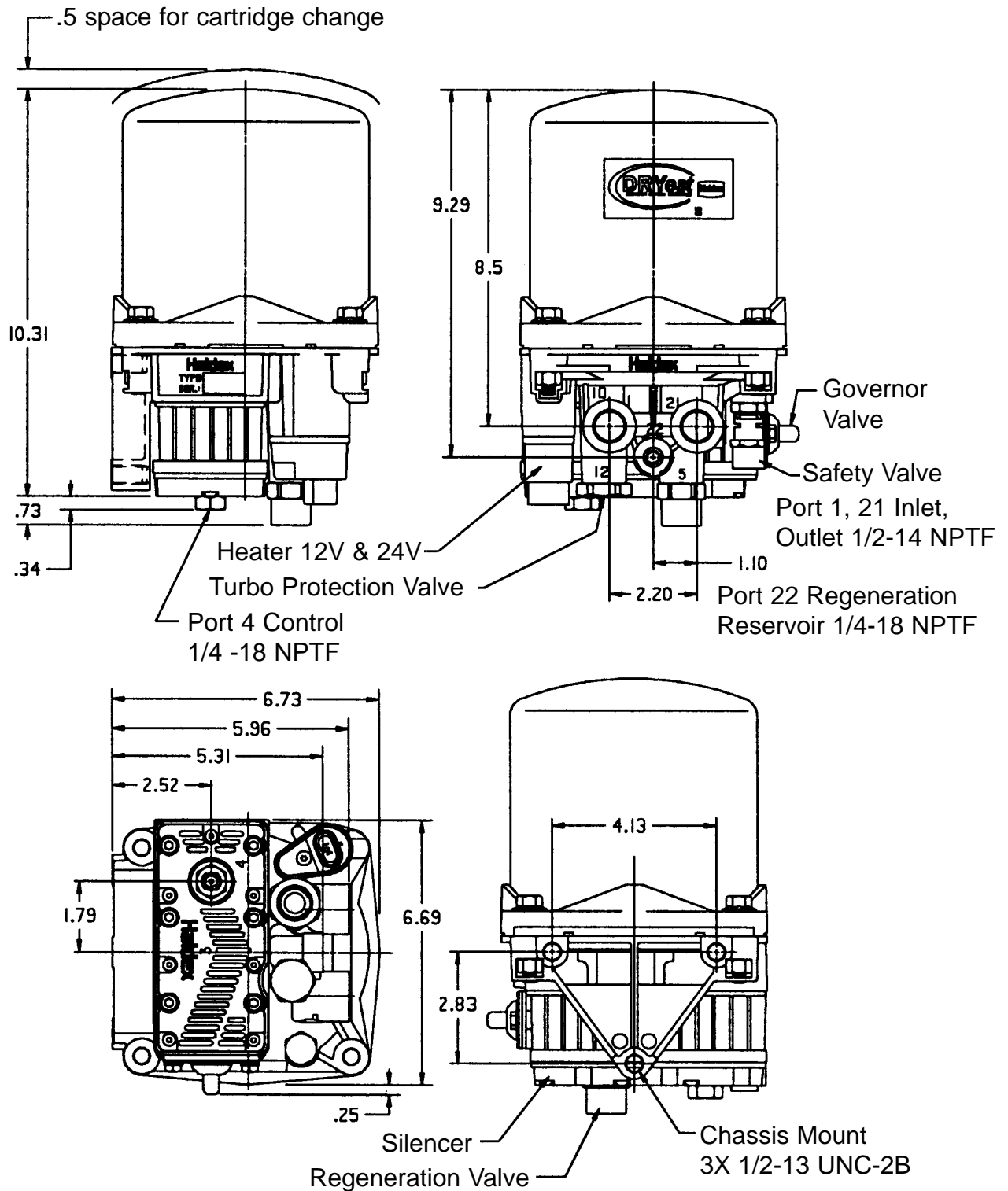




# DRYest Air Dryer Installation and Maintenance



The Haldex DRYest is a desiccant type dryer that effectively removes moisture, oil and contaminants from the compressed air system. This reduces the risk of freezing or corrosion of the components in the air system. When compressor cut-out is reached, dry air is allowed to flow back to regenerate the desiccant bed. The SIX (6) different applications available for the DRYest are illustrated on the next page.

