



Brief Introduction of Excavator

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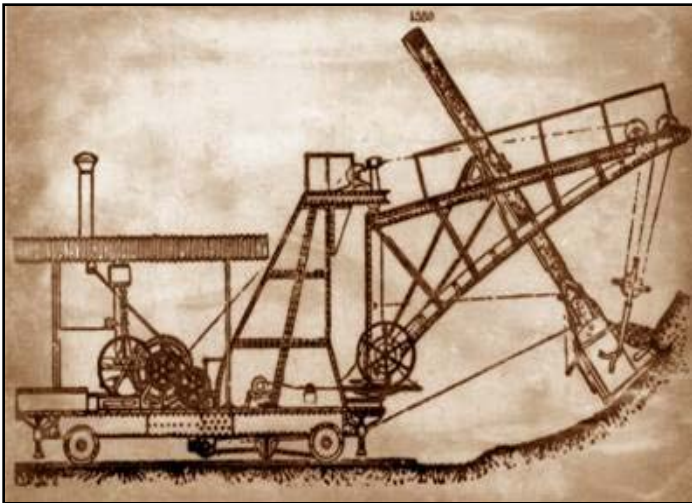
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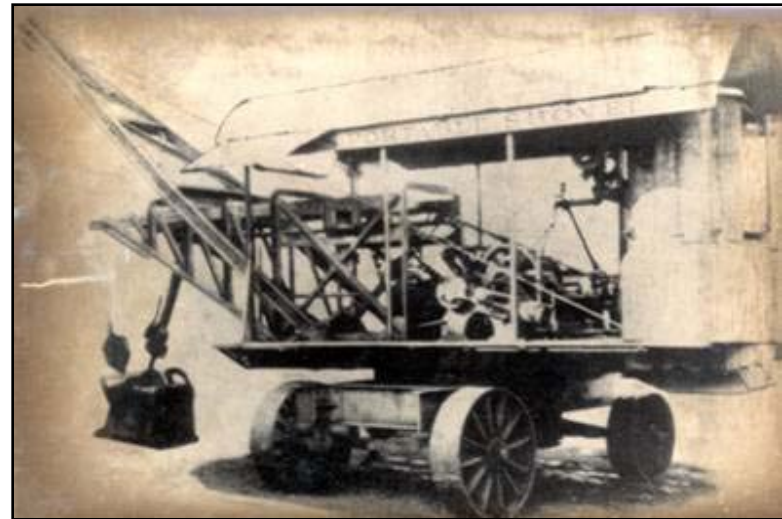
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Chapter 1 History of Excavator

1.1 History of World Excavator



In 1837, the first excavator was invented in American, which is powered by the steam engine.



In 1895, a total swing mechanical excavator was invented by Richard Wind, which is a milestone in the excavator history.

In 1900, the first diesel-engine excavator was invented.

In 1954, the first total-hydraulic excavator was invented in Germany.

In 1961, the hydraulic excavator was introduced to Japan from Europe and America.

In 1985, the first computer-controlled hydraulic excavator was invented.

1.2 History of Sany Excavator

1998~2001
1G Sany Hydraulic
Excavator



2001~ 2006
2G Sany Hydraulic
Excavator



2006~2008
3G Sany Hydraulic
Excavator



2008 ~ **today**
4G Sany Hydraulic
Excavator

1.3 Major Manufacturers of Excavator



KOMATSU



CATERPILLAR®

KOBELCO

SANY



Chapter 2 Product Knowledge of Sany Excavator

2.1 Summary of Excavator

2.1.1. Application

Excavator is a versatile earthwork construction machinery, mainly for earth excavation, loading, but also on land leveling, slope repair, hoisting and other operations, so it is widely used in the road, rail, bridge, airports and water conservancy project construction and so on.

It also combined with some functions of bulldozers, loaders, cranes and other functions.



2.1.2. Classification

(1) According to bucket:

Multi-bucket



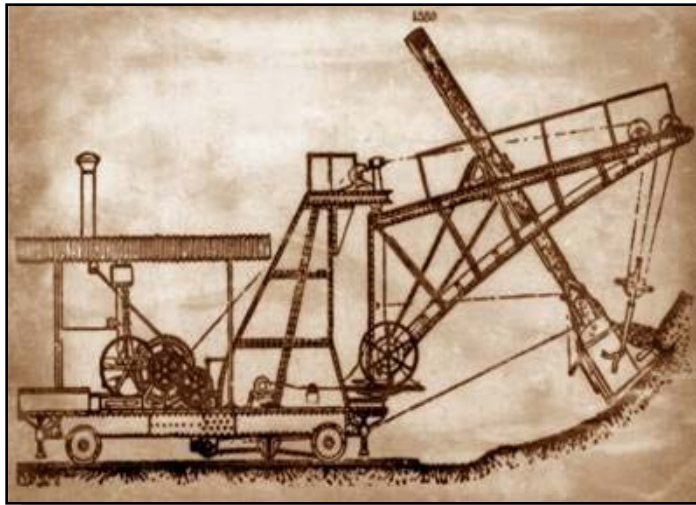
Single bucket

Bucket teeth backward



Bucket teeth forward

(2) According to transmission mode:



Mechanical Excavator



Hydraulic Excavator

(3) According to travelling mode:

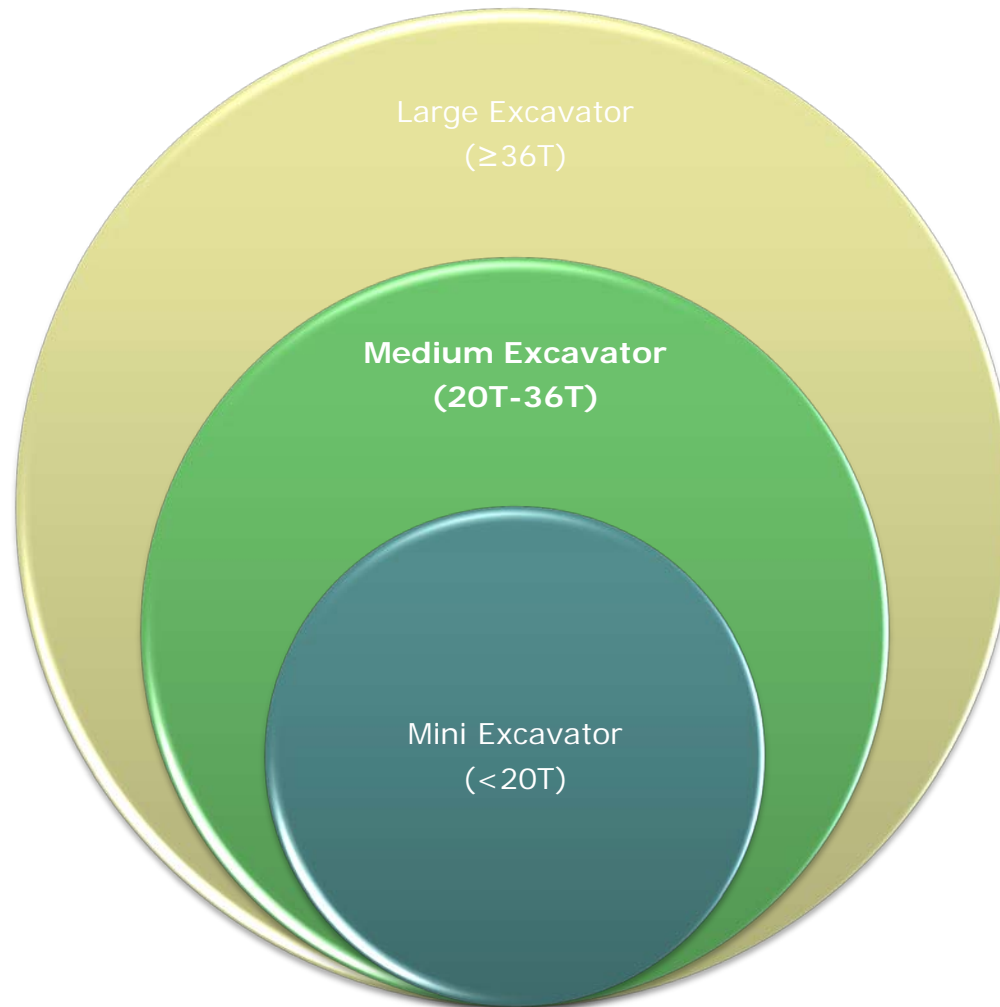


Wheel-type Excavator



Track-type Excavator

(4) According to tonnage: (Sany Classification Method)



