



Australian Government

AURETR131 Diagnose and repair ignition systems

Release: 1

AURETR131 Diagnose and repair ignition systems

Modification History

Release	Comments
Release 1	This version first released with AUR Automotive Retail, Service and Repair Training Package Version 6.0

Application

This unit describes the skills and knowledge required to diagnose and repair faults in the ignition systems of vehicles, vessels or machinery. The unit involves preparing for the task, selecting the correct diagnostic procedure, carrying out the diagnosis and the repair, performing post-repair testing, and completing workplace processes and documentation.

The unit applies to those who work in an automotive service and repair industry. The ignition systems include those in agricultural machinery, heavy commercial vehicles, light vehicles, marine vessels, mobile plant machinery, motorcycles or outdoor power equipment.

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

Unit Sector

Electrical Technical – Electrical and Electronics

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Prepare to diagnose and repair ignition system	1.1 Access workplace instructions to identify job requirements and confirm existence of fault according to workplace procedures 1.2 Source and interpret required information for diagnosis activity, including customer complaint, workplace and manufacturer procedures 1.3 Source testing strategy to efficiently identify cause of fault using workplace and manufacturer procedures 1.4 Identify hazards and environmental issues, assess potential risks and implement control measures in line with workplace

ELEMENT	PERFORMANCE CRITERIA
	policies 1.5 Identify diagnostic tools and equipment required for the job and examine them for serviceability
2. Diagnose ignition system	2.1 Carry out diagnostic tests according to manufacturer and workplace procedures, and workplace health and safety requirements 2.2 Analyse diagnostic test results to identify cause of fault, conducting further tests if required 2.3 Confirm and report cause of fault according to workplace procedures 2.4 Develop and report recommendations for necessary repairs or adjustments according to workplace procedures
3. Repair ignition system	3.1 Source and interpret required information for repair activity, including manufacturer specifications, workplace and manufacturer procedures 3.2 Identify repair tools, equipment and materials required for the job and examine for serviceability 3.3 Carry out repairs or component replacements and adjustments according to workplace and manufacturer procedures, manufacturer specifications, workplace health and safety and environmental requirements 3.4 Carry out post-repair testing according to workplace procedures, workplace health and safety and environmental requirements to confirm fault rectification and repair any issues identified
4. Compete work processes	4.1 Carry out final inspection to ensure work meets workplace expectations and vehicle is ready for use 4.2 Clear work area and dispose of or recycle materials according to workplace procedures 4.3 Complete documentation according to workplace procedures

Foundation Skills

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

SKILL	DESCRIPTION
Learning	- Locates required sources of information efficiently - Develops a sequenced plan for a specific task

SKILL	DESCRIPTION
Reading	• Organises and interprets technical information from workplace procedures, manufacturer procedures and manufacturer specifications • Interprets text, symbols and wiring diagrams in information relating to electrical system testing and repair equipment from manufacturer specifications and workplace instructions and procedures
Oral communication	• Clarifies instructions • Obtains information from customers and supervisors
Numeracy	• Matches electrical components and part identification numbers to workplace instructions, vehicle, machinery and component part lists, and manufacturer specifications • Interprets vehicle electrical measurements and readings • Measures voltage, current and resistance and uses mathematical operations • Calculates deviations from manufacturer specifications
Planning and organising	• Plans own work requirements • Prioritises actions to achieve required outcomes • Ensures tasks are completed within workplace timeframes
Technology	• Uses specialised diagnostic equipment.

Unit Mapping Information

Supersedes and is equivalent to AURETR031 Diagnose and repair ignition systems.

Links

Companion Volume Implementation Guide is found on VETNet -

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

Assessment Requirements for AURETR131 Diagnose and repair ignition systems

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Performance Evidence

The candidate must demonstrate the ability to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including evidence of the ability to:

- diagnose and repair a fault in the ignition systems of two different vehicles, vessels or machinery, including faults in two of the following:
 - magneto with contact points
 - magneto with solid state trigger
 - capacitive discharge ignition
 - distributor with contact points
 - distributor with hall effect sensor
 - distributor with induction magnetic trigger
 - distributor with optical sensor
 - waste spark
 - coil on plug
- carry out a diagnostic test in the course of the above for at least one of the following faults:
 - high resistance in an ignition system
 - loose or damaged connectors or wiring
 - malfunctioning ignition coils.

Knowledge Evidence

The candidate must be able to demonstrate knowledge to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including knowledge of:

- methods to locate and interpret information required to diagnose and repair ignition systems, including:
 - information provided by customers and supervisors
 - manufacturer specifications and procedures or equivalent documentation
- workplace information required to diagnose and repair ignition systems, including:

- establishing serviceability of tools and equipment
- documentation procedures
- housekeeping procedures, including:
 - examination of tools and equipment
 - storage of equipment
 - identification, tagging and isolation of faulty equipment
 - disposal of excess materials
 - recycling procedures
- workplace health and safety (WHS) requirements relating to diagnosing and repairing ignition systems, including procedures for:
 - using specialised tools and equipment, including multimeters, scan tools and oscilloscope
 - using appropriate personal protective equipment (PPE)
 - identifying hazards and controlling risks associated with:
 - working on high voltage ignition systems
 - wearing jewellery while working around high current wiring systems
- environmental requirements relating to diagnosing and repairing ignition systems
- diagnostic testing procedures for ignition systems, including:
 - using diagnostic flow charts
 - testing electrical systems, including procedures for:
 - accessing electrical terminals and using test probes without damaging connectors, fuse holders or wiring
 - checking resistance, current flow and voltage drop of ignition system circuits
 - testing ignition coils
 - using oscilloscopes, including interpreting ignition system primary and secondary waveforms
- repair procedures for ignition systems, including:
 - removing and replacing faulty or damaged components
- post-repair testing procedures for ignition systems, including static and dynamic performance tests of ignition systems
- operating principles of ignition systems and associated components, including:
 - generating principles, including Faraday's law and inducing an electromotive force (EMF)
- key features of ignition systems and components, including:
 - ignition coils, including:
 - internal component function and operation: primary windings, iron core and secondary windings
 - electromagnetic induction in the coil
 - spark plugs: identification, thread size, reach, heat range, resistance-type plugs, and type and number of earth electrodes
 - ignition leads

- firing order
- electronic ignition systems, including:
 - pulse generator systems: stator and rotor units, ignition control units, current limiting and dwell control
 - Hall effect systems: Hall effect device, and permanent magnet and signal waveform
 - optical ignition systems: light emitting diodes (LEDs), rotating disc and optical electronic semiconductors
 - coil on plug ignition systems.

Assessment Conditions

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 ignition systems that they have worked on, e.g. repair orders.

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
- workplace instructions
- manufacturer ignition system specifications
- two different vehicles, vessels or machinery with ignition system faults
- diagnostic equipment for ignition systems, including:
 - multimeter
 - scan tool
 - oscilloscope
- tools, equipment and materials appropriate for repairing vehicle, vessel or machinery ignition systems.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links

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