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

No.EL/3.2.1 Dt 30.1.95

MODIFICATION SHEET NO. WAM4/185

CONVERSION OF TRANSFORMER TYPE BOT- 3460 TO TYPE HETT-3900

1. OBJECT OF MODIFICATION

1.1 Some of the earlier WAM4 locomotives have provision of 2S-3P combinationof its traction motors. In view of Indian Railways decission to connect the traction motor of these locomotives to 6p combination. it has become essential to modify the existing transformer BOT 3460 of these locomotives to provide no load voltage of 865 V as against earlier 1730 Volts.

1.2 Transformer type BOT 3460 consists of 24 coil discs in each of the two traction windings. 12 out of these 24 coils discs lies on lamb II for each traction winding and are connected in 2s- 6p combination. similarly other 12 coil discs on limb iii. these coil discs at each traction winding lying on limb II and limb iii are further connected in aeries to provide the desired no load voltage of 730 V. The existing connection arrangements need to be so modified that the required no load output voltage of 865-V are achieved without alterning the power output capacity of the traction windings.

1.3 In case the existing transformer type BOT 3460 is required to be rehabilitated and it involves replacement of auto- windings only. railway must replace them with HETT 3900 KVA type auto windings and organise the modifications indicated herein to achieve the traction winding output of 3900 KVA.

2. WORK TO BE CARRIED OUT

i) Untank the core coil assembly of the transformer type BOT-3460. Remove the transformer cover after unscrewing the 6 core supporting bolts and disconnect bushing terminals.

ii) Identify the 24 coil discs each of both the traction windings a3-a4 and a5-a6 indicated in RDSO drawing No. SK. EL. 4325 and Schematic Drawing No.4327 enclosed. Coil series 200-300 indicated in the drawing item limb II/III respectively.

iii) Disconnect the coil coupling leads of the two series connected coils on limb II and III of the two traction windings as shown in schemative drawing No. SK. EL. 4327.

iii) Braze suitable lugs on the dis-connected coil disc leads and insulate the junction of the coil disc lead and lug with half layer of cotton tape. Due care should be taken to avoid heat conduction and breakage of strands while brazing.

iv) Replace the existing 8 nos. of bus bars of size of the 5x50 mm of tracaction windings on which coil disc leads are connected with bus bar of size 8x50 mm having in ‘L’ clamp arrangement similar to HETT 3900 KVA type for the required inter- connectinos as indicated in RDSO drg. NO. SK. EL.-4326 enclosed. It is to be noted that in the process the supporting arrangement and length of a3 bus bar get changed similar to HETT type.

vi) Reconnect the coil discs in IS-12P combination on limb II for each traction winding. Similarly, the other coils disc on limb III to be connectd. The coil discs lying on limb II and limb III of each traction winding should further be connected in series as shown in RDSO drg. No. SK. EL. 4326 and Schematic Drawing No. SK. EL.-4328 enclosed.

vii) Provide 3 layer of 1.2 lap crepe paper on the naked bus bars.

viii) Cut the steel plate (welded to the tank cover) on which a3 -a4 and a5-a6 bushings are mounted and reweld new plate with holes suitable to accommodate 3.6 KV/3150 A bushings in line with HETT 3900 cover.

ix) Reconnect the a3-a4, a5-a6 traction winding leads to the terminals of new bushing. Retank the modified core coil assembly carry out the pressure tests in the each with the cover and new bushings.

3. APPLICATION TO CLASS OF LOCOMOTIVE

All locomotives having transformer type BOT-3460.

4. MATERIAL REQUIRED

i) 8 Nos. of HETT type traction winding bus bars of size 8x50 mm.

ii) Adequate No. of lugs.

iii) 4 Nos. of 3.6 KV/3150 Amp : bushing as per IS: 3347 Pt. II, Section 1 & 2.

iv) Steel plates of same thickness as tank cover for mounting the above bushing

v) Sufficient length of crepe paper and cotton tape.

5. MATERIAL RENDERED SURPLUS

i) 8 Nos. of 5x50 mm bus bars.

ii) 4 Nos. of 3.6 KV 1000 Amp. bushings.

iii) Steel plates.

iv) Some length of interconnecting leads.

6. REFERENCE

Dsicussions with transformer manufacturers.

7. MODIFICATION DRAWING

As per Annexure I & II

8. AGENCY OF IMPLEMENTATION

i) All Transformer repair Shops for AC electric locomotives.

