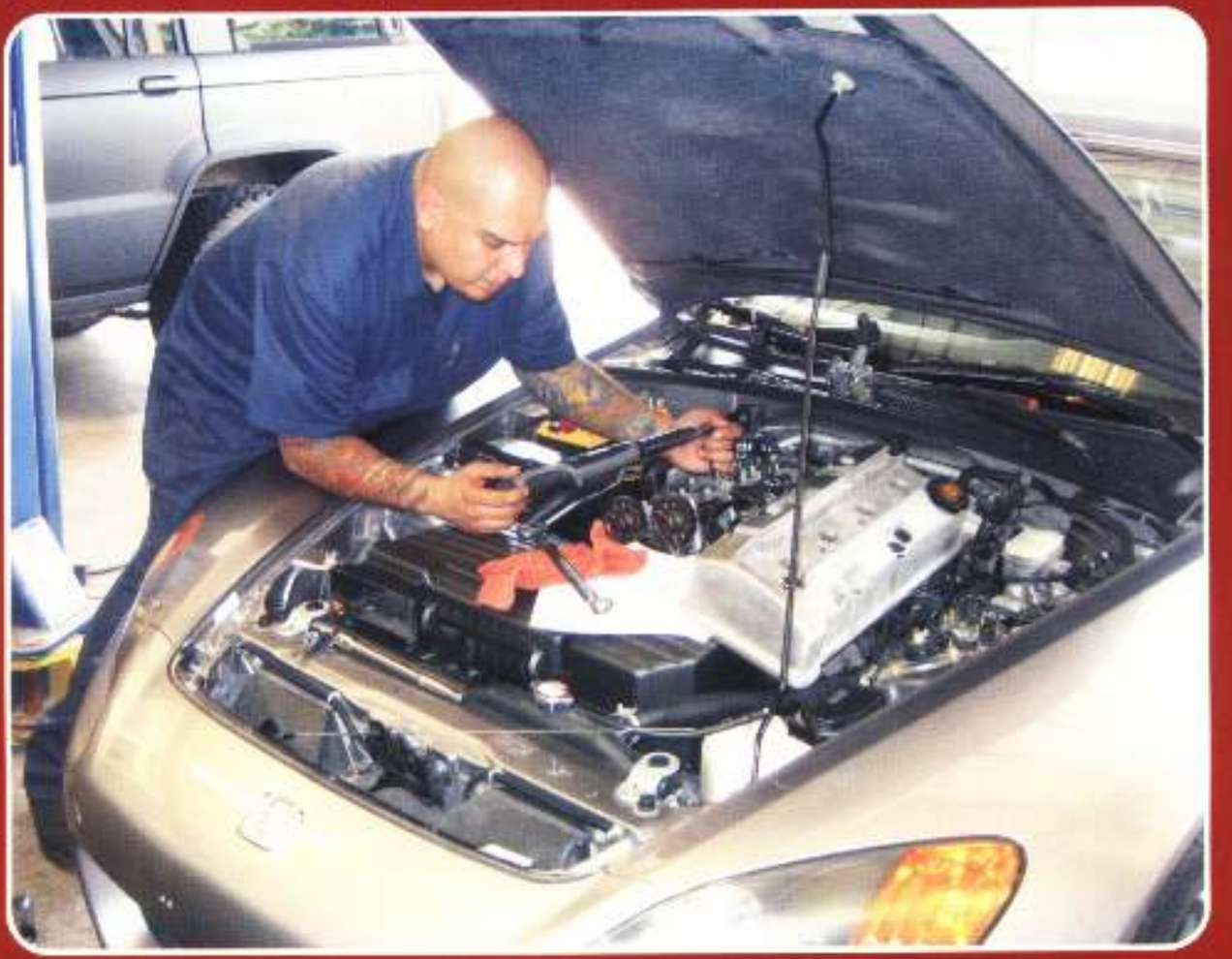
TECHNICAL DRAWING 3

AUTO - MECHANIC



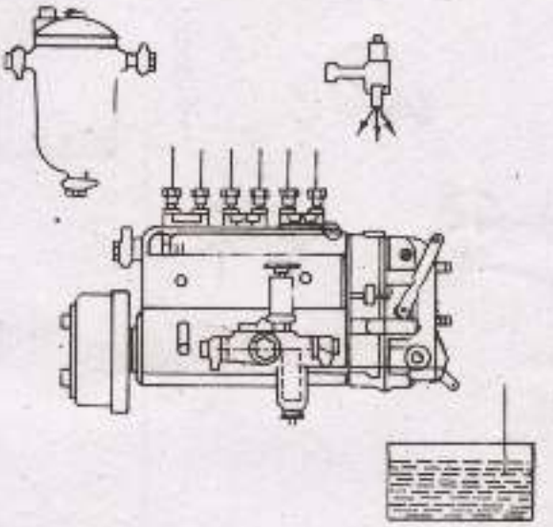
TEVTA

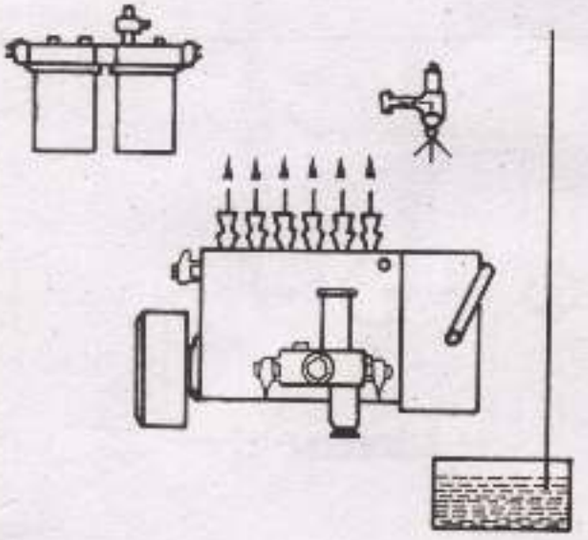
GOVERNMENT OF THE PUNJAB
TECHNICAL EDUCATION & VOCATIONAL TRAINING AUTHORITY
TRADE TESTING BOARD
DEVELOPMENT CELL LAHORE

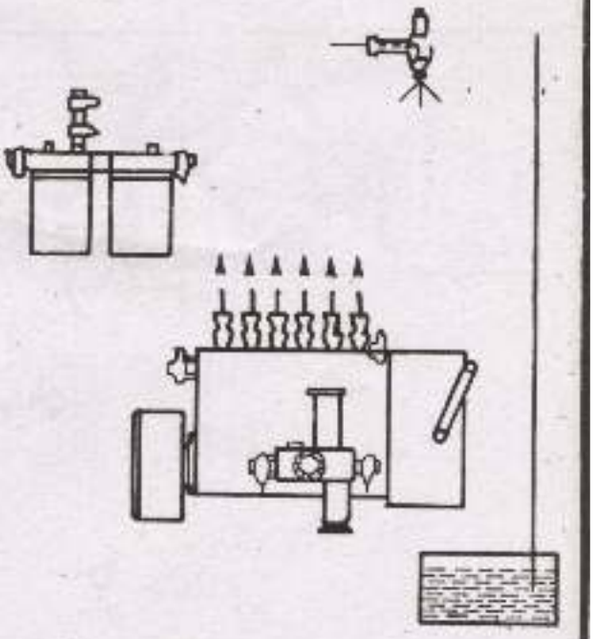
T.T.P. Series No. 82 Price Rs. 44/-

Task:

1. Complete the sketches and write their names.
2. Use the colours for indentification







Scale	FUEL SYSTEM	D_Engine parts
Date	Name	Auto Mechanic

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

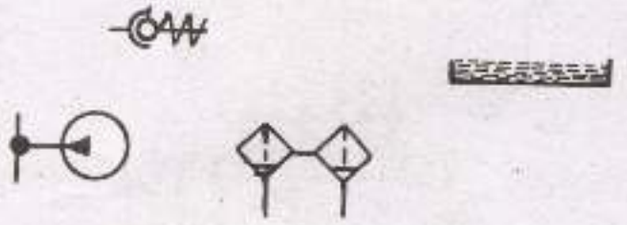
PAK GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing

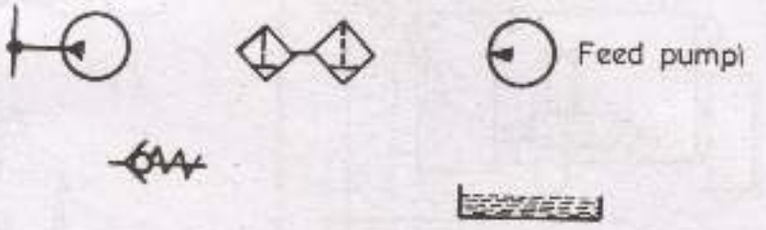
No: 39

Task:

1. Complete the sketches a and b.
2. Indicate the flow of fuel with colours and arrows.

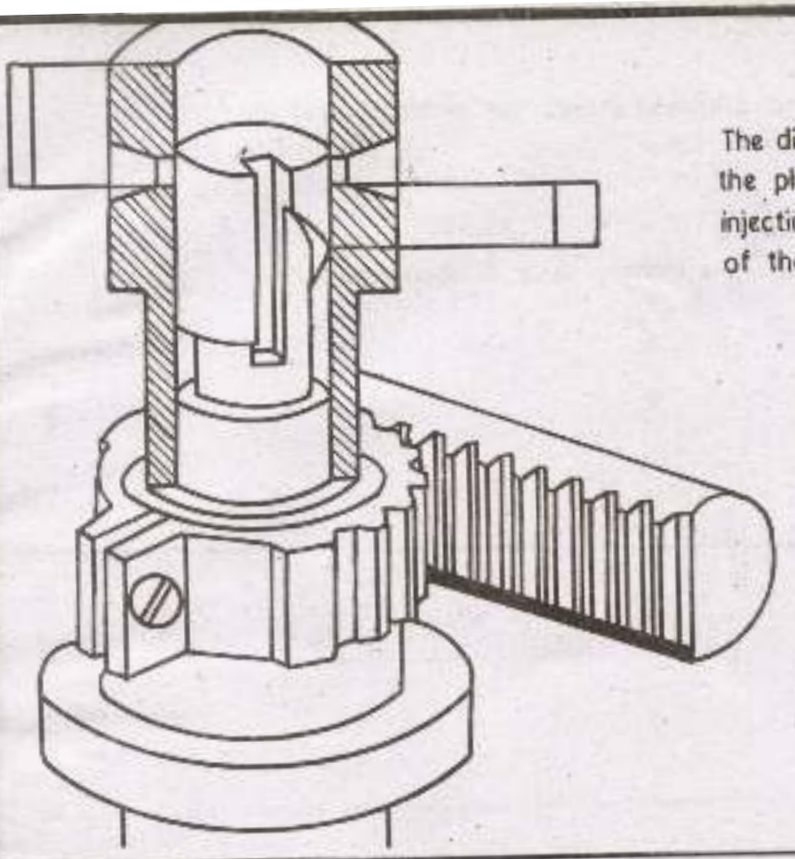


a

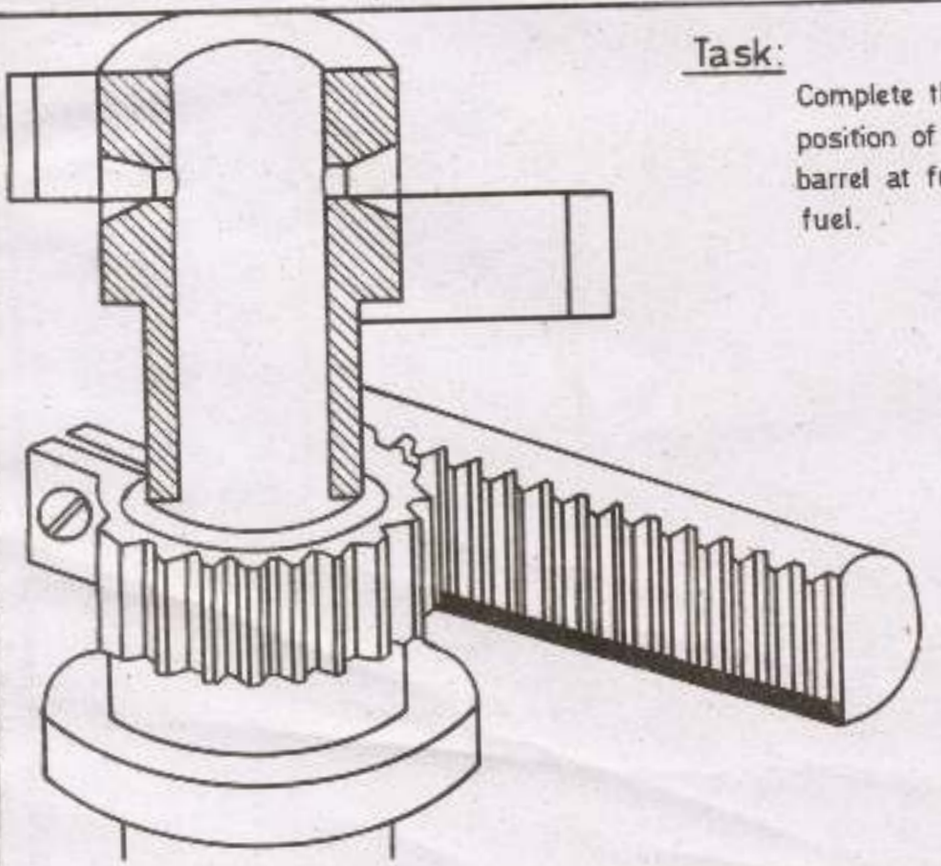


b

Scale	FUEL SUPPLY SYSTEM	D_Engine parts
Date	Name	Auto Mechanic
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		Technical Drawning No. 40



The diagram shows the position of the plunger in the barrel of a fuel injection pump at partial load delivery of the fuel.



Task:

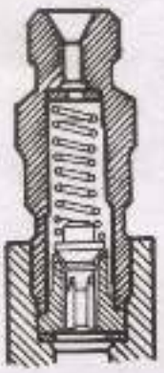
Complete the sketch showing the position of the plunger in the barrel at full load delivery of the fuel.

Scale	**FUEL DELIVERY**	D_Engine parts
Date	Name	Auto Mechanic

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No. 41



The diagram shows the close position of delivery valve.

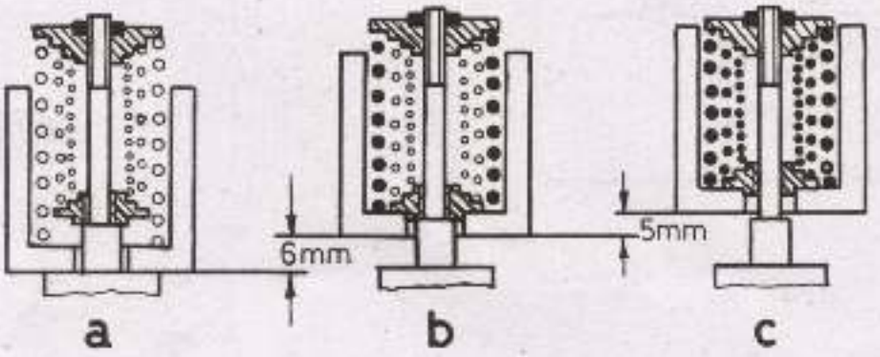
Task:

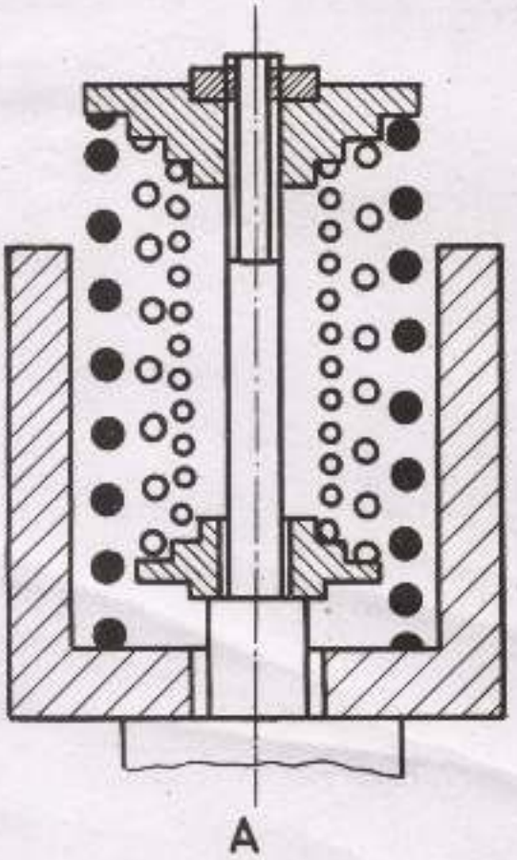
Draw the delivery valve in open position.

