



## US Series

Raymond® MEDIUM HEAVY DUTY DIE SPRINGS					INCH DIMENSIONS						RED
Hole Dia. (in)	Rod Dia. (in)	Free Length (in)	CATALOG NUMBER	Load at 1/10 in. Def. (lb)	LOAD DEFLECTION TABLE						
					For Optimum Life (20% of free length)		For Long Life (25% of free length)		Maximum Operating Def. (30% of free length)		*Maximum Deflection (37% of free length)
					Load (lb)	Deflection (in)		Deflection (in)	Load (lb)	Deflection (in)	Deflection (in)
A	B	C									
3/8	3/16	1	104-104	8.4	16.8	0.20	21.0	0.25	25.2	0.30	0.37
		1 1/4	104-105	7.3	18.3	0.25	22.8	0.31	27.4	0.38	0.46
		1 1/2	104-106	6.7	20.1	0.30	25.1	0.38	30.2	0.45	0.56
		1 3/4	104-107	5.8	20.3	0.35	25.4	0.44	30.5	0.53	0.65
		2	104-108	5.0	20.0	0.40	25.0	0.50	30.0	0.60	0.74
		2 1/2	104-110	3.7	18.5	0.50	23.3	0.63	27.8	0.75	0.93
		3	104-112	3.0	18.0	0.60	22.5	0.75	27.0	0.90	1.11
		12	104-148	0.8	19.2	2.40	24.0	3.00	28.8	3.60	4.44
		1/2	9/32	1	104-204	15.5	31.0	0.20	38.8	0.25	46.5
1 1/4	104-205			12.2	30.5	0.25	37.8	0.31	45.8	0.38	0.46
1 1/2	104-206			9.8	29.4	0.30	37.2	0.38	44.1	0.45	0.56
1 3/4	104-207			8.5	29.8	0.35	37.2	0.44	44.6	0.53	0.65
2	104-208			7.5	30.0	0.40	37.5	0.50	45.0	0.60	0.74
2 1/2	104-210			6.0	30.0	0.50	37.5	0.63	45.0	0.75	0.93
3	104-212			5.1	30.6	0.60	38.3	0.75	45.9	0.90	1.11
3 1/2	104-214			4.0	28.0	0.70	35.0	0.88	42.0	1.05	1.30
12	104-248			1.1	26.4	2.40	33.0	3.00	39.6	3.60	4.44
5/8	11/32	1	104-304	30.0	60.0	0.20	75.0	0.25	90.0	0.30	0.37
		1 1/4	104-305	21.5	53.8	0.25	67.2	0.31	80.6	0.38	0.46
		1 1/2	104-306	19.0	57.0	0.30	71.3	0.38	85.5	0.45	0.56
		1 3/4	104-307	16.8	58.8	0.35	73.5	0.44	88.2	0.53	0.65
		2	104-308	15.5	62.0	0.40	77.5	0.50	93.0	0.60	0.74
		2 1/2	104-310	11.5	57.5	0.50	71.9	0.63	86.3	0.75	0.93
		3	104-312	10.0	60.0	0.60	75.0	0.75	90.0	0.90	1.11
		3 1/2	104-314	8.5	59.5	0.70	74.4	0.88	89.3	1.05	1.30
		4	104-316	7.6	60.8	0.80	76.0	1.00	91.2	1.20	1.48
12	104-348	2.6	62.4	2.40	78.0	3.00	93.6	3.60	4.44		
3/4	3/8	1	104-404	50.0	100.0	0.20	125.0	0.25	150.0	0.30	0.37
		1 1/4	104-405	38.0	95.0	0.25	118.8	0.31	142.5	0.38	0.46
		1 1/2	104-406	31.0	93.0	0.30	117.8	0.38	139.5	0.45	0.56
		1 3/4	104-407	27.0	94.5	0.35	118.8	0.44	141.8	0.53	0.65
		2	104-408	24.0	96.0	0.40	120.0	0.50	144.0	0.60	0.74
		2 1/2	104-410	18.8	94.0	0.50	118.4	0.63	141.0	0.75	0.93
		3	104-412	14.9	89.4	0.60	111.8	0.75	134.1	0.90	1.11
		3 1/2	104-414	12.8	89.6	0.70	112.0	0.88	134.4	1.05	1.30
		4	104-416	11.0	88.0	0.80	110.0	1.00	132.0	1.20	1.48
		4 1/2	104-418	10.0	90.0	0.90	113.0	1.13	135.0	1.35	1.67
		5	104-420	9.0	90.0	1.00	112.5	1.25	135.0	1.50	1.85
		5 1/2	104-422	8.0	88.0	1.10	110.0	1.38	132.0	1.65	2.04
		6	104-424	7.5	90.0	1.20	112.5	1.50	135.0	1.80	2.22
12	104-448	3.5	84.0	2.40	105.0	3.00	126.0	3.60	4.44		

\* Deflection values shown represent compressed lengths near solid and are for design information only. The color blue is a registered trademark of Barnes Group Inc.



