



S&S POWER SWITCHGEAR EQUIPMENT LIMITED

**UNLOADING, STORAGE, ERECTION,
INSTALLATION & MAINTENANCE MANUAL**



**PANTOGRAPH ISOLATOR
(TYPE: RP 123kV)**

Disconnectors are remarkable pieces of equipment. They can stay in the same position for years before they have to switch. But, then at the critical movement they have to work perfectly. No matter what the conditions are, whether they are in the freezing cold or in the extreme heat.

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1.0. PREAMBLE:

This manual pertains to Pantograph disconnectors of voltage rating 123kV. The disconnector described in this publication is designed, manufactured and tested with care and will give satisfactory service if it is installed, operated and maintained in accordance with the instructions, by fully skilled personnel duly authorized to carry out this work.

Efforts are constantly being made to improve design and manufacture. The equipment supplied may differ in detail from the data given in this publication

2.0 GENERAL DESCRIPTION OF THE DISCONNECTOR:

- Disconnectors are primarily off-load mechanical switching device used to isolate equipments and lines in electrical network. They are able to make or break the magnetizing current and line charging current of 0.7Amps at 0.15 power factors.
- Pantograph Isolators are designed for independent single pole operation or three pole mechanical ganged operation.
- Pantograph Isolators are supplied as break down components and are assembled at site. The relevant standards for these are IS:9921 and IEC:129-1984. Insulators, which constitute a part, conforms to IS:2544 and IEC:273.
- The relevant standards for Disconnectors are IEC: 62271-102 and 62271-1 (Supersedes IEC: 60694) and IS: 9921 and for insulators IEC: 60273 and 60168 and IS: 2544.

SECTION-A

UNLOADING AND STROAGE INSTRUCTIONS

3.0 UNLOADING:

- Unload the crates / boxes using crane / fork lift truck, as appropriate.
- Do not roll the crates. Do not drop the crates over tyres / rubber mats. Etc.
- Use proper lifting tools / tackles like nylon belts / ropes etc.
- Count the number of crates / boxes and tally them against the shipping document.
- Inspect thoroughly all the crates / boxes for damages.
- In case of damage, identify the crate / box and keep it separately.
- Take adequate photos of the damage.
- Kindly report the damage to the transporter in writing.
- Also mail the damage report (along with the photographs) to the contracts manager of S&S Power Switchgear Equipment Limited. Email: cir@ssppower.com and sales@ssppower.com.

3.1 STORAGE:

“Failure to properly store and protect disconnectors / parts may cause damage to equipment. Such damage could cause hard operation, mal-operation and contact resistance issue when equipment is installed / tested and mal-function in service.”

- Storage shall be made in an area that is well ventilated and provided with drains to prevent water stagnation.
- It is advisable to leave all crates / boxes in packed condition until the start of erection.
- All crates / boxes shall be properly stored / stacked with proper covers.
- Disconnector and operating mechanism crates / boxes should always be stored in elevated position (at least two feet above ground) to prevent water entry.
- In case of longer storage period / damp atmosphere, the operating mechanism boxes shall be removed from packing and electrical space heating is to be provided.
- Space heating should continue till complete removal of moisture / condensation.
- Adequate care to be taken to prevent entry / ingress of dirt, moisture, cement, sand and other corrosive material.

3.2 LONG TERM STORAGE INSTRUCTIONS:

General instruction (for all materials):

Ground clearance:

All materials, including operating mechanisms, should be kept at a minimum of 600 mm (two feet) height from the ground level using pallets or cement concrete bed, to avoid water entry during rainy season. However, the water level rise at the respective site / storage locations shall be considered for fixing the ground clearance (but shall not be less than 600 mm).

Operating mechanisms:

The primary consideration in case of long term storage of operating mechanism is the temperature and relative humidity level of the storage location. This should be maintained as closely as possible to the standard reference atmospheric conditions.

Upon unloading from the container / truck, kindly follow the steps specified below, to ensure proper storage and preservation of operating mechanisms, for long term storage:

During normal seasons (without rain / snow):

- Take out the operating mechanisms from the wooden cases.
- Remove the polythene cover / bubble wrap sheet carefully.
- Check the operating mechanisms visually for any damages.
- Clean all the outer surfaces.
- Open the door and remove the desiccants (silica gel pack) fitted inside the box.
- Place five fresh bag indicator type desiccant packs (each 100 grams) of fresh silica gel granules (preservatives).
- Close the door.
- Do not cover or wrap the operating mechanism (so that better breathing is provided during long term storage).
- In case of longer periods of storage, replace the silica gel once in 3 months and close the door. (Note: the three month period is indicative only. Kindly check with the supplier of silica gel for time period of usage and time after when it has to be replaced).
- Ensure that the silica gels used are the fresh ones removed from the air tight container (before placing them inside the operating mechanism boxes).
- Keep all the drive mechanisms in a dust free environment.
- If dust is unavoidable then ensure complete cleaning at least once in a month.

- In addition carry out periodical checks for any abnormal dust accumulation and clean accordingly.
- Ensure that the entire storage area is temperature controlled (to ensure better storage and condition of the equipment).
- The optimum temperature is 20 deg c and relative humidity is 45% (values to be checked using combined humidity and temperature indicators placed throughout the warehouse / storage area and should be visible for close monitoring).

During monsoon seasons (with rain / snow):

- All points given above shall be followed.
- In addition, during rainy season, anti condensation heaters to be kept “on” and suitable electrical protection to trip the electrical circuit to be provided in case of any short circuit.
- Foam adhesive backed strip with volatile corrosion inhibitors also to be paste along the inner surfaces of the operating mechanism in place of silica gels.
- Inspect all operating mechanism boxes for integrity of the painted surfaces once in a month.

