Reclamation Land Equipment

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Reclamation process

The main obigective of the process of land reclamation is conservation the soil with in the appropriate for the growth of crops . and natural soil on two types are either saturated with water which affect s the growth of plants negative and to damage crops or the humidity is where in land causing damage plants depending reclamation of agricultural land two important foundations

1- organizing irrigation channel reclaimed land .

2- organization drainage to discharge excess water from reclaimed land .

There two processes are implementing number of ways

1- Nick tables and open channel for irrigation .

2- Open derange convertible large and small to collect
excess water

3- Generation drainage covered under the soil .

Mechanization :- performing various agricultural
process by machines and implement relying on power
movement either electrical or mechanical with a minimal
human or animal little efforts.

The importance of agricultural mechanization

1- To lower production costs .

2- To raise the agricultural production to soil unite

3- Maximize the employee productivity and his welfare

4- The enamel wealth availability

Agricultural Tractors :-

It is all machine crawler or wheel which work agricultural
done a certain plowing and seeding

1- Diesel Engines

2- Hydraulic Electronic unite injection

3- Oil steering clutches and breaks

4- Finger tip control

5- Differential steering

6- Electronic hydro power system

Uses tractors :-

Plowing – seeding – transfer- pump management

Types tractors :-

According uses

1- standard tractor

2- ulitility tractor

3- specialized tractor

According contact with land

1- crawler

2- wheel tractor

2WD – 4 WD

For according with farm

1- with farm

2- with not farm

3- with half farm

Bulldozer :-

Machine may be crawler or wheel proved blade the front , machine the carry out cutter and push the soil and a chive rise and low blade by wire or cylinder hydraulic

Uses bulldozer

1- Make straight and adjustment the soil

2- Work slopes and digging trenches

3- Bridging the excavator and removal of the rubber of building

4- The opening soil of roads in mountainous areas and rock

5- payment soil for distance of not more then 60 m

Advantage bulldozer crawler

1- Generation high pressure reduction blade for lower

2- Keeping on putting more careful blade

Advantage of bulldozer wheel

1- THE speed of movement

2- No need the trailers

3- Its moving street the paved

Preferred bulldozer crawler on bulldozer wheel put the speed is low and needs the trailer to take him to remote areas as well as the high speed
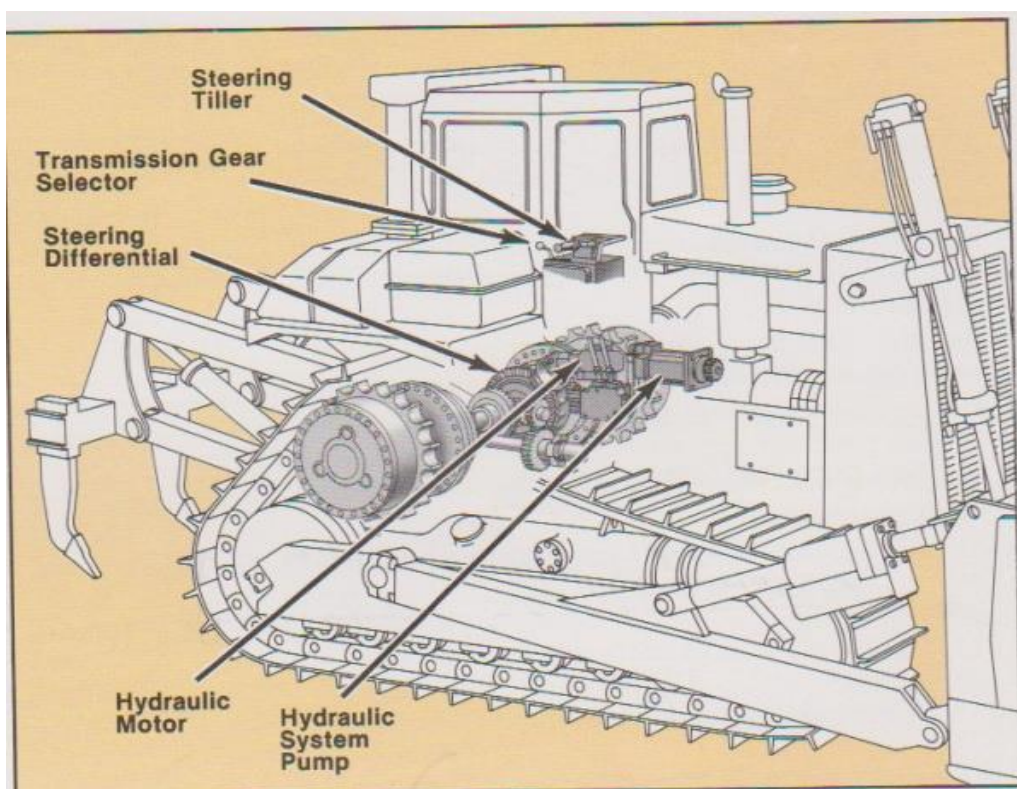
Ripper

