20-006 Defective On-Train Equipment

Version:	1.4		
Purpose:	Approval to proceed to consultation		
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Sponsor:	Gary Portsmouth – Professional Head of Rail Operations		
Lead industry committee:	Traffic Operation and Management Standards Committee (TOM SC)	**Date:**	01 March 2022
Supporting industry committee:	Plant Standards Committee (PLT SC)	**Date:**	03 March 2022
Supporting industry committee:	Rolling Stock Standards Committee (RST SC)	**Date:**	11 March 2022
Supporting industry committee:	Control, Command and Signalling Standards Committee (CCS SC)	**Date:**	17 March 2022

Decision

Traffic Operation and Management Standards Committee (TOM SC) is asked to:

- **DECIDE** if the proposed new issue 11 of GERT8000-TW5 and issue 3 of RIS-3437-TOM deliver the intentions of the proposal for change.
- **DECIDE** if the proposed new issue 11 of GERT8000-TW5 and issue 3 of RIS-3437-TOM are in a suitable state for consultation.
- **APPROVE** that the proposed new issue 11 of GERT8000-TW5 and issue 3 of RIS-3437-TOM is consulted on.
- **IDENTIFY** any specific organisations or individuals to be included in the consultation.

Rolling Stock (RST), Plant (PLT SC), and Control, Command and Signalling (CCS) Standards Committees are asked to:

- **SUPPORT** that the proposed new issue 11 of GERT8000-TW5 and issue 3 of RIS-3437-TOM deliver the intentions of the proposal for change.
- **SUPPORT** that the proposed new issue 11 of GERT8000-TW5 and issue 3 of RIS-3437-TOM are in a suitable state for consultation.
- **SUPPORT** that the proposed new issue 11 of GERT8000-TW5 and issue 3 of RIS-3437-TOM is consulted on.
- **IDENTIFY** any specific organisations or individuals to be included in the consultation.
- **APPROVE** that the post-consultation stage with the supporting Standards Committees is undertaken outside of committee meetings, via correspondence.

20-006 Defective On-Train Equipment

This business case for change has been developed to support standards committees in taking decisions related to changes to standards, it includes an assessment of the predicted impacts arising from the change.

Proposed documents

Number	Title	Issue
RIS-3437-TOM	Defective On-Train Equipment	3
GERT8000-TW5	Preparation and movement of trains: Defective or isolated vehicles and on-train equipment	11

Superseded documents

Number	Title	Issue
RIS-3437-TOM	Defective On-Train Equipment	2
GERT8000-TW5	Preparation and movement of trains: Defective or isolated vehicles and on-train equipment	10

Summary

Background and change

RIS-3437-TOM issue 2 *Defective On-Train Equipment* and Rule Book module TW5 issue 10 *Preparation and movement of trains: Defective or isolated vehicles and on-train equipment* set out requirements for the arrangements to be applied when on-train equipment becomes defective. Changes in technology, updates to rolling stock standards and the need for clarity in certain areas were drivers to revise the standard and the Rule Book module.

The revision was limited to the following areas of on-train equipment:

1. Communications in case of a train defect
2. Non-operative brakes
3. Speed to proceed with a defective Driver's Safety Device
4. Hot axle box
5. Fire suppression system
6. Doors locked out of use
7. Sanding equipment
8. On-train data recorder
9. Wheel flats

The objectives were 1) provide further clarity in areas known to be causing confusion, 2) improve the consistency in application of rules and requirements and 3) amend outdated terminology, definitions and references.

The initial scope of this business case for change included a revision of 'Defective headlights' and 'Alternative sunflower', but these were de-scoped due to the lack of conclusive information available to complete the drafting in the available timescales.

Industry impact due to changes

Impact areas	Scale of impact	Estimated value over 5 years
A. Legal compliance and assurance	N/A	N/A
B. Health, safety and security	Medium	£113,959
C. Reliability and operational performance	High	£474,631
D. Design and maintenance	Medium	£170,000
E. People, process and systems	Medium	£296,200
F. Environment and sustainability	High	Not quantified
G. Customer experience and industry reputation	Low	Not quantified
Total value of industry opportunity =		£1,054,790 over five years

The standards change contribution to the total value of industry opportunity				
☐ None or low	☐ Minor but useful	☐ Moderate	☑ Important / essential	☐ Urgent / critical

Detail

1. What were the objectives associated with this change?

Objective 1 – Provide further clarity on the arrangements for some defective on-train equipment

Communications in case of a train defect

1.1 Global System for Mobile Communications – Railway (GSM-R) enables drivers to seek direct assistance from controllers and rolling stock technicians when faced with a defect with their train. This creates the risk of the driver being given an instruction to move a train without the signaller's authority, or for the actions not to be in accordance with the defective on-train equipment (DOTE) contingency plan. It is not clear in Rule Book module TW5 issue 10 - *Preparation and movement of trains: Defective or isolated vehicles and on-train equipment*, that a clear line of communication needs to be established between driver, signaller, operations control and the train operator's control before moving a train.

Non-operative brakes

1.2 Rule Book module TW5 issue 10 section 5 provides instructions for dealing with a non-operative brake on the leading or trailing vehicle of a passenger train, allowing continuation of a journey if the defective vehicle is bar-coupled to the "…next vehicle on which the brake is operating". RSSB has received enquiries that show instructions in Rule Book module TW5 issue 10 are open to misinterpretation, as the intended meaning is that the brake must be operative on the next vehicle, and not that a number of vehicles are allowed to have inoperative brakes providing all are bar-coupled to a vehicle with a working brake.

Speed to proceed with a defective Driver's Safety Device

1.3 RSSB has received enquiries regarding the correct speed that a train may continue to run at if the Driver's Safety Device (DSD) becomes defective during a journey. The rules in section 8.4 of Rule Book module TW5 issue 10 have created some confusion within the industry.

Hot axle box

1.4 Every case where a hot axle box detector is activated, whether built-in or lineside, needs to be assessed by following the relevant train company instructions for their type of rolling stock. There may be occasions when the hot axle box detector is activated due to an in-cab display error. RIS-3437-TOM issue 2 and Rule Book module TW5 issue 10 do not contain requirements that allow for the scenario where the activation of the built-in hot axle box detector is deemed to be false upon investigation.

