



**DYNA 70025**  
**APECS Integrated Actuator**  
**For Stanadyne “D” Series Injection Pumps**

**Installation Guide**



## WARNING

Read this entire manual and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment. Practice all plant and safety instructions and precautions. Failure to follow instructions can cause personal injury and/or property damage.

The engine, turbine, or other type of prime mover should be equipped with an overspeed shutdown device to protect against runaway or damage to the prime mover with possible personal injury, loss of life, or property damage.

The overspeed shutdown device must be totally independent of the prime mover control system. An overtemperature or overpressure shutdown device may also be needed for safety, as appropriate.



## CAUTION

To prevent damage to a control system that uses an alternator or battery-charging device, make sure the charging device is turned off before disconnecting the battery from the system.

Electronic controls contain static-sensitive parts. Observe the following precautions to prevent damage to these parts.

- Discharge body static before handling the control (with power to the control turned off, contact a grounded surface and maintain contact while handling the control).
- Avoid all plastic, vinyl, and Styrofoam (except antistatic versions) around printed circuit boards.
- Do not touch the components or conductors on a printed circuit board with your hands or with conductive devices.



## IMPORTANT DEFINITIONS

**WARNING**—indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



**CAUTION**—indicates a potentially hazardous situation which, if not avoided, could result in damage to equipment.



**NOTE**—provides other helpful information that does not fall under the warning or caution categories.

**Revisions**—Text changes are indicated by a black line alongside the text.

Woodward Governor Company reserves the right to update any portion of this publication at any time. Information provided by Woodward Governor Company is believed to be correct and reliable. However, no responsibility is assumed by Woodward Governor Company unless otherwise expressly undertaken.

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## Electrostatic Discharge Awareness

All electronic equipment is static-sensitive, some components more than others. To protect these components from static damage, you must take special precautions to minimize or eliminate electrostatic discharges.

Follow these precautions when working with or near the control.

1. Before doing maintenance on the electronic control, discharge the static electricity on your body to ground by touching and holding a grounded metal object (pipes, cabinets, equipment, etc.).
2. Avoid the build-up of static electricity on your body by not wearing clothing made of synthetic materials. Wear cotton or cotton-blend materials as much as possible because these do not store static electric charges as much as synthetics.
3. Keep plastic, vinyl, and Styrofoam materials (such as plastic or Styrofoam cups, cup holders, cigarette packages, cellophane wrappers, vinyl books or folders, plastic bottles, and plastic ash trays) away from the control, the modules, and the work area as much as possible.
4. Do not remove the printed circuit board (PCB) from the control cabinet unless absolutely necessary. If you must remove the PCB from the control cabinet, follow these precautions:
  - Do not touch any part of the PCB except the edges.
  - Do not touch the electrical conductors, the connectors, or the components with conductive devices or with your hands.
  - When replacing a PCB, keep the new PCB in the plastic antistatic protective bag it comes in until you are ready to install it. Immediately after removing the old PCB from the control cabinet, place it in the antistatic protective bag.



### CAUTION

To prevent damage to electronic components caused by improper handling, read and observe the precautions in Woodward manual 82715, *Guide for Handling and Protection of Electronic Controls, Printed Circuit Boards, and Modules*.

# Chapter 1.

## Installation Instructions

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This manual provides instructions on the installation and calibration of the DYNA 70025 integrated actuator for Stanadyne "D" series injection pumps.

### Removal of Existing Governor Control Cover

1. Clean exterior of pump with solvent and dry with compressed air before removing the governor control cover. Place a suitable container under the fuel injection pump to catch any fuel that may spill when removing the cover.
2. Remove the fuel return line from the pump's return line connector assembly. Use two wrenches to loosen. See Figure 1.
3. Remove the return line connector assembly from the governor control cover using care not to allow dirt to enter the injection pump. Remove and discard the return line connector O-ring. Set aside the return line connector for later installation on the new actuator cover assembly.
4. Remove the electric shutoff (ESO) solenoid wire from the governor control cover. Trace the solenoid wire back to its source. Remove and discard the wire.

**CAUTION: Do not use this wire to power the new integrated actuator.**

5. Loosen the three cover screws and remove the governor control cover assembly from the pump. Save all three screws for later installation of the integrated actuator cover assembly.

