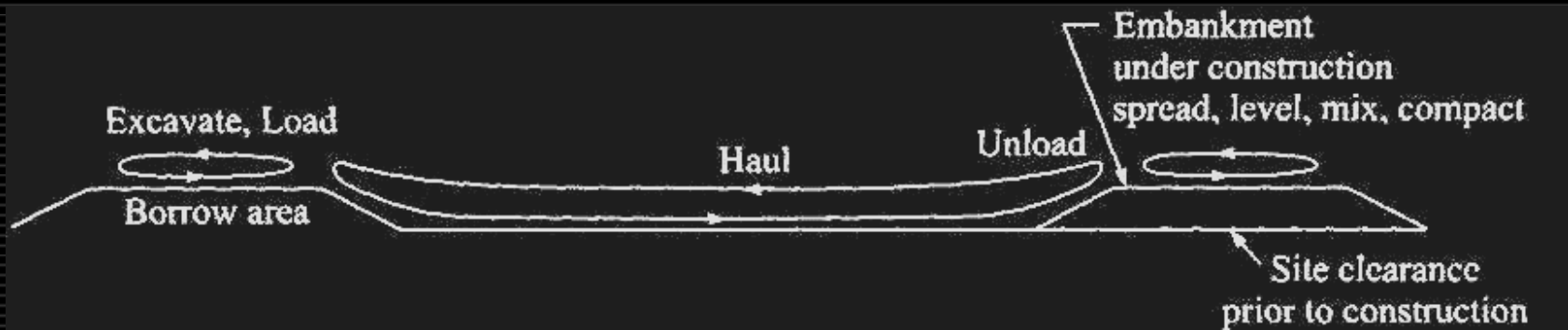


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- Subject: Advanced Building Construction & Services
 - Topic: Excavators
 - Presented by: Balraj Marjara
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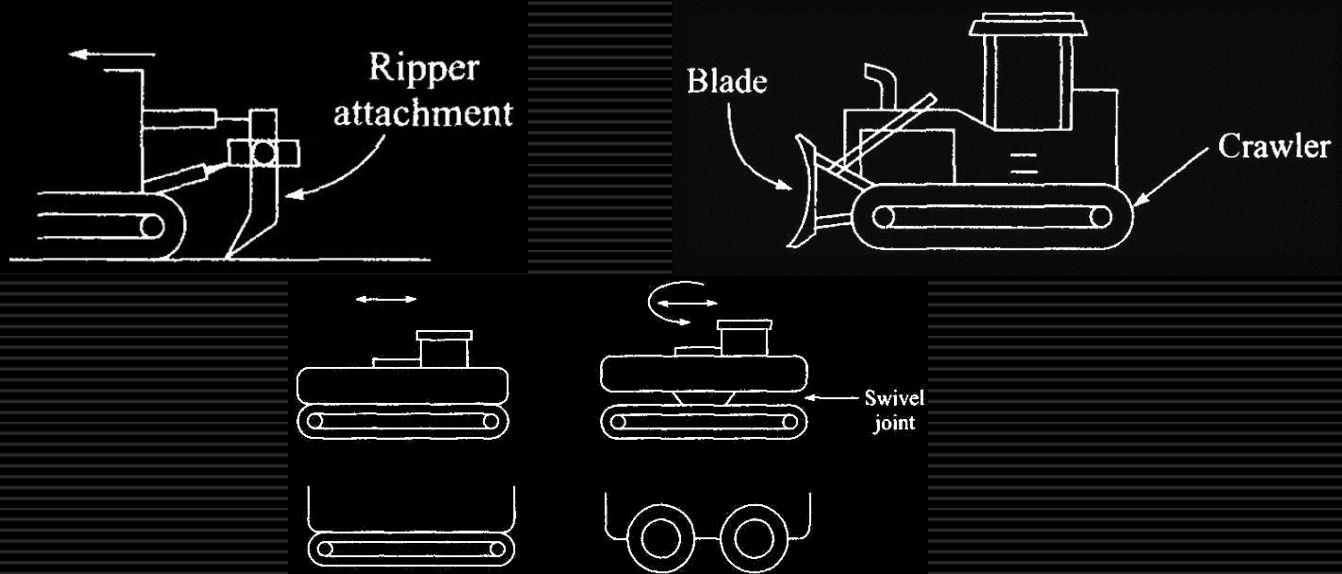
EARTHWORK AND EXCAVATIONS

