



# Railway Safety Regulations 1999

## Guide to Operation of Mark 1 type and hinged door rolling stock

30 July 2021



# Contents

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<b>Foreword</b>	<b>2</b>
<hr/>	
<b>1. What types of railway and rolling stock come under the RSR99?</b>	<b>3</b>
<hr/>	
<b>2. Using Mark 1 type rolling stock on railway infrastructure where line speed exceeds 40kph</b>	<b>6</b>
<hr/>	
<b>3. Using rolling stock with hinged doors on railways where line speed exceeds 40kph</b>	<b>7</b>
<hr/>	
<b>4. Applications for exemptions for operating Mark 1 type rolling stock and rolling stock with hinged doors.</b>	<b>9</b>
<hr/>	
<b>Annex – extracts from the Railway Safety Regulations 1999</b>	<b>12</b>

# Foreword

This document provides guidance on the application of the Railway Safety Regulations 1999 (RSR99) to Mark 1 type rolling stock and rolling stock with hinged doors. It replaces the previous guidance in relation to these types of rolling stock published in 2000 by the Health and Safety Executive (the previous health and safety regulator for the railway).

The revision has been undertaken in light of the need to update and modernise the previous guidance. It aims to ensure that any structural modifications to Mark 1 rolling stock are maintained, to reflect the current position whereby the components and technology for fitting central door locking (CDL) to hinged door stock are more readily available, and that ORR's consequent approach to consideration of applications for exemptions will therefore be more rigorously rooted in quantified risk assessment and application of the hierarchy of controls as set out in the Management of Health and Safety at Work Regulations 1999 (Schedule 1).

This is one of two updated guidance documents being published by ORR on RSR99. The other guidance document, on train protection systems, is intended to be published at a later date.

This document contains guidance on:

- Interpretation of the regulations
- Operation of Mark 1 type rolling stock on the mainline railway
- Operation of rolling stock with hinged doors on the mainline railway
- Exemptions

RSR99 also contains many other requirements which had to be met by a certain date. As these dates are in the past and the requirements have been met, this guidance does not refer to these elements.

# 1. What types of railway and rolling stock come under the RSR99?

- 1.1 RSR99<sup>1</sup> prohibits train operators from operating, and infrastructure managers from permitting the operation of:
- Mark 1 type rolling stock; and
  - rolling stock with hinged doors that does not have central locking.
- 1.2 This chapter explains to what type of railway the RSR99 applies and what is meant by 'Mark 1 type rolling stock' and 'hinged door rolling stock'. All references in this document are to RSR99 as amended, e.g. 'infrastructure controller' in RSR99 was changed by the Railways and Other Guided Transport Systems (Safety) Regulations 2006 (ROGS).

## Meaning of 'railway'

- 1.3 The meaning of 'railway' is defined in the Schedule to RSR99 (contained in the annex at the end of this document). This and other definitions are crucial to an understanding of the regulations. The definition of 'railway' excludes:
- (a) tramways;
  - (b) any street-running part of a railway;
  - (c) any part of a railway where driving is by line of sight (i.e. the maximum speed permitted is such as to enable the driver to stop in the distance they can see ahead in clear weather);
  - (d) any part of a railway which is not normally used by fare-paying passengers; and
  - (e) any railway on which the line speed is 25 mph (40 kph) or less throughout.
- 1.4 Paragraph 1.3(c) above excludes light railway systems which rely on 'line of sight' operation from RSR99. However, where signalling is provided on a railway to ensure the safe separation of trains, RSR99 will still apply where speeds are above 40kph; even if the permitted line speed is low.
- 1.5 Paragraph 1.3(d) refers to parts of a railway not normally used by fare paying passengers therefore parts of railways which are only occasionally used by fare paying passengers are not subject to RSR99. These include, for example, industrial

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<sup>1</sup> <https://www.legislation.gov.uk/uksi/1999/2244/contents/made>

railways which are used for occasional charters, and freight lines which may be used as a diversionary route for passenger trains in an emergency.

- 1.6 Other definitions are included in regulation 2(1) and the guidance will refer to these where they are relevant but train operators should read the regulations where necessary to ensure that they are complying with them.”