SY65C/SY75C



SY135C



SY205C
SY215C
SY230C



SY330C/360C



SY420C/460C



SY700C/SY850



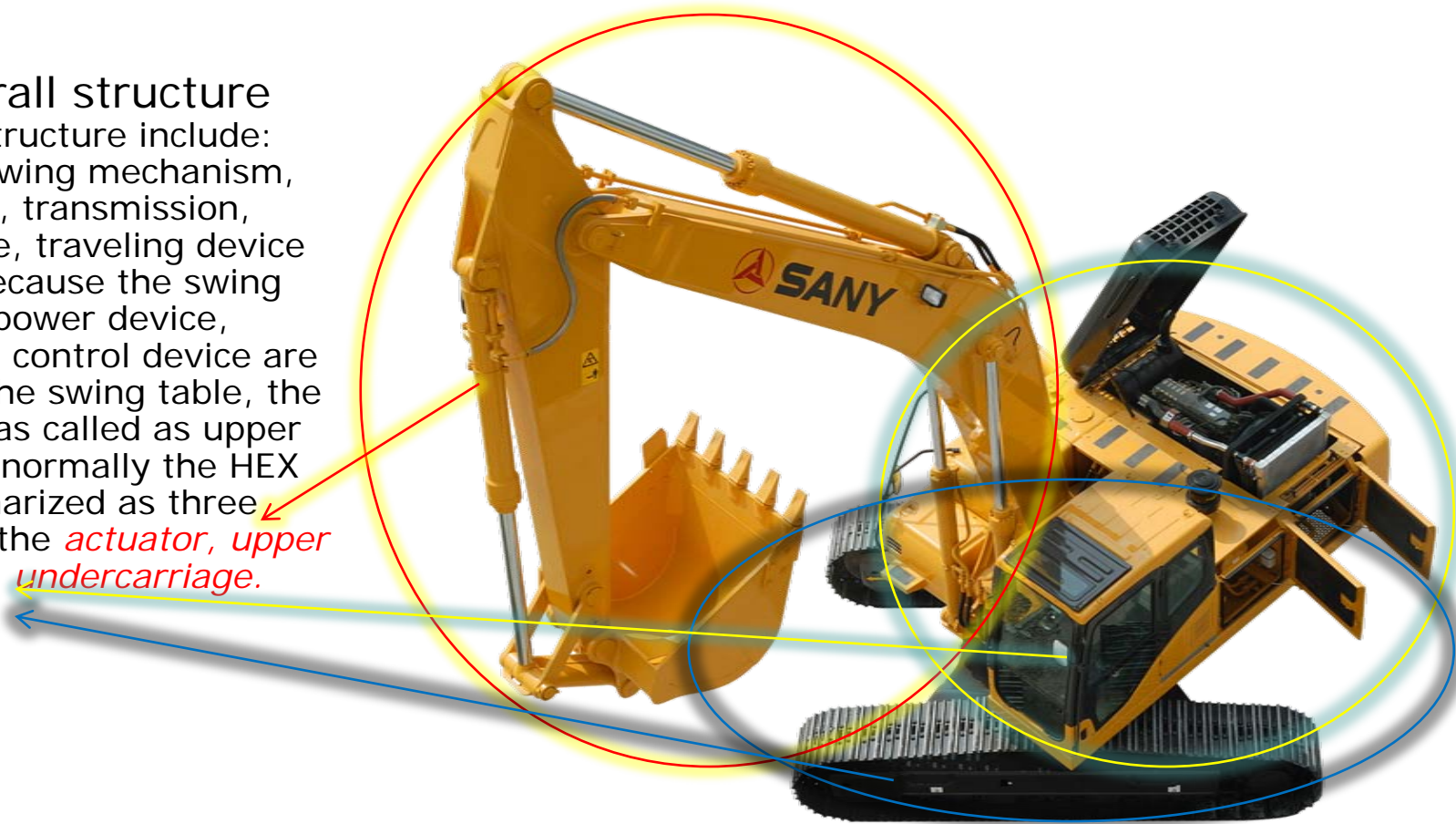
SY2000C



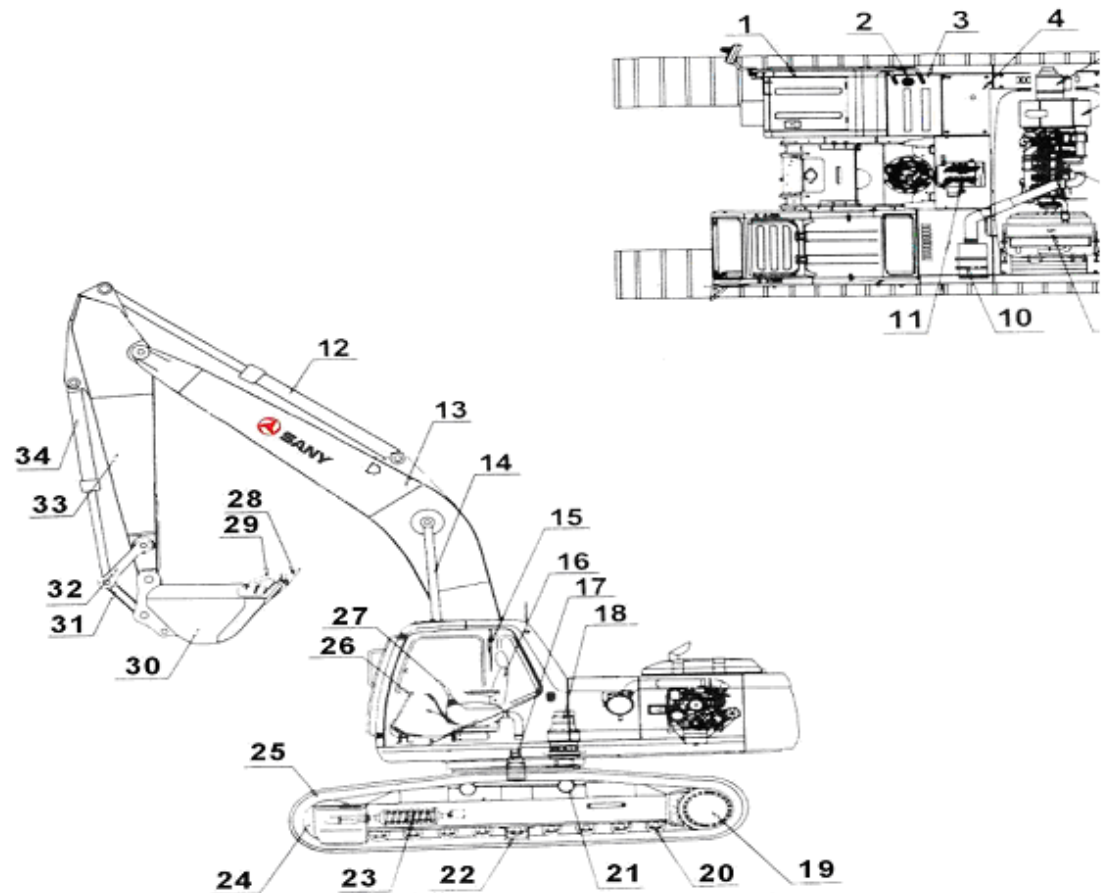
2.2 Structure of Excavator

2.2.1 Overall structure

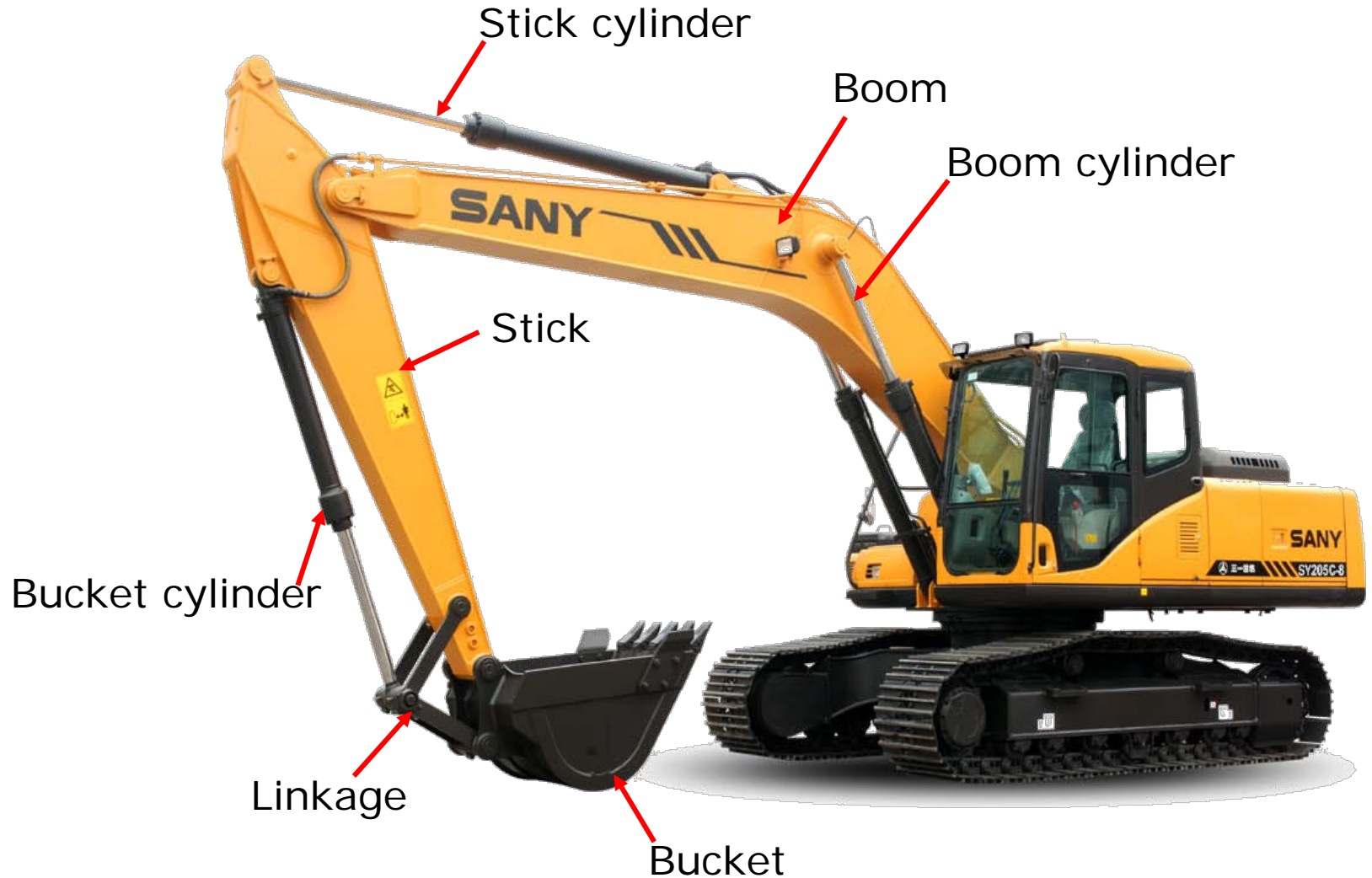
The overall structure include: implement, swing mechanism, power device, transmission, control device, traveling device and so on. Because the swing mechanism, power device, transmission, control device are installed on the swing table, the whole part was called as upper structure, so normally the HEX can be summarized as three major parts, the *actuator*, *upper structure* and *undercarriage*.



