Australian Government

AURTTM007 Carry out crankshaft grinding

Release: 1

AURTTM007 Carry out crankshaft grinding

Modification History

Release	Comment
Release 1	New unit of competency.

Application

This unit describes the performance outcomes required to carry out grinding operations on engine crankshafts to specific under sizes. It involves preparing for the task, determining crankshaft damage and required repair action, preparing and using grinding machines to grind crankshafts to specifications, tolerances and workplace requirements, and completing workplace processes and documentation.

It applies to those working in the automotive service and repair industry. The crankshafts include those in vehicles from all sectors of the industry.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Competency Field

Mechanical Miscellaneous

Unit Sector

Technical - Manufacture

Elements and Performance Criteria

Elements Elements describe the essential outcomes.	**Performance Criteria** Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold and italicised text is used, further information is detailed in the range of conditions section.
1. Prepare to grind crankshaft	1.1 Job requirements are determined from workplace instructions 1.2 ***Crankshaft is cleaned and inspected*** and condition reported 1.3 Information is sourced, procedures and methods are analysed, and appropriate crankshaft grinding machine and equipment are

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	selected for the crankshaft 1.4 Hazards associated with the work are identified and risks are managed 1.5 Tools and measuring equipment are selected and checked for serviceability 1.6 Crankshaft grinding wheel is ***prepared*** according to machine manufacturer specifications and tolerances, and workplace procedures 1.7 Crankshaft is measured to determine under size and tolerances, including journal diameters and sizes of grind 1.8 Crankshaft is positioned in grinder in correct direction of rotation, and clamped according to manufacturer specifications and workplace procedures
2. Grind crankshaft big end bearing journals	2.1 Chuck offsets are set according to the stroke of crankshaft 2.2 Crankshaft grinder wheel head position is set according to machine manufacturer procedures 2.3 Constant measuring gauge and steady rest are positioned on big end journal taking into account position of oil hole 2.4 Crankshaft is ground at correct rotational speed for crankshaft material and diameter according to ***safety requirements***, and following machinery safe operating procedures 2.5 Crankshaft is measured to ensure compliance with specifications and tolerances 2.6 Grinding operations are completed to required specifications and tolerances according to safety requirements, and following machinery safe operating procedures
3. Grind crankshaft main bearing journals	3.1 Crankshaft is removed from grinder 3.2 Chucks are centralised for main bearings and counterweights are adjusted 3.3 Crankshaft is refitted to grinder in correct direction of rotation, and is clamped according to manufacturer specifications and workplace procedures 3.4 Datum is set in relation to crankshaft rear flange and nose 3.5 Crankshaft grinder wheel head movement is set according to manufacturer procedures 3.6 Constant measuring gauge and steady rest are positioned on main bearing journal taking into account position of oil hole 3.7 Crankshaft is ground at correct rotational speed for crankshaft

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Elements Elements describe the essential outcomes.	**Performance Criteria** Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold and italicised text is used, further information is detailed in the range of conditions section.
	material and diameter according to safety requirements, and following machinery safe operating procedures 3.8 Crankshaft is inspected to ensure compliance with specifications and tolerances 3.9 Grinding operations are completed to required specifications and tolerances according to safety requirements, and following machinery safe operating procedures
4. Finish crankshaft grinding	4.1 Oil holes are chamfered and dressed 4.2 Journals are linished with correct grade of belt and in right direction of rotation and required finish 4.3 Flange ends and seal areas are faced 4.4 ***Crankshaft is examined and measured*** according to manufacturer specifications and tolerances, and workplace procedures 4.5 Crankshaft is cleaned according to workplace procedures 4.6 Bright surfaces are treated with rust prevention solution and crankshaft is prepared for further process or storage according to workplace procedures
5. Complete work processes	5.1 Final inspection is made to ensure finished work complies with workplace requirements and crankshaft is presented ready for use or storage 5.2 Work area is cleaned, waste and non-recyclable materials are disposed of, and recyclable material is collected 5.3 Tools and equipment are checked and stored according to workplace procedures 5.4 Workplace documentation is processed according to workplace procedures

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance and are not explicit in the performance criteria.

Skills	**Description**
Learning skills to:	• locate appropriate sources of information efficiently.

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Skills	Description
Reading skills to:	• interpret crankshaft specifications from workshop literature • interpret machinery safe operating procedures from operating manuals.
Writing skills to:	• legibly and accurately fill out workplace documentation to record measurements.

Numeracy skills to:	• interpret numerical information in manufacturer specifications, workshop literature, and machinery dials, gauges and computer readouts
	• use basic mathematical operations, including addition and subtraction, to:
	  • convert metric dimensions to imperial, and imperial dimensions to metric
	  • calculate tolerances and clearances.

Planning and organising skills to:	• select best tooling option for the work and sequence procedure to reduce time and material wastage.
Technology skills to:	• use metric and imperial precision measuring equipment.

Range of Conditions

This section specifies work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included. Bold italicised wording, if used in the performance criteria, is detailed below.

Cleaning and inspecting crankshaft must include:	• following procedures for chemically cleaning nitride and Tufftride crankshafts
	• inspecting crankshaft, including:
	  • coil shot
	  • end shot
	  • hardness
	  • alignment
	  • bend
	  • thread condition
	  • key way condition
	  • seal running surfaces condition
	  • rear flange condition
	  • nose gear condition.

Preparation must include:	• selecting wheel to suit radius and journal width

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	• procedures for dressing wheel.

Safety requirements must include:	• work health and safety (WHS) and occupational health and safety (OHS) requirements, including procedures for:
	  • selecting and using personal protective equipment (PPE) for using grinding machines and chemical cleaning and lubricating agents
	  • identifying hazards associated with rotating grinding machines
	  • manual handling techniques relating to grinding crankshafts.

Examining and measuring crankshaft must include:	• checking journals for:
	  • acceptable surface finish
	  • taper
	  • ovality
	  • barrelling
	  • hourglass
	  • grinding chatter and journal burning
	• checking crankshaft for straightness in V blocks using a dial indicator.

Unit Mapping Information

Equivalent to AURTTM3007 Carry out grinding operations

Links

Companion Volume implementation guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b4278d82-d487-4070-a8c4-78045ec695b1

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