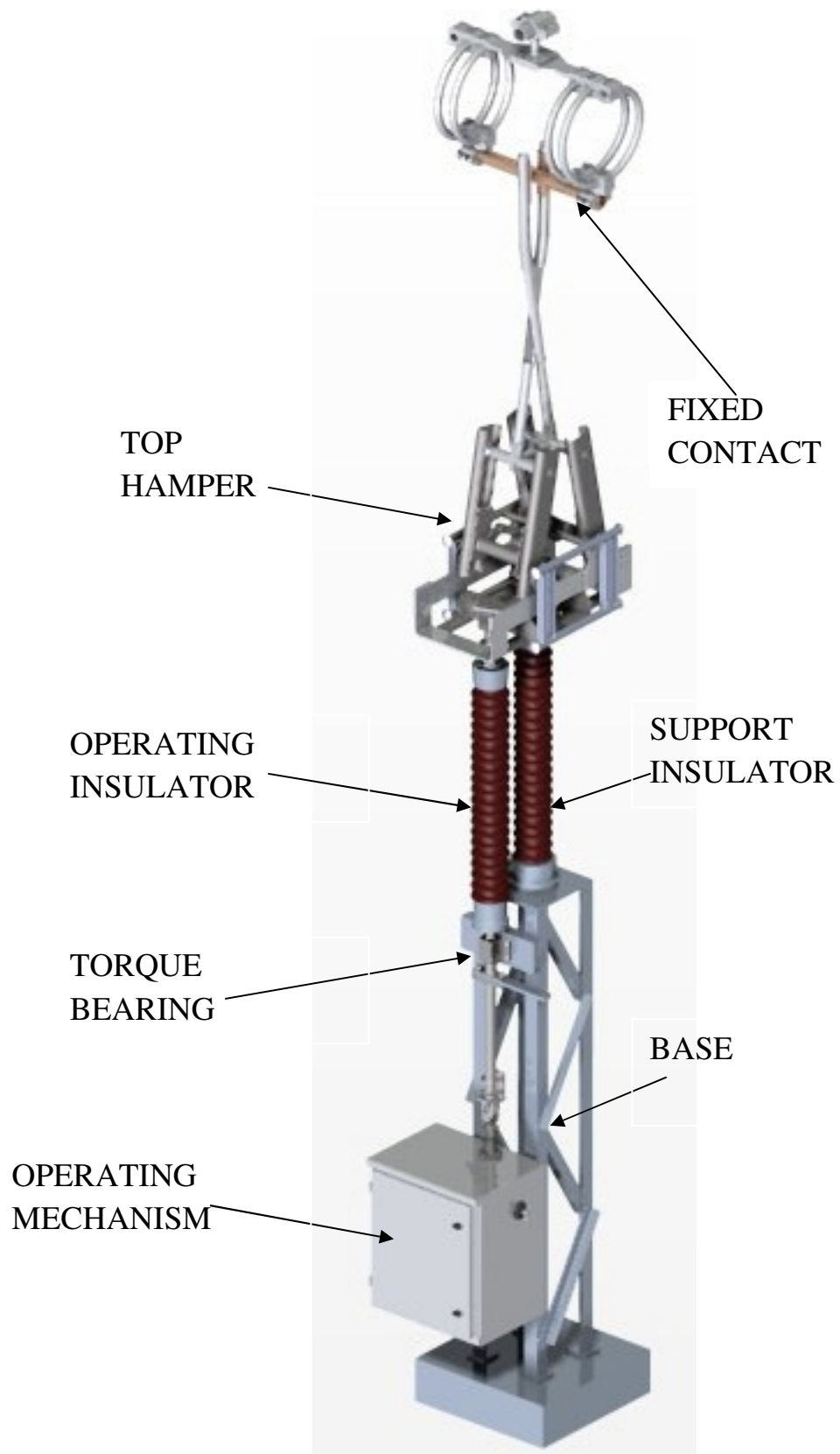
Other contacts and steel materials:

- Clean all the contact surfaces thoroughly with a lint-free cloth.
- Protect all contact surfaces with a thin layer of petroleum gel.
- Cover all contacts and Aluminium arms with polythene sheets / covers.
- Ensure that the inside surfaces of the polythene coverings are pasted with foam based adhesive strip.
- Provide volatile corrosion inhibitors sheets and paste them along the inner surfaces.
- Kindly repeat the above steps once in every three months.

Galvanized steel items:

These are to be wrapped / covered with waterproof / dust proof covering and sufficient bags of silica gels to be placed in various places inside the covering. Once in 3 months all materials to be cleaned and replaced with silica gel bags.

OVERALL ASSEMBLY



SECTION – B

CONSTRUCTION

4.0. SCOPE OF SUPPLY

Our 123kV pantograph Isolator comprises the following:

- 4.1 Support structure (optional)
- 4.2 Support insulator and operating insulator
- 4.3 Top hamper assembly
- 4.4 Operating mechanism
- 4.5 Down operating pipe
- 4.6 Fixed contact assembly

5.0. Support Structure

Support structures are made out of MS tube/or angular frame as required by customer site with the arrangement to fix over the foundation and to fix operating mechanism box for main & earth and to fix earth switch assembly.

