

GANAPATI INSTITUTE OF ENGINEERING AND TECHNOLOGY (POLYTECHNIC)

JAGATPUR, CUTTACK

LECTURE NOTE

SUB-AUTOMOBILE ENGG. & HYBRID VEHICLES (TH-2)

PREPARED BY : SHUBHAJIT BISWAL

LECTURER

DEPARTMENT OF MECHANICAL ENGG.

Automobile

Automobiles means self-propelled vehicles.

A vehicle producing power within itself for its propulsion is known as self-propelled vehicle
eg: - car, jeep, bus etc.

A self-propelled vehicle used for transportation of goods and passengers on the ground is called an automobile.

Automobiles means which moves by itself. The automobile made up of a frame supporting the body and certain power developing and transmitting units. An automobile supported by tyres and wheels through springs and axels. The engine supplies power, this is delivered by the transmission system and rear axel through the clutch.

The automobile is propelled through the friction of the contact between the road and wheels.

Types of Automobile :-

- (i) with respect to use \rightarrow eg, car, truck, bus, tractor.
- (ii) with respect to capacity \rightarrow (a) heavy transport vehicles
(b) light transport vehicles
- (iii) with respect to fuel used :- petrol vehicles
diesel vehicles
gas vehicles
electric vehicles
steam vehicles
- (iv) with respect to the make :- TATA, leyland
Ambassador, vespa, BAJAJ.

1) with respect to the wheels and axles ⇒
two wheels, three wheels, four wheels,
six wheels.

2) with respect to the drive ⇒
left hand drive, right hand drive, front drive
rear wheel drive, single wheel drive.

3) with respect to the motion ⇒ reciprocating -
piston engine.
gas turbine.

4) with respect to the suspension ⇒
conventional - leaf spring
independent - coil, torsion bar.

5) with respect to the body & no. of doors ⇒

6) with respect to the transmission ⇒
conventional
semi-automatic
automatic.

main parts of Automobiles

- 1) Body
- 2) chassis

Body: - It is fitted to chassis to provide comfort and protection to the passenger.

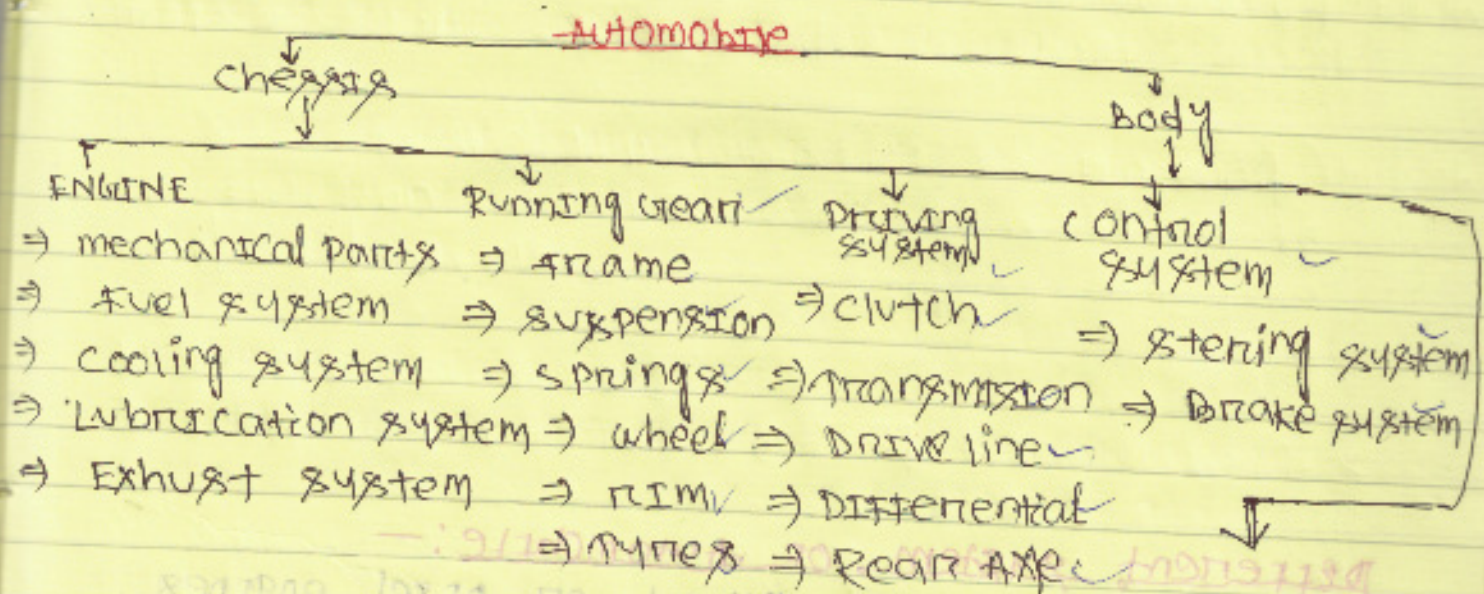
The body includes passenger compartment, bumpers, glass, paints, the traction, etc.

