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NAME OF THE PROGRAMME : B.VOC AUTOMOBILE TECHNOLOGY

PROGRAM CODE :**3UAB.VOCAT**

COURSE CODE :**AT17302**

COURSE NAME : AUTOMOTIVE TRANSMISSION SYSTEM

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DESIGNATION : GUEST FACULTY

TOPIC : **JOINT AND WHEEL SYSTEM**

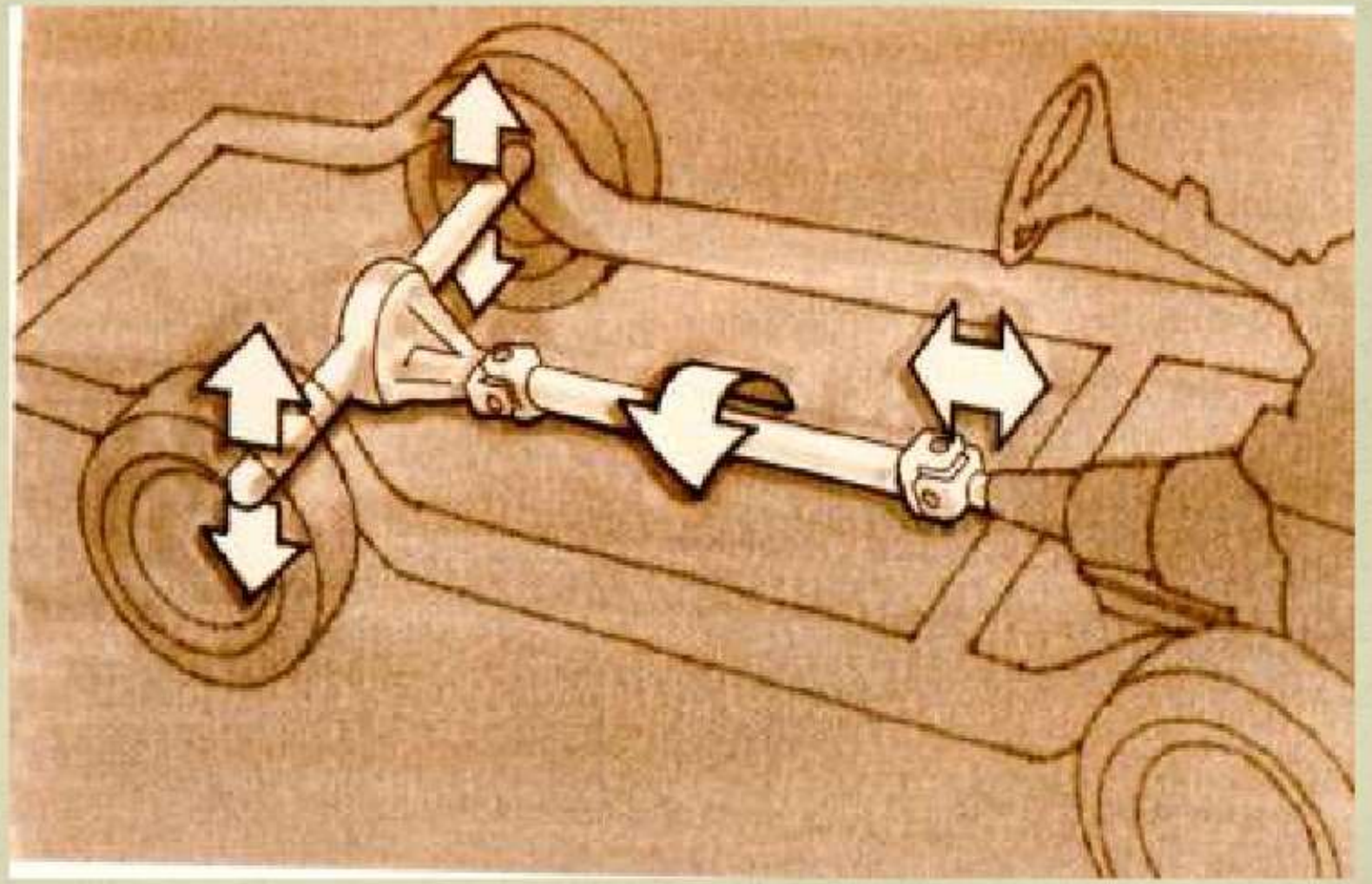
PROPELLOR SHAFT

PROPOELLOR SHAFT TRANSMITS THE ENGINE TORQUE FROM THE GEAR BOX/TRANSFER CASE TO THE DIFFERENTIAL.

PROPELLOR SHAFTS CAN BE EITHER :

