

Combined CAR/NAR/TRA Certified Rocket Motors List

As a service to NAR members, the NAR Standards and Testing Committee (S&T) publishes a comprehensive list of rocket motors certified for use at NAR launches in the July/Aug. and Jan./Feb. issues of Sport Rocketry. In addition, the list of certified motors is published on the NAR Web site, which is updated more frequently. As the NAR, the Tripoli Rocketry Association (TRA), and the Canadian Association of Rocketry (CAR) maintain a reciprocal certification policy, motors certified by all organizations are included in this list. Members of all organizations may use motors certified directly by any organization if the motor has been certified for transportation in your country (DOT certification in the USA).

The Contest Certification column indicates which motors are certified for use in NAR model rocket and high power contests. Model rocket motors tested by CAR and TMT will be contest certified when motor availability and the 60-day window have both been met to the satisfaction of NAR S&T and the Contest Board.

The Sport Use Ends column notes which motors have certification "expiring" in the near future, meaning their certification for general use will be withdrawn on the indicated date. So-called "consumer protection periods" are built into the expiration dates listed here. After the indicated date passes, no motors of the indicated type may be used at all. If you require more than one year advance warning of expiring motors, periodically check the web page of the certifying organization or subscribe to their newsletter. Note that once a motor becomes decertified, if the manufacturer starts making it again, it will have to be re-certified.

Additions, deletions, and other changes to the list of NAR-certified motors will be published in NAR journals as they become available. They will also be published electronically to the following computer bulletin boards:

- NAR Web site <http://www.nar.org>
- Rocketry Online: <http://www.rocketryonline.com>
- RMR: <http://groups.google.com/group/rec.models.rockets>
- ContestRoc: <http://groups.yahoo.com/group/contestRoc>

Individuals, such as Contest Directors, requiring the very latest list of NAR certified motors may contact the S&T Secretary:

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Questions may also be directed to the S&T Chairs:

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Questions regarding motors not tested by NAR S&T should be directed to:

- TRA: Paul Holmes, Chair, Tripoli Rocketry Association Motor Test Committee
- CAR: Max Baines, Chair, Canadian Association of Rocketry Motor Certification Committee

Order printed copies of S&T Motor Data Sheets from NARTS if you desire additional information. This report consists of data sheets for each motor currently certified by NAR S&T. Each data sheet contains a thrust curve together with values

from a test firing, including measured average thrust and total impulse, plus 32 data points for use in flight simulation computer programs.

Key to Motor Type

- S - Denotes single-use motor.
- H - Denotes a hybrid motor.
- R - Denotes a reloadable motor certified only with the manufacturer supplied casing, closures, nozzle, and propellant.
- (a) - Certified for use in Animal hardware only

Key to Manufacturer Abbreviations

- Aerotech - AeroTech, ISP, or Dr Rocket
- Alpha - Alpha Hybrid Rocketry, LLC
- Animal - Animal Motor Works
- Apogee - Apogee Components
- Cesaroni - Cesaroni Technology Inc.
- Contrail - Contrail Rockets LLC
- Ellis - Ellis Mountain Rocket Works
- Estes - Estes Industries
- Gorilla - Gorilla Motor
- Hypertek - Hypertek
- Kosdon/AT - Kosdon by AeroTech
- Loki - Loki Research
- PML - Public Missiles Ltd.
- Precision - Precision Motor Works
- Propulsion - Propulsion Polymers
- Quest - Quest Aerospace
- RATT Works - R.A.T.T. Works Precision Rocket Motors
- Roadrunner - RoadRunner Rocketry
- Sky Ripper - Sky Ripper Systems
- WCH - West Coast Hybrids

Propellant Mass Abbreviations

cc - (cubic centimeters) indicates the volume of nitrous in a hybrid motor

Key to Contest Approved Entries

- Yes - Motor allowed for NAR contests.
- In Process - Not currently allowed for contests, but expected to become so.
- HPR - Not allowed for contests because it's a high-power motor.
- No - Not allowed for contests because it is not widely available.

Note

N/A - in any column indicates information not provided by the certifying organization

Prepared: 2009 August 28

NAR S&T's Combined Motor List

Type Designation	Manufacturer	Dimensions (mm)	Impulse (N-sec)	Propellant Mass (g)	Tested By	Contest Approved	Sport Use Ends
S 1/8A.2 (MicroMaxx) -1	Quest	6 x 26	0.2	0.4	NAR	No	
S 1/8A.5 (MicroMaxxII) -1,NE	Quest	6 x 26	0.31	0.5	NAR	Yes	

Type Designation	Manufacturer	Dimensions (mm)	Impulse (N-sec)	Propellant Mass (g)	Tested By	Contest Approved	Sport Use Ends
S 1/4A3T -3	Estes	13 x 45	0.62	0.8	NAR	Yes	

Type Designation	Manufacturer	Dimensions (mm)	Impulse (N-sec)	Propellant Mass (g)	Tested By	Contest Approved	Sport Use Ends
S 1/2A3T -2,4	Estes	13 x 45	1.25	2	NAR	Yes	
S 1/2A6 -2	Estes	18 x 70	1.25	2.6	NAR	Yes	

Type Designation	Manufacturer	Dimensions (mm)	Impulse (N-sec)	Propellant Mass (g)	Tested By	Contest Approved	Sport Use Ends
S A3T -4	Estes	13 x 45	2.5	3.3	NAR	Yes	
S A6 -4	Quest	18 x 70	2.5	3.5	NAR	Yes	
S A6 -4	Quest	18 x 70	2.3	3	NAR	Yes	
S A8 -3,5	Estes	18 x 70	2.5	3.3	NAR	Yes	
S A10T -3,P	Estes	13 x 45	2.5	3.8	NAR	Yes	

Type Designation	Manufacturer	Dimensions (mm)	Impulse (N-sec)	Propellant Mass (g)	Tested By	Contest Approved	Sport Use Ends
S B4 -2,4	Estes	18 x 70	5	6	NAR	Yes	
S B6 -0	Estes	18 x 70	4.9	5.6	NAR	Yes	
S B6 -0,4	Quest	18 x 70	5	6.5	NAR	Yes	
S B6 -2	Quest	18 x 70	5	6.5	NAR	Yes	
S B6 -2,4,6	Estes	18 x 70	5	5.6	NAR	Yes	

Type Designation	Manufacturer	Dimensions (mm)	Impulse (N-sec)	Propellant Mass (g)	Tested By	Contest Approved	Sport Use Ends
S C6 -0	Quest	18 x 70	8.8	11	NAR	Yes	
S C6 -0,3,5,7	Estes	18 x 70	9	10.8	NAR	Yes	
S C6 -3,5	Quest	18 x 70	8.5	11	NAR	Yes	
S C6 -3,5	Quest	18 x 70	8.76	12	NAR	Yes	
S C11 -0,7	Estes	24 x 70	9	12	NAR	Yes	
S C11 -3,5	Estes	24 x 70	9	12	NAR	Yes	

Type Designation	Manufacturer	Dimensions (mm)	Impulse (N-sec)	Propellant Mass (g)	Tested By	Contest Approved	Sport Use Ends
S D5 -P	Quest	20 x 88	19.6	25	NAR	Yes	
R D7 -RC	Aerotech	24 x 70	20	10.5	NAR	Yes	
R D9 -4,7	Aerotech	24 x 70	20	10.1	NAR	Yes	
S D10 -3,5,7	Aerotech	18 x 70	18.3	9.8	NAR	Yes	
S D10 -3,5,7	Apogee	18 x 70	18.3	9.8	NAR	Yes	

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S	D11 -P	Estes	24 x 70	18	24.5	NAR	Yes
S	D12 -0,3,5,7	Estes	24 x 70	17	21.1	NAR	Yes
R	D13 -4,7,10	Aerotech	18 x 70	20	9.8	NAR	Yes
R	D15 -4,6	Aerotech	24 x 70	20	8.9	NAR	Yes
S	D21 -4,7	Aerotech	18 x 70	20	9.6	NAR	Yes
R	D24 -4,7	Aerotech	18 x 70	18.5	8.8	NAR	Yes

Type Designation	Manufacturer	Dimensions (mm)	Impulse (N-sec)	Propellant Mass (g)	Tested By	Contest Approved	Sport Use Ends
S E6 -4,6,8,P	Apogee	24 x 70	37.8	22	NAR	Yes	
R E6 -RC	Aerotech	24 x 70	40	21.5	NAR	Yes	
R E7 -RC	Aerotech	24 x 70	30	17.1	NAR	Yes	
S E9 -0	Estes	24 x 95	28.5	35.8	NAR	No	
S E9 -4,6,8,P	Estes	24 x 95	28.5	35.8	NAR	Yes	
S E10-6,10	Ellis	24 x 102	41.3	28.3	TRA	Yes	
R E11J -3	Aerotech	24 x 70	31.7	25	NAR	Yes	
S E12-6,10	Ellis	24 x 102	35.8	28.3	TRA	Yes	
R E12J -RC	Aerotech	24 x 70	36	30.3	NAR	Yes	
S E15 -4,7	Aerotech	24 x 70	40	20.1	NAR	Yes	
S E15W -P	Aerotech	24 x 70	40	20.1	NAR	Yes	
R E16 -4,7	Aerotech	29 x 124	40	19	NAR	Yes	
R E18 -4,8	Aerotech	24 x 70	39	20.7	NAR	Yes	
R E23 -5,8	Aerotech	29 x 124	37	17.4	NAR	Yes	
S E25R-4,7,P	Roadrunner	29 x 76	38.7	20.6	TRA	Yes	
R E28 -4,7	Aerotech	24 x 70	40	18.4	NAR	Yes	
S E30 -4,7	Aerotech	24 x 70	40	19.3	NAR	Yes	

