



Reference: BAV-521.110.0-2/31

Your reference:

Ittigen, 11 September 2025

The Federal Office of Transport (FOT)

has examined the matter of

Swiss railway undertakings in the freight transport sector

Freight wagon keepers based in Switzerland

Entities in charge of maintenance to whom vehicles are assigned in the Swiss rolling stock register

(by e-mail)

concerning

Measures relating to the safety of freight wagons

I and determined the following:

1. On 10 August 2023, freight train no 45016 derailed in the Gotthard Base Tunnel (GBT).
2. The Swiss Transportation Safety Investigation Board (STSB) investigated the incident and published an interim report on 22 September 2023. The initial findings of the investigation revealed similarities to the wheel failures examined in the first JNS Procedure 'Broken wheels'. In safety recommendation no 184, the STSB advised the FOT to request initiation of a JNS procedure¹ by the ERA². The purpose of the procedure is to develop harmonised measures across Europe so that safety problems can be resolved efficiently and with lasting effect.
3. The first meeting of the JNS Task Force 'Accident in the Gotthard base tunnel with focus on broken wheels' was held on 6 December 2023. Specialists from the FOT were actively involved in drawing up the measures. The ERA published version 2.0 of the final report on 11 July 2024 and version 3.0 on 4 April 2025 (report revised for better clarity). The report contains recommendations on risk-minimising measures for wheel types BA 004, BA 390, Db-004sa, RI 025, R32 and BA 304.
These recommendations supplement or replace those already adopted by the JNS Task Force 'Broken Wheels' in 2017 and 2019 following similar procedures.

¹ Joint Network Secretariat

² European Union Agency for Railways



4. In a letter dated 6 September 2024 (Derailed freight train in the Gotthard Base Tunnel – Instruction to implement the measures drawn up by the JNS Task Force ‘Broken Wheels’), the FOT instructed railway undertakings (RUs) to implement the JNS Task Force’s recommendations. The FOT checks that this instruction is being implemented during its regular monitoring activities. Entities in charge of maintenance (ECM) were also instructed to implement the recommendations.
5. In a letter dated 13 March 2025 (Derailed freight train in the Gotthard Base Tunnel – Reactivation of the JNS Task Force ‘Broken Wheels’) in relation to further wheelset series, the FOT recommended extending these measures to additional wheel types (BA 303, RI 101 and BA 005) based on findings from a train investigation in Italy. The FOT checks that this recommendation is being implemented during its regular monitoring activities.
6. The STSB published the final report on the GBT accident on 27 May 2025. The report sets out the causes of the derailment of freight train no 45016 and identifies a systematic problem. The STSB drew up three safety recommendations for the ERA’s consideration. It recommends extending the risk control measures for freight wagon operations proposed by the JNS Task Force to all wheel types equipped with composite brake blocks. The STSB also recommends modifying the requirements for the intervals at which these wheel types are maintained and the methodology used, and advises commissioning a study into how composite brake blocks affect thermal stresses on the wheels. A response from ERA to these safety recommendations is not yet known to the FOT.
7. In its 2024 safety report, the FOT identified the following safety gap in the maintenance of freight wagons:
Wagon keepers and railway undertakings (RUs) in the freight sector have signed a General Contract of Use for Wagons (GCU) under private law to regulate their cooperation. Some parts of this contract conflict with the legal requirements valid throughout Europe. This has created uncertainty as to how safety responsibilities are divided between RUs, wagon keepers and maintenance centres. Some areas that are affected include inspections before vehicles are first used or before trains depart and handling of damage that occurs during a journey. This could lead to maintenance centres’ tasks being delegated to RUs in a legally untenable manner and to defects being remedied too late or not at all.
8. On 2 June 2025, SBB stated in a press release that it considers the risk of freight transport accidents too high based on the findings in the STSB’s final report. Until effective official measures for modernisation and maintenance are adopted, SBB will phase out the transport of freight wagons with LL brake blocks. The majority of the phase-out will be completed by the end of 2025.
9. On 26 July 2025, the FOT held an initial round table with industry representatives to discuss potential measures. The industry representatives were asked to draw up ideas for possible and reasonable short- and medium-term measures to improve safety in freight transport and to submit these ideas to the FOT.
10. On 7 August 2025, the FOT held a second round table with industry representatives. The suggested measures were discussed, and a package of potential measures was outlined.
11. In the week from 25 to 30 August 2025, the FOT received among others additional responses to the measures discussed at the round table and planned by the FOT from economiesuisse, RUs and Hupac Group.