# Application Schematics

FIG. 2.A. Standard System Regeneration with Integrated Governor

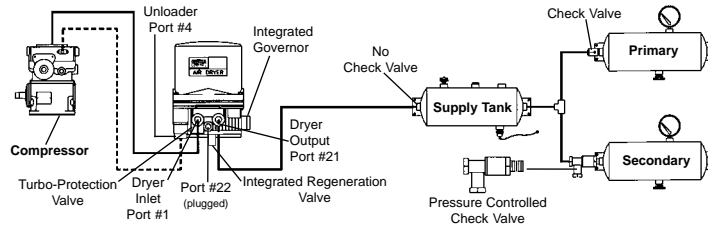


FIG. 2.B System Regeneration with External Governor

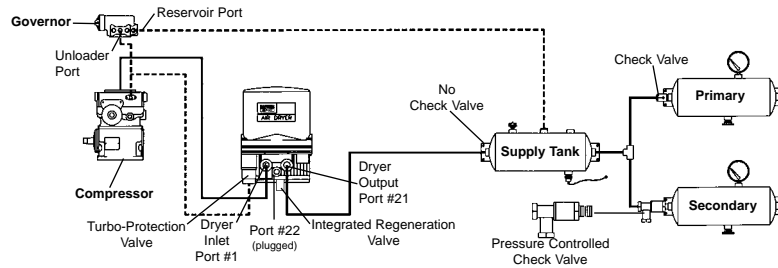


FIG. 2.C External Purge Tank Regeneration with Integrated Governor

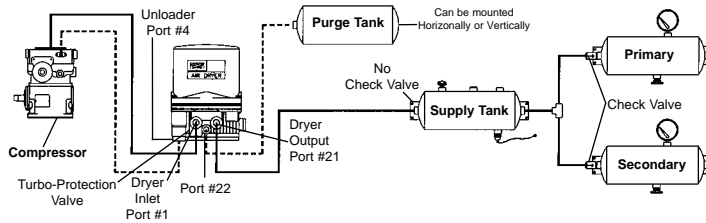


FIG. 2.D External Purge Tank Regeneration with External Governor

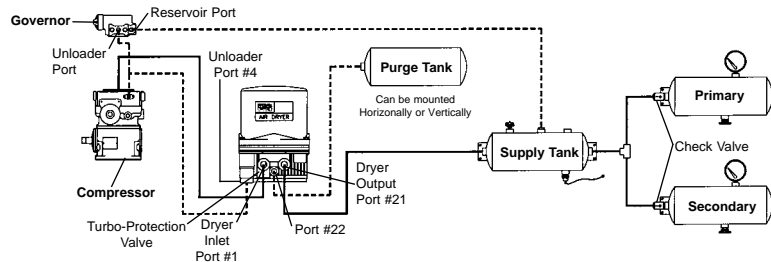


FIG. 2.E Blow Thru: External Purge Tank with Integrated Governor

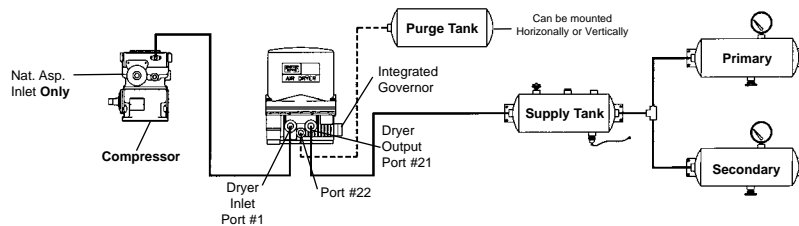
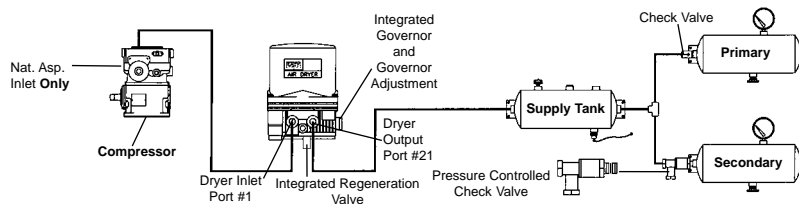


