

RESTRAINED SEISMIC SPRING MOUNTS

with & without EXTENDED BASE PLATES

SLRSO & SLRSOEBP

SLRSO 1" (25mm) Deflection B, 1 - 9 C Springs

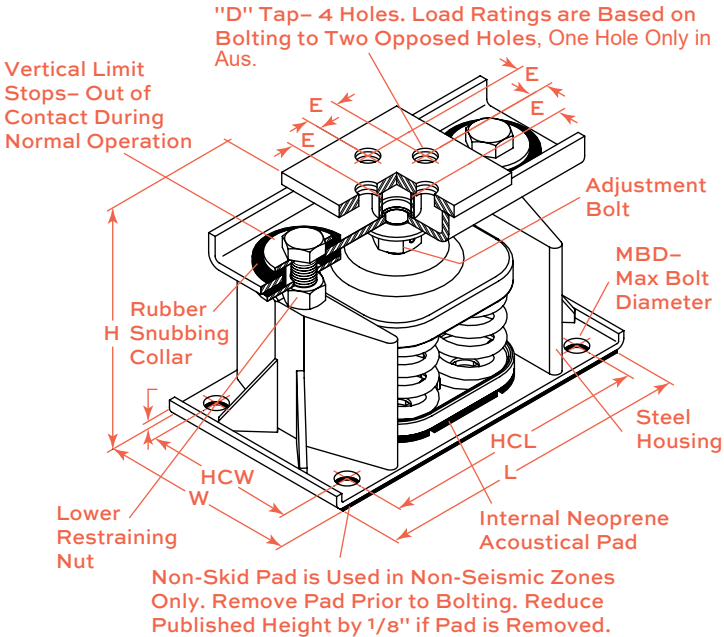
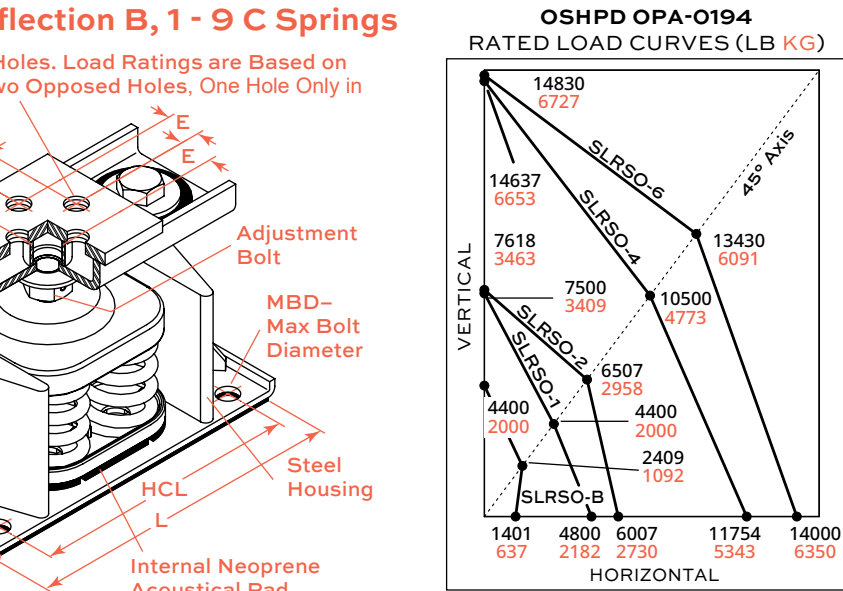
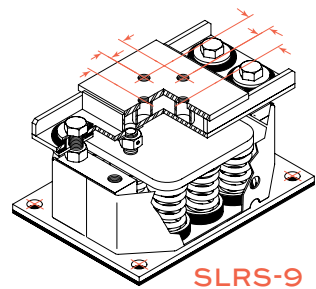


Illustration above shows a SLRSO-4 housing with four C springs. SLRS-9 has nine C springs and has closed sides. Not shown are SLRSO-B, which has one B spring and SLRSO-1, SLRSO-2 & SLRSO-6 which have one, two and six C springs respectively. Designs using these mounts to resist wind loads must be in accordance with ASCE 7-05.



All mounts except SLRS-9, and SLRS-9-C2 are awaiting OSHPD -0194 approval. SLRS-9 and SLRS-9-C2 have not been submitted.

