No. EL/2.2.1 Dated 04.11.2010

The Chief Electrical Engineer,

1. Central Railway, Mumbai, CST-400 001.
2. Northern Railway, Baroda House, New Delhi-110001.
3. North Central Railway, Block A2, Allahabad- 211 033
4. Eastern Railway, Fairlie Place, Kolkata -700 001.
5. East Central Railway, Hazipur-844101.
6. East Coast Railway, Chandrashekharpur, Bhubaneshwar-751016
7. Southern Railway, Park Town, Chennai-600 003.
8. South Central Railway, Secunderabad-500 371.
9. South Eastern Railway, Garden Reach, Kolkata -700 043.
10. South East Central Railway, Bilaspur-495004
11. Western Railway, Churchgate, Mumbai-400 020.
12. West Central Railway, Jabalpur-482001.
13. Chittarnjan Locomotive Works, Chittaranjan – 713 331 (W.B.)

MODIFICATION SHEET No. RDSO/ELRS/EL/MS/0389 Rev.'0' Dated 31.08.2010

1.0 TITLE :

Provision of additional spring catcher to prevent the main raising spring to fly off in case of breakage of spring of AM-12 or similar design pantographs used on electric locomotives and EMU/ MEMU.

2.0 OBJECT:

Railway have reported cases of breakage of main panto raising spring of AM-12 or similar design pantograph causing earth fault as broken portion of spring towards yoke assembly side coming in contact with the loco roof. This leads to tripping of the sub station circuit breaker and consequent loco failure on line.

In order to avoid the above failure of Electric locomotives / EMU/ MEMU on line and disruption of traffic due to OHE becoming dead, it is proposed to provide additional spring catcher over yoke assembly of main raising spring to prevent the fly off of breakage portion of spring and avoid contact with the loco roof.

3.0 EXISTING ARRANGEMENT:

RDSO vide office letter no. EL/2.2.1 / J-6 dated 31.07.1986 has issued modification sheet No. RDSO/WAM4/156 on subject "Provision of panto raising spring catcher to hold the spring in case of breakage". In the existing modification there is provision of two numbers of M.S. bottom spring catchers fitted on the panto base frame to prevent the spring from falling on the roof, in case of its breakage.

Two number of top spring catcher provided above the main raising spring to avoid fly off of breakage springs.

4.0 MODIFIED ARRANGEMENT:

It is observed that in case of breakage of spring near to the anchored location, the contracted length of broken portion is short enough to evade the top spring catchers and it could come and fall on loco roof after springing back.

To avoid the above problem it is observed that some Railways have welded two nos. of M.S. Plate of sizes 660 x 50 x 5mm thick and 490 x 50 x 5mm thick over lower arm assembly of the Pantograph.

This additional plate may affect the total contact force on contact wire due to air thrust pressure in actual working condition as well as due to high storm. This may also cause poor current collection.

RDSO have studied the above problem in detail and a modification has been worked out for provision of an additional spring catchers over yoke assembly of main raising spring.

In the event of breakage of main raising spring the modified catchers will not allow to fly off broken spring and it will rest over existing horizontal spring catchers. This will element the line failure due to earth fault by the broken spring.

5.0 Works to be carried out:

i. By Electric loco sheds and workshops:

Provision of addition spring catchers over yoke assembly of main raising spring is to be made as per as per RDSO Drg. No. SKEL 4835 Alt. '0' for the pantographs which are already in service by Electric loco sheds and workshops. The following procedures are to be followed:-

- The self tapped bushes are to be welded on horizontal tube over the location as shown in the drawing.
- For fixing the locations of the self tapped bush, raise the pantograph up to 2000mm height and mark lines on the

horizontal tube of lower arm assembly at 95mm from the tip of base frame.

- ❖ Tack welded the tapped bushes at a right angle to the horizontal tube of the lower arm assembly on both side of yoke assembly.
- ❖ Fix the clamp on the tapped bushes and check the operation of the pantograph. Ensure that there will not be any obstruction of pantograph with catcher during full range of operation.
- ❖ After verification of free movement of pantographs carry out continuous welding of tapped bushes.
- ❖ Before welding of the additional catcher above yoke assembly, proper care to be taken during welding of the bushes, Earthing to be made over lower arm not on the base frame to avoid return current not passing through end bearing of the lower arm assembly.

