



Installation of the Barber-Colman 8000 Series Electric Governor on a Detroit Diesel Inline 71 Series engine. The governor mounts on the right side (viewed from flywheel) of the engine and attaches directly to the fuel rack to maintain isochronous speed control.

This bulletin contains the following:

- I. Installation Instructions
- II. Parts List
- III. Layout Drawing
- IV. Calibration & Basic Wiring Diagram

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 existing governor. Be sure to remove the governor drive from the blower. If the governor being replaced is hydraulic, remove and discard the oil lines and oil reservoir.
3. Plug the oil supply line with a 1/8" plug — Item 22.
4. Install the blower cover plate and gasket — Items 26 and 27, onto the front of the blower where the governor drive was just removed. Refer to the layout drawing for a visual reference.
5. On all 2-71 and 3-71 engines, an air cleaner extension kit, DYNK-10084, is required.

B. Actuator Installation

1. Obtain from the parts kit one actuator mounting bracket, one mounting brace, two 3/8 - 24 x 3-1/2" screws, two 3/8 lock washers, two 3/8 - 24 nuts, two 1/4 - 20 x 5/8" screws, two 1/4 flat washers and two 1/4 lock washers — Items 3, 4, 5, 6, 7, 8, 9 and 10.

2. Install the actuator bracket — Item 3, to the engine with two 3/8 - 24 x 3-1/2" screws, two 3/8 lock washers and two 3/8 - 24 nuts — Items 5, 6 and 7. The actuator mounting bracket is attached to the back of the engine gear cover.

— See layout drawing on page 3 —

3. Install the mounting brace — Item 4, to the bracket and to the blower housing using two 1/4 - 20 x 5/8" screws, two 1/4 lock washers and two 1/4 flat washers — Items 8, 9 and 10. Use the existing screw in the blower housing.

4. Place the actuator — Item 1, on the mounting bracket as shown in the layout drawing. Secure the actuator to the bracket using four 1/4 - 20 x 1-1/4" screws, four 1/4 lock washers and four 1/4 - 20 nuts — Items 10, 11 and 12.

C. Linkage Installation

1. Obtain from the parts kit one actuator lever, one linkage rod assembly, one 5/16 - 24 x 1-1/2" screw, one 5/16 spacer, one 5/16 flat washer and one 5/16 - 24 locking nut — Items 13, 14, 15, 16, 17 and 18.

2. Place the actuator lever — Item 13, on the actuator as shown in the layout drawing (37 degrees from the reference line). Install the control rod assembly through the boot and let it lay free.

3. Connect the other end of the control rod to the actuator lever with one 5/16 - 24 x 1-1/2" screw, one 5/16 spacer, one 5/16 flat washer and one 5/16 - 24 lock nut — Items 15, 16, 17 and 18.

4. Set up the control linkage so that the maximum rotation of the actuator output shaft limits the travel of the fuel rack to the full position. This prevents overdriving of fuel rack and binding or jamming the injector.

5. To make the max travel adjustment, it is necessary to operate the actuator to the full rotation. With engine off and power off to the governor controller, jumper TP1 and TP2 on the control box. Turn power on to the controller. This will rotate the actuator to the MAX position.

6. Adjust the control rod linkage to give full rack position without overdriving the rack. Then connect the control rod to the fuel rack, securing it with a cotter pin.

C. Magnetic Pickup Installation

1. Most Detroit Diesel engines contain a 1-1/4" pipe plug in the flywheel housing over the flywheel teeth. If so, remove the plug and install the threaded bushing — Item 20. Align a tooth into the center of the hole.

2. Obtain the magnetic pickup — Item 19, and install it into the threaded bushing until it makes contact with the top of the ring gear tooth.

