



## BULLETIN NO. 198

### Application:

Installation of the Barber-Colman isochronous electric governor, DYNC-10502, on the Cummins "B" Series diesel engine.

The linear actuator connects to the throttle lever of the Lucas CAV-DPA fuel pump. By working through the throttle lever the electric governor de-droops the mechanical governor for isochronous speed control.

**Note: Barber-Colman Company strongly recommends that the heavy duty pump cover be used to reduce premature wear of the throttle shaft. HD Cover Cummins P/N 3917884**

### Enclosures:

- Installation Procedure
- Parts List
- Wiring Diagram
- Mechanical Governor Spring Replacement
- Layout Drawing

Unclassified Document  
For Historical Reference Only

**NOTE:**  
Barber-Colman believes that all information provided herein is correct and reliable and reserves the right to update at any time. Barber-Colman does not assume any responsibility for its use unless otherwise expressly undertaken.

**CAUTION**  
As a safety measure, the engine should be equipped with an independent overspeed shutdown device in the event of failure which may render the governor inoperative.

**A. Installing the Actuator**

- 1) Install the actuator - Item 3, on the actuator bracket - Item 4. Using four 1/4" - 28 screws, lock washers and nuts - Items 6, 7 and 14.
- 2) Refer to the layout drawing and install the actuator and bracket assembly - Item 3, on the top front left side of the engine using three M10 screws and lock washers - Items 5 and 6.

**B. Replacing Throttle Spring in Fuel Pump**

- 1) For optimum performance, replace the mechanical governor spring - Item 15. This is shown in the attached procedure on Page 7.

**C. Installing the Linkage**

- 1) Install the actuator clevis - Item 9, five complete turns onto the actuator shaft and tighten the jam nut against the clevis.
- 2) Back out pump throttle lever min/max travel limit screws.
- 3) Install the add-on fuel lever - Item 16 - on the throttle lever using one 1/4 - 20 screw and lock washer - Items 13, 14 and 17. The inboard end of the lever is to be secured under the throttle shaft nut when the fuel pump cover is standard type. **Note:** If the cover on the fuel pump is the heavy duty type having a clamp on lever, refer to paragraph "C" on the layout drawing, page 8.
- 4) Obtain the threaded rod - Item 12. Install one #10 hex nut - Item 11, on to each end of the rod. Install one #10 rod end bearing - Item 8, on each end of the threaded rod. **Note:** Read paragraph "D", steps 1 & 2, then proceed.

**D. Operate the engine as follows:**

- 1) Operate the engine a minute or two at an intermediate speed, moving the fuel pump throttle lever by hand. Slowly, move the throttle lever toward less fuel decreasing engine speed. When the engine stops, **MARK THE POSITION OF THE LEVER**. This is the position the lever should be in when the linkage is installed and the actuator de-energized. This is also the beginning of the active fuel range for the fuel pump.
- 2) Next, with the engine off - move the throttle lever slowly toward the rear of the engine. At the point where the lever force suddenly increases, the mechanical governor throttle plate in the pump will be at its maximum fuel position. The lever **NEVER** needs to rotate any farther. When the linkage

to the actuator is correctly set up as instructed, the throttle lever rotation will be correct for the system.

- 3) Install one rod end bearing into the actuator clevis using one #10 screw, lock washer and nut - Items 10, 11 and 19.
- 4) Adjust the throttle linkage so that the actuator is de-energized (retracted) and the throttle lever is in its minimum active fuel position. Tighten the rod end bearing jam nuts.
- 5) Install the other rod end bearing on the fuel throttle lever using one #10 screw and lock washer and nut - Items 10, 19 and 11.

#### E. Adjusting the Fuel Pump Throttle Lever Limit or Min/Max Screws

- 1) It is the installer's option to use or not use the min/max throttle lever limit screws. When the electric governor is installed, it de-droops the mechanical governor for isochronous operation. Therefore, the limit screws are no longer needed to set the minimum and maximum speeds of the engine. However, if it is desirable to use the limit screws, proceed as follows.
- 2) Turn the idle screw in until it makes contact with the throttle lever. Then back the screw out one full turn and tighten the jam nut.
- 3) Manually move the actuator shaft to full extended stroke while holding the actuator shaft at full stroke extended. Turn the max limit screw in until it makes contact with the throttle lever. Back the screw out one full turn and tighten the jam nut. **Note:** The internal stops in the actuator will now control the minimum and maximum rotation of the throttle lever. This avoids any side load or torque to the fuel pump throttle shaft. This is important if the CAV-DPA fuel pump has a standard cover. The throttle lever on the standard cover is secured by a nut and washer on the top of the throttle shaft.

