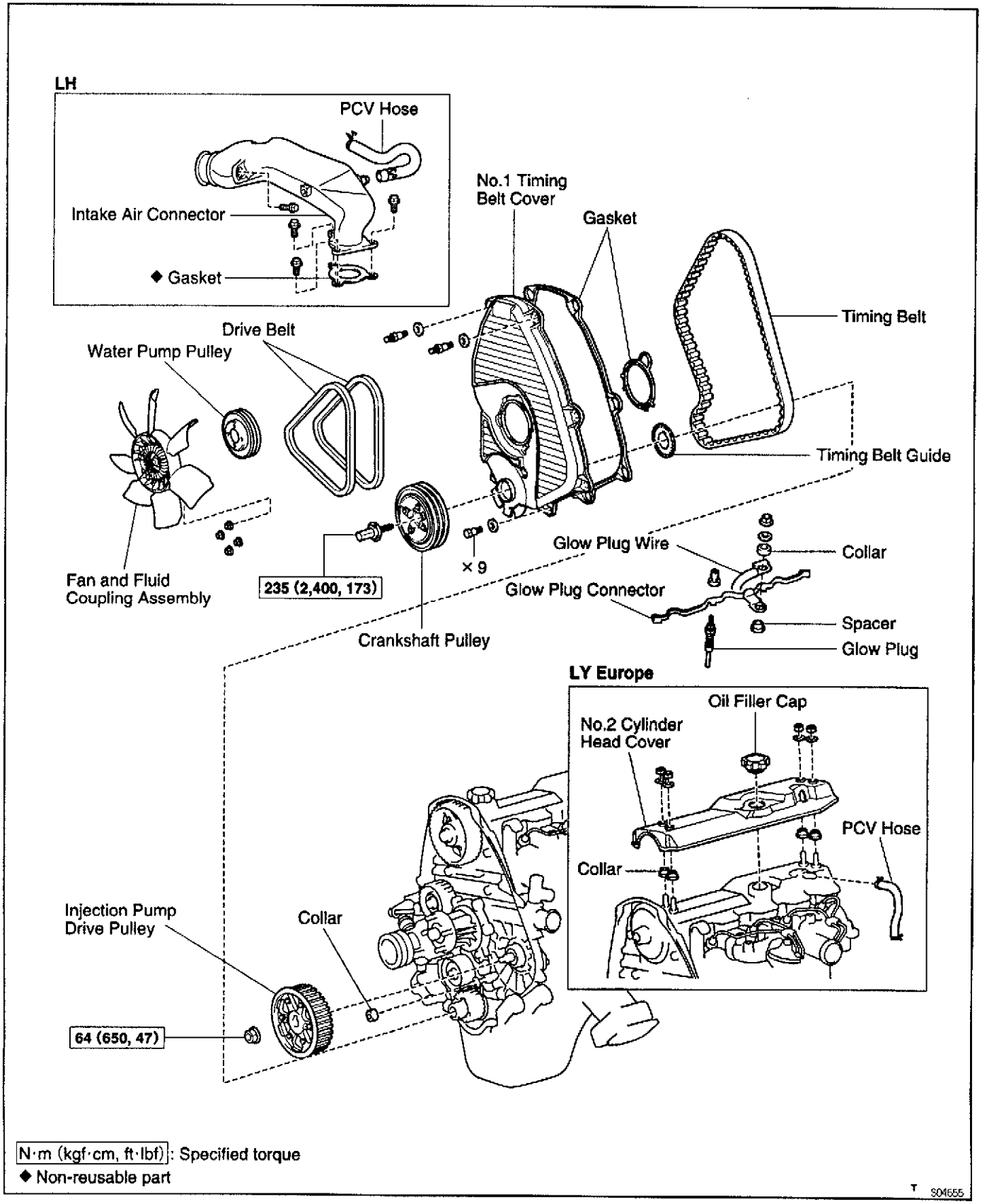
INJECTION PUMP

COMPONENTS FOR REMOVAL AND INSTALLATION

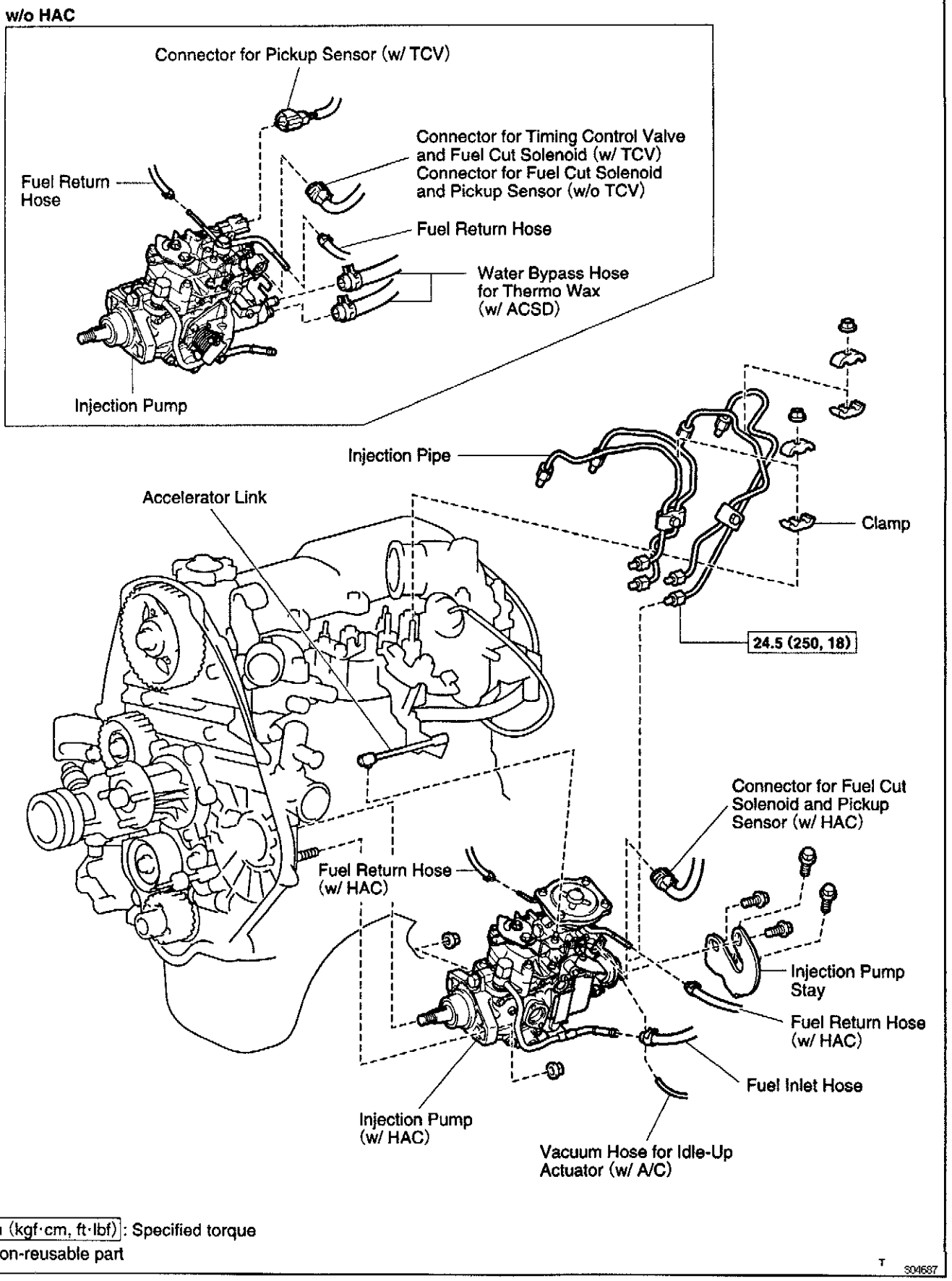
EG7DG-01

EG



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

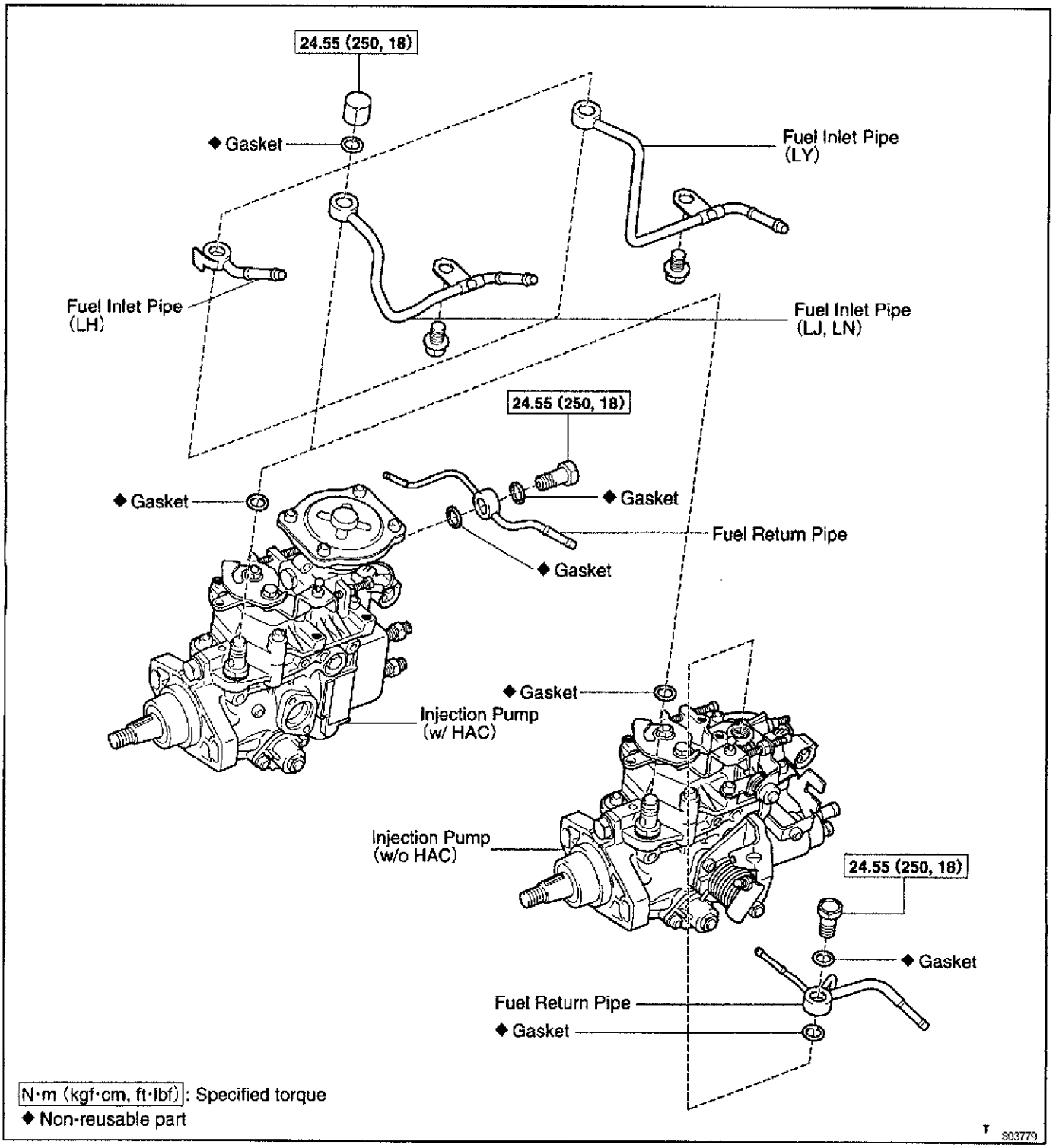
T S01655



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

T

EG



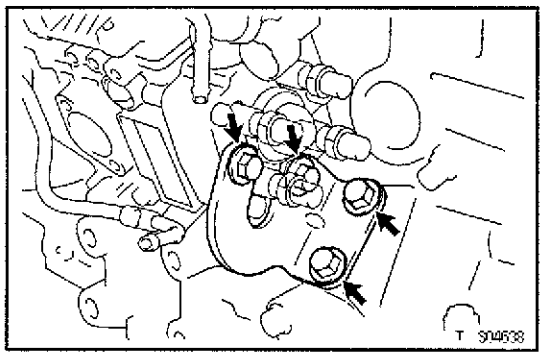
EG616-02

INJECTION PUMP REMOVAL

1. **w/ ACSD:**
   DRAIN ENGINE COOLANT
2. **REMOVE TIMING BELT**
   (See steps 1 to 7 in timing belt removal in Engine Mechanical)

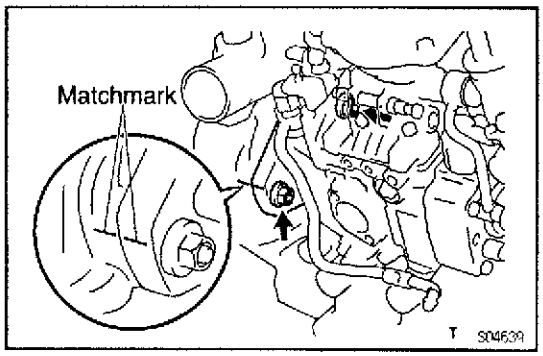
3. REMOVE INJECTION PUMP DRIVE PULLEY
(See step 10 in timing belt removal in Engine Mechanical)

4. DISCONNECT CONNECTORS, LINK AND HOSES
Disconnect the connectors, link and hoses:
- w/ TCV:
  Connector for timing control valve and fuel cut solenoid
- w/ TCV:
  Connector for pickup sensor
- w/o TCV:
  Connector for fuel cut solenoid and pickup sensor
- Accelerator link from injection pump
- Fuel inlet hose from fuel inlet pipe
- 2 fuel return hoses from fuel return pipe
- w/ A/C:
  Vacuum hose from idle—up actuator
- w/ ACSD:
  2 water bypass hoses from thermo wax



5. REMOVE INJECTION PIPES
(See injection nozzles removal)

6. REMOVE INJECTION PUMP
(a) Remove the 4 bolts and injection pump stay.



(b) Before removing the injection pump, check if the matchmarks are aligned.
If not, place new matchmarks for reinstallation.
(c) Remove the 2 nuts and injection pump.
NOTICE:
- **Do not hold or carry the injection pump by the adjusting lever.**
- **w/ HAC:**
  Do not put the injection pump at an angle more than 45° from the horizontal.

7. REMOVE FUEL INLET PIPE FROM INJECTION PUMP
(a) LJ, LN, LY:
Remove the bolt for the pipe clamp.
(b) Remove the union bolt, inlet pipe and 2 gaskets.

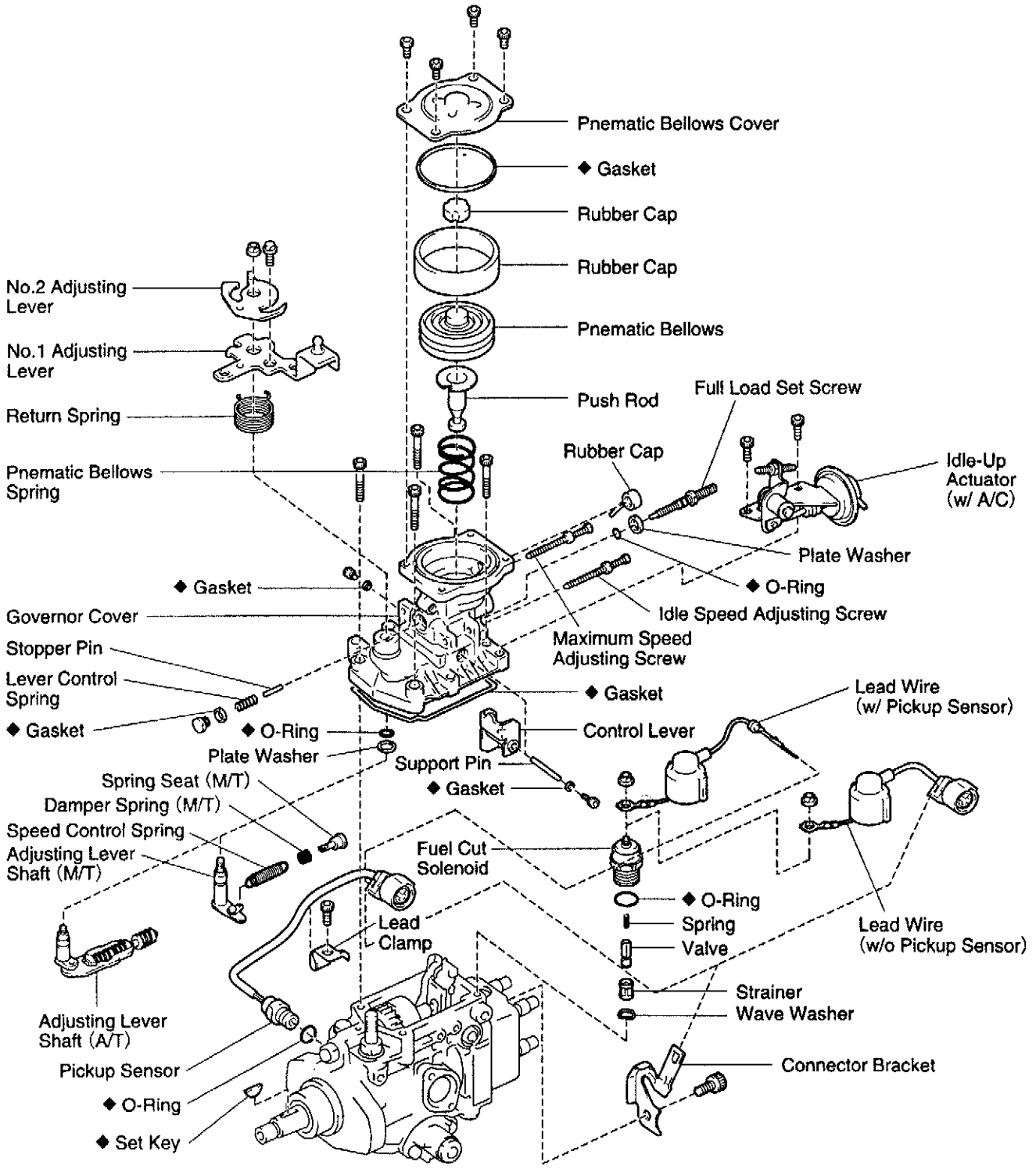
8. REMOVE FUEL RETURN PIPE FROM INJECTION PUMP
Remove the union bolt, return pipe and 2 gaskets.

