1 Scope/Application

Electrical installations in properties up to around 1937 were typically a DC system whereby two conductors were fused within the cut-out. With the move to AC, the cut-outs were often adapted such that both the Live and Neutral connections contained a fused link (usually fuse wire but could be a cartridge type fuse).

Due to the implications of a discontinuous Neutral giving rise to dangerous voltages, any installations found with a Fused Neutral should be immediately reported and action taken to remove the fuse connection in the Neutral pole. **This is a mandatory requirement to meet our legal obligations under the Electricity Safety, Quality and Continuity Regulations (ESQCR).**

This Standard Technique details the types of legacy cut-outs typically encountered and the necessary checks and any subsequent rectification options to remove the fusible Neutral pole. Where a Neutral link is introduced retrospectively into the cut-out as described in the procedures in this document, it shall be considered a temporary solution and reported for a more permanent upgrade using one of following options to be carried out when practicable;

- Full breakdown of existing cut-out and replacement with new 100 A cut-out (see Standard Techniques 13.2 , 13.3)
  or;
- A “Top & Block“ Partial Replacement (see Standard technique 13.7)

The document also details information for suitable labelling to be fitted to cut-outs which have been inspected and confirmed **NOT** to contain fused Neutrals in order to prevent any future misreporting by Meter Operators or other personnel. Jointing staff engaged in this activity must have received the relevant training to carry out the task specified and manage the risks identified and this must be evidenced by the holding of a suitable authorisation.

2 Safety Information

	**Work shall be carried out in accordance with General Requirements in Section 1 and Electricity North West Distribution Safety Rules.** **Unless otherwise stated, Approved PPE and work wear as specified below shall be worn.**			
		Full face Visor		Protection footwear (Jointers Wellingtons to be worn if the location permits)
		LV Insulated gloves		Rubber insulated matting

The task covered by this Standard Technique has significant hazards associated with it identified by the symbol and text ⚠ **WARNING:**

This Standard Technique details the risk control measures that must be applied when carrying out the task. If the risk control measures in this procedure are implemented the risks will be controlled.
This Standard Technique also forms the method statement for the task.

First aid measures:

- Electric Shock – Safely remove the person from source of supply, or isolate the source of supply from the person.
- If necessary call for an ambulance.

WARNING: Live LV Electrical Systems – Use Live Work Techniques/Procedures/PPE for those activities carried out or near equipment that could be LIVE.

- This Technique shall only be used for working on cut-outs which have been assessed using the guidance set out in CP 606, Procedure B07 and which have been judged to be suitable by the Competent person on site. If any doubt exists in identifying the type or the manufacturer of the cut-out to be work on, then advice must be taken to ascertain if it must be completed **DEAD**.
- Force must not be used on any account to remove any metal work which is part of a cut-out.
- Withdrawable Fuse carriers should only be removed or inserted by hand without use of any tools or excessive force. If the carrier is firmly stuck and cannot be removed , then the cut-out shall be considered dead and changed.
- When a cut-out fuse carrier is removed the **LIVE** fixed contact **Shall** be shrouded as soon as possible using approved shrouding material
- The photographs shown in this Technique are for illustrative purposes. All safety requirements in these instructions **MUST** be followed.

CAUTION: Asbestos Containing Materials

Where any of the equipment being worked on is found to contain asbestos containing materials or similar suspicious materials, all LIVE working shall stop and the procedures in CP670 'Working Safely with Asbestos Containing Materials' (Asbestos Task Book), shall be used to remove that equipment safely before any further work can proceed.

Black Plastic Cut-Outs (suspected Phenolic materials)

Before working on any cut-out with black plastic material , checks for any surface voltage shall be carried out as per **Standard technique 13.5**

	**Polarity & Earth Loop Impedance (ELI) Testing** Before removing any fuse carrier or cover on the cut-out , It is important the correct identification of the live phase and neutral should be made using an approved Polarity pen. Visual indication (e.g. colours of existing meter tails) should not be relied upon. Once fuse carriers and/or covers are removed to expose conductor terminals , a full Polarity & ELI check should be carried out as per **Standard Technique 14**
	The inspection and rectification procedures in this document include details of self adhesive vinyl labels to be affixed to the cut outs for warning and infomation purposes. In order to ensure the labels remain in position , it is vital to ensure a clean grease free surface is prepared before fixning label.Thorouglhy clean the surfaces with PF solvent wipes before applying labels.

