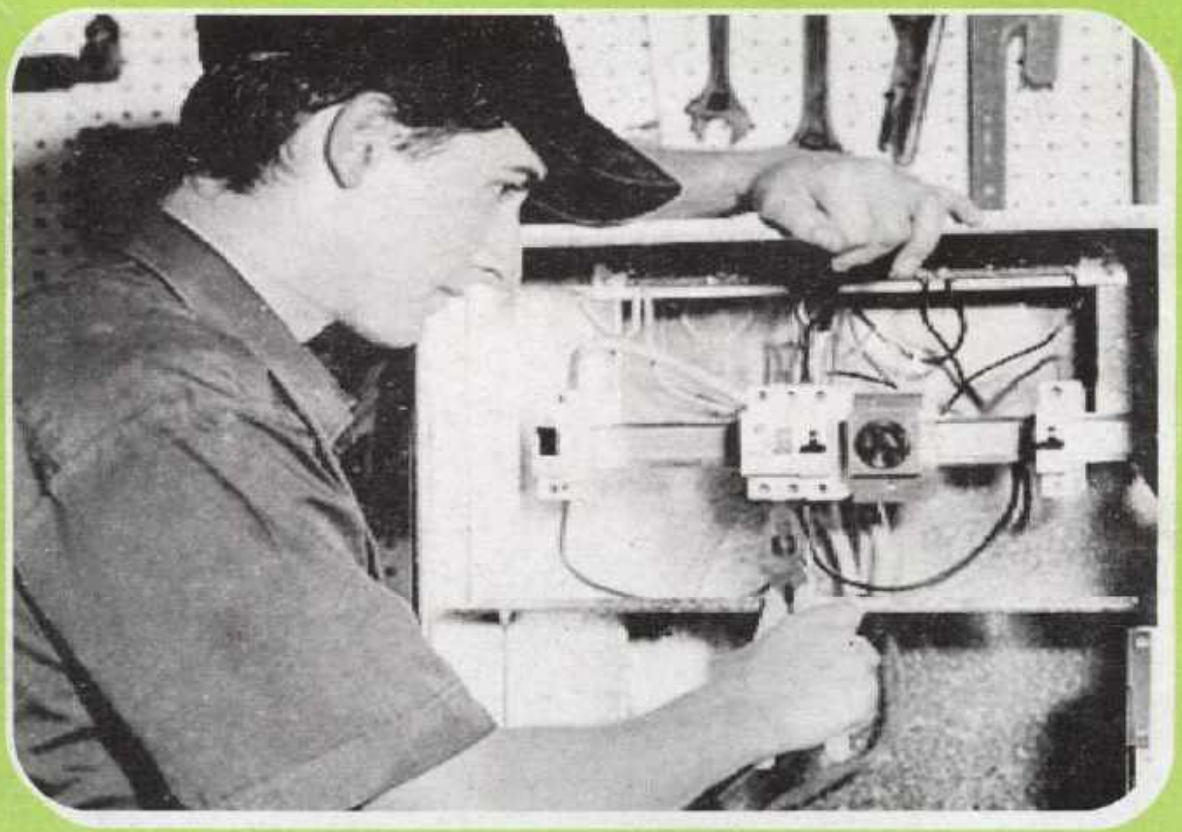
TRADE TRAINING-I

TTC PROGRAMME

ELECTRICIAN GENERAL



TEVTA

GOVERNMENT OF THE PUNJAB

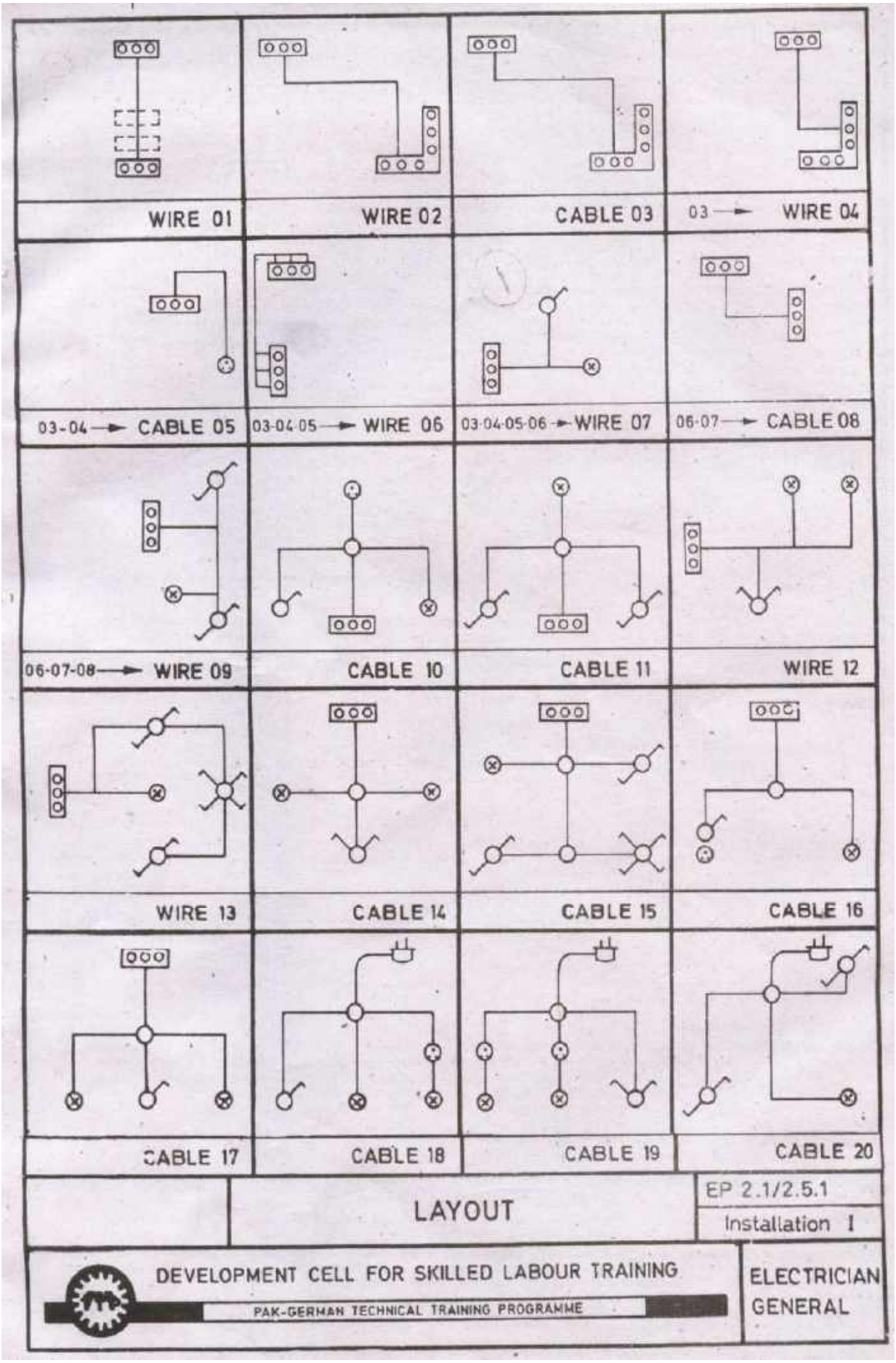
TECHNICAL EDUCATION & VOCATIONAL TRAINING AUTHORITY

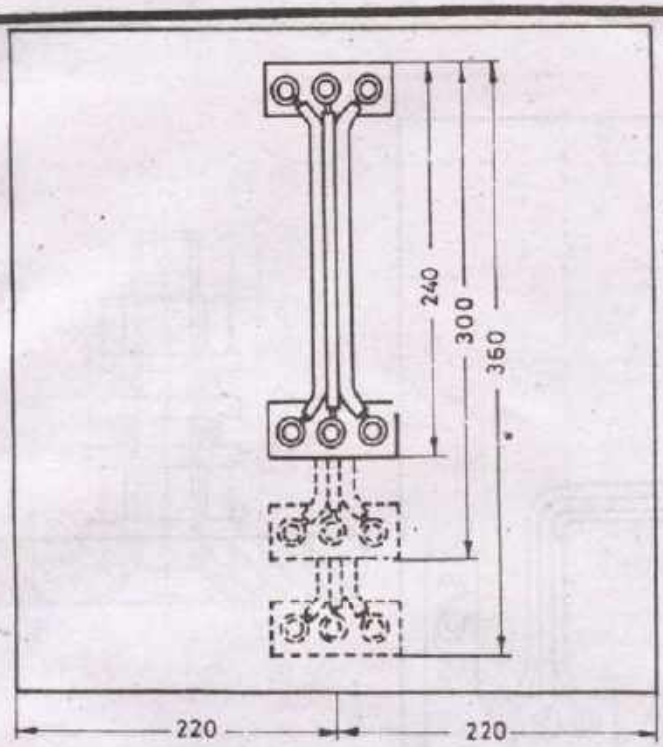
TRADE TESTING BOARD

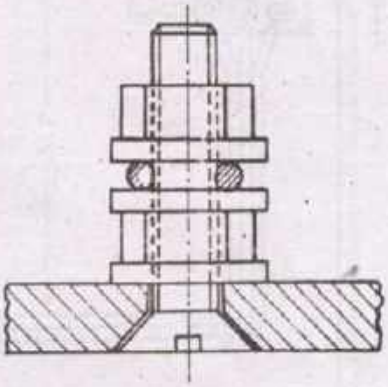
DEVELOPMENT CELL LAHORE

T.T.P. Series No. 33 Price Rs. 26/-

TTP


WIRE 01
WIRE 02
CABLE 03
03 → WIRE 04
03-04 → CABLE 05
03-04-05 → WIRE 06
03-04-05-06 → WIRE 07
06-07 → CABLE 08
06-07-08 → WIRE 09
CABLE 10
CABLE 11
WIRE 12
WIRE 13
CABLE 14
CABLE 15
CABLE 16
CABLE 17
CABLE 18
CABLE 19
CABLE 20
LAYOUT
EP 2.1/2.5.1
Installation I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING
PAK-GERMAN TECHNICAL TRAINING PROGRAMME
ELECTRICIAN
GENERAL





SEQUENCE OF OPERATION

1. Fix terminal plates on the exercise board according to drawing.
2. Straighten the wire and cut it into three equal pieces.
3. Remove the insulation from one end of each wire.
4. Make an eye on each bared end.
5. Bend the wires according to drawing.
6. Cut the other ends of the wires to the necessary length, remove the insulation and make eyes.
7. Connect the wires with terminals and tighten the nuts.
8. Check the job thoroughly and compare with drawing.

TOOLS REQUIRED

Electrician' s knife
Plier, Flat- and Round Nose Plier
Backsquare, Meterrule,
Spanner 9 mm

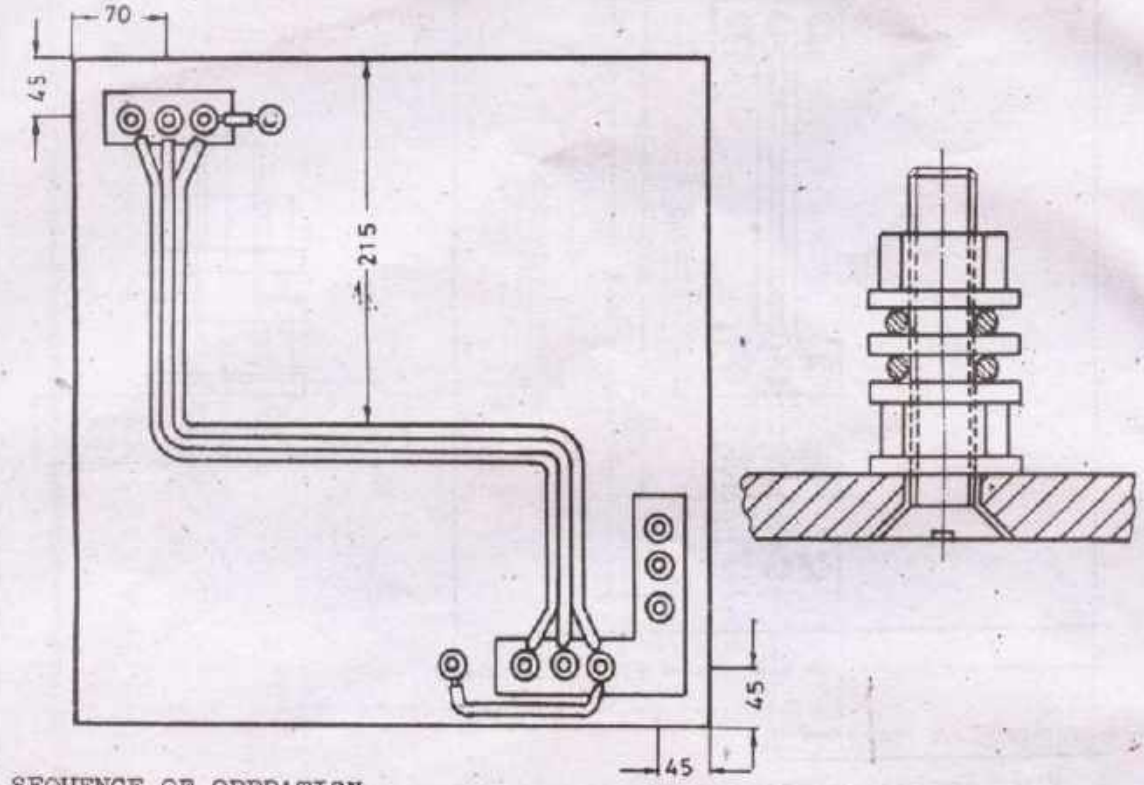
MATERIAL

2 Terminal plates I, compl.
1.20 m NYA 1.5 mm^2
(1/.044 ≈ 1 mm^2)
4 Cheese head screws M 4 x 25
(3/16 " x 1 ") w. nuts and washers

NOTE

Don' t damage the conductor when removing the insulation!
Don' t bend the wire with sharp edged tools!
Make eyes always according to screw-size and bend them clockwise!

	HANDLING OF WIRE	EP 2.3/2.5.1/1 Installation I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



SEQUENCE OF OPERATION

1. Remove all parts from exercise board.
2. Fix terminal plates on the exercise board according to drawing.
3. Straighten the wire and cut it into three equal pieces.
4. Remove the insulation, make eyes and connect the wires with terminals on one side.
5. Bend the wires according to drawing.
6. Cut the other ends of wires to the necessary length, remove the insulation and make eyes.
7. Connect the wires with terminals, tighten the nuts and do the final check.

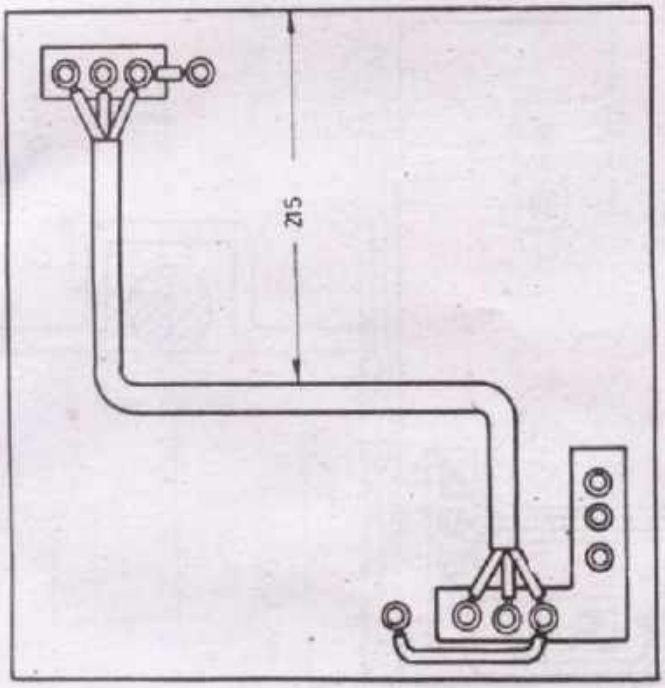
NOTE

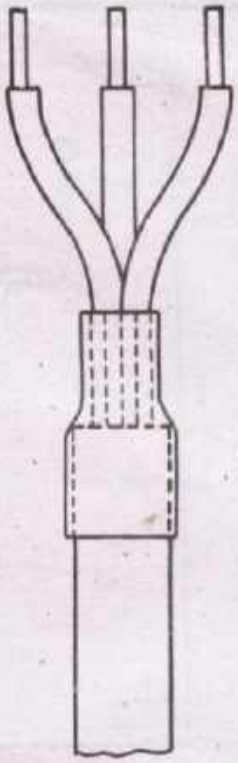
Don' t damage the conductor while removing the insulation!
Don't bend the wire with sharp edged tools!
Make eyes always according to screw-size and bend them clockwise!

MATERIAL

1 Terminal plate I, compl.
1 Terminal plate II, compl.
2.50 m NYA 1.5 mm^2 (1/.044 ~ 1 mm^2)
7 Cheese head screws M 4 x 25 (3/16 " x 1 ") w. nuts & washers

	HANDLING OF WIRE	EP 2.3/2.5.1/2. Installation I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL





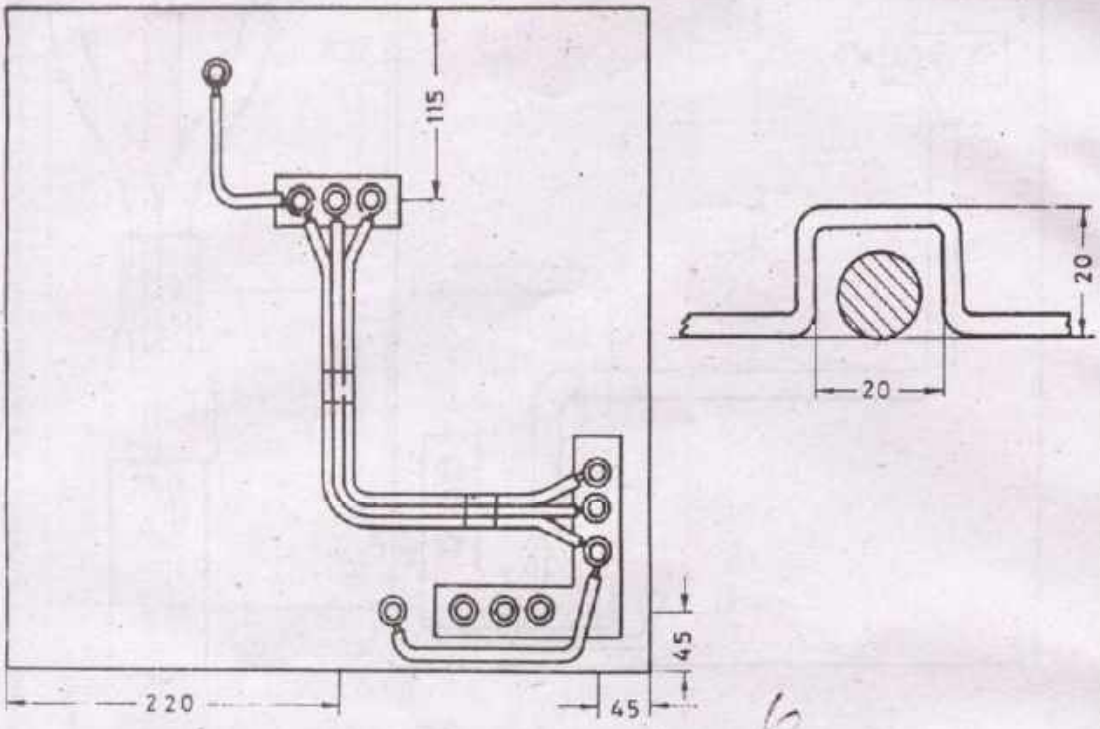
SEQUENCE OF OPERATION

1. Remove the wires of exercise 2.
2. Straighten the cable.
3. Bend the cable according to drawing.
4. Prepare both ends of the cable exactly as per special sketch and make eyes
5. Fix the cable on the exercise board with clamps and connect the wires with terminals.
6. Check the job thoroughly and compare with drawing.

NOTE
Don' t use tools to bend the cable.
Don' t damage conductor-insulation while removing the sheath-insulation.

MATERIAL
0.80 m NYM 3 x 1.5 mm^2
(3 core cable round 1/.044 - 3/.029)

	HANDLING OF CABLE	EP 2.3/2.5.1/3 Installation I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



SEQUENCE OF OPERATION

1. Fix an additional terminal plate on the exercise board.
2. Straighten the wire and cut it into three equal pieces.
3. Bundle the wires with insulation tape.
4. Bend the wires according to drawing and make the crossing as shown in additional sketch.
5. Cut the ends of the wires to the necessary length, remove the insulation and make eyes.
6. Connect the wires with both terminal plates, tighten the nuts and do the final check.

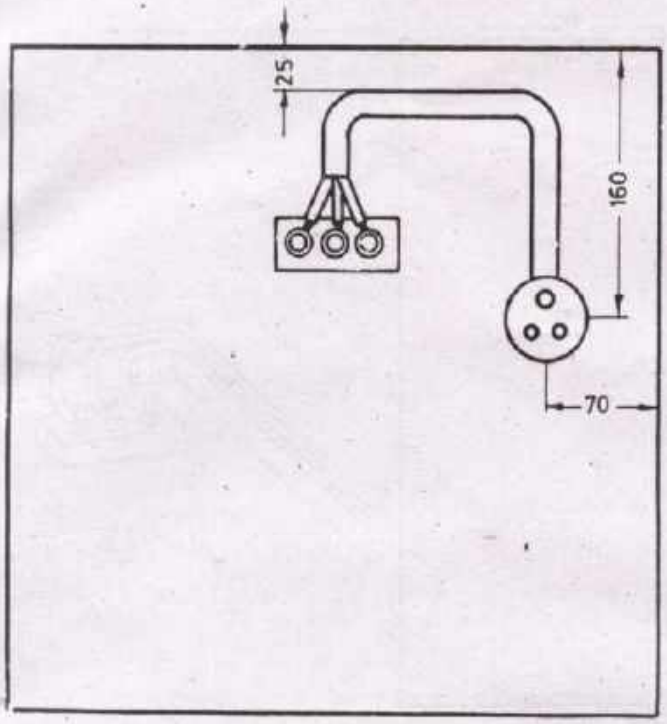
MATERIAL

1 Terminal plate I

2.0 m NYA 1,5 mm^2 (1/.044 ~ 1 mm^2)

2 Cheese head screws M4 x 25
(3/16" x 1") with nuts and washers

	HANDLING OF WIRE	EP 2.3/2.5.1/4 Installation I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



SEQUENCE OF OPERATION

1. Fix the socket on the exercise board.
2. Straighten the cable.
3. Bend the cable according to drawing.
4. Prepare the ends of the cable.
5. Fix the cable with clamps on the exercise board.
6. Connect the wires with terminals.
7. Check the job thoroughly and compare it with drawing.

NOTE

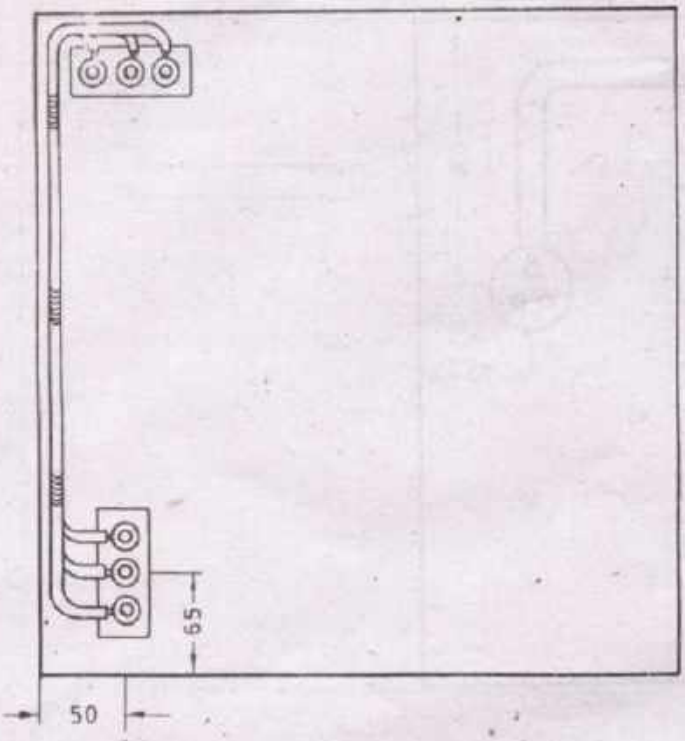
Connect all wires properly, especially the protective wire.

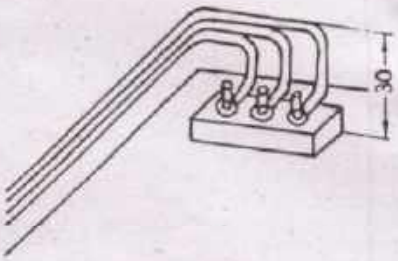
MATERIAL

1 3-pin socket
1 round block
0.50 m NYM 3 x 1.5 mm^2
(3 core cable round
1/.044 - 3/.029)

1 Countersunk screw M 4 x 50
(3/16 " x 2 ") w. nut &
washer)
2 Wood screws 3.5 x 20
half round head (No. 6 3/4")

	INSTALLING A SOCKET	EP 2.3 2.5.1/5 Installation I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL





SEQUENCE OF OPERATION

1. Fix the additional terminal plate on the exercise board.
2. Straighten the wire and cut it into three equal pieces.
3. Bundle the wires as shown in drawing.
4. Bend the wires as shown in additional sketch.
5. Connect the wires with terminals.
6. Check the job thoroughly and compare it with drawing.