SINGLE PROPELLOR SHAFT
SPLIT PROPELLOR SHAFT

PROPELLER SHAFT



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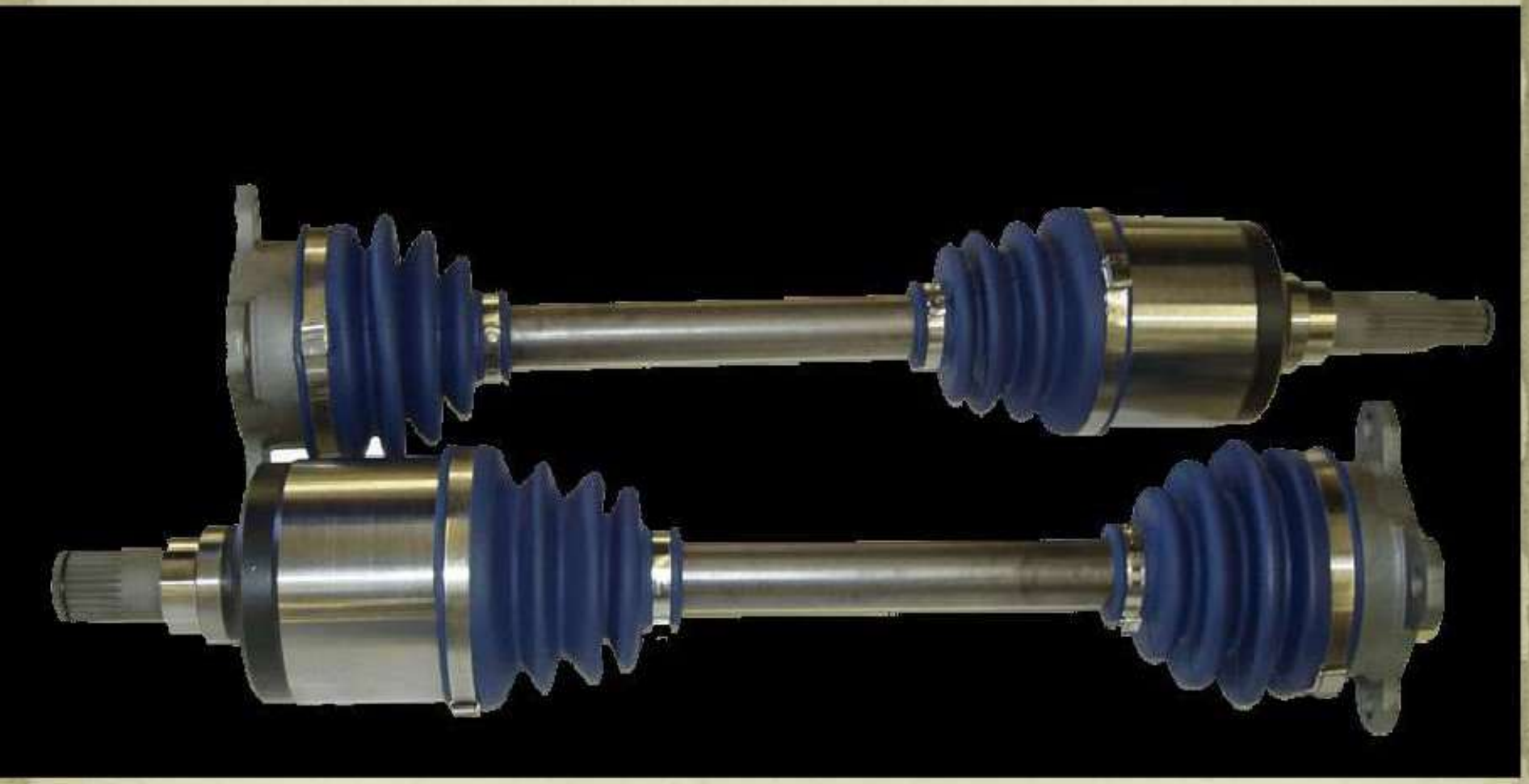
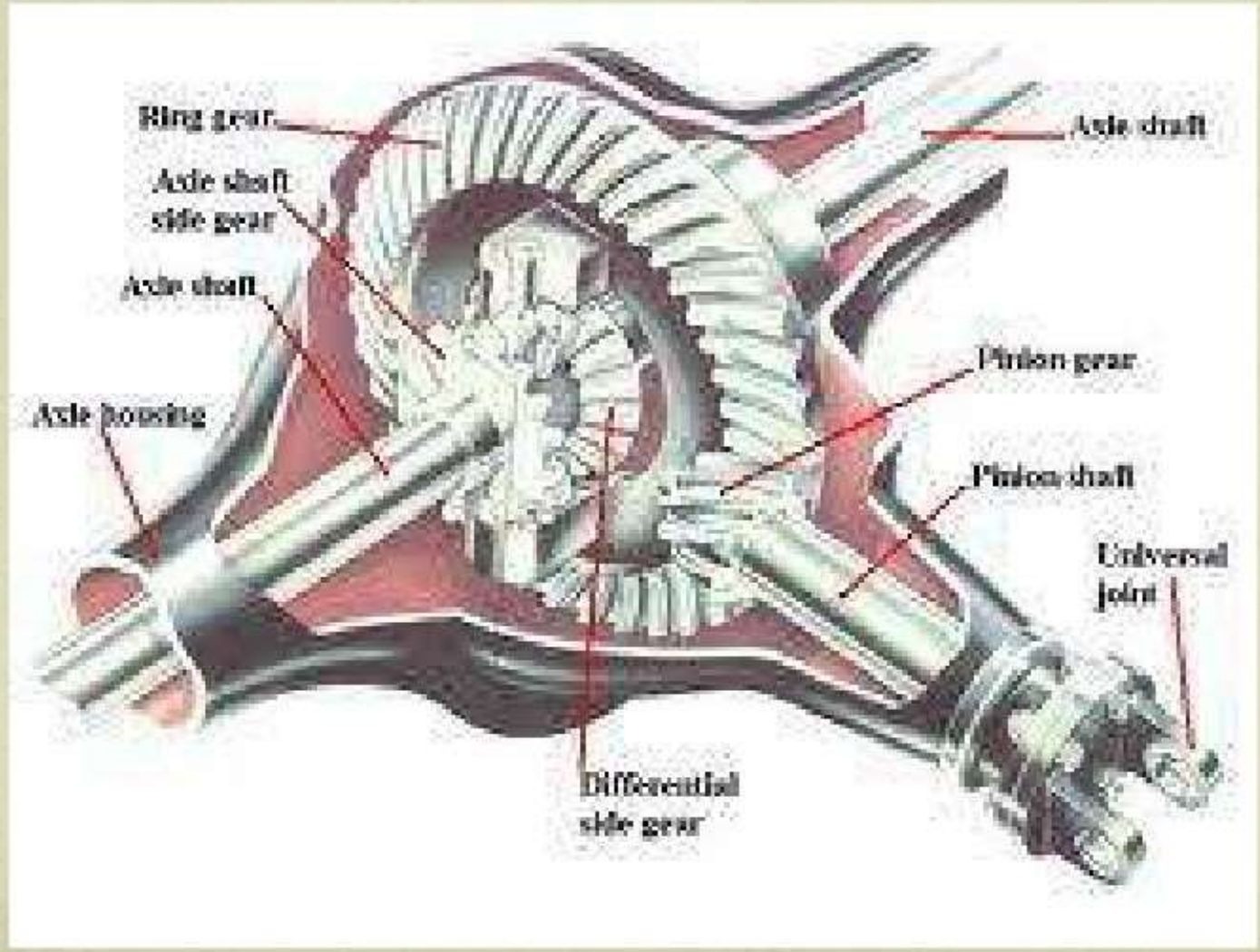
- To transmit power from one point to another in a smooth, continues action.
- In trucks and construction equipment, the propeller shaft is designed to send torque through an angle from the transmission to the axle(or auxiliary transmission).
- The Propeller shaft must operate through constantly changing relative angles the between transmission and axle.
- - it must also be capable of changing length while transmitting torque.
- - The axle of a vehicle is not attached directly to the frame, but rides suspended by springs in an irregular, floating motion.

