

6.8 Performance Testing Report

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September 1, 2008

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Testing Conducted By

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August 9-11, 2008

6.8 SPC Performance Testing

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Background:

This test was originally organized as a follow up to the first test which was reported on by Chris Lucci. The first test evolved out of an informal “get together” by people involved with the development of the 6.8 SPC. This is the kind of thing that happens when you put a group of innovative people together that are passionate and motivated about a particular item. In this case it was the 6.8 SPC cartridge. What was supposed to be a relaxing weekend of hog hunting at Chris’s Wild River Ranch morphed into a test of various 6.8 chambered AR-15 uppers. The goal, at the time, was to see which uppers could shoot the SSA Combat loads without exhibiting visible signs of high pressure and which ones couldn’t. This was also among the first field tests on wild hogs. Questions had arisen within the 6.8 community about what kind of performance could be expected. What was apparent then was that a performance bar had been unofficially set. Right or wrong, that bar was, and to a great extent still is, the Silver State Armory’s Combat line of ammunition. That first test was conducted in order to see what barreled uppers did or didn’t pass that bar. To this day, that test opened the door to more questions rather than answers. It can be said that to critique and redesign trials is progress. This work served to address weaknesses and short comings of the first test.

*** *To minimize confusion, the first test will be referred to as “SSA Combat Barrel Test” and this most recent test will be “6.8 Performance Test”.*

SSA Combat Barrel Test Objectives and Protocols:

The test consisted of shooting ammunition from the SSA Combat Line thru the uppers that were on hand. Hand loads were also used to test the velocity potential. The spent cases were visually examined for the typical signs of high pressure. Barrels whose spent cases displayed no pressure signs were deemed nominal (OK) and barrels whose cases showed these signs were deemed overpressure or questionable.

Weakness of the Combat Barrel Testing:

One of the greatest weaknesses of the test was that it was necessary to “read brass” rather than to use pressure testing equipment. At that stage the equipment was not available. Since so many variables affect the appearance of brass it was difficult to draw definitive conclusion regarding different barrels. It was impractical to acquire identical barrels with only one variable changed, and this also limited the conclusions.

Changes made for the 6.8 Performance Test:

- Pressure Testing Equipment was used for the first time to evaluate the barrel specifications that are now considered important.
- Top Performance Hand loads were tested.
- The focus of the test was changed in that the overall performance envelope of cartridge was considered. Accuracy and range testing was excluded due to time constraints. Despite having accurate pressure equipment we did not have the ability to supply the multiple barrels needed to test individual specifications.

Goals of 6.8 SPC Performance Test:

- To collect as much data on the performance of the 6.8 cartridge in various barrels.
- To examine the upper limits on performance.
- To pressure test Silver State Armory Ammunition and top performing hand loads.
- To interpret marks on the cases as they related to known pressure.
- Barrel bore diameters effect on pressure.
- To test new Custom and Experimental bullets and loaded ammo.

Equipment Used:

Pressure Equipment System:

- Pressure Trace System II

Chronographs:

- Competitive Edge Dynamics (CED) Millennium 2 (M2) Chronograph System.
- Shooting Chrony F-1

Caliper & Micrometers:

- Starrett No. 797B Series Caliper (0.0005)
- Starrett IP67 No. 795 Series Micrometer (0.00005)

Bore Gauge:

- Precision round pilot of 0.268"

Ammunition:

- Silver State Armory 115 Sierra OTM Commercial
- Silver State Armory 115 Sierra OTM Combat
- Silver State Armory 115 Sierra OTM Reference Ammunition
- Experimental 85gr Monolithic (Experimental Bullet and Loading)
- Hand Load 110 Sierra Pro Hunter, 32 grains Hodgdon H322, SSA Case**
- Hand Load 110 Sierra Pro Hunter, 30.5 grains Alliant Reloader 10x, SSA Case**
- Hand Load 80 GS Custom HV, 31.5 grains Accurate Arms 1680, SSA Case**

**** The hand loads listed above may not be safe in many of the barrels available. They were used for testing purposes only. We DO NOT recommend the use of the hand loads found in this document. As always, start with recommend reloading manuals charges and work up for your barrel. Do Not exceed the manual's posted maximums. Always consult proper official manuals for load data.**

Uppers and Their Barrel Specs:

DPMS:

*16", SAAMI Chamber, 1:10 Twist, 6 Groove, Chrome Moly, Non-Chrome Lined **

Superior Barrels:

20" SAAMI Chamber, 1:10 Twist, 6 Groove, Stainless Steel, Hard Blue Treated

20" SPCII Chamber, 1:10 Twist, 6 Groove, Stainless Steel, Hard Blue Treated

Denny's GTS Tactical:

*16" SAAMI Chamber, 1:11 Twist, 6 Groove, Stainless Steel, No bore coating **

Cardinal Armory (formally Kotonics):

*16" SPCII Chamber, 1:11 Twist, 4 Groove, Chrome Moly, Chrome Lined **

AR15Performance:

*18" DMR Chamber, 1:12 Twist, 6 Groove, Chrome Moly, No Bore Coating **

20" DMR Chamber, 1:13 Twist, 3 Groove, Stainless Steel, No Bore Coating

20" DMR Chamber, 1:11 Twist, 4 Groove, Stainless Steel, No Bore Coating

Upper checked excluded from Live Fire Testing:

Model 1 Sales:

20" SAAMI Chamber, 1:9.5 Twist, 6 groove, Chrome Moly, Chrome Lined

Cardinal Armory (formally Kotonics):

20" SPCII Chamber, 1:11 Twist, 4 Groove, Chrome Moly, Chrome Lined

*** *We were greatly disappointed in not being able to get a LWRC upper for testing. Jesse of LWRC tried very hard to make it possible but with their current backlog and the copious testing going on with official agencies and the military it was impossible.*

Testing Protocol:

- Strain Gauges were attached to each barrel
- Barrels were cleaned
- Bore checked for minimum diameter (0.269" 0 .001" under spec) with a 0.268" Pilot Bore Gauge
- Pressure Equipment was configured for each barrel
- Chronograph was setup and checked
- Reference Ammo was used to calibrate the pressure equipment.
- SSA Reference 115 OTM Ammo tested
- SSA Commercial 115 OTM Ammo tested
- SSA Combat 115 OTM Ammo tested
- Experimental and Hand Loaded ammo tested

Checking Barrels for Minimum Bore Spec:

When chrome lining is used several pitfalls may arise. One of the most critical is a build up in the bore. It has been reported that entire lots of barrels suffered this build up and thus had specs under the SAAMI minimum. This potential would increase the pressure in those barrels. This build can be sporadic or consistent. If build up is found in any one area (chamber, throat, bore) it is imperative that the entire barrel be checked for proper tolerances.

Harrison introduced the idea of using a precision pilot to check the bore. It was attached to a cleaning rod and using gentle pressure was pulled thru each barrels. If at any point along its travel, the pilot encountered increased resistance or actually stopped, it was noted.

The pilot and barrels were at room temperature recorded as 72 degrees. The pilot was checked and measured before and after each barrel pass. All measurements of the pilot stayed within ± 0.0001 ". The pilot was measured at 0.268". The .268 pilot was the only one we had on hand but was felt appropriate because if resistance or stoppage was encountered the bore was obviously undersized. Art of SSA actually uses precision drop pin gauges to test barrels he has. Drop Pin gauges are precision ground to 0.0001" accuracy, 6" long, and are normally used to check the straightness of a barrel. All of these mentioned gauges only check the "bore" diameter, that being the distance between the lands, as it is the shortest measurement. The grooves area normally makes up the larger percentage of the bore's surface area and cannot be checked with this device.

Bore Gauge Barrel Findings:

DPMS: Went thru without resistance

Superior Barrels 20" SAAMI: Went thru but there were various spots of increased resistance

Superior Barrels 20" SPCII: Went thru but there were various spots of increased resistance

Denny's 16": Went thru without resistance

Cardinal Armory 16": Went thru but there were various spots of increased resistance

Cardinal Armory 20": A complete stoppage 2" in front of the chamber

AR15Performance 18": Went thru without resistance

AR15Performance 20" 3 GV: Went thru without resistance

AR15Performance 20" 4 GV: Went thru without resistance

Model 1 Sales 20": Stoppage at the throat and 2" in from the muzzle. Rest of bore untested as the pilot could not proceed further from either end.

Pressure and Velocity Testing Technical Info:

CED M2 Chronograph:

- Setup 10' from the muzzle.
- Particular attention was given to the distance between sensor locations. It was measured and kept at precisely 24" which is the setting given for the CED M2 Chronograph. It was checked before each barrel and after to confirm that no changes occurred.
- Connection was made via USB to a laptop to have data centralized and as a secondary backup recorded with pen and paper.

Pressure Trace system Setup:

- The unit is built into a pelican storage box.
- A computer running the Pressure Trace software.
- A strain gauge which is mounted to the barrel with adhesive at a precise location over the chamber.
- The strain gauge is connected to a shielded cable that connects it to the Pressure Trace unit.
- The Pressure Trace unit communicates with the software on the laptop via a wireless blue tooth connection.

Firing procedure:

- 2 "fouling" shots fired to bring all barrels to a consistent operating temperature
- 5 Rounds were fired of each type of ammo.
- Each round was manually loaded into the chamber to control the time the round was in the chamber.
- One minute was taken between each shot of the string.
- Five minutes was taken between each string.
- Ammo and uppers were kept in the shade.
- All data was stored on the laptop and as a secondary backup recorded with pen and paper.

Environmental Conditions:

- Temperature: 103 F
- Humidity: 66
- Wind: 7 mph Gusts 19 mph
- Precipitation: 0
- 107 ft Above Sea Level

Barrels Excluded from Pressure Testing Portion:

A few barrels that were supposed to be part of the test had to be excluded from the pressure trace portion because of issues attaching the strain gauges. With two barrels, from AR15Performance and one from Cardinal Armory, the gauges would not fit because of the barrel nut and given the time constraints a swap could not be made. Strain gauges are precisely fitted and have very specific procedures that must be followed to ensure the gauge will function properly. One of these is a thorough cleaning which includes a lengthy scrub and soak with Acetone that is followed with alcohol. The precise placement of the strain gauge in relation to the chamber is required so all readings correlate properly from barrel to barrel. Once attached, the gauge must have a minimum of 24 hours cure time for the adhesive. The two Superior Barrels came with a special "Hard Blue" coating.

This coating was applied to all exterior surfaces and the bore and chamber. Given the inherent lubricity of this coating not even an industrial adhesive would adhere to the surface. Extensive effort was undertaken to rough up the surfaces to no avail. From a performance standpoint this would be considered a positive property.

