Transport for Wales, Rail Limited
Safety Management System

Procedure Number: SMS–OPS-003

Defective On-Train Equipment (Train Operator's Contingency Plan)

1. Control and Amendment History

	Name	Date:
Document Owner – Head of Current Operations	Elliott Swallow	12th May 2023
Document Approval and Authorisation Head of Health and Safety	Dean Katchi	12th May 2023

Issue No.	Date	Details of change
1	March 2019	First version – migrated from ATW SMS
2	May 2019	Updated First Suitable / Next Available stations to account for new Liverpool services
3	June 2019	Missing details regarding Track Circuit Actuators in section 6.33 added. No material change to the procedure.
4	July 2020	Updated in readiness for new / cascaded fleets, PRM-TSI equipment failure and a review of Maintenance Depot / Stabling points. Also updates to DSD failure on ERTMS L2 routes and permitted speed with use of competent person (AWS failure). Correction to TCA instruction regarding CL.175 failure
5	December 2020	Updated in line with TW5 re-issue and introduction of new and cascaded fleets.
6	March 2021	Updated business name to TfWRL (from TfWRS)
7	April 2021	Updated to remove items specific to CL.142 / CL.143. Further updates specific to new and cascaded fleets
8	August 2022	Revision to some CL.197 and CL 231 specific items including removal of items not deemed as safety systems Clarity on headlight defects for trains with non-standard yellow front ends. Inclusion of Barry Sidings as a stabling location and update to Operational workarounds for CL.153 units
9	February 2023	Updated to reflect MK4 SDO entry & Inclusion of MK4 modified loco list Updated to include items relating to Automatic Dropping Device (ADD), Automatic Power Change Over (APCO) and updated ASDO (to include CSDE) entries Class 231 TCA failure when operating on Rhymney Valley Route Update to include Taffs Well Depot & CL.398 / CL.756 in maintenance locations
10	1st April 2023	Updated details on: • Section 7.1 (Suspension systems) split into 7.1.1 (Air Suspension systems) and 7.1.2 (Diablo Suspension system, 230s only) • Section 7.3; wording clarified in Automatic Dropping Device (ADD) • Section 7.11; Class 230 added to list of units without an internal door. • Section 7.26; Hybrid Genset (Class 230s only) new section added. • Section 7.49; Speedometer also becomes defective if Wheel Slide Protection is defective/fails. • Section 7.17; Operation of the EBS in CL.197s and CL.231's • Section 8; Competent person requirements for AWS / TPWS / EBS (Rule book & RIS-3437-TOM changes) • Section 11; Change to CL.153 operational workaround for deflated air suspension
11	12th May 23	• Section 7.17; Clarification of EBS and use of Competent Person. • Section 7.26; Clarification of wording for Gensets on CL.230s. • Section 7.44; Special instructions for trains operating on TAM routes on the CVL in the event of an on-train or network failure affecting the Train Radio (GSM-R) • Multiple Sections; Added references to CL.756s. • Update to Titles and positions within Scope 4.

☆ **Denotes a change has been made to this section**

2. Legislative Compliance

The procedure is designed to ensure compliance with the following:

Legislation	• Railways and Other Guided Transport Systems Regulations
Railway Group Standards	N/A
Rail Industry Standards	• RIS–3437-TOM, Defective On-Train Equipment • GERT8000-TW5 Rule book Defective on train Equipment
Approved Codes of Practice	N/A
Guidance Documents	Individual fleet rescue and recovery plans

3. Purpose: **Why we need this procedure**

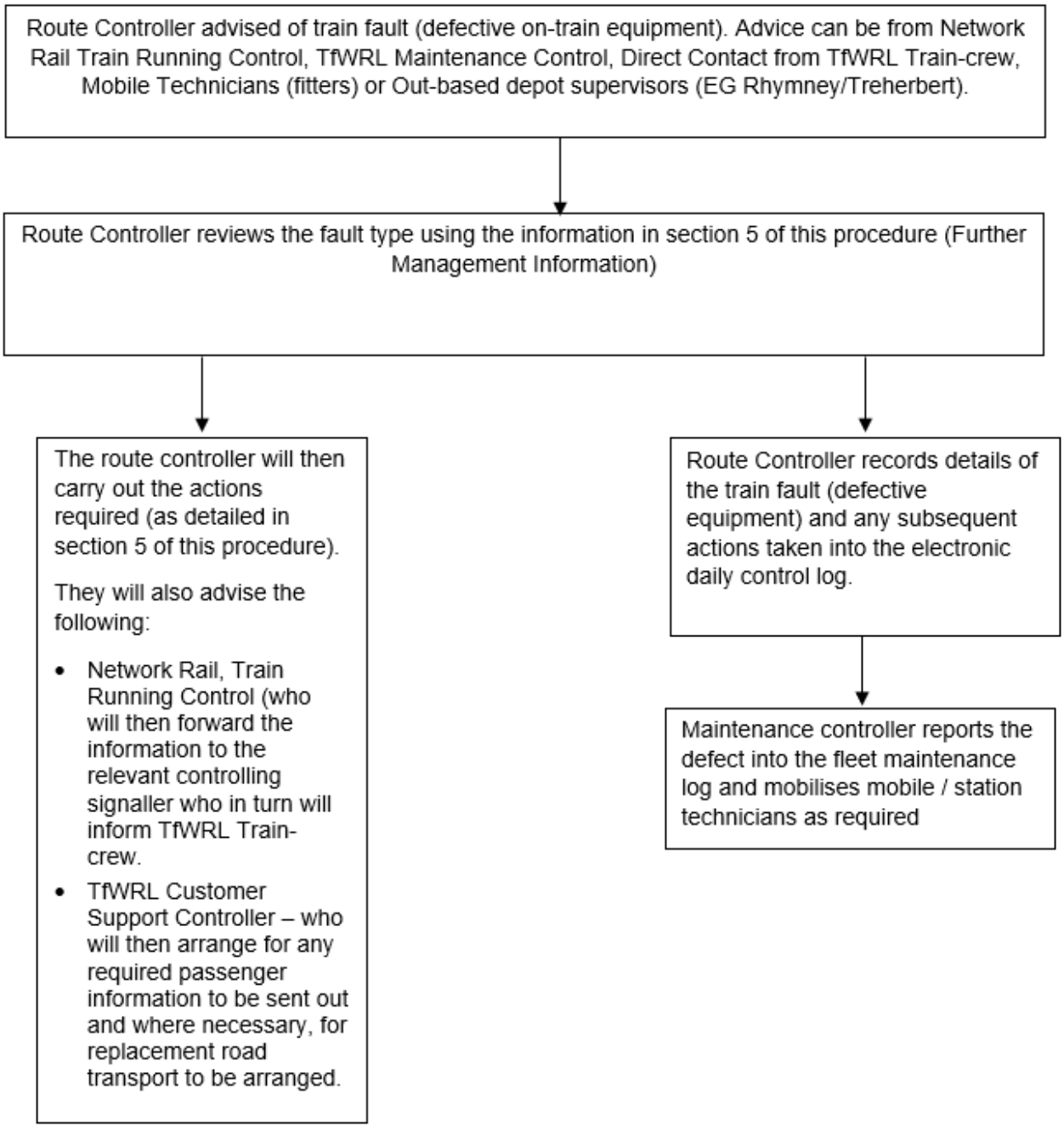
To ensure that TfWRL has in place a suitable and sufficient contingency plan (as noted in the Rule Book, Module TW5) that documents the arrangements for removing defective trains from service. It documents how the Company complies with the requirements of Rail Industry Standard – RIS-3437-TOM "Defective On-Train Equipment".

It also provides clear instructions concerning on when and how defective trains are removed from service and who must be informed.

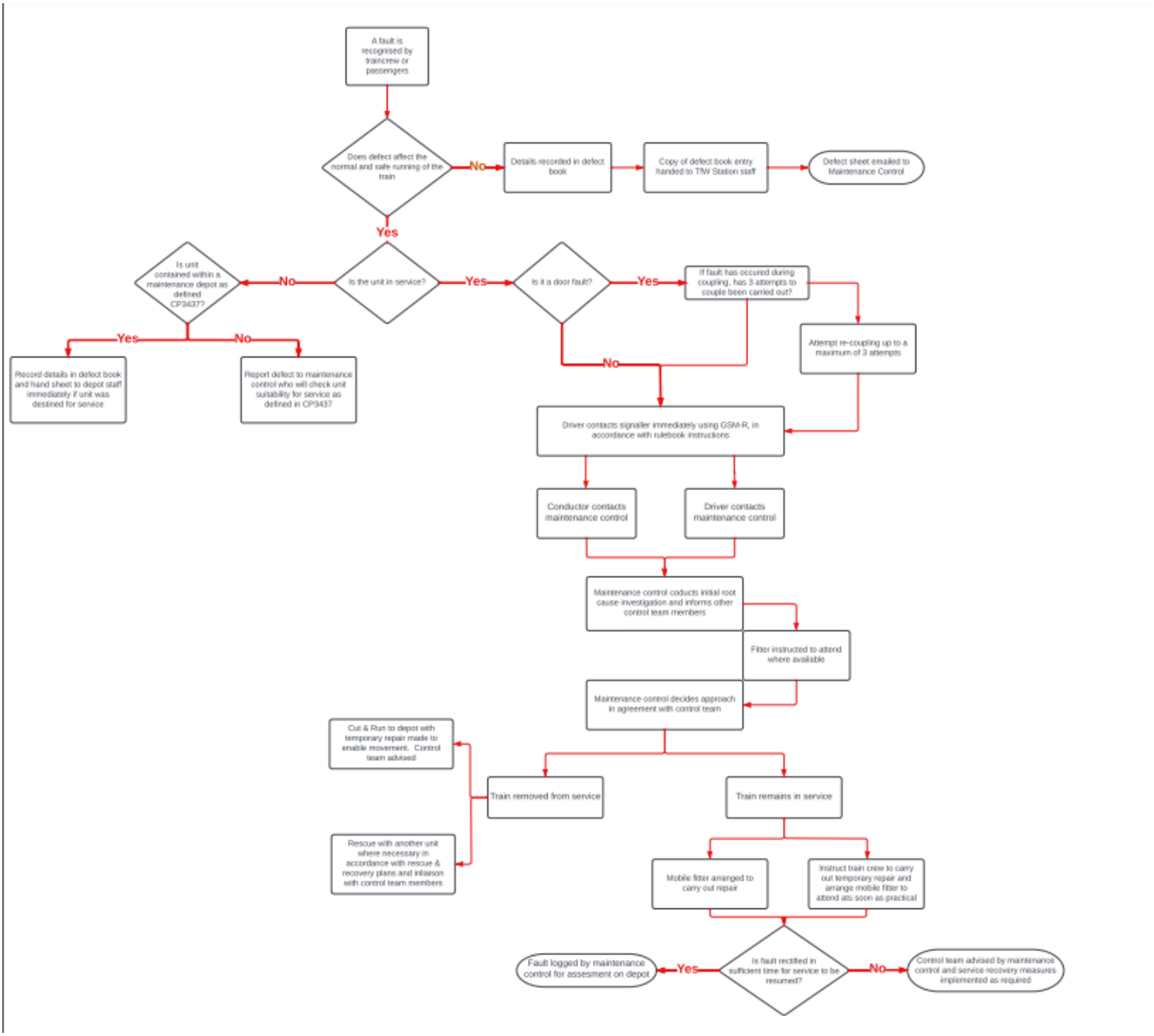
☆ 4. Scope: **Who is involved with making sure this procedure is followed**

