



Master Product Catalog
VOLUME 24

Welcome to

FAC *Racing*



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**Chris Osborn
Winner**
**2023 U.S. Nationals
Top Sportsman**



WARNING

 This product contains chemicals known to the State of California to cause cancer and reproductive harm.
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PAC Racing Philosophy



About Us



PAC Racing Springs is a manufacturer of springs and valvetrain components. Over 100+ years of spring making heritages goes into making the superior springs for racing and aftermarket applications. PAC Racing Springs is located in Southfield Michigan.

Service Commitment

We understand the demands of racing and provide a commitment to all of our customers to provide the best service possible. We continue to expand products and offer expanded onsite technical services at various racing events. We believe these interactions allow us to provide the latest product advancement and respond to additional future requirements. Because we are the manufacturer, we are able to design, build and supply parts within days if needed.



Custom Products



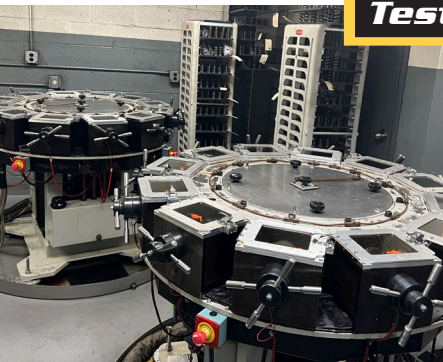
We believe in providing custom products for every product line. The philosophy is a premium choice to allow our customers an enhanced product or something unique to the application. Additional Private Label programs are available to many companies looking for their own brand identity and are typically for larger volume applications. We honor proprietary agreements and are dedicated to providing any aftermarket company a superior American made product at sustainable market pricing.

Technology

We can offer enhanced technology through engineering resources and expanded experience from all of our power-train engineers. Additionally, with over 100 years of manufacturing experience we continually improve our products to exceed demanding expectation.



Testing



Because of the extreme demands of racing, we routinely test all of our components using advanced testing technology. We have a fully accredited metallurgy lab with dedicated staff and equipment such as: SEM with EDAX, X-ray Diffraction, Micro Hardness, Impact Testing, and MTS Tensile Test machine. Additionally we are able to test functionality and fatigue properties in our Dynamics Laboratory, which includes a single post MTS Servo Hydraulic test machine, Various bench type equipment, and out High Tech Engine test lab. Whatever your application we strive to bring confidence that our products meet and exceed designed parameters.

Pride

- We are proud of our people that work at PAC Racing and in the culture we are building and growing.
- We are proud of the high quality product we produce, right here in the USA.
- We are proud to support our customers in their drive to succeed!



Passion

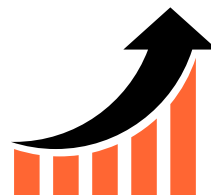
- We are passionate about our products and processes. Continually looking for better equipment, spring designs and manufacturing processing are what make us a leader in our market.
- We are passionate about racing. We support our customers through various major sponsorships, such as the NHRA contingency programs, and getting our hands dirty on site with your team.



Performance

We Expect to WIN

We have high expectations of performance from everyone on the PAC Racing Team and determined to provide the best possible product to our customers, whether that is the racer on the track or the next employees in the manufacturing process.



Intro

There are many springs available from our listings catalog and many High Performance 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's 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 High Performance racing clutch, throttle, oil pump and suspension springs. PAC is also a leader in piston pin retaining ring production.

PAC Racing Springs has a wide range of capabilities with numerous connections to OEM's and spring forming technologies. We can produce a wide range of springs with various wire sizes and spring diameters. Numerous processing methods and variations with shot peening, heat treating, nitriding and surface finishing 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 of valve spring steel in both round wire and multi-arc (ovate) sections. We carefully validate the quality and cleanliness of steel from mills worldwide.

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



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.





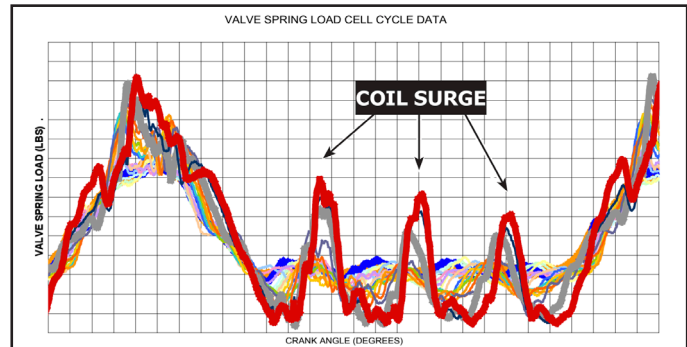
Options

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

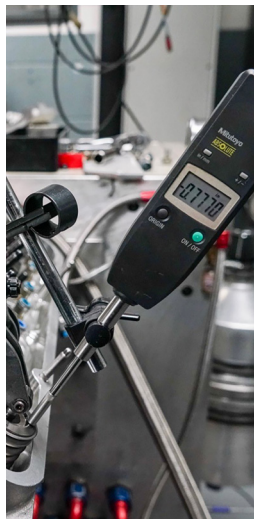
Processing	The manufacturing process is designed to match with the life, stress and cost compromises.
Finishing	PAC has numerous finishing options such as polishing, Nano Peening™ and identification.
Packaging	Many packaging options from individual to bulk and engine sets.
Details	<ul style="list-style-type: none"> • 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.

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.



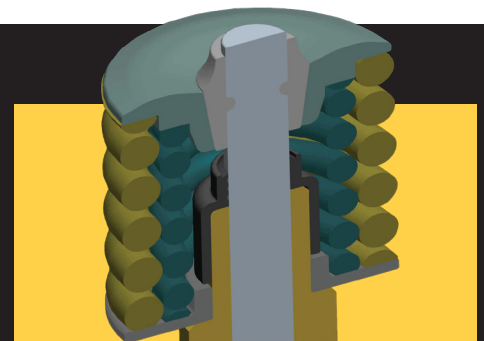
Installed Height Measurement



Actual Valve lift measurement (valve lashed)



Solid Height Measurement



Coil Bind Calculation Example

Measured Installation Height	1.980
Measured Valve Lift	-0.777
Measured Valve Spring Solid Height	-1.132
Actual Coil Bind Clearance	0.071

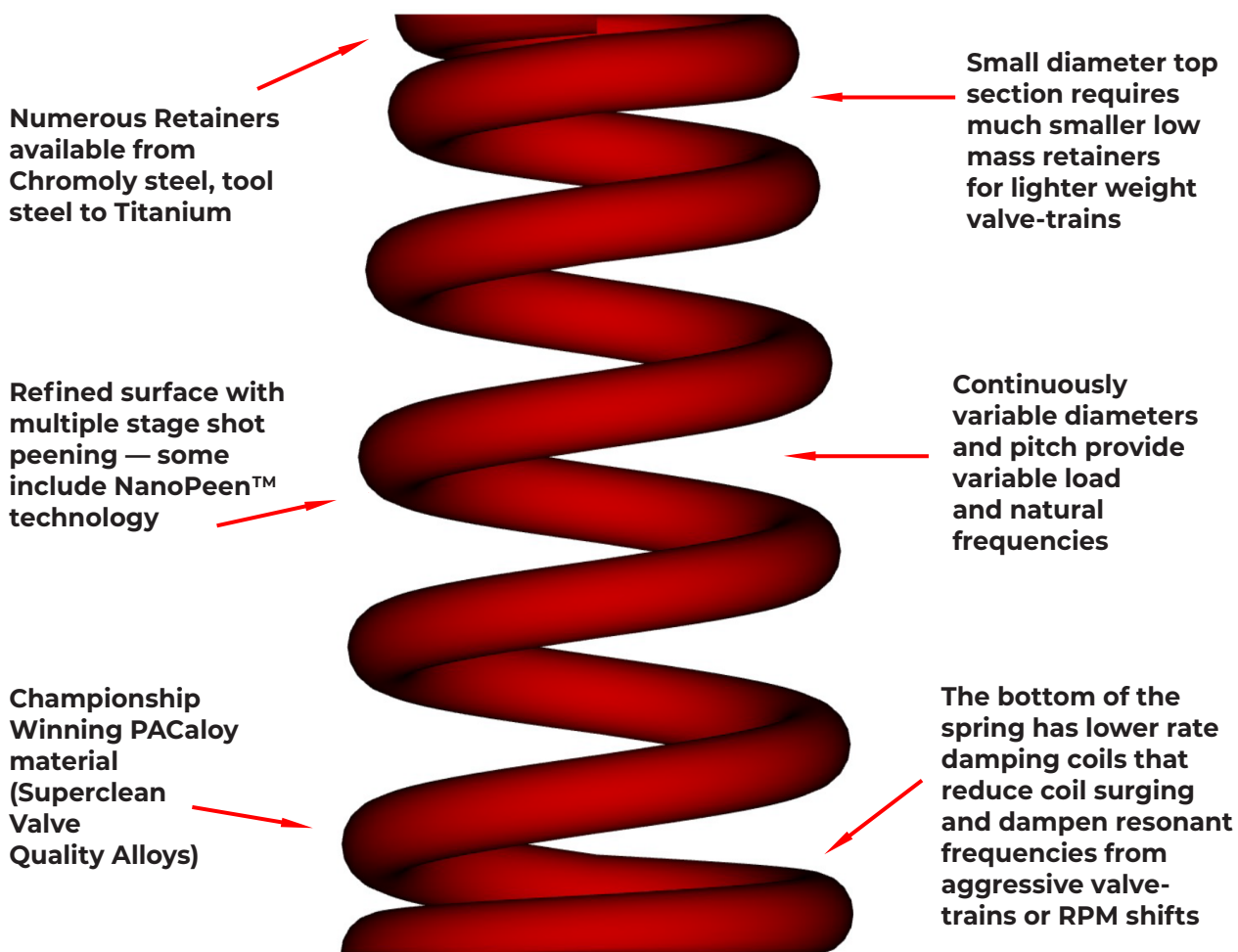


Conical Valve Springs

PAC Racing Springs technology and manufacturing to provide another option in the world of valve springs. Conical valve springs have continuously varying diameters from one of the spring to the other. This provides another spring option that continuously varies the loads and natural frequencies to control the engines valvetrain.

Conical springs provide more manufacturing challenges but can provide unique performance for various engine valvetrains.

PAC Racing Springs has several Conical spring PN's for various applications from hydraulic flat tappet to roller lifter applications.



Conical Valve Springs

Part No.	Spring Diameters				Spring Loads					Recommended Matching Components				Comments
	TOP OD	BOTTOM OD	TOP ID	BOTTOM ID	Installed Height (Valve Closed)	Open Load (Valve Open)	Spring Rate	Coil Bind	Max Lift	PAC 300 Series Retainers	PAC 500 Series Retainers	PAC 600 Series Retainers	PAC Spring Seats	
PAC-1421	1.012	1.305	0.650	0.943	150 @ 1.800	425 @ 1.170	437	1.047	0.670	R310, R311, R363	R510, R511	R633	PAC-S159	Conical Spring for Aggressive Hyd Roller and SFT Camshafts, Drop in for LS applications
PAC-1422	1.050	1.330	0.650	0.930	150 @ 1.900	505 @ 1.225	526	1.150	0.670	R310, R311, R363	R510, R511	R643	PAC-S160	Conical Spring for Aggressive Hyd Roller and SFT Camshafts, Drop in for Gen V Hemi
PAC-1423	1.072	1.307	0.650	0.885	160 @ 1.880	395 @ 1.230	362	1.136	0.660	R310, R311, R363	R510, R511	R633	PAC-S161	Gen V GM LT Engine Drop in Conical

SPECIFICATIONS: SPRING LOADS AND HEIGHTS

Part No.	PAC-1421	PAC-1422	PAC-1423
Mass (g)	67.8	64	83
Frequency	41174	30884	37896
Coil Bind	1.047	1.150	1.15
2.400			
2.350			
2.300			8
2.250			26
2.200			44
2.150		19	62
2.100	19	45	80
2.050	41	71	99
2.000	63	97	117
1.950	85	124	135
1.900	106	150	153
1.850	128	176	171
1.800	150	203	189
1.750	172	229	207
1.700	194	255	225
1.650	215	281	243
1.600	237	308	261
1.550	259	334	279
1.500	281	360	297
1.450	303	387	315
1.400	325	413	334
1.350	346	439	352
1.300	368	466	370
1.250	390	492	388
1.200	412	518	406
1.150	434	544	424
1.100	456		
1.050	477		
1.000	499		
0.950			
0.900			



1200 Series



Perfect for Sportsman Level Racing

The 1200 Series were developed for the sportsman racer looking for a quality but budget-minded product.

Part No.	Spring Diameters				Spring Loads					Recommended Matching Components				Comments
	OD Outer	ID Outer	ID Middle	ID Inner	Installed Height (Valve Closed)	Open Load (Valve Open)	Spring Rate	Max Coil Bind	Max Lift	PAC 400 Series Retainers	PAC 500 Series Retainers	PAC 600 Series Retainers	PAC Spring Seats	
PAC-1224	1.625	1.175	NA	0.851	275 @ 2.000	810 @ 1.150	629	1.100	0.850	R404	R504	NA	S101, S102	Bracket racing applications
PAC-1225	1.550	1.100	NA	0.788	250 @ 2.000	765 @ 1.200	644	1.150	0.800	R405	R505, R556	NA	S103, S104	Smaller diameter
PAC-1226	1.550	1.100	NA	0.788	275 @ 2.000	805 @ 1.200	663	1.150	0.800	NA	R506, R541	R606, R641, R661	S105, S106, S139	Smaller diameter
PAC-1228	1.625	1.175	NA	0.788	280 @ 2.100	847 @ 1.150	629	1.100	0.900	R404	R504	NA	S101, S102	Bracket racing application for higher lift and RPM requirements.
PAC-1246	1.645	1.195	0.871	0.635	250 @ 2.050	801 @ 1.250	689	1.130	0.800	R401, R402	R501, R502	R601, R602	S109	Bracket racing applications
PAC-1247	1.645	1.195	0.871	0.635	290 @ 2.070	835 @ 1.270	682	1.130	0.800	R401, R402	R501, R502	R601, R602	S109	Bracket racing applications
PAC-1248	1.645	1.195	0.871	0.635	332 @ 2.100	950 @ 1.200	687	1.130	0.900	R401, R402	R501, R502	R601, R602	S109	Bracket racing applications
PAC-1249	1.645	1.195	0.871	0.635	375 @ 2.200	1064 @ 1.200	689	1.130	1.000	R401, R402	R501, R502	R601, R602	S109	Bracket racing applications
PAC-1250	1.645	1.195	0.871	0.635	440 @ 2.200	1129 @ .200	689	1.130	1.000	R401, R402	R501, R502	R601, R602	S109	Bracket racing applications
PAC-1258	1.645	1.195	0.871	0.635	350 @ 2.150	1004 @ 1.200	688	1.130	0.950	R401, R402	R501, R502	R601, R602	S109	Bracket racing applications

Featuring:

- PACALOY Super Clean Wire to Ensure Satisfaction
- In House Heat Treating for the Best In Rate and Strength Benefits
- Multi Peen Process to Optimize Service Life



1200 Series

SPECIFICATIONS: SPRING LOADS AND HEIGHTS

Part No.	PAC-1224	PAC-1225	PAC-1226	PAC-1228	PAC-1246	PAC-1247	PAC-1248	PAC-1249	PAC-1250	PAC-1258
Mass (g)	152	152	158	152	183	183	183	183	183	183
Outer Freq	28793	29368	29368	28793	27188	27188	27188	27188	27306	27188
Middle Freq	NA	NA	Damper	NA	26867	26867	26867	26867	26945	26867
Inner Freq	27275	28294	28434	27275	28392	28392	28392	28392	28421	28392
Coil Bind	1.100	1.150	1.150	1.100	1.130	1.130	1.130	1.130	1.130	1.130
2.850									3	
2.800									27	
2.750								11	61	
2.700								41	96	3
2.650								75	130	13
2.600							8	109	164	40
2.550				2		0	23	144	199	75
2.500				28		11	57	178	233	109
2.450			4	60	5	31	92	213	268	144
2.400	23	5	15	91	20	65	126	247	302	178
2.350	55	25	46	123	43	99	160	282	337	212
2.300	86	57	76	154	78	133	195	316	371	247
2.250	118	89	109	186	112	167	229	351	406	281
2.200	149	121	142	217	147	201	263	385	440	316
2.150	181	153	176	249	181	236	298	419	475	350
2.100	212	186	209	280	216	270	332	454	509	384
2.050	244	218	242	311	250	304	366	488	543	419
2.000	275	250	275	343	284	338	401	523	578	453
1.950	306	282	308	374	319	372	435	557	612	488
1.900	338	314	341	406	353	406	469	592	647	522
1.850	369	347	374	437	388	440	504	626	681	557
1.800	401	379	407	469	422	474	538	661	716	591
1.750	432	411	441	500	457	508	572	695	750	625
1.700	464	443	474	532	491	542	607	730	785	660
1.650	495	475	507	563	526	576	641	764	819	694
1.600	527	507	540	595	560	610	675	798	853	729
1.550	558	540	573	626	594	644	710	833	888	763
1.500	590	572	606	658	629	678	744	867	922	798
1.450	621	604	639	689	663	712	778	902	957	832
1.400	653	636	672	721	698	746	813	936	991	866
1.350	684	668	706	752	732	781	847	971	1026	901
1.300	716	701	739	784	767	815	881	1005	1060	935
1.250	747	733	772	815	801	849	916	1040	1095	970
1.200	779	765	805	846	835	883	950	1074	1129	1004
1.150	810	797	838	878	870	917	984	1108	1164	1038
1.100	841			909					668	

Drag Race Dual Springs

1300 Series

Enhanced for Extreme Demand Applications



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.

