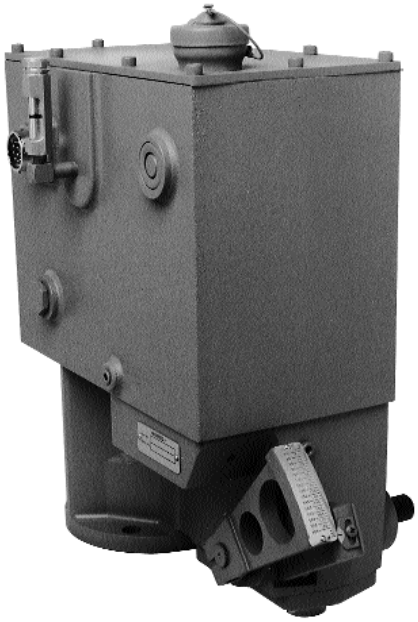
WOODWARD

Product Specification
37518

PG12R/PG12L Actuator

Hydraulic Powered Electric Actuator for Engine or Turbine Control



- Proportional electric/hydraulic actuator
- Rotary or linear output
- Works with all Woodward 0–200 mA output electronic controls
- Self-contained oil supply
- Integral magnetic pickup and LVDT available

DESCRIPTION

The PG Actuator converts a given electrical input signal to a proportional hydraulic output-shaft position to control engine-fuel flow. The actuator provides the muscle for Woodward LEC and CLC™ locomotive controls, as well as the 2301A series, 500-series, and 700-series controls.

The PG Actuator provides a maximum work capacity of 25.4 N·m (18.7 lb-ft) in the increase direction and 20.2 N·m (14.9 lb-ft) in the decrease direction, over 30 degrees of rotary output or 25 mm (1 inch) of linear output.

A magnetic pickup (MPU) may be easily installed in the actuator to make retrofit of engines from mechanical to electronic control easier. A PG drive in good mechanical condition makes an excellent MPU signal source.

The actuator oil pump is the proven high-output Gerotor, designed to provide long life with minimal maintenance. The actuator uses standard PG rod ends, output shafts, power levers, and piston links. The base is designed to fit exactly any drive designed for a PGE locomotive governor or PGA with 12 ft-lb power cylinder. Maintenance procedures are similar to those needed with a PG governor.

The actuator's electric-to-hydraulic transducer uses a Woodward-built torque motor which converts the 0–200 mA control signal to a given output position.

APPLICATION

The PG Actuator is used on diesel engines to replace PGA/PGE-type governors, providing the advantages of electronic control with the convenience of the existing PG-type drive and linkage. An LVDT is available to provide voltage feedback proportional to fuel-rack position. We recommend the PG Actuator for installation involving unattended starts.

The actuator has its own 6.0 L (6.3 qt) oil sump and does not need a separate oil supply.

The actuator operates with drive speeds from 200 to 1200 rpm. Applications with a high drive speed or high ambient temperatures may require a cooler.

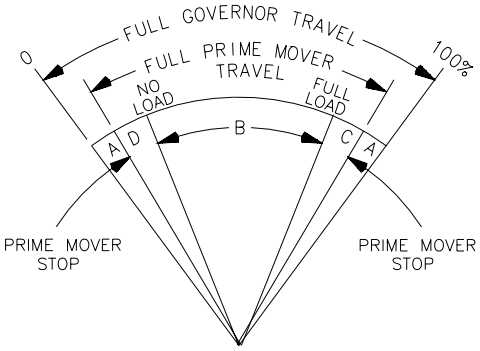
The availability of a self-contained MPU will simplify the conversion of a PG-controlled engine to an electronically controlled engine. A gear which has been specifically designed to operate the MPU means that the electronic control will receive sharp, clean speed signals. Low speed applications may require override of the control's failsafe during startup.

