Installation of the Barber-Colman 8000 Series Electric Governor connecting directly to the rack on a Detroit Diesel 6V71, 8V71, 12V71, 6V92 and 8V92 engine using kit DYNK-10350. In order to install this governor, the hydraulic governor housing must be used for the Barber-Colman mounting pad. Remove and discard the hydraulic governor drive.

This bulletin contains the following:

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

See the appropriate application bulletin for installation on engines equipped with a mechanical governor.

I. Installation Instructions

A. Engine Preparation

1. Disconnect the battery

2. Remove and discard the hydraulic governor and its oil filter or reservoir and any other associated hardware. The governor's oil supply line needs to be plugged. Also remove the four mounting bolts for the hydraulic governor.

3. The hydraulic governor's vertical and horizontal drive shafts, along with their gear assemblies, need to be removed from the governor's drive housing.

B. Actuator Installation

1. Obtain from the parts kit one mounting pad - Item 3, six 5/16-18 screws - Item 4, and six 5/16 lock washers - Item 5. Install the mounting pad to the top of the hydraulic governor housing using Items 4 and 5.

2. Obtain from the parts kit one actuator - Item 1, four 1/4-20 screws - Item 6, and four 1/4 lock washers - Item 7. Mount the actuator onto the mounting pad with actuator mounting screw - Item 6 and lock washer - Item 7.

C. Linkage Installation

1. Obtain from the parts kit one actuator lever - Item 8. Place the lever on the actuator (referring to the layout drawing) at a 38 degree angle from a vertical reference line. Secure the lever by tightening the screw.

2. Obtain from the parts kit one control rod assembly - Item 12, one 5/16-24 screw - Item 9, one 5/16-24 lock nut - Item 11, and two 5/16 flat washers - Item 10. Connect the control rod to the actuator lever with the 5/16-24 screw and locknut. Place two 5/16 flat washers on each side of the rod end bearing.

3. Set the control linkage such that the max rotation of the actuator matches max travel of the fuel rack. (This will prevent over-driving of the fuel rack and binding or jamming the injectors.)

— NOTE —
Make certain there is not a fuel limit limiting rack travel.

4. To make the max travel adjustment, it is necessary to operate the actuator to the full rotation. With engine off and power off to governor controller, jumper TP1 and TP2. Turn power on to the controller; this will rotate the actuator to the max position.

5. Obtain from the parts kit one 5/16-18 screw - Item 13 and two 5/16 flat washers - Item 10. Adjust the control rod to give full rack travel with full rotation of the actuator. Lengthen the control rod 1/2 turn by turning the rod end bearing 1/2 turn. Connect the control rod with one 5/16-18 screw - Item 13 to the rack. Also, place one 5/16 flat washer - Item 10 on each side of the rod end bearing.

6. Remove the jumper between TP1 and TP2.

D. Magnetic Pickup Installation

1. The magnetic pickup can be mounted in two different locations on the engine's flywheel housing. One way is on the face of the flywheel housing (left side of engine). Remove the plug and install the bushing - Item 15. The other location is on the side of the flywheel housing. Some engines contain 1-1/4" plug; if so, remove the plug and install the bushing - Item 15. Center a tooth in the center of the hole. On the 92 series, the magnetic pickup can be installed off the cam gear.

— NOTE —

Do not mount the magnetic pickup in the drain plug hole in the bottom of the flywheel housing.

2. Obtain the magnetic pickup - Item 14, and screw it into the threaded bushing until the tip of the pickup makes contact with the top or side of a tooth. Turn the magnetic pickup counterclockwise (CCW) 1/4 to 1/2 turn and tignten jam nut.

