



INDIAN RAILWAYS

TRACK MACHINES DIGEST

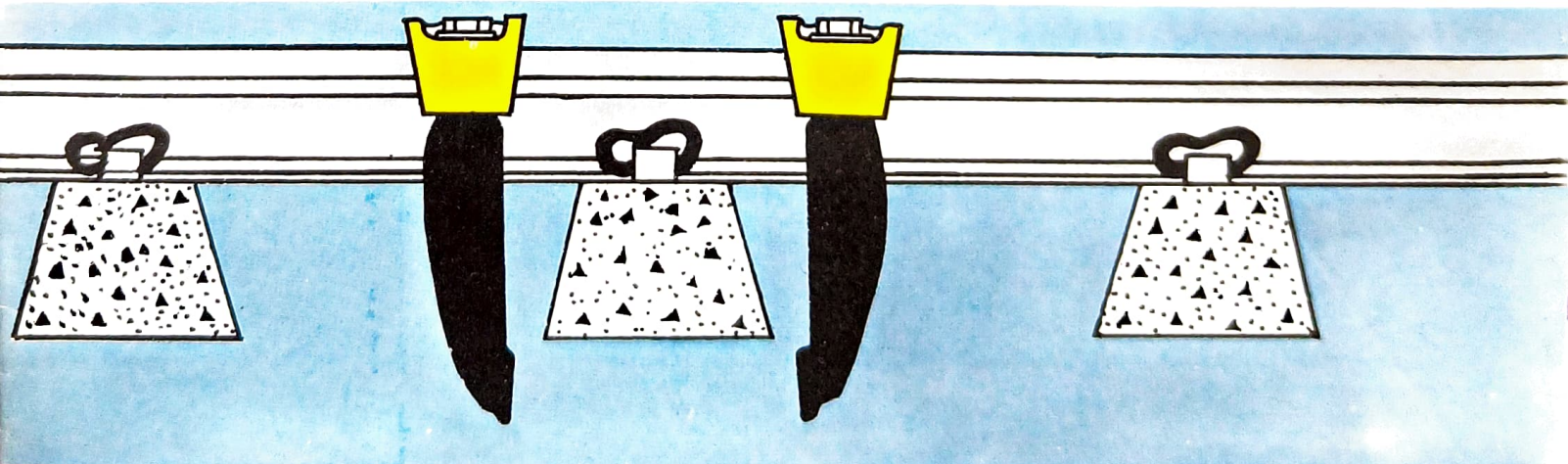
भारतीय रेलपथ मशीन डायजेस्ट

YEAR - 5

ISSUE-18

QUARTERLY

NOVEMBER - 1998



DO YOU KNOW THAT P. WAY PERSONNELS NEED TRAINING ON MACHINES IF THEY CAN NOT ANSWER THE FOLLOWING QUESTIONS

GENERAL:

1. Why tamping machines are deployed ?
2. What tamping machines does ?

By Manohar Singh

Principal, IRTMTC, Allahabad.

LEVELLING:

3. What is difference between proportional levelling and designed levelling?
4. Which line is kept as base line in Strg. track and curved track ?
5. How G. lift is decided in Str. Track ?
 - (a) If base line is higher line ?
 - (b) If base line is lower line ?
6. How G. lift is decided in curved track ?
 - (a) If existing S.E. is less than equilibrium S.E.
 - (b) If existing S.E. is more than equilibrium S.E.
7. What should be direction of cant selector switch in reference to base line ?
8. What defect will be created in track in trans, curve if cant selector switch does not co-relate with base line in Str. and curved track ?
9. How cant provided with machines ?
 - (a) Simple curve with transitions?
 - (b) Compound curve with common transition ?
 - (c) Reverse curve with zero str. in between, in method No. 1 & method No. 2 mentioned in P. Way manual for running out of S.E. in these types of curves ?
10. How to adjust G. lift if required ?
11. How the S.E. is to written in transitions so that track at change of cant gradient is not disturbed ?
12. What is bad effect on track if machine is not

properly calibrated and front tower is not working in auto mode ?

13. What is the principle of correction of longitudinal levels and cross levels ?
 - a) Does proportional elevelling removes long sags.

DESIGN LEVELLING:

14. How target levels are arrived at base line for designed levelling ?
15. How target beight is fixed at good points ?
16. What type of longitudinal defects are removed in design levelling and proportional levelling ?
17. What feeding is to be done for correcting the approaches of fixed structures ?
18. How vertical curves are to be negotiated ?
19. What is K. value. How it is to be fed in transition and circular curve ?
20. What is the difference in writing of S.E. on sleepers with CSM-09 machine and other models of TT/Machines.
21. What is had effect of extra lifting on track ?

LINING:

1. What are different types of lining system on Plasser's TT Machines ?
2. What is the difference between. Four points and three points lining ?
3. What is the geometric principal of four points and 3 points lining ?

4. What is difference between four points and three points lining ?
5. which system of alignment is better for proportional lining ?
6. Which system is better for designed lining ?
7. Why in practice curves in 3 point lining are not aligned ?
8. Why you do three point lining in straight track and open four points in a curve ?
9. Why goose necks are created at start and exist of curves in case of sharp curves in four point lining.
10. Do-you know additional versines has to be calculated from tables and are to be fed in versine potentiometer to avoid these goose neck in proper direction.
11. Do-you know that machine can also align, curve track in three point lining if theoretical versines are calculated for transition and circular portion.
12. Why machine can not remove false curve in proportional system of alignment.
13. How it is removed in designed alignment ?
14. How slews are calculated in str. and curved track for alignment by machines ?
15. How these slews are marked on sleepers ?
16. At what interval designed levels and slews are to be marked ?
17. Why it is essential to locate and mark zero slews stations ? While lining with machine.

of sleepers and it should be same for both of the units under load.

3. Do you know that compaction of crib ballast is must before the passage of train at normal speed. If compaction is not done first few trains should be passed at rolling speed for uniform settlement ?
4. Do you know that compacted base under the sleeper should be in pyramid shape ?
5. Do you know that G. lift in proportional levelling is not the clear Index of lift for the sleeper being tamped. The lift at this point will depend on track condition in ref. to rear and front feeler at the time of tamping. It can be lifted more than G. lift or less than G. lift, to create the desired relation of smoothing ?
6. Do you know that size of tamping tools blade and its shape effects the uniformity of compaction under the sleeper ?
7. do you know clean cushion and proper profile of ballast section is the birth right of tamping machine to give you quality output.

It is requested that training of P. Way staff for feeding of soft were data to machine "is must" for quality output. For last 30 years machine are being run at random and the parameter of efficiency is only No. of sleepers being tamped. So controlling officers are requested to depute the staff in these courses.

For the benefit of P. Way personnels the IRTMTC has designed the following courses for officer and subordinate staff.

OTHER POINTS:

1. do you know, that machine and track are both damaged if machine is deployed on hard bed ?
2. Do you know optimum frequency of vibration should not fall below 30 HTZ for proper packing

1. CE-51 FOR IRSE Probationers.
2. CE-50 For Promotee Officers (DEN/AEN)
3. CE-49 Sectional Engineer
4. CE-09 P.W.S.

The details of courses being conducted in IRTMTC in this year is as below:

1.	CE-51	Track Machine Induction FOR IRSE (P).	IRSE (P)	02	1 1/2W	Concluded
2.	CE-50	Track Machine Induction for Promoted AEN/DEN	Promoted AEN/DEN	04	1W	Concluded
3.	CE-09	Track Machine Induction for P. Way Supervisors.	Working P.W.S.	27	1W	In Progress 30.11.98 to 27.3.99 every Monday to saturday.
4.	CE-49	Track Machines Induction of JE-I-II/Section Engineer/ Sr. Section Engineer.	JE-I/II SE/SSE	19	1W	conducted. —do—
5.	4-SPL.	Machine Interaction course for P. Way & M/C Staff	JE-I/II/SE/SSE	25	1W	In progress 2.11.98 to 24.04.98 Every Monday to SAT.