## Who is an ‘infrastructure controller’?

- 1.7 Regulation 2(8) defines:

- (a) ‘infrastructure controller’ as a person in control of railway infrastructure.
- (b) ‘Railway infrastructure’ includes permanent way, any plant used for signalling and any plant used exclusively for supplying power to the railway for operational purposes e.g. traction. ‘Railway infrastructure’ does **not** include stations.

## What is meant by ‘a person operating a train or rolling stock’?

- 1.8 Regulation 2(3) makes it clear that regulations 3 and 4 apply to persons who operate trains or rolling stock in the course of a business or other undertaking, whether or not for profit. This definition includes a company and in this document the term ‘train operator’ is used to describe someone with obligations under regulation 2(3).
- 1.9 The regulation includes operations which are run on a voluntary basis, where there is no employment or self-employment and it also makes it clear that a self-employed train driver is not an ‘operator’.

## What is ‘Mark 1 type rolling stock’?

- 1.10 Regulation 4(1) prohibits the use of, or giving permission to use Mark 1 type rolling stock on a railway. (*Guidance on what is a ‘railway’ under the regulations is set out in paragraphs 1.3 - 1.6.*)
- 1.11 ‘Mark 1 type rolling stock’ refers to any type of vehicle where a relatively weak body shell is mounted on a much stronger structural underframe and not just in relation to a specific series of carriages used within the rail industry. These types of vehicle have inherently lower crashworthiness than vehicles constructed to modern standards.
- 1.12 The effect of the structural strength being confined primarily in the underframe is that in the event of collisions there is relatively little protection to vehicle occupants. As a result, these types of vehicles are particularly vulnerable to overriding whereby the underframe of one vehicle rides over the underframe of the next and penetrates

the passenger space of the next vehicle, with potentially catastrophic consequences.

- 1.13 Due to the lower speeds and the train protection systems in place, regulation 4(2) excludes from this prohibition any Mark 1 type rolling stock operated by London Underground Limited, Tyne and Wear Metro (Nexus), Glasgow Subway and Manchester Metrolink. Also excluded from the prohibition is the operation of Mark 1 type rolling stock where this rolling stock is not carrying fare paying passengers. This may happen when Mark 1 type vehicles are occupied by train support crew only.
- 1.14 More information on the operation of Mark 1 type rolling stock can be found in chapter 2.

### **What is 'hinged door' rolling stock?**

- 1.15 Regulation 5(1) prohibits the use of, or giving permission to use any rolling stock that has hinged doors for passengers to get on or off unless those doors can be centrally locked. This applies to hinged doors regardless of whether they open inward or outward. (*Guidance on what is a 'railway' under the regulations is in paragraphs 1.3 - 1.6.*)
- 1.16 Where hinged door rolling stock is *not* carrying fare paying passengers it is excluded from the prohibition on the operation of rolling stock with hinged doors. This may happen when vehicles are occupied by train support crew only.
- 1.17 More information on the operation of rolling stock with hinged doors can be found in chapter 3.

### **Position on current Exemptions**

- 1.18 Regulation 6 allows ORR to issue exemptions from various requirements of the regulations particularly from regulations 3, 4, & 5. Such exemptions may apply in general or specific cases and may include limitations on an exemption including its duration.
- 1.19 A list of the exemptions currently in place for Mark 1 type rolling stock or rolling stock with hinged doors is available on the [ORR website](#).

## 2. Using Mark 1 type rolling stock on railway infrastructure where line speed exceeds 40kph

- 2.1 Mark 1 type rolling stock has continued to form an important part of the operating fleets of the UK charter train operators on the mainline railway, and this has to date been achieved by applying a set of specific modifications and operational controls to manage safety and permit the issue of an exemption under RSR99 for operation on the mainline railway. The exclusions under RSR99 (e.g. London Underground, non-passenger carrying vehicles etc : see para 1.13 above) continue to apply.

### Reduction of risk of overriding in event of an accident

- 2.2 Exemptions for Mark 1 type rolling stock have previously been conditional upon the requirement to make structural modifications to reduce the risk of vehicles overriding each other. Normally this is by the fitting of buckeye couplers with lower shelf brackets and the provision of suitable crash pillars at the end of carriages to prevent the underframe of one vehicle entering the passenger space of the next if overriding were to occur.

