

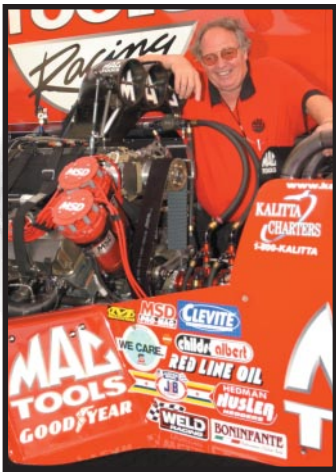
# CLEVITE 77<sup>®</sup>

ENGINE BEARINGS



**“Having won four NASCAR Winston Cup Championships, we know how to put a winner together, that is why every race is run with Clevite 77<sup>®</sup> Engine Bearings.”**

**- Rick Wetzel, #24 DuPont Chevrolet Engine Builder**



**“Now that I am a Top Fuel team owner, I know if we are going to run a 1/4 mile in 4.5 seconds, we can count on Clevite 77 TriMetal Bearings.”**

**- Connie Kalitta  
Owner of the Mac Tools  
Top Fuel Dragster**

**“I rebuild engines for a living. Since I don’t want to see my customers again and again, I have always trusted Clevite 77<sup>®</sup> Engine Bearings.”**

**- Ernie Holder**

**Owner of Holder Automotive, Ruston, Louisiana**



**If you want the REAL STORY on  
Clevite 77<sup>®</sup> TriMetal<sup>™</sup> vs. Bimetal,  
LOOK INSIDE!**

# CLEVITE 77<sup>®</sup>

ENGINE BEARINGS



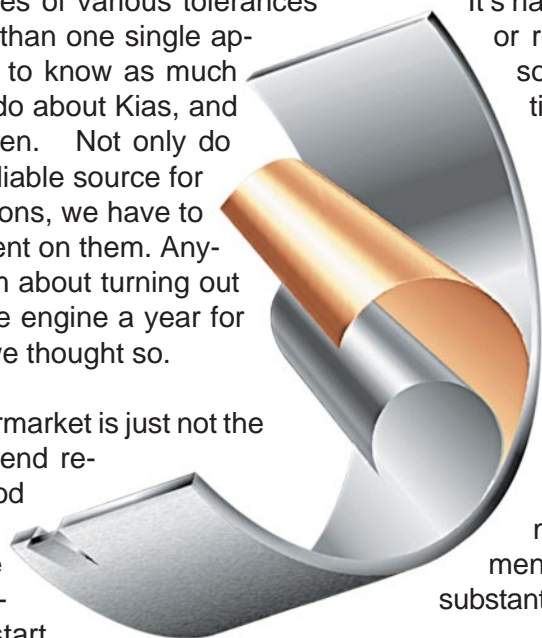
If being successful in the aftermarket was a matter of just duplicating what the original equipment (OE) manufacturers do, our life would be a lot simpler. In our industry the rebuilt engine or repair job has to equal or improve on the OE product. On top of that, we start with used pieces of various tolerances that cover far more than one single application. We have to know as much about Fords as we do about Kias, and everything in between. Not only do we have to find a reliable source for all critical specifications, we have to religiously stay current on them. Anyone else ever dream about turning out 500,000 of the same engine a year for five years? Yeah, we thought so.

Let's face it, the aftermarket is just not the same as OE. Our end result must be as good as, if not better than, OE, even though we have a lot less control over what we start with. Some days it can add new meaning to the phrase "buyer beware." The same is true when we talk about engine bearings. Companies trying to sell you bearings exactly like those that they supply to their

***"... the aftermarket is just not the same as OE. Our parts must perform better than OE..."***

OE customers are not always doing you a favor. In fact, they may even be doing you a disservice in some cases. In the OE environment where there are tight controls on every

component with little variability, but a whole lot of volume, bi-metal aluminum bearings make sense. But in the aftermarket, where flexibility and precision must be combined, it may not be the best choice.



It's hard to imagine any engine, new or rebuilt, that's not subjected to some type of load from the first time it is run to the last time it is shutdown. If load is applied to the engine when engine bearings are tested; the pictures you see would not be so impressive as the bearings would be seized to the crankshaft. What some companies fail to point out when they compare their bi-metal bearings to TriMetal, is that although their bearings may represent a slight improvement in wear resistance, they also substantially reduce seizure resistance.

Crankshaft journal finish is a critical factor, not because of what it does to engine bearings but because its role in promoting the development of an oil film. In normal operation the shaft rides on a thin film of oil and only briefly comes in contact with the bearing during start up and shutdown of the engine. When the surface of the crankshaft is too rough it interferes with the proper development of the oil film, similar to skiing on gravel. When the oil film breaks down, the shaft rubs on the bearing and either the surface of the bearing wears or the shaft wears. Now apply load to this combination and depending on how forging the

bearing surface is, you may have just ruined a perfectly good set of bearings. In fact, you may have to shell out for a new crankshaft as well.

***“Companies that sell you bearings exactly like those that they supply to their OE customers are not always doing you a favor.”***

Engineering quality engine bearings involves a number of interdependent factors. Here is how Clevite 77's TriMetal™ cast copper lead material compares to bi-metal bearings on the most important of these factors:

**Seizure Resistance:** TriMetal™ bearings have significantly greater seizure resistance than bi-metal bearings, by as much as 40%.

**Load Capacity:** TriMetal™ bearings can withstand much higher loads for longer periods of time as compared to bi-metal bearings, over 60% higher.

