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Installation of the Barber-Colman Linear Governor, DYNC-10502, on the Cummins "C" Range Diesel. The linkage connects to the Stop Lever of the RSV Mechanical Governor.

This bulletin contains the following:

- I. Installation Instructions**
- II. Parts List**
- III. Calibration & Wiring**
- IV. Troubleshooting**
- V. Installation Diagram**

Read all instructions and review the layout drawing before attempting this installation.

I. Installation Instructions

A. Installation of the electric governor bracket and actuator, Items 3 and 1

- 1) Obtain from the parts kit, Item 10, new stop lever. Install this lever on the stop shaft as shown in the layout drawing. This lever is also identified as Lever "D". Use original retainer washer and screw.
- 2) Next, install the Item 3 mounting bracket using screws and lock washers, Items 5 and 6.
- 3) Install the actuator, Item 1, on the mounting bracket using four each of Items 7, 8 and 9.
- 4) Install one rod end bearing, Item 11, on the Item 10 stop lever using two flat washers, Item 13, screw, Item 7, lock washer, Item 8, and one nut, Item 9. A flat washer is used on each side of the rod end bearing ball.
- 5) Install the other rod end bearing, Item 11, with a jam nut, Item 9, on one end of the threaded rod, Item 12.
- 6) Install one Item 9 nut on the other end of the threaded rod. Set the linkage rod aside for later use.

B. Fuel Pump Levers

- 1) Start the engine and control engine speed by moving the mechanical governor throttle lever. Move the throttle lever, increasing engine speed, until the engine speed is 10% above normal desired speed. Lock the throttle lever in this position.
- 2) Next, manually operate the inboard, Item 10, stop lever. Slowly move the lever toward the rear of the engine (decreasing engine speed) until the engine stops. Mark the position the lever is in. The lever should be in this position when the linkage is installed.

C. Actuator Shaft Clevis

- 1) Obtain the M6 Hex nut, Item 15, and the Item 14 clevis.
- 2) Install these on the actuator shaft. Tighten the M6 nut against the back side of the clevis.

D. Linkage Rod

- 1) Recover the linkage rod that was set aside.
- 2) Turn the free end of the threaded rod into the rod end bearing that is on the stop lever and tighten the rod jam nut, Item 9, against the bearing.

Move the stop lever, Item 10, to the "OFF" position that was marked. Adjust the length of the rod as necessary, in or out of the bearings until the rod end bearing ball lines up with the screw hole in the clevis. Note: At the clevis end of the threaded rod, turn the rod end bearing one additional full turn onto the rod.

- 3) Install the rod end bearing into the clevis using screw, Item 7, lock washer, Item 8, and a nut, Item 9. Last, secure the jam nuts on the threaded rod against the rod end bearings.

E. Magnetic Pickup

- 1) Observe that in the engine bell housing, a 3/4-16" hole has been drilled and threaded for the Item 16 magnetic pickup. Install the pickup. Back out one quarter turn, tighten nut.

F. Controller

- 1) The Item 2 controller should be panel mounted. The control is not potted and should not be engine mounted. This unit is capable of parallel operation and accepts remote speed.

G. Wiring Diagram

- 1) D.C. power leads and actuator leads should be 14 gauge minimum. If leads exceed 15 ft., use 12 gauge wire. It is recommended that the leads be twisted pairs.
- 2) D.C. supply leads to terminals 1 and 2 of the controller can be connected to where the large battery cables connect to the engine.
- 3) The positive lead can be wired through a normally open relay contact, rated to 10 amperes or more. The coil of the relay is then connected to the engine fault circuit for system protection.

H. Calibration

- 1) Calibration information is attached. Observe that the S1 and S2 switches on the controller are in the correct position for the governor type and the engine.

