OTR

TYRES WHEELS AXLES

GENERAL WARRANTY T&C'S AG WHEEL, RIM & AXLE






GENERAL WARRANTY
AGRICULTURAL WHEEL, RIM & AXLE PROCEDURE

TYRES WHEELS AXLES

HOW TO USE THIS DOCUMENT

Step 1: Read general warranty policy to determine if claim falls within ambit of the policy. If NO, claim will be denied. If YES, proceed to step 2.

Step 2: Check the product schedule to see if special conditions (such as maintenance procedures) apply to the item which is the subject of the warranty claim. If NO, claim may be considered (subject to compliance with paragraph 1 (a-d) GWP). If YES, the warranty claim may possible be admitted (subject to compliance with paragraph 1 (a d). Complete GWP claim form and forward to OTR.

Records should identify the product, the equipment (registration/serial number) date of service/fitment and engine hours. The person undertaking the process should also be identified.

Copies of records will be verified as part of the claims process.

SECTION 1: GENERAL WARRANTY POLICY (GWP)

1. OTR warrants to the customer that it shall free of charge either repair or replace or at its option refund the purchase price of defective goods where the defect appears under proper use within 12 months (the "Warranty Period") from the date of invoice.

   Provided that:

   a. The customer provides OTR with satisfactory proof of purchase.
   b. Notice of the defect is given to OTR immediately the customer becomes aware of it.

c. If so requested, the goods are returned to OTR at the purchaser's expense for assessment. (Accepting goods for return does not automatically constitute acceptance of a claim or any liability.)
d. The purchaser has adhered to the special conditions; required checks and maintenance procedures and the requirements of AS 4457-2007 Parts 1 and 2.

2. This warranty applies only to defects found to OTR satisfaction to be solely attributable to faulty design, workmanship or materials AND EXPRESSLY EXCLUDES damage caused by all or any of the following:
   a. Improper installation
   b. Inadequate maintenance
   c. Misuse
   d. Neglect
   e. Shipping (or other forms of transport)
   f. Accident
   g. Normal wear and tear
   h. Use other than ordinary commercial or industrial applications for the product
   i. Unauthorised alteration, processing or adaptation by the customer or a third party
   j. Corrosion due to field elements and conditions

3. OTR liability under the foregoing shall be to the exclusion of any other liability to the customer whether contractual, tortuous or otherwise AND OTR will not be liable to the purchaser for any increased costs or expenses or for any loss of profit, business, contracts, revenues or anticipated savings or for any indirect or consequential damage of any nature whatsoever.

4. OTR is not responsible for freight charges or losses in transit. AND FURTHER PROVIDED: That in respect of the items listed in the Product Schedule below, the Special Conditions set against such items shall apply.

SECTION 2: PRODUCT SCHEDULE

Item	Special Conditions
1. Stub axles and axles	The expression 'inadequate maintenance' (see paragraph 2(b) GWP) includes any failure to comply with OTR 'Stub Axle and Axle Assembly and Maintenance Procedure'.
2. Rims and wheels (passenger car, truck, bus off the road, agricultural, industrial, motorcycle) [i.e. categories as determined by the Tyre and Rim Association of Australia]	The exclusion referred to in paragraph 2 of the GWP shall include any failure to fit tyres appropriate to the respective use. Such use is to e determined from time to time by the Tyre and Rim Association of Australia or any other recognised standard.
3. Rims and wheels for industrial applications	For the warranty period referred to in paragraph 1 of GWP shall be substituted to nine months. The expression 'Inadequate Maintenance' (see paragraph 2(b) GWP) includes any failure to comply with OTR 'Industrial Wheel and Rim Safety and Maintenance Procedures'.

4. Wheels and rims for use with aircraft tyres (non-aviation use)

   The expression 'Inadequate Maintenance' (see paragraph 2(b) GWP) includes any failure to comply with OTR 'Industrial Wheel and Rim Safety and Maintenance Procedures', as well as includes, in the case of wheels and rims, carrying loads (per wheel exceeding 10 tonnes) any failure to comply with OTR 'Service and Maintenance Procedures for Heavyweight Wheels (5° Bead Angle)'.

