.308 Win - Lapua Scenar GB491 155gr - RS40

User Data:

Date:29-Mrz-2016 **Time:07:48:02** **File: *.dat**

Comment **26" barrel - 71.12mm COL - 38.0gr start load - 792m/s - 2990bar**

Cartridge / Caliber	**.308 Win. (CIP)**		**Bullet**	**.308, 155, Lapua Scenar GB491 707**	
Maximum Average Pressure, allowed	4150 bar	60191 psi. (Piezo CIP)		with boattail	
Groove Caliber	7.82 mm	0.308 in.	Bullet Weight	10.04 gm	155.0 gr.
Case Capacity, overflow	3.636 cm³	56.0 gr. H2O	Bullet Length	32.69 mm	1.287 in.
Case Length	51.16 mm	2.014 in.	Bullet Seating Depth	12.72 mm	0.501 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	2.462 gm	38.0 gr.	Load Density	0.806 gm/cm³	203.8 gr./in.³
Heat of Explosion, Potential	3990 J/gm	258.5 J/gr.	Energy Density of Charge	3214 J/cm³	52668 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	7.72 mm	0.304 in.	Capacity Displaced by Seated Bullet	0.58 cm³	0.0354 in.³
Useable Case Capacity	3.056 cm³	0.1865 in.³	Bullet Travel at Muzzle Exit	621.96 mm	24.49 in.
Loading Ratio("Density") / Filling	85.9 %		Charge Fraction Burnt at Shot Start	1.68 %	
Predicted Data:					
Maximum Chamber Pressure	2990 bar	43369 psi.	Bullet Travel at Pmax	35.4 mm	1.40 in.
at Muzzle Exit:					
Bullet Velocity	792.5 m/s	2600 fps.	Pressure at Muzzle	404 bar	5859 psi.
Bullet Energy	3154 Joule	2326 ft.lbs.	Bullet Barrel Time	1.341 ms	
Propellant Burnt	98.5 %		Ballistic Efficiency	32.1 %	

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	1.97	30.4	651	2134	2126	1568	1713	24843	322	4676	91.3	1.693	69
-18.0	2.02	31.2	665	2182	2221	1638	1815	26318	332	4814	92.3	1.654	70
-16.0	2.07	31.9	679	2229	2318	1710	1921	27865	341	4948	93.2	1.616	72
-14.0	2.12	32.7	694	2276	2417	1783	2033	29480	350	5079	94.1	1.580	74
-12.0	2.17	33.4	708	2323	2518	1857	2149	31167	359	5206	94.9	1.544	76
-10.0	2.22	34.2	722	2370	2621	1933	2271	32940	367	5328	95.7	1.510	77
-8.0	2.27	35.0	736	2416	2724	2010	2400	34810	375	5445	96.4	1.476	79
-6.0	2.31	35.7	751	2463	2830	2087	2536	36782	383	5557	97.0	1.444	81
-4.0	2.36	36.5	765	2509	2937	2166	2679	38861	390	5663	97.6	1.408	82
-2.0	2.41	37.2	779	2554	3045	2246	2831	41055	397	5764	98.1	1.374	84
Nominal	**2.46**	**38.0**	**792**	**2600**	**3154**	**2326**	**2990**	**43369**	**404**	**5859**	**98.6**	**1.341**	**86**
+2.0	2.51	38.8	806	2645	3265	2408	3158	45810	410	5948	99.0	1.309	88
+4.0	2.56	39.5	820	2690	3377	2490	3336	48387	416	6030	99.3	1.278	89
+6.0	2.61	40.3	833	2735	3489	2574	3524	51107	421	6106	99.6	1.248	91
+8.0	2.66	41.0	847	2779	3603	2658	3722	53979	426	6174	99.8	1.219	93
+10.0	2.71	41.8	860	2823	3718	2742	3931	57015	430	6236	99.9	1.191	94

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	2.46	38.0	803	2636	3242	2391	3148	45660	403	5841	99.4	1.312	86
Data for burning rate decreased by 3% relative to nominal value :													
Nominal	2.46	38.0	780	2561	3059	2257	2834	41101	404	5853	97.4	1.372	86