

Treatment of Lines for Mobile Devices and Appliances – Course: Basic Skills and Knowledge of Electrical Engineering. Instruction Examples for Practical Vocational Training

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Introduction

The present material contains 3 selected instruction examples on the basis of which essential skills in connection with the treatment of lines for mobile devices and appliances can be practised.

Since skills in the field of treatment of lines for mobile devices and appliances are acquired and mastered only by much practice, the instruction examples have to be constantly repeated.

In order to facilitate the preparation and performance of the exercises, for each instruction example the materials, testing and measuring equipment as well as basic knowledge are mentioned which are required to carry out the exercises.

In addition to the sequence of operations, drawings are attached showing how the exercises are done.

Instruction Example 6.1. Pressing–on of a Cable Eye on a Multiple–wire Cable

Material

Cable, moulded cable eye according to the cable

Tools

Side cutting pliers, cable stripper, deinsulating device, cleaning brush, half–round file, triangular scraper, flat–nose pliers, pressing device

Testing and measuring instruments

Rule

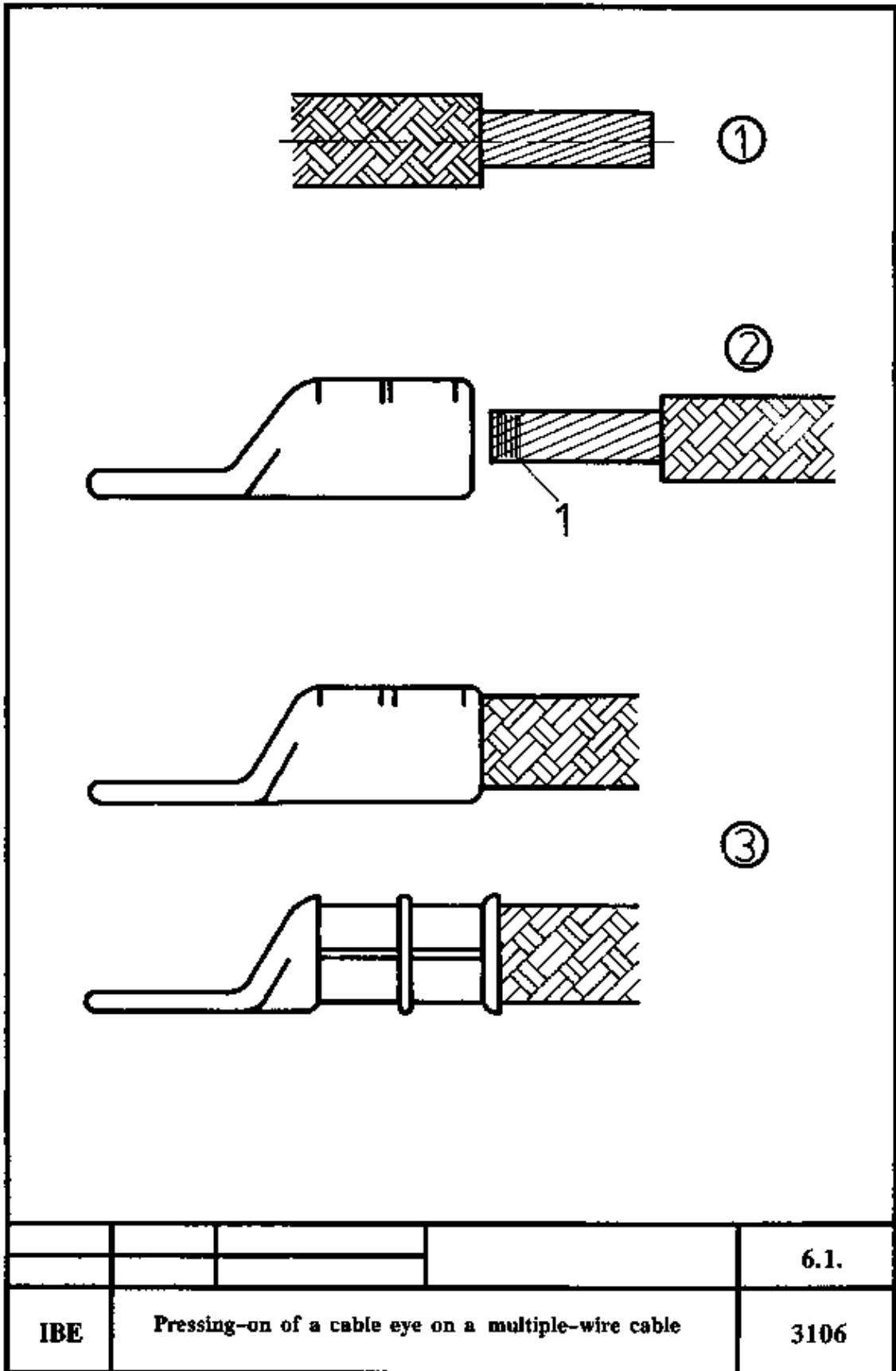
Auxiliary equipment

Pressing inserts according to cable eye, anti–corrosive grease

Required basic knowledge

Making of permanent joints

Sequence of operations	Comments
1. Cutting the conductor to length	With hexagonal pressings the change of the length due to pressing process has to be considered.
2. Removal of the core insulation (1)	Pay attention to the deinsulation length!
