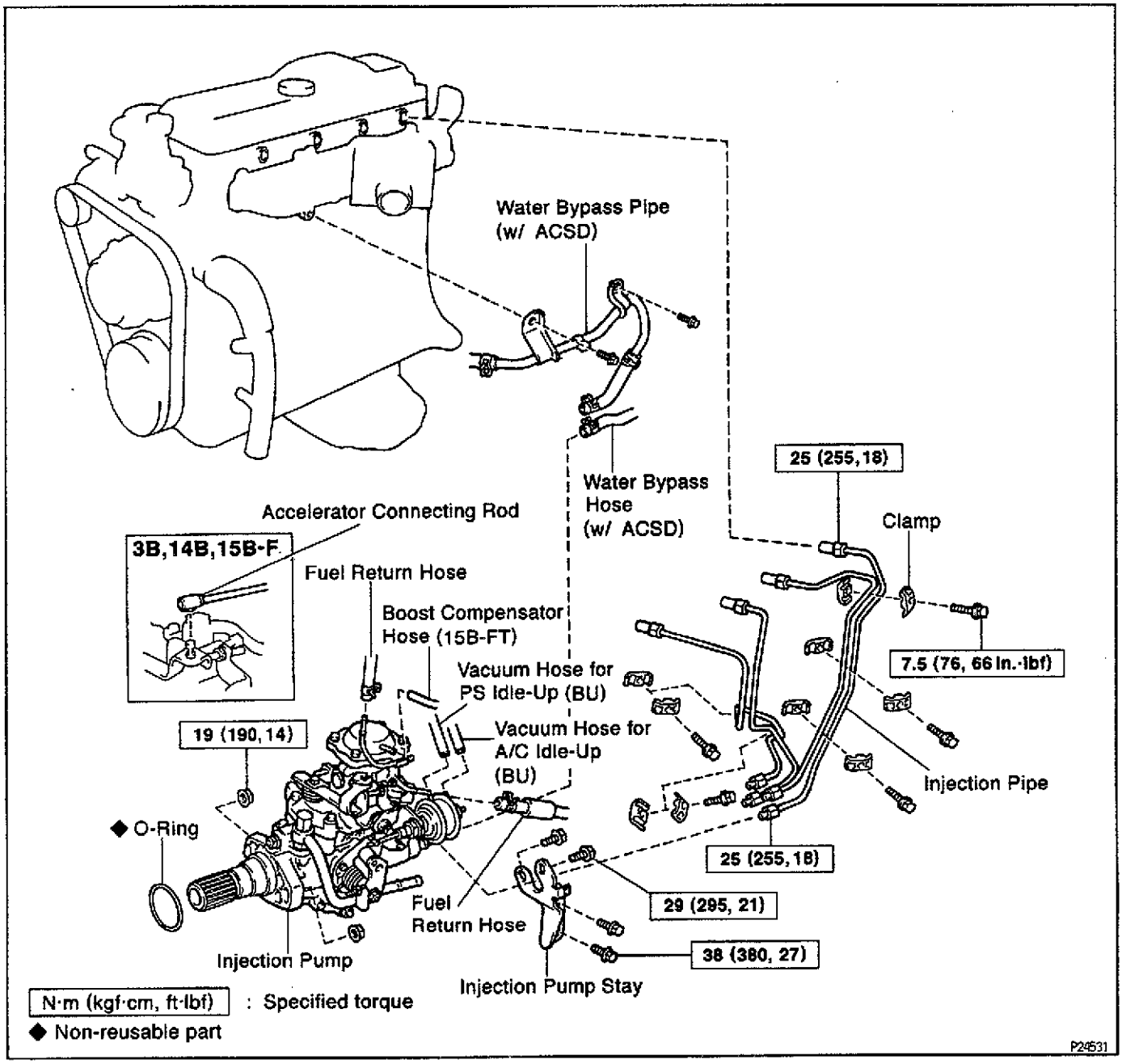
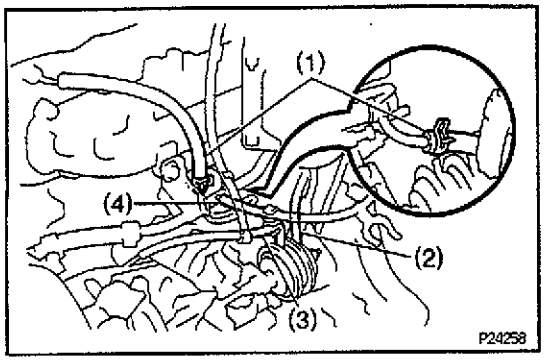
INJECTION PUMP

COMPONENTS FOR REMOVAL AND INSTALLATION



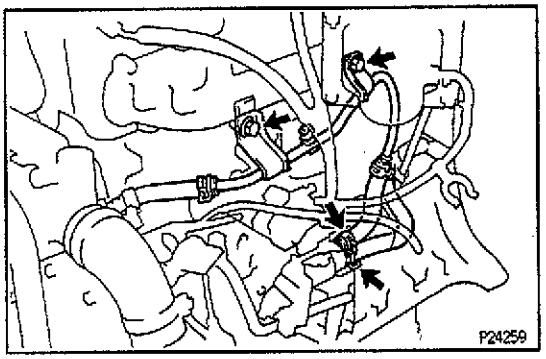
INJECTION PUMP REMOVAL

1. **w/ ACSD:**
   DRAIN ENGINE COOLANT
2. **REMOVE INJECTION PIPES**
   (See injection nozzles removal)



3. DISCONNECT HOSES

(a) Disconnect these hoses:
- (1) 2 fuel return hoses
- (2) BU:
  Vacuum hose (for A/C idle–up)
- (3) BU:
  Vacuum hose (for PS idle–up)
- (4) Boost compensator hose



(b) w/ ACSD:
Disconnect the 2 water bypass hoses from the thermo wax.

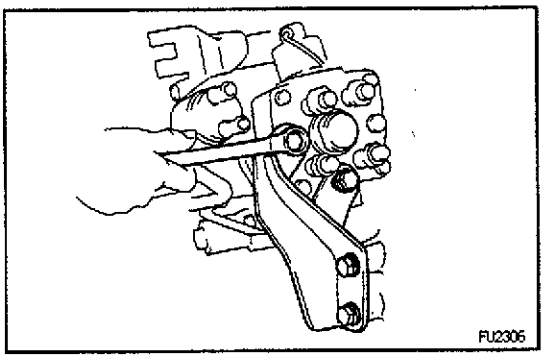
(c) w/ ACSD:
Remove the 2 bolts, and disconnect the water bypass pipe from the intake manifold.

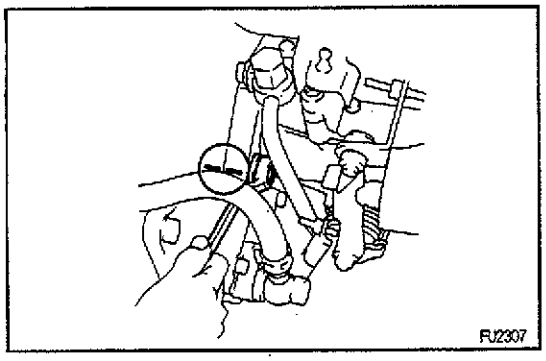
4. REMOVE INJECTION PUMP

(a) Disconnect the injection pump connector.

(b) Disconnect the accelerator cable (15B–FT) or accelerator link (Others) from the injection pump.

(c) Remove the 4 bolts and injection pump stay.





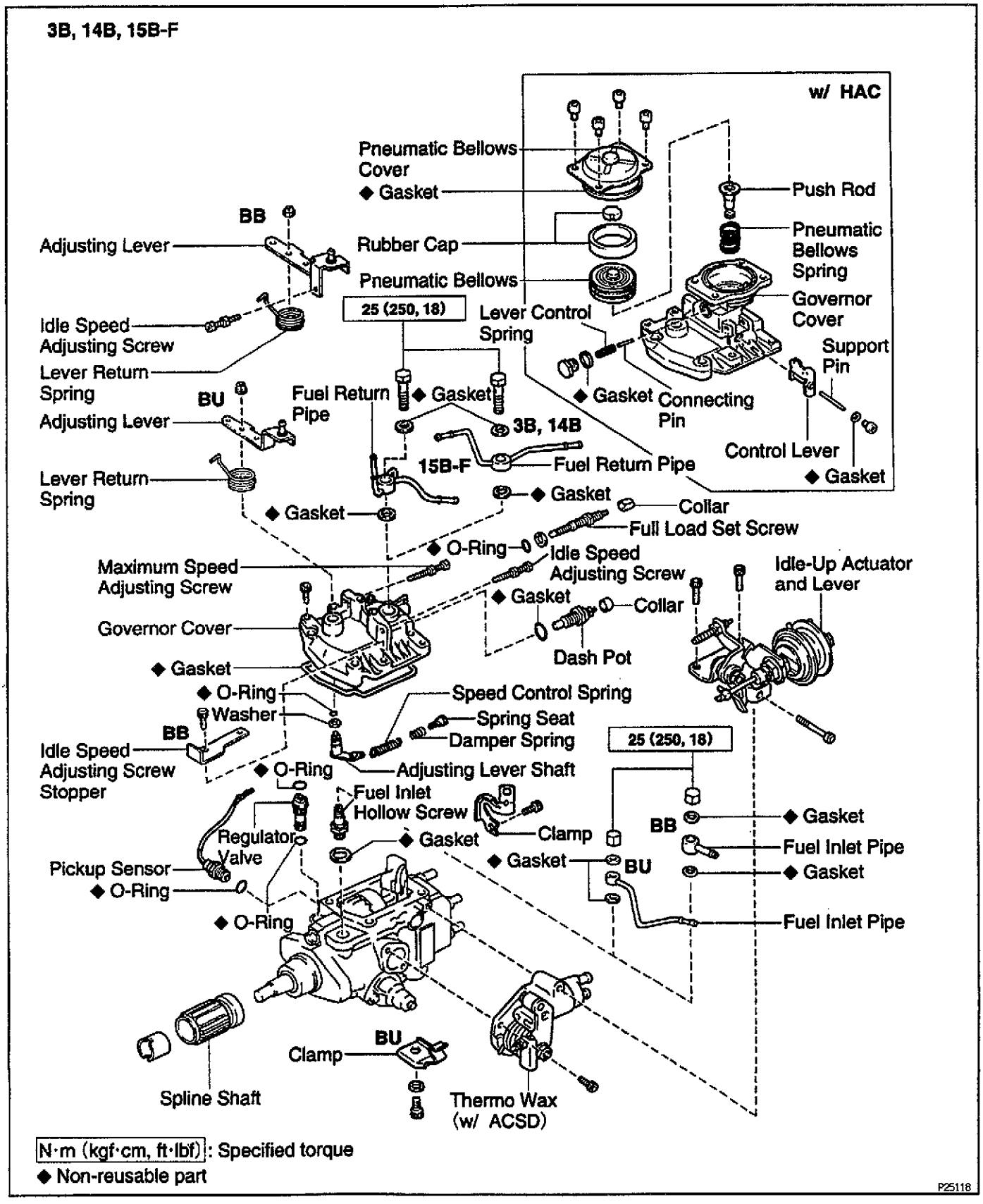
(d) Before removing the injection pump, check if the matchmarks are aligned. If not, place new matchmarks for reinstallation.

(e) Remove the 2 nuts and injection pump.

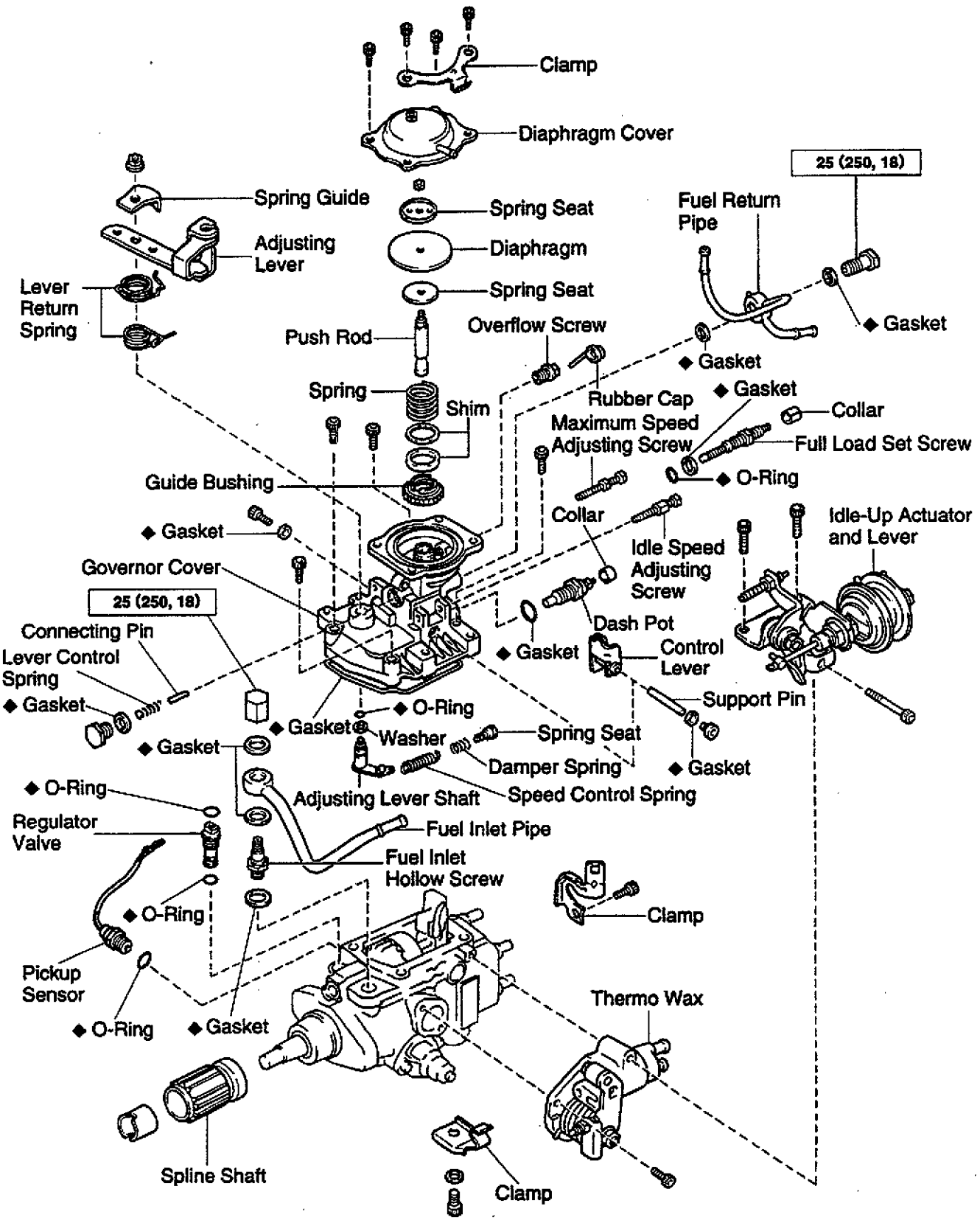
(f) Remove the O–ring from the injection pump flange.

COMPONENTS FOR DISASSEMBLY AND ASSEMBLY

EG



15B-FT

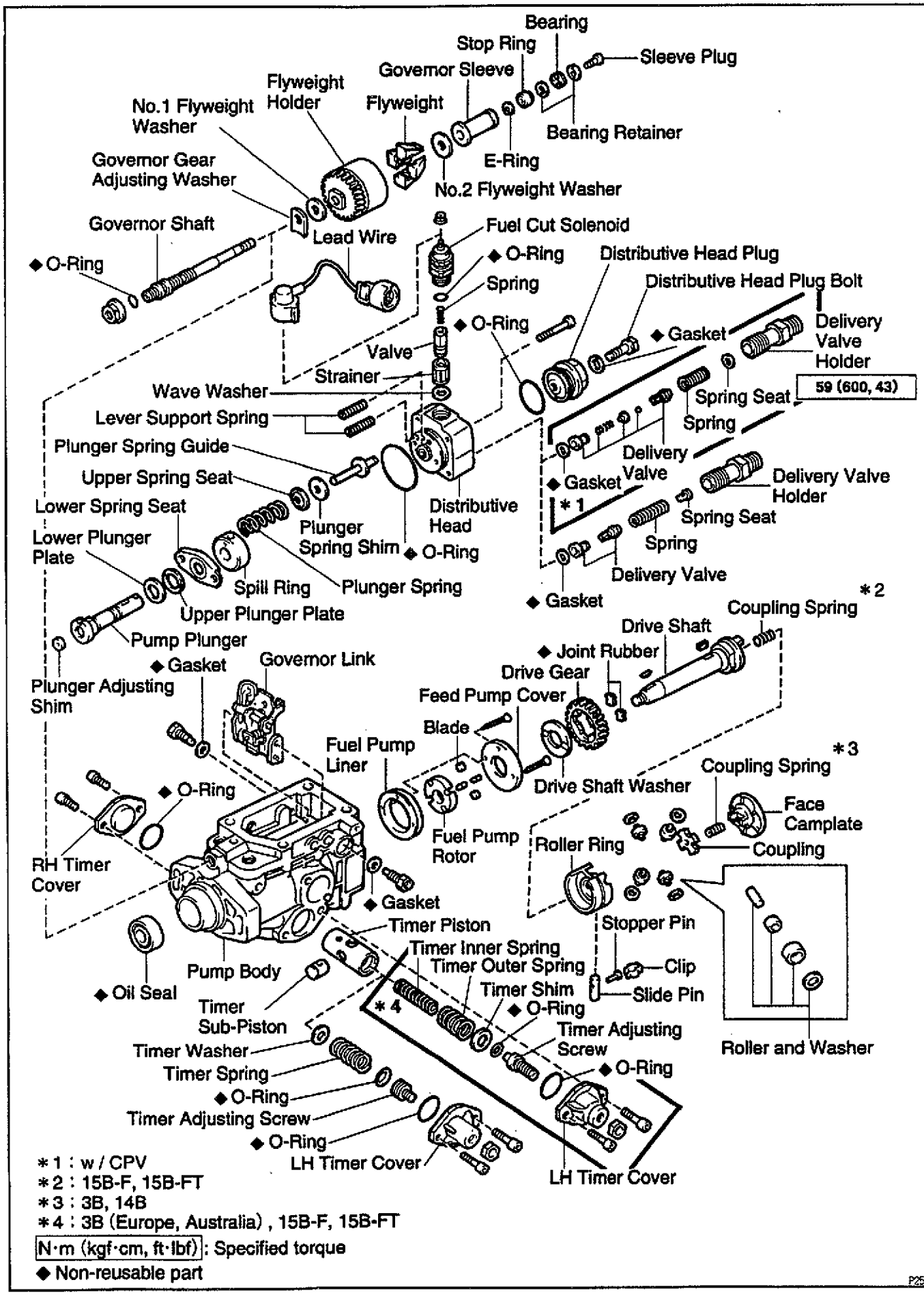


N·m (kgf·cm, ft·lbf): Specified torque

◆ Non-reusable part

P25119

EG

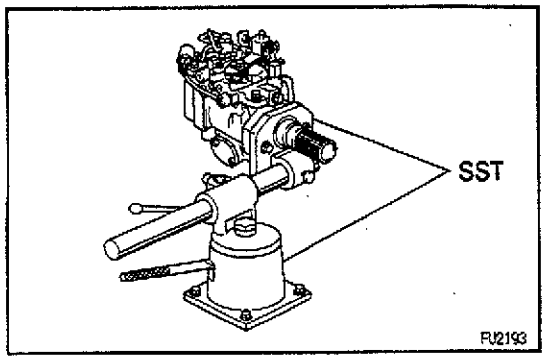


* 1 : w / CPV
* 2 : 15B-F, 15B-FT
* 3 : 3B, 14B
* 4 : 3B (Europe, Australia) , 15B-F, 15B-FT

N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

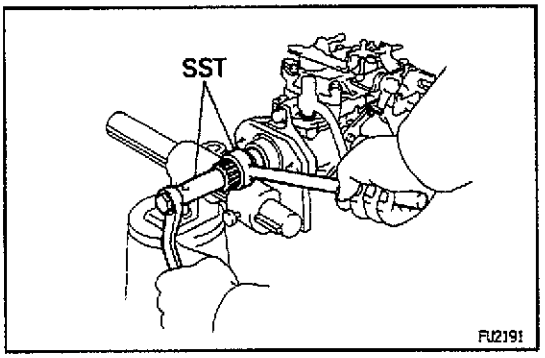
P25120



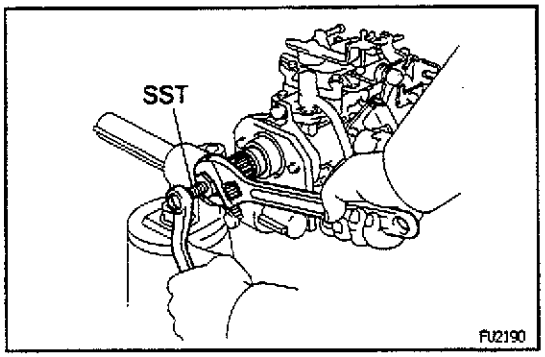
INJECTION PUMP DISASSEMBLY

NOTICE (w/ HAC and 15B–FT): When re–using the governor cover assembly, to prevent oil spilling out from the bushing of the governor cover when doing steps 1 to 13, remove it without tilting it 45° or more from the horizontal.

1. MOUNT PUMP ASSEMBLY TO SST (STAND)
SST 09241–76022 and 09245–54010



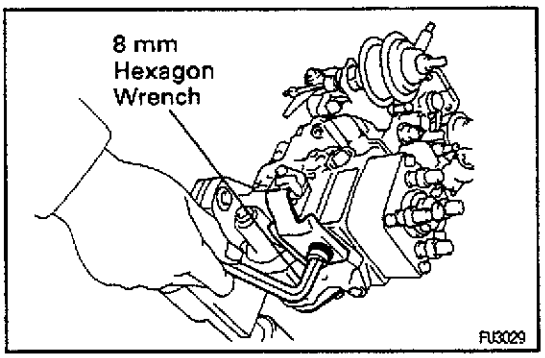
2. REMOVE SPLINE SHAFT
(a) Using SST, remove the round nut.
SST 09260–58010 (09266–76011, 09278–46020)



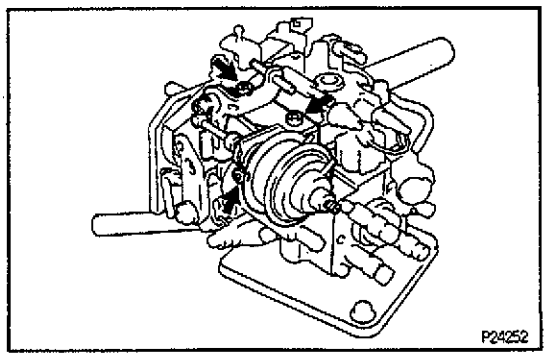
(b) Using SST, remove the spline shaft.
SST 09260–58010 (09267–76011)

3. REMOVE SET KEY OF SPLINE SHAFT FROM DRIVE SHAFT

4. REMOVE FUEL PIPES

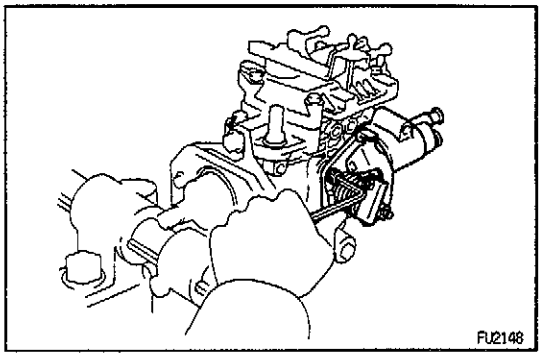


5. BU:
REMOVE CLAMP FOR FUEL INLET PIPE
Using an 8 mm hexagon wrench, remove the bolt, plate washer and clamp.



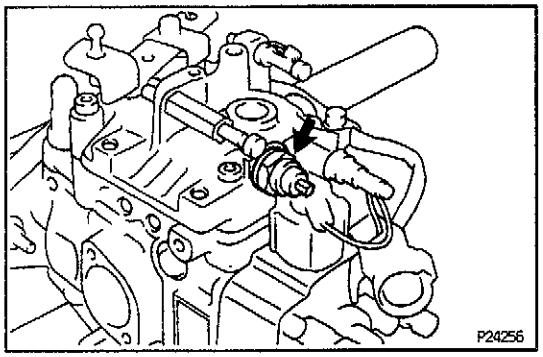
6. REMOVE IDLE–UP LEVER
(a) Set the adjusting lever to maximum position.
(b) Using a 5 mm hexagon wrench, remove the 3 bolts, the idle–up actuator, lever assembly and collar.

EG



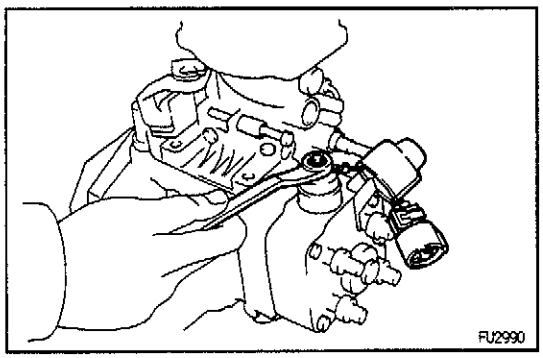
7. REMOVE THERMO WAX

Remove the 2 bolts, thermo wax and O–ring.



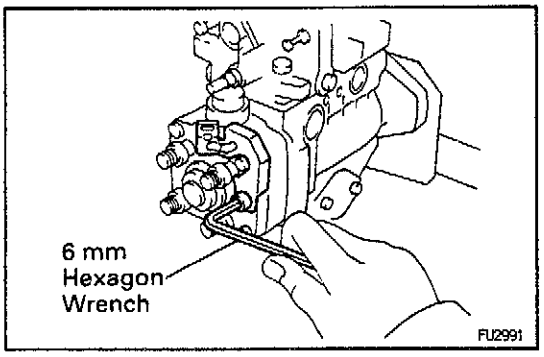
8. REMOVE DASH POT

Remove the dash pot and gasket.

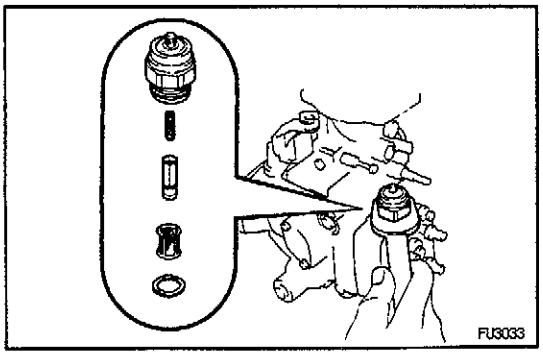


9. REMOVE FUEL CUT SOLENOID

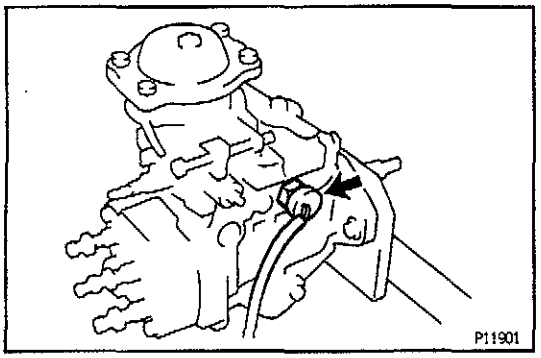
(a) Disconnect the lead wire connector from the bracket.
(b) Disconnect the dust cover from the fuel cut solenoid.
(c) Remove the nut, lead wire and dust cover.



