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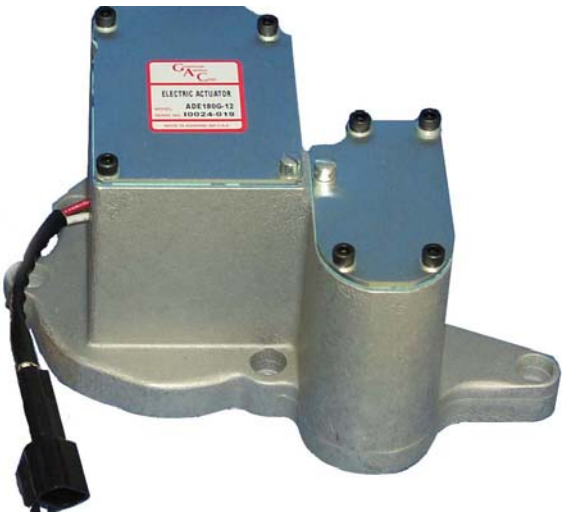
ADD-180G-xx Integral ACTUATOR
for
DEUTZ 1012/1013/2012 and VOLVO 520/720 ENGINES



INTRODUCTION

The 180 SERIES Integral Actuator is designed to mount directly to Deutz 1013/2012 and Volvo 520/720 engines. The existing mechanical governor is removed from the engine and the 180 SERIES integral actuator is mounted in its place. The actuator exhibits high quality construction and is designed for high temperature operation. GAC's unique electromechanical technology provides proportional actuator movement, based on actuator coil current.

This unique, optimized fuel control will out-perform externally mounted electric actuators. An integral high performance speed control system results when the 180 SERIES electric actuator is installed on the engine and electrically connected to compatible GAC governor system components. No external linkage or brackets are required.

The 180 SERIES actuator is an electromagnetic device, which moves the fuel system control rack. It can be integrated into a closed loop speed control system.

SYSTEM DESCRIPTION

A basic engine speed control system is described as follows: The magnetic speed sensor generates an electrical signal that is proportional to engine speed. This signal is sent to the electronic speed control unit, which compares it to a preset engine speed setting. If the engine speed and the preset engine speed are not equal, the speed control unit adjusts the actuator current, which adjusts the actuator's magnetic force. The actuator's internal output lever position is proportional to the magnetic force generated and is counterbalanced by an internal return spring.

INSTALLATION

Installing the 180 SERIES actuator involves removing the engine's mechanical governor control. Therefore, engine shutdown is achieved by switching off the power supply to the speed control unit. The actuator return spring counteracts the engine's internal fuel rack spring by forcing the rack to zero fuel.

Since the design incorporates precision parts of superior quality and is sealed from the environment, outstanding reliability results. No maintenance is required.

PREPARING THE ENGINE

Verify that the actuator voltage rating matches the battery voltage (See part number label).

WARNING: Remove the battery negative connection before proceeding.

Before removing the engine's mechanical governor and replacing it with the 180 Series electric actuator, it is important that the surrounding area be clean. Remove any dirt using compressed air

or a suitable cleaning solvent. Prevent any contamination from entering the engine. If a solvent is used, place a suitable container underneath the mechanical governor to collect the waste solvent and dirt. Dispose of the waste solvent by an environmentally accepted method.

Unbolt the engine's mechanical governor. Engine lubrication fluid will be present inside the mechanical governor.

INSTALLING THE ACTUATOR

Required material:

- **Installation Instructions for 180-Series actuator**
- **Loctite 638 (frost plug), 242 (screws)**
- **Liquid silicone gasket**
- **KT-180-HT Installation kit, containing:**
  - 1 Frost Plug No. 0118-1410
  - 4 Screws M8x55

1. Install the frost plug to seal off the area that allowed flow of lubrication fluid to the mechanical governor.
The 180 SERIES electric actuator does not require lubrication from the engine. Installing this frost plug will insure that sufficient lube oil pressure will be maintained in the engine.

2. Adjust the max fuel stop in the actuator.

For frost plug mounting and max fuel adjustment please refer to the installation instructions.

3. Use a small amount of silicone gasket maker to seal the mounting surface of the 180 SERIES electric actuator. A bead of the silicone gasket maker material should be placed in both circular grooves that are located on the actuator's mounting surface on the engine.

WIRING

The 180 SERIES has a dedicated 12 or 24-volt coil. The actuator models are identified in Chart 1. Insure that the actuator voltage matches the battery supply voltage.
An actuator cable harness is used to connect the 180 SERIES actuator to the selected GAC speed control unit. No polarity needs to be observed. The cable harness with mating half connector provides a vibration resistant and environmentally sealed electrical connection. See the specific speed control unit literature for additional wiring information.

TROUBLESHOOTING

If the electric governor system fails to operate, and the actuator is suspected to be the problem, make the following tests.

Measure Coil Resistance (Room Temp.)
2.4 ohms 12 VDC
9.8 ohms 24 VDC

Measure Coil Isolation (Each wire to actuator housing)
> 1M ohm

Remove the small actuator cover. Manually move the actuator lever through its range of motion. No binding or sticking should occur. Energize the actuator to full fuel (follow the steps in the speed control unit publication). The actuator should operate smoothly throughout its entire stroke without any binding or interruptions in motion.

If the actuator passes these tests, the problem is likely elsewhere in the governor or fuel system. Refer to the speed control unit publication for additional troubleshooting information.

Actuator Model	12 Volt	24 Volt	w/ Mating Connector
ADD-180G-12	X		X
ADD-180G-24		X	X

SPECIFICATIONS

Operating Voltage	12 or 24V DC available
Typical Operating Current	3.5 Amps @ 12V DC 2.0 Amps @ 24V DC
Maximum Current (cont.)	5.5 Amps @ 12V DC 3.0 Amps @ 24V DC
Operating Temperature Range	-40°to 100°C
Relative Humidity	up to 100%
All Surface Finishes	Fungus proof & Corrosion resistant
Dimensions	See illustration
Weight	3.1 kg
Mounting	directly on engine Deutz 1013/2012 & Volvo 520/720
Testing	All Units 100% Tested
Mating Hardware	Connector EC-1300 included

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