Head of Current Operations	Maintenance Controllers (WCB & CVL)
Control Centre Managers	Fleet Planner
Duty Control Manager (WCB)	Fleet Planning Manager
Duty Route Delivery Manager (CVL)	Route Controllers
Control Contingency Planning Manager	CVL ICC Operations Competence & Business Development Manager
CVL Service Delivery Manager	CVL ICC Depot Operation Controllers

5. Procedure Overview (Flow Chart) **What Must Be Done and When**



6. Further Management information and guidance: **Failed Train Process**



7. Further Management Information and guidance: **Contingency Plans**

Fault Detected	
Air Suspension	Hydraulic buffers
Air Conditioning (saloon)	Lifeguards
Automatic Dropping Device (ADD)	On Train CCTV
Automatic Power Changeover (APCO)	On-Train Data Recorders (OTDR / OTMR)
Automatic Warning System (AWS)	On-train emergency equipment
Battery Chargers	Passenger Communication Apparatus (PCA)
Bodyside windows	Passenger Information System (PIS)
Brake related defects	PRM Accessible Toilet
Buzzer Fault	Public Address System (PA)
Cab heating/cooling equipment	Sanding equipment
Doors (external)	Selective Door Opening facility (SDO / ASDO / CSDE)
Driver Advisory System (DAS)	Speedometer
Driver Reminder Appliance (DRA)	Tail lamps
Driver's Safety Device (DSD)	Track Circuit Actuators (TCA)
Driving cab windscreens	Traction Interlock Switch (TIS)
Driving Controls	Train lighting (internal)
Emergency Bypass Switch (EBS) / Brake Continuity	Train Control Management System (TCMS)
ETH	Train Management System (TMS)
ERTMS equipment	Train Protection and Warning System (TPWS)
Fire detection / suppression systems	Train radio including: (GSMR)
Hazard Light fault	Vehicle Couplings
Headlights	Vigilance equipment
Hot axle boxes / On board Hot Axle box detection	Warning horn
Hustle alarms	Wheel Impact Load Detection / Wheelchex / Gotcha
Hybrid Genset (Class 230 only)	Wheel Slide Protection (WSP)

7.1 **Air Suspension System**

7.1.1 Air Suspension System (all except Class 230s)

Entering service from a maintenance depot
You must not allow a train to enter service if the air suspension is not inflated on any bogie.

Entering service from somewhere other than a maintenance depot
A train may enter service from a stabling point with the air suspension isolated on any vehicle but only as an ECS movement to a maintenance depot.

In service
If passengers can be moved from the defective vehicle:

- Maximum speed but can be reduced at the Driver's discretion (Ride quality affected).
- Maximum speed must not exceed **45MPH** for CL.197
- ☆ Maximum speed must not exceed **60MPH** for CL.231 & CL.756

If Passengers are de-trained (ECS):

- Maximum speed can be reduced at the Driver's discretion (Ride quality affected).
- Maximum speed must not exceed **65MPH** for CL.197
- ☆ Maximum speed must not exceed **60MPH** for CL.231 & CL.756

If passengers cannot be moved to another vehicle or de-trained:

- ☆ Maximum speed 45mph (Class 153 = 30mph, CL.231 = 60MPH, CL.756 = 60MPH)
- Should the air suspension fail on a Class 175-unit, technical advice must be sought from fitters before moving the train.

Special Instructions
In the event of air suspension failure of Class 153 and Class 769 units on CVL services, and Mk4 LHCS operated services running through Shrewsbury special instructions exist on management of the failure. This is documented in section 11 of this document.

(*Note: On the affected vehicle the brakes will receive maximum air braking pressure, resulting in unusually high brake gauge readings for each braking step. Drivers are reminded of the problems this may cause in times of low rail adhesion and adjust their driving accordingly).*

7.1.2 Diablo Suspension System (Class 230s only)

Entering service from a maintenance depot
You must not allow a train to enter service if the Diablo suspension is defective on any bogie.

Entering service from somewhere other than a maintenance depot
A train must not enter service from a location other than a maintenance depot unless it is being attached back to a depot where a repair can be undertaken.

In service
If the Diablo Suspension fails in service, the train should proceed only as far as the next available station for detraining customers at a speed not exceeding **45MPH** and then to a maintenance depot for repair. The speed of the train can be reduced at the Drivers discretion once customers have been detrained (ride quality affected)

7.2 **Air Conditioning System (saloon)**

Entering service from a maintenance depot
You may allow a train to enter service with the air conditioning system defective if the train is being moved to another depot where the repair can be carried out if consideration is given to:
Additionally, a train may enter service if consideration is given to:

- Ambient air temperature.
- Radiant Temperature (high external temperatures and/or bright, direct sunshine).
- Still or Stagnant Air (ability to open or close windows).
- Humidity levels.
- Whether reasonable ambient conditions can be maintained for the duration of the train's journey - the longer the

journey, the greater the risk.
- The number and distribution of passengers on the train (commuter/local service) This will be significant as air quality will diminish more rapidly in areas where there are large concentrations of people.

The decision will be made between the DCM, Maintenance Controller and Fleet On-Call Manager using the considerations above as to whether the train will enter service.

Entering service from somewhere other than a maintenance depot
A train may enter service from a stabling point with the air conditioning system defective, judgement should be considered when deciding whether to allow a train to remain in traffic until the end of day but must end at a location where repairs can be carried out.

In all instances affecting CL.197 trains, The Emergency Ventilation system on Class 197 must be operational, due to the absence of opening saloon windows.

In service
Where the saloon air conditioning system has failed and there is no emergency ventilation and there are no windows fitted that can be opened, then the driver and conductor's judgement should be considered in conjunction with the criteria above, when deciding whether to allow a train to remain in traffic. The supply of bottled water to aid passenger comfort should be considered prior to removing a train from service.

7.3 Automatic Dropping Device (ADD)

Entering service from a maintenance depot
A train must not enter service from a maintenance depot if an Automatic Dropping Device is defective

Entering service from somewhere other than a maintenance depot
A train must not enter service from a location other than a maintenance depot unless it is being attached back to a depot where a repair can be undertaken.

In service
If the Automatic Dropping Device fails in service, the train should proceed only as far as the next available station. If the train is required to transition into a Catenary free section or Neutral Section, the driver must ensure that the beacon for Pantograph Down has been read and actioned as expected.

ADD activations
Class 398 and Class 756 trains will have an ADD activation as a result of an APCO beacon failing to action. Please see below item on APCO

Where an ADD activation is unexpected and not as a result of an APCO beacon, the train should proceed to the next available station after being switched manually to battery mode (providing sufficient state of charge is available)

7.4 Automatic Power Change over

Entering service from a maintenance depot
A train must not enter service from a maintenance depot if an Automatic Power Change over system is defective

Entering service from somewhere other than a maintenance depot
A train must not enter service from a location other than a maintenance depot unless it is being attached back to a depot where a repair can be undertaken.

In service
The following actions should be taken if there is an APCO failure on a train in service

Number of APCO beacon read failures	Action to be taken
1	Train can proceed as normal but end the day at a maintenance depot for checks to be undertaken
More than 1 (at same location)	Train can proceed as normal. Beacon location to be identified and details

	passed to the infrastructure manager ECO / Flight Engineer for repair
More than 1 (multiple locations)	Train to proceed as far as the next available location and then run Empty Stock to a maintenance depot after being switched to battery power only. If insufficient battery for ECS move, train should be stabled at a location where it can be charged and then returned ECS to depot.

7.5 Automatic Warning System (AWS)

Entering service from a maintenance depot

A train must not enter service from a maintenance depot with a defective AWS system

Entering service from somewhere other than a maintenance depot

A train may enter service from somewhere other than a maintenance depot with AWS isolated or with the seal broken on the isolating handle in the cab to be used but only as an ECS movement to a maintenance depot. If the service is contained entirely on ERTMS Level 2 operated routes, the train may enter service and remain in service provided it remains contained on ERTMS Level 2 operated routes

In service

If the Automatic Warning System (AWS) becomes defective on a train in service, the train should proceed only as far as the next available location. In the case of a passenger train, the passengers should be de-trained at the first suitable station, after which the train should proceed only as far as the next available location. TW5 GE/RT8000 module TW5 sets out the operational consequences when a competent person is available to accompany the driver and sets out the duties of the competent person . If **the use of a competent person to assist the driver as a result of AWS/TPWS failure is one of** the measures applied, the duration of that competent person's presence in the cab should be limited to the time needed to reach the appropriate designated location identified in the railway undertakings DOTE contingency plan.

If running entirely under ERTMS level 2 a train may continue in service with AWS isolated, but consideration must be given to the train transitioning onto level 0 lines

7.6 Battery Chargers (Class 197 only)

Entering service from a maintenance depot

A train may not enter service from a maintenance depot with a defective battery charging system.

Entering service from somewhere other than a maintenance depot/In service.

A train may complete one journey to a maintenance facility with a defective battery charging system. Note if the train loses 24V supply, the train will become disabled and require rescuing in accordance with the Class 197 Breakdown & Recovery Manual

In service

The battery charger major fault TCMS alarm is a severity C and the train can continue in service until the end of the day where it must return to a maintenance facility. Note if the train loses 24V supply, the train will become disabled and require in accordance with the Class 197 Breakdown & Recovery Manual.

Class 197 alarm severity explanations can be found in the CL.197 traction manual

7.7 Bodyside Windows

Entering service from a maintenance depot

A train must not enter service from a maintenance depot with a broken bodyside window.

Entering service from somewhere other than a maintenance depot/In service

If a train or vehicle enters service from other than a maintenance depot with a broken bodyside window, or if a bodyside window is broken on a train or vehicle in service, it may complete its journeys for the remainder of the day, provided that the following requirements are observed.

Note that TfWRL Rule book appendix defines a window with a crack longer than 80mm to be broken. If, in the circumstances, it is satisfied that:

a) The measures in place, such as an emergency window, outer skin only broken (remnants of glass must be removed) or locking of the vehicle, are sufficiently robust to remain effective to control risks to passengers and others for a longer period than the day of the breakage, and
b) The measures can be monitored:

The train may continue in service until the time when originally scheduled to arrive at a maintenance depot, rather than divert it specially to a maintenance depot at the end of the day.

When considering whether a measure is robust in this context, the impact of normal operating conditions including speed, tunnels and passing trains should be considered.

