

# 110 Series

## Integrated Actuator for DEUTZ 1011 Type Engines

### 1 INTRODUCTION

The GAC 110 Series Integral Actuator is designed to mount directly to DEUTZ 1011 Series 2, 3, and 4 cylinder engines in place of the electric stop solenoid and is available in 12 and 24 V DC. This unique, optimum fuel control, actuating device outperforms externally mounted types of electric actuators.

An integral high performance speed control system results when the 110 Series Electric Actuator is installed on the engine and electrically connected to complementing governor system components. No external linkages or brackets are required.

- ◇ Easy installation
- ◇ High quality construction
- ◇ Optimum fuel control
- ◇ Fast response to transients
- ◇ Outstanding reliability
- ◇ Designed for high temperature applications
- ◇ Ideal for variable and constant speed

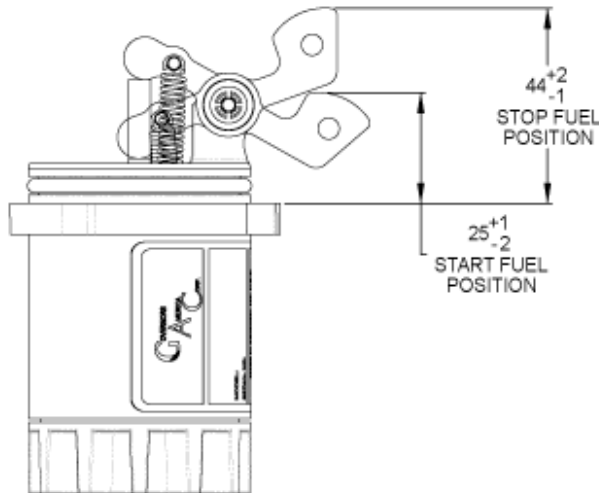
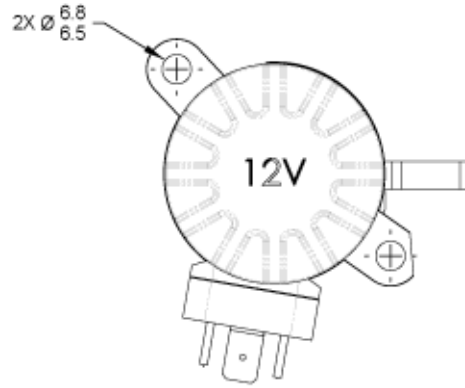
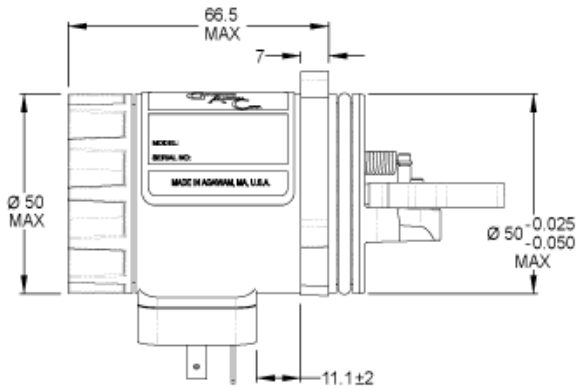


| SERIES    | 12 V | 24 V | INCLUDES MATING CONNECTOR |
|-----------|------|------|---------------------------|
| ACD110-12 |      |      |                           |
| ACD110-24 |      |      |                           |
| ACE110-12 |      |      |                           |
| ACE110-24 |      |      |                           |

### 2 SPECIFICATIONS

| POWER INPUT                  |   |
|------------------------------|---|
| Operating Voltage            | 12 or 24 V DC available   |
| Normal Operating Current     | 4.0 A at 12 V DC<br>2.0 A at 24 V DC                                      |
| Maximum Current (Continuous) | 7.0 A at 12 V DC<br>3.5 A at 24 V DC                                      |
| ENVIRONMENTAL                |   |
| Operating Temperature Range  | -40 to 212 °F [-40 to 100 °C]   |
| Relative Humidity            | up to 100 %   |
| All Surface Finishes         | Fungus proof and corrosion resistant                                      |
| PHYSICAL                     |   |
| Dimensions                   | See Section 3, Installation   |
| Weight                       | 1.5 lbf [0.68 kgf]  |
| Mounting                     | Directly on Deutz 1011 type 2, 3, 4 cylinder engines                      |
| RELIABILITY                  |   |
| Testing                      | 100 % Tested  |
| MATING HARDWARE              |   |
| Wiring Harness               | 2-wire with Automotive Connector<br>(not included with actuator - CH1110) |
| Mating Half Connector        | Connector (included w/ ACE110 Series - EC1120)                            |

### 3 DIMENSIONS



**NOTE** All dimensions are in millimeters.

### 4 INSTALLATION

Move and lock the engine's throttle lever 10% to 15% above the desired governed speed.



Use an overspeed shutdown device, independent of the governor system, to prevent loss of engine control which may cause personal injury or equipment damage. Do not rely exclusively on the governor system electric actuator to prevent overspeed. A secondary shutoff device, such as a fuel solenoid must be used.



