Engineered Solutions

Service Bulletin

Cracks in Off-Road Forestry, Construction, Mining & Industrial Wheels

Inspection, deflation, and removal-from-service guidance

SAFETY CRITICAL - CRACKED WHEELS CAN FAIL SUDDENLY
A wheel or rim component with a suspected crack or structural defect must be removed from service, completely depressurized, tagged unserviceable, and segregated from serviceable components.

1. Immediate Action

If a crack or other structural defect is found or suspected in a wheel or rim component:

- Immediately remove the wheel assembly from service.
- Completely deflate the tire by removing the valve core.
- Tag the wheel or component "**UNSERVICEABLE**".
- Segregate it from serviceable components.
- **DO NOT** reinstall, re-inflate, weld, braze, heat, straighten, or otherwise repair the damaged component.

Contact the wheel manufacturer or an authorized wheel distributor for evaluation and disposition instructions.

2. Deflation Before Servicing

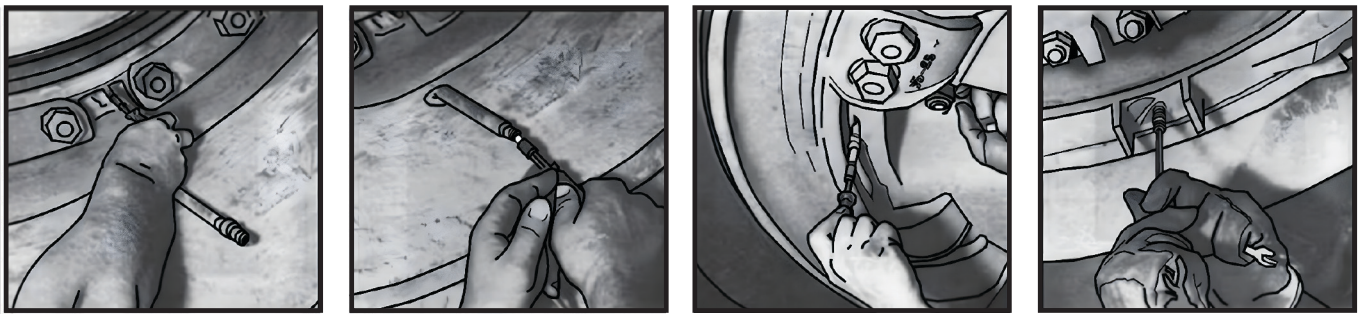
WARNING – COMPLETELY DEFLATE THE TIRE BEFORE SERVICING
Complete deflation is the first step in servicing any tire and wheel assembly. Serious or fatal injury can result if stored energy is released or wheel components separate.

Before loosening wheel nuts, clamps, fasteners, or rim components:

1. Remove the valve core.
2. Allow all air pressure to escape.
3. Verify that the valve stem is unobstructed, and the tire is completely deflated.

For dual-wheel assemblies, deflate **BOTH** tire assemblies separately and verify that both are completely depressurized.

This requirement is especially important for assemblies fitted with inner tubes. An inner tube may continue to contain air even when the wheel or rim is cracked. The stored energy can cause sudden release of air or separation of wheel components.



Run a wire (with sufficient stiffness) through the valve stem to ensure the tire is completely deflated.

Foreign material or ice may obstruct the valve stem and prevent complete deflation. Follow the approved servicing procedure to verify that the valve stem is clear and that no pressure remains. **DO NOT** begin work until complete deflation has been positively verified.

3. Wheels Fitted with Inner Tubes

WARNING – AN INNER TUBE MAY CONCEAL A CRACKED WHEEL
An inner tube can prevent a cracked wheel from leaking air. Loss of tire pressure may therefore provide no warning that a fatigue crack or other structural defect is present.

Unless a shorter interval is specified by the equipment or wheel manufacturer, inspect assemblies fitted with inner tubes at least every six months and whenever the tire or wheel is removed or serviced.

Only use an inner tube when it is approved for the specific tire-and-wheel combination. **NEVER** install an inner tube to compensate for air leakage from a wheel, rim, tire bead, valve, or other component.

4. Air Leakage

WARNING – NEVER USE AN INNER TUBE TO MASK AN AIR LEAK
Air leakage may indicate a fatigue crack, corrosion, sealing-surface damage, a damaged valve, tire-bead damage, or an incompatible or incorrectly assembled component.