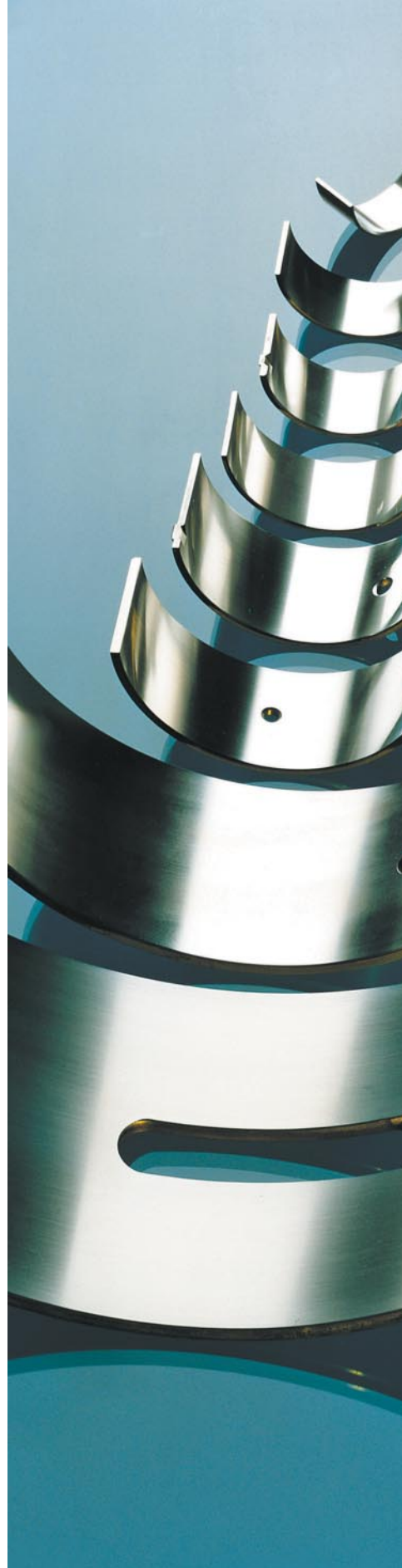
**Embedability & Conformability:** The overlay on a TriMetal™ bearing offers a far more forgiving surface than bi-metal bearings. These features may not be as critical during OE assembly as they once were, but they do offer additional protection that can be extremely beneficial in an engine that is poorly maintained.

**Durability:** Our TriMetal™ bearings not only exceed light vehicle OE durability requirements of 150,000 miles, they also exceed heavy vehicle OE durability requirements of 300,000 miles.

**Tolerances:** Because the surface layer of a TriMetal™ bearing adds an additional manufacturing step, we regularly hold wall sizes to within .0005" as compared to a bi-metal that can be held to within .0003". This stack up of tolerances has nothing to do with quality, suitability, or service life.

**Wear Resistance:** While the silicon in the bi-metal material does contribute to slightly improved wear resistance as compared to the Babbitt surface layer of a TriMetal™ material, it's at the direct expense of embedability and conformability.

One last caution: Not even all tri-metal engine bearings are the same. If you want the strongest engine bearings of the highest quality, ask exclusively for the original Clevite 77® Tri-Metal™ Engine Bearings.



# TAKE A LOOK AT SOME COMMON ENGINE BEARING FAILURES

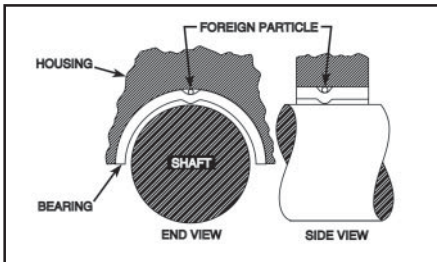
For more details and other analyses, refer to the *Engine Bearing Failure Analysis Guide (form# CL77-3-402)*.

## DIRT EMBEDMENT



**Appearance:** Bearing surface speckled, darkened and lightly or heavily scratched.

**Causes:** Foreign particle contamination. Engine components not thoroughly cleaned prior to assembly. Wear particles from another engine component. Faulty air filtration. Neglected oil filter replacement. Dirt entering engine during oil addition.

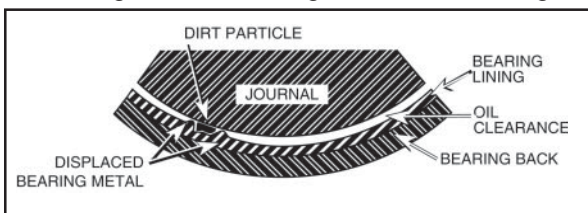


## DIRT ON BEARING BACK



**Appearance:** Concentrated area of distress on bearing I.D. with corresponding mark or discontinuity on O.D.

**Causes:** Foreign particle trapped between bearing back and housing. Damage to bearing back or housing bore (nick, burr, etc.). High spot on bearing back or housing bore due to fretting.



## DISTORTED CRANKCASE



**Appearance:** With main bearings arranged as installed in the engine, bearings show a progression of damage from one to another.

**Causes:** Main bearing bores out of alignment. Engine overheating. Improper tightening of engine components (bearing caps, heads, manifolds, etc.). Engine not properly or uniformly supported (large stationary engines).

## OIL STARVATION



**Appearance:** Bearing surface streaked and smeared with worst damage at center. Heat discoloration. May show pick-up of bearing material on shaft depending on severity. NOTE: This condition will progress into "Wiping" and "Hot Short".

**Causes:** Low oil level, blocked oil pick-up, oil pump failure, blocked oil hole or oil passage, excessive dilution of oil by fuel or coolant, lubrication system not primed before start-up, overspeed.