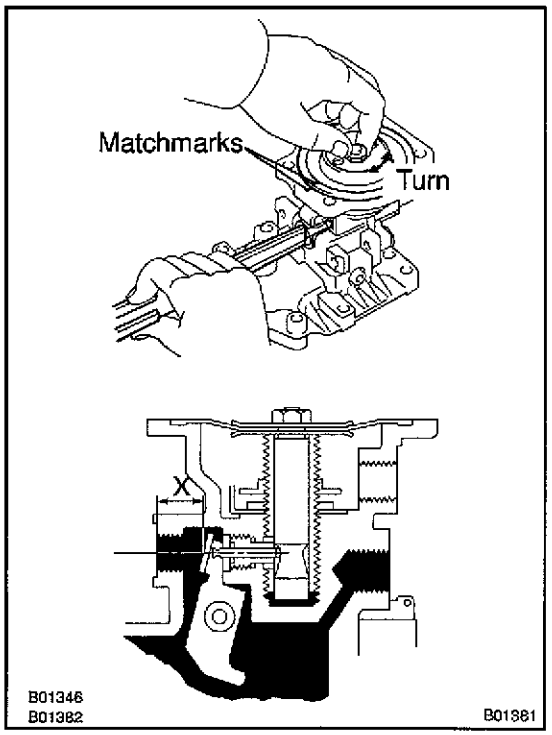
**Adhesive:**
**part No.08833 – 00080, THREE BOND 1344, LOCTITE 242 or equivalent**

(2) Assemble these parts with the nut.

**Torque: 7.35 N·m (75 kgf·cm, 65 in.·lbf)**

- Push rod
- Diaphragm
- 2 spring seats



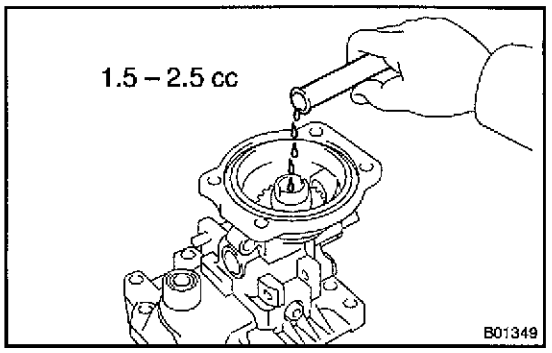



(3) Adjust the installation direction of boost compensator diaphragm assembly.
- Install the diaphragm assembly.

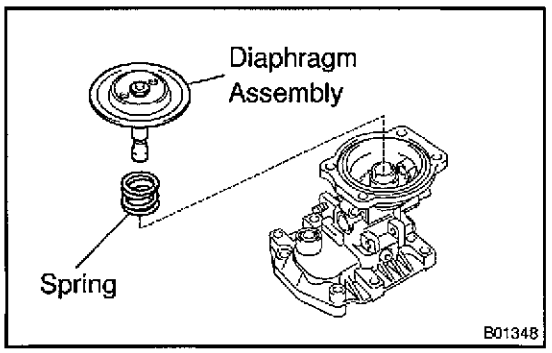
HINT:
Do not assemble the spring.
- While pushing on the diaphragm, using vernier calipers, measure the dimension X as shown in the illustration.

**Dimension X: 8.3 – 8.4 mm (0.327 – 0.331 in.)**

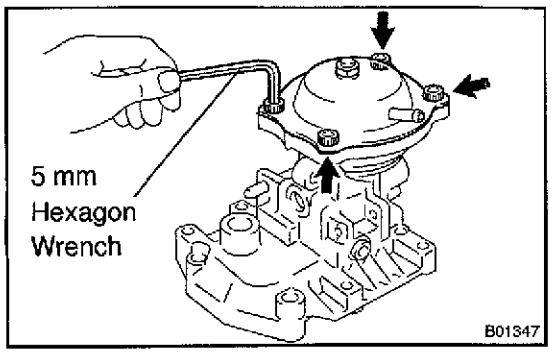
HINT:
Measure at the center of the hole.
- Adjust the dimension X by turning the diaphragm, and place matchmarks on the diaphragm and governor cover.
- Remove the diaphragm assembly.




(4) Insert 1.5 – 2.5 cc (0.09 – 0.15 cu in.) of engine oil into the bushing hole.

