



**AUSTRALIAN RAIL TRACK CORPORATION LTD**

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**Discipline**  
**Engineering Standard – NSW**

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**Signalling**

**Title**  
**Bridging or False Feeding of Signalling Circuits**

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## About This Standard

This Standard defines the requirement for placing Momentary or Temporary bridging on operational signalling circuits and specifies the processes to be followed, jumper wire requirements, and the Authorisation necessary.

Superseded by ESM-24-01

## Document History

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### List of Amendments –

ISSUE	DATE	CLAUSE	DESCRIPTION
1.1	01/09/2004		▪ Reformatting to ARTC Standard
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## 1 General

BRIDGING OR FALSE FEEDING IS NORMALLY NOT PERMISSIBLE.

The bridging of contacts on relays or on any circuit controlling device, which will in any way impair the protection normally provided by the relay or circuit controlling device, must not be done except when absolutely necessary and only in strict accordance with procedures prescribed in this Signalling Maintenance Procedures.

False feeding is a form of bridging and the restrictions similarly apply.

THE USE OF BRIDGING ALWAYS REQUIRES THAT THE PROTECTION DEFEATED BE PROVIDED BY SOME ALTERNATE MEANS.

## 2 Momentary Bridging (Hand Held) for Releasing

Bridging of specific circuit contacts for release of track locking or indication locking, as prescribed in maintenance procedure SMP 06, requires the signalling maintainer manually giving the release to hold the bridge on momentarily for just sufficient time to allow the requested release.

The bridging wire should always be hand held by the signalling maintainer giving the release (at least at one end) and must never be left connected.

### 2.1 Temporary Bridging Arrangements

Temporary bridging does not include bridging which is hand held and momentarily applied for releasing purposes under prescribed conditions.

Temporary bridging is bridging permitted in only a few special circumstances, as prescribed, where it is necessary to minimise the disruption to rail traffic when signalling equipment is damaged or disconnected/disarranged for renewal or other work and where safe and reliable arrangements are able to be made to prevent conflicting train movements and/or to secure the apparatus concerned so that it cannot be moved out of correspondence with the interlocking.

Authorisation of temporary bridging will generally be confined to bridging of closed contacts of trackside signalling apparatus that indicate the locked, fail-safe position of the apparatus (e.g. the normal indicating contacts of signals at stop or trainstops at stop, or the detection contacts of points closed and locked) and will generally require that that specific signalling apparatus be booked out of use and be disconnected from its power source in order to prevent its operation and to secure it in correspondence with the interlocking.

## 3 Regulation Jumper Wires for Temporary Bridging

Where temporary bridging is permitted as prescribed in these Procedures, regulation jumper wires are to be used.

The jumper wires must be not less than 1.5 metres long, be flexible, minimum conductor cross section 1.5mm squared, with insulation 0.6/1kv standard and be a bright colour which is to be orange unless otherwise approved by the Signal Engineer who authorises the temporary bridging..

Jumper wires are to be registered with the Maintenance Signal Engineer. Where preferable, the owner may be the signalling employee in charge, who retains the numbered jumper wires locked in a box and issues them for particular work, as required, utilising a detailed register and signatures for receipt of issue and return.

Jumper wires are to be accounted for by the owner and if a jumper wire is lost or missing, the details are to be reported to the Maintenance Signal Engineer. Any jumper wire found is to be forwarded to the Maintenance Signal Engineer advising details of the finding. Details of lost or destroyed jumper wires are to be recorded in their respective register.

Acceptable options for meeting these requirements include:-

- a) Do not keep bridging jumper wires on hand but make them up only as and when required to be used with the approval of the Maintenance Signal Engineer. Destroy immediately after use.

OR

- b) Keep bridging jumper wires secured in a locked unit in the depot/office and identify each of them by the depot/office name and consecutive number. Keep details in a register with individuals signing each bridging jumper wire in or out when it is issued and when returned.

OR

- c) Identify bridging jumper wires owned by individuals with their name or employee number or some other number they select and register with the Maintenance Signal Engineer.

The connection lugs, plugs or clips at each end of the jumper wire must be insulated as far as practical and applied and held secured so that there is no possibility of them connecting across adjacent circuit terminals or of an end coming loose and touching other exposed terminals.

