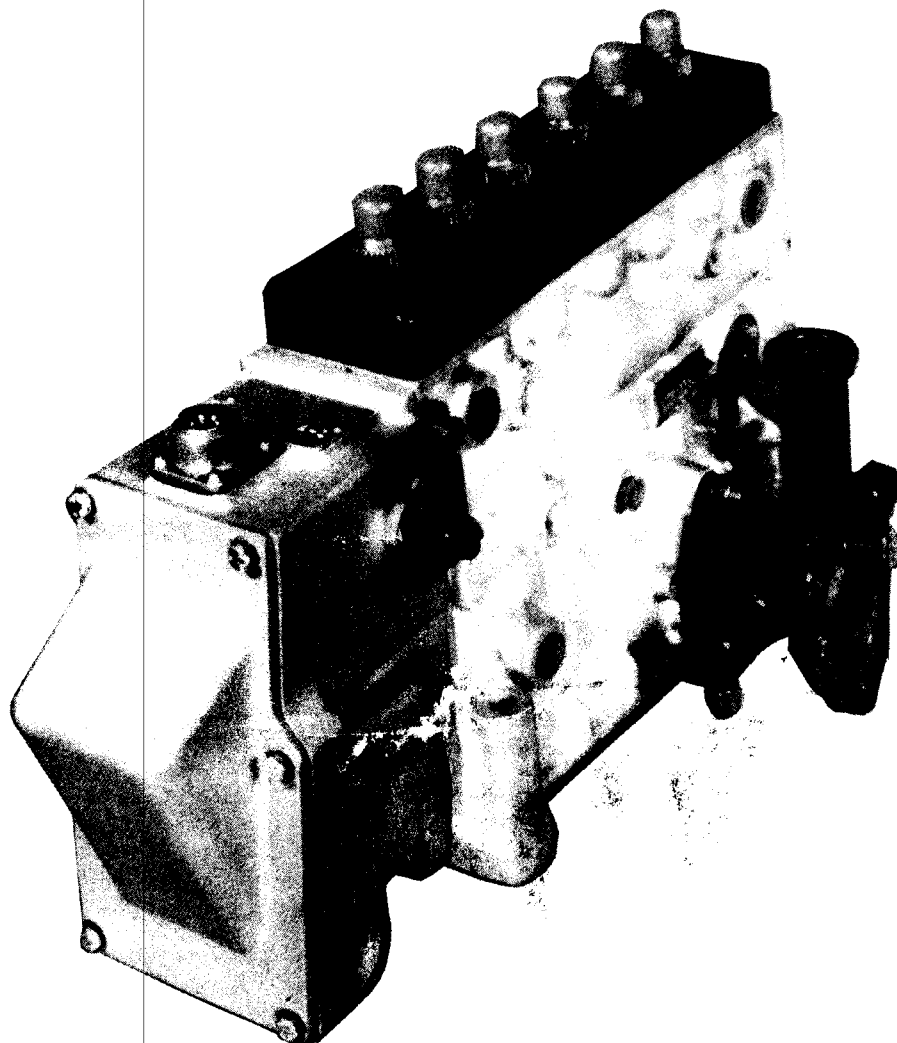


ACTUATORS

AGB 250





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INTRODUCTION

The AGB 250 actuator is a linear electro-magnetic throttle positioning device which is integral to all Robert Bosch (RB) PEP fuel injection pumps. It may also be utilized on other types of in-line fuel injection pumps with the use of an interface plate. It positions the engine fuel throttle according to the amount of current flowing from the speed control unit through the actuator. An external fuel shutoff lever is available to achieve emergency engine shutdown. The complete family of speed control units is suitable for use with the AGB 250 series actuator and will provide other governor system fail-safe features.

