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Racing Valve Springs

Master Product Catalog



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MANUFACTURERS OF VALVE SPRING, SUSPENSION, AND OTHER QUALITY PRODUCTS

PAC RACING SPRINGS

The world's premier valve spring manufacturer

Nascar, Drag Racing, F1, Rally and Sprint Cars to everyday street performance engines use PAC Racing products to provide unsurpassed performance in all forms of Motorsports. Innovative designs produced by skilled springmakers from the highest quality materials ensure the highest performing springs available.



New Products!

VALVE SPRINGS

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RPM Series

Introducing the new RPM Series Springs. PAC Racing Springs developed a new process using all the latest advancements from our circle track and drag racing success. We have applied this new method to great designs that will allow for a performance increase that exceeds all demands. If you don't see your application with the RPM process, please contact us for available options.



Dual Springs

Part Number	Spring Diameters				Spring Loads			Spring Rate	Max Coil Bind	Max Lift	Recommended Matching Components				Comments
	OD Outer	ID Outer	Damper	ID Inner	Installed Height (Valve Closed)	Open Load (Valve Open)	Titanium Retainers				Steel Retainers	Spring Seats	Spring Cups		
PAC-1204X	1.290	0.950	No	0.694	145 @ 1.800	385 @ 1.150	369	1.000	0.700	PAC-R435 PAC-R450 PAC-R550	PAC-R335 PAC-R635 PAC-R650	PAC-S129	NA	RPM Series Dual LS Engine Spring	
PAC-1205X	1.304	0.950	No	0.694	155 @ 1.800	410 @ 1.150	392	1.000	0.700	PAC-R435 PAC-R450 PAC-R550	PAC-R335 PAC-R635 PAC-R650	PAC-S129	NA	RPM Series Dual LS Engine Spring	
PAC-1206X	1.290	0.950	No	0.680	145 @ 1.800	411 @ 1.150	409	1.000	0.700	PAC-R435 PAC-R450 PAC-R550	PAC-R335 PAC-R635 PAC-R650	PAC-S129	NA	RPM Series Dual LS Engine Spring	
PAC-1207X	1.304	0.950	No	0.680	155 @ 1.800	436 @ 1.150	433	1.000	0.700	PAC-R435 PAC-R450 PAC-R550	PAC-R335 PAC-R635 PAC-R650	PAC-S129	NA	RPM Series Dual LS Engine Spring	
PAC-1208X	1.324	0.950	No	0.694	160 @ 1.800	482 @ 1.100	460	1.000	0.750	PAC-R435 PAC-R450 PAC-R550	PAC-R335 PAC-R635 PAC-R650	PAC-S129	NA	RPM Series Dual LS Engine Spring	
PAC-1209X	1.324	0.950	No	0.680	160 @ 1.800	510 @ 1.100	500	1.000	0.750	PAC-R435 PAC-R450 PAC-R550	PAC-R335 PAC-R635 PAC-R650	PAC-S129	NA	RPM Series Dual LS Engine Spring	

Beehive Single Springs

Part Number	Spring Diameters				Spring Loads			Spring Rate	Max Coil Bind	Max Lift	Recommended Matching Components				Comments
	Large End		Small End		Installed Height (Valve Closed)	Open Load (Valve Open)	Titanium Retainers				Steel Retainers	Spring Seats	Spring Cups		
	OD	ID	OD	ID											
PAC-1218X	1.290	0.885	1.055	0.650	140 @ 1.800	328 @ 1.200	313	1.140	0.600	PAC-R510 PAC-R511	PAC-R310 PAC-R311	PAC-S111	N/A	Same as the PAC-1218 but with premium RPM processing and higher loads to withstand the vigors of street and strip use.	
PAC-1219X	1.207	0.885	1.072	0.650	145 @ 1.800	358 @ 1.175	340	1.100	0.625	PAC-R510 PAC-R511	PAC-R310 PAC-R311	PAC-S111	N/A	Same as the PAC-1219 but with premium RPM processing and higher loads to withstand the vigors of street and strip use.	
PAC-1220X	1.445	1.000	1.095	0.650	160 @ 1.900	400 @ 1.250	370	1.210	0.650	PAC-R510 PAC-R511	PAC-R310 PAC-R311	PAC-S112 PAC-S113	PAC-C201	Same as the PAC-1220 but with premium RPM processing and higher loads to withstand the vigors of street and strip use.	
PAC-1255X	1.445	0.990	1.186	0.731	175 @ 1.950	440 @ 1.300	408	1.220	0.700	PAC-R513	PAC-R313	PAC-S111 PAC-S112	PAC-C201	Same as the PAC-1255 but with premium RPM processing and higher loads to withstand the vigors of street and strip use.	
PAC-1295X	1.589	1.135	1.185	0.731	175 @ 2.000	410 @ 1.250	313	1.180	0.750	PAC-R513	PAC-R313	PAC-S116	PAC-C202	Same as the PAC-1295 but with premium RPM processing and higher loads to withstand the vigors of street and strip use.	
PAC-1212X	1.355	0.910	NA	NA	125 @ 1.750	315 @ 1.250	380	1.180	0.550	NA	NA	NA	NA	GM 604 Crate motor "Cheater" Spring. This spring meets the nominal specs but has variable rate features that allow more RPM capability.	

SPECIFICATIONS: SPRING LOADS AND HEIGHTS

PART NO.	DUAL					BEEHIVE						SINGLE
	PAC-1204X	PAC-1205X	PAC-1206X	PAC-1207X	PAC-1208X	PAC-1209X	PAC-1218X	PAC-1219X	PAC-1220X	PAC-1255X	PAC-1295X	PAC-1212X
Mass (G)	85	89	86	90	93	94	75	67	80	87	90	99
Outer Freq	29930.0	29352	29930	29352	31797	31797	29277	31258	30755	30344	25686	30844
Inner Freq	30877.0	30877	33662	33662	30870	33662	NA	NA	NA	NA	NA	NA
Coil Bind	1.000	1.000	1.000	1.000	1.000	1.000	1.140	1.100	1.210	1.220	1.170	1.170
2.500											18	
2.450											34	
2.400											50	
2.350										12	65	
2.300									12	32	81	
2.250									31	53	97	
2.200	3	3	3	3			15	9	49	73	112	
2.150	16	18	14	16	2		30	26	68	93	128	
2.100	34	37	26	29	22	14	46	43	86	114	144	
2.050	53	57	43	47	45	35	62	60	105	134	159	11
2.000	71	77	63	69	68	60	77	77	123	155	175	30
1.950	90	96	84	90	91	85	93	94	142	175	191	49
1.900	108	116	104	112	114	110	109	111	160	195	206	68
1.850	127	135	125	133	137	135	124	128	178	216	222	87
1.800	145	155	145	155	160	160	140	145	197	236	238	106
1.750	163	175	165	177	183	185	156	162	215	257	253	125
1.700	182	194	186	198	206	210	171	179	234	277	269	144
1.650	200	214	206	220	229	235	187	196	252	297	285	163
1.600	219	233	227	241	252	260	203	213	271	318	300	182
1.550	237	253	247	263	275	285	218	230	289	338	316	201
1.500	256	273	268	285	298	310	234	247	308	358	332	220
1.450	274	292	288	306	321	335	250	264	326	379	347	239
1.400	293	312	309	328	344	360	265	281	345	399	363	258
1.350	311	332	329	350	367	385	281	298	363	420	379	277
1.300	330	351	350	371	390	410	297	315	382	440	394	296
1.250	348	371	370	393	413	435	312	332	400	460	410	315
1.200	367	390	391	414	436	460	328	349	418	481	426	334
1.150	385	410	411	436	459	485	344	366	437		441	
1.100	403	430	432	458	482	510	359	383				
1.050	422	449	452	479	505	535						
1.000	440	469	473	501	528	560						
0.950												



DRAG RACE SPRINGS

1200 Series *PAC's standard HP processing without sacrificing performance*

Part Number	Spring Diameters				Spring Loads		Spring Rate	Max Coil Bind	Max Lift	Recommended Matching Components					Comments
	OD Outer	ID Outer	ID Middle	ID Inner	Installed Height (Valve Closed)	Open Load (Valve Open)				400 Series Retainers	500 Series Retainers	600 Series Retainers	Spring Seats	Spring Cups	
PAC-1224	1.625	1.175	N/A	0.851	275 @ 2.000	810 @ 1.150	629	1.100	0.850	PAC-R404	PAC-R504	N/A	PAC-S101 PAC-S102	PAC-C205	Dual Drag Race Spring - Bracket Race applications
PAC-1228	1.625	1.175	N/A	0.851	280 @ 2.100	847 @ 1.150	629	1.100	0.900	PAC-R404	PAC-R504	N/A	PAC-S101 PAC-S102	PAC-C205	Dual Drag Race Spring - Bracket Race applications with higher lift / more aggressive cam and RPM requirements
PAC-1225	1.550	1.100	N/A	0.788	250 @ 2.000	765 @ 1.200	644	1.150	0.800	PAC-R405	PAC-R505	N/A	PAC-S103 PAC-S104	PAC-C204	Smaller Diameter Dual Drag Race Spring
PAC-1226	1.550	1.100	N/A	0.706	275 @ 2.000	805 @ 1.200	663	1.150	0.800	N/A	PAC-R506 PAC-R541	PAC-R606 PAC-R641	PAC-S105 PAC-S106	PAC-C204	Smaller Diameter Dual Drag Race Spring with a Damper
PAC-1298	1.625	1.175	N/A	0.769	250 @ 2.000	648 @ 1.300	564	1.210	0.700	N/A	PAC-R507	N/A	PAC-S107 PAC-S108	PAC-C205	Dual Drag spring with a damper for lower lift applications
PAC-1299	1.625	1.175	N/A	0.769	250 @ 2.050	673 @ 1.300	564	1.210	0.750	N/A	PAC-R507	N/A	PAC-S107 PAC-S108	PAC-C205	Dual Drag spring with a damper for lower lift applications
PAC-1246	1.645	1.195	0.871	0.635	250 @ 2.050	801 @ 1.250	689	1.130	0.800	PAC-R401 PAC-R402	PAC-R501 PAC-R502	PAC-R601 PAC-R602	PAC-S109	PAC-C206	Triple Drag Race Spring - Bracket Race Applications
PAC-1247	1.645	1.195	0.871	0.635	290 @ 2.070	835 @ 1.270	682	1.130	0.800	PAC-R401 PAC-R402	PAC-R501 PAC-R502	PAC-R601 PAC-R602	PAC-S109	PAC-C206	Triple Drag Race Spring - Bracket Race Applications
PAC-1248	1.645	1.195	0.871	0.635	332 @ 2.100	950 @ 1.200	687	1.130	0.900	PAC-R401 PAC-R402	PAC-R501 PAC-R502	PAC-R601 PAC-R602	PAC-S109	PAC-C206	Triple Drag Race Spring - Bracket Race Applications
PAC-1249	1.645	1.195	0.871	0.635	375 @ 2.200	1064 @ 1.200	689	1.130	1.000	PAC-R401 PAC-R402	PAC-R501 PAC-R502	PAC-R601 PAC-R602	PAC-S109	PAC-C206	Triple Drag Race Spring - High Lift / Top Fuel applications
PAC-1250	1.645	1.195	0.871	0.635	440 @ 2.200	1129 @ 1.200	689	1.130	1.000	PAC-R401 PAC-R402	PAC-R501 PAC-R502	PAC-R601 PAC-R602	PAC-S109	PAC-C206	Triple Drag Race Spring - High Lift / Top Fuel applications
PAC-1258	1.645	1.195	0.871	0.635	350 @ 2.150	1004 @ 1.200	688	1.130	0.950	PAC-R401 PAC-R402	PAC-R501 PAC-R502	PAC-R601 PAC-R602	PAC-S109	PAC-C206	Triple Drag Race Spring - Bracket Race Applications

1300 Series *Premium processed with Nano-Peen™ spring technology for enhanced durability and exotic heat treatment for minimal load loss*

PAC-1324	1.625	1.175	N/A	0.851	275 @ 2.000	810 @ 1.150	629	1.100	0.850	PAC-R404	PAC-R504	N/A	PAC-S101 PAC-S102	PAC-C205	Dual Drag Race Spring - Bracket / high lift applications
PAC-1328	1.625	1.175	N/A	0.851	280 @ 2.100	847 @ 1.150	629	1.100	0.900	PAC-R404	PAC-R504	N/A	PAC-S101 PAC-S102	PAC-C205	Dual Drag Race Spring - Bracket / high lift applications
PAC-1325	1.550	1.100	N/A	0.788	250 @ 2.000	765 @ 1.200	644	1.150	0.800	PAC-R405	PAC-R505	N/A	PAC-S103 PAC-S104	PAC-C204	Smaller Diameter Dual Drag Race Spring
PAC-1326	1.550	1.100	N/A	0.706	275 @ 2.000	805 @ 1.200	663	1.150	0.800	N/A	PAC-R506 PAC-R541	PAC-R606 PAC-R641	PAC-S105 PAC-S106	PAC-C204	Smaller Diameter Dual Drag Race Spring with a Damper
PAC-1346	1.645	1.195	0.871	0.635	250 @ 2.050	801 @ 1.250	689	1.130	0.800	PAC-R401 PAC-R402	PAC-R501 PAC-R502	PAC-R601 PAC-R602	PAC-S109	PAC-C206	Triple Drag Race Spring - Bracket Race Applications
PAC-1347	1.645	1.195	0.871	0.635	290 @ 2.070	835 @ 1.270	682	1.130	0.800	PAC-R401 PAC-R402	PAC-R501 PAC-R502	PAC-R601 PAC-R602	PAC-S109	PAC-C206	Triple Drag Race Spring - Bracket Race Applications
PAC-1348	1.645	1.195	0.871	0.635	332 @ 2.100	950 @ 1.200	687	1.130	0.900	PAC-R401 PAC-R402	PAC-R501 PAC-R502	PAC-R601 PAC-R602	PAC-S109	PAC-C206	Triple Drag Race Spring - Bracket Race Applications
PAC-1358	1.645	1.195	0.871	0.635	350 @ 2.150	1004 @ 1.200	688	1.130	0.950	PAC-R401 PAC-R402	PAC-R501 PAC-R502	PAC-R601 PAC-R602	PAC-S109	PAC-C206	Triple Drag Race Spring - Bracket Race Applications
PAC-1349	1.645	1.195	0.871	0.635	375 @ 2.200	1064 @ 1.200	689	1.130	1.000	PAC-R401 PAC-R402	PAC-R501 PAC-R502	PAC-R601 PAC-R602	PAC-S109	PAC-C206	Triple Drag Race Spring - High Lift / Bracket Race Applications
PAC-1350	1.645	1.195	0.871	0.635	440 @ 2.200	1129 @ 1.200	689	1.130	1.000	PAC-R401 PAC-R402	PAC-R501 PAC-R502	PAC-R601 PAC-R602	PAC-S109	PAC-C206	Triple Drag Race Spring - Pro Stock / Top Fuel applications
PAC-1351	1.667	1.195	0.871	0.635	450 @ 2.300	1240 @ 1.250	752	1.160	1.050	PAC-R401 PAC-R402	PAC-R501 PAC-R502	PAC-R601 PAC-R602	PAC-S109	PAC-C206	Triple Drag Race Spring - Pro Stock / Top Fuel applications
PAC-1351H	1.667	1.195	0.871	0.635	525 @ 2.300	1315 @ 1.250	752	1.160	1.050	PAC-R401 PAC-R402	PAC-R501 PAC-R502	PAC-R601 PAC-R602	PAC-S109	PAC-C206	Triple Drag Race Spring - Pro Stock / Top Fuel applications
PAC-1352	1.681	1.195	0.871	0.635	480 @ 2.300	1315 @ 1.250	795	1.190	1.050	PAC-R401 PAC-R402	PAC-R501 PAC-R502	PAC-R601 PAC-R602	PAC-S109	PAC-C207	Triple Drag Race Spring - Pro Stock / Top Fuel applications
PAC-1353	1.695	1.195	0.871	0.635	500 @ 2.300	1500 @ 1.200	900	1.140	1.100	PAC-R401 PAC-R402	PAC-R501 PAC-R502	PAC-R601 PAC-R602	PAC-S109	PAC-C207	Triple Drag Race Spring - Pro Stock / Mountain Motor
PAC-1362	1.725	1.225	0.871	0.635	475 @ 2.300	1515 @ 1.100	945	1.134	1.100	N/A	PAC-R503	N/A	PAC-S109	PAC-C208	Triple Drag Race Spring - Pro Stock / Mountain Motor
PAC-1363	1.725	1.225	0.871	0.635	525 @ 2.350	1565 @ 1.250	945	1.134	1.100	N/A	PAC-R503	N/A	PAC-S109	PAC-C208	Triple Drag Race Spring - Pro Stock / Mountain Motor
PAC-1364	1.681	1.195	0.871	0.635	525 @ 2.300	1365 @ 1.300	840	1.100	1.100	PAC-R401 PAC-R402	PAC-R501 PAC-R502	PAC-R601 PAC-R602	PAC-S109	PAC-C207	Triple Drag Race Spring - Pro Stock / Mountain Motor
PAC-1364L	1.681	1.195	0.871	0.635	500 @ 2.200	1256 @ 1.300	840	1.100	0.900	PAC-R401 PAC-R402	PAC-R501 PAC-R502	PAC-R601 PAC-R602	PAC-S109	PAC-C207	Triple Drag Race Spring-Top Alcohol
PAC-1365	1.715	1.195	0.871	0.635	500 @ 2.300	1605 @ 1.300	1005	1.165	1.100	PAC-R401 PAC-R402	PAC-R501 PAC-R502	PAC-R601 PAC-R602	PAC-S109	PAC-C208	Triple Drag Race Spring - Pro Stock
PAC-1366	1.710	1.210	0.871	0.635	380 @ 2.550	1545 @ 1.250	896	1.140	1.350	N/A	PAC-R503	N/A	PAC-S109	PAC-C208	Triple Drag Race Spring - Pro Stock / Mountain Motor
PAC-1367	1.659	1.195	0.871	0.635	480 @ 2.550	1356 @ 1.250	674	1.190	1.400	PAC-R401 PAC-R402	PAC-R501 PAC-R502	PAC-R601 PAC-R602	PAC-S109	PAC-C206	Triple Drag Race Spring for Mountain Motor Engines with High Lift and relatively low RPM under 8400

