Installation Instructions for

Base Insulator
Type A-0167
Installation Notes for the A-0167 Base Insulator

General Description

These insulators are single element units with a porcelain length of 32” designed for use with guyed towers. The porcelain tube is oil-filled and fitted with an internal shield at the top end to suppress priming streamers.

The ends of the porcelain tube, as well as both faces of the top and base plates, have a ground finish. Gaskets are placed between the porcelain ends and the plates to provide an oil seal. On assembly, and during shipping, the pressure for sealing is provided by tie rods. When the tower has been fitted onto the insulator, the tie rods are removed and the sealing pressure is provided by the tower weight.

The top plate is fitted with a spun rain-shield having a diameter of 23 7/8" (in.). The insulator is shipped with this rain-shield attached.

Note: This rain-shield cannot be removed from the insulator although it can be disconnected from the top plate and lowered to the base plate. If there is a need to do this, then unbolt it from the top plate and carefully lower the shield to the bottom ensuring that the porcelain is protected during this process.

Insulators of this type which are fastened to a pier or other support are designed so that the mast load is kept centred on the top plate of the insulator and the mast is free to rock. For this purpose a centring pin and rocking plate are located on the insulator top plate as shown on the attached profile drawing for the insulator.

Unpacking

Remove the top and sides of the crate. The following items are enclosed and should be checked and retained for later use:

Qty. 4 Tapered aluminium plugs - 3/4" nominal dia.,

Qty. 4 3/4 - 10 Threaded plugs,

Qty. 1 Can of grey paint and brush,

Qty. 1 Centre pin.

The bolts holding the base plate to the bottom of the crate can be removed and the insulator lifted into place. The base insulator is shipped with the centring pin replaced by a lifting eye. When
the insulator has been lifted into place, unscrew the lifting eye and install the centring pin, leaving the rocking pad in place on the top plate. See the attached profile drawing for the base insulator.

**Installation**

It is important that the tie rod assemblies remain tight during tower erection. To ensure this, the tie rod nuts should be torqued to 125 - 135 ft. lbs. as tower sections are added.

When the tower is complete and fully erected, the tie rod assemblies can be removed.

This base is fitted with tie rod assemblies, which can be removed from the space between the base plate and top plate of the insulator.

Throughout the following procedure, due caution must be exercised to avoid any damage to the porcelain cylinder. It is strongly recommended that plywood or similar is inserted between the porcelain and the tie rods. The tie rods are to be removed as follows, when the tower is complete and fully erected.

Unscrew (by approximately two turns) the jam nuts on the top of each of the upper tie rods.

Relieve the tie rod load by unscrewing a fraction of a turn each of the full nuts on the upper tie rods. Undertake this progressively around the tie rods until the rods are slack.

Lock the jam nut against the full nut.

Unlock the full nut at the lower end of the upper tie rod and run it up the tie rod to the end of its thread. Unlock the full nut at the upper end of the lower tie rod.

Run the hex bar up the thread of the upper tie rod. The locked nuts on the top will provide a purchase for a wrench against this operation. There will now be a gap between the upper and lower tie rods.

Unscrew the lower tie rod from the base plate and remove it from the insulator.

Unlock the nuts on the upper part of the upper tie rod and unscrew the upper tie rod from them and remove from the insulator.

The tie rod holes in the top plate should then be plugged using the tapered aluminium plugs provided. The vacant tie rod holes in the base plate are sealed with the 1" threaded plugs provided. These should be well greased before insertion. The tie rods and nuts should be retained in case it should ever be necessary to remove the base insulator.

Insulators are shipped with a vented plug fitted to the edge of the top plate. This vented plug should be left in place at all times.

The lightning arc gap can be adjusted by loosening the locking grub screws on the 90° (degree)
elbows at the end of the 15" long nipple.

Finally, clean the porcelain sleeve if it has been soiled during installation and retouch any painted surfaces which have been scratched.
PROPER INSTALLATION OF BASE INSULATORS


Base insulators in which the axial load is borne by a porcelain sleeve under compression are rarely damaged by purely compressive loads. Damage is more likely to occur due to unforeseen stresses as a result of shear loads imposed by improperly prepared foundation or faulty erection. During erection of a mast, it is good practice to complete the erection procedure using a dummy insulator, fabricated of steel. When the mast is plumb and all guy tensions correct, temporary jacks are used to enable the dummy to be removed and the permanent insulator installed. If the erection procedure is carried out using the insulator, it is important that the only shear loads imposed are those which will have been allowed for in the system design. For this reason it is important that precautions be taken during erection to ensure that this objective is met.

Base insulators must be installed on reinforced concrete foundations large enough and extending sufficiently far into the earth to carry the tower reactions under the most severe conditions without settling. In considering size it must also be remembered that they must be designed so that there will be no heaving and consequent loss of alignment due to frost.
Foundation bolts of the correct size for the particular insulator being installed will have been set in the concrete when it is poured and held in position by a suitable template to ensure proper alignment. It is good practice to provide pipe sleeves, approximately 1/4" larger inside diameter than the foundation bolts, set around the bolts and extending about one foot into the concrete. The provides for some flexibility in the foundation bolts to ensure they properly engage the bolt holes in the insulator base. These sleeves should be filled with grout prior to securing the insulator base in position. The insulator base or base plate must be set level on the foundation using grout as necessary. This grout should be given sufficient time to cure before mast erection proceeds.

Base insulators which do not have cemented ends are shipped with a number of tie rods fitted between the top and bottom plates. During the manufacture of the insulator, these tie rods are tensioned sufficiently to hold the insulator assembly together during shipping, handling, and the early stages of mast erection. As the insulator is loaded by the weight of the mast, the nuts which are used to tension the tie rods will become slack. It is good practice, as these nuts slacken off during erection, to periodically tighten them using the torque specified in the Insulator Installation Instructions. When erection is complete, the tie rods should be removed and stored away. Base insulators which are not of the rocking base type are intended to be bolted solidly to the concrete foundation, grout being used to ensure that the base plate and hence the top plate of the insulator are level. Ideally 0.10° (degree) is the maximum tolerance. Five percent of the critical shear capability of the insulator is lost for each 0.10° (degree) that the base is out of level.

The mast is not fastened rigidly to the top plate of the insulator but centred on the insulator using the centring pin and rocking plate provided. It is good practice to provide a protective cage around the base insulator during erection to ensure that the porcelain surface is not
scratched or the insulator otherwise damaged.

During erection of the mast, it is common practice to use a simple derrick attached to the top of the partially assembled mast to haul further mast sections into place. It cannot be overemphasized that great care must be taken during this procedure to avoid imposing excessive shear loads on the insulator by having unnecessary overhang on the load being lifted or by violent snatching or jerking of the lifting halyard.

At all times during erection, the mast should be checked to ensure that it remains vertical and frequent adjustments of the guys will be necessary to ensure this and avoid excessive stresses on the insulator.

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