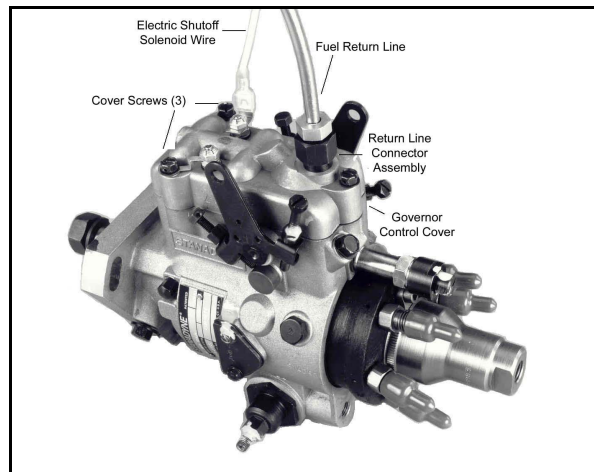


Figure 1

## Installing New Integrated Actuator Cover Assembly

1. Install new cover seal (item 2) into the groove of the integrated actuator cover assembly as shown in Figure 2.
2. Align and hold the metering valve drive coupling parallel to the side of integrated actuator cover as shown in Figure 3.
3. Position the integrated actuator cover assembly into the top of the pump while holding the metering valve drive coupling parallel to the pump body. Slightly lift the front portion of the integrated actuator cover as shown in Figure 4.
4. Carefully slide the integrated actuator cover toward the rear of the pump until the horseshoe portion of the metering valve drive coupling contacts the pump's governor linkage hook as shown in Figure 5. Once contact has been made, continue moving the integrated actuator cover in the same direction until the mounting holes between the integrated actuator cover and the pump body are aligned.

**CAUTION:** Failure to properly install the metering drive coupling to the pump's governor linkage can result in serious damage.

5. Retrieve the three cover screws from the original governor control cover. Assemble integrated actuator cover to the pump body with these screws. Tighten to 35-45 lbs./in.
6. Install a new O-ring (item 3), on the return line connector assembly retained from the original governor control cover. Apply a light coating of all-purpose grease to the O-ring and install connector into the 7/16-20 UNF-2A threaded hole located in the integrated actuator cover. Tighten to 43-53 lbs./in. See CAUTION below.

**CAUTION:** If the return line connector is a 7/16-20 UNF-2A, Step 2 can be completed. If the return line connector is not 7/16-20 UNF-2A, there are two possible solutions:

### OPTION 1

A Stanadyne 21251 return line connector may be used to replace the return line connector assembly on the return fuel line.

### OPTION 2

A Stanadyne 24509 connector body can be used to mate the 1/8-27 NPT return line connector assembly to the 7/16-20 UNF-2A threaded hole located in the integrated actuator cover.

7. Install the fuel return line to the return line connector. Hold return line connector in place and tighten fuel return line to engine manufacturer's specification.

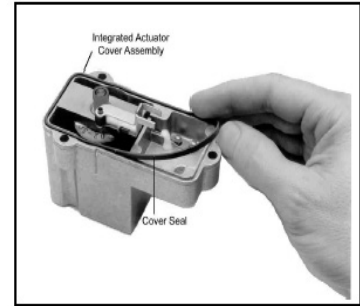


Figure 2

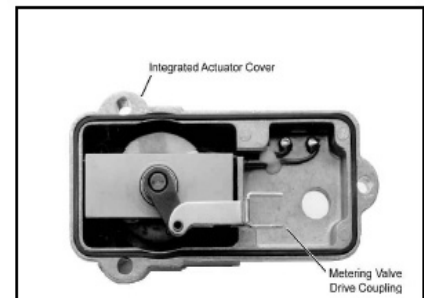


Figure 3

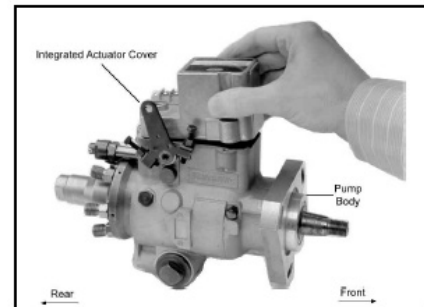


Figure 4

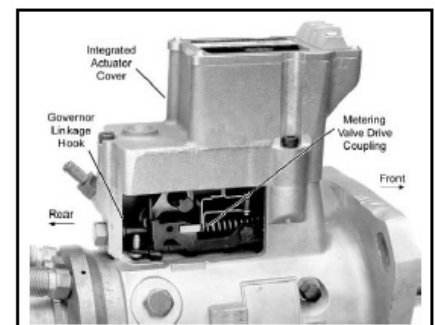


Figure 5

## Preliminary Set-Up Procedure

The following method will properly set up the mechanical governor for operation with the electronic integrated actuator. Proper calibration of both the mechanical and electronic governor must be performed in order for the system to operate properly. Failure to perform this procedure properly may result in inability to provide maximum power or cause poor steady state speed control.