Horizontal, Vertical and 45° plotted Ratings are California OSHPD submitted values having the OSHPD Anchorage Preapproval Number OPA-0194. Testing and calculations were performed to meet OSHPD criteria.

To use OSHPD submitted rated load curves:

1. Calculate Vertical and Horizontal Forces on mountings including translations and overturning moments.
2. Plot Horizontal and Vertical Loads. The intersection must fall within the area below the OSHPD curve.

SPRING CHARACTERISTICS

Spring Size	Spring OD (in) (mm)	Free Height (in) (mm)	Ratio (Kx/Ky)	Ratio (OD/OH)
B	23/8 60	4 102	0.70 - 0.80	0.80
C	27/8 73	41/8 105	0.90 - 1.10	0.92

All springs have an additional travel to solid equal to 50% of the rated deflection
Solid Spring Height = Free Height minus 1.5 times the Rated Deflection.

TYPE SLRSO & SLRS DIMENSIONS

Type & Size	H (in) (mm)	T (in) (mm)	D (in) (mm)	E (in) (mm)	L (in) (mm)	HCL (in) (mm)	W (in) (mm)	HCW (in) (mm)	MBD (in) (mm)
SLRSO-B	83/4 222	3/8 10	1/2 13	11/8 29	81/2 216	7 178	41/4 108	23/4 70	5/8 16
SLRSO-1	83/4 222	3/8 10	5/8 16	13/8 35	91/2 241	71/2 191	51/4 133	31/2 89	5/8 16
SLRSO-2	83/4 222	3/8 10	5/8 16	13/8 35	14 356	121/4 311	51/4 133	31/2 89	5/8 16
SLRSO-4	83/4 222	3/8 10	7/8 22	13/8 35	133/4 350	11 279	8 203	61/4 159	3/4 19
SLRSO-6	93/4 248	3/8 10	1 25	15/8 41	19 483	157/8 403	9 229	6 152	1 25
SLRS-9	93/4 248	5/8 16	1 25	2 51	18 457	153/4 400	13 330	103/4 273	1 25

TYPE SLRSO & SLRS RATINGS

SLRSO Size	Rated Capacity (lb) (kg)	Rated Defl. (in) (mm)	Mount Constant (lb/in) (kg/mm)	Max. Horiz. Housing G Rating	Spring Color
B-65	65 29	2.10 53	31 0.55	21.6	Brown
B-85	85 39	2.10 53	40 0.74	16.5	Wht/Blk
B-115	115 52	2.00 51	57 1.02	12.2	Silver
B-150	150 68	2.00 51	75 1.33	9.3	Orange
B-280	280 127	1.60 41	174 3.10	5.0	Green
B-450	450 204	1.31 33	344 6.18	3.1	Red
B-750	750 340	1.12 28	670 12.10	1.9	White
B-1000	1000 454	1.00 25	1000 18.20	1.4	Blue
1-1000	1000 454	1.00 25	1000 18.20	4.8	Black
1-1350	1350 612	1.00 25	1350 24.50	3.6	Yellow
1-1750	1750 794	1.00 25	1750 31.80	2.7	Black*
1-2100	2100 953	1.00 25	2100 38.10	2.3	Yellow*
1-2385	2385 1082	1.00 25	2385 43.30	2.0	Yellow**
1-2650	2650 1202	1.00 25	2650 48.10	1.8	Red*
1-2935	2935 1331	1.00 25	2935 53.20	1.6	Red**
2-3500	3500 1588	1.00 25	3500 63.50	1.7	Black*
2-4200	4200 1905	1.00 25	4200 76.20	1.4	Yellow*
2-4770	4770 2164	1.00 25	4770 86.60	1.3	Yellow**

TYPE SLRSO & SLRS RATINGS (continued)

