



SECTION 4 TRAIN MARSHALLING

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TRAIN MARSHALLING

Marshalling involves making up the vehicle consist of a train.

There are a number of marshalling restrictions that apply to freight trains to ensure safe and reliable operation.

Loaded vehicles should be marshalled immediately behind the locomotive(s), where possible. The position of a vehicle within a train is also determined by:

- the draw capacity
- brake equipment type
- main reservoir hoses (where fitted)
- type of vehicle (e.g. wooden body)
- vehicle destination
- dangerous goods
- length difference between adjacent vehicles
- independent brake fitted ('B' wagons)
- Assisting (banking) the train from the rear

The overall length of a train includes all locomotives whether powering, off line, dead attached or banking.

DRAW CAPACITY

The draw capacity of a vehicle is determined by the:

- coupler strength
- draft gear capacity
- or underframe strength

whichever is the weakest link, and is specified for each vehicle type in **Section 10 Locomotives and Rolling Stock Data** pages.

TRAIN LENGTH RESTRICTIONS DUE TO BRAKE TYPE

The brakes on a train apply and release due to changes in pressure in the brake pipe. These pressure changes are less definite the further the vehicle is from the locomotive(s). To ensure that the brakes on vehicles operate correctly towards the rear end of a train, operating limits have been determined based on the brake equipment sensitivity. Less sensitive equipment must be marshalled towards the front of a train where the pressure change is more prominent.

When a train is being marshalled at its point of origin, remarshalled or has vehicles attached enroute the **brake type** listed in **Section 10 Locomotives and Rolling Stock Data** pages must be checked against the following table to ensure these limits are not exceeded. The train length includes all locomotives on the train.

Brake type	Allowable vehicle position in train
B1	Any position in the first 900 metres of train
B2 & B3	Any position in the first 1500 metres of train
B4	Any position in train
E1	Any position in train (all locomotives and wagons ECP braked)

TRAILING TONNAGE TABLE

The trailing tonnage table indicates the trailing load permitted to be hauled behind a vehicle according to its draw capacity.

The trailing load is determined from the draw capacity of the vehicle and the ruling grade on the route the train is travelling.

Vehicles with light draw capacity shall be marshalled towards the rear of the train or towards the centre in the case of a push / pull train providing it complies with other marshalling restrictions listed below.

The tonnages given below are inclusive of the mass of the vehicle being assessed.