Scale 1 : 2	**DELIVERY VALVE**	D_Engine parts
Date	Name	Auto Mechanic
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		Technical Drawing No. 42

Task:

1. Select the fig. indicating mechanical governor at high speed from a, b and c.
2. Draw the sketch showing the position at high speed while fig. "A" shows position at idle speed.



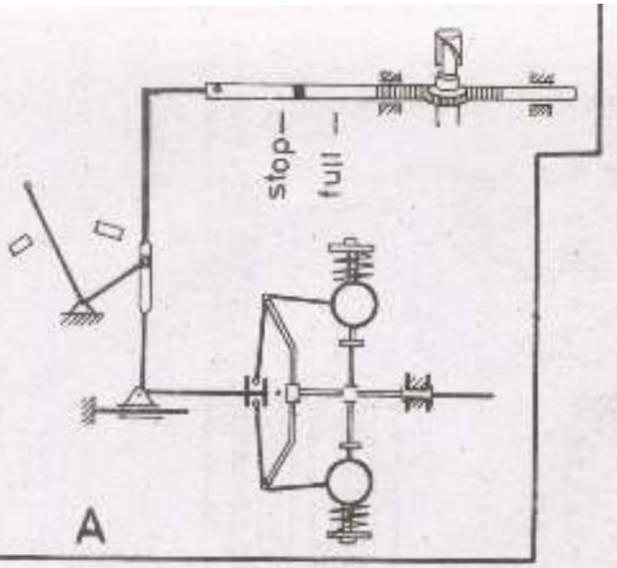


Scale	MECHANICAL GOVERNOR	D_Engine parts
Date	Name	Auto Mechanic

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

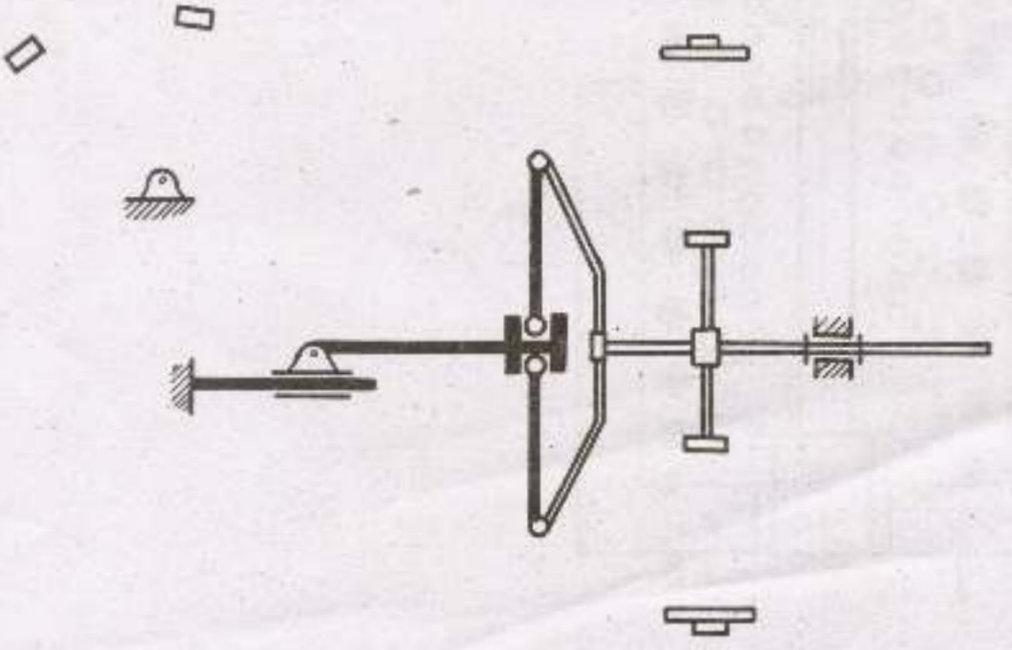
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No: 43



Task:

Complete the governor position at high speed while fig A shows the position at idle speed.

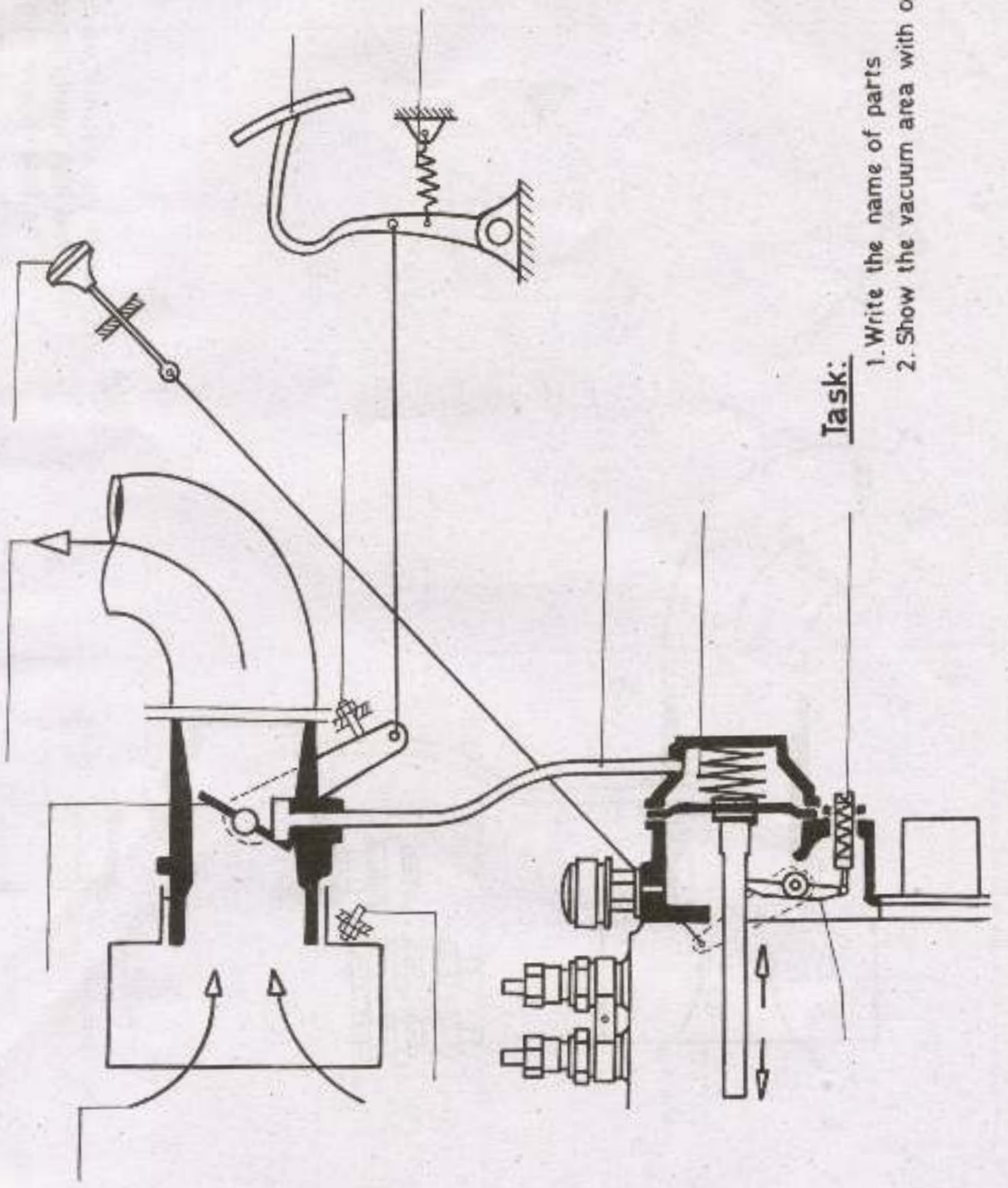


Scale	MECHANICAL GOVERNOR	D_Engine parts
Date	Name	Auto Mechanic

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No: 44

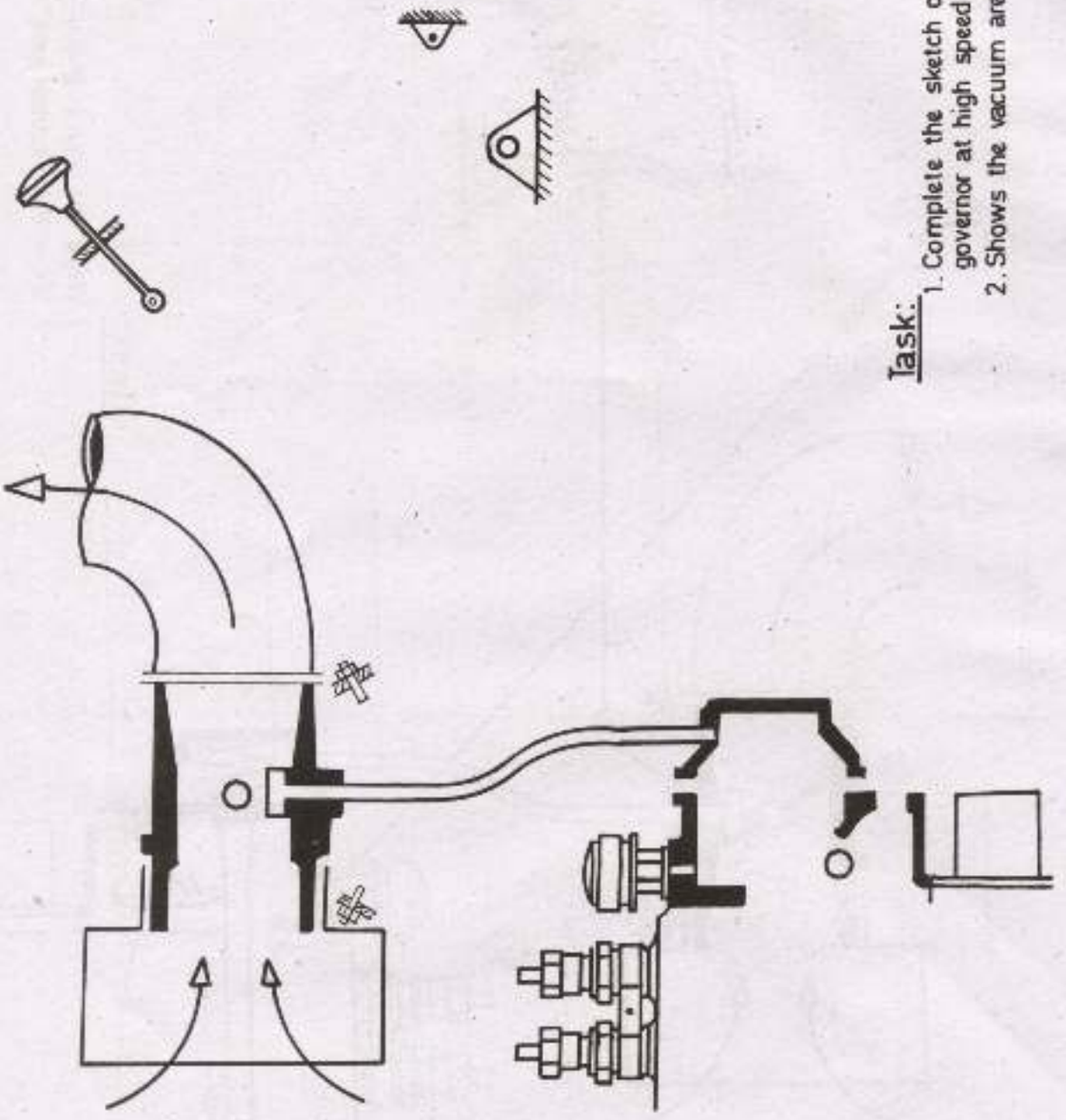


Task:

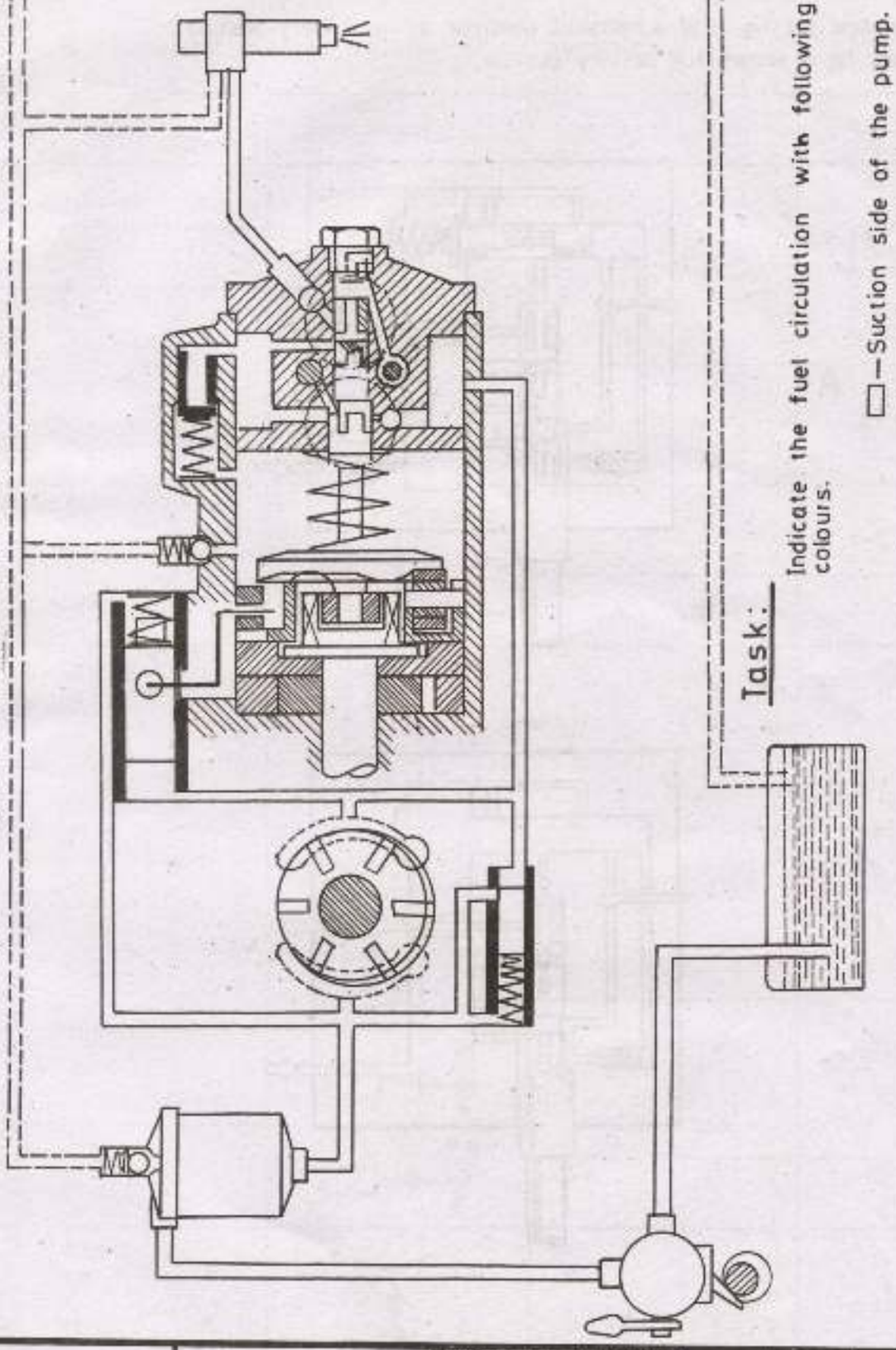
1. Write the name of parts
2. Show the vacuum area with colour.