The significant features of an engine governing system utilizing the integral actuator are the elimination of external fuel system control linkage and engine actuator brackets. The actuator requires no engine drive for hydraulic input. It is designed to have no sliding parts or gears, requires no maintenance and typically outlasts the life of the engine. The system provides the utmost in performance because the fuel injection pump rack is directly connected to the actuator, thus minimizing delays and insuring fast response. It is completely self-contained except for the wires connecting it to the speed control unit.

SPECIFICATIONS

AGB-250 ACTUATOR PERFORMANCE

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

PHYSICAL

- Dimensions See Figure 1
- Weight 3.75 kgs (8.3 lbs)
- Mounting Integrally mounted on the rear of the RB PEP fuel injection pump directly replacing the existing mechanical governor (See Installation Page 2)

RELIABILITY

- Tested 100%

MATING CONNECTOR

- Use EC1249-2 (6 pins)
- For CU671C series speed control units use EC1248-6 (17 pins)
- Wiring harness for CU671C (includes both connectors prewired) CB679
- For CU673C series speed control units use CB6711A

VARIATIONS

- AGB 250 A3 With temperature probe and KT 6731
- AGB 250 A6 Without temperature probe and without KT 6731

KITS

- KT 6729 Required when pump mechanical governor is removed in the field
- KT 6731 Actuator mounting kit, with fuel injection pump rack dust boot
- KT 6733 Actuator mounting kit without fuel injection pump rack dust boot.

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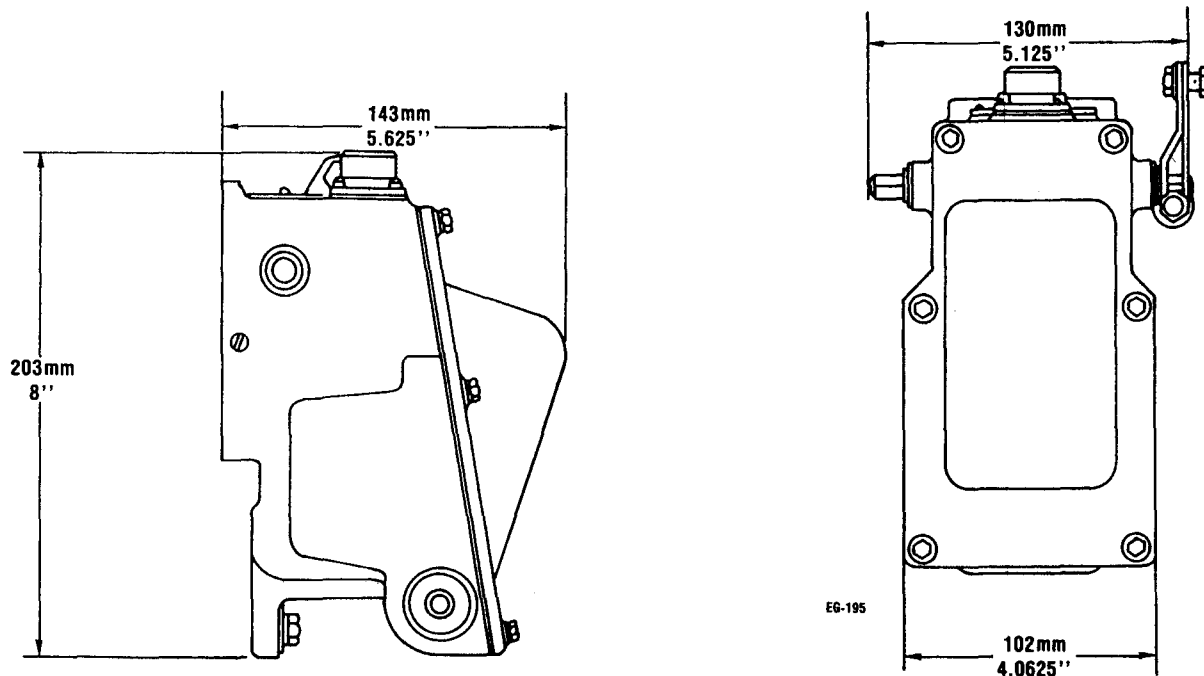


Figure 1. AGB 250 actuator dimensions

DESCRIPTION

An AC frequency signal (proportional to speed) generated by the magnetic speed sensor is constantly fed into the speed control unit. The signal is compared with the present frequency (speed setting). If the frequencies are not identical, a change in current from the speed control unit changes the magnetic force in the actuator. The change causes an angular rotation of the actuator shaft and linear repositioning of the fuel injection pump racks.

