



Australian Government

AURMTD4002 Prepare competition vehicle suspension

Release 1

AURMTD4002 Prepare competition vehicle suspension

Modification History

Release	Comment
Release 1	Replaces AURM441749B Prepare competition vehicle suspension Unit code updated to meet policy requirements Reference to OHS legislation replaced with new WHS legislation

Unit Descriptor

Unit descriptor	This unit of competency describes the skills and knowledge required to test, dismantle, inspect, reassemble and adjust the suspension of a competition vehicle. It requires the technical ability to determine competition vehicle suspension requirements and the effects of making changes to variables. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.
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Application of the Unit

Application of the unit	This unit applies to individuals who test, dismantle, inspect, reassemble and adjust the suspension of a competition vehicle in the motorsport environment.
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Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite units	
AURLTD3005	Repair suspension systems (light vehicle)
AURTTD2004	Inspect and service suspension systems

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Determine competition vehicle suspension requirements	1.1. Use controlling body and category rules, supplementary regulations, component supplier specifications and team instructions to specify task requirements, including design, quality, material, equipment and quantities 1.2. Examine regulations, specifications and tolerances for competitive advantage 1.3. Observe workplace health and safety (WHS) requirements, including regulatory requirements, equipment and system isolation requirements, and personal protection needs, throughout the work 1.4. Check specifications for required operating conditions and seek clarification, where required 1.5. Calculate suspension requirements according to known factors 1.6. List component requirements and communicate to appropriate persons
2. Prepare for work on suspension	2.1. Check tooling and equipment for safe and effective operation 2.2. Clean and lay out work area for job requirements 2.3. Clean vehicle and prepare for initial measurement 2.4. Measure existing suspension settings and document prior to component removal or adjustment 2.5. Report problems with the work area or the operation of the equipment to appropriate persons
3. Dismantle, repair/modify and assemble dampers	3.1. Identify methods for removing and dismantling dampers according to team procedures and manuals/specifications 3.2. Test, dismantle and clean dampers and check tolerances/wear against manufacturer specifications 3.3. Inspect components for functioning and quality 3.4. Make decision to retain, replace, repair, adjust or service component according to team policies and procedures 3.5. Carry out repairs/modifications to dampers in accordance with manufacturer specifications for methods, equipment and tolerances 3.6. Re-oil, bleed, bench test and re-gas (if required) dampers
4. Dismantle, replace	4.1. Identify methods for removing and dismantling

ELEMENT	PERFORMANCE CRITERIA
and/or change springs	springs according to team procedures and manuals/specifications 4.2.Document dimensions before disassembly 4.3.Disassemble and clean springs and check rates/tolerances against specifications and retain or replace according to team policies and procedures 4.4.Test replacement springs for rate and wear
5. Configure suspension components/settings	5.1.Inspect removed suspension components quality and readiness for installation 5.2.Use installation sequence and techniques 5.3.Install sub-assemblies and tension fasteners to manufacturer/component supplier specifications 5.4.Check to ensure accurate and complete fitting during and after installation 5.5.Inspect associated components, sub-assemblies or structural elements of vehicles that may affect suspension configuration for serviceability and repair, where necessary 5.6.Configure suspension components/settings within tolerances
6. Configure suspension components/settings	6.1.Document settings in accordance with team procedures 6.2.Report problems with sub-assemblies to appropriate persons
7. Clean up work area and complete record keeping	7.1.Maintain tooling, as required, and return to storage 7.2.Tag and shelf/store surplus components/consumables 7.3.Remove surplus material from work area 7.4.Clean up spillage from work area and vehicle 7.5.Complete team/component supplier documentation

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Required skills include:

- technical skills to the level required to use workplace technology related to determining requirements for the preparation of competition vehicle suspension, including tooling, measuring devices, equipment, calculators and computers
- communication skills to the level required to communicate ideas and information to enable clarification of requirements, coordination of work with supervisors and other workers, and to report work outcomes and problems
- literacy skills to the level required to collect, organise and understand information related to preparing competition vehicle suspension, including team requirements, manufacturer specifications, plans and safety procedures
- numeracy skills to the level required to use mathematical ideas and techniques to complete measurements and calculations required during the preparation of competition vehicle suspension
- problem-solving skills to the level required to use pre-checking and inspection techniques to anticipate assembly problems in order to work efficiently and effectively
- team skills to the level required to work with others to foster the team by recognising dependencies and using cooperative approaches to optimise workflow and productivity
- planning skills to the level required to plan and organise activities, including the preparation and layout of the work area, and the coordination of equipment, systems and materials to avoid backtracking, workflow interruptions or wastage

Required knowledge

Required knowledge includes:

- team requirements/job specifications, supplementary regulations and component supplier specifications
- competition vehicle suspension component types, function, applications, limitations and configuration considerations
- suspension-related calculations
- safety in relation to repair of suspension components and assemblies
- damper disassembly, inspection, repair/modification, assembly, re-oiling, bleeding, re-gassing and bench testing techniques, suspension components/settings configuration
- record keeping techniques
- procedures for reporting equipment faults and component defects
- workplace guidelines regarding acceptable tolerance levels

