ARP Ultra-Torque™ Fastener Assembly Lubricant

New Product Detail

ARP Ultra-Torque Fastener Assembly Lubricant™ has been specifically designed to reduce tension preload scatter and eliminate the need to cycle high performance engine fasteners before final installation. ARP Ultra-Torque far surpasses all requirements offered by previous ARP lubricants in terms of fastener preload repeatability and performance lubricating properties.

Benefits of ARP Ultra-Torque:

- Obtains 95%-100% of the recommended installed preload on the first cycle, allowing the fastener to reach the proper preload on the first pull without cycling
- Maintains installed preload levels within 5% on all subsequent cycles
- Stabilizes preload levels within 5% between a group of fasteners
- Prevents seizing and galling on threaded fasteners
- 360°F melting point
- Metal free

Lubricant Comparison Data

Thousands of tests were conducted on ARP bolts and studs over a two-year period while developing ARP Ultra-Torque Fastener Assembly Lubricant. The testing equipment used to gather the test data includes: a highly sophisticated Micro Controls MC911 data logging system with an electronic motor controller for precision torque control, an electronic load cell with an accuracy ratio of less than .5% to record fastener preload, and a electronic torque transducer capable of recording precise torque and angle readings within .25%.

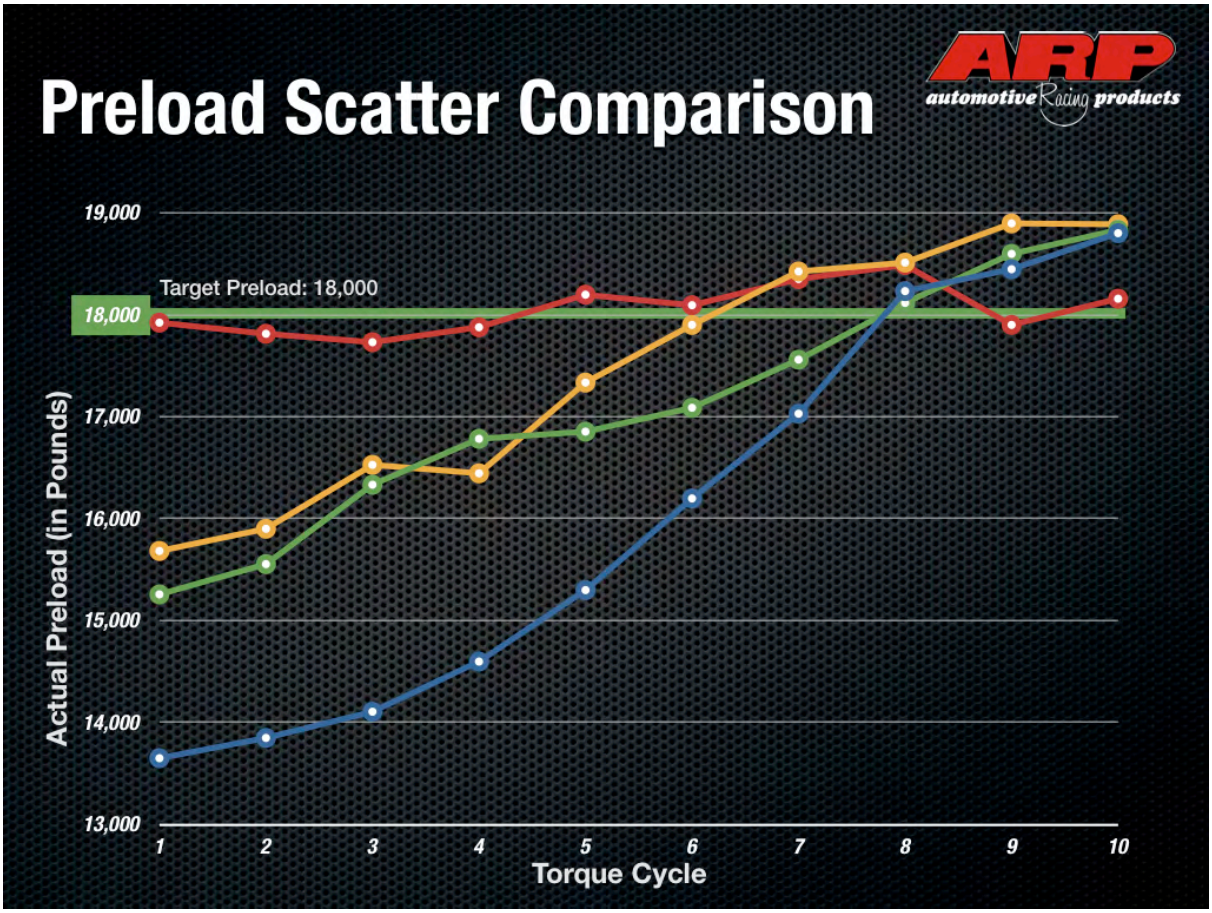
The following tests are performed daily as an industry standard at ARP's In-House Research and Development Department to ensure 100% customer satisfaction. The information below is a summary of the data collected during the test period with three commonly used lubricants and ARP's new Ultra-Torque Fastener Assembly Lubricant. The tests will clearly show the significant role lubricants play in the assembly of high performance engine fasteners.

