



## Injectors check



### NOTE

Checks are relative to fuel atomisation efficiency and injection start pressure.

Unscrew injection nozzle holder (1), remove injection nozzle assembly (2), the direction plate and drain the injection assembly of residual fuel.



### NOTE

The check cannot be performed if the residual fuel is not discharged.



### NOTE

Renew the copper gasket.

1.

Refit plug (1) and connect the injector to the injector test pump.

Pump several times to expel air from the circuit and fill the injector.

Activate pump slowly and check injection start pressure on the pressure gauge.

Repeat the procedure several times and check that injection pressure is uniform.



### NOTE

Use this method to check also that fuel atomisation is uniform; the fuel must be delivered with a number of jets equivalent to the number of injector nozzle orifices and each jet must be finely atomised and identical to the others. If injection start pressure does not correspond to the value indicated in "TECHNICAL DATA AND DIMENSIONS", have the calibration carried out by a specialised service centre.

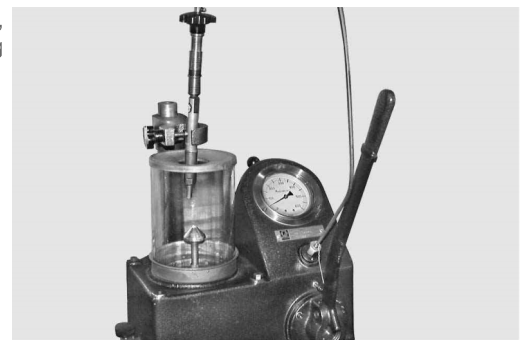
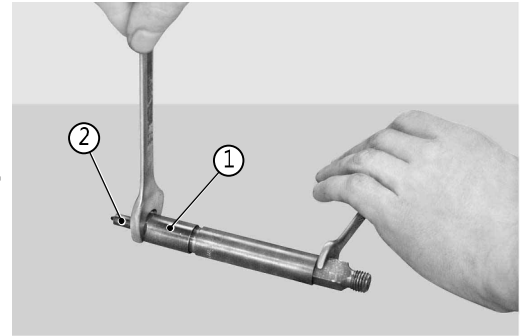
2.

Also check the seal between nozzle seat and needle valve. To do this, operate the pump to build up pressure to approx. 10% lower than opening pressure.

Maintain pressure and check that no fuel leaks from the nozzle.

If leakage occurs, the entire injector assembly must be renewed.

3.





## Injection pumps control rod

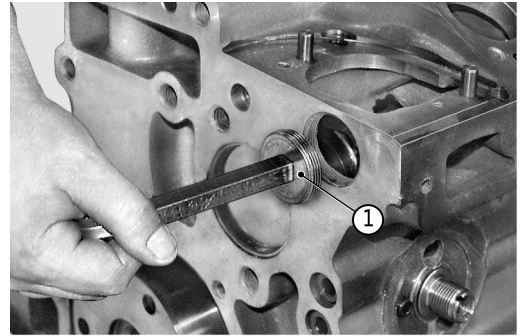
### Removal

Unscrew and remove retaining plug (1)



#### NOTE

Remove all traces of sealant from the thread.



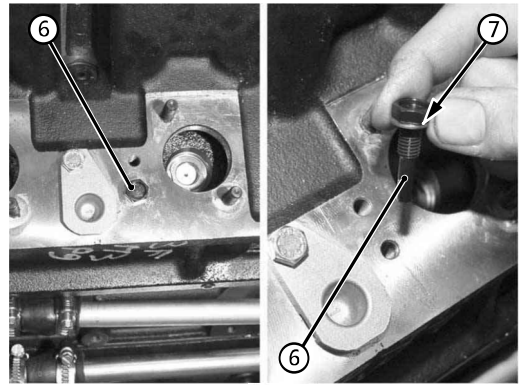
1.

Unscrew and remove stop pin (6) of rod (2).



#### NOTE

Renew copper washer (7) on reassembly.



2.