AR15Performance:

20" DMR Chamber, 1:13 Twist, 3 Groove, Stainless Steel, Uncoated bore

20" DMR Chamber, 1:11 Twist, 4 Groove, Stainless Steel, Uncoated bore

Superior Barrels:

20" SAAMI Chamber, 1:10 Twist, 6 Groove, Stainless Steel, Hard Blue Treated

20" SPCII Chamber, 1:10 Twist, 6 Groove, Stainless Steel, Hard Blue Treated

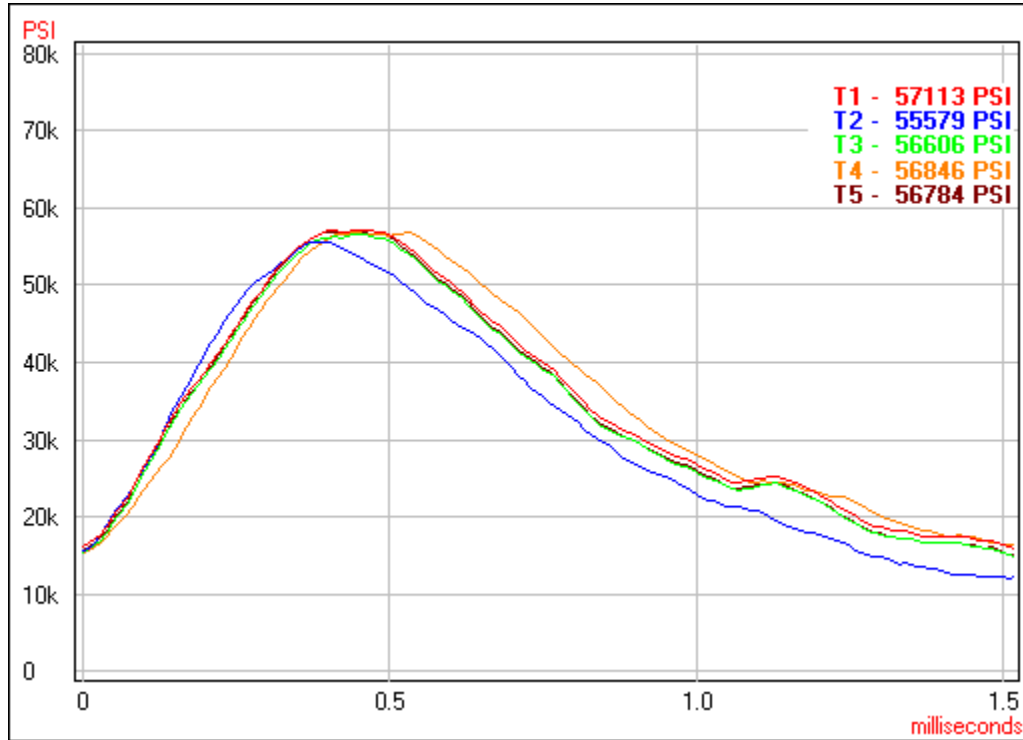
Cardinal Armory Barrel:

20" SPCII Chamber, 1:11 Twist, 4 Groove, Chrome Moly, Chrome Lined

Testing Data:

Ammunition: Silver State 115 OTM Commercial Load

DPMS: 16", SAAMI Chamber, 1:10 Twist, 6 Groove, Chrome Moly, Non-Chrome Lined



Average Peak Chamber Pressure: 56,585 PSI

Velocity / Pressure:

Shot 1: 2,501 FPS / 57,113 PSI

Shot 2: 2,466 FPS / 55,579 PSI

Shot 3: 2,484 FPS / 56,606 PSI

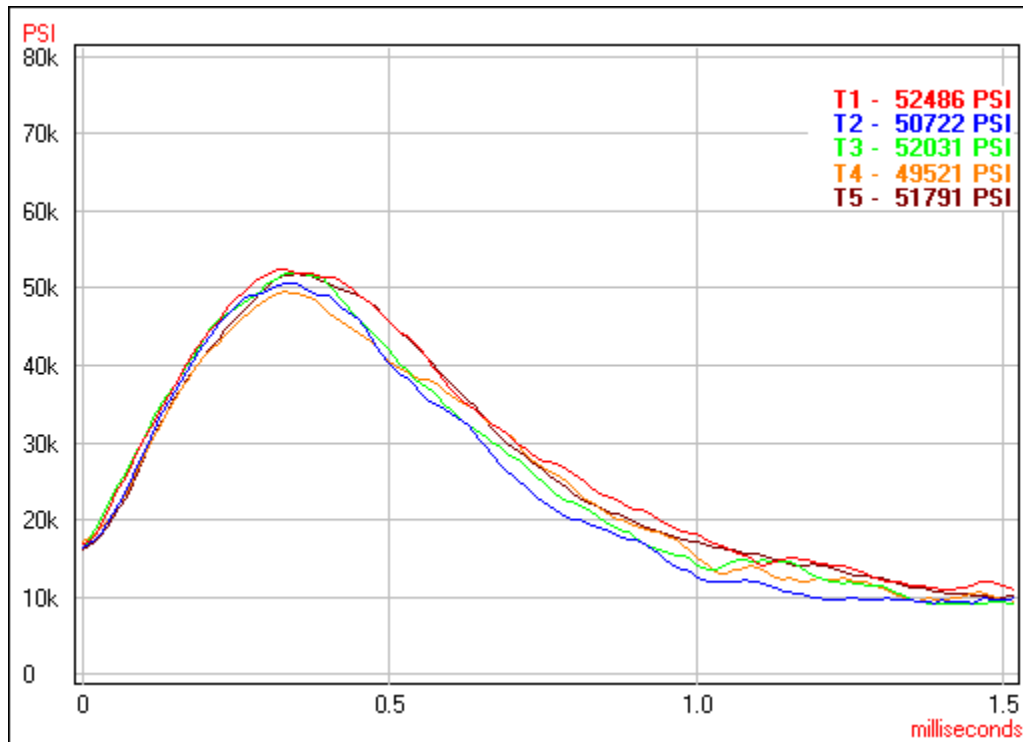
Shot 4: 2,491 FPS / 56,846 PSI

Shot 5: 2,489 FPS / 56,784 PSI

Fired Cases:



Cardinal Armory: 16" SPCII Chamber, 1:11 Twist, 4 Groove, Chrome Moly, Chrome Lined



Average Peak Chamber Pressure: 51,310 PSI

Velocity / Pressure:

Shot 1: 2,502 FPS / 52,486 PSI

Shot 2: 2,480 FPS / 50,722 PSI

Shot 3: 2,499 FPS / 52,031 PSI

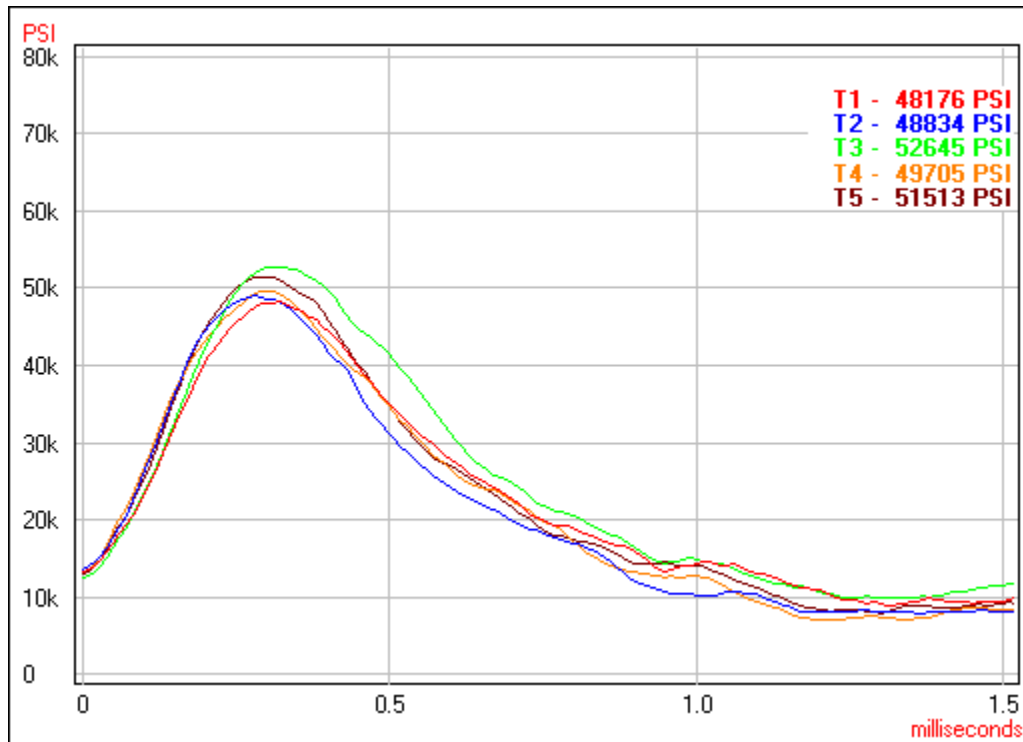
Shot 4: 2,454 FPS / 49,521 PSI

Shot 5: 2,483 FPS / 51,791 PSI

Fired Cases:



Denny's GTS Tactical: 16" SAAMI Chamber, 1:11 Twist, 6 Groove, Stainless Steel, No bore coating



Average Peak Chamber Pressure: 50,175 PSI

Velocity / Pressure:

Shot 1: 2,492 FPS / 48,176 PSI

Shot 2: 2,499 FPS / 48,834 PSI

Shot 3: 2,527 FPS / 52,645 PSI

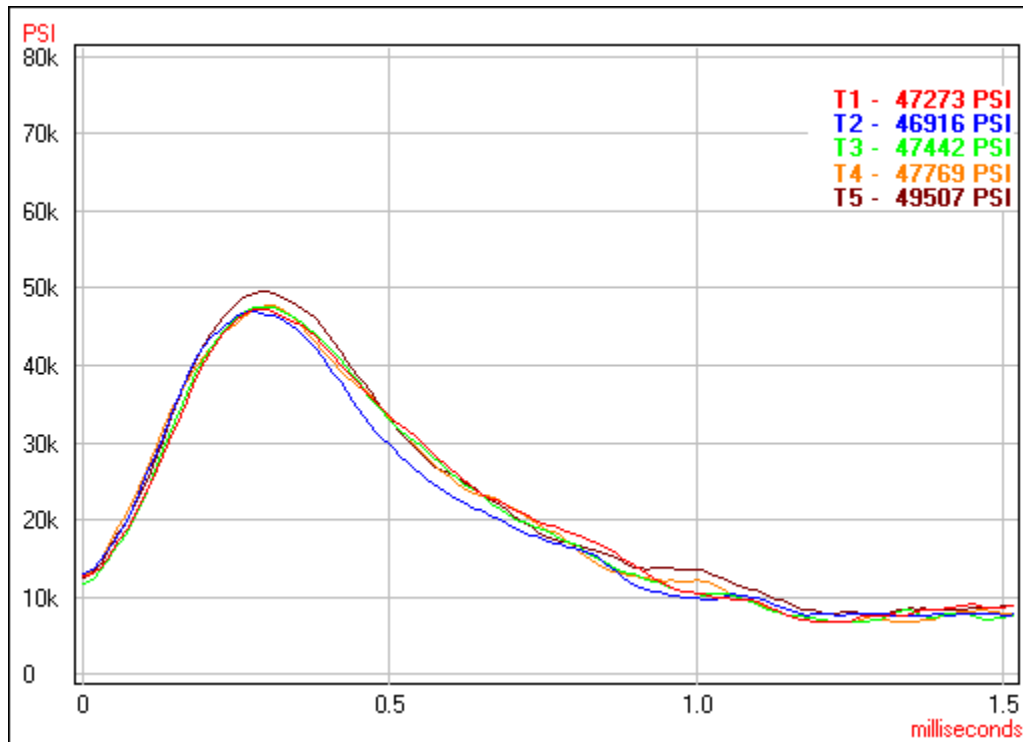
Shot 4: 2,509 FPS / 49,705 PSI

Shot 5: 2,510 FPS / 51,513 PSI

Fired Cases:



AR15 Performance: 18" DMR Chamber, 1:12 Twist, 6 Groove, Chrome Moly, No Bore Coating



Average Peak Chamber Pressure: 47,781 PSI

Velocity / Pressure:

Shot 1: 2,529 FPS / 47,273 PSI

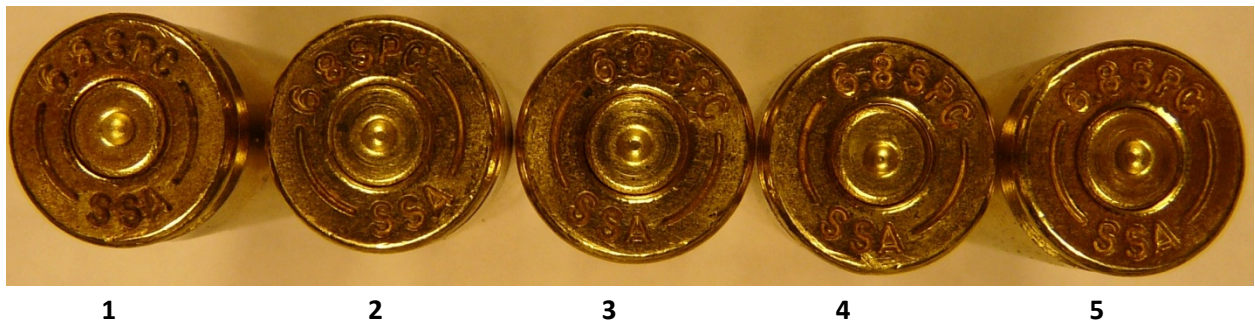
Shot 2: 2,518 FPS / 46,916 PSI

Shot 3: 2,530 FPS / 47,442 PSI

Shot 4: 2,538 FPS / 47,769 PSI

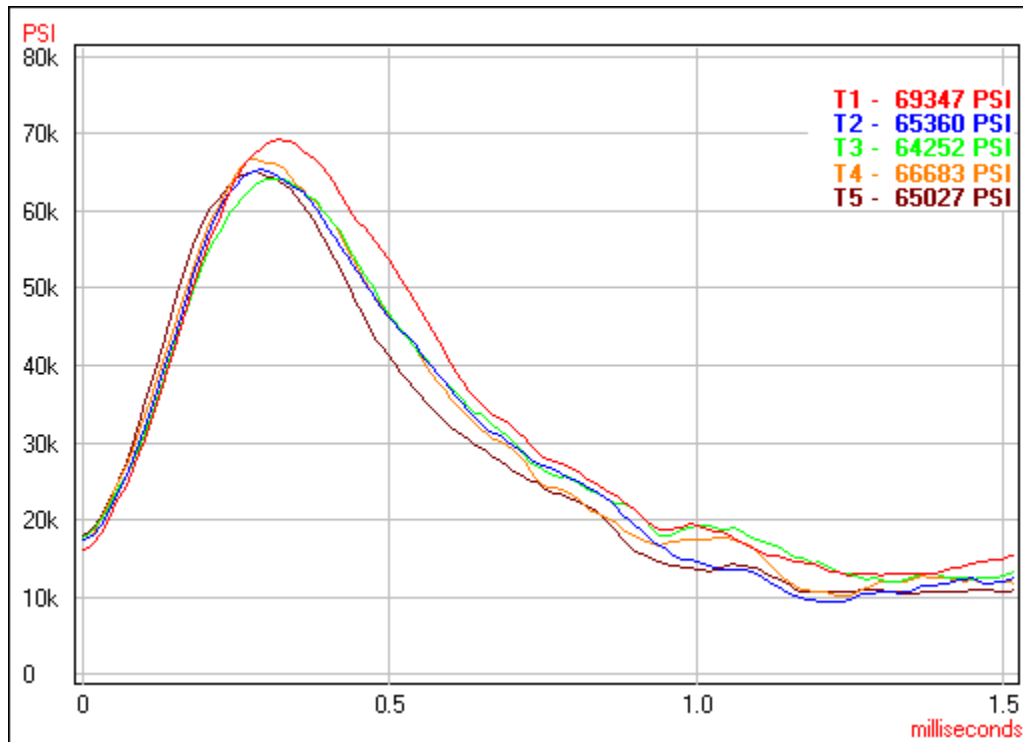
Shot 5: 2,540 FPS / 49,507 PSI

Fired Cases:



Ammunition: Silver State 115 OTM Combat Load

DPMS: 16", SAAMI Chamber, 1:10 Twist, 6 Groove, Chrome Moly, Non-Chrome Lined



Average Peak Chamber Pressure: 66,134 PSI

Velocity / Pressure:

Shot 1: 2,572 FPS / 69,347 PSI

Shot 2: 2,556 FPS / 65,360 PSI

Shot 3: 2,549 FPS / 64,252 PSI

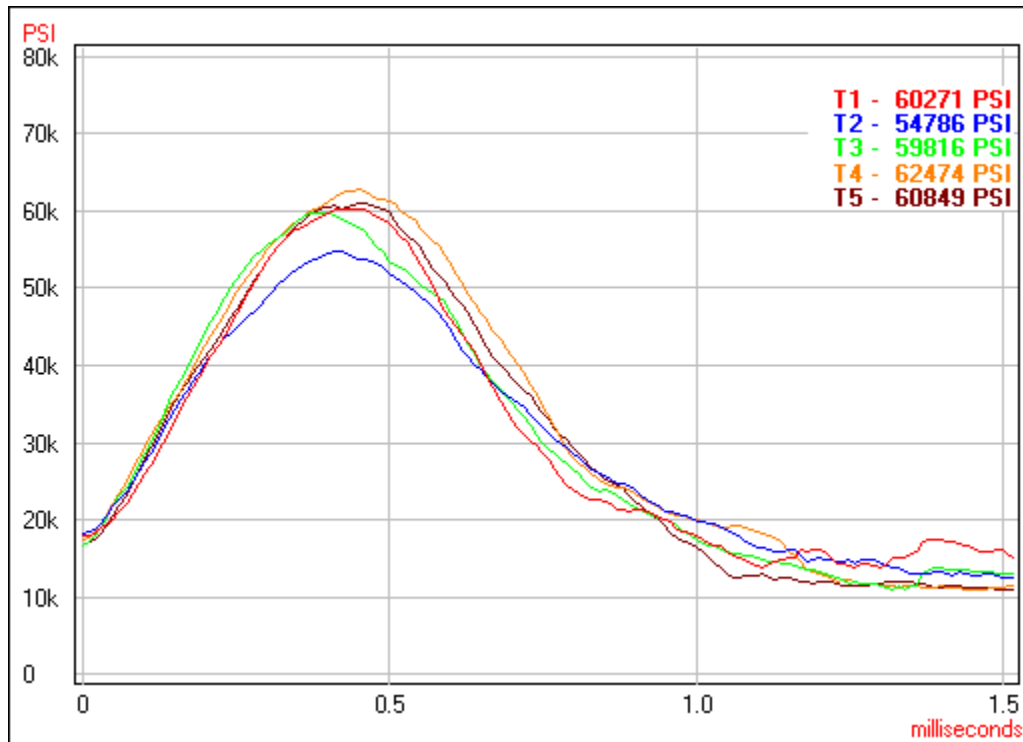
Shot 4: 2,563 FPS / 66,683 PSI

Shot 5: 2,551 FPS / 65,027 PSI

Fired Cases:



Cardinal Armory: 16" SPCII Chamber, 1:11 Twist, 4 Groove, Chrome Moly, Chrome Lined



Average Peak Chamber Pressure: 59,630 PSI

Velocity / Pressure:

Shot 1: 2,540 FPS / 60,271 PSI

Shot 2: 2,519 FPS / 54,786 PSI

Shot 3: 2,545 FPS / 59,816 PSI

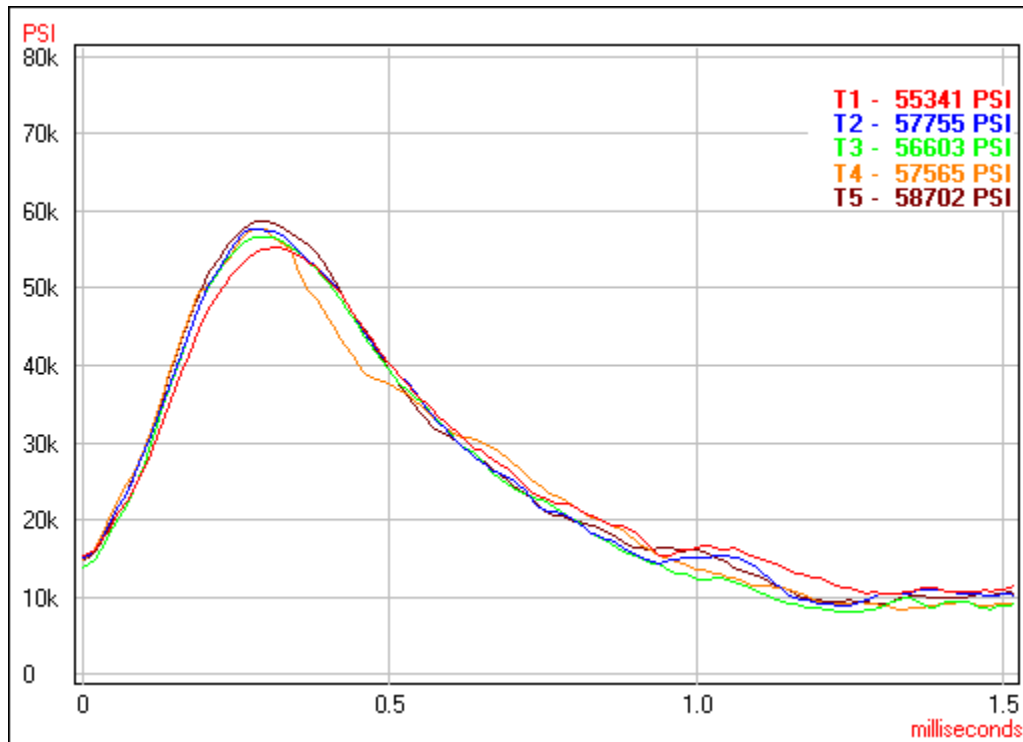
Shot 4: 2,557 FPS / 62,474 PSI

Shot 5: 2,548 FPS / 60,849 PSI

Fired Cases:



Denny's GTS Tactical: 16" SAAMI Chamber, 1:11 Twist, 6 Groove, Stainless Steel, No bore coating



Average Peak Chamber Pressure: 57,193 PSI

Velocity / Pressure:

Shot 1: 2,533 FPS / 55,341 PSI

Shot 2: 2,549 FPS / 57,755 PSI

Shot 3: 2,553 FPS / 56,603 PSI

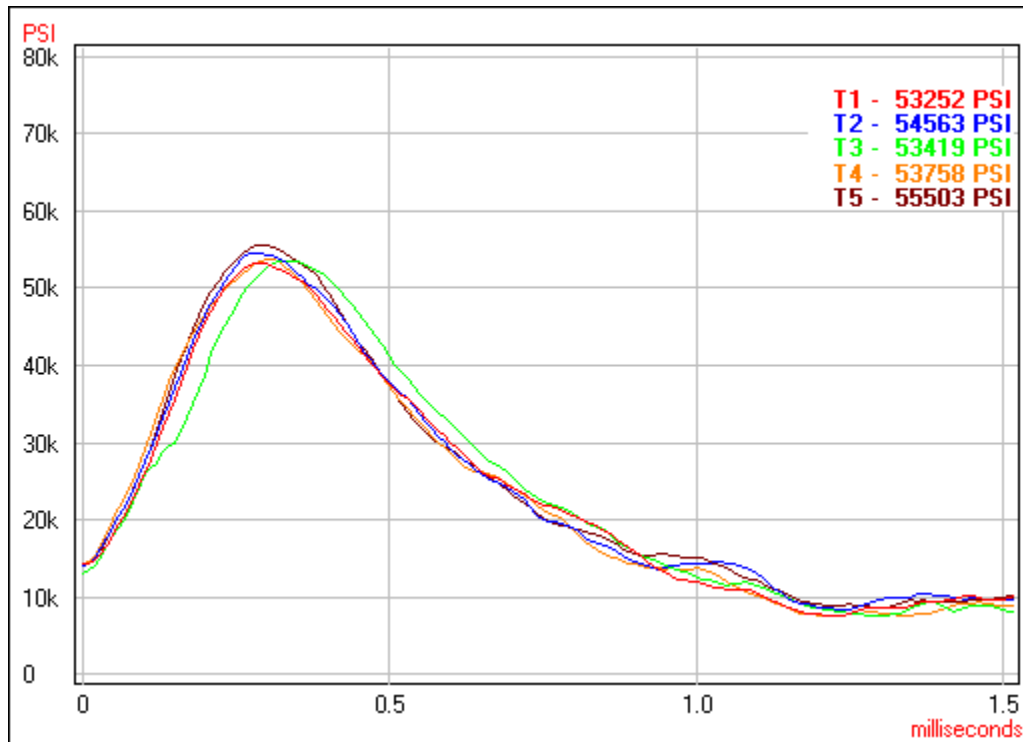
Shot 4: 2,556 FPS / 57,565 PSI

Shot 5: 2,569 FPS / 58,702 PSI

Fired Cases:



AR15 Performance: 18" DMR Chamber, 1:12 Twist, 6 Groove, Chrome Moly, No Bore Coating



Average Peak Chamber Pressure: 54,099 PSI

Velocity / Pressure:

Shot 1: 2,583 FPS / 53,252 PSI

Shot 2: 2,619 FPS / 54,563 PSI

Shot 3: 2,601 FPS / 53,419 PSI

Shot 4: 2,593 FPS / 53,758 PSI

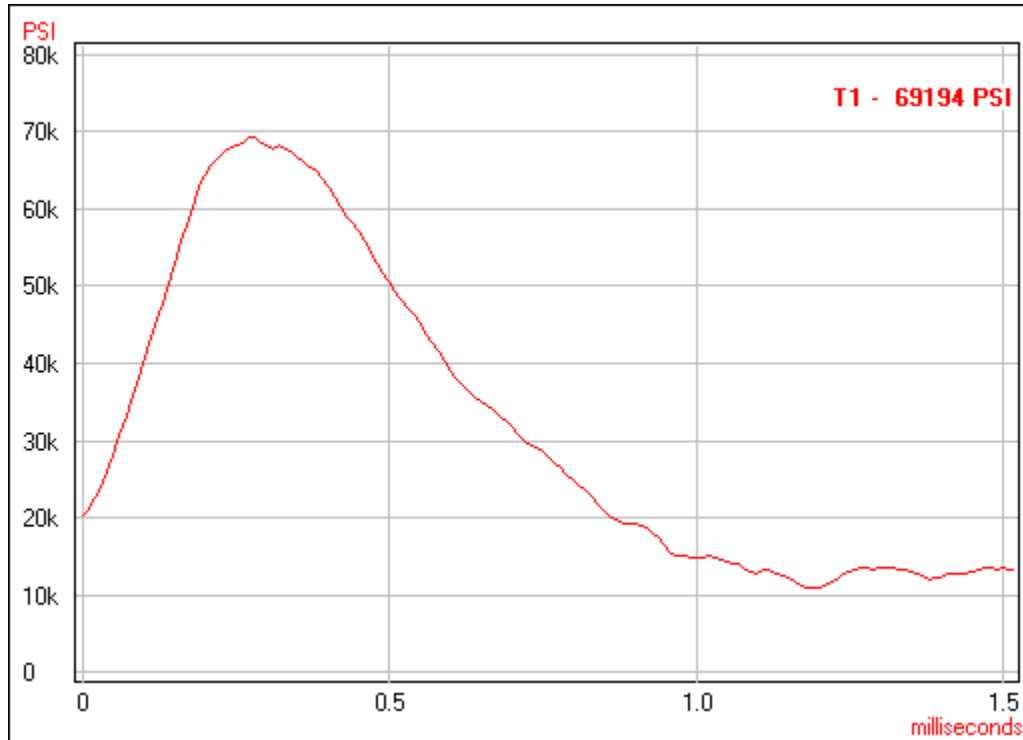
Shot 5: 2,629 FPS / 55,503 PSI

Fired Cases:



Ammunition: Hand Load 110 Sierra Pro Hunter, 32 grains H322, CCI #41, SSA Case

DPMS: 16", SAAMI Chamber, 1:10 Twist, 6 Groove, Chrome Moly, Non-Chrome Lined



Average Peak Chamber Pressure: 69,194 PSI

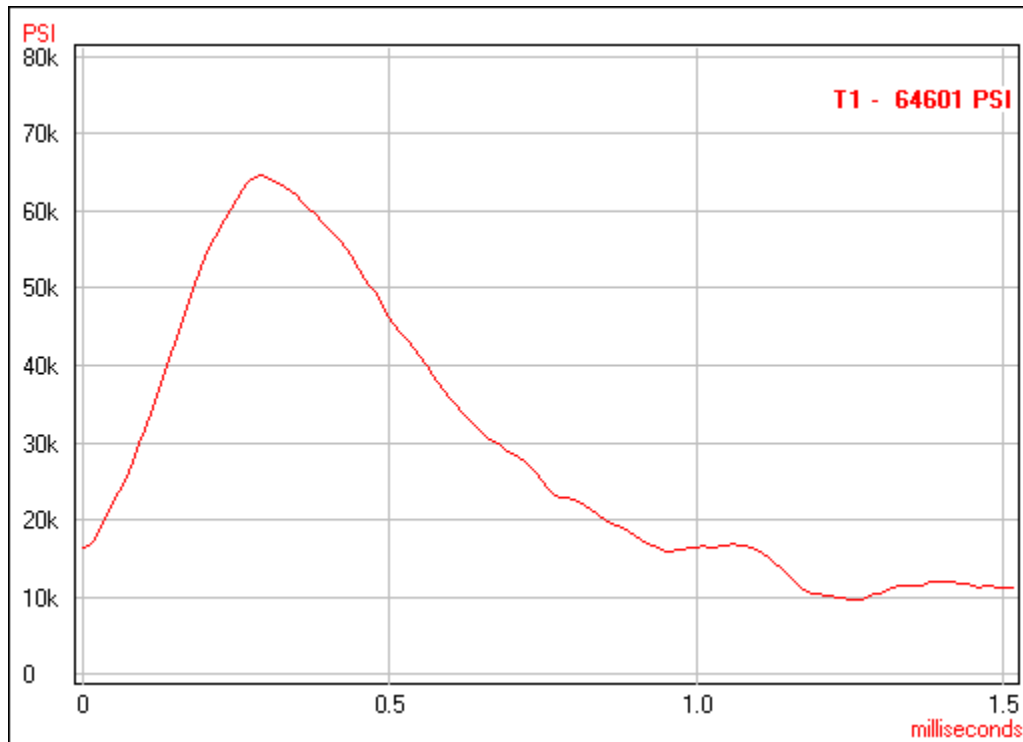
Velocities / Pressure:

Shot 1: 2,703 FPS / 69,194 PSI

Fired Case:



Cardinal Armory: 16" SPCII Chamber, 1:11 Twist, 4 Groove, Chrome Moly, Chrome Lined



Average Peak Chamber Pressure: 64,601 PSI

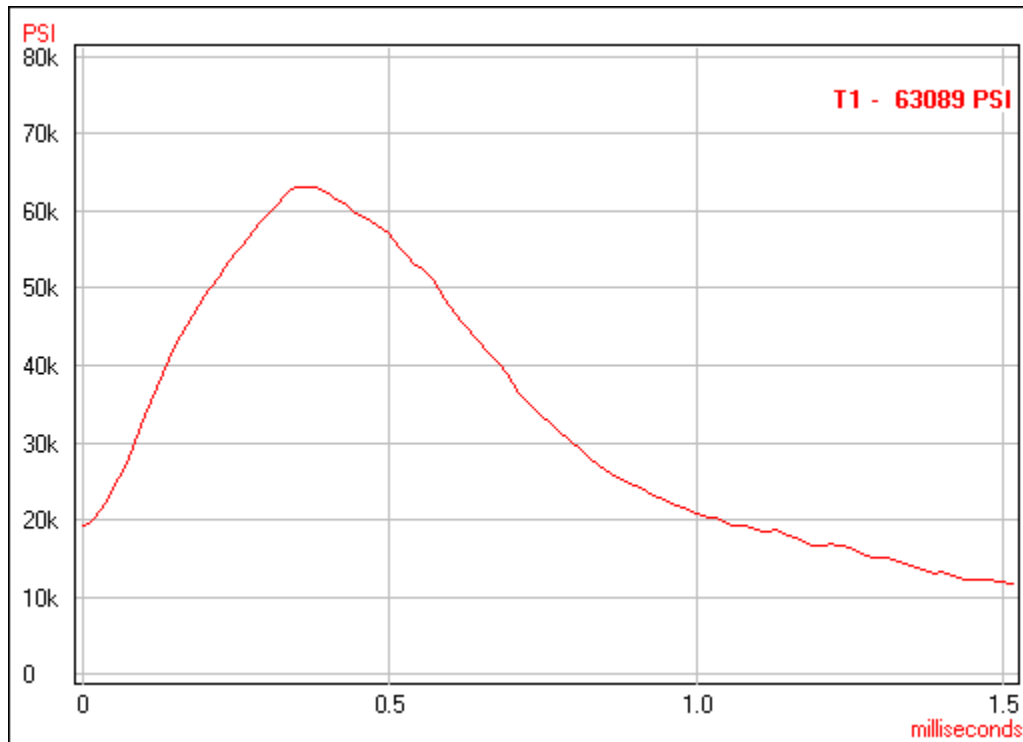
Velocities / Pressure:

Shot 1: 2,745 FPS / 64,601 PSI

Fired Case:



Denny's GTS Tactical: 16" SAAMI Chamber, 1:11 Twist, 6 Groove, Stainless Steel, No bore coating



Average Peak Chamber Pressure: 63,089 PSI

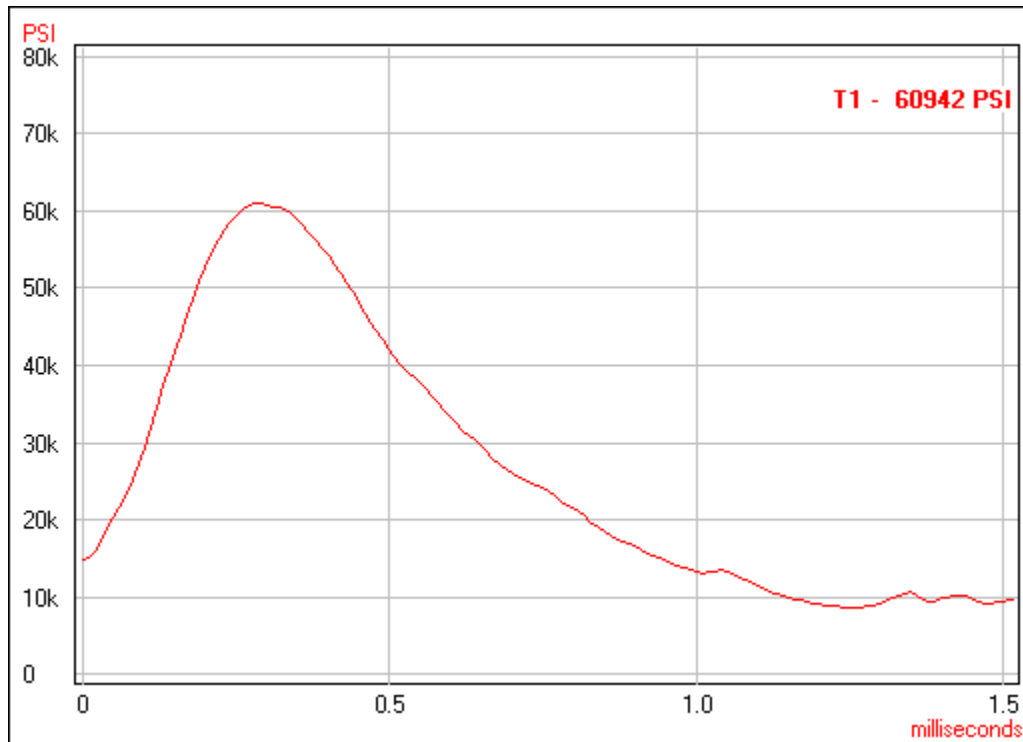
Velocities / Pressure:

Shot 1: 2,787 FPS / 63,089 PSI

Fired Case:



AR15 Performance: 18" DMR Chamber, 1:12 Twist, 6 Groove, Chrome Moly, No Bore Coating



Average Peak Chamber Pressure: 60,942 PSI

Velocities / Pressure:

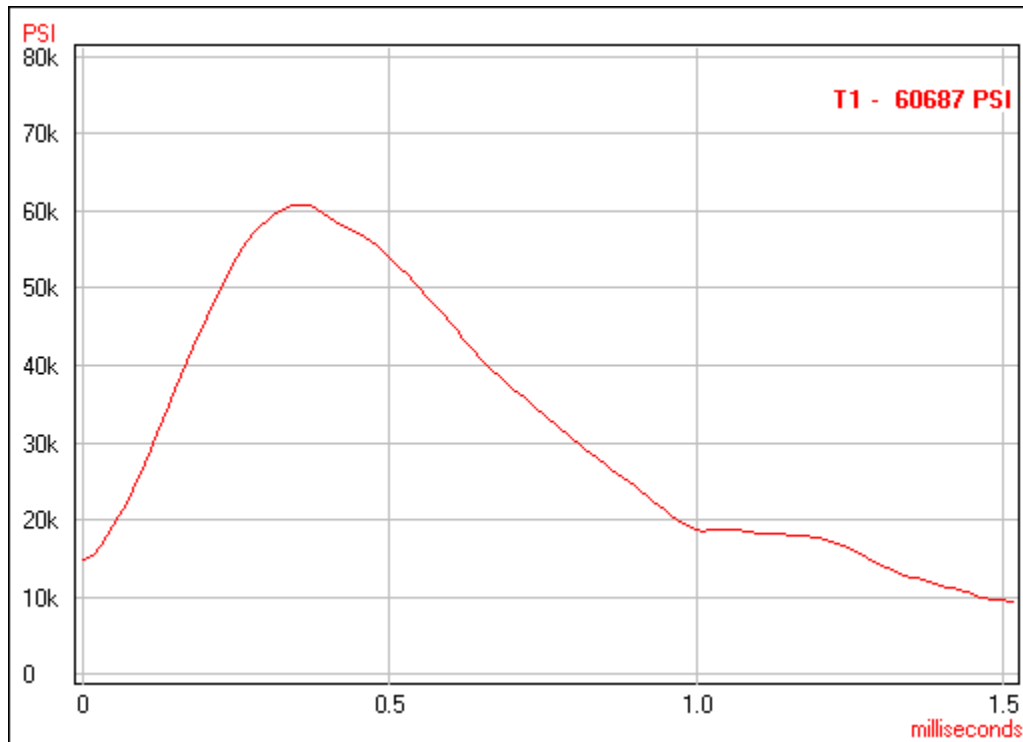
Shot 1: 2,821 FPS / 60,942 PSI

Fired Case:



Ammunition: Hand Load 110 Pro Hunter 30.5gr Alliant Rel10x

AR15Performance: 18" DMR Chamber, 1:12 Twist, 6 Groove, Chrome Moly, No Bore Coating



Average Peak Chamber Pressure: 60,687 PSI

Velocities / Pressure:

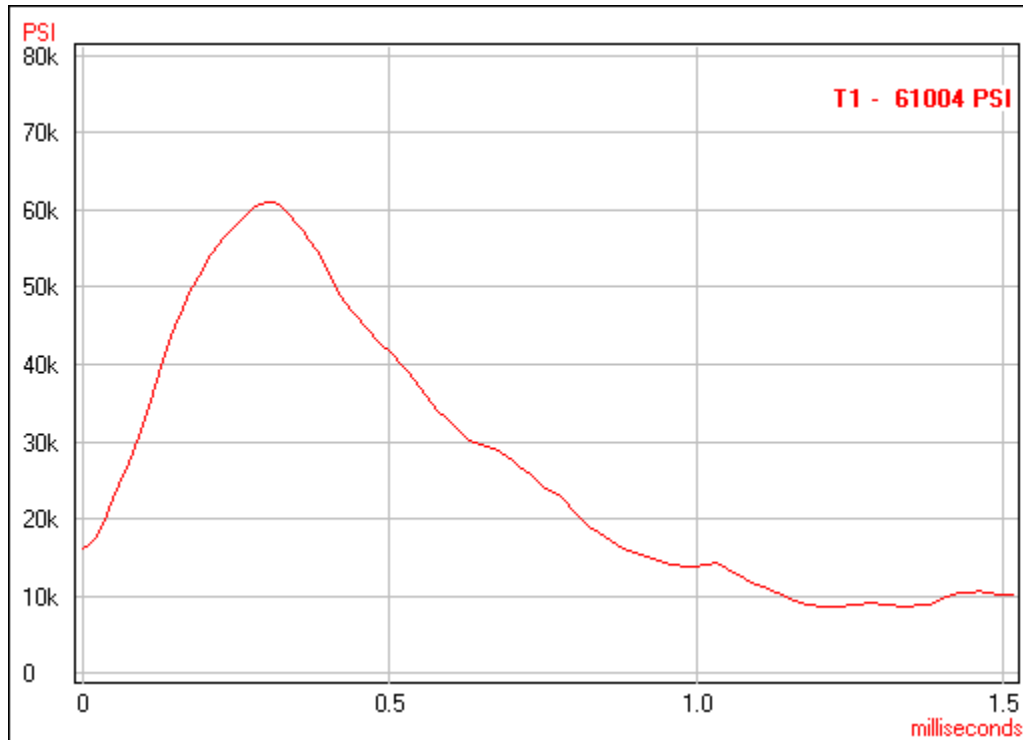
Shot 1: 2,869 FPS / 60,687 PSI

Fired Case:



Ammunition: GS Custom 80 gr HV 29.5 gr AA1680

AR15 Performance: 18" DMR Chamber, 1:12 Twist, 6 Groove, Chrome Moly, No Bore Coating



Average Peak Chamber Pressure: 61,004 PSI

Velocities / Pressure:

Shot 1: 3385 FPS / 61,004 PSI

Fired Case:



Superior Barrels: 20" SAAMI Chamber, 1:10 Twist, 6 Groove, Stainless Steel, Hard Blue Treated

Ammunition: SSA 115 OTM Combat Loads

Shot 1: 2,627

Shot 2: 2,573

Shot 3: 2,570

Shot 4: 2,608

Shot 5: 2,589

Average: 2,593

High: 2,627

Low: 2,570

Fired Cases:



Superior Barrels: 20" SPCII Chamber, 1:10 Twist, 6 Groove, Stainless Steel, Hard Blue Treated

Ammunition: SSA 115 OTM Combat Loads

Shot 1: 2,603

Shot 2: 2,616

Shot 3: 2,593

Shot 4: 2,590

Shot 5: 2,621

Average: 2,605

High: 2,621

Low: 2,590

Fired Cases:



AR15 Performance: 20", DMR Chamber, 1:13 Twist, 3 Groove, Stainless Steel, No Bore Coating

Ammunition: Hand Load 110 gr Pro Hunter 30.5 gr Alliant Rel 10x

Shot 1: 2901 fps

Shot 2: 2890 fps

Shot 3: 2923 fps

Average: 2905 fps

High: 2923 fps

Low: 2890 fps

Ammunition: Hand Load 80 gr HV 29.5 gr AA1680

Shot 1: **3412 fps** (see photo)

Shot 2: 3380 fps

Shot 3: 3384 fps

Shot 4: 3381 fps

Shot 5: 3397 fps

Average: 3391 fps

High: 3412 fps

Low: 3380 fps



AR15 Performance: 20", DMR Chamber, 1:11 Twist, 4 Groove, Stainless Steel, No Bore Coating

Ammunition: Silver State Armory 115 gr OTM Commercial

Cases showed no signs of excessive pressure

Ammunition: Silver State Armory 115 gr OTM Combat

Cases showed no signs of excessive pressure

6.8 Performance Data

Chart

<u>Silver State Armory 115 OTM Commercial</u>		<u>Shot 1</u>	<u>Shot 2</u>	<u>Shot 3</u>	<u>Shot 4</u>	<u>Shot 5</u>	<u>Average</u>
DPMS 16" <i>SAAMI / 1:10 / 6 Groove / Chrome Moly / No Chrome Lining</i>	Velocity	2,501	2,466	2,484	2,491	2,489	2,486
	Pressure	57,113	55,579	56,606	56,846	56,784	56,585
Cardinal Armory 16" ** <i>SPCII / 1:11 / 4 Groove / Chrome Moly/ Chrome Lined</i>	Velocity	2,502	2,480	2,499	2,454	2,483	2,483
	Pressure	52,486	50,722	52,031	49,521	51,791	51,310
Denny's GTS 16" <i>SAAMI / 1:11 / 6 Groove / Stainless Steel / No Chrome Lining</i>	Velocity	2,492	2,499	2,527	2,509	2,510	2,507
	Pressure	48,176	48,834	52,645	49,205	49,705	50,175
AR15Performance 18" <i>DMR / 1:12 / 6 Groove / Chrome Moly / No Chrome Lining</i>	Velocity	2,529	2,518	2,530	2,538	2,540	2,531
	Pressure	47,273	46,916	47,442	47,769	49,507	47,781
<u>Silver State Armory 115 OTM Combat</u>		<u>Shot 1</u>	<u>Shot 2</u>	<u>Shot 3</u>	<u>Shot 4</u>	<u>Shot 5</u>	<u>Average</u>
DPMS 16" <i>SAAMI / 1:10 / 6 Groove / Chrome Moly / No Chrome Lining</i>	Velocity	2,572	2,556	2,549	2,563	2,551	2,558
	Pressure	69,347	65,360	64,252	66,683	65,027	66,134
Cardinal Armory 16" ** <i>SPCII / 1:11 / 4 Groove / Chrome Moly/ Chrome Lined</i>	Velocity	2,540	2,519	2,545	2,557	2,548	2,541
	Pressure	60,271	54,786	59,816	62,474	60,849	59,630
Denny's GTS 16" <i>SAAMI / 1:11 / 6 Groove / Stainless Steel / No Chrome Lining</i>	Velocity	2,533	2,549	2,553	2,556	2,569	2,556
	Pressure	55,341	57,755	56,603	57,565	58,702	57,193
AR15Performance 18" <i>DMR / 1:12 / 6 Groove / Chrome Moly / No Chrome Lining</i>	Velocity	2,583	2,619	2,601	2,593	2,629	2,605
	Pressure	53,252	54,563	53,419	53,758	55,503	54,099
Superior Barrels: 20" <i>SAAMI / 1:10 / 6 Groove / Stainless Steel / Hard Blue Coating</i>	Velocity	2,627	2,573	2,570	2,608	2,589	2,593
	Pressure	n/a	n/a	n/a	n/a	n/a	n/a
Superior Barrels: 20" <i>SPCII / 1:10 / 6 Groove / Stainless Steel / Hard Blue Coating</i>	Velocity	2,603	2,616	2,593	2,590	2,621	2,604
	Pressure	n/a	n/a	n/a	n/a	n/a	n/a