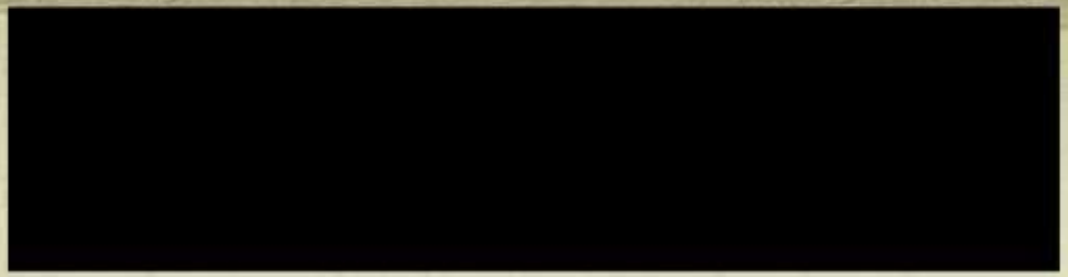


- To transmit required torque loads, the propeller shaft must be durable and strong. Forged steel and high-strength, cast, end yoke for heavy-duty vehicles are used to provide the necessary rigidity required to maintain bearing alignment under torque loads.
- Anti-friction bearings are used to with stand oscillating loads while the propeller shaft is rotating at high speeds. The needle roller bearings on the cross trunnions carry large loads and are used because of their high capacity in a limited space.

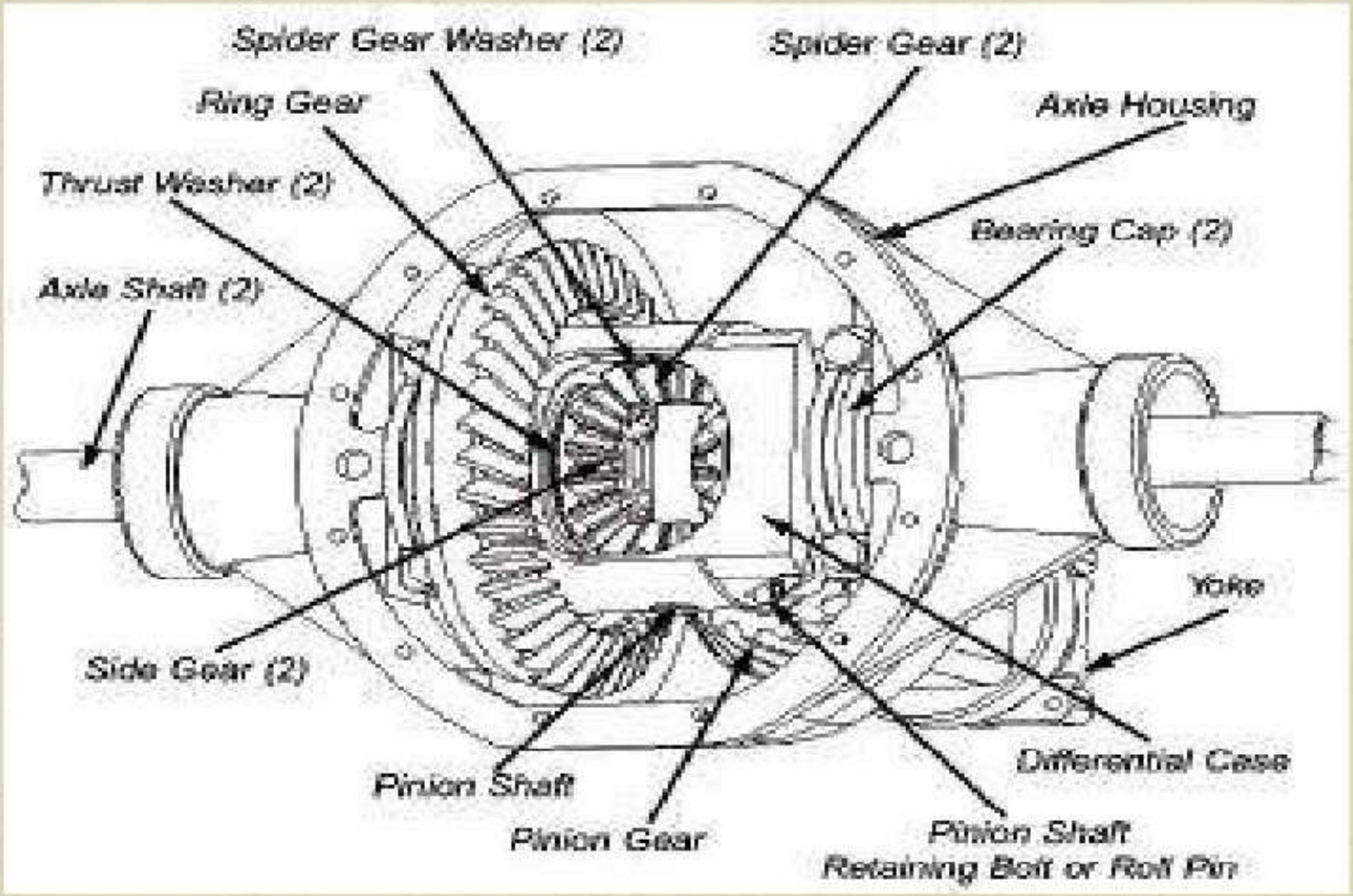
- Special high-strength tubing is used to provide maximum torque carrying capacity at minimum practical weight. Propeller shafts have been developed to meet the vehicular industry needs.