(d) Using a 6 mm hexagon wrench, remove the bolt and connector bracket.



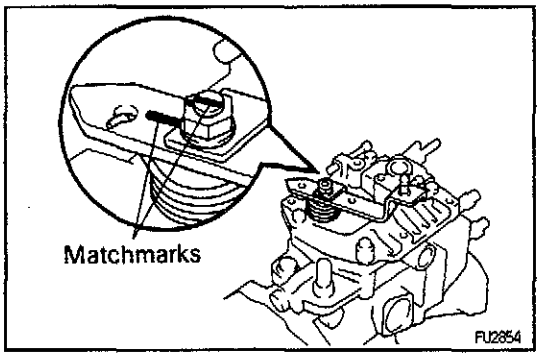
(e) Remove the fuel cut solenoid, O–ring, spring, valve, strainer and wave washer.



10. REMOVE PICKUP SENSOR

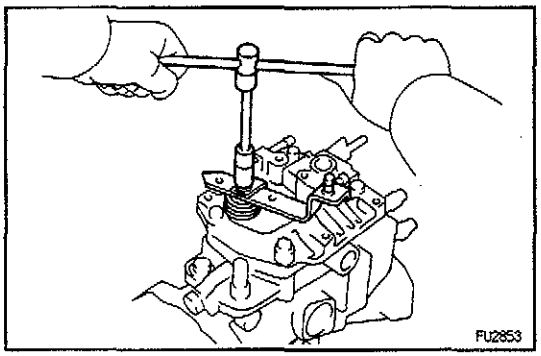
(a) Remove the pickup sensor and O–ring.

(b) Disconnect the sensor lead wires from the connector.



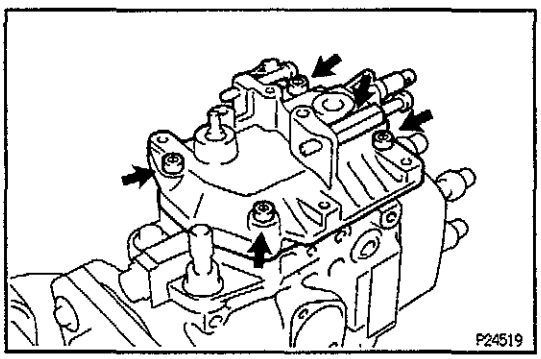
11. REMOVE ADJUSTING LEVER

(a) Place the matchmarks on the adjusting lever and shaft.



(b) 15B–FT:
Remove the nut, return spring guide, adjusting lever and 2 return springs.

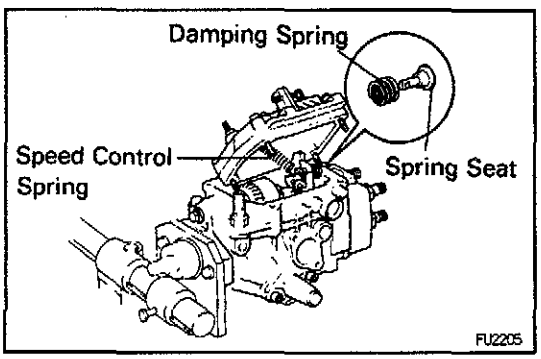
(c) Others:
Remove the nut, adjusting lever and adjusting spring.



12. REMOVE GOVERNOR COVER

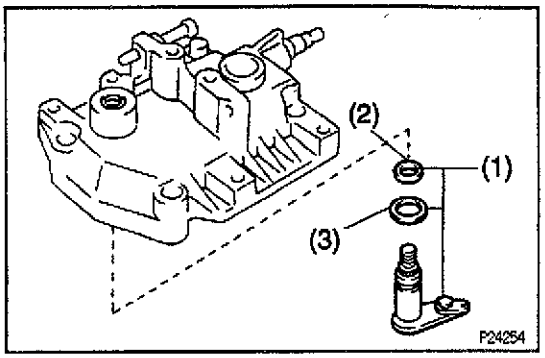
(a) Remove the idle speed adjusting screw.

(b) Using a 5 mm hexagon wrench, remove the 4 bolts.



(c) Disconnect the speed control spring from the spring seat, and remove the spring seat, damper spring, speed control spring, the governor cover, adjusting shaft assembly and gasket.

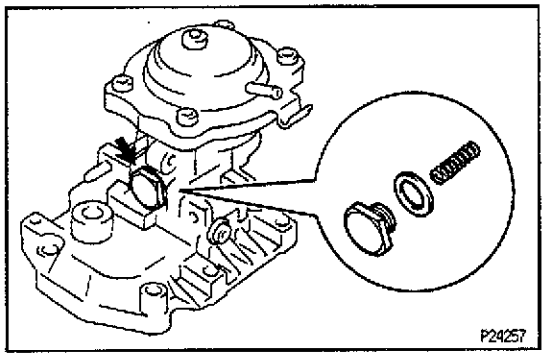
NOTICE (w/ HAC and 15B–FT): After removing the governor cover assembly, do not place it at an angle 45° or more from the horizontal.



13. REMOVE GOVERNOR ADJUSTING LEVER SHAFT FROM GOVERNOR COVER

Remove the following parts from the governor cover:

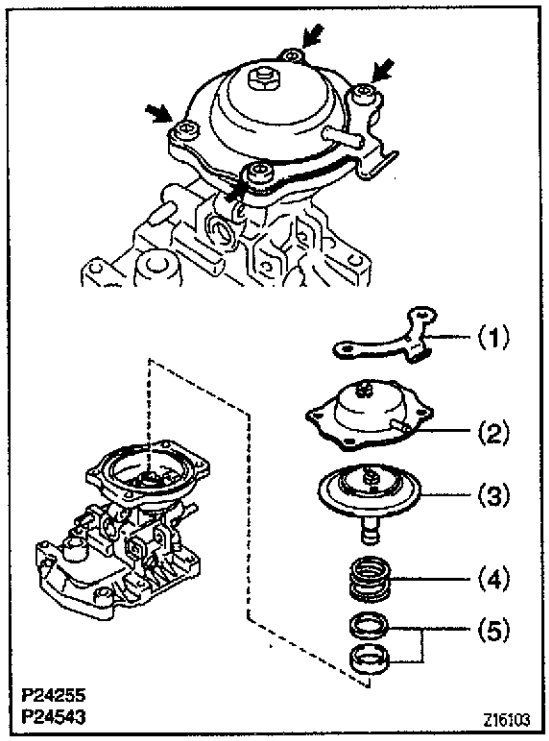
(1) Adjusting lever shaft, O–ring and washer assembly
(2) O–ring
(3) Washer



14. DISASSEMBLE HIGH ALTITUDE COMPENSATOR (w/ HAC) OR BOOST COMPENSATOR (15B–FT)

A. Remove lever control spring

Remove the bolt, gasket and lever control spring.

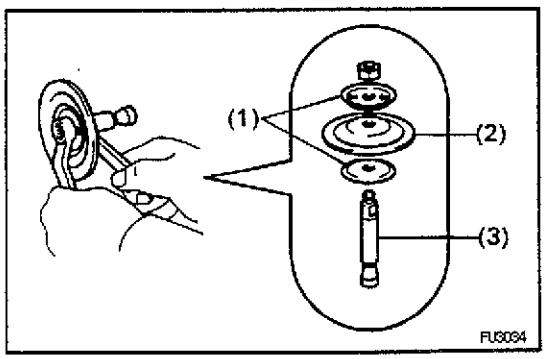


B. 15B–FT:

Remove boost compensator diaphragm

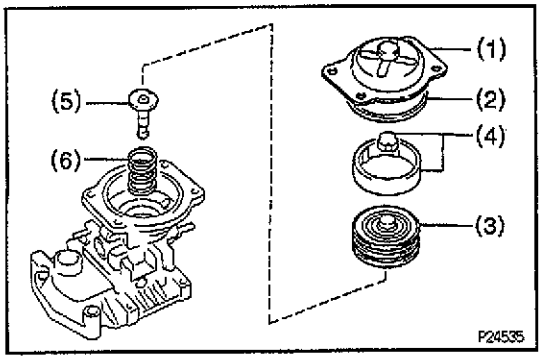
(a) Using a 5 mm hexagon wrench, remove the 4 bolts and these parts:

(1) Fuel outlet pipe clamp
(2) Diaphragm cover
(3) Diaphragm assembly
(4) Spring
(5) Shim(s)



(b) Remove the nut, and disassemble the following parts:

(1) 2 spring seats
(2) Diaphragm
(3) Push rod

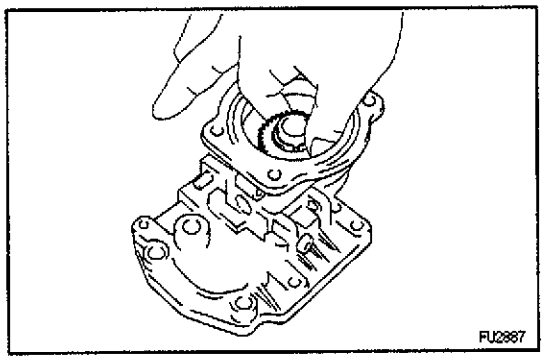


C. w/ HAC:

Remove pneumatic bellows

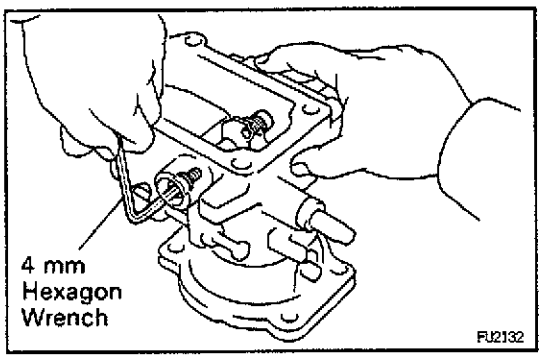
Using a 5 mm hexagon wrench, remove the 4 bolts and these parts:

(1) Pneumatic bellows cover
(2) Gasket
(3) Pneumatic bellows
(4) 2 rubber caps
(5) Push rod
(6) Pneumatic bellows spring



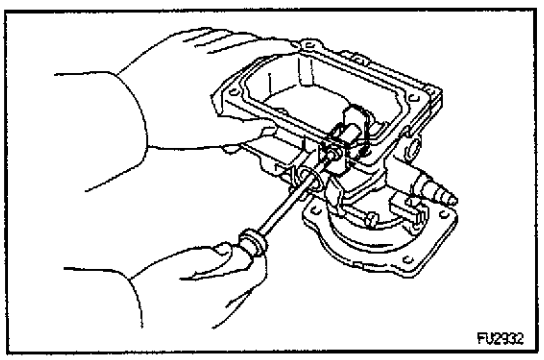
D. 15B—FT:

Remove guide bushing

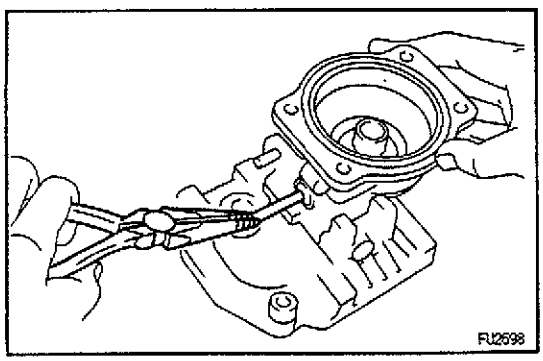


E. Remove control lever

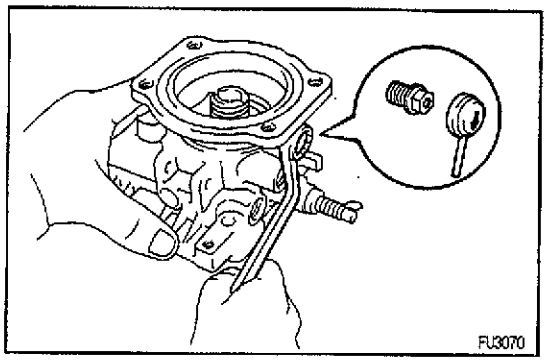
(a) Using a 4 mm hexagon wrench, remove the 2 bolts and gaskets.



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



(c) Using needle nose pliers, remove the connecting pin.
NOTICE: Be careful not to damage the connecting pin. Tape the tip of the pliers.



F. Remove overflow screw

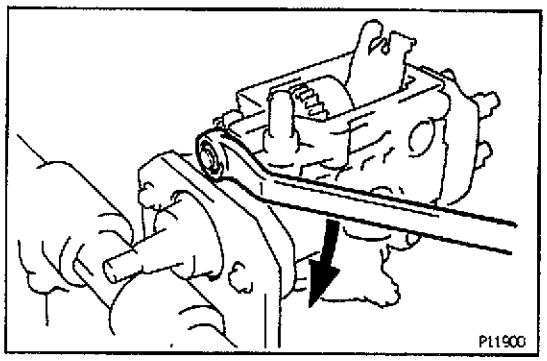
Remove the rubber cap and overflow screw.

15. CHECK FLYWEIGHT HOLDER THRUST CLEARANCE

(See step 19 in injection pump assembly)

Thrust clearance:

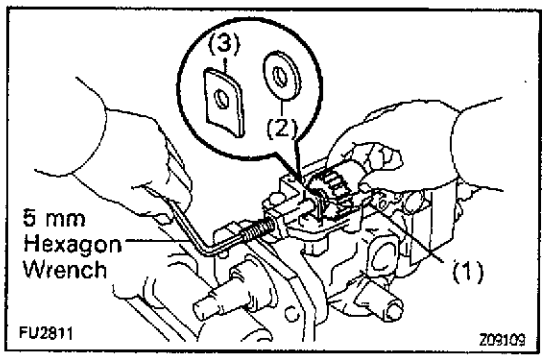
0.15 – 0.35 mm (0.0059 – 0.0138 in.)



16. REMOVE GOVERNOR SHAFT AND FLYWEIGHT HOLDER

(a) Remove the governor shaft lock nut by turning it clockwise.

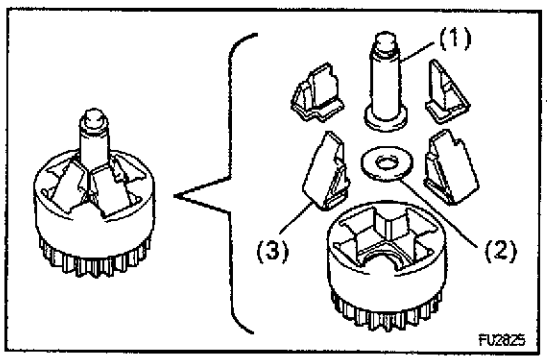
NOTICE: The governor shaft and lock nut have LH threads.



(b) Using a 5 mm hexagon wrench, remove the governor shaft clockwise, and remove the following parts:

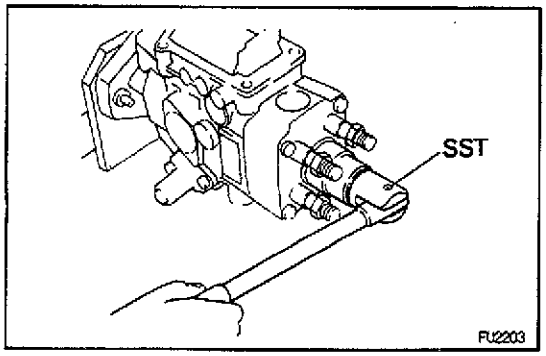
(1) Flyweight holder assembly
(2) No.1 flyweight washer
(3) Governor gear adjusting washer

HINT: Be careful not to drop the 2 washers into the pump housing.



(c) Remove the following parts from the flyweight holder.

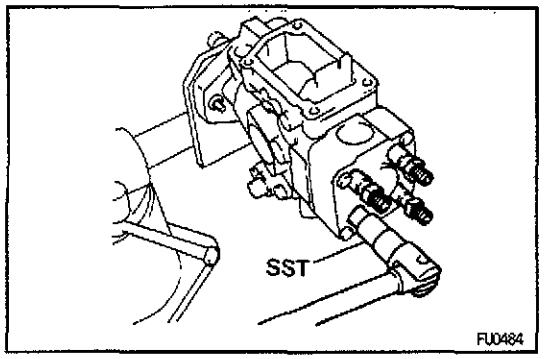
(1) Governor sleeve
(2) No.2 flyweight washer
(3) 4 flyweights



17. REMOVE DISTRIBUTIVE HEAD PLUG

Using SST, remove the distributive head plug.

SST 09260–54012 (09262–54010)



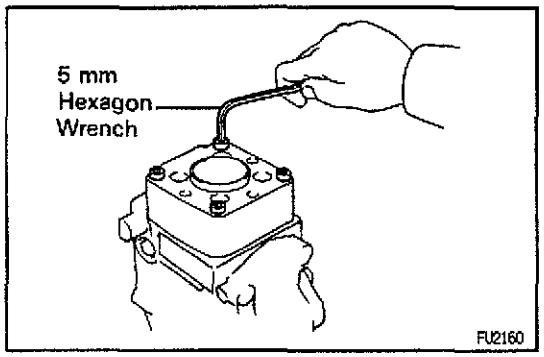
18. w/o CPV:
REMOVE DELIVERY VALVE HOLDERS

(a) Using SST, remove the 4 delivery valve holders and springs.
SST 09260–54012 (09269–54020)

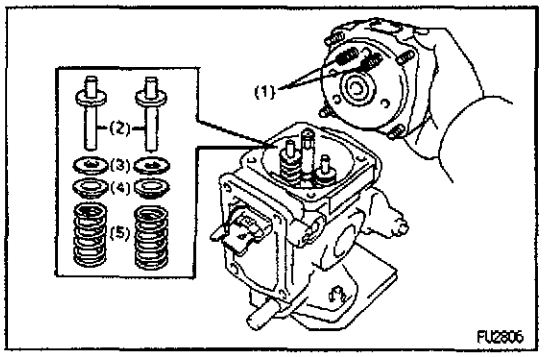
(b) Remove the 4 delivery valves and gaskets.
NOTICE: Do not touch the sliding surfaces of the delivery valve with your hand.
HINT: Arrange the delivery valves, springs, and holders in order.

19. REMOVE DISTRIBUTIVE HEAD

(a) Using a 5 mm hexagon wrench, remove the 4 bolts.

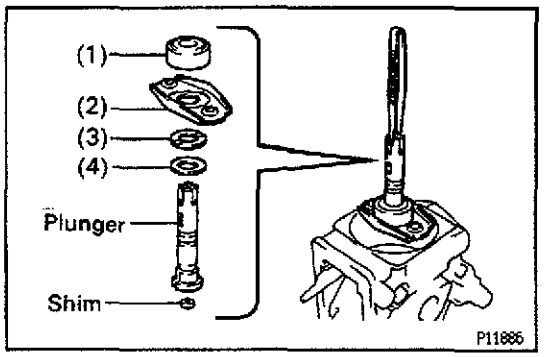


(b) Remove the distributive head and following parts:
(1) 2 lever support springs
(2) 2 plunger spring guides
(3) 2 plunger spring shims
(4) 2 upper spring seats
(5) 2 plunger springs



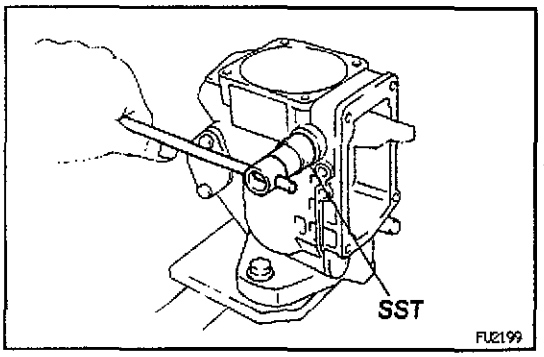
20. REMOVE PUMP PLUNGER

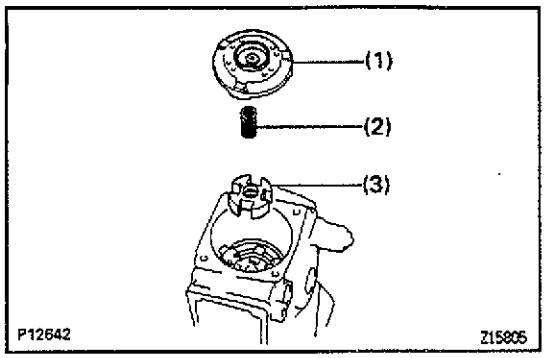
Using SST, remove the pump plunger and plunger adjusting shim together with the following parts:
(1) Spill ring
(2) Lower spring seat
(3) Upper plunger plate
(4) Lower plunger plate
SST 09260–54012 (09269–54030)
NOTICE: Do not touch the sliding surfaces of the pump plunger with your hand.



21. REMOVE GOVERNOR LINK

Using SST, remove the 2 support bolts, gaskets and governor link.
SST 09260–54012 (09269–54040)



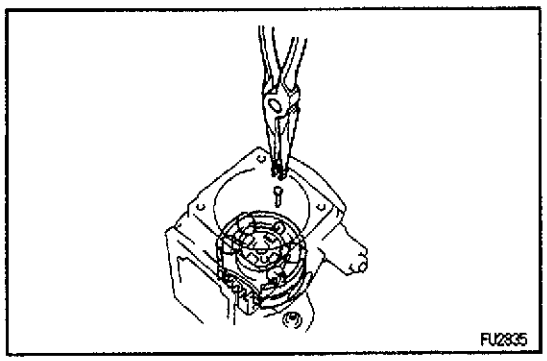


EG

22. REMOVE FACE CAMPLATE AND COUPLING

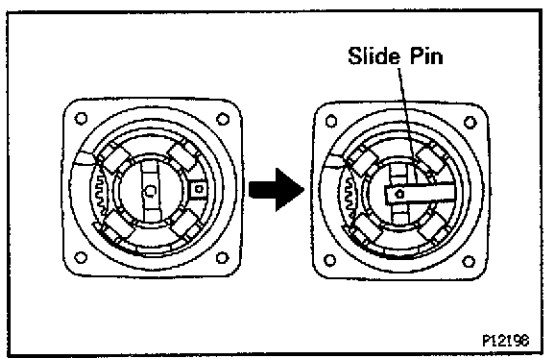
Remove these parts:

(1) Face camplate
(2) 3B, 14B:
Coupling spring
(3) Coupling

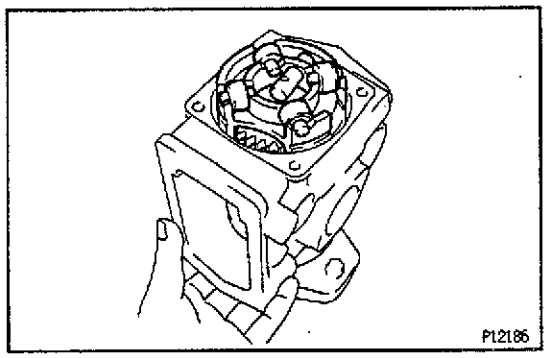


23. REMOVE ROLLER RING AND DRIVE SHAFT

(a) Remove the timer clip and stopper pin.



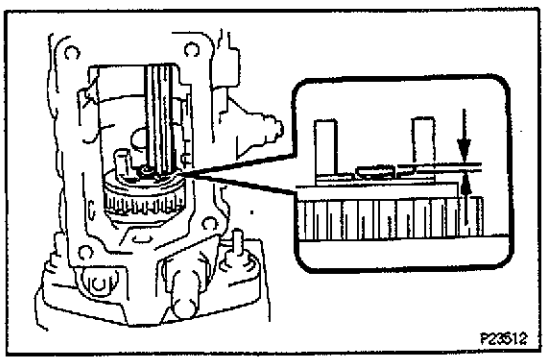
(b) Push the slide pin toward inside.



(c) Push the drive shaft, and remove the roller ring, 4 rollers and shims assembly.

NOTICE:

- **Be careful not to drop the rollers.**
- **Do not alter the position or assembly of the rollers.**



(d) 15B—F, 15B—FT:

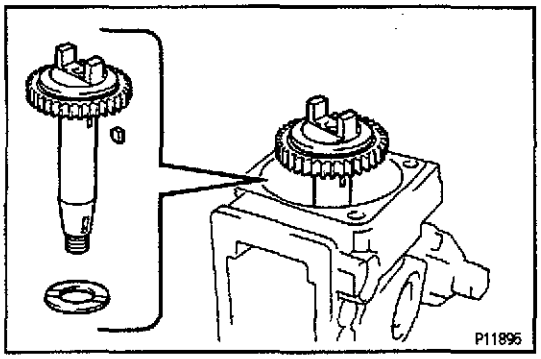
Using vernier calipers, measure the protrusion of the coupling spring.

Protrusion:

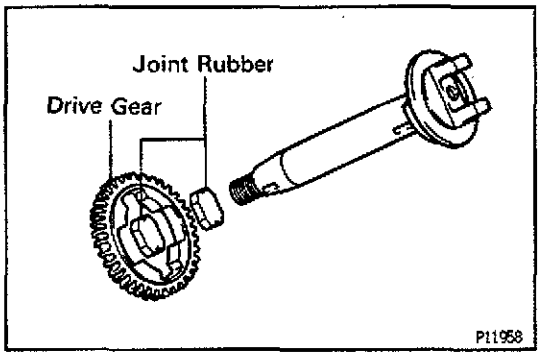
1.0 — 1.6 mm (0.039 — 0.063 in.)

If the protrusion is not as specified, replace the coupling spring.

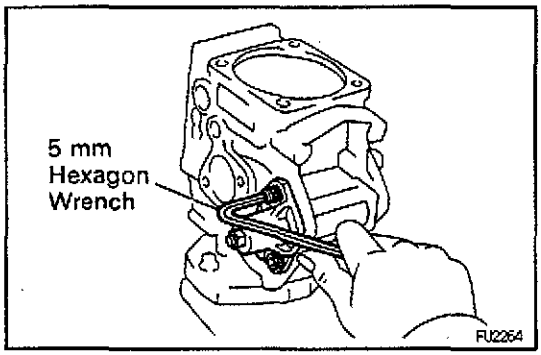
NOTICE: Do not remove the coupling spring unless necessary. If you remove the coupling spring, replace it with a new one.



(e) Remove the drive shaft, governor drive gear, 2 joint rubbers assembly, set key and drive shaft washer.

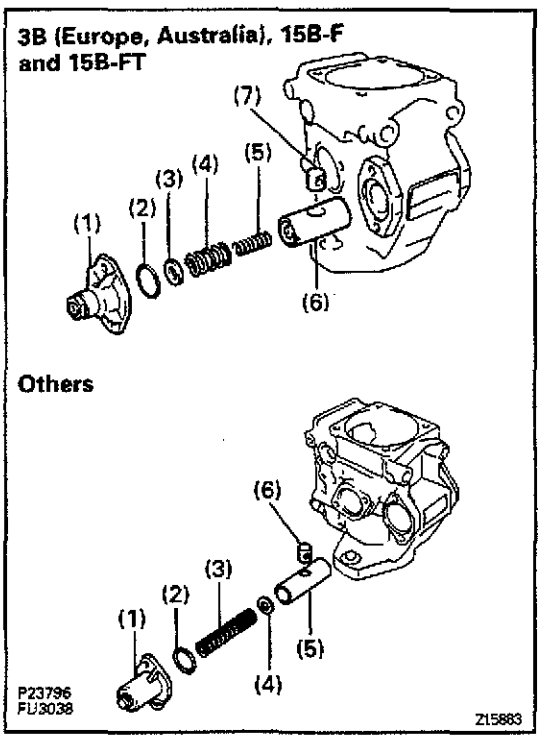


(f) Remove the drive gear and 2 joint rubbers from the drive shaft.