Should it be necessary to place the bridging jumper wires within closed equipment housings and if the standard jumper wires will not fit then the particular jumper wires involved may be reduced in length on the authority of the authorising Signal Engineer with the objective of keeping jumper wires at their maximum practical length.

Before use the jumper wires are to be examined to check they are clean and in good condition and when not in use they are to be kept in separate containers or plastic bags, in the custody of the owner who is to keep a check that none are missing. The number of jumper wires retained should be limited and jumper wires no longer required should be destroyed.

In an emergency the authorising Signal Engineer can approve the making up of an improvised jumper wire for temporary bridging. The emergency jumper wire is to be fitted with an identification label. The authorising Signal Engineer will write down a description of this jumper wire in the margin of the Authorising Form. Immediately after the emergency use, the jumper wire is to be destroyed.

## 4 Authorisation for Bridging

Bridging of contacts of vital signalling relays or control devices must only be applied by suitably accredited signalling maintainers.

## 5 Momentary Bridging

Momentary bridging for the release of track locking or indication locking is permitted by signalling maintainers in accordance with the procedures prescribed here in and on request from the signaller. All details of the request must be entered in the Train Register book and signed by both the Signaller and signal maintainer.

### 5.1 Temporary Bridging

**NOTE:** Temporary bridging around contacts in vital signalling circuits constitutes a disconnection of signalling equipment and the respective Network Rules and Procedures are to be observed.

Temporary bridging may be authorised by approved circuit diagrams. All other cases where temporary bridging is permitted as prescribed in these procedures require authorisation by a Signal Engineer on an appropriate, numbered form SF J101/A titled "Authority for Temporary Bridging of Contacts".

The signalling employee who is to apply the bridging must ensure that they have fully explained the details to the authorising Signal Engineer including the details of the terminal numbers that will be bridged.

The authorising Signal Engineer must ensure that he/she understands the circumstances requiring the bridging, and satisfy themselves that the bridging will be applied correctly by the signalling maintainer involved, that the protection defeated will be covered by alternate means of protection while the bridging is applied, and that the bridging will be removed and the normal functioning of the equipment will be tested before the alternate protection is removed.

The signalling employee applying the temporary bridging is also to ensure the local signalling maintainer responsible for the maintenance of the equipment concerned is made fully aware of the details.

### 5.2 Authority for Temporary Bridging of Contacts - Form SF J101/A

The Form 'Authority for Temporary Bridging of Contacts SF J101/A' is to be completed and signed by the authorising Signal Engineer when issuing the authority and again when advised that the bridging is removed.

In emergency and only when necessary, if a Signal Engineer who is the Authorising Signal Engineer cannot reasonably obtain an "Authority for Temporary Bridging of Contacts" Form, then the Signal Engineer, provided he/she establishes that all the other temporary bridging requirements are met and it is safe to do so, may verbally issue an interim Authority for Temporary Bridging of Contacts with the details written on an improvised form. In this case the interim Bridging Authority Number shall be the initials of the authorising Signal Engineer followed by the date. Also, in this case, a proper "Authority for Temporary Bridging of Contacts" Form must be completed at the earliest opportunity by the authorising Signal Engineer to supersede the interim copy.

Each SF J101/A form issued from a particular office is to be numbered with the next consecutive Bridging Authority number. The Bridging Authority number shall be alphanumeric and identify the office from which it is issued.



## 6 Removal of Temporary Bridging

The signalling maintainer responsible for removing the bridging is to inform the Authorising Signal Engineer that the bridging has been removed.

These arrangements for removal are to be discussed with the authorising Signal Engineer.

Wherever practical the signalling employee who applies the bridging is to be the signalling employee who removes the bridging. Where not the same signalling employee, arrangements must be made for the prompt return of jumper wires to the signalling employee who applied the bridging, who is to follow up this return with the signalling employee responsible for their removal as soon as practical after the planned removal time.

In all cases the Authorising Officer is to be promptly advised of the removal of the temporary bridging, either directly by telephone or by forwarding (or faxing) the field copy, signed off accordingly.

The authorising Signal Engineer is to pursue advice of the removal of bridging if he /she has not been so informed promptly after the planned removal time.