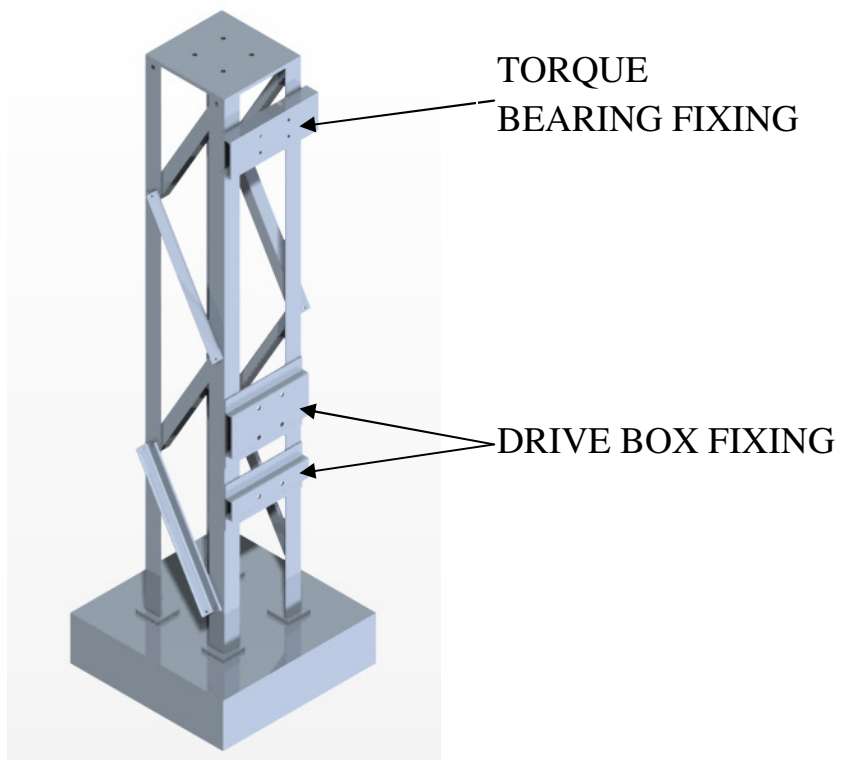


FIGURE A

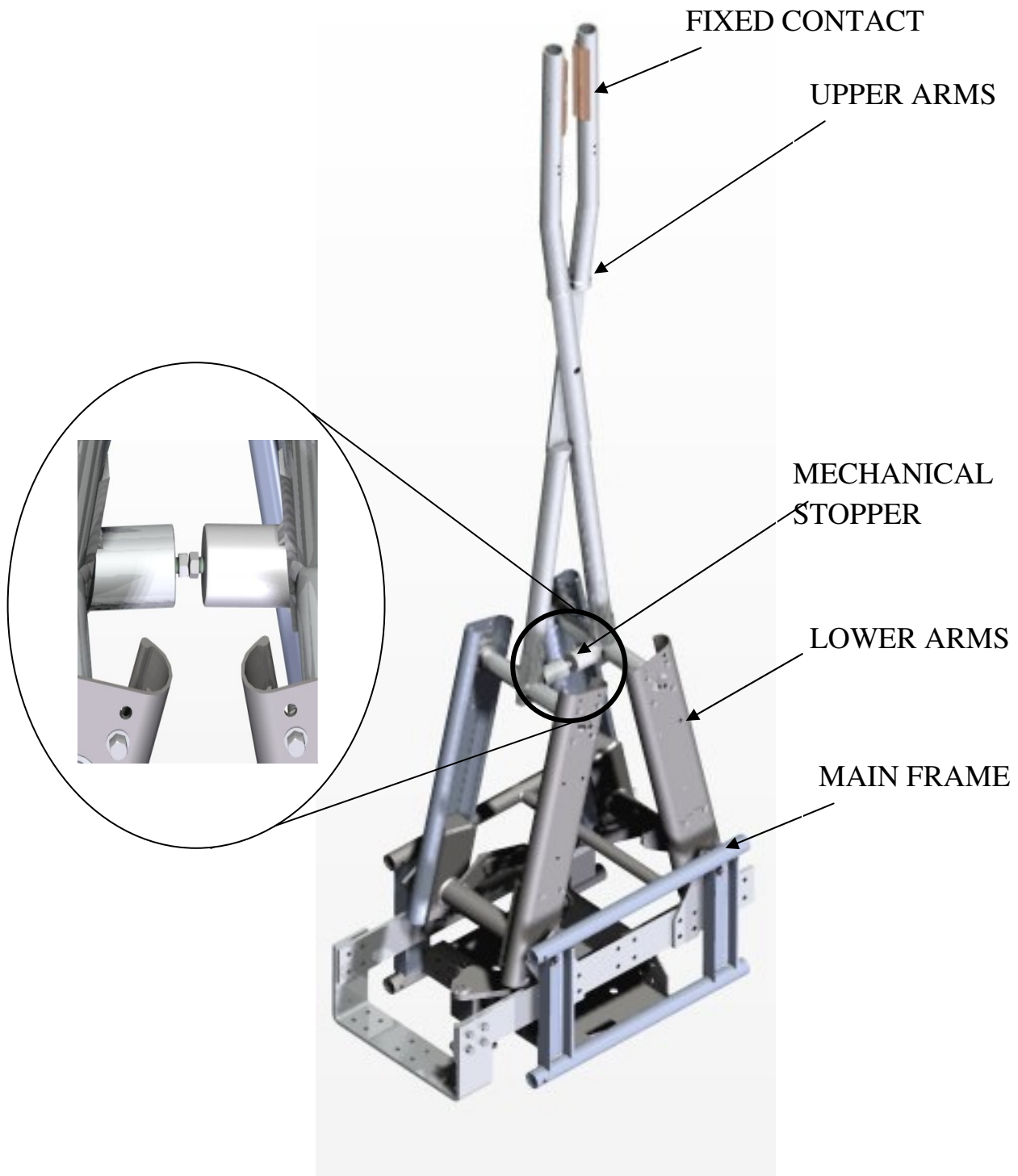
6.0. Support Insulator / Operating Insulator

- Support Insulator are selected to suit basic insulation level, minimum creepage and minimum bending load to suit customer and design requirement.
- Operating rod insulator are selected to suit the basic insulation level, minimum creepage and minimum torsion load to suit customer and design requirement.

7.0. Top Hamper Assembly

Top hamper assembly consist of Upper arm and Lower arm sections. The upper arm is made out of Aluminium tube where as the lower arm is constructed with specially extruded Aluminium channel. The Upper arm fourpoint contact is made out of electrolytic grade copper and silver plated for transferring the supply from the top bus to the lower bus section though current transfer rotating contacts fixed on the lower arm ends when the pantograph is in closed position. The MS frame work offers the necessary support for the scissors assembly and also for the aluminium/copper bus bar and also designed to minimize the corona discharge. The scissor's operation is achieved through the link which is in turn is actuated by the rotation of the drive lever. The 95° semi-circular rotation in achieved with the help of the rotation rod insulator. Toggle stopper limits the movements of drive lever both at the open and closed position.

TOP HAMPER ASSEMBLY



8.0. Fixed Contact

The design of trapeze contact arrangement will vary depending upon the top bus (Conductor or tube) The trapeze contact is hung from top bus conductor made out of silver plated copper contact tube. The copper fixed contact is suitably placed so as to position itself on the 4 point contact. Due to temperature variation if the bus contacts or elongates the fixed contact will simultaneously get raised/lowered. Even then it will confine itself within the contact zone as shown in sketch. The excess length of aluminium dropper rod can be cut.



Fixed Contact

9.0 OPERATING DRIVE MECHANISM:

- Geared motor operating mechanism consists of a final worm reduction gear driven by a DC or 3Ø AC motor in line with customer requirements.
- Necessary Overload protection, Control Switches for Local / Manual / Remote operation and Limit Switches for Control / Signal are provided. In the event of supply failure, the Mechanism can be operated manually. Manual operating mechanisms are supplied with or without reduction gear in accordance with customer requirements.
- The Mechanisms are housed in an IP55 grade box made of Aluminium / Mild steel / Stainless steel having a thickness of 2-3mm. Auxiliary switches having silver-plated contacts with positive wiping action with adequate number of NO, NC and long wipe contacts as per specific requirements are provided. Suitable blank gland plate is provided at the bottom for cable terminal gland.
- Suitable terminal blocks made of non-inflammable thermosetting plastic are provided for terminating control and auxiliary wiring. Front door of the mechanism box is provided with good quality gasket to ensure high degree of protection against polluted atmosphere. (See figure. D)

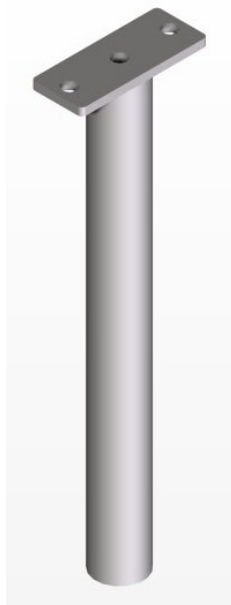
10.0 Down Operating Pipe

- This assembly is used to connect the torque bearing assembly fitted in isolator support assembly and flange fitted in operating mechanism box assembly.
- The above assembly are made out of MS pipe 'A' class with 'T' bar welded in top side and the other side directly fixing to 'U' clamp assy. in drive box, (Fig.D)site according to height.
- Supply is in galvanized condition.

