नाम
Name : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

अनुक्रमांक
Roll No : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

पाठ्यक्रम
Course : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

दिनांक
Date : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

प्राप्तांक
Marks Awarded :

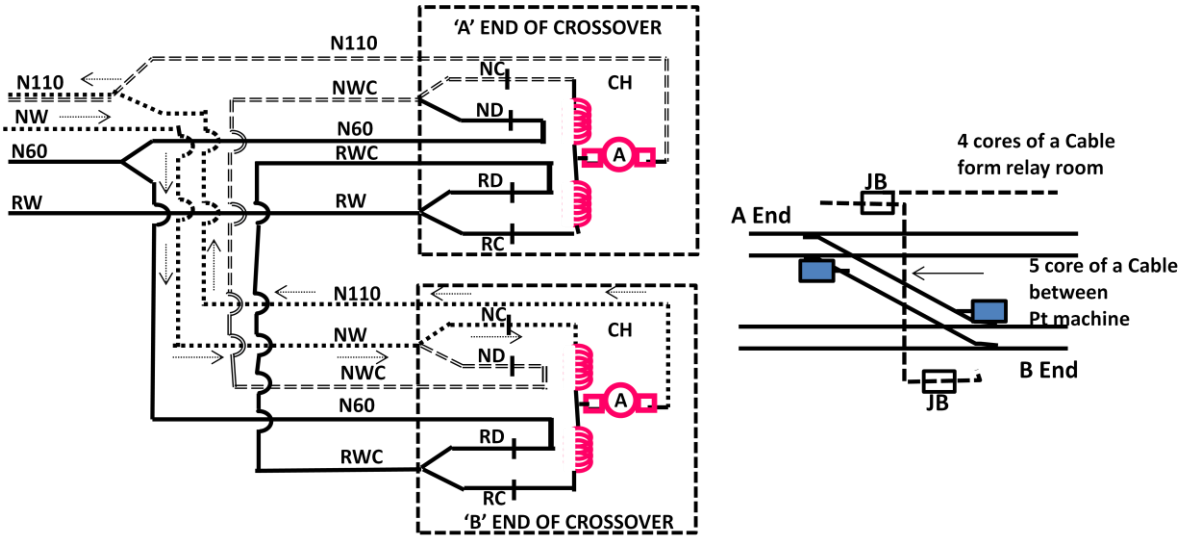
अनुदेशक के आद्यक्षर
Instructor Initial :

Wiring practice of SIEMENS point machine

In siemens Panel/ RRI interlocking, operation of point is series operation (successive operation where near end of crossover operates after completion of operation of far end and vice versa).It uses superimposed circuit where only four wires are used between relay room to point location and five wires between two point machine of a crossover. All four wires are used during operation of point and picking up of point detection/ indication relay.

In panel interlocking/RRI there are three possible modes of point operations.

1. Individual point operation,
2. Automatic Point operation under route setting
3. Emergency point operation.



..... & ——→ 'B' END OF CROSSOVER operates first and when point set & lock in normal then ND make

=====: 'A' END OF CROSSOVER operates next through ND contact of 'B' end Pt. Machine.

Successive Operation of cross over point in Super imposed circuit (reverse to normal)

In Siemens installations, either Siemens/IRS point machine or another make point machine may be used. If Siemens /IRS point machine are used then a group of prewired relays that is point group, is used to initiate, control, detect and lock the point. If other type of point machine is used then point group is used to initiate, control, detect and lock the point in addition to point switching group. If Siemens relays are to be used in British instillation then point contactor relay are used, this relay is also used in Siemens instillation along with point group if point is located far away from relay room. In British instillation the location of point contactor unit may be inside relay room or inside location box near the point, depending upon voltage drop and AC immunity of Point machine motor and point contractor relay. The detailed description of relays in point contactor unit is given in following paragraph. The operating voltage of point contactor relay can be 24 Volts DC or 60 Volts DC.

