

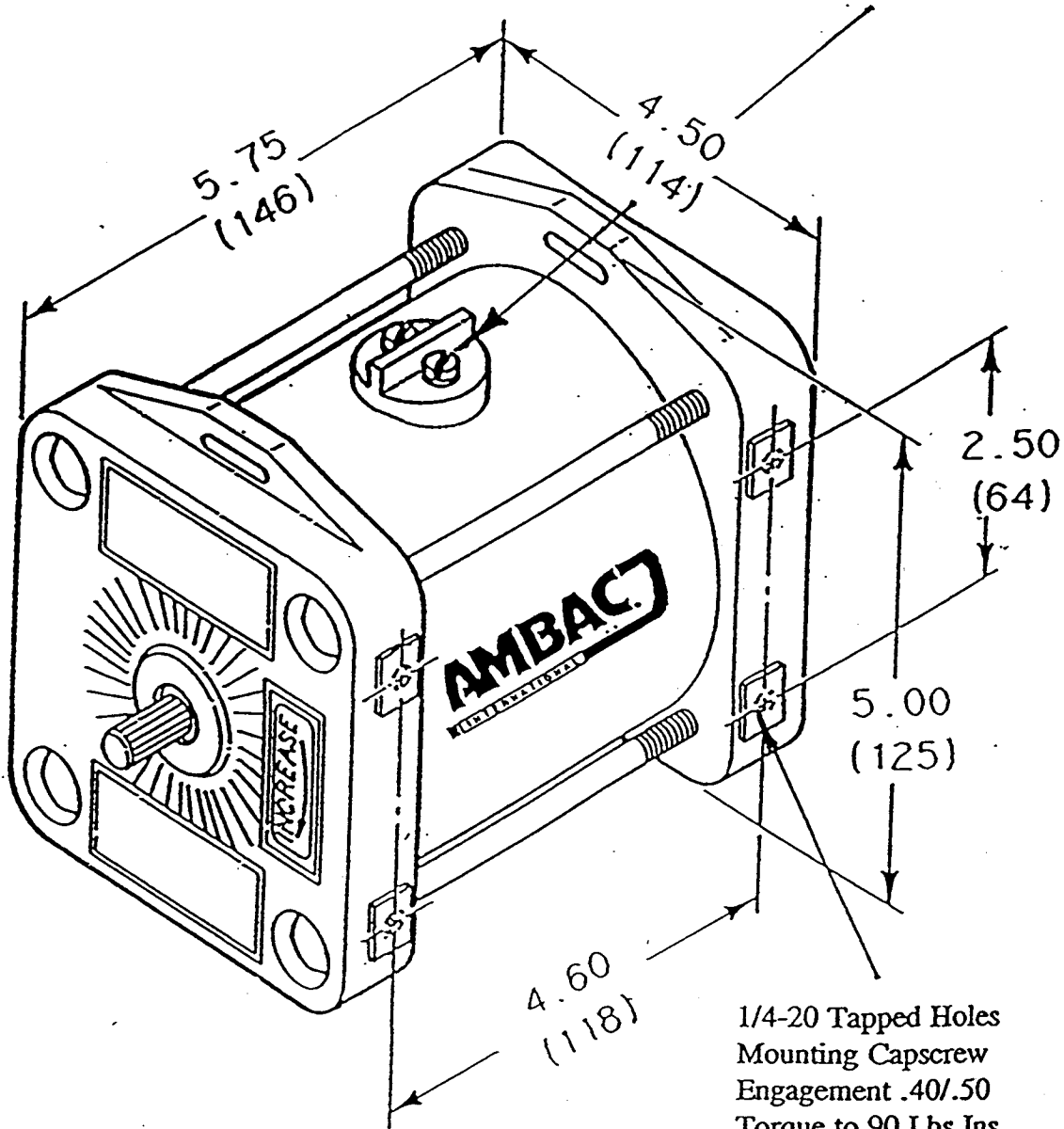
ENGINE GOVERNING SYSTEMS



AGK 1600 A1
AGK 2200 A1

ACTUATOR

Accepts No. 8
Ring Terminals



ENGINE GOVERNING SYSTEMS



AGK 1600 A1
AGK 2200 A1

SPECIFICATIONS

AGK 2200 SERIES ACTUATOR PERFORMANCE

- Available Work AGK 1600 A1 (12V) 1.6 Joules (1.2 ft.lbs.)
AGK 2200 A1 (24V) 2.2 Joules (1.7 ft.lbs.)
- Operating Shaft Travel 35 degrees rotation

