

# **Italian Ministry of Infrastructure and Transport**

## **INVESTIGATION REPORT**

## BREAK-UP RAIL GOODS TRAIN NO. 58006, NEAR BARLETTA, ON THE TRANI – BARLETTA ROUTE, ON 04/01/2022 (ERAIL IDENTIFIER: IT-10253)

27/11/2023



#### Foreword

The sole objective of DiGIFeMa's work is to prevent future accidents and incidents through the identification of the technical causes that generated the event and the consequent formulation of safety recommendations to operators in the sector.

Pursuant to Art. 21, p. 4, of Legislative Decree 50/2019, the investigation is not a substitute for those that could be carried out in this regard by the Judicial Authority and does not in any case aim to establish blame or liability.

Pursuant to Art. 26 of Legislative Decree 50/2019, the report and the related safety recommendations do not in any case constitute a presumption of blame or liability for an accident or incident, in the context of the Judicial Authority's procedures.

This investigation report has been prepared in accordance with the Commission Implementing Regulation (EU) 2020/572 of 24 April 2020 on the format to be followed in railway accident and incident investigation reports.

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## Abbreviations and Acronyms

AdC	Train Driver (Agente di Condotta)
ANSFISA	National Agency for Railway, Road Infrastructure and Motorway Safety
DCO	Train Dispatcher (Dirigente Centrale Operativo)
DiGIFeMa	General Directorate for Railway and Maritime Accident Investigation
ECM	Entity in Charge of Maintenance (Soggetto Responsabile della Manutenzione)
EVN	European vehicle number
PdC	Driver (Personale di condotta)
SCC	Command and Control System
SCMT	Train Running Control System



## 1. Summary

On January 4, 2022 at about 11:00 p.m., GTS Rail goods train No 58006 stopped at the protection signal at Barletta station, on the Bari – Foggia route, due to an air leak in the brake line caused by the interruption of the brake line, which occurred due to the break-up of the train between the seventh and eighth wagon of the composition.

The train broke-up due to the pulling hook slipping out of the eyelet of the pulling rod due to the pin, which held the hook in place, coming out.

The pin came out as a result of the unscrewing of the retaining bolts that secured the pin to the tension rod, which probably occurred due to the incorrect bending of the locking plate of these bolts.

The report concludes with Safety Recommendations addressed to ANSFISA and to the following stakeholders:

- railway undertakings, to ensure that, when purchasing new wagons, they check the presence and correct installation of the hook's fastenings to the tension rod, including their restraint systems;
- to vehicle manufacturers, for a similar verification in the assembly phase of the draw gear.

## 2. Investigation and relevant context

## 2.1. Decision to open the investigation

Having regard to the First Information Report (registered in the SIGE database under No. RF20220105.0025) submitted by the railway undertaking GTS Rail on 5/1/2022, notifying the incident which occurred on 04/01/2022, relating to the break-up of GTS Rail goods train no. 58006, with 7 wagons coupled to the locomotive and 12 wagons in line (two composite wagons carrying dangerous goods), near Barletta, on the Trani – Barletta route, which caused the interruption of the service for about four and a half hours, the Investigating Body deemed it necessary to launch a safety investigation by appointing, by decree no. 974 of 05/05/2022, the undersigned investigator to ascertain the causes of the accident.

#### 2.2. Reasons for the decision to open the investigation

Following an analysis of the disclosure report submitted by GTS Rail, registered in the SIGE database on 05/01/2022, detailing the information relating to this event, and considering that the event could have led to a major accident, it has been decided to carry out an investigation into the event, due to the potential danger of the event, also due to the presence of dangerous goods on two wagons, pursuant to paragraph 2 of Article 21 of Legislative Decree No 50/2019.

#### 2.3. Scope and limitations of the investigation

As stated above, DiGIFeMa's work is aimed at preventing future accidents and incidents. The investigation aims to identify the causal and con-causal factors that led to the event, it concludes with safety recommendations for operators in the sector and it is conducted independently of any possible Judicial Authority investigation. The report, which cannot be used to attribute blame or responsibility for what happened, is limited to the following event (as reported in the Decree of Assignment): "Investigation of the causes of the incident which occurred on 04/01/2022 concerning the break-up of GTS Rail goods train no. 58006, with 7 wagons coupled to the locomotive and 12 wagons in line (two wagons in composition carrying dangerous goods), near Barletta, on the Trani – Barletta route".