24. REMOVE TIMER

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



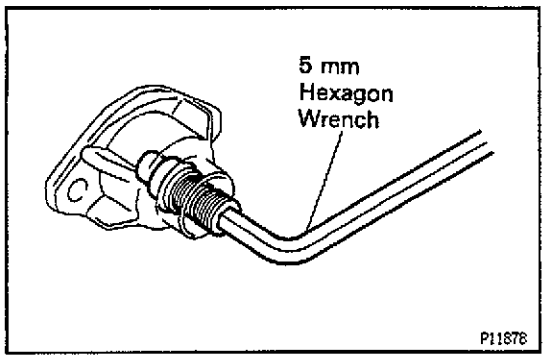
(b) Remove these parts:

3B (Europe, Australia), 15B–F and 15B–FT:

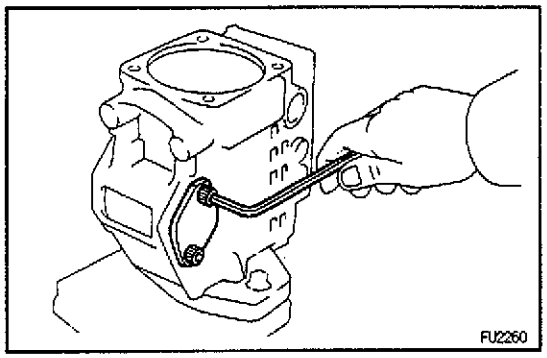
(1) LH timer cover, timer adjusting screw and nut assembly
(2) O–ring
(3) Shim
(4) Outer spring
(5) Inner spring
(6) Piston
(7) Sub–piston

Others:

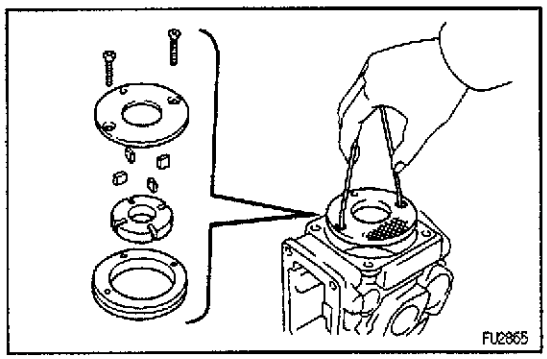
(1) LH timer cover, timer adjusting screw and nut assembly
(2) O–ring
(3) Spring
(4) Timer washer
(5) Piston
(6) Sub–piston



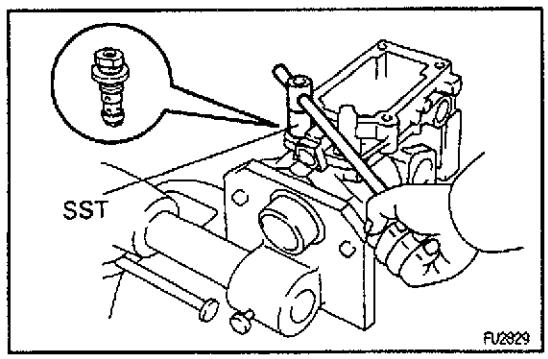
(c) Remove the nut from the LH timer cover.
(d) Using a 5 mm hexagon wrench, remove the timer adjusting screw.
(e) Remove the O–ring from the timer adjusting ring.



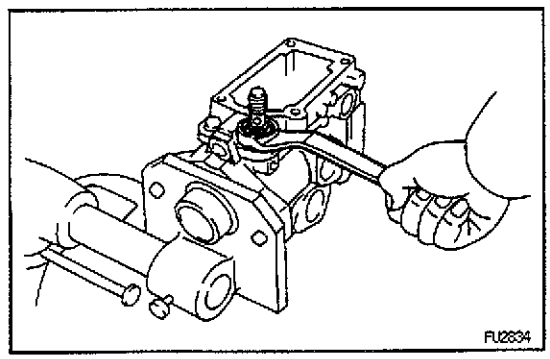
(f) Using a 5 mm hexagon wrench, remove the 2 bolts, RH timer cover and O–ring.



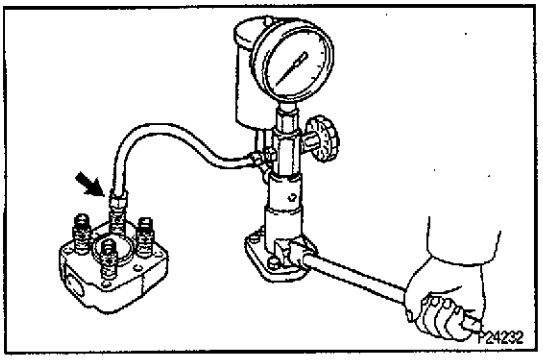
25. REMOVE FUEL FEED PUMP
(a) Remove the 2 screws.
(b) Using a piece of wire, remove the feed pump cover.
(c) Remove the feed pump rotor, 4 blades and liner.
NOTICE:
- **Be careful not to interchange the blade positions.**
- **Be careful not to damage the pump body.**

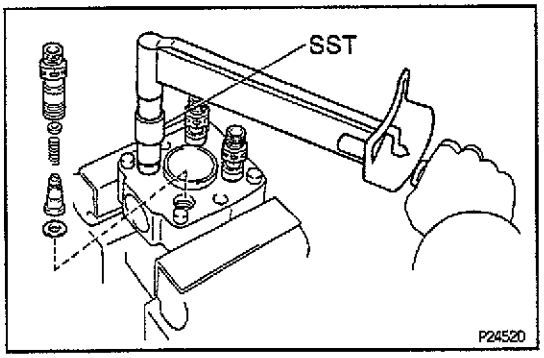


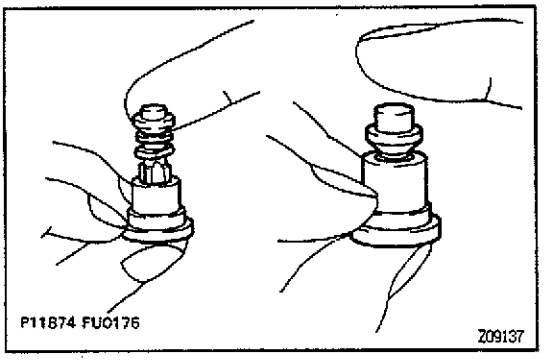
26. REMOVE REGULATOR VALVE
Using SST, remove the regulator valve and 2 O–rings.
SST 09260–54012 (09262–54020)

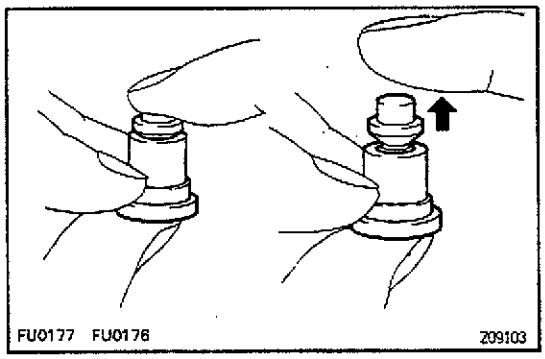


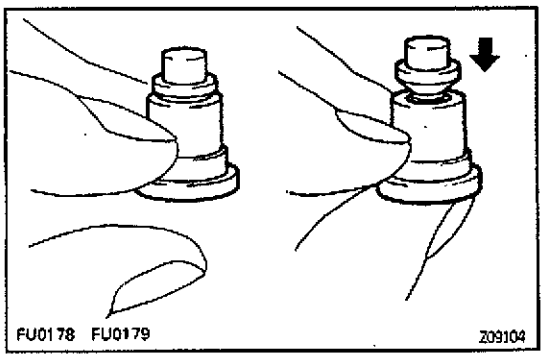
27. REMOVE FUEL INLET HOLLOW SCREW
Remove the hollow screw and gasket.











INJECTION PUMP COMPONENTS INSPECTION

1. INSPECT DELIVERY VALVES

w/ CPV:

(a) Attach the nozzle tester to the delivery valve holder of the pipe you wish to measure.

(b) Use the nozzle tester to check the valve opening pressure of the delivery valve.

Standard valve opening pressure:

7,350 – 8,330 kPa

(75 – 85 kgf/cm², 1,067 – 1,209 psi)

If the valve opening pressure of the delivery valve is not within specification, replace the delivery valve assembly.

SST 09260–54012 (09269–54020)

Torque: 59 N·m (600 kgf·cm, 43 ft·lbf)

NOTICE: Do not lose the steel ball when doing an overhaul.

w/o CPV:

NOTICE: Do not touch the sliding surfaces of the pump plunger and delivery valves.

(a) Pull up the valve and close the hole at the valve seat bottom end with your thumb.

When the valve is released, it should sink down quickly and stop at the position where the relief ring closes the valve seat hole.

(b) Close the hole at the valve seat bottom end with your thumb.

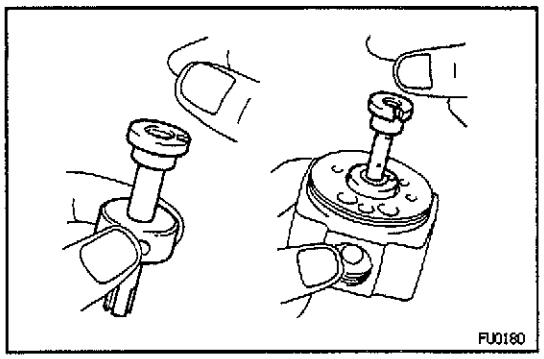
Insert the valve into the valve seat and press down with your finger. When your finger is released, the valve should rise back to its original position.

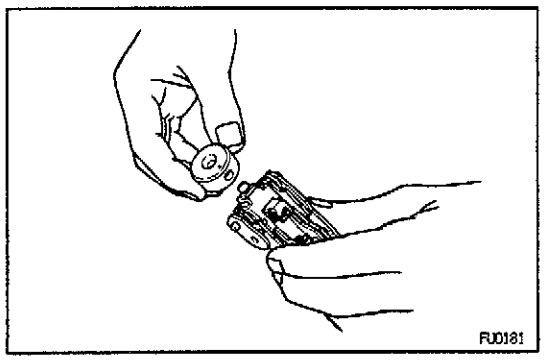
(c) Remove your thumb from the valve seat hole.

The valve should close completely by its own weight. If operation is not as specified, replace the valve as a set.

HINT: Before using a new valve set, wash off the rust prevention compound with light oil or gasoline. Then re – wash with diesel fuel and perform the above tests.

EG





2. INSPECT PUMP PLUNGER, SPILL RING AND DISTRIBUTIVE HEAD

(a) Tilt the spill ring (distributive head) slightly and pull out the plunger.

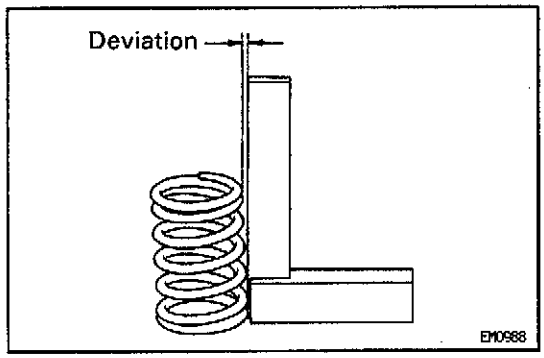
(b) When released, the plunger should sink down smoothly into the spill ring (distributive head) by its own weight.

(c) Rotate the plunger and repeat the test at various positions.

If the plunger sticks at any position, replace the parts as a set.

NOTICE: Do not touch the sliding surface of the pump plunger.

(d) Insert the governor link ball pin into the spill ring and check that it moves smoothly without any play.



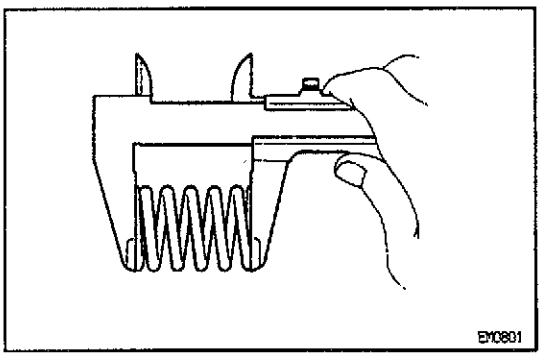
3. INSPECT PLUNGER SPRINGS FOR DEVIATION

Using a steel square, check the deviation of the plunger springs.

Maximum deviation:

2.0 mm (0.079 in.)

If deviation is greater than maximum, replace both springs.



4. INSPECT SPRING LENGTH

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

Spring free length:

Delivery valve spring

15B–F, 15B–FT: 12.6 mm (0.496 in.)

Others: 19.4 mm (0.764 in.)

Plunger spring

15B–F, 15B–FT: 34.1 mm (1.343 in.)

Others: 32.4 mm (1.276 in.)

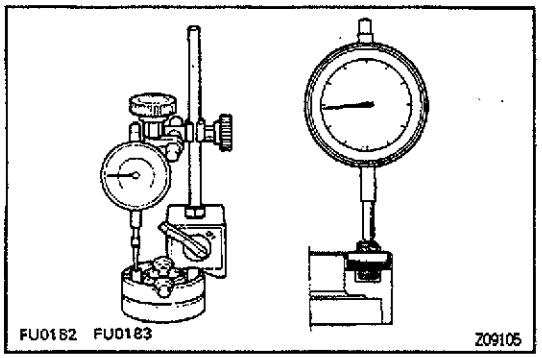
Coupling spring

3B, 14B: 15.4 mm (0.606 in.)

Boost compensator spring

15B–FT: 19.9 mm (0.783 in.)

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



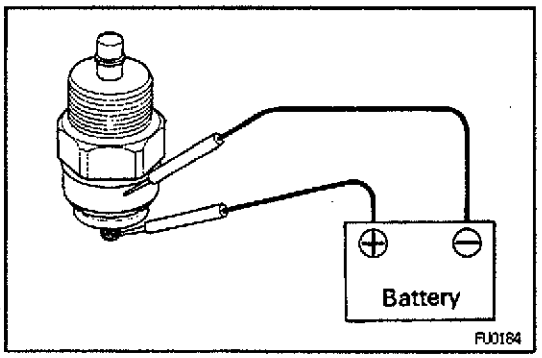
5. INSPECT ROLLER RING AND ROLLERS

Using a dial indicator, measure the roller height.

Maximum roller height variation:

0.02 mm (0.0008 in.)

If the variation is greater than specification, replace the roller ring and roller as a set.

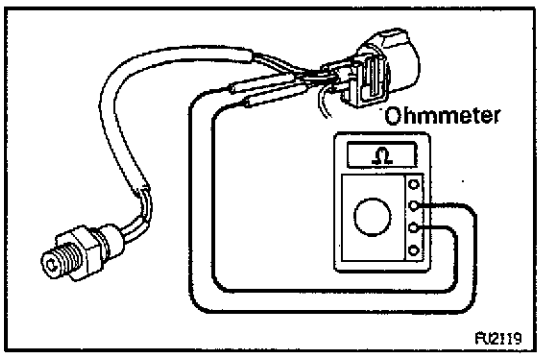


6. INSPECT FUEL CUT SOLENOID

(a) Connect the solenoid valve body and terminal to the battery terminals.

(b) You should feel the click from the solenoid valve when the battery power is connected and disconnected.

If the solenoid valve is not operating properly, replace it.

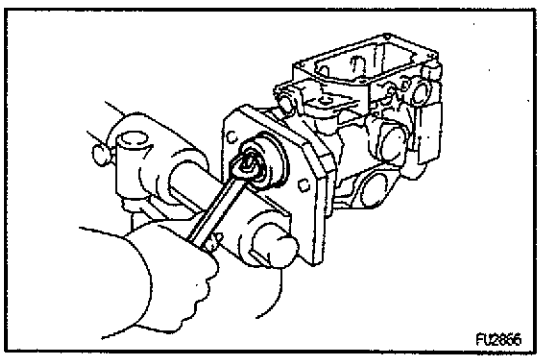


7. INSPECT PICKUP SENSOR

Using an ohmmeter, measure the resistance between the terminals.

Resistance: 650 – 970 Ω

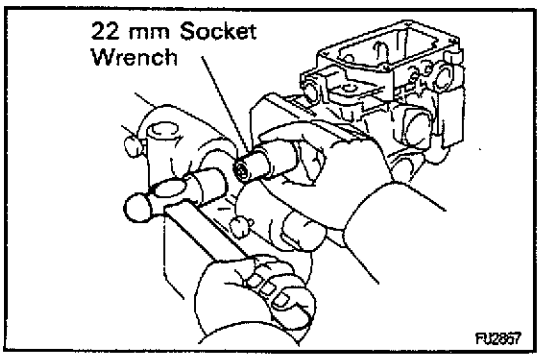
If resistance is not as specified, replace the sensor.



8. IF NECESSARY, REPLACE OIL SEAL

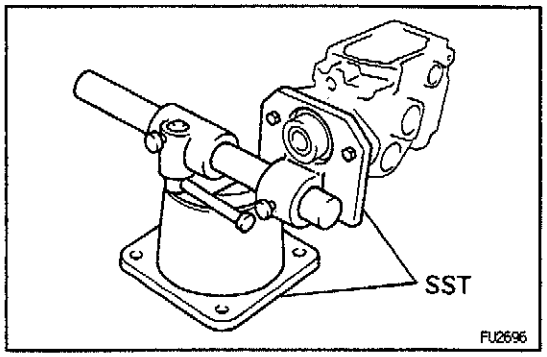
(a) Using a wrench, pry out the oil seal.

NOTICE: Be careful not to damage to the pump body.



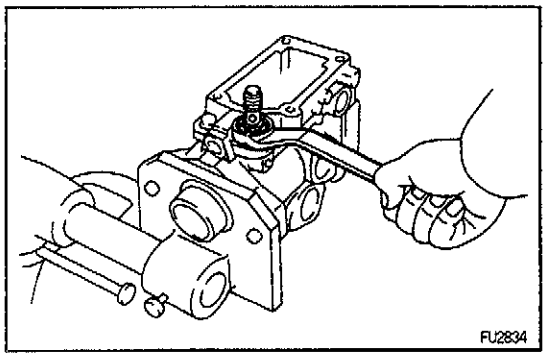
(b) Apply MP grease to the lip of a new oil seal.

(c) Using a 22 mm socket wrench, tap in the oil seal until its surface is flush with the pump housing.

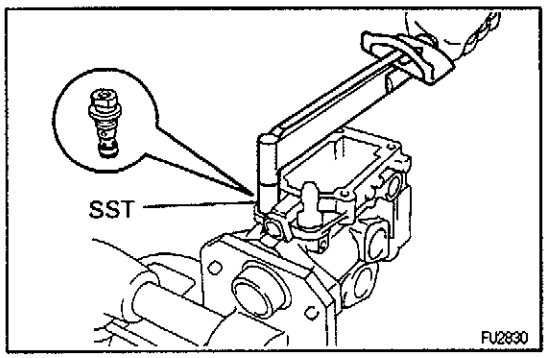


INJECTION PUMP ASSEMBLY

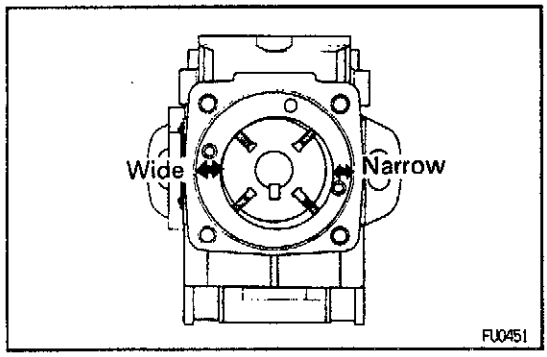
1. **MOUNT PUMP BODY TO SST (STAND)**
SST 09241–76022 and 09245–54010



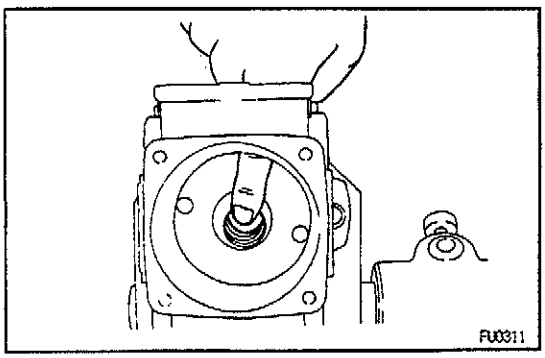
2. **INSTALL FUEL INLET HOLLOW SCREW**
Install a new gasket and the hollow screw.
Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)



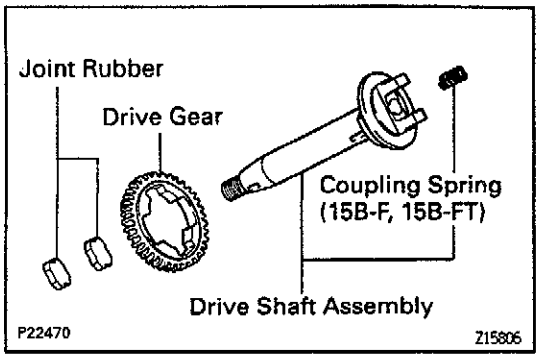
3. **INSTALL REGULATOR VALVE**
(a) Install the 2 O–rings to the regulator valve.
(b) Using SST, install the regulator valve.
SST 09260–54012 (09262–54020)
Torque: 8.8 N·m (90 kgf·cm, 78 in.·lbf)



4. **INSTALL FUEL FEED PUMP**
(a) Install the liner, rotor and 4 blades.
(b) Check that the liner and blades are facing in the correct direction, as shown.
(c) Check that the blades move smoothly.
(d) Align the fuel outlet holes of the cover and liner.
(e) Install the pump cover with the 2 screws.
Torque: 3.0 N·m (31 kgf·cm, 27 in.·lbf)



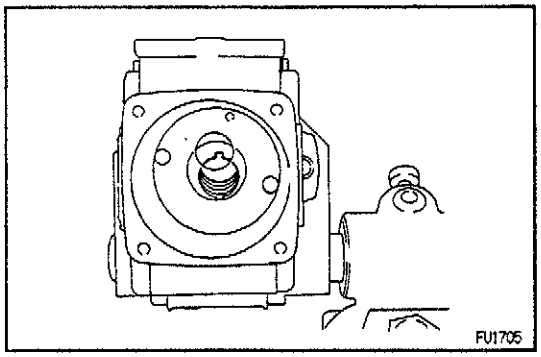
(f) Check that the rotor moves smoothly.



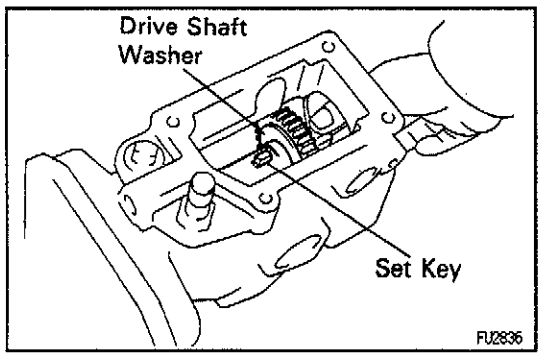
5. INSTALL DRIVE SHAFT

(a) Install the drive gear on the drive shaft assembly as shown.

(b) Install 2 new joint rubbers into the drive gear.

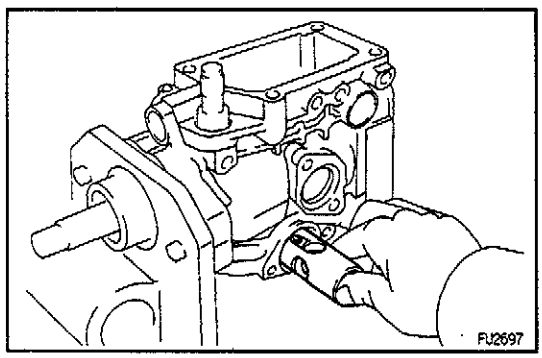


(c) Position the key groove of the feed pump rotor upward.



(d) Install the set key and drive shaft washer on the drive shaft and insert the drive shaft assembly into the pump housing.

(e) Check that the drive shaft turns without catching.

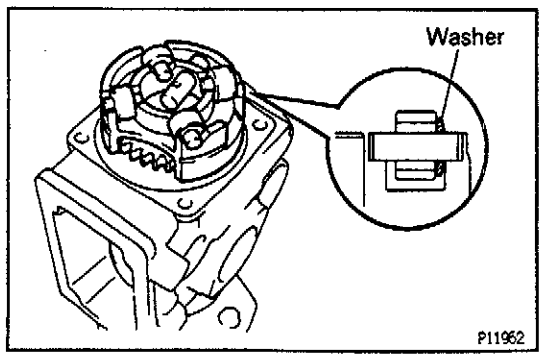


6. INSTALL TIMER PISTON

(a) Apply grease to the timer piston.

(b) Install the sub—piston into the timer piston.

(c) Insert the timer piston into the pump housing.

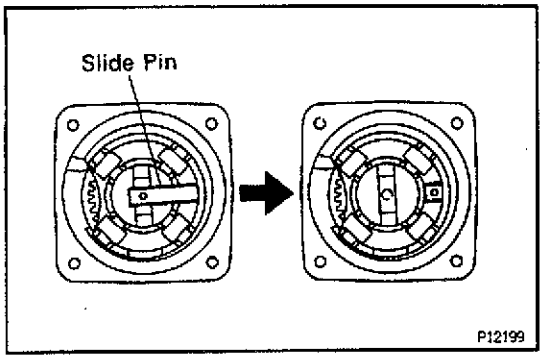


7. INSTALL ROLLER RING

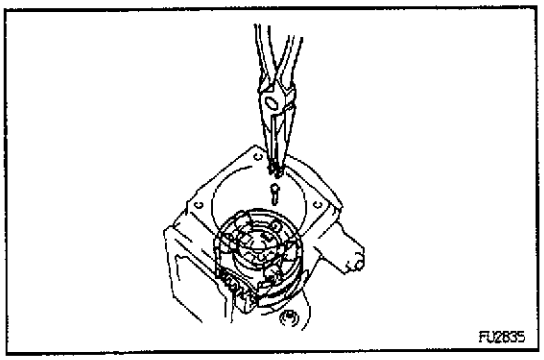
(a) Install the slide pin, 4 rollers and washers on the roller ring.

(b) Check that the roller is facing the flat surface of the washer.

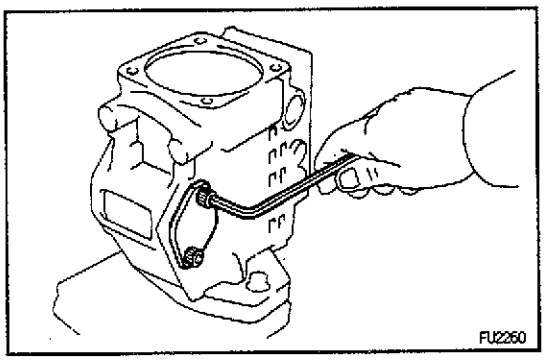
(c) Install the roller ring into the pump housing.