II. Parts List

A. 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	Controller	DYN1-10704**	1

**This controller has no provision for remote speed and cannot be used with any DYNA II accessories.

B. Table 2. Installation Kit

B-C Part Number DYNK-10291

Item	Description	Barber-Colman Part Number	Qty.
3	Actuator mounting bracket*	DYNK-138-24	1
4	Bracket support brace	DYNK-138-25	1
5	Bracket & brace screws M10 x 1.5 x 20 mm	S3-54	3
6	Lock washers M10 (Use with Item 5)	W1-4	3
7	Actuator mounting screws 1/4-28 x 1" Hex.	BYRF-1346	6
8	Lock washers 1/4	CYRD-558	6
9	Nuts 1/4 x 28	DYRF-110	8
10	New fuel pump stop lever shown as lever "D"	DYNK-138-23	1
11	Rod end bearings 1/4 - 28	DYNZ-47-1	2
12	Linkage rod 1/4 - 28 x 2-3/8" long	GYRF-42-15	1
13	Flat washers 1/4 (See note 3 on drwg.)	CYRD-59	6
14	Clevis - Install on actuator shaft	DYNK-218-1	1
15	M6 nut - Use on act. shaft with Item 14	N1-1	1
16	Magnetic pickup 3/4 - 16 (6 ft. leads)	DYNT-17200	1
17	3/4 - 26 to 3/8 - 24 Reducer	DYNC-600-2	1

C. Table 3. Optional Parts

Item	Description	Barber-Colman Part Number	Qty.
18	Simpler potted controller	DYN1-10754	1
19	Remote speed pot, 5K	DYNS-10000	1
20	3 Wire foil shielded cable	E26-22	*
21	D.C. power switch, toggle type	CYZP-11-1	1

* Specify length

III. Wiring and Calibration

All four controllers are wired as shown in Figure 1 Wiring Diagram.

1. Red to battery positive.
2. Black to battery negative.
3. Purple to the actuator, no polarity.
4. White to one side of the magnetic pickup.
5. Black & white to the other side of the magnetic pickup connected with the shield drain wire.

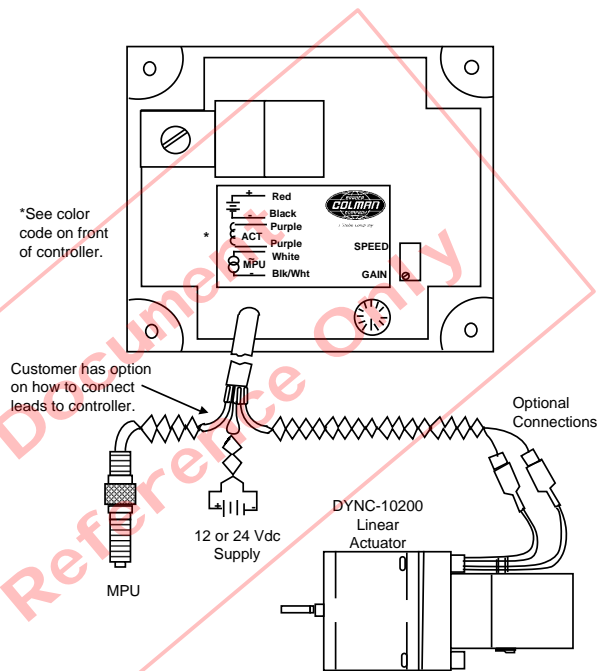


FIGURE 1

Calibration

1. With no power to the governor, adjust the GAIN to 9:00 o'clock.
2. Start the engine and adjust the speed by turning the speed pot clockwise to desired speed.

Note: Controllers are factory adjusted to minimum RPM. However, for safety, one should be capable of disabling the engine if an overspeed should exist.

