

An American National Standard

**IEEE Guide on Terminology for Tools
and Equipment to Be Used in Live
Line Working**

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**Transmission and Distribution Committee
of the
IEEE Power Engineering Society**

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IEEE Standards Board

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Foreword

(This Foreword is not a part of ANSI/IEEE Std 935-1989, IEEE Guide on Terminology for Tools and Equipment to Be Used in Live Line Working.)

This standard has been prepared by IEC Technical Committee No. 78: Tools for Live Line Working.

A first draft of this document was discussed during the inaugural meeting of this Technical Committee held in Paris in 1976.

Drafts were discussed at the meetings held in Stockholm in 1978, in Budapest in 1979, and in Philadelphia in 1980. As a result of the latter meeting, a draft, Document 78 (Central Office) 4, was submitted to the National Committees for approval under the Six Months' Rule in February, 1980.

Amendments, Document 78 (Central Office) 7, were submitted to the National Committees under the Two Months' Procedure for approval in April, 1981.

The National Committees of the following countries voted explicitly in favor of publication:

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IEEE Guide on Terminology for Tools and Equipment to Be Used in Live Line Working

1. Introduction

1.1 Scope

This standard applies to terminology for tools and equipment used in live line working. This standard is not intended to be a dictionary giving detailed definitions of all the terms used in live line working, but only the necessary details, without indications of their components and their methods of use, to permit identification of the tools and equipment and to standardize their names.

Terms used in this guide represent the terms normally used in North America. English terms in the IEC Publication 743 (1983), Terminology for Tools and Equipment to Be Used in Live Working, will typically use the word *pole* instead of *stick* and *tenon* instead of *tongue*. It should also be noted that there are other tools available and presently in use that are not shown in this guide.

1.2 General Terms

1.2.1 Difference between Insulated and Insulating Tools

1.2.1.1 Insulated Tool

A tool made of conductive material and fully or partly covered by insulating material.

1.2.1.2 Insulating Tool

A tool essentially made of insulating material.

1.2.2 Insulating Tool Components

1.2.2.1 End Fitting

Part (generally metallic) permanently fitted to the ends of insulating tube or rod.

1.2.2.2 Foam

An insulating material composed of closed polyurethane cells. Its purpose is to prevent the ingress and migration of moisture.

1.2.2.3 Rod

Solid rod composed of synthetic insulating material, normally reinforced.

1.2.2.4 Tube

Composed of synthetic insulating material, normally reinforced, the interior of which may be filled or hollow.

1.2.3 Types of Tools and Insulating Assemblies

1.2.3.1 Auxiliary Arm Assembly

Support tools arranged to form an auxiliary arm, to lift conductors off their insulators.

1.2.3.2 Hand Stick

Used to operate on network components at a distance. It is subjected only to the loads imposed by the worker.

Examples:

- 1) universal hand stick
- 2) wire cutting stick

1.2.3.3 Insulating or Insulated Hand Tools

Constructed of insulating material or of conductive material (e.g., metal) primarily for mechanical strength, and then coated or covered with insulating material to protect the worker from electrical contact and to avoid flashovers.

1.2.3.4 Mast Assembly

Various support sticks and tools arranged in a swivel-boom-type configuration assembled in place on a structure that, for example, may be used to

- 1) lift a string of insulators out of their position to facilitate changing damaged units;
- 2) lift conductors off their insulators.

1.2.3.5 Support Stick

Used to hold or move conductors and equipment.

Examples:

- 1) tension stick
- 2) suspension link stick
- 3) conductor support stick
- 4) swivel boom

1.2.3.6 Trolley Roll Layout

Various support tools assembled with support sticks, saddles, trolley wheels, pole-clamps, and insulator forks.

1.2.3.7 Working Stick

Consists of insulating tube and/or rod with end fittings.

The two types are

- 1) hand stick
- 2) support stick

1.2.4 Tools and Accessories

Tools and accessories that can be attached to the end fitting of universal sticks and that are used to perform various operations.

1.2.5 Protective Covers

Generally made of insulating materials, they are used to cover live or non-energized elements in order to avoid accidental contact.

