

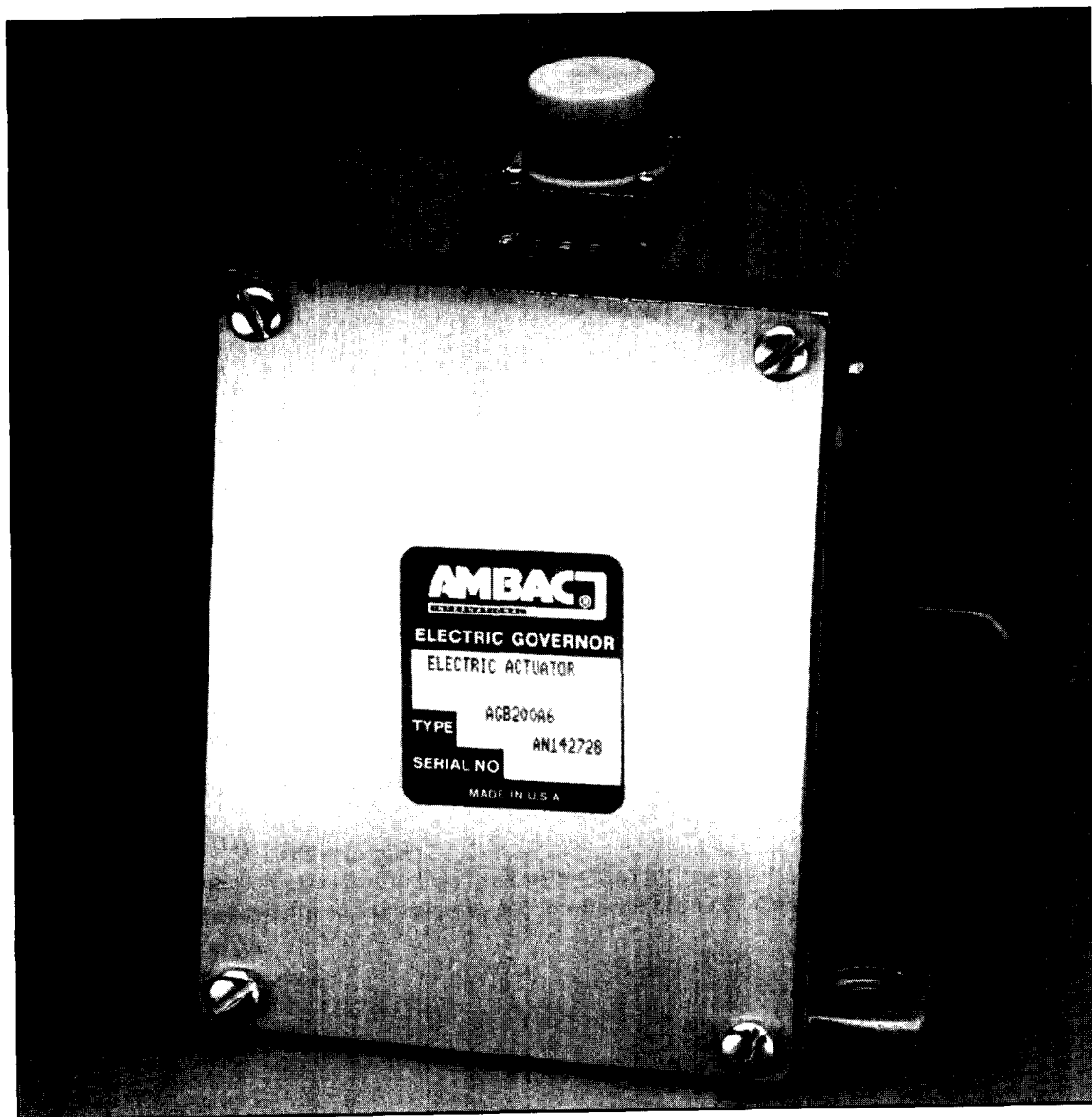
**ENGINE
GOVERNING SYSTEMS**



AGB 200

**Supercedes EG 60-2
Dated 3/89**

**Actuator
AGB 200**



ENGINE GOVERNING SYSTEMS

AMBAC[®]

INTERNATIONAL

AGB 200

Supersedes EG 60-2
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INTRODUCTION

The AGB 200 Actuator can be used with 12VDC, 24VDC, or 32VDC power supplies. See Pages 4 & 5 for proper wiring diagrams.