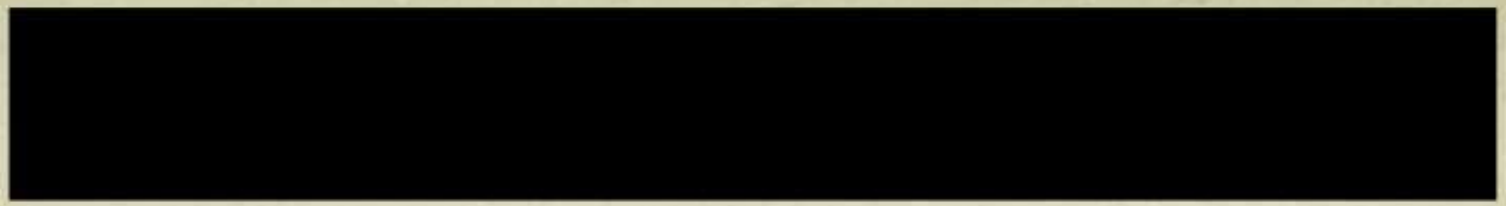
- The sliding plines betweens lip joint and permanent joint must support the propeller shaft and be capable of sliding under full torque loads.


Ring gear
Axle shaft
Axle shaft side gear
Axle shaft
Axle housing
Pinion gear
Pinion shaft
Universal joint
Differential side gear



- Differential is a very important part in a vehicle, as a component transfer the engine power is transmitted to the wheels. Engine power is transferred by a rear propeller shaft to wheel first changed direction by differential rotation are then referred to rear axle shafts after that to the rear wheels.