In Siemens installations, the point operation & detection are control by point group and superimposed operation & detection is achieved. In this arrangement ,one end (Let us say 'A' End)of crossover operates first and then through detection contact of this ('A' End) point machine 110 volts DC is extended to other end ('B' End) point machine for operation of point. At end operation of point, WKR3 Relay picks up through 110 DC point operation voltage to prove completion of point operation and detection circuit get actuated through same conductors to pick up WKR1relay (Point indication relay). For wiring, four cable conductors required between relay room and one point machine and five conductors are required between two point machines. As per RB directives, an additional four conductor are required between relay room and point machine for an additional detection circuit.

For purpose of understanding, the nomenclature & location various contacts and terminals at initial stage, the wiring practice is done with point contractor unit and not with point group. Such wiring also use in British interlocking with Siemens Pt. Contractor unit.

Three circuits are required to control motor operation and detection of point, they are

1. Point control circuit (point contractor unit circuit)
2. Point operation circuit
3. Detection circuit

Point control circuit (point contractor unit circuit)

This circuit controls feed to the motor in normal course of operation as well as in case of obstruction. During normal course of operation when point sets and lock in required position then feed to motor is cut of inside the machine itself as control contact opens and then feed is cut off at circuit level. In case of obstruction the motor get feed up to the laps of 10seconds and then feed is cut off at circuit level. This circuit also handles the switching current through heavy duty point contractor relay.

Relays used in this unit and their functions

N/R RELAY: **Normal/Reverse Relay**

Normally de-energized relay and acts as timer relay

Pick up when point operation is initiated and point controlling relay picks up.

Drops on completion of point operation OR after laps of ten seconds in case of obstruction.

XR RELAY: Sequential operation Relay

Normally de-energised relay It picks up after N/R relay and point controlling relay are picked up. As soon as it picks up, disconnects feed to N/R & but N/R do not drops as hold by condenser discharge. It prevents re-cycling operation of point contractor unit relays in case of obstruction in the point.

W(N)R Point normal controlling Relay:

Normal position –if point is set and locked in normal position then It is latched to make the front contacts. It picks up through N/R Relay front contact and latches mechanically. It drops when W(R)R picks up.

It is used to control the points from reverse to normal

W(R)R Point Reverse controlling Relay:

Normal position –if point is set and locked in reverse position then It is latched to make the front contacts. It picks up through N/R Relay front contact and latches mechanically. It is used to control the points from normal to reverse.

WCR point operation controlling Relay:

It is normally de-energized relay. It picks up through XR, N/R,W(N)R,W(R)R front contact. Picking up current 350 ma. Picking up voltage is 19-20 V. But the holding current is brought down by resistance across its own back contacts. It drops when N/R relay drops, drop away voltage 8 V. It has 2 front contacts (normally open) and 3 back contacts and carry breaking current of 10 amps. Its purpose is to handle high switching current at initial stage of point operation.

