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Guidance on Block System Interface Requirements

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Guidance on Block System Interface Requirements

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This Railway Group Guidance Note does not supersede any other Railway Group documents.

Supply

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Guidance on Block System Interface Requirements

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Guidance on Block System Interface Requirements

Part 1 Introduction

1.1 Purpose of this document

This document gives guidance on interpreting the requirements of Railway Group Standard GK/RT0055 Block System Interface Requirements. It does not constitute a recommended method of meeting any set of mandatory requirements.

All requirements in GK/RT0055 are reproduced in the sections that follow. Guidance is provided as a series of sequentially numbered clauses prefixed 'GN' immediately below the text to which it relates. Where there is no guidance given, this is stated.

Specific responsibilities and compliance requirements are laid down in the Railway Group Standard itself.

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1.3 Approval and authorisation of this document

The content of this document was approved by:

Control Command and Signalling (CCS) Standards Committee on 08 April 2010 and reconfirmed on 13 June 2013.

This document was authorised by RSSB on 29 July 2013.

Guidance on Block System Interface Requirements

Part 1 Purpose and Introduction

1.1 Purpose

- 1.1.1 This document mandates the requirements for block systems interfaces between signalling system infrastructure and railway operations.
- 1.1.2 The requirements are applicable to routes signalled using lineside signalling in accordance with GK/RT0045: Lineside Signals, Indicators, and Layout of Signals, and are not applicable to routes solely operated using the European Rail Traffic Management System (ERTMS).

1.2 Introduction

1.2.1 Background

- 1.2.1.1 Signalled movement authorities are generated by the infrastructure manager and displayed to railway undertakings at the signalling system interface by lineside signals and indicators (see GK/RT0045 Lineside Signals, Indicators and Layout of Signals).
- 1.2.1.2 Block systems are the means by which the signalling system regulates the generation of movement authorities so that only one train is authorised in a block section at a time (with some specific exceptions where shunting or permissive working is allowed).
- 1.2.1.3 Depending on the type of block system used, movement authorities at some locations can include additional signalling system interfaces (for example, single line tokens).
- 1.2.1.4 The railway between two adjacent block sections may be designated as station limits, which may comprise one or more signal sections controlled by the same signal box as the adjacent block sections. Guidance on station limits is set out in Appendix A of GK/GN0655 Guidance on Block System Interface Requirements.
- 1.2.1.5 Signallers are responsible for authorising train movements in accordance with the GK/RT8000 Rule Book. This includes the rules for:
 - a) Operation of block systems in accordance with the relevant block signalling regulations and any local operating instructions.
 - b) Controlling train movements within station limits.
 - c) Operation of the signalling control and display system.
 - d) Communication with train crew.
- 1.2.1.6 Train crew are responsible for controlling train operations in accordance with the GE/RT8000 Rule Book. This includes the rules for:
 - a) Controlling train movements in accordance with the movement authorities received, using their route knowledge and traction knowledge.
 - b) Operating signalling equipment where it is specifically provided for use by train crew.
 - c) Communication with signallers.

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1.2.2 Principles

- 1.2.2.1 Irrespective of the type of block system used, there are two key block principles associated with the interface between the infrastructure manager and railway undertakings:
- a) Except where permissive working or shunting is specifically permitted, each block section is reserved for one train at a time, and
 - b) Where permissive working is permitted, a train may only enter an occupied block or signal section under the authority of a position light signal, semaphore subsidiary signal or semaphore shunting signal.

1.2.3 Related requirements in other documents

- 1.2.3.1 The following Railway Group Standards contain requirements that are relevant to the scope of this document:

GE/RT8075	AWS and TPWS Interface Requirements
GI/RT7033	Lineside Operational Safety Signs
GK/RT0044	Controls for Signalling a Train onto an Occupied Line
GK/RT0045	Lineside Signals, Indicators and Layout of Signals
GK/RT0077	Ground Frames and Shunters' Releases
GK/RT0192	Level Crossing Interface Requirements

1.2.4 Supporting documents

- 1.2.4.1 The following Railway Group documents support this Railway Group Standard:
- | | |
|-----------|---|
| GK/GN0655 | Guidance on Block System Interface Requirements |
|-----------|---|

GN01 No guidance is associated with Part 1.