MATERIAL

1 Terminal plate I

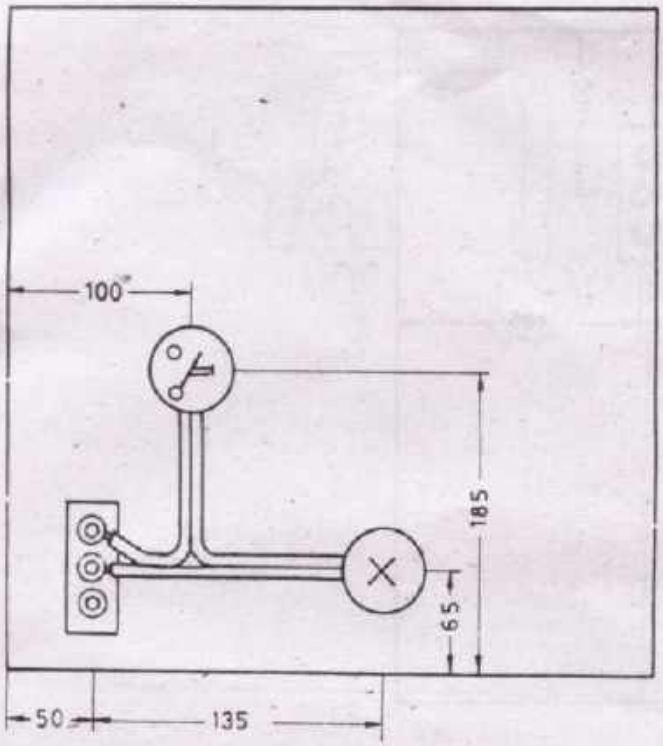
2.10 m NYA 1.5 mm^2

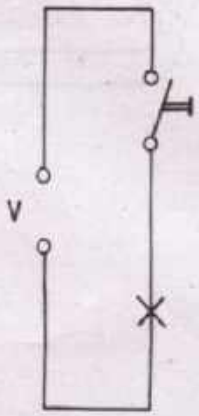
(1/.044 ~ 1 mm^2)

2 Cheese head screws M 4 x 25

(3/16 " x 1 ") w. nuts and washers

	HANDLING OF WIRE	EP 2.3/2.5.1/6
		Installation I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL





SEQUENCE OF OPERATION

1. Fix lamp holder and single pole switch on the exercise board.
2. Straighten the wire and cut it into the necessary length.
3. Bend the wires according to drawing.
4. Connect the wires as shown in drawing and additional sketch.
5. Check the job thoroughly and compare it with drawing.

NOTE

Phase wire always has to be connected to the switch.
Neutral to the lamp holder.

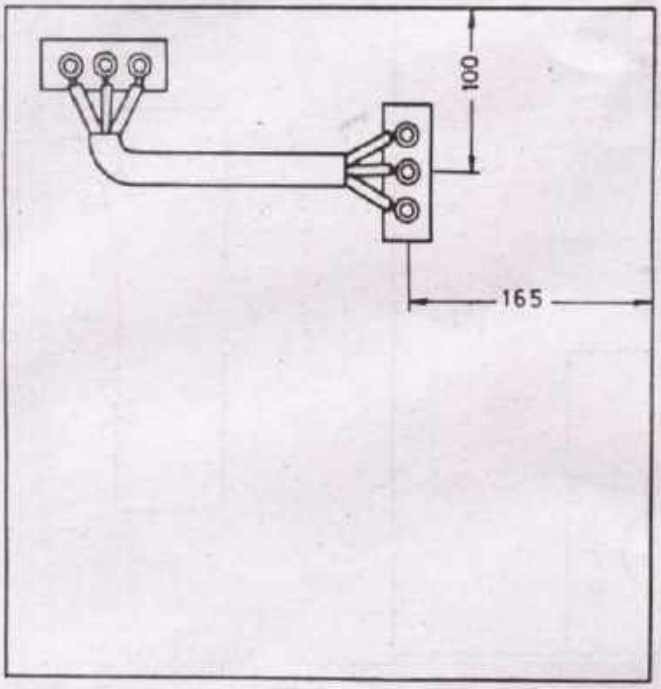
MATERIAL

1 Lamp holder
1 Single pole switch
2 Round blocks

0.9 m NYA 1.5 mm ^{2}
(1/.044 ~ 1 mm^2)

2 Countersunk screws M 4 x 50
(3/16 " x 2 ") w. nuts & washers
2 Wood screws half round head 3.5 x 15
(No. 6 x 1/2 ")
2 Wood screws half round head 3.5 x 20
(No. 6 x 3/4 ")

	LAMP-SINGLE POLE SWITCH	EP 2.3/2.5.1/7
		Installation I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



SEQUENCE OF OPERATION

1. Remove the parts from exercises 3, 4 and 5.
2. Fix terminal plate on the exercise board according to drawing.
3. Straighten the cable.
4. Bend the cable according to drawing and prepare the ends.
5. Fix the cable with clamps on the exercise board.
6. Connect the wires with terminals.
7. Check the job thoroughly and compare it with drawing.

MATERIAL

1 Terminal plate I

0.35 m NYM 3 x 1.5 mm^2

(3 core cable round 1/.044 - 3/.029)

2 Cheese head screws M 4 x 25

(3/16" x 1") w. nuts & washers

	HANDLING OF CABLE	EP 2.3/2.5.1/8
		Installation I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL

SEQUENCE OF OPERATION

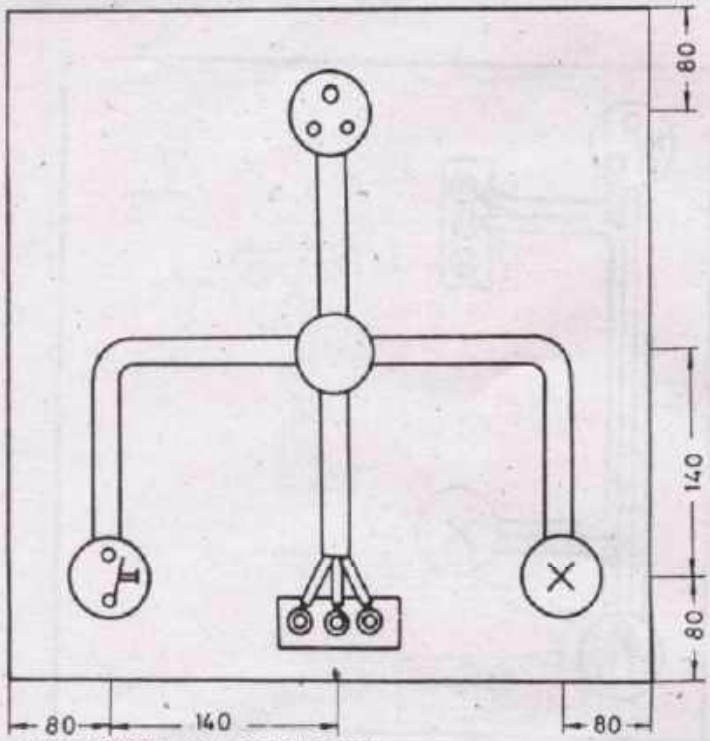
1. Fix lamp holder and two-way switches on the exercise board.
2. Straighten the wire and cut it into the necessary length.
3. Bend the wires according to drawing.
4. Connect the wires as shown in drawing and additional sketch.
5. Check the job thoroughly and do the final check.
6. Test the wiring.

MATERIAL

1 Lamp holder
2 Two-way switches
3 Round blocks
2.0 m NYA 1.5 mm^2
(1/.04+ 1 mm^2)

3 Countersunk screws M 4 x 50
(3/16 " x 2 ") w. nuts & washers
2 Wood screws half round head
3.5 x 15 (No. 6 x 1/2 ")
4 Wood screws half round head
3.5 x 20 (No. 6 x 3/4 ")

EP 2.3/2.5.1/9 Installation I	TWO WAY CIRCUIT	
ELECTRICIAN GENERAL	DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME	



SEQUENCE OF OPERATION

1. Remove all parts from exercise board.
2. Fix terminal plate, junction box, single pole switch, socket and lamp holder on the exercise board.
3. Straighten the cable and cut it into the necessary length.
4. Bend the cable according to drawing and prepare the ends.
5. Connect the wires with terminals. (Socket directly connected)
6. Check the job thoroughly and compare it with drawing.
7. Test the wiring

NOTE

The colour-code of protective wires is widely internationally standardised. In most countries yellow/green is prescribed, in some others, however, only green is used (USA, UK, Pakistan etc.). In any case, the colour of the protective wire must not be changed within one system.

MATERIAL

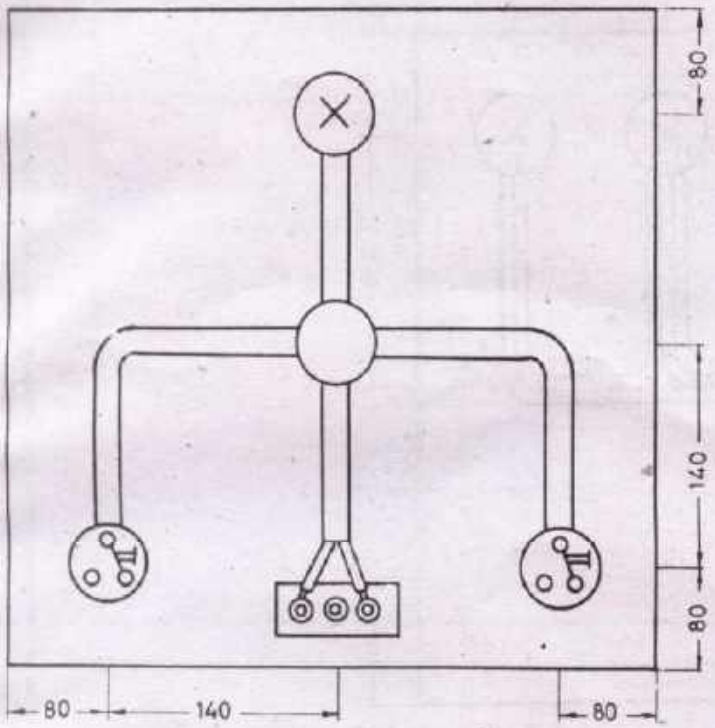
1 Terminal plate I
1 Single pole switch
1 3-pin socket
1 Lamp holder
1 Junction box
3 Round blocks

0.5 m NYM 3 x 1.5 mm^2 (3 core cable round 1/.044 - 3/.029)

0.75 m NYM 2 x 1,5 mm^2 (2 core cable round 1/.044 - 3/.029)

3 Countersunk screws M 4 x 50 (3/16 " x 2 ") w. nuts & washers
4 Cheese head screws M 4 x 25 (3/16 " x 1 ") w. nuts & washers
2 Wood screws half round head 3.5 x 15 (No. 6 x 1/2 ")
4 Wood screws half round head 3.5 x 20 (No. 6 x 3/4 ")

	LAMP AND SOCKET	EP 2.3/2.5.1/10
		Installation I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



SEQUENCE OF OPERATION

1. Remove all parts from exercise board.
2. Fix terminal, junction box, two two-way switches and lamp holder on the exercise board.
3. Straighten the cable and cut it into the necessary length.
4. Bend the cable according to drawing and prepare the ends.
5. Connect the wires with terminals.
6. Check the job thoroughly and compare it with drawing.
7. Test the wiring.

MATERIAL

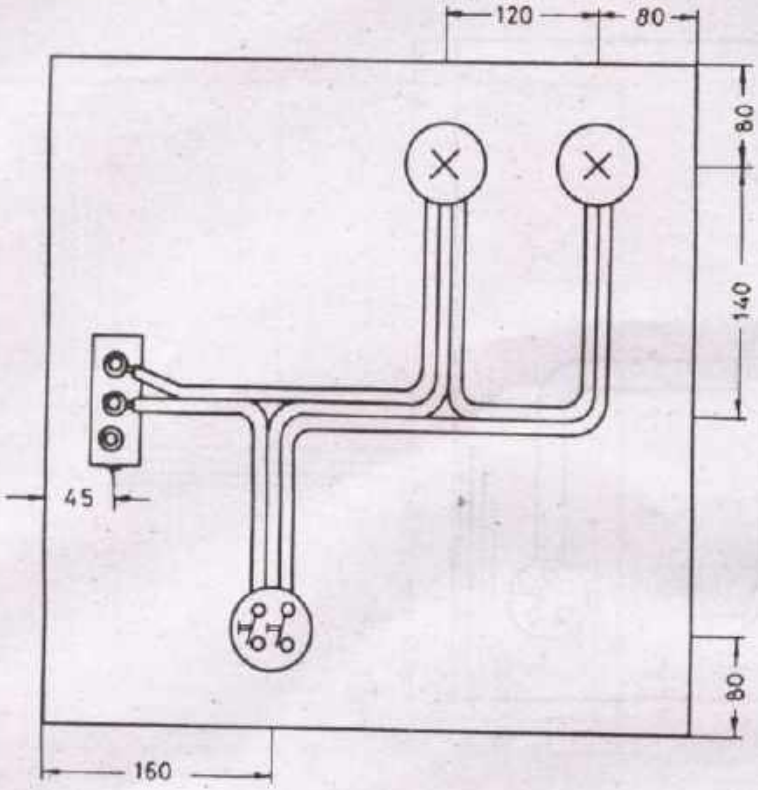
1 Terminal plate I
2 Two-way switches
1 Lamp holder
1 Junction box
3 Round blocks

0.5 m NYM x 1.5 mm^2
(2 core cable round 1/.044 - 3/.029)

0.75 m NYM 3 x 1.5 mm^2
(3 core cable round 1/.044 - 3/.029)

3 Countersunk screws M 4 x 50 (3/16 " x 2 ") w. nuts & washers
4 Cheese head screws M 4 x 25 (3/16 " x 1 ") w. nuts & washers
2 Wood screws half round head 3.5 x 15 (No. 6 x 1/2 ")
4 Wood screws half round head 3.5 x 20 (No. 6 x 3/4 ")

	TWO WAY CIRCUIT	EP 2.3/2.5.1/11
		Installation I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



SEQUENCE OF OPERATION

1. Remove all parts from exercise board.
2. Fix lamp holders, multicircuit switch and terminal plate on the exercise board.
3. Straighten the wire and cut it into the necessary length.
4. Bend the wires according to drawing and connect them.
5. Check the job thoroughly and compare it with drawing.
6. Test the wiring.

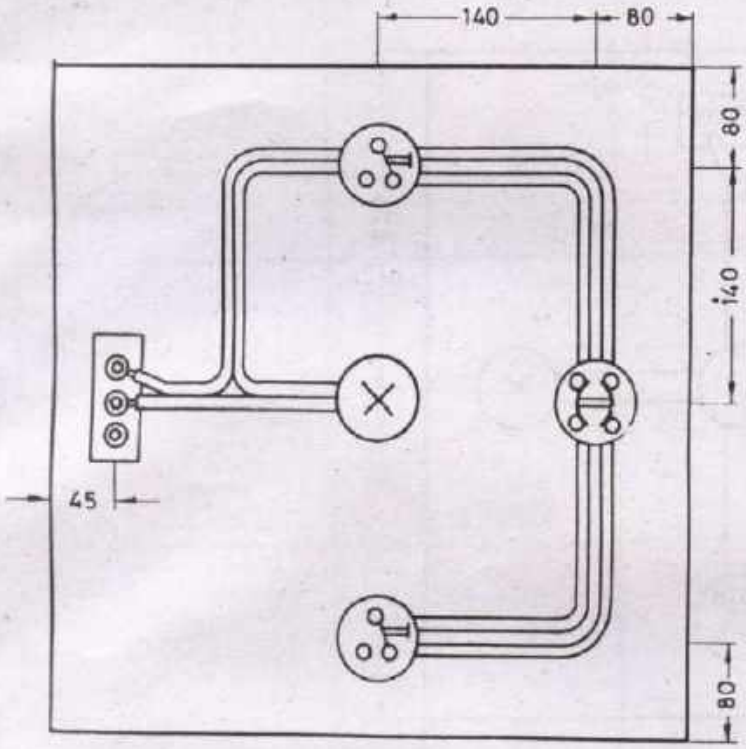
MATERIAL

1 Terminal plate I
2 Lamp holders
1 Multicircuit switch
3 Round blocks

2.50 m NYA 1.5 mm^2 (1/.044 ~ 1 mm^2)

3 Countersunk screws M 4 x 50 (3/16 " x 2 ") w. nuts & washers
2 Cheese head screws M 4 x 25 (3/16 " x 1 ") w. nuts & washers
4 Wood screws half round head 3.5 x 15 (No. 6 x 1/2 ")
2 Wood screws half round head 3.5 x 20 (No. 6 x 3/4")

	TWO LAMPS-MULTICIRCUIT SWITCH	EP 2.3/2.5.1/12 Installation I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



SEQUENCE OF OPERATION

1. Remove all parts from exercise board.
2. Fix lamp holder, two-way switches, terminal plate and intermediate switch on the exercise board.
3. Straighten the wire and cut it into the necessary length.
4. Bend the wires according to drawing and connect them.
5. Check the job thoroughly and compare it with drawing.
6. Test the wiring.

MATERIAL

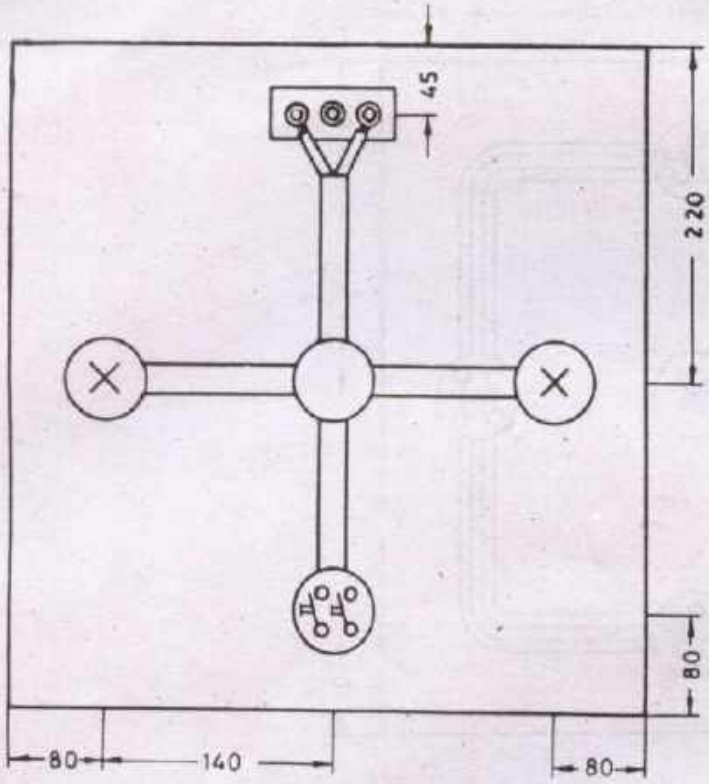
1 Terminal plate I
1 Lamp holder
2 Two-way switches
1 Intermediate switch
4 Round blocks

3.5 m NYA 1.5 mm ^{2} (1/.044~1 mm^2)

4 Countersunk screws M 4 x 50 (3/16 " x 2 ") w. nuts & washers
2 Cheese head screws M 4 x 25 (3/16 " x 1 ") w. nuts & washers
2 Wood screws half round head 3.5 x 15 (No. 6 x 1/2 ")
6 Wood screws half round head 3.5 x 20 (No. 6 x 3/4 ")

If intermediate switch is not available then perform practical exercise of Drg. EP 2.3/2.5.1/21

	LAMP-TWO WAY AND INTERMEDIATE SWITCH	EP 2.3/2.5.1/13
		Installation I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



SEQUENCE OF OPERATION

1. Remove all parts from exercise board.
2. Fix junction box, multicircuit switch, lamp holder and terminal plate on the exercise board.
3. Straighten the cable and cut it into the necessary length.
4. Prepare the ends and connect the wires.
5. Check the job thoroughly and connect the wires.
6. Test the wiring.

MATERIAL

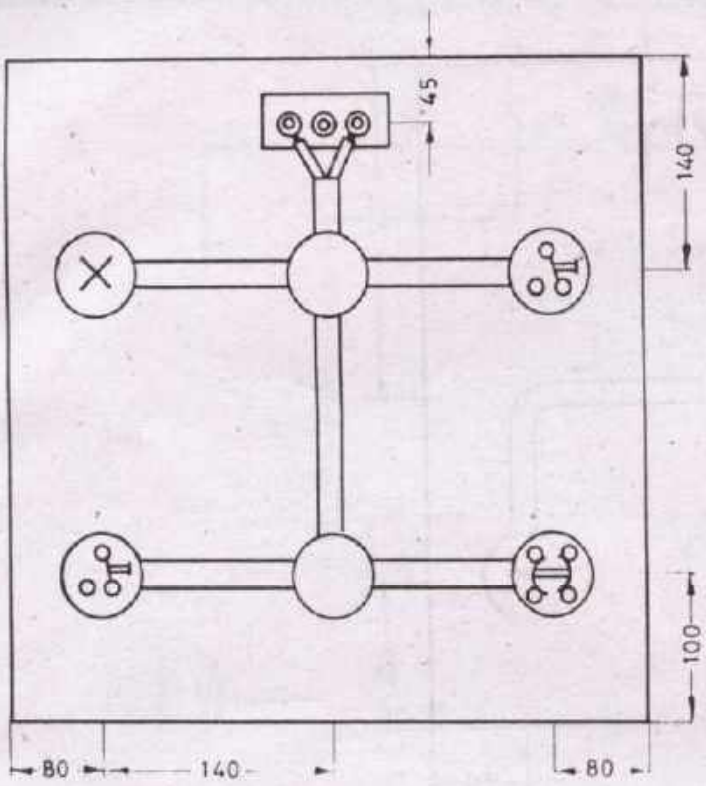
1 Terminal plate I
2 Lamp holders
1 Multicircuit switch
1 Junction box
3 Round blocks

0.9 m NYM 2 x 1.5 mm^2 (2 core cable round 1/.044 - 3/.029)

0.3 m NYM 3 x 1.5 mm^2 (3 core cable round 1/.044 - 3/.029)

3 Countersunk screws M 4 x 50 (3/16 " x 2 ") w. nuts & washers
4 Cheese head screws M 4 x 25 (3/16 " x 1 ") w. nuts & washers
4 Wood screws half round head 3.5 x 15 (No. 6 x 1/2 ")
2 Wood screws half round head 3.5 x 20 (No. 6 x 3/4 ")

	TWO LAMPS-MULTICIRCUIT SWITCH	EP 2.3/2.5.1/14 Installation I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



SEQUENCE OF OPERATION

1. Remove all parts from exercise board.
2. Fix junction boxes, switches, lamp holder and terminal plate on the exercise board.
3. Straighten the cable and cut it into the necessary length.
4. Prepare the ends and connect the wires.
5. Check the job thoroughly and compare it with drawing.
6. Test the wiring.

MATERIAL

1 Terminal plate I
2 Two-way switches
1 Intermediate switch
1 Lamp holder
2 Junction boxes
4 Round blocks

0.5 m NYM 2 x 1.5 mm^2 (2 core cable round 1/.044 - 3/.029)

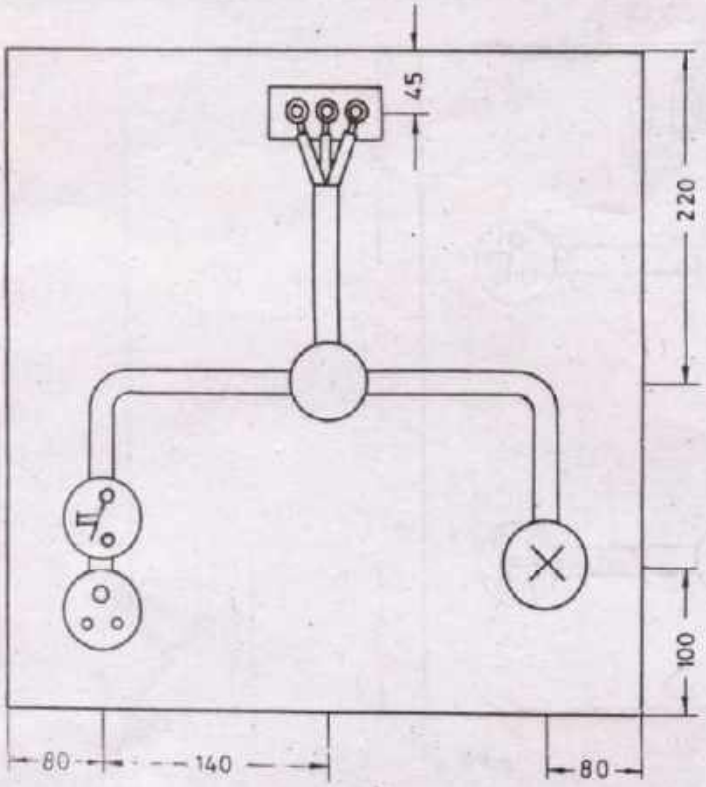
0.9 m NYM 3 x 1.5 mm^2 (3 core cable round 1/.044 - 3/.029)

0.35 m NYM 4 x 1.5 mm^2 (4 core cable round 1/.044 - 3/.029)

4 Countersunk screws M4 x 50 (3/16" x 2") w. nuts & washers
6 Cheese head screws M4 x 25 (3/16" x 1") w. nuts & washers
2 Wood screws half round head 3.5 x 15 (No. 6 x 1/2")
6 Wood screws half round head 3.5 x 20 (No. 6 x 3/4")

If intermediate switch is not available then perform practical exercise of Drg. EP 2.3/2.5.1/22

	LAMP-TWO WAY AND INTERMEDIATE SWITCH	EP 2.3/2.5.1/15 Installation I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



SEQUENCE OF OPERATION

1. Remove all parts from exercise board.
2. Fix junction box, lamp holder, switch, socket and terminal plate on the exercise board.
3. Straighten the cable and cut it into the necessary length.
4. Bend the cable according to drawing and prepare the ends.
5. Connect the wires and check the job thoroughly.
6. Test the wiring.
   (Socket directly connected)

MATERIAL

1 Terminal plate I
1 Single pole switch
1 3-pin socket
1 Lamp holder
1 Junction box
3 Round blocks

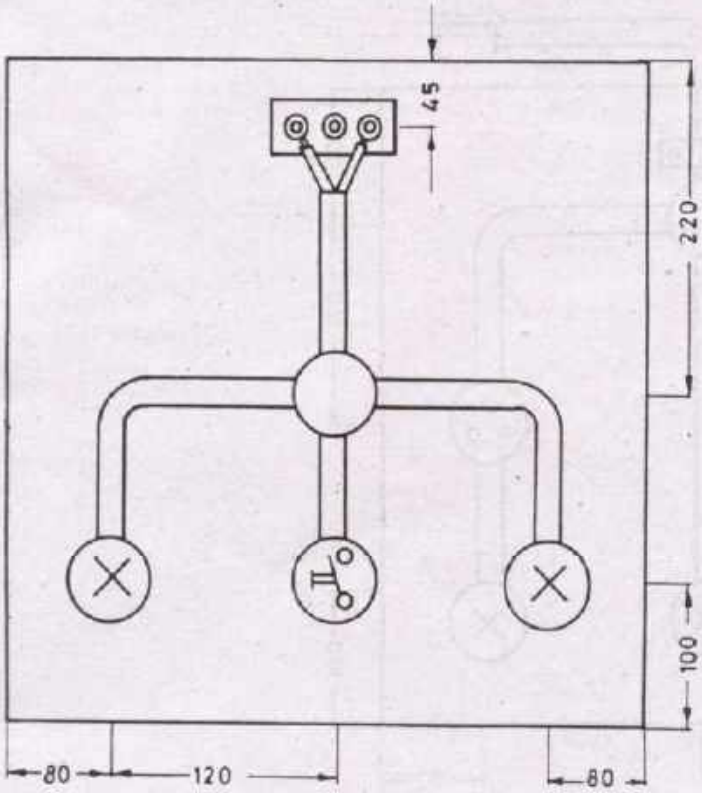
0.4 m NYM 2 x 1.5 mm^2 (2 core cable round 1/.044 - 3/.029)

0.3 m NYM 3 x 1.5 mm^2 (3 core cable round 1/.044 - 3/.029)

0.5 m NYM 4 x 1.5 mm^2 (4 core cable round 1/.044 - 3/.029)

3 Countersunk screws M 4 x 50 (3/16" x 2") w. nuts and washers
4 Cheese head screws M 4 x 25 (3/16" x 1") w. nuts and washers
2 Wood screws half round head 3.5 x 15 (No. 6 x 1/2")
4 Wood screws half round head 3.5 x 20 (No. 6 x 3/4")

	LAMP-SINGLE POLE SWITCH-SOCKET	EP 2.3/2.5.1/16
		Installation I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



(19)

SEQUENCE OF OPERATION

1. Remove all parts from exercise board.
2. Fix junction box, single pole switch, lamp holders and terminal plate on the exercise board.
3. Straighten the cable and cut it into the necessary length.
4. Bend the cable according to drawing and prepare the ends.
5. Connect the wires and check the job thoroughly.
6. Test the wiring.

