



AUSTRALIAN RAIL TRACK CORPORATION LTD

Discipline  
Engineering Standard

Category  
Rolling Stock

# Drawings

## WOS 01.G

Applicability

<b>ARTC Network wide</b>	
<b>New South Wales</b>	✓
<b>Western Jurisdiction</b>	
<b>Victoria</b>	

Primary Source  
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List of Amendments

Issue	Date	Clause	Description
1.0	07/12/2005	All	Reformatting to ARTC Standard

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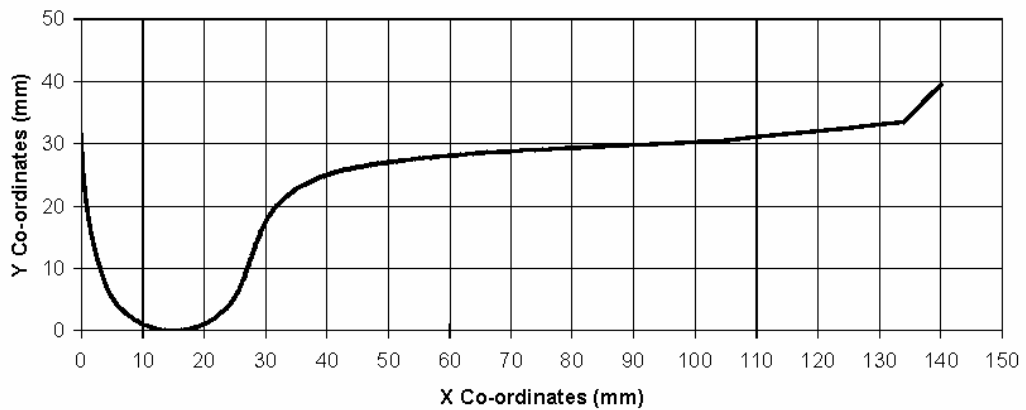
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## Contents

The following drawings have been referenced in the Rolling Stock Operation Standards and are reproduced in this Appendix.

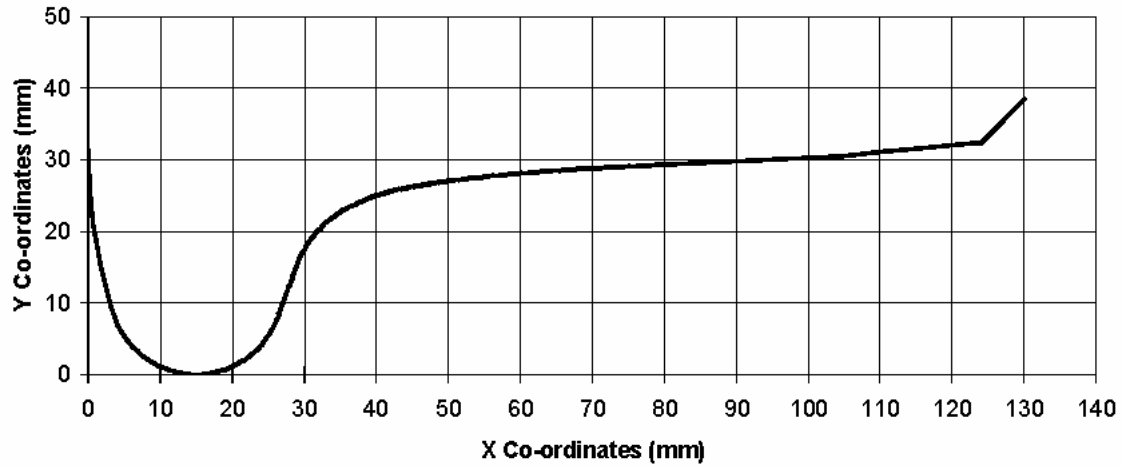
G1	WRP 2000	Intersystem Wheel Profile Full 140 mm Wide
G2	WRP 2000	Intersystem Wheel Profile Full 130 mm Wide
G3	WRP 2000	Intersystem Wheel Profile 7/8 140 mm Wide
G4	WRP 2000	Intersystem Wheel Profile 7/8 130 mm Wide
G5	206-931	Rolling Stock Standards Wheel Tread Profile ‘Mod 3’
G6	ROA Diag 3-1	ROA Test Profile for Field Worn Wheel
G7	ROA Diag 13-16	Standard Wheel Profile – ANZR1
G8	ROA Diag 6-2	Axle Markings
G9	ROA Diag 7-12	Location of Brake pipe (Single)
G10	ROA Diag 7-13	Location of Brake Pipe (Bifurcated)
G11	ROA Diag 13-12	Standard Location of End Equipment
G12	ROA Diag 13-13	Standard Location of Air Connections at End
G13	ROA Diag 13-15	Standard Wheel – Nominal Dimensions
G14	207-668	Freight wheel tread “No Go” profile gauge
G15		Flange height and thin flange gauge
G16		Short flange gauge
G17		Hollow tread gauge
G18	RAC Drg 356-01	Trainstop Mounting Dimensions