FIG.1 Wires & terminals of SIEMENS point machine

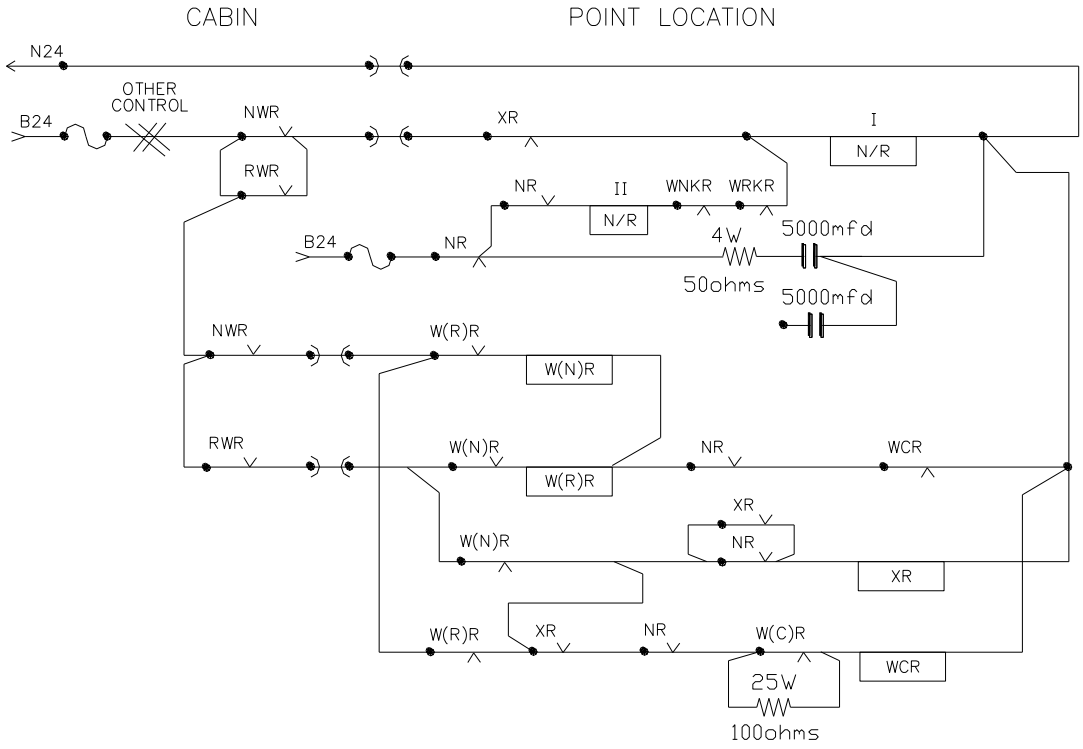
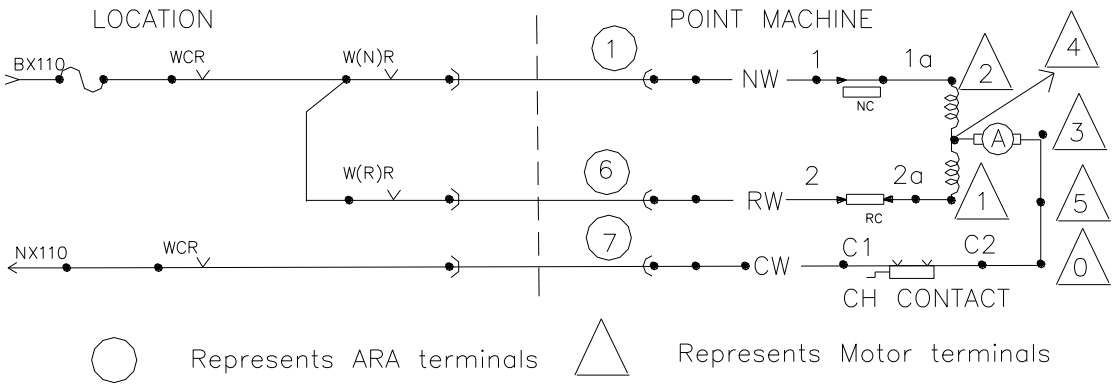


Fig. 2

Exercise: 1

Trace & indicate the point contractor unit circuits for Normal to reverse operation with the help arrow or different colour in the fig1.



