

**WARNING: DEVIATION FROM THESE INSTALLATION INSTRUCTIONS MAY LEAD TO IMPROPER ENGINE OPERATION WHICH COULD CAUSE PERSONAL INJURY TO OPERATORS OR OTHER NEARBY PERSONNEL.**

## **1.0 OVERVIEW**

- 1.1 This manual provides installation instructions and maintenance information for the Altronic Gas Control Valve, models 690154-1 and 690154-2. It is recommended that the user read this manual in its entirety before commencing operations.

It is not our intention to instruct others on how to design control systems, nor can we assume responsibility for their safe operation. This advice is intended to help the end user install the Altronic Gas Control Valve in such a manner to reduce the risk of accident to personnel or to equipment.

Do **NOT** attempt to operate, maintain, or repair the fuel control valve until the contents of this document have been read and are thoroughly understood.

- 1.2 The Altronic Gas Control Valves are normally used with natural gas. Natural gas and air, when combined together, become very combustible and when contained within an enclosure, such as a gas engine or its exhaust system, can explode in a violent manner when ignited. It is necessary to always use extreme caution when working with any fuel system. The control systems used with gas engines or other similar machines should always be designed to be "fail-safe".
- 1.3 The Gas Control Valve is **NOT** a shutoff valve. Shutoff valves must be used in addition to the control valve. The fuel system should be designed in such a way that:
- no failure of a single component will cause the fuel system to admit fuel to the engine when the engine has been shutdown, and
  - no single failure can result in grossly over-fueling the engine when attempting to start.

**WARNING: Failure to follow the above rules may lead to serious damage to equipment or to personnel.**

- 1.4 The two versions, 690154-1 and 690154-2, differ in the length of the internal piston to accommodate different gas flow rates. Valve 690154-1 is recommended for use on gas engine applications from 250 HP to 1,000 HP. Valve 690154-2 is recommended for use on applications below 250 HP.
- 1.5 Maximum gas working pressure is **40 psig**. Gas pressure at the valve must **NOT** exceed this rating at any time.

## **2.0 INSTALLATION**

- 2.1 The Gas Control Valve should be inspected immediately after unpacking. Check for any damage that may have occurred during shipping. If there are any questions regarding the physical integrity of the valve, contact the distributor or Altronic, Inc.  
NOTE: If possible, keep the original shipping container. If future transportation or storage of the valve is necessary, this container will provide the optimum protection.
- 2.2 The Gas Control Valve is designed to be installed on natural gas fired, reciprocating engines. It is a flow-control device that responds directly to the control output of the Altronic EPC-100 and EPC-150 series of Air Fuel Ratio controllers. Additionally, by the use of a special adaptor device, Altronic P/N 691156-1, the valve can be made to control based upon a 4 to 20 mA signal from a general purpose controlling device such as a PLC. In all cases the valve is installed between the fuel supply pressure regulator and the carburetor and is used to throttle the fuel available to the engine. When considering where to place the Gas Valve, choose a location away from any extreme sources of heat. Operating ambient temperature is  $-40^{\circ}\text{F}$  to  $+185^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ ). Do not expose the valve to temperatures higher than indicated here.

## **3.0 MOUNTING THE FUEL CONTROL VALVE**

- 3.1 In order to control the air/fuel ratio, the electronically controlled valve is connected in series between the regulator and carburetor or mixer. The valve should be installed as close to the fuel inlet of each carburetor or mixer as possible. The distance from the valve to the carburetor inlet should not exceed 12 pipe diameters in length. The preferred mounting of the valve would be in the vertical position, with the Flow arrow pointing up or down. Horizontal mounting of the valve is acceptable as long as the valve is **NOT** installed with the control cable connector facing downward. This is necessary to avoid the collection of condensation in the electronics housing. See FIG. 1 for dimensional details.
- 3.2 If possible, gas connection piping should be of the same diameter as that currently in use. The 690154 series valves have 1.5 inch NPT threads. In some applications, the threaded connection to the valve body may require the use of thread adapters. If adapters are used, proper plumbing procedures must be followed.
- 3.3 Each control valve is connected to the EPC-100 or EPC-150 using the 693005-x cable. This cable has connectors on both ends and in unshielded installations these connectors are simply plugged into the valve and the EPC unit. If it is desired to enclose the cable in conduit, this can be easily accomplished by cutting the 693005 cable in half. The cables are color coded and must be reconnected inside a junction box with each wire color matching. This cable must not be run in the same conduit as the ignition primary or other wires. A distance of 4 to 6 inches should be maintained between EPC-100 or EPC-150 wiring and other engine wiring. Note that the upper connector on the EPC-100 or EPC-150 controls the stepper valve for single control channel applications and the left bank valve on V-engines.



