

**Rail Industry Standard**  
**RIS-0734-CCS**  
**Issue: One**  
**Date: December 2018**

## **Signing of Permissible Speeds**

### **Synopsis**

This document sets out requirements, rationale and guidance for signing of permissible speeds on the Great Britain (GB) mainline railway.

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**Issue Record**

Issue	Date	Comments
One	01/12/2018	New document containing the material from GKRT0075 issue four and GKG0675 issue four not within scope of Railway Group Standards.

**Superseded Documents**

The following documents are superseded, either in whole or in part as indicated:

Superseded documents	Sections superseded	Date when sections are superseded
GKRT0075 issue four Lineside Signal Spacing and Speed Signage	3.1.2, 3.2.1.1, 3.2.1.2, 3.2.1.3, 3.2.1.4, 3.2.1.5, 3.2.1.6, 3.2.2.1, 3.2.2.2, 3.2.3.3, 3.2.3.2, 3.3.1.1, 3.3.1.2, 3.3.1.4, 3.3.1.5, 3.3.1.7, 3.3.2.1, 3.3.2.3, 3.3.2.4, 3.3.2.5, 3.3.2.6, 3.3.2.7, 3.3.3.1, 3.3.3.2, 3.3.4.1, 3.3.4.2, 3.3.4.3, 3.3.5.1, 3.3.5.2, 3.3.5.3, 3.3.5.4, 3.3.5.5, 3.3.5.6, 3.3.6.1, 3.3.7.1, 3.3.7.2, 3.3.7.3, 3.3.7.4, 3.3.8.1, 3.3.8.2, 3.3.9.1	01/12/2018
GKG0675 issue four Guidance on Lineside Signal Spacing and Speed Signage	All sections supporting those sections listed above.	01/12/2018

**Supply**

The authoritative version of this document is available at [www.rssb.co.uk/railway-group-standards](http://www.rssb.co.uk/railway-group-standards). Enquiries on this document can be submitted through the RSSB Customer Self-Service Portal <https://customer-portal.rssb.co.uk/>

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## Part 1 Introduction

### 1.1 Purpose

- 1.1.1 This document sets out the industry agreed requirements for signing of permissible speeds on the Great Britain (GB) mainline railway.
- 1.1.2 The requirements in this document are available to Proposers in applying the Common Safety Method for Risk Evaluation and Assessment (CSM RA) risk acceptance principles to the hazard of a train exceeding the permissible speed.

### 1.2 Application of this document

- 1.2.1 Compliance requirements and dates have not been specified because these are the subject of internal procedures or contract conditions.
- 1.2.2 If you plan to do something that does not comply with a requirement in this RIS, you can ask a Standards Committee to comment on your proposed alternative. If you want a Standards Committee to do this, please submit your deviation application form to RSSB. You can find further advice in the 'Guidance to applicants and members of Standards Committee on using alternative requirements', available from RSSB's website [www.rssb.co.uk](http://www.rssb.co.uk).

### 1.3 Scope of application

- 1.3.1 The requirements in this document apply to lines where trains are operated using lineside signals to authorise train movements and lineside signs to provide information on permissible speeds and speed restrictions, whether or not a cab signalling system is also provided on the line.

### 1.4 Health and safety responsibilities

- 1.4.1 Users of documents published by RSSB are reminded of the need to consider their own responsibilities to ensure health and safety at work and their own duties under health and safety legislation. RSSB does not warrant that compliance with all or any documents published by RSSB is sufficient in itself to ensure safe systems of work or operation or to satisfy such responsibilities or duties.

### 1.5 Structure of this document

- 1.5.1 This document sets out a series of requirements that are sequentially numbered. This document also sets out the rationale for the requirement, explaining why the requirement is needed and its purpose and, where relevant, guidance to support the requirement. The rationale and the guidance are prefixed by the letter 'G'.
- 1.5.2 Some subjects do not have specific requirements but the subject is addressed through guidance only and, where this is the case, it is distinguished under a heading of 'Guidance' and is prefixed by the letter 'G'.

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**1.6 Approval and authorisation of this document**

1.6.1 The content of this document was approved by Control Command and Signalling Standards Committee (CCS SC) on 25 September 2018.

1.6.2 This document was authorised by RSSB on 26 October 2018.

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### Part 2 Assessments for Signing of Permissible Speeds

#### 2.1 Driveability assessment factors for permissible speeds

- 2.1.1 The driveability assessment shall check that the permissible speeds are compatible with existing and planned train operations on each route, including the following factors:
- a) The permissible speed profiles.
  - b) The configuration and position of permissible speed indicators (PSIs) and permissible speed warning indicators (PSWIs).
  - c) The provision of additional permissible speed signs, where this is a permitted option to manage operational risk, including:
    - i) Additional PSWI (see [4.2](#)).
    - ii) Repeater PSI at converging junctions (see [4.4.1](#)).
  - d) The omission of differential speed signs, where differential speeds are implemented by instruction (see [4.2](#)).
  - e) The configuration and position of permissible speed signs that display standard and non-standard differential speeds, where trains compatible with the minimum signalling braking distances (MSBD) set out in Appendices B and C of GKRT0075 'Requirements for Minimum Signalling Braking and Deceleration Distances' are authorised to operate at higher permissible speeds (see [4.3](#)).
  - f) The display of metric speed information, where this is required (see [3.1](#)).
  - g) The overall presentation of information to the driver as set out in [3.2](#).
  - h) Train Protection and Warning System (TPWS) Overspeed sensors (OSSs) for PSIs and signals.
  - i) Strike-in points for level crossings.

#### **Rationale**

- G 2.1.2 These factors support and influence the driveability of routes.

#### **Guidance**

- G 2.1.3 Further requirements for driveability assessments are set out in RIS-0713-CCS.
-

## **Part 3 Requirements for Change of Permissible Speeds**

### **3.1 Display of permissible speed information**

- 3.1.1 The infrastructure manager (IM) shall provide lineside operational safety signs to display permissible speeds information, applicable to each running line, for each direction that trains can be operated under signalled movement authorities for main running movements.
- 3.1.2 Permissible speed signs shall be positioned on the left-hand side of the line in the direction of travel, unless they cannot be accommodated there.
- 3.1.3 Permissible speed signs shall display speed information in units of miles per hour (mph).
- 3.1.4 Where trains are operated using speedometers calibrated in kilometres per hour (km/h), the speed information shall also be presented in units of km/h.
- 3.1.5 Permissible speed signs that display differential speeds shall display the lower (the lowest) speed above the higher speed(s).
- 3.1.6 Permissible speed signs shall be configured so that all of the applicable speeds (including differential speeds) over the same section of track are displayed together at the same position and location. It is permitted for nominally co-located speed signs to be separated by a short distance where readability would not be impaired.

#### **Rationale**

- G 3.1.7 Permissible speed signs provide information to assist the driver in controlling the speed of the train.
- G 3.1.8 Permissible speed signs are displayed in units of mph because these units are currently used on the GB mainline railway.
- G 3.1.9 Locating signs in consistent positions can help in reducing train drivers' workload.
- G 3.1.10 Provision of a differential speed arrangement enables operational flexibility.

