



Rifle Recoil Table

By Chuck Hawks

For every action there is an equal and opposite reaction; that is one of the physical laws of our universe. This means that the momentum of a rifle's reaction will exactly equal the momentum of the bullet and powder gasses ejected from the barrel. In the shooting sports we call that reaction recoil or "kick." It can be measured or computed empirically and has been for this recoil table.

Do not forget that rifle weight is a crucial factor in the recoil equation, inversely proportional to recoil. Increase the gun weight by, say, 25% and the recoil goes down by 25%. In the real world, firearms chambered for less powerful cartridges are typically built lighter than firearms chambered for more powerful cartridges. Violate this principle by, for example, chambering a lightweight, short action rifle for a powerful Magnum cartridge like the 300 WSM and the result will be a dramatic increase in kick. Just because it can be done does not mean it makes sense, despite what you might read in advertising copy. Choose a rifle weight appropriate for the loads you intend to shoot.

However, perceived recoil, what the shooter feels, is a highly subjective matter. In addition to gun weight, it is influenced by many factors. One of the most important of these is the fit and shape of the rifle stock. A good recoil pad can help soften the blow to the shooter's shoulder. Gas-operated semi-automatic actions reduce apparent recoil by spreading it over a longer period of time. These sorts of things cannot be accounted for in a recoil table. Also, please understand that there are dozens of loads for any given bullet weight in any cartridge that will produce the same velocity, but a different amount of recoil. So the figures in any recoil table should be taken as approximate. Never-the-less, the table below should give a reasonably accurate comparison of the recoil of most popular rifle cartridges.

It is worth remembering that the majority of authorities agree that recoil of over twenty foot pounds will cause most shooters to develop a serious flinch, which is ruinous to bullet placement (the prime component of killing power). Fifteen foot pounds is probably about the maximum recoil energy most shooters feel reasonably comfortable with, particularly at the shooting range, where most serious marksmanship practice occurs.

While recoil energy determines how hard the blow to the shoulder feels, recoil velocity determines how abrupt the blow to the shoulder feels. My subjective impression is that, with a well designed stock, recoil velocity above about 10 fps begins to feel like a sharp rap on the shoulder rather than an abrupt push.

In 1909, the *British Textbook of Small Arms* stated that 15 ft. lbs. of free recoil energy was the maximum allowable for a military service rifle. (The standard British .303 Lee-Enfield infantry rifle was below that figure, as are most service rifles to this day. This should tell you something.) The 1929 edition of the same textbook stated, in addition, that recoil velocity should not exceed 15 fps; above that velocity a gun-headache was very likely to occur. These figures remain practical maximums for the modern hunter.

Above this level recoil becomes increasingly intrusive. In addition, the effects of recoil are cumulative. The longer you shoot, and the harder the rifle kicks, the more likely you are to flinch. These are good things to remember when comparing rifle cartridges.


In the table below rifle weight is given in pounds, free recoil energy is given in foot pounds, and free recoil velocity is given in feet-per-second. All recoil values have been rounded off to one decimal place.

The recoil energy and recoil velocity figures are taken from various sources including the recoil nomograph in the *Handloader's Digest 8th Edition*, various online recoil calculators, the Remington Shoot! program or calculated from the formula given in the *Lyman Reloading Handbook, 43rd Edition*.

Note:For an expanded version of this table showing more calibers and many more loads, including British, European, wildcat, obsolescent American and proprietary calibers, see the [Expanded Rifle Recoil Table](#).

