SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35.

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DEPARTMENT OF AUTOMOBILE ENGINEERING

COURSE NAME : 19AUE308 - SPECIAL VEHICLES

III YEAR /VI SEMESTER

Unit 2- Constructional Vehicles

Topic 1 : Excavators

CONTENT

- Introduction
- Need for Excavator
- Components
- Construction & Working
- Advantages & Disadvantages
- Applications
- Manufacturing Companies

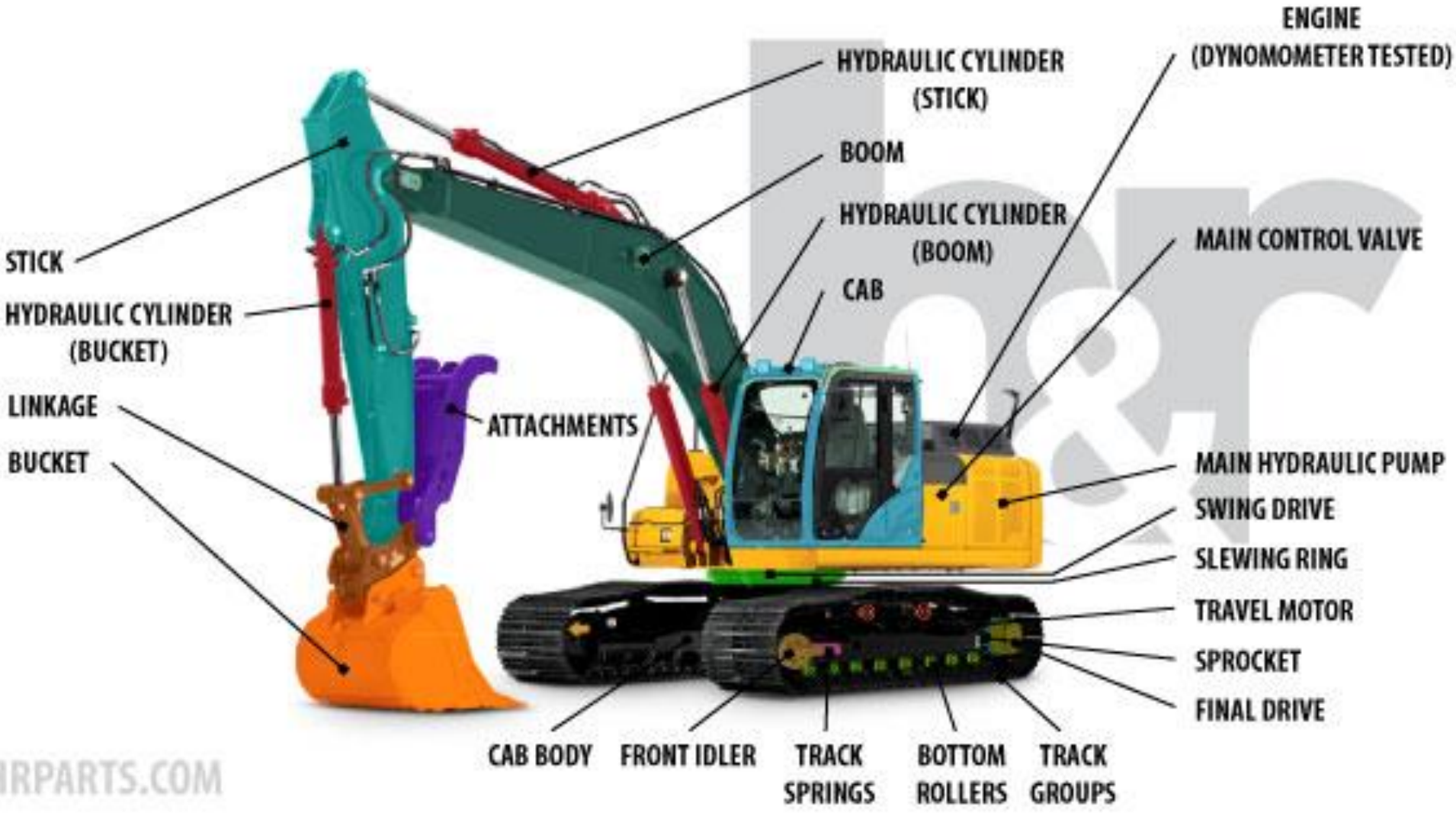
INTRODUCTION

- **Excavators** are heavy construction equipment consisting of a boom, stick, bucket and cab on a rotating platform.
- The house sits a top an undercarriage with tracks or wheels.
- Modern hydraulic excavators come in a wide variety of sizes.
- All movement and functions of a excavator are done through the use of hydraulic system.

NEED FOR EXCAVATOR

- Normally the loaders and dozers serve the purpose of material handling, digging, demolition etc.
- But the main disadvantage is that they do their process only at one direction.
- By the use of Excavator we can rotate the body alone up to 360° and serve the same process at different directions.

