ISHIHARA-JOHNSON CRANK SCRAPERS

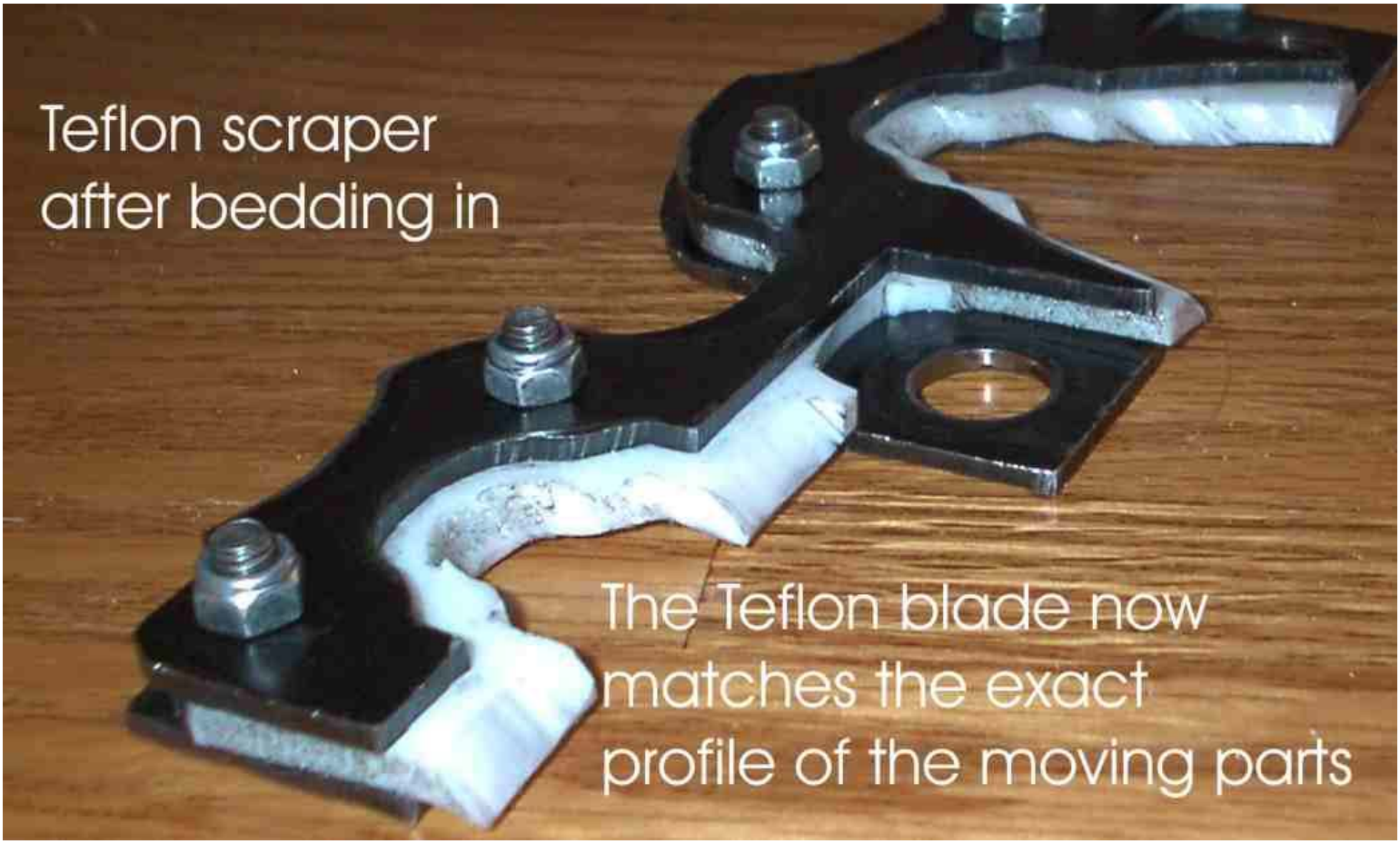
CRANK-SCRAPERS.COM

Ishihara-Johnson crank scrapers are a very simple but effective way to improve the performance of your engine!

