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| Title | **Explain, and repair, heavy vehicle or machine component metal fatigue failure and reflect on own repair procedures** |
| Level | **5** | **Credits** | **10** |

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| Purpose | People credited with this unit standard are able to explain metal fatigue causing component failure, repair component metal fatigue failure and demonstrate knowledge of own learning experience in response to repairing component metal fatigue failure. |

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| Classification | Motor Industry > Automotive Workshop Engineering |

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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. 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**

Explain metal fatigue causing component failure.

**Performance criteria**

* 1. Causes of metal fatigue are explained.

Range may include – overheating, incorrectly specified coolant, lack of oil, incorrect oil pressure, faulty filtration, incorrectly specified oil, oil contamination, incorrect component clearances (excessive, minimal), misalignment, corrosion, over-speeding, wear (abrasive, scuffing, hammering, erosion, cavitation, electrolysis), seal failure, unbalanced components, distortion (mechanical and thermal), faulty assembly procedure, general wear and tear, abuse and lack of service, parts fitment; incorrect, damaged, or defective;

 evidence of three different causes is required.

* 1. Methods of diagnosing metal fatigue are explained.

 Range explanation may include – diagnostic testing, oil sampling data or history, inspection;

 evidence of two different diagnostic methods is required.

**Outcome 2**

Repair component metal fatigue failure.

Range evidence of three different component failures, each on a different heavy vehicle or machine is required.

**Performance criteria**

2.1 Metal fatigue is analysed and factors causing failure determined.

 Range analysis will include – operator description, diagnostic testing, diagnostic test results.

2.2 Component is repaired.

2.3 Repair method is reported.

 Range report must include – final system test, testing of any related systems.

**Outcome 3**

Demonstrate knowledge of own learning experience in response to repairing component metal fatigue failure.

**Performance criteria**

3.1 Own experience repairing component metal fatigue failure is reflected on and described in relation to knowledge and analytical skills acquired.

3.2 Improvements to own future diagnostic 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.