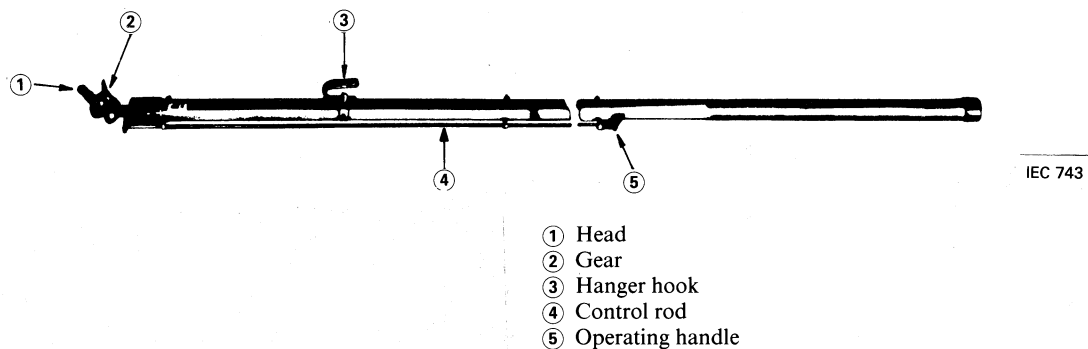
They may be rigid or flexible and either shaped or in sheets.

2. Insulating Sticks

2.1 Hand Sticks

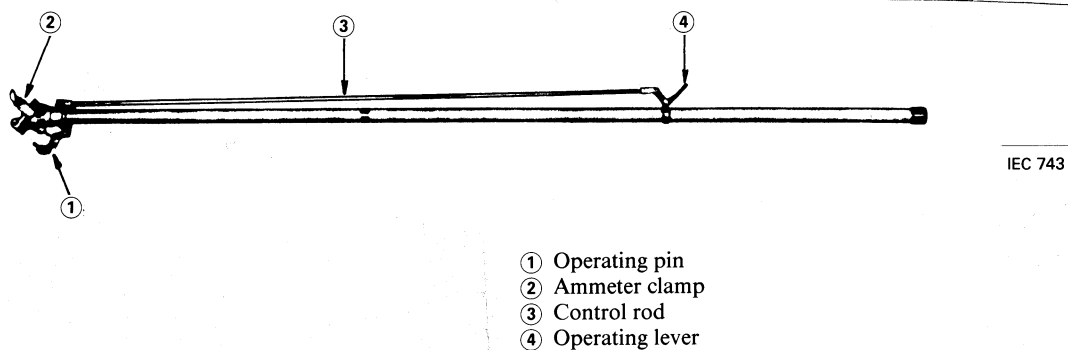
2.1.1 All-Angle Cog Wrench

Used with removable sockets to install and remove bolts and nuts.



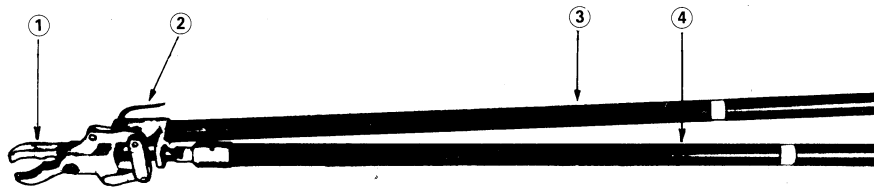
2.1.2 Clip-on Ammeter Stick

A tool to which a clip-on ammeter is attached.



2.1.3 Cotter Key Plier Stick

Used to grip, hold in place, or remove various small pieces.



IEC 743

- ① Jaw
- ② Hanger hook
- ③ Support handle
- ④ Operating handle

2.1.4 Flexible Insulated Wrench

Used with removable sockets to hold, install, and remove bolts and nuts.