SPECIFICATIONS: SPRING LOADS AND HEIGHTS

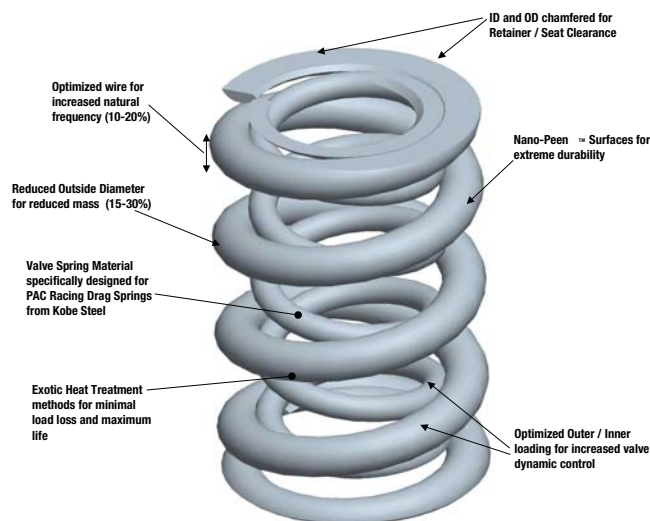
1200 SERIES	PAC-1224	PAC-1228	PAC-1225	PAC-1226	PAC-1298	PAC-1299	PAC-1246	PAC-1247	PAC-1248	PAC-1258	PAC-1249	PAC-1380	PAC-1351	PAC-1352	PAC-1353	PAC-1362	PAC-1363	PAC-1364	PAC-1365	PAC-1366	N/A	N/A	1200 SERIES
1300 SERIES	PAC-1324	PAC-1328	PAC-1325	PAC-1326	PAC-1298	PAC-1299	PAC-1346	PAC-1347	PAC-1348	PAC-1358	PAC-1349	PAC-1380	PAC-1351H	PAC-1352	PAC-1353	PAC-1362	PAC-1363	PAC-1364	PAC-1365	PAC-1366	N/A	N/A	1300 SERIES
Mass (G)	152	152	152	158	179	179	183	183	183	183	183	183	196	205	205	214	214	189	214	207	202	202	Mass (G)
Outer Freq	28793	29368	29368	29368	25640	25640	27188	27188	27188	27188	27188	27188	28610	28780	32070	30516	29649	33611	33611	33611	25256	25256	Outer Freq
Middle Freq	NA	NA	NA	NA	Damper	Damper	26867	26867	26867	26867	26867	26867	26867	26867	26867	29317	28327	26867	26867	26867	27783	24989	Middle Freq
Inner Freq	27275	28294	28294	28434	25106	25106	28392	28392	28392	28392	28392	28392	28392	28392	28392	28392	29985	29985	28392	30246	28392	28392	Inner Freq
Coil Bind	1.100	1.100	1.150	1.150	1.210	1.210	1.130	1.130	1.130	1.130	1.130	1.130	1.160	1.190	1.140	1.134	1.100	1.100	1.150	1.150	1.190	1.190	Coil Bind
3.100													16									127	3.100
3.050													26								5	155	3.050
3.000												5	35	5	5	2				5	16	184	3.000
2.950												14	44	14	14	12				14	28	212	2.950
2.900												26	74	26	26	23				25	66	244	2.900
2.850												3	40	111	43	63				40	111	278	2.850
2.800												27	74	149	82	99				55	156	312	2.800
2.750												61	111	186	122	147				69	201	345	2.750
2.700												96	149	224	162	194				98	246	379	2.700
2.650												130	187	262	202	241				148	290	413	2.650
2.600												164	224	299	288	273				199	335	446	2.600
2.550												199	262	337	281	315				249	380	480	2.550
2.500												233	300	375	321	357				299	425	514	2.500
2.450												268	337	412	361	399				349	470	547	2.450
2.400												302	375	450	401	441				400	514	581	2.400
2.350												337	412	487	440	483				450	559	615	2.350
2.300												371	450	525	480	525				500	604	648	2.300
2.250												406	488	563	520	567				550	649	682	2.250
2.200												440	525	600	560	609				600	694	716	2.200
2.150												475	563	638	599	617				651	738	750	2.150
2.100												509	601	676	639	664				701	783	783	2.100
2.050												543	638	713	679	711				751	828	817	2.050
2.000												578	676	751	719	759				801	873	851	2.000
1.950												612	713	788	758	815				852	918	884	1.950
1.900												647	751	826	798	860				902	962	918	1.900
1.850												681	789	864	838	905				952	1007	952	1.850
1.800												716	826	901	878	950				1002	1052	985	1.800
1.750												750	864	939	917	995				1063	1097	1019	1.750
1.700												785	901	976	957	1040				1103	1142	1053	1.700
1.650												819	939	1014	997	1085				1153	1187	1086	1.650
1.600												853	977	1052	1037	1130				1203	1231	1120	1.600
1.550												888	1014	1089	1076	1175				1253	1276	1154	1.550
1.500												922	1052	1127	1116	1220				1304	1321	1188	1.500
1.450												957	1090	1165	1156	1265				1354	1366	1221	1.450
1.400												991	1127	1202	1196	1310				1404	1411	1255	1.400
1.350												1026	1165	1240	1236	1355				1454	1455	1289	1.350
1.300												1060	1202	1277	1275	1400				1505	1500	1322	1.300
1.250												1095	1240	1315	1315	1445				1555	1545	1356	1.250
1.200												1129	1278	1353	1355	1490				1605	1590	1390	1.200
1.150												1164	1390	1468	1468	1635				1655	1635	1450	1.150
1.100												1198	1504	1583	1583	1770				1710	1685	1500	1.100
1.050												1232	1618	1707	1707	1975				1755	1735	1550	1.050

DUAL DRAG RACE SPRINGS

Next generation springs feature all of the material and processing features of the 1300 series with smaller diameters for minimal weight for increased valvetrain stability and high RPM's

PAC Racing Springs has brought the latest technology to the Drag Racing Market. Traditional springs were made with higher load and rates without concern of spring mass and frequency. PAC Racing Springs has taken years of research and coupled that with exotic new heat treatment methods to produce the next generation drag race springs.

These springs feature a 15-30% reduction in physical mass! This coupled with a natural frequency increase of 20% means that your engine will rev higher, faster and last longer with more aggressive valve motion. Get the performance of Titanium with improved life and cost of steel directly from the spring manufacturer.



A complete line of retainers is available for these springs (see pages 16-19). Retainers are available in 8 and 10 degree angles and with and without solid stops in the bottom. PAC also has pacaloy billet steel retainers available for all of these dual springs.

Part Number	Spring Diameters				Spring Loads				Max Coil Bind	Max Lift	Recommended Matching Components					Comments
	OD Outer	ID Outer	ID Middle	ID Inner	Installed Height (Valve Closed)	Open Load (Valve Open)	Spring Rate	400 Series Retainers			500 Series Retainers	600 Series Retainers	Spring Seats	Spring Cups		
PAC-1312	1.106	0.810	NA	0.574	150 @ 1.700	430 @ 1.000	400	0.700	0.800	PAC-R439	NA	NA	PAC-S132	NA	Ford 4V Drag Spring	
PAC-1335	1.300	0.900	N/A	0.616	250 @ 1.800	860 @ 1.050	813	0.985	0.800	PAC-R432	PAC-R532	PAC-R632	PAC-S128	NA	Very Small diameter drag race valve spring for high lift LS style engines. Very lightweight spring for very aggressive valvetrains - Very high RPM	
PAC-1354	1.550	1.050	N/A	0.726	425 @ 2.300	1440 @ 1.300	1015	1.230	1.000	NA	PAC-R508 PAC-R509	PAC-R608 PAC-R609	PAC-S110 PAC-S126	PAC-C204	High Lift Dual Drag Race Spring - Very high rate springs for very aggressive valve trains - very high RPM potential	
PAC-1355	1.500	1.050	N/A	0.726	420 @ 2.175	1200 @ 1.175	780	1.130	1.000	NA	PAC-R508 PAC-R509	PAC-R608 PAC-R609	PAC-S110 PAC-S126	PAC-C202	High Lift Dual Drag Race Spring - Works well in TAFC and Pro-Mod alcohol Engines	
PAC-1355H	1.500	1.050	N/A	0.726	440 @ 2.200	1220 @ 1.200	780	1.130	1.000	NA	PAC-R508 PAC-R509	PAC-R608 PAC-R609	PAC-S110 PAC-S126	PAC-C202	High Lift Dual Drag Race Spring - Works well in TAFC and Pro-Mod alcohol Engines	
PAC-1330	1.500	1.050	N/A	0.726	275 @ 2.050	938 @ 1.200	780	1.130	0.850	PAC-R408	PAC-R508 PAC-R509	PAC-R608 PAC-R609	PAC-S110 PAC-S126	PAC-C202	High Lift Dual Drag Race Spring - great spring for Comp, superstock engines	
PAC-1331	1.514	1.050	N/A	0.726	425 @ 2.200	1288 @ 1.200	863	1.150	1.000	NA	PAC-R508 PAC-R509	PAC-R608 PAC-R609	PAC-S110 PAC-S126	PAC-C203	High Lift Dual Drag Race Spring - Very high rate springs for very aggressive valvetrains - very high RPM potential	
PAC-1332	1.514	1.050	N/A	0.726	350 @ 2.100	1127 @ 1.200	863	1.150	0.900	PAC-R408	PAC-R508 PAC-R509	PAC-R608 PAC-R609	PAC-S110 PAC-S126	PAC-C203	High Lift Dual Drag Race Spring - great spring for Comp, superstock engines	
PAC-1356	1.500	1.050	N/A	0.726	300 @ 2.100	1002 @ 1.200	780	1.130	0.900	PAC-R408	PAC-R508 PAC-R509	PAC-R608 PAC-R609	PAC-S110 PAC-S126	PAC-C202	High Lift Dual Drag Race Spring - great spring for Comp, superstock engines	
PAC-1329	1.500	1.050	N/A	0.726	350 @ 2.100	1052 @ 1.200	780	1.130	0.900	PAC-R408	PAC-R508 PAC-R509	PAC-R608 PAC-R609	PAC-S110 PAC-S126	PAC-C202	High Lift Dual Drag Race Spring - great spring for Comp, superstock engines	
PAC-1357	1.500	1.050	N/A	0.726	375 @ 2.150	1116 @ 1.200	780	1.130	0.950	PAC-R408	PAC-R508 PAC-R509	PAC-R608 PAC-R609	PAC-S110 PAC-S126	PAC-C202	High Lift Dual Drag Race Spring - great spring for Comp, superstock engines	
PAC-1359	1.522	1.050	N/A	0.726	375 @ 2.200	1200 @ 1.300	895	1.190	0.900	NA	PAC-R508 PAC-R509	PAC-R608 PAC-R609	PAC-S110 PAC-S126	PAC-C203	High Lift Dual Drag Race Spring - Works well in TAFC and Pro-Mod alcohol Engines	
PAC-1360	1.522	1.050	N/A	0.726	400 @ 2.250	1252 @ 1.300	895	1.190	0.950	NA	PAC-R508 PAC-R509	PAC-R608 PAC-R609	PAC-S110 PAC-S126	PAC-C203	High Lift Dual Drag Race Spring - Works well in TAFC and Pro-Mod alcohol Engines	
PAC-1361	1.536	1.050	N/A	0.726	425 @ 2.300	1389 @ 1.300	964	1.215	1.000	NA	PAC-R508 PAC-R509	PAC-R608 PAC-R609	PAC-S110 PAC-S126	PAC-C203	High Lift Dual Drag Race Spring	
PAC-1370	1.550	1.065	N/A	0.740	555 @ 2.350	1433 @ 1.300	836	1.230	1.050	NA	PAC-R547	NA	PAC-S110 PAC-S126	NA	High Lift Dual Drag Race Spring	

