

LSdf Scale

Straight Switch Turnout

TURNOUT DIMENSIONS

Revised: February 2015

RP-12.39

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	4.994	4.874	4.873	7.449	7.668	7.642	8.019	10.109	10.156
(4)	Switch Heel Spread	0.259	0.259	0.259	0.259	0.259	0.259	0.259	0.259	0.259
(5)	Switch Heel Angle (deg.)	2.976	3.050	3.051	1.995	1.938	1.945	1.853	1.470	1.463
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	7.608	9.451	11.175	13.648	15.448	16.541	18.510	21.057	22.458
(10)	Curved Rail Length	7.752	9.566	11.271	13.730	15.520	16.605	18.569	21.109	22.506
(11)	Curved Rail Radius	39.397	65.476	99.716	127.370	170.525	215.505	274.801	323.809	389.727
GAGE LINE OFFSETS ON CURVED CLOSURE RAIL										
(12)	1st Point Y1	0.404	0.428	0.448	0.424	0.434	0.440	0.448	0.437	0.443
(13)	1st Point X1	6.896	7.237	7.666	10.862	11.531	11.777	12.647	15.373	15.771
(14)	Mid-Point Y2	0.643	0.683	0.715	0.681	0.696	0.699	0.715	0.701	0.708
(15)	Mid-Point X2	8.798	9.599	10.460	14.274	15.393	15.912	17.274	20.637	21.385
(16)	3rd Point Y3	0.976	1.026	1.062	1.030	1.047	1.039	1.061	1.051	1.054
(17)	3rd Point X3	10.700	11.962	13.254	17.686	19.255	20.047	21.902	25.901	27.000
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	3.241	3.675	4.109	4.918	5.352	6.536	6.783	7.670	8.339
(20)	Toe Length	1.428	1.550	1.671	2.074	2.258	2.786	2.845	3.108	3.448
(21)	Heel Length	1.813	2.125	2.438	2.844	3.094	3.750	3.938	4.563	4.891
(22)	Toe Spread	0.354	0.308	0.278	0.296	0.282	0.309	0.284	0.282	0.287
(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	7.080	8.850	10.620	12.390	14.160	15.930	17.700	19.470	21.240
DATA FOR CROSSOVERS: PF TO PF ON PARALLEL TRACKS										
For Track Centers of:		4.875	(13 prototype feet)							
(25)	Straight Track Dist.	5.035	6.431	7.807	9.171	10.528	11.880	13.228	14.574	15.918
(26)	Crossover Track Dist.	5.645	6.919	8.213	9.519	10.832	12.150	13.472	14.796	16.122
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	10.280	10.429	14.048	14.013	14.081	14.169	14.340	14.530
(4)	Switch Heel Spread	0.259	0.259	0.259	0.259	0.259	0.259	0.259	0.259
(5)	Switch Heel Angle (deg.)	1.446	1.425	1.058	1.060	1.055	1.049	1.036	1.023
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	24.067	25.652	28.919	30.755	32.127	33.480	35.311	37.125
(10)	Curved Rail Length	24.112	25.694	28.958	30.790	32.161	33.512	35.342	37.155
(11)	Curved Rail Radius	466.790	552.202	601.032	700.238	796.301	899.979	1023.391	1156.031
GAGE LINE OFFSETS ON CURVED CLOSURE RAIL									
(12)	1st Point Y1	0.450	0.456	0.436	0.444	0.448	0.452	0.457	0.462
(13)	1st Point X1	16.297	16.842	21.278	21.701	22.113	22.539	23.168	23.811
(14)	Mid-Point Y2	0.718	0.728	0.700	0.713	0.717	0.722	0.731	0.740
(15)	Mid-Point X2	22.314	23.255	28.508	29.390	30.144	30.909	31.996	33.092
(16)	3rd Point Y3	1.065	1.074	1.052	1.067	1.068	1.070	1.081	1.092
(17)	3rd Point X3	28.331	29.668	35.737	37.079	38.176	39.279	40.824	42.374
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	9.008	9.676	10.033	10.701	11.370	12.039	12.403	12.767
(20)	Toe Length	3.648	3.848	4.189	4.233	4.581	4.929	4.973	5.017
(21)	Heel Length	5.360	5.828	5.844	6.469	6.789	7.109	7.430	7.750
(22)	Toe Spread	0.280	0.275	0.279	0.264	0.269	0.274	0.262	0.251
(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	23.010	24.780	26.550	28.320	30.090	31.860	33.630	35.400
DATA FOR CROSSOVERS: PF TO PF ON PARALLEL TRACKS									
For Track Centers of:		4.875	(13 prototype feet)						
(25)	Straight Track Dist.	17.261	18.603	19.944	21.284	22.623	23.962	25.301	26.639
(26)	Crossover Track Dist.	17.449	18.777	20.106	21.436	22.767	24.098	25.429	26.761
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