3. Cleaning of the contact surfaces	There should not be more than 10 minutes between cleaning and pressing.
4. Putting the conductor into the cable eye (2)	The conductor should perhaps be provided with a wire binding (1) before being put into the cable eye.
5. Carrying out of the pressing (3)	After having touched the pressing jaws no further pressure must be exercised on the pressing tool.



Pressing-on of a cable eye on a multiple-wire cable

Instruction Example 6.2. Connection of a Safety Plug to a Cable with Cab-tyre Sheathing

Material

Cable with cab–tyre sheathing, safety plug

Tools

Side cutting pliers, cable stripper (electrician's knife), wire strippers, deinsulating device, screw driver, round–nose pliers/arbor, soldering iron

Testing and measuring equipment

Rule, continuity tester

Auxiliary equipment

Soldering tin, flux,

Required basic knowledge

Knowledge of the kinds of electric lines and the colour coding as well as the order of connection of the conductors;

Making permanent joints.

Sequence of operations

1. Cutting the cable to a certain length.
2. opening the plug.
3. Removing the sheath insulation (external sheathing).
4. Shortening the external conductor.
5. Deinsulating of the individual conductors.
6. Removing the oxide film.
7. Clockwise twisting of the conductors.
8. Moistening the conductors with flux and tinning them.
9. Shoving the upper part of the plug on the line.
10. Bending the cores as required for connection.
11. Undoing of the tension relief.
12. Clamping of the conductors.
13. Fastening the tension relief.
14. Shoving the upper part of the plug on the lower part and closing the plug.

Comments

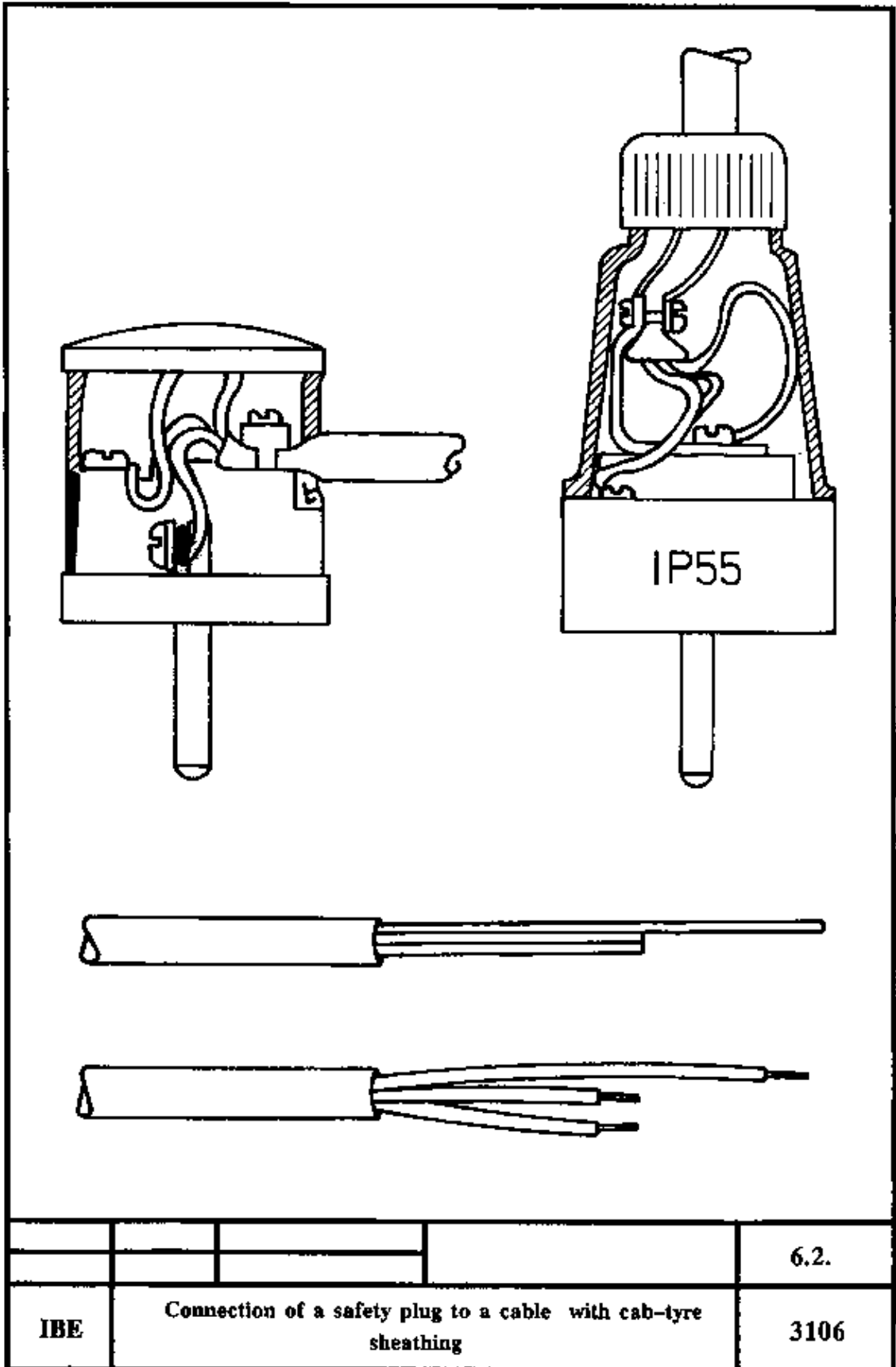
Rules of thumb:
Remove the sheath insulation over a distance of approximately 45 mm.

