



Urgent Review of K Crossings on Diamonds

Applicability

ARTC Network Wide		Western Jurisdiction		New South Wales	✓	Victoria	
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Audience	Main Points	Change History
Corridor/Delivery Managers Team Managers Work Group Leaders Project/Delivery Engineers Engineering Compliance Managers	Condition of K Crossings especially on sharp curves Need to ensure that crossing noses do not show excessive side wear Wear limits and recommended responses Inspection method detailed Correction of K Crossing problems difficult – should only be attempted by qualified staff with experience with diamonds New method of repair requires special approval and expertise	Previously Civil Enq Instruction N0117 (RIC CTN 01/17)

It is essential to pay close attention to the condition of “K” crossings in Diamonds especially on sharp curves of less than 450m radius.

Inspections must ensure that crossing noses do not show excessive side wear or other evidence of wheels tending to go towards the wrong road. In extreme cases crossing noses may have worn away completely or broken off.

Measurement of wear and recommended response is given in Table 1 with details of wear shown in Figure 3.

Table 1 – Assessment of Side Wear at Crossing Nose Tip and the Ramp up to the nose.

Category	Condition	Response
1	Side wear on any one side of no more than 3mm and side wear on both sides totalling no more than 5 mm	Normal monitoring
2	Side wear of greater than 3mm on one side but with at least 2mm of the original width remaining* or side wear on both sides totalling more than 5mm but with at least 2mm of the original width remaining*	Arrange investigation and appropriate corrective action
3	Side wear where there is less than 2mm remaining of the original width	Urgent attention required and review permissible speed
4	Side wear where nose or ramp is completely worn away or broken away at any point Where there is any loss of height in the ramp up to the nose	Trains should not be permitted to pass excepting where certified by the nominated Delivery Managers or nominated representative and then only at greatly reduced speed.

*If the rail in the ramp is rolled over this is not to be included in the original width. It is important to check if the nose has broken off or been worn away.

A typical K Crossing nose in Category 3 is shown in Figure 1. The ramp up to the nose is worn and rolled over.

An example of K Crossing nose in Category 4 is shown in Figure 2. The nose and ramp has been completely worn away.

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Crossing noses should also be checked for hit marks that may indicate a wheel has tried to track the wrong way. Where nose wear has occurred prior to repair being carried out or where there is uncertainty as to the current wheel tracking the situation should be reviewed by painting the area in and around the nose.

This should be checked after the passage of several trains over each route to determine where wheel contact is occurring. If repairs have been effective in keeping wheels clear of the nose then the priority for replacement should be reviewed, however:

- If the wear is already in category 3 or 4 (from Table 1) replacement or upgrading will still be required and increased monitoring should be arranged.
- In addition if wear is in category 4 (from Table 1) then the speed of trains should be reduced until the crossing can be replaced or upgraded.

The wear on all four K Crossings on a diamond should be inspected. The wear on a trailing nose may impact on the facing nose on the opposite rail for which it provides checking.

When crossing noses have excessive side wear it is evidence that there is something wrong with the diamond. **It is not permissible to simply repair the nose or wingrail of the crossing via welding as this will not correct the tracking of the wheel and may create additional hazards.**

Problems with diamonds that could lead to excessive wear include:-

- Incorrect checkrail effectiveness from incorrect gauge.
- Incorrect checkrail effectiveness from worn flangeway
- Incorrect position of K Crossings relative to one another
- Bent or skewed K Crossings
- Worn wing rails

Determining the appropriate repair method for K Crossing problems is difficult and should only be attempted by qualified staff with experience with diamonds. There are also some unusual crossing designs that are not covered by the inspection methods described in this Instruction. Specialist assistance may be obtained by contacting the ARTC Standards & Systems Department.