#### F. Magnetic Pick-up Installation

- 1) Find and remove 3/4" plug from the flywheel housing and install the Item 18 - bushing.
- 2) Rotate the flywheel positioning a tooth in the middle of the hole.
- 3) Turn the magnetic pick-up, Item 20, into the hole until it makes contact with a gear tooth. Turn the pick-up counterclockwise one turn and tighten the jam nut.

- 4) Refer to the enclosed wiring diagram and connect the pick-up leads to the controller as shown.

G. **Wiring Refer to the attached diagram**

- 1) D.C. power leads and actuator leads should be twisted pairs of 14 ga. minimum wire size.
- 2) The negative power lead to terminal 2 of the governor controller should be connected to where the large battery minus cable ties to the engine.

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**Table 1.** Governor Assembly

Specify voltage when ordering Items 1 and 2.

Item	Description	Barber-Colman Part Number	Qty.
1	Governor Actuator	DYNC-10502	1
2	Control	DYN1-10704 *	1

\* If remote speed is a requirement, use a DYN1-10754 controller.

**Table 2.** Installation KitBarber-Colman Part Number DYNK-10304

Item	Description	Barber-Colman Part Number	Qty.
3	Actuator mounting bracket	DYNK-138-34	1
4	Bracket mounting screws M10 - 1.5 x 30	S4-10	3
5	M10 Lock Washers	W1-4	3
6	Actuator mounting screws 1/4 - 28 x 1" socket hd.	BYRF-1461	4
7	Nuts 1/4 - 28 Hex.	DYRF-293	4
8	Rod end bearings 10-32	AKKH-175	2
9	Clevis - Fits on actuator shaft	DYNK-218-2	1
10	Screws 10-32 x 3/4 Socket Hd.	BYRF-2516	2
11	Nuts, 10 - 32	DYRF-29	5
12	Threaded Rod 10 - 32 x 1-5/8"	DYNK-31-16	1
13	Screw 1/4 - 20 x 5/8 (Use with one Item 14 & 17)	BYRF-1336	1
14	Lock Washer 1/4"	CYRD-558	5
15	Governor Spring (Install in fuel pump-See page 6)	DYNK-196	1
16	Add-on fuel lever	DYNK-138-36	1
17	Nut 1/4 - 20 Hex.	DYRF-274	1
18	3/4" to 3/8" Bushing (Use to install Item 20)	DYNC-600-2	1

Table 2. (Continued).

Item	Description	Barber-Colman Part Number	Qty.
19	Lock washer #10	CYRD-198	2
20	Magnetic Pickup	DYNT-17200	1

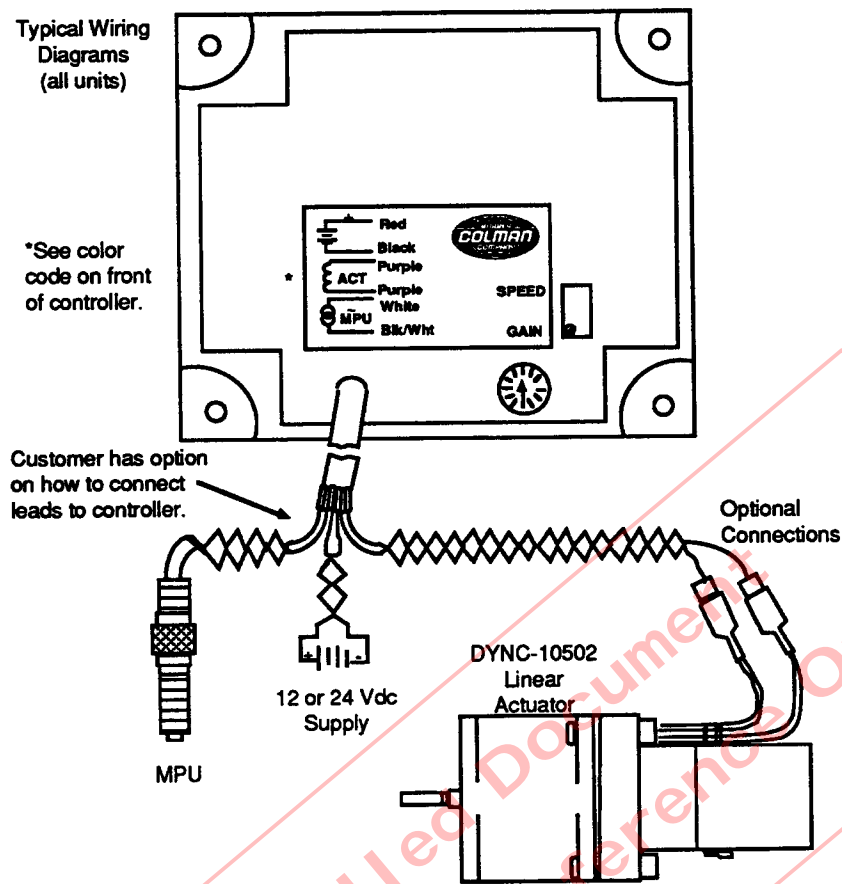
Table 3. Optional Control Components.