### Structural Integrity

- 2.3 Inspection by ORR has shown that the maintenance of the structural components of some Mark 1 type rolling stock has not always been to acceptable standards and this has raised questions over the assumptions on their performance were a collision resulting in overriding to occur.
- 2.4 In the light of experience and given technological improvements, ORR considers that for any future applications for exemption, it is now reasonable to insist that where Mark 1 type carriages are used there should be a clear inspection and maintenance regime. The maintenance regime should have appropriate accompanying records (including a photographic record if appropriate) to demonstrate:
- (a) that structural crash pillars are maintained to an acceptable standard, and
  - (b) that the remainder of the vehicle underframe and body shell are also maintained in a state of good repair.
- 2.5 Where such evidence as highlighted in 2.4 above is available, ORR will continue to consider granting exemptions.

# 3. Using rolling stock with hinged doors on railways where line speed exceeds 40kph

3.1 RSR99 prohibits the use of *‘vehicles with hinged doors without a means of centrally locking them in a closed position’*. This applies to operations on the mainline and any other railway as defined in the schedule to the regulations, where line speed exceeds 40kph.

## Background to the revised guidance

3.2 Following the coming into force of the regulations in 1999, exemptions have been issued to operators for specific carriages where hinged doors are present, allowing their continued operation on the mainline railway, provided:

- secondary door locks have been fitted (this has normally been achieved with the addition of a bolt at high level on the door for staff use only, which is required to be in place when the train is not at a station); and
- suitable and effective management arrangements and operating rules, have been implemented.

3.3 This has been considered an acceptable interim arrangement to allow a suitable time period for central locking to be fitted as mandated by the regulations.

3.4 Compliance with the ‘Joint TOC Document’ of 2005 “**Charter Train Managers Operation of Coaching Stock fitted with Secondary Door Locking**” has been considered to be a good starting point for considering operating practices but it has been for each operator to satisfy itself that it is appropriate for their stock and the routes and stations upon which they operate.

## Policy under this guidance

3.5 In relation to design and availability of centralised door locking systems, technology has advanced since the regulations were originally written in the late 1990’s. The retrofitting of central door locking (CDL) equipment in a sympathetic manner to older vehicles is now considered to have become achievable in a way that was not achievable in the late 1990s.

3.6 ORR believes that full implementation of regulation 5 requiring the use of CDL will also provide an opportunity for operators to implement improved control of the risks associated with passengers leaning out of droplight windows.



- 3.7 ORR recognises that vehicles with hinged doors will still have a role to play in the UK rolling stock fleet for some time to come, particularly for the part of the charter industry wishing to provide the historical experience. However, where such vehicles are to continue being used on the mainline after 31 March 2023, ORR now expects CDL to be fitted in line with the requirements of RSR99 Reg 5.
- 3.8 The current long-term exemptions relating to the operation on the mainline railway of vehicles with hinged doors *not* fitted with CDL are due to expire in March 2023. In light of the passenger safety purpose of the RSR99, ORR expects to issue further exemptions from regulation 5 only in exceptional circumstances. ORR will continue to exercise its function in determining whether to grant an exemption by considering and determining each application on its own merits taking into account all circumstances of the case.

## **4. Applications for exemptions for operating Mark 1 type rolling stock and rolling stock with hinged doors not currently fitted with Central Door Locking**

- 4.1 The RSR99 regulations (regulation 6) provides that ORR may issue exemptions subject to conditions and to a limit of time. Prior to granting an exemption ORR will consult such persons as it considers appropriate.
- 4.2 When considering whether to grant an exemption, ORR will have regard to:
- The conditions, if any, which it proposes to attach to the exemption;
  - Any other requirements imposed by or under any enactment which apply to the case; and
  - All other circumstances of the case.

### **Making an exemption application:**

#### **(i) criteria for ORR granting an exemption from regulation 4 concerning Mark 1 type rolling stock**

- 4.3 With regard to Mark 1 Type vehicles, ORR may consider issuing an exemption where the applicant can demonstrate that such vehicles have features to improve crashworthiness by provision of:
- crash pillars to improve the structural strength: and
  - lower shelf brackets and buckeye couplings to provide override protection and prevention.