Arrear part of the bulldozer curry out fragment and breaking rocks and the teeth cuter either straight or tilted

Repairs and maintenance

1- Lubrication and greasing all parts especially crawler

2- change rubber or metal pipes damage

3- Replacement teeth ripper

4- Inspection of the tool transfer movement before work

5- Make sure filling hydraulic oil tank and replaced time to time .

Front bulldozer blade

Most bulldozer proved with blade in front of straight and concave   controlled and can make an angle with the direction of movement the enduring of the blade is curved and is called moldboard where they payment of soil piled in front of him . but the concavity moldboard cause rolling soil and sliding soil reduces the friction with the surface of the ground , in the case sandy soil the soil not rolling but sliding in front of moldboard . while the clay soil piled in front of the blade in the farm of snail . so the rate of productivity of the bulldozer in the sand soil less than in clay soil
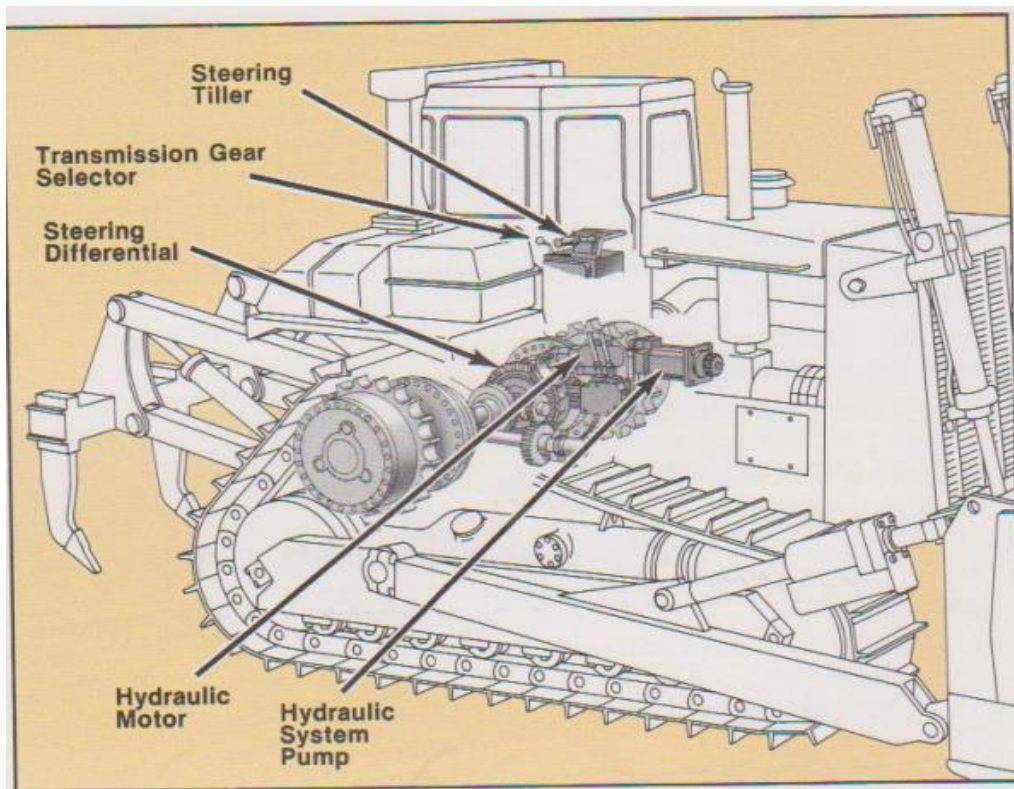
Hydraulic system

Is controlled system hydraulic by a group of levers private are present in the operator is made up system of pipes hydraulic oil related cylinder and lifting the weapon where the oil from the reservoir and trough the oil refineries and on the valve control installed on the tank and cylinder lift the knife and take the pump movement of the p.t.o when operation of the engine .