FIGURE – D
OPERATING MECHANISM



FIGURE – E
DOWN OPERATING PIPE



SECTION-C

INSTALLATION & SETTING INSTRUCTION

11.0. ERECTION SEQUENCE:

- SUPPORT STRUCTURE
- INSULATORS
- TOP HAMPER ASSEMBLY
- FIXED CONTACT ASSEMBLY
- OPERATING DRIVE BOX
- DOWN OPERATING PIPE

12.0 SUPPORT STRUCTURE

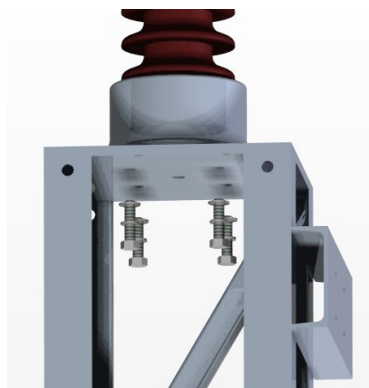
- Check for substation foundation plan, as the centre line of foundation is shifted by 130mm from the line contact to the centre line of the top.
- Ascertain the orientation of pantograph in relation with the location of operating mechanism.
- Lift the structure assembly and fix it over the plinth. (without damaging the foundation bolts)
- Assemble washer, spring washer and nut in all foundation bolts.
- Check for level at the top structure in both directions by using spirit levels. If required give shims below the base plate of structure for levelling once levelled tighten the nuts.

13.0. ERECTION OF INSULATOR

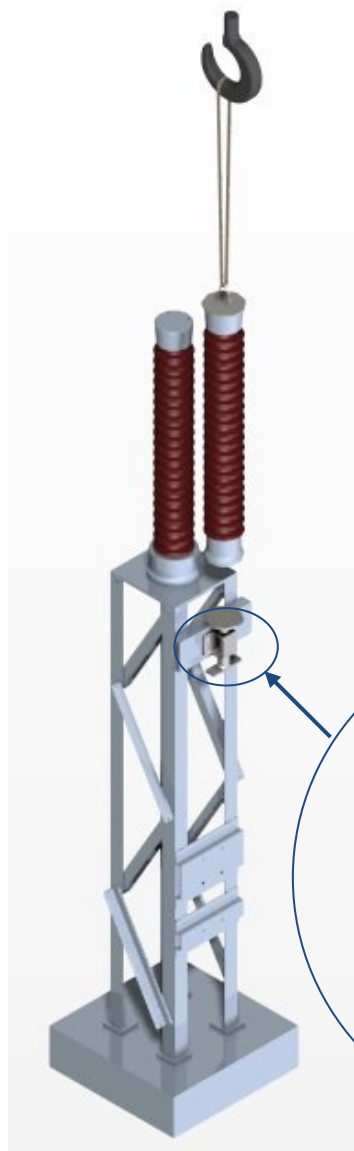
- Identify the insulator by using GA drawing.
- Keep the insulators fixing hardware's ready.
- Lift the insulator stack by using proper hook and place it over the support structure.
- Without removing the hook align the holes and fix all bolts.
- Remove the hook and check for level of top surface of insulator by spirit level/plumb.
- If necessary add shims below the bottom flange of the insulator.

ERECTION OF INSULATOR

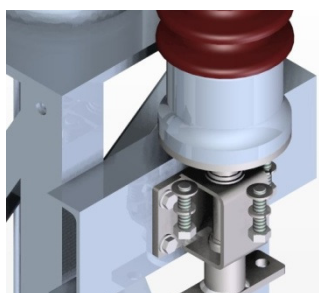
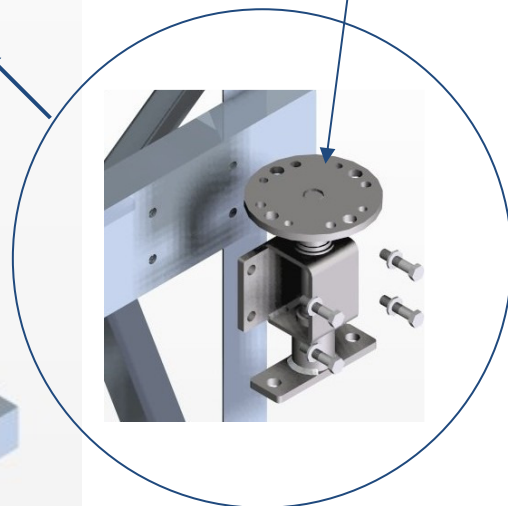
Support Insulator