Where such crashworthiness features are in place the application should also demonstrate that these (as well as the vehicle structure in general) have been properly maintained (see Para 2.4).

4.4 Applications for an exemption from regulation 4 should also meet the requirements set out in ORR document (Railway Safety Regulations 1999, Assessment and Guidance Manual for Exemption Applications<sup>2</sup>) relating to :

- (a) Details of modifications made to improve crashworthiness
- (b) Prevention of vehicles overriding
- (c) Maintenance of structural integrity
- (d) Plans for ongoing maintenance
- (e) Risk assessments underpinning a-d above.

## **(ii) criteria for ORR granting an exemption from regulation 5 concerning hinged door rolling stock not currently fitted with Central Door Locking**

4.5 ORR will consider granting an exemption from regulation 5 where the applicant can demonstrate that there are exceptional circumstances, for example:-

- (a) where a robust evidenced case is provided setting out alternative automated door locking or single-action multi-door locking solutions that provide an equivalent level of safety protection to CDL or
- (b) where fitment of CDL cannot be completed by the expiry of current exemptions.

4.6 ORR expects any such application to demonstrate the requirements set out in ORR document (Railway Safety Regulations 1999, Assessment and Guidance Manual for Exemption Applications<sup>3</sup>) are met by either:

- (a) Setting out how the means of controlling risks associated with the operation of hinged doors other than the use of CDL as required under regulation 5:
  - I. are in line with the hierarchy of controls within the Management of Health and Safety at Work Regulations 1999;

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<sup>2&3</sup> <https://www.orr.gov.uk/sites/default/files/om/assessment-and-guidance-for-exemption-applications-under-1999-safety-regulations.pdf>

- II. provide an alternative engineering solution not relying on individual human action to lock each door, that ensures doors are secondarily locked in position at all times the carriage is in the course of its journey; and
- III. is supported by a quantified risk assessment to demonstrate as a minimum, equivalence to CDL as a means of risk control;

or:

where fitment of a form of CDL to rolling stock with hinged doors is not achievable by the 31 March 2023 date; that a time bound programme of work is in hand for such fitment.

In such cases a limited period of exemption may be considered to allow the programme to be completed, so long as other methods of secondary door locking are in place and being operated effectively in the meantime.

# Annex – extracts from the Railway Safety Regulations 1999

The following text taken from the Railway Safety Regulations 1999 has been amended to reflect modifications made by

- A) The Railways and Other Guided Transport Systems (Safety) Regulations 2006,
- B) The Health and Safety (Enforcing Authority for Railways and Other Guided Transport Systems) Regulations 2006,
- C) The Railway Safety (Miscellaneous Amendments) Regulations 2001, and
- D) The Office of Rail Regulation (Change of Name) Regulations 2015.

The amended text is enclosed in in square brackets.

## Regulation 2 Interpretation

(1) *In these Regulations, unless the context otherwise requires -*

*"approved" means approved for the time being in writing;*

*"buffer stop" means a buffer stop at the end of a passenger platform;*

*"emergency crossover" means a connection between two railway tracks to enable trains to change tracks and which is used -*

*(a) in an emergency, or*

*(b) to enable engineering work to be carried out,*

*in accordance with special procedures established by the infrastructure controller;*

*"excessive speed" in relation to -*

*(a) an approach to a stop signal or buffer stop, means such speed as would prevent the train from stopping at that signal or buffer stop,*

*(b) an approach to part of the railway where there is a speed restriction, means such speed as would prevent the restriction from being complied with when the train enters that part, and for the purposes of this sub-paragraph a speed restriction shall be treated as being complied with if the speed of the train does not exceed the total of the permitted speed and such additional speed as may be approved by the [relevant authority] for the purpose of this sub-paragraph;*

*"infrastructure controller" [means a person who controls railway infrastructure]<sup>A</sup>;*

*"line speed" means the highest of the permitted speeds on the railway concerned;*

*"Mark I rolling stock" means rolling stock which has a structural underframe which provides its own longitudinal strength and has a passenger compartment created on the underframe which relies mainly on the underframe for its longitudinal strength;*