7.8 **Brake Systems**

Entering service from a maintenance depot
A train may not enter service from a maintenance depot with a defective brake system.

Entering service from somewhere other than a maintenance depot / In Service
A train may not enter service from somewhere other than a maintenance depot with a defective brake system. If a brake system becomes defective while in service, the train should only proceed as far as the first suitable location to detrain passengers and as far as the next available location where the train should be removed from traffic but only after inspection from a rolling stock technician.

7.8.1 Automatic Brake Systems

Entering service from a maintenance depot
A train may not enter service from a maintenance depot with a defective automatic brake system.

Entering service from somewhere other than a maintenance depot/In service
If the automatic brake system becomes defective on a train in service, the train or vehicle should proceed in accordance with the instructions set out in the Rule Book, module TW 5

If a train is operating in a multiple formation of 5 vehicles or more and the brakes require to be isolated on no more than 1 vehicle, the train may continue in service with a maximum speed of 10mph below line-speeds above 35mph providing the ratio of unbraked vehicles does not drop below 1 in 5. The defective train must end the day at a maintenance depot for repair. Rule book module TW1 section 4 sets out any further restrictions associated with gradients.

If a train is formed of fewer than 5 vehicles and the brakes require to be isolated on one vehicle, the train may proceed only as far as the first suitable location at a safe speed at the drivers discretion, taking account of weather conditions, gradients, train loading and other local conditions. Consideration should always be given to ensuring the ratio of 1 unbraked vehicle in 5 is maintained where possible.

7.8.2 Dragging brakes / Locked Wheels / Wheel Flats / Shifted Tyres

Entering service from a maintenance depot
A train may not enter service from a maintenance depot with dragging brakes, Locked Wheels or shifted tyres. Trains will be permitted to enter service from a maintenance depot with wheel flats that fall within a defined tolerance

Entering service from somewhere other than a maintenance depot/In service
In the event of locked wheels, shifted tyres or dragging brakes on a train or vehicle in service, the train may proceed forward only after consultation with control and after successful completion of a rotational test. Where a train has suspected wheel flats, and the driver decides that the train may proceed forward for examination by a rolling stock technician, the train should proceed only as far as the next available location. The judgement of the rolling stock technician should be relied upon in determining what further measures need to be applied.

If the driver decides, in accordance with the table in TW5 of the Rule Book, that the train may proceed forward only after examination by a rolling stock technician, the judgement of the driver and the rolling stock technician should be relied upon in determining what further measures need to be applied. GM/RT2466 Railway Wheelsets sets out requirements for railway wheelsets.

7.8.3 Poor Brake efficiency

Entering service from a maintenance depot
A train may not enter service from a maintenance depot with poor braking efficiency

Entering service from somewhere other than a maintenance depot/In service
In the event of a driver reporting a poor brake on any unit the train must be taken out of service at the first suitable station, the train must then proceed to a maintenance depot.

7.8.4 Parking Brake

Entering service from a maintenance depot
A train may not enter service from a maintenance depot with a defective parking brake.

Entering service from somewhere other than a maintenance depot/In service
A train may not enter service from a location other than a maintenance depot with a defective parking brake. Should the parking brake become defective while a train is in service, the train should only proceed as far as the first suitable station to detrain passengers before returning to a maintenance depot for repair

7.8.5 Dynamic brake (CL.197 only)

Entering service from a maintenance depot
A train may not enter service from a maintenance depot with a defective dynamic brake.

Entering service from somewhere other than a maintenance depot/In service
A train may enter service from a location other than a maintenance depot and remain in service until the end of the day with a defective dynamic brake.

7.9 **Buzzer fault**

Entering service from a maintenance depot
A train may not enter service from a maintenance depot with defective signal bell / buzzer equipment

Entering service from somewhere other than a maintenance depot/In service
A train may enter service from somewhere other than a maintenance depot with a defective signal bell / buzzer and remain in service for the remainder of that day providing it ends at a maintenance depot.

A train formed of Mk4 Loco hauled coaching stock may not enter service from any location. If the buzzer becomes defective in service, the train may only proceed as far as the first suitable location where passengers should be detrained and then empty stock to a maintenance depot for repair.

7.10 **Cab heating / cooling equipment**

Entering service from a maintenance depot
You may allow a train to enter service with the Cab Heating/Cooling Equipment defective if consideration is given to:

- Ambient air temperature
- Radiant Temperature (high external temperatures and/or bright, direct sunshine)
- Still or Stagnant Air (ability to open or close windows)
- Humidity levels
- Availability of emergency ventilation / supplementary heating system
- Whether reasonable ambient temperature can be maintained for the duration of the train's journey - the longer the journey, the greater the risk.

It is usually accepted that people work best at a temperature between 16°C and 24°C, maximum temperature. **The decision will be made between the DCM and the Fleet Operations Manager using the considerations above as to whether the train will enter service.**

Entering service from somewhere other than a maintenance depot/In Service
In the event of a report from a driver that the cab heating or cooling equipment is defective, with no available emergency ventilation or supplementary heater operational, and the driver considers that the safe operation of the train will be affected, the driver's judgement should be considered in determining for how long the train may continue safely in service. Re-marshalling multiple units to ensure the affected cab is not required for use is a possible short-term alternative measure.

7.11 **Doors (External)**

Entering service from a maintenance depot

A train may not enter service from a maintenance depot with a defective door(s).

Entering service from somewhere other than a maintenance depot / In Service

If a train or vehicle enters service from other than a maintenance depot with a defective door, or if a door becomes defective whilst a train or vehicle is in service, it may complete its journeys for the remainder of the day, provided that the requirements of the Rule Book, are observed. The train or vehicle should end its final journey of the day at a maintenance depot. Detailed instructions for traincrew and others are set out in the TfWRL Rule Book Appendix.

You must place a vehicle out of public use and arrange to transfer passengers to another vehicle if the following doors are defective:

- All doors including those only available to the public for use as an emergency exit on one or both sides of the vehicle and the nearest door on the next vehicle
- A door only used as an emergency exit at the leading end of the first passenger vehicle or the trailing end of the last one

Where doors leading to the PRM accessible area on a train are defective, the train should be removed from passenger service at the first available opportunity without causing a cancellation. Special arrangements should be made for passengers with mobility constraints to minimise inconvenience

☆ **NOTE: CL.197, CL.230, CL.231 & CL.756 units have no internal vestibule doors meaning individual vehicles cannot be locked out of use. In the event that this is required, the train must proceed only as far as the first suitable location to detrain passengers and then proceed to a maintenance depot for repair**

If the train must be worked forward with a door open it must be taken out of passenger service.

If the train is not at a station, you must:

- Transfer passengers to another vehicle
- Close and lock the vestibule doors on the affected vehicle. If you are not able to do both passengers must be kept as far away from the open door as possible. If a guard or other competent person is available, they must travel in the affected vehicle. The train must be taken out of passenger service at the next station. Exceptionally if the next station is unable to accommodate the detrained passengers, or during severe weather the train operator can give permission for the train to continue to a more suitable station. Consideration must also be given to passengers on board with reduced mobility.

Consideration must also be given to the first and last train of the day and overcrowding of trains if the decision is made to withdraw a train from service.

If there is a failure of a door key switch (DKS) and the only other DKS is in the driving cab from which the train is being driven, the train may complete its journey.

- 175 doors self-closing; if the doors self-close on one occasion, the train can remain in service until the end of day, if the doors self-close on more than one occasion the passengers should be de-trained at the first suitable station.

For MKIV Loco hauled Coaching Stock faults that necessitate the following isolations, the maximum speed of the train is **40MPH** and should proceed only as far as the Next Available location:

- Emergency train door override switch
- Door Interlock valve isolation

NOTE: Where doors are locked out of use as part of a process for calling at short platforms (CL.230 / Mk4 LHCS), the end passenger door refers to the next usable passenger door.

7.12 **Drivers Advisory System (DAS)**

There are no restrictions preventing a train from either entering or remaining in service with a defective Driver Advisory System

7.13 **Drivers Reminder Appliance (DRA)**

Entering service from a maintenance depot
A train may not enter service from a maintenance depot with a defective DRA in any cab that is to be used.

Entering service from somewhere other than a maintenance depot/In service
If a DRA becomes defective on a train the train must be taken out of service at the First Suitable location unless the affected cab is boxed in or is in a cab that is not required to be used. If the affected cab is boxed in it can continue in service until the end of day but must finish at a Depot

7.14 **Drivers Safety Device (DSD)**

Entering service from a maintenance depot
A train may not enter service from a maintenance depot with a defective DSD.

Entering service from somewhere other than a maintenance depot
A train may enter service from other than a maintenance depot with a defective DSD in the driving cab but only as an ECS movement to a maintenance depot as per the instructions in Rule Book TW5. If the service is contained entirely on ERTMS Level 2 operated routes, the train may enter service and remain in service provided it remains contained on ERTMS Level 2 operated routes

In service
If the Driver's Safety Device becomes defective on a train in service, the train should proceed only as far as the next available location. In the case of a passenger train, the passengers should be de-trained at the first suitable station, after which the train should proceed only as far as the next available location. In the event of a failure on an ERTMS level 2 operated route, the train may remain in service provided it remains contained to the ERTMS level 2 operated route

Note: It is acceptable for the train to remain in passenger service on its journey to a maintenance depot as long as it is being driven from an unaffected cab.

Details for dealing with the train are set out in rule book section TW5. This sets out the operational requirements when a competent person is not available to accompany the driver.

7.15 **Driving Cab Windscreens**

Entering service from a maintenance depot
A train may not enter service from a maintenance depot with a defective driving cab windscreen.

Entering service from somewhere other than a maintenance depot/In service
In the event of a report from a driver that the driving cab windscreen is defective, and the driver considers that the safe operation of the train will be affected, the driver's judgement, together with the availability of a competent person to accompany the driver, should be considered in determining how long the train may continue safely in service.
GE/RT8000 module TW5 sets out the duties of a competent person accompanying the driver when the cab windscreen is broken or obscured, the requirements of the competent person are also shown in section 7.49 of this document.
A train can enter service from somewhere other than a maintenance depot if the affected cab windscreen is not required to be used or the affected cab can be boxed in.

7.16 **Driving Controls**

Entering service from a maintenance depot
A train may not enter service from a maintenance depot with defective driving controls

Entering service from somewhere other than a maintenance depot
A train may enter service from somewhere other than a maintenance depot with defective driving controls in a cab not to be used for movement to a maintenance depot

In service
A competent person must be provided to ride in the leading cab, if permission is given for the train to proceed, driven from another cab, which must be forward-facing if one is available.
If the automatic brake cannot be applied by the competent person because only a hand or parking brake is available in the leading cab, the train must not exceed 5 mph (10 km/h).

7.17 Emergency Bypass Switch (EBS) / Brake Continuity Switch

Entering service from a maintenance depot

You must not allow a train to enter service if the EBS has been operated in any driving cab.

