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भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ - 226011
Government of India-Ministry of Railways
Research Designs & Standards Organisation
LUCKNOW - 226011



TECHNICAL CIRCULAR NO. 35 Rev.1

No. EI/3.1.39 / 1

Dated 29.4.99

CHIEF ELECTRICAL ENGINEER,

- Central Railway, Mumbai CSTM-400 001
 - Eastern Railway, Fairlie Place, Calcutta-700 001
 - Northern Railway, Baroda House, New Delhi-110 001
 - Southern Railway, Park Town, Chennai-600 003
 - South-Eastern Railway, Garden Reach, Calcutta-700 043
 - Western Railway, Churchgate, Mumbai-400 020
 - South-Central Railway, Rail Nilayam, Secunderabad-500 371
 - Chittaranjan Locomotive Works, Chittaranjan-713 331
- Director, IRIEEN, Post Box No.233, Nasik Road, Nasik - 422101

Sub: Tractive Effort Values in Tonnes at Various Speeds of Electric Locomotive.

Technical Circular No. 35 on Tractive Effort values in tonnes for locomotive type WAM4, WAP1 & WAP4 at different speeds upto 120 kmph was issued on 15.1.99. During CELE's Conference in Calcutta on 22/23.3.99, the Railway desired that the tractive effort values of other locomotives should also be included. Accordingly the tractive effort values of all major electric locomotive is included in this circular for guidance of Railways. With this old T.C. No. 35 is superseded and to be replaced in your record by this T.C. No. 35 Rev.1.

Encl: Sheet 1/2 & 2/2

Copy to: Secretary (Elect.), Railway Board, Rail Bhavan, New Delhi-1


(Ramesh Chandra)
for Director General/Elect.

Encl:As above


(Ramesh Chandra)
for Director General/Elect.

REF: TECHNICAL CIRCULAR No. 35 Rev. 1
TRACTIVE EFFORT VALUES IN TONNES AT VARIOUS SPEEDS

SPEED KMPH	WAM4 (2S- 3P) 667A Cont. WF4 GR 15:62 (TM-TAO-659)	WAM4 (2S- 3P) 667A Cont. WF2 GR 15:62 (TM- TAO-659)	WAP1/WAP3 750A Cont. WF4 GR 21:58 (TM- TAO-659)	WAP1 750A Cont. WF4 GR 23:58 (TM- Hitachi)	WAP4 900A Cont. WF4 GR 23:58 (TM- Hitachi)
0	32.2	32.2	22.4	30.6	30.8
10	17.6	17.6	13.8	15.0	18.8
20	17.6	17.6	13.8	15.0	18.8
30	17.6	17.6	13.8	15.0	18.8
40	17.6	17.6	13.8	15.0	18.8
50	17.6	17.6	13.8	15.0	18.8
60	16.4	16.4	13.8	15.0	18.8
70	14.0	14.0	13.8	14.6	18.8
80	12.5	10.5	13.0	12.8	17.2
90	11.2	8.2	11.6	11.5	15.4
100	9.4	6.6	10.5	10.4	13.8
110	7.8	5.5	9.5	9.3	12.6
120	-	-	8.5	8.4	11.4
130	-	-	7.4	7.0	9.0
140	-	-	6.6	6.0	7.5
150	-	-	5.7	-	-
160	-	-	5.0	-	-

* with BOT 3460 TEF

@ with HETT3900 TEF

Note: WAP1 with TAO-659TM and flexicoil mark I is cleared for 130 kmph.
WAP3 with TAO-659TM and flexicoil mark IV bogies is cleared for 160 kmph

REF: TECHNICAL CIRCULAR No. 35 Rev. 1 (Continued)
TRACTIVE EFFORT VALUES IN TONNES AT VARIOUS SPEEDS

SPEED KMPH	WAP4 960A 1 hr. WF4 GR 23:58 (TM- Hitachi)	WAP5 370A Cont. GR 17:67 (TM- 6FXA7059) 3- Phase	WAP7 270A Cont. GR 20:72 TM- 6068 3-Phase	WAM4P 667A Cont. WF4 GR 21:58 (TM- TAO 659) *	WAM4(6P) 750A Cont. WF4 GR 21:58 (TM- TAO 659) @
0	30.8	26.3	32.8	22.4	22.4
10	20.6	22.4	23.2	11.6	13.8
20	20.6	22.4	23.2	11.6	13.8
30	20.6	22.4	23.2	11.6	13.8
40	20.6	22.4	23.2	11.6	13.8
50	20.6	22.4	23.2	11.6	13.8
60	20.6	21.2	23.2	11.6	13.8
70	20.6	18.8	23.2	11.6	13.8
80	18.6	18.3	20.6	11.6	13.0
90	16.0	16.3	18.3	11.0	11.6
100	14.6	14.5	16.5	9.8	10.5
110	13.2	13.4	15.0	9.0	9.5
120	11.4	12.2	13.7	-	-
130	9.0	11.1	12.7	-	-
140	7.5	10.6	11.8	-	-
150	-	9.6	-	-	-
160	-	9.1	-	-	-

REF: TECHNICAL CIRCULAR No. 35 Rev. 1
Tractive Effort Values In Tonnes At Various Speeds of Electric Locomotives

SPEED KMPH	WAG5 750 A Cont. WF4 GR 15:62 TM(TAO- 659)	WAG5 750 A Cont. WF3 GR 18:64 TM(Hitachi)	WAG7 900A Cont. WF4 GR 16:65 TM(Hitachi)	WAG9 270A Cont. GR 15:77 TM 6068 (3-Phase)
0	33.6	37.8	44.0	46.8
10	20.6	21.0	30.8	33.1
20	20.6	21.0	30.8	33.1
30	20.6	21.0	30.8	33.1
40	20.6	21.0	30.8	33.1
50	20.6	18.4	27.0	33.1
60	17.0	12.6	22.6	27.5
70	13.8	9.0	19.5	23.7
80	10.6	6.4	14.6	20.6
90	8.0	-	10.8	18.3
100	6.6	-	7.6	16.6
105	5.6	-	-	-
110	-	-	-	-
120	-	-	-	-

REF: TECHNICAL CIRCULAR No. 35 Rev. 1
Tractive Effort Values In Tonnes At Various Speeds of Electric Locomotives

SPEED KMPH	WCAM2 840A Cont. WF4 GR 15:62 TM(TAO-659)		WCAM3 900A Cont. WF3 GR 18:64 TM(Hitachi)		WCAG1 900A Cont. WF3 GR 16:65 (TM- Hitachi)	
	AC	DC	AC	DC	AC	DC
0	33.4	26.0	41.0	26.8	44.0	30.0
10	23.8	24.6	26.8	26.8	30.8	30.0
20	23.8	24.6	26.8	24.4	30.8	30.0
30	23.8	24.6	26.8	22.8	30.8	30.0
40	23.8	20.2	26.8	21.8	30.8	30.0
50	23.8	13.2	26.8	20.8	27.0	24.0
60	21.2	8.8	22.2	20.4	22.6	17.2
70	18.8	6.2	17.6	14.4	16.0	11.5
80	13.8	4.6	12.2	10.4	11.8	8.4
90	10.5	3.2	9.4	8.0	8.8	6.4
100	8.4	2.1	7.2	6.2	6.4	4.6
105	7.6	1.8	6.6	5.4	-	-
110	6.8	-	-	-	-	-
120	5.6	-	-	-	-	-