



नाम

Name : _____

अनुक्रमांक

Roll No : _____

पाठ्यक्रम

Course : _____

दिनांक

Date : _____

प्राप्तांक

Marks Awarded : _____

अनुदेशक के आद्यक्षर

Instructor Initial : _____

DISMANTLING & ASSEMBLING OF CATCH HANDLE LOCKING INTERLOCKING FRAME (SA-1101)

The catch handle locking interlocking frame to Drg.SA.1101 is so called because the actuation of the locking is dependent upon operation of the catch handle.

The lever frame is erected on two supporting girders provided in the cabin basement. These girders are parallel to the track, and have their ends embedded in the side walls of the cabin. The distance between these girders and their height from cabin floor are important, so as to enable the lever frame to be correctly assembled.

On top of these girders, the standards are bolted. The number of standards depends upon the size of the lever frame. This lever frame is available in bays of 8 levers and 10 levers. The bay of levers can hence be defined as "The distance in terms of the lever at which the standards are fixed". The shaft upon which the levers are mounted rests in a groove provided on each standard. The shaft is secured in position by means of bearing caps and shaft end caps. For each standard, one bearing cap is provided while the end caps are always two in number, irrespective of the size of the lever frame. The shaft is available in lengths suitable for 8 levers and 10 levers.

Each lever is not directly mounted on the shaft but is co-connected to a lever shoe, which rests on the shaft. The lever shoe cover is bolted to the lever shoe from beneath the shaft. The lever shoes have projections, which automatically maintain lever pitch. Hence, 3 types of the lever shoes are necessary.

- Lever shoe L.H. _____ with one projection of R.H.side.
- Lever shoe R.H. _____ with one projection on L.H.side.
- Lever shoe intermediate _____ with projection on both sides.

The lever shoe cover has a stop incorporated in its casting which serves as a limiting stop for Link-A.

The lever tail is the curved part of the lever body itself hence, it is not detachable. There are 5 holes in the lever tail giving 5 strokes of different magnitudes, for circuit controller, point and

signal operations. A hole in the body of the lever gives the facility of attaching a help weight by means of wire rope, in case of long distance signal transmissions.

Each standard has incorporated in its casting a locking box bracket on which the first locking tray is supported. Locking boxes are available in 6 channels, 8 channels and 10 channels for 8 levers and 10 levers. The locking boxes are inclined by 30 degrees to the vertical, and in case more number of channels are required additional locking boxes supported by angle iron can be attached one below the other:

The quadrant supporting bars (front and rear) are of rectangular section, their sole function being to support the quadrants.

Quadrants are of three types:

- | | |
|----|------------------------|
| a) | Quadrant L.H. |
| b) | Quadrant R.H. |
| c) | Quadrant Intermediate. |

The functions of each quadrant are – 1. to secure the lever in 'N' & 'R' position. 2. to guide the lever during operation. 3. to maintain lever pitch.

The lever itself terminates at the top in a handle, immediately below which a smaller handle, called the catch handle is connected. The catch handle is connected to a catch handle rod through a knuckle passes through a spring loaded catch box which takes the form of a catch block and extends further downwards to terminate in a catch rod lug. The catch handle rod has threads at its top and bottom ends for adjustment of the catch block and link 'A'. Link 'A' consists of a pair of links connected one on either side of the catch rod lug through a pin. At the other end of Link 'A', a smaller link called Link 'B' is attached in between two 'A' Links. The tappet (plunger) is connected to Link 'B' at its other end. The jaw of the plunger rests on the plunge guide, which is an angle iron extending from one end of the lever frame to the other end and is bolted to the projections provided in the standards. In this frame, the catch handle is restored to its standards. In this frame, the catch handle is restored to its original positions by means of the spring loaded catch box. The catch block performs the function of securing the lever in 'N' and 'R' positions. Minimum lift of the catch block to permit lever operation should be 22mm. (7/8") and clearance between catch block and top of quadrant should not exceed 3.25mm. (1/8").

The total stroke of the tappet consists of 4 movements. With lever normal and catch handle pressed the tappet gets a downward stroke. While the lever is being moved from 'N' to 'R', the tappet gets first a downward stroke than an upward stroke. Finally, when the catch handle is released in the 'R' position of the lever, the tappet gets a further downward stroke.

