Locomotive sandbox fixing arrangements

The incident

A recent rail incident involved the displacement of a locomotive sandbox onto the track where it was struck by a trailing passenger service. The strike resulted in significant damage to the passenger train and also represented a serious derailment risk. The locomotive was part of a freight service carrying out mainline operations on the Main Southern line in NSW when the incident occurred.

This event highlights the risks associated with loose or damaged locomotive bogie mounted equipment. OTSI has issued this Safety Advisory to inform rolling stock operators and operational staff of a potential broader industry safety concern.

Key points for operators

An investigation by the locomotive operator revealed the sandbox was extensively damaged and its fixing points on the bogie showed evidence of failure at the weld attachment points with the bogie frame. Figure 1 (next page) identifies the sandbox type involved in the incident and the actual fixing arrangement failure points.

The operator also found evidence that the locomotive had been involved in a prior strike event with an unknown object in the vicinity of the bogie, with that event potentially contributing to the eventual displacement of the sandbox.

The root cause of the sandbox's displacement could not be categorically determined due to the damage it sustained. However, a subsequent inspection of the locomotive class and the sandbox fixing arrangements revealed a number of fractured welds, fractured brackets and loose bolts. Based on that observation the operator has undertaken several remedial safety actions including:

- Issuing safety advice to its train crew and maintenance staff to be vigilant in inspecting sandbox fixing arrangement condition (checking for fractured welds, fractured brackets and loose bolts) during sandbox provisioning and maintenance inspections.
- Redesigning sandbox fixing arrangements to replace the current bolt arrangement. The redesign involved a change from a welded nut to a bolt and free nut, nyloc nut and nord washer configuration, noting that this type of fixing arrangement has proven successful on other locomotive and passenger cars.

Safety message

Ensuring that sandbox fixing arrangement designs are suitable and subject to ongoing inspections is essential for managing the risk of sandbox displacement and consequential damage to rail infrastructure and rolling stock, and the potential for trailing rolling stock to derail. This risk is applicable to freight locomotives and passenger rolling stock operating bogie mounted sandboxes and also applies to other bogie mounted equipment.

The reporting of rolling stock strike events to track managers and rolling stock operators is critical for reducing the risk of subsequent strikes and ensuring any damage to the rail infrastructure and rolling stock is inspected and safety assessed.

For further information contact: Transport.Safety@otsi.nsw.gov.au

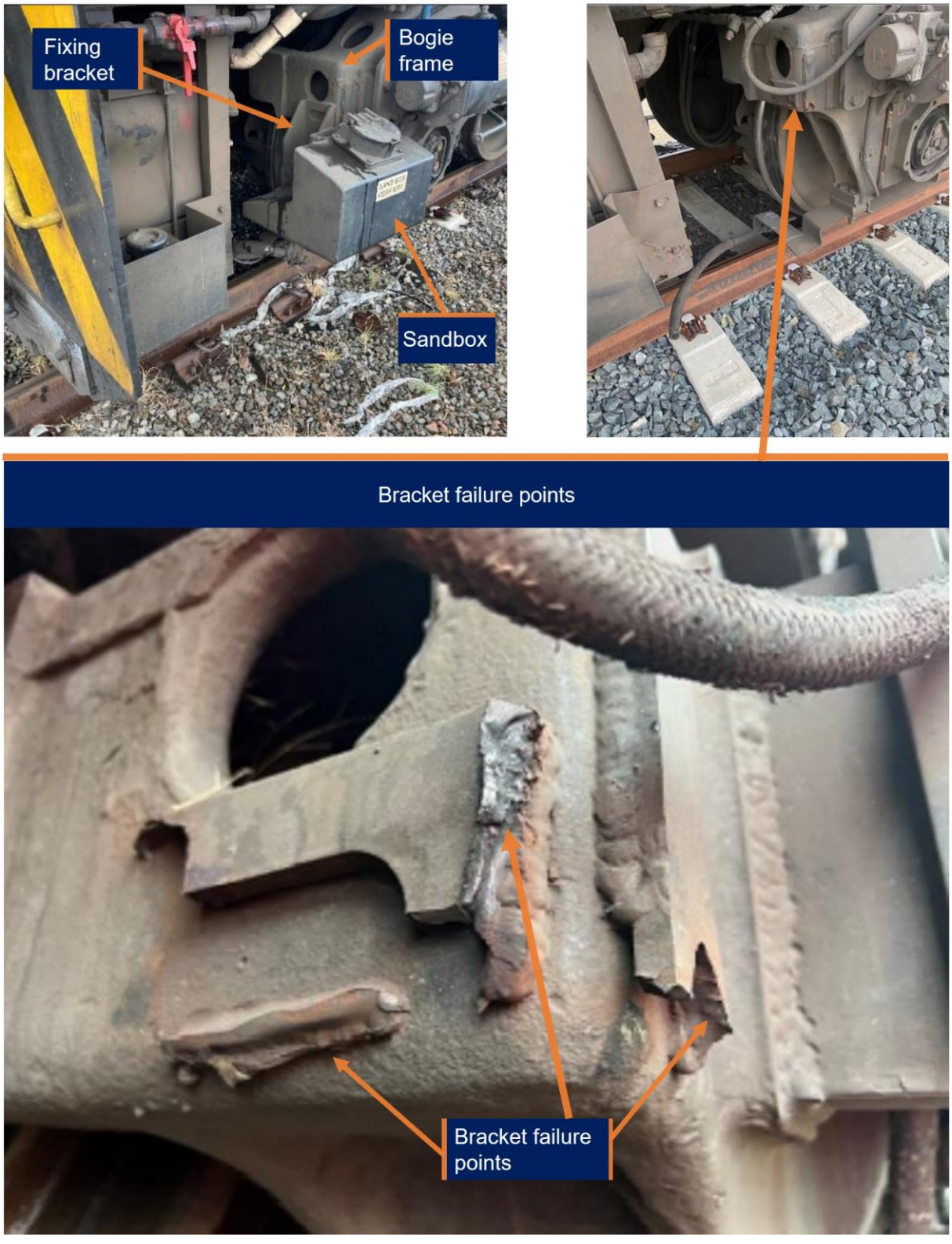

Figure 1 - Locomotive sandbox type involved in the incident