During normal engine operation a significant amount of oil adheres to or becomes entrained in a cloud surrounding the spinning bottom end. This oil eats up horsepower your engine is making by increasing the rotating mass and also creating parasitic drag. A crank scraper mechanically strips off excess oil by coming close to, but not touching*, the moving crankshaft and rods. It also interferes with the pressure differential that draws oil into the so-called windage cloud. Here is a short video clip made by one of our customers showing a rotating assembly and crank scraper from a Mitsubishi 4G54.

Our crank scrapers are constructed from 12 gauge mild steel (about .10” or 2.5mm thick) unless noted and include installation instructions. The scrapers are installed in a variety of positions but generally between the oil pan and engine block or along the main bearing caps. Some fitting to your individual engine may be required and the procedure for carefully checking this is explained in the installation instructions. Here is a pictorial of the crank scraper installation on the earlier scraper for the Suzuki G10 engine. Here is a pictorial of an installation on an AMC V8 -- very typical of two piece scrapers.

* Our new Teflon scrapers (patent pending) can safely contact rotating engine components. The closer you can run a scraper the more efficient it becomes. Typical safe clearances for standard scrapers run from .035" through .060" -- some more daring builders run them as close as .010" Teflon scrapers can run in actual contact with the part, .000" clearance, but in reality the rotating assembly will bed or seat in the soft Teflon and develop a running clearance of perhaps .001 to .005".



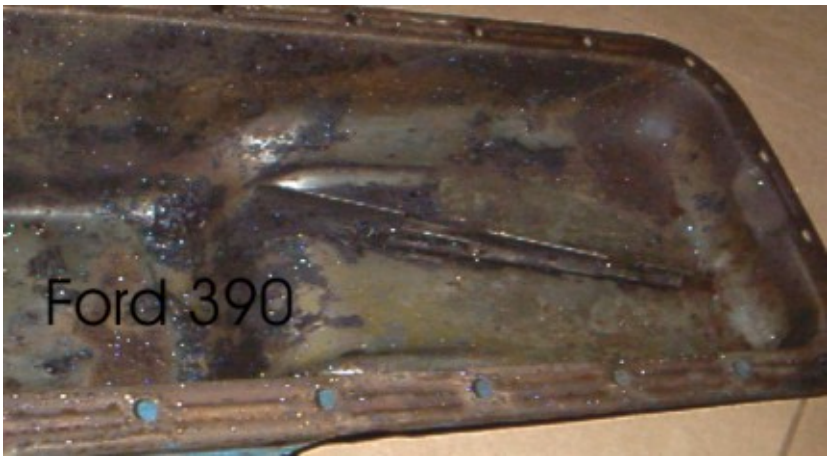
What are some of the benefits?

- **Less rotating mass for the engine to accelerate because of the removed oil**
- **Less loss of power because of excessive drag caused by the windage cloud**
- **Helps reduce engine damaging oil-foaming**
- **Helps avoid oil starvation by keeping the oil in the pan during hard braking and turning as well as during off-road driving**
- **Helps to cool critical engine parts by quickly returning heated oil to the sump**
- **Helps to prevent the cylinder walls from being overloaded with oil**
- **Can help with fuel efficiency**

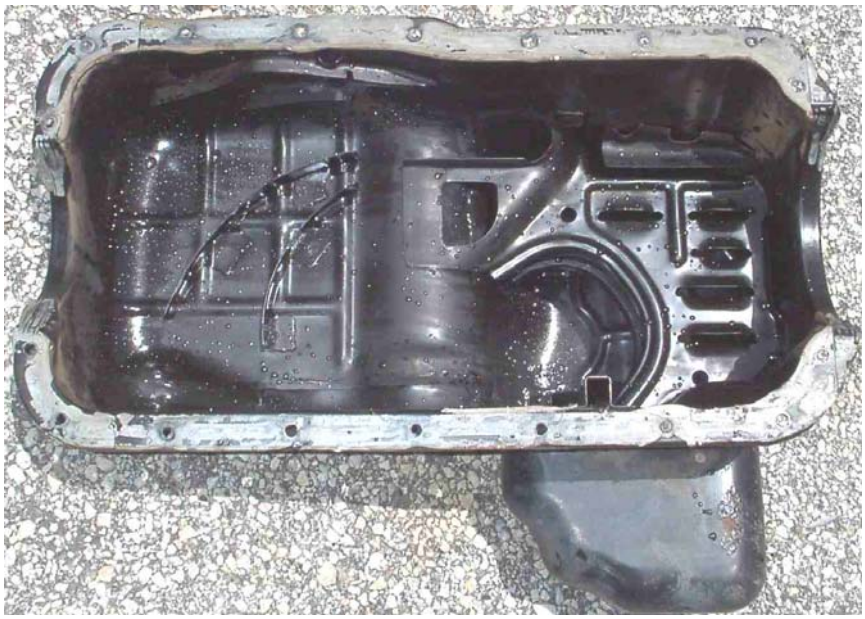
Do they really work?