Part No.	Spring Diameters			Spring Loads	
	OD Outer	ID Outer	ID Inner	Installed Height (Valve Closed)	Open Load (Valve Open)
PAC-1312	1.106	0.810	0.574	150 @ 1.700	430 @ 1.000
PAC-1312L	1.106	0.810	0.574	110 @ 1.550	330 @ 1.000
PAC-1321	1.522	1.050	0.710	400 @ 2.250	1320 @ 1.300
PAC-1322	1.536	1.050	0.710	425 @ 2.300	1463 @ 1.300
PAC-1323	1.551	1.065	0.725	525 @ 2.350	1510 @ 1.300
PAC-1324	1.625	1.175	0.851	275 @ 2.000	810 @ 1.150
PAC-1328	1.625	1.175	0.851	280 @ 2.100	847 @ 1.150
PAC-1329	1.500	1.050	0.726	345 @ 2.100	1047 @ 1.200
PAC-1330	1.500	1.050	0.726	275 @ 2.050	938 @ 1.200
PAC-1331	1.514	1.050	0.726	425 @ 2.200	1288 @ 1.200
PAC-1332	1.514	1.050	0.726	350 @ 2.100	1127 @ 1.200
PAC-1333	1.274	0.900	0.616	245 @ 1.800	750 @ 1.050
PAC-1334	1.300	0.900	0.630	255 @ 1.800	810 @ 1.050
PAC-1335	1.300	0.900	0.616	250 @ 1.800	860 @ 1.050
PAC-1336	1.514	1.050	0.726	475 @ 2.200	1338 @ 1.200
PAC-1354	1.550	1.050	0.726	425 @ 2.300	1440 @ 1.300
PAC-1354L	1.550	1.050	0.726	525 @ 2.100	1342 @ 1.300
PAC-1355	1.500	1.050	0.726	420 @ 2.175	1200 @ 1.175
PAC-1355H	1.500	1.050	0.726	440 @ 2.200	1220 @ 1.200
PAC-1356	1.500	1.050	0.726	300 @ 2.100	1002 @ 1.200
PAC-1357	1.500	1.050	0.726	375 @ 2.150	1116 @ 1.200
PAC-1359	1.522	1.050	0.726	375 @ 2.200	1200 @ 1.300
PAC-1360	1.522	1.050	0.726	400 @ 2.250	1252 @ 1.300
PAC-1361	1.536	1.050	0.726	425 @ 2.300	1389 @ 1.300
PAC-1361H	1.536	1.050	0.726	491 @ 2.300	1455 @ 1.300
PAC-1370	1.550	1.065	0.740	555 @ 2.350	1433 @ 1.300

Featuring:

- PACALOY Super Clean Wire To Ensure Satisfaction
- In House Heat Treating for the Best In Rate and Strength Benefits
- Multi Peen Process to Optimize Service Life
- ID/OD Chamfer Finishing
- Polishing to Improve Operating Cycles
- Nano-Peen™ Proprietary Surface Treatment



1300 Series

Part No.	Spring Rate	Max Coil Bind	Max Lift	Recommended Matching Components				Comments
				PAC 400 Series Retainers	PAC 500 Series Retainers	PAC 600 Series Retainers	PAC Spring Seats	
PAC-1312	400	0.850	0.700	R439	R539	NA	S132	FMOD 4.6L 4V
PAC-1312L	400	0.850	0.550	R439	R539	NA	S132	Low load version of PAC-1312
PAC-1321	968	1.192	0.950	R408	R508, R509, R544	R608, R609, R644	S110, S126, S134, S132	T AFC and Pro-Mod alcohol engines
PAC-1322	1038	1.215	1.000	R408	R508, R509, R544	R608, R609, R644	S110, S126, S134, S132	T AFC and Pro-Mod alcohol engines
PAC-1323	938	1.200	1.050	R408	R508, R509, R544	R608, R609, R644	S110, S126, S134, S132	High lift aggressive applications
PAC-1324	629	1.100	0.850	R404	R504	NA	S101, S102	Bracket racing and high lift applications
PAC-1328	629	1.100	0.950	R404	R504	NA	S101, S102	Bracket racing and high lift applications
PAC-1329	780	1.130	0.900	R408	R508, R509, R544	R608, R609, R644	S110, S126, S134, S132	Comp and Super Stock engines
PAC-1330	780	1.130	0.850	R408	R508, R509, R544	R608, R609, R644	S110, S126, S134, S132	Comp and Super Stock engines
PAC-1331	863	1.160	1.000	NA	R508, R509, R544	R608, R609, R644	S110, S126, S134, S132	High rate for aggressive valvetrains and RPM
PAC-1332	863	1.160	0.900	408	R508, R509, R544	R608, R609, R644	S110, S126, S134, S132	Comp and Super Stock engines
PAC-1333	673	0.971	0.750	R432	R532	R632	S128, S138	LS Solid Roller
PAC-1334	740	0.973	0.750	R432	R532	R632	S128, S138	LS Solid Roller
PAC-1335	813	0.985	0.800	R432	R532	R632	S128, S138	High lift LS applications
PAC-1336	863	1.161	1.000	R408	R508, R509, R544	R608, R609, R644	S110, S126, S134, S132	T AFC and Pro-Mod alcohol engines
PAC-1354	1015	1.230	0.800	R408	R508, R509, R544	R608, R609, R644	S110, S126, S134, S132	High rate for aggressive valvetrains and RPM
PAC-1354L	1015	1.230	1.000	R408	R508, R509, R544	R608, R609, R644	S110, S126, S134, S132	Low load version of PAC-1354
PAC-1355	780	1.130	1.000	R408	R508, R509, R544	R608, R609, R644	S110, S126, S134, S132	T AFC and Pro-Mod alcohol engines
PAC-1355H	780	1.130	1.000	R408	R508, R509, R544	R608, R609, R644	S110, S126, S134, S132	T AFC and Pro-Mod alcohol engines
PAC-1356	780	1.130	0.900	R408	R508, R509, R544	R608, R609, R644	S110, S126, S134, S132	Comp and Super Stock engines
PAC-1357	780	1.130	0.950	R408	R508, R509, R544	R608, R609, R644	S110, S126, S134, S132	Comp and Super Stock engines
PAC-1359	895	1.190	0.900	R408	R508, R509, R544	R608, R609, R644	S110, S126, S134, S132	T AFC and Pro-Mod alcohol engines
PAC-1360	895	1.190	0.950	R408	R508, R509, R544	R608, R609, R644	S110, S126, S134, S132	T AFC and Pro-Mod alcohol engines
PAC-1361	964	1.215	1.000	R408	R508, R509, R544	R608, R609, R644	S110, S126	High lift applications
PAC-1361H	964	1.215	1.000	R408	R508, R509, R544	R608, R609, R644	S134, S132, S110, S126	A higher load version of 1361
PAC-1370	836	1.230	1.050	NA	R547	NA	S134, S132	High lift applications



Drag Race Dual Springs

1300 Series

SPECIFICATIONS: SPRING LOADS AND HEIGHTS

Part No.	PAC-1312	PAC-1312L	PAC-1321	PAC-1322	PAC-1323	PAC-1324	PAC-1328	PAC-1329	PAC-1330	PAC-1331	PAC-1332	PAC-1333	PAC-1334
Mass (g)	54	54	160	166	166	152	152	144	144	151	151	89	93
Outer Freq	37229	37233	33105	34042	31858	28793	28793	30568	30568	32885	32885	35938	40679
Inner Freq	42789	42792	38081	38082	33561	27275	27275	35649	35649	35649	35649	44180	38918
Coil Bind	0.850	0.850	1.192	1.215	1.200	1.100	1.100	1.130	1.130	1.150	1.150	0.971	0.973
2.900					22								
2.850					56								
2.800				17	103								
2.750			8	50	150					2			
2.700			37	83	197					30			
2.650			67	117	244					59			
2.600			97	150	290					87			
2.550			127	183	337		2	19		123	13		
2.500			158	218	384		28	43		166	42		
2.450			206	270	431		60	77		209	70		
2.400			255	322	478	23	91	116	22	252	98		
2.350			303	373	525	55	123	155	46	296	134		
2.300			352	425	572	86	154	194	80	339	177		
2.250			400	477	619	118	186	233	119	382	220		
2.200			448	529	666	149	217	272	158	425	264	18	
2.150	5		497	581	713	181	249	311	197	468	307	37	3
2.100	16		545	633	760	212	280	350	236	511	350	56	33
2.050	27		594	685	806	244	311	389	275	554	393	77	70
2.000	39		642	737	853	275	343	428	314	598	436	110	107
1.950	50		691	788	900	306	374	467	353	641	479	144	144
1.900	70		739	840	947	338	406	506	392	684	523	178	181
1.850	90	7	787	892	994	369	437	545	431	727	566	211	218
1.800	110	18	836	944	1041	401	469	584	470	770	609	245	255
1.750	130	30	884	996	1088	432	500	623	509	813	652	279	292
1.700	150	50	933	1048	1135	464	532	662	548	856	695	312	329
1.650	170	70	981	1100	1182	495	563	701	587	900	738	346	366
1.600	190	90	1029	1152	1229	527	595	740	626	943	782	380	403
1.550	210	110	1078	1204	1275	558	626	779	665	986	825	413	440
1.500	230	130	1126	1255	1322	590	658	818	704	1029	868	447	477
1.450	250	150	1175	1307	1369	621	689	857	743	1072	911	481	514
1.400	270	170	1223	1359	1416	653	721	896	782	1115	954	514	551
1.350	290	190	1272	1411	1463	684	752	935	821	1159	997	548	588
1.300	310	210	1320	1463	1510	716	784	974	860	1202	1041	582	625
1.250	330	230	1368	1515	1557	747	815	1013	899	1245	1084	615	662
1.200	350	250	1417	1567	1604	779	846	1052	938	1288	1127	649	699
1.150	370	270				810	878	1091	977	1331	1170	683	736
1.100	390	290				841	909					716	773
1.050	410	310										750	810
1.000	430	330										784	847
0.950	450	350											
0.900	470	370											
0.850	490	390											

SPECIFICATIONS: SPRING LOADS AND HEIGHTS

1300 Series

Part No.	PAC-1335	PAC-1336	PAC-1354	PAC-1354L	PAC-1355	PAC-1355H	PAC-1356	PAC-1357	PAC-1359	PAC-1360	PAC-1361	PAC-1361H	PAC-1370
Mass (g)	94	151	172	172	144	144	144	144	155	155	162	163	169
Outer Freq	40679	32885	35502	35502	30568	30568	30568	30568	33120	33120	34042	34042	31094
Inner Freq	44180	35649	31490	31490	35649	35649	35649	35649	35649	35649	35649	35649	28509
Coil Bind	0.990	1.161	1.230	1.230	1.130	1.130	1.130	1.130	1.190	1.190	1.215	1.220	1.230
2.900													95
2.850			4			8						26	137
2.800		12	17			32					9	59	179
2.750		40	31		24	56				7	42	92	221
2.700		68	44		48	80		11		37	75	125	262
2.650		97	70	9	72	104		35	53	66	109	159	304
2.600		130	120	22	96	128		59	78	96	142	202	346
2.550		173	171	73	127	167	14	83	107	133	184	250	388
2.500		216	222	124	166	206	38	107	142	178	232	298	430
2.450		259	273	175	205	245	62	141	180	223	280	346	471
2.400		302	323	225	244	284	86	180	219	268	329	395	513
2.350		346	374	276	283	323	110	219	258	312	377	443	555
2.300		389	425	327	322	362	144	258	298	357	425	491	597
2.250		432	476	378	361	401	183	297	338	402	473	539	639
2.200		475	526	428	400	440	222	336	378	447	521	587	680
2.150		518	577	479	439	479	261	375	418	491	570	636	722
2.100	19	561	628	530	478	518	300	414	459	536	618	684	764
2.050	47	604	679	581	517	557	339	453	499	581	666	732	806
2.000	87	648	729	631	556	596	378	492	541	626	714	780	848
1.950	128	691	780	682	595	635	417	531	582	670	762	828	889
1.900	169	734	831	733	634	674	456	570	624	715	811	877	931
1.850	209	777	882	784	673	713	495	609	666	760	859	925	973
1.800	250	820	932	834	712	752	534	648	708	805	907	973	1015
1.750	291	863	983	885	751	791	573	687	751	849	955	1021	1057
1.700	331	906	1034	936	790	830	612	726	795	894	1003	1069	1099
1.650	372	950	1085	987	829	869	651	765	838	939	1052	1118	1140
1.600	413	993	1136	1038	868	908	690	804	884	984	1100	1166	1182
1.550	453	1036	1186	1088	907	947	729	843	932	1028	1148	1214	1224
1.500	494	1079	1237	1139	946	986	768	882	982	1073	1196	1262	1266
1.450	535	1122	1288	1190	985	1025	807	921	1034	1118	1244	1310	1308
1.400	575	1165	1339	1241	1025	1064	846	960	1088	1163	1293	1359	1349
1.350	616	1209	1389	1291	1064	1103	885	999	1145	1207	1341	1407	1391
1.300	657	1252	1440	1342	1103	1142	924	1038	1204	1252	1389	1455	1433
1.250	697	1295	1491	1393	1142	1181	963	1077	1264	1297	1437	1503	1475
1.200	738	1338			1181	1220	1002	1116	1329	1342			
1.150	779	1381			1220	1259	1041	1155					
1.100	819												
1.050	860												
1.000	901												
0.950													
0.900													
0.850													



Drag Race Triple Springs

1300 Series



Enhanced for Extreme Demand Applications

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.

Part No.	Spring Diameters				Spring Loads		Spring Rate
	OD Outer	ID Outer	ID Middle	ID Inner	Installed Height (Valve Closed)	Open Load (Valve Open)	
PAC-1347	1.645	1.195	0.871	0.635	290 @ 2.070	835 @ 1.270	682
PAC-1348	1.645	1.195	0.871	0.635	332 @ 2.100	950 @ 1.200	687
PAC-1349	1.645	1.195	0.871	0.635	375 @ 2.200	1064 @ 1.200	689
PAC-1350	1.645	1.195	0.871	0.635	440 @ 2.200	1129 @ 1.200	689
PAC-1351	1.667	1.195	0.871	0.635	450 @ 2.300	1240 @ 1.250	752
PAC-1351H	1.667	1.195	0.871	0.635	525 @ 2.300	1315 @ 1.250	752
PAC-1351L	1.667	1.195	0.871	0.635	412 @ 2.300	732 @ 1.250	752
PAC-1353	1.695	1.195	0.871	0.635	500 @ 2.300	1500 @ 1.200	900
PAC-1358	1.645	1.195	0.871	0.635	350 @ 2.150	1004 @ 1.200	688
PAC-1364	1.681	1.195	0.871	0.635	525 @ 2.300	1365 @ 1.300	840
PAC-1364L	1.681	1.195	0.871	0.635	500 @ 2.200	1256 @ 1.300	840
PAC-1364M	1.681	1.195	0.871	0.635	600 @ 2.150	1399 @ 1.200	841
PAC-1366	1.710	1.210	0.871	0.635	380 @ 2.550	1545 @ 1.250	896
PAC-1366H	1.710	1.210	0.871	0.635	420 @ 2.550	1585 @ 1.250	896
PAC-1366L	1.710	1.210	0.870	0.634	480 @ 2.350	1465 @ 1.250	896
PAC-1369	1.750	1.240	0.879	0.630	450 @ 2.550	1675 @ 1.250	942
PAC-1379	1.659	1.195	0.871	0.635	400 @ 2.200	1150 @ 1.200	750
PAC-1379H	1.659	1.195	0.871	0.635	450 @ 2.200	1200 @ 1.200	750
PAC-1379L	1.659	1.195	0.871	0.635	375 @ 2.150	1088 @ 1.200	750

Featuring:

- PACALOY Super Clean Wire To Ensure Satisfaction
- In House Heat Treating for the Best In Rate and Strength Benefits
- Multi Peen Process to Optimize Service Life
- ID/OD Chamfer Finishing
- Polishing to Improve Operating Cycles
- Nano-Peen™ Proprietary Surface Treatment



1300 Series

Part No.	Recommended Matching Components						Comments
	Max Coil Bind	Max Lift	PAC 400 Series Retainers	PAC 500 Series Retainers	PAC 600 Series Retainers	PAC Spring Seats	
PAC-1347	1.130	0.800	R401, R402	R501, R502	R601, R602	S109, S133	Bracket racing applications
PAC-1348	1.130	0.900	R401, R402	R501, R502	R601, R602	S109, S133	Bracket racing applications
PAC-1349	1.130	1.000	R401, R402	R501, R502	R601, R602	S109, S133	Bracket racing applications
PAC-1350	1.130	1.000	R401, R402	R501, R502	R601, R602	S109, S133	Pro Stock and Top Fuel applications
PAC-1351	1.160	1.050	R401, R402	R501, R502	R601, R602	S109, S133	Pro Stock and Top Fuel applications
PAC-1351H	1.160	1.050	R401, R402	R501, R502	R601, R602	S109, S133	High load version of PAC-1351
PAC-1351L	1.160	1.050	R401, R402	R501, R502	R601, R602	S109, S133	Low load version of PAC-1351
PAC-1353	1.140	1.100	R401, R402	R501, R502	R601, R602	S109, S133	Pro Stock and Mountain Motor applications
PAC-1358	1.130	0.950	R401, R402	R501, R502	R601, R602	S109, S133	Bracket racing applications
PAC-1364	1.115	1.100	R401, R402	R501, R502	R601, R602	S109, S133	Pro Stock and Mountain Motor applications
PAC-1364L	1.115	1.050	R401, R402	R501, R502	R601, R602	S109, S133	Low load version of 1364
PAC-1364M	1.115	0.950	R401, R402	R501, R502	R601, R602	S109, S133	Mid load version of PAC-1364
PAC-1366	1.146	1.300	NA	R503, R565	NA	S109, S133	Pro Stock and Mountain Motor applications
PAC-1366H	1.146	1.300	NA	R503, R565	NA	S109, S133	Pro Stock and Mountain Motor applications
PAC-1366L	1.146	1.100	NA	R503, R565	NA	S109, S133	Low load version of PAC-1366
PAC-1369	1.180	1.300	NA	R503, R565	NA	S109, S133	Mountain Motor Valve Spring
PAC-1379	1.100	1.000	R401, R402	R501, R502	R601, R602	S109, S133	High lift bracket racing applications
PAC-1379H	1.100	1.000	R401, R402	R501, R502	R601, R602	S109, S133	High load version of PAC-1379
PAC-1379L	1.100	0.950	R401, R402	R501, R502	R601, R602	S109, S133	Low load version of PAC-1379

Drag Race Triple Springs

1300 Series

SPECIFICATIONS: SPRING LOADS AND HEIGHTS

Part No.	PAC-1347	PAC-1348	PAC-1349	PAC-1350	PAC-1351	PAC-1351H	PAC-1351L	PAC-1353	PAC-1358	PAC-1364
Mass (g)	183	183	183	183	196	196	196	205	183	189
Outer Freq	27188	27188	27188	27188	28610	28610	28616	32070	27188	29649
Middle Freq	26867	26867	26867	26867	26867	26867	25670	26867	26867	28327
Inner Freq	28392	28392	28392	28392	28392	28392	27196	28392	28392	29985
Coil Bind	1.130	1.130	1.130	1.130	1.160	1.160	1.160	1.140	1.130	1.100
3.100						16				
3.050						26				
3.000					5	35		5		2
2.950					14	44		14		12
2.900					26	74		26		23
2.850				3	40	111	9	40		63
2.800				27	74	149	36	55		105
2.750			11	61	111	186	74	95		147
2.700			41	96	149	224	112	140	3	189
2.650			75	130	187	262	149	185	13	231
2.600		8	109	164	224	299	187	230	40	273
2.550	0	23	144	199	262	337	224	275	75	315
2.500	11	57	178	233	300	375	262	320	109	357
2.450	31	92	213	268	337	412	300	365	144	399
2.400	65	126	247	302	375	450	337	410	178	441
2.350	99	160	282	337	412	487	375	455	212	483
2.300	133	195	316	371	450	525	412	500	247	525
2.250	167	229	351	406	488	563	450	545	281	567
2.200	201	263	385	440	525	600	488	590	316	609
2.150	236	298	419	475	563	638	525	635	350	651
2.100	270	332	454	509	601	676	563	680	384	693
2.050	304	366	488	543	638	713	600	725	419	735
2.000	338	401	523	578	676	751	638	770	453	777
1.950	372	435	557	612	713	788	676	815	488	819
1.900	406	469	592	647	751	826	713	860	522	861
1.850	440	504	626	681	789	864	751	905	557	903
1.800	474	538	661	716	826	901	788	950	591	945
1.750	508	572	695	750	864	939	826	995	625	987
1.700	542	607	730	785	901	976	864	1040	660	1029
1.650	576	641	764	819	939	1014	901	1085	694	1071
1.600	610	675	798	853	977	1052	939	1130	729	1113
1.550	644	710	833	888	1014	1089	976	1175	763	1155
1.500	678	744	867	922	1052	1127	1014	1220	798	1197
1.450	712	778	902	957	1090	1165	1052	1265	832	1239
1.400	746	813	936	991	1127	1202	1089	1310	866	1281
1.350	781	847	971	1026	1165	1240	1127	1355	901	1323
1.300	815	881	1005	1060	1202	1277	1164	1400	935	1365
1.250	849	916	1040	1095	1240	1315	1202	1445	970	1407
1.200	883	950	1074	1129	1278	1353	1240	1490	1004	1449
1.150	917	984	1108	1164		1390	1277	1535	1038	1491
1.100										1533

SPECIFICATIONS: SPRING LOADS AND HEIGHTS

1300 Series

Part No.	PAC-1364L	PAC-1364M	PAC-1366	PAC-1366H	PAC-1366L	PAC-1369	PAC-1379	PAC-1379H	PAC-1379L
Mass (g)	189	189	207	207	207	224	187	187	187
Outer Freq	29649	29649	29198	29190	9190	27621	28997	28997	28997
Middle Freq	28327	28327	27783	27809	27809	27767	26945	26945	26945
Inner Freq	29985	29985	30246	30064	30064	28760	28421	28421	28421
Coil Bind	1.100	1.100	1.150	1.146	1.146	1.180	1.100	1.100	1.100
3.100									
3.050			5	20					
3.000			16	31		30			
2.950			28	63		73			
2.900			66	106	10	120			
2.850	2	12	111	151	32	167		3	
2.800	12	53	156	196	77	214		13	
2.750	37	95	201	241	122	262	8	38	
2.700	79	137	246	286	167	309	25	75	3
2.650	122	179	290	330	211	356	63	113	13
2.600	164	222	335	375	256	403	100	150	37
2.550	206	264	380	420	301	450	138	188	75
2.500	248	306	425	465	346	497	175	225	112
2.450	290	348	470	510	390	544	213	263	150
2.400	332	390	514	554	435	591	250	300	187
2.350	374	432	559	599	480	638	288	338	225
2.300	416	474	604	644	525	686	325	375	262
2.250	458	516	649	689	570	733	363	413	300
2.200	500	558	694	734	614	780	400	450	338
2.150	542	600	738	778	659	827	438	488	375
2.100	584	642	783	823	704	874	475	525	413
2.050	626	684	828	868	749	921	513	563	450
2.000	668	726	873	913	793	968	550	600	488
1.950	710	768	918	958	838	1015	588	638	525
1.900	752	810	962	1003	883	1063	625	675	563
1.850	794	852	1007	1047	928	1110	663	713	600
1.800	836	894	1052	1092	972	1157	700	750	638
1.750	878	936	1097	1137	1017	1204	738	788	675
1.700	920	978	1142	1182	1062	1251	775	825	713
1.650	963	1021	1187	1227	1107	1298	813	863	750
1.600	1005	1063	1231	1271	1152	1345	850	900	788
1.550	1047	1105	1276	1316	1196	1392	888	938	825
1.500	1089	1147	1321	1361	1241	1439	925	975	863
1.450	1131	1189	1366	1406	1286	1487	963	1013	900
1.400	1173	1231	1411	1451	1331	1534	1000	1050	938
1.350	1215	1273	1455	1495	1375	1581	1038	1088	975
1.300	1257	1315	1500	1540	1420	1628	1075	1125	1013
1.250	1299	1357	1545	1585		1675	1113	1163	1051
1.200	1341	1399	1590	1630		1722	1150	1200	1088
1.150	1383	1441	1635	1675			1188	1238	1126
1.100	1450	567					1225	1275	1163



Circle Track Endurance Springs

1200 Series

Perfect for Sportsman Level Racing



The 1200 Series were developed for the sportsman racer looking for a quality but budget minded product.