(d) Carefully install the slide pin into the sub–piston.

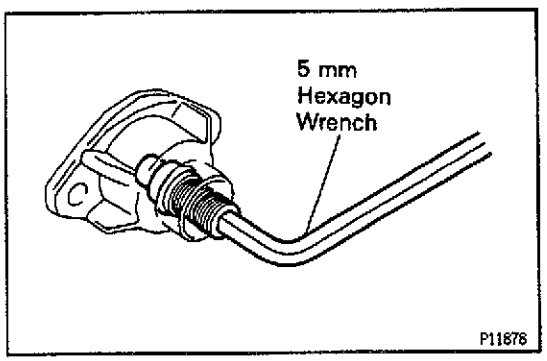


(e) Install the stopper pin and clip.



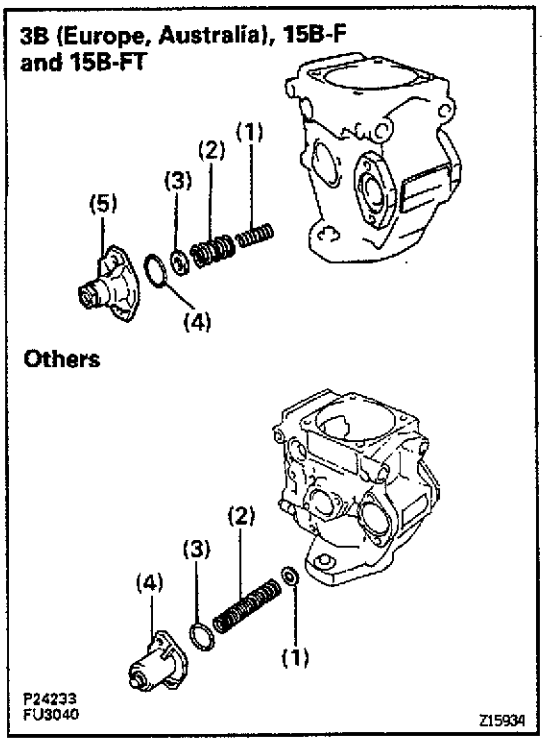
8. INSTALL TIMER SPRING

(a) Using a 5 mm hexagon wrench, install a new O–ring and the RH timer cover with the 2 bolts.



(b) Install a new O–ring to the timer adjusting screw.

(c) Using a 5 mm hexagon wrench, install the timer adjusting screw to the LH timer cover and temporarily install the nut.



(d) Install these parts with the 2 bolts:

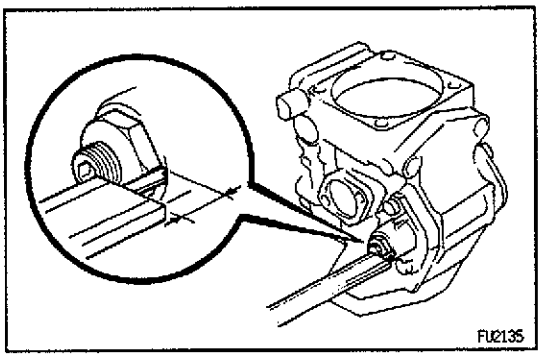
3B (Europe, Australia), 15B–F and 15B–FT:

(1) Inner spring
(2) Outer spring
(3) Shim
(4) New O–ring
(5) LH timer cover, timer adjusting screw and nut assembly

Others:

(1) Timer washer
(2) Timer spring
(3) New O–ring
(4) LH timer cover, timer adjusting screw and nut assembly

EG

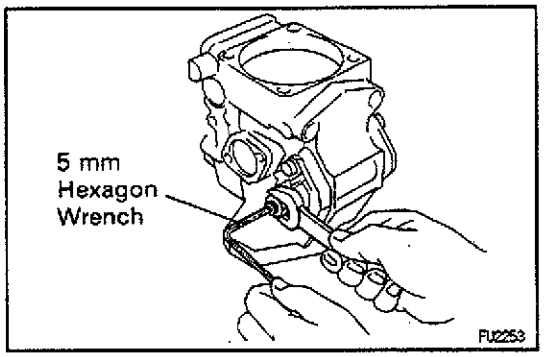


9. PRESET TIMER ADJUSTING SCREW

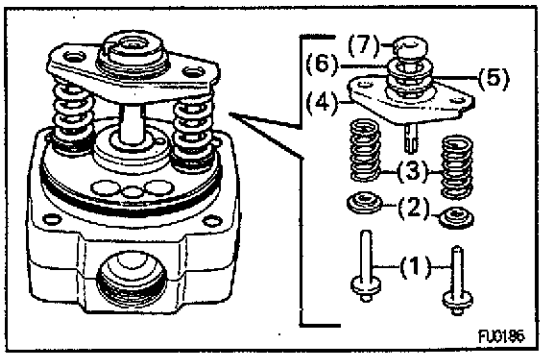
(a) Using vernier calipers, measure the protrusion of the adjusting screw from the timer cover.

Protrusion:

7.5 – 8.0 mm (0.295 – 0.315 in.)



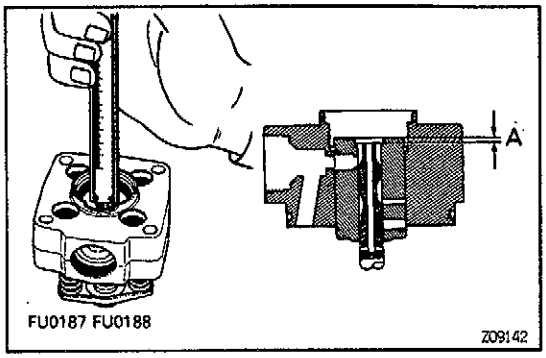
(b) Using a 5 mm hexagon wrench, adjust the protrusion of the adjusting screw from the timer cover.



10. ADJUST PLUNGER SPRING SHIM

(a) Install the following parts to the distributive head:

(1) 2 plunger spring guides
(2) 2 upper spring seats
(3) 2 plunger springs
(4) Lower spring seat
(5) Upper plunger plate
(6) Lower plunger plate
(7) Pump plunger



EG

HINT: Do not assemble the plunger spring shims at this time.

(b) Using vernier calipers, measure clearance A indicated in the illustration.

(c) Determine the plunger spring shim size by using the following formula and chart.

3B (Europe and Australia):

New plunger spring shim thickness = 6.4 – A

A ... Measured plunger position

Plunger spring shim selection chart: **mm (in.)**

Measured clearance	Shim thickness
More than 5.9 (0.232)	0.5 (0.020)
5.6 – 5.8 (0.220 – 0.228)	0.8 (0.031)
5.4 – 5.5 (0.213 – 0.217)	1.0 (0.039)
5.2 – 5.3 (0.205 – 0.209)	1.2 (0.047)
4.9 – 5.1 (0.193 – 0.201)	1.5 (0.059)
4.6 – 4.8 (0.181 – 0.189)	1.8 (0.071)
Less than 4.5 (0.177)	2.0 (0.079)

3B (Others):

New plunger spring shim thickness = 5.4 – A

A ... Measured plunger position

Plunger spring shim selection chart: **mm (in.)**

Measured clearance	Shim thickness
More than 4.9 (0.193)	0.5 (0.020)
4.6 – 4.8 (0.181 – 0.189)	0.8 (0.031)
4.4 – 4.5 (0.173 – 0.177)	1.0 (0.039)
4.2 – 4.3 (0.165 – 0.169)	1.2 (0.047)
3.9 – 4.1 (0.154 – 0.161)	1.5 (0.059)
3.6 – 3.8 (0.142 – 0.150)	1.8 (0.071)
Less than 3.5 (0.138)	2.0 (0.079)

14B:

New plunger spring shim thickness = 5.9 – A

A ... Measured plunger position

Plunger spring shim selection chart: **mm (in.)**

Measured clearance	Shim thickness
More than 5.4 (0.213)	0.5 (0.020)
5.1 – 5.3 (0.201 – 0.209)	0.8 (0.031)
4.9 – 5.0 (0.193 – 0.197)	1.0 (0.039)
4.7 – 4.8 (0.185 – 0.189)	1.2 (0.047)
4.4 – 4.6 (0.173 – 0.181)	1.5 (0.059)
4.1 – 4.3 (0.161 – 0.169)	1.8 (0.071)
Less than 4.0 (0.157)	2.0 (0.079)

15B–F, 15B–FT:

New plunger spring shim thickness = 7.1 – A

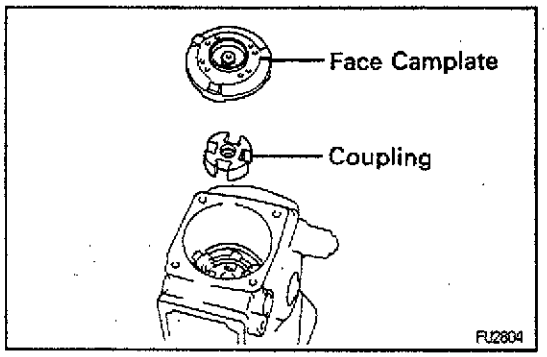
A ... Measured plunger position

Plunger spring shim selection chart: mm (in.)

Measured clearance	Shim thickness
More than 6.6 (0.260)	0.5 (0.020)
6.3 – 6.5 (0.248 – 0.256)	0.8 (0.031)
6.2 (0.244)	0.9 (0.035)
6.1 (0.240)	1.0 (0.039)
6.0 (0.236)	1.1 (0.043)
5.9 (0.232)	1.2 (0.047)
5.8 (0.228)	1.3 (0.051)
5.7 (0.224)	1.4 (0.055)
5.6 (0.220)	1.5 (0.059)
5.3 – 5.5 (0.209 – 0.217)	1.8 (0.071)
Less than 5.2 (0.205)	2.0 (0.079)

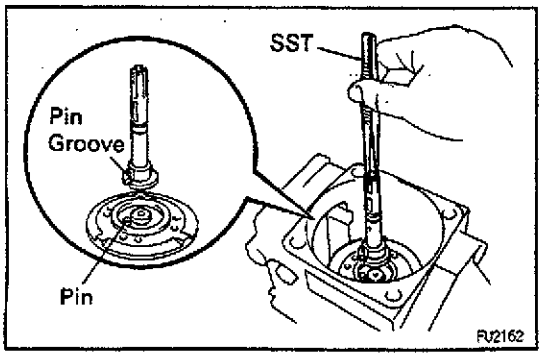
HINT:

- For a measurement between listed sizes, use the next larger size. Ex. If thickness is 1.6 mm (0.063 in.) by calculation, use a 1.8 mm (0.071 in.) shim.
- Select 2 shims which have the same thickness.



11. ADJUST PLUNGER ADJUSTING SHIM

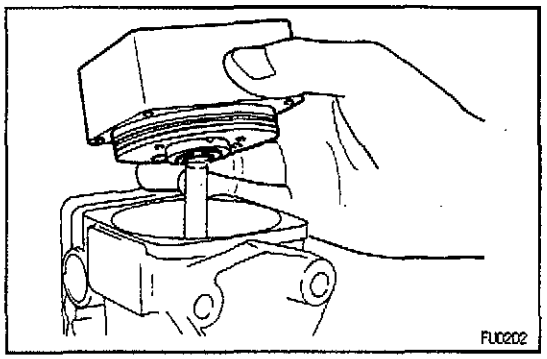
(a) Install the coupling and face camplate.
HINT (3B, 14B): Do not assemble the coupling spring.



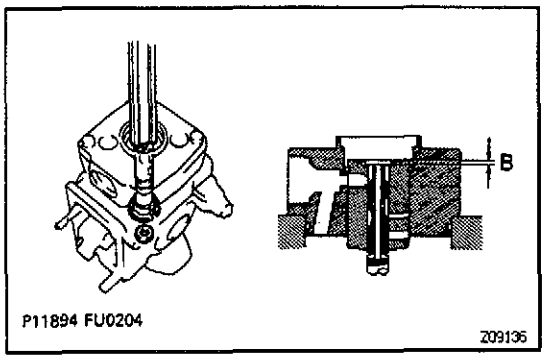
(b) Clean the plunger adjusting shim and contacting surface area.

(c) Align the pin groove of the pump plunger with the face camplate pin.

(d) Using SST, install the used plunger adjusting shim and pump plunger.
SST 09260–54012 (09269–54030)



(e) Install the distributive head with the 4 bolts.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)
NOTICE: Be careful not to damage the pump plunger.



(f) Using vernier calipers, measure dimension B indicated in the illustration.

(g) Determine the plunger adjusting shim size by using the following formula and chart.
3B, 14B:
New adjusting shim thickness = T + (B – 3.3)
T ... Thickness of used shim
B ... Measured plunger position

Plunger adjusting shim selection chart

Installed shim mm	Measured clearance mm																			
	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2 – 3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4
1.9											2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	2.9
2.0									1.9		2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	2.9	
2.1								1.9	1.9		2.3	2.4	2.5	2.6	2.7	2.8	2.9	2.9		
2.2							1.9	1.9	2.0		2.4	2.5	2.6	2.7	2.8	2.9	2.9			
2.3						1.9	1.9	2.0	2.1		2.5	2.6	2.7	2.8	2.9	2.9				
2.4					1.9	1.9	2.0	2.1	2.2		2.6	2.7	2.8	2.9	2.9					
2.5				1.9	1.9	2.0	2.1	2.2	2.3		2.7	2.8	2.9	2.9						
2.6			1.9	1.9	2.0	2.1	2.2	2.3	2.4		2.8	2.9	2.9							
2.7		1.9	1.9	2.0	2.1	2.2	2.3	2.4	2.5		2.9	2.9								
2.8	1.9	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6		2.9									
2.9	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7											

Plunger adjusting shim thickness mm (in.)	1.9 (0.075)	2.0 (0.079)	2.1 (0.083)	2.2 (0.087)	2.3 (0.091)	2.4 (0.094)	2.5 (0.098)	2.6 (0.102)	2.7 (0.106)	2.8 (0.110)	2.9 (0.114)

V03690

EXAMPLE: The 2.4 mm (0.094 in.) shim is installed and measured clearance is 3.7 mm (0.146 in.). Replace the 2.4 mm (0.094 in.) shim with a 2.8 mm (0.110 in.) shim.

15B–F, 15B–FT:

New adjusting shim thickness = T + (B – 3.5)

T ... Thickness of used shim

B ... Measured plunger position

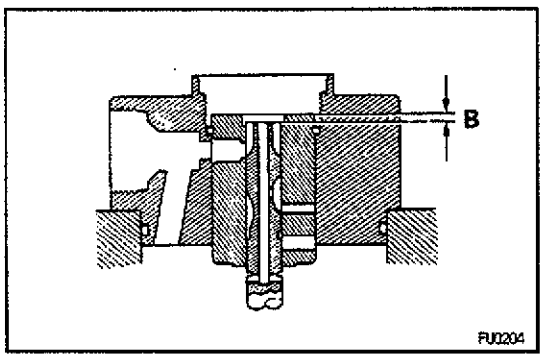
Plunger adjusting shim selection chart

Installed shim mm	Measured clearance mm																		
	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4 – 3.6	3.7	3.8	**3.9**	4.0	4.1	4.2	4.3	4.4	4.5
1.9											2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9
2.0											2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	
2.1									1.9		2.3	2.4	2.5	2.6	2.7	2.8	2.9		
2.2								1.9	2.0		2.4	2.5	2.6	2.7	2.8	2.9			
2.3							1.9	2.0	2.1		2.5	2.6	2.7	2.8	2.9				
2.4						1.9	2.0	2.1	2.2		2.6	2.7	**2.8**	2.9					
2.5					1.9	2.0	2.1	2.2	2.3		2.7	2.8	2.9						
2.6				1.9	2.0	2.1	2.2	2.3	2.4		2.8	2.9							
2.7			1.9	2.0	2.1	2.2	2.3	2.4	2.5		2.9								
2.8		1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6										
2.9	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7										

Plunger adjusting shim thickness mm (in.)	1.9 (0.075)	2.0 (0.079)	2.1 (0.083)	2.2 (0.087)	2.3 (0.091)	2.4 (0.094)	2.5 (0.098)	2.6 (0.102)	2.7 (0.106)	2.8 (0.110)	2.9 (0.114)

T V06936

EXAMPLE: The 2.4 mm (0.094 in.) shim is installed and measured clearance is 3.9 mm (0.154 in.). Replace the 2.4 mm (0.094 in.) shim with a 2.8 mm (0.110 in.) shim.



(h) Install a new plunger adjusting shim and recheck dimension B.

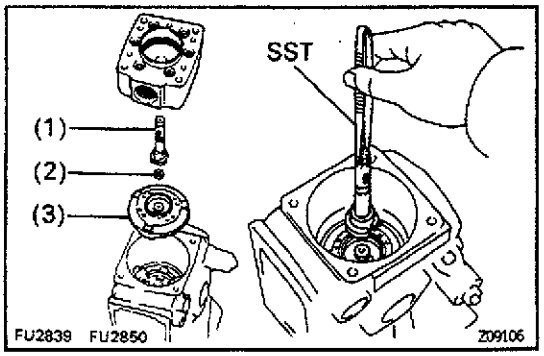
Dimension B:

3B, 14B:

3.2 – 3.4 mm (0.126 – 0.134 in.)

15B–F, 15B–FT:

3.4 – 3.6 mm (0.134 – 0.142 in.)



(i) Remove the distributive head.

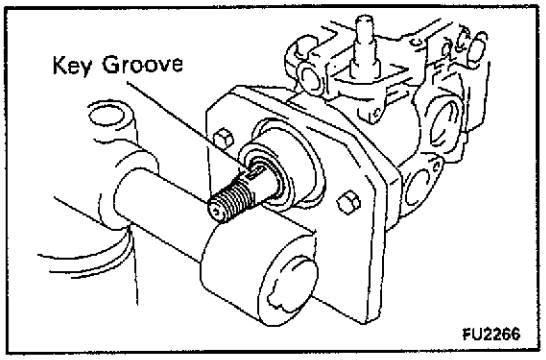
(j) Using SST, remove the following parts:

(1) Pump plunger

(2) Plunger adjusting shim

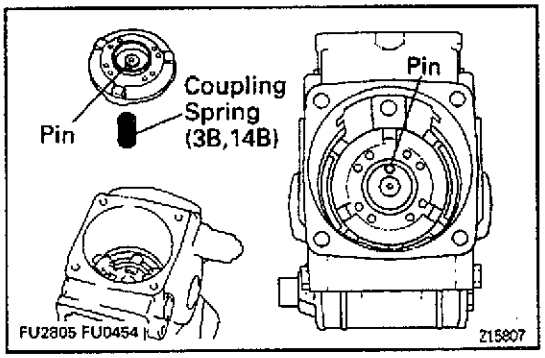
(3) Face camplate

SST 09260–54012 (09269–54030)



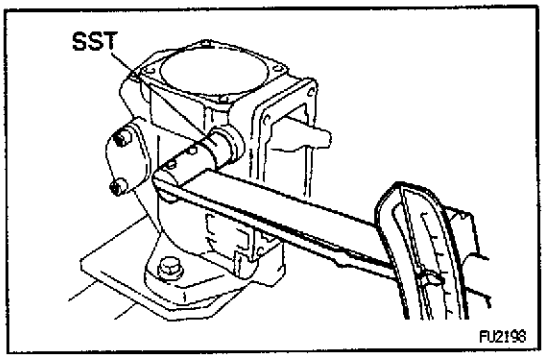
12. INSTALL FACE CAMPLATE

(a) Face the drive shaft with the key groove facing upward.



(b) 3B, 14B:
Install the coupling spring and camplate with the camplate pin facing the governor cover side.

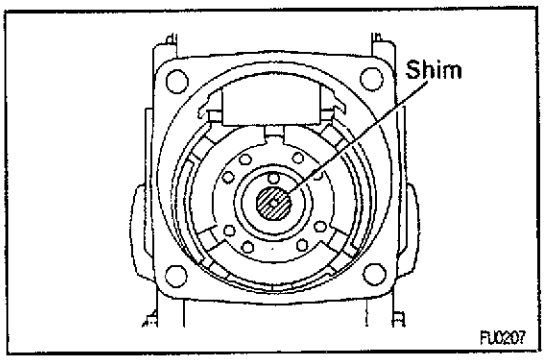
(c) 15B–F, 15B–FT:
Install the camplate with the camplate pin facing the governor cover side.



13. INSTALL GOVERNOR LINK

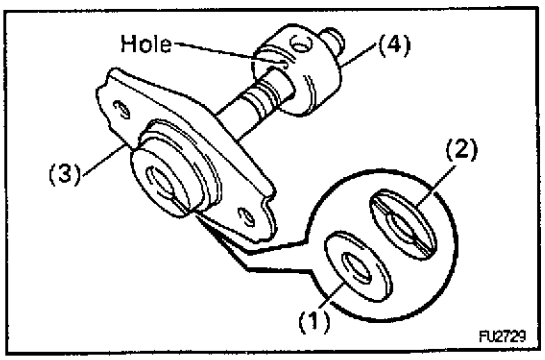
(a) Using SST, install the governor link with 2 new gaskets and the 2 support bolts.
Torque: 11 N·m (115 kgf·cm, 8 ft·lbf)
SST 09260–54012 (09269–54040)

(b) Check that the governor link moves smoothly.

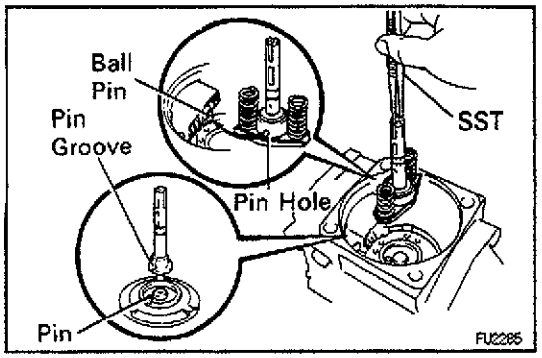


14. INSTALL PUMP PLUNGER

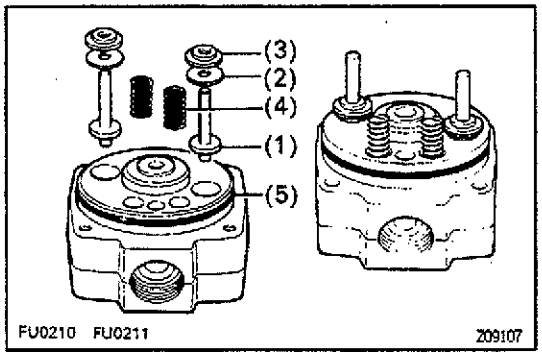
(a) Place the selected new plunger adjusting shim on the center of the camplate.
NOTICE: Do not apply grease to the shim.



(b) Install the following parts to the pump plunger:
(1) Lower plunger plate
(2) Upper plunger plate
(3) Lower spring seat
(4) Spill ring
HINT: Face the spill ring with the hole facing the lower spring seat.

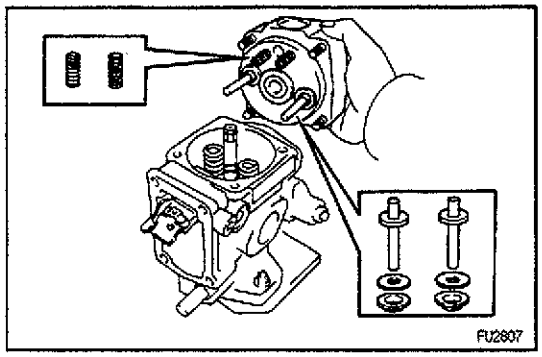


(c) Align the pin groove of the plunger with the pin of the face camplate.
(d) Align the ball pin of the governor link with the pin hole of the spill ring.
(e) Using SST, install the pump plunger and 2 plunger springs.
SST 09260–54012 (09269–54030)

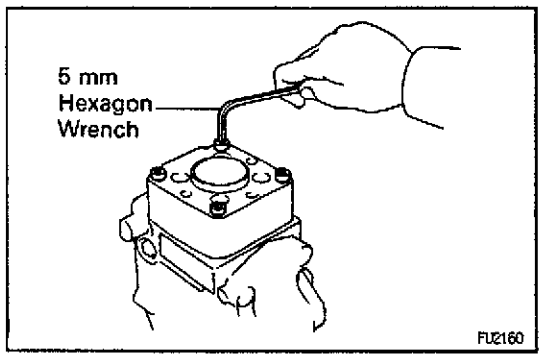


15. INSTALL DISTRIBUTIVE HEAD

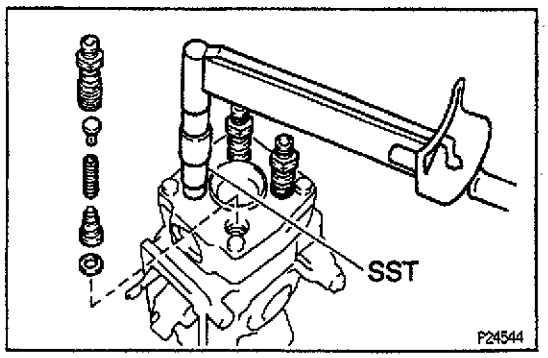
(a) Apply grease to the following parts and install them to the distributive head:
(1) 2 plunger spring guides
(2) 2 new selected plunger spring shims
(3) 2 upper spring seats
(4) 2 lever support springs
(5) New O–ring



(b) Install the distributive head.
NOTICE: Be careful not to damage the pump plunger.

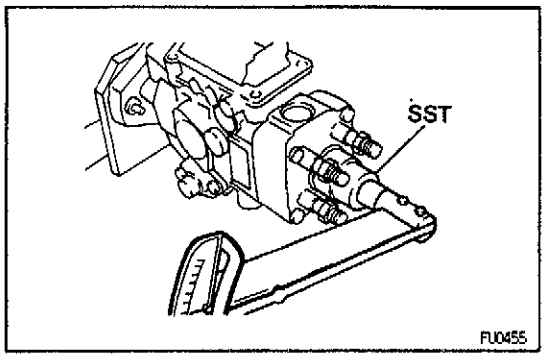


(c) Using a 5 mm hexagon wrench, install the 4 bolts.
Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)
HINT: Use the bolt which is 45 mm (1.77 in.) in length.



16. w/o CPV:
INSTALL DELIVERY VALVE HOLDERS

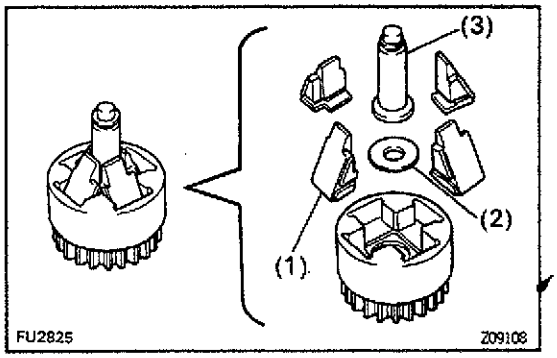
(a) Install new gaskets and the valves into the distributive head.
(b) Install the springs into the delivery valve holders.
(c) Using SST, install the delivery valve holders.
SST 09260–54012 (09269–54020)
Torque: 59 N·m (600 kgf·cm, 43 ft·lbf)



17. INSTALL DISTRIBUTIVE HEAD PLUG

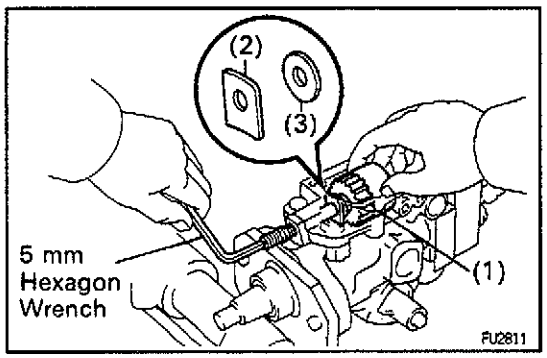
(a) Install a new O–ring to the head plug.