Shortening the active cores to approximately 30 mm.

Remove 8 mm of the core insulation.

Normally plug–in connection eye, if necessary bending of eyes.

First the protective conductor, then the rest of the conductors.
(The active cores, too are led to the connections in a slight curve.)



Connection of a safety plug to a cable with cab-tyre sheathing

Instruction Example 6.3. Testing of Mobile Devices and Appliances

Material

Extension cords, flexible cables, movable multi-way connectors (sockets), mobile devices and appliances

Tools

Screw drivers (nick and cross nick), grub screw drivers, socket wrenches of various sizes, adjusting pliers, sealing tongs

Testing and measuring equipment

Continuity tester (high- and low-resistive), insulation detector, protective conductor testing device

Auxiliary equipment

Instrument leads, measuring terminals, seals, sealing wire, measuring card file

Required basic knowledge

Knowledge of the protective measures against hazardous contact voltage; instructions for use of the individual testing and measuring instruments.

Sequence of operations

Comments

Mobile devices and appliances, especially portable electric hand appliances, have to be examined at regular intervals. Approximately every six months.

Control checks are allowed to be carried out only by authorized people who have the appropriate experience and knowledge.

1. Inspection

General condition, completeness, marking.

2. Testing of the insulating capacity of the device or appliance.

3. Testing of the efficiency of the protective measure against hazardous contact voltage of the device or appliance.

Pay attention to the connection between casing and earth bushing by means of instrument lead.

4. Testing of the functioning of the device or appliance

5. Providing the examined device or appliance with a test seal or badge.

Only if all tests have proved the proper condition of the device or appliance.

