22MET101: Introduction to Mechanical Systems

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- Power plant of vehicles
- Frame and body
- Transmission and transmission systems
- Steering systems
- Electrical systems

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Mobility Systems

- Mobility systems refer to the technologies and infrastructure that enable movement, transportation, and logistics for people, goods, and services. They encompass a wide range of systems, including personal vehicles, public transportation, industrial logistics systems, and autonomous robotic systems.

Types of Mobility Systems:

Personal Mobility Systems:

1. Bicycles, scooters, mopeds etc.
2. Electric cars, motorcycles, and micro-mobility solutions.

Mobility Systems

Mobility Systems

Land Transportation Systems:

•Buses, trucks, trams or by animals

Merits:

- Economical over short distances
- Speedier movement
- Touching for-flung markets

Demerits:

- Uneconomical over long distances
- Not suitable for bulk transport

Mobility Systems

Rail Transportation Systems:

Merits:

- Large carrying capacity
- It is economical
- It is all weather modes
- It has containerisation

Demerits:

- Costlier over short distances
- Slower movement

Mobility Systems

Air Transportation Systems:

Merits:

- Fastest means of transport
- It is known for its dependable service during the times of floods, wars, earth-quakes
- Consumer satisfaction

Demerits:

- It is costlier means of transport
- Limited cargo capacity

Mobility Systems

Water Transportation Systems:

Merits:

- It is cheaper means of transport
- Most suitable for heavy and fragile products
- No problem of congestion

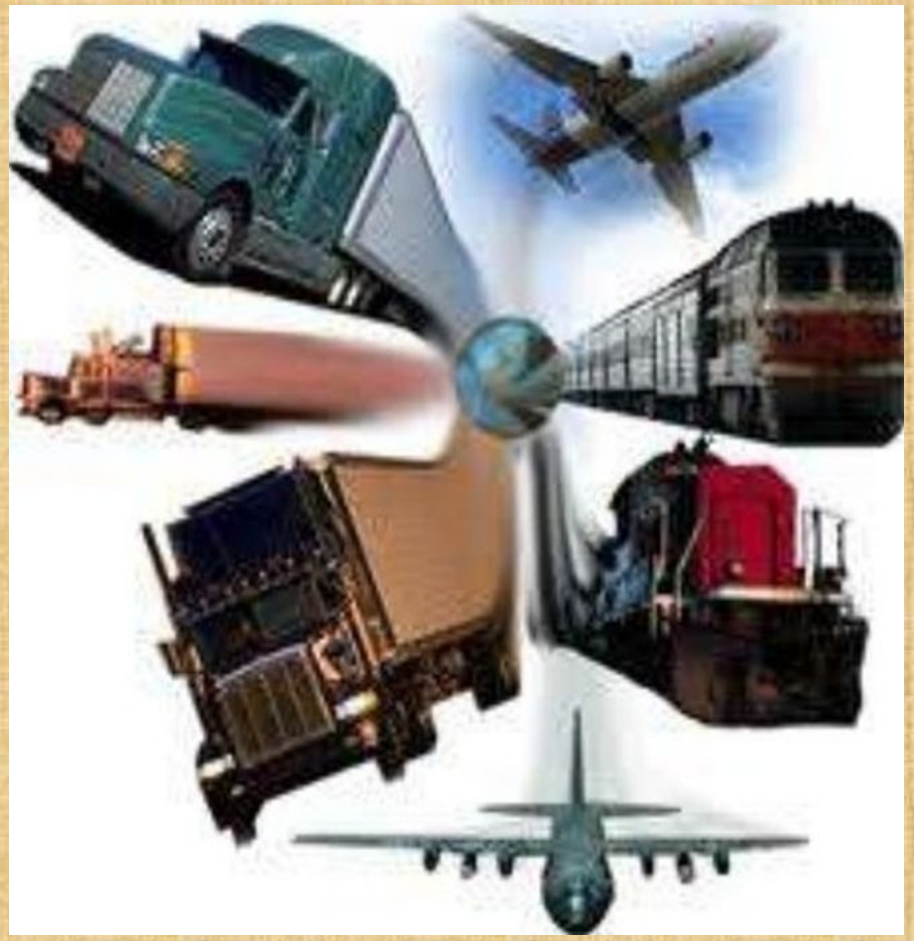
Demerits:

- Slow speed
- Unreliable

Mobility Systems

MULTI MODAL TRANSPORTATION

Combination of two or more modes of movement of goods, such as air, road, rail, or sea. Also called combined transport.