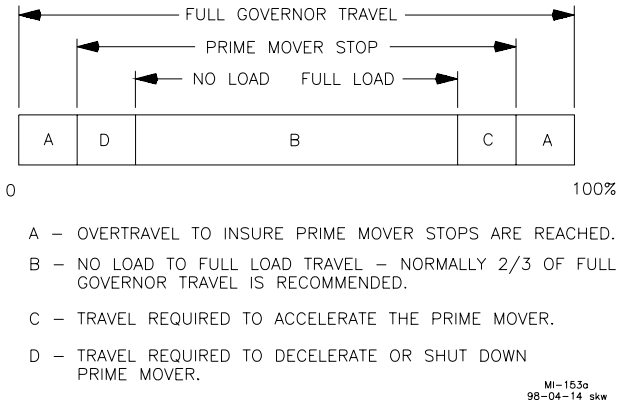
SPECIFICATIONS

Control Qualities

Hysteresis	Within 3% of maximum travel when measured over full travel. Within 0.5% of maximum travel when measured over 4% of full travel at 0.1 Hz.
Temperature Drift	Nominally ±1 degree per 38 °C (100 °F)
Time Constant	65 to 85 ms for ±50 mA step with 1379 kPa (200 psi) actuator oil pressure and 80 SUS viscosity oil
Linearity	within 2.5% of full travel

Work Output





MAXIMUM WORK CAPACITY OVER FULL GOVERNOR TRAVEL OF 42° IS * . SEE ABOVE FOR RECOMMENDED GOVERNOR OUTPUT TRAVEL. IN SPECIAL APPLICATIONS MIN AND MAX PRIME MOVER STOPS MAY BE OUTSIDE THE GOVERNOR STOPS.

Stall Torque	48.5 N·m (35.8 lb-ft) in the increase direction or 38.8 N·m (28.6 lb-ft) in the decrease direction
Work Over Full Stroke	25.4 N·m (18.7 lb-ft) in the increase direction or 20.2 N·m (14.9 lb-ft) in the decrease direction
Construction	Base and power block are cast iron. Column is aluminum. Internal parts are case-hardened steel.
Pump	Gerotor. Relief valve set at 1379 kPa (200 psi).
Output Shaft	0.750-48 inch serrated or 0.500 inch diameter rod end. In same location relative to drive as PGE Governor.
Drive Shaft	1.125-48 serration is standard
Weight	34 kg (75 lb), dry weight
Vibration Resistance	Vibration tested to US MIL-STD 810C, Curve D (10 G to 2000 Hz; in Y-axis, parallel to drive shaft, 8 G maximum)

Drive/Hydraulic Specifications

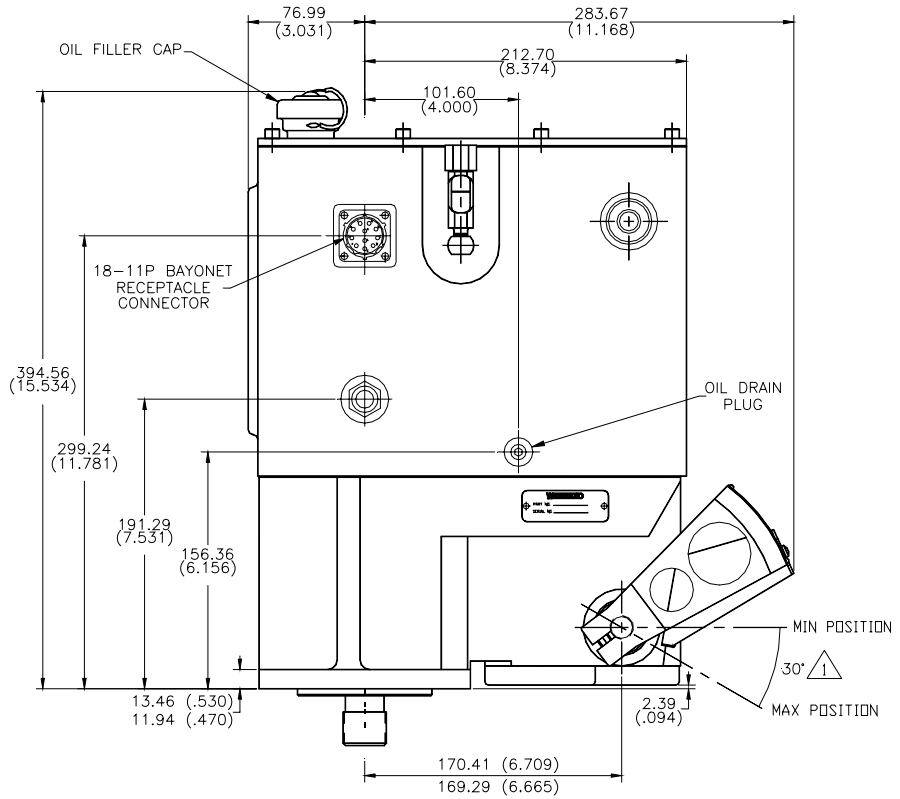
Drive Speed and Rotation	200 to 1200 rpm. Drive operates in one direction only. Drive reversible by indexing pump housing 180°.
Drive Power Requirement	Drive will use a maximum of 375 W (0.5 hp)
Hydraulic Supply	Self-contained sump, 6.0 L (6.3 qt) capacity. See Woodward Manual 25071, *Oils for Hydraulic Controls*, for specific recommendations. In most cases, the same type and weight of oils used in the engine can be used in the governor.
Ambient Temperature Range	–29 to +93 °C (–20 to +200 °F)
Operating Temperature	–29 to + 104 °C (–20 to +220 °F), within the limits of the oil being used in the governor