3 Preliminary Operations

Refer to **Standard Technique 1** , and in addtion ;

Prior to carrying out any procedures detailed in the tables in Section 5 , the following must always be carried out:

- Ensure there is adequate and secure lighting. Hand held torches are not deemed adequate.
- Ensure there is adequate space and ventilation to work.
- Visually examine the service termination to ensure that the cut-out can be safely worked on with the service cable LIVE.
  Follow CP606 Procedure B07.
- Check for signs of any damage ,interference, burning , unusual smells or leakages from the cut out body.

4 Materials Required

The following materials may be required for rectification of Fused Neutral cut-outs
(This does not cover materials used for partial or full replacement of cut outs)

Equipment	ENW Commodity Code
Warning Label for Neutral Fuse Carrier “DO NOT REMOVE”	**195161**
Label – “THIS IS NOT A FUSED NEUTRAL”	**195160**
Cut Out Labels – Pack of 50	**069050**
Fluvent Neutral link 18mm diameter x 60mm copper tube	**995296**
Fluvent Neutral link 22mm diameter x 58mm copper tube	**995297**

5 Inspection and Rectification Procedures

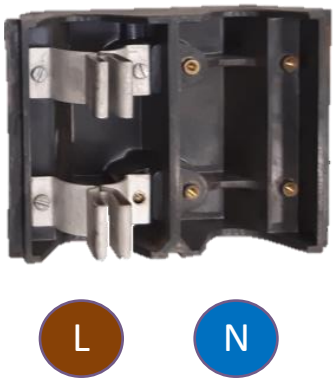
The following tables give details of specific types of legacy cut-outs found on the Network, and the procedures to be followed in order to assess the following:

- if a fused Neutral **COULD** be present – what further checks shall be made to confirm ;
- if a fused Neutral **IS** found in the cut-out - what actions need to be undertaken to remove it.
- if a fused Neutral is **NOT** found in the cut-out - what labelling to be fitted to ensure it can be correctly identified in the future (i.e to prevent misreporting of Fused Neutral Cut-Out).

The tables are not an exhaustive list of all cut-outs; there may be many variations of the types shown but the general principles can be applied to other cut-out designs.

Category		Description	Table
A	**Cut-Outs that may appear to have a Fused Neutral but do NOT** (simple check required)	**BI Callender Common Cover Cut-Out**	**A1**
		Crabtree Metalclad Cut-Out (3 way)	**A2**
		Crabtree Metalclad Cut-Out (2 way)	**A3**
		ISCO S 60A Metalclad Cut-Out	**A4**
B	**Cut-Outs that may have a Fused neutral but can be rectified safely and easy without making Dead** (check and simple procedure required)	**Fluvent Cut-Out**	**B1**
		BI Callender Separate Carriers	**B2**
C	**Cut-Outs that have a Fused Neutral but require to be considered for changing live with either a part or full cut-out change or make dead.**	**MCEW Separate Fuse Chambers**	**C1**
		MCEW Common Fuse Chamber	**C2**
		PRENTO (BARROW) Cut-Out	**C3**
		ISCO Metalclad Cut-Out (Various designs)	**C4**
		Mackintosh Derby Metalclad Cut-Out	**C5**
		Siemens Cut-Outs (Various designs)	**C6**

TABLE A1 – BI CALLENDAR CUT-OUT (ONE PIECE COVER)



Construction:

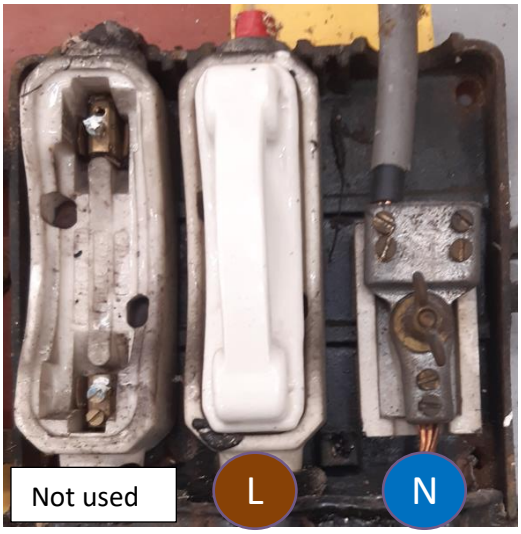
- Single plastic cover over phase and neutral poles
- Could be suspected to be fused neutral **but is not**
- Red disc on cable chamber indicates phase (might not always be present or correct !)
- Plastic material could be phenolic – check for surface voltage (**See Standard Technique 13.5)**

Inspection and Rectification Procedure:

- Check Polarity & ELI
- Remove carrier
- Check Neutral way is a solid connector block (as per photo)
- Insert carrier
- Fix "**Not a Fused Neutral**" label on cable chamber
- Seal carrier

Labelling:

TABLE A2 –CRABTREE CUT-OUT (COMMON HINGED COVER/3 WAY)



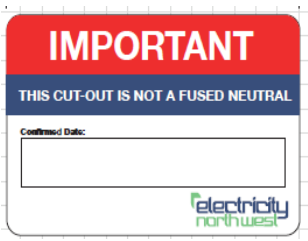
Construction:

- Metal Cable Chamber / Hinged top cover over fuses
- Two Re-wirable fuses and a Solid Neutral pole in porcelian carrier
- Live should be in one fuse carrier only (one fused pole should be disconnected)
- Polarity could be reversed

Inspection and Rectification Procedure:

- Check Polarity & ELI
- Open Cover
- Check Neutral is connected to solid link (DO NOT REMOVE PORCELAIN FUSE CARRIERS)
- Close Cover
- Fit “NOT A FUSE NEUTRAL” label on cover
- Fit L and N coloured labels at top of cover at the appropriate position (optional)
- Check Polarity

Labelling:



Labels from **CC 069050**

TABLE A3 –CRABTREE CUT-OUT (COMMON HINGED COVER/2 WAY)

Photo shows live carrier removed

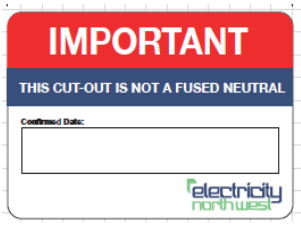
Construction:

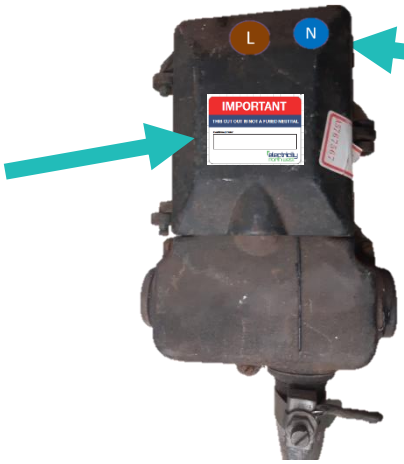
- Metal Cable Chamber / Hinged top cover over fuses
- Re-wirable fuse carrier in phase and a solid link fitted in the Neutral pole across porcelian base
- Polarity could be reversed

Inspection and Rectification Procedure:

- Check Polarity & ELI
- Open Cover
- Check Neutral is connected to solid bar (DO NOT REMOVE PORCELAIN FUSE CARRIER)
- Close Cover
- Fit “NOT A FUSE NEUTRAL” label on cover
- Fit L and N colourded labels at top of cover at the appropriate position (optional)
- Check Polarity

