

CHAPTER 1

COACH

101 INTRODUCTION

The first attempt at standardisation of manufacture of passenger coaches on Indian Railways led to the development of IRS design of steel bodied coaches. An integral all metal coach design was taken from M/s Schlieren, Switzerland in 1954 for manufacture at Integral Coach Factory, Perambur. The original design had bogies with speed potential of 96 kmph only. The design was modified to all coil bogies with longer suspension hangers and weight transfer through side bearers, thereby enabling speed potential to 105 kmph on main line standard track and gradually to 140 kmph for Rajdhani/Shatabdi Express trains on tracks maintained to standards laid down in RDSO report No. C&M-I, volume I.

Over the years changes have been made to use helical springs instead of laminated springs in the secondary suspension while minor changes in the shell have been made to reduce corrosion and improve the strength of certain members. At present all new coaches are being manufactured with bogie mounted air brake system and enhanced capacity draw gear. To meet the demands of the passengers, coaches of various layout like second class sitting accommodation, sleepers, upper class, air conditioned chair car and sleeper, pantry cars, generator cars, luggage-cum-passenger cars and postal vans have been designed and manufactured. Luxury coaches mainly to boost tourism having air conditioned sleeping and sitting accommodation with catering facilities have also been designed and manufactured. On date, more than a hundred coach layouts catering to the needs of different class of passengers are on line. Transportation codes for coaches in general use are given in Appendix A.

102 CODAL LIFE OF COACHES

Steel bodied coaches 25 years
(including dining/pantry cars)

IRS coaches 30 years

Light utilisation categories of coaches 40 years

103 PERIODICITY OF PERIODIC OVERHAULS (POH) IN DESIGNATED WORKSHOPS

Table 1.1

i) PCVs and OCVs on Mail and Express rakes	
(a) Coaches earning less than 2.5 lakhs kms. per annum	12 months
(b) Coaches earning more than 2.5 lakhs kms. per annum	12 months with IOH after 6 months
ii) PCVs on other than Mail and Express rakes	18 months. 12 months for AC coaches.
iii) OCVs on other than Mail and Express rakes	24 months
iv) Rajdhani and Shatabdi Express Coaches	POH in workshops after 4 lakhs kms or 18 months whichever is earlier. IOH in workshops after 2 lakhs kms or 9 months whichever is earlier

104. PERIODICAL OVERHAUL

- 104a The general sequence of work during POH of a coach is given in a typical PERT chart for normal POH as shown in **figure 1.1**.
- 104b List of “must change items” during POH is given in Appendix B
- 104c Modifications in BG coaching stock is given in Appendix C
- 104d List of relevant RDSO's technical pamphlets/instructions/specifications is given in Appendix D.

- (xiv) Battery box and electrical fittings.
(xv) AC equipment in AC coaches.

- 105c Coach body should be lifted off the bogies either by two overhead electric cranes of 25 tonnes capacity each with suitably designed lifting tackles or by four powered lifting jacks of 15 tonnes capacity each operated simultaneously by one control switch. The coach body should be lifted uniformly without jerks and should remain horizontal during the lifting/ lowering operation. Coach should not be lifted from any point other than at the lifting pads as shown in **figure 1.2** (sketch 68078).

105 LIFTING THE COACH BODY

- 105a On receipt of a coach for POH, it must be taken on Lifting line/ Stripping line where electrical fittings should be stripped and batteries removed. Furnishings, especially seats and backrests should be inspected thoroughly and only those that require repairs or attention should be removed.
- 105b Before lifting a coach, the following components should be removed, disengaged or disconnected:-
- (i) Dynamo belt on the axle pulley in case of underframe mounted dynamos and disconnection of electrical connection from junction box on alternator in case of bogie mounted alternator.
 - (ii) Lavatory chute, if situated over the bogie.
 - (iii) Brake pull rod from bogie brake rigging.
 - (iv) Centre pivot cotter.
 - (v) Axle box safety straps.
 - (vi) Bolster safety straps.
 - (vii) Steel/ wooden blocks of requisite thickness should be inserted in between the bolster and bogie frame on both sides and of both the bogies so as to keep the bolster springs compressed.
 - (viii) Dismantle vertical shock absorbers.
 - (ix) Air vent screws on bogie frame above dash pots should be unscrewed completely after cleaning the area around the air vent holes properly.
 - (x) Vacuum/air brake fittings
 - (xi) Buffer and draw gear
 - (xii) Lavatory chutes
 - (xiii) Under slung water tanks & WRAS, where provided.

- 105d The coach should never be lifted from one end only. If lifted from one end, the Centre pivots and the dash pot guides are likely to suffer damages, body panels are likely to get dented near the body bolster. The sealed windows of AC coaches are also likely to break.

- 105e After the coach body is lifted, it should be kept on trestles. The revolving steel trestles of the design shown in **Figure 1.3** (sketch 77310) would prove useful for this purpose Lines should be protected by scotch blocks with locking arrangement and key should be kept with Engineer till the time maintenance work is carried out.

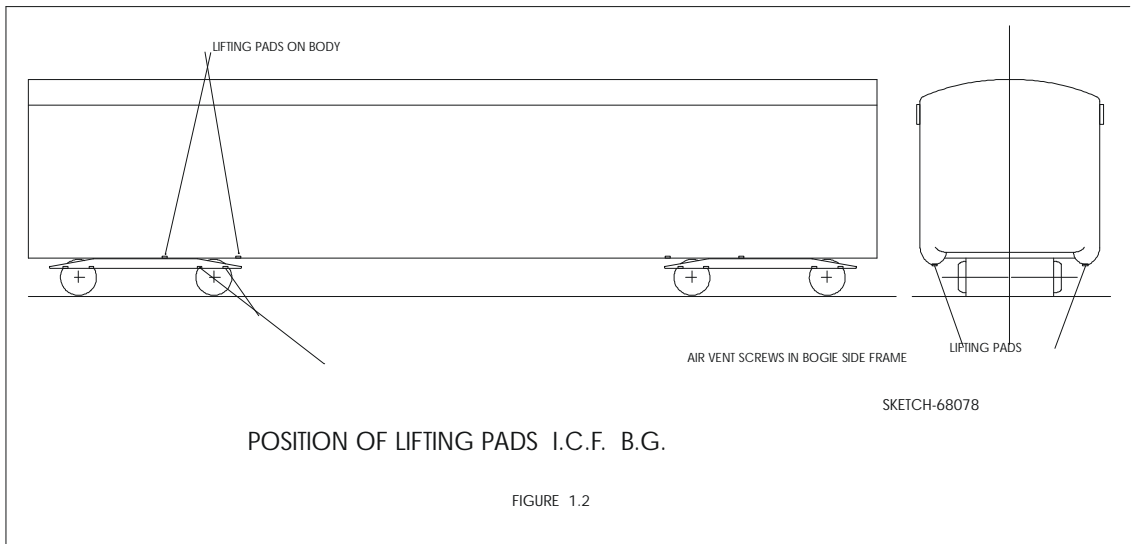
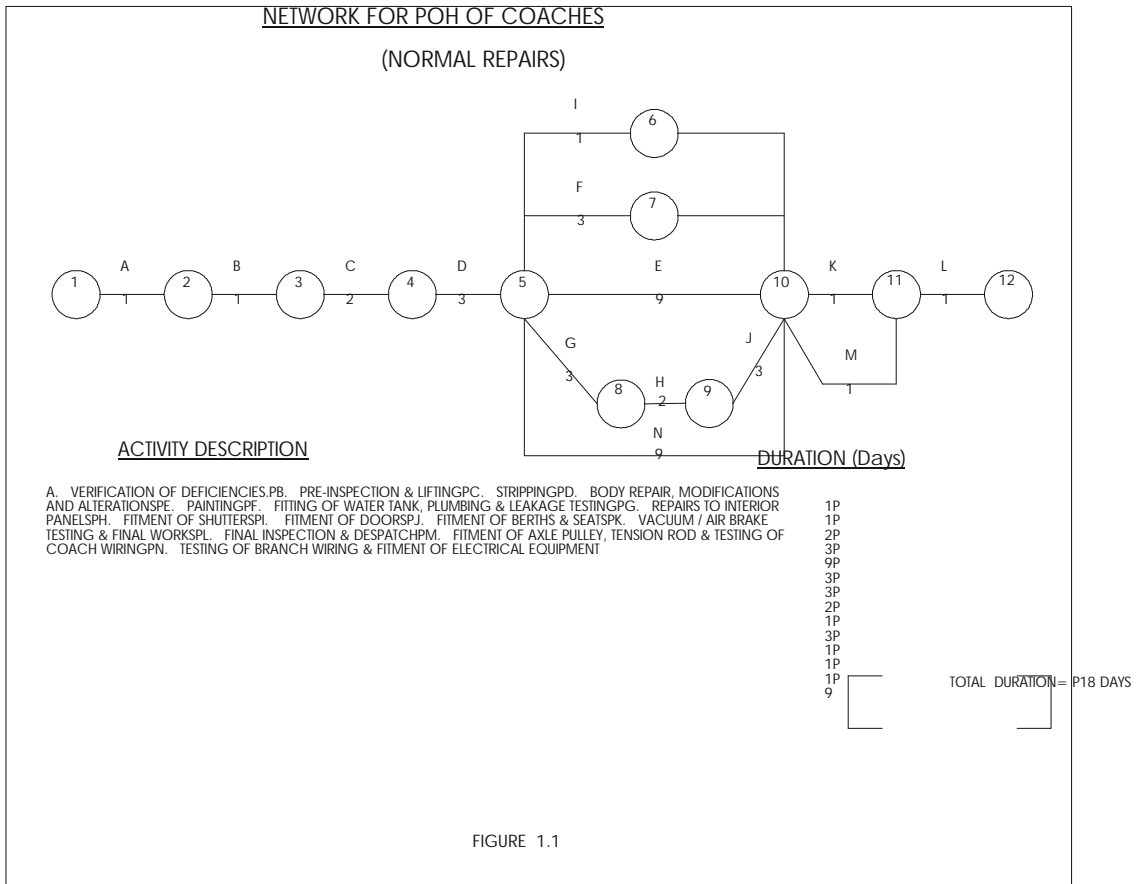
- 105f The entire under frame should be cleaned of dust, rust etc. from underneath by pneumatic/water jet followed by wire brushing at critical locations and check for cracks/damage, corrosion etc. on the under frame members. Refer chapter 2 (Shell) for carrying out repairs on the coach shell.

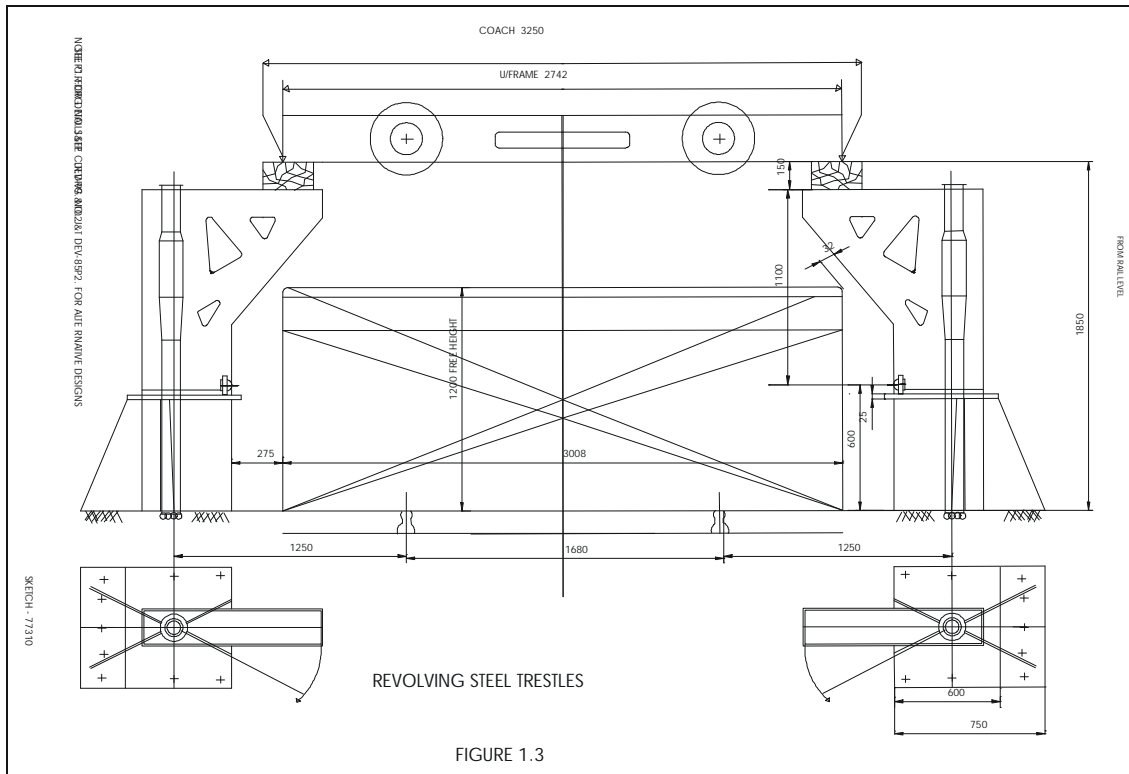
- 105g After carrying out all repairs, the under frame should be painted as detailed in the chapter on Painting.

106 LOWERING THE COACH BODY

- 106a After all the repairs are carried out refit all repaired sub-assemblies which are removed for maintenance and lower the coach body on the overhauled and tested bogies.

- 106b The Centre pivot cotter should be fitted into position and secured by means of a split pin. A bottom cover should be fitted in position to cover the entire assembly to prevent dust getting in.





106c **Buffer height**

- i) Buffer height of a coach under its tare condition should be as under:-

Table 1.2

	Maximum height from rail level	Minimum height from rail level
Production units	1105 mm	1095 mm
Workshops	1105 mm	1090 mm

- ii) Buffer height of a coach should be measured under its tare condition from the top of the rail on a level and straight track. For this purpose, a specific portion of the track should be earmarked in each carriage repair workshop. Engineer (Permanent Way) should get track attended and leveled once every month and then give a certificate that nominated portion of the track has been fully attended to and is in perfect level and straight condition.
- iii) Before the buffer height adjustment of the coach is taken up, it should be ensured that all its buffers are secured firmly in position.
- iv) The diameters of all the wheels, measured before the assembly of the bogies must be available with the staff carrying out the buffer height adjustment.