1. Battery
2. Fuel Tank Cap
3. Fuel Tank
4. Hydraulic Oil Tank
5. Hydraulic Pump
6. Muffler
7. Counterweight
8. Engine
9. Radiator & Oil Cooler
10. Air Cleaner
11. Control Valve
12. Arm Cylinder
13. Boom
14. Boom Cylinder
15. Cab
16. Driver Seat
17. Swivel Joint
18. Swing Motor
19. Travel Motor
20. Track Roller
21. Carrier Roller
22. Guard Plate
23. Track Tension Assembly
24. Front Idler
25. Track Assembly
26. Travel Pilot Control Lever
27. Implement Pilot Control Lever
28. Bucket Teeth
29. Side Cutter
30. Bucket
31. Linkage
32. Connecting Lever
33. Arm
34. Bucket Cylinder



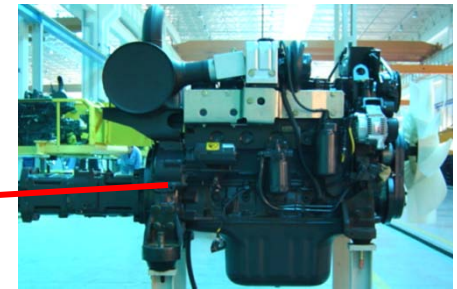
(1) Implement/working device



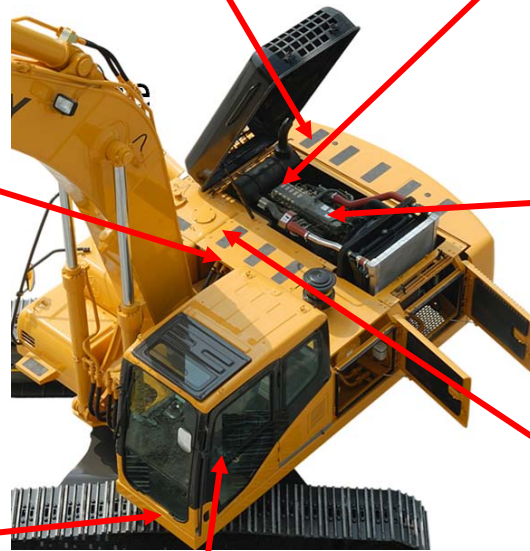
(2) Upper structure



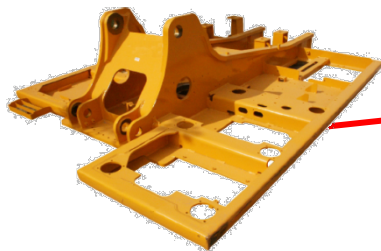
Counterweight



Engine



Cab

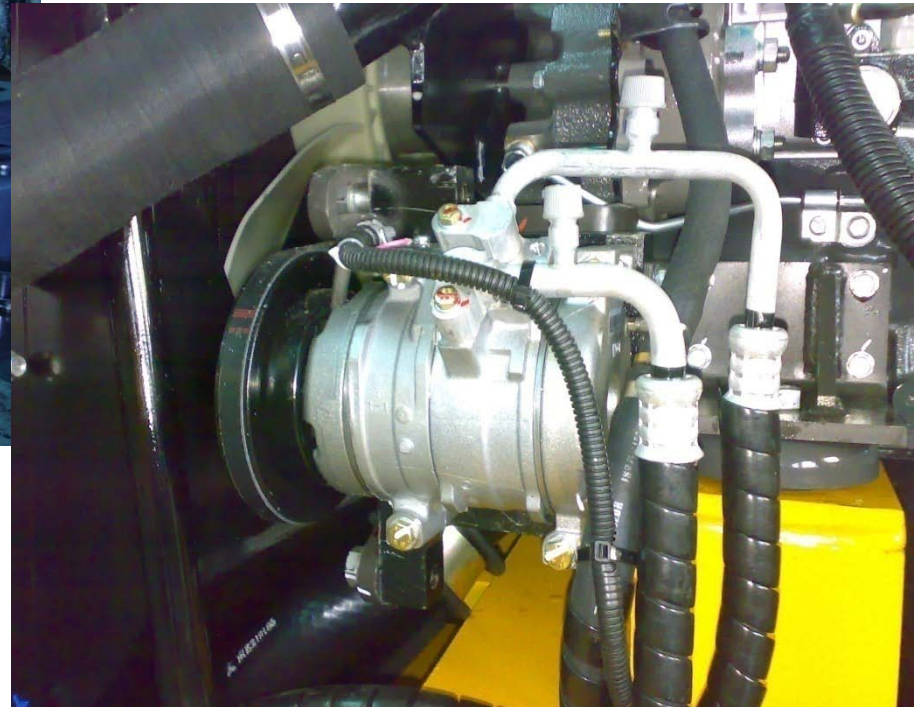


Main control valve

Upper structure include the following components:

- ◆ **Swing platform.**
- ◆ **Main hyd. pump, swing assembly.**
- ◆ **Main ctrl. valve, pilot valves and related hoses.**
- ◆ **Engine and it's components**
- ◆ **cab**
- ◆ **Air conditioner system.**
- ◆ **Electrical components.**
- ◆ **Fuel tank, hyd. tank, and so on.**
- ◆ **counterweight**

Air conditioner



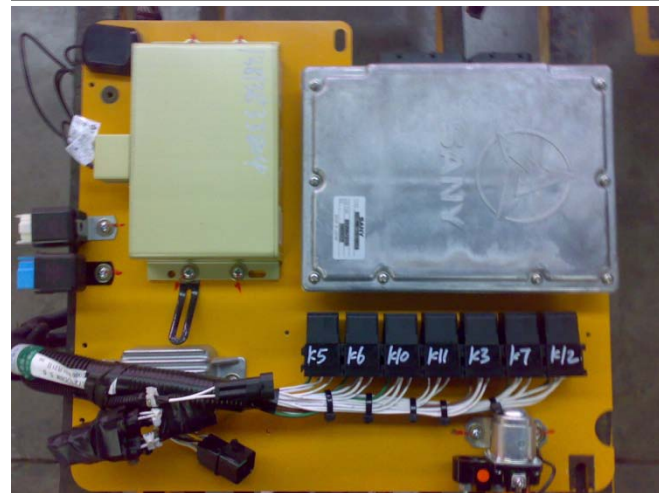
Compressor

Electronic control system

Monitor

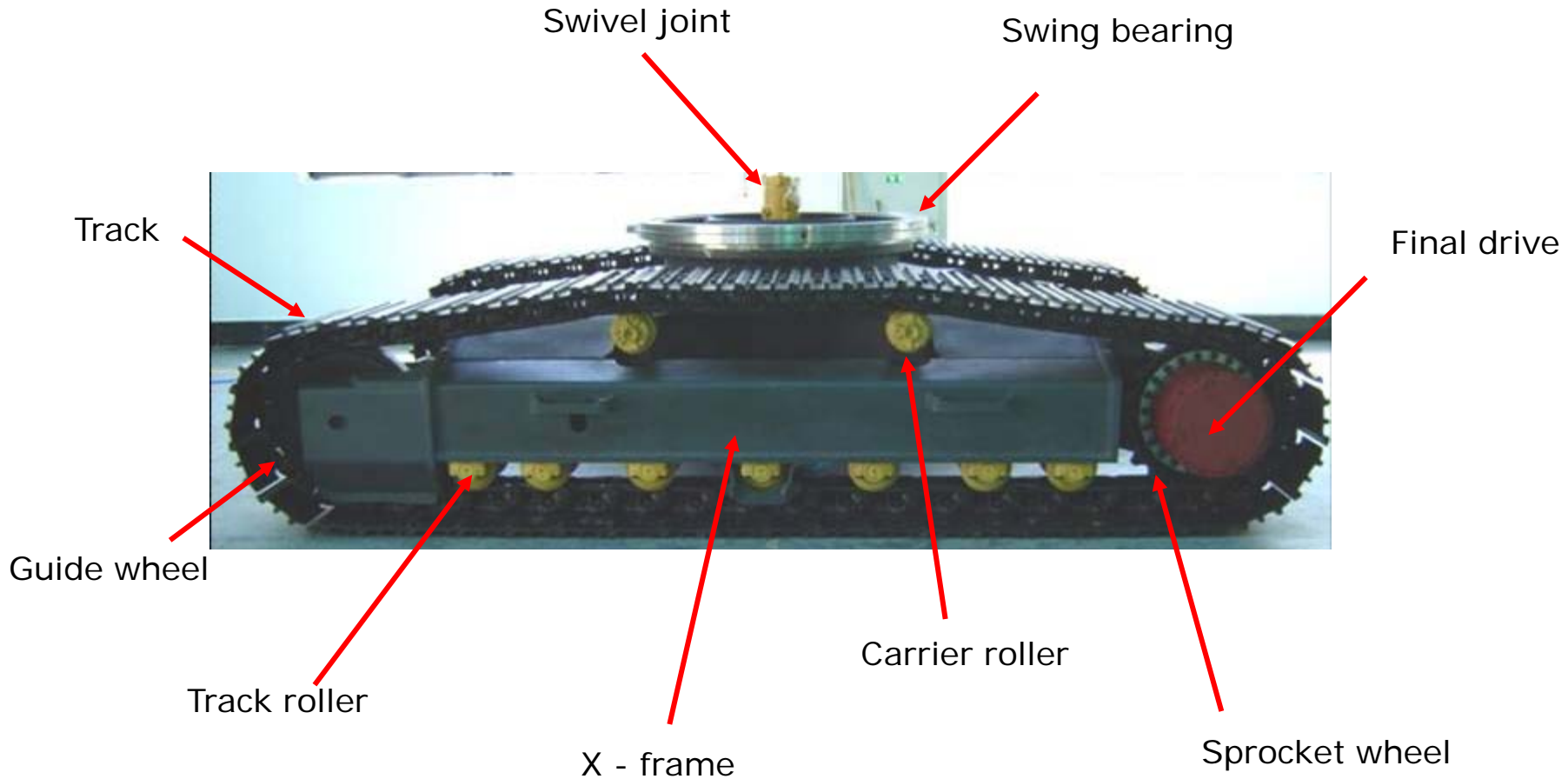


EC-7 controller



KCM controller

(3) Undercarriage



Undercarriage include the following components:

“4 wheels and 1 track”: track, carrier roller, track roller, sprocket wheel and the guide wheel.