5. The purchaser is responsible for recording maintenance checks, including equipment identification, date/operating hours at the time of check and the name of the person undertaking it.

SECTION 3: PROCEDURES (CONDITION OF WARRANTY)

Stub Axle & Axle Assembly/Maintenance Procedure

Proper maintenance is essential in avoiding premature damage to bearings and as a consequence, wheels. The following steps are considered necessary in a good maintenance program for axle bearings.

Bearing Clearance

After 200 kilometres and then every 500 kilometres, verify the side clearance of the bearings in the hub.

Procedure: Lift the suspension, release the brake if fitted, verify if the wheels turn without excessive side clearance or jolting caused by tight wheel bearings. Adjust bearing if required. (See adjust bearing, below).

Yearly Maintenance

Inspection and maintenance of axle hub bearings and all associated components shall be carried out at least annually, however, more frequently if operated in high use, high load or hostile environment conditions.

Remove tyre and wheel assembly, remove dust cap, cotter pin, adjusting nut to correct tension.

Remove Hub Assembly

Pull hub toward you to loosen outer bearing cone. Don't let cone fall. Pull hub assembly off axle. The inner bearing and seal (in most hubs) will come with it. To remove the inner cone, use a seal puller to pull out the inner seal. Discard the seal after removal.

Clean & Inspect Axle & Hub

Remove all old lubricant from hub assembly and axle, then clean them with kerosene or mineral seal. Inspect axle for scoring, bending, thread or other damage. File off nick and burrs. A light grease coating on cone seats will make installation easier, prevent fretting.

Inspect Cups & Hub

Inspect cups in the housing for pitting, metal flaking, scoring, rust or other obvious damage. Remove damaged cups with mild steel bar. Replace cup and mating cone. Inspect hub bore and cup backing shoulder and remove nicks and burrs that prevent cup from seating properly.

Clean & Inspect Cones

Using a long-bristled brush and kerosene or mineral seal, wash all old lubricant from cones. Allow cones to air-dry.

WARNING: Do not spin the bearing at any time with an air gun because the rollers may escape through the cage and be forcefully expelled from the bearing, thereby creating a risk of injury or damage.

Inspect cones for wear, metal flaking, rust, cage damage or other visual damage. Replace all damaged cones and mating cups.

Install Cup

Use cup driver or mild steel bar to press or drive new cup into hub until solidly seated against hub shoulder. Be careful not to damage cup surfaces. Never use a cone to drive a cup.

Lubricate

Repack cones immediately after inspection or fresh from carton. A pressure grease packer is recommended. To hand pack cones, force grease under the cage between the rollers from the large end of the rollers until it shows at the small end. Fill the hub with grease to the inside diameter of the outer races and also fill hub grease cap. This layer combats moisture and retains grease in cones.

WARNING: Failure to correctly lubricate bearing and maintain proper lubrication may result in damage, which could cause wheel to lock or come off during operation, creating a risk of injury or damage. Over-greasing (filling hub capacity) will cause over heating and increased internal pressures which may also result in hub failure.

Install Grease Seal

Grease seals must be replaced when they leak or when bearings are being repacked or replaced. Install inner cone in hub, then the seal. Make sure seal lips are pointed in right direction. Use proper seal installation tool.

Install Hub Assembly

Slide hub assembly back over axle, being careful not to damage the seal against the axle outer end or threads. Insert grease-packed outer cone, washer (if required) and adjusting nut.

Adjust Bearing

Tighten adjusting nut while turning hub. When hub binds slightly, all parts are properly seated. Back nut off 1/6 o 1/4 turn or sufficiently to allow .001” to .007” end play. Then lock the nut with a new cotter pin.