COMPONENTS


ENGINE
(DYNOMOMETER TESTED)
HYDRAULIC CYLINDER
(STICK)
BOOM
HYDRAULIC CYLINDER
(BOOM)
CAB
MAIN CONTROL VALVE
STICK
HYDRAULIC CYLINDER
(BUCKET)
LINKAGE
BUCKET
ATTACHMENTS
MAIN HYDRAULIC PUMP
SWING DRIVE
SLEWING RING
TRAVEL MOTOR
SPROCKET
FINAL DRIVE
CAB BODY
FRONT IDLER
TRACK
SPRINGS
BOTTOM
ROLLERS
TRACK
GROUPS
HRPARTS.COM

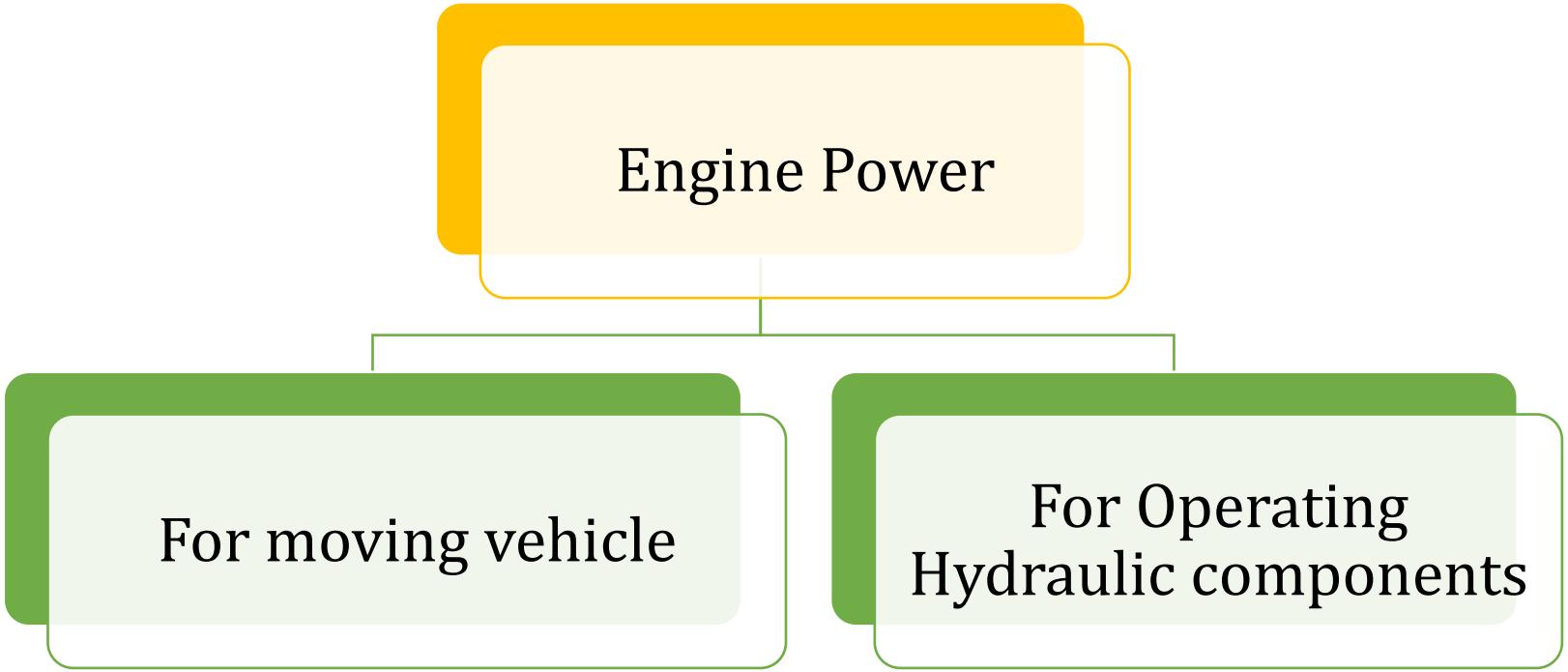
CONSTRUCTION

- The three main sections of an excavator are the **undercarriage, house and arm.**
- The undercarriage includes tracks, track frame, and final drives.
- Undercarriage can also have blade similar to that of a bulldozer.
- House includes the operator cab, counterweight, engine, fuel and hydraulic oil tanks.

CONSTRUCTION

- The house attaches to the undercarriage by way of a centre pin.
- High pressure oil is supplied to the track's hydraulic motors through a hydraulic swivel at the axis of the pin, allowing the machine to slew 360° unhindered.
- The arm provides the up-and-down and closer-and-further (or digging movement).

WORKING


Engine Power
For moving vehicle
For Operating Hydraulic components

WORKING

- The engine power runs the hydraulic pump.
- The hydraulic pump forces the hydraulic fluid to the hydraulic cylinder.
- Through the movement of the hydraulic cylinder, the arm is moved.
- The controlling of the hydraulic system is done by the use of valve control lever.

WORKING

- With the help of the hydraulic power, the swing motor is runned.
- By using swing motor, the platform can be moved in 360°.

ADVANTAGES

- Multiple jobs can be done in single vehicle
- Can perform work in all terrains
- Can Operate in 360°.
- Less operating time
- More efficient work.

DISADVANTAGES

- High Capital cost
- High operating cost
- Requires Skill driver

APPLICATION

- Digging of trenches, holes, foundations
- Demolition
- Material handling
- General grading/landscaping
- Forestry work
- Lifting and placing of pipes
- Mining
- River dredging

MANUFACTURING COMPANIES

- Volvo
- Caterpillar
- Mahindra
- JCB
- Komatsu
- John Deere

1. Mention the type of steering system used in Excavator.
2. Mention the Specialty of Excavator.
3. what is the cost of Excavator?

REFERENCE

- https://en.wikipedia.org/wiki/Excavator
- https://www.youtube.com/watch?v=4Y31MD36xF4

THANK YOU !!!