Dual Fuel QSK50 Well Servicing Leak Check Procedure

1. Full System External Leak Check
When to Leak Check the Gas System

This leak test procedure tests the sealing of all Cummins Dual Fuel Gas System connections and components. Only qualified personnel should perform this test.

A leak check shall be performed with:
1. Air using 4.5 +/- 0.5 psig pressure
   a) Pressure shall NOT exceed 5 psig at any point during testing

A full system external leak check shall be performed for:
1. Before initial system startup
2. Every year the system exists on engine
3. After any service event that requires breaking a sealed gas system connection
### Pressure Testing Service Tools:

<table>
<thead>
<tr>
<th>Tool Description</th>
<th>Image</th>
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<tbody>
<tr>
<td>¼” NPT Male Schrader fitting</td>
<td><img src="image1.png" alt="Image" /></td>
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<tr>
<td>¼” NPT Male with Hose Spigot</td>
<td><img src="image2.png" alt="Image" /></td>
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<tr>
<td>1.44” – 1.55’ Expanding plug + Nylon chord and Plastic tag</td>
<td><img src="image3.png" alt="Image" /></td>
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<tr>
<td>McMaster Carr P/N 2527K17, Neoprene seal – max air pressure 5psig</td>
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<tr>
<td>All purpose leak detection solution or soapy water</td>
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DSOV DIN Connector Pin Locations

- DIN Connector
- PIN 1: Neg DC
- PIN 3: Valve 2 + DC
- PIN 2: Valve 1 + DC
- PIN Ground: AC not used

Gas Flow

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System Preparation - All Leak Check Procedures

1. Remove the Air Plenums just in front of the Turbocharger Mixer.
2. Install the Neoprene plug into the Gas inlet port of the mixer
3. Allow the plastic tag to dangle freely outside of the turbo mixer for the duration of leak checking
4. Repeat steps 1-3 for the opposite mixer
1. Install the Schrader Fitting onto one of the test ports on the upstream OEM connection Flange.
Leak Check – Full System External Leak Check

1. With a 24 Volt DC power source, energize pins 2 and 3 on the DSOV DIN connector. Both valves of the Dual Shutoff Valve will open (this should be audible).
   a) If a 24 Volt DC power source is not readily available, use alternate procedure listed on slide 18.

2. Close the OEM manual Ball Valve; Pressurize the System

   IF USING OEM GAS SUPPLY CONNECTION:
   a) The system can be pressurized through the OEM gas supply connection. Be sure that all knockdown regulators and OPPD devices are properly installed in front of the Gas Train.
   b) Pressurize the OEM Gas Supply with AIR
   c) Be sure that no more then 5 psig is allowed in front of the OEM manual Ball Valve
   d) SLOWLY open the OEM manual Ball Valve to pressurize the system

   IF USING THE PROVIDED SCHRADER VALVE
   a) SLOWLY Pressurize the Gas System with AIR through the Schrader Valve
   b) Be sure that no more then 5 psig is allowed to charge the Gas System
Leak Check – Full System External Leak Check

3. Apply an all purpose liquid leak detector solution to the Gas System. The presence of bubbles indicates a leak, which needs to be rectified before proceeding. Check all gas conveying pipes and connections from gas train inlet to engine side mixer including:
   a) “External Leakage Test Areas” indicated on the DSOV illustration
   b) Accessories mounted to the safety valve
   c) All gas piping and gas components downstream of the equipment isolation valve
   d) O-ring area of gas tubes
   e) The inlet and outlet gas piping of the automatic safety shutoff valve.

4. Let the system stand charged for 10 minutes. During this time, NO loss of pressure shall occur.
   a) Clamp both push button valves below the LP Pressure Gauge and HP Pressure Gauge for the full duration of the leak check
   b) Observe both gauges for a loss in pressure

5. De-pressurize the system and De-energize the DSOV
   a) Release pressure via the Schrader valve
Finishing Steps

1. Remove the Neoprene plug from the Gas inlet port of the mixer
2. Install the Air Plenums just in front of the Turbocharger Mixer.
3. Repeat steps 1-2 for the opposite mixer
Finishing Steps

1. Remove the Schrader Fitting from the test port on the upstream OEM connection Flange.
Alternate Procedure for Opening DSOV w/o 24 V DC Supply

1. Unplug CR2 (the middle of the three relays) inside the panel.
2. Insert a jumper wire from the bottom right terminal of that relay to one of the ground connections on the right side of the panel labeled 2001 (See green wire in pictures below)
2. Plug the relay back in to hold both valves in the DSOV open.
3. To open the individual valves within the DSOV, unplug the appropriate fuse. FU3 corresponds to V2 and FU4 corresponds to V1.