Item	Description	Barber-Colman Part Number	Qty.
21	Controller	DYN1-10754	1
22	Digital controller	DYN1-10810	1
23	Remote speed potentiometer, 5k	DYNS-10000	1
24	3 wire foil shielded cable	E26-22	*
25	D.C. power switch, toggle type	CYZP-11-1	1

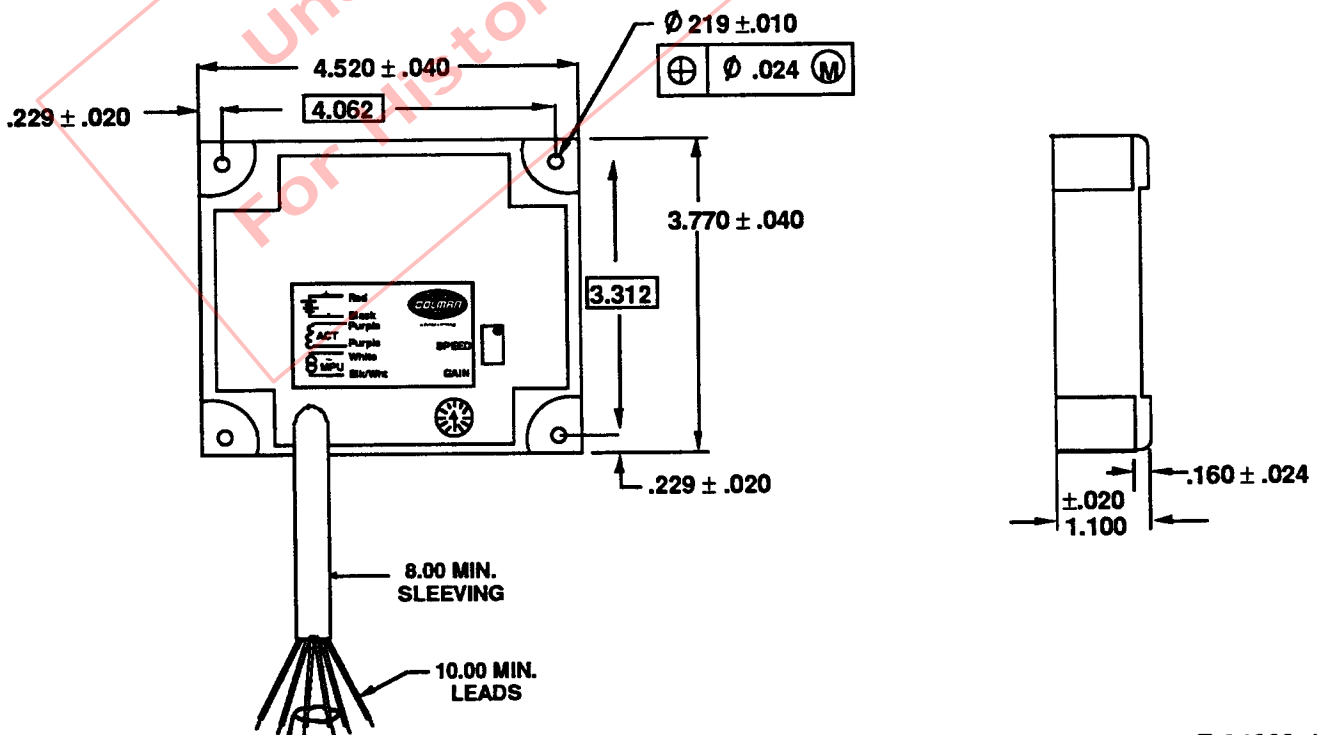
\* Specify length

Typical Wiring Diagrams (all units)

\*See color code on front of controller.