SPECIFICATIONS: SPRING LOADS AND HEIGHTS

1300 SERIES	PAC-1312	PAC-1331	PAC-1332	PAC-1335	PAC-1354	PAC-1330	PAC-1356	PAC-1329	PAC-1357	PAC-1355	PAC-1355H	PAC-1359	PAC-1360	PAC-1361	PAC-1370	1300 Series
Mass (g)	54.0	151	151	94	172	144	144	144	144	144	144	155	155	162	169	
Outer Freq	37229.0	32885	32885	40679	35502	30568	30568	30568	30568	30568	30568	33120	33120	34042	31094	
Middle Freq	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Inner Freq	42789.0	35649	35649	44180	31490	35649	35649	35649	35649	35649	35649	35649	35649	35649	28509	
Coil Bind	0.825	1.150	1.150	0.990	1.230	1.130	1.130	1.130	1.130	1.130	1.130	1.190	1.190	1.215	1.230	Coil Bind
2.950															73	2.950
2.900															95	2.900
2.850					4						8				137	2.850
2.800					17						32			9	179	2.800
2.750		2			31					24	56		7	42	221	2.750
2.700		30			44				11	48	80		37	75	262	2.700
2.650		59			70				35	72	104	53	66	109	304	2.650
2.600		87			120				59	96	128	78	96	142	346	2.600
2.550		123	13		171		14	19	83	127	167	107	133	184	388	2.550
2.500		166	42		222		38	43	107	166	206	142	178	232	430	2.500
2.450		209	70		273		62	77	141	205	245	180	223	280	471	2.450
2.400		252	98		323	22	86	116	180	244	284	219	268	329	513	2.400
2.350		296	134		374	46	110	155	219	283	323	258	312	377	555	2.350
2.300		339	177		425	80	144	194	258	322	362	298	357	425	597	2.300
2.250		382	220		476	119	183	233	297	361	401	338	402	473	639	2.250
2.200		425	264		526	158	222	272	336	400	440	378	447	521	680	2.200
2.150	5	468	307		577	197	261	311	375	439	479	418	491	570	722	2.150
2.100	16	511	350	19	628	236	300	350	414	478	518	459	536	618	764	2.100
2.050	27	554	393	47	679	275	339	389	453	517	557	499	581	666	806	2.050
2.000	39	598	436	87	729	314	378	428	492	556	596	541	626	714	848	2.000
1.950	50	641	479	128	780	353	417	467	531	595	635	582	670	762	889	1.950
1.900	70	684	523	169	831	392	456	506	570	634	674	624	715	811	931	1.900
1.850	90	727	566	209	882	431	495	545	609	673	713	666	760	859	973	1.850
1.800	110	770	609	250	932	470	534	584	648	712	752	708	805	907	1015	1.800
1.750	130	813	652	291	983	509	573	623	687	751	791	751	849	955	1057	1.750
1.700	150	856	695	331	1034	548	612	662	726	790	830	795	894	1003	1099	1.700
1.650	170	900	738	372	1085	587	651	701	765	829	869	838	939	1052	1140	1.650
1.600	190	943	782	413	1136	626	690	740	804	868	908	884	984	1100	1182	1.600
1.550	210	986	825	453	1186	665	729	779	843	907	947	932	1028	1148	1224	1.550
1.500	230	1029	868	494	1237	704	768	818	882	946	986	982	1073	1196	1266	1.500
1.450	250	1072	911	535	1288	743	807	857	921	985	1025	1034	1118	1244	1308	1.450
1.400	270	1115	954	575	1339	782	846	896	960	1025	1064	1088	1163	1293	1349	1.400
1.350	290	1159	997	616	1389	821	885	935	999	1064	1103	1145	1207	1341	1391	1.350
1.300	310	1202	1041	657	1440	860	924	974	1038	1103	1142	1204	1252	1389	1433	1.300
1.250	330	1245	1084	697	1491	899	963	1013	1077	1142	1181	1264	1297	1437	1475	1.250
1.200	350	1288	1127	738		938	1002	1052	1116	1181	1220	1329	1342			1.200
1.150	370	1331	1170	779		977	1041	1091	1155	1220	1259					1.150
1.100	390			819												1.100
1.050	410			860												1.050
1.000	430															

CIRCLE TRACK ENDURANCE VALVE SPRINGS

Part Number	Spring Diameters			Spring Loads		Spring Rate	Max Coil Bind	Max Lift	Recommended Matching Components				Comments	
	OD Outer	ID Outer	Damper	ID Inner	Installed Height (Valve Closed)				Open Load (Valve Open)	400 & 500 Series Retainers	300 & 600 Series Retainers	Spring Seats		Spring Cups
1200 Series														
PAC-1227	1.539	1.125	Yes	0.731	200 @ 1.950	550 @ 1.250	500	1.130	0.700	PAC-R515	PAC-R315 PAC-R615	PAC-S117 PAC-S118	PAC-C204	Dual spring with a damper for high lift flat tappet applications. General purpose spring that works well with many endurance applications.
PAC-1239	1.550	1.126	Yes	0.720	220 @ 2.050	625 @ 1.300	540	1.180	0.800	PAC-R515	PAC-R315 PAC-R615	PAC-S110 PAC-S126	PAC-C204	Dual spring with a damper for roller cam applications.
PAC-1240	1.500	1.085	No	0.790	250 @ 2.030	614 @ 1.250	467	1.180	0.780	PAC-R540	NA	PAC-S103 PAC-S104	PAC-C202	Dual spring without damper for roller cam application
PAC-1243	1.550	1.136	No	0.812	240 @ 1.900	625 @ 1.200	550	1.100	0.700	PAC-R505 PAC-R405	NA	PAC-S119 PAC-S120	PAC-C204	Dual spring for roller applications.
PAC-1244	1.570	1.120	No	0.780	190 @ 1.950	710 @ 1.250	743	1.035	0.800	PAC-R551	NA	PAC-S103 PAC-S104	PAC-C204	High Frequency High Lift Dual Spring for Roller Cam Applications
PAC-1245	1.550	1.136	No	0.812	240 @ 2.000	608 @ 1.300	526	1.200	0.750	PAC-R536	NA	PAC-S119 PAC-S120	PAC-C204	Dual spring for roller cam applications.
PAC-1254	1.554	1.140	Yes	0.746	194 @ 1.950	499 @ 1.300	470	1.170	0.650	PAC-R515	PAC-R315 PAC-R615	PAC-S117 PAC-S118	PAC-C204	Dual spring with a damper for various applications including marine.
PAC-1289	1.550	1.136	No	0.812	230 @ 2.000	580 @ 1.300	500	1.210	0.750	PAC-R536	NA	PAC-S119 PAC-S120	PAC-C204	Dual spring without damper for roller cam applications.
PAC-1294	1.545	1.131	Yes	0.757	175 @ 1.900	442 @ 1.275	428	1.180	0.700	PAC-R515	PAC-R315 PAC-R615	PAC-S117 PAC-S118	PAC-C204	Dual spring with a damper for flat tappet applications.
PAC-1297	1.539	1.125	Yes	0.731	200 @ 2.000	550 @ 1.300	500	1.130	0.700	PAC-R515	PAC-R315 PAC-R615	PAC-S117 PAC-S118	PAC-C204	Dual spring with a damper for high lift flat tappet applications. General purpose spring that works well with many endurance applications.
PAC-1298	1.625	1.175	Yes	0.769	250 @ 2.000	648 @ 1.300	564	1.210	0.700	PAC-R507	NA	PAC-S107 PAC-S108	PAC-C205	Dual spring with a damper for high lift roller applications.
PAC-1299	1.625	1.175	Yes	0.769	250 @ 2.050	673 @ 1.300	564	1.210	0.750	PAC-R507	NA	PAC-S107 PAC-S108	PAC-C205	Dual spring with a damper for high lift roller applications.
1300 Series														
PAC-1325	1.550	1.100	No	0.788	250 @ 2.000	765 @ 1.200	644	1.150	0.800	PAC-R505 PAC-R405	NA	PAC-S103 PAC-S104	PAC-C204	High rate dual spring for aggressive valvetrains.
PAC-1326	1.550	1.100	Yes	0.706	275 @ 2.000	805 @ 1.200	662	1.150	0.800	PAC-R506 PAC-R541	PAC-R606 PAC-R641	PAC-S105 PAC-S106	PAC-C204	High rate dual spring with a damper for aggressive valvetrains.
PAC-1340	1.500	1.085	No	0.790	250 @ 2.030	614 @ 1.250	467	1.180	0.780	PAC-R540	NA	PAC-S103 PAC-S104	PAC-C202	Dual spring without damper for roller cam application
PAC-1342	1.574	1.150	No	0.826	250 @ 2.050	655 @ 1.250	506	1.200	0.800	PAC-R537 PAC-R538	NA	PAC-S130 PAC-S131	PAC-C204	Dual spring without a damper for high lift roller applications.
PAC-1371	1.374	1.000	No	0.716	150 @ 1.950	455 @ 1.250	436	1.190	0.700	PAC-R517 PAC-R552	PAC-R317 PAC-R348	PAC-S114 PAC-S115	NA	Small diameter flat tappet spring for high RPM engines. Low mass and high frequency
PAC-1385	1.564	1.150	Yes	0.744	250 @ 2.000	670 @ 1.200	525	1.140	0.800	PAC-R514 PAC-R519	PAC-R614 PAC-R619	PAC-S117 PAC-S118	PAC-C204	Dual spring with a damper for high lift applications.
PAC-1386	1.564	1.150	No	0.826	245 @ 2.000	655 @ 1.200	513	1.150	0.800	PAC-R537 PAC-R538	NA	PAC-S130 PAC-S131	PAC-C204	Dual spring without a damper for high lift roller applications.
PAC-1395	1.574	1.150	Yes	0.744	265 @ 2.000	705 @ 1.200	550	1.150	0.800	PAC-R514 PAC-R519	PAC-R614 PAC-R619	PAC-S117 PAC-S118	PAC-C204	Dual spring with a damper for high lift roller applications.
PAC-1396	1.574	1.150	No	0.826	260 @ 2.000	690 @ 1.200	538	1.150	0.800	PAC-R537	NA	PAC-S130 PAC-S131	PAC-C204	Dual spring without a damper for high lift roller applications.
1500 Series														
PAC-1509	1.539	1.125	Yes	0.731	200 @ 2.000	550 @ 1.300	500	1.130	0.750	PAC-R515	NA	PAC-S117 PAC-S118	PAC-C204	High endurance nitrided spring for high lift roller applications.
PAC-1530	1.284	0.900	No	0.616	160 @ 2.000	580 @ 1.250	560	1.180	0.750	PAC-R432 PACR-532	PAC-R632	PAC-S128	NA	Small diameter lightweight spring for lightweight valvetrains.
PAC-1561	1.514	1.100	No	0.804	250 @ 2.000	636 @ 1.200	483	1.160	0.800	PAC-R505 PAC-R405	NA	PAC-S119 PAC-S120	PAC-C202	High endurance nitrided spring for high lift aggressive applications.
PAC-1572	1.510	1.086	No	0.774	180 @ 1.980	650 @ 1.180	588	1.110	0.800	PAC-R540	NA	PAC-S103 PAC-S104	PAC-C202	Dual spring without a damper for high lift roller applications.
PAC-1574	1.510	1.086	No	0.762	180 @ 1.980	685 @ 1.180	631	1.110	0.850	PAC-R553	NA	PAC-S103 PAC-S104	PAC-C202	High endurance Nitrided Spring for high lift aggressive applications.
PAC-1575	1.409	0.995	No	0.700	150 @ 2.000	645 @ 1.150	582	1.110	0.850	PAC-R552	NA	PAC-S114 PAC-S115	NA	High endurance Nitrided Spring for high lift aggressive applications.
PAC-1589	1.464	1.050	No	0.754	250 @ 2.000	627 @ 1.250	502	1.160	0.750	PAC-R508 PAC-R509	PAC-R608 PAC-R609	PAC-S110 PAC-S126	PAC-C201	High endurance Nitrided Spring for high lift aggressive applications.
PAC-1590	1.474	1.050	No	0.754	250 @ 2.050	670 @ 1.200	525	1.195	0.800	PAC-R508 PAC-R509	PAC-R608 PAC-R609	PAC-S110 PAC-S126	PAC-C202	High endurance Nitrided Spring for high lift aggressive applications.

SPECIFICATIONS: SPRING LOADS AND HEIGHTS

Part No.	PAC-1227	PAC-1239	PAC-1240	PAC-1243	PAC-1244	PAC-1245	PAC-1254	PAC-1289	PAC-1294	PAC-1297	PAC-1298	PAC-1299	PAC-1325	PAC-1326	PAC-1340	PAC-1342	PAC-1371	PAC-1385	PAC-1386	PAC-1395	PAC-1396	PAC-1509	PAC-1530	PAC-1561	PAC-1572	PAC-1574	PAC-1575	PAC-1589	PAC-1590	Part No.
Mass (g)	148	162	142	140	142	152	153	155	155	148	176	176	151	158	142	157	119	156	149	159	152	148	111	141	136	140	125	135	141	Mass (g)
Outer Freq	25510	25566	25500	27566	32630	26459	24192	25228	23344	25510	25673	25673	29368	29368	25500	24906	27294	26113	26431	26431	26431	25510	29735	26618	28580	28580	29026	26876	28458	Outer Freq
Inner Freq	27259	27420	26142	29978	32965	28489	26331	26999	24294	27259	25290	25290	28294	28434	26412	26443	29226	28374	28095	28374	28095	27259	32947	27568	30487	32458	30604	26721	26721	Inner Freq
Coil Bind	1.130	1.180	1.180	1.100	1.035	1.200	1.170	1.210	1.180	1.130	1.210	1.200	1.150	1.150	1.180	1.190	1.190	1.140	1.150	1.150	1.150	1.130	1.180	1.160	1.110	1.100	1.100	1.160	1.195	Coil Bind
2.550		7										2			7	7														2.550
2.500		6	31			1					1	10			31	22		10	10	12	12		11					3	15	2.500
2.450		22	54			17		13			9	31		4	54	47		25	25	29	29		33					27	40	2.450
2.400		40	77			32	2	30		11	30	57	5	15	77	73		42	40	47	45	11	57					53	66	2.400
2.350	11	65	101	6		56	17	55		32	56	83	25	46	101	98		67	66	73	72	32	81					78	92	2.350
2.300	32	90	124	22		82	39	80	7	55	83	109	57	76	124	123	7	92	91	100	99	55	5	105	2			103	119	2.300
2.250	55	115	147	47		109	60	105	27	78	109	137	89	109	147	149	21	119	117	127	126	78	22	129	21	20	11	128	145	2.250
2.200	78	140	171	75	4	135	82	130	48	101	136	165	121	142	171	174	41	145	142	155	152	101	44	153	51	41	34	153	171	2.200
2.150	101	166	194	103	41	161	103	155	68	125	165	194	153	176	194	199	63	171	168	182	179	125	72	178	80	73	63	178	197	2.150
2.100	125	193	217	130	79	187	125	180	90	150	193	222	186	209	217	225	85	197	194	210	206	150	100	202	109	104	92	203	224	2.100
2.050	150	220	241	157	116	214	147	205	111	175	222	250	218	242	241	250	106	224	219	237	233	175	128	226	139	136	121	228	250	2.050
2.000	175	247	264	185	153	240	171	230	132	200	250	278	250	275	264	275	128	250	245	265	260	200	156	250	168	167	150	253	276	2.000
1.950	200	274	287	212	190	266	194	255	154	225	278	306	282	308	287	301	150	276	271	292	287	225	184	274	198	199	179	279	302	1.950
1.900	225	301	311	240	227	293	217	280	175	250	307	335	314	341	311	326	172	302	296	320	314	250	211	298	227	230	208	304	329	1.900
1.850	250	328	334	267	264	319	241	305	196	275	335	363	347	374	334	351	194	329	322	347	341	275	239	322	256	262	237	329	355	1.850
1.800	275	355	357	295	301	345	264	330	218	300	364	391	379	407	357	377	215	355	347	375	367	300	267	346	286	294	266	354	381	1.800
1.750	300	382	381	322	339	371	288	355	239	325	392	419	411	441	381	402	237	381	373	402	394	325	295	371	315	325	296	379	407	1.750
1.700	325	409	404	350	376	398	311	380	260	350	421	447	443	474	404	427	259	407	399	430	421	350	323	395	344	357	325	409	434	1.700
1.650	350	436	427	377	413	424	335	405	282	375	449	476	475	507	427	452	281	434	424	457	448	375	351	419	374	388	354	429	460	1.650
1.600	375	463	451	405	450	450	358	430	303	400	477	504	507	540	451	478	303	460	450	485	475	400	379	443	403	420	383	454	486	1.600
1.550	400	490	474	432	487	477	382	455	325	425	506	532	540	573	474	503	324	486	476	512	502	425	407	467	433	451	412	479	512	1.550
1.500	425	517	497	460	524	503	405	480	340	450	534	560	572	606	497	528	346	512	501	540	525	450	434	491	462	483	441	504	539	1.500
1.450	450	544	521	488	561	529	429	505	367	475	563	588	604	639	521	554	368	539	527	567	556	475	462	515	491	515	470	530	565	1.450
1.400	475	571	544	515	599	555	452	530	389	500	591	617	636	672	544	579	390	565	552	595	582	500	490	539	521	546	499	555	591	1.400
1.350	500	598	567	543	636	582	476	555	410	525	620	645	668	706	567	604	411	591	578	622	609	525	518	564	550	578	529	580	617	1.350
1.300	525	625	591	570	673	608	499	580	431	550	648	673	701	739	591	630	433	617	604	650	636	550	546	588	580	609	558	605	644	1.300
1.250	550	652	614	598	710	634	522	605	453	575	676	701	733	772	614	655	455	644	629	677	663	575	574	612	609	641	587	630	670	1.250
1.200	575	679	637	625	747	661	546	630	474	600	705		765	805	637	680	477	670	655	705	690	600	602	636	638	672	616	655	696	1.200
1.150	600			653	784	569				625			797	838				696	681	732	717	625		660	668	704	645		1.150	
1.100																									697					1.100
1.050																														1.050