SIEMENS POINT MACHINE OPERATING UNIT

Fig. 3

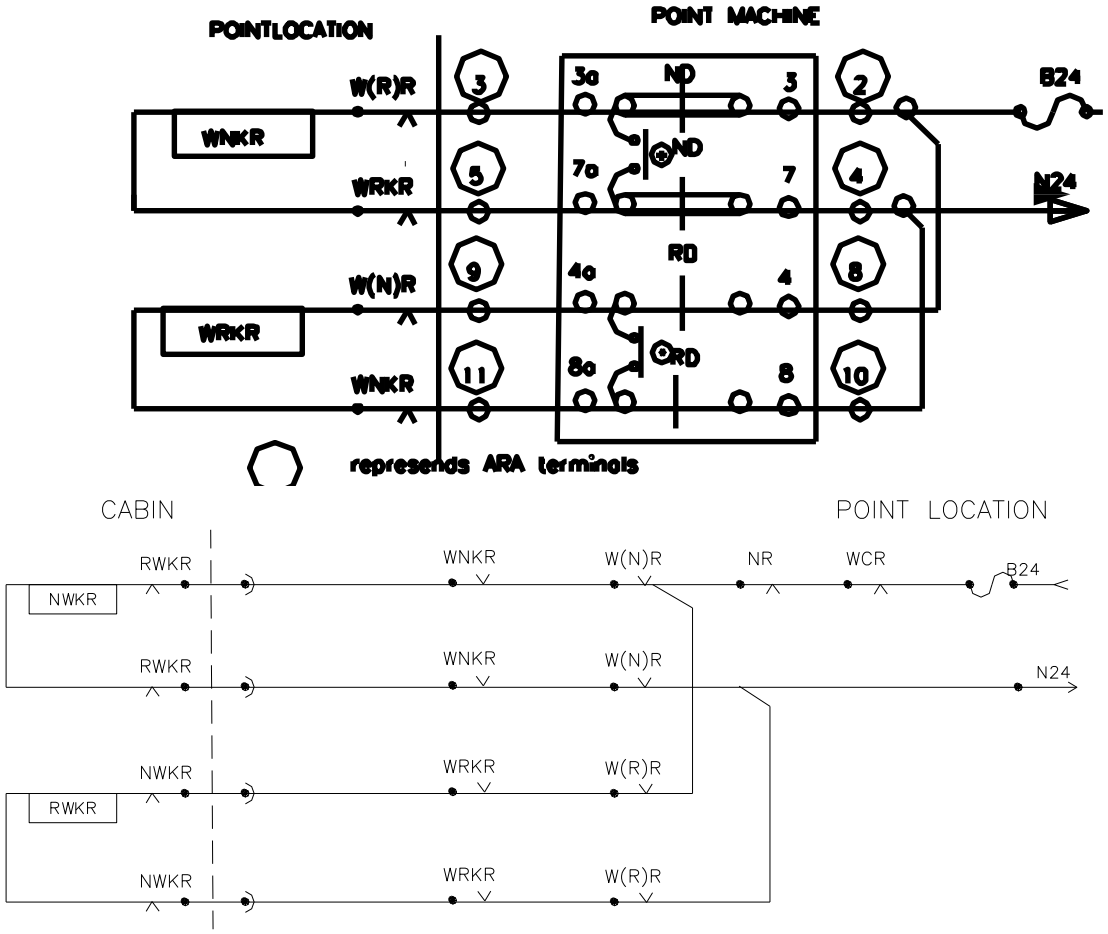


Fig. 4

Exercise: 2

Trace & indicate the point operation and detection circuits with the help arrow or different colour and connect cable terminals in the machine with terminals of motor, detection / control contacts and CH cut off contacts as per the fig3 and fig4

Tools Required

1. Cutting pliers 8”	1No	5. Screw driver 8”	1No
2. Nose pliers 6”	1No	6. Multi-meter	1No
3. Wire stripper	1No	7. Loose wires	as required
4. Pen knife	1No		