The first test is a Cycle Test, this test determines how repeatable a fastener is when it's tightened and loosened multiple times. Consistency in a cycle test is critical because it will determine whether a new fastener reaches the proper preload on the first installation and has the ability to repeat itself during its life cycle. Previously, it was necessary to cycle high performance engine fasteners numerous times to level out the friction before final installation, to achieve and stabilize the recommended installation preloads. Frankly, the old procedure was cumbersome and required a significant amount of time, and now with the introduction of ARP's new Ultra-Torque Fastener Assembly Lubricant "cycling" a new fastener, before final installation becomes a "thing of the past."

ARP Ultra-Torque - Cycle Test Data: Pinpointing “Preload Scatter”

Test Criteria: One stud used to test each lubricant. Ten consecutive pulls on each stud. Torque value set at 120 ft-lbs (+/- 1 ft-lb). Lubricant re-applied after 5 pulls. A pull is defined as one tighten/loosen cycle. Preload scatter is defined as the amount of preload growth between the 1st and 10th cycle.

Test Objectives: Obtain a target preload of 18,000 lbs (+/- 750 lbs) on all ten cycles.



Number of Torque Cycles	1	2	3	4	5	6	7	8	9	10
ARP Ultra-Torque	**17,928**	**17,819**	**17,736**	**17,883**	**18,202**	**18,099**	**18,356**	**18,494**	**17,906**	**18,163**
Oil	13,655	13,854	14,111	14,603	15,304	16,203	17,035	**18,237**	**18,452**	18,806
Moly	15,262	15,559	16,338	16,788	16,859	17,093	**17,565**	**18,121**	18,603	18,838
EPL	15,688	15,906	16,533	16,450	17,340	**17,906**	**18,430**	18,517	18,902	18,893

Conclusion: Oil, Moly and CMD/EPL do not meet the test objectives. All three lubricants have a large amount of preload scatter requiring 6 to 8 cycles before achieving the recommended preload. ARP Ultra-Torque clearly allows the fastener to

reach the optimum preload level on the first cycle, and becomes repeatable within 5% on all remaining cycles. Consistency on a Cycle Test will pay major dividends on line honing and cylinder honing operations saving the machinist time and money. The less preload scatter you have, the more repeatable your cylinder and housing bores will be on assembly, reassembly, and mock-up procedures.