## **8.0 DISASSEMBLY OF THE GAS CONTROL VALVE**

- 8.1 This section covers the disassembly of the fuel control valve for purposes of field service or maintenance. This valve was designed to be serviceable while connected to the gas pipeline **providing that the gas flow has been shut off to the valve. Failure to shut off the gas flow can cause a very dangerous situation.** If servicing is to be done with the valve removed from the gas pipeline, then it is recommended that a clean flat work surface be prepared and the proper tool be made available.
- 8.2 This is a recommended tool list to disassemble the 690154 series Gas Control Valves:
- #2 Phillips Head screwdriver
  - 5/16" socket with ratchet and short extension
  - 5/32" T - handle hex wrench (Allen wrench)
- 8.3 With the stepper motor in its fully retracted position (valve fully open), remove the four 8-32 seal screws (2-7) that secure the connector to the cover. Next remove the six 10-24 hex head screws (2-9) and lock washers (2-3) that fasten the cover plate (2-6) to the valve body (2-1). Note gasket (2-5) between connector and cover. There is also a gasket (2-8) between the cover plate and the valve body.
- 8.4 With the cover (2-3) removed, the inner workings of the valve are now exposed. Keep this area free from contaminants such as excessive dirt and moisture. Removing the two socket head cap screws (2-4) and the lock washers (2-3) will allow you to remove the stepper Motor/Connector/Piston Assembly (2-2) from the valve body (2-1). Having available a spare Motor/ Connector/Piston Assembly (2-2) will minimize downtime.

## **9.0 REASSEMBLY OF THE GAS CONTROL VALVE**

- 9.1 To reassemble the valve, follow the instructions given.
- 9.2 Replace the Motor/Connector/Piston Assembly (2-2) into the valve body (2-1). Secure the motor using the two socket head cap screws (2-4) and lock washers (2-3).
- 9.3 Replace the connector into the cover plate (2-6), taking care to properly mount the connector gasket (2-5) between the connector and the cover. Secure the connector to the cover using the four 8-32 phillips head seal screws (2-7).
- 9.4 Attach the cover plate (2-6) to the valve body (2-1), taking care to properly mount the cover plate gasket (2-8) between the valve body and the cover plate. Secure the cover plate using the six 10-24 hex head screws (2-9) and lock washers (2-3). See tightening sequence and torque specification on FIG. 2.
- 9.5 Before returning the valve to service, the valve should be thoroughly leak tested using a soapy water solution. Brush a small amount of this solution onto the area to be tested. A constant bubbling of the liquid indicates a leak. Do not submerge the valve in the test solution. Carefully check the area around the cover gasket and around the connector.