COMPONENTS FOR DISASSEMBLY AND ASSEMBLY

EG7DN-01

EG

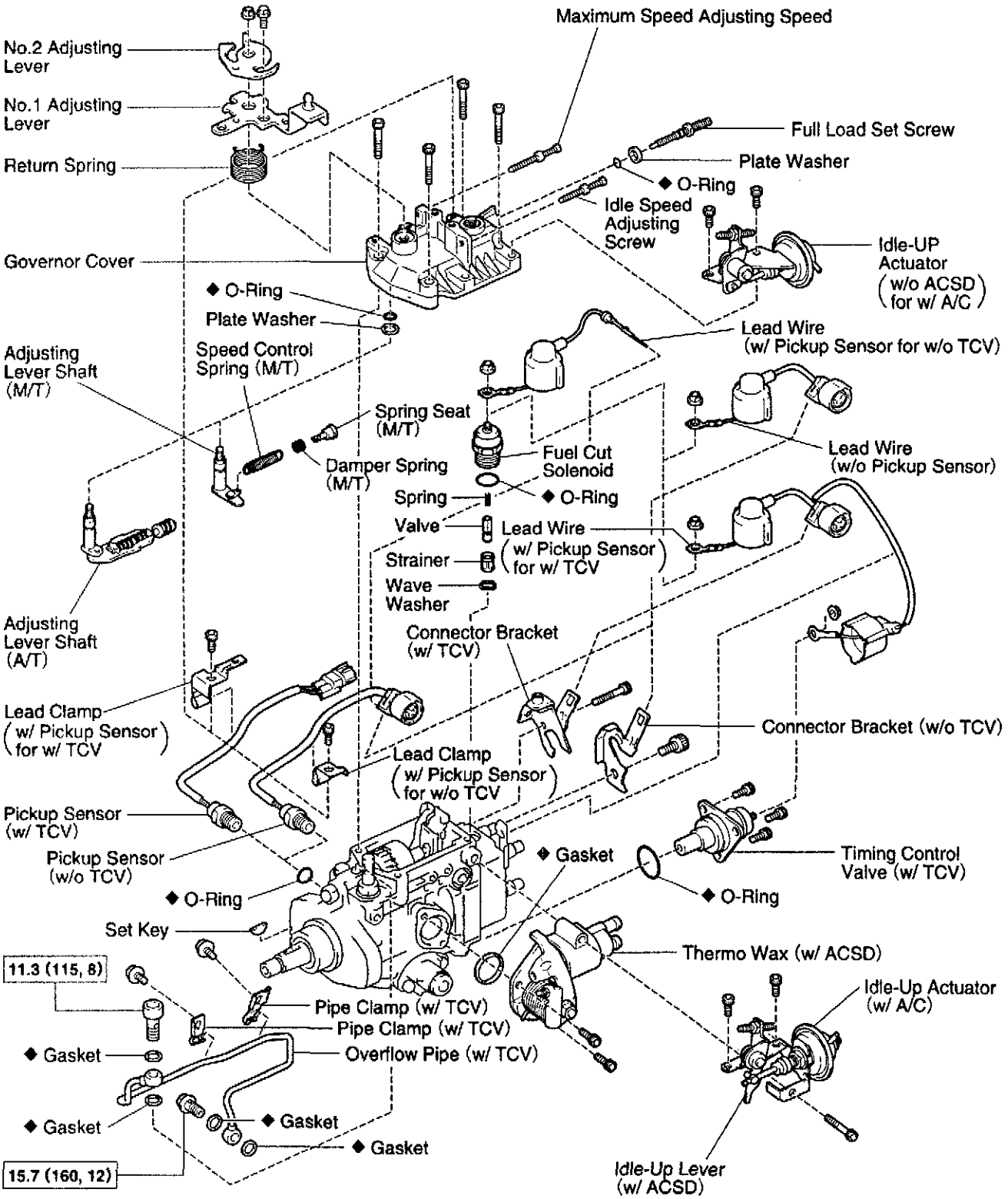
w/ HAC



◆ Non-reusable part

T 903754

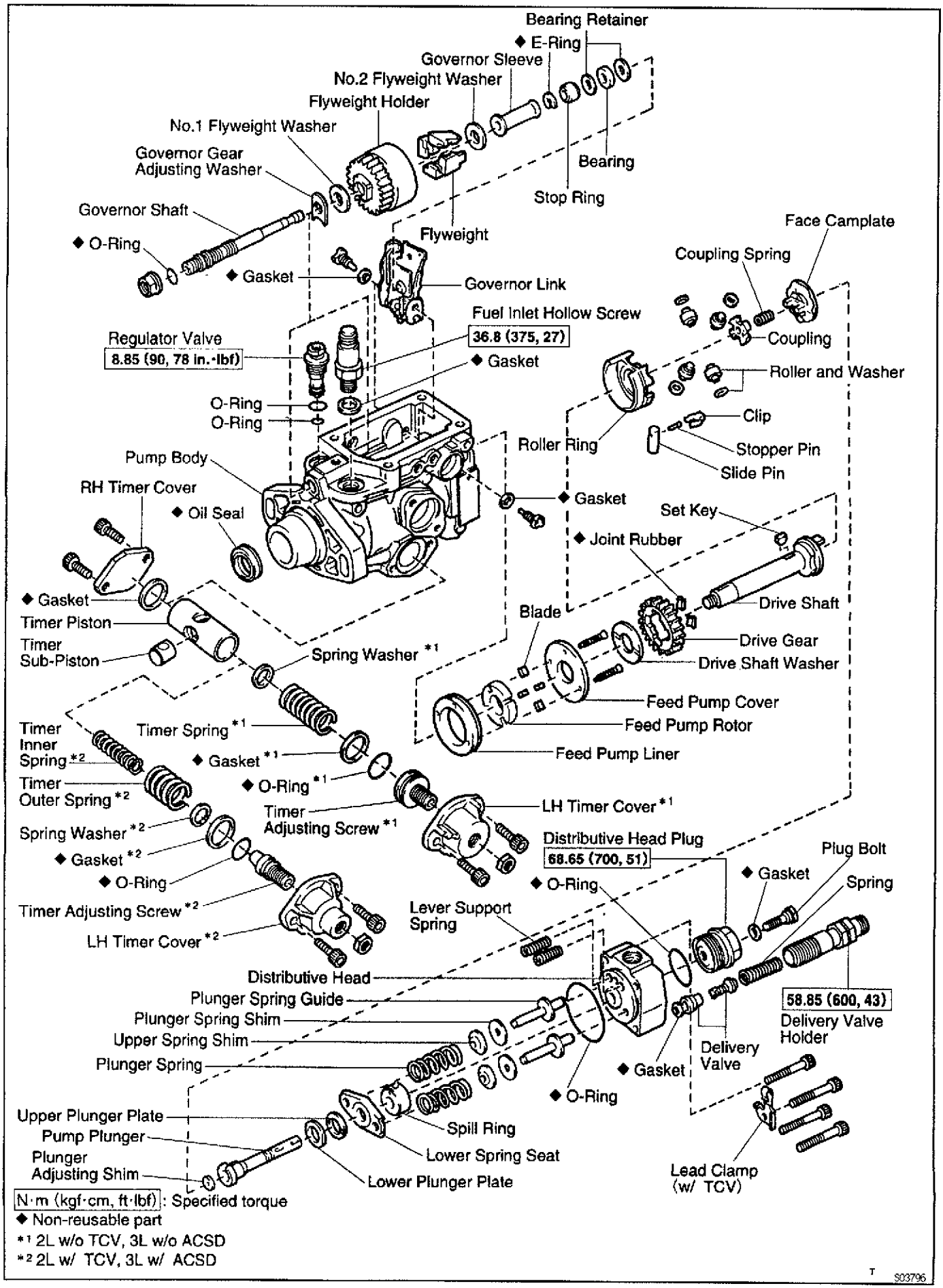
w/o HAC



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

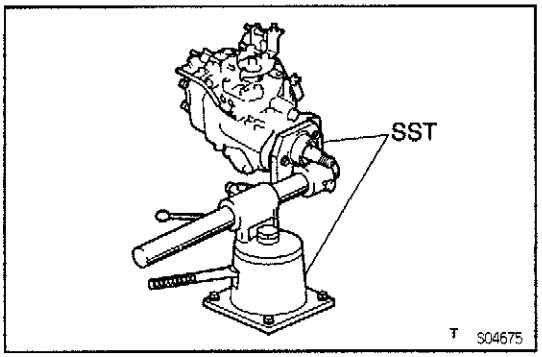
T S03755

EG


Bearing Retainer
◆ E-Ring
Governor Sleeve
No.2 Flyweight Washer
Flyweight Holder
No.1 Flyweight Washer
Governor Gear Adjusting Washer
Bearing
Stop Ring
Governor Shaft
◆ O-Ring
Flyweight
Face Camplate
Coupling Spring
◆ Gasket
Governor Link
Fuel Inlet Hollow Screw
36.8 (375, 27)
Coupling
Regulator Valve
8.85 (90, 78 in.-lbf)
◆ Gasket
Roller and Washer
O-Ring
O-Ring
Clip
Roller Ring
Stopper Pin
Slide Pin
Pump Body
RH Timer Cover
◆ Gasket
Set Key
◆ Oil Seal
◆ Joint Rubber
◆ Gasket
Timer Piston
Timer Sub-Piston
Spring Washer *1
Blade
Drive Shaft
Drive Gear
Drive Shaft Washer
Feed Pump Cover
Feed Pump Rotor
Feed Pump Liner
Timer Inner Spring *2
Timer Spring *1
◆ Gasket *1
◆ O-Ring *1
Timer Outer Spring *2
Timer Adjusting Screw *1
LH Timer Cover *1
Distributive Head Plug
68.65 (700, 51)
Plug Bolt
Spring Washer *2
◆ Gasket *2
◆ O-Ring
◆ O-Ring
◆ Gasket
Spring
Timer Adjusting Screw *2
Lever Support Spring
LH Timer Cover *2
Distributive Head
Plunger Spring Guide
Plunger Spring Shim
Upper Spring Shim
Plunger Spring
58.85 (600, 43)
Delivery Valve Holder
Delivery Valve
◆ Gasket
◆ O-Ring
Upper Plunger Plate
Spill Ring
Pump Plunger
Lower Spring Seat
Plunger Adjusting Shim
Lower Plunger Plate
Lead Clamp (w/ TCV)
N·m (kgf·cm, ft·lbf): Specified torque
◆ Non-reusable part
*1 2L w/o TCV, 3L w/o ACSD
*2 2L w/ TCV, 3L w/ ACSD
S03796

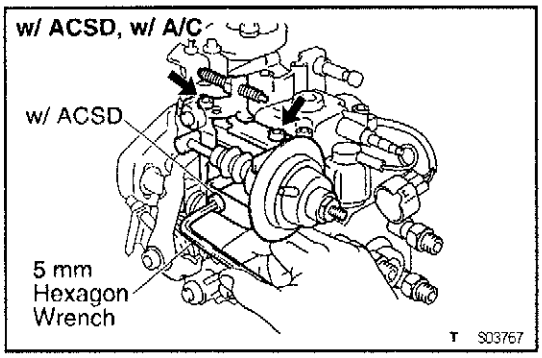
E67DJ-01

INJECTION PUMP DISASSEMBLY

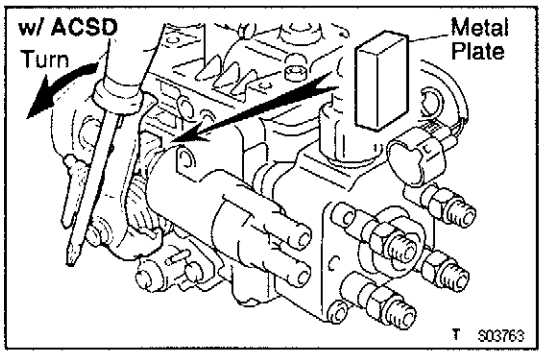


NOTICE (w/ HAC): When re–using the governor cover assembly, to prevent oil spilling out from the bushing of the governor cover when doing steps 1 to 13, remove it without tilting it 45° or more from the horizontal.

1. **MOUNT PUMP ASSEMBLY TO SST (STAND)**
   SST 09241–76022, 09245–54010
2. **REMOVE SET KEY OF DRIVE PULLEY FROM DRIVE SHAFT**



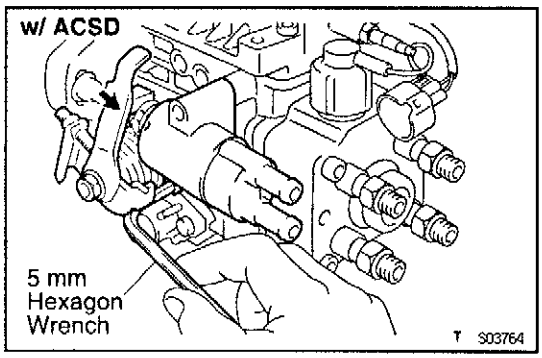
3. **w/ ACSD:**
   REMOVE IDLE–UP LEVER AND ACTUATOR (w/ A/C) ASSEMBLY
   Using a 5 mm hexagon wrench, remove the 3 bolts, the idle–up lever and actuator (w/ A/C) assembly.
4. **w/o ACSD for w/ A/C:**
   REMOVE IDLE–UP ACTUATOR
   Using a 5 mm hexagon wrench, remove the 2 bolts and idle–up actuator.



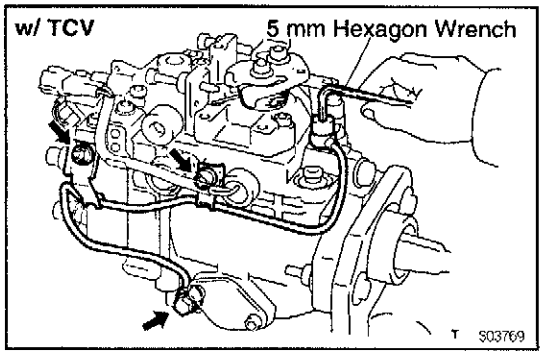
5. **w/ ACSD:**
   REMOVE THERMO WAX

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

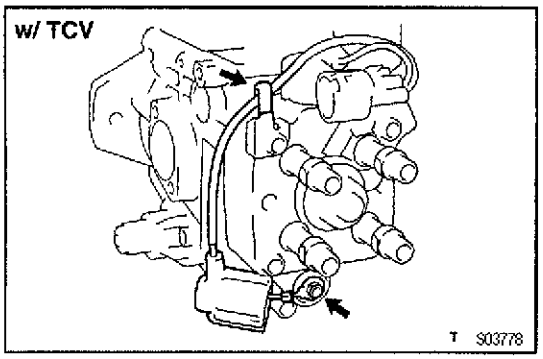
(b) Put a metal plate (thickness of 8.5 – 10.0 mm (0.335 – 0.394 in.)) between the cold starting lever and thermo wax plunger.



(c) Using a 5 mm hexagon wrench, remove the 2 bolts, thermo wax and gasket.



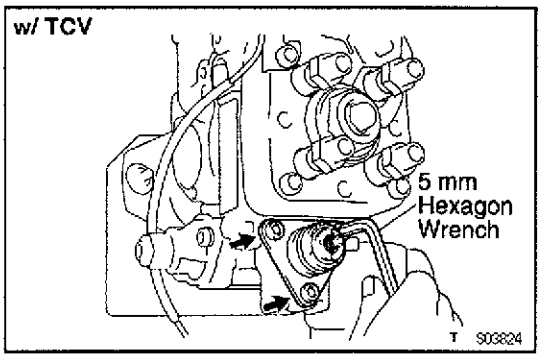
6. **w/ TCV:**
   REMOVE OVERFLOW PIPE
   Using a 5 mm hexagon wrench, remove the 2 bolts, 2 union bolts, 4 gaskets, overflow pipe and 2 pipe clamps.



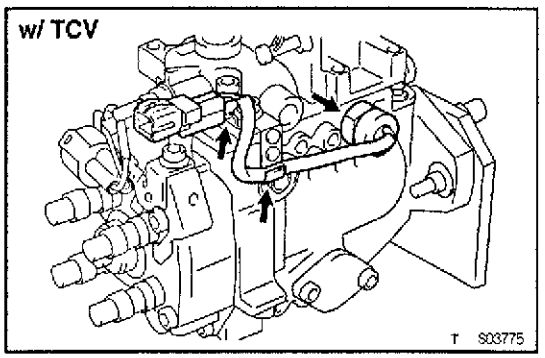
EG

7. w/ TCV:
REMOVE TIMING CONTROL VALVE

(a) Disconnect the dust cover from the timing control valve.
(b) Remove the nut, and disconnect the lead wire from the timing control valve.
(c) Disconnect the lead wire from the lead clamp on the distributive head.

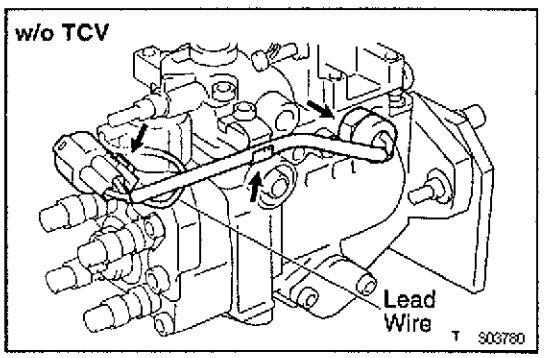


(d) Using a 5 mm hexagon wrench, remove the 3 bolts and timing control valve.
(e) Remove the O–ring from the timing control valve.



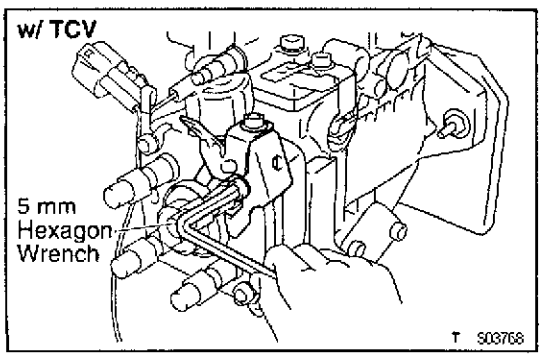
8. REMOVE PICKUP SENSOR
w/ TCV:

(a) Disconnect the lead wire and connector from the lead clamp on the governor cover.
(b) Remove the pickup sensor and O–ring.



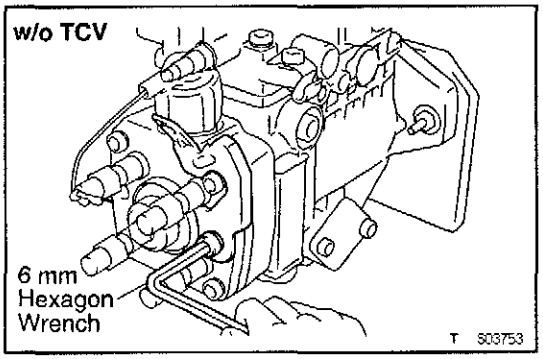
w/o TCV:

(a) Disconnect the lead wire from the lead clamp on the governor cover.
(b) Disconnect the connector from the connector bracket on the distributive head.
(c) Disconnect the lead wire for fuel cut solenoid from the connector.
(d) Remove the pickup sensor and O–ring.

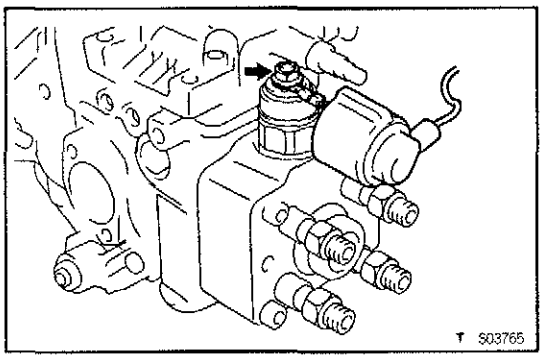


9. REMOVE CONNECTOR BRACKET
w/ TCV:

Using a 5 mm hexagon wrench, remove the bolt and connector bracket.

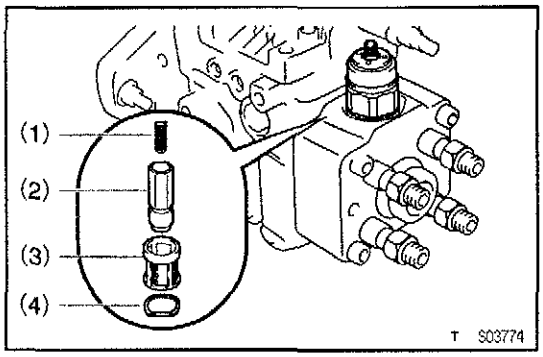


w/o TCV:
Using a 6 mm hexagon wrench, remove the bolt and connector bracket.

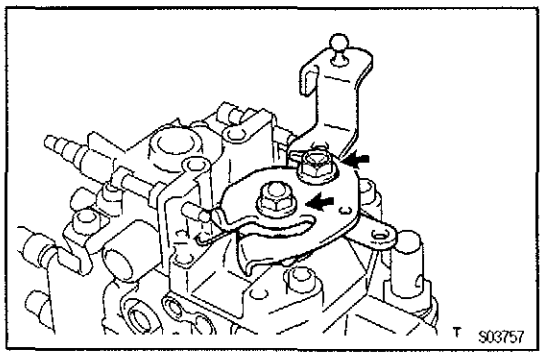


10. REMOVE FUEL CUT SOLENOID

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

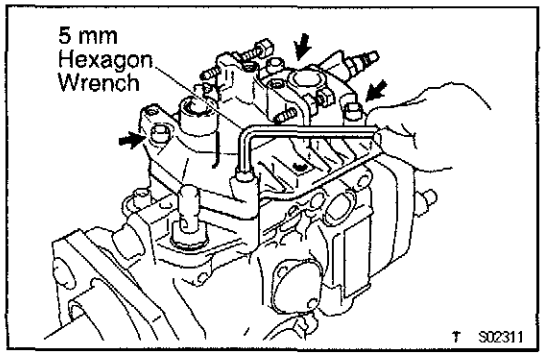


(c) Remove the fuel cut solenoid, O—ring and these parts:
(1) Spring
(2) Valve
(3) Strainer
(4) Wave washer



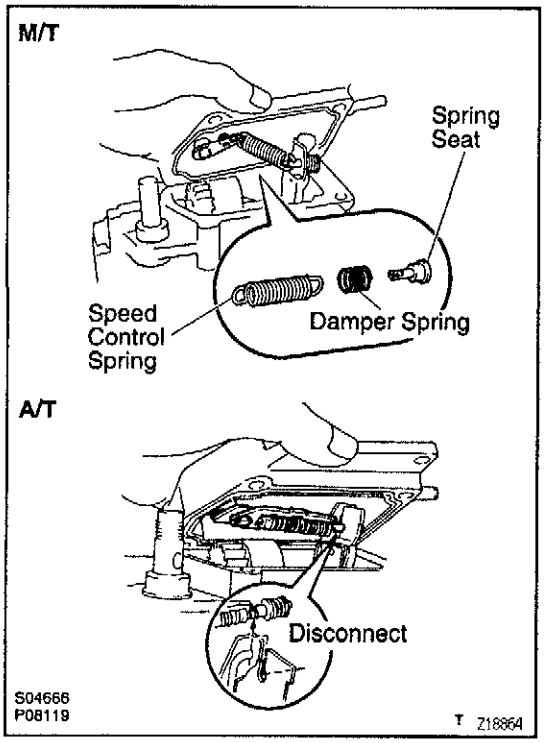
11. REMOVE ADJUSTING LEVERS

Remove the bolt, nut, No.1 and No.2 adjusting levers and return spring.



12. REMOVE GOVERNOR COVER

(a) w/ HAC:
Remove the idle speed adjusting screw.
(b) Using a 5 mm hexagon wrench, remove the 4 bolts.



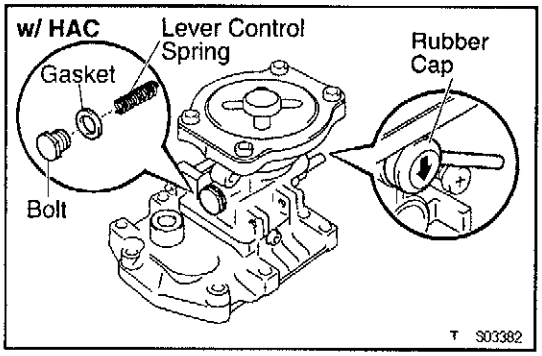
(c) Disconnect the adjusting lever shaft from the governor cover, and remove the governor cover and gasket.

(d) M/T:
Remove the adjusting lever shaft, speed control spring, spring seat and damper spring from the governor link.

(e) A/T:
Disconnect the adjusting lever shaft from the governor link, and remove the adjusting lever shaft.

(f) Remove the O–ring and plate washer from the adjusting lever shaft.

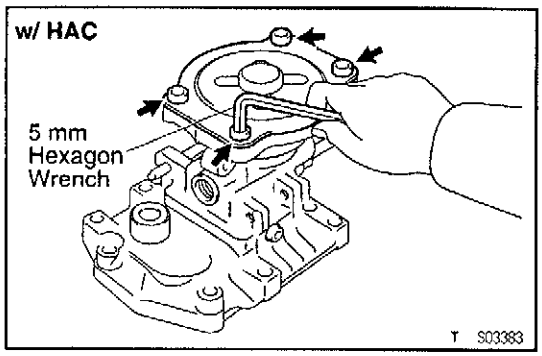
NOTICE (w/ HAC): After removing the governor cover assembly, do not place it at an angle 45° or more from the horizontal.



13. w/ HAC:
DISASSEMBLE HIGH ALTITUDE COMPENSATOR

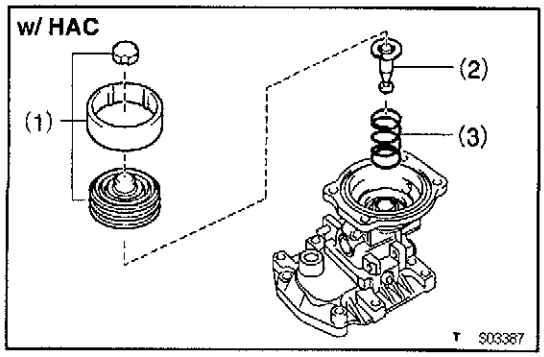
A. Remove lever control spring
Remove the bolt, gasket and lever control spring.

B. Remove rubber cap

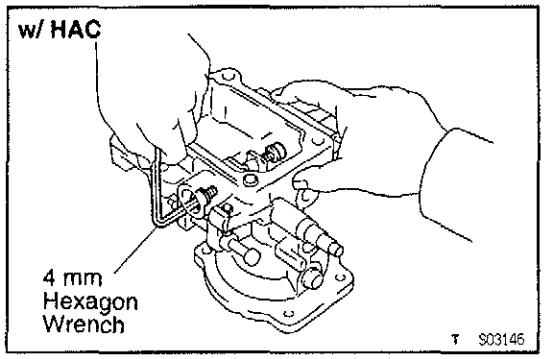


C. Remove pneumatic bellows

(a) Using a 5 mm hexagon wrench, remove the 4 bolts, pneumatic bellows cover and gasket.

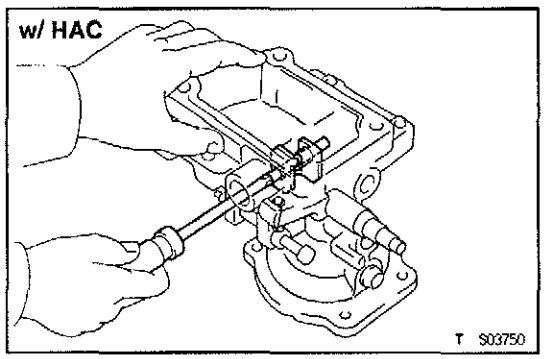


(b) Remove these parts:
(1) Pneumatic bellows and 2 rubber caps
(2) Push rod
(3) Pneumatic bellows spring

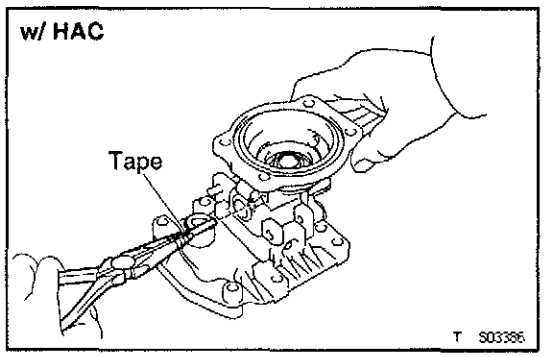


D. Remove control lever

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

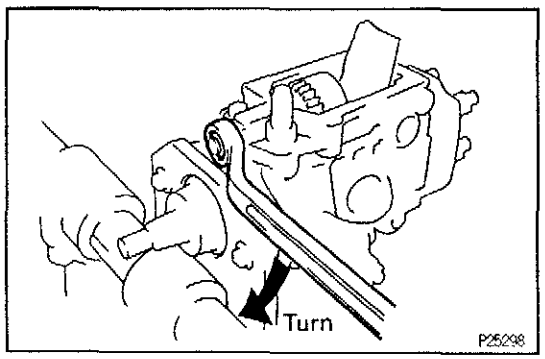


(b) Using a small screwdriver, push out the support pin and remove the control lever.



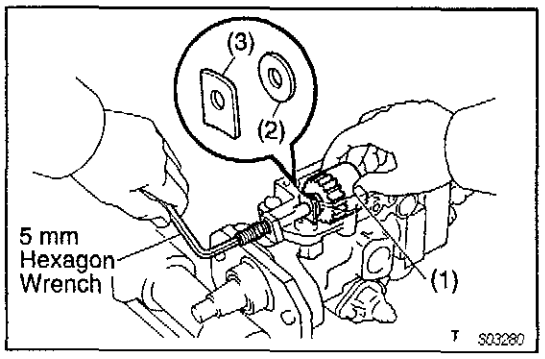
(c) Using needle nose pliers, remove the connecting pin.
NOTICE: Be careful not to damage the connecting pin. Tape the tip of the pliers.

14. CHECK FLYWEIGHT HOLDER THRUST CLEARANCE
(See step 20 in injection pump assembly)



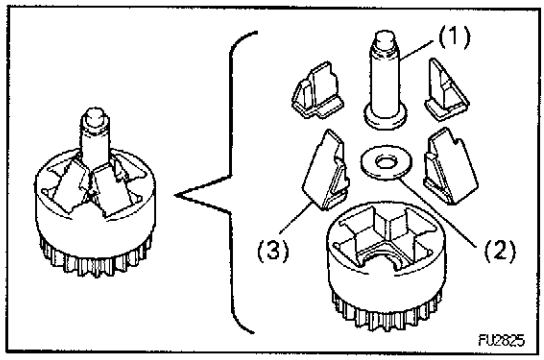
15. REMOVE GOVERNOR SHAFT AND FLYWEIGHT HOLDER

(a) Remove the governor shaft lock nut by turning it clockwise.
NOTICE: The governor shaft and lock nut have LH threads.

