



Switchgear Portable Earth Device

ELECTRICAL+INDUSTRIAL | TOOLS+TECHNOLOGIES

TMACTM
THEW &
McCANN
GROUP

ACTIVE INNOVATION



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BEFORE YOU START

GENERAL PRECAUTIONS



Read and understand this guide before operating this equipment.

The TMAC Switchgear Portable Earthing Device (SWPED) is to be only used by qualified personnel and must be used in conjunction with the user's own working and safety procedures, without compromising the integrity of the TMAC product supplied.

Follow all safety instructions contained within this guide.

QUALIFIED PERSON

A qualified person is one who is familiar with the installation, construction, operation or maintenance of the equipment and the hazards involved. In addition this person is competent, trained and authorized to undertake the work involved in accordance with established safety and working procedures.

SAFETY SYMBOLS USED IN THE GUIDE



Mandatory Action - This symbol indicates the action must be taken to avoid a hazard. Any information that follows this symbol must be obeyed to avoid possible harm.



Hazard Identification - This is a general warning sign. It is used to alert the user to potential hazards. Any information that follows this symbol must be obeyed to avoid possible harm.



Prohibition - This symbol indicates an action that must not be taken or must be stopped. Any information that follows this symbol must be obeyed to avoid possible harm.

GENERAL INFORMATION

DESCRIPTION

The TMAC Switchgear Portable Earthing Device is designed to provide a reliable method for earthing orifice contacts in vertically-racked metal-clad switchgear. The SWPED is a fully-rated earthing system which retains the advantage of portability and flexibility in substations where earthing switches or earthing circuit breakers are not available.

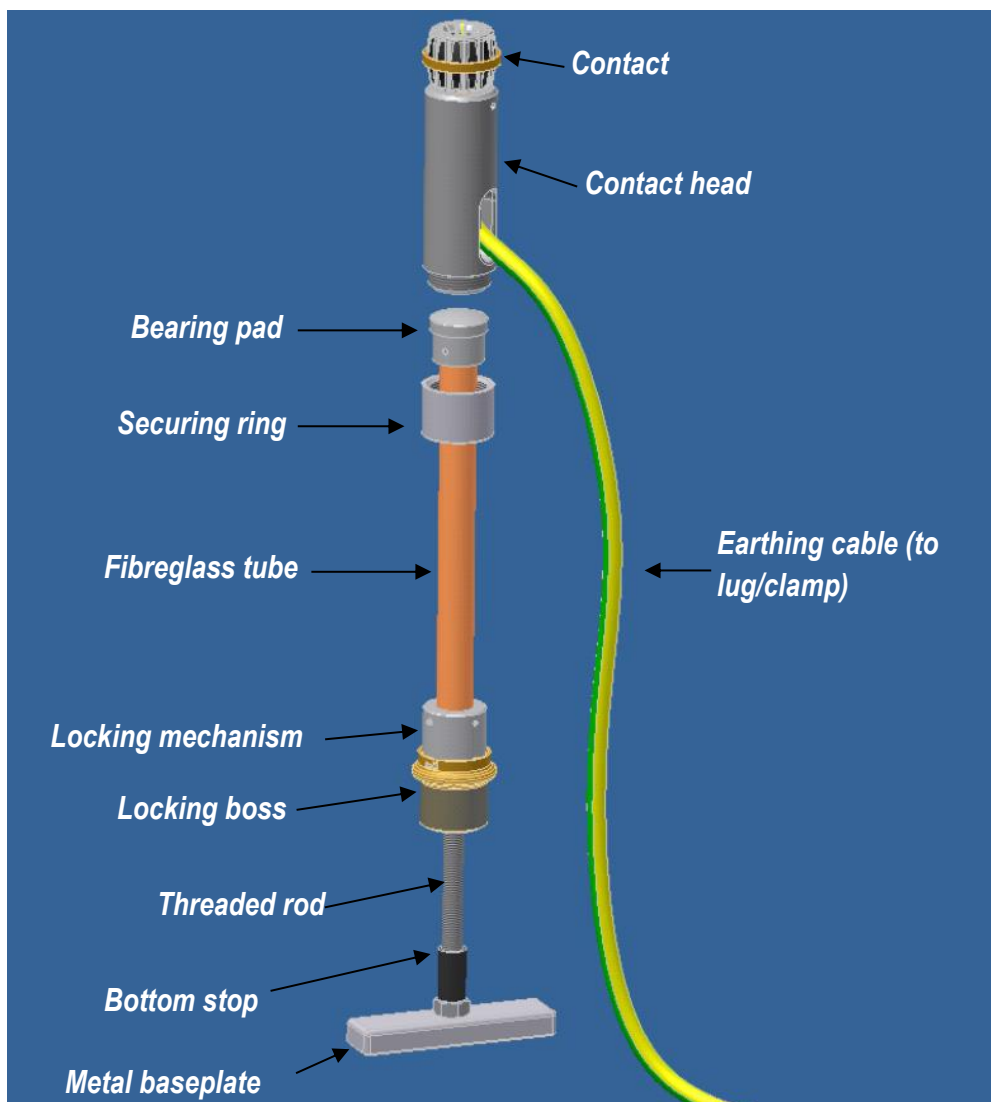
The SWPED is made to the requirements of the substation switchgear. Key dimensions are specified, and the configuration, contacts and earthing connection provided to customer's requirements, as per the Customer Specification Data Sheet.