II The FOT has considered the following information:

A Legal information:

1. Under Article 10 of the Railways Act of 20 December 1957 (RailA, SR 742.101), the construction and operation of railways are subject to supervision by the Federal Council; the supervisory authority is the FOT.

Under Article 9 of the Railways Ordinance of 23 November 1983 (RailO, SR 742.141.1), the FOT monitors compliance with safety requirements. If necessary, it orders that the railways be brought in line with regulations.

Under Article 17 paragraph 4 RailA, the RU is responsible for safe operation in accordance with the regulations.

Under Article 17b RailA, the entity entered in the register of rolling stock approved in Switzerland is responsible for maintaining a vehicle.

Under Article 19 RailA, the RU must take the precautions necessary to ensure the safety of the construction and operation of the railway and to prevent danger to persons and property, in accordance with the Federal Council's regulations and the conditions attached to the approved plans.

Under Article 12 RailA, the FOT is authorised to suspend decisions and orders made by governing bodies or offices of RUs or to prevent these decisions/orders from being carried out if they violate RailA, the railway licence or international agreements or if they are detrimental to vital national interests.
2. Companies must:
 - have a licence for network access and/or a safety certificate in accordance with Article 8c RailA (for RUs);
 - have an entry in the rolling stock register in accordance with Article 17a (for railway freight carriers);
 - have been entered in the rolling stock register as the ECM, in accordance with Article 17b RailA.
3. Based on Article 89 RailA, the FOT may revoke licences, permits and authorisations on a temporary or permanent basis or restrict their scope if RailA or its implementing provisions are violated or if the restrictions or conditions attached to their issuance are disregarded. If necessary, employees, agents or governing body members at RUs who repeatedly give cause for justified complaints when carrying out their duties must be removed from these duties at the FOT's request, in accordance with paragraph 3.
4. Under Article 39 of the Administrative Procedure Act of 20 December 1968 (APA, SR 172.021), an authority may enforce its rulings if the ruling can no longer be contested through legal remedies. In accordance with Article 41 APA, the authority may enforce the ruling by means of substitute performance by the authority itself or by a third party instructed by the authority at the liable party's expense. The authority must warn the liable party of the substitute performance and give them a suitable period of time to comply, indicating the statutory penalties.
5. Under Article 292 of the Swiss Criminal Code of 21 December 1937 (SCC, SR 311.0), anyone who intentionally violates a ruling that is based on the SCC or one of its implementing provisions and notifies them of the criminal penalty for non-compliance shall be liable to a fine.
6. The FOT therefore has authority in this matter.

B *Material information:*

1. Risks due to incidents involving wheel failures

The investigation report on the accident in the Gotthard Base Tunnel on 10 August 2023 reveals that further wheel failures and derailments are a possibility in freight transport. National and international measures taken to date cover only some of the potentially problematic wheels, as the STSB takes the view that all wheels fitted with composite brake blocks, i.e. virtually all freight wagons currently in use in Switzerland, could be affected. For this reason, the STSB recommends further measures at European level.

Switzerland's rail network is very heavily used and operates mixed traffic. The population density is also very high along several routes that are important for freight transport. This means that the potential impact of a freight transport derailment is very high, as it could lead to a collision with a passenger train or the release of dangerous goods in a densely populated conurbation.

Due to the non-negligible probability of a further event, combined with significant uncertainty and the very high potential impact, the FOT assesses the current risk level as too high. This assessment is in line with that of SBB, Switzerland's largest RU, which has planned extensive measures as part of its risk and safety management system in case no further official measures are ordered.