Merits:

- Cost of product is reduced
- Quick delivery

Mobility Systems

OTHER MODES

Pipeline transport sends goods through a pipe, most commonly liquid and gases are sent. For e.g. liquids/gases, any chemically stable liquid or gas can be sent through a pipeline. Long-distance pipe networks are used for petroleum and natural gas.

Unmanned aerial vehicle transport (drone transport)

Mobility Systems

OTHER MODES

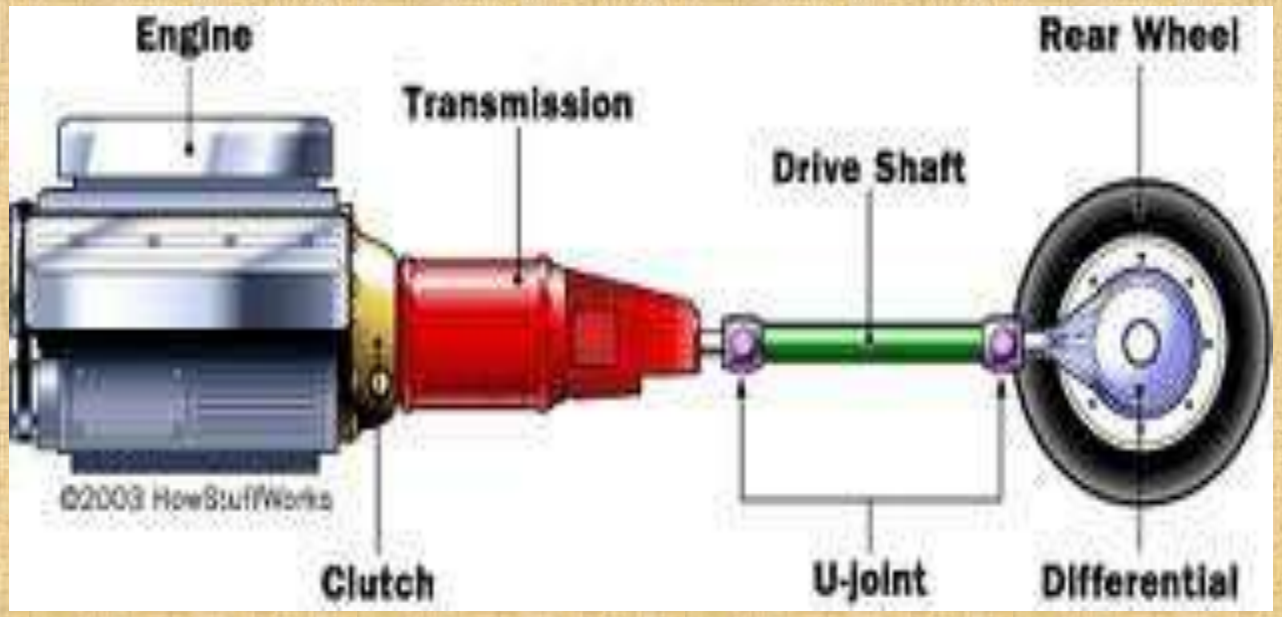
- Cable transport is a mode where vehicles are pulled by cables instead of an internal power source

- Typical solutions include aerial tramway, elevators, escalator etc.

Definition Of Transmission System :-

The mechanism that transmits the power developed by the engine of automobile to the engine to the driving wheels is called the TRANSMISSION SYSTEM (or POWER TRAIN).It is composed of –

- ***Clutch***
- ***The gear box***
- ***Propeller shaft***
- ***Universal joints***
- ***Rear axle***
- ***Wheel***
- ***Tyres***