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					For Optimum Life (20% of free length)		For Long Life (25% of free length)		Maximum Operating Def. (30% of free length)		*Maximum Deflection (37% of free length)
					Load (lb)	Def. (in)	Load (lb)	Def. (in)	Load (lb)	Def. (in)	Deflection (in)
	B	C									
1	1/2	1	104-504	82.7	165.4	0.20	206.8	0.25	248.1	0.30	0.37
		1 1/4	104-505	65.3	163.3	0.25	202.4	0.31	244.9	0.38	0.46
		1 1/2	104-506	53.8	161.4	0.30	204.4	0.38	242.1	0.45	0.56
		1 3/4	104-507	46.1	161.4	0.35	202.8	0.44	242.0	0.53	0.65
		2	104-508	40.0	160.0	0.40	200.0	0.50	240.0	0.60	0.74
		2 1/2	104-510	32.2	161.0	0.50	202.9	0.63	241.5	0.75	0.93
		3	104-512	26.7	160.2	0.60	200.3	0.75	240.3	0.90	1.11
		3 1/2	104-514	22.9	160.3	0.70	201.5	0.88	240.5	1.05	1.30
		4	104-516	20.2	161.6	0.80	202.0	1.00	242.4	1.20	1.48
		4 1/2	104-518	17.8	160.2	0.90	201.1	1.13	240.3	1.35	1.67
		5	104-520	15.7	157.0	1.00	196.3	1.25	235.5	1.50	1.85
		5 1/2	104-522	13.7	150.7	1.10	189.1	1.38	226.1	1.65	2.04
6	104-524	12.5	150.0	1.20	187.5	1.50	225.0	1.80	2.22		
7	104-528	10.9	152.6	1.40	190.8	1.75	228.9	2.10	2.59		
8	104-532	9.6	153.6	1.60	192.0	2.00	230.4	2.40	2.96		
12	104-548	6.5	156.0	2.40	195.0	3.00	234.0	3.60	4.44		
1 1/4	5/8	1 1/2	104-606	114.4	343.2	0.30	429.0	0.38	514.8	0.45	0.56
		1 3/4	104-607	100.8	352.8	0.35	441.0	0.44	529.2	0.53	0.65
		2	104-608	83.8	335.2	0.40	419.0	0.50	502.8	0.60	0.74
		2 1/2	104-610	62.4	312.0	0.50	390.0	0.63	468.0	0.75	0.93
		3	104-612	51.2	307.2	0.60	384.0	0.75	460.8	0.90	1.11
		3 1/2	104-614	44.0	308.0	0.70	385.0	0.88	462.0	1.05	1.30
		4	104-616	38.1	304.8	0.80	381.0	1.00	457.2	1.20	1.48
		4 1/2	104-618	32.9	296.1	0.90	371.8	1.13	444.2	1.35	1.67
		5	104-620	30.0	300.0	1.00	375.0	1.25	450.0	1.50	1.85
		5 1/2	104-622	26.4	290.4	1.10	363.0	1.38	435.6	1.65	2.04
		6	104-624	25.0	300.0	1.20	375.0	1.50	450.0	1.80	2.22
		7	104-628	21.0	294.0	1.40	367.5	1.75	441.0	2.10	2.59
8	104-632	18.4	294.4	1.60	368.0	2.00	441.6	2.40	2.96		
10	104-640	14.5	290.0	2.00	362.5	2.50	435.0	3.00	3.70		
12	104-648	12.4	297.6	2.40	372.0	3.00	446.4	3.60	4.44		
1 1/2	3/4	2	104-708	103.0	412.0	0.40	515.0	0.50	618.0	0.60	0.74
		2 1/2	104-710	81.2	406.0	0.50	511.6	0.63	609.0	0.75	0.93
		3	104-712	62.4	374.4	0.60	468.0	0.75	561.6	0.90	1.11
		3 1/2	104-714	54.0	378.0	0.70	475.2	0.88	567.0	1.05	1.30
		4	104-716	46.5	372.0	0.80	465.0	1.00	558.0	1.20	1.48
		4 1/2	104-718	41.0	369.0	0.90	463.3	1.13	553.5	1.35	1.67
		5	104-720	36.8	368.0	1.00	460.0	1.25	552.0	1.50	1.85
		5 1/2	104-722	33.0	363.0	1.10	455.4	1.38	544.5	1.65	2.04
		6	104-724	29.5	354.0	1.20	442.5	1.50	531.0	1.80	2.22
		7	104-728	25.5	357.0	1.40	446.3	1.75	535.5	2.10	2.59
		8	104-732	22.0	352.0	1.60	440.0	2.00	528.0	2.40	2.96
		10	104-740	17.6	352.0	2.00	440.0	2.50	528.0	3.00	3.70
12	104-748	14.4	345.6	2.40	432.0	3.00	518.4	3.60	4.44		
2	1	2 1/2	104-810	118.4	592.0	0.50	740.0	0.63	888.0	0.75	0.93
		3	104-812	93.0	558.0	0.60	697.5	0.75	837.0	0.90	1.11
		3 1/2	104-814	78.2	547.4	0.70	688.2	0.88	821.1	1.05	1.30
		4	104-816	66.4	531.2	0.80	664.0	1.00	796.8	1.20	1.48
		4 1/2	104-818	60.0	540.0	0.90	675.0	1.13	810.0	1.35	1.67
		5	104-820	53.4	534.0	1.00	667.5	1.25	801.0	1.50	1.85
		5 1/2	104-822	49.0	539.0	1.10	676.2	1.38	808.5	1.65	2.04
		6	104-824	45.0	540.0	1.20	675.0	1.50	810.0	1.80	2.22
		7	104-828	37.4	523.6	1.40	654.5	1.75	785.4	2.10	2.59
		8	104-832	33.0	528.0	1.60	660.0	2.00	792.0	2.40	2.96
		10	104-840	26.0	520.0	2.00	650.0	2.50	780.0	3.00	3.70
		12	104-848	21.5	516.0	2.40	645.0	3.00	774.0	3.60	4.44

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