Siemens Point Machine

1. Introduction

Siemens electric point machine type BSG-ANTR-9i (non- trailable) with internal locking serves to operate the point tongue rails and lock them in their respective end positions. Provision is available for the detection of both the switch rails, mid stroke operation and setting of the points with the help of crank handle.

2. Main Parts

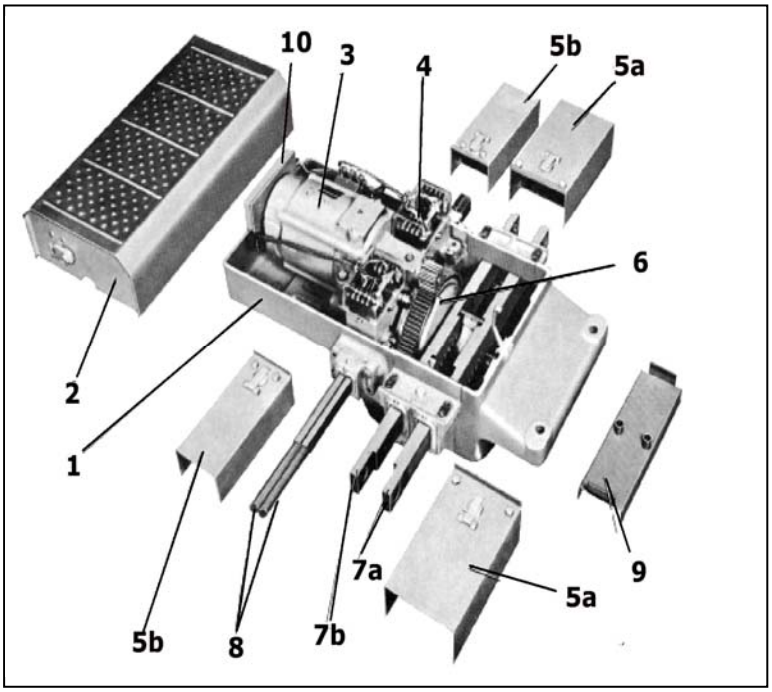

Fig.1 Main parts of Siemens point machine Bsg.-antr-9i (Non-trailable)

Part No.	Nomenclature
1.	Cast Iron Housing
2.	Housing cover assembly with lock
3.	Geared Motor assembly (Split field DC Electric Motor).
4.	Switch Pedestal with contact device.
5a.	Cover assembly for Gear rack.
5b.	Cover assembly for detection slide
6.	Transmission assembly (including friction clutch.)
7.	a) Gear rack (Throw rod) b) Locking rod
8.	Detector Slide Left hand. Detector Slide Right hand
9.	Lubricating of cover assembly
10.	Voltage cutout switch

3. Ground Connections:

Following are the ground connections (shown in Fig No.2):

(i) Switch brackets
(ii) Operating or Throw Rod
(iii) Point Blade connecting rod
(iv) Locking Rod
(v) Detector Rod Long (Far end)
(vi) Detector Rod Short (Near end)
(vii) Drive lug and
(viii) Sleeve arrangement

4. Operation

The rotary motion of the motor is transmitted through reduction gears and transmission assembly and converted into a linear movement of a toothed rack through a pinion. The gear rack drives the switch rails to the required position and the locking slide and gear rack get locked at the end of its stroke by a segment engaging in their locking curves.