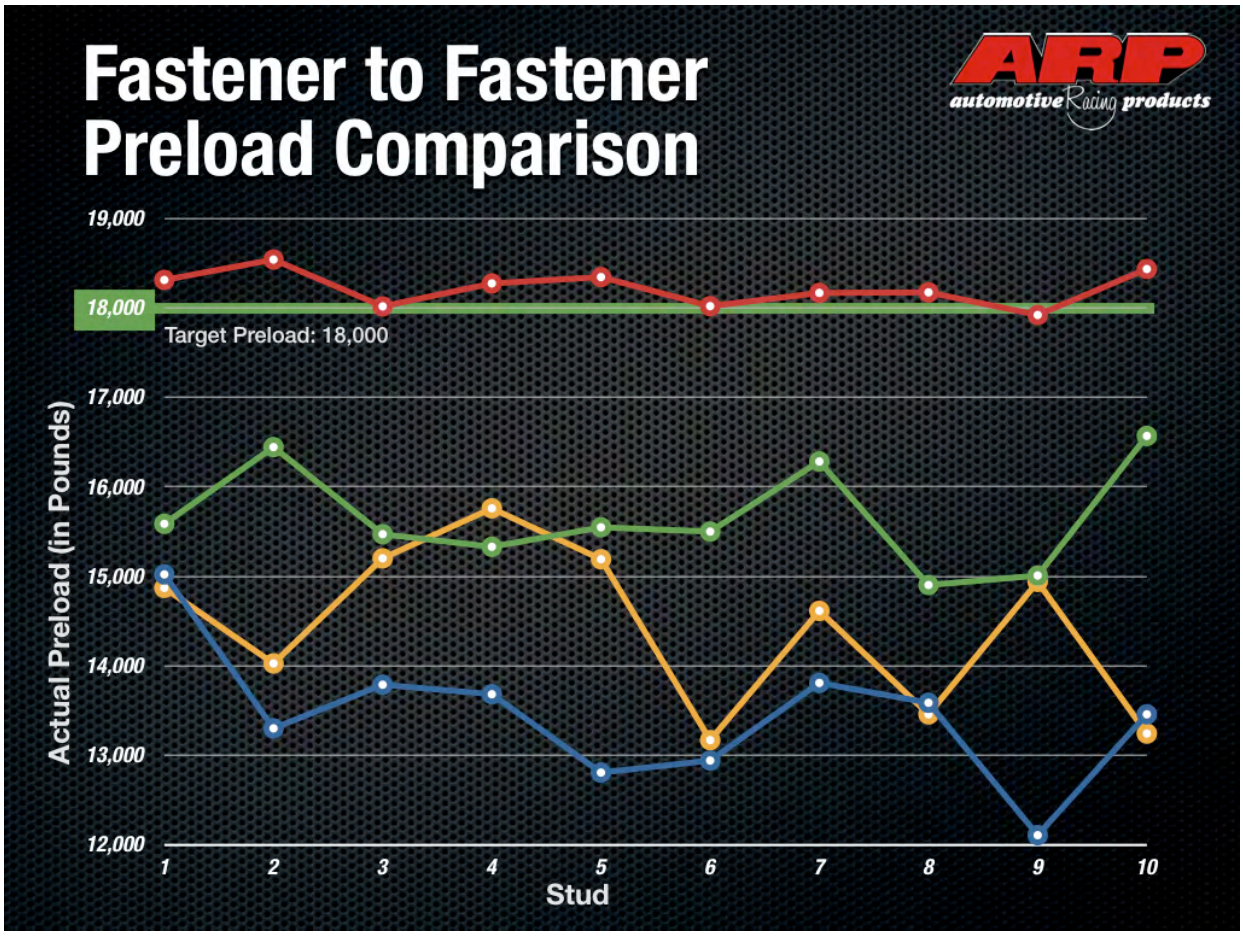
The second test is a Consistency Test, this test is used to simulate a typical cylinder head or a main bearing cap installation procedure on a cylinder block and determines how even or close the preloads on a group of fasteners are “relative to one another”. The Consistency Test is equally important, if not more important than the Cycle Test because uneven preloads as well as low preloads can cause blown head gaskets, bearing failure and/or catastrophic engine failure.