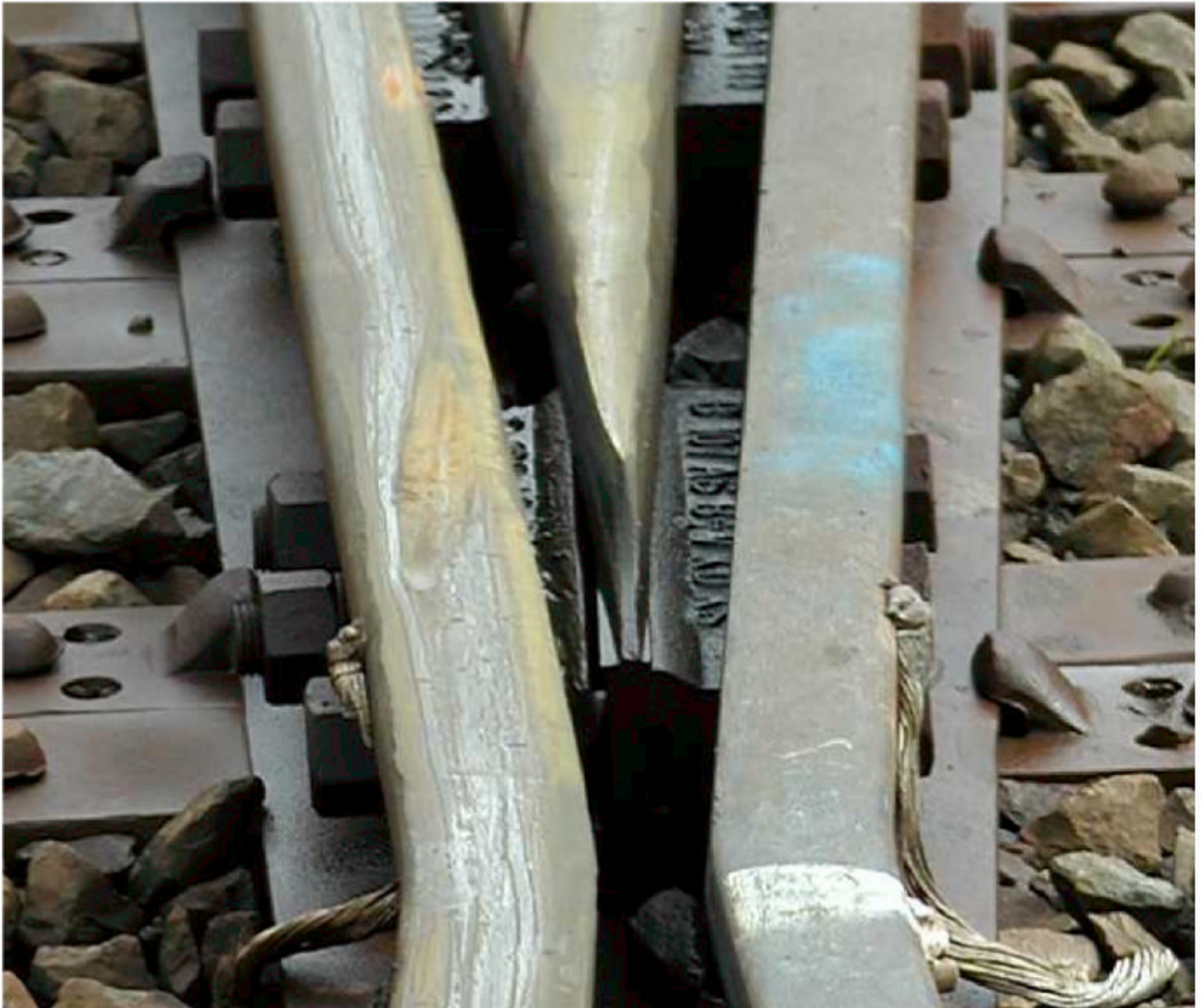


Figure 1 A typical K Crossing nose in Category 3. The ramp up to the nose is worn and rolled over.



Figure 2. The ramp and nose of the K Crossing have been completely worn away. Note that the wingrail on the LHS has been raised to reestablish checking for the diamond.

