



# Installation Instructions

Kit Piece Number  
5018534

## FIELD CONVERSION KIT FOR THE BENDIX AD-IS® EXTENDED PURGE AIR DRYER SYSTEM

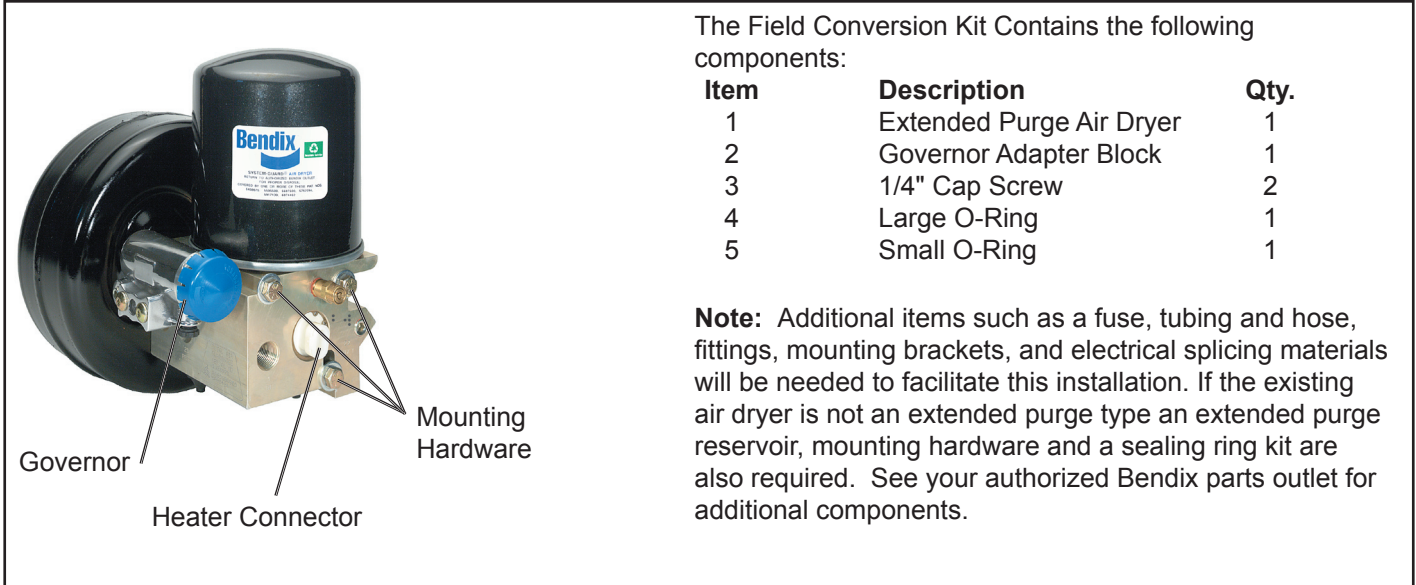


Figure 1 Bendix® AD-IS® Air Dryer Conversion Kit

### GENERAL

This modification kit is used to convert a vehicle from a single AD-IS® extended purge air dryer to a tandem AD-IS® extended purge system. The tandem system provides extra drying capacity to vehicles with large reservoir volumes. This kit facilitates the installation of a second air dryer and modification of the initial air dryer to operate in parallel. It provides extra drying capacity and is not an EverFlow™ air dryer system. Air from the compressor is delivered to both air dryers where it is cleaned and dried. The new air dryer passes its treated air to the existing air dryer for distribution to the primary and secondary reservoirs. If the existing AD-IS® air dryer is not an extended purge model, the purge volume reservoir must be replaced with an extended purge reservoir and is not included in this kit.

### VEHICLE PREPARATION

1. Park the vehicle on a level surface and prevent movement by means other than the brakes.
2. Drain all reservoirs to 0 p.s.i. **CAUTION:** Always depressurize the air dryer purge reservoir, and all other reservoirs on the vehicle to 0 p.s.i. before servicing the air dryer.

**WARNING! PLEASE READ AND FOLLOW THESE INSTRUCTIONS TO AVOID PERSONAL INJURY OR DEATH:**

When working on or around a vehicle, the following general precautions should be observed at all times.

The Field Conversion Kit Contains the following components:

Item	Description	Qty.
1	Extended Purge Air Dryer	1
2	Governor Adapter Block	1
3	1/4" Cap Screw	2
4	Large O-Ring	1
5	Small O-Ring	1

**Note:** Additional items such as a fuse, tubing and hose, fittings, mounting brackets, and electrical splicing materials will be needed to facilitate this installation. If the existing air dryer is not an extended purge type an extended purge reservoir, mounting hardware and a sealing ring kit are also required. See your authorized Bendix parts outlet for additional components.