THE PROCESSES BY WHICH SOIL IS EXCAVATED FROM THE SURFACE OF EARTH, TRANSPORTED TO ANOTHER LOCATION AND PLACED THERE TO ACHIEVE AN ENGINEERING OBJECTIVE ARE COLLECTIVELY REFERRED TO AS EARTHWORK. THESE MAY INVOLVE ONE OR MORE OF THE FOLLOWING OPERATIONS:

1. SITE CLEARANCE INCLUDING DEMOLITION AND STRIPPING OF TOP SOIL,
2. EXCAVATION OF SOIL,
3. LOADING OF SOIL,
4. HAULAGE, THAT IS, TRANSPORTATION OF SOIL,
5. UNLOADING OF SOIL,
6. SPREADING AND LEVELING OF SOIL,
7. MIXING OF WATER OR ADDITIVES TO SOIL INCLUDING BREAKING DOWN SOIL LUMPS OR CLODS,
8. COMPACTION OF SOIL.



EQUIPMENT USED IN EARTHWORKS IS REFERRED TO AS EARTHMOVING EQUIPMENT. IT INCLUDES EQUIPMENT USED FOR EXCAVATING, LOADING, TRANSPORTING, SPREADING, LEVELING, MIXING AND COMPACTING SOIL. ALL THESE TYPES OF EQUIPMENT ARE DESCRIBED BRIEFLY IN THIS SECTION WITH THE EXCEPTION OF COMPACTION EQUIPMENT THAT HAS BEEN DISCUSSED IN A SEPARATE SECTION FOR INCREASED EMPHASIS.

