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**Installation of the Barber-Colman Linear Governor, DYNC-10500, on the Hercules G4800. The Linear Actuator operates the butterfly throttle lever of the Impco C.A. 200 Carburetor. The engine ring gear has 138 teeth.**

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

**A. Installation Procedure**

1. Verify that the Item 20 carburetor adapter between the carburetor and intake manifold exists. If it does not, refer to Table 3, the Optional Parts List, Items 20, 21 and 22.
2. Verify also that the carburetor is positioned on the manifold such that the carburetor butterfly is in the closed position when the linkage to the actuator is installed.

**B. Magnetic Pickup**

1. The engine bell housing will have a 5/8 - 18 threaded hole located directly over the ring gear teeth.
2. With the engine off, position a ring gear tooth directly in the middle of the hole.
3. Install the bushing, Item 19, first. Next, install the Item 17 magnetic pickup. When the tip makes contact with the gear tooth, turn the pickup back out **one half turn** and tighten the jam nut.

**C. Wiring**

1. A typical wiring diagram is included. The controller, Item 2, is to be panel mounted. The actuator and D.C. power leads should be 14 gage twisted pairs.
2. The negative D.C. power lead to terminal two of the controller should be connected to the negative battery terminal or to where the large battery negative cable connects to the engine block. This is recommended because this is an ignition type engine.

**D. Linkage**

1. When the linkage is installed, verify that when the actuator shaft is manually moved to full stroke (extended), the carburetor butterfly should be approximately ten degrees short of full open.
2. Be sure all bracket, linkage screws and rod jam nuts are secure.

— Note—

Field Installation — Refer to Table 3 (Optional Parts). Carburetor adaptor block is required. Order Items 20, 21 and 22 separately. Hercules supplied if factory installed.

**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 (2500 Series)	DYNC-10500	1
2	Controller	DYN1-10724	1

**B. Table 2. Installation Kit**

**B-C Part Number DYNK-10294**

Item	Description	Barber-Colman Part Number	Qty.
3	Actuator mounting bracket	DYNK-32-20	1
4	Screws 5/16 - 18 x 2-1/2" socket hd. (Replace screws marked "A")	BYRF-1477	2
5	Screw 5/16 - 18 x 1" Hex Hd.	BYRF-2182	1
6	Lock washer 5/16	CYRD-559	1
7	Nut 5/16 - 18	DYRF-9	1
8	Bracket support brace (Attaches to bracket using Items 5, 6 & 7)	DYNK-32-21	1
9	Actuator mounting screws 1/4 - 28 x 1" Hex	BYRF-1346	6
10	Lock washers 1/4"	CYRD-558	6
11	Nuts 1/4 - 28 Hex	DYRF-110	8
12	Flat washers 1/4"	CYRD-59	1
13	Rod end bearings 1/4 - 28	DYNZ-47-1	2
14	Linkage rod 1/4 - 28 x 2-3/8" long	GYRF-42-15	1
15	M6 Nut - Use on actuator shaft	N1-1	1
16	Clevis - Install on actuator shaft	DYNK-218-1	1
17	Magnetic pickup with leads	DYNT-17200	1
18	Wire lugs - Use on actuator leads	E24-866-1	2
19	Magnetic pickup bushing 5/8 - 18 to 3/8 - 24 Thread	DYNC-600-3	1

**C. Table 3. Optional Parts**

Item	Description	Barber-Colman Part Number	Qty.
20	Carburetor Adaptor - Fits between carburetor & manifold. Hercules no. 40-3904801	DYNK-32-22	1
21	Screws 7/16 - 14 x 2" Hex Hd.	BYRF-1377	2
22	Screws 7/16 - 14 x 1" Socket Hd.	BYRF-1513	2
23	D.C. power switch, toggle type	CYZP-11-1	1
24	Remote speed pot, 5K, 10T	DYNS-10000	1
25	3 Wire foil shielded cable	E26-22	*
26	D.C. power & actuator leads, 6ft.	DYNK-63-3	**2
27	Optional controller	DYN1-10754	***