Featuring:

- PACALOY Super Clean Wire to Ensure Satisfaction
- In House Heat Treating for the Best In Rate and Strength Benefits
- Multi Peen Process to Optimize Service Life

Part No.	Spring Diameters				Spring Loads					Recommended Matching Components					Comments
	OD Outer	ID Outer	Damper	ID Inner	Installed Height (Valve Closed)	Open Load (Valve Open)	Spring Rate	Coil Max Bind	Max Lift	PAC 300 Series Retainers	PAC 400 Series Retainers	PAC 500 Series Retainers	PAC 600 Series Retainers	PAC Spring Seats	
PAC-1200	1.244	0.860	Yes	0.770	125 @ 1.750	350 @ 1.250	450	1.090	0.550	R349	NA	NA	R649	NA	Fits stock pocket without machining
PAC-1201	1.260	0.860	Yes	0.770	140 @ 1.750	437 @ 1.200	540	1.115	0.550	R349	NA	NA	R649	NA	Fits stock SBC pocket without machining. High Rate for aggressive cam applications
PAC-1201X	1.260	0.860	Yes	0.770	150 @ 1.750	460 @ 1.200	540	1.115	0.550	R349	NA	NA	R649	NA	Extreme use & endurance over traditional PAC-1201
PAC-1202	1.244	0.860	No	0.624	160 @ 1.750	484 @ 1.150	540	1.100	0.575	R334	NA	NA	NA	S128	Aggressive cam applications
PAC-1203	1.260	0.860	No	0.624	145 @ 1.800	511 @ 1.200	610	1.115	0.650	R334	NA	NA	NA	S128	Aggressive cam applications
PAC-1227	1.539	1.125	Yes	0.731	200 @ 1.950	550 @ 1.250	500	1.110	0.700	R315	NA	R515	R615	S117 S118	General endurance spring for high lift flat tappet applications
PAC-1239	1.550	1.126	Yes	0.720	220 @ 2.050	625 @ 1.300	540	1.180	0.800	R315	NA	R515	R615	S110 S126	Roller cam applications
PAC-1243	1.550	1.136	No	0.812	240 @ 1.900	625 @ 1.200	550	1.150	0.700	NA	R436	R536	NA	S119 S120	Short installed height for high roller cams
PAC-1244	1.570	1.120	No	0.780	190 @ 1.950	710 @ 1.250	743	1.055	0.800	NA	NA	R551	NA	S103 S104	High rate and frequency for roller cam applications
PAC-1245	1.550	1.136	No	0.812	240 @ 2.000	608 @ 1.300	526	1.200	0.700	NA	R436	R536	NA	S119 S120	Roller cam applications
PAC-1294	1.545	1.131	Yes	0.757	175 @ 1.900	442 @ 1.275	428	1.185	0.625	R315	NA	R515	R615	S117 S118	Flat tappet applications
PAC-1297	1.539	1.125	Yes	0.731	200 @ 2.000	550 @ 1.300	500	1.110	0.700	R315	NA	R515	R615	S117 S118	General purpose spring for high lift, flat tappet applications

SPECIFICATIONS: SPRING LOADS AND HEIGHTS

Part No.	PAC-1200	PAC-1201	PAC-1201X	PAC-1202	PAC-1203	PAC-1227	PAC-1239	PAC-1243	PAC-1244	PAC-1245	PAC-1294	PAC-1297
Mass (g)	76	82	82	90	96	148	162	140	142	152	155	148
Outer Freq	35516	36938	36938	35516	36938	25510	25566	27566	32630	26459	23344	25510
Inner Freq	NA	NA	NA	30832	30832	27259	27420	29978	32965	28489	24294	27259
Coil Bind	1.075	1.130	1.130	1.075	1.115	1.130	1.180	1.150	1.035	1.200	1.180	1.130
2.500							6			1		
2.450							22			17		
2.400							40			32		11
2.350						11	65	6		56		32
2.300						32	90	22		82	7	55
2.250						55	115	47		109	27	78
2.200						78	140	75	4	135	48	101
2.150						101	166	103	41	161	68	125
2.100						125	193	130	79	187	90	150
2.050				9	9	150	220	157	116	214	111	175
2.000	12	7	12	25	22	175	247	185	153	240	132	200
1.950	35	32	38	52	53	200	274	212	190	266	154	225
1.900	57	59	65	73	83	225	301	240	227	293	175	250
1.850	80	86	94	106	114	250	328	267	264	319	196	275
1.800	103	113	122	133	145	275	355	295	301	345	218	300
1.750	125	140	150	160	175	300	382	322	339	371	239	325
1.700	148	167	178	187	206	325	409	350	376	398	260	350
1.650	170	194	206	214	236	350	436	377	413	424	282	375
1.600	193	221	235	241	267	375	463	405	450	450	303	400
1.550	215	248	263	268	297	400	490	432	487	477	325	425
1.500	238	275	291	295	328	425	517	460	524	503	340	450
1.450	260	302	319	322	358	450	544	488	561	529	367	475
1.400	283	329	348	349	389	475	571	515	599	555	389	500
1.350	305	356	376	376	419	500	598	543	636	582	410	525
1.300	328	383	404	403	450	525	625	570	673	608	431	550
1.250	350	410	432	430	480	550	652	598	710	634	453	575
1.200	373	437	460	457	511	575	679	625	747	661	474	600
1.150	395	464	489	484	541	600		653	784			625
1.100	418	491	517	511	572				821			
1.050												

Circle Track Dual Springs

1300 Series

Enhanced for Extreme Demand Applications



The 1300 Series springs were designed to have the highest endurance and latest advancements in springs processing.

Part No.	Spring Diameters				Spring Loads	
	OD Outer	ID Outer	Damper	ID Inner	Installed Height (Valve Closed)	Open Load (Valve Open)
PAC-1325	1.550	1.100	NA	0.788	250 @ 2.000	765 @ 1.200
PAC-1326	1.550	1.100	Yes	0.706	275 @ 2.000	765 @ 1.200
PAC-1326H	1.550	1.100	Yes	0.706	300 @ 2.000	765 @ 1.200
PAC-1340	1.500	1.085	NA	0.790	250 @ 2.030	765 @ 1.250
PAC-1343	1.550	1.136	NA	0.812	240 @ 1.900	765 @ 1.200
PAC-1344	1.570	1.120	NA	0.780	190 @ 1.950	765 @ 1.250
PAC-1371	1.374	1.000	NA	0.716	150 @ 1.950	765 @ 1.250
PAC-1372	1.449	1.025	NA	0.713	250 @ 2.000	765 @ 1.150
PAC-1373	1.430	1.002	NA	0.688	250 @ 2.100	765 @ 1.200
PAC-1373L	1.430	1.002	NA	0.688	200 @ 2.100	765 @ 1.200
PAC-1385	1.564	1.150	Yes	0.744	250 @ 2.000	765 @ 1.200
PAC-1386	1.564	1.150	NA	0.826	245 @ 2.000	765 @ 1.200
PAC-1392	1.314	0.900	NA	0.616	185 @ 2.060	765 @ 1.260
PAC-1395	1.574	1.150	Yes	0.744	265 @ 2.000	765 @ 1.200
PAC-1396	1.574	1.150	NA	0.826	260 @ 2.000	765 @ 1.200

Featuring:

- PACALOY Super Clean Wire To Ensure Satisfaction
- In House Heat Treating for the Best In Rate and Strength Benefits
- Multi Peen Process to Optimize Service Life
- ID/OD Chamfer Finishing
- Polishing to Improve Operating Cycles
- Nano-Peen™ Proprietary Surface Treatment

1300 Series

Part No.	Recommended Matching Components								Comments
	Spring Rate	Max Coil Bind	Max Lift	PAC 300 Series Retainers	PAC 400 Series Retainers	PAC 500 Series Retainers	PAC 600 Series Retainers	PAC Spring Seats	
PAC-1325	644	1.150	0.800	NA	R405	R505, R556	NA	S103, S104	Asphalt solid roller
PAC-1326	663	1.150	0.800	NA	NA	R506, R541	R606, R641, R661	S105, S106, S139X	For dirt Sprint Cars
PAC-1326H	663	1.150	0.800	NA	NA	R506, R541	R606, R641, R661	S105, S106, S139X	High load version of PAC-1326
PAC-1340	467	1.195	0.780	NA	NA	R540	NA	S103, S104	Roller cam applications
PAC-1343	550	1.150	0.700	NA	R436	R536	NA	S119, S120	Short installed height for high roller cams
PAC-1344	743	1.055	0.800	NA	NA	R551	R651	S103, S104	Roller cam applications
PAC-1371	436	1.175	0.700	R317, R348	NA	R517, R552	NA	S114, S115	Flat tappet applications with low mass, high frequency for high RPM engines
PAC-1372	706	1.103	0.850	NA	NA	R572	R672	S114, S115	Roller cam applications
PAC-1373	670	1.152	0.900	NA	NA	NA	R659	S137X	Small diameter endurance spring. MUST USE SPECIAL RETAINER.
PAC-1373L	670	1.152	0.900	NA	NA	NA	R659	S137X	Small diameter endurance spring. MUST USE SPECIAL RETAINER.
PAC-1385	525	1.145	0.800	NA	NA	R514, R519	R614, R619	S117, S118	High lift applications
PAC-1386	513	1.140	0.800	NA	NA	R537, R538	NA	S130, S131	High lift roller applications
PAC-1392	681	1.196	0.800	NA	NA	R568	R668, R768	S154	Sprint cars under 8,500 RPM
PAC-1395	550	1.150	0.800	NA	NA	R514, R519	R614, R619	S117, S118	High lift roller applications
PAC-1396	538	1.150	0.800	NA	NA	R537	NA	S130, S131	High lift roller applications



1300 Series

SPECIFICATIONS: SPRING LOADS AND HEIGHTS

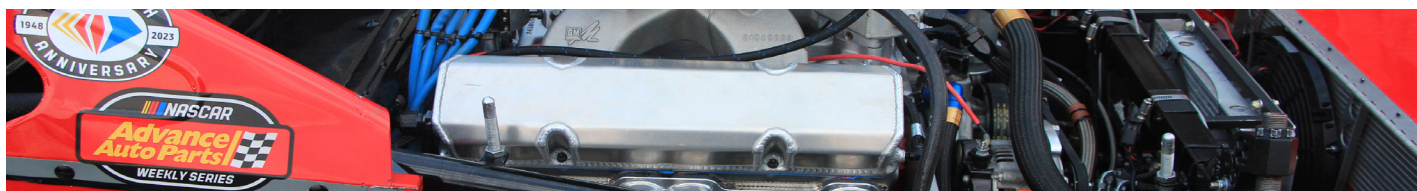
Part No.	PAC-1325	PAC-1326	PAC-1326H	PAC-1340	PAC-1343	PAC-1344	PAC-1371
Mass (g)	151	158	159	142	140	142	119
Outer Freq	29368	29368	29368	25500	27566	32630	27294
Inner Freq	28294	28434	28434	26412	29978	32965	29226
Coil Bind	1.150	1.150	1.137	1.180	1.150	1.035	1.190
2.550				7			
2.500				31			
2.450		4	4	54			
2.400	5	15	15	77			
2.350	25	46	46	101	6		
2.300	57	76	76	124	22		7
2.250	89	109	109	147	47		21
2.200	121	142	142	171	75	4	41
2.150	153	176	176	194	103	41	63
2.100	186	209	209	217	130	79	85
2.050	218	242	242	241	157	116	106
2.000	250	275	275	264	185	153	128
1.950	282	308	308	287	212	190	150
1.900	314	341	341	311	240	227	172
1.850	347	374	374	334	267	264	194
1.800	379	407	407	357	295	301	215
1.750	411	441	441	381	322	339	237
1.700	443	474	474	404	350	376	259
1.650	475	507	507	427	377	413	281
1.600	507	540	540	451	405	450	303
1.550	540	573	573	474	432	487	324
1.500	572	606	606	497	460	524	346
1.450	604	639	639	521	488	561	368
1.400	636	672	672	544	515	599	390
1.350	668	706	706	567	543	636	411
1.300	701	739	739	591	570	673	433
1.250	733	772	772	614	598	710	455
1.200	765	805	805	637	625	747	477
1.150	797	838	838		653	784	
1.100						821	
1.050						859	



SPECIFICATIONS: SPRING LOADS AND HEIGHTS

1300 Series

Part No.	PAC-1372	PAC-1373	PAC-1373L	PAC-1385	PAC-1386	PAC-1392	PAC-1395	PAC-1396
Mass (g)	130	136	136	156	149	117	159	152
Outer Freq	33021	30043	30043	26113	26113	32841	26431	26431
Inner Freq	33706	32323	32323	28374	28095	32947	28374	28095
Coil Bind	1.103	1.160	1.160	1.140	1.150	1.196	1.150	1.150
2.550								
2.500				10	10		12	12
2.450		20		25	25		29	29
2.400		49	6	42	40		47	45
2.350	14	82	32	67	66		73	72
2.300	38	116	66	92	91	21	100	99
2.250	74	149	99	119	117	56	127	126
2.200	109	183	133	145	142	90	155	152
2.150	144	216	166	171	168	124	182	179
2.100	179	250	200	197	194	158	210	206
2.050	215	283	233	224	219	192	237	233
2.000	250	317	267	250	245	226	265	260
1.950	285	350	300	276	271	260	292	287
1.900	321	384	334	302	296	294	320	314
1.850	356	417	367	329	322	328	347	341
1.800	391	451	401	355	347	362	375	367
1.750	426	484	434	381	373	396	402	394
1.700	462	518	468	407	399	430	430	421
1.650	497	551	501	434	424	464	457	448
1.600	532	585	535	460	450	498	485	475
1.550	568	618	568	486	476	532	512	502
1.500	603	652	602	512	501	566	540	525
1.450	638	685	635	539	527	601	567	556
1.400	674	719	669	565	552	635	595	582
1.350	709	752	702	591	578	669	622	609
1.300	744	786	736	617	604	703	650	636
1.250	779	819	769	644	629	737	677	663
1.200	815	853	803	670	655	771	705	690
1.150	850	887	836	696	681		732	717
1.100	885							
1.050								



Specialty & Class Specific Springs

1400 Series

Stock Eliminator Applications

Featuring:

- PACALOY Super Clean Wire To Ensure Satisfaction
- In House Heat Treating for the Best In Rate and Strength Benefits
- Multi Peen Process to Optimize Service Life
- Polishing to Improve Operating Cycles
- Nano-Peen™ Proprietary Surface Treatment

Part No.	Spring Diameters				Spring Loads				Recommended Matching Components				Comments	
	Bottom OD	Bottom ID	Top OD	Top ID	Installed Height (Valve Closed)	Open Load (Valve Open)	Spring Rate	Max Coil Bind	Max Lift	PAC 300 Series Retainers	PAC 500 Series Retainers	PAC 600 Series Retainers		PAC Spring Seats
*PAC-1409X	1.25	0.845	1.055	0.65	175 @ 1.800	425 @ 1.250	436	1.115	0.550	R333	NA	R633	NA	Stock Eliminator and Drag Racing applications only
PAC-1421	1.012	1.305	0.650	0.943	150 @ 1.800	425 @ 1.170	437	1.047	0.670	R310, R311, R363	R510, R511	R633	PAC-S159	Conical Spring for Aggressive Hyd Roller and SFT Camshafts, Drop in for LS applications
PAC-1422	1.050	1.330	0.650	0.930	150 @ 1.900	505 @ 1.225	526	1.150	0.670	R310, R311, R363	R510, R511	R643	PAC-S160	Conical Spring for Aggressive Hyd Roller and SFT Camshafts, Drop in for Gen V Hemi
PAC-1423	1.072	1.307	0.650	0.885	160 @ 1.880	395 @ 1.230	362	1.136	0.660	R310, R311, R363	R510, R511	R633	PAC-S161	Gen V GM LT Engine Drop in Conical
*PAC-1427	1.454	1.000	1.104	0.65	200 @ 1.850	500 @ 1.250	500	1.175	0.625	R310, R333	R510	R643	S112 S113	Big block stock eliminator applications. Variable rates for aggressive camshafts
*PAC-1427H	1.454	1.000	1.104	0.65	220 @ 1.850	525 @ 1.250	500	1.175	0.625	R310, R333	R510	R643	S112 S113	Big block stock eliminator applications. Variable rates for aggressive camshafts

*These springs are very highly stressed. Not designed for street use.

Circle & Track Endurance Springs

1500 Series

Designed for Extreme Endurance

Featuring:

- PACALOY Super Clean Wire To Ensure Satisfaction
- Fully Nitride to Enhance High Cycle Environments
- Multi Peen Process to Optimize Service Life
- ID/OD Chamfer Finishing
- Polishing to Improve Operating Cycles
- Nano-Peen™ Proprietary Surface Treatment

Part No.	Spring Diameters			Spring Loads				Recommended Matching Components				Comments	
	OD Outer	ID Outer	ID Inner	Installed Height (Valve Closed)	Open Load (Valve Open)	Spring Rate	Max Coil Bind	Max Lift	PAC 300 Series Retainers	PAC 500 Series Retainers	PAC 600 Series Retainers		PAC Spring Seats
PAC-1529	1.284	0.900	0.630	180 @ 1.900	600 @ 1.150	560	1.090	0.750	R432	R532	R632	S128, S138	LS high performance, high endurance circle track spring with high frequency for high RPM

Specialty & Class Specific Springs

Class Specific

Part No.	Spring Diameters			Spring Loads				Recommended Matching Components				Comments	
	OD Outer	ID Outer	ID Inner	Installed Height (Valve Closed)	Open Load (Valve Open)	Spring Rate	Max Coil Bind	Max Lift	PAC 300 Series Retainers	PAC 500 Series Retainers	PAC 600 Series Retainers		PAC Spring Seats
PAC-1210X	1.245	0.891	NA	87 @ 1.700	212 @ 1.270	290	1.150	0.430	NA	NA	NA	NA	GM 602 crate motor "cheater" spring. Meets specs with more RPM and endurance.
PAC-1212X	1.355	0.910	NA	125 @ 1.750	315 @ 1.250	380	1.180	0.550	NA	NA	NA	NA	GM 604 crate motor "cheater" spring. Meets specs with more RPM and endurance.
PAC-1216L	1.260	0.906	0.876	121 @ 1.800	348 @ 1.300	454	1.13	0.500	NA	NA	NA	NA	Race saver spring. This spring was designed with RaceSaver's rulebook
PAC-1280X	1.077 / 1.282	0.655 / 0.860	NA	92 @ 1.800	285 @ 1.300	386	1.181	0.500	NA	NA	NA	NA	GM 604 crate motor "Beehive" spring. Meets specs with more RPM and endurance.