Controller Installation Dimensions





APPLICATION: LUCAS CAV-DPA DIESEL FUEL PUMP

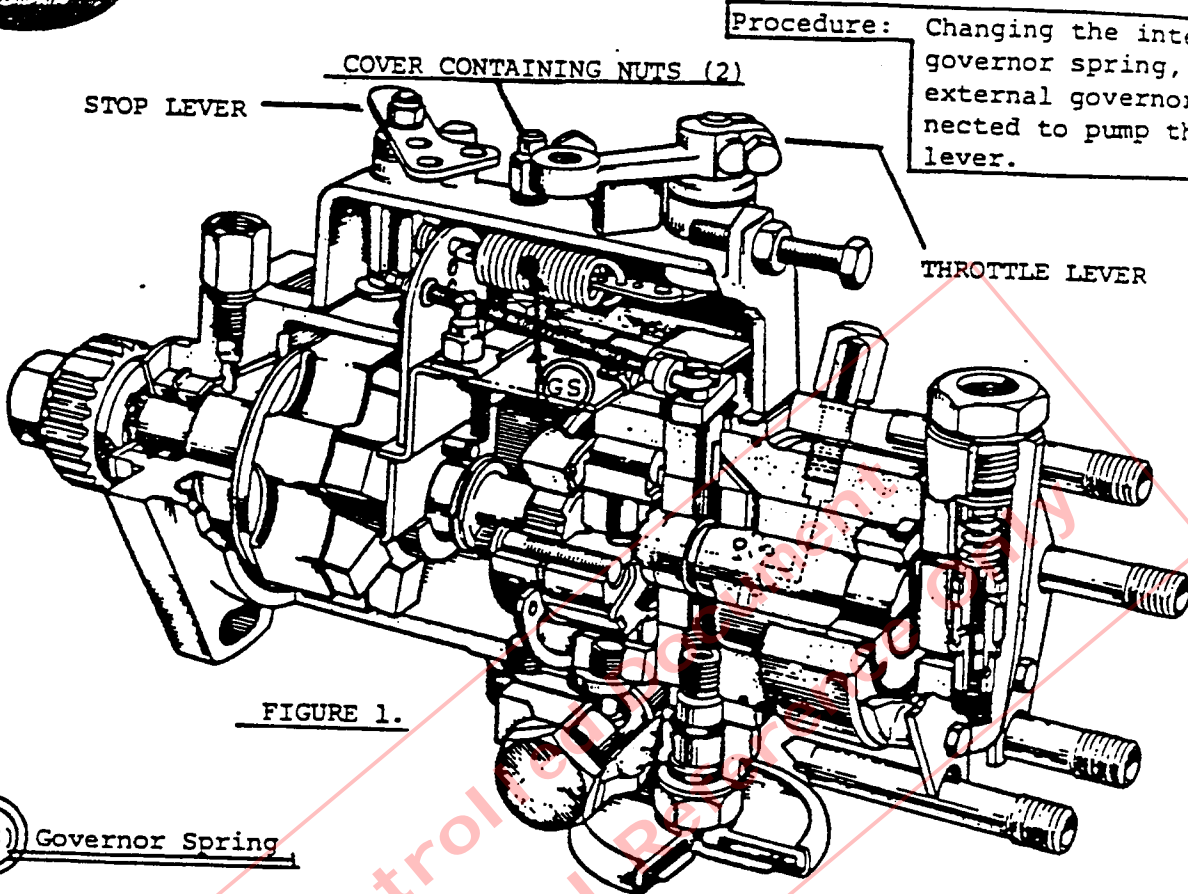


FIGURE 1.