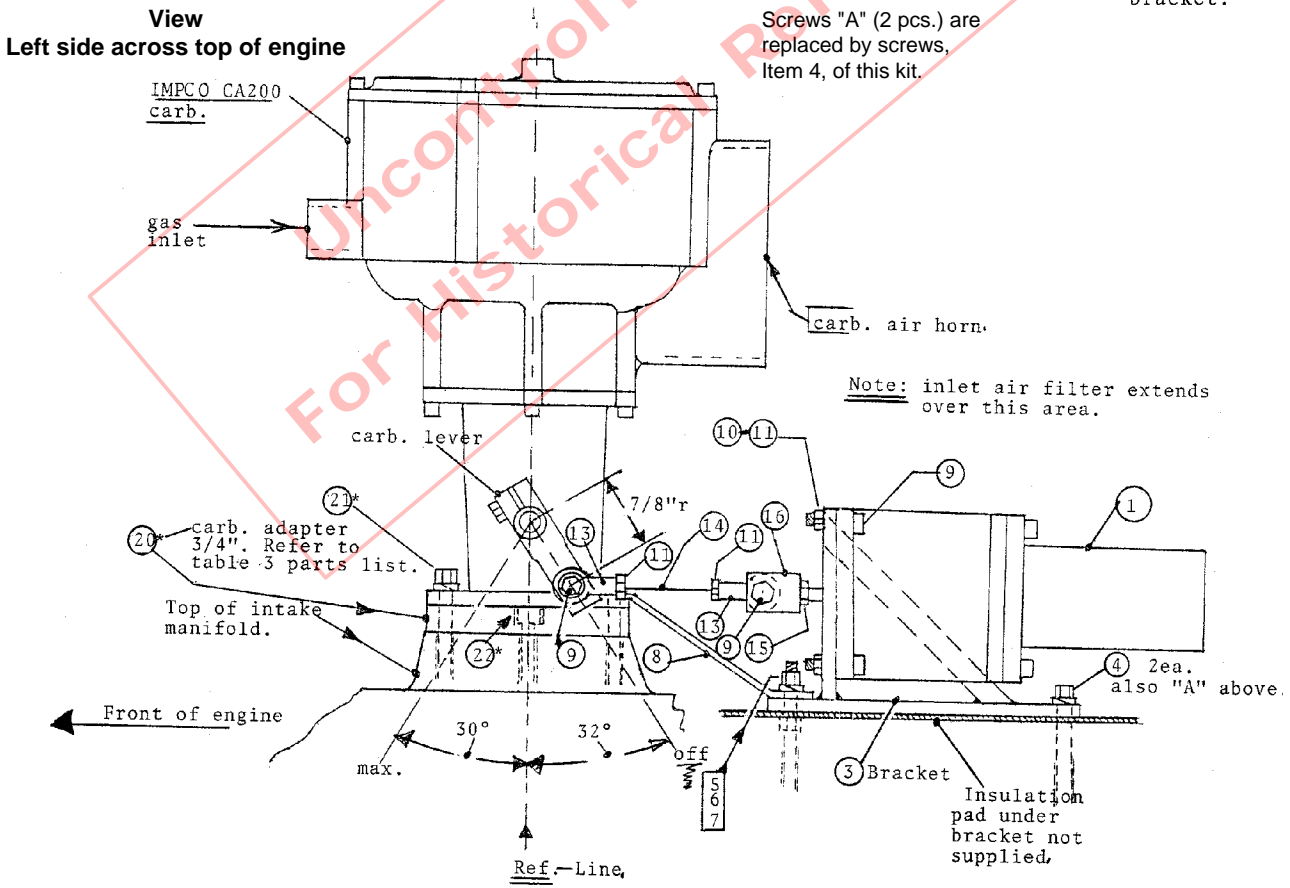