#### **Guidance**

- G 3.1.11 Sections [4.1](#), [4.2](#) and [4.3](#) set out the provision and positioning requirements for PSIs, including the circumstances in which a PSWI and automatic warning system (AWS) permanent magnet are provided.
- G 3.1.12 Where dual speed signage in mph and km/h would result in a multiplicity of signs, the impact on the readability of the signage is assessed to avoid any potential confusion.

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### **3.2 Overall presentation of information to the driver**

- 3.2.1 Permissible speed signs and their associated AWS permanent magnets shall be positioned so that the totality of information (including lineside operational signs, signal aspects, indications and lineside equipment) displayed to the train driver is not liable to cause confusion.

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3.2.2 Where train protection systems are in use, the position of permissible speed signs shall be compatible with the warning and intervention functionality of these systems.

### **Rationale**

G 3.2.3 Permissible speed signs, and warning and intervention equipment are positioned to provide the driver with information to assist in controlling the speed of the train.

### **Guidance**

G 3.2.4 In some complex layouts, strict application of all the requirements in this standard may not achieve the objective of providing clear and unambiguous information to the driver. In such cases, alternative solutions which meet this objective include:

- a) Alterations to the proposed geographical limits of the permissible speeds.
- b) Alterations to the speed value(s) of the permissible speeds.
- c) Alteration to the signalling arrangements.

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## **3.3 Provision of deceleration distance**

3.3.1 The deceleration distance between the PSWI and PSI shall be determined using the minimum deceleration distance (MDD) data as set out in GKRT0075.

3.3.2 Where differential speeds are associated with a speed reduction to a lower permissible speed, the deceleration distance shall be determined for each type of train, taking account of:

- a) The applicable speeds for that train, and
- b) The longest deceleration distance required.

### **Rationale**

G 3.3.3 The deceleration distance is provided to enable the train with the worst braking performance to achieve the required speed reduction.

### **Guidance**

G 3.3.4 PSWIs are positioned at a sufficient distance on the approach to the point where the reduced speed commences to enable a train to decelerate under service brake application to the required permissible speed. The permissible speed for certain trains can be limited by:

- a) Differential speed limits.
- b) Maximum speeds applicable to particular types of train.
- c) Other speed restrictions applied by instruction (for example, the two-thirds rule for freight trains in operation on former Southern Region lines).

G 3.3.5 Where differential speeds apply, all trains that are authorised to operate over the route are considered, including the following speed transition combinations:

- a) One differential speed to another differential speed.
- b) A standard speed to a differential speed.
- c) A differential speed to standard speed.

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- G 3.3.6 Where differential speeds apply, all applicable combinations of differential approach speed and differential speed restrictions are considered so that the correct speed differentials are used to determine the required deceleration distance.
- G 3.3.7 There may be circumstances in which a different type of train with better braking performance is to be operated over an existing route (for example, a train compatible with GKRT0075, Appendix C, which is to be operated on a route signalled to GKRT0075, Appendix A). In this case the braking performance of the train would be checked against the MSBD and the position of speed indicators, before an increased speed is authorised.
- G 3.3.8 The higher permissible speed is signed as a differential speed unless all other trains that can be operated over the route are also compatible with the signalling braking distances and the position of speed indicators.
- 

### 3.4 Publication of altered permissible speeds

- 3.4.1 Details of alterations to permissible speeds shall be published in:
- The Weekly Operating Notice (WON), prior to implementation, and
  - The next available Periodical Operating Notice (PON), pending reissue of the appropriate Table A entry in the Sectional Appendix.

#### Rationale

- G 3.4.2 Alterations to permissible speeds are published by the infrastructure manager (IM) so that train drivers' route knowledge, with respect to permissible speeds, can be managed by the relevant railway undertakings (RUs).

#### Guidance

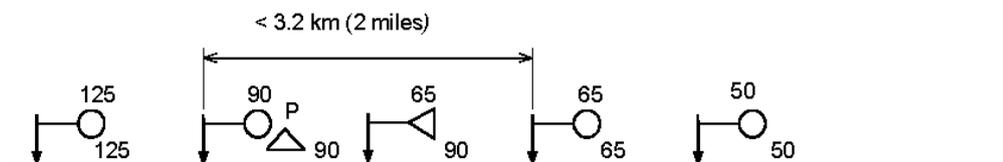
- G 3.4.3 RIS-3215-TOM sets out the requirements for publication of WONs, PONs and sectional appendices.
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### Part 4 Requirements for Permissible Speed Signs

#### 4.1 Principles for signing of permissible speeds

- 4.1.1 A Signal Sighting Committee (SSC), as set out in RIS-0737-CCS, shall agree the position and sighting of permissible speed signs; these are:
- PSIs.
  - PSWIs.
- 4.1.2 The PSIs and PSWIs shall display the relevant speed(s) applicable to the route.
- 4.1.3 The PSIs shall be provided for every increase or decrease of permissible speed, except where differential speeds applying to certain types of train are implemented by instruction. This applies where speed is required to be restricted for particular types of train that do not constitute a recognised category for which differential speed signs are specified in the Rule Book module SP.
- 4.1.4 Except where the criteria in 4.1.5 apply, a PSWI shall be provided on all signalled approaches to each permissible speed reduction, where either:
- The permissible speed on the approach, including any differential speed, is 60 mph or greater and the required speed reduction is one-third or more, taking account of any differential permissible speeds that apply, or
  - There are two or more successive reductions in permissible speed within a distance of 3.2 km (2 miles), none of which individually meets the criteria set out in a), but which together require a speed reduction of one-third or more from an approach speed of 60 mph or greater (see Figure 1).



**Figure 1:** An arrangement for two or more successive reductions in permissible speed

- 4.1.5 PSWIs shall not be provided for:
- A speed reduction over a diverging route where the signalling system is configured to display signal aspects that provide for the required speed reduction (see 4.4.4).
  - A speed reduction over a level crossing where a Level Crossing Warning Sign (St Georges Cross) is provided.
- 4.1.6 Only one PSWI shall be provided on each approach to a PSI, unless an additional indicator is required to mitigate safety risk and will not cause confusion to drivers.

#### Rationale

- G 4.1.7 PSIs are provided to support driveability.
- G 4.1.8 A PSWI gives a warning and identifies the point at which a full brake application would achieve the specified speed by the PSI.

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- G 4.1.9 PSWIs are only necessary for circumstances where a PSI alone is not deemed sufficient to control the hazards.
- G 4.1.10 PSWIs are positioned to mark an adequate deceleration distance for trains with the worst braking performance so they can decelerate to the speed specified at their location of PSI.
- G 4.1.11 A PSWI gives a warning and identifies the point at which a full service brake application would achieve the specified speed by the PSI.
- G 4.1.12 A PSWI with an associated AWS permanent magnet provides both visual and audible warnings to the train driver. Excessive use of PSWIs and associated audible warnings could increase driver workload and cause potential confusion.
- G 4.1.13 Where the speed reduction is controlled by restrictive signalling aspects, a PSWI does not provide any additional benefit.
- G 4.1.14 A level crossing warning sign (St Georges Cross) performs the same function as a PSWI.