Fire suppression system

1.5 It is not a requirement of the Locomotives and Passenger Rolling Stock National Technical Specification Notice (LOC & PAS NTSN) for passenger trains to have a fire suppression system installed. However, there are trains in operation with this system fitted. The guidance in RIS-3437-TOM issue 2 section 5.4 does not address the actions of the railway undertaking in case of failure of the fire suppression system.

Objective 2 – Improve the consistency in application of rules and requirements

Doors locked out of use

1.6 The instructions in Rule Book module TW5 issue 10 and the associated guidance in RIS-3437-TOM issue 2 on how to deal with defective doors do not reflect trains and vehicles with non-standard door and gangway configurations. Requirements for those configurations are set out in GMRT2130 *Vehicle Fire Safety,* and RIS-2730-RST *Vehicle Fire Safety and Evacuation*.

Sanding equipment

1.7 GMRT2461 issue 3 *Sanding Equipment* allows multiple sanders to be in operation on a train. Neither RIS-3437-TOM issue 2 nor Rule Book module TW5 issue 10 recognise this. In some circumstances, it might be possible to allow trains with some defective sanders to leave a maintenance depot if there are other sanders in operation.

On-train data recorder

1.8 The guidance on RIS-3473-TOM issue 2 and Rule Book module TW5 issue 10 allows trains to enter service from a maintenance depot or continue a journey with a defective on-train data recorder (OTDR) in the leading cab as long as there is an alternative operating OTDR elsewhere on the train. Generally, the 'other' OTDR does not record the minimum data required by the Operation and Traffic Management National Technical Specification Notice (OPE NTSN).

1.9 There is no specific guidance on how long trains can run with a defective OTDR in the leading cab and, as such, there is no incentive for the maintainer to fix the fault within a defined period. Because of this, should an incident occur, some key information would be unavailable for investigation.

Wheel flats

1.10 There are several standards containing limits for the control of wheel flats and the specific speeds a vehicle can be run at if wheel flats are found to exceed the given limits:

a) RIS-2766-RST *Rail Industry Standard for Wheelsets*;
b) RIS-2702-RST *In-Service Examination and Reference Limits for Freight Wagons*;
c) GERT8000-TW5 *Preparation and movement of trains: Defective or isolated vehicles and on-train equipment*; and
d) NR/SP/TRK/0133 *Control of Wheel Impact Force*.

1.11 Across these standards, a serious wheel flat is generally defined as a flat greater than 60 mm; however, the speed that a vehicle can run at once the flat is identified (in order to get to a maintenance facility) varies between the standards. The standards also assume traincrew will correctly establish the size of the wheel flat, which may not always be possible due to the availability of equipment or visibility conditions (the assessment may be needed in darkness when the defect could be hidden or obscured by other equipment). If the judgement in wheel flat size was incorrect, the conditions in the standards would not be suitable.

Objective 3 – Amend outdated terminology, definitions and references

1.12 Following the departure of the UK from the European Union and the end of the transition period on 31 December 2020, European regulations such as Technical Specifications for Interoperability (TSIs) have ceased to apply in the UK. The technical content of the TSIs has been replicated as National Technical Specification Notices (NTSNs), which came into effect on 1 January 2021. As RIS-3437-TOM issue 2 reflects the previous regulatory framework of the UK, references to legislation were reviewed and updated.

2. How has the content in the standard changed to achieve the objectives?

Objective 1 – Provide further clarity on the arrangements for some defective on-train equipment

Communications in case of a train defect

2.1 To reduce the risks associated with movements that are not authorised by the signaller or that are not in accordance with the railway undertaking's DOTE plan, the proposed update to section 1 of Rule Book module TW5 issue 11 reminds the driver that they must have permission from the signaller to make a movement.

Vehicle formation in case of non-operative brakes

2.2 The proposed sections 5.4 and 5.5 of Rule Book module TW5 issue 11 were revised to make it clearer that if a brake becomes defective on a leading or trailing vehicle of a passenger service, then the train may only continue its journey if the defective vehicle is bar-coupled to an adjacent vehicle on which the brake is operative.

Speed to proceed with a defective Driver's Safety Device

2.3 A table specifying restrictions in speeds in case of defect was duplicated in both Rule Book module TW5 issue 10 and RIS-3437-TOM issue 2. It was also complicated and difficult to understand due to the inclusion of instructions for compound or simultaneous failures. This table has been simplified in the proposed RIS-3437-TOM issue 3 to contain requirements relevant to the DSD defect exclusively.

2.4 In addition, the proposed section 4.9 in RIS-3437-TOM issue 3 has been completely rewritten to improve the clarity of the requirements, incorporate enhanced rationale and provide improved relevant guidance. The section now only contains restrictions relevant to a DSD defect and, establishing a hierarchy of hazards, it refers to the relevant alternative section if another system becomes defective at the same time.

Hot axle box

2.5 The requirements and rules in the proposed RIS-3437-TOM issue 3 and Rule Book module TW5 issue 11 allow for the scenario where the activation of a built-in hot axle box detector is deemed to be false upon investigation.

2.6 Apart from other minor updates, a new section – section 15.8 – was incorporated to Rule Book module TW5 issue 11 to indicate the driver instructions in case of a false activation of the built-in hot axle box detector.

2.7 In addition, the content of proposed section 4.15 of RIS-3437-TOM issue 3 was subject to minor editorial changes to incorporate updated format styles, as well as some rationale relevant to defective built-in detectors.

Fire suppression system

2.8 The proposed section 5.4 of RIS-3437-TOM issue 3 was updated to incorporate guidance on the relevant actions in case of a fire suppression system defect or failure.

Objective 2 – Improving the consistency in application of rules and requirements

Doors locked out of use

2.9 The proposed section 4.7 of RIS-3437-TOM issue 3 was aligned to the content of RIS-2730-RST *Vehicle Fire Safety and Evacuation*, making the instructions suitable to any new door arrangements. Due to the variety of train door configurations present within industry, restrictions are now based on evacuation times, and guidance is provided for the railway undertaking to be able to perform the relevant risk assessments.

2.10 The proposed section 6 of Rule Book module TW5 issue 11 was also updated to include additional circumstances in which the traincrew must seek instructions, as there will be more permitted permutations of defective doors.

