



a Siebe company

Product Information

DYNA
Power Controls

DYNA I Smoke Limit Controller

General

The Barber-Colman DYNA I Controller provides smoke control on start up for diesel engines using the DYNA 8000 or 8200 electric actuator. (Model DYN1-10695 is used only with the DYNA 8400 actuator.) These controllers provide isochronous or droop speed control with both adjustable start up fuel limit and ramp time.

The controller's electronics are heavily conformal coated, protecting against moisture and vibrations associated with engines. It is easy to adjust, having only SPEED, GAIN and combination INTEGRAL and DERIVATIVE. The power for the governor is obtained from the engine's DC starting system, eliminating the need for mechanical drives and hydraulic lines. Neither the start up fuel limit or ramp need any external signal for initializing the smoke limit function.

Standard Features

- All electric
- All engine compatible — diesel and gas
- Generator paralleling compatibility
- Temperature stable
- Remote speed adjustable
- High reliability
- Mounts in any position

Typical Applications

- Speed Governing
- Generator Sets
- Compressors
- Power Carts
- Pump Sets

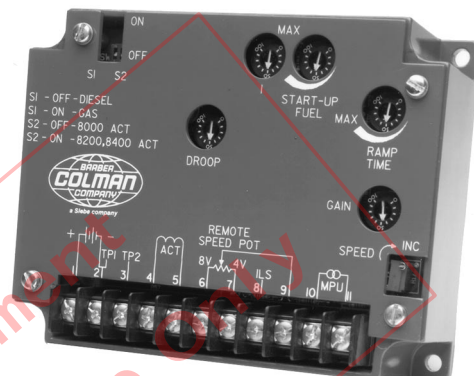
Actuator Compatibility

- DYNA 8000 and 8200
- DYNA 8400 (For use with DYN1-10695 only)

Failsafe

The DYNA Governor has an internal FAILSAFE circuit that instantly reacts to:

- Interruption of the DC power to spring return actuator to minimum fuel position.
- Loss of speed reference signal to remove power from actuator causing it to spring return to minimum fuel position.



Speed Sensing

The DYNA all-electric governor requires a frequency signal to read engine speed. Typically, a hole is drilled and tapped in the flywheel housing perpendicular to the crankshaft, and a magnetic pickup is inserted into it to sense the teeth on the ring gear. Minimum input signal is 2.5 volt AC RMS.

Input Signal Frequency

$$\text{Input Signal Frequency in Hertz} = \frac{\text{Engine RPM} \times \text{Number of Gear Teeth on Flywheel}}{60 \text{ Seconds}}$$

Select controller for the correct input signal frequency range generated by the magnetic pickup at the maximum engine operated (RPM) speed, as listed below.

Available Models	Input Signal Frequency
DYN1-10693-001-0-12/24	1200 to 2500 Hz
DYN1-10693-002-0-12/24*	1200 to 2500 Hz
DYN1-10694-001-0-12/24	2500 to 5000 Hz
DYN1-10694-002-0-12/24*	2500 to 5000 Hz
DYN1-10695-000-0-12*	2500 to 5000 Hz

* (C) (E)

Control Box Specifications

Operating Voltages: 12 or 24 volts, $\pm 20\%$

Steady State Speed Band Capability: $\pm 0.25\%$

Ambient Operating Temperature: -40°F to $+180^{\circ}\text{F}$
(-40°C to $+85^{\circ}\text{C}$)

Temperature Stability: Better than $\pm 0.5\%$ over temperatures of -40°F to $+167^{\circ}\text{F}$ (-40°C to $+75^{\circ}\text{C}$)

Mechanical Vibration: Withstands the following vibration without failure or degraded performance: 0.06 inch double amplitude at 5 to 18 Hz; 1 G at 18 to 30 Hz; 0.02 inch double amplitude at 30 to 48 Hz; 2.5 G's at 48 to 70 Hz.