If a tire and wheel assembly is leaking:

1. Remove the assembly from service.
2. Completely deflate the tire.
3. Identify and correct the cause before reassembly or inflation.
4. Tag and segregate any cracked, damaged, or otherwise unserviceable component.

DO NOT return the assembly to service until its condition has been properly evaluated.

5. Underinflated or Run-Flat Tires

WARNING – DO NOT RE-INFLATE BEFORE INSPECTION
Do not add air to a tire that has been operated underinflated or flat. Damage may have occurred, and re-inflation could cause an explosive separation resulting in serious injury or death.

For this procedure, a tire is considered underinflated when its pressure is 80% or less of the recommended operating pressure.

Before removing or servicing an affected assembly:

1. Completely deflate the tire by removing the valve core.
2. Verify that no pressure remains.
3. Remove the assembly using the approved procedures.
4. Inspect the tire, wheel, rim, valve, and associated components thoroughly.
5. Replace all damaged or unserviceable components before reassembly and inflation.

Visual inspection, eyeballing, or striking or 'thumping' a tire does not provide a reliable pressure measurement. **ALWAYS** use an accurate pressure gauge.

NEVER deflate or service a tire near sparks, open flames, hot work, or other ignition sources. Tires exposed to excessive heat or fire require specialized handling and must not be approached or serviced until declared safe under the applicable emergency procedure.

6. Inspection Guidelines

Wheels and rims are critical parts of the machine's driveline and load-carrying system. Driving, braking, cornering, impact, and dynamic loads are transmitted through these assemblies. Fatigue, corrosion, impact damage, wear, and overloading can therefore lead to structural deterioration.

Periodic inspection helps identify damage before it results in wheel failure or unplanned machine downtime.

Inspection Frequency

Inspect wheel assemblies:

- At least every six months when inner tubes are used, unless a shorter interval is specified.
- Whenever a tire is serviced.
- Whenever a wheel assembly is removed.
- After severe impact, overload, or operation with low tire pressure.
- Whenever air leakage, abnormal vibration, movement, or visible damage is reported.
- At the interval specified by the equipment, tire, or wheel manufacturer.

Shorten the inspection interval for severe-duty applications or where operating history indicates an increased risk of fatigue or damage.

Preparation for Inspection

Before removing a wheel assembly from the machine:

1. Park and secure the machine in accordance with the approved maintenance procedure.
2. Completely deflate the tire by removing the valve core.
3. Verify that the valve stem is clear, and no pressure remains.
4. Deflate both tires of a dual-wheel assembly separately.
5. Clean the wheel thoroughly before inspecting it.

Remove mud, dirt, grease, rust scale, and other debris that could conceal a crack or defect. Use a cleaning method that does not damage the wheel or obscure evidence of cracking.

DO NOT use welding, flame cutting, brazing, or any other heat-producing process on an assembled tire and wheel.

