

**Making Fastening Joints – Course: Basic Skills and Knowledge of
Electrical Engineering. Instruction Examples for Practical Vocational
Training**

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Making Fastening Joints – Course: Basic Skills and Knowledge of Electrical Engineering. Instruction Examples for Practical Vocational Training

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Introduction

The present booklet contains 3 selected instruction examples to practise the main techniques of making fastening joints (detachable joints), including joints with lugs, with cable eyes and direct connection with distributor plate.

The instruction examples 1 and 2 are a continuation of the instruction example 1 of "Making Permanent Joints" and may be used, for example, as connection between a motor and a protective motor switch. Instruction example 3 may represent, for example, the connection of the conductors to a socket or a plug. In that case the correct connection of the phases and of the neutral conductor is to be ensured.

In order to facilitate the preparation and execution of the work, the necessary materials as well as working, measuring and testing tools are specified for each instruction example. The additional knowledge required for carrying out the work is also mentioned. Moreover, working drawings are attached to show more details of certain steps of work.

Instruction Example 2.1. Detachable Joint with Wire Lug

To practise the manufacture of a detachable joint with wire lug.

Material

Stripped flexible rubber sheathed
cable $3 \times 2.5 \text{ mm}^2$
(from instruction example 1 of "Making Permanent Joints"),
Length: 2000 mm
Stripped length: 80 mm

Working tools

Cable stripper (cable stripping knife) or stripping tool, round nose plier, open ended wrench, 100 W soldering iron

