
AUTOMOTIVE PNEUMATICS
Demonstrate knowledge of, and
interpret, complex automotive
pneumatic diagrams and circuitry

level:	5
credit:	6
final date for comment:	December 2008
expiry date:	December 2009
sub-field:	Motor Industry
purpose:	People credited with this unit standard are able to demonstrate knowledge of complex automotive pneumatic diagrams, and interpret automotive complex pneumatic diagrams and circuitry.
entry information:	Recommended: Unit 2340, <i>Describe the operation of pneumatic systems for heavy vehicle and equipment use</i> , or demonstrate equivalent knowledge and skills.
accreditation option:	Evaluation of documentation and visit by NZQA and industry.
moderation option:	A centrally established and directed national moderation system has been set up by the NZ Motor Industry Training Organisation.
special notes:	<ol style="list-style-type: none">1 For the purpose of this unit standard, <i>complex automotive pneumatic diagrams and circuitry</i> is defined as a number of interacting pneumatic and electric circuits in schematic form that are interrelated and referred to as Mechatronics (systems which combine electronic and mechanical components with modern controls and microprocessors).2 Reference to <i>suitable test equipment</i> means industry approved test equipment that is 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 and the integrity of the system.

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- 3 The following standard symbols are included in this unit standard:
International Organization for Standardization (ISO);
European Oil Hydraulic and Pneumatic Committee (CETOP);
United States Standards Institute (USASI);
Japanese Standards Association (JSA).

Elements and Performance Criteria

element 1

Demonstrate knowledge of complex automotive pneumatic diagrams.

performance criteria

- 1.1 The analysis of complex pneumatic diagrams identifies the information that is provided as a diagnostic guide.
- Range: includes but is not limited to – relationships and linkages of circuits to one another, what type of test to perform, what outputs to expect, how a particular system is designed to work.
- 1.2 The description identifies methods used to simplify complex diagrams according to the manufacturers' specifications.
- Range: methods include but are not limited to – pneumatic symbol tables, colour code markers to represent pressure conditions, dividing schematic diagrams into manageable sections, parts lists, service manual contents pages and descriptions, block diagrams, cutaway diagrams, pictorial diagrams.
- 1.3 Sources of diagrams used for complex circuits are identified.
- Range: may include but is not limited to – workshop manuals, CDs, DVDs, on-line diagnostic systems and/or services.

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1.4 Features of system circuit diagrams that improve the interpretation of complex systems are defined and explained according to the vehicle manufacturers' manual instructions.

Range: includes but is not limited to – standard symbols, colour coded and/or shading, special notes, junction blocks, directional control paths, component ID, exploded views.

1.5 System outlines of complex circuit diagrams are identified in terms of a diagnostic resource tool.

Range: includes but is not limited to – operation of circuits, maps path of air flow for each mode of operation.

element 2

Interpret automotive complex pneumatic diagrams and circuitry.

performance criteria

2.1 The pneumatic diagram for a particular mobile application is identified as matching the manufacturer's specifications.

2.2 Operations of components are explained by reference to pneumatic diagrams.

Range: components include but are not limited to – flow control valves, directional control valves, exhaust valves, cylinders, compressors and driers and/or filters, pressure regulators, in-line gauges, actuators, electro-mechanical integration.

2.3 Locations of components are identified by reference to pneumatic diagram information.

2.4 The test procedure and suitable test equipment to trace faults in complex circuits are identified by reference to pneumatic and/or electro-pneumatic diagram information, and to comply with the manufacturer's specifications.

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2.5 A circuit is traced from a complex pneumatic diagram that isolates a particular given fault and its cause.

Range: given faults include but are not limited to – air flow restriction, low pressure, actuator fault, electric solenoid supply fault.

Comments on this unit standard

Please contact the NZ Motor Industry Training Organisation jlane@mito.org.nz if you wish to suggest changes to the content of this unit standard.

Please Note

Providers must be accredited by the Qualifications Authority or a delegated inter-institutional body before they can register credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be accredited by the Qualifications Authority before they can register credits from assessment against unit standards.

Accredited providers and Industry Training Organisations assessing against unit standards must engage with the moderation system that applies to those standards.

Accreditation requirements and an outline of the moderation system that applies to this standard are outlined in the Accreditation and Moderation Action Plan (AMAP). The AMAP also includes useful information about special requirements for providers wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

This unit standard is covered by AMAP 0014 which can be accessed at <http://www.nzqa.govt.nz/site/framework/search.html>.