Operating Insulator



Torque bearing
assembly



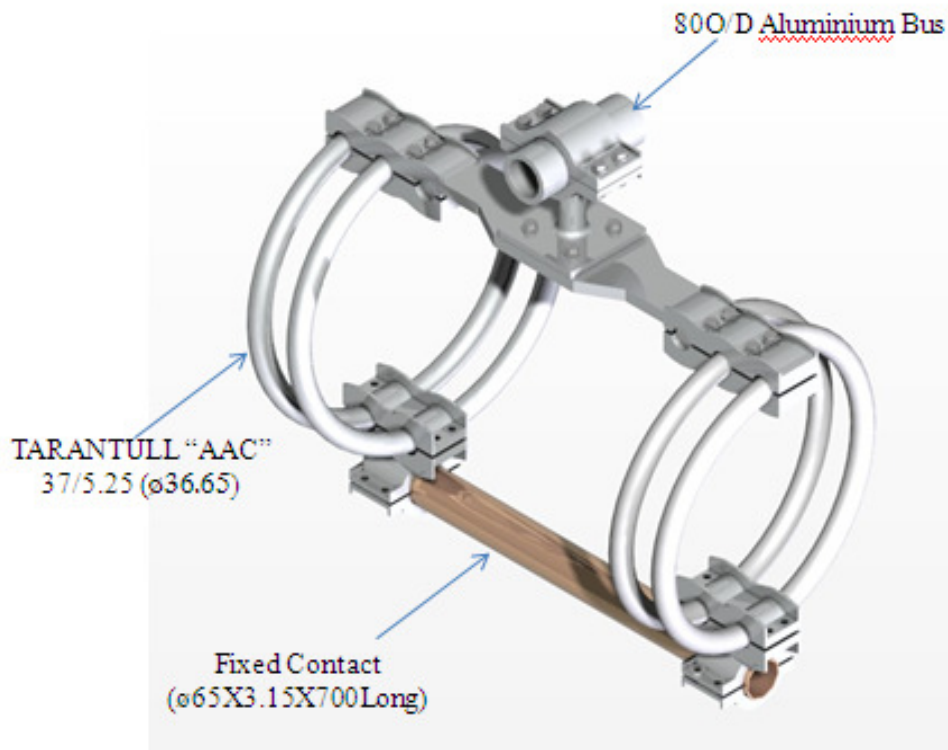
14.0 ERECTION OF TOP HAMPER ASSEMBLY

- Keep the insulator vertically in ground.
- Fix the mounting plate on the top of the Support insulator and fix it with proper bolts.
- Lift the top hamper assembly by using proper rope.
- Remove the nuts from mounting stud (M20) 4 nos.
- Place the top hamper assembly over the top plate assembled with top unit of insulator.
- Assemble the nuts (ensure the position of top hamper assembly in line drive box mounting arrangement.)
- Lift the operating rod insulator and fix it with the universal coupling fitted in top hamper assembly.
- Give some packing in between the support and operating rod insulator and tie with rope. (To avoid damage during lifting)
- Without removing the rope/hook align the holes of the insulator and tighten the bolts.
- Remove the rope/hook.
- Now check the gap between bottom flange of operating insulator and top flange of torque bearing fitted in the base (After removing the packing).
- Minimize the gap by lifting the torque bearing or lowering top hamper assembly by jack screw.
- Add small shims and fix the bolts for down operating rod insulator and torque bearing flange (ensure the position of torque bearing in relation with the position of top hamper assembly).
- Check for alignment of top hamper assembly if required adjust jack screw and align it

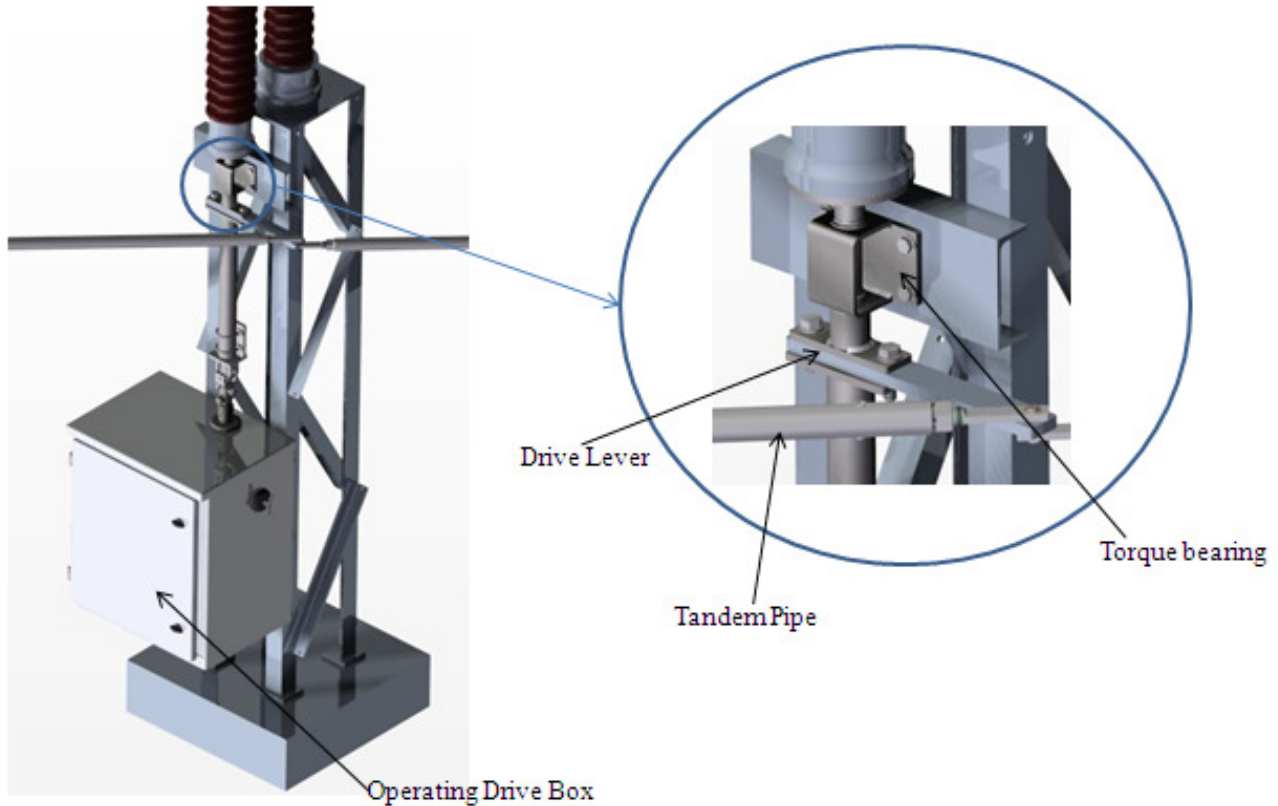


15.0 ERECTION OF FIXED CONTACT ASSEMBLY

- Locate the position to fix fixed contact Assembly in the conductor. (Centre line of Top Hamper assembly).
- Fix the Aluminium Connector by using clamps and M16screw at 0.5mtrs left side to Centre line
- Same Way fix the other aluminium connector by 0.5mtrs in right side.
- Ensure the accurate length of the Vertical dropper rod.
- Fix the dropper rod along with the 'L' piece in the Aluminium Connector.
Note: 'L' piece should be towards the other side dropper.
- Same way fix the other side dropper also.
- Connect the copper conductor with 'L' piece of both side dropper rods.
- Tighten all the bolts to hand tight.
Note: For all electrical jointing use jointing compound (Densal).
- Ensure that the 4 point contact in the centre line of fixed contact.
- If required align the Aluminium connector to the required side.
- To align in 'Y' axis the position of fixed contact should be in line with site climate (middle, top or bottom) to take care of thermal expansion and contraction.
- Finally tighten all the bolts.
- Repeat the operation two to three times and conform the operation.