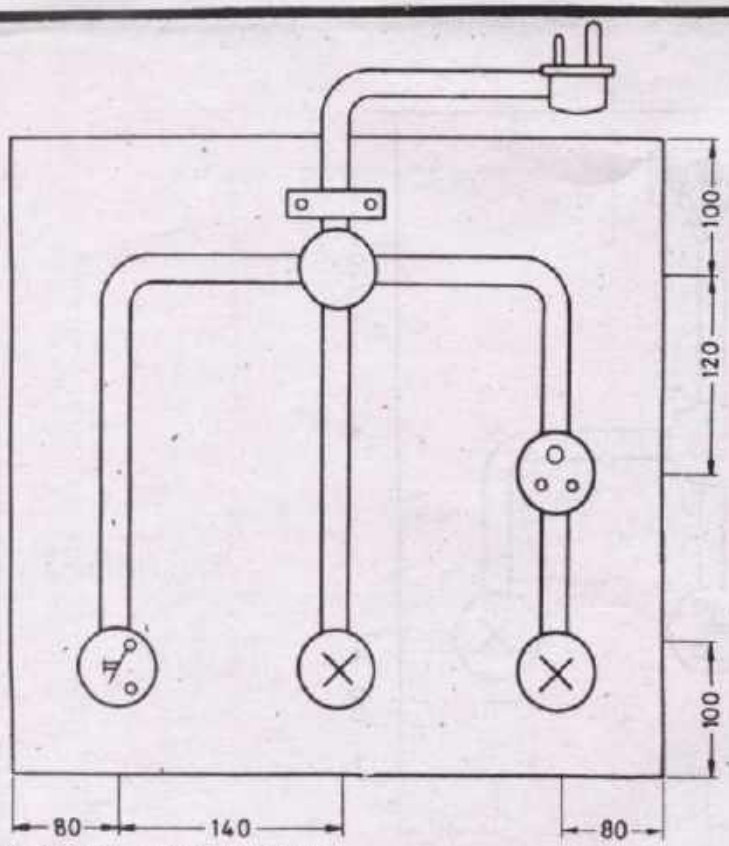
MATERIAL

1 Terminal plate I
1 Single pole switch
2 Lamp holders
1 Junction box
3 Round blocks

1.30 m NYM 2 x 1.5 mm^2 (2 core cable round 1/.044 - 3/.029)

3 Countersunk screws M 4 x 50 (3/16 " x 2 ") w. nuts& washers
4 Cheese head screws M 4 x 25 (3/16 " x 1 ") w. nuts & washers
4 Wood screws half round head 3.5 x 15 (No. 6 x 1/2 ")
2 Wood screws half round head 3.5 x 20 (No. 6 x 3/4 ")

	LAMPS- SINGLE POLE SWITCH	EP 2.3/2.5.1/17 Installation I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



SEQUENCE OF OPERATION

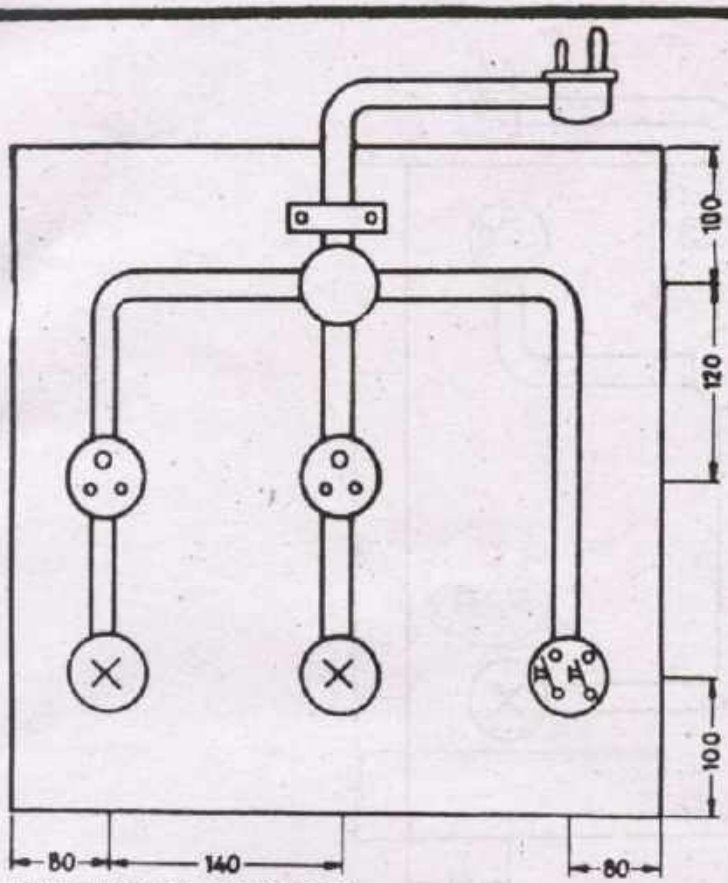
1. Remove all parts from exercise board.
2. Fix junction box, switch, clamp, lamp holder and socket on the exercise board.
3. Straighten the cable and cut it into the necessary length.
4. Bend the cable according to drawing and prepare the ends.
5. Prepare the ends of flexible cable, connect one side with 3-pin plug and the other side with the junction box on the exercise board.
6. Connect the wires and check the job thoroughly.
7. Test the wiring. (Socket directly connected)

MATERIAL

1 Single pole switch
1 3-pin plug
1 3-pin socket
2 Lamp holders
4 Round blocks

1.25 m NYM 2 x 1.5 mm^2 (2 core cable round 1/.044 - 3/.029)
0.4 m NYM 4 x 1.5 mm^2 (4 core cable round 1/.044 - 3/.029)
1.0 m Flex. 3 x 1.5 mm^2 (3 core cable round 40/.0076)
4 Countersunk screws M 4 x 50 (3/16 " x 2 ") w. nuts & washers
2 Cheese head screws M 4 x 25 (3/16 " x 1 ") w. nuts & washers
4 Wood screws half round head 3.5 x 15 (No. 6 x 1/2 ")
4 Wood screws half round head 3.5 x 20 (No. 6 x 3/4 ")
1 Clamp compl. for flexible cable

	LAMPS - SINGLE POLE SWITCH-SOCKET	EP 2.3/2.5.1/18 Installation I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAN-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



SEQUENCE OF OPERATION

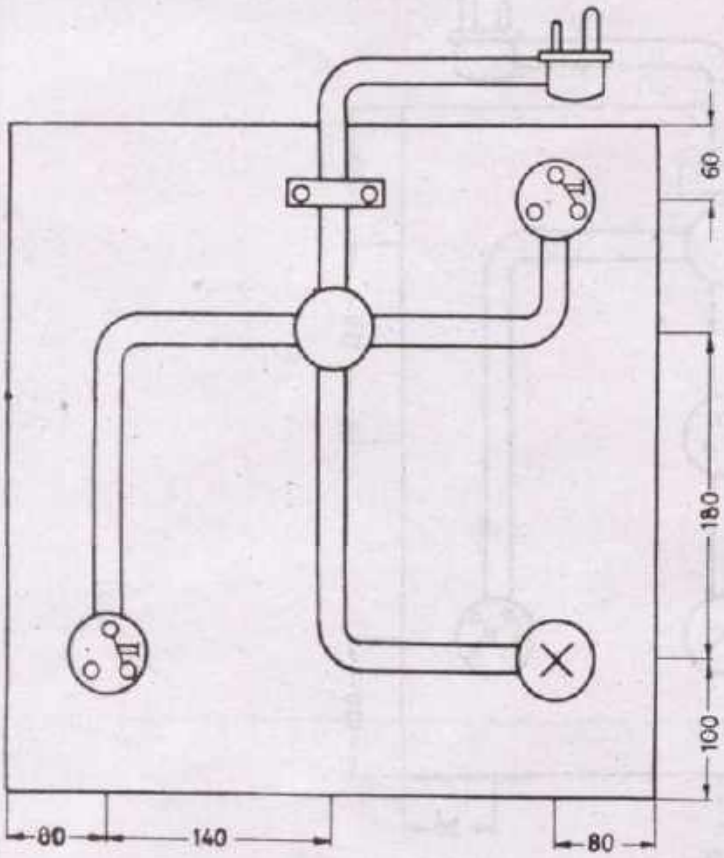
1. Remove all parts from exercise board.
2. Fix junction box, switch, clamp. lampholders and sockets on the exercise board.
3. Straighten the cable and cut it into the necessary length.
4. Bend the cable according to drawing and prepare the ends.
5. Connect the wires and check the job thoroughly.
6. Test the wiring.
   (Sockets and lamps controlled by multicircuit switch.)

MATERIAL

1 Multicircuit switch (or 2 S.P.S.)
2 Lamp holders
2 3-pin sockets
5 Round blocks
1 Junction box

1.1 m NYM 3 x 1.5 mm^2 (3 core cable round 1/.044 - 3/.029)
1 flexible cable with plug (from previous exercise)
0.6 m NYM 2 x 1.5 mm^2 (3 core cable round 1/.044 - 3/.029)
5 Countersunk screws M 4 x 50 (3/16 " x 2 ") w. nuts & washers
2 Cheese head screws M 4 x 25 (3/16 " x 1 ") w. nuts & washers
4 Wood screws, half round head 3.5 x 15 (No. 6 x 1/2")
6 Wood screws, half round head 3.5 x 20 (No. 6 x 3/4")
1 Clamp compl. for flexible cable

	LAMPS-MULTICIRCUIT SWITCH-SOCKET	EP 2.3/2.5.1/19
		Installation 1
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAN-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



SEQUENCE OF OPERATION

1. Remove all parts from exercise board.
2. Fix junction box, switches, clamp and lamp holder on the exercise board.
3. Straighten the cable and cut it into the necessary length.
4. Bend the cable according to drawing and prepare the ends.
5. Connect the wires and check the job thoroughly.
6. Test the wiring.

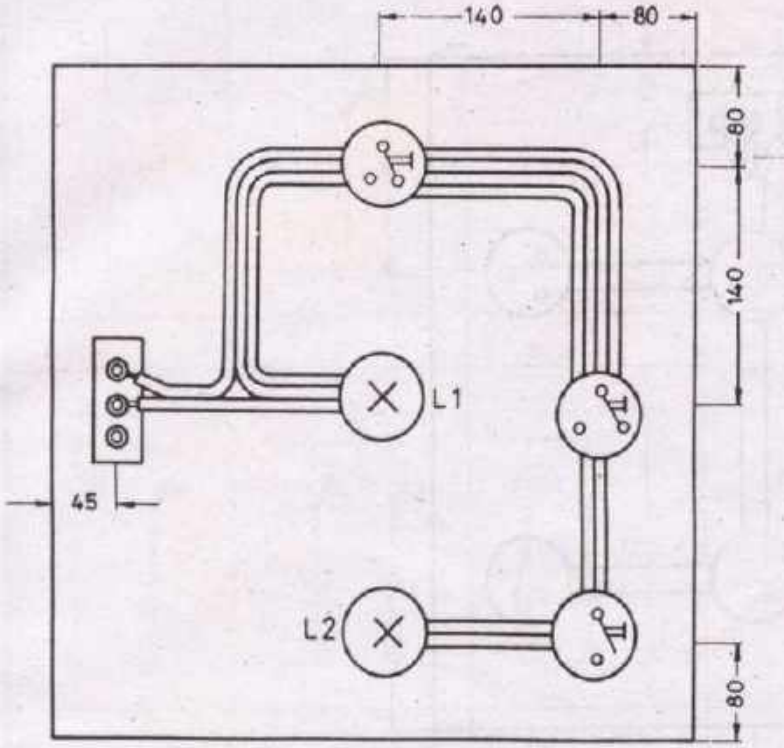
MATERIAL

2 Two-way switches
1 Junction box
3 Round blocks
1 Lamp holder

0.50 m NYM 2 x 1.5 mm^2 (2 core cable round 1/.044 - 3/.029)
0.80 m NYM 3 x 1.5 mm^2 (3 core cable round 1/.044 - 3/.029)
1 flexible cable with plug (from previous exercise)

3 Countersunk screws M 4 x 50 (3/16 " x 2 ") w. nuts & washers
2 Cheese head screws M 4 x 25 (3/16 " x 1 ") w. nuts & washers
2 Wood screws, half round head 3.5 x 15 (No. 6 x 1/2 ")
4 Wood screws, half round head 3.5 x 20 (No. 6 x 3/4 ")
1 Clamp compl. for flexible cable

	LAMP-TWO WAY SWITCH	EP 2.3/2.5.1/20
		Installation I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PGK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



SEQUENCE OF OPERATION

1. Remove all parts from exercise board.
2. Fix lamp holders, terminal plate, two-way switches and single pole switch on the exercise board.
3. Straighten the wire and cut it into the necessary length.
4. Bend the wires according to drawing and connect them.
5. Check the job thoroughly and compare it with drawing.
6. Test the wiring.

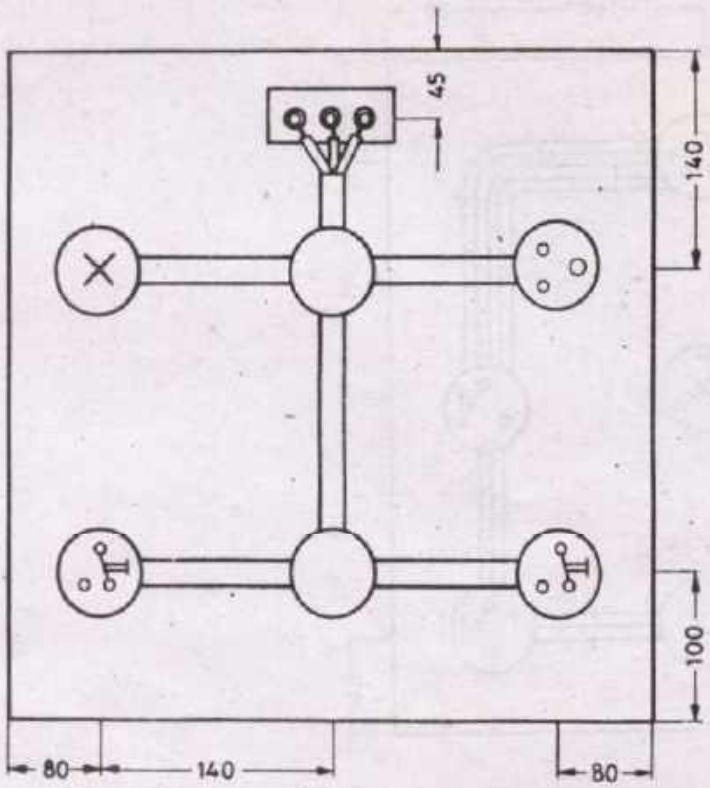
Lamp L_1 controlled by two-way switches.
Lamp L_2 controlled by SPS.

MATERIAL

1 Terminal plate I
2 Lamp holders
2 Two-way switches
1 Single pole switch
5 Round blocks

5.40 m NYA 1.5 mm^2 (1/.044 ~ 1 mm^2)
5 **Countersunk** screws M 4 x 50 (3/16 " x 2 ") w. nuts & washers
2 Cheese head screws M 4 x 25 (3/16 " x 1 ") w. nuts & washers
4 Wood screws, half round head 3.5 x 15 (No.6x 1/2 ")
6 Wood screws, half round head 3.5 x 20 (No. 6 x 3/4 ")

	LAMPS-SINGLE POLE AND TWO WAY SWITCHES	EP 2.3/2.5.1/21 Installation I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



SEQUENCE OF OPERATION

1. Remove all parts from exercise board.
2. Fix junction boxes, switches, lamp holder and terminal plate on the exercise board.
3. Straighten the cable and cut it into the necessary length.
4. Prepare the ends and connect the wires.
5. Check the job thoroughly and compare with drawing.
6. Test the wiring.
   (Socket directly connected)

MATERIAL

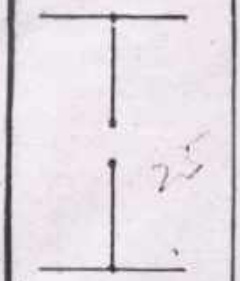
1 Terminal plate I	1 Lamp holder
2 Two-way switches	2 Junction boxes
1 3-pin socket	4 Round blocks

0.7 m NYM 2 x 1.5 mm^2 (2 core cable round 1/.044 - 3/.029)

1.2 m NYM 3 x 1.5 mm^2 (3 core cable round 1/.044 - 3/.029)

4 Countersunk screws M 4 x 50 (3/16 " x 2 ") w. nuts & washers
6 Cheese head screws M 4 x 25 (3/16 " x 1 ") w. nuts & washers
2 Wood screws, half round head 3.5 x 15 (No. 6 x 1/2 ")
6 Wood screws, half round head 3.5 x 20 (No. 6 x 3/4 ")

	LAMP - TWO WAY SWITCHES-SOCKET	EP 2.3/2.5.1/22 Installation I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



1

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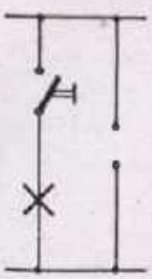

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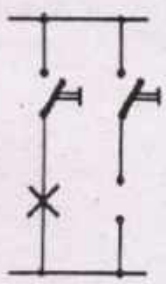

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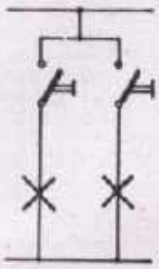

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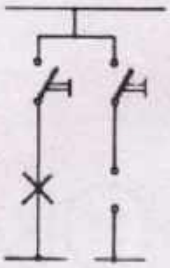

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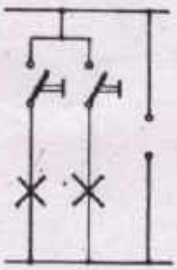

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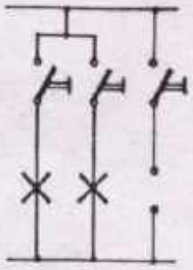

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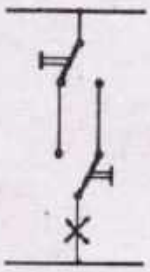

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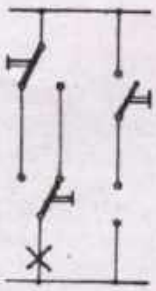

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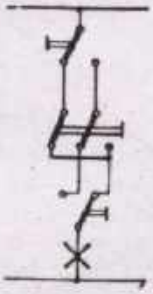

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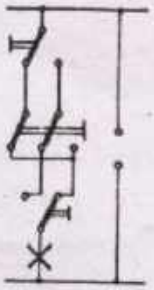

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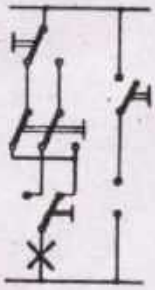

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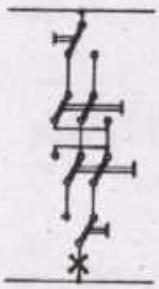
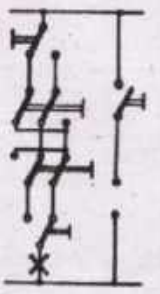


16

THE COURSE CIRCUITS I IS MEANT TO IMPROVE TRAINEES KNOWLEDGE ABOUT CIRCUITS AND THEIR CONNECTIONS AND RUNS PARALLEL WITH THE PRACTICAL COURSE INSTALLATION I. 17 DIFFERENT CIRCUIT-DRAWINGS IN THREE REPRESENTATIONS, NAMELY WIRING DIAGRAM, CURRENT PATH DIAGRAM AND INSTALLATION LAYOUT HAVE TO BE COMPLETED BY THE TRAINEE AS A DRAWING EXERCISE. AFTER THAT THE PLUG-WIRING EXERCISES WILL BE DONE ON THE EXERCISE-FRAME ACCORDING TO THE DIAGRAMS.

SAFETY PRECAUTIONS MUST BE STRICTLY OBSERVED WHEN HANDLING PLUG WIRES.



17

LAYOUT

EP 2.1/2.5.2

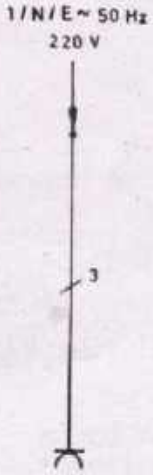
Circuits 1

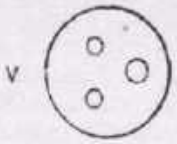
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

ELECTRICIAN GENERAL

L1 ——————————————————

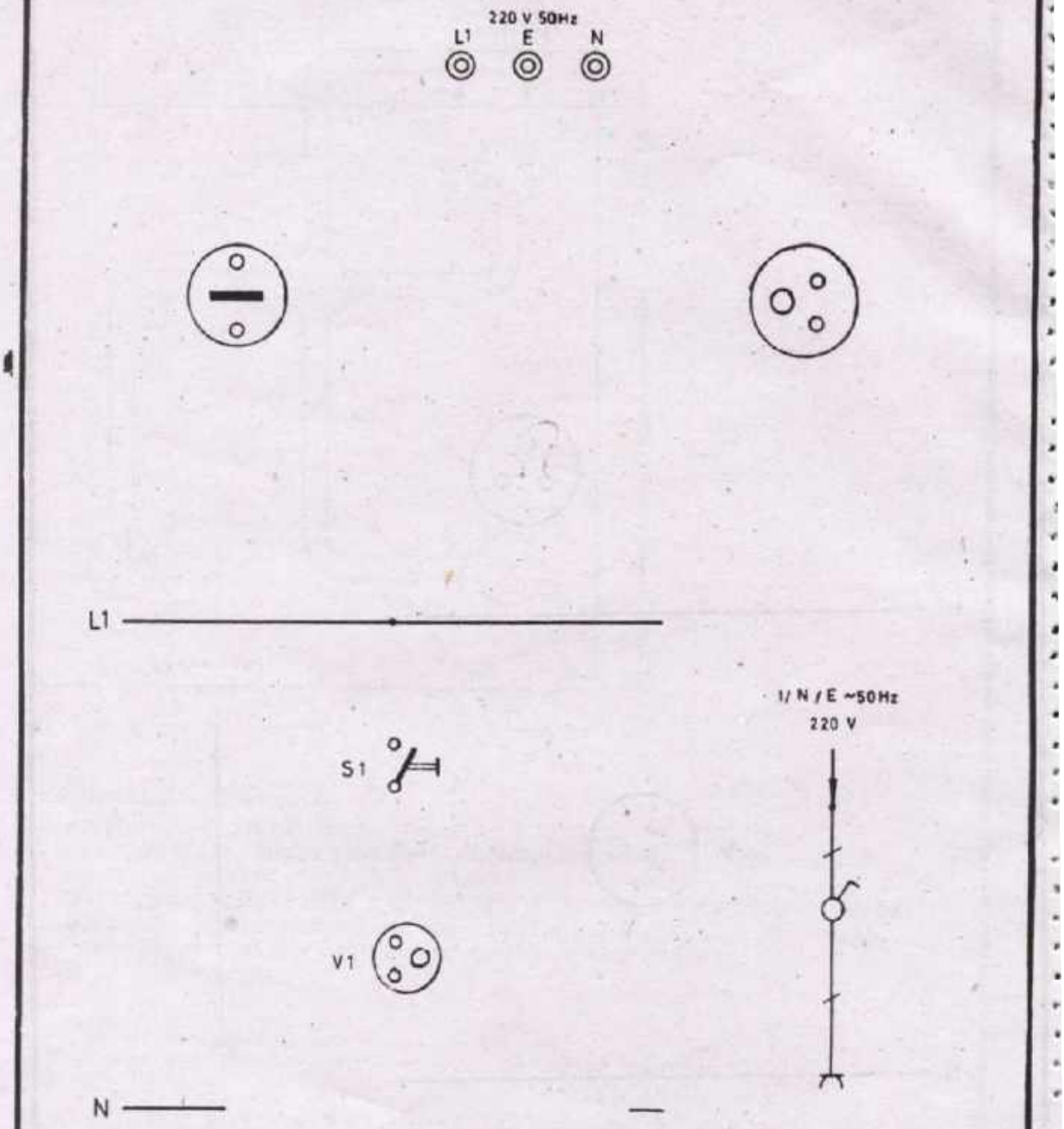




N ——————————————————

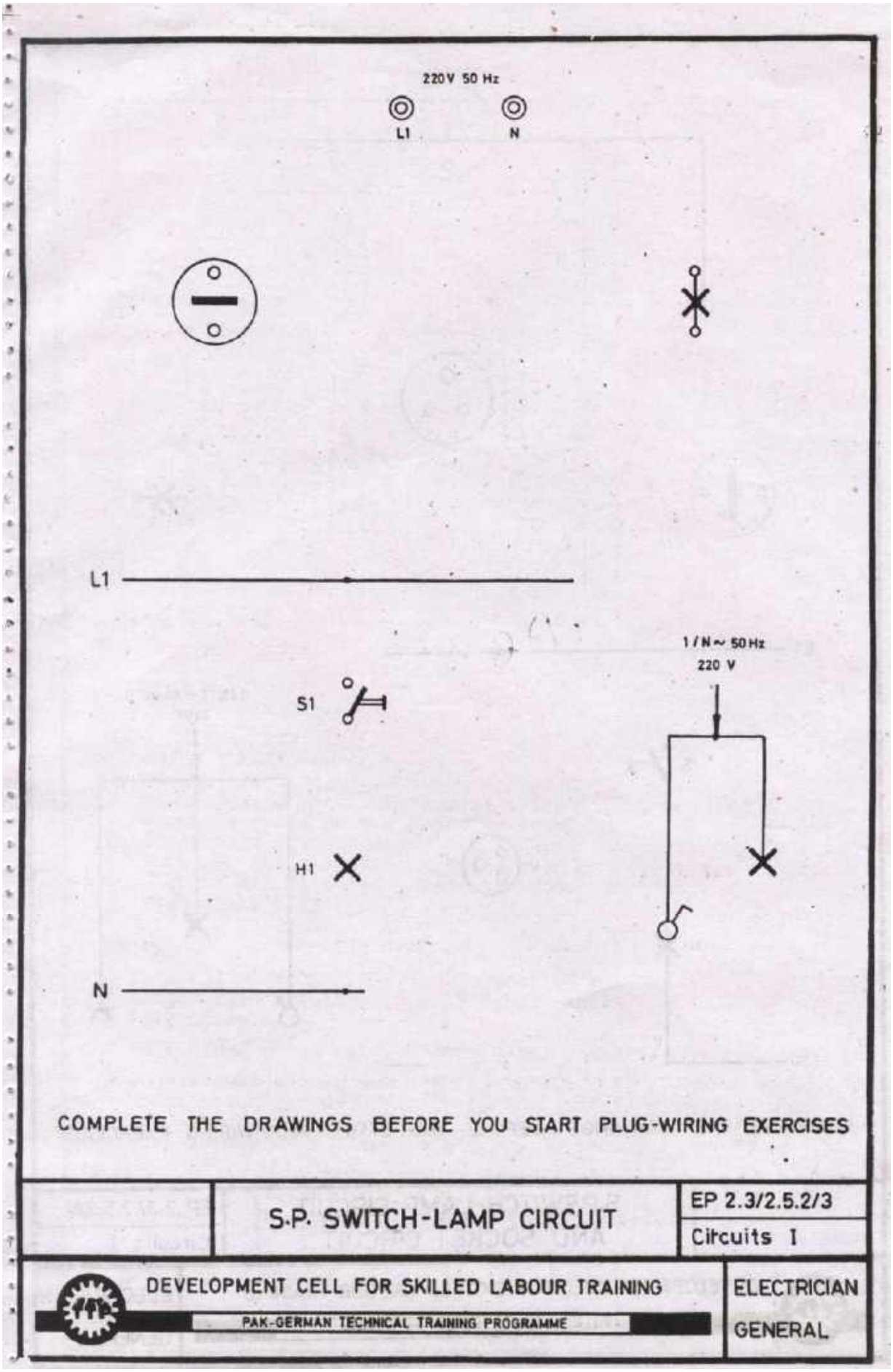
COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES

	SOCKET CIRCUIT	EP 2.3/2.5.2/1
		Circuits I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



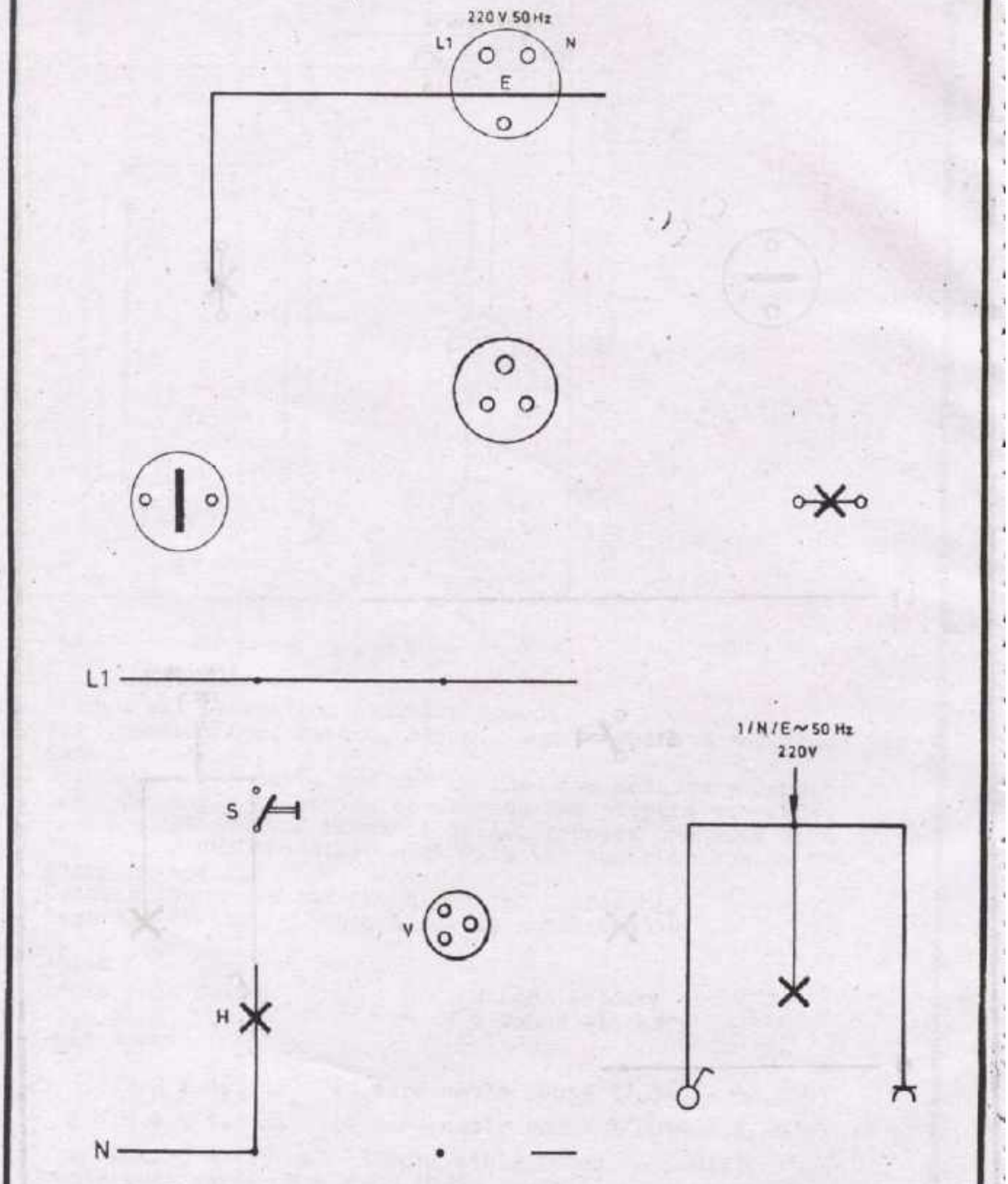
COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES

	S.P.SWITCH-SOCKET CIRCUIT	EP 2.3/2.5.2/2
		Circuits 1
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING. PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



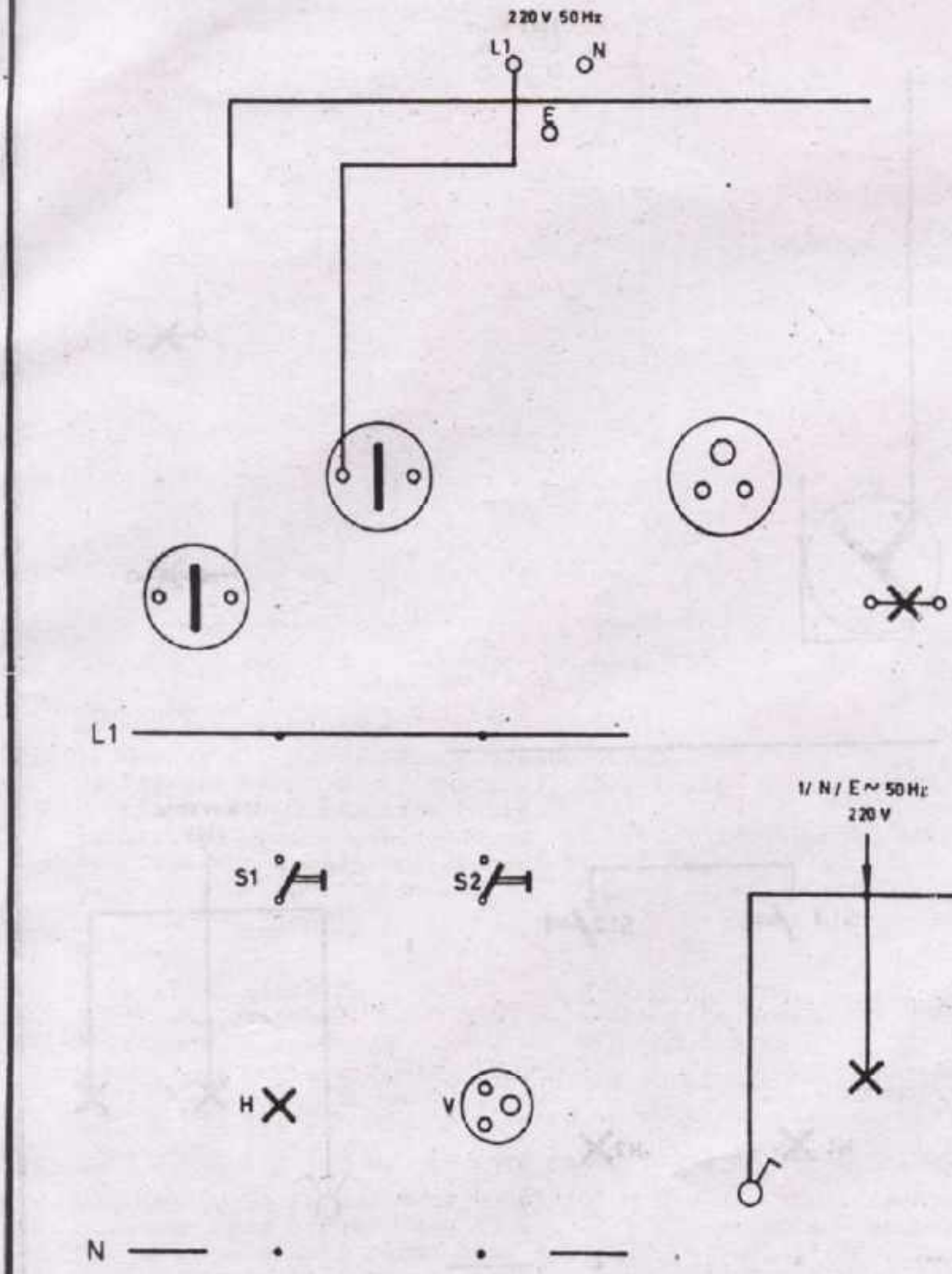
COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES

	S.P. SWITCH-LAMP CIRCUIT	EP 2.3/2.5.2/3
		Circuits 1
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



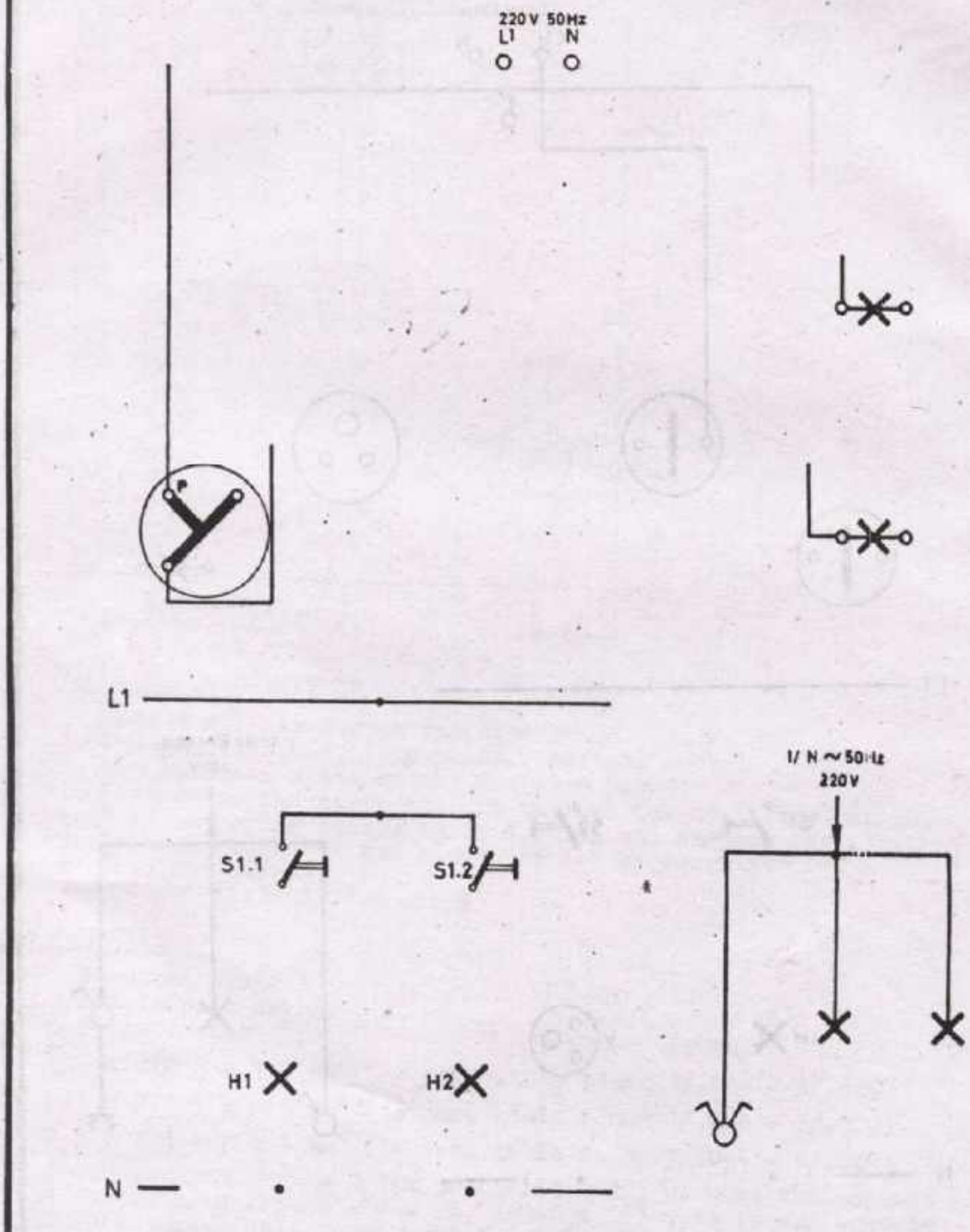
COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES

	S.P.SWITCH-LAMP CIRCUIT AND SOCKET CIRCUIT	EP 2.3/2.5.2/4 Circuits I
	DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME	ELECTRICIAN GENERAL



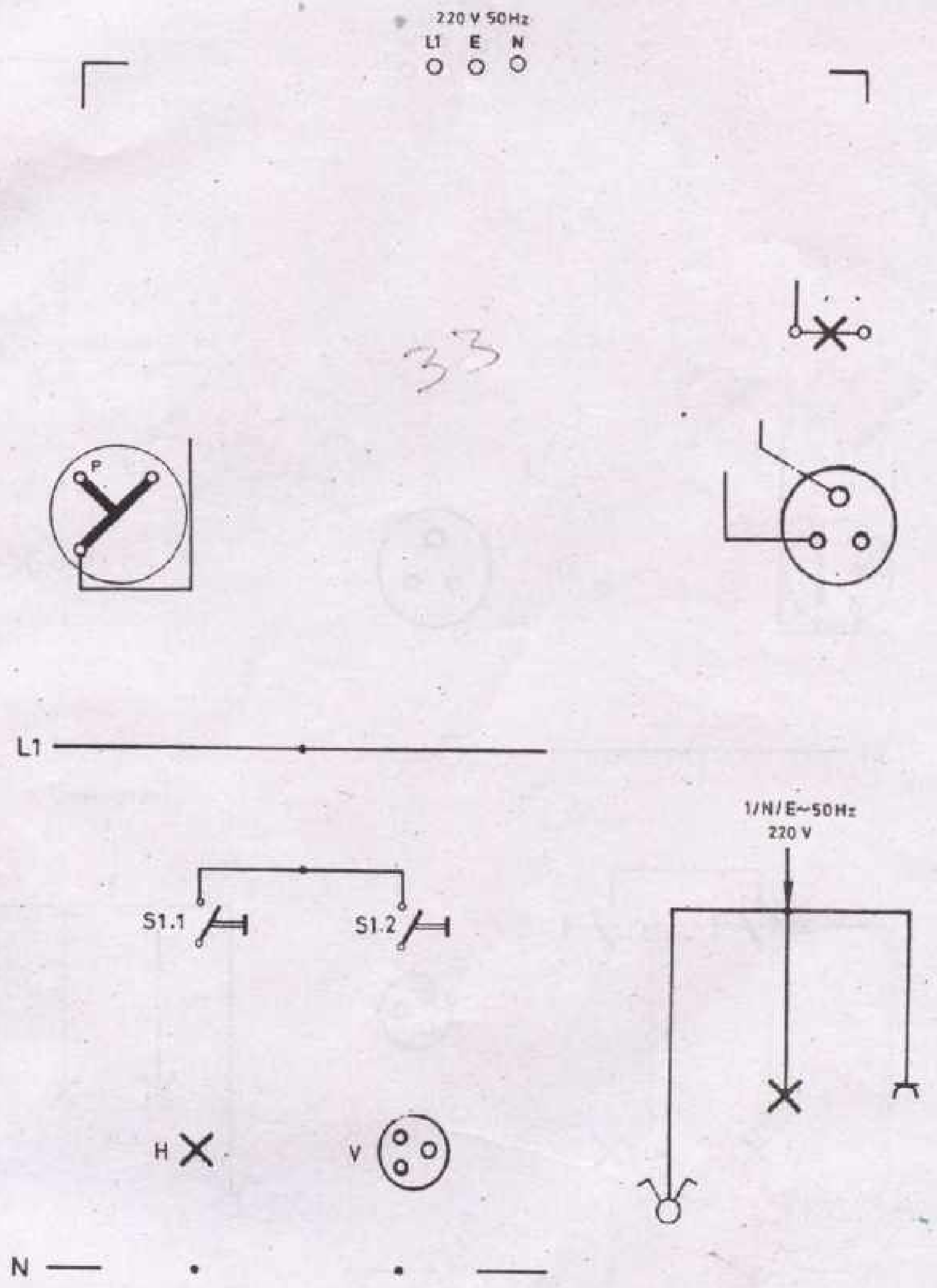
COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES

	S-P-SWITCH-LAMP CIRCUIT AND S-P-SWITCH-SOCKET CIRCUIT	EP 2.3/2.5.2/5 Circuits I
	DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAR-GER-... TECHNICAL TRAINING PROGRAMME	ELECTRICIAN GENERAL



COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES

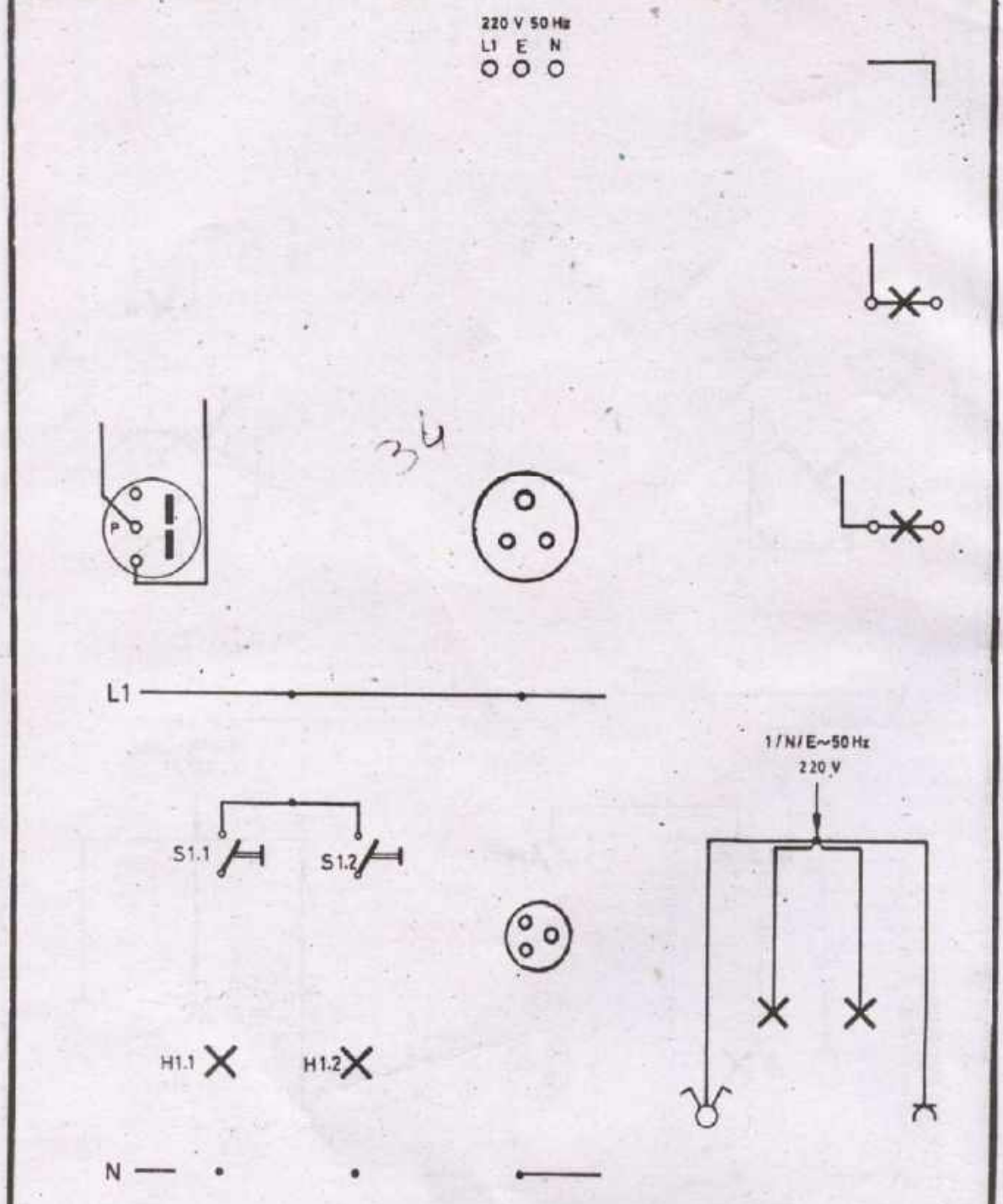
	MULTICIRCUIT-SWITCH CIRCUIT	EP 2.3/2.5.2/6
		Circuits 1
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES

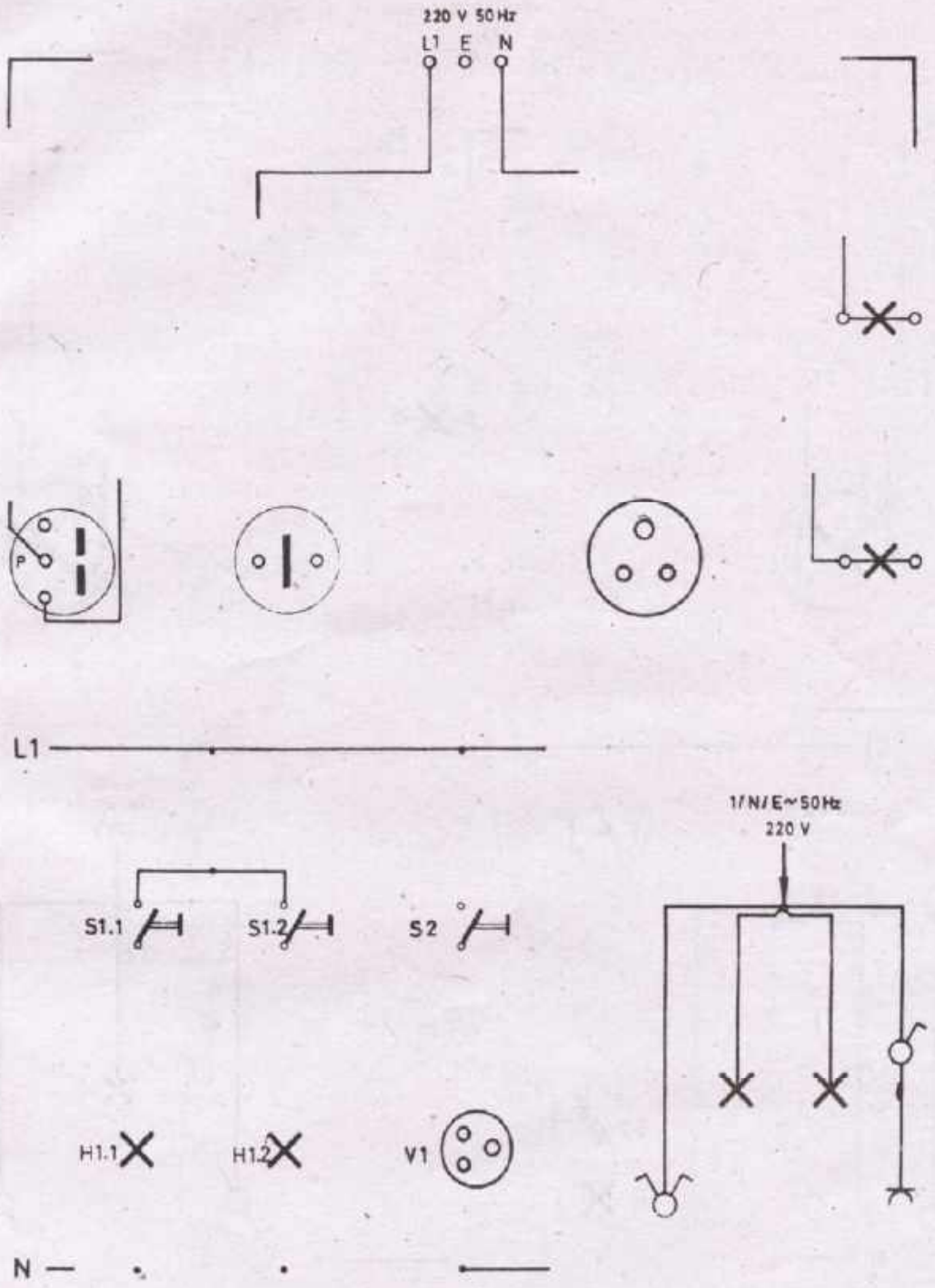
	MULTICIRCUIT-SWITCH CIRCUIT	EP 2.3/2.5.2/7
		Circuits I