106d **Buffer height adjustment**

- i) To bring the buffer height to within the limits specified, depending on the wheel diameters, packing rings of thickness as given in **Table 3.18 of Bogie chapter** should be kept under the flanges of the lower spring seats as shown in **Figure 3.17** (sketch 77354) in bogie chapter.

NOTES:

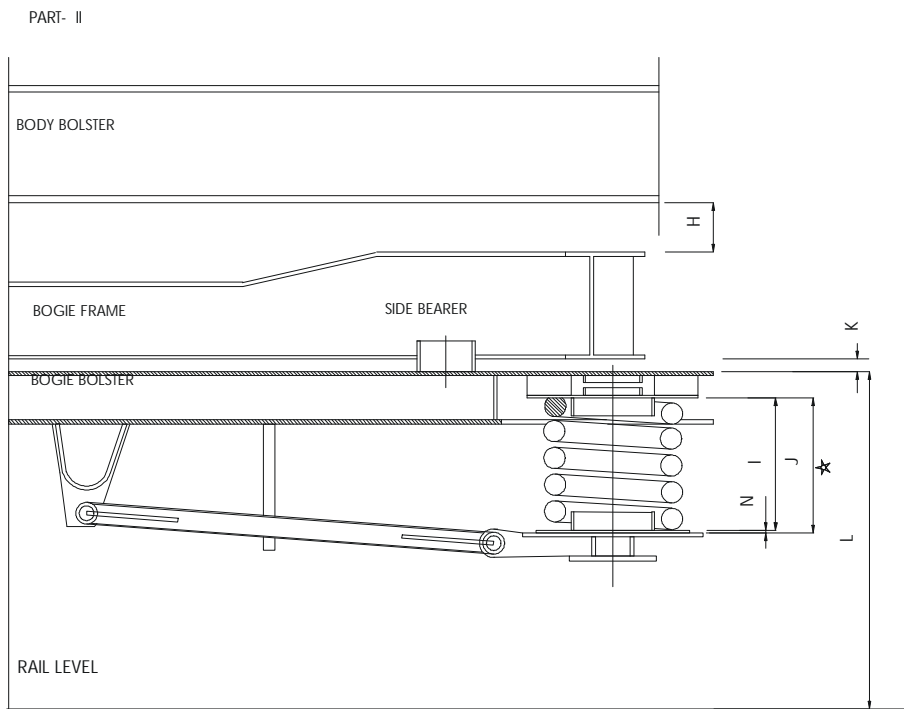
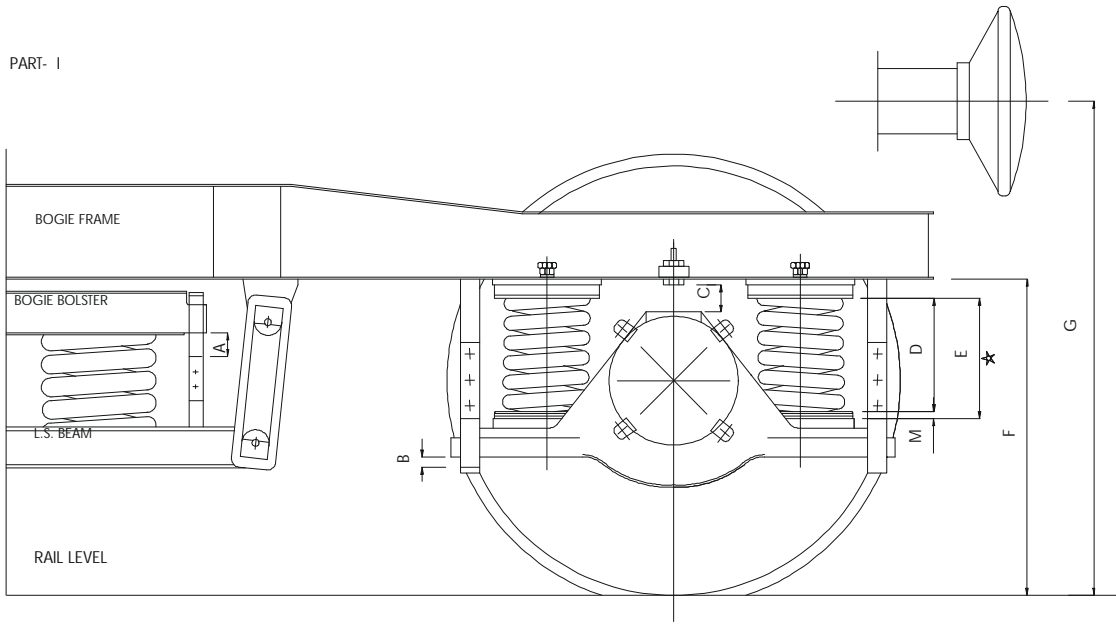
- i) The lowest permissible wheel diameter for a coach turned out after POH shall not be less than **836 mm**.
- ii) According to tare weight of coaches compensating ring shall be provided over lower spring seats as shown in suspension diagrams issued by ICF and RCF for various

types of coaches (see suspension diagrammatic arrangement of ICF self generating AC coaches in **figure 1.4a** and table nos. 1.3 & 1.4. See suspension diagrammatic arrangement of RCF AC coaches in **figure 1.4b** and table no. 1.5. See suspension diagrammatic arrangement of RCF Non AC coaches in **figure 1.4c** and table no. 1.6). Over this, additional compensating rings can be added to a limit not exceeding **12 mm**.

- iii) While lowering the bogie frame and the bolster assembly on to the wheels, it should be ensured that the bogie frame is set evenly on the four axle boxes.
- iv) The bogie assembled with packing and compensating rings as required, should now be loaded and the height of its bolster top surface from rail level measured. This should be compared with predetermined dimensions to decide on further adjustment of buffer height.
- v) If the buffer height requires further adjustment, the load on the axle box springs should be released and the packing rings in halves should be inserted below the axle box springs. The total height of primary springs and compensating rings should not exceed **295 mm**. There should be a minimum clearance of **40 mm** between the axle box wing lugs and their safety straps.
- vi) The clearance between the axle box crown and the bogie frame should thereafter be adjusted as per the table given below:

Table 1.7

Type of coach	Crown clearance (mm)
GS, SDC, SLR, SCN, VPH	43^{+0}_{-3}
WCB, WFC, WFAC, WSCZAC, WGSCZAC, WCBAC, WLRRM, WFCZAC, WGFAC, WACCW, WGACCW, WGFACCW, WACCN, WGACCN	27^{+0}_{-3}



NOTE - P1. Dimensions E & J shall be maintained with required number of compensating rings of standard thickness of 4 mm.P2. Axle box springs : WIAC -0-1-202P Bolster springs : WIAC -0-5-202

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SUSPENSION DIAGRAMMATIC ARRANGEMENT
FOR SELF GENERATING AC COACHES (ICF DRAWING NO. ICF/SK -9-0-126)P

FIGURE 1.4a

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**SUSPENSION DATA FOR SELF GENERATING AC COACHES
(DRAWING NO. ICF/SK₂-9-0-126)**

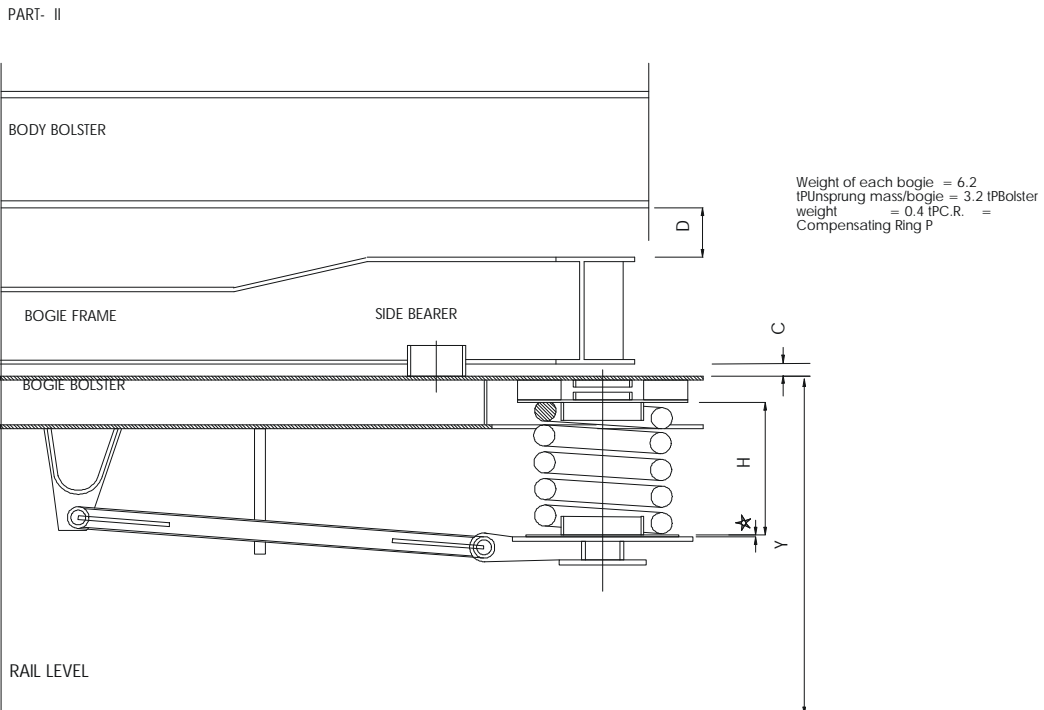
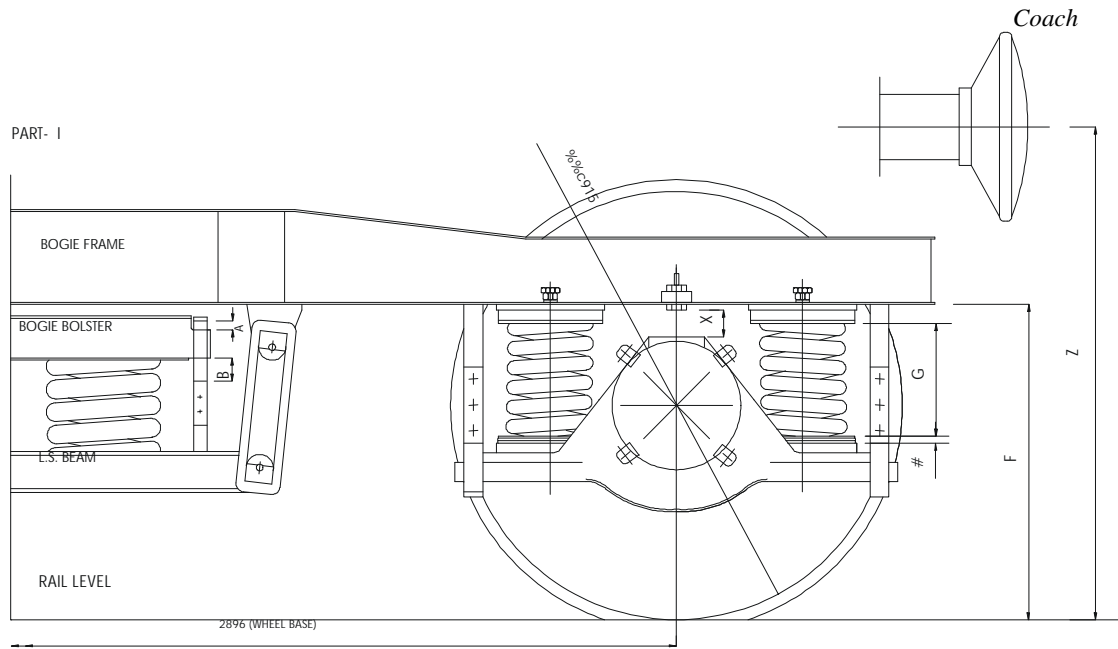
Table 1.3

