Justification:
Safety Instruction

***(Maintenance)***

# Private Owner Circular Letter 626 Issue 3

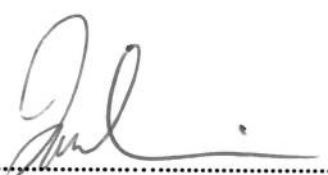
Title

## Wheelset Maintenance



**AUTHORISATION**

**Authorised by:**



J. Collinson, Professional Head of Plant and T&RS

## 1. INTRODUCTION

POCL 626, Issue 3 has been produced in order to advise Private Owners that:

a). The list of Approved Wheelset Suppliers is now available at:

http://www.risas-online.org/

b). The rust preventative compounds listed in WOSS612/10 may now be difficult to obtain and an acceptable alternative is Castrol Rustillo 431.

c). The need to notify the RSSB of any NDT failure of an axle within seven days and to send a summary report of all axle NDT examinations to RSSB every three months is no longer a requirement.

## 2. INSTRUCTION

Appendix 1 prescribes the following:

a). The visual inspection of wheelsets under wagons, including:

- The applicable checks and measurements.
- The limits that apply.
- What action needs to be taken if outside the limits.

b). The Inspections/actions to be carried out on wheelsets removed from wagons (and in special circumstances).

c). The maintenance standards that shall be applied.

The Appendix may be included directly into an Owner's maintenance plan. However, note that certain information relevant to each particular application (see additional Appendices A and B) is required to be completed for the wagon in question.

## 3. SCOPE

This instruction applies to owners of wagons operating under Private Wagon Registration Agreements.

## 4. IMPLEMENTATION

This document shall be implemented immediately.

In the event of any query arising, or clarification required, please contact:

Senior PWRA Engineer
PWRA Management Group
Room 207 Derwent House
rtc Business Park
London Road
Derby
DE24 8UP

# APPENDIX 1

## WHEELSET INSPECTION DURING MAINTENANCE

### INSPECTIONS TO BE CARRIED OUT WITH WHEELSETS FITTED UNDER WAGONS

| Visually inspect wheelset for: | Checks/measurements/limits: | If outside limits: |
|---|---|---|
| Relative movement at the interference fit between wheel and axle. | Measure back-to-back dimension (A). | Remove from service immediately. |
| Any signs of overheating anywhere on the wheelset. | Measure back-to-back dimension (A). | Remove from service immediately. |
| Corrosion anywhere, other than on the wheel tread. | Any corrosion that is:<br>• Located in any transition area.<br>• Concentrated at a particular point that is a corrosion pit, particularly where it has a ring of red/brown staining.<br>• Greater than 1mm deep or longer than 30mm circumferentially or 50mm axially.<br>• Cannot be removed by polishing up to 1mm deep.<br>• Occurs at more than 10 points on the axle. | Remove from service immediately. |
| Wheel profile is correct. | Confirm correct profile is used | Remove from service immediately. |
| | Wear has caused discontinuities in the profile shape (tread or the flange). | Remove from service within 24 hours. |
| Step in the flange. | A circumferential step in the flange profile greater than 1.5mm. | Remove from service within 24 hours. |
| Flange height and thickness. | Measure or gauge (B) and (C). | Remove from service immediately. |
| Flange toe radius/sharp flange | Check with radius gauge (i.e.5mm radius, with 7mm chord). | Remove from service within 24 hours. |
| False flange. | If 2mm or greater. | Remove from service immediately and advise Infrastructure Controller of the wagon number, train formation and routes. |
| Wheel tread roll-over. | If 5mm or greater. | Remove from service immediately. |
| Wheel rim distortion. | Measure damage on the inner surface of the wheel rim (not to exceed 4mm in depth). | Remove from service immediately and scrap. |
| | Check there are no sharp indentations in the inner surface of the wheel rim.<br>Measure wheel rim face bulging (not to exceed 2mm). | Rectify or remove from service within 24 hours. |
| Wheel diameters. | Although not part of normal maintenance, if diameter is suspected as being outside limits measure (D). | Remove from service immediately. |
| Wheel throat thickness. | Measure or gauge (E). | Remove from service immediately. |
| Wheel tread run-out | Although not part of normal maintenance, if diameter is suspected as being outside limits measure (F). | Remove from service immediately and advise Infrastructure Controller of the wagon number, train formation and routes. |
| Wheel tread cavities | A single tread cavity exceeds 15mm continuous length circumferentially around the wheel.<br>Multiple tread cavities exceed 10mm continuous length and occur less than 50mm apart. | Remove from service within 24 hours. |