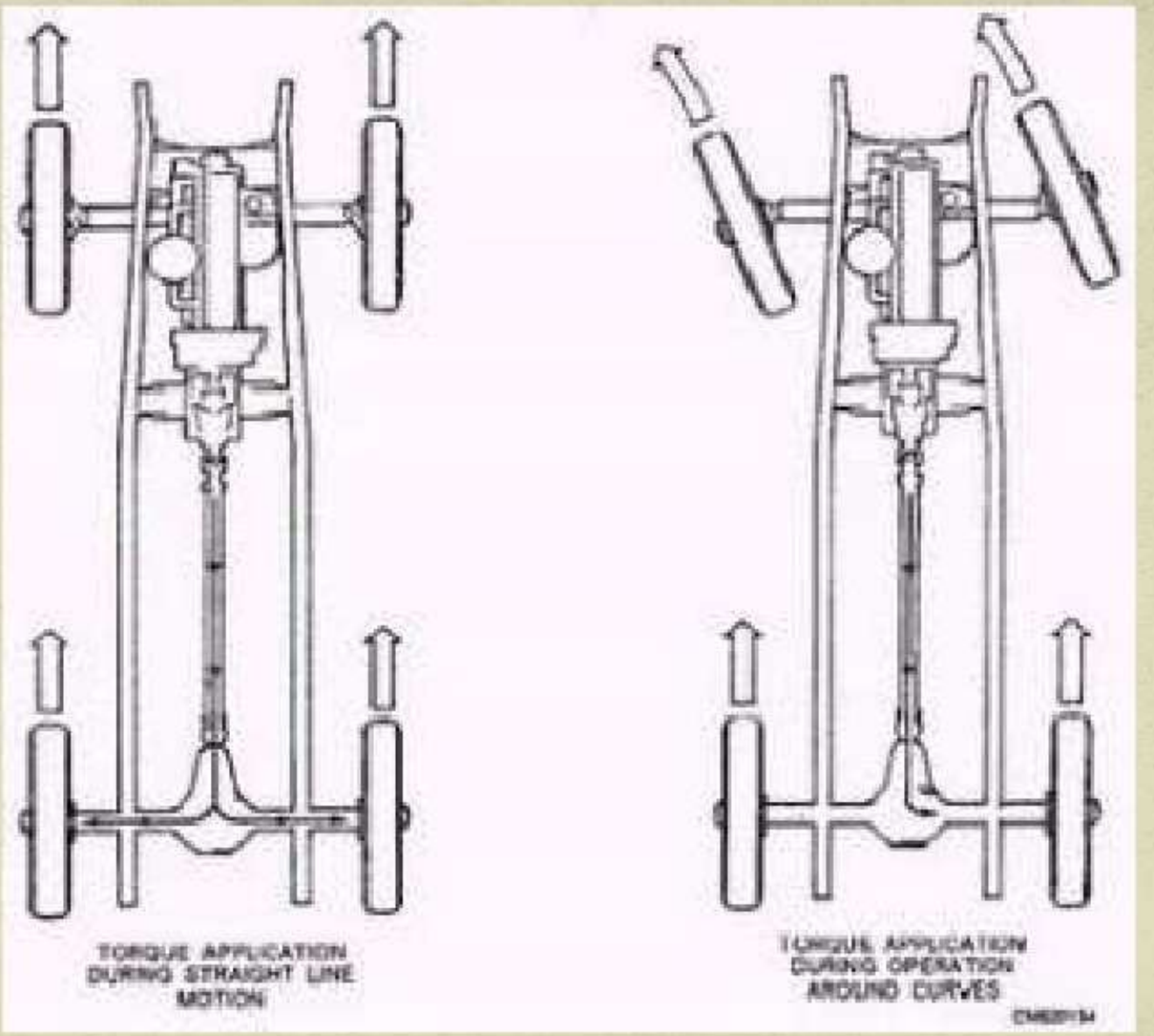

Spider Gear Washer (2)
Spider Gear (2)
Ring Gear
Axle Housing
Thrust Washer (2)
Bearing Cap (2)
Axle Shaft (2)
Yoke
Side Gear (2)
Differential Case
Pinion Shaft
Pinion Gear
Pinion Shaft
Retaining Bolt or Roll Pin



1. Bevel Pinion
2. Crown Wheel / Ring Gear
3. Half Axle
4. Sun Gear
5. Star Gear
6. Cage
7. Bearing

- At the time of straight road.

  During the vehicle runs straight, the wheels of the rear axle will be screened by the drive pinion through the ring gear differential case, wheel-wheel differential gear pinion shaft, wheel-pinion differential gears, side gear teeth is not spinning, remain to be drawn into the ring gear rotation. Thus the spin on the wheel left and right alike.


TORQUE APPLICATION
DURING STRAIGHT LINE
MOTION
TORQUE APPLICATION
DURING OPERATION
AROUND CURVES

WHEELS

WHEELS CARRY THE LOAD OF THE VEHICLE & TRANSMIT THE TORQUE TO THE TYRES

WHEELS ARE SUPPORTED IN WHEEL BEARINGS

BASED ON WAY IN WHICH THE LOAD IS CARRIED AND THE TORQUE IS TRANSMITTED, THE AXLE CAN BE CLASSIFIED AS :

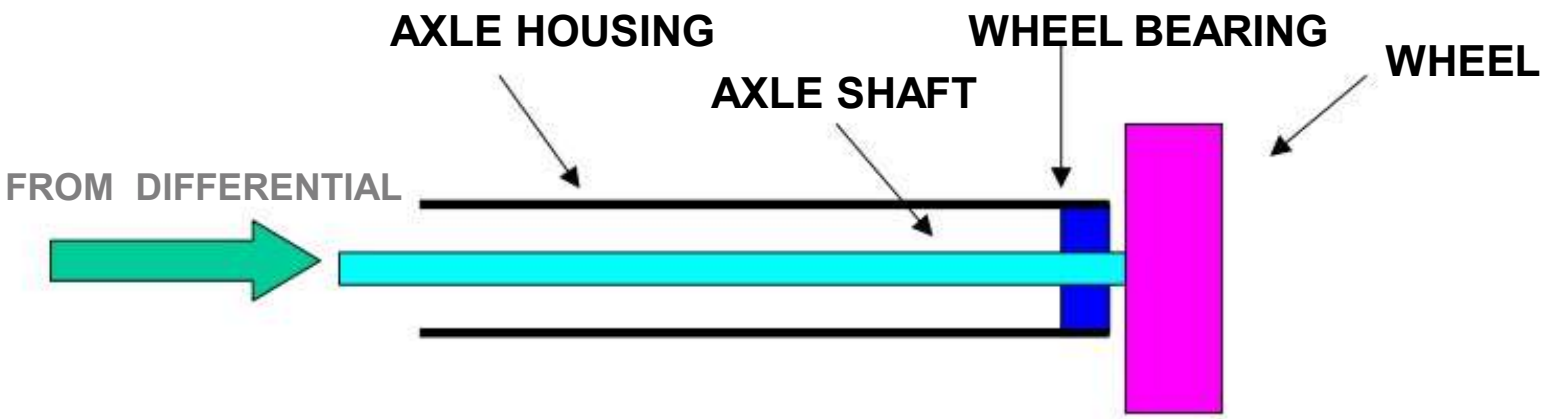
SEMI-FLOATING AXLE - In which the vehicle load as well as the torque are transmitted by the axle shaft

FULL FLOATING AXLE - In which the axle shaft only transmits the drive torque to the wheels. The vehicle load is taken up by the rear axle housing.