**WOS 01.G - Drawings**



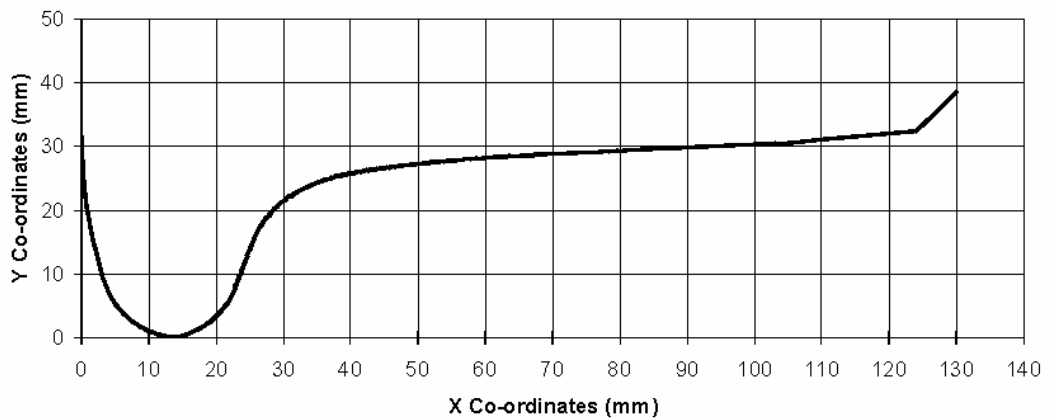
X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
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0.2	25.855	20.2	1.185	29	15.374	39	24.673	49	26.901	67.5	28.674
0.7	21.074	20.7	1.44	29.25	15.99	39.25	24.767	49.25	26.937	68	28.705
1.2	17.913	21.2	1.726	29.5	16.538	39.5	24.858	49.5	26.972	68.5	28.736
1.7	15.38	21.7	2.045	29.75	17.034	39.75	24.946	49.75	27.007	69	28.766
2.2	13.211	22.2	2.4	30	17.489	40	25.032	50	27.041	69.5	28.795
2.7	11.287	22.7	2.796	30.25	17.91	40.25	25.114	50.25	27.075	70	28.823
3.2	9.544	23.2	3.239	30.5	18.302	40.5	25.194	50.5	27.108	70.5	28.851
3.7	7.961	23.7	3.735	30.75	18.669	40.75	25.271	51	27.172	71	28.878
4.2	6.769	24.2	4.295	31	19.014	41	25.345	51.5	27.233	72	28.929
4.7	5.843	24.7	4.935	31.25	19.339	41.25	25.416	52	27.292	73	28.979
5.2	5.075	25.2	5.679	31.5	19.647	41.5	25.484	52.5	27.351	74	29.029
5.7	4.416	25.7	6.568	31.75	19.939	41.75	25.55	53	27.409	75	29.079
6.2	3.842	26.2	7.686	32	20.217	42	25.613	53.5	27.465	76	29.129
6.7	3.333	26.3	7.961	32.25	20.481	42.25	25.673	54	27.521	77	29.179
7.2	2.881	26.4	8.236	32.5	20.733	42.5	25.731	54.5	27.575	78	29.229
7.7	2.476	26.5	8.51	32.75	20.973	42.75	25.786	55	27.629	79	29.279
8.2	2.113	26.6	8.785	33	21.202	43	25.839	55.5	27.682	80	29.329
8.7	1.787	26.7	9.06	33.25	21.422	43.25	25.891	56	27.733	81	29.379
9.2	1.495	26.8	9.335	33.5	21.632	43.5	25.942	56.5	27.784	82	29.429
9.7	1.234	26.9	9.609	33.75	21.833	43.75	25.992	57	27.834	83	29.479
10.2	1.002	27	9.884	34	22.025	44	26.042	57.5	27.883	84	29.529
10.7	0.797	27.1	10.159	34.25	22.209	44.25	26.091	58	27.93	85	29.579
11.2	0.618	27.2	10.434	34.5	22.385	44.5	26.14	58.5	27.977	87.5	29.704
11.7	0.463	27.3	10.708	34.75	22.554	44.75	26.188	59	28.023	90	29.829
12.2	0.331	27.4	10.983	35	22.716	45	26.235	59.5	28.068	92.5	29.954
12.7	0.222	27.5	11.258	35.25	22.87	45.25	26.281	60	28.112	95	30.079
13.2	0.136	27.6	11.533	35.5	23.019	45.5	26.327	60.5	28.155	97.5	30.204
13.7	0.071	27.7	11.807	35.75	23.16	45.75	26.372	61	28.197	100	30.329
14.2	0.027	27.8	12.082	36	23.297	46	26.417	61.5	28.238	102.5	30.454
14.7	0.004	27.9	12.357	36.25	23.43	46.25	26.461	62	28.279	105	30.579
15.2	0.002	28	12.632	36.5	23.56	46.5	26.504	62.5	28.318	110	31.079
15.7	0.02	28.1	12.906	36.75	23.686	46.75	26.547	63	28.357	115	31.579
16.2	0.06	28.2	13.181	37	23.808	47	26.589	63.5	28.396	120	32.079
16.7	0.121	28.3	13.456	37.25	23.928	47.25	26.63	64	28.433	125	32.579
17.2	0.203	28.4	13.731	37.5	24.044	47.5	26.671	64.5	28.47	130	33.079
17.7	0.308	28.5	14.005	37.75	24.156	47.75	26.711	65	28.506	134	33.479
18.2	0.435	28.6	14.28	38	24.266	48	26.75	65.5	28.541	136	35.479
18.7	0.585	28.7	14.555	38.25	24.372	48.25	26.789	66	28.575	138	37.479
19.2	0.759	28.8	14.83	38.5	24.476	48.5	26.827	66.5	28.609	140	39.479

G1 WPR 2000 Intersystem Wide Profile Full 140 mm



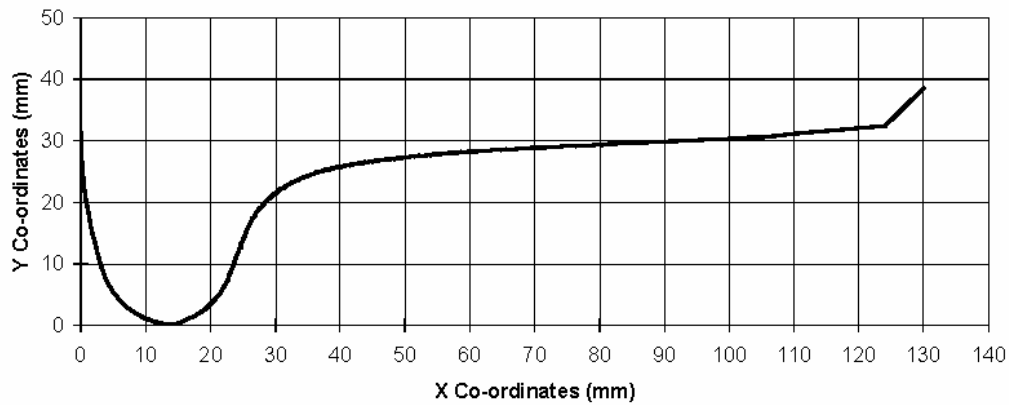
X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
0	31.365	19.7	0.959	28.9	15.104	38.75	24.576	48.75	26.864	67	28.642
0.2	25.855	20.2	1.185	29	15.374	39	24.673	49	26.901	67.5	28.674
0.7	21.074	20.7	1.44	29.25	15.99	39.25	24.767	49.25	26.937	68	28.705
1.2	17.913	21.2	1.726	29.5	16.538	39.5	24.858	49.5	26.972	68.5	28.736
1.7	15.38	21.7	2.045	29.75	17.034	39.75	24.946	49.75	27.007	69	28.766
2.2	13.211	22.2	2.4	30	17.489	40	25.032	50	27.041	69.5	28.795
2.7	11.287	22.7	2.796	30.25	17.91	40.25	25.114	50.25	27.075	70	28.823
3.2	9.544	23.2	3.239	30.5	18.302	40.5	25.194	50.5	27.108	70.5	28.851
3.7	7.961	23.7	3.735	30.75	18.669	40.75	25.271	51	27.172	71	28.878
4.2	6.769	24.2	4.295	31	19.014	41	25.345	51.5	27.233	72	28.929
4.7	5.843	24.7	4.935	31.25	19.339	41.25	25.416	52	27.292	73	28.979
5.2	5.075	25.2	5.679	31.5	19.647	41.5	25.484	52.5	27.351	74	29.029
5.7	4.416	25.7	6.568	31.75	19.939	41.75	25.55	53	27.409	75	29.079
6.2	3.842	26.2	7.686	32	20.217	42	25.613	53.5	27.465	76	29.129
6.7	3.333	26.3	7.961	32.25	20.481	42.25	25.673	54	27.521	77	29.179
7.2	2.881	26.4	8.236	32.5	20.733	42.5	25.731	54.5	27.575	78	29.229
7.7	2.476	26.5	8.51	32.75	20.973	42.75	25.786	55	27.629	79	29.279
8.2	2.113	26.6	8.785	33	21.202	43	25.839	55.5	27.682	80	29.329
8.7	1.787	26.7	9.06	33.25	21.422	43.25	25.891	56	27.733	81	29.379
9.2	1.495	26.8	9.335	33.5	21.632	43.5	25.942	56.5	27.784	82	29.429
9.7	1.234	26.9	9.609	33.75	21.833	43.75	25.992	57	27.834	83	29.479
10.2	1.002	27	9.884	34	22.025	44	26.042	57.5	27.883	84	29.529
10.7	0.797	27.1	10.159	34.25	22.209	44.25	26.091	58	27.93	85	29.579
11.2	0.618	27.2	10.434	34.5	22.385	44.5	26.14	58.5	27.977	87.5	29.704
11.7	0.463	27.3	10.708	34.75	22.554	44.75	26.188	59	28.023	90	29.829
12.2	0.331	27.4	10.983	35	22.716	45	26.235	59.5	28.068	92.5	29.954
12.7	0.222	27.5	11.258	35.25	22.87	45.25	26.281	60	28.112	95	30.079
13.2	0.136	27.6	11.533	35.5	23.019	45.5	26.327	60.5	28.155	97.5	30.204
13.7	0.071	27.7	11.807	35.75	23.16	45.75	26.372	61	28.197	100	30.329
14.2	0.027	27.8	12.082	36	23.297	46	26.417	61.5	28.238	102.5	30.454
14.7	0.004	27.9	12.357	36.25	23.43	46.25	26.461	62	28.279	105	30.579
15.2	0.002	28	12.632	36.5	23.56	46.5	26.504	62.5	28.318	110	31.079
15.7	0.02	28.1	12.906	36.75	23.686	46.75	26.547	63	28.357	115	31.579
16.2	0.06	28.2	13.181	37	23.808	47	26.589	63.5	28.396	120	32.079
16.7	0.121	28.3	13.456	37.25	23.928	47.25	26.63	64	28.433	124	12.4
17.2	0.203	28.4	13.731	37.5	24.044	47.5	26.671	64.5	28.47	126	14.4
17.7	0.308	28.5	14.005	37.75	24.156	47.75	26.711	65	28.506	128	16.4
18.2	0.435	28.6	14.28	38	24.266	48	26.75	65.5	28.541	130	18.4
18.7	0.585	28.7	14.555	38.25	24.372	48.25	26.789	66	28.575		
19.2	0.759	28.8	14.83	38.5	24.476	48.5	26.827	66.5	28.609		