## APPENDIX 1

## WHEELSET INSPECTION DURING MAINTENANCE

### INSPECTIONS TO BE CARRIED OUT WITH WHEELSETS FITTED UNDER WAGONS

| Visually inspect wheelset for: | Checks/measurements/limits: | If outside limits: |
|---|---|---|
| Cracks in a wheel. | Any cracks that are:<br>In the transition between wheel tread and rim.<br>On the wheel chamfer or outside face of the wheel rim.<br>In the flange, or in any roll-over.<br>An isolated coarse crack longer than 30mm is found on the tread.<br>Emanate from wheel web holes. | Remove from service immediately. |
| | Multiple fine cracks in the tread and one of the cracks exceeds 40mm in length.<br>An isolated crack longer than 20mm in the tread. | Remove from service within 24 hours. |
| Wheel flats. | Wheel flats of length (G). | Advise Infrastructure Controller of the wagon number, train formation and routes.<br><br>If moved limit speed to 35 mile/h.<br><br>Note: If a flat greater than 100mm long is found the wagon shall not be moved unless agreed with the Infrastructure Controller. |
| Wheel tread scoring grooving. | Severe/excessive scoring or grooving. | Remove from service upon completion of journey. |
| Metal build-up on the tread. | Metal build-up on the wheel tread is 1mm or greater in height. | Remove from service immediately. If moved limit speed to 35 mile/h.<br><br>Note: If metal build-up of 1mm in height or greater may be removed with hand tools and returned to service if the area involved extends no more than 50mm around the wheel tread circumference. |
| Thermal crazing or rolling contact fatigue cracks in the centre of the tread surface. | | Remove from service immediately. |
| Damage to the oil injection hole or missing oil injection hole plug. | | Seek advice from Supervisor. |

# APPENDIX I

## WHEELSET INSPECTION DURING MAINTENANCE

### INSPECTIONS TO BE CARRIED OUT WITH WHEELSETS FITTED UNDER WAGONS

| Visually inspect wheelset for: | Checks/measurements/limits: | If outside limits: |
|---|---|---|
| Any damage to the axle body i.e.<br>• Cracks<br>• Raised edges or burrs<br>• Sharp indentations.<br>• Impact marks.<br>• Fretting.<br>• Flame cutting damage.<br>• Weld spatter.<br>• Electrical arc damage.<br>• Any sign of scoring<br>• Integrity of the axle protective surface coating. | **Note:** If axle scoring is found, investigate what caused it whilst the wheelset is still fitted to the wagon. Rectify any fault that caused scoring prior to the wagon being returned to service. Assemble and adjust all components adjacent to the axle such that in the worst case (i.e. at the maximum wear of components, suspension displacement, movement of brake linkages, etc.) a minimum clearance of 6mm is maintained to the axle.<br><br>Confirm all deficiencies in axle condition by measuring the extent of any defects, such as axle body run-out, surface texture, back-to-back, etc. Axles found deficient shall be labelled as such and quarantined pending repair, overhaul or scrapping. If an axle is scrapped (for whatever reason) an NDT inspection shall be carried out and the journals mutilated to prevent reclamation or repair. | Remove from service immediately. |
| Any damage to the axle end faces (at UAT) that affects NDT i.e.<br>• Raised edges.<br>• Indentations.<br>• Depressions.<br>• Poor surface texture.<br>• Grooving.<br>• Damage to axle end threaded holes. | | Rectify or seek advice from Supervisor. |

# APPENDIX I

# WHEELSET INSPECTION DURING MAINTENANCE

## GENERAL NOTES

1). Use only calibrated gauges or equipment to assess dimensions, wear and damage.

2). All defects found shall be recorded, clearly marked on the wheelset and the Supervisor advised.