### 6.1 Temporary Bridging for an Extended Period

Where bridging is required to extend beyond one shift this would normally be for planned work and the bridging jumper wires should be ones issued from the depot/office concerned. These are to be left on between shifts where required, as prescribed.

In exceptional cases if a signalling employee applies their own personal bridging jumper wire(s) then they may remove them at the end of their shift and see them replaced by ones provided by the relieving signalling employee, provided the Signal Engineer has been consulted and agrees with this arrangement. Frequent changing of bridging wires (between shifts) is to be avoided.

### 6.2 Bridging for Planned Works

For planned work by workforces who are not the District staff, or for planned work requiring the temporary bridging to be on for more than one shift, a field copy of the Bridging Authority in its written form is to be obtained by the signalling employee in charge of the field work before the work commences

Where applicable, a copy of the completed SF J101/A Form is to be forwarded by the authorising Signal Engineer to the local Maintenance Signal Engineer for his/her information and retention on file. The original is to be retained by the authorising Signal Engineer and kept with the book of forms.

The local Maintenance Signal Engineer is to examine the details on the copy of the completed SF J101/A Form, investigate any matters of concern and, when satisfied, initial the copy for filing in the District office.

**Note :** If there is a possibility of confusion or the incorrect terminals being bridged (e.g. when signalling employees are unfamiliar with the particular equipment or the location, or circuits are unusual or complex, or circuits are undergoing modification including changes to naming or labelling etc.) then a sketch of the circuit diagram is to be prepared showing the temporary bridging to be applied.

A copy of the sketch is to be signed by the authorising Signal Engineer and forwarded to the signalling employee who is to apply the bridging.

The sketch is to be titled “Temporary Bridging for ..... equipment at ..... location on date ..... in accordance with Bridging Authority No.....”

The sketch is to be signed by the signalling employee who applies the bridging at the time of bridging and also is to be signed by the signalling employee who removes the bridging at the time of removal, and then promptly returned to the Signal Engineer who is to attach it with his/her copy to the book of SF J101/A forms.

### **6.3 Temporary Bridging in exceptional circumstances**

For situations not prescribed in this ARTC procedure special approval is required from the ARTC General Manager ISP or nominated Signalling representative, or delegated Senior Engineer.

## **7 Work Instructions for Planned Work.**

Further to the above requirements, where there is work which is not of a minor nature, such as planned upgrading or project work, and which extends over more than one shift or involves different signalling employees applying and removing the bridging, then Work Instructions are to be prepared by the Signal Engineer in charge of the work and issued to the respective team leaders involved, specifying the bridging application and removal details as well as the testing requirements.

For planned works, the Signal Engineer in charge of the work should provide regulation jumper wires, individually registered and formally issued by and returned to him/her (or delegate) together with the associated Work Instructions; in such case the use of jumper wires from other sources for the work must be forbidden.

For planned works, a sketch of the circuit diagrams showing the temporary bridging should also be used.

#### **Note: New Non-Commissioned Equipment**

With new signalling equipment, prior to it being commissioned into use, temporary bridging may be utilised to facilitate testing on the authority of the appointed Test Engineer or Commissioning Engineer; as the circuit controlling device at this stage has not yet been commissioned to provide protection, temporary bridging of its contacts does not come under the requirements of this procedure but under the relevant procedures in the manuals/specifications for testing and commissioning new and altered works.

## **8 Network Procedures (NPR 704)**

Where signalling equipment is booked out of use and bridging is applied, The requirements of Network Procedure NPR 704 is to be followed, the bridging authority number is to be entered in the space provided at section 4 on the Infrastructure Booking Authority form (NRF 003). The word ‘BRIDGED’ in brackets is to be entered against the effected equipment in the column headed “Infrastructure Equipment details” under section 3 of the above form. following the entry.

e.g. ‘No... points (BRIDGED)’.

When the signalling equipment is to be restored to use the signalling maintainer signing the form is to ensure that the bridging has been removed and the signalling is safe to restore to use.

By signing the NRF 003 form the signalling maintainer certifies that the signalling equipment has been tested and is operating safely and correctly and is fit to return to use.

## 9 Testing Procedures When Bridging Removed

After the bridging is removed the signalling contacts that were bridged out must be function tested to be effective in their normal operation of the relevant signalling circuit. Such testing is to be completed before the alternate protection is removed and before the signalling equipment is booked back into use.