OVATE BEEHIVE SPRINGS

1200 Series

Part Number	Spring Diameters				Spring Loads				Recommended Matching Components				Comments	
	Large End		Small End		Installed Height (Valve Closed)	Open Load (Valve Open)	Spring Rate	Max Coil Bind	Max Lift	Titanium Retainers	Steel Retainers	Spring Seats		Spring Cups
	OD	ID	OD	ID										
PAC-1213	1.061	0.738	0.959	0.636	80 @ 1.640	185 @ 1.090	191	1.020	0.550	NA	NA	NA	NA	Ford 4.6L 2 valve spring for up to 550 lift. This ovate beehive spring is a drop-in design that requires no machining and fits stock retainers and seats.
PAC-1214	1.061	0.698	0.999	0.636	100 @ 1.640	265 @ 1.080	275	1.040	0.600	NA	NA	NA	NA	Ford 4.6L 2 valve spring for up to 600 lift. This ovate beehive spring is a drop-in design that requires no machining and fits stock retainers and seats.
PAC-1215	1.290	0.885	1.055	0.650	105 @ 1.800	293 @ 1.200	313	1.140	0.600	PAC-R510 PAC-R511	PAC-R310 PAC-R311	PAC-S111	NA	OEM type LS1 ovate beehive valve spring for applications up to 0.600 lift. This is a drop-in spring that fits stock seats and retainers. This spring has higher loading for more demanding applications.
PAC-1218	1.290	0.885	1.055	0.650	130 @ 1.800	318 @ 1.200	313	1.140	0.600	PAC-R510 PAC-R511	PAC-R310 PAC-R311	PAC-S111	NA	Performance LS1 ovate beehive valve spring for applications up to 0.600 lift. This is a drop-in spring that fits stock seats & retainers. This spring has higher loading for more demanding applications.
PAC-1219	1.207	0.885	1.072	0.650	135 @ 1.800	348 @ 1.175	340	1.100	0.625	PAC-R510 PAC-R511	PAC-R310 PAC-R311	PAC-S111	NA	LS Ovate beehive spring that has increased loads, rates and frequencies for more aggressive cams. This remains a drop-in spring for stock parts but will handle increased lifts.
PAC-1220	1.445	1.000	1.095	0.650	155 @ 1.880	377 @ 1.280	370	1.210	0.600	PAC-R510 PAC-R511	PAC-R310 PAC-R311	PAC-S112 PAC-S113	PAC-C201	Primarily designed as Big Block Chevy spring. This larger ovate beehive can replace numerous springs for flat tappet and hydraulic roller applications.
PAC-1223	1.105	0.742	0.943	0.580	90 @ 1.470	252 @ 0.970	324	0.900	0.500	PAC-R512 PAC-R442 PAC-R445	PAC-R312	NA	NA	Ford 4.6L 4 valve spring for up 500 lift. This ovate beehive spring is a drop-in spring that requires no machining and fits stock retainers and seats. Fits V-Rod Motorcycles
PAC-1233	1.025	0.662	0.930	0.567	105 @ 1.670	270 @ 1.120	300	1.060	0.550	PAC-R512	PAC-R312	NA	NA	Ford 4.6L 3 valve spring for up 550 lift. This ovate beehive spring is a drop-in design that requires no machining and fits stock retainers and seats.
PAC-1235	1.210	0.805	1.035	0.630	135 @ 1.800	350 @ 1.200	358	1.160	0.600	NA	NA	NA	NA	Chrysler Hemi 5.7L, 6.1L Valve spring for up to 0.600 Lift. This ovate beehive spring is a drop-in design that requires no machining.
PAC-1255	1.445	0.990	1.186	0.731	160 @ 1.950	425 @ 1.300	408	1.220	0.700	PAC-R513	PAC-R313	PAC-S111 PAC-S112	PAC-C201	Ovate Beehive spring designed for high lift flat tappet applications and hydraulic roller application up to 0.700 lift.
PAC-1283	1.250	0.845	1.085	0.680	110 @ 1.750	328 @ 1.150	363	1.080	0.600	PAC-R510 PAC-R511	PAC-R310 PAC-R311	NA	NA	SRT Viper V-10 performance ovate beehive spring for applications up to 0.600 lift. This is a drop-in spring that fits the stock retainers and seats.
PAC-1286	1.405	1.000	1.055	0.650	125 @ 1.750	295 @ 1.150	283	1.060	0.600	PAC-R510 PAC-R511	PAC-R310 PAC-R311	PAC-S112 PAC-S113	NA	HP Beehive spring designed for a variety of hydraulic or flat tappet applications that can make use of 1.405 OD spring. Works well on many small block engines.
PAC-1295	1.589	1.135	1.185	0.731	150 @ 2.000	385 @ 1.250	313	1.180	0.750	PAC-R513	PAC-R313	PAC-S116	PAC-C202	Large Ovate beehive spring for high lift applications. Higher load and lift capability spring for applications up to 0.750 lift. This spring is PAC-Enhanced processed to handle the additional increased durability.

SPECIFICATIONS: SPRING LOADS AND HEIGHTS

PART NO.	PAC-1213	PAC-1214	PAC-1215	PAC-1218	PAC-1219	PAC-1220	PAC-1223	PAC-1233	PAC-1235	PAC-1255	PAC-1283	PAC-1286	PAC-1295	PART NO.
Mass (g)	45	52	75	75	67	97	45	51	73	105	73	78	106	Mass (g)
Freq (cpm)*	26302	31946	29277	29277	31258	27047	38138	33317	31793	29996	33960	29337	25074	Freq (cpm)*
Coil Bind	0.964	1.030	1.093	1.096	1.100	1.210	0.850	1.060	1.100	1.220	1.080	1.080	1.130	Coil Bind
2.500														22
2.450														35
2.400						15								48
2.350						28								61
2.300					4	41				17				73
2.250					15	54				38				86
2.200					22	67				58				94
2.150	2		14	40	16	80			10	78		12	112	2.150
2.100	8		27	53	33	92			28	99		26	124	2.100
2.050	16		40	66	50	105			45	119	1	40	137	2.050
2.000	23	12	53	79	67	118		6	63	140	19	54	150	2.000
1.950	30	26	66	92	84	132		21	81	160	37	68	163	1.950
1.900	38	40	79	105	101	147		36	99	180	56	83	175	1.900
1.850	46	53	92	118	118	161		51	117	201	74	97	188	1.850
1.800	54	67	106	131	135	176		66	135	221	92	111	201	1.800
1.750	63	81	119	145	152	191	8	81	153	242	110	125	214	1.750
1.700	72	95	132	158	169	208	22	96	171	262	128	139	228	1.700
1.650	81	108	145	172	186	224	36	111	189	282	146	153	242	1.650
1.600	90	122	159	187	203	241	51	126	207	303	165	168	256	1.600
1.550	99	136	174	202	220	259	66	141	225	323	183	182	270	1.550
1.500	108	150	189	218	237	278	80	156	243	343	201	196	287	1.500
1.450	117	163	206	234	254	298	95	171	260	364	219	210	304	1.450
1.400	126	177	222	251	271	318	110	186	278	384	237	224	321	1.400
1.350	135	191	239	267	288	339	125	201	296	405	255	238	339	1.350
1.300	144	205	257	283	305	361	140	216	314	425	274	253	356	1.300
1.250	153	218	275	300	322	384	155	231	332	445	292	267	373	1.250
1.200	163	232	294	318	339	415	172	246	350	466	310	281	397	1.200
1.150	173	246	313	337	356		188	261	368	486	328	295	526	1.150
1.100	184	260	456	354	373		206	276	386		346	309		1.100
1.050	195	273					223							1.050
1.000	208						241							1.000
0.950	607						261							0.950
0.900							281							0.900

* The frequency of beehive springs are extremely variable depending on installation height. The base frequency is listed but can be greatly influenced by installation height.

1400 Series

Part Number	Spring Diameters				Spring Loads		Spring Rate	Max Coil Bind	Max Lift	Recommended Matching Components				Comments
	Large End		Small End		Installed Height (Valve Closed)	Open Load (Valve Open)				Titanium Retainers	Steel Retainers	Spring Seats	Spring Cups	
	OD	ID	OD	ID										
Stock Eliminator														
PAC-1409	1.250	0.845	1.055	0.650	150 @ 1.800	390 @ 1.250	436	1.190	0.550	PAC-R510 PAC-R511	PAC-R310 PAC-R311 PAC-R333	NA	NA	Stock Eliminator - Recent rule change allows the use of latest technology, a very sophisticated spring with reduced end size for a small light weight retainer. This spring is recommended for drag race applications only.
PAC-1427	1.454	1.000	1.104	0.650	200 @ 1.850	500 @ 1.250	500	1.190	0.625	PAC-R510	PAC-R310 PAC-R333	PAC-S112 PAC-S113	PAC-C201	A true conical spring for the BBC stock eliminator applications. This spring has very advanced processing technology and highly variable rates for aggressive camshafts. This spring is recommended for drag race applications only.

1500 Series

Part Number	Spring Diameters				Spring Loads		Spring Rate	Max Coil Bind	Max Lift	Recommended Matching Components				Comments
	Large End		Small End		Installed Height (Valve Closed)	Open Load (Valve Open)				Titanium Retainers	Steel Retainers	Spring Seats	Spring Cups	
	OD	ID	OD	ID										
1500 Series														
PAC-1514	1.061	0.698	0.999	0.636	115 @ 1.680	280 @ 1.080	275	1.010	0.650	N/A	N/A	N/A	N/A	Nitrided version of PAC-1214
PAC-1517	1.061	0.698	0.873	0.525	115 @ 1.600	300 @ 1.000	308	0.965	0.625	N/A	PAC-R331 PAC-R346	N/A	N/A	Nitrided Ford 4.6L 2 valve spring for up to 0.600 lift. This ovate beehive spring has a smaller diameter at the top and requires a special retainer.
PAC-1518	1.290	0.885	1.055	0.650	130 @ 1.800	318 @ 1.200	313	1.140	0.625	PAC-R510 PAC-R511	PAC-R310 PAC-R311	PAC-S111	N/A	High Performance LS1 spring that features additional nitriding processing for increased durability for high lift applications up to 0.650 lift. This spring remains a drop-in replacement for extremely high demanding applications.
PAC-1519	1.207	0.885	1.072	0.650	150 @ 1.800	363 @ 1.175	340	1.100	0.625	PAC-R510 PAC-R511	PAC-R310 PAC-R311	PAC-S111	N/A	Nitrided Version of PAC-1219
PAC-1520	1.445	1.000	1.095	0.650	155 @ 1.880	377 @ 1.280	370	1.210	0.650	PAC-R510	PAC-R310	PAC-S112	PAC-C201	High performance BBC spring that features additional nitriding processing for increased durability for high
PAC-1523	1.105	0.742	0.930	0.580	85 @ 1.500	263 @ 0.950	324	0.880	0.550	PAC-R512 PAC-R442	PAC-R312	NA	NA	Nitrided Version of PAC-1223 Also Fits V-Rod Motorcycles Note*** Retainers PAC-R442 and PAC-R445 are designed for the V-Rod and V-Rod Destroyer Engine.
PAC-1533	1.025	0.662	0.943	0.580	120 @ 1.670	285 @ 1.120	300	1.060	0.575	PAC-R512	PAC-R312	NA	NA	Nitrided version of the PAC-1233
PAC-1535	1.210	0.805	1.035	0.630	140 @ 1.800	355 @ 1.200	358	1.160	0.600	NA	NA	NA	NA	Nitrided version of the PAC-1235
PAC-1555	1.445	0.990	1.186	0.731	160 @ 1.950	425 @ 1.300	408	1.220	0.750	PAC-R513	PAC-R313	PAC-S111 PAC-S112	PAC-C201	Nitrided version of the PAC-1255
PAC-1595	1.589	1.135	1.185	0.731	150 @ 2.000	385 @ 1.250	313	1.180	0.750	PAC-R513	PAC-R313	PAC-S116	NA	Large Ovate beehive spring for high lift applications. Higher load and lift capability spring for applications up to 0.750 lift. This spring is PAC-Enhanced processed to handle additional increased durability.