Sanding equipment

2.11 The proposed section 4.20 of RIS-3437-TOM issue 3 and section 19 of Rule Book module TW5 issue 11 were updated to recognise that in some circumstances, where there is availability of multiple sanders, it may be possible to allow trains with some defective sanders to leave a maintenance depot. Due to the variety of types and configurations, for units where several sanders are present, the railway undertaking will need to have their own risk assessments in place to ascertain the minimum requirements to operate safely.

On-Train Data Recorder

2.12 Having an OTDR that records the activity in the leading cab is a requirement of the OPE NTSN. Any other OTDR present in the train may not record the minimum requirements, so references to this were removed from the proposed Rule Book module TW5 issue 11. Instructions in section 17 were also separated to better illustrate the difference between journeys starting from a maintenance depot or elsewhere.

2.13 The content of the proposed section 4.18 of RIS-3437-TOM issue 3 was also enhanced to provide railway undertakings with relevant guidance on how to comply with the requirements.

Wheel flats

2.14 The outputs from RSSB research project COF-UOH-56 focusing on the harmonisation of wheel flat limits were published in the first quarter of 2021. These identified the content in Rule Book module TW5 issue 10 as being adequate, based on a driver performing the initial assessments. Once a rolling stock technician has provided an examination, other restrictions may apply.

2.15 The terminology used to refer to flats over 60 mm has also been updated to "obvious damage", to make it easier to identify – it refers to damage 'obvious' to the eye, based on the driver's assessment. These changes were incorporated to the proposed section 26 of Rule Book module TW5 issue 11 and section 4.29 of RIS-3437-TOM issue 3, now providing a consistent set of requirements that are aligned with rolling stock standards.

2.16 In addition, the content of the proposed section 4.29 in RIS-3437-TOM was further enhanced with additional requirements and guidance in alignment with the content of Rule Book module TW5 issue 11.

Objective 3 – Amend outdated terminology, definitions and references

2.17 Any references to 'TSIs' were changed to 'NTSNs' and definitions and references were checked for correctness. In addition, some definitions used in RIS-3437-TOM issue 2 were updated.

3. How urgently did the change need to happen to achieve the objectives?

3.1 Industry identified this project as 'high priority' due to the expected updates to RIS-3437-TOM and Rule Book module TW5.

3.2 The drafting stage of this project took longer than anticipated due to a number of challenges encountered. Because of this, the project is currently still on track for publication in September 2022 but is subject to the supporting standards committees agreeing to undertake the post-consultation review via correspondence.

4. What are the positive and negative impacts of implementing the change?

A. Legal compliance and assurance

4.1 This area is not directly applicable to the changes.

B. Health, safety and security

Objective 1 - Communications in case of a train defect.

4.2 The change will reduce the risk of drivers carrying out a movement not authorised by the signaller. The risk of Signals Passed at Danger (SPADs) will be minimised.

4.3 The risk of injury from SPADs due to ignorance of instructions from the signaller (the closest cause precursor from the Safety Risk Model (SRM) v8.5.0.2) is 0.01208 Fatalities and Weighted Injuries (FWI) per year. If there is a 10% reduction in this risk as a result of this change, then this represents 0.001208 FWI per year. Using the Value of Preventing a Fatality (£2,017,000) this represents a benefit of £12,184 over five years.

Objective 1 – Vehicle formation in case of non-operative brakes.

4.4 The change will make it less likely for a train to be moved with inadequate brake force, lessening the risk of SPADs or any event involving loss of control of speed, like collisions or derailments.

4.5 The risk of injury from SPADs due to brake failure (the closest cause precursor from the SRM) is 0.03525 FWI per year. If there is a 5% reduction in risk as a result of this change, then this

represents 0.001763 FWI per year. Using the Value of Preventing a Fatality (£2,017,000) this represents a benefit of £17,775 over five years.

4.6 Brakes are the root cause of a high number of derailments, so it would be a conservative assumption to estimate that the changes have the potential to reduce the risk of one derailment in a five-year period. Based on previous research that establishes the risk of a derailment due to the costs incurred from property damage, delays, investigation, insurance, and emergency services, this equates to a benefit of approximately £84,000 per incident.

Objective 1 – Speed to proceed with a defective Driver's Safety Device.

4.7 Improving clarity on the necessary speed to proceed depending on the type of fault will increase safety reducing the number of times a train runs at incorrect speed.

Objective 2 – Wheel flats

4.8 Providing a set of consistent requirements and a set of instructions that are realistic to follow by traincrew will have benefits on health, safety, and security, preventing instances in which a train will run with the defect at an inappropriate speed.

C. Reliability and operation performance

Objective 1 – Hot axle box.

4.9 Including in RIS-3437-TOM issue 3 and Rule Book module TW5 issue 11 the scenario where the activation of a built-in hot axle box detector is deemed to be false upon investigation will allow more trains to be considered suitable to continue their journey when previously they would have been removed from service.

4.10 In 2018/19, trains that had a wrong detection or no fault found caused 11,941 minutes delay. Assuming that 50% of these delays are associated to the hot axle detection, all these train services would have been removed from service, costing £298,525 (cost of a minute delay taken at £50). If this change contributed towards only 5% of these faults being correctly identified as false on the day, and those trains remained in service, this would save industry nearly £74,631 over five years.

Objective 2 – Doors locked out of use.

4.11 The changes will improve performance by reducing the number of times a vehicle will have to be locked out of service. The need to transfer passengers to another carriage always has the potential to increase dwell times and even cancel services.

4.12 Door faults caused 14,177 incidents (321,412 minutes delay) in 2018/19, at an estimated cost of over £16m. If this change contributed to a conservative reduction of 0.5% of these delays, this would reduce costs by £400,000 over five years.

Objective 2 – Sanding equipment.

4.13 The proposed changes to RIS-3437-TOM issue 3 and Rule Book module TW5 issue 11 allow trains with multiple sanders to enter service with a defective sander without affecting safety, as long as other sanders are available. This will increase unit availability and reduce the number of services cancelled.

Objective 2 – Wheel flats.

4.14 A consistent set of wheel flat limits across standards that can be realistically determined by traincrew will lead to performance benefits by reducing the number of trains that run at restrictive speeds.

Objective 2 - On-Train Data Recorder.

4.15 Depending on the final arrangements decided to manage the risk, there is a potential negative impact on performance if trains need to be removed from service or further checks are performed, causing delays.

D. Design and maintenance

Objective 2 – Sanding equipment.