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-11021-000-0-X	1
2	Controller	See Below (a or b)	1

a) Magnetic Pickup Installed Off Ring Gear DYN1-10654-000-0-X
b) Magnetic Pickup Installed Off Cam Gear DYN1-10653-000-0-X

B. Table 2. Installation Kit

B-C Part Number DYNK-10350

Item	Description	Barber-Colman Part Number	Qty.
3	Mounting bracket	DYNK-75-26	1
4	Mounting bracket screws 5/16-18 x 1	BYRF-2182	6
5	Lock washer 5/16	CYRD-560	6
6	Actuator mounting screw 1/4 - 20 x 1	BYRF-2520	4
7	Lock washer 1/4	CYRD-558	4
8	Actuator lever	DYNC-182-20	1
9	Linkage screws 5/16 - 24 x 1.250	BYRF-2807	1
10	Flat washers 5/16	CYRD-549	4
11	Locking nut 5/16 - 24	DYRF-501	1
12	Control rod assembly	DYNK-69-7	1
13	Linkage screw 5/16 - 18 x 7/8	BYRF-1351	1
14	Magnetic pickup	DYNT-10200	1
15	MPU threaded bushing	DYNC-338	1
16	Magnetic pickup cable	DYNK-44-3	1

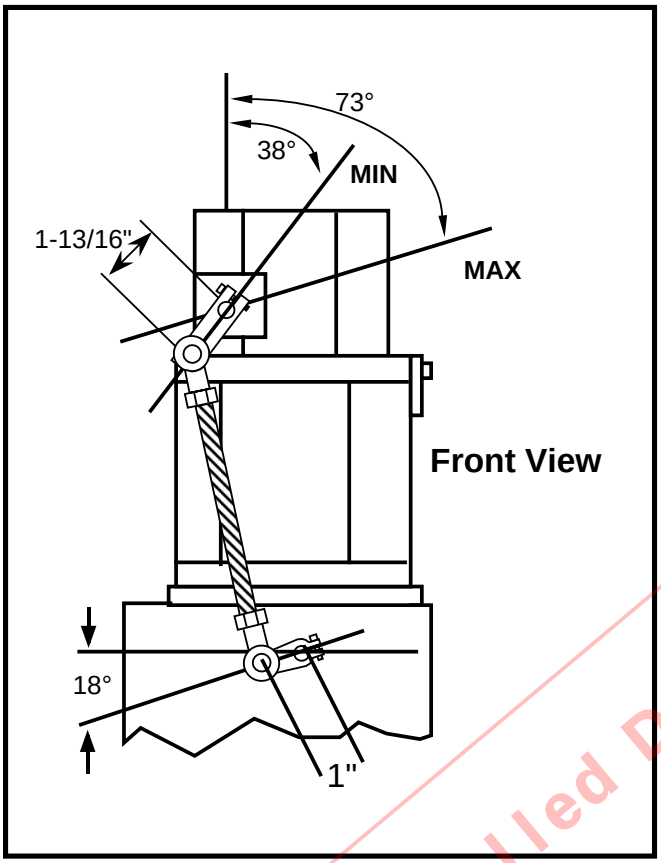
C. Table 3. Optional Control Components

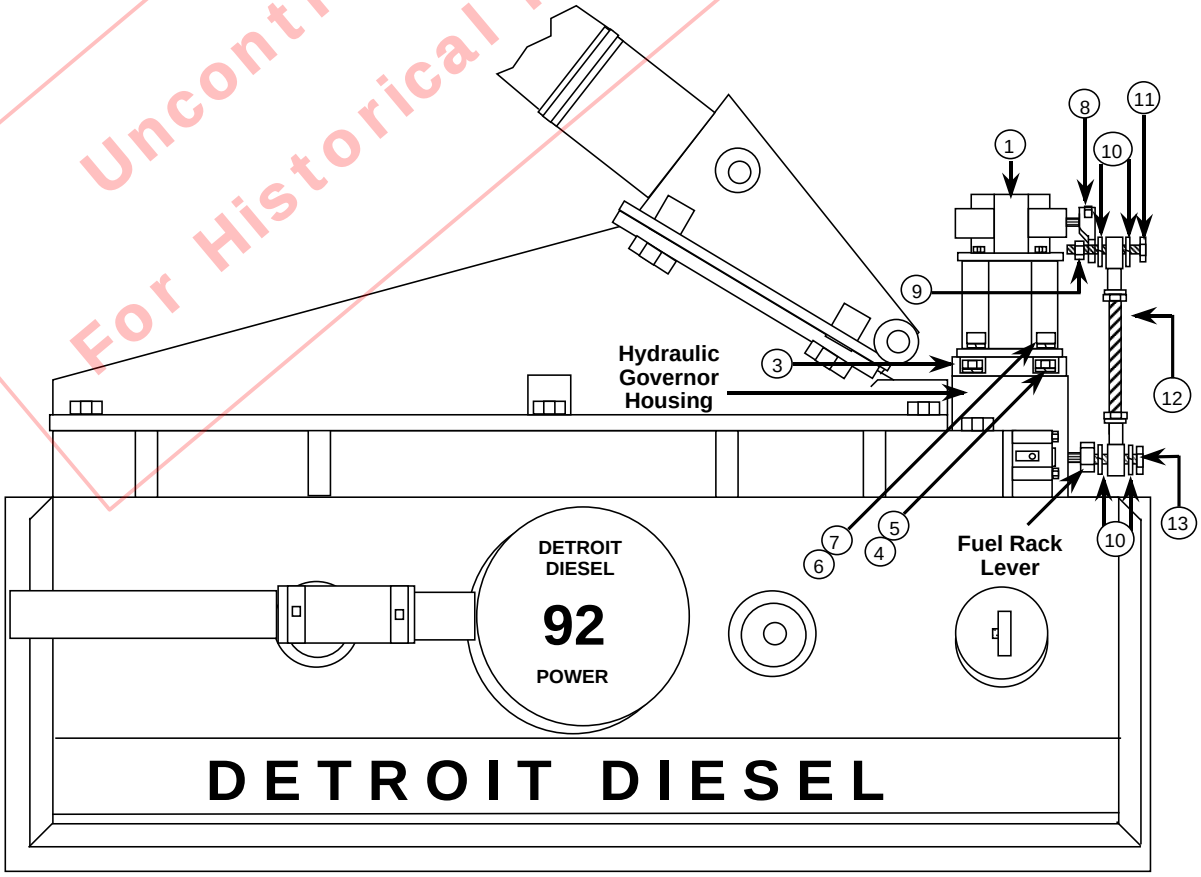
Item	Description	Barber-Colman Part Number	Qty.
17	Remote speed pot 5K	DYNS-10000	1
18	Power switch DPDT 10 amp	CYZP-11-1	1
19	Smoke limit controller	See Below (a or b)	1
20	3 Conductor 22 ga. shielded cable	E26-22	*
21	2 Conductor 22 ga. twisted cable	E26-23	*

a) Magnetic Pickup Installed Off Ring Gear DYN1-10694-000-0-X
b) Magnetic Pickup Installed Off Cam Gear DYN1-10693-000-0-X

* Specify length

III. Layout Drawing - Figure 1





IV. Calibration & Basic Wiring Diagram

Part Number	Input Signal Frequency Maximum
DYN1-10652-000-0-12 DYN1-10652-000-0-24	250 to 1200 Hz