16.0 ERECTION OF DRIVE BOX

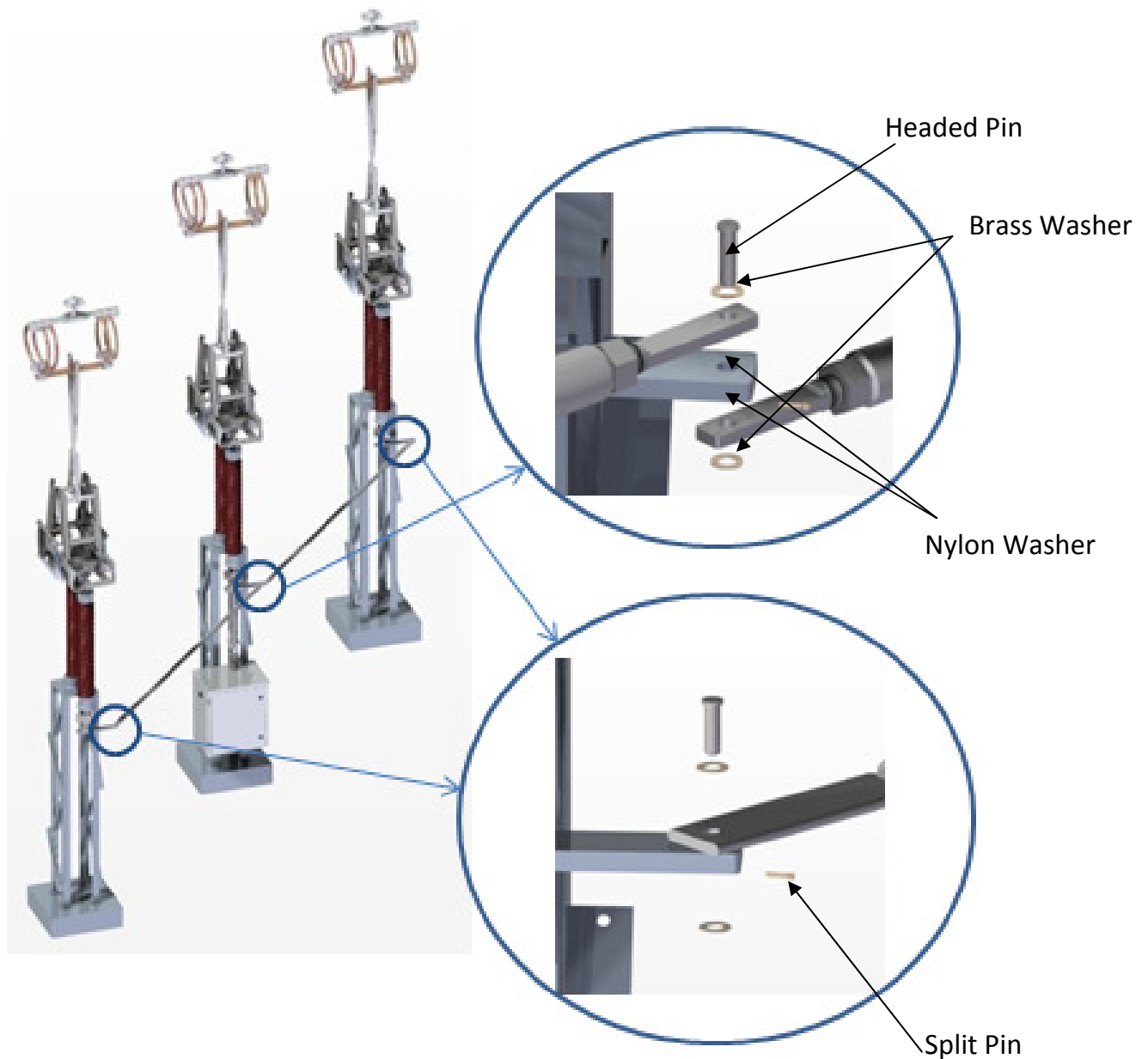


Identify the mechanism box with the help of drawing and packing list and open the case carefully.

MOUNTING:

Do not attempt to lift mechanism by drive coupling flange. Use slings or forklift at base of cubicle. Lift mechanism box into position and fix with structure. At this stage fixing bolts should only be hand tightened.

17.0 ERECTION OF TANDEM FOR 3-POLES



- Remove the connecting pin from the lever and keep it separately.
- Keep the Drive end Disconnector in closed position
- Keep the Second pole in closed position. Connect the tandem pipe (Phase coupling pipe). If required extend or shorten by adjusting the screw rod.
- Operate the Disconnector manually and ensure it opens and closes properly. If not, then adjust the tandem pipe length. Ensure all split pins are secured properly

CONNECTING DISCONNECTOR:

- Check for centre line and vertical line between torque bearing flange and drive flange with a plumb.
- Fix the tee bar end of the down operating pipe to the universal yoke and fix the assembly to the provision available on the drive end base (See figure. M).
- Now fix the other end of down operating pipe to the universal yoke and fix the assembly to drive box flange using the principle of vernierhole alignment (Only two holes will be aligned).
- Tighten all bolts.
- Operate the pole manually and ensure open/close label is in proper position.

ADJUSTMENT:

A. MANUAL

By using emergency handle, operate the coupled disconnector and observe whether it is OPENS or CLOSES fully at each end of its operating cycle. (Ensure minimum 10mm gap between pad lock brackets.) If the disconnector does not CLOSE fully remove clamping bolts which is bolted on the operating mechanism flange and turn mechanism slightly towards OPEN and re-tighten the bolts with the help of the Vernier holes provided. Proceed with disconnector closing. Repeat until satisfactory operation is obtained.

B. ELECTRICAL

Make electrical connections strictly according to the contract diagram of connections of incoming supply. Do not attempt to operate the Disconnector under power at this stage.

When selector switch is fitted, set it to LOCAL.

When Motor is fitted, manually set Mechanism to mid Position and: -

- Operate Control Switch and at the same time observe whether the mechanism rotates towards the selected position.
- If it rotates in opposite direction to that selected, stop motor immediately, by switching off power supply using Emergency push button switch.
- Reverse the connection of motor supply.

ELECTRICAL OPERATING EQUIPMENT:

A hinged panel on the left hand or right hand side of the cabinet carries the electrical control, for operation of the mechanism, which is accessible immediately after the cabinet outer door is opened.