Type Designation	Manufacturer	Dimensions (mm)	Impulse (N-sec)	Propellant Mass (g)	Tested By	Contest Approved	Sport Use Ends
S F10 -4,6,8	Apogee	29 x 93	74.3	40	NAR	Yes	
R F12 -2,5	Aerotech	24 x 70	45	30	NAR	Yes	
R F13 -RC	Aerotech	32 x 107	63	32.3	NAR	Yes	
R F16 -RC	Aerotech	32 x 107	80	62.5	NAR	Yes	
S F20 -4,7	Aerotech	29 x 73	64	30	NAR	Yes	
S F20-6,10	Ellis	24 x 140	67.9	31.2	TRA	Yes	
S F21w-4,6,8	Aerotech	24 x 98	55	30	TRA	No	
R F22 -4,7	Aerotech	29 x 124	65	46.3	NAR	Yes	
S F23FJ -4,7	Aerotech	29 x 73	56	32	NAR	Yes	
S F23FJ -4,7	Aerotech	29 x 83	41.2	30	NAR	Yes	
S F23-6,10	Ellis	24 x 140	67.9	31.2	TRA	Yes	
R F23SK -RC	Aerotech	32 x 107	70	37.8	NAR	Yes	
R F24 -4,7	Aerotech	24 x 70	50	19	NAR	Yes	
S F25W -4,6,9	Aerotech	29 x 98	80	35.6	NAR	Yes	
S F26FJ -6,9	Aerotech	29 x 98	62.2	43.1	NAR	Yes	
S F27R -4,8	Aerotech	29 x 83	49.6	28.4	NAR	Yes	

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S	F32T -4,6,8	Aerotech	24 x 90	56.9	25.8	NAR	Yes
R	F35W -5,8,11	Aerotech	24 x 95	57.1	30	NAR	Yes
S	F35 -6,10	Roadrunner	29 x 112	76.5	40.1	NAR	Yes
R	F36SS-11A	Cesaroni	29 x 98	41.2	29.5	CAR	PENDING
R	F36BS-14A	Cesaroni	29 x 98	51.5	25.6	CAR	PENDING
R	F37 -6,10,14	Aerotech	29 x 99	50	28.2	NAR	Yes
R	F39 -3,6	Aerotech	24 x 70	50	22.7	NAR	Yes
R	F40 -4,7,10	Aerotech	29 x 124	80	40	NAR	Yes
S	F42T -4,8	Aerotech	29 x 83	52.9	27	NAR	Yes
S	F45R-5,8,P	Roadrunner	29 x 93	62.3	30	TRA	Yes
S	F50 -4,6,9	Aerotech	29 x 98	80	37.9	NAR	Yes
S	F50T -6	PML	29 x 98	80	37.9	NAR	No
R	F52 -6,8,11	Aerotech	29 x 124	78	36.6	NAR	Yes
R	F59WT-12A	Cesaroni	29 x 98	57	26.1	CAR	PENDING
S	F60 -4,7,10	Roadrunner	29 x 112	75.9	38.1	NAR	Yes
R	F62T-S,M,L	Aerotech	29 x 89	51	30.5	TRA	Yes

Type	Designation	Manufacturer	Dimensions (mm)	Impulse (N-sec)	Propellant Mass (g)	Tested By	Contest Approved	Sport Use Ends
R	G12 -RC	Aerotech	32 x 107	93	51.1	NAR	Yes	
S	G20-3	Ellis	29 x 149	113.5	62	TRA	Yes	
R	G33 -5,7	Aerotech	29 x 124	100	72.2	NAR	HPR	
S	G35-6,10	Ellis	29 x 165	124.2	62	TRA	Yes	
S	G37-6,10,P	Ellis	24 x 181	110.5	62	TRA	Yes	
S	G38FJ -4,7	Aerotech	29 x 98	94	55	NAR	Yes	
s	G39-6,10,P	Roadrunner	29 x 140	103	58.6	TRA	pending	
S	G40W -4,7	PML	29 x 124	120	55.1	NAR	No	
S	G40W -4,7,10	Aerotech	29 x 124	97.1	55.1	NAR	Yes	
s	G45-6,10,P	Roadrunner	29 x 140	110	58.6	TRA	pending	
R	G46-11A	Cesaroni	38 x 127	127.3	62.5	CAR	Yes	
R	G50IM-15A	Cesaroni	38 x 127	150	77.7	CAR	HPR	
R	G53FJ -5,7,10	Aerotech	29 x 124	90.9	60	NAR	Yes	
R	G54 -6,10,14	Aerotech	29 x 124	85	46	NAR	Yes	
H	G55-P	WCH	38 x 308	150.6	142cc	CAR	HPR	
R	G57CL-12A	Cesaroni	29 x 142	107.8	51.4	CAR	PENDING	
R	G60-12A	Cesaroni	38 x 127	139.4	78.4	TRA	HPR	
R	G60-14A	Cesaroni	38 x 27	134.2	68.3	CAR	HPR	
R	G61W-S,M,L	Aerotech	38 x 106	110.5	61.5	TRA	Yes	
H	G63-P	SkyRipper	29 x 305	85	75cc	TRA	HPR	
R	G64 -4,8,10	Aerotech	29 x 124	120	62.5	NAR	Yes	
R	G67R-S,M	Aerotech	38 x 106	110	60	TRA	Yes	
R	G69-12A	Cesaroni	38 x 127	128.8	84	TRA	Yes	
R	G69SK-14A	Cesaroni	38 x 127	117.15	198	TRA	HPR	
R	G69N -P	Aerotech	38 x 106	136.7	62.2	NAR	Yes	
H	G69-P	SkyRipper	29 x 406	128	125cc	TRA	HPR	

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R	G71R -4,7,10	Aerotech	29 x 124	107	56.9	NAR	Yes
R	G75J-S,M	Aerotech	29 x 194	135.6	104.3	TRA	HPR
R	G76G -4,7,10	Aerotech	29 x 124	115	60	NAR	Yes
S	G77R -4,7,10	Aerotech	29 x 146	102.9	58.1	NAR	Yes
R	G77R-S,M	Aerotech	29 x 150	105	58	TRA	Yes
R	G78BS-15A	Cesaroni	38 x 127	140.9	67	TRA	HPR
S	G78G -4,7,10	Aerotech	29 x 146	109.9	59.7	NAR	Yes
R	G79SS-13A	Cesaroni	38 x 127	129	100	CAR	HPR
S	G79W -4,7,10	Aerotech	29 x 146	108	60.1	NAR	Yes
R	G79W-S,M,L	Aerotech	29 x 150	108.6	62	TRA	Yes
R	G80LW-17A	Loki	38 x 127	122.5	60	TRA	Yes
S	G80T -4,7	PML	29 x 124	120	56.9	NAR	No
S	G80 -4,7,10	Aerotech	29 x 124	120	56.9	NAR	Yes
S	G80 -4,7,10	Roadrunner	29 x 140	105.7	54.7	NAR	Yes
S	G80T -7,10,13	Aerotech	29 x 128	136.6	62.5	NAR	Yes
R	G82W-S,M,L	Kosdon/AT	29 x 206	141	84	TRA	HPR
R	G83BS-14A	Cesaroni	29 x 142	107.4	51.1	CAR	HPR
R	G88SS-11A	Cesaroni	29 x 142	84.3	59	CAR	HPR
H	G100-P	Contrail	38 x 407	146	140cc	TRA	HPR
R	G104T-S,M,L	Aerotech	29 x 125	81.5	43.9	TRA	HPR
R	G106SK-14A	Cesaroni	29 x 187	138.3	75	CAR	HPR
R	G115-13A	Cesaroni	38 x 127	140.6	61.8	CAR	HPR
R	G118BS-15A	Cesaroni	29 x 187	159.1	76.7	CAR	HPR
H	G123-P	Contrail	38 x 407	142	140cc	TRA	HPR
R	G125RL-14A	Cesaroni	29 x 187	159.6	81.9	CAR	HPR
H	G125-P	SkyRipper	38 x 406	145	120cc	TRA	HPR
R	G126WT-13A	Cesaroni	29 x 142	116	52.1	CAR	HPR
H	G130-P	Contrail	38 x 407	100	140cc	TRA	HPR
R	G131SS-14A	Cesaroni	29 x 187	125.2	88.6	CAR	HPR
R	G135R-SML	Kosdon/AT	29 x 206	146	90	TRA	HPR
R	G142 -6,10,14	Aerotech	29 x 113	84.3	38.6	NAR	HPR
H	G170PVC-P	Contrail	38 x 406	82.9	140cc	TRA	HPR
R	G185-12A	Cesaroni	38 x 127	128	62.1	CAR	HPR
H	G234-P	Contrail	38 x 414	118	90cc	TMT	HPR
H	G300-P	Contrail	38 x 406	100	90cc	TRA	HPR
R	G339-P	Aerotech	38 x 106	110	48	TRA	HPR

