Title	**Demonstrate knowledge of mechanical fasteners used in mechanical engineering**		
Level	**2**	**Credits**	**3**

Purpose	This is an introductory unit standard for people working in the mechanical engineering trades involved in the selection and use of fasteners. People credited with this unit standard are able to demonstrate knowledge of threaded fasteners, washers, nuts, pins, circlips and rivets used in mechanical engineering.

Classification	Mechanical Engineering > Engineering Core Skills

Available grade	Achieved

Explanatory notes

1 Identification of fasteners, washers, nuts, and rivets may be assessed from physical examples or pictorial representations.

2 Assessment information
Examples/evidence given must be within the context of mechanical engineering or fabrication. Numerous reference texts and training manuals on fasteners are available and may be used; however, no one textbook or source of information is envisaged.

Outcomes and evidence requirements

Outcome 1

Demonstrate knowledge of threaded fasteners.

Evidence requirements

1.1 Thread features are identified on a diagram and labelled.

Range thread features – minor; major and pitch diameters; root; crest; pitch; thread angle.

1.2 Tables are used to determine pitch or threads per inch (TPI), and thread angle for thread patterns of given diameter bolts.

Range metric thread patterns – metric fine, metric coarse.
imperial thread patterns – Unified coarse (UNC), Unified fine (UNF), British Standard Whitworth (BSW).

1.3 The difference between bolts and engineering screws (set screws) is described.

1.4 The difference between a bearing type joint and a friction type joint is described in terms of forces, friction, and threaded fasteners suitable for each.

1.5 Common grades and classes of threaded fasteners are described in terms of identification markings and tensile strength.

Range common grades of threaded fasteners include but are not limited to – imperial grades 2, 5, 8; metric classes 4.6, 8.8,10.9.

1.6 Head types are identified.

Range examples of head types – hexagonal, round, countersunk; evidence is required of a minimum of six different head types.

1.7 Left hand threaded bolts are identified.

Outcome 2

Demonstrate knowledge of washers.

Evidence requirements

2.1 Washers are identified from given and a typical application stated for each type.

Range washers include but are not limited to – plain, spring, conical, internal tooth, external tooth.

Outcome 3

Demonstrate knowledge of nuts.

Evidence requirements

3.1 Common grades and classes of nuts are identified.

Range includes but is not limited to – imperial grades 2, 5, 8; metric class 8, 10.

3.2 Types of nuts are identified and a typical application stated for each type.

Range nuts include but are not limited to – hexagonal, dome, nyloc, castellated, wingnut, half-nut.

Outcome 4

Demonstrate knowledge of pins and circlips.

Evidence requirements

4.1 Types of pins and circlips are described in terms of construction and material, and a typical application stated for each type.

Range includes but is not limited to – dowel pin, roll pin, split pin, taper pin, internal circlip, external circlip.

Outcome 5

Demonstrate knowledge of rivets.

Evidence requirements

5.1 The difference between a snap-head rivet and pop rivet is described.

5.2 Snap-head rivet head types are identified and a typical application for each type is stated.

Range snap-head rivet types include but are not limited to – button, flat countersunk, round countersunk, pan.

5.3 Pop rivet types are identified and a typical application for each type is stated.

Range pop rivet head types include but are not limited to – domed head, countersunk, sealed, large flange.

5.4 The selection of pop rivets is described for given scenarios with reference to material, head type, diameter and length.

Range a minimum of five different given scenarios given by the assessor.

Replacement information	This unit standard replaced unit standard 21909

Planned review date	31 December 2021

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	8 December 2016	N/A

Consent and Moderation Requirements (CMR) reference	0013

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

Please note
Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMR). The CMR also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

Comments on this unit standard

Please contact Competenz qualifications@competenz.org.nz if you wish to suggest changes to the content of this unit standard.