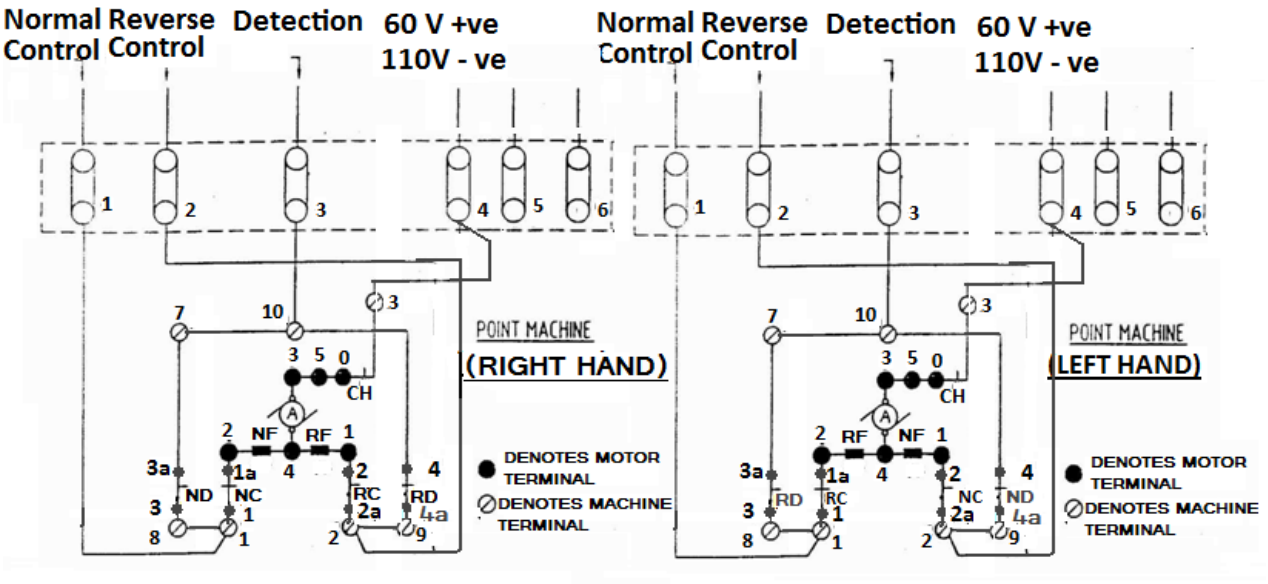


Fig. 5 Wiring of SIEMENS right hand and left hand mounted point machine

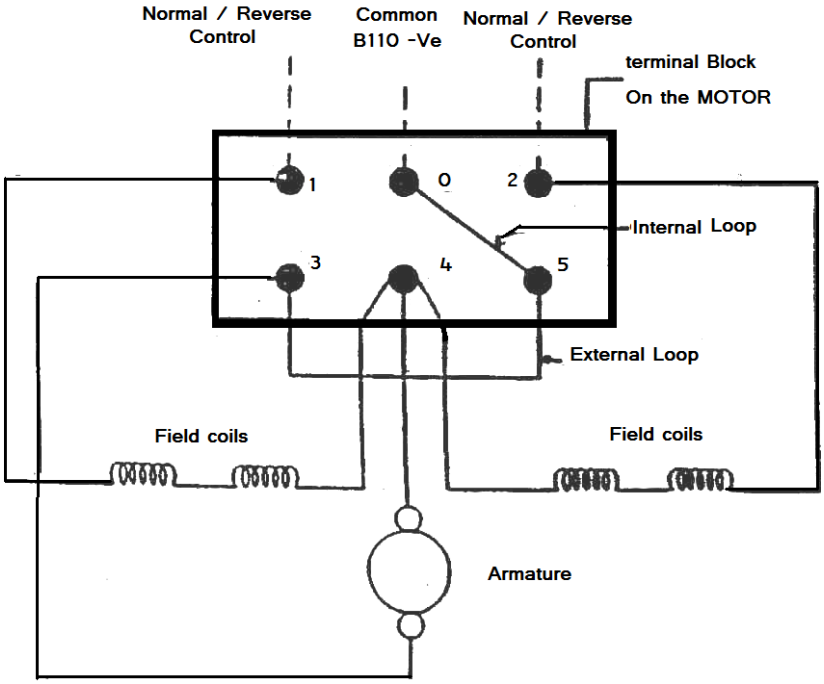