3). Measure the back-to-back dimension (A) at axle height and at three equi-spaced locations around the wheelset.

4). With axles over 40 years old the NDT periodicity is specified by the Senior PWRA Engineer for the particular axle type and application, which the wheelset database should be updated to reflect. Such axles shall be stamped with an "X" in front of the manufacturer's / assembling contractor's code.

5). All axles found to be defective shall have their journals mutilated (or the axle cut in two) so that re-use of the axle is impossible.

## INSPECTIONS/ACTIONS TO BE CARRIED OUT ON WHEELSETS REMOVED FROM WAGONS (AND IN SPECIAL CIRCUMSTANCES)

### Additional Safety Inspections

In addition to normal maintenance events, safety inspections of wheelsets shall be carried out:
Following any wagon repair that affects the wheelsets, bogies or suspension.
Upon receipt of an incident report (e.g. rough riding, striking an object, unusual noise, wheel flats).
Post collision or derailment.
Following report of a wheel load impact detector exceedance.
Following activation of a hot box detector, or having a hot axle box or bearing.
Following report of dragging brakes.
If any other wheelset deficiencies are identified by an Urgent Safety Related Defect Report (NIR).

### Post Incident

On overheated, or suspect overheated wheels measure:
Back-to-back dimension, measured at axle height and at three equi-spaced locations around the wheelset.
Wheel diameters and check wheel diameter difference.
Wheelsets fitted to wagons involved in a collision, a derailment or striking an object on the track shall be subject to a NDT axle examination and removed from service immediately if any damage cannot be rectified.

### Wheelsets removed from wagons

Wheelsets removed from wagons shall either be scrapped or rectified using a controlled, approved procedure as follows:

TS/TN0574 – 'Wheelset Off-Vehicle Repair Specification'.
WOSS 612/10 – 'Wheelset Overhaul Procedures'.

### Handling, storage and transportation of free wheelsets and components

Ensure that wheelsets (and their components) which are not in service under wagons are always protected, stored, handled and transported in a manner which is not detrimental to the wheelset/component life..

### Before replacement wheelsets are fitted to wagons confirm:

The wheelset has been NDT certificated as defect free using an approved NDT procedure and operative.
The diameters of wheels on the same axle are within 0.5mm of each other.
The permitted variation in wheel diameter (between wheelsets in a wagon) is within limits (D).

### NDT

Check that NDT recall labels shall be fitted to the axle. Any damaged or missing labels shall be re-fitted or the axle re-tested.

Carry out NDT to an approved procedure at the frequency prescribed in POCL 506. All NDT techniques and procedures used on a wheelset shall have been validated for that wheelset.

Re-instate all surface protection of a wheelset following completion of NDT.

**NDT Records**

Retain all records of NDT examinations of wheelsets (including all NDT examinations showing axles are clear of defects). All axles with suspect NDT signals found in service shall be labelled as such, quarantined and the Owner informed.

## APPENDIX A - Wheelset information to be stated in maintenance plan

Wheel profile
Wheelset drawing number
Wheel drawing number
Axle drawing number
UAT procedure chart
MPI (or equivalent) procedure
Paint system to be used

## APPENDIX B - Wheelset dimensions to be stated in maintenance plan

1. **Back to back dimension – in service and at overhaul (A).**
2. **Maximum flange height (B).**
3. **Minimum flange thickness (C).**
4. **Wheel diameters – new, last turning, scrap and permitted wheel diameter variation within the wagon (D).**
5. **Minimum wheel throat thickness (E).**
6. **Wheel tread run-out (F).**

   Axle load of 17.5t or less

   Tread run out between 3mm and 5mm remove on completion of journey.
   Tread run out exceeding 5mm remove immediately.

   Axle load greater than 17.5t

   Tread run out between 2mm and 4mm remove on completion of journey.
   Tread run out exceeding 4mm remove immediately.

7. **Wheel flats(G)**

   Axle load of 17.5t or less

   Flat length between 60mm and 80mm remove from service on completion of journey.
   Flat length greater than 80mm remove from service immediately.

   Axle loads greater than17.5t

   Flat length between 50mm and 70mm remove from service on completion of journey.
   Flat length greater than 70mm remove from service immediately.