

Justification:
Safety Instruction
(Maintenance)

**Private Owner
Circular Letter
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Title

**Modification to
Y25 Bogie Clasp
Brake 'Banana'
Link**

AUTHORISATION

Authorised by:



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1. **INTRODUCTION**

It has been found on certain wagons fitted with Y25 bogies that the clasp brake 'banana' links have occasionally been rubbing on the axles. Subsequent examinations revealed that the design of the Y25 bogie was such, that at extremes of allowable tolerance, and with a wagon in the loaded condition, contact could occur between the lower face of the 'banana' link and the axle. This contact occurred predominantly at the innermost axle position on both bogies.

Further investigations revealed that the bogie manufacturer had proposed a design change to correct this deficiency. However, this involved extensive modifications to the mounting locations for the brake hangers on the bogie frame to raise them by 10mm. It was therefore suggested that a simpler change might be to modify the 'banana' links themselves by machining them to remove material from the lower face in order to increase the clearance to the axle.

2. **FEASIBILITY STUDY**

The feasibility of the suggested modification was examined thoroughly, the process for which included the following:

- a). Videoing the movement of a 'banana' link in service in both tare and laden conditions.
- b). Measurement of static brake block loads in the tare and laden conditions on a 22.5t axleload wagon. The maximum loads generated were less than 5kN in the tare condition and 17kN in the laden condition.
- c). Incremental testing of existing and modified links up to a load of 200kN to determine the load/deflection characteristics of both the existing and modified links. In conjunction with the brake block loads the load/deflection characteristics were used to validate the finite element model.

Note: The 200kN limit was the maximum that the testing machine could deliver.

- d). Finite element analysis confirmed that the modification did not result in the modified link being over stressed or significantly reduce its fatigue life.

The feasibility study concluded that it was possible to modify the Y25 bogie clasp brake 'banana' links by machining them to remove material from the lower face without comprising the integrity. The modification was also shown to be applicable to the various Y25 bogie clasp brake 'banana' links* and hence it was formally approved by Network Rail's Vehicle Conformance Team and certificated as a direct replacement component (see Appendix A).

*Note: Only 10mm of material may be removed from the lower face of links to drawing F-A1-19373. However, either 10mm or 20mm may be removed from links to drawings 100 M 3321 019 or 459.0.807.25.229a.

3. **INSTRUCTION**

3.1 **Determining whether the modified clasp brake 'banana' link is required**

If rubbing is found on an axle, which is identified as arising from clasp brake 'banana' link contact, then before fitting a modified link it will be necessary to firstly check:

a). **That the correct version of the Y25 bogie clasp brake 'banana' link is fitted**

There are three versions of the 'banana' link. These may be identified by the differing cross sections at the centre and by the different amount of off-set (measured from the mounting holes centres to the lower face of the link at its centre section). The three types of 'banana' link are as follows:

Drawing No. 100 M 3321 003 (F-A1-19373) - see Appendix B

This has a 10mm offset and an elongated inverted 'T' section at the centre.

Drawing No. 100 M 3321 019 - see Appendix C

This has a 17mm offset and a squat, inverted 'T' section at the centre.

Drawing No. 459.0.807.25.229a - see Appendix D

This has a 20mm offset and a flat-bottomed oval section at the centre.

If contact is evident between the axle and the 'banana' link it is recommended that in the first instance it is first checked that the link with the 20mm offset is fitted as this may solve the problem, without the need to consider modifications by machining.

It should be noted, however, that any of the links to the above three drawings may be modified by machining away material from the lower face.

b). **The general condition and correct adjustment of the brake rigging**

The modified clasp brake 'banana' link will only be effective in preventing rubbing of axles if the general condition of the brake rigging is kept within maintenance limits and the brake linkage is correctly adjusted as follows:

- Examine for damage and measure/gauge the brake rigging i.e. shafts, levers, links rods, pins and bushes for signs of excessive wear. Replace any components found to be outside of limits and the lubricate pins and bushes as required.
- Adjust the brake rigging to suit the wheel diameter by ensuring that the correct hole in the adjustment support is used (see Figure 1).

3.2 Fitting modified clasp brake 'banana' links

If it is established that 'banana' links require to be modified in order to increase the clearances then the drawings showing the modifications are as follows:

Drawing No. RV-C0-2407558 - Appendix E

For existing banana' links to Drawing No. 100 M 3321 003 (F-A1-19373), for which it is permitted to only machine 10mm from the lower face.

Drawing No. RV-C0-2407557 - see Appendix F

For existing banana' links to Drawing No. 100 M 3321 019, for which it is permitted to machine either 10mm or 20mm from the lower face.

Drawing No. RV-C0-2407556 - see Appendix G

For existing banana' links to Drawing No. 459.0.807.25.229a, for which it is permitted to machine either 10mm or 20mm from the lower face.

Note: Modified 'banana' links shall be stamped as shown on the drawings for identification purposes. However, it is recommended that if modified 'banana' links are required on any wagon within a fleet, then all wagons are converted with the same modified items in order to prevent future problems when 'banana' links are removed for maintenance.

4. **SCOPE**

This instruction applies to any Y25 bogies where the clasp brake 'banana' links have been found to be rubbing on the axles.

5. **IMPLEMENTATION**

This document may be implemented immediately.

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

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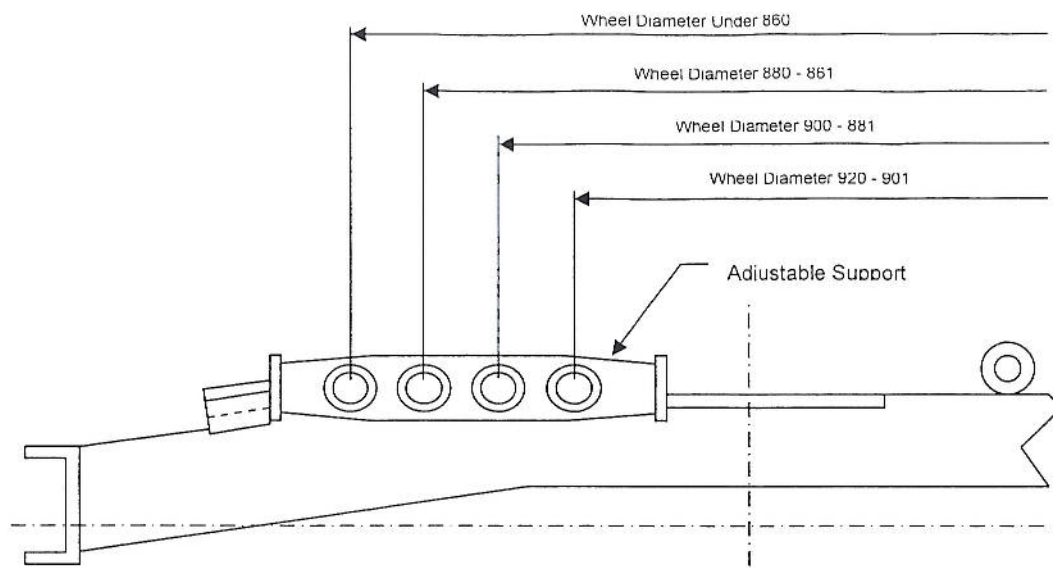


Figure 1 Adjustment of brake rigging to suit the wheel diameter