Entering service from somewhere other than a maintenance depot

A train can enter service (but not passenger service) with the EBS operated in any driving cab to travel ECS to a maintenance depot for repair as long as you:

- tell the signaller
- get permission for the train to enter service in this condition
- tell the guard, if there is one, about the circumstances.

☆ Where a train is required to be moved ECS to a maintenance depot formed of more than one unit, **a guard or a competent person** must travel in the rear unit and, if necessary, carry out the instructions in Rule Book module M1 Dealing with a train accident or train evacuation. **A competent person is not required if the unit operates on its own.**

When in service

The train must travel as far as First suitable station. When all passengers are detrained then proceed only as far as the next available location.

If the train is formed of more than one multiple unit, the guard must:

- transfer all passengers to the leading unit, if it is possible
- lock the remaining units out of use.
- ☆ travel in the rear unit.

☆ **NOTE: Where the EBS is operated on CL. 197, CL. 231 and CL.756 units, this will also result in both the DSD and Vigilance being isolated, and the train must therefore operate with a competent person in the cab of the train in accordance with** rule book section TW5.

7.18 Electrical Train Heat Supply / Head End Power (LHCS)

If the ETH supply is inoperative due to a fault on either locomotive or stock, the fault must be rectified within two hours. If the fault is not rectified within two hours the train must be taken out of passenger service at the First Suitable Station thereafter. Failure of ETH will also result in no power being supplied to the DVT. Once the power has been lost and the DVT batteries are depleted, the train will be unable to be driven from the DVT.

7.19 European Rail Traffic Management System (ERTMS) including GSM-R voice and data radio equipment

7.19.1 ERTMS LEVEL 2 LINES ONLY

Entering service from a maintenance depot

A train must not be allowed to enter service from a maintenance depot if the ERTMS equipment is defective in a cab to be used, unless the unit is confined to ERTMS level 0 routes.

A train can operate from Machynlleth Depot to Machynlleth Station with ERTMS isolated as long as it attaches to an ERTMS operational unit in Machynlleth station. This can be achieved by the signaller and the driver obtaining a clear understanding through written orders.

Entering service from other than a maintenance depot

A train must not enter passenger service or ECS on an ERTMS Level 2 route with defective ERTMS or GSM-R (including GSM-R network failures) and must be attached to the next service.

In Service

If the on-train ERTMS or GSM-R equipment becomes defective on a train in service on an ERTMS level 2 route the train should proceed at caution only as far as the Next Available location. If it is necessary to isolate the on-train ERTMS/GSM-R equipment the train must not exceed a maximum speed of 40 km/h (25 mph).

7.19.2 IF ERTMS IS OPERATING IN LEVEL 0 ONLY

Entering service from a maintenance depot

A train can enter traffic from a maintenance depot with defective ERTMS providing it is not required to operate onto ERTMS Level 2 routes

Entering service from somewhere other than a maintenance depot / In Service

If the on-train ERTMS equipment becomes defective on a unit which is in service on a line not fitted with ERTMS then the equipment should be isolated and TfWRL Maintenance control be advised immediately. The unit will then be restricted to ERTMS level 0 routes

7.20 Fire Detection / Suppression systems

Entering Service from a maintenance depot

A train may not enter service from a maintenance depot with a defective fire detection / suppression system except if the engine with the defective fire detection system is shut down and isolated

Entering service from other than a maintenance depot/In Service

If the fire detection system controlling fire hazards to passenger accommodation becomes defective on a train which is In Service, the train should proceed only as far as the Next Available Location. Passengers should, be de-trained at the First Suitable Station.

The train, however, may complete its journeys for the rest of the day provided that it ends its final journey at a maintenance depot if the fire detection system is, for example, for an engine, and that engine can be isolated thereby eliminating the hazard the fire detection system was controlling.

7.21 Hazard lights (Bodyside Indicator Lights)

Entering service from a maintenance depot

A train may not enter service from a maintenance depot with a defective hazard light / Bodyside Indicator light in any vehicle

Entering service from somewhere other than a maintenance depot / In Service

A train may complete its journeys for the remainder of the day providing it ends at a maintenance depot with defective Hazard lights / Bodyside Indicator Lights.

If the orange hazard light on the outside of the vehicle stays lit after three attempts to close the door you must: carry out the instructions as listed in GE/RT8000 TW5, the train may remain in service but finish at a maintenance depot (consideration must be given to the fault potentially being a passcomm having been operated on the vehicle where the hazard light is lit, or there being a TCA fault)

7.22 Headlights, Marker Lights & Tail Lamps

7.22.1 Trains with Nose-End reflective colouring (Yellow front / rear ends)

Entering service from a maintenance depot

A train may not enter service from a maintenance depot with any headlight(s), Tail lamp or marker light not working on any vehicle that is required to be at the front or rear of a train.

Entering service from somewhere other than a maintenance depot/In service

You must not allow a train to enter service without a working headlight or tail lamp on any vehicle that is required to be at the front or rear of a train. If the headlight has failed and there is no other headlight, the train can enter service if a portable headlight is provided and the speed of the train is restricted to 75 mph (120 km/h).

A train can enter service with a defective tail lamp if the train is fitted with two built-in tail lamps, one of which is working, or a portable tail lamp is provided.

If the only headlight becomes defective on a train in service, or if both or all headlights become defective on a train in service which is fitted with more than one headlight, the train should proceed only as far as the next available location unless the train can be fitted with a portable headlight. In this case the train may complete its journeys for the rest of the day provided that its final journey ends at a maintenance depot. A table of permissible arrangements is set out in GE/RT8000 TW5.

7.22.2 Trains without Nose-End reflective (Yellow) colouring (CL.197 / CL231 / CL398 / CL756 only)

Roof Mounted High-Definition headlamp only (Cyclops light)

Entering service from a maintenance depot

A train may not enter service from a maintenance depot with any headlight(s), Tail lamp or marker light not working on any vehicle that is required to be at the front or rear of a train.

Entering service from somewhere other than a maintenance depot/In service

A train may not enter service from any location with any headlight(s), Tail lamp or marker light not working on any vehicle that is required to be at the front or rear of a train. If any of these lights should fail while the train is in service, the train must proceed to the next available location only at a speed not exceeding **20 MPH**

7.23 Hill Start Button

Entering service from all locations

A train may not enter service from any location with a defective Hill Start Button

In Service

If the Hill Start button becomes in-operative when a train is in service, the train should only proceed as far as the next suitable location to de-train customers and then return to a maintenance depot for repair

7.24 Hot Axle Boxes (Includes on-board Hot Axle Box Detectors)

Entering service from all locations

A train may not enter service from a maintenance depot with defective Hot Axle Box Detection system or where axle temperature strips indicate a hot axle

In Service

If a hot axle box is detected by any means, the train should be brought to a stand in a controlled manner for the driver to carry out initial fault finding. If the driver decides, in accordance with the Rule Book GE/RT8000 TW5, that the train may go forward for examination by a rolling stock technician, the train should proceed only as far as the Next Available Location. The judgement of the rolling stock technician should be relied upon in determining what further measures need to be applied, for example, the detaching of the affected vehicle.

If the driver decides that the train may go forward only after examination by a rolling stock technician, the judgement of the rolling stock technician should be relied upon in determining what further measures need to be applied.
If no fault is found following a hot axle box indication, the train should end the day at a maintenance depot for further investigation.

If on board Hot axle box detection systems become defective on a train in service, passengers should be detrained at the first suitable location and the train then proceed ECS only as far as the next available location.

NOTE: CL.197 units have onboard bearings that could be missed by trackside hot axle box detectors

7.25 Hustle Alarm

Entering service from a maintenance depot

A train may not enter service from a maintenance depot with a defective hustle alarm.

Entering service from somewhere other than a maintenance depot/In service

In the event of a train entering service from other than a maintenance depot with a defective hustle alarm, or if a hustle alarm becomes defective on a train or vehicle In Service, provided that the measures set out can be applied, the train may complete its journeys for the remainder of the day. The train should end its final journey of the day at a maintenance depot.
The train may continue normally, but only if:

- The public-address system is operative in all vehicles in which passengers will ride
- The Guard announces at each station when the doors are about to open and close

7.26 **Hybrid Genset (Class 230 only)**

There are 8 possible sources of power on a 3-car hybrid train – 4 Gensets and 4 batteries. The Traction system is configured to remain operational with the loss of one or more of those individual sources. This means that under loss of say a battery, the Genset will continue to provide power for that bogie. Similarly, with loss of a Genset, the battery will continue to provide power to that bogie until the State of Charge (SOC) of the battery gets to a minimum pre-set value. With just a battery available, at 15% SOC the traction will start to reduce its demand on the battery, and at 10% no further demand will be made on the battery, but it will be capable of recharging from any available regenerative braking. Regenerative braking will be available as long as 2 batteries are available on a car. Upon total loss of one battery, only air braking will be available. Be aware that loss of a Genset means that the related battery will discharge from its residual state through use, and will reach a point whereas detailed above it no longer contributes to traction.

☆ Entering service from a maintenance depot
A unit may enter service from a maintenance depot with 3 operational Gensets.

☆ Entering service from somewhere other than a maintenance depot
A unit may enter service from a maintenance depot with 3 operational Gensets.

☆ When in Service
3 operational gensets:
A train can remain in service for the remainder of the day providing it ends at a maintenance depot.

2 operational gensets:
Should a genset fail in service meaning the train has only two operational gensets, the train can be permitted to remain in service for the remainder of the day only after an inspection by a mobile fitter (or a qualified Operations Team Leader from Birkenhead TMD) and providing regular monitoring of the unit. Upon completion of its journey, the unit should be returned to its designated maintenance depot.

1 or 0 operational gensets:
Should 3 or more of the on-board gensets fail (i.e. only one or no gensets are working), the train should proceed only as far as the next available location where customers should be de-trained for the train to proceed empty to the first suitable location. The train should be assisted back to a maintenance depot if the gensets cannot be repaired.

7.27 **Hydraulic Buffers**

Entering service from a maintenance depot
A train may not enter service from a maintenance depot with defective hydraulic buffers.

Entering service from somewhere other than a maintenance depot
A train may only enter service from a stabling point to run empty to a maintenance depot
In service
Defective hydraulic buffers may affect the safe movement of the train and lead to derailment, particularly on curves. If a train or vehicle has developed defective hydraulic buffers, the train should proceed only as far as the next available location for RST inspection. In the case of a passenger train, the passengers should, be de-trained at the first suitable station.

7.28 **Lifeguards**

Entering service from a maintenance depot
A train may not enter service from a maintenance depot with a defective lifeguards(s).

Entering service from somewhere other than a maintenance depot/In service
If a lifeguard on a train or vehicle in service is loose or damaged, it may become a hazard to the infrastructure with the potential to cause derailment. The driver may decide, in accordance with the Rule Book, GE/RT8000 TW5, that the train may proceed forward only after examination by a rolling stock technician. The judgement of the rolling stock technician should be relied upon in determining what further measures need to be applied.

