



HE28

OPERATION MANUAL



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EuroTrac wants to thank you for having chosen the EuroTrac **HE28 excavator**. The technological evolution and the new request of today's world have pushed our company to a continue improvement, focused on the product, on the quality of the materials and on the quality of work.

In case of doubt about the interpretation of the subjects described and illustrated in this manual, we suggest you to contact us; we are ready to assist you whenever you need.

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1 Basic information

This manual contains important information for the correct and safe use of the excavator. Please always follow the instructions in this manual. You can find the following symbols in different places in this manual:

WARNING



Possible accident and injury hazard

NOTE



Important general information

Whenever you see these symbols, you must carefully read the content that appears after the symbol before starting the operation. This is information provided for the safety of you and others. Always be alert to dangerous situations.

2 Driving and operation

Excavator drivers and managers must keep in mind "safety first", and carry out safe and standardized operations in strict accordance with the "Operation and Maintenance Manual".

2.1 Transportation

When shipping the excavator in a container or car, the following must be noted:

- The stick is retracted, the bucket is retracted, and the boom is extended, so that the front part of the stick is placed on the ground.
- The front and rear positions of the crawler are well secured with wedge blocks.

2.2 Storage

1. Drain the cooling water in the engine cleanly during storage (Please drain cooling water containing antifreeze in an ecofriendly way).
2. Change the engine oil.
3. Apply anti-rust oil on the surface of unpainted parts.
4. Pull up the left armrest box to park the machine.
5. Pad the front and rear of the crawler with wedges.

2.3 Preparation before use

- Do not check fuel, oil leakage, oil level and electrical instruments in places with open flames;
- Do not add fuel when the engine is running;
- Do not smoke when the fuel system is working and the battery is checked;
- Check the tension of the crawler, and add grease for tensioning when the tension is insufficient;
- The joystick should be in the middle (neutral) position.
- Check the operation of each handle and pedal;
- Check the pollution degree of hydraulic oil (not more than 12 grades);

2.4 Operation of the excavator

- Only the driver who has passed the training and holds the driver's license of this type of excavator can drive this machine.
- Check all controls and alarm devices before driving, and repair them if they are damaged before operating.
- Pay attention to the surrounding people when driving and manipulating.
- When the engine is overheated, do not open the cover of the water tank or the auxiliary water tank to avoid injury.

WARNING

- Once it is found that the excavator function fails, or there are unsafe factors that need to be repaired, it should be reported to the management personnel in time, and the excavator should be stopped immediately until it returns to a safe state.
- When the vehicle needs to be dismantled under special circumstances, the lifting and transportation at the part with the lifting mark should be strictly followed.

NOTE

Normal use of the excavator: First, confirm the surrounding conditions. When turning, be aware of the surrounding obstacles and terrain, and operate safely; when operating, confirm the front and rear directions of the crawler to avoid tipping or impact; The direction of travel is in the direction of excavation, otherwise it is easy to damage the walking motor or hose; during operation, it is necessary to ensure that the left and right crawler tracks are in complete contact with the ground to improve the dynamic stability of the whole machine.

NOTE

- When the bucket cylinder and the connecting rod cylinder and the stick are at 90 degrees to each other, the excavator is the largest; when the bucket teeth and the ground are maintained at an angle of 30 degrees, the digging force is the best and the cutting resistance is the smallest; When digging, make sure that the angle of the digging arm is between 45 degrees from the front and 30 degrees from the back, this will achieve the best results. Simultaneous use of boom and bucket can improve digging efficiency.
- Spare parts used for repair and maintenance need to be provided by EuroTrac or a supplier approved by EuroTrac, otherwise EuroTrac will not be responsible for the warranty.

3 Technical specifications

3.1 Vehicle performance data

Model	HE28
Type	Full Coverage Crawler Excavator
Undercarriage width	1400 mm
Minimum swing radius	1470 mm
Dimensions	2400 mm x 1400 mm x 4440 mm (Transport condition with cab)
Maximum excavator height	4620 mm
Maximum unloading height	2900 mm
Minimum ground clearance	290 mm
Counterweight ground clearance	530 mm
Track size	1969 mm (length) x 300 mm (width) x 400 mm (height)
Maximum horizontal digging distance	4910 mm
Maximum lifting height of bulldozer	300 mm
Track wheelbase	1560 mm
Maximum digging radius	5030 mm
Maximum reach from the ground	4910 mm
Tail turning radius	1200 mm
Total vehicle weight	2850 kg

3.2 Component performance data

3.2.1 Engine

Model	Kubota V1505-E4B-JSQ-1
Type	Inline, water-cooled, 4-stroke diesel engine
Number of cylinders -bore	4-78 x 78.4 (3.07 x 3.09) diameter x stroke
Displacement	1.498
Power (without fan)	18.2/2300 kw/rpm
Maximum torque	91.2/1700 N-m/rpm
Maximum idle speed	2520 rpm
Idle speed	1250~1350 rpm
Fuel type	Diesel fuel No.2-D (S15)
Start motor	12V - 1.4 kW
Charging generator	12V-60A
Length x width x height	591.3 x 396.0 x 607.0 mm
Weight	110 kg
Direction of rotation	Counterclockwise (viewed from the flywheel side)
Cooling system	Pressurized radiator, forced circulation water pump
Lubricating oil	Recommended API CF Grade Lubricant

3.2.2 Hydrostatic pump

Model HLPP34-SQC			
Rotating speed	2200 rpm	Hydraulic power	13 kW
Variable starting pressure	10.5 Mpa	Maximum pressure	22 Mpa
Interface description	Thread specification	Recommended torque for piping installation	Shipping status
Pressure port (B)	Φ25		
Fixed thread	M10	38.7±2.5 N.m	
Suction port (S)	Φ40		
Fixed thread	M12	56.5±2.5 N.m	
Drain port (L)	7/8-14UNF Adapter M22 x 1.5	66±10 N.m	With steel ED plug
Drain port (L1)	7/8-14UNF	66±10 N.m	With steel plug
Oil pump installation (K)	M12 Class 10.9	66±2.5 N.m	With steel ED plug
Control pressure port (X)	7/16-20UNF Adapter M14 x 1.5	34±2.5 N.m	With steel ED plug

3.2.3 Slewing ring

Model 013.20.500.011	
Modulus	5
Number of teeth	74
Pressure angle	20
Precision (GB10095-88)	10
Modification coefficient	+0.5
Index circle	φ370
Amount of topping	1
Grease nipple (4)	M10 x 1

3.2.4 Rotary motor

Model HSM13-21.5-1			
Motor parameters		Shaft end spur gear parameters	
Displacement	12.5 ml/r	Modulus	5
Theoretical output speed	90 r/min	Number of teeth	13
Maximum working pressure	17.7 Mpa	Pressure angle	20°
Theoretical output torque	644 N.m	Modification coefficient	0.4
Brake braking torque	70 N.m	Common normal	39.010-39.110
Control oil pressure	2~7 Mpa	Number of teeth	2
Brake release pressure	1.5 Mpa	Addendum diameter	φ78 (0 - 0.2)

3.2.5 Drive wheel

Model YQSQ30-01001	
Number of teeth	21
Pitch diameter	φ341
Addendum diameter	φ354
Matching chain pitch	101.6
Root circle diameter	φ314
Meshing	Meshing with teeth
Pin sleeve diameter	φ13

3.2.6 Idler and tensioner

Model YQSQ30-02000	
Maximum outer circle of guide wheel	φ315
Outer circle at both ends of guide wheel	φ273
Spring diameter	φ20
Spring mounting dimensions	174

3.2.7 Shock absorber

Model XTA-SH35-35-00	
Material	Natural rubber St12
Rubber hardness	38±3HA
Axial load rating	350N
Deformation	2.5±0.5mm

3.2.8 Rollers

Type: YQSQ30 05000

3.2.9 Vehicle body

Model: Chassis reinforced with welded beams

3.2.10 Armrest box

Model: SD-SW40YIL

Material: ABS Engineering plastics

3.2.11 Driving motor

Model JA7K2000		
Suction flow		35 L/min
Work pressure		220 kgf/cm ²
Motor displacement		10.4/16.4 cc/rev
Motor output torque		3.64/5.74 kgf.m
Two-speed control pressure		30 kgf/cm ²
Gear ratio		53.7/1
Theoretical output speed		3365/2134 rpm
Gear oil quantity		0.6 L
Theoretical braking torque	Min	5 kgf.m
Brake release pressure	Min	6.6 kgf/cm ²
	Max	9.9 kgf/cm ²
Drain pressure	Normal state	2 kgf/cm ²
Total output torque		195.4/308 kgf.m
Total output speed		62.6/39.7 rpm
Weight		38 kgf

