

Tarasov Etch for Crankshafts

When remanufacturing crankshafts, in addition to inspecting the dimensional tolerances, the crankshaft must also be carefully checked for surface defects, particularly for grinding cracks and burns. It is advisable to magnetic or dye penetrant check the crankshaft after grinding and finishing to ensure that there is no surface cracking.

In order to establish the acceptability of a regrind procedure, the crankshaft should be etched **before** finishing to determine whether the crankshaft was burned during the regrinding procedure. The best etch to use is the Tarasov etch, which will show both the re-hardened and the over-tempered areas. The etching procedure is as follows:

CAUTION: DUE TO THE SHARP ODOUR AND FLAMMABILITY OF THE TARASOV ETCH, THE ETCHING SHOULD BE DONE IN A WELL VENTILATED AREA, AWAY FROM ANY OPEN FLAME.

- a. Clean surface with a scouring powder and water or a good solvent.
- b. Wash thoroughly and rinse with alcohol.
- c. Apply etchant No. 1 (4 parts nitric acid in 96 parts water) for approximately 15 seconds with a cotton swab.
- d. Rinse with water and dry with filtered compressed air.
- e. Apply etchant No. 2 (2 parts hydrochloric acid in 98 parts acetone) for approximately 15 seconds with a cotton swab.

CAUTION: ACETONE IS HIGHLY FLAMMABLE.

- f. Rinse with alcohol and dry thoroughly with compressed air.

IMPORTANT: IF THE CRANKSHAFT HAS BEEN BURNED, IT WILL SHOW UP AS A CHANGE OF COLOR AFTER THE ETCH. AREAS REHARDENED BY EXCESSIVE HEAT APPEAR NEARLY WHITE, WHILE SOFTENED AREAS TURN DARK GREY OR BLACK. AREAS UNAFFECTED BY THE HEAT OF GRINDING ETCH A LIGHT GREY.

IMPORTANT: IF ANY BURNS SHOW UP AFTER THE ETCH IS USED, THE PHYSICAL PROPERTIES OF THE CRANKSHAFT WILL HAVE BEEN SERIOUSLY REDUCED, AND THE CRANKSHAFT SHOULD NOT BE USED.

NOTE: If burning becomes an ongoing problem, it can usually be eliminated by reducing the feed-in rate of the wheel, using a softer grade of wheel, or increasing the work spindle speed. Sometimes, a combination of these factors, along with the recommendations mentioned above, will be necessary to overcome the problem.