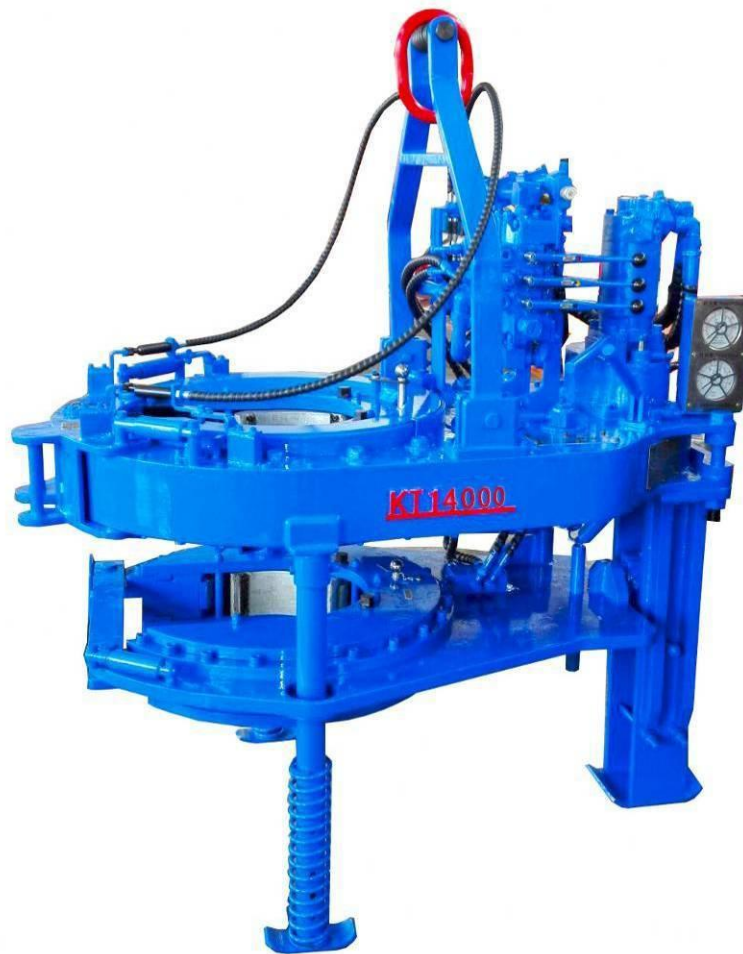




MODEL KT14000 CASING POWER TONG



BIG RIG SUPPLY CO., LTD.

Ver 201

1. Summary

KT14000 Casing Power Tong is used to make up and break out for casing operation in oil fields. It has greatly reduced the labor of worker, enhanced connection quality of thread and diminished accidents in inappropriate casing operation. The power tong has the following features as well:

Features :

- 1.1. Opening type, convenient and prompt to enter and slide off the working position, with an integral tong head of great strength and rigidity.
- 1.2. Double swing head jaws, convenient to assemble and disassemble.
- 1.3. Brake belt assembly, easy to operate and convenient to maintain and replace.
- 1.4. Four-gear rotation is adopted for large speed regulation range. And the rated torque is large;
- 1.5. Open gear supporting structure, improving the strength and rigidity.
- 1.6. Wholly hydraulic mode and mechanical gear shift.
- 1.7. High strength steel plate used on the shell, increasing the strength. The jaws are cast with precise technology, artistic and strong.
- 1.8. With hydraulic torque indicator and also installation interface, convenient to realize the computer management.
- 1.9. Use safety door hydraulic safety device and have a great safety performance.
- 1.10. Large torque range, can meet the requirement of larger torque use.

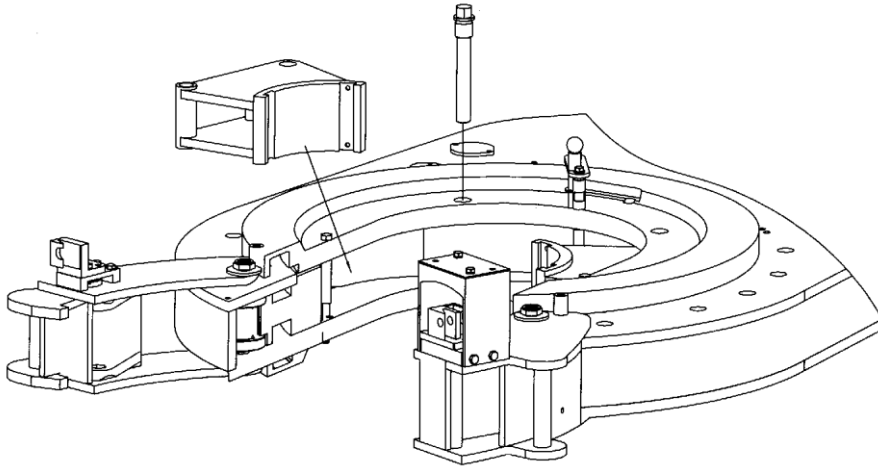
2. Specifications

2.1	Application Range:	Master tong	4"--14"
		Backup tong	4"--15 ¹ / ₂ "
2.2	Tong head rotation speed:	High gear	41 rpm
		Second high gear	18 rpm
		Second low gear	10 rpm
		Low gear	4.5 rpm
2.3	Rated torque:	High gear	5500 ft.lbs
		Second high gear	12500 ft.lbs
		Second low gear	22500 ft.lbs
		Low gear	50000 ft.lbs
2.4	Rated pressure:	17.2 MPa / 2500 PSI	
2.5	Work flow:	150 L/min (40 GPM)	
2.6	Torque arm:	1006mm/ 39.6"	
2.7	Overall dimension(L×W×H):	1676×1017×1900mm/66 "×40" ×74.8 "	
2.8	Weight	Master tong	1200kg/2646lbs(including spring cast)
		Composite tong	1720kg/3790lbs(including hydraulic cast)
2.9	Specification of jaw plates:	Three kinds of jaws equipped with tong 7",9 ⁵ / ₈ ",13 ³ / ₈ "	
		The others 4",4 ¹ / ₂ ",5",5 ¹ / ₂ ",6 ⁵ / ₈ ",7 ⁵ / ₈ ",8 ⁵ / ₈ ",9 ⁷ / ₈ ",10 ³ / ₄ ",11 ³ / ₄ ",13 ⁵ / ₈ ",14"and15 ¹ / ₂ "(for backup tong) are optional.	