Total volume soil = length * width *thick soil

Time transport = distance transport / speed transport

Time back = distance back / speed back

One cycle time = time transport + time back + fixed time

Rev cycle = coefficient time / one cycle time

Capacity blade = W* (S)^2 *R*H / 360

W = Blade width

S=(1.167 * high)^2

   R= 3.14   H = 30 OR 28

Active volume soil = capacity blade * coefficient

Bulldozer production = active volume soil * rev cycle

Total time achievement work = total volume soil / bulldozer production

Bulldozer transport soil in field length 143m and wide 50 m and thick soil 35 cm . find the total time achievement work if you know distance transport 45m and speed transport 5km/hr and speed back 6km/ hr fixed time 0.45min and blade wide 3m and high 1.35 m and retie 1.67 and angle 30 and coefficient 0.8 coefficient time 45 min

Total volume soil = 143*50 *0.35 = 2502.5 m

Time tr = 45*60/ 5*1000= .54 min

Time back = 45 *60 / 6 *1000 = 0.45 min

One cycle time = 0.54 + .45 + 045 = 1.44 min

Rev cycle = coefficient time / one cycle time

$$= 45 / 1.44 = 31 \text{ cycle}$$

Capacity blade = $w(s)^2 r h / 360$

$$= 3(1,67 * 1.35)^2 * 3.14 * 30 / 360$$

$$= 4 \text{ m}^3$$

Active volume soil = capacity blade * coefficient

$$= 4 * 0.8 = 3.2 \text{ m}^3 / hr$$

Bulldozer production = active volume soil * rev cycle

$$3.2 * 31 = 99 \text{ m}^3 / hr$$

Total volume achievement work =

 total volume soil / bulldozer production

= 2502.5 / 99 = 25 hr

Bulldozer transport soil in field length 120 m and wide 80.5 m and thick soil 40 cm . find the total time achievement work if you know distance transport 40m and speed transport 4km/hr and speed back 6km/ hr fixed time half min and blade wide 4 m and high 1.25 m and retie 1.67 and angle 30 and coefficient 0.8 coefficient time 50 min

Total volume soil = 120*80.5 *0.40 = 3864 m^3

Time tr = 40*60/ 4*1000= 0.6 min

Time back = 40 *60 / 6 *1000 = 0.4 min

One cycle time = 0.6 +0 .4+ 0.5= 1.5 min

Rev cycle = coefficient time / one cycle time

$\qquad$ = 50 / 1.5 = 33 cycle

Capacity blade = w(s)^2 r h / 360

$\qquad$ = 4(1,67 * 1.25)^2 * 3.14 * 30 / 360

$\qquad$ = 4.5 m^3

Active volume soil = capacity blade * coefficient

$\qquad$ = 4 .5 * 0.8 = 3.5 m^3/ hr

Bulldozer production = active volume soil * rev cycle

3.5 * 33 = 115.5 m^3/ hr

Total volume achievement work =

total volume soil / bulldozer production

= 3864 / 115.5 = 33 hr

Loader or AL- Shovel

Which is the most suitable machinery for the transfer of a few quantities of soil and rise the soil and carried by track to move it to place you want to add to the possibility of the use of loader in some of the reclamation and excavation and settlement .

Types loader

1- crawler loader

2- wheel loader

3- according to the weight soil that can load

Loader wheel would be most favorable because to high speed and the movement maneuver

Design loader

Bucket capacity loader ranging between 1/4 m^3 to 20 m^3 in the huge loader in either habitual amounted $4m^3$.