Type	Designation	Manufacturer	Dimensions (mm)	Impulse (N-sec)	Propellant Mass (g)	Tested By	Contest Approved	Sport Use Ends
S	H48-8,P	Ellis	38 x 172	249	138	TRA	HPR	
S	H50-6,10	Ellis	29 x 279	264	163	TRA	HPR	
S	H55W-6,10,14	Aerotech	29 x 191	162.3	99.7	TRA	HPR	
H	H70-P	Propulsion	38 x 464	237	318.3	CAR	HPR	
H	H70-P	RATTWorks	29 x 457	204.3	135.8cc	TRA	HPR	
R	H73J-S,M	Aerotech	38 x 152	185.6	142.7	TRA	HPR	

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H	H78-P	SkyRipper	29 x 523	172.9	185cc	TRA	HPR
R	H87IM-12A	Cesaroni	29 x 187	167.9	92.7	CAR	HPR
R	H90CL-12A	Cesaroni	29 x 187	164.2	77.1	CAR	HPR
R	H90LR-14A	Loki	38 x 177	234.4	120	TRA	HPR
R	H97J-S,M	Aerotech	29 x 238	177.3	137.1	TRA	HPR
R	H100IM-15A	Cesaroni	38 x 186	286.4	154.4	CAR	HPR
R	H100SF-17A	Loki	38 x 177	201.5	120	TRA	HPR
H	H100-P	WCR	38 x 403	247	189cc	CAR	HPR
R	H112J-6,10,14	Aerotech	38 x 191	261.1	191.2	TRA	HPR
R	H118CL-12A	Cesaroni	29 x 231	216.2	102.8	CAR	HPR
R	H120-14A	Cesaroni	38 x 186	260.7	136.6	CAR	HPR
H	H121-P	Contrail	38 x 508	225	185cc	TRA	HPR
R	H123SK-12A	Cesaroni	29 x 231	176.5	100	CAR	HPR
R	H123-14A	Cesaroni	38 x 186	232.4	123	CAR	HPR
R	H123W-6,10,14	Aerotech	38 x 152	223.6	119	TRA	HPR
H	H124-P	SkyRipper	38 x 533	225	220cc	TRA	HPR
R	H125-12A	Cesaroni	38 x 186	265.6	125	CAR	HPR
R	H128W-S,M,L	Aerotech	29 x 194	172.9	93.6	TRA	HPR
R	H130W-P	Kosdon/AT	29 x 291	247	140	TRA	HPR
R	H133BS-14A	Cesaroni	29 x 187	163.3	76.7	CAR	HPR
R	H140CL-11A	Cesaroni	29 x 276	268	128.5	CAR	HPR
H	H141-P	Contrail	38 x 508	241	185cc	TRA	HPR
R	H143SS-13A	Cesaroni	38 x 186	247	187	CAR	HPR
R	H144LW-17A	Loki	38 x 190	239.3	126	TRA	HPR
R	H148R-S,M,L	Aerotech	38 x 152	206	122	TRA	HPR
R	H152BS-15A	Cesaroni	38 x 185	275.9	137	TRA	HPR
R	H153-13A	Cesaroni	38 x 186	258	143.9	TRA	HPR
H	H155-P	SkyRipper	38 x 533	229	220cc	TRA	HPR
R	H160CL-12A	Cesaroni	29 x 320	311.7	154.2	CAR	HPR
R	H160SK-14A	Cesaroni	29 x 276	220.5	125	CAR	HPR
R	H160LB-15A	Loki	38 x 177	260.1	120	TRA	HPR
R	H163WT-14A	Cesaroni	29 x 187	166.3	78.2	CAR	HPR
R	H165R-M,L	Aerotech	29 x 194	165	90	TRA	HPR
R	H170BS-14A	Cesaroni	29 x 231	217.1	102.3	CAR	HPR
R	H175SS-14A	Cesaroni	29 x 231	166	118.1	CAR	HPR
R	H180SK-14A	Cesaroni	29 x 320	258	150	CAR	HPR
R	H180W-S,M,L	Aerotech	29 x 238	217.7	125	TRA	HPR
R	H186RT-20A	Gorilla	38 x 249	312.12	178	TRA	HPR
R	H200BS-14A	Cesaroni	29 x 276	260.8	127.9	CAR	HPR
H	H200BS-P	Contrail	54 x 762	269	N/A	TRA	HPR
R	H210R -10,P	Aerotech	29 x 238	220	110.8	NAR	HPR
H	H211	Contrail	38 x 508	206	185cc	TRA	HPR
R	H220T -6,10,14	Aerotech	29 x 238	220	106.4	NAR	HPR
H	H222-P	Contrail	38 x 406	161	140cc	TRA	HPR
R	H225-14A	Cesaroni	38 x 186	273.2	123.6	CAR	HPR

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R	H225BL-P	Gorilla	38 x 249	226	162	TRA	HPR
R	H226SK-14A	Cesaroni	29 x 365	305	175	CAR	HPR
R	H233RL-14A	Cesaroni	29 x 320	311.5	163.7	CAR	HPR
R	H237SS-13A	Cesaroni	29 x 276	206.2	147.6	CAR	HPR
R	H238T-6,10,14	Aerotech	29 x 194	165.5	85	TRA	HPR
R	H242T-6,10,14	Aerotech	38 x 152	231.7	115	TRA	HPR
R	H245PVC-P	Contrail	38 x 719	262	275cc	TRA	HPR
H	H246-P	Contrail	38 x 508	222	185cc	TRA	HPR
R	H250G-S,M,L	Aerotech	29 x 239	219.5	120	TRA	HPR
R	H255BS-14A	Cesaroni	29 x 320	315.4	153.4	CAR	HPR
R	H255WT-14A	Cesaroni	29 x 231	229.3	104.3	CAR	HPR
R	H268R -10,14,P	Aerotech	29 x 333	320	166	NAR	HPR
S	H275-10	Ellis	29 x 275	293.5	163	TRA	HPR
H	H277-P	Contrail	38 x 712	292	370cc	TRA	HPR
R	H295SS-13A	Cesaroni	29 x 320	252.7	177.1	CAR	HPR
H	H300-P	Contrail	38 x 508	161	185cc	TRA	HPR
H	H303-P	Contrail	38 x 508	170	185cc	TRA	HPR
R	H340SS-14A	Cesaroni	29 x 365	287.3	206.7	CAR	HPR
H	H340-P	Contrail	38 x 719	304.5	275cc	TRA	HPR
R	H399WT-12A	Cesaroni	29 x 320	282.2	132.6	CAR	HPR
R	H400-14A	Cesaroni	38 x 186	255	122.4	TRA	HPR
R	H500-17A	Loki	38 x 295	317	156	TRA	HPR
R	H565-A	Cesaroni	38 x 245	319.8	165	CAR	HPR
R	H669-P	Aerotech	38 x 152	221	98	TRA	HPR
R	H999-P	Aerotech	38 x 203	319.9	147	TRA	HPR

Type Designation	Manufacturer	Dimensions (mm)	Impulse (N-sec)	Propellant Mass (g)	Tested By	Contest Approved	Sport Use Ends
R	I49N -P	Aerotech	38 x 184	383	190.8	NAR	HPR
R	I59WN -P	Aerotech	38 x 232	486	251.7	NAR	HPR
S	I65W -P	Aerotech	54 x 235	630.5	369.7	NAR	HPR
S	I69-10	Ellis	29 x 406	460	236	TRA	HPR
R	I80SK-14A	Cesaroni	38 x 245	338.43	394	TRA	HPR
H	I80-P	Propulsion	38 x 646	460	332.4	CAR	HPR
H	I80-P	RATTWorks	29 x 730	360	221.8	TRA	HPR
H	I90L-P	RATTWorks	29 x 921	493.8	289.3	TRA	HPR
R	I110LW-M,L	Loki	38 x 305	487	289	TRA	HPR
H	I110-P	WCR	38 x 606	499.7	327	CAR	HPR
R	I115W-S,M,L	Aerotech	54 x 156	409.3	229	TRA	HPR
H	I117-P	SkyRipper	38 x 914	592	580cc	TRA	HPR
R	I117FJ-S,M,L	Aerotech	54 x 156	364.9	253	TRA	HPR
H	I119-P	SkyRipper	38 x 711	407	400cc	TRA	HPR
S	I130-P	Ellis	38 x 330	597.6	308	TRA	HPR
H	I130(300CC098J)-P	Hypertek	54 x 546	470.6	298	TRA	HPR
S	I134-15	Ellis	38 x 355	444.9	300.5	TRA	HPR