3. Operation

The instructions for tongs preparing and working as following:

3.1 Jaw installation (see illustration below):



To install the jaws, remove the jaw pivot bolts from the cage plate. Plate one jaw at a time between the upper and lower cage plates with the jaw roller pin facing upward. Align the hole in the jaw with the matching hole in the cage plates, and insert the jaw pivot bolt.

3.2 Tong rig-up

3.2.1 Hang the tongs

- (1) Fix the single pulley (with the load of 5 tons) on the bottom girder of the crown.
- (2) Put the Slip wire rope (which has a diameter of not less than 5/8") through the pulley. One end of wire rope fastened on the bottom girder, and other end fastened on the lift bucket(master tong can choose to use spring lift bucket, combined tong can choose to use hydraulic lift bucket).The height of power tongs should be equal to the average height of connectors for tripping string.

3.2.2 Leveling the tong

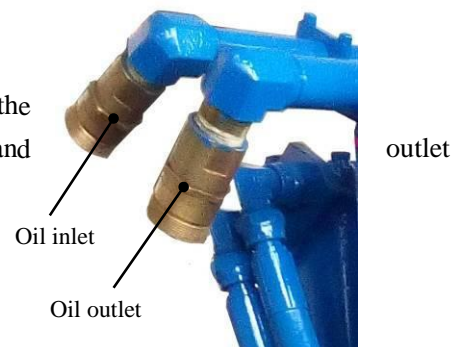
It is necessary to level the tongs after Hang the tongs. Otherwise, it will lead to tong tooth slipping.

Front-rear leveling--it is adjusted through the left and right two horizontal bolts at the connection position between lifting bracket and tong body of the power tongs.

Transverse leveling--it is adjusted through leveling bolts on the upper part of lifting bracket. And it may be adjusted through turning the bolts.

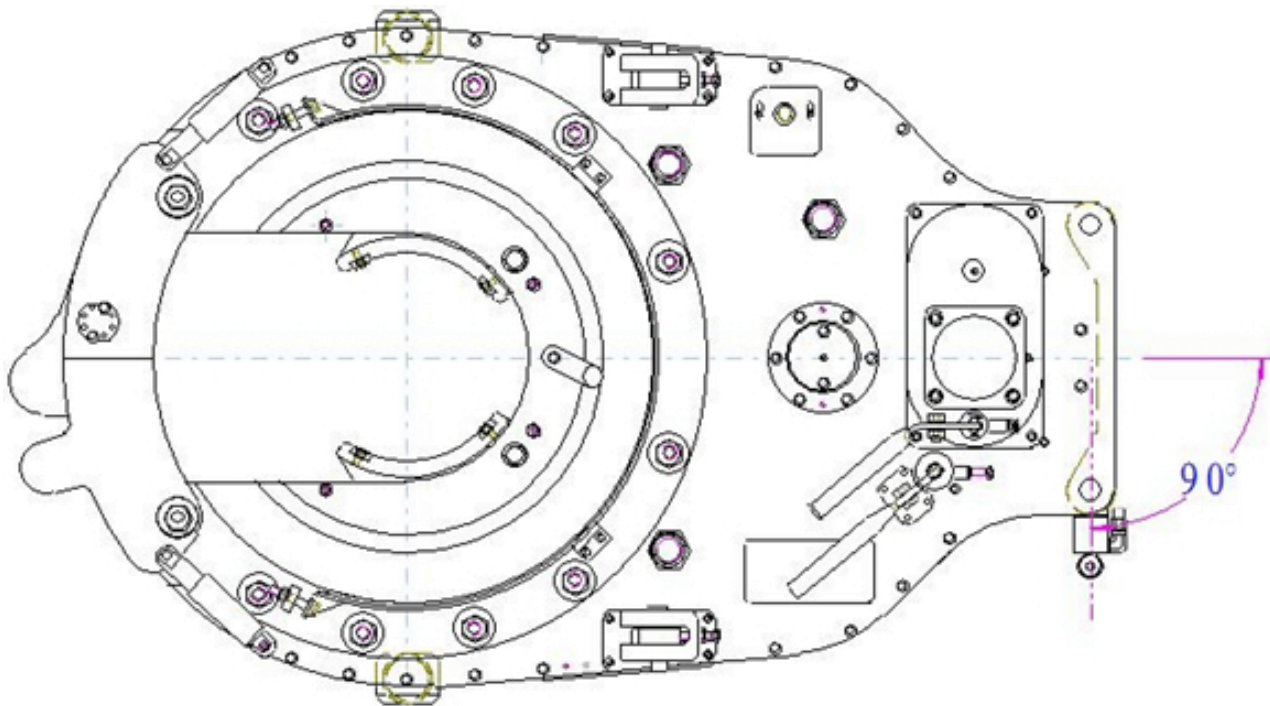
3.2.3 Pipe Connection

When the power unit is not running, or the hydraulic pump is disengaged, the hydraulic hoses may be installed to the tong. Pay attention to the oil inlet and ports before installing, oil inlet port is NPT1", oil outlet port is NPT1 1/4".



3.2.4 Tie the back guy

Tail rope diameter should be no less than 5/8". One end of tail rope is fixed on tong tail seat. And another end is fixed on drilling platform or the derrick. Note: when tail rope is tightened, it should be in the same level with power tongs and perpendicular to median line of tong body.



3.2.5 Refueling Torque Cylinder

Master tong: when stretched length of piston rod of tension cylinder reaches 1 1/8" (28 mm), it is necessary to add oil.

Composite tong: when the piston of tension cylinder is retreated to the position which is 1/4" (6.35 mm) away from cylinder end, it is necessary to add oil.

When it is necessary to add oil, remove quick connector from torque cylinder and insert it into the quick connector which is on the oil filled equipment (Purchase Code:KT14000-323). After oil filling, connect it with quick connector which is on the torque meter. Then release plug on torque cylinder until the pressure on torque meter turns to zero.

Note: Torque testing system of master tong and Torque testing assembly can be selected according to user needs.

