

O Scale

Straight Switch Turnout

TURNOUT DIMENSIONS

Revised: February 2015

RP-12.25

Design and calculations by Van S. Fehr

(1)	FROG NUMBERS	4	5	6	7	8	9	10	11	12
PROPERTIES OF STRAIGHT SWITCHES										
(2)	Switch Rail Length	2.999	2.902	2.892	4.448	4.566	4.532	4.755	6.011	6.027
(4)	Switch Heel Spread	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175
(5)	Switch Heel Angle (deg.)	3.343	3.454	3.466	2.253	2.195	2.211	2.107	1.667	1.662
LEAD TO THEORETICAL POINT OF FROG										
(8)	Lead	9.354	10.583	11.812	15.448	16.917	17.979	19.583	22.849	24.042
CLOSURE DISTANCE										
(9)	Straight Rail Length	5.402	6.646	7.804	9.614	10.843	11.586	12.928	14.762	15.711
(10)	Curved Rail Length	5.504	6.728	7.873	9.673	10.894	11.633	12.970	14.800	15.746
(11)	Curved Rail Radius	28.912	48.385	74.424	93.641	125.894	160.661	205.413	239.653	290.142
GAGE LINE OFFSETS ON CURVED CLOSURE RAIL										
(12)	1st Point Y1	0.286	0.304	0.319	0.300	0.308	0.313	0.319	0.311	0.315
(13)	1st Point X1	4.349	4.564	4.843	6.852	7.276	7.429	7.987	9.702	9.955
(14)	Mid-Point Y2	0.460	0.491	0.514	0.488	0.500	0.503	0.515	0.504	0.509
(15)	Mid-Point X2	5.699	6.225	6.794	9.256	9.987	10.325	11.219	13.392	13.883
(16)	3rd Point Y3	0.701	0.736	0.762	0.738	0.751	0.747	0.761	0.754	0.757
(17)	3rd Point X3	7.050	7.887	8.745	11.659	12.698	13.222	14.451	17.083	17.811
PROPERTIES OF FROGS										
(18)	Frog Angle (deg.)	14.250	11.421	9.527	8.171	7.153	6.360	5.725	5.205	4.772
(19)	Overall Length	2.162	2.452	2.741	3.281	3.571	4.361	4.525	5.117	5.563
(20)	Toe Length	0.954	1.035	1.116	1.385	1.508	1.860	1.900	2.076	2.303
(21)	Heel Length	1.209	1.417	1.625	1.896	2.063	2.500	2.625	3.042	3.261
(22)	Toe Spread	0.237	0.206	0.185	0.197	0.188	0.206	0.190	0.188	0.192
(23)	Heel Spread	0.300	0.282	0.270	0.270	0.257	0.277	0.262	0.276	0.271
(35)	Wing Rail Extension	0.740	0.839	0.938	1.037	1.136	1.235	1.333	1.432	1.531
(36)	Wing Rail Flare Length	0.375	0.375	0.375	0.375	0.500	0.500	0.667	0.667	0.750
(37)	Wing Rail Flare Width	0.050	0.050	0.050	0.050	0.047	0.047	0.045	0.045	0.045
(38)	Wing Rail Bend Width	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(39)	Wing Rail End Chamfer	0.073	0.073	0.073	0.073	0.073	0.073	0.073	0.073	0.073
POINT OF FROG TO INTERSECTION OF CENTERLINES										
(24)	PF to ICL	5.000	6.250	7.500	8.750	10.000	11.250	12.500	13.750	15.000
DATA FOR CROSSOVERS: PF TO PF ON PARALLEL TRACKS										
For Track Centers of:		3.250	(13 prototype feet)							
(25)	Straight Track Dist.	2.797	3.588	4.365	5.134	5.898	6.660	7.419	8.176	8.932
(26)	Crossover Track Dist.	3.203	3.913	4.635	5.366	6.102	6.840	7.581	8.324	9.068
For Track Center Increment of:		0.250	(1 prototype foot)							
(28)	Straight Track Incr.	0.984	1.238	1.490	1.741	1.992	2.243	2.494	2.744	2.995
(29)	Crossover Track Incr.	1.016	1.263	1.510	1.759	2.008	2.257	2.506	2.756	3.005
GUARD RAILS										
(30)	Parallel End Setback	0.167	0.177	0.188	0.198	0.208	0.219	0.229	0.240	0.250
(31)	Bevel Length	0.271	0.271	0.271	0.271	0.271	0.271	0.271	0.271	0.271
(32)	Flare Length	0.604	0.604	0.604	0.604	0.604	0.688	0.688	0.688	0.688
(33)	Overall Length	2.063	2.063	2.063	2.063	2.063	2.750	2.750	2.750	2.750
(34)	Parallel Length	0.854	0.854	0.854	0.854	0.854	1.375	1.375	1.375	1.375
(37)	Flare Width	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040
(38)	Plane Width	0.024	0.024	0.024	0.024	0.024	0.021	0.021	0.021	0.021
(39)	End Chamfer	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063