Output Signal: PWM current to 15 amp max

Connection: Terminal strip

Circuit Boards: Heavy conformal coating for moisture and vibration protection

Enclosure: Die cast aluminum

Weight: 1.36 lbs. (.62 kg)

Control Box Adjustments

Speed Setting: 20 turn potentiometer

Gain: Single turn potentiometer

Integral/Derivative: Single turn potentiometer

Droop: Single turn potentiometer approx. 0 to 15%

Start-up Fuel Limit: Single turn potentiometer

Ramp Time: Single turn 0 to 10 seconds

Fuel Selection: Diesel or gas

Actuator Selection:

- DYNA 8000 and 8200
- DYNA 8400 (For use with the DYN1-10695 only)

Smoke Limiting Features

Barber-Colman's start-up Smoke Limit Controller has two features for smoke limiting:

1. Restrictive Fuel Limiting

The start-up fuel limit potentiometer will allow the operator to set a specific fuel limit on start-up. This fuel limit will be held until the engine obtains 90% of set speed.

Fuel limit is set by cranking the engine and turning the fuel limit potentiometer clockwise (CW) until the engine starts. After engine starts, turn potentiometer an additional 3 to 5% to ensure positive starts.

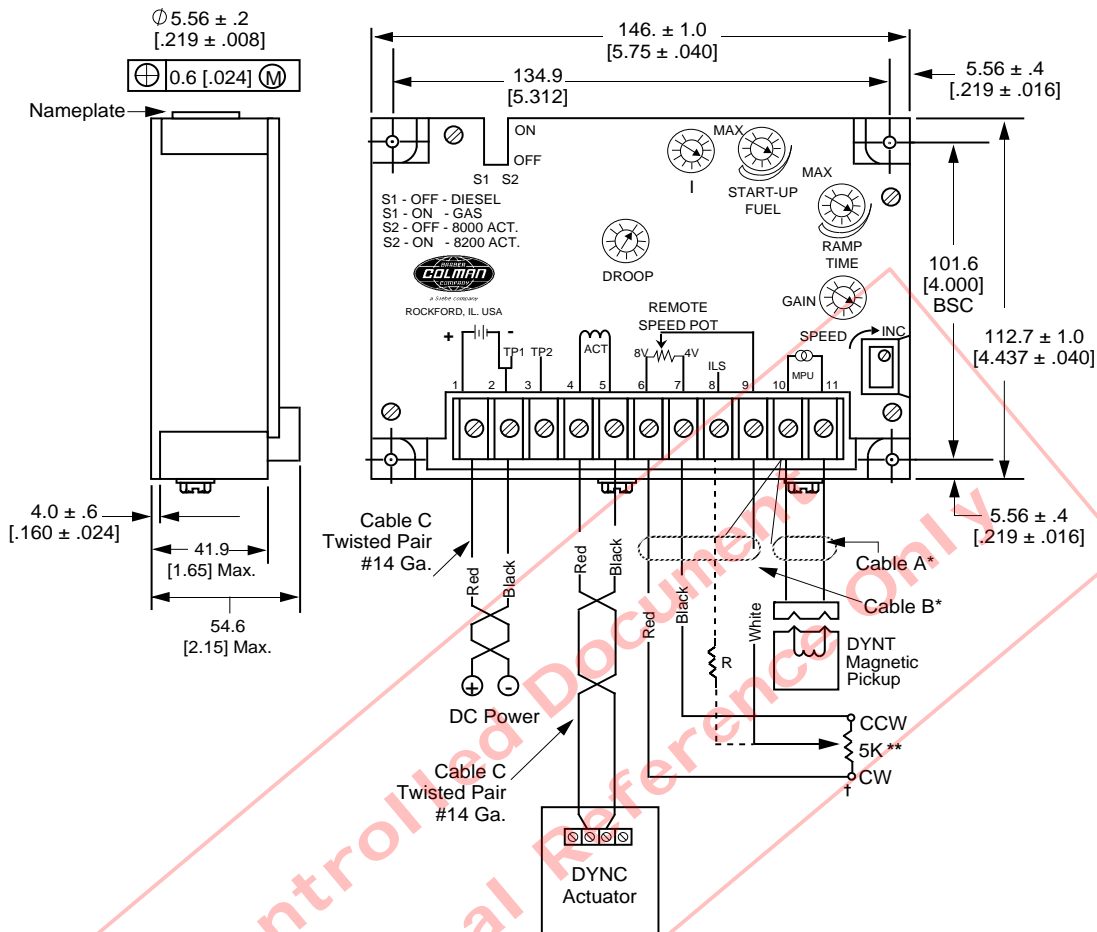
2. Fuel Ramp