Fig. 6 Wiring of Motor of SIEMENS Point machine

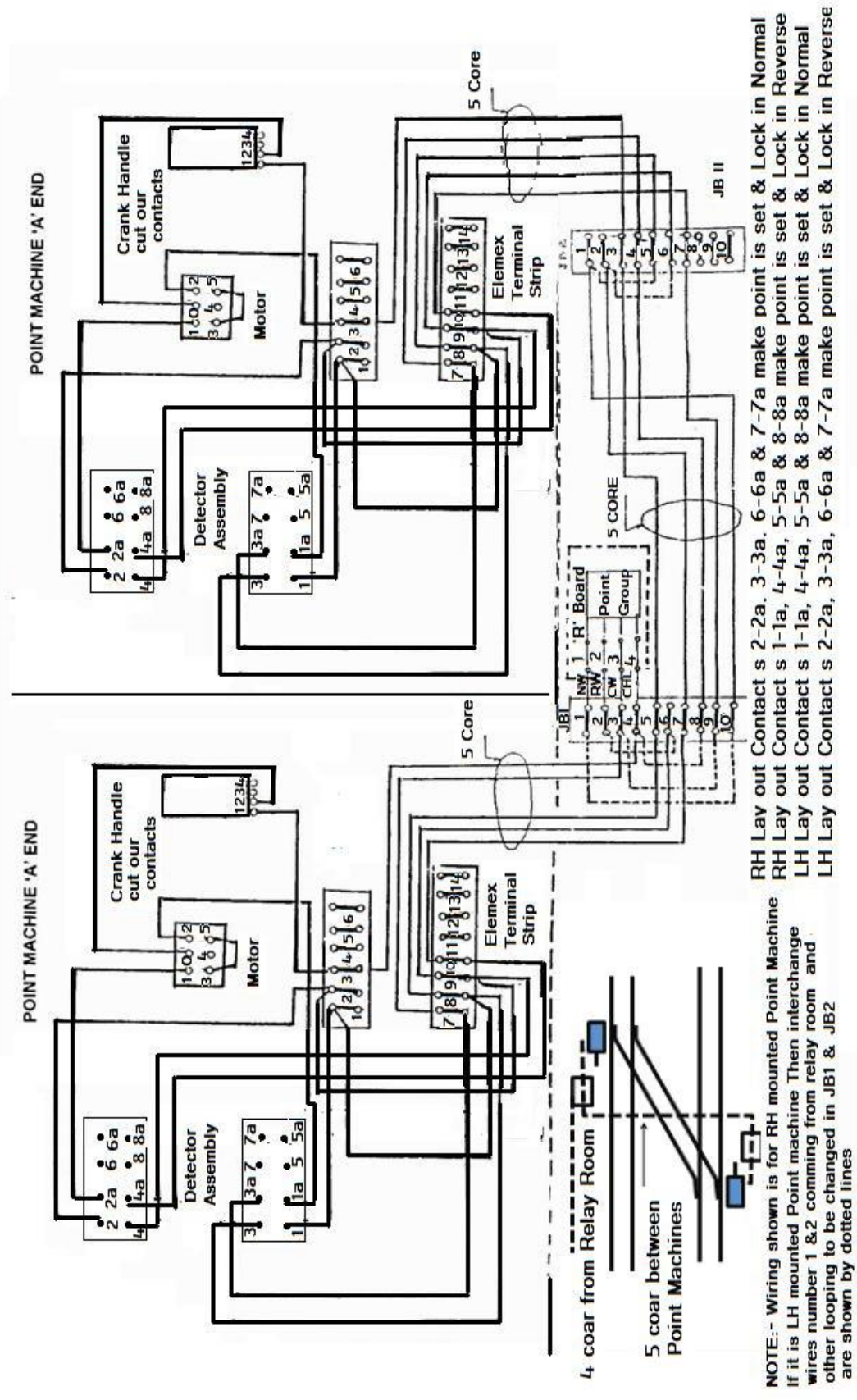
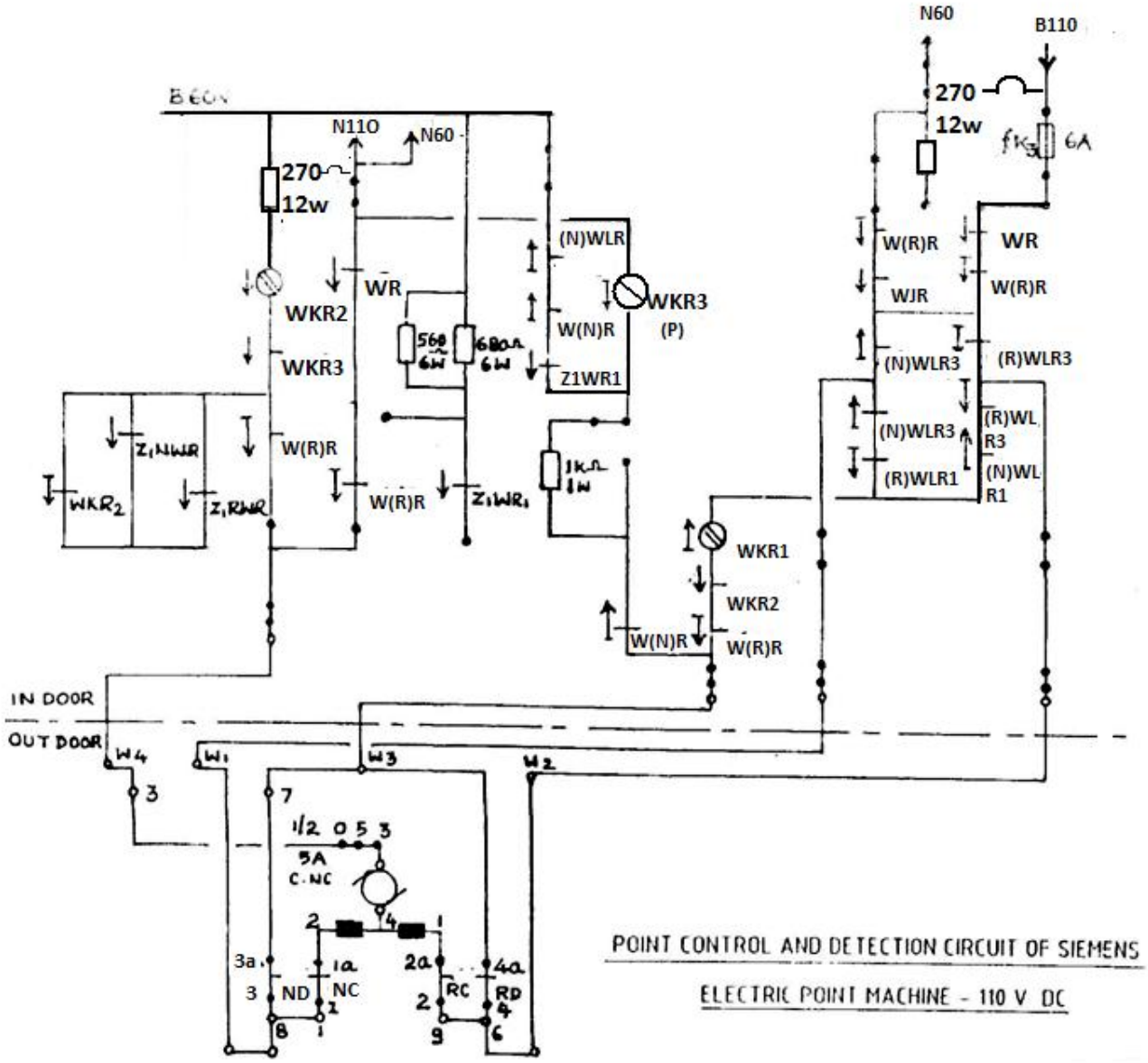