SPECIFICATIONS: SPRING LOADS AND HEIGHTS

PART NUMBER	1500 SERIES										STOCK ELIMINATOR		
	PAC-1514	PAC-1517	PAC-1518	PAC-1519	PAC-1520	PAC-1523	PAC-1533	PAC-1535	PAC-1555	PAC-1595	Part Number	PAC-1409	PAC-1427
Mass (g)	52	40	75	67	75	45	43	73	105	106	Mass (g)	73	79
Freq (cpm)*	31546	35183	29277	31258	29277	38138	33385	31793	29996	25074	Freq (cpm)*	39023	35022
Coil Bind	1.030	0.965	1.096	1.100	1.210	0.880	1.060	1.100	1.120	1.130	Coil Bind	1.190	1.190
2.500										22	2.500		
2.450										35	2.450		
2.400					15					48	2.400		
2.350					28					61	2.350		
2.300			4		41				17	73	2.300		
2.250			15		54				38	86	2.250		0
2.200			22	14	67				58	94	2.200	10	25
2.150			40	31	80			15	78	112	2.150	24	50
2.100			53	48	92			33	99	124	2.100	37	75
2.050	13		66	65	105		6	50	119	137	2.050	51	100
2.000	27		79	82	118		21	68	140	150	2.000	65	125
1.950	41	7	92	99	132		36	86	160	163	1.950	78	150
1.900	55	23	105	116	147		51	104	180	175	1.900	94	175
1.850	68	38	118	133	161		66	122	201	188	1.850	130	200
1.800	82	53	131	150	176		81	140	221	201	1.800	150	225
1.750	96	69	145	167	191	4	96	158	242	214	1.750	170	250
1.700	110	84	158	184	208	20	111	176	262	228	1.700	191	275
1.650	123	100	172	201	224	36	126	194	282	242	1.650	212	300
1.600	137	115	187	218	241	53	141	212	303	256	1.600	233	325
1.550	151	130	202	235	259	69	156	230	323	270	1.550	255	350
1.500	165	146	218	252	278	85	171	248	343	287	1.500	277	375
1.450	178	161	234	269	298	101	186	265	364	304	1.450	299	400
1.400	192	177	251	286	318	117	201	283	384	321	1.400	321	425
1.350	206	192	267	303	339	134	216	301	405	339	1.350	343	450
1.300	220	208	283	320	361	150	231	319	425	356	1.300	366	475
1.250	233	223	300	337	384	166	246	337	445	373	1.250	390	500
1.200	247	238	318	354	415	182	261	355	466	397	1.200	412	525
1.150	261	254	337	372		198	276	373	486	526	1.150		
1.100	275	269	354	389		214	291	391			1.100		
1.050	288	285				231	306				1.050		
1.000		300					247				1.000		
0.950		315					263				0.950		
0.900							285				0.900		

STREET PERFORMANCE VALVE SPRINGS

Part Number	Spring Diameters			Spring Loads			Spring Rate	Max Coil Bind	Max Lift	Recommended Matching Components				Comments
	OD Outer	ID Outer	Damper	ID Inner	Installed Height (Valve Closed)	Open Load (Valve Open)				Titanium Retainers	Steel Retainers	Spring Seats	Spring Cups	
PAC-1200	1.244	0.860	Yes	0.770	125 @ 1.750	350 @ 1.250	450	1.100	0.550	NA	PAC-R349 PAC-R649	NA	NA	Small diameter to fit stock pocket without machining. Single Spring with a Damper
PAC-1201	1.260	0.860	Yes	0.770	140 @ 1.750	410 @ 1.200	540	1.115	0.550	NA	PAC-R349 PAC-R649	NA	NA	Small diameter to fit stock SBC pocket without machining. Single Spring with a Damper. High rate for aggressive cam.
PAC-1202	1.244	0.886	No	0.624	160 @ 1.750	484 @ 1.150	540	1.100	0.575	NA	PAC-R334	PAC-S128	NA	Dual Spring for aggressive cams.
PAC-1203	1.260	0.860	No	0.624	145 @ 1.800	511 @ 1.200	610	1.115	0.650	NA	PAC-R334	PAC-S128	NA	Dual Spring for aggressive cams.
PAC-1900	1.500	1.086	Yes	1.410	98 @ 1.880	316 @ 1.300	376	1.100	0.600	NA	NA	NA	NA	99839 spring for AMC V8 Application Street and RV applications.
PAC-1901	1.540	1.140	Yes	0.754	145 @ 1.900	465 @ 1.250	493	1.140	0.650	NA	NA	NA	NA	99896 Spring for Chevy Big Block Hydraulic Roller applications, Street and RV applications.
PAC-1902	1.465	1.020	No	NA	120 @ 1.940	375 @ 1.380	457	1.320	0.560	NA	NA	NA	NA	99841 Beehive spring for Ford 5.0 liter and 351 Windsor Street and RV applications. Small End ID is 0.863
PAC-1512	1.102	0.806	No	0.580	110 @ 1.470	300 @ 0.920	346	0.850	0.575	PAC-R439	NA	NA	NA	FMOD Ford Dual Nitrided Spring For high RPM applications

SPECIFICATIONS: SPRING LOADS AND HEIGHTS

Part Number	PAC-1200	PAC-1201	PAC-1202	PAC-1203	PAC-1900	PAC-1901	PAC-1902	PAC-1512	Part Number
Mass	76	82	90	96	102	145	115	53	Mass
Outer Freq	35516.0	36938	35516	36938	29314	27123	30033	33486	Outer Freq
Inner Freq	NA	NA	30832	30832	NA	29956	NA	39747	Inner Freq
Coil Bind	1.100	1.1125	1.100	1.115	1.100	1.140	1.330	0.850	Coil Bind
2.200						14.6			
2.150						29.2	24.4		
2.100					15.3	46.5	47.1		
2.050			9	9	34.1	71.2	69.9		2.050
2.000	12	7	25	22	52.9	95.8	92.7		2.000
1.950	35	32	52	53	71.7	120.4	115.4		1.950
1.900	57	59	73	83	90.5	145.0	138.2		1.900
1.850	80	86	106	114	109.3	169.6	161.0	4	1.850
1.800	103	113	133	145	128.1	194.2	183.8	14	1.800
1.750	125	140	160	175	146.9	218.8	206.5	24	1.750
1.700	148	167	187	206	165.7	243.5	229.3	34	1.700
1.650	170	196	214	236	184.4	268.1	252.1	47	1.650
1.600	193	221	241	267	203.2	292.7	274.8	65	1.600
1.550	215	248	268	297	222.0	317.3	297.6	82	1.550
1.500	238	275	295	328	240.8	341.9	320.4	99	1.500
1.450	260	302	322	358	259.6	366.5	343.1	116	1.450
1.400	283	329	349	389	278.4	391.2	365.9	134	1.400
1.350	305	356	376	419	297.2	415.8	388.7	151	1.350
1.300	328	383	403	450	316.0	440.4	411.4	168	1.300
1.250	350	410	430	480	334.8	465.0		186	1.250
1.200	373	437	457	511	353.6	489.6		203	1.200
1.150	395	464	484	541	372.4	514.2		220	1.150
1.100	418	491	511	572				237	1.100
1.050								255	1.050
1.000								272	1.000
0.950								289	0.950
0.900								306	0.900

LS ENGINE VALVE SPRINGS

Part Number	Spring Diameters				Spring Loads			Spring Rate	Max Coil Bind	Max Lift	Recommended Matching Components				Comments
	OD Outer	ID Outer	Damper	ID Inner	Installed Height (Valve Closed)	Open Load (Valve Open)	Titanium Retainers				Steel Retainers	Spring Seats	Spring Cups		
RPM Series Dual Springs															
PAC-1204X	1.290	0.950	No	0.694	145 @ 1.800	385 @ 1.150	369	1.000	0.700	PAC-R435	PAC-R335	PAC-S129	NA	RPM Series Dual LS Engine Spring	
PAC-1205X	1.304	0.950	No	0.694	155 @ 1.800	410 @ 1.150	392	1.000	0.700	PAC-R435	PAC-R335	PAC-S129	NA	RPM Series Dual LS Engine Spring	
PAC-1206X	1.290	0.950	No	0.680	145 @ 1.800	411 @ 1.150	409	1.000	0.700	PAC-R435	PAC-R335	PAC-S129	NA	RPM Series Dual LS Engine Spring	
PAC-1207X	1.304	0.950	No	0.680	155 @ 1.800	436 @ 1.150	433	1.000	0.700	PAC-R435	PAC-R335	PAC-S129	NA	RPM Series Dual LS Engine Spring	
PAC-1208X	1.324	0.950	No	0.694	160 @ 1.800	482 @ 1.100	460	1.000	0.750	PAC-R435	PAC-R335	PAC-S129	NA	RPM Series Dual LS Engine Spring	
PAC-1209X	1.324	0.950	No	0.680	160 @ 1.800	510 @ 1.100	500	1.000	0.750	PAC-R435	PAC-R335	PAC-S129	NA	RPM Series Dual LS Engine Spring	
Dual Springs															
PAC-1221	1.300	0.895	No	0.655	135 @ 1.800	400 @ 1.150	408	1.080	0.650	PAC-R416 PAC-R516	PAC-R616	PAC-S121	NA	Dual LS Spring made from Ovate Wire for Street Applications.	
PAC-1521	1.300	0.895	No	0.655	135 @ 1.800	400 @ 1.150	408	1.080	0.650	PAC-R416 PAC-R516	PAC-R616	PAC-S121	NA	Nitrided version of PAC-1221	
Extreme Duty Duals															
PAC-1530	1.284	0.900	No	0.616	160 @ 2.000	580 @ 1.250	560	1.180	0.750	PAC-R532 PAC-R432	NA	PAC-S128	NA	High Performance High Endurance LS Circle Track Spring. This spring is a High Frequency High RPM capable Spring.	
PAC-1335	1.300	0.900	No	0.616	250 @ 1.800	860 @ 1.050	813	0.985	0.800	PAC-R532 PAC-R432	NA	PAC-S128	NA	This is a High Rate Dual LS Spring used For Drag Racing Solid Roller Cam Applications.	

Beehive Springs

Part Number	Spring Diameters				Spring Loads			Spring Rate	Max Coil Bind	Max Lift	Recommended Matching Components				Comments
	Large End		Small End		Installed Height (Valve Closed)	Open Load (Valve Open)	Titanium Retainers				Steel Retainers	Spring Seats	Spring Cups		
	OD	ID	OD	ID											
PAC-1215	1.290	0.885	1.055	0.650	105 @ 1.800	293 @ 1.200	313	1.140	0.600	PAC-R510 PAC-R511	PAC-R310 PAC-R311	PAC-S111	NA	OEM type LS1 ovate beehive valve spring for applications up to 0.600 lift. This is a drop-in spring that fits stock seats and retainers.	
PAC-1218	1.290	0.885	1.055	0.650	130 @ 1.800	318 @ 1.200	313	1.140	0.600	PAC-R510 PAC-R511	PAC-R310 PAC-R311	PAC-S111	NA	Performance LS1 ovate beehive valve spring for applications up to 0.600 lift. This is a drop-in spring that fits stock seats and retainers.	
PAC-1219	1.207	0.885	1.072	0.650	135 @ 1.800	348 @ 1.175	340	1.100	0.625	PAC-R510 PAC-R511	PAC-R310 PAC-R311	PAC-S111	NA	LS Ovate beehive spring that has increased loads, rates and frequencies for more aggressive cams. This remains a drop-in spring for stock parts but will handle increased lifts.	
PAC-1518	1.290	0.885	1.055	0.650	130 @ 1.800	318 @ 1.200	313	1.140	0.625	PAC-R510 PAC-R511	PAC-R310 PAC-R311	PAC-S111	N/A	High Performance LS1 spring that features additional nitriding processing for increased durability for high lift applications up to 0.650 lift.	
PAC-1519	1.207	0.885	1.072	0.650	150 @ 1.800	363 @ 1.175	340	1.100	0.625	PAC-R510 PAC-R511	PAC-R310 PAC-R311	PAC-S111	N/A	Nitrided Version of PAC-1219	
RPM Series Beehives															
PAC-1218X	1.290	0.885	1.055	0.650	140 @ 1.800	328 @ 1.200	313	1.140	0.600	PAC-R510 PAC-R511	PAC-R310 PAC-R311	PAC-S111	N/A	Same as the PAC-1218 but with premium processing and higher loads to withstand the vigors of street and strip use.	
PAC-1219X	1.207	0.885	1.072	0.650	145 @ 1.800	358 @ 1.175	340	1.100	0.625	PAC-R510 PAC-R511	PAC-R310 PAC-R311	PAC-S111	N/A	Same as the PAC-1219 but with premium processing and higher loads to withstand the vigors of street and strip use.	

SPECIFICATIONS: SPRING LOADS AND HEIGHTS

PN	PAC-1204X	PAC-1205X	PAC-1206X	PAC-1207X	PAC-1208X	PAC-1209X	PAC-1221	PAC-1521	PAC-1530	PAC-1335	PAC-1215	PAC-1218	PAC-1219	PAC-1518	PAC-1519	PAC-1218X	PAC-1219X	PN
Mass (g)	85	89	86	90	93	94	102	102	111	94	75	75	67	75	67	75	67	Mass (g)
Outer Freq	29930.0	29352	29930	29352	31797	31797	29745	29745	29735	40679	29277	29277	31258	29277	31258	29277	31258	Outer Freq
Inner Freq	30877.0	30877	33662	33662	30870	33662	28480	28480	32847	44180	NA	NA	NA	NA	NA	NA	NA	Inner Freq
Coil Bind	1.000	1.000	1.000	1.000	1.000	1.000	1.080	1.080	1.180	0.990	1.140	1.140	1.100	1.140	1.100	1.140	1.100	Coil Bind
2.300									5			4		4				2.300
2.250									22			15		15				2.250
2.200	3	3	3	3					45			22		22	14	15	9	2.200
2.150	16	18	14	16	2			17	73		14	40	16	40	31	30	26	2.150
2.100	34	37	26	29	22	14	13	38	100	19	27	53	33	53	48	46	43	2.100
2.050	53	57	43	47	45	35	33	58	128	47	40	66	50	66	65	62	60	2.050
2.000	71	77	63	69	68	60	53	78	156	87	53	79	67	79	82	77	77	2.000
1.950	90	96	84	90	91	85	74	99	184	128	66	92	84	92	99	93	94	1.950
1.900	108	116	104	112	114	110	94	119	212	169	79	105	101	105	116	109	111	1.900
1.850	127	135	125	133	137	135	115	140	240	209	92	118	118	118	133	124	128	1.850
1.800	145	155	145	155	160	160	135	160	268	250	106	131	135	131	150	140	145	1.800
1.750	163	175	165	177	183	185	155	180	296	291	119	145	152	145	167	156	162	1.750
1.700	182	194	186	198	206	210	176	201	323	331	132	158	169	158	184	171	179	1.700
1.650	200	214	206	220	229	235	196	221	351	372	145	172	186	172	201	187	196	1.650
1.600	219	233	227	241	252	260	217	242	379	413	159	187	203	187	218	203	213	1.600
1.550	237	253	247	263	275	285	237	262	407	453	174	202	220	202	235	218	230	1.550
1.500	256	273	268	285	298	310	257	282	435	494	189	218	237	218	252	234	247	1.500
1.450	274	292	288	306	321	335	278	303	463	535	206	234	254	234	269	250	264	1.450
1.400	293	312	309	328	344	360	298	323	491	575	222	251	271	251	286	265	281	1.400
1.350	311	332	329	350	367	385	318	343	519	616	239	267	288	267	303	281	298	1.350
1.300	330	351	350	371	390	410	339	364	546	657	257	283	305	283	320	297	315	1.300
1.250	348	371	370	393	413	435	359	384	574	697	275	300	322	300	337	312	332	1.250
1.200	367	390	391	414	436	460	380	405	602	738	294	318	339	318	354	328	349	1.200
1.150	385	410	411	436	459	485	400	425		779	313	337	356	337	372	344	366	1.150
1.100	403	430	432	458	482	510	420	445		819	456	354	373	354	389	359	383	1.100
1.050	422	449	452	479	505	535	441	466		860								1.050
1.000	440	469	473	501	528	560				901								1.000
0.950																		0.950