DRAW CAPACITY	GRADES 1 : X																					
	MN	30	33	35	40	45	48	50	55	60	66	70	72	75	77	80	85	90	95	100	110	120
	TRAILING LOAD TONNES																					
0.05	94	103	109	123	136	144	150	163	175	190	200	205	212	216	223	235	246	257	267	288	308	
0.10	189	206	217	245	273	289	299	325	351	380	400	409	423	433	447	469	492	513	534	576	615	
0.15	283	309	326	368	409	433	449	488	526	571	600	614	635	649	670	704	737	770	802	863	923	
0.20	377	412	435	491	545	577	598	651	701	761	800	819	847	866	893	939	983	1026	1069	1151	1230	
0.25	471	515	543	613	681	722	748	813	877	951	999	1023	1059	1082	1117	1173	1229	1283	1336	1439	1538	
0.30	566	618	652	736	818	866	898	976	1052	1141	1199	1228	1270	1299	1340	1408	1475	1540	1603	1727	1845	
0.35	660	721	760	858	954	1010	1047	1138	1227	1331	1399	1433	1482	1515	1563	1643	1720	1796	1871	2015	2153	
0.40	754	823	869	981	1090	1155	1197	1301	1403	1522	1599	1637	1694	1731	1787	1877	1966	2053	2138	2302	2460	
0.45	849	926	978	1104	1227	1299	1347	1464	1578	1712	1799	1842	1906	1948	2010	2112	2212	2310	2405	2590	2768	
0.50	943	1029	1086	1226	1363	1443	1496	1626	1753	1902	1999	2047	2117	2164	2233	2347	2458	2566	2672	2878	3075	
0.55	1037	1132	1195	1349	1499	1588	1646	1789	1929	2092	2199	2251	2329	2381	2457	2581	2703	2823	2940	3166	3383	
0.60	1131	1235	1304	1472	1635	1732	1795	1952	2104	2282	2399	2456	2541	2597	2680	2816	2949	3079	3207	3454	3690	
0.65	1226	1338	1412	1594	1772	1876	1945	2114	2279	2473	2599	2661	2753	2813	2903	3051	3195	3336	3474	3742	3998	
0.70	1320	1441	1521	1717	1908	2021	2095	2277	2455	2663	2798	2865	2964	3030	3127	3286	3441	3593	3741	4029	4305	
L	0.75	1414	1544	1629	1860	2044	2165	2244	2439	2630	2853	2998	3070	3176	3246	3350	3520	3687	3849	4009	4317	4613
	0.80	1509	1647	1738	1962	2181	2309	2394	2602	2805	3043	3198	3275	3388	3463	3573	3755	3932	4106	4276	4605	4921
	0.85	1603	1750	1847	2085	2317	2453	2543	2765	2981	3234	3398	3479	3600	3679	3797	3990	4178	4363	4543	4893	5228
M1	0.90	1697	1853	1955	2207	2453	2598	2693	2927	3156	3424	3598	3684	3811	3896	4020	4224	4424	4619	4810	5181	5536
	0.95	1791	1956	2064	2330	2589	2742	2843	3090	3331	3614	3798	3889	4023	4112	4244	4459	4670	4876	5078	5468	5843
	1.00	1886	2059	2173	2453	2726	2886	2992	3253	3507	3804	3998	4093	4235	4328	4467	4694	4915	5132	5345	5756	6151
	1.05	1980	2162	2281	2575	2862	3031	3142	3415	3682	3994	4198	4298	4447	4545	4690	4928	5161	5389	5612	6044	6458
	1.10	2074	2265	2390	2698	2998	3175	3292	3578	3858	4185	4398	4503	4658	4761	4914	5163	5407	5646	5879	6332	6766
	1.15	2169	2368	2499	2820	3135	3319	3441	3741	4033	4375	4597	4707	4870	4978	5137	5398	5653	5902	6146	6620	7073
	1.20	2263	2470	2607	2943	3271	3464	3591	3903	4208	4565	4797	4912	5082	5294	5360	5632	5898	6159	6414	6907	7381
	1.25	2357	2573	2716	3066	3407	3608	3740	4066	4384	4755	4997	5117	5294	5410	5584	5867	6144	6416	6681	7195	7688
M2	1.30	2451	2676	2824	3188	3543	3752	3890	4228	4559	4945	5197	5321	5505	5627	5807	6102	6390	6672	6948	7483	7996
	1:35	2546	2779	2933	3311	3680	3897	4040	4391	4734	5136	5397	5526	5717	5843	6030	6336	6636	6929	7215	7771	8303
	1.40	2640	2882	3042	3434	3816	4041	4189	4554	4910	5326	5597	5731	5929	6060	6254	6571	6882	7185	7483	8059	8611
	1.45	2734	2985	3150	3556	3952	4185	4339	4716	5085	5516	5797	5935	6141	6276	6477	6806	7127	7442	7750	8346	8918
	1.50	2829	3088	3259	3679	4089	4330	4488	4879	5260	5706	5997	6140	6352	6493	6700	7040	7373	7699	8017	8634	9226
	1.55	2923	3191	3368	3802	4225	4474	4638	5042	5436	5896	6197	6345	6564	6709	6924	7275	7619	7955	8284	8922	9534
	1.60	3017	3294	3476	3924	4361	4618	4788	5204	5611	6087	6396	6549	6776	6925	7147	7510	7865	8212	8552	9210	9841
	1.65	3111	3397	3585	4047	4497	4763	4937	5367	5786	6277	6596	6754	6988	7142	7370	7744	8110	8468	8819	9498	10149
	1.70	3206	3500	3694	4169	4634	4907	5087	5529	5962	6467	6796	6959	7199	7358	7594	7979	8356	8725	9086	9785	10456
	1.75	3300	3603	3802	4292	4770	5051	5237	5692	6137	6657	6996	7163	7411	7575	7817	8214	8602	8982	9353	10073	10764
H	1.80	3394	3706	3911	4415	4906	5196	5386	5855	6312	6847	7196	7368	7623	7791	8040	8449	8848	9238	9621	10361	11071
	1.85	3489	3809	4019	4537	5043	5340	5536	6017	6488	7038	7396	7573	7835	8007	8264	8683	9094	9495	9888	10649	11379
	1.90	3583	3912	4128	4660	5179	5484	5685	6180	6663	7228	7596	7777	8046	8224	8487	8918	9339	9752	10155	10937	11686
	1.95	3677	4015	4237	4783	5315	5629	5835	6343	6838	7418	7796	7982	8258	8440	8710	9153	9585	10008	10422	11225	11994
	2.00	3771	4117	4345	4905	5451	5773	5985	6505	7014	7608	7996	8187	8470	8657	8934	9387	9831	10265	10690	11512	12031
	2.05	3866	4220	4454	5028	5588	5917	6134	6668	7189	7798	8196	8391	8682	8873	9157	9622	10077	10521	10957	11800	12609
	2.10	3960	4323	4563	5150	5724	6062	6284	6830	7364	7989	8395	8596	8893	9090	9380	9857	10322	10778	11224	12088	12916
	2.15	4054	4426	4671	5273	5860	6206	6433	6993	7540	8179	8595	8801	9105	9306	9604	10091	10568	11035	11491	12376	13224
	2.20	4149	4529	4780	5396	5997	6350	6583	7156	7715	8369	8795	9005	9317	9522	9827	10326	10814	11291	11759	12640	13532
	2.25	4243	4632	4888	5518	6133	6495	6733	7318	7890	8559	8995	9210	9529	9739	10050	10561	11060	11548	12026	12951	13839
	2.30	4337	4735	4997	5641	6269	6639	6882	7481	8066	8750	9195	9415	9740	9955	10274	10795	11395	11805	12293	13239	14147
	2.35	4431	4838	5106	5764	6405	6783	7032	7644	8241	8940	9395	9619	9952	10172	10497	11030	11551	12061	12560	13527	14454
	2.40	4526	4941	5214	5886	6542	6927	7182	7806	8416	9130	9595	9824	10164	10388	10720	11265	11797	12318	12827	13815	14762
X	2.45	4620	5044	5323	6009	6678	7072	7331	7969	8592	9320	9795	10029	10376	10604	10944	11499	12043	12574	13095	14103	15069
	2.50	4714	5147	5432	6131	6814	7216	7481	8132	8767	9510	9995	10233	10587	10821	11167	11734	12289	12831	13362	14390	15377