 Indicates New Product

SPECIFICATIONS: SPRING LOADS AND HEIGHTS

Part No.	PAC-1210X	PAC-1212X	PAC-1216L	PAC-1280X	*PAC-1409X	PAC-1421	PAC-1422	PAC-1423	*PAC-1427	*PAC-1427H	PAC-1529
Mass (g)	65	100	74	70	60	67.8	64	83	80	80	99
Outer Freq	31555	30844	35885	34702	40554	41174	30884	37896	35022	35022	32185
Inner Freq	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	34200
Coil Bind	1.150	1.180	1.048	1.181	1.115	1.047	1.150	1.15	1.190	1.190	1.085
2.500											
2.450											
2.400											
2.350											
2.300								8			
2.250								26		17	
2.200								44	25	42	15
2.150					16		19	62	50	67	40
2.100					39	19	45	80	75	93	68
2.050		11	13		61	41	71	99	100	118	96
2.000		30	34	15	84	63	97	117	125	144	124
1.950	14	49	54	34	107	85	124	135	150	169	152
1.900	29	68	76	53	130	106	150	153	175	195	180
1.850	43	87	98	73	152	128	176	171	200	220	208
1.800	58	106	121	92	175	150	203	189	225	245	236
1.750	72	125	144	111	198	172	229	207	250	271	264
1.700	87	144	166	131	220	194	255	225	275	296	292
1.650	102	163	189	150	243	215	281	243	300	322	320
1.600	116	182	212	169	266	237	308	261	325	347	348
1.550	131	201	235	189	289	259	334	279	350	372	376
1.500	145	220	257	208	311	281	360	297	375	398	404
1.450	160	239	280	227	334	303	387	315	400	423	432
1.400	174	258	303	246	357	325	413	334	425	449	460
1.350	189	277	325	266	380	346	439	352	450	474	488
1.300	203	296	348	285	402	368	466	370	475	500	516
1.250	218	315	371	304	425	390	492	388	500	525	544
1.200	232	334	393	324	447	412	518	406	525	550	572
1.150	247		416		470	5434	544	424		576	600
1.100			1600			456					
1.050						477					
1.000						499					

*These springs are very highly stressed. Not designed for street use.



1900 Series

Street Performance with a Budget

Featuring:

- PACALOY Super Clean Wire To Ensure Satisfaction
- Multi Peen Process to Optimize Service Life



Single Springs

Part No.	Spring Diameters			Spring Loads					Recommended Matching Components		Comments	
	OD Outer	ID Outer	Damper	ID Inner	Installed Height (Valve Closed)	Open Load (Valve Open)	Spring Rate	Max Coil Bind	Max Lift	PAC 300 Series Retainers		PAC Spring Seats
PAC-1900	1.500	1.086	Yes	0.996	98 @ 1.880	316 @ 1.300	376	1.100	0.600	R378	S112, S113	AMC and BBC applications
PAC-1902	1.295 / 1.450	0.859 / 1.014	No	NA	120 @ 1.940	375 @ 1.380	455	1.316	0.575	R382	S103, S104	SBC beehive spring for hydraulic roller and flat tappet applications
PAC-1921	1.460	1.060	Yes	0.970	109 @ 1.850	293 @ 1.250	307	1.145	0.600	R379	S112, S113	Hydraulic flat tappet applications

Dual Springs

Part No.	Spring Diameters			Spring Loads					Recommended Matching Components		Comments	
	OD Outer	ID Outer	Damper	ID Inner	Installed Height (Valve Closed)	Open Load (Valve Open)	Spring Rate	Max Coil Bind	Max Lift	PAC 300 Series Retainers		PAC Spring Seats
PAC-1901	1.540	1.140	Yes	0.754	145 @ 1.900	465 @ 1.250	492	1.130	0.650	R387	S110, S126	Big block hydraulic roller, marine, and solid flat tappet applications
PAC-1903	1.459	1.075	No	0.794	120 @ 1.875	394 @ 1.175	391	1.060	0.700	R391	S103, S104	Ford, GM, and Mopar big block hydraulic roller, solid flat tappet racing applications
PAC-1904	1.290	0.950	No	0.694	150 @ 1.800	400 @ 1.125	370	1.010	0.625	R335	S129, S135	LS Engine
PAC-1905	1.304	0.950	No	0.694	160 @ 1.800	425 @ 1.125	392	1.020	0.650	R335	S129, S135	LS Engine
PAC-1908	1.465	1.090	No	0.807	106 @ 1.688	306 @ 1.208	417	0.910	0.650	R389	S119, S120	6cyl AMC, Buick V8 and other short installed height applications
PAC-1914	1.490	1.105	No	0.810	165 @ 1.800	385 @ 1.200	367	1.100	0.600	R388	S119, S120	Hydraulic flat tappet applications
PAC-1916	1.538	1.140	Yes	0.752	157 @ 1.850	440 @ 1.200	436	1.135	0.650	R387	S117, S118	Hydraulic flat tappet applications
PAC-1924	1.540	1.140	Yes	0.754	144 @ 1.900	403 @ 1.300	431	1.125	0.650	R387	S117, S118	Big block hydraulic roller applications
PAC-1940	1.555	1.140	Yes	0.747	194 @ 1.950	500 @ 1.300	469	1.120	0.700	R387	S117, S118	Solid flat tappet and hydraulic roller applications
PAC-1941	1.539	1.125	Yes	0.731	240 @ 1.950	600 @ 1.240	507	1.160	0.710	R315	S110, S126	Solid roller drag and circle track applications
PAC-1950	1.645	1.195	No	0.871	207 @ 2.050	671 @ 1.250	580	1.115	0.800	R383	S101, S102	Solid roller drag and circle track applications

SPECIFICATIONS: SPRING LOADS AND HEIGHTS

Single Springs

Part No.	PAC-1900	PAC-1902	PAC-1921
Mass (g)	102	115	100
Outer Freq	29314	30033	25239
Inner Freq	NA	NA	NA
Coil Bind	1.115	1.316	1.145
2.200			1
2.150		24	17
2.100	15	47	32
2.050	34	70	47
2.000	53	93	63
1.950	72	115	78
1.900	90	138	94
1.850	109	161	109
1.800	128	184	124
1.750	147	207	140
1.700	166	229	155
1.650	184	252	171
1.600	203	275	186
1.550	222	298	201
1.500	241	320	217
1.450	260	343	232
1.400	278	366	247
1.350	297	389	263
1.300	316	411	278
1.250	335	434	294
1.200	354	457	309
1.150	372	480	324
1.100			
1.050			
1.000			
0.950			
0.900			
0.850			

Dual Springs

Part No.	PAC-1901	PAC-1903	PAC-1904	PAC-1905	PAC-1912	PAC-1914	PAC-1916	PAC-1924	PAC-1940	PAC-1941	PAC-1950
Mass (g)	146	115	85	90	139	126	147	148	151	152	161
Outer Freq	27123	25170	29975	29344	21473	22606	22984	22871	24210	25271	27484
Inner Freq	29956	26835	30890	30890	21188	25219	27459	26384	26361	28097	26610
Coil Bind	1.130	1.050	1.010	1.020	1.200	1.075	1.090	1.125	1.150	1.160	1.130
2.200	15		8	8	34	18	21	23	82	116	120
2.150	29	12	21	23	50	37	34	36	103	139	149
2.100	47	32	39	42	66	55	48	58	125	164	178
2.050	71	51	58	62	83	73	70	79	147	189	207
2.000	96	71	76	82	100	92	92	101	171	215	236
1.950	120	91	95	101	116	110	113	122	194	240	265
1.900	145	110	113	121	133	128	135	144	217	265	294
1.850	170	130	132	140	150	147	157	166	241	291	323
1.800	194	149	150	160	166	165	179	187	264	316	352
1.750	219	169	168	180	183	183	201	209	288	341	381
1.700	243	189	187	199	200	202	222	230	311	367	410
1.650	268	208	205	219	216	220	244	252	335	392	439
1.600	293	228	224	238	233	238	266	274	358	417	468
1.550	317	247	242	258	250	257	288	295	382	443	497
1.500	342	267	261	278	266	275	310	317	405	468	526
1.450	367	286	279	297	283	293	331	338	429	493	555
1.400	391	306	298	317	300	312	353	360	452	519	584
1.350	416	326	316	337	316	330	375	381	476	544	613
1.300	440	345	335	356	333	348	397	403	499	570	642
1.250	465	365	353	376	350	367	419	425	522	595	671
1.200	490	384	372	395	366	385	441	446	546	620	700
1.150	514	404	390	415		403	462			646	729
1.100		423	409	435		422					
1.050		443	427	454							
1.000			446								
0.950											
0.900											
0.850											

Diesel Valve Springs

Part No.	Spring Diameters			Spring Loads					Recommended Matching Components		Comments
	OD Outer	ID Outer	ID Inner	Installed Height (Valve Closed)	Open Load (Valve Open)	Spring Rate	Max Coil Bind	Max Lift	PAC 300 Series Retainers	PAC Spring Seats	
PAC-D100	1.025	0.730	NA	105 @ 1.350	215 @ 0.900	250	0.825	0.450	R313	NA	Cummins 5.9/6.4L 24V
PAC-D200	1.010	0.647	NA	120 @ 1.830	300 @ 1.265	320	1.190	0.565	R362	NA	Ford Powerstroke 6.0/6.4L
PAC-D300	1.000	0.650	NA	100 @ 1.680	290 @ 1.080	320	0.990	0.600	R362	S121	GM Duramax 6.6L

SPECIFICATIONS: SPRING LOADS AND HEIGHTS

Part No.	PAC-D100	PAC-D200	PAC-D300
Mass (g)	33	60	51
Freq (cpm)*	38522	35339	35037
Coil Bind	0.825	1.190	0.990
2.200		2	
2.150		18	
2.100		34	
2.050		50	
2.000		66	
1.950		82	15
1.900		98	30
1.850		114	46
1.800		130	62
1.750	2	145	78
1.700	15	161	94
1.650	28	177	110
1.600	40	193	125
1.550	53	209	141
1.500	65	225	157
1.450	78	241	173
1.400	90	257	189
1.350	103	273	205
1.300	115	289	220
1.250	128	305	236
1.200	140	321	252
1.150	153		268
1.100	165		284
1.050	178		300
1.000	190		315
0.950	203		
0.900	215		
0.850	228		





Part No.	Spring Loads					Valve Spring Included	Retainers Included	Seats Included	Locks Included	Seals Included	Comments
	Installed Height (Valve Closed)	Open Load (Valve Open)	Spring Rate	Max Coil Bind	Max Lift						
PAC-KS60	100 @ 1.680	290 @ 1.080	320	0.990	0.600	D300	Yes	Yes	Yes	Yes	GM Duramax Engine Kit, 6.6L
PAC-KS65	105 @ 1.350	215 @ 1.900	250	0.825	0.450	D100	Yes	NA	Yes	Yes	Cummins 24V Engine Kit, 5.9L
PAC-KS66	105 @ 1.350	215 @ 1.900	250	0.825	0.450	D100	Yes	NA	Yes	Yes	Cummins 24V Engine Kit, 6.1L
PAC-KS70	120 @ 1.830	300 @ 1.265	320	1.190	0.565	D200	Yes	NA	Yes	Yes	Ford Powerstroke Engine Kit, 6.0/6.4L

Beehive Valve Springs

PAC Racing Springs didn't invent Beehive springs but we have perfected them for racing and hot rod applications. PAC Racing Springs' Beehive springs are essential three springs made into one. This modern design can effectively replace many of the older springs that are much heavier and larger and made up of multiple springs. Many of the springs utilize ovate shaped wire that has more refined stress distribution as shown below. PAC Racing Springs has numerous Beehive spring PN's for various applications, from hydraulic flat tappet to roller lifter applications.

Numerous Retainers available from Chromoly steel to Titanium

Refined surface with multiple stage shot peening, some include NanoPeen™ technology

Championship Winning PACaloy material (Superclean Valve Quality Alloys)



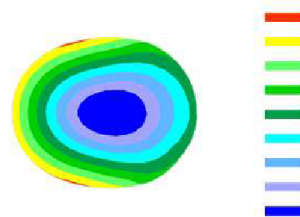
Conical Top Section — smaller diameter requires much smaller low mass retainers for lighter weight valve-trains

Higher Rate Main Coils in the middle of the spring provide high RPM valve control through high natural frequencies in the spring

The bottom of the spring has lower rate damping coils that reduce coil surging and dampen resonant frequencies from aggressive valvetrains or RPM shifts

Ovate Wire Section

- Many of PAC Racing Springs beehive springs utilize Ovate section wire
- Lower stresses
- Reduced Coil Bind heights
- Higher Fatigue Strength Wire



Stress levels of ovate wire

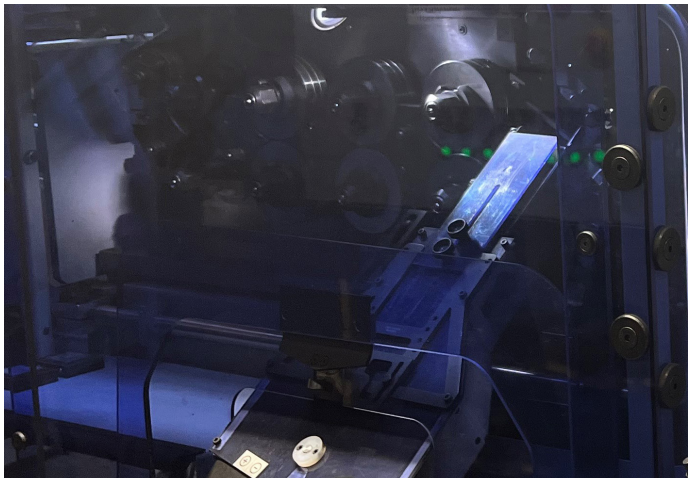
Red = Highest stress point
Blue = Lowest stress point

1200 Series

Street Performance with an Attitude



Part No.	Spring Diameters				Spring Loads					Recommended Matching Components				Comments
	Bottom End		Top End		Installed Height (Valve Closed)	Open Load (Valve Open)	Spring Rate	Max Coil Bind	Max Lift	PAC 300 Series Retainers	PAC 400 Series Retainers	PAC 500 Series Retainers	PAC Spring Seats	
	OD	ID	OD	ID										
PAC-1213	1.061	0.959	0.738	0.636	80 @ 1.640	185 @ 1.090	191	1.020	0.550	NA	NA	NA	NA	Ford 4.6L 2V drop in design without machining. Fits stock retainers and seats.
PAC-1214	1.061	0.999	0.698	0.636	100 @ 1.640	265 @ 1.080	275	1.040	0.600	NA	NA	NA	NA	Ford 4.6L 2V drop in design without machining. Fits stock retainers and seats.
PAC-1215	1.290	1.055	0.885	0.650	105 @ 1.800	293 @ 1.200	313	1.140	0.600	R310, R311, R362, R363	NA	R510, R511	S111	Fits stock LS1 retainers and seats. Drop in design with more load.
PAC-1218	1.290	1.055	0.885	0.650	130 @ 1.800	318 @ 1.200	313	1.115	0.600	R310, R311, R362, R363	NA	R510, R511	S111	Fits stock LS1 retainers and seats. Drop in design with more load.
PAC-1219	1.307	1.072	0.885	0.650	135 @ 1.800	348 @ 1.175	340	1.115	0.625	R310, R311, R362, R363	NA	R510, R511	S111	Fits stock LS1 retainers and seats. Drop in design with more load, rate, and frequency for aggressive cams.
PAC-1220	1.445	1.095	1.000	0.650	155 @ 1.880	377 @ 1.280	370	1.210	0.600	R310, R311, R362, R363	NA	R510, 511	S112, S113	BBC spring for flat tappet and hydraulic roller applications.
PAC-1223	1.105	0.943	0.742	0.580	90 @ 1.470	252 @ 0.970	324	0.880	0.500	R312, R342	R442, R445	R512	NA	Ford 4.6L 4V drop in design without machining. Fits stock retainers and seats. Also fits V-Rod motorcycles.
PAC-1233	1.025	0.930	0.662	0.567	105 @ 1.670	270 @ 1.120	300	1.060	0.550	NA	NA	R512	NA	Ford 4.6L 3V drop in design without machining. This spring requires PAC retainers.
PAC-1235	1.210	1.035	0.805	0.630	135 @ 1.800	350 @ 1.200	358	1.130	0.600	NA	NA	NA	NA	Chrysler Hemi replacement for 03-07 5.7L, 05-10 6.1L. Requires OD damper replacement modifications.
PAC-1283	1.250	1.085	0.845	0.680	110 @ 1.750	328 @ 1.150	363	1.080	0.600	R310, R311, R362, R363	NA	R510, R511	NA	Viper SRT-10 drop-in spring that fits stock retainers and seats.
PAC-1286	1.405	1.055	1.000	0.650	125 @ 1.750	295 @ 1.150	283	1.060	0.600	R310, R311, R362, R363	NA	R510, R511	S112, S113	For many small block engines as well as a variety of hydraulic or flat tappet applications.



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-1283	PAC-1286
Mass (g)	45	52	75	75	67	97	45	51	73	73	78
Outer Freq	26302	31946	29277	29277	31258	27047	38138	33317	31793	33960	29337
Coil Bind	0.964	1.030	1.093	1.096	1.100	1.210	0.850	1.060	1.100	1.080	1.080
2.500											
2.450											
2.400						15					
2.350						28					
2.300				4		41					
2.250				15		54					
2.200				22		67					
2.150	2		14	40	16	80			10		12
2.100	8		27	53	33	92			28		26
2.050	16		40	66	50	105			45	1	40
2.000	23	12	53	79	67	118		6	63	19	54
1.950	30	26	66	92	84	132		21	81	37	68
1.900	38	40	79	105	101	147		36	99	56	83
1.850	46	53	92	118	118	161		51	117	74	97
1.800	54	67	106	131	135	176		66	135	92	111
1.750	63	81	119	145	152	191	8	81	153	110	125
1.700	72	95	132	158	169	208	22	96	171	128	139
1.650	81	108	145	172	186	224	36	111	189	146	153
1.600	90	122	159	187	203	241	51	126	207	165	168
1.550	99	136	174	202	220	259	66	141	225	183	182
1.500	108	150	189	218	237	278	80	156	243	201	196
1.450	117	163	206	234	254	298	95	171	260	219	210
1.400	126	177	222	251	271	318	110	186	278	237	224
1.350	135	191	239	267	288	339	125	201	296	255	238
1.300	144	205	257	283	305	361	140	216	314	274	253
1.250	153	218	275	300	322	384	155	231	332	292	267
1.200	163	232	294	318	339	415	172	246	350	310	281
1.150	173	246	313	337	356		188	261	368	328	295
1.100	184	260	456	354	373		206	276	386	346	309
1.050	195	273					223				
1.000	208						241				
0.950	607						261				
0.900							281				

RPM Series

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- Multi Peen Process to Optimize Service Life
- Polishing to Improve Operating Cycles
- Nano-Peen™ Proprietary Surface Treatment