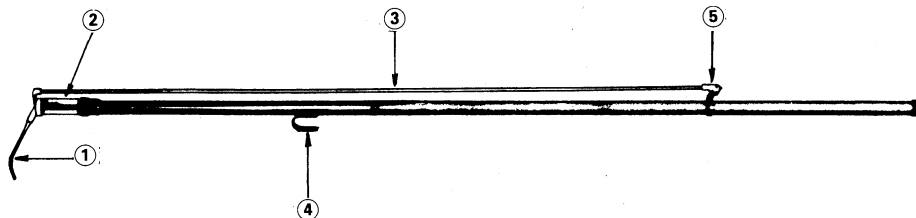


IEC 743

- ① Flexible socket wrench head
- ② Universal splined-head

2.1.5 Insulating Oiler Stick

Used to apply a lubricant or rust penetrant.

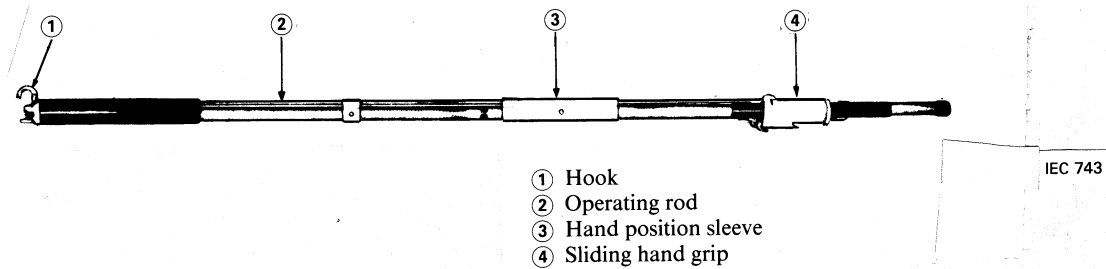


IEC 743

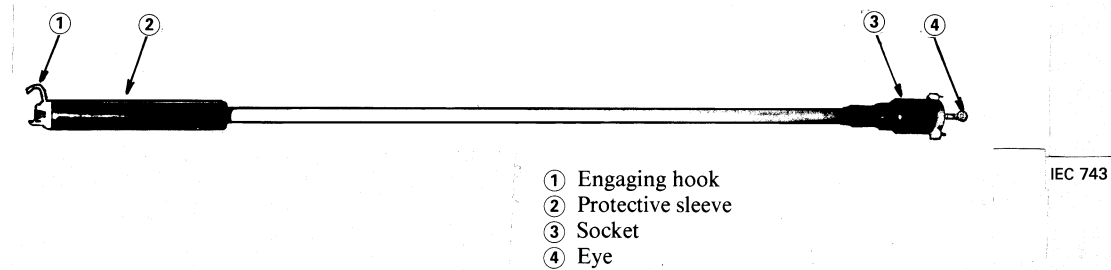
- ① Spout
- ② Oil reservoir
- ③ Control rod
- ④ Hanger hook
- ⑤ Operating handle

2.1.6 Retractable Hook Stick

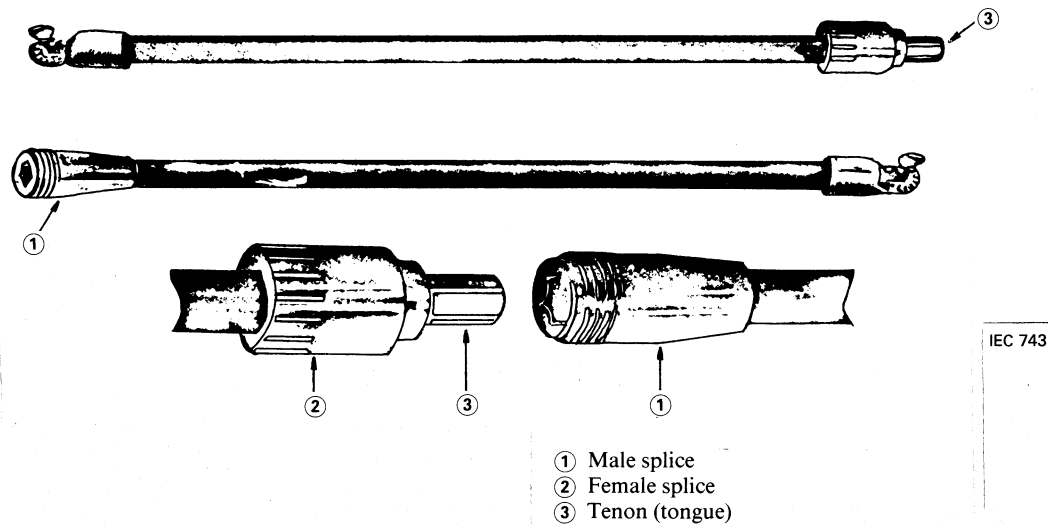
Used to install, remove, or handle live-line clamps and various accessories equipped with an eye.