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H	I136(300CC098J2)-P	Hypertek	54 x 546	507	283	TRA	HPR
H	I145FX(300CC098JFX)-P	Hypertek	54 x 546	541	298	TRA	HPR
H	I147-P	SkyRipper	38 x 711	519	400cc	TRA	HPR
R	I150BS-11A	Cesaroni	54 x 152	465.1	224	TRA	HPR
R	I150-20,P	Ellis	38 x 229	346.2	178.6	TRA	HPR
R	I154J-6,10	Aerotech	38 x 241	378	252.8	TRA	HPR
H	I155HP-P	Contrail	38 x 719	541	370cc	TRA	HPR
R	I160-20,P	Ellis	38 x 280	462.7	238	TRA	HPR
H	I160-P	Propulsion	38 x 646	484	307.7	CAR	HPR
R	I161W-S,M,L	Aerotech	38 x 191	328.7	178.6	TRA	HPR
R	I170-14a	Cesaroni	38 x 245	382	187.5	CAR	HPR
R	I170S-L	Kosdon/AT	38 x 314	374	182	TRA	HPR
R	I195-16A	Cesaroni	38 x 245	396.2	204.9	CAR	HPR
R	I195WW -18	Animal	38 x 249	358	192.2	NAR	HPR
R	I195J-6,10,14	Aerotech	38 x 299	426.1	272	TRA	HPR
R	I200W-6,10,14	Aerotech	29 x 333	324.5	186.5	TRA	HPR
R	I204IM-13A	Cesaroni	29 x 320	347.7	185.4	CAR	HPR
R	I205-13A	Cesaroni	38 x 245	380.9	206.1	TRA	HPR
H	I205(300CC125J)-P	Hypertek	54 x 546	469	298	TRA	HPR
R	I210LR-14A	Loki	38 x 292	489.8	240	TRA	HPR
H	I210-P	Contrail	38 x 915	497	550cc	TRA	HPR
R	I211W-6,10,14	Aerotech	38 x 248	441.6	238	TRA	HPR
R	I212SS-14A	Cesaroni	38 x 245	364	275	CAR	HPR
R	I215R-S,M,L	Aerotech	54 x 156	397	208	TRA	HPR
R	I216CL(I)-14A	Cesaroni	38 x 367	636.1	312.5	CAR	HPR
R	I218WT-14A	Cesaroni	54 x 152	491.2	230	TRA	HPR
R	I218R -6,14,P	Aerotech	38 x 203	330	172.7	NAR	HPR
R	I220SK -20	Animal	38 x 249	358	201.9	NAR	HPR
H	I221-P	Contrail	38 x 712	370	370cc	TRA	HPR
H	I222(300CC125J2)-P	Hypertek	54 x 546	519	275	TRA	HPR
R	I223SK-14A	Cesaroni	38 x 303	434.05	494	TRA	HPR
R	I223GT-20A	Gorilla	38 x 249	327.93	181	TRA	HPR
R	I225FJ-6,10,14	Aerotech	38 x 250	368	264	TRA	HPR
H	I225FX(300CC125JFX)-P	Hypertek	54 x 546	527.5	298	TRA	HPR
R	I229T-S,M,L	Aerotech	54 x 156	411	206	TRA	HPR
R	I230-20,P	Ellis	38 x 331	540	298	TRA	HPR
R	I236BS-17A	Cesaroni	38 x 243	413	204	TRA	HPR
R	I240-15A	Cesaroni	38 x 303	555.8	279	TRA	HPR
R	I245G-S,M,L	Aerotech	38 x 201	334.07	187	TRA	HPR
H	I247WS-P	Contrail	54 x 711	637	N/A	TRA	HPR
H	I250 -P	Alpha	54 x 711	540	353.8	NAR	HPR
R	I250HP-P	Contrail	38 x 719	430	275cc	TRA	HPR
R	I255-16A	Cesaroni	38 x 303	517.3	273.2	CAR	HPR
H	I260(440CC172J)-P	Hypertek	54 x 614	570.4	382.8	TRA	HPR
R	I271BB -20	Animal	38 x 258	390	188.7	NAR	HPR

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R	I280F-L	Kosdon/AT	38 x 314	382	182	TRA	HPR
R	I284W-6,10,14	Aerotech	38 x 299	607.3	315.9	TRA	HPR
R	I285R -10,14,P	Aerotech	38 x 250	420	230.2	NAR	HPR
R	I285-15A	Cesaroni	38 x 303	510.1	272.4	TRA	HPR
R	I285GG -20	Animal	38 x 258	353	206.5	NAR	HPR
R	I287SS-15A	Cesaroni	38 x 303	486	363	CAR	HPR
H	I290-P	Contrail	38 x 922	430	460cc	TRA	HPR
R	I297SK-15A	Cesaroni	38 x 367	542.8	591	TRA	HPR
R	I300T -6,10,14	Aerotech	38 x 250	440	221.6	NAR	HPR
R(a)	I301W -18	Kosdon/AT	38 x 370	554	310	NAR	HPR
R	I303BS-16A	Cesaroni	38 x 302	537.6	270	TRA	HPR
R	I305FJ-6,10,14	Aerotech	38 x 299	452	330	TRA	HPR
H	I307-P	Contrail	38 x 915	573	550cc	TRA	HPR
H	I310(440CC172J)	Hypertek	54 x 645	574.5	401.2	TRA	HPR
R	I310S-S,L,P	Kosdon/AT	38 x 368	633.8	316.3	TRA	HPR
R	I315SK -20	Animal	38 x 370	572	333.7	NAR	HPR
R	I316SF-17A	Loki	38 x 292	432.2	240	TRA	HPR
R	I324RT-20A	Gorilla	38 x 370	526.46	299	TRA	HPR
R	I325WW -18	Animal	38 x 370	594	316.8	NAR	HPR
H	I333-P	Contrail	38 x 922	556	460cc	TRA	HPR
R	I345-15A	Cesaroni	38 x 245	408.58	185.4	CAR	HPR
S	I350R-10	Aerotech	38 x 355	634	348	TRA	HPR
R	I350SS-16A	Cesaroni	38 x 367	601	413	CAR	HPR
R	I357T-S,M,L	Aerotech	38 x 203	342	170	TRA	HPR
R	I360-15A	Cesaroni	38 x 367	625.5	334.6	TRA	HPR
R	I364FJ-6,10,14	Aerotech	38 x 337	570	396	TRA	HPR
R	I366R-M,L	Aerotech	38 x 299	539	300	TRA	HPR
R	I370F-P	Kosdon/AT	38 x 368	634.3	316.9	TRA	HPR
R	I375GG -20	Animal	38 x 370	596	340.2	NAR	HPR
R	I389GT-20A	Gorilla	38 x 370	553.15	303	TRA	HPR
R	I396LS-17A	Loki	38 x 406	611	372	TRA	HPR
H	I400-P	Contrail	38 x 922	432	460	TRA	HPR
R	I405LW-17A	Loki	38 x 305	493.2	252	TRA	HPR
R	I430LB-15A	Loki	38 x 292	532.6	240	TRA	HPR
R	I435T-6,10,14	Aerotech	38 x 299	568.9	273	TRA	HPR
R	I450F-L	Kosdon/AT	38 x 368	633	302	TRA	HPR
R	I455VM-16A	Cesaroni	54 x 143	474.9	212.7	CAR	HPR
R	I470-15A	Cesaroni	38 x 303	540.1	247.2	CAR	HPR
H	I500-P	Contrail	38 x 712	336	275cc	TRA	HPR
R(a)	I550R -20	Kosdon/AT	38 x 370	575	295	NAR	HPR
R	I566-16A	Cesaroni	38 x 245	370	183.6	CAR	HPR
R	I599N-P	Aerotech	54 x 156	404.9	195	TRA	HPR
R	I600R-M	Aerotech	38 x 337	597.3	330	TRA	HPR
H	I727-P	Contrail	38 x 922	611	410cc	TRA	HPR
H	I747-P	Contrail	38 x 719	431	225cc	TRA	HPR