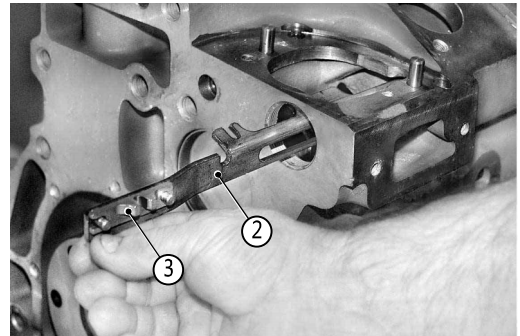
3. Remove rod (2).

Recover rod (2) driver plate (3).



#### NOTE

Take care not to drop plate (3) into the engine block.



4.



#### NOTE

The rod contrast spring is fitted on the other side of the engine. To remove this spring refer to "Timing gear disassembly".

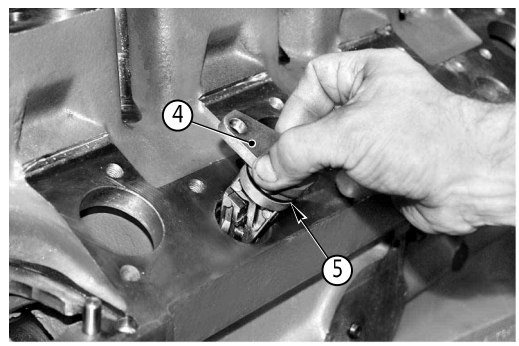
5.

Remove the screws and remove rod driver assemblies (4).



#### NOTE

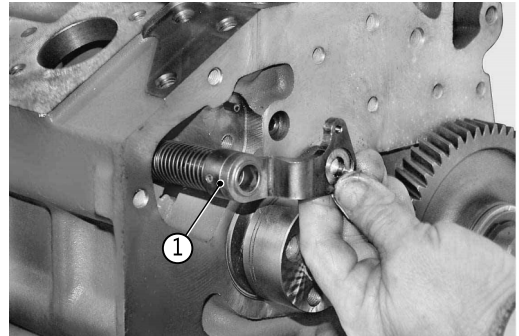
Renew O-rings (5) and remove all traces of sealant



6.

## Installation

Fit the contrast spring assembly (1) for the pump control rod in the crankcase and secure with the screw.

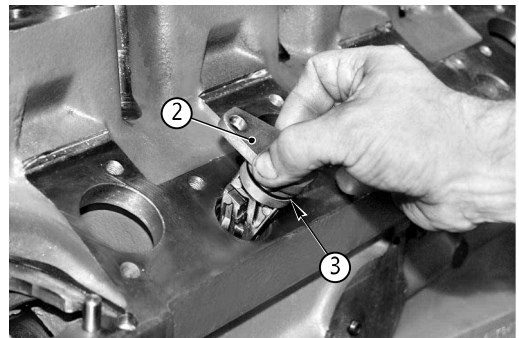


1.

Fit O-rings (3) on rod drivers (2) .

Coat the cylindrical part next to the flange with sealant and fit the rod guides (3), orienting the fixing hole.

Rod guide: Loctite 510



2.

Partially tighten the fixing screws and fit control rod (4) complete with spring guide, spring and driver plate (5).



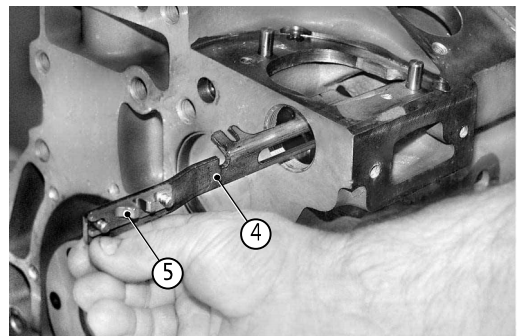
### NOTE

To prevent driver plate (5) from falling apply grease to the mating surface of rod (4).