4.16 Operators may be encouraged to specify the fitting of multiple sanders on trains if it will allow further reliability and resilience. The direct impact of low adhesion is estimated to cost industry and wider society £345m per annum. If this change contributed to a reduction of 0.01% of industry costs, then nearly £170,000 of savings over 5 years could be realised.

E. People, process and systems

Objective 1 - Communications in case of a train defect.

4.17 RSSB project 18-020 *Passing Two Consecutive Signals at danger* concluded that the average cost of investigating a SPAD is £29,620. With 300 SPADs occurring in 2018-19, and 362 in 2019-20, if the proposed changes contributed to a reduction of only one SPAD per year, the industry would save £148,100 over five years.

Objective 1 – Vehicle formation in case of non-operative brakes.

4.18 The estimated cost of investigating a SPAD could signify a benefit to industry of £148,100 over five years if the risk was reduced by just one SPAD per year.

Objective 2 - On-Train Data Recorder.

4.19 The risk of running a train with a defective OTDR is that the train will not record all required data, making routine or emergency investigations much more difficult.

F. Environment and sustainability

Objective 2 – Wheel flats.

4.20 Wheel defects such as wheel flats affect the integrity of the wheelsets and pose a risk to critical track components. A train that continues to operate with a severe wheel flat can cause serious damage to the infrastructure, including broken rails, broken sleepers, damage to rail fastenings and potentially damage to drainage such as culverts. Apart from increasing the risk of accidents to following trains, damage to critical components will result in closure of the railway, with the consequential cost raising to millions of pounds.

G. Customer experience and industry reputation

Objective 2 – Doors locked out of use.

4.21 The changes will improve the customer experience by reducing the number of times passengers will have to be moved from a vehicle with defective doors. Locking a vehicle out of service increases delays and causes overcrowding in other vehicles and on platforms.

Objective 2 - On-Train Data Recorder.

4.22 The negative impact on industry's reputation would be extremely damaging should a major accident occur, and vital evidence was unavailable, leading to an inconclusive investigation.

5. What is the contribution of this standards change in realising the value to industry opportunity?

5.1 The proposed changes are expected to make an important and essential contribution in realising the value to industry opportunity.

6. What was the effort required by RSSB to make the change?

6.1 RSSB revised and updated RIS-3437-TOM and Rule Book module TW5 as mentioned in sections 1 and 2 of this business case for change. Some of the revisions required engagement with rolling stock and risk experts.

6.2 The initial scope of this business case for change included a revision of 'Defective headlights' and 'Alternative sunflower'. The objectives were:

a) Alternative sunflower: Revise the topic area related to the additional resilience provided by units equipped with AWS on the driver machine interface (DMI) displayed on a dual screen, allowing essential items still to be displayed. In addition, the objective was to consider situations where a reduced size sunflower may be available, potentially allowing a train to continue a journey when one of the screens becomes defective.

b) Defective headlights: Revise the instructions in Rule Book Module TW5 issue 10 and the guidance on RIS-3437-TOM issue 2 on defective headlights and permissible train speeds to ensure adequate measures were in place in case of a defective headlight.

6.3 However, TOM SC approved de-scoping those two areas from the project due to a lack of conclusive information and the fact that finding a resolution would have delayed the publication of RIS-3437-TOM issue 3 and Rule Book module TW5 issue 11 (minute numbers TOM/02012022/12.6 and TOM/09072021/12.4).

6.4 During the revision of RIS-3437-TOM, some duplication of content was removed and new style conventions were applied to the format, this makes the content easier to manage but led to inconsistencies in other content of RIS-3437-TOM issue 11, part 4, that was not part of the revision. Whilst the revision may appear as simple editorial changes, RSSB exercised the decision not to apply the same changes to other content in the standard that was not under the scope of this business case for change, as it may introduce unintended consequences.

6.5 A new proposal for change will be submitted to continue the revision of defective on-train equipment, this will include the sections de-scoped from this project, the consistency of the document and any other emerging areas that need revision. The new proposal will be submitted to TOM SC at the start of financial year 2022/23.

7. Did RSSB deliver against industry's expected timescales?

7.1 The project is currently on track to publish the proposed RIS-3437-TOM issue 3 and Rule Book module TW5 issue 11 in September 2022 subject to the post-consultation review being undertaken via correspondence, as stated in section 3 of this document.

8. How will the industry implement the change?

8.1 Railway undertakings will be able to implement the changes by incorporating the content supplied by RSSB into their DOTE contingency plans and training and briefing materials for staff.

9. How will RSSB assess whether the change is achieving the objectives?

9.1 RSSB will review RIS-3437-TOM issue 3 and Rule Book module TW5 11 one year after their publication to assess whether their content is fit for purpose. We will seek specific feedback from transport operators that have adopted and implemented the changes.

Appendix A Disposition Table

A.1.1 Only sections that have been subject to review have been included in the disposition table. Sections not mentioned below remain unchanged.

Table A1: RIS-3437-TOM issue 02 to RIS-3437-TOM issue 03

From RIS-3437-TOM issue 2	To RIS-3437-TOM issue 3	Way forward	Comments	Objective
1.2.1 Background	1.2.1 Background	Redrafted	References updated to reflect legislation following the UK exit from the European Union.	3
1.3.2 Principles	1.3.2 Principles	Redrafted	References updated to reflect legislation following the UK exit from the European Union.	3
G 2.1.2 Identifying defects	G 2.1.2 Identifying defects	Redrafted	References updated to reflect legislation following the UK exit from the European Union.	3
4.7.1.1 Doors on passenger vehicles	4.7.1.1 Doors on passenger vehicles	Revised	Requirement revised to align with RIS-2730-RST and the LOC & PAS NTSN.	2
NA	4.7.1.2 Doors on passenger vehicles	New	Rationale associated to requirement.	2
NA	4.7.1.3 Doors on passenger vehicles	New	Rationale associated to requirement.	2
G 4.7.1.4 Doors on passenger vehicles	NA	Withdrawn	Rationale no longer applicable – linked to withdrawn requirement.	2
NA	G 4.7.1.4 Doors on passenger vehicles	New	Guidance associated to the new requirement.	2
G 4.7.1.5 Doors on passenger vehicles	G 4.7.1.5 Doors on passenger vehicles	Revised	Guidance updated with correct terminology.	2
G 4.7.1.6 Doors on passenger vehicles	NA	Withdrawn	Guidance no longer applicable – linked to withdrawn requirement.	2