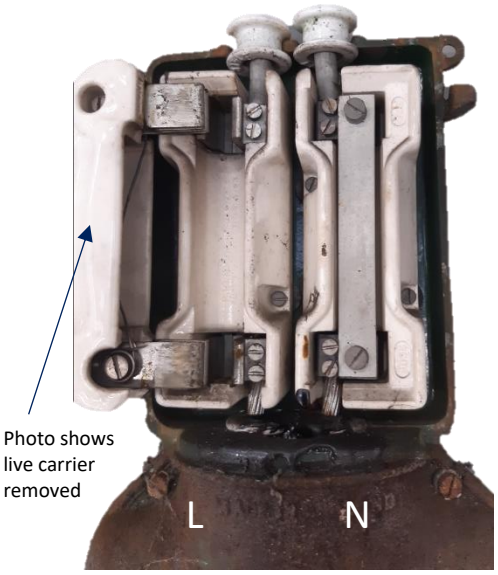
Labelling:





Labels from **CC 069050**

TABLE A4 –ISCO S 60A CUT-OUT (COMMON HINGED COVER)



Construction:

- Metal Cable Chamber / Hinged top cover over fuses
- Re-wirable fuse in phase and a solid link in the Neutral pole
- Polarity could be reversed

Inspection and Rectification Procedure:

- Check Polarity & ELI
- Open Cover
- Check Neutral is connected to solid bar (DO NOT REMOVE PORCELAIN FUSE CARRIER)
- Close Cover
- Fit “NOT A FUSE NEUTRAL” label on cover
- Fit L and N colourded labels at top of cover at the appropriate position (optional)
- Check Polarity

Labelling:

Labels from **CC 069050**

TABLE B1 - FLUVENT CUT - OUTS

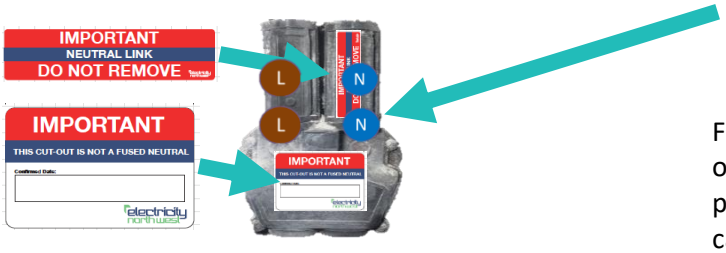
Construction:

- Twin identical fuse carriers on metal or plastic cable chamber
- Possibility of reversed polarity – **refer to Standard Technique 14**
- Plastic material could be phenolic – check for surface voltage (**See Standard Technique 13.5)**

Inspection and Rectification Procedure:

- Check Polarity & ELI
- Fix L and N coloured stickers on cut-out body and Fuse Carriers
- Remove Live carrier and shroud incoming live terminal, then remove Neutral carrier
- Check Neutral carrier for existing link – this may be a copper tube or a flat bar link
- If there is a fuse fitted in the Neutral Carrier, **then it must be removed and a solid link fitted**
- Insert Neutral carrier, fix Warning label over Neutral Carrier and seal.
- Insert Live fused Carrier and seal.
- Fix "**Not a Fused Neutral**" label on cable chamber
- Check Polarity

Labelling:



Labels from **CC 069050**

Fit coloured Phase and Neutral labels on cut-out body and fuse carrier to prevent risk of incorrect fitting of carriers

See Supporting Notes overleaf

TABLE 1 - FLUVENT CUT – OUTS – SUPPORTING NOTES

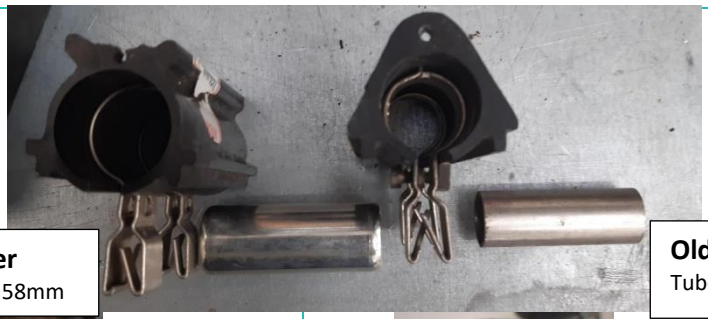
If a fused link is found in the Neutral Carrier , then it should be removed and replaced with a copper tube link.