SLRSO Size	Rated Capacity (lb) (kg)	Rated Defl. (in) (mm)	Mount Constant (lb/in) (kg/mm)	Max. Horiz. Housing G Rating	Spring Color
4-5400	5400 2449	1.00 25	5400 98.00	2.2	Yellow
4-7000	7000 3175	1.00 25	7000 127.00	1.7	Black*
4-8400	8400 3810	1.00 25	8400 152.40	1.4	Yellow*
4-9540	9540 4327	1.00 25	9540 173.10	1.2	Yellow**
4-10600	10600 4808	1.00 25	10600 192.30	1.1	Red*
4-11740	11740 5325	1.00 25	11740 213.00	1.0	Red**
6-12600	12600 5715	1.00 25	12600 228.60	1.1	Yellow*
6-14310	14310 6491	1.00 25	14310 259.60	1.0	Yellow**
6-15900	15900 7212	1.00 25	15900 288.50	0.9	Red*
6-17610	17610 7988	1.00 25	17610 319.50	0.8	Red**
SLRS Size					
9-18900	18900 8573	1.00 25	18900 342.90	††	Yellow*
9-21465	21465 9736	1.00 25	21465 389.40	††	Yellow**
9-23850	23850 10818	1.00 25	23850 432.70	††	Red*

*with red inner spring **with green inner spring ††SLRS-9 under test

†Housing load ratings expressed in Gs are based on tests with bolted connections to steel top and bottom. SLRSO & SLRS housings require uniform support under entire base plate.



SLRSO 2" (51mm) Deflection B, B2, B3, 2-C2, 4-C2, 6-C2 & 9-C2 Springs

"D" Tap- 4 Holes. Load Ratings are Based on Bolting to Two Opposed Holes, One Hole Only in Aus

Vertical Limit Stops- Out of Contact During Normal Operation

Rubber Snubbing Collar

MBD- Max Bolt Diameter

Lower Restraining Nut

Steel Housing

Internal Neoprene Acoustical Pad

Non-Skid Pad is Used in Non-Seismic Zones Only. Remove Pad Prior to Bolting. Reduce Published Height by 1/8" if Pad is Removed.

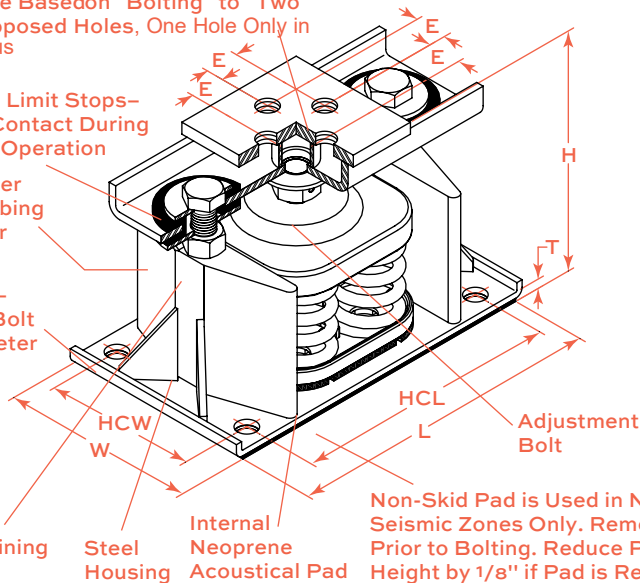
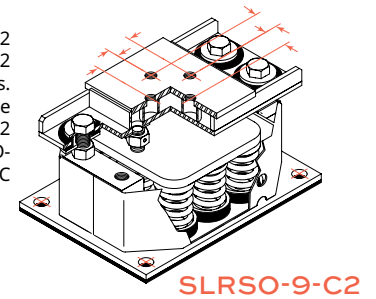


Illustration to the left shows a SLRSO-4-C2 housing with four C springs. SLRS-9-C2 has nine C2 springs and has closed sides. Not shown are SLRSO-B, which has one B spring; SLRSO-B2, which has one B2 spring; SLRSO-C2, SLRSO-2-C2 & SLRSO-6-C2, which have one, two and six C springs respectively.

Designs using these mounts to resist wind loads must be in accordance with ASCE 7-05.



SPRING CHARACTERISTICS

Spring Size	Spring OD (in) (mm)	Free Height (in) (mm)	Ratio (Kx/Ky)	Ratio (OD/OH)
B	23/8 60	4 102	0.55 - 0.65	0.95 - 1.00
B2	23/8 60	4 1/2 114	0.80 - 0.90	1.19 - 1.48
C2	27/8 73	5 127	0.63 - 0.85	0.96 - 1.15

Solid Spring Height = Free Height minus 1.5 times the Rated Deflection.