3.2.6 Direction control

The handle control valve controls the tong's rotation direction. For clockwise rotation, push the valve handle forward, and for reverse rotation, pull the valve handle in the opposite direction. (see Fig. below):



3.3 Operation

3.3.1 Requirements for operators

- (1) The operator should know the tong structure and the properties.
- (2) Be familiar with the operation of hydraulic reversing handle on power tongs:
 When manual reversing valve of control master tong is pushed, large gear on master tong turns in the making-up tong direction; when manual reversing valve of control master tong is pulled, large gear on master tong turns in the braking-out tong direction;
 When manual reversing valve of control back tong is pushed, back tong is clamped; when manual reversing valve of control back tong is pulled, back tong is released.
- (3) Be familiar with the operation of shifting handle (various gears of shifting handle are shown in Fig. below).

档次名称 Gears	低档 Low Gear	次低档 Second Low Gear	次高档 Second High Gear	高档 High Gear
手柄位置 Handle Positions				

- (4) Adjustment of safety door clearance
 The clearance between safety door buckle and latch seat on the shell may be regulated through adjusting turning angle of eccentric shaft for minimum clearance for normal opening of safety door.
- (5) Learn operation sequence and safety requirements;
- (6) Be familiar with the instrument operation.

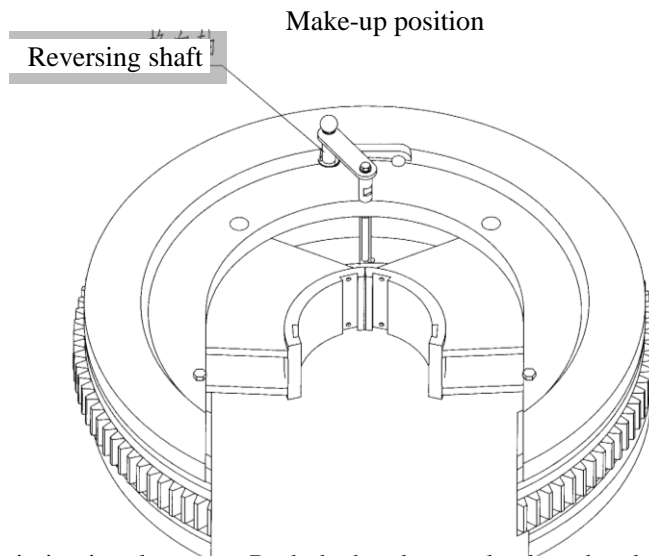
3.3.2 Operation of power tong

- (1) Learn specifications of jaw plates and Die: each specification jaw plate of master tong and backup tong have two jaw plates, and the two are same and may be installed on the left and right. During installing jaw plate, it is necessary to check whether Die is worn or clean. It is necessary to tighten fixation bolts of Die.
- (2) Install jaw plate and Die with corresponding size for the string.
- (3) Put shifting handle of the upper and lower shifting device on the neutral position;
- (4) Start hydraulic power station;
- (5) When hydraulic reversing handle is pushed or pulled, rotation noise of hydraulic motor should be heard and open gear of tong head should not rotate;
- (6) When shifting handle is put on any gear and hydraulic reversing

Note: shifting should be carried out when hydraulic motor stops the rotation.

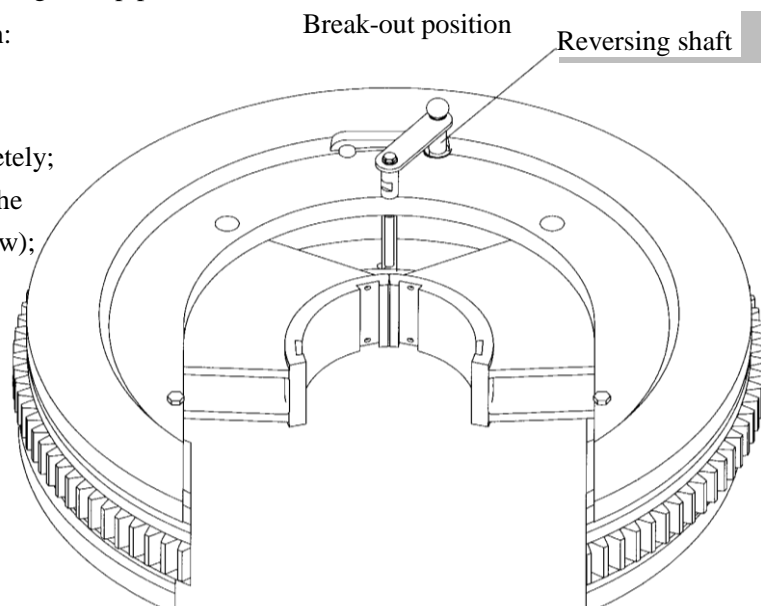
3.3.3 Working Process

- (1) Align the opening of large gear of tong head with the opening of jaw plate bracket.
- (2) Insert reversing pin into making-up and breaking-out hole according to the operation requirements and adjust the tight degree of braking staple.
- (3) Align the opening of large gear of tong head with the shell opening.
- (4) Pull out safety door, push power tongs toward the string to allow the string to be on the central position of tong head and close safety door.
- (5) Making-up operation regulation:
 - a. Open the safety door, push the tong's opening to the casing pipe;
 - b. Close the safety door completely;
 - c. Put the reversing shaft into the reversing hole (shown in the Fig. below);
Shift transmission into high gear. Push the hand control valve rod to the casing tube thread. When the thread has one or two circles left, release the valve rod.



- d. Shift transmission into low gear. Push the hand control valve rod to make the casing tube thread flap. Observe the torque indicator, make sure the torque meets the requirement.
 - e. Reverse hand control valve rod to disengage jaws until the table gear aligns with the door opening.
 - f. Unlatch the door and remove the tong from pipe.

- (6) Breaking-out operation regulation:
 - a. Open the safety door, push the tong's opening to the casing pipe;
 - b. Close the safety door completely;
 - c. Put the reversing shaft into the reversing hole (shown in the Fig. below);



- d. Shift the transmission into low gear. Pull the hand control valve rod make the casing tube thread completely loosen.
- e. Shift the transmission into high gear. Pull the hand control valve rod make the casing tube thread completely unscrewed to the end.
- f. Unlatch the door and remove the tong from pipe.

3.3.4 Working Process

- (1) The power station must be shut down when dismantling the jaws, in case of accident.
- (2) Make sure the power tong is properly leveled
- (3) Ensure that all tong hydraulic hoses are correctly connected
- (4) Pay attention to the specification of the jaws when installing.
- (5) Changing gear is not allowed during operation.
- (6) Only when the safety door is shut down, the gear notch can start turning, in case of damage to the operators.
- (7) Check the clearance between safety door and shell frequently. Adjust the clearance make the door work normally. If the clearance is too much will damage the power tong.
- (8) Check the lifting rope and tail rope for safe reliability.
- (9) Adjust the Relief valve of the hydraulic power station above 2500PSI(17.2MPa),the pressure regulating handle will be deadlocked.
- (10) When the tong is operating above 36,000ft.lb,ensure that both idler drive gears are engaged with the main gear.