Scale	**VACUUM GOVERNOR**	D_Engine parts
Date	Name	Auto Mechanic
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		Technical Drawing No: 45

Task:
1. Complete the sketch of vacuum governor at high speed postion.
2. Shows the vacuum area with colour.



Scale	VACUUM GOVERNOR	D_Engine parts
Date	Name	Auto Mechanic
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		Technical Drawing No: 46



Task:

Indicate the fuel circulation with following colours.

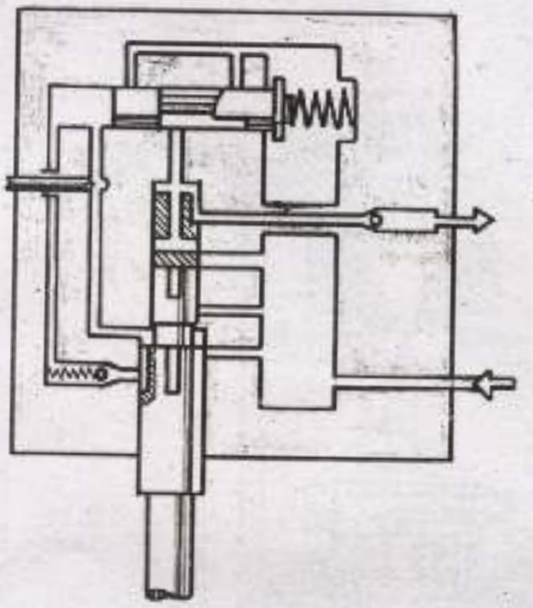
- ☐ — Suction side of the pump.
- ☐ — Delivery side of the pump.
- ☐ — Governor circuit.
- ☐ — Injection side.

Scale	**DISTRIBUTOR** FUEL INJECTION PUMP	D_Engine parts
Date	Name	Auto Mechanic
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		Technical Drawing No: 47

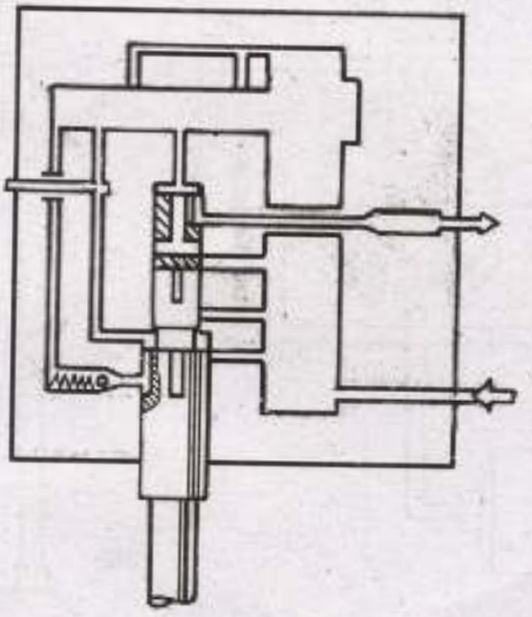
Task:

Complete the fig. B of a hydraulic governor at no delivery postion while fig. A shows full delivery postion.

A



B



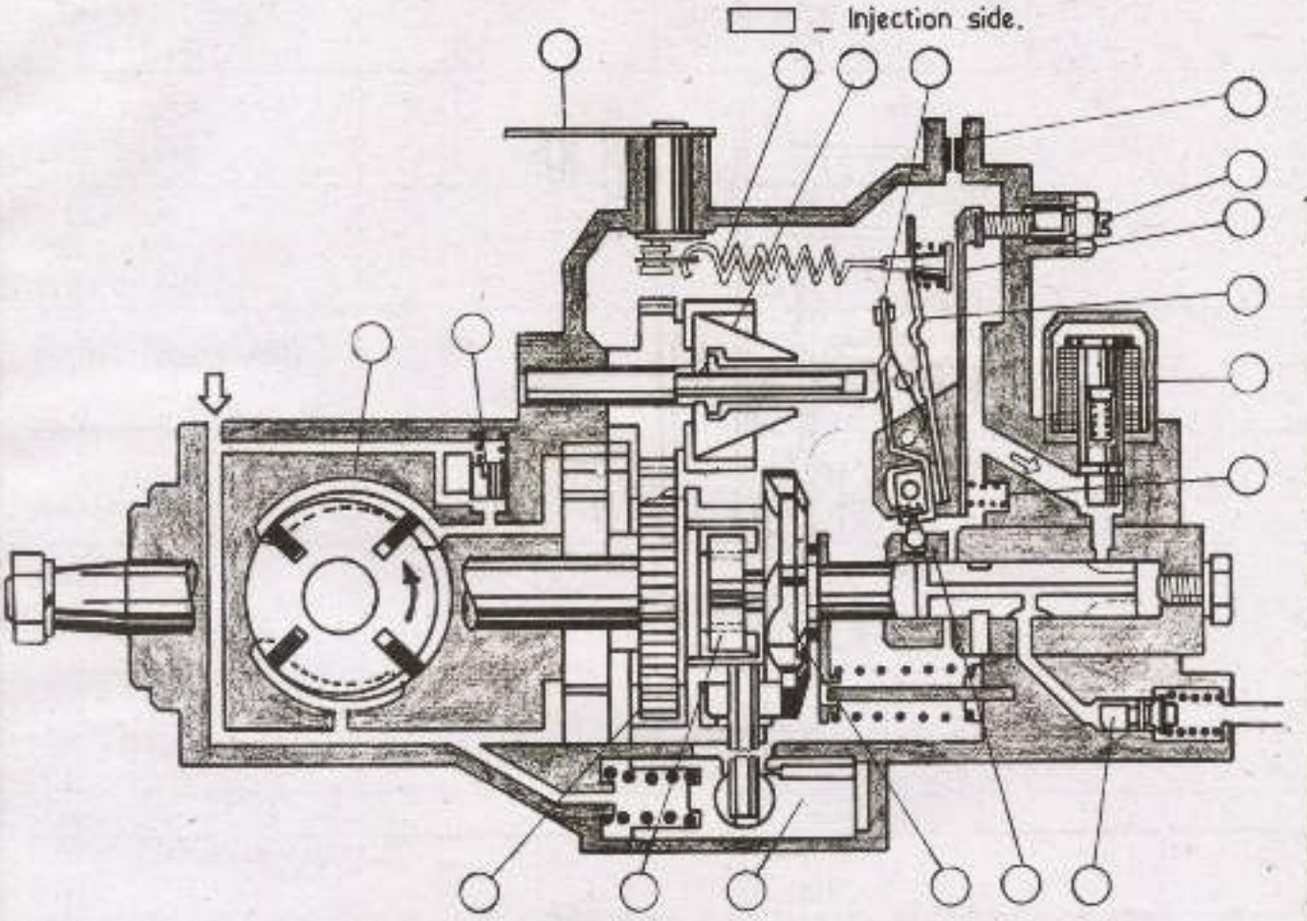
Scale	HYDRAULIC GOVERNOR	D-Engine parts
Date	Name	Auto Mechanic
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		Technical Drawning No: 48

Task:

1. Write down the appropriate numbers, of the circuit.

2. Indicate the fuel-circulation with following colours.

- ▭ _ Suction side of the pump.
- ▭ _ Delivery side of the pump.
- ▭ _ Governor circuit.
- ▭ _ Injection side.



1	Adjustable lever	10	Retaining spring
2	Governor spring	11	Delivery valve
3	Fly weight	12	Governing slide valve
4	Starting lever	13	Cam disc
5	Over pressure throttle	14	Piston for advance spray
6	High Speed adjusting screw	15	Driving plate
7	Adjusting lever	16	Speed control governor
8	Tensioning lever	17	Over pressure valve
9	Magnet valve	18	Delivery pump

Scale	**DISTRIBUTOR** FUEL INJECTION PUMP	D-Engine parts
Date	Name	Auto Mechanic

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

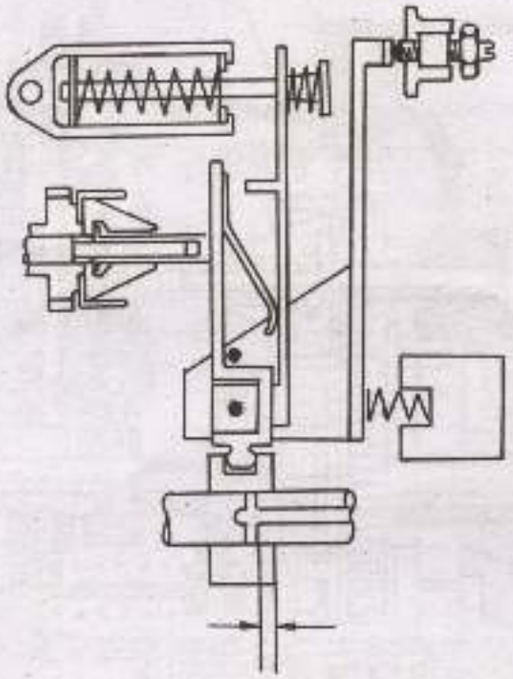
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No. 49

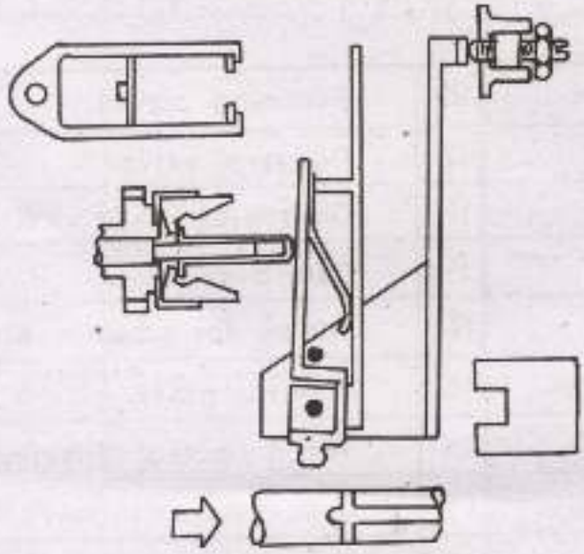
Task:

Complete the fig. B at high speed position.

Fig. A shows mechanical governor at starting position.



A



B

Scale	MECHANICAL GOVERNOR	D_Engine parts.
Date	Name	Auto Mechanic

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawning No: 50

Task:
Draw the symbols againts their names.

Cable crossing without conductive connection		Pilot light indicator light tail light	
Fixed conductive connection		Double - filament bulb	
Detachable conductive connection		Connection with frame of body of the vehicle	
Switch (general)		Storage battery (with three cells)	
Hand operated switch		Spark plug	
Foot operated switch		FUSE	
Mechanically operated switch (cam drive etc.)		Outlet socket	
Pressure operated switch (break switch etc.)		F= Fuse gauge A= Ammeter C= Clock	
Magnetically operated switch (relay)		Tank unit for petrol gauge	
Two step switch		Seperate unit (internal wiring not shown)	
Ignition/starter switch		Momentary contact	
Dimmer switch		Bulb (general)	

Scale	AUTO ELECTRICAL SYMBOLS	
Date	Name	Auto Electric

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No. 51

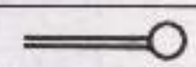
Task:
Draw the symbols against their names.

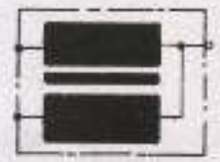
Conductor (above 20A)		Indicator	
Conductor (up to 20A)		Hand operated	
Boundary		Foot operated	
Detachable		Cam operated	
Non detachable		Vacuum operated	
Ground		Fuse	
Lamp		Heater	
Indicator lamp general		Resistor	
Flasher lamp (with build in bimetal)		Variable resistor	
Indicator lamp (gas discharge)		Test prod	
Break contact		M = Starter motor G = Generator MG = Starter motor generator Unit = DC = AC	
Make contact			
Change over contact		A = Ammeter V = Voltmeter	
Three position switch		Quick self returning (in direction of arrows)	
Diode (rectifier variode)			

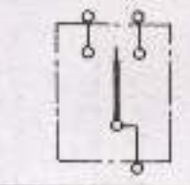
Scale	**AUTO ELECTRICAL SYMBOLS**	
Date	Name	Auto Electric

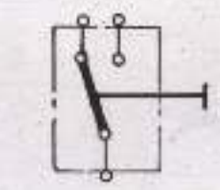
Task:

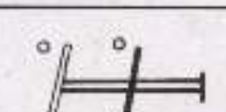
Write the names against their symbols.

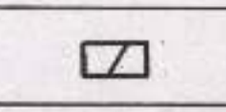


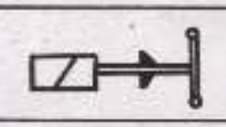


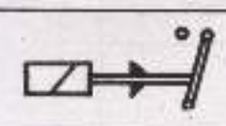


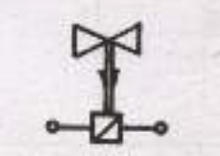


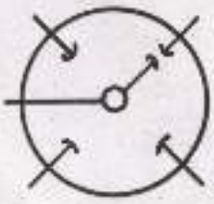


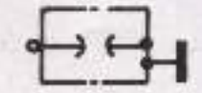


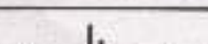


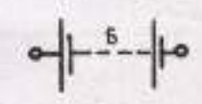


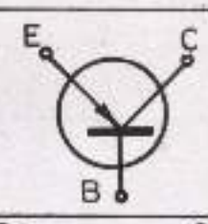


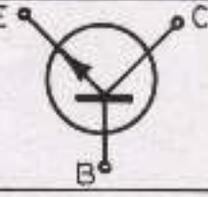


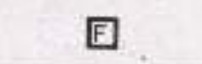












Scale	AUTO ELECTRICAL SYMBOLS	
Date	Name	Auto Electric

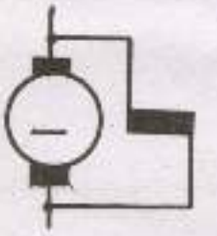
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

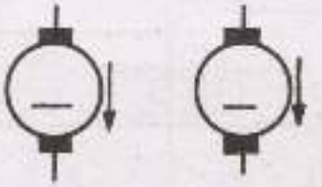
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

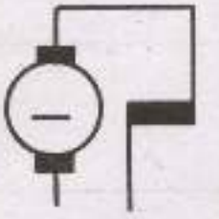
Technical Drawing No. 53

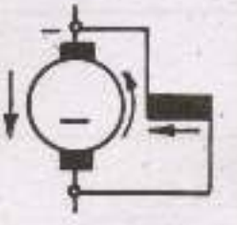
Task:

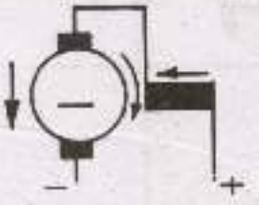
Write the names against their symbols.