COACH		LOAD	A	B	C	D	E	F	G	H	I	J	K	L	M✱ Nominal	N✱ Nominal
WGFAc ₄	Tare		38 ^{±5}	40 ^{±5}	36 ^{±3}	275 ^{+6/-4}	290 ^{±3}	686 ^{±5}	1104 ^{+0/-10}	70 ^{±3}	299 ^{+6/-4}	310 ^{±3}	40 ^{±5}	646 ^{±5}	15	11
	Gross		34 ^{+8/-5}	44 ^{±5}	32 ^{+5/-2}	275 ^{+6/-4}	286 ^{±3}	682 ^{±5}	1098 ^{+8/-5}	66 ^{±3}	295 ^{+6/-4}	308 ^{±3}	44 ^{±5}	638 ^{+8/-5}	-	-
WGSCZAC	Tare		38 ^{±5}	40 ^{±5}	36 ^{±3}	276 ^{+6/-4}	290 ^{±3}	686 ^{±5}	1104 ^{+0/-10}	70 ^{±3}	300 ^{+5/-4}	310 ^{±3}	40 ^{±5}	646 ^{±5}	14	10
	Gross		23 ^{+8/-5}	54 ^{±5}	22 ^{+5/-2}	262 ^{+6/-4}	276 ^{±3}	672 ^{±5}	1075 ^{+8/-5}	55 ^{±3}	285 ^{+7/-4}	295 ^{±3}	55 ^{±5}	617 ^{+8/-5}	-	-
WGSCWAC	Tare		38 ^{±5}	40 ^{±5}	36 ^{±3}	274 ^{+6/-4}	290 ^{±3}	686 ^{±5}	1104 ^{+0/-10}	70 ^{±3}	298 ^{+6/-4}	310 ^{±3}	40 ^{±5}	646 ^{±5}	16	12
	Gross		28 ^{+8/-5}	49 ^{±5}	27 ^{+5/-2}	265 ^{+6/-4}	281 ^{±3}	677 ^{±5}	1085 ^{+8/-5}	60 ^{±3}	288 ^{+7/-4}	300 ^{±3}	50 ^{±5}	627 ^{+8/-5}	-	-
WGFCZAC	Tare		38 ^{±5}	40 ^{±5}	36 ^{±3}	272 ^{+6/-4}	290 ^{±3}	686 ^{±5}	1104 ^{+0/-10}	70 ^{±3}	296 ^{+6/-5}	310 ^{±3}	40 ^{±5}	646 ^{±5}	18	14
	Gross		28 ^{+8/-5}	48 ^{±5}	28 ^{+5/-2}	264 ^{+6/-4}	282 ^{±3}	678 ^{±5}	1086 ^{+8/-5}	60 ^{±3}	286 ^{+7/-4}	300 ^{±3}	50 ^{±5}	628 ^{+8/-5}	-	-
WGFCWAC	Tare		38 ^{±5}	40 ^{±5}	36 ^{±3}	273 ^{+6/-4}	290 ^{±3}	686 ^{±5}	1104 ^{+0/-10}	70 ^{±3}	297 ^{+6/-4}	310 ^{±3}	40 ^{±5}	646 ^{±5}	17	13
	Gross		31 ^{+8/-5}	46 ^{±5}	30 ^{+5/-2}	267 ^{+6/-4}	284 ^{±3}	680 ^{±5}	1091 ^{+8/-5}	63 ^{±3}	290 ^{+7/-4}	303 ^{±3}	47 ^{±5}	633 ^{+8/-5}	-	-
WGMWAC	Tare		38 ^{±5}	40 ^{±5}	36 ^{±3}	282 ^{+6/-4}	290 ^{±3}	686 ^{±5}	1104 ^{+0/-10}	70 ^{±3}	307 ^{+6/-3}	310 ^{±3}	40 ^{±5}	648 ^{±5}	8	3
	Gross		32 ^{+8/-5}	45 ^{±5}	31 ^{+5/-2}	277 ^{+6/-4}	285 ^{±3}	681 ^{±5}	1093 ^{+8/-5}	64 ^{±3}	301 ^{+6/-4}	304 ^{±3}	46 ^{±5}	635 ^{+8/-5}	-	-
ARMVAC	DRIVING END	Tare	38 ^{±5}	40 ^{±5}	36 ^{±3}	279 ^{+6/-4}	290 ^{±3}	686 ^{±5}	1104 ^{+0/-10}	70 ^{±3}	304 ^{+6/-4}	310 ^{±3}	40 ^{±5}	646 ^{±5}	11	6
		Gross	35 ^{+8/-5}	43 ^{±5}	33 ^{+5/-2}	276 ^{+6/-4}	287 ^{±3}	683 ^{±5}	1098 ^{+8/-5}	67 ^{±3}	301 ^{+6/-4}	307 ^{±3}	43 ^{±5}	640 ^{+8/-5}	-	-
	NON DRIVING END	Tare	38 ^{±5}	40 ^{±5}	36 ^{±3}	272 ^{+6/-4}	290 ^{±3}	686 ^{±5}	1104 ^{+0/-10}	70 ^{±3}	296 ^{+6/-4}	310 ^{±3}	40 ^{±5}	646 ^{±5}	18	14
		Gross	33 ^{+8/-5}	44 ^{±5}	32 ^{+5/-2}	268 ^{+6/-4}	286 ^{±3}	682 ^{±5}	1095 ^{+8/-5}	65 ^{±3}	291 ^{+7/-4}	305 ^{±3}	45 ^{±5}	637 ^{+8/-5}	-	-

**WEIGHT AND TEST LOAD (IN TONNES)
FOR SELF GENERATING AC COACHES (DRAWING NO. ICF/SK₂-9-0-126)**

Table 1.4

Description		WGFAC ₄	WGSCZAC	WGSCWAC	WGMWAC	ARMVAC	
Tare weight of the coach		49.75	49.30	50.00	46.50	49.30	
Weight of the bogie		6.200	6.200	6.200	6.200	6.200	
Weight of the bolster		0.400	0.400	0.400	0.400	0.400	
Unsprung mass per bogie		3.200	3.200	3.200	3.200	3.200	
Normal pay load		1.440 (18x80 kg)	5.680 (71x80 kg)	3.680 (46x80 kg)	2.275 (34+1)x65 kg	1.495 (23x65 kg)	
Over load		Nil	Nil	Nil	Nil	Nil	
Total pay load		1.440	5.680	3.680	2.275	1.495	
Gross weight of the coach		51.19	54.98	53.65	48.78	50.79	
Test load/Bogie	Tare	18.68	18.45	18.80	17.05	DE 17.87	NDE 19.23
	Gross	19.38	21.29	20.64	18.19	18.31	20.08



NOTE - P1. Dimensions A & B marked should be ensured less than dimensions C & D marked respectively. P2. # CR to drawing No.-CC01140 to be provided. P3. * CR to drawing No. -CC05252 to be provided. P4. F the variation in all the four bogie corner heights must be less than or equal to 10 mm. P5. Drawing No. WIA3-9-0.306 all -e, AE90014, AE90015 are superseded by this drawing. P6. The height of axle box spring and Bolster spring in tare and gross conditions is for reference only. P7. The requirement of CR's as shown in the columns for primary & secondary suspension is for reference only. P8. The compensation by means of CR's must not exceed 20 mm in primary in all coaches except ACCN (SG) in P ACCN (SG) it is 30 mm & 30 mm in secondary suspension for all coaches.

SUSPENSION DIAGRAMMATIC ARRANGEMENT

FOR AC COACHES (RCF DRAWING NO. AW 90017)P

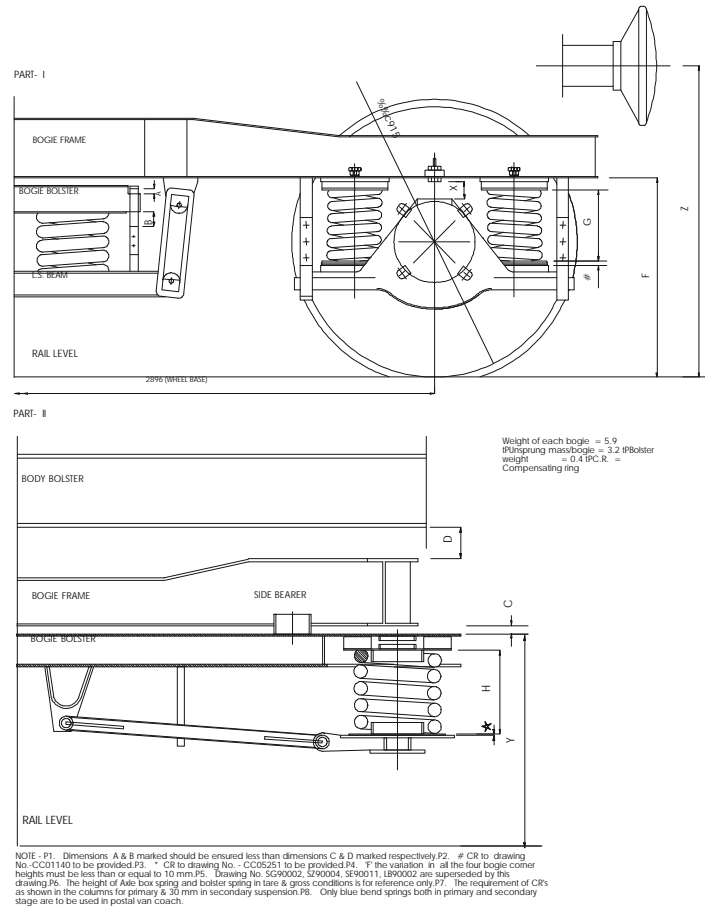
FIGURE 1.4b

TESTING PARAMETERS FOR AC COACHES (RCF DRAWING NO. AW90017)

Table 1.5

Type of coach	Tare weight of coach	Normal pay load	Total pay load	Test load per bogie		Bogie frame bolster clearance		Body bogie clearance		Axle box spring height			Bolster spring height		Crown clearance		Bogie bolster height		Buffer height		
				Under tare	Under Gross	C		D		G		CR	H		CR	X		Y		Z	
				In tonnes	In tonnes	Tare	Gross	Tare	Gross	Tare	Gross	Tare	Gross	#	Tare	Gross	*	Tare	Gross	Tare	Gross
ACCW (EOG)	44.8	3.68	3.68	16.2	18.04	40±5	50±5	70±3	60±3	286 ^{+5/-4}	278 ^{+6/-4}	4	312 ^{+5/-4}	302 ^{+7/-5}	Nil	28±3	20±3	646±5	628 ^{+8/-5}	1104 ^{+0/-10}	1086 ^{+8/-5}
ACCW (SG)	49.1	3.68	3.68	18.35	20.19	40±5	50±5	70±3	60±3	276 ^{+5/-4}	268 ^{+6/-4}	14	301 ^{+6/-4}	291 ^{+7/-4}	9	30±3	22±3	646±5	628 ^{+8/-5}	1104 ^{+0/-10}	1086 ^{+8/-5}
ACCN (EOG)	48.3	5.12	5.12	17.95	20.51	40±5	54±5	70±3	56±3	278 ^{+6/-4}	266 ^{+7/-4}	12	303 ^{+6/-4}	289 ^{+7/-4}	7	34±3	22±3	646±5	620 ^{+8/-5}	1104 ^{+0/-10}	1078 ^{+8/-5}
ACCN (SG)	52.53	5.12	5.12	20.07	22.63	40±5	53±5	70±3	57±3	268 ^{+7/-4}	256 ^{+7/-5}	22	291 ^{+7/-4}	278 ^{+7/-5}	19	35±3	23±3	646±5	621 ^{+8/-5}	1104 ^{+0/-10}	1079 ^{+8/-5}
ACCZ (EOG)	43.1	5.36	5.36	15.35	18.03	40±5	54±5	70±3	56±3	290 ^{+6/-3}	278 ^{+6/-4}	Nil	316 ^{+6/-3}	302 ^{+6/-4}	Nil	32±3	20±3	646±5	620 ^{+8/-5}	1104 ^{+0/-10}	1078 ^{+8/-5}

Type of coach	Tare weight of coach	Normal pay load	Total pay load	Test load per bogie		Bogie frame bolster clearance		Body bogie clearance		Axle box spring height			Bolster spring height		Crown clearance		Bogie bolster height		Coupler height		
				Under tare	Under Gross	C		D		G		CR	H		CR	X		Y		Z	
						In tonnes	In tonnes	Tare	Gross	Tare	Gross		Tare	Gross		#	Tare	Gross	*	Tare	Gross
AC	In tonnes	In tonnes	In tonnes																		
ACCZ (SG)	46.83	5.84	5.84	17.22	20.14	40±5	56±5	70±3	54±3	281 ^{+6/-4}	268 ^{+6/-4}	9	307 ^{+5/-4}	291 ^{+7/-4}	3	35±3	22±3	646±5	617 ^{+8/-5}	1104 ^{+0/-10}	1075 ^{+8/-5}
FACZ (EOG)	42.6	3.68	3.68	15.10	16.94	40±5	50±5	70±3	60±3	291 ^{+5/-3}	283 ^{+6/-4}	Nil	318 ^{+5/-3}	308 ^{+5/-4}	Nil	27±3	19±3	646±5	628 ^{+8/-5}	1104 ^{+0/-10}	1086 ^{+8/-5}
RA (NON AC)	41.3	1.20	1.20	14.45	14.05	40±5	44±5	70±3	66±3	279 ^{+5/-3}	276 ^{+6/-4}	11	298 ^{+5/-3}	294 ^{+5/-4}	17	20±3	17±3	646±5	640 ^{+8/-5}	1104 ^{+0/-10}	1098 ^{+8/-5}
VP (HIGH CAPA CITY)	32	23	23	9.8	21.3	40±5	81±5	70±3	29±3	287 ^{+5/-3}	262 ^{+6/-4}	03	310 ^{+5/-3}	269 ^{+5/-4}	Nil	36±3	11±3	646±5	580 ^{+8/-5}	1104 ^{+0/-10}	1038 ^{+8/-5}
IRQ ACCN (SG)	41.3	5.12	5.12	19.45	22.01	40±5	54±5	70±3	56±3	271 ^{+7/-4}	259 ^{+7/-5}	19	295 ^{+7/-4}	281 ^{+7/-5}	15	35±3	23±3	646±5	620 ^{+8/-5}	1104 ^{+0/-10}	1079 ^{+8/-5}
RA AC	46.69	1.20	1.20	17.14	17.14	40±5	43±5	70±3	67±3	282 ^{+5/-3}	279 ^{+6/-4}	8	307 ^{+5/-3}	304 ^{+5/-4}	3	22±3	19±3	646±5	640 ^{+8/-5}	1104 ^{+0/-10}	1098 ^{+8/-5}



SUSPENSION DIAGRAMMATIC ARRANGEMENT

FOR NON AC COACHES (RCF DRAWING NO. CC'90019)P
 FIGURE 1.4c

TESTING PARAMETERS FOR NON AC COACHES (RCF DRAWING NO. CC90019)

Table 1.6

Type of coach	Tare weight of coach	Normal payload	Over load	Total payload	Test load per bogie		Bogie frame bolster clearance		Body bogie clearance		Axle box spring height		Bolster spring height		Crown clearance		Bogie bolster height		Buffer height			
					Under tare	Under Gross	C		D		G	CR	H	CR	X		Y		Z			
AC	In tonnes	In tonnes	In tonnes	In tonnes	In tonnes	In tonnes	Tare	Gross	Tare	Gross	Tare	Gross	#	Tare	Gross	*	Tare	Gross	Tare	Gross		
GS	36.99	5.85	100%	11.70	12.6	18.45	40±5	74±3	70±3	36±3	289 ^{+4/-3}	262 ^{+5/-4}	1	308 ^{+5/-3}	274 ^{+7/-4}	7	47±3	20±3	646±5	585 ^{+8/-5}	1104 ^{+0/-10}	1043 ^{+8/-5}
SOC	37.00	7.02	100%	14.04	12.6	19.62	40±5	81±5	70±3	29±3	289 ^{+4/-3}	257 ^{+6/-4}	1	308 ^{+5/-3}	267 ^{+7/-5}	7	50±3	18±3	646±5	572 ^{+8/-5}	1104 ^{+0/-10}	1030 ^{+8/-5}
SCN	38.03	5.76	-	5.76	13.12	16.00	40±5	57±5	70±3	53±3	287 ^{+4/-3}	273 ^{+5/-3}	3	305 ^{+5/-3}	288 ^{+6/-4}	10	31±3	17±3	646±5	616 ^{+8/-5}	1104 ^{+0/-10}	1074 ^{+8/-5}

