



Australian Government

AURMTQ001 Analyse and repair faults in performance driveline systems

Release: 1

AURMTQ001 Analyse and repair faults in performance driveline systems

Modification History

Release	Comment
Release 1	New unit of competency.

Application

This unit describes the performance outcomes required to analyse and repair performance transmissions, final drive and drivelines, including engine to transmission drive couplings. It involves identifying, evaluating, selecting, justifying, documenting and carrying out the most appropriate rectification method or variation. The unit includes the analysis of multi-system and intermittent faults which may be caused by operating in adverse conditions.

It applies to those working in the motor sport industry.

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

Competency Field

Motor Sport

Unit Sector

Technical - Driveline and Final Drives

Elements and Performance Criteria

Elements	Performance Criteria
Elements describe the essential outcomes.	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. Identify and confirm the work requirement	1.1 Objective of analysis and evaluation is determined from workplace instructions 1.2 Specifications for driveline system are sourced and interpreted 1.3 System faults, deficiencies or discrepancies are identified and

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	confirmed from direct and/or indirect evidence, and are documented 1.4 Hazards associated with the work are identified and risks are managed according to <i>safety and environmental requirements</i>
2. Prepare for analysis and repairs	2.1 Evaluative criteria are developed or adopted to meet the objective of the analysis and evaluation 2.2 <i>Analytical and evaluative methodology</i> are developed or identified from technical information 2.3 Possible causes of faults, including intermittent faults, are identified from analysis of technical support information and available on-board diagnostic systems 2.4 Diagnostic options are analysed and those most appropriate to the circumstances are selected 2.5 Test equipment is selected and prepared according to manufacturer procedures and team requirements 2.6 Tools and materials required to support the diagnostic process are selected and checked for serviceability 2.7 Vehicle driveline system and components are prepared for the diagnostic process
3. Carry out analysis and determine repairs and performance enhancement strategies	3.1 Selected analytical and evaluative methodology is followed according to manufacturer and workplace procedures 3.2 Tests are carried out according to manufacturer and workplace procedures and safety and environmental requirements 3.3 Analytical and other diagnostic findings are verified, as required, by using reliable alternative or optional processes 3.4 Analytical findings and results are assessed against the evaluative criteria 3.5 Valid conclusions are drawn from the available evidence and documented to workplace requirements 3.6 Options for responding to the analysis and evaluation objective are determined from further research of technical support information 3.7 Repair or modification method is selected from an analysis of the options, operating conditions, controlling body rules, category rules, and financial implications, and are documented
4. Conduct repairs and implement performance improvement strategies	4.1 Repair tools and materials are selected and prepared 4.2 Repairs and component replacements and adjustments are carried out according to manufacturer specifications, team requirements,

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	and safety and environmental requirements, and carried out without causing damage to other components or systems 4.3 Post-repair testing and vehicle start-up are carried out to ensure performance and operation are to team requirements
5. Complete work processes	5.1 Final inspection is made to ensure work is to workplace expectations and vehicle is presented ready for use 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.
Reading skills to:	- interpret controlling body rules, category rules and supplementary regulations - interpret information from manufacturer and workshop literature when seeking driveline system specifications and procedures.
Writing skills to:	legibly and accurately fill out workplace documentation when reporting analysis findings.
Numeracy skills to:	- measure system components and use basic mathematical operations, including addition and subtraction, to calculate distances, tolerances and deviations from manufacturer specifications. - interpret units of measurement of angles and torque.
Planning and organising skills to:	plan own work requirements and prioritise actions to achieve required outcomes and ensure tasks are completed within workplace timeframes.
Technology skills to:	use precision measuring equipment, such as micrometers, verniers, torque wrenches and inclinometers.

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.

<i>Safety and environmental requirements</i> must include:	• work health and safety (WHS) and occupational health and safety (OHS) requirements, including procedures for: • working with hot and potentially toxic oils • working with rotating driveline components • environmental requirements, including procedures for trapping, storing and disposing of oils released from driveline components.
<i>Analytical and evaluative methodology</i> must include:	• diagnostic process, sequence, tests and testing equipment.

Unit Mapping Information

AURMTQ4001 Analyse and repair complex performance driveline systems

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b4278d82-d487-4070-a8c4-78045ec695b1>

Assessment Requirements for AURMTQ001 Analyse and repair faults in performance driveline systems

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Performance Evidence

Before competency can be determined, individuals must demonstrate they can perform the following according to the standards defined in this unit's elements, performance criteria, range of conditions and foundation skills:

- carry out the analysis, repair and post-repair checks on two different competition vehicles with performance driveline system faults, including:
 - gear selection
 - noise
 - vibration
 - harsh engagement
 - slipping.

Knowledge Evidence

Individuals must be able to demonstrate knowledge of:

- work health and safety (WHS) and occupational health and safety (OHS) requirements relating to analysing and repairing faults in performance driveline systems, including procedures for:
 - working with hot oils
 - working with rotating driveline components
- environmental requirements, including procedures for trapping, storing and disposing of oils released from driveline components
- types, function, operation and limitations of performance transmission, final drive and driveline components, including:
 - manual transmissions
 - automatic transmissions
 - drive shafts

- final drives
- drive axles
- diagnostic testing procedures of performance driveline systems, including:
 - noise and vibration analysis
 - road testing procedures
 - scan tool and data logger
- procedures for the repair and improvement of performance driveline systems, including:
 - driveline component dismantling, cleaning, repair and reassembly procedures
 - driveline component replacement and adjustment procedures
- post-repair testing procedures of performance driveline systems, including gear selection.

Assessment Conditions

Assessors must satisfy NVR/AQTF assessor requirements.

Competency is to be assessed in the workplace or a simulated environment that accurately reflects performance in a real workplace setting.

Assessment must include direct observation of tasks.

Where assessment of competency includes third-party evidence, individuals must provide evidence that links them to the performance driveline systems that they have analysed and repaired, e.g. work order.

Assessors must verify performance evidence through questioning on skills and knowledge to ensure correct interpretation and application.

The following resources must be made available:

- automotive repair workplace or simulated workplace
- manufacturer specifications for vehicle performance driveline systems
- two different competition vehicles with faults in their performance driveline systems
- diagnostic equipment for performance driveline systems
- tools, equipment and materials appropriate for analysing and repairing performance driveline systems.

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