X - frame

Swivel joint

Swing bearing

Travel motor

Final drive

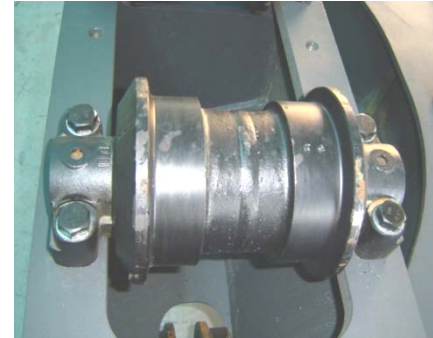
Guide wheel



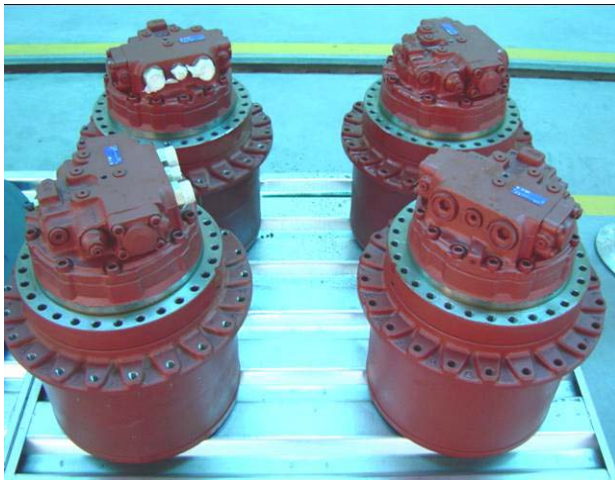
Carrier roller



Track roller

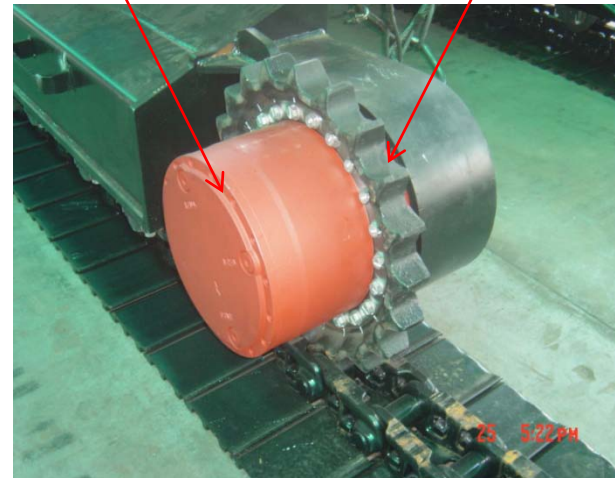


Travel motor



Final drive

Sprocket



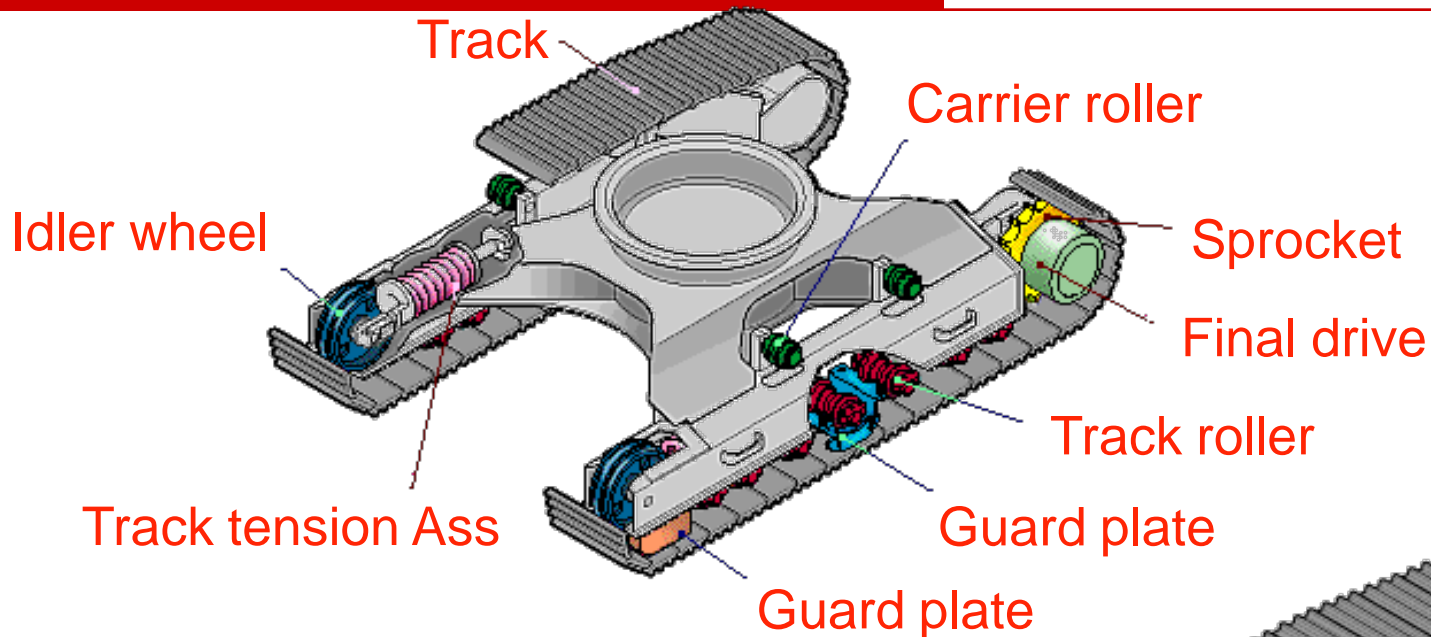
X - frame



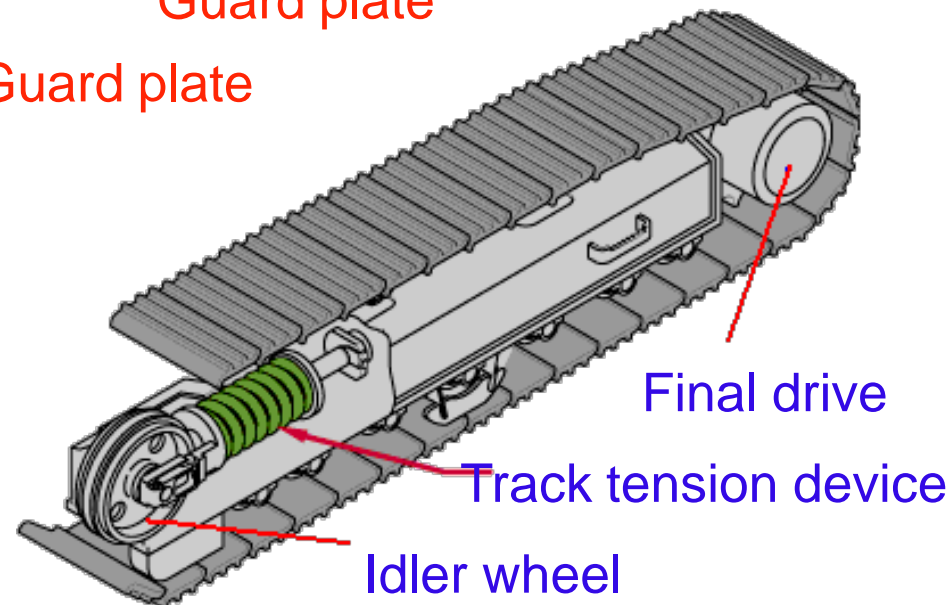
Swing bearing



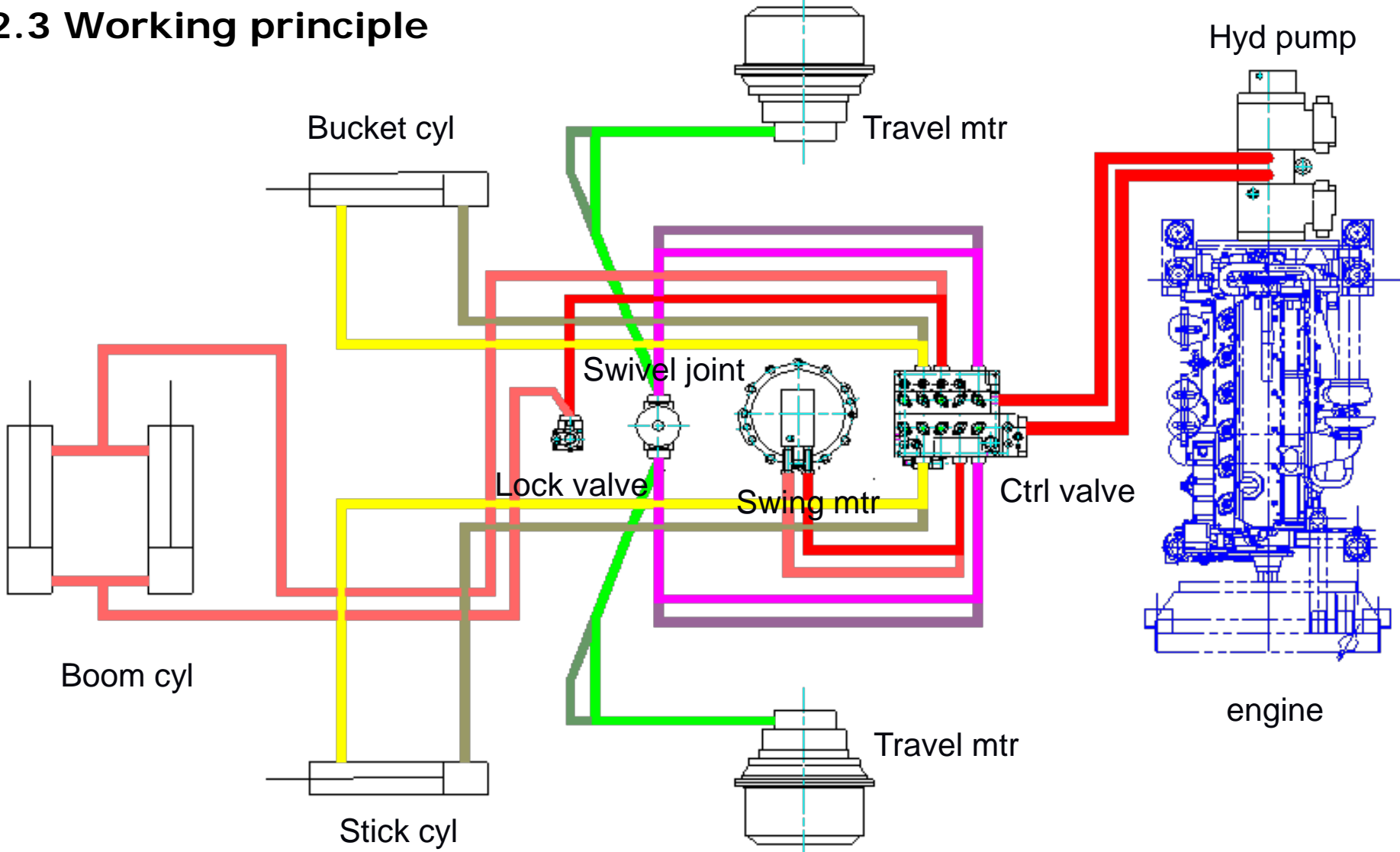
Swivel joint



- Each track has only one master pin.
- Track loop can only be opened by removing the master pin.



2.3 Working principle



2.3.1 Power transmission route (Traveling): engine—Coupling —
—hydraulic Pump (mechanic power transferred into hydraulic power
) —main valve—Center Swivel Joint—final driver (hydraulic
power transferred into mechanic power) —reductor—driving
wheel—crawler—traveling

2.3.2 Power transmission route (Swing) : engine—Coupling —
hydraulic Pump (mechanic power transferred into hydraulic power)
—main valve—swing motor (hydraulic power transferred into
mechanic power) —reductor—Swing ring—swing

2.3.3 Power transmission route (Boom up&down) : engine—
Coupling —hydraulic Pump (mechanic power transferred into
hydraulic power) —cylinder (hydraulic power transferred into
mechanic power) —Boom up&down

2.3.4. **Power transmission route (stick in&out) :** engine—
Coupling —hydraulic Pump (mechanic power transferred into hydraulic power) —cylinder (hydraulic power transferred into mechanic power) —**stick in&out**

2.3.5. **Power transmission route (Bucket in&out) :** engine—
Coupling —hydraulic Pump (mechanic power transferred into hydraulic power) —cylinder (hydraulic power transferred into mechanic power) —bucket up&down

2.4 Major products of Sany excavator

Mini-hex: SY55C1I2H、SY65C1I2H、
SY75C3I2H、SY75C3I2R、SY75C3I3R
SY135C8I2K、 SY135C8I3K

Medium hex: SY205C9M2K、SY200C9C3K、
SY 215C9M2K 、SY210C9C3K、
SY235C9I2K、SY 235C8C3K、SY235c8I3k
SY335C9I2k、

