

Ref:	SSI8003-66
Issue:	9
Date:	05/09/2015
Compliance date:	06/12/2015

SSI Applications Manual

Restoration of Points

Endorsement, Authorisation and Issue Record

For endorsement, authorisation and issue record of this document, please refer to the SSI Applications Manual Contents, NR/L2/SIG/17002.

Copyright Network Rail

Ref:	SSI8003-66
Issue:	9
Date:	05/09/2015
Compliance date:	06/12/2015

User information

This Network Rail standard contains colour-coding according to the following Red–Amber–Green classification.

Red requirements – *No variations, could stop the railway*

- **Red requirements shall** always be complied with and achieved.
- Red requirements shall be presented in a red box **with the word “shall” or expressed as a direct instruction**.
- Accountability for the efficacy of red requirements lies with the Professional Head/Standard Owner.
- Red requirements are monitored for compliance.
- Corrective actions shall be enforced if deviations are discovered through functional checks (e.g. engineering verification visits, audit or Operations Self-Assurance).

Amber requirements – *Controlled variations, approved risk analysis and mitigation*

- **Amber requirements shall** be complied with unless variation has been approved in advance.
- Amber requirements shall be presented with an amber sidebar **and with the word “shall” or expressed as a direct instruction**.
- Accountability for the efficacy of these requirements lies with the Professional Head/Standard Owner, or their nominated Delegated Authority.
- Amber requirements are monitored for compliance.
- Variations **may** be permitted. Variations are approved by the Standard Owner or through existing Delegated Authority arrangements.
- Corrective actions shall be enforced if **non-approved** variations are discovered through functional checks (e.g. engineering verification visits, audit or Operations Self-Assurance).

Green – *Guidance*

- Guidance is based on good practice. Guidance represents supporting information to help achieve **Red** and **Amber** requirements.
- Guidance shall be presented with a dotted green sidebar **and with the word “should” (usually in notes) or as a direct instruction**.
- Guidance is **not mandatory** and is not monitored for compliance.
- Alternative solutions may be used. Alternative solutions do not need to be formally approved.

Ref:	SSI8003-66
Issue:	9
Date:	05/09/2015
Compliance date:	06/12/2015

- Decisions made by a competent person to use alternative solutions should be backed up by appropriate evidence or documentation.

Contents

1	Introduction	4
2	Principles	4
2.1	The Automatic Restoration Call	4
2.2	Visual Indication	4
3	Interlocking Data	5
3.1	Automatic restoration not provided	6
3.2	Automatic restoration provided	8
3.3	Two Track Section Option	13
4	Panel Processor Data	16
4.1	Flashed Common and Reverse Leg Route Lights	16
4.2	Flashed Reverse Detection Route Light Only	17
5	Special Features	18
5.1	Reverse detection of automatically restored points	18
5.2	Restoration of Points Held Reverse by Flank Locking	19
5.3	TORR Delayed until Route's Second Track Section Cleared	22
5.4	Optional Audible Alarm	25

Ref:	SSI8003-66
Issue:	9
Date:	05/09/2015
Compliance date:	06/12/2015

1 Introduction

Signalling Principles Standard GK/RT0064 [1] provides for certain points to be automatically restored to normal, or for the Signaller to be given a visual indication to remind him/her to set the points normal. A visual indication is also given if unreleased route locking is preventing automatic restoration of the points or if the points have failed to respond to an automatic restoration call.

2 Principles

Note that in track circuited areas, the enhanced track circuit bobbing protection as required by Signalling Principles Standard GK/RT0011 [2] shall be applied to all routes requiring the points reverse (see SSI8003-10F Section 1.1).

A general requirement applied throughout is that intervention by the Signaller or ARS through point keying or route setting will inhibit self restoration and inhibit or terminate the visual restoration indications. This requirement is detailed in the principles shown below.

2.1 The Automatic Restoration Call

The points are called to move to their normal position 5 - 10 seconds after all the following conditions have been satisfied (a value of 10 seconds has been used in the data examples).

- (i) The points are free of all locking holding them reverse.
- (ii) The points key is not in the reverse position.
- (iii) The points are not detected normal.
- (iv) The points are not already called normal.