Cartridge (Wb@MV)	Rifle Weight	Recoil energy	Recoil velocity
.17HMR (17 at 2550)	7.5	0.2	n/a
.17 Hornet (20 at 3650)	8.5	0.6	2.0
.17 Rem. (25 at 4000)	8.5	1.6	3.5
.204 Ruger (33 at 4225)	8.5	2.6	4.4
.218 Bee (45 at 3800)	8.5	1.3	3.1
.219 Wasp (55 at 3300)	8.5	3.2	4.9
.219 Zipper (55 at 3400)	8.5	3.4	5.1
.22 LR (40 at 1165)	4.0	0.2	n/a
.22 WMR (40 at 139)	6.75	0.4	n/a
.22 Hornet (45 at 2800)	7.5	1.3	3.3
.22 PPC (52 at 3300)	8.5	3.0	4.8
.221 Fireball (50 at 3000)	8.5	1.8	3.7
.222 Rem. (50 at 3200)	7.5	3.0	5.1
.223 Rem. (45 at 3500)	8.5	2.6	4.5
.223 Rem. (55 at 3200)	8.0	3.2	5.1
.223 Rem. (62 at 3025)	7.0	3.9	6.0
.223 Rem. (70 at 2900)	8.0	3.6	5.4
.22 BR Rem. (52 at 3664)	8.0	4.1	5.7
.225 Win. (55 at 3700)	8.5	4.4	5.7
.224 Wby. Mag. (55 at 3700)	10.0	3.6	4.8
.22-250 Rem. (55 at 3600)	8.5	4.7	6.0
.22-250 Rem. (60 at 3500)	12.5	3.1	4.0
.220 Swift (50 at 3900)	10.5	3.7	4.8
.220 Swift (55 at 3800)	8.5	5.3	6.4
.223 WSSM (55 at 3850)	7.5	6.4	7.4
.224 TTH (80 at 3550)	7.5	10.2	9.4
5.6x50 Mag. (60 at 3300)	7.5	4.0	5.9
5.6x52R (70 at 2800)	7.5	3.7	5.7
5.6x57 RWS (60 at 3800)	7.5	6.9	7.7
6mm PPC (85 at 2800)	7.5	5.3	n/a
6mm BR Rem. (80 at 3100)	8.5	5.2	6.3
6mm 223 (75 at 2950)	7.5	4.6	n/a
6mm Norma BR (95 at 2914)	8.5	5.9	6.7
6mm Lee Navy (112 at 2650)	8.5	6.5	7.0
.243 Win. (75 at 3400)	8.5	7.2	7.4
.243 Win. (95 at 3100)	7.25	11.0	9.9
.243 Win. (100 at 2960)	7.5	8.8	8.7
6mm Rem. (100 at 3100)	8.0	10.0	9.0
6mm-284 (105 at 3000)	7.5	10.9	9.7
6mm-06 (105 at 3000)	8.0	10.2	9.1
.243 WSSM (100 at 3100)	7.5	10.1	9.3
.240 Wby. Mag. (100 at 3406)	8.0	17.9	n/a
.25-20 Win. (86 at 1460)	6.5	1.3	3.5
.256 Win. Mag. (75 at 2400)	7.5	2.4	4.5
.25-35 Win. (110 at 2425)	7.5	6.0	7.2
.25-35 Win. (117 at 2230)	6.5	7.0	8.3
.250 Savage (100 at 2900)	7.5	7.8	8.2
.257 Roberts (100 at 3000)	7.5	9.3	8.9
.257 Roberts (120 at 2800)	8.0	10.7	9.3
.257 Rob. Imp. (115 at 2900)	8.5	10.8	9.8
.25 WSSM (120 at 2900)	7.25	13.8	11.1
.25-06 Rem. (100 at 3230)	8.0	11.0	9.4
.25-06 Rem. (120 at 3000)	8.0	12.5	10.0
.257 Wby. Mag. (100 at 3602)	9.25	15.8	10.5
.257 Wby. Mag. (115 at 3433)	9.25	17.7	11.1
.257 Wby. Mag. (120 at 3300)	9.25	15.1	10.3
6.5mm Grendel (120 at 2600)	7.5	8.9	8.8
6.5mm Grendel (123 at 2590)	8.0	7.9	8.0
6.5x50 Arisaka (140 at 2600)	8.0	10.0	n/a
6.5x52 M-C (140 at 2200)	8.0	7.8	n/a
6.5x54 M-S (140 at 2400)	7.5	11.1	9.7
6.5x55 Swede (129 at 2700)	8.0	12.5	10.0
6.5x55 Swede (140 at 2650)	9.0	10.6	8.7
6.5x55 Swede (140 at 2735)	8.5	12.1	9.6
6.5x55 Swede (160 at 2400)	8.0	12.7	10.1
.260 Rem. (120 at 2860)	7.5	13.0	10.6
.260 Rem. (140 at 2360)	8.0	9.5	8.8
.260 Rem. (129 at 2900)	8.25	12.5	9.9
.260 Rem. (140 at 2750)	8.25	11.9	9.7
6.5x57 (140 at 2700)	8.0	12.5	10.0
6.5mm-284 Norma (140 at 2920)	8.0	14.7	10.9
6.5mm-06 (140 at 2800)	8.0	13.9	10.6
6.5mm Rem. Mag. (120 at 3100)	8.0	13.1	10.3
6.5mm Rem. Mag. (140 at 2900)	8.5	13.9	10.3