7.29 **On Train CCTV equipment**

7.29.1 Class 15X and Class 17X only

There are no restrictions on trains entering or remaining in service with defective on-train CCTV or where CCTV drives are not installed

7.29.2 All other TFW-RL Rolling Stock

Entering service from a maintenance depot

A train must not enter service from a maintenance depot with defective CCTV or with no CCTV drives fitted

Entering service from somewhere other than a maintenance depot / failure in service

Should the on-train CCTV become defective on a train in service then the train may complete its journeys for the rest of the day providing it ends at a maintenance depot.

7.30 **On Train Data Recorder (OTDR / OTMR) also includes ERTMS juridical recorder (JRU)**

Entering service from a maintenance depot

A train must not enter service from a maintenance depot with a defective on-train data recorder

Entering service from somewhere other than a maintenance depot/In service

Should an on-train data recorder become defective on a train in service then the train may complete its journeys for the rest of the day provided there is another data recorder on the train which is confirmed as working providing it ends at a maintenance depot.

NOTE: CL.197's only have a single OTDR recorder per complete train therefore a train not working in multiple that becomes defective should operate only as far as the First Suitable location

☆ **Defective OTDR on CL.231 & CL.756 trains will require operation of the emergency bypass switch (EBS) in order for the train to move, which would also result in loss of DSD and Vigilance**

7.31 **On-train emergency equipment**

Entering service from a maintenance depot

A train may not enter service from a maintenance depot unless all necessary emergency equipment is provided. GM/RT2130 identifies the on-train emergency equipment that has to be provided on a train before it may enter service.

Entering service from somewhere other than a maintenance depot/In service

If it has been necessary for on-train emergency equipment to be used, arrangements should be made for it to be replaced as soon as is reasonably possible.

7.32 **Passenger communication Apparatus (PCA / PassComm / PAD / CFA)**

The Passenger Communication Apparatus (PCA) provides a means of enabling passengers to alert the driver to a hazard to their safety or welfare on the train, such as a violent disturbance or illness. On some trains, the PCA also provides two-way communication between the driver and the location in the train at which the PCA has been activated.

Entering service from a maintenance depot

A train may not enter service from a maintenance depot with defect PCA / Pass Comm / PAD / CFA equipment.

Entering service from somewhere other than a maintenance depot / Failure in service

In the event of a train other than a (DO) train entering service from other than a maintenance depot with a defective PCA / Pass Comm / PAD / CFA, or the equipment becoming defective while in service, TfWRL Rule book appendix module sets out measures to be taken for passenger security and welfare. The train may complete its journeys for the remainder of the day provided the measures that have been adopted remain in place and it ends its final journey at a maintenance depot.

If it is not practicable to apply one or more of the measures in the TfWRL Rule Book Appendix passengers should be de-trained at the next suitable station. After the passengers have been detrained, the train may proceed to a maintenance depot.

Note: On lines where trains are of short length (for example one vehicle) and passenger numbers are low, consideration should be given to allowing the train to remain in service to the end of the day, provided its last journey is to a maintenance depot and a competent person (such as a guard), who has access to all passenger accommodation on the train, is provided to reassure passengers.

CL.197 only
The Passenger Alarm Device (PAD) performs the function previously known as 'Pass Comm', which can be overridden by the Driver (Passenger Alarm Override) within 10 seconds of alarm activation. The PAD also provides two-way communication between the Driver and the location in the train at which the PAD has been activated. The Call For Aid (CFA) performs the same function as the Passenger Communication Apparatus (PCA) and provides two-way communication between the Driver and the location in the train at which the CFA/PCA has been activated.

7.33 Passenger Information System (PIS)

Entering Service from a maintenance Depot
A train may not enter service from a maintenance depot with a defective Passenger Information System.

Entering service from somewhere other than a maintenance depot / In service
A train may continue in passenger service for the rest of the day but must end at a maintenance depot for repair that day

7.34 PRM (Persons of reduced mobility) accessible toilets

Entering Service from a maintenance Depot
A train may not enter service from a maintenance depot with a defective PRM Accessible toilet unless it is in multiple with a train with an operational PRM toilet for the duration of its journey

Entering service from somewhere other than a maintenance depot / Failure in service
A train may enter service from somewhere other than a maintenance depot and remain in service following failure for 1 trip only to a maintenance depot, unless the train can be coupled to a train with an operational PRM accessible toilet in which case, the train can remain in passenger service until the end of the day but must end at a maintenance depot. Efforts should be taken to inform customers at stations through use of CIS / PA that the accessible toilet is out of use.

7.35 Public Address (PA) / On Board communications equipment (Cab to Cab)

Entering Service from a maintenance Depot
A train may not enter service from a maintenance depot with a defective PA system.

Entering service from somewhere other than a maintenance depot/In service
In the event of a train entering service from other than a maintenance depot with a defective PA system in any vehicle, or the PA system becoming defective in any vehicle on a train in service, examples of contingency arrangements include:
Arranging for staff to provide information to passengers in the defective vehicle.
TfWRL may, depending on the circumstances of each defect and the contingency arrangements available, permit the train to remain in service with contingency arrangements in place. The train must end at a maintenance depot

7.36 Sanding equipment

7.36.1 Train Sanding equipment (Not including one-shot sander)

Entering Service from a maintenance Depot
A train may not enter service from a maintenance depot with defective sanding equipment.

Entering service from somewhere other than a maintenance depot/In service
If sanding equipment that is used to assist train braking becomes defective on a train in service, or if the supply of sand is completely exhausted, the train should end its final journey of the day at a location where the sand can be replenished, a location where the sanding equipment can be repaired, or a maintenance depot.
If the driver believes that there may be difficulty in stopping the train if it was to continue in service, the train should proceed only as far as the next available location, if necessary at reduced speed. In the case of a passenger train, the train may proceed at reduced speed to the next available location to detrain passengers, or passengers should be de trained at the first suitable station, depending on the judgement of the driver.

7.36.2 Train Sanding Train Sanding equipment (One-Shot Sander)

Entering service from a maintenance depot
A train may not enter service from a maintenance depot with a defective one-shot sander(s).

Entering service from somewhere other than a maintenance depot/In service
A train may enter and remain in service from locations other than maintenance depots with a defective one-shot sander

providing it ends that day at a maintenance depot.
Should the one-shot sander become defective or is deployed in service, the train may continue in service for the remainder of the day providing it ends at a maintenance depot.

7.37 Selective door opening (ASDO / SDO) On-train and Beacon / Balise driven systems (Including Correct Side Door Enable (CSDE)

Entering service from a maintenance Depot
A train may not enter service from a maintenance depot with a defective ASDO / SDO / CSDE facility where fitted.

Entering service from somewhere other than a maintenance depot/In service
If the Automatic Selective Door Opening (ASDO) or Correct Side Door Enable (CSDE) facility, which is required to be used becomes defective on a train in service or on a train entering service from other than a maintenance depot, the ASDO feature must not be used and manual selective door opening (SDO) should be used instead. In the event both systems are inoperative, the train should proceed only as far as the first suitable location unless SDO is not required to be used (train formation length that fits on all station platforms on the route.

In the event the SDO facility fails on MK4 LHCS Stock then the train should proceed to the next station that can accommodate the full train on the platform and then the train should be removed from traffic. The train should not stop at intermediate stations that cannot accommodate the full length of the train.

7.38 Speedometer

Entering service from a maintenance depot
A train may not enter service from a maintenance depot with a defective speedometer

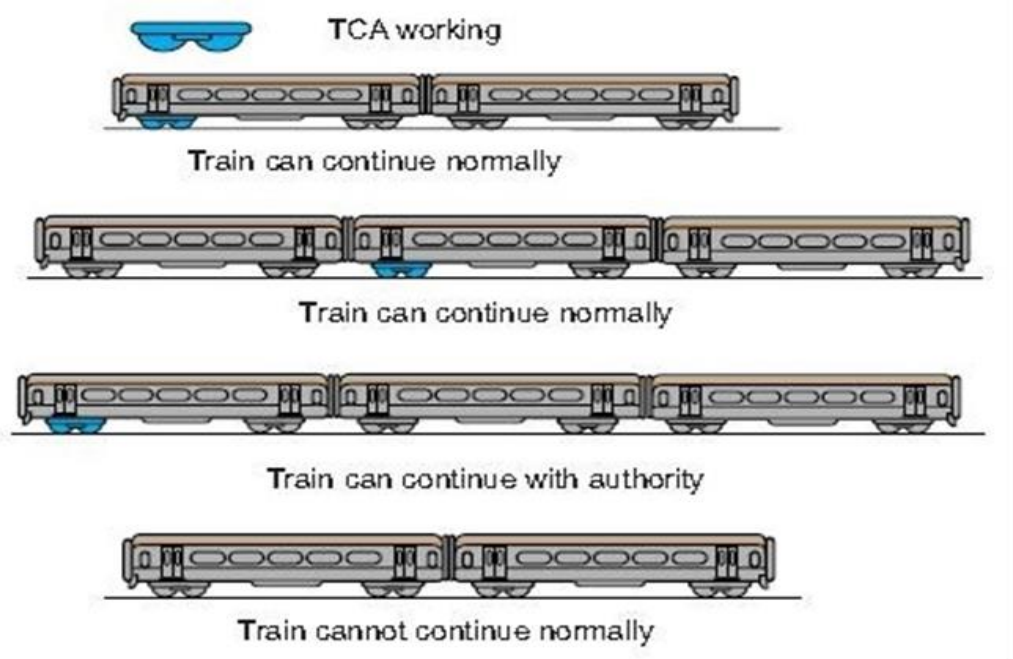
Entering service from somewhere other than a maintenance depot/In service
If no operative speedometer is available in any cab required to be used on a train in service, the train should proceed only as far as the next available location. In the case of a passenger train, the passengers should be de-trained at the first suitable station and the train then proceed only as far as the next available location. Should a secondary speedometer continue to be operational, the train can remain in service until the end of the day provided the train ends at a maintenance depot

7.39 Track Circuit Actuators (TCA)

Entering service from a maintenance depot.
A train may not enter service from a maintenance depot with a defective TCA anywhere on the train.

Entering service from somewhere other than a maintenance depot or in service
You can allow a Train to enter service from somewhere other than a maintenance depot or continue in service with one or more defective TCAs, providing that:

- If a train is formed of one or two vehicles there is at least one working TCA on the train
- If a train is formed of three or more vehicles, there is at least one TCA working on either of the first two vehicles and at least one TCA working on either of the last two vehicles.
- The train is a Class 231 or Class 769 unit and operates solely on the route between Penarth – Cardiff Central – Rhymney (and intermediate points) then the train can enter service and remain in service with either or both TCA's defective or isolated as the train operates on routes fitted solely with Axle Counters.