## 2.4. Technical and functional capabilities of the investigation team

Subject to verification of the requirements of independence from the partiesinvolved and absence of conflicts of interest6



or of incompatibility, the assignment was entrusted (by Decree no. 974/2022) to the writer, who had the appropriate expertise to carry out the safety investigation of the accident in question and was included in the list of experts who can be appointed as investigators by DiGIFeMa.

## 2.5. Communication and consultation with persons or entities involved

The communication was mainly with the railway undertaking, which was the only entity involved. It was always carried out quickly and efficiently.

On 21/08/2023, DiGIFeMa submitted the Draft final investigation report to ANSFISA, to GI RFI and to IF GTR Rail. On 13/10/2023, a telematic meeting was held with representatives of ANSFISA to discuss and deepen the analysis carried out and the safety recommendations proposed by the investigator in charge. On 20/10/2023, the Agency then submitted some comments to DiGIFeMa (protocol no. 3427). No observations or comments on the Draft Report were received from the Manager and the Undertaking.

This document takes into account what has emerged during the consultation phase described above.

#### 2.6. The level of cooperation offered by the actors involved

The level of cooperation found was high, the railway undertaking has always coped with the demands quickly and comprehensively.

#### 2.7. Investigation methods and techniques

The investigation was carried out by examining the documentation required from the railway undertaking.

#### 2.8. Difficulties and problems encountered in the course of the investigation

No particular difficulties or problems were identified in carrying out the investigation.

#### 2.9. Interactions with judicial authorities

There was no reason to interact with the investigative bodies in the course of the investigation activities conducted.

#### 2.10. Additional remarks

For the record.

#### 3. Description of the event

#### 3.1. Event and background information

The goods train no. 58006, departing from Bari Lamasinata and bound for Piacenza, on January 04, 2022 at about 11:00 p.m., stopped near the protection signal at Barletta station (arranged at danger), between the progressive km 596+000 and km 595+000. At near stop, the first train driver notices a leak of compressed air from the main pipe of the train braking system.

Once the emergency call was made to the train dispatcher, with a request for suspension of the train traffic on the adjoining track, the second train driver went along the train and found that the train had broken-up between the 7th and 8th wagon of the train convoy. The two parts of the train stopped at a distance of about 10 m. All the rolling stock was regularly on the track, since the break-up did not lead to any derailment.

#### 3.1.1. Description and type of the event

The type of the event subject to this investigation is represented by the break-up of the train convoy in two parts caused by the pulling hook slipping out of the pulling rod of the seventh wagon in the composition.



#### 3.1.2. Date, time and place of the event

The event took place on January 4, 2022 at about 11:00 p.m., on the Bari-Foggia line, between the progressive km 596+000 and km 595+000.

**3.1.3.** Description of the place of the event, weather and geographical conditions, possible work in progress

The weather conditions at the time of the event were good: clear sky, no significant weather phenomena and good visibility.

3.1.4. Deaths, injuries and material damage

There were no deaths, no injuries or any particular material damage to the rolling stock and infrastructure.

3.1.5. Other consequences

The train no. 58006 of 04/01/2022, which broke-up, left Barletta with only 7 wagons (the other 12 returned to Bari) and with a 318 minutes delay.

In addition, for the recovery of the 12 wagons remaining in line, it was organized:

- an isolated locomotive service Molfetta - Barletta (operated with the locomotive owner train no. 58018 of 04/01/2022)

- a Barletta - Bari Lamasinata train for the recovery of the 12 wagons;

- an isolated locomotive service from Bari Lamasinata to Molfetta to restart the train 58018 with a 463 minutes delay.

In addition, the event caused the cancellation of the train no. 55027 of 05/01/2022.

#### 3.1.6. People and actors involved

The driver of train 58006, consisting of the first and second train drivers, and the train shunter for vehicle testing were involved in the event.

#### 3.1.7. Rolling stock

Train no. 58006 of 04/01/2022 consisted of 19 wagons towing locomotive E483.026.

Among the wagons there were also two container wagons containing dangerous goods (molten sulphur), namely the 6th and 9th wagons in the composition.

The wagon from which the break-up of the train originated was the 7th in composition with serial number 33544962476-6.

3.1.8. Infrastructure and signalling system

The Trani – Barletta route, which is part of the Bari – Foggia line, operated by RFI, is a doubletrack line electrified in electric charge 3 kV and has a slight ascent of 2 ‰. The route is equipped with an automatic electrical lock with coded currents and with Train Running Control System. Finally, the route is operated under the command and control system circulation regime with the train dispatcher located in Bari Lamasinata.