Rack position is proportional to the amount of current flowing thru the actuator coils and is counter balanced by internal springs. A mechanical override of the fuel rack is provided through the shaft. This shaft can be connected to an external electric or pneumatic solenoid or a manually operated shutdown device to move the fuel rack to the no-fuel position and hence shut down the engine. The actuator housing is sealed against engine environment with gaskets at all openings so steam or other water based cleaning will not affect the systems' operation. **No maintenance is necessary.**

INSTALLATION AND ADJUSTMENTS

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.

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 their respective terminals at the speed control unit. (SEE TABLE A.)

24 VOLT OPERATION

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

1. B to C
2. A & D to their respective terminals at the control unit.
(SEE TABLE A.)

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).

SPEED CONTROL UNIT	ACTUATOR TERMINALS	
	A	D
CU 671C SERIES*	B	D
CU 673C SERIES*	B	D
ECQ 1000 SERIES	1	2
ECD 67-SERIES	1	2
ECD 67-5111 BELOW SN 23000	A	B
ECD 67-5111 ABOVE SN 23000	A	B
ECD 67-5221	A	B

Table A
Wiring chart for AGB 130 actuators

*Note: For droop operation see Droop Control literature EG 70-2.

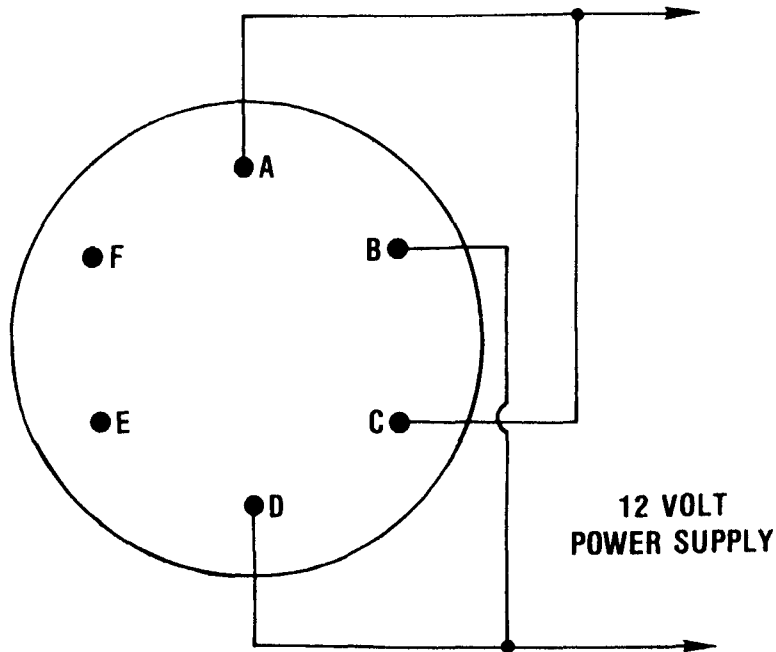


Figure 2. Wiring to AGB 250 actuator for 12 volt operation

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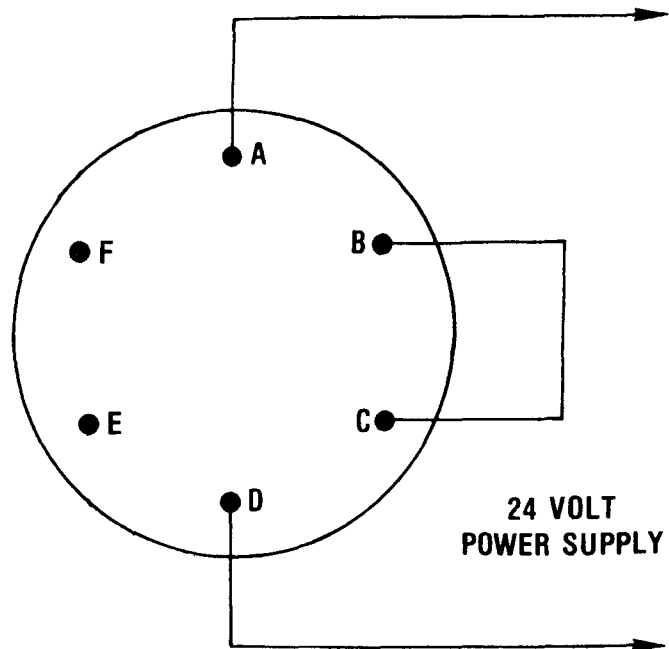


Figure 3. Wiring to AGB 250 actuator for 24 volt operation

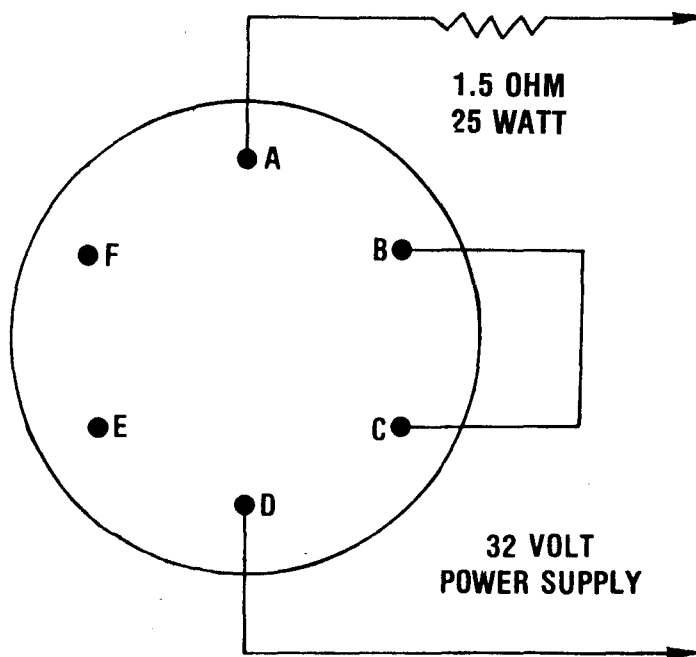


Figure 4. Wiring to AGB 250 actuator for 32 volt operation

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

Integral Actuator Mounting Procedure (refer to Figure 5)

NOTE: If pump still has a mechanical governor attached consult RB agent or instructions in KT 6729.