1. Park the vehicle on a level surface, apply the parking brakes, and always block the wheels. Always wear safety glasses.
2. Stop the engine and remove ignition key when working under or around the vehicle. When working in the engine compartment, the engine should be shut off and the ignition key should be removed. 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.
3. 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 use of those tools.
4. If the work is being performed on the vehicle's air brake system, or any auxiliary pressurized air systems, make certain to drain the air pressure from all reservoirs before beginning ANY work on the vehicle. If the vehicle is equipped with an AD-IS® air dryer system or a dryer reservoir module, be sure to drain the purge reservoir.
5. Following the vehicle manufacturer's recommended procedures, deactivate the electrical system in a manner that safely removes all electrical power from the vehicle.

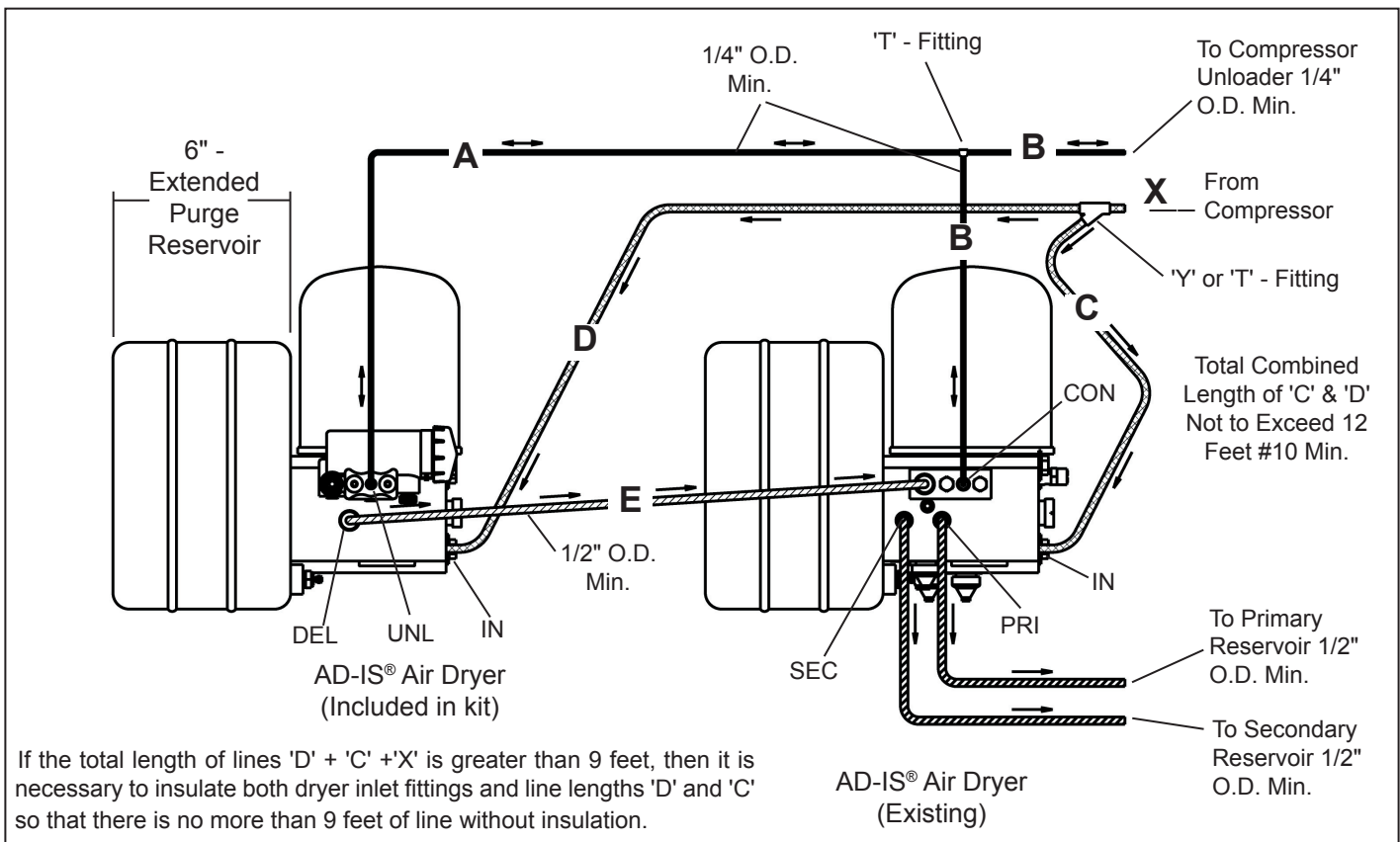


Figure 2 System schematic of two AD-IS® Air Dryers mounted in tandem

6. **Never exceed manufacturer's recommended pressures.**
7. **Never connect or disconnect a hose or line containing pressure; it may whip. Never remove a component or plug unless you are certain all system pressure has been depleted.**
8. **Use only genuine Bendix® replacement parts, components and kits. Replacement hardware, tubing, hose, fittings, etc. must be of equivalent size, type and strength as original equipment and be designed specifically for such applications and systems.**
9. **Components with stripped threads or damaged parts should be replaced rather than repaired. Do not attempt repairs requiring machining or welding unless specifically stated and approved by the vehicle and component manufacturer.**
10. **Prior to returning the vehicle to service, make certain all components and systems are restored to their proper operating condition.**
11. **For vehicles with Antilock Traction Control (ATC), the ATC function must be disabled (ATC indicator lamp should be ON) prior to performing any vehicle maintenance where one or more wheels on a drive axle are lifted off the ground and moving.**

**LOCATING THE NEW AD-IS® AIR DRYER ON THE VEHICLE**

1. Locate the existing AD-IS® air dryer on the vehicle and identify the compressor discharge line.

Note: It will be necessary to modify the compressor discharge line to incorporate a "Y" or "T" fitting that will

allow air from the compressor to be delivered to each air dryer. The new AD-IS® air dryer must be mounted in a position that will allow the combined discharge line length (C and D) to be no longer than 12 feet. See figure 2. The new air dryer must be mounted vertically (±5°) and must not be exposed to direct wheel splash (located behind axle mud flap is acceptable).

2. To minimize vibration, mount the new air dryer on a frame rail.