The actuator is a linear electro-magnetic throttle positioning device. It positions the engine fuel throttle

according to the amount of current flowing from the speed control unit through the actuator coils. The AGB 200 series actuator is an ideal choice for in-line fuel pumps up to 12 cylinders, medium carburetors with good bearings and minimal offset, and other fuel controls with modest friction and low mass levers.

SPECIFICATIONS

AGB-200 ACTUATOR PERFORMANCE

- Net work with return spring fitted 0.2 Joule (2 in.-lb)
- Available Torque 2.712 Nm (2.0 lbF - ft)
- Maximum Operating Shaft Angular Travel 15° CW or CCW

POWER INPUT

- Operating Voltage 12, 24, or 32 VDC
- Normal Operating Current 4A at 12 VDC
2A at 24 or 32 VDC
- Maximum Current (Instantaneous) 8A at 12 VDC
4A at 24 or 32 VDC

ENVIRONMENTAL

- Temperature Range -54°C to + 93°C (-65°F to + 200°F)
- Relative Humidity up to 100%
- Case Fungus proof and corrosion resistant

PHYSICAL

- Dimensions See Figure 1
- Weight 3.29 kgs (7.25 lbs)
- Mounting Any position (See Installation Page 3)

RELIABILITY

- Tested 100%

MATING CONNECTOR

- Use AMBAC Part No. EC1249-2 (6 pins) per MS3106R14S-6S
- Wiring harness (two connectors and trim pot) used with CU671C Control Units CB679
- Wiring harness (single 6 pin connector and trim pot) used with CU673C Control Units CB6711A

BALL BEARING ROD ENDS

- For a ¼-28 linkage rod and bolt BG671
- For a 10-32 linkage rod and bolt BG672

LEVERS (order separately)

- LE673-1A (Fits 10-32 Rod Ends) 4.3" Length 3/16" Holes
- LE673-2A 4.3" Length 1/4" Holes
- LE673-3A (Fits 10-32 Rod Ends) 7.1" Length 3/16" Holes

VARIATIONS

- AGB 200A5 With temperature probe. No lever
- AGB 200A6 Without temperature probe. No lever

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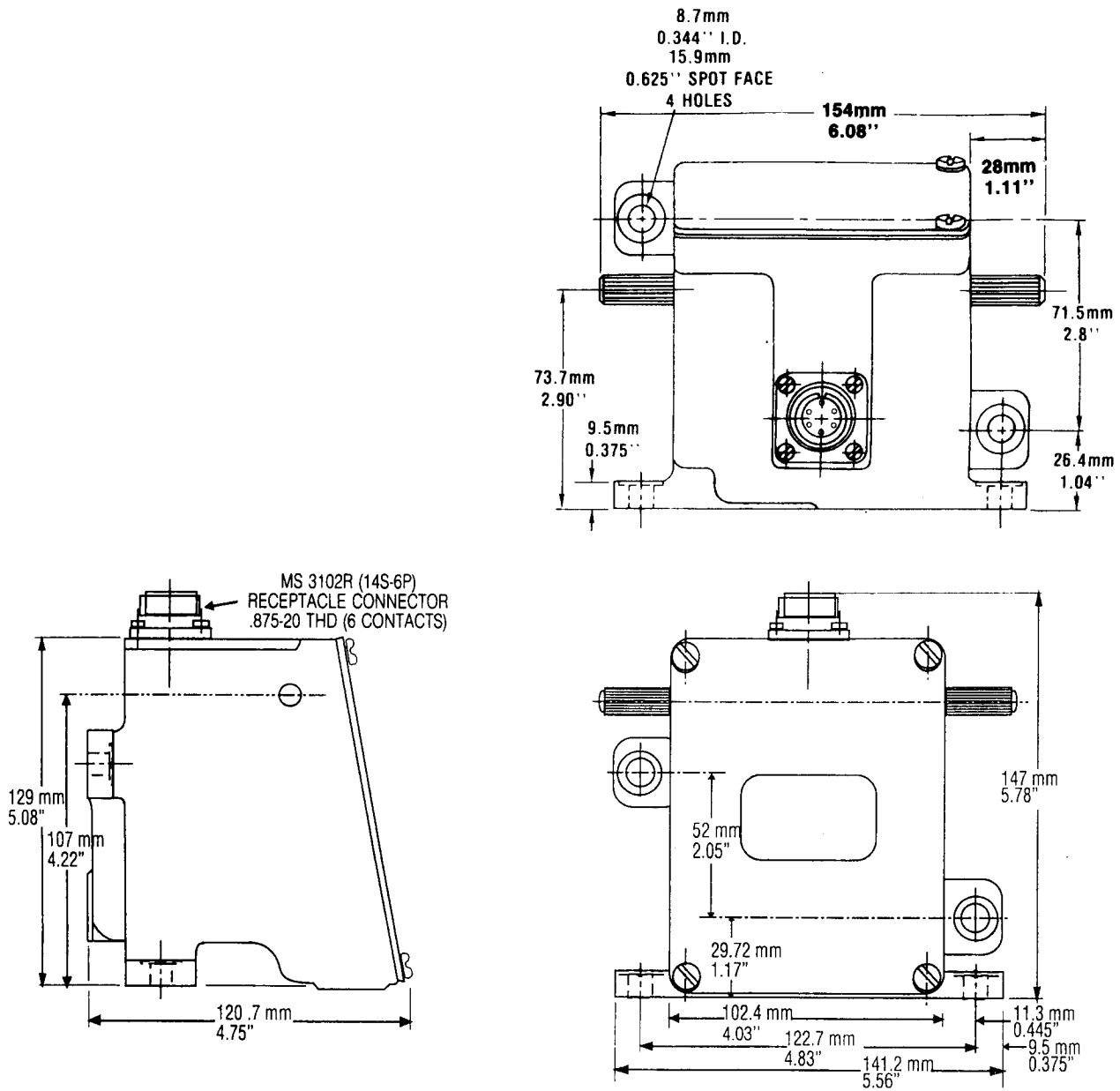