MOTORCYCLE AND ATV SPRINGS

Part Number	Brand	Model	OD Outer (in)	ID Outer (in)	ID Inner (in)	Installed Loads (lbs/in)	Open Loads (lbs/in)	Coil Bind (in)	Rate (lbs/in)	Outer Frequency (cpm)	Inner Frequency (cpm)	Lift (in)	MASS (g)
Single Springs													
PAC-MX100	Yamaha	YZF250-I	0.634	0.450	NA	27 @ 1.100	74 @ 0.720	0.660	123.7	48979	NA	0.380	10
PAC-MX101	Yamaha	YZF250E	0.708	0.512	NA	33 @ 1.100	88 @ 0.720	0.660	144.7	53370	NA	0.380	12
PAC-MX102	Honda	CRF150	0.731	0.491	NA	38 @ 1.260	135 @ 0.890	0.835	262.2	52739	NA	0.370	19
PAC-MX103	Honda	CRF150	0.731	0.491	NA	48 @ 1.496	138 @ 1.146	1.090	257.1	51729	NA	0.350	25
PAC-MX104	Honda	CRF150	0.717	0.491	NA	39 @ 1.260	118 @ 0.890	0.835	213.5	50850	NA	0.370	18
PAC-MX105	Honda	CRF250	0.740	0.514	NA	32 @ 1.309	110 @ 0.929	0.870	205.3	50747	NA	0.380	19
PAC-MX106	Honda	CRF250	0.754	0.514	NA	40 @ 1.525	135 @ 1.150	1.090	253.3	52881	NA	0.375	26
PAC-MX107	Honda	CRF250	0.780	0.510	NA	40 @ 1.525	168 @ 1.124	1.045	319.2	47609	NA	0.401	28
PAC-MX108	Yamaha	YZF450I, E	0.756	0.560	NA	32 @ 1.060	75 @ 0.680	0.625	113.2	45009	NA	0.380	12
PAC-MX109	Honda	CRF150	0.761	0.491	NA	49 @ 1.496	163 @ 1.146	1.095	325.7	47149	NA	0.350	29
PAC-MX110	Kawasaki	KXF250	0.800	0.560	NA	35 @ 1.317	120 @ 0.957	0.870	236.1	52862	NA	0.360	22
PAC-MX111	Kawasaki	KXF250	0.800	0.560	NA	35 @ 1.317	128 @ 0.920	0.835	234.3	52447	NA	0.397	21
PAC-MX112	Kawasaki	KXF450-I, E	0.825	0.575	NA	36 @ 1.240	131 @ 0.852	0.800	244.8	49926	NA	0.388	22
PAC-MX113	Kawasaki	KXF250	0.800	0.560	NA	37 @ 1.315	135 @ 0.935	0.885	257.9	57739	NA	0.380	22
PAC-MX114	Kawasaki	KXF450-I, E	0.845	0.575	NA	37 @ 1.319	162 @ 0.915	0.865	309.4	50798	NA	0.404	26
PAC-MX115	Honda	CRF450E	0.934	0.650	NA	52 @ 1.416	179 @ 1.031	0.960	329.9	51912	NA	0.385	33
PAC-MX116	Honda	CRF450I	0.934	0.650	NA	42 @ 1.337	170 @ 0.902	0.850	294.3	46307	NA	0.435	30
PAC-MX117	Suzuki	RMZ450E	0.910	0.670	NA	28 @ 1.160	105 @ 0.760	0.705	192.5	50070	NA	0.400	20
PAC-MX118	Suzuki	RMZ450I	1.000	0.730	NA	37 @ 1.160	134 @ 0.760	0.710	242.5	48505	NA	0.400	25
PAC-MX119*	Yamaha	Rhino 700	1.055	0.515	NA	85 @ 1.250	195 @ 0.850	0.780	275.0	43565	NA	0.400	28
PAC-MX123	Suzuki	Hyabusa E	0.930	0.608	NA	47 @ 1.400	170 @ 1.000	0.920	308.0	44511	NA	0.400	38
PAC-MX126	Yamaha	YZF 450	0.856	0.600	NA	46 @ 1.370	143 @ 0.992	0.935	257.0	50681	NA	0.378	27
PAC-MX127	Yamaha	YZF 450	0.738	0.528	NA	37 @ 1.210	101 @ 0.847	0.822	176	54850	NA	0.363	16
Dual Springs													
PAC-MX219	Kawasaki	Teryx 750	1.010	0.740	0.580	80 @ 1.250	181 @ 0.850	0.760	252.5	39455	42170	0.400	35
PAC-MX222	Suzuki	Hyabusa I	0.963	0.707	0.523	70 @ 1.400	200 @ 1.000	0.900	325.0	48137	50551	0.400	42
PAC-MX224	Yamaha	Rhino 660	0.970	0.730	0.546	68 @ 1.150	173 @ 0.750	0.630	263.8	41279	54189	0.400	27
PAC-MX225	Polaris	RZR	1.125	0.841	0.657	80 @ 1.200	197 @ 0.800	0.650	292.5	44436	35571	0.400	37

* Beehive spring



SPRING CUPS, SEATS, AND SHIMS

CHROME MOLY SPRING CUPS (0.060 THICKNESS)

Part No.	Diameters (in.)		
	Diameter A (OD)	Diameter B (Spring ID)	Diameter C (ID)
PAC-C201	1.570	1.475	0.640
PAC-C202	1.625	1.525	0.640
PAC-C203	1.670	1.550	0.640
PAC-C204	1.670	1.575	0.640
PAC-C205	1.740	1.650	0.640
PAC-C206	1.740	1.675	0.640
PAC-C207	1.780	1.695	0.640
PAC-C208	1.825	1.725	0.640
PAC-C209	1.740	1.650	0.570
PAC-C210	1.740	1.675	0.570
PAC-C211	1.780	1.695	0.570
PAC-C212	1.825	1.725	0.570

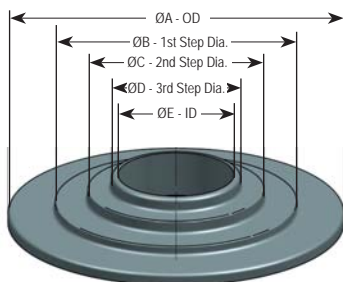
CHROME MOLY SPRING SEATS (0.060 THICKNESS)

Part No.	Diameters (in.)		
	Diameter A (OD)	Diameter B (Spring ID)	Diameter C (ID)
PAC-S101	1.550	0.855	0.575
PAC-S102	1.550	0.855	0.635
PAC-S103	1.550	0.770	0.575
PAC-S104	1.550	0.770	0.635
PAC-S105	1.550	0.700	0.575
PAC-S106	1.550	0.700	0.635
PAC-S107	1.625	0.760	0.635
PAC-S108	1.625	0.760	0.575
PAC-S109	1.650	0.630	0.570
PAC-S110	1.500	0.715	0.570
PAC-S111	1.270	0.870	0.570
PAC-S112	1.450	0.980	0.570
PAC-S113	1.450	0.980	0.630
PAC-S114	1.450	0.700	0.570
PAC-S115	1.450	0.700	0.630
PAC-S116	1.550	1.120	0.630
PAC-S117	1.550	0.730	0.575
PAC-S118	1.550	0.730	0.630
PAC-S119	1.550	0.800	0.575
PAC-S120	1.550	0.800	0.630
PAC-S121	1.270	0.640	0.520
PAC-S126	1.500	0.715	0.630
PAC-S127	1.500	0.715	0.630**
PAC-S128	1.270	0.600	0.520
PAC-S129	1.270	0.680	0.520
PAC-S130	1.550	0.820	0.575
PAC-S131	1.550	0.820	0.630
PAC-S132	1.100	0.580	0.510**
PAC-S133	1.650	0.630	0.570**
PAC-S134	1.500	0.715	0.570**

STEP SEATS For Use w/600 Series Retainers

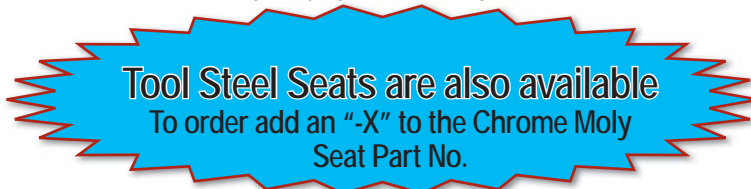
Part No.	Diameters (in.)				
	Diameter A (OD)	Diameter B (1st Step Dia.)	Diameter C (2nd Step Dia.)	Diameter D (3rd Step Dia.)	Diameter E (ID)
PAC-S122	1.500	1.040	0.715	N/A	0.570
PAC-S123	1.650	1.185	0.865	0.635	0.570
PAC-S124	1.550	1.140	0.730	N/A	0.570
PAC-S125	1.270	0.880	0.640	N/A	0.520

Note: PAC-S122, PAC-S124, and PAC-S125 have only (2) steps.



Step Seat

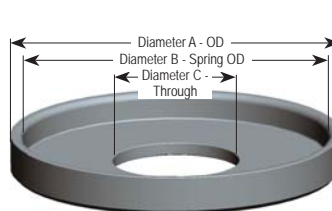
** 0.030 thick seats. These are a great way to get more installed height.



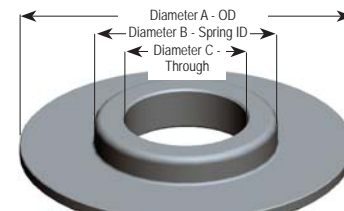
SPRING SHIMS

Hardened spring shims are critical to achieving the correct spring installed height. PAC has several sizes to choose to set it correctly.

Part No.	Outside Diameter (in)	Inside Diameter (in)	Thickness (in)
PAC-S184	1.500	0.570	0.050
PAC-S185	1.500	0.570	0.030
PAC-S186	1.500	0.570	0.020
PAC-S187	1.500	0.570	0.015
PAC-S188	1.250	0.570	0.050
PAC-S189	1.250	0.570	0.030
PAC-S190	1.250	0.570	0.020
PAC-S191	1.250	0.570	0.015
PAC-S192	1.500	0.645	0.050
PAC-S193	1.500	0.645	0.030
PAC-S194	1.500	0.645	0.020
PAC-S194	1.500	0.645	0.015
PAC-S196	1.620	0.645	0.050
PAC-S197	1.620	0.645	0.030
PAC-S198	1.620	0.645	0.020
PAC-S199	1.620	0.645	0.015



Chrome Moly Spring Cup



Chrome Moly Spring Seat

The following kits contain 16 pcs each of 0.015, 0.020, 0.030 and 0.050 thick shims for precise adjustment of the spring installed height.

Part No.	Description	
PAC-KS91	1.620 Dia shim kit -(64 pcs total)	0.645 I.D.
PAC-KS92	1.500 Dia shim kit -(64 pcs total)	0.645 I.D.
PAC-KS93	1.250 Dia shim kit -(64 pcs total)	0.570 I.D.
PAC-KS94	1.500 Dia shim kit -(64 pcs total)	0.570 I.D.

SPRING RETAINERS



PAC offers a full line of matching retainers, seats, and cups for PAC Valve Springs. They are specifically matched with radii and diameters to optimize the performance of the valvetrain.

300 Series Spring Retainers

These retainers are made from 4140 chrome moly steel, primarily designed for smaller beehive springs. These retainers are heat treated, black oxide finished and processed to maintain high strength with lightweight designs.

300 Series Chrome Moly Steel

Part No.	Retainer Dimensions (in.)				Lock Angle (deg.)	Weight (grams)	Notes and Applications *other applications may apply call for tech support
	Diameter A	Diameter B	Diameter C	Diameter D			
Beehive 300 Series							
PAC-R310	1.035	0.640	N/A	N/A	10	10.2	Beehive retainer for 1215, 1218, 1219, 1220, 1283, 1286 and more
PAC-R311	1.035	0.640	N/A	N/A	LS (7°)	10.4	Steel Beehive LS Retainer for 1218 and more
PAC-R312	0.865	0.570	N/A	N/A	7	7.7	Ford (FMOD)
PAC-R313	1.115	0.721	N/A	N/A	10	11.6	Beehive retainer for 1255, 1295 and more
PAC-R331	0.800	0.500	N/A	N/A	7	5.4	Ford (FMOD)
PAC-R333	0.875	0.640	N/A	N/A	STD 7	6.3	Super Stock Only
PAC-R342	0.865	0.580	N/A	N/A	6	9.2	V-Rod
PAC-R346	0.800	0.495	N/A	N/A	7	5.5	Ford (FMOD) plus 0.060 installed height
Dual Spring 300 Series							
PAC-R315	1.475	1.110	0.710	N/A	STD 10	26.3	Steel retainer for Marine applications
PAC-R316	1.235	0.880	0.640	N/A	LS (7°)	19.3	Steel LS retainer for 1221,1521
PAC-R317	1.325	0.990	0.700	N/A	STD 10	17.0	Steel retainer for 1371
PAC-R334	1.200	0.850	0.600	N/A	7	17.0	Steel retainer for 1202,1203
PAC-R335	1.300	0.940	0.680	N/A	LS (7°)	20.0	Steel retainer for LS RPM Series Duals
PAC-R348	1.360	0.985	0.690	N/A	mini 8	15.1	Steel retainer for 1371 Spring
PAC-R349	1.200	0.775	N/A	N/A	STD 8	10.9	Steel retainer for 1200-1201

400 Series Spring Retainers

PAC-Tuff™ Retainers are made from the best 6AL4V Titanium alloy and completely sonic tested to aerospace standards prior to being machined. These retainers are designed for standard to high durability use and are designed to be very robust.

400 Series PAC-TUFF 64 Titanium

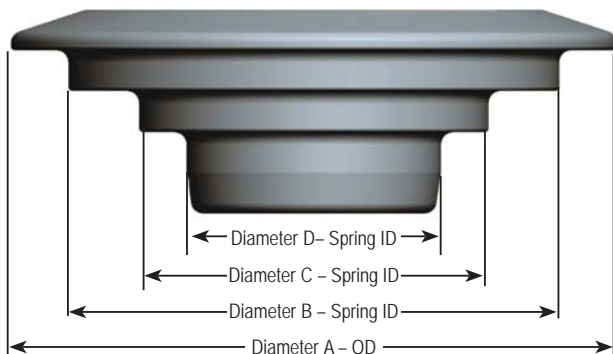
Part No.	Retainer Dimensions (in.)				Lock Angle (deg.)	Weight (grams)	Notes and Applications *other applications may apply call for tech support
	Diameter A	Diameter B	Diameter C	Diameter D			
Beehive 400 Series							
PAC-R442	0.865	0.580	N/A	N/A	6	5.2	V-Rod
PAC-R445	0.825	0.565	N/A	N/A	6	4.8	V-Rod Destroyer
Dual Spring 400 Series							
PAC-R404	1.480	1.165	0.840	N/A	STD 10	18.8	+0.050 Sportsman Drag Race/Circle Track
PAC-R405	1.450	1.090	0.780	N/A	STD 10	16.6	+0.050 Sportsman Drag Race/Circle Track
PAC-R416	1.235	0.880	0.640	N/A	LS (7°)	10.9	Titanium LS retainer for 1221,1521
PAC-R432	1.200	0.890	0.600	N/A	Mini 8	10.4	Titanium LS retainer for 1530,1335
PAC-R435	1.300	0.940	0.680	N/A	LS (7°)	11.1	Titanium retainer for LS RPM Series Duals
PAC-R439	1.075	0.800	0.575	N/A	7	7.8	Titanium Ford (FMOD) for 1512 spring
PAC-R450	1.240	0.940	0.685	N/A	Mini 8	11.7	RPM Series Dual Springs (mini 8 Locks)
Triple Spring 400 Series							
PAC-R401	1.480	1.185	0.865	0.635	STD 10	17.9	+0.050 Sportsman Triple Spring Drag Race
PAC-R402	1.480	1.185	0.865	0.635	STD 8	18.1	+0.050 Sportsman Triple Spring Drag Race

PAC RACING SPRINGS CAN CUSTOM MANUFACTURE RETAINERS, SEATS, AND CUPS TO ANY SPECIFICATIONS. CALL FOR MORE INFORMATION.

500 Series Spring Retainers

Titanium spring retainers made from Ti-17 alloy. This alloy has shown greater tensile properties over other titanium products with its high strength and deep hardening alloys. These retainers are micropolished for enhanced fatigue life and are laser engraved for PN and batch identification.