FIG. 2.F Blow Thru: System Regeneration with Integrated Governor



# Installing the DRYest

## **IMPORTANT CAUTION**

1. Park the vehicle on a level surface, apply the parking brakes and always block the wheels.
2. Stop the engine when working around the vehicle.
3. Make certain to drain the air pressure from all reservoirs before beginning any work on the vehicle.
4. Following the vehicle manufacturer's recommended procedures; deactivate the electrical system in a manner that removes all electrical power from the vehicle.
5. When working in the engine compartment, the engine should be shut off. Where circumstances require that the engine be in operation, extreme caution should be used to prevent personal injury resulting from contact with moving, rotating, leaking, heated or electrically charged components.
6. Never connect or disconnect a hose or line containing pressure. Never remove a component plug unless you are certain all system pressure has been depleted.
7. Never exceed recommended pressures and always wear safety glasses.
8. Do not attempt to install, remove, disassemble or assemble a component until you have read and thoroughly understand the recommended procedures. Use only the proper tools and observe all precautions pertaining to the use of those tools.
9. Use only genuine Haldex replacement parts, components and kits. Replacement hardware, tubing, fitting, etc should be of equivalent size, type and strength as original equipment and be designed specifically for such applications and systems.
10. Components with stripped threads or damaged parts should be replaced rather than repaired. Repairs requiring machining or welding should not be attempted unless specifically approved and stated by the vehicle or component manufacturer.
11. Prior to returning the vehicle to service, make certain all components and systems are restored to their proper operating condition.

## **General**

The vehicle installation guidelines presented in the Application Schematic apply to all DRYest Air Dryer installations. Determine your system configuration and plumb accordingly. Vehicles with the Holset Type-E or QE compressor require the following additional instructions.

Haldex "isolation valve" must be mounted before the DRYest. Consult Cummins for additional plumbing requirements.

## **Mounting on Vehicle**

1. Locate with sufficient space to facilitate service & visual access.
2. Mount away from direct tire splash.
3. Brackets, Fittings and Lines to be mounted in a protected area.
4. Exhaust port downward.
5. Mount in area to avoid excessive heat.
6. Rigid mount to avoid excess vibration.
7. Line from compressor to DRYest should have continuous downward slope and no dips.
8. 90° Fittings should be avoided.
9. Not to exceed 15° inclination.
10. Maintain a minimum of ½" above the dryer for access to the desiccant cartridge.
11. The dryer is equipped with an integrated mounting bracket. The enclosed template is to be used to drill three (3) 9/16" holes. If the dryer is to be bolted directly to the frame or support member, check vehicle manufacturer's recommendations.
12. A mounting bracket can be used if necessary.
13. Install the dryer using the enclosed ½" bolts. Tighten to 45-55 ft-lb.

## **Heater Connection**

1. Locate a circuit with the correct voltage that is "hot" when the ignition is "ON". The current draw is 8 amp@12V; 4amp@24V. A 10-15amp fuse is recommended in this line. Connect one heater lead to this wire.
2. Connect other lead to a good ground on vehicle chassis or electrical junction box.
3. For upgrade heater and connector information see " Service Information".

## Installing the DRYest (con'd)

### **Compressor Discharge Line**

#### **General**

While minimum diameters are specified, larger line diameters generally improve performance and life and reduce temperatures, particularly in severe applications.

1. The compressor discharge line material should be wire braided "Teflon" hose, copper tubing or a combination of both.
2. Compressor discharge line lengths and inside diameter requirements are dependent on the vehicle application.
3. The dryer inlet temperature must be less than 170°F. This can normally be accomplished with 12' to 15' of air compressor discharge line length.
4. Excessive line length should also be avoided to prevent freeze-up. The dryer inlet temperature must be greater than 40°F. If the discharge line exceeds 15', the line can be insulated as needed to prevent freeze-up.

#### **Air Connections**

1. Connect a suitable line from the compressor to the ½" NPT Inlet Port #1.
2. From the ½" NPT dryer outlet, Port #21, use a suitable line and connect to the supply tank.
3. Connect a ¼" nylon line or equivalent for control line(s).

#### **Exhaust Line**

1. If it is necessary to direct DRYest Air Dryer discharge contaminates away from vehicle components, it will be necessary to purchase an air dryer with special hose fitting option.

