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## **MG T Series Connecting Rod Bolt & Nut Set (AEF123CSET) Fitting Instructions**

### **Importance of the Proper Torque**

The connecting rod bolts are in a class by themselves when you consider the stress they are exposed to when the engine is running. ARP explained it well: ". . . properly preloading a rod bolt is essential for trouble-free performance. If a bolt is installed without sufficient preload (or pre-stretch), every revolution of the crankshaft will cause a separation between the connecting rod and rod cap. This imposes additional stretch in the bolt. The stretch disappears when the load is removed on each revolution, or cycle. Over time, this cycle of stretching and relaxing can cause the bolt to fail due to fatigue, just like a paper clip that is bent back and forth by hand. To prevent this condition, the bolt's pre-load must be greater than the load caused by engine operation. A properly installed bolt remains stretch by its preload and isn't exercised by the cyclic loads imposed on the connecting rod. A quality bolt will stay stretched this way for years without failing. The important thing is to prevent the bolt from failing due to fatigue by tightening it to a load greater than the demand of the engine." Connecting rod bolts 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. "Protect your bolts - tighten them as recommended."

### **Importance of Using ARP Assembly Lube**

Anyone that has assembled an engine will remember coating the threads of the bolts with motor oil, perhaps without understanding exactly what that was supposed to do. Simply put, there is going to be friction between the threaded fastener and the threads of the paired nut or hole; assembled "dry", the torque readings will include some of that friction, and as a result the bolt or nut will not be torqued properly. The aim of torquing all the con rod nuts to the same value is to apply the same clamping force with each bolt. Since the friction varies, the torque recorded will not be correct, and the clamping force will not be uniform. This variance is called "pre-load scatter". To overcome this problem, conventional tightening procedures for bolts/nuts specify that they be torqued in stages, and then loosened and re-torqued several times. The solution? Lubricate the threads with something that eliminates the friction variable and allows you to torque the nuts to their final value once. And if you do back a nut off, you know that when it is re-torqued, the clamping force will be the same as the first time. Suffice to say that motor oil will not work as well as ARP Ultra Torque Assembly Lube. That is why it is provided in this kit.

### **What is the Proper Torque?**

ARP has determined that 32 ft-lbs with use of ARP Ultra Torque Assembly Lube is optimal for the connecting rod big end nuts and bolts. Note that this is higher than the 27 ft-lbs given for the factory hardware, and note that the ARP assembly lube included with this nut and bolt set must be used.

### **What about Stretch?**

For those that have the necessary instruments, you may measure the bolt stretch as an alternative to using the torque figures above. ARP has determined that the stretch for these bolts will be 0.0065-0.0070" when properly tightened using the ARP Ultra Torque Assembly Lube.