*"permitted speed" means the maximum speed permitted on the part of the railway concerned;*

*"railway" has the meaning assigned to it by the Schedule to these Regulations;*

*["railway infrastructure" means fixed assets used for the operation of a railway including its permanent way and plant used for signalling or exclusively for supplying electricity for operational purposes to the railway, but it does not include a station]<sup>A</sup>;*

*"relevant approach" means -*

*(a) an approach to a stop signal referred to in sub-paragraph (a) (i) of the definition of "train protection system" in this regulation except where a train travelling at the maximum speed it could attain on that approach would be stopped within the distance between the signal and the point where it could collide with another train by reason of the train protection system installed at the stop signal;*

*(b) an approach to part of the railway where there is a speed restriction if -*

*(i) the permitted speed on that approach is 60 miles per hour or more; and*

*(ii) in order to comply with the restriction, a train travelling at the permitted speed on that approach would need to have its speed reduced by one third or more;*

*(c) an approach to a buffer stop;*

*["relevant authority" means—*

*(a) the [Office of Rail and Road]<sup>P</sup> where it is made the enforcing authority in relation to the operation of a railway by regulation 3(1) of the Health and Safety (Enforcing Authority for Railways and Other Guided Transport Systems) Regulations 2006; and*

*(b) the Health and Safety Executive in any other case;<sup>B</sup>*

*"speed restriction" means a permitted speed other than the line speed;*

*["station" means a railway passenger station or terminal, but does not include any permanent way or plant used for signalling or exclusively for supplying electricity for operational purposes to the railway]<sup>A</sup>;*

*"stop signal" means a signal conveying to the driver of the train an instruction that he should stop the train except that it does not include-*

*(a) a signal provided for shunting purposes only;*

*(b) a hand signal; or*

*(c) a buffer stop;*

*"temporary speed restriction" means a speed restriction which is in place for no longer than 3 months and used in accordance with special procedures established by the infrastructure controller;*

*"train" has the same meaning as in section 83(1) of the Railways Act 1993 (1993 c.43);*

*"train protection system" means equipment which -*

*(a) causes the brakes of the train to apply automatically if the train -*

*(i) passes without authority a stop signal such passing of which could cause the train to collide with another train, or*

*(ii) travels at excessive speed on a relevant approach;*

*(b) is installed so as to operate at every stop signal referred to in sub-paragraph (a), except a stop signal on the approach to an emergency crossover, and at an appropriate place on every relevant approach; except that where it is reasonably practicable to install it, it means equipment which automatically controls the speed of the train to ensure, so far as possible, that a stop signal is not passed without authority and that the permitted speed is not exceeded at any time throughout its journey.*

*(2) Nothing in these Regulations shall require equipment referred to in sub-paragraphs (a) and (b) of the definition of a train protection system to function in relation to a temporary speed restriction, and accordingly any reference in these Regulations to the permitted speed in relation to such equipment is, in a case where a temporary speed restriction is in place, a reference to the permitted speed which normally applies on that part of the line concerned.*

*(3) Any reference in these Regulations to a person operating a train or rolling stock is a reference to the person operating a train or rolling stock for the time being in the course of a business or other undertaking carried on by him (whether for profit or not), but it does not include a self-employed person by reason only that he himself drives or otherwise controls the movement of a train.*

*(4) Any reference in these Regulations, except regulation 4, to a train colliding with another train does not include a reference to a train colliding with the rear of another train travelling in the same direction on the same track.*

*[(4A) Any reference in these Regulations to a person who controls railway infrastructure is a reference to a person who—*

*(a) in the course of a business or other undertaking carried on by him (whether for profit or not);*

*(b) is in operational control of that infrastructure,*

*except that where such control is for the time being exercised by a person undertaking maintenance, repair or alteration work on the infrastructure, it is a reference to a person who would be in operational control of the infrastructure if such work were not being undertaken.]<sup>A</sup>*

*(5) Any reference in these Regulations to -*

*(a) a numbered regulation is a reference to the regulation in these Regulations so numbered, and*

*(b) a numbered paragraph is a reference to the paragraph so numbered in the regulation in which the reference appears.*

