



# FRONT END LOADER



## NEED FOR FRONT END LOADER

Normally the dumpers used for carrying the loosen materials from one place to another. But the dumper cannot grab the loosen material from the ground surface. By the use of front end loader we can grab the loosen materials from the ground and also we can transmit that loosen material to the required destination with the help of a front bucket.

## FRONT END LOADER

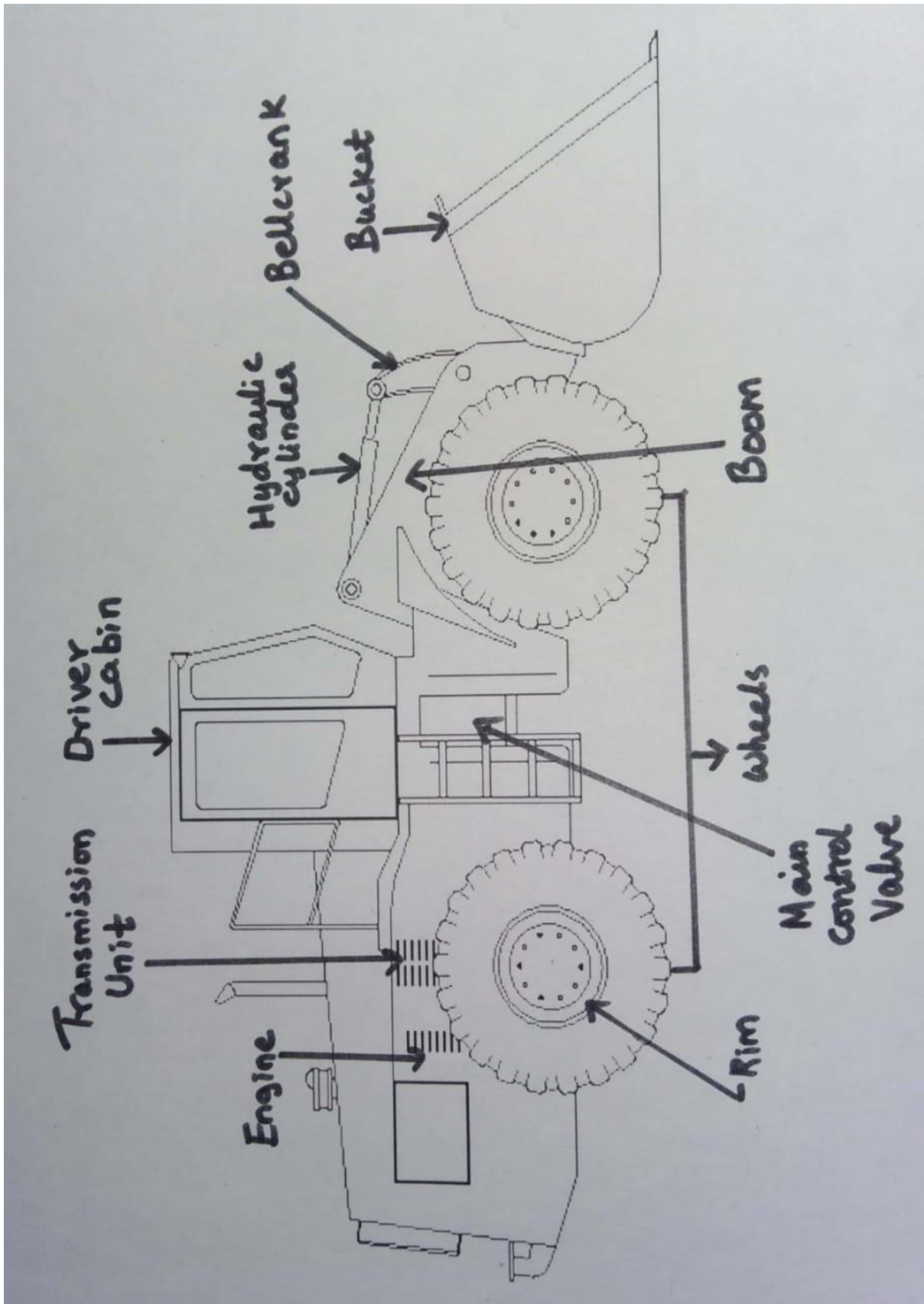
A loader is a type of tractor, usually wheeled, sometimes on tracks, that has a front-mounted square wide bucket connected to the end of two booms (arms) to scoop up loose material from the ground, such as dirt, sand or gravel, and move it from one place to another without pushing the material across the ground. A loader is commonly used to move a stockpiled material from ground level and deposit it into an awaiting dump truck or into an open trench excavation. The loader assembly may be a removable attachment or permanently mounted. Often the bucket can be replaced with other devices or tools.

## MAIN COMPONENTS

- Engine and Transmission unit
- Hydraulic pumps
- Main control valve
- Hydraulic cylinders
- Front Bucket
- Boom
- Wheel or track
- Driver cabin
- Hydraulic Steering (Orbitrol Steering system)
- Hydraulic braking System



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### CONSTRUCTION DETAILS

The major components included in a loader are the engine (diesel in almost all cases), the hydraulic components (such as pumps, motors and valves) and the transmission components (gearbox, axles, wheels/tracks, pumps, motors, etc.). The engine runs both the hydraulics and the transmission, and these in turn move the front attachment (a bucket, forks, sweeper, etc.) to manipulate the material which we are handling (sand, gravel, cereal, manure or anything else) and the wheels or tracks to move the machine around the jobsite.

The engine power as mentioned above is utilised for the two purposes. The first purpose is for moving the vehicle by transferring the power from the engine to the wheels or tracks through the transmission unit. The second purpose is to use the engine power for moving the boom for operating the front bucket by transferring the power from engine to the part of the loader (Bucket, Boom) that needed to be moved. The second purpose is done successfully by the use of hydraulic arrangement. The hydraulic arrangement comprises of Hydraulic pump, Hydraulic cylinder, Fluid reservoir and Control valve. The Hydraulic cylinders are attached to the respective components that needed to be moved for performing a specific task like moving of buckets etc.

The hydraulic pump is connected to the engine through a chain or belt drive. The power from engine is first transmitted to the Hydraulic pump. With the help of the engine power, the hydraulic pump pressurize the Hydraulic fluid and then pressurised fluid is sent to the respective hydraulic cylinder through the tubes for performing the specified task. The hydraulic system is operated by means of the control valves operated by the levers provided in the driver cabin. The driver cabin is provided with the FOPS (Falling Object Protection Structure) for providing the safety for the driver while operating the vehicle.

The Steering system used in the front end loaders is the Orbitrol steering system, which moves the front wheel tyres according to the direction given by the driver through the steering wheel. In case of tracks are used instead of tyres, then the steering system will be different. The two levers were used to give direction for the vehicle. The braking system is operated by means of hydraulic system.



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### APPLICATION

- ❖ In construction areas loaders are also used to transport building materials - such as bricks, pipe, metal bars, and digging tools - over short distances.
- ❖ Front loaders are commonly used to remove snow.
- ❖ Used in Mining areas
- ❖ Levelling the ground surface.
- ❖ Transporting the loosen materials to the dump truck

### MANUFACTURING COMPANIES

- ❖ Volvo
- ❖ Caterpillar
- ❖ Mahindra
- ❖ JCB
- ❖ Komatsu