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME	ELECTRICIAN GENERAL



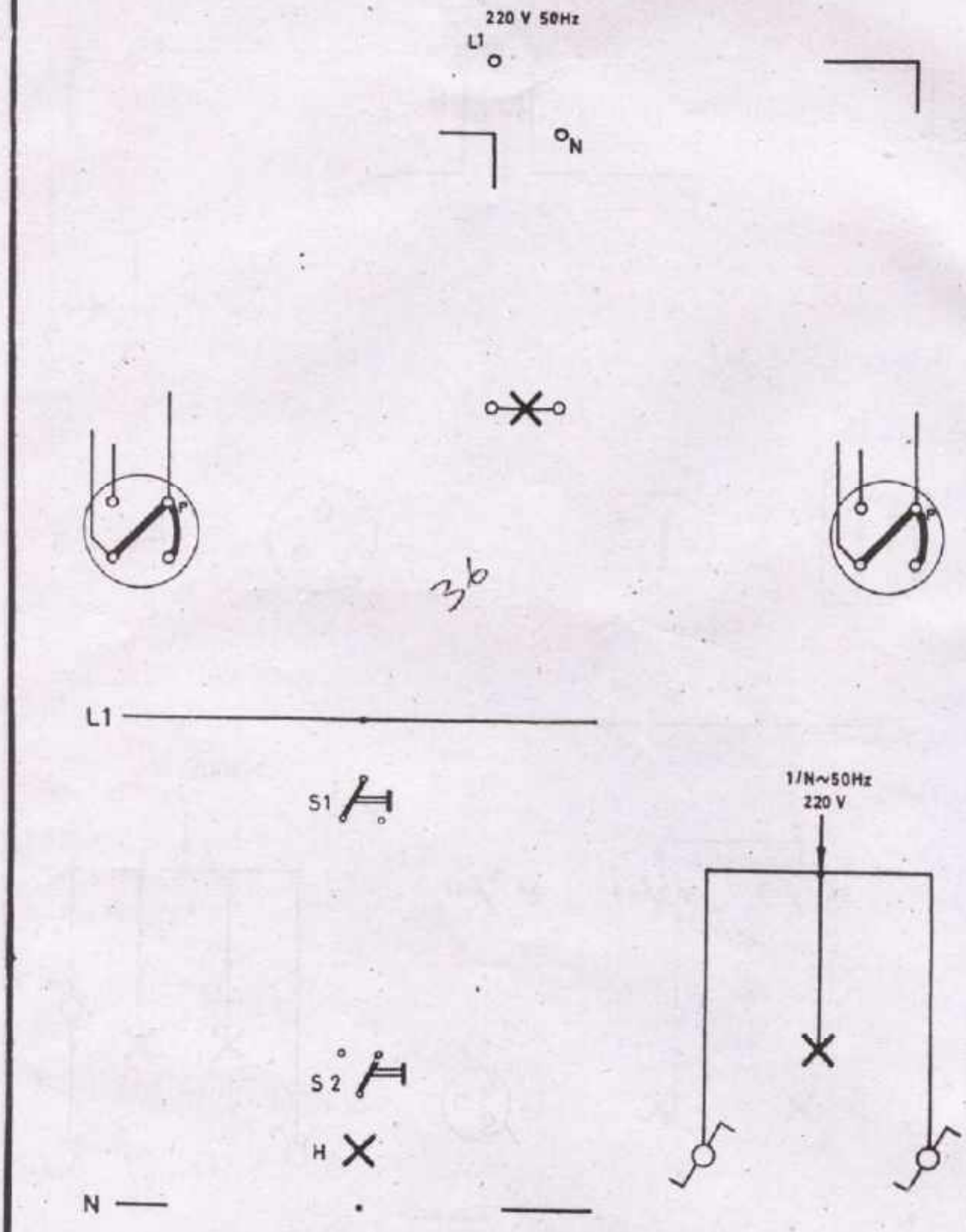
COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES

	MULTICIRCUIT-SWITCH CIRCUIT+SOCKET CIRCUIT	EP 2.3/2.5.2/8 Circuits I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



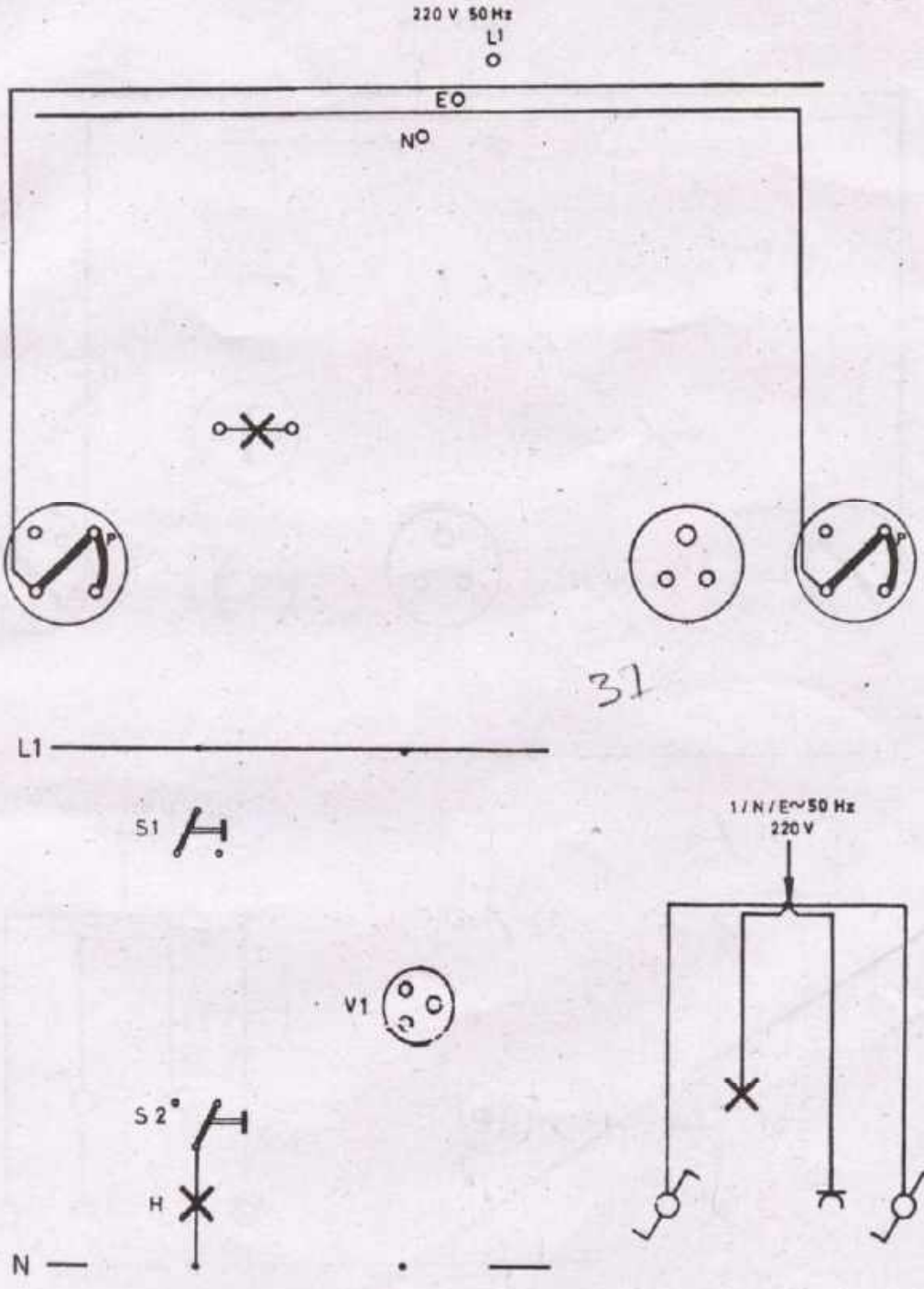
COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES

	MULTICIRCUIT SWITCH-LAMPS AND S-P-S- SOCKET CIRCUIT	EP 2.3/2.5.2/9
		Circuits 1
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



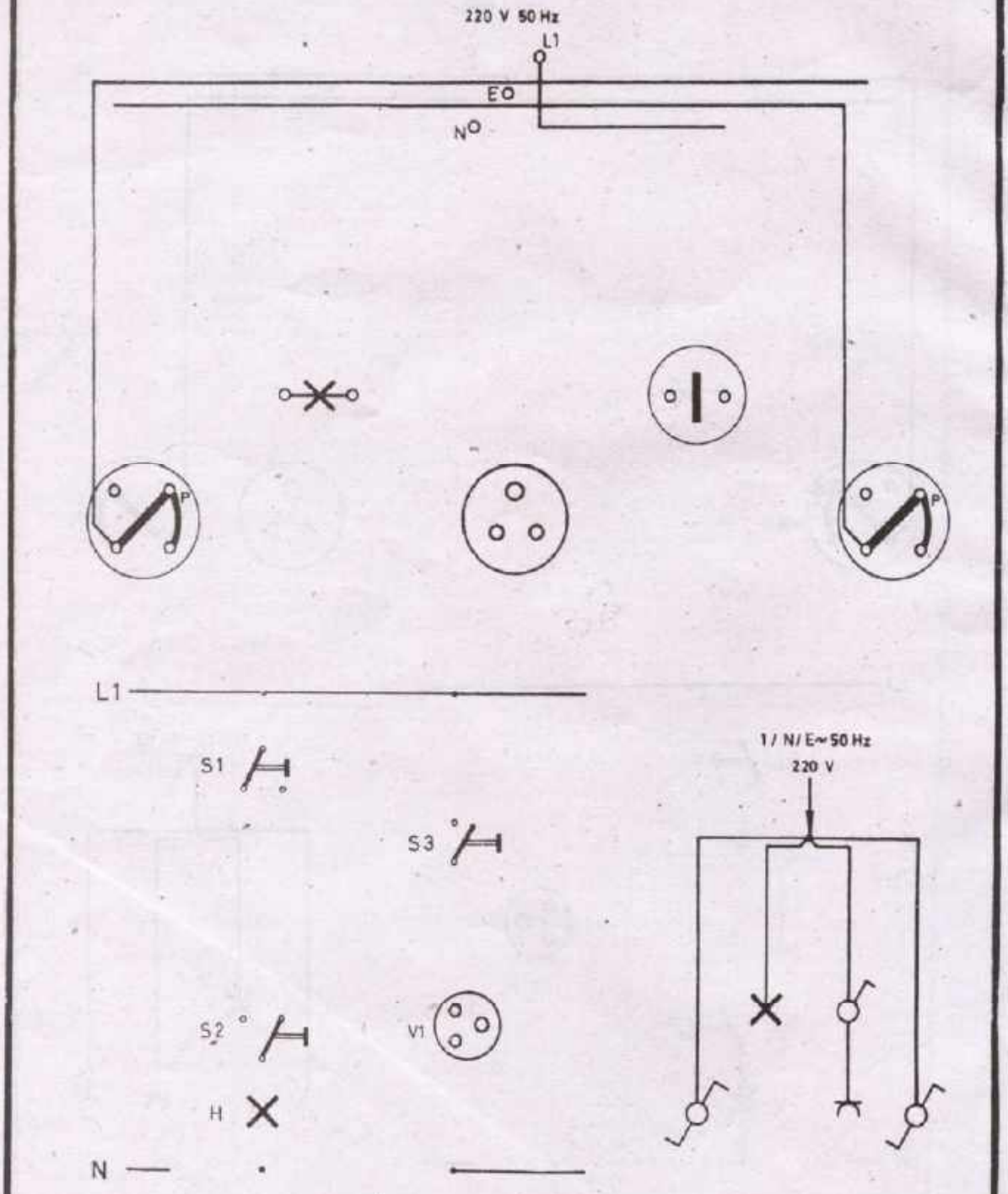
COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES

	TWO-WAY SWITCH CIRCUIT	MP 2.3/2.5.2/10 Circuits I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



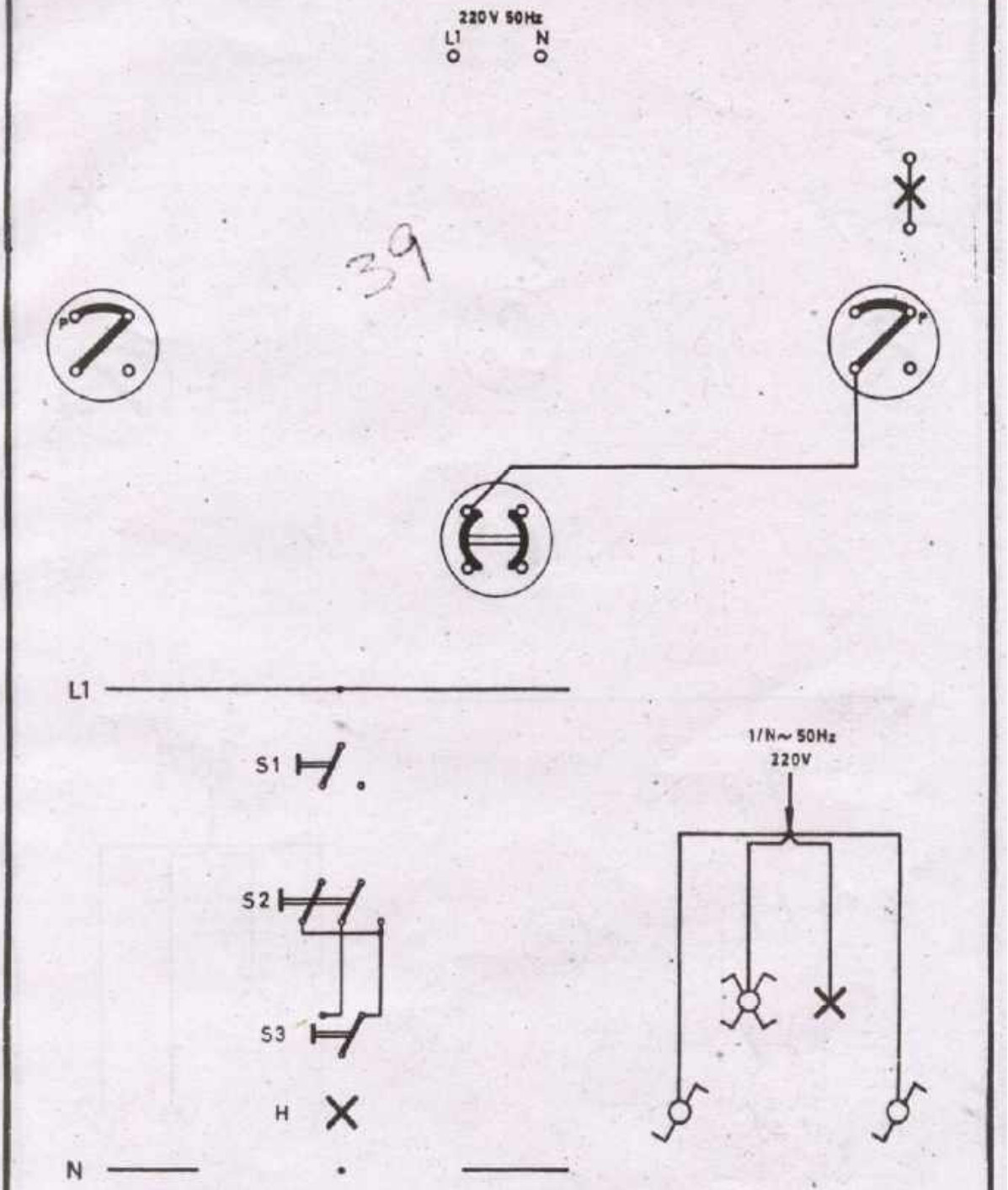
COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES

	TWO-WAY SWITCH CIRCUIT AND SOCKET CIRCUIT	EP 2.3/2.5.2/11
		Circuits I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES

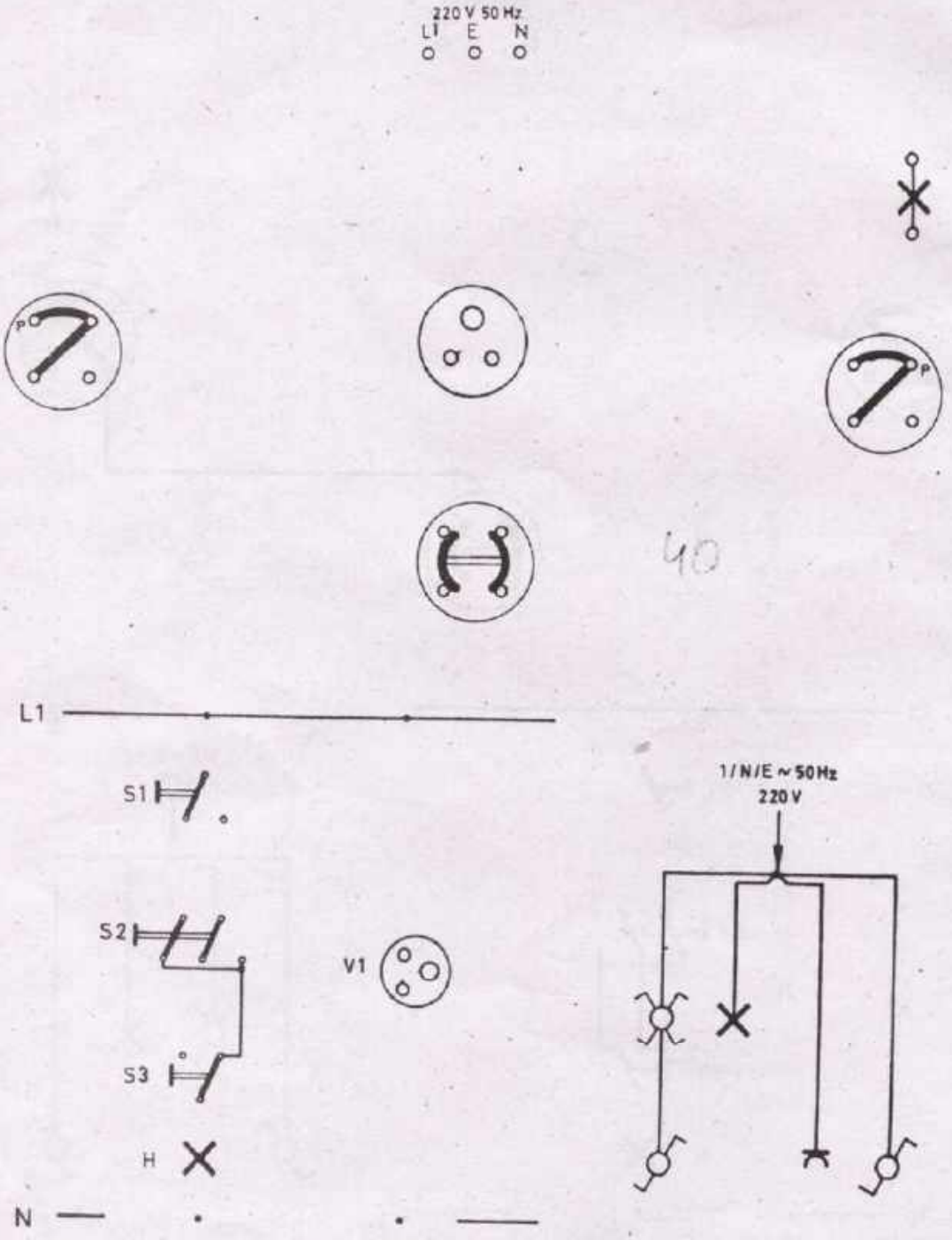
	TWO-WAY SWITCH CIRCUIT AND S.P.S. SOCKET CIRCUIT	EP 2.3/2.5.2/12
		Circuits I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES

If intermediate switch is not available then perform practical exercise of Drg.No. EP/2.3/2.5.2/18

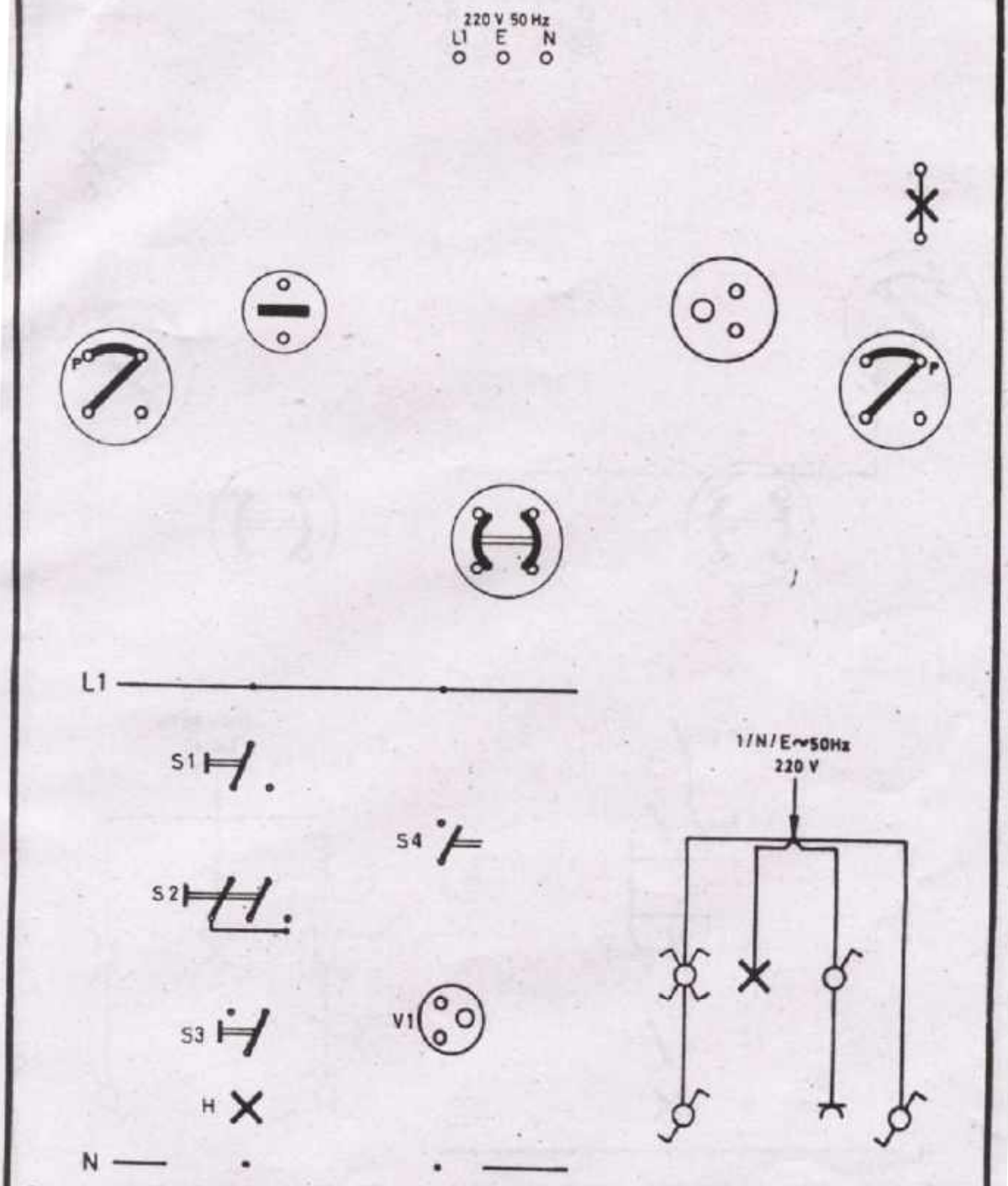
	INTERMEDIATE SWITCH CIRCUIT	EP 2.3/2.5.2/13
		Circuits 1
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES

If intermediate switch is not available then perform practical exercise of Drg.No. EP/2.3/2.5.2/19

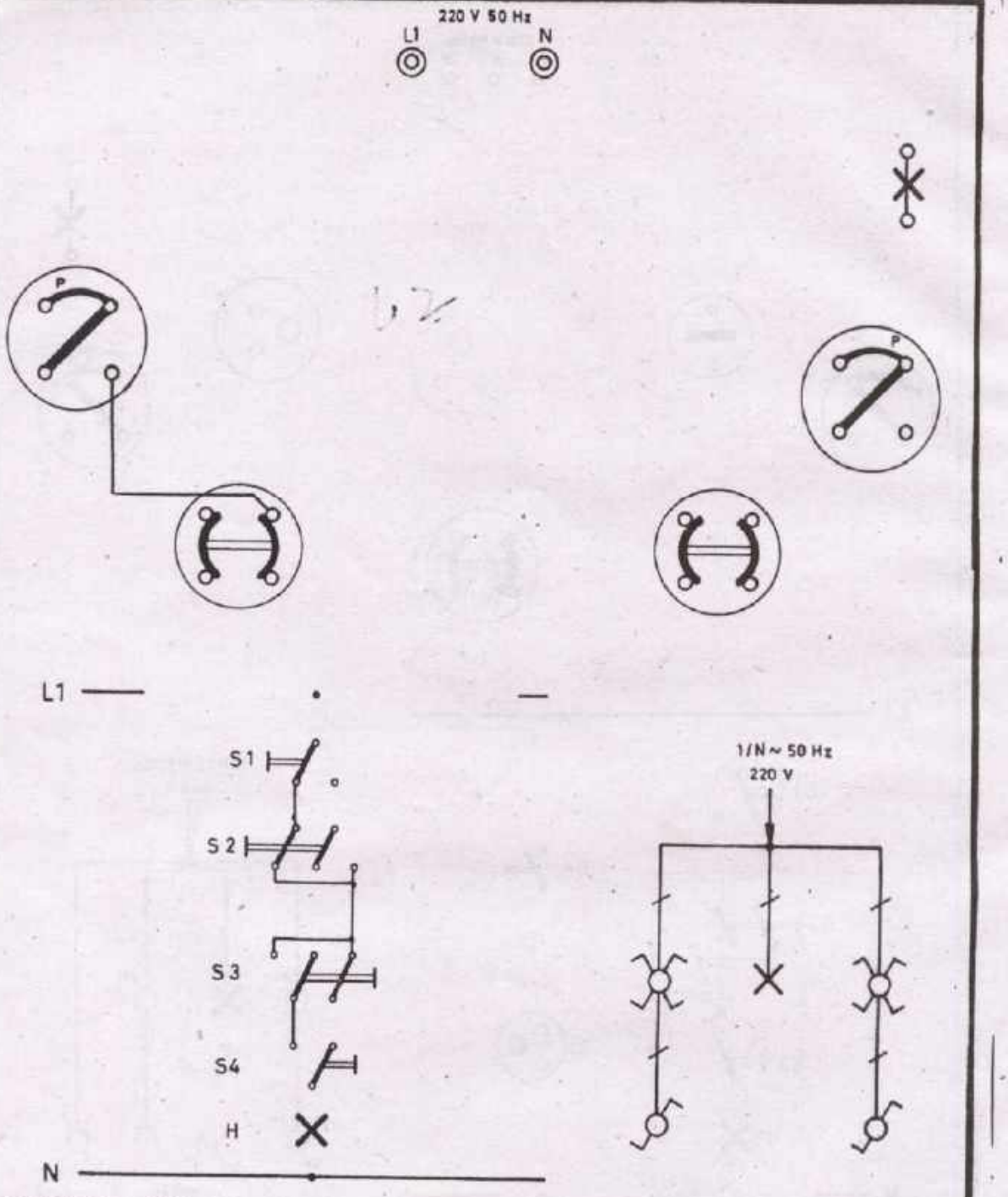
	INTERMEDIATE SWITCH CIRCUIT AND SOCKET CIRCUIT	EP 2.3/2.5.2/14
		Circuits I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES

If intermediate switch is not available then perform practical exercise of Drg.No. EP/2.3/2.5.2/20

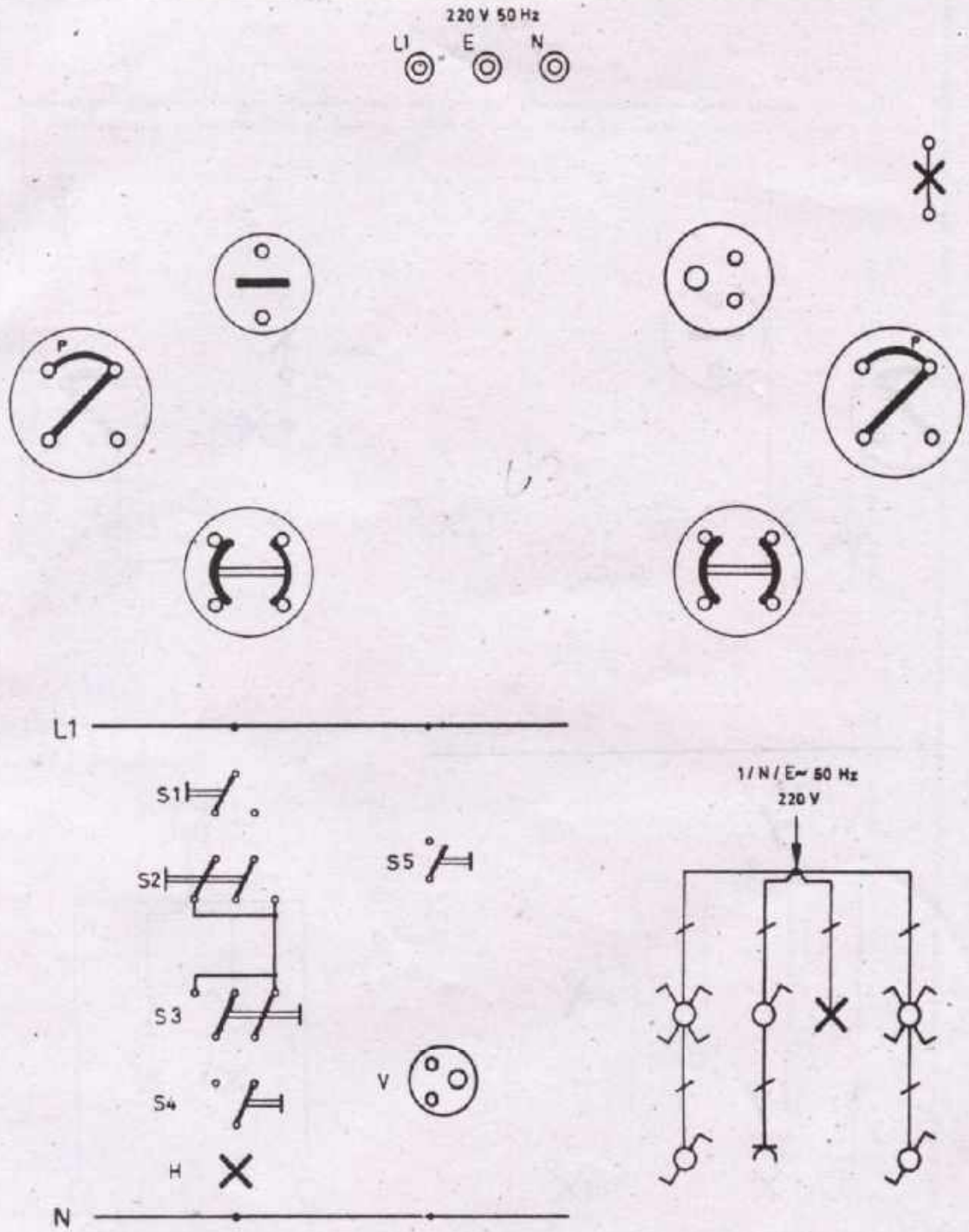
	INTERMEDIATE SWITCH CIRCUIT AND SOCKET CIRCUIT	EP 2.3/2.5.2/15
		Circuits I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES

If intermediate switch is not available then perform practical exercise of Drg.No. EP/2.3/2.5.2/21

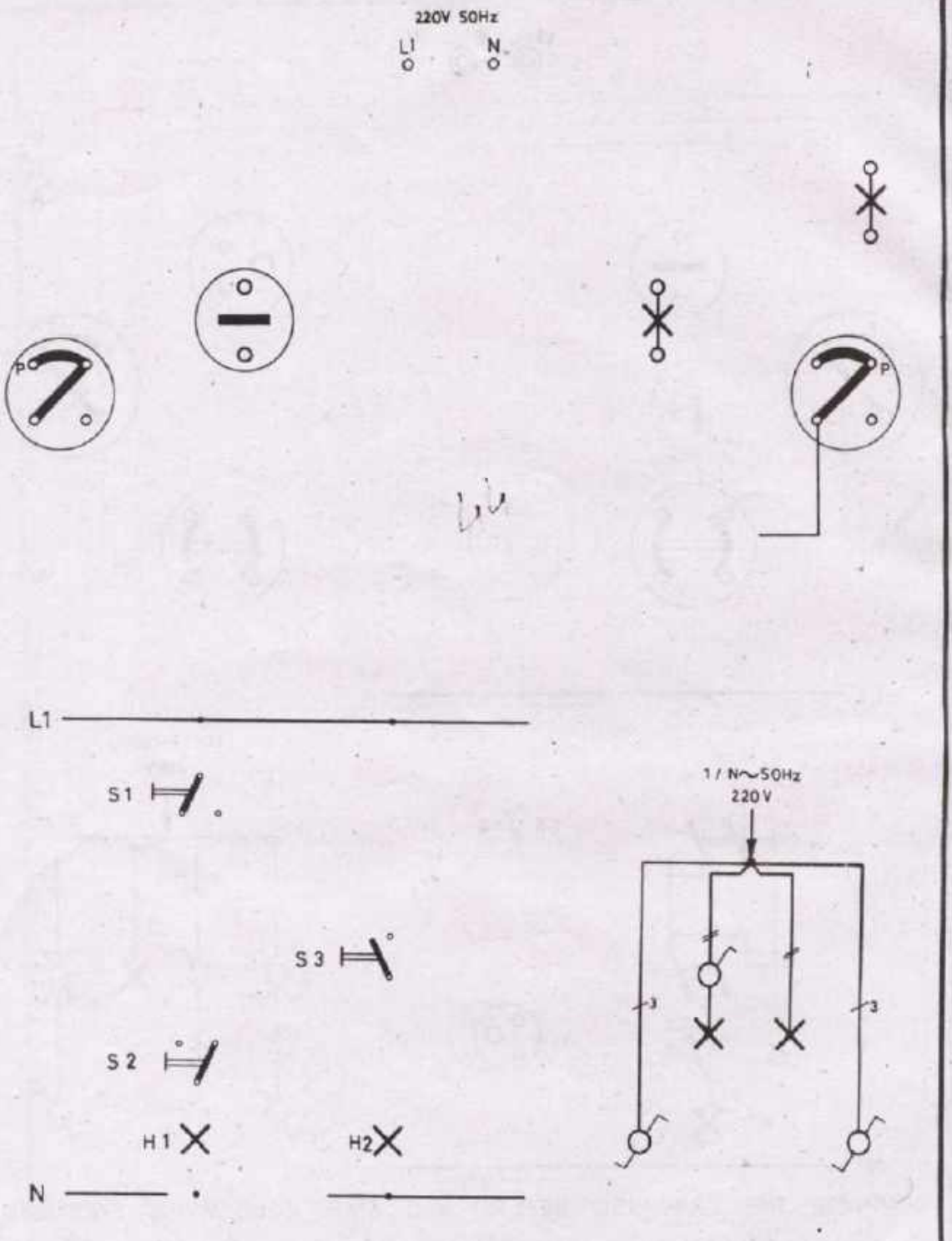
	INTERMEDIATE SWITCH CIRCUIT	EP 2.3/2.5.2/16
		Circuits 1
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES

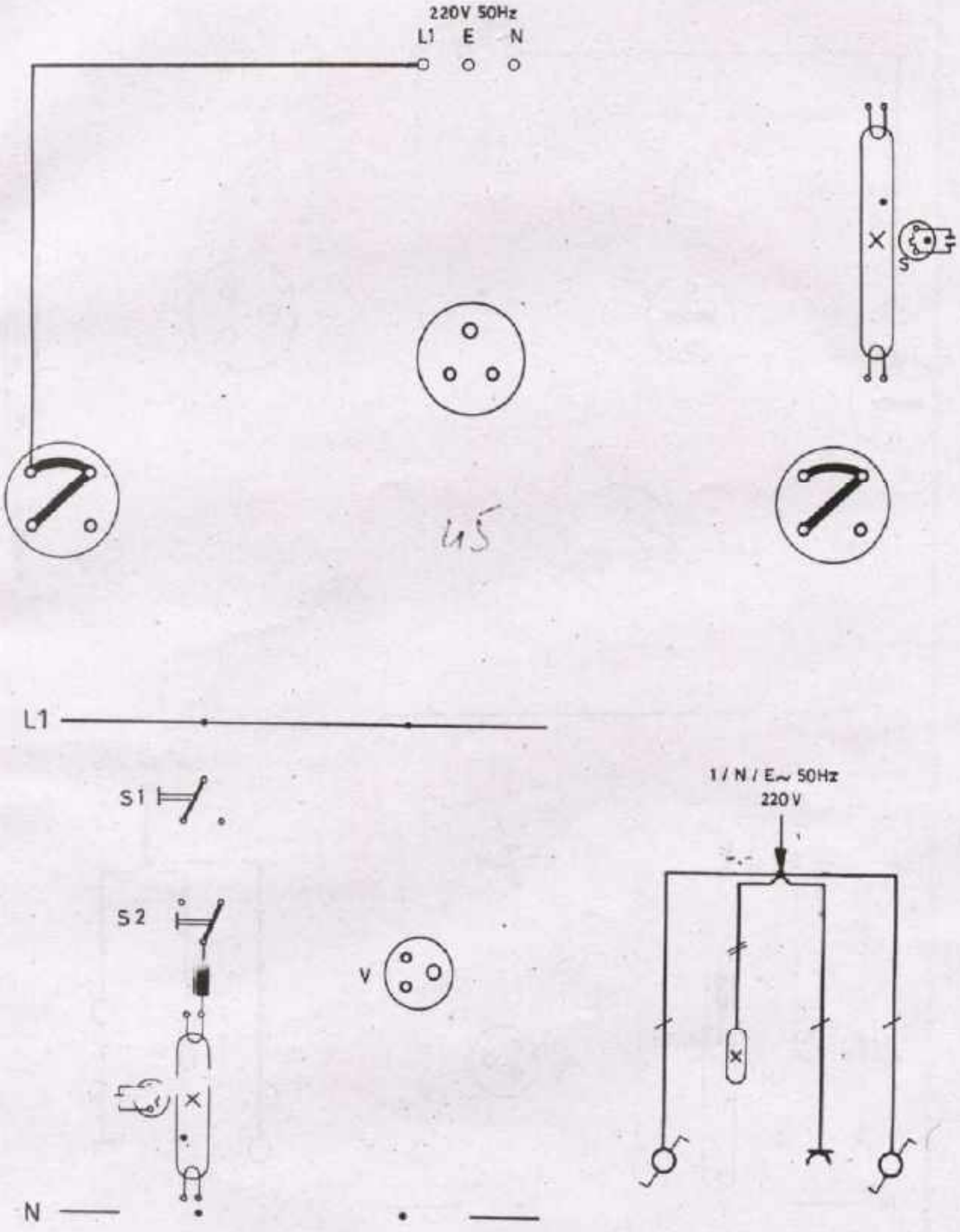
If intermediate switch is not available then perform practical exercise of Drg.No. EP/2.3/2.5.2/22

	INTERMEDIATE SWITCH CIRCUIT AND SOCKET CIRCUIT	EP 2.3/2.5.2/17
		Circuits I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING	PAK-GERMAN TECHNICAL TRAINING PROGRAMME	ELECTRICIAN GENERAL



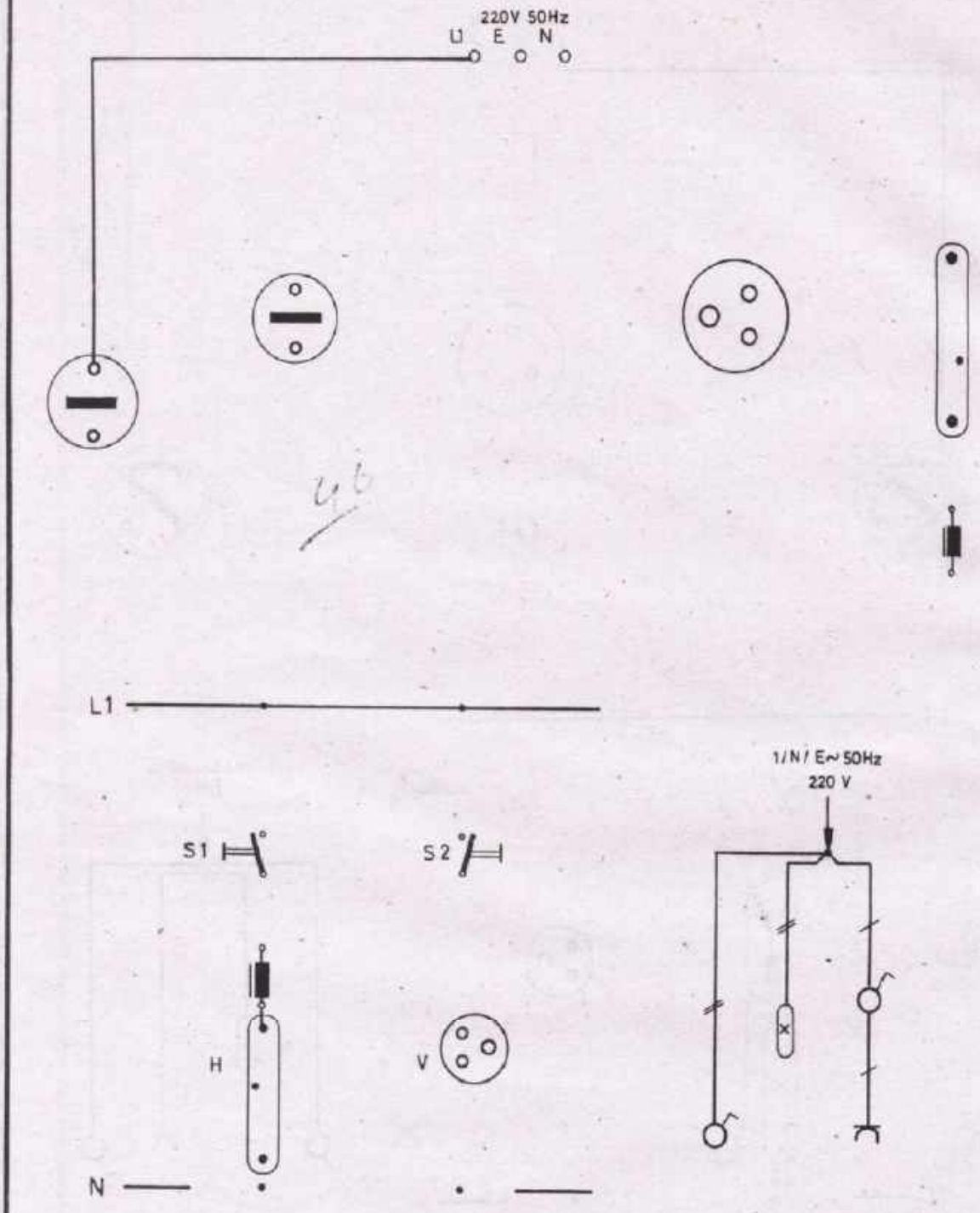
COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES

	TWO WAY AND S.P. SWITCH CIRCUIT	EP 2.3/2.5.2/18
		Circuits 1
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



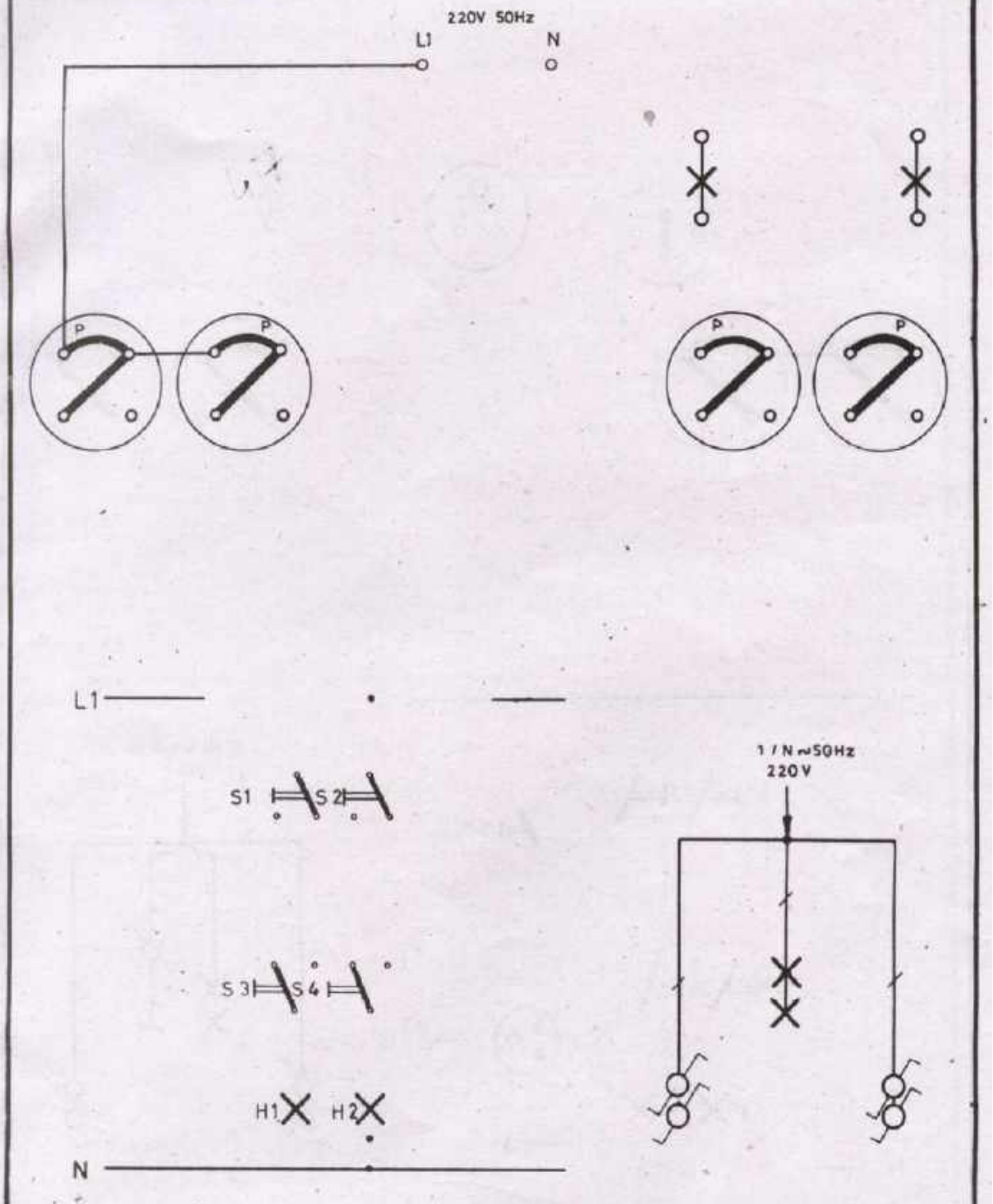
COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES

	TWO WAY AND S.P. SWITCH CIRCUIT	EP 2.3/2.5.2/19 Circuits I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



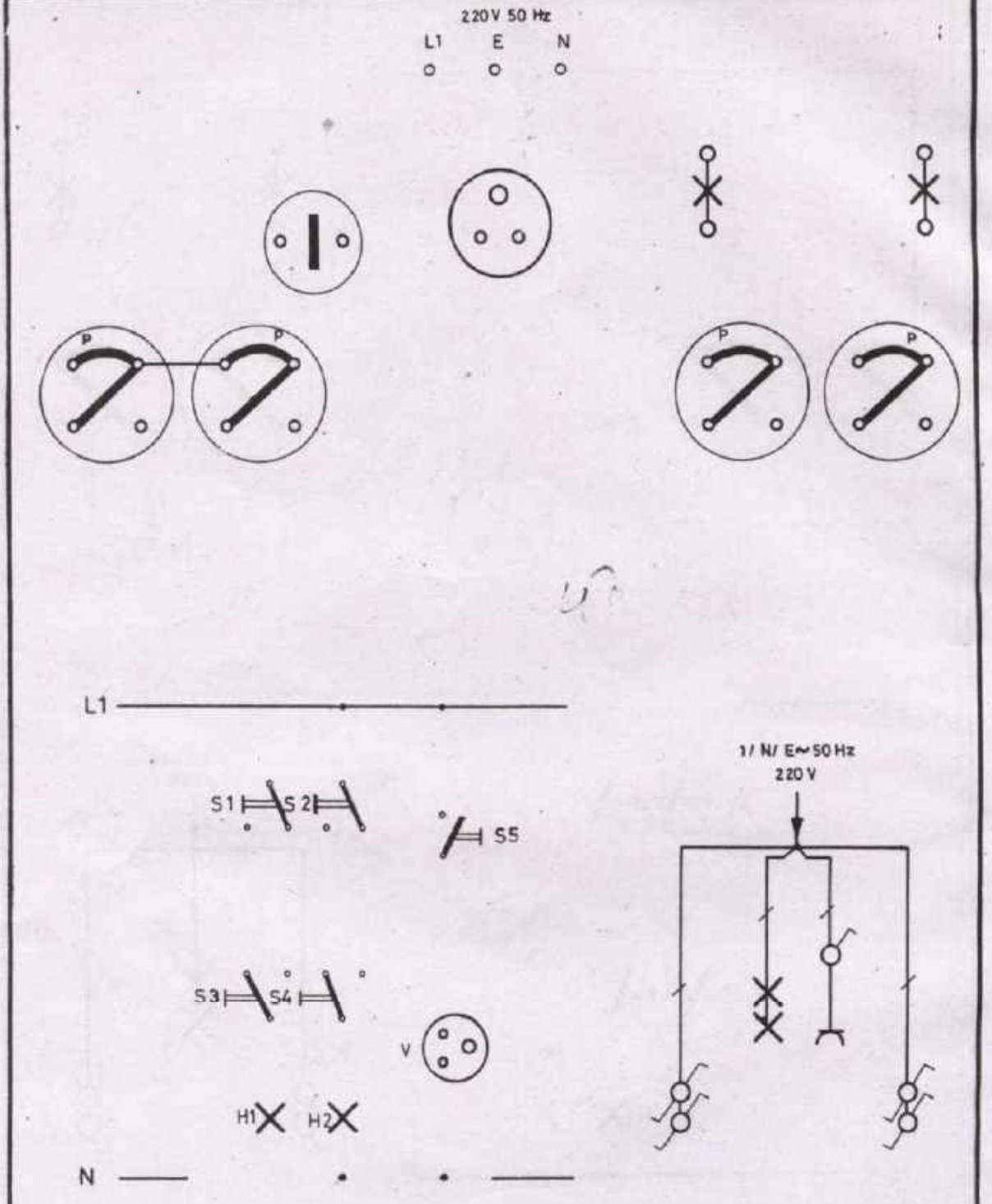
COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES.