2. Need for action

Based on the principles of interoperability, the current risk of wheel failures must be addressed at international level in order to avoid national or even company-specific solutions. With this in mind, the FOT has asked for a JNS procedure to be initiated and has been actively involved in the Task Force's work. Under current conditions, the FOT has determined that no internationally harmonised measures will eliminate the existing risk in the near future. Based on its assessment of the risk, the FOT considers itself obliged, as the national safety authority, to take action within its own remit. It has therefore developed several measures intended to replace or supplement measures taken by individual companies wherever possible, enabling a harmonised national approach as a minimum. These measures are based on proposals from the industry (particularly wagon keepers and RUs) and incorporate stakeholders' feedback as far as possible.

3. Thermal overload of wheelsets

In its final report (version 3.0) dated 4 April 2025, the JNS set out various measures relating to the investigation into the Gotthard Base Tunnel accident ('Broken Wheels'). It recommended that wheel type BA 004 and comparable wheel types no longer be considered as thermostable.

In its safety recommendation no 205, the STSB recommends extending the operational risk control measures proposed by the JNS Task Force to all wheel types fitted with composite brake blocks. The date for the implementation of the safety recommendation in Europe is not yet known. The FOT currently considers it essential to implement the measure on thermostable wheels in Switzerland.

4. Minimum wheel diameter

In its final report dated 4 April 2025, the JNS set out various measures relating to the investigation into the Gotthard Base Tunnel accident ('Broken Wheels'). It recommended increasing the service wheel diameter for wheel type BA 004 and comparable wheel types – which had already been increased from 840mm to 860mm in 2019 – by another 4mm to 864mm. This further increase was based on the evaluation of incidents following the Gotthard accident, which showed that the previously selected service diameter of 860mm was too small. Because the new service wheel diameter cannot easily be measured during operations, the JNS also introduced a value of 880mm for the last reprofiling. If the diameter falls below this limit, this is considered a significant change under EU law and must be handled in accordance with Commission Implementing Regulation (EU)

No 402/2013 of 30 April 2013 on the common safety method for risk evaluation and assessment and repealing Regulation (EC) No 352/2009 (CSM RA).

In a note from the FOT to the JNS dated 31 May 2024, wheel types BA 303, RI 101, BA 304 and BA 005 were reported as comparable wheel types. Only BA 304 was added to the list of wheel types regarded as comparable by the JNS. Wheel type BA 303 and comparable wheel type RI 101 were rejected by the JNS participants because one comparison criterion did not apply. The incident involving a cracked wheel in Domodossola on 28 November 2024 demonstrated that wheels of type BA 303 and comparable type RI 101 may also be affected. Wheel type BA 005 was not added to the JNS list of affected wheel types because it is only intended for a wheelset load of 20 tonnes. This limit differentiates wheel type BA 005 from wheel type BA 004, which is approved for 22.5 tonnes. BA 004 and BA 005 differ in terms of hub bore parameters but are identical in terms of wheel web and wheel rim, and the FOT therefore considers them comparable with regard to the essential criteria. Furthermore, incidents involving low wheelset loads have been identified, and the thermal load may vary for individual wagons due to the train composition, regardless of their actual wheelset loads. Based on the considerations discussed above, the FOT is adding wheel types BA 005, BA 303 and RI 101 to the JNS list of identified comparable wheel types.

5. Technical inspection of freight wagons

In its final report dated 4 April 2025, the JNS set out various measures relating to the investigation into the Gotthard Base Tunnel accident ('Broken Wheels'). It recommended carrying out a visual inspection of wheel type BA 004 and comparable wheel types each time the brake blocks are changed and, in particular, in workshops during repairs.

In its safety recommendation no 205, the STSB recommends extending the operational risk control measures proposed by the JNS Task Force to all wheel types fitted with composite brake blocks. The date for the implementation of the safety recommendation in Europe is not yet known. The FOT considers it essential to implement visual wheel inspections in Switzerland.

The certification scheme for the ECM Regulation specifies that the ECM is responsible for carrying out operations-related maintenance activities (maintenance level 2) between journeys. The FOT is of the opinion that a visual wheel inspection could be carried out during these technical wagon inspections (in addition to visual inspections at workshops), provided a suitable location is available. The FOT notes that implementation of operations-related maintenance (level 2) is currently not sufficiently regulated and established, presenting a serious gap in the system. The FOT reserves the right to order an expansion of technical wagon inspections (maintenance level 2), in addition to the requirement to carry out visual wheel inspections.