WARNING: Failure to back off adjusting nut will cause bearing to run hot and be damaged. Wheel could then lock or come off during operation, creating a risk of injury or damage.

Check Bearing Adjustment

Use a dial indicator to measure end play. Mount indicator base as close to centre of hub as possible. With the indicator tip against the end of the axle, set indicator at zero. Grasp hub at nine o’clock and three o’clock. Push hub in and oscillate, and pull hub out and oscillate to seat the bearing. Read bearing end play as the total indicator movement. Reinstall all components.

WARNING: Failure to follow recommended procedure for removal and reinstallation may cause damage resulting in wheel locking or coming off and creating a risk of injury or damage.

Assembly of Unassembled Stub Axle & Axle Components

Stub axle or axle assemblies sold in an unassembled kit form (or disassembled by the customer) must be assembled by a suitably qualified person in accordance with the foregoing procedure.

SECTION 4: INDUSTRIAL WHEEL AND RIM SAFETY AND MAINTENANCE PROCEDURES

Introduction

The following are recommended, basic wheel and rim maintenance and service procedures which are

designed to ensure long and safe operational life for your wheel/rim.

Please note that detailed procedures may vary according to the particular tyre/wheel system involved.

Please also ensure staff responsible for wheel and rim maintenance read and understand any safety information contained in these procedures. Failure to observe safety instructions may expose personnel to risk of injury or death.

If you have any questions please contact OTR Pty Ltd or your nearest tyre service centre.

Safety

1. Tyre and wheel service and maintenance should only be performed by trained personnel with sufficient experience and qualifications to undertake the work. PERSONNEL HANDLING EARTHMOVING RIMS SHOULD DO SO IN ACCORDANCE WITH AS 4457-2007 Part 2.

2. Use of personal safety equipment is essential, as per OHS safe work method statements for the site.

3. OTR recommends the use of proper tools and specialist equipment in an open and safe area. Other workers shall vacate the immediate area for safety reasons.

4. The following are key points relating to rim servicing safety:
   a. Exhaust all air pressure prior to demounting any rim.
   b. Never use damaged or rusted components.
   c. Unidentified or components from another brand of rim should not be used.
   d. All components should be seated properly before inflation.
   e. Inspect rims and wheels for damage, fractures, or wear during tyre checks. Recording tyre pressure history is recommended to find leaks from rim cracks. Early detection of potential rim failures may prevent hazard.
   f. When inflating tyre, use dry air. Make sure that the airline has adequate filter to remove moisture. This filter should be checked regularly. Moisture causes corrosion of the rim or components which leads to difficult disassembly and premature failure.
   g. Never use a tube in a tubeless tyre/rim assembly if the rim is suspected of leaking. Loss of air pressure through a fatigue crack or other fracture in a tubeless rim warns you of a potential rim failure. This safety feature is lost when tubes are used.
   h. Never add or remove an attachment or otherwise modify a rim to which a tyre is fitted nor attempt to weld on or heat by flame. Heat from welding will cause a sudden, drastic increase in tyre pressure and possible explosion which can cause serious injury or death. Modification or heating of a rim may weaken it or its components or tyre structure.
   i. Do not over inflate or overload the tyre/rim assemblies. Consult OTR Technical Department if special operating conditions are required. Excessive pressure and load increases component stresses can result in premature failure.
   j. Where possible inflate tyre/rim assembly in a safety cage or use an equivalent restraining device.
   k. Do not re-inflate a tyre that has been run flat or under inflated to less than 80% of the original pressure without first disassembling and inspecting the tyre/rim assembly. Check the rim and components for cracks and damage before inflation occurs. The rim or components may have been damaged or dislocated during the time the tyre was run flat or seriously under inflated.
   l. Never run a machine on one tyre of a dual assembly. The carrying capacity of the single rim will be dangerously exceeded and can result in damage to the rim and is a safety hazard.

5. It is strongly recommended for safety purposes, when design permits, to build a multi piece wheel with the lock ring and removable flange facing towards the machine.