The SWPED has been proven at the maximum rating by type-testing in accordance with the requirements of *IEC 61230 – Live working – portable equipment for earthing or earthing and short-circuiting*.

PRODUCT INFORMATION

Description of Mechanism

The SWPED consists of an operating mechanism driving a contact head which is inserted into the switchgear orifice. The contact head is connected to the earth busbar via a flexible earthing cable.



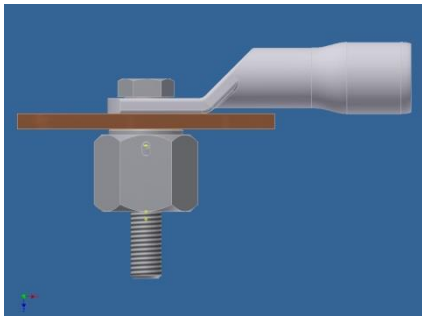
Earth Cables & Connections

One of two standard earthing cables may be selected. A clear PVC-insulated 95mm² fine-stranded braided flexible copper cables is fitted with clear heat-shrink stress-relief tube over each cable termination.

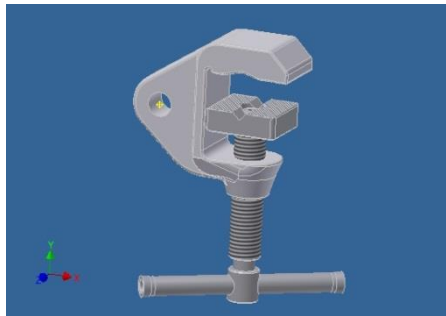
All ratings are **indoor current ratings**, at a temperature limit on the cable conductor of 250°C.

All Portable Earthing Devices (PED) will have their rating attached to the cable.

Earth Connection Options



M12 CP-Nut & lug to earth busbar



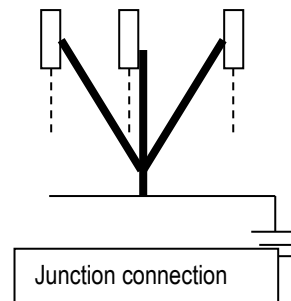
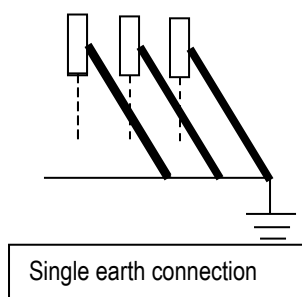
CLE420 to round or flat



CL950B to ball pin

Configuration

The most common and easily-used is for each phase pole to be individually & directly connected to the earth busbar. However, if only one earth connection point is available, an alternative is for the three poles to be connected to a junction, which is then connected to the single earth connection.