The stroke of the tappet in case of this lever frame also, is more than the pitch of the channel, with the result that conflicting notches are possible only in adjacent channels. Conflicting notches avoided by restoring to top pieces, riveted on to the tappet itself. The notch is not cut in the plunger but in the top piece. The lock for this notch will also have to be put to suit this notch. In the adjacent channel, a notch is cut as is usually done in the plunger itself and a thick lock is provided for this notch. When the notch under the top piece reaches up to the adjacent channel, the thick lock in this channel cannot enter the notch, as the top piece being whole, prevents it from doing so. Thus, conflicting notches are avoided.

Each channel has a sufficient width to accommodate 4 interlocking bars – 2 top and 2 bottom.

Slack locking in this type of frame is defined as follows:

"If the catch block of a locked lever can be lifted more than 10 mm. (3/8") above the quadrant notch, it is said to have developed slack locking".

1. Study the lever frame and state:

- a. The size of lever frame:
- b. Pitch of levers:
- c. The No. of standards used:
- d. Distance (in terms of levers) at which standards are fixed:
- e. Press the catch and release it and see how it is forced down on to its seat:
- f. Types of quadrants:
 - i)
 - ii)
 - iii)
- g. The section of quadrant supporting bar.
- h. Types of lever shoe:
 - i)
 - ii)
 - iii)
- i. Purpose of shaft cap:
- j Strokes available from lever tail:
- k. Number of interlocking bars in each channel:
- l. Pitch of channel:
- m. The height at which the supporting girder are required to be fixed in a cabin
(Give the distance from cabin floor).

2. Dismantle the lever frame and state briefly how you carried out the job.

- a. All the parts were marked serially starting from _____ hand side.
- b. Then dismantle the different parts of the lever frame in the following order:
 - i) Locking Box C

- ii) Top (L)
- iii) PI
- iv) Bottom (L)
- v) L
- vi) L.H.Q.
- vii) Lever No.
- viii) First Intermediate Q
- ix) Thus all levers and Q
- x) Shoes with link _____ and _____.
- xi) Sh
- xii) Quadrant S.
- xiii) Plunger G.

3. Having dismantled and separated the parts, study the following and state:

- a) Length of lever from the centre of the lever shoe.
- b) Distance of hole giving 200 mm. (8") stroke from centre of lever shoe.
- c) Mechanical advantage of lever for 200 mm. (8") stroke.
- d) Diameter of shaft.
- e) Number of link A per lever.
- f) Number of link B per lever.
- g) Section of plunger.
- h) Section of Interlocking bar.
- i) Width of locking channel.

4. State briefly the procedure for assembling the lever frame in short sentence.

- i)
- ii)
- iii)
- iv)

v)

vi)

vii)

viii)

ix)

x)

xi)

xii)

xiii)

xiv)