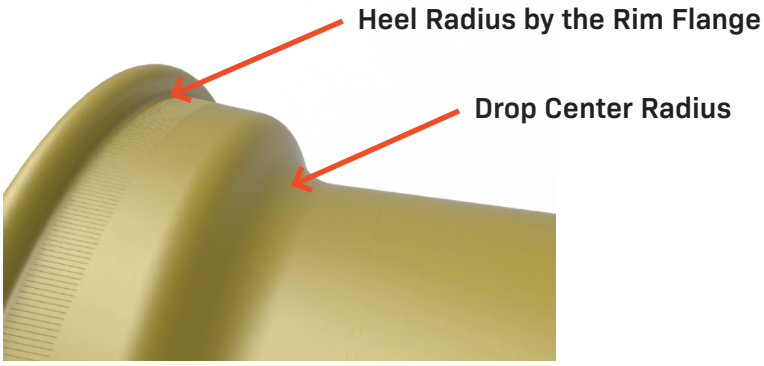
7. Inspection Areas

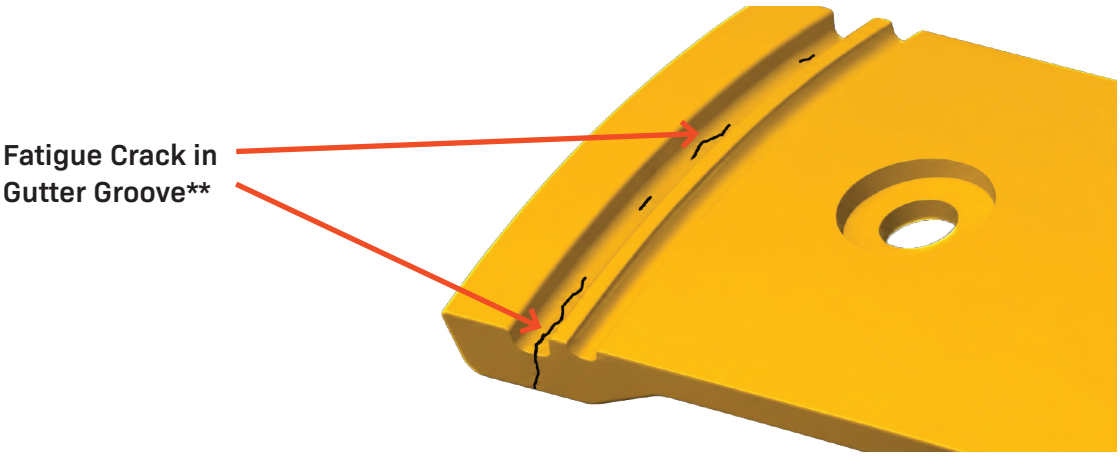
Inspect the entire wheel assembly under adequate lighting.
Pay particular attention to the following high-stress areas.

Rim Base – Corner Radii *(Both Sides)*

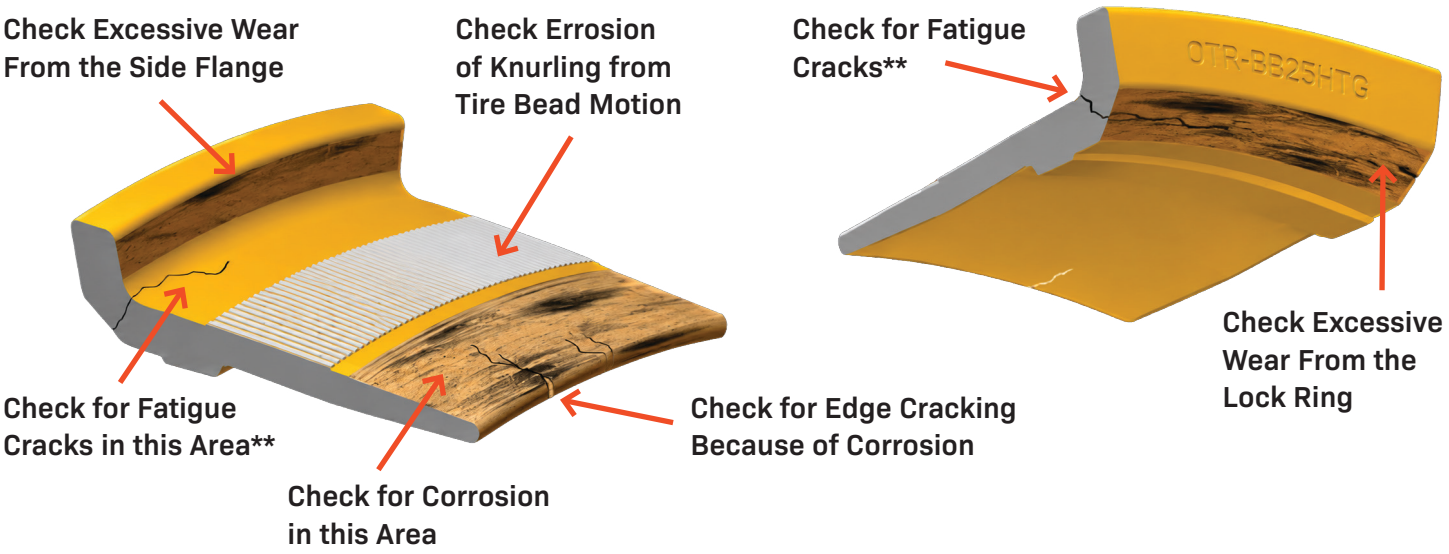
Inspect for:

- Circumferential fatigue cracks
- Localized deformation
- Corrosion or pitting
- Abrasion or material loss
- Evidence of overload or impact damage