### Guidance

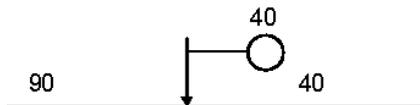
- G 4.1.15 PSI and PSWI are permanent assets of the signalling system. Consequently, like signals, their positioning is agreed by an SSC (see RIS-0737-CCS).
- G 4.1.16 Permissible speed information is displayed using approved permissible speed signs as set out in GIGN7634 issue one 'Index for Lineside Signs'.
- G 4.1.17 Where differential speeds apply (see 4.3), there may be a change in permissible speed at a particular location for some categories of trains, but not for others. In this case, a PSI is provided that displays all the differential speeds.
- G 4.1.18 In some circumstances speed restrictions are imposed using operating instructions, instead of lineside signs. Typically, these speed restrictions can be associated with:
  - a) Specific train movements (for example, degraded mode of operations).
  - b) Axle load or clearance criteria associated with particular vehicle types.
  - c) Defined classes of train.
- G 4.1.19 The criteria for provision of PSWI and associated AWS magnets (sometimes referred to as the 'Morpeth rules') were introduced following a number of incidents where drivers entered a section of line with a severe speed restriction at excessive speed, in some cases leading to derailment. The criteria are intended to ensure that drivers cannot approach a severe speed reduction without being aware of it.
- G 4.1.20 Where differential speeds apply, either on the approach to a speed reduction or to the speed beyond the reduction, the speed reduction applicable to each category of train is considered. A permissible speed warning indicator is required when any category of train has a permissible approach speed of 60 mph or greater and a required speed reduction of one-third or more.
- G 4.1.21 The additional criteria set out in 4.1.4b) apply where there is a series of successive speed reductions, each of which, considered individually, does not come within the conditions of 4.1.4a) but together still result in a risk associated with a driver approaching a low-speed area at excessive speed.

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- G 4.1.22 Additional PSWIs can be provided for speed reductions falling outside the criteria of 4.1.4 where this increases safety and does not cause confusion to drivers. To avoid confusion, such provision would be applied consistently on each route section.
- G 4.1.23 Where a junction signal is approach controlled from red for a diverging route, the aspect sequence can be used to inform the driver of the need to control the speed of the train approaching the divergence. In this case, a PSWI would not provide any additional value.
- G 4.1.24 Where the speed reduction required for a divergence is within the criteria of 4.1.4 and an aspect sequence other than approach control from red is used for the diverging route, a PSWI is used to advise the driver of the speed reduction. See 4.4.4 for further details.
- G 4.1.25 To avoid confusion, a train will normally only pass one PSWI associated with a particular PSI. Section 4.4.3 sets out the arrangement normally provided at converging junctions to achieve this.

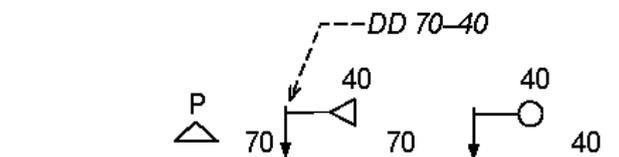
### 4.2 Position of permissible speed signs

- 4.2.1 The PSIs shall be positioned where the change of permissible speed occurs (see Figure 2).



**Figure 2:** Typical arrangement of a PSI

- 4.2.2 Where provided, the PSWIs shall:
- Be positioned as close as practicable to the associated PSI, but not less than the MDD as set out in GKRT0075, taking account of the longest deceleration distance required (see Figure 3), and
  - Not be positioned between a signal, or other sign applicable in the same direction of travel and the AWS equipment associated with that signal or sign.



**Figure 3:** An example of positioning of a PSWI.

- 4.2.3 Where two PSIs are located at the same position (for example, at a diverging junction) and PSWIs are required for both, the position of the PSWIs shall be determined using the greatest deceleration distance required.

#### Rationale

- G 4.2.4 PSIs are used to support driveability.

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- G 4.2.5 The PSWI gives a warning and identifies the point at which a full service brake application would achieve the specified speed by the PSI.
- G 4.2.6 The PSWIs are positioned to mark an adequate deceleration distance for trains with the worst braking performance so they can decelerate to the speed specified at their location of PSI.

### Guidance

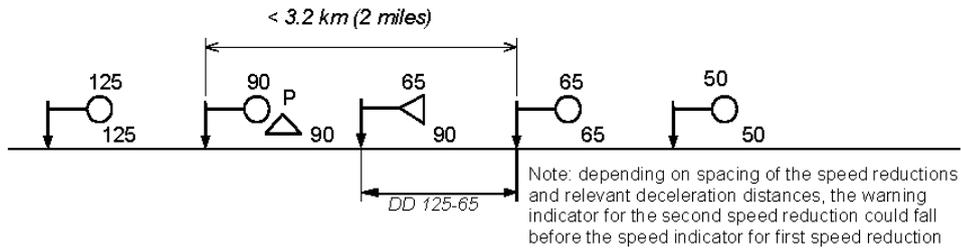
- G 4.2.7 On sections of line where it is not possible for trains to achieve the maximum permissible speed, for example on the approach to a reduction in permissible speed or immediately beyond an increase in permissible speed, the IM determines appropriate maintenance requirements based on the maximum attainable speed on that section of line. Where attainable speeds are used solely to determine maintenance specifications, it is not necessary to advise these speeds to drivers as changes in permissible speed and, in this case, they will not be shown either in the Sectional Appendix or on lineside signs.
- G 4.2.8 The PSWI provides sufficient deceleration distance for all types of train. Where differential speeds apply, the longest deceleration distance applies.
- G 4.2.9 The longest required deceleration distance might be significantly greater than the distance required by some trains, and this is acceptable.
- G 4.2.10 The distance between the PSWI and the PSI might need to be increased to provide adequate sighting, or to avoid AWS conflicts or positions where it is not practicable to site the PSWI .
- G 4.2.11 If PSIs are at the same position, the associated PSWIs are also at the same position; if the PSIs are in different places the PSWIs would be considered separately for each.
- G 4.2.12 Where a PSWI is required only for the lower speed diverging route, and the speed reduction for the higher speed route is not great enough to require a PSWI to be provided, then a PSWI can be provided for only the lower speed (diverging) route.
- G 4.2.13 Where the speed reduction required for a diverging route is enforced by the signalling system approach releasing the junction signal from red (see [4.1.5](#) and [4.4.4.1](#)) a PSWI is not provided for the speed on the diverging route. Where there is also a speed reduction on the straight route which commences at the same point and requires a PSWI, the PSWI is provided only for the speed reduction on the straight route with no PSWI for the speed reduction on the diverging route.

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### Position of PSWIs at a series of permissible speed reductions

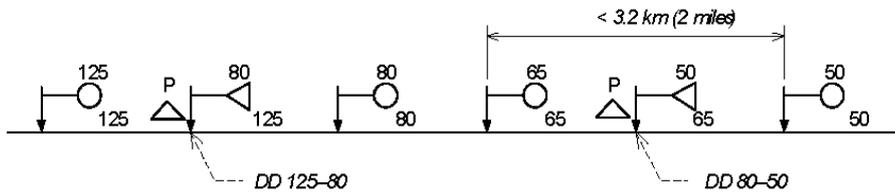
- 4.2.14 Where the circumstances set out in [4.1.4b](#)) apply, the deceleration distance used to position the PSWI shall be determined using the permissible speed applicable prior to the commencement of the series of reductions in speed (see [Figure 4](#)).