#### 3.1.9. Other

For the record

#### 3.2. Objective description of the events

On 04/01/2022, at about 11:00 p.m., the first train driver of the train no. 58006, arriving in Barletta and approaching the protection signal, arranged at danger, noticed an important leak of air in the main pipe, not attributable to the Train Running Control System. The train was immediately arrested between the km 596+000 milestone and the km 595+000 milestone. When the emergency call was sent, the train driver informed the train dispatcher of the probable break-up of the train with possible derailment, thus requesting the suspension of the train traffic on the adjoining track. Having completed all the formalities required by the current legislation, the second



The second train driver went along the train to check the condition of the train convoy and when he arrived between wagons 33544962476-6 (7th wagon) and 33544962261-2 (8th wagon) he noticed the actual break-up of the material with a gap of about 10 meters between the two parts. The break-up originated on the EVN 33544962476-6 wagon because the pulling hook was released from the pulling rod and found inside the track. The first train driver formalized the distress request for the recovery of the uncoupled rolling stock. Once the rescue was completed, the necessary operations were carried out so that the locomotive E483-026 and part of the rolling stock of train 58006 could restart, with destination of Piacenza.

#### 3.2.1. Chain of events leading to the event

The chain of events leading to the event originates from first unscrewing and from the subsequent loss of bolts of the pulling hook due to vibrations induced during the train running. Without the fastenings bolts, the pin holding the pulling hook in place slipped out of the pulling rod, thus releasing the pulling hook itself which, as a result, due to the traction/braking forces it slipped out and the train broke-up at 11:00 p.m. on 04/01/2022.

#### 3.2.2. Chain of events from the occurrence of the event

Once the train has broken-up, the consequent brake pipe failure has resulted in a significant air leak, as detected by the first train driver. The train driver stopped the train near the entrance sign of the Barletta station, between the km 596+000 milestone and the km 595+000 milestone.

Once the train was stopped, the first train driver sent the emergency call and informed the train dispatcher of the probable break-up of the train with the possibility of a part of it being derailed, requesting the suspension of the train traffic on the adjoining track. The second train driver then connected the shunt cable to the adjoining track and placed the stop signal at braking distance from train no. 58006. The second train driver then proceeded to inspect the train, arrived at the seventh wagon (no. 33544962476-6) and noticed the train break-up, since the next wagon, the eighth of the composition (no. 33544962261-2), was about 10 meters from the seventh. At this point, the second train driver tightened the handbrakes of the 12 decoupled wagons, ensuring that there were no diverted wagons.

Once in the queue, the second train driver ensured that the train was complete by visually checking for the presence of the traffic signal. Once the checks had been completed, the second train driver communicated the results to the first train driver and removed the shunt cable and the stop signal. The first train driver informed the train dispatcher that it was no longer necessary to interrupt the adjoining track and then he sent a distress request of the decoupled part of the train.

The second train driver went back to the decoupled part of the train, affixing the movable scotch blocks to it and positioning the stop signal at an appropriate orientation distance for the rescue locomotive. When the rescue locomotive arrived, coupling and brake testing was carried out. The first train driver of train no. 58006 transmitted the instructions concerning the part of the train to be rescued to the colleague of the rescue locomotive. The second train driver of train no. 58006 removed the brackets and loosened the handbrakes of all vehicles.

Once the rescue train had departed, the driver of train no. 58006 was responsible for the traffic regularization, the wagon verification EVN 33544962476-6, for training and brake testing, in order to be able to resume running with the owner locomotive (E483-026) and the seven wagons still coupled. Finally, the train driver requested the authorization to resume running to the train dispatcher; once granted the train left again at 3:18 am.

## 4. Event Analysis

4.1. Roles and tasks



#### 4.1.1 Railway undertaking

The railway undertaking GTS Rail S.p.A. is involved in the event with the train drivers no. 58006, consisting of the first and the second train drivers and the train shunter for vehicle testing.

When the event occurred the train drivers acted correctly, following the planned procedures by interfacing with the Infrastructure Manager in the person of the train dispatcher, carrying out the actions described in paragraph 3.2.

The train shunter has correctly checked the rolling stock before departure from Bari Lamasinata: his duties do not include checking the pulling pin restraint systems of the wagons, which were certainly at least partially efficient at the time of departure.