POINT MACHINE 'A' END
Crank Handle cut our contacts
Motor
Detector Assembly
Elemex Terminal Strip
5 Core
JB II
5 CORE
JB1
'R' Board
Point Group
4 coar from Relay Room
5 coar between Point Machines
RH Lay out Contact s 2-2a, 3-3a, 6-6a & 7-7a make point is set & Lock in Normal
RH Lay out Contact s 1-1a, 4-4a, 5-5a & 8-8a make point is set & Lock in Reverse
LH Lay out Contact s 1-1a, 4-4a, 5-5a & 8-8a make point is set & Lock in Normal
LH Lay out Contact s 2-2a, 3-3a, 6-6a & 7-7a make point is set & Lock in Reverse
NOTE:- Wiring shown is for RH mounted Point Machine
If it is LH mounted Point machine Then interchange wires number 1 &2 comming from relay room and other looping to be changed in JB1 & JB2 are shown by dotted lines
WIRING DIAGRAM OF 110 SIEMENS POINT MACHINE RH MOUNTING

Fig. 6



POINT CONTROL AND DETECTION CIRCUIT OF SIEMENS ELECTRIC POINT MACHINE - 110 V DC

Fig. 7

Exercise: 3

Trace & indicate the point operation and detection circuits with the help arrow or different colour in fig7

Date: **Signature of the Trainee**