Part No.	Spring Diameters				Spring Loads				Recommended Matching Components				Comments	
	Bottom End		Top End		Installed Height (Valve Closed)	Open Load (Valve Open)	Spring Rate	Max Coil Bind	Max Lift	PAC 300 Series Retainers	PAC 400 Series Retainers	PAC 500 Series Retainers		PAC Spring Seats
	OD	ID	OD	ID										
PAC-1211X	1.290	1.034	0.906	0.650	130 @ 1.800	370 @ 1.175	385	1.100	0.625	R310, R311, R363	NA	R510, R511	S111	LS Engine
PAC-1214X	1.071	1.071	0.999	0.636	120 @ 1.680	285 @ 1.080	275	1.013	0.600	NA	NA	NA	NA	Ford 4.6L 2V drop in design without machining. Fits stock retainers and seats. Higher load than a 1214 for performance use
PAC-1217X	1.061	0.873	0.698	0.525	115 @ 1.600	300 @ 1.000	308	0.975	0.600	R331, R346	R464	NA	NA	Ford 5.0L Coyote drop in for more RPM and lift. Also works on other FMODs with R331 & R346, adding 0.060" installed height.
PAC-1218X	1.290	1.055	0.885	0.650	140 @ 1.800	328 @ 1.200	313	1.115	0.600	R310, R311, R363	NA	R510, R511	S111	Fits stock LS1 retainers and seats. Drop in design with more load than a 1218 for performance use
PAC-1219X	1.307	1.072	0.885	0.650	145 @ 1.800	358 @ 1.175	340	1.115	0.625	R310, R311, R363	NA	R510, R511	S111	Fits stock LS1 retainers and seats. Drop in design with more load, rate, and frequency than a 1219 for performance use
PAC-1220X	1.445	1.095	1.000	0.650	160 @ 1.900	400 @ 1.250	370	1.165	0.650	R310, R311, R363	NA	R510, R511	S112, S113	BBC spring for flat tappet and hydraulic roller applications with more load than a 1220 for performance use
PAC-1223X	1.105	0.943	0.742	0.580	100 @ 1.470	262 @ 0.970	324	0.880	0.500	R312, R342	R442, R445	R512	NA	Ford 4.6L 4V drop in design without machining. Fits stock retainers and seats. Also fits V-Rod motorcycles. Higher load than a 1223 for performance use
PAC-1230X	1.083	0.999	0.720	0.636	120 @ 1.715	280 @ 1.165	291	1.089	0.550	NA	NA	NA	NA	Ford 5.4L GT500 and Cobra Jet high lift intake spring. Fits stock retainers and seats
PAC-1231X	1.083	0.999	0.720	0.636	120 @ 1.575	280 @ 1.025	291	0.952	0.550	NA	NA	NA	NA	Ford 5.4L GT500 and Cobra Jet high lift exhaust spring. Fits stock retainers and seats
PAC-1232X	1.345	1.095	0.900	0.650	175 @ 2.050	450 @ 1.400	423	1.346	0.650	R310, R311, R374	NA	R510, R511	S111	Hemi 6.4L drop-in spring
PAC-1234X	1.021	0.848	0.698	0.525	92 @ 1.575	218 @ 1.050	240	0.941	0.575	R363	R464	NA	NA	Ford 5.0L Gen I & 2 Coyote drop-in design
PAC-1255X	1.445	1.186	0.990	0.731	175 @ 1.950	440 @ 1.300	408	1.220	0.700	R313	NA	R513	S112, S113	High performance spring for street and strip use
PAC-1275X	1.290	1.034	0.906	0.650	140 @ 1.950	405 @ 1.300	408	1.215	0.660	R310, R311, R362, R363, R374	NA	R510, R511	S111	LS7 drop in and Hemi Exhaust
PAC-1276X	1.290	1.034	0.906	0.650	150 @ 1.800	420 @ 1.140	409	1.070	0.660	R310, R311, R362, R363	NA	R510, R511	S111	LS drop in for very high lift
PAC-1281X	1.031	0.849	0.709	0.527	80 @ 1.811	215 @ 1.260	245	1.208	0.551	NA	R464	NA	NA	Ford Gen 3 Coyote 5.0L spring for more RPM and endurance
PAC-1282X	1.270	1.105	0.825	0.660	160 @ 2.350	420 @ 1.700	400	1.544	0.750	R393, R394	NA	NA	NA	Ford Godzilla Drop in
PAC-1282LX	1.270	1.105	0.825	0.660	160 @ 2.250	420 @ 1.600	400	1.544	0.650	R393, R394	NA	NA	NA	Low Load Ford Godzilla
PAC-1295X	1.589	1.185	1.135	0.731	175 @ 2.000	410 @ 1.250	313	1.170	0.750	R313	NA	R513	S116	High performance version of 1295 with additional processing for street and strip use

SPECIFICATIONS: SPRING LOADS AND HEIGHTS

Part No.	PAC-1211X	PAC-1214X	PAC-1217X	PAC-1218X	PAC-1219X	PAC-1220X	PAC-1223X	PAC-1230X	PAC-1231X	PAC-1232X	PAC-1234X	PAC-1255X	PAC-1275X	PAC-1275X	PAC-1281X	PAC-1282X	PAC-1282LX	PAC-1295X	
Mass (g)	75	44	40	75	67	80	46	47	41	87	36	87	82	73	44	94	94	90	
Freq	32952	32230	35241	29277	31258	30755	38138	34529	34529	32716	37515	30344	34933	35050	38747	29312	29312	25686	
Coil Bind	1.100	1.013	0.965	1.140	1.100	1.210	0.900	1.089	0.952	1.346	0.941	1.220	1.215	1.070	1.208	1.544	1.544	1.170	
2.700																		20	
2.650																		40	
2.600																	60	20	
2.550																	80	40	
2.500																	100	60	
2.450										6							120	80	
2.400										27							140	100	
2.350										48		12					160	120	
2.300						12				69		32					180	140	
2.250						31				90		53	18				200	160	
2.200				15	9	49				112		73	38				220	180	18
2.150				30	26	68				133		93	58	7			240	200	34
2.100	15	4		46	43	86		8		154		114	79	27	9	260	220	50	
2.050	34	18		62	60	105		23		175		134	99	48	21	280	240	65	
2.000	53	32		77	77	123		37		196		155	119	68	34	300	260	81	
1.950	72	46	7	93	94	142		52	11	217	2	175	140	89	46	320	280	97	
1.900	92	59	23	109	111	160		66	25	238	14	195	160	109	58	340	300	112	
1.850	111	73	38	124	128	178		81	40	260	26	216	180	130	70	360	320	128	
1.800	130	87	53	140	145	197		95	55	281	38	236	201	150	83	380	340	144	
1.750	149	101	69	156	162	215	9	110	69	302	50	257	221	171	95	400	360	159	
1.700	168	115	84	171	179	234	25	124	84	323	62	277	241	191	107	420	380	175	
1.650	188	128	100	187	196	252	42	139	98	344	74	297	261	212	119	440	400	191	
1.600	207	142	115	203	213	271	58	153	113	365	86	318	282	232	132	460	420	206	
1.550	226	156	130	218	230	289	74	168	127	387	98	338	302	253	144	480	440	222	
1.500	245	170	146	234	247	308	90	183	142	408	110	358	322	273	156			238	
1.450	264	183	161	250	264	326	106	197	156	429	122	379	343	294	168			253	
1.400	284	197	177	265	281	345	123	212	171	450	134	399	363	314	181			269	
1.350	303	211	192	281	298	363	139	226	185	471	146	420	383	335	193			285	
1.300	322	225	208	297	315	382	155	241	200		158	440	404	355	205			300	
1.250	341	238	223	312	332	400	171	255	215		170	460	424	376	217			316	
1.200	360	252	238	328	349	418	187	270	229		182	481	444	396	230				
1.150	380	266	254	344	366	437	204	284	244		194			417					
1.100	399	280	269	359	383		220	299	258		206			437					
1.050		293	285				236		273		218			458					
1.00		307	300				252		287		230								
0.950			315				268		302		242								
0.900							285												
0.850																			



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- Nano-Peen™ Proprietary Surface Treatment

Part No.	Spring Diameters			Spring Loads			Recommended Matching Components								Comments
	OD Outer	ID Outer	Damper	ID Inner	Installed Height (Valve Closed)	Open Load (Valve Open)	Spring Rate	Max Coi Bind	Max Lift	PAC 300 Series Retainers	PAC 400 Series Retainers	PAC 500 Series Retainers	PAC 600 Series Retainers	PAC Spring Seats	
PAC-1204X	1.290	0.950	NA	0.694	145 @ 1.800	385 @ 1.150	369	1.000	0.700	R335	R435, R450	R550	R635, R650	S129, S135, S136	LS Engine
PAC-1205X	1.304	0.950	NA	0.694	155 @ 1.800	410 @ 1.150	392	1.000	0.700	R335	R435, R450	R550	R635, R650	S129, S135, S136	LS Engine
PAC-1206X	1.290	0.950	NA	0.680	145 @ 1.800	411 @ 1.150	409	1.000	0.700	R335	R435, R450	R550	R635, R650	S129, S135, S136	LS Engine
PAC-1207X	1.304	0.950	NA	0.680	155 @ 1.800	436 @ 1.150	433	1.000	0.700	R335	R435, R450	R550	R635, R650	S129, S135, S136	LS Engine
PAC-1208X	1.324	0.950	NA	0.694	160 @ 1.800	482 @ 1.100	460	1.000	0.750	R335	R435, R450	R550	R635, R650	S129, S135, S136	LS Engine
PAC-1209X	1.324	0.950	NA	0.680	160 @ 1.800	510 @ 1.100	500	1.000	0.750	R335	R435, R450	R550	R635, R650	S129, S135, S136	LS Engine
PAC-1222X	1.280	0.925	NA	0.655	180 @ 1.800	480 @ 1.100	425	1.055	0.700	R355	R455	NA	R655	S121, S141	LS spring for aftermarket heads
PAC-1236X	1.310	0.925	NA	0.665	156 @ 1.800	495 @ 1.150	520	1.080	0.650	R355	R455	NA	R655	S121, S141	LS spring for aftermarket heads
PAC-1237X	1.274	0.900	NA	0.630	200 @ 1.800	585 @ 1.100	550	1.045	0.700	NA	R432	R532	R632	S128, S138	LS spring for drag racing, street strip, High rate and high frequency
PAC-1238X	1.274	0.900	NA	0.630	250 @ 1.800	700 @ 1.050	600	0.985	0.750	NA	R432	R532	R632	S128, S138	LS spring for drag racing, street strip, High rate and high frequency



SPECIFICATIONS: SPRING LOADS AND HEIGHTS

Part No.	PAC-1204X	PAC-1205X	PAC-1206X	PAC-1207X	PAC-1208X	PAC-1209X	PAC-1221X	PAC-1222X	PAC-1236X	PAC-1237X	PAC-1238X
Mass (g)	85	89	86	90	93	94	102	93	100	93	87
Outer Freq	29930.0	29352	29930	29352	31797	31797	29745	27620	33349	33101	35938
Inner Freq	30877.0	30877	33662	33662	30870	33662	28480	33143	32433	35380	38918
Coil Bind	1.000	1.000	1.000	1.000	1.000	1.000	1.080	1.055	1.080	1.050	0.985
2.500											
2.450											
2.400											
2.350											
2.300											
2.250								18			
2.200	3	3	3	3				30			18
2.150	16	18	14	16	2		17	42		13	40
2.100	34	37	26	29	22	14	38	55		35	70
2.050	53	57	43	47	45	35	58	74	26	62	100
2.000	71	77	63	69	68	60	79	95	52	90	130
1.950	90	96	84	90	91	85	99	116	78	118	160
1.900	108	116	104	112	114	110	119	137	104	145	190
1.850	127	135	125	133	137	135	140	159	130	173	220
1.800	145	155	145	155	160	160	160	180	156	200	250
1.750	163	175	165	177	183	185	180	201	182	228	280
1.700	182	194	186	198	206	210	201	223	208	255	310
1.650	200	214	206	220	229	235	221	244	234	283	340
1.600	219	233	227	241	252	260	241	265	260	310	370
1.550	237	253	247	263	275	285	262	286	286	338	400
1.500	256	273	268	285	298	310	282	308	313	365	430
1.450	274	292	288	306	321	335	303	329	339	393	460
1.400	293	312	309	328	344	360	323	350	365	420	490
1.350	311	332	329	350	367	385	343	372	391	448	520
1.300	330	351	350	371	390	410	364	393	417	475	550
1.250	348	371	370	393	413	435	384	414	443	503	580
1.200	367	390	391	414	436	460	404	435	469	530	610
1.150	385	410	411	436	459	485	425	457	495	558	640
1.100	403	430	432	458	482	510	445	478	521	585	670
1.050	422	449	452	479	505	535	465			613	700
1.000	440	469	473	501	528	560	486				730
0.950											
0.900											
0.850											



Late Model Series

GM

LS Beehive

Part No.

PAC-1215
PAC-1218
PAC-1219

LS Beehive RPM

Part No.

PAC-1211X
PAC-1218X
PAC-1219X
PAC-1276X

LS Dual HYD Roller Hot Rod

Part No.

PAC-1904
PAC-1905

LS Dual HYD Roller RPM

Part No.

PAC-1204X
PAC-1205X
PAC-1206X
PAC-1207X
PAC-1208X
PAC-1209X
PAC-1222X
PAC-1236X

LS Dual Solid Roller

Part No.

PAC-1237X
PAC-1238X
PAC-1333
PAC-1334
PAC-1335
PAC-1529

LT

Part No.

PAC-1275X

Ford

FMOD 2V

Part No.

PAC-1213
PAC-1214
PAC-1214X

FMOD 3V

Part No.

PAC-1233

FMOD 4.6 4V

Part No.

PAC-1223
PAC-1223X

FMOD Coyote

GEN 1 & 2

Part No.

PAC-1234X

GEN 3

Part No.

PAC-1234X

FMOD 4.6 & 5.0 Coyote Race

Part No.

PAC-1217X

GT500

INTAKE

Part No.

PAC-1230x

EXHAUST

Part No.

PAC-1231x

Godzilla

Part No.

PAC-1282X
PAC-1282LX

Dodge

HEMI

03-07 5.7 & 6.1 LITER

Part No.

PAC-1235

6.4 LITER

Part No.

PAC-1232X

GEN 3 5.7 & 6.1 LITER

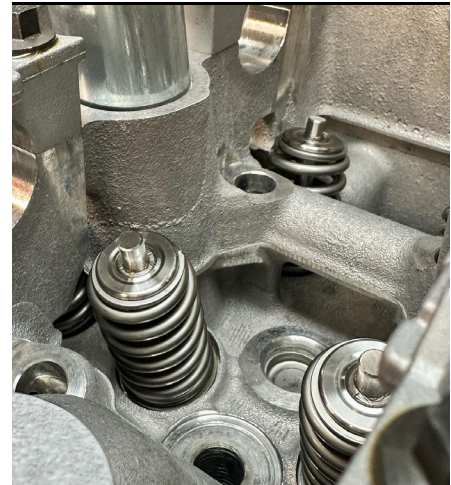
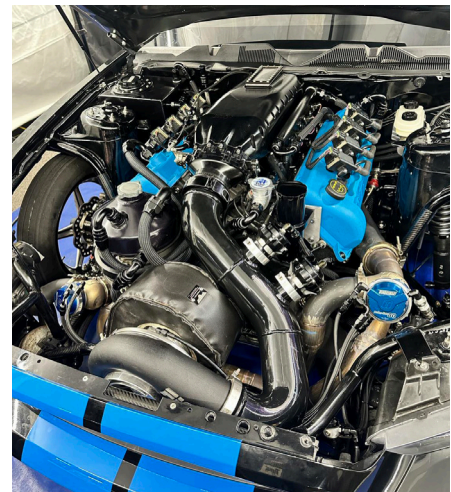
Part No.

1275x

Viper

Part No.

PAC-1283



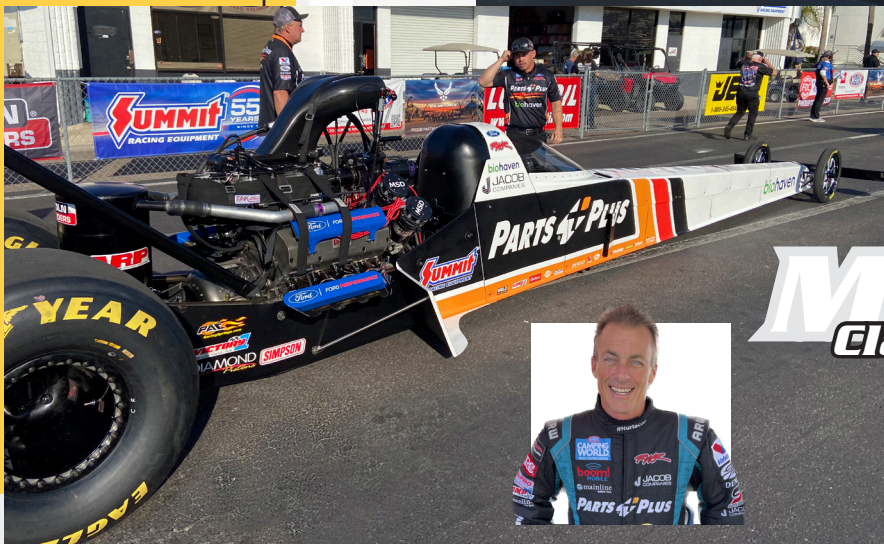
Winners Run With



Racing Valve Springs

Brown

Antron Brown



Milligan

Clay Milligan



Michael Malmgren

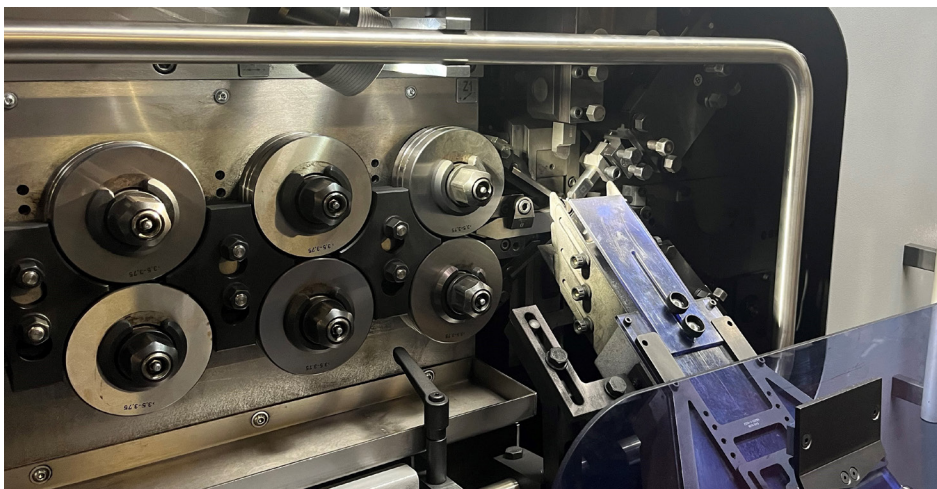


Single Springs

Part No.	Spring Diameters			Spring Loads		Spring Rate	Max Coil Bind	Max Lift	Comments
	OD Outer	ID Outer	ID Inner	Installed Loads (lbs/in)	Open Loads (lbs/in)				
PAC-MX108	0.756	0.560	NA	32 @ 1.060	75 @ 0.680	113	0.625	0.380	Yamaha 2003-2012 YZF450I, E Single Valve Spring
PAC-MX111	0.800	0.560	NA	35 @ 1.317	128 @ 0.920	234	0.835	0.397	Kawasaki 2004-2012 KXF250 Single Valve Spring
PAC-MX115	0.934	0.650	NA	52 @ 1.416	179 @ 1.031	339	0.960	0.385	Honda 2002-2012 CRF450E Single Valve Spring
PAC-MX116	0.934	0.650	NA	42 @ 1.337	170 @ 0.902	294	0.850	0.435	Honda 2002-2012 CRF450I Single Valve Spring
PAC-MX118	1.000	0.730	NA	37 @ 1.160	134 @ 0.760	243	0.741	0.400	Suzuki 2008-2012 RMZ450I Single Valve Spring
PAC-MX119	1.055	0.515	NA	85 @ 1.250	195 @ 0.850	275	0.780	0.400	Yamaha 2008-2012 Rhino 700 Single Beehive Valve Spring
PAC-MX126	0.856	0.600	NA	46 @ 1.370	143 @ 0.992	257	0.935	0.378	Yamaha 2008-2012 Hyabusa E Single Valve Spring
PAC-MX131	0.875	0.625	NA	52 @ 1.300	120 @ 1.00	227	0.830	0.300	KTM 2011-2012 250SXF-I,E Single Valve Spring
PAC-MX138	0.840	0.570	NA	42 @ 1.300	160 @ 0.950	337	0.858	0.350	Yamaha 2008-2014 R6-I,E Single Valve Spring
PAC-MX143	0.81	0.56	NA	25 @ 1.347	155 @ 0.878	277	0.844	0.469	Suzuki 2013-2024 RMZ250 I,E Single Valve Spring

Dual Springs

Part No.	Spring Diameters			Spring Loads		Spring Rate	Max Coil Bind	Max Lift	Comments
	OD Outer	ID Outer	ID Inner	Installed Loads (lbs/in)	Open Loads (lbs/in)				
PAC-MX219	1.010	0.740	0.580	80 @ 1.250	181 @ 0.850	252	0.760	0.400	Kawasaki 2004-2012 Teryx 750 Dual Valve Spring
PAC-MX222	0.963	0.707	0.523	70 @ 1.400	200 @ 1.000	325	0.900	0.400	Suzuki 1999-2007 Hyabusa I Dual Valve Spring