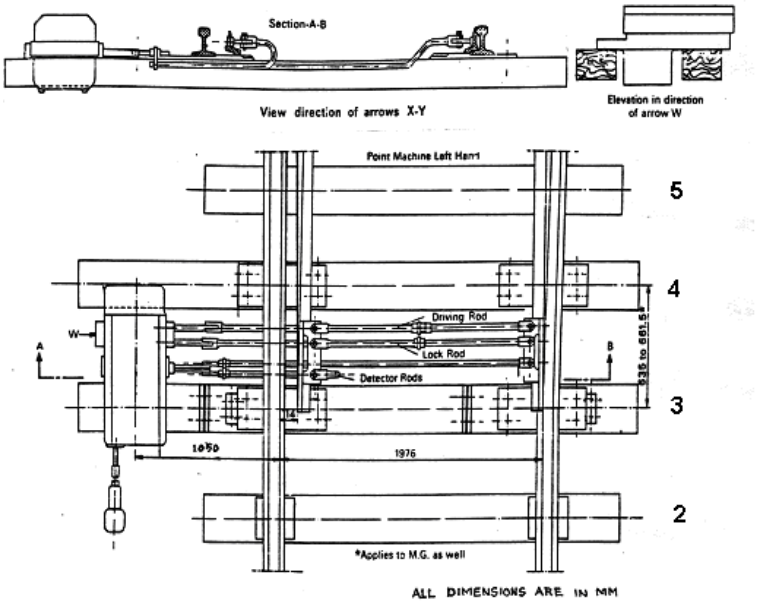

Fig No. 2: Ground connections and installation

The position of detection and control contacts in the switch pedestals :

Position/Setting of Point	**NC**	**RC**	**ND**	**RD**
Set & locked in Normal	Break	Make	Make	Break
Set & locked in Reverse	Make	Break	Break	Make
Unlocked & Moving	Make	Make	Break	Break

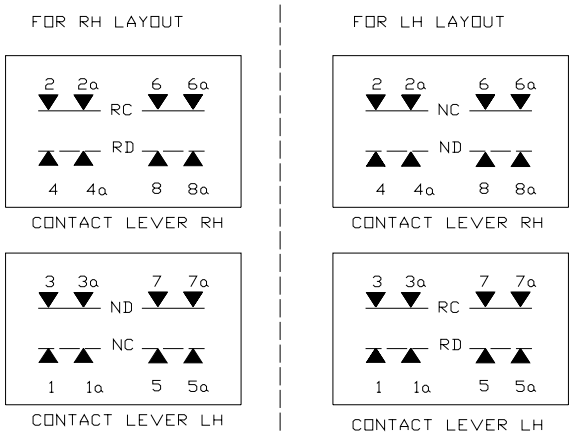

Fig No. 3: Contact arrangement in switch pedestals

5. Parameters

1.	Type of Motor	110 V DC Split field, Series wound motor
2.	Minimum Operating Voltage	60 V DC
3.	Normal Operating Current	2.5 to 3.0 Amps
4.	Operating Current during obstruction	3.6 to 3.8 Amps
5.	R.P.M.	1700
6.	Min. & Max. throw of the machine	94 mm.& 143 mm.
7.	Operating Time	3 to 4 sec.
8.	Necessary Throwing Force	200 Kg.
9.	Range of Operation with 1.5 sq. mm conductor	820 Mtr.

6. Installation

Following should be ensured (Ref: RDSO Drg. No 3291-92):

(i) Machine installed on Sleeper No.3 &4 (3750 mm long).

(ii) Extended gauge tie plate on sleeper No.3 and MS plate on No.4.

(iii) Distance from machine center to the inner gauge face is 1050 mm.
(iv) The spacing between sleepers to be kept as under:
Sleeper No.1 & 2 – 457 mm., Sleeper No. 3 & 4 – 685 mm
Sleeper No. 2 & 3 – 505 mm., Sleeper No. 4 & 5 – 547 mm
(v) The distance of leading stretcher bar from the toe shall be 465 mm.

7. Adjustments

a) Install the machine and hand crank to the centre position
b) Keep the switch rails also in centre position.
c) Connect the throw rod between the gear rack and the lug of the driving rod .
d) Adjust the switch rails for proper setting with both stock rails.
e) Ensure that the spring is equal on either side.
f) Connect the detector slides and adjust them such that the roller falls inside the groove only when point is fully set and locked. Insert a test gauge of 3.25 mm between the switch rail and stock rail at 150 mm. from the toe of the switch. Adjust the detector connection of the closed switch till the appropriate detector contacts are just broken. Tighten the nuts and check nuts after adjustment. Repeat the same for other end switch rail.
g) Connect the split lock stretcher bars to the lock rod and adjust them through their serrated faces and bolt screws such that the locking segment can enter the notches only when the point is correctly set. Ensure that the notches are not available to receive the locking segment when 5 mm obstruction is placed at 150mm from the toe of the switch. Tighten the nuts and check nuts after adjustment
h) Operate the machine several times to see that the locking segment goes smoothly inside the circular locking notches of the stretcher bars and the gear rack and lock detection rollers roll freely on the periphery of the control and lift-out discs.