## Testing the DRYest

Before placing the vehicle in service, perform the following tests.

1. Close all reservoir drain cocks.
2. Build up system air pressure to governor cut-out and note that the air dryer purges with an audible exhaust of air. If system 2.E or 2.F is used, the purge will be followed by a steady pulsating flow of air indicating that the system is "unloaded" and is venting to atmosphere.
3. Actuate the service brakes to reduce system air pressure to governor cut-in. Note that the system once again builds to full pressure and is followed by a purge.
4. It is recommended that the vehicle be tested for leakage using the following procedure to assure that the air dryer will not cycle excessively:
  - A. Apply the parking brakes, build system pressure to governor cut-out and allow pressure to stabilize for at least 1 min.
  - B. Observe the dash gauge pressures for 2 min. and note any pressure drop. Pressure drop should not exceed 4 psi with brake released and 6 psi with brakes applied. Any noticeable leakage must be repaired to avoid excessive cycling.
  - C. On vehicles using "system regeneration": At cut-out pressure, system air is allowed to backflow from the secondary reservoir for desiccant regeneration. The vehicle secondary air gauge pressure will drop approximately 6 psi after the dryer purges.
5. Charge Cycle Time: During normal, daily operation the compressor should recover from governor cut-in to governor cut-out in 90 seconds or less at engine RPM's depending on vehicle vocation.
6. Purge Cycle Time: During normal vehicle operation, the air compressor must remain unloaded for a minimum of 30 seconds between charge cycles. This minimum purge time is required to insure complete regeneration of the desiccant.