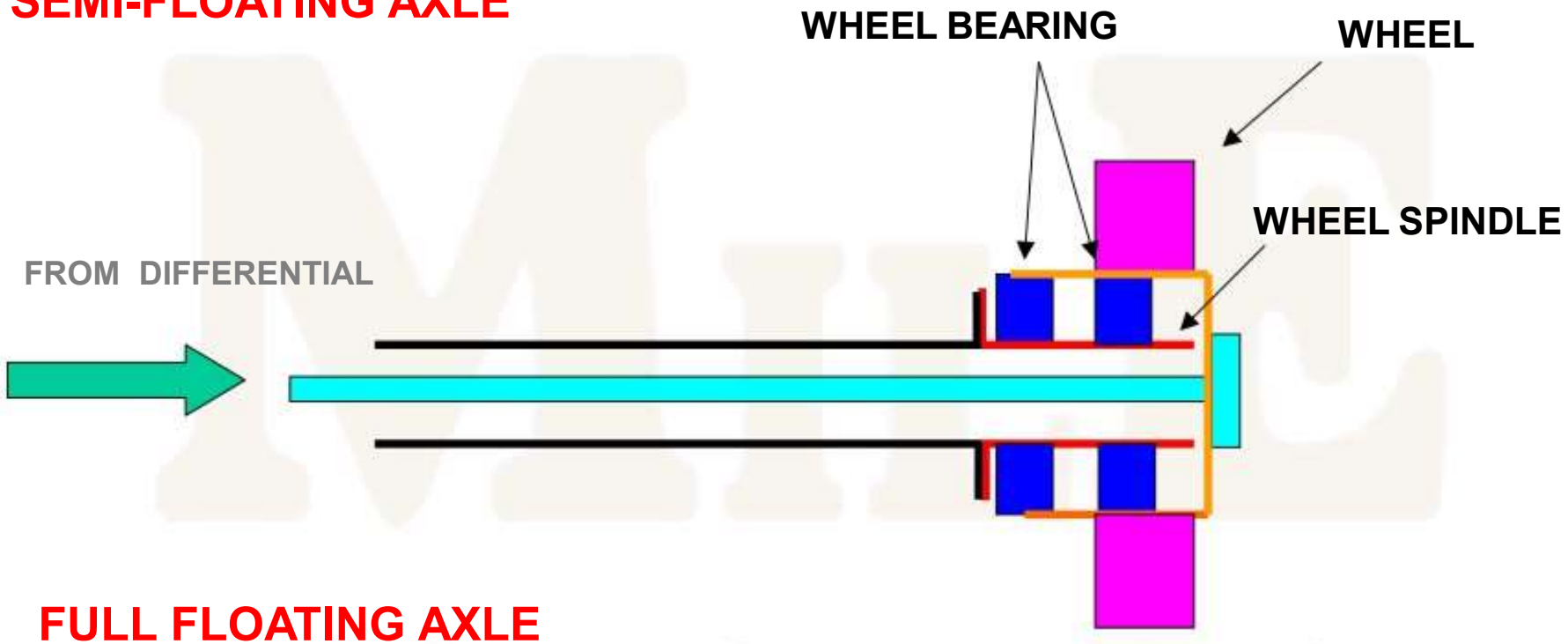
COMPONENTS OF WHEELS

- AXLE SHAFT
- WHEEL SPINDLE
- WHEEL BEARINGS

WHEELS



SEMI-FLOATING AXLE



FULL FLOATING AXLE

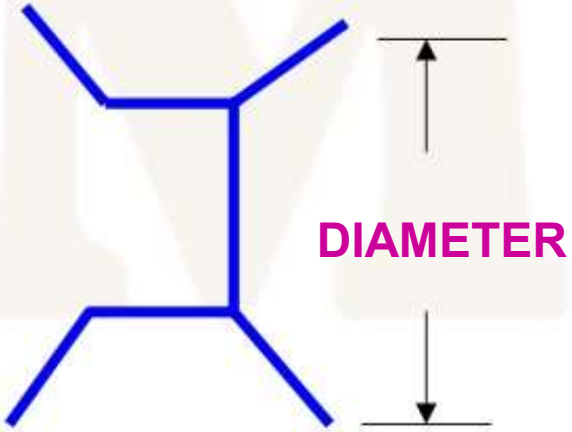
WHEEL RIM

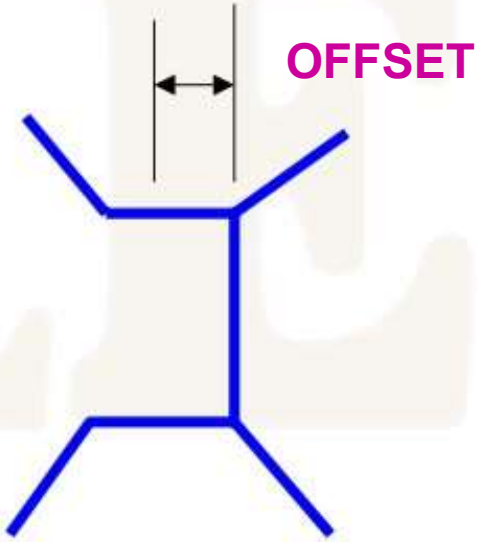
WHEEL RIMS ARE ATTACHED TO THE WHEEL AND CARRY THE TYRE & TUBE AT THE OTHER END.