*Authority may be given by Control for a 3 car train with only one working TCA to continue in service but if the train is formed of 4 or more vehicles (for example a train in multiple) and has only one working TCA the train must travel as far as First suitable station when all passengers are detrained then proceed only as far as the next available location.

7.40 **Traction Interlock Switch (TIS)**

Entering service from a maintenance depot.
A train may not enter service from a maintenance depot with a TIS isolated.

Entering service from somewhere other than a maintenance depot
A train may not enter service from somewhere other than a maintenance with a TIS isolated unless as an ECS movement to a maintenance depot.

In service
If the TIS has been isolated on a passenger Train in Service, the passengers should be de-trained at the First Suitable Station. The Train should then proceed only as far as the Next Available Location.

However, the Guard must have access to each vehicle of the Train where passengers are being accommodated (transferring them to other coaches if necessary) and must also patrol the train to inform them of the situation.

7.41 **Train lighting (Internal)**

Failure of internal lighting presents hazards to the safety of passengers. The effect of failure of lights throughout the train, compared with failure in one vehicle only, will influence the contingency arrangements to be applied in each situation

Entering service from a maintenance depot.
A train may not enter service from a maintenance with internal lighting defective.

Entering service from somewhere other than a maintenance depot/In service
If the train lighting becomes defective on a train or vehicle in service or entering service from other than a maintenance depot, the train may complete its journeys for the remainder of the day provided its final journey ends at a maintenance depot, if:

a) Measures are put in place to reduce or eliminate the hazards, such as placing the vehicle(s) out of use and transferring the passengers to another vehicle(s)
b) The route(s) to be travelled has no tunnels more than 400 meters in length or passenger journeys can be completed during daylight, or
c) The route(s) to be travelled during hours of darkness do not have AOCL/ABCL level crossings (this is because during certain failures of such crossings a train may not be able to proceed over such a crossing unless its internal lights are illuminated – see GE/RT8000 for the rules applicable in this situation).

If there are no practicable measures, there are tunnels more than 400 meters in length on the route(s) or passenger journeys cannot be completed during daylight, the passengers should be de-trained at either the First Suitable Station or the next available location, depending on local conditions, and the train should then proceed as ECS to a maintenance depot.

7.42 Train Control Management System (TCMS – CL.197 / CL.231 / CL.398 / CL.756 only)

Entering service from a maintenance depot.
A train may not enter service from a maintenance depot with a defective TCMS in any cab.

Entering service from somewhere other than a maintenance depot/In service
A train may not enter service from a location other than a maintenance depot with defective TCMS Where the TCMS fails in service, the train will be required to be rescued and must only proceed as far as the next available location.

If the TCMS bypass is operated, the train will operate in degraded mode with reduced traction and braking capabilities with other internal features inactive (PIS / HVAC etc). The train should only proceed as far as the first suitable location and then ECS to the next available location where a repair can be made or unit attached to a maintenance depot at a speed at the drivers discretion

7.43 Train Management System (TMS)

Entering service from a maintenance depot.
A train may not enter service from a maintenance depot with a defective TMS in a cab to be used.

Entering service from somewhere other than a maintenance depot/In service
A train can remain in service until next scheduled visit to a maintenance depot provided OTMR is confirmed to still be operating (healthy light). A Train can enter service from other than a maintenance depot provided it ends at a maintenance depot.

7.44 Train Protection and Warning System (TPWS)

Entering service from a maintenance depot.
A train may not enter service from a maintenance depot with defective TPWS.

Entering service from somewhere other than a maintenance depot
A train may not enter service from other than a maintenance depot with a defective TPWS unless moving ECS to a maintenance depot utilising a competent person as described in Section 8. Movement back to a maintenance depot should always be coupled with defective cab buried where possible. If the service is contained entirely on ERTMS Level 2 operated routes, the train may enter service and remain in service provided it remains contained on ERTMS Level 2 operated routes

In service
If the Train Protection and Warning System (TPWS) becomes defective on a train in service, the train should proceed only as far as the next available location. In the case of a passenger train, the passengers should be de-trained at the first suitable station, after which the train should proceed only as far as the next available location. GE/RT8000 module TW5 details the operational consequences when a competent person is available to accompany the driver and sets out the duties of the competent person as shown in section 6.48.

If running entirely under ERTMS level 2 a train may continue in service with TPWS isolated. but consideration must be given to the train transitioning onto level 0 lines

7.44 Train radio (GSM-R) excluding ERTMS (For ERTMS see section 7.16)

Entering service from a maintenance depot.
A train may not enter service from a maintenance depot with defective GSM-R in any cab

Entering service from somewhere other than a maintenance depot
A train shall be permitted to enter service from a location other than a maintenance depot with a defective train radio, provided that one of the following applies:

- The defect is in a cab which is not required to be driven from during that journey.
- You have been told that there is a radio network failure.
- GSM-R transportable equipment or an OPH able to send and receive RECs is provided for a journey where the defective cab is being driven from.

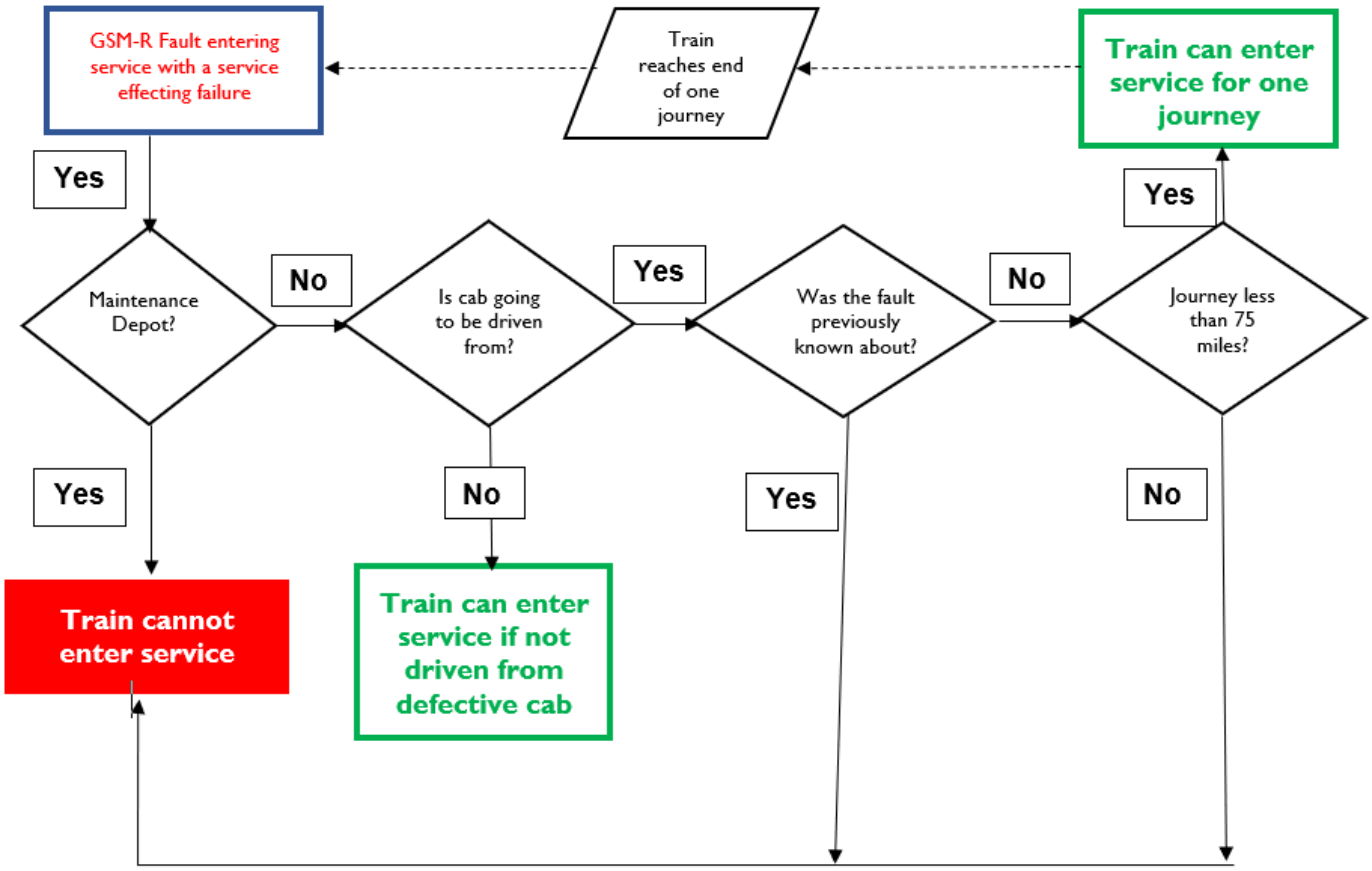
(Note – TfWRL will not be utilising transportable or handheld equipment as a contingency measure). This rule also applies when an on-board train radio fails during a journey.

– If the defect was not previously known, the train may enter service if either a GSM-R Transportable or OPH (portable handset) can be provided at first location en-route, or if not, the affected train's total journey length will not exceed 75 miles.
(This rule also applies when an on-board train radio fails during a journey).

In service
Should the registration of GSM-R in a driving cab fail, the train may still continue in normal service provided GSM-R GB is displayed on the console display and permission has been obtained from the controlling signaller.