When applying the 110 series actuator to the Deutz 1011 4 cylinder engines, the engine must be equipped with Deutz's extra start fuel spring Deutz part number 04174748.

#### PREPARING THE ENGINE



Remove the battery negative connection before proceeding.

Be sure the actuator voltage rating matches the battery voltage (see label part number or voltage stamp on end cap.)

1. Before removing the engine's stop solenoid and replacing it with the 110 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 contaminants from entering the engine. If a solvent is used, place a suitable container underneath the stop solenoid to collect the waste solvent and dirt. Dispose of waste by an environmentally accepted method.
2. Follow the engine manufacturer's procedures and instructions when removing engine shrouds or protective covers.
3. Disconnect the engine stop solenoid from the wiring harness.
4. Continue with the procedures for removal of the standard engine stop solenoid.
5. Carefully remove the stop solenoid from the engine block. Placing the engine stop lever in the shutdown position this will ease removal.

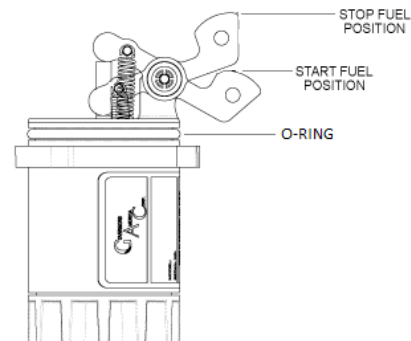
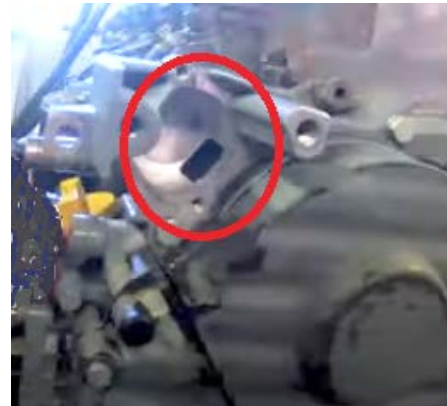
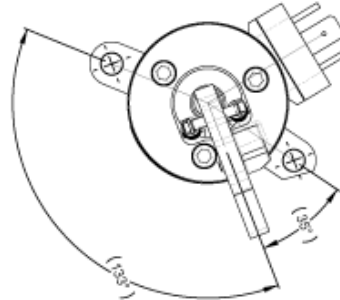
## 4 INSTALLATION (CONTINUED)

### INSTALLING THE ACTUATOR



Improper engagement of the actuator to the engine's fuel rack can cause an engine overspeed condition. Only qualified technicians trained on the 1011 engine should install the actuator.

1. Move the engine's mechanical governor shut down lever to the minimum fuel position (the rack will be pushed further into the engine block).
2. Orient the GAC 110 Series actuator so that the lever is at the 4 o'clock position looking from the back of the actuator.
3. Insert the actuator into the engine block bore leading with the lever at the 4 o'clock position. The lever fits into a cavity inside the block in front of the fuel rack. Adding a little grease to the actuator's O-ring will make the installation easier.
4. Guide the mounting flange diameter of the actuator into the bore ensuring that the O-ring is properly aligned.
5. Push the actuator into the block until the mounting flange ears are flat against the engine surface. Release the engine shut-down lever.
6. Mount the actuator loosely by reusing the engine stop solenoid fasteners. Do not torque at this time.
7. Rotate the actuator in the engine fully counter-clockwise against the mounting fasteners.
8. Torque the fasteners to the values recommended by DEUTZ. Replace all guards and shields in the actuator area.
9. The supplied mating half electrical connector (P/N EC1120) may be used to make up a wiring harness which will provide an electrical connection to the selected GAC speed control unit.



## 5 WIRING



The 110 Series is designed to have a dedicated 12 or 24 volt coil. Ensure that the actuator voltage noted on the end of the actuator matches the battery supply voltage.

An actuator cable harness is used to link the 110 Series actuator to the selected GAC speed control unit. There are no polarity connections from the speed control unit to the actuator which need to be observed. The cable harness mating half connector, EC1120 provides a vibration resistant and environmentally sealed electrical connection. See your specific speed control unit manual for additional wiring information.

## 6 SYSTEM TROUBLESHOOTING

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

1. Measure coil resistance to confirm table values below.

| MEASURE COIL RESISTANCE<br>(ROOM TEMPERATURE) | MEASURE COIL ISOLATION |
|---|------------------------|
| 1.6 $\Omega$ 12 V DC<br>7.2 $\Omega$ 24 V DC  | >1M $\Omega$ to case   |

2. Remove actuator. Hold the actuator with lever side down.
3. Manually move the actuator's shaft through its range by depressing the actuator's lever. No binding or Sticking should occur.
4. Energize the actuator to full fuel following your speed control units manual. The actuator should operate smoothly throughout its entire stroke without any interruptions in motion.
5. If the actuator passes these tests, the problem is likely elsewhere in the governor or fuel system. Refer to the speed control unit troubleshooting publication.