From RIS-3437-TOM issue 2	To RIS-3437-TOM issue 3	Way forward	Comments	Objective
NA	G 4.7.1.6 Doors on passenger vehicles	New	New guidance supporting new requirement.	2
4.7.1.2 Doors on passenger vehicles	G 4.7.1.7 Doors on passenger vehicles	Revised	Clause more suited to guidance. Content revised.	2
4.7.1.3 Doors on passenger vehicles	G 4.7.1.8 Doors on passenger vehicles	Revised	Clause more suited to guidance. Content revised.	2
G 4.7.1.7 Doors on passenger vehicles	G 4.7.1.9 Doors on passenger vehicles	Revised	Editorial changes to improve clarity. "Train operator" changed to "railway undertaking" to ensure consistency. Improvement of the punctuation and wording, eliminating "may consider".	2
G 4.7.1.8 Doors on passenger vehicles	G 4.7.1.10 Doors on passenger vehicles	Redrafted	Redrafted to emphasise 'good practice' arrangements when compiling a DOTE contingency plan.	2
4.9.1.1 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from a maintenance depot	4.9.1.1 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from a maintenance depot	Redrafted	Editorial changes.	1
NA	G 4.9.1.2 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from a maintenance depot	New	New rationale relevant to requirement.	1
G 4.9.1.2 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from a maintenance depot	G 4.9.1.3 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from a maintenance depot	Revised	Content completely amended to better reflect the rationale of driver incapacitation.	1

From RIS-3437-TOM issue 2	To RIS-3437-TOM issue 3	Way forward	Comments	Objective
NA	G 4.9.1.4 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from a maintenance depot	New	New guidance relevant to requirement.	1
NA	G 4.9.1.5 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from a maintenance depot	New	New guidance relevant to requirement.	1
NA	G 4.9.1.6 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from a maintenance depot	New	New guidance relevant to requirement, pointing to relevant standard with further information.	1
4.9.2.1 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from other than a maintenance depot or during a journey	NA	Withdrawn	Table removed due to the content being confusing and complex. The complete topic has been revised.	1
NA	4.9.2.1 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from other than a maintenance depot or during a journey	New	Requirements associated to defective DSD.	1

From RIS-3437-TOM issue 2	To RIS-3437-TOM issue 3	Way forward	Comments	Objective
NA	4.9.2.2 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from other than a maintenance depot or during a journey	New	Requirements associated to defective DSD.	1
NA	4.9.2.3 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from other than a maintenance depot or during a journey	New	Requirements associated to defective DSD. A table includes the speed restrictions relevant to the defect.	1
NA	4.9.2.4 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from other than a maintenance depot or during a journey	New	Requirements associated to defective DSD only.	1
G 4.9.2.2 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from other than a maintenance depot or during a journey	NA	Withdrawn	Complete section revised to better incorporate requirements.	1
G 4.9.2.3 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from other than a maintenance depot or during a journey	G 4.9.2.8 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from other than a maintenance depot or during a journey	Redrafted	Editorial changes to improve readability.	1

From RIS-3437-TOM issue 2	To RIS-3437-TOM issue 3	Way forward	Comments	Objective
G 4.9.2.4 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from other than a maintenance depot or during a journey	NA	Withdrawn	The rationale is only relevant to an AWS failure. AWS failures are covered in other topics of the standard.	1
G 4.9.2.5 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from other than a maintenance depot or during a journey	NA	Withdrawn	Complete section revised.	1
G 4.9.2.6 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from other than a maintenance depot or during a journey	G 4.9.2.9	Revised and converted to guidance.	Revised to give guidance on the role of a competent person.	1
G 4.9.2.7 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from other than a maintenance depot or during a journey	G 4.9.2.9	Revised	Revised to give more guidance on the role of a competent person.	1
G 4.9.2.8 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from other than a maintenance depot or during a journey	NA	Withdrawn	Included within the requirements of the topic 'Starting a journey from other than a maintenance depot or during a journey'.	1

From RIS-3437-TOM issue 2	To RIS-3437-TOM issue 3	Way forward	Comments	Objective
G 4.9.2.9 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from other than a maintenance depot or during a journey	NA	Withdrawn	Included within the requirements of the topic 'Starting a journey from other than a maintenance depot or during a journey'.	1
G 4.9.2.10 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from other than a maintenance depot or during a journey	NA	Withdrawn	Content relevant to AWS/TPWS failures. AWS/TPWS failures are covered in other topics of the standard.	1
G 4.9.2.11 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from other than a maintenance depot or during a journey	NA	Withdrawn	Complete section revised.	1
NA	G 4.9.2.5 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from other than a maintenance depot or during a journey	New	New rationale that explains the requirements in legislation.	1
NA	G 4.9.2.6 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from other than a maintenance depot or during a journey	New	New rationale relevant that explains the risks of driver incapacitation.	1

From RIS-3437-TOM issue 2	To RIS-3437-TOM issue 3	Way forward	Comments	Objective
NA	G 4.9.2.7 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from other than a maintenance depot or during a journey	New	New rationale relevant to requirements.	1
NA	G 4.9.2.10 Driver's Safety Device (DSD) and driver's vigilance equipment. Starting a journey from other than a maintenance depot or during a journey	New	New guidance on compound failures.	1
4.15.1.1 Hot axle box and activation of lineside hot axle box detectors. Starting a journey	4.15.1.1 Hot axle box and activation of lineside hot axle box detectors. Starting a journey	Revised	Content updated to incorporate missing requirement (built-in hot axle box detectors).	1
G 4.15.1.2 Hot axle box and activation of lineside hot axle box detectors. Starting a journey	G 4.15.1.2 Hot axle box and activation of lineside hot axle box detectors. Starting a journey	Redrafted	Editorial change – use of consistent terminology ("bearing" changed to "box").	1
NA	G 4.15.1.3 Hot axle box and activation of lineside hot axle box detectors. Starting a journey	New	Inclusion of rationale for built-in detectors.	1
4.18.1 On-train data recorder (OTDR)	4.18.1 On-train data recorder (OTDR)	Revised	Revised to align with OPE NTSN.	2
G 4.18.3 On-train data recorder (OTDR)	4.18.1 On-train data recorder (OTDR)	Converted to requirement	Clause more suited to requirement. Content revised.	2