HOW TO REACH IRTMTC:

Training Centre is situated in healthy and pleasant surrounding over 6 Hectares of land adjoining I.O.C. Bulk Terminal, I.O.C. Bottling Plant and 1.5 Km. west of Subedarganj Railway Station and 7.5 K., from Allahabad Station on Allahabad-Kanpur line. It can be approached by road conveniently as few unimportant trains stop at Subedarganj Railway station and public conveyance is not available at this station.

It is advisable to get down at Allahabad Railway Station and come to the exisit of Platform No. 1 where you will get either Institute vehicle (Matador No. UGH-301) in front of officer's Rest House or public conveyance which is available on main road and get down at Dhoomanjang Police Station crossing. The training centre is 1 Km. from this crossing on Pipalgaon Road. The Conveyance like Tempo, Cycle rickshaw are available.

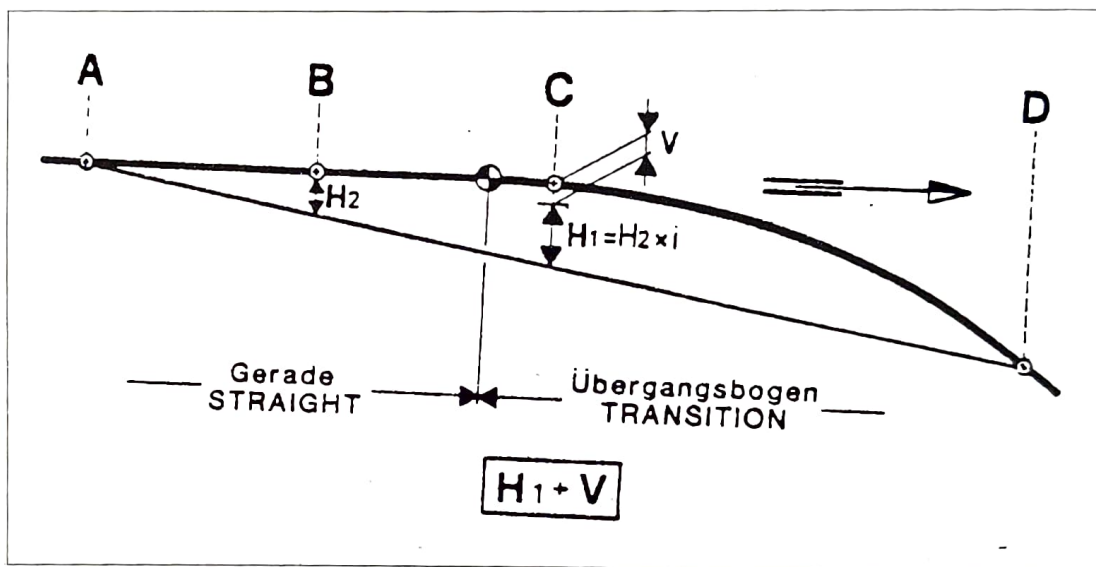
CORRECTION VALUE SPL. IN FOUR-POINT LINING IN CURVES i.e. (Vm VALUES)

By. Manohar Singh
Principal/IRTMTTC/ALD.

The modern machines of M/S Plasser and Theurer are equipped with single chord lining system. The principle of four point lining applies to curves of regular radius i.e. straight and circular. This principle does not hold good for transition curves as there is change in curvature. The machine will disturb the cubic parabola profile of transition, and goose necks will be formed at entry and exit of transitions in case of sharp curves; to avoid it certain additional correction valves has to be applied at lining bogie through versine

2. When machine enters from smaller radius to bigger radius; the direction of feeding will be toward inner rail.

These valves are picked up from adjusting table of corresponding machine on the basis of length of transition in meters and radius of curves in meters, the picked up values are in mm (The tables are at page No. 7 to 11) This is the max adjustment valves in machine lining base.



potentiometer in front cabin in proper direction. These valves may be called as Vm Valves and the cut off point at lining point will remain in cubic parabola profile.

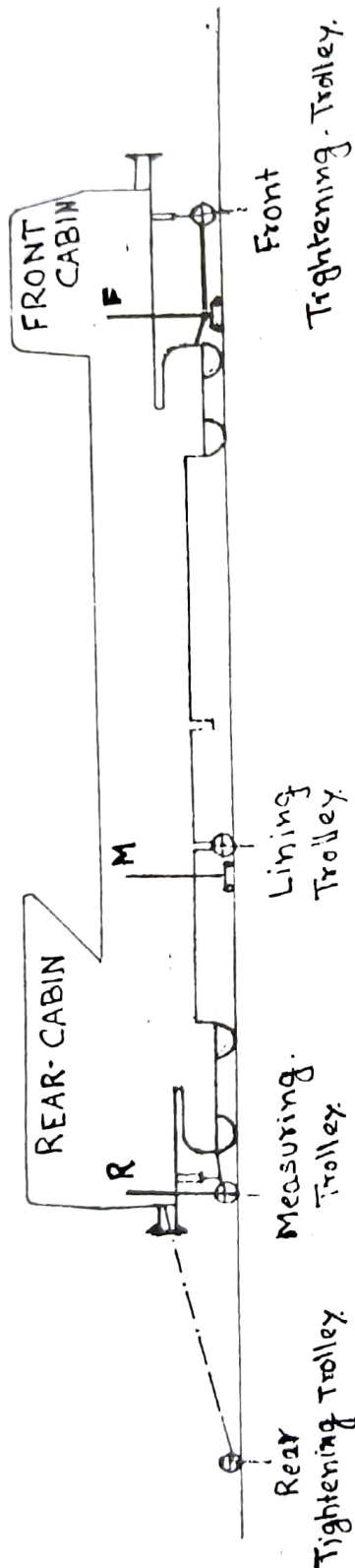
THUMB PULE FOR FEEDING DIRECTION OF Vm VALVES:

1. When machine enters from Bigger radius to smaller radius, the direction of feeding will be towards outer rail.

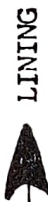
These valves are increased or decreased at charge points of curvature i.e. at TTP & CTP in machine lining base, and remains constant in remaining portion of transition. the pattern of distribution can be had from corresponding table of the machine at page No. 12 to 18.

The direction feeding can be had for different types of curves at page No. 19 to 23.

:- ARRANGEMENT OF LINING SYSTEM :-



DIRECTION OF WORK



LEVELLING



S.N. POS	08 DUO/UNO Mt.	08 UNI-2S Mt.	08 UNI-3S Mt.	09 CSM Mt.	MP-2000 Mt.
1. AD	20.00	20.6	22.60	20.75	21.4
2. AC	10.00	10.00	9.78	10.60	10.4
3. AB	5.00	5.00	4.20	6.00	5.00
4. CD	10.00	10.60	12.82	10.05	11.00
5. BC	5.00	5.00	5.58	4.70	5.4
6. BD	15.00	15.6	18.40	14.75	16.40
VERSINE RATIO	1.33333	1.35897	1.62241	1.21571	1.395122
ERROR REDUCTION FACTOR	6.00	6.42720	7.61997	6.27692	6.2493

S.N.	Dist	08 DUO/UNO	08 UNI-2S	08 UNI-3S	09 CSM	MP-2000
1	RM	4.04	3.32	4.85	3.90	5.10
2	MF	9.64	8.99	10.73	8.90	9.05
3	RF	13.68	12.21	15.58	12.30	14.15
4	LIFTING RATIO	3.326	3.678	3.212	3.232	2.775

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	R/L																			
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08 – UNIMAT - 2S																				
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08 – UNIMAT - 3S