TYPE SLRSO & SLRS DIMENSIONS

Type & Size	H (in) (mm)	T (in) (mm)	D (in) (mm)	E (in) (mm)	L (in) (mm)	HCL (in) (mm)	W (in) (mm)	HCW (in) (mm)	MBD (in) (mm)
SLRSO-B & B2	83/4 222	3/8 10	1/2 13	11/8 29	81/2 216	7 178	41/4 108	23/4 70	5/8 16
SLRSO-C2	83/4 222	3/8 10	5/8 16	13/8 35	91/2 241	71/2 191	51/4 133	31/2 89	5/8 16
SLRSO-2-C2	83/4 222	3/8 10	5/8 16	13/8 35	14 356	121/4 311	51/4 133	31/2 89	5/8 16
SLRSO-4-C2	83/4 222	3/8 10	7/8 22	13/8 35	133/4 350	11 279	8 203	61/4 159	3/4 19
SLRSO-6-C2	93/4 248	3/8 10	1 25	15/8 41	19 483	157/8 403	9 229	6 152	1 25
SLRS-9-C2	93/4 248	5/8 16	1 25	2 51	18 457	153/4 400	13 330	103/4 273	1 25

TYPE SLRSO & SLRS RATINGS

SLRSO Size	Rated Capacity (lb) (kg)	Rated Defl. (in) (mm)	Mount Constant (lb/in) (kg/mm)	Max. Horiz. Housing G Rating†	Spring Color
B-20	20 9	2.40 61	8 0.15	70.0	Tan
B-26	26 12	2.18 55	12 0.22	53.9	Wht/Blue
B-35	35 16	2.20 56	16 0.29	40.0	Purple
B-50	50 23	2.20 56	24 0.41	28.0	Wht/Red
B-65	65 29	2.10 53	31 0.55	21.6	Brown
B-85	85 39	2.10 53	40 0.74	16.5	Wht/Blk
B-115	115 52	2.00 51	57 1.02	12.2	Silver
B-150	150 68	2.00 51	75 1.33	9.3	Orange
B2-210	210 95	2.12 54	99 1.76	6.8	Silver
B2-290	290 132	2.00 51	144 2.59	4.9	Blue
B2-450‡	450 204	2.00 51	224 4.00	3.2	Tan
B2-680‡	680 308	2.00 51	340 6.04	2.1	Gray
C2-125	125 57	2.50 64	50 0.89	38.4	Purple
C2-170	170 77	2.40 61	70 1.26	28.2	Brown
C2-210	210 95	2.30 58	90 1.64	22.8	Red
C2-260	260 118	2.20 56	120 2.11	18.5	White
C2-330	330 150	2.00 51	165 2.94	14.5	Black
C2-460	460 209	2.00 51	230 4.10	10.4	Blue
C2-610	610 277	2.00 51	305 5.43	7.9	Green
C2-880‡	880 399	2.00 51	440 7.82	5.5	Gray
C2-1210‡	1210 549	2.00 51	605 10.80	4.0	Silver
C2-1540‡	1540 699	2.00 51	770 13.70	3.1	Gray*
C2-1870‡	1870 848	2.00 51	935 16.60	2.6	Silver*
2-C2-340	340 154	2.40 61	140 2.52	17.7	Brown
2-C2-420	420 191	2.30 58	180 3.29	14.3	Red
2-C2-520	520 236	2.20 56	240 4.21	11.6	White
2-C2-660	660 299	2.00 51	330 5.86	9.1	Black
2-C2-920	920 417	2.00 51	460 8.18	6.5	Blue

*with red inner spring ††SLRS-9 under test

†Housing load ratings expressed in Gs are based on tests with bolted connections to steel top and bottom. SLRSO & SLRS housings require uniform support under entire base plate.