(b) Using SST, install the head plug.
SST 09260–54012 (09262–54010)
Torque: 88 N·m (900 kgf·cm, 65 ft·lbf)



18. INSTALL GOVERNOR SHAFT AND FLYWEIGHT HOLDER

(a) Install the following parts to the flyweight holder:
(1) 4 flyweight
(2) No.2 flyweight washer
(3) Governor sleeve
HINT: Replace the 4 flyweights as a set.

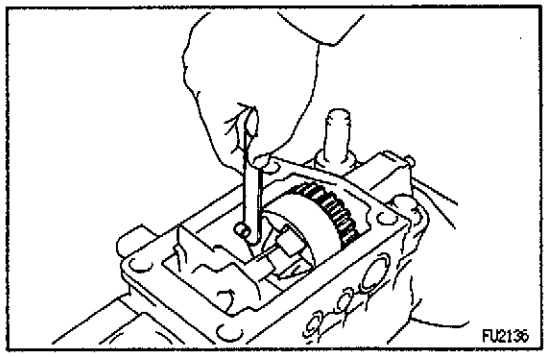


(b) Install a new O–ring to the governor shaft.

(c) Place the flyweight holder assembly (1) in position, and install the governor gear adjusting washer (2) and No. 1 flyweight washer (3) between the flyweight holder and pump housing.

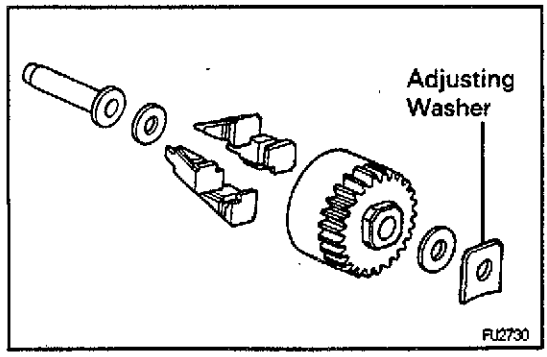
(d) Install the governor shaft through the governor gear adjusting washer, No. 1 flyweight washer and flyweight holder assembly.

(e) Using a 5 mm hexagon wrench, turn the governor shaft counterclockwise.
HINT: The governor shaft has LH threads.

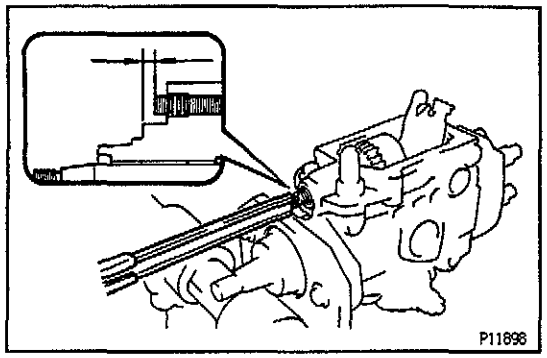


19. CHECK FLYWEIGHT HOLDER THRUST CLEARANCE

Using a thickness gauge, measure the thrust clearance between the housing pin and flyweight holder.
Thrust clearance:
0.15 – 0.35 mm (0.0059 – 0.0138 in.)



If the thrust clearance is not as specified, adjust with a governor gear adjusting washer.
Governor gear adjusting washer thickness:
1.05 mm (0.0413 in.)
1.25 mm (0.0492 in.)
1.45 mm (0.0571 in.)
1.65 mm (0.0650 in.)
1.85 mm (0.0728 in.)



20. ADJUST PROTRUSION OF GOVERNOR SHAFT

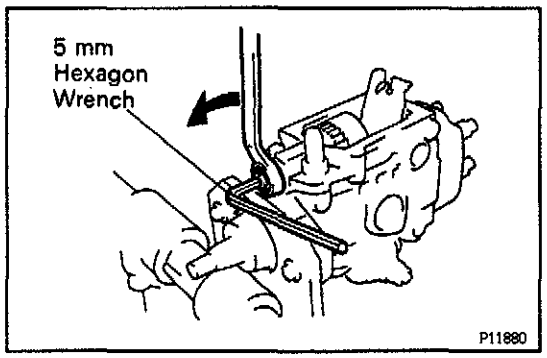
(a) Using vernier calipers, measure the protrusion of the governor shaft.

Protrusion:

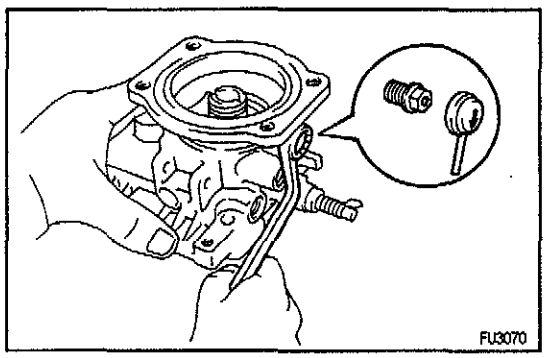
0.5 – 2.0 mm (0.020 – 0.079 in.)

If the protrusion is not as specified, adjust by turning the governor shaft.

HINT: The governor cover shaft has LH threads.



(b) Install and tighten the nut while holding the governor shaft with a 5 mm hexagon wrench.

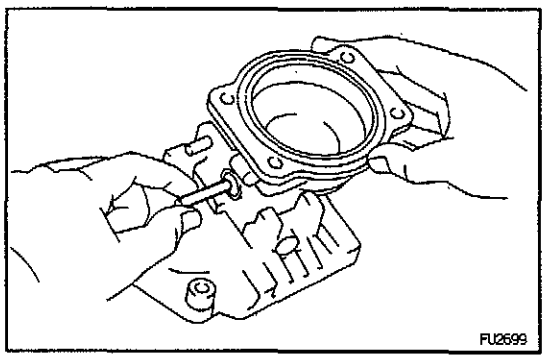


21. ASSEMBLE BOOST COMPENSATOR (15B–FT) OR HIGH ALTITUDE COMPENSATOR (w/ HAC)

A. Install overflow screw

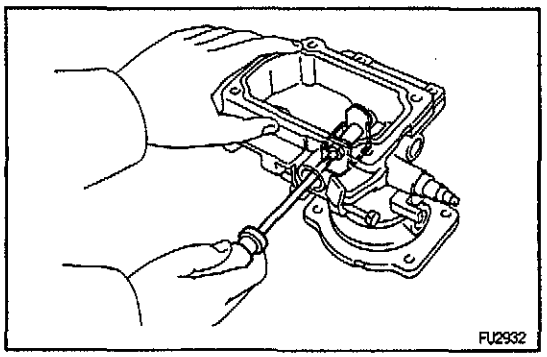
(a) Install the overflow screw.

(b) Install the rubber cap facing the arrow downward.

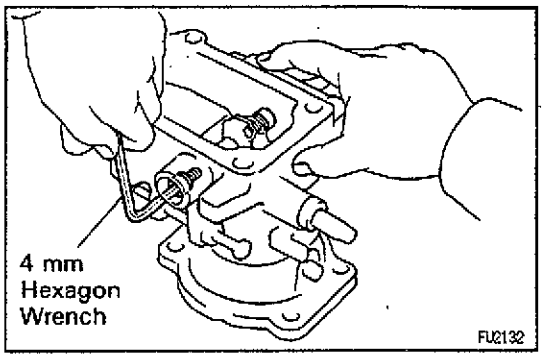


B. Install control lever

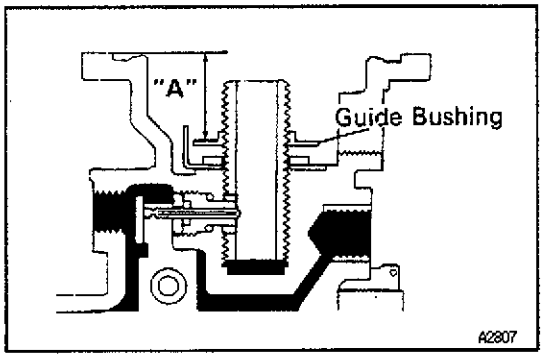
(a) Insert the connecting pin into the governor cover.



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



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



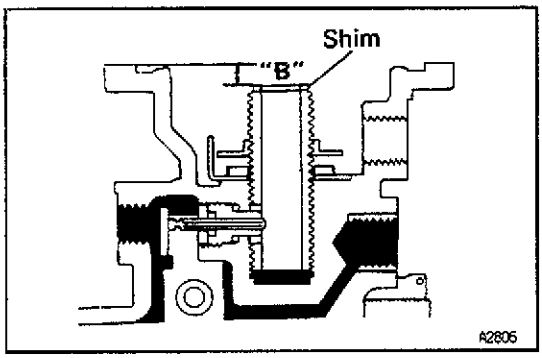
C. 15B–FT:

Install guide bushing

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.)



D. 15B–FT:

Install boost compensator diaphragm

(a) Adjust boost compensator shim(s).

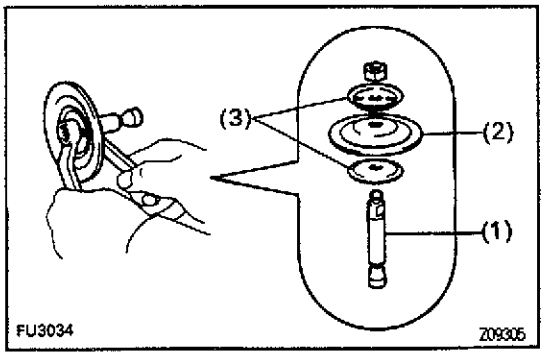
- Place the shim on the guide bushing.
- Using vernier calipers, measure the dimension "B" as shown in the illustration.

Dimension "B":

6.8 – 8.0 mm (0.268 – 0.315 in.)

If the dimension is not within specification, select and install the correct shim.

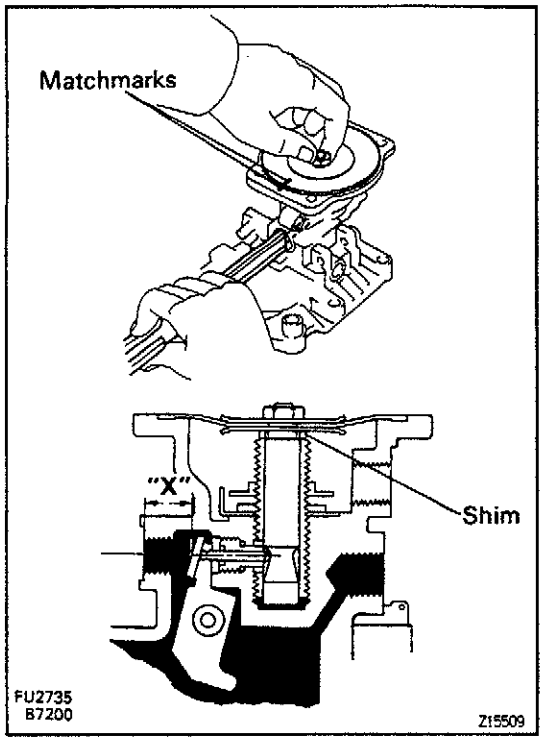
HINT: Shim are available in sized in increments 0.2 mm (0.008 in.), from 1.1 mm (0.043 in.) to 3.3 mm (0.130 in.).



(b) Assemble these parts with the nut.

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

(1) Push rod
(2) Diaphragm
(3) 2 spring seats



(c) Adjust the installation direction of boost compensator diaphragm assembly.

- Install the shim and diaphragm assembly.

HINT: Do not assemble the spring.

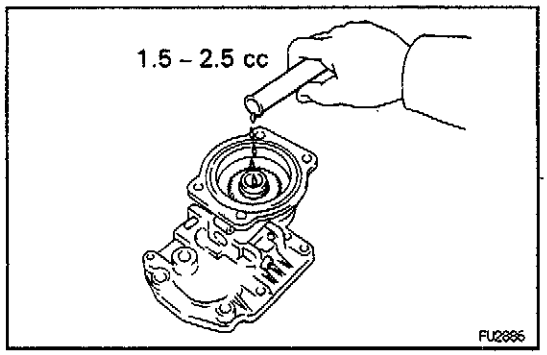
- While pushing on the diaphragm, using vernier calipers, measure the dimension "X" as shown in the illustration.

Dimension "X":

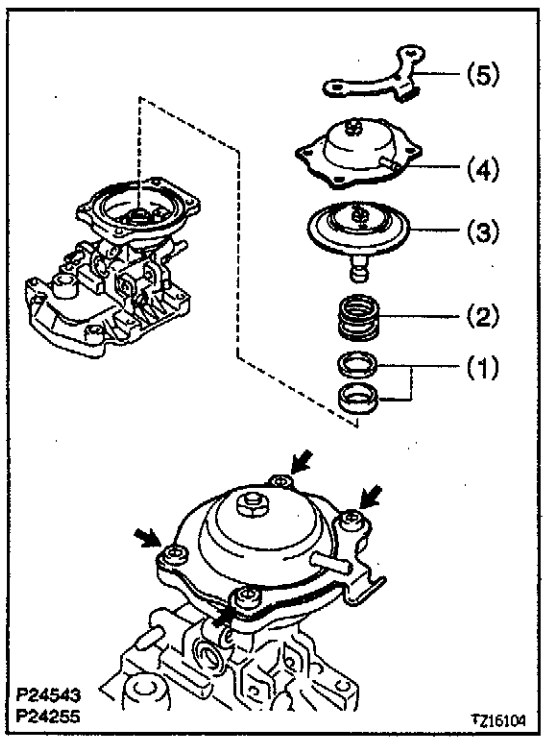
7.7 – 7.8 mm (0.303 – 0.307 in.)

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.

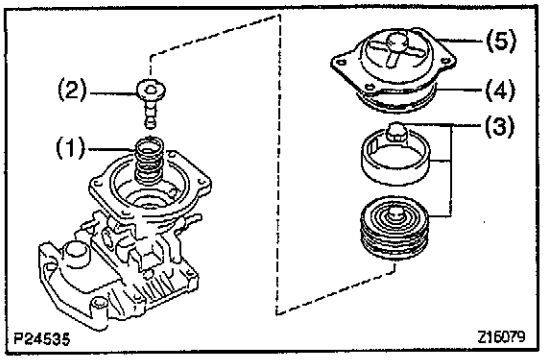


(d) Insert 1.5 – 2.5 cc (0.09 – 0.15 cu in.) of engine oil into the bushing hole.



(e) Using a 5 mm hexagon wrench, install these parts to the governor cover with the 4 bolts:

(1) Shim(s)
(2) Spring
(3) Diaphragm assembly
(4) Diaphragm cover
(5) Fuel outlet pipe clamp

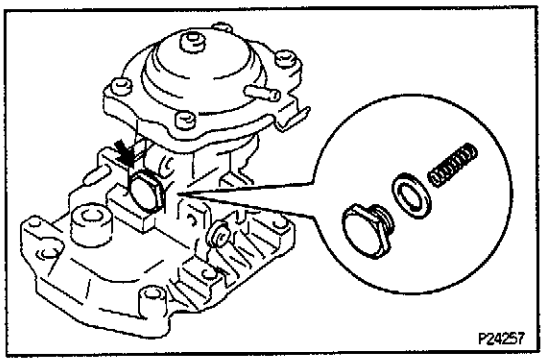


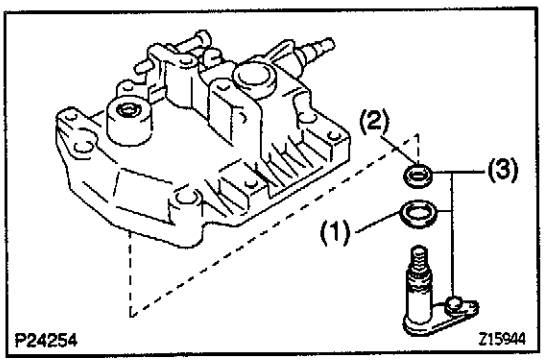
E. **w/ HAC:**
Install pneumatic bellows

(a) Insert 3 – 4 cc (0.18 – 0.24 cu in.) of engine oil into the bushing hole.

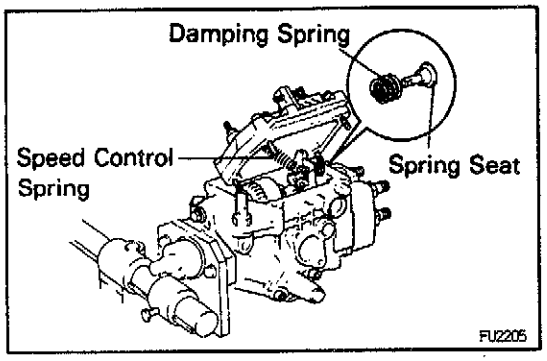
(b) Using a 5 mm hexagon wrench, install these parts to the governor cover with the 4 bolts:
(1) Pneumatic bellows spring
(2) Push rod
(3) Pneumatic bellows and 2 rubber caps assembly
(4) New gasket
(5) Pneumatic bellows cover

F. **Install lever control spring**
Install the lever control spring with a new gasket and the bolt.

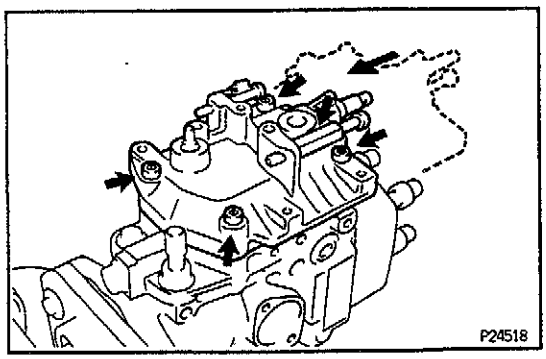




22. INSTALL ADJUSTING LEVER SHAFT TO GOVERNOR SHAFT
Install these parts to the governor cover:
(1) Washer
(2) New O–ring
(3) Adjusting lever shaft, O–ring and plate washer assembly

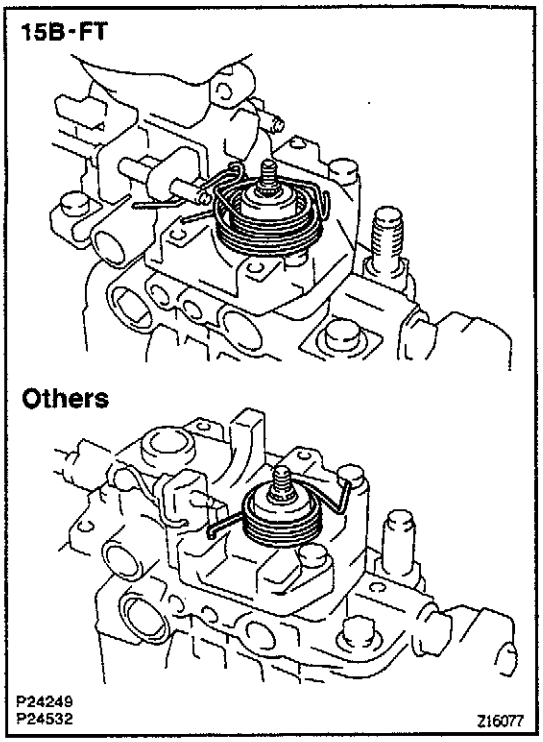


23. INSTALL GOVERNOR COVER
(a) Install a new gasket to the groove of the governor cover.
(b) Install the speed control spring to the adjusting shaft.
(c) Install the damper spring and spring seat, and connect the speed control spring to the spring seat.



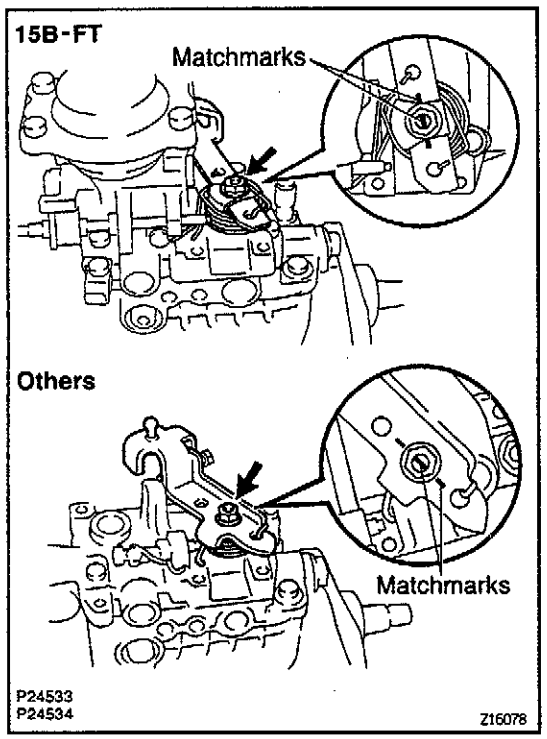
(d) Slide the governor cover forward.
(e) Using a 5 mm hexagon wrench, install the governor cover with the 4 bolts.
Torque: 8.3 N·m (85 kgf·cm, 74 in.·lbf)
HINT: Use the bolt which is 35 mm (1.38 in.) length.

(f) Install the idle speed adjusting screw with the lock nut.



24. INSTALL ADJUSTING LEVER

(a) Place the 2 return springs (15B–FT) or return spring (Others) on the governor cover as shown in the illustration.

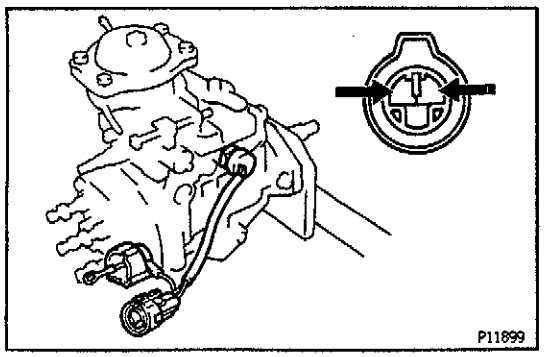


(b) Hook the return springs to the adjusting lever, and turn and place the adjusting lever on the governor shaft as shown in the illustration.

(c) Align the lines of the adjusting lever shaft and adjusting lever.

(d) 15B–FT:
Insert the spring guide between the return springs.

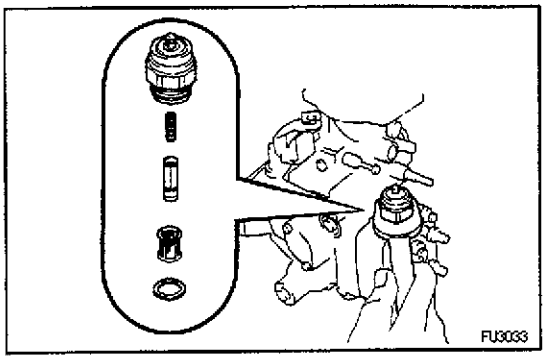
(e) Install the nut.
Torque: 8.3 N·m (85 kgf·cm, 74 in.·lbf)



25. INSTALL PICKUP SENSOR

(a) Connect the sensor lead wires to the connector.

(b) Install a new O–ring and pickup sensor.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

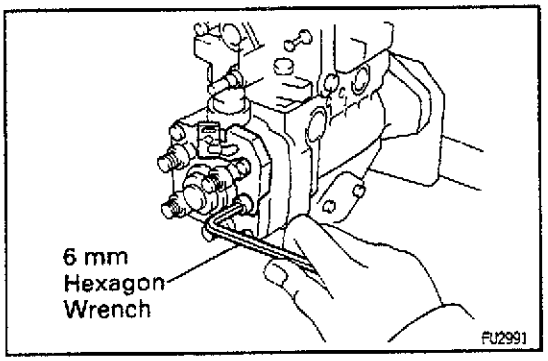


26. INSTALL FUEL CUT SOLENOID

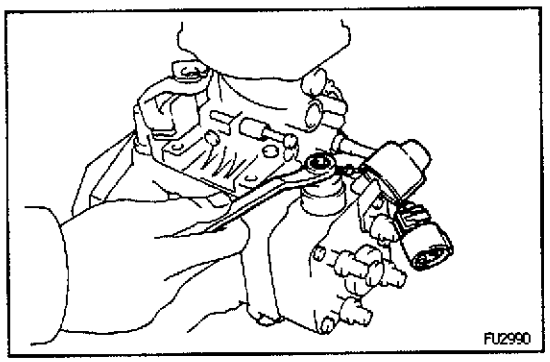
(a) Install a new O–ring on the fuel cut solenoid.

(b) Install the wave washer, strainer, valve, spring and fuel cut solenoid.

Torque: 22 N·m (225 kgf·cm, 16 ft·lbf)



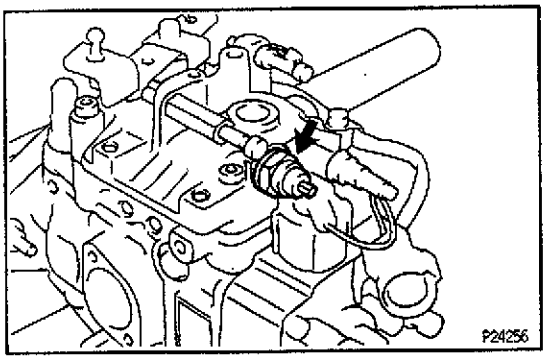
(c) Using a 6 mm hexagon wrench, install the connector bracket with the bolt.



(d) Install the lead wire to the fuel cut solenoid with the nut.

(e) Install the dust cover to the fuel cut solenoid.

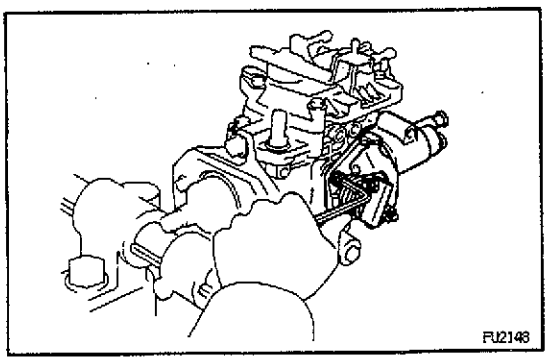
(f) Install the lead wire connector to bracket.



27. INSTALL DASH POT

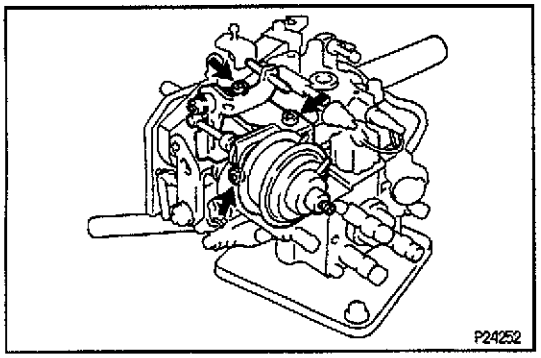
Install a new gasket and the dash pot.