6.5x68 S (140 at 2990)	8.5	16.8	11.1
.264 Win. Mag. (140 at 3200)	8.5	19.2	12.1
.26 Nosler (129 at 3400)	8.5	22.9	13.5
6.5-300 Wby. Mag. (140 at 3395)	9.5	21.1	12.0
6.8mm Rem. Mag. (115 at 2625)	7.5	8.0	8.3
6.8mm Rem. SPC (120 at 2460)	8.0	7.5	n/a
.270 Win. (120 at 2675)	8.0	10.0	9.0
.270 Win. (130 at 3140)	8.0	16.5	n/a
.270 Win. (140 at 3000)	8.0	17.1	11.7
.270 Win. (150 at 2900)	8.0	17.0	11.7
.270 WSM (130 at 3275)	8.0	18.7	12.3
.270 WSM (150 at 3000)	8.0	18.9	12.3
.270 Wby. Mag. (130 at 3375)	9.0	21.0	12.3
.270 Wby. Mag. (150 at 3000)	9.25	17.8	11.1
7-30 Waters (120 at 2700)	7.0	10.0	9.6
7x57 Mauser (139 at 2700)	8.75	11.7	9.3
7x57 Mauser (140 at 2660)	8.0	13.5	10.4
7x57 Mauser (145 at 2725)	8.5	13.0	9.9
7x57 Mauser (160 at 2600)	8.0	14.3	n/a
7x57 Mauser (175 at 2500)	8.0	15.5	11.2
7mm-08 Rem. (120 at 3000)	7.5	12.1	10.2
7mm-08 Rem. (140 at 2860)	8.0	12.6	10.1
7mm-08 Rem. (150 at 2750)	7.5	13.9	10.9
.284 Win (150 at 2860)	7.5	17.4	n/a
7x64 (154 at 2850)	8.0	17.9	n/a
7x65R (175 at 2600)	8.0	17.1	11.7
.280 Rem. (140 at 3000)	8.0	17.2	11.8
.280 Rem. (150 at 2900)	8.0	17.4	11.8
.280 Rem. (160 at 2800)	8.0	17.0	11.7
.280 Ackley Imp. (150 at 2930)	8.5	16.3	11.1
7.61 S&H Mag. (154 at 3090)	8.5	18.4	11.8
7mm Rem. SAUM (160 at 2931)	8.0	21.5	13.2
7mm WSM (140 at 3200)	8.0	20.7	12.9
7mm WSM (160 at 3000)	8.0	21.9	13.3
7mm Rem. Mag. (139 at 3100)	9.0	19.3	11.8
7mm Rem. Mag. (140 at 2700)	8.5	15.5	10.8
7mm Rem. Mag. (150 at 3100)	8.5	19.2	12.1
7mm Rem. Mag. (154 at 3035)	8.5	20.3	12.4
7mm Rem. Mag. (160 at 2950)	9.0	20.3	12.0
7mm Rem. Mag. (175 at 2870)	9.0	21.7	12.5
.275 H&H Mag. (160 at 3050)	8.5	19.5	12.2
7mm Wby. Mag. (140 at 3300)	9.25	19.5	11.7
7mm Wby. Mag. (160 at 3200)	9.0	25.6	13.5
7mm STW (160 at 3185)	8.5	27.9	14.6
.28 Nosler (160 at 3200)	7.5	29.4	14.9
7mm Ultra Mag. (140 at 3425)	8.5	25.3	n/a
7mm Ultra Mag. (160 at 3200)	8.5	29.4	n/a
.30 Carbine (110 at 1990)	7.0	3.5	5.7
.30 Blackout (135 at 2085)	8.0	7.0	n/a
.30 Rem. (170 at 2120)	7.5	9.8	9.2
.30-30 Win. (125 at 2175)	7.5	6.6	7.5
.30-30 Win. (150 at 2364)	8.0	9.4	8.7
.30-30 Win. (150 at 2400)	7.5	10.6	9.5
.30-30 Win. (160 at 2400)	7.5	12.7	10.5
.30-30 Win. (170 at 2200)	7.5	11.0	9.7
7.5x54 MAS (150 at 2600)	9.0	11.3	9.0
.30-40 Krag (180 at 2430)	8.0	16.6	n/a
.300 Sac. (150 at 2630)	7.5	14.8	n/a
.307 Win. (150 at 2600)	7.5	13.7	10.9
.308 Marlin Express (160 at 2660)	8.0	13.4	10.4
7.5x55 Swiss (150 at 2800)	9.0	12.9	9.6
.308 Win. (125 at 2675)	8.75	9.0	8.1
.308 Win. (150 at 2800)	7.5	15.8	11.7
.308 Win. (165 at 2700)	7.5	18.1	12.5
.308 Win. (180 at 2610)	8.0	17.5	11.9
.30 T/C (150 at 2900)	8.5	13.9	10.3
.30-06 Spfd. (125 at 2660)	8.0	10.2	n/a
.30-06 Spfd. (150 at 2910)	8.0	17.6	11.9
.30-06 Spfd. (165 at 2900)	8.0	20.1	12.7
.30-06 Spfd. (180 at 2700)	8.0	20.3	12.8
.30-06 Ackley Imp. (150 at 2985)	8.5	23.0	13.2