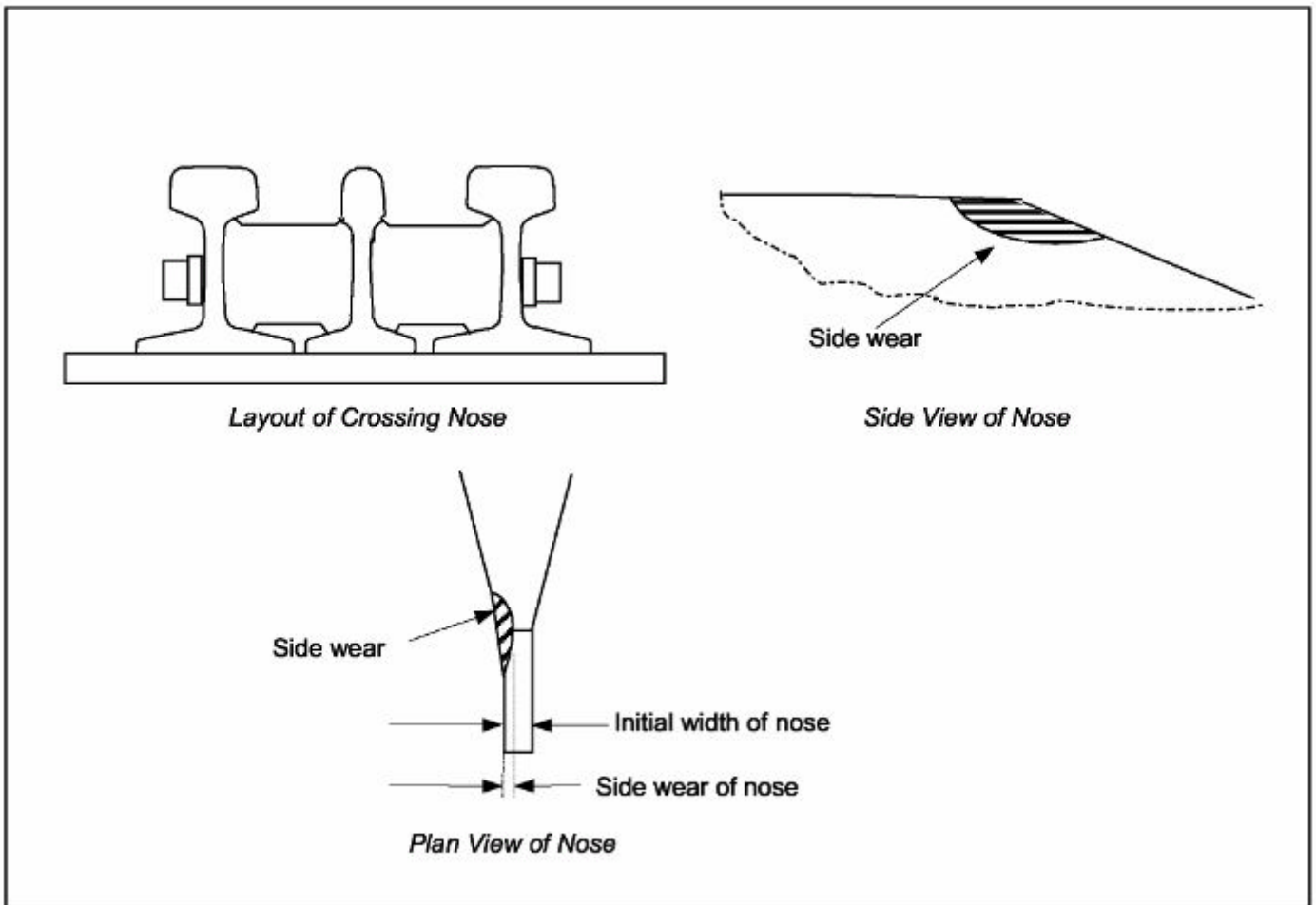


Figure 3