



नाम

Name : _____

अनुक्रमांक

Roll No : _____

पाठ्यक्रम

Course : _____

दिनांक

Date : _____

प्राप्तांक

Marks Awarded : _____

अनुदेशक के आद्यक्षर

Instructor Initial : _____

ADJUSTMENT OF ROD OPERATED POINT AND STUDY THE LAYOUT

A point consists of a pair of switch rails i.e., located at interior and a pair of stock rails i.e., located at exterior.

A switch rail is a rail which tapers to a point called the toe of the switch. The other end is known as the heel of the switch.

Switch rails may be classified as two:

- i) The manner in which the switch is made to house against the stock rail.
- ii) The manner in which the heel is connected.

Under the first classification, switches are available as a) overriding type, i.e., the switch rail rides over the base of the stock rail in the process of housing, against the stock rail. In case of b) Non-overriding type, the switch rail is made to house against the stock rail by cutting away the base of the stock rail itself.

The two switches are joined together by at least two stretcher bars called Williams flexible stretchers, thus the two switches, when operated move as one unit, so that when one switch is housed against the stock rail (closed switch), the other is at a fixed distance away from its stock rail (open switch). Therefore, for one position of the points, a movement can be made over one route; while for the other position, a movement can be made over a second route, pair of points has two positions only viz., 'N' & 'R'.

The Williams Flexible Stretcher nearest to the toe of the switch is called the 'Leading Stretcher' while the one behind it is called the 'Following Stretcher'. The leading stretcher, besides joining the two switches together extends beneath the stock rail, clearing the underside of stock rail by a maximum of 3mm. (1/8"). This ensures that the closed switch cannot lift above its stock rail when the heel of the switch is depressed.

The switch rails rest on slide chairs for their entire lengths (i.e., from toe to heel). These slides chairs afford bearing surfaces for the switches when they are being operated.

Very near to the toe of the switch, a set of split stretcher bars is connected, one bar to each switch. These stretcher bars are used for independent locking of closed and open switches and

usually these bars are straight, without any offset. The stretcher bars bear notches corresponding to 'N' & 'R' setting of the points. A plunger enters these notches to achieve the locking. The plunger itself being housed in a casting called the facing point lock. In case of B.G., the facing point lock is not fitted at centre of track, so as to avoid damage by any hanging consoling of B.G. vehicle.

It is a good practice to provide a protection cover plate over the facing point lock, so as to avoid any failure of the lock due to coal ash, cinders, etc., falling and accumulating inside the lock. This cover plate is generally fitted on the sleepers on either side of the facing point lock, and passes over the later.

The toe of both switches should be in the same alignment as viewed from a position at right angles to the track. When this is so, the points are said to be 'in square' or 'have square ness'.

The Williams Flexible Stretcher bars are usually fitted by the Engineering Department, before the points are handed over to the S&T Department for interlocking. It should be ensured that these stretcher bars are correctly fitted to give the required gap between switch and stock rail. Also, with those stretcher bars in connected state, it must be ensured that the split lock stretchers butt against each other longitudinally i.e., the split lock stretchers should be in a state of compression. To test whether loose heel or fixed heel switches have been correctly installed by the Engineering Department, each switch should be housed against its stock rail by hand (in case of loose heel type) or by a crow bar (in case of fixed heel type). On removal of this pressure (i.e., hand pressure or crow bar pressure), the switch rail should remain housed against its stock rail (in case of loose heel type), or should spring away from its stock rail (in case of fixed heel type). This springing in the latter case should be equal for both switches.

The leading William Flexible Stretcher has a lug connected to it. The point operating rod or throw rod is connected to this lug. The throw rod in turn is connected to the adjustable arm of the adjustable crank. The adjustable crank is the last crank in the roding transmission coming from the cabin. The fixed arm 300mm. (12") arm is always connected towards the cabin, while the adjustable arm (variable arm) is always connected towards the unit to be adjusted (i.e., the points in this case).