1. Remove cover (Pos. 27), gasket (Pos. 28) and packing material from actuator housing. Retain the six screws and lock washers. Remove bottom two bolts and lock washers holding bearing retainer to pump.
2. Fasten bellows (Pos. 1) to pump rack ring using clamp (Pos. 2). Position locking screw horizontally as shown in diagram. Screw head to left.
3. Secure rack connector link (Pos. 3) to rack using two socket head screws and lock washers (Pos. 4 & 5).
4. Fasten bellows (Pos. 1) to rack connector link (Pos. 3) with clamp (Pos. 6). do no overlap edge of rack connector (Pos. 3) with bellows or clamp. Note position of locking screw as shown in diagram. Screw head to left.
5. Assemble "O" ring camshaft dust seal (Pos. 7) to housing using grease to hold "O" ring in place. Also apply a small amount of grease to the face of the internal stop lever (Pos. 22) as viewed from cover side.
6. Back off two spacer adjusting screws (Pos. 8) so spacers will not contact surface "S" when installed.
7. Mount actuator to pump using gasket (Pos. 9) with two socket head screws and lock washer (Pos. 10 and 11) and two hex head screws, lockwashers and flat washers (Pos. 12, 13 and 14).
NOTE: Snug hex screws only -- **DO NOT** torque to requirement. Torque socket head screws (Pos. 10) to 7-9 Nm (9.5-12.25 lb. ft.).
8. Remove one hex head screw, lock washer and flat washer (Pos. 12, 13 and 14) and bring spacer adjusting screw (Pos. 8) with a screwdriver to just contact face "S" on pump cover. Re-insert hex head screw, lock washer and flat washer and snug tighten only.
9. Repeat Step 8 with other hex screw, lockwasher and flat washer (Pos. 12, 13 & 14). Torque hex screws to 7-9 Nm (9.5 - 12.25 lb. ft.).
10. Install spring (Pos. 15) and spring seat (Pos. 33) and L bracket (Pos. 16) fastening with shoulder screw (Pos. 17) and locknut (Pos. 18) to rack connector link (Pos. 3)