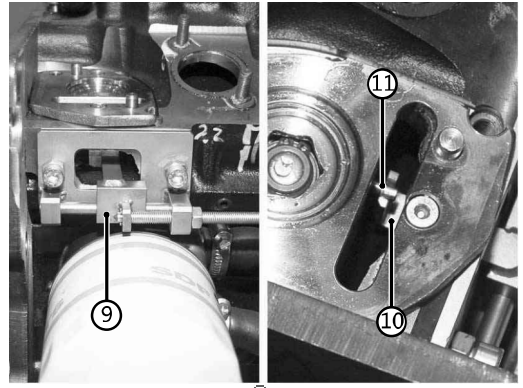
### NOTE

Secure rod guides (2) and check that the control rod slides freely.



3.

Secure tool (9) to the crankcase, engaging yoke (10) on rod control pin (11).



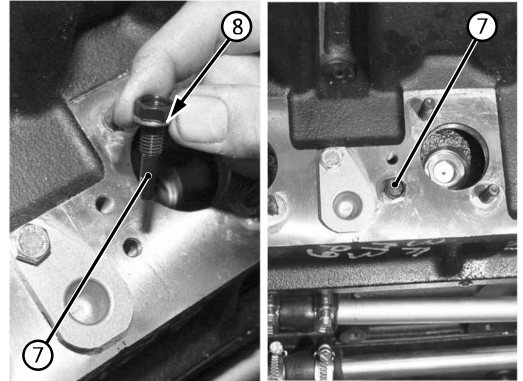
4.

Manually snug stroke limit pin (7) of rod (4), moving the rod and aligning it in its seat.



**NOTE**

Renew copper washer (8) on reassembly.



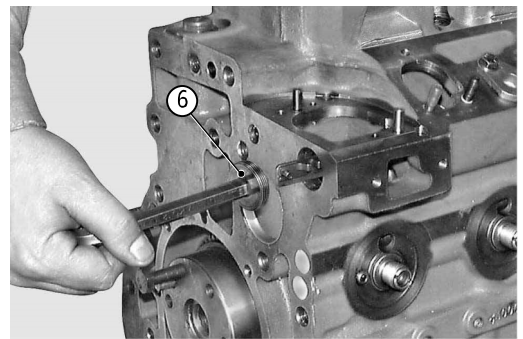
5.

Partially tighten rod retaining plug (6).

Smear sealant on plug (6).

Plug: Loctite 542

Screw plug (6) down until it is recessed by 0.5 mm with respect to the crankcase surface.



6.



## Overhaul of the mechanical governor (standard and with LDA valve)



### DANGER

- 1 - Prior to overhaul, the governor must be removed from the engine and installed on service tool 5.9030.665.0



### DANGER

- 2 - General adjustments that affect operation of the governor must be carried out on the workbench.



### DANGER

- 3 - Adjustments affecting operation of the engine must be carried out with governor installed.



### DANGER

- 4 - Remove only those parts indicated in this section; other parts that are not mentioned must be left in place because their position is factory set and must remain unchanged for the entire lifetime of the governor and the engine.



### DANGER

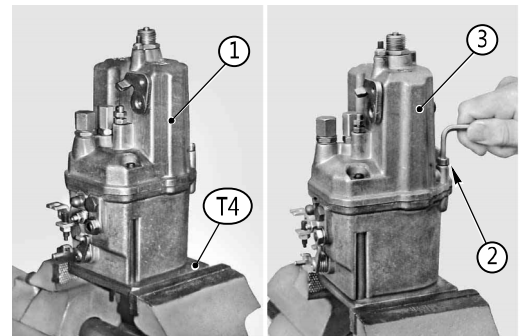
- 5 - If the parts indicated are disassembled by mistake, ship the entire governor to the factory for comprehensive calibration and overhaul.

## Standard governor disassembly

### Separation of lower housing from upper housing

Fit governor (1) on tool T4 (P/N 5.9030.665.0) held in a vice.

Loosen and remove fixing screws (2) of upper housing (3).



1.

