Front axle and Steering System

Front axle

* Front axle is designed to transmit the weight of the automobile from the spring to the front wheels, turning right or left as required.

* To prevent interference due to front engine location and for providing greater stability and safety at high speed by lowering the center of gravity of the road vehicle, the entire center portion of the axle is dropped

* Front axle includes the axle beam stub axle with brake assemblies, track rod and stub axle arm

* Front axle can be live axles and dead axle. A live front axle contains the differential mechanism through which the engine power flow ~~through~~ towards the front wheel.

* The front axle are generally dead axles, which does not transmit power.

* The front wheel shules rotate on anti friction bearing of tapered - roller type on the Steering spindles, which are an integral part of Steering Knuckle.

* To permit the wheels to be turned by the Steering gear, the Steering spindle and Steering Knuckle assemblies are hinged on the end of axles.

* The pin that forms the pivot of this hinge is known as king pin or Steering Knuckle pin.

* Generally dead front axles are three types

- Elliot type front axle
- Reverse Elliot type front axle
- Lemoine type front axle.

* In the Elliot type front axle the yoke for king spindle is located on the end of the I-beam. The axle end are forked to hold the steering knuckle extension between them.

* The reversed elliot front axle have hinged spindle yoke on spindle it self instead of on the axle. The forked portion is integral with steering knuckle. This type is commonly used, as this facilitates the mounting of brake backing plate on the forged leg of the steering knuckle.

* In Lemoine type front axle, instead of a yoke type hinge, an L-shaped spindle is used, which is attached to the end of the axle by means of pivot - It is normally used in tractors.

* The axle beam in use is of I or H-section and is manufactured from alloy forged steel for rigidity and strength

* As compared to dead front axle, a totally different type of swivelling mechanism is used on live front axle.

* To connect the wheel hub axles with driving axle shafts, constant velocity joints are used for the vehicles fitted with the front live axles.

* Hooke, Rzeppa or Birfix constant velocity or universal joints are normally used.