The exisitng link may be a flat bar fitted across the spring contacts :

The existing link may be a copper tube inserted in the fuse carrier :

There are various designs of the Fluvent fuse carriers. The majority will take a tube of 18mm diameter x 60mm.

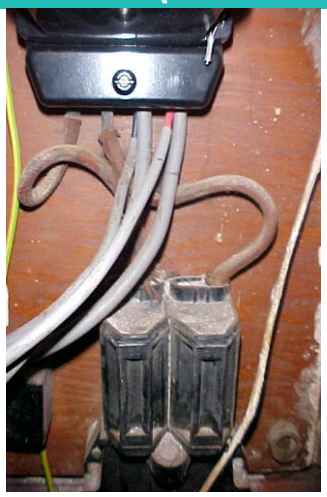
The more modern versions of these Cut-Outs have a carrier profile with “fluted handles” – this carrier will take a tube of 22mm diameter x 58mm.



Modern Carrier
Tube 22mm dia x 58mm

Older Carriers
Tube 18.2mm dia x 60mm

TABLE B2 – BI CALLENDAR CUT-OUT (TWIN CARRIER)



Construction:

- Twin identical fuse carriers on metal or plastic cable chamber
- Possibility of reversed polarity – **always check** !
- Plastic material could be phenolic – check for surface voltage (**See Standard Technique 13.5)**
- Uses a cartridge fuse 22mm diameter x 58mm long

Inspection and Rectification Procedure:

- Check Polarity & ELI
- Fix L and N coloured stickers on cut-out body and fuse carriers
- Remove Live carrier and shroud incoming live terminal with suitable material
- Remove Neutral carrier
- Check Neutral Carrier for existing link – this may be a copper tube
- Note if any wires are found fitted across either carrier (as per photo), they MUST be removed
- If there is a fuse fitted in the Neutral carrier, **then it must be removed and insert a solid link**
- Insert Neutral carrier
- Insert Live fused carrier
- Check Polarity
- Fix Warning label over neutral carrier
- Fix "**Not a Fused Neutral**" label on cable chamber
- Seal both carriers with separate sealing wire

Labelling:

Fit coloured Phase and Neutral labels on cut-out body and Fuse carrier to prevent risk of incorrect fitting of carriers

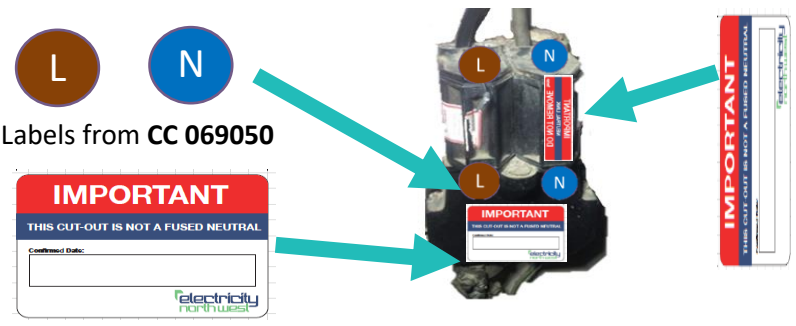
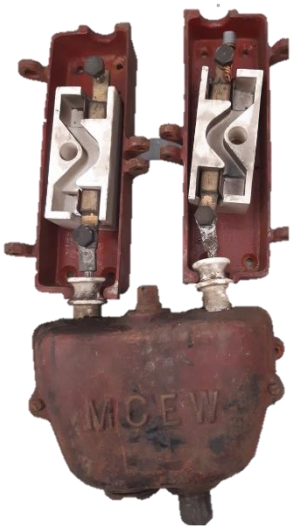