6.8 Performance Data Chart

<u>Hand Load 110 Sierra Pro Hunter, 32 grains H322</u>		<u>Shot 1</u>		<u>Average</u>			
DPMS 16" SAAMI / 1:10 / 6 Groove / Chrome Moly / No Chrome Lining	Velocity	2,703		2,703	FPS		
	Pressure	69,194		69,194	PSI		
Cardinal Armory 16" ** SPCII / 1:11 / 4 Groove / Chrome Moly/ Chrome Lined	Velocity	2,745		2,745	FPS		
	Pressure	64,601		64,601	PSI		
Denny's GTS 16" SAAMI / 1:11 / 6 Groove / Stainless Steel / No Chrome Lining	Velocity	2,787		2,787	FPS		
	Pressure	63,089		63,089	PSI		
AR15Performance 18" DMR / 1:12 / 6 Groove / Chrome Moly / No Chrome Lining	Velocity	2,821		2,821	FPS		
	Pressure	60,942		60,942	PSI		
<u>Hand Load 110 Pro Hunter 30.5gr Alliant Rel10x</u>		<u>Shot 1</u>	<u>Shot 2</u>	<u>Shot 3</u>	<u>Shot 4</u>	<u>Shot 5</u>	<u>Average</u>
AR15Performance 18" DMR / 1:12 / 6 Groove / Chrome Moly / No Chrome Lining	Velocity	2,869	n/a	n/a	n/a	n/a	2,869
	Pressure	60,687	n/a	n/a	n/a	n/a	60,687
AR15Performance 20" DMR / 1:13 / 3 Groove / Stainless Steel / No Chrome Lining	Velocity	2,901	2,890	2,923			2,905
	Pressure	n/a	n/a	n/a			n/a
<u>Hand Load GS Custom 80 gr HV 29.5 gr AA1680</u>		<u>Shot 1</u>	<u>Shot 2</u>	<u>Shot 3</u>	<u>Shot 4</u>	<u>Shot 5</u>	<u>Average</u>
AR15Performance 18" DMR / 1:12 / 6 Groove / Chrome Moly / No Chrome Lining	Velocity	3,385	n/a	n/a	n/a	n/a	3,385
	Pressure	60,687	n/a	n/a	n/a	n/a	60,687
AR15Performance 20" DMR / 1:13 / 3 Groove / Stainless Steel / No Chrome Lining	Velocity	3,412	3,380	3,384	3,381	3,397	3,391
	Pressure	n/a	n/a	n/a	n/a	n/a	n/a

6.8 Performance Data Chart

Average Peak Chamber Pressure and Difference <u>Silver State Armory 115 OTM Commercial</u>	Average <u>Pressure</u>	DPMS <u>Diff.</u>	Cardinal <u>Diff.</u>	Denny's <u>Diff.</u>	AR15Perf <u>Diff.</u>
DPMS 16" <i>SAAMI / 1:10 / 6 Groove / Chrome Moly / No Chrome Lining</i>	Average 56,585	DPMS 0	DPMS -5,275	DPMS -6,410	DPMS -8,804
Cardinal Armory 16" ** <i>SPCII / 1:11 / 4 Groove / Chrome Moly/ Chrome Lined</i>	Average 51,310	Cardinal 5,275	Cardinal 0	Cardinal -1,135	Cardinal -3,529
Denny's GTS 16" <i>SAAMI / 1:11 / 6 Groove / Stainless Steel / No Chrome Lining</i>	Average 50,175	Denny's 6,410	Denny's 1,135	Denny's 0	Denny's -2,394
AR15Performance 18" <i>DMR / 1:12 / 6 Groove / Chrome Moly / No Chrome Lining</i>	Average 47,781	AR15Perf 8,804	AR15Perf 3,529	AR15Perf 2,394	AR15Perf 0
Average Peak Chamber Pressure and Difference <u>Silver State Armory 115 OTM Combat</u>	Average <u>Pressure</u>	DPMS <u>Diff.</u>	Cardinal <u>Diff.</u>	Denny's <u>Diff.</u>	AR15Perf <u>Diff.</u>
DPMS 16" <i>SAAMI / 1:10 / 6 Groove / Chrome Moly / No Chrome Lining</i>	Average 66,134	DPMS -66,134	DPMS -6,504	DPMS -8,941	DPMS -12,035
Cardinal Armory 16" ** <i>SPCII / 1:11 / 4 Groove / Chrome Moly/ Chrome Lined</i>	Average 59,630	Cardinal 6,504	Cardinal 0	Cardinal -2,437	Cardinal -5,531
Denny's GTS 16" <i>SAAMI / 1:11 / 6 Groove / Stainless Steel / No Chrome Lining</i>	Average 57,193	Denny's 8,941	Denny's 2,437	Denny's 0	Denny's -3,094
AR15Performance 18" <i>DMR / 1:12 / 6 Groove / Chrome Moly / No Chrome Lining</i>	Average 54,099	AR15Perf 12,035	AR15Perf 5,531	AR15Perf 3,094	AR15Perf 0

6.8 Performance Data Chart

Average Peak Chamber Pressure and Difference <u>Hand Load 110 Sierra Pro Hunter, 32 grains H322</u>	Average <u>Pressure</u>	DPMS <u>Diff.</u>	Cardinal <u>Diff.</u>	Denny's <u>Diff.</u>	AR15Perf <u>Diff.</u>
DPMS 16"	Average	DPMS	DPMS	DPMS	DPMS
<i>SAAMI / 1:10 / 6 Groove / Chrome Moly / No Chrome Lining</i>	69,194	0	-4,593	-6,105	-8,252
Cardinal Armory 16" **	Average	Cardinal	Cardinal	Cardinal	Cardinal
<i>SPCII / 1:11 / 4 Groove / Chrome Moly/ Chrome Lined</i>	64,601	4,593	0	-1,512	-3,659
Denny's GTS 16"	Average	Denny's	Denny's	Denny's	Denny's
<i>SAAMI / 1:11 / 6 Groove / Stainless Steel / No Chrome Lining</i>	63,089	6,105	1,512	0	-2,147
AR15Performance 18"	Average	AR15Perf	AR15Perf	AR15Perf	AR15Perf
<i>DMR / 1:12 / 6 Groove / Chrome Moly / No Chrome Lining</i>	60,942	8,252	3,659	2,147	0

*** Cardinal Armory 16" was found to have a bore below spec.
This can contribute to increased peak chamber pressures*

Narrative:

As has been mentioned before the purpose of this test was not to attempt to definitively show how changes to any one barrel specification would affect performance. This was simply outside our financial capabilities at this time. What we looked to do was to collect as much data as possible from barrels with various barrel specifications as well as to find some of the upper limits of the 6.8's performance capabilities. There does need to be some explanation of what those specs are and how it is believed they affect the barrels performance:

Chambers:

Murray: This is the original chamber and we don't have the specific specs but from people that do they say it very closely resembles the current SPCII chamber.

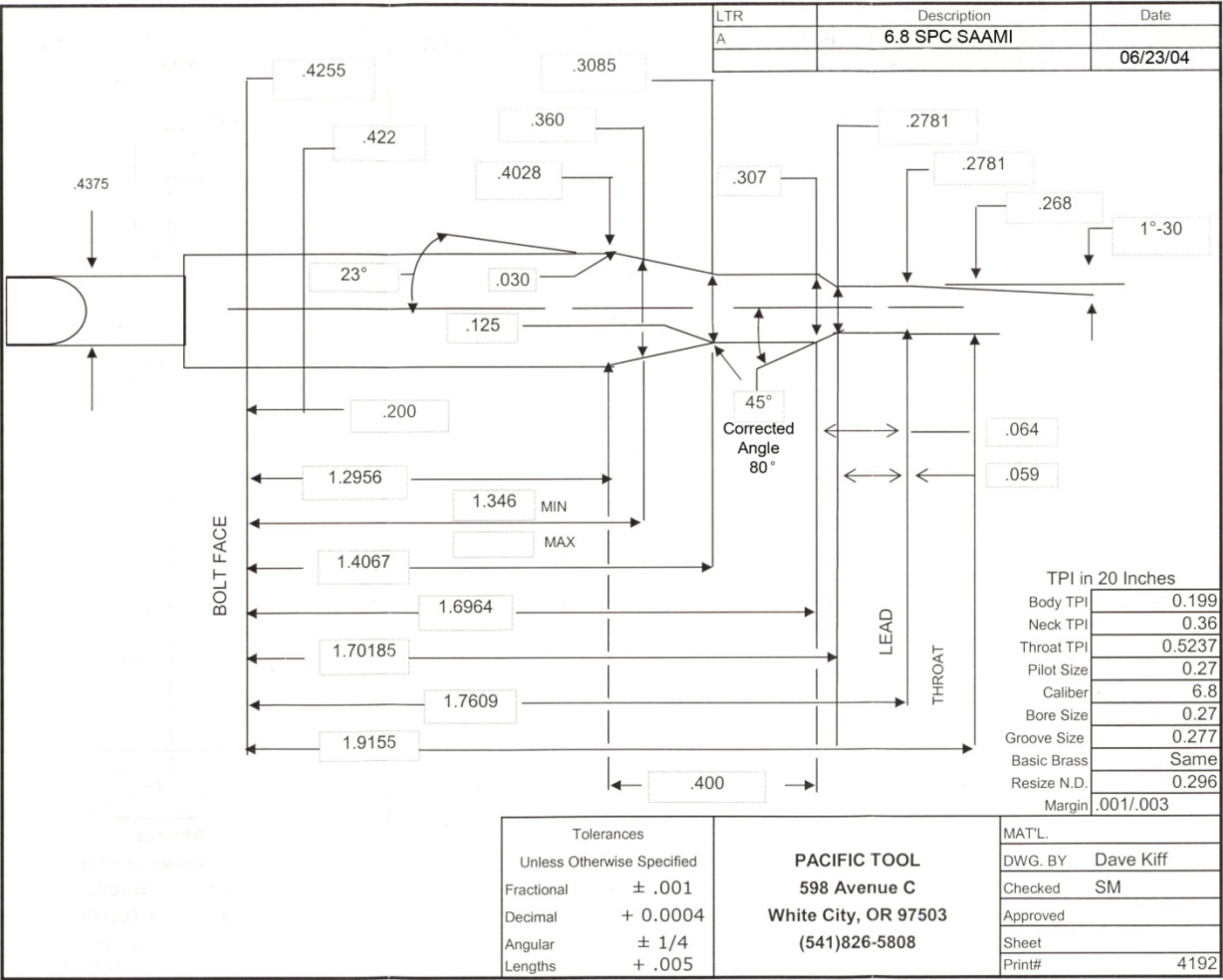
SAAMI: This chamber is the one Remington submitted to SAAMI. All the testing done up to that point had been using the Murray chamber. It has a leade (otherwise called throat or freebore) that is as much as half the length of the others.

SPCII: This chamber was conceived by Art Kalwas the owner of Silver State Armory and was motivated by the fact that the change Remington 100% in Military testing. It's only difference from the SAAMI chamber spec is in the leade. It is 2x longer then the SAAMI in the leade.