3. Do not locate the air dryer near heat producing components such as the vehicle exhaust. Provide adequate clearance from moving components e.g. drive shaft, suspension, pitman arm, etc.
4. Locate the new AD-IS® air dryer (1) on the vehicle with a minimum of 1 inch of clearance horizontally (90° minimum arc) to allow for servicing. This will permit, for example, a strap wrench to be used when replacing the cartridge.
5. Be sure that there is sufficient room to attach air lines or hoses to the air dryer. Hoses must be installed without tight turns that might cause air flow restrictions.

**MOUNTING THE NEW AD-IS® AIR DRYER**

1. After positioning the air dryer according to the installation requirements, mark the position of the mounting holes on the frame rail. Note: Check the vehicle manual before drilling a frame member.
2. Use vehicle manufacturer guidelines for mounting hardware (use at minimum grade 5 hardware).

## MODIFYING THE EXISTING AD-IS® AIR DRYER

If the existing AD-IS® air dryer is not an extended purge model the purge reservoir will need to be replaced with an extended purge reservoir. (Purchase Bendix® reservoir piece number 5009028 and bolt kit 5009233.) Note: Extended purge AD-IS® air dryer reservoirs are 6 inches in length. See Figure 2. If the existing dryer is an extended purge model, proceed to step 9.

1. If the air dryer must be removed from the vehicle to replace the purge volume reservoir, identify and mark all air line connections prior to removal. Disconnect the electrical connector to the heater.
2. Remove the mounting hardware that secures the air dryer to the vehicle or mounting bracket.
3. Remove the air dryer cartridge.
4. Remove and discard the hardware that secures the reservoir to the air dryer.
5. Remove and discard the sealing ring between the air dryer and reservoir.
6. Clean the air dryer sealing ring surface.
7. Install the new sealing ring on the air dryer and install the new extended purge reservoir on the air dryer.
8. Secure the extended purge reservoir to the air dryer using the new hardware supplied in the kit. Torque to 360-420 inch-pounds.
9. Remove and discard the governor and governor adapter from the existing air dryer.
10. Install the two o-rings on the governor adapter block(2) in the location shown in figure 4.
11. Ensure the delivery check valve is in place in the air dryer. See figure 4. Install the governor adapter block(2), with the o-rings, onto the air dryer body in place of the governor. Align the brass insert with the governor adapter port. Secure using the two 1/4" cap screws (3). Install a 1/4" NPT pipe plug (Bendix piece number 230576 or equivalent) in the top port of the air dryer adapter.
12. Install the new air dryer cartridge(6) on the existing air dryer. Replacement of the air dryer cartridge is required for the new system to operate properly.
13. If previously removed, return the air dryer and purge reservoir to the vehicle in its previous mounting location.

