

# PRE-QUALIFICATION PROCEDURE

The following eleven step IMS Retrofit Pre- Qualification procedure was developed by Jake Raby at Flat 6 Innovations. During the initial development of the IMS Retrofit Procedure and components, some items of concern were noted from the very beginning. Over the years, these procedures have been updated to address these, thus increasing the effectiveness of the IMS Retrofit procedure. This procedure has been employed at Flat 6 Innovations since the very first IMS Retrofit was performed. To date it has resulted in a 100% success rate for the Flat 6 Innovations Preventative Service program. Having performed the very first IMS Retrofit and after performing more IMS Retrofits than any other facility, a perfect record has been maintained by Flat 6 Innovations by employing these procedures verbatim. Today, roughly 20% of all engines that are inspected will fail this pre- qualification, and will require repairs to be made prior to the IMS Retrofit being performed. The biggest mistake that can be made is assuming that every vehicle is healthy enough to have the IMS Retrofit performed. The second biggest mistake that can be made is not taking the pre-qualification procedure seriously. **Please, pay attention to each and every engine, and realize that not every engine is a viable candidate for an IMS Retrofit.**

- ➔  Perform controller interrogation (check for any Fault Codes, engine over-revs, Camshaft deviation #'s, etc...)
- ➔  Five (5) chain M96 engines are known for high camshaft deviation values due to abnormally high wear found on the timing chain adjuster wear pads. This can occur at low mileage points. **Camshaft deviations found over 6 degrees must be addressed prior to performing the IMS Retrofit.** Failure to do this may result in a loss of valve timing during the procedure, or a Check Engine Light illumination immediately following the IMS Retrofit. This will be due to camshaft deviations that are operating out of range.
- ➔  Perform Crankcase Manometer test. Healthy engines with healthy Air/ Oil Separators at sea level will test at 5" of water. (Use CR Tools Manometer for best results)
- ➔  Check over car completely, perform vehicle safety inspection, and listen to engine to determine overall condition. Inspect for any engine and/or gearbox oil and/or coolant leaks and document. Driving the car prior to the retrofit is recommended, as issues may be caught prior to the retrofit process.
- ➔  Drain engine oil and inspect how the oil looks while draining. Inspect engine oil drain plug closely. Inspect for ANY debris. **Again, any debris is concerning, and must be taken seriously.** Engines can run perfectly and exhibit no other symptoms of imminent failure, yet can be slowly dying due to debris laden oil.
- ➔  Remove engine oil filter, cut open and inspect for ANY debris. Look closely at the bottom of the factory filter canister, where debris often is collected. If ANY debris is present, the retrofit process must be aborted; and the source of the debris must be identified. Action must be taken to address these issues prior to the retrofit process being carried out. **Retrofitting the IMSB of ANY engine that has wear metals, or other debris in the oil, will lead to collateral damages that can destroy the retrofitted IMS Bearing, as well as all other internally lubricated engine components.**
- ➔  Remove Engine Oil Sump plate, inspect for debris. Removal of the sump plate is highly encouraged, as debris will lurk here that is not notable in the oil or in the filter. Again, ANY debris of any sort is concerning and must be investigated.
- ➔  During all oil, sump and filter inspections, remember that the tiniest particles are just as concerning as larger pieces. This is because they are even more easily mixed into and suspended from the engine oil, allowing the debris to circulate all throughout the engine with damaging effects.
- ➔  Perform bore scope inspection of all cylinder bores. Watch closely for scoring and any signs of wear. Wear debris from failing / failed cylinders has been proven to be very damaging to all engine internals, including IMS Bearings.
- ➔  With the transaxle removed, inspect the Rear Main Seal bore to ensure the engine does not have a factory defect known as "crankshaft sag". If this exists, oil leakage at the RMS will be a terminal condition that can't ever be remedied.
- ➔  Once the IMS Flange is removed, inspect the original IMS Bearing for signs of failure. Also, check for signs that the engine may have already experienced an IMS Bearing failure, and may have had another bearing fitted. Engines that have IMS shaft assemblies that have been through a failure are always damaged, and it is very important that these shafts are not fitted with any IMS Retrofit.

**NOTE: Any and all fault codes, and or symptoms of rough running, etc., must be addressed prior to any IMS Retrofit Procedure. It is imperative that ONLY healthy, good running engines be retrofitted.**

**NEVER, UNDER ANY CIRCUMSTANCE, IS IT PERMISSABLE TO REMOVE A FAILED OR FAILING IMS BEARING AND REPLACE IT WITH AN IMS RETROFIT PRODUCT. IMS RETROFIT COMPONENTS AND PROCEDURES WERE DESIGNED FOR PREVENTATIVE PURPOSES ONLY.**