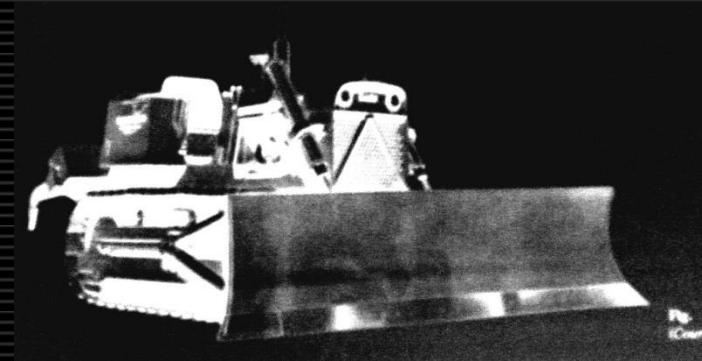


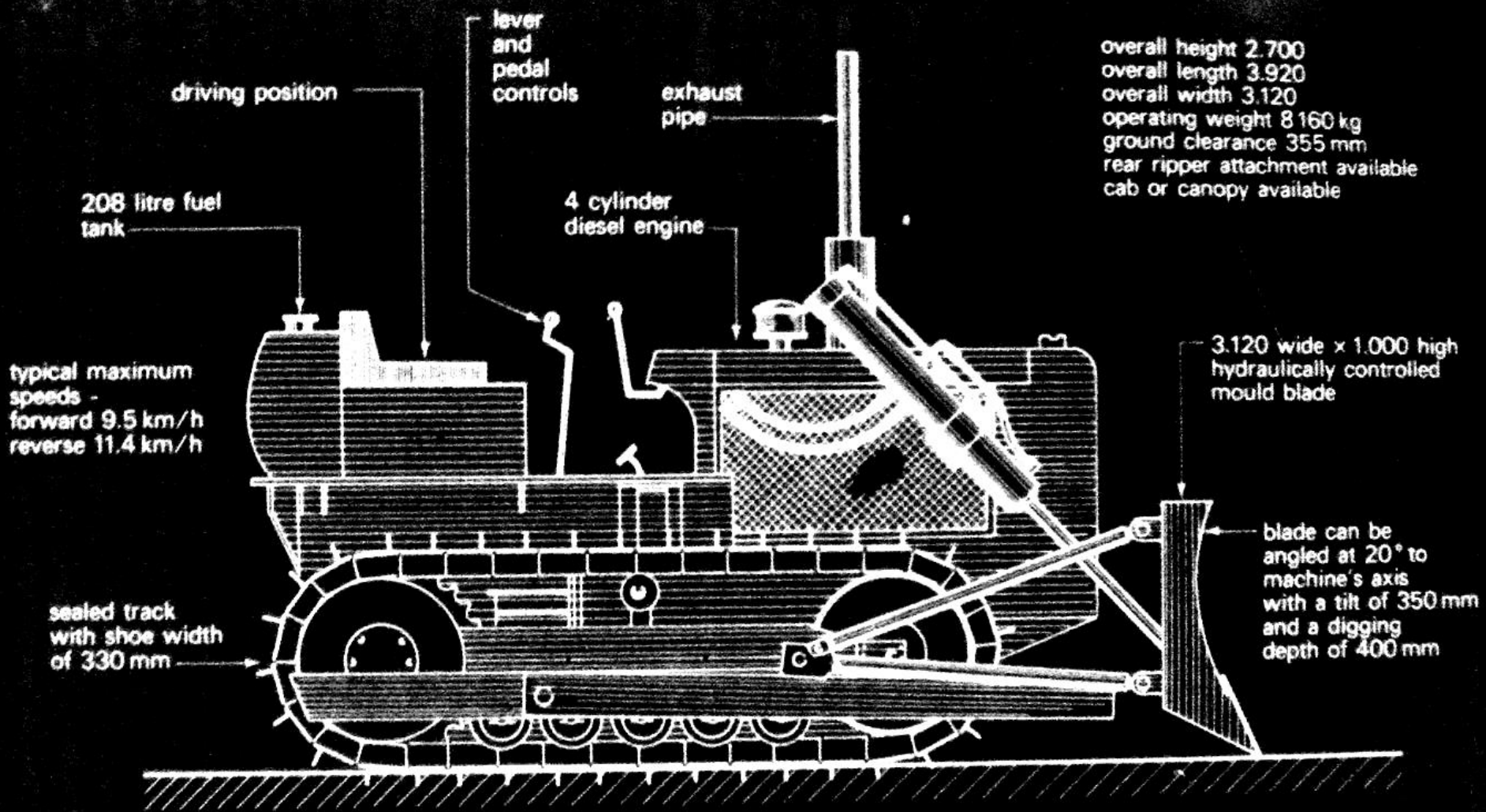
BULLDOZER

A **DOZER**, SOMETIMES CALLED A BULL-DOZER, IS A TRACTOR UNIT NORMALLY CRAWLER-MOUNTED WITH A BLADE AT THE FRONT AS SHOWN IN FIG. 3. IT IS PRIMARILY A PUSHING OR PULLING DEVICE.

IT IS USED TO

- HORIZONTALLY STRIP (EXCAVATE) SOIL,
- SPREAD SOIL IN THIN LAYERS,
- HAUL SOIL FOR SHORT DISTANCES (25 TO 100 M) AND STOCKPILE IT,
- CLEAR SITES OF DEBRIS AND VEGETATION,
- MAKE AND MAINTAIN TEMPORARY ACCESS ROADS, AND PULL ROLLERS, ETC





driving position

lever and pedal controls

exhaust pipe

208 litre fuel tank

4 cylinder diesel engine

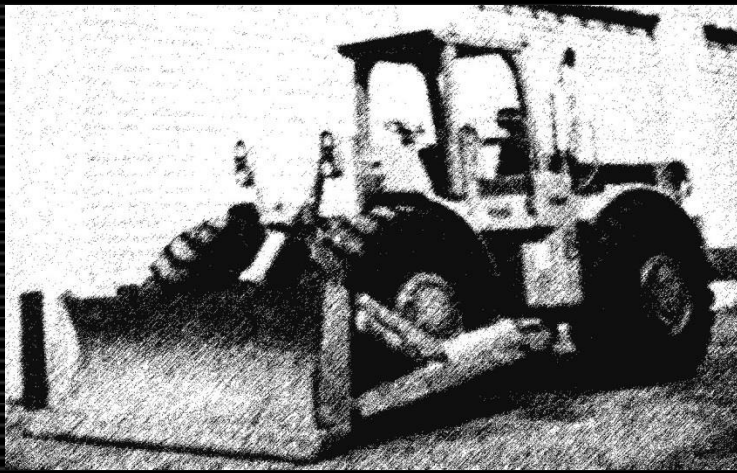
overall height 2.700
overall length 3.920
overall width 3.120
operating weight 8 160 kg
ground clearance 355 mm
rear ripper attachment available
cab or canopy available