Inspection & Maintenance

(Refer to AS 4457-2007 Part 1: Maintenance and Repairs and Part 2: Earthmoving machinery off the road - rims and wheels)

6. Clean rim base and components to facilitate inspection and tyre mounting. Clean all dirt and rust from those interlocking features of multi-piece rim components, particularly the gutter section which holds the lock ring in place. Check rim well and flange corners for single piece rim. Parts must be cleaned for a proper fit and for inspection for fractures.

7. Check rim base and components for cracks. Parts that are cracked, worn, damaged or pitted from corrosion must not be used and must be rendered unusable and discarded, stamp 'failed' and scrap. When the condition of a part is in doubt, replace it with same size and type. Parts that are cracked, worn, damaged or excessively corroded are weakened and also may not assemble properly. Special attention must be given to the lock rings on multi piece rims. Such parts may fail explosively upon inflation or in service.

8. After inspection, repaint to stop detrimental effects of corrosion.

9. Never add or remove an attachment or otherwise modify a rim (especially by heating, welding or brazing) unless the tyre has been removed and approval has been received from OTR Pty Ltd modification or heating of a rim or one of its components may weaken a part to the extent that it cannot withstand forces created by inflation or operation and it will fail explosively in service. Deformation caused by heat may result in premature failure of the component.

10. Never attempt to weld on or heat by flame an inflated tyre/rim assembly or on a rim assembly with a deflated tyre. Heat from welding will cause a sudden, drastic increase in tyre pressure and possible explosion. Deflated tyres can ignite inside the air chamber and pressure can build up as described with the same results. Such an explosion can cause serious injury or death.

11. Note: The three main causes of rim/wheel failure (other than damage caused by outside impact) are:
    a. Failure to keep wheel nuts torqued to correct settings (refer to the equipment manufacturers recommendations for torque settings and inspection intervals').
    b. Corrosion: Only dry air should be used to inflate tyres, particularly tubeless tyres. Wheels operating in corrosive environments, (wet, salty, etc.) should also be inspected more frequently (at least every six months) and proper protective coatings (e.g. paint, galvanising) should be maintained. Severe corrosion or rust pitting weakens the rim and will result in rim failure.
    c. Fatigue; All wheels will fail eventually as a result of metal fatigue. Wheels are a consumable item that must be replaced as required. The working conditions a wheel is used in will determine the service life of the wheel/rim. To increase the service life of the wheel/rim you should always avoid the factors that cause fatigue. These factors include:
        i. Overloading of the wheel.
        ii. Excessive speed.
        iii. Over/under inflation of the tyre.
        iv. Tight cornering at high speed or in loose surface conditions like sand or mud, especially if axles are non-steering.

v. Any environment that places excessive side loading on wheel/rim assembly, i.e. hillside work.
vi. Machinery design. When designing machinery the wheel equipment should be capable of not only supporting the static or flat surface working weight of the machine but should also support spike loads that may occur due to high centre of gravity, uneven surface conditions, tight turning, transporting speeds, multiple axle sets, shifting loads i.e. folding wing farm equipment, when folded for transport raises centre of gravity and centre frame wheel load is increased. Increased product load, i.e. spray tanks using liquid nitrogen weigh approx. 30% more than if filled with water.

These factors should be taken into account when designing equipment.

Demounting

12. Before servicing a rim assembly on a machine, block the tyre and wheel on the opposite side of the machine then place the jack at vehicle manufacturer's recommended position. Put hardwood blocks under the jack. Crib up the machine with blocks or use jack stands. Don't rely on the jack alone as it may shift or fail.

13. Always exhaust all pressure from a single tyre and from both tyres of a dual assembly prior to removing any rim components or attaching hardware such as rim nuts and clamps. Remove the valve core(s) from the valve stem(s). Check the valve stem by running a piece of wire through the stem to make sure it is not plugged. Stand clear during deflating. A broken or damaged rim or component under pressure can blow apart.