TYPE SLRSO & SLRS RATINGS (continued)

SLRSO Size	Rated Capacity (lb) (kg)	Rated Defl. (in) (mm)	Mount Constant (lb/in) (kg/mm)	Max. Horiz. Housing G Rating†	Spring Color
2-C2-1220	1220 553	2.00 51	610 10.80	4.9	Green
2-C2-1760‡	1760 798	2.00 51	880 15.70	3.4	Gray
2-C2-2420‡	2420 1098	2.00 51	1210 21.50	2.5	Silver
2-C2-3080‡	3080 1397	2.00 51	1540 27.40	1.9	Gray*
2-C2-3740‡	3740 1696	2.00 51	1870 33.20	1.6	Silver*
4-C2-4840‡	4840 2195	2.00 51	2420 43.00	2.4	Silver
4-C2-6160‡	6160 2794	2.00 51	3080 54.80	1.9	Gray*
4-C2-7480‡	7480 3393	2.00 51	3740 66.50	1.6	Silver*
6-C2-7260‡	7260 3293	2.00 51	3630 64.60	1.9	Silver
6-C2-9240‡	9240 4191	2.00 51	4620 82.20	1.5	Gray*
6-C2-11220‡	11220 5089	2.00 51	5610 99.80	1.3	Silver*
SLRS Size					
9-C2-13860‡	13860 6287	2.00 51	6930 123.20	††	Gray*
9-C2-16830‡	16830 7634	2.00 51	8415 149.70	††	Silver*

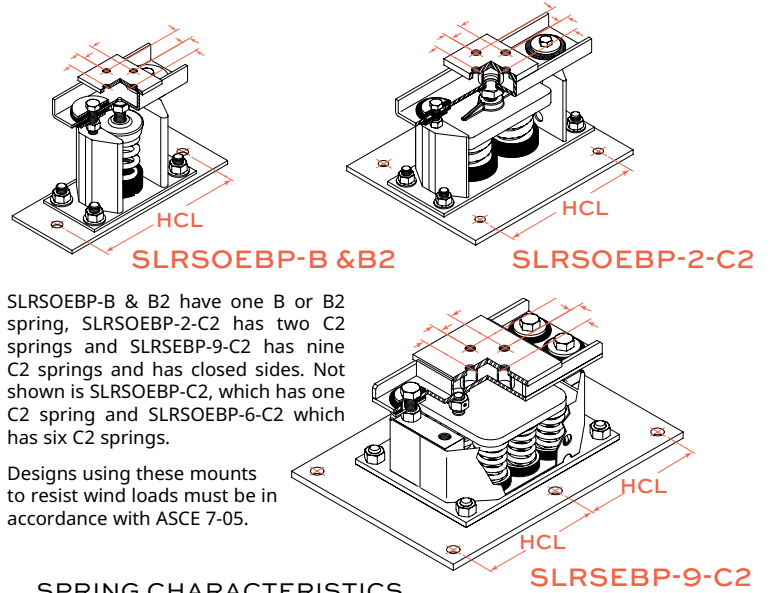
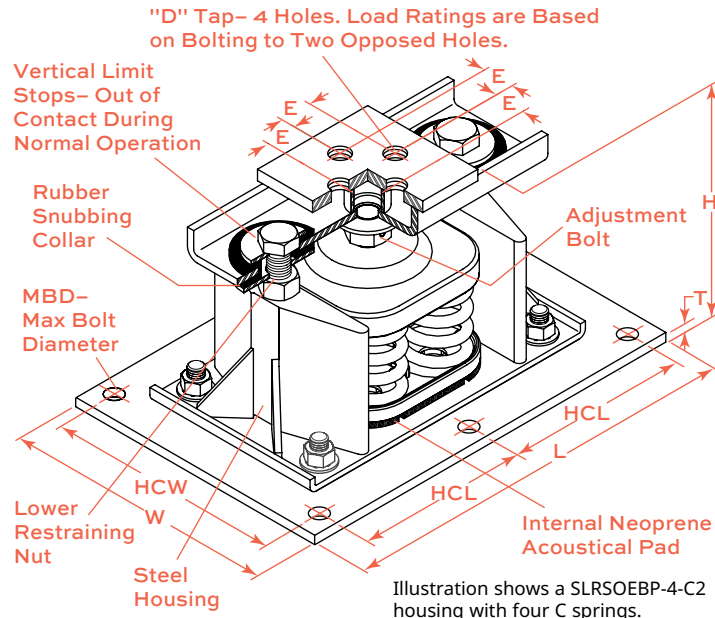
All springs without "‡" have additional travel to solid equal to 50% of the rated deflection.

‡Published ratings allow minimum 25% additional travel to solid.