Scale	AUTO ELECTRICAL SYMBOLS	
Date	Name	Auto Electric

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No. 54

Task:

Connect the ammeter and voltmeter in the circuits.

A = Ammeter

V = Voltmeter

Scale	MEASURING INSTRUMENTS	
Date	Name	Auto Electric

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No: 55

Task:

Complete the circuits.

Sources of current

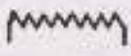
dynamo

storage battery

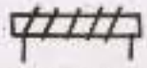
dry cell

Current consumers

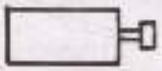
bulb



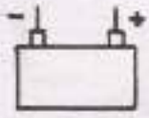
heater elements

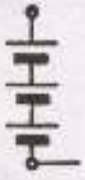


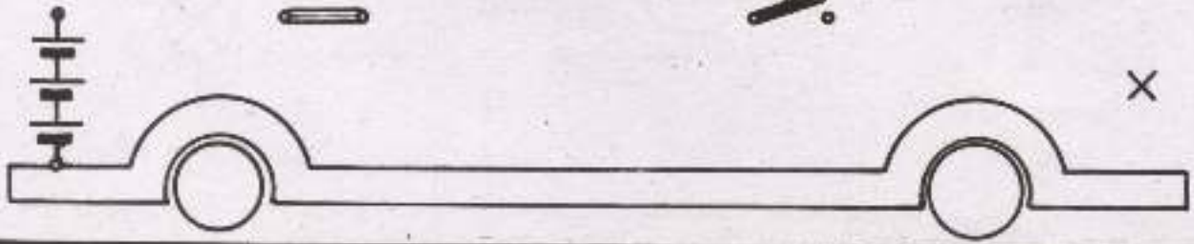
magnet coil



electric motor







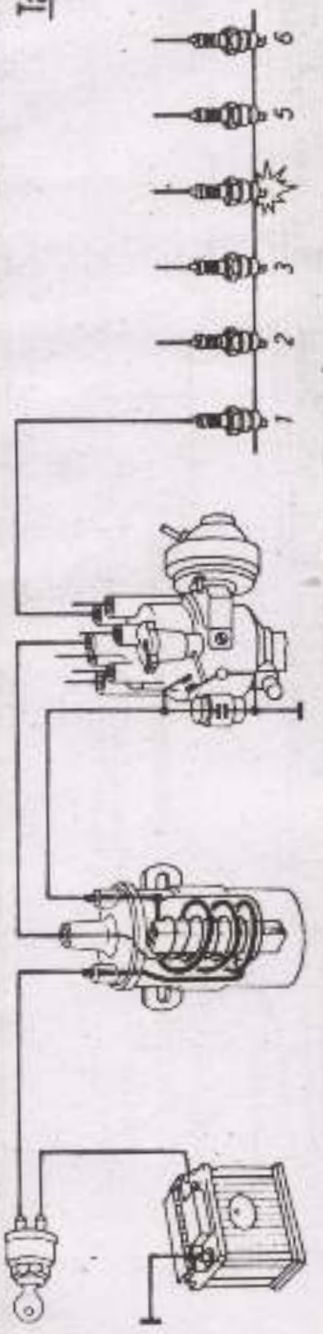
Scale	ELECTRIC CIRCUITS	
Date	Name	Auto Electric

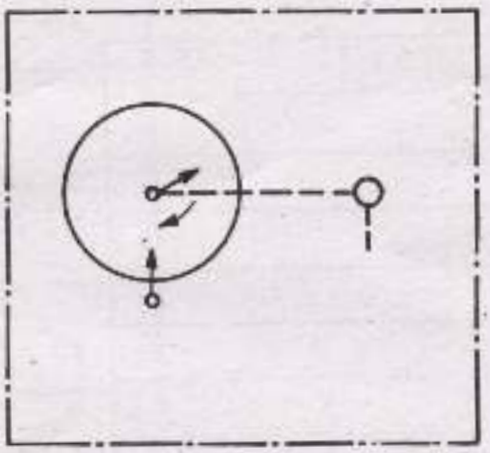
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Techaical Drawning No. 56

Task: Draw the ignition circuit while firing order is 153624.





Scale	BATTERY & COIL IGNITION SYSTEM	
Date	Name	Auto Electric

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

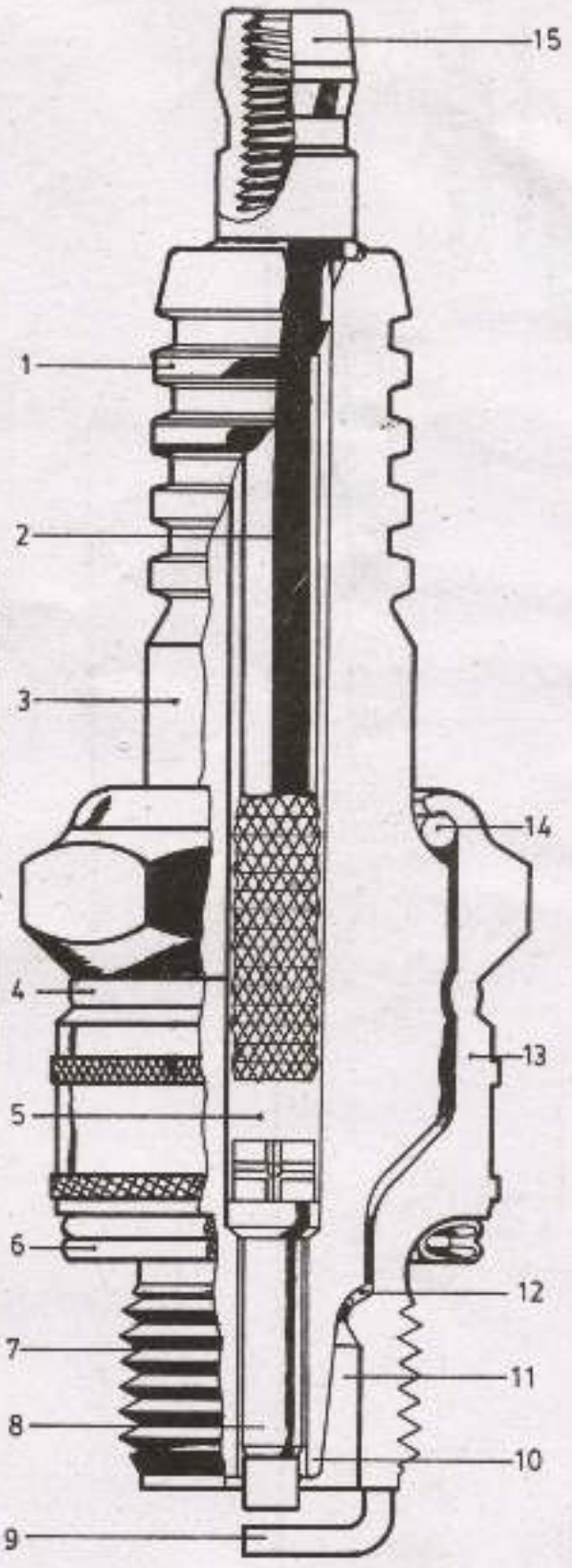
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No. 57

Task:

Write the names of parts of spark plug.

S.No	Name of parts
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	



Scale	SPARK PLUG	
Date	Name	Auto Electric

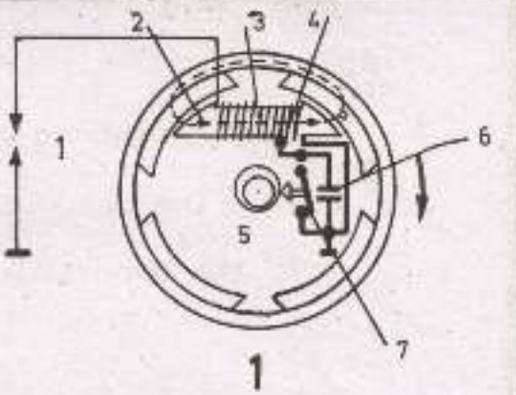
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

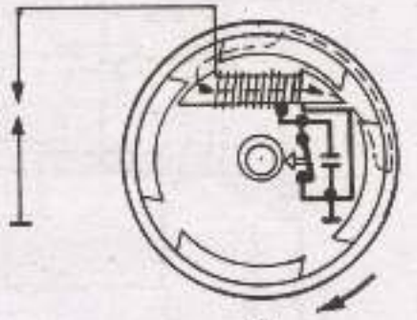
Technical Drawing No. 58

Task:

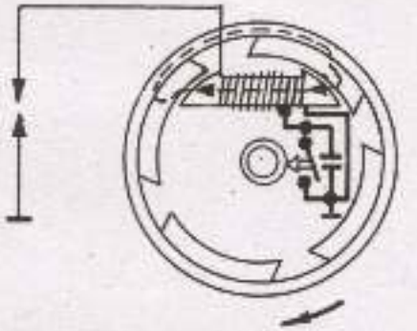
1. Select the figure which is at spark position and write down the figure number:_____
2. Write the names of parts.



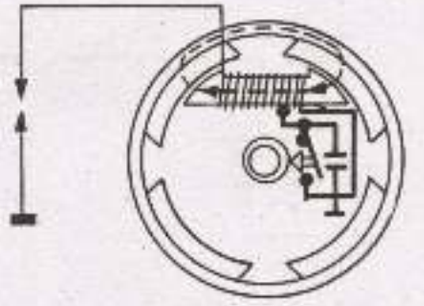
1



2



3



4

No.	Name of the parts
1	
2	
3	
4	
5	
6	
7	

Scale	MAGNETO IGNITION CIRCUIT	
Date	Name	Auto Electric

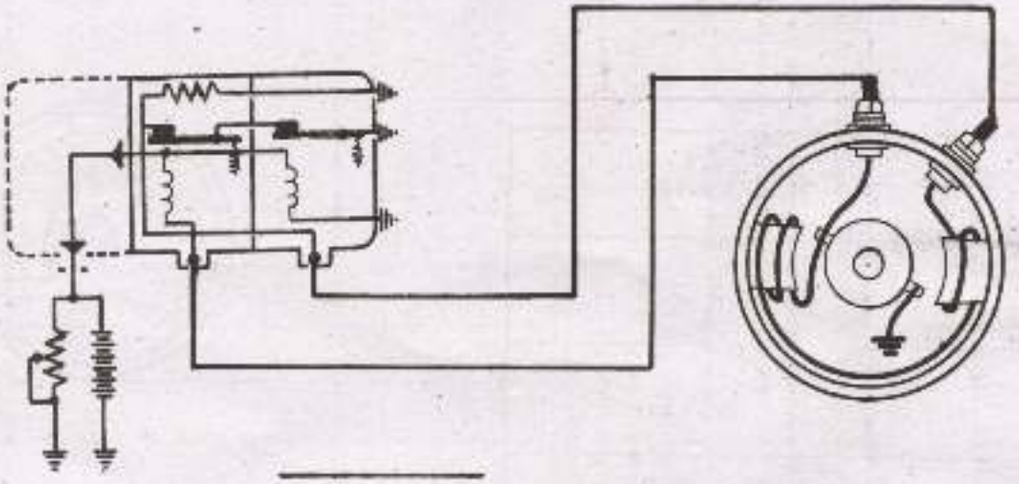
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

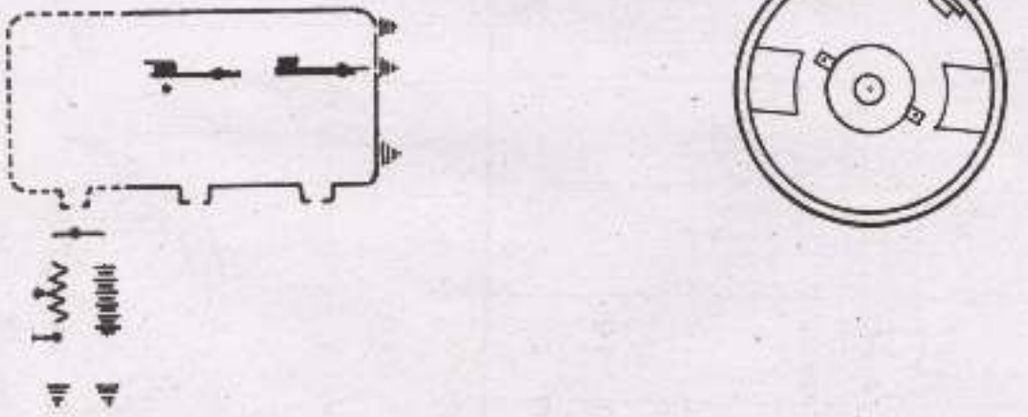
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No. 59

Task:

1. Draw the missing cable connections.
2. Write the name of generator according to the connections.





Scale	D C GENERATOR CIRCUIT	
Date	Name	Auto Electric

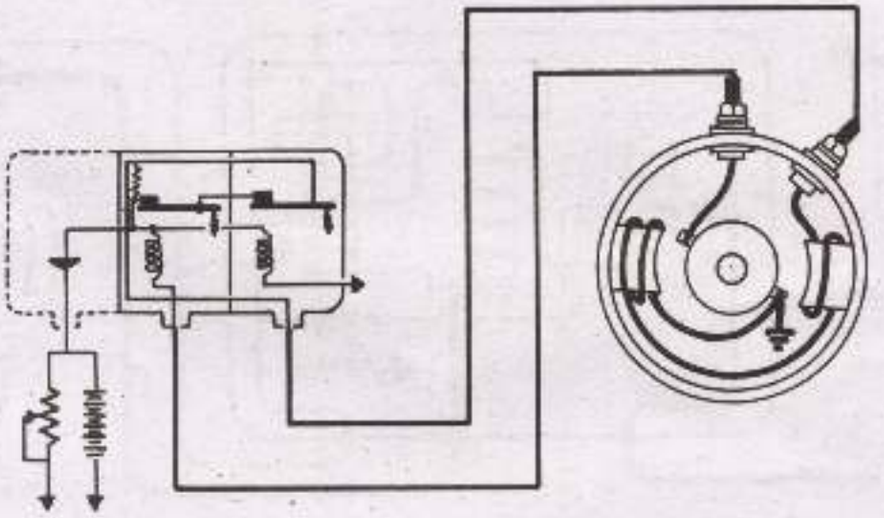
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

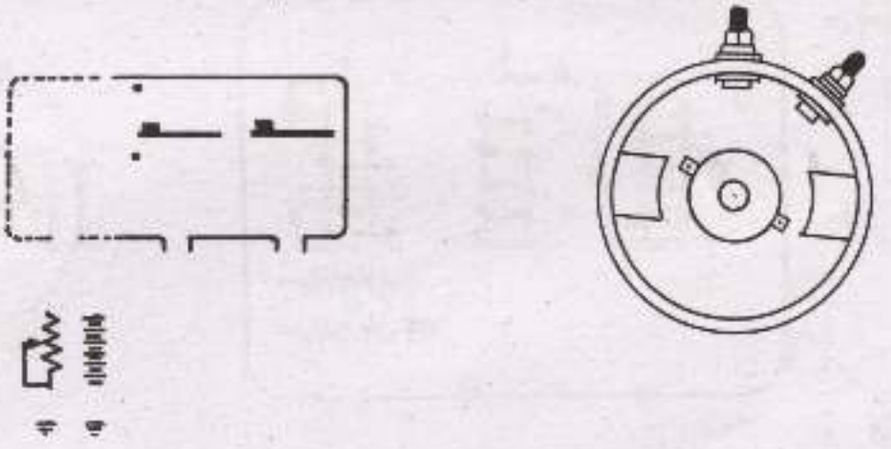
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No. 60

Task:

1. Draw the missing cable connections.
2. Write the name of generator according to the connections.





Scale	D C GENERATOR CIRCUIT	
Date	Name	Auto Eectric

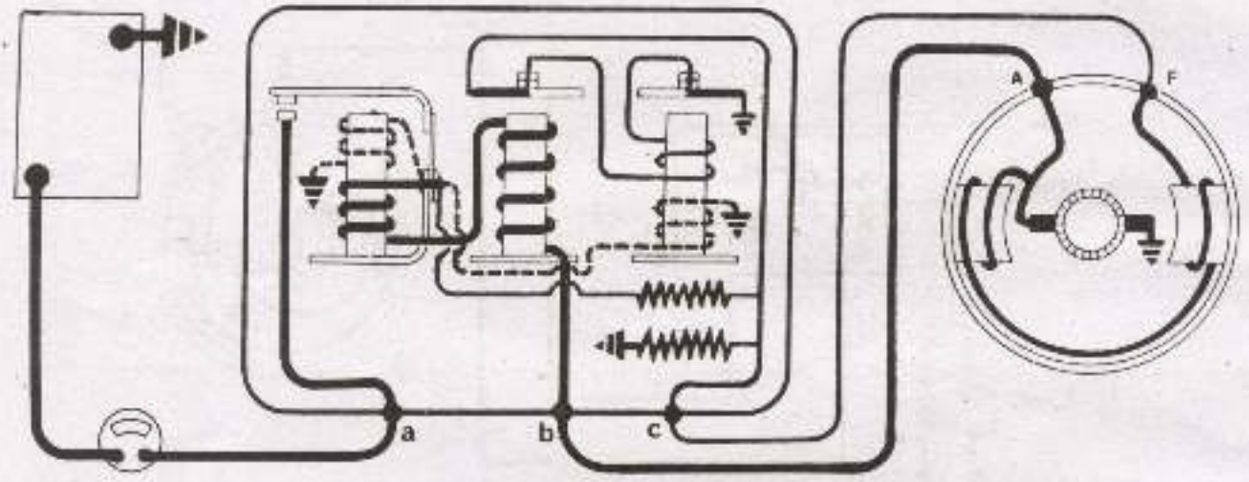
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

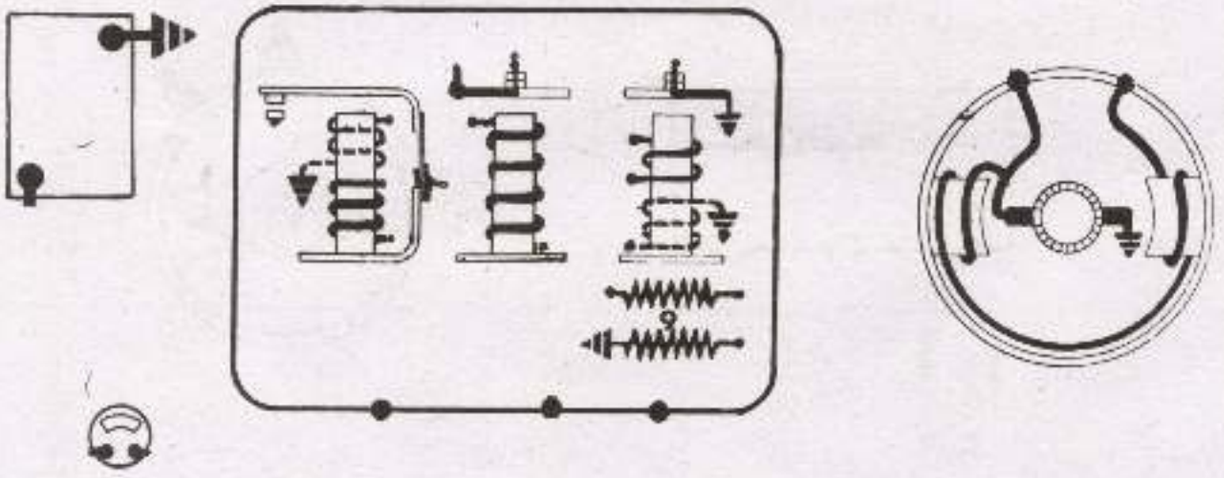
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No. 61

Task:

1. Draw the missing cable connections of DC genertor and regulator.
2. Write the name of the regulator. _____





Scale	D C GENERATOR CIRCUIT	
Date	Name	Auto Electric

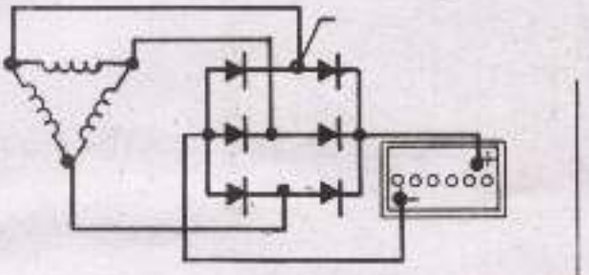
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

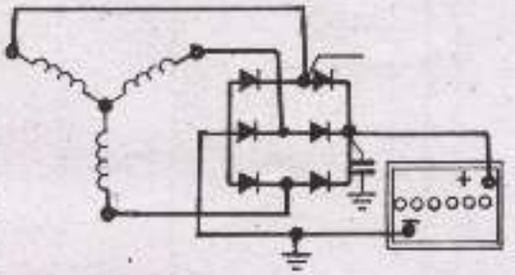
Technical Drawing No. 62

Task:

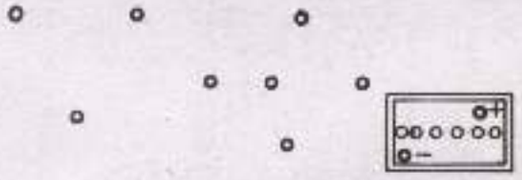
1. Write the names of the circuits 'A' and 'B.
2. Complete the circuits 'C' and 'D' according to 'A' and 'B' respectively.



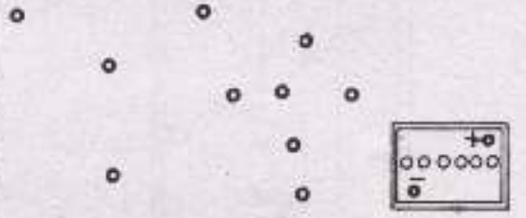
A



B



C



D

Scale	AC GENERATOR (ALTERNATOR)	
Date	Name	Auto Electric

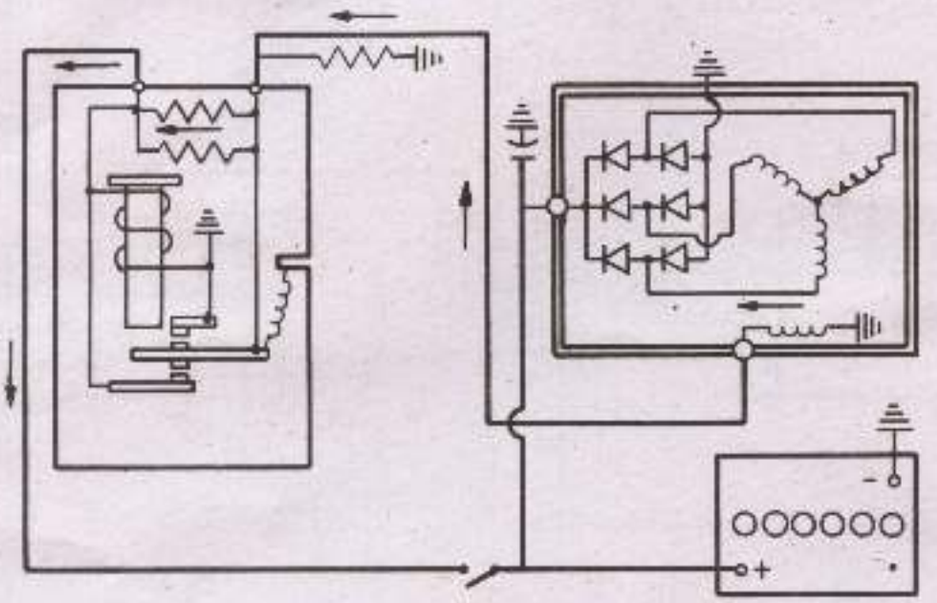
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

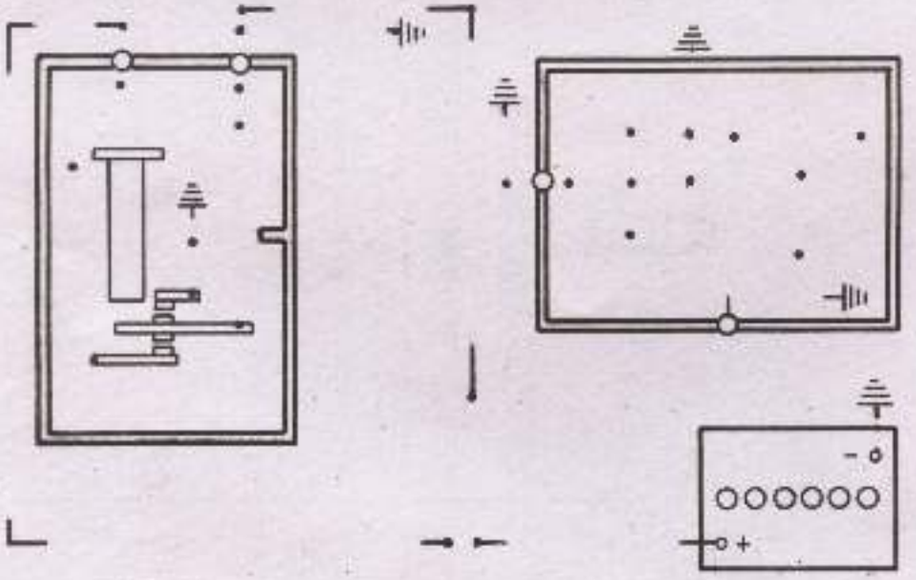
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No. 63

Task:

1. Draw the missing lines of this circuit.
2. Write the name of regulator. _____





Scale	A C GENERATOR	
Date	Name	Auto Electric

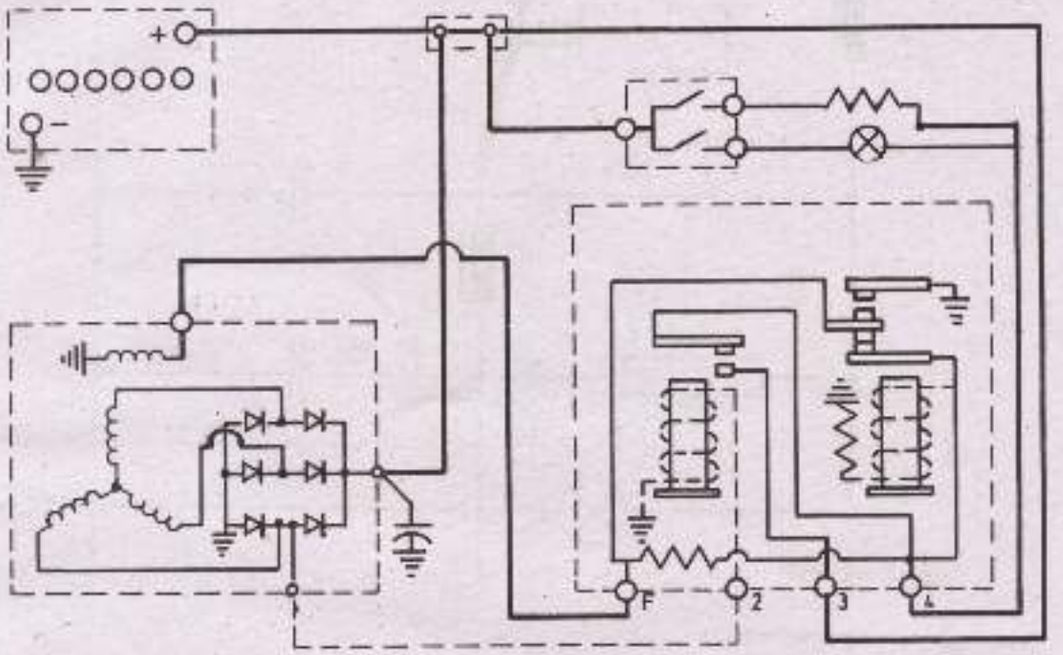
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

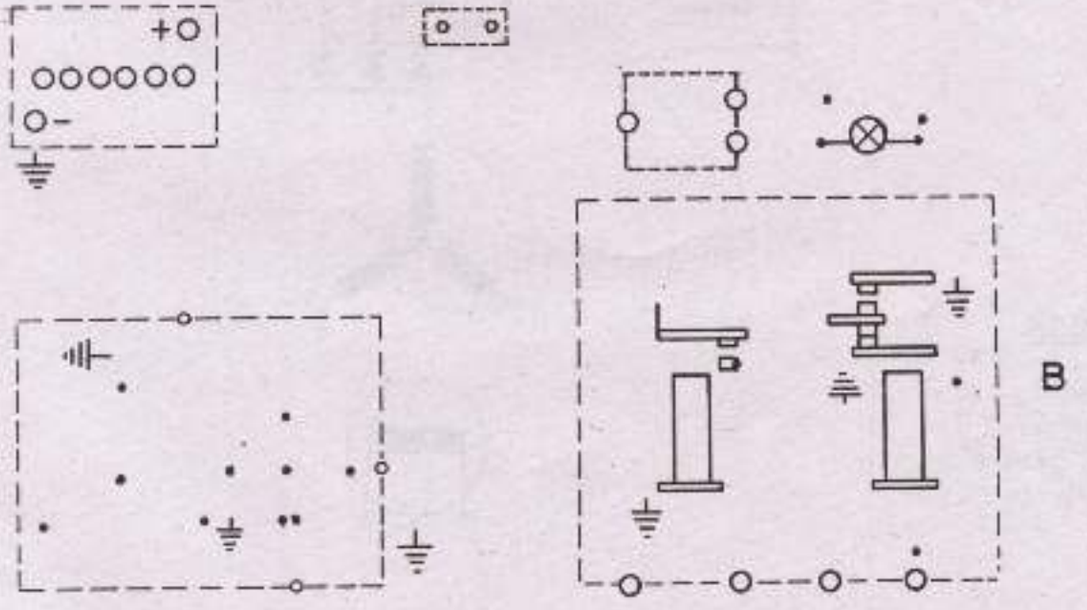
Technical Drawing No. 64

Task:

Draw the missing lines in the circuit 'B'



