Inspect and machine engine crankshafts

Level 4
Credits 25

Purpose
This unit standard is for people in the automotive machining industry. People credited with this unit standard are able to inspect and machine an engine crankshaft.

Subfield Motor Industry
Domain Engines
Status Registered
Status date 25 January 2008
Date version published 25 January 2008
Planned review date 31 December 2012

Entry information
Recommended: Unit 11726, Demonstrate knowledge of engine design factors and machining practices, or demonstrate equivalent knowledge and skills.

Accreditation Evaluation of documentation and visit by NZQA and industry.

Standard setting body (SSB) NZ Motor Industry Training Organisation (Incorporated)

Accreditation and Moderation Action Plan (AMAP) reference 0014
This AMAP can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Special notes
1 Legislation relevant to this unit standard includes but is not limited to – Health and Safety in Employment Act 1992.

2 Definitions
Company requirements refer to instructions to staff on policy and procedures which are documented in memo or manual format and are available in the workplace. These requirements include but are not limited to – company specifications and procedures, work instructions, manufacturer specifications, product quality specifications, and legislative requirements.
Machining refers to inspecting, testing, and machining operations as stated to make the crankshaft fully and safely operational.
**Suitable tools and equipment** means industry approved tools and equipment that are recognised within the industry as being the most suited to complete the task in a professional and competent manner with due regard to safe working practices.

3 Assessment against this standard includes solid crankshafts from either petrol or diesel fuelled multi-cylinder two or four stroke engines.

### Elements and performance criteria

**Element 1**

Inspect an engine crankshaft.

**Performance criteria**

1.1 Safe working practices are observed throughout the task in accordance with legislative requirements.

Range personal safety, safety of others, workshop safety, environmental safety, tools and equipment safety.

1.2 Suitable tools and equipment are selected and used to enable the condition of the engine crankshaft to be assessed in accordance with company requirements.

1.3 The engine crankshaft is cleaned in accordance with company requirements to enable an inspection to be carried out.

1.4 An inspection of the engine crankshaft is completed, and a report on the feasibility of repair is completed, in accordance with company requirements.

Range visual inspection, precision measuring; report includes – estimated cost of repair compared to replacement cost.

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

Range one of – dye penetrant test, magnetic particle test.

1.6 The engine crankshaft is hardness tested in accordance with manufacturer specifications.

1.7 Outwork is arranged in accordance with company requirements.
Element 2

Machine an engine crankshaft.

Performance criteria

2.1 Safe working practices are observed throughout the task in accordance with legislative requirements.

Range personal safety, safety of others, workshop safety, environmental safety, tools and equipment safety.

2.2 Suitable tools and equipment are selected and used to enable the engine crankshaft to be machined in accordance with company requirements.

2.3 Engine crankshaft is straightened to enable the machining to meet engine manufacturer specifications.

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 Engine crankshaft is set up and prepared for grinding in accordance with grinding machine instructions.

2.5 A journal is reground to a suitable undersize in accordance with company requirements, and the fillet radii is maintained in accordance with grinding machine instructions.

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

2.7 Engine crankshaft journal is built up in accordance with rebuilding machine instructions.

Range journals – metal spraying; welding may include either short arc or submerged arc.

2.8 Engine crankshaft is rechecked for straightness after the rebuilding operation to ensure that grinding can be carried out to engine manufacturer specifications.

2.9 Engine crankshaft is reground to comply with engine manufacturer specifications.

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

2.10 Engine crankshaft journals are polished to comply with engine manufacturer tolerances.

Range main journals, big end journals, thrust surfaces.
2.11 Oil plugs are replaced so that no foreign matter can enter the galleries.

2.12 Oil seal areas are repaired to prevent oil leakage under operating conditions.

2.13 Engine crankshaft snout and keyway are repaired to ensure the crankshaft is fully serviceable.

2.14 All oil passages are cleared in accordance with company requirements to enable the lubricant to reach all running surfaces.

2.15 The re-machined engine crankshaft is lubricated, protected against damage and foreign matter, and labelled to ensure identification in accordance with company requirements.

Please note

Providers must be accredited by NZQA, or an inter-institutional body with delegated authority for quality assurance, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be accredited by NZQA before they can register credits from assessment against unit standards.

Accredited providers and Industry Training Organisations assessing against unit standards must engage with the moderation system that applies to those standards.

Accreditation requirements and an outline of the moderation system that applies to this standard are outlined in the Accreditation and Moderation Action Plan (AMAP). The AMAP 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.

Comments on this unit standard

Please contact the NZ Motor Industry Training Organisation (Incorporated) info@mito.org.nz if you wish to suggest changes to the content of this unit standard.