

Engineering Instruction Electrical Distribution Unit	EI D 18-20
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This Engineering Instruction includes urgent engineering information. Adherence to the information in this Instruction is <b>MANDATORY</b> .	
<b>Locking of Hawker Siddeley SafeBond Switchgear Disconnecter</b>	
Audience: <ul style="list-style-type: none"> <li>Network Maintenance Division</li> <li>Infrastructure and Services Division, TfNSW</li> </ul>	Main Points: <ul style="list-style-type: none"> <li>Replacement of locks on the Locking mechanism of the Rail Connection Function</li> </ul>
Primary Affected Document: PR D 78105 DANGER Tags for Electrical Equipment PR D 78104 Locking Systems for Electrical Equipment	

## Scope

This Engineering Instruction sets out the requirements to remove the current metallic lock attached to the SafeBond Disconnecter (rail connecting function) and replace it with a non-metallic fastener (cable tie) and Danger Tag.

## Background

TfNSW via the Power Supply Upgrade program has introduced new DC switchgear into the network. The new switchgear (Hawker Siddeley SafeBond) incorporates a motorised rail connection feature (with an alternate manual drive) for use in future remote 1500V rail connection operations.

To prevent inadvertent operation of the manual drive, an access cover secured in position by a metallic padlock is fitted to the SafeBond Disconnecter.

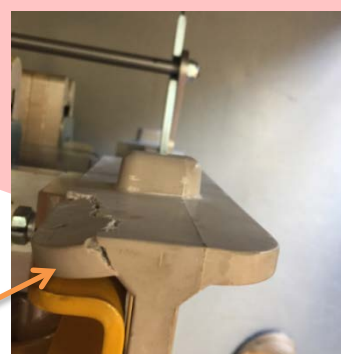
During commissioning this has been locked with a special metallic padlock and associated danger tag by commissioning staff as per the manufacturer's manual.

Rail connecting is still carried out via separate facilities per PR D 78305.

Two known incidents occurred, involving the metallic padlock

- the metallic padlock may impact on the frame of the breaker

Damaged Frame at rear of switchgear



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2. the metallic padlock has the potential to create a flash over within the breaker

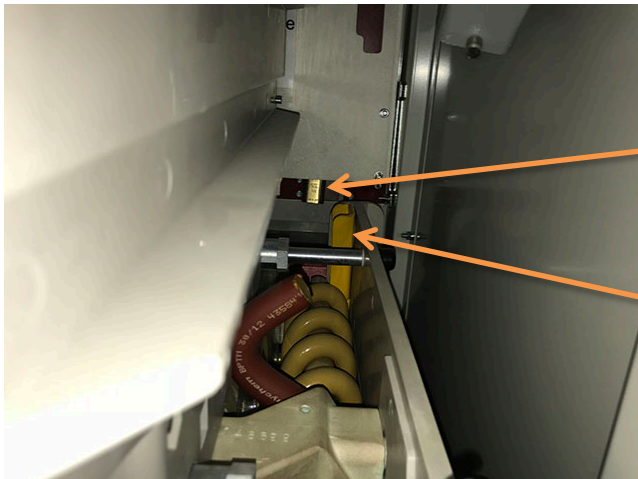
### Cubicle Shutter barrier Raised



### Cubicle Shutter Barrier Lowered



### Cubicle HSCB Racked In



Padlock and associated danger tag to be replaced

Live 1500V DC

## Action required

1. All Hawker Siddeley Lightning Switchgear shall be inspected for damage to the frame.
2. All Locks and Danger Tags applied to the Hawker Siddeley Switchgear SafeBond Disconnecter access cover shall be replaced with a non-metallic cable tie with the tail cut off and a Danger Tag secured in such a manner that it cannot protrude beyond the shutter barrier when raised.
3. Prior to racking in the DCCB truck, check for foreign objects e.g. spanners.
4. Review and update Equipment Local Instructions on securing and restoration process of Hawker Siddeley Lightning Switchgear.

## Contact

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Engineering Procedure  
Electrical Distribution Unit

PR D 78104

# Locking Systems for Electrical Equipment

Version 1.1

Date in Force: 23 August 2017

Procedure

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## Document control

Version	Date	Author/ Prin. Eng.	Summary of change
1.0	11 November 2015	Chris Leung	First issue as a Sydney Trains document, rebranded from previous RailCorp SMS-06-EN-0555 V1.2
1.1	23 August 2017	Wayne Halls	Management and Return of keys to EDU

## Summary of changes from previous version

Summary of change	Section
<i>Note for the requirement to return keys to EDU</i>	3

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## 1 Purpose and Scope

To specify locking system standards to be used by workers, to ensure:

- the safety of themselves and other persons, and
- the integrity of RailCorp electrical equipment.

## 2 General

### 2.1 Precautions When Conducting Work

Workers shall ensure that electrical equipment at a voltage greater than extra-low voltage that has been de-energised to allow electrical work on or near exposed electrical equipment is not inadvertently re-energised while the work is being carried out.

The detailed isolation procedures for High Voltage, 1500 Volt DC and Low Voltage equipment are detailed in the appropriate procedures, namely:

- PR D 78203 High Voltage Operating Procedures,
- PR D 78305 1500V Operating Procedures, or
- PR D 78401 Isolation and Energisation of Low Voltage Equipment.

‘Danger Do Not Operate’ tags (DANGER Tags) serve as a warning that the electrical equipment to which they are attached with a Special Lock, shall not be operated. For further details refer to the procedure ‘*PR D 78105 DANGER Tags for Electrical Equipment*’.

