

Inspection of Rim Assemblies of Off-Highway Trucks

Off-Highway Truck/Tractor: All

Introduction

Every effort has been made in order to provide the most current information that is known to Caterpillar. Continuing improvement and advancement of product design might have caused changes to your product which are not included in this publication.

This Guideline must be used with the latest technical information that is available from Caterpillar.

Summary

The guideline provides fundamental procedures for the maintenance and inspection of rims. The information is intended as a guideline to minimize risks that are associated with the Off-Highway Truck tire and rim assemblies and the information is intended as a guideline to maximize the life of tires and rims. Detailed procedures may vary with the particular rim that is involved.

Off-Highway Truck wheel and rim assemblies are often exposed to loads at the maximum capabilities of the assemblies or close to the maximum capabilities of the assemblies. Variations in haul roads can result in higher than normal loads on wheels. High cyclic stress can be generated in rim assemblies by hauling with vehicles that have not been loaded evenly, hauling with vehicles with under inflated tires, and hauling downhill with high speed turns, resulting in reduced fatigue life.

Furthermore, the effects of corrosion and fretting between mating parts of a rim assembly can produce surface irregularities that result in the initiation of cracks at different sites, which ultimately result in the fracture of a rim part.

Important Safety Information

Work safely. Most accidents that involve product operation, maintenance, and repair are caused by failure to observe basic safety rules or precautions. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs. A person must be alert to potential hazards. This person should also have the necessary training, skills, and tools in order to perform these functions properly. Safety precautions and warnings are provided in this instruction and on the product. If these hazard warnings are not heeded, bodily injury or death could occur to you or to other persons.

Caterpillar cannot anticipate every possible circumstance that might involve a potential hazard. Therefore, the warnings in this publication and the warnings that are on the product are not all inclusive. If a tool, a procedure, a work method or operating technique that is not specifically recommended by Caterpillar is used, you must ensure that it is safe for you and for other people to use. You should ensure that the product will not be damaged or the product will not be made unsafe by the operation, lubrication, maintenance or the repair procedures that are used.



Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.

Do not operate or perform any lubrication, maintenance or repair on this product, until you have read and understood the operation, lubrication, maintenance and repair information.

Safety precautions and warnings are provided in this document and on the product. If these hazard warnings are not heeded, bodily injury or death could occur to you or to other persons.

The hazards are identified by the "Safety Alert Symbol" which is followed by a "Signal Word" such as: "DANGER", "WARNING" or "CAUTION". The "WARNING" Safety Alert Symbol is shown below.



This safety alert symbol means:

Pay Attention! Become Alert! Your Safety is Involved.

The message that appears under the safety alert symbol explains the hazard.

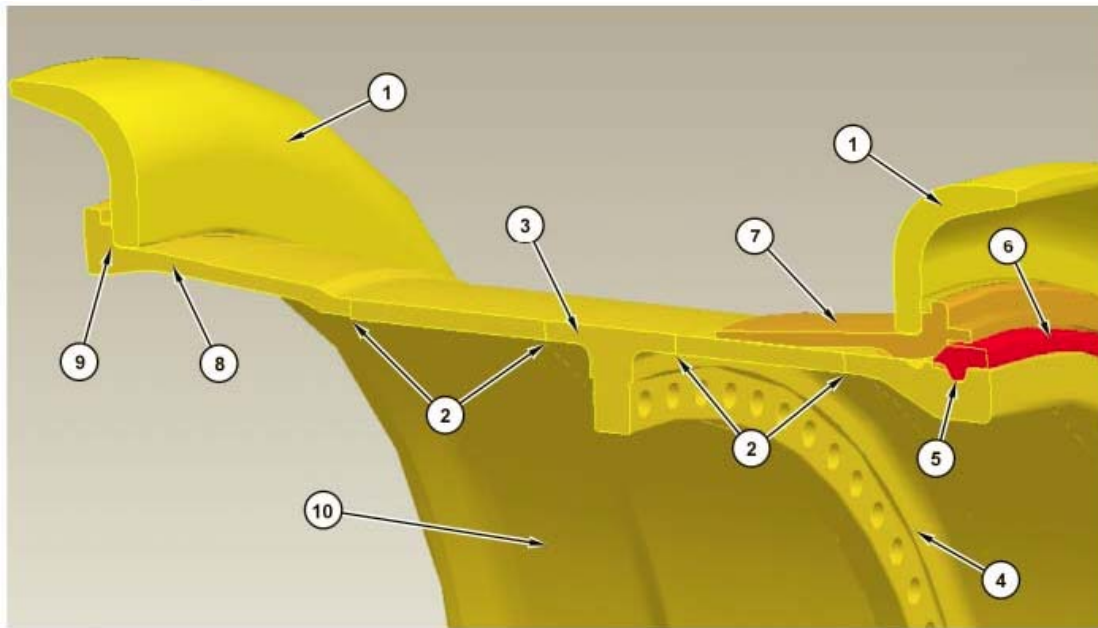
Operations that may cause product damage are identified by "NOTICE" labels on the product and in this publication.