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600	10	8	6	6	5	4	4	4	3	3	3	3	2	2	2	1	1	1	1	
650	9	7	6	5	4	4	4	3	3	3	3	2	2	2	1	1	1	1	1	
700	8	7	6	5	4	4	3	3	3	3	2	2	2	2	1	1	1	1	1	
750	8	6	5	4	4	3	3	3	3	2	2	2	2	2	1	1	1	1	1	
800	7	6	5	4	4	3	3	3	2	2	2	2	2	1	1	1	1	1	1	
850	7	5	5	4	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1	
900	6	5	4	4	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1	
1000	6	5	4	3	3	3	2	2	2	2	2	2	2	1	1	1	1	1	1	
1500	4	3	3	2	2	2	1	1	1	1	1	1	1	1	1	1	0	0	0	
2000	3	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	
3000	2	2	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	
3500	2	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	
4000	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	
4500	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	
5000	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
6000	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7000	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8000	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

MP – 2000																					
V = max		102960					AD = 21.40					AC = 10.4 m					AB = 5.00 m				
R*L																					
Meter	R/L	20	25	30	35	40	45	50	55	60	65	70	75	80	100	120	140	160	180	200	220
120	43	34	29	25	21	19	17	16	14	13	12	11	11	11	9	7	6	5	5	4	4
130	40	32	26	23	20	18	16	14	13	12	11	11	10	10	8	7	6	5	4	4	4
140	37	29	25	21	18	16	15	13	12	11	11	10	9	9	7	6	5	5	4	4	3
150	34	27	23	20	17	15	14	12	11	11	10	9	9	9	7	6	5	4	4	3	3
160	32	26	21	18	16	14	13	12	11	10	9	9	8	8	6	5	5	4	4	3	3
170	30	24	20	17	15	13	12	11	10	9	9	8	8	8	6	5	4	4	3	3	3
180	29	23	19	16	14	13	11	10	10	9	8	8	7	7	6	5	4	4	3	3	3
190	27	22	18	15	14	12	11	10	9	8	8	7	7	7	5	5	4	3	3	3	2
200	26	21	17	15	13	11	10	9	9	8	7	7	7	6	5	4	4	3	3	3	2
220	23	19	16	13	12	10	9	9	8	7	7	7	6	6	5	4	3	3	3	2	2
240	21	17	14	12	11	10	9	8	7	7	6	6	6	5	4	4	3	3	2	2	2
260	20	16	13	11	10	9	8	7	7	6	6	5	5	5	4	3	3	2	2	2	2
280	18	15	12	11	9	8	7	7	6	6	5	5	5	5	4	3	3	2	2	2	2
300	17	14	11	10	9	8	7	6	6	5	5	5	5	4	3	3	2	2	2	2	2
320	16	13	11	9	8	7	6	6	5	5	5	5	4	4	3	3	2	2	2	2	1
340	15	12	10	9	8	7	6	6	5	5	4	4	4	4	3	3	2	2	2	2	1
360	14	11	10	8	7	6	6	5	5	4	4	4	4	4	3	2	2	2	2	1	1
380	14	11	10	8	7	6	5	5	5	4	4	4	4	3	3	2	2	2	2	1	1
400	13	10	9	7	6	6	5	5	4	4	4	4	3	3	3	2	2	2	1	1	1
420	12	10	8	7	6	5	5	4	4	4	4	4	3	3	2	2	2	2	1	1	1
440	12	9	8	7	6	5	5	4	4	4	4	3	3	3	2	2	2	1	1	1	1
460	11	9	7	6	6	5	4	4	4	4	3	3	3	3	2	2	2	1	1	1	1
480	11	9	7	6	5	5	4	4	4	4	3	3	3	3	2	2	2	1	1	1	1
500	10	8	7	6	5	5	4	4	4	3	3	3	3	3	2	2	1	1	1	1	1
520	10	8	7	6	5	4	4	4	4	3	3	3	3	2	2	2	1	1	1	1	1
540	10	8	6	5	5	4	4	4	3	3	3	3	3	2	2	2	1	1	1	1	1
560	9	7	6	5	5	4	4	4	3	3	3	3	2	2	2	2	1	1	1	1	1
580	9	7	6	5	4	4	4	4	3	3	3	3	2	2	2	1	1	1	1	1	1
600	9	7	6	5	4	4	4	3	3	3	3	2	2	2	2	1	1	1	1	1	1
650	8	6	5	5	4	4	4	3	3	3	2	2	2	2	2	1	1	1	1	1	1
700	7	6	5	4	4	4	3	3	3	2	2	2	2	2	1	1	1	1	1	1	1
750	7	5	5	4	3	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1	1
800	6	5	4	4	3	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1	1
850	6	5	4	3	3	3	3	2	2	2	2	2	2	2	1	1	1	1	1	1	1
900	6	5	4	3	3	3	3	2	2	2	2	2	2	1	1	1	1	1	1	1	1
950	5	4	4	3	3	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1
1000	5	4	3	3	3	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	0
1500	3	3	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
2000	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
2500	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	0	0
3000	2	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
3500	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
4000	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
4500	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5000	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6000	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7000	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8000	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

08 - DUO - UNO

V_m - VALUES

→ STRAIGHT - TRN - CURVE

→ CURVE - 1 TRN - CURVE - 2

CURVE - TRANSITION - STRAIGHT ←

CURVE - 1 TRANSITION - CURVE - 2 ←

	20	15.5	14.2	13.2	12.4	11.5	10.6	9.6	8.4	6.6	0 ←
Meter	0	7.0	8.9	10.2	10.8	12.2	13.0	13.9	14.9	16.2	20
	→										
V	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
2	0	0	0	1	1	1	1	1	2	2	2
4	0	0	1	1	2	2	2	3	3	4	4
6	0	1	1	2	2	3	4	4	5	5	6
8	0	1	2	2	3	4	5	6	6	7	8
10	0	1	2	3	4	5	6	7	8	9	10
12	0	1	2	4	5	6	7	8	10	11	12
14	0	1	3	4	6	7	8	10	11	13	14
16	0	2	3	5	6	8	10	12	13	14	16
18	0	2	4	5	7	9	11	13	14	16	18
20	0	2	4	6	8	10	12	14	16	18	20
22	0	2	4	7	9	11	13	15	18	20	22
24	0	2	5	7	10	12	14	17	19	22	24
26	0	3	5	8	10	13	16	18	21	23	26
28	0	3	6	8	11	14	17	20	22	25	28
30	0	3	6	9	12	15	18	21	24	27	30
32	0	3	6	10	13	16	19	23	26	29	32
34	0	3	7	10	14	17	20	24	27	31	34
36	0	4	7	11	14	18	22	25	29	32	36
38	0	4	8	11	15	19	23	27	30	34	38
40	0	4	8	12	16	20	24	28	32	36	40
42	0	4	8	13	17	21	25	29	34	38	42
44	0	4	9	13	18	22	26	31	35	40	44
46	0	5	9	14	18	23	28	32	37	41	46
48	0	5	10	14	19	24	29	34	38	43	48
50	0	5	10	15	20	25	30	35	40	45	50