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**Figure 4:** Example of PSWI for successive reductions in speed

4.2.15 Where further permissible speed reductions occur beyond a reduction for which a PSWI and associated AWS permanent magnet is provided, these shall be assessed separately. A further PSWI shall be provided if the criteria set out in 4.1.4 are met (see Figure 5). 6



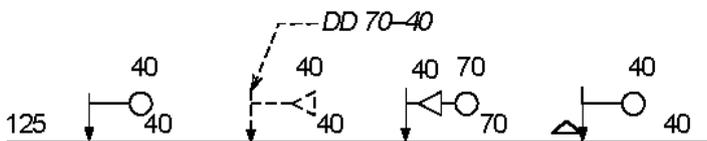
**Figure 5:** Example of successive reductions in speed where a further PSWI is required

4.2.16 Where exceptionally the speed profile is such that the deceleration distance would either:

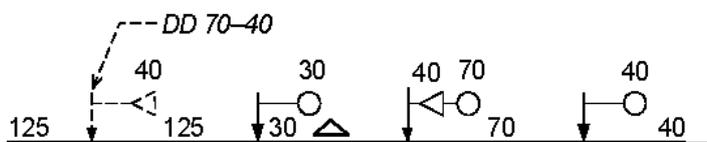
- Position a PSWI within a section of line with a lower permissible speed than that immediately preceding the speed reduction (see Figure 6), or
- Encompass a section of line with a lower permissible speed (see Figure 7).

and this lower speed is equal to or less than the speed displayed on the PSWI, one of the following arrangements shall be used:

- The permissible speeds shall be adjusted to avoid this arrangement (preferred), or
- The PSWI shall be positioned at the end of the lower speed section, beneath the PSI for the higher speed (non-preferred).



**Figure 6:** Example of positioning of PSWI where deceleration distance falls within lower speed section



**Figure 7:** Example of positioning of permissible speed warning indicator where deceleration distance encompasses lower speed section

- 4.2.17 If the permissible speed on the preceding lower speed section is higher than the permissible speed displayed on the PSWI and there is an intermediate higher permissible speed, the PSWI shall be positioned either:
- At not less than the deceleration distance, or
  - At the end of the lower speed section, beneath the PSI or the higher speed, whichever is the greater distance. In this case the intermediate higher permissible speed shall be disregarded when determining the position of the PSWI.

**Rationale**

- G 4.2.18 The criteria for provision of PSWIs and associated AWS permanent magnets (see [4.1.4](#)) are intended to ensure that train drivers cannot approach a severe speed reduction without there being an AWS warning. If the train driver fails to respond to the warning, the AWS permanent magnet applies the brakes.
- G 4.2.19 Where a series of successive speed reductions apply, as shown in [Figure 4](#), the first speed reduction (from 125 mph to 90 mph) is not considered severe enough to cause a significant risk of derailment if the train driver continues at the approach speed (125 mph), and therefore a PSWI is not provided.
- G 4.2.20 Similarly, if the train driver correctly reduces speed to 90 mph but fails to observe the further reduction to 65 mph, the risk from overspeeding is again small. It is only if the train driver fails to observe both reductions in speed, and continues at the approach speed (125 mph) into the second (lower) speed restriction (65 mph), that a significant risk arises.
- G 4.2.21 To provide protection against this possibility, the PSWI and associated AWS permanent magnet for the second speed reduction to 65 mph are positioned to provide deceleration distance from the initial approach speed of 125 mph. This enables train drivers (or the AWS brake application if the driver fails to respond) to reduce speed to 65 mph before reaching the start of the 65 mph restriction, even if train drivers have failed to observe the earlier reduction to 90 mph.

**Guidance**

- G 4.2.22 Where the arrangement of signs could be potentially confusing, for instance where the PSWI for a reduction in speed would be required to be positioned before the PSI for a previous reduction in speed, consideration would be given to providing a PSWI (with AWS permanent magnet) for the first speed reduction, even though the requirements set out in [4.1.4](#) do not apply.
- G 4.2.23 The principle applied in [4.2.14](#) is extended to cover further reductions in speed, based on the assumption that the train driver responds to the speed reduction for which a PSWI and AWS permanent magnet are provided. Therefore, in [Figure 5](#) it is assumed that the driver has responded to the reduction from 125 mph to 80 mph (for which a PSWI and AWS permanent magnet are provided).
- G 4.2.24 The subsequent reduction from 80 mph to 65 mph, even if it is within the two-mile zone, is assessed in relation to an approach speed of 80 mph, and therefore does not require a PSWI. The further reduction from 65 mph to 50 mph is also assessed for an approach speed of 80 mph (since no PSWI was provided for the reduction to 65 mph),

## Signing of Permissible Speeds

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and the PSWI for this is located to provide the required deceleration distance from 80 mph to 50 mph.

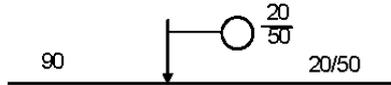
- G 4.2.25 In the example shown in Figure 6, the deceleration distance from 70 mph to 40 mph is longer than the length of line to which the 70 mph permissible speed applies, and this would position the warning indicator within the previous 40 mph section. In this case the 40 mph warning indicator is placed at the end of the previous 40 mph section, below the 70 mph permissible speed indicator. This provides adequate warning to train drivers to accelerate only to a speed from which they can decelerate back to 40 mph before reaching the start of the subsequent 40 mph section.
- G 4.2.26 In the example shown in Figure 7, the deceleration distance from 70 mph to 40 mph is again longer than the length of line to which the 70 mph permissible speed applies; in addition, it would extend through the previous 30 mph section into the preceding section of line on which the permissible speed is 125 mph. However, as trains are restricted to 30 mph in the intervening section, placing the 40 mph warning indicator at the end of the 30 mph section, below the 70 mph permissible speed indicator, provides adequate warning to train drivers to accelerate only to a speed from which they can decelerate back to 40 mph.
- G 4.2.27 In the above cases it may not be appropriate to sign the intermediate section for 70 mph, particularly where this section is short and it is not possible for any trains to accelerate to this speed before decelerating again to the 40 mph restriction. The signed speed should be compatible with the acceleration and braking performance of trains.
- G 4.2.28 Where the deceleration distance for the preceding lower speed would position the PSWI within the intermediate higher speed section, the PSWI is positioned below the PSI for the higher speed section, as set out in 4.2.16. This provides adequate warning to drivers to accelerate only to a speed from which they can decelerate to the appropriate speed before reaching the start of the permissible speed restriction for which the PSWI applies.
- G 4.2.29 Where the deceleration distance for the preceding lower speed requires the PSWI to be positioned within the lower speed section, the PSWI is placed at not less than the deceleration distance.

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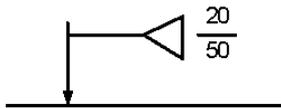
### 4.3 Signs for display of differential permissible speeds

- 4.3.1 PSIs and PSWIs shall display a maximum of three differential speeds, applicable to different categories of trains, including standard and non-standard differential speeds. The only permitted combinations are:
- Two displayed speeds, each for one of two standard categories of train, where standard differential speeds apply.
  - One displayed speed for a standard category of train and either one or two displayed non-standard speeds applicable to the train categories set out in GERT8000 'Rule Book module SP'.
  - Two displayed speeds for the two standard categories of train (standard differential speeds), together with one displayed non-standard differential speed applicable to a train category set out in GERT8000, 'Rule Book module SP'.