When determining the kilometre/time intervals, the FOT bases its decisions primarily on the mileage of previously identified cases of wheel cracks and breakages. There is currently insufficient reliable data to determine exact criteria, especially given that each wheel would have to be considered individually due to its manufacture and in particular to its use in operations.

In order for compliance with these maintenance level 2 activities and consideration of the relevant criteria for intervals in operations to be fully effective, it is necessary for stakeholders to share data. Specifically, ECMs must show RUs which wagons have been inspected and are within the specified intervals. For their part, RUs will no longer be able to use wagons in their trains without this information.

6. Voluntary commitment declarations by freight wagon keepers

Freight wagon keepers have repeatedly stated their intention to take longer-range measures to significantly reduce the risk of wheel failures over the long term. These measures relate to the procurement and maintenance of wheelsets, in particular:

- Replacing wheel types BA 004, BA 390, Db-004sa, RI 025, R32, BA 304, BA 303, RI 101 and BA 005 and wheel types comparable to BA 004 with unaffected types during maintenance level 3 (reprofiling);
- Applying design criteria to increase the thermomechanical load capacity of the wheels based on the current state of the art;
- Applying specifications to detect thermal overload through thermosensitive paint on the wheels based on the current state of the art.

The FOT supports this approach and expects that these measures will be implemented going forward, independently of any further measures that may be introduced.

7. Measures taken by freight wagon keepers relating to tread-braked wheelsets with composite brake blocks

During the second round table discussion on 1 August 2025, freight wagon keepers gave the FOT a list of measures already introduced to increase the safety of freight wagons. These are as follows:

- Inspecting wheelsets at fixed intervals during scheduled vehicle overhauls and predominantly wear-related reprofiling, as well as during brake block replacements and visual inspections in accordance with the European Visual Inspection Catalogue (EVIC) for Wheelsets;
- Manufacturing a crack-free tread and monitoring the internal tensile state during each reprofiling;
- Implementing Appendix 10 GCU with regard to inspections of wheelsets with LL brake blocks;
- Reprofiling wheelsets and carrying out inspections during wear-related wheel profile maintenance measures in accordance with the operational limit values set out in Appendix 9 GCU;
- Prohibiting the use of LL brake blocks in new vehicles;
- Procuring solid wheels with residual tensile stresses only in the wheel rim and applying design criteria as set out in the JNS report ‘Accident Gotthard base tunnel – broken wheels’.

The FOT regards these measures as necessary and effective at increasing the safety of freight wagons. The FOT expects that these measures will continue to be implemented, independently of any further measures that may be introduced.

8. Sound test (hammer test) on tread-braked wheelsets fitted with composite brake blocks during train inspections by the RU

On 28 November 2024, a cracked wheel was discovered when performing a sound test during a train inspection in Domodossola. This shows that a sound test on-site can be useful and appropriate for detecting cracked and broken wheels, provided operating conditions allow for the test to be carried out with the required diligence. The test must also be performed by appropriately trained and experienced staff.

Sound tests during train inspections are a supporting measure.

9. Raising awareness among train crew of driving habits that prevent thermal wheel overload

Train crew can help to prevent thermal overload of wheels by adapting their driving habits. This in turn can help to reduce the need for maintenance measures in workshops. Specific recommendations for RUs can be found in the JNS report ‘Consequences of unintended brake applications with LL blocks’ (link: [JNS NP LL brake blocks Final report v2.0.pdf](#)).

The FOT expects RUs to review these measures and implement them wherever practicable and appropriate.