Vm-VALUES
STRAIGHT TRANSITION CURVE
CURVE - 1 TRANSITION - CURVE - 2
09 - C.S.M.
ADJUSTMENT FROM FRONT CABIN

METER	2	4	6	8	9	10	11	12	13	14	15	17	19	20.8
V	.0	.0	.1	.2	.2	.3	.4	.5	.7	.8	.9	.1	.1	.1
2	0	0	0	0	0	1	1	1	1	2	2	2	2	2
4	0	0	0	1	1	1	2	2	3	3	3	4	4	4
6	0	0	0	1	1	2	3	3	4	5	5	6	6	6
8	0	0	1	1	2	3	3	4	5	6	7	8	8	8
10	0	0	1	2	2	3	4	5	7	8	9	10	10	10
12	0	0	1	2	3	4	5	7	8	9	10	12	12	12
14	0	0	1	2	3	5	6	8	9	11	12	13	14	14
16	0	0	1	3	4	5	7	9	11	12	14	15	16	16
18	0	0	1	3	4	6	8	10	12	14	15	17	18	18
20	0	0	1	3	5	6	9	11	13	15	17	19	20	20
22	0	0	2	4	5	7	9	12	15	17	19	21	22	22
24	0	0	2	4	6	8	10	13	16	18	21	23	24	24
26	0	1	2	4	6	8	11	14	17	20	22	25	26	26
28	0	1	2	5	7	9	12	15	18	22	24	27	28	28
30	0	1	2	5	7	10	13	16	20	23	26	29	30	30
32	0	1	2	5	8	10	14	17	21	25	27	31	32	32
34	0	1	2	6	8	11	15	18	22	26	29	33	34	34
36	0	1	3	6	8	12	15	20	24	28	31	35	36	36
38	0	1	3	6	9	12	16	21	25	29	33	36	38	38
40	0	1	3	7	9	13	17	22	26	31	34	38	40	40
42	0	1	3	7	10	14	18	23	28	32	36	40	42	42
44	0	1	3	7	10	14	19	24	29	34	38	42	44	44
46	0	1	3	8	11	15	20	25	30	35	39	44	46	46
48	0	1	3	8	11	15	21	26	32	37	41	46	48	48
50	0	1	3	8	12	16	21	27	33	38	43	48	50	50
52	0	1	4	9	12	17	22	28	34	40	45	50	52	52
54	0	1	4	9	13	17	23	29	36	41	46	52	54	54
56	0	1	4	9	13	18	24	30	37	43	48	54	56	56
58	0	1	4	10	14	19	25	32	38	45	50	56	58	58
60	0	1	4	10	14	19	26	33	40	46	51	58	60	60
62	0	1	4	10	15	20	26	34	41	48	53	60	62	62
64	0	1	4	11	15	21	27	35	42	49	55	61	64	64
66	0	1	5	11	15	21	28	36	44	51	56	63	66	66
68	0	1	5	11	16	22	29	37	45	52	58	65	68	68
70	0	1	5	12	16	23	30	38	46	54	60	67	70	70
72	0	1	5	12	17	23	31	39	48	55	62	69	72	72
74	0	2	5	12	17	24	32	40	49	57	63	71	74	74
76	0	2	5	13	18	24	32	41	50	58	65	73	76	76
78	0	2	5	13	18	25	33	42	52	60	67	75	78	78
80	0	2	6	13	19	26	34	43	53	61	68	77	80	80

Vm-VALUES
 CURVE TRANSITION STRAIGHT
 CURVE - 1 TRANSITION - CURVE - 2
 09 - C.S.M.
 ADJUSTMENT FROM FRONT CABIN

METER	2	4	6	8	9	10	11	12	13	14	15	17	19	20.8
V	1	1	.9	.8	.8	.7	.6	.5	.3	.2	.1	.0	.0	.0
2	2	2	2	2	2	1	1	1	1	0	0	0	0	0
4	4	4	4	3	3	3	2	2	1	1	1	0	0	0
6	6	6	6	5	5	4	3	3	2	1	1	0	0	0
8	8	8	7	6	6	5	5	4	3	2	1	0	0	0
10	10	10	9	8	8	7	6	5	4	3	2	0	0	0
12	12	12	11	10	9	8	7	6	5	3	2	1	0	0
14	14	14	13	12	11	9	8	7	5	4	2	1	0	0
16	16	16	15	13	12	11	9	7	6	4	3	1	0	0
18	18	18	17	15	14	12	10	8	6	5	3	1	0	0
20	20	20	19	17	15	14	11	9	7	5	3	1	0	0
22	22	22	20	18	17	15	13	10	7	5	3	1	0	0
24	24	24	22	20	18	16	14	11	8	6	3	1	0	0
26	26	25	24	22	20	18	15	12	9	6	4	1	0	0
28	28	27	26	23	21	19	16	13	10	6	4	1	0	0
30	30	29	28	25	23	20	17	14	10	7	4	1	0	0
32	32	31	30	27	24	22	18	15	11	7	5	1	0	0
34	34	33	32	28	26	21	19	16	12	8	5	1	0	0
36	36	35	33	30	28	24	21	16	12	8	5	1	0	0
38	38	37	35	32	29	26	22	17	13	9	5	2	0	0
40	40	39	37	33	31	27	23	18	13	9	6	2	0	0
42	42	41	39	35	32	28	24	19	14	10	6	2	0	0
44	44	43	41	37	34	30	25	20	15	10	6	2	0	0
46	46	45	43	38	35	31	26	21	16	11	7	2	0	0
48	48	47	45	40	37	33	27	22	16	11	7	2	0	0
50	50	49	47	42	38	34	29	23	17	12	7	2	0	0
52	52	51	48	43	40	35	30	24	18	12	7	2	0	0
54	54	53	50	45	41	37	31	25	18	13	8	2	0	0
56	56	55	52	47	43	38	32	26	19	13	8	2	0	0
58	58	57	54	48	44	39	33	26	20	13	8	2	0	0
60	60	59	56	50	46	41	34	27	20	14	9	2	0	0
62	62	61	58	52	47	42	36	28	21	14	9	2	0	0
64	64	63	60	53	49	43	37	29	22	15	9	3	0	0
66	66	65	61	55	51	45	38	30	22	15	10	3	0	0
68	68	67	63	57	52	46	39	31	23	16	10	3	0	0
70	70	69	65	58	54	47	40	32	24	16	10	3	0	0
72	72	71	67	60	55	49	41	33	24	17	10	3	0	0
74	74	72	69	62	57	50	42	34	25	17	11	3	0	0
76	76	73	71	63	58	52	44	35	26	18	11	3	0	0
78	78	76	73	65	60	53	45	36	26	18	11	3	0	0
80	80	78	74	67	61	54	46	37	27	19	12	3	0	0

Vm-VALUES
STRAIGHT TRANSITION CURVE
CURVE - 1 TRANSITION - CURVE - 2
08 - UNIMAT - 2S

ADJUSTMENT FROM FRONT CABIN:

METER 2	4	6	8	9	10	11	12	12	14	15	16	18	20	20.6
V	.0	.0	.1	.2	.2	.3	.4	.5	.6	.7	.8	.9	.1	.1
2	0	0	0	0	0	1	1	1	1	1	2	2	2	2
4	0	0	0	1	1	1	2	2	2	3	3	4	4	4
6	0	0	0	1	1	2	2	3	4	4	5	5	6	6
8	0	0	1	1	2	2	3	4	5	6	7	7	8	8
10	0	0	1	2	2	3	4	4	6	7	8	9	10	10
12	0	0	1	2	3	4	5	6	7	9	10	11	12	12
14	0	0	1	2	3	4	5	7	9	10	12	13	14	14
16	0	0	1	2	3	5	6	8	10	12	13	14	16	16
18	0	0	1	3	4	5	7	9	11	13	15	16	18	18
20	0	0	1	3	4	6	8	10	12	15	17	18	20	20
22	0	0	1	3	5	6	9	11	14	16	18	20	22	22
24	0	0	2	4	5	7	9	12	15	18	20	22	24	24
26	0	0	2	4	6	8	10	13	16	19	22	24	26	26
28	0	1	2	4	6	8	11	14	17	20	23	25	28	28
30	0	1	2	5	6	9	12	15	19	22	25	27	29	30
32	0	1	2	5	7	9	12	16	20	23	27	29	31	32
34	0	1	2	5	7	10	13	17	21	25	28	31	33	34
36	0	1	2	5	8	11	14	18	22	26	30	33	35	36
38	0	1	2	6	8	11	15	19	24	28	32	34	37	38
40	0	1	3	6	9	12	16	20	25	29	33	36	39	40
42	0	1	3	6	9	12	16	21	26	31	35	38	41	42
44	0	1	3	7	9	13	17	22	27	32	37	40	43	44
46	0	1	3	7	10	14	18	23	28	34	38	42	45	46
48	0	1	3	7	10	14	19	24	30	35	40	43	47	48
50	0	1	3	8	11	15	20	25	31	37	42	45	49	50
52	0	1	3	8	11	15	20	26	32	38	43	47	51	52
54	0	1	3	8	12	16	21	27	33	39	45	49	53	54
56	0	1	4	8	12	16	22	28	35	41	46	51	55	56
58	0	1	4	8	12	17	23	29	36	42	48	53	57	58
60	0	1	4	9	13	18	23	30	37	44	50	54	59	60
62	0	1	4	9	13	18	24	31	38	45	51	56	61	62
64	0	1	4	10	14	19	25	32	40	47	53	58	63	64
66	0	1	4	10	14	19	26	33	41	48	55	60	65	66
68	0	1	4	10	15	20	27	34	42	50	56	62	67	68
70	0	1	4	11	15	21	27	35	43	51	58	63	69	70
72	0	1	5	11	15	21	28	36	45	53	60	65	71	72
74	0	1	5	11	16	22	29	37	46	54	61	67	73	74
76	0	1	5	11	16	22	30	38	47	56	63	69	75	76
78	0	1	5	12	17	23	30	39	48	57	65	71	77	78
80	0	2	5	12	17	23	31	40	50	59	66	72	79	80