500 Series Ti-17 Titanium							
Part No.	Retainer Dimensions (in.)				Lock Angle (deg.)	Weight (grams)	Notes and Applications *other applications may apply call for tech support
	Diameter A	Diameter B	Diameter C	Diameter D			
Beehive 500 Series							
PAC-R510	0.990	0.640	N/A	N/A	10	5.7	Beehive retainer for 1215, 1218, 1219, 1220, 1283, 1286 and more
PAC-R511	0.990	0.640	N/A	N/A	LS (7°)	5.7	Titanium Beehive LS Retainer for 1218 and more
PAC-R512	0.865	0.570	N/A	N/A	7	5.3	Ford (FMOD)
PAC-R513	1.115	0.721	N/A	N/A	10	7.7	Beehive retainer for 1255, 1295 and more
Dual Spring 500 Series							
PAC-R504	1.475	1.165	0.840	N/A	STD 10	17.0	Ti retainer for 1.175 Series Dual Springs
PAC-R505	1.400	1.090	0.780	N/A	STD 10	15.0	Ti retainer for 1225,1325,1243,1561 Dual Springs
PAC-R506	1.400	1.090	0.695	N/A	STD 10	14.4	Ti retainer for 1226,1326 Dual Springs
PAC-R507	1.475	1.165	0.760	N/A	STD 10	16.5	Ti retainer for 1298, 1299 Dual springs
PAC-R508	1.365	1.040	0.715	N/A	STD 10	12.9	Ti retainer for all 1.050 ID Dual Springs
PAC-R509	1.365	1.040	0.715	N/A	STD 8	12.9	Ti retainer for all 1.050 ID Dual Springs
PAC-R514	1.475	1.140	0.735	N/A	STD 10	14.8	Ti retainer for 1385,1395 Dual springs
PAC-R515	1.475	1.110	0.710	N/A	STD 10	14.4	Ti retainer for 1227,1239,1254,1297,1509, Dual Springs
PAC-R516	1.235	0.880	0.640	N/A	LS (7°)	7.7	Ti retainer for LS Dual Springs, 1221,1521
PAC-R517	1.325	0.990	0.700	N/A	STD 10	11.8	Ti retainer for 1371 Dual Spring
PAC-R519	1.475	1.140	0.735	N/A	STD 8	14.7	Ti retainer for 1385,1395 Dual springs
PAC-R532	1.200	0.890	0.600	N/A	Mini 8	10.2	Ti retainer for 1530,1335 Dual springs
PAC-R536	1.450	1.125	0.800	N/A	STD 10	15.9	Ti retainer for 1245,1289 Dual springs
PAC-R537	1.475	1.140	0.815	N/A	STD 8	15.8	Ti retainer for 1342,1386,1396 Dual springs
PAC-R538	1.475	1.140	0.815	N/A	STD 10	17.3	Ti retainer for 1342,1386,1396 Dual springs
PAC-R540	1.400	1.080	0.770	N/A	STD 8	14.1	Ti retainer for 1240,1340,1540 Dual spring
PAC-R541	1.400	1.090	0.695	N/A	STD 8	13.2	Ti retainer for 1226, 1326, Dual Springs
PAC-R544	1.365	1.040	0.715	N/A	Mini 8	14.2	Ti retainer for all 1.050 ID Dual Springs (mini 8 Locks)
PAC-R547	1.450	1.060	0.735	N/A	STD 8	17.0	Ti retainer for 1370 Dual Drag Race Spring
PAC-R550	1.240	0.940	0.685	N/A	Mini 8	11.7	RPM Series Dual Springs (mini 8 Locks)
PAC-R551	1.450	1.110	0.785	N/A	STD 8	16.8	Titanium Retainer for 1244 Dual spring
PAC-R552	1.360	0.985	0.680	N/A	Mini 8	13.1	Titanium Retainer for 1371,1575 Dual spring
PAC-R553	1.440	1.070	0.750	N/A	STD 8	15.8	Titanium Retainer for 1574 Dual spring
Triple Spring 500 Series							
PAC-R501	1.475	1.185	0.865	0.635	STD 10	16.6	Titanium Retainer for Triple Drag Race Springs
PAC-R502	1.475	1.185	0.865	0.635	STD 8	16.6	Titanium Retainer for Triple Drag Race Springs
PAC-R503	1.490	1.215	0.865	0.635	STD 10	17.2	Titanium Retainer for 1362,1363,1366 Triple Drag Springs
Solid Stop Retainers <i>These retainers feature a detent at the bottom of the cone to mechanically stop locks from pulling through</i>							
PAC-R520	1.325	1.040	0.715	N/A	10	16.0	Standard Duty for Sportsman Racers
PAC-R521	1.325	1.040	0.715	N/A	8	15.8	Standard Duty for Sportsman Racers
PAC-R522	1.480	1.180	0.865	0.635	10	19.4	Heavy Duty Top for abusive Top Alcohol Engines-Triple
PAC-R523	1.480	1.180	0.865	0.635	8	19.4	Heavy Duty Top for abusive Top Alcohol Engines-Triple
PAC-R524	1.380	1.040	0.715	N/A	10	16.7	Heavy Duty Top for abusive Top Alcohol Engines-Dual
PAC-R525	1.380	1.040	0.715	N/A	8	16.7	Heavy Duty Top for abusive Top Alcohol Engines-Dual
PAC-R526	1.365	1.040	0.715	N/A	TF7	17.8	This is for use in Top Fuel 7 Degree - Dual Spring
PAC-R527	1.480	1.180	0.865	0.630	TF7	21.0	This is for use in Top Fuel 7 Degree - Triple Spring



Ask about Custom and Private Label Retainers

SPRING RETAINERS (Cont'd.)

600 Series Spring Retainers

PACALLOY® BILLET TOOL STEEL RETAINERS – These are the latest developments from PAC Racing Springs. These retainers feature ultra lightweight designs from valve spring type alloys. Sophisticated processing such as micropolishing and Nano Peen™ technology are used to enhance the retainer life. The high hardness of the steel has higher wear resistance properties.

600 Series Tool Steel

Part No.	Retainer Dimensions (in.)				Lock Angle (deg.)	Weight (grams)	Notes and Applications *other applications may apply call for tech support
	Diameter A	Diameter B	Diameter C	Diameter D			
Beehive 600 Series <i>Some require special spring seats for proper installation</i>							
PAC-R633	0.875	0.640	N/A	N/A	7	6.0	Ultra Light Weight Steel for Super Stock 1409 Spring
PAC-R643	0.950	0.658	N/A	N/A	Mini 8	8.4	Ultra Light Weight Steel for Super Stock 1427 Spring
Dual Spring 600 Series <i>Some require special spring seats for proper installation</i>							
PAC-R606	1.400	1.090	0.695	N/A	STD 10	16.6	Tool Steel retainer for 1226,1326 Dual Springs
PAC-R608	1.350	1.040	0.715	N/A	STD 10	15.7	Tool Steel retainer for all 1.050 ID Dual Springs
PAC-R609	1.350	1.040	0.715	N/A	STD 8	15.9	Tool Steel retainer for all 1.050 ID Dual Springs
PAC-R614	1.450	1.140	0.735	N/A	STD 10	18.8	Tool Steel retainer for 1385,1395 Dual springs
PAC-R615	1.475	1.110	0.710	N/A	STD 10	21.8	Tool Steel retainer for 1227,1239,1254,1297,1509, Duals
PAC-R616	1.235	0.880	0.640	N/A	LS (7°)	12.6	Tool Steel retainer for LS Dual Springs, 1221,1521
PAC-R619	1.450	1.140	0.735	N/A	STD 8	17.8	Tool Steel retainer for 1385,1395 Dual springs
PAC-R635	1.200	0.940	0.685	N/A	LS (7°)	13.4	Light Weight Steel Version of R335 LS RPM Dual Spring
PAC-R641	1.400	1.090	0.695	N/A	STD 8	17.5	Tool Steel retainer for 1226, 1326,Dual Springs
PAC-R649	1.200	0.775	N/A	N/A	STD 8	8.6	Tool Steel retainer 1200-1201 spring
Triple Spring 600 Series <i>Some require special spring seats for proper installation</i>							
PAC-R601	1.450	1.185	0.865	0.635	10	19.1	Tool Steel Retainer for Triple Drag Race Springs
PAC-R602	1.440	1.185	0.865	0.635	8	19.3	Tool Steel Retainer for Triple Drag Race Springs

VALVE LOCKS

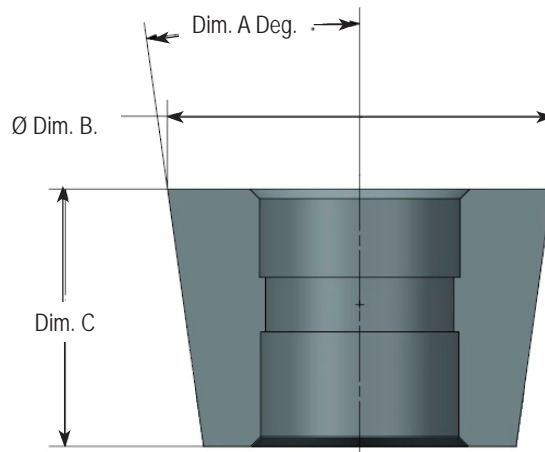
Part No.	Listed Valve Size	Type	Lock Angle	Valve Groove Type	Installation Height	Material
3/8" Valve Locks						
PAC-L8090	3/8	STD 10	10°	Square	STD	Titanium
PAC-L8091	3/8	STD 10	10°	Square	+0.050	Titanium
PAC-L8092	3/8	STD 10	10°	Square	STD	Steel
PAC-L8093	3/8	STD 10	10°	Square	+0.050	Steel
PAC-L8094	3/8	STD 8	8°	Square	STD	Titanium
PAC-L8095	3/8	STD 8	8°	Square	+0.050	Titanium
PAC-L8096	3/8	STD 8	8°	Square	STD	Steel
PAC-L8097	3/8	STD 8	8°	Square	+0.050	Steel
PAC-L8127	3/8	Mini 8	8°	Square	STD	Steel
PAC-L8128	3/8	Mini 8	8°	Square	+0.050	Steel

Part No.	Listed Valve Size	Type	Lock Angle	Valve Groove Type	Installation Height	Material
11/32" Valve Locks						
PAC-L8005	11/32	STD 10	10°	Square	0.000	Titanium
PAC-L8006	11/32	STD 10	10°	Radius	0.000	Titanium
PAC-L8007	11/32	STD 10	10°	Square	+0.050	Titanium
PAC-L8008	11/32	STD 10	10°	Radius	+0.050	Titanium
PAC-L8025	11/32	STD 10	10°	Square	0.000	Steel
PAC-L8026	11/32	STD 10	10°	Radius	0.000	Steel
PAC-L8027	11/32	STD 10	10°	Square	+0.050	Steel
PAC-L8028	11/32	STD 10	10°	Radius	+0.050	Steel
PAC-L8015	11/32	STD 8	8°	Square	0.000	Titanium
PAC-L8016	11/32	STD 8	8°	Radius	0.000	Titanium
PAC-L8017	11/32	STD 8	8°	Square	+0.050	Titanium
PAC-L8018	11/32	STD 8	8°	Radius	+0.050	Titanium
PAC-L8035	11/32	STD 8	8°	Square	0.000	Steel
PAC-L8036	11/32	STD 8	8°	Radius	0.000	Steel
PAC-L8037	11/32	STD 8	8°	Square	+0.050	Steel
PAC-L8038	11/32	STD 8	8°	Radius	+0.050	Steel
PAC-L8119	11/32	Mini 8	8°	Radius	STD	Titanium
PAC-L8121	11/32	Mini 8	8°	Square	STD	Titanium
PAC-L8131	11/32	Mini 8	8°	Radius	STD	Steel
PAC-L8132	11/32	Mini 8	8°	Radius	+0.050	Steel
PAC-L8133	11/32	Mini 8	8°	Square	STD	Steel
PAC-L8134	11/32	Mini 8	8°	Square	+0.050	Steel
PAC-L8146	11/32	STD 7°	7°	Square	STD	Steel
PAC-L8147	11/32	STD 7°	7°	Square	+0.050	Steel
PAC-L8154	11/32	STD 7°	7°	Radius	STD	Steel
PAC-L8155	11/32	STD 7°	7°	Radius	+0.050	Steel

VALVE LOCKS (Cont'd.)

Part No.	Listed Valve Size	Type	Lock Angle	Valve Groove Type	Installation Height	Material
5/16" Valve Locks						
PAC-L8045	5/16	STD 10	10°	Square	0.000	Titanium
PAC-L8046	5/16	STD 10	10°	Radius	0.000	Titanium
PAC-L8047	5/16	STD 10	10°	Square	+0.050	Titanium
PAC-L8048	5/16	STD 10	10°	Radius	+0.050	Titanium
PAC-L8064	5/16	STD 10	10°	Square	0.000	Steel
PAC-L8065	5/16	STD 10	10°	Radius	0.000	Steel
PAC-L8066	5/16	STD 10	10°	Square	+0.050	Steel
PAC-L8067	5/16	STD 10	10°	Radius	+0.050	Steel
PAC-L8055	5/16	STD 8	8°	Square	0.000	Titanium
PAC-L8056	5/16	STD 8	8°	Radius	0.000	Titanium
PAC-L8057	5/16	STD 8	8°	Square	+0.050	Titanium
PAC-L8058	5/16	STD 8	8°	Radius	+0.050	Titanium
PAC-L8073	5/16	STD 8	8°	Square	0.000	Steel
PAC-L8074	5/16	STD 8	8°	Radius	0.000	Steel
PAC-L8075	5/16	STD 8	8°	Square	+0.050	Steel
PAC-L8076	5/16	STD 8	8°	Radius	+0.050	Steel
PAC-L8123	5/16	Mini 8	8°	Radius	STD	Titanium
PAC-L8125	5/16	Mini 8	8°	Square	STD	Titanium
PAC-L8135	5/16	Mini 8	8°	Radius	STD	Steel
PAC-L8136	5/16	Mini 8	8°	Radius	+0.050	Steel
PAC-L8137	5/16	Mini 8	8°	Square	STD	Steel
PAC-L8138	5/16	Mini 8	8°	Square	+0.050	Steel
PAC-L8148	5/16	STD 7°	7°	Square	STD	Steel
PAC-L8149	5/16	STD 7°	7°	Square	+0.050	Steel
PAC-L8150	5/16	STD 7°	7°	Radius	STD	Steel
PAC-L8151	5/16	STD 7°	7°	Radius	+0.050	Steel
7mm Valve Locks						
PAC-L8078	7 mm	STD 10	10°	Radius	STD	Titanium
PAC-L8079	7mm	STD 10	10°	Radius	+0.050	Titanium
PAC-L8080	7mm	STD 10	10°	Radius	STD	Steel
PAC-L8081	7mm	STD 10	10°	Radius	+0.050	Steel
PAC-L8082	7mm	STD 8	8°	Radius	STD	Titanium
PAC-L8083	7mm	STD 8	8°	Radius	+0.050	Titanium
PAC-L8084	7mm	STD 8	8°	Radius	STD	Steel
PAC-L8085	7mm	STD 8	8°	Radius	+0.050	Steel
PAC-L8129	7mm	Mini 8	8°	Radius	STD	Titanium
PAC-L8130	7mm	Mini 8	8°	Radius	+0.050	Titanium

VALVE LOCK STANDARDS



VALVE LOCK STANDARDS			
Lock Type	Dim. A (Angle)	Dim. B (Cone Top)	Dim. C (Lock Height)
STD 10	10.00°	0.6100	0.400
STD 8	8.00°	0.6000	0.400
Mini 8	8.00°	0.5200	0.380
LS-1	7.00°	0.4700	0.300
STD 7°	7.00°	0.4950	0.360

See our new Lock Tool to help identify valve locks and angles located on page 21

LS ENGINE VALVE LOCKS

Part No.	Listed Valve Size	Type	Lock Angle	Valve Groove Type	Installation Height	Material
PAC-L8117	8mm	Mini 8	8°	Radius	STD	Titanium
PAC-L8118	8mm	Mini 8	8°	Radius	+0.050	Titanium
PAC-L8141	8mm	Mini 8	8°	Radius	STD	Steel
PAC-L8142	8mm	Mini 8	8°	Radius	+0.050	Steel
PAC-L8113	8mm	LS-1	7°	Radius	STD	Steel
PAC-L8114	8mm	LS-1	7°	Radius	+0.050	Steel
PAC-L8116	8mm	LS-1	7°	Radius	-0.050	Steel
PAC-L8152	8mm	STD 7	7°	Radius	STD	Steel
PAC-L8153	8mm	STD 7	7°	Radius	+0.050	Steel

VALVETRAIN TOOLS

SPRING INSTALLED HEIGHT GAGE

- Stainless steel construction for extremely long life.
- Non-magnetic to avoid pulling shims when using
- Increased accuracy and precision with finer pitch threads
- 2 models to choose from – one suited to beehive springs

- **PAC-T902** gage standard model
1.800 to 2.600 range
- **PAC-T901** gage is suited for small beehive retainers and short installed heights. 1.250 base diameter for springs 1.400 to 2.00 Range



PAC-T902 PAC-T901

CHECKING SPRINGS



PAC-T910
These lightweight springs are used for valvetrain mock-up 0.860 OD x 3.0 long. These springs are easily compressed by hand for ease of valvetrain setup and checking.