10. The FOT recommends that the addressees of this ruling commission a joint study on the effect of composite brake blocks on thermal stress on wheels. This study should then be used to develop the intervals and methodology set out in the maintenance specifications for wheelsets.
11. The FOT recommends that addressees of this ruling stop using the wheel types mentioned above, as well as comparable wheel types, and work towards separating the lateral guidance and braking features in freight wagons developed in future.
12. Due to the factors involved in the spread of wheel cracks, some of which have not yet been explored, it is conceivable that changes will be made to the measures ordered if new findings become available. At present, however, it is not possible to order less stringent measures or dispense with measures entirely, as requested in some feedback, because of the need to guarantee safety.
13. The letter sent from the FOT to the industry, as described in I: 4, remains valid and is supplemented by this ruling. As version 3.0 of the JNS final report, as described in I: 3, has entered into force, this new version must be applied. There are no conflicts between the letter and this ruling.
14. The letter sent from the FOT to the industry, as described in I: 5, is replaced by this ruling.
15. Under Article 55 paragraph 2 APA, the lower court may revoke the suspensive effect of an appeal against a ruling, provided no monetary payment is involved. In this case, such an order is required: the introduction of the required measures cannot be postponed until a final judgment has been handed down, given the need to reduce the risk of wheel breakages in a timely manner.
16. This ruling does not release the addressees from their duty to examine, within the scope of their competences and responsibilities, whether the ordered measures are sufficient, or whether they need to arrange for and/or implement different or more extensive measures to guarantee safety. This is because the companies involved have primary responsibility for railway safety. Intervention by the supervisory authority does not alter these responsibilities.
17. This ruling for transport services in Switzerland also has an indirect effect on companies based outside Switzerland. RUs with a safety certificate for Switzerland should therefore inform any partners they may have outside Switzerland (partner RUs, ECMs, wagon keepers) who are affected.
18. Anyone who requests a service from the FOT must pay a fee in accordance with Article 2 of the Ordinance of 25 November 1998 on Fees and Charges for Public Transport (GebV-öV, SR 742.102). Taking into account the effort involved, the interest and benefits for the parties liable to pay the fees, and their active participation in the 'Freight Wagon Safety' round tables, the FOT will waive the fee in accordance with Article 9 paragraph 1 GebV-öV.
19. Under Article 36 paragraph 3 of the Data Protection Act of 25 September 2020 (FADP, SR 235.1), personal data may be disclosed when providing official information to the public, either ex officio or based on the Freedom of Information Act (FoIA, SR 152.3), if the data is related to the fulfilment of public duties and there is an overriding public interest in disclosing it. Under Article 57s paragraph 4 of the Government and Administration Organisation Act of 21 March 1997 (GAOA, SR 172.010), the same applies to data relating to legal entities. As there is an overriding public interest in the content of this ruling, only the names of natural persons who have not signed this ruling must be redacted.

III The FOT issues the following ruling:

1. For all tread-braked wheelsets on freight wagons

Tread-braked wheelsets must be considered thermally unstable, regardless of any labelling on the wheelset bearing caps. Thermal overloading of the wheelsets must be checked in accordance with the specifications in the JNS report 'JNS report Accident Gotthard base tunnel – broken wheels' (version 3.0).

Wheelsets with thermal overload during operations must be reported to the ECM or directly to the maintenance centre once detected.

2. For freight wagons with tread-braked wheelsets of types BA 004, BA 390, Db-004sa, RI 025, R32, BA 304, BA 303, RI 101 and BA 005 and wheel types comparable to type BA 004

The ECM must check for comparability based on the JNS report 'Accident Gotthard base tunnel – broken wheels' (version 3.0).

In freight wagon operations, the minimum wheelset diameter for the wheel types listed above is 864mm.

Wheelsets with a diameter of less than 864mm must be sent for maintenance.

3. For freight wagons with tread-braked wheelsets and composite brake blocks

The ECM must carry out a technical inspection of the freight wagons. Third parties may be engaged for this.

The technical wagon inspection may be carried out during other maintenance measures.

The technical wagon inspection must include at least a visual inspection of the complete circumference of the wheelset for cracks in the wheel tread, wheel web and wheel rim (as set out in the JNS report), as well as for thermal overload, minimum wheelset diameter and other damage to the tread of the wheelsets, such as spalling, material build-up, wheel flats, grooves, hollow tread and overrolling.

In addition to the visual inspection, a sound test must be carried out on the wheel discs.

The technical wagon inspection must be carried out by the ECM in accordance with the maintenance specifications.