Type of coach	Tare weight of coach	Normal payload	Over load	Total payload	Test load per bogie		Bogie frame bolster clearance		Body bogie clearance		Axle box spring height		Bolster spring height		Crown clearance		Bogie bolster height		Coupler height			
					Under tare	Under Gross	C		D		G	#	H	*	X		Y		Z			
AC	In tonnes	In tonnes	In tonnes	In tonnes	In tonnes	In tonnes	Tare	Gross	Tare	Gross	Tare	Gross	CR	Tare	Gross	CR	Tare	Gross	Tare	Gross		
SLR	37.10	10.60	2.6	13.20	12.65	19.25	40±5	79±5	70±3	31±3	289 ^{+4/-3}	258 ^{+6/-4}	1	308 ^{+5/-3}	269 ^{+7/-5}	7	50±3	20±3	646±5	577 ^{+8/-5}	1104 ^{+0/-10}	1035 ^{+8/-5}
VP	32.00	18.00	-	18.00	10.30	19.30	40±5	77±5	70±3	33±3	285 ^{+4/-3}	257 ^{+6/-4}	5	302 ^{+5/-3}	265 ^{+7/-5}	13	39±3	11±3	646±5	581 ^{+8/-5}	1104 ^{+0/-10}	1039 ^{+8/-5}
IRQ SCN	37.2	5.76	-	5.76	12.7	15.58	40±5	57±5	70±3	53±3	289 ^{+4/-3}	275 ^{+5/-3}	1	308 ^{+5/-3}	291 ^{+6/-4}	7	30±3	17±3	646±5	616 ^{+8/-5}	1104 ^{+0/-10}	1074 ^{+8/-5}
Postal Van	36.5	3.0	-	3.0	12.35	13.85	40±5	49±5	70±3	61±3	290 ^{+4/-3}	283 ^{+5/-3}	Nil	310 ^{+5/-3}	301 ^{+6/-4}	5	22±3	15±3	646±5	630 ^{+8/-5}	1104 ^{+0/-10}	1088 ^{+8/-5}

Coach

107 EXAMINATION OF TRAINS

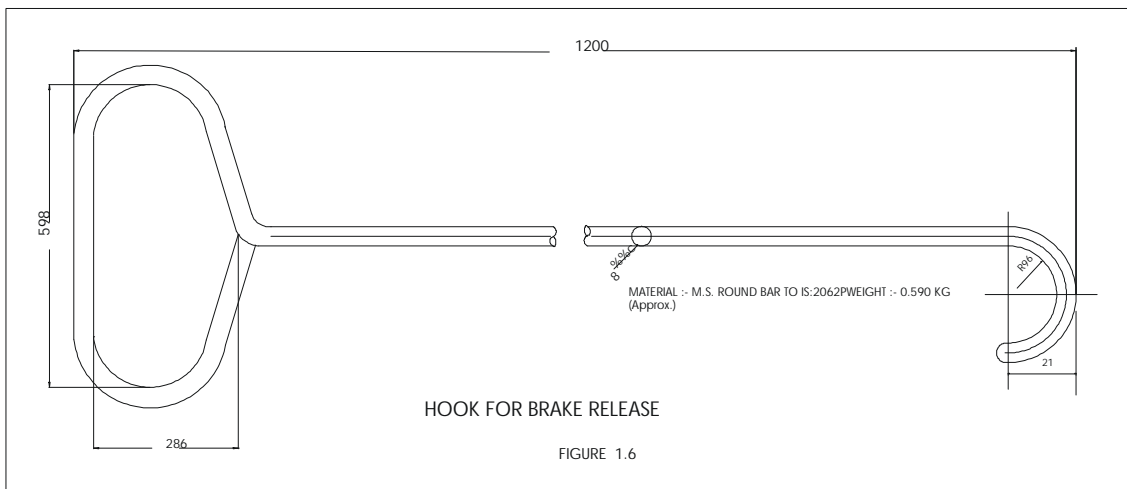
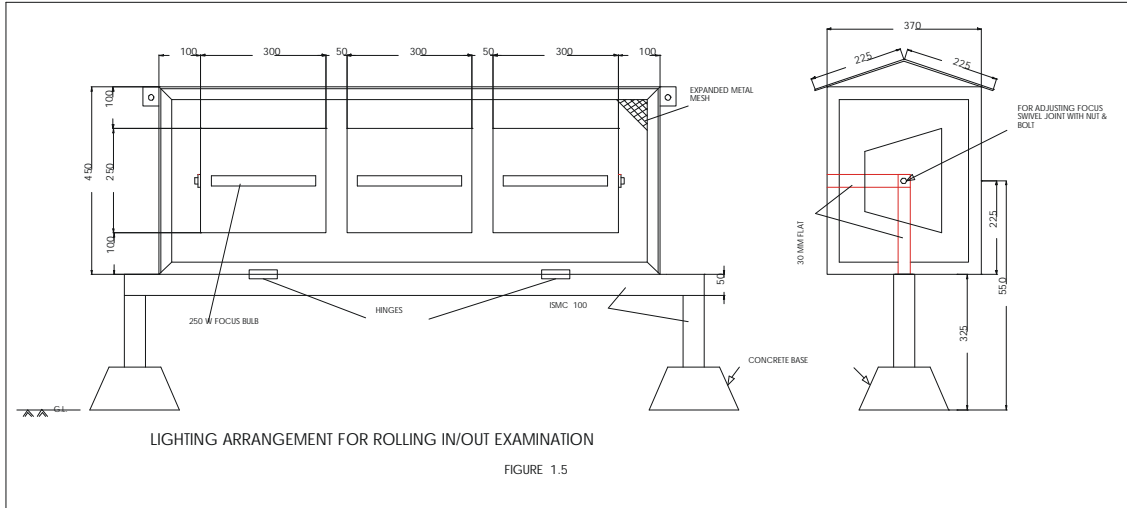
107a Examination of originating trains

- i) All trains must be examined by the mechanical train examining staff before dispatch to ensure that all coaches on the train are in fit condition and without rejectable defects (for rejectable defects, please refer to IRCA Conference Rules, Part IV). On formation of a rake and after its placement for Examination, washing, cleaning and watering, the station master (SM) shall pass necessary memo to the Engineer (C&W). After carrying out all necessary work, the Engineer (C&W) shall communicate fitness of the train to Station Master. Normally, Railways have standard forms for the use of Station Masters and Engineers for this purpose. Railways, where such forms are not used, should also start using these forms as uniform practice for the guidance of both Engineer (C&W) and Station Master. The Station Master shall not dispatch the train unless the fitness certificate, in the prescribed form, is received from the Engineer (C&W).
- ii) The level of the air pressure/vacuum on the train engine and the brake van gauges as well as the percentage of operative cylinders should be recorded on a prescribed certificate and signatures of the driver and the guard of the train should be obtained by the Engineer (C&W) as per the procedure laid down by each Railway. A suggested standard format for the certificate is placed at Annexure 1.1. No train should be allowed to leave with an inoperative/defective Brake cylinder on any coach after pit attention. Trains which have been attended on pitline should have **100% brake power**. Trains which are attended on platform or where secondary examination has been dispensed with or enroute should have minimum **90% brake power**.

107b Enroute/Terminating Examination of Passenger Trains

- i) Sr.DME/DME incharge shall nominate the site for carrying out rolling in/rolling out examination after personal inspection of site. While nominating the site following should be kept in view:
 - a) Site shall provide unobstructed view of undergear from both sides.

- b) Speed of the train shall not be more than **30 KMPH**,
- c) It should cover the entire length of train,
- d) Should have adequate space for fixing the lighting arrangement and for staff.
- ii) For rolling in examination of train it has to be ensured that proper lighting arrangement is provided on both the sides of the track at nominated spots for examination of undergear parts during night. Focussing of lights shall be done by keeping a coach on the line and adjusting the angle of light to illuminate undergear and bogie. Use of fixed lights as indicated in **figure 1.5** is preferable.
- iii) C&W staff should take position at nominated rolling in place on both the sides of the track before the arrival of train.
- iv) As the train passes the nominated point, C&W staff should watch out vigilantly for loose/hanging/broken undergear parts of the coaches, any unusual sound coming from the coaches or any other abnormality in the coaches.
- v) After train comes to halt, it should be ensured that the train is protected from both the sides (with the stop board/red flag during day time and red lamp during night time) before commencing the examination of the train. It should be ensured that a suitable indication board is placed at conspicuous location visible to the driver indicating that C&W staff is at work.
- vi) Temperature of the axle boxes should be measured preferably with the help of the electronic temperature measuring device.
- vii) Brake release shall be checked by physically moving the brake beam. However, in case where train locomotive has to be detached, brakes of all coaches shall first be manually released. For checking the release of brakes the hook may be used (drawing of hook is attached as **figure 1.6**).
- viii) Other undergear parts should be examined visually to ensure that the train is safe to run further. During night the lamps/search light shall be used for illumination .
- ix) Repairs if required should be carried out promptly to avoid detention to train to the extent possible.



- x) Lavatories of the coaches should be properly cleaned using High pressure water jet machine provided at nominated stations during halt of the train. Any complaint from passengers should be attended promptly to the satisfaction of the passenger.
- xi) After attending to any required repairs stop board/red flag should be removed.
- xii) Carriage controller (CCR) should be informed about any out of course work done.
- xiii) CCR shall repeat the out of course work done to the Primary Maintenance (PM) depot after corrective action.
- xiv) At the train examination stations where locomotives are changed on through trains, the level of air pressure/vacuum created on the locomotive and brake van gauges should be recorded on the certificate to be issued to the guard and driver on prescribed form. The inoperative/blanked cylinders, if any, should also be written in the certificate for their information. This certification should be an endorsement on the original brake power certificate; no fresh brake power certificate needs to be issued.

**108. MAINTENANCE PATTERN FOR COACHING TRAINS
(Railway Board letter no. 95/M(C)/141/1 dtd. 29.10.01)**

Table 1.8

Sr. No.	Category of trains	Preventive maintenance schedules at pitline	Under gear examination and brake system maintenance at pit line	Internal cleaning, passenger amenity attention and watering	External cleaning on nominated line with proper facilities	Enroute/Terminating examination	Brake system check prior to start at platform at the other end
01	Mail/Exp. One-way run > 2500 kms	At primary end	At both the ends	At both the ends	At both the ends	Enroute: After every 250 to 350 kms of run at locations to be decided by Railway for each train. Terminating Exam Terminating station	Complete air/vacuum check with fresh BPC.
02	Mail/Exp. One way run < 2500 kms but round trip run > 2500 kms	At primary end	At both the ends	At both the ends	At both the ends	- do -	Complete air/vacuum check with fresh BPC.
3 (a)	Mail/Exp. Round Trip run upto 2500 kms	At primary end	At both the ends	At both the ends	At primary ends	- do -	Only continuity check if stabled at platform, otherwise, brake power check with endorsement on original BPC.

Sr. No.	Category of trains	Preventive maintenance schedules at pitline	Under gear examination and brake system maintenance at pit line	Internal cleaning, passenger amenity attention and watering	External cleaning on nominated line with proper facilities	Enroute/Terminating examination	Brake system check prior to start at platform at the other end
3 (b)	Shuttles/Interconnected Mail/Exp. round trip run upto 2500 kms.	At primary end	To be done after 2500 kms or 4 days whichever is earlier only at Primary end.	At primary end and each terminal or as decided by the CME to ensure proper cleanliness.	At primary end <i>Once a day for shuttles.</i>	Enroute: After every 250 to 350 kms of run at locations to be decided by Railway for each train. Terminating Exam Each Terminating station	Only continuity check if stabled at platform, otherwise, brake power check with endorsement on original BPC.
4.	Passenger trains with toilets including interconnected passenger trains/Shuttles	At primary end	To be done after 2500 kms or 7 days whichever is earlier at Primary end.	At every terminal or as decided by the CME to ensure proper cleanliness.	At primary end.	Enroute: After every 250 to 350 kms of run at locations to be decided by Railway for each train. Terminating Exam Once a day at nominated Terminating station	
5.	Passenger trains without toilets.	At primary end	To be done after 2500 kms or 7 days whichever is earlier at Primary end.	Once a day	At primary end.	Once a day at primary or a nominated terminal.	Only continuity check if stabled at platform, otherwise brake power check with endorsement on original BPC.

- Internal cleaning, Passenger amenity attention and watering may be done at platform line or nominated stabling line provided stipulated facilities are available at such line.
- Incase the rake stabled in yard for more than 6 hours positive safety arrangement should be made for the rake and in case the security is considered inadequate, the rakes should be taken to pit line for attention to under gear as given under column (4).

108a Approved Mandatory conditions to be fulfilled prior to introduction of Round Trip Primary Pattern of Maintenance on Coaching Trains

The following mandatory conditions should be fulfilled prior to introduction of **round trip/kilometers base PRIMARY** maintenance pattern on any passenger carrying train on Indian Railways:

PRIMARY END:

1. The attention during primary maintenance should be made more intensive with special emphasis on the following aspects:
 - i) The brake gearing should be properly adjusted including the slack adjuster 'A' dimension & the brake cylinder stroke to ensure **100% brake power.**
 - ii) Brake blocks should be changed in bogie sets only.
 - iii) Dash-pot oil level must be checked and maintained.
 - iv) All missing passenger amenity fittings must be replaced and the rake must be turned out as 'Zero-Missing-Fitting' rake.
 - v) Intensive cleaning of coach toilets and lavatory.
 - vi) No coach should run overdue schedule.
2. Clear maintenance time of 6 hours on the pit as per train schedule. Any exception to be jointly decided by COM/CME of the Railways.
3. Provision of proper washing cum maintenance pit line facility with adequate testing equipment and high pressure water cleaning arrangement.
4. Adequate gang strength with proper supervision.