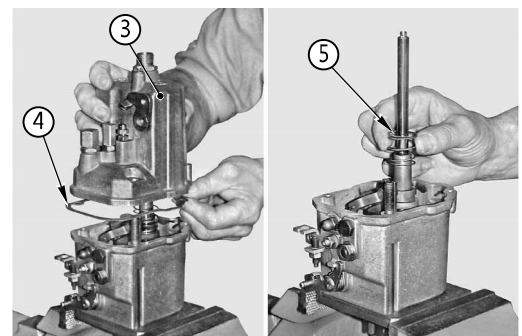
Remove upper housing (3) and gasket (4).



### NOTE

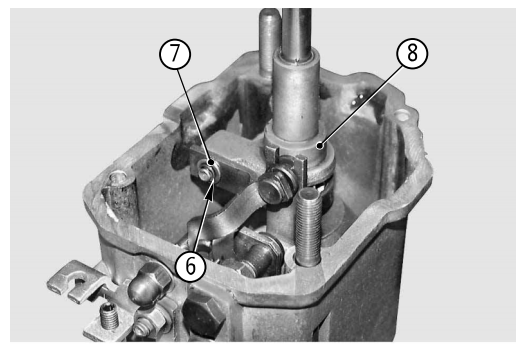
Renew the gasket on reassembly.

Remove spring (5).



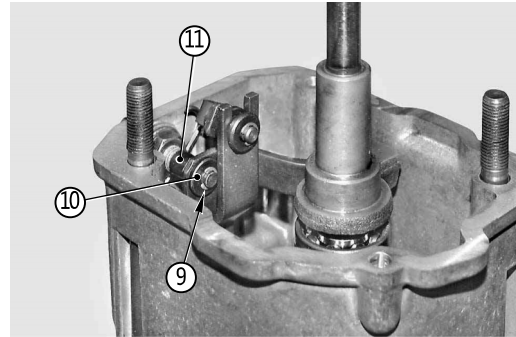
2.

Remove circlip (6) and washer (7) connecting the levers to control sleeve (8).



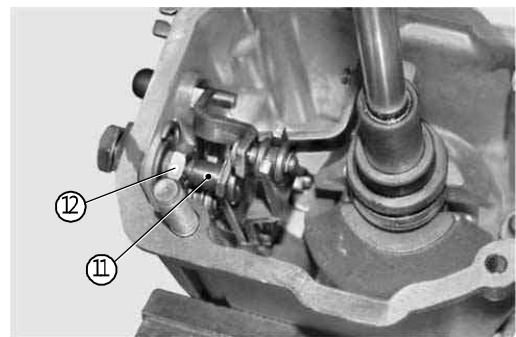
3.

Remove circlip (9) and washer (10) of pivot pin (11).



4.

Loosen and partially unscrew nut (12) of pivot pin (11).



5.

Unscrew pivot pin (11) from the exterior until releasing lever (13).



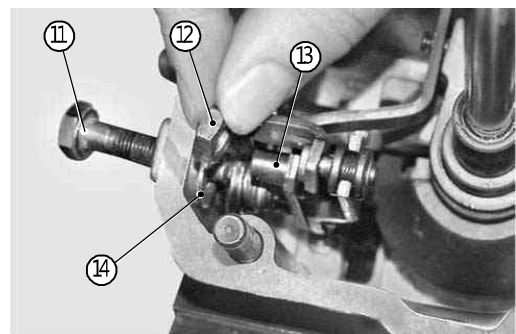
**NOTE**

Recover nut (12) and washer (14).



**NOTE**

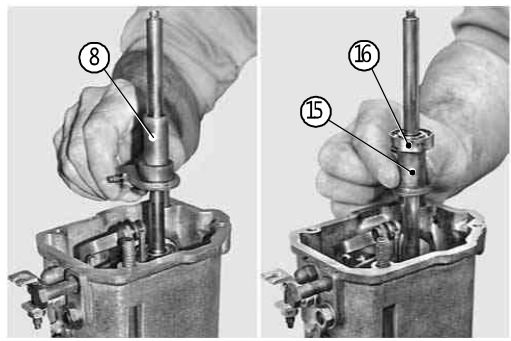
Renew the copper gasket.



6.