Torque: 11 N·m (115 kgf·cm, 8 ft·lbf)



28. INSTALL THERMO WAX

Install a new O–ring and the thermo wax with the 2 bolts.



29. INSTALL IDLE–UP ACTUATOR AND LEVER

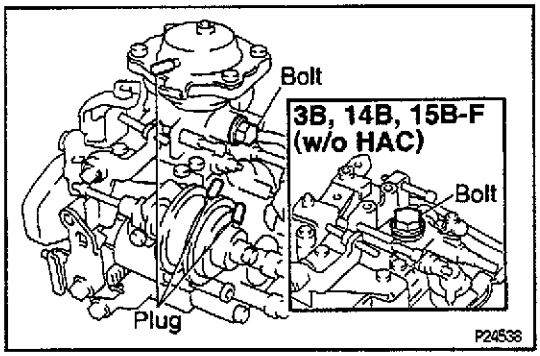
(a) Set the adjusting lever to maximum position.

(b) Using a 5 mm hexagon wrench, install the collar, the idle–up actuator and lever assembly with the 3 bolts. Alternately tighten the bolts in several passes.

30. REMOVE INJECTION PUMP FROM SST (STAND)

SST 09241–76022 and 09245–54010

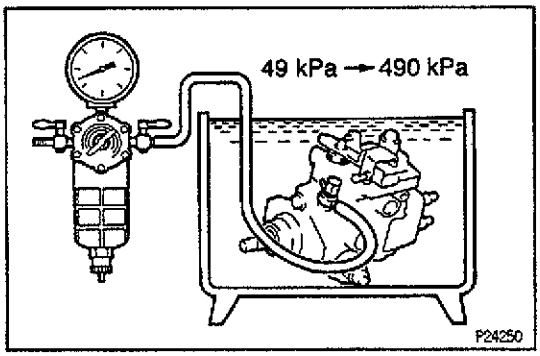
EG



31. PERFORM AIR TIGHT TEST

(a) Install a bolt to the overflow port.

(b) Install the plug to each port of the boost compensator (15B–FT) and idle–up actuator (BU).



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

(d) Apply 49 kPa (0.5 kgf/cm², 7 psi) of pressure and confirm that there are no leaks.

(e) Next check that there are no leaks with 490 kPa (5.0 kgf/cm², 71 psi) of pressure applied.

32. INSTALL SET KEY OF INJECTION PUMP DRIVE PULLEY ON DRIVE SHAFT

EG

INJECTION PUMP ADJUSTMENT

1. PRE–TEST CHECK AND PREPARATION

(a) The specifications for test nozzle and nozzle holders are as follows.

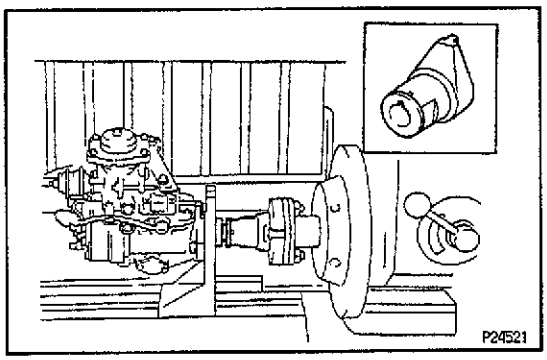
Test nozzle:

DN12SD12 (NIPPONDENSO)

Test nozzle opening pressure:

14,510 – 14,910 kPa

(148 – 152 kgf/cm², 2,105 – 2,162 psi)



(b) Check the accuracy of the tachometer.

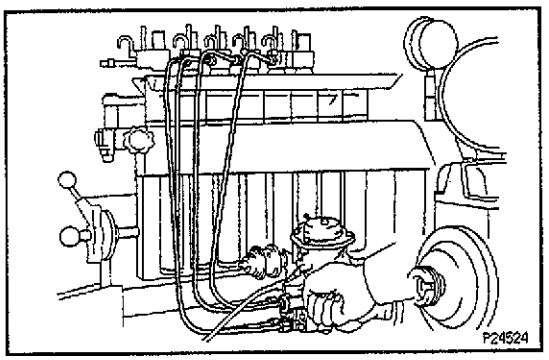
Allowable error:

± 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 the following specifications.

Outer diameter:

6.0 mm (0.236 in.)

Inner diameter:

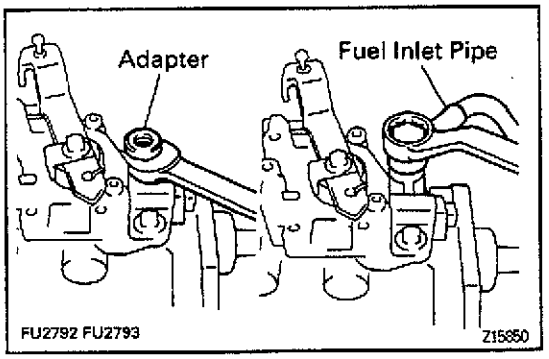
2.0 mm (0.079 in.)

Length:

840 mm (33.07 in.)

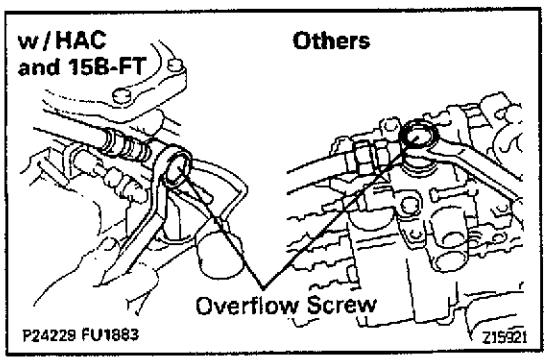
Minimum bending radius:

25 mm (0.98 in.) or more



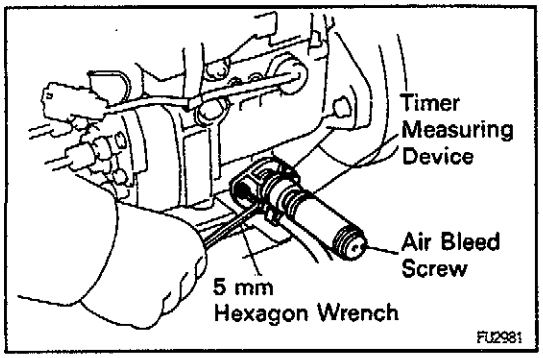
(f) Remove the fuel inlet hollow screw.

(g) Connect the fuel inlet pipe with an adapter.



(h) Install an overflow hose with 2 new gaskets and union bolt.

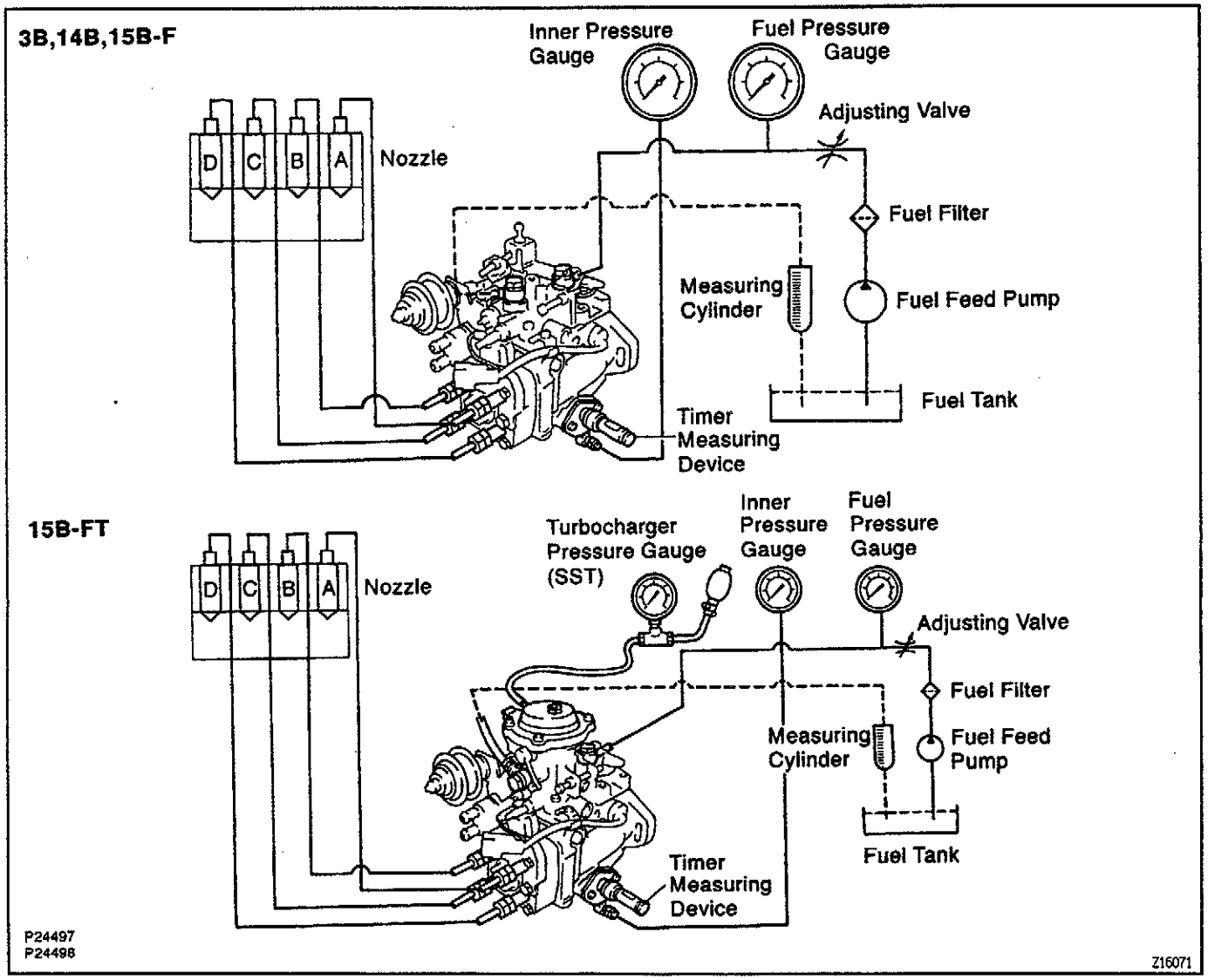
HINT: Always use the overflow screw installed on the pump to be adjusted.

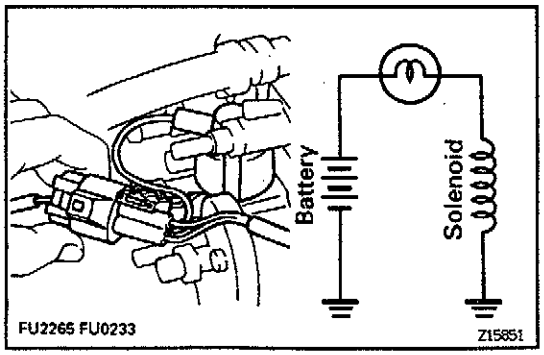


(i) Using a 5 mm hexagon wrench, remove the 2 bolts and RH timer cover.

(j) Install the inner pressure gauge with the timer measuring device.
Part No. 95095–10231 and 95095–10480 (NIPPONDENSO)
HINT: Bleed the air by the air bleed screw.

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





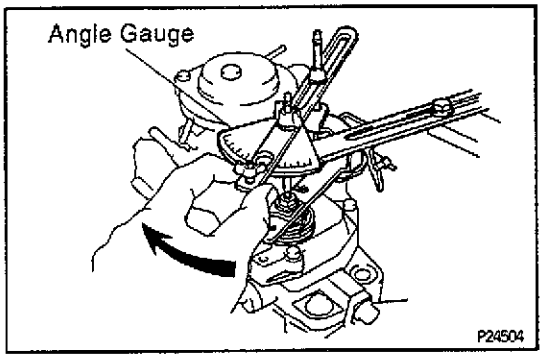
(l) Apply about 6 or 12 volts of DC power to the fuel cut solenoid.
NOTICE:

- **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: For a 12 V or 24 V battery, connect the battery through a 10 or 12 W bulb.

(m) The pressure for feeding fuel to the injection pump should be 20 kPa (0.2 kgf/cm², 2.8 psi). The fuel temperature for pump testing should be 40 – 45°C (104 – 113°F).

EG

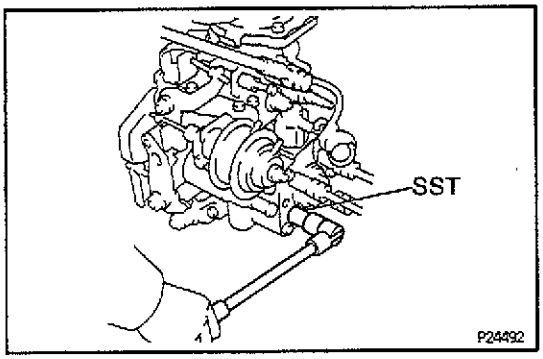


(n) Install an angle gauge to the stand and set it to the adjusting lever.
Part No. 95095–10360 (Stand w/ angle gauge)

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

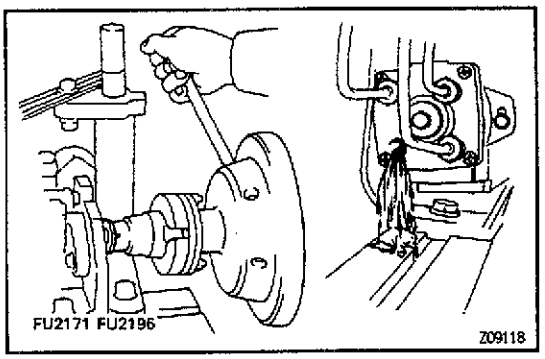
(p) Check the installation direction of the camplate as follows:

- Disconnect the injection pipe from the position marked "C" on the distributive head.



- Using SST, remove the delivery valve holder.

SST 09260–54012 (09269–54020)

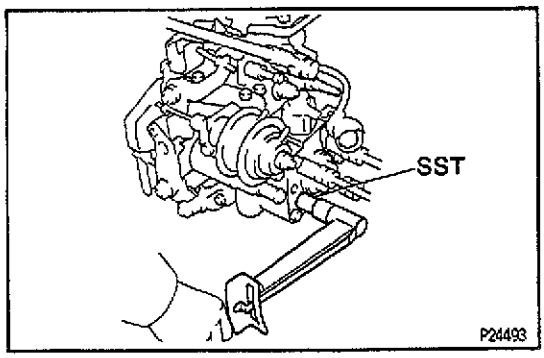


- Check that fuel is flowing out when the mark is in the position shown in the illustration.

If not, it is improperly assembled.

- Disassemble and change the camplate position 180° in the opposite direction.

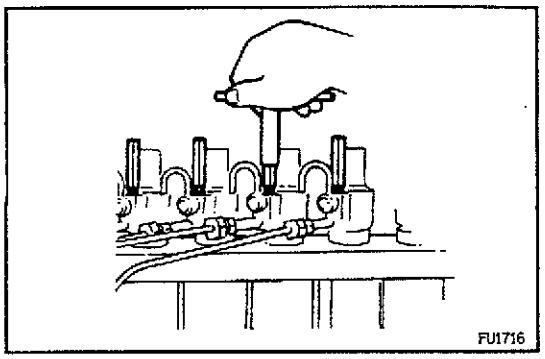
HINT: At this time, disconnect the fuel cut solenoid wire harness.



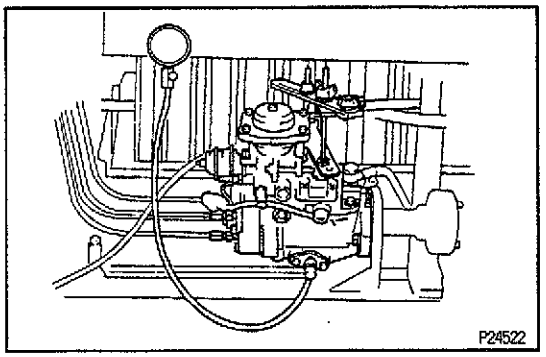
- Using SST, install the delivery valve holder.

SST 09260–54012 (09269–54020)
Torque: 59 N·m (600 kgf·cm, 43 ft·lbf)

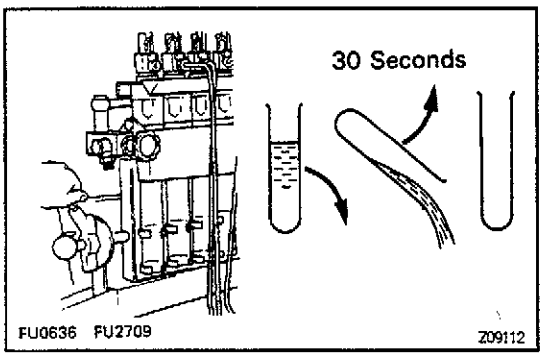
- Connect the injection pipe.



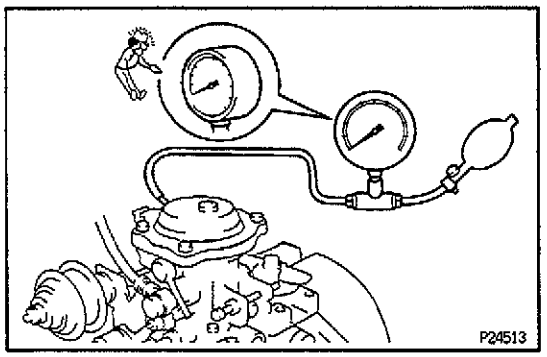
(q) Bleed the air from the injection pipes.



(r) Race the injection pump for 5 minutes at 1,200 rpm.
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. 15B–FT:
CHECK BOOST COMPENSATOR FOR AIR TIGHTNESS

(a) Apply 98 kPa (1.00 kgf/cm², 14.2 psi) of pressure to the boost compensator.

(b) Measure the time it takes for pressure to drop to 95 kPa (0.97 kgf/cm², 13.8 psi).
Pressure drop:
10 seconds or more

3. PRE–SET FULL LOAD INJECTION VOLUME

(a) Set the adjusting lever to maximum position.

(b) w/ HAC:
Apply 97.3 ± 0.2 kPa (730 ± 1.5 mmHg, 28.74 ± 0.06 in.Hg) absolute pressure.

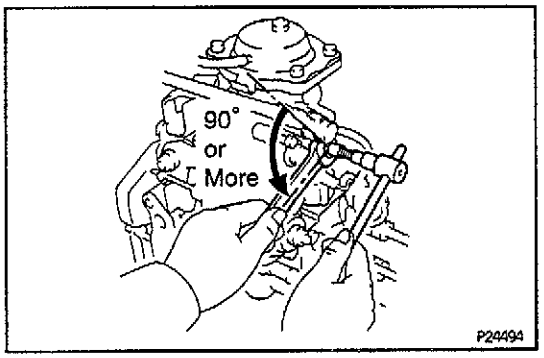
(c) 15B–FT:
Apply 33.4 kPa (0.34 kgf/cm², 4.9 psi) of pressure to the boost compensator.

(d) Measure the injection volume.

Item		Pump rpm	No.of measuring strokes	Each injection volume cc (cu in.)
3B	Europe, Australia	1,100	200	12.23 - 12.57 (0.75 - 0.77)
	Others			11.33 - 11.67 (0.69 - 0.71)
14B	Hong Kong, Taiwan Algeria			11.36 - 11.84 (0.69 - 0.72)
	China, Others (w/o HAC)			13.75 - 14.35 (0.84 - 0.88)
	Others (w/ HAC)			13.15 - 13.75 (0.80 - 0.84)
15B - F		1,000		17.50 - 18.10 (1.07 - 1.10)
15B - FT		900		13.90 - 14.50 (0.85 - 0.88)

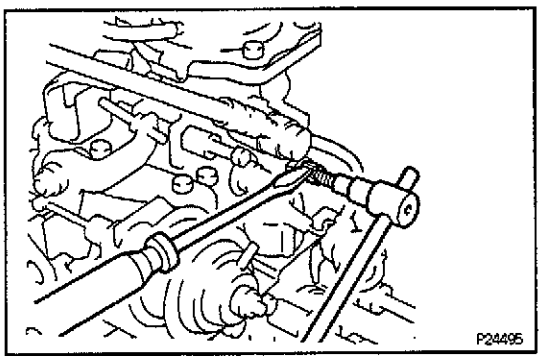
V06917

EG



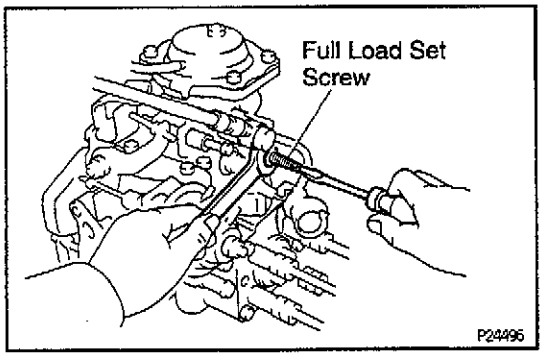
(e) w/ Collar seal type:
Remove the collar seal as follows:

- 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.

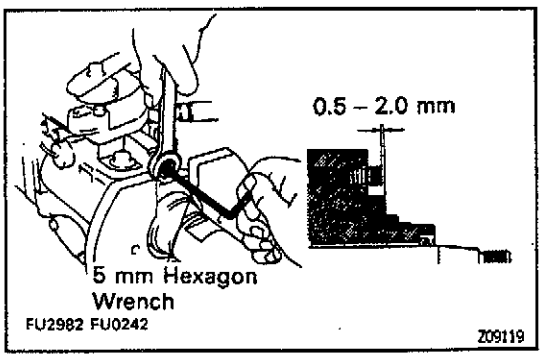


- Using a screwdriver, pry out the collar seal.

(f) w/ Wire seal type:
Cut off the wire seal.



(g) 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.



4. Taiwan:
PRE–SETTING OF 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.)

5. PRE–SET MAXIMUM SPEED

(a) Set the adjusting lever to maximum position.

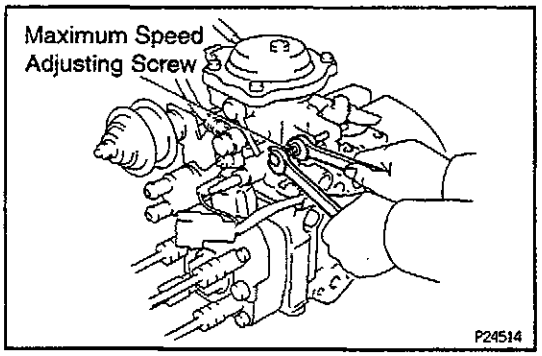
(b) w/ HAC:
Apply 97.3 ± 0.2 kPa (730 ± 1.5 mmHg, 28.74 ± 0.06 in.Hg) absolute pressure.

(c) 15B–FT:
Apply 33.4 kPa (0.34 kgf/cm², 4.9 psi) of pressure to the boost compensator.

(d) Measure the injection volume.

Item		Pump rpm	No.of measuring strokes	Each injection volume cc (cu in.)
3B	Europe, Australia	2,050	200	4.1 - 5.3 (0.25 - 0.32)
	Others			4.6 - 5.8 (0.28 - 0.35)
14B		2,075		3.4 - 5.8 (0.21 - 0.35)
15B - F		2,000		2.4 - 4.8 (0.15 - 0.29)
15B - FT		1,850		3.0 - 5.4 (0.18 - 0.33)

V06918



(e) Cut off the seal wire.

(f) Adjust the injection volume with the maximum speed adjusting screw.

6. ADJUST PUMP INNER PRESSURE

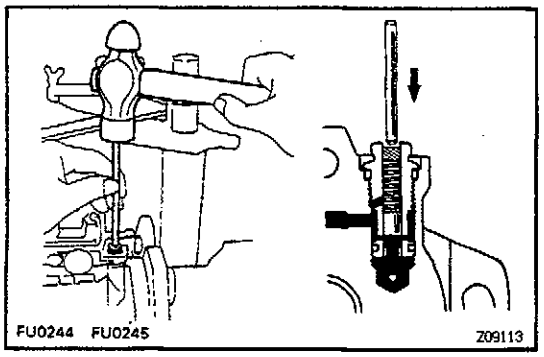
(a) Set the adjusting lever to maximum position.

(b) 15B–FT:
Apply 33.4 kPa (0.34 kgf/cm², 4.9 psi) of pressure to the boost compensator.

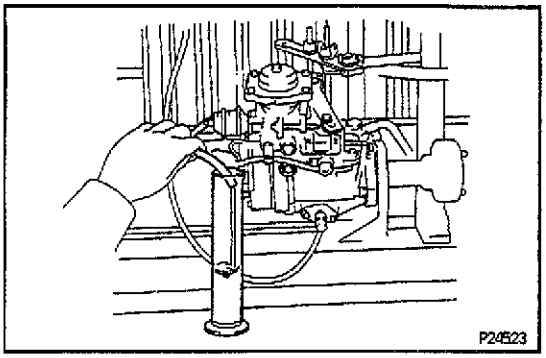
(c) Measure the pump inner pressure at the below listed rpm.

Item		Pump rpm	Inner pressure kPa (kgf / cm², psi)
3B		400	216 - 275 (2.2 - 2.8, 31 - 40)
		1,900	667 - 726 (6.8 - 7.4, 97 - 105)
14B	Hong Kong, Taiwan Algeria	400	216 - 275 (2.2 - 2.8, 31 - 40)
		1,600	628 - 686 (6.4 - 7.0, 91 - 100)
	Others	400	216 - 275 (2.2 - 2.8, 31 - 40)
		1,700	667 - 726 (6.8 - 7.4, 97 - 105)
15B - F		500	323 - 362 (3.3 - 3.7, 47 - 53)
		1,500	656 - 736 (6.7 - 7.5, 95 - 107)
15B - FT		500	323 - 362 (3.3 - 3.7, 47 - 53)
		1,300	588 - 666 (6.0 - 6.8, 85 - 97)

V06919



(d) 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.



EG

7. CHECK OVERFLOW VOLUME

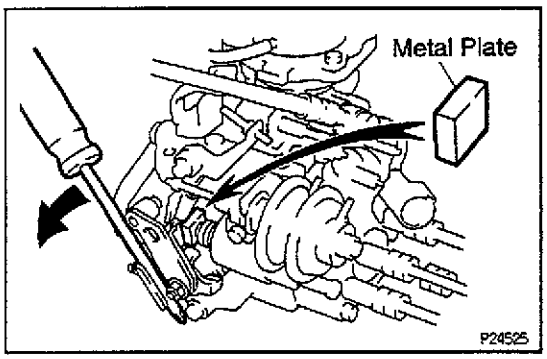
(a) Set adjusting lever to maximum position.

(b) Apply 33.4 kPa (0.34 kgf/cm², 4.9 psi) of pressure to the boost compensator.

(c) Measure the overflow volume at the below listed rpm.
HINT: Always use the overflow screw installed on the pump to be adjusted.