Large hex: SY365C9I2k、SY425C2M2K、SY465C2M2K
SY700C1I2K、SY850C1I2K

Biggest hex: SY2000C

2.5 Common parameter of Sany Excavator

2.5.1. Mini Hex (SY135C)



- Total weight: 13.5t.
- Bucket capacity: 0.53 m³
- Engine power: 70kw/2050(I)
69.6kw/2200(M)
- Swing speed: 12 rpm.
- Travel speed: 5.5/3.5 km/h
- Gradeability: 35 degree or 70%
- Pressure to the ground: 41.7kPa

2.5.2. Medium Hex (SY235C)

- Total weight: 23.15t.
- Bucket capacity: 1.2 m³
- Engine power: 128.5kw/2100(I)
- Swing speed: 13 rpm.
- Travel speed: 5.5/3.2 km/h
- Gradeability: 35 degree or 70%
- Pressure to the ground: 47.6kPa



2.5.3. Large Hex (SY425C)

- Total weight: 42.5t.
- Bucket capacity: 2.0 m³
- Engine power: 250kw/2000(M)
- Swing speed: 9.5 rpm.
- Travel speed: 5.2/3.2 km/h
- Gradeability: 35 degree or 70%
- Pressure to the ground: 80kPa



2.6 Main Optional Attachments of Sany Excavator

2.6.1. Hydraulic breaker

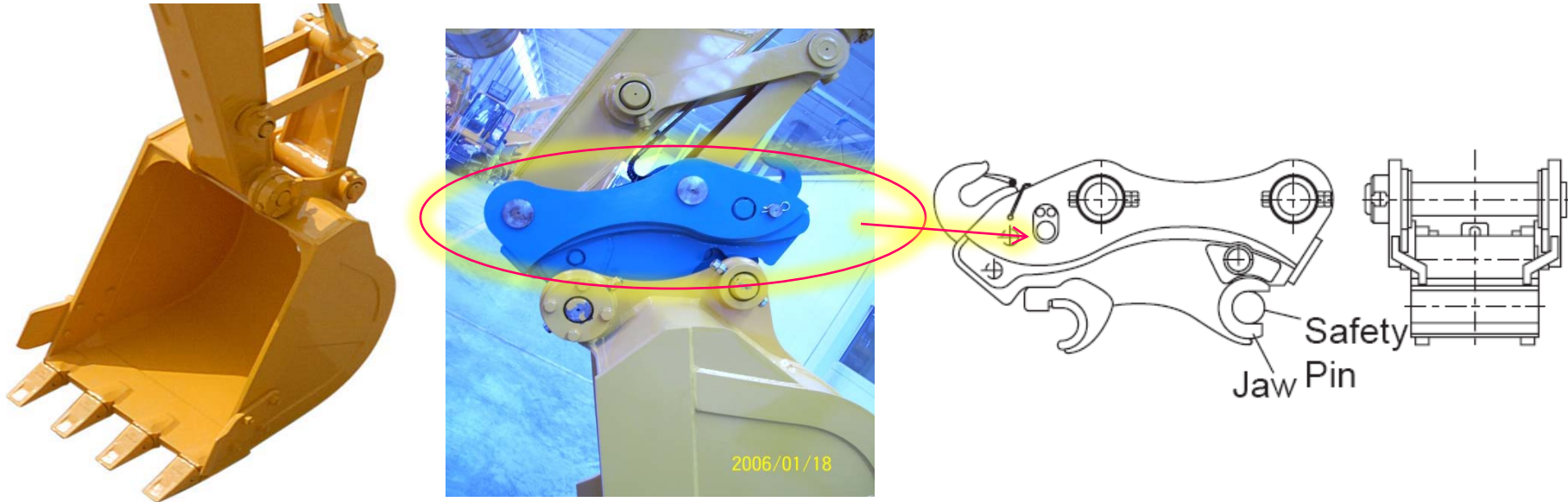
Major applications:

- Crushing rocks
- Demolition
- Road Engineering

This attachment can be used widely for, such as demolishing buildings, breaking road surface or slag, tunneling, crushing rocks, and breaking operation at quarry.



2.6.2. Quick Coupler



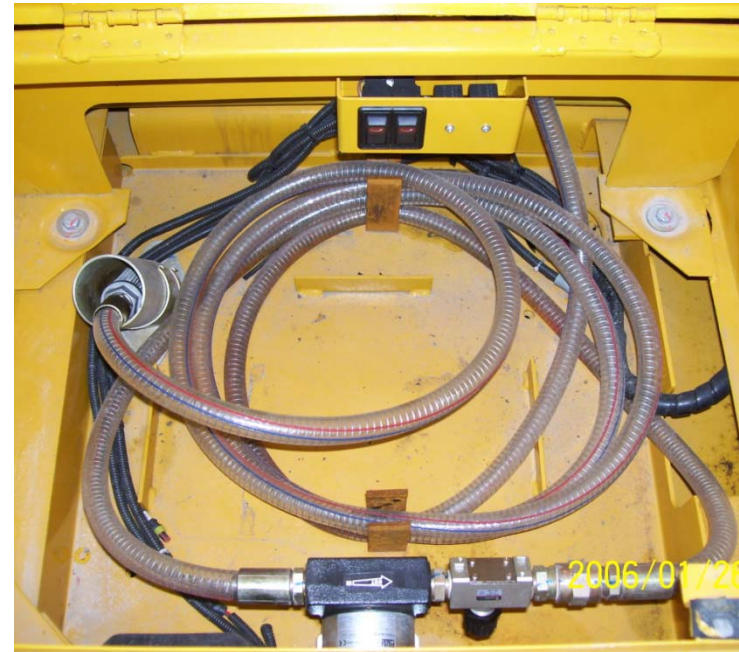
Removal of bolts and pins may cost you a lot of time, now you can only press the button to quickly replace the bolts and pins.

2.6.3. Central Lubrication System



You do not need to take the grease gun every day up and down to grease any more, it can add quantificational grease on time automatically and never be lazy.

2.6.4. Refueling System



No need to manually refuel which time consumed, it will stop refueling automatically without worrying about the fuel overflow from the tank.

2.6.5. Cab with FOPS



More safe under the falling objects working condition.

2.6.6. Bucket

Standard bucket



Reinforced bucket



Import steel, thicker and more resistant

Bucket for rock digging



Rock bucket, with three-layer thicker bottom plate

2.6.7. Widened track



For wetlands working condition.