FASTENER TORQUE RECOMMENDATIONS

Listed are the recommended torque values for most ARP® fasteners. Recommended torque is equal to 75% of the fastener's yield strength. **THE TORQUE VALUES REPRESENTED HERE ARE INTENDED TO BE FOR GENERAL INFORMATION, NOT FOR SPECIFIC INSTALLATIONS!** In special instances, where supplied instructions deviate from the torque values recommended here, always follow the instructions. Simply read down to the correct fastener size, then cross to find the torque value for your application. Stud torque values are based on the coarse thread yield strength and torque being applied to the fine thread i.e. (7/16-14 into the block and torque applied to 7/16-20 threaded nut). NOTE: **ALWAYS LUBRICATE FASTENERS PRIOR TO APPLYING TORQUE TO ENSURE ACCURATE READINGS**.

Recommended Torque to Achieve Optimum Preload (Clamping Force) Using ARP® Moly Assembly Lubricant or 30-wt. oil - Torque (ft./lbs.) - Preload (lbs.)

Note: For those using Newton/meters as a torquing reference, you must multiply the appropriate ft./lbs. factor by 1.356.

Thread Size and Type	Fastener Tensile Strength (PSI)								
	170,000 (1171 N/mm²)			190,000 (1309 N/mm²)			220,000 (1515 N/mm²)		
	Torque w/30 wt. oil	Torque w/ARP® Moly	Preload	Torque w/30 wt. oil	Torque w/ARP® Moly	Preload	Torque w/oil *Not recommended*	Torque w/ARP® Moly	Preload
1/4" stud	12	10	3,804	14	11	4,280	15	12	4,755
1/4-20	13	10	3,804	14	11	4,280	16	13	4,755
1/4-28	14	11	4,344	16	13	4,887	18	14	5,430
5/16" stud	25	20	6,264	28	22	7,047	32	25	7,830
5/16-18	26	21	6,264	29	23	7,047	32	26	7,830
5/16-24	28	22	6,948	32	25	7,817	35	28	8,685
3/8" stud	45	35	9,276	50	39	10,436	56	44	11,595
3/8-16	46	36	9,276	51	41	10,436	57	45	11,595
3/8-24	50	39	10,512	57	44	11,826	63	49	13,140
7/16" stud	71	56	12,720	80	63	14,310	89	70	15,900
7/16-14	73	58	12,720	82	65	14,310	91	72	15,900
7/16-20	80	62	14,220	90	70	15,998	100	78	17,775
1/2" stud	108	84	16,992	122	95	19,116	135	105	21,240
1/2-13	111	88	16,992	125	99	19,116	138	110	21,240
1/2-20	122	95	19,164	137	107	21,560	152	119	23,955
9/16" stud	156	122	21,792	175	137	24,516	195	152	27,240
9/16-12	159	126	21,792	179	142	24,516	199	158	27,240
9/16-18	174	136	24,312	196	153	27,351	217	170	30,390
5/8" stud	214	167	27,072	241	187	30,456	268	208	33,840
5/8-11	220	174	27,072	247	196	30,456	275	217	33,840
5/8-18	243	189	30,660	273	212	34,493	303	236	38,325
8mm stud	25	20	6,264	28	22	7,047	32	25	7,830
10mm stud	54	42	10,680	61	48	12,015	68	53	13,350
11mm stud	80	63	14,220	90	71	15,998	100	79	17,775
12mm stud	97	77	15,540	109	86	17,483	122	96	19,425

In other types of bolted joints, this careful attention to tightening is not as important. For example, flywheel bolts need only be tightened enough to prevent them from working loose. Flywheel loads are carried either by shear pins or by side loads in the bolts; they don't cause cyclic tension loads in the bolts. Connecting rod bolts, on the other hand, support the primary tension loads caused by engine operation and must be protected from cyclic stretching. That's why proper tightening of connecting rod bolts is so important. See the adjacent charts for recommended stretch and torque.

Friction is an extremely challenging problem because it is so variable and difficult to control. The best way to avoid the pitfalls of friction is by using the stretch method. This way preload is controlled and independent of friction. Each time the bolt is torqued and loosened, the friction factor gets smaller. Eventually the friction levels out and becomes constant for all following repetitions. Therefore, when installing a new bolt where the stretch method can not be used, *the bolt should be tightened and loosened several times before final torque.* The number of cycles depends on the lubricant. When using ARP® recommended lubes, five loosening and tightening cycles is enough. This will "break in" the threads sufficiently.

ARP® THREAD LUBRICANTS & SEALERS

It's difficult to determine the amount of torque required to provide the correct preload and clamp force of a given fastener. For example—when tightened, dry uncoated fasteners use up about 85% of the applied torque simply overcoming the friction between the male and female threads. To ensure that all ARP® fasteners provide the optimum level of service, the installed residual stress is calculated and verified experimentally using a superior quality lubricant. It is important to note that the friction coefficients of lubricants vary, making it difficult to consistently get the exact amount of stress within the fastener to clamp the components together. That's why ARP® developed an ultra-consistent moly lubricant and companion thread sealer. Because both of these products have been thoroughly tested and proven effective, they are recommended. See page 66 of this catalog.