Yes! Crank scrapers in various forms have been in use for at least 40 years -- and not just in racing! More importantly, they are currently in use in a variety of OEM engines of both large and small displacement -- from relatively low RPM V8 engines to high RPM straight fours. Most auto enthusiasts are surprised to learn just how common they really are. In short, it is an extremely well-proven technology that is often simply not recognized. The modern trend is

to have many more oil control devices in engines. Crank scraper technology is OEM equipment on various modern engines from Nissan, BMW, DaimlerChrysler, Ford, Mazda, Honda and many other manufacturers.



Above: Ford 390 pan with crank scraper, circa 1961.



Above: Nissan VG30TT pan with numerous scraper devices, circa 1996.

Is a windage tray the same as a crank scraper?

No, a windage tray serves a different but related basic function. It is present to act as a physical barrier between the rotating assembly and the sump reservoir. A crank scraper actively removes excess oil and returns it to the sump. Some windage trays do have scraper technology built into them but even then a scraper will approach the moving parts much more closely.

Above: Honda B-series engine showing an installed Teflon scraper on the left and the factory windage tray covering the entire assembly on the right. The windage tray shields the rotating assembly from splashing sump oil while the scraper actively removes excess oil. Before 6000 RPM the standard steel version of this scraper returned a 1.5 % to 2 % hp gain and from 6000-8900 RPM the hp gains averaged 2.5 %. Remember that this was on a statically mounted engine already having a full windage tray as with the Suzuki G10 mentioned below.

Above: The Ford SHO V6 crank scraper mounts between the rotating assembly and the main girdle and windage tray. The scraper directs removed oil out of existing ports in the side of the factory windage tray.

Above: The Ford Zetec engine has an aluminum sump bulkhead that acts as a windage tray (circa present day). It also uses small scraper louvers at approximately the level of the pan floor and has piston bay dividing walls to further inhibit windage losses. As can be seen, the Teflon scraper installed in the pan comes much, much closer to the rotating assembly than the factory louvers for greater efficiency. This particular scraper is sold complete with the aluminum bulkhead which is modified to accept it.

A windage cloud will still form on a statically mounted engine with a full windage tray. For example, roller dyno

testing of a scraper in the Suzuki 993 cc three-cylinder G10 engine with a full windage tray still showed an average 3 % hp increase (over four pulls data ranged from 2.4 % to 3.5 %). Power began growing at about 2750 rpm and peaked at 5300 rpm (the maximum for that economy cam). In a moving car the oil would be sloshing around and making at least partial contact with the rotating assembly creating larger windage losses -- consequently the gains would be greater when using a scraper.

Will my engine still get enough internal splash lubrication?

Yes. The rod and main bearing journals are constantly spraying large amounts of oil in all directions when the engine is operating. Much of this oil lands directly on the cylinder walls and other internal components which depend on splash lubrication. The scraper removes oil directly only from portions of the surface of the crankshaft and the rod big ends, neither of which depend upon lubrication of any sort. These components, as well as the pistons, do depend upon a flow of oil to cool them. By constantly removing oil that has contacted these hot surfaces and allowing fresh oil to re-wet and cool them the thermal efficiency of the engine is enhanced. Hopefully, too, the user is reassured by over four decades of the successful and dependable use of scrapers in OEM stock engines as well as competition engines of all sorts.

Many enthusiasts remember splash lubricated engines where the big ends of the rods dipped directly into the sump reservoir for lubrication. This is essentially pre-WWII technology and does not apply to modern engines with positive pressure bearing lubrication from an oil pump.

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