Note: Be sure the doors are closed and securely latched before power unit is started to insure safety for operation personnel.

Use start up procedures as recommended by the power unit engine operator's manual. Prior to starting engine, an inspection should be made to assure proper lube oil level in the engine and hydraulic oil level in the hydraulic reservoir. Open the by-pass valve on the hydraulic system. Check all pressure and return line hose connections to make sure they are securely installed.

After the hoses are checked, start the engine and allow it to idle until warm. After the power unit engine has been started and hydraulic oil has circulated for approximately 10 minutes, slowly close the by-pass valve which will allow oil to circulate through the hoses and to the tong. Place the tong gear shifter in low gear and rotate the tong slowly forward and then reverse with the throttle valve control lever. Once this has been done and the proper size jaws have been installed, the tong is then ready to run pipe.

3.3.5 General comments

It is recommended that torque not exceed 36,000ft.lbs. Unless both idler gears are in drive position. This will enhance the life expectancy and dependability of the tong. When operating the tong at high gear, it is recommended to frequently check the tightness of the door and make periodic adjustments to assure a secure door fit.

For safety of rig personnel, make sure the door is securely closed and latched at all times.

When make-up integral (shouldered) joints, it is essential to make up the last turn of the threads in low gear. This reduces the tendency of an instant stop or a sudden increase in torque, which induces high stresses to the gear train.

When pulling a string, do not employ the “snap break” method of breaking out joints. By definition, the “snap break” method is a procedure used by some operations to break-out connections.

This is accomplished by leaving slack in the “jaw-pipe” engagement, and then quickly pulling the throttle valve control lever allowing the tong to snap into its loaded or high torque conditions. This method, although very effective in breaking out joints, highly stresses the gear train and very frequently causes gear breakage. This method is also dangerous to operating personnel.

4. Maintenance

It is suggested that a regular maintenance program be established, to assure dependable operation of the Hydraulic power tong. The following recommendations concerning cleaning, lubrication, and adjustments will enhance the life expectancy of the tong and assure safety to operating personnel.

4.1 Cleaning

The centralizing roller(2) of the upper panel and open gear should be thoroughly cleaned with a good petroleum base cleaning agent, after each job, prior to storage. One month later after usage of the new tong, replace the hydraulic oil to clear the sediment on motor and valve, later, make the change every six months.

4.2 Lubrication

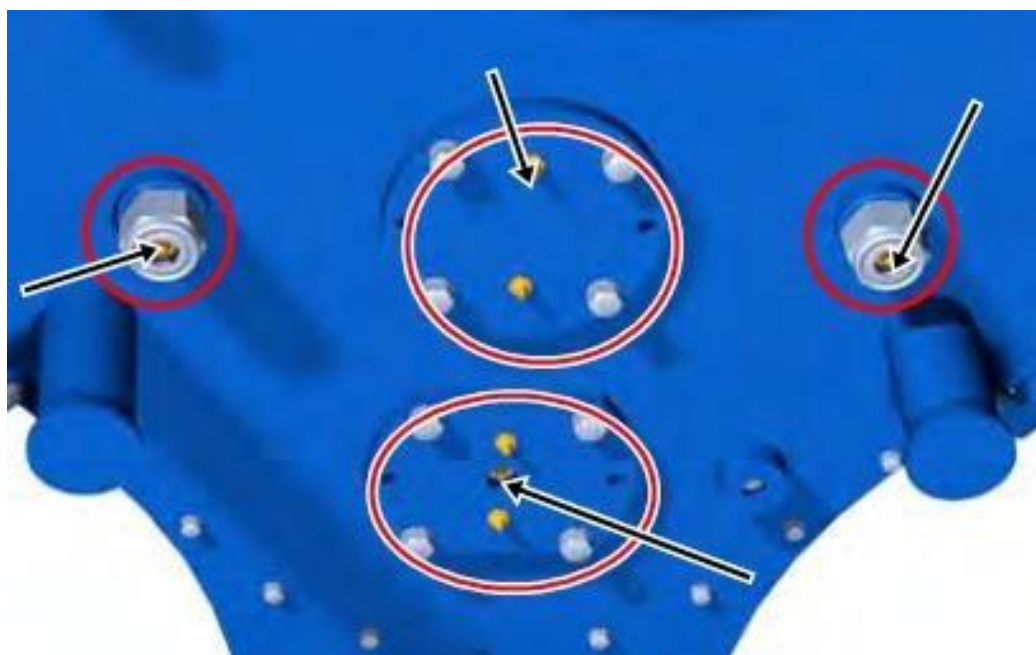
A good grade of multipurpose bearing lubricant which is compatible with expected ambient temperatures is recommended along with the following lubrication procedures, at the completion of each job prior to storage