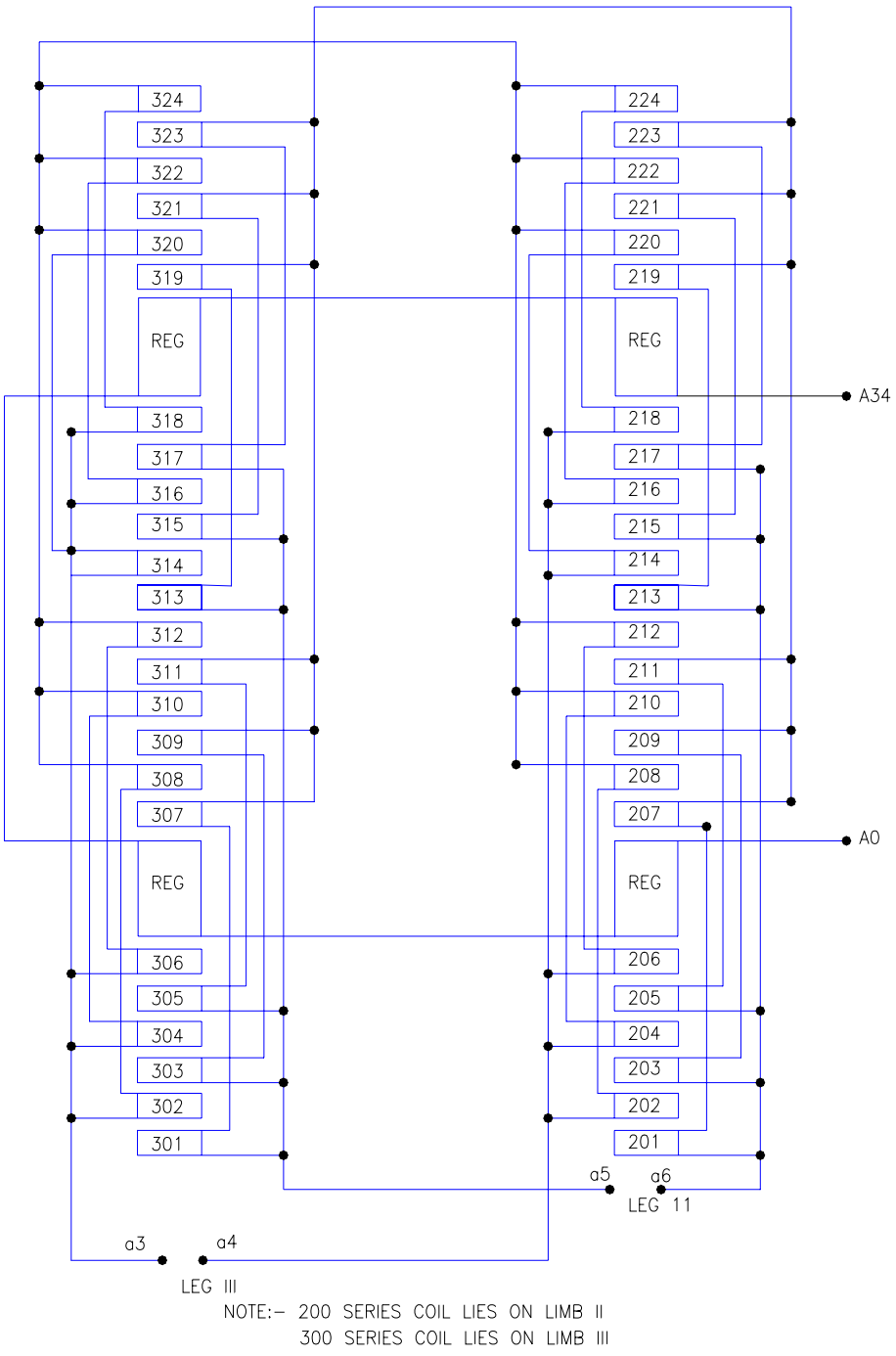
ii) All Transformer manufacutrers.

9. DISTRIBUTION

As per List enclosed.

Encl: As above

(R. N. LAL)
for Director General (Elect.)