G2 WPR 2000 Intersystem Wide Profile Full 130 mm



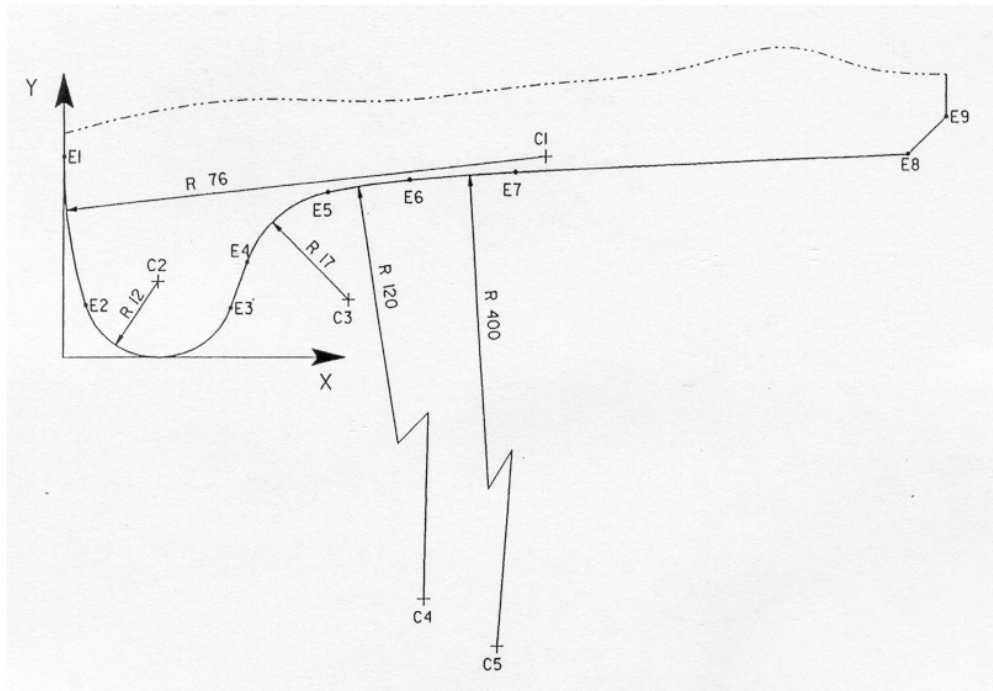
X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
0	31.365	19.7	3.064	27	18.127	37	25.019	47	26.933	67	28.676
0.2	25.855	20.2	3.56	27.25	18.494	37.25	25.096	47.5	26.997	67.5	28.703
0.7	21.074	20.7	4.12	27.5	18.839	37.5	25.17	48	27.058	68.5	28.754
1.2	17.913	21.2	4.76	27.75	19.164	37.75	25.241	48.5	27.117	69.5	28.804
1.7	15.38	21.7	5.504	28	19.472	38	25.309	49	27.176	70.5	28.854
2.2	13.211	22.2	6.393	28.25	19.764	38.25	25.375	49.5	27.234	71.5	28.904
2.7	11.287	22.7	7.511	28.5	20.042	38.5	25.438	50	27.29	72.5	28.954
3.2	9.544	22.8	7.786	28.75	20.306	38.75	25.498	50.5	27.346	73.5	29.004
3.7	7.961	22.9	8.061	29	20.558	39	25.556	51	27.4	74.5	29.054
4.2	6.769	23	8.335	29.25	20.798	39.25	25.611	51.5	27.454	75.5	29.104
4.7	5.843	23.1	8.61	29.5	21.027	39.5	25.664	52	27.507	76.5	29.154
5.2	5.075	23.2	8.885	29.75	21.247	39.75	25.716	52.5	27.558	77.5	29.204
5.7	4.416	23.3	9.16	30	21.457	40	25.767	53	27.609	78.5	29.254
6.2	3.842	23.4	9.434	30.25	21.658	40.25	25.817	53.5	27.659	79.5	29.304
6.7	3.333	23.5	9.709	30.5	21.85	40.5	25.867	54	27.708	80.5	29.354
7.2	2.881	23.6	9.984	30.75	22.034	40.75	25.916	54.5	27.755	81.5	29.404
7.7	2.476	23.7	10.259	31	22.21	41	25.965	55	27.802	84	29.529
8.2	2.113	23.8	10.533	31.25	22.379	41.25	26.013	55.5	27.848	86.5	29.654
8.7	1.787	23.9	10.808	31.5	22.541	41.5	26.06	56	27.893	89	29.779
9.2	1.495	24	11.083	31.75	22.695	41.75	26.106	56.5	27.937	91.5	29.904
9.7	1.234	24.1	11.358	32	22.844	42	26.152	57	27.98	94	30.029
10.2	1.002	24.2	11.632	32.25	22.985	42.25	26.197	57.5	28.022	96.5	30.154
10.7	0.797	24.3	11.907	32.5	23.122	42.5	26.242	58	28.063	99	30.279
11.2	0.618	24.4	12.182	32.75	23.255	42.75	26.286	58.5	28.104	101.5	30.404
11.7	0.463	24.5	12.457	33	23.385	43	26.329	59	28.143	103	30.479
12.2	0.331	24.6	12.731	33.25	23.511	43.25	26.372	59.5	28.182	105	30.579
12.7	0.222	24.7	13.006	33.5	23.633	43.5	26.414	60	28.221	110	31.079
13.2	0.136	24.8	13.281	33.75	23.753	43.75	26.455	60.5	28.258	115	31.579
13.7	0.071	24.9	13.556	34	23.869	44	26.496	61	28.295	120	32.079
14.2	0.133	25	13.83	34.25	23.981	44.25	26.536	61.5	28.331	125	32.579
14.7	0.26	25.1	14.105	34.5	24.091	44.5	26.575	62	28.366	130	33.079
15.2	0.41	25.2	14.38	34.75	24.197	44.75	26.614	62.5	28.4	134	33.479
15.7	0.584	25.3	14.655	35	24.301	45	26.652	63	28.434	136	35.479
16.2	0.784	25.4	14.929	35.25	24.401	45.25	26.689	63.5	28.467	138	37.479
16.7	1.01	25.5	15.199	35.5	24.498	45.5	26.726	64	28.499	140	39.479
17.2	1.265	25.75	15.815	35.75	24.592	45.75	26.762	64.5	28.53		
17.7	1.551	26	16.363	36	24.683	46	26.797	65	28.561		
18.2	1.87	26.25	16.859	36.25	24.771	46.25	26.832	65.5	28.591		
18.7	2.225	26.5	17.314	36.5	24.857	46.5	26.866	66	28.62		
19.2	2.621	26.75	17.735	36.75	24.939	46.75	26.9	66.5	28.648		