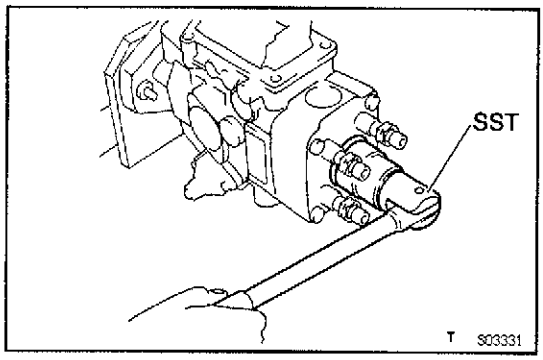


(b) Using a 5 mm hexagon wrench, remove the governor shaft clockwise, and remove these parts:
(1) Flyweight holder assembly
(2) No.1 flyweight washer
(3) Governor gear adjusting washer
HINT: Be careful not to drop the 2 washers into the pump housing.

(c) Remove the O–ring from the governor shaft.

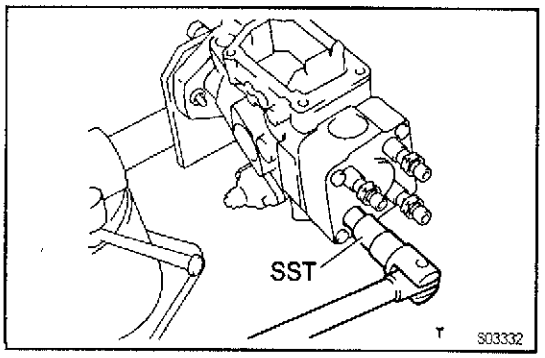


(d) Remove these parts from the flyweight holder:
(1) Governor sleeve
(2) No.2 flyweight washer
(3) 4 flyweights



16. REMOVE DISTRIBUTIVE HEAD PLUG

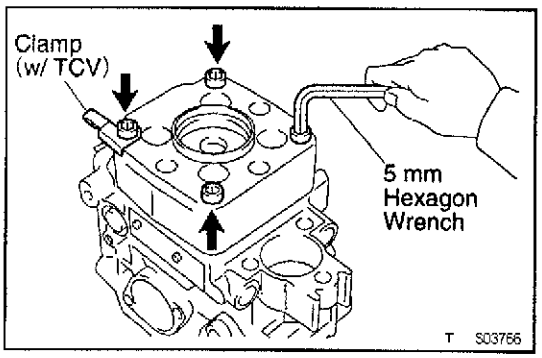
Using SST, remove the distributive head plug and O–ring.
SST 09260–54012 (09262–54010)



17. REMOVE DELIVERY VALVE HOLDERS

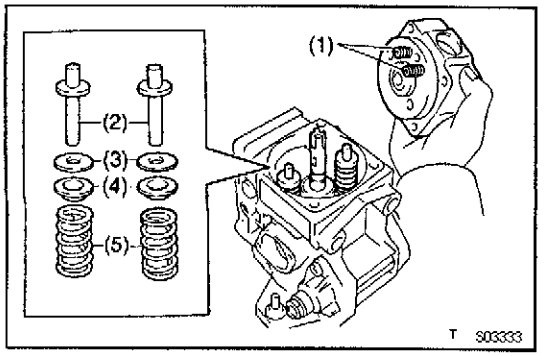
(a) Using SST, remove the 4 delivery valve holders and springs.
SST 09260–54012 (09269–54020)

(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.



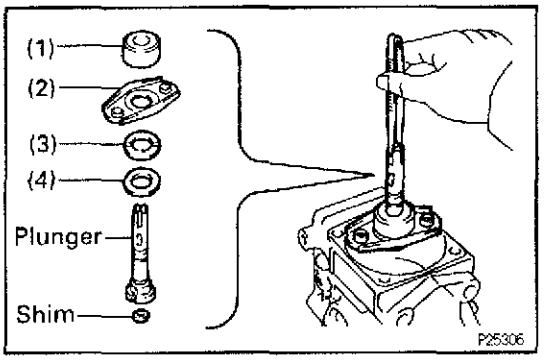
18. REMOVE DISTRIBUTIVE HEAD

(a) Using a 5 mm hexagon wrench, remove the 4 bolts and lead clamp (w/ TCV).



(b) Remove the distributive head and these 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

(c) Remove the O–ring from the distributive head.



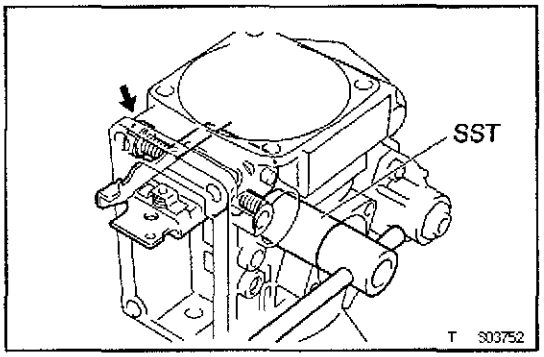
19. REMOVE PUMP PLUNGER

Using SST, remove the pump plunger and plunger adjusting shim together with these parts:

(1) Spill ring
(2) Lower spring seat
(3) Upper plunger plate
(4) Lower plunger plate

SST 09260–54012 (09269–54030)

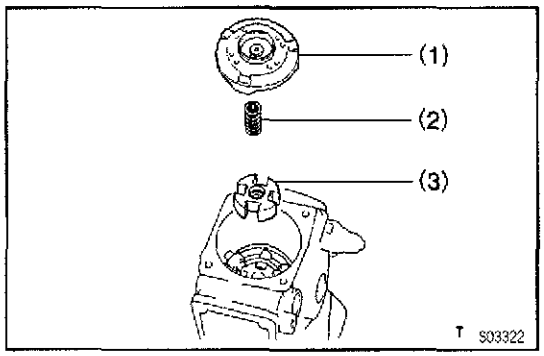
NOTICE: Do not touch the sliding surfaces of the pump plunger with your hand.



20. REMOVE GOVERNOR LINK

Using SST, remove the 2 support bolts, 2 gaskets and governor link.

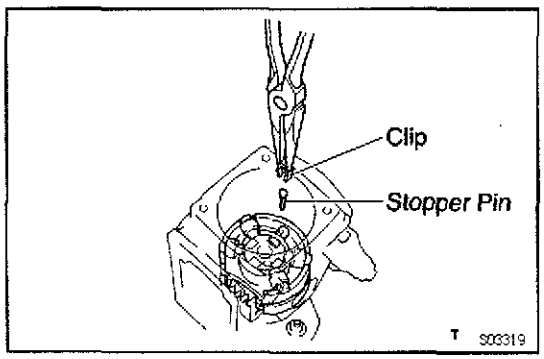
SST 09260–54012 (09269–54040)



21. REMOVE FACE CAMPLATE AND COUPLING

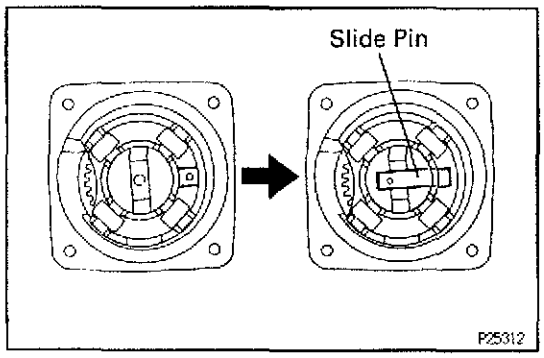
Remove these parts:

(1) Face camplate
(2) Coupling spring
(3) Coupling



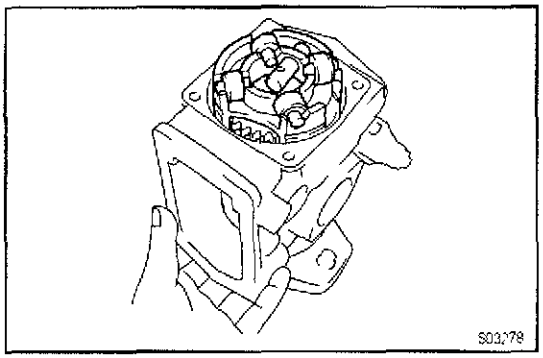
22. REMOVE ROLLER RING AND DRIVE SHAFT

(a) Remove the clip and stopper pin.



(b) Push the slide pin toward inside.

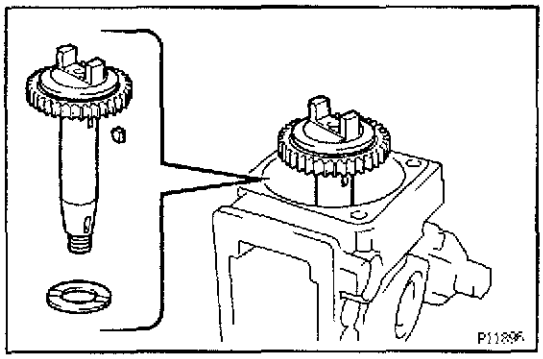
EG



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

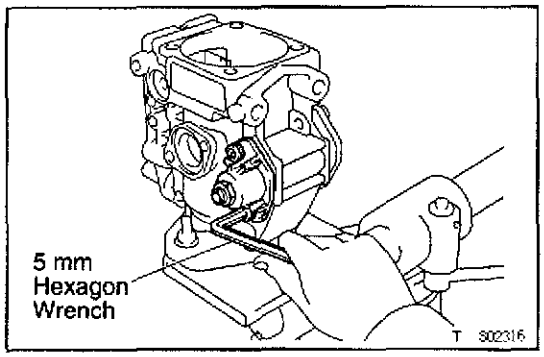
NOTICE:

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



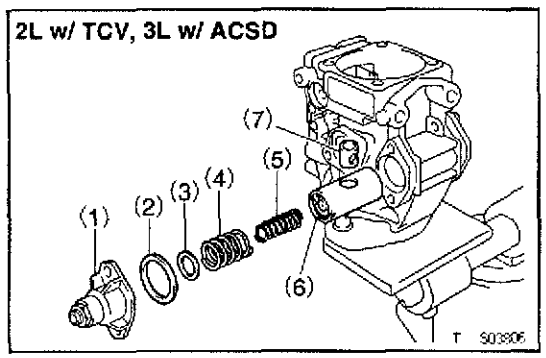
(d) Remove the drive shaft, governor drive gear, 2 joint rubbers assembly, set key and drive shaft washer.

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



23. REMOVE TIMER

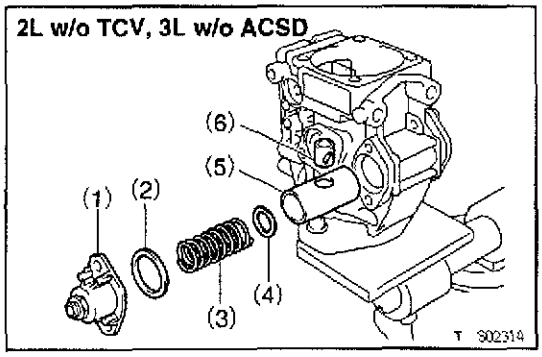
(a) Using a 5 mm hexagon wrench, remove the 2 LH timer cover bolts.



(b) 2L w/ TCV, 3L w/ ACSD:

Remove these parts:

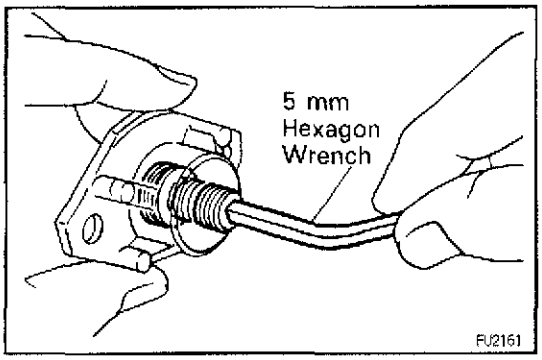
(1) LH timer cover, timer adjusting screw and nut assembly
(2) Gasket
(3) Spring washer
(4) Timer outer spring
(5) Timer inner spring
(6) Timer piston
(7) Timer sub–piston



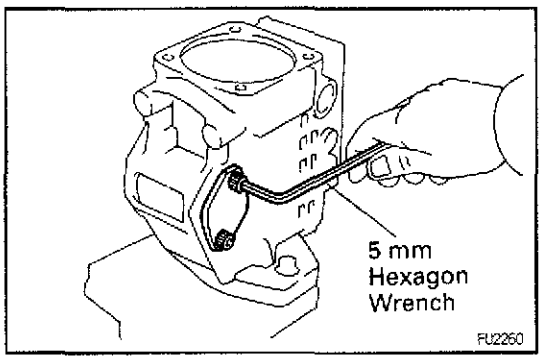
(c) 2L w/o TCV, 3L w/o ACSD:

Remove these parts:

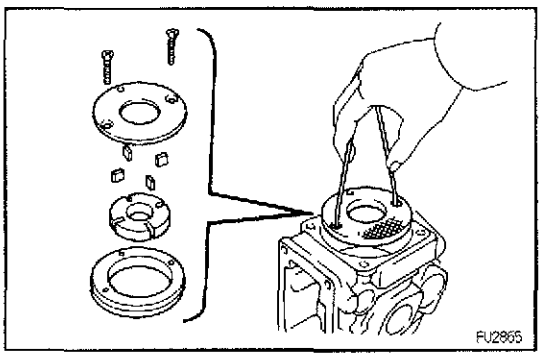
(1) LH timer cover, timer adjusting screw and nut assembly
(2) Gasket
(3) Spring washer
(4) Timer spring
(5) Timer piston
(6) Timer sub–piston



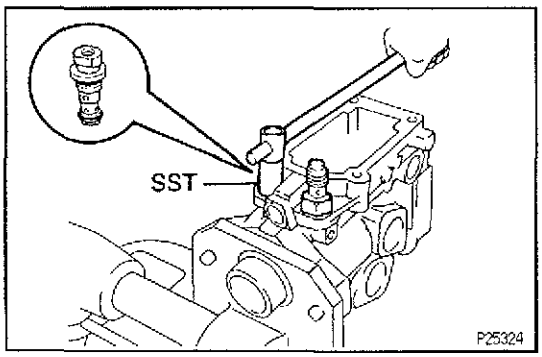
(d) Remove the nut from the LH timer cover.
(e) Using a 5 mm hexagon wrench, remove the timer adjusting screw.
(f) Remove the O–ring from the timer adjusting ring.



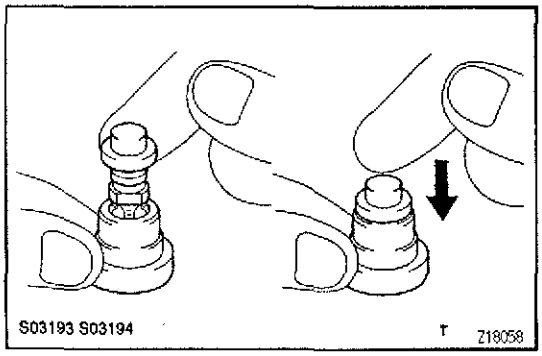
(g) Using a 5 mm hexagon wrench, remove the 2 bolts, RH timer cover and O–ring.



24. 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.**



25. REMOVE REGULATOR VALVE
Using SST, remove the regulator valve and 2 O–rings.
SST 09260–54012 (09262–54020)
26. REMOVE FUEL INLET HOLLOW SCREW
Remove the hollow screw and gasket.



INJECTION PUMP COMPONENTS INSPECTION

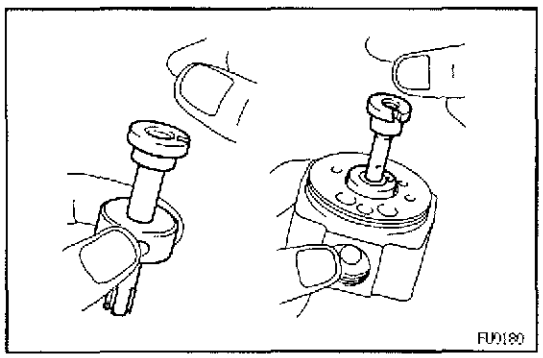
EG7DK–01

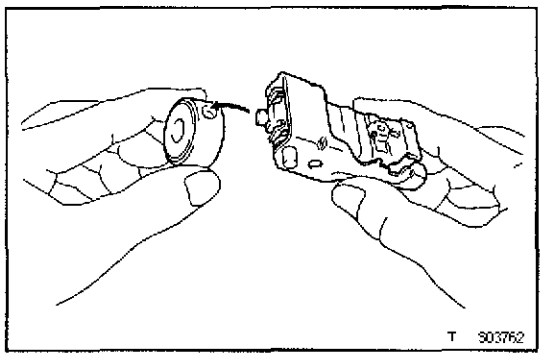
1. INSPECT DELIVERY VALVES
NOTICE: Do not touch the sliding surfaces of the pump plunger and delivery valves.
Pull up the valve, and release it. Check that it sinks smoothly to the valve seat.

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.

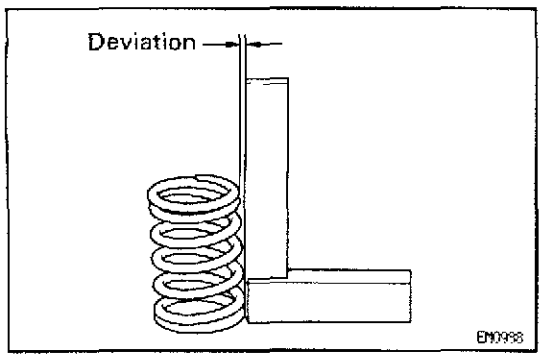
(b) When released, the plunger should sink down smoothly into the spill ring (distributive head) by its own weight.

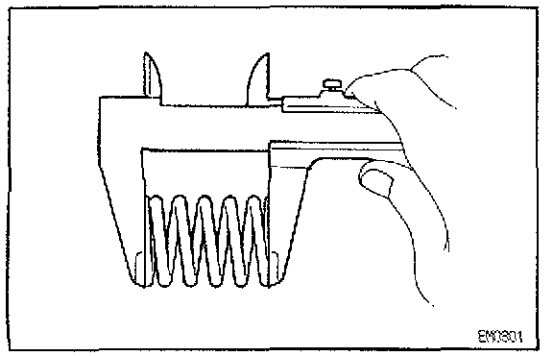
(c) Rotate the plunger, and repeat the test at various positions.

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.

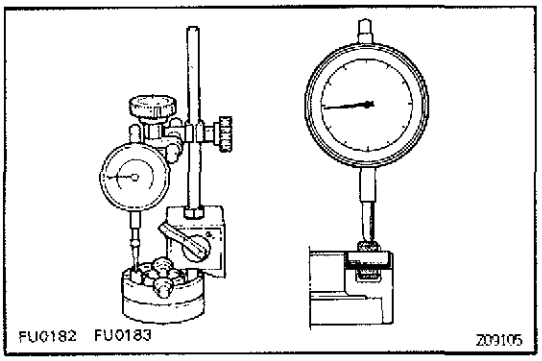
4. INSPECT SPRING LENGTH

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

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

Delivery valve spring	24.4 (0.961)
Plunger spring	30.0 (1.181)
Coupling spring	16.6 (0.654)
Pneumatic bellows spring (w/ HAC)	30.0 (1.181)

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



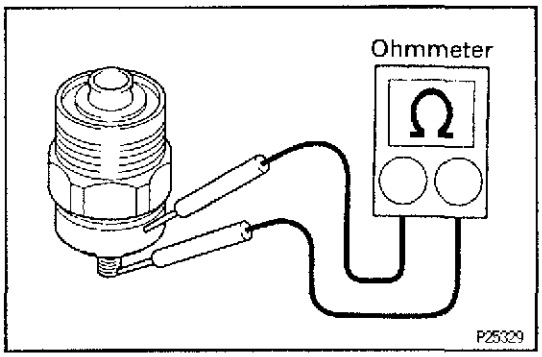
5. INSPECT ROLLER RING AND ROLLERS

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.



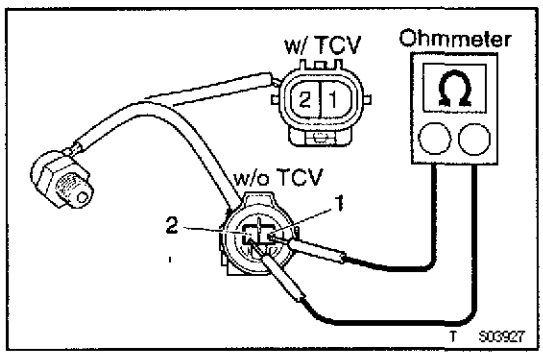
6. INSPECT FUEL CUT SOLENOID

Using an ohmmeter, measure the resistance between the terminal and solenoid body.

Resistance at 20°C (68°F):

9.5 – 11.9 Ω

If the resistance is not as specified, replace the solenoid.



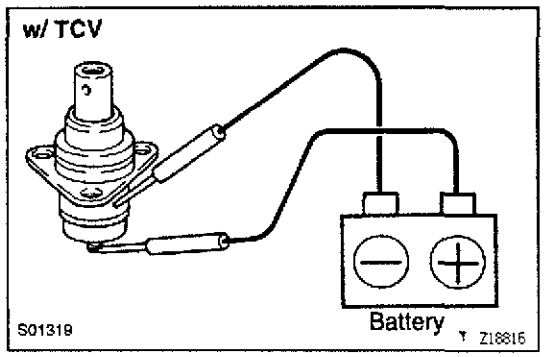
7. INSPECT PICKUP SENSOR

Using an ohmmeter, measure the resistance between terminals 1 and 2.

Resistance at 20°C (68°F):

650 – 970 Ω

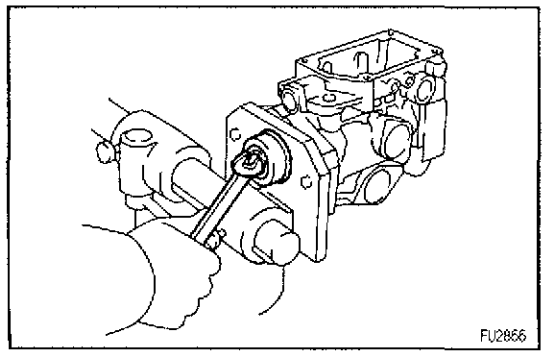
If the resistance is not as specified, replace the sensor.



8. w/ TCV:
INSPECT TIMING CONTROL VALVE

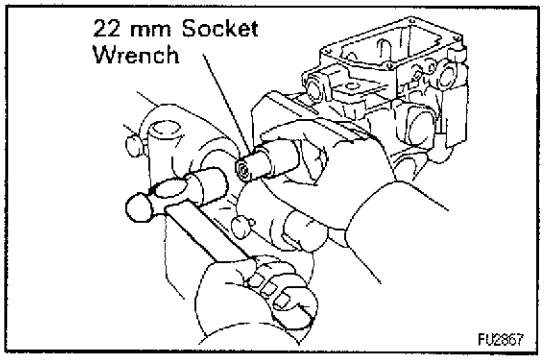
(a) Connect the valve body and terminal to the battery terminals.

(b) You should feel the click from the control valve when the battery power is connected and disconnected.
If the control valve is not operating properly, replace it.



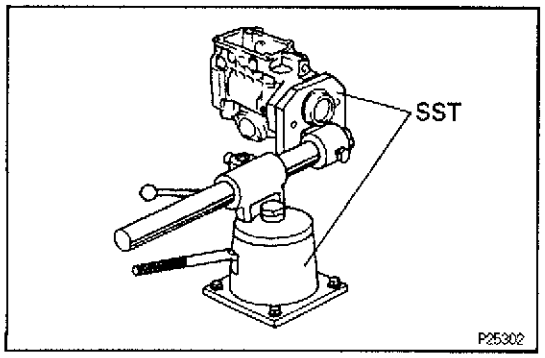
9. IF NECESSARY, REPLACE OIL SEAL

(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 body.