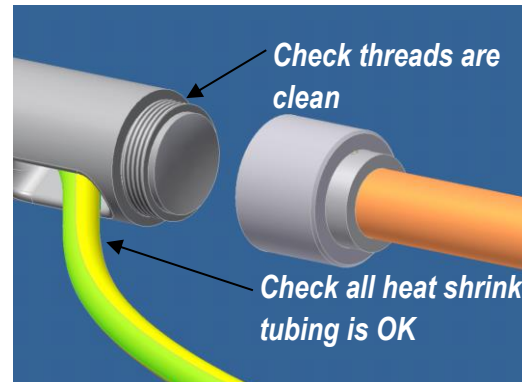
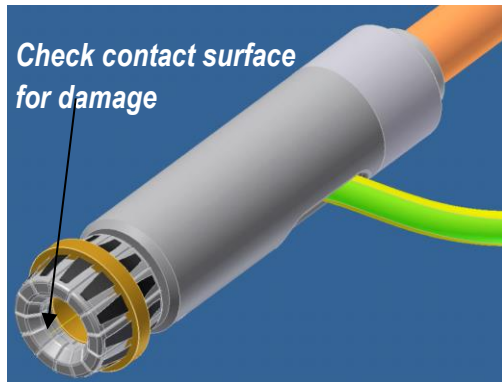
BEFORE USE

Earth Connection & Cables

- Check earth connection clamp is clean, tight on the lug, and the lug and clamp are in good condition.
- Check earth cable is in good condition, with no cable damage at lugs and cable entry into contact head. Check the heatshrink protection is intact and undamaged.
- If a retest date is specified on the cable tag, check the SWPED is still in date.

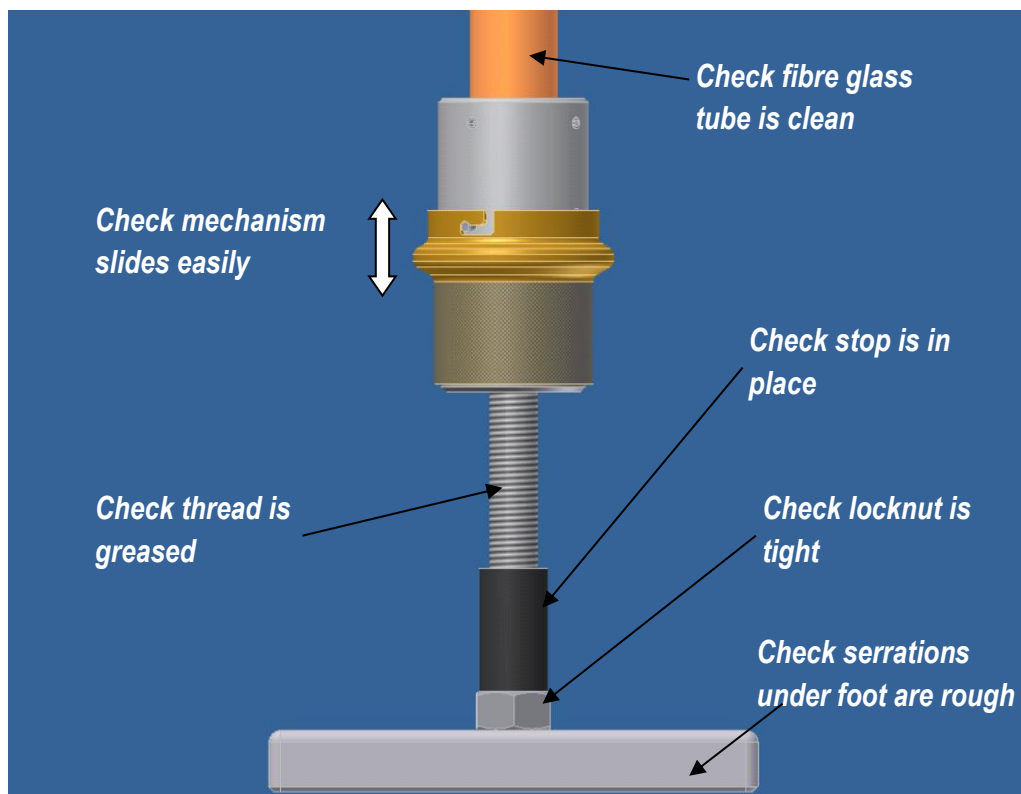
Contact Head

- Check the contact head is clean and undamaged.
- Check the contacts are firmly fixed into contact head, are clean and in good condition.
- Check the threads in the base of the contact head (which mesh with the securing ring) are clean and undamaged.



Operating Mechanism

- Check that the fibreglass tube outer surface is undamaged. Clean the surface with a silicone-impregnated cloth as per normal insulating fibreglass tool practice.
- Check the locking boss slides easily over the locking pins and locking mechanism.
- Extend the mechanism and check the internal rod thread is clean and lightly greased.
- Check that the metal baseplate is secure on the threaded rod with the stop in place.
- Check that the serrations underneath are rough for a good bite into the floor.