# FIG. 1 CONTROL VALVE DETAIL

## MEDIA COMPATIBILITY

- 304 STAINLESS STEEL BODY AND COVER,  
NYLON PISTON,  
CORROSION RESISTANT STEPPER MOTOR

## ELECTRICAL SPECIFICATION

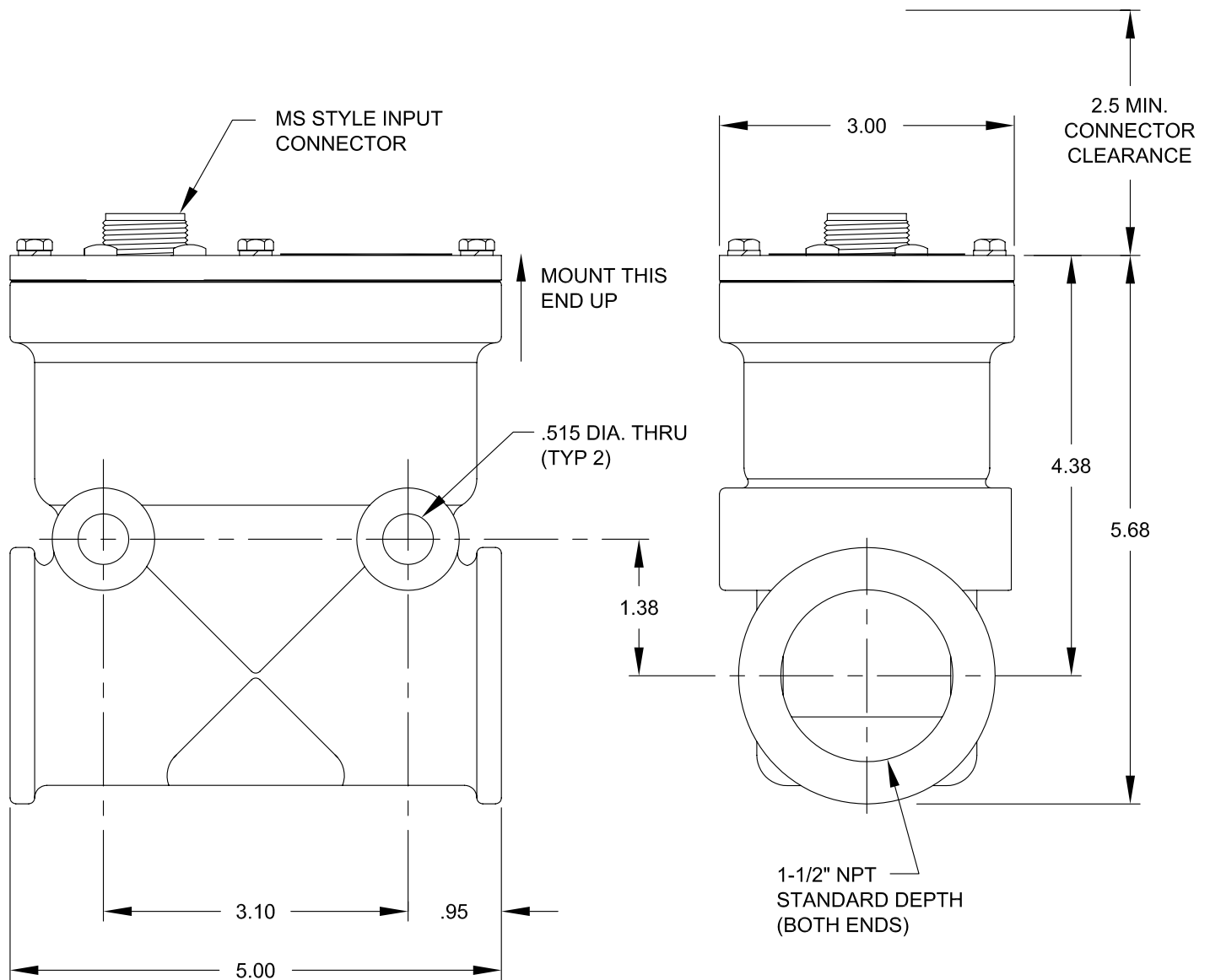
- 12 VOLTS @ 5 WATTS MAX.