## CONNECTING THE AIR LINES

Refer to figure 2 for the air line connections.

1. Cut the compressor unloader line 'B' and install a 'T' fitting.
2. From the 'T' fitting add the unloader line 'A'. This unloader line should be 1/4" O.D. minimum with 1/8" NPT fittings. Connect unloader line 'A' to the 'T' fitting in line 'B' and to the control port 'UNL' of the governor on the new AD-IS® extended purge air dryer. Connect unloader line 'B' to the 1/8" air dryer adapter port of the governor adapter block (2).
3. Install a 1/2" O.D. minimum air line with 3/8" NPT fittings between the 'DEL' port of the new air dryer and the 3/8" port of the air dryer adapter block.
4. Install a 1/2" 'T' or 'Y' fitting in the compressor discharge

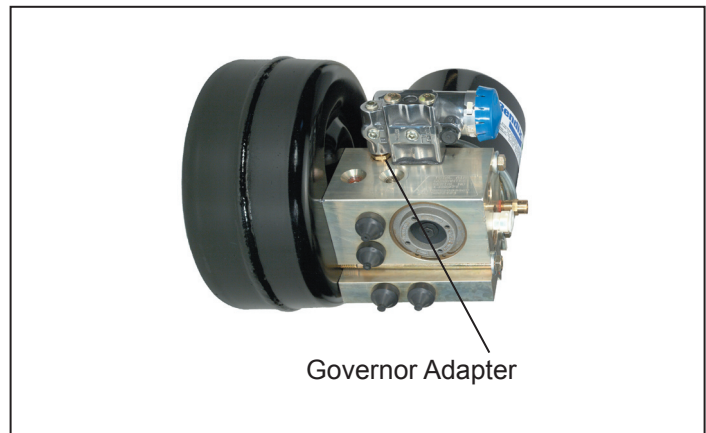


Figure 3 Governor adapter

line 'X'. Add a new discharge line 'D' from this fitting to the new air dryer inlet port marked 'IN'. Line 'D' should be #10 (1/2" I.D. minimum) with 1/2" NPT fittings. The combined length of lines 'C' and 'D' should not exceed 12 feet. Be sure that there are no "dips" in the line that could allow water to collect.

5. If the total length of lines 'D' + 'C' + 'X' is greater than 9 feet, then it is necessary to insulate both dryer inlet fittings and line lengths 'D' and 'C' so that there is no more than 9 feet of line without insulation.
6. If previously removed, reconnect all identified and marked air lines as indicated in "Modifying the existing AD-IS® Air Dryer", step 1.

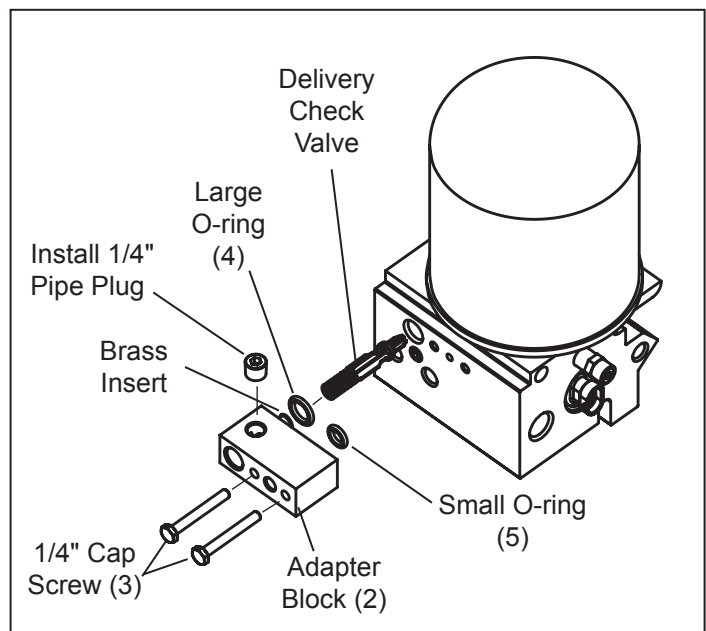


Figure 4 Existing AD-IS® air dryer with adapter assembly

## CONNECTING THE HEATER WIRING

1. Cut the wire leads of the existing harness.
2. Cut the new wire lead to the appropriate length to enable the splicing of the two harnesses. Be sure to allow some slack in the line.
3. Strip the end of each wire approximately 1/4".
4. Using a butt connector and heat shrink tubing splice the two heater harnesses together.



5. Replace the existing heater fuse with a 20 amp fuse for 12 volt system or a 15 amp for a 24 volt system.
6. Connect the wire harnesses to the air dryer connector, be sure the connection is secure.

