Barber-Colman Integrated Actuator for Stanadyne "D" Series Injection Pump — Model DYNA 70025

Installation Procedure

**STEP I**

**REMOVAL OF EXISTING GOVERNOR CONTROL COVER**

--- NOTE ---

Clean outside of pump with solvent and dry with compressed air prior to removing the GOVERNOR CONTROL COVER. A suitable container should be placed underneath the fuel injection pump to catch any fuel that may spill when removing the GOVERNOR CONTROL COVER.

1.0 Remove the FUEL RETURN LINE from the pump's RETURN LINE CONNECTOR ASSEMBLY. Use two wrenches to loosen. See Figure 1.

1.1 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 INTEGRATED ACTUATOR COVER ASSEMBLY.

1.2 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.

1.3 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.
STEP 2
INSTALLING THE NEW INTEGRATED ACTUATOR COVER ASSEMBLY

2.0 Install new COVER SEAL — Item 2 from the parts list, into the groove of the INTEGRATED ACTUATOR COVER ASSEMBLY as shown in Figure 2.

2.1 Align and hold the METERING VALVE DRIVE COUPLING parallel to the side of the INTEGRATED ACTUATOR COVER as shown in Figure 3.

2.2 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.

2.3 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 VALVE DRIVE COUPLING to the pump’s GOVERNOR LINKAGE can result in serious damage.

2.4 Obtain three COVER SCREWS retained from the original GOVERNOR CONTROL COVER. Assemble the INTEGRATED ACTUATOR COVER to the PUMP BODY with these screws. Tighten screws to 35 - 45 lbs/in.

2.5 Install a new O-RING — Item 3 from the parts list, 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 following on page 3.
Steps 3.0 thru 3.3 are performed PRIOR to starting the engine.

3.0 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.

3.1 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.

3.2 Adjust the droop by turning the DROOP ADJUSTING SCREW in a counterclockwise (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 ELECTRONIC INTEGRATED ACTUATOR GOVERNOR. Do not operate the engine without the electronic governor connected and the system calibrated properly as described in Step 6.

Once this droop adjustment has been made, do not readjust.
STEP 4
MAGNETIC PICKUP INSTALLATION

4.0 Refer to Bulletin Number 2, F-16457-1.

STEP 5
GOVERNOR CONTROL BOX INSTALLATION

--- CAUTION ---
Make certain that proper voltage (12 or 24 Vdc) GOVERNOR CONTROL BOX and INTEGRATED ACTUATOR ASSEMBLY are used.

5.0 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 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.

5.1 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.

STEP 6
CALIBRATION PROCEDURE

6.0 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.

6.1 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.

6.2 Turn on the DC power to the system.

--- NOTE ---
Be sure Step 6.0 has been performed.

6.3 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.

6.4 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)

6.5 Keep increasing the speed until it is approximately 20 RPM higher than the speed calculated in Step 5.1. 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.

6.6 Set the speed with the electronic governor to the value calculated in Step 5.1. 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.

6.7 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 or maximum speed and power will not be obtainable.

—— CAUTION ————
Do not attach springs to the engine’s high pressure lines.

6.8 Decrease the speed on the ELECTRONIC GOVERNOR CONTROL BOX until the desired run speed is obtained.

6.9 Properly calibrate the adjustments of the electronic governor.

Check the system for good response and stability at all possible loads and speeds.

STEP 7
SHUT OFF ENGINE
Parts List

Table 1: Governor Assembly
Specify voltage when ordering Items 1 and 4

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Barber-Colman Part Number</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Integrated Actuator</td>
<td>DYNC-70025</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Cover Seal</td>
<td>L5-162</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>O-Ring for Fuel Return</td>
<td>L5-163</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Controller — See options below (Items 5 &amp; 6)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Optional Control Components

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Barber-Colman Part Number</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Controller — Analog without Remote Speed</td>
<td>DYN1-1078X</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Controller — Analog with Remote Speed</td>
<td>DYN1-1079X</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Magnetic Pickup — 3/8 In. Dia.</td>
<td>DYNT-17200</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>Remote Speed Potentiometer</td>
<td>DYNS-10000</td>
<td>1</td>
</tr>
</tbody>
</table>

"X" Specify operating frequency

CAUTION
As a safety measure, the engine should be equipped with an independent overspeed shutdown device in the event of failure which may render the governor inoperative.

NOTE
Barber-Colman believes that all information provided herein is correct and reliable and reserves the right to update at any time. Barber-Colman does not assume any responsibility for its use unless otherwise expressly undertaken.