

JOB ROLE – AUTOMOTIVE SERVICE TECHNICIAN

Sector: Automotive
(Qualification Pack Code : ASC/Q1401)



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Unit – 1 : Automobile and their Components
Session 7 : Transmission System

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Session Objectives

1. The student will be Able to explain transmission system
2. After this Session student Can Identify the components of Transmission system.

Introduction

Transmission System : Transmission system is used in motor vehicles to supply the output of the internal combustion engine to the drive wheels. The transmission reduces the higher engine speed to the slower wheel speed, increasing torque in the process.

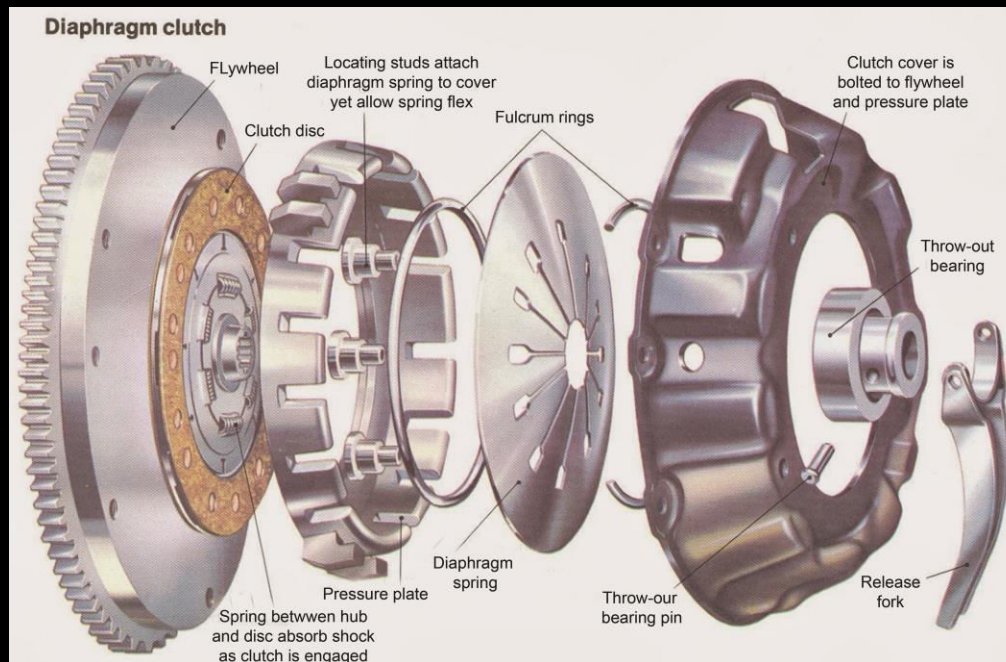
Transmission System

The transmission system consists of following components.

1. Clutch assembly
2. Gear box assembly (transmission case assembly)
3. Propeller shaft

Clutch assembly

Clutch is a mechanism which enables the rotary motion of one shaft to be transmitted, when desired. The axes of driving shaft and driven shaft are coincident.



Function of a clutch

1. To disconnect the engine power from the gear box as required under following circumstances.
 - (a) To start the engine and warm it up.
 - (b) To facilitate to engage 1st and 2nd gear to start the vehicle from rest.
 - (c) To facilitate to change the gear as required.
 - (d) Disconnecting drive from the engine to stop the vehicle after application of brakes.
2. Allow the engine to take up load gradually without shock or jerk.

Requirements of a Clutch

1. Torque transmission. The clutch should be able to transmit maximum torque of the engine.
2. Gradual engagement. The clutch should engage gradually to avoid sudden jerks.
3. Heat dissipation. The clutch should be able to dissipate large amount of heat which is generated during the clutch operation due to friction.
4. Dynamic balancing. The clutch should be dynamically balanced.