For a full 50% specified minimum use the following ratings:

Size	Derated Capacity (lb) (kg)	Defl. (in) (mm)	Size	Derated Capacity (lb) (kg)	Defl. (in) (mm)
B2-450	410 186	1.83 46	2-C2-3740	3120 1415	1.67 42
B2-680	565 256	1.67 42	4-C2-4840	4040 1833	1.67 42
C2-880	800 363	1.82 46	4-C2-6160	5145 2334	1.67 42
C2-1210	1010 458	1.67 42	4-C2-7480	6245 2833	1.67 42
C2-1540	1285 583	1.67 42	6-C2-7260	6060 2749	1.67 42
C2-1870	1560 708	1.67 42	6-C2-9240	7715 3500	1.67 42
2-C2-1760	1600 726	1.67 42	6-C2-11220	9370 4250	1.67 42
2-C2-2420	2020 916	1.67 42	9-C2-13860	11570 5248	1.67 42
2-C2-3080	2570 1166	1.67 42	9-C2-16830	14050 6363	1.67 42

SLRSEBP (Extended Base Plate)
2" (51mm) Deflection B, B2 & C2, 2-C2, 4-C2, 6-C2 & 9-C2 Springs



SLRSEBP-B & B2 have one B or B2 spring, SLRSEBP-2-C2 has two C2 springs and SLRSEBP-9-C2 has nine C2 springs and has closed sides. Not shown is SLRSEBP-C2, which has one C2 spring and SLRSEBP-6-C2 which has six C2 springs.

Designs using these mounts to resist wind loads must be in accordance with ASCE 7-05.

SPRING CHARACTERISTICS

Spring Size	Spring OD (in) (mm)	Free Height (in) (mm)	Ratio (Kx/Ky)	Ratio (OD/OH)
B	2 3/8 60	4 102	0.55 - 0.65	0.95 - 1.00
B2	2 3/8 60	4 1/2 114	0.80 - 0.90	1.19 - 1.48
C2	2 7/8 73	5 127	0.63 - 0.85	0.96 - 1.15

Solid Spring Height = Free Height minus 1.5 times the Rated Deflection.

TYPE SLRSEBP & SLRSEBP DIMENSIONS

Type & Size	H (in) (mm)	T (in) (mm)	D (in) (mm)	E (in) (mm)	L (in) (mm)	HCL (in) (mm)	W (in) (mm)	HCW (in) (mm)	MBD (in) (mm)
SLRSEBP-B & B2	9 229	3/8 10	1/2 13	11/8 29	13 330	10 1/2 267	5 127	— —	5/8 16
SLRSEBP-C2	9 229	3/8 10	5/8 16	13/8 35	10 254	8 203	10 254	8 203	5/8 16
SLRSEBP-2-C2	9 229	3/8 10	5/8 16	13/8 35	14 1/2 368	11 280	11 280	9 229	3/4 19
SLRSEBP-4-C2	9 229	3/8 10	7/8 22	13/8 35	19 482	8 203	14 356	11 280	3/4 19
SLRSEBP-6-C2	10 1/4 260	1/2 13	1 25	15/8 41	27 686	12 305	15 381	12 305	1 25
SLRSEBP-9-C2	10 1/4 260	5/8 16	1 25	2 51	27 686	12 305	19 483	16 406	1 25

*Horizontal load ratings expressed in Gs are based on calculations with bolted connections to steel on top and concrete inserts on bottom. SLRSEBP housings require uniform support under entire base plate.