WHEEL RIMS ARE SPECIFIED AS :

1. WHEEL RIM DIAMETER - The diameter of the wheel rim is specified in inches - 16”, 15” etc

2. WHEEL RIM OFFSET - It is the difference between the wheel rim centre and the wheel rim mounting face





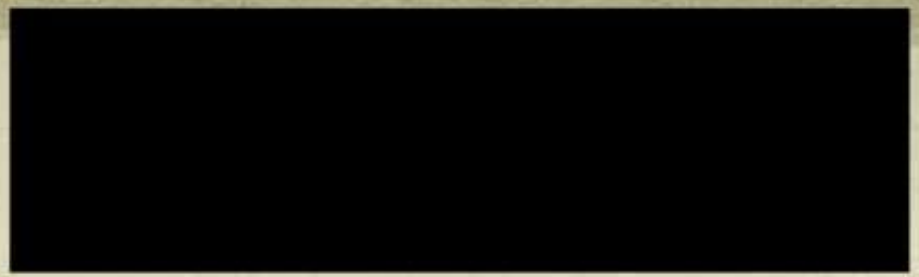
WHEEL RIM

WHEEL RIM SPECIFICATIONS

6J X 15

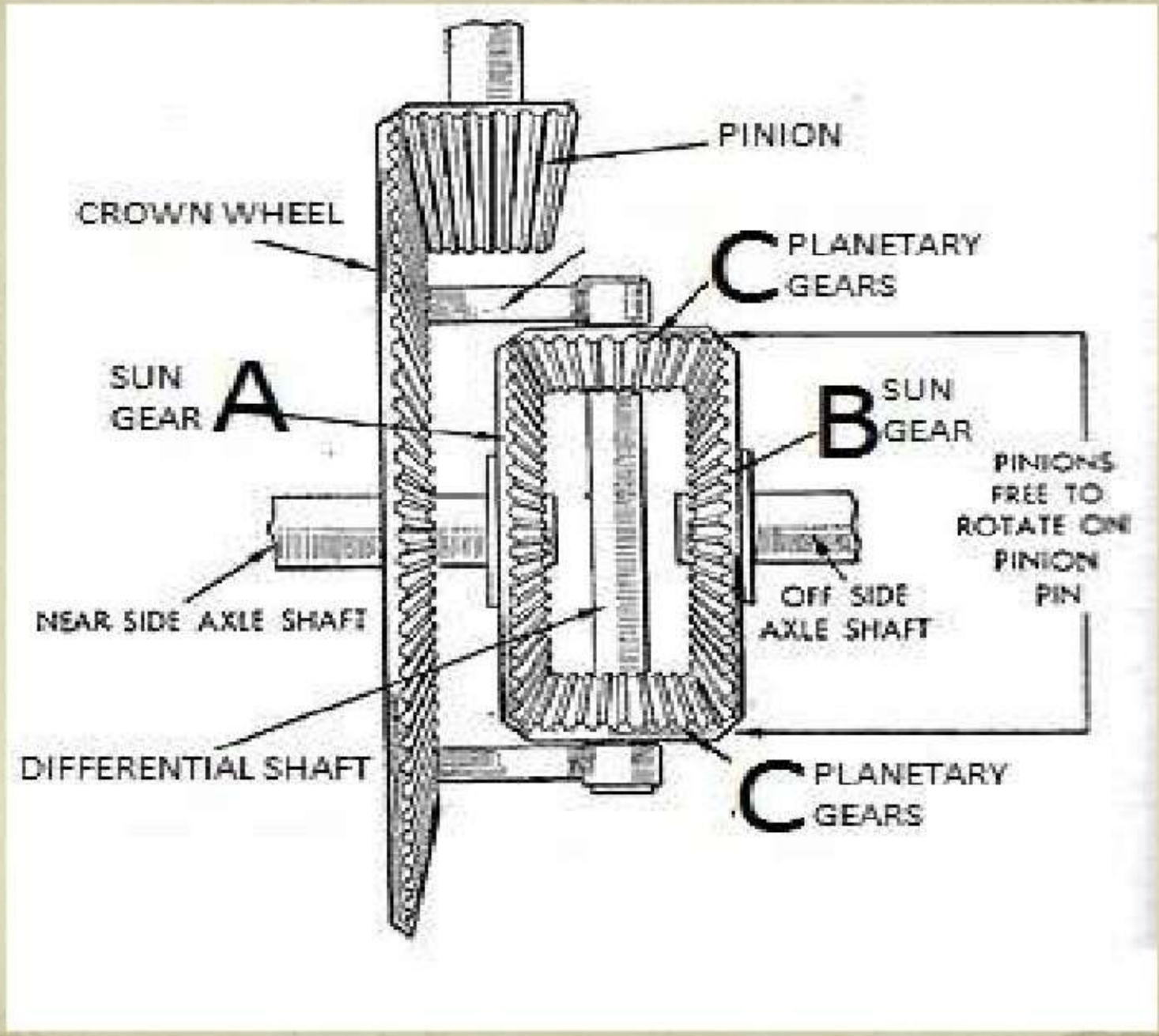
WHEEL RIM OFFSET

WHEEL RIM DIAMTER, in



- At the time of turning.
  At the time of vehicle turning left prisoners left wheel is bigger than the right wheel. If the differential case with the ring gear rotates the pinion will rotate on its axis and also the movement around the left side gear, so round the right hand side gear increases, the side where the number of revolutions of the gear which is 2 times round the ring gear. It can be said that the average second round gear is comparable with the rotary ring gear. as it should.

1. The basic principle of the differential gear unit can be understood by using equipment that consists of two gears pinion and rack.
2. Both rack can be moved in the vertical direction as far as the weight rack and slip resistance will be lifted simultaneously. Placed between the tooth pinion rack and pinion gear connected to the braces and can be moved by these braces.


PINION
CROWN WHEEL
C PLANETARY GEARS
SUN GEAR A
B SUN GEAR
PINIONS FREE TO ROTATE ON PINION PIN
NEAR SIDE AXLE SHAFT
OFF SIDE AXLE SHAFT
DIFFERENTIAL SHAFT
C PLANETARY GEARS

1. When the same load “W” placed on each rack then braces (Shackle) is pulled up the second rack would be lifted at the same distance, this will prevent the pinion gear does not rotate.