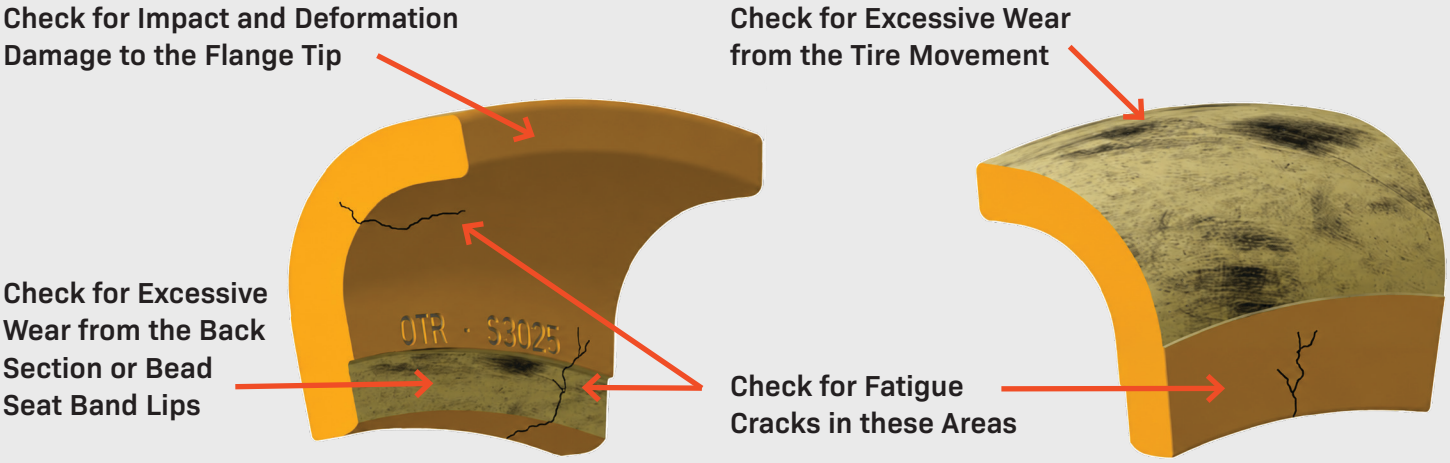




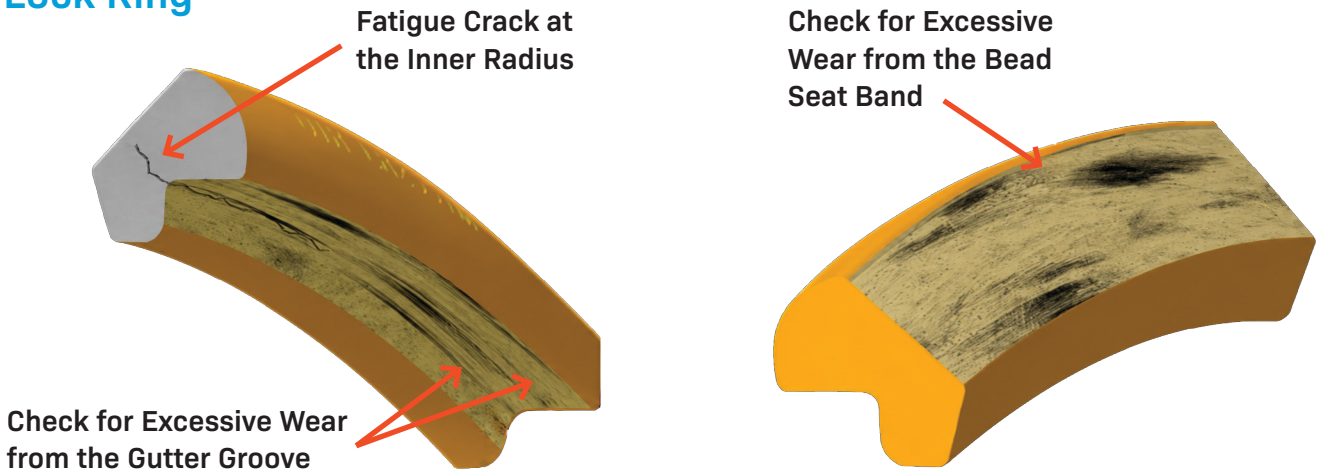
Bead Seat Bands



Flanges



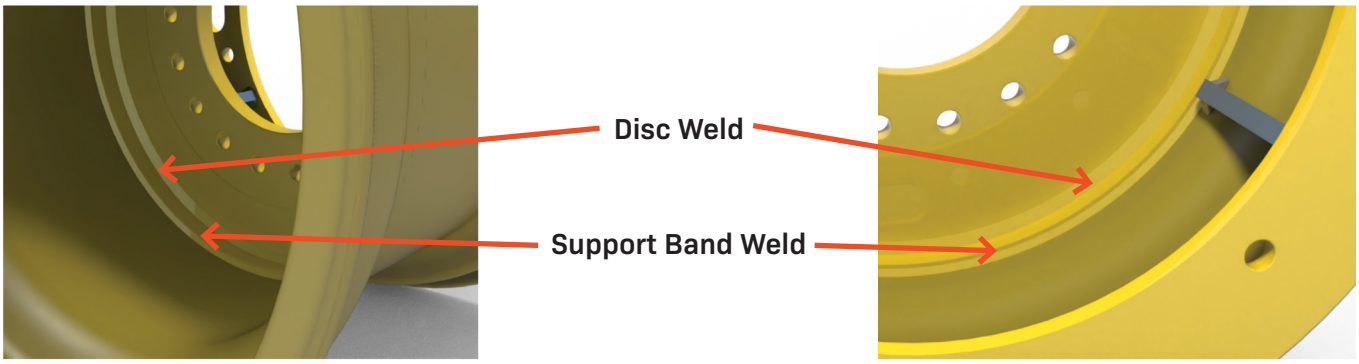
Lock Ring



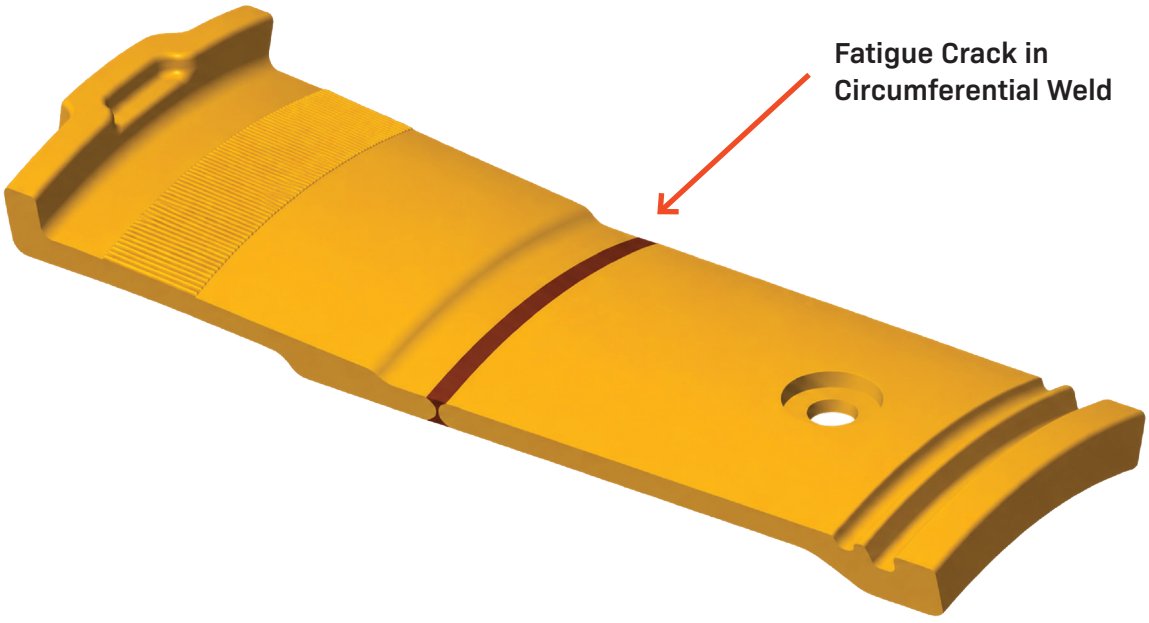
Circumferential Welds

Inspect for:

- Cracks in the weld or adjacent heat-affected area
- Weld separation
- Corrosion
- Deformation
- Evidence of previous unauthorized repair