G3 WPR 2000 Intersystem Wide Profile 7/8 140 mm



X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
0	31.365	19.7	3.064	27	18.127	37	25.019	47	26.933	67	28.676
0.2	25.855	20.2	3.56	27.25	18.494	37.25	25.096	47.5	26.997	67.5	28.703
0.7	21.074	20.7	4.12	27.5	18.839	37.5	25.17	48	27.058	68.5	28.754
1.2	17.913	21.2	4.76	27.75	19.164	37.75	25.241	48.5	27.117	69.5	28.804
1.7	15.38	21.7	5.504	28	19.472	38	25.309	49	27.176	70.5	28.854
2.2	13.211	22.2	6.393	28.25	19.764	38.25	25.375	49.5	27.234	71.5	28.904
2.7	11.287	22.7	7.511	28.5	20.042	38.5	25.438	50	27.29	72.5	28.954
3.2	9.544	22.8	7.786	28.75	20.306	38.75	25.498	50.5	27.346	73.5	29.004
3.7	7.961	22.9	8.061	29	20.558	39	25.556	51	27.4	74.5	29.054
4.2	6.769	23	8.335	29.25	20.798	39.25	25.611	51.5	27.454	75.5	29.104
4.7	5.843	23.1	8.61	29.5	21.027	39.5	25.664	52	27.507	76.5	29.154
5.2	5.075	23.2	8.885	29.75	21.247	39.75	25.716	52.5	27.558	77.5	29.204
5.7	4.416	23.3	9.16	30	21.457	40	25.767	53	27.609	78.5	29.254
6.2	3.842	23.4	9.434	30.25	21.658	40.25	25.817	53.5	27.659	79.5	29.304
6.7	3.333	23.5	9.709	30.5	21.85	40.5	25.867	54	27.708	80.5	29.354
7.2	2.881	23.6	9.984	30.75	22.034	40.75	25.916	54.5	27.755	81.5	29.404
7.7	2.476	23.7	10.259	31	22.21	41	25.965	55	27.802	84	29.529
8.2	2.113	23.8	10.533	31.25	22.379	41.25	26.013	55.5	27.848	86.5	29.654
8.7	1.787	23.9	10.808	31.5	22.541	41.5	26.06	56	27.893	89	29.779
9.2	1.495	24	11.083	31.75	22.695	41.75	26.106	56.5	27.937	91.5	29.904
9.7	1.234	24.1	11.358	32	22.844	42	26.152	57	27.98	94	30.029
10.2	1.002	24.2	11.632	32.25	22.985	42.25	26.197	57.5	28.022	96.5	30.154
10.7	0.797	24.3	11.907	32.5	23.122	42.5	26.242	58	28.063	99	30.279
11.2	0.618	24.4	12.182	32.75	23.255	42.75	26.286	58.5	28.104	101.5	30.404
11.7	0.463	24.5	12.457	33	23.385	43	26.329	59	28.143	103	30.479
12.2	0.331	24.6	12.731	33.25	23.511	43.25	26.372	59.5	28.182	105	30.579
12.7	0.222	24.7	13.006	33.5	23.633	43.5	26.414	60	28.221	110	31.079
13.2	0.136	24.8	13.281	33.75	23.753	43.75	26.455	60.5	28.258	115	31.579
13.7	0.071	24.9	13.556	34	23.869	44	26.496	61	28.295	120	32.079
14.2	0.133	25	13.83	34.25	23.981	44.25	26.536	61.5	28.331	124	32.479
14.7	0.26	25.1	14.105	34.5	24.091	44.5	26.575	62	28.366	126	34.479
15.2	0.41	25.2	14.38	34.75	24.197	44.75	26.614	62.5	28.4	128	36.479
15.7	0.584	25.3	14.655	35	24.301	45	26.652	63	28.434	130	38.479
16.2	0.784	25.4	14.929	35.25	24.401	45.25	26.689	63.5	28.467		
16.7	1.01	25.5	15.199	35.5	24.498	45.5	26.726	64	28.499		
17.2	1.265	25.75	15.815	35.75	24.592	45.75	26.762	64.5	28.53		
17.7	1.551	26	16.363	36	24.683	46	26.797	65	28.561		
18.2	1.87	26.25	16.859	36.25	24.771	46.25	26.832	65.5	28.591		
18.7	2.225	26.5	17.314	36.5	24.857	46.5	26.866	66	28.62		
19.2	2.621	26.75	17.735	36.75	24.939	46.75	26.9	66.5	28.648		

