

Air Dryer Systems: Troubleshooting and Maintenance *Inspection and Upkeep Help Ensure Effective System Operation*

With commercial vehicle technology advancing and expanding the use of air for non-braking functions, the experts at Bendix Commercial Vehicle Systems LLC stress the importance of protecting air systems from contamination to ensure longevity and performance. As part of its Bendix Tech Tips series, Bendix offers preventive maintenance and troubleshooting insight on air dryer systems and some of their key components.

“Systems that can be impacted by excessive oil or moist air – from the air brakes to the engine, emission, and drivetrain systems – are susceptible to failure when that air is contaminated,” said Rick Conklin, Bendix product line director, Air Treatment. “These systems often include technologies that improve productivity and fuel economy, or that are required to meet emissions regulations. Protecting them is important to keep vehicles on the road, increase their service cycles, and reduce maintenance costs.”

An overall air dryer system check should begin with opening the drain valves on the reservoirs to check for moisture in the system. If moisture is present, verify that no external air has been applied to the system, and check the air dryer’s service data sheet to confirm that the air dryer is mounted in the correct location with the correct discharge line length.

If external air was applied, drain all reservoirs and purge tanks, restart the vehicle, and allow system pressure to build to the governor cutout pressure. Verify that the proper system pressure has been reached, then operate the vehicle normally. Recheck for water in the reservoirs after one week.

If an issue with the air dryer mounting or plumbing is encountered, have it corrected, and ensure that the discharge line from the compressor to the air dryer slopes continuously downward to the air dryer inlet, with no water traps.

Also remember to take into account any significant temperature changes within the previous 24 hours. Ambient temperature shifts of greater than 30 degrees Fahrenheit can cause a temporary accumulation of moisture. If a significant temperature change occurred, continue to operate the vehicle under normal conditions. The small amount of water that may have condensed due to the temperature shift will be reabsorbed by the dry air once the vehicle is in operation. Check the air system again after one week.

Whether moisture is present in the system or not, check all the air lines for damage such as chafing, and examine the air dryer mounting bolts for tightness and torque as specified in the manufacturer’s service data sheet.

Within the air dryer system, there are three key components to monitor: the air dryer cartridge, the purge valve, and the delivery check valve.

Air Dryer Cartridge Maintenance – Easy as 1-2-3

Depending on vocation, Bendix recommends a one-, two-, or three-year air dryer cartridge replacement on vehicles equipped with a Bendix compressor.

- One year or 100,000 miles: Severe service applications such as residential refuse trucks or school buses
- Two years or 200,000 miles: Pickup and delivery operations; double- and triple trailer line haul trucks

- Three years or 300,000 miles: Line haul operations using a single trailer

Recommended intervals for trucks equipped with non-Bendix compressors are six months (50,000 miles), one year (100,000 miles), and two years (200,000 miles), respectively. More frequent intervals may be required depending on a vehicle's age, compressor condition, and operating environment.

For better air dryer performance and increased system protection, Bendix recommends using an oil-coalescing cartridge like the Bendix® PuraGuard®. Oil can be particularly harmful to air systems, deteriorating seals – which can cause leaks – and contributing to premature damage in a variety of other components such as push-pull dash valves, spring brake modulating valves, and brake chamber diaphragms.

Standard cartridges may be replaced with oil-coalescing cartridges, but fleets should always change out oil-coalescing cartridges with like replacements. Additionally, fleets need to beware of low-cost and counterfeit cartridges, which are not as effective as OEM equipment.

Purge Valve Issues and Replacement

As a best practice in preventive maintenance, Bendix recommends replacing the purge valve assembly whenever the air dryer cartridge is replaced. This will address several potential purge valve issues, including:

- Air leakage or lack of pressure building due to purge valve seal wear
- “Popping” of the purge valve due to intermittent sticking
- Loss of engine turbocharger boost during the purge cycle due to leakage in the turbo cutoff valve

Delivery Check Valve Issues and Replacement

Signs that the system's delivery check valve is in need of replacement include a lack of pressure buildup due to the valve sticking in the closed position, and rapid cycling or loss of pressure during the purge cycle caused by a leaky valve.

Bendix recommends replacing the air dryer system's delivery check valve with every other cartridge replacement.

“Keeping an air system operating properly is critical – but it doesn't have to be complicated,” Conklin said. “By understanding the system's key components, installing oil coalescing air dryer cartridges, and following a regular maintenance schedule, fleets can keep their vehicles on the road, operating safely and generating revenue.”

Bendix provides commercial fleets, technicians, and drivers with the tools they need to ensure safe operation through assessment, maintenance, and repair. The Bendix On-Line Brake School at www.brake-school.com provides access to the company's knowledge database and technical resources on all aspects of electronics and air brake maintenance and product education. The Bendix Brake Training School, one of the industry's longest-running training programs, has educated more than 250,000 students since its founding more than 50 years ago.

About the Bendix Tech Tips Series

Bendix, the North American leader in the development and manufacture of leading-edge active

safety and braking system technologies, is committed to helping keep commercial vehicles on the road and in good working condition. The Bendix Tech Tips series addresses common commercial vehicle maintenance questions and issues concerning the total range of components found within foundation and air brake systems, as well as advanced safety systems.