14. When demounting dual assemblies from the machine, support the outer dual prior to removing attaching hardware. An unsupported tyre/rim assembly can fail.

15. For larger wheels use mechanical aids to handle tyre/rim or components using a cable or chain sling. Stand clear. Dropping a tyre/rim or component is dangerous. Never attempt to stop a slipping rim or components as they are too heavy to handle. The cable or chain may break, lash out. Dropped tyre/rim components may rebound.

16. When removing lock ring or "O" ring keep fingers clear.

17. When unseating tyre bead, use proper tools, keep fingers clear and stand to one side. Pay special attention for the tool not to slip off as it may fly with force. Use proper tools to dismount tyre from single piece rim so as not to damage tyre bead or rim. Damaged tyre or rim while disassembling may result in premature failure or burst of tyre or rim while inflating or in service.

Assembly & Inflation

(Refer to AS 4457-2007 Part 1: Maintenance and repairs and Part 2: Earthmoving machinery off the road - rims and wheels)

18. Always use the recommended rim assembly for the tyre and machine. Consult your tyre distributor or manufacturer for proper matching. Use of other than the approved rim assembly can result in premature rim/tyre/machine component failure.

19. Make sure parts of the correct size and specification type are being assembled. Many rim components look similar although they are different in design and type. Therefore, carefully check correct application and fitting instructions to the machine of the rim and components prior to use so that compatible rim

and components are used. Check with your distributor or the manufacturer if you have any doubts about the suitability of the components. Mismatched parts may appear to fit – but when the tyre is inflated, may fly apart with explosive force resulting in serious injury or death.

20. Make sure to use correct rim and rim flange size to suit the tyre. Follow the tyre manufacturer's recommendation regarding use of a bead lubricant. Improper tyre mounting may cause premature failure of tyre or rim.

21. Check to ensure that all components are properly seated prior to inflation, paying special attention to lock ring area on multi piece rims. If you are not sure about the proper mating of rim parts, stop and consult the tyre/rim servicing organisation, the rim and wheel distributor or the manufacturer for expert guidance. Failure to exercise proper care in assembly can result in sudden flying apart of rim parts with explosive force during inflation or in service.

22. Mount tyre from shorter ledge side using tyre lubricant. Never hit tyre bead when mounted with single piece rim. Mounting from longer ledge side, poor lubrication or hitting tyre bead may damage tyre resulting in tyre burst while inflating or in service.

23. Do not hammer on rim or components with steel hammers. Use rubber, lead, plastic or brass faced mallet if it is necessary to tap uninflated components together during assembly. Properly matched and assembled components will seat without tapping during inflation. Steel hammers may damage or distort the rim or components causing improper fit or premature failure. The inflation equipment should have a filter to remove moisture from the air line. This filter should be checked to insure it is functioning properly. Moisture causes corrosion of the rim or components which lead to difficult disassembly and premature failure.

24. Place the tyre/rim assembly in a safety cage or use an equivalent restraining device during inflation. If not possible, take actions necessary to keep personnel out of the potential blast and trajectory area. During inflation, improperly assembled components may fly apart with explosive force.

25. Always use a clip on fitting with a sufficient length of hose to permit the person inflating the tyre to stand clear of the potential blast and trajectory of the rim components. Use an in-line valve with gauge or a pressure regulator preset to a desired value when inflating a tyre. During inflation, improperly assembled components may fly apart with explosive force.

26. Inflate to 3 psi and recheck rim components for proper assembly. If assembly is not correct, deflate and reassemble. Never try to seat rings or components by hammering while the tyre is inflated or partially inflated. When assembly is proper at 3 psi, continue to inflate to fully seat tyre beads as per tyre manufacturer's recommendation. This recheck at partial inflation ensures proper component assembly. If a misassembled part is tapped, it or the tapping tool may fly out.

27. Never try to reseat rings or other components by hammering while tyre is inflated or partially inflated. Deflate, inspect and reassemble following proper procedures. Hammering on a misassembled component may cause the assembly to fly apart with explosive force.