PANEL DOOR COMPONENTS:

LOCAL / REMOTE / MANUAL SELECTOR SWITCH

This selector switch is provided to select the position according to the requirement. When the selector switch is set to local, operation of the mechanism will be governed by the controls in the cabinet. Setting the selector switch to remote transfers controls of the mechanism to remote control point.

OPEN AND CLOSE SWITCH

In case of individual pole drives, the master control cabinet will have push buttons / selector switch for opening / closing also. The control switch determines the direction of travel of the disconnect. When a cycle is initiated by switching to the appropriate position, the disconnect will open or close. Once the mechanism receives a signal from the push button/ selector switch, the mechanism will commence the operation and will not respond to further signals until it has completed its operation. An indicator is provided outside the top sheet of the cabinet (below the output shaft) to show the disconnect is OPEN or CLOSE.

HEATER AND THERMOSTAT (OPTIONAL)

An anti-condensation heater is fitted in the cabinet. A switch is mounted on the front of the control panel for the control of the heater through a thermostat. It should be switched on as and when required to ensure that appropriate temperature inside the cabinet is maintained. The heated air leaves the cabinet by way of a breather.

OPEN AND CLOSE CONTACTORS

These contactors are mounted in the rear of the panel door. They directly control the reversing operation of the motor. Further contacts are used for electrically interlocking the contactors, providing circuit across the 'OPEN' and 'CLOSE' Push Buttons / Cam Switch.

AUXILIARY SWITCHES

Auxiliary switches are mounted in the rear side of the cabinet connected to gear shaft through cam and operating lever. It consists of silver plated contacts with a positive wiping action, which provides low current signal to the control circuit.

TERMINAL BLOCKS

Terminal Blocks are designed for use with 1.5 / 2.5 Sqmm cable. Rated Miniature circuit Breaker / Fuse is mounted in the panel door. The current ratings of Fuse/MCB - links are shown on the schematic diagram.

FOR CLOSING THE DISCONNECTOR

Set the selector switch to local execution as required and then operate the cam switch

for closing, there by causing the closing contactor (CC) to pick up. The hold on contact of closing contactor (CC) will now be closed there by retaining the supply after the cam switch is released.

After completion of closing cycle, when the disconnecter operate for opening, the opening contactor (OC) will pickup. The hold on contact of opening contactor (OC) will now be closed there by retaining the supply after the cam switch is released. Ensure motor direction is towards closing. Otherwise change the phase sequence of motor in terminal box. The disconnecter will start to close. At the end of the closing operation limit switch for closing (LSC) will open, de-energizing the closing contactor (CC). The circuit is now de-energized and the closing operation is completed.

Kindly note, to prevent malfunction, contact (CC) of the closing contactor will isolate the opening circuit, once contactor (CC) is energized.

FOR OPENING THE DISCONNECTOR

A Similar sequence of operation will be executed by operating the cam switch in the other direction.

OPERATION OF BOLT COIL (MOTOR / MANUAL)

CONDITION – 1

MAIN DISCONNECTOR CLOSED AND EARTH SWITCH OPEN

LMR (Local Manual Remote) switch in local or remote position.

- The plunger is in protruded condition (coil de-energized).
- The cap fixed to the plunger blocks the insertion of the manual handle (there by preventing manual operation).
- At this condition there will not be supply to push button switch. (MPB).

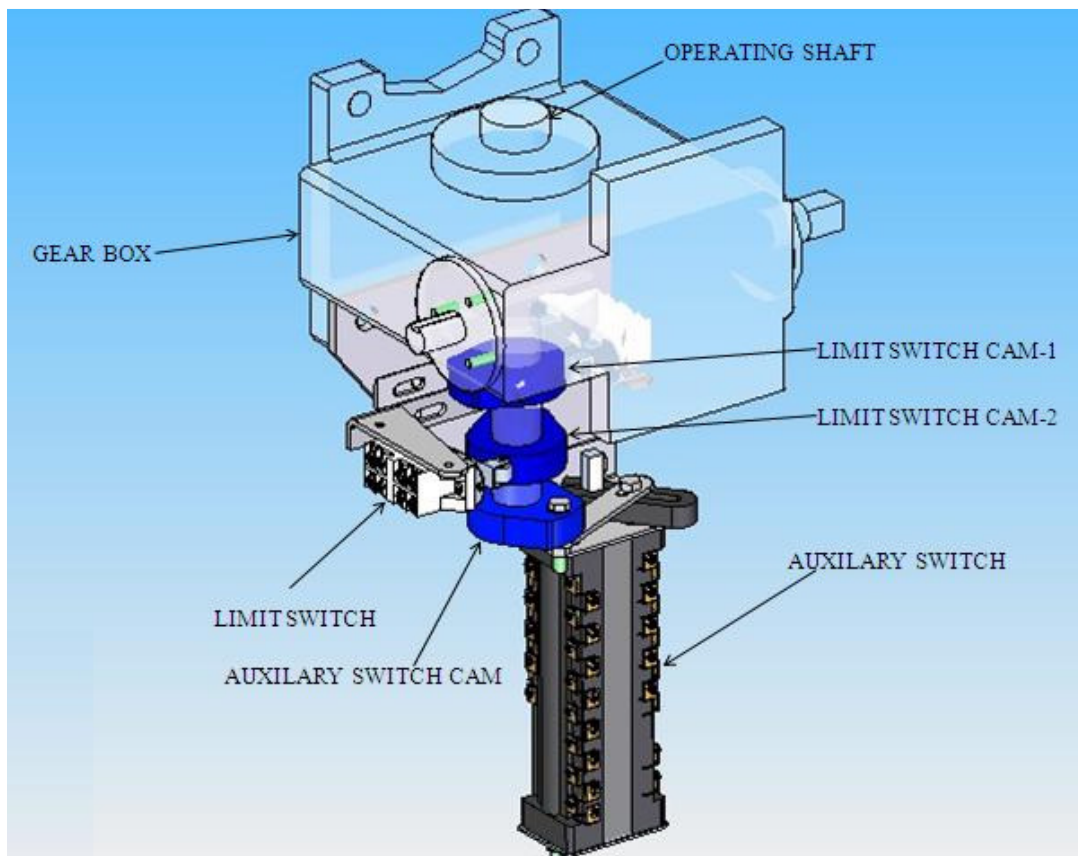
CONDITION -2.

MAIN DISCONNECTOR OPENED

LMR switch in manual position.

