Equipment

Used in Rubber Gloving
Energized Lines

Insulated Mechanical Jumpers

(Macs)

Insulated Jumpers

Primary use Temporary by Pass to redirect The electrical Energy while Work is Performed.

Insulated Jumpers

Three styles of Jumper Clamp ends

1. **Hand tighten**
2. **Hot stick**
3. **Load pickup (Used to make quick connections to conductors with expected load)**

Clamp openings range from #6 to 1590 Kcmil depending on the model.

Adequate rubber gloves and/or hot sticks must be used when installing or removing jumper clamps.

Insulated Jumpers

Jumper wire itself available in different sizes:

Size	Approx. Ampacity
#2	200
1/0	250
2/0	300
4/0	400

Insulated Jumpers

Macs can be made to order for any length.

8 ft., 10 ft. and 12 ft. are very common.

Use the shortest length mac for the job. During faults, the slack or loops in the mac will whip around and could cause severe damage or personal harm.

Insulated Jumpers

Inspect the mac prior to use.

When applying a mac, make sure you know the load current -- then select the proper size.

Make sure connection point of jumper clamp is in right location, clean and tight (do not over-tighten)

For accidental brush contact only.

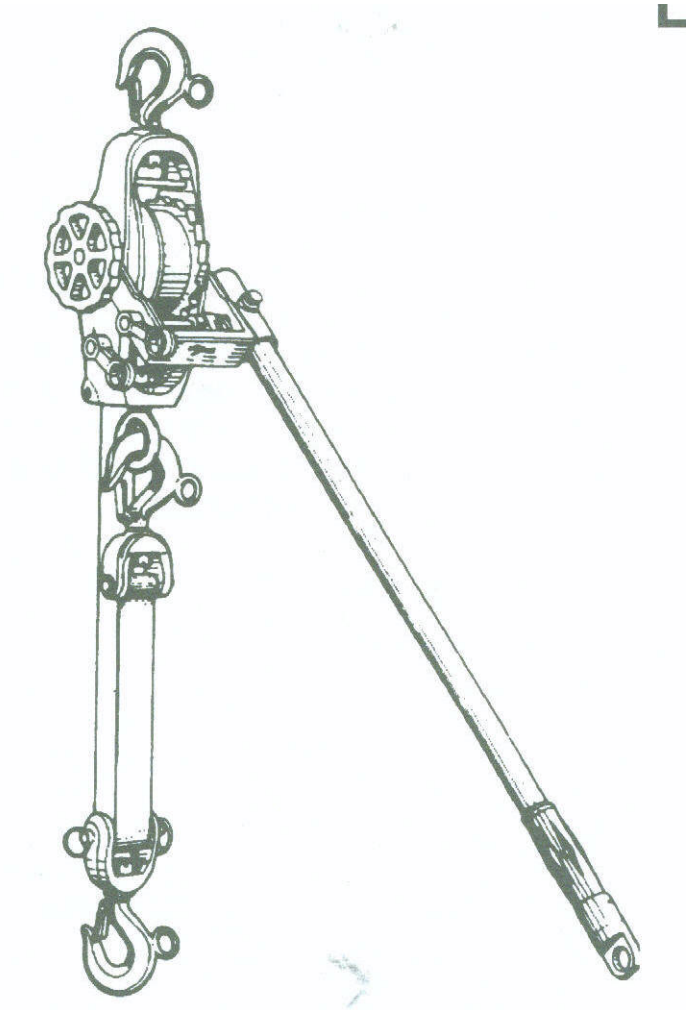
If laying a mac across an arm or next to a pole, use a rubber blanket or pole guard between the mac and structure.

Hot Line Hoists

(Nylon Strap Hoists)

Hot Hoists

Primary use- Hoisting operations around energized parts.



Hot Hoists

Hot hoists are a common tool used by linemen when doing hot line work.

They are used for many purposes such as dead-ending, sagging or transferring conductors

Hot Hoists

Other ways to abuse hot hoists:

Trying to move more weight than the hoist is rated for. (overloading)

Letting the hoist self-ratchet in the down mode.

Over stressing the handle,
using a longer handle or
using a “cheater”.

If it takes more than one person to jack the handle, you need a bigger hoist.

Hot Hoists

Hot hoists provide an added measure of safety by using a nylon strap between the hooks instead of a conductive cable or chain.

Insulation Links

(Link Sticks)

Insulation Links

Primary use-Provide insulation between hot hoist when used at different potentials.

Insulation Links

When using a hot hoist on an energized conductor, you must use an insulated hoist link stick.