OPERATION

INSTALLING THE SWPED



Always wear correct personal protective equipment, and carry out standard procedures in the correct sequence for the switchgear, in accordance with standard HV access procedures for the substation.

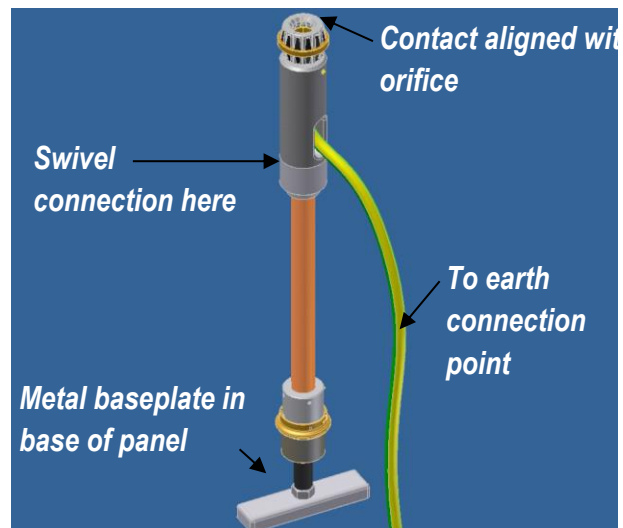
Ensure the locking boss is secure on the locking pins.

Ensure the tube is screwed home tightly so that the mechanism is rigid against the orifice contact and the foot will not move.



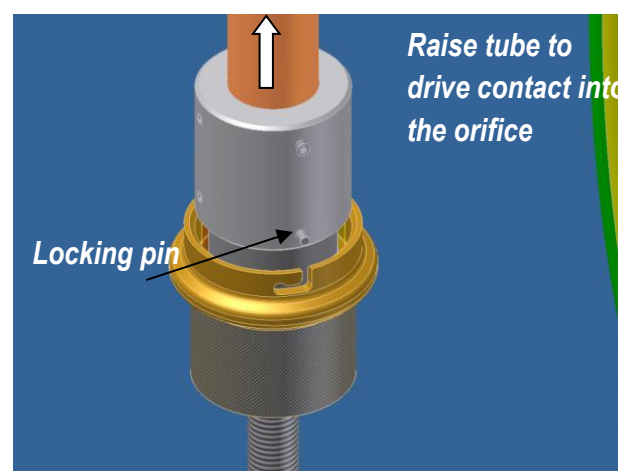
Do not over tighten the tube, to avoid damaging the orifice insulator.

1. Screw the contact assembly onto the operating mechanism. Ensure the contact assembly can swivel on top of the operating rod.
2. Prior to insertion of the SWPED into the orifice, make the earth connection to the earth busbar or earthing point. Then prove dead the switchgear orifices to be earthed.
3. Place the metal foot flat on the ground directly under the orifice of the circuit to be earthed.



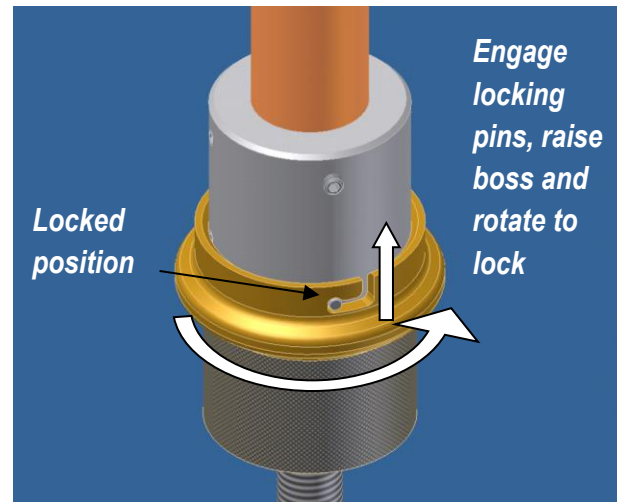
Switchgear PED ready for use

4. Check the locking boss is in the "free" position, allowing the mechanism to slide up and down freely along the internal threaded rod.
5. Grasping the fibreglass tube, raise the contact assembly vertically until contact is made with the orifice contact. Keep clear of the earthing cable during this operation