Figure 1. AGB 200 Actuator Dimensions

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DESCRIPTION

An AC frequency signal (proportional to speed), generated by the magnetic speed sensor, is constantly fed into the 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 springs. The actuator housing is sealed against engine environment with gaskets at all openings so steam or water will not affect the system's operation. **No maintenance is necessary.**

INSTALLATION

The actuator should be rigidly mounted as close as possible to the throttle lever on the engine. The lever on the actuator should be as nearly parallel to the throttle lever as possible at mid throttle position. 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 the 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 setup will allow the actuator to control the throttle at zero throttle and full throttle with some excess travel beyond these positions for shutoff and maximum power respectively.

The linkage arrangement between the carburetor (throttle body) and the electric actuator should be non-linear. The most ideal linkage arrangement is for the carburetor butterfly valve lever and the actuator lever to be parallel to each other at engine full load.

The leads from the speed control unit to the actuator should be at least #18 for 24 volt and 32 volt and #16 wire for 12 volt operation. Large gauge wire is necessary for long wire lengths to compensate for current losses.

INSTALLATION COMPONENTS

Actuators have internal springs against which the magnetic forces work to open the throttle. Standard springs for the AGB 200 actuator are SP 675-3. If the throttle has an appreciable force inherent, it may be

desirable to substitute other springs. Available springs are:

Part No.	Rate lb/in.	Color Code
SP 675-1	4.77	Blue
SP 675-2	4.16	Red
SP 675-3	3.65	White
SP 675-4	3.25	Yellow
SP 675-5	3.04	Green
SP 675-6	2.54	Black

Spring Kit KT 410065 has two each of the above springs.

12 VOLT OPERATION

Connect the following actuator terminals together with jumpers at the mating half of the connector (see Figure 2).

1. A to C
2. B to D
3. A & D to the respective terminals of the speed control unit.

24 VOLT OPERATION

Connect the following terminals together with jumpers at the mating half of the connector (see Figure 3).

1. B to C
2. A & D to the respective terminals of the speed control unit.

32 VOLT OPERATION

To use with 32 volt supply, wire the connector as for 24 volt operation but add a 1.5 ohm, 25 watt resistor or a 2 ohm, 50 watt adjustable resistor, set to 1.5 ohms. Then wire the resistor in series with terminal A of the actuator (see Figure 4).

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ADJUSTMENTS

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

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). A maximum of 12 degrees is the useful actuator travel.
2. Calculate the required ratio of linkage lever lengths to give adequate travel of the throttle. The fuel systems stops (shutoff and full fuel) should be used as fuel stops rather than the internal actuator stops.
3. Make the linkage rod lengths such that the actuator is slightly off its stop when the throttle lever is in the full shutoff position. This insures adequate spring force for actuator return.