((GS)) Governor Spring

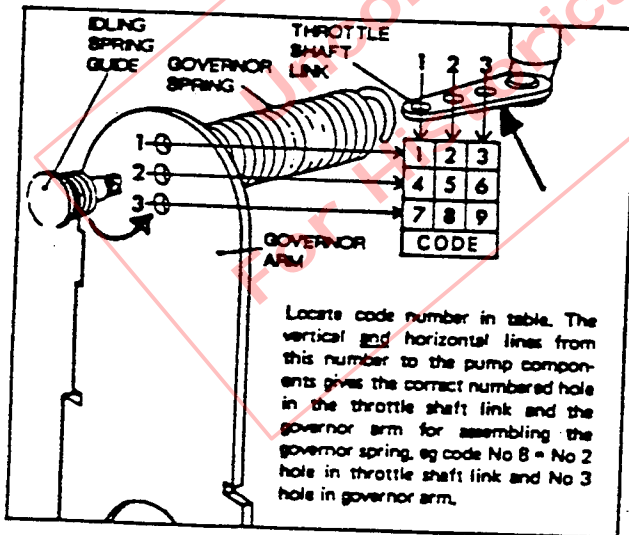


FIGURE 2.

PROCEDURE:

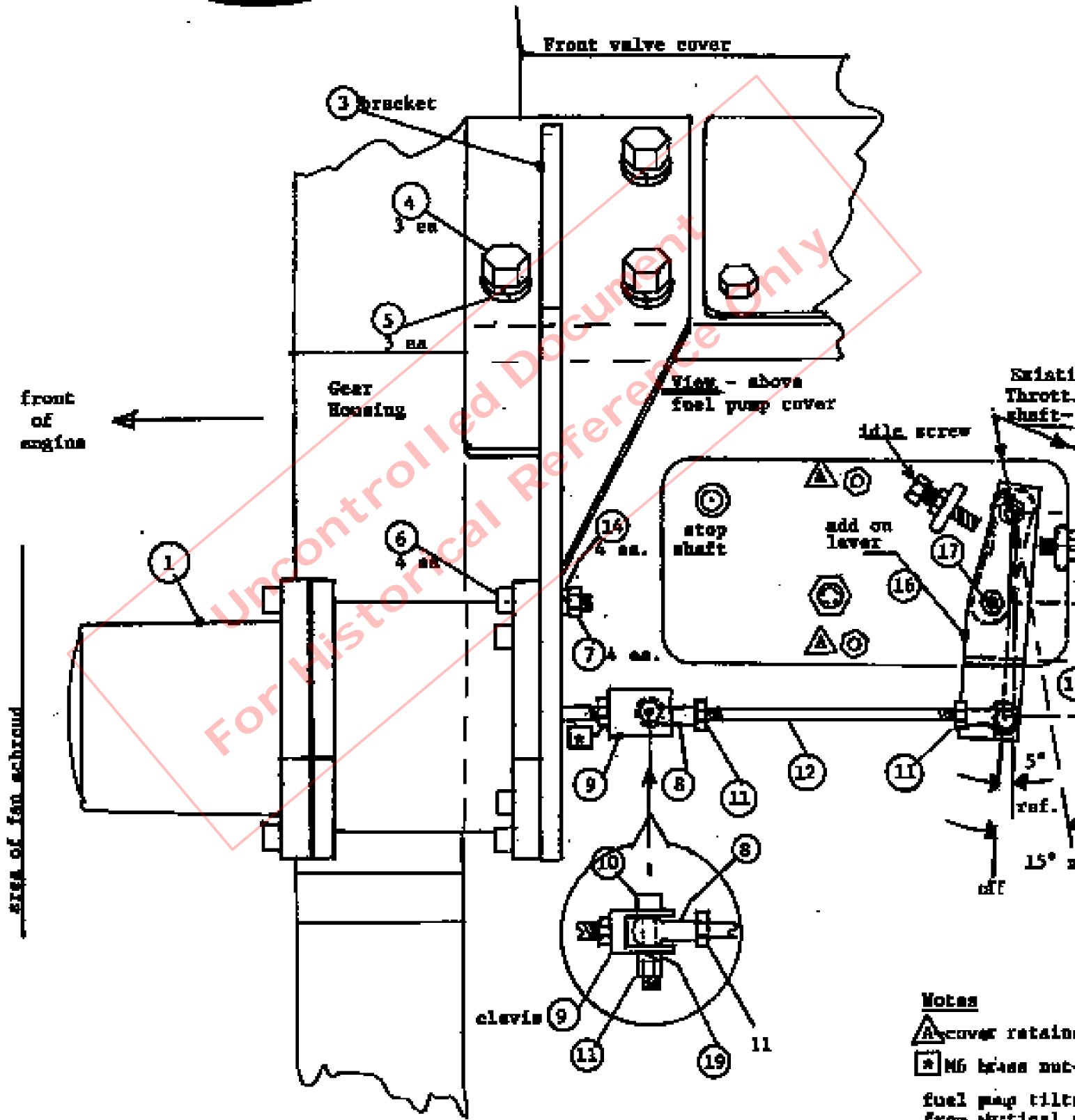
1. Observe in Figure 1 how existing governor spring looks when installed.
2. Remove the (2) cover stud nuts.
3. Lift and tilt the cover toward the engine block.
- 4a. Observe in Figure 2 how throttle shaft link fits inside the spring.
- 4b. Observe how the opposite end of the spring fits in the idle spring guide on the governor arm.
5. Remove existing spring first at the idle spring guide; then at the throttle shaft link.
6. In reverse order, install new spring (Lucas Part No. 7139-918B).
7. Move idle spring guide to Hole #3 in the governor arm.
8. Position throttle shaft link inside spring placing spring hook end in Hole #3.
9. Hook opposite end of spring in the idle spring guide.
10. Replace cover and (2) cover retaining nuts.