DYN1-10653-000-0-12 DYN1-10653-000-0-24	1200 to 2500 Hz
DYN1-10654-000-0-12 DYN1-10654-000-0-24	2500 to 5000 Hz
DYN1-10656-000-0-12 DYN1-10656-000-0-24	5000 to 9000 Hz

NOTE

See Step 3.0 for proper procedures for setting switches S1 and S2, if you have a controller that has the two switches located on top of the controller.

1.0 Connection Information

1.1 When using an ILS unit, the remote speed potentiometer may be left connected to terminal 9 of the controller as shown, or connected to the ILS.

1.2 When an ILS unit is used, connect 3-wire shielded cable to terminals 6, 7 and 8. Connect drain shield wire to terminal 10 at the controller only. Other end of drain shield wire is to be cut off and taped.

2.0 Calibration And Adjustments

2.1 See *Figure 2* for a reference guide before making any adjustments of the potentiometers, DROOP, I, GAIN and SPEED.

2.2 Power OFF — engine not operating.

2.3 Initial potentiometer settings:

2.3.1 Set the I adjustment three divisions from zero and the GAIN at the second division from zero.

2.3.2 For isochronous operation, set DROOP counterclockwise to minimum position as shown in *Figure 2*.

2.3.3 For DROOP operation, set DROOP potentiometer clockwise to obtain desired amount of DROOP from no-load to full load. Turning potentiometer clockwise increases DROOP.

— NOTE —

If the full 35° rotation of the actuator shaft is used and the linkage adjusted to use only the active fuel range, the maximum obtainable DROOP would be approximately 12% at full load.