- 4.3.2 Where standard differential speeds apply, the two speeds shall be displayed on a single PSI (see Figure 8) and, where a PSWI is provided, on a single PSWI (see Figure 9).



**Figure 8:** Example of a standard differential PSI



**Figure 9:** Example of a standard differential PSWI

### Rationale

- G 4.3.3 The number of differential speeds presented are limited to three to reduce the likelihood of misinterpretation by the train driver.

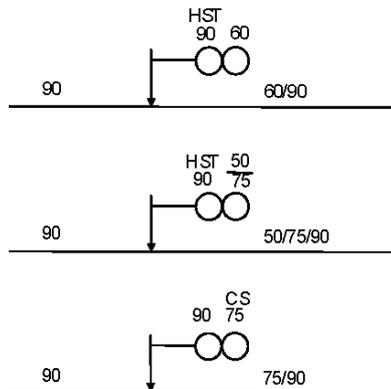
### Guidance

- G 4.3.4 'Standard' differential speeds are shown on a PSWI by two speed values, one above the other (see 3.1.5), without any specific indications to identify particular categories of trains. The bottom figure (which shows the higher speed) applies to passenger trains (loaded or empty), parcels and postal trains (loaded or empty), and light locomotives; the top figure (which shows the lower speed) applies to all other trains.
- G 4.3.5 For the purposes of this section, an enhanced permissible speed (EPS) as defined in GERT8012 shall be considered as a non-standard differential speed.
- G 4.3.6 The arrangement for displaying standard differential speeds, with the lower speed value shown by the top figure and the higher speed value by the bottom figure:
- Provides a consistent display.
  - Means that the lower speed value, which is a safe speed for all trains, is prominent and intended to be read first by the train driver.

### Display of non-standard differential permissible speeds

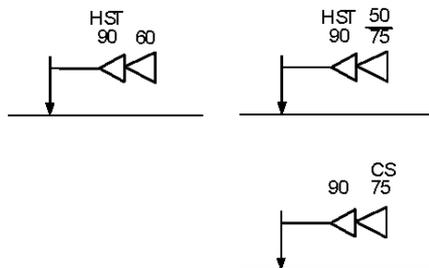
- 4.3.7 Non-standard differential permissible speeds shall be displayed by a separate speed sign incorporating an indication of the applicable train category.
- 4.3.8 A non-standard PSI shall be mounted on the same post as the associated standard PSI (see Figure 10) and:
- Where the non-standard speed is higher than the standard speed(s), it shall be displayed below the standard speed(s).
  - Where the non-standard speed is lower than the standard speed(s), it shall be displayed above the standard speed(s).

## Signing of Permissible Speeds



**Figure 10:** Examples of a non-standard differential PSI

- 4.3.9 Where a PSWI is required, non-standard differential speeds shall be displayed by a separate permissible speed sign, which shall incorporate an indication of the applicable train category.
- 4.3.10 A non-standard PSWI shall be mounted on the same post as the standard PSWI (see Figure 11) and:
- Where the non-standard speed is higher than the standard speed(s), it shall be displayed below the standard speed(s).
  - Where the non-standard speed is lower than the standard speed(s), it shall be displayed above the standard speed(s).



**Figure 11:** Examples of a non-standard differential PSWI.

### Rationale

- G 4.3.11 Non-standard differential speed signs are limited to one speed per sign, together with the applicable train category identifier for ease of readability.
- G 4.3.12 The number of non-standard differential speeds presented at a location is limited to three to reduce the likelihood of misinterpretation.

### Guidance

- G 4.3.13 The meanings of letter abbreviations for non-standard speeds are set out in GERT8000 'Rule Book Module SP'. The classes of train that apply in a given situation are set out in the Sectional Appendices.
- G 4.3.14 Non-standard differential speeds are shown on speed indicators and warning indicators by an additional speed value on a separate sign, with additional letters

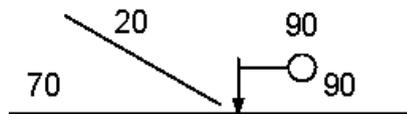
above the speed value that identify the category of train to which the speed applies. The letters used to indicate the different categories of trains are set out in the Sectional Appendices.

- G 4.3.15 Most non-standard differential speeds (for example, HST, MU, SP) apply to categories of trains that are permitted to travel at a higher speed than the standard permissible speed(s) applying at that location. The sign showing a non-standard differential speed that is higher than the standard permissible speed(s) is placed on the same post, but below the standard speed indicator, for the same reason that this arrangement is used for signing of standard differential speeds (see 4.3.2).
- G 4.3.16 There are cases where a non-standard differential speed (for example, CS) applies to a particular category of train that is required to travel at a lower speed than the standard permissible speed(s) applying at that location. In this case the sign showing a non-standard differential speed that is lower than the standard permissible speed(s) is placed above the standard speed indicator.

#### 4.4 Provision of permissible speed signs at junctions

##### 4.4.1 PSI at converging junctions

- 4.4.1.1 A PSI shall be provided at converging junctions if the permissible speed beyond the converging junction is different from the permissible speed on the higher speed route (see Figure 12).



**Figure 12:** Typical arrangement of PSI at converging junction

- 4.4.1.2 It is permissible to provide a miniature PSI (AD02m/AD02k, as set out in GIGN7634), as a repeating sign immediately after a converging junction, where all of the following apply:
- The permissible speed beyond the junction is the same as the permissible speed of the approach on the higher speed route.
  - The permissible speed beyond the junction is higher than that on the converging route.
  - The junction is not located within the deceleration distance approaching a lower speed for which warning has already been given.

##### Rationale

- G 4.4.1.3 Provision of PSI is provided beyond a junction so that the different permissible speed is displayed to all trains after they have passed the converging junction.

##### Guidance

- G 4.4.1.4 A miniature PSI is considered sufficient for use as a repeating sign because it is not critical for the driver to observe the higher permissible speed and it is only relevant to the train approaching from the converging route.

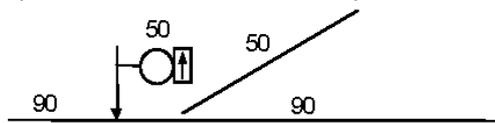
## Signing of Permissible Speeds

G 4.4.1.5 The decision on whether to use a miniature PSI involves co-operation between the IM and RU in assessing the compatibility between the signage arrangements and train operations. This could be achieved by an SSC.

### 4.4.2 PSI at diverging junctions

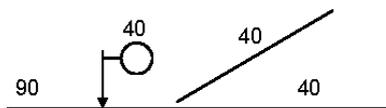
4.4.2.1 A PSI with an arrow indicating the direction of the diverging (lower speed) route shall be provided immediately before a diverging junction (including a facing crossover) over which there is a reduction in permissible speed (see Figure 13).

4.4.2.2 Where the permissible speed of the straight route does not change at the junction, a speed indicator shall not be provided for the straight route.