Chassis:- The chassis is the complete operating system capable of running with own power. The chassis includes engine, running gear, driving system, control system, electrical system.

There are two methods of body and chassis construction.

(i) Separate body and chassis construction.

(ii) Unibody construction or chassis less or integral construction. In which there is no mounting.



* A vehicle without body is called chassis. It is the backbone of the vehicle, all the moving rest.

(The base frame of vehicle)

Motor Vehicle Act: (10 Act)

→ Motor vehicle Act comes to play for road transportation technology development of road network.

→ Improving technology of the motor vehicle management.

- (I) Difference states should maintain a register driving license.
- (II) National road safety council, and state level council to be set up.
- (III) Straight procedure for issue driving license, involving driving skill, text drive. Comprehensive text knowledge.
- (IV) Drivers should attend a driving training school.
- (V) Driving license should be renewale.
- (VI) Validity as well as renewale driving license will be the basis of straight medical fitness.
- (VII) No minm educational qualification has been prescribe for drive of the vehicle.
- (VIII) Registration of the vehicle only fulfill safety standard of critical components. Safety standard, pollution standard to be lead down.
- (IX) Permiity of goods carriers will cover - 10 minm - four states, including the home state.
- (X) These individual will not more than five, ten permiity against the existing setting

CLUTCH :- A clutch is a mechanical device that engage and disengage power transmission special from a drive shaft to a driven shaft.

(i) A mechanism for connecting and disconnecting an engine and the transmission system in a vehicle or the working parts of any machine.

(ii) Working (function)

In the simplest application clutches connect and disconnect two rotating shaft. One shaft is typically attached to an engine and other to power unit the (driving member), all the other shaft (driven member), provides output power for work.

(iii) Typically the motion involved act rotating but inner clutches also exist.

Manual Transmission :-

→ most cars and trucks with manually transmission have clutch consisting of a friction disc.

→ which is operated using left pedal. with the motion transfer to the clutch using hydraulics or a cable.

→ The clutch is only disengage. At times when the driver is pressing the clutch pedal towards the floor.