Measuring and testing tools

Folding rule or steel rule

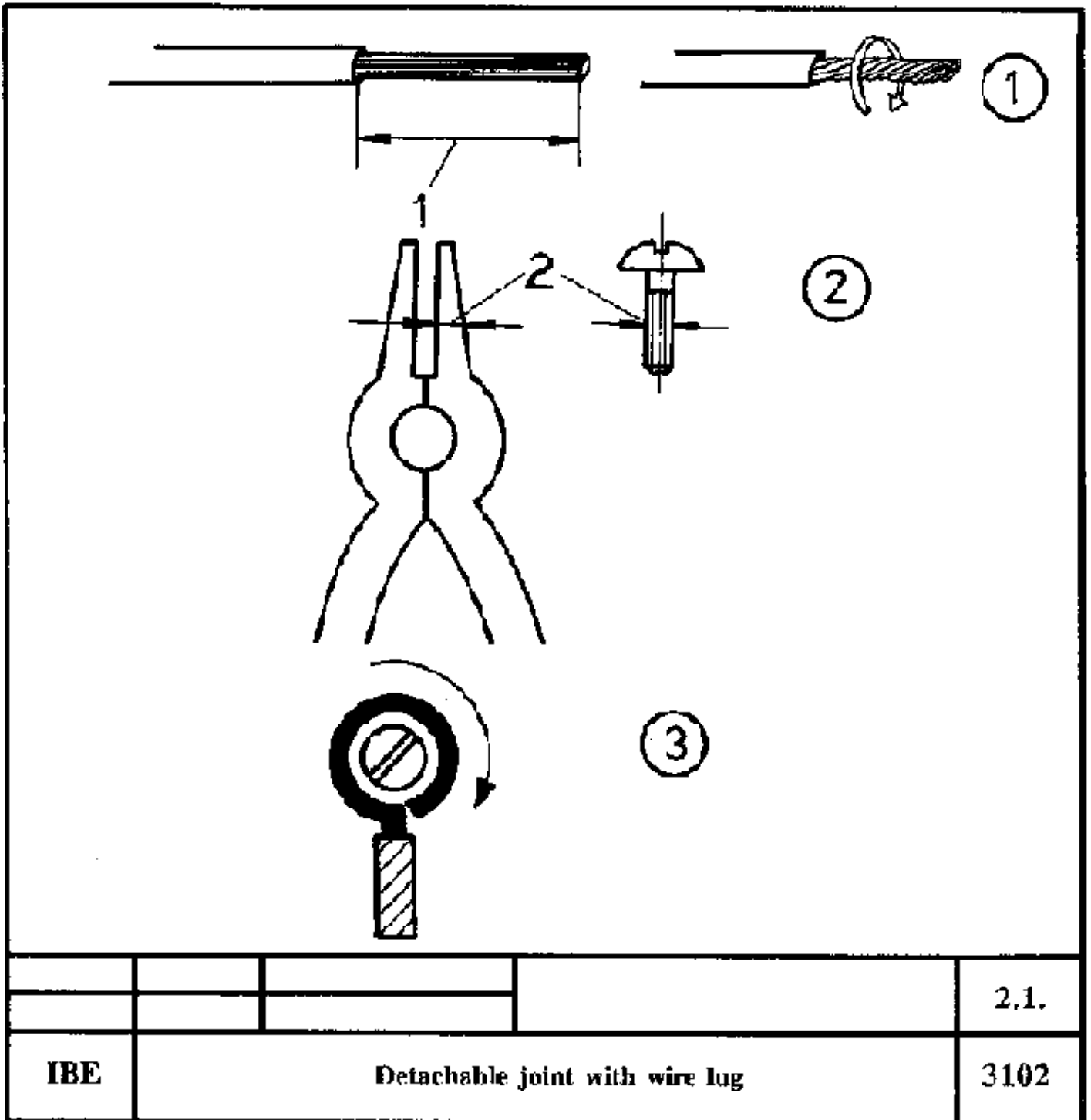
Accessories

Soldering flux, soldering tin

Necessary additional knowledge

Reading of drawings, treatment of cables and lines, making permanent joints, measuring

Sequence of operations	Comments
1. Preparation of workplace. Making available the working materials.	Check tools, materials and accessories for completeness.
2. Checking of initial lengths.	Cut to length, if necessary.
3. Stripping of conductors.	The stripping length 1 to be determined by means of the formula in the "Trainees' Handbook of Lessons". Twist stripped wire ends by clockwise rotation. (1)
4. Tin-coating of conductors.	Moisten conductors with flux first.
5. Bending of lugs.	Apply round nose plier according to required diameter 2. (2)
6. Bending of lugs to centre of conductor.	(2)
7. Connection (clamping) of lugs.	See to correct composing order. Insert lugs so that they will be drawn in when the joint is tightened. (3)



Detachable joint with wire lug

Instruction Example 2.2. Detachable Joint with Cable Eye

To practise the manufacture of a detachable joint with cable eye.

Material

Stripped flexible rubber sheathed
 cable $3 \times 2.5 \text{ mm}^2$ (from instruction example 1 of "Making Permanent Joints"),
 Length: 2000 mm,
 Stripped length: 80 mm

Working tools

Screwdriver

Necessary additional knowledge

Reading of drawings

Sequence of operations

Comments

1. Preparation of workplace. Making available the working materials.

Check for completeness.

2. Unscrewing of screws.

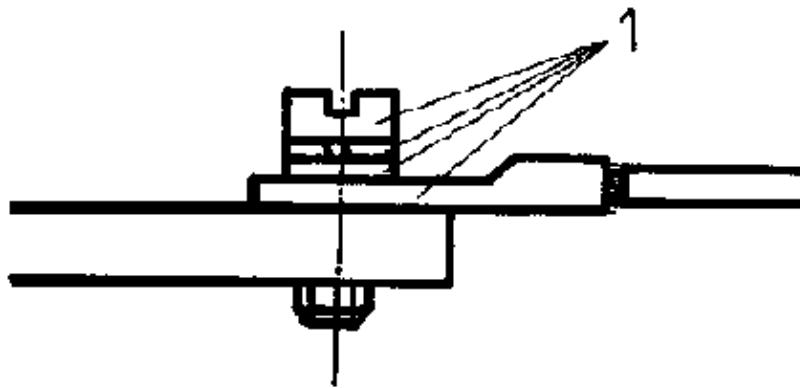
Unscrew screws with suitable screwdriver.

3. Composing of screw assemblies.

See to correct composing order. (1)

4. Tightening of the screws.

Srew in the screw by hand, then tighten it firmly with screwdriver.



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Detachable joint with cable eye

Instruction Example 2.3. Detachable Joint with Distributor Plate

To practise the manufacture of a detachable joint with distributor

Material

Stripped plastic-sheathed
cable $2 \times 1.5 \text{ mm}^2$, aluminium,
Length: 300 mm,
Stripped length: 60 mm

Working tools

Cable stripper (cable stripping knife) or stripping tool, screwdriver

Measuring and testing tools

Folding rule or steel rule

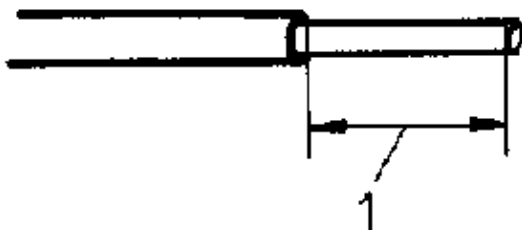
Necessary additional knowledge

Reading of drawings, treatment of cables and lines, measuring

Sequence of operations	Comments
1. Preparation of workplace. Making available the working materials.	Check tools and materials for completeness.
2. Checking of initial length.	Cut conductor to length, if necessary. (1)
3. Stripping of conductors.	Stripping length 1 depends on size of clamped joint 1. Don't notch the conductors when stripping them. (2)
4. Unscrewing of the screw.	Unscrew just as much as necessary for inserting the conductors.
5. Feeding in of conductors.	Insert conductors so that they are drawn into the clamped joint when the screw is tightened. (3)
6. Tightening of the screw.	



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Detachable joint with distributor plate