3.2.12 Single valve

Model JRCVJ-07	
Preset pressure	100 kgf/cm ²
Back pressure	3 kgf/cm ²

3.2.13 Pilot valve block

Model KXDF20-35-13ER	
Rated flow	20L/min
P maximum pressure	350 bar
Pressure reducing valve factory setting	35 bar
Relief valve factory setting	42 bar
Electronic valve	13VDC±15 % 25W
Solenoid valve connector	DT04-2P
Oil port	DIN 3852 G1/4ED
Oil temperature range	-20°~+90°C

3.2.14 Multi-way valve

Model HLMCV10-9-SQC		
Maximum flow	P Port	80 L/min
	A/B Port	50 L/min
Nominal pressure	P Port	20 Mpa
Port working pressure	P port	20 Mpa
	LS port	17.5 Mpa
	A1/B1 port	27 Mpa (Overload valve with charge valve)
	A2/B2 port	
	A5/B5/A8 port	27 Mpa (Overload valve with charge valve)
	A3/B3 port	20 Mpa
	A4/B4 port	
	A6/B6 port	
	A7/B7 port	
	B8 port	
	A9/B9 port	
	T port	2.5 Mpa
Pilot oil inlet flow	P Pilot port	≥10 L/min
Pilot port maximum pressure	A/B port	3.5 Mpa
Pilot port linear pressure range	A/B port	0.8-2.5 Mpa

3.3 Oil of excavator

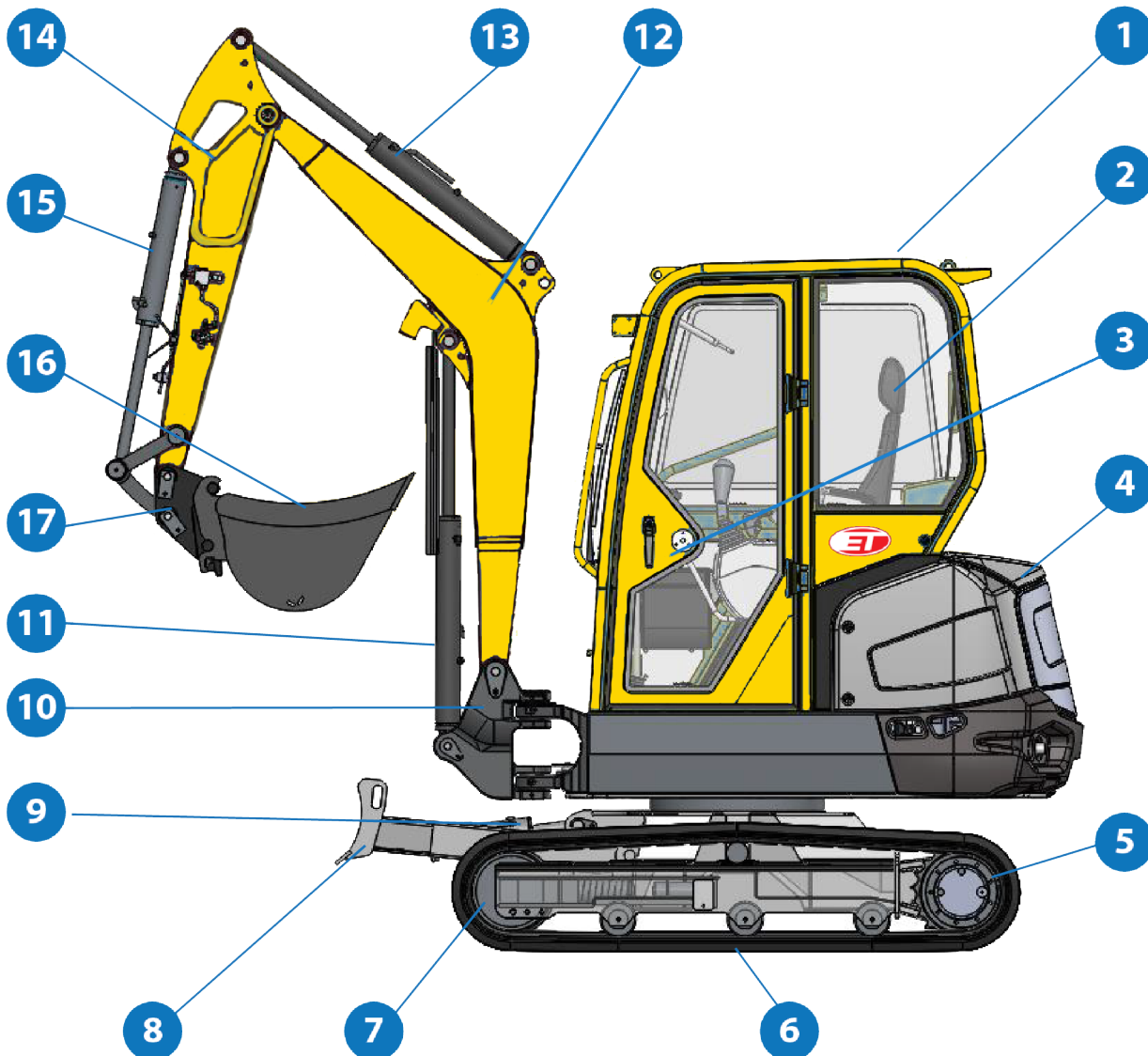
Engine oil: CF or CH grade

Hydraulic oil: 32# anti wear hydraulic oil

Grease: 2#lithium grease

4 Operating instructions for main components

4.1 Body system

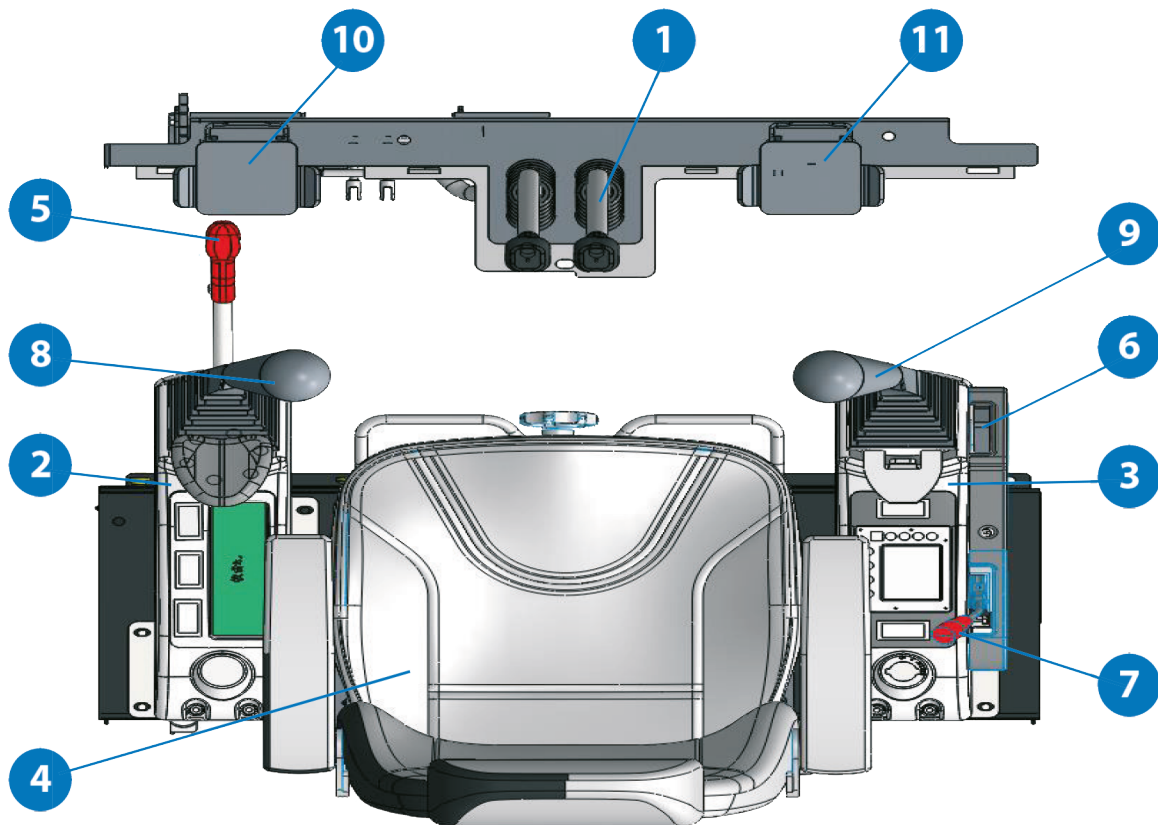


1	Cab	10	Swing arm articulated body
2	Seat	11	Movable arm cylinder
3	Cab door	12	Movable arm
4	Tail cover	13	Bucket rod cylinder
5	Walking motor	14	Bucket rod
6	Crawler	15	Bucket cylinder
7	Guide wheel	16	Bucket
8	Bulldozer	17	Quick change locking device
9	Bulldozing cylinder		

4.2 Engine

The engine of this car adopts Kubota (V1505 E4B JSQ 1).