Spring Kits

RPM Series - Dual Spring Kits

Part No.	Spring Loads										Comments
	Installed Height (Valve Closed)	Open Load (Valve Open)	Spring Rate	Max Coil Bind	Max Lift	Valve Spring Included	Retainers Included	Seats Included	Locks Included	Seals Included	
PAC-KS23	145 @ 1.800	385 @ 1.150	369	1.000	0.700	1204X	R335	S129	L8113	Yes	LS Engine Kit
PAC-KS24	155 @ 1.800	410 @ 1.150	392	1.000	0.700	1205X	R335	S129	L8113	Yes	LS Engine Kit
PAC-KS25	145 @ 1.800	385 @ 1.150	369	1.000	0.700	1204X	R435	S129	L8113	Yes	LS Engine Kit
PAC-KS26	155 @ 1.800	410 @ 1.150	392	1.000	0.700	1205X	R435	S129	L8113	Yes	LS Engine Kit
PAC-KS31	145 @ 1.800	411 @ 1.150	409	1.000	0.700	1206X	R435	S129	L8113	Yes	LS Engine Kit
PAC-KS32	155 @ 1.800	436 @ 1.150	433	1.000	0.700	1207X	R435	S129	L8113	Yes	LS Engine Kit
PAC-KS33	160 @ 1.800	482 @ 1.100	460	1.000	0.750	1208X	R435	S129	L8113	Yes	LS Engine Kit
PAC-KS34	160 @ 1.800	510 @ 1.100	500	1.000	0.750	1208X	R435	S129	L8113	Yes	LS Engine Kit
PAC-KS35	145 @ 1.800	411 @ 1.150	409	1.000	0.700	1206X	R435	S135	L8113	No	LS Engine Kit, Aftermarket Cylinder Heads (w/ Larger Valve Guides)
PAC-KS36	155 @ 1.800	436 @ 1.150	433	1.000	0.700	1207X	R435	S135	L8113	No	LS Engine Kit, Aftermarket Cylinder Heads (w/ Larger Valve Guides)
PAC-KS37	160 @ 1.800	482 @ 1.100	460	1.000	0.750	1208X	R435	S135	L8113	No	LS Engine Kit, Aftermarket Cylinder Heads (w/ Larger Valve Guides)
PAC-KS38	160 @ 1.800	510 @ 1.100	500	1.000	0.750	1209X	R435	S135	L8113	No	LS Engine Kit, Aftermarket Cylinder Heads (w/ Larger Valve Guides)
PAC-KS46	145 @ 1.800	385 @ 1.150	369	1.000	0.700	1204X	R435	S135	L8161	No	LS Engine Kit, Aftermarket Cylinder Heads for 5/16" valves (w/ Larger Valve Guides)
PAC-KS50	180 @ 1.800	480 @ 1.100	425	1.055	0.700	1222X	R455	S141	L8161	No	LS Engine Kit, Aftermarket Cylinder Heads for 5/16" valves (w/ Larger Valve Guides)

RPM Series - Beehive Spring Kits

Part No.	Spring Loads										Comments
	Installed Height (Valve Closed)	Open Load (Valve Open)	Spring Rate	Max Coil Bind	Max Lift	Valve Spring Included	Retainers Included	Seats Included	Locks Included	Seals Included	
PAC-KS23	145 @ 1.800	385 @ 1.150	369	1.000	0.700	1204X	R335	S129	L8113	Yes	LS Engine Kit
PAC-KS24	155 @ 1.800	410 @ 1.150	392	1.000	0.700	1205X	R335	S129	L8113	Yes	LS Engine Kit
PAC-KS25	145 @ 1.800	385 @ 1.150	369	1.000	0.700	1204X	R435	S129	L8113	Yes	LS Engine Kit

Hot Rod Series - Dual Spring Kits

Part No.	Spring Loads										Comments
	Installed Height (Valve Closed)	Open Load (Valve Open)	Spring Rate	Max Coil Bind	Max Lift	Valve Spring Included	Retainers Included	Seats Included	Locks Included	Seals Included	
PAC-KS06	150 @ 1.800	400 @ 1.125	370	1.010	0.625	1904	R435	S135	L8113	Yes	LS Engine Kit, Aftermarket Cylinder Heads (w/ Larger Valve Guides) w/ Ti Retainers
PAC-KS07	160 @ 1.800	425 @ 1.125	392	1.020	0.650	1905	R435	S135	L8113	Yes	LS Engine Kit, Aftermarket Cylinder Heads (w/ Larger Valve Guides) w/ Ti Retainers
PAC-KS11	150 @ 1.800	400 @ 1.125	370	1.010	0.625	1904	R335	S129	OE	Yes	LS Engine Kit, Dual Spring w/ Chrome Moly Retainer
PAC-KS12	160 @ 1.800	425 @ 1.125	392	1.020	0.650	1905	R335	S129	OE	Yes	LS Engine Kit, Dual Spring w/ Chrome Moly Retainer
PAC-KS15	150 @ 1.800	400 @ 1.125	370	1.010	0.625	1904	R335	S129	L8113	Yes	LS Engine Kit, Dual Spring w/ Chrome Moly Retainer
PAC-KS16	160 @ 1.800	425 @ 1.125	392	1.020	0.650	1905	R335	S129	L8113	Yes	LS Engine Kit, Dual Spring w/ Chrome Moly Retainer
PAC-KS17	150 @ 1.800	400 @ 1.125	370	1.010	0.625	1904	R435	S129	L8113	Yes	LS Engine Kit, Dual Spring w/ Ti Retainers
PAC-KS18	160 @ 1.800	425 @ 1.125	392	1.020	0.650	1905	R435	S129	L8113	Yes	LS Engine Kit, Dual Spring w/ Ti Retainers

RPM Series - Beehive Spring Kits

Part No.	Spring Loads										Comments
	Installed Height (Valve Closed)	Open Load (Valve Open)	Spring Rate	Max Coil Bind	Max Lift	Valve Spring Included	Retainers Included	Seats Included	Locks Included	Seals Included	
PAC-KS04	155 @ 1.800	377 @ 1.280	370	1.210	0.0600	1220	R362	S112	L8086	Yes	Harley Twin Cam EVO Kit - 3 groove locks with 7mm valve (4 pc set)
PAC-KS05	155 @ 1.800	377 @ 1.280	370	1.210	0.0600	1220	R363	S112	L8148	Yes	Harley Twin Cam - 5/16 Valve Square Groove (4 pc set)
PAC-KS13	135 @ 1.800	348 @ 1.175	340	1.100	0.625	1219	R311	S111	L8113	Yes	LS Engine Kit, PAC-1219 Beehive Spring Kit w/ Chrome Moly Retainer
PAC-KS14	130 @ 1.800	318 @ 1.200	313	1.140	0.600	1218	R311	S111	L8113	Yes	LS Engine Kit, PAC-1218 Beehive Spring Kit w/ Chrome Moly Retainer



Spring Retainers

Overview

300 Series

Chrome Moly Steel Retainers

Standard chrome moly steel retainers manufactured with precise CNC machinery and heat treated to withstand wear and abrasion. Available in beehive and dual spring versions for budget minded performance without sacrificing quality.



400 Series

Sportsman Titanium Retainers

Sportsman series titanium using aerospace grade 6AL4V titanium manufactured to exacting standards. Designed to have enhanced strength, while retaining a budget minded price.



500 Pro Series

Titanium Retainers

Pro grade ultra-high strength and lightweight 500 series retainers are optimized for thickness and strength using Ti-17 material. Stringent material certifications and ultimate strength testing ensure peak performance.



600 Series

Tool Steel Retainers

Offer superior abrasion resistance using a proprietary alloy with metallurgic processing enhancements to improve fatigue strength while reducing weight. Retainers come with a reduced step and need to be combined with a matching seat where applicable.



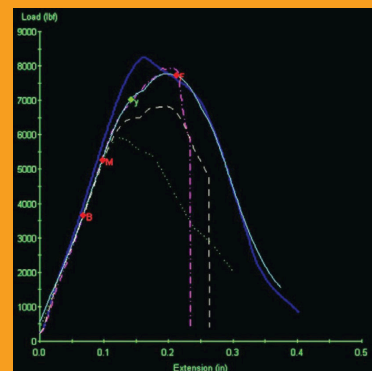
700 Endurance Series

Tool Steel Retainers

700 Series Steel Retainers are made from Exotic Aerospace steel alloy. This alloy is used on the most sophisticated defense aircraft which demonstrates its toughness. This alloy was previously unavailable to the public.



Retainer Technology Research & Development

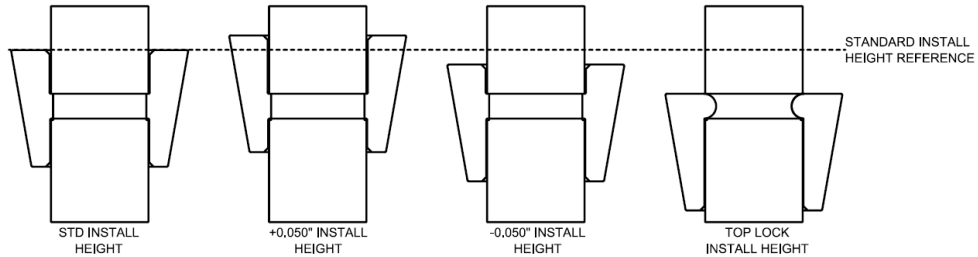


Retainer pull-through testing

Valve Locks

Overview

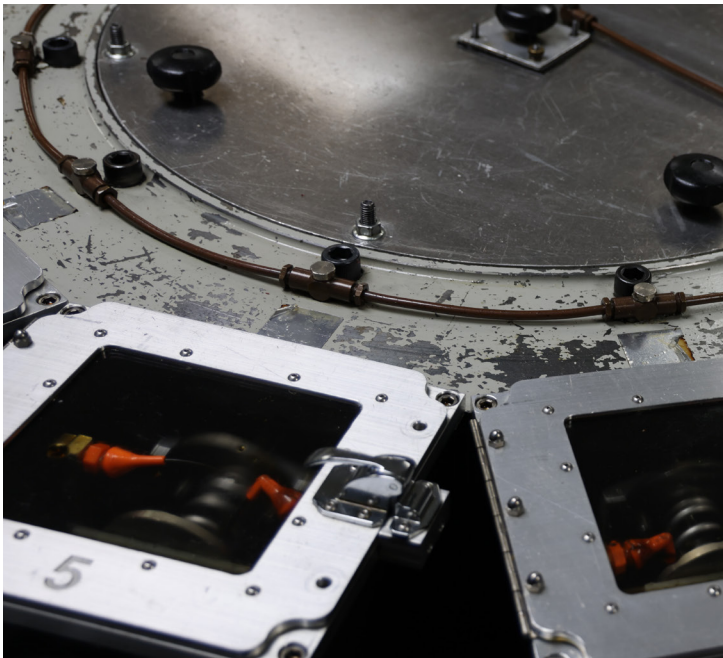
We have standardized the spring retainer “cone style” to improve specifying the fitment into a matching PAC Racing retainer. Available in popular valve sizes with and without lash cap recess in titanium and steel. Custom versions available upon request.



Seats & Shims

Overview

Available in standard, heat treated chrome moly steel and tool steel options (as an “X” suffix), various sizes are available to match valve guides and valve springs. Tool steel options have improved wear and durability characteristics over traditional spring seats.



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
FMOD A	7.00°	0.4200	0.300
FMOD B	7.00°	0.3430	0.275

Spring Retainers



300 Series

Chrome Moly Steel Retainers

Standard chrome moly steel retainers manufactured with precise CNC machinery and heat treated to withstand wear and abrasion. Available in beehive and dual spring versions for budget minded performance without sacrificing quality.

Beehive 300 Series

Part No.	Retainer Dimensions (in.)			Lock Angle (deg.)	Weight (grams)	Comments
	Diameter A	Diameter B	Diameter C			
PAC-R310	1.035	0.640	NA	STD 10	10.2	Fits 1211, 1215, 1218, 1219, 1220 and 1286
PAC-R311	1.035	0.640	NA	LS 7	10.4	Fits 1211, 1215, 1218, 1219, 1220 and 1286
PAC-R312	0.865	0.570	NA	FMOD A	7.7	Fits 1223 and 1233
PAC-R313	1.115	0.721	NA	STD 10	11.6	Fits 1255 and 1295
PAC-R331	0.800	0.500	NA	FMOD A	5.4	Fits 1217, 1234 and 1281
PAC-R333	0.875	0.640	NA	STD 7	6.3	Fits 1409 - for drag race use only
PAC-R342	0.865	0.580	NA	6	9.2	Fits v-rod (non destroyer)
PAC-R346	0.800	0.495	NA	FMOD A	5.5	+0.060 version of 331
PAC-R362	1.035	0.640	NA	FMOD A	12.8	Fits 1211, 1215, 1218, 1219, 1220 and 1286
PAC-R363	1.035	0.640	NA	STD 7	12.8	Fits 1211, 1215, 1218, 1219, 1220 and 1286
PAC-R364	0.795	0.517	NA	FMOD B	5.1	Fits 1217, 1234 and 1281
PAC-R373	1.050	0.725	NA	HEMI 7	11.7	6.4L Hemi, fits 1255 and 1295
PAC-R374	1.050	0.650	NA	HEMI 7	10.7	6.4L Hemi, fits 1232
PAC-R375	1.015	0.625	NA	MC-7	9.7	Fits gen2 Mini Cooper with 1214 or 1214x
PAC-R393	0.975	0.640	NA	Godzilla 7	10.9	Fits 1282, uses Factory Godzilla locks
PAC-R394	0.975	0.640	NA	Godzilla 7	11.2	-0.100 version of R393, uses Factory Godzilla locks

Dual Spring 300 Series

Part No.	Retainer Dimensions (in.)			Lock Angle (deg.)	Weight (grams)	Comments
	Diameter A	Diameter B	Diameter C			
PAC-R315	1.475	1.110	0.710	STD 10	26.3	Fits 1227, 1239, 1297, 1341 and 1509
PAC-R316	1.235	0.880	0.640	LS 7	19.3	Fits 1221
PAC-R317	1.325	0.990	0.700	STD 10	17.0	Fits 1371 and 1575
PAC-R334	1.200	0.850	0.600	STD 7	17.0	Fits 1202 and 1203
PAC-R335	1.300	0.940	0.680	LS 7	20.0	Fits most LS RPM duals
PAC-R348	1.360	0.985	0.690	MINI 8	15.1	Fits 1371
PAC-R349	1.200	0.775	NA	STD 8	18.8	Fits 1200 and 1201
PAC-R355	1.225	0.920	0.650	LS 7	19.0	Fits 1222
PAC-R383	1.495	1.167	0.866	STD 10	33.0	Fits 1950
PAC-R387	1.450	1.122	0.735	STD 10	29.0	Fits 1901, 1916, 1918, 1924 and 1940
PAC-R388	1.440	1.097	0.802	STD 10	29.0	Fits 1914
PAC-R389	1.400	1.067	0.802	STD 10	29.0	Fits 1908
PAC-R391	1.400	1.067	0.785	STD 10	28.0	Fits 1903
PAC-R392	1.200	0.892	0.669	STD 10	17.0	Fits 1903

Single Spring 300 Series

Part No.	Retainer Dimensions (in.)			Lock Angle (deg.)	Weight (grams)	Comments
	Diameter A	Diameter B	Diameter C			
PAC-R377	1.480	1.102	1.000	STD 10	32.0	Fits 1933
PAC-R378	1.460	1.072	0.963	STD 10	30.0	Fits 1900
PAC-R382	1.235	0.857	0.755	STD 10	17.0	Fits 1902



400 Series

Sportsman Titanium Retainers

Sportsman series titanium using aerospace grade 6AL4V titanium manufactured to exacting standards. Designed to have enhanced strength, while retaining a budget minded price.

Beehive 400 Series

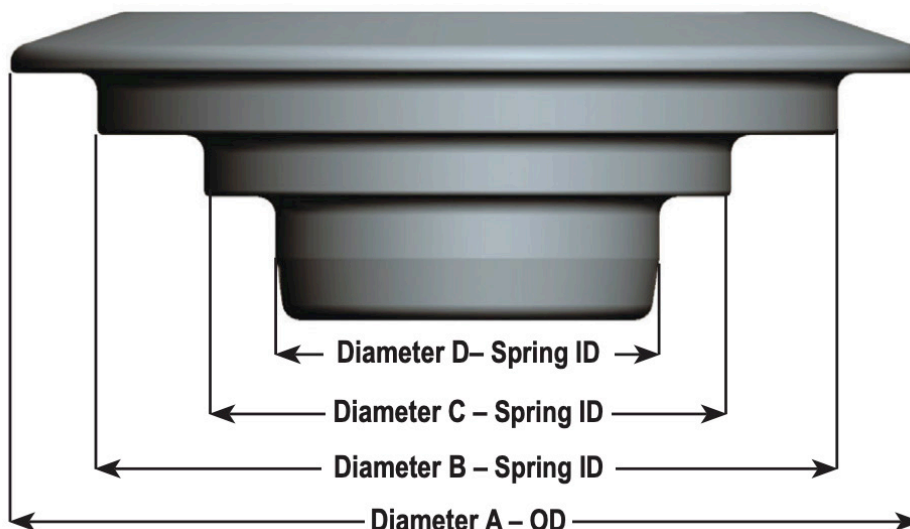
Part No.	Retainer Dimensions (in.)				Lock Angle (deg.)	Weight (grams)	Comments
	Diameter A	Diameter B	Diameter C	Diameter D			
PAC-R442	0.865	0.580	NA	NA	6	5.2	Fits v-rod (non destroyer)
PAC-R445	0.825	0.565	NA	NA	6	4.8	Fits v-rod destroyer
PAC-R464	0.795	0.517	NA	NA	FMOD A	4.0	Fits 1217, 1234 and 1281

Dual Spring 400 Series

Part No.	Retainer Dimensions (in.)				Lock Angle (deg.)	Weight (grams)	Comments
	Diameter A	Diameter B	Diameter C	Diameter D			
PAC-R404	1.480	1.165	0.840	NA	STD 10	18.8	Fits 1.625 dual springs
PAC-R405	1.450	1.090	0.780	NA	STD 10	16.6	Fits, 1225, 1243, 1325, 1343 and 1561
PAC-R408	1.450	1.040	0.715	NA	STD 10	15.0	Fits most dual drag race springs
PAC-R416	1.235	0.880	0.640	NA	LS 7	10.9	Fits 1221
PAC-R432	1.200	0.890	0.600	NA	MINI 8	10.4	Fits 1335, 1529 and 1530
PAC-R435	1.300	0.940	0.680	NA	LS 7	11.1	Fits most LS Duals
PAC-R436	1.450	1.125	0.800	NA	STD 10	17.6	Fits 1243, 1245, 1289 and 1343
PAC-R439	1.075	0.800	0.575	NA	FMOD A	7.8	Fits 1312 and 1312L
PAC-R450	1.240	0.940	0.685	NA	MINI 8	11.7	Fits most LS Duals
PAC-R455	1.225	0.920	0.650	NA	LS 7	11.1	Fits 1222, 1236

Triple Spring 400 Series

Part No.	Retainer Dimensions (in.)				Lock Angle (deg.)	Weight (grams)	Comments
	Diameter A	Diameter B	Diameter C	Diameter D			
PAC-R401	1.480	1.185	0.865	0.635	STD 10	17.9	Fits most triples
PAC-R402	1.480	1.185	0.865	0.635	STD 8	18.1	Fits most triples



Spring Retainers



500 Series

Titanium Retainers

Pro grade ultra-high strength and lightweight 500 series retainers are optimized for thickness and strength using Ti-17 material. Stringent material certifications and ultimate strength testing ensure peak performance.