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(1)	FROG NUMBERS	13	14	15	16	17	18	19	20
PROPERTIES OF STRAIGHT SWITCHES									
(2)	Switch Rail Length	6.095	6.180	8.358	8.328	8.358	8.402	8.503	8.616
(4)	Switch Heel Spread	0.175	0.175	0.175	0.175	0.175	0.175	0.175	0.175
(5)	Switch Heel Angle (deg.)	1.644	1.621	1.199	1.203	1.199	1.193	1.178	1.163
LEAD TO THEORETICAL POINT OF FROG									
(8)	Lead	25.331	26.620	31.437	32.667	33.859	35.052	36.417	37.781
CLOSURE DISTANCE									
(9)	Straight Rail Length	16.799	17.869	20.282	21.512	22.442	23.358	24.592	25.814
(10)	Curved Rail Length	16.831	17.899	20.310	21.538	22.466	23.382	24.614	25.835
(11)	Curved Rail Radius	349.244	415.279	444.230	519.208	593.032	673.281	767.879	870.039
GAGE LINE OFFSETS ON CURVED CLOSURE RAIL									
(12)	1st Point Y1	0.321	0.325	0.310	0.316	0.319	0.322	0.326	0.330
(13)	1st Point X1	10.295	10.648	13.428	13.706	13.968	14.241	14.651	15.069
(14)	Mid-Point Y2	0.517	0.524	0.503	0.512	0.516	0.519	0.526	0.533
(15)	Mid-Point X2	14.495	15.115	18.499	19.084	19.579	20.081	20.799	21.523
(16)	3rd Point Y3	0.764	0.771	0.754	0.765	0.766	0.768	0.776	0.784
(17)	3rd Point X3	18.694	19.582	23.569	24.462	25.189	25.920	26.947	27.976
PROPERTIES OF FROGS									
(18)	Frog Angle (deg.)	4.405	4.091	3.818	3.580	3.369	3.182	3.015	2.864
(19)	Overall Length	6.010	6.456	6.693	7.140	7.586	8.032	8.275	8.518
(20)	Toe Length	2.437	2.570	2.798	2.827	3.060	3.292	3.322	3.351
(21)	Heel Length	3.573	3.886	3.896	4.313	4.526	4.740	4.953	5.167
(22)	Toe Spread	0.187	0.183	0.186	0.177	0.180	0.183	0.175	0.168
(23)	Heel Spread	0.275	0.277	0.260	0.269	0.266	0.263	0.261	0.258
(35)	Wing Rail Extension	1.698	1.865	1.964	2.167	2.266	2.365	2.531	2.698
(36)	Wing Rail Flare Length	0.977	1.106	1.155	1.294	1.339	1.384	1.515	1.646
(37)	Wing Rail Flare Width	0.044	0.043	0.043	0.043	0.043	0.043	0.042	0.042
(38)	Wing Rail Bend Width	0.044	0.043	0.043	0.043	0.043	0.043	0.042	0.042
(39)	Wing Rail End Chamfer	0.073	0.073	0.073	0.073	0.073	0.073	0.073	0.073
POINT OF FROG TO INTERSECTION OF CENTERLINES									
(24)	PF to ICL	16.250	17.500	18.750	20.000	21.250	22.500	23.750	25.000
DATA FOR CROSSOVERS: PF TO PF ON PARALLEL TRACKS									
For Track Centers of:		3.250	(13 prototype feet)						
(25)	Straight Track Dist.	9.688	10.442	11.196	11.949	12.702	13.455	14.207	14.959
(26)	Crossover Track Dist.	9.813	10.558	11.304	12.051	12.798	13.545	14.293	15.041
For Track Center Increment of:		0.250	(1 prototype foot)						
(28)	Straight Track Incr.	3.245	3.496	3.746	3.996	4.246	4.497	4.747	4.997
(29)	Crossover Track Incr.	3.255	3.504	3.754	4.004	4.254	4.503	4.753	5.003
GUARD RAILS									
(30)	Parallel End Setback	0.261	0.271	0.281	0.292	0.302	0.313	0.323	0.333
(31)	Bevel Length	0.271	0.271	0.271	0.271	0.271	0.271	0.271	0.271
(32)	Flare Length	0.688	0.750	0.750	0.750	0.750	0.750	0.854	0.854
(33)	Overall Length	2.750	3.250	3.250	3.250	3.250	3.250	4.125	4.125
(34)	Parallel Length	1.375	1.750	1.750	1.750	1.750	1.750	2.417	2.417
(37)	Total Flare at End	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040
(38)	Bevel Cut at End	0.021	0.020	0.020	0.020	0.020	0.020	0.019	0.019
(39)	End Chamfer	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063