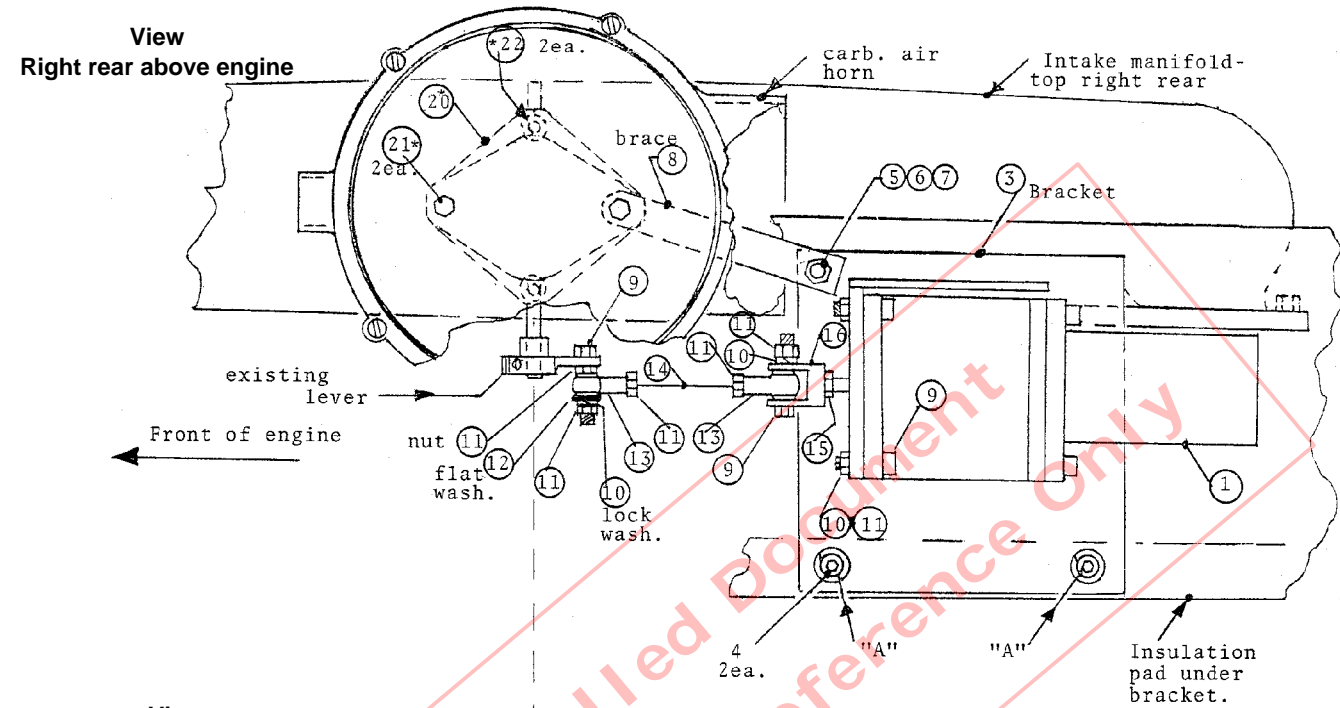
\* Specify length