For adjusting a pair of points, the following procedure may be followed:

- a) Measure the stroke available at the 300mm. (12") arm of the adjustable crank. (This can be done by operating the lever from 'N' to 'R' and measuring how much the roding has moved, at the 300mm. (12") arm of the crank) say 'X'.
- b) The adjusting sleeve, is then adjusted to give a stroke to the points equal to 'points throw Plus 5mm. (1/4") for spring (i.e., housing of switch rail against stock rail with some force) say 'Y'. This adjustment can be done by taking the crank arm ratio into consideration. The fixed arm length being 300mm. (12"), if the length of adjustable arm is 'Z', then $Z=Y \times 12/X$ or $Z=Y \times 300/X$.
- c) The point lever is kept in mid-position (i.e., the adjustable arm of adjustable crank should be parallel to the track). The switches are kept in mid-position with the help of a crowbar. The required length of the throw rod is connected.

The lever is operated and it is checked to see that the switch rail house against its stock rail in 'N' & 'R' positions, with sufficient spring. The spring on the points is tested by two methods.

- a) With the lever in 'N' or 'R' the catch handle alone is pressed. The lever should spring forward over the quadrant by 12mm. (1/2").

- b) A tommy bar is inserted in between the closed switch and its stock rail. Effort is made to lever out the closed switch away from the stock rail. On releasing the pressure on the tommy bar, the closed switch should spring back and house firmly against the stock rail. This indicates that the spring is sufficient.

If the spring is not equal on both sides, the point adjusting screws provided in the throw rod should be so adjusted as to equalise the spring. If the spring is less or more on both sides, the length of adjustable arm of the adjustable crank should be increased or decreased as required.

OBSTRUCTION TEST:

- a) Place a 3mm. (1/8") thick obstruction test piece in between closed switch and stock rail at 150mm. (6") away from the toe of the switch.
- b) Try to operate the lock bar lever and ensure that:
- i) The FPL plunger gets obstructed by the split lock stretcher.
 - ii) The lock bar lever cannot be latched in its 'R' position.
- c) At the unit detector, pull the relevant signal slide and ensure that the closed switch point slide obstructs it.

2. Study the layout and state:

- a. Layout B.G. or M.G.
- b. Type of Switches:
 - (Fixed heel or loose heel)
 - (Over-riding or non-over-riding)
- c. Number of flexible stretcher bars.
- d. Distance at which they are connected from the toe of switch.
- e. Clearance between the leading flexible stretcher bar and underneath of the stock rail.
- f. Position of the toe of switches on slide chair (whether the toe of the switch is exactly at the centre of slide chair or off centre). If off centre, measure and indicate.
- g. The distance at which the split stretcher bar is connected from the toe.
- h. Offset in the split stretcher bar, if any.
- i. Whether the facing point lock has been fitted at centre of track or off centre.

- j. Whether a protection cover plate has been provided to the facing point lock.
 - k. Check for the square ness of points and indicate your observation.
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- 3. Set each switch against stock rail and with the help of a crowbar in fixed heel type or by hand if of loose heel type and comment upon the adjustment of switches.
 - 4. Connect both the flexible stretcher bars and ensure the flexible stretcher bar holds the split stretcher bars are held tightly against one another.
 - 5. Measure the stroke at lever tail.
 - 6. Measure the stroke at 300mm. (12") arm of the adjustable crank.
 - 7. Loss of stroke is _____.
 - 8. Indicate reasons for loss of stroke.
 - 9. Measure the opening of switches both when points are normal and points are reverse. Do you find the opening the same or do you find any difference in the opening.
 - 10. Calculate the setting of sleeve of adjustable crank for correct operation of switches.
 - 11. State how did you connect the points to the lever and carried out the spring test and obstruction test.
 - a)
 - b)
 - c)
 - d)
 - e)
 - f)
 - g)

h)

i)

j)

k)

l)

Date;

Signature of trainee