WHY??

After a short time on the job, the nylon strap of the hot hoist WILL become dirty and contaminated and thus conductive.

Insulation Links

There is no effective way to clean the strap in the field, so you must use the insulated hoist link stick.

This link stick will provide insulation between the rigging point (usually at ground potential) and the conductor (usually energized).

Insulation Links

Available in lengths from 6” to 24”

Ends can be:

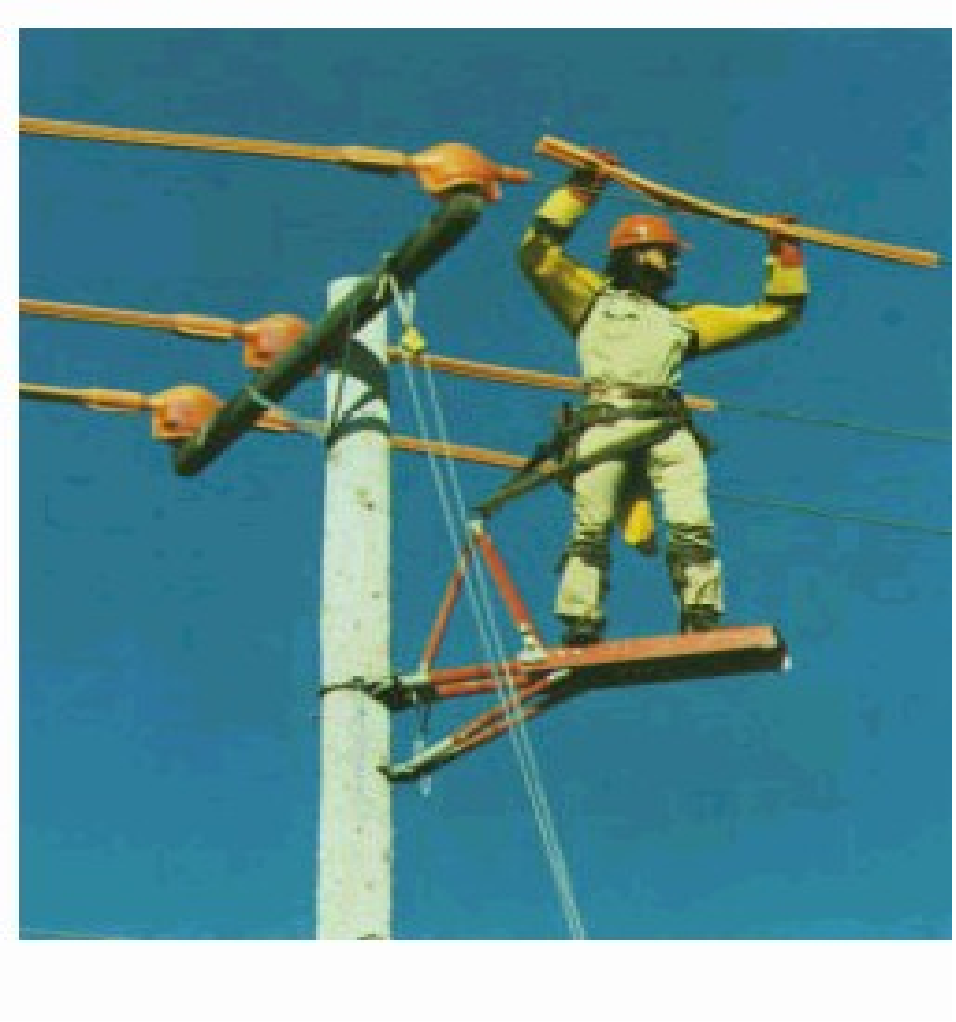
- **swivel eye on both ends**
- **swivel eye and safety hook**
- **safety hook and clevis roller and pin**

Insulated Aerial Platforms (Baker Boards)

Insulated Aerial Platforms

Primary use-Position lineman away from pole and closer to work.