4.2.1 Power input shaft assembly bearings

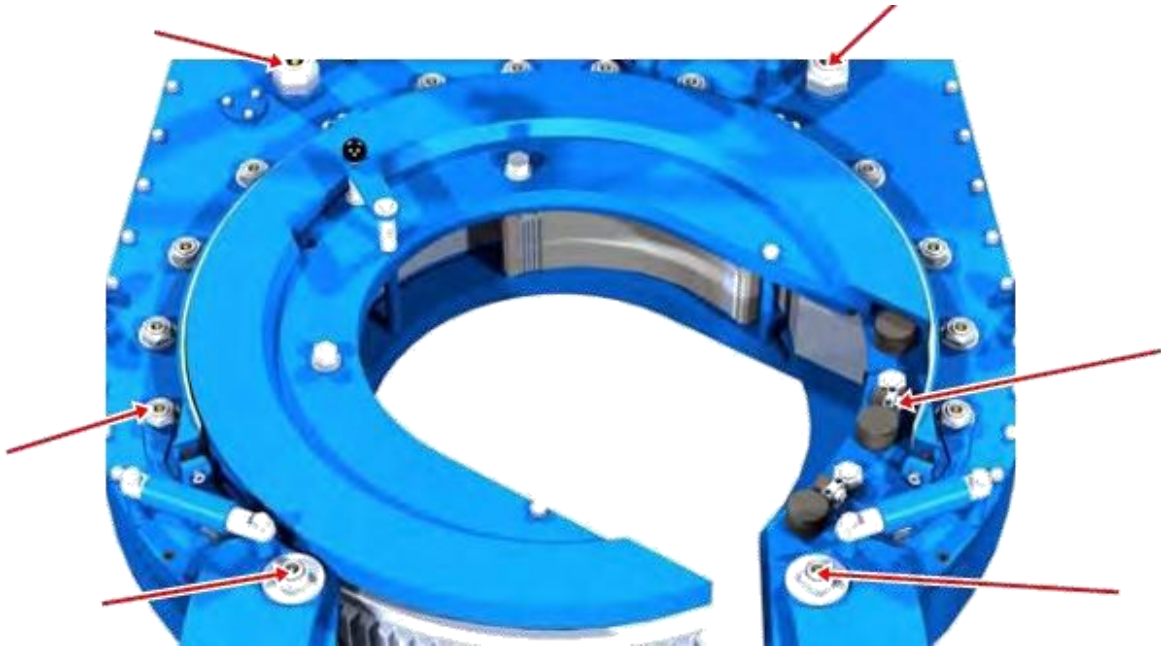
Unscrew the plug screws on the bearing cover, grease should be applied to these bearings through the grease fittings in the bearing cap located at the bottom face of the tong.

4.2.2 Bearings of big idler gear assembly and triple gear assembly

Grease should be applied to these bearings through the grease fittings in the end of the shaft located at the top face of the tong. (see illustration below):

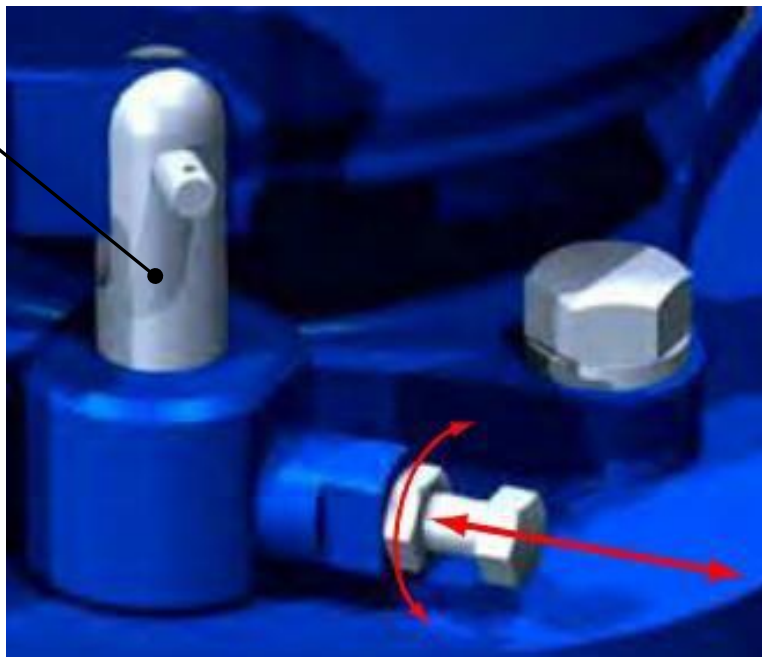


4.2.3 Centralizing roller assembly(1), centralizing roller assembly(2), bearing roller assembly and small idle gear assembly should grease as following Fig.



4.2.4 Apply grease to the reversing shaft through the shaft seat mouth.

Shifting fork shaft



4.3 Adjustments

4.3.1 Gear shifting adjustment

If the groove-skipping phenomenon appears after the tong use a time, users can loosen the hexagon nut according to the figure above, then twist the hexagon bolt inward and wrench the control lever of gear shift, feel strength properly and tighten the nut.

4.3.2 Door latch adjustment

During normal operation of the tong, the left door latch may experience wear which will cause the door to develop a loose fit at the latch. When this occurs, an adjustment can easily be made to assure a secure door fit. This is accomplished as follows (see illustration below):



Located at the top face of the left door is a latch cam plate which has eight positioning holes located on a 360 degree bolt circle. To make any adjustment in door alignment, the 3/8" hex head bolt located at the top and bottom latch shaft sleeve should be removed first, then use a wrench to rotate the latch shaft and shaft sleeve, when desired alignment is achieved, the 3/8" hex head bolt should be tightened.

Note: It is important to keep a secure fit at the doors as this helps maintain proper gear alignment, reduces possibility of impact tensional stress occurs in the gear case and assure safety to operation personnel.

4.3.3 Brake band adjustment (see illustration):



As the tong is used, it becomes necessary at times to adjust the brake bands to provide a smoother and more efficient jaw cam action. If the cage plate turns with the rotary gear, the jaws will not cam properly and therefore, will not bite on the tubing or casing. By tightening the brake band against the cage plates, enough frictional resistance occurs to allow jaws to cam properly and grip the casing. To adjust the brake band, simply turn the adjustment bolt clockwise to tighten and counterclockwise to loosen.

4.4 Periodic check list

4.4.1. Shifting shaft

The shifting Yoke is secured to the shifting shaft by one hex jam nut $3/8" \times 1"$ and one nut on the bottom of the yoke. These nuts should be checked after each job. This can be accomplished by removing the clutch inspection plate and insuring a snug fit prior to lubrication.

4.4.2. Torque gauge assembly

Periodic calibration of the torque gauge is recommended to assure accurate torque readings. When having the torque gauge serviced and calibrated.

4.5 Overhaul procedures

Should the need arise to overhaul any portion of the tong, certain disassembly procedures must be followed. Access to the gear train is possible by removal of the top plate of the tong.

Note: All maintenance and overhaul should be accomplished from the top. Therefore, the bottom plate of the tong should never be removed from the gear case housing.

4.5.1 The first step in disassembly of the top plate for overhaul is to remove the motor-valve assembly. This is accomplished by removing the four $5/8" \times 2"$ socket head cap screws, which secure the motor to the motor mount, and removing the four $1/2" \times 1 1/4"$ hex head screws, which secures the valve to the valve mount. The motor-valve assembly may then be lifted off.

4.5.2 Disconnect & remove the linkage between the shifting handle and the shifting shaft.

4.5.3 Back-off the shifting detent bolt ($7/16" \times 2"$). This relieves compression on the spring and allows the ball to disengage from the groove in the shifting shaft. Remove the shifting detent bolt and, using pencil magnets, extract the ball and spring before the shifting shaft is removed; this prevents loss of the ball inside the tong.