and rod end bearing (Pos. 19). Torque to 4-5 Nm (5.5-6.75 lb. ft.).

NOTE: Check that L bracket (Pos. 16) is free to slide along spring retaining pin (Pos. 20) with no binding when rack is manually moved to maximum fuel position. **THIS IS AN IMPORTANT TEST** - binding can cause loss of control resulting in engine damage.

11. A full fuel stop is available to limit the fuel rack's maximum travel. With the rack manually held in its maximum position toward the pump, turn adjusting screws CW (Pos. 21) until it contacts the inner stop lever (Pos. 22). Back off the adjusting screw approximately one full turn CCW. Further CW adjustment limits the maximum fuel level. After adjusting, lock screw with locking nut (Pos. 34). A low fuel stop is available to limit the fuel rack cutoff position if required. Adjust by turning screw (Pos. 25) located on the armature fuel rack linkage tab. After adjustment, lock screw with nut (Pos. 26). Torque to 2 Nm. (2.75 lb.ft.)
12. Adjust the actuator connecting link (Pos. 19, 23 & 24) so it is 52 to 54 mm long from hole center to hole center. Install the link between the rack connector link (Pos. 3) and the actuator using shoulder screw (Pos. 17) and locking nut (Pos. 18). Check to be sure rod end bearings are properly aligned to eliminate binding when the actuator moves and lock in this position using locking nut (Pos. 23)
13. The linkage may be further optimized after the complete governor system is installed and wired 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 at 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. It is desirable to have an appreciable current difference (1.0 amp), indicating actuator movement, no load to full load. Suggested current values are given below which will insure adequate current spread to insure stable governor operation. The current values correspond to 8° of actuator travel.

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	12 Volt	24 Volt
No Load	2.5 amps, 4 volts	1.5 amps, 9 volts
Full Load	4 amps, 6 volts	2.5 amps, 15 volts

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4. Assemble cover (Pos. 27) and gasket (Pos. 28) to actuator using two drilled hex head screws (Pos. 29) and lockwasher (Pos. 30) at cover top locations.

NOTE: Drilled heads provide for lockwiring a seal to screws after actuator is assembled and adjusted. Complete cover assembly using four hex head screws (Pos. 31) and lock washers (Pos. 32). Torque all six screws to 4-5 Nm (5.5 - 6.75 lb-ft.).