TYPE SLRSEBP & SLRSEBP RATINGS

SLRSEBP Size	Rated Capacity (lb) (kg)	Rated Defl. (in) (mm)	Mount Constant (lb/in) (kg/mm)	Max. Horiz. Housing G Rating*	Spring Color
B-20	20 9	2.40 61	8 0.15	70.0	Tan
B-26	26 12	2.18 55	12 0.22	53.9	Wht/Blue
B-35	35 16	2.20 56	16 0.29	40.0	Purple
B-50	50 23	2.20 56	24 0.41	28.0	Wht/Red
B-65	65 29	2.10 53	31 0.55	21.6	Brown
B-85	85 39	2.10 53	40 0.74	16.5	Wht/Blk
B-115	115 52	2.00 51	57 1.02	12.2	Silver
B-150	150 68	2.00 51	75 1.33	6.8	Orange
B2-210	210 95	2.12 54	99 1.76	9.3	Silver
B2-290	290 132	2.00 51	144 2.59	4.9	Blue
B2-450 [†]	450 204	2.00 51	224 4.00	3.2	Tan
B2-680 [†]	680 308	2.00 51	340 6.04	2.1	Gray
C2-125	125 57	2.50 64	50 0.89	35.5	Purple
C2-170	170 77	2.40 61	70 1.26	26.1	Brown
C2-210	210 95	2.30 58	90 1.64	21.1	Red
C2-260	260 118	2.20 56	120 2.11	17.1	White
C2-330	330 150	2.00 51	165 2.94	13.5	Black
C2-460	460 209	2.00 51	230 4.10	9.6	Blue
C2-610	610 277	2.00 51	305 5.43	7.3	Green
C2-880 [†]	880 399	2.00 51	440 7.82	5.0	Gray
C2-1210 [†]	1210 549	2.00 51	605 10.8	3.7	Silver
C2-1540 [†]	1540 699	2.00 51	770 13.7	2.9	Gray*
C2-1870 [†]	1870 848	2.00 51	935 16.6	2.4	Silver*
2-C2-340	340 154	2.40 61	140 2.52	17.7	Brown
2-C2-420	420 191	2.30 58	180 3.29	14.3	Red
2-C2-520	520 236	2.20 56	240 4.21	11.6	White
2-C2-660	660 299	2.00 51	330 5.86	9.1	Black
2-C2-920	920 417	2.00 51	460 8.18	6.5	Blue
2-C2-1220	1220 553	2.00 51	610 10.80	4.9	Green

*with red inner spring ††SLRSEBP-9 under test

TYPE SLRSEBP & SLRSEBP RATINGS (continued)

SLRSEBP Size	Rated Capacity (lb) (kg)	Rated Defl. (in) (mm)	Mount Constant (lb/in) (kg/mm)	Max. Horiz. Housing G Rating*	Spring Color
2-C2-1760 [†]	1760 798	2.00 51	880 15.70	3.4	Gray
2-C2-2420 [†]	2420 1098	2.00 51	1210 21.50	2.5	Silver
2-C2-3080 [†]	3080 1397	2.00 51	1540 27.40	1.9	Gray*
2-C2-3740 [†]	3740 1696	2.00 51	1870 33.20	1.6	Silver*
4-C2-4840 [†]	4840 2195	2.00 51	2420 43.00	1.9	Silver
4-C2-6160 [†]	6160 2794	2.00 51	3080 54.80	1.5	Gray*
4-C2-7480 [†]	7480 3393	2.00 51	3740 66.50	1.2	Silver*
6-C2-7260 [†]	7260 3293	2.00 51	3630 64.60	1.4	Silver
6-C2-9240 [†]	9240 4191	2.00 51	4620 82.20	1.1	Gray*
6-C2-11220 [†]	11220 5089	2.00 51	5610 99.80	0.9	Silver*
SLRSEBP Size					
9-C2-13860 [†]	13860 6287	2.00 51	6930 123.20	††	Gray*
9-C2-16830 [†]	16830 7634	2.00 51	8415 149.70	††	Silver*

All springs without "†" have additional travel to solid equal to 50% of the rated deflection.

†Published ratings allow minimum 25% additional travel to solid. For a full 50% specified minimum use the following ratings:

Size	Derated Capacity (lb) (kg)	Defl. (in) (mm)	Size	Derated Capacity (lb) (kg)	Defl. (in) (mm)
B2-450	410 186	1.83 46	2-C2-3740	3120 1415	1.67 42
B2-680	565 256	1.66 42	4-C2-4840	4040 1833	1.67 42
C2-880	800 363	1.82 46	4-C2-6160	5145 2334	1.67 42
C2-1210	1010 458	1.67 42	4-C2-7480	6245 2833	1.67 42
C2-1540	1285 583	1.67 42	6-C2-7260	6060 2749	1.67 42
C2-1870	1560 708	1.67 42	6-C2-9240	7715 3500	1.67 42
2-C2-1760	1600 728	1.67 42	6-C2-11220	9370 4250	1.67 42
2-C2-2420	2020 916	1.67 42	9-C2-13860	11570 5248	1.67 42
2-C2-3080	2570 1166	1.67 42	9-C2-16830	14050 6373	1.67 42