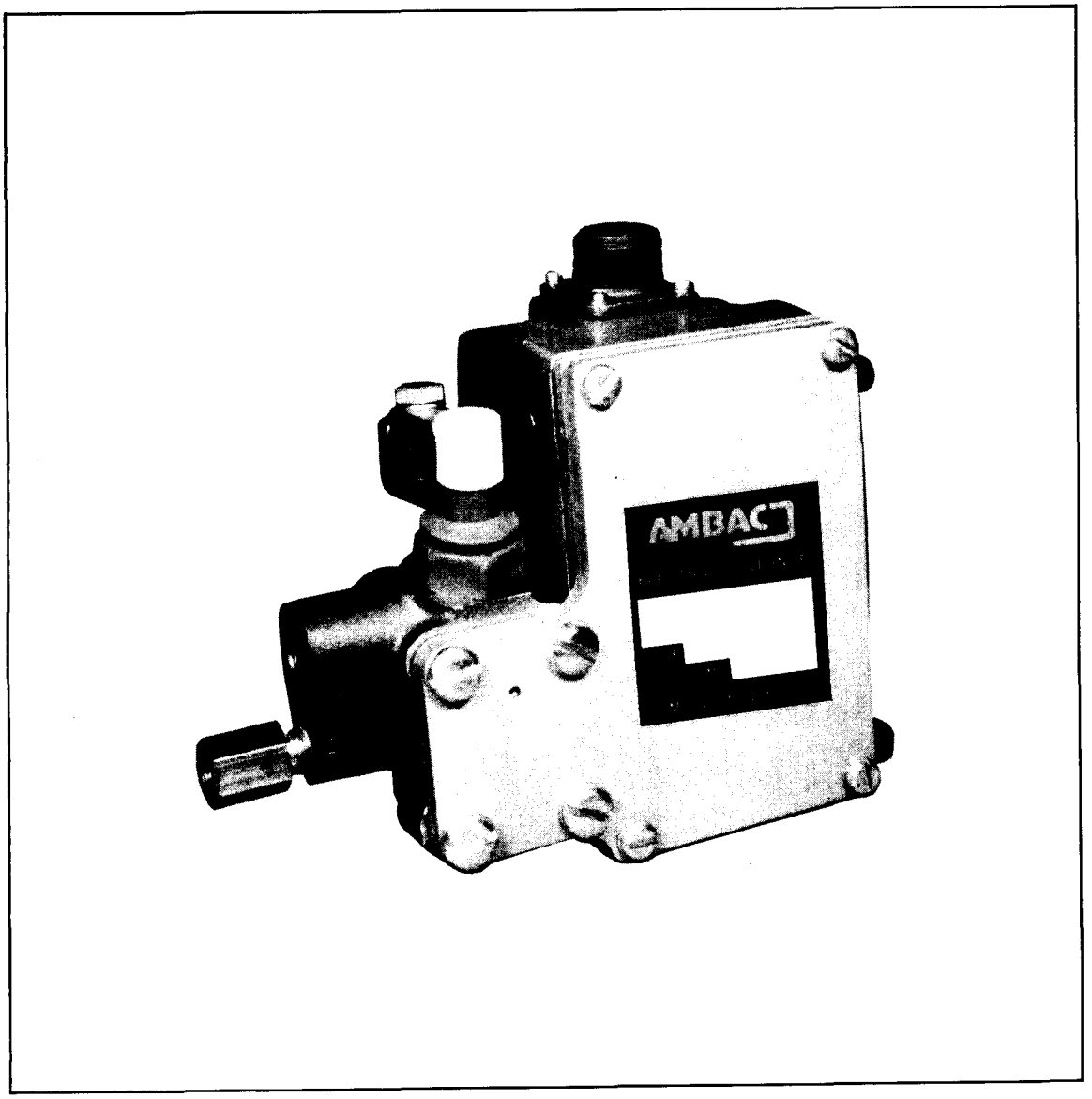
ENGINE GOVERNING SYSTEMS

AMBAC INTERNATIONAL

AGD 130

Supersedes EG 60-4
Dated December 1984

Actuator



AGD 130

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INTRODUCTION

The AGD 130 actuator can be used with 12VDC, 24VDC, or 32VDC power supplies. It is used with Cummins PT fuel systems on all but 12cyl and 16cyl engines which use AGD 200 actuators. See Pages 4 & 5 for proper wiring diagrams.

