

## SB027

### Valve Guide and Stem Wear

Excessive valve guide and stem wear can occur on both inlet and exhaust valves. It is usually more prevalent with exhaust valves and can be caused by a number of factors. The effective sealing of a valve and valve seat is governed by the correct alignment of the valve in the guide and the concentricity of the valve seat and valve guide. A correctly fitted and sized valve guide accounts for approximately 25% of the heat transfer from the valve. In most cases, the valve stem and tip will experience considerable side thrust from either the camshaft or rockers. If any of these conditions are incorrect, excessive valve guide and/or valve stem wear and scuffing will occur.

The most likely causes of excessive valve guide and/or stem wear are:

- Excessive valve stem to guide clearance, resulting in guide 'bell-mouthing'.
- Insufficient valve stem to guide clearance, resulting in stem and guide wear and/or scuffing.
- Excessive carbon build-up on the valve neck and adjoining stem, resulting in stem scuffing.
- Insufficient or a breakdown of valve stem lubrication, resulting in stem scuffing and scoring.
- Abrasive particles contaminating the valve stem and guide bore, resulting in accelerated wear.
- Incorrect valve seat and valve guide alignment, resulting in extreme side loading on the stem and flexing of the valve neck and stem.
- Incorrect rocker to valve tip geometry, resulting in excessive side loading.
- Insufficient oil supply when starting a cold engine in subzero temperatures.
- A bent valve stem.
- A badly worn valve tip, resulting in excessive side loading.