Welding electrodes- MMAW electrodes approved by RDSO under class A3 / B1, as per IRS M-28-02 should be used. Preferably, 4.0mm diameter of electrode shall be taken to facilitate welding work. The electrodes must be preheated to about 250° C for two hours before use. MIG/MAG welding filler wires approved by RDSO under class -1 as per IRS M-46-03 in 1.2 mm diameter can also be used. The shielding gas for MIG / MAG process shall be carbon dioxide (CO_2)

ii. By Manufacturers for new pantograph:

Provision of additional spring catchers over yoke assembly of main raising spring is to be made as per RDSO Drg. No. SKEL-4836 Alt. '0' for the new pantograph by manufacturers.

Drawing No. SKEL-4836 Alt. '0' is for manufacturers for new pantographs as the drilling procedure at shed level may be difficult as it require proper zigs & fixtures for drilling hole on horizontal tube.

Modification to be implemented on New orders as per RDSO Drg. No. SKEL-4835 Alt. '0' and on pantographs which are not dispatched as per RDSO Drg. No. SKEL-4836 Alt. '0'

6.0 APPLICATION:

Pantographs of electric locomotives / EMU /MUMU's

- ❖ AM-12 of M/s Stone India Lid.,
- ❖ IR-01 of M/s Contransys Pvt. Ltd.,
- ❖ PAN01 M/s. General Stores & Engineering Co.
- ❖ EL-01 of M/s Concept Engineers

7.0 MATERIAL REQUIRED:

Two nos. of spring captures and other parts as per RDSO's drawing no. SKEL-4835 Alt. '0' for fitment on existing pantographs which are working on line. Material as per RDSO's drawing no. SKEL-4836 Alt. '0' for the new pantographs to be modified by the pantograph manufacturer.

8.0 MATERIAL RENDERED SURPLUS:

NIL

9.0 REFERENCE:

i. Problem reported by CELE/SER vide letter CEE/RS/220/B/Pt XXIV dated 26.06.2010.

ii. Problem reported by CELE/NR vide letter 230/Elect/TRS/19 dated 20.07.2010.

10.0 MODIFICATION DRAWING:

i. Drg. No. SKEL-4835 Alt. '0' for the existing pantographs which are already in service.

ii. Drg. No. SKEL-4836 Alt. '0' for pantograph's manufacturers.

11.0 AGENCY OF IMPLEMENTATION:

i. All the Electric Loco Sheds & Electric Loco Workshops.
ii. All Manufacturers.

(A.K. Goswami)
for Director General/Elect.

Encl: SKEL Drg. No. SKEL-4835 Alt. '0' & SKEL-4836 Alt. '0'

DISTRIBUTION

Copy to: As per Standard Mailing List No. EL/M/0019, Ver. '3'

(A.K. Goswami)
for Director General/Elect.

Encl: SKEL Drg. No. SKEL-4835 Alt. '0' & SKEL-4836 Alt. '0'