**2.1.7 Retractable Hook Stick Extension**

Attached to the retractable hook stick to provide a longer reach.

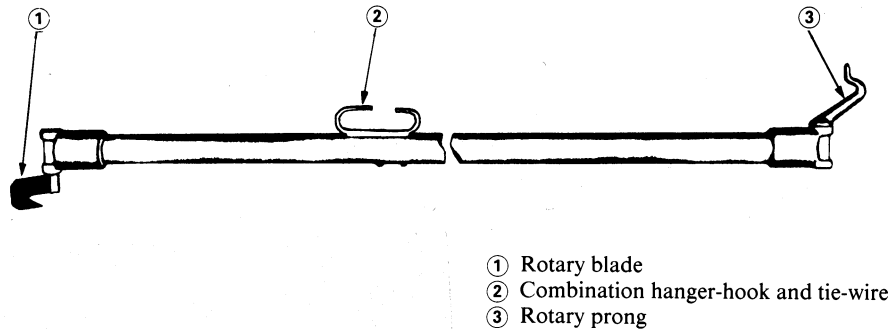
**2.1.8 Spliced Universal Hand Stick**

Made of one or more elements spliced together.



2.1.9 Tie Stick

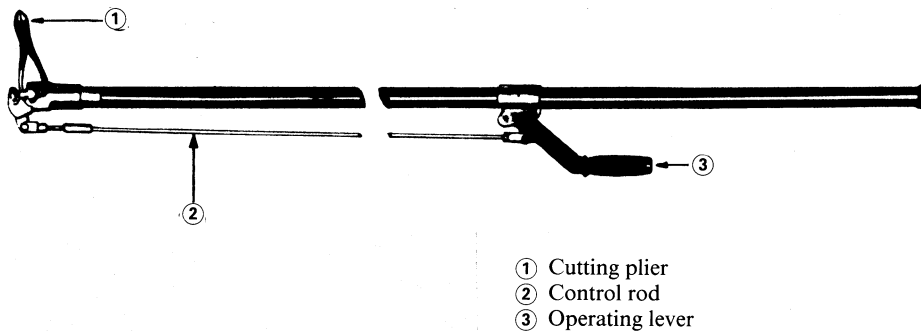
Used to install or remove tie wires.



IEC 743

2.1.10 Tie Wire Cutter

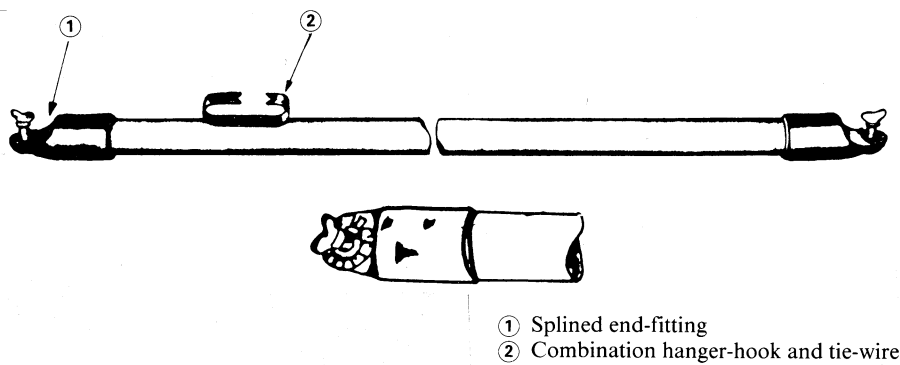
Used to cut tie wires.