Item		Pump rpm	Overflow volume cc / min. (cu in./ min.)
3B		1,800	367 - 800 (22.4 - 48.8)
14B	Hong Kong, Taiwan Algeria	1,600	633 - 1,067 (38.6 - 65.1)
	Others	400	250 - 683 (15.3 - 41.7)
15B - F		1,500	600 - 1,067 (36.6 - 65.1)
15B - FT		1,300	550 - 967 (33.6 - 59.0)

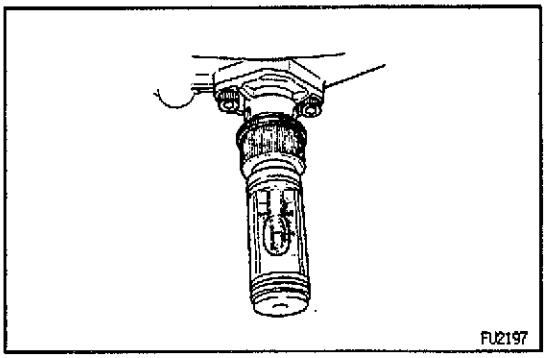
JU6920



8. w/ ACSD:
RELEASE COLD STARTING SYSTEM FOR NEXT INSPECTIONS

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

(b) Put a metal plate (thickness of 8.5 – 10 mm (0.33 – 0.39 in.)) between the cold starting lever and thermo wax plunger.
HINT: Keep the cold starting system released until all measurements and adjustments are finished.



9. ADJUST TIMER

(a) Set the timer measuring device at zero.

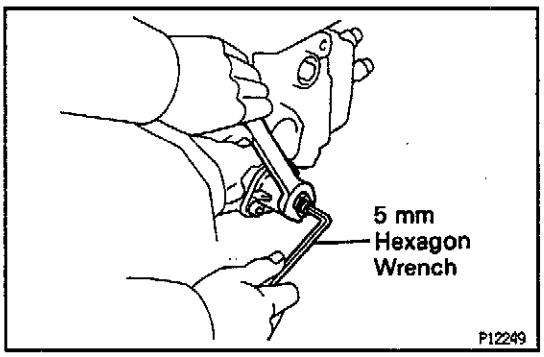
(b) 15B–FT:
Apply 33.4 kPa (0.34 kgf/cm², 4.9 psi) of pressure to the boost compensator.

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

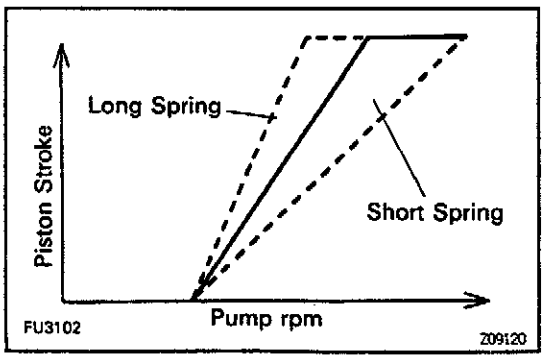
Item		Pump rpm	Piston strokes mm (in.)
3B	Europe Australia	700	0.2 - 1.2 (0.008 - 0.047)
		1,100	2.6 - 3.6 (0.102 - 0.142)
		1,400	4.2 - 5.2 (0.165 - 0.205)
		1,900	6.36 - 6.84 (0.250 - 0.269)
	Others	900	0.9 - 1.9 (0.035 - 0.075)
		1,100	2.0 - 3.0 (0.079 - 0.118)
		1,400	3.9 - 4.9 (0.154 - 0.193)
		2,050	7.16 - 7.64 (0.282 - 0.301)
14B	Taiwan	1,360	2.1 - 3.2 (0.083 - 0.126)
		1,460	3.3 - 4.4 (0.130 - 0.173)
		1,600	4.2 - 4.6 (0.165 - 0.181)
		1,900	4.2 - 4.6 (0.165 - 0.181)
	Hong Kong Algeria	1,000	0.3 - 1.3 (0.012 - 0.051)
		1,300	2.6 - 3.6 (0.102 - 0.142)
		1,650	4.76 - 5.24 (0.187 - 0.206)
	Others	1,000	0.3 - 1.3 (0.012 - 0.051)
		1,550	4.5 - 5.5 (0.177 - 0.217)
		1,700	5.6 - 6.4 (0.220 - 0.252)
		1,900	5.6 - 6.4 (0.220 - 0.252)
15B - F		700	1.0 - 2.0 (0.039 - 0.079)
		1,000	3.0 - 4.0 (0.118 - 0.157)
		1,500	6.2 - 7.2 (0.244 - 0.283)
		2,000	6.96 - 7.44 (0.274 - 0.293)
15B - FT		700	0.85 - 1.95 (0.033 - 0.077)
		1,100	3.55 - 4.65 (0.140 - 0.183)
		1,300	4.95 - 6.05 (0.195 - 0.238)
		1,600	6.96 - 7.44 (0.274 - 0.293)

V06921

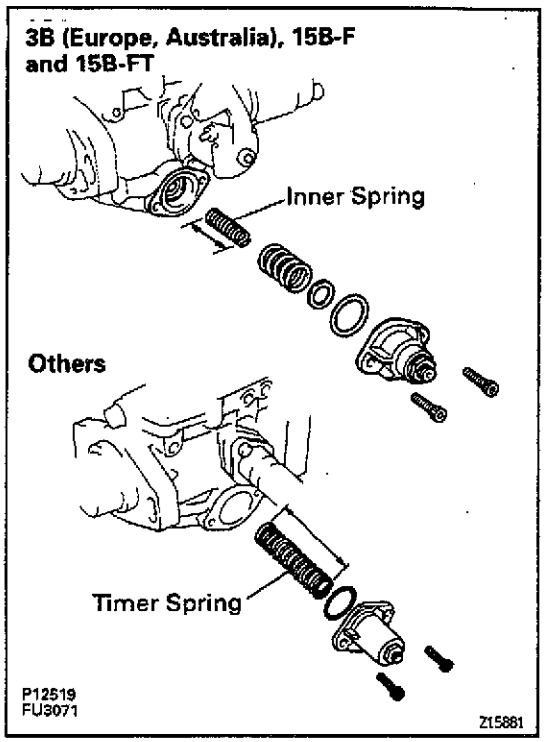
HINT: Check that the hysteresis is within 0.3 mm (0.012 in.).



(d) 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.



(e) Check the timer stroke for characteristic tendency.



(f) 3B (Europe, Australia), 15B–F and 15B–FT:
If tendency is not as specified, select and replace the inner spring.

Timer inner spring free length: mm (in.)

3B (Europe, Australia):

32.0 (1.26)	32.3 (1.27)	33.5 (1.32)

15B–F:

34.4 (1.35)	34.6 (1.36)	35.1 (1.38)
34.5 (1.36)	35.0 (1.38)	–

15B–FT:

34.6 (1.36)	35.1 (1.38)	–
35.0 (1.38)	35.9 (1.41)	–

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

Timer spring free length: mm (in.)

3B:

35.6 (1.40)	37.9 (1.49)	38.2 (1.50)

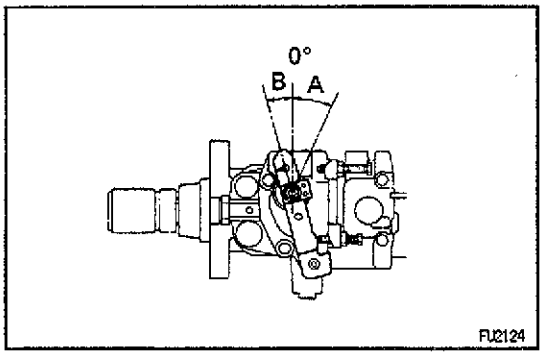
14B (Taiwan):

68.25 (2.69)	69.9 (2.75)	71.8 (2.83)

14B (Others):

56.5 (2.22)	57.1 (2.25)	57.8 (2.28)

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



10. ADJUST FULL LOAD INJECTION VOLUME

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

Item	Adjusting lever angle	
	A (Maximum speed side)	B (Idle speed side)
15B - FT	Minus 4 - Plus 6°	Minus 27 - 37°
Others	Plus 21 - 31°	Minus 12 - 22°

V06934

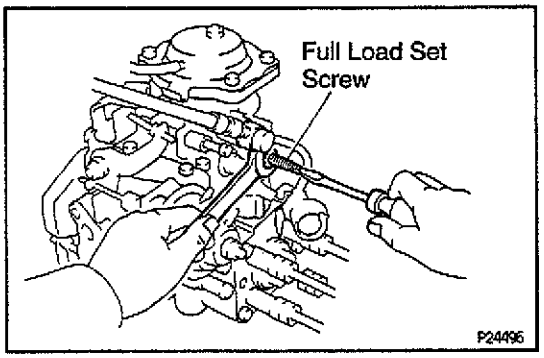
(b) w/HAC:
Apply 97.3 ± 0.2 kPa (730 ± 1.5 mmHg, 28.74 ± 0.06 in.Hg) absolute pressure.

(c) 15B–FT:
Apply 33.4 kPa (0.34 kgf/cm², 4.9 psi) of pressure to the boost compensator.

(d) Measure the full load injection volume.

Item		Pump rpm	No.of measuring strokes	Each injection volume cc (cu in.)
3B	Europe, Australia	1,100	200	12.23 - 12.57 (0.75 - 0.77)
	Others			11.33 - 11.67 (0.69 - 0.71)
14B	Hong Kong, Taiwan Algeria			11.36 - 11.84 (0.69 - 0.72)
	China, Others (w/o HAC)			13.75 - 14.35 (0.84 - 0.88)
	Others (w/ HAC)			13.15 - 13.75 (0.80 - 0.84)
15B - F		1,000		17.50 - 18.10 (1.07 - 1.10)
15B - FT		900		13.90 - 14.50 (0.85 - 0.88)

V06917



(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.

11. ADJUST MAXIMUM SPEED

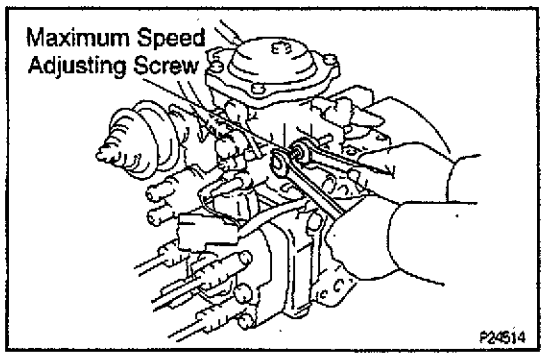
(a) w/ HAC:
Apply 97.3 ± 0.2 kPa (730 ± 1.5 mmHg, 28.74 ± 0.06 in.Hg) absolute pressure.

(b) 15B–FT:
Apply 33.4 kPa (0.34 kgf/cm², 4.9 psi) of pressure to the boost compensator.

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

Item		Adjusting lever angle	Pump rpm	No.of measuring strokes	Each injection volume cc (cu in.)	Remarks
3B	Europe Australia	Plus 21 - 31°	2,050	200	4.1 - 5.3 (0.25 - 0.32)	Adjust
			2,200		1.5 (0.09) or less	—
	Others		2,050		4.6 - 5.8 (0.28 - 0.35)	Adjust
			2,200		1.5 (0.09) or less	—
14B			2,075		3.4 - 5.8 (0.21 - 0.35)	Adjust
			2,400		1.2 (0.07) or less	—
15B - F			2,000		2.4 - 4.8 (0.15 - 0.29)	Adjust
			2,200		1.2 (0.07) or less	—
15B - FT		Minus 4 - Plus 6°	1,750		5.8 - 9.4 (0.35 - 0.57)	—
			1,850		3.0 - 5.4 (0.18 - 0.33)	Adjust
			2,150		1.2 (0.07) or less	—

V06922



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

12. CHECK INJECTION VOLUME

(a) w/ HAC:
Apply 97.3 ± 0.2 kPa (730 ± 1.5 mmHg, 28.74 ± 0.06 in.Hg) absolute pressure.

(b) 3B, 14B, 15B–F:
Measure the injection volume at each pump rpm and boost pressure.

EG

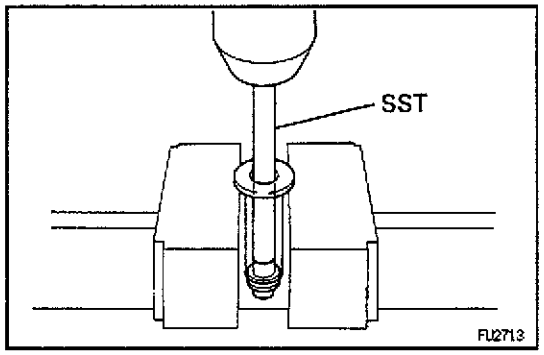
Item		Adjusting lever angle	Pump rpm	No.of measuring strokes	Each injection volume cc (cu in.)	Variation limit cc (cu in.)	Remarks
3B	Europe Australia	Plus 21 – 31°	1,100	200	12.23 – 12.57 (0.75 – 0.77)	0.4 (0.02)	Basic full load injection volume
			100		12.4 – 16.4 (0.76 – 1.00)	1.2 (0.07)	Volume during starting
			400		10.4 – 12.4 (0.63 – 0.76)	—	—
			500		9.3 – 10.3 (0.57 – 0.63)	0.5 (0.03)	—
			1,750		11.25 – 12.35 (0.69 – 0.75)		—
			1,950		7.95 – 10.05 (0.49 – 0.61)	—	—
	Others		1,100		11.33 – 11.67 (0.69 – 0.71)	0.4 (0.02)	Basic full load injection volume
			100		12.7 – 16.5 (0.77 – 1.01)	0.2 (0.07)	Volume during starting
			400		11.1 – 13.1 (0.68 – 0.80)	—	—
			500		10.0 – 11.0 (0.61 – 0.67)	0.5 (0.03)	—
			1,750		10.65 – 11.75 (0.65 – 0.72)		—
			1,950		9.25 – 11.35 (0.56 – 0.69)	—	—
14B	China Ex – USSR		1,100		13.75 – 14.35 (0.84 – 0.88)	0.7 (0.04)	Basic full load injection volume
			100		16.6 – 21.4 (1.01 – 1.31)	1.3 (0.08)	Volume during starting
			500		11.2 – 12.4 (0.68 – 0.76)	0.7 (0.04)	—
			700		11.9 – 13.1 (0.73 – 0.80)		—
			1,700		13.1 – 14.3 (0.80 – 0.87)		—
	Hong Kong Taiwan Algeria		1,100		11.36 – 11.84 (0.69 – 0.72)	0.6 (0.04)	Basic full load injection volume
			100		13.0 – 17.0 (0.79 – 1.04)	1.4 (0.09)	Volume during starting
			500		9.5 – 10.5 (0.58 – 0.64)	0.6 (0.04)	—
			700		10.7 – 11.7 (0.65 – 0.71)		—
			900		11.6 – 12.6 (0.71 – 0.77)		—
			1,700		9.6 – 10.6 (0.59 – 0.65)		—
	Others (w/ HAC)		1,100		13.15 – 13.75 (0.80 – 0.84)	0.7 (0.04)	Basic full load injection volume
			100		12.6 – 17.4 (0.77 – 1.06)	1.3 (0.08)	Volume during starting
			500		10.4 – 12.0 (0.63 – 0.73)	0.7 (0.04)	—
			700		11.2 – 12.8 (0.68 – 0.78)		—
			1,700		11.9 – 13.5 (0.73 – 0.82)		—
	Others (w/ o HAC)		1,100		13.75 – 14.35 (0.84 – 0.88)	0.7 (0.04)	Basic full load injection volume
			100		12.6 – 17.4 (0.77 – 1.06)	1.3 (0.08)	Volume during starting
			500		11.2 – 12.4 (0.68 – 0.76)	0.7 (0.04)	—
			700		11.9 – 13.1 (0.73 – 0.80)		—
			1,700		13.1 – 14.3 (0.80 – 0.87)		—
15B - F			1,100		17.5 – 18.1 (1.07 – 1.10)	0.7 (0.04)	Basic full load injection volume
			100		10.0 – 14.8 (0.61 – 0.90)	1.4 (0.09)	Volume during starting
			500		10.5 – 11.7 (0.64 – 0.71)	0.7 (0.04)	—
			700		14.5 – 15.7 (0.88 – 0.95)		—
			900		16.7 – 17.9 (1.02 – 1.09)		—
			1,300		17.5 – 18.7 (1.07 – 1.14)		—
			1,600		17.5 – 18.7 (1.07 – 1.14)	—	—

V06923

(c) 15B–FT:
Measure the injection volume at each pump rpm and boost pressure.

Item	Adjusting lever angle	Pump rpm	Boost pressure kPa (kgf / cm², psi)	No.of measuring strokes	Each injection volume cc (cu in.)	Variation limit cc (cu in.)	Remarks
15B - FT	Minus 4 - Plus 6°	1,300	33.4 (0.34, 4.9)	200	14.4 - 15.6 (0.88 - 0.95)	0.7 (0.04)	Basic full load injection volume
		100	0 (0, 0)		15.6 - 20.4 (0.95 - 1.24)	1.4 (0.09)	Volume during starting
		500	0 (0, 0)		9.0 - 9.8 (0.55 - 0.60)	0.7 (0.04)	–
		700	33.4 (0.34, 4.9)		13.1 - 14.5 (0.80 - 0.88)		–
		900	33.4 (0.34, 4.9)		13.9 - 14.5 (0.85 - 0.88)		–
		1,600	33.4 (0.34, 4.9)		14.4 - 15.6 (0.88 - 0.95)		–

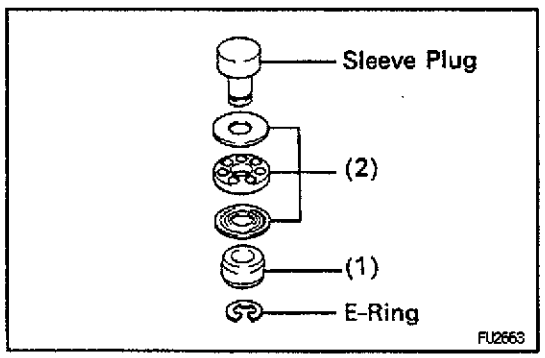
V06925



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

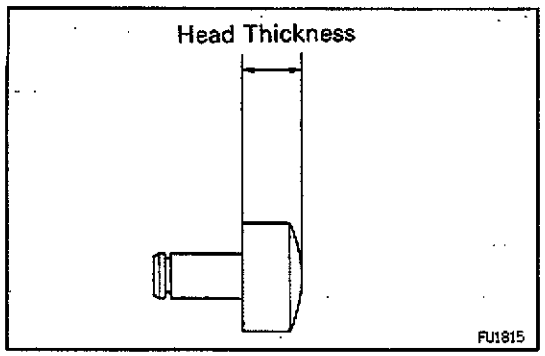
- Using SST and a press, press out the sleeve plug assembly from the governor sleeve.

SST 09236–00101 (09237–00070)



- Remove the E–ring and following parts from the sleeve plug:

(1) Stop ring
(2) Bearing and 2 bearing retainers



- Measure the head thickness of the sleeve plug, and select a new sleeve plug.

Governor sleeve plug head thickness: mm (in.)

3B:

2.2 (0.087)	2.5 (0.098)	3.3 (0.130)
2.3 (0.091)	2.6 (0.102)	3.4 (0.134)
2.4 (0.094)	2.7 (0.106)	–

14B:

3.0 (0.118)	3.6 (0.142)	4.2 (0.165)
3.1 (0.122)	3.7 (0.146)	4.3 (0.169)
3.2 (0.126)	3.8 (0.150)	4.5 (0.177)
3.3 (0.130)	3.9 (0.154)	4.7 (0.185)
3.4 (0.134)	4.0 (0.157)	–
3.5 (0.138)	4.1 (0.161)	–

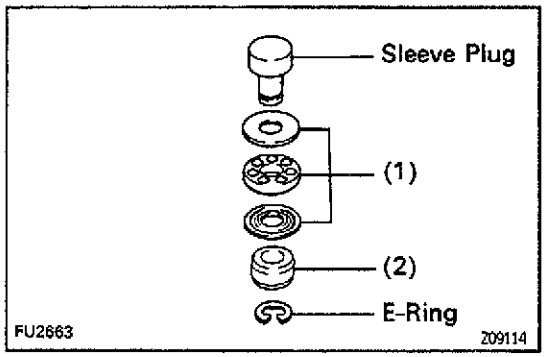
EG

15B–F, 15B–FT:

Sleeve plugs are available in 37 sizes in increment of 0.1 mm (0.004 in.), from 3.0 mm (0.118 in.) to 6.6 mm (0.260 in.).

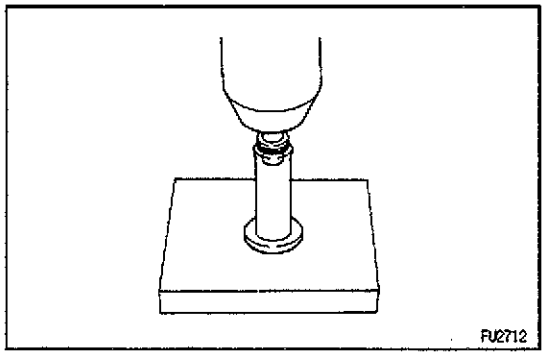
HINT: Lengthening the plug by 0.1 mm (0.004 in.) will decrease injection volume by 0.6 cc (0.04 cu in.).

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



- Install the following parts to the new sleeve plug with a new E–ring:

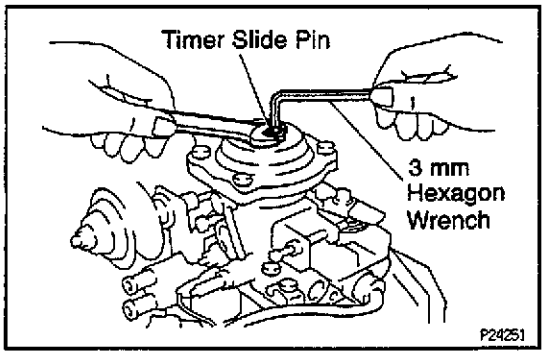
(1) Bearing and 2 retainers
(2) Stop ring



- Using a press, press in the sleeve plug assembly to the governor sleeve.

13. 15B–FT:
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 injection volume.



Pump rpm	No. of measuring strokes	Each injection volume cc (cu in.)
500	200	9.0 – 9.8 (0.55 – 0.60)

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

14. 15B–FT: ADJUST BOOST COMPENSATOR

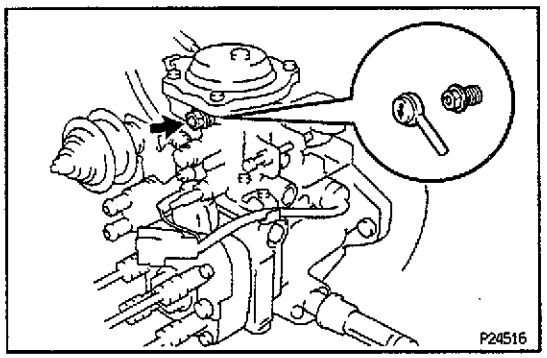
A. Adjust characteristic

(a) Set the adjusting lever to maximum position.

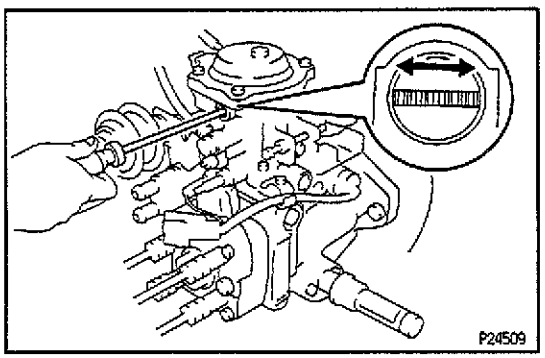
(b) Apply 19.9 kPa (0.20 kgf/cm², 2.8 psi) of pressure to the boost compensator.

(c) Measure the injection volume.

Pump rpm	No. of measuring strokes	Each injection volume cc (cu in.)
500	200	9.7 – 10.7 (0.59 – 0.65)



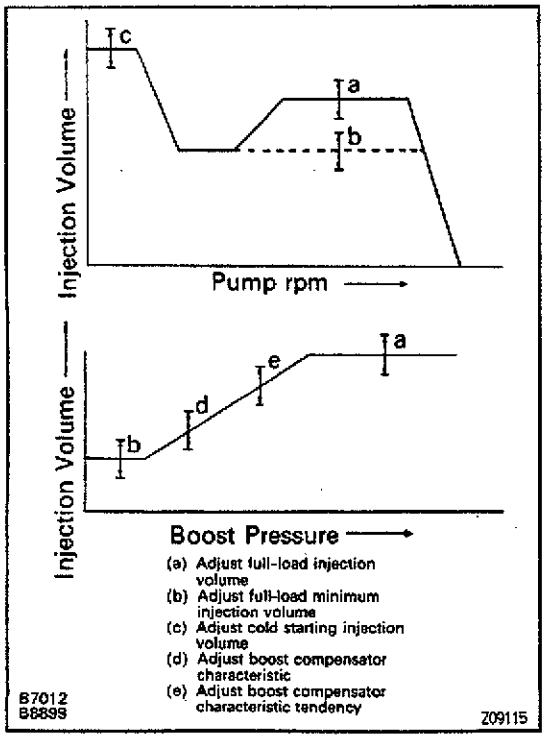
(d) Remove the rubber cap and overflow screw.



(e) Using a screwdriver, adjust the injection volume by the guide bushing.
HINT: When the guide bushing is turned clockwise, as seen from above, the injection volume will increase.

(f) Install the overflow screw.

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



B. Check for characteristic tendency

(a) Set the adjusting lever to maximum position.

(b) Apply 26.5 kPa (0.27 kgf/cm², 3.8 psi) of pressure to the boost compensator.

(c) Measure the injection volume.

Pump rpm	No. of measuring strokes	Each injection volume cc (cu in.)
500	200	10.8 – 12.0 (0.66 – 0.73)

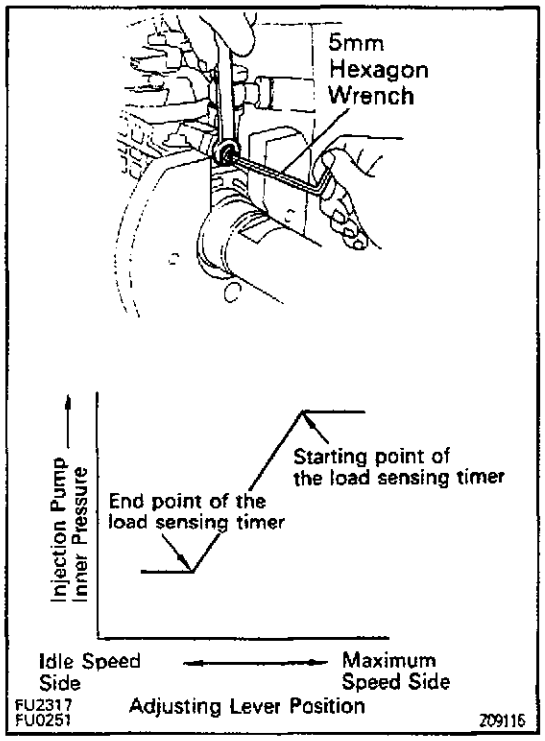
C. CHECK HYSTERESIS

Compare the injection volume when the boost compensator pressure is lowered from 94 kPa (0.96 kgf/cm², 13.7 psi) to 0 kPa (0 kgf/cm², 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.