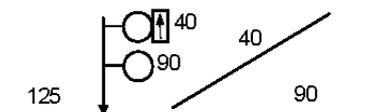
**Figure 13:** An example of PSI at diverging junction with speed reduction on diverging route only

4.4.2.3 Where a lower permissible speed applies equally to both routes, a single PSI shall be provided without directional arrows (see Figure 14).

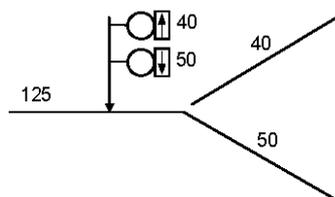


**Figure 14:** Example of PSI at diverging junction with the same speed reduction on both routes

4.4.2.4 Where different permissible speeds commence for each route at a diverging junction or crossover, two PSIs shall be positioned side-by-side. Arrow(s) shall be incorporated into the sign to indicate any divergence (see Figures 15 and 16).



**Figure 15:** Example of PSI at diverging junction with different speed reduction on both routes



**Figure 16:** Example of PSI at diverging junction with no straight route

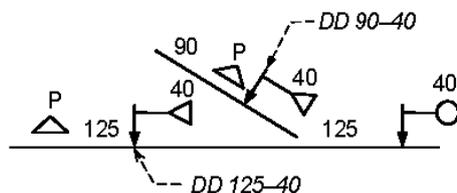
### Rationale

G 4.4.2.5 Provision of speed signs at a junction identifies the permissible speed through the junction.

- G 4.4.2.6 Where the permissible speeds on the diverging routes are the same as the main route, directional arrows do not provide any additional information about the permissible speed of either route.
- G 4.4.2.7 The provision of permissible speed signs side-by-side helps in identifying the speed applicable to each route (main and diverging).
- Guidance**
- G 4.4.2.8 A PSI with an arrow applies only to the diverging route (or routes) in the direction indicated by the arrow. Where only an indicator with an arrow is provided, a PSI can be omitted for the straight route.
- G 4.4.2.9 Where a position light junction indicator (PLJI) is provided, the direction of the arrow corresponds with the orientation of the PSI. This is particularly important where the permissible speed over the straight route is lower than that over the diverging route.
- G 4.4.2.10 A PSI at a diverging junction can be omitted where the permissible speed through the junction is the same for all routes, and is the same as the permissible speed that applies on the approach to the junction. Typically, this applies in low-speed areas such as on the approach to a large station.
- G 4.4.2.11 PSIs applying to different routes are placed side-by-side, not vertically on the same post. This is so that train drivers do not interpret the indicated speeds as differential speeds for the same route.
- G 4.4.2.12 Where space is limited and it is not practicable to position the signs side-by-side, an SSC may decide to position the two PSIs one after the other.

### 4.4.3 PSWI at converging junctions

- 4.4.3.1 Where the criteria set out in 4.1.4 apply at converging junctions, PSWI shall be provided:
- On each signalled approach to a PSI (see Figure 17).
  - So that all approaching trains receive one warning for each permissible speed reduction.



**Figure 17:** Example of PSWIs at converging junction

#### Rationale

- G 4.4.3.2 PSWIs are positioned at converging junctions to inform the train driver that there is adequate deceleration distance to achieve the specified speed reduction at the PSI.

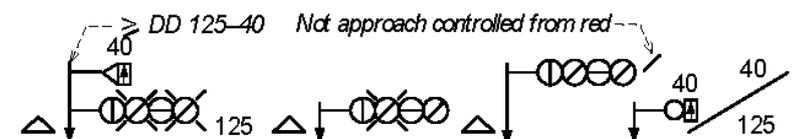
## Signing of Permissible Speeds

### Guidance

- G 4.4.3.3 It is undesirable for a driver to pass more than one PSWI for the same permissible speed indicator. Therefore, if the deceleration distance required for the higher speed approach places the PSWI before a converging junction, the warning for a lower speed approach is placed before the converging junction.
- G 4.4.3.4 In the example shown in Figure 17, the deceleration distance for the lower speed approach (90 mph to 40 mph) requires the warning board to be placed before the converging junction.
- G 4.4.3.5 If the speed on the lower speed approach was such that the deceleration distance for this speed would place the warning board on the main line beyond the converging junction, the warning board would still be placed on the approach to the converging junction, so that it is not passed by a train on the main line that has already passed a PSWI for the same PSI.

### 4.4.4 PSWI at diverging junctions

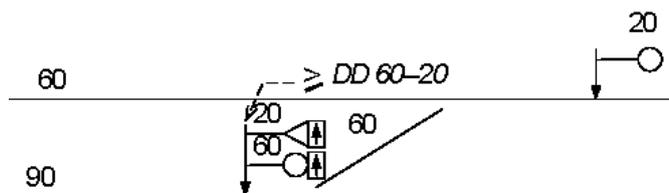
- 4.4.4.1 A PSWI incorporating a directional arrow shall be provided to indicate a permissible speed on a diverging route over or beyond a diverging route ahead, where:
- The junction signal is not approach controlled from red.
  - The required speed reduction meets the criteria set out in 4.1.4.
- 4.4.4.2 Where a PSWI incorporating a directional indication is positioned at a signal that displays a cautionary aspect for the diverging route to which the warning indicator applies:
- The warning indication given by the AWS permanent magnet associated with the signal shall also apply to the warning indicator.
  - A separate AWS permanent magnet shall not be provided for the warning indicator (see Figure 18).



**Figure 18:** Example of PSWI for diverging junction positioned at a signal that displays a cautionary aspect

- 4.4.4.3 Where a PSWI incorporating a directional indication is not positioned at a signal that displays only a cautionary aspect for the diverging route to which the warning indicator applies:
- A separate AWS permanent magnet shall be provided for the PSWI, and
  - The AWS permanent magnet shall be suppressed when the junction signal and any intervening signals between the PSWI and the junction signal have been cleared for a route for which the warning indicator does not apply.
- 4.4.4.4 A PSWI, incorporating a directional arrow, shall be positioned adjacent to the PSI (with directional arrow) at a diverging junction, or crossover (see Figure 19) where:

- a) A reduction in permissible speed on the diverging route beyond the diverging junction (or crossover) requires a PSWI, or
- b) The deceleration distance would position the PSWI in the vicinity of the diverging junction or crossover, or
- c) Either it is not practicable to locate the warning indicator within the diverging junction or crossover, or it is necessary to make it clear to which line the warning indicator applies.



**Figure 19:** Example of PSWI for speed reduction on a diverging route

### Rationale

- G 4.4.4.5 A PSWI with directional arrow is provided on the advance to the diverging junction to indicate that the speed reduction applies to the diverging route.
- G 4.4.4.6 A separate AWS permanent magnet is provided to alert the driver to the PSWI for the diverging route.
- G 4.4.4.7 The PSWI for the diverging route is suppressed when the signals have been cleared for the straight route at the junction, to avoid giving an AWS warning indication which is not applicable when the train is approaching the junction under green signals.
- G 4.4.4.8 When the signal at the junction has not been cleared for either route, an AWS warning indication is received. As this is associated with a PSWI incorporating a directional arrow, the train driver should understand that this only applies to the diverging route ahead.
- G 4.4.4.9 The PSWI with directional arrow is located adjacent to the PSI with a directional arrow to indicate the speed through the crossover. Train drivers should understand that the PSWI applies to a further speed restriction on the diverging route beyond the crossover.