Figure 1 shows examples of ‘Lock Out’ kits that can be used where practicable for different LV applications.

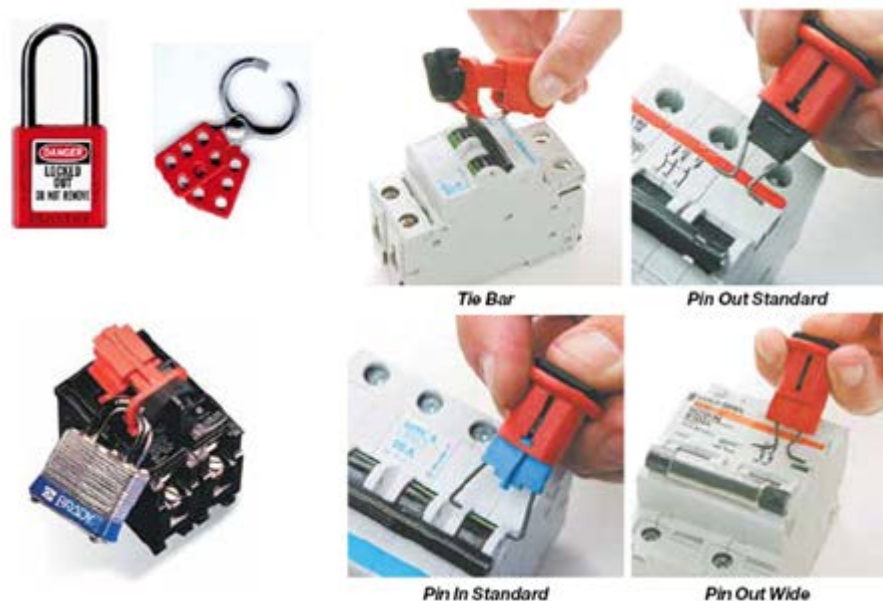


Figure 1 Examples of ‘Lock Out’ Kits

Keys for the types of locks (standard/ special) listed below shall only be issued to persons authorised for duties requiring them.

A signed register of the keys issued shall be kept at each key issuing location. Unauthorised copies of a key for any of the locks listed below shall not be made.

## 2.2 Precautions When Leaving Work

High Voltage and 1500V DC equipment shall be secured at all times either directly or by being located in a secured area to prevent inadvertent operation of the equipment.

Where practicable, Low Voltage equipment should be secured at all times either directly or by being located in a secured area to prevent inadvertent operation of the equipment.

## 3 Standard Locks

Access to, and operation of, electrical equipment is restricted by the following types of locks:

Lock	Used for
C1	Non-traction substations and substation (traction and non-traction) yards
C1A	Sectioning huts, link areas, 1500 volt field switches, HV field switches, Low Voltage Distribution Supply Main Switch Boards and collapsible ladders to live equipment. (ie. locks which prevent access to live HV equipment)
C1B	Low Voltage Installation Supply Main Switch Boards, (ie. locks preventing access to locations containing enclosed equipment) which may be operated by station staff
D1	Traction substations and sectioning huts with external links
Falcon 22 or R	Signalling Equipment Power Rooms
No. 2	Low Voltage switchboard. (May also be locked with the local electricity distributor's lock)
M	Low Voltage switchboards at various locations in the Northern Region

C keys unlock any of the C series locks.

C1 keys unlock C1, C1A, and C1B locks.

C1A keys unlock C1A and C1B locks.

### **NOTE:**

*The Manager EDU is the nominated custodian for C and D type keys.*

*Keys shall be recorded and issued / used only by personnel authorised for the relevant duties. Any person or organisation that does not have the required authorisations shall cease operation and access of equipment/areas that are controlled by C and D type locks and return the keys to the EDU section.*



## 4 Special Locks

### 4.1 General

Where it is necessary to secure an isolating device for the protection of personnel or equipment, the Standard Lock shall be replaced with a Special Lock. A Special Lock may be any lock not listed above and not otherwise in general use.

Where practicable, the following types of padlock may be used as special locks:

- S - Mains "Special" lock
- SS - Mains "Small Special" lock
- Bridge - Cover flaps on 2kV switches.

Where a Special Lock is used, it should also secure any associated DANGER Tags.

*(PR D 78105 DANGER Tags for Electrical Equipment).*

Special Locks are used in addition to DANGER Tags to provide added security where individual isolating devices or their enclosures can be locked.

### 4.2 Application of Special Locks

Isolating devices are secured with a Special Lock by the:

- Authorised Person performing the work, or
- Authorised Person holding the Authority, WHVI, or
- Person issuing Substation Access Permit or Low Voltage Access Permit for the work to be undertaken, or

in support of the process for application of a DANGER Tag as per '*PR D 78105 DANGER Tags for Electrical Equipment*' section 2.1.

### 4.3 Removal of Special Locks

The Special Lock shall be removed only on the direction of the:

- Electrical System Operator after the Authority, WHVI, Substation Access Permit or Low Voltage Access Permit is cancelled, or
- Authorised Person who is cancelling the Authority, WHVI, Substation Access Permit or Low Voltage Access Permit, or

in support of the process for removal of a DANGER Tag as per '*PR D 78105 DANGER Tags for Electrical Equipment*' section 5.2.



## 5 References

PR D 78203 High Voltage Operating Procedures

PR D 78305 1500V Operating Procedures

PR D 78401 Isolation and Energisation of Low Voltage Equipment

PR D 78105 DANGER Tags for Electrical Equipment

ESB E001 Low Voltage Electrical Standards

Work Health and Safety Act 2011 No 10

Work Health and Safety Regulation 2011