NOTE:– 200 SERIES COIL LIES ON LIMB II
300 SERIES COIL LIES ON LIMB III

REF:– WAM4	185	SCALE:–	APPROVED BY:–

EXISTING INTER CONNECTION OF COILS IN BOT 3460 KVA TFPS

RDSO. ELEC. DTE.	SKEL 4325

Dt.	1.1.95
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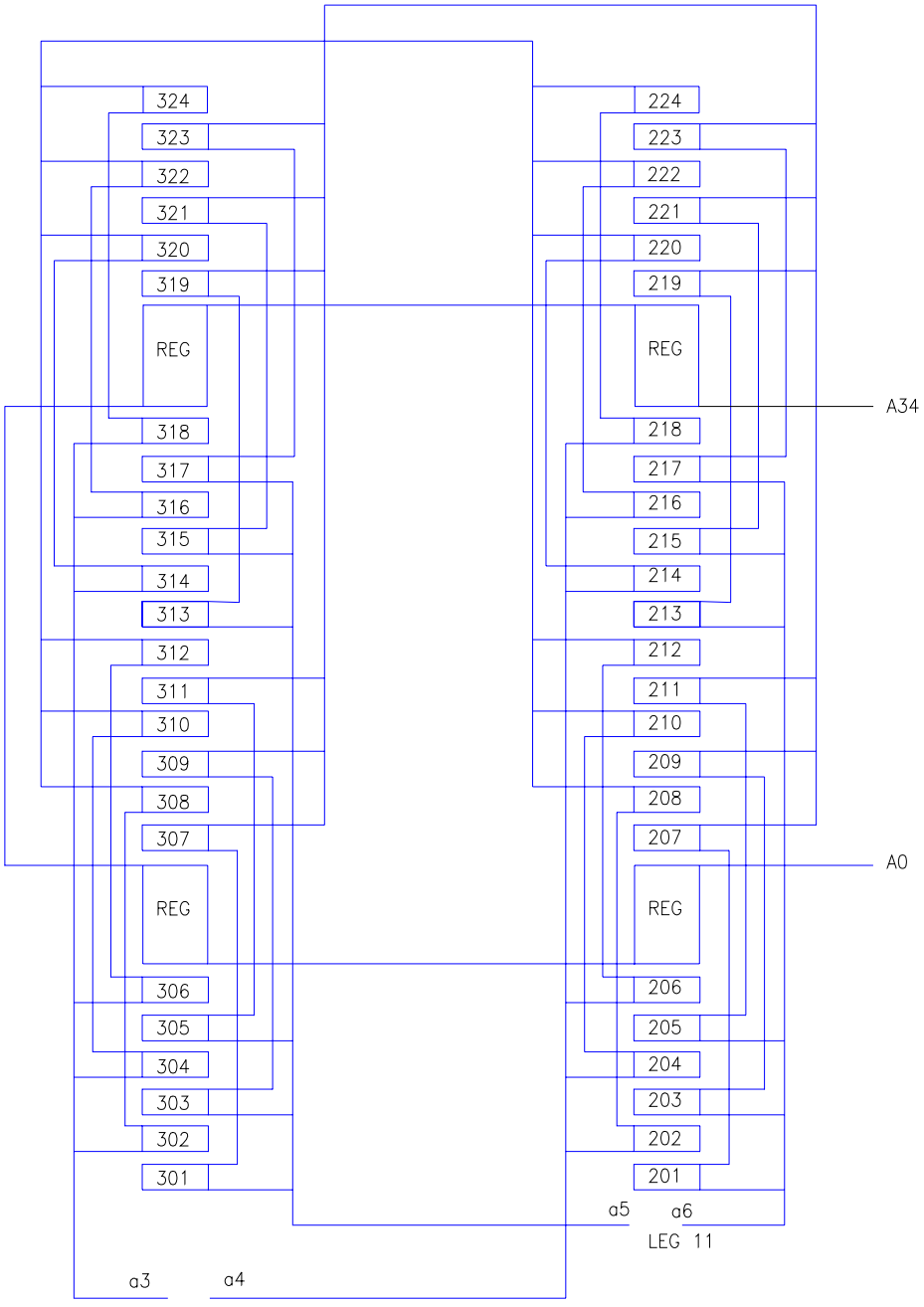

NOTE:– 200 SERIES COIL LIES ON LIHR 11
300 SERIES COIL LIES ON LIHR 111

REF:– WAM4	155	SCALE:–	APPROVED BY:–

EXISTING INTER CONNECTION OF COILS IN BOT 3460 KVA TFPS

RDSO. ELEC. DTE.	SKEL 4326

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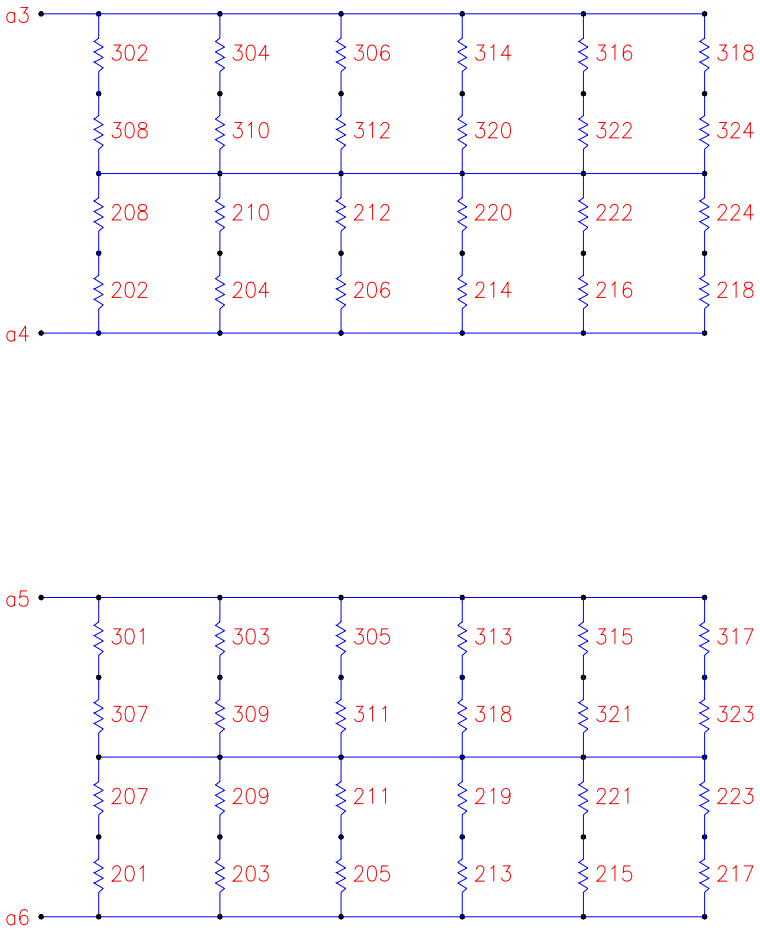