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R	I800-16A	Cesaroni	38 x 303	419	221	CAR	HPR	
R	I1299N-P	Aerotech	38 x 250	422	192	TRA	HPR	
Type	Designation	Manufacturer	Dimensions (mm)	Impulse (N-sec)	Propellant Mass (g)	Tested By	Contest Approved	Sport Use Ends
R	J90W-S,M,L	Aerotech	54 x 243	707.3	426	TRA	HPR	
S	J110-P	Ellis	54 x 276	751.2	421	TRA	HPR	
H	J115(440CC076J)-P	Hypertek	54 x 614	474	416	TRA	HPR	
H	J120FX(440CC076JFX)-P	Hypertek	54 x 614	758	446	TRA	HPR	
S	J135W-S,M,L	Aerotech	54 x 368	1069	663	TRA	HPR	
H	J140-P	Propulsion	38 x 881	664	538.5	CAR	HPR	
H	J144-P	SkyRipper	38 x 914	699	580cc	TRA	HPR	
H	J145H2-jetstd.-P	Aerotech	54 x 709	825.7	409.5	TRA	HPR	12/31/2009
R	J148-L	Ellis	54 x 356	903.4	357.2	TRA	HPR	
H	J150-P	Contrail	38 x 922	654	550cc	TRA	HPR	
H	J160-P	RATTWorks	38 x 1219	667	490cc	TRA	HPR	
R	J167WC-P	Gorilla	54 x 326	950	600	TRA	HPR	
H	J170H3-jetstd.-P	Aerotech	54 x 709	739	409.5	TRA	HPR	12/31/2009
H	J170(440CC098J)-P	Hypertek	54 x 614	728	407.5	TRA	HPR	
R	J175LW-PS	Loki	54 x 330	1146	630	TRA	HPR	
R	J180T-S,M,L	Aerotech	54 x 230	764	437.1	TRA	HPR	
H	J190FX(440CC098JFX)-P	Hypertek	54 x 614	827	443.3	TRA	HPR	
R	J210-16A	Cesaroni	54 x 236	836	396	CAR/NAR	HPR	
H	J210H4-jetstd.-P	Aerotech	54 x 709	850.0	471	TRA	HPR	12/31/2009
H	J220(440CC110J)-P	Hypertek	54 x 645	721	422.6	TRA	HPR	
H	J222-P	Contrail	38 x 1227	928	830	TRA	HPR	
R	J230SK -P	Animal	54 x 326	995	525.7	NAR	HPR	
H	J234-P	Contrail	54 x 922	1033	910cc	TRA	HPR	
R	J240-16A	Cesaroni	54 x 236	806	446	CAR	HPR	
H	J242-P	Contrail	38 x 1220	752	830cc	TRA	HPR	
H	J245-P	Contrail	54 x 719	644	530cc	TRA	HPR	
H	J246-P	Contrail	38 x 922	673	550cc	TRA	HPR	
R	J250SK-15A	Cesaroni	54 x 236	682.8	406	TRA	HPR	
H	J250-P	Contrail	38 x 711	430	370cc	TRA	HPR	
H	J250(440CC125J)-P	Hypertek	54 x 614	744.5	404.6	TRA	HPR	
R	J250FJ-S,M,L,XL	Aerotech	54 x 241	711.6	511	TRA	HPR	
H	J260HW3-jetEFX-P	Aerotech	54 x 709	1150.0	547	TRA	HPR	12/31/2009
H	J261G-P	SkyRipper	54 x 727	1248	830cc	TRA	HPR	
H	J263G-P	SkyRipper	54 x 607	844	550cc	TRA	HPR	
R	J270-20,P	Ellis	38 x 384	649	357	TRA	HPR	
H	J270FX(440CC125JFX)-P	Hypertek	54 x 614	802.2	423.2	TRA	HPR	
H	J272-P	Contrail	54 x 922	1065.5	910cc	TRA	HPR	
R	J275W-S,M,L,XL	Aerotech	54 x 230	774	472	TRA	HPR	
H	J277WS-P	Contrail	54 x 914	1031	N/A	TRA	HPR	
R	J280SS-16A	Cesaroni	54 x 236	716.5	512	CAR	HPR	

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R	J285-15A	Cesaroni	38 x 360	684	327	CAR	HPR
H	J292-P	Contrail	54 x 719	734	530cc	TRA	HPR
R	J293BS-13A	Cesaroni	54 x 236	837.8	414	TRA	HPR
R	J295-16A	Cesaroni	54 x 320	1196.3	594	CAR	HPR
H	J295FX(440CC172JFX)-P	Hypertek	54 x 552	655	409	TRA	HPR
R	J300-15A	Cesaroni	38 x 360	694	345.4	TRA	HPR
R	J315R-L,P	Aerotech	54 x 230	763.3	438	TRA	HPR
H	J315-P	Hypertek	81 x 552	998.8	711.9	TRA	HPR
R	J320LR-14A	Loki	38 x 406	721	372	TRA	HPR
R	J325-P	Cesaroni	54 x 326	1099	537	CAR	HPR
R	J330-16A	Cesaroni	38 x 419	765	392	CAR	HPR
R	J330-20,P	Ellis	38 x 433	738	417	TRA	HPR
H	J330FX(835CC172JFX)-P	Hypertek	81 x 552	1051	738	TRA	HPR
H	J333-P	Contrail	38 x 1220	752	830cc	TRA	HPR
R	J335-15A	Cesaroni	38 x 367	649.2	341.5	CAR	HPR
R	J335BG-P	Contrail	54 x 719	679	530cc	TRA	HPR
H	J337B-P	SkyRipper	54 x 727	1073	830cc	TRA	HPR
H	J345-P	Contrail	38 x 1227	891	735cc	TRA	HPR
H	J348B-P	SkyRipper	54 x 607	716	550cc	TRA	HPR
R	J350SF-PS	Loki	54 x 327	931	574	TRA	HPR
R	J350W(0.5"core)"-S,M,L	Aerotech	38 x 337	670.1	361.1	TRA	HPR
R	J350W(.425 core)-S,M,L	Aerotech	38 x 337	697.4	381.1	TRA	HPR
R	J355-16A	Cesaroni	54 x 329	1189.5	669	CAR	HPR
H	J355-P	Contrail	54 x 712	678.9	530cc	TRA	HPR
R	J357BS-17A	Cesaroni	38 x 360	657.6	338	TRA	HPR
R	J357WW -P	Animal	54 x 326	1000	548.1	NAR	HPR
H	J358-P	Contrail	54 x 922	913.9	910cc	TRA	HPR
R	J360-15A	Cesaroni	38 x 419	826	413.1	TRA	HPR
R	J360SM-16A	Cesaroni	54 x 320	1015.9	606	TRA	HPR
R	J365SK -P	Animal	54 x 403	1125	702.3	NAR	HPR
R	J365BL-P	Gorilla	54 x 326	852	498	TRA	HPR
R	J370GG -P	Animal	54 x 326	1040	598.3	NAR	HPR
R	J380SS-16A	Cesaroni	54 x 320	1043	769	CAR	HPR
R	J381SK-15A	Cesaroni	38 x 421	659.9	688	TRA	HPR
R	J390-turbo-P	Aerotech	54 x 709	1280	391	TRA	HPR
R	J395-P	Cesaroni	54 x 326	1079.3	573	CAR	HPR
R	J395RT-P	Gorilla	N/A x N/A	1026	524	TRA	HPR
R	J400SS-16A	Cesaroni	38 x 419	700	490	CAR	HPR
R	J400RR -P	Animal	54 x 326	1100	558	NAR	HPR
R	J400-P	Cesaroni	54 x 326	976.9	723	CAR	HPR
R	J401FJ-S,M,L	Aerotech	54 x 314	1115.4	730	TRA	HPR
R	J405S-L	Kosdon/AT	38 x 476	722	367	TRA	HPR
R	J410-16A	Cesaroni	38 x 421	773.8	409.8	CAR	HPR
R	J415W-S,M,L	Aerotech	54 x 314	1232	697	TRA	HPR
H	J416-P	Contrail	54 x 922	1130	910cc	TRA	HPR

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R	J420CL-15A	Cesaroni	38 x 500	1007.8	479.6	CAR	HPR
R	J420R-S,M,L	Aerotech	38 x 337	658	345	TRA	HPR
R	J425BS-16A	Cesaroni	38 x 419	78309	406	TRA	HPR
R	J440BB-20	Animal	38 x 370	653	313.1	NAR	NAR
R	J440BB-P	AMW	54 x 326	1109	528.4	CAR	HPR
R	J449BS-15A	Cesaroni	54 x 320	1260.5	624	TRA	HPR
R	J450ST-P	Animal	54 x 326	1070	533.1	NAR	HPR
R	J450BL-P	Gorilla	54 x 402	1121	658	TRA	HPR
R	J460T-S,M,L	Aerotech	54 x 230	806	386	TRA	HPR
R	J465GT-P	Gorilla	54 x 326	1023	566	TRA	HPR
R	J475BB-P	AMW	54 x 403	1233.4	704.5	CAR	HPR
R	J475-P	Cesaroni	54 x 326	1024.9	723	CAR	HPR
R	J480BB-P	Animal	54 x 326	1165	556	NAR	HPR
R	J485WC-PS	Gorilla	54 x 326	1059.7	552	TRA	HPR
R	J500ST-20A	Animal	38 x 370	660	327	TRA	HPR
R	J500G-S,M,L	Aerotech	38 x 344	693.35	375	TRA	HPR
R	J520SK-16A	Cesaroni	38 x 510	658	498	TRA	HPR
R	J525LW-P-SM	Loki	54 x 330	1112.5	625	TRA	HPR
R	J528LW-17A	Loki	38 x 419	741	374	TRA	HPR
R	J530IM-15A	Cesaroni	38 x 500	1115.5	576.5	CAR	HPR
R	J540R-S,M,L,P	Aerotech	54 x 314	1161	679	TRA	HPR
H	J555-P	Contrail	38 x 1220	795	735cc	TRA	HPR
R	J570W-S,M,L	Aerotech	38 x 479	973	535.8	TRA	HPR
R	J575FJ-S,M,L	Aerotech	38 x 479	805	519	TRA	HPR
R	J580SS-17A	Cesaroni	38 x 510	896.3	550	TRA	HPR
R	J595BS-16A	Cesaroni	38 x 510	985	510	TRA	HPR
R	J600RL-16A	Cesaroni	38 x 510	998.6	688	TRA	HPR
R	J605F-L	Kosdon/AT	38 x 476	737	367	TRA	HPR
H	J642-P	Contrail	54 x 922	1092.6	910cc	TRA	HPR
R	J712LB-15A	Loki	38 x 406	751.9	372	TRA	HPR
R	J745-P	Cesaroni	54 x 326	1196.4	549	CAR	HPR
R	J750SP-16A	Loki	38 x 622	942	617	TRA	HPR
H	J800-P	Contrail	38 x 1227	928	685cc	TRA	HPR
R	J800T-S,M,L,XL	Aerotech	54 x 314	1295	619.4	TRA	HPR
R	J825R-M	Aerotech	38 x 479	970	497	TRA	HPR
R	J1055-17A	Cesaroni	54 x 236	746.6	358	CAR	HPR
R	J1299N-P	Aerotech	54 x 230	845	371.6	TRA	HPR
R	J1365-P	Cesaroni	54 x 326	932.4	444	CAR	HPR
R	J1423N-P	Aerotech	54 x 230	845	371.6	TRA	HPR
R	J1520-17A	Cesaroni	54 x 329	1092.5	1026	CAR	HPR
R	J1999N-P	Aerotech	54 x 314	1261	557.4	TRA	HPR
R	J2135N-P	Aerotech	54 x 314	1261	557.4	TRA	HPR