	MERCURY LAMP	EP 2.3/2.5.2/20 Circuits I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



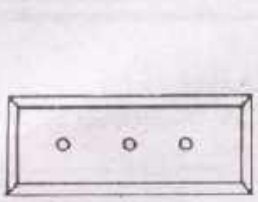
COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES

	TWO TWO WAY SWITCH CIRCUIT	EP 2.3/2.5.2/21 Circuits I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL

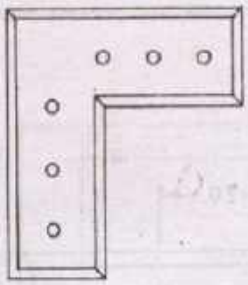


COMPLETE THE DRAWINGS BEFORE YOU START PLUG-WIRING EXERCISES

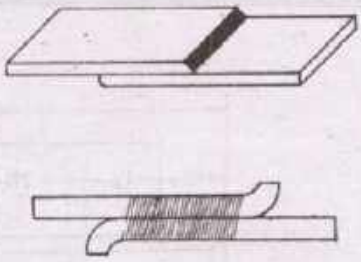
	TWO WAY AND S.P. SWITCH CIRCUIT	EP 2.3/2.5.2/22 Circuits I
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



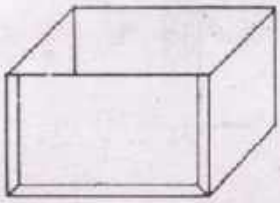
1 TERMINAL PLATE I



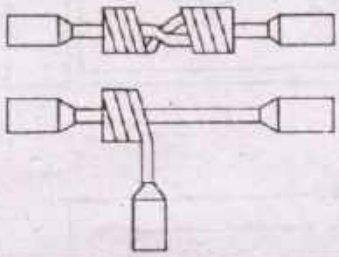
2 TERMINAL PLATE II



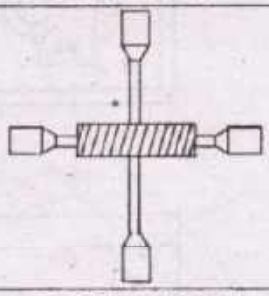
3 SOLDERING I



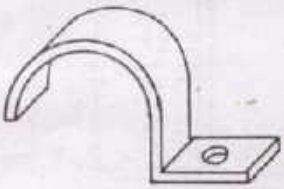
4 SOLDERING II



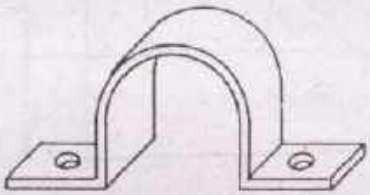
5 SOLDERING III



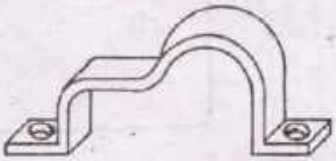
6 SOLDERING IV



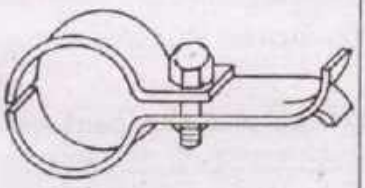
7 CLAMPS I



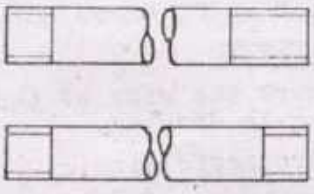
8 CLAMPS II



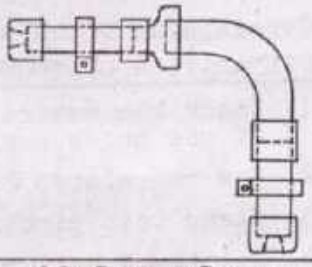
9 CLAMPS III



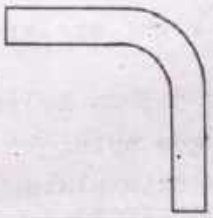
10 CLAMPS IV



11 CONDUIT PIPE I



12 CONDUIT PIPE II



13 CONDUIT PIPE III

14 CONDUIT PIPE IV

PERFORATED STEEL-PLATES (EXERCISE PLATES FOR INSTALLATION I) ARE TO BE MADE ON DEMAND ONLY

15 INSTALLATION DEVICE

LAYOUT

EP 2.1/2.5.3

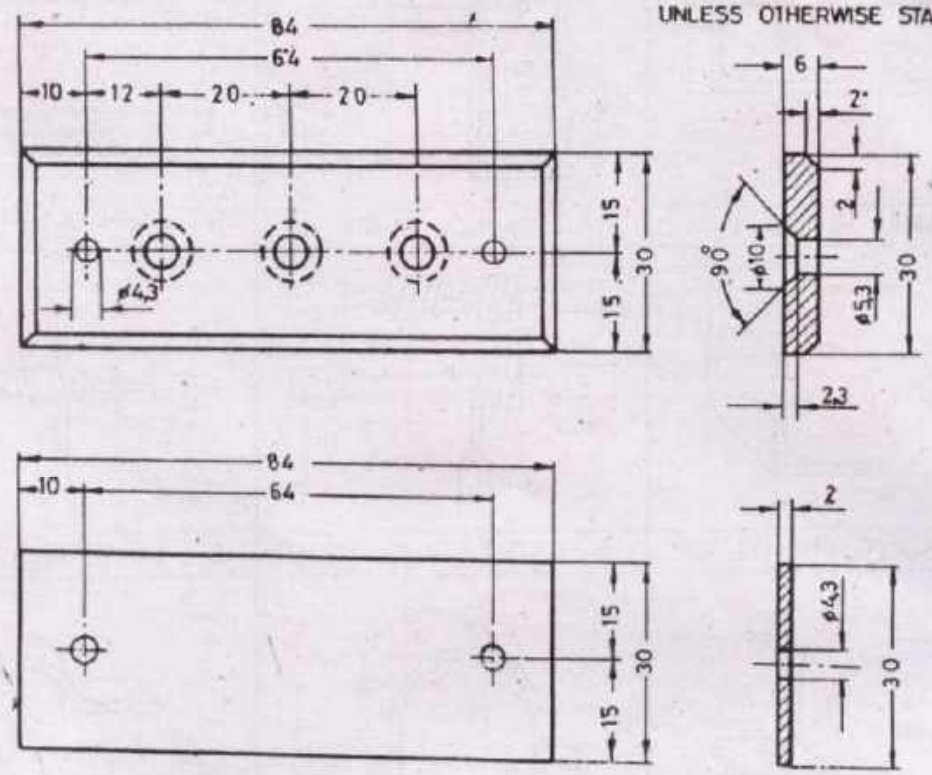
Bench Work

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

ELECTRICIAN GENERAL

TOLERANCE ± 0.1
UNLESS OTHERWISE STATED



50

MATERIAL

2 mm and 6 mm hardpaper plates "Pertinax"

Countersunk brass screws M 5x30, brass nuts M5, brass washers 5 mm

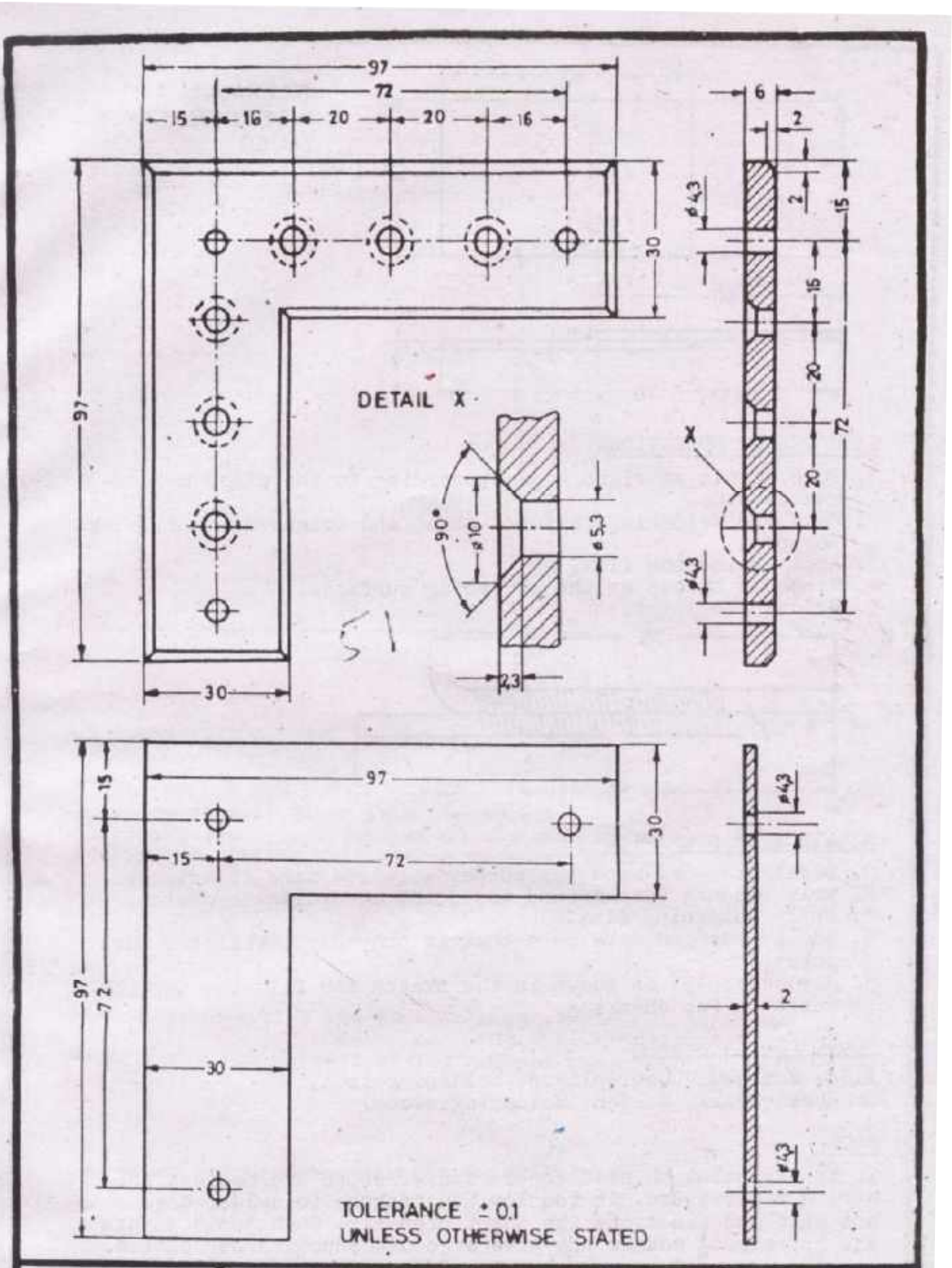
PREPARATION OF TERMINAL PLATES

1. Check the material, mark the size of the plates and the centres of the holes according to drawing.
2. Saw the plates to approximate size.
3. Clamp both pieces together and drill the 4.3 mm holes.
4. Fit the 4 mm screws temporarily and the filing should be done according to marking.
5. File the workpieces according to size, mind the right angles and remove the burr as required.
6. Take the plates apart, drill and countersink the 5.3 mm holes.
7. Fit the countersunk screws with washers and hexagon nuts.
8. Cover and isulate the screw heads by fitting the thin plate from underneath with the help of 4 mm cheese head screws.

	TERMINAL PLATE 1	EP 2.3/2.5.3/1
		Bench Work

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

ELECTRICIAN GENERAL



TERMINAL PLATE 2

EP. 2.3/2.5.3/2

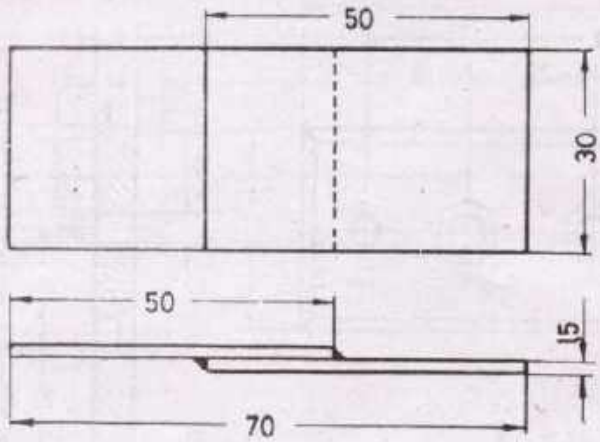
Bench Work

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK GERMAN TECHNICAL TRAINING PROGRAMME

ELECTRICIAN GENERAL

A

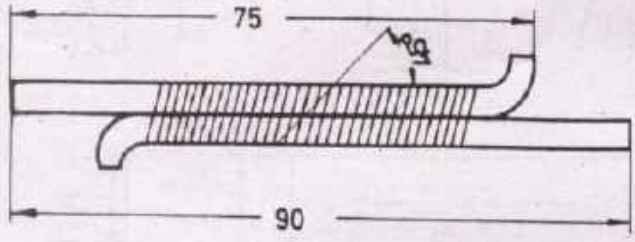


TOLERANCE ± 0.1
UNLESS OTHERWISE
STATED

SEQUENCE OF OPERATION

1. File sheets at right angle according to the given measurment.
2. Make the soldering surfaces clean and bright using file or scraper.
3. Apply soldering flux.
4. Tin both sheets at the soldering surfaces.
5. Solder the joint.

B



SEQUENCE OF OPERATION

1. Straighten and bend the copper wire and make it bright.
2. Wrap bendung wire around the joint according to sketch.
3. Apply soldering flux.
4. Add solder and make sure that it properly penetrates the joint.
5. Saw under 45° as shown in the sketch and file the cutting surfaces for checking.

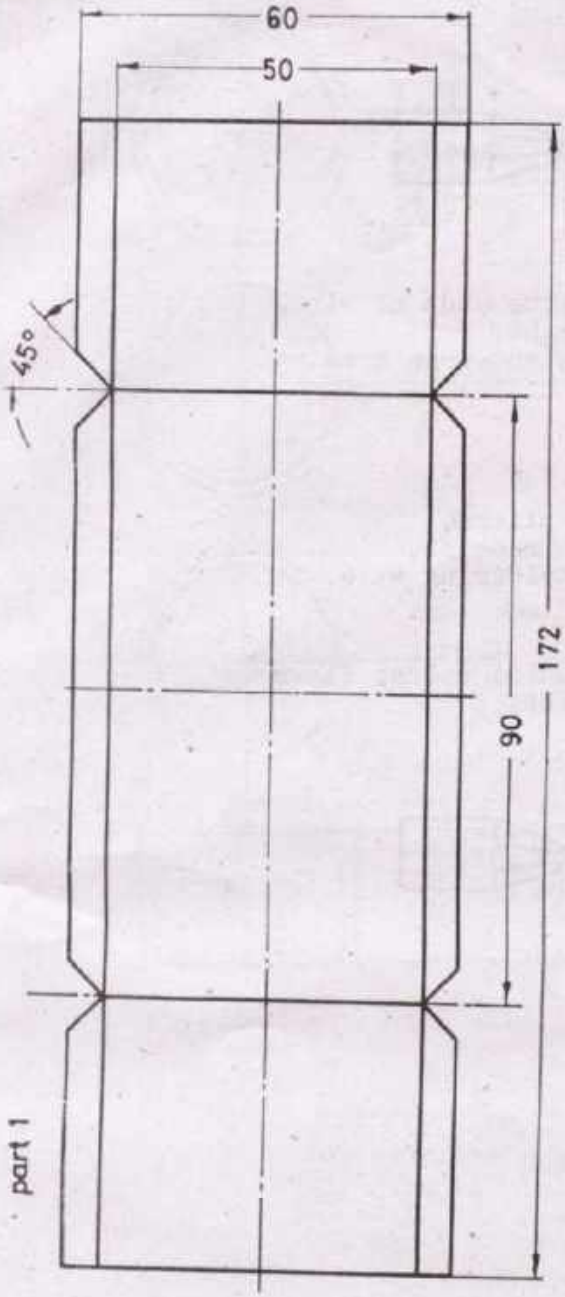
TOOLS AND MATERIALS

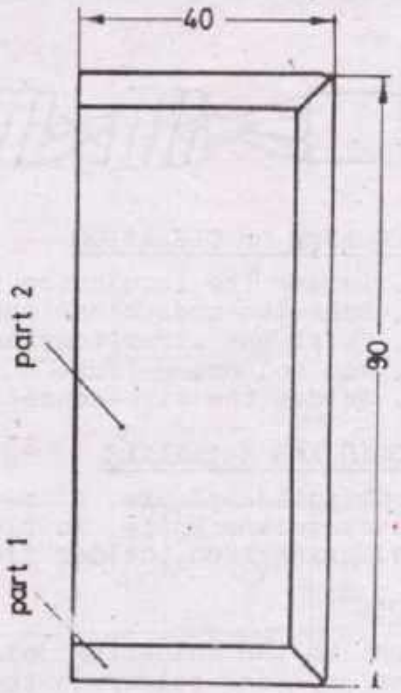
File, Scraper, Combi-pliers, Soldering iron,
Soldering flux, Solder, Soldering stone.

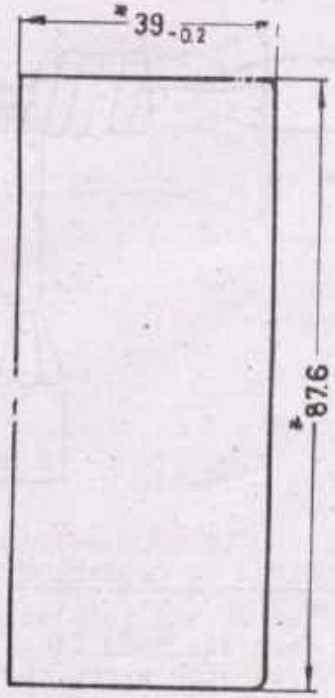
NOTE

It is essential to heat sheets and wires to the correct soldering temperature. At too low temperature to solder does not melt and penetrate the joint properly. Such "cold joints" are not strong and do not give a good conductive connection.

	SOLDERING A. SOLDERING JOINT B. WIRE JOINT	EP 2.3/2.5.3/3 Bench Work
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL







PREPARE THE BOX ONLY IF NOT MADE IN 1.0.1/7 & 16.

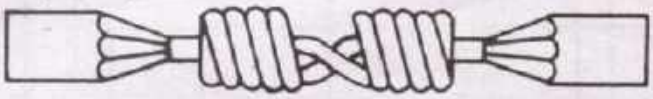
THICKNESS 1mm or SWG 19 OTHERWISE CHANGE MEASUREMENTS OF PART 2 *

GIVE SEQUENCE OF OPERATION OVERLEAF

TOLERANCE ± 0.1 UNLESS OTHERWISE STATED

	SOLDERING SHEETMETAL BOX	EP 2.3/2.5.3/4 Bench Work
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING INDO-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL

A



SEQUENCE OF OPERATION

1. Remove the insulation from the ends of wire.
2. Make the ends clean and bright.
3. Twist the wires together as shown in drawing.
4. Add soldering flux.
5. Solder the wire-connection.

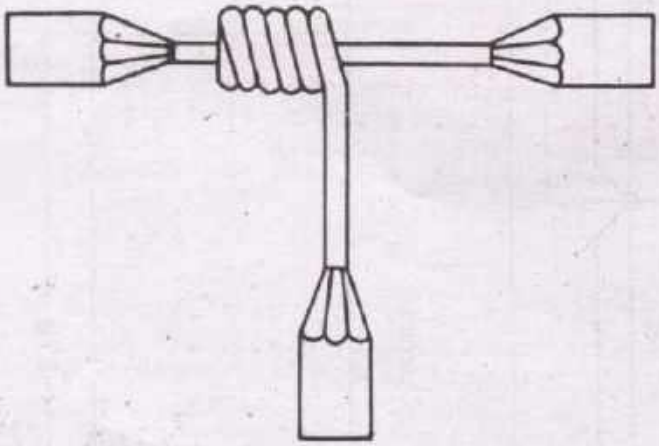
TOOLS AND MATERIALS

Combination-pliers, flat-nose-pliers, electricians knife, insulation remover, soldering iron, solder flux, soldering wire.

NOTE

Heat up the soldering joints until solder flows. Don' t stick solder to the joint.

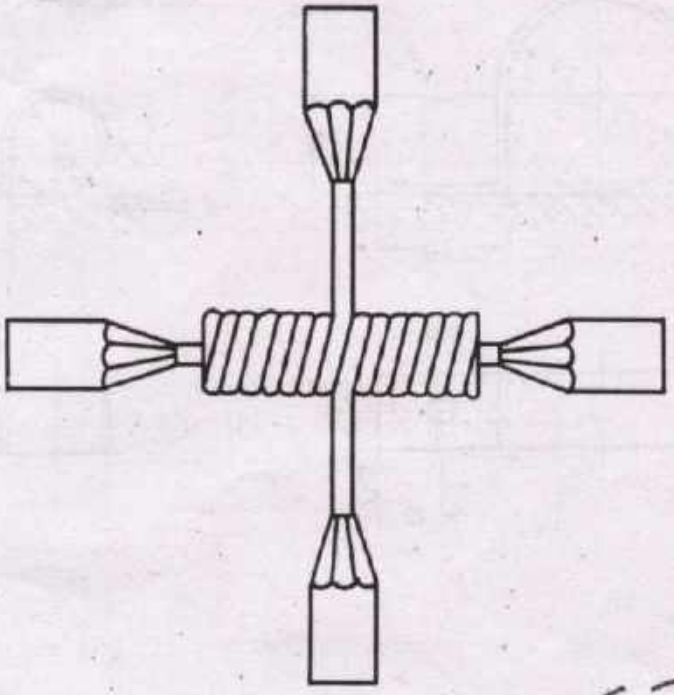
B



SEQUENCE OF OPERATION

1. Remove the insulation from the ends of wire.
2. Make the ends clean and bright.
3. Twist the wires together as shown in drawing.
4. Add soldering flux.
5. Solder the wire-connection.

	SOLDERING A. MARRIED-JOINT B. T-JOINT	EP 2.3/2.5.3/5 Bench Work
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



5.5

SEQUENCE OF OPERATION

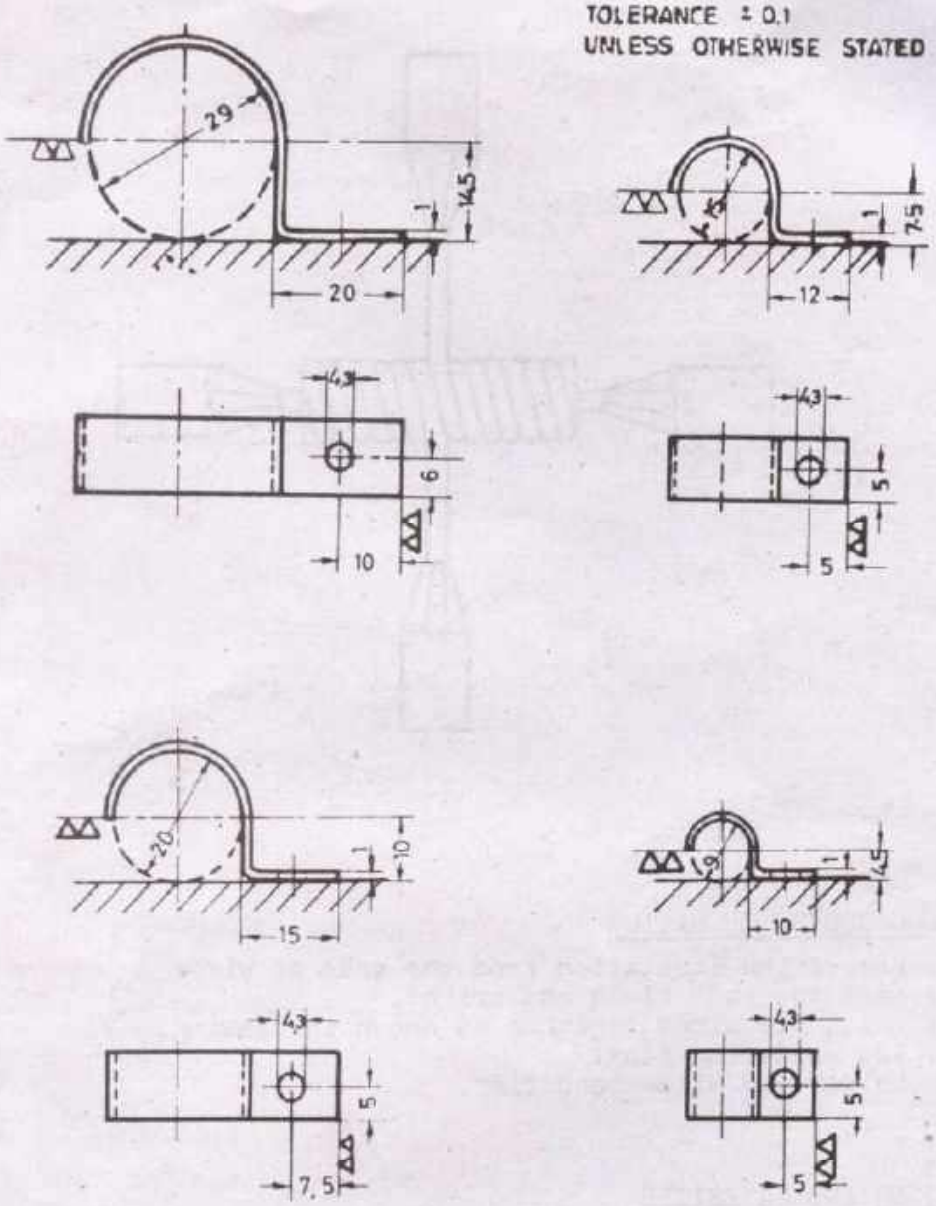
1. Remove the insulation from the ends of wire.
2. Make the ends clean and bright.
3. Twist the wires together as shown in drawing.
4. Add soldering flux.
5. Solder the wire-connection.

TOOLS AND MATERIALS

Combination-pliers, flat-nose-pliers,
electricians knife, insulation remover,
soldering iron, solder flux, soldering wire.

	SOLDERING CROSS JOINT	EP 2.3/2.5.3/6 Bench Work
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL

TOLERANCE ± 0.1
UNLESS OTHERWISE STATED

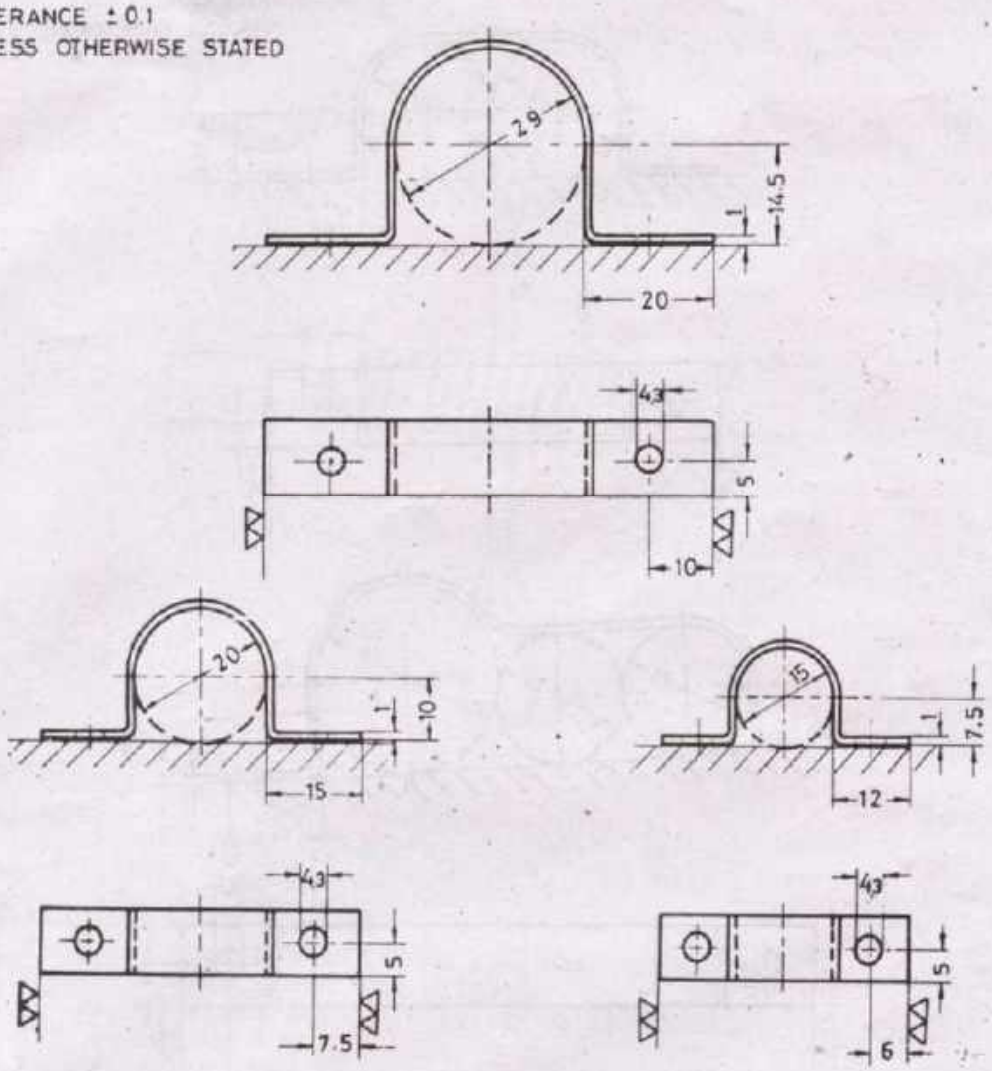


SEQUENCE OF OPERATION

1. File one end in right angle.
2. Mark the bending edge and bend it in right angle.
3. Bend the radius with the help of the bending-rod.
4. Cut the second end according to size and file it in right angle.
5. Mark, punch and drill the hole.

