



DYNA 2000 & 2500 LINEAR ACTUATORS

General

The Barber-Colman "Linear Actuator" design is coupled with 65 years of actuator design experience, providing accurate precise positioning with a minimal number of moving parts. Many of the moving parts normally associated with electric are eliminated, prolonging the MTBF (mean time between failure).

The actuator design utilizes the principal of variable reluctance. This simple design of a proportional electric solenoid has a sliding armature whose magnetic force is proportional to the input coil current.

The "Linear Actuator" is very easy to install by mounting near the fuel system and direct connecting to the fuel control rod or lever. In most installations the normal rotary to rotary connection is eliminated, resulting in a more troublefree and accurate control system.

The actuator is suitable for installation on diesel, gasoline or natural gas engines with fuel system force requirements of less than 13 pounds of force.



WHISPERWATT™ GENERATORS
ISUZU ENGINE-POWERED

TYPICAL APPLICATIONS

- Speed governing
- Generator sets
- Forklift trucks
- Power carts
- Off-road vehicles
- Pump sets
- Pleasure boats
- Wood chippers

AVAILABLE MODELS:

- DYNC-10202-000-0-(12 or 24)
Select voltage required.

- DYNC-10502-000-0-(12 or 24)
Select voltage required.

STANDARD FEATURES

- All electric
- Fast response
- Small — compact
- Meets INR & EMP for moderate tactical battlefield environment
- Mounts in any position
- Precise repeatability
- Spring return to min fuel
- Two moving parts

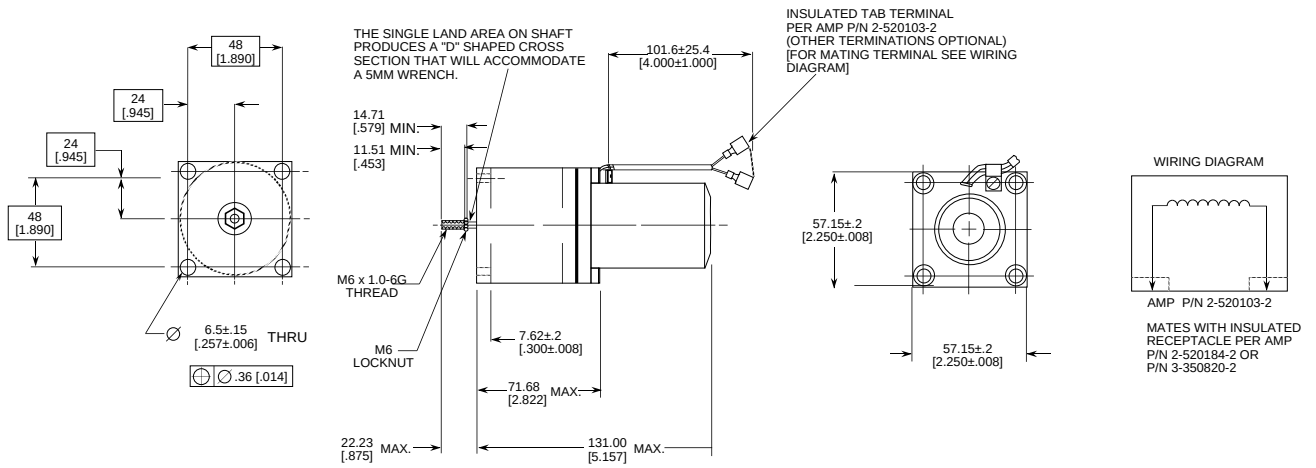
CAUTION

As a safety measure, the engine should be equipped with an independent overspeed shut-down device in the event of failure which may render the governor inoperative.