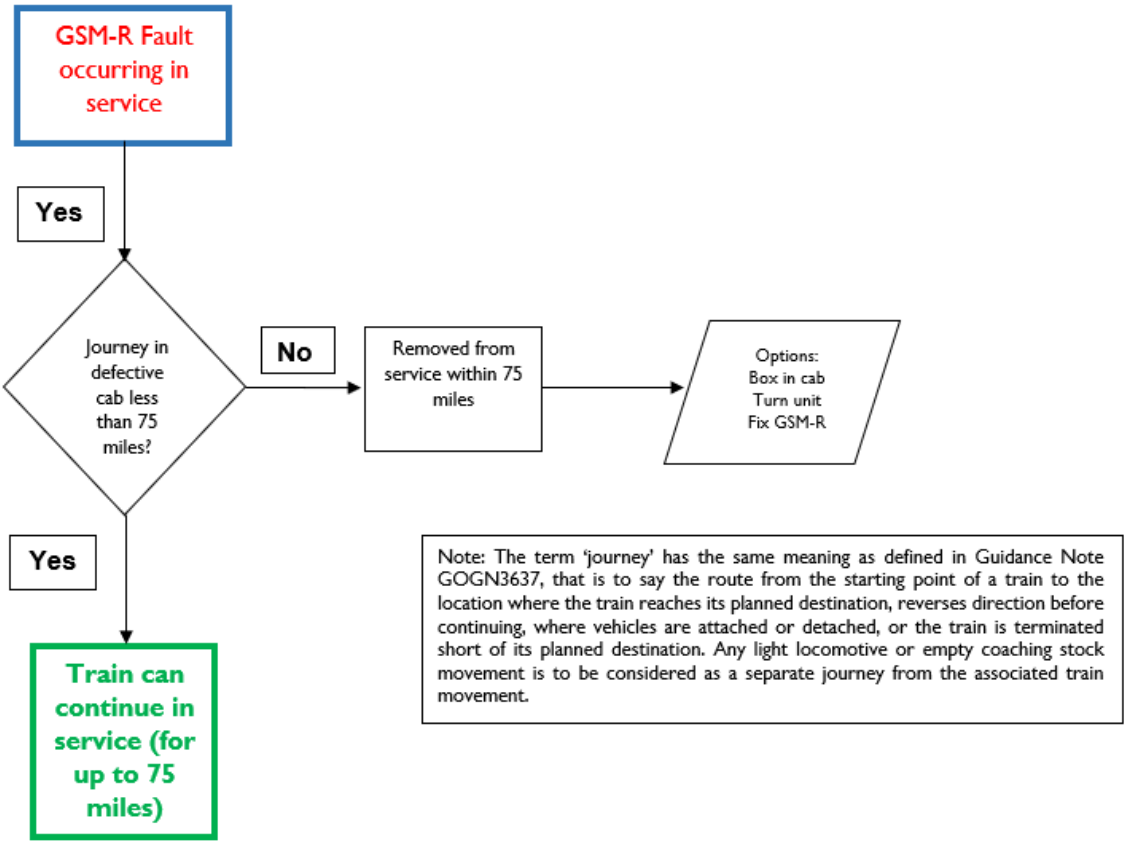
☆ Special Instructions
All trains operating on Treherbert, Aberdare and Merthyr routes (including the City Line) must have a member of staff with a company issued mobile phone on-board due to the removal of signal post telephones. In the event of either on-train or network failure affecting GSM-R, should a train not have a member of staff with a company issued mobile device on-board, the train should proceed only as far as the first suitable location where the train can be removed from traffic.

7.44.1 GSM-R fault (Entering service flowchart)



Note: The term 'journey' has the same meaning as defined in Guidance Note GOGN3637, that is to say the route from the starting point of a train to the location where the train reaches its planned destination, reverses direction before continuing, where vehicles are attached or detached, or the train is terminated short of its planned destination. Any light locomotive or empty coaching stock movement is to be considered as a separate journey from the associated train movement.

7.44.2 GSM-R fault (In service flowchart)



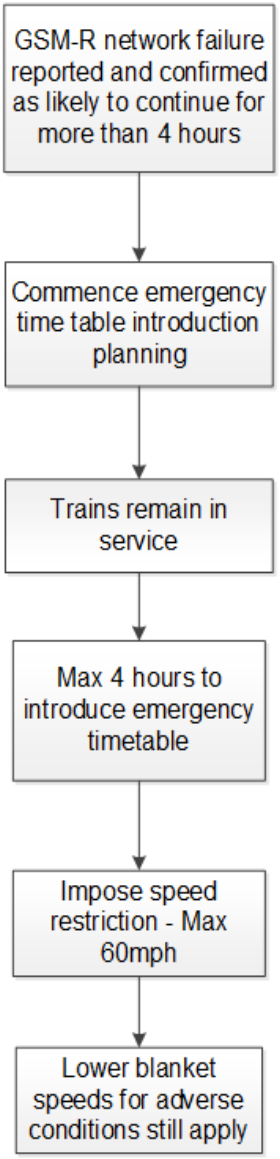
7.44.3 GSM-R fault (Network Failure)

- A failure affecting less than 1% of the network.
  - Train operations shall continue normally.

- A failure covering more than 1% of the network.
  - Train operations shall continue normally, but permissible speed is reduced to 100mph, where necessary.

  - Should the failure continue in excess of four hours, the following apply from that time;
    - Permissible speed is reduced to 60 mph, where necessary.
    - Pre-planned alternative train service introduced which can be operated to plan at a maximum speed of 60 mph, where necessary.

GSM-R Network Failure flowchart



7.45 Vehicle Auto Couplers

Entering service from a maintenance depot

A train may enter service from a maintenance depot with defective auto couplers provided control have been informed and a non-multi restriction placed on the unit.

Entering service from somewhere other than a maintenance depot/In service

If a vehicle coupling becomes defective whilst in service, the train can remain in service until the next depot visit providing the vehicle is not coupled.

7.46 Vigilance equipment

Entering service from a maintenance depot.

A train may not enter service from a maintenance depot with defective vigilance equipment

Entering service from somewhere other than a maintenance depot

A train may enter service from other than a maintenance depot with a defective Vigilance Device in the driving cab but only as an ECS movement to a maintenance depot as per the instructions in Rule Book TW5.

In service

If the vigilance equipment becomes defective in service, the train should proceed only as far as the next available location. GE/RT8000 module TW5 details the operational requirements for moving to this location, and the consequences of providing a competent person to accompany the driver to this location.

7.47 Warning Horn

Entering service from a maintenance depot.

A train may not enter service from a maintenance depot with a defective horn(s).

Entering service from somewhere other than a maintenance depot/In service

If a train enters service from other than a maintenance depot with the warning horn partially defective, or if there is a partial failure of the horn, for example one tone not working, on a train in service, the train may complete its journeys for the remainder of the day, provided that its final journey of the day ends at a maintenance depot.

When the warning horn becomes completely defective on a train in service, the train should proceed only as far as the next available location at a maximum speed of **20MPH**

7.48 Wheel impact Load detection / Wheelchex / Gotcha

See section 9 of this document on page 32

7.49 Wheel Slide Protection (WSP)

Entering service from a maintenance depot.

You must not allow a train to enter service if you are aware the WSP equipment is defective

Entering service from somewhere other than a maintenance depot/In service

If the Wheel Slide Protection (WSP) becomes defective on a train in service, the train should end its final journey of the day at a maintenance depot. The following factors should be taken into account in determining whether the train can complete its journeys for the remainder of the day provided its final journey of the day ends at a maintenance depot:

a) The driver believes that local track conditions are making the train difficult to stop
b) Weather conditions could make the train difficult to stop.
c) The Driver feels confident and comfortable that they can operate the train safely

If it is decided that the train should not continue in service, then the train should proceed only as far as the next available location. In the case of a passenger train, the passengers should be de-trained at the first suitable station before that location.

Note for the following classes of train, where the WSP equipment becomes defective there will be a loss of Speedometer and the actions defined above also enacted:

- CL.150
- CL.153
- CL.170
- CL.230
- MK4 DVT

8 Further Management Information and guidance: **Competent Persons instructions and limitations**

The instructions regarding the deployment of a Competent Person in respect of defective or isolated on train Safety Systems are covered in Rule Book GE/RT8000 TW5, and the extent of allowable train movement guide are reproduced below for reference.

★ **Where Rule Book Module TW5 and this Company Procedure refer to a Competent Person, the following will apply:**

- Automatic Warning System (AWS)
- Broken or Obscured Driver's Windscreen
- Train Protection and Warning System (TPWS)
- Emergency Bypass Switch / Brake Continuity (EBS)

In respect of the above **four** scenarios a **Competent Person** in this context means someone who has the relevant **Driver Route and Traction Knowledge** (e.g. Driver or Driver Manager)

- Driver's Safety Device (DSD)
- Driver's Vigilance Device (DVD)

In respect of the above **two** instances a **Competent Person** is deemed to be Rules/PTS competent and would be able to stop the train in the event of the Driver being incapacitated (e.g. Driver, Guard, Mobile Fitter, TOLO-trained Manager) – there is NO requirement for specific 'route knowledge'.

Speeds:

Competent person NOT provided	**Competent person is provided**
AWS	
Proceed at a speed not exceeding 60 mph (95 kph), or any lower speed that may apply, to the location where a competent person is available or to the location where the train can be dealt with. Trains running under ERTMS or ETCS signalling can operate as normal provided their journeys remain wholly within areas covered with either ERTMS or ETCS **AWS**: During poor visibility, the train speed must not exceed 40 mph.	Proceed at the permitted speed to the location where the train can be dealt with. **AWS**: During poor visibility, the train speed must not exceed 40 mph.
DSD/Vigilance defective or isolated	
Provided the AWS / TPWS / ERTMS (where applicable) is working proceed at a speed not exceeding 60 mph, or any lower speed that may apply, to the location where a competent person is available or to the location where the train can be dealt with. --- If the AWS is working correctly but the TPWS is not working correctly proceed at a speed not exceeding 40 mph. --- If neither the AWS or the TPWS are working correctly DO NOT MOVE until a competent person is provided. ---	Proceed at the permitted speed to the location where the train can be dealt with. --- Proceed at the permitted speed to the location where the train can be dealt with. --- When a competent person has been provided you must proceed at a speed not exceeding 60 mph (95 kph) to the location where the train can be dealt with. ---

If ERTMS is not working correctly DO NOT MOVE until a competent person is provided (Cambrian lines only)	When a competent person has been provided you must proceed at a speed not exceeding 25 mph (40 kph) to the location where the train can be dealt with.
EBS operated	
	Where a train is formed of more than one multiple unit, a competent person MUST be provided to travel in the rear unit. In the event of a passenger service, all passengers should be transferred to the leading unit and the guard should travel in the rear unit. There is no requirement for a competent person where a train is formed of a single unit.
TPWS defective or isolated	
Train may proceed to the next available location for detraining passengers and then as far as the first suitable location at a speed not exceeding 60MPH	A competent person shall be provided as soon as possible, and must be provided on a passenger train within 160 km (100 miles) of the location where the defect occurred. After a competent person has been provided, the remaining journey time with passengers must not be expected to exceed two hours. If necessary, passengers are to be de-trained at a suitable station

9 Further Management Information and guidance: **Control of Wheel Impact Forces (Wheel Impact Load detector / Wheelchex or Gotcha activations)**

Wheel rail force, P (kN)	**Speed restriction (mph)**	**Additional actions required**
P<200	None	**No action required**
200<P< 349 Level 1 Response	None	**No action required**
349<P< 399 Level 2 Response	Passenger 50	Train will be stopped at designated stopping point. Driver will be advised and speed restriction to apply before train is allowed to proceed. Train will be taken out of service at the first convenient location.
400<P<499 Level 3 Response	All stock 20	Train to be stopped at designated point for inspection. Driver will be advised and speed restriction to apply before train is allowed to proceed. Train will be taken out of service at the first convenient location.
P>500 Level 4 Response	Movement by wheel skates at first option. Fall back is to move at 10mph to designated detaching point, where the train must be taken out of service	Train stopped for inspection before any further movement. Train movement is allowed at 10mph to the detaching point, train must not re-enter service until RST have examined the train and the necessary repairs/remedial work has been completed. Network Rail will fax a wheel check form to TfWRL Control Office

10 Further Management Information and guidance: **Location definitions**

10.1 Locations specified as first suitable stations

Factors which have been considered in both the production of the TfWRL Contingency Plan and decision making by Operations Control employees include:

- the loading of the train and service density;
- densely populated or remote area;
- station facilities and station capacity/suitability for numbers of passengers involved;
- control and safety of detrained passengers;
- availability of means of forward transport of passengers