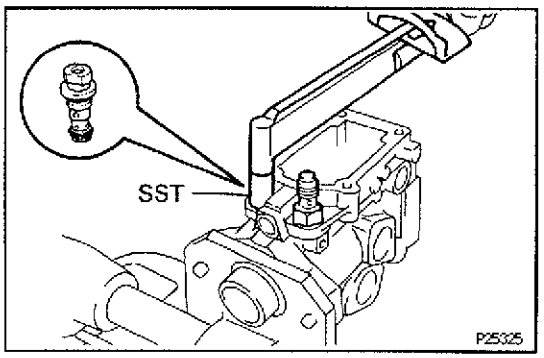
EG



INJECTION PUMP ASSEMBLY

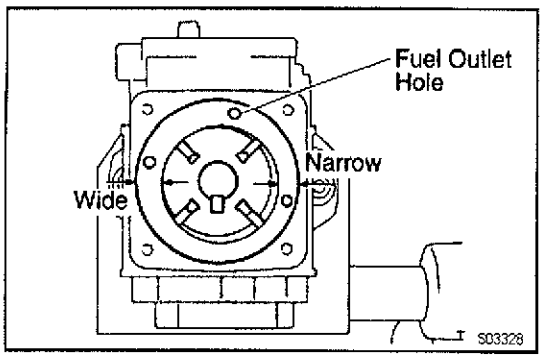
EG7DL-01

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

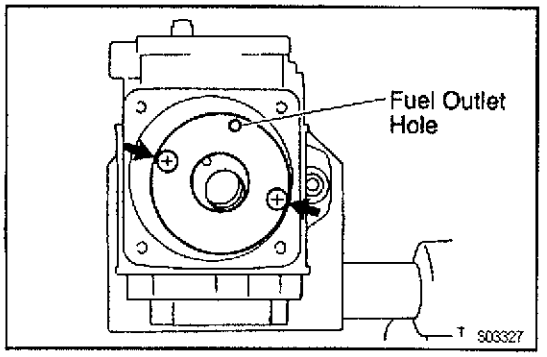


2. INSTALL FUEL INLET HOLLOW SCREW
Install a new gasket and the hollow screw.
Torque: 36.8 N·m (375 kgf·cm, 27 ft·lbf)

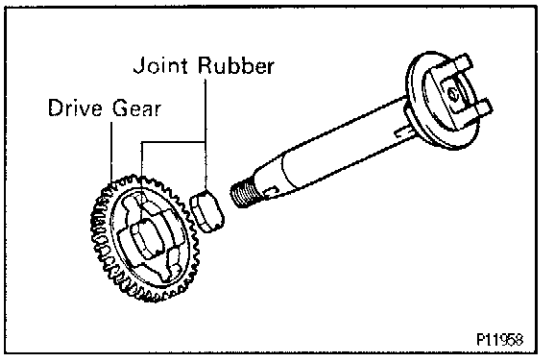
3. INSTALL REGULATOR VALVE
(a) Install the 2 O–rings to the regulator valve.
(b) Using SST, install the regulator valve.
SST 09260–54012 (09262–54020)
Torque: 8.85 N·m (90 kgf·cm, 78 in.·lbf)



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.



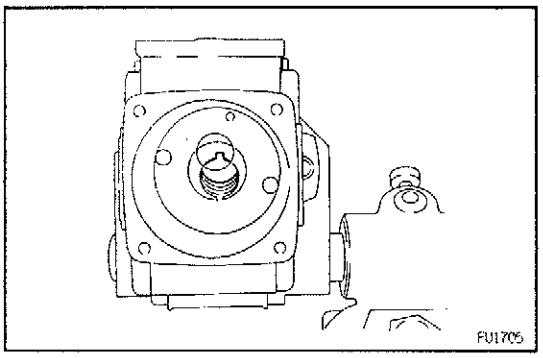
(d) Align the fuel outlet holes of the cover and liner.
(e) Install the pump cover with the 2 screws.
Torque: 2.45 N·m (25 kgf·cm, 22 in.·lbf)
(f) Check that the rotor moves smoothly.



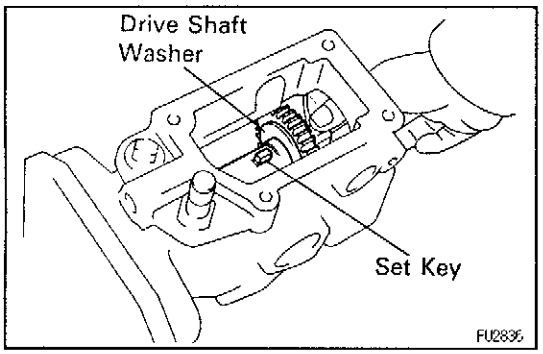
5. INSTALL DRIVE SHAFT

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

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

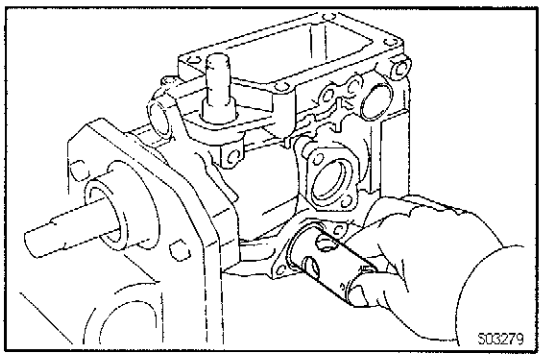


(c) Position the key groove of the feed pump rotor upward.



(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.

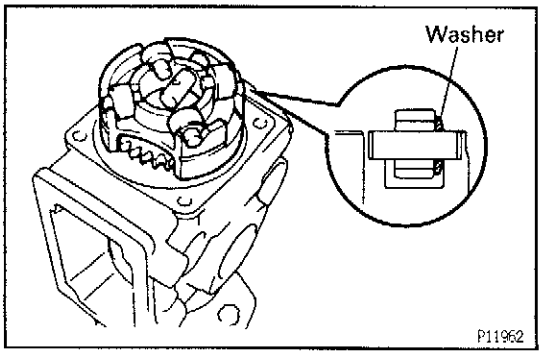


6. INSTALL TIMER PISTON

(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.



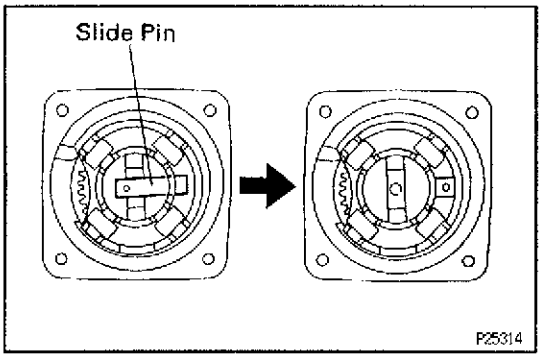
7. INSTALL ROLLER RING

(a) Turn the drive shaft clockwise or counterclockwise approx. 90°.

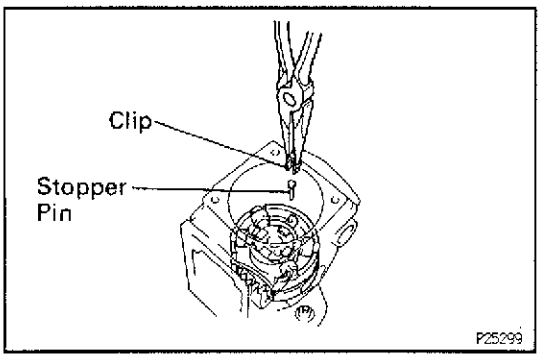
(b) Install the slide pin, 4 rollers and washers on the roller ring.

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

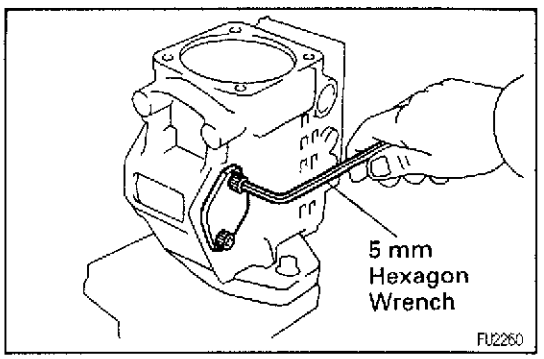
(d) Install the roller ring into the pump housing.



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

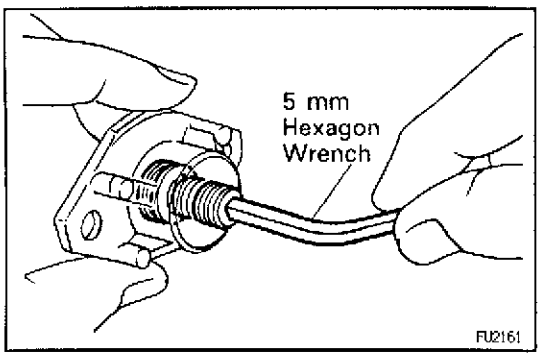


(f) Install the stopper pin and clip.

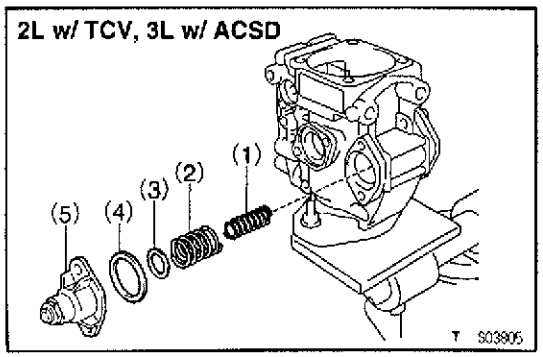


8. INSTALL TIMER SPRING

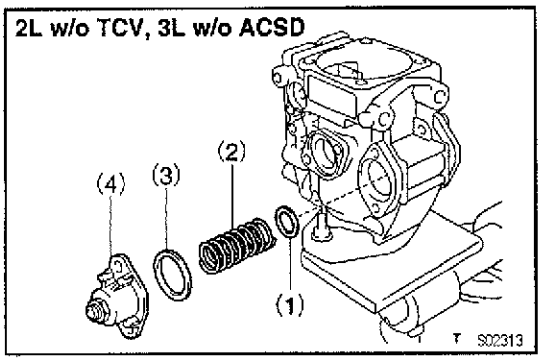
(a) Using a 5 mm hexagon wrench, install a new O–ring and the RH timer cover with the 2 bolts.
Torque: 8.35 N·m (85 kgf·cm, 74 in.·lbf)



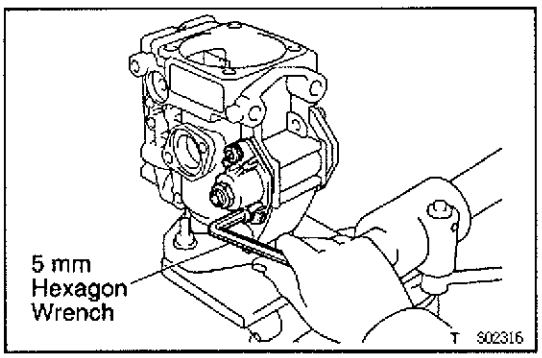
(b) Install a new O–ring to the timer adjusting screw.
(c) Using a 5 mm hexagon wrench, install the timer adjusting screw to the LH timer cover and temporarily install the nut.



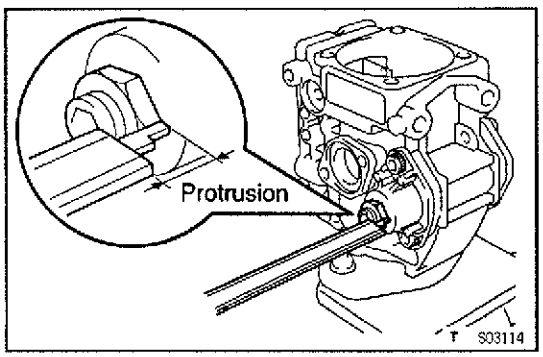
(d) 2L w/ TCV, 3L w/ ACSD:
Install these parts:
(1) Timer inner spring
(2) Timer outer spring
(3) Spring washer
(4) New gasket
(5) LH timer cover, timer adjusting screw and nut assembly



(e) 2L w/o TCV, 3L w/o ACSD:
Install these parts:
(1) Timer spring
(2) Spring washer
(3) New gasket
(4) LH timer cover, timer adjusting screw and nut assembly

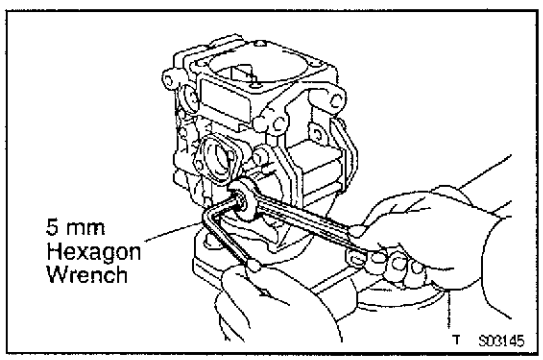


(f) Using a 5 mm hexagon wrench, install the 2 LH timer cover bolts.
Torque: 8.35 N·m (85 kgf·cm, 74 in.·lbf)

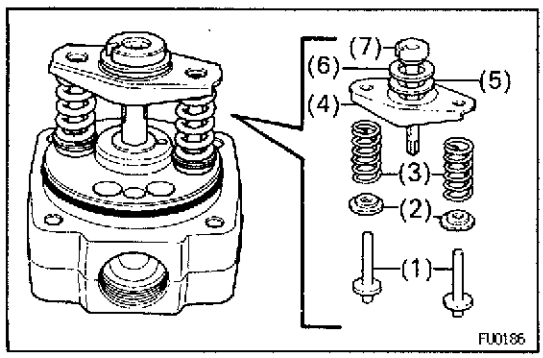


9. PRE–SET TIMER ADJUSTING SCREW

(a) Using vernier calipers, measure the protrusion of the adjusting screw from the timer cover.
Protrusion:
5.0 – 6.0 mm (0.197 – 0.236 in.)

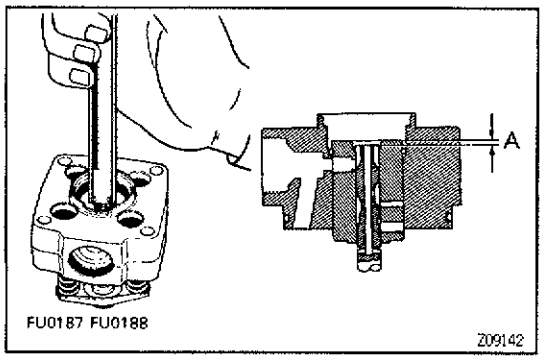


(b) Using a 5 mm hexagon wrench, adjust the protrusion of the adjusting screw from the timer cover.
Torque: 14.2 N·m (145 kgf·cm, 10 ft·lbf)



10. ADJUST PLUNGER SPRING SHIM

(a) Install these 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
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 these formula and chart.

New plunger spring shim thickness = 5.8 – A

A ... Measured plunger position

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

Measured clearance	Shim thickness
More than 5.3 (0.209)	0.5 (0.020)
5.0 – 5.2 (0.196 – 0.205)	0.8 (0.031)
4.8 – 4.9 (0.189 – 0.193)	1.0 (0.039)
4.6 – 4.7 (0.181 – 0.185)	1.2 (0.047)
4.3 – 4.5 (0.169 – 0.177)	1.5 (0.059)
4.0 – 4.2 (0.157 – 0.165)	1.8 (0.071)
Less than 3.9 (0.154)	2.0 (0.079)

HINT:

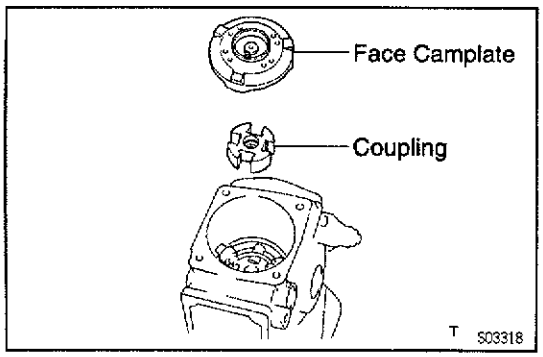
- For a measurement between listed sizes, use the next larger size. e.g. If thickness is 1.1 mm (0.043 in.) by calculation, use a 1.2 mm (0.047 in.) shim.
- Select 2 shims which have the same thickness.

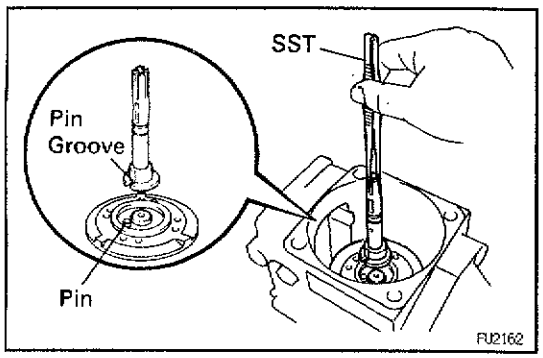
11. INSTALL COUPLING

12. ADJUST PLUNGER ADJUSTING SHIM

(a) Install the face camplate.

HINT: Do not install the coupling spring.



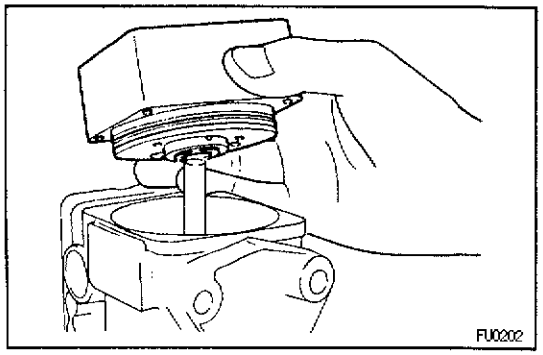


(b) Clean the plunger adjusting shim and contacting surface area.

(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.

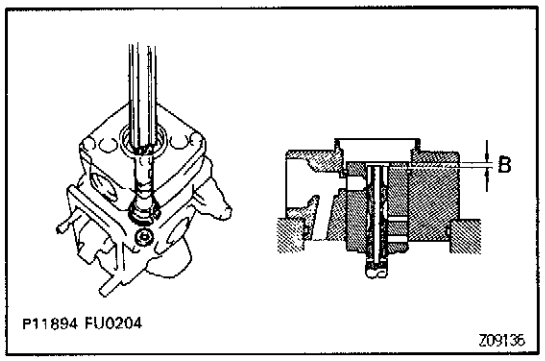
SST 09260–54012 (09269–54030)



(e) Install the distributive head with the 4 bolts.

Torque: 11.75 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 these formula and chart:

New adjusting shim thickness = T + (B – 3.3)

T ... Thickness of used shim

B ... Measured plunger position

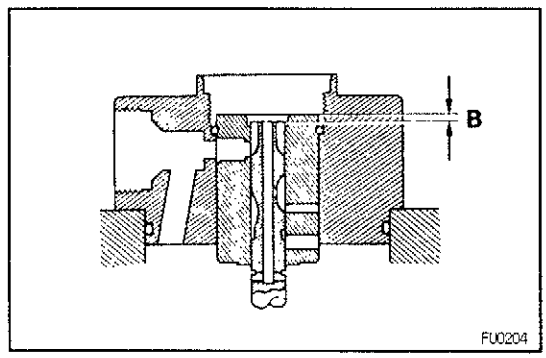
EG

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

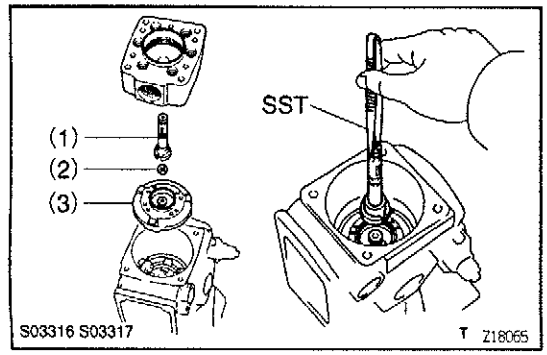


EXAMPLE: The 2.4 mm (0.094 in.) shim is installed and measured clearance is 3.7 mm (0.146 in.). Replace the 2.4 mm (0.094 in.) shim with a 2.8 mm (0.110 in.) shim.

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

Dimension B:

3.2 – 3.4 mm (0.126 – 0.134 in.)



(i) Remove the distributive head.

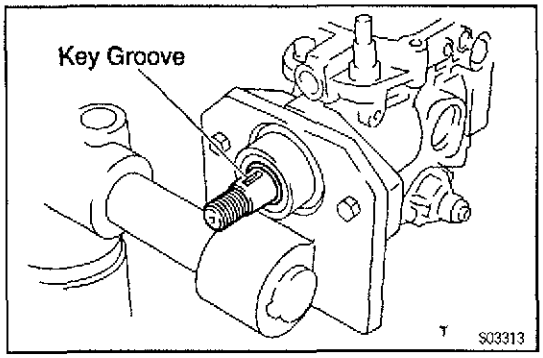
(j) Using SST, remove these parts:

(1) Pump plunger

(2) Plunger adjusting shim

(3) Face camplate

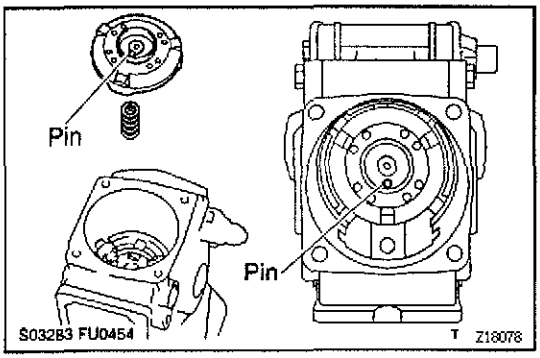
SST 09260–54012 (09269–54030)



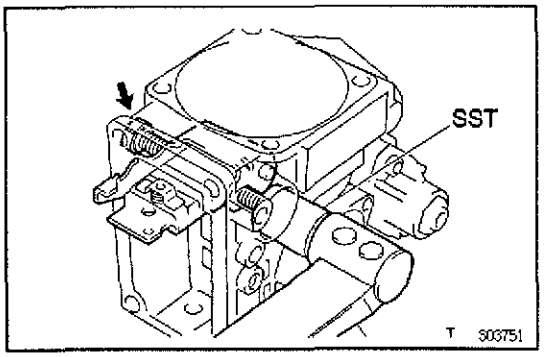
EG

13. INSTALL FACE CAMPLATE

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



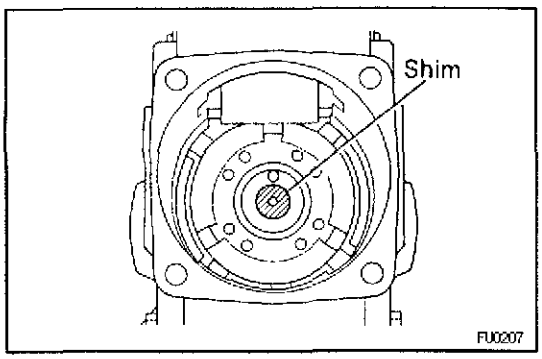
(b) Install the coupling spring and camplate with the camplate pin facing the governor cover side.



14. INSTALL GOVERNOR LINK

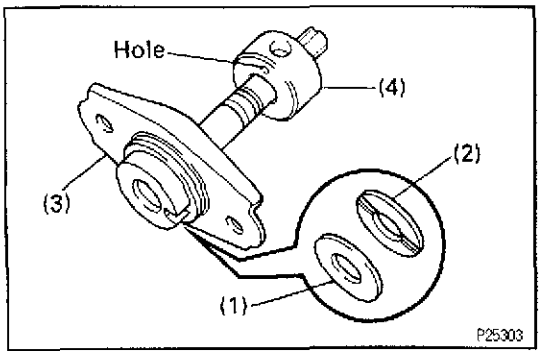
(a) Using SST, install the governor link with 2 new gaskets and the 2 support bolts.
Torque: 13.75 N·m (140 kgf·cm, 10 ft·lbf)
SST 09260−54012 (09269−54040)

(b) Check that the governor link moves smoothly.

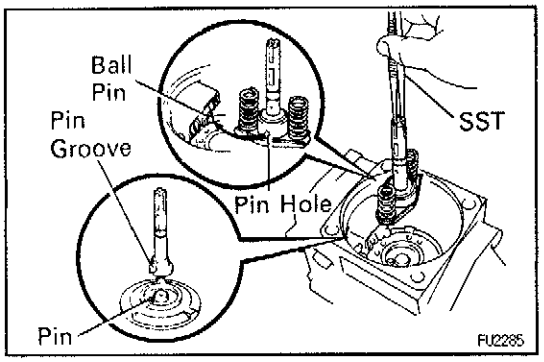


15. INSTALL PUMP PLUNGER

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

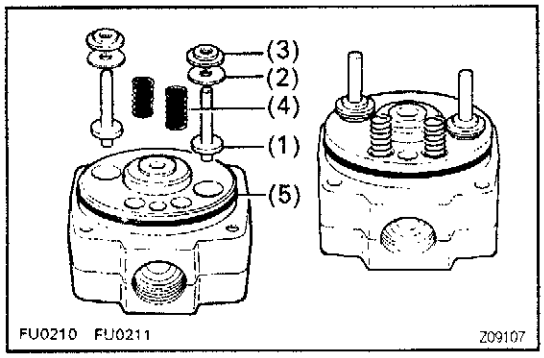


(b) Install these parts to the pump plunger:
(1) Lower plunger plate
(2) Upper plunger plate
(3) Lower spring seat
(4) Spill ring
HINT: Face the spill ring with the hole facing the lower spring seat.