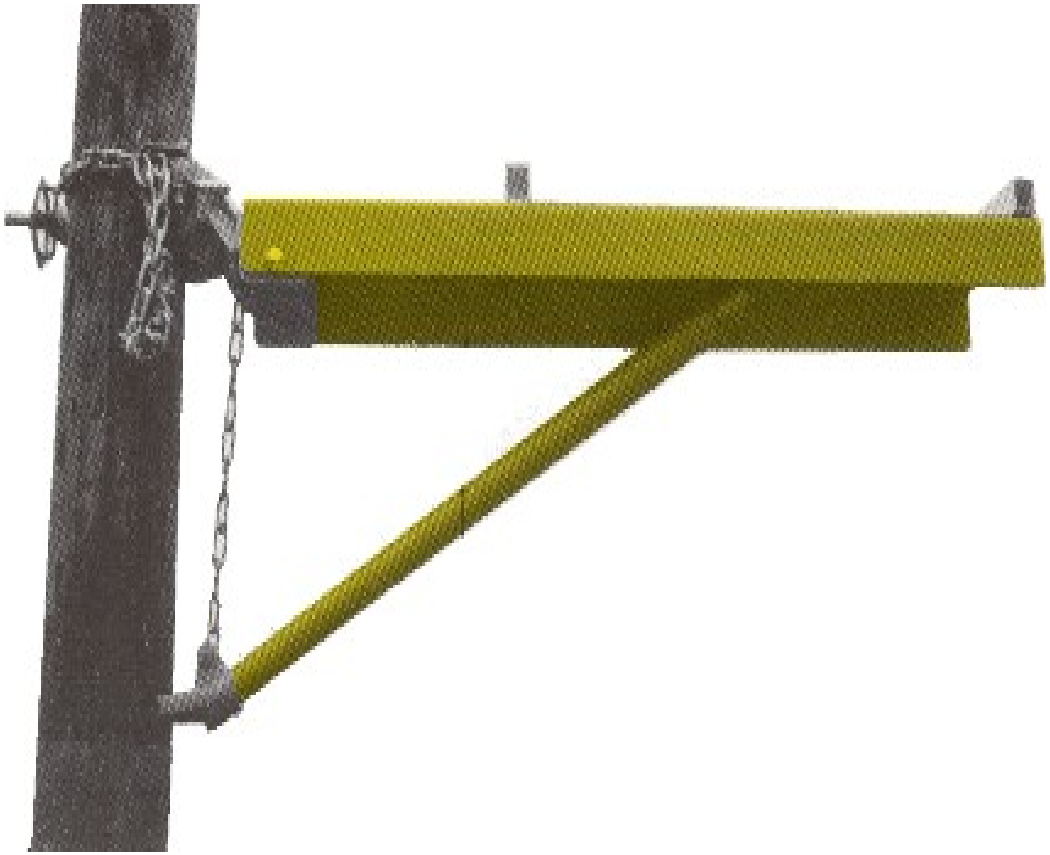
Insulated Aerial Platforms



Insulated Aerial Platforms

6-ft. insulated platforms are offered with Pivot-Type or Adjustable-Type mounting brackets and have Epoxiglas railings.

Insulated Aerial Platforms



Insulated Aerial Platforms

Baker boards are <u>not</u> considered a form of primary insulation. (just because you're standing on a baker board doesn't mean you can bare hand primary)

Contaminates can transfer from the Lineman's boots to the baker board.

Newer style baker boards have insulating links in them.

Insulated Aerial Platforms

Insulating links

Insulated Aerial Platforms

While Baker Boards allow the linemen to position themselves away from the pole (which is considered as being at ground potential) and actually closer to the work---

They do not eliminate the chance of phase to phase or
phase to ground contact!

Insulated Aerial Platforms

Options:

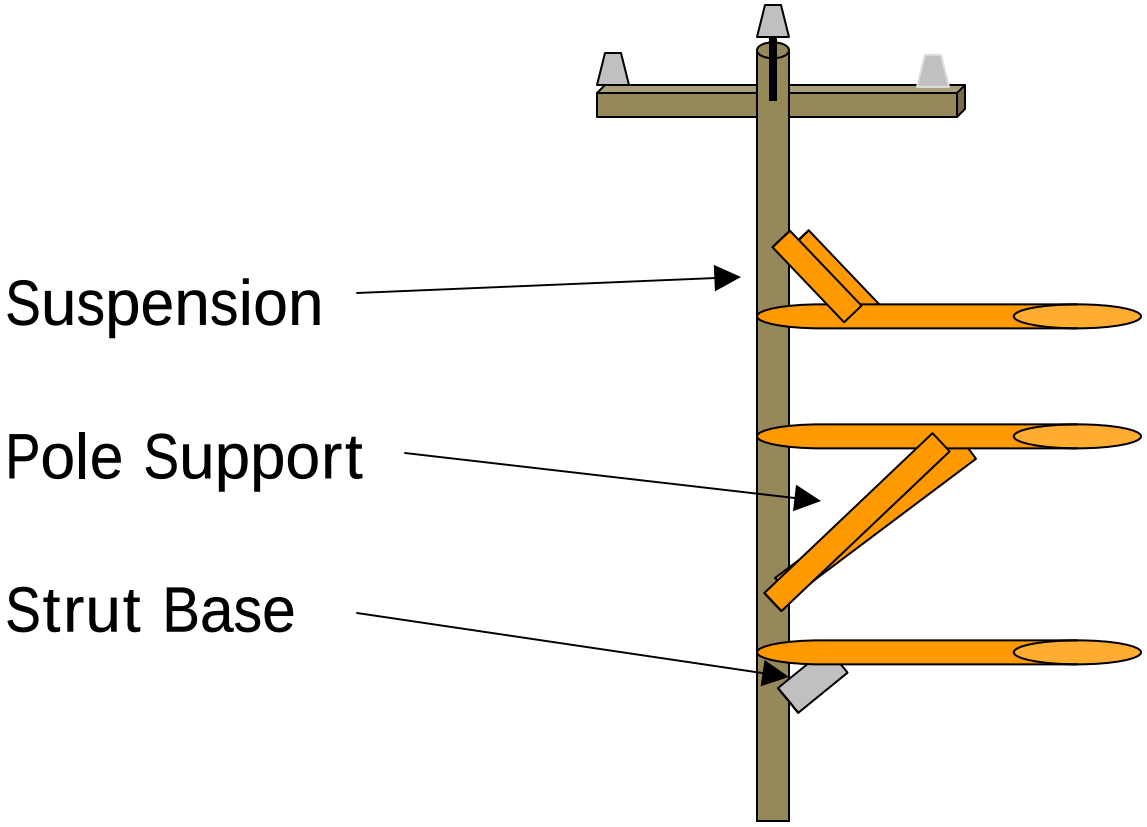
Different lengths; from 30” to 10 feet

Fixed mount or pivoting mount

Tripod or railing

Strut base, suspension attachment or pole support

Insulated Aerial Platforms



Insulated Aerial Devices (Bucket Trucks)

Insulated Aerial Devices

Primary use-Position lineman closer to work.

Insulated Aerial Devices

Most bucket trucks are not considered a form of primary insulation. (just because you're standing in an insulated bucket truck doesn't mean you can bare hand primary)

Only those bucket trucks used in live line bare hand work can be considered primary insulation.

Insulated Aerial Devices

Bucket Trucks allow the linemen to position themselves closer to the work and to reach areas that may not be accessible from the pole.

They do not eliminate the chance of
phase to phase or
phase to ground contact!

Insulated Aerial Devices

Care, use and inspection of bucket trucks is an entirely separate course in itself.

Insulated Aerial Devices

Keep in mind—

It is becoming more common to glove higher and higher voltages out of bucket trucks.

It is critical that you understand the limits of your rubber gloves and what you can and cannot do with your rubber gloves.

Insulated Aerial Devices

Some parting thoughts:

A brand new, tested $150,000.00 bucket truck
will not protect you from a phase to phase contact.

Don’t mislead yourself in thinking you are fully protected
when in a bucket truck.

Auxiliary Arms
(Hot arms)

Hot arms

Hot arms are rated for voltages up to 34.5KV

Hot arms

Hot arm styles:

Pole mounted with chain tightener or strap tightener (nylon or polyester)

Arm mounted (2 styles-single “C-clamp” and the more common “arm loop”)

Auxiliary side arm

Conductor lift arm (Christmas tree)

Temporary Dead end

Hot arms

Conductor holders or “saddles” can be:

Fitted with insulators for higher voltages (above 15KV)

Fixed or adjustable – make sure to maintain proper separation (rule of thumb-12” min. then 1” per KV)

Standard size or large capacity for conductors that are covered with line hose

Hot arms

Size and capacities:

34” long up to 6’ long

150# to 300# per conductor – differs by style and manufacturer.

Single, double or three saddles
(3 saddles for Aux. side arm and Christmas tree)

Hot arms

Do not lay conductor on fiberglass portion of arm
(no control and not designed for that by the manufacturer)

If exposed to rain:

- **Wipe down with silicon cloth first.**
- **Just like any other hot line tool-keep it dry.**
- **Also recommended to add saddle insulators.**

Hot arms

Make sure saddle latch is properly working.

Do not side load a hot arm.
Use special Temporary Dead end hot arm designed for side loads.

Do not “crank” or “bury” the attachment bolts into the cross-arm.

Use special caution to avoid contact with outside phase.