#### 4.1.2 Infrastructure Manager

The infrastructure manager, in the person of the train dispatcher, managed the event for the actions within its competence.

#### 4.1.3 Person responsible for maintenance

The person responsible for maintenance of the wagon is Rail Services s.r.l., which is part of the same group GTS Logistics S.p.A. During the period from delivery in July 2020 until the day of the event, the wagon was not subject to any maintenance work on the pulling rod and on the pulling hooks, as this was not included in the maintenance plan and no incidents occurred.

For the record, it should be noted that, from the documentation examined, during the same period above-mentioned the wagon underwent some maintenance operations all on condition mainly concerning (12 cases) the loosening of the bolts of the current collector spring, due to the normal loading/unloading activities carried out by the Terminals. This was followed by 10 interventions due to the presence of worn brake sole, which is normal wear out due to the circulation of the wagon. Finally, an intervention for a problem with the main pipe due to air leaks.

Rail Services also carried out an analysis of the event at the request of GTS Rail, following which it carried out a check on all GTS Rail wagons that are part of the same lot of the EVN 33 54 4962 476-6 wagon involved in the event under investigation.

#### 4.2. Rolling stock and technical installations

Only rolling stock was involved in the event.

The vehicle that caused the train to break-up, which is the subject of this report, is the Sggmrss 90 type wagon (figure 1) with serial number 33 54 4962 476-6. It was built by NYMWAG CS a.s. company in 2020 with serial number VK9 00009 and is owned by G.T.S. – GENERAL TRANSPORT SERVICE SPA, while the person responsible for ECR maintenance is RAIL SERVICES SrI, which is part of the same GTS group.





Figure 1 - Assembly view of Sggmrss 90 type wagon (internet source)

In this type of wagon, the pulling hook is attached to the pulling rod (figure 2) with a pin that is inserted from below for structural reasons; therefore, it must be held in the position required by means of retaining.



Figure 2 – Pulling rod (GTS source)

The pin itself consists of two parts: a shaped steel cylinder, highlighted in red in Figure 2, with one extremity having a smaller diameter, and a plate attached to the pin by a linchpin, in blue in Figure 2.

The pin is held in the working position by the plate attached to it, which is bolted to the pulling rod by two bolts, also screwed from below, highlighted in green in Figure 2. In turn, the bolts are held in place by bending over the bolt heads of the flaps of a plate held in place by themselves (Figure 3).





Figure 3 – Correct locking of the pulling pin bolts by bending the plate flaps (GTS source)

From the inspection carried out on the site, the pulling hook was found immediately after the event (Figure 4) and the king-pin (Figure 6) between the hook and the pulling rod during a subsequent inspection carried out on 14/01/2022.

Neither the pin fastening bolts nor the respective locking plate where found.



Figure 4 – Wagon pulling hook 33 54 4962 476-6 (GTS source)

Both the pulling hook and the pin show no signs of damage.





Figure 5 - Wagon Pulling rod 33 54 4962 476-6 (GTS source)

Figure 5 shows the pulling rod of the wagon from which the pulling hook slipped out, which also shows no defects and is undamaged.

Since the pulling hook and its pin, as well as the eyelet of the pulling rod of wagon 33 54 4962 476-6 are intact, it can be assumed that the loss of the pin occurred due to the unscrewing of the fasting bolts, despite the presence of the locking plate.



Figure 6 – Wagon hook fastening pin 33 54 4962 476-6 (GTS source)

In fact, the fastening pin has the print that shows the presence of the plate (Figure



furthermore, the shape of the print shows that it was bent, so it is likely that it was bent incorrectly, allowing the bolts and the plate to be unscrewed and subsequently lost.

## 4.3. Human factors

For the record: since it was an event due to a problem with a mechanical component of the wagon.

#### 4.4. Feedback and control mechanisms

4.4.1 Regulations for railway traffic (ANSF Decree 4/2012 of 09-08-2012)

PART 1: GENERAL INFORMATION

- 1 GENERAL PROVISIONS
- 2 Railway infrastructure
- 3 Railway rolling stock
- 4 Safety principles of railway traffic
- 5 Safety principles of the signalling system PART
- 2: OPERATION UNDER NORMAL CONDITIONS 6 -