From RIS-3437-TOM issue 2	To RIS-3437-TOM issue 3	Way forward	Comments	Objective
New	G 4.18.2 On-train data recorder (OTDR)	New	New rationale associated to requirement.	2
G 4.18.4 On-train data recorder (OTDR)	G 4.18.2 On-train data recorder (OTDR)	Converted to rationale	Incorporation into rationale clause.	2
NA	G 4.18.3 On-train data recorder (OTDR)	New	New guidance associated to requirement.	2
G 4.18.2 On-train data recorder (OTDR)	G 4.18.4 On-train data recorder (OTDR)	First sentence withdrawn. Second sentence converted to guidance.	Second sentence better suited to guidance. Content revised.	2
NA	G 4.18.5 On-train data recorder (OTDR)	New	New guidance associated to requirement.	2
NA	G 4.18.6 On-train data recorder (OTDR)	New	New guidance associated to requirement.	2
NA	G 4.18.7 On-train data recorder (OTDR)	New	New guidance associated to requirement.	2
4.20 Sanding equipment to assist train braking	4.20 Sanding equipment to assist train braking 4.20.1 Starting a journey from a maintenance depot 4.20.2 Starting a journey from other than a maintenance depot or continue a journey.	Revised	The topic is now divided into two: - Starting a journey from a maintenance depot - Starting a journey from other than a maintenance depot or continue a journey.	2

From RIS-3437-TOM issue 2	To RIS-3437-TOM issue 3	Way forward	Comments	Objective
4.20 Sanding equipment to assist train braking. 4.20.1	4.20.1.1 Sanding equipment to assist train braking. Starting from a maintenance depot	Revised	Editorial change and inclusion of new requirement to incorporate multiple sanders.	2
NA	4.20.1.2 Sanding equipment to assist train braking. Starting from a maintenance depot	New	New requirement to incorporate multiple sanders.	2
NA	G 4.20.1.3 Sanding equipment to assist train braking. Starting from a maintenance depot	New	Rationale to support new requirement.	2
NA	G 4.20.1.4 Sanding equipment to assist train braking. Starting from a maintenance depot	New	Rationale to support new requirement.	2
NA	G 4.20.1.5 Sanding equipment to assist train braking. Starting from a maintenance depot	New	Rationale to support new requirement.	2
NA	G 4.20.1.6 Sanding equipment to assist train braking. Starting from a maintenance depot	New	Guidance to support new requirement.	2
NA	G 4.20.1.7 Sanding equipment to assist train braking. Starting from a maintenance depot	New	Guidance to support new requirement.	2

From RIS-3437-TOM issue 2	To RIS-3437-TOM issue 3	Way forward	Comments	Objective
NA	G 4.20.1.8 Sanding equipment to assist train braking. Starting from a maintenance depot	New	Guidance to support new requirement.	2
4.20.2 Sanding equipment to assist train braking.	4.20.2.1 Sanding equipment to assist train braking. Starting from other than a maintenance depot or continue a journey	Redrafted	Update of requirement.	2
NA	G 4.20.2.2 Sanding equipment to assist train braking. Starting from other than a maintenance depot or continue a journey	New	Rationale to support new requirement. Inclusion of reference link.	2
NA	G 4.20.2.3 Sanding equipment to assist train braking. Starting from other than a maintenance depot or continue a journey	New	Rationale to support new requirement. Inclusion of reference link.	2
NA	G 4.20.2.4 Sanding equipment to assist train braking. Starting from other than a maintenance depot or continue a journey	New	Rationale to support new requirement. Inclusion of reference link.	2
NA	G 4.20.2.5 Sanding equipment to assist train braking. Starting from other than a maintenance depot or continue a journey	New	Guidance to support new requirement. Inclusion of reference link.	2

From RIS-3437-TOM issue 2	To RIS-3437-TOM issue 3	Way forward	Comments	Objective
G 4.20.5 Sanding equipment to assist train braking	G 4.20.2.6 Sanding equipment to assist train braking. Starting from other than a maintenance depot or continue a journey	Moved to guidance	Guidance to support new requirement (from other than a maintenance depot).	2
G 4.20.6 Sanding equipment to assist train braking	G 4.20.2.7 Sanding equipment to assist train braking. Starting from other than a maintenance depot or continue a journey	Revised	Guidance revised and moved to support new requirement (from other than a maintenance depot).	2
4.20.3 Sanding equipment to assist train braking	G 4.20.2.8 Sanding equipment to assist train braking. Starting from other than a maintenance depot or continue a journey	Converted to guidance.	Guidance to support new requirement. Content revised.	2
4.20.4 Sanding equipment to assist train braking	G 4.20.2.9 Sanding equipment to assist train braking. Starting from other than a maintenance depot or continue a journey	Moved to guidance	Guidance to support new requirement (from other than a maintenance depot).	2
G 4.20.7 Sanding equipment to assist train braking	NA	Withdrawn	Content withdrawn, as specific to one particular type (one-shot systems). The new requirement expands to include all types and the railway undertaking is responsible for establishing the type and braking capability of their units.	2
4.29 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes	4.29 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes 4.29.1 Starting a journey 4.29.2 During a journey.	Revised	Topic divided into two, mirroring associated TW5 section: - Starting a journey - During a journey	2

From RIS-3437-TOM issue 2	To RIS-3437-TOM issue 3	Way forward	Comments	Objective
4.29.1 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes	4.29.1.1 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. Starting a journey	Revised	Amendment of terminology referring to wheel flats in alignment with changes to Rule Book TW5 issue 11 and editorial changes to the clause.	2
NA	G 4.29.1.2 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. Starting a journey	New	Inclusion of rationale supporting requirement, following the separation of content to incorporate 'starting a journey' and 'during a journey' in separate sections.	2
NA	G 4.29.1.3 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. Starting a journey	New	Inclusion of guidance referring to definition of the new terminology ("obvious damage to wheels") by link to the relevant section.	2
NA	4.29.2.1 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. During a journey	New	Inclusion of requirements in alignment with Rule Book TW5 issue 11.	2
NA	4.29.2.2 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. During a journey	New	Alignment of requirements with Rule Book TW5 issue 11.	2
G 4.29.9 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes	4.29.2.2 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. During a journey	Converted to requirement	Clause more suited as a requirement. Content revised in alignment with Rule Book TW5 issue 11.	2
NA	4.29.2.3 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. During a journey	Revised	Alignment of requirements with Rule Book TW5 issue 11.	2