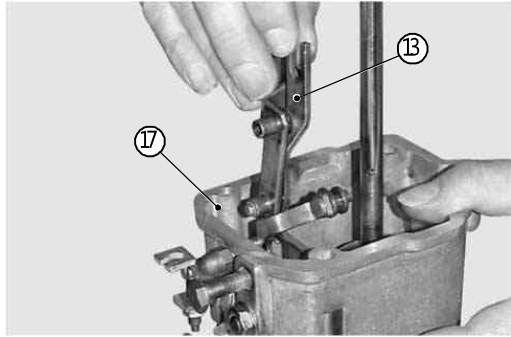
Turn control sleeve (8) to detach it from the levers and remove.

Remove thrust sleeve (15) complete with bearing (16).




7.

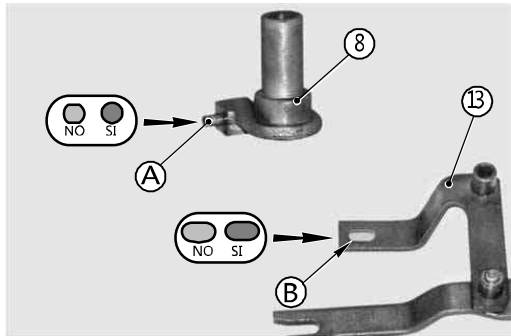
Remove lower housing (17) from tool T4 (P/N) 5.9030.665.0 and remove lever assembly (13).



8.

Carefully check pin (A) of sleeve (8) and slot (B) of lever (13).  
If the pin is worn and the slot has a concave profile, renew the parts.

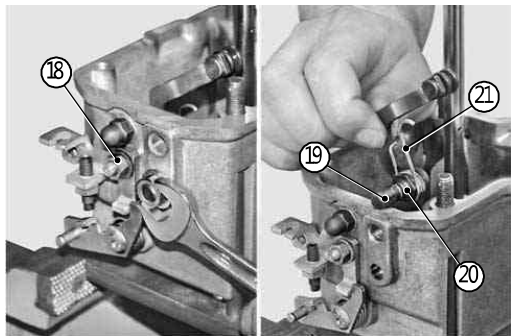
	<p><b>NOTE</b></p> <p>Remove any burr that has formed on the slot profile.</p>
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9.

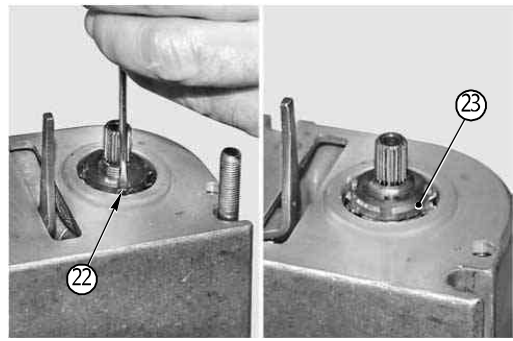
Loosen and remove nut (18) and the relative washer.  
Remove spring pivot pin (19), bush (20) and spring (21) simultaneously.

	<p><b>NOTE</b></p> <p>Renew the O ring.</p>
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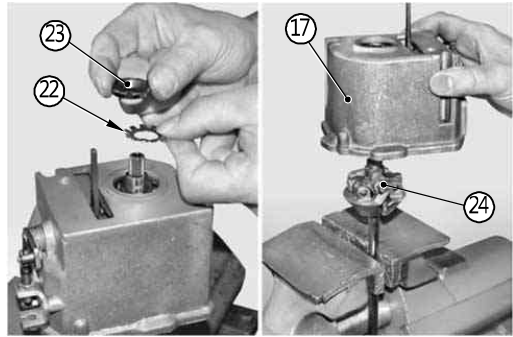
10.

Relieve the staking on lock washer (22) and loosen shaft locking ringnut (23).



11.

Remove ringnut (23) and lock washer (22) and withdraw lower housing (17) from shaft (24).



