



Ministry of Railways
Government of India
(for Official use only)

MAINTENANCE OF INTERLOCKED GATES



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INTRODUCTION

This pamphlet covers maintenance instructions on Mechanically and Electrically operated interlocked level crossing gates.

Mechanical Lifting barrier

LIFTING BARRIER -RH (FOR LEVEL CROSSING)
SA7981-88

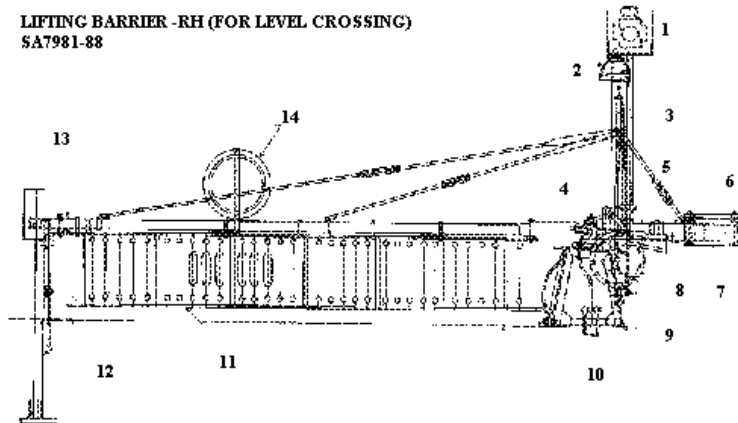


Fig. 1.: Lifting Barrier RH (For level crossing) SA 7981-88

- | | | | |
|---|------------------|----|----------------|
| 1 | Gate Indicator | 8 | Drum |
| 2 | Bell | 9 | Bracket |
| 3 | Guy arm | 10 | Pedestal |
| 4 | Clamp A | 11 | Fringes |
| 5 | Trunion Bracket | 12 | Stop post |
| 6 | Auxiliary weight | 13 | Tabular pole |
| 7 | Balance weight | 14 | Indicator disc |

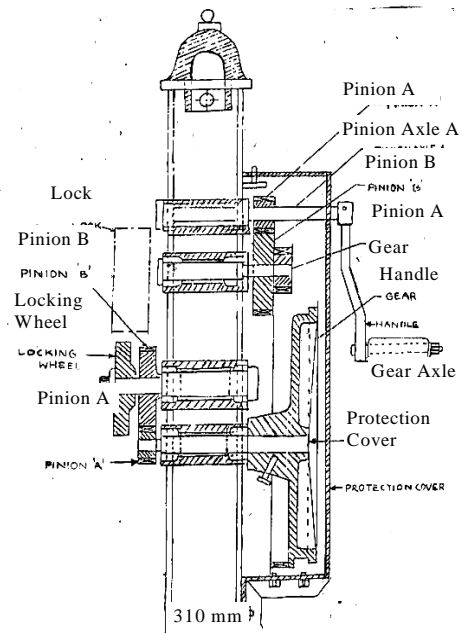


Fig. 2.: Winch for operation of Lifting Barriers

Maintenance

Boom

Operate the gate and see that both the booms are moving simultaneously. If not then adjust stay guide and balance weight of the boom and correct alignments of pull and return wire near drums of both booms.

Ensure that booms are resting properly on its boom stop when closed, if not then correct the alignment.

Check that all three pieces of the booms are in perfect straight alignment. Cross bolts at both the joints are fully tight.

Ensure the free roller movement in the cam path during boom operation. Clean and oil the cam path and ensure that it is free from dust.

Pedestal unit

Ensure that no foundation is shaky. Check and tighten the pedestal nut bolts of the foundation.

Check and tighten the trunion bracket, guy arm nut bolts.

Check and clean the pedestal drum and its teeth. Lubricate the drum after removing the dust. Ensure that not a single tooth is broken on the drum.

Ensure that there is no excessive sag developed in ropes due to jamming at any place.

Winch and Wire run

Apply grease on gear of train, i.e. teeth of the gears.

Check that the wire run within duct have no obstruction.

Safety Checks

Close the gate and try to reverse the gate lever by lifting one boom. It shall not operate. Test the second boom similarly.

In the closed condition of the gate, gate lever can become reverse. Try to lift the booms one after another it should not lift.

It should not be possible to extract the locking key from the winch in open condition of gate.

Winch drum should be locked in close condition of gate and it should not be possible to operate the winch when key is extracted.