It is desirable to approach linearity between engine power and actuator position as closely as possible. That is, the actuator position should be halfway between its no load and full load positions when the engine is delivering half power.

Ideally, the linkage arms should be perpendicular to the linkage rod when the actuator levers are in mid-position. Be sure the linkage is free of any obstruction, friction, or binding. Before starting the engine, manually push

the actuator to full fuel position and release it. It should return instantly to the no fuel position. Re-check the installation to insure 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 or by measuring the voltage across the actuator. Measure the actuator current at no load and with full load or measure the voltage across the actuator with 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 lever 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 (1.0 amps) for 24V system, indicating actuator movement, no load to full load. The limiting condition is sufficient linkage ratio to permit movement of the throttle through its full stroke. Suggested current values are given below which will insure adequate current spread to insure stable speed control unit operation. The current values correspond to 8° of actuator travel. Varying the effective length of the throttle link will permit the no load current value to be adjusted to the proper value.

	12 VDC System	24 or 32 VDC System
No load	2.5 amps, 4 volts	1.5 amps, 12 volts
Full load	4 amps, 6 volts	2.5 amps, 18 volts

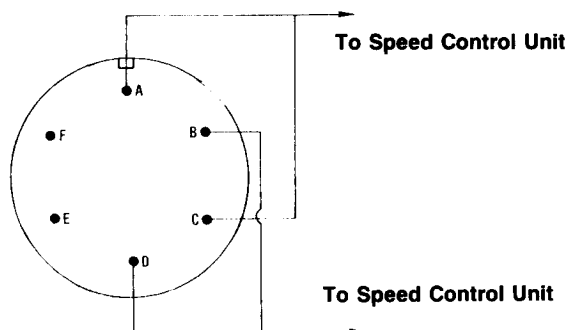


Figure 2. Wiring to AGB 200 actuator for 12 volt operation

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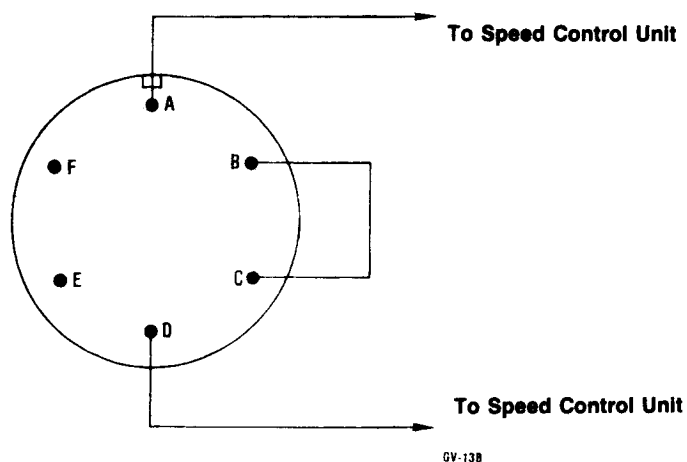


Figure 3. Wiring to AGB 200 actuator for 24 volt operation

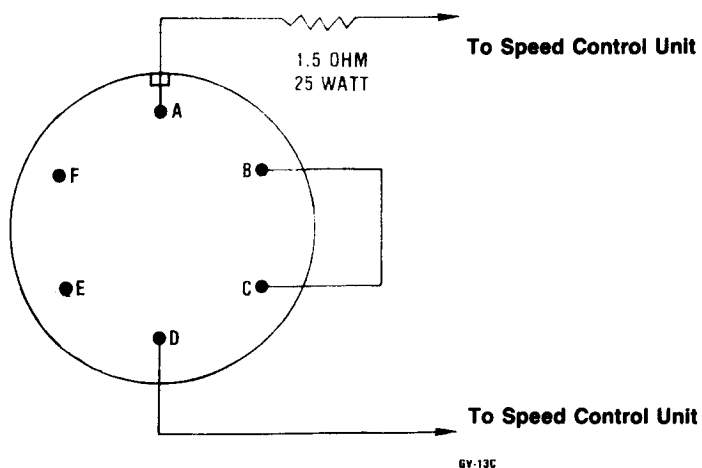


Figure 4. Wiring to AGB 200 actuator for 32 volt operation