.300 Win Mag - Nosler CT BalSilTip 51170 180gr - RS70

User Data:

Date:1-Jun-2016 **Time:16:39:19** **File: *.dat**

Comment	**620mm barrel - 84.84mm COL - 69.0gr start load - 851m/s - 3026bar**				
Cartridge / Caliber	**.300 Win. Mag.(@)**		**Bullet**	**.308, 180, Nosler CT BalSilTip 5117**	
Maximum Average Pressure, allowed	4300 bar	62366 psi. (Piezo CIP)		with boattail	
Groove Caliber	7.82 mm	0.308 in.	Bullet Weight	11.66 gm	180.0 gr.
Case Capacity, overflow	5.986 cm³	92.2 gr. H2O	Bullet Length	34.54 mm	1.360 in.
Case Length	66.55 mm	2.620 in.	Bullet Seating Depth	16.27 mm	0.641 in.
Cartridge O.A. Length	84.84 mm	3.340 in.	Barrel/Tube Length	620.0 mm	24.4094 in.
Shot Start / Init Pressure	250.0 bar	3626 psi.	Cross Section Area of Bore	0.4732 cm²	0.07335 in.²
Propellant type	**ReloadSwiss RS 70**				
Charge Weight	4.471 gm	69.0 gr.	Load Density	0.856 gm/cm³	216.5 gr./in.³
Heat of Explosion, Potential	3950 J/gm	256.0 J/gr.	Energy Density of Charge	3381 J/cm³	55405 J/in.³
Propellant Solid Density	1.6 gm/cm³	404.63 gr./in.³	Used Ratio of Specific Heats cp/cv	1.2294	
Burning Rate Factor Ba	0.411 1/s		Weighting Factor	0.5	
Burning Function Limit Z1	0.628		Prog.-/ Degressivity Factor a0	0.689	
Factor b	1.963		Bulk Density	0.980 gm/cm³	247.8 gr./in.³

Calculated and Estimated Data:

Bullet Shank Seating Depth	13.67 mm	0.538 in.	Capacity Displaced by Seated Bullet	0.764 cm³	0.0466 in.³
Useable Case Capacity	5.223 cm³	0.3187 in.³	Bullet Travel at Muzzle Exit	569.72 mm	22.43 in.
Loading Ratio("Density") / Filling	87.3 %		Charge Fraction Burnt at Shot Start	1.50 %	
Predicted Data:					
Maximum Chamber Pressure	3026 bar	43886 psi.	Bullet Travel at Pmax	66.7 mm	2.63 in.
at Muzzle Exit:					
Bullet Velocity	851.0 m/s	2792 fps.	Pressure at Muzzle	808 bar	11720 psi.
Bullet Energy	4225 Joule	3116 ft.lbs.	Bullet Barrel Time	1.350 ms	
Propellant Burnt	98.3 %		Ballistic Efficiency	23.9 %	

Check Loading Manuals for Safe Minimum Charge Weight to Avoid Hazardous Ignition Conditions like Secondary Explosion Effects !
Real maximum (peak) of pressure is reached while bullet moves within barrel.
End of combustion occurs after the bullet's base passes muzzle.

Table of incremented charges ranging from +10.0% to -20.0% of above specified charge

D A N G E R ! : Table data may exceed maximum average pressures ! Pressures exceeding SAAMI or CIP specs are printed underlined!

Diff.	Charge Weight		Muzzle Vel.		Muzzle Energy		Max. Pressure		Muzzle Pressure		Prop.Burnt	B_Time	L.R./Filling
%	Gramm	Grains	m/s	fps	Joule	ft.lbs	bar	psi	bar	psi	%	ms	%
-20.0	3.58	55.2	677	2223	2677	1974	1666	24156	614	8907	87.3	1.733	70
-18.0	3.67	56.6	694	2278	2813	2075	1768	25638	637	9237	88.8	1.693	72
-16.0	3.76	58.0	712	2335	2954	2179	1876	27211	659	9561	90.2	1.655	73
-14.0	3.85	59.3	729	2391	3099	2286	1991	28880	681	9876	91.6	1.617	75
-12.0	3.93	60.7	746	2448	3248	2396	2114	30654	702	10181	92.8	1.579	77
-10.0	4.02	62.1	764	2506	3402	2509	2243	32536	722	10474	94.0	1.542	79
-8.0	4.11	63.5	781	2563	3559	2625	2381	34536	742	10755	95.1	1.506	80
-6.0	4.20	64.9	799	2620	3720	2744	2528	36662	760	11021	96.0	1.471	82
-4.0	4.29	66.2	816	2678	3885	2866	2684	38922	777	11271	96.9	1.429	84
-2.0	4.38	67.6	834	2735	4053	2990	2849	41324	793	11505	97.7	1.389	86
Nominal	**4.47**	**69.0**	**851**	**2792**	**4225**	**3116**	**3026**	**43886**	**808**	**11720**	**98.4**	**1.350**	**87**
+2.0	4.56	70.4	868	2849	4399	3245	3214	46611	822	11916	98.9	1.312	89
+4.0	4.65	71.8	886	2906	4576	3375	3414	49517	834	12091	99.3	1.275	91
+6.0	4.74	73.1	903	2962	4756	3508	3628	52614	844	12245	99.7	1.240	93
+8.0	4.83	74.5	920	3019	4938	3642	3856	55923	853	12377	99.9	1.206	94
+10.0	4.92	75.9	937	3074	5122	3778	4099	59456	861	12484	100.0	1.173	96

Results caused by ±3% powder lot-to-lot burning rate variation using nominal charge

Data for burning rate increased by 3% relative to nominal value :

Nominal	4.47	69.0	867	2843	4380	3231	3207	46518	808	11718	99.4	1.315	87

Data for burning rate decreased by 3% relative to nominal value :

Nominal	4.47	69.0	834	2737	4058	2993	2852	41359	803	11647	96.8	1.387	87