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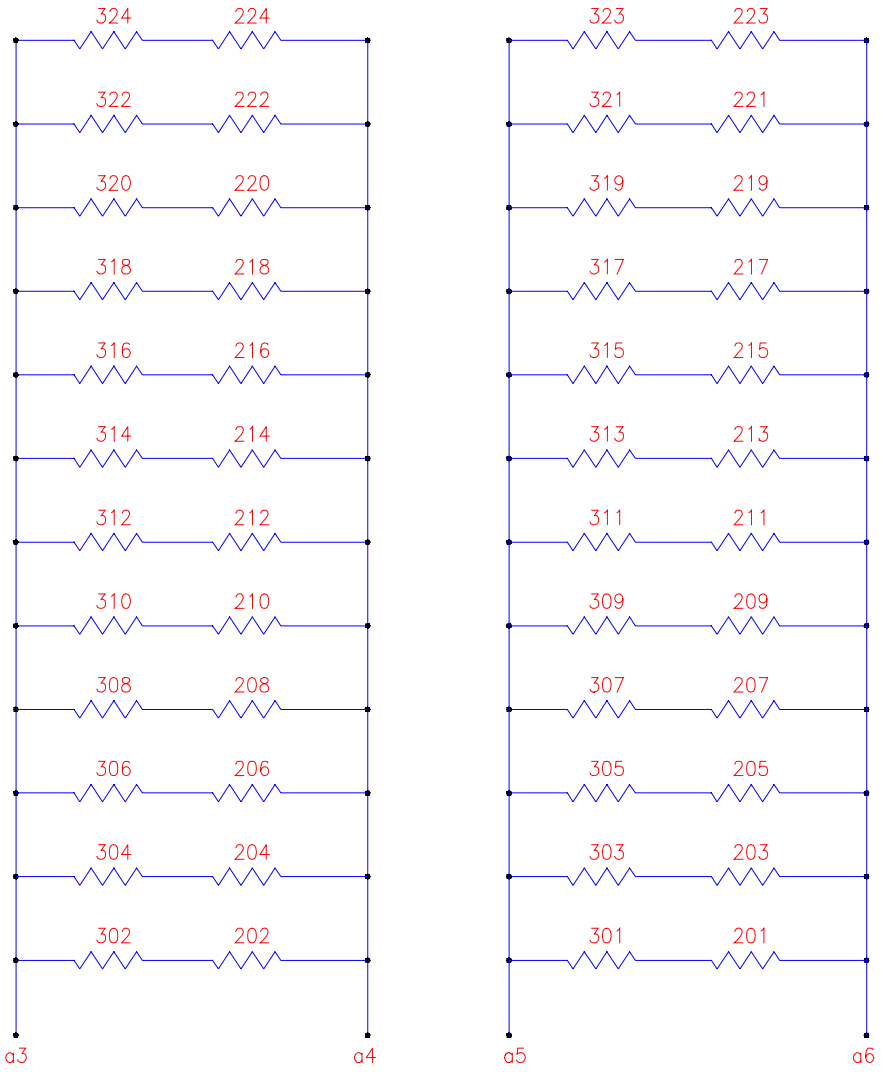
EXISTING SCHEMATIC INTERCONNECTION OF COILS IN BOT 3460 KVA TFPS

RDSO. ELEC. DTE.	SKEL–4327



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REF:– WAM 4 /185	SCALE:–	APPROVED BY:– FOR D.G.

PROPOSED SCHEMATIC INTERCONNECTION OF COILS IN BOT 3460 KVA TFPS

RDSO. ELEC. DTE.	SK.EL–4328