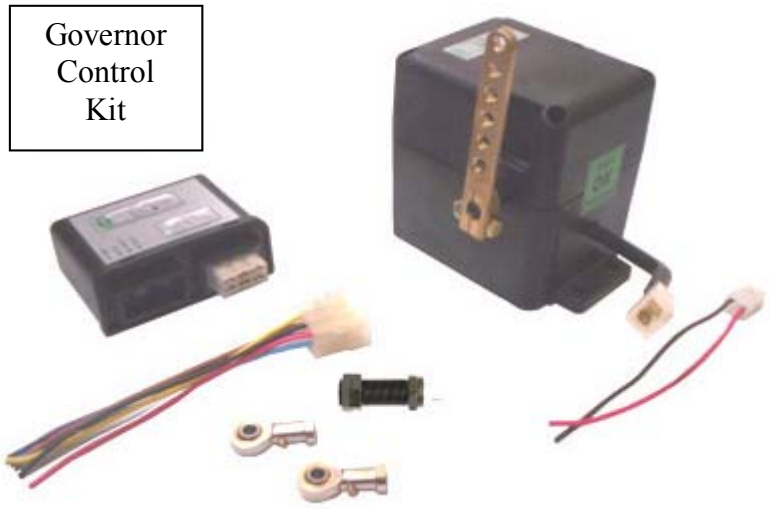
Engine Governing Systems

Governor Control Kit



The D 250 series actuator is a rotary output, linear torque, computer designed, proportional servo, made to improved engine performance and quick response for engine governing systems.
The speed of operation of the actuator is faster than competitive mechanical units. This rotary throttle-positioning device is an ideal choice for engines typically up to a 500 horsepower rating. Applications include most block injection pumps, with or without mechanical governors; distributor type pumps or medium sized carbureted natural gas engines.
The actuator was designed for failsafe operation. An internal spring returns the throttle to the shutoff position when the actuator is de-energized.
This design combines fast operation, wider rotation angles and reliability.
Different model actuator can operate with12, 24 or 32-volt battery supplies.

DESCRIPTION

The actuator is an electromagnetic servo.
A magnetic speed sensor usually a MPU generates an AC frequency signal, which is proportional to engine speed. This signal is sent to the electronic speed control unit “Governor” and compared with the preset engine speed setting.
If the both signals are not identical, a change in current from the speed control unit changes the magnetic force in the actuator, which, in turn, causes rotation of the actuator shaft, adjusting the fuel to the engine, and cause the engine speed to be equal to the preset engine speed setting.
Shaft rotation is proportional to actuator current counterbalanced by the internal spring and injector pump force.
The actuator housing is designed to protect it against harsh engine environments. No maintenance is necessary in normal operation.

INSTALLATION

The actuator must be rigidly mounted as close as possible to the throttle lever on the engine.
Vibration from the engine does not affect the operation of the actuator, as long as they are mounted together.
Low friction and lightweight linkage must be used to provide control and fast speed response.

High quality rod end bearings must be used. High friction causes instability and problems. A linkage arrangement allows the actuator to control the fuel control lever at minimum and maximum throttle positions with some excess travel beyond these positions for shutoff and full fuel respectively. (This is very important)

When working with linear control system, it is important to obtain a linear 1 to 1 relationship between actuator stroke and fuel delivery. The lever on the actuator should be nearly parallel to the pump lever at the mid fuel position (see fig 1).

For operation with non-linear fuel control, such as carbureted, PT Pumps (Cummins), it is desirable to obtain a non-linear relationship between actuator stroke and fuel delivery. A non-linear fuel system results when more engine power is developed for a given stroke at position of low fuel settings than at high fuel settings. In this case, the levers should be parallel at full load position. (see fig 2).

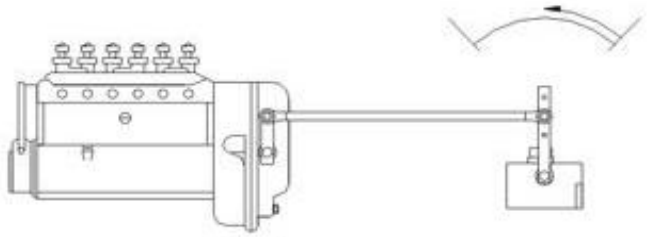


Fig.1

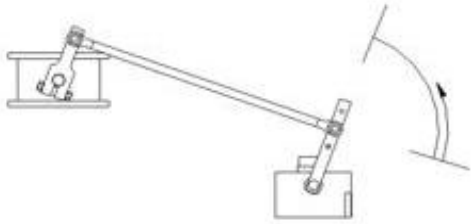


Fig.2

ADJUSTMENTS

WARNING: The engine must have an independent shutdown mechanism to prevent loss of engine control, which can cause equipment damage or personnel injury.

Manually confirm that all linkages are free and not binding and friction is minimal, before starting the engine, push the throttle to the full fuel position and release it, It must return freely and instantly to the shutoff position, re-check all installations to insure that all linkage and levers are securely fastened. Have another person un standby to manually stop the engine if it goes over-speed.

After starting the engine make sure that linkages can be optimized by measuring the voltage across the actuator, at full load and no load (suggested voltage values are shown in the table below). Low actuator voltage can cause instability and poor performance at lower ranges. To increase actuator voltage, move the linkage to a lower hole on the actuator lever. To increase or decrease the no load voltage adjusts the length of the link between the levers.
If the ratio of the actuator lever length to throttle length is too large, there will be very little actuator movement and speed control will tend to be unstable. Smaller angles of actuator travel may improve transient performance, but will reduce available force at the fuel control lever. Allowing the actuator to operate through at least one half of its stroke will usually provide near optimum

Actuator Voltage Range		
	12Volts	24Volts
No Load	4.2 Volts	12.6 Volts
Full Load	6.3 Volts	18.7 Volts

SPECIFICATIONS

PERFORMANCE	
Available Torque	Max 2.2 lb-ft (2.7 Nm)
Maximum Operating Shaft Angular Travel	25 degree CW/CCW
POWER IMPUT	
Operating Voltage	12/24/32 VDC
Normal Operating Current	2.8 A at 12 VDC
Maximum Current-Continuously Rated	8.2 A at 12 VDC
Polarity	Case Isolated
ENVIROMENTAL	
Temperature Range	-70° to +220°F (-55° to + 100°C)
Relative Humidity	Up to 100%
Case	Fungus proof and corrosion resistant
PHISICAL	
Dimensions	See Diagram
Weight	7.9 lb (3.6 Kg.)
Mounting	any position
RELIABILITY	
Vibration	up to 20G @ 50-500 Hz
Testing	100% Tested