## MAX. WORKING PRESSURE

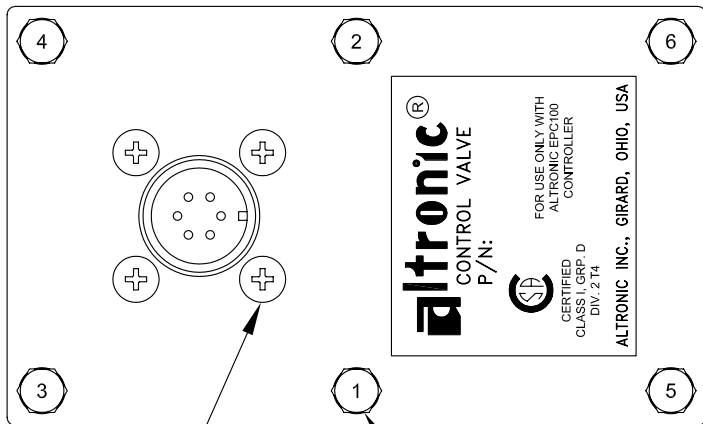
- 40 PSIG

## MAX. OPERATING TEMPERATURE

- -40°F TO 175°F



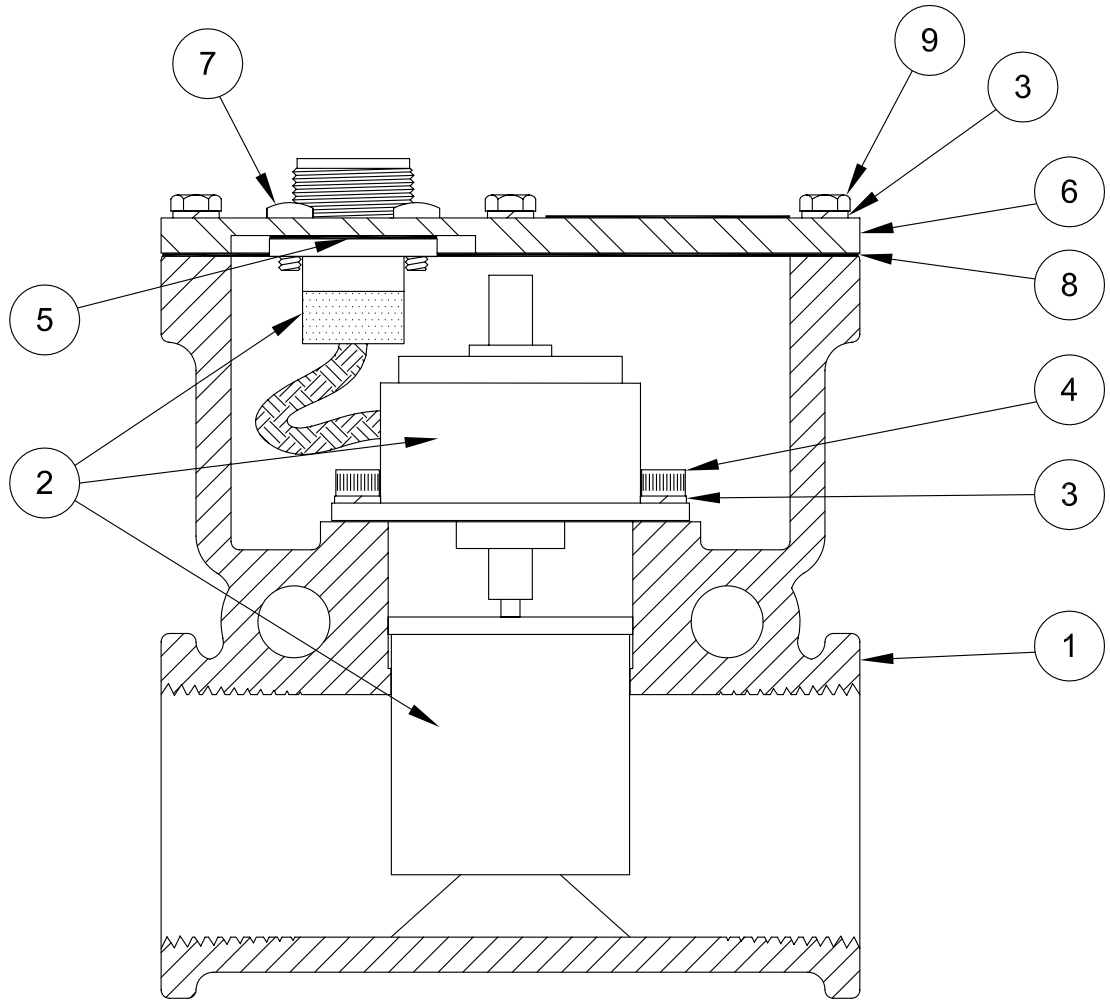
# FIG. 2 PART BREAKDOWN - CONTROL VALVE



**Altronic**<sup>®</sup>  
CONTROL VALVE  
P/N:  
FOR USE ONLY WITH  
ALTRONIC EPC100  
CONTROLLER  
CERTIFIED  
CLASS I, GRP. D  
DIV. 2 14  
ALTRONIC INC., GIRARD, OHIO, USA

TORQUE TO  
10 IN/LBS.