Type Designation	Manufacturer	Dimensions (mm)	Impulse (N-sec)	Propellant Mass (g)	Tested By	Contest Approved	Sport Use Ends
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R	K185W-S,M,L	Aerotech	54 x 437	1417.2	836.8	TRA	HPR
R	K222WC-P	Gorilla	54 x 402	1315	800	TRA	HPR
H	K234-P	Contrail	54 x 1220	1657	1490cc	TRA	HPR
H	K240(835CC125J)-P	Hypertek	81 x 552	1292	799.2	TRA	HPR
H	K240H-P	RATTWorks	64 x 908	1844.7	1292	TRA	HPR
S	K250W-P	Aerotech	54 x 673	2484	1543	TRA	HPR
R	K250-P	Aerotech	54 x 649	2342	1400	TRA	HPR
R	K250LWM-P-SM	Loki	54 x 499	1607	938	TRA	HPR
H	K257G-P	SkyRipper	54 x 912	1733	1130cc	TRA	HPR
H	K265SP-P	Contrail	54 x 1219	1684	1490cc	TRA	HPR
R	K270W-S,M,L,XL	Aerotech	54 x 579	1968	1188	TRA	HPR
H	K300-P	Contrail	75 x 1016	1909	2050cc	TRA	HPR
H	K321-P	Contrail	54 x 1220	1570	1490cc	TRA	HPR
R	K327WC-P	Gorilla	54 x 491	1616	1000	TRA	HPR
H	K347B-P	SkyRipper	54 x 912	1529	1130cc	TRA	HPR
R	K350LWM-P-SM	Loki	54 x 736	2374	1400	TRA	HPR
R	K365RR -P	Animal	75 x 244	1675	946	NAR	HPR
R	K400S-S,M,L	Kosdon/AT	54 x 403	1386.2	721.8	TRA	HPR
H	K404-P	Contrail	75 x 1016	2441	2050cc	TRA	HPR
R	K445-17A	Cesaroni	54 x 404	1636.3	792	CAR	HPR
R	K450BB -P-SM	Animal	75 x 244	1845	881.6	NAR	HPR
R	K454SK-19A	Cesaroni	54 x 404	1363.7	769.2	CAR	HPR
R	K455-P	Cesaroni	54 x 403	1483	716	CAR	HPR
H	K456-P	Contrail	75 x 813	1628	1400cc	TRA	HPR
R	K458W-P	Aerotech	98 x 275	2464.6	1425	TRA	HPR
H	K460-P	WCH	75 x 762	1988	1493cc	CAR	HPR
R	K470ST-P	Animal	75 x 302	1679	826	TRA	HPR
R	K475-L	Ellis	54 x 664	2434.9	1133	TRA	HPR
R	K475WW -P	Animal	54 x 403	1400	728.6	NAR	HPR
H	K485H(3jet)-P	Aerotech	54 x 699	1686.8	923.4	TRA	HPR
R	K500-18A	Cesaroni	54 x 404	1595.6	892	CAR	HPR
R	K500SK -P	Animal	75 x 368	1811	1123.5	NAR	HPR
H	K500SP-P	Contrail	54 x 1524	2237	N/A	TRA	HPR
R	K510-P	Cesaroni	75 x 350	2486	1197	CAR	HPR
R	K513FJ-S,M,L,XL	Aerotech	54 x 410	1496.3	974	TRA	HPR
R	K515SK-16A	Cesaroni	38 x 500	1653.9	961.5	CAR	HPR
R	K520RT-P	Gorilla	N/A x N/A	1356	698	TRA	HPR
H	K525WS-P	Contrail	54 x 1219	1620	N/A	TRA	HPR
R	K530SS-16A	Cesaroni	54 x 404	1412	1025	CAR	HPR
R	K530GG -P	Animal	54 x 403	1410	796.7	NAR	HPR
R	K533BL-P	Gorilla	54 x 491	1420	900	TRA	HPR
R	K535-P	Cesaroni	54 x 403	1441.8	764	CAR	HPR
R	K550W-S,M,L,XL	Aerotech	54 x 410	1568	889.1	TRA	HPR
R	K555SK -P	Animal	54 x 492	1300	862	NAR	HPR
R	K555BG-P	Contrail	54 x 1220	1687	1490cc	TRA	HPR

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R	K555GT-P	Gorilla	54 x 401	1397	780	TMT	HPR
R	K560RR -P	Animal	54 x 430	1480	750	NAR	HPR
R	K560W-P-SM	Aerotech	75 x 396	2511	1425	TRA	HPR
R	K570-17A	Cesaroni	54 x 488	2062.9	990	CAR	HPR
R	K570WW -P	Animal	54 x 492	1700	914.6	NAR	HPR
R	K575SS-P	Cesaroni	75 x 395	2493	1803	CAR	HPR
R	K590-P	Cesaroni	54 x 403	1336.5	964	CAR	HPR
R	K600WW -P-SM	Animal	75 x 368	2500	1223.3	NAR	HPR
R	K600F-S,M,L,P	Kosdon/AT	54 x 403	1428.5	724.3	TRA	HPR
R	K605RR -P	Animal	75 x 368	2410	1231	NAR	HPR
R	K610SK-P	AMW	54 x 491	1531	861	CAR	HPR
R	K630BS-15A	Cesaroni	54 x 404	1679.4	912	TRA	HPR
H	K630-P	Contrail	75 x 813	1341	1400cc	TRA	HPR
R	K630WC-PS	Gorilla	54 x 403	1414.8	736	TRA	HPR
R	K635-17A	Cesaroni	54 x 488	1994.4	1115	CAR	HPR
R	K650SS-16A	Cesaroni	54 x 488	1749.5	1281	CAR	HPR
R	K650T-P	Aerotech	98 x 289	2405.7	1280	TRA	HPR
R	K650RR -P	Animal	54 x 492	1840	931	NAR	HPR
H	K654BS-P	Contrail	75 x 711	2132	N/A	TRA	HPR
R	K660-17A	Cesaroni	54 x 572	2437	1177	CAR	HPR
R	K665-P	Cesaroni	54 x 403	1379.9	964	CAR	HPR
R	K670GG -P	Animal	54 x 492	1751	1014	NAR	HPR
R	K670-P	Cesaroni	54 x 491	1806.1	955	CAR	HPR
R	K675SK-18A	Cesaroni	54 x 572	2009.6	1140	CAR	HPR
H	K678-P	Contrail	75 x 1016	1847	2050	TRA	HPR
R	K680R-P	Aerotech	98 x 289	2358	1316	TRA	HPR
R	K690SF-PS	Loki	54 x 483	1616	920	TRA	HPR
R	K695R-M,L,P	Aerotech	54 x 410	1514	903	TRA	HPR
R	K700W-P	Aerotech	54 x 568	2261	1303	TRA	HPR
R	K700BB -P	Animal	54 x 430	1650	745	NAR	HPR
R	K700-P	Cesaroni	54 x 491	1659.6	1205	CAR	HPR
R	K700RT-P	Gorilla	54 x 492	1691	856	TRA	HPR
H	K707-P	Contrail	75 x 813	1386	1400cc	TRA	HPR
R	K710BB-P	AMW	54 x 491	1791.4	880.7	CAR	HPR
R	K750-18A	Cesaroni	54 x 572	2352.5	1321	CAR	HPR
R(a)	K750W -P	Kosdon/AT	54 x 728	2468	1315	NAR	HPR
R	K763GT-P	Gorilla	54 x 491	1740.27	975	TMT	HPR
H	K777-P	Contrail	75 x 1017	1833	2050cc	TRA	HPR
R	K780BS-15A	Cesaroni	54 x 488	2107.8	1140	TRA	HPR
R	K780R-P	Aerotech	75 x 395	2371	1268	TRA	HPR
R	K800BB -P	Animal	54 x 492	1950	914	NAR	HPR
R	K805G-P	Aerotech	54 x 401	1762	871.1	TRA	HPR
R	K805WC-PS	Gorilla	54 x 492	1765	920	TRA	HPR
R	K815SK-P	Cesaroni	54 x 649	2303.7	1342.1	CAR	HPR
R	K820BS-17A	Cesaroni	54 x 572	2383	1164	CAR	HPR