Guidance on Block System Interface Requirements

Part 2 Guidance on Block System Requirements

2.1 Compatibility requirements for block systems

2.1.1 Compatibility between block systems and train operations

- | | |
|---------|--|
| 2.1.1.1 | Before any new or changed infrastructure or rolling stock (including lineside and / or on-board control, command and signalling equipment) is brought into use, it is necessary to check that it is compatible with the infrastructure and rolling stock assets and operations on the routes on which it is to be used. |
| 2.1.1.2 | GE/RT8270 sets out the requirements and responsibilities for the assessment of compatibility between rolling stock and infrastructure assets, including control, command and signalling equipment and their operations. It sets out the arrangements by which the assessment of compatibility is undertaken and identifies those responsible for managing that assessment. |
| 2.1.1.3 | This document GK/RT0055 mandates the specific requirements for the assessment of compatibility for the different types of block systems. |

GN02 The generic process to be used for assessing operational compatibility between railway infrastructure and rolling stock is set out in GE/RT8270.

GN03 An assessment of compatibility should be made if proposed changes to the signalling layout or signalling operations affect the interface with railway undertakings or infrastructure managers operating stations. The infrastructure manager and affected parties should co-operate by sharing information that is relevant to the assessment.

GN04 The assessment of compatibility should invite participation from all parties affected by the proposed signalling arrangements.

- | | |
|---------|--|
| 2.1.1.4 | <p>The assessment shall check that the block system is compatible with the movement authorities required by railway undertakings, including:</p> <ul style="list-style-type: none"> a) Passenger and non-passenger movements. b) Permissive working. c) Shunting. |
|---------|--|

GN05 Incompatibility between the block system and train operations may result in operational difficulties and could be a causal factor of an operational incident.

GN06 The assessment should check that the block system is compatible with all of the following:

- a) The train movement specification, including:
 - i) Passenger and non-passenger train operations through clear sections.
 - ii) Shunting movements into the block section and within station limits (where relevant), including attaching, detaching, propelling and run-round movements.
 - iii) Reversing movements.
 - iv) Permissive movements (for platform sharing and for attaching / detaching vehicles).
 - v) Train stabling (including standage requirement).
 - vi) Dwell times at stations and during shunting.

Guidance on Block System Interface Requirements

- b) Train parameters, including:
 - i) The types of traction units and rolling stock involved.
 - ii) Train formations.
 - iii) Permissible and attainable speeds.
 - c) Railway undertaking professional driving policies.
- GN07 The provision of signals for shunting movements should include an assessment of:
- a) The frequency and extent of shunting movements.
 - b) The number and length of vehicles to be shunted, including any stabled vehicles.
 - c) Propelling, reversing and running round movements.
 - d) The method of displaying movement authorities at ground frames (as set out in GK/RT0077).
 - e) The operational interface at the entrance to each depot and yard (as set out in GK/RT0077).
- GN08 Where a shunt-ahead facility is provided for a train to proceed into a forward block section, the assessment of compatibility should check that the local operating instructions cover:
- a) On a single line worked by tokenless block or 'one train without token' systems, the requirement for the train to proceed in rear of the home signal applicable to the opposite direction before returning. This is due to the passage into and out of the block section being defined by the sequential operation of adjacent train detection sections, and
 - b) On a single line worked using a token system, the requirement for the driver to obtain the token.
- GN09 GK/RT0044 sets out the requirements for permissive train movements.

- 2.1.1.5 The assessment shall check that the signalling system is compatible with the risk mitigation measures that will be put in place by railway undertakings, including:
- a) Compatibility between the omission of opposing route locking on shunt class routes and the shunting that will take place.

- GN10 Opposing locking may be omitted between opposing shunt class routes where there is a requirement to allow repeated forwards and backwards shunting movements without requiring repeated actions by the signaller.
- GN11 The assessment of compatibility should check that the movement authority displayed by opposing signal OFF aspects can be used only by shunting.
- GN12 If there is a possibility that more than one driver could respond to the signal OFF aspects, opposing locking should be provided to prevent the clearance of opposing signals.

- b) Compatibility between approach locking release times and the time required for trains to stop when a movement authority is shortened or withdrawn.