REQUIRED SKILLS AND KNOWLEDGE

- WHS policies and procedures
- applicable commonwealth, state or territory legislation, regulations, standards and codes of practice, including WHS, personal safety and environment, relevant to complex fuel systems

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Assessors must be satisfied that the candidate can competently and consistently:

- interpret and apply team requirements, controlling body and category rules and supplementary regulations
- correctly apply and use safety equipment and personal protective equipment
- follow task instructions, operating procedures and inspection processes to:
 - minimise the risk of injury to self or others
 - prevent damage to competition vehicle or equipment
 - achieve required outcomes within team time and quality standards
- correctly prepare suspension on a minimum of two (2) competition vehicles in situations involving each of the following:
 - calculations to determine spring rate and spring pre-load
 - determination of component selection within constraints of known factors
 - configuration of dampers and springs
 - adjustment of suspension components/settings
- work effectively with others
- modify activities to cater for variations in workplace context and environment and within tolerances.

Context of, and specific resources for assessment

- The application of competency is to be assessed in the workplace or a simulated environment that reflects as far as possible the actual working environment.
- Assessment is to occur using standard and authorised work practices, safety requirements and environmental constraints.
- Assessment is to comply with relevant regulatory requirements, including specified Australian standards.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and

EVIDENCE GUIDE

	disability. • The following resources should be made available: • access to competition vehicles • associated assembly tooling • computing, operational and inventory support systems • materials and equipment • information on work specifications • team requirements • organisational procedures • safety procedures and regulations • quality standards.
Method of assessment	• Assessment must satisfy the endorsed Assessment Guidelines of this Training Package. • Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of Required Skills and Knowledge. • Assessment methods must be by direct observation of tasks and include questioning on Required Skills and Knowledge to ensure its correct interpretation and application. • Assessment may be applied under project-related conditions (real or simulated) and require evidence of process. • Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances. • Competence in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role.
Guidance information for assessment	Assessment processes and techniques must be culturally sensitive and appropriate to the language and literacy capacity of the candidate and the work being performed.

Range Statement

RANGE STATEMENT

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Competition vehicle suspension components

Competition vehicle suspension components may include:

- springs
- dampers
- suspension/swing arms/joints
- pivot locations/pickup points
- lateral control devices
- travel limiters
- anti-roll bars
- weight jackers

Dismantling, repair/modification and assembly of dampers

Dismantling, repair/modification and assembly of dampers applies only to:

- non-sealed dampers (manufacturer/component supplier safety recommendations must be observed at all times)

Factors and calculations for determining suspension requirements

Factors for determining suspension requirements may include:

- regulatory constraints
- team budgetary constraints
- load and speed characteristics
- terrain and climate conditions
- driver/rider preferences

When determining suspension requirements calculations may include:

- wheel rate
- spring rate
- linkage and leverage ratios
- spring pre-load
- vehicle weight
- sprung and unsprung weight
- anti-roll bar rate

Determinations can be confirmed through the use

RANGE STATEMENT	
	of: • shock dynamometer testing • track testing and data analysis • software simulation
WHS requirements	WHS requirements are to be in accordance with applicable commonwealth, state or territory legislation and regulations, and organisational safety policies and procedures, and may include: • personal protective equipment and clothing • safety equipment • first aid equipment • hazard and risk control • elimination of hazardous materials and substances • manual handling, including shifting, lifting and carrying • emergency procedures • team insurance requirements • material safety management systems • controlling body requirements • manufacturer/component supplier specifications • local safe operating procedures
Legislative requirements	Legislative requirements are to be in accordance with applicable commonwealth, state or territory legislation, regulations, certification requirements and codes of practice, and may include: • award and enterprise agreements • industrial relations • Australian standards • Australian Design Rules • confidentiality and privacy • WHS • the environment • equal opportunity • anti-discrimination • duty of care • health regulations
Tooling and equipment	Tooling and equipment may include:

RANGE STATEMENT

	• component supplier specified tooling • jacking equipment • measuring devices • hand tooling • calculators • computers • data acquisition systems
Information and procedures	Information and procedures may include: • controlling body rules, category rules and supplementary regulations • event scheduling and location details • team procedures and standards related to: • preparing competition vehicle suspension • reporting and communication • use of tooling and equipment • emergency service contacts and team persons emergency contacts • team emergency and event procedures for accidents or injury • work instructions, including worksheets, material safety data sheets (MSDS), assembly procedures, plans, drawings, designs and checklists • manufacturer/component supplier specifications and application procedures for test equipment and material • Australian Design Rules (where applicable) • safety body publications • environmental, hazardous chemicals and dangerous goods legislation and local requirements relating to the disposal and use of fuels, lubricants, coolants and cleaning agents

Unit Sector(s)

Unit sector	Motorsport
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Co-requisite units

Not applicable.

Competency field

Competency field	Technical - Steering and Suspension
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