- Now the push button switch (MPB) will get supply.
- When the MPB switch is pressed, the supply will go to bolt coil and pulls the plunger downwards.
- The plunger in turn actuates the limit switch positioned below the plunger, cutting off the supply to the motor.
- The manual operating handle can now be inserted & the gear box can be operated manually.

SETTING OF AUXILIARY SWITCH AND LIMIT SWITCH CAMS



OPERATION OF AUXILIARY SWITCH AND SETTING

CONSTRUCTION – 1

- Auxiliary switch is fixed to the rear sheet of the drive box along with bracket.
- A slotted lever is fixed with the drive shaft (square) of auxiliary switch and clamped with bolt and nut.
- A cam is fixed with the main shaft (bottom side extended) of the gearbox below the limit switch cam and locked with screw and nut.
- A link plate is assembled with cam on one side and with auxiliary lever on the other side.

OPERATION

Whenever the main shaft rotates either to close or open, the cam also will rotate and operates the auxiliary switch through the link

Note:

The auxiliary switch settings are done at works. However, in case fine tuning is required then follow the steps given below.

SETTING OF AUXILIARY SWITCH

- Keep the main Disconnecter in open / closed condition.
- Keep the auxiliary switch lever in 'NO' position according to scheme.
- Rotate the cam and check the continuity of required contacts in auxiliary switch.
- If required loosen the pin in auxiliary switch slot and move the pin within the slot either inside or outside and lock it again.
- After this adjustment again operate and check for continuity.
- In the same way other positions also can be set.

LIMIT SWITCH OPERATION IN DRIVE MECHANISM

CONSTRUCTION-1

- Limit switch is fixed to a bracket and the entire set is fitted to the rear sheet of the drive box.
- The operating cam is fixed to the main shaft (bottom side extended) of gear box and locked with screw after positioning the cam.

OPERATION

Whenever the main shaft rotates either in close direction or open direction, the cams fitted in the main shaft also will rotate and operates the relevant limit switch.

Note:

The limit switch settings are done at works. However, in case fine tuning is required then follow the steps given below.

SETTING OF LIMIT SWITCH CAM 1 AND CAM 2

- Operate the disconnecter manually to open position.
- Rotate the cam and see that the cam presses the limit switch roller till it disconnects the contact (a click sound will be heard).
- Again close the disconnecter manually.
- Now operate the disconnecter by motor and see that the operation is completed by the limit switch.
- If small adjustment is required, then, loosen the screw of the limit switch CAM 1.
- Rotate the cam either towards the roller or away from the roller, as required.
- Ensure the cam makes contact with the limit switch (for opening).
- Tighten the screw of the limit switch CAM 1.
- In the same way another switch (for closing – CAM 2) can be set.

18.0 ERECTION OF DOWN OPERATING PIPE:

- Identify the Main down pipe.
- Keep the Disconnecter and Drive box in open position
- 5 nos. packer plates provided for any minor adjustment.
- Fix the tee bar end to the provision available on the Drive end base as shown in the fig.
- Fix the other end to drive box flange using vernier holes.
- Operate the pole manually and ensure open/close label is in proper position.

Alignment

Open and close isolator manually and observe correct functioning. Ensure that the 4 point contact grips the fixed contact trapeze firmly and centrally contact is fully engaged and the drive lever is stopped against the toggle stop. Open and close the isolator electrically. Make final check up of all bolts and lock them.

In the same way connect the Y & B phase poles of pantograph assembly. Individually operate the poles manually and electrically and make sure they operate satisfactorily. Operate through the main MGB in case of electrically ganged pantograph. In case of any slight variation, slightly advance the opening position of the particular pantograph which is lagging behind. This can be achieved with the help of the stopper bolt.

SECTION – D

COMMISSIONING AND MAINTENANCE

19.0 COMMISSIONING OF DISCONNECTOR:

- Carry out test operation manually; ensure satisfactory engagement of contacts for all three poles. If necessary, align the contacts.
- Operate the Disconnector by power. Ensure proper open/close operation. Ensure limit switch / auxiliary switch settings are proper.

20.0 MAINTENANCE:

Caution:

- **Working on high-voltage is very dangerous; hence follow substation and other standard safety rules.**
- Don't use emery paper for cleaning the contacts.
- Don't try to operate the Earth switch when Disconnect or is in closed condition.

Do:

- Ensure disconnection of circuits before doing maintenance activity.
- Do proper earthing of the circuit.
- Stay clear of adjacent live parts; wherever possible, earth the adjacent live parts.
- Use proper tools.

We recommend the following inspection intervals

- Normal ambient condition: After every 5 years or after every 1000 operations (Close/open cycle).
- Extreme ambient conditions i.e. Climate (tropical) and heavy contamination (dust, salt, rust and Sulphur): After every 2 years or after every 500 operations (Close/open cycle).

21.0 TOOLS AND TACKLES:

Apart from standard tools, the following are required

- Brass wire brush for cleaning of Copper surfaces.
- Steel wire brush for cleaning for Aluminum and steel surfaces.
- Contact grease (Petroleum jelly).
- Cold cleaning agent for Silver plated surfaces.
- Lint – free cloth's

22.0 CLEANING:

Bolted or sliding contact surfaces that conduct current have an effect on the electrical resistance of the current path. Dirty or oxidized contact surfaces increase the electrical resistance. This will result in damage to main contacts. Hence the following cleaning procedure shall be strictly adhered to:

Bolted Contact Surfaces: Aluminum

- Grease lightly.
- With steel wire brush, remove oxide film fully (Do not use emery paper).
- Wipe off contaminated grease immediately using lint – free cloth.
- Re-apply grease again (Immediately after cleaning with lint –free cloth).
- Bolt together treated surfaces and grease joints.

Silver plated contact surfaces.

- Clean with cold cleaning agent (do not destroy silver surfaces).
- Grease immediately.
- Bolt together treated surfaces and grease joints.

Silver plated contact surfaces (Sliding)

- Clean with cold cleaning agent (do not destroy silver surfaces).
- Grease immediately

23.0 INSPECTION CHECKS:

The following operations must be carried out during inspection

Disconnecter:

- Clean contact area (Male and Female contacts). Check for any damage; if required, change the contacts.
- Apply grease on contact surfaces.
- Clean the insulators. Check for any damage; if required, change.
- Check all bolted connections.
- Carry out three or four test operations manually.
- Reconnect the power supplies and control voltage.
- Carry out three or four test operations electrically.

24.0 RECOMMENDED SPARES:

Keep adequate quantity of following spares at all times.

- Fixed contact Assembly.
- Top Hamper Extrusion.
- Rings and Bearings.
- Motor and Gear Boxes.



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