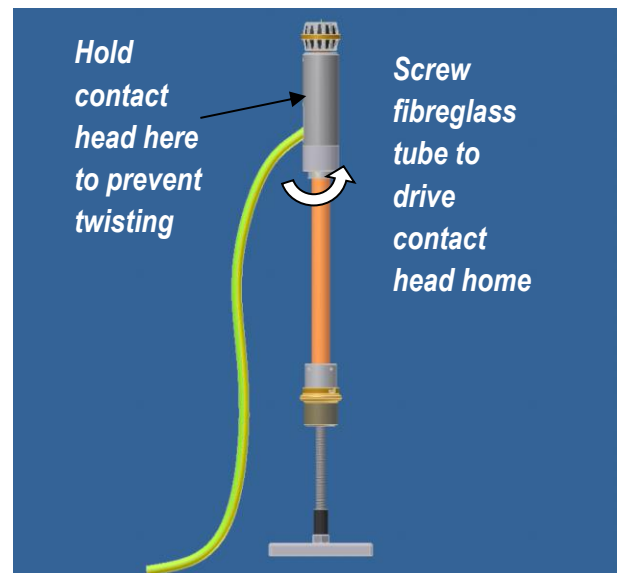
Locking Boss in "FREE" position ready to raise mechanism into orifice

6. When contact is made in the orifice, align the locking boss to engage the locking pins, raise the boss and rotate it to the "locked" position. The mechanism is now locked to the internal threaded rod.



Operating boss in "LOCKED" position

7. The fibreglass tube is then screwed by hand to drive the contact assembly home onto the orifice contact inside the switchboard.
8. As the contacts drive home to a tight fit, it may be necessary to grip the contact head to prevent the cable twisting round behind the mechanism.
9. Install other poles to complete the earthing operation.



Switchgear PED pole in position

REMOVAL OF THE SWPED

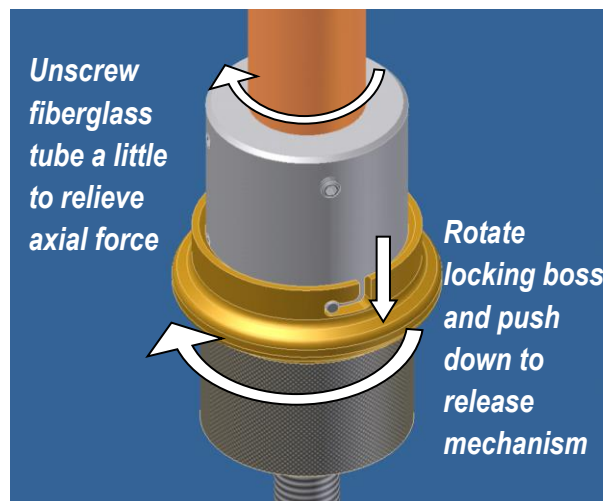


Always wear correct personal protective equipment, and carry out standard procedures in the correct sequence for the switchgear, in accordance with standard HV access procedures for the substation.



Ensure the mechanisms are locked before carrying them. This prevents the internal rods sliding inside the tube under the weight of the metal baseplate.

1. Clearance for removal of SWPED to be obtained in accordance with standard operating procedures.
2. Unscrew the FG tube a small amount to remove axial force on the orifice contact.
3. When the contact head is able to be moved by hand, grasp the locking boss and rotate it to the left, then drop the locking boss downwards.
4. This releases and collapses the operating mechanism. The fibreglass tube and contact head will slide out of the orifice. Remove from the cubicle.
5. Remove the earth connection if it is an individual pole.
6. Remove the other poles in a similar way.
7. Remove the earth connection(s) and clear the SWPEDs from the switch cubicle.



STORAGE

When not in use, the Switchgear PED should be stored in a safe and secure place, to prevent abrasion or damage while in transit.