### Guidance

- G 4.4.4.10 Except where approach control of the junction signal from red (see RIS-0703-CCS) enforces a reduction in speed, a PSWI is required for the speed reduction over a diverging junction where it meets the normal criteria for provision of a warning indicator.
- G 4.4.4.11 It is good practice to locate the PSWI, applying to a diverging route, at a signal which displays a cautionary aspect for the diverging route.
- G 4.4.4.12 In this case the same AWS inductor gives a warning indication for the signal and the PSWI. This has the following advantages:

## Signing of Permissible Speeds

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- a) It avoids the need for suppression of the AWS, which would be required for a separate AWS permanent magnet (see section [4.4.4.3](#)).
  - b) The train driver receives information about the turnout speed, to supplement the signal aspect which advises them of the diverging route.
- G 4.4.4.13 PSWI can be located at either the outer (flashing YY) or the inner (flashing Y) signal, depending on the required deceleration distance. If the deceleration distance is less than the Y to R spacing, the preferred arrangement is to locate the warning indicator at the inner signal. Similar arrangements apply for splitting distant signals.
- G 4.4.4.14 Except where the arrangement of [4.4.4.2](#) is applied, a separate AWS permanent magnet is provided to alert the train driver to the PSWI for the diverging route.
- G 4.4.4.15 Except where the arrangement of [4.4.4.2](#) is applied, the AWS permanent magnet associated with the PSWI for the diverging route is suppressed when the signals have been cleared for the straight route at the junction, to avoid giving the driver an AWS warning indication which is not applicable when the train is approaching the junction under green signals.
- G 4.4.4.16 When the signal at the junction has not been cleared for either route, an AWS warning indication is received. As this is associated with a PSWI incorporating a directional arrow, the train driver should understand that this only applies to the diverging route ahead.
- G 4.4.4.17 Where the deceleration distance would position the PSWI in the vicinity of a crossover, the arrangement shown in Figure [19](#) is applied because it is not normally practicable to position a speed sign part way through a crossover.
- G 4.4.4.18 A PSWI is not positioned on the approach side of the permissible speed indicator, because train drivers would interpret the warning indicator with a directional arrow as an indication of the speed through the diverging route at the crossover (as set out in section [4.4.4.1](#)), rather than a speed restriction beyond the crossover.
- G 4.4.4.19 If the speeds and distances shown in Figure [19](#) are such that the deceleration distance approaching the 20 mph speed indicator would require the warning indicator for the move through the crossover to be situated before the crossover, a possible solution would be to reduce the speed through the crossover, such that the deceleration distance is reduced to equal to, or less than, the distance between the crossover and the speed indicator. The arrangement shown in Figure [19](#) could then be applied.
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### 4.5 Provision of AWS magnets for PSWI

- 4.5.1 An AWS permanent magnet shall be provided on the approach to all PSWI provided to satisfy the criteria set out in [4.1.4](#) except:
- a) Where the AWS permanent magnet associated with a signal displaying a cautionary aspect is configured to provide an equivalent warning (see [4.4.4.2](#)).
  - b) On lines not fitted with AWS.
  - c) In AWS gap areas.
  - d) In respect of additional PSWIs.

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### Rationale

- G 4.5.2 An AWS permanent magnet is provided to give an audible warning to the train driver of the approaching speed hazard.
- G 4.5.3 The AWS permanent magnet will generate a brake application if the audible warning is not acknowledged.

### Guidance

- G 4.5.4 The AWS system is configured so that a warning indication is given to the driver on the approach to every PSWI, except as shown above.
- 

### Position of AWS permanent magnet

- 4.5.5 The AWS permanent magnet shall:
- a) Be positioned in accordance with RIS-0775-CCS.
  - b) Not be positioned between any other AWS equipment and its associated signal, board or indicator.

### Rationale

- G 4.5.6 A consistent distance between the AWS magnet and the applicable PSWI helps drivers to reliably identify which equipment the AWS permanent magnet applies to.
- G 4.5.7 It is important that each AWS indication is directly associated with the signal or indicator that the train driver is approaching, which means that AWS permanent magnets provided in connection with PSWIs are not positioned between any other AWS permanent magnet and the equipment associated with it.

### Guidance

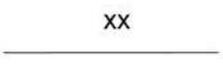
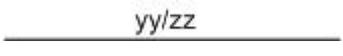
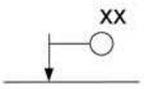
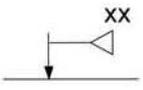
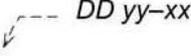
- G 4.5.8 Further details on positioning of AWS permanent magnet are set out in RIS-0775-CCS.
- G 4.5.9 Where independent AWS equipment is provided on the approach to a PSWI (there being no signalled movements in the opposite direction), it will incorporate a permanent magnet only.
- G 4.5.10 GERT8075 specifies the circumstances in which it is acceptable to provide AWS which is not suppressed for signalled movements in the opposite direction, together with AWS cancellation indicators. In these circumstances the AWS permanent magnets provided for permissible speed indicators do not have to be suppressed.
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# Signing of Permissible Speeds

## Appendices

### Appendix A Key to Symbols Used in this Standard

#### A.1 Key to symbols used in this standard

Symbol	Description
	Section of line showing the permissible speed (xx mph)
	Section of line with differential permissible speeds (yy mph and zz mph)
	AWS permanent magnet for permissible speed warning indicator ('P' indicates permanent magnet only)
	PSI (xx indicates speed displayed)
	PSWI (xx indicates speed displayed)
	Position of PSWI at deceleration distance (DD) from the associated PSI (for speed reduction from yy mph to xx mph)
	AWS cancelling indicator
	Distance between the PSWI and associated AWS equipment

## Definitions

Assets	For the purposes of this document, the term 'assets' refers to mainline vehicles or infrastructure.
Attainable speed	The assessed maximum speed that a train can achieve over a specific section of line, where this is less than or equal to the permissible speed.
Automatic Warning System (AWS)	A system that gives train drivers in-cab warnings of the approach to signals, reductions in permissible speed and temporary / emergency speed restrictions, and to apply the brakes in the event that a train driver does not acknowledge cautionary warnings given by the system within the specified time. <i>Source: GERT8075.</i>
Converging junction	One or more trailing points within a signal section where trains can be routed from alternative lines towards a common destination.
CSM RA	Common Safety Method for Risk Evaluation and Assessment. COMMISSION REGULATION (EU) No 2015/1136 of 13 July 2015 amending Implementing Regulation (EU) No 402/2013 on the common safety method for risk evaluation and assessment.
Differential speed	<p>A value of permissible speed or speed restriction that is only applicable to certain trains.</p> <p>Differential speeds include:</p> <ul style="list-style-type: none"><li>a) Standard differential speed - Two values of permissible speed, or two different speed values for a temporary speed restriction, each of which is applicable to one of two standard categories of trains, as defined in the Rule Book.</li><li>b) Non-standard differential speed - A permissible speed for a specific type of train, which is different from that for other types of trains on the same section of line. This comprises 'Permissible speed indicators with letters' and 'Enhanced permissible speed indicators' as described in the Rule Book. Non-standard differential speeds are not applicable to temporary or emergency speed restrictions.</li></ul>
Diverging junction	One or more facing points within a signal section where a train can be routed towards alternative lines.
Diverging route	Any signalled line beyond a diverging junction that is not designated as the principal route. This includes routes on which only a shunt MA applies.
Driveability	The ease and reliability that train drivers are able to perform train operations in accordance with rules and procedures, throughout the range of operational and ambient conditions applicable to

