

Title	Inspect and rebuild an engine crankshaft or camshaft		
Level	4	Credits	6

Purpose	This unit standard is for people in the automotive machining industry. People credited with this unit standard are able to check the condition of the engine crankshaft or camshaft and carry out the rebuilding operation on the shaft.
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Classification	Motor Industry > Engine Repairs
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Available grade	Achieved
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Explanatory notes

- 1 This unit standard refers to crankshafts and camshafts applicable to petrol and diesel fuelled multi-cylinder 2 and 4 stroke engines.
- 2 The following legislation and its amendments are required to be consulted and followed where applicable:
Health and Safety in Employment Act, 1992.
- 3 *Rebuilding* in this unit standard means the inspecting, machining, and welding or spraying operations necessary to build up the profile of a worn or damaged shaft to make it fully and safely operational.
- 4 Reference to *suitable equipment* means industry approved equipment that is recognised within the industry as being the most suited to complete the task to a professional and competent manner with due regard to safe working practices.

Outcomes and evidence requirements

Outcome 1

Check the condition of the engine crankshaft or camshaft.

Evidence requirements

- 1.1 Safe working practices are observed throughout the task.
Range personal safety, safety of others, no damage to equipment.
- 1.2 Suitable equipment is selected and used to enable the shaft to be checked.
- 1.3 The shaft is cleaned to enable an inspection to be carried out.

1.4 An inspection is completed on the shaft, and a report on the feasibility of repair is given to the supervisor.

Range visual inspection, precision measuring, bend check;
estimated cost of repair compared with replacement cost.

1.5 The shaft is crack tested in accordance with test equipment instructions.

Range dye penetrant test, magnetic particle test.

1.6 Approval for the shaft to be rebuilt is obtained from the supervisor in accordance with company policy.

Outcome 2

Carry out the rebuilding operation on the shaft.

Evidence requirements

2.1 Safe working practices are observed throughout the task.

Range personal safety, safety of others, no damage to equipment.

2.2 Suitable equipment is selected and used to enable the shaft to be rebuilt.

2.3 The shaft is straightened in a straightening press according to equipment manufacturer's instructions and within engine manufacturer's tolerances.

Range determining type and position of the bend, determining original method of heat treatment of the shaft, pre-heating, supporting the shaft and pressing, overcoming springback, relieving stresses.

2.4 A journal is reground to a suitable undersize in accordance with supervisor's instructions, and maintains the fillet radii according to grinding machine's instructions.

2.5 The shaft is pre-heated in a suitable furnace to ensure even heating, and at a temperature that will not affect any induction hardening.

2.6 The crankshaft journal is built up according to the rebuilding machine's instructions or, the camshaft lobe is built up with hardfacing material according to the welding equipment's instructions.

Range journals – metal spraying;
welding – short arc, submerged arc.

2.7 The shaft is rechecked for straightness after the rebuilding operation to ensure that grinding can be carried out to manufacturer's specifications.

2.8 The shaft is reground to engine manufacturer's specifications.

Range stress relieving by heating, post grinding, ensuring fillet radii are maintained (for journals), dressing oil holes (for journals), checking hardness, finish grinding.

This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	25 September 1997	31 December 2016
Review	2	28 February 2001	31 December 2016
Review	3	25 January 2008	31 December 2020
Rollover	4	19 November 2010	31 December 2020
Rollover	5	22 August 2014	31 December 2020

Consent and Moderation Requirements (CMR) reference

0014

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Please note

Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMR). The CMR also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.