

## *Metric Mechanic Engine Warranty Policy*

Following is the Official Warranty Policy on Metric Mechanic Engines - which we honor in full. While these guidelines must be stated and explained, in the unfortunate and rare event of a warranty claim, Metric Mechanic will treat any failure with individual attention and negotiate the most expedient, fair and just compensation possible for our customers while striving to understand what actually occurred.

All Metric Mechanic Engines are under warranty the moment they are shipped or picked up.

We accept responsibility for settling claims with transport providers in the event of damage or loss unless the customer has arranged for their own shipping. Metric Mechanic will provide extensive phone &/or written support to our customers directly &/or other technicians to determine the type/extent of failure and whether the engine needs to be returned. If the engine must be returned to Metric Mechanic, we accept the cost for disassembly, inspection, causal determination, replacing damaged parts and rebuilding the engine.

Metric Mechanic cannot be held liable for removal and installation at another shop, a replacement engine purchased elsewhere, shipping, towing, lodging, or charges from missed driving events. Once we receive the engine or component part such as a head at our facility, we will warranty it in the following manner:

<b>Engine Series</b>	<b>Time Passed</b>	<b>MM Covers</b>	<b>Owner Covers</b>
<b>Sport Engines</b>	<b>0 - 90 Days</b>	<b>100%</b>	<b>0%</b>
	<b>90 Days - 1 Year</b>	<b>50%</b>	<b>50%</b>
	<b>1 Year - 5 Years</b>	<b>25%</b>	<b>75%</b>
<b>Rally Engines</b>	<b>0 - 90 Days</b>	<b>50%</b>	<b>50%</b>
	<b>90 Days - 1 Year</b>	<b>25%</b>	<b>75%</b>
<b>Forced Induction Engines</b>	<b>0 - 90 Days</b>	<b>25%</b>	<b>75%</b>
<b>Race Engines</b>	<b>0 - 90 Days</b>	<b>25%</b>	<b>75%</b>

### **The Warranty is in the Build**

For the last 25 years, Metric Mechanic has stood alone as the only independent BMW Company solely devoted to building HiPerformance Drivetrains for BMWs. We have spent our lives exclusively developing, designing and re-engineering performance BMW engines, transmissions, and differentials and related drivetrain components. Our products have become legendary due to their innovations and durability.

### **Durability and Performance**

Rather than rebuilt as stock engines with a little performance flavor thrown in, our engines are rebuilt using every possible quality part - selecting from the best components specially designed to take the rigors and demands of performance driving. For example, rather than aftermarket cast pistons, our much lighter stronger forged pistons live 3 times as long. Rather than wasting time on money lightening (and weakening) stock rods, we start with strong premium 4340 Chrome Moly forged steel "H" and "I" beam rods. You'll find complete explanations of the merits of all component parts in our literature.

### **Our "Blueprinting" Standard**

Our engines are blueprinted to the tightest tolerance possible for longevity and reliability. All measurements are done to within .0001" or one ten thousands of an inch. Clearances and cam indexing are double checked by 2 separate technicians. Building specifications are recorded on an Engine Build Sheet: crankshaft journal diameter, main & rod bearing clearance, piston size, piston to cylinder wall clearance, piston deck height, crankshaft end plays, cam overlap ATDC, intake/exhaust opening/closing points, and valve lash. Also piston and rod weights are recorded and balanced to within 1 gram of each other.

### **Which Engine is Right for YOU**

When purchasing a performance engine, buy the build that most fits your needs, requirements and sport. Warranty considerations are vital but remember that a longer warranty does not guarantee higher reliability. For example, purchasing a "long warranty" Sport Engine and then adding some form of boost (forced induction) voids the long warranty. However, an engine built for forced induction, driven and tuned properly can be extremely reliable.

### Typical Engine Failures

Most engine failures we have experienced in the past occurred during installation and tuning, specifically due to incorrect fuel/air mixture or timing resulting in a failure to run properly, for example, missing on a cylinder. Also sustained high RPM running at or near redline can destroy an engine. Usually a piston becomes over-heated and sticks in the bore. Before running our engines under full load, they must be running properly on all cylinders, with the correct fuel/air mixture and timing and then the rings must be seated. This is explained below.

### Avoiding Engine Failures

1. We ship dry engines so oil must be added first. During break-in, we recommend using either Havoline 10-40 or Quaker State 10-40 for the first 500-1000 miles. Either of these oils will allow the rings to seat in. Do NOT use synthetic oil or a premium mineral oil during the break-in period. The rings may not wear in and the engine may consume oil.

2. After installation, the engine must run properly on all cylinders. If it's not, this condition needs to be diagnosed and corrected first since an engine not running properly can be irreversibly damaged in as little as 50 miles. Once you are confident the engine is running on good behavior, you are ready to seat the rings in.

3. To seat the rings you either need to vary your engine speed up to 4500 rpm under load or do the following: Start at 2000 RPM. Accelerate up to 4000 RPM under full load. Immediately decelerate back to 2000 RPM and then go back up to 4100 RPM. Repeat this until you reach 4500 RPM, then relax the engine for a few miles. Continuing this procedure, repeat this till you hit 5000 RPM. After flexing the rings hard 10 times, the rings will be seated into the cylinder walls.

### Relaxing the Piston Against the Cylinder Wall

Each Metric Mechanic engine is clearanced for it's intended use. For example, a Rally Engine is built with a half thousands (.0005" to .0010") more cylinder wall clearance than a Sport Engine. If your Metric Mechanic Engine is running smoothly on all cylinders, is properly tuned (fuel/air mixture and timing) has no over heating or detonation problems and is up to operating temperature, it can now take a burst RPM up to 1000 RPM short of redline in any of the first 3 gears. By Burst RPM, we mean holding high RPM for just a second or two before shifting. For the first 500 miles, the engines upper RPM should be held to the following RPM.

<b>Engine</b>	<b>Burst RPM in the 1st 3 Gears</b>	<b>Redline</b>
<b>Sport Rally SOHC Engines</b>	<b>5800 - 6000 RPM</b>	<b>6800 - 7000 RPM</b>
<b>Race SOHC Engines</b>	<b>6800 - 7000 RPM</b>	<b>7800 - 8000 RPM</b>
<b>Sport DOHC</b>	<b>6000 - 6200 RPM</b>	<b>7000 - 7200 RPM</b>
<b>Rally DOHC</b>	<b>6700 - 6800 RPM</b>	<b>7700 - 7800 RPM</b>
<b>Race DOHC</b>	<b>7200 - 7400 RPM</b>	<b>8200 - 8400 RPM</b>