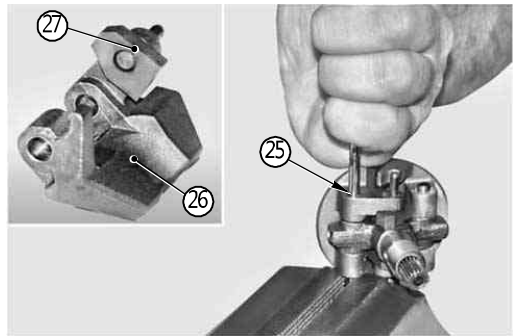
12.

Using a pin punch, remove pivot pins (25) and remove weights (26).



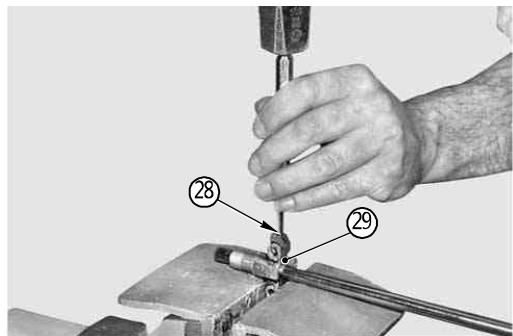
**NOTE**

Note the orientation of the contrast blocks (27).



13.

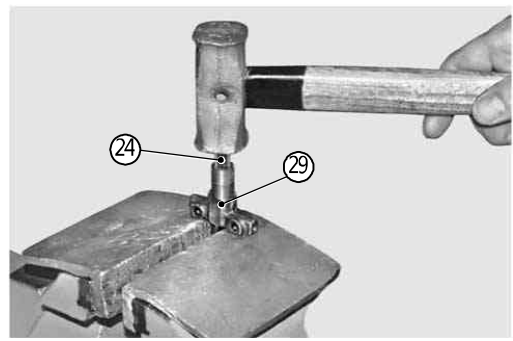
Using a pin punch of suitable diameter, drive out spring pin (28) securing weights support (29).



14.

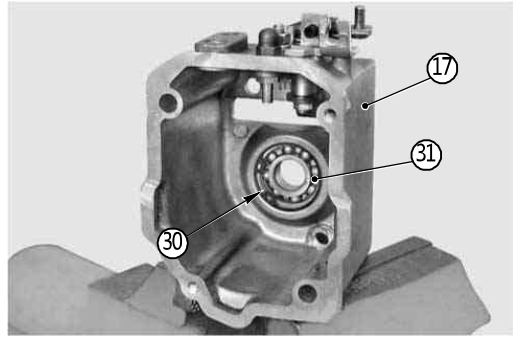
Using a soft mallet (aluminium or copper), drive shaft (24) out of support (29).





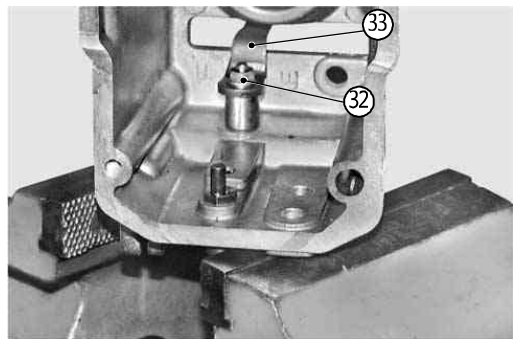
15.

Remove circlip (30) and remove bearing (31) from lower housing (17).



16.

Loosen and remove nut (32), the relative washer and engine stop and automatic fuel boost lever (33).



17.

Remove engine stop control lever (34) and relative spring (35).



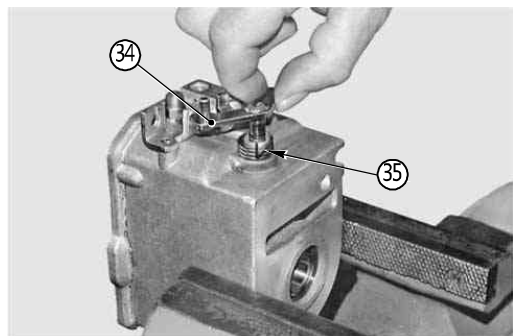
**NOTE**

Renew the O ring.