4.3 Control system



1	Walking joystick	7	Speed operating lever
2	Left armrest box	8	Left-hand working device handle
3	Right armrest box	9	Right-hand working device handle
4	Seat	10	Yaw pedal (left pedal)
5	Safety lock lever	11	Quick lock pedal (right pedal)
6	Bulldozer operating handle		

The operating system is mainly composed of safety locking lever, walking joystick, left hand working device handle, right hand working device handle, yaw pedal, quick change locking pedal, etc.

4.3.1 Walking joystick

Used to control the front and rear walking and left and right turns of the excavator. Under normal conditions, the guide wheel should be in the front and the driving wheel should be in the back.

- **to move forward:** push the operating lever forward or tilt the foot pedal forward.
- **to move backwards:** pull the walking lever backwards or tilt the pedals backwards.
- **to stop moving:** put the operating lever in the neutral position (N) or release the foot pedal.

4.3.2 Safety lock lever

Control the connection and closing of the hydraulic oil circuit of the working device, the rotary motor and the walking motor through the solenoid valve. Its position is installed on the left side of the operating lever of the left hand working device, and there are two positions for locking and releasing.

Its main function is to quickly cut off the circuit when the working device, the rotary motor and the travel motor have wrong actions, so as to avoid safety accidents. When the lever is in the release position, the handle of the working device, the travel operation lever, the rotary motor and the travel motor can all act. When the lever is in the locked position, the handle of the working device, the travel operation lever, the rotary motor and the travel motor cannot be moved.

4.3.3 Left-hand working device handle

It is used to control the extension and retraction of the excavator's stick cylinder and the forward and reverse rotation of the rotary motor.

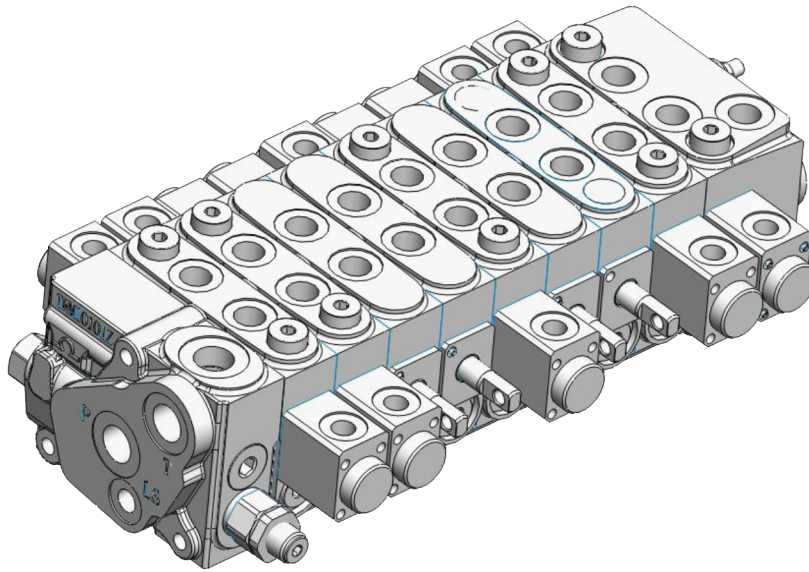
- **handle forward:** the stick cylinder contracts and the stick extends ;
- **handle back:** the stick cylinder is extended, and the stick is retracted ;
- **handle swings to the left:** the rotary motor drives the turntable to rotate to the left ;
- **handle swings to the right:** the rotary motor drives the turntable to rotate to the right .

4.3.4 Right-hand working device handle

Used to control the extension and shortening of the boom cylinder and the bucket cylinder, so as to control the boom and bucket execution actions.

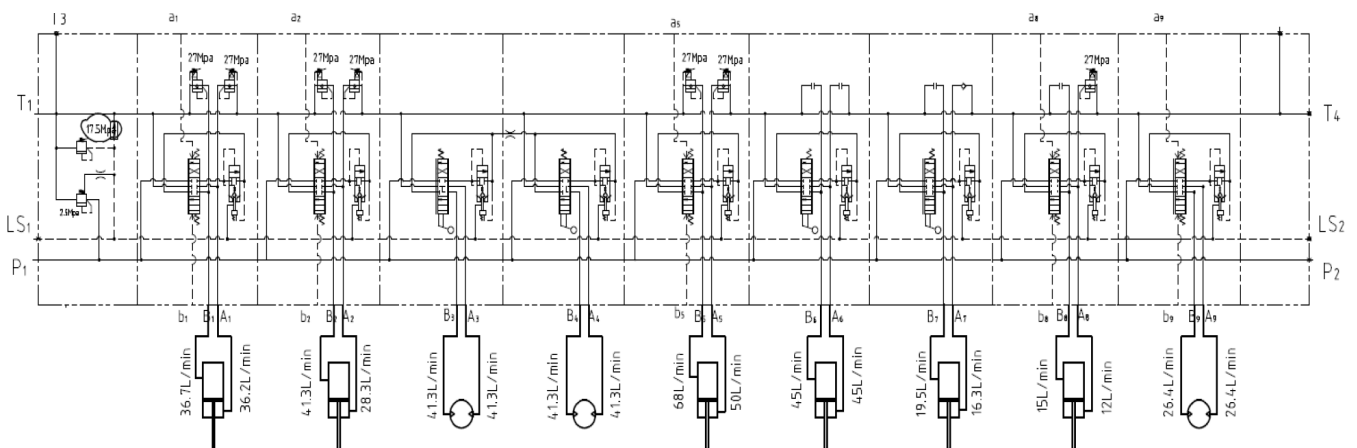
- **handle forward:** the boom cylinder is shortened and the boom is lowered ;
- **handle back:** the boom cylinder is extended and the boom is lifted ;
- **the handle swings to the left:** the bucket cylinder is extended and the bucket is retracted ;
- **handle to the right:** the bucket cylinder is shortened and the bucket is opened .

4.4 Multi-way valve



The multi-way valve is a load-sensitive control main valve, which consists of five pilot reversing valves and four manual reversing valves.

- *P1 and P2 ports at the left and right ends:* enter oil and are sealed with a flat surface or a combination gasket.
- *T port:* returns oil, Using a combination of gasket or the open return is blocked.
- *AB port:* is sealed with a plane or a combined gasket, the external dimension is 384x233.6x102.5.
- *LS ports at the left and right ends:* flow control and adjustment ports.



4.5 Walking device

The walking mechanism is composed of left and right track frames, track assemblies, roller assemblies, guide wheel assemblies, driving wheels, tensioner, hydraulic motors, etc.

The left and right crawler frames are the load-bearing skeleton of the crawler traveling device.

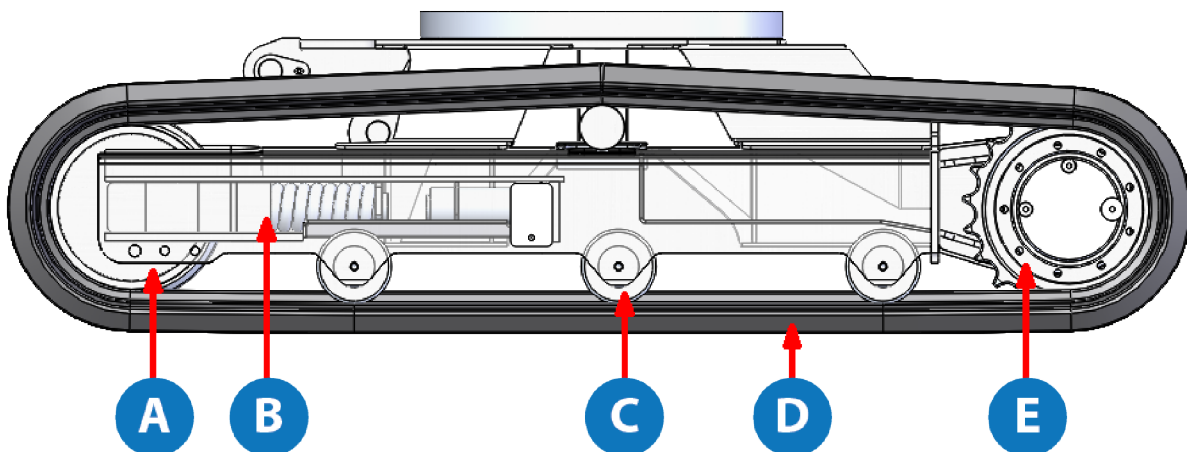
The crawler is in direct contact with the rock of the roadway floor, bearing the full weight and driving force of the machine, and the working conditions are very harsh. The hydraulic excavator standard combined crawler used by this machine can make the crawler slide laterally on the ground when turning. The rollers work in muddy water and withstand strong impacts and poor working conditions. Therefore, the wheel rim

and rolling tread are required to be wear-resistant and the sealing between the wheel and the shaft is better. The wheel body of this machine is made of high-strength alloy steel, and has been strengthened by heat treatment, which has high strength and good wear resistance. The floating seal is used between the wheel and the shaft, which has a simple structure and reliable performance. One-time oil injection during assembly. It is not necessary to inject oil during normal work, which is convenient for maintenance. After the wear reaches the limit, the parts can be replaced directly.