IEC 743

2.1.11 Universal Hand Stick

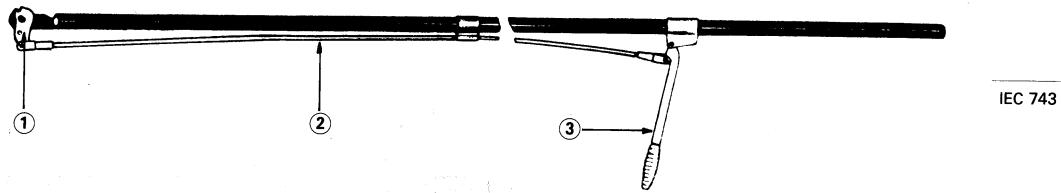
A tool to the end of which universal tools can be attached.



IEC 743

2.1.12 Wire Cutter Stick

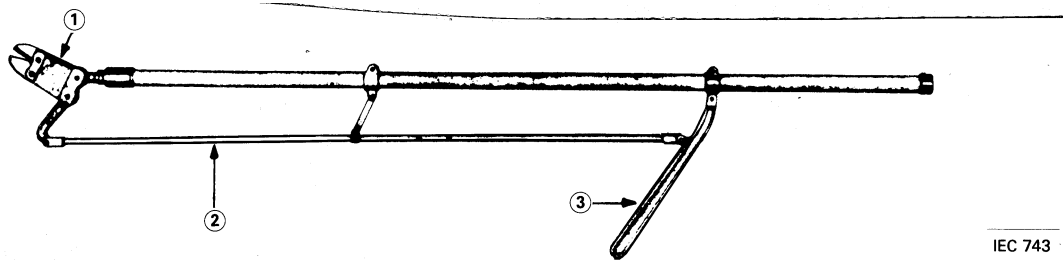
Used to cut conductors or binding wires.



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- ① Cutting head
- ② Control rod
- ③ Operating handle

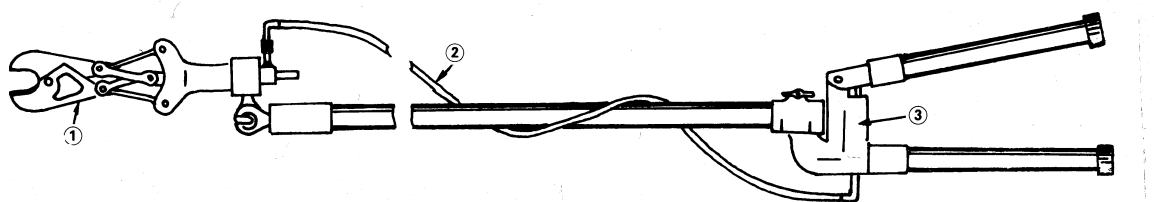
Lever-type (light duty)



IEC 743

- ① Cutting head
- ② Control rod
- ③ Operating handle

Lever-type (medium duty)