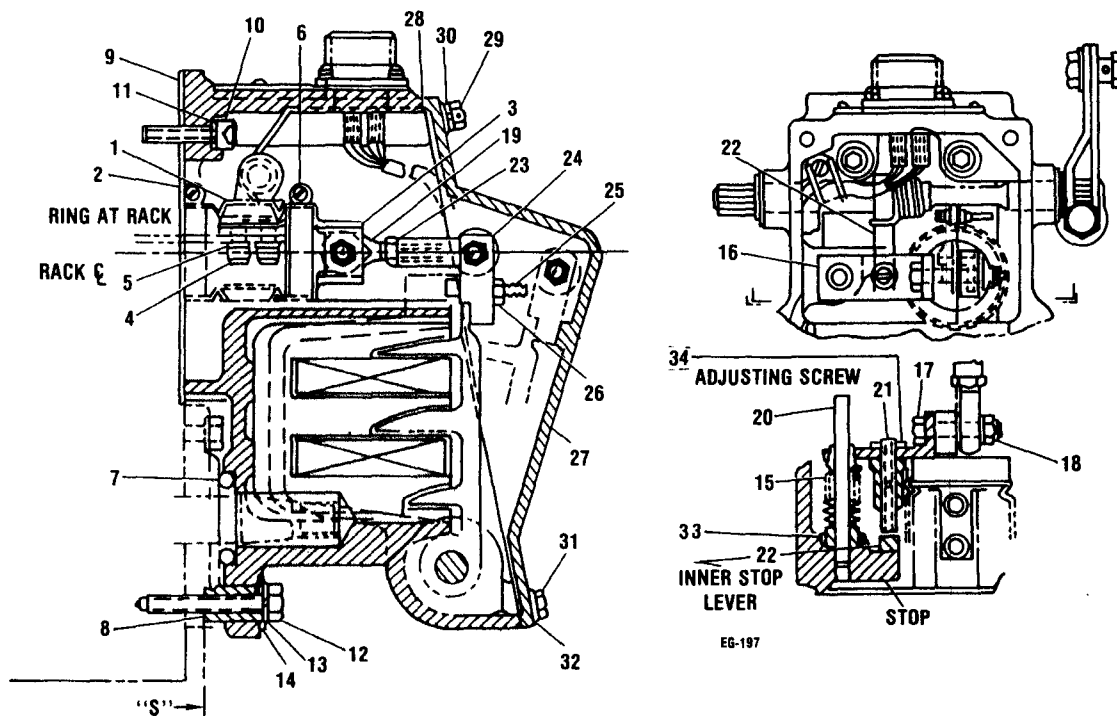


Figure 5. Actuator assembly parts location



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ACTUATOR ASSEMBLY PARTS LIST

Pos.	U.T.D.S. Part No.	Qty.	Description
1	BW 674	1	BELLOWS
2 & 6	HP 675	2	CLAMP
3	LK 677	1	RACK CONNECTOR LINK
4	SC 2233-8M	2	SOCKET HEAD SCREWS
5	WA 2012-5M	2	LOCKWASHER
7	GA 1210	1	"O" RING
8	SR 6711	2	ADJUSTING SPACERS
9	GA 6771	1	ACTUATOR GASKET
10	SC 2224-25M	2	SOCKET HEAD SCREWS
11	WA 2012-6M	2	LOCKWASHER
12	SC 2212-40M	2	HEX HEAD SCREWS
13	WA 2010-6M	2	LOCKWASHER
14	WA 674	2	FLAT WASHER
15	SP 676	1	ACTUATOR SPRING
16 & 21	BK 6728 A	1	STOP "L" BRACKET
17	SC 672	2	SHOULDER SCREW
18	NT 1305-4M	2	LOCKING NUT
19	BG 673	1	ROD END BEARING
20	Applied at Factory		
22	Applied at Factory		
23	NT 4-5 CA	1	NUT
24	BG 672	1	ROD END BEARING
25	SC 2153	1	LOW FUEL STOP SCREW
26	NT 4-3 BL	1	LOCKING NUT
27	CV 6754	1	ACTUATOR COVER
28	GA 6710	1	COVER GASKET
29	SC 2216-16M	2	HEX HEAD SCREWS (drilled)
30 & 32	WA 2010-5M	6	LOCKWASHER
31	SC 2211-16M	4	HEX HEAD SCREWS
33	GU 672	1	SPRING SEAT
34	NT4-5ZN	1	LOCKING NUT