MAIN RESERVOIR

Some vehicles are fitted with a main reservoir pipe and hoses. The main reservoir may be used to recharge the air brake system on the vehicle and/or operate pneumatic equipment such as air operated doors or a pneumatic discharge system.

On trains containing vehicles with a main reservoir pipe, these vehicles should be marshalled together and coupled to the locomotive(s) or to any other vehicles with main reservoir hoses, which are already attached to the locomotive(s).

Where main reservoir hoses are duplicated at each end of a vehicle, all hoses should be coupled and all coupling cocks opened:

- between locomotives
- between the rear locomotive and the first vehicle
- and between the vehicles

On some sections of descending steeply graded track, operating restrictions may apply to the total train length/mass of loaded trains in the case where “two pipe” main reservoir equipped vehicles are not marshalled at the front of the train.

Vehicles that are fitted with a main reservoir pipe are identified in Section 10 Locomotives and Rolling Stock Data pages.

- indicates that the vehicle is fitted with a “two pipe” air brake system. The main reservoir pipe recharges the air brake system.
- indicates that the vehicle is fitted with a main reservoir pipe but it does not recharge the air brake system from that pipe. This vehicle can be marshalled anywhere in a two pipe train but is not categorized as a “two pipe” vehicle.

WOODEN BODIED VEHICLES

A locomotive hauled train conveying wooden-bodied vehicles at either end of the consist must be worked as a block train unless both terminal vehicles are steel strengthened or they are unoccupied for the duration of the journey

A self propelled train containing wooden-bodied vehicles (such as CPH railcars) must be worked as a block train unless such vehicles are fitted with approved hazard warning lights at each terminal end and approved impact resistant barriers on the front and rear windows.

LOCOMOTIVE HAULED PASSENGER CARS ON FREIGHT TRAINS

Locomotive hauled passenger cars may be marshalled empty anywhere on a freight train, within normal marshalling restrictions, and operated under the same conditions as a freight vehicle.

If a passenger vehicle is the last vehicle on a train, an approved end of train marker must be fitted to the rear of that vehicle.

TEST ACCOMMODATION AND CREW CARS

Test accommodation vehicles or crew cars may be marshalled anywhere within a train consist as determined by the operator or staff travelling on those vehicle(s) and with agreement of the Network Manager.

VEHICLES UNDER TEST

The approval of the Network Manager is required before any vehicle or train is permitted to undergo on-track tests.

DANGEROUS GOODS

All vehicles containing dangerous goods must be labelled in accordance with the provisions of the Australian Dangerous Goods Code (ADG Code).

Shunting of vehicles containing or carrying dangerous goods shall be in accordance with Safeworking Rules.

Separation between dangerous goods on rail wagons and marshalling of rolling stock containing dangerous goods must comply with the provisions of Volume 2 Part 9 of the current ADG Code and any regulations, provisions or exemptions to that code as approved by the Competent Authority.