The idler wheel supports the sprocket and guides the track to be wound correctly, preventing the track from slipping laterally. At the same time, together with the tensioner installed behind it, the crawler can maintain a certain degree of tension and alleviate the impact force caused by the uneven ground when the machine is walking. When the crawler track encounters an obstacle, the tensioner makes the guide wheel move back a certain distance along the guide rails on both sides of the guide frame, so as to avoid excessive force on the crawler track.

The tensioner is a hydraulic tensioner. Use a grease gun to press grease into the hydraulic cylinder, so that the piston extends out, one end moves the guide wheel, and the other end compresses the spring to preload it. The preloaded spring still needs to have a proper stroke for buffering. If the track is too tight and needs to be loosened, unscrew the grease nipple and release appropriate grease from the hydraulic cylinder.

The two tracks are driven by two hydraulic motors respectively. The hydraulic motor is installed at the rear of the track frame, and the cover can be opened for maintenance.

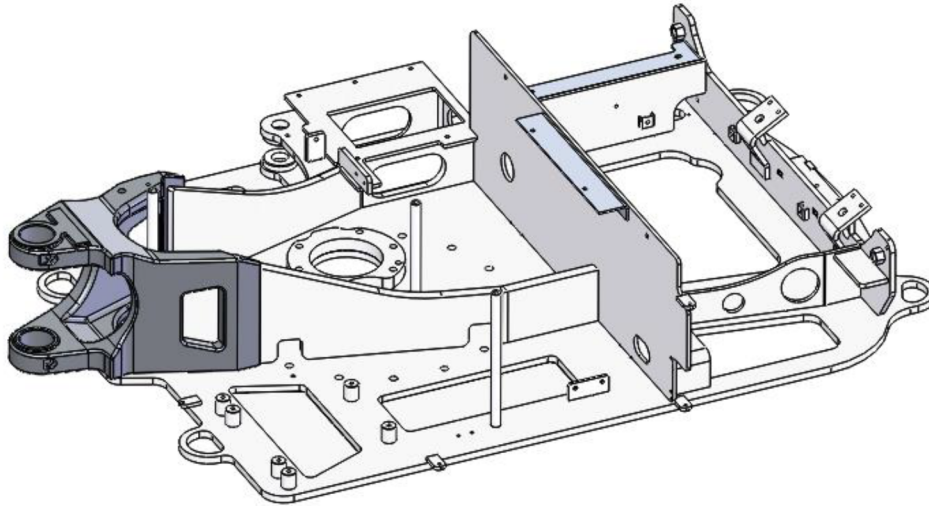


A	Guide wheel
B	Tensioning assembly
C	Rollers
D	Track assembly
E	Drive sprocket

4.6 Rotary mechanism

The slewing mechanism is composed of a slewing support, a slewing platform and a slewing motor. The left-hand and right-hand rotation of the slewing platform is controlled by the handle of the left-hand working device.

The slewing platform is composed of welded steel plates, and the left and right sides and the front of the multi-way valve are installed by detachable cover plates, which are more convenient for maintenance, inspection and repair.

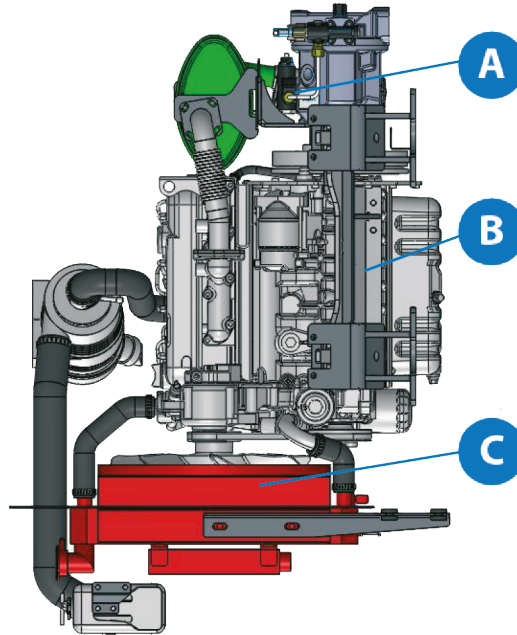


4.7 Hydraulic control system

The hydraulic control system of this machine is mainly composed of hydraulic plunger pump, Jiulian hydraulic control multi-way reversing valve, pilot oil source valve, oil radiator, oil tank and other hydraulic components. The maximum pressure of the hydraulic system of this machine is set to 22Mpa. The main pump provides the pressure required by all hydraulic components of the whole machine (the pilot valve has its own pressure reducing valve). This system is a load-sensitive hydraulic system, which can be precisely controlled according to the amplitude of the operating lever.

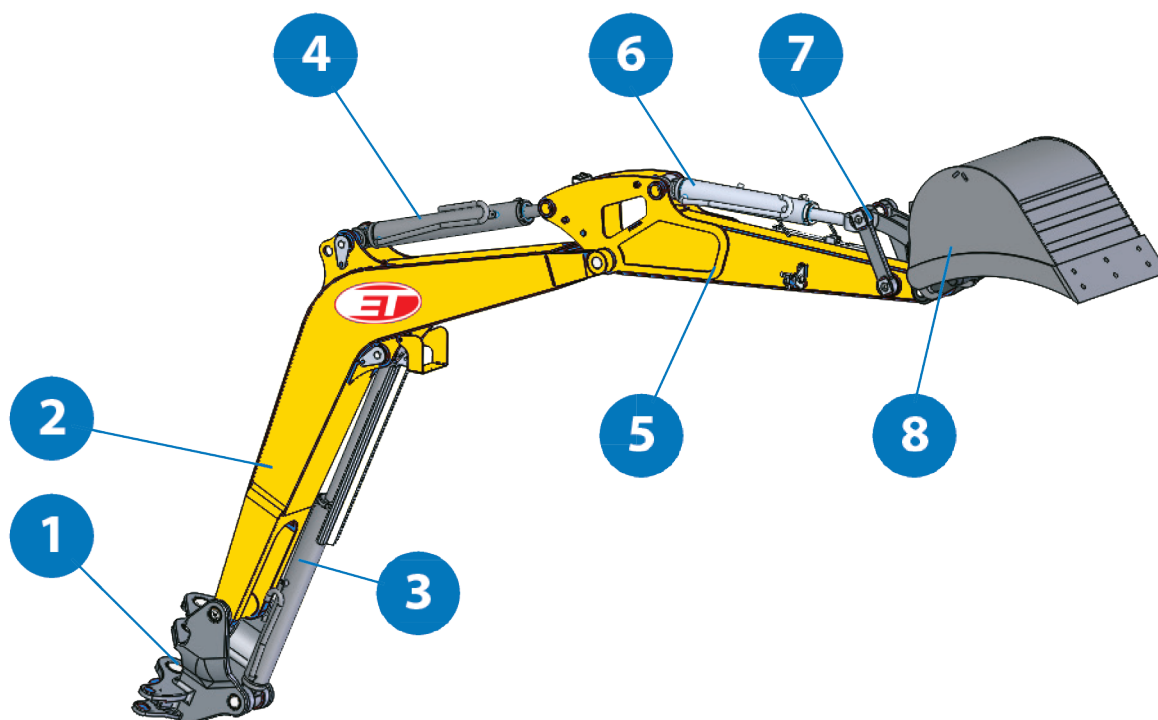
4.8 Hydraulic power system

The hydraulic power mechanism is mainly composed of an engine, a plunger pump, a gear coupling, etc. This machine adopts Kubota Euro V emission standard engine. The engine drives the plunger pump through nylon gear coupling. The structure is simple, compact and reliable.