**CAUTION: Perform Steps 1 thru 3 PRIOR to starting the engine.**

1. Position the shut-off shaft assembly (if equipped with one) in the “Fuel On” position by rotating it in the direction shown in Figure 6 until it reaches its limit of travel. Secure the shut-off shaft assembly in place with existing mechanical linkage. A spring may be used to hold it in place when there is no linkage.

**CAUTION: Do not attach springs to the engine’s high-pressure lines.**

2. Throttle shaft assemblies are often locked in the “High Idle” position on pumps equipped with speed droop governors. When this is the case, the low idle screw may be backed out a **maximum** of three (3) turns. This should only be done if the high idle speed is known to be greater than 12% above the rated speed. Excessive backing out of the low idle screw may result in the disengagement of the pump’s internal components.

### WARNING

This procedure must be followed carefully in order to not overspeed the engine and cause damage to the generator or other load.

3. Adjust the droop by turning the droop adjusting screw in a counter-clockwise (CCW) direction until it stops. See Figure 6. Some pumps may not be equipped with a speed droop adjustment.

Turn the droop adjusting screw clockwise (CW) two full turns. The mechanical governor is now set in a position that will permit starting the engine to calibrate the electric integrated actuator governor. Do not operate the engine without the electronic governor connected and the system calibrated properly as described in the calibration chapter.

Once this droop adjustment has been made, do not readjust.

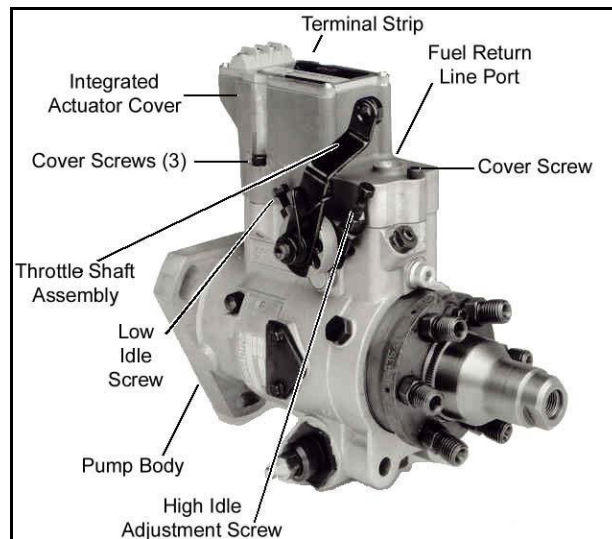


Figure 6

## Magnetic Pickup Installation

Refer to Manual 36535.

## Governor Control Box Installation

**CAUTION: Make certain that proper voltage (12 or 24 Vdc) governor control box and integrated actuator assembly are used.**

1. Wire and pre-set the adjustments of the integrated governor system as described in the wiring and calibration information for the controller's specific part number. Make certain to use the shielded wire and the twisted cables as shown in the installation information. Connect actuator wires to the two center terminals on the terminal strip. Do not connect any other wires to the actuator than the ones from the governor control box.
2. The mechanical governor is to be set 12% higher than the desired running speed. Calculate the maximum speed setting for the mechanical governor as follows:

EXAMPLE: If desired speed is 1800 RPM for electronic governing, then  $1800 \times 0.12 = 216$  RPM:  $1800 + 216 = 2016$  RPM.



## Chapter 2. Calibration

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1. Make certain the electronic governor adjustments are set as stated in the proper governor literature. The speed adjustment is a 20-turn potentiometer on the DYN1-10784 and DYN1-10794 control boxes. Turn it counterclockwise (CCW) 20 turns and then clockwise (CW) 5 turns.
2. Rotate and hold the throttle shaft lever to maximum position as permitted by present high idle screw adjustment. Do not attempt at this time to adjust the high idle screw beyond its present setting.
3. Turn on the DC power to the system.

NOTE: Be sure Step 1 above has been performed.

4. Start the engine. The engine should be operating on the integrated actuator cover governor. The speed should be below 1800 RPM or the desired speed.

NOTE: Check for fuel leaks.