3. Turn the magnetic pickup counterclockwise (CCW) 1/4 to 1/2 turn and tighten the 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-11020	1
2	Controller	DYN1-10654	1

B. Table 2. Installation Kit

B-C Part Number DYNK-10349

Item	Description	Barber-Colman Part Number	Qty.
3	Actuator mounting bracket	DYNZ-91-16	1
4	Mounting brace	DYNZ-91-17	1
5	Mounting screws 3/8 - 24 x 3-1/2"	BYRF-2928	2
6	3/8 lock washer	CYRD-561	2
7	3/8 - 24 nuts	DYRF-296	2
8	Brace mounting screws 1/4 - 20 x 5/8"	BYRF-1336	2
9	1/4 flat washers	JYRD-55-10	2
10	1/4 lock washers	CYRD-558	6
11	Mounting screws 1/4 - 20 x 1-1/4"	BYRF-1340	4
12	1/4 - 20 nuts	DYRF-272	4
13	Actuator lever	DYNC-182-15	1
14	Control rod 5/16 - 24 x 11.02	DYNZ-263-8	1
15	Linkage screw 5/16 - 24 x 1-1/2"	BYRF-2807	1
16	5/16 spacer	DYNC-465-3	1
17	5/16 flat washer	CYRD-549	1
18	5/16 - 24 self locking nut	DYNC-3067	1
19	Magnetic pickup	DYNT-10100	1
20	Threaded sensor plug	DYNC-338	1
21	Cotter pin	AYRF-91	1
22	1/8 pipe plug	X-5514	1
23	Cable assembly (mag pickup)	DYNK-44-3	1