A



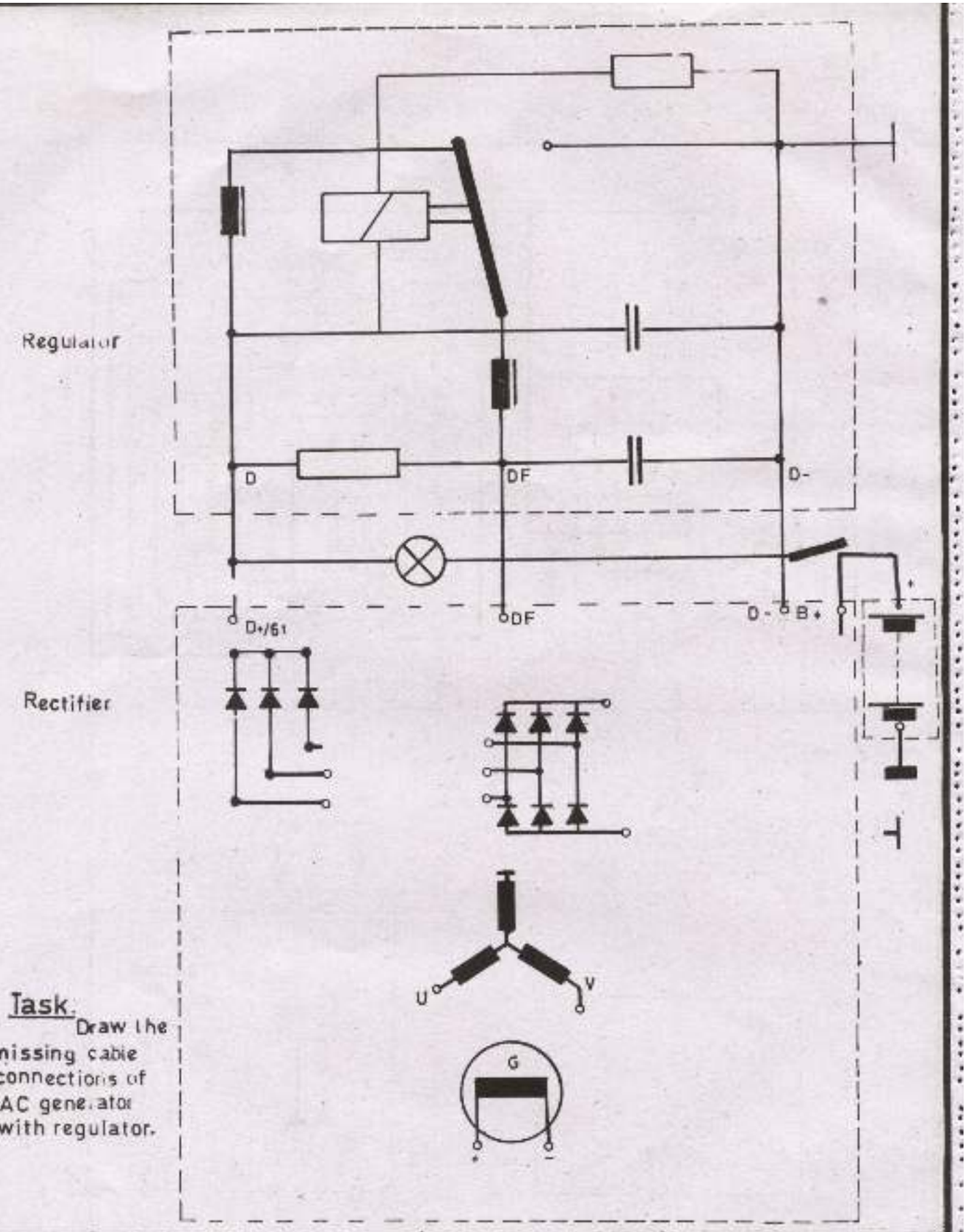
B

Scale	A C GENERATOR	
Date	Name	Auto Electric

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No. 65



Task. Draw the missing cable connections of AC generator with regulator.

Scale	A C GENERATOR	
Date	Name	Auto Electric

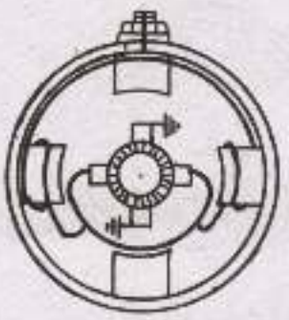
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

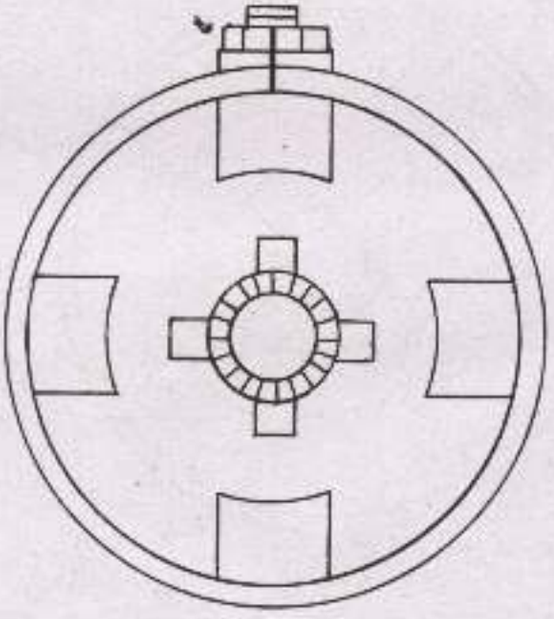
Technical Drawing No: 66

Task:

1. Draw the missing connections in Fig 'B
2. Write the correct name of the motor according to poles & their connections.



A



B

Scale	STARTER MOTOR	
Date	Name	Auto Electric

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

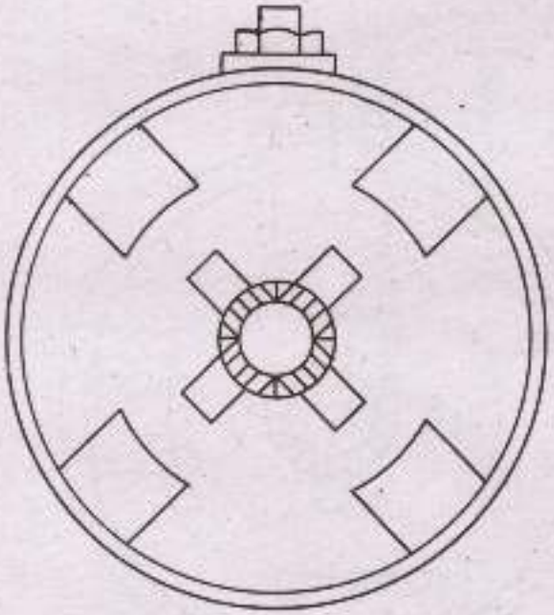
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No. 67

Task:

1. Complete the diagram 'B'
2. Write the correct name of the motor according to poles & their connection. _____

A



B

Scale	STARTER MOTOR	
Date	Name	Auto Electric

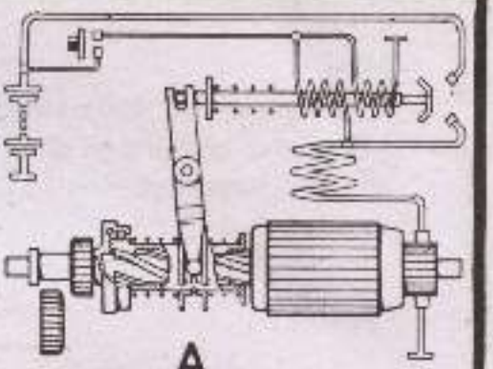
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No. 68

Task:

Complete the sketch B showing engaged position while Fig A indicate disengaged position of starter motor



A

B

Scale	STARTER MOTOR	
Date	Name	Auto Electric

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

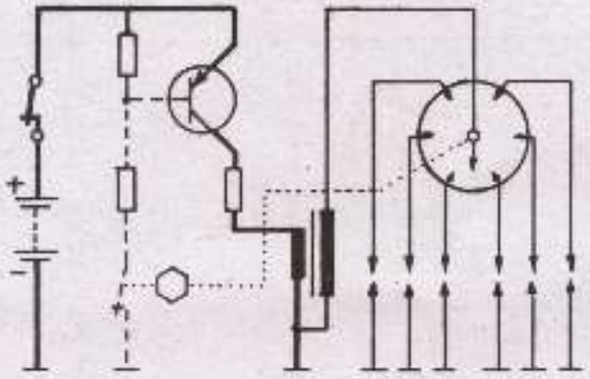
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No. 69

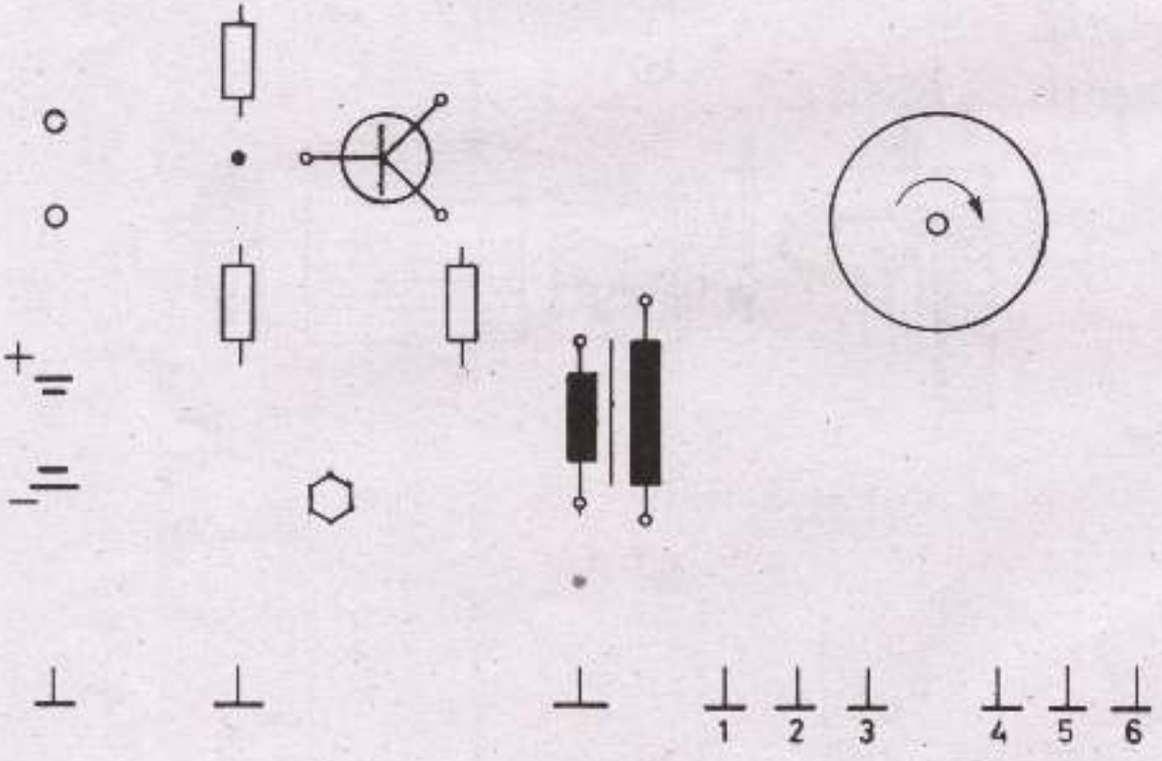
Task:

Complete the transistorized ignition system diagram,
use the colours to differentiate the circuit 'A',
While firing order is 153624.

Example.



A



Scale 1:2	IGNITION SYSTEM	
Date	Name	Auto Electric

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

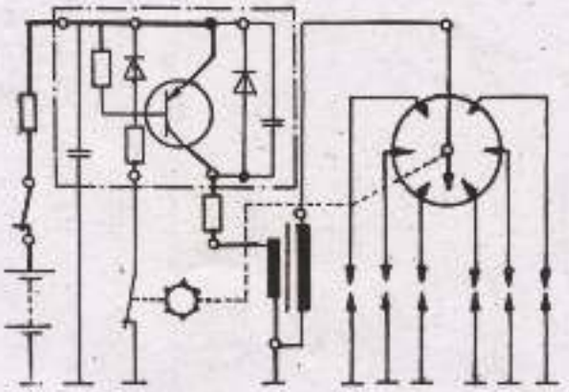
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

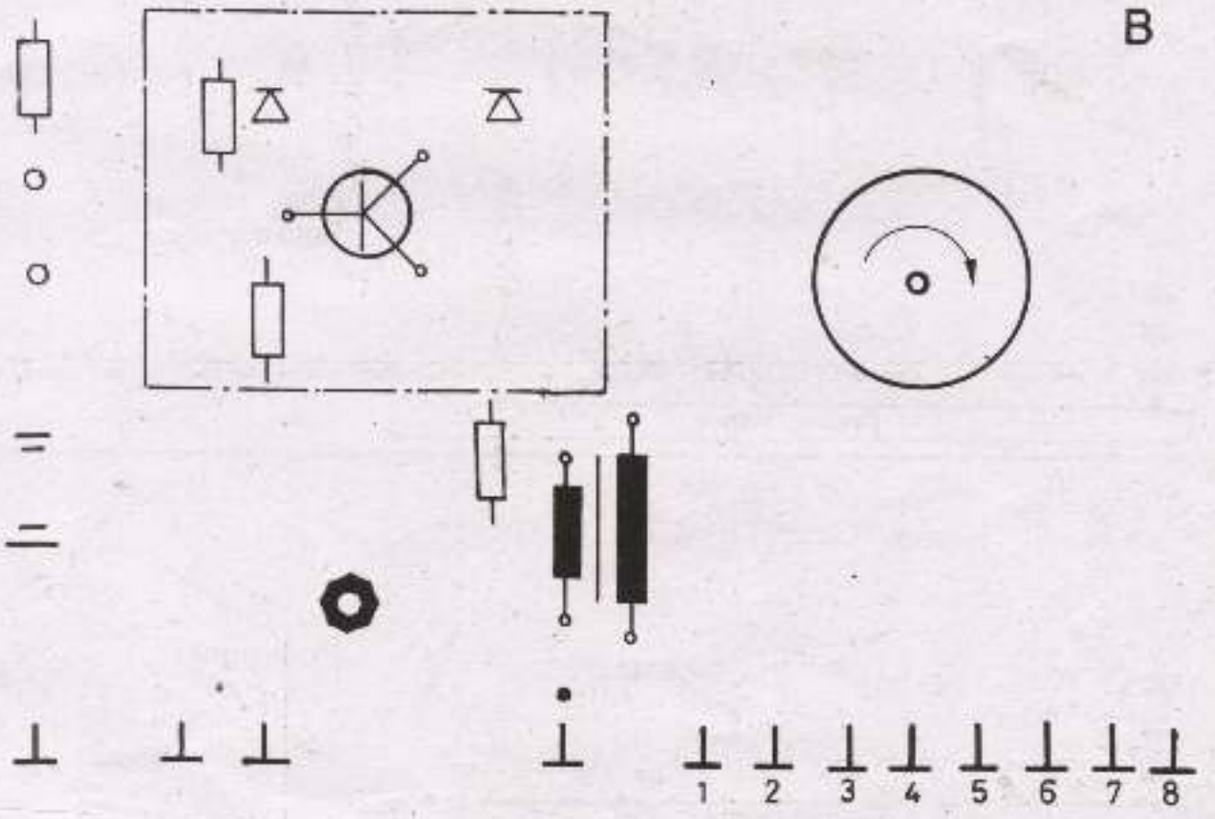
Technical Drawing No. 70

Task:

Complete the transistorized Ignition system diagram, use the colours to differentiate the circuit 'B'.
While firing order is 1 5 4 8 6 3 7 2.