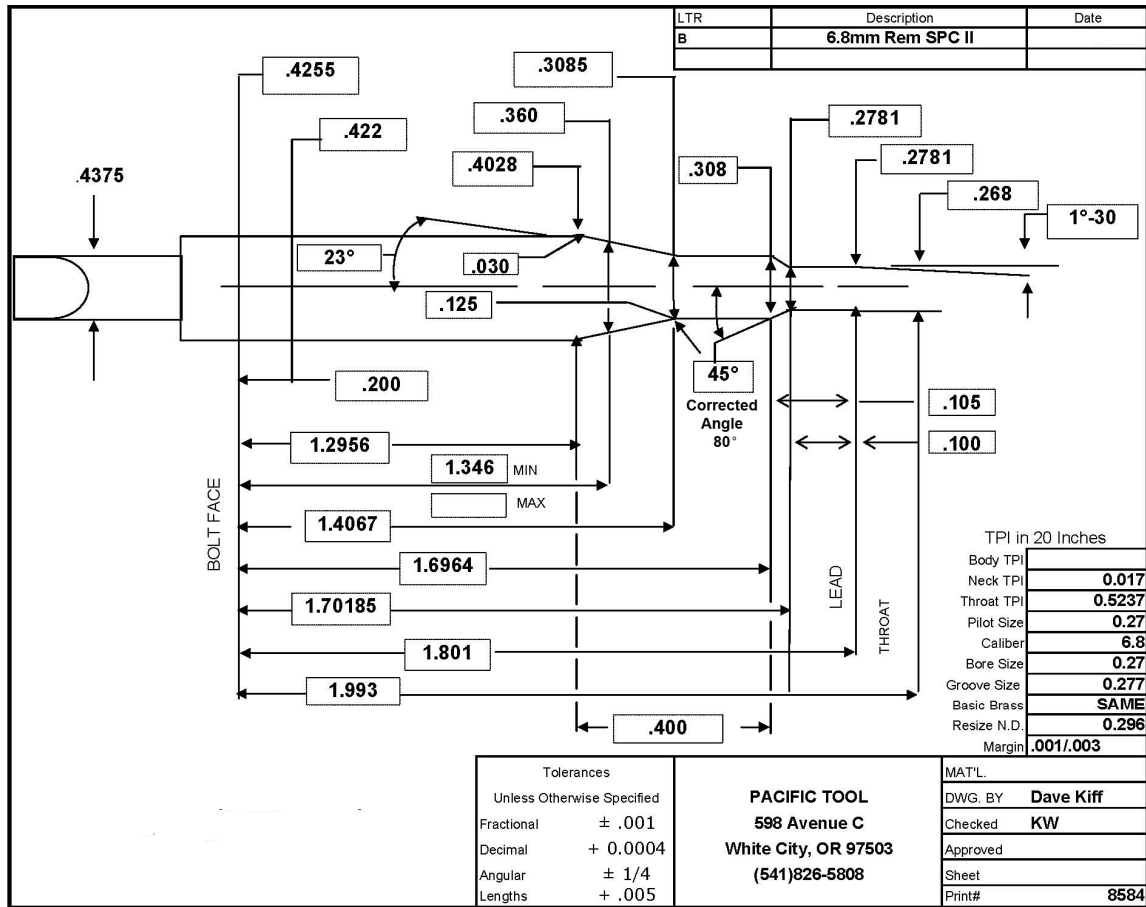
DMR: This chamber is the brain child of Harrison Beene the owner of AR15Performance. It represents an accuracy chamber including the benefits gained by the SPCII and properly addresses the neck to leade angle (Cone). The needed leade length along with the max overall length that was allowed by the largest magazine was factored. The changes in some of the case areas including the throat diameter being taken from 0.278" to 0.277" were the end result. The other change of note is the angle of the "cone" which is the angle from the neck to the leade. Even though the SAAMI and SPCII reamer drawings show that angle to be 45°, upon computing the angle, it was found to be significantly steeper with an angle of 80°. The 45° entry found on most reamer drawings is there by default and is not the actual computed angle of the "Cone".

	<u>SAAMI</u>	<u>SPCII</u>	<u>DMR</u>
Leade Length	0.0645	0.105	0.100
Leade Diameter	0.278	0.278	0.277
Neck @Throat Diameter	0.307	0.308	0.305
Neck @ Shoulder Diameter	0.3085	0.3085	0.305
Shoulder Diameter	0.4028	0.4028	0.403
Base Diameter	0.422	0.422	0.4205
Neck to Leade Angle (Cone)	80°	80°	35°

SAAMI Chamber Drawing:



SPCII Chamber Drawing:



LTR	Description	Date
A	6.8mm DMR	12/10/2007
	Harrison Beene	

Technical drawing of a 6.8mm DMR cartridge case. The drawing shows the case with various dimensions and tolerances. The dimensions are as follows:

- Head diameter: .4375
- Head length: .423
- Neck diameter: .305
- Neck length: .360
- Body diameter: .305
- Body length: .277
- Lead: 1°-30
- Throat: .268
- Throat diameter: .100
- Throat length: .060
- Body length: .200
- Body diameter: .421
- Body length: 1.2956
- Body diameter: .403
- Body length: 1.346 MIN
- Body diameter: .305
- Body length: 1.411 MAX
- Body diameter: .277
- Body length: 1.690
- Body diameter: .268
- Body length: 1.730
- Body diameter: .257
- Body length: 1.790
- Body diameter: .246
- Body length: 1.961
- Body diameter: .235
- Body length: .4014

Tolerances:

- Fractional: ± .001
- Decimal: + 0.0004
- Angular: ± 1/4
- Lengths: + .005

PACIFIC TOOL
598 Avenue C
White City, OR 97503
(541)826-5808

DWG. BY Dave Kiff
Checked MC
Approved
Sheet
Print# 1268

TPI in 20 Inches

Body TPI	0.159
Neck TPI	0.017
Throat TPI	0.5237
Pilot Size	0.27
Caliber	6.8
Bore Size	0.27
Groove Size	0.277
Basic Brass	SAME
Resize N.D.	0.296
Margin	.001/.003

Leade (Throat/Freebore):

There is plenty of data to support the pressure decreasing and performance increasing effect of using a longer leade. There is our current military cartridge the 5.56 NATO which is virtually the same as the .223 except it uses a longer leade which allows higher performance to be attained thru an increased powder charge. There is also the famous Weatherby cartridges which made famous the extra 150-300 FPS there ammo would attain when used in there longer leade chambers and the warning that it could not be used in normal chambers that didn't have this feature as it would cause dangerously high pressure. We fell that for none chrome lined barrels the DMR represents the best choice if maximum performance in both velocity and accuracy is wanted. If the barrel is going to be chrome lined then the larger tolerances of the SPCII chamber would be best as it gives the extra tolerance to allow for the variations chrome.

Rifling:

While there is less data on the effects on performance the number of land and grooves and or ratio between the areas of lands to grooves has. A decrease in the number of grooves and an increase in the ratio of grooves area to that of the lands increases the bores cross sectional area and has less engraving points. It is certainly logical and the current data as well as that from other sources seems to confirm this can increase performance. The cross sectional area in the bore is the area of the bore if you cut an imaginary sliver from the bore and measure the area inside. The SAAMI spec lists a minimum bore area. The larger this cross sectional area is the less the bullet has to deform to fit into the bore allowing more area for the gases from the powder to occupy. This causes a decrease in pressure with the bullet being farther down the barrel in time. This should contribute to capability for increased performance.

Twist Rate:

The one area that has the least data of all or conflicting data about its effect on pressure or velocity is the twist rate. There is no question it does as anytime you move a mass you use energy. The question is whether it's significant enough to matter. There have been tests before with a few other calibers which have shown little effect from changes in twist. The difference with this cartridge is the bore to bullet length and percentage of bearing surface with the bullets used. Compared to other cartridges and the corresponding bullets used it is surmised the twist rate can have an enough of an effect on performance to be significant. An example of this can be seen with Palma shooters that are limited to bullet s with a maximum weight of 155 grains. Much slower twists are used then are typically used for that cartridge. 1:13 and 1:14 compared to 1:12-1:10. One reason stated is to get every last bit of velocity from the lighter bullets. If that were not the case and the velocity gain or pressure drop was insignificant there are still very good reasons to use the proper twist rate. If not, then taken to the extreme, we could use one twist rate for all cartridges.

The first and most important requirement of twist is it must spin the bullet fast enough to properly stabilize the flight of the bullet that will be used. If not then the bullets would be unstable and literally fly end over end or wobble terribly. Once that requirement is met spinning the bullet much faster can and does have negative effects.

Excessive spin can cause the bullet nose to stay at the same angle at which it was fired from the barrel rather than following the trajectory of the bullets arcing path. As the bullet comes down the back side of its trajectory it will tend to stay nose up the faster it is spinning rather than the nose pointing down at the angle of the bullets trajectory. This can cause the bullet to become less stable and more erratic in their flight. Excessive spin when a bullet not balanced to its center of mass is used increases wobble which can affect accuracy. Bullet construction has been greatly improved yet very few bullets are perfectly center balanced.

How much does excessive twist negatively affect the 6.8 SPC's performance? We cannot be sure. It has been established that any twist faster than one revolution in every 11 or even 12 inches is unnecessary to effectively stabilize the longest bullets that can realistically be used from an AR-15 and still feed from a magazine. The maximum total length a cartridge can measure and feed thru the most generous magazine is 2.30". The SAAMI specification actually calls for no cartridge to be longer than 2.26". This length would preclude any bullet over the length of 1.1" to be used, as it would take up too much case capacity. In all likelihood if a bullet longer than 1.1" was loaded to the 2.26" specification the bullets ogive (the area before the bullet reaches full caliber diameter .277) would be inside the cases neck which goes against standard ammunition loading practices as it has a negative effect on accuracy and chamber pressure by causing erratic behavior in both.

Cris Murray the gunsmith for the AMU (Army Marksman Unit) and designer of this cartridge felt the ideal twist rate for this cartridge in the AR-15 is 1:12. Unfortunately, the only barrel blanks made for this bore size at that time used a 1:10 twist. The only cartridge in the USA to use the 0.277" bore diameter before the 6.8 SPC was the .270 Winchester and its standard twist rate is 1:10. The .270 Winchester typically shoots bullet no lighter than 130 grains with bullets up to 160 grains and lengths up to 1.4". This is far greater than the 1.1" maximum length used in the 6.8 SPC.

As has been shown there is a need to spin a bullet fast enough to stabilize it, yet there is no benefits to anything faster with several reasons not to increase it beyond that.

Does this mean that if you own a 1:10 twist barrel you have a barrel that is going to have terrible accuracy? Certainly not. But there does seem to be a correlation between achievable velocity and pressure drop with twist rate for this cartridge.

It is hoped that AR-15 manufactures based on this info will consider changing their twist rate and other specifications as needed. The faster twists are not ideal and if anything can only hurt peak performance without adding any advantages.

This test shows when a chamber with a longer leade is combined with a ideal twist rate it produces less pressure at a given velocity then barrels not using them. The additional use of a 3 or 4 groove rifling increases these gains.

Recommended Barrel Specifications:

Based on extensive testing and data from others we feel the ideal barrel specification to attain maximum performance from the 6.8 SPC cartridge in the AR-15 platform to be as follows:

- **Chamber:** DMR if not chrome lined and SPCII if chrome lined.
- **Rifling:** 3 groove for standard rifling and/or nothing less than a 30/70 ratio groove/land
- **Twist rate:** 1:12 is ideal with a maximum of 1:11 and a minimum of 1:13

Proper Tolerances:

An important thing to come out of the research and also confirmed by several ammunition, barrel, and gun manufactures is to make sure that a barrel is actually built to the specifications it is listed to be. While we did not have the time or capabilities to air gauge or taking castings, from our limited and simple test of pulling a gauge down the barrel it was quite obvious that there was certainly significant variations in bore diameter. From this test and the reports from outside sources the single largest contributing factor to these variations appears to be chrome lining. When done properly it can achieve very exacting tolerances, if not, bore and chamber specifications can vary significantly and erratically.

This was seen to some extent in the Cardinal Barrels and to a severe amount in the Model One Sales barrel. Cardinal has recently become aware that they have had barrels from various batches that have had excessive chrome build up. We happened to have one of these barrels. Prior to testing Tim Hicks the owner of Cardinal Armory was made aware that it was believed to be the situation. To his credit he agreed that they should be tested to show the effects of such an issue. He is also in the process of addressing this issue. As can be seen from the testing it is quite obvious that that excessive build up of chrome, which constricted bore space, had a detrimental effect on the Cardinal barrel's performance used in this test. When allowed to heat up from quick firing this particular barrel had popped a few primers when the full power SSA 115 OTM combat loads were used. There are thousands of other Cardinal barrels that regularly use this load without issue so it is fair to say that this is obviously an effect of this bore constriction and not indicative of the performance of these barrels which has been stellar from barrels with proper chroming.

In looking at the posted data above it is quite apparent that changes in the specifications of the barrels can and does have a dramatic effect on the performance that can be attained.