Requirements of a Clutch

5. Vibration damping. The clutch should have suitable mechanism to damp vibrations to eliminate noise produced during the power transmission.
6. Size. The clutch size should be as small as possible so that it will occupy minimum space.
7. Free pedal play. The clutch should have free pedal play in order to reduce effective load on the carbon thrust bearing and its wear.
8. Easy in operation. The clutch should be easy to operate requiring as little exertion as possible on the part of the driver.

The main parts of clutch are divided into three groups

1. Driving members. The driving members consist of a flywheel mounted on the engine crankshaft. The flywheel is bolted to a cover which carries a pressure plate or driving disc, pressure springs and releasing levers.
2. Driven members. The driven member consists of a disc or plate, called the clutch plate. It is free to slide lengthwise on the splines of the clutch shaft (primary shaft). It carries friction materials on both of its surfaces.
3. Operating members. The operating members consist of a foot pedal, linkage, release bearing, release levers and the springs.

Types of clutch

Different types of clutches are as follows:

1. Friction Clutch

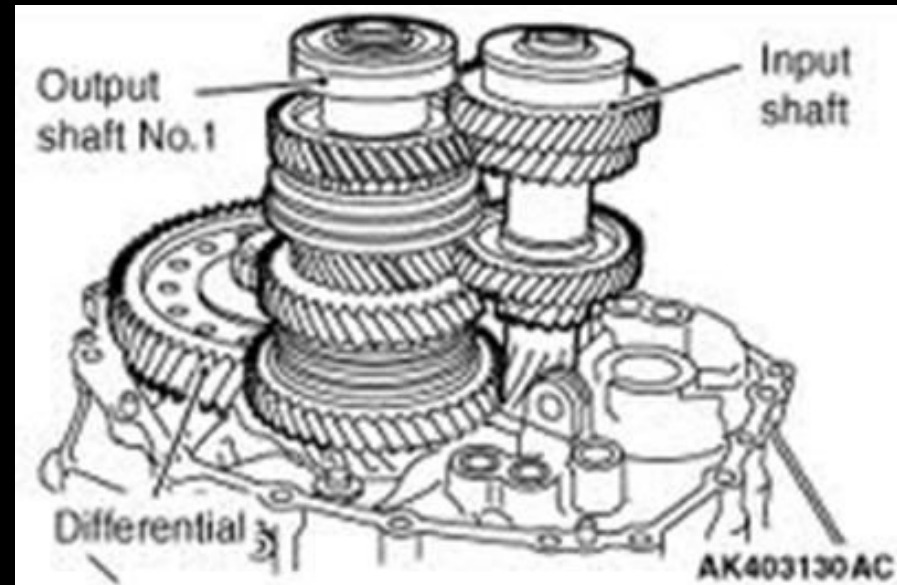
- Single plate clutch
- Multiplate clutch
- Wet
- Dry
- Cone clutch
- External
- Internal

Cont...

2. Centrifugal Clutch.
3. Semi-centrifugal Clutch.
4. Conical Spring Clutch or Diaphragm Clutch
 - Tapered finger type
 - Crown spring type.
5. Positive Clutch – Dog and spline Clutch
6. Hydraulic Clutch
7. Electro-magnetic Clutch.
8. Vacuum Clutch
9. Over running Clutch or free-wheel unit.

Gear Box Assembly

- We need different gear ratios in the gear box or transmission system to enable the vehicle move in different speed. As the engine speed increases the amount of torque is reduced in the fly wheel and it is required to select higher gear ratio.



Gear Box Function

1. The main purpose of the gear box is to provide a means to vary the leverage or torque ratio between the engine and the road wheels as required.
2. The transmission also provides a neutral position so that the engine and the road wheels are disconnected even with the clutch in the engaged position.
3. A means to reverse the car by selecting the reverse gear.

Summary

In this session you have learnt a following , Transmission system is used in motor vehicles to supply the output of the internal combustion engine to the drive wheels.

- The main purpose of the gear box is to provide a means to vary the leverage or torque ratio between the engine and the road wheels as required.
- The transmission also provides a neutral position so that the engine and the road wheels are disconnected even with the clutch in the engaged position. To disconnect the engine power from the gear box as required under Clutch .

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