Pump rpm	Boost pressure kPa (kgf / cm², psi)	No.of measuring strokes	Each injection volume cc (cu in.)	Hysteresis cc (cu in.)
1,600	94 (0.96, 13.7)	200	15.0 (0.92) or less	0.3 (0.02) or less
900	60 (0.61, 8.7)		13.8 – 14.6 (0.84 – 0.89)	
	33.4 (0.34, 4.9)		13.9 – 14.5 (0.85 – 0.88)	
500	26.5 (0.27, 3.8)		10.8 – 12.0 (0.66 – 0.73)	
	19.9 (0.20, 2.8)		9.7 – 10.7 (0.59 – 0.65)	
	0 (0, 0)		9.0 – 9.8 (0.55 – 0.60)	

V06926

EG



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

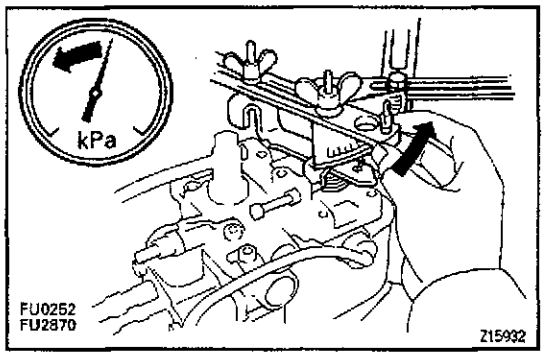
15. **Taiwan:**
ADJUST LOAD SENSING TIMER

(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.

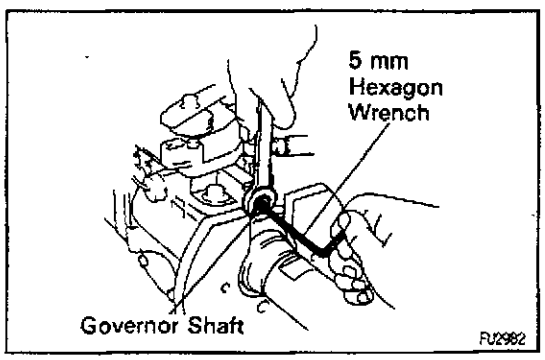
Adjusting lever position	Pump rpm	No. of measuring strokes
Maximum speed side	1,360	200



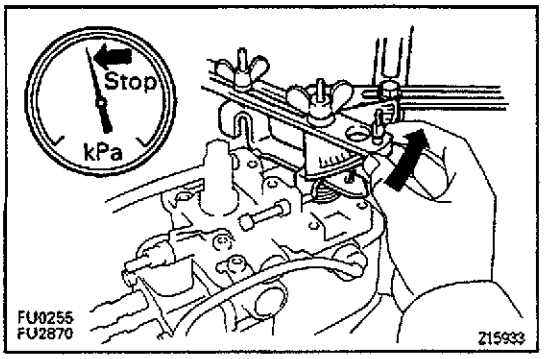
(d) Slowly move the adjusting lever from the maximum speed side to the idle speed side, and secure it at the point where the pump inner pressure begins to drop.

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

Pump rpm	No. of measuring strokes	Each injection volume cc (cu in.)
1,360	200	Measured value at step (b) minus 1.0 (0.06) ± 0.5 (0.04)

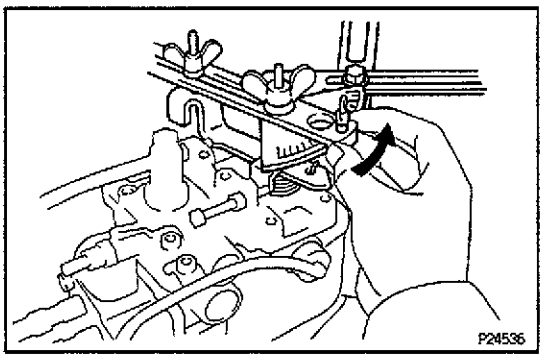


(f) Using a 5 mm hexagon wrench, adjust the load sensing timer by turning the governor shaft, and perform the measurement again as specified.
HINT: The injection volume will increase approx. 3 cc (0.2 cu in.) with each 1/2 turn of the governor shaft.



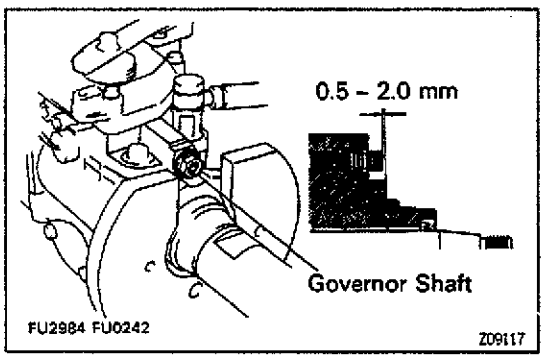
(g) Check the end point injection volume by slowly moving the adjusting lever from the maximum speed side to the idle speed side, and secure it at the point where the pump inner pressure stops dropping.

Pump rpm	No. of measuring strokes	Each injection volume cc (cu in.)
1,360	200	11.2 – 11.6 (0.68 – 0.71)

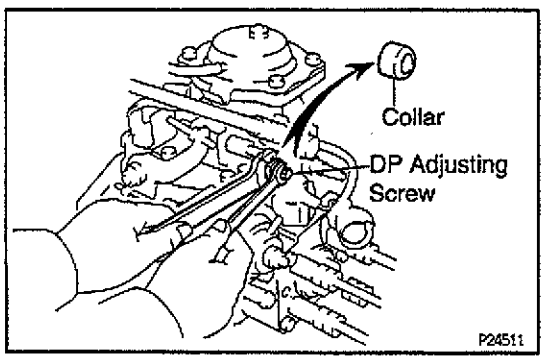


(h) Check the timer piston fluctuation when the adjusting lever is moved from the maximum speed side to the idle speed side.

Pump rpm	Timer piston fluctuation mm (in.)
1,360	0.2 – 0.3 (0.012 – 0.018)



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

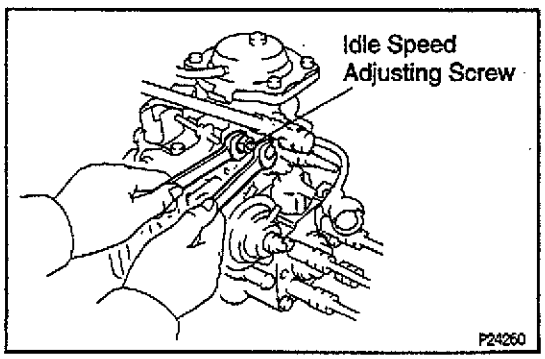


16. ADJUST IDLE SPEED

(a) 14B, 15B–F, 15B–FT:
Using pliers, remove the dash pot collar.

(b) 14B, 15B–F, 15B–FT:
Fully loosen the dash pot adjusting screw.

(c) 15B–FT:
Release the pressure from the boost compensator.



(d) 14B, 15B–F, 15B–FT:
Pre–Set Idle Speed:
Adjust injection volume by turning the idle speed adjusting screw.

EG

Item	Pump rpm	No.of measuring strokes	Each injection volume cc (cu in.)
14B	325	200	q = 3.8 - 4.2 (0.23 - 0.26)
15B - F	360		q = 3.2 - 3.6 (0.20 - 0.22)
15B - FT	400		q = 2.8 - 3.2 (0.17 - 0.20)

V06927

EG

(e) 14B, 15B–F, 15B–FT:
Adjust DP Speed:
Adjust injection volume by turning the DP adjusting screw.
HINT: The stroke will decrease with turn to clockwise and increase with turn to counterclockwise.

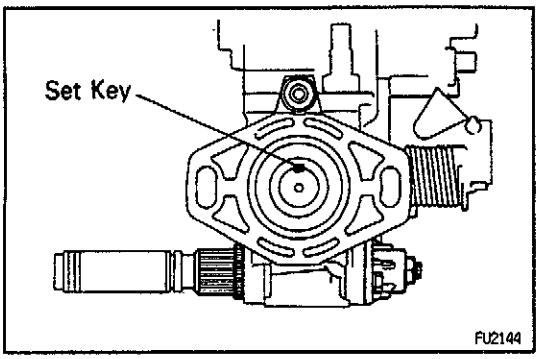
Item	Pump rpm	No.of measuring strokes	Each injection volume cc (cu in.)
14B	325	200	q plus 0.14 - 0.46 (0.009 - 0.028)
15B - F	360		q plus 0.2 - 0.4 (0.008 - 0.016)
15B - FT	400		

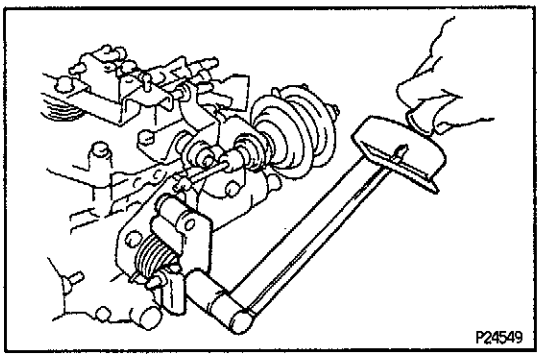
V06928

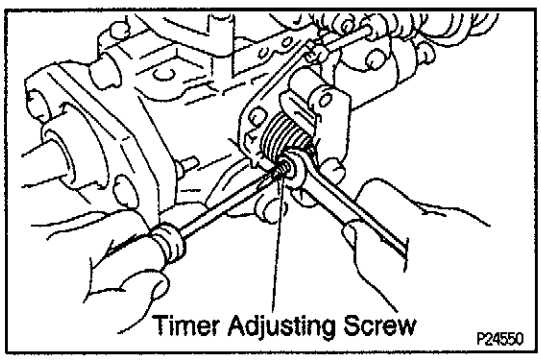
(f) Adjust Idle Speed:
Adjust injection volume by turning the idle speed adjusting screw.

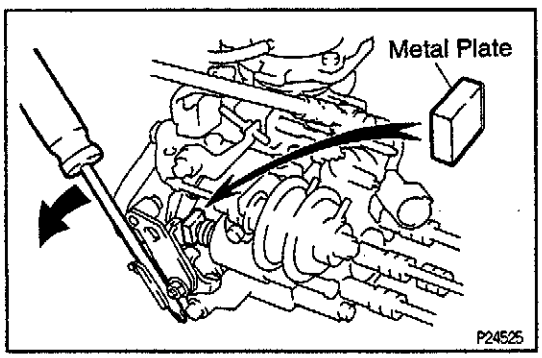
Item	Adjusting lever angle	Pump rpm	No.of measuring strokes	Each injection volume cc (cu in.)	Variation limit cc (cu in.)
3B	Minus 12 - 22°	350	200	1.55 - 2.45 (0.09 - 0.15)	0.4 (0.02)
14B		325		1.1 - 2.7 (0.07 - 0.16)	0.5 (0.03)
15B - F		360		0.4 - 2.0 (0.02 - 0.12)	
15B - FT	Minus 27 - 37°	400		0.8 - 2.4 (0.05 - 0.15)	

V06929









17. 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.

Item	Pump rpm	Piston strokes mm (in.)
14B	400	0.4 – 0.8 (0.016 – 0.031)
15B–F	360	0.8 – 1.2 (0.031 – 0.047)
15B–FT	400	1.5 – 1.7 (0.059 – 0.067)

(h) Adjust by turning the timer adjusting screw.
HINT: Screw in for stroke decrease.

18. w/ ACSD:
ADJUST FAST IDLE

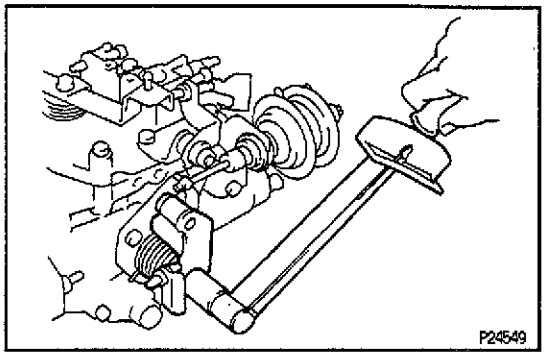
(a) Using a screwdriver, turn the cold starting lever counterclockwise approx. 20°.

(b) Put a metal plate (thickness of 8.5 – 10 mm (0.33 – 0.39 in.)) between the cold starting lever and thermo wax plunger.

(c) Measure the injection volume.

Item	Adjusting lever angle	Pump rpm	No.of measuring strokes	Each injection volume cc (cu in.)
14B	Minus 12 - 22°	400	200	q
15B - F	Minus 12 - 22°	360		q = 0.4 - 2.0 (0.02 - 0.12)
15B - FT	Minus 27 - 37°	400		q = 0.8 - 2.4 (0.05 - 0.15)

V06930

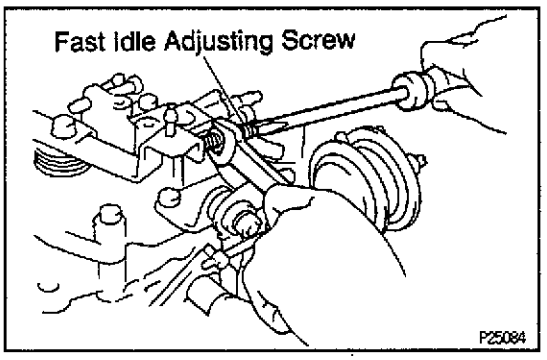


(d) Remove the metal plate between the cold starting lever and thermo wax plunger.
(e) Torque the cold starting lever clockwise to approx. 4.9 N·m (50 kgf·cm, 43 in.·lbf) and keep the lever tightened for about 10 seconds. Then release the torque.
(f) Measure the injection volume.

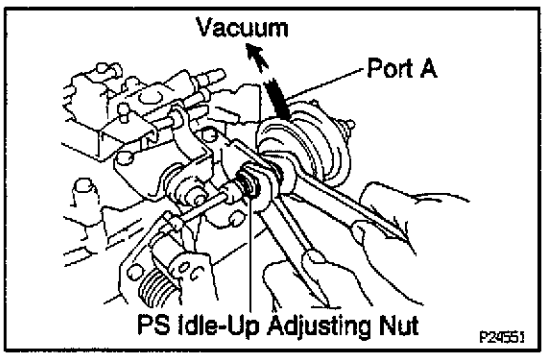
EG

Item	Adjusting lever angle	Pump rpm	No.of measuring strokes	Each injection volume cc (cu in.)
14B	Minus 12 - 22°	400	200	q plus 0.8 - 1.2 (0.05 - 0.07)
15B - F	Minus 12 - 22°	360		q plus 0.4 - 0.8 (0.02 - 0.05)
15B - FT	Minus 27 - 37°	400		q plus 1.2 - 1.6 (0.07 - 0.10)

V06931



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

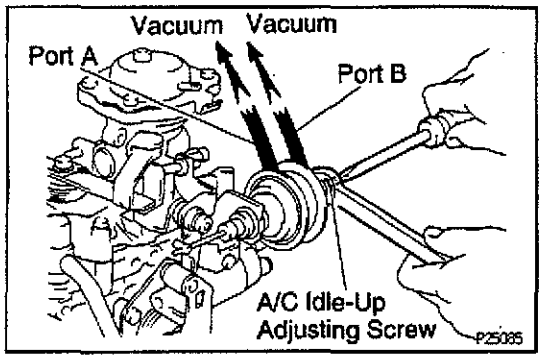


19. 15B–F, 15B–FT:
ADJUST IDLE–UP SPEED

(a) Disengage the ACSD (See step 18. (a) and (b)).
(b) Apply 46.7 kPa (350 mmHg, 13.78 in.Hg) of vacuum to port A of the idle–up actuator.
(c) Measure the injection volume.
(d) Adjust the injection volume by turning the PS idle–up adjusting nut.

Item	Adjusting lever angle	Pump rpm	No.of measuring strokes	Each injection volume cc (cu in.)
15B - F	Minus 12 - 22°	400	200	1.0 - 1.4 (0.06 - 0.09)
15B - FT	Minus 27 - 37°	475		

V06932

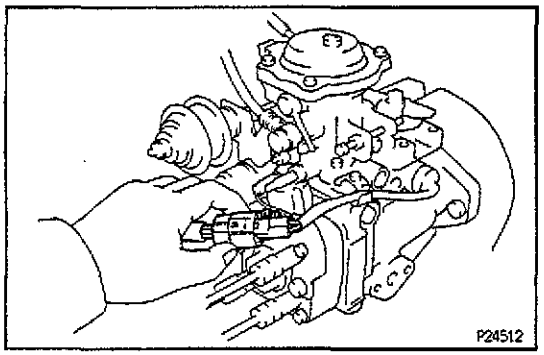


(e) Apply 46.7 kPa (350 mmHg, 13.78 in.Hg) of vacuum to ports A and B of the idle–up actuator.
(f) Measure the injection volume.
(g) Adjust the injection volume by turning the A/C idle–up adjusting screw.

EG

Item	Adjusting lever angle	Pump rpm	No.of measuring strokes	Each injection volume cc (cu in.)
15B - F	Minus 12 - 22°	400	200	2.6 - 3.0 (0.16 - 0.18)
15B - FT	Minus 27 - 37°	475		3.6 - 4.0 (0.22 - 0.24)

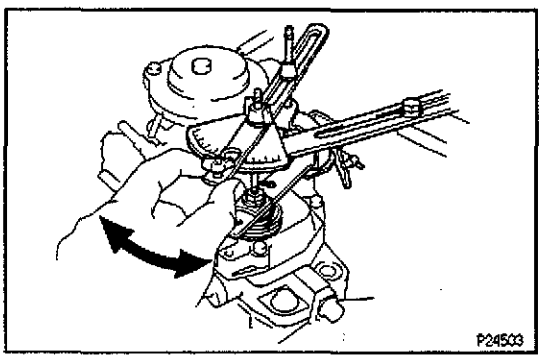
V06933



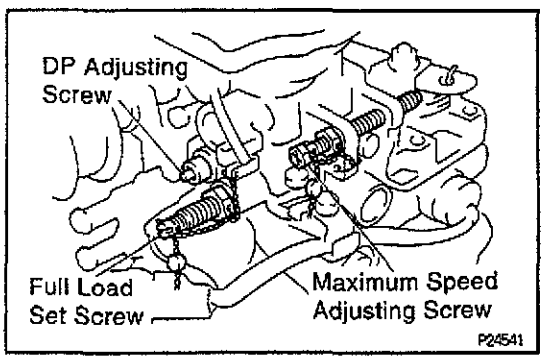
(h) *Remove the metal plate between the cold starting* lever and thermo wax plunger.

20. POST ADJUSTMENT CHECK

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



(b) Disengage the ACSD (See step 18. (a) and (b)).
(c) Check the adjusting lever movement.
Adjusting lever angle:
3B, 14B, 15B–F: 38 – 48°
15B–FT: 28 – 38°



21. SEAL PARTS

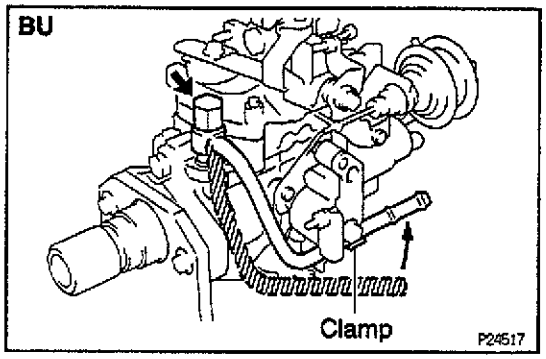
(a) Seal the full load set screw and maximum speed adjusting screw with new lead seals.
(b) Seal the DP adjusting screw with a new collar.

22. REMOVE INJECTION PUMP FROM PUMP TESTER

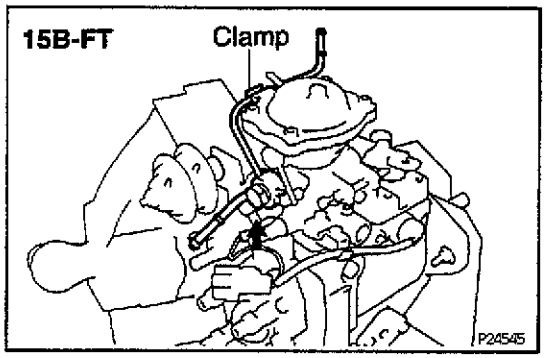
NOTICE (w/ HAC and 15B–FT): To prevent oil spilling out from the bushing of the governor cover, do these steps (23 to 26) without tilting the injection pump 45° or more from the horizontal.

23. BU:
INSTALL CLAMP FOR FUEL INLET PIPE
Using an 8 mm hexagon wrench, install the clamp with the plate washer and bolt.

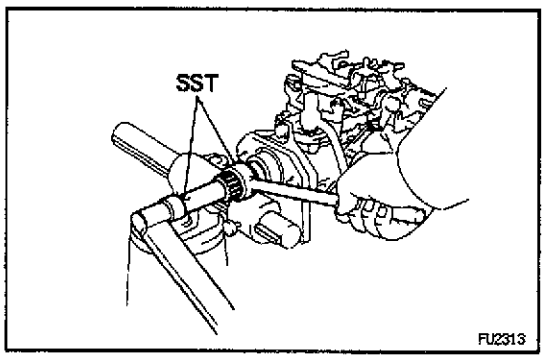
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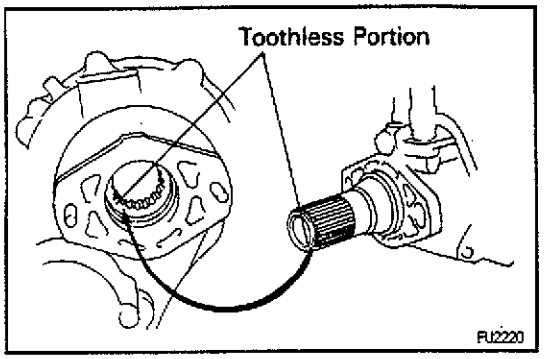
24. INSTALL FUEL INLET PIPE
(a) Temporarily install the inlet pipe with 2 new gaskets and the nut.
(b) BU:
Connect the inlet pipe to the clamp.
(c) Tighten the nut.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)



25. INSTALL FUEL OUTLET PIPE
(a) Temporarily install the outlet pipe with 2 new gaskets and the union bolt.
(b) 15B–FT:
Connect the outlet pipe to the clamp.
(c) Tighten the union bolt.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)



26. INSTALL SPLINE SHAFT
(a) Align the set key groove of the spline shaft with the set key.
(b) Using SST, install the spline shaft with the round nut.
SST 09260–58010 (09266–76011, 09278–46020)
Torque:
3B, 14B:
54 N·m (550 kgf·cm, 40 ft·lbf)
15B–F, 15B–FT:
84 N·m (860 kgf·cm, 62 ft·lbf)



INJECTION PUMP INSTALLATION

1. INSTALL INJECTION PUMP

NOTICE (w/ HAC and 15B–FT): Do not put the injection pump at an angle more than 45° from the horizontal.

(a) Install a new O–ring to the pump.

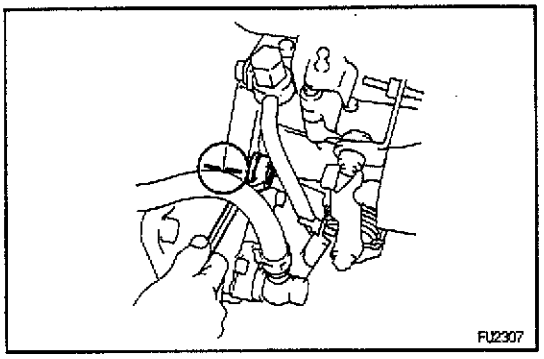
(b) Apply a light coat of engine oil on the O–ring.

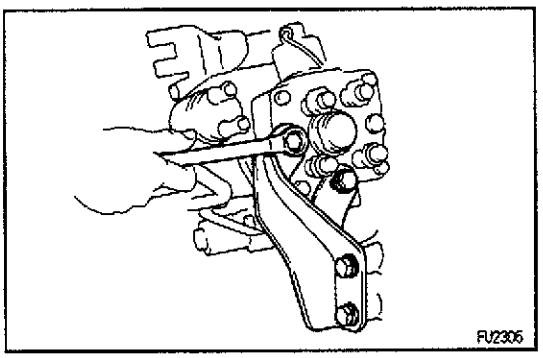
(c) Align the spline toothless portions of the injection pump and injection pump drive gear, and install the injection pump.

(d) Align the matchmark of the injection pump flange and timing gear case.

(e) Install the injection pump with the 2 nuts.

Torque: 19 N·m (190 kgf·cm, 14 ft·lbf)





(f) Install the injection pump stay with the 4 bolts.

Torque:

12 mm head: 29 N·m (295 kgf·cm, 21 ft·lbf)

14 mm head: 38 N·m (380 kgf·cm, 27 ft·lbf)

(g) Connect the accelerator cable (15B–FT) or accelerator link (Others) to the injection pump.

(h) Connect the injection pump connector.

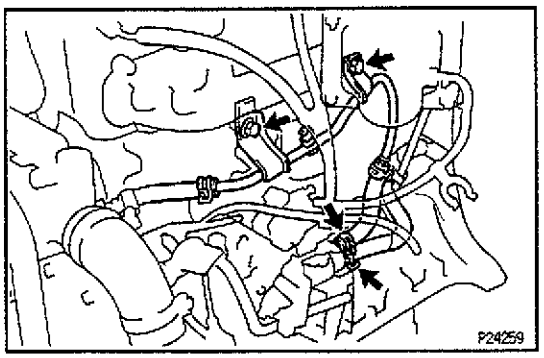
2. CHECK INJECTION TIMING

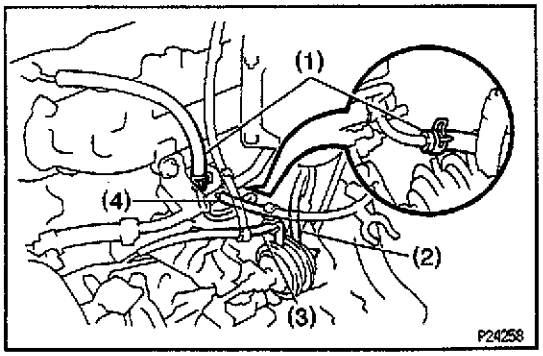
(See injection timing adjustment in Engine Mechanical)

3. CONNECT HOSES

(a) w/ ACSD:
Connect the water bypass pipe to the intake manifold with the 2 bolts.

(b) w/ ACSD:
Connect the 2 water bypass hoses to the thermo wax.





(c) Connect these hoses:

(1) 2 fuel return hoses

(2) BU:
Vacuum hose (for PS idle–up)

(3) BU:
Vacuum hose (for A/C idle–up)

(4) 15B–FT:
Boost compensator hose

4. **INSTALL INJECTION PIPES**
   (See injection nozzles installation)
5. **w/ ACSD:**
   FILL RADIATOR WITH ENGINE COOLANT
6. **FILL INJECTION PUMP WITH FUEL**
   Operate the priming pump until you feel more resistance.
7. **BLEED INJECTION NOZZLES**

(a) Loosen all union nuts of the injection pipe on the nozzle side.

(b) Crank the engine to bleed air and force out the fuel from the injection pipe.

8. **START ENGINE AND CHECK FOR FUEL LEAKS**
9. **CHECK ENGINE IDLE SPEED AND MAXIMUM SPEED**
   (See idle speed and maximum speed inspection in Engine Mechanical)
10. **w/ ACSD:**
    RECHECK COOLANT LEVEL