**NOTICE:**

**This air dryer is intended to remove moisture and other contaminants normally found in the air brake system. Do not inject alcohol, anti-freeze, or other de-icing substances into or upstream of the air dryer. Alcohol is removed by the dryer, but reduces the effectiveness of the device to dry air. Use of these or other substances can damage the air dryer and may void the warranty.**

**OPERATION & LEAKAGE TESTS**

1. Check all lines and fittings leading to and from the air dryer for leakage and integrity. Repair any leaks found.
2. Build up system pressure to governor cut-out and note that each AD-IS® air dryer purges with an audible escape of air. Watch the system pressure and note the pressure fall-off for a ten minute period. If pressure drop exceeds, for a single vehicle - 1 psi/minute from either service reservoir; or for tractor trailer - 3 psi/minute from either service reservoir, inspect the vehicle air systems for sources of leakage and repair them. Refer to section entitled Troubleshooting, Symptoms 1 and 4.
3. **Caution: Be sure to wear safety glasses in case of a purge blast.** Check for excessive leakage around the purge valve with the compressor in the loaded mode (compressing air). Apply a soap solution to the purge valve exhaust port and observe that leakage does not exceed a 1" bubble in 1 second. If the leakage exceeds the maximum specified, refer to the AD-IS® air dryer

Service Data Sheet for troubleshooting information.

4. Build up system pressure to governor cut-out and note that the AD-IS® air dryer purges with an audible burst of air, followed immediately by approximately 30 seconds of air flowing out of the purge valve. "Fan" 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 an AD-IS® air dryer purge. If system does not follow this pattern, refer to the AD-IS® air dryer Service Data Sheet for troubleshooting information.
5. Check the operation of the end cover heater and thermostat assembly during cold weather operation as follows:

A. Electric Power to the Dryer

With the ignition or engine kill switch in the RUN position, check for voltage to the heater and thermostat assembly using a voltmeter or test light. Unplug the electrical connector at the air dryer and place the test leads on each of the connections of the female connector on the vehicle power lead. If there is no voltage, look for a blown fuse, broken wires, or corrosion in the vehicle wiring harness. Check to see if a good ground path exists.

B. Thermostat and Heater Operation

Note: These tests are not possible except in cold weather operation.

Turn off the ignition switch and cool the thermostat and heater assembly to below 40 degrees Fahrenheit. Using an ohmmeter, check the resistance between the electrical pins in the air dryer connector half. The resistance should be 1.5 to 3.0 ohms for the 12 volt heater assembly and 6.0 to 9.0 ohms for the 24 volt heater assembly.

Warm the thermostat and heater assembly to approximately 90 degrees Fahrenheit and again check the resistance. The resistance should exceed 1000 ohms. If the resistance values obtained are within the stated limits, the thermostat and heater assembly is operating properly. If the resistance values obtained are outside the stated limits, replace the heater and thermostat assembly.

6. Pressure Protection Valves

Observe the pressure gauges of the vehicle as system pressure builds from zero. The primary or secondary gauge should rise until it reaches approximately 106 p.s.i. ( $\pm 6$  p.s.i.), then level off (or a momentary slight fall) as the next pressure protection valve opens supplying its reservoir. When that pressure gauge passes through approximately 106 p.s.i. ( $\pm 6$  p.s.i.) there should be an associated leveling off (or momentary slight fall) of pressure as the third and fourth pressure protection valves open. Then the primary and secondary gauges should increase together until they reach their full pressure of approximately 130 psi ( $\pm 5$  psi).

If the AD-IS® air dryer does not perform within the pressure ranges as described above, recheck using gauges known to be accurate. If the readings remain outside of the ranges outlined above, replace the AD-IS® air dryer. NOTE: There are no kits available for the servicing of the pressure protection valves. Warning: Do not attempt to adjust or service the pressure protection valves - incorrect pressure protection valve settings can result in automatic application of the vehicle spring brakes without prior warning in the event one of the supply circuits experiences rapid pressure loss.

**TESTING THE AD-IS® AIR DRYER**

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

1. Close all reservoir drain valves.
2. Build up system pressure to governor cut-out and note that the AD-IS® air dryer purges with an audible burst of air, followed immediately by approximately 30 seconds of air flowing out of the purge valve.
3. "Fan" 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 at the AD-IS® air dryer exhaust.
4. It is recommended that the total air system be tested for leakage to assure that the AD-IS® air dryer will not cycle excessively.

See Bendix publication BW5057 "Air Brake Handbook."