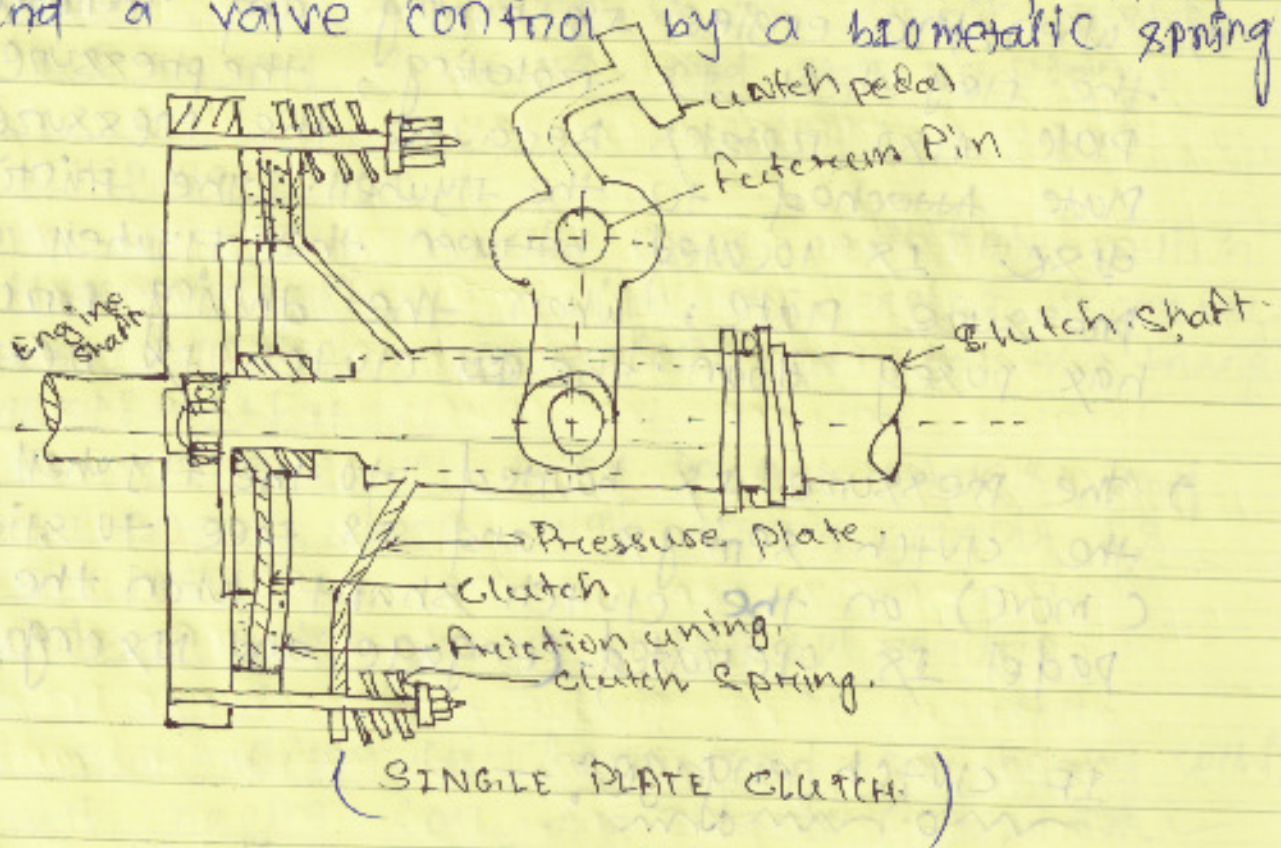
→ The clutch is very require for gear engage.

Automating Transmission :-

- Some automating transmission use a lockup clutch to prevent slipping of the torque
- some automating converter when crossing at higher speed.
 - The propose of lockup clutch is to improve fuel economic by minimize energy losse caused by slippage of the torque convert

Other Automatic Uses :-

- Car uses clutches. In places other than the drive train. for example a belt driven engine may have a cooling fan. may have heat activated clutch the driving a driven member are seperated by a seal con based fluid and a valve control by a biometalic spring.



04/10/22

Spark plug:- It is a device to produce electric spark to ignite the compressed air-fuel mixture inside the cylinder.

(ii) The spark plug is screwed in the top of the cylinder so that the electrode.

Construction:-

→ A spark plug consist on mainly 3 parts

i) Center electrode

ii) Ground electrode

iii) Insulation separating the two electrode.

→ The open end of center electrode the is connected to the spark plug terminal, where HT (high tension) cable from ignition coil is connected. It is surrounded by porcelain insulator.

→ The lower half portion of insulator is fasten with a metal shell.

→ The lower portion of the shell has a short electrode attached to the one side and beyond to words the center electrode. so that there is gap between two electrode. so that are thus separated by the insulation.

→ The sealing gaskets are provided between the insulator and the shell to prevent the escape the gases under the various temperature and pressure condition.

carburation of carburetor:-

(i) Carburation refers to entire process of, vaporization atomizing the petrol fuel and mixing it, with the air in varying proportion to suit the changing operating condition.