typical maximum speeds -
forward 9.5 km/h
reverse 11.4 km/h

3.120 wide x 1.000 high
hydraulically controlled
mould blade

sealed track
with shoe width
of 330 mm

blade can be
angled at 20° to
machine's axis
with a tilt of 350 mm
and a digging
depth of 400 mm



THE MAIN FUNCTIONS OF THE BULLDOZER ARE:

- SHALLOW EXCAVATION UP TO 300 MM DEEP EITHER ON LEVEL GROUND OR SIDE HILL CUTTING,
- MOVING EARTH OR ROCK FOR SHORT HAUL (PUSH) DISTANCES, UP TO ABOUT 90M,
- SPREADING EARTH OR ROCK-FILL, OR BACK-FILLING TRENCHES,
- OPENING UP PILOT ROADS THROUGH MOUNTAINS OR ROCKY TERRAIN,
- CLEARING LAND OF SHRUBS AND SMALL TREES,
- ACTING AS A TOWING TRACTOR OR A PUSHER TO SCRAPER MACHINE.



TYPES OF BULLDOZERS

CRAWLER MOUNTED Crawler dozer equipped with special clearing blades are excellent machines for land clearing. Clearing trees and vegetation is necessary before undertaking earthmoving operations.

WHEEL MOUNTED The case of wheel machines, wider tires provide greater contact area and increase traction. It has four-wheel-drive. An advantage of wheel dozer over crawler dozer is the higher speed possible with the former machine - in excess of 50 km/h. It is excellent for push-loading self-propelled scraper, for grading the cut and spreading and compacting the fill.

ANGLED OZERS A bulldozer with a blade that can be pivoted on a vertical center pin, so as to cast its load to either side. Used for back-filling operations, the angle dozer is used with its mould board set at an angle, in plan to machines.