THE OTHER END:

5. Whenever the lie-over is more than 2 hours at the platform or the rake is stabled in the yard, the rake should be locked and positive security should be provided.
6. Amenity and cleaning attention is *carried out best on the washing lines* where complete infrastructure by way of men, material and machines are available. Watering and drainage facilities are also available on these washing lines. Ideally, for cleaning and watering, the rakes

should be taken to washing lines as far as possible. In the event of this being not feasible, such rakes can be returned from platform/yards. However, the minimum infrastructure to be provided at the platforms from where trains are returned without secondary maintenance should be as under.

- i) One storage room for essential safety and passenger amenity item.
 - ii) Road transportation facility for ferrying material from the main depot to the platform.
 - iii) Adequate number of mobile high pressure jet cleaning machines or high pressure water pipe line running around the platform /yard line.
 - iv) Washable apron on the platform lines with the covered drains to facilitate movement of maintenance staff.
 - v) Walkie-Talkie/mobile telephones for quick and easy communication.
 - vi) Standard watering hydrants.
 - vii) Flood light at the platform ends for rolling-in examination at night and 110 V inspection lights along the side of the track for night examination of the under gear.
7. The decision, whether such trains may be shunted for working on pit line or attended at platform itself, has to be taken carefully after weighing these factors by the mechanical and Traffic HODs on the zonal Railway on case to case basis.
 8. The status of implementation of revised pattern of coaching trains should be reviewed every year in the month of June by Mechanical and Operating branches at Divisional level and any discrepancy should be removed.

109 WASHING AND CLEANING OF COACHES

Use recommended solutions for cleaning as per RDSO specification No. M&C/PCN/101/2001 or use cleaning agents approved by CME of the Railway.

109a Platform cleaning and washing

- i) Wherever washable aprons are available on the platforms, the time available before the terminating trains are pulled out into the yard, should be utilised for inside sweeping and toilet cleaning.

109b External Cleaning / Washing

- i) Place the rake/coaches on the washing pit provided with equipments required for washing and cleaning. It should be ensured that the rake/coach is protected with proper board/signal for safety of the staff working on washing/cleaning job to prevent movement/disturbance in the activity. Scotch blocks with locking arrangement should protect lines and keys should be kept with Engineer (C&W) till the time rake is under maintenance.
- ii) Before starting washing and cleaning of side wall, ensure that the glass shutters and louver shutters of that side are lowered. Remove dirt/dust accumulated on shutters by compressed air or duster.
- iii) Remove old reservation charts/labels on the body panels. Splash water on old charts so that they are wet for easy separation. Care should be taken to avoid any damage to the paint.
- iv) The cleaning solution should be spread/rubbed with nylon brush or sponge brushes and then rubbed thoroughly to clean the panels. Extra attention should be given to oily and badly stained surfaces.
- v) Destination boards may be removed and cleaned with brush/duster.
- vi) Clean the external surface by high pressure jet where facilities are available.
- vii) All exterior panels including end panels should be hosed with water and brushed with diluted soft soap (detergent solution) The strength of the solution may be increased or decreased according to RDSO specification M&C/PCN/101/2001.

109c Cleaning of Toilet

- i) Before starting cleaning of toilets ensure that all repairs in the toilets have been carried out and after cleaning no employee should enter in the toilet.
- ii) Doors and walls should be cleaned with water sprayed by high pressure jet up to waist level. Apply specified solution and rub thoroughly with sponge brush/duster/nylon bristle brush.
- iii) Indian style lavatory pans have to be cleaned by thorough rubbing with concentrated solution of recommended cleaning agent.
- iv) Western style commode shall be cleaned as (iii) however due care should be taken that recommended solution should not fall on commode lid which may damage/spoil it.

- v) The flooring should be rubbed with nylon bristles/sponge brush and cleaned with recommended cleaning agent. The drain holes should be cleaned thoroughly for easy discharge of water.
- vi) The mirrors in toilet should be cleaned with light wet cloth. Recommended solution should be used for cleaning the dirty portion of glasses.
- vii) After all the washing and cleaning in the toilets mentioned above, the toilets should be thoroughly cleaned with water jets and water should be flushed out. All fittings and floor should be wiped dry with a cloth.
- viii) After cleaning, spray deodorant in the toilet to remove the bad odour.

109d Internal cleaning of upper class AC and sleeper coaches

- i) Collect the cigarette ends from all Ash trays, news paper from magazine bag and waste from dust bin. Sweep the whole coach with broom in sleeper coaches. Clean the floor of AC coaches with vacuum cleaner.
- ii) Remove dust from floor, berths/seat, magazine nylon wire mesh bag fitted on panels and fan guards with duster. Use of vacuum cleaner is excellent in such areas.
- iii) Also remove dust/dirt from under the berths, window sill, sliding door, railing corner and all corner & crevices of coach interior with vacuum cleaner if provided.
- iv) Ceiling panels, wall panels, cushion berths, fittings, table top, etc. should be cleaned with duster and stain marks on these should be removed by use of recommended soft detergent.
- v) Aluminum frames, strips, and other metal fittings, etc. should be cleaned with recommended cleaning agent.
- vi) FRP window frames, louvers, etc. should be cleaned with recommended solution and rubbed out by nylon brush or sponge /duster to remove stain marks.
- vii) Alarm chain handle and its holding bracket should be washed and cleaned.
- viii) The coach flooring should be rubbed with hard coir brush and PVC flooring should be rubbed with nylon bristles/sponge brush and cleaned with recommended cleaning agent.
- ix) In AC coaches, the amenity fittings and toilet fittings such as coat hanger, stools, arm rest, foot rest, towel hanger, etc. should be cleaned with duster. Stains on these items should be removed with recommended detergent solution.
- x) The compartment carpet should be cleaned with vacuum cleaner. Every

month, the carpet should be cleaned thoroughly by taking it out from compartment and if necessary they should be dry cleaned in every three to four months. Before re-laying the carpet, the compartment floor should be thoroughly cleaned.

- xi) Spray recommended air freshener in the coach. No employee should be allow to enter the coach for any purpose/work after complete cleaning
- xii) Curtains in the AC Coaches and Tourist Cars should be removed for periodical washing and cleaning. Faded and damaged curtains should be replaced on condition basis.
- xiii) Precaution should be taken to prevent nuisance of cockroaches in AC coaches and pantry cars by periodical spray of recommended insecticides
- xiv) No repair works on Electrical train light/fan/AC) or Mechanical account should be left to be carried out after washing and cleaning of the coach..

109e Internal Cleaning of GS, SLR

- i) Cleaning of GS, guard and passenger compartments of SLR should be done as mentioned under para 109d above wherever applicable.
- ii) If necessary clean the wooden seat and their frames with recommended detergent solution and water.
- iii) Interior surfaces of parcel and luggage vans should be cleaned with recommended detergent and water.

109f Cleaning of buffers and screw couplings

- i) Buffer plungers should be scrubbed with a scraper to remove dirt and muck. Thereafter, they should be wiped clean with cleaning oil and rubbed with coir rope.
- ii) Screw coupling threads should be cleaned with wire brush to remove all dirt and dust. Thereafter, it should be cleaned and given a light coat of oil. Oiling should be done on slack adjuster also.

110 CONDITIONS REQUIRED FOR MAINTENANCE OF 24 COACH TRAINS

(Railway Bd.'s letter no. 98/M(C)/137/19 Pt. I dt. 28.7.99 & dt. 05.05.2000)

110a Infra structural Requirements

- (i) 24 coach length fully equipped pit line.
- (ii) High pressure jet cleaning pipeline with plant for cleaning at primary pit line. Mechanised external cleaning is preferable.
- (iii) Water hydrants for 24 coach length at en route watering stations with 20 minutes stoppage at nominated stations
- (iv) Availability of the prescribed air brake maintenance and testing equipment.

110b Coach Design related Requirements

- (i) Air brake with twin pipe graduated release system
- (ii) Only enhanced capacity draw gear and screw coupling to RDSO sketch No. 79061 and 79067 are to be provided on the rake

110c Maintenance Practices and system related requirements

- (i) The integrity of the rakes to be maintained.
- (ii) Primary maintenance of the rake should be done in one hook without splitting
- (iii) Minimum maintenance time of 6 hours on the pit during primary maintenance
- (iv) It is mandatory to provide secondary maintenance to all trains augmented to 24 coaches .
- (v) Trains leakage rate to be maintained within prescribed limits by using rake test rig.
- (vi) Provision of proportionate brake system on the locomotive in good working order
- (vii) Provision of audio visual alarm system on the locomotive
- (viii) In case of double-headed diesel locos maximum traction motor current will be restricted to **650 amperes** and in case of double headed WAP1/WAP3 electric locos, the traction motor current limit will be **750 amperes** as prescribed in RDSO 's instructions for operation of main line air brake trains - C-9408.

110d Operational requirements

- i) Communication between driver and guard should be provided through suitable means.
- ii) Special care to ensure no gap between coach buffers after tightening the coupler.
- iii) No additional coach attachment beyond **24 coaches** will be permissible.

111 MAINTENANCE PRACTICES IN OPEN LINE DEPOTS

111a Nomination of a Depot

- i) All passenger coaching vehicles (PCVs), other coaching vehicles (OCVs), owned by individual railways should be allotted a base depot for primary maintenance and a base workshops for periodical overhaul and special repairs by the Chief Mechanical Engineer/Chief Operation Manager of the Railway.
- ii) The base depot to which the coaches are allotted will be responsible for their maintenance. It will also be responsible for the secondary maintenance of the coaches as prescribed by the Railway.
- iii) If a coaching stock allotted to a particular depot, finds its way to another depot, it should be despatched to the allotted depot for proper service.
- iv) Due to exigencies of service a coach of another depot can be retained with the sanction of the Chief Mechanical Engineer (CME). It should, however, be subjected to necessary examination and repairs including maintenance schedules in the manner as it belonged to the depot.
- v) No overdue periodical overhaul (POH) coaches of other railway should be allowed in service but should be booked to the owning railway for POH.
- vi) If home railway stock is retained in service beyond return date for any reason, IRCA rule 2.2.4 should be followed.
- vii) Standard integrated modular pit line should be provided as given in Appendix E.

111b Special Repairs

- i) The special repairs (Non-POH repairs) by workshops are those repairs, which can not be done in the sickline with their existing facilities or are specifically prohibited to be carried out on the divisions.
- ii) Special repair coaches should be sent to the base workshops only after obtaining

the permission of the Chief Mechanical Engineer and according to the calling in program of the workshop.

- iii) For requesting permission for non-POH repairs, the supervisor incharge of the depot should prepare a complete list of damages and deficiencies and forward it to Divisional Mechanical Engineer for getting permission of the Chief Mechanical Engineer to book the coach to the shop for non-POH repairs. A copy of the list of damages and deficiencies should simultaneously be sent to the workshop concerned for planning it in their calling-in programme.

111c Intermediate Overhaul

- i) All bogies of such ICF coaches shall be given IOH after **six months ± 15 days** of the date of last POH as per table 1.1. All the newly built coaches shall be given IOH after one year of service.
- ii) During this lifting schedule, bogies/underframe members and body including trough floors of integral type coaches should be thoroughly examined and all parts of running gears are repaired/replaced as necessary. The bogie frames should be particularly checked to detect damage, cracks or deformation and necessary repairs carried out. Where it is not possible for the maintenance depot to do these repairs or are prohibited to be done in the maintenance depots, the bogies should be sent to the shops for carrying out these repairs.
- iii) The detailed table of maintenance activities to be carried out during IOH schedule is enclosed as appendix-G.
- iv) The date of intermediate lifting should then be stencilled at the appropriate place in schedule chart on the end panel.

111d Formation of Block Rakes

- i) For the purpose of maintaining the coaches and the rakes in good condition and to avoid public complaints, the Chief Mechanical Engineer, in consultation with the Chief Operations Manager of the Railway, shall form Block Rakes for each of the long distance trains and the inter-railway trains; and also nominate spare block rake coaches of adequate number for these block rakes to replace sick block rake coaches.
- ii) The station staff shall ensure that no non-block coach is attached in any Block Rake

except with the express permission of the Divisional Mechanical Engineer, who will grant such permission only in emergency and that too for a specified trip only.

111e Destination Boards

- i) Coaches on originating trains should be provided with destination boards of approved types as prescribed by each Railway.

111f Fire Extinguishers

- i) Fire Extinguishers should be provided on all originating trains according to the number prescribed by the Railways for air-conditioned coaches, brake vans, postal vans, dining cars, etc. These fire extinguishers should be checked every three months and completely refilled after one year. These extinguishers should not be overdue testing / refilling. In case they are used or damaged en route, the report of the same should be obtained from the guard, head sorter, etc., as the case may be, and replaced.

111g Brake Van Equipment

- i) Similarly, other brake van equipment, which Mechanical Train Examining staff is responsible to supply, should be provided according to the instructions of each Railway. As per RDSO's letter no. MC/CB/28 dtd. 19.5.2000, racks have to be provided in the SLRS for provision of portable control telephones, portable train lighting equipments, portable fire extinguisher, wooden wedges/skids and stretcher. Railways can modified existing emergency equipments rooms in the guard's compartment to provide racks for keeping the above mentioned items except fire extinguisher as shown in the **figure 1.7** (RDSO's sketch K 0014)

111h Watering and cleaning of rakes.