CARE SHOULD BE TAKEN SO COVER GASKET IS NOT DAMAGED.



**Application:** Installation of the Barber-Colman L on the Cummins "B" Series Diesel Engine

The linear actuator connects to the pump. By working through the throttle the mechanical governor for Isochron instructions before proceeding.



Asynchronous Electric Governor, DYNR-10502  
line.

throttle lever of the Lucas CAV-DPA fuel  
the lever, the electric governor de-droops  
ous speed control. Refer to all written

**A. Instructions:**

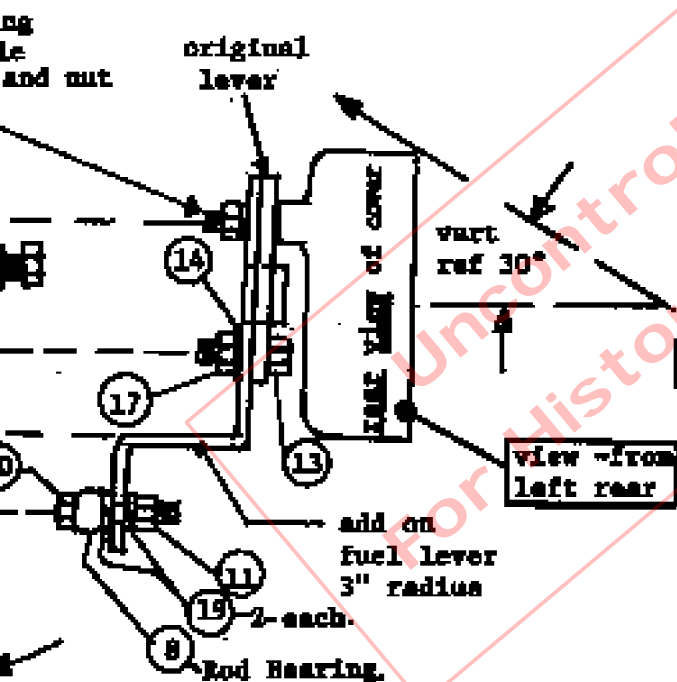
1. For optimum performance, the mechanical governor spring needs to be replaced with a stiffer spring-Item 15. This spring acts as a solid link between the throttle lever and the fuel valve. Refer to page 7

**B. Procedure**

1. After completing step one above, install the add-on fuel lever-Item 16. See paragraph C1 Page 1
2. Manually operate the throttle lever and run the engine. Move the throttle lever toward decreasing fuel until the engine stops. Mark the position of the lever. The throttle lever should be in this position when the linkage is connected.
3. If remote speed is required or parallel operation, order controller DYNR-10754-Item 21-in the optional parts list.

**C. Heavy Duty Cover**

1. The throttle lever will be cast steel and clamp to the throttle shaft by a screw, lock washer and nut.
2. Observe that the add on Fuel lever item 16 has a tang bent at  $90^\circ$  to the flat of the lever on the inboard end.
3. Remove only the nut from the lever clamping screw. Install the tang of the add on lever item 16, on the screw and re-install and tighten the clamping screw nut.
4. Omit step "C" if the cover is standard.



er nuts  
-comes with actuator  
s left approximately  $30^\circ$   
center line of engine,