Title	**Demonstrate knowledge of inductance, capacitors and chokes, and alternating current used in automotive applications**		
Level	**3**	**Credits**	**3**

Purpose	People credited with this unit standard are able to, for automotive applications, demonstrate knowledge of: inductance; capacitors and chokes; and alternating current (ac) used.

Classification	Motor Industry > Automotive Electrical and Electronics

Available grade	Achieved

Guidance Information

1 It is recommended that people hold credit for Unit 30571, *Demonstrate knowledge of the principles and testing of automotive electrical circuits* before being assessed against this unit standard.

2 Evidence presented for assessment against this unit standard must be consistent with safe working practices and be in accordance with applicable service information, and company requirements and legislative requirements. This includes the knowledge and use of suitable tools and equipment.

3 Performance of the outcomes of this unit standard must comply with the following: Health and Safety at Work Act 2015.

4 Any new, amended or replacement Acts, regulations, standards, codes of practice, guidelines, or authority requirements or conditions affecting this unit standard will take precedence for assessment purposes, pending review of this unit standard.

5 Definitions
Company requirements refer to instructions to staff on policy and procedures that are available in the workplace. These requirements may include – company policies and procedures, work instructions, product quality specifications and legislative requirements.
Service information refers to technical information for a vehicle, machine, or product detailing operation; installation and servicing procedures; manufacturer instructions; technical terms and descriptions; and detailed illustrations.
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.

6 Information on automotive electrical principles can be found from: training providers, industry and/or manufacturer courses; vehicle workshop manuals; automotive

electrical and electronic textbooks (contact a local book retailer, school or polytechnic library or the public library lending service).

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of inductance for automotive applications.

Performance criteria

1.1 Types of magnetic fields are described by showing the lines of flux.

Range around a coil, around a magnet, around a conductor.

1.2 The principle of inductance is described in accordance with Lenz's Law.

Range self-inductance, mutual inductance.

1.3 Magnetic properties of materials are identified.

Range air, ferrite, hard and soft iron.

1.4 Automotive application and uses of magnetic material are described.

Range hard and soft iron.

Outcome 2

Demonstrate knowledge of capacitors and chokes for automotive applications.

Performance criteria

2.1 Factors that affect capacitance are explained in terms of plate area, distance apart, and dielectric material.

2.2 Types of capacitors are identified, and their automotive applications are defined.

Range electrolytic, plastic.

2.3 Capacitor operation is described by plotting charge and discharge of voltage and current.

2.4 Types of chokes and their automotive application are described.

Range iron (ferrite) cored, air cored.

Outcome 3

Demonstrate knowledge of ac used in automotive applications.

Performance criteria

3.1 Procedures for calculating the frequency of ac from a given signal on an oscilloscope is described.

Range sine curve terms.

3.2 AC values relating to automotive applications are explained by reference to an oscilloscope trace of a signal generator and transformer.

Range peak values, average value, root mean square (RMS).

3.3 Impedance in an ac circuit containing capacitance, inductance, and resistance is explained in terms of the effects on lead and lag of voltage and current.

Replacement information	This unit standard, unit standard 24129, unit standard 24131, and unit standard 24132 replaced unit standard 5464.

Planned review date	31 December 2025

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	25 January 2008	31 December 2022
Review	2	25 March 2021	N/A

Consent and Moderation Requirements (CMR) reference	0014

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact the MITO New Zealand Incorporated info@mito.org.nz if you wish to suggest changes to the content of this unit standard.