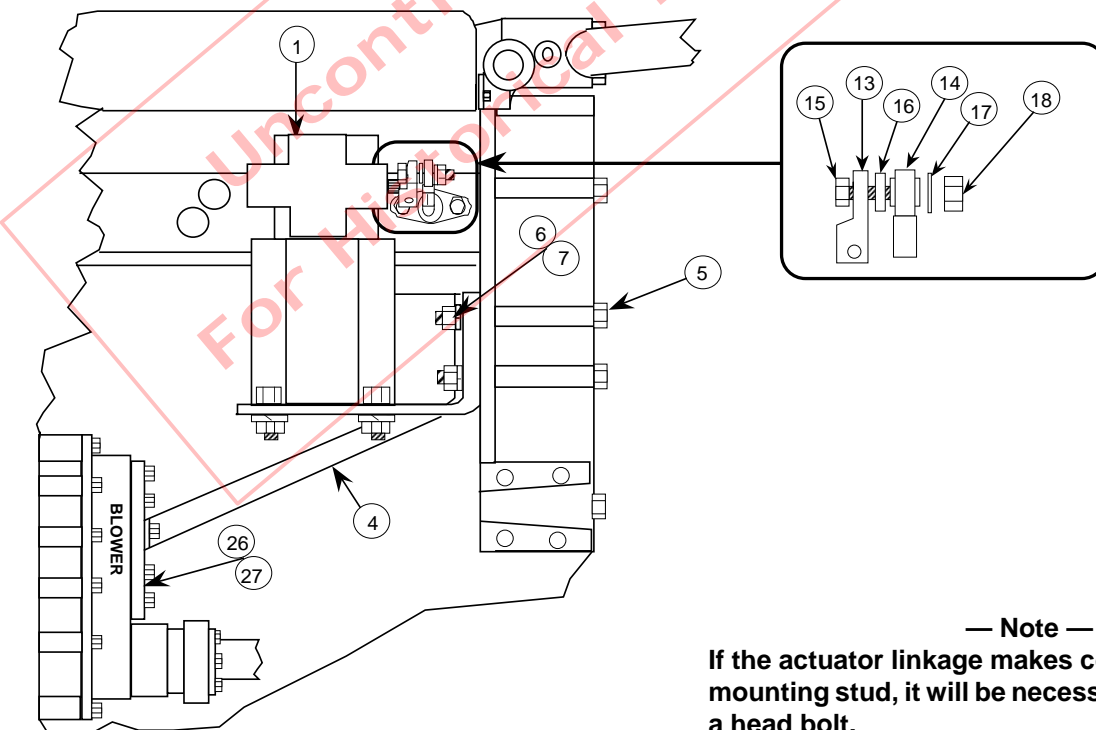
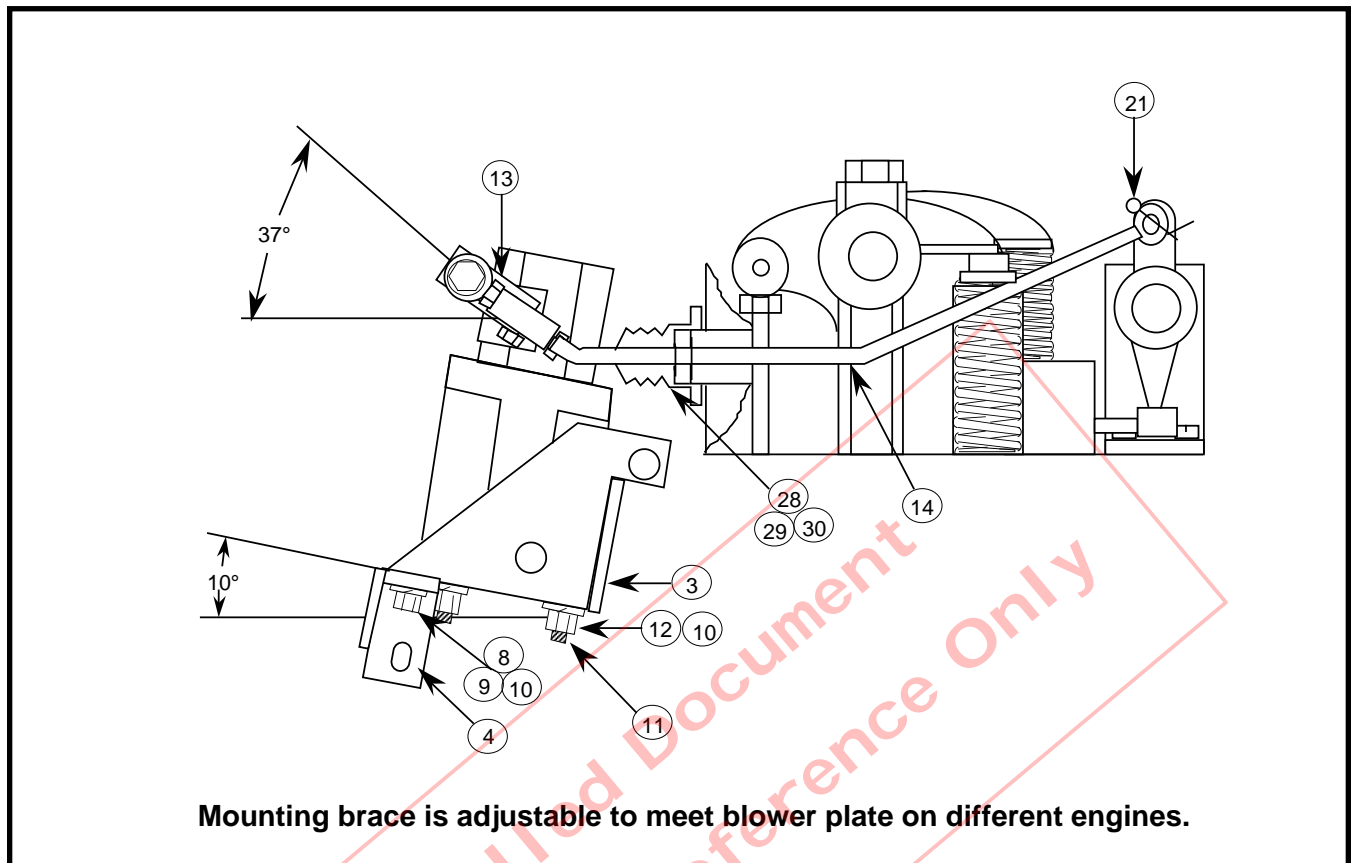
C. Table 3. Optional Control Components

Item	Description	Barber-Colman Part Number	Qty.
24	Remote speed pot 5K	DYNS-10000	1
25	Cable assembly (controller to actuator)	DYNK-63-004	1

D. Table 4. These installation parts are available from Detroit Diesel Distributors or Barber-Colman Kit Number DYNK-10075

Item	Description	Barber-Colman Part Number	Detroit Diesel Part Number	Qty.
26	Blower plate	DYNK-36	5112157	1
27	Cover gasket	DYNK-37	5150246	1
28	Boot	DYNK-38	5121385	1
29	Boot adaptor bracket	DYNK-39-1	5126098	1
30	Gasket adaptor boot	DYNK-40	5123812	1

III. Layout Drawings



View shows mounting on right side of engine.