## 10 Other Situations Not Detailed In The Procedures

Bridging of circuit contacts that in any way impairs the protection normally provided by the relay or circuit controlling device, is not permitted except as specifically prescribed by detailed procedures in this signalling Maintenance Procedures or as specifically determined by the ARTC GM ISP or nominated Signalling representative.

In any case, temporary bridging must not be connected across any contacts of vital signalling equipment which is providing protection for the movement of trains where it:-

- prevents signalling apparatus properly returning to a more restrictive position or to a locking position, or
- allows signalling apparatus to indicate falsely that it is in a restrictive or locking position where it could actually be in an unprotected permissive or releasing position, or
- allows signalling apparatus to operate to a more permissive or unlocked position when it is not safe to do so.

### **Note: Non-Vital Equipment and Circuits**

If it is necessary to avoid significant disruption to services, the contacts of non-vital circuit controlling devices in non-vital circuits, or the contacts of non-vital circuit controlling devices providing non-vital switching in vital signalling circuits, may be temporarily bridged by a suitably accredited signalling maintainer provided that the non-vital controlling devices and the terminals being bridged are clearly physically separate from the vital signalling equipment.

**11 AUSTRALIAN RAIL TRACK CORPORATION Signalling Form SF J101/A Rev.2**

**AUTHORITY FOR TEMPORARY BRIDGING OF CONTACTS**

THIS FORM MUST BE COMPLETED FOR AUTHORITY TO APPLY TEMPORARY BRIDGING (WHICH IS NOT AUTHORISED BY APPROVED CIRCUIT DIAGRAMS) AROUND CONTACTS OF SIGNALLING CONTROL DEVICES

<b>AUTHORISATION</b>	<b>BRIDGING AUTHORITY No.</b> _____
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**Authorising Officer:** \_\_\_\_\_ (Name & Position)

**Employee Authorised to Apply Bridging:** \_\_\_\_\_ (Name & Position)

**Employee Required to Remove Bridging:** \_\_\_\_\_ (Name & Position)

**Planned Application Date:** \_\_\_\_ / \_\_\_\_ / \_\_\_\_      **Planned Removal Date:** \_\_\_\_ / \_\_\_\_ / \_\_\_\_

**Location:** \_\_\_\_\_      **Equipment:** \_\_\_\_\_

**Circuits:** \_\_\_\_\_      **Contacts:** \_\_\_\_\_

**Reason for Bridging:** \_\_\_\_\_

**Alternate Protection:** \_\_\_\_\_

**Procedures to be Observed:** \_\_\_\_\_

<b>BRIDGING DETAILS</b> (Sketch of circuits diagram issued <input type="checkbox"/> YES <input type="checkbox"/> NO Tick which is applicable)			
Jumper Wire	Circuit	From Contact / Terminal	To Contact / Terminal
1			
2			
3			
4			

**Local Signal Engineer** \_\_\_\_\_ **consulted / advised on:** \_\_\_\_ / \_\_\_\_ / \_\_\_\_  
 (if applicable)

**Authorising Officer's Signature:** \_\_\_\_\_ **Date :** \_\_\_\_ / \_\_\_\_ / \_\_\_\_

*After signature, authority may be issued verbally, advising the Bridging Authority Number; copies of the form should be sent to the signalling employee authorised to apply bridging and the local Signal Engineer and the local Maintenance Supervisor for their information, unless the bridging will be removed within the current shift. The original is to be retained with the book of forms and frequently checked by the Authorising Officer for follow up of outstanding removal advice.*

<b>Signature of Signalling Employee Receiving Handover</b>			

<b>REMOVAL ADVICE</b>	
The _____ jumper wire(s) for the bridging listed above were removed (insert number of)	
by _____ (insert Name)	On: ____ / ____ / ____
(Advice received from _____ )	
<b>Signature of Officer receiving advice:</b> _____	Date: ____ / ____ / ____

*Immediately upon completion of the form, a copy is to be forwarded by the Authorising Officer to the local Maintenance Supervisor for information and a copy forwarded to the local Signal Engineer. The local Maintenance Supervisor is to retain the copy on file. The completed original is to be retained by the Authorising Officer with the book of forms and the next form to be used is to be given the next consecutive Bridging Authority number.*