First and foremost the barrels must meet the minimum specification for this cartridge. That means bores that are 0.277 groove / 0.270 lands and no smaller. The same applies for chambers. It is actually a bit more complex but for the purposes of this report it will suffice. If you look at the SAAMI Certified Cartridge drawing you will see that the tolerances for all the listed specifications are + (plus) that specification but not - (minus).

That means while a chamber or bore specification is allowed to be slightly larger to a certain degree they must never be smaller and still be considered within the specifications put forth by SAAMI.

This is very important as most tolerances for items usually have a +/- and many people would assume that is the same with barrels. It is not, unless specifically set forth in that drawing.

Environmental Conditions:

It is well known temperature is an important factor in ballistic testing. On the day of this test temperatures reached 103 F. The ammo and uppers were kept out of direct sunlight at all times. These temperatures represent the maximum likely to be encountered. It is also quite consistent with temperatures found in the Middle East aka "The Sand Box". After all, this cartridge was created as a military round so it does only seem fitting that was tested in conditions that would be found where we are presently engaged in conflicts.

The pressure data speaks for itself. From the above chart there is up to a 12,000 PSI difference between the DPMS and AR15Performance barrels. This is the pressure difference that exhibited between a short leade (throat, free bore), SAAMI chamber 1:10 twist, and 6 groove and a barrel with a DMR chamber, using a 1:12 twist when loads were pushed to the max of what this last barrel could safely handle if not a bit past it. The latter specifications allowed for higher performance.

By examining case fired from the AR15Performance DMR chamber 1:13 twist 3 groove rifled barrel we surmise the pressure was lower than in barrels with more grooves. This would seem logical given the increased bore area proved by the 3 groove rifling.

Fired Cases:

The following are terms used to describe visible signs of high pressure on fired cases. Most shooters and Hand Loaders don't have access to pressure equipment therefore they rely on reading these signs on the brass:

- Swipe
- Flattened Primer
- Cupped Primer
- Expansion Ring(Case head ring)

Case Swipe: is brass flowing from the case head into the ejector hole in the bolt face. This is known as a swipe and will look like a half moon shaped shiny area on the case head where a little bit of the surface had been swiped off revealing untarnished fresh brass.

Flattened Primer: If you look at an unfired case you can see a nice rounded edge of the primer once fired this will be decreased. The diameter of the primer appears to have increases such that it fills the primer pocket. This is also dependent on which primers are used. Example of this is Federal primers are very well known to severely flatten if not rupture when used in high pressure cartridges such as the 6.8 or 5.56 and many others.

Primer cupping: primer cup metal flows into the firing pin hole on the bolt face. This forms a cup shape versus the typical firing pin dent normally created. Again this is effected by the actual primer that is used and can vary wildly just as with flattening.

Photographing cases with the intent of showing signs from pressure is challenging at best. Therefore a review of the photographed case is necessary.

With the commercial ammo, all the cases from all the barrels looked fine with no noticeable signs of high pressure. This was expected. Any marks you may see are from ground contact, the extractor, or the angle and lighting of the photo. With combat loads the condition of the cases from some barrels changed drastically. Historically, SAAMI 1:10 twist barrels have not handled the increased powder charge of the SSA Combat ammunition. In an attempt to reach the maximum safe limit of the best performing barrels hotter load was constructed. It was clear that the pressure created by this load was excessive for some barrels. After a clear ranking had been established, the highest performing barrels were used to test the top hand loads we had assembled. Pictures of the fired cases from the Superior barreled uppers are also included as they serve as a good example of the effects a longer leade has on pressure.

DPMS:

Silver State Armory 115 OTM Combat:



Case 1 got destroyed. The primer blew and the extractor ripped or otherwise mangled the rim. Case 2 shows extreme primer flattening especially when you consider these are small rifle primers and are the thicker/ harder CCI #41 Military primers. Case 3 has a clear swipec in the upper left corner and you can actually see the whole ejector imprint if you look close. Number 4 the primer is flattened as well but if didn't have a good case to compare it to you might think it was ok from the picture. Number 5 is also flattened there is also gas flow about the edges. You can see it most clearly at 9 O'clock. This barrel can't handle these rounds safely.

Hand Load 110 Pro Hunter 32gr H322:



Only one round of this load was fired for obvious reason. It was expected to be over pressure in this barrel. Indeed you can see the swipec and gas blow by all the way around the primer. The second picture of the same primer shows how the entire primer is lifted out of the pocket. There is also clear swipec at 11 O'clock and an extractor mark on the 3-6 O'clock in photo 1. The case had a bulge in the body just above the head which is typically where you get a rupture or case head separation.

Cardinal Armory:

Silver State Armory 115 OTM Combat:



All primers showed some degree of flattening.

Hand Load 110 Pro Hunter 32gr H322:



There is a swipe on the "6" of the "6.8" stamp. There is extractor imprint on the "SSA" stamp. There is primer cupping as well. If you see this stop shooting!!

Denny's:

Silver State Armory 115 OTM Combat:



These cases all looked quite good. There were no clear swipes. The primers all looked OK. Any discolorations you may see are from ground contact or picture angle.

Hand Load 110 Pro Hunter 32gr H322:



You can see the swipe on this case at the 9 O'clock position.

AR15Performance:

Silver State Armory 115 OTM Combat:



Again as with the Denny's the cases all looked very good.

Hand Load 110 Pro Hunter 32gr H322:



This case actually looks quite good. There is a slight imprint from the ejector at 12 O'clock but no brass flow therefore this was not considered a swipe.

Superior Barrels SAAMI:

Silver State Armory 115 OTM Combat:



These cases had pressure signs. Cases 1, 2, and 4 had flattened primers and case 3 was blown. Case 5 has a swipe at 9-10 O'clock but it doesn't show up and there is clearly visible blow by about the primer.

Superior Barrels SPCII:

Silver State Armory 115 OTM Combat:



When compared to cases fired from its identical twin (except for the chamber) the lack of pressure signs is evident. All cases show some degree of primer flattening.

Again all of these loads were fired in temperatures near 103 F. All barrels were fired 2 times before recording results to get them to the same operating temperature. Be sure to factor in temperature when you develop your rounds.

Top Ammunition Performance:

As with the original Combat barrel a goal here was to examine the velocity potential of this cartridge. An agreement was made with GS Custom to purchase a bullet that could be used in the 6.8 SPC. They are best known for producing high end CNC Lathe Turned Solid copper bullets for African hunting. The bullet decided upon was 80 grains had a distinct open tip to aid in expansion and uses driving bands that were the barrel groove diameter of 0.277" with the main body's bearing surface being .270. These bullets are precision made and variations in bullet weight were extremely low. The driving bands on the bullet lowers pressure which allows for a larger and faster powder charge to be used.

GS Custom 80 grain HV bullet and loaded round:





It was quite surprising this bullet reached 3,385 FPS when fired from an 18" 6.8 SPC barrel. Compare this to a maximum load from either a .243 or 6 mm Remington using a 24" barrel now at 3360 and 3460 respectively as listed in the RamShot manual. These cartridges also use 40% more powder compared to the mere 29.5 grains of powder and a 4-12" shorter barrel of the 6.8 SPC. This round shot from the 16" Cardinal Armory barrel produced 3252 FPS. The 20" DMR 1:13 3 groove barrel produced an all time recorded high of 3412 FPS.

We also tested a load Constructor had worked up using the Sierra 110 grain Pro Hunter bullet with 30.5 grains of Alliant Reloader 10x. This round was shot across the chronograph on several occasions during our time there and it averaged 2,900 FPS. Again this, like the 80gr bullet's, is amazing performance from this little cartridge. Now while this load and the 80 are certainly not light they are not any worse than what many are running pressures using SSA Combat loads to no ill effect. In fact several of us have well over 4,000 round through our barrels, some with considerably more, all with the original bolts with no incidences of broken lugs etc.. The vast amount of these round counts coming from ammunition with this level of pressure. I don't recall ever seeing a post about a person breaking a 6.8 bolt. While I am sure there must be some as it is a consumable part, same as a barrel, it certainly is rare.

Operating Pressures and Performance:

Based on our extensive experience with this cartridge it seems reasonable to set the max operating pressure closer to 60K. A listed maximum pressure of 58K would leave a good safety margin. The fact is, it is possible to load to this level and see no premature parts wear or breakage. The Ram Shot Manual has loads listed to 56,200PSI.

Our conclusion is when the proper chamber and barrel specifications are used together they create a synergetic effect that we have found allows for a considerable increase in the amount of performance that can be realized from this cartridge.

We have tested and recorded the following velocities from careful hand loading:

- **2,725 FPS 115gr Sierra OTM – 18"**
- **2,900 FPS 110gr Sierra Pro Hunter - 20"**
- **2,760 FPS 110gr Sierra Pro Hunter – 16"**
- **3,197 FPS 90gr Speer TNT – 18"**
- **3,200 FPS 85gr Experimental bullet and load – 16"**
- **3,385 FPS 80gr GS HV – 18"**
- **3,412 FPS 80gr GS HV – 20"**
- **2,700 FPS 110gr Barnes Tipped TSX – 16"**

In a constant effort to make sure our data is accurate we included reading from a second chronograph (a Chrony).

Hopefully the data found in this report is deemed to be helpful. We believe this data will provide further insight into this cartridge's performance capabilities. Use of the proper barrel specifications is necessary to ensure optimal performance.

Availability of improved bullet designs for this cartridge will result in an increased performance. Without letting the cat out of the bag, there are some very exciting developments in that area that will be released to the public in the near future.

Credits and Recognition:

I would like to sincerely thank all those who helped out in any way with this testing event. Without all the help we received this could not have possibly happened.

Harrison Beene: Owner of AR15Performance. One of the three members of the testing team. He has been involved with the 6.8 SPC since 2005. He is also the real source of a good portion of my knowledge. He has given a large portion of his free time and dedicated it to helping educate people on the 6.8 SPC and help answer the land slide of questions we field on the 68forums.com site. Builds high-end custom AR uppers and specializes in wildcats. If you are in the market for a precision AR you cannot do better.

Chris Lucci: Owner of Wild River Ranch. One of the three members of the testing team. Involved in the development of the 6.8 SPC since 2004. Supplied all lodging, meals and recreational hog hunting. Expert in the use of night vision devices for “combat” hog hunting.

Art Kalwas: Owner of Silver State Armory: Donated all the ammo used in the tests and his experience. SSA makes by far the best performing ammunition for the 6.8 SPC that is available. It is the fastest and most accurate you can get. His cases are also the very best and will last many times longer and hold more powder than any of the competitors’ He also loaned us the DPMS upper used in the testing so we could have a base line.

Denny: Owner of Denny Gun and GTS Tactical without hesitation sent us the same upper that was used in the 6.8 upper testing performed by AR-15. He has also been kind enough to impart some of his vast knowledge on me on many occasions. If you are looking for something AR flavored he would be one of the tops on my list.

Superior Barrels: Who graciously loaned us two of their premium barreled uppers. Their “Hard Blue” coating was most impressive. In fact, it was so slick the strain gauges could not be affixed.

Jim Ristow & Burt Mitchell: A very special thanks goes out to Jim Ristow of Recreational Software Inc, from whom I had purchased my pressure and chronograph equipment and Burt Mitchell, as they both bent over backwards, going way beyond what I could have ever hoped for, in getting replacement equipment out to me in the middle of nowhere in the backcountry of Texas.

68Forums.com: Thanks to Jansen the owner who has provided the community a dedicated venue for discussion and sharing of information. It is one of the best run sites of its kind and to the members who have made it “THE” portal for the most current and largest collection of information related to the 6.8 SPC. [HTTP://68forums.com](http://68forums.com)

We also would like to thank a gentleman going by the screen name “**SC-Texas**” on 68forums.com and AR15.com. He supplied us with the Model 1 Sales Upper to check the barrel bore on.

The Author:

Tim W has been involved in the continued development of the 6.8 SPC cartridge after its public release. He is presently working with others to maximize the performance of this cartridge.

Photographs