\*\* These are 14 ga. twisted pairs of wire

\*\*\* Has capability for remote speed & recommended where parallel operation is required.

### III. Layout Drawings

The actuator connects to the lever of a CA 200 Impco carburetor. For full stroke of the actuator, the carburetor butterfly should be at least 10° short of full open. The actuator shaft is shown retracted by its internal spring and de-energized. The engine ring gear has 138 teeth. A temperature insulation pad is required under the bracket. This item is not supplied. When the governor is factory installed, Hercules will install the insulation pad. Note: If Item 20 — Carburetor adaptor, is field installed, R.T.V. may be used as a gasket. Governor DE power and actuator leads should be a minimum of 14 gage twisted pairs of wire. A typical wiring diagram and controller calibration information is included.



\*Refer to Table 3, Optional Parts, for field retrofit. Order Items 20, 31 and 22 separately.

## Calibration & Basic Wiring Diagram

Part Number	Input Signal Frequency Maximum	Part Number	Input Signal Frequency Maximum
DYN1-10752-000-0-12 ] DYN1-10752-000-0-24 ]	250 to 1200 Hz	DYN1-10754-000-0-12 ] DYN1-10754-000-0-24 ]	2500 to 5000 Hz
DYN1-10753-000-0-12 ] DYN1-10753-000-0-24 ]	1200 to 2500 Hz	DYN1-10756-000-0-12 ] DYN1-10756-000-0-24 ]	5000 to 9000 Hz

### NOTE

See Step 4.0 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 CALIBRATION PROCEDURE

1.1 Observe that potentiometer settings are adjustable from zero to 100%. Each small division is 10%. The speed potentiometer is 10K, 20 turn.

1.2 Set the small dip switch, S1, for the correct engine. (See paragraph 4) Set switch S2 in the "OFF" position for actuator DYNC 10200 and DYNC 10202 or in the "ON" position for DYNC 10500 and DYNC 10502

1.3 If a remote speed potentiometer is used for narrow range, set to mid range.

## 2.0 INITIAL POTENTIOMETER SETTINGS

GAIN	20%
I	20%
D	30%
DROOP	Zero

2.1 For isochronous operation, set DROOP counterclockwise to minimum position as shown in Figure 1.

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

## 3.0 START ENGINE (NO LOAD)

3.1 Adjust the controller speed potentiometer for desired engine speed.

### NOTE

A warm engine is normally more stable than a cold one. If the governor is adjusted on a warm engine, turn the adjustment potentiometers counterclockwise 5% (1/2 div.) to ensure a stable engine when started cold.

3.2 Adjust the GAIN potentiometer clockwise until the engine begins to hunt. (If the engine remains stable at 100% GAIN, physically disrupt the actuator linkage by hand.) With the engine hunting, turn the GAIN potentiometer counterclockwise until stable.

3.3 Repeat step 3.2 for the "D" setting.

3.4 Repeat step 3.2 for the "I" setting.

3.5 After calibration, it may be necessary to readjust the speed.

3.6 If the engine is a diesel, following the above calibration, conduct the following test. With the engine operating at rated speed, turn the electric governor off. When engine speed slows to approximately half of rated speed, turn the electric governor back on. Observe the overshoot. If the overshoot is too great, turn the "I" potentiometer clockwise to lessen the overshoot. If there is a small hunt at steady state, slightly turn the "I" potentiometer counterclockwise until stable. In some cases, 2 to 5 Hz overshoot may be acceptable.

3.7 If the engine is an ignition type using compressed fuel such as natural gas or LP, stop the engine and restart in the normal manner to check overshoot.