IV. Calibration & Basic Wiring Diagram

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

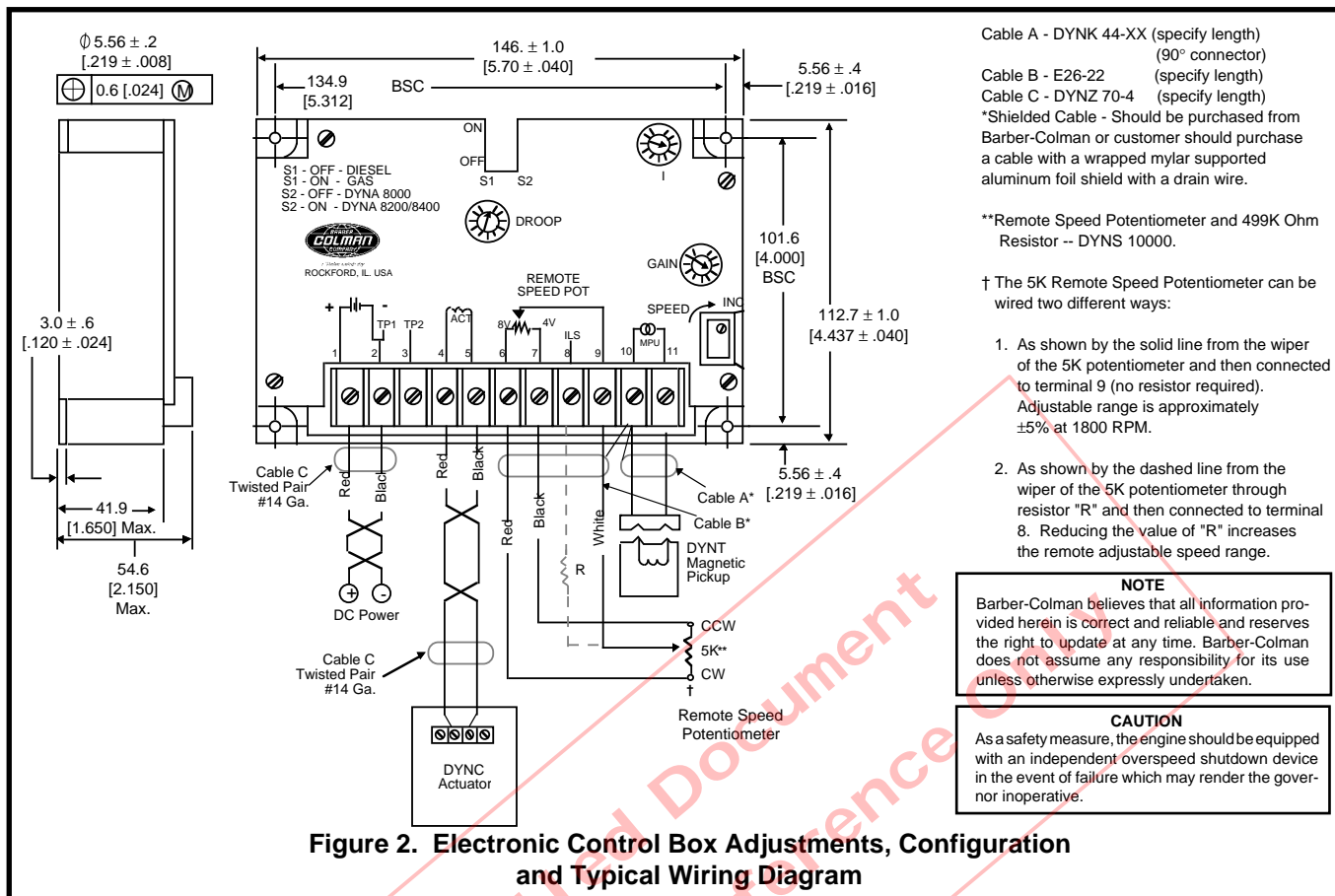
These units have two new features now added to the DYN1 1065X series controllers. They are:

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.



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.

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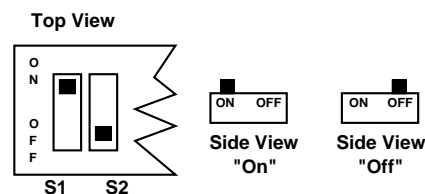
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— NOTE —

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.