Against the safety coup loader in front of the so called (loading capacity coup) which is so necessary to protect the loader when you work in the difficult operation

Methods loading by loader

1- loading rotated

Stop the tow truck on both sides of the machine and load rotated

2- loading an angle

Angle of the truck stops 60 dgree on the direction of the bucket loader after fill bucket moving the loader back with a certain circularity to be perpendicular to the direction of the truck then moves forward and unloading the truck

3- loading in the transfer direction

after fill bucket move the loader back in a straight line and then move the truck between

The soil pile and loader and then progresses to unload   its cargo in the truck which then moves forward to repeat process

Operating load and excavator by loader

Bucket to put down so that it rises about 40 cm from the surface of the land loader moving to pile soil . it is advisable no to proceed quickly pile to avoid the damage that may happen to the arms of bucket . in the case the force in the entry of soil pile during the progress bucket in front of the loader when ther is difficulty in penetrating the soil move bucket to up and down dip and short stroke and when bucket penetrate the soil to attract the top with moving loader forward at the same time

One cycle time = time transport + time back + unload time

Time transport = distance transport \ speed transport

Time back = distance back \ speed back

Number cycle = capacity truck \ capacity loader

Time load to truck = number cycle * time cycle loader

Number trucks = one cycle time \ time load to truck

Production of loader = 1 * (capacity loader * coefficient time) \ time cycle loader

في ساعة واحدة

تضرب كمية الاتربة في عدد ساعات العمل اليومي مثلا ٦ ساعات

Want transport 20000m3 of soil by loader and trucks with a few possible time find the number of trucks and production loader and number days the following information

Coefficient time = 45 mint

Capacity truck= 6m3

Working hours = 6 hr

Capacity loader = 2m3

Time cycle loader= 0.6 min

Distance transport = 1500m

Speed transport = 20 km \ hr

Distance back = 1800 m

Speed back= 30 km\ hr

Time unload= 0.4 min

Scraper

Is machine reclamation task is digging and transport and unloading soil in cycle operation one

It feature the work

1- can work alone

2- cut and distribution of soil depth simple

3- distance transport between 30 m and several kilometers

4- economically efficient machines

5- efficient settlement high because the weapon scraper in middle of machine between the front and rear wheel the help control depth operation

Types scraper

Trailer with one axis and must be with drown by the tractor

With trailer two axis of movement   -

Scraper single engine

Two engine with basins

Mutable basins

Way to too much average production scraper

1- Disassembly groaned

2- Wetting soil before loading

3- Loading down slope side lower

4- Nothing loading scraper for maximum capacity

Division scraper

1- according to capacity weapon

2- way to movement

3- way to un loading

4- way to control

5- way of work equipment

6- way to with draw

7- according to rise weapons

Examination before operation (maintenance)

1- Check the amount of fuel tank

2- Check the amount of oil and water

Check after operation

1-Disclosure of the existence of leak the cooling system and lubrication

2- check piston position

3- check the air pressure in the system time

4- Making sure the safety and switching speed and router system

5- Maintain the front and rear tires

Operation cycle time for scraper

The time required for loading and unloading and transport and back to the down load again this time is divided into fixed time and time changing

Time constant :-

Includes loading and unloading time and cycle

Time changing :-

Includes transportation time and time back and its depending on the transport distance and speed

The force required to operation scraper =

Rolling resisting + cutting resisting + slope resisting   To up

= Rolling resisting + cutting resisting – slope resisting To down

Rolling resisting = weight machine load * coefficient rolling resisting

Weight machine load = empty weight +(tank capacity * density of soil * 9.81) / 1000

Cutting resisting = coefficient cutting r * weapon length * depth cutting / 1000

Slope resisting = empty weight +((tank capacity * ^{density} of soil * 9.81) / 1000)* coefficient slope r

EX

The scraper work on rod soil resisting of cutting 6 n/ cm^2. Find the push soil force required to operation of scraper if you know the weight of empity 200kn and capacity of tank 20 m^2 and deasity of soil 1500 kg / cm^2 and coefficient of rolling resisting 0.2 coefficient of slope 0.01 to down . weapon length 3m depth of cutting 15 cm and coefficient of cutting resisting 10 n/ cm^2 .

Rolling resisting = 200 +(20*1500*9.8 / 1000) * 0.2

= 98 k n / cm2

Rolling slope= 200 + (20 *1500 * 9.8 / 1000) * 0.01

= 4.9 = 5 kn/ cm2

Cutting resisting = 10 * 300 * 15 / 1000

= 45k n / cm2

The force required to operation = rolling resisting + cutting resisting – slope resisting

= 98 + 45 – 5 = 138 kn

Grader :-

With frame for long and extends behind and front the weapon of big distance and efficient in the settlement depends on the long frame is the weapon cut in the middle of frame the way it can control the amount of cut soil and settlement .long farme between 7-12 m and wide weapon between 1.5 -4.5 m