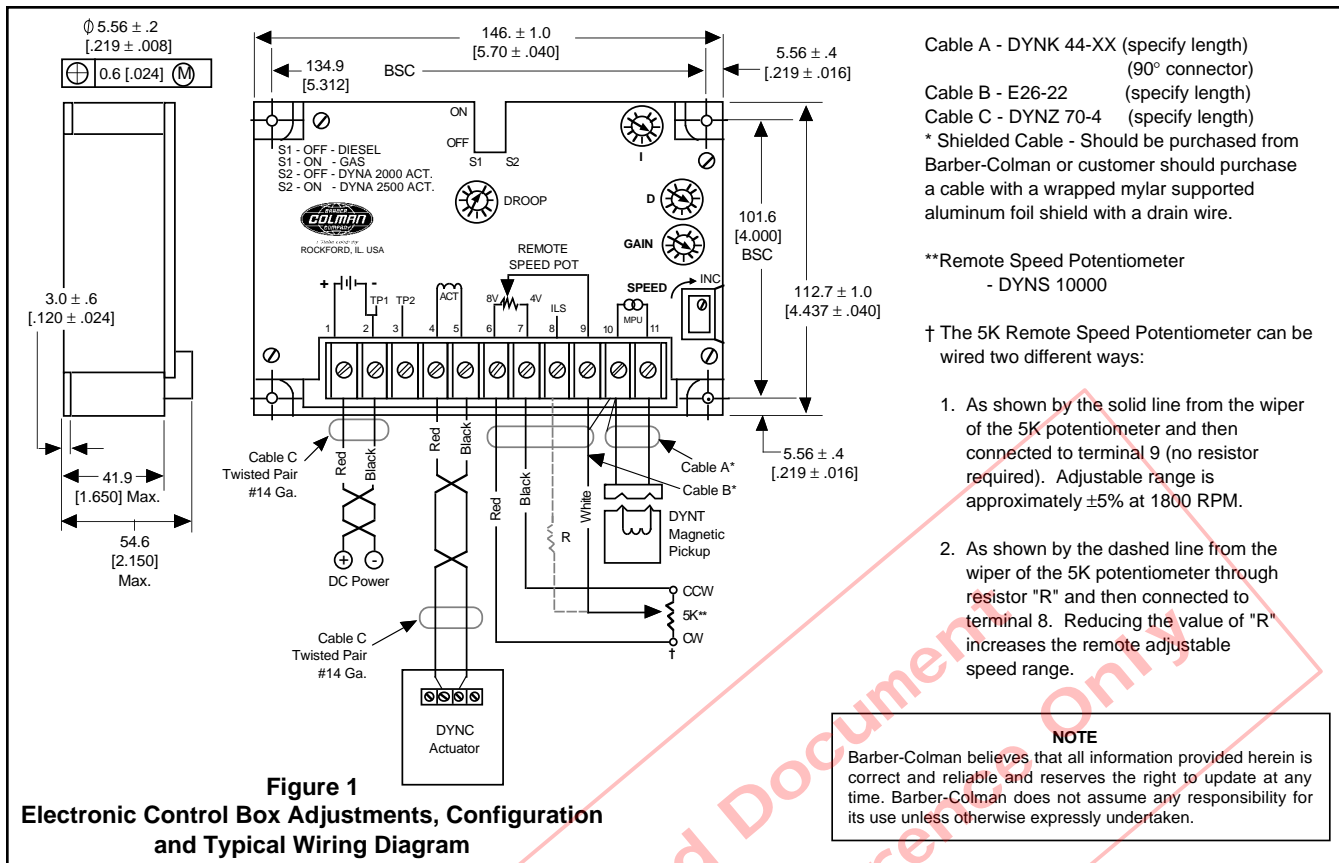
If possible, operate the unit through various load ranges up to 100% to ensure stability.

## 4.0 CONTROLLERS HAVE SWITCHES S1 AND S2

These units have two features now added to the DYN1 1075X series controllers. They are:

4.1 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.



4.2 Two actuator selections, so the same controller can be used on the DYNA 2000 or DYNA 2500 actuator.\*

- Set S2 to the OFF position when using a DYNA 2000 actuator.
- Set S2 to the ON position when using a DYNA 2500 actuator.

**5.0 GENERAL INFORMATION ON S1 AND 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 varies for 12 and 24 volt as shown below.

	12 Volt	24 Volt
DYNA 2000 — S2 OFF	5.1A	2.3A
DYNA 2500 — S2 ON	7.2A	3.4A

\* DYNA 2000 — DYNC 10200 and DYNC 10202  
 DYNA 2500 — DYNC 10500 and DYNC 10502

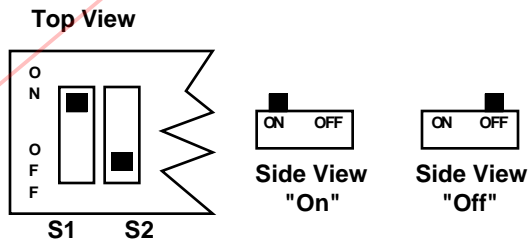
These actuators do not have a potentiometer feedback transducer.