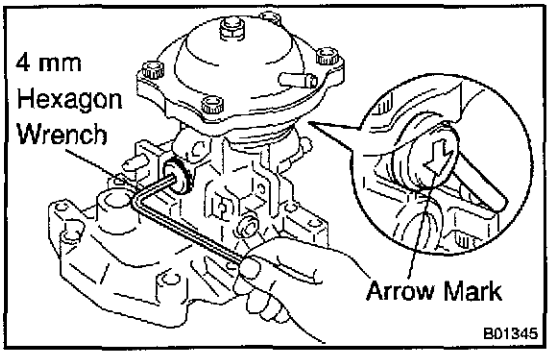



(5) Install these parts:
- Spring
- Diaphragm assembly




(6) Using a 5 mm hexagon wrench, install the diaphragm cover with the 4 bolts.

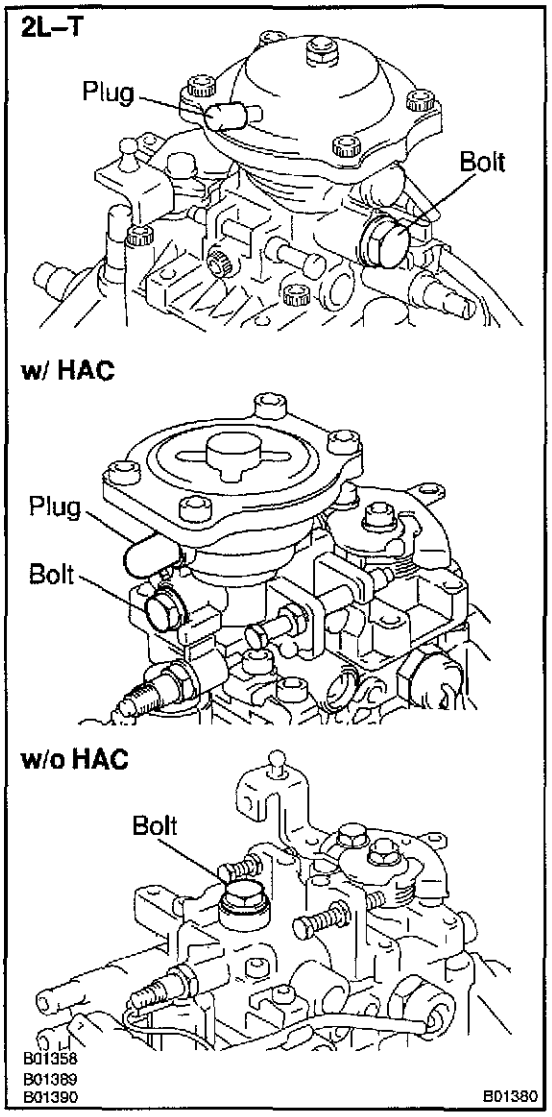
**Torque: 7.35 N·m (75 kgf·cm, 65 in.·lbf)**




(d) Install the overflow screw.
**Torque: 24.55 N·m (250 kgf·cm, 18 ft·lbf)**

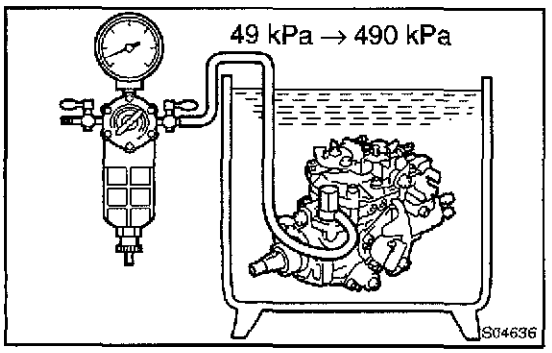
(e) Install the rubber cap with the arrow mark facing downward.

(f) Using a 4 mm hexagon wrench, install a new gasket and the bolt.
**Torque: 11.3 N·m (115 kgf·cm, 8 ft·lbf)**




**2. PERFORM AIR TIGHT TEST**

(a) Plug each port with a bolt and plug.




(b) Connect an air hose to the fuel inlet pipe and place the injection pump into diesel fuel.

(c) Apply 49 kPa (0.5 kgf/cm$^2$, 7 psi) of pressure and confirm that there are no leaks.

(d) Next check that there are no leaks with 490 kPa (5.0 kgf/cm$^2$, 71 psi) of pressure applied.

(e) Remove the bolt and plug from each port.