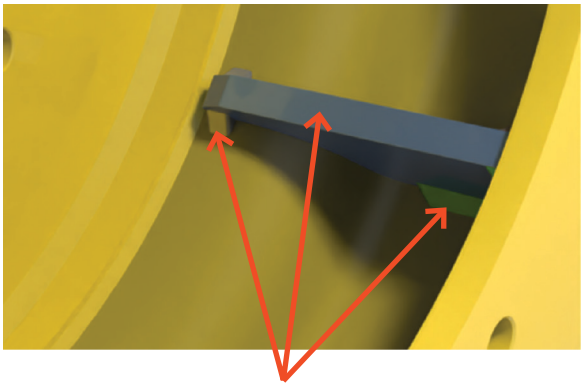
Rim Base



Disc and Gussets

Inspect for:

- Cracks at weld ends and transitions
- Cracks around gusset corners
- Distortion or bending
- Cracked or separated welds
- Elongated or damaged bolt holes
- Evidence of movement at the hub interface



Gusset Attachment Welds and Gusset

Mounting and Fastener Areas

Inspect for:

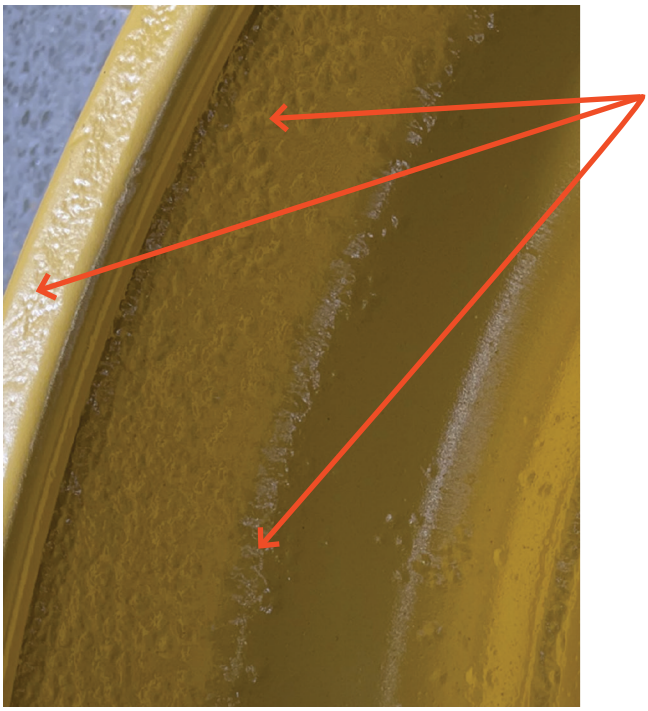
- Cracks
- Fretting or movement
- Elongated bolt holes
- Distortion
- Excessive wear
- Loose, damaged, or missing fasteners

Corrosion

Inspect the following areas for corrosion or pitting:

- Welds
- Corner radii
- Bead seats
- Gutters and flanges
- Mounting areas

Remove loose surface rust and contamination sufficiently to permit inspection. Any component with corrosion or pitting that could affect structural integrity or proper seating must be tagged unserviceable and removed from service.



Rust Pits

Excessive rusting/pitting can lead to fatigue crack initiation.

8. Disposition of Defective Components

WARNING – DO NOT REPAIR CRACKED OR STRUCTURALLY DAMAGED WHEEL COMPONENTS

Cracked, broken, significantly deformed, or severely corroded wheel components must be removed from service and must not be welded, brazed, heated, straightened, or otherwise reworked.

- Remove the component from service immediately.
- Mark or tag the item as "**UNSERVICEABLE**".
- Segregate it from usable components.
- **DO NOT** weld, braze, heat, straighten, or otherwise rework the item or component.
- Contact the wheel manufacturer or an authorized distributor for replacement and disposition instructions.

DO NOT return the wheel assembly to service unless all components have been confirmed serviceable, and the assembly has been completed in accordance with the applicable manufacturer's instructions.

References

This guidance should be used together with the applicable wheel, rim, tire, and equipment manufacturer's service instructions and the employer's approved safe-work procedures.

- OSHA 29 CFR 1910.177 - Servicing Multi-Piece and Single-Piece Rim Wheels.
- Mine Safety and Health Administration (MSHA) - Tire and Rim Safety Awareness Program.
- SAE J1337 Off-Road Maintenance Procedures and Precautions, Diameter Code 20 and Larger.
- SAE J2828 Off-Road Tire Fire Handling Guidelines.
- SAE J2611 Off-Road Tire Replacement Guidelines.

If cracks or other defects are found in the wheel, the wheel must be removed from service.

Consult your local wheel distributor to review the findings and determine the best course of action.