From RIS-3437-TOM issue 2	To RIS-3437-TOM issue 3	Way forward	Comments	Objective
4.29.2 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes	4.29.2.4 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. During a journey	Revised	Clause incorporated to new clause. Alignment of requirements with Rule Book TW5 issue 11.	2
4.29.3 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes	4.29.2.5 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. During a journey	Revised	Requirements relevant to WILD alerts.	2
4.29.4 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes	4.29.2.5 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. During a journey	Revised	First sentence incorporated to WILD requirements.	2
G 4.29.6 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes	G 4.29.2.6 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. During a journey	Revised	Rationale revised to support requirements.	2
G 4.29.7 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes	G 4.29.2.7 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. During a journey	Redrafted	Content of the first sentence updated to clarify meaning.	2
G 4.29.7 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes	G 4.29.2.6 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. During a journey	Redrafted	Second sentence incorporated to previous clause. Meaning is generic and applicable to the whole section, and not just WILD equipment.	2
NA	G 4.29.2.8 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. During a journey	New	New rationale applicable to requirements.	2

From RIS-3437-TOM issue 2	To RIS-3437-TOM issue 3	Way forward	Comments	Objective
4.29.5 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes	G 4.29.2.9 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. During a journey	Converted to guidance	Clause more suited as guidance. Content revised in alignment with Rule Book TW5 issue 11.	2
NA	G 4.29.2.10 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. During a journey	New	New guidance to support requirements in alignment with Rule Book TW5 issue 11.	2
NA	G 4.29.2.11 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. During a journey	New	Additional guidance supporting the requirements.	2
4.29.4 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes	4.29.2.12 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. During a journey	Part converted to guidance	Second sentence more suited to guidance.	2
G 4.29.10 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes	G 4.29.2.12 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. During a journey	Revised	Incorporation of guidance to new clause.	2
G 4.29.11 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes	G 4.29.2.12 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. During a journey	Revised	Incorporation of guidance to new clause. Editorial changes to existing content.	2
G 4.29.12 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes	G 4.29.2.12 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. During a journey	Revised	Existing clause found fit for purpose. Further guidance incorporated.	2

From RIS-3437-TOM issue 2	To RIS-3437-TOM issue 3	Way forward	Comments	Objective
G 4.29.8 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes	G 4.29.2.13 Vehicles with locked wheels/wheel flats/shifted tyres/dragging brakes. During a journey	Revised	Guidance updated. Speed limits are set depending on the different levels of impact force and are set by the infrastructure manager.	2
NA	G 5.4.8 Fire detection and fire suppression systems	New	Incorporation of new clause regarding defective fire suppression systems.	1
Definitions	Definitions	Revised	Term “infrastructure manager” updated in alignment to master glossary. Two new definitions added: “good practice” and “railway undertaking”.	3
References	References	Revised	General housekeeping of referenced documents	3

Table A2: GERT8000-TW5 issue 10 to GERT8000-TW5 issue 11

From GERT8000-TW5 issue 10	To GERT8000-TW5 issue 11	Way forward	Comments	Objective
1. Reporting defective or isolated on-train equipment. 1.1 c) Driver reporting a defect	1. Reporting defective or isolated on-train equipment. 1.1 c) Driver reporting a defect	Revised	Update to incorporate further instructions regarding a driver talking directly to their operations control.	1
1. Reporting defective or isolated on-train equipment. 1.2	1. Reporting defective or isolated on-train equipment. 1.2	No change		1
1. Reporting defective or isolated on-train equipment. 1.3	1. Reporting defective or isolated on-train equipment. 1.3	No change		1
1. Reporting defective or isolated on-train equipment. 1.4	1. Reporting defective or isolated on-train equipment. 1.4	No change		1
1. Reporting defective or isolated on-train equipment. 1.5	1. Reporting defective or isolated on-train equipment. 1.5	No change		1
5. Brake defects. 5.1 Brake no longer operating on the leading vehicle of a passenger train	5. Brake defects. 5.1 Brake no longer operating on the leading vehicle of a passenger train	No change		1
5. Brake defects. 5.2 Brake no longer operating on the leading vehicle of a passenger train	5. Brake defects. 5.2 Brake no longer operating on the leading vehicle of a passenger train	No change		1

From GERT8000-TW5 issue 10	To GERT8000-TW5 issue 11	Way forward	Comments	Objective
5. Brake defects. 5.3 Brake no longer operating on the leading vehicle of a passenger train	5. Brake defects. 5.3 Brake no longer operating on the leading vehicle of a passenger train	No change		1
5. Brake defects. 5.4 Brake no longer operating on the leading vehicle of a passenger train	5. Brake defects. 5.4 Brake no longer operating on the leading vehicle of a passenger train	Redrafted	Minor rewording of clause to improve clarity on condition for the brake to operate normally.	1
5. Brake defects. 5.5 Brake no longer operating on the last vehicle	5. Brake defects. 5.5 Brake no longer operating on the last vehicle	Redrafted	Minor rewording of clause to improve clarity on condition for the brake to operate normally.	1
6. Door defects on passenger vehicles. 6.1 Vehicles in which passengers must not travel in	6. Door defects on passenger vehicles. 6.1 Vehicles in which passengers must not travel in	No change		2
6. Door defects on passenger vehicles. 6.2 Vehicles in which passengers must not travel in	6. Door defects on passenger vehicles. 6.2 Vehicles in which passengers must not travel in	No change		2
6. Door defects on passenger vehicles. 6.3 Vehicles in which passengers must not travel in	6. Door defects on passenger vehicles. 6.3 Vehicles in which passengers must not travel in	Revised	Instructions changed to seek advice from train operator's control. Table removed as no longer relevant.	2