The actuator is a linear electro-magnetic fuel metering device. It meters fuel quantities up to 1700 lbs. per hr. according to the amount of current flowing from the speed control unit through the actuator.

SPECIFICATIONS

AGD 130 ACTUATOR PERFORMANCE
—Maximum Flow Rate (Diesel #2) ..... 771 kg/hr (14.4 litre/min)
1700 lbs/hr (3.80 gpm)

POWER INPUT
—Operating Voltage ..... 12, 24, or 32 VDC
—Normal Operating Current ..... 2A at 12 VDC
1.5A at 24 or 32 VDC
—Maximum Current (Instantaneous) ..... 6A at 12 VDC
3A 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 ..... 1.75 kgs (3.85 lbs)
—Mounting ..... Any position (See Installation Page 2)

RELIABILITY
—Tested 100%

MATING CONNECTOR
—Use ..... AMBAC Part #EC1249-2 (6 pins) per MS3106R14S-6S
—Wiring harness (two connectors & trim pot) for use with CU671C Control Units CB679
—Wiring harness (6 pin connector & trim pot) for use with CU673C Control Units CB6711A

VARIATIONS
—AGD 130 E4 ..... With temperature probe and standard fuel metering valve
—AGD 130 E5 ..... High temperature coil and standard fuel metering valve + 107°C (+225°F)

KITS
—KT 6723 (See service letter EG 120-7) ..... Replacement valve assembly for all AGD 130 E Series Actuators
—KT 6724 (See service letter EG 120-5) ..... Replacement valve plunger & cap nut assembly for all AGD 130 Series valves
—KT 6726 (See service letter EG 120-6) ..... Replacement valve assembly and spacer plate for AGD 130A and 130D Series actuators
—KT 6732 (See service letters EG 120-9 & EG 120-10) ..... Replacement actuator section less valve for E5 and F2 actuators

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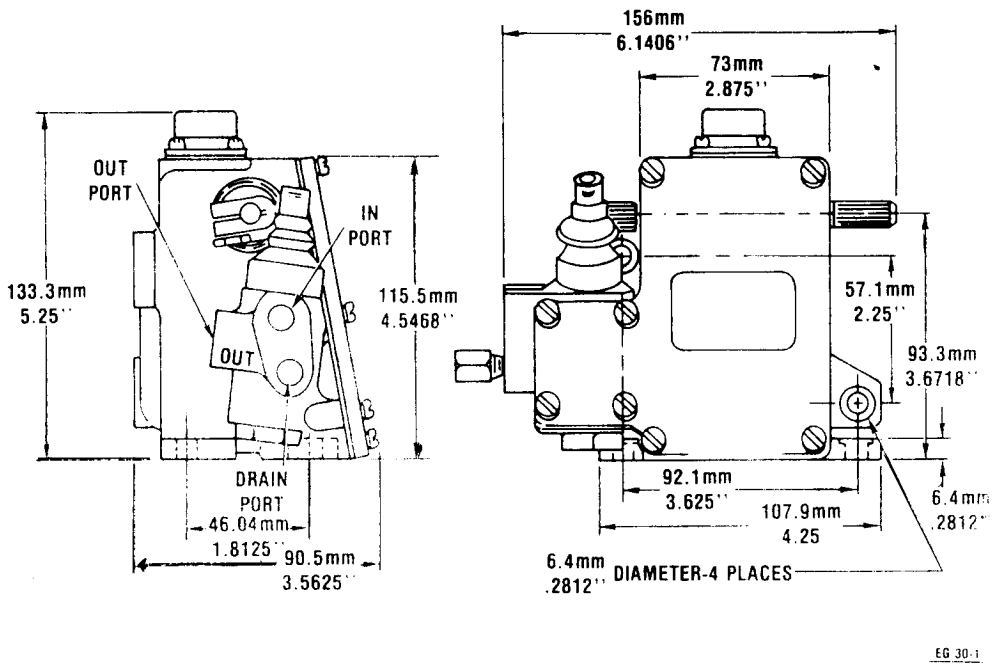

Figure 1. AGD 130 actuator dimensions

DESCRIPTION

An AC frequency signal (proportional to speed), generated by a 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 causes angular rotation of the actuator shaft and, in turn, linear movement of the metering valve. Fuel metering is proportional to the amount of current flowing through the actuator and is counterbalanced by an internal valve spring. The valve is used to meter fuel quantities up to (1700 lbs. per hour) 771 kg per hour, which is ample for all Cummins 6 and 8 cylinder engines with PT fuel systems. 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 mounted as closely as possible to the outlet of the fuel injection pump. The actuator may be mounted in any position. However, the preferred mounting position is with the electrical connector at the top. The actuator should be located in an air stream if possible. No adjustment of the valve linkage is necessary.