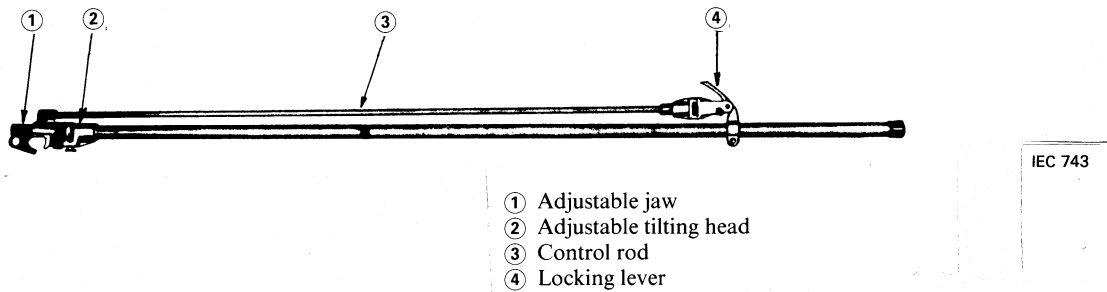
IEC 743

- ① Cutting head
- ② Flexible hose
- ③ Hydraulic pump

Hydraulic

2.1.13 Wire Holding Stick

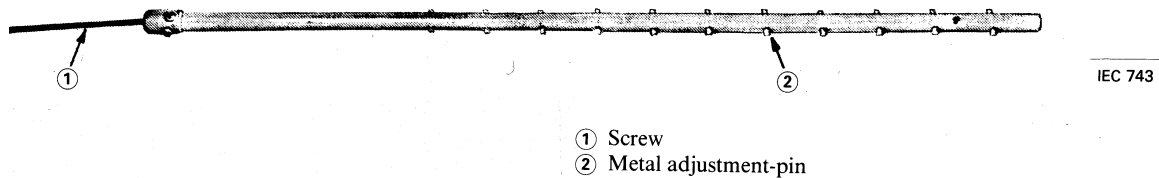
Used to hold conductors or wire during operations.



2.2 Support Sticks

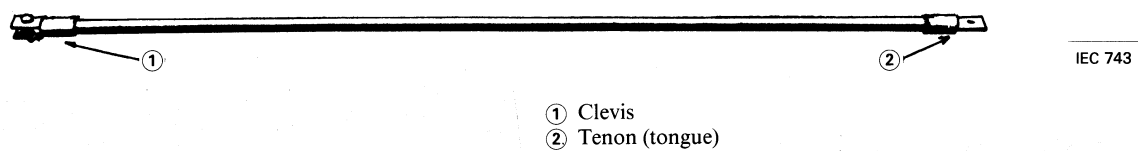
2.2.1 Adjustable Strain Stick

A support tool that, with various accessories, can be used to lift or tension wires.



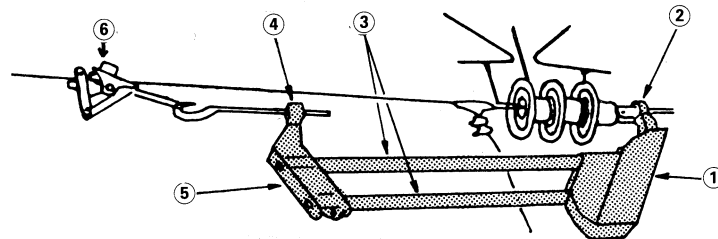
2.2.2 Clevis/Tongue Stick

A support tool used with appropriate attachment and/or adapters to perform various operations.



2.2.3 Deadend Tool

Used to hold the tension of a conductor, in order to replace a deadend string of insulators.

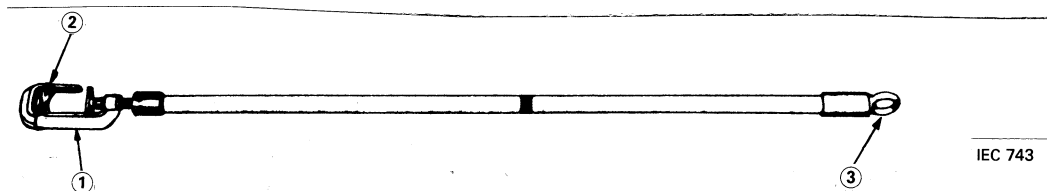


IEC 743

- ① Flange (with insulated cover)
- ② Hook
- ③ Poles (sticks)
- ④ Jacking-screw
- ⑤ Flange
- ⑥ Automatic come-long clamps (wire grips)

2.2.4 Roller Link Stick

A link stick equipped with a roller that allows its movement along the conductor.

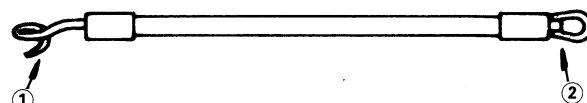


IEC 743

- ① Head
- ② Roller
- ③ Swivel eye (butt-ring)

2.2.5 Spiral Link Stick

A tension link stick equipped with a spiral link at one end.