.300 RCM (180 at 2900)	8.5	22.3	13.0
.300 Rem. SAUM (180 at 2960)	8.25	23.5	13.6
.300 WSM (150 at 3300)	8.25	22.5	13.3
.300 WSM (180 at 2970)	7.25	27.1	15.5
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.300 WSM (180 at 2970)	8.25	23.8	13.6
.308 Norma Mag. (180 at 3000)	8.5	25.9	14.0
.300 Win. Mag. (150 at 3320)	8.5	23.5	13.3
.300 Win. Mag. (165 at 3110)	8.0	26.2	14.5
.300 Win. Mag. (180 at 2960)	8.5	25.9	14.0
.300 H&H Mag. (180 at 2920)	8.5	23.1	13.2
.300 Dakota (180 at 3100)	8.5	28.3	14.7
.30 Nosler (180 at 3112)	9.0	26.9	13.9
.300 Wby. Mag. (150 at 3400)	9.25	24.6	13.1
.300 Wby. Mag. (180 at 3240)	9.0	31.6	15.0
.300 Ultra Mag. (180 at 3230)	8.5	32.8	15.8
.300 Norma Mag. (180 at 3317)	8.5	35.5	16.4
.30-378 Wby. Mag. (180 at 3300)	9.75	42.6	16.8
7.62x39 Soviet (125 at 2350)	7.0	6.9	8.0
.303 Savage (170 at 2170)	7.5	10.3	9.4
7.65x53 Mauser (180 at 2500)	8.0	15.4	n/a
7.62x53R Finn (150 at 2800)	9.0	13.1	9.7
7.62x54R Russian (150 at 2800)	9.0	13.1	9.7
7.62x54R Russian (174 at 2600)	9.0	15.0	10.4
.303 British (150 at 2700)	7.5	14.2	11.0
.303 British (180 at 2420)	8.0	15.4	11.1
7.7x58 Jap (150 at 2700)	9.0	11.9	9.2
.32-20 Win. (100 at 1984)	6.5	3.3	n/a
.32 S&C. (165 at 2400)	7.5	13.2	10.6
.32 Spec. (170 at 2250)	7.0	12.2	10.6
8x56 M-S (170 at 2260)	8.0	12.4	10.0
8x57 Mauser (170 at 2400)	8.0	13.6	10.4
8x57JS Mauser (150 at 2900)	8.0	17.1	11.7
8x57JS Mauser (195 at 2500)	8.0	18.5	12.2
.325 WSM (180 at 3060)	7.5	33.1	16.9
.325 WSM (220 at 2840)	7.5	37.5	17.9
8x68S (150 at 3300)	8.5	25.3	13.9
8x68S (200 at 2950)	9.0	29.1	14.4
8mm Rem. Mag. (200 at 2900)	8.5	32.9	15.8
.33 Win. (200 at 2100)	8.0	13.9	10.6
.338-57 O'Connor (200 at 2400)	8.0	19.2	12.4
.338 Marlin Express (200 at 2400)	8.0	16.2	11.4
.338 Marlin Express (200 at 2600)	8.0	22.0	14.0
.338 Federal (200 at 2600)	7.0	22.2	14.3
.338 Federal (200 at 2660)	8.5	19.3	12.1
.338 Federal (210 at 2630)	8.0	21.9	13.3
.338-06 A-Square (200 at 2800)	8.0	23.9	13.9
.338-06 A-Square (250 at 2500)	8.5	28.2	14.6
.338 RCM (200 at 2800)	8.0	26.1	14.5
.338 Win. Mag. (200 at 2950)	8.5	32.8	15.8
.338 Win. Mag. (225 at 2780)	8.5	35.2	16.3
.338 Win. Mag. (250 at 2700)	9.0	33.1	15.4
.330 Dakota (250 at 2878)	8.5	40.5	17.6
.338 Ultra Mag (250 at 2860)	8.5	43.1	n/a
.340 Wby. Mag. (200 at 3100)	10.0	29.6	13.8
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416 Rem. Mag. (400 at 2400)	10.0	52.9	18.5
416 Rby. (400 at 2400)	10.0	58.1	19.2
416 Dakota (400 at 2500)	10.0	59.0	19.5
416 Wby. Mag. (400 at 2700)	10.25	83.2	22.8
.44-40 Win. (200 at 1200)	7.0	3.4	n/a
.44 Rem. Mag. (240 at 1760)	7.5	11.2	9.8
.44 Rem. Mag. (275 at 1580)	7.5	11.4	9.9
.444 Marlin (240 at 2400)	7.5	23.3	14.2
.444 Marlin (265 at 2250)	8.5	22.1	12.9
.444 Marlin (265 at 2325)	7.5	27.6	15.4
.45 Colt (255 at 1100)	8.0	4.0	5.6
.45 Colt +P (250 at 1500)	6.5	11.1	10.5
.458 SOCOM (300 at 1840)	7.5	20.2	