180 SERIES
INTEGRAL ACTUATOR
for DEUTZ 1013/2012 & VOLVO 520/720 Engines

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1 OVERVIEW

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. GAC's unique electromechanical technology provides proportional actuator movement based on actuator coil current. This unique, optimized fuel control will outperform 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.

- ◊ Packard Connector with Mating Connector EC1300
- ◊ Includes KT188 Installation Kit
- ◊ For DEUTZ 1012 and 1013/2012 and VOLVO 520/720 engines
- ◊ Replaces existing mechanical governors
- ◊ Spring balance system that allows fuel rack to return

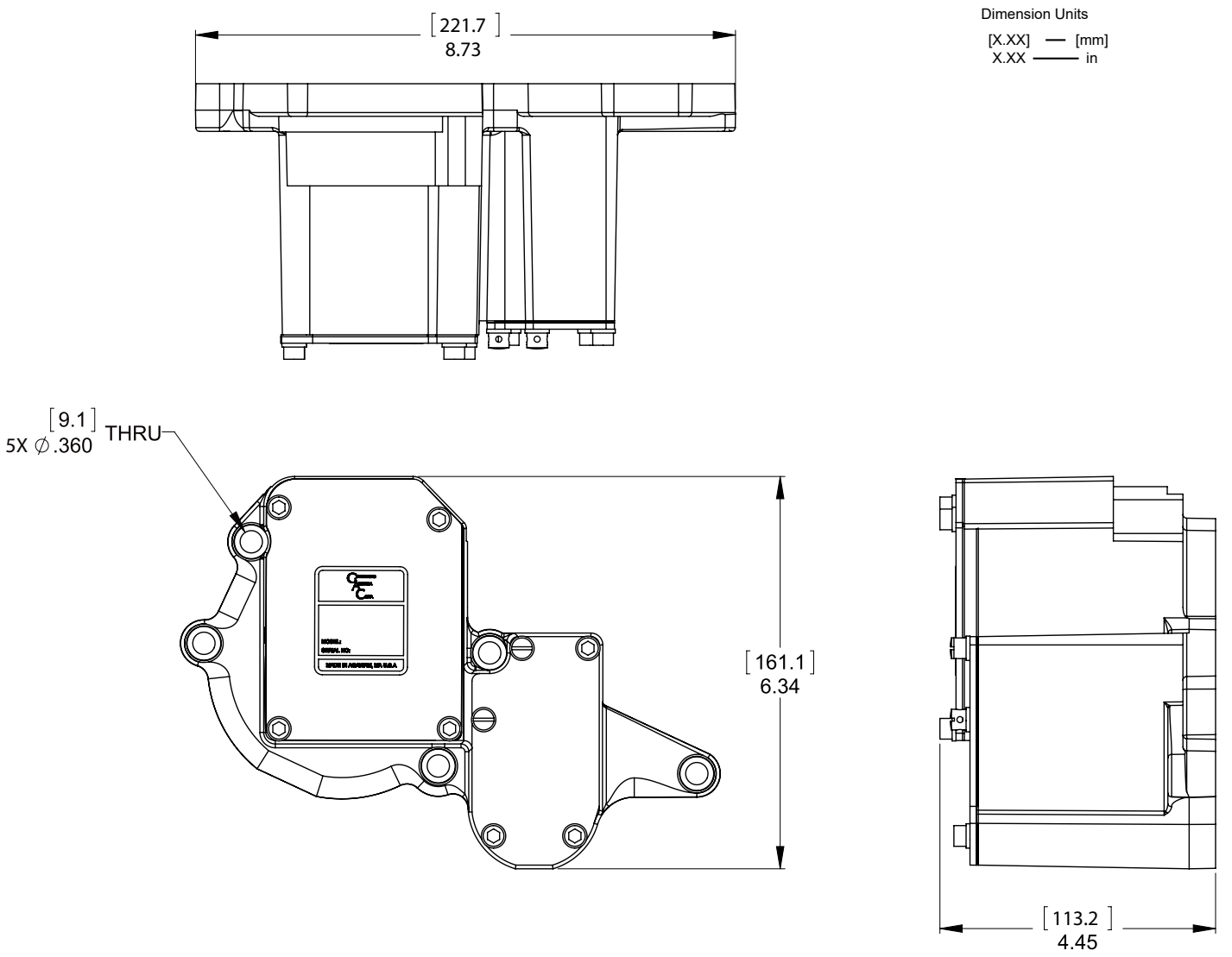
Product No.	Voltage		Packard Connector	With Mating Connector	With Mating Harness
	12	24			
ADD180G-12					
ADD180G-24					
ADE180G-12					
ADE180G-24					

2 SPECIFICATIONS

PERFORMANCE	
Operating Stroke	0.78 in [20 mm]
POWER INPUT	
Operating Voltage	12 or 24 V DC
Normal Operating Current	3.5 A @ 12 V DC 2.0 A @ 24 V DC
Maximum Current Continuously Rated	5.5 A @ 12 V DC 3.0 A @ 24 V DC

ENVIRONMENT	
Operating Temperature Range	-40 to +212 °F (-40 to +100 °C)
Relative Humidity	up to 100 %
All Surface Finishes	Fungus Proof and Corrosion Resistant
Ingress Protection	IP65
PHYSICAL	
Operating Temperature Range	-65 to +200 °F (-54 to +95 °C)
Relative Humidity	up to 100 %
RELIABILITY	
Testing	100 % Tested

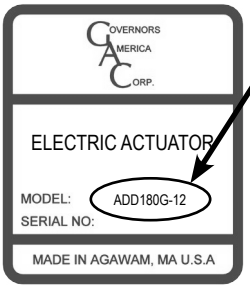
3 OUTLINE DIAGRAM



4 VOLTAGE

Remove the battery negative connection before proceeding.