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- GN13** The Rule Book, GE/RT8000, requires drivers to stop their train and contact the signaller whenever a signal ahead of the train is observed to change to display a more restrictive aspect than was previously readable (for example, green to double yellow or single yellow to red). The signaller should only attempt to set a different route after communicating with the driver.
- GN14** If the change of signal aspect either shortens or withdraws a movement authority where an approaching train may have passed the sighting point of the first cautionary aspect, the signal route should be approach locked until the train has either stopped or has passed the signal at the end of the movement authority.
- GN15** A timing function should be used to release the approach locking to prevent the signaller from setting a different route until the train has stopped.
- GN16** The assessment of compatibility should check that approach locking release times are compatible with the time required for trains to stop (or pass the stop signal denoting the end of the movement authority).
- GN17** The following approach locking release times may be used for the conditions, types of signal and types of traffic described. The times should be adjusted according to the specific risk associated with each signal:
- a) On mixed traffic lines where the distance between consecutive signals is:
 - i) Not more than 825 m (900 yds) 2 minutes
 - ii) 826 m – 1650 m (901 – 1800 yds) 3 minutes
 - iii) Over 1650 m (1800 yds) 4 minutes
 - b) On lines usually carrying only passenger traffic where the distance between consecutive signals is:
 - i) Not more than 1470 m (1600 yds) 2 minutes
 - ii) Over 1470 m (1600 yds) 3 minutes
 - c) At terminal or bay platforms and other signals at which trains always start from rest:
 - i) Usually 1 minute
 - ii) Where long trains are usually standing ahead 2 minutes
 - d) At major through stations or critical junctions:
 - i) Approach controlled from red 2 minutes
 - ii) With max 275 m (300 yds) berth TC occupied 1 minute
 - iii) Approach controlled from single yellow aspect 1 minute
 - e) At signals reading from a siding:
 - i) Where no berth track circuit is provided 1 minute
 - ii) Where a berth track circuit is provided 30 seconds
 - f) Position light signals not associated with a main aspect (except where cleared automatically as part of a main route, or already covered above) 30 seconds.

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- c) Compatibility between the length of overlaps (including reduced and restricted overlaps), and the overrun risk that needs to be controlled.

- GN18 Overlaps are provided by the infrastructure manager as a contribution towards the mitigation of SPAD risk. Other mitigations may also be provided by the infrastructure manager (for example, train protection and warning systems) and railway undertakings (for example, a professional driving policy).
- GN19 Where it is not practicable to provide a full overlap, a reduced overlap can be used in conjunction with a reduced permissible speed on the approach to the signal. The assessment of compatibility should check that reduced overlap lengths are compatible with the SPAD risk associated with reduced train speeds.
- GN20 The length of the permissible speed on the approach to the signal to which the reduced overlap applies should be compatible with the distance required for trains to stop at that signal. Further guidance about stopping distances is set out in GK/GN0675.
- GN21 Table 1 sets out the permissible speeds and the reduced overlap lengths that can be used. These are the minimum parameters, which should be adjusted according to the specific risk associated with each signal:

Permissible speed / attainable speed	Minimum overlap length
15 mph	45 m
20 mph	55 m
25 mph	60 m
30 mph	70 m
35 mph	75 m
40 mph	80 m
45 mph	90 m
50 mph	105 m
55 mph	125 m
60 mph	135 m

Table 1 Reduced overlap lengths for colour light signals in TCB areas

- GN22 For main class routes, the permissible speed should apply for at least the distance from the signal as far back as the point from which trains can brake from the permissible speed to stop at the signal. For main class routes, the permissible speed should commence at the point from which all trains can brake from the permissible speed to stop at the signal.
- GN23 Restricted overlaps may be provided in addition to a full or reduced overlap so that a warning class route may be set if the full overlap is not available. The assessment of compatibility should check that the point at which the preceding signal is approach released from red is compatible with the required reduction in train speed on the approach to the signal at the end of the movement authority.

- 2.1.1.6 The assessment shall check the method of displaying movement authorities at the lineside using:
- Worked signals (see GK/RT0045).
 - Lineside signs and buffer stops used as signals (see GK/RT0045).
 - Lineside operational signs (see GI/RT7033).