Composition and braking of trains

- 7 train checks and tests
- 8 Traffic management
- 9 Train driving

PART 3: OPERATION UNDER NORMAL CONDITIONS AND

FAULTS 10 – General information

- 11 Train movement in the absence of movement authorizations granted by the signalling system
- 12 Abnormal protection of train running
- 13 Abnormal infrastructure
- 14 Train running in the opposite direction to that for which the track is equipped
- 15 Abnormal level crossing
- 16 Abnormal rolling stock
- 17 Abnormal braking system

18 – Train rescue

#### PART 4: MANOEUVRING AND PARKING

- VEHICLES 19 Manoeuvres
- 20 Parking vehicles

PART 5: MAINTENANCE OF RAILWAY INFRASTRUCTURE AND ROLLING STOCK

- 21 Circulation of vehicles
- 22 Maintenance of infrastructure
- 23 Rolling stock tests and checks
- 24 Maintenance of rolling stock

#### 4.4.2 GTS – Instruction for service of IPCL locomotive drivers

- Art. 1 General provisions;
- Art. 2 Train drivers dependence;

Art. 3 Staff presence on traction vehicles and trains;

Art. 4 Production and management of the flow of train circulation

documents; Art. 5 Additional tasks entrusted to train drivers;



Art. 6 Transport of objects and persons in the driver's cabs of traction vehicles;

Art. 7 Preparation of traction vehicles;

Art. 8 Parking of traction vehicles;

Art. 8 bis Parking of ordinary equipment vehicles

of; Art. 9 Manoeuvres;

Art. 10 Manoeuvres on platforms, on weigh-bridges and operating rules for vertical load measurement systems (SMCV);

Art. 11 Manoeuvres of trains with several locomotives;

Art. 12 Push and gravity manoeuvres;

Art. 13 Provisions for the execution of unions;

Art. 14 Participation of Movement and Technical

prescriptions; Art. 15 Departure and start of trains; Art.

16 Route of trains;

Art. 17 Trains in multiple traction;

Art. 18 Trains provided with continuous brake –

compressor failure; Art. 19 Isolated traction vehicles;

Art. 20 Delays and abnormalities in train running – Retrogression– sudden illness of train staff;

Art. 20 bis Train assistance;

Art. 21 Vehicle failures.

4.4.3 GTS – IPCL – Annex 1 – Operating accidents and incidents in tunnels – Accidental scenarios.

The Annex sets out in detail the activities of the train drivers for the following accidental scenarios:

assistance to a train in the event of a technical failure of the traction

vehicle; assistance to a train in the event of a technical failure of the towed vehicles;

accident to a goods train with the derailment of one or more vehicles;

fire on a freight train stopped in a tunnel;

accident to a goods train carrying dangerous goods with derailment of one or more vehicles;

accident involving a goods train carrying dangerous goods, and a passenger train, with outbreak of fire.

4.4.4. GTS – Procedure DE PdE.13.08.00 – Management of operating accident/incident to rolling stock and/or traction vehicle.

The purpose of the procedure is to provide the train driver with the support of technical staff with appropriate professional training for the decision to resume train running. The procedure is also aimed to define the correct behaviour of the staff responsible for carrying out initial investigations in the event of operational accidents/incidents and to define the procedures for carrying out such investigations.

4.4.5 GTS – Procedure GS PS.09.05.00 – Management of anomalous events and operating accident/incident.

The procedure defines:

1.the methods for reporting, analysing and recording operational non-compliances that are distinguished between abnormal events and operational accidents/incidents;

2. the immediate measures to be taken against personnel with safety task in the event of serious accidents or operational accidents and/or incidents;

3. the information flow of the above-mentioned events;

4. the definition of the initial investigation process for operational accidents/incidents and the investigation process for anomalies and accidents/incidents;

5. the individual follow-up actions to recover unfulfilled skills to be taken against



## the personnel who may be responsible for the above-mentioned events.

The staff involved complied with the regulations and procedures and were therefore able to manage the event safely.

As far as the technical installations are concerned, they functioned normally, starting with the braking system of the train, which, once the train was broken-up, and the resulting interruption of the main pipe, ensured that the two sections automatically stop safely.

#### 4.5. Previous events of a similar nature

4.5.1 Train break-up 48371 took place at the Milan Smistamento station on 07/01/2019

Train no. 48371 was operated by the Captrain railway undertaking. At 07:30 a.m. on 07/01/2019, the train was broke-up due to the breakage of the stretcher of wagon no. 3587 4770 543-4, due to undue braking by the Train Running Control system equipment. The wagon 3587 4770 543-4 was positioned at the 11th place from the head of the train consisting of 22 vehicles. Following the break-up, the crew carried out the necessary relegation to re-join the train.