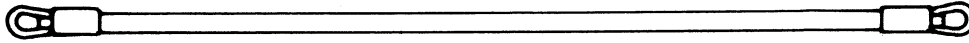


IEC 743

- ① Spiral link
- ② Swivel eye (butt-ring)

2.2.6 Swivel Link Stick

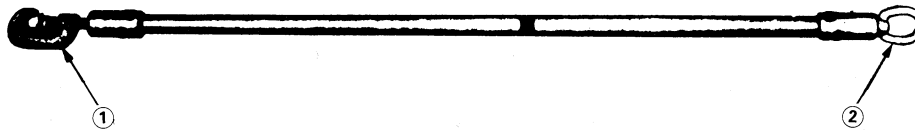
A tension link stick equipped with a swivel eye at one or both ends.



IEC 743

2.2.7 Tension Link Stick

Used to apply tension to a component (or conductor).

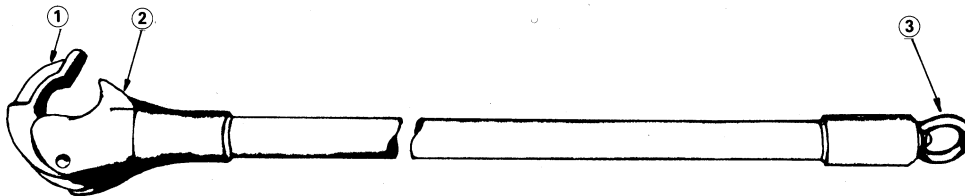


IEC 743

- ① Jaws
- ② Swivel eye (butt-ring)

2.2.8 Wire Support Stick

Used to position or move a conductor.



IEC 743

- ① Movable jaw
- ② Fixed jaw
- ③ Swivel eye (butt-ring)

3. Universal Tool Fittings

3.1 Splined End-Tools

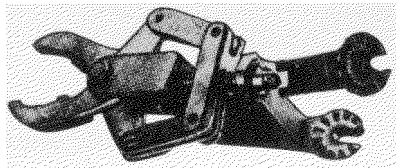
3.1.1 Adjustable Insulator Fork

Used to control insulators during their installation or removal. May have insulated adjustable jaws.



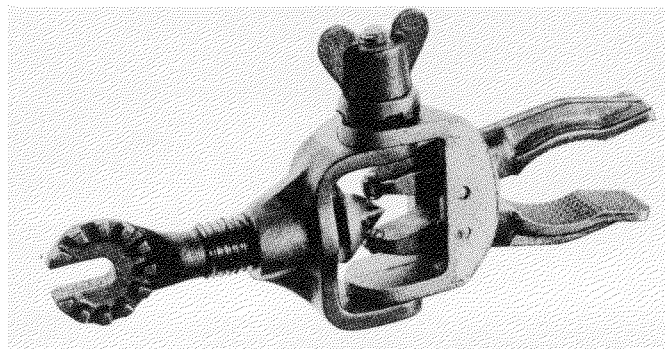
3.1.2 Adjustable Pliers

Used to grip small parts.



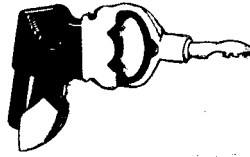
3.1.3 All-Angle Pliers

Used to hold various loose parts adjustable to various angles.



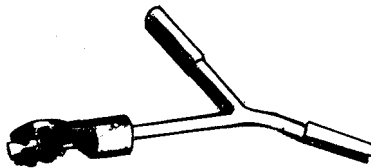
3.1.4 Ammeter Holder

Used to hold a clip-on ammeter.



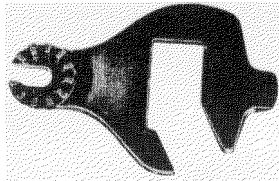
3.1.5 Anti-Interference Braid Applicator

Used to install antistatic braids between the pin of the insulator and the conductor clamp.