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R	K828FJ-S,M,L,XL	Aerotech	54 x 579	2052.15	1450	TRA	HPR
R	K830SF-PS	Loki	54 x 726	2287	1376	TRA	HPR
R	K855-P	Cesaroni	54 x 491	1725.2	1205	CAR	HPR
H	K888BM-P	Contrail	76 x 1016	2400	2050cc	TRA	HPR
R	K950ST -P	Animal	54 x 492	1860	887.4	NAR	HPR
R	K960LWB-P-SM	Loki	54 x 499	1946	960	TRA	HPR
R	K975WW -P-SM	Animal	54 x 728	2450	1357.3	NAR	HPR
R	K1000S-P	Kosdon/AT	54 x 728	2592.7	1301	TRA	HPR
R	K1000SK -P-SM	Animal	54 x 728	2120	1297	NAR	HPR
S	K1050W-P	Aerotech	54 x 676	2530	1362.2	TRA	HPR
R	K1050W-PS	Aerotech	54 x 648	2426	2240	TRA	HPR
R	K1075GG -P	Animal	54 x 728	2400	1399.9	NAR	HPR
R	K1085WT-P	Cesaroni	75 x 350	1125	2412	CAR	HPR
R	K1100T-S,M,L,XL	Aerotech	54 x 398	1472	771	TRA	HPR
R	K1130BB-P	AMW	54 x 728	2550.7	1334	CAR	HPR
R	K1185GT-P	Gorilla	54 x 728	2460	1314	TRA	HPR
R	K1200-16A	Cesaroni	54 x 404	1364	960	CAR	HPR
R	K1250WW-P	AMW	54 x 491	1950.9	915	CAR	HPR
R	K1275R-P	Aerotech	54 x 568	2224.9	1170	TRA	HPR
R	K1440-17A	Cesaroni	54 x 572	2437	1129	CAR	HPR
R	K1499N-P	Aerotech	75 x 260	1321	604	TRA	HPR
R	K1620-P	Cesaroni	98 x 240	2436.9	1193	CAR	HPR
R	K1720-P	Cesaroni	54 x 403	1176.2	592	CAR	HPR
R(a)	K1750R -P	Kosdon/AT	54 x 728	2423	1253	NAR	HPR
R	K1999N-P	Aerotech	98 x 275	2569	1195	TRA	HPR
R	K2045-17A	Cesaroni	54 x 404	1407.6	716	CAR	HPR

Type	Designation	Manufacturer	Dimensions (mm)	Impulse (N-sec)	Propellant Mass (g)	Tested By	Contest Approved	Sport Use Ends
H	L200(1685CC098L)-P	Hypertek	75 x 1031	2639	1614	TRA	HPR	
H	L225FX(1685CC098LFX)-P	Hypertek	75 x 1031	2789	1688	TRA	HPR	
R	L330-P	Ellis	76 x 381	2856	1489.9	TRA	HPR	
R	L339N-P	Aerotech	98 x 302	2793	1796	TRA	HPR	
H	L350(1685CC125L)-P	Hypertek	75 x 1031	3042.9	1619.8	TRA	HPR	
H	L355FX(1685CC125LFX)-P	Hypertek	75 x 1031	2851	1638	TRA	HPR	
H	L369-P	Contrail	75 x 1347	3829	3200cc	TRA	HPR	
H	L475(1685CC172L)-P	Hypertek	75 x 1031	2774	1543	TRA	HPR	
R	L480LR-P	Loki	76 x 498	3203.4	1830	TRA	HPR	
H	L535FX(1685CC172LFX)-P	Hypertek	75 x 1031	2994	1616	TRA	HPR	
H	L540(2800CC172L)-P	Hypertek	75 x 1387	4615	2559	TRA	HPR	
H	L550(1685CCRGL)-P	Hypertek	75 x 1031	3095	1552	TRA	HPR	
H	L570FX(2800CC172LFX)-P	Hypertek	75 x 1387	4716	2608	TRA	HPR	
H	L575(2800CCRGL)-P	Hypertek	75 x 1387	4831	2553	TRA	HPR	
R	L585IM-P	Cesaroni	75 x 350	2653.4	1449.8	CAR	HPR	
R	L600-P	Ellis	76 x 584	4995.4	2472.8	TRA	HPR	8/31/2008

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H	L600-P	RATTWorks	64 x 1066	3152	2200	TRA	HPR
H	L600-P	WCH	75 x 1016	3161	2363cc	CAR	HPR
R	L610-P	Cesaroni	98 x 394	4842	2415	CAR	HPR
H	L610FX(1685CCRGLFX)-P	Hypertek	75 x 1031	3131	1603	TRA	HPR
H	L625FX(2800CCRGLFX)-P	Hypertek	75 x 1387	4951	2602	TRA	HPR
R	L640DT-P	Cesaroni	54 x 649	2772.2	1293	CAR	HPR
R	L666SK -P	Animal	75 x 870	2700	1646.7	NAR	HPR
R	L700BB -P-SM	Animal	75 x 368	2590	1193.9	NAR	HPR
R	L730-P	Cesaroni	54 x 649	2765	1351	CAR	HPR
H	L740FX(2800CC200MFX)-P	Hypertek	75 x 1438	5033	2598	TRA	HPR
R	L777WW -P-SM	Animal	75 x 497	3140	1762.3	NAR	HPR
R	L780SF-PS	Loki	76 x 498	3006	1772	TRA	HPR
R	L789RT-PS	Gorilla	75 x 498	3251.78	1796	TRA	HPR
R	L800-P	Cesaroni	75 x 486	3759	1795	CAR	HPR
H	L800-P	Contrail	75 x 1372	3759	3200	TRA	HPR
R	L850W-P	Aerotech	75 x 531	3642	2075	TRA	HPR
R	L890SS-P	Cesaroni	75 x 530	3762	2670	CAR	HPR
R	L900RR -P	Animal	75 x 497	3450	1771	NAR	HPR
R	L930LWB-P-SM	Loki	75 x 499	3587	1836	TRA	HPR
R	L952W-P-SM	Aerotech	98 x 427	4656	2749.7	TRA	HPR
H	L970(2800CC300M)-P	Hypertek	75 x 1438	5098	2537	TRA	HPR
R	L985-P	Cesaroni	54 x 728	2664.6	1295	CAR	HPR
R	L985GT-PS	Gorilla	75 x 497.84	3580	1875	TRA	HPR
R	L990BS-P	Cesaroni	24 x 649	2771	1369.4	CAR	HPR
R	L995RL-P	Cesaroni	75 x 486	3618	1912.5	CAR	HPR
R	L1000S-P	Kosdon/AT	54 x 728	2592	1301	TRA	HPR
R	L1030-P	Cesaroni	54 x 649	2787.9	1516	CAR	HPR
R	L1060GG -P-SM	Animal	75 x 497	3622.6	1917.8	NAR	HPR
R	L1065BL-BS	Gorilla	75 x 787	4209.66	5329	TRA	HPR
R	L1080BB -P	Animal	75 x 497	3700	1717	NAR	HPR
R	L1090SS-P	Cesaroni	75 x 665	4815	3490.3	CAR	HPR
R	L1100RR -P-SM	Animal	54 x 728	2576	1346	NAR	HPR
R	L1111ST-P	Animal	75 x 497	3480	1642	TRA	HPR
R	L1115-P	Cesaroni	75 x 621	5015	2394	CAR	HPR
R	L1120W-P	Aerotech	75 x 665	4947	2777.8	TRA	HPR
R	L1150R-P	Aerotech	75 x 530	3517	1902	TRA	HPR
R	L1170FJ-PS	Aerotech	75 x 665	4229	2805	TRA	HPR
H	L1222SF-P	Contrail	75 x 1524	3895	786	TRA	HPR
R	L1276RR-PS	AMW	54 x 728	2729	1475	TRA	HPR
R	L1300R-P	Aerotech	98 x 443	4567	2632	TRA	HPR
R	L1300BB -P-SM	Animal	54 x 728	2672	1314	NAR	HPR
R	L1355SP-P	Cesaroni	75 x 621	4025.5	3012.4	CAR	HPR
R	L1390G-PS	Aerotech	78 x 531	3948.7	4104	TRA	HPR
R	L1395-P	Cesaroni	75 x 621	4895.4	2364.9	CAR	HPR
R	L1400SK -P	Animal	75 x 785	4744	2829.4	NAR	HPR