POWER INPUT

- Operating Voltage 12 and 24 VDC
- Normal Operating Current 7 amps max.
- Polarity Case Isolated

ENVIRONMENTAL

- Temperature Range -40 deg. to 80 deg. C (-40 deg. to +180 deg. F)
- Relative Humidity up to 100%
- Case Fungus, corrosion resistant and waterproof

PHYSICAL

- Dimensions See Figure 2
- Weight 7.3 kgs. (16 lbs.)
- Mounting Any position

RELIABILITY

- Life Exceeds B10 of 6250 hours

INSTALLATION KIT

- Kit includes: Speed sensor, wire, connectors, lever, rod ends, 18" rod and fasteners KT410633

ACTUATOR LEVERS

- 4.3" length, 1/4" holes LE673-2A

BALL BEARING ROD ENDS

- For a 1/4-28 linkage rod (1/4" bolt) BG671

VARIATIONS

- AGK 1600 A1 For 12 VDC Operation
- AGK 2200 A1 For 24 VDC Operation

SPEED CONTROLLER Use type CW673C

ENGINE GOVERNING SYSTEMS

AMBAC

INTERNATIONAL

AGK 1600 A1
AGK 2200 A1

INTRODUCTION

The AMBAC International Model AGK 2200 series actuator was designed to provide stable control of larger engine governing systems. This proportional actuator is compatible with AMBAC CW type speed control units. This rotary throttle positioning device is an ideal choice for diesel or carbureted engines typically up to a 1000 horsepower rating.

The actuator controls the engine speed by moving the fuel system linkage to a position that is proportion-

al to the amount of current flowing through the actuator coil. Its shaft rotation is counterbalanced by an internal spring that causes the actuator to act as a displacement driver. The AGK 2200 actuator was designed for fail-safe operation. The internal spring returns the throttle to shutoff when de-energized by the speed control unit. It is dynamically balanced and can be mounted in any position.

DESCRIPTION

An AC frequency signal (proportional to speed) generated by the magnetic speed sensor is constantly fed into the speed control unit and compared with a preset frequency. If the frequencies do not remain identical, a change in current from the speed control unit changes the magnetic force in the actuator which, in turn, causes angular rotation of the actuator shaft. Shaft rotation is proportional to the amount of current flowing through the actuator and is counterbalanced by the internal spring. The actuator housing is sealed against normal engine environments with gaskets at all openings. The actuator should be mounted to a 1/4"

thick steel plate bracket. Stiffening ribs are required to prevent excessive vibration.

The wire size connecting the speed controller to the actuator should be as listed below:

ACTUATOR	MAXIMUM WIRE LENGTH IN FEET	
	14AWG	12AWG
AGK 1600 A1 (12V)	10	20
AGK 2200 A1 (24V)	35	75

INSTALLATION

The actuator should be rigidly mounted as close as possible to the throttle lever on the engine. The ball joints will accommodate a maximum of 10 degrees misalignment. Low friction is mandatory and light weight linkage should be used to provide optimum control.

The proper setup of linkage is one of the most important adjustments of a total engine governing system. The speed control unit increases actuator current to control the engine in the full fuel direction and spring force acts to control the engine in the fuel shutoff direction. A proper linkage arrangement will allow the actuator to control the throttle at zero throttle and full throttle with some excess travel beyond these positions for shutoff and full fuel, respectively.

CAUTION:

STEAM OR OTHER HIGH PRESSURE CLEANING SYSTEMS MAY PENETRATE THE SEALED BALL BEARINGS AND SHORTEN THEIR LIFE.