REMINDER: IF YOU ARE NOT TRAINED IN HANDLING A PARTICULAR WHEEL/TYRE ASSEMBLY, LEAVE IT TO SOMEONE WHO IS. Refer to AS 4457-2007 Part 2: Earthmoving machinery off the road – rims and wheels for additional technical references.

SECTION 5: SERVICE AND MAINTENANCE PROCEDURES FOR HEAVYWEIGHT WHEELS (5° BEAD ANGLE)

These procedures apply to wheels with 5° bead angle which are intended to carry loads in excess of 10 tonnes per wheel. Such wheels must be inspected and tested according to AS 4457-2007 Part 1: Maintenance and repairs and Part 2: Earthmoving machinery off the road – rims and wheels recommended inspection schedules. This process should be recorded with reference to vehicle identification number, hours and the name of the person undertaking the process.

The standard accordingly recommends:

1. Daily visual inspection of rims/wheels for damage to be carried out during daily inspection of tyres.

2. Full inspection and test according to AS 4457-2006 Part 1: Maintenance and repairs and Part 2: Earthmoving machinery off the road – rims and wheels must be performed on a new wheel after 4,000 hours service and then at 4,000 hour intervals thereafter unless otherwise specified on the original sales invoice. These services should be done in conjunction with a major tyre change if possible.

   Note: Service inspection may be required earlier than 4,000 hours if an incident occurs that may in any way cause damage or suspected damage to the wheel/rim, i.e.
   a. Severe impact to tyre/wheel assembly.
   b. If tyre blows or is driven flat or below 80% of inflation pressure.
   c. Visual inspection shows signs of cracks or damage to rim/wheel.
   d. Tyre inflation records show the rim may be leaking.

Notes

Anyone performing service inspections on the wheel/rim assemblies should be familiar with AS 4457-2006 Part 1: Maintenance and repairs and Part 2: Earthmoving machinery off the road - rims and wheels.

Refer to Note 11: OTR Industrial Wheel and Rim Safety and Maintenance Procedures.

SECTION 6: RECOMMENDATIONS FOR TORQUE SETTINGS AND INSPECTION INTERVALS

Minimum Recommended Tension Intervals for Agricultural Wheels

Initial fitment re-tension at:
- 4 hours of operation
- 8 hours of operation
- 16 hours of operation
- 24 hours of operation
- 48 hours of operation

Alternatively, after the first 50 kilometres and subsequently every 100 kilometres, the stud bolt nuts are to be tightened by means of a dynamometric key and with the torque valves listed below.

Ongoing inspection and re tensioning should be done in accordance with daily wheel/tyre inspection procedures. These inspection periods may vary depending on vehicle operating conditions.

Recommended Torque Values for OTR Axles | Metric Wheel Studs

STUD SIZE	TORQUE
M12	73 ft.lbs (100 N.m)
M14	122 ft.lbs (166 N.m)
M16	173 ft.lbs (235 N.m)
M18	253 ft.lbs (344 N.m)
M20 Csk Nut	372 ft.lbs (504 N.m)
M20 Cap/w Nut	253 ft.lbs (344N.m)
M22 Csk Nut	442 ft.lbs (600 N.m)
M22 Cap/w Nut	425 ft.lbs (575N.m)
M24 Csk Nut	562 ft.lbs (762 N.m)
M24 Cap/w Nut	540 ft.lbs (732 N.m)
M27 Cap/w Nut	789 ft.lbs (1070 N.m)

Recommended Torque Values for OTR Axles | Imperial Wheel Studs

STUD SIZE	TORQUE
7/16"	61 ft.lbs (83 N.m)
1/2"	86 ft.lbs (117 N.m)
9/16"	134 ft.lbs (182 N.m)
5/8"	176 ft.lbs (239 N.m)
3/4"	297 ft.lbs (404 N.m)
7/8"	482 ft.lbs (654 N.m)