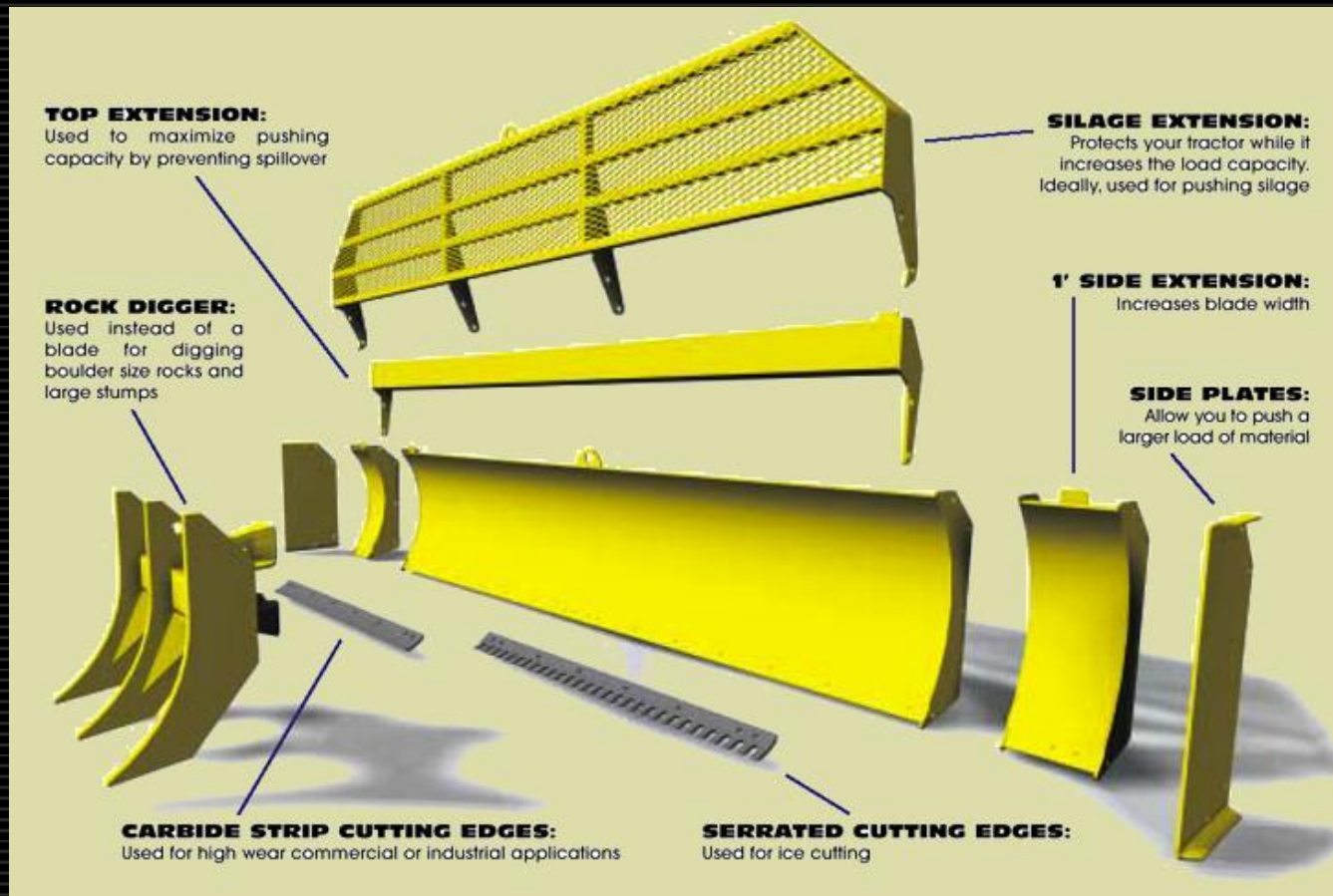


DIFFERENT TYPES OF
BULLDOZERS

ATTACHMENTS

- **BLADE** The bulldozer blade is a piece of heavy metal plate installed on the front of the tractor with the aim of pushing things, handle rough objects and shoving sand ,dirt , and debris. Usually comes in three varieties:
 - STRAIGHT BLADE –Short and has no lateral curve , no side wings and can be used for fine grading.
 - UNIVERSAL BLADE –Tall and curved, and has larger side wings to carry more material.
 - S-U BLADE – A combination blade which is shorter , has less curvature and has smaller side wings. Used for pushing piles of large rocks.
 - **MODIFICATIONS** Bulldozers have been modified over time to evolve into new machines which are capable of working in many ways .LOADER tractors were created by removing the blade and substituting a large volume bucket and hydraulic arms which can raise and lower the bucket .A very small dozer is known as CALFDOZER.
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DIFFERENT BLADES OF BULLDOZERS



RIPPERS

A RIPPER TOOL HAVING A GENERALLY INVERTED "Y" SHAPED ARRANGEMENT FOR USE WITH EARTH-WORKING EQUIPMENT SUCH AS BACKHOES, EXCAVATOR BUCKETS, TRACTORS, ETC. THE TOOL COMPRISES A STRAIGHT SHANK INCLUDING MEANS FOR STURDY ATTACHMENT TO THE EARTH-WORKING EQUIPMENT AND TWO TEETH ANGLED OUT FROM SAID SHANK TOWARDS THE GROUND, THE ANGLE BETWEEN SAID TEETH BEING FROM ABOUT 38.DEGREE. TO 62.DEGREE.. THIS BIFURCATED ANGLED ARRANGEMENT HAS BEEN FOUND TO BE BOTH MORE EFFECTIVE AND LONGER WEARING THAN SINGLE TOOTH RIPPERS OR RIPPERS USING TWO OR MORE PARALLEL TEETH.