Actuator bracket, BK 6726 may be used to facilitate preferred mounting on all Cummins engines. The valve inlet (marked "in") on the actuator is connected to the outlet of the PT fuel pump. The valve outlet (marked "out") is connected to the rail leading to the injectors. Steel tubing or single wire braided rubber hose may be used for all fuel lines. Use 5/16" I.D. tubing for all engines except the 12 and 16 cylinder units which required 3/8" I.D. lines and use the AGD 200 actuator. The valve ports are 1/4" NPTF.

The drain port (marked drain) is 1/8" NPTF. It should be connected to the injector fuel return line. A normal back pressure on the drain of 2-4 PSI is acceptable. Higher back

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pressures may cause external fuel leakage. All fuel valve fittings should be hand tightened and then wrench tightened to 1 to 1-1/2 turns. If sealant is used it should be liquid type and not tape.

Right angle bends in fuel lines and fittings should be avoided near the fuel pump and actuator; use 30° to 45° fittings, or tubing with gradual sloping bends.

On original installations made at the factory, the fuel pumps have been calibrated to compensate for a small pressure drop across the actuator valve. On installations made in the field, it will be necessary to re-adjust the throttle stop as required to obtain rated h.p. However, on engines where the h.p. is marginal for the load at the outset, it will be necessary to compensate for the pressure drop by adding shims to the PTR pumps. On AFC pumps, it will be necessary to replace the throttle shaft, and turn in the adjusting screw until the required rail pressure is obtained. The pressure drop should be measured only at rated speed. This adjustment is necessary only for engines that have no reserve power.

AFC fuel pumps with turbo-charger fuel limiting will limit the transient response of the engine.

The leads used for actuator connections should be at least #18 wire for 24 volt and 32 volt operation and #16 wire for 12 volt operation.

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. (SEE TABLE A)
4. E & F used only for droop mode. (SEE TABLE A and ★)

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 the respective terminals to the control unit. (SEE TABLE A)
3. E & F used only for droop mode. (SEE TABLE A and ★)

32 VOLT OPERATION

To use with 32 volt supply, wire the connector as for 24 volt operations but add a 2 ohm, 20 watt resistor (minimum) in series with terminal A of the actuator (see Figure 4).

SPEED CONTROL TYPE	ACTUATOR CONNECTOR TERMINALS				
	A	D	E	F	
	SPEED CONTROL TERMINALS				
CU 671C Series	B	D	N	P	★
CU 673C Series	B	D	N	P	★
ECQ 1000 Series	1	2	NOT USED		
ECD 67-2000 Series	1	2			
ECD 67-5000 Series	A	B			

***Actuator Terminals E & F are used only for droop operation. Consult Droop Control Literature EG 70-2.**

NOTE: See speed control unit literature specifications for proper operating voltage.

Table A
Wiring chart for AGD 130 actuators

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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.

After the governor system has been installed and properly wired, apply battery power. Refer to the applicable speed control unit publication to momentarily apply full power to the actuator. The actuator valve should go into the full flow position (the valve actuator link moves down). If not, check for proper wiring of the 6 pin actuator connector. Remove the cable and check between pins A and B and between C and D on the actuator. Each coil should have about 4 ohms resistance. If not, replace the actuator.

The throttle lever on the PT pump should be held in the full fuel position. However, it may be used to manually control the engine during the first startup. DC power should be applied through the wiring harness to the engine governing system by closing a switch in the battery circuit. Starting the engine may now proceed normally. During cranking, but before the engine starts, the actuator will push its valve open. Once started, the engine will be controlled at low idle by the speed control unit. The throttle lever on the PT pump should be held wide open at this time if it hasn't been earlier. If the engine is under the control of the governor, engine speed and performance adjustments can be made in accordance with the applicable speed control publication.

