



## Review on Engine Reconditioning

**Prof. Ravindra R. Paliwal, Aasim Akhtar Shaikh Karim, Mukul Kumar Jha, Aashi Meshram**

Mechanical Engineering, Anjuman College of Engineering and Technology, Nagpur, Maharashtra, India

### ABSTRACT

Engine Reconditioning is the maintenance of a used engine to enhance its performance, efficiency and hopefully extend its lifespan. Typically, the task of reconditioning in a used engine would be performed by a trained professional as the engine is the most important element of any car, truck or even motor boat and requires special equipment. Often reconditioned engines are cost-effective alternative in buying another car, however it's important to investigate the services of a good mechanic who is used to working with reconditioned engines. It can involve a number of services – from a major engine rebuild to a service involving line boring, crack repairs or even replacing engine parts like spark plugs, and carburetors While some car-owners rely on manuals and guides to engage, most engine reconditioning requires the work of an experienced professional with specialties in the reconditioning of engines, trained staff and a workshop devoted to engine maintenance. The task of engine reconditioning is an important one, for the lifespan of the car and the safety of the occupants.

**Keywords :** Engine Reconditioning, Line Honing And Boring, Crankshaft

### I. INTRODUCTION

Engine reconditioning is the process in which the engine is completely stripped down, inspected and micro-metered within OEM tolerance. Each and every parameter is thoroughly checked due to which the problem may arise in the engine.

After inspection everything is put into a hot acid tank &/or chemical cleaning process, not just to remove dirt and grime, but to also make sure all oil and water ways are clean and free from debris so as to avoid the problems which can be faced while doing the repairing work. This is especially important if the engine components have been badly damaged due to something like an oil pump failure, as small bits of metal referred to as fine chips or filings of stone are

left in the engine, further damage could occur. After cleaning all the separate components, they are taken to respective stations where they are reconditioned.

The block is re-bored or re-honed and the crankshaft is polished, with new pistons and new bearings being ordered to suit. The cylinder head is pressure tested, with the valves faced and valve seats again made to cut, any of the valves which are burnt or showing signs of extreme heat are replaced in order to avoid the bigger mechanical failure. Valve guides are also inspected for wear and replaced where necessary. After all gaskets surfaces and components are spotlessly clean, it is all then re-assembled using new gaskets, oil seals and oil pump.

Challenges in today's market environments: a continuing tendency towards reduction of product development times and shortened product lifecycles. All these modifications require the machine to be out of production during a certain period of time, including some previous preparation, reconditioning work, commissioning, verification and final validation before taking it back into production. When a firm quote for engine reconditioning, they may or may not be including the steps outlined above. Often, a firm will present a price without even seeing the engine in question and it's difficult to switch vendors once the engine has been disassembled. If a company finds itself in need of this work, it's critical to get a complete understanding of what is and what is not included in a quote in order to ensure that the work is done efficiently, effectively, and at the optimal price point.

The crankshaft will normally be reground, and the cylinder head will receive new valves and springs. Whether our needs are for individual component machining, balancing or engine assembly, the processes are done professionally to satisfy our needs.

## II. METHODS

### 1.1 Project description

The objective of our project is to reduce the time taken into performing the operations on the repairing of the crankshaft.

The most common problems occur when the big ends wear down and the engine produces a loud knocking sound. Any significant wear in this area of the engine can be catastrophic, and should be repaired immediately. In most cases the crankshaft can be machined back to working condition. Material is removed from the shaft in the grinding process and

replacement, oversize bearings are installed to compensate for its new diameter. The finale inspection is carried out using magnaflux and black light to detect hidden cracks as some cracks can't be seen by the naked eye.

### 2.2 Housing Bore

- In general terms, the value of oil clearance = housing diameter minus bearing wall thickness x2 minus journal diameter.
- The bearing housing diameter should provide reliable hydrodynamic lubrication within the whole range of tolerance, to tight a clearance (low diameter) may cause overheating of oil.



Figure 2:

### Housing Bore

- Too high a clearance will increase oil leakage, lower oil pressure and may produce knocking.
- A firmly tightened bearing has uniform contact with the housing surface, which fulfills the following functions.
- Housing diameter affects two characteristics of engine bearing operation: oil clearance and bearing press fit in the housing bore.

### 2.3 Problems observed

- Problems can arise in the lubricant delivery system, if lubricant return holes in the housing's

seal area are blocked, the pumping action caused by certain types of seals causes oil to leak.

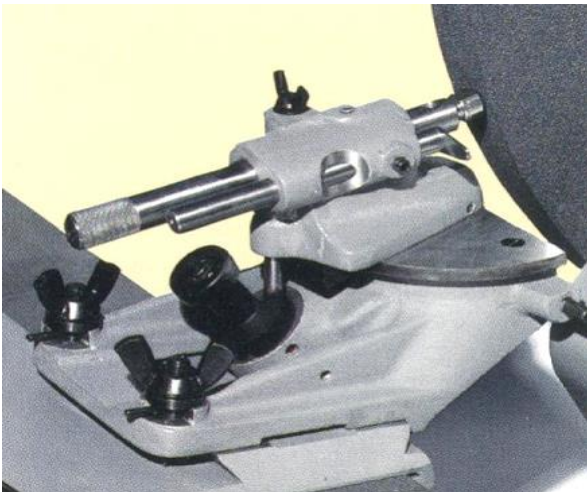
- These problems include out-of-round and undersized housings, oversized housings, and housings enlarged by wear.
- Contact seals may also be excessively tight, leading to a build-up of heat.

#### 2.4 Housing bores

- Diameters within tolerance
- Round with 0.003"

#### 2.5 Crankshaft Grinding

- In this the crankshaft setup is made and the grinding wheel is well dressed with specified radius.



**Figure 1:** Crankshaft grinding

- Crankshaft is fitted to 1/2 the stroke length
- Other journals are indexed
- Mains are ground on centre of rotation
- Positioning is done from seal surface or gear/sprocket surface.

#### 2.6 Crankshaft solutions

- Diameter within tolerance
- Round within 0.0005"
- Straight within 1/2 of oil clearance

- Surface finish 10Ra or better

### III. CONCLUSION

Reconditioned engines are used engines that have had modifications. This includes replacing parts, re-engineering or re-working to make a new engine. They can operate almost like new and are held to hefty standards, making them a safe and desirable option. Engine reconditioning can involve a number of different services, depending on the damage to the existing engine. This could be anything between a major engine rebuild through to a service. Such services include rod resizing, line boring, repairs, crack repairs or even replacing engine parts like alternators, spark plugs, pumps and carburetors.

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