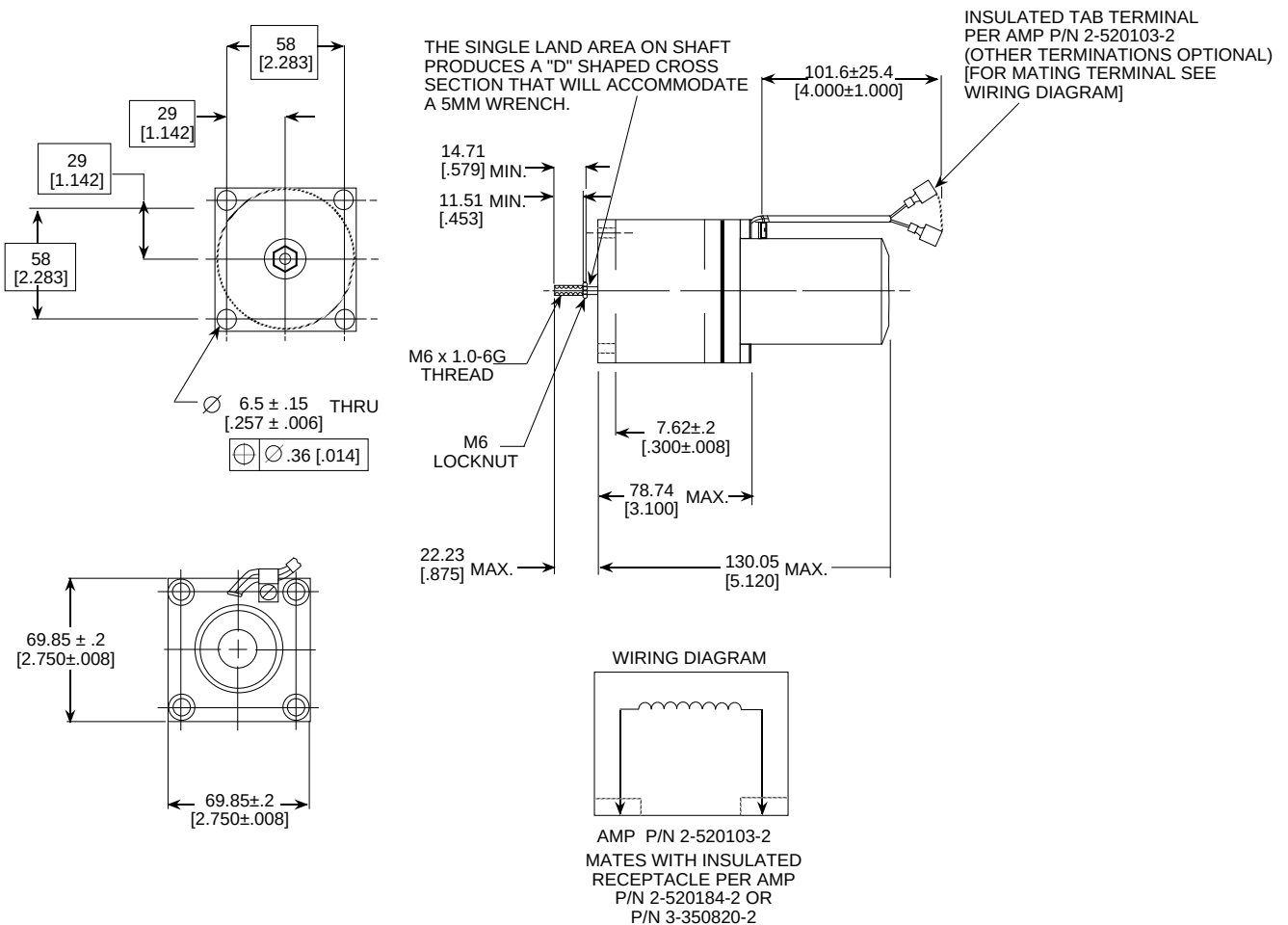
TABLE 1. ACTUATOR SPECIFICATIONS

ACTUATOR		DYNC-10202	DYNC-10502
Work	Joules	0.33	0.66
	Foot-pounds	0.25	0.50
Force	Pounds energized	6.5	13.0
	Grams energized	2955	5910
Output Stroke	Linear travel in inches	0.775-0.825	
	Linear travel in millimeters	19.68-20.95	
Weight	Kilograms	1.14	1.73
	Pounds	2.5	3.8
Current @ 12 Vdc	Nominal steady state amperes	2.5	2.5
	Maximum amperes @ stall @ 24°C	5.4	5.9
	Maximum amperes @ stall @ 125°C	3.9	4.2
Current @ 24 Vdc	Nominal steady state amperes	1.0	1.0
	Maximum amperes @ stall @ 24°C	3.0	3.0
	Maximum amperes @ stall @125°C	2.0	2.0
Nominal Response Time to Travel 63% of Stroke in ON Direction (seconds)		0.05	0.05
Nominal Response Time to Travel 63% of Stroke in OFF Direction (seconds)		0.032	0.032
Operating Voltage	12 or 24 Vdc ±20%		
Ambient Operating Temperature	-65° to +250°F (-55° to +125°C)		
Mechanical Vibration	5 to 500 Hz, Curve L, per MIL-STD-810C		
Sealing	Oil, water and dust resistant.		
Connection	#18 gauge leads with min. length of 3 inches (7.6 cm) with insulated tab terminal per AMP P/N 2-52013-2. Mates with insulated receptacle per AMP P/N 2-520184-2.		

DYNC-10202



DYNC-10502



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NOTE

Barber-Colman believes that all information provided herein is correct and reliable and reserves the right to update at anytime. Barber-Colman does not assume any responsibility for its use unless otherwise expressly undertaken.

Barber-Colman DYNA Products

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DYNA I CONTROLLER

General

This Barber-Colman DYNA I Controller incorporates the latest technology to provide the most cost effective and versatile unit for precise control of diesel, gasoline, or natural gas engines in the marketplace.

Separate circuits measure the PROPORTIONAL (amount of off-speed), INTEGRAL (time of offspeed), and DERIVATIVE (rate of change of offspeed) values. These parameters all work together to provide a control that results in fast and stable engine response to load changes while maintaining precise speed regulation.

Speed Sensing

Typically the engine speed reference signal is obtained from a magnetic pickup mounted in the flywheel housing perpendicular to the ring gear. The number of teeth sensed per revolution is converted into an engine speed signal. Other techniques may be used to obtain speed reference.