ARP Ultra-Torque - Consistency Test Data

"Fastener to Fastener" Preload Comparison

Test Criteria: Ten studs used to test each lubricant. One pull on each stud. Torque value set at 120 ft-lbs (+/- 1 ft-lb). A pull is defined as one tighten/loosen cycle.

Test Objectives: Obtain a target preload of 18,000 lbs (+/- 750 lbs) on all ten fasteners with each lubricant.



Number of Torque Cycles	1	2	3	4	5	6	7	8	9	10
ARP Ultra-Torque	18,321	18,549	18,025	18,282	18,353	18,028	18,176	18,182	17,929	18,443
Oil	15,027	13,305	13,793	13,687	12,810	12,945	13,813	13,591	12,110	13,462
Moly	15,593	16,451	15,477	15,336	15,554	15,506	16,290	14,908	15,014	16,576
EPL	14,876	14,031	15,207	15,766	15,197	13,173	14,619	13,462	14,944	13,247

Conclusion: Oil, Moly and CMD/EPL again, do not meet the test objectives. All three lubricants have low initial preload levels magnified by a large variation in preload levels

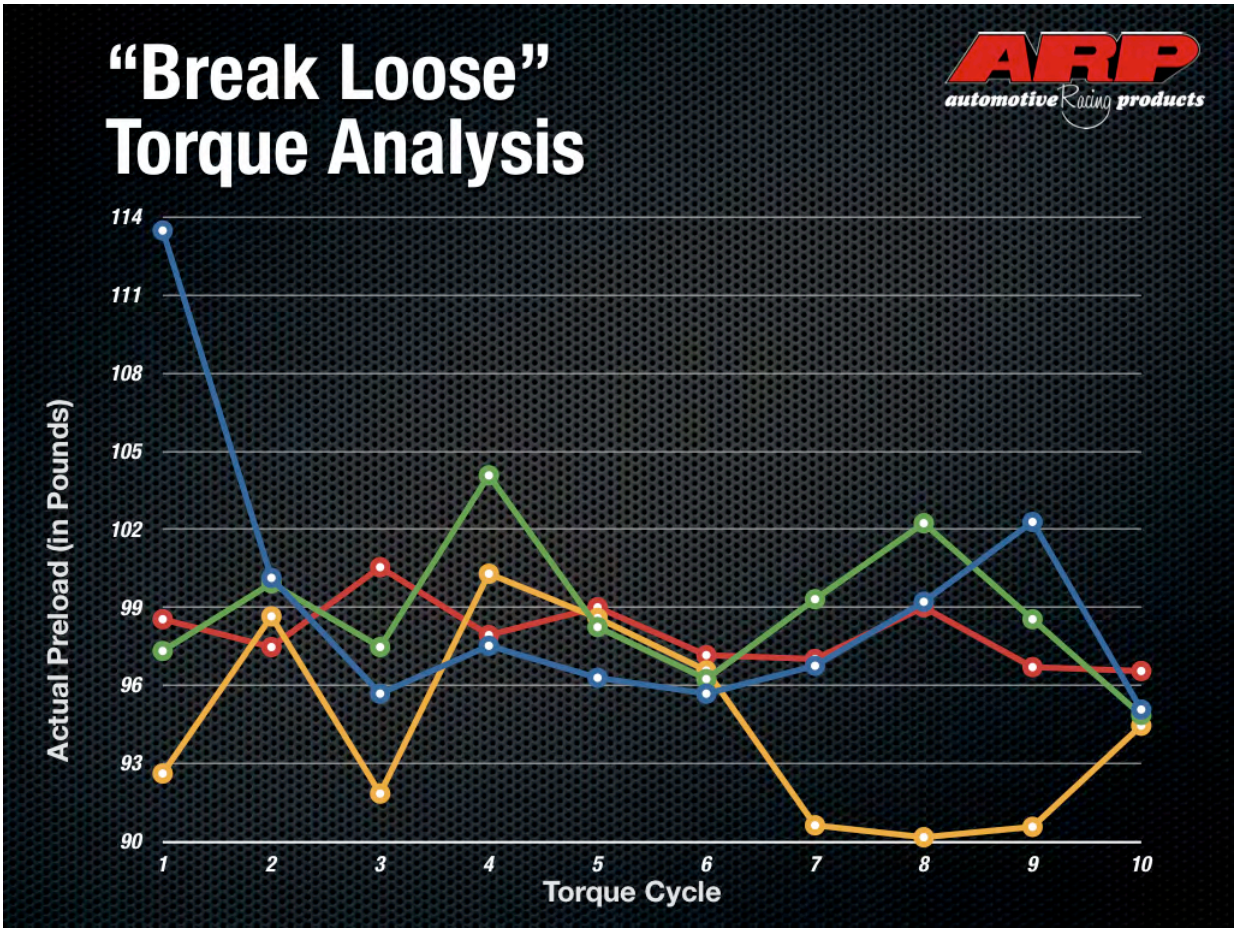
from a “Fastener to Fastener” comparison. This develops uneven clamping pressure across the cylinder head surface and/or housing bores. ARP Ultra-Torque Fastener Assembly Lubricant evens out the frictional differences from “stud to stud” and/or “bolt to bolt” so that all the fasteners can be installed within 5% of your target preload. It is easy to see the advantages that ARP’s new Ultra-Torque Fastener Assembly Lubricant can give a machinist, engine builder, car owner or end user. Time, money and the reassurance that a fastener is making the proper installation preload and that all the fasteners are working at their optimum level of performance.