**NOTE**

Make a note of the engagement positions of the ends of the spring.



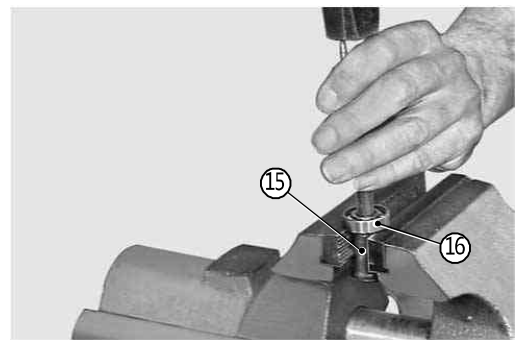
18.

Using a driving tool calibrated on the bearing inner diameter, remove thrust bearing (15) from bearing (16).

**NOTE**




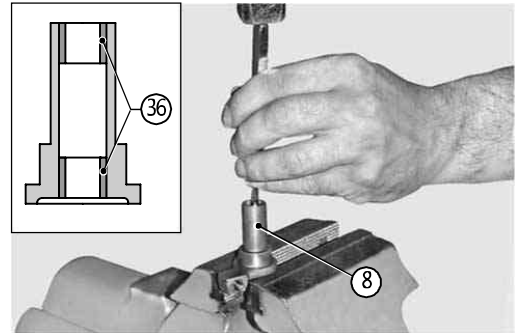
Recover any shims used to adjust axial play of the bearing.



19.

Using a suitable tool, remove bushes (36) from levers control sleeve (8).

	<p><b>NOTE</b></p> <p>Make sure the bushes are flush with the sleeve.</p>
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20.

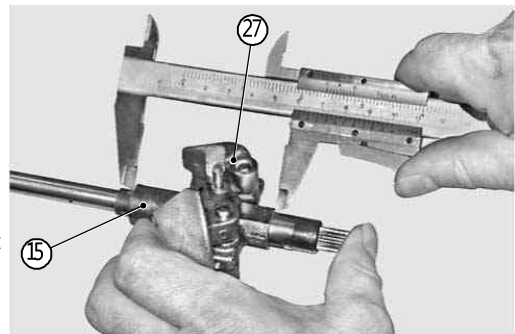
### Lower housing assembly


Repeat the removal steps in reverse order.

- o Stake lock nut (23).
- o Apply Loctite 270 to spring pin (28).
- o Apply Loctite 601 to shaft (24) and support (29).

Calculate the thickness of the shim pack to be installed under the bearing using the following procedure:

1. Install thrust sleeve (15) and, keeping it pressed against contrast blocks (27) measure the distance between the bearing shoulders. Example: measured value 60.5 mm (2.384 in.)
2. Subtract the calculated value from the design fixed value. Resulting value "S" is the shim to be added under the bearing.



	<p><b>NOTE</b></p> <p>Nominal value: <math>61 \pm 0.1</math> (2.403 <math>\pm</math> 0.0039 in.), <math>S = 61 \pm 0.1 - 60.5 = 0.4 \dots 0.6</math> mm</p>
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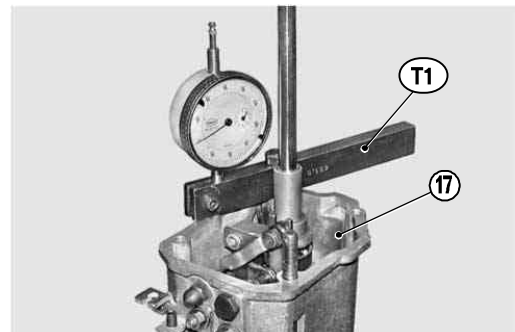
1.

### Bush height adjustment

Position governor lower housing on tool T4 (P/N 5.9030.665.0).

Position a dial gauge on tool T1 (P/N 5.9030.433.0) and install the assembly on the stud, securing it with a nut (hand tightened).

Preload the dial gauge by about 5-6 mm (0.197-0.236 in.) on governor lower housing surface (17) and set it to zero.



1.

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