A	Piston pump
B	Engine
C	Oil radiator

4.9 Working device



1	Swing arm articulated body	5	Stick
2	Boom	6	Bucket cylinder
3	Boom cylinder	7	Quick change mechanism
4	Stick cylinder	8	Bucket

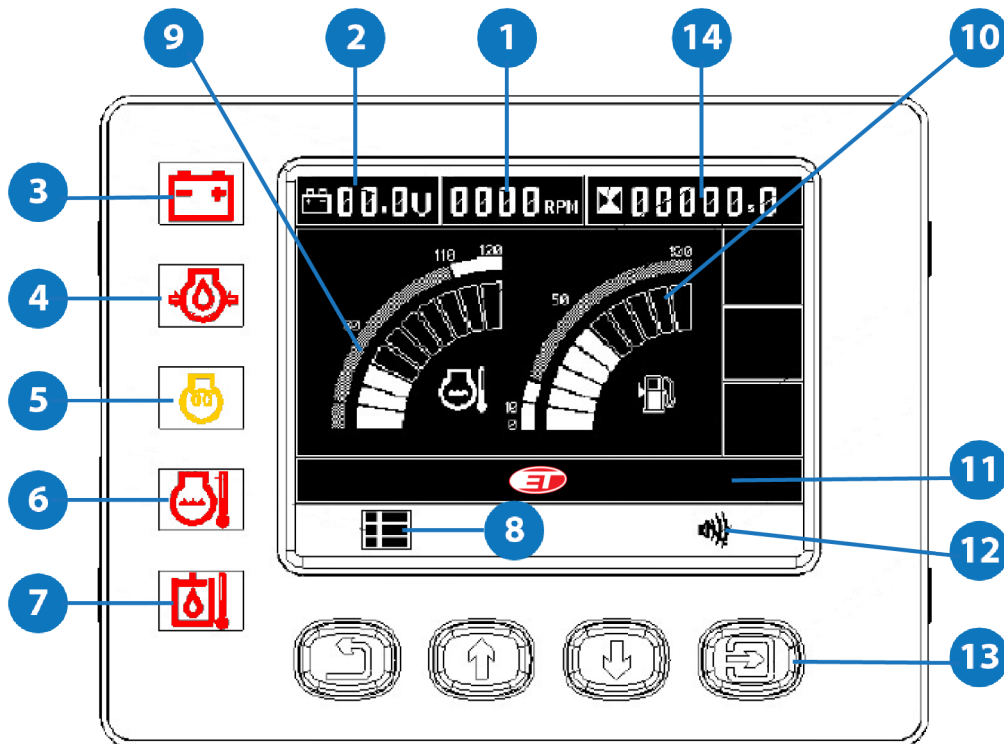
The working device consists of a swing arm hinged body, a boom, a stick, a quick-change mechanism, a link mechanism, a bucket, a boom cylinder, a stick cylinder, and a bucket cylinder. Control the extension and retraction of the yaw cylinder to make the working device rotate left and right. Operating the telescopic boom cylinder moves the boom up and down. Controlling the extension of the stick cylinder can make the stick move back and forth. Controlling the expansion and contraction of the bucket cylinder can make the bucket perform digging action. There are four types of buckets, which can be replaced in response to different situations. The shaft material is 35CrMo, the heat treatment process is quenching and tempering, the surface is high-frequency quenching, and the strength and wear resistance are very high.

4.10 Electrical equipment





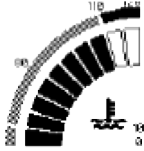
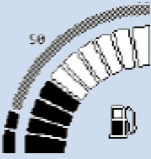



Part No.	Name	Specification	Qty
K30G00 800200	Horn	DL124E12VD	1
0018-800100-005	Meter	YLK-3	1
0018-800100-002	Working light	921	2
0018-800100-002	Boom light	5045S	1
K30G00 800040	Starting switch	JK428	1
K30G00 814000	Warning light	TTD112-124	1
0018-800100-001	Main power switch	DK138S-08	1
0018-800100-001	Oil pressure sensor	NPT1/8	1
0018-800100-001	Water temperature sensor	NPT3/8	1

Part No.	Name	Specification	Qty
QC20-700500-G00	Relay	DC12V	2
QC20-700400-G00	Fuel level sensor		1
1130-701200-G00	Fuse holder	ANS-H	1
1130-701201-G00	Bolt fuse	ANF	1
K30G41 864000	Battery	95D31R	1
0018-800200-001	Rocker switch	JK969	5
0018-800200-001	Control box	LZSU-51	2
0018-800100-003	Safety lock limit switch	Comes with control box	1
0018-800100-004	Fuse box	SQ-F-V1.0	1
0018-800100-002	Wiper	ZD1232-170A7	1
0018-800200-001	Wiring harness	Self made	1
0018-800100-002	Heater		1
0018-800100-002	Radio	TK18	1

4.11 Description of main working interface of instrument



Item	Icon	Function	Note
1	0000 RPM	Engine speed	
2	000.0V	Power voltage	
3		Charge indication	Red
4		Low oil pressure alarm	Red

Item	Icon	Function	Note
5		Preheat indicator	Yellow
6		High engine water temperature alarm	Red
7		High hydraulic oil temperature alarm	Red
8		Instrument menu key prompt symbol	
9		Water temperature gauge	10 segment fan display
10		Fuel gauge	10 segment fan display
11	System is functioning normally	System working status text prompt	Display working status in text mode, such as high water temperature, low oil pressure, etc.
12		Mute key	When audible alarm, press this key to silence
13		Instrument function keys	Meter has 4 buttons
14		Engine working hours	Start timing when engine speed is greater than 650 rpm

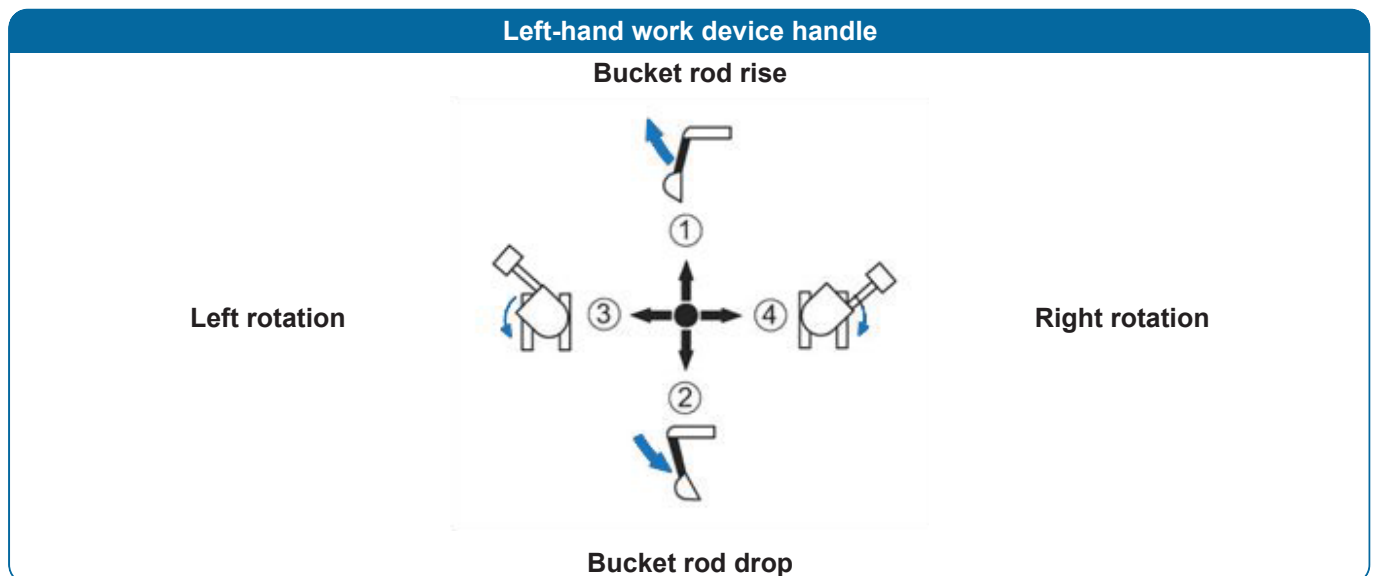
5 Brief description of operation

5.1 Preparation before startup

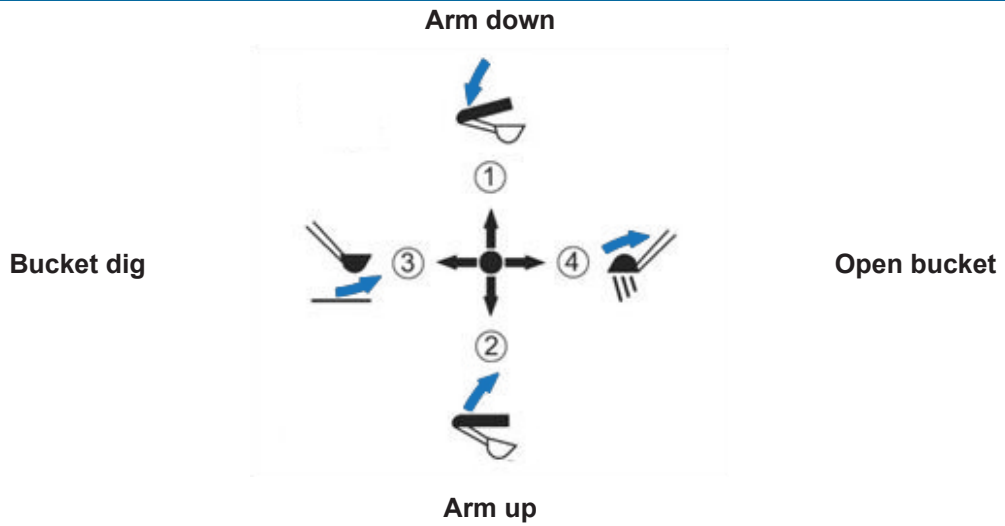
1. Check the rubber hose assembly on the mobilized machine. Where it is in contact with the machine hardware and obtuse angle and repeatedly worn during operation, wrap the worn part of the rubber hose assembly with soft rubber to avoid wearing the rubber and steel wire on the outer layer of the rubber hose; The top of the oil tank shall be sealed with a filler cap to prevent impurities from penetrating into the oil tank.
2. The operator shall be trained. Before operating the machine, the driver must be familiar with the manual, the structure, working principle, performance, operation method and maintenance technology of the machine, the functions and positions of each button, and the functional schematic diagram of each joystick position. After passing the examination, the operator can operate the machine.
3. No. 46 anti-wear hydraulic oil is recommended, and no. 32 anti-wear hydraulic oil is recommended in winter. The hydraulic oil must be kept clean. Do not use dirty containers to hold it, and it must be added from the hydraulic air filter for refueling. The oil tank capacity of this machine is 28 liters, and the oil level should be maintained at more than three-quarters of the oil level.
4. Check whether all fasteners, electrical components and hydraulic components are in good condition.
5. Check whether each operation handle is in the stop position. (Only when the left armrest box is raised)