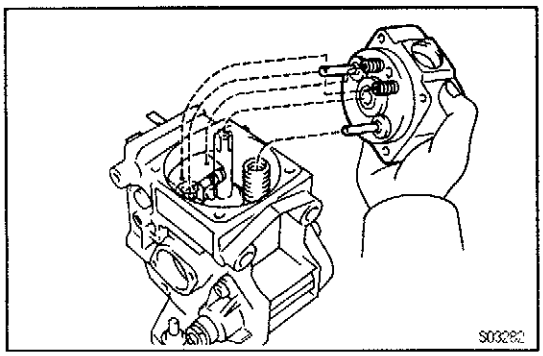
(c) Align the pin groove of the plunger with the pin of the face camplate.
(d) Align the ball pin of the governor link with the pin hole of the spill ring.
(e) Using SST, install the pump plunger and 2 plunger springs.
SST 09260–54012 (09269–54030)

EG

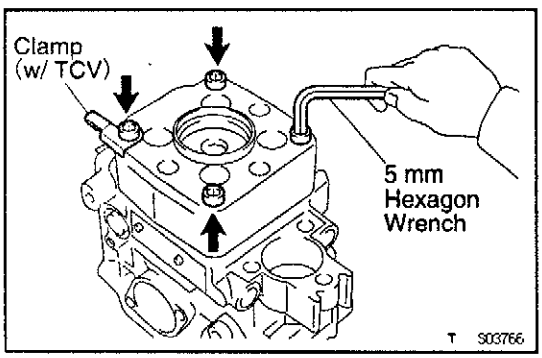


16. INSTALL DISTRIBUTIVE HEAD

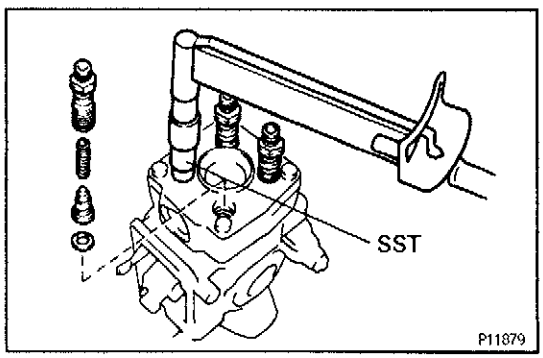
(a) Apply grease to these parts, and install them to the distributive head:
(1) 2 plunger spring guides
(2) 2 new selected plunger spring shims
(3) 2 upper spring seats
(4) 2 lever support springs
(5) New O–ring



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

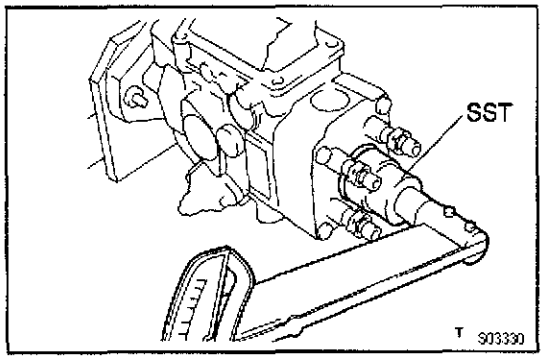


(c) Using a 5 mm hexagon wrench, install the 2 lead clamp (w/ TCV) and 4 bolts. Uniformly tighten the bolts in several passes.
Torque: 11.75 N·m (120 kgf·cm, 9 ft·lbf)
HINT: Use the bolt which is 45 mm (1.77 in.) in length.



17. 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: 58.85 N·m (600 kgf·cm, 43 ft·lbf)

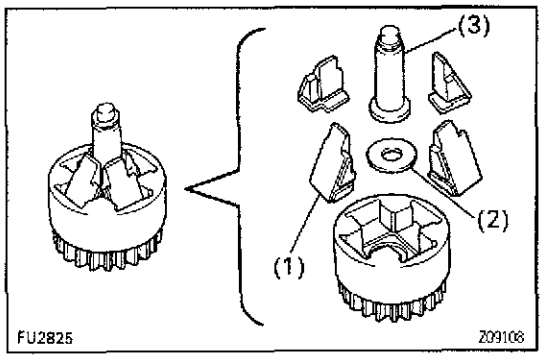


EG

18. INSTALL DISTRIBUTIVE HEAD PLUG

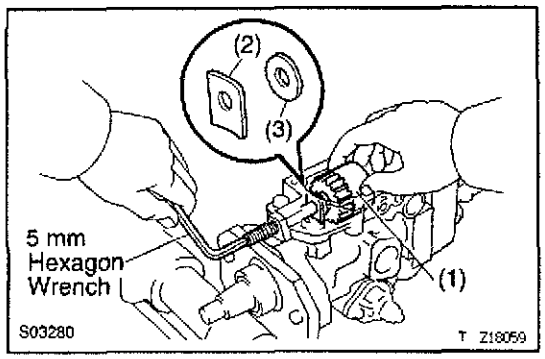
(a) Install a new O–ring to the head plug.

(b) Using SST, install the head plug.
SST 09260–54012 (09262–54010)
Torque: 68.65 N·m (700 kgf·cm, 51 ft·lbf)



19. INSTALL GOVERNOR SHAFT AND FLYWEIGHT HOLDER

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

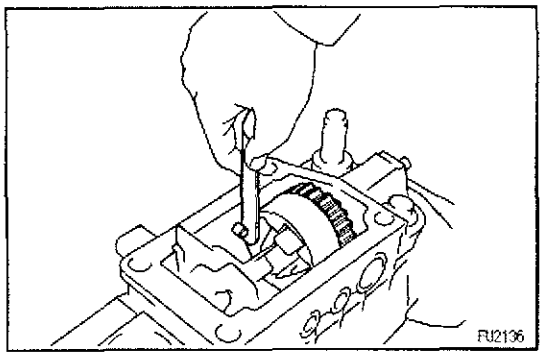


(b) Install a new O–ring to the governor shaft.

(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.

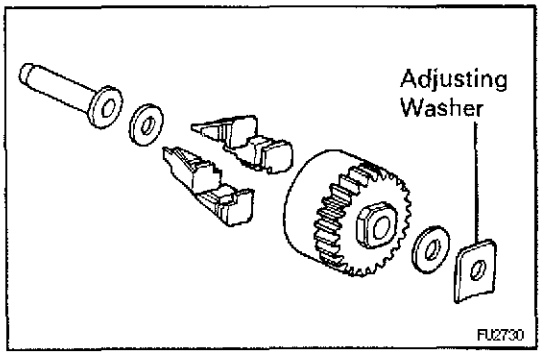
(d) Install the governor shaft through the governor gear adjusting washer, No. 1 flyweight washer and flyweight holder assembly.

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



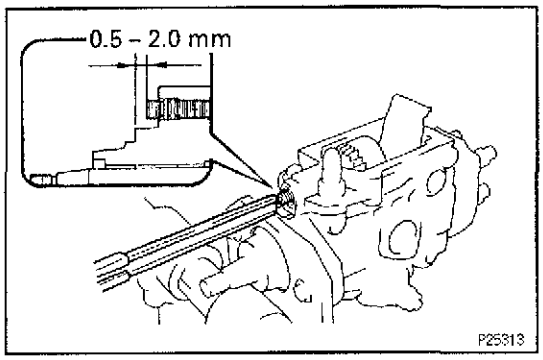
20. CHECK FLYWEIGHT HOLDER THRUST CLEARANCE

Using a feeler 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: mm (in.)

1.05 (0.0413)	1.65 (0.0650)
1.25 (0.0492)	1.85 (0.0728)
1.45 (0.0571)	–



21. ADJUST PROTRUSION OF GOVERNOR SHAFT

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

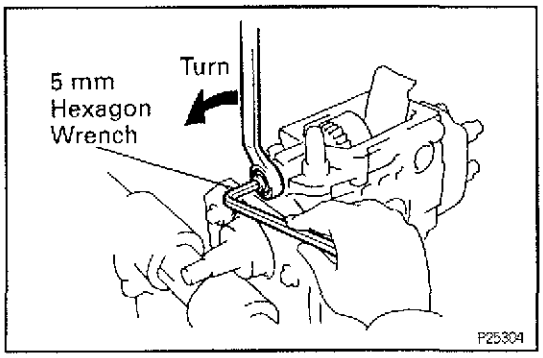
Protrusion:

0.5 – 2.0 mm (0.020 – 0.079 in.)

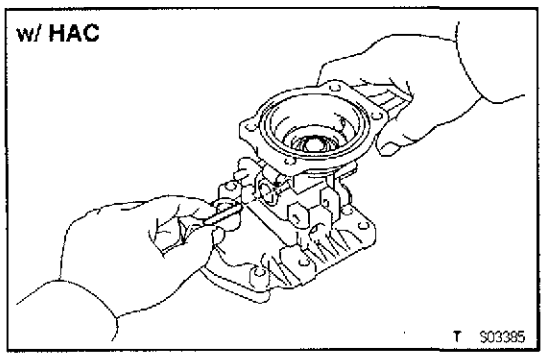
If the protrusion is not as specified, adjust by turning the governor shaft.

HINT: The governor cover shaft has LH threads.

EG



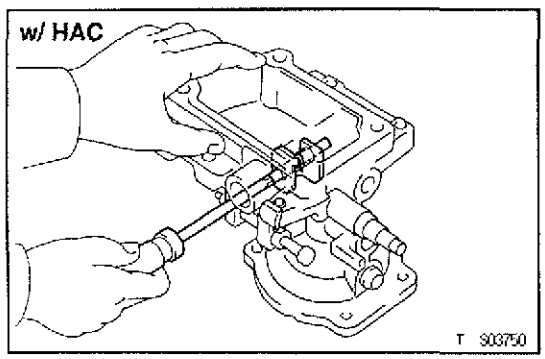
(b) Install and tighten the nut while holding the governor shaft with a 5 mm hexagon wrench.



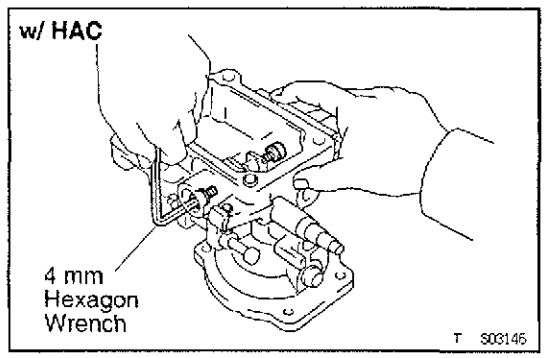
22. w/ HAC:
ASSEMBLE HIGH ALTITUDE COMPENSATOR

A. Install control lever

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

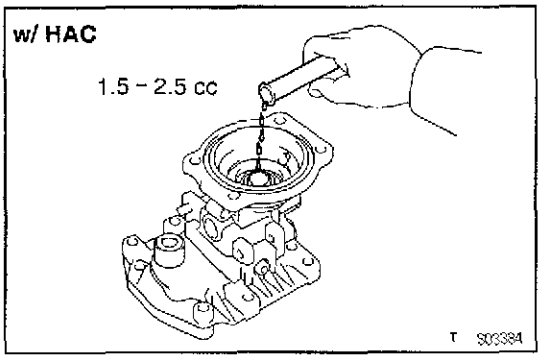


(b) Using a small screwdriver, install the control lever with the support pin.



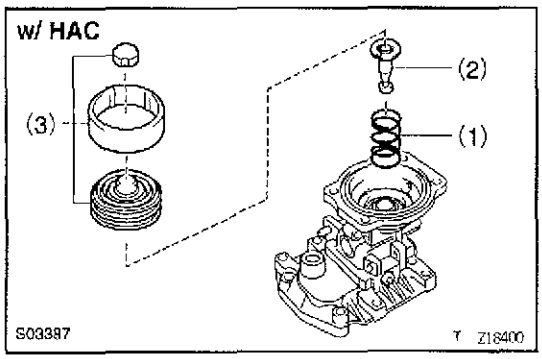
(c) Using a 4 mm hexagon wrench, install 2 new gaskets and the 2 bolts.

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

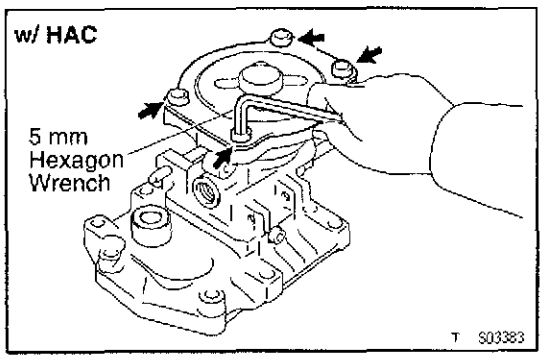


B. Install pneumatic bellows

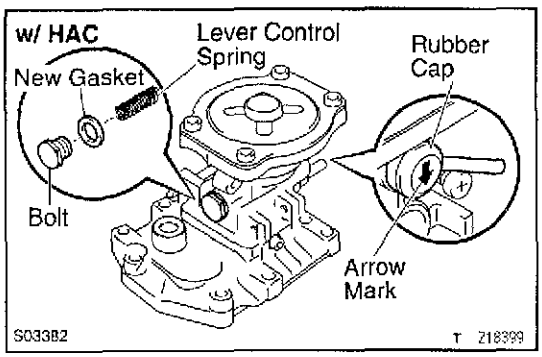
(a) Insert 1.5 – 2.5 cc (0.09 – 0.15 cu in.) of engine oil into the bushing hole.



(b) Install these parts:
(1) Pneumatic bellows spring
(2) Push rod
(3) Pneumatic bellows and 2 rubber caps



(c) Using a 5 mm hexagon wrench, install a new gasket and the pneumatic bellows cover with the 4 bolts.
Torque: 7.35 N·m (75 kgf·cm, 65 in.·lbf)

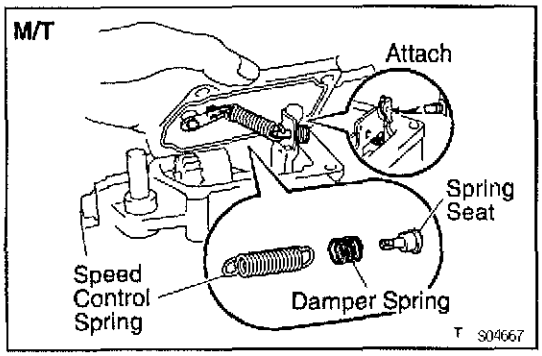


C. Install rubber cap

Install the rubber cap with the arrow mark facing downward.

D. Install lever control spring

Install the lever control spring with a new gasket and the bolt.
Torque: 11.3 N·m (115 kgf·cm, 8 ft·lbf)



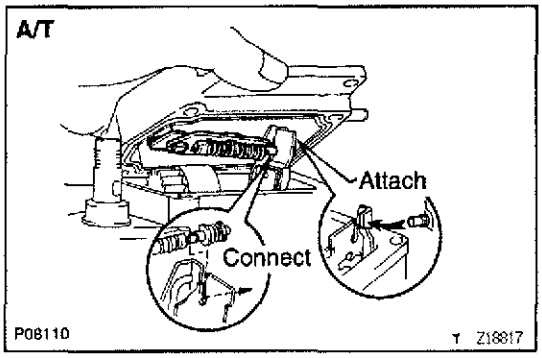
23. INSTALL GOVERNOR COVER

(a) Install the plate washer and a new O–ring to the adjusting lever shaft.

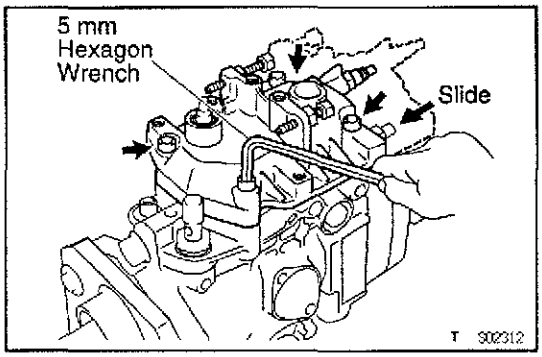
(b) M/T:
Install the damper spring, spring seat, speed control spring and adjusting lever shaft to the governor link.

(c) A/T:
Connect the adjusting lever shaft to the governor link.

(d) Install the adjusting lever shaft to the governor cover.



(e) Attach the full load set screw to the governor link.



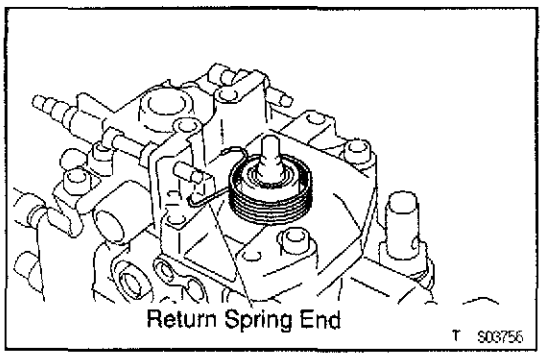
(f) Slide the governor cover forward.

(g) Using a 5 mm hexagon wrench, install the governor cover with the 4 bolts. Uniformly tighten the bolts in several passes.

Torque: 8.35 N·m (85 kgf·cm, 74 in.·lbf)

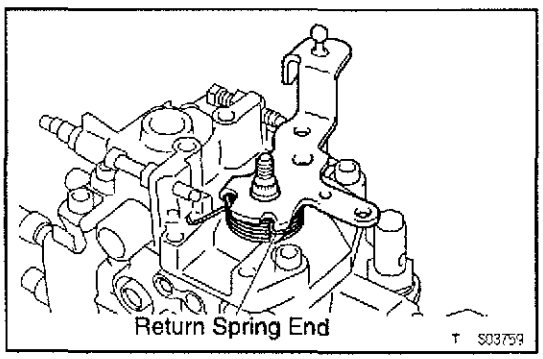
HINT: Use the bolt which is 35 mm (1.38 in.) length.

(h) w/ HAC:
Install the idle speed adjusting screw.



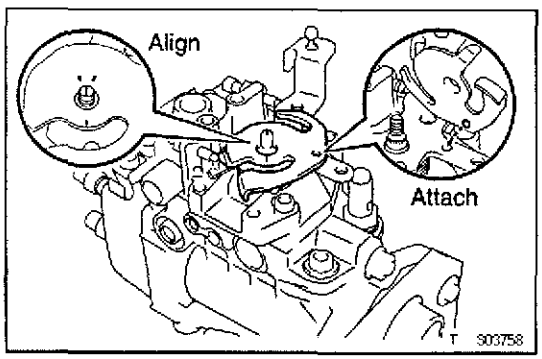
24. INSTALL ADJUSTING LEVERS

(a) Place the return spring on the governor cover as shown in the illustration.



(b) Hook the return spring to the No.1 adjusting lever.

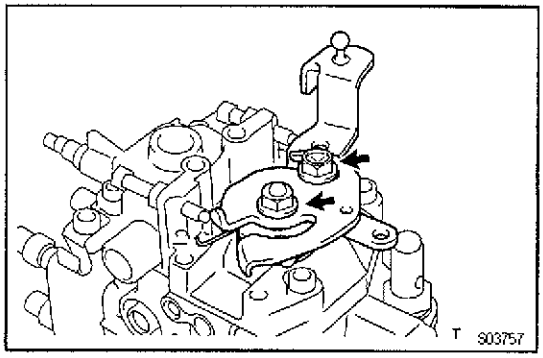
(c) Attach the No.1 adjusting lever to the idle speed adjusting screw end.



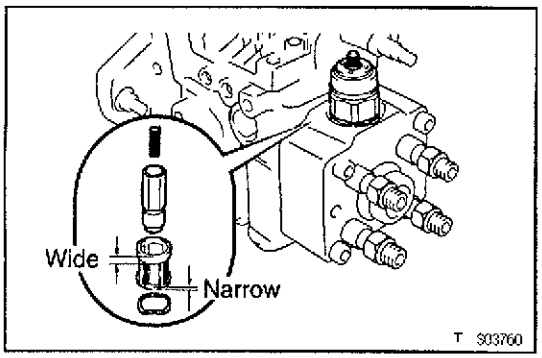
(d) Align the lines of the adjusting shaft and No.2 adjusting lever.

(e) Attach the protrusion of the No.2 adjusting lever to the hole of the No.1 adjusting lever.

(f) Place the No.2 adjusting lever on the No.1 adjusting lever.

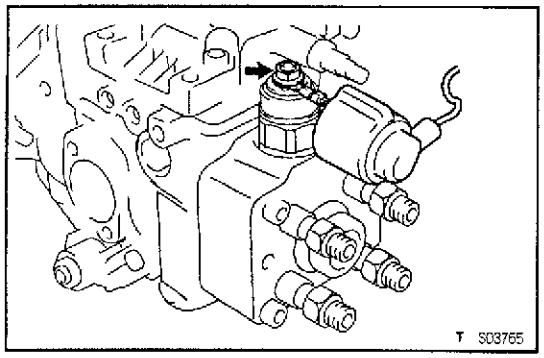


(g) Install the 2 adjusting levers with the nut and bolt.
Torque:
Nut
8.35 N·m (85 kgf·cm, 74 in.·lbf)
Bolt
6.05 N·m (62 kgf·cm, 54 in.·lbf)

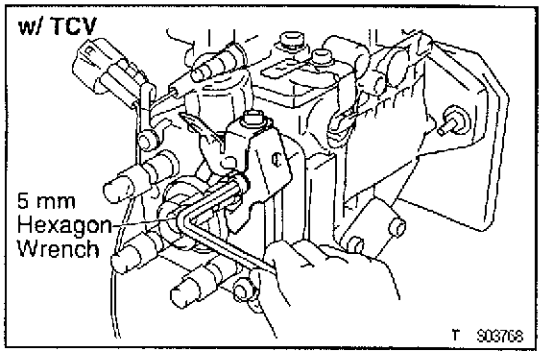


25. INSTALL FUEL CUT SOLENOID

(a) Install these parts:
(1) Wave washer
(2) Strainer
NOTICE: Be careful of the installation direction.
(3) Valve
(4) Spring
(b) Install a new O–ring to the fuel cut solenoid.
(c) Install the fuel cut solenoid.
Torque: 22.1 N·m (225 kgf·cm, 16 ft·lbf)

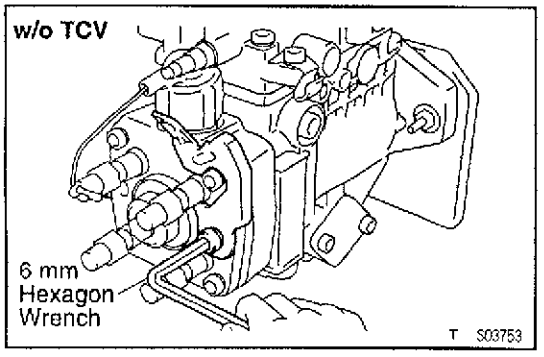


(d) Install the lead wire to the fuel cut solenoid with the nut.
Torque: 1.7 N·m (17.5 kgf·cm, 15 in.·lbf)
(e) Install the dust cover to the fuel cut solenoid.

