

LS Scale

Straight Switch Turnout

TURNOUT DIMENSIONS

Revised: February 2015

RP-12.23

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	5.004	4.883	4.881	7.463	7.683	7.656	8.034	10.128	10.175
(4)	Switch Heel Spread	0.258	0.258	0.258	0.258	0.258	0.258	0.258	0.258	0.258
(5)	Switch Heel Angle (deg.)	2.959	3.033	3.034	1.984	1.927	1.934	1.843	1.462	1.455
LEAD TO THEORETICAL POINT OF FROG										
(8)	Lead	14.031	15.875	17.718	23.172	25.375	26.969	29.375	34.273	36.062
CLOSURE DISTANCE										
(9)	Straight Rail Length	7.603	9.447	11.172	13.641	15.442	16.535	18.506	21.049	22.451
(10)	Curved Rail Length	7.746	9.562	11.269	13.723	15.513	16.600	18.564	21.101	22.499
(11)	Curved Rail Radius	39.308	65.310	99.427	127.068	170.094	214.893	273.991	322.964	388.632
GAGE LINE OFFSETS ON CURVED CLOSURE RAIL										
(12)	1st Point Y1	0.403	0.426	0.446	0.422	0.432	0.438	0.446	0.436	0.441
(13)	1st Point X1	6.904	7.245	7.674	10.874	11.543	11.790	12.660	15.390	15.788
(14)	Mid-Point Y2	0.641	0.681	0.713	0.678	0.694	0.697	0.713	0.699	0.706
(15)	Mid-Point X2	8.805	9.607	10.467	14.284	15.404	15.924	17.287	20.652	21.401
(16)	3rd Point Y3	0.974	1.023	1.059	1.027	1.044	1.036	1.058	1.048	1.052
(17)	3rd Point X3	10.706	11.968	13.260	17.694	19.264	20.058	21.913	25.914	27.013
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	3.237	3.670	4.103	4.911	5.344	6.527	6.773	7.659	8.327
(20)	Toe Length	1.424	1.545	1.665	2.067	2.250	2.777	2.835	3.097	3.436
(21)	Heel Length	1.813	2.125	2.438	2.844	3.094	3.750	3.938	4.563	4.891
(22)	Toe Spread	0.353	0.307	0.277	0.295	0.281	0.308	0.283	0.281	0.286
(23)	Heel Spread	0.450	0.423	0.405	0.405	0.386	0.416	0.393	0.414	0.407
(35)	Wing Rail Extension	1.110	1.258	1.407	1.555	1.703	1.852	2.000	2.149	2.297
(36)	Wing Rail Flare Length	0.563	0.563	0.563	0.563	0.750	0.750	1.000	1.000	1.125
(37)	Wing Rail Flare Width	0.075	0.075	0.075	0.075	0.071	0.071	0.068	0.068	0.067
(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	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109
POINT OF FROG TO INTERSECTION OF CENTERLINES										
(24)	PF to ICL	7.064	8.830	10.596	12.362	14.128	15.894	17.660	19.426	21.192
DATA FOR CROSSOVERS: PF TO PF ON PARALLEL TRACKS										
For Track Centers of:		4.875	(13 prototype feet)							
(25)	Straight Track Dist.	5.067	6.471	7.855	9.227	10.592	11.952	13.308	14.662	16.014
(26)	Crossover Track Dist.	5.677	6.959	8.261	9.575	10.896	12.222	13.552	14.884	16.218
For Track Center Increment of:		0.375	(1 prototype foot)							
(28)	Straight Track Incr.	1.477	1.856	2.234	2.612	2.988	3.365	3.741	4.116	4.492
(29)	Crossover Track Incr.	1.523	1.894	2.266	2.638	3.012	3.385	3.759	4.134	4.508
GUARD RAILS										
(30)	Parallel End Setback	0.250	0.266	0.282	0.297	0.313	0.328	0.344	0.360	0.375
(31)	Bevel Length	0.406	0.406	0.406	0.406	0.406	0.406	0.406	0.406	0.406
(32)	Flare Length	0.906	0.906	0.906	0.906	0.906	1.031	1.031	1.031	1.031
(33)	Overall Length	3.094	3.094	3.094	3.094	3.094	4.125	4.125	4.125	4.125
(34)	Parallel Length	1.281	1.281	1.281	1.281	1.281	2.063	2.063	2.063	2.063
(37)	Flare Width	0.060	0.060	0.060	0.060	0.060	0.060	0.060	0.060	0.060
(38)	Plane Width	0.035	0.035	0.035	0.035	0.035	0.032	0.032	0.032	0.032
(39)	End Chamfer	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094