5.2 Manipulation

The machine controls all actions of the machine by operating the manual handle in the driver's room, the manual pilot handle and the foot pedal. The layout of the driver's room and the action of the mechanism are shown in the figure below.

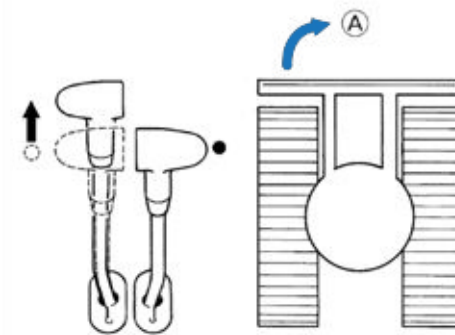


Right-hand work device handle



Walking joystick

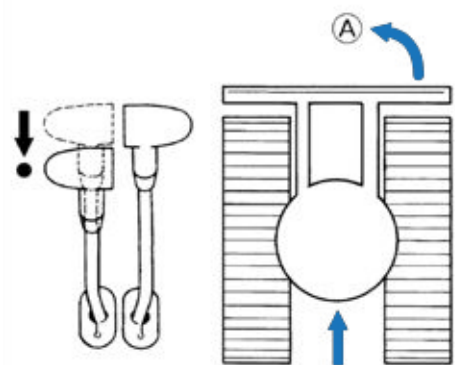
Left track forward



Left track back

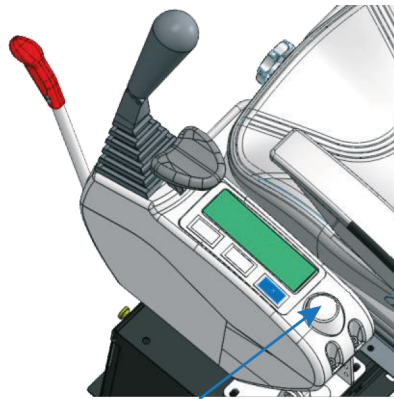
Walking joystick

Right track forward



Right track back

The left foot pedal controls the left and right yaw of the work device. The right foot pedal controls the quick-change locking cylinder (step on the right foot pedal to the right, press the switch of the quick-change solenoid valve at the same time, and push out the quick-change locking cylinder. When retracting, press the pedal to the left, and at the same time press the solenoid valve switch)



Quick-change solenoid valve switch

6 Safety precautions

1. The handle can move at the same time during loading, and the walking mechanism must be constantly pushed. Under different mound conditions, the joint action of the boom, stick and bucket is required to improve efficiency.
2. The lifting height of the boom should be determined according to the pile height of the mound, and it is not necessary to raise to the highest position each time to speed up the work rhythm.
3. When operating, try to avoid extending and retracting the working cylinder to the end. This will not only avoid excessive shocks to the cylinder and working mechanism, prolong the service life of the parts, but also avoid frequent overflow of the safety valve and excessive oil temperature.
4. If the track is stuck by a hard stone, you can temporarily stop working, open the tensioning cylinder, drain the oil plug, and release the butter.
5. It is strictly forbidden to stand around the working institution when working.
6. When the machine is not in use, it should be parked 50 meters away from work. The bucket and stick should be retracted and the boom should be lowered. The bulldozer is lowered to the lowest position and the left armrest box is placed in the raised position.
7. Four buckets are used for different digging situations.
8. Bucket working mechanism and walking cannot be used at the same time;
9. Product warranty period is 6 months. This time is counted from the date when the first user installed the device and commissioned it.
10. The parts guaranteed during the warranty period do not include routinely overhauled parts, such as oil filters and filter elements and other wearing parts.
11. When the excavator is walking or reversing, the warning light should be activated as a warning signal.

7 Lubrication of excavator

The correct lubrication work of the excavator can greatly reduce the frictional resistance of the vehicle and the wear of parts and components.

In the lubrication work, clean and normal lubricants are required.

Item	Lubrication area	Lubrication points	Lubricant type	Lubrication time (h)				
				Daily	50	100	250	500
1	Bulldozer	4	butter		check			
2	Slewing bearing	1	butter	check				
3	Swing arm articulated body	2	butter	check				
4	Boom shaft	3	butter	check				
5	Stick shaft	3	butter	check				
6	Quick change mechanism	4	butter	check				
7	Door hinge	2	butter					check

8 Daily maintenance

1. The machine should always be kept intact and clean. Especially in wet tunnels with water leakage, the fuel tank should be covered with rubber plates or canvases. Rainwater should not be allowed to leak into the fuel tank. Special attention should also be paid to equipment maintenance. Rainwater and dirt are not allowed to pollute the oil system.
2. Always check and tighten the bolts and nuts of various parts.
3. Frequently check the joints of hydraulic components and pipelines to eliminate leakage and check the high pressure hoses for damage. Replace them if they are severely damaged. When checking the leakage of the hydraulic pipeline, wait until the working device has fallen to the ground, turn off the power, and release the pressure in the system before performing maintenance work on the hydraulic pipeline. Direct contact with high temperature hydraulic oil is strictly prohibited to prevent burns.
4. Check the oil level and oil temperature frequently. If the oil level is lower than the oil level, the hydraulic oil should be replenished in time. If the oil temperature exceeds 80°C, the machine should be suspended.
5. Check and adjust the working pressure of each oil circuit regularly (once a month) or when you feel an abnormal working pressure of the hydraulic system.
6. The hydraulic oil was replaced for the first time during 120 hours of work. At the same time, the oil return filter was replaced and the fuel tank, suction filter and air filter were cleaned. Replace it for the second time during 300 hours of work. At the same time, replace the oil return filter, suction filter and air filter, and clean the fuel tank and pipeline. It will need to be replaced every 500 hours in the future. At the same time, the oil return filter, oil suction filter and air filter should be replaced, and the fuel tank and pipeline should be cleaned. Note: The suction filter element should be replaced in time according to the blockage.
7. Wherever there is a butter cup, butter must be added once a week, and the connecting pin of the working mechanism must be buttered once a day.
8. After 6 months of use, the wear of the track rollers, guide wheels, and tracks should be checked frequently. When the wear on a side of a track is greater than 5 mm, the track must be replaced.
9. When it is found that the overhang area of the track is greater than 30 mm, it must be adjusted in time. The method of tightening the track is: from the hole of the tightening cylinder, use a grease gun to insert lithium based grease; the method of loosening the track: unscrew the check valve and release the grease.
Note: When adjusting the tension of the track, do not bring your head close to the detection port. Because under high pressure, the lubricating oil in the cylinder may spray out, which will cause you injury. (The adjustment of the tensioner is 80 mm.)
10. The connection bolts of the hydraulic walking motor should be checked frequently for any problems such as falling off and loosening.
11. Hard stones and other hard objects stuck in the tracks should be removed in time.
Note: Do not start the track type backhoe loader when large stones, wood blocks, iron wires, etc. are inserted in the center of the track section. If forced to move, these large debris may cause serious damage to the machine.
12. Regularly check the grounding device and explosion proof performance of electrical equipment. The explosion proof surface should be kept oil to prevent rust.
13. A portable methane alarm must be equipped when used in coal mines.
14. Check the lubrication points and fill with lubricant as required.