	MAKING OF CLAMPS	EP 2.3/2.5.3/1 Bench Work
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL

TOLERANCE ± 0.1
UNLESS OTHERWISE STATED

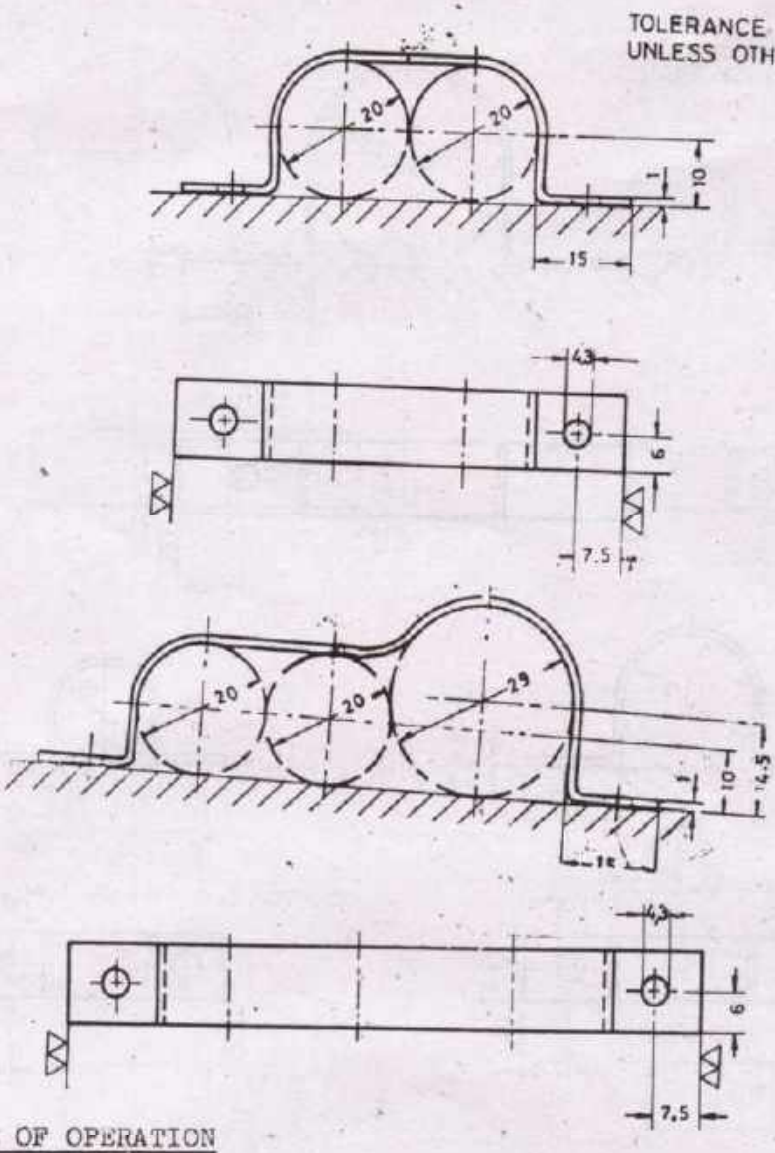


SEQUENCE OF OPERATION

1. File one end at right angle.
2. Mark the bending edge and bend it at right angle.
3. Bend the radius with the help of the bending-rod.
4. Mark the second bending edge and bend it.
5. Cut the second end to size and file it at right angle.
6. Mark, punch and drill the holes.

	MAKING OF CLAMPS	EP 2.3/2.5.3/8 Bench Work
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL

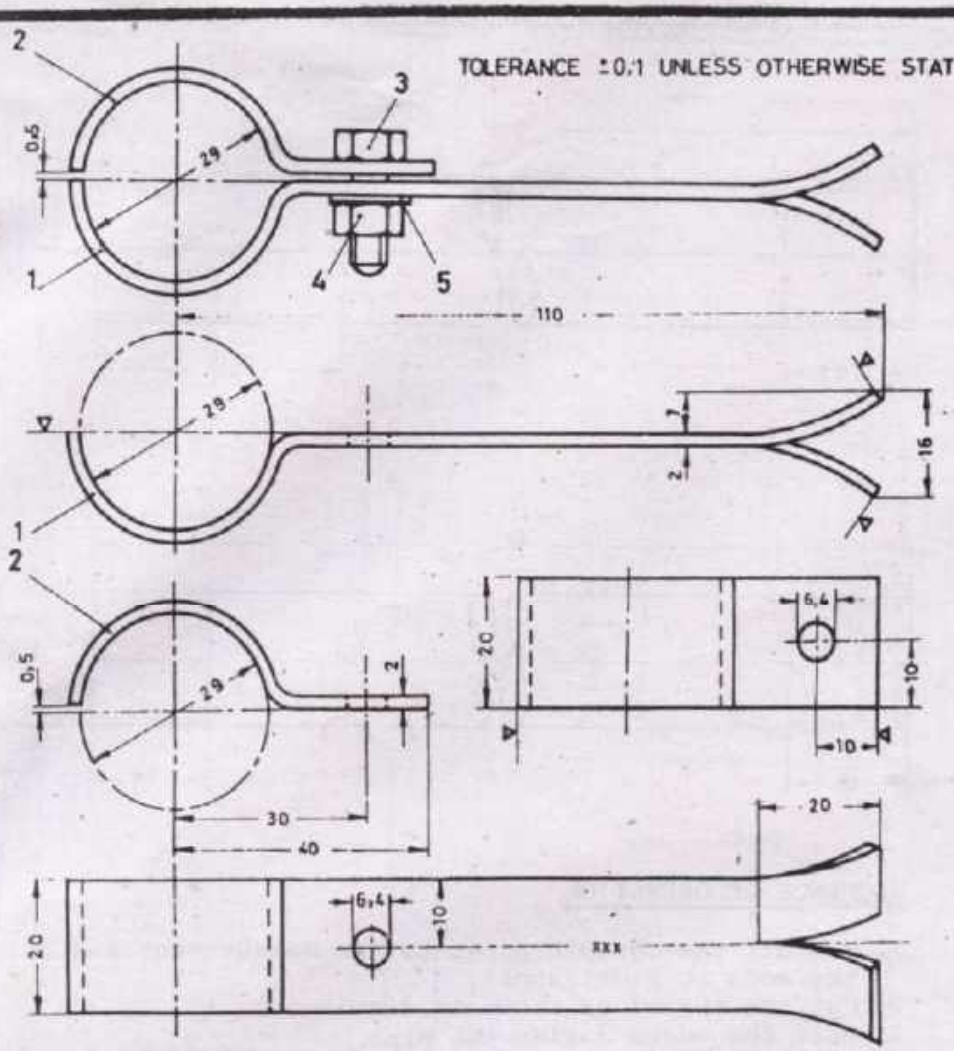
TOLERANCE ± 0.1
UNLESS OTHERWISE STATED



SEQUENCE OF OPERATION

1. File one end at right angle.
2. Mark the bending edge and bend it at right angle.
3. Bend the clamp according to drawing.
4. Mark the second bending edge and bend.
5. Cut the second end to size and file it at right angle.
6. Mark, punch and drill the holes.

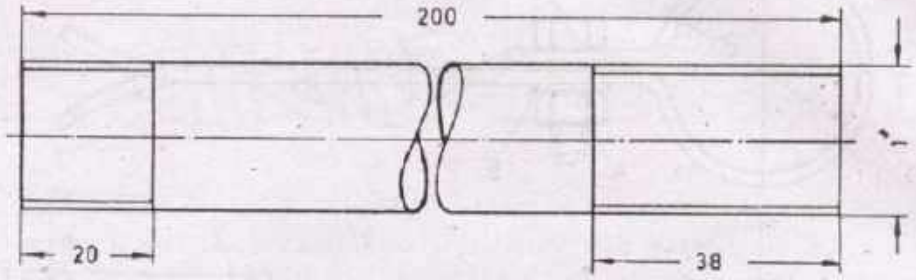
	MAKING OF CLAMPS	EP 2.3/2.5.3/9 Bench Work
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL

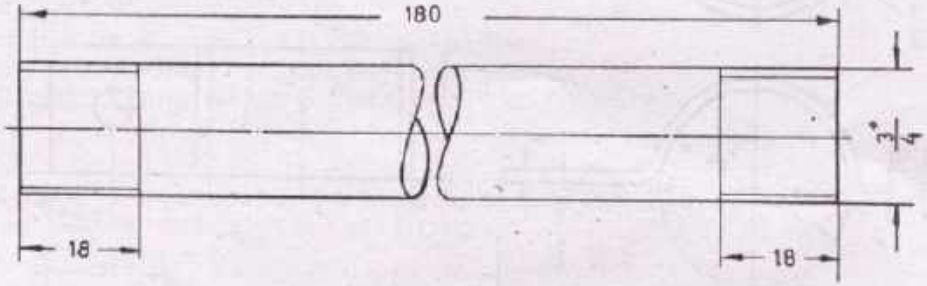


SEQUENCE OF OPERATION

Part No. 1	1. File one end at right angle.
	2. Mark the bending edge and bend the radius with the help of the bending rod.
	3. Cut the second end to size and file it at right angle.
	4. Split and bend the wall-side end.
Part No. 2	5. File one end at right angle.
	6. Mark the bending edge and bend the radius with the help of the bending-rod.
	7. Cut the second end to size and file it at right angle.
Part No. 1 + 2	8. Mark, punch and drill the holes in both parts.
Part No. 1 - 5	9. Assemble all five parts together.

	MAKING OF CLAMPS	EP 2.3/2.5.3/10
		Bench Work
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING		ELECTRICIAN GENERAL
PAK.GERMAN TECHNICAL TRAINING PROGRAMME		





SEQUENCE OF OPERATION

1. Cut off the conduit pipes to the measurement and file the ends at right angle.
2. Cut the thread as shown in drawing.
3. Burr the edges inside the pipe.

TOOLS

Hacksaw, flat file 25o x 1
flat file 25o x 3, half round file 2oo x 3
die-stock 3/4" and 1" size

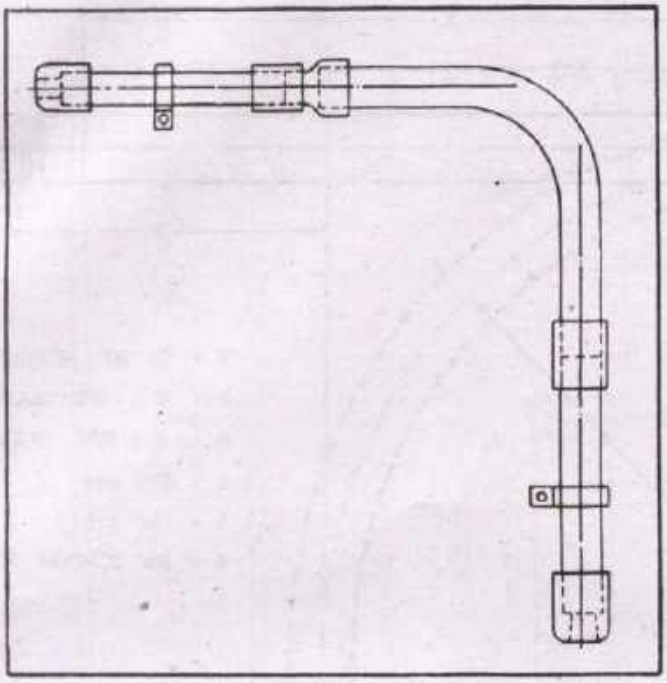
NOTE

Never thread without Lubrication !

Do not turn the die stock continuously but stop after each revolution and move it a bit back to break of the shippings.

Some dies are adjustable in diameter, when using such dies it is advisable to cut the thread not in one operation.

	HANDLING OF CONDUIT PIPE CUTTING AND THREADING	EP 2.3/2.5.3/11 Bench Work
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



SEQUENCE OF OPERATION

1. Fit socket and reducing socket on conduit pipe bend.
2. Screw conduit pipes into the sockets.
3. Tighten bush-type sockets on the ends of pipes.
4. Fix the fitting with clamps on exercise board.

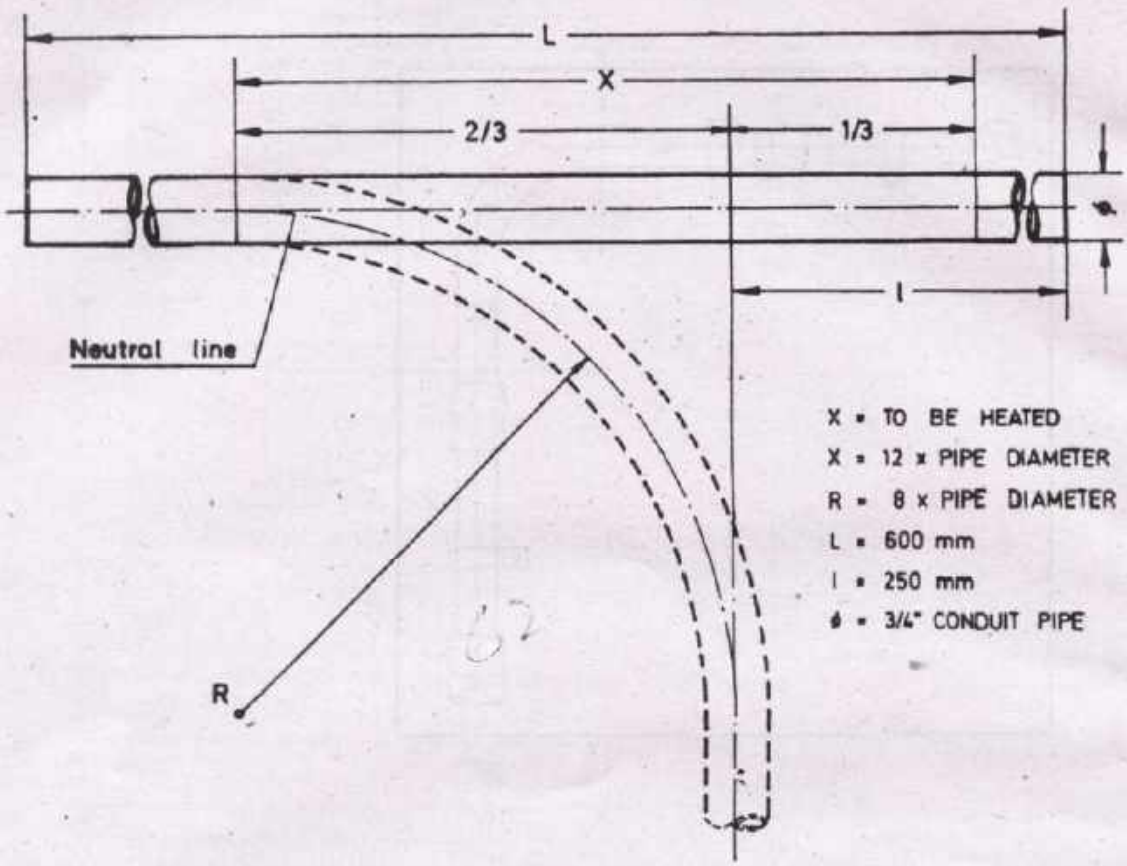
Note:

Always cut and file the ends at right angle !

Never fit pipes without having removed the inside burrs !

Use pipes prepared in exercise No. EP/23/252/11

	HANDLING OF CONDUIT PIPE	EP 2.3/2.5.3/12 Bench Work
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



Material: 1 conduit pipe 3/4" x 600 mm

SEQUENCE OF OPERATION

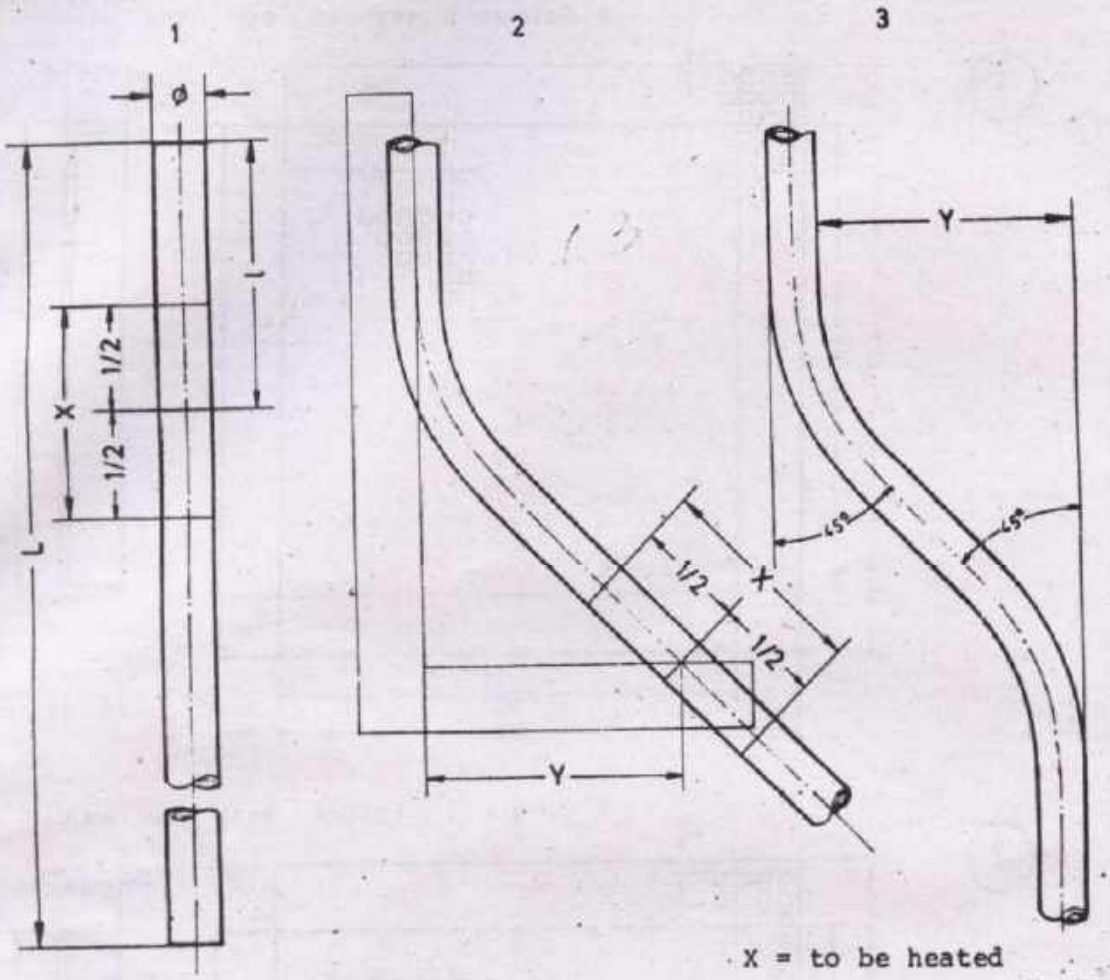
1. Fill the pipe properly with dry bending sand (slightly hammer the pipe to allow setting of the sand) and then close the ends of the pipe with wooden plugs.
2. Mark the job according to the sketch and the dimensions given for this exercise.
3. Heat the portion X and bend equally.

NOTE

Take care that the weld-seam of the pipe falls in with the neutral line of the bend.
Do not make too sharp bends, the wires will be grateful to you.

(This technique is important if no pre-fabricated bends can be obtained and no special bending device is available.)

	HANDLING OF CONDUIT PIPE BENDING	EP 2.3/2.5.3/13 Bench Work
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL



Material: 1 Conduit pipe 3/4" x 600 mm

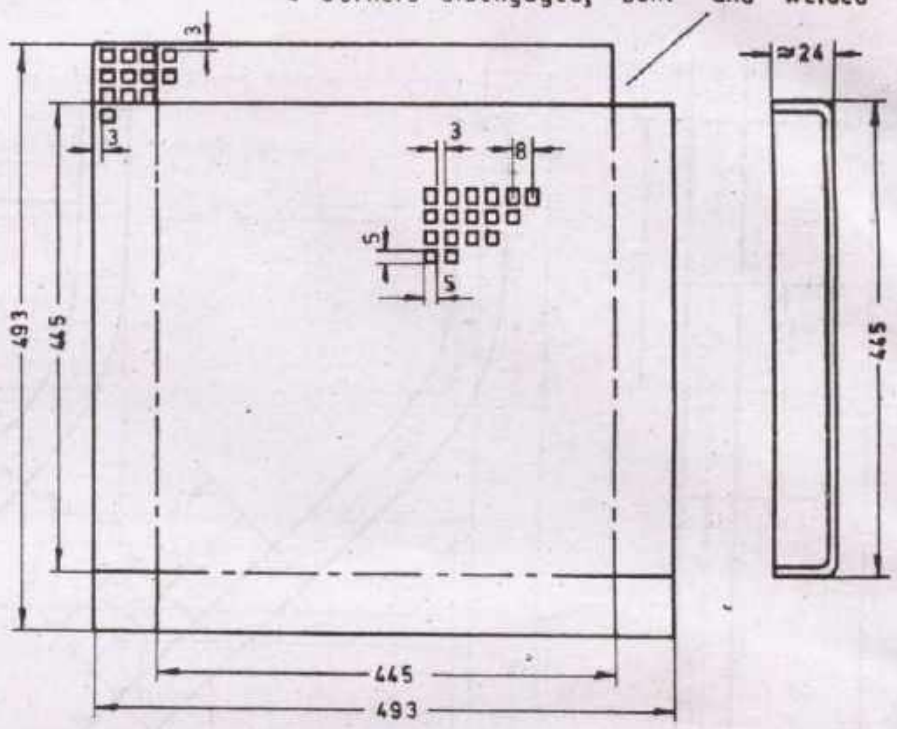
X = to be heated
X = 4 x pipe diameter
L = 600 mm
I = 250 mm
Y = 100 mm

Sequence of operation

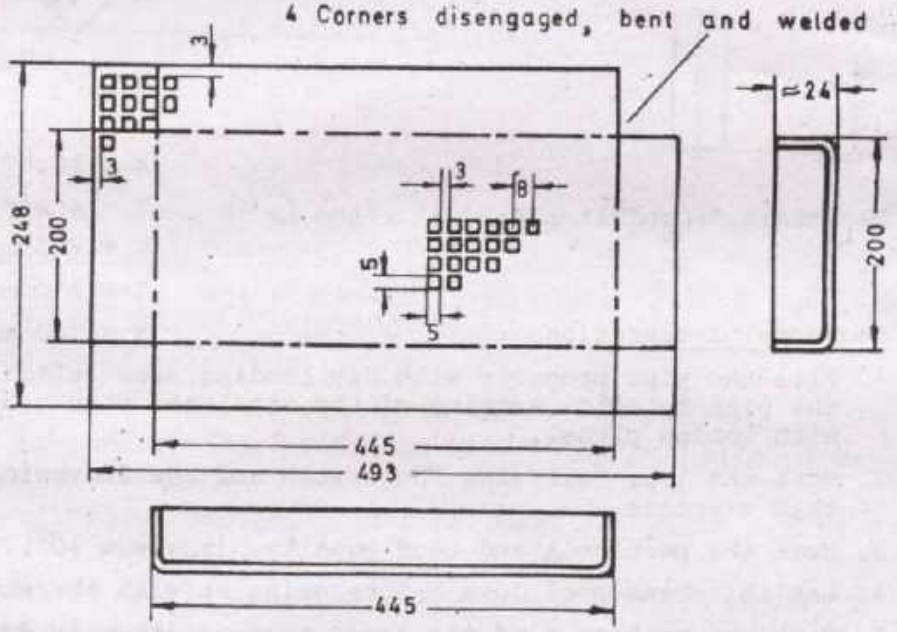
1. Fill the pipe properly with dry bending sand (slightly hammer the pipe to allow setting of the sand) and then close the ends with wooden plugs.
2. Mark the job, following the sketch and the dimensions given for this exercise.
3. Heat the portion X and bend equally. (angle = 45^{o}).
4. Let this bend cool down before going on with the work.
5. Mark the portion X of the lower bend as shown in drawing 2.
6. Heat the portion X and bend in the same angle as first one.
7. Check measurements Y and parallelism.

	HANDLING OF CONDUIT PIPE	EP 2.3/2.5.3/14 Bench Work
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL

1

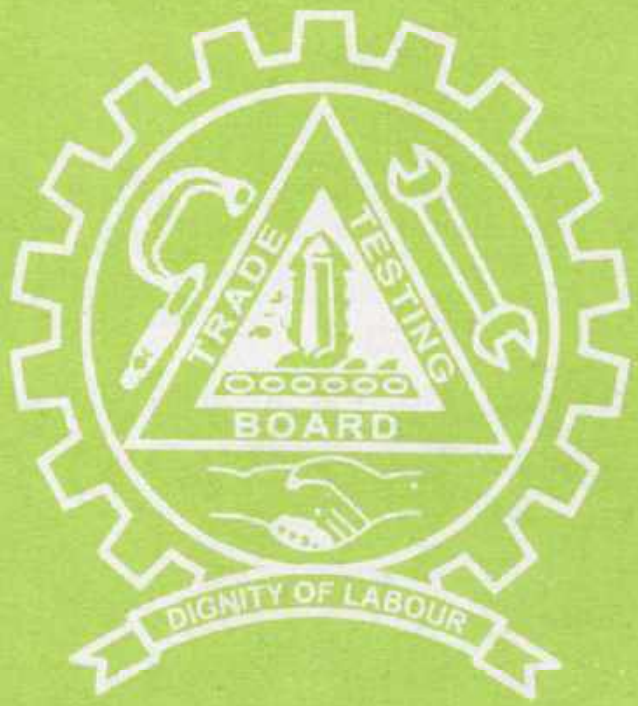


2



Example of Perforated Sheets Holed Steel-Plate 1.5 mm thick
Division 8 mm

	INSTALLATION DEVICE PERFORATED SHEET-PLATES	EP 2.3/2.5.3/15 Bench Work
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		ELECTRICIAN GENERAL


TRADE TESTING
BOARD
DIGNITY OF LABOUR