8. Maintenance Instructions:

1. Check that the machine is kept free from rust, dirt and fixtures.

2. Check for tightness of all nuts and bolts, rodding connections, terminal screws and point machine fittings.
3. Creep anchors and level pillars are provided and there is no creep in the vicinity of point
4. Sleepers are well packed with ballast, proper drainage is provided and no water stagnates in the vicinity of points.
5. Check that control and detection contacts are functioning properly and they make with sufficient pressure.
6. The commutator surface is clean and dry. Check for any jamming of brushes in the brush housing. Replace the worn out brushes.
7. Check the normal working current of the motor and friction clutch slipping current periodically.(JE/SE-M, SSE-Q).
8. Conduct Insulation tests on point motor insulation and switch bracket insulation.(JE/SE-HY, SSE-Y).
9. Ensure that the voltage and current at motor terminals for both N and R operations are within specified limits.(JE/SE-M, SSE-Q)

9. Periodicity of Maintenance and Testing:

Fortnightly for Maintainer, Monthly for JE/SE and Quarterly for SSE unless otherwise specified by CSTE's office.

10. Functioning of Friction clutch (Ref.:SEM Part II Para 19.37)

Friction Clutch should trip when current reaches 1½ times to twice the normal operating current. When difference in current is less than 0.5A, the machine should be replaced and the friction clutch sent to workshop.

11. Obstruction Test :

Place an obstruction piece of 5 mm between the switch and the stock rail at 150 mm from the toe of switch and ensure that:

- The Lock segment does not enter into the notches of Locking bar and gear rack.
- Switch detection contacts do not make.
- The friction clutch slips.

12. Lubrication particulars:

All movable parts to be cleaned/lubricated with:

- 100 CC lubricating oil as per IS: 1628, SAE 30 or shell 100 X through oil inlet for lubricating motor transmission.
- 10CC of same oil over gear rack and lock stretcher bars.
- Spindle oil on the helical spring guides of contact assembly.
- Grease through all the 8 grease nipple and external gears of the transmission assembly.
- Lubricate the machine during installation and after 10,000 operations or at six month's interval whichever is earlier.

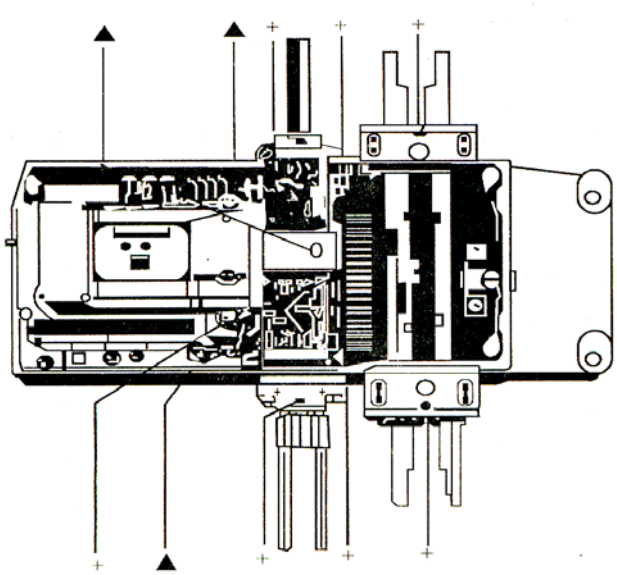

Fig No. 4: Lubricating points + for grease ▼for oil

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GOVERNMENT OF INDIA
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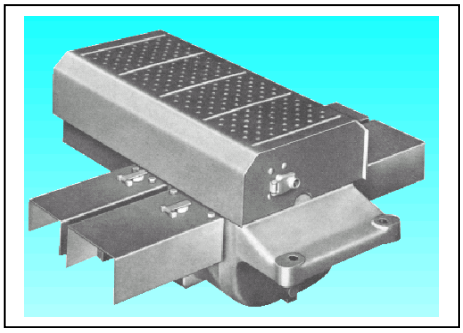
SIEMENS POINT MACHINE



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