9 Regular maintenance schedule

The schedule is set based on standard working hours and operating conditions. If the excavator is in harsh conditions, please perform maintenance in advance
(Black dot means "replace")

9.1 Engine

Item	Content	Tools	Daily (8 h)	Monthly (200 h)	3 months (600 h)	6 months (1200 h)	Yearly (2400 h)
Engine	Visually check the engine operating status		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Engine sound		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Exhaust color		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Clean or replace the air filter element		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Check and adjust valve clearance	Rear plug gauge				<input type="checkbox"/>	<input type="checkbox"/>
	Tighten the cylinder head bolts	Torque wrench			<input type="checkbox"/>		<input type="checkbox"/>
					Gasoline engine Only this one time		
	Check cylinder compression pressure	Pressure gauge					<input type="checkbox"/>
Governor or jet pump	Check the no load maximum speed	Tachometer					<input type="checkbox"/>
Lubrication system	Whether the engine leaks oil		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Check oil quantity, cleanliness		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Change engine oil			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
					The first 50 hours		
	Replace the engine oil filter			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
				The first 200 hours			
Fuel System	Visually check the oil pipe, oil pump, and oil tank for leaks		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Check if the fuel filter is blocked				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cooling system	Coolant volume	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Leakage		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Hose aging		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Performance and installation of water tank cover			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Clean and replace coolant				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Check fan operation		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9.2 Hydraulic system

Item	Content	Tools	Daily (8 h)	Monthly (200 h)	3 months (600 h)	6 months (1200 h)	Yearly (2400 h)
Hydraulic tank	Oil quantity check			<input type="checkbox"/>			
	Clean the suction filter				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Oil change					<input type="checkbox"/>	<input type="checkbox"/>
Oil return filter	Replace oil return filter					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Pipe joint	Leakage, loosening, cracking, deformation, damage				<input type="checkbox"/>		
	Replace the pipe			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> 1-2 year

9.3 Electric

Item	Content	Tools	Daily (8 h)	Monthly (200 h)	3 months (600 h)	6 months (1200 h)	Yearly (2400 h)
Starting motor	Pinion meshing						<input type="checkbox"/>
Electric wire	Harness damage, loose fixation						<input type="checkbox"/>
	Loose connection						<input type="checkbox"/>

9.4 Safety devices and accessories

Item	Content	Tools	Daily (8 h)	Monthly (200 h)	3 months (600 h)	6 months (1200 h)	Yearly (2400 h)
Cabin and protective fence	Whether installation is firm						
	Check for deformation, cracking and damage						<input type="checkbox"/>
Horn	Work and installation						<input type="checkbox"/>
Lamp and bulb	Work and installation						<input type="checkbox"/>
Back mirror	Dirt and damage						<input type="checkbox"/>
Instrument	Instrument working conditions						<input type="checkbox"/>
Seat	Inspect bolts for damage or looseness						<input type="checkbox"/>
Vehicle body	Whether the frame and beam are damaged or cracked						<input type="checkbox"/>
	Whether rivets and bolts are loose						<input type="checkbox"/>
	If necessary, inspect parts that have been repaired						<input type="checkbox"/>
	Comprehensive inspection						<input type="checkbox"/>
Add grease or change oil	Check chassis lubrication after cleaning						<input type="checkbox"/>
	Check the oil in the tank						<input type="checkbox"/>

NOTE

When using oil, coolant or antifreeze that is different from the specifications of this machine, the replacement cycle cannot be the same as that specified in this book. Therefore, the replacement time is reduced by half or 1/4 compared with the time specified in this manual. Although the high viscosity oil has a wide working range, it needs to be replaced frequently. This is because the additives will slowly deteriorate, reducing the viscosity of the oil and severely damaging the hydraulic system at high temperatures.

10 Common faults and troubleshooting methods

Item	Failure phenomenon	Solution
1	No response after turning on the key switch	Check if the main power switch is on Check if the power cord is loose
2	Cannot start the engine	Check for sufficient fuel Check whether the pipeline is leaking Check whether the starting motor works Check whether the left armrest box is lifted
3	The meter is not displayed after starting	Check if the connector under the meter Check the fuse is loose or damaged
4	Oil pressure indicator alarm	Check if the oil is sufficient
5	Oil leak	Tighten the connector / Replace the seal
6	Water temperature alarm	Check for sufficient antifreeze Check if the electronic fan works
7	Not walk a straight line or turning ineffective	Troubleshoot oil motor or oil circuit Adjust track tension Adjust the left and right joystick limit

10.1 Common obstacles and elimination methods of hydraulic cylinder

Inspection	Failure situation	Solution
Inside of the cylinder	Light linear scratches or point like scars	Can be trimmed with very fine sandpaper or wetstone and continue to use
	Longitudinal scratches	Remake cylinder
Piston rod sliding surface	Light linear scratches or point like scars	Can be trimmed with very fine sandpaper or wetstone and continue to use
	Partial chrome plating layer peeled off due to wear to form longitudinal scars	Remove the original chrome layer and rechrome or remake the piston rod
Seal	Broken due to lip extrusion	Replace the new seal
	There is slight wear or slight scars on the lips or friction surface	It is best to replace the new seal

10.2 Common failures of hydraulic motors and repairing methods

Malfunction	Possible Causes	Method of exclusion
The motor does not rotate or rotates very slowly	The load is large, the pump supply pressure is not enough	Adjust the pressure of the safety valve to the rated pressure
The hydraulic motor inlet pressure gauge has abnormal vibration	There is air in the oil	Eliminate the factors that generate air in the oil until there are no bubbles in the oil return
	The hydraulic motor is abnormal	Repair hydraulic motor
Motor has external leakage	Damaged seal	Replace the sealing ring
	The thread of the drain joint is too long, and the shaft connected to the rotor and the motor is too long or the shaft different from the motor causes the pressure in the motor housing cavity to be too high, which breaks the seal ring.	Change the sealing ring after reducing the screw in length of the drain joint or adjusting the length of the coupling shaft and the coaxiality with the motor

10.3 Common faults and elimination methods of multi-way directional

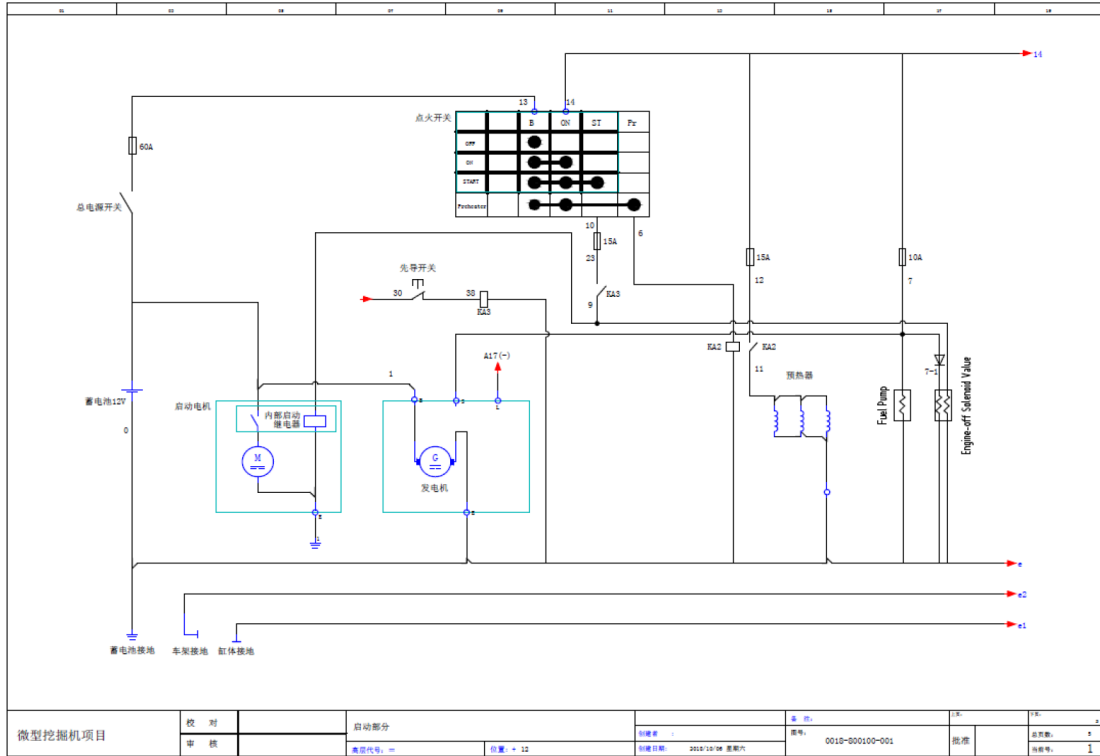
Malfunction	Possible Causes	Method of exclusion
The spool valve cannot be reset or cannot be positioned at the positioning position	Deformation of return spring	Replace the return spring
	Deformation of positioning spring	Replace the positioning spring
	Position sleeve wear	Replace the positioning sleeve
	Not clean between valve body and spool	Clean
	The control mechanism outside the valve is not working	Adjustment valve external control mechanism
	The coupling bolt is tightened too tightly, which deforms the valve body	Retighten the coupling bolt
External leakage	Damaged O ring seals on both ends of the directional valve	Replace O ring
	Damaged O ring seals between the contact surfaces of the valve bodies	Replace O ring
Pressure relief valve is unstable or cannot be adjusted	Deformation of pressure regulating spring	Replace the pressure regulating spring
	Tapered valve wear	Replace cone valve
	Spool orifice blocked	Cleaning the spool
	Loose lock nut	Tighten the lock nut