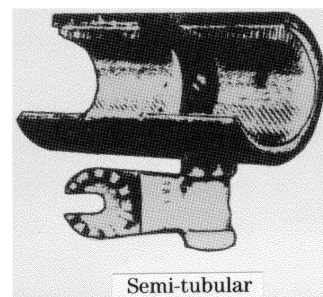
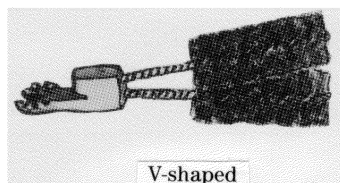
3.1.6 Ball Socket Adjuster

Used to hold a ball socket during connection and disconnection.



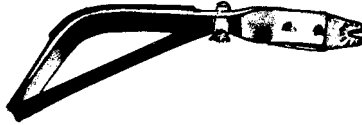
3.1.7 Conductor Cleaning Brush

Used to clean conductors.



3.1.8 Conductor Sander

Used to polish the conductor surface.



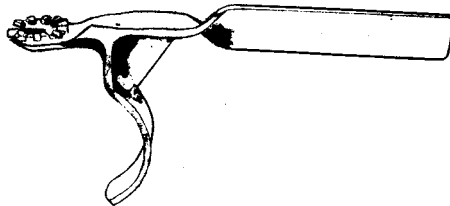
3.1.9 Cotter Key Installer

Used to install split pins, cotter keys, etc.



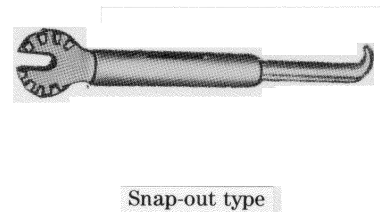
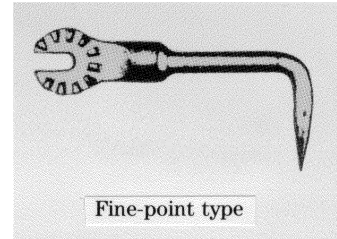
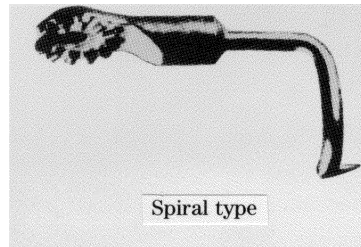
3.1.10 Cotter Key Installer-Remover

Used to install or remove split pins, cotter keys, etc.



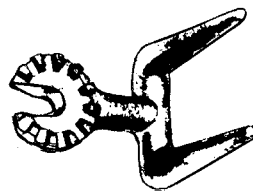
3.1.11 Cotter Key Remover

Used to pull cotter keys from fittings or hardware.



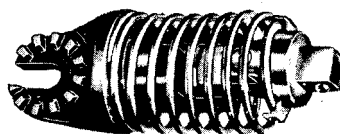
3.1.12 Fixed Double-Prong Head

Used to manipulate tie wire or equipment.



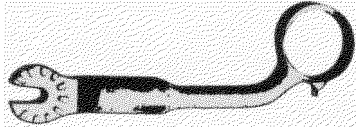
3.1.13 Flexible Wrench Head

Used with removable socket to tighten or loosen nuts and bolts.



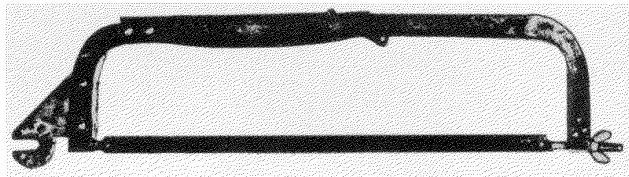
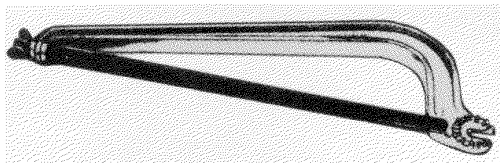
3.1.14 Formed Wire Tool

Used to install and remove formed or pre-formed tie wire.



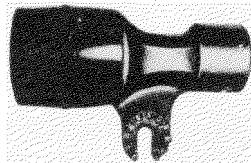
3.1.15 Hack Saw

Used for sawing any metal part.



3.1.16 Hammer

Used to impact equipment as required.



3.1.17 Holding Fork.

Used to hold components in position when using other tools.