On warm or hot engines, a specific fuel limit setting will control start-up smoke, but not completely. A warm or hot engine does not need the same fuel limit to start as a cold engine does.

To reduce smoke even further on start-up for a warm or hot engine, a specific ramp time can be set. Ramp time can be set from 0 to 10 seconds. The ramp time starts from release of the failsafe, allowing fuel setting to increase over the selected ramp time.

Installation Dimensions — DYN1 10694

(For reference only)



Dimensions in mm
Inches in brackets []

NOTE: Wiring Diagram for CE Controllers on page 4

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 — DYN10000

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

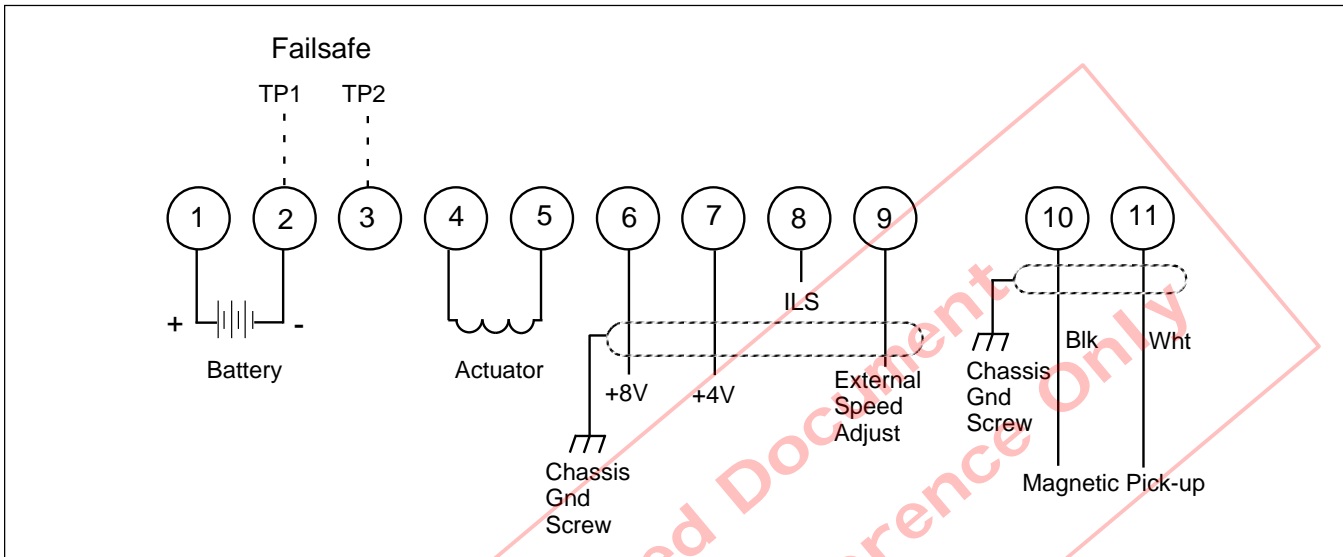
1. As shown by the solid line from the wiper of the 5K potentiometer and then connected to terminal 9 (no resistor required). Adjustable range is approximately $\pm 5\%$ at 1800 RPM.
2. As shown by the dashed line from the wiper of the 5K potentiometer through resistor "R" and then connected to terminal 8. Reducing the value of "R" increases the remote adjustable speed range.

Wiring Diagram For Controllers

DYN1-10693-002-0-12/24

DYN1-10694-002-0-12/24

DYN1-10695-000-0-12



— 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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