**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.

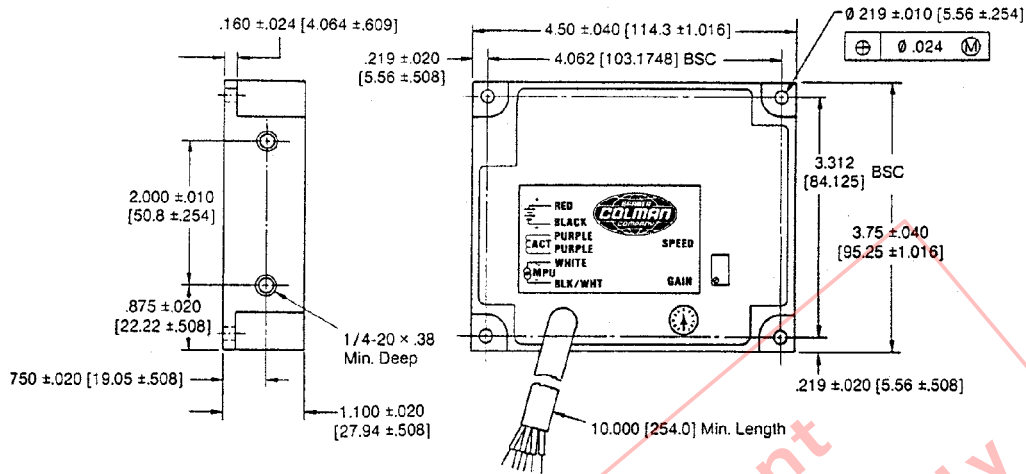
**6.0 PROPER PROCEDURES FOR SETTING SWITCHES S1 AND S2**

**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?

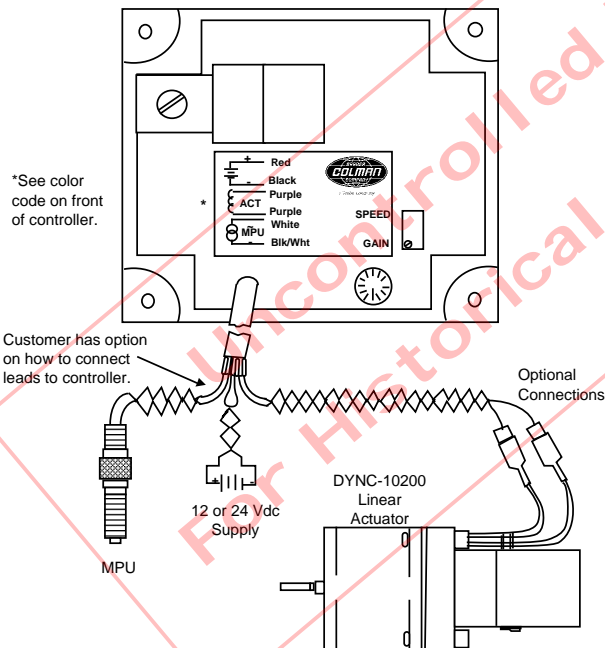


**Answer:** The drawings above should clarify any confusion about switch settings. The easiest way to set the switches is to apply pressure with a small pointed object until the switch clicks into position.

**Governor Controller — DYN1-10724**  
**Item 2 of Table 1 of the Parts List**



**Typical Wiring Diagram**



\*See color code on front of controller.

Customer has option on how to connect leads to controller.

Optional Connections

**Note:**

The bare shield drain wire of the magnetic pickup leads should be connected to the black minus power lead to the controller.

**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.

**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.

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