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- GN24 The equipment used to display movement authorities should be compatible with the train movements required. Further guidance about permitted types of signals, route indicators, lineside indicators and standard performance categories is set out in GK/GN0645.
- GN25 Where a stop board is provided, the assessment should check that:
- The provision of a stop board is compatible with the requirement for all trains to stop, and
 - The wording displayed on the stop board provides sufficient information so that train crew know what actions are required before the train passes the stop board.
- GN26 Lineside operational signs should only be used to display movement authority information where the driver is responsible for controlling train movements in accordance with local operating instructions. This may include co-operation between the driver and an authorised person who is responsible for authorising train movements within a defined area (for example, a shunter).
- GN27 Further guidance about movement authorities in connection with ground frame operations is set out in GK/GN0677.

2.1.1.7 The assessment shall check the risk of driver misunderstanding where AWS equipment is not suppressed on bi-directional lines (see GE/RT8075 and GI/RT7033).

- GN28 The decision to provide AWS cancelling indicators instead of AWS suppression should check that the risk of driver misunderstanding is reduced to an acceptable level. Requirements for AWS are set out in GE/RT8075.

2.1.1.8 The assessment shall check that, where required, facilities are provided for authorised railway personnel to either:

- Verify and report train completeness to the signaller at the end of block sections and at token control points, or
- On lines fitted with radio electronic token block (RETB), report train location to the signaller.

- GN29 If the signaller is not situated in a position to be able to directly observe the tail lamp, one of the following alternative arrangements may be used to advise the signaller that the train is complete:
- A tail light detection and display system, comprising:
 - Tail light cameras, positioned beyond the end of the block section and aligned to detect the light emitted by tail lamps fitted to all types of rolling stock authorised to operate over the route, and
 - A visual display unit to display tail lamps to the signaller
 - A control device (for example, a 'train arrived' plunger) that is operated by authorised railway personnel in accordance with local operating instructions.
 - Use of axle counters.
- GN30 The infrastructure manager may agree arrangements with railway undertakings to report train completeness to the signaller, either verbally or by operation of a control device. The

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assessment should check that the arrangements are sufficient to control the risk of the signaller assuming that a train is complete when it is not.

GN31 If the signaller is not situated in a position to be able to directly observe the tail lamp, the infrastructure manager may agree arrangements with another party to report train completeness to the signaller, either verbally or by operation of a control device (for example, a 'train arrived' plunger). The assessment should check that the arrangements are sufficient to control the risk of the signaller assuming that a train is complete when it is not.

GN32 On lines operated using the radio electronic token block (RETB) system, the assessment of compatibility should also check that the facilities provided for the driver to report train location to the signaller are sufficient to control the risk of incorrect reporting.

2.1.1.9 The assessment shall check that, where token or one-train staff systems are used, the requirement for token or one-train staff exchange on single lines is compatible with train operations:

- a) Using direct transfer of the single line token / one-train staff between the signaller and the driver.
- b) Where an auxiliary token instrument or one-train staff instrument is provided for drivers to obtain and / or return tokens without requiring direct transfer between the signaller and the driver.
- c) Where a no signaller token instrument is provided as part of a no signaller token block or no signaller token block – remote system.

GN33 The following methods of working a single line include a requirement for all trains to stop at each signal box or token control point due to the need to exchange tokens:

- a) Electric token block (see 2.2.4).
- b) No signaller token block (see 2.2.5).
- c) No signaller token block – remote (see 2.2.6).
- d) One-train system with staff (see 2.2.7).
- e) RETB (see 2.2.9).

GN34 The following methods of working a single line may be used where there is a requirement to operate trains without stopping (there being no token exchange protocol):

- a) Track circuit block (see 2.2.1).
- b) Interlocked absolute block (see 2.2.2).
- c) Tokenless block (see 2.2.3).
- d) One-train system without staff (see 2.2.8).

GN35 If a token system is used on a single line, the assessment should check that the method of working single lines is compatible with:

- a) The requirement for the driver to obtain a token or one-train staff before the train movement takes place on the single line, and
- b) The requirement for the driver to return the token or one-train staff after the train has cleared the single line.