2.2 Visual Indication

A visual indication is given to the Signaller by flashing the white route lights through the points reverse. The lights to be flashed for each point end are assumed to be either just the route light containing reverse detection, i.e. RKUKE, or the route lights throughout the common and reverse legs, i.e. RKUKE, and RUKE and CUKE as provided. For a crossover the lights associated with both point ends are flashed.

- a) Restoration provided and route not cancelled after train:

The visual indication is initiated when the train has taken the route and has passed over the points reverse, but the points remain route-locked through the route for that movement not being cancelled, whether by TORR failure or the Signaller failing to pull the entrance button. Sufficient delay in starting the indication is provided after the train has passed over the points reverse in order to allow the sequential release of the route locking at the points to be effective.

Ref:	SSI8003-66
Issue:	9
Date:	05/09/2015
Compliance date:	06/12/2015

This indication is terminated when the points become free to go normal. Also, it is inhibited or terminated by the following Signaller or ARS intervention:

- the points key has been or is moved to the reverse position, or
- a route has been or is set or overset through the points reverse for a subsequent train.

- b) Restoration provided and points have not responded to an automatic restoration call:

A further 8 seconds have elapsed since the automatic restoration call above but the points have not yet been detected normal. (The usual points-out-of-correspondence indication is also given if appropriate).

This indication is terminated by the points subsequently being detected normal. Also, it is inhibited or terminated by the following Signaller or ARS intervention subsequent to the automatic restoration call:

- putting the points key normal or reverse, or
- route setting through the points normal or reverse.

- c) Restoration not provided - reminder to key points normal.

The visual indication is initiated when the train has taken the route and has passed over the points reverse.

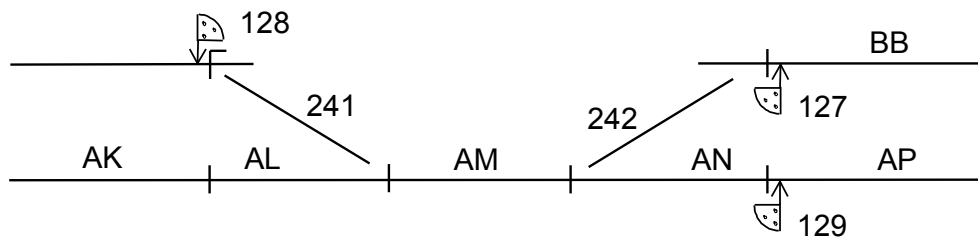
This indication is terminated when the Signaller or ARS intervenes to call the points normal by point keying or route setting. Also, it is inhibited or terminated by the following Signaller or ARS intervention:

- the points key has been or is moved to the reverse position, or
- a route has been or is set or overset through the points reverse for a subsequent train.

3 Interlocking Data

In the following data examples, the points to be restored are 241. The routes through these points reverse are 127B, 129B, and both those from signal 128 (128A & 128B).

Ref:	SSI8003-66
Issue:	9
Date:	05/09/2015
Compliance date:	06/12/2015



3.1 Automatic restoration not provided

3.1.1 Identities

In the FLG file two additional latch identities are allocated:

L241ROCC: This latch is used to register that a train has passed over the points reverse.

L241UKFL: This latch indicates to the Panel Processor that the visual indication is required.

3.1.2 OPT File

The following data is included in the OPT file, in telegram data before the appropriate points special, as a conditional statement that calls a "Carry Out Commands At" data sub-routine, which in turn calls a further such sub-routine. These sub-routines are located outside of the telegram data, and are employed to minimise data processing time. As this data will not be evaluated during the initialisation period after a Mode 1 or 2 start-up, the sequence will not start until the Signaller's Panel switches, etc., are operational.

If the points are split such that the data for controlling the points appears in two output telegrams then the following data is included in just the lower numbered of the two telegrams.

The data takes the following form:

*O22

```
if P241 cn                                     / (i)
then L241ROCC xs , L241UKFL xs
else @241FL
\
```

```
'P241    G s 76 $
```

```
. / end of tgm 22
```

Ref:	SSI8003-66
Issue:	9
Date:	05/09/2015
Compliance date:	06/12/2015

```

*241FL
  if TAL o , P241 cr                               / (ii)
  then L241ROCC s
  \

  if L241ROCC s , TAL c                             / (iii)
  then L241ROCC xs , L241UKFL s
  \

  if L241UKFL s then @241STOPFL \                   / (iv)
\

*241STOPFL
  if ( P241 kr , P241 xkn                           / (v)
    or R127B s , S127 set stick , S127 clear bpull
    or ( R128A s or R128B s )
      S128 set stick , S128 clear bpull
    or R129B s , S129 set stick , S129 clear bpull
  )
  then L241UKFL xs
  \
\

```

The subroutine *241FL is only processed if points 241 are not controlled normal. Data block (ii) registers when a train has occupied the track section at the points (AL), with the points controlled reverse, by setting latch L241ROCC.

