



IPD Technical Bulletin: **Breaking In Rebuilt Engines**

Even with quality replacement parts and engine assembly, you can still have problems with oil consumption if the engine is not broken in correctly to get the piston rings to seat.

Rings are designed to apply a certain amount of tangential force outward. Compression rings rely on greater combustion pressure to force them down against the bottom of the piston's ring lands and outward to the cylinder wall. Without this combustion force, these rings may not seat or seal properly. Oil control rings regulate the amount of oil film left on the cylinder wall to lubricate the compression rings, and each compression ring removes some amount of this oil film resulting in proper oil control.

While it is ideal to break an engine in under a controlled environment (such as a dynamometer test where load factors, horsepower, temperatures, etc. can be controlled and monitored), it is simply not always an option available after a repair or rebuild. That's not to say you cannot get piston rings to seat without such equipment, but it is important that an adequate load be put on the engine to create enough combustion pressure and temperatures to seat the rings. This is most critical within the first few hours of the engine's new service life. Idling, increasing the RPM, and hauling light loads will not create enough combustion pressure to seat new rings. Only under load can you obtain the pressure and temperatures needed.

We have not found an OE publication that formally details the process for breaking in an engine outside of a controlled environment to reference, but our research has found that keeping idle time to a minimum, and operating a freshly rebuilt engine at 75% of full load for at least the first 3 to 4 hours, produces satisfactory results in getting piston rings to seat.

The percentage of load and duration may change from rebuilder to rebuilder (many already have a proven process for engine break in). All agree that once the initial start-up and checks are complete, getting a load on the engine is vital to seating the rings. Delaying this loading process can result in increased oil consumption.

Notice: Approved Lubricants

The brand, type, classification, and oil grade used during an engine break-in period can affect the piston rings performance. Use of OEM recommended oil is preferred. There are also several additives and break-in oils available. Those should only be used according to the manufacturer's recommendations.

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