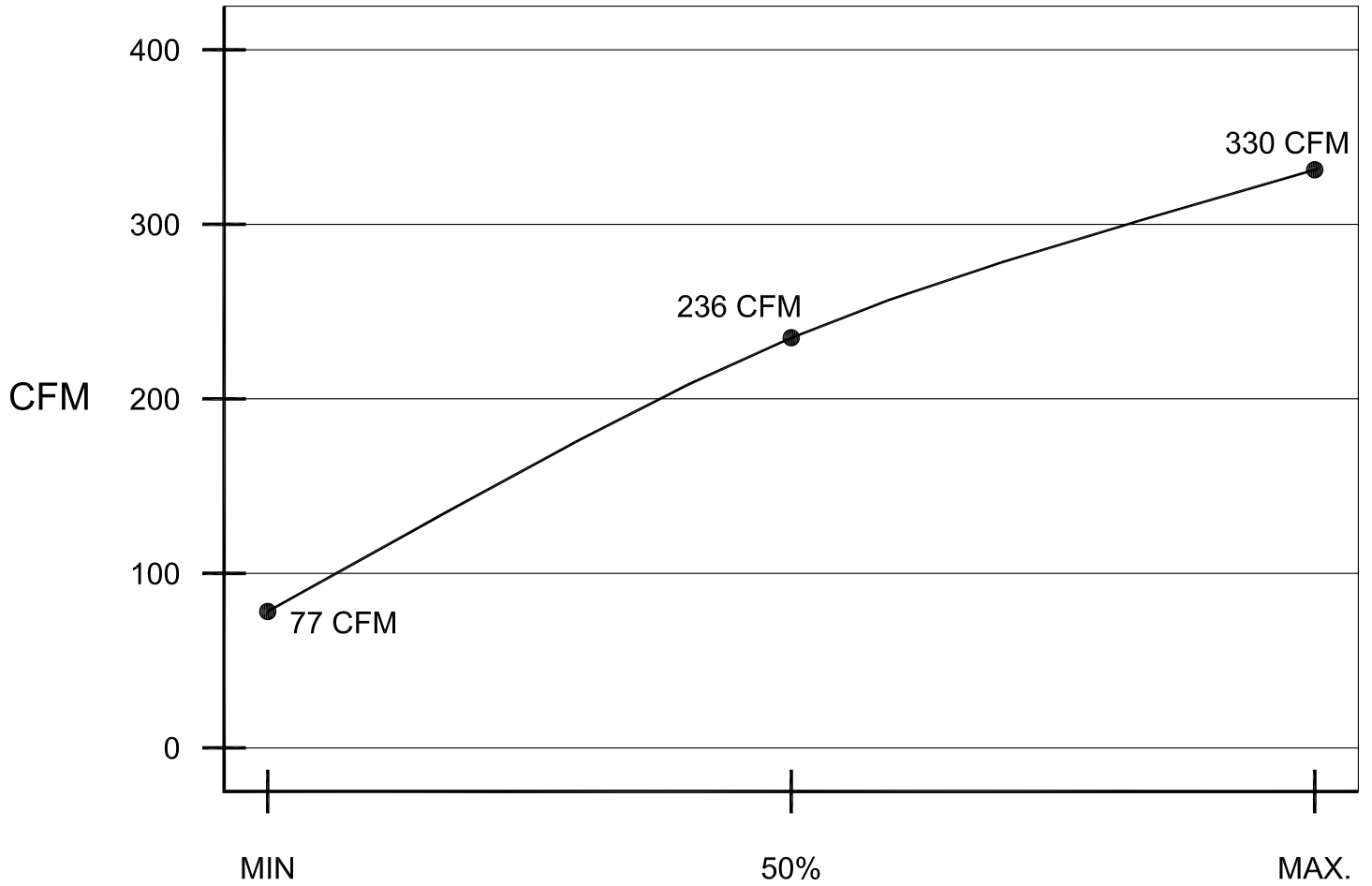
TORQUE TO 50 IN/LBS.  
IN SEQUENCE SHOWN



**FIG. 2 - PARTS IDENTIFICATION**

ITEM NO.	QUANTITY	PART NO.	DESCRIPTION
1	1	610651	Valve Body, Machined
2	1	680003-1	Motor-Piston Assembly (690154-1)
		680003-2	Motor-Piston Assembly (690154-2)
3	1	901004	Lockwasher #10
4	1	902628	Screw 8-32 x 1/2" Socket Hd
5	1	501335	Gasket, Connector
6	1	610609	Cover Plate
7	1	902632	Screw 8-32 x 3/8" Seal Rd Hd
8	1	610610	Gasket, Cover Plate
9	1	902472	Screw 10-24 x 5/8" Hex Hd

# FIG.3 FLOW CURVE FOR 690154-1



VALVE TRAVEL  
DATA TAKEN @ 1 PSI & 65°F