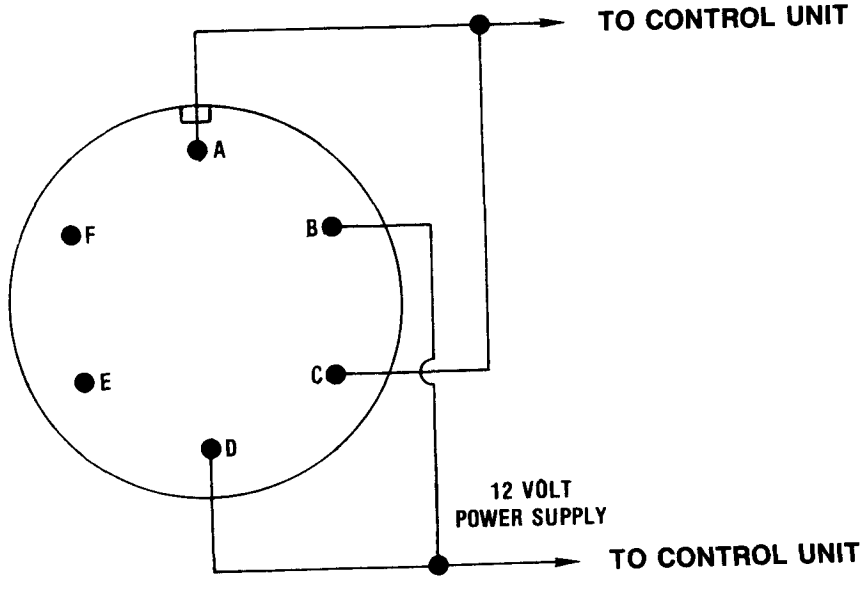

Figure 2. Wiring to AGD 130 actuator for 12 volt operation

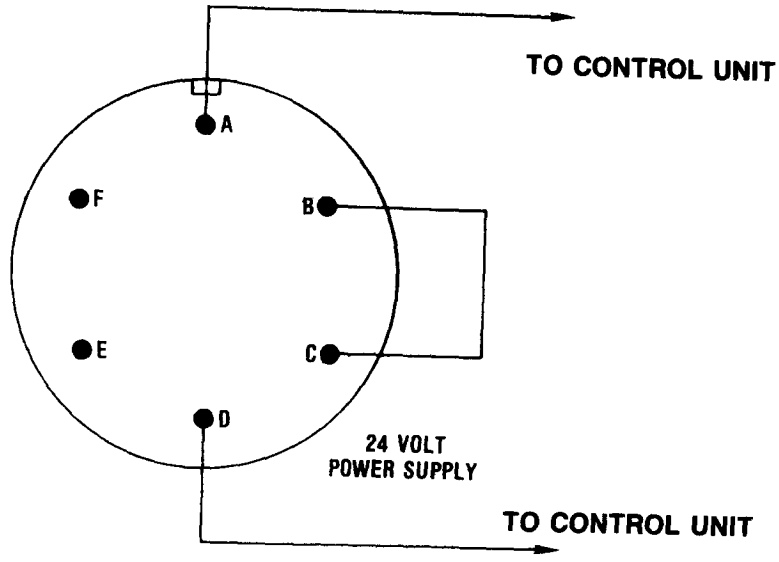

Figure 3. Wiring to AGD 130 actuator for 24 volt operation

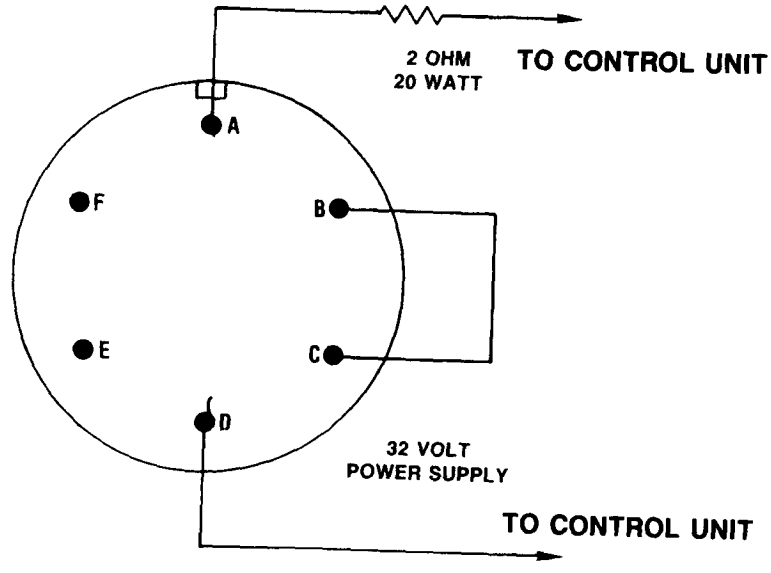

Figure 4. Wiring to AGD 130 actuator for 32 volt operation