G4 WPR 2000 Intersystem Wide Profile 7/8 130 mm

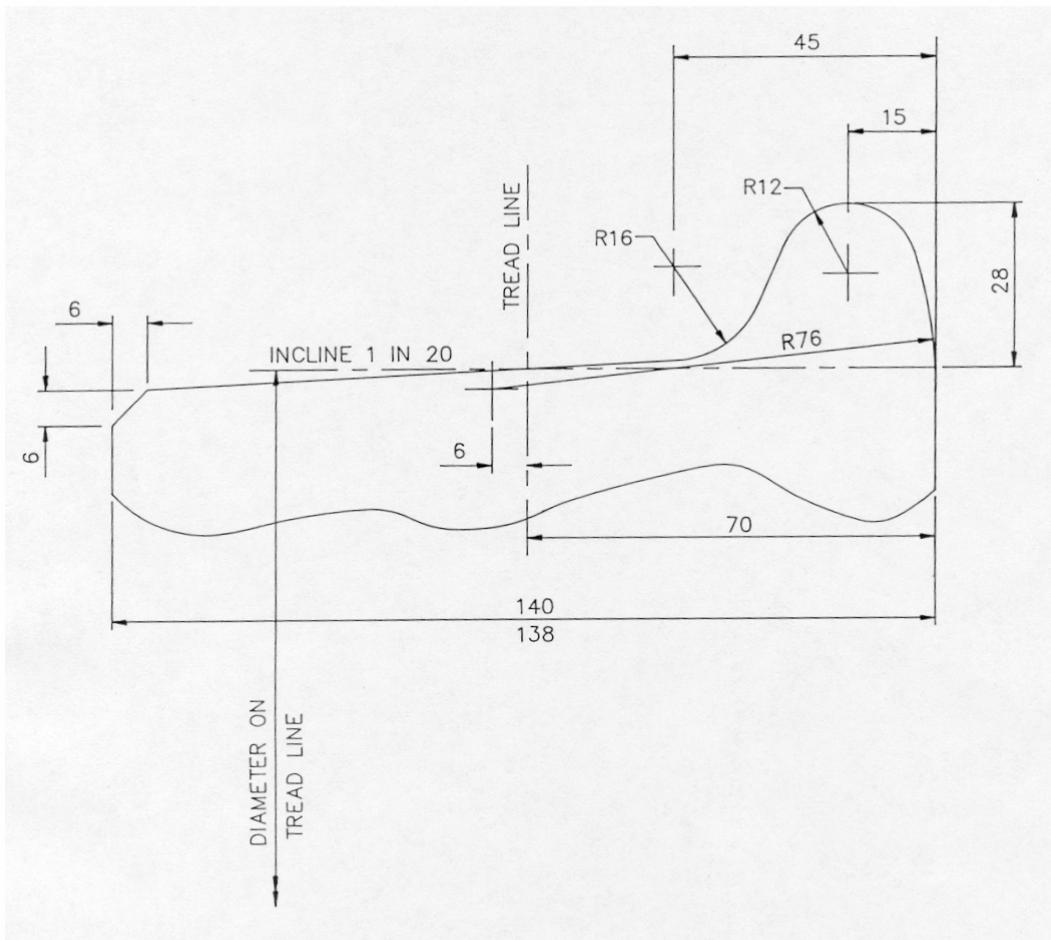


CO-ORDINATES OF CENTRES			
Centre	X (mm)	Y (mm)	Radius (mm)
C1	76.000	31.365	76.0
C2	15.000	12.000	12.0
C3	44.836	9.190	17.0
C4	65.405	-91.735	120.0
C5	91.139	-370.550	400.0

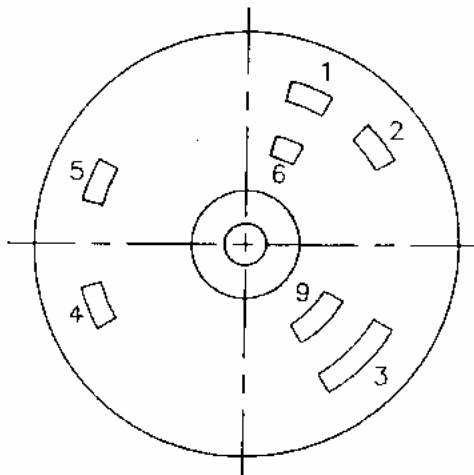
CO-ORDINATES OF END POINTS		
End Point	X (mm)	Y (mm)
E1	0	31.365
E2	3.563	8.376
E3	26.276	7.896
E4	28.860	15.000
E5	41.441	25.848
E6	54.376	27.757
E7	71.164	28.951
E8	134.000	32.093
E9	140.000	38.093