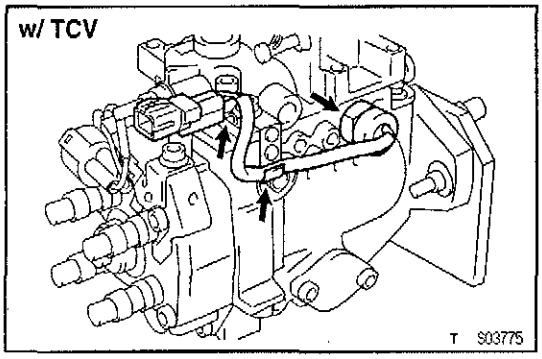


26. INSTALL CONNECTOR BRACKET

w/ TCV:
Using a 5 mm hexagon wrench, install the connector bracket with the bolt.
Torque: 11.75 N·m (120 kgf·cm, 9 ft·lbf)



w/o TCV:
Using a 6 mm hexagon wrench, install the connector bracket with the bolt.
Torque: 20.1 N·m (205 kgf·cm, 15 ft·lbf)

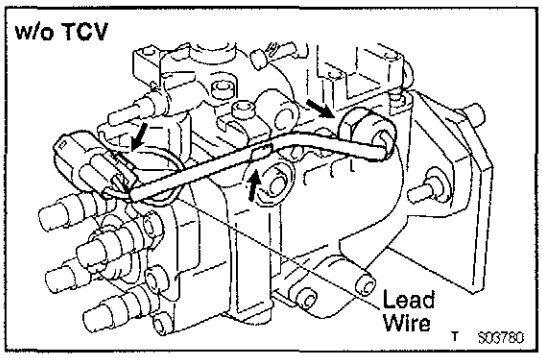


27. INSTALL PICKUP SENSOR

w/ TCV:

(a) Install a new O–ring and the pickup sensor.
Torque: 20.6 N·m (210 kgf·cm, 15 ft·lbf)

(b) Install the lead wire and connector to the lead clamp on the governor cover.



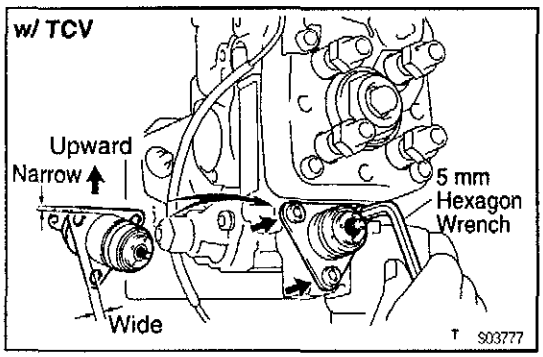
w/o TCV:

(a) Install a new O–ring and the pickup sensor.
Torque: 20.6 N·m (210 kgf·cm, 15 ft·lbf)

(b) Connect the lead wire for the fuel cut solenoid to the connector.

(c) Install the connector to connector bracket on the distributive head.

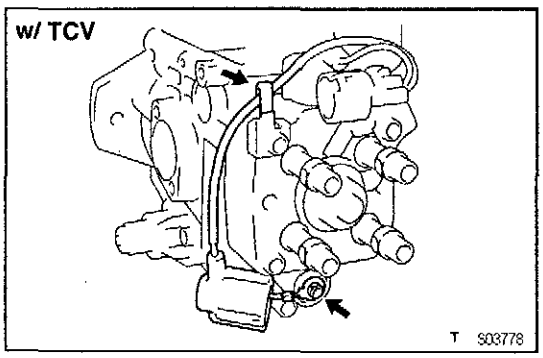
(d) Install the lead wire to the lead clamp on the governor cover.



28. w/ TCV:
INSTALL TIMING CONTROL VALVE

(a) Install a new O–ring and the timing control valve.

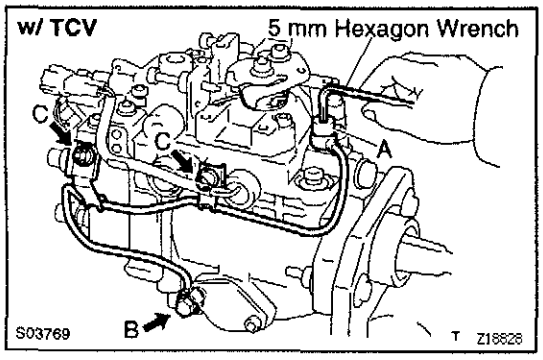
(b) Using a 5 mm hexagon wrench, install the timing control valve with the 3 bolts.
Torque: 8.35 N·m (85 kgf·cm, 74 ft·lbf)
NOTICE: Be careful of the installation direction.



(c) Install the lead wire to the timing control valve with the nut.
Torque: 1.7 N·m (17.5 kgf·cm, 15 in.·lbf)

(d) Install the dust cover to the timing control valve.

(e) Install the lead wire to the lead clamp on the distributive head.



29. w/ TCV:
INSTALL OVERFLOW PIPE

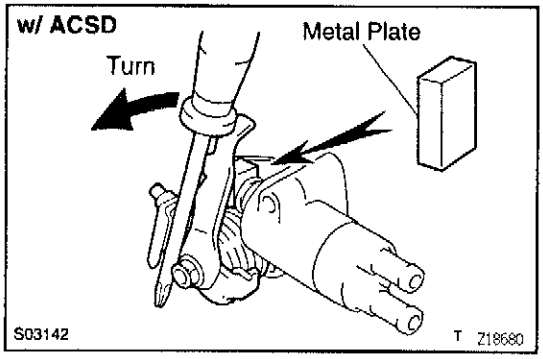
Using a 5 mm hexagon wrench, install the overflow pipe and 2 pipe clamps with 4 new gaskets, the 2 union bolts and 2 bolts.

Torque:

Union bolt A
14.2 N·m (145 kgf·cm, 10 ft·lbf)

Union bolt B
19.6 N·m (200 kgf·cm, 14 ft·lbf)

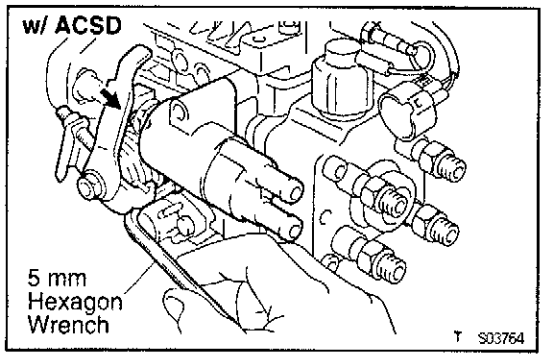
Bolt C
8.35 N·m (85 kgf·cm, 74 in.·lbf)



30. w/ ACSD:
INSTALL THERMO WAX

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

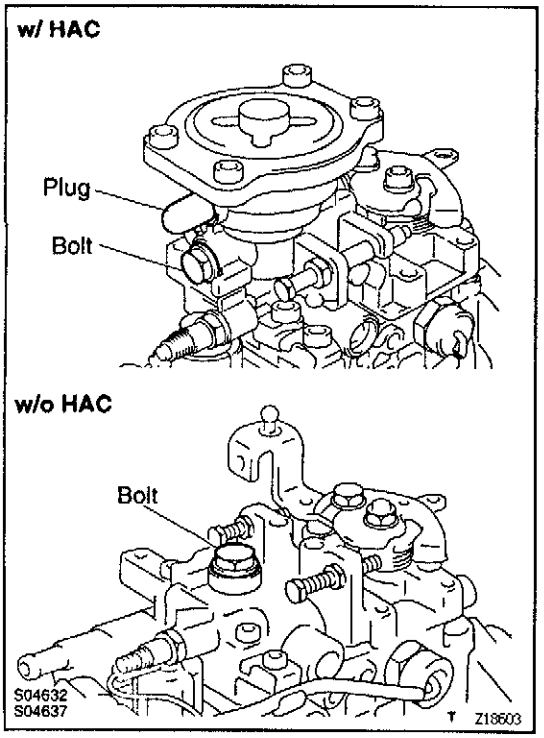
(b) Put a metal plate (thickness of 8.5 – 10.0 mm (0.335 – 0.394 in.)) between the cold starting lever and thermo wax plunger.



(c) Install a new gasket to the pump body.

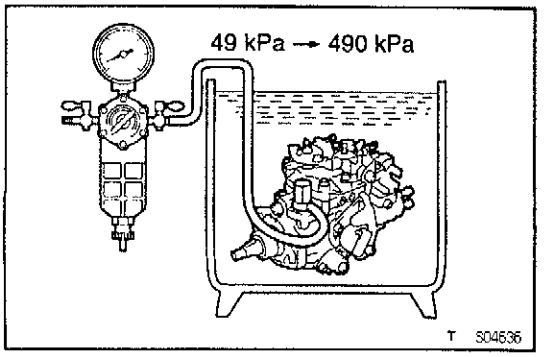
(d) Using a 5 mm hexagon wrench, install the thermo wax with the 2 bolts.
Torque: 8.35 N·m (85 kgf·cm, 74 in.·lbf)

(e) Remove the metal plate.



31. PERFORM AIR TIGHT TEST

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

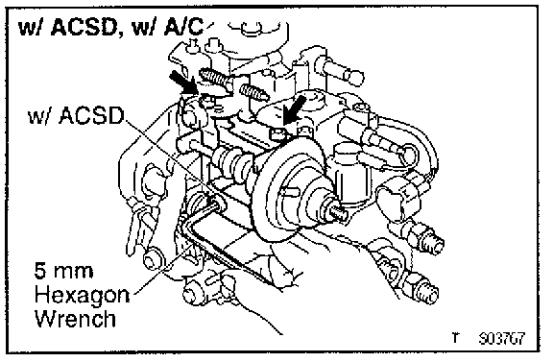


(b) Connect an air hose to the fuel inlet pipe and place the injection pump into diesel fuel.

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

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

(e) Remove the bolt and plug from the overflow port and idle-up actuator.



32. w/ ACSD:
INSTALL IDLE–UP LEVER AND ACTUATOR (w/ A/C) ASSEMBLY
Using a 5 mm hexagon wrench, install the idle–up lever and actuator (w/ A/C) assembly with the 3 bolts. Alternately tighten the bolts in several passes.
Torque: 8.35 N·m (85 kgf·cm, 74 in.·lbf)

33. w/o ACSD for w/ A/C:
INSTALL IDLE–UP ACTUATOR
Using a 5 mm hexagon wrench, install the idle–up actuator with the 2 bolts.
Torque: 8.35 N·m (85 kgf·cm, 74 in.·lbf)

34. REMOVE INJECTION PUMP FROM SST (STAND)
SST 09241–76022, 09245–54010

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

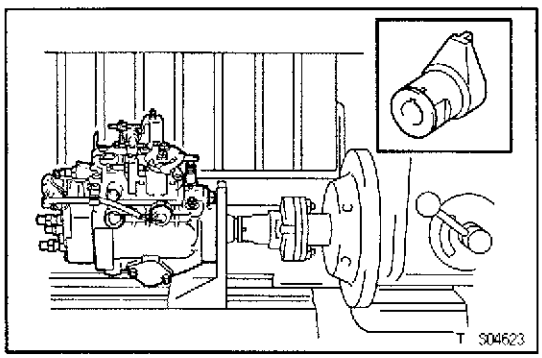
EG

EG753-02

INJECTION PUMP ADJUSTMENT

1. PRE–TEST CHECK AND PREPARATION

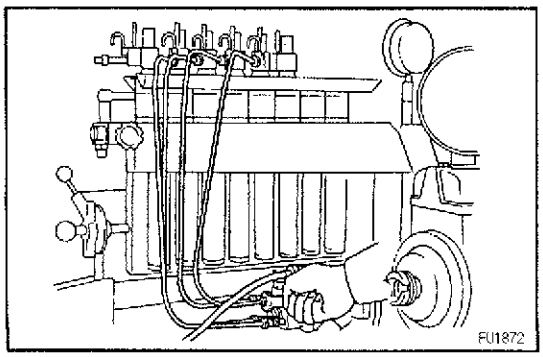
(a) The specifications for test nozzle and nozzle holders are as follows.
Test nozzle:
DN12SD12 (NIPPONDENSO)
Test nozzle opening pressure:
14,220 – 15,200 kPa
(145 – 155 kgf/cm², 2,062 – 2,205 psi)



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

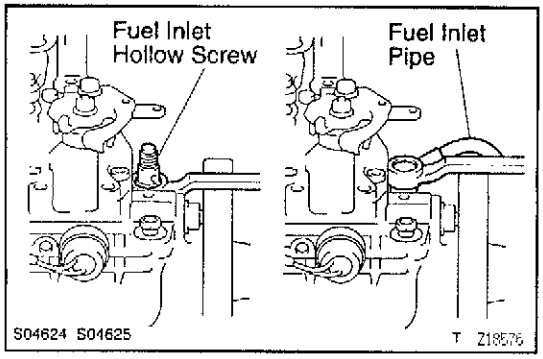
(c) Install the angle gauge stand.

(d) Mount the injection pump body on the pump tester.
HINT: Place a mark on the key groove portion of the coupling.



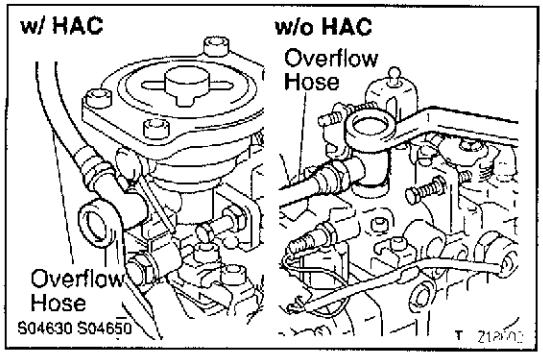
(e) Install an injection pipe with these specifications:

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



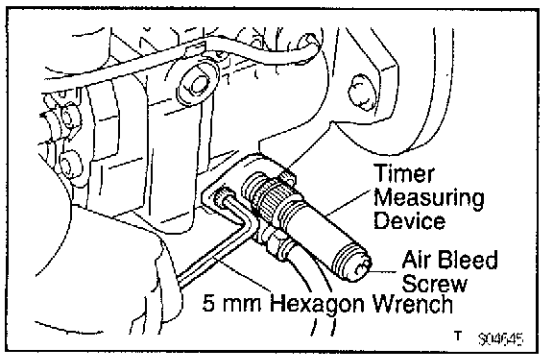
(f) Remove the fuel inlet hollow screw.

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

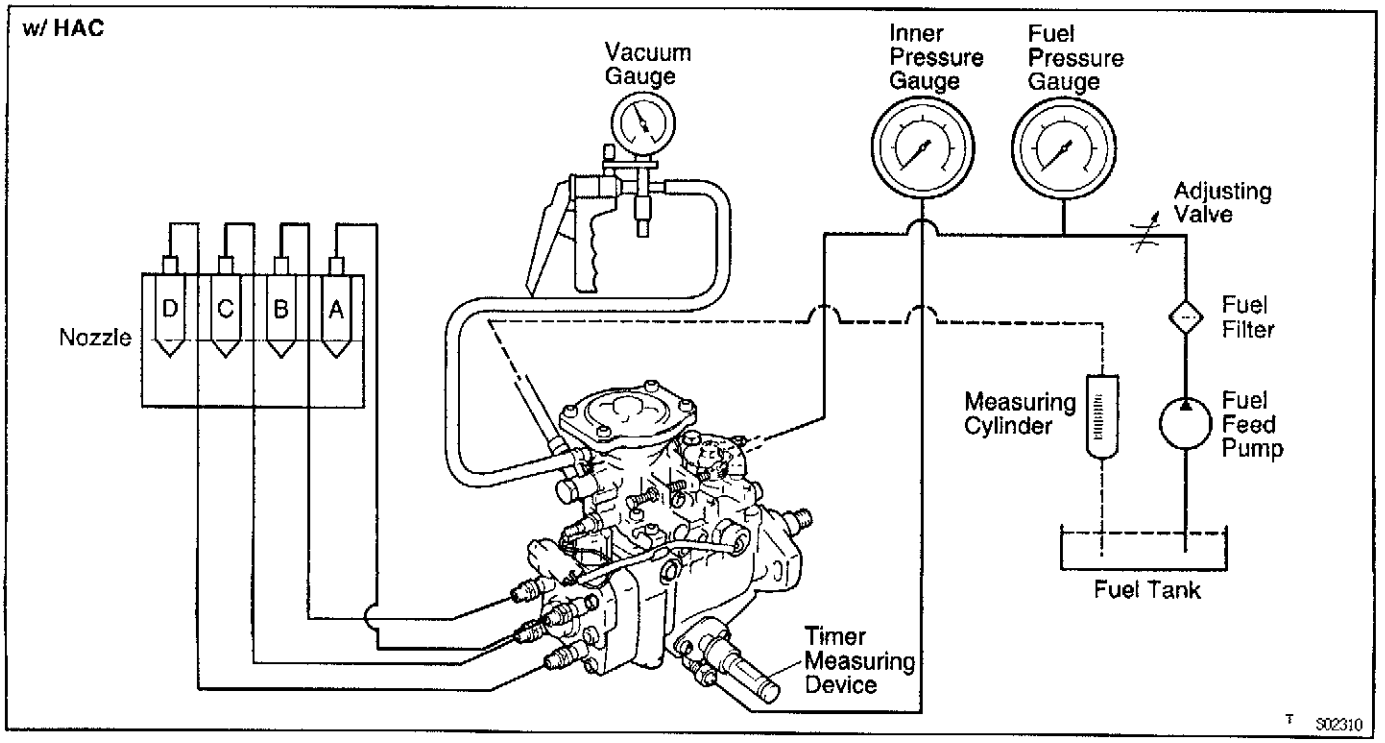


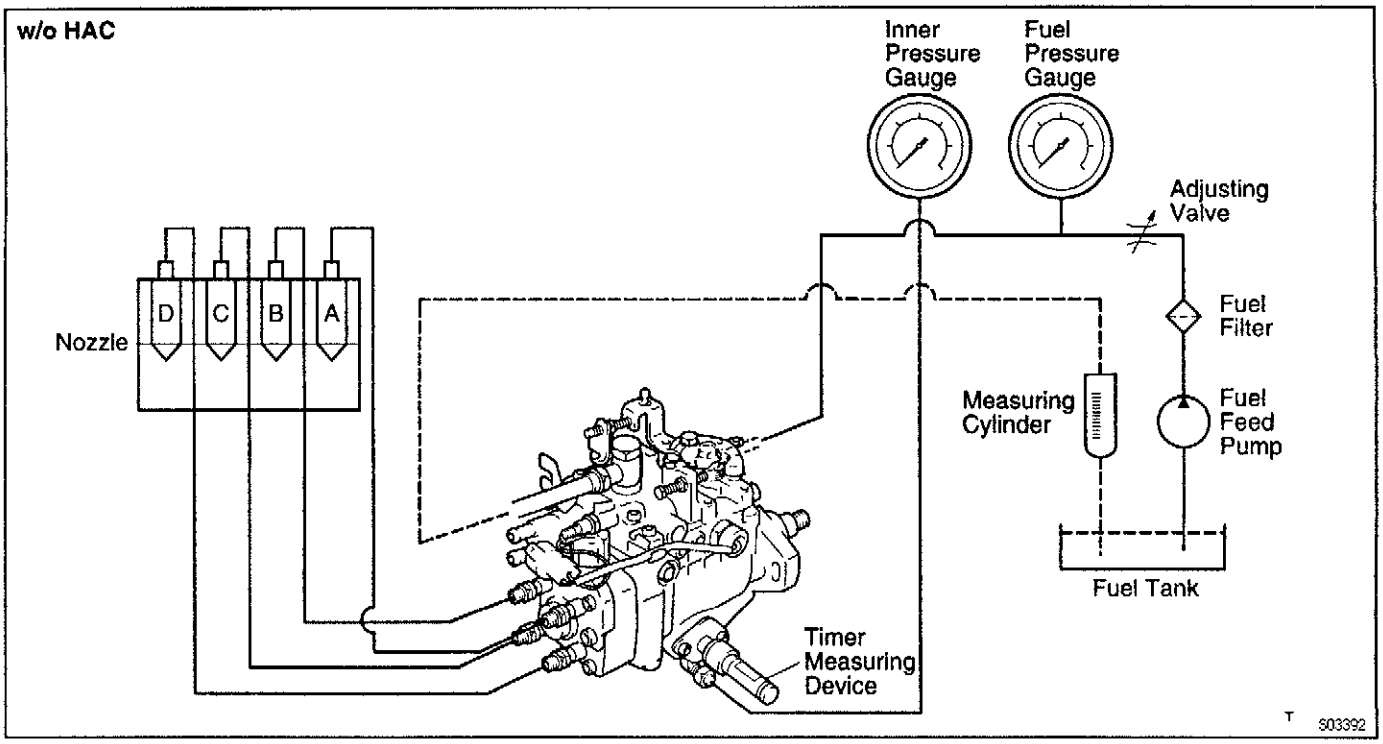
(h) Install an overflow hose with the 2 gaskets and an overflow screw.
Torque: 24.55 N·m (250 kgf·cm, 18 ft·lbf)
HINT: Always use the overflow screw installed on the pump to be adjusted.

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



(j) Install the inner pressure gauge with the timer measuring device.
Part No. 95095–10231, 95095–10480
(NIPPONDENSO)
Torque: 8.35 N·m (85 kgf·cm, 74 in.·lbf)
HINT: Bleed the air by the air bleed screw.





(k) 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.**

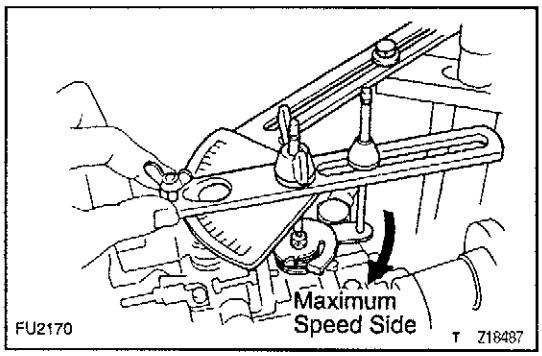
HINT: Connect the battery through a 10 W bulb.

(l) 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).

(m) Install an angle gauge to the stand, and set it to the adjusting lever.

Part No. 95095–10360 (Stand w/ angle gauge)

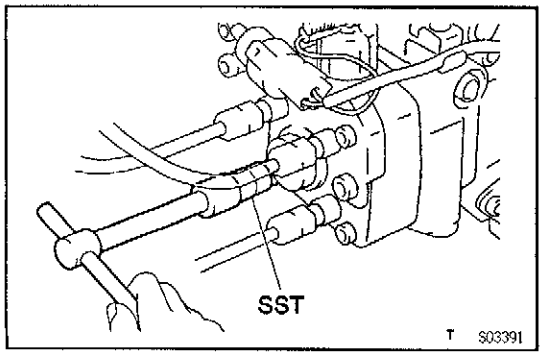
(n) Secure the adjusting lever fully on the maximum speed side.



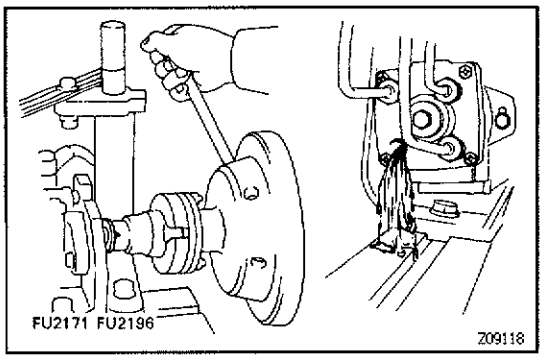
(o) Check the installation direction of the camplate as follows:

- 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)



EG

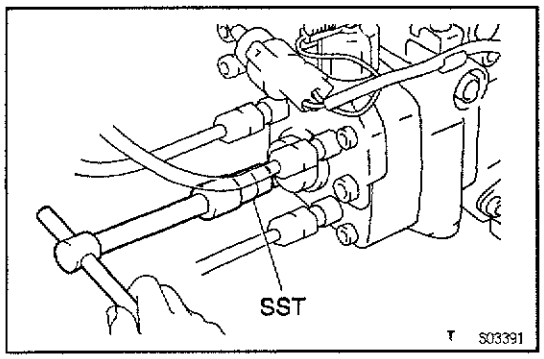


- Check that fuel is flowing out when the mark is in the position shown in the illustration.

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.

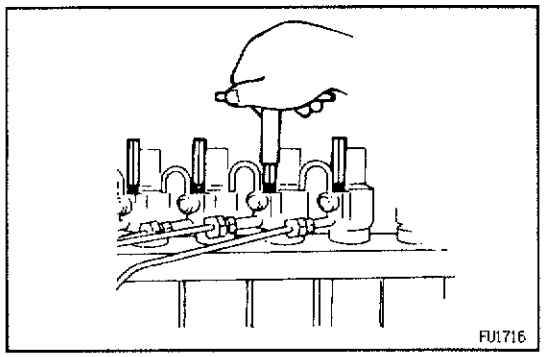


- Using SST, install the delivery valve holder.

SST 09260–54012 (09269–54020)

Torque: 58.85 N·m (600 kgf·cm, 43 ft·lbf)

- Connect the injection pipe.