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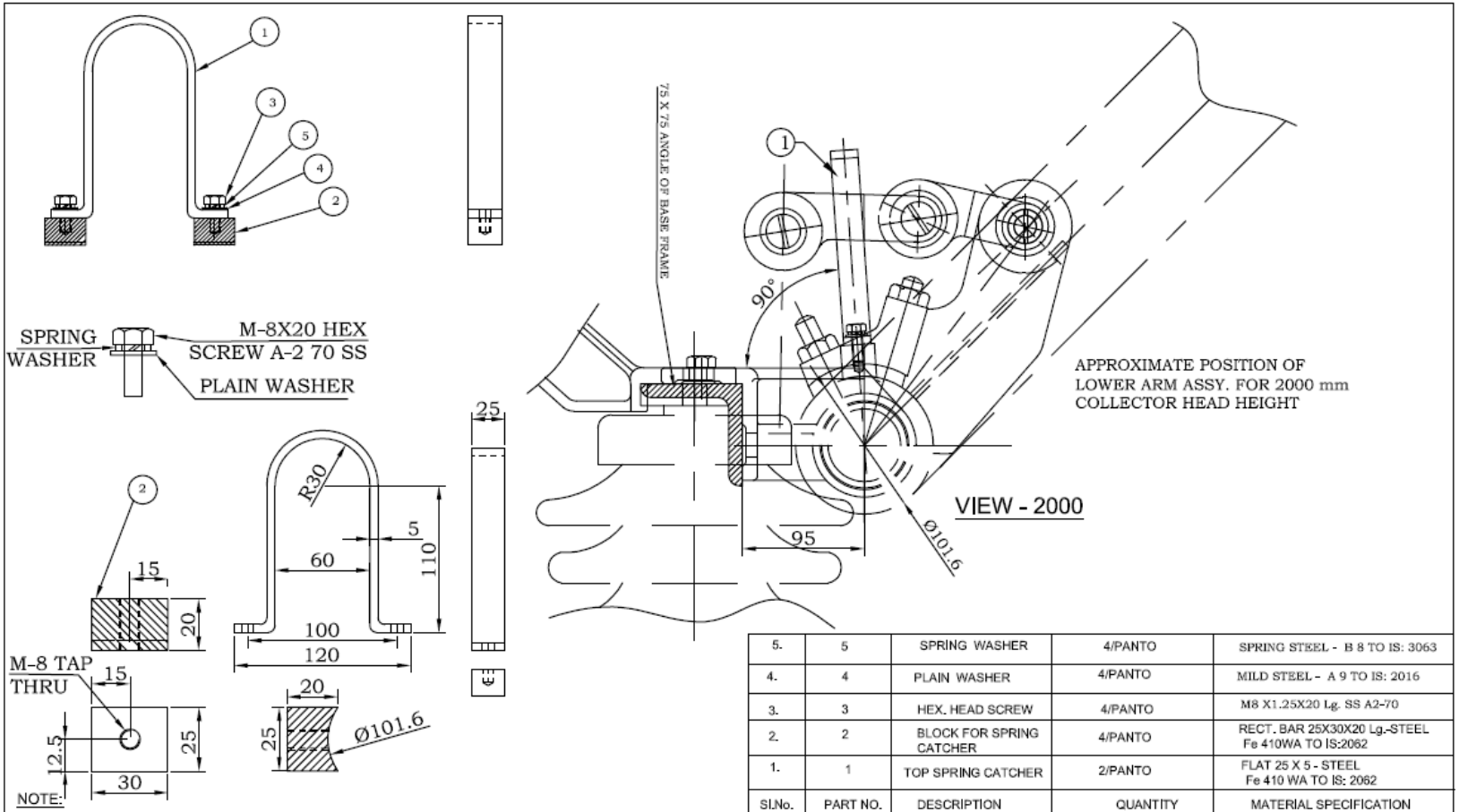


Sl.No.	PART NO.	DESCRIPTION	QUANTITY	MATERIAL SPECIFICATION
5.	5	SPRING WASHER	4/PANTO	SPRING STEEL - B 8 TO IS: 3063
4.	4	PLAIN WASHER	4/PANTO	MILD STEEL - A 9 TO IS: 2016
3.	3	HEX. HEAD SCREW	4/PANTO	M8 X1.25X20 Lg. SS A2-70
2.	2	BLOCK FOR SPRING CATCHER	4/PANTO	RECT. BAR 25X30X20 Lg.-STEEL Fe 410WA TO IS:2062
1.	1	TOP SPRING CATCHER	2/PANTO	FLAT 25 X 5 - STEEL Fe 410 WA TO IS: 2062

REF : RDSO/2010/EL/MS/00 ., Rev. '0', Dated

SCALE: NTS

APPD.BY (FOR DG)

NOTE:

1. MANUFACTURE THE TOP SPRING CATCHER ASSEMBLY CONTAINING COMPONENTS AS DESCRIBED IN THE PART LIST.
2. MARK LINES ON THE HORIZONTAL TUBE OF LOWER ARM ASSY. AT 95 mm FROM THE TIP OF 75X75X10 ANGLE OF BASE FRAME AS SHOWN IN VIEW - 2000, AT THIS LOCATIONTHE C.L. OF CLAMPSHALL BE VERTICAL
3. TACK WELD THE BLOCKS OF TOP SPRING CATCHER ASSY. ON THE HORIZONTAL TUBE HOLDING IT AS DESCRIBED ABOVE.
4. CHECK THE TIGHTNESS OF THE SCREWS IN THE TOP SPRING CATCHER ASSEMBLY.
5. CHECK THE BLANCING OF THE PANTOGRAPH WITH 7 Kg.