Vm-VALUES
 CURVE TRANSITION STRAIGHT
 CURVE - 1 TRANSITION - CURVE - 2
 08 - UNIMAT - 2S
 ADJUSTMENT FROM FRONT CABIN:

METER 2	4	6	8	9	10	11	12	13	14	15	16	18	20	20.6
V	1	1	.9	.8	.8	.7	.6	.5	.4	.3	.2	.1	.0	.0
2	2	2	2	2	2	1	1	1	1	1	0	0	0	0
4	4	4	4	3	3	3	2	2	2	1	1	0	0	0
6	6	6	6	5	5	4	4	3	2	2	1	1	0	0
8	8	8	7	7	6	6	5	4	3	2	1	1	0	0
10	10	10	9	8	3	7	6	5	4	3	2	1	0	0
12	12	12	11	10	9	8	7	6	5	3	2	1	0	0
14	14	14	13	12	11	10	9	7	5	4	2	1	0	0
16	16	16	15	14	13	11	10	8	6	4	3	2	0	0
18	18	18	17	15	14	13	11	9	7	5	3	2	0	0
20	20	20	19	17	16	14	12	10	8	5	3	2	0	0
22	22	22	21	19	17	16	13	11	8	6	4	2	0	0
24	24	24	22	20	19	17	15	12	9	6	4	2	0	0
26	26	26	24	22	20	18	16	13	10	7	4	2	0	0
28	28	27	26	24	22	20	17	14	11	8	5	3	0	0
30	30	29	28	25	24	21	18	15	11	8	5	3	1	0
32	32	31	30	27	25	23	20	16	12	9	5	3	1	0
34	34	33	32	29	27	24	21	17	13	9	6	3	1	0
36	36	35	34	31	28	25	22	18	14	10	6	3	1	0
38	38	37	36	32	30	27	23	19	14	10	6	4	1	0
40	40	39	37	34	31	28	24	20	15	11	7	4	1	0
42	42	41	39	36	33	30	26	21	16	11	7	4	1	0
44	44	43	41	37	35	31	27	22	17	12	7	4	1	0
46	46	45	43	39	36	32	28	23	18	12	8	4	1	0
48	48	47	45	41	38	34	29	24	18	13	8	5	1	0
50	50	49	47	42	39	35	30	25	19	13	8	5	1	0
52	52	51	49	44	41	37	32	26	20	14	9	5	1	0
54	54	53	51	46	42	38	33	27	21	15	9	5	1	0
56	56	55	52	48	44	40	34	28	21	15	10	5	1	0
58	58	57	54	49	46	41	35	29	22	16	10	5	1	0
60	60	59	56	51	47	42	37	30	23	16	10	6	1	0
62	62	61	58	53	49	44	38	31	24	17	11	6	1	0
64	64	63	60	54	50	45	39	32	24	17	11	6	1	0
68	68	67	64	58	53	48	41	34	26	18	12	6	1	0
70	70	69	66	59	55	49	43	35	27	19	12	7	1	0
72	72	71	67	61	57	51	44	36	27	19	12	7	1	0
74	74	73	69	63	58	52	45	37	28	20	13	7	1	0
76	76	75	71	65	60	54	46	38	29	20	13	7	1	0
78	78	77	73	66	61	55	48	39	30	21	13	7	1	0
80	80	78	75	68	63	57	49	40	30	21	14	8	1	0

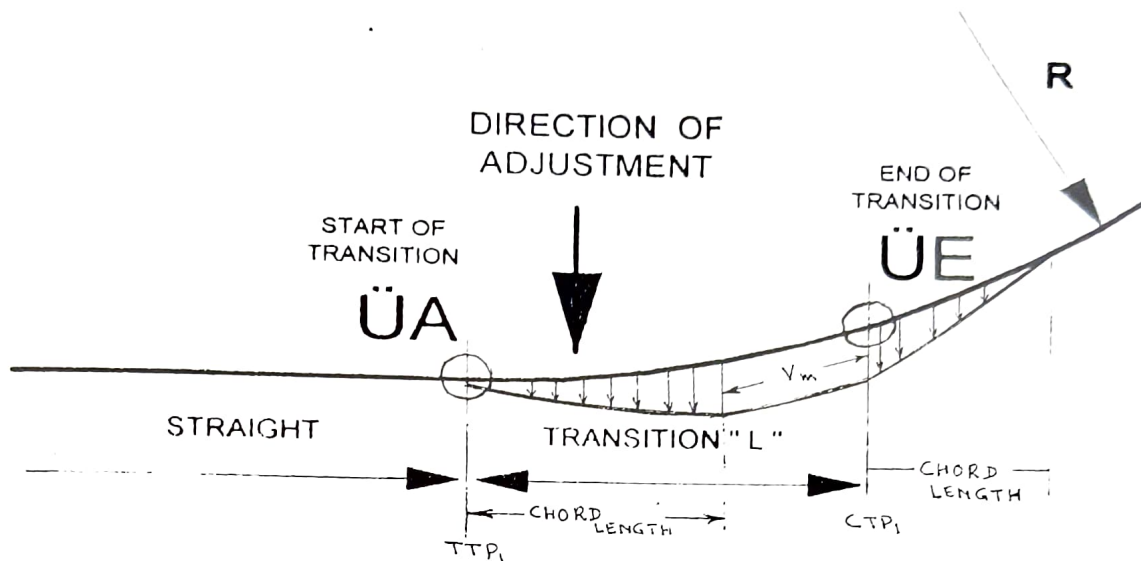
Vm-VALUES
STRAIGHT TRANSITION CURVE
CURVE - 1 TRANSITION - CURVE - 2
08 - UNIMAT - 3S
ADJUSTMENT FROM FRONT CABIN:

METER 2	4	6	8	9	10	11	12	13	14	15	16	17	18	19	21	22.6
V	.0	.0	.0	.1	.1	.2	.2	.3	.4	.5	.6	.7	.8	.9	1	1
2	0	0	0	0	0	0	0	1	1	1	1	1	2	2	2	2
4	0	0	0	0	1	1	1	1	2	2	2	3	3	4	4	4
6	0	0	0	1	1	1	1	2	2	3	4	4	5	5	6	6
8	0	0	0	1	1	2	2	3	3	4	5	6	7	7	8	8
10	0	0	0	1	1	2	2	3	4	5	6	7	8	9	9	10
12	0	0	0	1	2	2	3	4	5	6	7	9	10	11	11	12
14	0	0	1	1	2	3	3	5	6	7	9	10	11	13	13	14
16	0	0	1	2	2	3	4	5	7	8	10	12	13	14	15	16
18	0	0	1	2	2	3	4	6	7	9	11	13	15	16	17	18
20	0	0	1	2	3	4	5	6	8	10	12	14	16	18	19	20
22	0	0	1	2	3	4	5	7	9	11	14	16	18	20	21	22
24	0	0	1	2	3	5	6	8	10	12	15	17	20	21	23	24
26	0	0	1	2	4	5	6	8	11	13	16	19	21	23	25	26
28	0	0	1	3	4	5	7	9	12	14	17	20	23	25	27	28
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32	0	0	1	3	4	6	8	10	13	16	20	23	26	29	30	32
34	0	0	1	3	5	6	8	11	14	17	21	25	28	30	32	34
36	0	0	1	3	5	7	9	12	15	18	22	26	29	32	34	36
38	0	0	2	4	5	7	9	12	16	19	23	27	31	34	36	38
40	0	0	2	4	5	8	10	13	16	20	25	29	33	36	38	40
42	0	1	2	4	6	8	10	14	17	22	26	30	34	38	40	42
44	0	1	2	4	6	8	11	14	18	23	27	32	36	39	42	44
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62	0	1	3	6	8	12	15	20	26	32	38	45	51	56	59	62
64	0	1	3	6	9	12	16	21	26	33	40	46	52	57	61	64
66	0	1	3	6	9	12	16	21	27	34	41	48	54	59	63	66
68	0	1	3	7	9	13	17	22	28	35	42	49	56	61	65	68
70	0	1	3	7	10	13	17	23	29	35	43	51	57	63	66	70
72	0	1	3	7	10	14	18	23	30	37	45	52	59	64	68	72
74	0	1	3	7	10	14	18	24	30	38	46	53	60	66	70	74
76	0	1	3	7	10	14	19	25	31	39	47	55	62	68	72	76
78	0	1	3	7	11	15	19	25	32	40	48	56	64	70	74	78
80	0	1	3	7	11	15	19	25	32	40	48	56	64	70	74	78

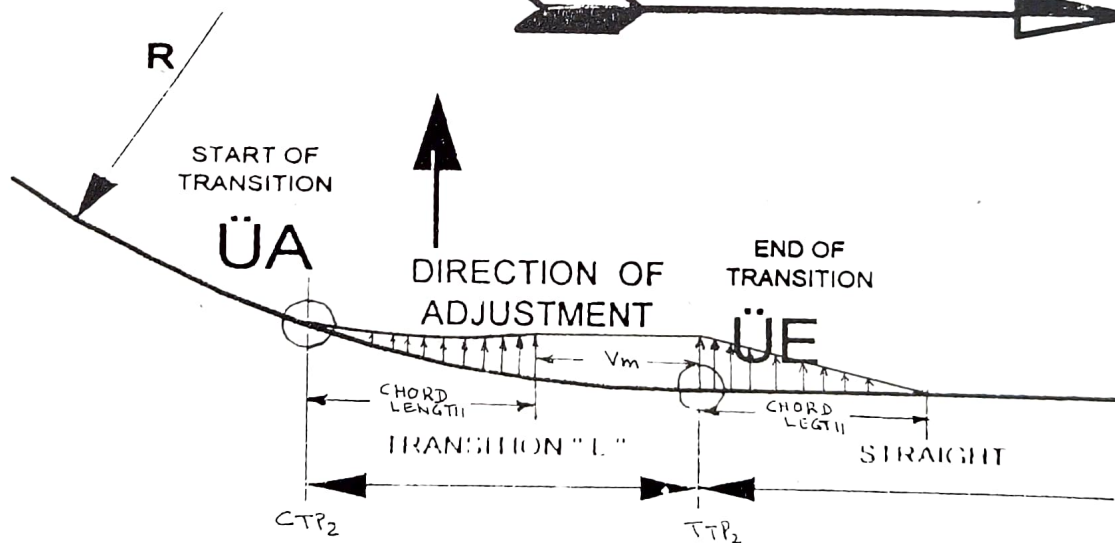
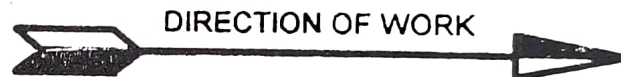
Vm-VALUES
 CURVE TRANSITION STRAIGHT
 CURVE - 1 TRANSITION - CURVE - 2
 08 - UNIMAT - 3S
 ADJUSTMENT FROM FRONT CABIN:

METER 2	4	6	8	9	10	11	12	13	14	15	16	17	18	19	21	22.6	
V	1	1	1	.9	.9	.8	.8	.7	.6	.5	.4	.3	.2	.1	.1	.0	.0
2	2	2	2	2	2	2	2	1	1	1	1	1	0	0	0	0	0
4	4	4	4	4	3	3	3	3	2	2	2	1	1	0	0	0	0
6	6	6	6	5	5	5	5	4	4	3	2	2	1	1	0	0	0
8	8	8	8	7	7	6	6	5	5	4	3	2	1	1	0	0	0
10	10	10	10	9	9	8	8	7	6	5	4	3	2	1	1	0	0
12	12	12	12	11	10	10	9	8	7	6	5	3	2	1	1	0	0
14	14	14	13	13	12	11	11	9	8	7	5	4	3	1	1	0	0
16	16	16	15	14	14	13	12	11	9	8	6	4	3	2	1	0	0
18	18	18	17	16	16	15	14	12	11	9	7	5	3	2	1	0	0
20	20	20	19	18	17	16	15	14	12	10	8	6	4	2	1	0	0
22	22	22	21	20	19	18	17	15	13	11	8	6	4	2	1	0	0
24	24	24	23	22	21	19	18	16	14	12	9	7	4	3	1	0	0
26	26	26	25	24	22	21	20	18	15	13	10	7	5	3	1	0	0
28	28	28	27	25	24	23	21	19	16	14	11	8	5	3	1	0	0
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38	38	38	36	34	33	31	29	26	22	19	15	11	7	4	2	0	0
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42	42	41	40	38	36	34	32	28	25	20	16	12	8	4	2	0	0
44	44	43	42	40	38	36	33	30	26	21	17	12	8	5	2	0	0
46	46	45	44	42	40	37	35	31	27	22	18	13	8	5	2	0	0
48	48	47	46	43	41	39	36	32	28	23	18	13	9	5	2	0	0
50	50	49	48	45	43	41	38	34	29	24	19	14	9	5	3	0	0
52	52	51	50	47	45	42	39	35	31	25	20	14	10	5	3	0	0
54	53	53	52	49	47	44	41	36	32	26	21	15	10	6	3	0	0
56	56	55	54	51	48	45	42	38	33	27	21	16	10	6	3	0	0
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60	60	59	58	54	52	49	45	41	35	29	23	17	11	6	3	0	0
62	62	61	59	56	54	50	47	42	36	30	24	17	11	6	3	0	0
64	64	63	61	58	55	52	48	43	38	31	24	18	12	7	3	0	0
66	66	65	63	60	57	54	50	45	39	32	25	18	12	7	3	0	0
68	68	67	65	61	59	55	51	46	40	33	26	19	12	7	3	0	0
70	70	69	67	63	60	57	53	47	41	34	27	19	13	7	4	0	0
72	72	71	69	65	62	58	54	49	42	35	27	20	13	8	4	0	0
74	74	73	71	67	64	60	56	50	44	36	28	21	14	8	4	0	0
76	76	75	73	69	66	62	57	51	45	37	29	21	14	8	4	0	0
78	78	77	75	71	67	63	59	53	46	38	30	22	14	8	4	0	0
80	80	79	77	72	69	65	60	54	47	39	31	22	15	8	4	0	0