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R	L1400F-P	Kosdon/AT	54 x 728	2640	1248	TRA	HPR
R	L1400LW-P-SM	Loki	54 x 736	2850.6	1400	TRA	HPR
R	L1410SK-P	Cesaroni	75 x 757	4828.3	2875	CAR	HPR
R	L1420R-P	Aerotech	75 x 443	4603	2560	TRA	HPR
H	L1428SF-P	Contrail	76 x 1753	4733	320Occ	TRA	HPR
R	L1482LB-P-SM	Loki	54 x 497	3882	1839	TRA	HPR
R	L1500T-P	Aerotech	98 x 665	5089.3	2490.9	TRA	HPR
R	L1685SS-P	Cesaroni	75 x 757	5069.3	3773.1	CAR	HPR
R	L1720WT-P	Cesaroni	75 x 486	1688	2660	CAR	HPR
R	L2200G-P	Aerotech	75 x 653	5104	2518	TRA	HPR
R	L2375WT-P	Cesaroni	75 x 621	2225	4864	CAR	HPR
H	L2525GF-P	Contrail	75 x 1524	4681.4	1306	TRA	HPR
R	L3150-P	Cesaroni	98 x 394	4807.8	2386	CAR	HPR

Type Designation		Manufacturer	Dimensions (mm)	Impulse (N-sec)	Propellant Mass (g)	Tested By	Contest Approved	Sport Use Ends
R	M520-P	Cesaroni	98 x 548	7278.5	3713	CAR	HPR	
R	M650W -P	Aerotech	75 x 801	5964	3351	NAR	HPR	
H	M700-P	WCH	75 x 1473	5592	3951cc	CAR	HPR	
H	M711BS-P	Contrail	75 x 1371	5507	727	TRA	HPR	
H	M740(2800CC200M)-P	Hypertek	75 x 1438	5143	2589	TRA	HPR	
R	M750W -p	Aerotech	98 x 732	9325	5300	NAR	HPR	
R	M795-P	Cesaroni	98 x 702	10133	4892	CAR	HPR	
H	M845-p	Aerotech	98 x 782	6159	3433	TRA	HPR	12/31/2009
R	M900-P	Loki	76 x 785	5332.4	3030	TRA	HPR	
H	M900-P	RATTWorks	69 x 1828	6463.5	3288	TRA	HPR	
H	M956(3500CCRGM)-P	Hypertek	98 x 1166	6421	3162	TRA	HPR	
H	M960FX(2800CC300MFX)-P	Hypertek	75 x 1438	5126	2629	TRA	HPR	
R	M1000-P	Ellis	76 x 787	7320	3511	TRA	HPR	8/31/2008
H	M1000(4630CCRGM)-P	Hypertek	98 x 1405	9155	4236	TRA	HPR	
H	M1001(5478CCRGM)-P	Hypertek	98 x 1438	9835	5161	TRA	HPR	
H	M1010FX(4630CCRGMFX)-P	Hypertek	98 x 1405	9114	4301	TRA	HPR	
H	M1015FX(3500CCRGMFX)-P	Hypertek	98 x 1166	6334	3250	TRA	HPR	
H	M1040FX(4630CCRGMFX)-P	Hypertek	98 x 1438	10098	5293	TRA	HPR	
R	M1060-P	Cesaroni	98 x 548	7441	3622	CAR	HPR	
R	M1200SF-PS	Loki	76 x 785	5122.6	2968	TRA	HPR	
R	M1297W-P	Aerotech	75 x 665	5416.6	2722	TRA	HPR	
R	M1315W-P	Aerotech	75 x 801	6713.5	3499.4	TRA	HPR	
R	M1350WW -P-SM	Animal	75 x 785	5725	2927.3	NAR	HPR	
R	M1355RT-PS	Gorilla	75 x 787	5164.65	5216	TRA	HPR	
R	M1400-P	Cesaroni	75 x 757	6251	2992	CAR	HPR	
R	M1419W-P	Aerotech	98 x 579	7755.5	4077	TRA	HPR	
R	M1450-P	Cesaroni	98 x 702	9955	4830	CAR	HPR	
R(a)	M1450W -P	Kosdon/AT	75 x 1039	7813	4150	NAR	HPR	
R	M1480RR -P-SM	Animal	75 x 785	5800	3000	NAR	HPR	

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R	M1500G-P	Aerotech	75 x 653	5220	2631	TRA	HPR
R	M1540IM-P	Cesaroni	75 x 757	6819.4	3624.4	CAR	HPR
R	M1550R-P	Aerotech	75 x 801	5600	3170	TRA	HPR
H	M1575-P	Contrail	98 x 1524	6547	5300cc	TRA	HPR
R	M1600R-P	Aerotech	98 x 579	7084	4026	TRA	HPR
R	M1665WC-PS	Gorilla	75 x 787	5705.01	5579	TRA	HPR
R	M1670BS-P	Cesaroni	75 x 757	6041.7	2956.1	CAR	HPR
R	M1730SK -P	Animal	98 x 870	8115	4945.2	NAR	HPR
R	M1770SK-P	Cesaroni	75 x 893	5933.4	3520	CAR	HPR
R	M1800FJ-P	Aerotech	98 x 665	8200	9163	TRA	HPR
R	M1810RL-P	Cesaroni	75 x 757	6132	3196	CAR	HPR
R	M1850W-P	Aerotech	75 x 924	7680	4009	TRA	HPR
R	M1850GG-P	Animal	75 x 781	5920	3375	TRA	HPR
R	M1882LW-PS	Loki	76 x 787	6303	3130	TRA	HPR
R	M1890-P	Cesaroni	98 x 702	9875.6	5280	CAR	HPR
R	M1900BB -P	Animal	75 x 785	6100	2733	NAR	HPR
R	M1939W-P	Aerotech	98 x 732	10482	5719.1	TRA	HPR
R	M2000R-P	Aerotech	98 x 732	9218	5368	TRA	HPR
R	M2100G-P	Aerotech	98 x 598	7802	3948	TRA	HPR
R	M2200SK -P-SM	Animal	75 x 1039	6350	3766	NAR	HPR
H	M2281BF-P	Contrail	75 x 1524	5481	727	TRA	HPR
H	M2400T-P	Aerotech	98 x 597	7717	3692.6	TRA	HPR
R	M2500T-P	Aerotech	98 x 751	9671	4711.2	TRA	HPR
R	M2500GG -P-SM	Animal	75 x 1039	7800	4248	NAR	HPR
R	M2505-P	Cesaroni	98 x 579	7450	3339	CAR	HPR
R	M2550LB-P-SM	Loki	76 x 785	6502	3065	TRA	HPR
H	M2700BS-P	Contrail	98 x 1524	6034	5300cc	TRA	HPR
H	M2800BG-P	Contrail	98 x 1524	6060	5300cc	TRA	HPR
R(a)	M2900R -P	Kosdon/AT	75 x 1039	7310	3755	NAR	HPR
H	M3000ST-P	Animal	75 x 1039	7367	3819	TRA	HPR
R	M3500R -P	Aerotech	75 x 1039	7310	3755	NAR	HPR
R	M4770-P	Cesaroni	98 x 548	7312.4	379	CAR	HPR

Type	Designation	Manufacturer	Dimensions (mm)	Impulse (N-sec)	Propellant Mass (g)	Tested By	Contest Approved	Sport Use Ends
R	N1000W -P	Aerotech	98 x 1046	14126	7925	NAR	HPR	
R	N1100-P	Cesaroni	98 x 1046	14005	6790	CAR	HPR	
R	N2000W-P	Aerotech	98 x 1046	13347.1	7752.6	TRA	HPR	
R	N2020WW -P	Animal	98 x 870	10281	5160.9	NAR	HPR	
R	N2500-P	Cesaroni	98 x 1010	13633	6778	CAR	HPR	
R	N2600GG -P	Animal	98 x 870	10607	5591.4	NAR	HPR	
R	N2700BB -P	Animal	98 x 870	11452	5147.1	NAR	HPR	
R	N2800WW -P	Animal	98 x 1213	14802	7694.7	NAR	HPR	
R	N2876SK-PS	AMW	98 x 122	11939.73	13675	TRA	HPR	
R	N3180-p	Cesaroni	98 x 1010	14200.1	7460	CAR	HPR	

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R	N4000BB -P	Animal	98 x 1213	16,461	7565.7	NAR	HPR
R	N4800T-P	Aerotech	98 x 1201	19361	9570.8	TRA	HPR

Type Designation		Manufacturer	Dimensions (mm)	Impulse (N-sec)	Propellant Mass (g)	Tested By	Contest Approved	Sport Use Ends
R	O4900BS-P	Cesaroni	161 x 957	37148.5	17700	CAR	HPR	
R	O5100-P	Cesaroni	161 x 803	29990	13245	CAR	HPR	
R	O5800-P	Cesaroni	161 x 754	30605.7	13950	CAR	HPR	
H	O6300-P	Contrail	156 x 1829	27244	15000cc	TRA	HPR	
R	O8000-P	Cesaroni	161 x 957	40960	18610	CAR	HPR	