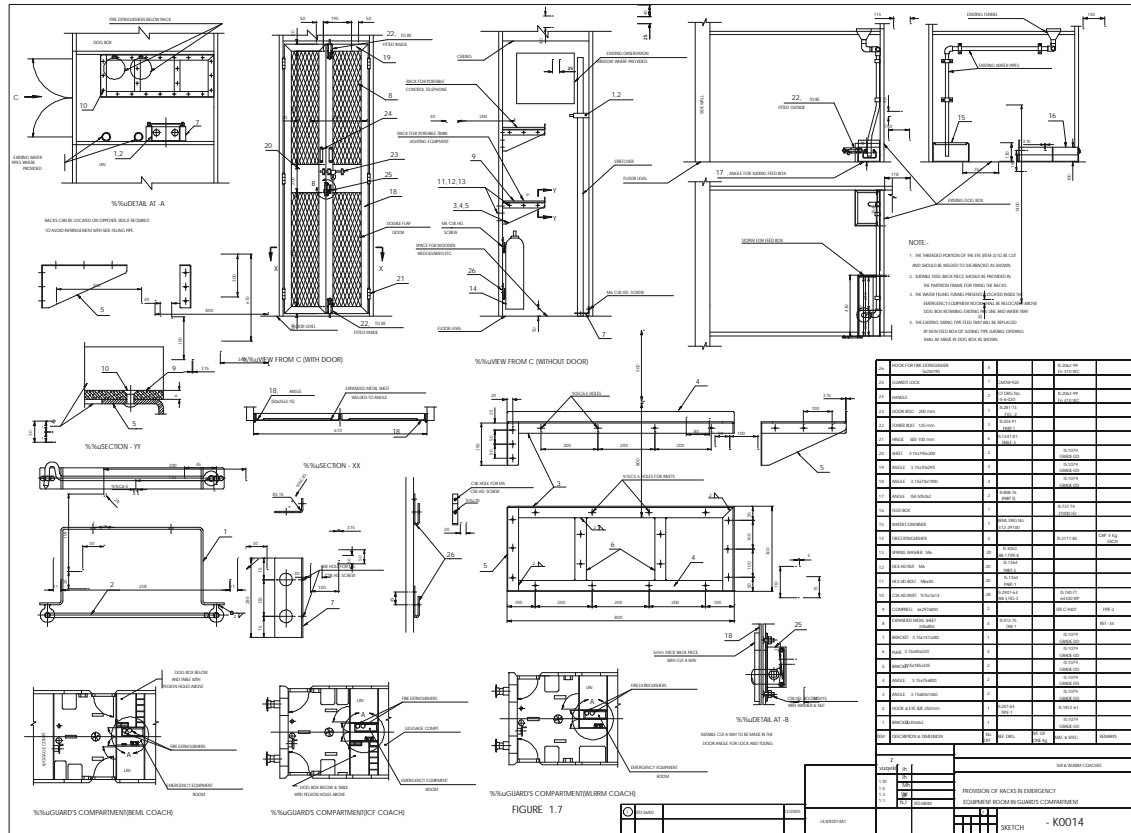
- i) Mechanical department of each railway will nominate the watering and the cleaning stations on the railway.
- ii) All water tanks should be filled on a washing line so that no watering is necessary on a platform at the originating station. Arrangements should, however, be available at each of the platforms for filling the tanks in emergencies.
- iii) Adequate staff and time should be provided at intermediate stations to enable complete replenishment of all the water

tanks of the train at each of the nominated watering stations of the railway. If necessary, where halts are small, boosters of adequate capacity should be provided to increase the water pressure and accelerate water filling.

- iv) After completing watering, the staff, in case of overhead watering arrangement, must ensure that water hosepipes are coiled and secured properly with the overhead hydrants and that the hydrants are fully closed. All leaky hydrants should be reported to the Engineer (C&W)/Engineer(Civil), as the case may be, who will arrange to get them attended. In case of ground level side filling watering arrangements, it should be ensured that water hose pipes are not dragged or left over on the platform aprons, but are hung properly on the poles to prevent contamination of water.
- v) Adequate staff and time should be provided to clean the compartment and the bathrooms/ lavatories as prescribed at nominated cleaning stations of the railway. Portable pressure jet cleaning equipment should be used for efficient cleaning of toilets.
- vi) Deployment of C&W staff on Rajdhani/Shatabdi Express/Rajdhani type nominated trains/Other superfast and Mail/Express trains should be as per Railway Board's letter no. 99/TG.V//12/2 dated 13.9.99. The 'Safaiwalas' should wear identification armbands while on duty. A suitable cleaning kit consisting of requisite cleaning agents, brushes, mops, etc. should be standardised by the Railway and provided to them.

111i Deficiency Rolling Stock (DRS) for Coaching Stock

- i) Railway should devise system for detecting deficiencies. Reports of deficiencies/ defects in Rolling Stock (DRS) reports in the proforma given in **Annexure 1.2**, should be prepared for each mail/express/passenger originating train in duplicate by the Engineer (C&W)/Electrical (TL) and should be signed jointly with the RPF representatives. Reports for mechanical deficiencies should be prepared on Performa I (the fittings mentioned in these Performa are selective and not exhaustive



- and may be altered by each Railway on the basis of the items most prone to theft on their system). This should be done soon after the maintenance of the rake is complete in the sick/ washing lines. In case the train starts from the platform itself, these reports should be prepared by the train duty Engineer (C&W)/Electrical (TL). The originating station must keep copy of the report. It should be preferable if one booklet is maintained for each service so that the carbon copy is sent with train guard, retaining the original for record.
- ii) After the coaches have been jointly checked, and DRS reports have been made, the coaches should be padlocked/ key locked and the key and report should be sent to the platform Engineer (C&W).
- iii) **Coaches with attendants**
For the coaches, which have nominated attendants, the DRS card will be given to him. Deficiencies will be noted down by the attendant and advised to Engineer (C&W) and Engineer (Electrical) at the coaching depot after end of the journey. So he will have to keep a register noting down the deficiencies and the date of advice and the date of recoupment.
- iv) **Trains which are escorted by Engineer (C&W) & Engineer (Elect.)**
For trains where an escorting C&W staff is provided on the train, he shall carry DRS card for coaches other than para iii) above and get them filled up at the secondary maintenance depot by the Mechanical/Electrical staff and get the rake examined by RPF personnel in case of any deficiency.
- v) **Trains/Coaches not covered in para iii) & iv)**
a) For other trains/coaches not covered in para iii) & iv), the DRS Reports should be handed over to the train guard and his signature obtained on the office copy. The guard will be responsible for safe carriage of the Report up to the destination. At the destination station, the outgoing guard must ensure that the reports are handed over to the Mechanical/Electrical staff immediately on arrival of the train.
b) On arrival of the train at the destination station, the Engineer (C&W) staff and electrical staff shall check the rakes jointly with a representative of RPF and comparison may be made with original report. If original report is not received,
- vi) The Supervisors at the destination station, viz., Engineer (C&W)/Engineer (TL) shall report the thefts on the form already prescribed by RPF, to the RPF/GRP as quickly after arrival of the train as possible and not later than 24 hours after the arrival of each rake. If the GRP refuses to accept such reports at the arrival station of train from the Mech. /Elec. Supervisors, it shall be incumbent on the RPF in-charge at the arrival station of the train to get cases registered with GRP and take further action as deemed fit to get the thefts traced/ reduced. If such reports are to be made to any other RPF post, this shall also be done by the RPF in-charge of the train arriving station.
- vii) The Supervisors of the originating station should compare these DRS Reports with the original DRS Reports and prepare a summary of the deficiencies/ thefts occurring in the up and down trips separately.
- viii) A train wise summary of the deficiencies/ defects shall be prepared and forwarded to the DME/DEE with a copy to Security Commissioner, RPF, of the division. The cost of the fittings should also be shown in the summary, price being taken from IRCA Rules Part IV. For items not covered in these, stores cost should be given.
- ix) In the first week of every month, Supervisors in charge of Mechanical, Electrical and Officer- in charge of RPF Posts/Outposts should hold a joint meeting to identify the areas where the deficiencies/ thefts are occurring and analyse the items more prone to breakage/losses/thefts. The officials should take remedial measures as possible at their level. A monthly statement of thefts, giving their cost and analysis should be prepared by RPF but jointly signed by Engineer(C&W), Engineer (TL)

- with the copy each sent to DME, DEE and Security Commissioner, RPF.
- x) The Divisional Officers, viz. Sr. DME, Sr. DEE & SC must meet every three months to carry out similar analysis and decide upon preventive steps to be taken in each area. They should submit similar joint report to their Headquarters Officers concerned, viz., CME, CEE and CSC.
 - xii) The CME, CEE and CSC should furnish every six months a report to the Director/ Mechanical Engineering, the Director/ Electrical Engineering and DG/RPF in the Railway Board, indicating the extent of theft of C&W and electrical fittings on their system and the remedial measures taken by them bringing out any help in any area required from the Ministry of Railways.

111j Reporting of thefts

- i) All damages/deficiencies which may apparently be due to mischief or theft during service should be reported to the RPF/GRP and the Divisional Mechanical Engineer according to the procedure laid down in Railway Board's letter No.73M(c)/165/4 dt.4.7.77 circulated to General Managers, all Indian Railways.

111k Coach Maintenance History Card

- i) Every coaching depot shall have computers for maintaining the coach maintenance history in a software programme which should be compatible with the programme of the coaching workshop.
- ii) The "Coach Maintenance History Card" (MHC) for each of its coaches. The card will contain records of maintenance schedules including POH and special repairs in shops. It will also show the history of the coach from the time the coach is placed in service till its condemnation and will give details of all major repairs like wheel changing, bogie changing, etc.
- iii) The complete history book of each coach, consisting of maintenance history cards, date card, trial card, etc. will, however, be maintained by the base workshops. When a coach is sent for POH or special repairs, a copy of its maintenance history card should be sent by its base depot to the workshops for record in its complete history book.
- iv) The workshops should send a new maintenance history card (MHC) giving the condition of the coach, the list of

important fittings and furniture in case of Air Conditioned coaches, dining cars, etc., defects and deficiencies of the fittings, if any, to the base depot when a coach is turned out of workshops after POH or special repairs. Any special instructions regarding the coach for its base depot should also be maintained in the card. If modifications are carried out, they should be indicated in the card under its appropriate column. Similarly, if trial fittings/ components are fitted or materials are on trial on the coach, the details of the fittings/ components or the materials, the authority for conducting such a trial, the purpose of the trial, the nature and the frequency of the observations to be made, the type of interim/final reports required to be submitted, the name and the address of the authority to whom it is to be submitted and any other instruction in detail should be maintained in a "Trial Card" which should be sent by the workshops to the base depot for compliance of the instructions. The base depot, on receipt of the coach from the shop, will check the fittings/ articles in the coach with the list sent by the workshops and note all the instructions for compliance. It will also make examinations and observations as prescribed in respect of trial fittings, components or materials and submit the trial reports to the appropriate authority as prescribed in the Trial Card received with the coach.

- vii) The base workshops will also carry out a detailed examination when a new coach is received, register the coach, open its history book, make a list of all defects and deficiencies and then, in consultation with the CME's office, will allot a rake number and its base depot, stencil the same on the coach and, if it is fit in all respects, it will then send the coach to the base depot for service. Also, it will prepare a warranty card as per Performa given in **Annexure 1.3** and will forward it to the base depot with detailed instructions for preferring claims from the manufacturers through Divisional Mechanical Engineer.

111 l Warranty claim for defective/failed items

There are some items for which it is mandatory for the manufacturers to give warranty claim if the item fails or becomes defective during the warranty period as specified in the specification/drawings /purchase order.

Warranty period for few items is given below as an illustration:

Table 1.9

S. No	Description of item	Warranty period
1.	Distributor valve	36 months from the date of delivery or 24 months for date of fitment whichever is earlier
2	Air brake cylinder	-do-
3	BP/FP hose	-do-
4	Slack adjuster	-do-
5	Shock absorber	15 months form the date of delivery or 12 months from date of fitment whichever is earlier.
6	Direct mounted spherical Roller bearing	36 months from the date of delivery or 4 lakhs km from the date of commissioning whichever is later
7	Upholstery for 1 st AC coaches and executive class chair car of shatabdi express	One and half year from the date of delivery
8	Composition brake blocks	18 months from the month of supply or duty life cycle i.e. time taken in reaching the wear limit of the brake block, whichever is earlier
9	UIC type elastomer flange for UIC vestibule	36 months from the date of delivery or fitment whichever is later.
10	Rubber spring of 1000 kg.m side buffers	2 years from the date of mounted in coaching stock.

Format of warranty claim is given in **Annexure 1.5** (for workshop use) and **Annexure 1.6** (for Division/depot use).

112 MAINTENANCE SCHEDULES TO BE FOLLOWED IN COACHING DEPOTS

112a To maintain coaching stock in good condition, the following maintenance schedules are prescribed to be carried out

in carriage depots on divisions where rake has been based for primary maintenance.

- i) Schedule A - Monthly (1 month \pm 3 days) in rake
- ii) Schedule B - Quarterly (3 month \pm 7 days) in rake
- iii) Schedule C - After (6 months \pm 15 days) detach coaches

A detailed table of maintenance activities to be carried out during schedules is enclosed as **Appendix-F**

112b Primary maintenance schedules are required to be carried out by the base depots to which coaches are allotted. In emergency, when due to any reason coaches cannot reach their base depots and primary maintenance schedules become due, A & B schedules should be undertaken by the carriage depots where the coaches are available. 'C' schedule should be done at base depot.

112c Open Line Maintenance of Parcel Vans (as per Rly. Bd's Lr. No. 95/M (C)/141/1Pt. dated 19.12.2001)

For piecemeal operation of ordinary parcel vans or VHP, the responsibility to carry out openline schedules including 'C' schedule (irrespective of the owning railway) will be under :

1. **In case of parcel vans which from a regular part of the rake as per authorised composition:**
The primary depot of the train.
2. **In case independent movement of parcel vans:**
The coaching depot where it becomes due prior to next movement.

In case facilities are not available at any destination, the van shall be moved a coaching depot for schedule within the stipulated period as per BG coaching Maintenance Manual.

No VPU's will be permitted to be attached to a train from a coaching depots without attending to prescribed preventive schedules as laid down above. As regards POH, the instructions contained in Board's above referred letter will be applicable.