Example





Scale 1:2	IGNITION SYSTEM	
Date	Name	Auto Electric

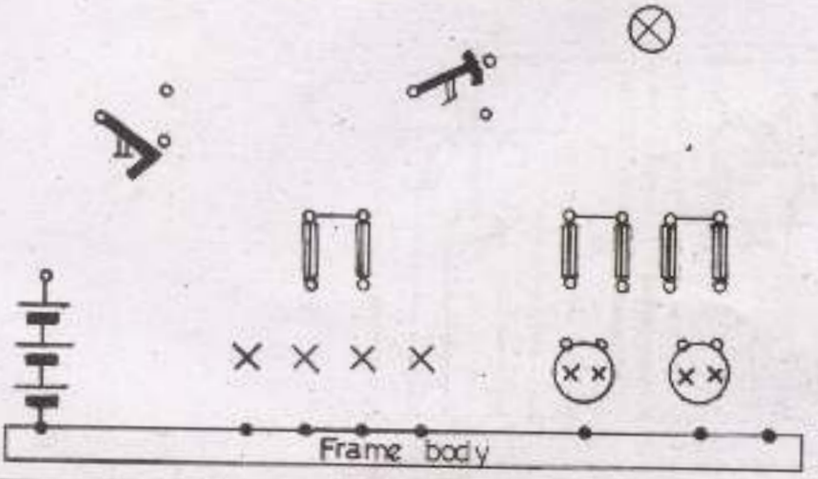
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

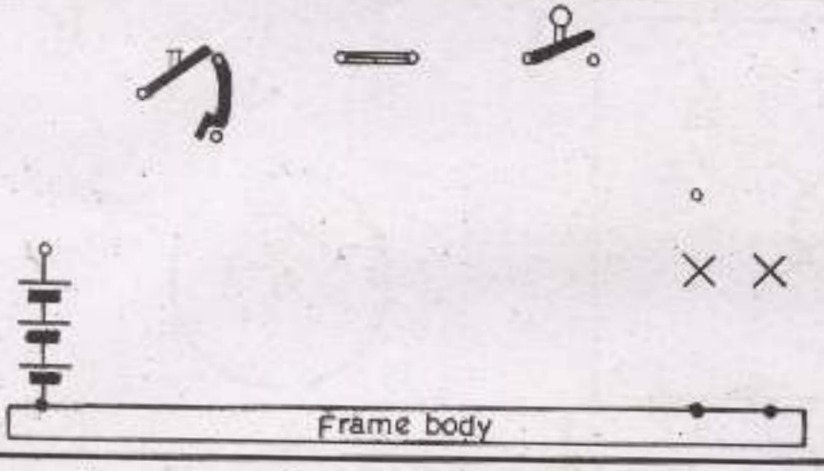
Technical Drawing No. 71

Task:

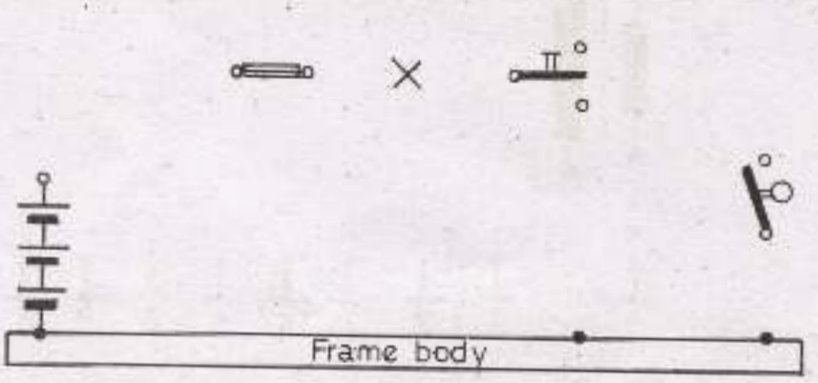
Add the missing cable connections in following circuits.



Side light
Tail light
Lower beams
Main beams
Main beam indicator



Backing light



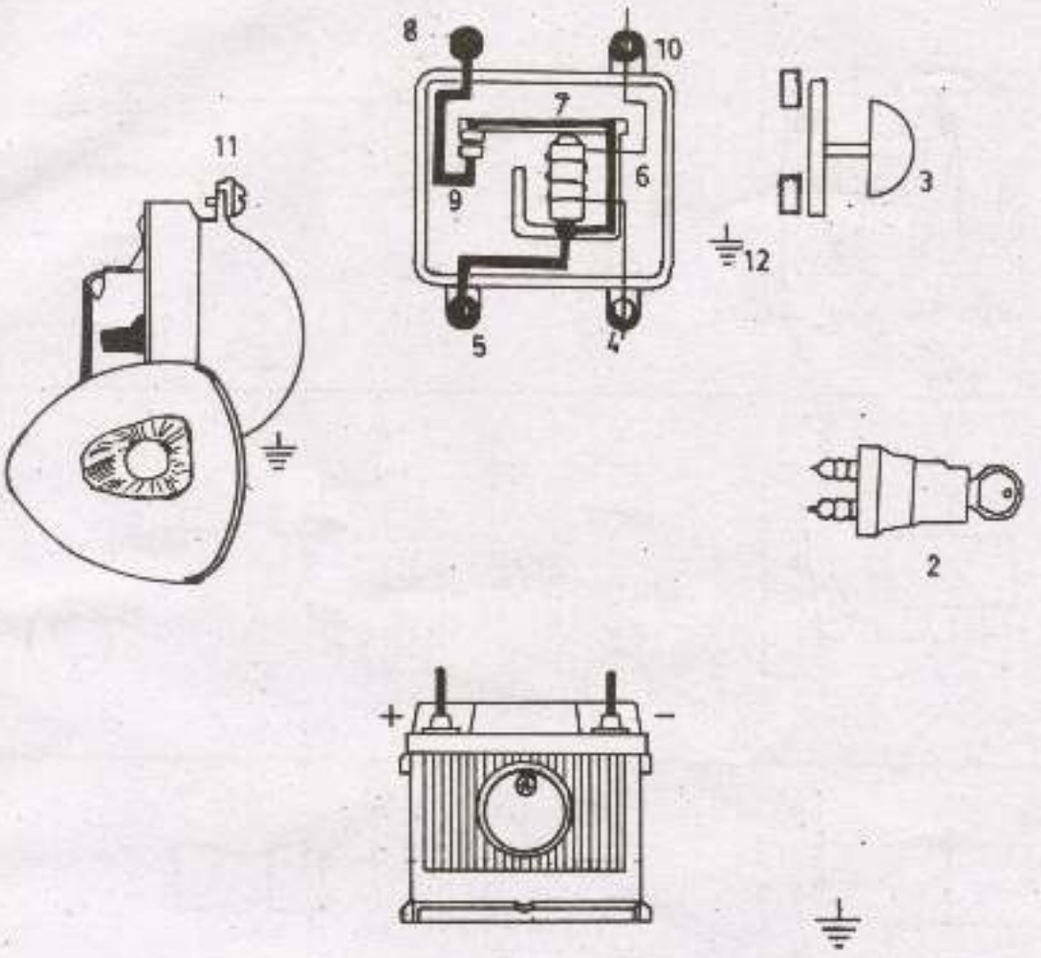
Roof light

Scale	LIGHTING UNITS	
Date	Name	Auto Electric

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No. 72



Task

1. Complete the horn circuit.
2. Write down the name of parts against their numbers.

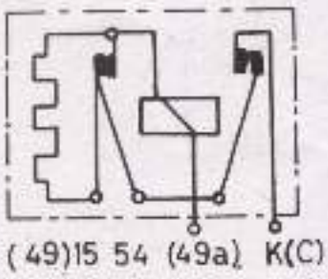
No.	Name of parts	No.	Name of parts
1		8	
2		9	
3		10	
4		11	
5		12	
6		13	
7		14	

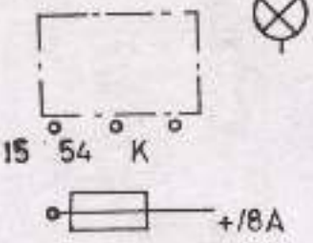
Scale	HORN CIRCUIT	
Date	Name	Auto Electric

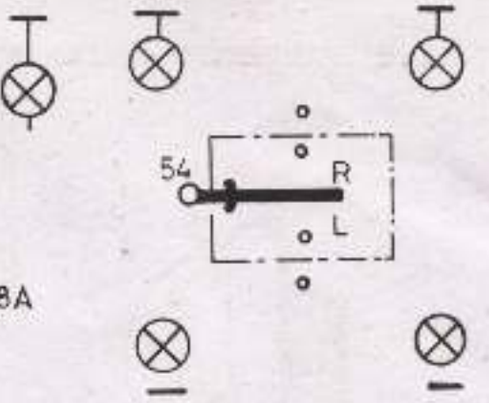
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

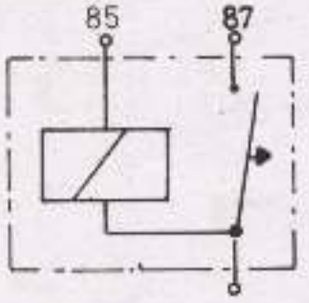
Technical Drawing No. 73

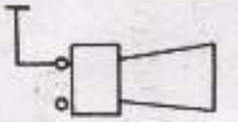




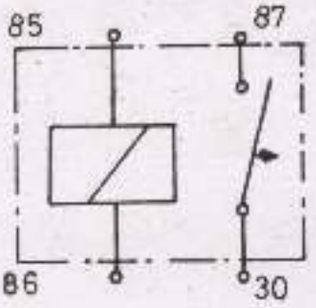


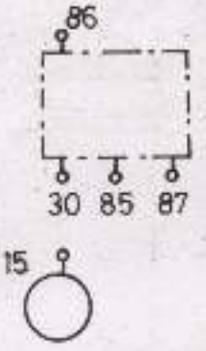
Flasher relay

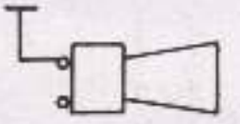




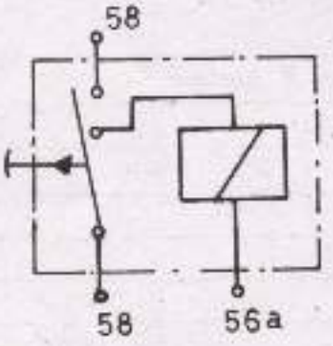
Horn relay

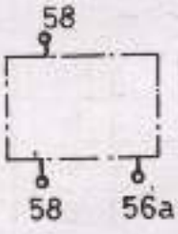


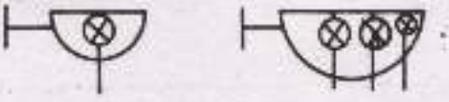


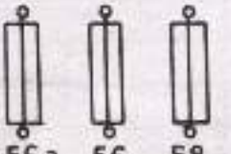


Horn relay









Foglight relay

Task:
Complete the circuits.

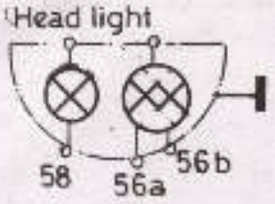
Scale	**RELAY CIRCUITS**	
Date	Name	Auto Electric

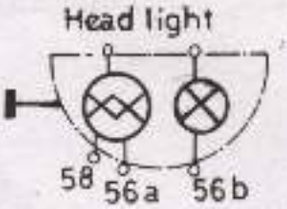
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

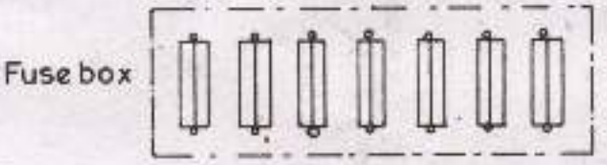
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

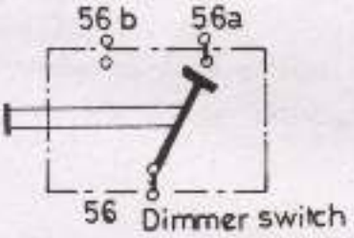
Technical Drawing No. 74

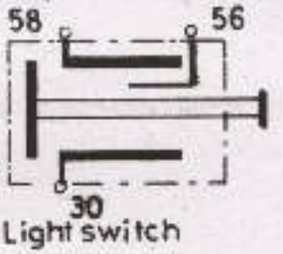
Task:
Complete the head light circuit.

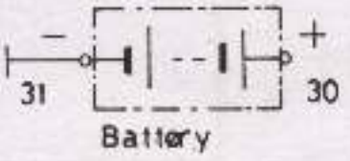












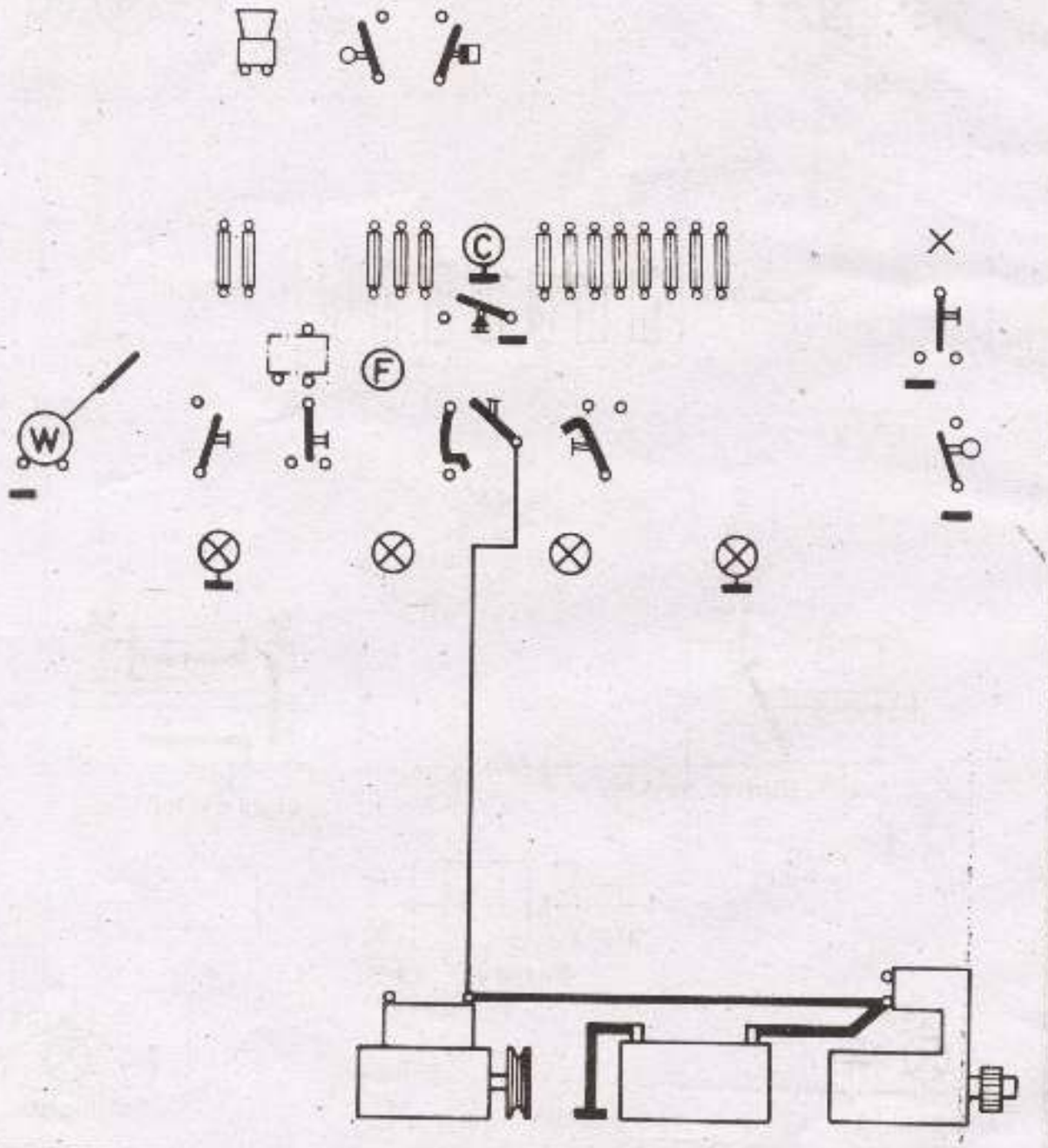
Scale	LIGHTING CIRCUITS	
Date	Name	Auto Electric

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

Technical Drawing No. 75

Task

Complete the following circuits :-
windscreen wiper, horn and rooflight with door switch.