Adjustments

- **Speed Setting:** 20 turn potentiometer
- **Gain:** Single turn potentiometer. 0 to 100%
- **Integral:** Single turn pot. 0 to 100%
- **Derivative:** Single turn pot. 0 to 100%
- **Droop:** Single turn pot. 0 to 15%
- **Fuel Selection:** Diesel, gasoline or gas
- **Actuator Selection:** DYNA 2000 & 2500
- **Remote Speed:** Use DYNS 10000 potentiometer

Features

- All electric
- All engine compatible
- Generator paralleling option
- Temperature stable
- High reliability
- Mounts in any position

Specifications

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

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

Ambient Operating Temperature:
-40°F to +180°F (-40°C to +85°C)



Temperature Stability: Better than $\pm 0.5\%$ over temperatures of -40°F to +167°F (-40°C to +75°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 6 amp max.

Connections: Terminal strip

Circuit Boards: Heavy conformal coating for moisture and vibration protection

Enclosure: Die cast aluminum

Weight: 635 grams (1.4 lbs.)

Actuator Compatibility: This controller is to be used with either the DYNA 2000 or DYNA 2500 actuator.

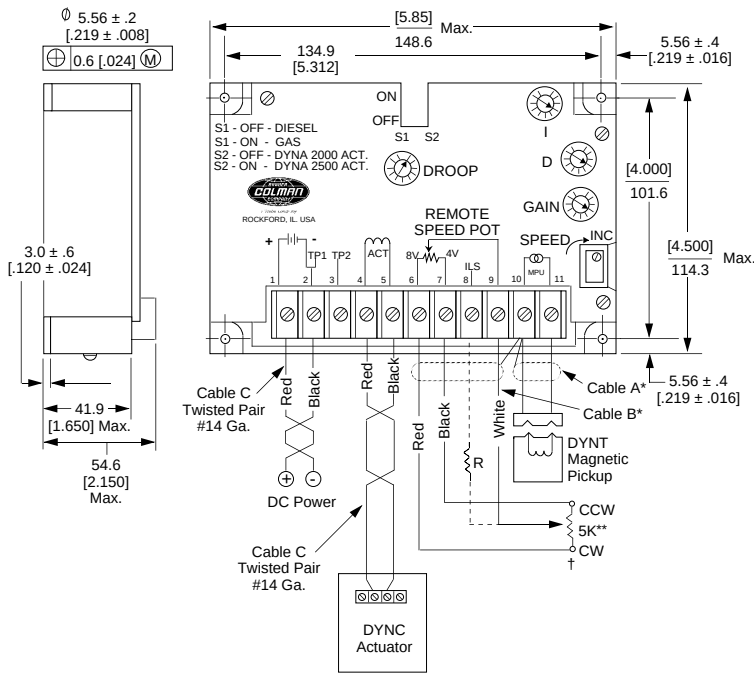
Available Models

Part Number	Input Frequency
DYN1-10752-000-0-12/24	250 to 1200 Hz
DYN1-10753-000-0-12/24	1200 to 2500 Hz
DYN1-10754-000-0-12/24	2500 to 5000 Hz
DYN1-10756-000-0-12/24	5000 to 9500 Hz
DYN1-10752-001-0-12/24	250 to 1200 Hz
DYN1-10753-001-0-12/24	1200 to 2500 Hz
DYN1-10754-001-0-12/24	2500 to 5000 Hz
DYN1-10756-001-0-12/24	5000 to 9500 Hz

Select the controller for the correct input signal frequency range generated by the magnetic pickup at the maximum engine speed and for the required DC voltage, 12 or 24.



DIMENSIONS — DYNA CONTROLLER INSTALLATION



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—DYNS 10000

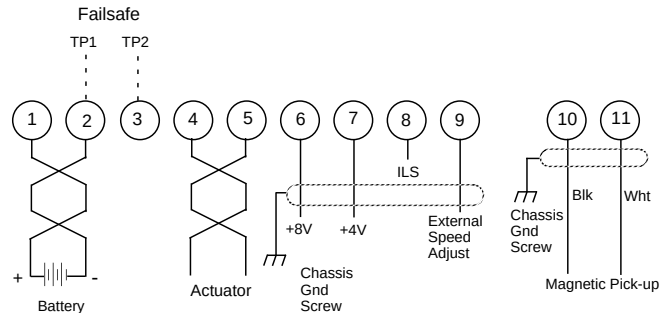
† The 5K Remote Speed Potentiometer can be wired two different ways:

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 $\pm 5\%$ 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.

Features Are Easy To Add

It is easy to add features to the electric governor to provide benefits the customer needs. Remote speed setting, isochronous load sharing, automatic synchronizing, ramp generator, single phase load pulse and KW limits can be added at the time of initial governor installation or, just as easily, added later when the need arises. No modification to the basic governor is required when these features are added.

WIRING DIAGRAM FOR C€ CONTROLLERS



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