

# JOB ROLE – AUTOMOTIVE SERVICE TECHNICIAN

Sector: Automotive  
(Qualification Pack Code : **ASC/Q01402**)



PSS Central Institute of Vocational Education  
Shyamla Hills, Bhopal – 462013, Madhya Pradesh, India

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## **UNIT 2 : Fasteners**

### **Session 4 : Automotive Washers and Rivets**

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# Session Objectives

1. The student will be able to understand importance of washers as fasteners.
2. Able to understand importance of rivets as fasteners
3. Able to identify different types of washers
4. Able to remove and fix the circlip using hand tools
5. Able to remove and fix the split pin using hand tools

# Introduction

A **washer** is a thin plate (typically disk-shaped) with a hole (typically in the middle) that is normally used to distribute the load of a threaded fastener, such as a screw or nut. Other uses are as a spacer, spring, wear pad, preload indicating device, locking device, and to reduce vibration. Washers usually have an outer diameter (OD) about twice the width of their inner diameter (ID).



Different types of washers

Automotive washers are the small flat dishes having a hole in the center. These essential auto fasteners are generally made of metal, leather, plastic, and rubber. The main function of the automotive washers is to hold or bear the load of a threaded fastener or bolt.

Washers can be categorized into three types;

1. 'plain washers', which spread a load, and prevent damage to the surface being fixed, or provide some sort of insulation such as electrical;
2. 'spring washers', which have axial flexibility and are used to prevent fastening loosening due to vibrations; and
3. 'locking washers' which prevent fastening loosening by preventing unscrewing rotation of the fastening device; locking washers are usually also spring washers.

# Rivets

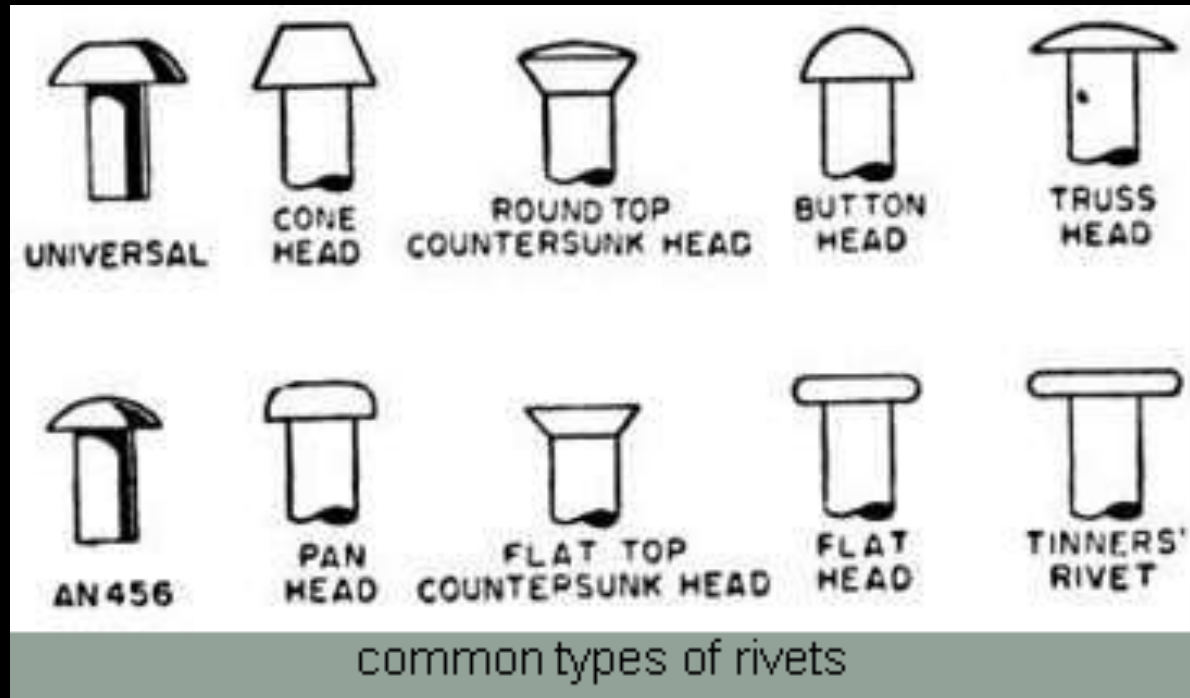
Rivets often regarded as a semi-permanent mechanical fastener having a cylindrical shaft with head on one hand and the end opposite the head is called buck-tail. Rivets are the oldest forms of automotive fasteners used in building traditional wooden boat. But now rivets are used as automobile fasteners in a wide number of applications like vehicle bodies, aircraft, bridges, cranes, building frames etc.