G5 SRA Drawing 206-931 'MOD 3' Wheel Tread profile

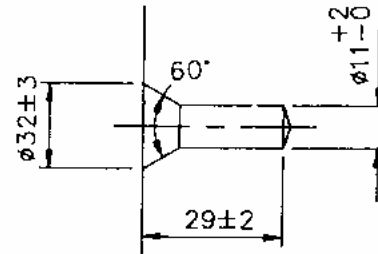




G7 ROA Diagram 13-16  
Standard Wheel Profile – ANZR 1



BRAND MARKINGS



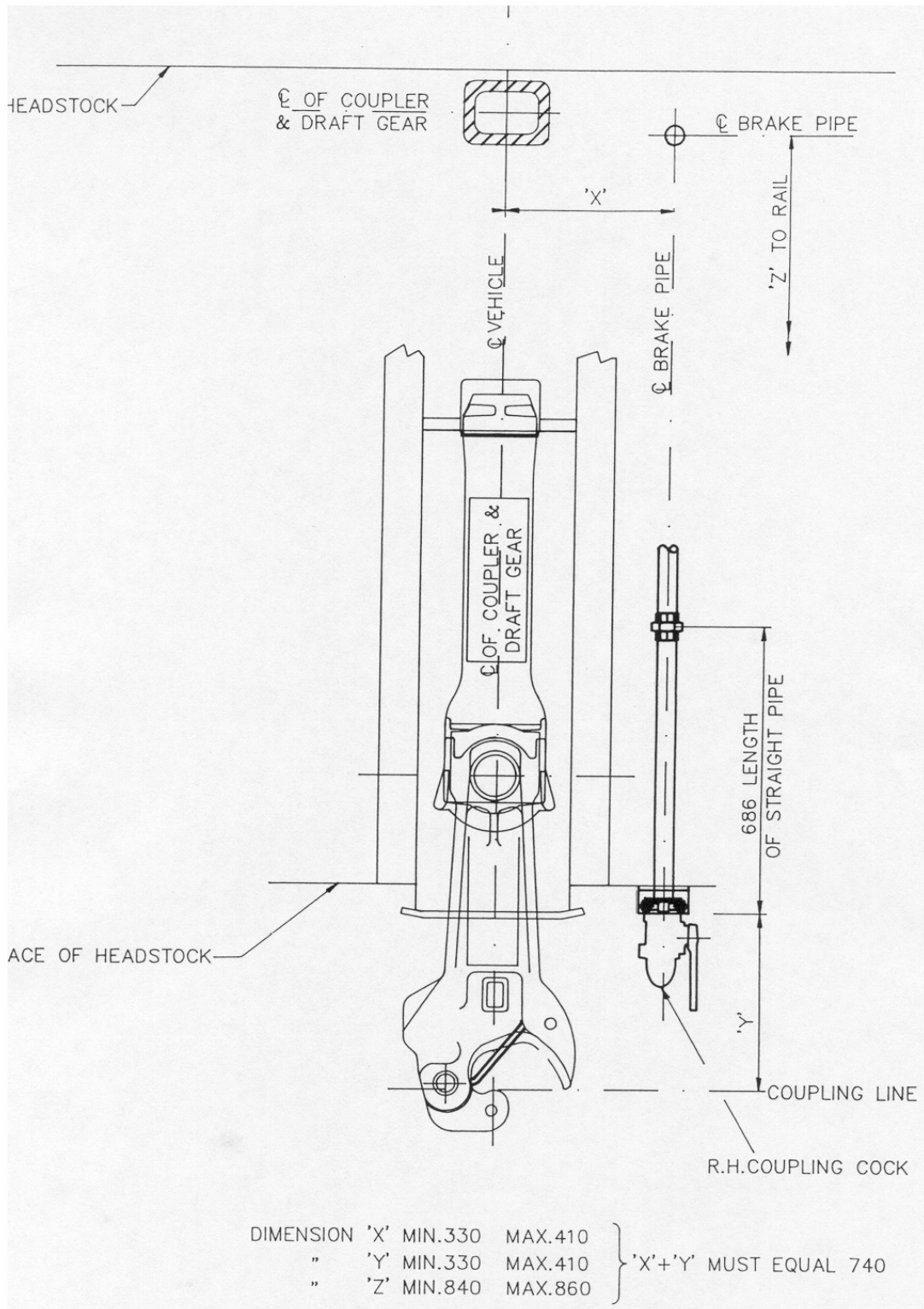
DETAIL OF CENTRE

1. OWNER'S INITIALS.
2. MANUFACTURER'S NAME OR INITIALS.
3. AXLE SERIAL NUMBER. (ALLOTTED BY SYSTEM OR MANUFACTURER)
4. HEAT NUMBER
5. YEAR ULTRASONICALLY OR MAGNETICALLY TESTED.
6. WHEEL MOUNTING FIRM'S NAME OR INITIALS.
7. SIZE OF BRANDING 5mm MIN. TO 8mm MAX.
8. THE AXLE NUMBER SHALL BE STAMPED ON BOTH, THE LEFT AND RIGHT HAND ENDS OF THE AXLE. ALL OTHER BRANDINGS SHALL BE ON THE RIGHT HAND END OF THE AXLE ONLY.
9. L AND R TO BE STAMPED ON THE LEFT AND RIGHT HAND ENDS OF EACH AXLE.

NOTE: TO FACILITATE ULTRASONIC TESTING ALL BRANDING TO BE DRESSED FLUSH.