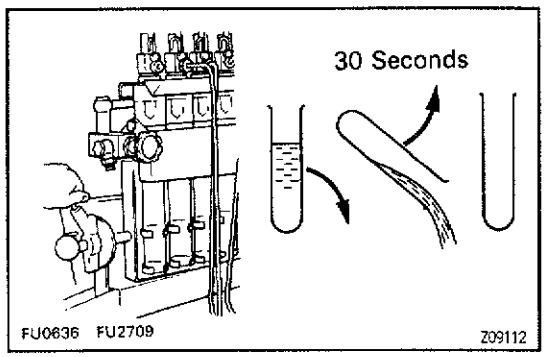


(p) Bleed the air from the injection pipes.

(q) Race the injection pump for 5 minutes at 2,000 rpm.

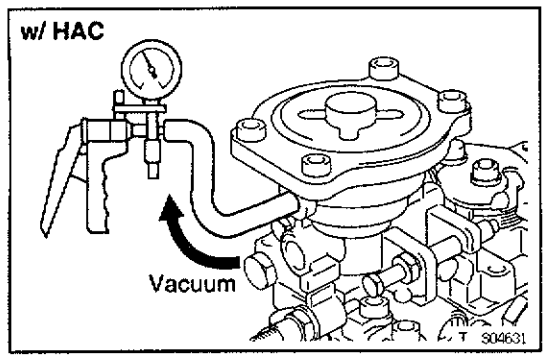
HINT: Do this operation by replacing the overflow screw to a hollow screw.

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



HINT:

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



2. w/ HAC:

CHECK HIGH ALTITUDE COMPENSATOR FOR AIR TIGHTNESS

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

(b) Measure the time it takes for vacuum to drop to 72 kPa (540 mmHg, 21.26 in.Hg).

Vacuum drop:

5 seconds or more

3. PRE–SET FULL LOAD INJECTION VOLUME

(a) Set the adjusting lever to maximum position.

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

(c) Measure the injection volume.

2L for LN Europe:
(Part No. 22100–5B320, 5B360)

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

2L for LN Thailand
(Part No. 22100–5B500, 5B590)

Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)
1,200	200	10.20 – 10.52 (0.62 – 0.64)

2L for Except LN Europe, Thailand:
(Part No. 22100–54770, 54780, 54800, 54810, 5B170)

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

2L for Except LN Europe, Thailand:
(Part No. 22100–5B060, 5B430)

Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)
1,200	200	9.62 – 9.94 (0.59 – 0.61)

3L:
(Part No. 22100–54850, 54860, 54870, 54880, 5B121, 5B520)

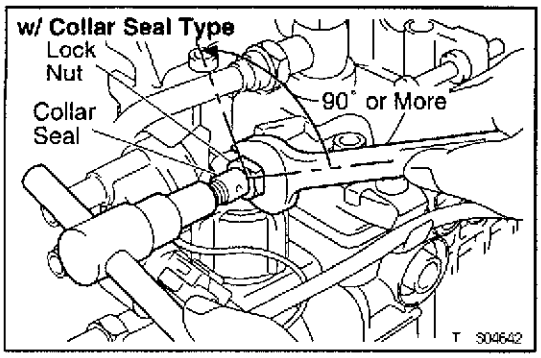
Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)
1,200	200	11.56 – 11.88 (0.71 – 0.72)

EG

3L:

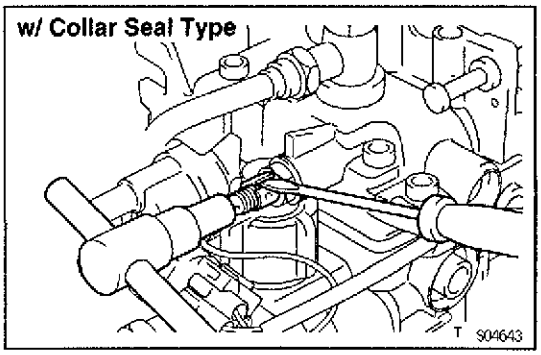
(Part No. 22100−54710, 5B030, 5B510)

Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)
1,200	200	10.96 − 11.28 (0.067 − 0.69)



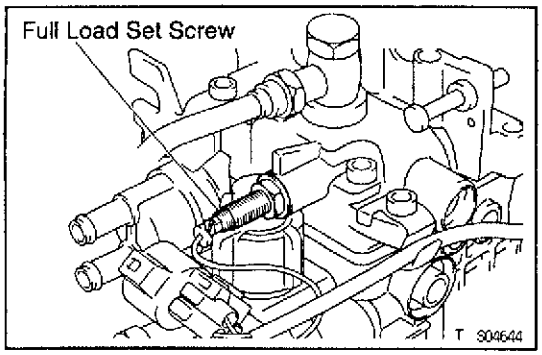
(d) w/ Collar Seal Type:
Remove the collar seal as follows:

- 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.

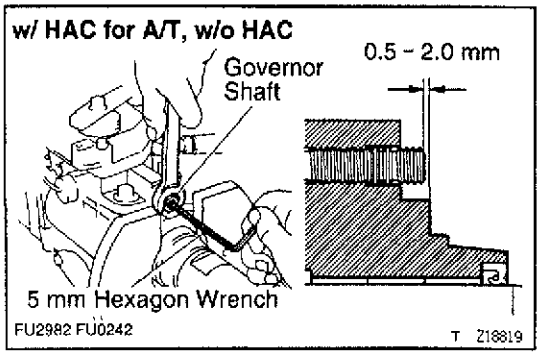


- Using a screwdriver, pry out the collar seal.

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



(f) 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. w/ HAC for A/T, w/o HAC:
PRE−SET LOAD SENSING TIMER
Using a 5 mm hexagon wrench, adjust the protrusion of the governor shaft.
Protrusion:

0.5 − 2.0 mm (0.020 − 0.079 in.)

5. PRE–SET MAXIMUM SPEED

(a) Set the adjusting lever to maximum position.

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

(c) Measure the injection volume.

2L w/ ACSD for LN Thailand, w/o ACSD:
(Part No. 22100–54770, 54780, 54800, 54810, 5B500, 5B590)

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

2L w/ ACSD for Except LN Thailand:
(Part No. 22100–5B170, 5B320, 5B360)

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

2L w/o ACSD:
(Part No. 22100–5B060, 5B430)

Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)
2,350	200	4.0 – 5.6 (0.24 – 0.34)

3L w/ ACSD for w/ TCV:
(Part No. 22100–5B520)

Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)
2,400	200	4.6 – 6.2 (0.28 – 0.38)

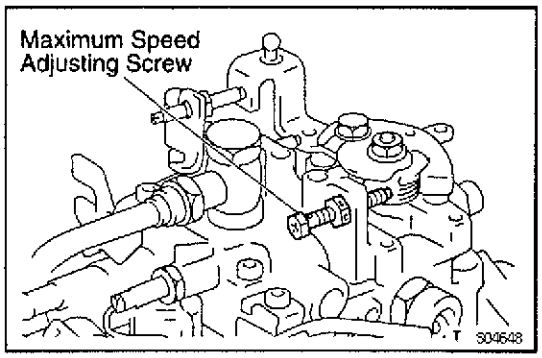
3L w/ ACSD for w/o TCV, w/o ACSD:
(Part No. 22100–54710, 5B030, 5B510)

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

3L w/o ACSD:

(Part No. 22100−54850, 54860, 54870, 54880, 5B121)

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

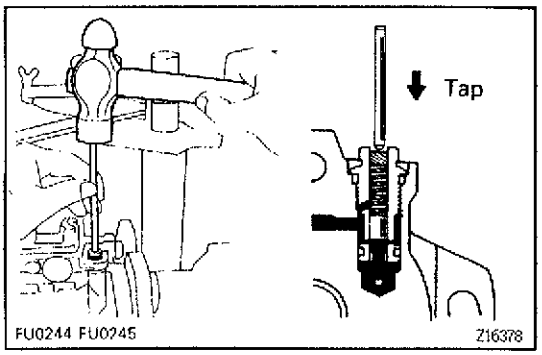


(d) Cut off the seal wire.
(e) Adjust the injection volume with the maximum speed adjusting screw.

6. ADJUST PUMP INNER PRESSURE

(a) Set the adjusting lever to maximum position.
(b) w/ HAC:
Apply 101 kPa (760 mmHg, 29.83 in.Hg) of vacuum to the high altitude compensator.
(c) Measure the pump inner pressure at the below listed rpm.

Pump rpm	Inner pressure kPa (kgf/cm², psi)
500	314 − 373 (3.2 − 3.8, 46 − 54)
2,100	647 − 706 (6.6 − 7.2, 94 − 102)

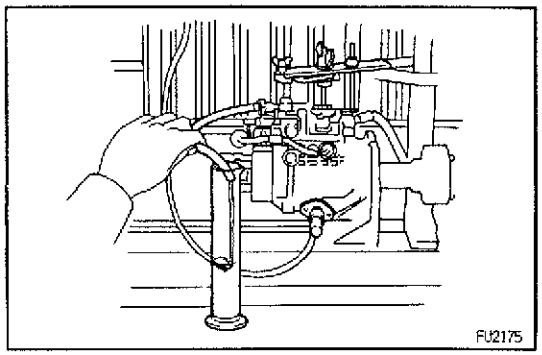


(d) If the pressure is low, adjust by lightly tapping the regulator valve piston while watching the pressure gauge.
HINT: If the pressure is too high or if the regulator valve was tapped in too far, the regulator valve must be replaced.

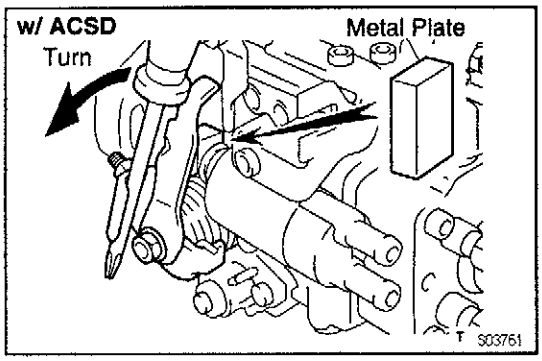
7. CHECK OVERFLOW VOLUME

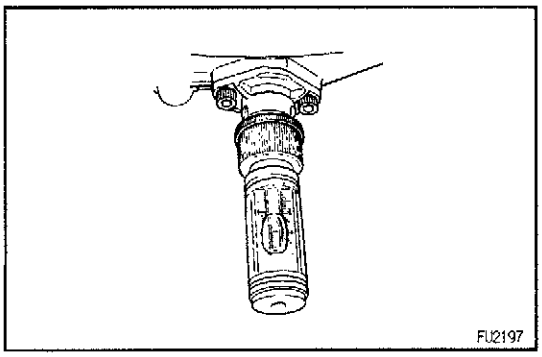
(a) Set adjusting lever to maximum position.
(b) w/ HAC:
Apply 101 kPa (760 mmHg, 29.83 in.Hg) of vacuum to the high altitude compensator.
(c) Measure the overflow volume at the below listed rpm.

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



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





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 – 10.0 mm (0.335 – 0.394 in.)) between the cold starting lever and thermo wax plunger.
HINT: Keep the cold starting system released until all measurements and adjustments are finished.

9. ADJUST TIMER

(a) Set the timer measuring device at zero.

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

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

2L w/ ACSD for w/ TCV:
(Part No. 22100–5B320, 5B360, 5B500, 5B590)

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

2L w/ ACSD for w/o TCV:
(Part No. 22100–5B170)

Pump rpm	Piston stroke mm (in.)
800	2.30 – 3.10 (0.0906 – 0.1220)
1,200	3.80 – 4.60 (0.1496 – 0.1811)
2,000	6.80 – 7.60 (0.2677 – 0.2992)
2,300	7.96 – 8.44 (0.3134 – 0.3323)

2L w/o ACSD:
(Part No. 22100–54770, 54780, 54800, 54810, 5B060, 5B430)

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

EG

3L w/ ACSD for w/ TCV:
(Part No. 22100–5B520)

Pump rpm	Piston stroke mm (in.)
800	w/ TCV OFF 2.00 – 3.00 (0.0787 – 0.1181)
1,200	w/ TCV OFF 3.40 – 4.40 (0.1339 – 0.1732)
2,000	w/ TCV OFF 6.30 – 7.30 (0.2480 – 0.2874) w/ TCV ON 3.20 – 4.60 (0.1260 – 0.1811)
2,300	w/ TCV OFF 7.06 – 7.54 (0.2780 – 0.2968)

3L w/ ACSD for w/o TCV:
(Part No. 22100–5B510)

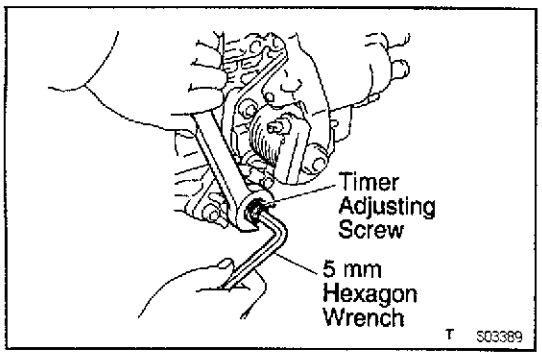
Pump rpm	Piston stroke mm (in.)
800	2.10 – 2.90 (0.0827 – 0.1142)
1,200	3.50 – 4.30 (0.1378 – 0.1693)
2,000	6.40 – 7.20 (0.2520 – 0.2835)
2,300	7.06 – 7.54 (0.2780 – 0.2968)

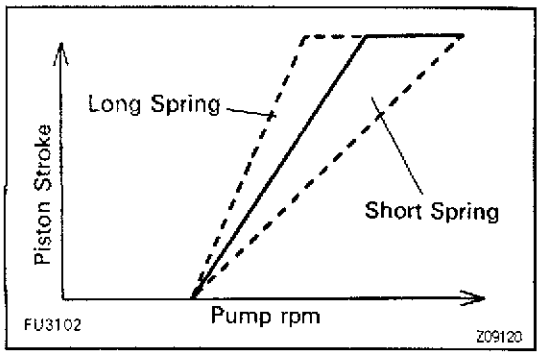
3L w/o ACSD:
(Part No. 22100–54710, 54850, 54860, 54870, 54880, 5B030, 5B121)

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

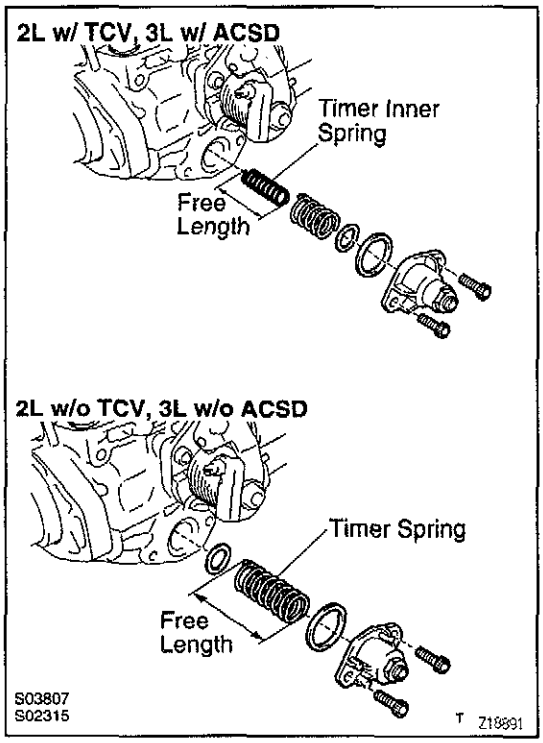
HINT: Check that the hysteresis is within 0.3 mm (0.012 in.).

(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.

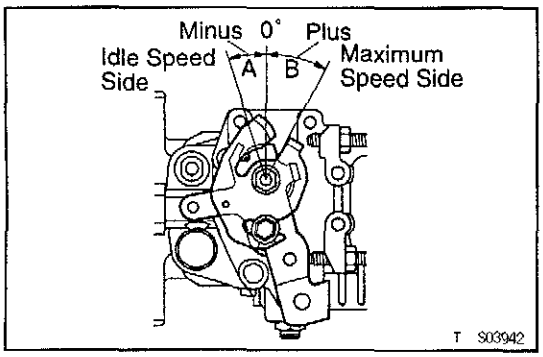




(e) Check the timer stroke for characteristic tendency.



(f) If tendency is not as specified, select and replace the timer (inner) spring.
HINT: The timer stroke will increase with a long spring and decrease with a short spring.



10. ADJUST FULL LOAD INJECTION VOLUME

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

A (Maximum speed side)	B (Idle speed side)
Plus 23.5 – 33.5°	*M/T Minus* 12.5 – 22.5° A/T Minus 13.5 – 21.5°

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

(c) Measure the full load injection volume.
2L for LN Europe:
(Part No. 22100–5B320, 5B360)

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

2L for LN Thailand:
(Part No. 22100–5B500, 5B590)

Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)
1,200	200	10.20 – 10.52 (0.62 – 0.64)

EG

2L for Except LN Europe, Thailand:
(Part No. 22100–54770, 54780, 54800, 54810, 5B170)

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

2L for Except LN Europe, Thailand:
(Part No. 22100–5B060, 5B430)

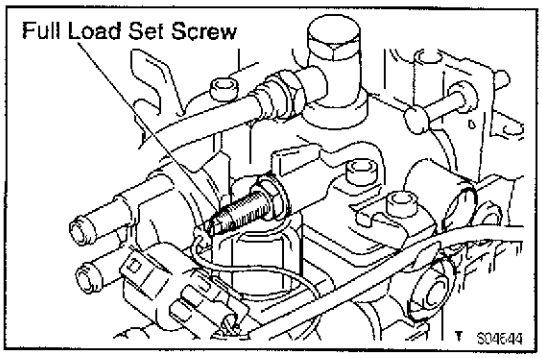
Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)
1,200	200	9.62 – 9.94 (0.59 – 0.61)

3L:
(Part No. 22100–54850, 54860, 54870, 54880, 5B121, 5B520)

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

3L:
(Part No. 22100–54710, 5B030, 5B510)

Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)
1,200	200	10.96 – 11.28 (0.067– 0.69)



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

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

2L w/ ACSD for w/ TCV for LN Europe:

(Part No. 22100–5B320, 5B360)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)	Remark
Plus 23.5 - 33.5°	2,200	200	8.0 - 9.6 (0.49 - 0.59)	–
	2,575		4.0 - 5.6 (0.24 - 0.34)	Adjust
	2,850		1.0 (0.06) or less	–

T V07875

2L w/ ACSD for w/ TCV for LN Thailand:

(Part No. 22100–5B500, 5B590)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)	Remark
Plus 23.5 - 33.5°	2,250	200	6.9 - 8.5 (0.42 - 0.52)	–
	2,450		4.0 - 5.6 (0.24 - 0.34)	Adjust
	2,700		1.3 (0.08) or less	–

T V08062

2L w/ ACSD for w/o TCV:

(Part No. 22100–5B170)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)	Remark
Plus 23.5 - 33.5°	2,250	200	8.0 - 9.6 (0.49 - 0.59)	–
	2,575		4.0 - 5.6 (0.24 - 0.34)	Adjust
	2,850		1.3 (0.08) or less	–

T V07874

2L w/o ACSD:

(Part No. 22100–54770, 54780, 54800, 54810)

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

T V07876

2L w/o ACSD:

(Part No. 22100–5B060, 5B430)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)	Remark
Plus 23.5 - 33.5°	2,150	200	6.9 - 8.9 (0.42 - 0.54)	–
	2,350		4.0 - 5.6 (0.24 - 0.34)	Adjust
	2,700		1.3 (0.08) or less	–

T V07877

EG

3L w/ ACSD for w/ TCV:

(Part No. 22100–5B520)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)	Remark
Plus 23.5 - 33.5°	1,900	200	9.3 - 11.3 (0.57 - 0.69)	–
	2,400		4.6 - 6.2 (0.28 - 0.38)	Adjust
	2,800		1.3 (0.08) or less	–

T V07928

3L w/ ACSD for w/o TCV, w/o ACSD:

(Part No. 22100–54710, 5B030, 5B510)

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

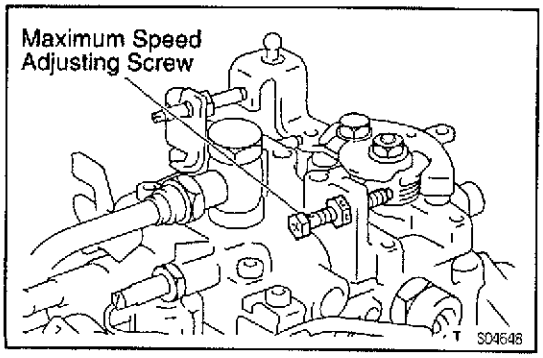
T V07878

3L w/o ACSD:

(Part No. 22100–54850, 54860, 54870, 54880, 5B121)

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

T V07879



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

12. CHECK INJECTION VOLUME

Measure the injection volume at each pump rpm and HAC vacuum (w/ HAC).

2L w/ HAC:

(Part No. 22100–54800, 54810)

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

T V07925

2L w/o HAC for w/ TCV for LN Europe:

(Part No. 22100–5B320, 5B360)

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

T V07890

2L w/o HAC for w/ TCV for LN Thailand:

(Part No. 22100–5B500, 5B590)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)	Variation limit cc (cu in.)	Remark
Plus 23.5 - 33.5°	100	200	10.6 - 15.4 (0.65 - 0.94)	1.2 (0.07)	Volume during starting
	500		9.4 - 10.4 (0.57 - 0.63)	0.5 (0.03)	–
	1,200		10.20 - 10.52 (0.62 - 0.64)	0.4 (0.02)	Basic full load injection volume
	2,100		8.03 - 8.93 (0.49 - 0.54)	0.5 (0.03)	–

T V08063

EG

EG

2L w/o HAC for w/o TCV:

(Part No. 22100–54770, 54780, 5B170)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)	Variation limit cc (cu in.)	Remark
Plus 23.5 - 33.5°	100	200	10.6 - 15.4 (0.65 - 0.94)	1.2 (0.07)	Volume during starting
	350		11.2 - 13.8 (0.68 - 0.84)	–	–
	500		9.32 - 10.32 (0.57 - 0.63)	0.5 (0.03)	–
	1,200		10.42 - 10.74 (0.64 - 0.66)	0.4 (0.02)	Basic full load injection volume
	2,100		8.95 - 9.85 (0.55 - 0.60)	0.5 (0.03)	–

T V07926

2L w/o HAC for w/o TCV:

(Part No. 22100–5B060, 5B430)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)	Variation limit cc (cu in.)	Remark
Plus 23.5 - 33.5°	100	200	10.6 - 15.4 (0.65 - 0.94)	1.2 (0.07)	Volume during starting
	350		10.4 - 13.0 (0.63 - 0.79)	–	–
	500		8.32 - 9.72 (0.51 - 0.59)	0.5 (0.03)	–
	1,200		9.62 - 9.94 (0.59 - 0.61)	0.4 (0.02)	Basic full load injection volume
	2,050		7.95 - 9.25 (0.49 - 0.56)	0.5 (0.03)	–

T V07927

3L w/ HAC:

(Part No. 22100–54870, 54880, 5B121)

Adjusting lever angle	Pump rpm	HAC vacuum kPa (mmHg, in.Hg)	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)	Variation limit cc (cu in.)	Remark
Plus 23.5 - 33.5°	100	101 (760, 29.83)	200	11.6 - 16.4 (0.71 - 1.00)	1.2 (0.07)	Volume during starting
	350*	101 (760, 29.83)		12.2 - 14.8 (0.74 - 0.90)	–	–
	500	101 (760, 29.83)		10.44 - 11.44 (0.64 - 0.70)	0.5 (0.03)	–
	1,200	101 (760, 29.83)		11.56 - 11.88 (0.71 - 0.72)	0.4 (0.02)	Basic full load injection volume
		70.7 (530, 20.88)		9.36 - 10.12 (0.57 - 0.62)	–	–
	2,000	101 (760, 29.83)		10.19 - 11.09 (0.62 - 0.68)	0.5 (0.03)	–

* Except A/T (Part No.22100 - 5B121)

T V07951

3L w/o HAC for w/ TCV:

(Part No. 22100–5B520)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)	Variation limit cc (cu in.)	Remark
Plus 23.5 - 33.5°	100	200	11.6 - 16.4 (0.71 - 1.00)	1.2 (0.07)	Volume during starting
	350		12.2 - 14.8 (0.74 - 0.90)	—	—
	500		10.44 - 11.44 (0.64 - 0.70)	0.5 (0.03)	—
	1,200		11.56 - 11.88 (0.71 - 0.72)	0.4 (0.02)	Basic full load injection volume
	1,800		10.49 - 11.79 (0.64 - 0.72)	0.5 (0.03)	—

T V07952

3L w/o HAC for w/o TCV:

(Part No. 22100–54710, 5B030, 5B510)

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

T V07953

3L w/o HAC for w/o TCV:

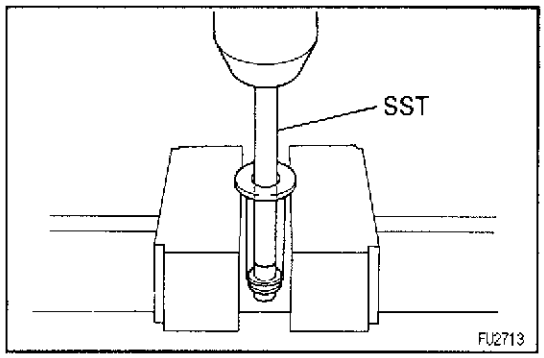
(Part No. 22100–54850, 54860)

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

T V07954

EG

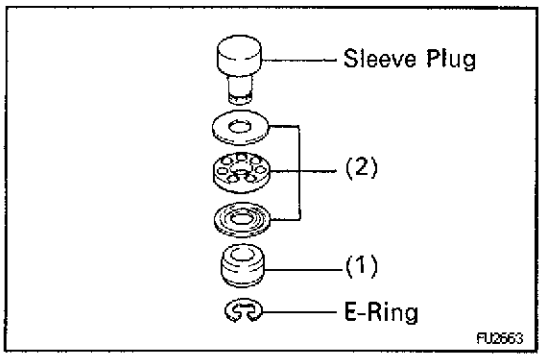
EG



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

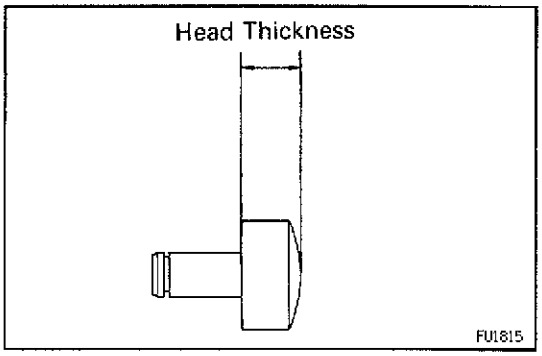
- Using SST and a press, press out the sleeve plug assembly from the governor sleeve.