As well as the usefulness of this machine lies in that the weapon can take several situation depend on the type of work required

Division grader

By the weight and divided into   -

1- arrive up to 10 tons

2- an average of up to 14 ton

3- heavy up to 20 ton

A According to the design of transmission

1- four wheel

2- six wheel

As the control system of the equipment work

Hydraulic

Mechanical

Working class equipment

Knife

Plate knife

Chinese round about

Weapons of drilling

Uses grader

1- Settlement the land

2- Mixing soil

3- Removal snow

4- Cut slopes

5- Crack rocks

6- Brush soil to open channels

Grader equipment parts maneuver

1- Knife movement to right or lift

2- Move the knife up or down

3- Lower up side and rise the other side in order to change the slope angle

4- Change the cutting angle

5- The move of the knife out side the farm work of the grader

6- Rise and lower the excavation weapons

Wired and hydraulic excavators

Drilling Machine :-

Including many kinds and most important of bulldozer – excavator – hoes – used to all drilling operation and the work of construction of guiles

Features excavator in general

1- Can work in clay soil or even in the presence of water

2- Digging channel and trenching to way vertical to the direction of travel

3- The length of her arm extended gives the possibility to work for the length distance

4- Control in the corner digging channels

5- Dosed vantage of slow at work and need high power to activate

The volume of drilling

The volume of the drilling at the expense of size bucket cubic meter and depth required to drill and the ability of machine itself

Main parts of the excavator

Excavator body – crawler – bucket – total of pulleys and cables –

Engine

Advantage of cable excavator :-

1- Can lifted and lower bucket more quickly

2- Can work in the field longer

3- Can be extended wires of different length

4- Could use large bucket

Dias vantage cable excavator

1- Need the largest effort in the process of lifting bucket after the cutting process

2- Need the big Manteca

3- Chang the pulleys and wire from time to time due to corrosion and wear

4- When you start operation that must no length wire for fear of complexity

Advantage of hydraulic excavators :-

1- No many parts prone to damage

2- Have a greater power when drilling operation

3- The largest in the control of the cutting process

Dais vantages

1- Oil leak on hydraulic oil pipes

2- Pressure pumps some time be less than necessary

3- Cannot work in large round

4- Cannot use a great bucket in this type of drillings

Depending power drilling with

1- Depth of cut

2- Angle of sewing in bucket

3- Size and type of bucket

4- length of arm

5- Job condition and management work

6- Method of transferring and unloading in truck

7- Size of healing unites if used

8- Skill of operation

9- Physical condition of the machine

Trenching

Opening streams and channel for the purposes of put paracentesis

Function :-

Trenching work itself the process of developing paracentesis filling soil over

With scroll wheel – with escalator – with vertical knife

Returns the efficiency of machine but it digs wide required and depth and therefore types reduce the costs and main power as the settlement of the trenches and digging all kinds of soil except rocky soil

Trenching with scroll wheel

It is suitable for depth cut 3 m and the speed of drilling 15 m/ min can select the speed suitable to the natural of work and the of the process of drilling consist of wheel is composed on the outside scroll its frame work number of transport vessels have teeth to facilitate the drilling process

The drilling process start low the scroll wheel to the desired depth while the machine itself is moving slowly at the front and either resulting from the drilling process they are placed on conveyor pelt for the infinite

Trenching of the escalator

These machine worked escalator tends to the vertical direction at an angle and there is this escalator vessels have teeth digging the soil at different depths and you move these vessels a series of both sides and this trenching arms can be length ender needed allowing to work at all depths

Trenching with vertical knife

Features from its predecessor comber move to the front of the knife to digging depth big when alien of works placed to apipe line as in percent pipes as well as it is not working to rise the soil directly fall down over percent

The choice of trenching suitable to work

1- Natural of the work

2- Depth and wide of the trench

3- The quality of soil

4- High ground water

5- Cutting width

When digging a trench to be shallow and narrow the trenching scrall whell is suitable for work

Carriage

Top Clamp Cylinder

Top Clamp

Point of Top Clamp

Tip of Log Fork

Tilt Link

Tilt Lever

Tilt Cylinder

Bucket Positioner

Control Levers

Filler Cap

Hydraulic Tank

Hydraulic Filter

Step

Lift Cylinder

Track Guide

Roller Frame

Muffler

Lift Arms

Case of Final Drive

Main F

Log Fork