STRAIGHT → TRANSITION → CURVE



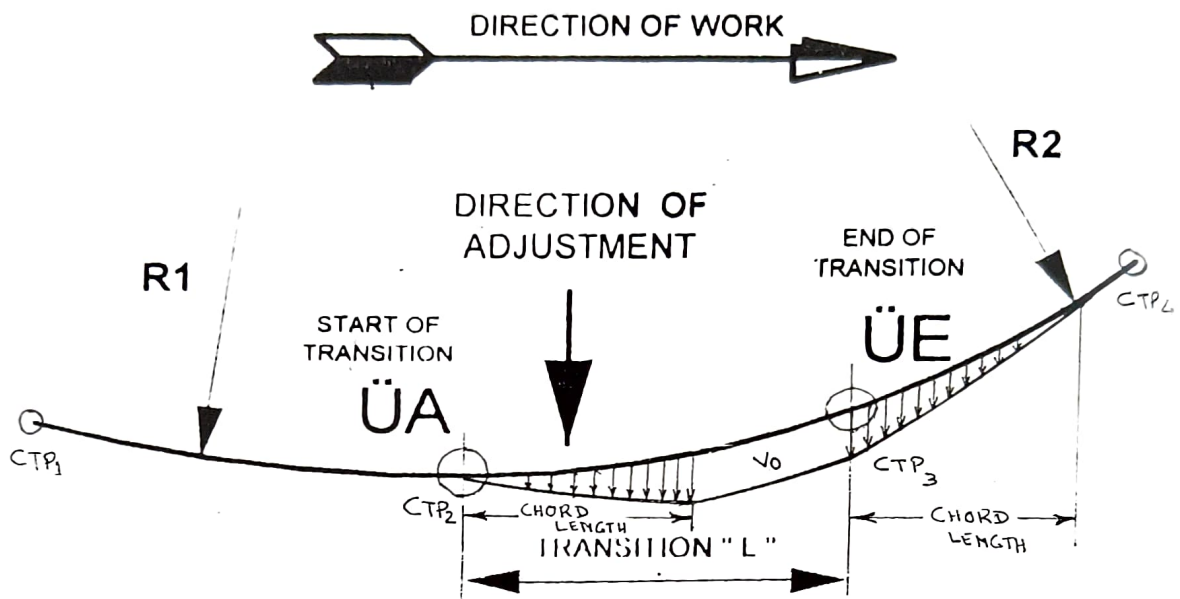
CURVE → TRANSITION → STRAIGHT



CURVE 1 → TRANSITION → CURVE 2

R1 BIGGER THAN R2

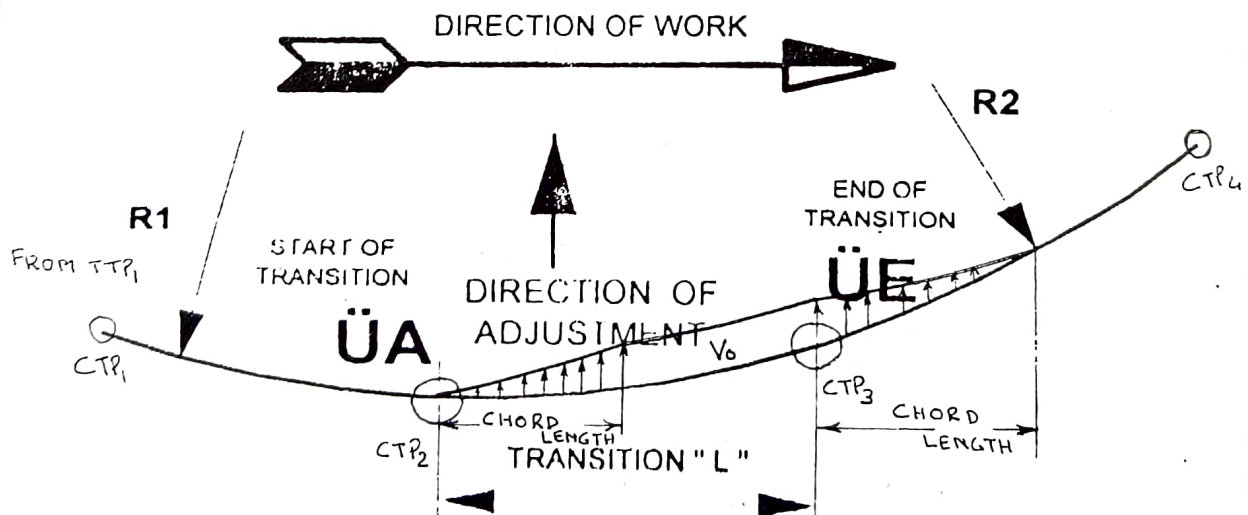
$$V_0 = V_2 - V_1$$



CURVE 1 → TRANSITION → CURVE 2

R1 SMALLER THAN R2

$$V_0 = V_1 - V_2$$

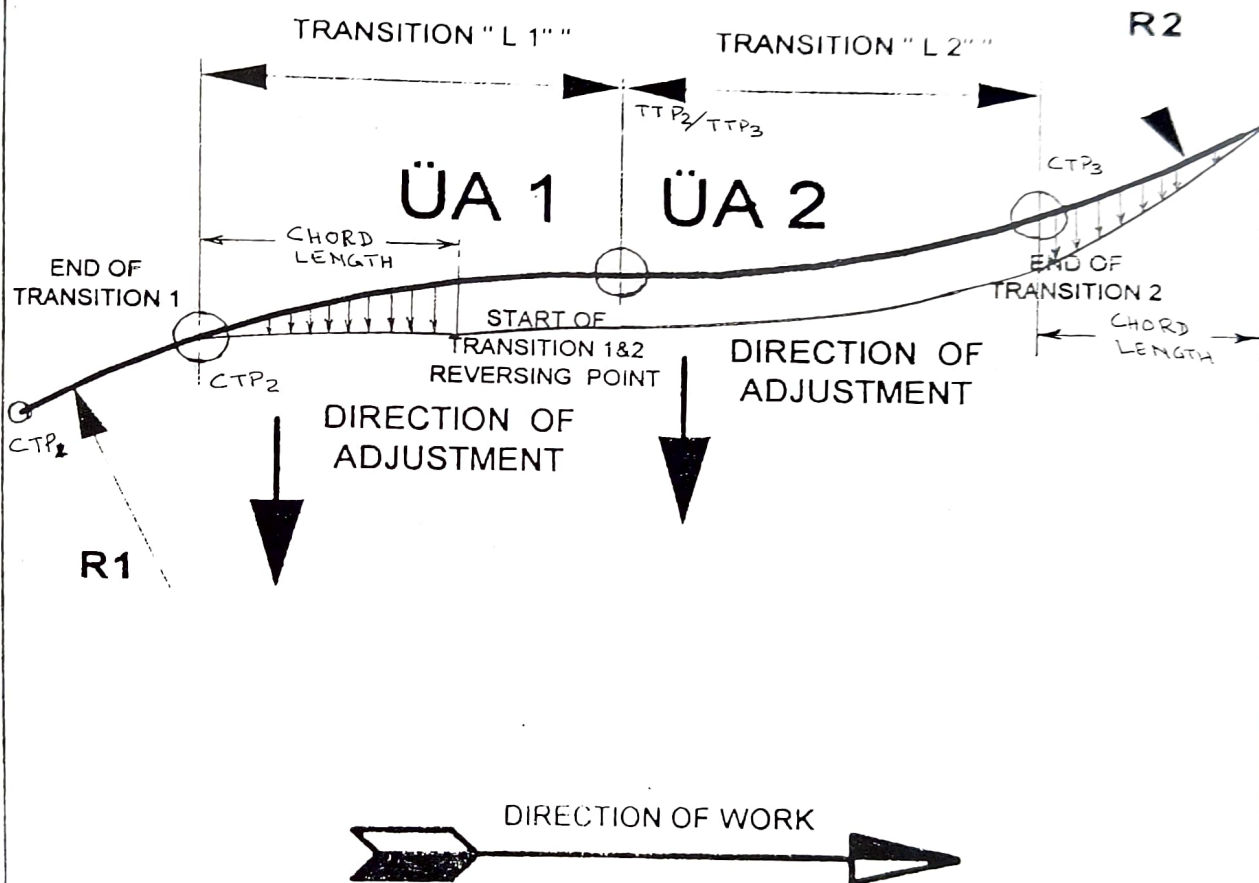


CURVE 1 → TRANSITION → REVERSED CURVE

$$V_{m1} = V_{m2}$$

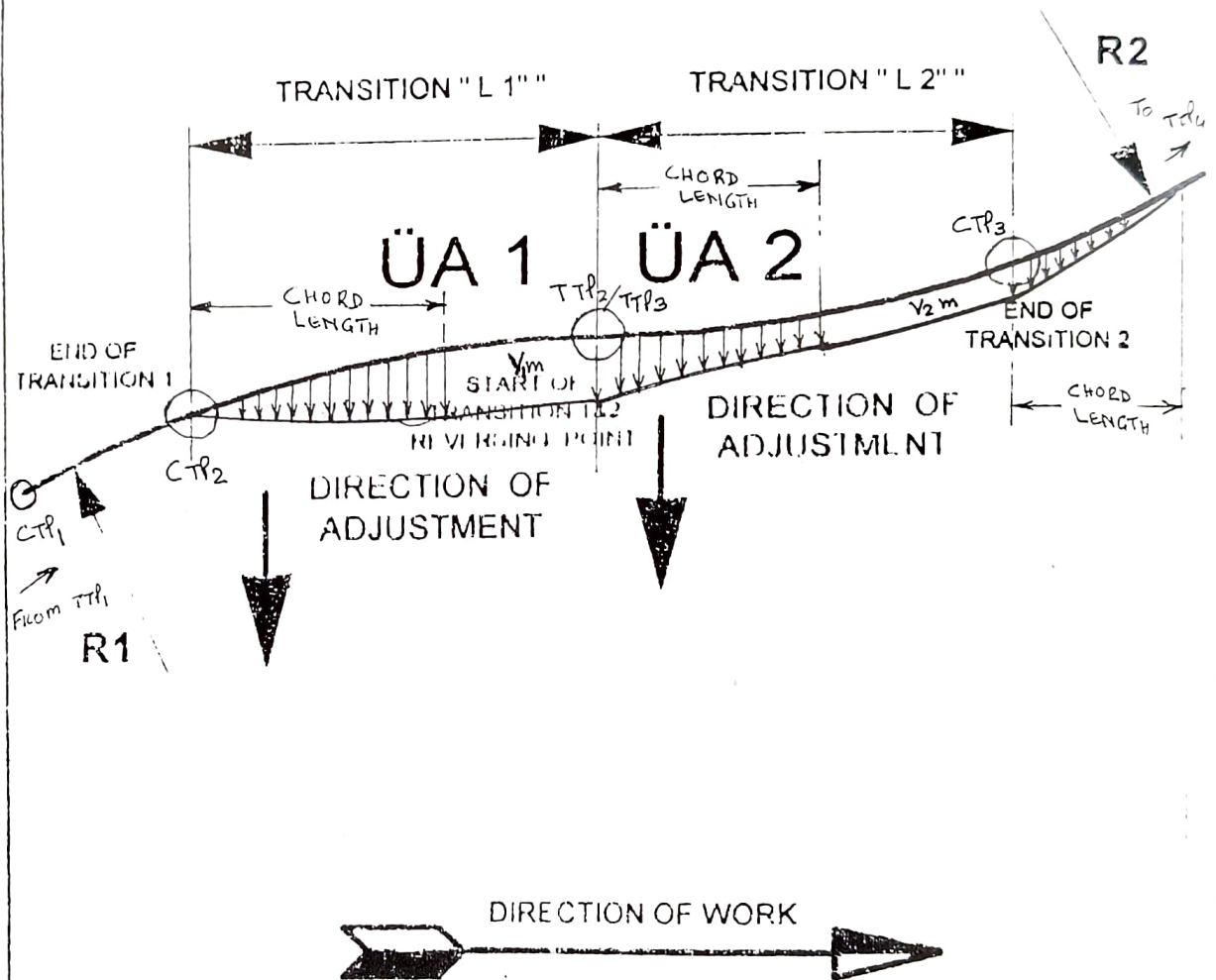
$$R_1 = R_2$$

$$L_1 = L_2$$