2.3.4 See step 3.0 for setting switches S1 and S2.

2.4 If a remote speed potentiometer is used for narrow range, set it to mid-range. If the remote speed potentiometer is connected to terminals 6, 7 and 9, a resistor "R" in the wiper is not needed. This will provide approximately a ±5% adjustable speed range.

2.5 Start the engine.

2.5.1 Adjust the controller speed potentiometer until the engine is operating at the desired engine RPM. Clockwise increases engine RPM.

2.5.2 If the governor system is unstable, reduce the GAIN setting until stable.

— NOTE —

Except for the speed adjustment, the potentiometers have internal stops at the 0 and 100% positions.

2.6 With the engine unloaded, finalize the settings, I and GAIN adjustments as follows:

2.6.1 Turn the GAIN adjustment clockwise slowly until the actuator lever oscillates. (One may need to disturb actuator lever to cause oscillation.) Reduce the GAIN adjustment slowly counterclockwise until the lever is stable. Upset the lever by hand. If the lever oscillates 3 to 5 diminishing oscillations and stops, the setting is correct.

If system performance to load changes is satisfactory, omit step 2.6.2.

2.6.2 Reduce the GAIN setting counterclockwise one division. Next, turn the I adjustment fully clockwise while observing the actuator lever. If the lever does not become unstable, upset it by hand. When the lever slowly oscillates, turn the adjustment counterclockwise slowly until the lever is stable. Upset the lever again; it should oscillate 3 to 5 times and then become stable for optimum response.

— NOTE —

Use the settings of step 2.6.1 or step 2.6.2, whichever provides the best performance.

2.6.3 Unit is now calibrated.

3.0 All Controllers With Revision J And Above Have Switches S1 And S2

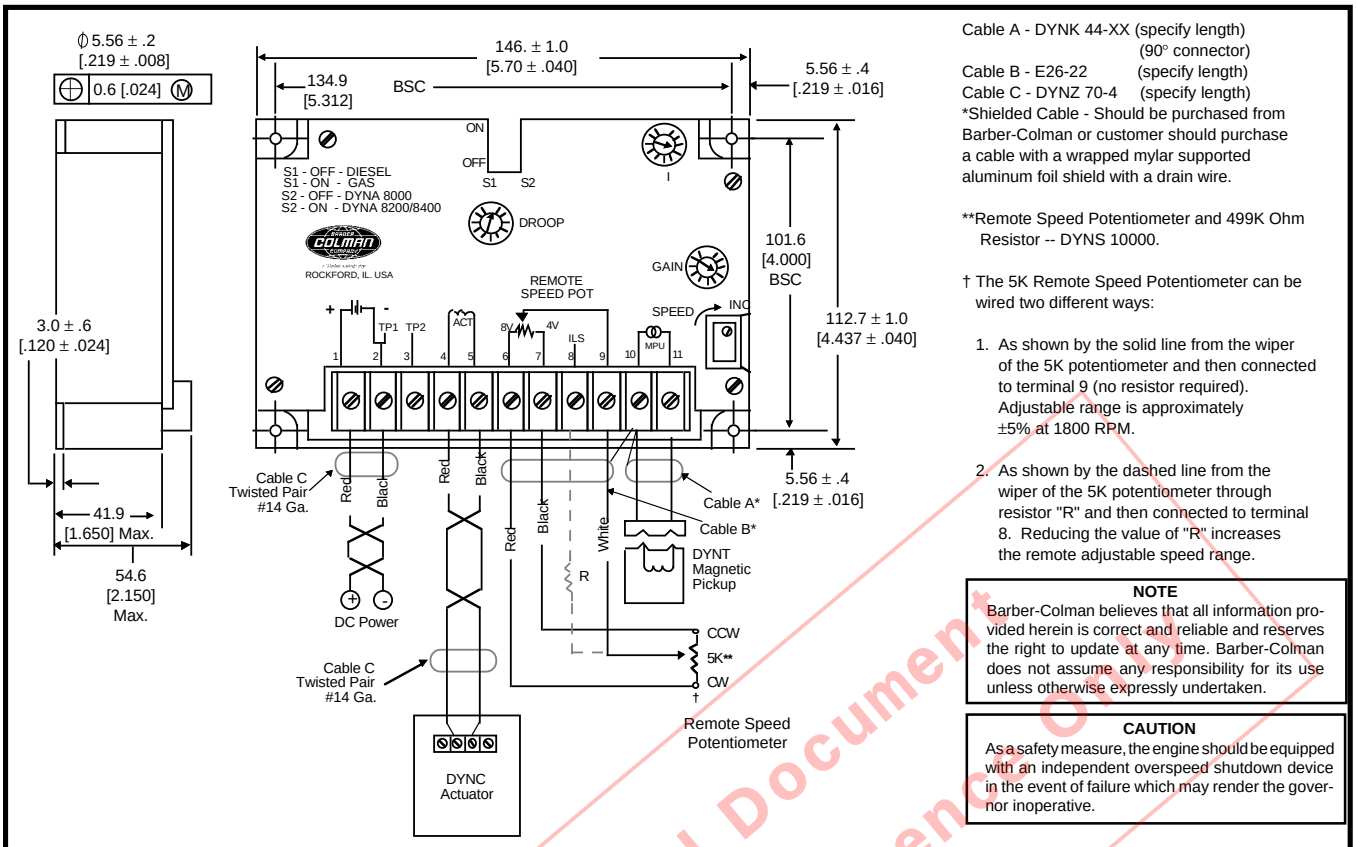
These units have two new features now added to the DYN1 1065X series controllers. They are:

3.1 Two response ranges, for matching either the diesel or gas engine dynamics.

- Set S1 to the OFF position for diesel engine applications.
- Set S1 to the ON position for gas/gasoline engine applications.

3.2 Two actuator selections, so the same controller can be used on the DYNA 8000, DYNA 8200 or DYNA 8400 actuator.*

- Set S2 to the OFF position when using a DYNA 8000 actuator.
- Set S2 to the ON position when using a DYNA 8200 or DYNA 8400 actuator.



Cable A - DYNK 44-XX (specify length)
(90° connector)
Cable B - E26-22 (specify length)
Cable C - DYNZ 70-4 (specify length)
*Shielded Cable - Should be purchased from Barber-Colman or customer should purchase a cable with a wrapped mylar supported aluminum foil shield with a drain wire.

**Remote Speed Potentiometer and 499K Ohm Resistor -- DYNS 10000.

† The 5K Remote Speed Potentiometer can be wired two different ways:

1. As shown by the solid line from the wiper of the 5K potentiometer and then connected to terminal 9 (no resistor required). Adjustable range is approximately ±5% at 1800 RPM.

2. As shown by the dashed line from the wiper of the 5K potentiometer through resistor "R" and then connected to terminal 8. Reducing the value of "R" increases the remote adjustable speed range.

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.

Figure 2. Electronic Control Box Adjustments, Configuration and Typical Wiring Diagram

4.0 General Information On S1 & S2

- Switch S1 selects one of two integrating rate ranges. The diesel version integrates at twice the rate of the gas version.
- Switch S2 selects the point at which actuator coil current level causes the integrator limit to be actuated. This level is nominally 6.3 amperes for the DYNA 8000 and 7.3 amperes for the DYNA 8200 and 8400 actuator.

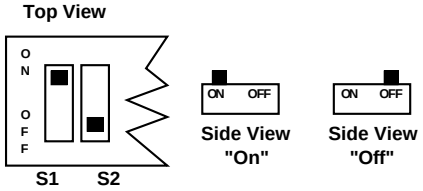
* DYNA 8000 — DYNC 11020 Series
DYNA 8200 — DYNC 12000 Series
DYNA 8400 — DYNC 14800 Series

These actuators do not have a potentiometer feedback transducer.

— NOTE —
For some diesel engines, better operation may be obtained by placing SW1 in "ON" position. If difficulty is experienced in "OFF" position, try SW1 "ON" and recalibrate.

5.0 Proper Procedures For Setting Switches S1 & S2

Question: How do I know if the switches in the dual-in-line packages are correctly set as far as being in the OFF position or the ON position?



Answer: The drawings above should clarify any confusion about switch settings. The easiest way to set the switches is to apply pressure with a small pointed object until the switch clicks into position.

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