CALIBRATION SPRINGS



PAC-T900
Specially designed springs for calibrating spring testers.

These springs come complete with data sheets showing various loads at heights to check the accuracy of spring testers.



PAC-T940

DIGITAL GRAM SCALE

This small, inexpensive scale is extremely useful for weighing springs, retainers, locks or any of your valvetrain components. This scale is used regularly by PAC engineers.

- 1000 gram capacity
- Easy one-button calibration
- Stainless steel platform
- Backlit LCD display
- Powered by 2 AAA batteries (included)
- Auto-off timeout feature to save battery life

DIGITAL SPRING LOAD TESTER TWO MODELS TO CHOOSE FROM

These testers offer a full functioning digital load test capability. They utilize an electronic force transducer rather than an un-reliable spring scale, which changes with temperature. They have a two line backlit LCD display of force and length. Also included is a base deflection compensation module for accurate NIST capable readings. These units have rugged cast aluminum base and steel frame for mounting to any work bench. Height measurement uses a well engineered, hand operated rack and pinion mechanism, that allowing for ease of deflection measurement. Machines also come with the ability to lock the spring at a set height and mechanical overrides to prevent overload damage.

- Compression testing of force and length
- Tracking or peak modes (2,000 samples / sec)
- Load cell and frame deflection compensation
- Mechanical and software overload protection
- Built-in shunt calibration verification
- Digital calibration and linearization
- Standard 5" range
- Standard 5" stroke
- 2" Ø platform
- Up to 0.001" length resolution
- NIST traceable calibration
- Backlit digital LED display of force and length
- Wipe-clean embossed key faceplate
- Push-button force and length zeroing

Part No.	Load Capacity
PAC-T930	750
PAC-T935	1,500



THROTTLE SPRINGS

Part Number	Free Length	Tension
PAC-3001	2.500	Light
PAC-3002	2.500	Med
PAC-3003	2.500	Heavy
PAC-3004	3.750	Light
PAC-3005	3.750	Med
PAC-3006	3.750	Heavy
PAC-3007	5.000	Light
PAC-3008	5.000	Med



PAC throttle springs are designed and produced with extreme emphasis on safety. The ends of the springs are designed with larger radii so that stresses remain low and any danger of a broken spring is virtually eliminated. Don't trust a cheap hardware store spring when safety is concerned! PAC Racing Springs offer a variety of springs that are sure to fit any application.

THROTTLE SPRINGS BRACKETS

PAC has developed a throttle spring bracket kit for dominator carburetors. This kit is complete with a variety of springs to adjust throttle tension.



PAC-T950 LOCK AND RETAINER CONE IDENTIFICATION TOOL KIT

PAC Racing Springs has developed this tool for Racers and Engine builders to correctly identify lock angles and correct cones for the various locks and retainers. This tool has a combined lock standards guide and assorted lock standards to alleviate choosing the wrong locks with matching retainers.

This tool simply works by choosing the lock standard cone (laser marked and identified) and placing it on the easy to grip handle and inserting into current or new retainers. Use this tool if you don't know what angle you need and alleviate lost part number headaches. This information will help identify the correct parts and allow PAC Racing Associates to get you the correct parts

The PAC-T950 Kit comes with the following parts:

- PAC-T951 Aluminum knurled anodized handle
- PAC-T953 STD 7 Degree Street Lock cone (LT-1)
- PAC-T954 STD 8 Degree Cone (Also known as Super 7)
- PAC-T955 Mini 8 Degree Cone (Top Lock Design)
- PAC-T956 STD 10 Degree cone
- PAC-T958 LS Based 7 degree cone
- PAC-T959 Top Fuel 7 degree cone

Bolts to use with the handle

Allen Wrench to secure lock standards to handle



PAC RACING SPRINGS CUSTOM SPRINGS

There are many springs available from our listings catalog and many HP cam and valve companies. However, with the multitude of engines that are available and the different valvetrain configurations possible, it becomes very difficult to find the correct spring. PAC racing springs custom design and manufacturing services can produce a proprietary spring tailored specifically for your application.



PAC Racing spring is not limited to just valve springs. We have produced many HP racing clutch, throttle, oil pump and suspension springs. PAC is a leader in piston pin retaining ring production.

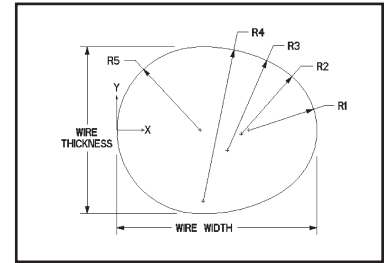
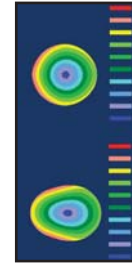
PAC Racing Springs has a wide range of capabilities through our connection to the automotive OEM market. We offer springs with wire diameters from 0.008 to 1.250 inches. Spring diameters can range from 0.024 to 18 inches with free lengths up to 8 feet long. Numerous processing methods and variations of peening, heat treating, nitriding and finishing work make PAC the leader in custom springs.



SPRING WIRE

PAC Racing Springs has many material options for wire chemistry and shape. We utilize all of the latest grades from Kobe steel in both round wire and multi-arc (ovate) sections.

PAC has many standard ovate sections readily available and custom sections can be produced from FEA analyzed sections.



Ovate wire analysis

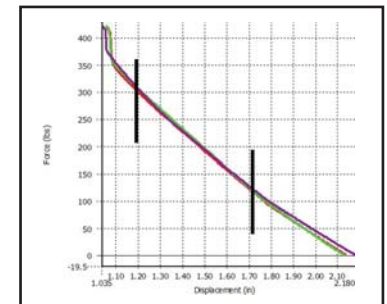
SPRING DESIGN

There is a vast number of ways to produce springs with characteristics that improve engine performance. The best way to start is with the custom design form or call PAC Racing Springs. Engineers at PAC will review the data and design unique and exact solutions for your spring requirements.

OPTIONS...OPTIONS...OPTIONS...

There are many options that PAC Racing can provide for custom springs beyond the design and wire:

- Processing:** The manufacturing process is designed to match with the life, stress and cost compromises.
- Finishing:** PAC has numerous finishing options such as polishing, Nano Peening® and identification.
- Packaging:** Many packaging options from individual to bulk and engine sets.
- Details:**
 - ID / OD chamfering
 - Tip conditioning
 - Tolerances – Coil bind height, loads, diameters, etc.
 - Documentation for wire, spring and assembly characteristics
- Spring Loads:** The loads of the springs can be tailored to specific applications high load versions (-H) and low load versions (-L) are available for various PN's. Call PAC for more details.



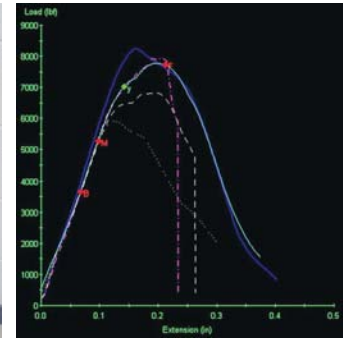
Load Testing



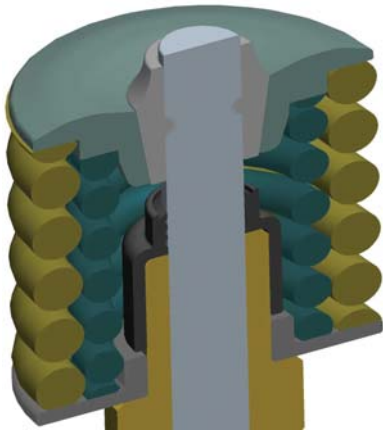
PAC RACING SPRINGS TECHNICAL INFORMATION

INSTALLED HEIGHT

With high rate springs that are used in today's engines, the installed height accuracy is more critical than ever. For example, a 0.015 difference in height on a 800 lb/in rate spring will have 12 lbs. of spring force variation. Measuring and setting the height to within 0.005 inches with PAC gages and shims will insure a smoother running valvetrain.

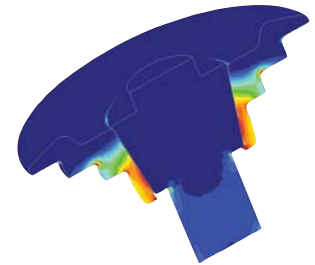


Retainer pull-through testing



COIL BIND CALCULATION EXAMPLE

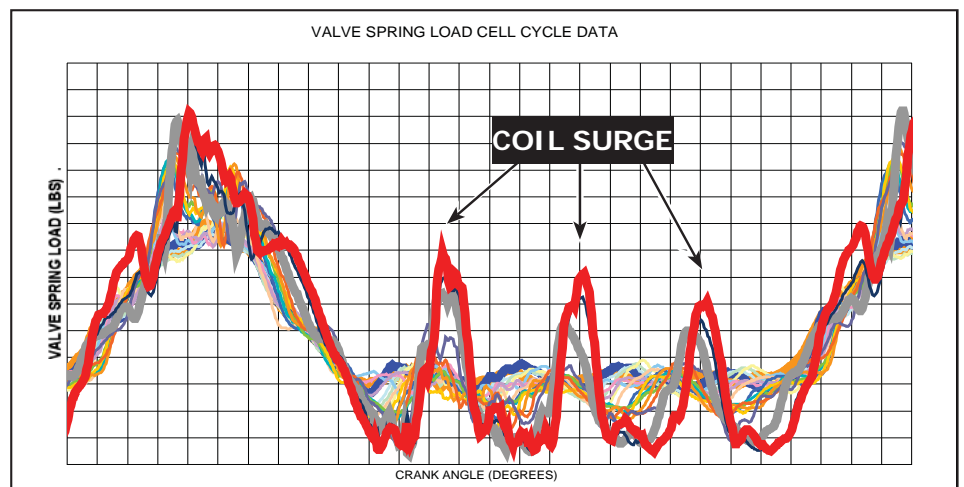
Installed height	1.950
Valve Lift (minus lash)	-0.785
Spring Coil Bind Height	<u>-1.105</u>
CLEARANCE	0.060



FEA analysis

COIL BIND CLEARANCE

This number is a valvetrain tuning parameter. Higher-revving engines generally run closer to bind to reduce valve spring surging. The close running of the spring coils to each other will inherently reduce the spring surging. The chart below illustrates the spring load from a load cell under the spring. The large fluctuations of load are from coil surging. This can reach very high loads and go to zero in the worst case. Valvetrain damage will result. This clearance relies heavily on the quality of valvetrain parts, measurement equipment and engine builder skill to be able to run close tolerances without going past bind.



Spring Design

Racing valve spring design is extremely complicated when the harmonics of high-speed valvetrain operations are applied. PAC has various valvetrain software analysis packages developed in-house to optimize the spring to suit high-speed operation.

One of the most successful methods is our Rapid Prototype Development (RPD) process of utilizing our in-house Spintron[®], with our coiling machines to produce a spring that provides superior dynamic valvetrain stability with actual on-engine hardware. This can be validated with high-speed video (see website for samples), load cells and other instrumentation.

Testing...Testing...Testing...

PAC Racing Springs has the most elaborate testing facility complete with a full metallurgical lab. Capabilities include electron microscope, XRD, metallography, tensile testing, fatigue, RBF, EDAX, impact as well as various forms of fatigue testing are used.



S.E.M.



Tensile Tester



XRD Tester

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CUSTOM VALVE SPRING DESIGN REQUEST FORM

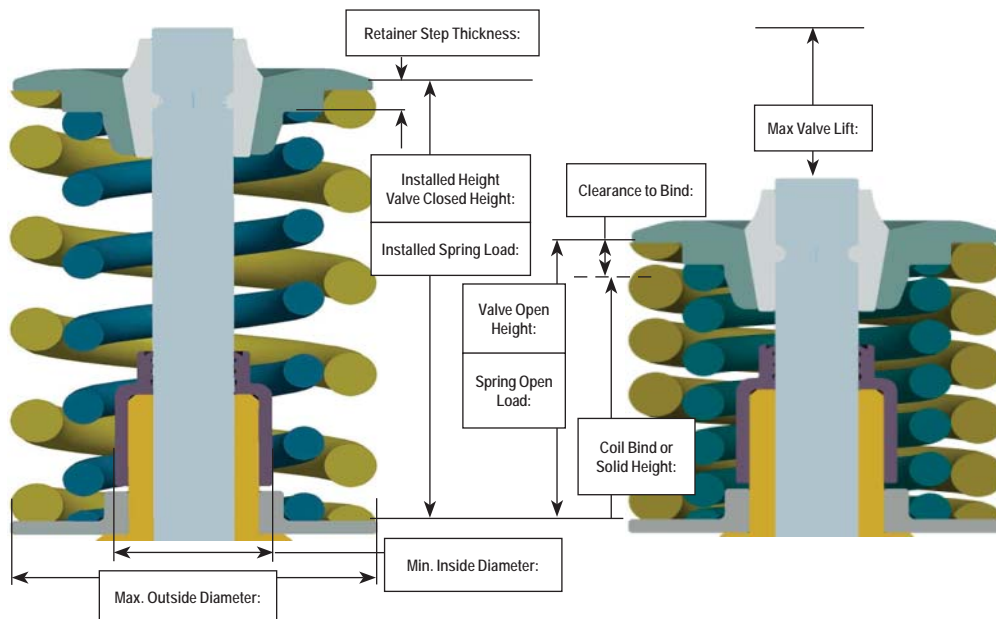
NAME _____
 COMPANY NAME _____
 ADDRESS _____
 ADDRESS _____
 CITY _____ STATE _____ ZIP CODE _____
 COUNTRY _____
 PHONE NUMBER _____
 FAX NUMBER _____
 EMAIL ADDRESS _____
 WEBSITE _____



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 Southfield, MI 48033
 1-866-799-9417

This is PAC's starting point to provide you the absolute best valve spring tailored completely to your engine application. Please fill this out as completely as possible. This information will be used by our engineering staff to design a spring that will provide a spring that will control the valve to the requested RPM while reducing operating stresses as much as possible. Please feel free to contact our staff for any assistance with this. All information provided will be held in the strictest confidence and will be completely proprietary to your company.

BASIC SPRING LAYOUT



This diagram is very general but the basic load, height and operating envelopes can be defined for most engine configurations

Other Requirements	
Chamfering	
Identification	
Tip Conditioning	
Load Tolerance	
Solid Height Tolerance	

What is the application: (Street, Drag, Oval, etc.)? _____
 What is the expected RPM Range? _____
 What is the expected life of the spring: (Race, Season, Cycles, etc.)? _____
 What type of springs is desired: (Single, Dual, Triple, Beehive, etc.)? _____
 Does this spring need to fit an existing retainer or seat? _____
 What is the current spring used for this application? _____
 What are the problems / issues with the current springs used? _____
 Any other comments: _____

Valvetrain Information: (if not proprietary)

Engine / type _____ Rocker arm ratio _____
 Cam lift / profile * _____ Rocker arm mass / stiffness _____
 Tappet mass _____ Retainer mass _____
 Pushrod mass _____ Valve stem lock mass _____

*We can accept many forms of lift / profile data – contact PAC Racing Springs for more detailed information.

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