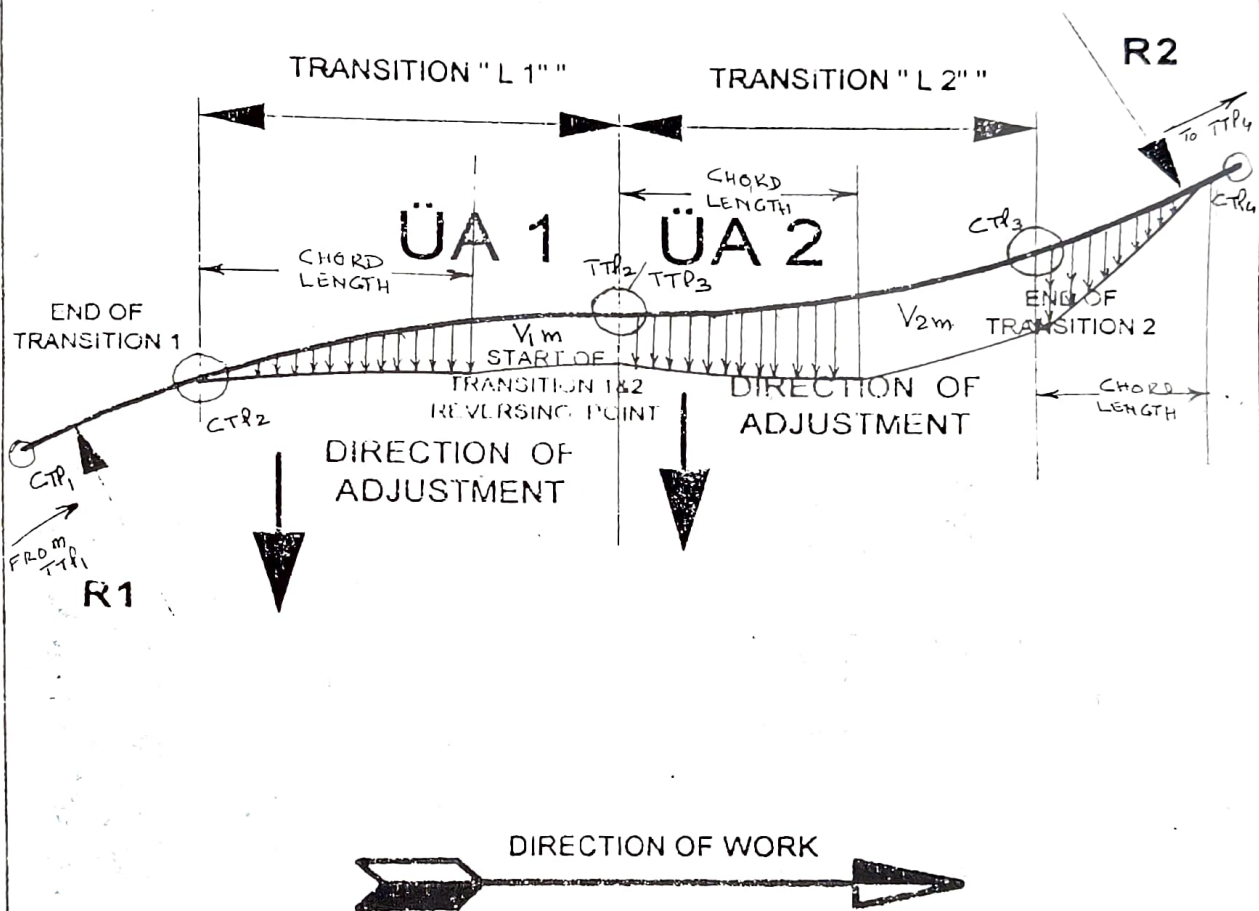
CURVE 1 → TRANSITION → REVERSED CURVE

$$V_{1m} > V_{2m}$$



CURVE 1 → TRANSITION → REVERSED CURVE

$$V_{1m} < V_{2m}$$



EDITORIAL

Dear Reader,

Now 18th issue of IRTM digest is with you. It is your digest. Please contribute articles on Track Machines based on experience like improvement in operation, Maintenance overhauling & Quality Control.

Manohar Singh
Principal



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