112d **Maintenance Pattern for NMG rakes
(as per Rly. Bd's Letter No. 91/M
(C)/650/1 dated 29.5.2000)**

In order to optimize utilization of NMG rakes it has been decided to introduce the following maintenance pattern :

- i) NMG rakes may be run on goods pattern with intensive examination at both the ends, following other conditions for enroute detention in case at stabling at road side stations. In case of close circuit runs upto 2500 km, the rake may be run on round trip basis.
- ii) Close circuit rake must be clearly identified and should have a nominated base depot where adequate trained staff and spares should be available. Also each NMG coach should be marked with the nominated POH workshop and return date.
- iii) The maintenance schedules of the NMG coaches will continue to be on the coaching pattern to be carried out by the base depot.
- iv) NMG coaches are fit for only 75 kmph. Also the revised maximum payload of NMG coaches is fixed at 9.2 tonnes. Therefore, using these coaches as parcel vans for running on piecemeal basis on passenger carrying trains is strictly prohibited.

The instruction regarding POH and life of converted coaches continue to remain same which are as per Board's letter no. 91/M(C)/650/1 dtd. 10.9.96.

112e Each coach should be stencilled at a suitable place on its end panel, the code name of the base depot and a schedule chart. The date and station code of the depot where a particular schedule is carried out should be stencilled at the appropriate place in the schedule chart immediately when the schedule is completed.

**113 PRIMARY/ SECONDARY
MAINTENANCE**

113a The rakes/ coaches of all trains should be given a Primary/Secondary Maintenance examination as prescribed by the Chief Mechanical Engineer of the Railway.

113b Coaches shall be washed and cleaned thoroughly from outside and inside as prescribed in clause 109.

113c **Brake system maintenance**

Air brake system (Bogie mounted and underframe mounted)

- i) Visually check all the air brake equipments (DV, PEASD, PEAV, etc.) including their mounting brackets and anti pilferage devices for any damage on coach of the rake as per the check list given in clause 423.
- ii) Check the operation of brake cylinder while conducting brake tests. If the red paint on the piston rod is visible, replace the brake blocks and make necessary resetting of Adjusting tube sub-assembly before the coaches are put into service runs.
- iii) Perform leakage test for brake pipe and feed pipe and its connecting pipes as described in annexure 4.5 para 3 (Rake test).
- iv) Performs service application and release tests as described in annexure 4.5 para 3 (Rake test).
- v) Carry out alarm chain pull test & check the working of PEASD and Passenger emergency valve as per annexure 4.4 para 4.6 (Rake test)..
- vi) Drain the dirt collectors for removal of water/moisture.
- vii) Perform manual release test and check the movement of brake cylinder piston. Brakes should be in fully release condition.

Vacuum brake system

- i) Entire vacuum brake system including slack adjusters and direct admission valves should be tested for leakage and proper functioning as described in vacuum brake system chapter at para no. 509b (Balance vacuum test and normal vacuum test). Balance vacuum test to be done as per schedule when vacuum cylinder is replaced.
- ii) Test alarm chain apparatus under full vacuum. and check clappet for leakage.

113d In addition to above the following items of work should be attended during the maintenance schedule examination:

- * underframes
- * bogie frames
- * axle boxes
- * springs.

These items should be wiped with wet waste weaves or cotton waste as necessary so as to facilitate examination. All under gear components should then be examined and repaired as necessary to ensure that there is no 'S' marked rejectable defect as mentioned in Chapter IV of IRCA Conference Rules.

113e The following items of undergear components should, however, be specially examined and attended to:-

- i) Oil in hydraulic dash pots of Rajdhani and Shatabdi coaches should be checked once in 15 days to detect oil leakage from them through defective seals or through the vent screw. Add/ replenish with specified grade of oil if the oil level is below **40 mm** in the tare condition for ensuring better riding comfort.
- ii) Wheel profiles should be visually examined and gauged in case they appear to be near condemning limits.
- iii) The brake gear should be checked and so adjusted that the piston stroke is within the limits specified for different types of coaches. (see table 1.10). 'A' and 'e' dimensions for slack adjuster should be as per table 1.11.

Table – 1.10
Brake cylinder piston stroke

Type	Minimum	Maximum
Bogie mounted air brake cylinder	32	95
Under frame mounted air brake cylinder	75	95
Vacuum brake cylinder	125	135

Table – 1.11

'A' & 'e' dimension for slack adjuster		
Type of bogie	'A' dimension	'e' dimension
13 tonne bogie	16 ± 2 mm	375 ± 25 mm
16.25 tonne bogie	22 ± 2 mm	375 ± 25 mm

113f The following coach body components and fittings should be specially checked and attended to :

- (i) Doors should be properly secured with the hinges/pivots and should not be grazing with floor or door sill plates.
- (ii) Door latches and safety catches should be firmly secured with screw of correct sizes and engaging properly and smoothly in their slots. The tongue of a gravity type latch should be in proper alignment with its slot plate.
- (iii) Door lock handles should neither be stiff nor too loose and should be properly engaging on the striking plate.
- (iv) Tower bolts should be complete and should operate easily and be in alignment with the clamp. Tower bolts should be fitted on a sound base with proper screws, at an **angle of 15°** to the horizontal to avoid locking by its self.
- (v) Window shutters should neither be tight nor loose in railings to allow rattling and disengaging of catches on run.
- (vi) Window shutter safety catches should properly engage in their slots.
- (vii) Window frame should not be broken and its glass, gauze wire or venetian louvers should be in proper condition.
- (viii) Vestibule assemblies of all vestibule coaches should be checked and repaired as necessary. No coach with vestibule ends should be allowed to work without provision of proper fall plates and end doors to make the vestibules functional.
- (ix) Any defective vestibule should be checked with permanent locking.
- (x) Water pipe connections, flushing valves, cocks and shower roses should not be leaking or choked.
- (xi) Drain grills and drain holes in the bathroom floors and wash basin drainpipes should be cleaned and opened where found choked.
- (xii) Any other deficiency as per **Annexure 1.2** should be made good.

113g After coaches are attended to in washing/pit lines, they should be disinfected and insecticide sprayed

- especially at crevices and corners before they are released for use.
- 113h A proper record should be kept by Engineer (C&W) at washing/pit lines of schedules carried out by them, especially of items required to be attended at specific periodicity.
- 114 SCHEDULE `A' EXAMINATION**
- 114a Schedule `A' is required to be given every month ± 3 days at the nominated primary maintenance depot within the normal primary maintenance time on a washing/pit line in a rake. A coach need not be detached from the rake for Schedule `A' examination unless it requires such repairs which cannot be attended to on the washing line or within the prescribed maintenance time on the washing line.
- 114b **Brake system maintenance**
- Air brake system (Bogie mounted)**
- 'A' schedule maintenance as per air brake chapter.
- (i) All items of primary/secondary maintenance schedule.
 - (ii) Test the working of brake cylinders for proper application and release.
 - (iii) Thorough inspection of brake pipe, feed pipe and their connecting pipes to brake cylinder, distributor valve, Auxiliary reservoir and hose coupling for leakage and attention.
 - (iv) Carry out manual brake release test on every coach to ensure proper functioning of release lever of distributor valve.
 - (v) Micro switch of ACP should be tested by electrical staff for proper functioning.
 - (vi) Clean Dirt collector filter with kerosene and refit.
 - (vii) Test the working of slack adjuster in under frame mounted air brake system as per **annexure 4.4 para 4.8** in Air brake chapter. Repair/Replace the defective slack adjuster.
 - (viii) Examine loops/ brackets and their securing devices and rectify.
 - (ix) Examine for wear and replace if required brake hanger pins, brake blocks and brake heads.
- Vacuum brake**
- i) Thorough inspection of train pipe, hose pipes including their cages, vacuum cylinders, siphon pipes and vacuum system.
 - ii) Testing of cylinders and train pipe joints with exhauster under **51 cms of vacuum**.
 - (iii) Cleaning, greasing and testing of alarm chain apparatus under full vacuum with a spring balance and cleaning and checking of clappet valve for leakage.
 - (iv) Cleaning of DA valve filters as mentioned under in vacuum brake chapter para no. 506b for Escort / Greysham D.A valve.
- 114c The following items of work should be attended during Schedule `A' examination, i.e., monthly examination:-
- (i) All items of primary/secondary maintenance schedule.
 - (ii) Intensive cleaning of coaches.
 - (iii) Intensive cleaning of lavatory pans and commode with specified cleaning agent.
 - (iv) Thorough flushing of tanks.
 - (v) Checking of water pipes, flush pipe, flushing cocks, push cocks, etc., for ease of operation and free flow of water.
 - (vi) Thorough dis-infection of all compartments.
 - (vii) Thorough inspection and repairs of draw gear as per item 6.0 of appendix F.
 - (viii) Thorough inspection and repairs of buffers as per item 7.0 of **appendix F**.
 - (ix) Oil in hydraulic dash pots should be checked to detect oil leakage from them through defective seals or through vent screws. Add/replenish with specified grade of oil if oil level is below 40 mm in tare condition to ensure better riding comfort. Similarly oil in side bearer baths should be checked when the oil is below the plug and replenished with specified grade of oil so that wear plate is fully covered by oil.
 - (x) Inspection and repairs of commode chute.
 - (x) Thorough check and repairs of sliding doors and vestibule doors for easy and smooth operation and

- correct alignment and all wearing parts, loose screws, etc.
- 115 SCHEDULE `B' EXAMINATION**
- 115a Schedule `B' is required to be given every three months ± 7 days at the nominated primary maintenance depot within the normal time allowed for primary maintenance on a washing line in rake. Coach need not be detached from the rake for purpose of this examination unless it requires such repairs which cannot be attended to on the washing line or within the prescribed maintenance time on the washing line.
- 115b The following items of work should be attended.
- Brake system maintenance**
Air brake system (Bogie mounted)
- (i) Same as 'A' schedule
- Vacuum Brake system**
- (i) Examination, overhauling and testing of alarm chain apparatus as prescribed in vacuum brake chapter.
(ii) Overhauling of release valve, replacement of its diaphragm and sealing washers, if necessary.
(iii) Examination of neck rings and their replacement, if necessary.
- Other assembly maintenance**
- (i) Besides brake system other items should be attended as given below:
(ii) All items of Schedule `A'
(iii) Painting of lavatories from inside.
(iv) Thorough inspection and repairs of brake gear components.
(v) Thorough checking of trough floor, turn unders, etc., from underneath for corrosion.
(vi) Touching up of painted portion, if faded or soiled.
- 116 DETACHMENT A COACH**
- A coach is detached from the rake due to several reasons such as:
- 116a **For IOH and schedule `C' maintenance.**
- i) Coaches required for detachment for maintenance under schedule 'C' and IOH maintenance.
- ii) For maintenance of major break-down/mal-functioning of any subassembly etc. the decision whether the coach is to be detached from the formation for attending to maintenance/replacement of major subassembly is dependent on maintenance requirements, operational convenience, time availability etc. The decision is taken by the Engineer (C&W). Coach failure report as per **Annexure 1.4** should be made. For failure components/assemblies during warranty, action to be taken as per para 111).
- iii) At depot, the coach that is detached for schedule `C' maintenance is taken over to the washing line for cleaning, lubrication and minor maintenance. The coach that are detached due to a major defect in the distributor valve, brake cylinder, Auxiliary reservoir etc, is taken to the pit line for the replacement of such sub-assemblies, on unit exchange basis. The detachment of coach is carried out so as to make the maintenance or testing activities convenient and faster so that the coach is made ready for use without delay.
- 116b PROCEDURE**
- The activities performed to detach a coach with Air Brake system are as follows:
- i) Safety precautions shall be taken to prevent injury while detaching/attaching a coach.
ii) Remove the clamps on the cut-off angle cocks. Close the cut-off angle cock of both feed pipe and brake pipe on both sides of the coach that has to be detached.
iii) Close the cut-off angle cocks of the feed and brake pipe of adjacent coaches. This is to ensure that the air pressure locked up in the air hose coupling gets vented to atmosphere through the vent hole of the cut-off angle cock.
iv) Observe above mentioned safety measures to close all the four cut-off angle cocks on either side of the coach to be detached so that while opening air hose coupling, it may not cause injury due to air pressure inside.
v) Release the brake of the coach to be detached by pulling the manual release lever of the distributor valve.
vi) Open the Feed Pipe and Brake Pipe hose coupling from both sides of the coach.
vii) If the air pressure of brake cylinder does not vent by pulling the manual release valve of distributor valve, open the brake cylinder vent plug to drain the air pressure.

- viii) Uncouple Screw coupling and detach the coach.
- ix) Observe all other safety measures as prescribed.

117 SCHEDULE `C' EXAMINATION

Brake system Maintenance

Air brake maintenance:

- (i) Schedule `C' is required to be given every six months \pm 15 days at the nominated primary depot.
 - (ii) Coaches are required to be detached from the rake and taken to the sick line for schedule `C' examination and repairs.
- 117a The following items of work should be attended during schedule `C' examination.

Air brake system maintenance

- (i) `C' schedule maintenance as per para 426 of air brake chapter.
- (ii) Check brake cylinder for loose rocker arm plate and change on Bogie Mounted system.
- (iii) Check proper functioning of slack adjuster mechanism.
- (iv) Brake cylinder should be checked for smooth functioning and prescribed stroke. Defective brake cylinders shall be sent for repairs.
- (v) Guard's van valve should be tested as per para 412d of air brake chapter.
- (vi) Test BP & FP air pressure measuring gauges with master gauge and replace if found defective. A set of two master gauges should be kept for this purpose at every Primary Maintenance Depot and each master gauge should be sent one after the other to the base workshops for testing, repairs and calibration.
- (vii) Thoroughly clean Dirt collector filter in kerosene or replace on condition basis.
- (viii) Check working of PEASD & PEAV by hearing the hissing sound of exhaust air. After resetting with the help of key the exhaust of air should stop. Replace the defective PEASD/PEAV.

Vacuum brake system

- (i) All items of `B' schedule
- (ii) Overhauling of vacuum cylinders, if due.

- (iii) Testing of vacuum gauges with the master gauge, and replacement of defective or inaccurate gauge. A set of two master gauges should be kept for this purpose at every Primary Maintenance Depot and each master gauge should be sent one after the other to the base workshops for testing, repairs and calibration.

- (iv) Thorough checking of train pipes under pressure of 2 kg/cm^2 to detect thin, corroded and punctured pipes. A high pressure pump must be provided at each Primary Maintenance Depot for this purpose.