CAUTION:

THE ENGINE SHOULD BE EQUIPPED WITH AN INDEPENDENT OVERSPEED SHUTDOWN MECHANISM TO PREVENT RUNAWAY WHICH CAN CAUSE EQUIPMENT DAMAGE OR PERSONNEL INJURY.

ENGINE GOVERNING SYSTEMS

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INTERNATIONAL

AGK 1600 A1

AGK 2200 A1

ADJUSTMENTS

1. Determine the total angular movement of the engine throttle lever. The last 20 degrees of opening on a carburetor throttle body results in very little change in flow and can be left unused.
2. Calculate the required ratio of linkage lever lengths to give adequate travel of the throttle. Approximately 28 degrees is the most useful actuator travel. The fuel system's stops (shutoff and full fuel) should be used as fuel stops rather than the internal actuator stops.
3. Make the linkage rod length such that the actuator is slightly off its stop when the throttle lever is in the full shutoff position. This ensures adequate spring force for actuator return.

It is desirable to have more linkage gain at maximum power and less gain at minimum power. That is, in the case where the linkage operates horizontally, the actuator and fuel pump arms will be vertical at the full power position. Actuators will have more effective torque in this standard geometric gain configuration (see Figure 1).

For reduced gain and greater stability at light load, reposition the actuator arm as shown on Figure 2. Be sure the linkage is free of any obstructions, friction, or binding. Before starting the engine, manually push the actuator to the full fuel position

and release it. It should return instantly to the no fuel position. Re-check the installation to ensure that all linkage and levers are securely fastened before operating the engine.

After the engine has been started and is under governor control, the linkage adjustments can be optimized by temporarily inserting an ammeter in one of the wires between the speed control unit and the actuator. Measure the actuator current at no load and full load. The current required for any governing condition indicates the actuator position to satisfy that condition. If the ratio of actuator lever length to throttle length is too large, there will be very little actuator movement (no load to full load), adjustments will be critical, and the speed control unit will tend to be less stable. It is desirable to have an appreciable current difference, corresponding to actuator movement, no load to full load. The limiting condition is sufficient linkage ratio to permit movement of the throttle through its full stroke. Typical current values are given below. The values correspond to approximately 28 degrees of actuator travel. Varying the effective length of the throttle link should permit the no load value to be adjusted to the stated value.

ACTUATOR CURRENT SETTINGS

No Load	2 amps
Full Load	6 amps

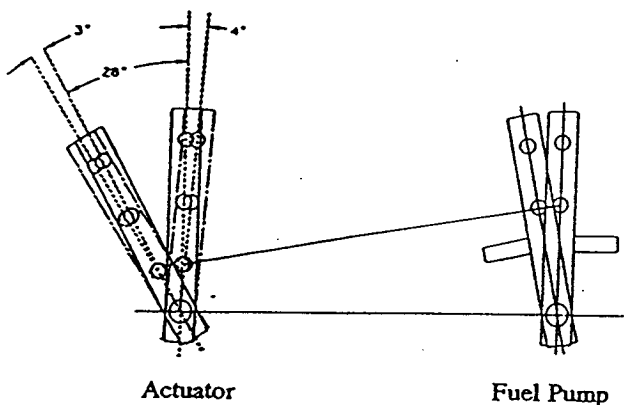


Figure 1: Standard Linkage Geometry

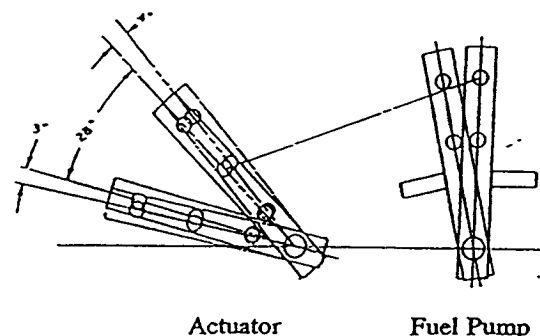


Figure 2: Non-Linear Linkage