The third and final test is a Break Loose Torque Test, this test is used to determine a fasteners ability to resist loosening on an assembled joint using a specified lubricant. Typically the break loose torque will be 10%-20% less than the applied torque. The higher the break loose torque is to the applied torque the more resistant to loosening the fastener will be. This test does not take into consideration gasket relaxation or other factors it is simply used to test a lubricant’s ability to retain its respective torque and preload figures in a solid joint such as a main cap or connecting rod cap. Consistency here assures that all fasteners are resistant to loosening on an equal level.

ARP Ultra-Torque - “Break Loose” Torque Analysis

Test Criteria: One stud used to test each lubricant. Ten consecutive pulls on each stud. Applied Torque value set at 120 ft-lbs (+/- 1 ft-lb). Lubricant re-applied after 5 pulls. A pull is defined as one tighten/loosen cycle. Break Loose Torque is defined as the torque it takes to loosen a threaded fastener from a predetermined applied torque value.

Test Objectives: Obtain a consistent “Break Loose” torque that is within 5 ft-lbs on all ten cycles.



Number of Torque Cycles	1	2	3	4	5	6	7	8	9	10
ARP Ultra-Torque	98.57	97.50	100.57	97.96	99.03	97.19	97.04	99.03	96.73	96.58
Oil	113.51	100.16	95.71	97.55	96.32	95.71	96.78	99.24	102.31	95.10
Moly	97.35	99.95	97.50	104.10	98.27	96.27	99.34	102.26	98.57	94.89
EPL	92.64	98.68	91.87	100.32	98.62	96.60	90.65	90.19	90.59	94.48

Conclusion: Oil, Moly and CMD/EPL have a 10-20 ft-lb variation in break loose torque figures while ARP's new Ultra-Torque has a variation of only 4 ft-lbs. Although, the relative average between Oil, Moly and ARP Ultra-torque is within 1 ft-lb of each other it is easy to see the significant difference in consistency that each lubricant can make. ARP Ultra-Torque Fastener Assembly Lubricant is more consistent in all three tests and it provides the performance and repeatability one would associate with high performance engine fasteners.