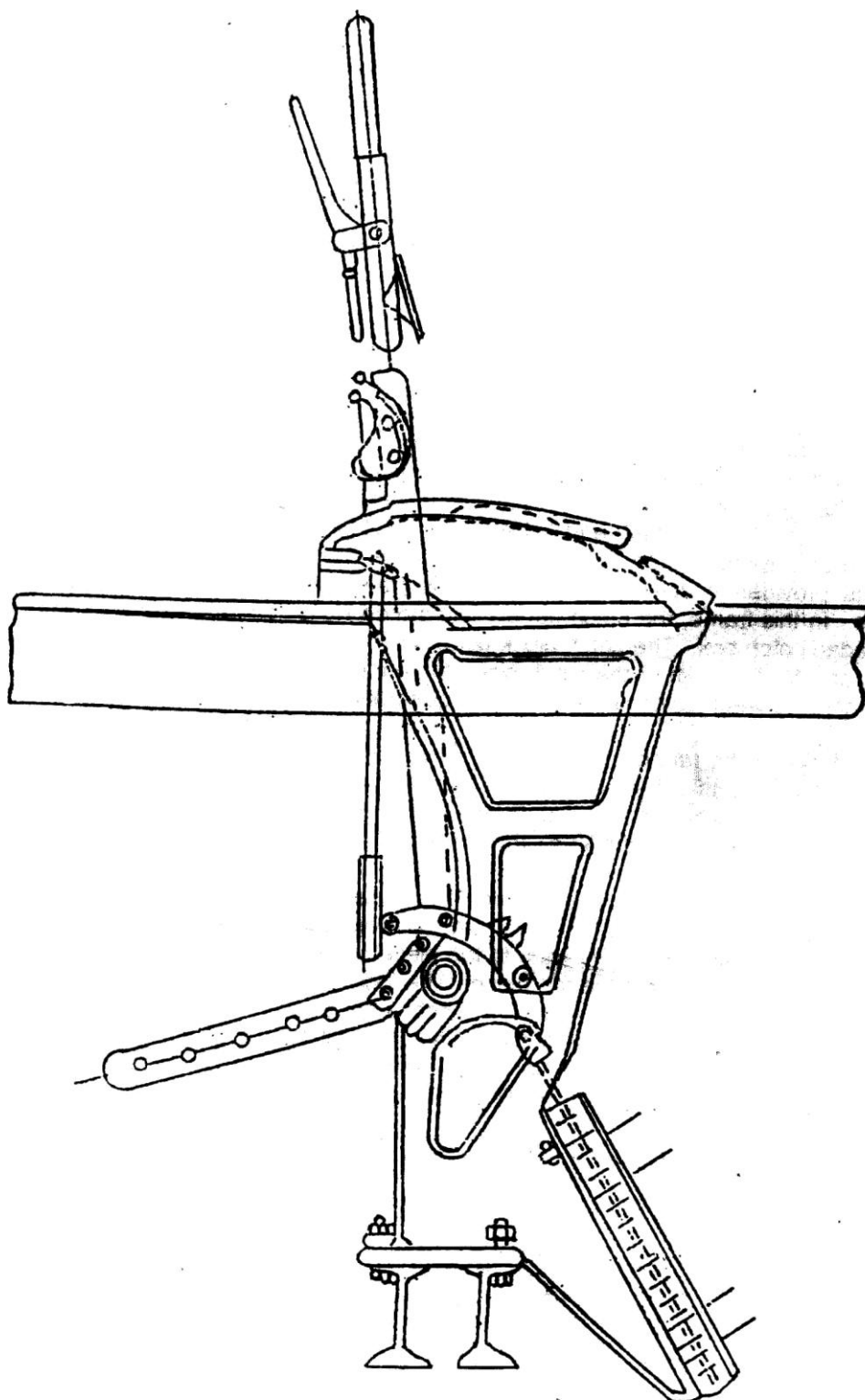
5. Indicate the following parts in the sketch:

- a) Knuckle
- b) Spring
- c) Lever shoe and Cover
- d) Link "A"
- e) Catch rod
- f) Catch box
- g) Standard
- h) Link "B"
- i) Catch rod lug
- j) Supporting girders
- k) Catch Handle
- l) Lever Shoe & Cover

6. Study the following with respect to lever No. _____.

- a) Depth of quadrant notch in normal position of lever.
- b) Depth of quadrant notch in reverse position of lever.
- c) Lift of the catch block when catch is pressed in normal position of lever.
- d) Lift of the catch block in the reverse position of lever.
- e) Note whether the link A is resting against the stop on the lever shoe cover in normal position of lever.
- f) Note whether the link A is resting against the stop on the lever shoe cover in reverse position of lever.
- g) Press the catch in normal position of lever and measure how much plunger has moved.
- h) Move the lever slowly from normal to reverse and note what happens to the locking plunger.
- i) Leave the catch and make it seat and see how much the plunger is moved thereby.
- j) What is the displacement of locking plunger from “Normal catch up” position to “Reverse Catch up” position of lever.
- k) What is the total stroke of locking plunger?
- l) Whether the conflicting notches are likely to arise. How these are prevented?
 - 1.
 - 2.
 - 3.

- m) What should be the depth of quadrant notch?
7. a) Press the catch handle on Lever No._____ in normally locked position and measure the lift of the catch block above the quadrant notch.
- b) Press the catch handle of lever No._____ in normal locked position and measure the lift of the catch block above the quadrant notch.
- c) In which case the locking can be called “Slack” and why?
8. Is there any arrangement for adding double wire levers on this lever frame?
9. What modifications are required for mounting double wire levers on this lever frame for operation of outer and Warner by double wire transmission? Write down the names of parts and explain briefly.



Date;

Signature of trainee