6. Entering the date of the examination, the result of the control check and the seal number into the testing card file.

Legends to the drawings

(1) Front panel of a protective conductor testing instrument – example –

(2) Example of carrying out an examination of extension cords

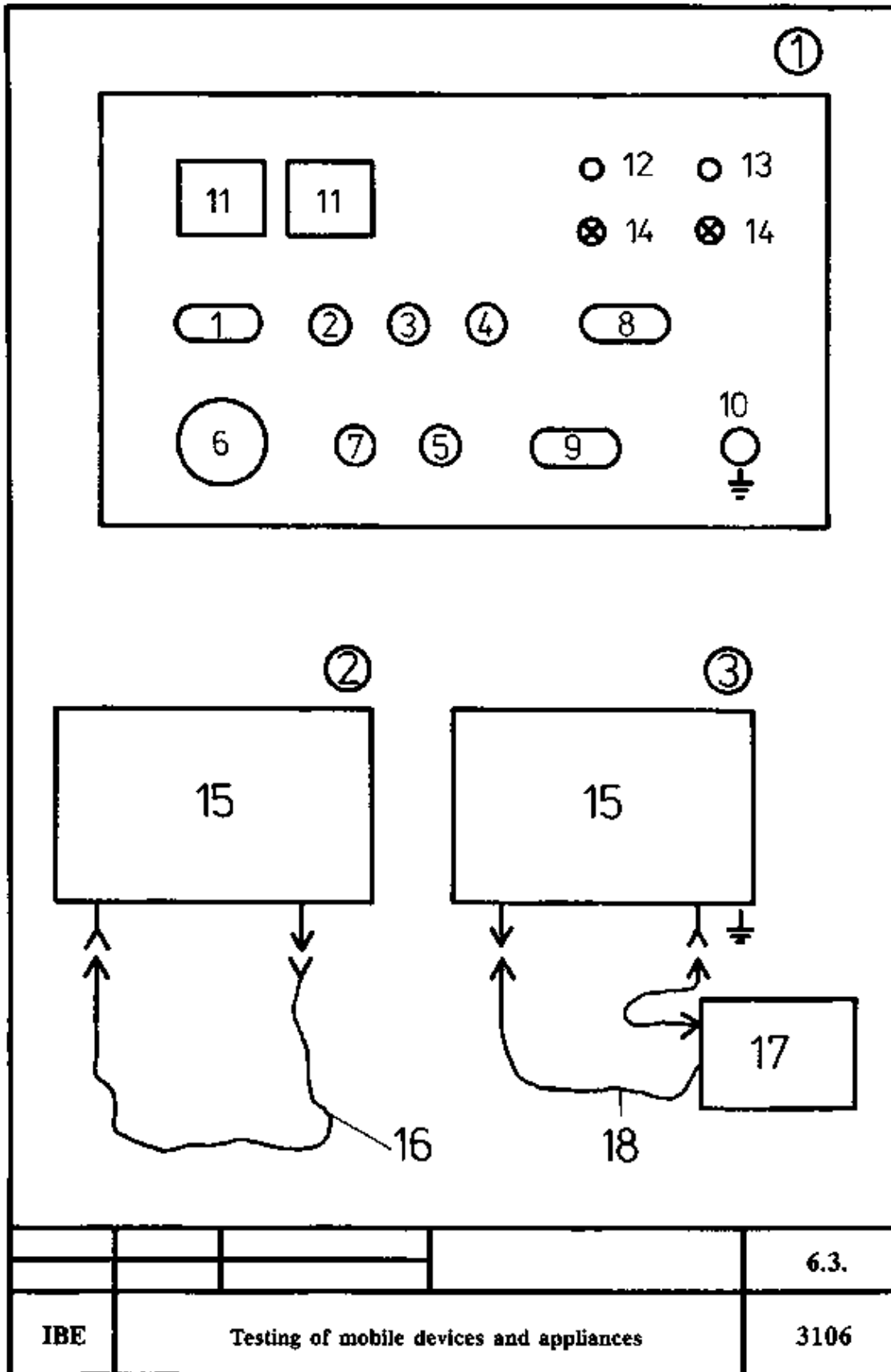
– Test voltage maximally 500 V

– Test current of the protective conductor loop for cross sections

- . from 0.75 to 1.5 mm² – approximately 30 A and
- . from 2.5 to 10 mm² – approximately 50 A

(3) Example of how to carry out a control check of devices and/or appliances

- 1 Built-in plug; 2 F appliance coupler (IEC standard coupler socket, interchangeable);
- 3 A appliance coupler (IEC standard plug for cold appliances);
- 4 Bipolar appliance coupler (hot appliance plug with inundation nozzle);
- 5 Double-pole appliance plug with earthing contact;
- 6 IF ED 16 socket with shrouded contacts for flash installation;
- 7 Double-pole socket with earthing contact;
- 8 Flush-mounted socket with shrouded contacts (six-pole, not interchangeable);
- 9 Flush-mounted socket with shrouded contacts (three-pole, with N-type and PE-type contact);
- 10 Measuring terminal, (earth bushing); 11 Measuring instrument; 12 Rocker switch;
- 13 Push-button switch; 14 Telltale lamps; 15 Protective conductor testing device;
- 16 Extension cord; 17 Device/appliance to be checked;
- 18 Plug-in device and connecting line of device/appliance;
- 19 Instrument lead between casing and earth bushing.



Testing of mobile devices and appliances