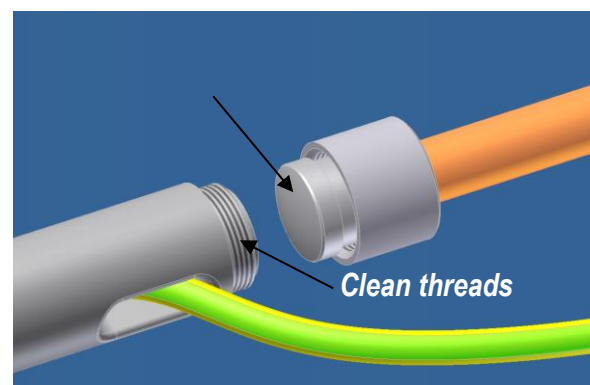
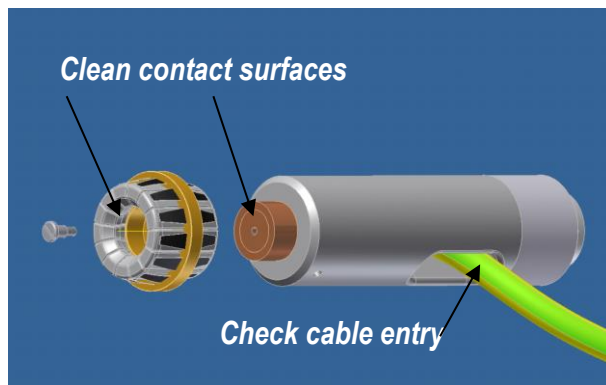
ROUTINE MAINTENANCE & INSPECTIONS

Preliminary

1. Visually inspect the SWPED for signs of damage.
2. Remove the earth clamp if necessary, and remove the contact head from each operating pole.

Contacts and Cables

3. Clean the earth clamp faces to restore a good contact surface. Re-torque the clamp connecting bolt to the recommended installation torque. For T-Mac® clamps, this is normally 56Nm.
4. Check the cable insulation and lugs. Check the heat-shrink stress relief at each lug. The cable cannot be removed from the contact head. If it is considered necessary to replace the cable, contact TMAC.
5. Inspect the contact inside the contact head. There should be a clean contact surface (the SWPED may be fitted with a contact cluster from the switchgear CBs, depending on availability from the switchgear manufacturer).
6. If necessary, remove the securing screw and take the cluster out to dress the contacts. Take care not to remove silver-plating on the contact surface by over-vigorous polishing. Ensure the contact interface inside the contact head is clean, and then screw the contact cluster back into the head.
7. If employed as a standard practice, check the resistance reading of the SWPED cables and compare with the manufacturer's data. Replace the test date tag.
8. Check the label on the cable is intact and legible.
9. Before reassembling the contact head onto the operating mechanism, apply a thin smear of silicone grease over the domed face of the top bearing pad. Screw the contact head onto the top of the operating mechanism.



Operating Mechanism

10. Check the operation of the locking mechanism for free running and effective locking of the locking boss. If it works positively and easily, no maintenance is required. Apply a little general-purpose lubricant to the surface of the internal threaded rod.
11. With the locking boss unlocked, check ease of sliding over the full range of travel. Then lock the locking boss, and screw the locking mechanism along the threaded rod over the full range of travel. Check the mechanism winds freely.
12. Repair of the locking mechanism is a TMAC workshop procedure. If such repair is required, the complete SWPED should be returned to TMAC