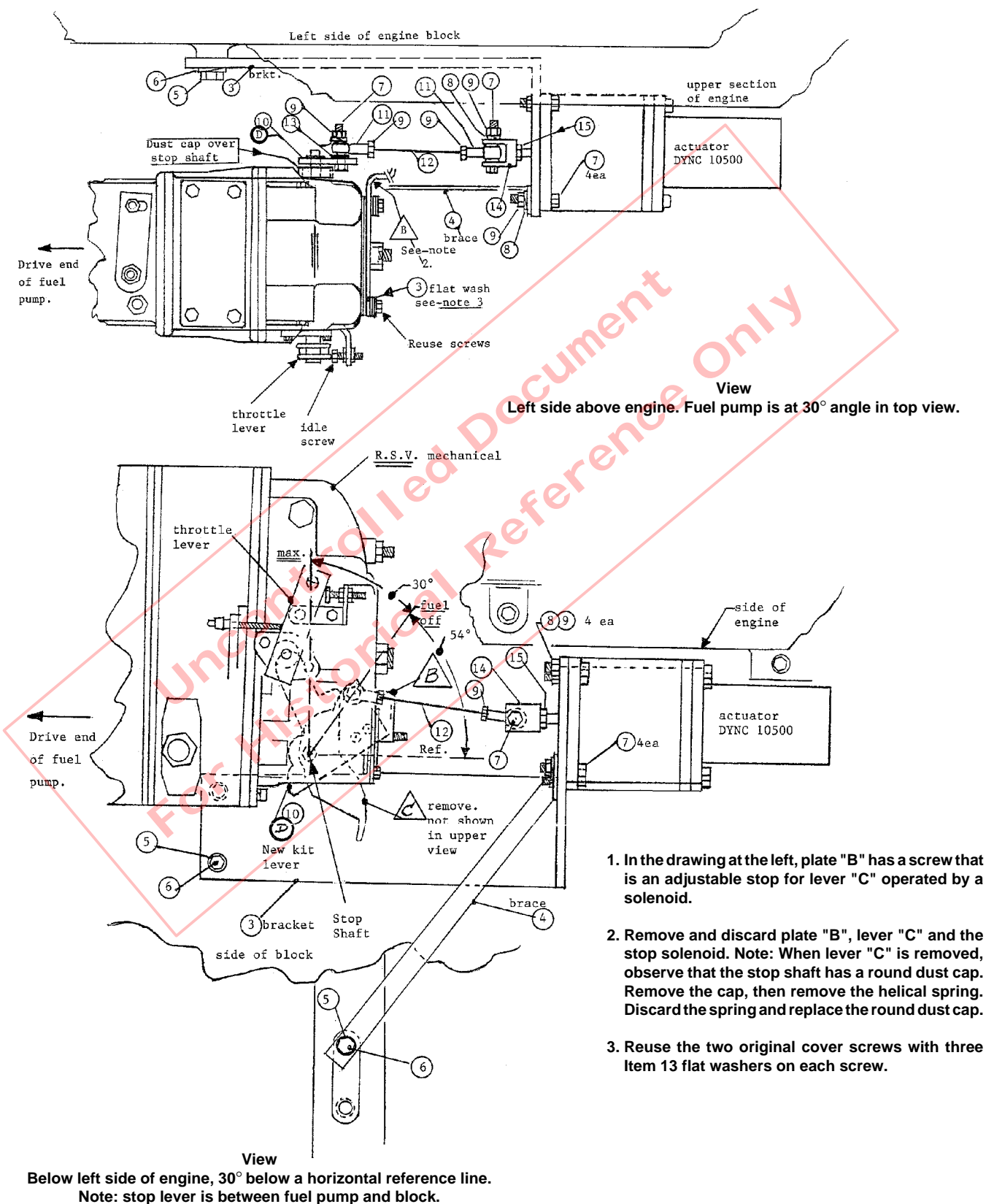
3. At no load, turn the GAIN potentiometer clockwise until the engine begins to hunt. If the engine does not hunt, physically upset the governor linkage.
4. Turn the GAIN potentiometer counterclockwise until stable.

