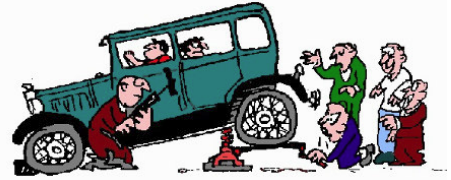




# From the Garage -

by Paul Hunter



## Troubleshooting Noisy Engines

The original article was titled "Engine Basics and Troubleshooting" written by Merle Smith and published May-June 1970 issue of "The Restorer".

In most cases lack of lubrication is the initial cause of engine knock. Before checking engine for knock be sure oil level is correct. A knocking sound in engine is most likely caused by one of the following: (1) piston slap, (2) valve noise, (3) main bearing knock, (4) rod bearing knock, (5) timing gear knock, or (6) wrist pin knock.

An explanation of each type of knock, method of detection, and method of repair follows.

**Piston slap** is a sharp metallic noise caused by piston striking cylinder wall at top of power stroke. This can be diagnosed by idling engine and shorting out each cylinder, one at a time until the noise disappears. The cylinder is shorted out by placing a screwdriver against cap of the spark plug and top of the cylinder head causing spark to be diverted away from spark gap. If the knocking noise disappears when one of the cylinders is shorted out, you probably have piston slap in that cylinder. The cure for piston slap is to replace piston if broken. If cylinder is worn excessively, engine would have to be rebored and new pistons installed.

**Valve noise** is caused by excessive clearance between valve lifter and end of valve itself. This condition can be caused by excessive wear on valve stem or lifter, by poor adjustment, or by a stuck valve. If there is excessive wear on valve stem or lifter, the item worn would have to be replaced. If valve is out of adjustment, merely adjust. A stuck valve can sometimes be loosened by passing oil through carburetor with engine running.

**Main bearing knock** is usually a dull knock which is noticeable between 20 and 50 miles per hour. Unless main bearings are extremely worn they will not knock excessively while pulling nor while decelerating, but in the range between pulling and decelerating the knock will be loudest. Main bearing knock is caused by excessive clearance between crankshaft and main bearing and can be repaired by adjusting main bearings to a clearance of .0015 using plastic gauge as a reference.

**Rod bearing knock** is not usually heard at idle speed but is heard just above it and continues as engine speed is increased. To detect difference between piston slap and rod noise, remember that piston slap will leave as engine is accelerated, but rod knock will begin as engine speed is increased. Also, rod knock has a slightly lower pitch than that of piston slap. Rod bearing knock can usually be cured by adjustment. Before installing a new rod it is good practice to "mike" the shaft to determine if it is out of round or is tapered. Rods should be adjusted to .0015 using plastic gauge as reference.

**Timing gear knock** is most difficult to diagnose. If timing gear is worn or loose it will knock in all speed ranges. There is really no way to be sure if it is in reality the timing gear. However, a better than average method of diagnosing timing gear knock is to run engine slightly above idle speed and slowly open and close throttle. The knock will continue to be present, but just as engine slows down knock will become a slight rattle. The cure for timing knock is simple—replace timing gear. A method of preventing excessive wear is to plug oil return pipe and force oil in valve chamber to return through opening in front of engine over camshaft gear. A little extra oil is required in crankcase when this is done. Also, for longer life a steel or aluminum timing gear can be used instead of the old fiber gear.

**Wrist pin knock** is also difficult to diagnose and cannot be detected by shorting out cylinders. However, it can be pinpointed by rapidly accelerating engine, then decelerating. The engine will pass through a certain speed range at which the pins will rattle at about the same pitch as a valve tappet. If, in manually checking during overhaul, piston pin is found to be loose, new pins or bushing should be installed on all pistons and rods, and pistons should be realigned.

