

No. ECoR/SFY/67/56

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Safety Circular No. 17/2024

Subject: Frequently Asked Questions (FAQ) on Locked Axles.

In the recent past a number of Axle lock in Locos/wagons/coaches having potential threat to safe train operation were detected prior to any incident. In order to inculcate safety awareness among staff some FAQs are as under for necessary preparedness and precautionary measure to prevent recurrence.

1. What is a locked axle in a train?

A locked axle refers to a condition where one or more axles of a train become immobilized, meaning the axle and its connected wheels cannot rotate properly or not rotate at all. This can be caused by mechanical failure, brake malfunction, or external obstructions, preventing the train from moving or causing damage to the wheels and track. It can happen in both locomotive as well as wagons and coaches.

2. What causes a locked axle?

Common causes of a locked axle include:

- **Brake Malfunctions:** When a brake remains engaged or fails to release properly.
- **Bearing Failure:** A faulty or seized bearing can prevent the axle from rotating.
- **Obstructions:** Debris or objects caught in the wheel or axle assembly.
- **Overheating:** Overheated components, such as bearings or brakes, can seize and lock the axle.
- **Mechanical Damage:** Wear or structural damage to the axle or wheel assembly.

3. What are the symptoms of a locked axle?

Symptoms of a locked axle include:

- Train not moving or moving slowly despite power being applied.
- Unusual noise or grinding sound from the affected wheel or axle.
- Overheating wheels or brakes with potentially visible smoke or heat waves.
- Excessive wear or damage to the wheels or tracks.
- Sparks or friction visible from the affected wheel.

4. What are the repercussions if an axle is locked?

If an axle is locked, the wheels attached to it won't rotate properly or not rotate at all, preventing the train from moving efficiently. This can lead to:

- Train delay or stoppage.
- **Increased wear** on the track and wheels.
- **Potential for derailment** if one or more wheels are not rotating, it can cause the train to behave unpredictably, leading to an uneven distribution of weight or track damage, which may result in a derailment, especially if not addressed in time.
- **Damage to the mechanical components** of the train, especially the axle, bearings, and wheels.
- **Increased Friction:** A locked axle generates excessive heat, which could lead to brake fires or damage to the track.

5. How do LP/ALP, TMR and station staff detects a locked axle?

LP/ALP may notice a locked axle through:

- Performance issues such as the train not accelerating properly.
- Excessive braking or the train pulling to one side.
- Visible signs of damage or overheating on a specific wheel or axle.
- Signals from onboard monitoring systems that track wheel and axle performance.
- Unusual sound and drag/rubbing mark on track during run while exchange of all right signal by station staff with crew.
- Guard to observe rubbing mark or scabbed rail from rear during run.

6. What should be done, by LP/ALP, if a locked axle is detected?

If a locked axle is detected, immediate action should be taken to:

- **Pull Over Safely:** LP/ALP should stop the train immediately in a safe location and inspect the affected area.
- **Examination:** Affected axle to be examined LP/ALP/TMR and decision is to be taken if the vehicle can move to next station or has to be detached immediately to prevent further damage to railway property.
- **Reporting:** Line staff to immediately alert TMR by shouting or hand gestures and then report to SM/SMR of the nearest station and sectional controller for controlling the train.
- **Movement for Repair:** Repairing locked axle in open line is quite difficult. On detection of locked axle, the affected vehicle should be moved to spare line for wheel change. or to shed with restricted speed as decided by the C&W staff of Shed.

7. How can a locked axle be prevented?

Preventive measures include:

- **Regular Maintenance:** Timely and proper maintenance of brake systems, bearings, and axles to ensure proper functionality.
- **GDR:** Inspections by LP/ALP and TMR before and after each trip to identify early signs of wear or damage.
- **Monitoring:** Monitoring parameters that track wheel and axle conditions, alerting operators to potential issues before they become critical.
- **Clear Tracks:** Clear tracks to avoid debris or obstacles that could get caught in the axle assembly.

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