4.5.4 Remove the doors. This is accomplished as follows:

- (1) Remove the two door stop assemblies by removing the hexagon bolt $1/2" \times 1 1/2"$
- (2) Remove the top lock nuts from the door roller shaft.
- (3) Remove the grease fittings from the end of the door roller shafts and drive the shafts out. The shafts should be very carefully driven out with a soft alloy material (e.g., brass rod, etc.) to eliminate the

possibility of damage to the shafts or door. This then allows the doors to be removed.

Note: When removing the doors make careful note of the bearing shims which align the doors. At reassemble of the doors after overhaul, it will still be necessary to reassemble door bearing shims in the same sequence to assure desired door alignment.

4.5.5 The next step is to loosen the top and bottom brake band. This is accomplished by backing off the brake band adjustment bolts until the nut is flush with the end of the bolt.

4.5.6 With the brake bands loosened, the next step is to remove the top and bottom cage plate. This is accomplished by removing the three cage plate support bolts. With these three bolts removed, the top cage plate can be lifted off.

Note: Care should be taken in removing the cage plate bolts as they are the only means of support for the bottom cage plate, after the brake band is loosened. To prevent damage to the bottom cage plate or personal injury to the mechanic, it is recommended that the bottom cage plate be braced while the mechanic removes the three cage plate bolts.

4.5.7 Remove the lock nut and washer from the big idler gear assembly, small idler gear assembly, centralizing roller assembly on the face plate. Remove the 3/8" x 1-1/2" long hex head bolts from the case body assembly.

4.5.8 With all the above steps taken, the top tong plate can be lifted off providing access to the inside of the gear case.

5. Problem diagnosis

Trouble	Causes	Remedy
The head doesn't turn	<ol style="list-style-type: none"> 1. No pressure from hydraulic station. 2. Damage of the hydraulic reversing valve. 3. Gear changing system fails. 	<ol style="list-style-type: none"> 1. Check the station. Add pressure. 2. Replace the valve. 3. Repair
Speed is not enough	<ol style="list-style-type: none"> 1. Low pressure or low flow from the power station. 2. Bad leakage loss from oil motor or hand-reversing valve. 	<ol style="list-style-type: none"> 1. Check the station pressure. 2. Replace the motor or hand-reversing valve.
Head slide	<ol style="list-style-type: none"> 1. Disagreement of the sizes of the jaws and casing. 2. Tongs not be leveled. 3. Dies worn out. 4. Die notch filled with oil dirt. 5. Brake band too loose or worn out. 6. Jaw roller failure to turn. 	<ol style="list-style-type: none"> 1. Change the jaws. 2. Level the tongs. 3. Change the dies. 4. Get rid of it with a wire brush. 5. Adjust or change the band. 6. Check the roller or oil and repair the pin shaft.

Torque valve less than rated	<ol style="list-style-type: none"> 1. Low pressure from the hydraulic power station or its insufficient oil discharge. 2. Function failure of the hydraulic motor or of the reversing valve. 3. Insufficient oil in the torque cylinder or the sealing ring worn out. 4. Torque gauge failure. 	<ol style="list-style-type: none"> 1. Deal with it according to the instruction of hydraulic power station. 2. Repair or change it. 3. Fill in oil or change the ring. 4. Repair or change the torque gauge.
Motor is running but the tong head keeps still or moves slowly, or will stop even loaded light.	<ol style="list-style-type: none"> 1. Gear changing device fails 2. Much leakage loss from the hydraulic motor or the hand-reversing valve. 3. Gear of gearbox damaged or seriously worn out. 	<ol style="list-style-type: none"> 1. Repair or change. 2. Repair or change the motor and the valve. 3. Check or repair the gearbox .

6. Storage recommendations

- 6.1 When storing the tong, an effort should be made to locate the unit in a clean, dry, ventilated area.
- 6.2 The tong, while in storage, should be well lubricated.
- 6.3 Spare moving parts (gears, shafts, etc.), if required to remain in storage for a long period of time, tong should be coated with a good corrosion inhibitor, and should be stored in a good dry environment.
- 6.4 All O^r rings, seals, packing, gaskets, etc., should be stored in a good moisture proof, air tight container.
- 6.5 All bearings (cam followers, roller bearing, etc.) should be well lubricated and stored in a dust free box or container, protected from moisture.