From GERT8000-TW5 issue 10	To GERT8000-TW5 issue 11	Way forward	Comments	Objective
6. Door defects on passenger vehicles. 6.4 Vehicles in which passengers must not travel in	6. Door defects on passenger vehicles. 6.4 Vehicles in which passengers must not travel in	No change		2
6. Door defects on passenger vehicles. 6.5 Vehicles in which passengers must not travel in	6. Door defects on passenger vehicles. 6.5 Vehicles in which passengers must not travel in	No change		2
8. Driver's safety device (DSD) and driver's vigilance equipment. 8.1 Starting a journey from somewhere other than a maintenance depot	8. Driver's safety device (DSD) and driver's vigilance equipment. 8.1 Starting a journey from somewhere other than a maintenance depot	No change		2
8. Driver's safety device (DSD) and driver's vigilance equipment. 8.2 Starting a journey from somewhere other than a maintenance depot	8. Driver's safety device (DSD) and driver's vigilance equipment. 8.2 Starting a journey from somewhere other than a maintenance depot	Revised	Provided the conditions in the table in section 8.4 are followed, a train can start a journey from other than a maintenance depot. References to "not carrying passengers" and "to travel to maintenance depot" removed.	2
8. Driver's safety device (DSD) and driver's vigilance equipment. 8.3 Starting a journey from somewhere other than a maintenance depot	8. Driver's safety device (DSD) and driver's vigilance equipment. 8.3 Starting a journey from somewhere other than a maintenance depot	No change		2

From GERT8000-TW5 issue 10	To GERT8000-TW5 issue 11	Way forward	Comments	Objective
8. Driver's safety device (DSD) and driver's vigilance equipment. 8.4 During a journey	8. Driver's safety device (DSD) and driver's vigilance equipment. 8.4 During a journey	Revised	The table in Rule Book module TW5 issue 10 contained information for multiple defects coinciding. The table in issue 11 has been simplified to include speed restrictions only relevant to a DSD defect.	2
15. Hot axle boxes and activation of lineside hot axle box detectors. 15.1 Starting a journey	15. Hot axle boxes and activation of lineside hot axle box detectors. 15.1 Starting a journey	Revised	Expansion of instructions to incorporate built-in axle box detectors.	1
15. Hot axle boxes and activation of lineside hot axle box detectors. 15.2 Starting a journey	15. Hot axle boxes and activation of lineside hot axle box detectors. 15.2 Starting a journey	No change		1
15. Hot axle boxes and activation of lineside hot axle box detectors. 15.3 Starting a journey	15. Hot axle boxes and activation of lineside hot axle box detectors. 15.3 Starting a journey	No change		1
15. Hot axle boxes and activation of lineside hot axle box detectors. 15.4 Starting a journey	15. Hot axle boxes and activation of lineside hot axle box detectors. 15.4 Starting a journey	No change		1
15. Hot axle boxes and activation of lineside hot axle box detectors. 15.5 Starting a journey	15. Hot axle boxes and activation of lineside hot axle box detectors. 15.5 Starting a journey	No change		1

From GERT8000-TW5 issue 10	To GERT8000-TW5 issue 11	Way forward	Comments	Objective
15. Hot axle boxes and activation of lineside hot axle box detectors. 15.6 Starting a journey	15. Hot axle boxes and activation of lineside hot axle box detectors. 15.6 Starting a journey	No change		1
15. Hot axle boxes and activation of lineside hot axle box detectors. 15.7 Activation of a built-in hot axle box detector	15. Hot axle boxes and activation of lineside hot axle box detectors. 15.7 Activation of a built-in hot axle box detector	Revised	Revision of instructions to incorporate when a defect is found during a journey.	1
NA	15. Hot axle boxes and activation of lineside hot axle box detectors. 15.8 No evidence of a built-in hot axle box detector overheating	New	New subtopic to complement 15.7 by providing instructions in case of false activation.	1
17. On-train data recorder (OTDR). 17.1 Starting a journey	17. On-train data recorder (OTDR). 17.1 Starting a journey	Revised	Rule updated to only mention OTDRs that record activity in driver cab, as other OTDRs present would not comply with OPE NTSN requirements.	2
17. On-train data recorder (OTDR). 17.2 During a journey	17. On-train data recorder (OTDR). 17.2 During a journey	Revised	Rule updated to differentiate between 'from maintenance depot' and 'other than a maintenance depot or during a journey'.	2
19. Sanding equipment to assist train braking. 19.1 Starting a journey from a maintenance depot	19. Sanding equipment to assist train braking. 19.1 Starting a journey from a maintenance depot	Revised	Rule revised to incorporate seeking instructions from the operator's control in case of failure in order to cater for trains where more than one set of sanders is present.	2

From GERT8000-TW5 issue 10	To GERT8000-TW5 issue 11	Way forward	Comments	Objective
19. Sanding equipment to assist train braking. 19.2 Starting a journey from a maintenance depot	19. Sanding equipment to assist train braking. 19.2 Starting a journey from a maintenance depot	Revised	Rule revised to incorporate seeking instructions from the operator's control in case of failure in order to cater for trains where more than one set of sanders is present.	2
26. Vehicles with locked wheels, wheel flats, shifted tyres or dragging brakes. 26.1 Starting a journey	26. Vehicles with locked wheels, wheel flats, shifted tyres or dragging brakes. 26.1 Starting a journey	Redrafted	Change of terminology from "serious wheel flats" to "obvious damage to the wheels", in alignment with content in 26.2.	2
26. Vehicles with locked wheels, wheel flats, shifted tyres or dragging brakes. 26.2 During a journey	26. Vehicles with locked wheels, wheel flats, shifted tyres or dragging brakes. 26.2 During a journey	Revised	26.2 c) renamed to clarify its meaning. The table content has been revised to align with the findings from RSSB project COF-UOH-56 (2021) *Harmonising Wheel Flat Limits* and RIS-2766-RST. Original levels "slight flats/more serious flats/serious damage" now shown clearer to the reader as "no evidence of damage/ obvious damage/serious damage". Further instructions incorporated to the 'action to be taken' column in order to ensure the driver confirms with the signaller any agreed actions with the rolling stock technician. 26.2 e) renamed to align terminology (if the damage to the vehicle is "obvious").	2
26. Vehicles with locked wheels, wheel flats, shifted tyres or dragging brakes. 26.3 Detaching the defective vehicle	26. Vehicles with locked wheels, wheel flats, shifted tyres or dragging brakes. 26.3 Detaching the defective vehicle	No change		2

From GERT8000-TW5 issue 10	To GERT8000-TW5 issue 11	Way forward	Comments	Objective
26. Vehicles with locked wheels, wheel flats, shifted tyres or dragging brakes. 26.4 Moving vehicles with wheelskates	26. Vehicles with locked wheels, wheel flats, shifted tyres or dragging brakes. 26.4 Moving vehicles with wheelskates	No change		2