Beehive 500 Series

Part No.	Retainer Dimensions (in.)				Lock Angle (deg.)	Weight (grams)	Comments
	Diameter A	Diameter B	Diameter C	Diameter D			
PAC-R310	1.035	0.640	NA		STD 10	10.2	Fits 1211, 1215, 1218, 1219, 1220 and 1286
PAC-R311	1.035	0.640	NA		LS 7	10.4	Fits 1211, 1215, 1218, 1219, 1220 and 1286
PAC-R312	0.865	0.570	NA		FMOD A	7.7	Fits 1223 and 1233
PAC-R313	1.115	0.721	NA		STD 10	11.6	Fits 1255 and 1295

Dual Spring 500 Series

Part No.	Retainer Dimensions (in.)				Lock Angle (deg.)	Weight (grams)	Comments
	Diameter A	Diameter B	Diameter C	Diameter D			
PAC-R504	1.475	1.165	0.840	NA	STD 10	17.0	Fits 1.625 dual springs
PAC-R505	1.400	1.090	0.780	NA	STD 10	15.0	Fits 1225, 1243, 1325, 1343 and 1561
PAC-R506	1.400	1.090	0.695	NA	STD 10	14.4	Fits 1226, 1326, 1326H, AND 1393
PAC-R508	1.365	1.040	0.715	NA	STD 10	12.9	Fits most drag race duals
PAC-R509	1.365	1.040	0.715	NA	STD 8	12.9	Fits most drag race duals
PAC-R514	1.475	1.140	0.735	NA	STD 10	14.8	Fits 1385 and 1395
PAC-R515	1.475	1.110	0.710	NA	STD 10	14.4	Fits 1227, 1239, 1297, 1341 and 1509
PAC-R516	1.235	0.880	0.640	NA	LS 7	7.7	Fits 1221
PAC-R517	1.325	0.990	0.700	NA	STD 10	11.8	Fits 1371 and 1575
PAC-R519	1.475	1.140	0.735	NA	STD 8	14.7	Fits 1385 and 1395
PAC-R532	1.200	0.890	0.600	NA	MINI 8	10.2	Fits 1335, 1529 and 1530
PAC-R536	1.450	1.125	0.800	NA	STD 10	15.9	Fits 1243, 1245, 1289 and 1343
PAC-R537	1.475	1.140	0.815	NA	STD 8	15.8	Fits 1342, 1386 and 1396
PAC-R538	1.475	1.140	0.815	NA	STD 10	17.3	Fits 1342, 1386 and 1396
PAC-R540	1.400	1.080	0.770	NA	STD 8	14.1	Fits 1340, 1541 and 1572
PAC-R541	1.400	1.090	0.695	NA	STD 8	13.2	Fits 1226, 1326, 1326H, AND 1393
PAC-R544	1.365	1.040	0.715	NA	MINI 8	14.2	Fits most drag race duals
PAC-R547	1.450	1.060	0.735	NA	STD 8	17.0	Fits 1323 and 1370
PAC-R550	1.240	0.940	0.685	NA	MINI 8	11.7	Fits most ls duals
PAC-R551	1.450	1.110	0.785	NA	STD 8	16.8	Fits 1244 and 1344
PAC-R552	1.360	0.985	0.680	NA	MINI 8	13.1	Fits 1371 and 1575
PAC-R553	1.440	1.070	0.750	NA	STD 8	15.8	Fits 1574
PAC-R556	1.440	1.090	0.780	NA	STD 8	16.3	Fits 1225, 1243, 1325, 1343 and 1561
PAC-R557	1.450	1.120	0.715	NA	STD 8	15.4	Fits 1227, 1239, 1297, 1341 and 1509
PAC-R558	1.200	0.880	0.615	NA	MINI 8	9.5	Fits 1392
PAC-R559	1.360	0.990	0.675	NA	MINI 8	12.6	Fits 1373
PAC-R566	1.550	1.120	0.780	NA	STD 10	20.0	Fits 1244 and 1344
PAC-R572	1.240	1.020	0.710	NA	MINI 8	12.2	Fits 1372

Triple Spring 500 Series

Part No.	Retainer Dimensions (in.)				Lock Angle (deg.)	Weight (grams)	Comments
	Diameter A	Diameter B	Diameter C	Diameter D			
PAC-R501	1.475	1.185	0.865	0.635	STD 10	16.6	Fits most triple springs
PAC-R502	1.475	1.185	0.865	0.635	STD 8	16.6	Fits most triple springs
PAC-R503	1.490	1.215	0.865	0.635	STD 10	17.2	Fits 1366
PAC-R565	1.620	1.215	0.865	0.630	STD 10	21.5	Large OD for better edge wear

Solid Stop Retainers

Part No.	Retainer Dimensions (in.)				Lock Angle (deg.)	Weight (grams)	Comments
	Diameter A	Diameter B	Diameter C	Diameter D			
PAC-R522	1.480	1.180	0.865	0.635	STD 10	19.4	Fits most triple springs
PAC-R523	1.480	1.180	0.865	0.635	STD 8	19.4	Fits most triple springs
PAC-R524	1.380	1.040	0.715	NA	STD 10	16.7	Fits most drag race duals
PAC-R525	1.380	1.040	0.715	NA	STD 8	16.7	Fits most drag race duals

Spring Retainers



600 Series

Tool Steel Retainers

Offer superior abrasion resistance using a proprietary alloy with metallurgic processing enhancements to improve fatigue strength while reducing weight. Retainers come with a reduced step and need to be combined with a matching seat

Beehive 600 Series

Part No.	Retainer Dimensions (in.)				Lock Angle (deg.)	Weight (grams)	Comments
	Diameter A	Diameter B	Diameter C	Diameter D			
PAC-R633	0.875	0.640	NA	NA	STD 7	6.0	Fits 1409 and all .650 ID beehives- for drage race use only
PAC-R643	0.950	0.640	NA	NA	MINI 8	8.4	Fits 1427 (for drag race use only)
PAC-R654	1.125	0.715	NA	NA	MINI 8	13.0	Fits 1295

Dual Spring 600 Series

Part No.	Retainer Dimensions (in.)				Lock Angle (deg.)	Weight (grams)	Comments
	Diameter A	Diameter B	Diameter C	Diameter D			
PAC-R606	1.400	1.090	0.695	NA	STD 10	16.6	Fits 1226, 1326, 1326H, AND 1393
PAC-R608	1.350	1.040	0.715	NA	STD 10	15.7	Fits most drag race duals
PAC-R609	1.350	1.040	0.715	NA	STD 8	15.9	Fits most drag race duals
PAC-R614	1.450	1.140	0.735	NA	STD 10	18.8	Fits 1385 and 1395
PAC-R615	1.475	1.110	0.710	NA	STD 10	21.8	Fits 1227, 1239, 1297, 1341 and 1509
PAC-R616	1.235	0.880	0.640	NA	LS 7	12.6	Fits 1221
PAC-R619	1.450	1.140	0.735	NA	STD 8	17.8	Fits 1385 and 1395
PAC-R632	1.250	0.890	0.600	NA	MINI 8	11.7	Fits 1335, 1529 and 1530
PAC-R635	1.200	0.940	0.685	NA	LS 7	13.4	Fits most LS duals
PAC-R641	1.400	1.090	0.695	NA	STD 8	17.5	Fits 1226, 1326, 1326H, AND 1393
PAC-R644	1.400	1.040	0.715	NA	MINI 8	22.0	Fits most drag race duals
PAC-R649	1.200	0.775	NA	NA	STD 8	14.8	Fits 1200 and 1201
PAC-R650	1.250	0.940	0.685	NA	MINI 8	15.9	Fits most LS duals
PAC-R651	1.450	1.110	0.785	NA	STD 8	13.5	Fits 1244 and 1344
PAC-R655	1.225	0.920	0.650	NA	LS 7	16.3	Fits 1222, 1236
PAC-R658	1.200	0.880	0.615	NA	MINI 8	16.2	Fits 1392
PAC-R659	1.380	0.990	0.675	NA	MINI 8	21.0	Fits 1373
PAC-R660	1.420	1.120	0.715	NA	MINI 8	24.0	Fits 1341
PAC-R661	1.430	1.095	0.695	NA	MINI 8	22.0	Fits 1226, 1326, 1326H, AND 1393
PAC-R672	1.240	1.020	0.710	NA	MINI 8	18.8	Fits 1372

Triple Spring 600 Series

Part No.	Retainer Dimensions (in.)				Lock Angle (deg.)	Weight (grams)	Comments
	Diameter A	Diameter B	Diameter C	Diameter D			
PAC-R601	1.440	1.185	0.865	0.635	STD 10	19.0	Fits most Drag Race Triples
PAC-R602	1.440	1.185	0.865	0.635	STD 8	19.0	Fits most Drag Race Triples

700 Series

Tool Steel Retainers

700 Series Steel Retainers are made from Exotic Aerospace steel alloy. This alloy is used on the most sophisticated defense aircraft which demonstrates its toughness. This alloy was previously unavailable to the public.



Dual Spring 700 Series

Part No.	Retainer Dimensions (in.)				Lock Angle (deg.)	Weight (grams)	Comments
	Diameter A	Diameter B	Diameter C	Diameter D			
PAC-R758	1.145	0.880	0.610	NA	MINI 8	13.2	Fits 1392
PAC-R768	1.360	1.076	0.752	NA	MINI 8	20.1	Fits 1394



Valve Locks



We have added several lock part numbers that feature a machined recess for lash caps. The available locks with these feature are highlighted orange.

TO ORDER, USE:

PAC-LR xxxx instead of the standard Part Number **PAC-Lxxxx**

Reference:

LR = Lash recess

L = STD Lock no recess

STD installed height has recess of 0.030

+0.050 installed height has recess of 0.080 depth

Lash Cap Recess Locks

Pro grade ultra-high strength and lightweight 500 series retainers are optimized for thickness and strength using Ti-17 material. Stringent material certifications and ultimate strength testing ensure peak performance.

3/8" Valve Locks

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

11/32" Valve Locks

Part No.	Valve Size	Type	Lock Angle (deg.)	Valve Groove Type	Installation Height	Material
PAC-L8005	11/32"	STD 10	10	Square	-0.050	Titanium
PAC-L8006	11/32"	STD 10	10	Radius	-0.050	Titanium
PAC-L8007	11/32"	STD 10	10	Square	STD	Titanium
PAC-L8008	11/32"	STD 10	10	Radius	STD	Titanium
PAC-L8015	11/32"	STD 8	8	Square	STD	Titanium
PAC-L8016	11/32"	STD 8	8	Radius	STD	Titanium
PAC-L8017	11/32"	STD 8	8	Square	+0.050	Titanium
PAC-L8018	11/32"	STD 8	8	Radius	+0.050	Titanium
PAC-L8025	11/32"	STD 10	10	Square	-0.050	Steel
PAC-L8026	11/32"	STD 10	10	Radius	-0.050	Steel
PAC-L8027	11/32"	STD 10	10	Square	STD	Steel
PAC-L8028	11/32"	STD 10	10	Radius	STD	Steel
PAC-L8035	11/32"	STD 8	8	Square	STD	Steel
PAC-L8036	11/32"	STD 8	8	Radius	STD	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-L8145	11/32"	MINI 8	8	Square	Top Lock	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
PAC-L8156	11/32"	STD 7	7	Square	-0.05	Steel
PAC-LR8025	11/32"	STD 10	10	Square	-0.050	Steel
PAC-LR8027	11/32"	STD 10	10	Square	STD	Steel
PAC-LR8028	11/32"	STD 10	10	Radius	STD	Steel

5/16" Valve Locks

Part No.	Valve Size	Type	Lock Angle (deg.)	Valve Groove Type	Installation Height	Material
PAC-L8045	5/16"	STD 10	10	Square	-0.050	Titanium
PAC-L8046	5/16"	STD 10	10	Radius	-0.050	Titanium
PAC-L8047	5/16"	STD 10	10	Square	STD	Titanium
PAC-L8048	5/16"	STD 10	10	Radius	STD	Titanium
PAC-L8055	5/16"	STD 8	8	Square	STD	Titanium
PAC-L8056	5/16"	STD 8	8	Radius	STD	Titanium
PAC-L8057	5/16"	STD 8	8	Square	+0.050	Titanium
PAC-L8058	5/16"	STD 8	8	Radius	+0.050	Titanium
PAC-L8064	5/16"	STD 10	10	Square	-0.050	Steel
PAC-L8065	5/16"	STD 10	10	Radius	-0.050	Steel
PAC-L8066	5/16"	STD 10	10	Square	STD	Steel
PAC-L8067	5/16"	STD 10	10	Radius	STD	Steel
PAC-L8073	5/16"	STD 8	8	Square	STD	Steel
PAC-L8074	5/16"	STD 8	8	Radius	STD	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-L8124	5/16"	MINI 8	8	Radius	+0.050	Titanium
PAC-L8125	5/16"	MINI 8	8	Square	+0.050	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-L8139	5/16"	MINI 8	8	Radius	Top Lock	Titanium
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
PAC-L8161	5/16"	LS-1	7	Radius	STD	Steel
PAC-L8162	5/16"	LS-1	7	Radius	+0.050	Steel
PAC-LR8064	5/16"	STD 10	10	Square	-0.050	Steel
PAC-LR8065	5/16"	STD 10	10	Radius	-0.050	Steel
PAC-LR8066	5/16"	STD 10	10	Square	STD	Steel
PAC-LR8067	5/16"	STD 10	10	Radius	STD	Steel

6mm Valve Locks

Part No.	Valve Size	Type	Lock Angle (deg.)	Valve Groove Type	Installation Height	Material
PAC-L8089	6mm	FMOD B	7	Triple Radius	STD	Steel (OE)

7mm Valve Locks

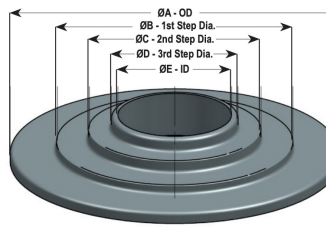
Part No.	Valve Size	Type	Lock Angle (deg.)	Valve Groove Type	Installation Height	Material
PAC-L8078	7mm	STD 10	10	Radius	-0.100	Titanium
PAC-L8079	7mm	STD 10	10	Radius	-0.050	Titanium
PAC-L8080	7mm	STD 10	10	Radius	-0.100	Steel
PAC-L8081	7mm	STD 10	10	Radius	-0.050	Steel
PAC-L8082	7mm	STD 8	8	Radius	-0.050	Titanium
PAC-L8083	7mm	STD 8	8	Radius	STD	Titanium
PAC-L8084	7mm	STD 8	8	Radius	-0.050	Steel
PAC-L8085	7mm	STD 8	8	Radius	STD	Steel
PAC-L8086	7mm	FMOD A	7	Triple Radius	STD	Steel (Oe)
PAC-L8087	7mm	FMOD A	7	Radius	Top Lock	Steel
PAC-L8088	7mm	FMOD A	7	Radius	+0.050	Steel
PAC-L8129	7mm	MINI 8	8	Radius	-0.050	Titanium
PAC-L8130	7mm	MINI 8	8	Radius	STD	Titanium
PAC-L8140	7mm	MINI 8	8	Radius	Top Lock	Titanium

8mm Valve Locks

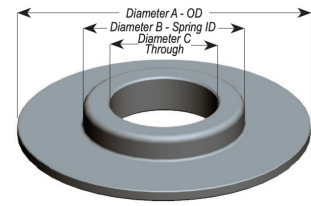
Part No.	Valve Size	Type	Lock Angle (deg.)	Valve Groove Type	Installation Height	Material
PAC-L8112	8mm	LS-1	7	Radius	-0.080	Steel
PAC-L8113	8mm	LS-1	7	Radius	STD	Steel
PAC-L8114	8mm	LS-1	7	Radius	+0.050	Steel
PAC-L8116	8mm	LS-1	7	Radius	-0.050	Steel
PAC-L8117	8mm	MINI 8	8	Radius	STD	Titanium
PAC-L8118	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-L8143	8mm	MINI 8	8	Radius	-0.050	Steel
PAC-L8144	8mm	MINI 8	8	Radius	Top Lock	Steel
PAC-L8152	8mm	STD 7	7	Radius	STD	Steel
PAC-L8153	8mm	STD 7	7	Radius	+0.050	Steel
PAC-L8159	8mm	STD 10	10	Radius	-0.050	Steel
PAC-L8160	8mm	STD 10	10	Radius	STD	Steel
PAC-L8163	8mm	STD 8	8	Radius	STD	Steel
PAC-L8164	8mm	STD 8	8	Radius	+0.050	Steel

Seats & Shims

Available in standard, heat treated chrome moly steel and tool steel options (as an "X" suffix), various sizes are available to match valve guides and valve springs. Tool steel options have improved wear and durability characteristics over traditional spring seats.



Step Seat



Chrome Moly Spring Seat

Step Seats

Part No.	Diameters (in.)					For Use With
	Diameter A (OD)	Diameter B (1st Step Dia.)	Diameter C (2nd Step Dia.)	Diameter D (3rd Step Dia.)	Diameter E (Thru Hole ID)	
PAC-S122	1.500	1.040	0.714	NA	0.570	R608
PAC-S123	1.650	1.185	0.865	0.635	0.570	R601, R602
PAC-S124	1.550	1.140	0.730	NA	0.570	R614, R619
PAC-S125	1.270	0.880	0.640	NA	0.520	R616

Chrome Moly Spring Seats

0.060 Thickness

Part No.	Diameters (in.)			
	Diameter A (OD)	Diameter B (Spring ID)	Diameter C (ID)	Dim "E" Thickness
PAC-S101	1.550	0.855	0.575	0.060
PAC-S102	1.550	0.855	0.635	0.060
PAC-S103	1.550	0.770	0.575	0.060
PAC-S104	1.550	0.770	0.635	0.060
PAC-S105	1.550	0.700	0.575	0.060
PAC-S106	1.550	0.700	0.635	0.060
PAC-S107	1.625	0.760	0.635	0.060
PAC-S108	1.625	0.760	0.575	0.060
PAC-S109	1.650	0.630	0.570	0.060
PAC-S110	1.500	0.715	0.570	0.060
PAC-S111	1.270	0.870	0.570	0.060
PAC-S112	1.450	0.980	0.570	0.060
PAC-S113	1.450	0.980	0.630	0.060
PAC-S114	1.450	0.700	0.570	0.060
PAC-S115	1.450	0.700	0.630	0.060
PAC-S116	1.550	1.120	0.630	0.060
PAC-S117	1.550	0.730	0.575	0.060
PAC-S118	1.550	0.730	0.630	0.060
PAC-S119	1.550	0.800	0.575	0.060
PAC-S120	1.550	0.800	0.630	0.060
PAC-S121	1.270	0.640	0.520	0.060
PAC-S126	1.500	0.715	0.630	0.060
PAC-S127	1.500	0.715	0.630	0.060
PAC-S128	1.270	0.600	0.520	0.060
PAC-S129	1.270	0.680	0.520	0.060
PAC-S130	1.550	0.820	0.575	0.060
PAC-S131	1.550	0.820	0.630	0.060
PAC-S135	1.270	0.680	0.570	0.060
PAC-S138	1.270	0.615	0.575	0.060
PAC-S159	1.285	0.930	0.575	0.060
PAC-S160	1.350	0.915	0.575	0.060
PAC-S161	1.350	0.870	0.575	0.060

0.030 Thickness

Part No.	Diameters (in.)			
	Diameter A (OD)	Diameter B (Spring ID)	Diameter C (ID)	Dim "E" Thickness
PAC-S132	1.100	0.580	0.510	0.030
PAC-S133	1.650	0.630	0.570	0.030
PAC-S134	1.500	0.715	0.570	0.030
PAC-S136	1.270	0.680	0.510	0.030
PAC-S137	1.400	0.685	0.570	0.030
PAC-S141	1.271	0.640	0.575	0.030
PAC-S154	1.300	0.615	0.570	0.035

Tool Steel Seats

0.030 Thickness

Part No.	Diameters (in.)			Dim "E" Thickness
	Diameter A (OD)	Diameter B (Spring ID)	Diameter C (ID)	
PAC-S137X	1.400	0.685	0.570	0.030
PAC-S154X	1.300	0.615	0.570	0.035

0.060 Thickness

Part No.	Diameters (in.)			Dim "E" Thickness
	Diameter A (OD)	Diameter B (Spring ID)	Diameter C (ID)	
PAC-S105X	1.550	0.700	0.575	0.060
PAC-S140X	1.400	0.685	0.570	0.060

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.

Spring Shims

Part No.	Diameters (in.)		Thickness (in.)
	Outside Diameter (in.)	Inside Diameter (in.)	
PAC-S181	1.040	0.615	0.015
PAC-S182	1.040	0.615	0.020
PAC-S183	1.040	0.615	0.030
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-S195	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

SPRING SHIM KITS

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	Diameters (in.)				
		Inside Diameter (in.)	0.015 Shim	0.020 Shim	0.030 Shim	0.050 Shim
PAC-KS91	1.620 Dia Shim Kit- (64 pcs total)	0.645	S199	S198	S197	S196
PAC-KS92	1.500 Dia Shim Kit- (64 pcs total)	0.645	S195	S194	S193	S192
PAC-KS93	1.250 Dia Shim Kit- (64 pcs total)	0.570	S191	S190	S189	S188
PAC-KS94	1.500 Dia Shim Kit- (64 pcs total)	0.570	S187	S186	S185	S184



www.racingsprings.com

1-866-799-9417

Calibration Springs PN PAC-T900

This spring is specially designed calibration spring to verify the heights and loads of valve spring testers. This spring has been measured with the utmost accuracy at PAC Racing springs labs.

Important: The spring must be pressed to coil bind 3 times before measurement.