The **steering system** of a vehicle is having the following requirements-

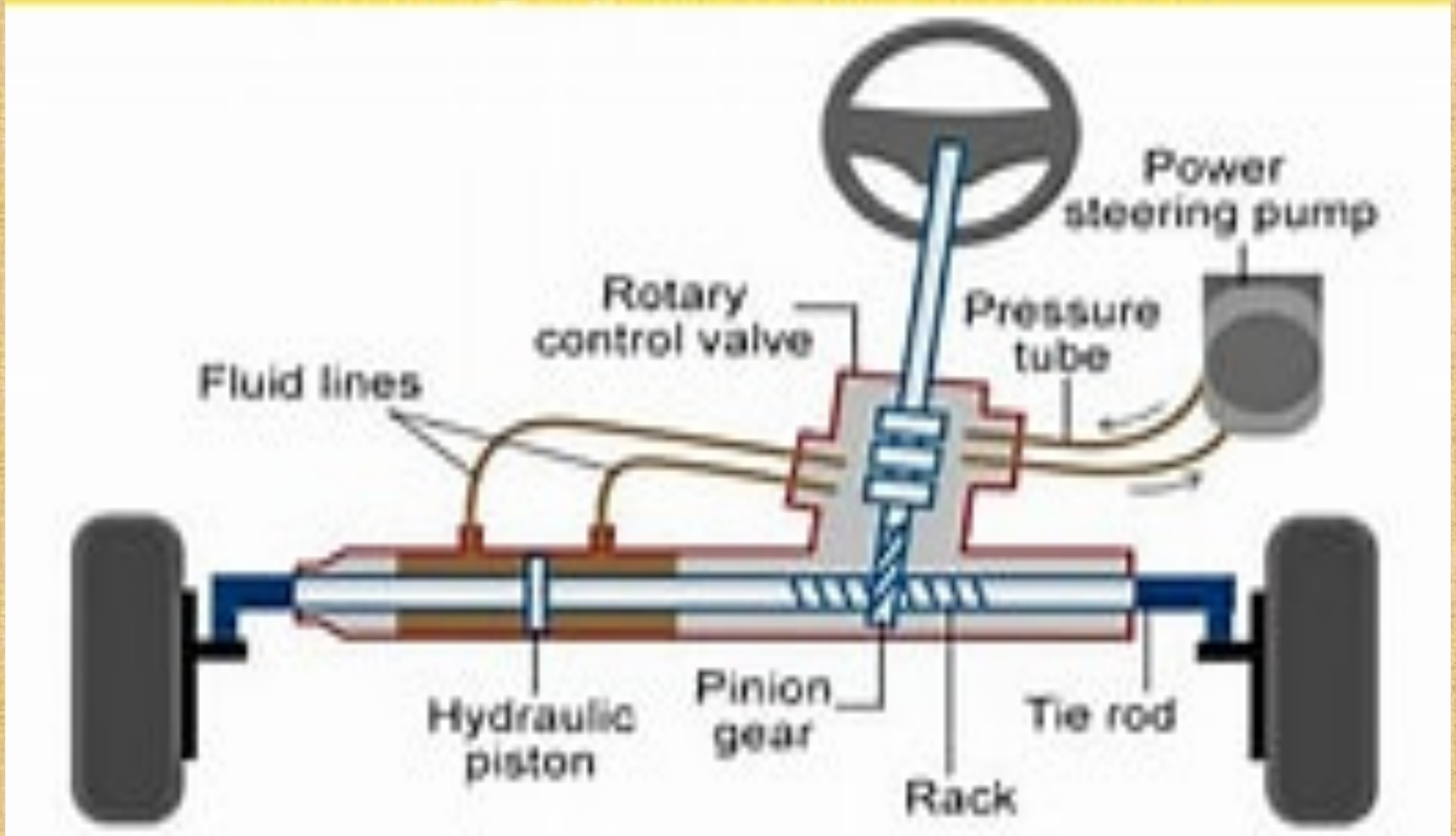
(1) It should be able to turn the vehicle with more mechanical advantage and less efforts.

(2) It should turn the wheel within shortest possible time

(3) There should be self-centering action in the steering geometry

(4) It should be certain degree irreversible so that the shocks of the roads surface are not transmitted to the hands of the driver.

Steering System Information



What is the Frame of a Car? Definition

Car Frame components include the frame and underbody. Upon mounting the frame, the remaining chassis part is attached. The frame holds together the major parts like a skeleton. On the front side of the frame is mounted the engine.

In addition to the engine, the clutch and transmission systems are also mounted on the front side of the car. For shock absorption, the suspension system supports the frame on the body's wheels.

Thank You