2. But if a greater burden placed on the left rack and pinion buffer will then be drawn up along the gear rack rotates the load gets heavier, which is attributed to differences in prisoners who are given the pinion gear, so the smaller the burden will be lifted.

DIFFERENTIAL

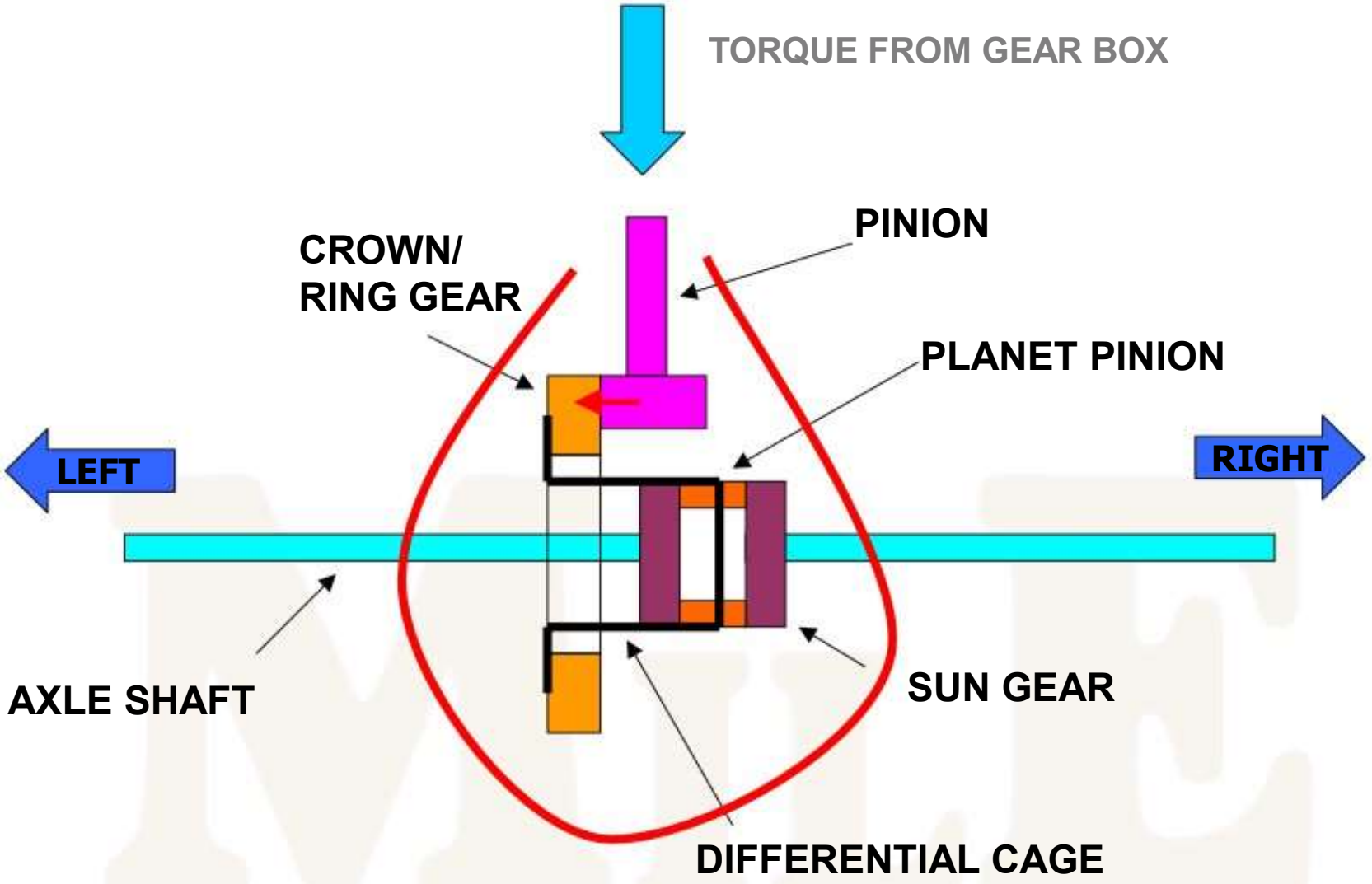
DIFFERENTIAL RECEIVES TORQUE FROM THE GEAR BOX, MODIFIES AND TRANSMITS IT TO THE WHEELS, IN A PERPENDICULAR DIRECTION.

DIFFERENTIAL ALSO ALLOWS EACH WHEEL TO ROTATE AT DIFFERENT SPEEDS, ESPECIALLY WHEN THE VEHICLE TAKES A TURN

COMPONENTS OF DIFFERENTIAL

- CROWN WHEEL /PINION (REAR AXLE RATIO)
- DIFFERENTIAL GEARS

DIFFERENTIAL



SYSTEMS IN AN AUTOMOBILE

A. POWER TRAIN SYSTEM

- POWER PLANT (POWER GENERATION - ENGINE)
  - ENGINE
  - FUEL SYSTEM
  - INTAKE SYSTEM
  - EXHAUST SYSTEM
  - COOLING SYSTEM
- DRIVE LINE (POWER TRANSMISSION)
  - CLUTCH
  - GEAR BOX/TRANSMISSION
  - TRANSFER CASE
  - DIFFERENTIAL
  - WHEELS/TYRES

B. RUNNING SYSTEM

- SUSPENSION
- STEERING
- BRAKING

C. COMFORT SYSTEM

- HVAC/AC/HEATER SYSTEM
- SEATING/UPHOLSTRY/FACIA/INSTRUMENTS
- AUDIO/VIDEO/GPS