

The ConMet Connection

A Quarterly Publication of Consolidated Metco, Inc.

Spring 2007 Volume 4

Causes and Prevention of Wheel Seal Leaks

Premature wheel seal failure can occur for a number of reasons, including improper installation at the factory. This issue of the ConMet Connection outlines the most common conditions that create seal leaks and how they can be prevented.

Improper Bearing Adjustment

Improper bearing adjustment can allow the wheel bearings to run in excessive end play, resulting in improper axial hub movement. This movement causes the seal to wear rapidly, and may lead to premature seal failure.

Note: *Since the bearings and seal on ConMet's PreSet® hub assemblies are installed at the factory in a controlled environment, seal leakage due to improper seal installation is greatly reduced.*

In order to prevent possible seal leaks through improper bearing adjustment, technicians should follow industry standards for proper bearing adjustment, such as TMC's RP618, or follow the hub manufacturer's recommended procedures.

Improper Hub Installation

Improper hub installation can result in seal cocking, which is a condition in which the seal is not properly aligned with the hub seal bore. A cocked seal will cause the seal to be worn excessively on one side of the wear sleeve. As a result, the opposite side of the seal may lose lip seal contact with the wear sleeve, which would create a path for lubricant to escape.

The most important precaution that can be taken to avoid seal leaks from improper hub installation is to ensure that the hub is in alignment with the axle spindle prior to installation, *while keeping the outer bearing in place*. If the outer bearing is not kept in proper position, the hub will sag, which can cause the seal to cock.

Improper Seal Installation

Over the years seal technology has changed greatly. Seals have gone from a simple one piece configuration to highly engineered multiple piece components. Along with these new seal designs, come some new requirements for installation and maintenance.

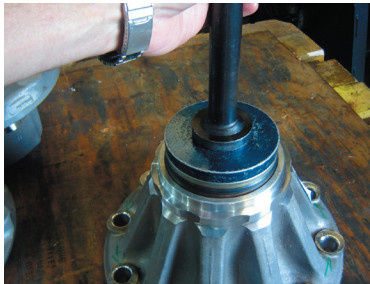
It has always been important to follow good shop practices when installing a wheel seal. Seal manufacturer's now have part-specific installation instructions to insure that a seal is installed in a manner that will insure the longest life. For that reason it is important that the manufacturer's instructions be closely followed.

All parts must be thoroughly cleaned to remove any foreign

material or contaminants that could shorten the life of the new seal. This includes the bearings as well as the grease cavity of the hub, the seal bore of the hub and the spindle. Careful attention should be paid to the seal bore diameter of the hub and the seal journal of the spindle. In some cases it may be necessary to use emery cloth to remove nicks or foreign material from these surfaces prior to installing the seal.

Follow the seal manufacturer's installation instructions to install the seal into the hub. In most cases this will require that the outside of the seal be lightly lubricated prior to installation and a seal driver designed specifically for that seal be used. The seal driver will insure that the seal is installed square to the bore and to the correct depth. The seal driver will also prevent damage to the seal during installation. Seal drivers can be obtained from your seal supplier.

Most seal manufacturers recommend that the inside diameter of the seal be lightly lubricated with the same lubricant that will be in the hub, prior to installing the hub onto the spindle. Hold the outer bearing in place as the hub assembly is positioned onto the spindle. Having the outer bearing in place will help prevent the seal from becoming cocked or crooked in the hub.



Using a seal driver prevents damage to the seal during installation.

Lubricant Contamination

If a technician follows the recommendations stated above, the likelihood of lubricant contamination is very low. Lubricant contamination can still occur because of a leaking hubcap gasket, cracked hubcap, contamination from inside of the axle, or contamination that enters the hub through the seal. These contaminants include water, dirt, metal flakes, rust and road chemicals. The contaminants can damage the primary sealing lip of the seal, resulting in a seal leak.

It is recommended that technicians routinely inspect the lubricant for signs of contamination, usually during scheduled inspections and service of wheel ends. Most seal manufacturers have developed a list of lubricants that have been tested and have proved to be compatible with the seal materials. Reference the seal manufacturer's list of approved lubricants to insure that there is not a reaction between the seal and the lubricant that could shorten the life of the seal. Never mix different types of lubricants in the hub assembly.

Preventing wheel seal leaks 100% of the time is nearly impossible. However, following the industry recommended procedures can help technicians get to the point where leaks are rare and hub assemblies perform at optimum levels.