### **Regulation 3 - use of a train protection system**

*The text of this regulation omitted.*

*Guidance on train protection systems is not within the scope of this guidance document and is to be covered in the second of these documents (currently in development – Work year 2021-22) which will specifically address train protection systems.*

### **Prohibition of Mark I rolling stock**

*4.— (1) No person shall operate, and no infrastructure controller shall permit the operation of, any Mark I rolling stock on a railway.*

*(2) Paragraph (1) shall not apply to rolling stock which at the relevant time is being exclusively operated other than for the carriage of fare paying passengers or by London Underground Limited, Tyne and Wear Passenger Transport Executive, Strathclyde Passenger Transport Executive or Serco Metrolink Limited.*

*(3) Until 1st January 2005 paragraph (1) shall not apply to Mark I rolling stock which has been modified so as to ensure that in the event of a collision—*

*(a) the underframe of one vehicle will not ride over the underframe of another vehicle so modified (whether or not the other vehicle is part of the same train);*



(b) where sub-paragraph (a) is not practicable, the extent of any such riding over is as small as can practicably be achieved by a modification to the rolling stock.

(4) In this regulation “modified” means modified by the installation of interlocking devices on vehicles and “modification” shall be construed accordingly

### **Prohibition of hinged doors**

5.— (1) No person shall operate, and no infrastructure controller shall permit the operation of any rolling stock on a railway if the rolling stock has hinged doors for use by passengers for boarding and alighting from the train (other than doors which have a means of centrally locking them in a closed position).

(2) Paragraph (1) shall not apply to rolling stock which at the relevant time is being exclusively operated other than for the carriage of fare paying passengers

### **Exemption certificates**

6.— (1) The [relevant authority]<sup>B</sup> may, by certificate in writing, exempt any person or class of persons, railway, part of a railway or class of railways, train or rolling stock, or class of train or rolling stock from any prohibition imposed by these Regulations and any such exemption may be granted subject to conditions and to a limit of time and may be revoked by a certificate in writing at any time.

(2) Before granting an exemption the [relevant authority]<sup>B</sup> shall consult such persons as it considers appropriate.

(3) In deciding whether to grant any such exemption the [relevant authority]<sup>B</sup> shall have regard to—

(a) the conditions, if any which it proposes to attach to the exemption;

(b) any other requirements imposed by or under any enactment which apply to the case;

(c) all other circumstances of the case.

### **[Regulation 7**

*Regulation 7 of the 1999 regulations was revoked by The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013.]*

## **SCHEDULE**

### **MEANING OF RAILWAY**

1. “Railway” means a system of transport employing parallel rails which provide support and guidance for vehicles carried on flanged wheels and form a track which either is of a gauge of at least 350 millimetres or crosses a carriageway (whether or not on the same level), except that it does not include—
  - (a) a tramway;
  - (b) any part which runs along and at the same level as a street or in any other place to which the public has access (including a place to which the public has access only on making a payment);
  - (c) any part where the permitted speed is such as to enable the driver to stop the train in the distance he can see ahead in clear weather conditions;
  - (d) any part normally used other than for the carriage of fare paying passengers; or
  - (e) such a system if on no part of it there is a line speed exceeding [40 kilometres per hour]<sup>c</sup>.

2. In this Schedule—

“carriageway” has the same meaning as in the Highways Act 1980(1) or in Scotland, the Roads (Scotland) Act 1984(2);

“street” means—

- (a) in England and Wales, a street within the meaning of section 48 of the New Roads and Street Works Act 1991(3), together with land on the verge of a street or between two carriageways;
- (b) in Scotland, a road within the meaning of section 107 of the New Roads and Street Works Act 1991, together with land on the verge of a road or between two carriageways;

[“tramway” means a system of transport used wholly or mainly for the carriage of passengers—

- (a) which employs parallel rails which—
  - (i) provide support and guidance for vehicles carried on flanged wheels; and
  - (ii) are laid wholly or partly along a road or in any other place to which the public has access (including a place to which the public only has access on making payment); and

(b) on any part of which the permitted speed is such as to enable the driver to stop a vehicle in the distance he can see to be clear ahead;]<sup>A</sup>

“vehicle” includes a mobile traction unit.



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