7. FIGURES AND DETAILED PART TABLES

7.1 KT14000 assembly (Fig 1, Table 1)

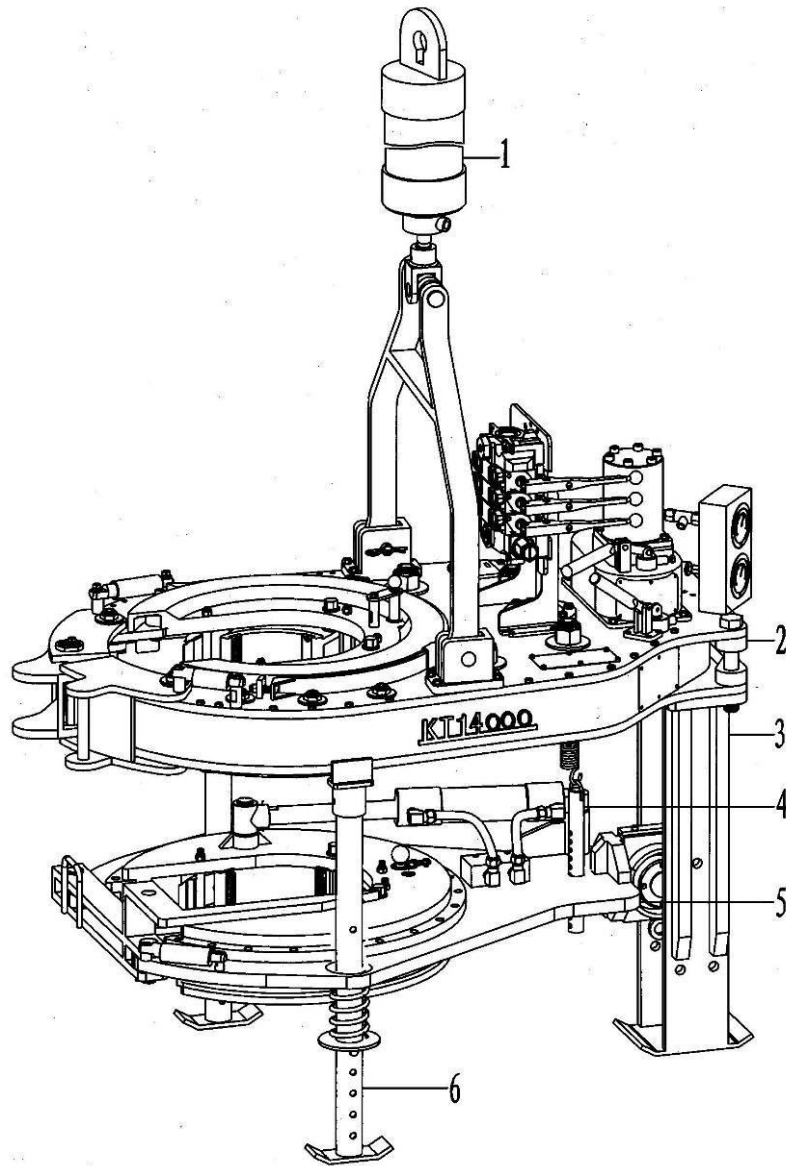


Fig 1

Table 1 KT14000 assembly

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-01	KHT9625.1.17 (2)	Hydraulic spring suspending device	1
2	KT14000-02	KHT14.1	Master tong	1
3	KT14000-03	KHT14.3	Rear supporting seat	1
4	KT14000-04	KD13375.4	Rear guide post assembly	1
5	KT14000-05	KHT14.2	Backup tong	1
6	KT14000-06	KD13375.3	Fore guide pole assembly	2

7.2 Assembly (Fig 2, Table 2)

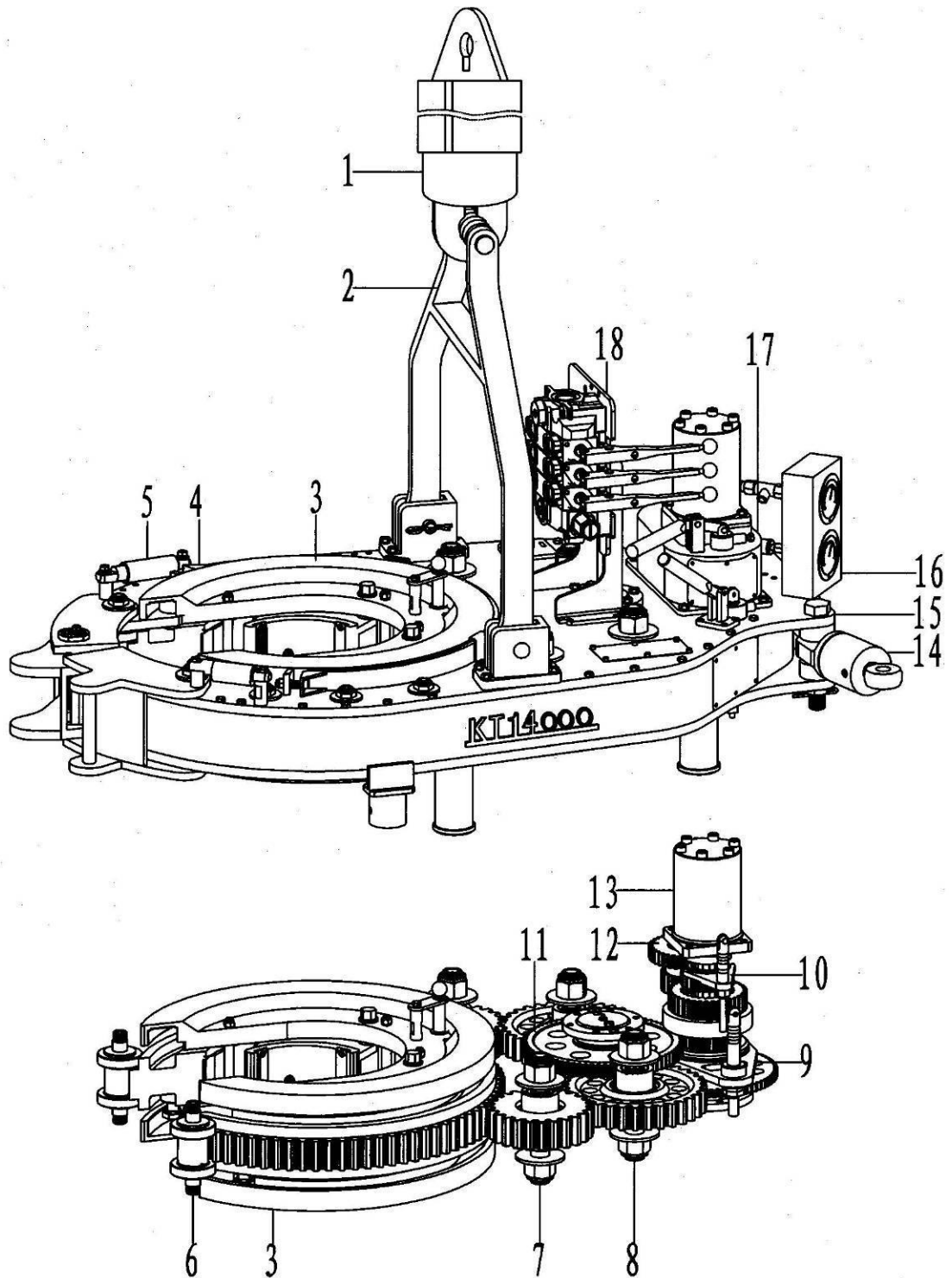


Fig 2

Table 2 Assembly

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-08	TQ508/70Y.13	Spring suspension barrel	1
2	KT14000-09	KHT14.1.14	Suspension rod assembly	1
3	KT14000-10	KHT14.1.1	Tong head assembly	1
4	KT14000-11	KHT14.1.13	The brake assembly	2
5	KT14000-12	KHT14.1.10	Safety door assembly	1
6	KT14000-13	TQ508/70Y.2.1	Centering roller assembly (1)	10
7	KT14000-14	KHT14.1.3	Small idle gear assembly	2
8	KT14000-15	KHT14.1.4	Big idle gear assembly	2
9	KT14000-16	KHT14.1.11	Shift mechanism assembly (down)	1
10	KT14000-17	KHT14.1.12	Shift mechanism assembly (up)	1
11	KT14000-18	KHT14.1.5	Triple gear assembly	1
12	KT14000-19	KHT14.1.8	Double gear assembly	1
13	KT14000-20	KHT14.1.6	Power input shaft assembly	1
14	KT14000-21	KHT14.1.15	Pull cylinder assembly	1
15	KT14000-22	KHT14.1.2	Shell assy	1
16	KT14000-23	KHT5500.1.8.2	Oil filled assembly	1
17	KT14000-24	KHT14.1.7	Box assembly	1
18	KT14000-25	KHT14.1.9	Control valve assembly	1