Other assemblies maintenance

- (i) All items of Schedule `B'
- (ii) Thorough repairs of running gear including running out of bogies where considered necessary. All bogies which are working on rake links earning more than **2.5 lakhs kms.** per annum must however be run out and thoroughly attended to as laid down in clause **111c** under "**Intermediate Overhaul**".
- (iii) Touching up damaged paint of coaches on outside as well as inside.
- (iv) Polishing of the polished surfaces.
- (v) Shock absorbers should be replaced and sent to the base workshops for repairs, testing and return. For this purpose, adequate spares must be maintained in the depot.
- (vi) Thorough cleaning and removal of dust, rust, dirt, etc., accumulated at the pillars through the turn under holes, with coir brush and compressed air.
- (vii) Thorough examination and repairs of upholstery, cushions, curtains, etc.
- (viii) Thorough checking and full repairs of all window shutters, safety catches, safety latches, staples and hasps of compartment, lavatory, body side

- and vestibule doors for ease of operation.
- (ix) Thorough checking and repairs of UIC vestibules, their rubber flanges metal frames, doors, fall plate, locking gear, etc., for ease of operation and safety .
- (x) Thorough checking and repairs of all cracks and worn out portions of flooring of the compartments.
- 117d Engineer (C&W) of Primary Coaching Maintenance Depots should be fully familiar with the vulnerable areas of ICF coaches for corrosion, viz., sole bar at doorways, lavatories and adjoining areas, corridor sides - more so in case of those SLRs which are used for Fish, Salt, etc. For facilitating inspection of sole bars even spaced elongated holes of (215x127 mm) are already provided in the turn unders.
- 117e Special attention should be taken for the following:-
- i) Pocket between sole bars and turn unders should be thoroughly cleaned through the inspection opening of the sole bars and inspected with the help of torch light or inspection lamps.
- ii) Drain holes provided in the trough floors should be kept clean and unclogged. If during the cleaning of these drain holes any accumulation of water is observed, the affected area should be very carefully inspected for possible corrosion.
- iii) A register should be maintained of the primary maintenance coaches on the subject.

118 SPECIAL SCHEDULE

- 118a For high speed trains and some special coaches like Power Vans, etc., special maintenance schedules by the individual railways may be followed.
- 118b For maintenance of coaches of Rajdhani/Shatabdi Express Rakes, the instructions given in RDSO Technical Pamphlet No. C-7807 should be followed.
- 118c The IOH of Rajdhani/Shatabdi high speed coaches should be carried out in workshops.

119. PROCEDURE FOR SENDING THE COACHES TO SHOPS FOR POH

- The following procedure may be followed in regard to movement of coaching stock for repair to shops -
- (a) Security Department shall arrange to escort all coaches booked to shops when booked by coaching specials or in lots of 3 coaches or more on receipt of memo from Engineer (C&W) of the booking station.
- (b) All coaches booked to shops for POH will be booked by passenger/parcel/Coaching special.
- (c) Before any carriage is allowed to proceed to workshops a joint check should be carried out by the representatives of the Mechanical, Electrical and Security Branches on the basis of which a deficiency list will be prepared at the rake/coach maintaining station under joint signature of the three representatives in five legible copies with proper reference, number and date out of which one copy should be pasted in side the compartment on one of the end wall. Two copies of the deficiency list will remain in the personal custody of the RPF sainik accompanying the rolling stock to the workshop (In case of unescorted coach, deficiency list will be sent by post to CWM concerned and one copy will be sent to OC/RPF).the remaining two copies will be retained by the Engineer (C&W) /Electrical Supervisor of the base station. Upper class coaches must be pad locked/locked with carriage key and also sealed after the joint check at the starting station by the booking Engineer (C&W).
- (d) Once a Joint check has been carried out and the deficiency list drawn out no removal of fitting from the stock at the starting depot should be entertained.
- (e) Coaches escorted by the RPF staff will continue to be under watch of the Security Force (RPF) until coaches are taken over by the shops. On arrival of carriage at the Workshops, a careful check be made out jointly by the representatives of the Mechanical & Electrical Departments in presence of RPF staff in four copies. In case of any additional deficiency being noticed, a list of such additional deficiencies be made out in four copies jointly by all the three staff.
- (f) One copy each of the deficiency list prepared by the representatives of workshop duly signed by RPF be sent to

the Engineer (C&W) /Elec. Supervisor of base station and one copy be given to RPF for submission of the same to the OC/RPF of the base station and one copy is to be kept on shop record. On receipt of the additional deficiency list, OC/RPF of the base station will arrange to fix responsibility for the additional deficiencies and take suitable action including sending a copy of his report to Engineer (C&W) /Elec. Supervisor concerned. On receipt of the report from OC/RPF, Engineer (C&W) /Elec. Supervisor will submit a report to the controlling Divisional Officer enclosing copies of the original as well as the additional deficiencies to enable the Divisional Officer to initiate action for the write-off of the cost of such materials. While granting write off or forwarding the case to Headquarters for arranging the write off due remarks should be given for the reasons of the deficiencies and the action taken. A certified true copy of the joint check mentioned above should accompany the losses due to theft and pilferage.

A copy of the write-off memo should be submitted to Budget section of the divisional Headquarters office for exhibition in Appropriation Accounts.

- (g) Generally coaches should be sent in lots of three duly escorted. In exceptional cases coaching stock coming to Workshop by passenger/parcel trains unescorted by RPF sainik, the deficiency list prepared jointly at the originating station should again be checked at the workshop in presence of RPF representative and the difference of the two checking should be taken as theft. On receipt of unescorted coach in the Shop, the deficiency list in five copies in presence of representatives of RPF, Mechanical and Electrical Dept. will be prepared jointly. One copy of the deficiency list will be retained as office copy, 2 copies will be given to OC/RPF of the shop station and one copy each will be sent to Engineer (C&W) /Electrical Supervisor of base station. Out of two copies of deficiency list received by the RPF representative at the workshop, one copy be sent to OC/RPF base station for necessary action by the security Department.
- (h) The workshop should have a proper organisation to check these coaches immediately on arrival.

Annexure 1.1
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Indian Railways

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 BRAKE POWER CERTIFICATE

1. Date fnulM		2. Station/Railways LV\$ku@ jYos													
3. Train No. Vtu ua		4. Load yM													
5. Engine No. batu ua		6. Attached at xMh ij yxusdk l e;													
7. Vac./Air Pr.ready oD; @ ; ; j i \$kj r\$ kj gkusdk l e;		8. Vac/Air Pr. on Departure oD; @ ; ; j i \$kj pyrs l e; In engine batu ea In Brake Van cdlolu ea	<table border="1" style="margin: auto;"> <tr> <th colspan="2">Air Pressure (kg/cm²)</th> <th>Vac. cms of Hg</th> </tr> <tr> <th>FP</th> <th>BP</th> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>	Air Pressure (kg/cm ²)		Vac. cms of Hg	FP	BP							
Air Pressure (kg/cm ²)		Vac. cms of Hg													
FP	BP														
9. Pressure of Brake Power l pfyrcdl iloj dk i \$kj Air Brake Train ; j cdl Vtu Vacuum Brake Train oD; @ cdl xMh	<table border="1" style="margin: auto;"> <tr> <td style="width: 50px; height: 20px;">100%</td> </tr> <tr> <td style="width: 50px; height: 20px;"></td> </tr> </table>	100%													
100%															
9. A.i) Total No. of brake/Vac/Cylinders cdl@oD; @ fl yMjldh dly l a No. of operative Brake Vac. Cylinders vMj\$Vo cdl oD; @ fl yMj dh l a		<table border="1" style="margin: auto;"> <tr> <td style="width: 50px; height: 20px;"></td> </tr> <tr> <td style="width: 50px; height: 20px;"></td> </tr> </table>													
10. Individual numbers of two coaches next to the Engine and at rear in case of Vacuum trains and of 4 middle coaches also in case of Air Brake Trains oD; @ Vtu ea batu@ cdlolu ea yxs nls nls dlp ds ua ; ; j i \$kj Vtu ea buds vrfjDr cdp ds plj dlnz ds dlpds u- Mh vidr djA															
Engine end batu l s Middle el;	<table border="1" style="margin: auto;"> <tr> <td style="width: 25px; height: 20px;"></td> <td style="width: 25px; height: 20px;"></td> <td style="width: 25px; height: 20px;"></td> <td style="width: 25px; height: 20px;"></td> </tr> <tr> <td style="width: 25px; height: 20px;"></td> <td style="width: 25px; height: 20px;"></td> <td style="width: 25px; height: 20px;"></td> <td style="width: 25px; height: 20px;"></td> </tr> </table>									Rear end fiNyk fl jk					

THIS CERTIFICATE IS VALID UPTO DESTINATION PROVIDED THE RAKE INTEGRITY IS NOT BROKEN OR CHANGED BY MORE THAN TWO VEHICLE UNITS OR THE TRAIN ENGINE IS NOT CHANGED IF RAKE INTEGRITY IS BROKEN BY MORE THAN TWO VEHICLE UNITS, A FRESH CERTIFICATE IS REQUIRED. IF THE TRAIN ENGINE IS CHANGED. THE CERTIFICATE SHOULD BE VALIDATED BY ENGINEER (C&W) THROUGH ENDORSEMENT IN THE COLUMN ON THE REVERSE.

; g iek.k lk= ijs j\$l ds xr0; lFku rd ; fn [MMr u ghl g\$ tkjh fd; k tk; xk ; k nls dlp l s vf/kd bdlbz ea ifjofr' ghz g\$; k Vtu batu dls u cnyk x; k g\$; fn j\$l dh v[Mrk nls dlp l s vf/kd bdlbz ea ifjofr' ghz g\$ r\$ iek.k lk= dh vto'; drk g\$rh g\$ iek.k lk= dh o\$rk v\$ik; rk %dS, oao% }kj fi Nyh rjQ fy [ls dlye }kj fd; k tk; xkA

Driver's name & signature Guard's name & signature Engineer (C&W)
 Mboj dk uke o gLrk(kj) xMz dk uke o gLrk(kj) v\$ik; rk %dS, oao%

(Space for enroute endorsement & Driver's remarks on the reverse)
 Mboj dh f'kdk; ra iN\$ i llus ij

Annexure 1.3

WARRANTY CARD

PROFORMA FOR REPORTING DEFECTS ON THE NEWLY BUILT COACHES DURING THE WARRANTY PERIOD

1. Coach No.
2. Code transportationMechanical code
3. Owning Railways
4. Name of manufacturer
5. Date of manufacture
6. Date of commission
7. Due date of warranty inspection
8. Date of inspection(by the depot)
9. Defects attributable to the manufacturers

Remark (cost will be advised by the Railway board)

Report No.

Engineer (C&W)
(Rubber stamp of the depot)

Annexure 1.4

----- Railway
Carriage Depot (station)

COACH FAILURE REPORT

Train Details:

Date
Station
Originating Stn.
Prim. Maint. Depot

Train No.
Division
Last Exam. Stn
Sec. Maint. Depot.

Coach Details:

Coach Number
Coach type code
Last POH Date & Shop

Owning Railway & Base Depot
Coach Make: IRS/ICF/BEML/RCF
Return Date

Failure Particulars:

Cause of Failure (Detachment)

Defect found (on examination)

Defect code

Remarks:

File No.

DRM(M)'s Office,
--- Railway
--- (Station)
Date:-----

Copy forwarded to:

- CME, (owning) Railway
- CME, (reporting) Railway
- Sr. DME, (C&W), Division Railway (of primary maint. depot)
- Sr. DME, (C&W), Division Railway (of Secondary maint. depot)
- CWM, Railway and Workshop (of last POH)

(Signature)
(Name and Designation)

Annexure - 1.5

File No.

CWM's Office
 Carriage Workshop
 _____Railway
 Tele/Fax. no.
 e.mail no.
 Date:

To,
 M/s

Sub: Warranty claim for failed /defective item (name) _____

1	Reporting workshop & Railway	
2	a) Coach no. & type	
	b) POH date	
	c) Return date	
3	a) Manufacturer's name	
	b) Date of Manufacture	
	c) No. given by Manufacturer	
4	Date of supply to workshop	
5	a) P.O. No.	
	b) Name of Inspecting agency	
6	a) Date of first fitment	
	b) Date of failure	
7	Type of service to which coach is generally attached	
8	Defects found/ cause of failures	
9	Other observations and remarks	i)
		ii)
		iii)
		iv)
		v)

Inspecting Officer
 For CWM

Copy to:-

1. CME/ Rly. for kind information
2. COS/ Rly. for kind information
3. ED/Carriage/ RDSO Manak nagar Lucknow - 226011
4. CME/ ICF Perambur, Chennai/ RCF Kapurthala & BEML Bangalore
5. COS/ ICF Perambur, Chennai/ RCF Kapurthala & BEML Bangalore
6. Dy COS/Workshop for proper storage, delivery and receipt
7. Inspecting agency

Annexure - 1.6

File No.

CDO's/ DRM's Office
 _____ Division
 _____ Railway
 Tele/Fax. no.
 e.mail
 Date:

To,
 M/s

Sub: Warranty claim for failed /defective item (name of item)

1	Reporting Division/Depot & Railway	
2	a) Coach no. & type	
	b) POH date	
	c) Return date	
3	a) Manufacturer's name	
	b) Date of Manufacture	
	c) No. given by Manufacturer	
4	Date of supply to workshop	
5	a) P.O. No. (if available)	
	b) Name of Inspecting agency (if available)	
6	a) Date of first fitment	
	b) Date of failure	
7	Type of service to which coach is generally attached	
8	Defects found/ cause of failures	
9	Other observations and remarks	i)
		ii)
		iii)
		iv)
		v)

Depot Officer/DME
 For DRM(M)

Copy to:-

1. CME/ Rly. for kind information
2. COS/ Rly. for kind information
3. ED/Carriage/ RDSO Manak nagar Lucknow - 226011
4. CME/ ICF Perambur, Chennai/ RCF Kapurthala & BEML Bangalore
5. COS/ ICF Perambur, Chennai/ RCF Kapurthala & BEML Bangalore
6. CWM/Workshop
7. Dy COS/Workshop for proper storage, delivery and receipt
8. Inspecting agency