5. Slowly, using the governor control box speed adjustment, increase the engine speed. (If the engine does not increase in speed, follow the troubleshooting procedure in the governor manual.)
6. Keep increasing the speed until it is approximately 20 RPM higher than the speed calculated in Step 2 of the control box installation procedure. If this speed cannot be obtained, loosen the jam nut on the high idle speed adjustment screw of the throttle lever and turn the high idle adjustment screw counterclockwise (CCW) until the calculated speed can be obtained. See Figure 6.
7. Set the speed with the electronic governor to the value calculated in Step 2 of the control box installation procedure. Then *slowly* turn the high idle adjustment screw on the throttle lever clockwise (CW) until the speed just starts to decrease. Turn the high idle adjustment screw counterclockwise (CCW) until the speed just controls at the proper calculated speed. Tighten the high idle adjusting screw locknut to 35-45 lbs/in.
8. Turn the low idle screw clockwise (CW) to lock the throttle lever at this maximum position. Tighten the low idle adjustment screw locknut to 35-45 lbs/in.

NOTE: On some pump bodies, the low idle adjustment screw may not be able to position the throttle lever to the proper position. If it cannot hold the throttle to the proper position, use a spring to hold the throttle to the maximum position, otherwise maximum speed and power will not be obtainable.

**CAUTION: Do not attach springs to the engine's high pressure lines.**

9. Decrease the speed on the electronic governor control box until the desired run speed is obtained.
10. Properly calibrate the adjustments of the electronic governor. Check the system for good response and stability at all possible loads and speeds.
11. Shut off the engine.

## Chapter 3. Parts List

### Governor Assembly

ITEM	DESCRIPTION	PART NUMBER	QTY.
1	Integrated actuator *	DYNC-70025	1
2	Cover seal	L5-162	1
3	O-ring for fuel return	L5-163	1
4	Controller	See Notes a & b	1

#### NOTES

(a) DYN1-1078X analog controller w/o remote speed

(b) DYN1-1079X analog controller with remote speed

"X" Specify operating frequency

(\*) Specify voltage

### Optional Control Components

ITEM	DESCRIPTION	PART NUMBER	QTY.
--	Magnetic pickup (3/8" dia.)	DYNT-17200	1
--	Remote speed potentiometer	DYNS-10000	1

## Chapter 4. Service Options

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### Product Service Options

The following factory options are available for servicing Dyna 70025 Actuators, based on the standard Woodward Product and Service Warranty (5-01-1205) that is in effect at the time the product was purchased from Woodward or the service is performed:

- Replacement/Exchange (24-hour service)

If you are experiencing problems with installation or unsatisfactory performance of an installed system, the following options are available:

- Consult the troubleshooting guide in the manual.
- Contact QCC technical assistance (see “How to Contact Woodward” later in this chapter) and discuss your problem. In most cases, your problem can be resolved over the phone. If not, you can select which course of action you wish to pursue based on the available services listed in this section.

### Replacement/Exchange

Replacement/Exchange is a premium program designed for the user who is in need of immediate service. It allows you to request and receive a new replacement unit in minimum time (usually within 72 hours of the request), providing a suitable unit is available at the time of the request, thereby minimizing costly downtime.

How to Contact QCC for a replacement unit:

In North America use the following address when shipping or corresponding:

QCC LLC  
7301 W. Wilson Avenue  
Harwood Heights, IL 60706

Telephone—+1 708-887-5400  
sales@qccorp.com



## Replacement Parts

When ordering replacement parts for controls, include the following information:

- the part number(s) (XXXX-XXXX) that is on the enclosure nameplate;
- the unit serial number, which is also on the nameplate.

## How to Contact QCC

In North America use the following address when shipping or corresponding:

QCC LLC  
7301 W. Wilson Avenue  
Harwood Heights, IL 60706

Telephone—+1 708-887-5400

Or order online at [QCC.Parts](http://QCC.Parts)

## Technical Assistance

If you need to telephone for technical assistance, you will need to provide the following information. Please write it down here before phoning:

### General

Your Name \_\_\_\_\_  
Site Location \_\_\_\_\_  
Phone Number \_\_\_\_\_  
Fax Number \_\_\_\_\_  
Application \_\_\_\_\_

### Control/Governor Information

Please list all Woodward governors, actuators, and electronic controls in your system:

Part Number and Revision Letter
Control Description or Governor Type
Serial Number

*If you have an electronic or programmable control, please have the adjustment setting positions or the menu settings written down and with you at the time of the call.*

**We appreciate your comments about the content of our publications. Send  
comments to: [weborder@qccorp.com](mailto:weborder@qccorp.com)  
Please include the manual number from the front cover of this publication.**



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