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- GN36 Where the method of working includes transfer of a physical token at a signal box, the assessment should check that:
- a) The arrangements for issuing and returning the token at the end of the single line are compatible with the type of rolling stock that will be operated, and
 - b) Where an auxiliary token instrument is provided as a means of improving operational efficiency, drivers are able to leave the cab to operate the token instrument.
- GN37 Where the method of working includes transfer of a physical token or one-train staff at a token control point that is not located at a signal box, the assessment should check that the functionality of the signalling system is compatible with the operating instructions provided for the signaller and train crew. This may include:
- a) Compatibility between the operation of the train and the requirement for the driver to be in possession of the token or one-train staff, and
 - b) Compatibility between operation of the train and the requirement for the driver to inform the signaller that the single line is clear.

2.1.1.10 The assessment shall check that, where a signal box controlling two adjacent single line sections can be switched out:

- a) The applicability of each long section token / one-train staff and short section token / one-train staff is compatible with train operations, and
- b) The different arrangements for token exchange / one-train staff exchange when an intermediate signal box is opening and closing is compatible with train operations.

- GN38 Further guidance about tokens and one-train staffs is set out in 2.3.1 and 2.3.2.
- GN39 Although worked signals may be provided, the token or one-train staff is the prime means of issuing a movement authority on a single line worked in accordance with:
- a) Electric token block regulations.
 - b) No signaller token block regulations.
 - c) No signaller token block – remote regulations.
 - d) One-train working with staff regulations.
 - e) RETB instructions.
- GN40 The assessment should check that the arrangements for switching out an intermediate signal box are compatible with the driver's understanding of the different movement authorities associated with each short section and long section token.
- GN41 If an intermediate signal box may be switched out when a train is present at that signal box, the assessment of compatibility should check the arrangements for the signaller and driver to exchange short section and long section tokens.

2.1.1.11 The assessment shall check that the risk mitigation measures are sufficient to reduce risk to an acceptable level:

- a) At the transition between lines worked in accordance with different block regulations.

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GN42 The assessment of compatibility should check that sufficient risk control measures are in place to control the risk of a driver misunderstanding the extent of a movement authority at transitions between different types of single line system.

GN43 Particular attention should be given to transitions that change the method used to issue movement authorities (for example, at transitions between track circuit block working and electric token block working).

- b) When either a token or one-train staff is carried beyond the end of the applicable single line section.
- c) To prevent the insertion of a token or one-train staff in the wrong single line instrument.

GN44 Additional guidance about the configuration of tokens and one-train staffs is set out in 2.3.1 and 2.3.2.

GN45 The assessment should assess the risk that a driver may carry the token or one-train staff beyond the end of the single line section to which it applies. While adjacent single line sections should be configured to prevent insertion of an incompatible token or one-train staff, there may be circumstances where there is a risk of further over-carrying towards another section with the same token configuration. Typically, this risk may be a significant factor where an intermediate signal box is being switched out and a short section token is mistaken for a long section token.

GN46 Where the risk is considered to be significant, consideration should be given to maintaining the signal at the exit of the single line section at danger until the token has been replaced into the token instrument at that end of the single line.

- d) To manage a discrepancy between the number of trains in each direction and the number of available tokens.

GN47 Where there is known to be a long-term, significant mismatch between the number of trains in each direction over a single line, a method of single line operation should be used that does not use tokens.

GN48 Where a token system is provided, the assessment should check that the total number of tokens within each single line system is sufficient to cover planned train movements.

GN49 The token system may incorporate a mechanism to securely transfer tokens between the token instruments at each end of the single line. The assessment should check that the arrangements are in place to transfer tokens to address the following circumstances:

- a) For planned long-term operations, where there is known to be a routine requirement to transfer tokens, and
- b) For unplanned short-term operations, for example when extra trains have to be operated over the single line.

2.1.1.12 The assessment shall check that the facilities required to support voice communication between the driver and the signaller are in accordance with the GE/RT8000 Rule Book at the following locations:

- a) Stop signals.
- b) Token control points.

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- c) At other locations where there is an anticipated or known requirement for communication.

GN50 The infrastructure manager and railway undertakings should agree what systems should be provided at each location where compliance with the GE/RT8000 Rule Book involves voice communication between the driver and the signaller, typically at stop signals, token control points, level crossings and ground frames.

GN51 Voice communications may be provided using either of the following:

- a) Lineside operational telephone systems (for example, signal post telephone systems).
- b) Secure radio systems.
- c) Face-to-face communication.