# Troubleshooting

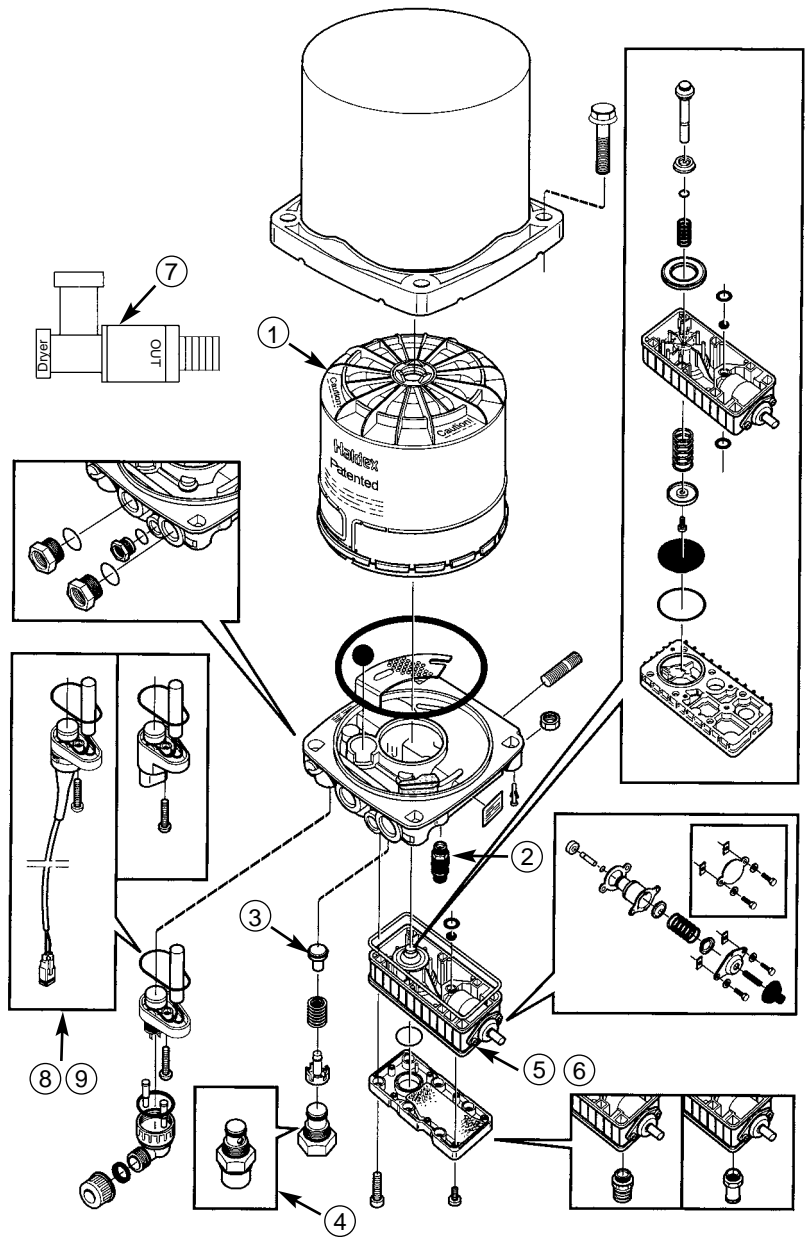
<b>Problem</b>	<b>Cause</b>	<b>Repair</b>
<b>Water in air system</b>	<ol style="list-style-type: none"> <li>1. Contaminants in desiccant.</li> <li>2. Leaks in air system.</li> </ol>	<ol style="list-style-type: none"> <li>1. Change desiccant cartridge. Check compressor for excessive oil passage.</li> <li>2. Tighten air connections, soap connection and recheck for leaks per Testing the <i>DRYest</i> section.</li> </ol>
<b>Constant exhaust of air at air dryer and not Blow-Thru Type</b>	<ol style="list-style-type: none"> <li>1. Defective dryer outlet check valve.</li> <li>2. Dryer unloading valve not closing.</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean valve seat and replace check valve.</li> <li>2. At compressor cut-out there <b>must</b> be a slight blow of regenerated air from the purge tank for approximately 30 seconds. If air flow continues, replace valve pack.</li> </ol>
<b>Excessive compressor cycling</b>	<ol style="list-style-type: none"> <li>1. Excessive leaks in air system.</li> <li>2. Defective dryer outlet check valve.</li> <li>3. Undersize compressor, duty cycle of compressor should not exceed 25%.</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten air connections, soap connection and recheck for leaks.</li> <li>2. Clean valve seat and replace check valve.</li> <li>3. Reduce air demand or use greater output compressor.</li> </ol>
<b>Safety valve is open</b>	<ol style="list-style-type: none"> <li>1. Desiccant cartridge is plugged.</li> <li>2. Ice block in dryer.</li> <li>3. Excessive system pressure.</li> </ol>	<ol style="list-style-type: none"> <li>1. Excessive oil passage from compressor. Check for worn compressor. Replace desiccant cartridge.</li> <li>2. Check heater function.</li> <li>3. Repair or replace governor.</li> </ol>
<b>Short life of dryer or desiccant cartridge</b>	<ol style="list-style-type: none"> <li>1. Air at inlet of dryer exceeds 170°F.</li> <li>2. Duty cycle of compressor does not allow for sufficient time for desiccant regeneration.</li> </ol>	<ol style="list-style-type: none"> <li>1. Extend length of compressor discharge line; see Installing the <i>DRYest</i> section. The 170°F dryer inlet temperature can usually be accomplished with 12' to 15' of compressor discharge line.</li> <li>2. During normal operation the compressor must remain unloaded for a minimum of 30 seconds to allow for sufficient purge. Lengthy loading times must be avoided. Air dryer must be "by-passed" in applications with high air use such as bulk unloading.</li> </ol>
<b>Poor drying efficiency</b>	<ol style="list-style-type: none"> <li>1. Air at inlet of dryer exceeds 170°F.</li> </ol>	<ol style="list-style-type: none"> <li>1. Extend length of compressor discharge line; see Installing the <i>DRYest</i> section. The 170°F dryer inlet temperature can usually be accomplished with 12' to 15' of compressor discharge line.</li> </ol>

# Service Parts

## General Instructions

The following parts are available for maintenance and repair. Each service kit comes with specific repair instructions.

1. Desiccant Cartridge: 47178964
2. Safety Valve: 47178275
3. Check Valve: 47177433
4. Regeneration Valve: 47177434
5. Valve Pack with Integrated Governor: 47177343
6. Valve Pack w/o Integrated Governor: 47177442
7. Pressure Controlled Check Valve: 47110007
8. 12 V Heater: 47110020
9. 24 V Heater: 47110021
10. Integrated Turbo Protection Valve: 47189189 (Not Shown)



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