Government of India
Ministry of Railway
Research Designs & Standards Organisation
Manak Nagar, Lucknow-226 011

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TECHNICAL CIRCULAR NO.: ELRS / TC / 0077

ADOPTION OF IMPROVED DESIGN OF NOTCHING SPRINGS FOR TAP CHANGER TYPE NO 32

1.0 Background

In the tap changer type NO32 manufactured and supplied by M/s. Bombardier Transportation for use in the conventional locomotives, the performance of the Notching Springs (OEM Pt. No. A2209), has not been satisfactory and failure of breakage of these notching springs have been reported from railways. Such breakage is normally detected during scheduled inspections. These springs are procured by Railways from the OEM only and replaced in every IOH.

The problem has been examined by the OEM and following probable causes were identified which could lead to the breakage of the notching springs:-

(i) Hydrogen embrittlement of the springs during the process of phosphate treatment &
(ii) High working stress

2.0 Improved Design of Notching Spring:

2.1 To avoid Hydrogen embrittlement of the spring during the process of phosphating, BT have started application of a corrosion protective solution on the spring surface.

2.2 Further In order to eliminate the suspect cause for failures of the notching springs due to high working stress, M/s.BT have changed the design of the notching springs. The new design of the notching spring has been manufactured from a wire of increased dia. of 2.0mm as against 1.8mm dia. wire used in the earlier design. Further, the spring dia. and the number of turns have also been increased. With these changes in the spring design the working stress level of the spring has been reduced from 52 kg/cm^2 to 41 kg/cm^2.

2.2.1 The improved design of the notching spring was finalised after endurance tests by M/s Bombardier Transportation and is expected to give improved performance.

3.0 Action to be taken by the Sheds / Shops

3.1 M/s BT has already cut in the new design of notching spring from tap changer type NO32 Sl.No.IB40C021730 onwards since October'2002. The scheduled replacement of these Notching springs is during IOH schedule.

3.2 Sheds / shops should replace the existing springs (OEM Pt. No. A2209) by these improved design of springs (OEM Pt. No. A2215) during IOH. While changing the old spring, the Strap (OEM Pt. No.2210) and Pin (OEM Pt. No. 2213) forming a part of the notching assembly will also need to be changed with a new Strap (OEM Pt. No.A2216) & a new Pin(OEM Pt. No. 2217) since the dimensions of these have also been modified to match the dimensional changes in the improved design of notching spring.

4.0 Reference Drawing

The reference drawing **RDSO SKEL No. 4668** giving details of the existing design as well as the improved design of the notching spring is enclosed.

5.0 Distribution

As per Mailing List.

(Arun Srivastava)
for Director General (Electrical)

Encl: As above.