SST 09236–00101 (09237–00070)



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

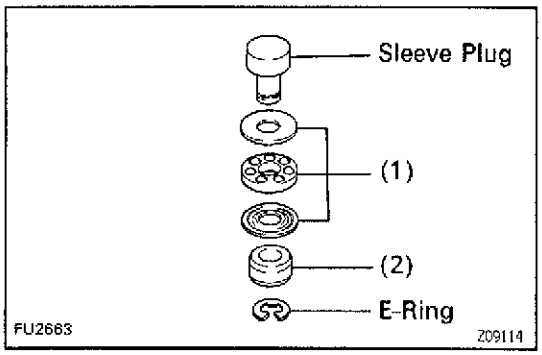
(1) Stop ring
(2) Bearing and 2 bearing retainers



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

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

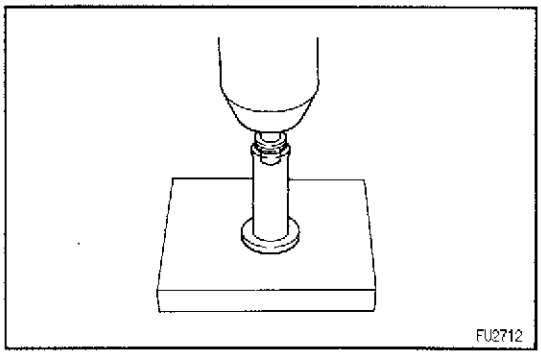
3.0 (0.118)	3.5 (0.138)	4.0 (0.157)
3.1 (0.122)	3.6 (0.142)	4.1 (0.161)
3.2 (0.126)	3.7 (0.146)	4.2 (0.165)
3.3 (0.130)	3.8 (0.150)	–
3.4 (0.134)	3.9 (0.154)	–



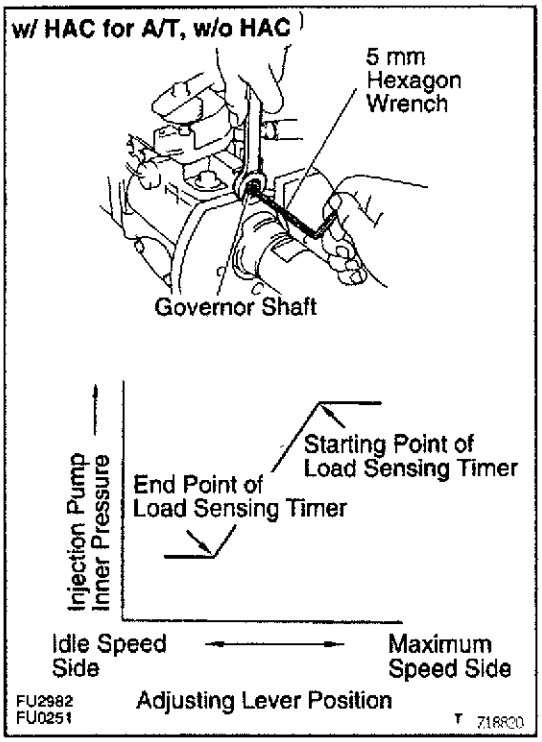
HINT: Lengthening the plug by 0.1 mm (0.004 in.) will decrease injection volume by 0.6 cc (0.04 cu in.).
If the variation limit is greater than specified, replace the delivery valve.

- Install these 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. w/ HAC for A/T, w/o HAC:
ADJUST LOAD SENSING TIMER

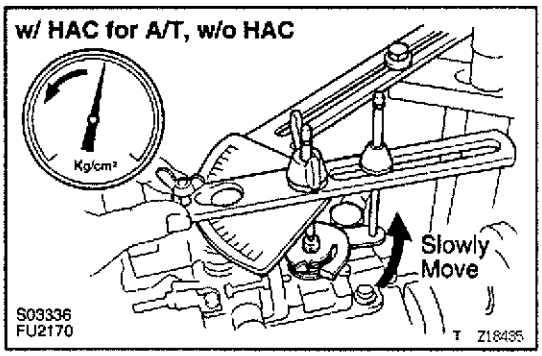
(a) Using a 5 mm hexagon wrench, adjust the starting and end points of the load sensing timer by turning the governor shaft.

(b) Set the adjusting lever to maximum position.

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

(d) Measure the injection volume.

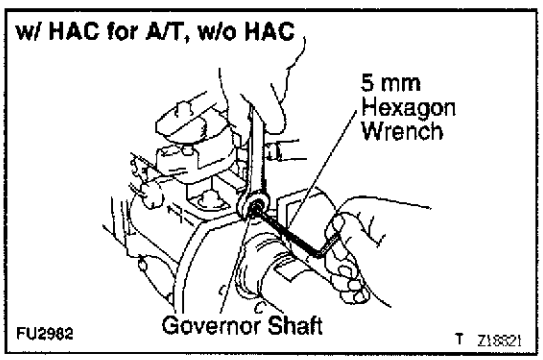
Adjusting lever position	Pump rpm	No. of measuring strokes
Maximum speed side	1,200	200



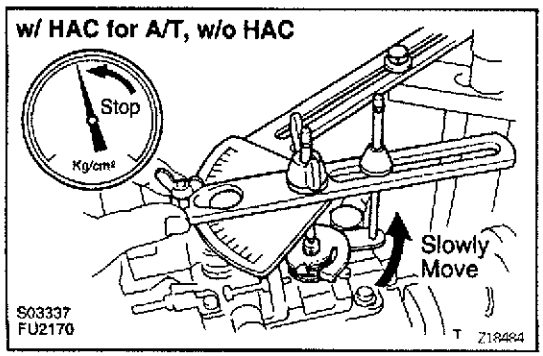
(e) Slowly move the adjusting lever from the maximum speed side to the idle speed side, and secure it at the point where the pump inner pressure begins to drop.

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

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



(g) 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.



(h) 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.

EG

2L w/ ACSD for w/ TCV for LN Europe:
(Part No. 22100–5B320, 5B360)

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

2L w/ ACSD for w/ TCV for LN Thailand:
(Part No. 22100–5B320, 5B360)

Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)
1,200	200	8.16 – 8.56 (0.50 – 0.52)

2L w/ ACSD for w/o TCV, w/o ACSD:
(Part No. 22100–54770, 54780, 5B170)

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

2L w/o ACSD:
(Part No. 22100–5B060, 5B430)

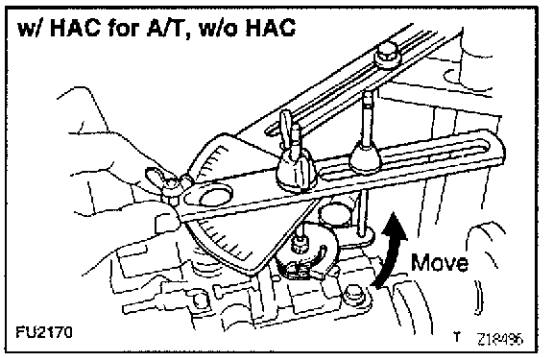
Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)
1,200	200	7.58 – 7.98 (0.46 – 0.49)

3L:
(Part No. 22100–54710, 5B030, 5B510)

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

3L:
(Part No. 22100–54850, 54860, 5B121, 5B520)

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



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

2L w/ ACSD for w/ TCV:
(Part No. 22100–5B320, 5B360, 5B500, 5B590)

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

2L w/ ACSD for w/o TCV, w/o ACSD:
(Part No. 22100–54770, 54780, 5B060, 5B170, 5B430)

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

3L w/ ACSD for w/ TCV:
(Part No. 22100–5B520)

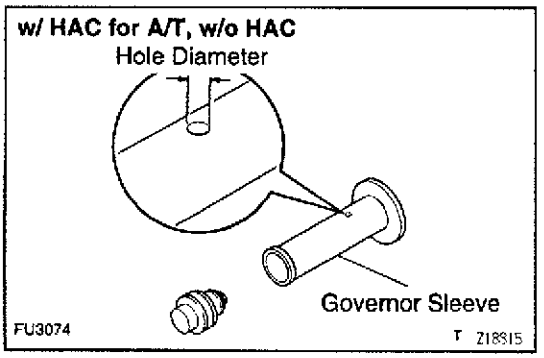
Pump rpm	Timer piston fluctuation mm (in.)
1,200	w/ TCV OFF 1.44 – 1.84 (0.0567 – 0.0724)

3L w/ ACSD for w/o TCV:
(Part No. 22100–5B510)

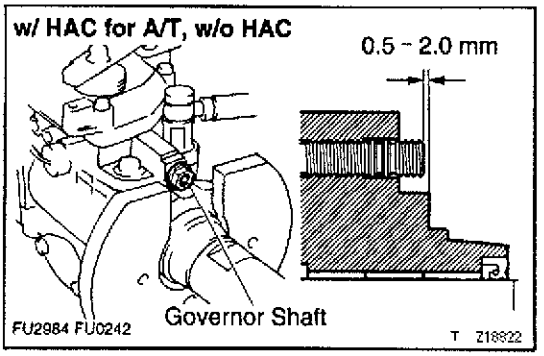
Pump rpm	Timer piston fluctuation mm (in.)
1,200	1.90 – 2.70 (0.0748 – 0.1063)

3L w/o ACSD:
(Part No. 22100–54710, 54850, 54860, 5B030, 5B121)

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



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



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

14. ADJUST IDLE SPEED

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

2L for M/T:

(Part No. 22100–54770, 54780, 54800, 54810, 5B170, 5B320, 5B360, 5B590)

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

T V07880

2L for M/T:

(Part No. 22100–5B060, 5B430)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)	Variation limit cc (cu in.)	Remark
Minus 12.5 – 22.5°	350	200	1.5 – 2.5 (0.09 – 0.15)	0.34 (0.02)	Adjust
	525		1.2 (0.07) or less	–	–

T V07881

2L for A/T:

(Part No. 22100–5B500)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)	Variation limit cc (cu in.)	Remark
Minus 12.5 – 22.5°	350	200	1.7 – 2.7 (0.10 – 0.16)	0.34 (0.02)	Adjust
	575		1.2 (0.07) or less	–	–

T V08064

3L for M/T:

(Part No. 22100–54710, 54850, 54860, 54870, 54880, 5B030, 5B510, 5B520)

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

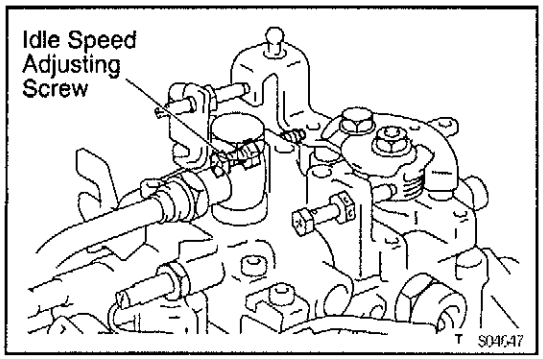
T V07882

3L for A/T:

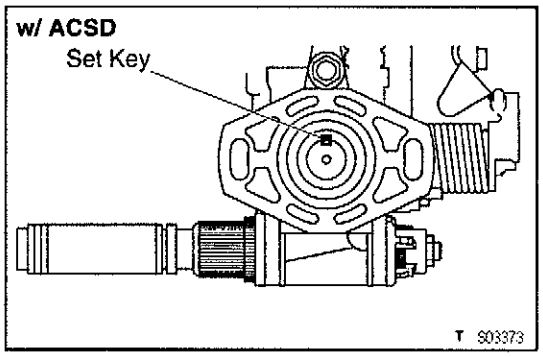
(Part No. 22100–5B121)

Adjusting lever angle	Pump rpm	No. of measuring strokes	Injection volume of each cylinder cc (cu in.)	Variation limit cc (cu in.)	Remark
Minus 13.5 – 21.5°	400	200	q = 1.8 – 2.8 (0.11 – 0.17)	0.34 (0.02)	Adjust
	375		q plus 0.5 (0.03) or more	–	–
	475		q minus 0.7 – 1.7 (0.04 – 0.10)	–	–

T V07883



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

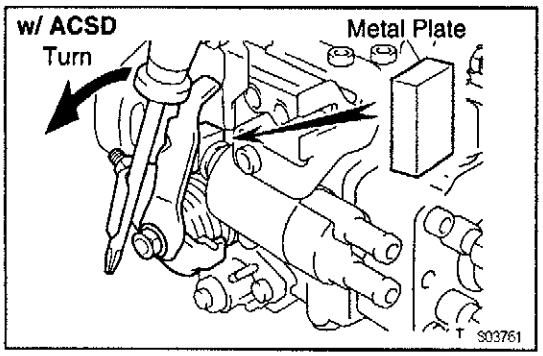


15. w/ ACSD:
ADJUST COLD STARTING SYSTEM

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

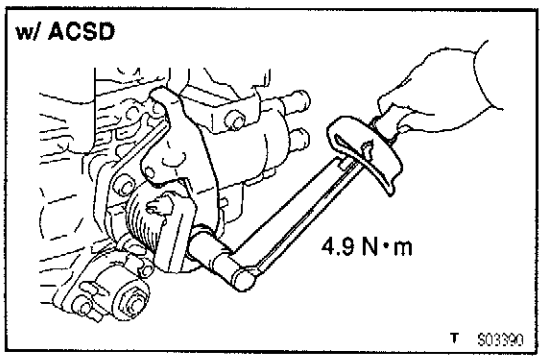
(b) Set the set key of the pump drive shaft in a vertical or horizontal position.

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



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

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



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

(g) Measure the timer piston stroke.
2L for w/ TCV:
(Part No. 22100—5B320, 5B360, 5B500, 5B590)

Fuel temperature °C (°F)	Pump rpm	Piston strokes mm (in.)
25 (77)	350	1.50 — 1.90 (0.0591 — 0.0748)

2L for w/o TCV:
(Part No. 22100—5B170)

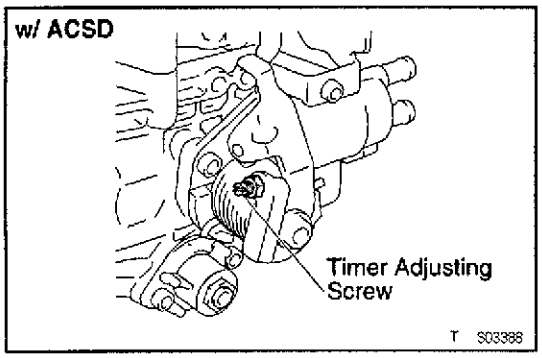
Fuel temperature °C (°F)	Pump rpm	Piston strokes mm (in.)
25 (77)	350	0.85 — 1.05 (0.0335 — 0.0413)

3L:

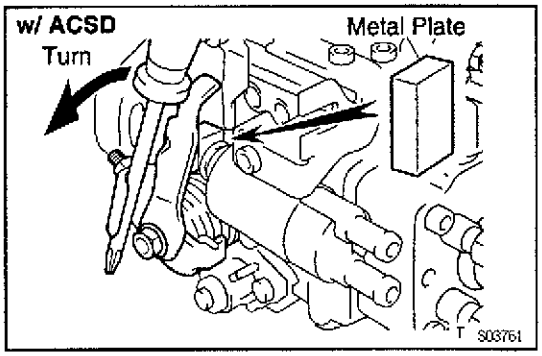
(Part No. 22100–5B510, 5B520)

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

EG



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



EG7DM–01

16. w/ ACSD:
ADJUST FAST IDLE SPEED

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

(b) Set the adjusting lever to idle position.

(c) Measure the injection volume.

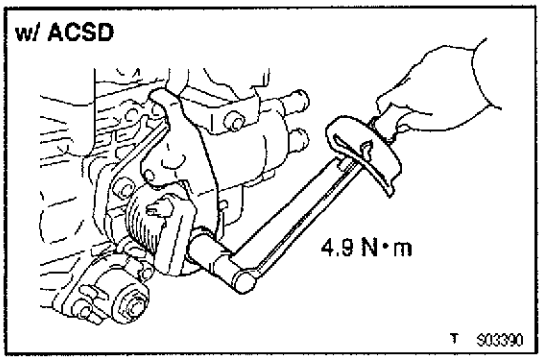
2L:

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

3L:

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

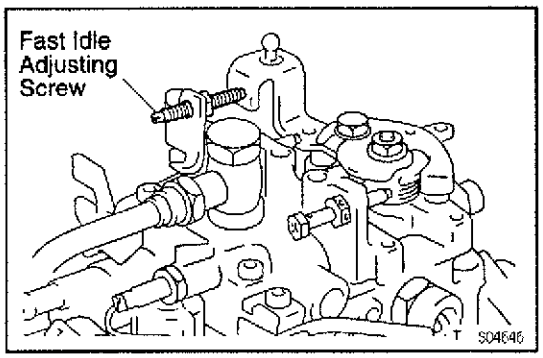
(d) Remove the metal plate between the cold starting lever and thermo wax plunger.



(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.

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



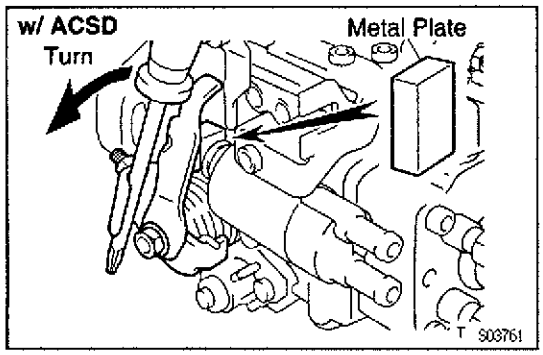
(g) Adjust the injection volume by turning the fast idle adjusting screw.

17. POST ADJUSTMENT CHECK

(a) Check that injection stops when the fuel cut solenoid harness is removed.

Pump revolution:

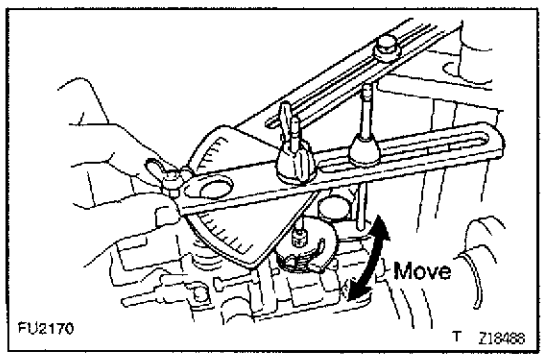
100 rpm



(b) w/ ACSD:

Release the cold starting system.

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



(c) Check the adjusting lever movement.

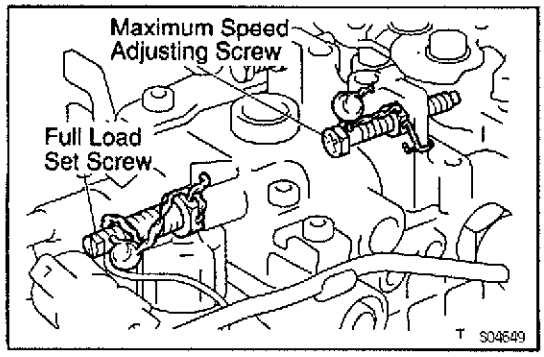
Adjusting lever angle:

M/T	43 – 49°
A/T	41 – 51°

(d) w/ ACSD:

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

18. REMOVE INJECTION PUMP FROM PUMP TESTER



19. SEAL PARTS

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

EG7DK-01

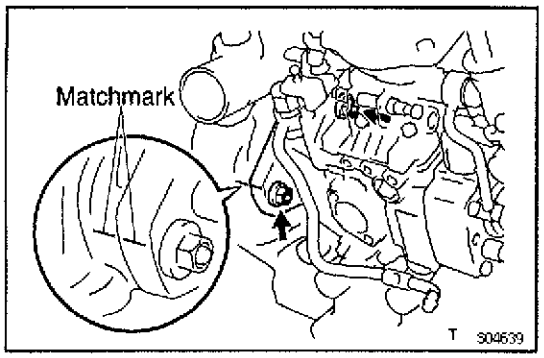
INJECTION PUMP INSTALLATION

1. **INSTALL FUEL INLET PIPE TO INJECTION PUMP**

(a) Install the inlet pipe with 2 new gaskets and the union bolt.
Torque: 24.55 N·m (250 kgf·cm, 18 ft·lbf)

(b) LJ, LN, LY:
Install the bolt for the pipe clamp.

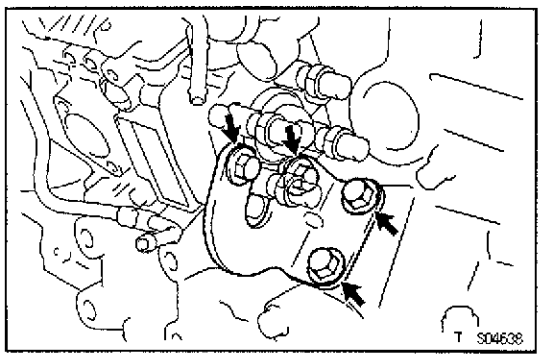
2. **INSTALL FUEL RETURN PIPE TO INJECTION PUMP**
Install the return pipe with 2 new gaskets and the union bolt.
Torque: 24.55 N·m (250 kgf·cm, 18 ft·lbf)



3. **INSTALL INJECTION PUMP**
NOTICE (w/ HAC): Do not put the injection pump at an angle more than 45° from the horizontal.

(a) Align the matchmarks of the injection pump flange and timing gear case.

(b) Install the injection pump with the 2 nuts.
Torque: 20.5 N·m (210 kgf·cm, 15 ft·lbf)



(c) Install the injection pump stay with the 4 bolts.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

4. **INSTALL INJECTION PIPES**
(See injection nozzles installation)

5. **CONNECT HOSES, LINK AND CONNECTORS**
Connect the hoses, link and connectors:
- Fuel inlet hose to fuel inlet pipe
- 2 fuel return hoses to fuel return pipe
- w/ ACSD:
  2 water bypass hoses to thermo wax
- w/ A/C:
  Vacuum hose to idle-up actuator
- Accelerator link to injection pump
- w/ TCV:
  Connector for timing control valve and fuel cut solenoid
- w/ TCV:
  Connector for pickup sensor
- w/o TCV:
  Connector for fuel cut solenoid and pickup sensor

6. **INSTALL INJECTION PUMP DRIVE PULLEY**
(See step 3 in timing belt installation in Engine Mechanical)

7. **INSTALL TIMING BELT**
(See steps 6 to 13 in timing belt installation in Engine Mechanical)