Locations defined as 'First Suitable Stations':

Cardiff Valleys Network

Cardiff Central	Pontypridd	Aberdare	Barry Island	Treherbert
Merthyr	Caerphilly	Cardiff Bay	Barry	Cardiff Central
Cardiff Queen St	Rhymney	Penarth	Coryton	

Birmingham - to Shrewsbury/Machynlleth/Pwllheli/Aberystwyth, also Shrewsbury to Chester

Birmingham International	Birmingham New Street	Wolverhampton	Stafford
Telford Central	Wellington	Shrewsbury	Wrexham General
Chester	Machynlleth	Aberystwyth	Pwllheli

Holyhead to Chester (& branches), Crewe, Liverpool & Manchester Piccadilly

Manchester Airport	Manchester Piccadilly	Manchester Oxford Road	Warrington Bank Quay
Stockport	Chester	Prestatyn	Rhyl
Colwyn Bay	Llandudno Junction	Llandudno	Bangor
Holyhead	Bidston	Crewe	Wrexham General
Wrexham Central	Runcorn	Liverpool South Parkway	Liverpool Lime St

Cardiff to Swansea, Carmarthen, West Wales and Central Wales Line

Cardiff Central	Bridgend	Maesteg	Llandrindod
Port Talbot	Neath	Swansea	Llanelli
Carmarthen	Milford Haven	Pembroke Dock	Fishguard Harbour

Cardiff to Hereford, Shrewsbury, and Manchester (and diversionary routes)

Cardiff Central	Newport	Abergavenny	Telford Central
Hereford	Shrewsbury	Crewe	Wellington
Manchester Piccadilly	Stoke-on-Trent	Macclesfield	Wilmslow
Stafford	Manchester Oxford Road	Warrington Bank Quay	Stockport

Cardiff to Ebbw Vale, Gloucester and Cheltenham Spa

Cardiff Central	Newport	Gloucester	Ebbw Vale Town	Cheltenham Spa

If the first available station above is known to be unstaffed, the train must continue to the next station where staff available or branch line terminus whichever is sooner on the line of route.

10.2 Locations specified as Next Available location

The definition of Next Available Location considers the following:

- A location where the train can be re-marshalled to avoid using defective equipment
- A location where the train can be removed from traffic and stabled with minimal impact on other operators train services
- A location where the train can be removed from traffic and repaired

Locations defined as 'Next Available Stations':

Cardiff Valleys Network

Cardiff Central	Treherbert	Coryton	Aberdare
Merthyr Tydfil	Cardiff Bay	Rhymney	Penarth
Barry Island			

Birmingham- to Shrewsbury/Machynlleth/Pwllheli/Aberystwyth, also Shrewsbury to Chester

Birmingham International	Birmingham New Street	Wolverhampton	Stafford
Shrewsbury	Machynlleth	Aberystwyth	Pwllheli
Wrexham General	Chester	Crewe	

Holyhead to Chester (and branches), Crewe, Liverpool and Manchester Piccadilly

Manchester Airport	Manchester Piccadilly	Manchester Oxford Road	Warrington Bank Quay
Chester	Rhyl	Llandudno Junction	Bangor
Holyhead	Llandudno	Blaenau Ffestiniog	Wrexham Central
Wrexham General	Bidston	Stockport	Liverpool Lime St
Liverpool South Parkway			

Cardiff to Swansea, Carmarthen and West Wales (and branches) also the Central Wales Line

Cardiff Central	Maesteg	Swansea	Carmarthen
Shrewsbury	Pembroke Dock	Milford Haven	Fishguard Harbour

Cardiff to Hereford, Shrewsbury and Manchester (and diversionary routes)

Cardiff Central	Newport	Hereford	Shrewsbury
Crewe	Warrington Bank Quay	Manchester Oxford Road	Manchester Piccadilly
Stockport	Stafford	Stoke on Trent	

Cardiff to Ebbw Vale, Gloucester and Cheltenham Spa

Cardiff Central	Newport	Gloucester	Cheltenham
Ebbw Vale Town			

10.3 Maintenance depot locations and definitions

Maintenance depot - a location where all defective on-train equipment repairs and scheduled maintenance can be undertaken

Stabling Point - a location with fuelling facilities but limited ability to undertake train repairs / maintenance.

	150	153	158	170	175	197	230	231	LHCS	398	756	769
Barry Sidings	S	S	S	N/A	N/A	N/A	N/A	S	N/A	N/A	S	N/A
Birkenhead EMD	N/A	N/A	N/A	N/A	N/A	N/A	M	N/A	N/A	N/A	N/A	N/A
Canton CSD	M	M	M	M	S	S	N/A	M	S	N/A	M	M
Chester DMUD	S	S	S	S	M	M	S	N/A	N/A	N/A	N/A	N/A
Crewe ATC	M	M	M	S	S	S	N/A	N/A	M	N/A	N/A	N/A
Holyhead CMD	S	S	S	N/A	S	S	N/A	N/A	S	N/A	N/A	N/A
Landore TMD	S	S	S	S	S	S	N/A	N/A	N/A	N/A	N/A	N/A
Machynlleth TMD	N/A	N/A	M	N/A	N/A	M	N/A	N/A	N/A	N/A	N/A	N/A
Rhymney	N/A	N/A	N/A	N/A	N/A	N/A	N/A	S	N/A	N/A	S	S
Taffs Well Depot	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	M	N/A	N/A

Key
M – Maintenance Depot
S – Stabling Point
N/A – Not applicable to this location / fleet

10.4 Class 67 Locomotives modified for use with Mk4 coaches

The below list of locomotives only are modified to work with MK4 Loco hauled coaching stock trains

- 67008
- 67010
- 67012
- 67013
- 67014
- 67015
- 67017
- 67020
- 67022
- 67025
- 67029

Please refer to Mk4 Rescue & Recovery plan for instructions on use of non-modified locomotives for the purpose of rescue & recovery

10.5 List of branch line locations

Branch Line location where train may enter non-passenger service	***Location that unit concerned is to be allowed to run for replacement/technical attention or remarshalling***
Barry Island Penarth Aberdare Coryton Merthyr Tydfil Cardiff Bay	Cardiff Central/Canton Cardiff Central/Canton Cardiff Central/Canton Cardiff Central/Canton Cardiff Central/Canton Cardiff Central/Canton
Ebbw Vale Town Maesteg Pembroke Dock Milford Haven Fishguard Harbour Aberystwyth Pwllheli	Cardiff Central/Canton Cardiff Central/Canton Carmarthen Carmarthen Carmarthen Machynlleth Machynlleth
Bidston Wrexham Central Llandudno Blaenau Ffestiniog	Wrexham General Wrexham General Llandudno Junction Llandudno Junction

It should be noted that for the purposes of this document all intermediate points are acceptable – for example a train may enter non-passenger service at Mountain Ash on the Aberdare line for the purpose of running to Cardiff Central/Canton for replacement/technical attention or remarshalling.

11 Further Management Information and guidance: **Operational workarounds for deflated air suspension**

Gauge clearance restrictions exist on the Rhymney Valley route for both CL.153's and CL.769s. Each location along with the restriction is detailed below

Class 769

Class 769s with deflated air suspension are prohibited from running over the route between Cardiff Queen St and Cardiff Bay and also over the down line between Cardiff Queen St and Cardiff Central. Dependant on the location of failure, the following actions should be taken:

Failure occurs North of Heath Junction:
The defective train must be de-trained at the next station and then stabled in Caerphilly Bay platform, Bargoed CS or Rhymney CS. Movement of the train to Canton depot for repair will need to be undertaken at the end of service with the train required to run wrong road from Heath Junction to Cardiff Central

Failure occurs between Heath Jn and Cardiff Queen St (down direction) only):
The defective train should be stabled in platform 2 at Cardiff Queen St until the end of service. To move the train back to Canton depot, the train must run wrong road Cardiff Queen St – Heath Junction then cross over to run wrong road Heath Junction – Cardiff Central

Failure south of Cardiff Central:
The train should be removed from traffic at Cardiff Central and returned to Canton Depot

☆ **Class 153's**

In the event of the Air suspension failing on a CL.153 on the CVL operated route, passengers should be removed from affected vehicles and trains proceed through platforms at all locations at a speed **not exceeding 5MPH**

Mk4 LHCS

In the event of an air suspension failure on any Mk4 vehicle (Including DVT) customers must me moved out of the affected vehicle and proceed at 5MPH (through Shrewsbury Platform 7 only). There is no restriction at any other station / platform. If customers are unable to be moved out of the affected vehicle, the train must not operate through platform 7 and should wait for an alternative platform to become available

12 Definitions: **Specific terminology applicable to this procedure**

Contingency Plan	A plan produced by TfWRL and agreed by the Infrastructure Controller, which sets out the action to be taken when On-Train Equipment becomes defective on any Train or Vehicle operated by TfWRL.
Defective On-Train Equipment	On-Train Equipment, which is not performing its intended safety function, either fully or in part, or is isolated or missing.
Fault recovery process	A process map demonstrating functional responsibility when dealing with a train borne defect (included in section 6)
On-Train Equipment	Equipment identified in Section 7 of this document or identified additionally by Transport for Wales (Rail Services).
Operations Control	The general term applied to the Joint TfWRL/Network Rail South Wales Control Centre.

Journey	The route between the depot, siding, platform line or other authorised place where the train enters service and the depot, siding, platform line or other authorised place where one of the following occurs:
	
	• reaches its destination
	• is required to reverse before continuing to its destination
	• is required to have vehicles attached or detached
	• is required to terminate short of its destination as a result of:
	  ○ infrastructure fault
	  ○ line blockage
	  ○ defective On-Train Equipment
	  ○ any other operational reason.
	
	This definition applies also to short distance shunting movements, except where the train is being taken out of service in accordance with the provisions of this contingency plan, in which case the train may be moved from any platform line to an adjacent platform line, depot or siding solely for this purpose.

In passenger Service	A Train is In Service from the time it starts its journey in passenger service until the time it completes its journey. A vehicle is In Service when it forms part of a Train which is In Service.
Maintenance Depot	A location, identified in the TfWRL Contingency Plan page 34, with the facilities to repair or replace the specified items of Defective On-Train Equipment.
First Suitable Station	The first station on the line of route which has suitable facilities for accommodating the passengers detrained from a Train or Vehicle with Defective On-Train Equipment. The factors that have been considered when determining suitability of stations for detraining passengers are contained on page 32
Next Available Location	The next depot, siding, platform line or other authorised place where one or more of the following actions can be taken: - the Train or Vehicle can be turned or re-marshalled so that the driving cab with the Defective On-Train Equipment is no longer required to be used - the Train or Vehicle can be replaced - the Train or Vehicle can be examined by a Rolling Stock Technician - the Defective On-Train Equipment can be repaired or replaced - the Train or Vehicle can be taken Out of Service. Locations which meet these criteria are contained on page 33