SAFETY CLAMP & BOSS FOR SPRING CATCHER

* FOR RETROFITMENT IN SHEDS

FIRST ISSUED

SUPERSEDES

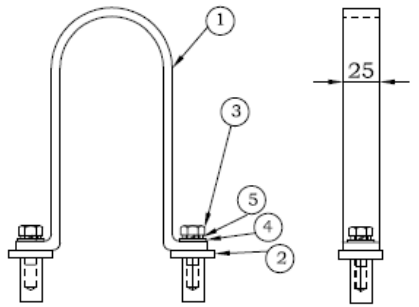
SUPERSEDED BY

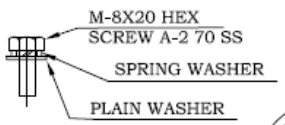
RDSO ELECT. DTE

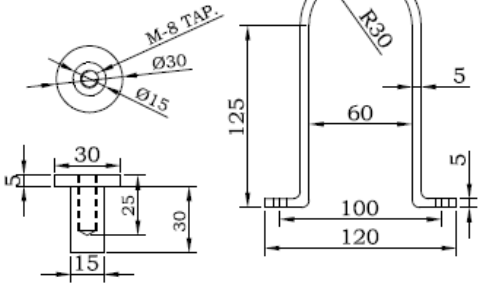
SKEL 4835, Alt. '0'

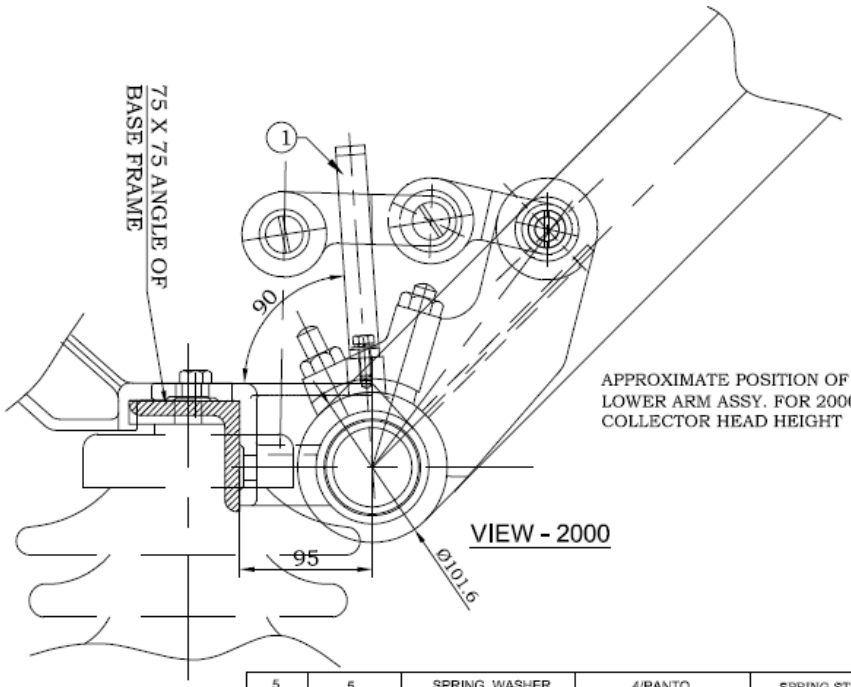
REVISION	DATE	DESCRIPTION

DT	25.08.10
D	VKYADAV
C	MCMAHANT









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SAFETY CLAMP & BOSS FOR SPRING CATCHER

FOR MANUFACTURERS

FIRST ISSUED

SUPERSEDES

SUPERSEDED BY

RDSO ELECT. DTE

SKEL 4836 Alt. '0'

REVISION	DATE	DESCRIPTION

DT	25.08.10
D	V.K.YADAV
C	M.C.MAHANT