#### 4.5.2 Train break-up 43766 at Milan Lambrate station occurred on 10/03/2019

Train no. 43766 was operated with the traction of locomotive E486.503 of the railway undertaking GTS. While the train was travelling along the entrance route to Milan Lambrate station, the train drivers noticed the loss of pressure in the main pipe of the braking system; after some attempts to reload the pipe, the train drivers inspected the train and found that it had broken-up at the last four wagons. The train had broken-up due to the loss of the pulling hook of wagon no. 33544962310-7. The hook had slipped out from the pulling rod as a result of the pin that holds it in the eyelet of the rod slipping out. The pin pulled out due to the unscrewing of the bolts securing the pin, due to the absence or incorrect bending of the locking plate of the bolts. The wagon built by Legios company was almost new: the company's inspection certificate is dated 23/01/2019.

4.5.3 Train break-up 68042 took place at Pescara Porta Nuova station on 27/04/2019

Train no. 68042 runs on a track owned by the Captrain railway undertaking, but was drawn by the Ferrotramaria railway undertaking. Once on the shelter platform of Pescara Porta Nuova station, where it had to stop for about two and a half hours, the train drivers, once the end-of-shift actions had been completed, noticed the train break-up. It was caused by the break-up of the pulling hook of wagon no. 33874571489-3. After immobilizing the locomotive-free part of the train with the scotch blocks and checking that it was possible to reassemble the train using the hook of the adjacent wagon, they carried out the reassembly and brake test, so that the train could resume running regularly after the scheduled stop.

Although a larger list of train break-ups was identified, amounting to around 6 cases per year for the years 2019 and 2020, information could only be found on the above-mentioned events.

In the case of train no. 48371 and train no. 68042 the train was broken-up due to mechanical failure of a decoupling system component, the stretcher in the case of train no. 48371, the hook in the case of train no. 68042.

However, in the case of train no. 43766 the cause of the breakage is similar to that of the present case even if the investigation report and photographic documentation do not indicate whether the locking plate of the bolts was absent, present but not bent or present but bent incorrectly; also, in this case, the wagon manufacturer is different.



## 5. Conclusions

The examination and analysis of the documentation found and the considerations set out in the previous paragraphs show the following conclusions.

The train was broken-up by the pulling hook slipping out of the eyelet of the pulling rod (primary cause).

The pulling hook slipped out as a result of the pin that held the pulling hook in place slipping out (secondary cause).

The pin slipped out due to the unscrewing of the retaining bolts that secured the pin to the pulling rod (2nd secondary case).

The pin retaining bolts have probably been unscrewed due to incorrect bending of the locking plate of the pin retaining bolts (3rd secondary cause)

Since the wagon had not been in service for long (the factory inspection certificate dated June 2020, the event took place in January 2022), and that in the meantime there had been no maintenance work on the traction vehicles, it seems likely that the incorrect bending was carried out at the factory.

è This is also supported by the fact that, following the event, the owner of the rolling stock, on the initiative of the ECM, ordered a check on the fastening of the pulling hook pins to all wagons belonging to the same lot of wagon no. 33 54 4962 476-6. It is in fact part of a lot of 40 similar wagons. Checks on the remaining 39 wagons in the lot were carried out between January and June 2022. During these checks, another wagon was found to have the fasting plate of the bolts that hold the pulling pin bent incorrectly.



## 6. Safety recommendations

On the basis of the findings in chapters 4 and 5, the following recommendations are made:

#### Recommendation no. IT-10253-01

It is recommended that the Agency for Railway, Road Infrastructure and Motorway Safety ensure that GTS Rail and other railway undertakings, when purchasing new wagons, verify, or have verified by ECM, the presence and correct installation of the hook-fastening attachments to the pulling rod, including their restraint systems (bolts and plate) and keep documentary evidence of this.

#### Recommendation n. IT-10253-02

It is recommended that the Agency for Railway, Road Infrastructure and Motorway Safety ensure that manufacturers in charge of the manufacture and construction of vehicles, when assembling the traction vehicles, ensure that the hook attachments are correctly installed to the pulling rod, included the restraint systems (bolts and plate).

#### Recommendation n. IT-10253-03

It is recommended that the National Agency for Railway, Road Infrastructure and Motorway Safety (ANSFISA) reiterate these recommendations in the appropriate international fora.

Mr. Marco Antognoli, engineer