Verify the actuator voltage rating matches the battery voltage.



12 Volt: ADD180G-12 or ADE180G-12
24 Volt: ADD180G-24 or ADE180G-24

NOTE ADE actuator models (ex. ADE180G-12) includes a connector harness inside the box in which it comes packaged. ADD actuator models (ex. ADD180G-12) do not include a cable harness. However, the actuator and installation kits are identical.

5 PREPARATION

Before removing the engine's current mechanical governor and replacing it with the 180 Series electric actuator, it is important that the surrounding area be clean.

1. Remove any dirt using compressed air or a suitable cleaning solvent.
2. Prevent any contaminates 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.
3. Unbolt the engine's mechanical governor.
4. Engine lubrication fluid will be present inside the mechanical governor.

6 INSTALLATION

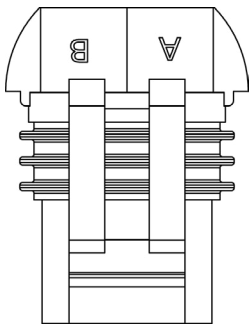
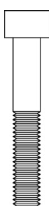
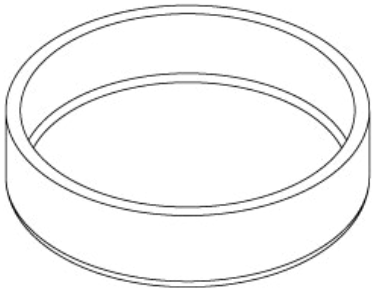
Use an overspeed shutdown device, independent of the governor system, to prevent loss of engine control which may cause personal injury or equipment damage.

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.

The 180 Series electric actuator does not require lubrication from the engine. Installing this Freeze Plug will ensure that sufficient lube oil pressure will be maintained in the engine.

INSTALLATION ITEMS

The following are included with the actuator for use in installation.

Packard Mating Connector	M8 2.25" Bolts (5)	Freeze Plug (1)
		

The following items are not included but are also required for installation:
- Loctite 638
- Short length of steel pipe with a 38mm diameter

6 INSTALLATION (CONTINUED)

Before installing the actuator, the supplied Freeze Plug must be installed to seal off the area that allows flow of lubrication fluid to the mechanical governor.

INSTALLING THE FREEZE PLUG

1. Once the mechanical governor has been removed from the engine, make sure the mounting surface and the inner bore (Figure 1) are sufficiently clean. The inner bore is where the Freeze Plug will be pressed into to maintain engine oil pressure.
2. Make sure that the outer surface of the Freeze Plug is clean and free of any nicks or burrs (Figure 2).
3. Following Loctite instructions, apply Loctite 638 to the outer surface of the Freeze Plug and to the mating surface of the inner bore.
4. Using the steel pipe (Figure 3) with the 38 mm diameter to hold the freeze plug in place, press the Freeze Plug into the engine inner bore.
5. Gently use a hammer to tap the steel pipe, driving the Freeze Plug into the inner bore making certain that it goes in straight.
6. Drive the Freeze Plug in until the edge of the Freeze Plug is aligned with the edge of the inner bore (Figure 4).

FIGURE 1

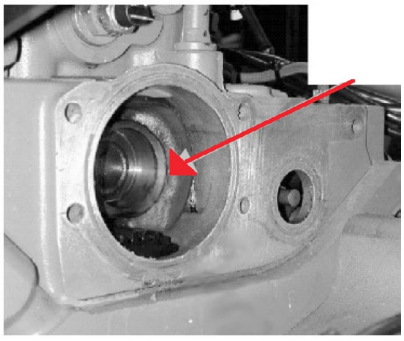


FIGURE 2

FIGURE 3

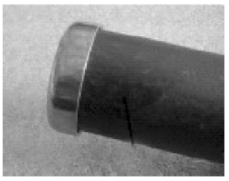
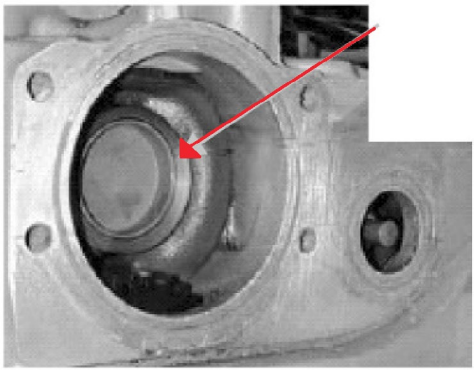


FIGURE 4



INSTALLING THE ACTUATOR

The actuator must be rigidly mounted as close as possible to the fuel control lever of the engine. Vibration from the engine will not affect the operation of the actuator. The preferred mounting is with the electrical connector at the top. Applications with the actuator upside down, on its back, or sideways should be avoided.

Using the screws included with the actuator, mount the actuator.

7 WIRING

The 180 Series is prewired for 12 or 24 V DC operation. 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.

8 TROUBLESHOOTING

If the governor system fails to operate, make the following tests at the actuator mounted connector while moving the actuator through its stroke.

MEASURING COIL RESISTANCE	
12 V DC ACTUATORS	24 V DC ACTUATORS
2.5 Ω	10.7 Ω

MEASURING COIL ISOLATION
EACH WIRE TO ACTUATOR HOUSING
>1M Ω

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.