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(1)	FROG NUMBERS	13	14	15	16	17	18	19	20
PROPERTIES OF STRAIGHT SWITCHES									
(2)	Switch Rail Length	10.299	10.448	14.074	14.038	14.106	14.194	14.365	14.554
(4)	Switch Heel Spread	0.258	0.258	0.258	0.258	0.258	0.258	0.258	0.258
(5)	Switch Heel Angle (deg.)	1.437	1.417	1.052	1.054	1.049	1.043	1.030	1.017
LEAD TO THEORETICAL POINT OF FROG									
(8)	Lead	37.996	39.930	47.156	49.000	50.789	52.578	54.625	56.672
CLOSURE DISTANCE									
(9)	Straight Rail Length	24.062	25.648	28.908	30.745	32.119	33.473	35.305	37.121
(10)	Curved Rail Length	24.107	25.689	28.947	30.781	32.153	33.505	35.336	37.150
(11)	Curved Rail Radius	465.399	550.459	599.489	698.355	794.045	897.295	1020.229	1152.332
GAGE LINE OFFSETS ON CURVED CLOSURE RAIL									
(12)	1st Point Y1	0.448	0.454	0.435	0.442	0.446	0.450	0.455	0.460
(13)	1st Point X1	16.314	16.860	21.301	21.725	22.136	22.562	23.192	23.834
(14)	Mid-Point Y2	0.716	0.725	0.698	0.711	0.715	0.719	0.729	0.737
(15)	Mid-Point X2	22.330	23.272	28.528	29.411	30.166	30.930	32.018	33.115
(16)	3rd Point Y3	1.062	1.071	1.049	1.064	1.065	1.067	1.079	1.089
(17)	3rd Point X3	28.345	29.683	35.755	37.097	38.195	39.298	40.844	42.395
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	8.995	9.662	10.018	10.685	11.353	12.021	12.384	12.747
(20)	Toe Length	3.635	3.834	4.174	4.217	4.564	4.911	4.954	4.997
(21)	Heel Length	5.360	5.828	5.844	6.469	6.789	7.109	7.430	7.750
(22)	Toe Spread	0.279	0.274	0.278	0.263	0.268	0.273	0.261	0.250
(23)	Heel Spread	0.412	0.416	0.389	0.404	0.399	0.395	0.391	0.387
(35)	Wing Rail Extension	2.547	2.797	2.945	3.250	3.399	3.547	3.797	4.047
(36)	Wing Rail Flare Length	1.466	1.659	1.732	1.940	2.008	2.076	2.272	2.468
(37)	Wing Rail Flare Width	0.065	0.065	0.065	0.064	0.064	0.064	0.064	0.063
(38)	Wing Rail Bend Width	0.065	0.065	0.065	0.064	0.064	0.064	0.064	0.063
(39)	Wing Rail End Chamfer	0.109	0.109	0.109	0.109	0.109	0.109	0.109	0.109
POINT OF FROG TO INTERSECTION OF CENTERLINES									
(24)	PF to ICL	22.958	24.724	26.490	28.256	30.022	31.788	33.554	35.320
DATA FOR CROSSOVERS: PF TO PF ON PARALLEL TRACKS									
For Track Centers of:		4.875	(13 prototype feet)						
(25)	Straight Track Dist.	17.365	18.715	20.064	21.412	22.759	24.106	25.453	26.799
(26)	Crossover Track Dist.	17.553	18.889	20.226	21.564	22.903	24.242	25.581	26.921
For Track Center Increment of:		0.375	(1 prototype foot)						
(28)	Straight Track Incr.	4.868	5.243	5.619	5.994	6.369	6.745	7.120	7.495
(29)	Crossover Track Incr.	4.882	5.257	5.631	6.006	6.381	6.755	7.130	7.505
GUARD RAILS									
(30)	Parallel End Setback	0.391	0.406	0.422	0.438	0.453	0.469	0.484	0.500
(31)	Bevel Length	0.406	0.406	0.406	0.406	0.406	0.406	0.406	0.406
(32)	Flare Length	1.031	1.031	1.125	1.125	1.125	1.125	1.281	1.281
(33)	Overall Length	4.125	4.125	4.875	4.875	4.875	4.875	6.188	6.188
(34)	Parallel Length	2.063	2.063	2.625	2.625	2.625	2.625	3.625	3.625
(37)	Total Flare at End	0.060	0.060	0.060	0.060	0.060	0.060	0.060	0.060
(38)	Bevel Cut at End	0.032	0.032	0.031	0.031	0.031	0.031	0.029	0.029
(39)	End Chamfer	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094