Serial Number	PAC-001
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Height (in)	Load (lbs)
2.000	84.1
1.900	142.0
1.800	199.9
1.700	258.0
1.600	321.0
1.500	391.8
1.400	465.0
1.300	550.2



This spring may be returned to PAC Racing Springs for re-verification

PAC Racing Springs
21200 Telegraph
Road Southfield, MI
48034
1-866-799-9417

Signed: _____
Date: _____

Calibration Springs

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-T900



PAC-T902

PAC-T901

PAC-T903

PAC-T904

Spring Installed Height Gauge

- Stainless steel construction for extremely long life
- Non-magnetic to avoid pulling shims when using
- Increased accuracy and precision with finer pitch threads

Part No.	Height Range	ID	Per Turn	Use	Color
PAC-T901	1.400 to 2.000	0.760	0.050	Beehive springs	Blue
PAC-T902	1.800 to 2.500	1.200	0.050	"Pro Series & Drag Race"	Red
PAC-T903	1.400 to 1.900	1.200	0.050	Engine Builders	Orange
PAC-T904	1.400 to 2.000	0.975	0.050	LS Dual Springs	Purple



TERMS & CONDITIONS

1. Governing Provisions; Order Acceptance. These terms and conditions ("Terms") govern the sale of products (the "Products") by Race Winning Brands, and its portfolio of companies (Boostline Products, Corsa Performance, Dart Machinery, Diamond Pistons, Haltech, JE Pistons, K1 Technologies, Manley Performance, MGP, PAC Racing Springs, ProX Racing Parts, Rekluse, RevMax, TransGo, Transmission Specialties, Trend Performance, Victory 1, Volant and Wiseco Performance Products), herein referred to as "RWB" to the buyer of the Products ("Buyer"). The quote, order acknowledgment and/or invoice of RWB attached to these Terms, together with these Terms, other specifications for the Products and any packing slip of RWB comprise the entire agreement between the parties with respect to the Products (the "Contract"). In the event of conflict between a provision in the Terms and any other component of the Contract, these Terms shall prevail. This Contract supersedes all prior or contemporaneous understandings, agreements, negotiations, representations and warranties, and communications, both written and oral between the parties with respect to the purchase of Products. No additional or different terms will be binding upon RWB unless specifically agreed to in writing by an authorized representative of RWB. Any additional or different terms proposed by Buyer, either previously or in the future, whether in a purchase order, other communication or otherwise, are hereby rejected and shall not apply. RWB's failure to object to provisions contained in any purchase order or other communication from Buyer shall not be construed as a waiver of these Terms nor an acceptance of any such provisions. RWB is not bound by any order until it is either accepted in writing by an authorized representative of RWB or RWB ships the Products, whichever occurs first.

2. Delivery; Title. RWB does not guarantee delivery on any specific date and RWB will not be liable for any damages caused by a delay in a projected or estimated delivery date. The Products are delivered FOB shipping point, using RWB's standard methods for packaging and shipping any Products. Acceptance of a shipment by a common carrier constitutes delivery to Buyer, at which time all risk of loss transfers to Buyer. RWB may choose the means of transportation and the route of shipments unless otherwise agreed in writing prior to acceptance of an order. The Buyer must make any claim for shortages and other errors in delivery in writing to RWB within 5 days after receipt of the Products. Failure to give such notice constitutes an unqualified acceptance of the Products and a waiver of any claim Buyer may have regarding the delivery. RWB reserves the right to make delivery in installments. Any installments will be separately invoiced and paid for when due, as set forth on the invoice, without regard to subsequent deliveries.

3. Cancellation. The Buyer may not cancel an order after it is accepted by RWB, unless RWB agrees in writing. Any reduction in quantities ordered constitutes a cancellation. In the event RWB agrees to a cancellation, Buyer shall pay all costs and expenses (including indirect expenses) directly or indirectly caused by Buyer's cancellation.

4. Default. Each of the following are an "Event of Default": (i) Buyer fails to pay RWB for any amount owed to RWB under the Contract when due; (ii) Buyer breaches any provision of the Contract; (iii) Buyer files a petition, answer or consent to a petition seeking relief under Title 11 of the United States Code, as now constituted or hereafter amended, or any other applicable federal, state or foreign bankruptcy law; (iv) Buyer consents to proceedings or actions instituting a receiver, liquidator, assignee, trustee, custodian or similar official of the Buyer; (v) the insolvency of Buyer. Upon an Event of Default, RWB may, in addition to exercising any or all other rights and remedies that RWB may have, (i) demand full or partial payment in advance before proceeding or continuing with performance of the Contract, (ii) defer delivery of the Products and/or (iii) without notice to Buyer, cancel any or all of RWB's unperformed obligations under the Contract or with any other agreement to which Buyer and RWB are parties. Upon any cancellation pursuant to this Section, Buyer shall pay RWB for any Products delivered and for the full Price of any accepted order at the time this Contract is terminated.

5. Quotations; Prices. Any written quotations automatically expire 30 calendar days from the date issued unless sooner terminated by notice. Verbal quotations expire, unless accepted in writing, the same day they are made. Buyer shall pay the purchase price for the Products specified in the quotation or invoice, as applicable, and shall at all times be subject to any then applicable pricing policy of RWB, including any modifications or adjustments to the pricing policy (the "Price"). The Price will include ordinary pre-delivery packing only. Prices are subject to escalation in future quotations or orders.

6. Payment. Unless otherwise stated in the Contract, net invoice amounts are due upon receipt of the invoice. RWB may issue invoices as it makes partial shipments. Prices do not include taxes or other charges. The Buyer shall pay any manufacturer's tax, retailer's occupation tax, use tax, sales tax, excise tax, inspection or testing fee, or any other like tax, fee or charge of any nature whatsoever, imposed by any governmental authority, on or measured by any transaction between RWB and Buyer, in addition to the Price. In the event RWB is required to pay any tax, fee or charge and/or any associated penalties and interest, Buyer shall promptly reimburse RWB. If Buyer is exempt from any applicable tax or fee, then Buyer shall provide RWB at the time the order is submitted with an exemption certificate or other document acceptable to the authority imposing the tax, fee or charge. All payments shall be made in United States currency. If shipment is delayed beyond the scheduled date for the convenience of Buyer, payment shall be due in full when RWB is prepared to make the shipment. Interest shall be payable by Buyer on any amount not paid when due at the rate of 1.5% per month, or the maximum rate allowable by law, whichever is less, calculated daily and compounded monthly. Buyer shall reimburse RWB for all collection costs, court costs, administration costs, investigation costs, attorneys' fees and all other incidental costs, charges or expenses incurred in the collection of past due amounts or otherwise resulting or arising from any breach by Buyer of the Contract.

7. Limited Warranty and Limitation of Liability. RWB warrants that any Product manufactured by RWB will be free from defects in material and workmanship for 30 days following date of original purchase ("RWB Warranty"). The RWB Warranty extends to the End-User of such Product. The End-User is defined as the person purchasing the Products directly from RWB or an authorized dealer of RWB. RWB specifically disclaims all warranties on any Product (express or implied) not manufactured by RWB. No warranty is transferable by the End-User. As a condition to granting the RWB Warranty, Buyer covenants to use the Product with due care and consistently with the Product's specifications. Any failure of Buyer to adhere to this covenant voids the RWB Warranty. Such failure includes, without limitation, misuse, mishandling, misapplication, neglect (including but not limited to improper maintenance), accident, improper installation, modification (including but not limited to use of unauthorized parts or attachments), or adjustment or repair performed by anyone other than RWB. **THE RWB WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES (EXCEPT OF TITLE), ARISING FROM OPERATION OF LAW, OR ARISING FROM TRADE USAGE OR COURSE OF DEALING, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT AND FITNESS FOR A PARTICULAR PURPOSE.** RWB shall not be subject to any other obligations or liabilities whatsoever, with respect to the Products manufactured or furnished by it, or any undertakings, acts or omissions relating thereto. If Buyer believes a Product is defective and therefore covered by the RWB Warranty, the original buyer shall initiate an RMA as set forth in Section 8 of this Contract. If RWB determines that such Product is covered under the RWB Warranty, then RWB, at its option may, (i) repair the Product, (ii) replace the Product, or (iii) refund the Price of the Product.

NOTWITHSTANDING ANYTHING TO THE CONTRARY IN THE CONTRACT, RWB SHALL NOT BE LIABLE FOR ANY OF THE FOLLOWING TYPES OF LOSS OR DAMAGE ARISING UNDER OR IN RELATION TO THE CONTRACT (WHETHER ARISING BY TORT (INCLUDING NEGLIGENCE), BREACH OF CONTRACT OR OTHERWISE AND WHETHER OR NOT SUCH LOSS OR DAMAGE IS FORESEEABLE, FORESEEN OR KNOWN): (I) ANY LOSS OF PROFITS, BUSINESS, CONTRACTS, ANTICIPATED SAVINGS, GOODWILL OR REVENUE, ANY WASTED EXPENDITURE, OR ANY LOSS OR CORRUPTION OF DATA (REGARDLESS OF WHETHER ANY OF THESE TYPES OF LOSS OR DAMAGE ARE DIRECT, INDIRECT OR CONSEQUENTIAL); OR (II) ANY SPECIAL, INDIRECT, PUNITIVE OR CONSEQUENTIAL LOSS OR DAMAGE OF ANY KIND HOWSOEVER ARISING, EVEN IF ANY OF THE LIMITED REMEDIES OF THIS CONTRACT FAIL TO FULFILL THEIR ESSENTIAL PURPOSE. IN NO EVENT SHALL RWB'S AGGREGATE LIABILITY ARISING OUT OF OR RELATED TO THE PRODUCTS, ANY ANCILLARY SERVICES PROVIDED BY RWB, OR THE CONTRACT, WHETHER ARISING OUT OF OR RELATED TO BREACH OF CONTRACT, TORT (INCLUDING NEGLIGENCE) OR OTHERWISE, EXCEED THE TOTAL OF THE AMOUNTS PAID TO RWB WITH RESPECT TO THE PRICE PAID FOR SUCH PRODUCT OR PRODUCTS GIVING RISE TO RWB'S LIABILITY.

8. Return of Products for Credit Consideration. RWB's Companies are not required to accept any returns but may accept returns from time to time in its sole discretion. **Request for returns must be made within 30 days of purchase date. Only Products that are new, unused, have never been installed, and remain undamaged are eligible for returns.** All Products returned must have an authorized RMA (Returned Materials Authorization) number issued by a RWB Company. Buyer shall apply for an RMA number by contacting RWB Company (phone or email). When applying for the RMA number, Buyer must provide the article/Product serial number, date of original shipment, invoice and any other details requested by a RWB company. Products returned for the convenience of Buyer, or any reason beyond the control of RWB company, will be subject to a minimum service charge of 20% of the invoiced Price for such Products. The Buyer shall prepay all transportation costs associated with a return. The return of any nonstandard Products may be subject to higher restocking fees at RWB's Companies sole discretion. Should a claim be found to be a valid RWB Warranty claim, Buyer shall receive pre-paid freight reimbursement from RWB's Companies plant of origin to the original shipping destination. No obsolete or customized Products or parts may be returned. All items returned to RWB Companies must be shipped freight prepaid, properly protected and intact to the respective RWB brand facility, contact RWB brand for destination address. **This policy ONLY applies to Products purchased directly through a RWB Company.** For any other purchases, please contact your authorized retailer directly. Arrangements must be made in advance - before item is returned to RWB Company. Products shipped prior to cancellation or refused upon delivery may be charged published shipping cost rates for both outbound and returned shipping. In ALL cases shipping costs will not be refunded. Returns must be initiated by the original purchaser. There are NO returns or refunds awarded on used or installed Products. In order to begin a return, please call us directly at to speak with a representative regarding all returns. (See a RWB Company Website for Contact Info.)

9. Confidentiality. All non-public, confidential or proprietary information of RWB, including but not limited to specifications, samples, patterns, designs, plans, drawings, documents, data, pricing, discounts or rebates, disclosed by RWB (or any of its subcontractors or sub suppliers) to Buyer, whether disclosed orally or disclosed or accessed in written, electronic or other form or media, and whether or not marked, designated or otherwise identified as "confidential" in connection with this Contract is confidential, solely for the use of performing this Contract and may not be disclosed, used or copied unless authorized in advance by RWB in writing or unless expressly permitted in the Contract. Upon RWB's request, Buyer shall promptly return all documents and other materials received from RWB. RWB shall be entitled to injunctive relief for any violation of this Section. This Section does not apply to information that is: (a) in the public domain; (b) known to Buyer at the time of disclosure; or (c) rightfully obtained by Buyer on a non-confidential basis from a third party not under an obligation of confidentiality with a RWB Company. Neither Buyer itself shall, nor shall Buyer permit any party to, reverse engineer RWB's Products and or Product components.

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TERMS & CONDITIONS – CONTINUED

10. Security Interest. As collateral security for the payment of the Price of the Products, Buyer hereby grants to RWB a lien on and security interest in and to all of the right, title and interest of Buyer in, to and under the Products, wherever located, and whether now existing or hereafter arising or acquired from time to time, and in all accessions thereto and replacements or modifications thereof, as well as all proceeds (including insurance proceeds) of the foregoing. The security interest granted under this provision constitutes a purchase money security interest under the Uniform Commercial Code.

11. Indemnity. BUYER SHALL INDEMNIFY AND DEFEND RWB AND ITS AFFILIATES AGAINST ANY AND ALL LOSSES, DAMAGES AND EXPENSES (INCLUDING ATTORNEY'S FEES AND OTHER COSTS OF DEFENDING ANY ACTION) THAT IT MAY SUSTAIN OR INCUR AS A RESULT OF: (I) THE USE, OPERATION OR POSSESSION OF THE PRODUCTS BY BUYER, (II) THE ALTERATION OR MODIFICATION OF THE PRODUCTS OR THE USE OR COMBINATION OF THE PRODUCTS WITH OTHER PRODUCTS OR DEVICES BY BUYER, (III) A NEGLIGENCE OR WILLFUL ACT OR OMISSION OF BUYER, (IV) THE BREACH BY BUYER OF THIS CONTRACT, OR (V) THE FAILURE OF BUYER TO COMPLY WITH ANY APPLICABLE LAW OR REGULATION.

12. Governing Law; Venue. The Contract and all claims arising from the relationship between RWB and Buyer will be interpreted, governed and enforced by the laws of the State of Ohio, without regard to any conflict of laws principles and to the exclusion of the provisions of the United Nations Convention on the International Sale of Goods. The parties agree that all litigation between RWB and Buyer which may arise out of or in connection with the Contract or any transaction between them shall be subject to the exclusive jurisdiction of the federal and state courts in the State of Ohio, and each hereby consents to the exclusive jurisdiction of such courts. Buyer agrees that any and all processes directed to it in any such litigation may be served upon it outside of the State of Ohio with the same force and effect as if such service had been made within the State of Ohio.

13. Assignment. The Contract shall be binding upon the respective permitted assignees, successors, executors, administrators and heirs of the parties.

14. No Waiver/Severability. Any waiver by either party of any breach of any provision of the Contract shall not be construed as a waiver of any continuing or succeeding breach of such provision, a waiver or modification of the provision itself, or a waiver or modification of any right under the Contract. If any part of the Contract is void, voidable, invalid, or unenforceable, for any reason, the other provisions in the Contract shall then be considered divisible as to such part, with the remainder of the Contract remaining as valid and binding as though such part were not included in the Contract.

15. Export. Buyer represents and warrants that it will not directly or indirectly arrange for or participate in the export or sale of Products, in whole or in part, outside of the territory agreed to by Buyer and RWB or, if none, the country to which RWB shipped the Products (the "Territory"), without RWB's prior written consent. Buyer agrees that Buyer will take all reasonable and adequate steps to prevent the export or sale of the Products outside of the Territory by others who purchase or lease from Buyer who might reasonably be expected to export or sell them outside the Territory. It shall be Buyer's responsibility to investigate and determine whether any sale or lease by Buyer would be in violation of this Section 15. In the event that Buyer is in violation of this Section 15, any and all warranties provided by RWB for the Products involved in such violation shall immediately become null and void and Buyer shall indemnify and hold RWB harmless from any liability arising out of such prohibited export or sale.

16. Intellectual Property. All intellectual property rights in, or relating to, the Products are owned by or licensed to RWB, and nothing herein shall have the effect of transferring the ownership of such intellectual property rights to Buyer. In the event of any third party demand, claim or action alleging that the proper use of the Products by Buyer in accordance with any instructions and directions issued with or in relation to such Products by RWB infringes any patent or other intellectual property right belonging to a third party, Buyer shall: (i) promptly notify RWB in writing of such claim; (ii) not make any admission in relation to or attempt to settle or compromise the claim; (iii) give RWB express authority to conduct all negotiations and litigation, and to settle all litigation, arising from such claim; and (iv) provide RWB with all available information, documents and assistance as RWB may reasonably require, including without limitation ceasing to use the Products if deemed reasonably necessary by RWB until the infringement claim is resolved. RWB may also, at any time, at its option: (i) procure for Buyer the right to continue to use the Products and/or Services in question, free of any liability for such infringement; or (ii) direct Buyer to cease use of and not market or sell such Products and/or Services and (a) modify the Products and/or Services in question so that they become non-infringing; (b) substitute the Products and/or Services in question with functionally equivalent non-infringing Products and/or Services; or (c) refund the price paid by Buyer for the infringing Products and/or Services. This section states the entire liability of RWB for any infringement of third-party intellectual property rights. Buyer shall indemnify RWB from and against all losses, damages, costs, liabilities and expenses (including legal expenses) arising out of or in connection with any third party demand, claim or action alleging that any Product manufactured or Service provided by RWB in accordance with designs and/or specifications provided to RWB by Buyer infringes any patent or other intellectual property right belonging to a third party.

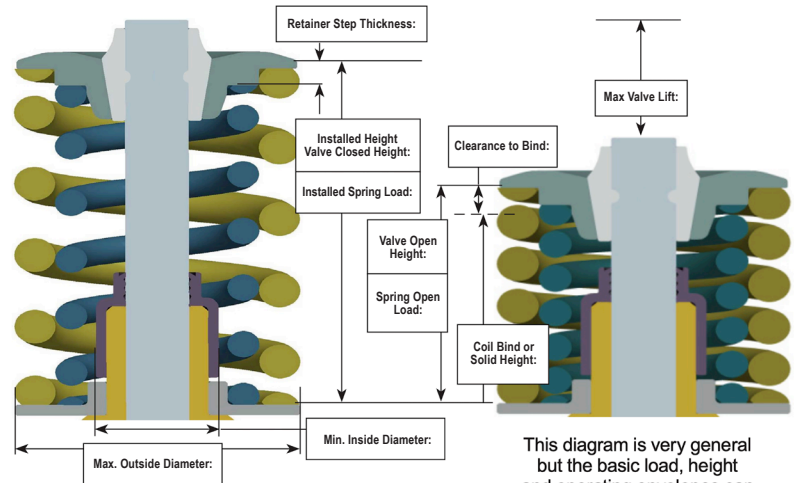
17. Force Majeure. RWB shall not be liable for damages under the Contract for a delay or failure in its performance under the Contract as a result of causes beyond its reasonable control, including any law, order, regulation, direction, or request of any government having or claiming to have jurisdiction over RWB, its subcontractors and/or its suppliers; failure or delay of transportation; insurrection, riots, national emergencies, war, acts of public enemies, strikes or inability to obtain necessary labor, manufacturing facilities, material or components from RWB's usual sources; fires, floods or other catastrophes; acts of God, acts of omissions of Buyer or any causes beyond the reasonable control of RWB and/or of its suppliers. Upon the giving of prompt written notice to Buyer of any such causes of a delay or failure in its performance of any obligation under the Contract, the time of performance by RWB shall be extended to the extent and for the period that its performance of said obligations is prevented by such cause.

18. Anti-Bribery Compliance. Buyer hereby certifies that Buyer and its directors, officers, employees, agents, sub-contractors and/or consultants: (i) are familiar with, and shall comply in all respects with, all applicable laws in force from time to time regarding bribery, fraudulent acts, corrupt practices and/or money laundering, including the U.S. Foreign Corrupt Practices Act, as amended, and the U.K. Bribery Act 2010, as amended; (ii) have not and shall not authorize or make any payments or gifts or any offers or promises of payments or gifts of any kind, directly or indirectly, in connection with the Contract to any "foreign official," including (a) any official, agent, or employee of any government or governmental agency; (b) any political party or officer, employee or agent thereof; or (c) any holder of public office or candidate for political office; and (iii) are not officials or employees of any government, an official of a political party, or a candidate for political office, or a director, officer, employee, or affiliate of a government instrumentality. Buyer understands that for purposes of this section, a "foreign official" may include an employee or official of a commercial entity in which a government body has an ownership interest or exerts control over the activities of such entity, as well as officials and employees of public international organizations.

Custom Valve Spring Design Request Form

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

Your Information:

Name _____
 Company Name _____
 Address _____
 Apt. / Suite / Number _____
 City _____ State _____
 Zip _____ Country _____
 Phone Number _____ Fax Number _____
 Email Address _____ Website _____
 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.



PAC RACING SPRINGS
 21200 Telegraph Road
 Southfield, MI 48033

Toll Free: 866.799.9417
 Email: orders@racingsprings.com

Other Requirements	
Chamfering	
Identification	
Tip Conditioning	
Load Tolerance	
Solid Height Tolerance	





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