Electric Lifting Barriers

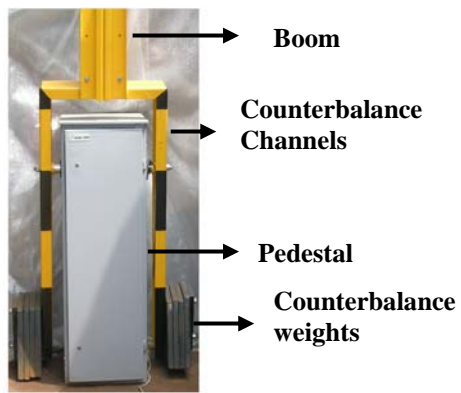
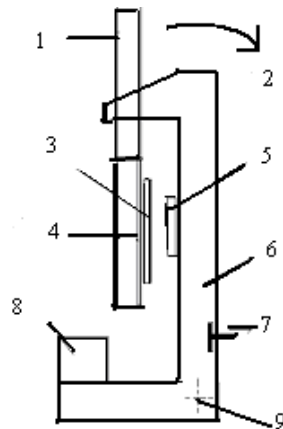


Fig.3: Pedestal



1. Boom hook fixed to boom tip.
2. Unlock by solenoid.
3. Magnet fixed to boom hook.
4. Non-magnetic Aluminium base plate for fixing magnet.
5. Reed switch fixed to lock lever.
6. Lock lever.
7. Electric solenoid for unlocking.
8. Dead weight.
9. Fulcrum.

Note: Position of Switch and Magnet to be adjusted so that switch contact makes when Boom hook falls in and lock lever moves to lock position.

Fig.4: Boom lock proving contact

Limit Switches

LS1 & LS2-to control auto stop in the fully open and closed position of the barriers.

LS3, LS4 & LS5 -to give back indications in fully open and closed positions.



Fig.5: 8 Contact Circuit Controller with Top Roller Type Limit Switches actuated by Nylon

Limit Switch

Cams

The limit switches are actuated by contoured cams fixed on boom shaft and position of these cams can be adjusted as follows :

- Loosen the cam fixing screws using an allen key.
- Adjust the position of cam as required, by rotating it on boom shaft.
- Tighten one of cam fixing screws and check the position of cam by operating the barrier.
- Tighten all fixing screws after cam position is properly adjusted.



Fig.6: Nylon Cams

Cams fully adjustable for full 360 deg for accurate adjustment of make/break angle

Positions of the cams are to be adjusted such that its contacts:

- The cam for LS1 - just break in the fully closed position of barrier.
- The cam for LS2 - just break in the fully open position of barrier.
- The cam for LS3 - just make in the fully open position of barrier.
- The cams for LS4 and LS5 - just make in the fully closed position of barrier.

Friction clutch



Adjustment nut to be tightened/ loosened until Clutch Slips only when boom movement is obstructed.

Check motor current is within limits when clutch is slipping

Fig.7: Friction clutch

Timing belt



Adjustment can be done as follows:

- Loosen 4 motor fixing bolts.
- Adjust position of motor, until desired belt tension is achieved by providing suitable packing below motor.
- Re-tighten 4 fixing bolts.
- Ensure that motor is parallel to the clutch shaft to avoid excess wear of belts.
- Timing belt should be left as loose as possible, without it slipping out while working. Tightened timing belt will wear out very fast.

Fig.8: Timing belt

Maintenance Schedule

Sr. No.	Maintenance work to be done by maintainer	Period-icity
Mechanical Lifting barrier		
1.	Adjustment of wire sag and tension	M
2.	Checking boom locking and 'E' type lock locking	F
3.	Testing of Interlocking	M
4.	Cleaning of all pipes and ducts	Q
Electrical Lifting barrier		
1.	Cleaning of contacts and adjustment.	M
2.	Checking cleanliness and smooth working of commutator	M
3.	Checking declutching of friction clutch when boom is fully raised or lowered.	M
4.	Adjustment of shock absorber	M
5.	Checking operating time, voltage & current	Q
6.	Checking level of lubricating oil in gear box	F
7.	Checking lubrication of gate lock	F
8.	Checking working of 'E' type lock	M
9.	Checking Fixing of gate locks	M
Activity common for both type of lifting barriers		
1.	Ensuring cleanliness of mechanism	F
2.	Lubrication of moving parts	F
3.	Checking of Audio visual warning	F
4.	Checking of Approach warning	F
5.	Telephone communication between gate and SM's office/cabin	F
6.	Checking integrity of interlocking	M

Disclaimer

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