Wheelsets with one or more identified defects must be sent for maintenance following the technical wagon inspection.

The technical wagon inspection must be carried out for each wagon at the intervals specified below, either after a certain mileage or after a certain period of time, whichever occurs first. The exact requirements depend on the brake block type and the wheelset diameter.

Freight wagons fitted with tread-braked wheelsets with a nominal diameter of 920mm and brake block type LL:

- 50,000km or no more than one year for freight wagons with at least one wheelset with a diameter of less than or equal to 880mm;
- 100,000km or no more than one year for freight wagons with wheelsets with a diameter greater than 880mm.

Freight wagons fitted with tread-braked wheelsets with a nominal diameter of 920mm and brake block type K:

- 100,000km or no more than one year for freight wagons with at least one wheelset with a diameter of less than or equal to 880 mm;
- 200,000km or no more than one year for freight wagons with wheelsets with a diameter greater than 880mm.

The ECM must document any defects identified during the technical wagon inspections in its annual activity report. The report must include the following information about the inspections:

- Number of freight wagons inspected;
- Number of wheelsets inspected;
- Wheelsets, including details of the wheelset type, wheelset diameter and identified defects, that have been sent for maintenance with:
 - cracks in the wheel tread, wheel web and wheel rim, as in the JNS report;
 - thermal overload or
 - other damage to the tread of the wheelsets, such as spalling, material build-up, wheel flats, grooves, hollow tread and plastic flow.
- Details on the maintenance regulations applied during the inspections.

Before being transported to the Swiss standard-gauge network by the RU, each freight wagon requires proof that it has undergone a technical wagon inspection in compliance with the inspection intervals specified above. This proof must be managed in such a way that an RU can verify the existence of proof before including a freight wagon in a train.

4. Sound test (hammer test) on tread-braked wheelsets fitted with composite brake blocks

RUs shall carry out a sound test as set out in the JNS report 'Accident Gotthard base tunnel – broken wheels' during the technical train inspection, provided operating conditions allow for this.

5. Implementation of the measures under III: 1 to 4 must begin immediately and be completed by 31 December 2025 at the latest.
6. Any appeals lodged against points 1 to 6 and 11 of this section of the ruling will not have suspensive effect.
7. This ruling supplements the FOT instruction laid down in the letter 'Derailed freight train in the Gotthard Base Tunnel – Instruction to implement the measures drawn up by the JNS Task Force "Broken Wheels"' dated 6 September 2024. As version 3.0 of the JNS final report, as described in I: 3, has entered into force, this new version must be applied. There are no conflicts between the letter and this ruling.
8. This ruling replaces the FOT recommendation set out in the letter 'Derailed freight train in the Gotthard Base Tunnel – Reactivation of the JNS Task Force "Broken Wheels" in relation to further wheelset series' dated 13 March 2025.
9. The measures set out above represent the minimum required measures. If freight wagon keepers or their ECMs determine that additional or more stringent measures are required to maintain operational safety, these must be arranged within the scope of the wagon keepers' or ECMs' own responsibilities.
10. No fee will be charged.

11. The ruling may be published by the FOT or made publicly accessible upon request. The names of natural persons who have not signed the ruling will be redacted.

Federal Office of Transport

Dr Stefano Oberti
Vice Director

Bruno Revelin
Deputy Head of Division

Right of appeal:

In accordance with Article 50 APA, an appeal against this ruling may be lodged in writing within 30 days of notice being given. The written notice of appeal must be sent to the Federal Administrative Court, PO Box, 9023 St Gallen. In accordance with Article 20 APA, the appeal period shall begin the day after notice is given if the parties are notified personally. Legal holidays are governed by Article 22a APA.

This must meet the requirements under Article 44ff APA. The notice of appeal must be submitted to the court in duplicate; it must state the remedies requested and the grounds therefor together with details of the evidence. The complainant must append to the appeal the disputed ruling and the documents cited as evidence, insofar as these are available. The notice of appeal must be signed by the appellant or by his or her representative; any representative must identify himself or herself by means of a written power of attorney. The costs of the appeal proceedings are governed by Article 63 APA.

Copy to:

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