Malfunction	Possible Causes	Method of exclusion
	The working pump is faulty	Repair or replace working pump
When the spool valve is in the neutral position, the working mechanism sinks significantly	The clearance between the valve body and the spool increases due to wear	Repair or replace the spool
	Spool position is centered	Keep the spool position aligned
	The cone valve is worn or covered with dirt	Replace cone valve or remove dirt

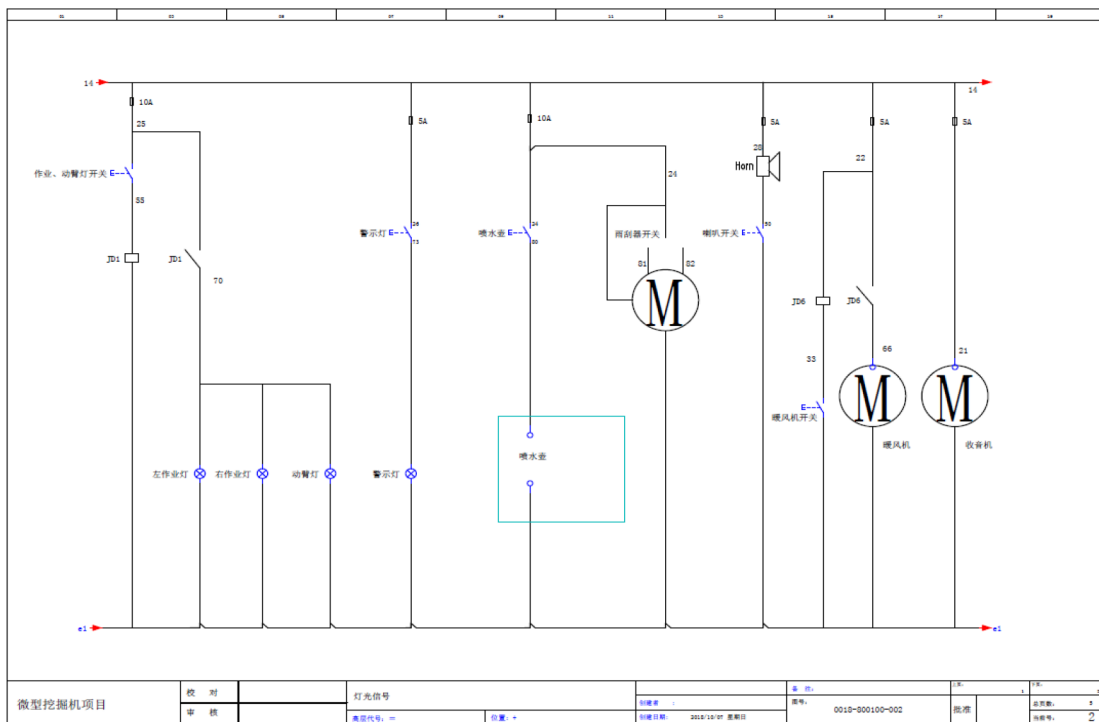
11 Appendix

11.1 Electrical diagrams

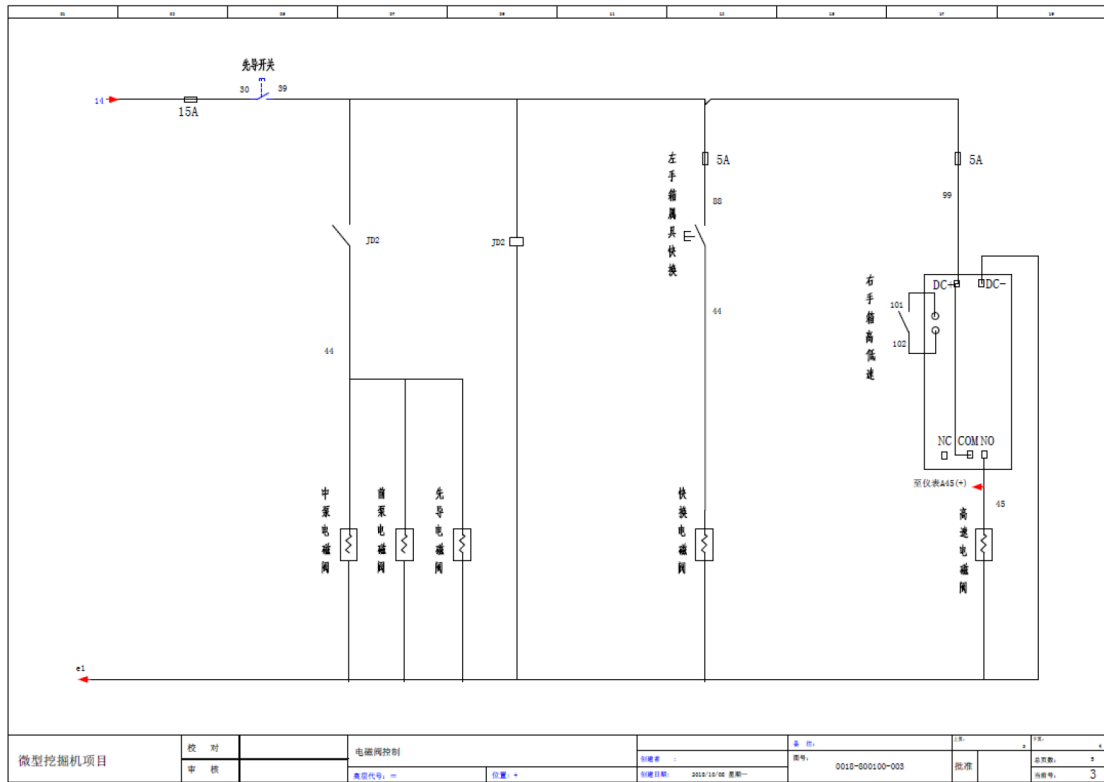
11.1.1 Diagram 1



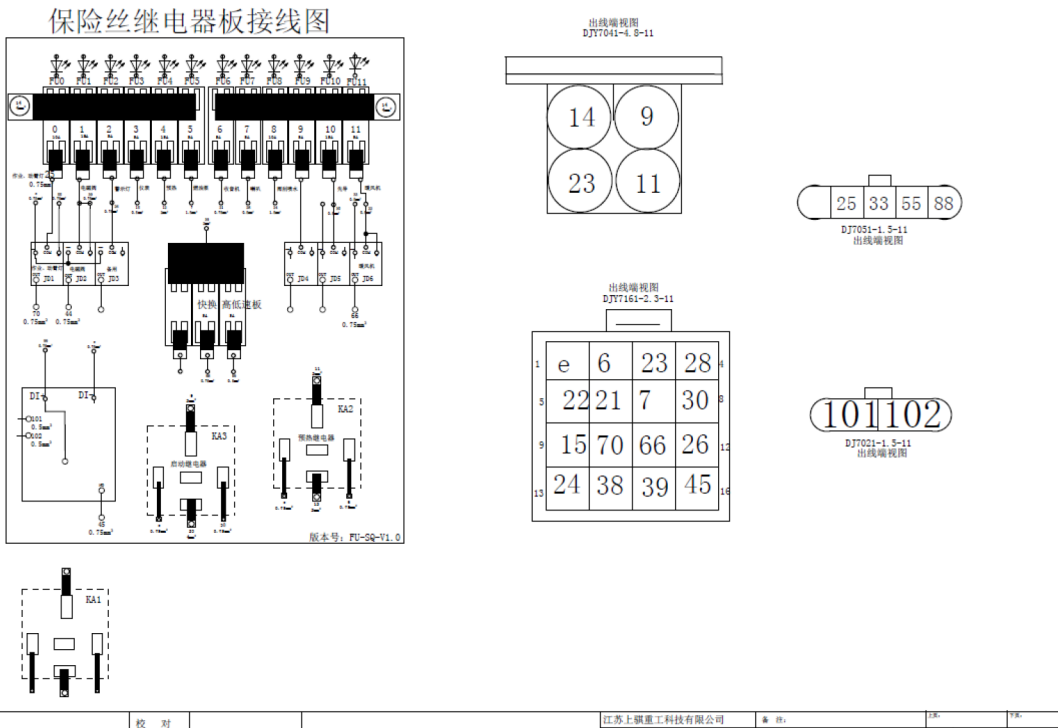
11.1.2 Diagram 2



11.1.3 Diagram 3



11.1.4 Schematic diagram of fuse relay box distribution



11.2 Hydraulics diagram

