.308 Win - Lapua Scenar GB422 167gr - RS40

User Data:

Date:29-Mrz-2016 **Time:07:49:12** **File: *.dat**

Comment	**26" barrel - 71.12mm COL - 37.5gr start load - 764m/s - 2954bar**				
Cartridge / Caliber	**.308 Win. (CIP)**		**Bullet**	**.308, 167, Lapua Scenar GB422 706**	
Maximum Average Pressure, allowed	4150 bar	60191 psi. (Piezo CIP)		with boattail	
Groove Caliber	7.82 mm	0.308 in.	Bullet Weight	10.82 gm	167.0 gr.
Case Capacity, overflow	3.636 cm³	56.0 gr. H2O	Bullet Length	31.5 mm	1.240 in.
Case Length	51.16 mm	2.014 in.	Bullet Seating Depth	11.54 mm	0.454 in.
Cartridge O.A. Length	71.12 mm	2.800 in.	Barrel/Tube Length	660.4 mm	26.0 in.
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	0.780 gm/cm³	197.3 gr./in.³
Heat of Explosion, Potential	3990 J/gm	258.5 J/gr.	Energy Density of Charge	3111 J/cm³	50980 J/in.³
Propellant Solid Density	1.6 gm/cm³	404.63 gr./in.³	Used Ratio of Specific Heats cp/cv	1.2293	
Burning Rate Factor Ba	0.643 1/s		Weighting Factor	0.5	
Burning Function Limit Z1	0.419		Prog.-/ Degressivity Factor a0	0.782	
Factor b	1.494		Bulk Density	0.938 gm/cm³	237.2 gr./in.³

Calculated and Estimated Data:

Bullet Shank Seating Depth	7.04 mm	0.277 in.	Capacity Displaced by Seated Bullet	0.519 cm³	0.0317 in.³
Useable Case Capacity	3.117 cm³	0.1902 in.³	Bullet Travel at Muzzle Exit	620.78 mm	24.44 in.
Loading Ratio("Density") / Filling	83.1 %		Charge Fraction Burnt at Shot Start	1.80 %	
Predicted Data:					
Maximum Chamber Pressure	2954 bar	42840 psi.	Bullet Travel at Pmax	36.3 mm	1.43 in.
at Muzzle Exit:					
Bullet Velocity	764.3 m/s	2507 fps.	Pressure at Muzzle	404 bar	5866 psi.
Bullet Energy	3161 Joule	2331 ft.lbs.	Bullet Barrel Time	1.394 ms	
Propellant Burnt	99.1 %		Ballistic Efficiency	32.6 %	

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	1.94	30.0	630	2067	2149	1585	1720	24949	326	4725	92.9	1.753	66
-18.0	1.99	30.8	644	2112	2243	1655	1818	26373	335	4860	93.8	1.713	68
-16.0	2.04	31.5	658	2157	2340	1726	1921	27856	344	4991	94.6	1.674	70
-14.0	2.09	32.3	671	2202	2438	1798	2028	29413	353	5117	95.4	1.637	71
-12.0	2.14	33.0	685	2246	2537	1871	2141	31052	361	5240	96.1	1.601	73
-10.0	2.19	33.8	698	2291	2638	1946	2260	32776	369	5357	96.8	1.566	75
-8.0	2.24	34.5	712	2335	2740	2021	2385	34591	377	5470	97.4	1.531	76
-6.0	2.28	35.3	725	2378	2844	2097	2517	36499	385	5577	97.9	1.498	78
-4.0	2.33	36.0	738	2422	2948	2174	2655	38507	392	5679	98.4	1.462	80
-2.0	2.38	36.8	751	2465	3054	2253	2801	40619	398	5775	98.8	1.428	81
Nominal	**2.43**	**37.5**	**764**	**2507**	**3161**	**2331**	**2954**	**42840**	**404**	**5866**	**99.2**	**1.394**	**83**
+2.0	2.48	38.3	777	2550	3269	2411	3115	45177	410	5949	99.5	1.361	85
+4.0	2.53	39.0	790	2592	3377	2491	3284	47637	416	6027	99.7	1.330	86
+6.0	2.58	39.8	803	2634	3487	2572	3463	50226	420	6097	99.8	1.300	88
+8.0	2.62	40.5	815	2675	3598	2653	3651	52951	425	6161	100.0	1.270	90
+10.0	2.67	41.3	828	2716	3709	2735	3849	55822	429	6218	100.0	1.242	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	774	2540	3244	2392	3106	45056	402	5831	99.7	1.365	83

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

Nominal	2.43	37.5	753	2471	3071	2265	2802	40643	405	5875	98.2	1.426	83