Different types of rivets and rivet joint

# Types of rivets

Rivets are usually categorized on the basis of their heads. The material of the rivets must be tough and ductile. They are usually made of steel (low carbon steel or nickel steel), brass, aluminium or copper, but when strength and a fluid tight joint is the main consideration, then the steel rivets are used.





## Other important fasteners

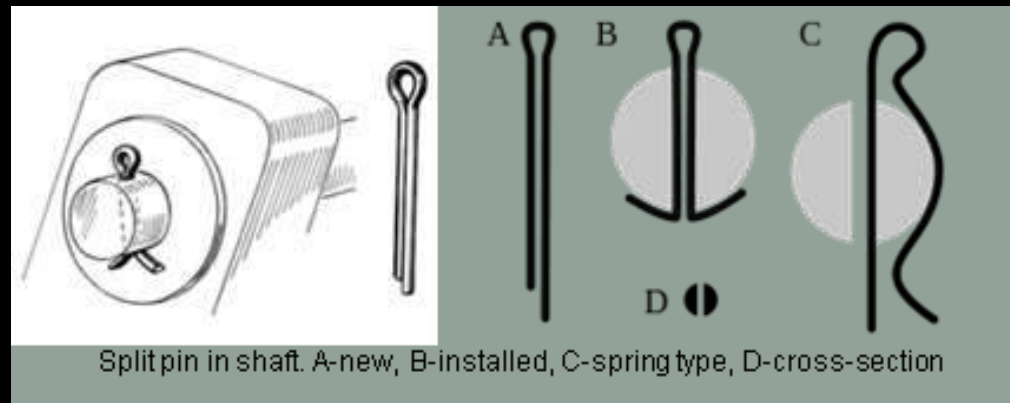
**Circlip** A circlip, is a type of fastener or retaining ring consisting of a semi-flexible metal ring with open ends which can be snapped into place, into a machined groove on a dowel pin or other part to permit rotation but to prevent lateral movement. There are two basic types: internal and external, referring to whether they are fitted into a bore or over a shaft. Circlips are often used to secure pinned connections. These are used to retain piston wrist pins / gudgeon pins, the clips are known as wrist pin clips or wrist pin retainers or gudgeon pin clips.



Circlip and circlip plier

## Split pin

A split pin, also known as a cotter pin or cotter key, is a metal fastener with two tines that are bent during installation, similar to a staple or rivet. Typically made of thick wire with a half-circular cross section, split pins come in multiple sizes and types. A new split pin has its flat inner surfaces touching for most of its length so that it appears to be a split cylinder. Once inserted, the two ends of the pin are bent apart, locking it in place. When they are removed they are supposed to be discarded and replaced, because of fatigue from bending.



# Spring pin

A spring pin, (also called tension pin or roll pin) is a mechanical fastener that secures the position of two or more parts of a machine relative to each other. Spring pins have a body diameter which is larger than the hole diameter, and a chamfer on either one or both ends to facilitate starting the pin into the hole. The spring action of the pin allows it to compress as it assumes the diameter of the hole.



# Summary

In this session you have learnt about, A washer is a thin plate (typically disk-shaped) with a hole (typically in the middle) that is normally used to distribute the load of a threaded fastener, such as a screw or nut. Other uses are as a spacer, spring, wear pad, preload indicating device, locking device, and to reduce vibration.

Rivets often regarded as a semi-permanent mechanical fastener having a cylindrical shaft with head on one hand and the end opposite the head is called buck-tail. A circlip, is a type of fastener or retaining ring consisting of a semi-flexible metal ring with open ends which can be snapped into place, into a machined groove on a dowel pin or other part to permit rotation but to prevent lateral movement.

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