Data block (iii) will then register when track section AL is cleared by setting latch L241UKFL, this indicating to the Panel Processor that the indication (i.e. flashing the relevant route lights) is required. Latch L241ROCC is unconditionally unset at this point by data block (iii) thus providing a one shot feature.

Once latch L241UKFL has been set then data sub-routine (v) is entered via data block (iv). If the points key is in the reverse position or any of the routes through the points reverse have been overset for a second train since the first train entered its route then data block (v) will immediately unset latch L241UKFL thus either inhibiting the flashing indication, or terminating it if it has already started flashing.

Calling the points normal will terminate the flashing indications by data block (i) unsetting latch L241UKFL. Latch L241ROCC is also unset, just in case the points were called normal immediately on clearing track section AL before this latch could be unset by data block (iii).

In track circuited areas, where the route beyond the points leads onto a non track circuited line then enhanced track circuit bobbing protection applied to the last sub-route will result in this sub-route not being freed until 15 seconds after the clearing of the track circuit. Sub-route UAL-AC is so affected in the above data example. When the route lights through the points reverse are flashing this obscures the indication to the Signaller of whether the points are still route locked or not so in this

Ref:	SSI8003-66
Issue:	9
Date:	05/09/2015
Compliance date:	06/12/2015

situation the initiation of the flashing indications should be delayed until the track section has been cleared long enough for the sub-route to be capable of being freed. Thus the test for track section clear "TAL c" in data block (iii) should be changed to a test for track section clear for 16 seconds "TAL c> 16".

3.2 Automatic restoration provided

3.2.1 Identities

In the FLG file three additional latch identities are allocated:

L241ROCC: This latch is used to register that a train has passed over the points reverse.

L241UFL: This latch controls whether the visual indication is required after points-reverse route locking has not been freed quickly enough.

L241UKFL: This latch indicates to the Panel Processor that the visual indication is required.

In the ELT file one additional elapsed timer identity is allocated:

E241AUN: This elapsed timer controls the timing of the call on the points to be automatically restored to normal and also of the associated visual indication.

3.2.2 OPT File

The following data is included in the OPT file, in telegram data before the appropriate points special, as a conditional statement that calls a "Carry Out Commands At" data sub-routine, which in turn calls further such sub-routines. These sub-routines are located outside of the telegram data, and are employed to minimise data processing time. As this data will not be evaluated during the initialisation period after a Mode 1 or 2 start-up, the sequence will not start until the Signaller's Panel switches, etc., are operational.

If the points are split such that the data for controlling the points appears in two output telegrams then the following data is included in just the lower numbered of the two telegrams.

Ref:	SSI8003-66
Issue:	9
Date:	05/09/2015
Compliance date:	06/12/2015

The data takes the following form:

*O22

```

if P241 dn                                     / (i)
then L241ROCC xs , E241AUN stopped
    L241UFL xs , L241UKFL xs
else @241AUN
\

'P241    G s 76 $

```

. / end of tgm 22

*241AUN

```

if TAL o , P241 cr                             / (ii)
then L241ROCC s
\

```

```

if L241ROCC s , TAL c > 4                       / (iii)
then L241ROCC xs , L241UFL s
\

```

```

if L241UFL s then @241STOPFL \                 / (iv)

```

```

if P241 fn                                     / (v)
then @241TI
else E241AUN stopped
\

```

```

if ( L241UFL s or E241AUN > 18 )               / (vi)
then L241UKFL s
else L241UKFL xs
\

```

\

*241STOPFL

```

if ( UAL-AC f , UAL-CA f                       / (vii)
    or P241 kr , P241 xkn
    or R127B s , S127 set stick , S127 clear bpull
    or ( R128A s or R128B s )
        S128 set stick , S128 clear bpull
    or R129B s , S129 set stick , S129 clear bpull
    )
then L241UFL xs
\

```

\