LINEAR TROUBLESHOOTING CHART

Problem	Detection	Corrective Action
I. System appears dead. (Actuator fails to move to full fuel.)	1. CHECK BATTERY VOLTAGE AT CONTROLLER with power switch "ON". Measure DC battery voltage between the Red (+) and Black (-) leads. Battery voltage should be present.	Check connections to battery.
	2. CHECK LINKAGE. Manually operate linkage to see that it is not sticking or binding.	Free linkage.
	3. NO SIGNAL OR WEAK SIGNAL FROM MAGNETIC PICKUP. Measure AC voltage between the White and Black/White leads on controller while cranking engine. Voltage should be 2.5 volts RMS or greater. (AC input impedance of meter must be 5000 ohms/volt or greater.)	Check for damage to or improper adjustment of magnetic pickup. Replace or re-adjust.
	4. CHECK ACTUATOR with power "ON" to controller. Measure following terminals on control box with respect to the Black lead. All points should read BATTERY VOLTAGE. (+0.00/-0.75 VDC) <ul style="list-style-type: none"> a.. Purple lead to Black lead on controller. b. Second Purple lead to Black lead on controller. (Continue this test only if battery voltage is not present.) c. Following checks are terminals on the actuator and the Black lead on controller. <ul style="list-style-type: none"> 1) Low voltage (1.0-2.0 VDC) at either actuator connector. 2) Battery voltage at both actuator connectors. 3) Battery voltage at one actuator lead but not at the other. 	Replace controller if battery voltage is not present at both Purple leads. Broken actuator lead. Broken actuator lead. Replace actuator.
II. Actuator lever goes to full fuel whenever the power is turned "ON" and engine is not running.	1. CHECK CONTROLLER by removing actuator lead to Purple lead and turning power "ON" to controller. <ul style="list-style-type: none"> a. Actuator goes to full fuel. b. Actuator does not go to full fuel. <p>Note: Turn off power and reconnect Purple lead.</p>	Check for shorted actuator lead. Replace Controller because it should not cause actuator lever to go to full fuel with engine not running.
III. Actuator hunts during operation.	1. Linkage or rod end bearings sticking or binding.	Lubricate or replace.
	2. Improper linkage arrangement. (Stroke too short or improper non-linear linkage used)	See installation information.
	3. Improper governor adjustment.	Readjust calibration.
	4. Inadequate power supply voltage. <ul style="list-style-type: none"> a. Turn power switch "OFF" b. Connect a DC voltmeter to Red and Black leads at control box. c. Disconnect both leads to actuator at Purple leads of control box. d. Connect one actuator lead to the Red lead and one actuator lead to the Black lead of the control box. e. Momentarily turn "ON" the D.C power. The actuator should go to full fuel and the DC voltage must be greater than 80% of supply. <p style="text-align: center;"> 24 VDC @ 80% = 19.2 VDC 12 VDC @ 80% = 9.6 VDC </p> <p>Note: Reconnect actuator leads properly after completing this test.</p>	If actuator doesn't get to full fuel, then check actuator leads. If voltage is less than specified, check for loose or poor connections to battery, or get larger supply leads or larger power supply.

V. Installation Diagram

The electric governor linkage connects to a new stop lever — Item 10, of the parts list. (Identified as lever "D" in the layout drawing below). The G-Drive engine flywheel has 127 teeth. The mechanical governor throttle lever must be set and locked to operate the engine at 10% above nominal speed to avoid limiting fuel by the mechanical governor under full load. In the drawing at the bottom, the fuel pump stop shaft is on the back side pointing toward the engine block. Refer to all instructions.



1. In the drawing at the left, plate "B" has a screw that is an adjustable stop for lever "C" operated by a solenoid.
2. Remove and discard plate "B", lever "C" and the stop solenoid. Note: When lever "C" is removed, observe that the stop shaft has a round dust cap. Remove the cap, then remove the helical spring. Discard the spring and replace the round dust cap.
3. Reuse the two original cover screws with three Item 13 flat washers on each screw.

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.

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