G8 ROA Diagram 6-2

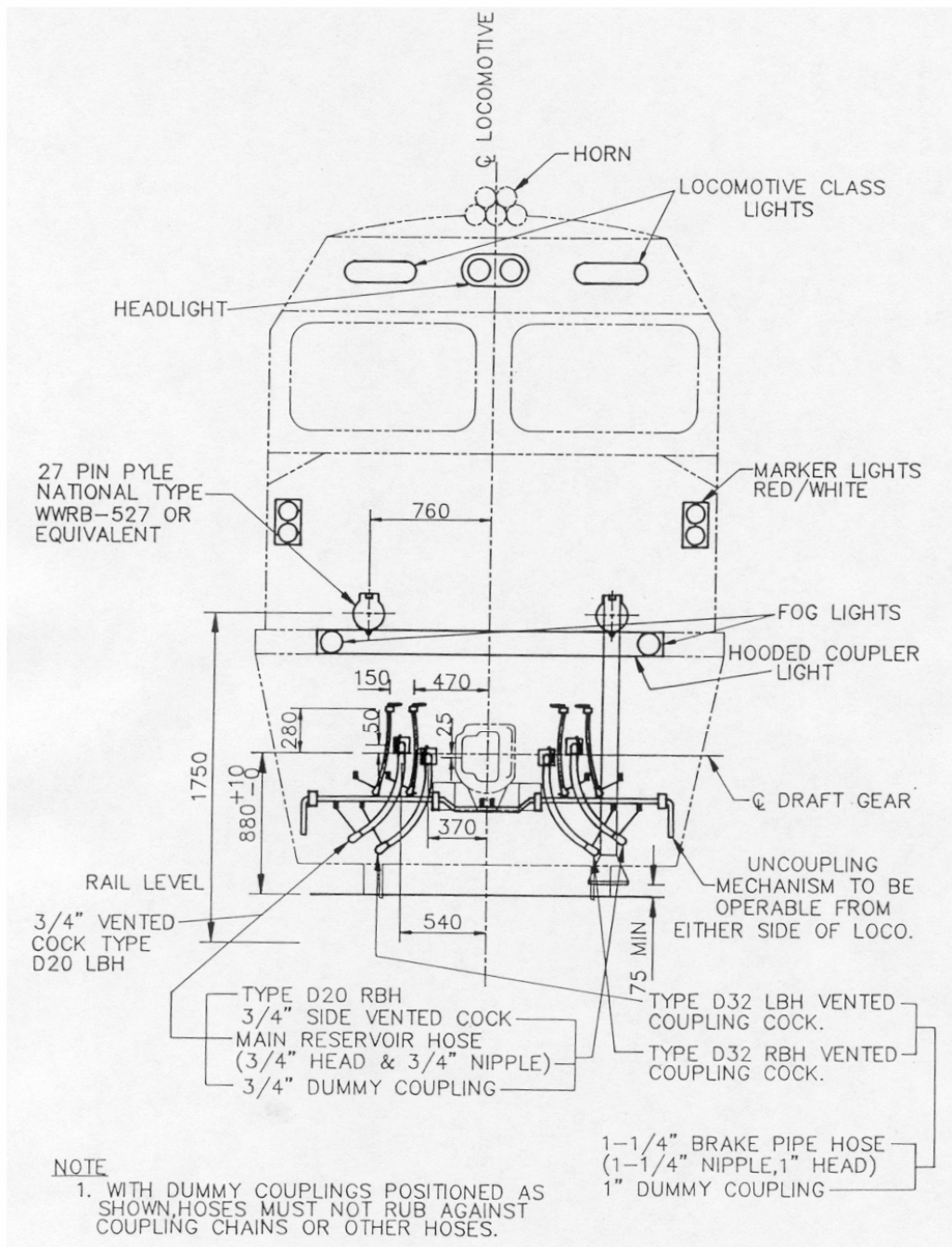
Axle Markings



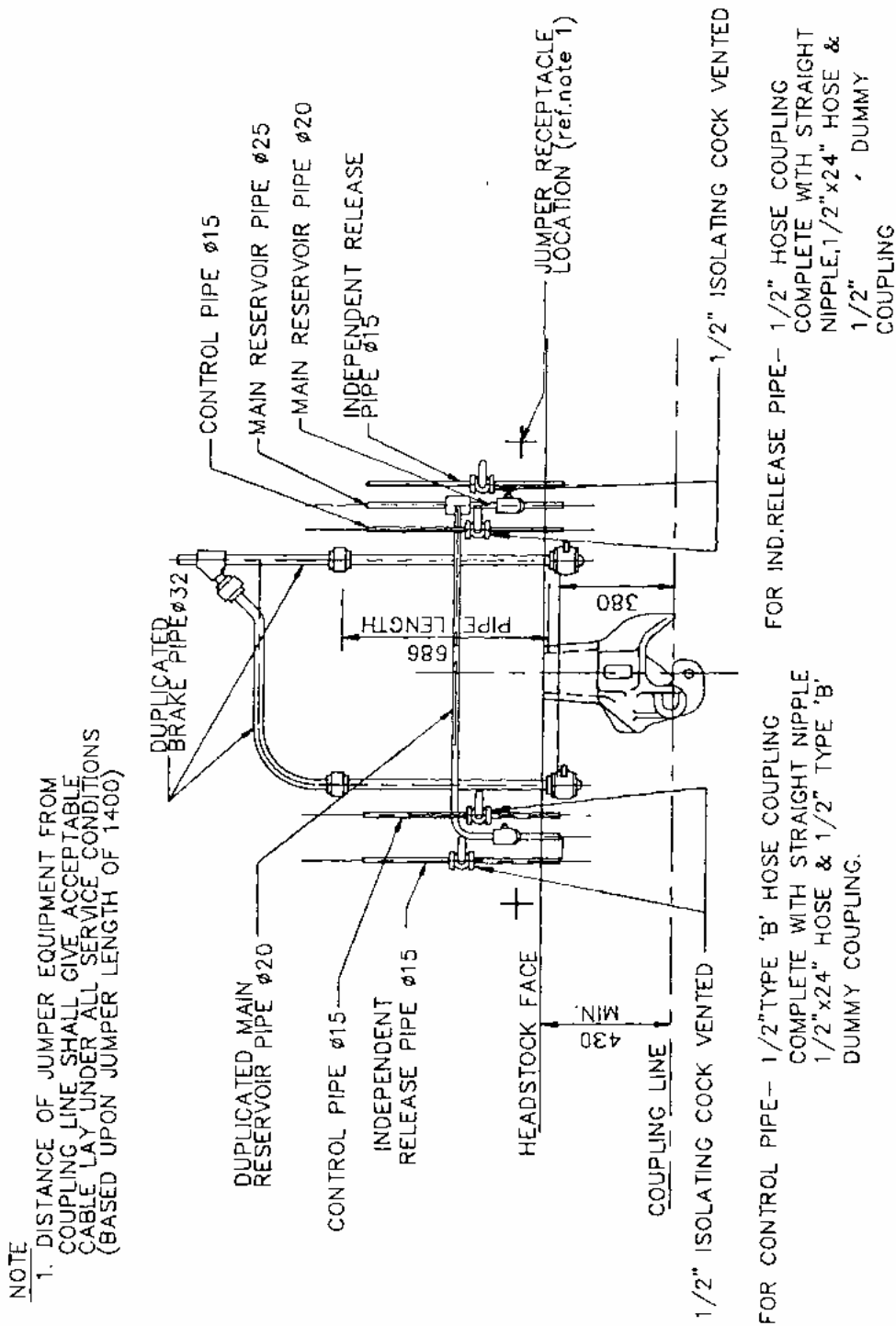
G9 ROA Diagram 7-12

Location of Brake Pipe (Single brake pipe)



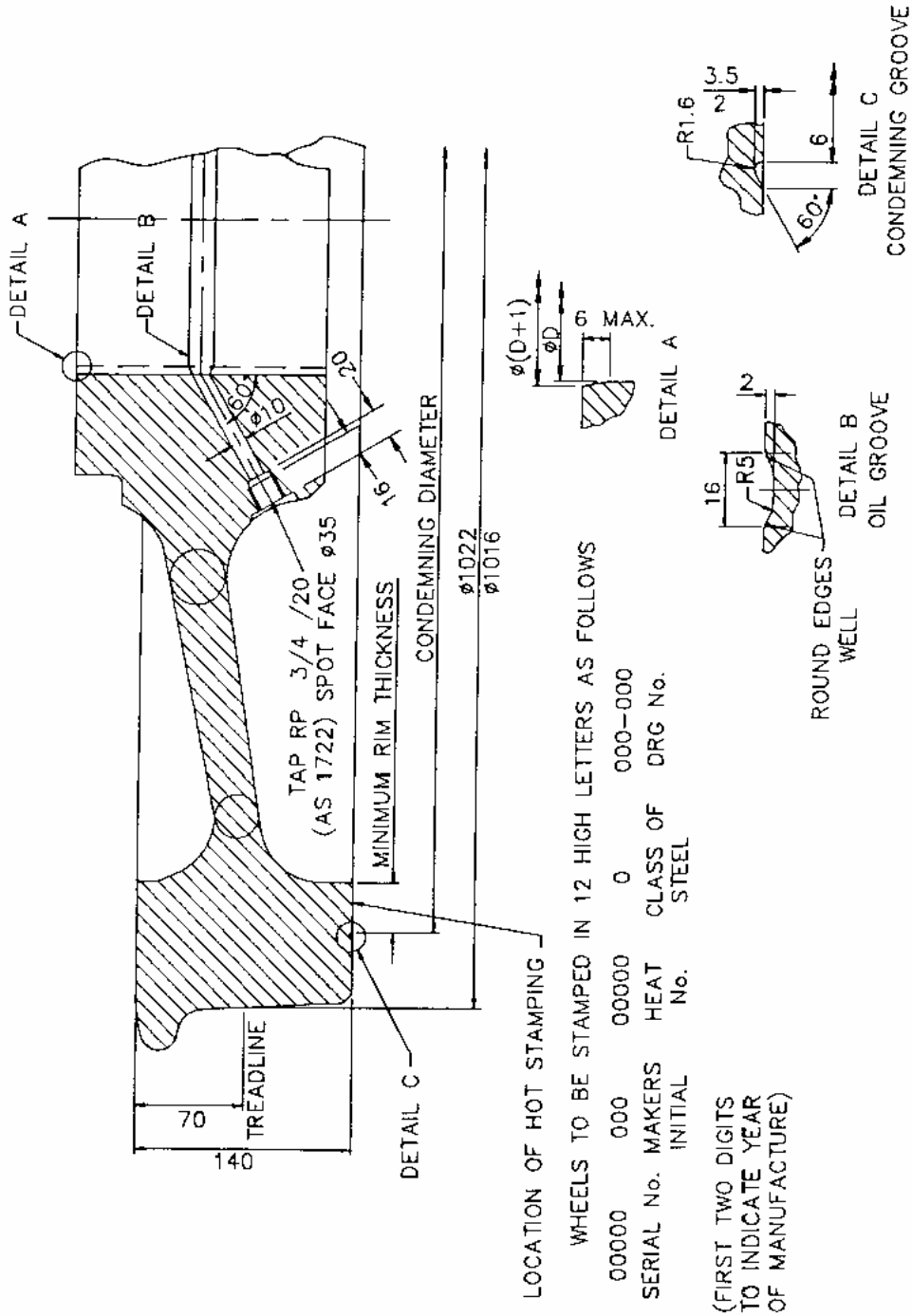


G11 ROA Diagram 13-12  
 Standard Location of End Equipment



G12 ROA Diagram 13-13

Standard Location of Air Connections at End



G13 ROA Diagram 13-15

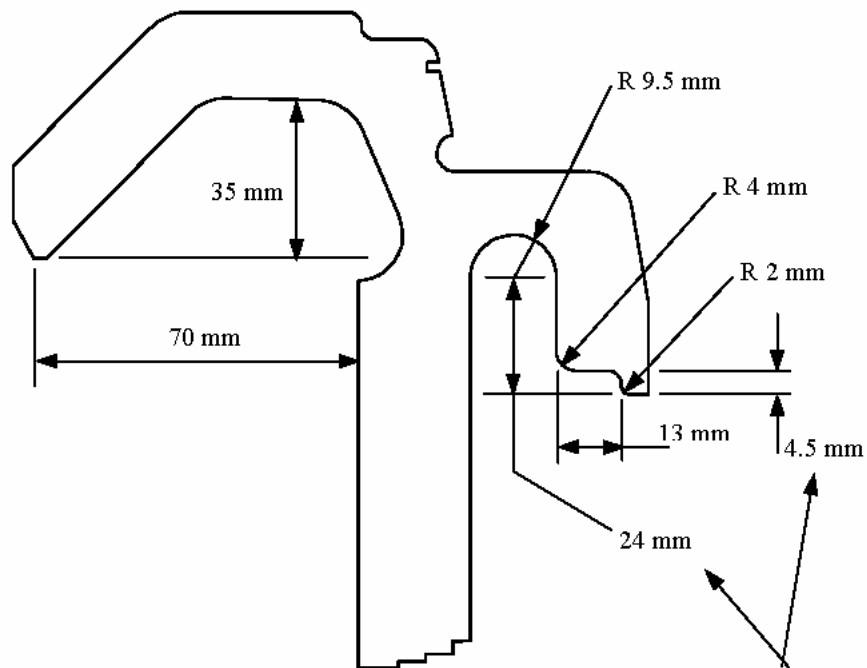
Standard Wheel – Nominal Dimensions



NOTES:

1. ALL EDGE SURFACE FINISH TO BE 0.8um.
2. GRADUATION SCALE & ALL DIMENSIONS MA  
WITH \* TO BE TOLERANCED ±0.1 ALL OTH  
DIMENSIONS ±0.5.
3. ALL RADII TO BE 3.0 UNLESS OTHERWISE  
STATED.
4. GRADUATION SCALE MARKINGS AND LETTEF  
BE ENGRAVED ON BOTH SIDES OF THE GAI
5. ALL ENGRAVING TO BE 3.0 IN HEIGHT.
6. HOLES AT B-4 AND D-4 TO BE  $\varnothing 4$ mm NOM
7. THIS GAUGE SUPERSEDES GAUGES 92444,  
304-100, 305-958, 305-970 AND 307-001.
8. ALL SCRIBE LINES 5mm LONG EXCEPT INT  
GRADUATIONS, 2mm LONG.

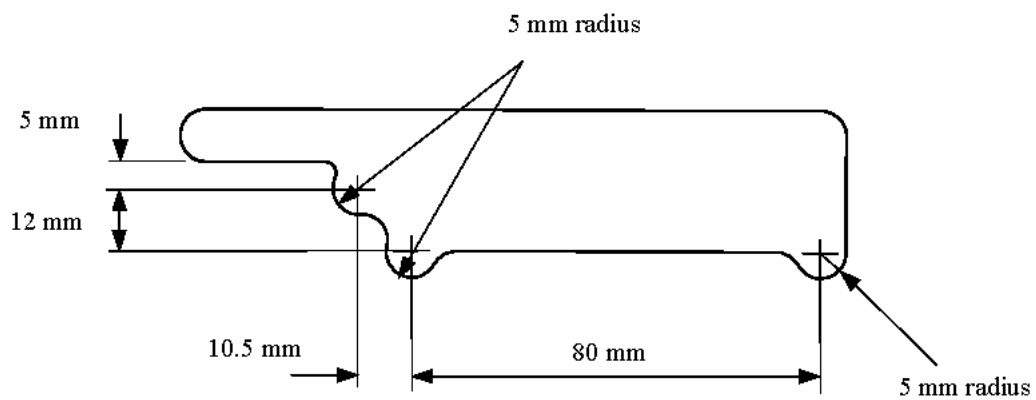
G14 SRA Drawing 207-668 Freight Wheel Tread "No Go" Profile Gauge



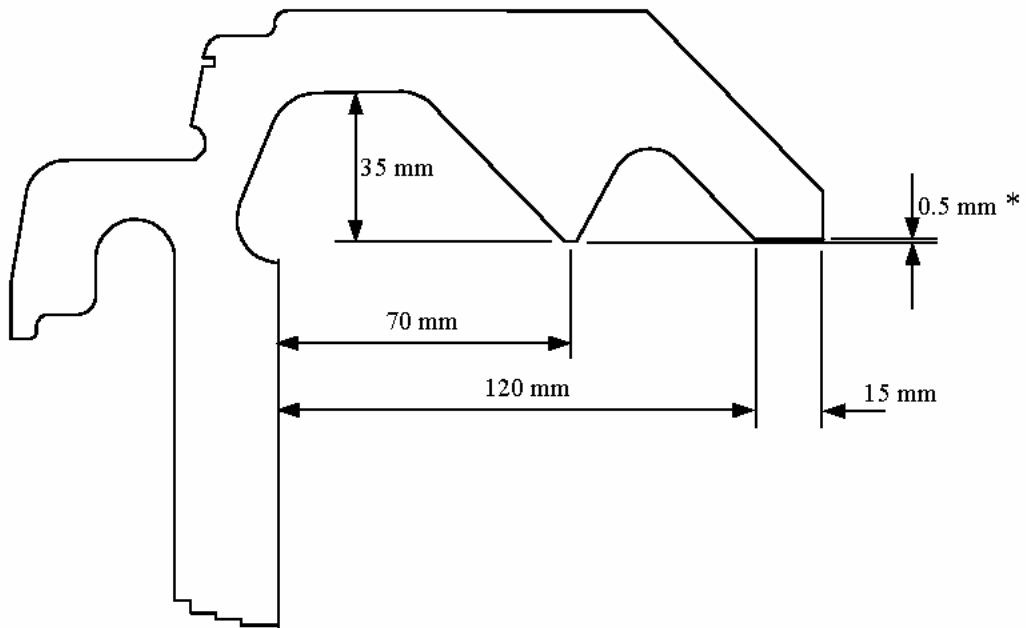
Tolerance on Dimensions +/- 0.2 mm

Due to the introduction of the WPR2000 wheel profile, these dimensions have been reduced by 1.5 mm to effectively maintain a 19 mm minimum flange thickness.

G15 Flange height and thin flange gauge – controlling dimensions

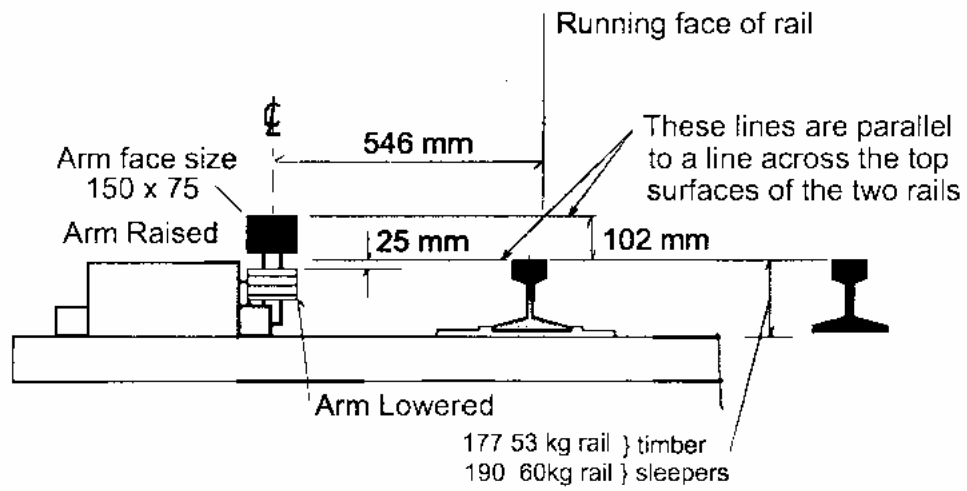


G16 Short Flange Gauge - Controlling Dimensions



Tolerance on Dimensions marked \*  $\pm 0.1$  mm  
Tolerance on other Dimensions  $\pm 0.2$  mm

G17 Hollow tread gauge – controlling dimensions



G18 RAC Drawing 356-01  
Trainstop Mounting Dimensions