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	each train, within the operational context and while performing typical required duties.
Enhanced permissible speed (EPS)	The permitted speed (higher than the permissible speed) over a section of line which applies to a specific type of train operating at cant deficiencies in excess of those permitted at the permissible speed (see GERT8012 and GCRT5021).
GB mainline railway	Mainline railway has the meaning given to it in the Railways and Other Guided Transport Systems (Safety) Regulations 2006 (as amended) and the associated exclusions. GB Mainline Railway is the mainline railway network excluding any railway in Northern Ireland, the Channel Tunnel, the dedicated high speed railway between London St Pancras International Station and the Channel Tunnel, and any other exclusions determined by the member state.
Indicator	A lineside signalling asset that is capable of displaying a signalling indication.
Infrastructure	For the purposes of this document, infrastructure includes all the network subsystems: infrastructure, energy and trackside CCS, as defined in the Railway Interoperability Directive 2008/57/EC.
Infrastructure manager (IM)	'Infrastructure manager' means any 'body' or firm responsible in particular for establishing, managing and maintaining railway infrastructure, including traffic management and control-command and signalling; the functions of the infrastructure manager on a network or part of a network may be allocated to different bodies or firms. <i>Source: Article 3(2) of Directive 2012/34/EU.</i>
Interpret / interpreting (signalling system displays)	The action of understanding the information conveyed by the signal aspect or indication after it has been read (for example, understanding that a red signal aspect means 'limit of MA').
Junction / junction area	A geographical location within the railway infrastructure that incorporates one or more diverging junctions or converging junctions
Lineside operational sign	Lineside operational signs include speed indicators, warning indicators and emergency indicators, as depicted in GIRT7033: Lineside Operational Safety Signs, Appendix A, sections AD, AE and AF.
Lineside signalling asset	A lineside signal, indicator or lineside operational sign (excluding signs associated with temporary and emergency speed restrictions).
Lineside signalling system	A type of signalling system that presents information about movement authorities, routing, equipment status, operational information and changes in permissible speeds using lineside displays. The system is configured using the following asset types:

	<ul style="list-style-type: none"><li>a) Signals.</li><li>b) Route indicators.</li><li>c) System status indicators.</li><li>d) Train dispatch system indicators.</li><li>e) Some types of lineside operational sign.</li></ul>
Maximum speed [of a train]	The maximum speed at which a train is able to run, as determined by the lowest maximum speed of any rail vehicle which is included in the formation of the train.
Minimum deceleration distance (MDD)	A signalling system parameter that supports technical compatibility with the specified braking performance of trains when decelerating to a lower target speed after the full service brake is commanded, taking account of: <ul style="list-style-type: none"><li>a) The highest train speed when the brake is commanded</li><li>b) The infrastructure gradient after the brake is commanded</li><li>c) The required speed reduction.</li></ul>
Minimum signalling braking distance (MSBD)	A signalling system parameter that supports technical compatibility with the specified braking performance of trains when decelerating to a stop after the full service brake is commanded, taking account of: <ul style="list-style-type: none"><li>a) The highest train speed when the brake is commanded</li><li>b) The infrastructure gradient after the brake is commanded</li><li>c) The required stopping position.</li></ul>
Permissible speed	The authorised maximum speed over a section of line, either for all trains or (where differential speeds are applied) for specific types of trains, as set out in the Sectional Appendix.
Permissible speed indicator (PSI)	A lineside signalling asset that displays the permissible speed(s) over a section of line.
Permissible speed warning indicator (PSWI)	A lineside signalling asset that displays the advance warning of a reduction in permissible speed.
Proposer	The railway undertaking (RU) or infrastructure manager (IM) proposing a change that has a potential to affect physical interfaces between vehicles and infrastructure.
Railway undertaking (RU)	Any private or public undertaking the principal business of which is to provide rail transport services for goods and/or passengers, with a requirement that the undertaking must ensure traction; this also includes undertakings which provide traction only. <i>Source: Article 3 (a) of Directive 2004/49/EC.</i>

## Signing of Permissible Speeds

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RIS	Rail Industry Standard.
Risk	The combination of the likelihood of occurrence of harm and the severity of that harm (specifically defined in CSM RA regulation as: the frequency of occurrence of accidents and incidents resulting in harm (caused by a hazard) and the degree of severity of that harm).
Route Section	A section of a route over which a regular long-distance commuter is assumed to travel (in one direction) for the purposes of calculating the risk to the commuter from overturning of the train in which they are travelling. The route section extends between stations or junctions at which the commuter joins and leaves the route. Route sections for long-distance commuters are in the order of 100 miles long.
Safe integration	According to Commission Recommendation 2014/897/EU (2b) on matters related to the placing in service and use of structural subsystems and vehicles under Directives 2008/57/EC and 2004/49/EC, 'safe integration' means the action to ensure the incorporation of an element (for example, a new vehicle type, network project, subsystem, part, component, constituent, software, procedure, organisation) into a bigger system, does not create an unacceptable risk for the resulting system.
Train	A train is defined as (a) traction unit(s) with or without coupled railway vehicles, including light locomotive and self-propelled rail vehicle operating in rail mode, with train data available operating between two or more defined points.
Train protection and warning system (TPWS)	Train Protection and Warning System (TPWS) is a system mitigating Signals Passed At Danger and non-respect of permissible speeds.
UK	United Kingdom.
Weekly operating notice (WON)	The official printed notice which includes advice to drivers of temporary speed restrictions and alterations to permissible speeds.

Other defined terms are included in GKG0802: Glossary of Signalling Terms.

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## Signing of Permissible Speeds

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### References

The Standards catalogue gives the current issue number and status of documents published by RSSB: <http://www.rsb.co.uk/railway-group-standards.co.uk>.

RGSC 01	Railway Group Standards Code
RGSC 02	Standards Manual

### Documents referenced in the text

#### Railway Group Standards

GCRT5021	Track System Requirements
GERT8000	Rule Book
GERT8012	Controlling the Speed of Tilting Trains Through Curves
GERT8075	AWS and TPWS Interface Requirements
GIRT7033	Lineside Signs
GKRT0075	Requirements for Minimum Signalling Braking and Deceleration Distances

#### RSSB Documents

GIGN7634	Index for Lineside Signs
GKG0675	Guidance on Lineside Signal Spacing and Speed Signage
GKG0802	Glossary of Signalling Terms
RIS-0713-CCS	Lineside Signalling Layout Driveability Assessment Requirements
RIS-0703-CCS	Signalling Layout Requirements
RIS-0737-CCS	Signal Sighting Assessment Requirements
RIS-0775-CCS	AWS and TPWS Application Requirements
RIS-3215-TOM	Weekly Operating Notice, Periodical Operating Notice and the Sectional Appendix

#### Other References

RS521	Signals, hand signals, indicators and signs handbook
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