GN52 The method chosen should take account of any requirement to record the voice communications that take place.

2.1.1.13 The assessment shall check that the risk mitigation measures necessary to control the risk accruing from secondary hazards introduced by the fail-safe design of the interlocking that result in degraded situations (for example, hand signalling), are sufficient to reduce risk to an acceptable level.

GN53 The assessment should check that the block system is capable of achieving availability targets for movement authorities generated by the signalling system.

GN54 The assessment of compatibility should check that the risk associated with issuing an incorrect movement authority is reduced to an acceptable level in the following circumstances:

- a) When the signalling system is operating normally.
- b) When the signalling system is operating in degraded mode (for example, using proceed on sight aspects, as set out in GE/RT8071).
- c) When an alternative method of working is used to permit train operations during a signalling system failure.

2.1.1.14 The assessment shall check, for RETB systems:

- a) The functionality of voice and data radio communication systems, including coverage.
- b) The means of train identification that is compatible with the train reporting system.
- c) The procedures for testing the on-train equipment prior to a train operating over a route signalled using the RETB system.

GN55 Further guidance about RETB systems is set out in GK/GN0554.

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2.2 Requirements for movement authorities

2.2.1 Track circuit block

2.2.1.1 Except where signalling facilities are specifically provided to facilitate permissive working, as set out in GK/RT0044, the track circuit block system shall only permit one train in a signal section at a time.

- GN56 The track circuit block system is compatible with train operations on unidirectional or bi-directional lines where the train detection system (see GK/RT0028) is:
- a) Capable of detecting all of the rolling stock that will be authorised to run on the route, and
 - b) Continuous through each signal section so that it is not necessary for the signaller to observe train completeness.
- GN57 The Sectional Appendix, required by GO/RT3215, identifies all of the lines worked in accordance with the track circuit block regulations. This information is available to infrastructure managers and railway undertakings.
- GN58 The GE/RT8000 Rule Book sets out the operational requirements when train movements take place on track circuit block lines, including:
- a) The meaning of signal aspects and indications and how to identify them.
 - b) The requirements for drivers, signallers and persons controlling train movements who need to observe and act upon the signal aspects and indications applicable to them.
 - c) The requirements for signallers operating signalling equipment under the track circuit block method of signalling.
 - d) The arrangements for operating trains that are not compatible with the train detection system provided.
- GN59 Except where either permissive working is authorised, or stationary trains may be divided (for example, in station platforms), drivers should understand that the presence of more than one train in a signal section at a time is an operational irregularity that should be reported to the signaller in accordance with the GE/RT8000 Rule Book.
- GN60 The requirements for displaying permissive movement authorities on lines worked using the track circuit block system are set out in GK/RT0044.

2.2.1.2 The requirements for provision of signals on lines operated in accordance with the track circuit block regulations are set out in GK/RT0045.

- GN61 The signalling system should be designed in accordance with the following principles:
- a) Movement authorities are displayed by lineside signals. Further guidance about signal aspect sequences and the layout of signals is set out in GK/GN0645.
 - b) Except where the signalling system is configured to display shunting or permissive movement authorities, the signalling system should only authorise one train in each signal section at a time.
 - c) A clear overlap should be available at the end of each movement authority.

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2.2.2 Absolute block (including interlocked absolute block)

2.2.2.1 The signalling system shall only permit one train in an absolute block section, intermediate block section or station limits signal section at a time, except where signalling facilities are specifically provided to facilitate permissive working, as set out in GK/RT0044.