Removal of Fibreglass Tube

13. Normally the fibreglass tube requires no workshop maintenance.



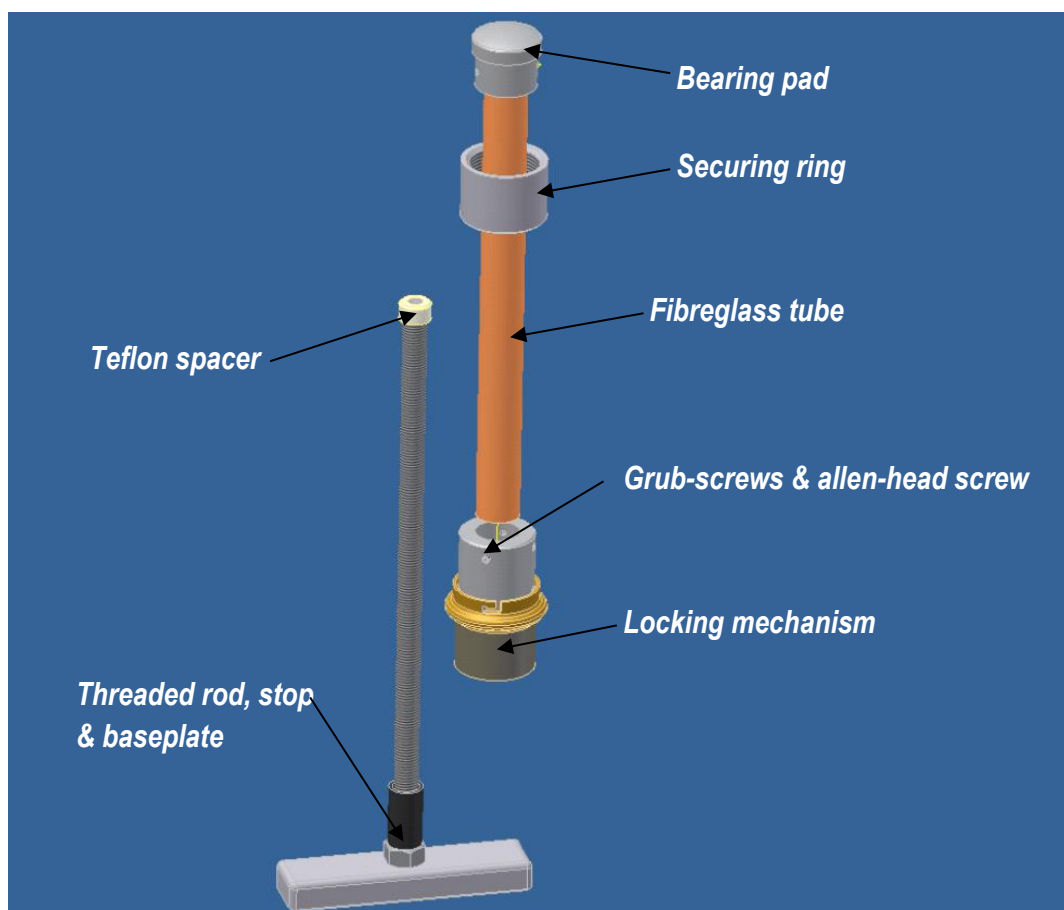
Prohibition - This tube is a special heavy-duty fibreglass tube made specifically for the high forces generated in switchboard faults. **DO NOT** replace it with a standard fibreglass rod.

14. To remove the tube from the locking mechanism, remove the single allen head screw, and then remove the three M6 grub-screws in the mechanism housing. **NOTE: Use a long-shaft allen key, as these grub-screws are very tight.**
15. The fibreglass tube is now easily withdrawn over the threaded rod.



Prohibition - **DO NOT** remove the domed bearing pad from the top of the rod. This is a TMAC factory procedure.

16. Check the internal surface of the fibreglass rod. As there is an internal teflon spacer at the top of the threaded rod, there is no metal contact against the internal fibreglass surface, and the internal surface should be quite clean. To clean out, pass a clean cloth down the fibreglass tube using a suitable probe. Clean the teflon spacer also.
17. Check the label on the FG tube is intact and legible.
18. Drop the fibreglass rod over the internal threaded rod into the ring on the locking mechanism.
19. Reinsert the grub screws with a long-shaft allen key. Replace the allen head screw to resecure the fibreglass tube in the locking mechanism



REPAIR

The end user must not repair or modify any component associated with this device without written permission from TMAC.
If repair is required contact TMAC.

TMAC

45 Enterprise St Cleveland

QLD 4163 Australia

Tel: (+61) 07 3826 6000

<http://www.tmacgroup.com.au/>

DEFECTS / WARRANTY

DEFECTS

Goods are warranted to be free from defects. Provided they have been used strictly as recommended and subjected only to fair wear and tear, Goods (including parts within) which are found to be defective within 90 days after delivery to the Buyer will be repaired or replaced at the option of the Seller and at its expense. Repair or replacement by the Seller is the exclusive remedies of the Buyer.

WARRANTY

To the maximum extent permitted by law, the Seller makes no warranties, either express or implied, as to merchantability, fitness for purpose or otherwise with respect to the Goods other than in paragraph above and as required by statute. The Seller is not liable for any prospective profits or special, indirect or consequential damages or any general loss or damage, or for any expense resulting from use by the Buyer or others of defective Goods. The Seller's liability is limited to no more than the sale price of the Goods plus replacement delivery charges. Prior authority for the return of goods is required by the seller.

Please contact the seller by email sales@tmacgroup.com.au, phone 07 3826 6000 or fax 07 3826 6066 for claims related to defective / warranty of goods provided.

FOR THE FULL TERMS AND CONDITIONS PLEASE REFER TO TMAC "STANDARD TERMS OF TRADE"