Scale	LIGHTING CIRCUITS	
Date	Name	Auto Electric

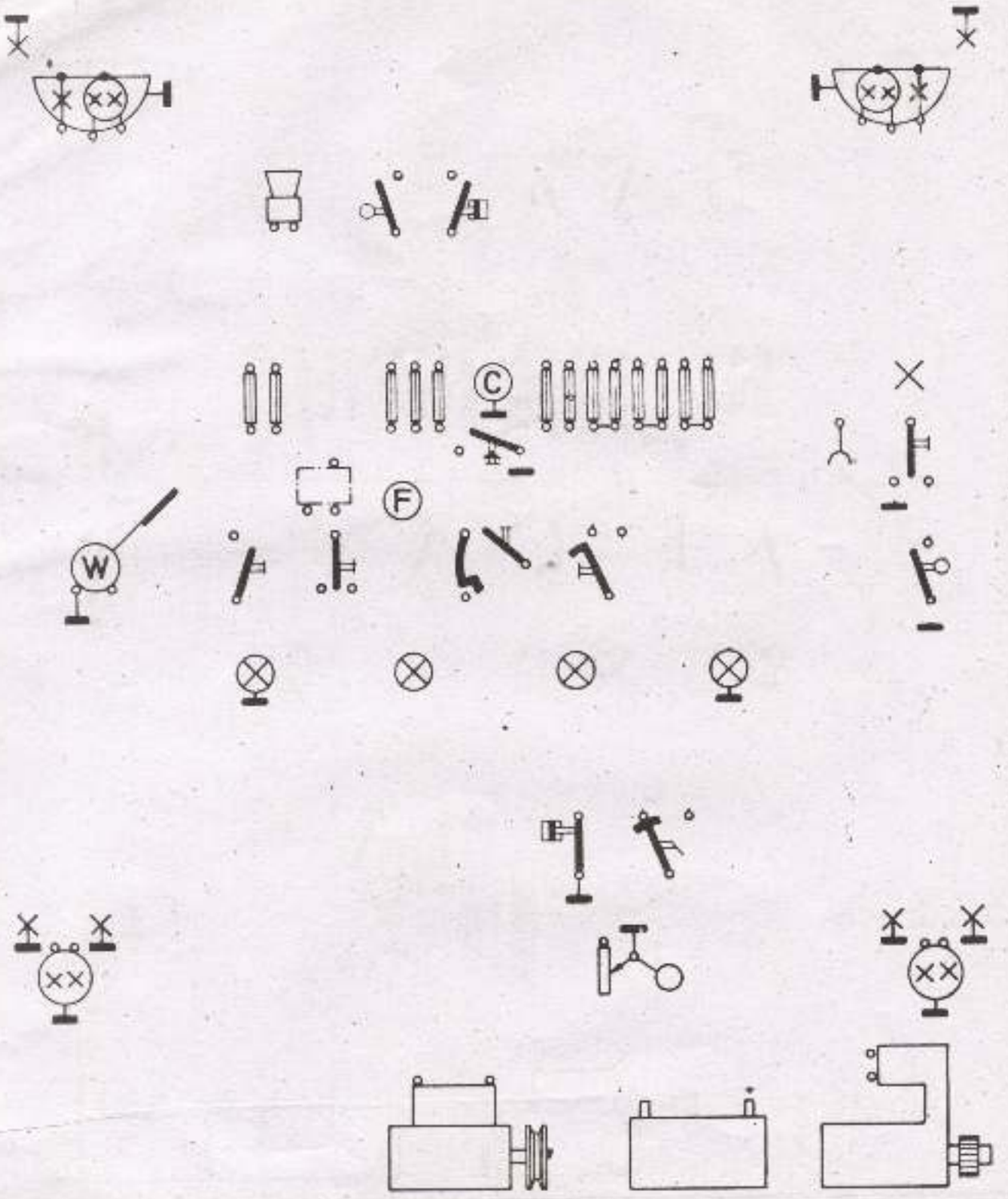
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No.76

Task

Complete the following circuits-
flaslights with indicator light,
brake lights, and reverse lights.



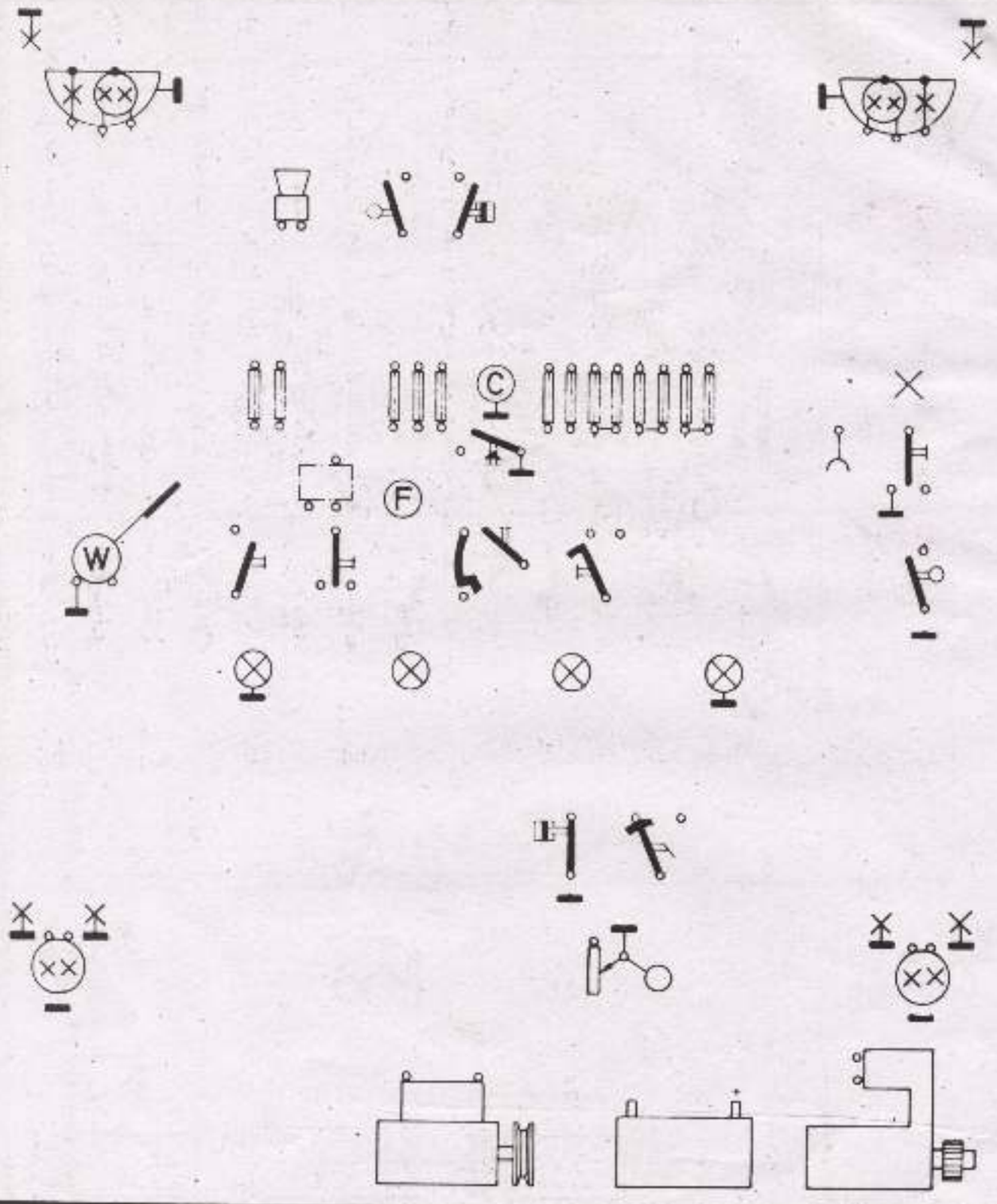
Scale	LIGHTING CIRCUITS	
Date	Name	Auto Electric

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No. 77

Task: Complete the following circuits
side light, tail light, dimmer light,
and head light with indication light.



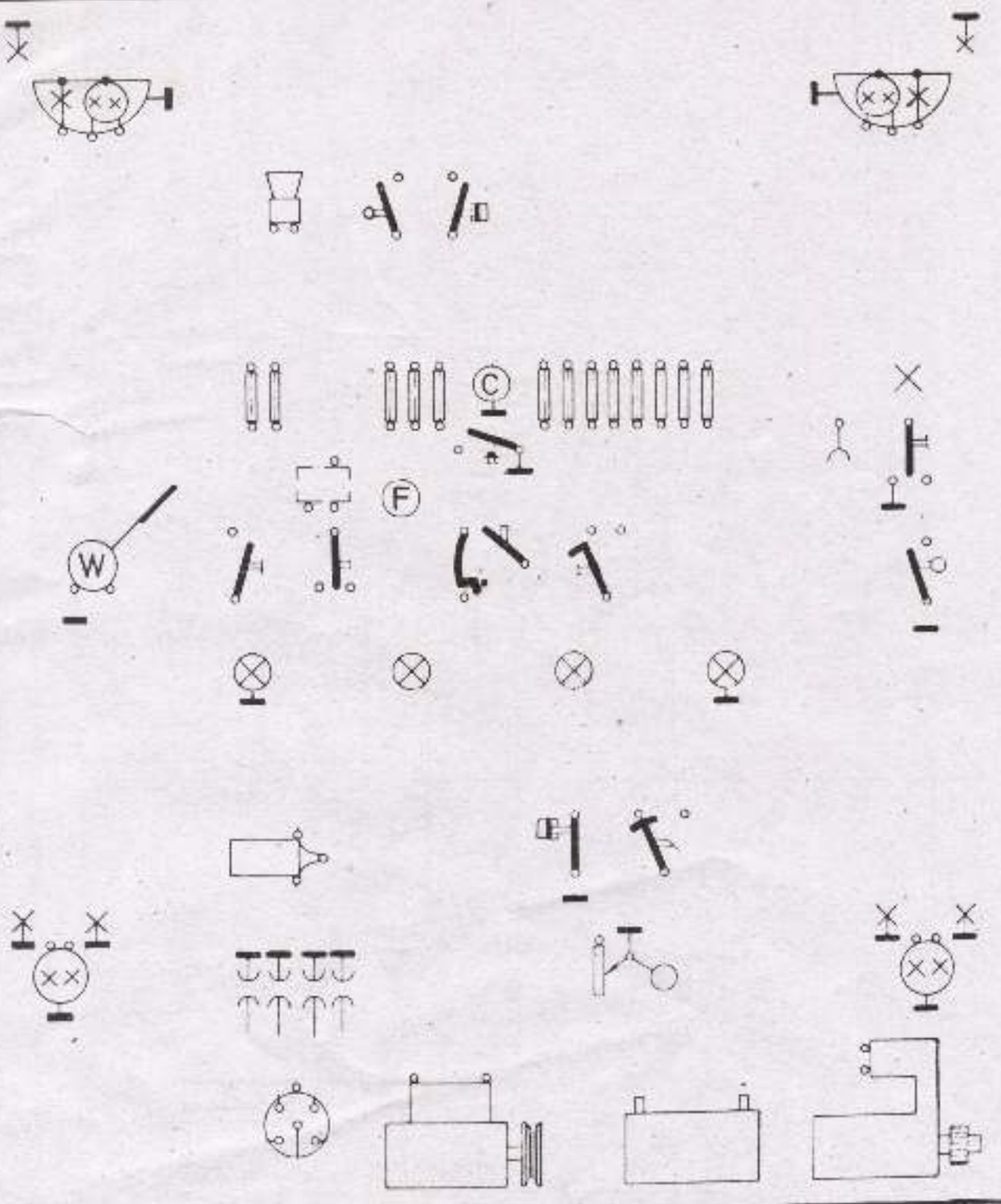
Scale	**LIGHTING CIRCUITS**	
Date	Name	Auto Electric

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No: 78

Task: Complete the following circuits-
starter/solenoid, charging indicator light, ignition system,
oil pressure indicator light, fuel gauge clock and socket for repair lamp.

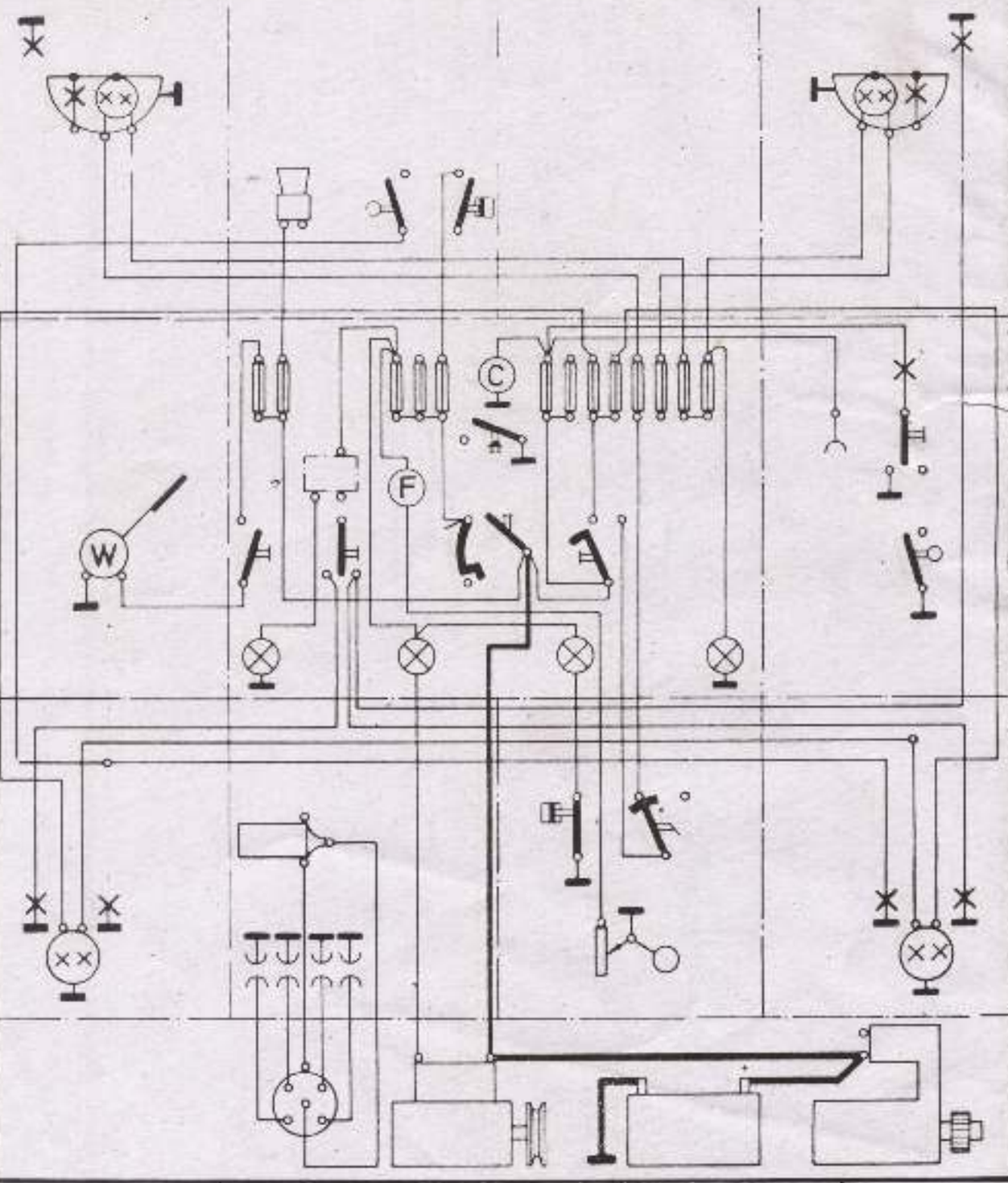


Scale	LIGHTING CIRCUITS	
Date	Name	Auto Electric

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING
PAK GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No: 79

Task: Write down the incomplete circuits and complete



Scale	LIGHTING CIRCUITS	
Date	Name	Auto Electric

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

P&K GERMAN TECHNICAL TRAINING PROGRAMME

Technical Drawing No: 80