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| Title | **Repair heavy vehicle or machine complex mechanical engine failures and reflect on own diagnostic and repair procedures** |
| Level | **5** | **Credits** | **15** |

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| Purpose | People credited with this unit standard are able to repair heavy vehicle or machine complex mechanical engine faults requiring an overhaul and demonstrate knowledge of own learning experience in response to diagnosing and repairing complex mechanical engine failures on a heavy vehicle or machine.  |

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| Classification | Motor Industry > Engines |

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| Available grade | Achieved |

**Guidance information**

1. 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 and legislative requirements. This includes the knowledge and use of suitable tools and equipment.
2. Legislation, regulations and industry standards relevant to this unit standard include but are not limited to the current version of the Health and Safety at Work Act 2015; and any subsequent amendments and replacements.
3. 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.

*Heavy vehicle* refers to a motor vehicle that is of Class MD3, MD4, ME, NB, NC, TC or TD; or has a gross vehicle mass that exceeds 3500 kg and is not of a class specified in the Table of vehicle classes as listed from Land Transport New Zealand website <http://www.landtransport.govt.nz/publications/infosheets/infosheet-1-10.html#classes>.

*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.

1. Range

Complex faults may include faults within multiple systems, intermittent faults, faults caused indirectly by the effect of external systems or caused through system repairs. Fault diagnosis would require applying a complex investigative diagnostic process to rectify them.

Complex engine mechanical failure may include – engine seizure, piston failure, connecting rod or valve breakage; evidence of two different mechanical engine failures, each on a different vehicle or machine is required.

Machines may include – forklifts, earth moving equipment, grader equipment, loaders, dozers, tractors, agricultural equipment, dump trucks, prime movers; electric machines including – forklift, walk-behind pallet, ride-on pallet, reach truck, order picker, counterbalance truck, turret truck.

**Outcomes and performance criteria**

**Outcome 1**

Repair heavy vehicle or machine complex mechanical engine faults requiring an overhaul.

**Performance criteria**

* 1. Complex engine failure is analysed and determined.

 Range operator description, inspection, diagnostic testing, diagnostic test results.

1.2 Engine failure is repaired.

1.3 Repair method is reported.

 Range report must include – final engine tests and adjustments, testing of any related systems.

**Outcome 2**

Demonstrate knowledge of own learning experience in response to diagnosing and repairing complex mechanical engine faults in a heavy vehicle or machine.

**Performance criteria**

2.1 Own experience diagnosing and repairing complex mechanical faults in an engine are reflected on and described in relation to knowledge and analytical skills acquired.

2.2 Improvements to own future diagnostic and repair procedures are identified based on own reflection.

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| 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 |  | N/A |

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