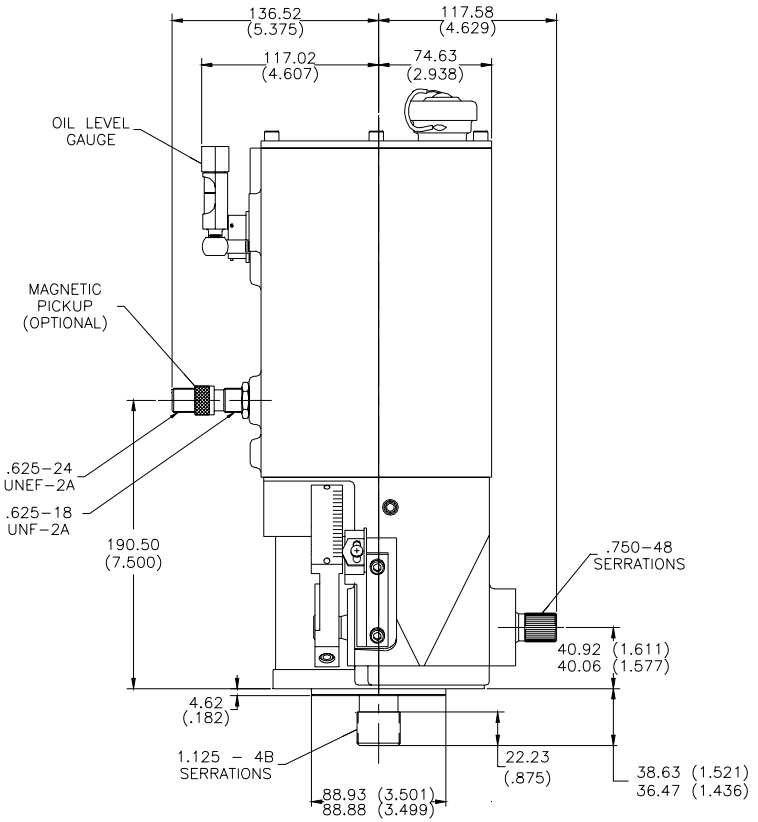
Electrical Specifications

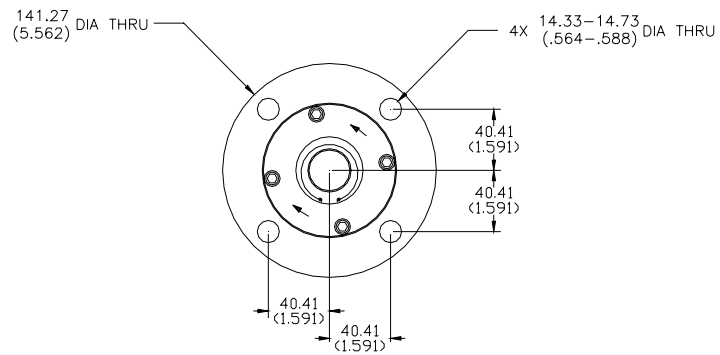
Electrical Connector	11 pin, US MIL-STD 3440H-18-11P, located in column
Coil Resistance	23–26 W at 20 °C

Technical Manual	37517

PG12R Actuator Outline Drawing
(Do not use for construction)







1 30° STROKE AVAILABLE. RECOMMENDED TRAVEL BETWEEN NO LOAD AND FULL LOAD IS 20°.

METRIC

NOTE: INCHES SHOWN IN PARENTHESIS

375–063
98–01–16 RAM/skw

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