

## The Rules of Successful Camshaft Installation

Research and experience has shown that most cams that wear out start to fail during the first few moments of operation. Many cams are irreparably damaged, even before the engine is started, because the basic rules of camshaft installation and 'break in' have not been followed.

The cause of premature cam and follower failure is metal to metal contact between the follower and cam lobe. Should this contact occur due to lack of lubrication and excessive high pressure due to valve train interface shearing the oil film, then 'galling' will take place. When this happens, metal is transferred from the follower to the cam lobe or vice versa in a process comparable to welding. Microscopic high spots, which are present on all machined parts, become overheated due to friction and pressure and bond together, tearing sections loose from follower or lobe. These pieces of metal remain attached and create further local overheating during the following revolutions of the camshaft and lead to ultimate failure of the affected components. The following procedure should be used to ensure a long and trouble free life from the camshaft and associated components:

- 1 New Piper Cam followers must be used.
- 2 Coat cam and followers generously with Piper cam lube.
- 3 Check the entire valve train to ensure that no interference is occurring.

Spring Boxing: Valve springs should show .030" clearance between the centre coils.

Valve to piston contact: Valves should have a minimum of .060" clearance from the piston.  
In the case of twin cam engines: Possible 'valve to valve' contact should be checked.

- 4 To ensure that Piper Camshafts reach the customer in the same condition that they leave the factory a special rust inhibitor coating is used. This can be removed easily by washing in paraffin. Do not try to remove the black phosphate coating from cam lobes. This is an aid to 'running in' cam and followers. After washing, it is essential that the cam is liberally coated with Piper cam lube.
- 5 It is essential that the customer checks that the cam being fitted is identical in every way (except for the lobe profile) to the cam being replaced.
- 6 Before starting all engines, prime the oil system by turning the oil pump manually, fill the carb or injection system with petrol, fill the radiator, and ensure correct ignition timing. The engine must start right away and not be subject to a long grind on the starter.
- 7 **Do not idle the engine** during the first 20 minutes of operation: run at 2500 rpm or above. In pushrod engines, 'oil throw' from the crank is the main lubrication for the cam followers. Also contact stresses at the nose of the cam are very high at low speeds. Engines may be run in the shop, on the road, or at the track. If adjustments need to be made during the first 20 minutes 'break in' period, shut the engine down. **DO NOT IDLE.**