TABLE C1 – MCEW CUT-OUT (SEPARATE CHAMBER TYPE)



Construction:

- Separate phase and neutral chambers with rewirable fuses
- Polarity could be reversed – check using **Standard Technique 14**

Inspection and Rectification Procedure:

- This Cut-Out cannot be worked on safely to insert a Neutral link
- **Consider for a live Cut-Out change, either part or full, depending on the existing cut-out arrangement. Refer to CP606 B07, ST13.2, 13.3 & 13.7.**

TABLE C2 – MCEW CUT-OUT (COMMON HINGED COVER)

Construction:

- Metal Cable Chamber / Hinged top cover over fuses (may have clear inspection window)
- Re-wirable fuses in both phase and Neutral poles
- Polarity could be reversed

Inspection and Rectification Procedure:

- This Cut-Out cannot be worked on safely to insert a Neutral link
- **Consider for a live Cut-Out change, either part or full, depending on the existing cut-out arrangement. Refer to CP606 B07, ST13.2, 13.3 & 13.7.**

TABLE C3 –PRENTO (BARROW) CUT-OUT (COMMON HINGED COVER)

Construction:

- Metal Cable Chamber / Hinged top cover over fuses
- Re-wirable fuses in both phase and Neutral poles in porcelian carrier
- Polarity could be reversed

Inspection and Rectification Procedure:

- There is no easy solution to fit a solid link
- This Cut-Out cannot be worked on safely to insert a Neutral link
- **Make Dead and Change Cut-Out**

TABLE C4 –ISCO CUT-OUT (COMMON OR SEPARATE HINGED COVER)

Construction:

- Metal Cable Chamber / Hinged top cover over fuses
- Re-wirable fuse in phase and neutral
- Polarity could be reversed

Inspection and Rectification Procedure:

- There is no easy solution to fit a solid link
- This Cut-Out cannot be worked on safely to insert a Neutral link
- **Consider for a live Cut-Out change, either part or full, depending on the existing cut-out arrangement. Refer to CP606 B07, ST13.2, 13.3 & 13.7.**

TABLE C5 –MACKINTOSH DERBY CUT-OUT

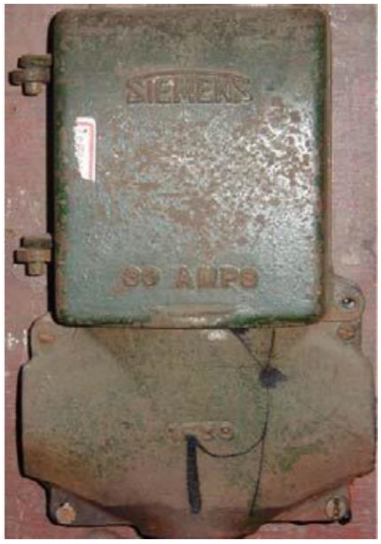
Construction:

- Metal or plastic Cable Chamber with removable cover over fuses held by central bolt
- Re-wirable fuse in phase and neutral
- Polarity could be reversed

Inspection and Rectification Procedure:

- There is no easy solution to fit a solid link
- This Cut-Out cannot be worked on safely to insert a Neutral link
- **Consider for a live Cut-Out change, either part or full, depending on the existing cut-out arrangement. Refer to CP606 B07, ST13.2, 13.3 & 13.7.**

TABLE C6 –SIEMENS (VARIOUS) CUT-OUT



Construction:

- Metal Cable Chamber , top or side hinged fuse covers
- Re-wirable fuse in phase and neutral
- Polarity could be reversed

Inspection and Rectification Procedure:

- There is no easy solution to fit a solid link
- This Cut-Out cannot be worked on safely to insert a Neutral link
- **Consider for a live Cut-Out change, either part or full, depending on the existing cut-out arrangement. Refer to CP606 B07, ST13.2, 13.3 & 13.7.**