- GN62 The absolute block system is compatible with train operation on unidirectional lines, single lines and bi-directional lines where:
- a) A signal box is provided at each end of the block section, and
 - b) The level of traffic is compatible with the requirement for signallers to confirm that each block section is clear by observing the tail lamp on each train.
- GN63 If the signaller is not able to directly observe the tail lamp on each train to confirm that the block section is clear, a facility should be provided to indicate train completeness to the signaller (for example, a train arrived plunger). Further guidance, if this requires operations by a railway undertaking or an infrastructure manager operating a station, is set out in 2.1.1.8.
- GN64 In addition to the absolute block section, a signal box may also control one or more intermediate block sections and signals within station limits. A facility should be provided for the signaller to confirm that:
- a) The intermediate block section is clear up to the clearing point after the passage of each train (for example, a continuous train detection system), and
 - b) The requirements for operating stop signals within station limits have been met.
- GN65 The Sectional Appendix, required by GO/RT3215, identifies all of the lines worked in accordance with the absolute block regulations. This information is available to infrastructure managers and railway undertakings.
- GN66 The GE/RT8000 Rule Book sets out the operational requirements when train movements take place on absolute block lines, including:
- a) The meaning of signal aspects and indications and how to identify them.
 - b) The requirements for drivers, signallers and persons controlling train movements who need to observe and act upon the signal aspects and indications applicable to them.
 - c) The requirements for signallers operating signalling equipment under the absolute block method of signalling and within station limits.
- GN67 Except where permissive working is authorised, drivers should understand that the presence of more than one train in an absolute block section is an operational irregularity that should be reported to the signaller in accordance with the GE/RT8000 Rule Book.
- GN68 Permissive working is not compatible with either:
- a) Intermediate block sections, or
 - b) Single lines or bi-directional lines worked using the interlocked absolute block system.
- GN69 The requirements for displaying permissive movement authorities, which may be provided on unidirectional lines worked using the absolute block system and within station limits, are set out in GK/RT0044.

Guidance on Block System Interface Requirements

2.2.2.2 The requirements for provision of signals on lines operated in accordance with the absolute block regulations are set out in GK/RT0045, including signals associated with:

- a) Absolute block sections, and
- b) Station limits.

- GN70** The signalling system should be designed in accordance with the following principles:
- a) Except where the signalling system is configured to display a permissive movement authority, the signalling system should only authorise one train in each block section and station limits signal section at a time.
 - b) Movement authorities are displayed by lineside signals, which may be either colour light signals or semaphore signals. The following stop signals should be provided (further guidance about signal aspect sequences and the provision of stop signals is set out in GK/GN0645):
 - i) A section signal (which may be combined with the home signal), at the entrance to the block section.
 - ii) A home signal (or equivalent stop board) at the exit of the block section. The home signal protects station limits, where relevant.
 - iii) Where station limits incorporates more than one signal section, an additional home signal (second home, third home and so on) at the entrance of each signal section.
 - c) The section signal (or intermediate block home signal) should only display a movement authority when the forward block section is clear as far as the clearing point beyond the next home signal.
 - d) On single lines or bi-directional lines, the absolute block instruments for each direction should be interlocked so that it is only possible to issue a movement authority for one direction at a time.
 - e) A home signal should only display an unrestricted movement authority if it includes all forward signal sections within station limits and the forward block section. A facility should be provided to advise the signaller when a train has reached the sighting point of each home signal.

GN71 Figures 1 and 2 show examples of typical signalling layouts worked in accordance with the absolute block system.

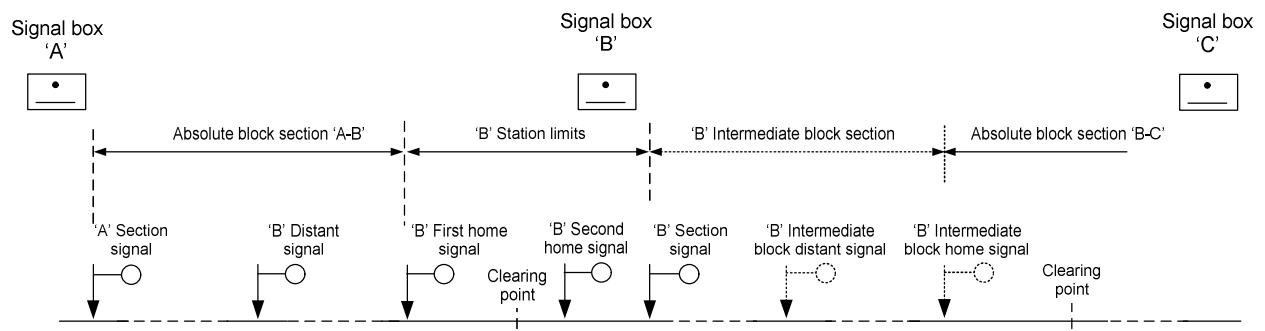


Figure 1 An example of the signals provided with an absolute block system, including an intermediate block section and station limits (only one direction shown)