

.308 Win - Sierra SPBT 165gr - RS40

WARNING: Since we have no control over equipment or data which may be used with this program, no responsibility is implied or assumed for results obtained through its use. Input data and results may be incorrect or wrong. Therefore the use of this data for loading ammunition can cause serious injury to personnel and material. The computer-results had to be checked against data available in current loading manuals.

LOT-TO-LOT VARIATIONS OF POWDERS, PRIMER SUBSTITUTION AND COMPONENT CHANGE OFTEN RAISE PRESSURES TO UNSAFE LEVELS. THE USER MUST ASSUME THE ENTIRE RISK OF USING THIS DATA FOR LOADING PURPOSES.

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User Data:	Date:12-Okt-2018	Time:10:38:36	File: *.dat
Comment	450mm barrel - 69.85mm COL - 37.5gr start load - 702m/s - 2909bar		
Cartridge / Caliber	.308 Win. (CIP)	Bullet	.308, 165, Sierra SPBT 2145
Maximum Average Pressure, allowed	4150 bar	60191 psi. (Piezo CIP)	with boattail
Groove Caliber	7.82 mm	0.308 in.	Bullet Weight
Case Capacity, overflow	3.636 cm³	56.0 gr. H2O	Bullet Length
Case Length	51.16 mm	2.014 in.	Bullet Seating Depth
Cartridge O.A. Length	69.85 mm	2.750 in.	Barrel/Tube Length
Shot Start / Init Pressure	250.0 bar	3626 psi.	Cross Section Area of Bore
			0.4751 cm² 0.07364 in.²

Propellant type	ReloadSwiss RS 40		
Charge Weight	2.43 gm	37.5 gr.	Load Density
Heat of Explosion, Potential	3990 J/gm	258.5 J/gr.	Energy Density of Charge
Propellant Solid Density	1.6 gm/cm³	404.63 gr./in.³	Used Ratio of Specific Heats cp/cv
Burning Rate Factor Ba	0.643 1/s		Weighting Factor
Burning Function Limit Z1	0.419		Prog.-/ Degressivity Factor a0
Factor b	1.494		Bulk Density
			0.777 gm/cm³ 196.5 gr./in.³
			3100 J/cm³ 50800 J/in.³
			1.2293
			0.5
			0.782
			0.938 gm/cm³ 237.2 gr./in.³

Calculated and Estimated Data:

Bullet Shank Seating Depth	8.0 mm	0.315 in.	Capacity Displaced by Seated Bullet	0.508 cm³	0.031 in.³
Useable Case Capacity	3.128 cm³	0.1909 in.³	Bullet Travel at Muzzle Exit	410.27 mm	16.15 in.
Loading Ratio("Density") / Filling	82.8 %		Charge Fraction Burnt at Shot Start	1.81 %	

Predicted Data:					
Maximum Chamber Pressure	2909 bar	42187 psi.	Bullet Travel at Pmax	36.6 mm	1.44 in.
at Muzzle Exit:					
Bullet Velocity	701.9 m/s	2303 fps.	Pressure at Muzzle	630 bar	9136 psi.
Bullet Energy	2634 Joule	1943 ft.lbs.	Bullet Barrel Time	1.109 ms	
Propellant Burnt	96.8 %		Ballistic Efficiency	27.2 %	

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 Gramm	Weight Grains	Muzzle Vel. m/s	fps	Muzzle Energy Joule	ft.lbs	Max. Pressure bar	psi	Muzzle Pressure bar	psi	Prop.Burnt %	B_TimeL.R./Filling ms	%
-20.0	1.94	30.0	571	1872	1741	1284	1696	24598	483	7012	88.0	1.393	66
-18.0	1.99	30.8	584	1915	1822	1344	1793	26003	500	7245	89.1	1.362	68
-16.0	2.04	31.5	597	1959	1905	1405	1894	27467	515	7475	90.2	1.333	70
-14.0	2.09	32.3	610	2002	1990	1468	1999	28997	531	7701	91.2	1.304	71
-12.0	2.14	33.0	623	2045	2077	1532	2110	30607	546	7922	92.1	1.275	73
-10.0	2.19	33.8	636	2088	2166	1597	2227	32302	561	8139	93.1	1.248	75
-8.0	2.24	34.5	650	2131	2256	1664	2350	34084	576	8351	93.9	1.221	76
-6.0	2.28	35.3	663	2174	2348	1732	2479	35959	590	8557	94.7	1.195	78
-4.0	2.33	36.0	676	2217	2442	1801	2615	37931	604	8757	95.5	1.169	80
-2.0	2.38	36.8	689	2260	2537	1871	2758	40005	617	8950	96.2	1.138	81
Nominal	2.43	37.5	702	2303	2634	1943	2909	42187	630	9136	96.8	1.109	83
+2.0	2.48	38.3	715	2345	2733	2015	3067	44482	642	9314	97.4	1.082	84
+4.0	2.53	39.0	728	2388	2832	2089	3233	46896	654	9483	97.9	1.055	86
+6.0	2.58	39.8	741	2430	2934	2164	3409	49437	665	9644	98.4	1.030	88
+8.0	2.62	40.5	754	2472	3036	2240	3593	52112	675	9796	98.8	1.005	89
+10.0	2.67	41.3	766	2514	3140	2316	3787	54929	685	9939	99.2	0.981	91

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	2.43	37.5	713	2339	2717	2004	3059	44372	633	9177	98.1	1.084	83
Data for burning rate decreased by 3% relative to nominal value :													
Nominal	2.43	37.5	690	2264	2546	1878	2759	40021	624	9057	95.3	1.137	83