Caterpillar cannot anticipate every possible circumstance that might involve a potential hazard. The safety information in this document and the safety information on the machine are not all inclusive. You must determine that the tools, procedures, work methods, and operating techniques are safe. You must determine that the operation, lubrication, maintenance, and repair procedures will not damage the machine. Also, you must determine that the operation, lubrication, maintenance, and repair procedures will not make the machine unsafe.

The information, the specifications, and the illustrations that exist in this guideline are based on information which was available at the time of publication. The specifications, torques, pressures, measurements, adjustments, illustrations, and other items can change at any time. These changes can affect the service that is given to the product. Obtain the complete, most current information before you start any job.

Caterpillar dealers can supply the most current information.

Visual Inspection of the Rim Assembly



Typical rim assembly

- (1) Flange
- (2) Weld
- (3) Centre section
- (4) Disc of rim
- (5) Groove on lock ring
- (6) Lock ring
- (7) Bead seat band
- (8) Back section
- (9) Radius of back section
- (10) Rim base

The following list of components of the rim assembly can be visually inspected for damage at each changing of the tires:

1. **Lock Ring (6)** - Inspect the lock ring for wear, corrosion, flat spots, and warping. In the free state, or the disassembled state, the lock ring must have overlap of the two ends.
2. **Bead Seat Band (7)** - Inspect the bead seat band for wear, corrosion, and cracks in the areas of contact with the lock ring, flange, base rim or any weld.
3. **Flanges (1)** - Inspect the flanges for wear, corrosion, cracks, fretting, and general damage.
4. **Rim Base (10)** - Inspect the rim base for wear, corrosion, cracks, fretting, and general damage. The inside area of the rim shall be visually inspected for corrosion.

Note: Parts that are cracked, worn, damaged, or pitted from corrosion shall not be reused and these parts shall be rendered unusable and discarded. Consult your Caterpillar Dealer if you have any questions on the acceptability of parts.

Magnetic Particle Inspection of the Rim Assembly

To perform a magnetic particle inspection, the tires must first be removed. Magnetic particle inspection should be performed when accumulated service hours on the rim have reached 12,000 to 15,000 hours and at every following 12,000 to 15,000 hour interval.

Note: Magnetic particle inspection may need to be performed sooner than 12,000 hours on some rims if any damage is found during visual inspection.

Check the following areas of the rim:

1. Welds on Centre Section (3)
2. Butt welds
3. Welds on Disc of Rim (4)
4. Areas of contact with Flanges (1) and Radius of the Back Section (9)
5. Areas of contact with Lock Ring (6) and O-ring groove

The primary areas of high stress are the following areas:

1. Circumferential welds
2. Butt welds
3. Welds on Disc of Rim (4)
4. Radius of Back Section (9)
5. Groove on Lock Ring (5)

For more information that is related to magnetic particle inspection, refer to Reuse and Salvage Guideline, SEBF8148, "General Salvage and Reconditioning Techniques" or consult your Caterpillar Dealer.

Note: Parts that are cracked, worn, damaged, or pitted from corrosion shall not be reused and these parts shall be rendered unusable and discarded. Consult your Caterpillar Dealer if you have any questions on the acceptability of parts.

Note: This information is not intended to override compliance with any regulatory agency. If any regulatory agency or statutory authority requires an inspection of the rim, this information can be used as a guideline.

Australian Standards

The following Australian Standard references should also be consulted.

AS4457-1997 Part 1

DR 06232 (Revision of AS4457-1997) Earth Moving Machinery-Off-the-road wheels, rims and tyres-Maintenance and repair

Need for revisions to AS4457 have been supported by the Mines Inspectorates of Queensland, New South Wales and Western Australia. Failure of wheel or rim assemblies has caused fatalities and serious injuries when correct procedures to manage risks with rims have not been followed.