73 Tong head assembly (Fig 3, Table 3)

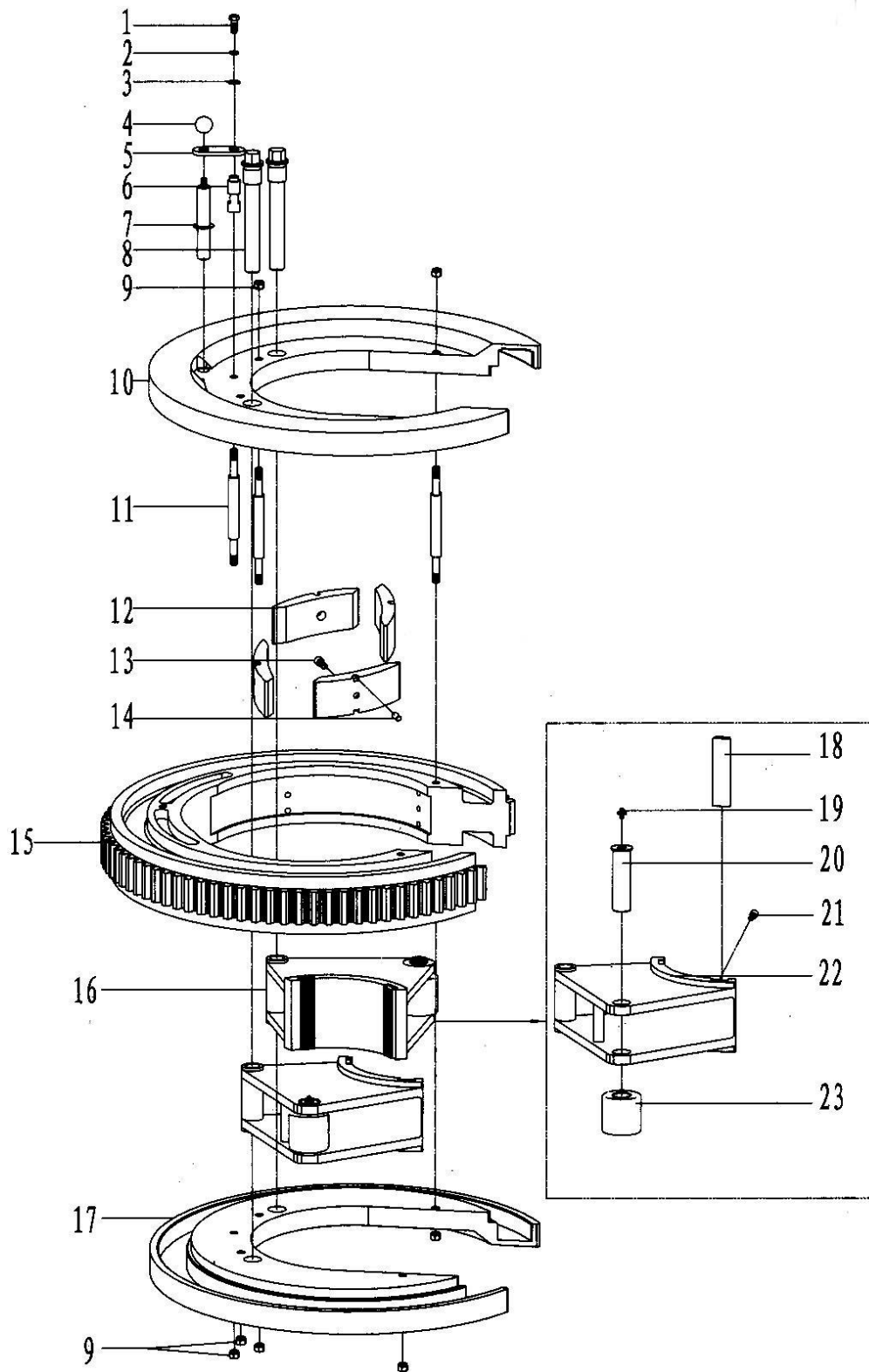


Fig 3

Table 3 Tong head assembly

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-100		Hexagonal head bolt3/8"×1"	1
2	KT14000-101		Spring washer3/8	1
3	KT14000-102		flat washer 3/8"	1
4	KT14000-103	TQ508/70Y.1.1-4	ball knob	1
5	KT14000-104	KHT14.1.1-5	connecting plate	1
6	KT14000-105	KJD9625.1.1-3	connecting screw rod	1
7	KT14000-106	TQ508/70Y.1.1-2	reverse shaft	1
8	KT14000-107	TQ508/70Y.1-6	Bolt	2
9	KT14000-108		locknut 1/2"	9
10	KT14000-109	KHT14.1.1-1	Upper jaw set bracket	1
11	KT14000-110	KHT14.1.1-4	Supporting screw	5
12	KT14000-111	KHT14.1.1-6	slope board	4
13	KT14000-112		Hexagon socket head cap screws 3/8"×5/8"	4
14	KT14000-113	GB/T119	Pin 10×20	8
15	KT14000-114	KHT14.1.1-2	Open gear	1
16	KT14000-30	KHT14.1.1.1. (1)	Jaw set assembly 1 (14)	2
	KT14000-31	KHT14.1.1.1. (2)	Jaw set assembly 2 (13 5/8)	2
	KT14000-32	KHT14.1.1.1. (3)	Jaw set assembly 3 (13 3/8)	2
	KT14000-33	KHT14.1.1.1. (4)	Jaw set assembly 4 (11 3/4)	2
	KT14000-34	KHT14.1.1.1. (5)	Jaw set assembly 5 (10 3/4)	2
	KT14000-35	KHT14.1.1.1. (6)	Jaw set assembly 6 (9 5/8)	2
	KT14000-36	KHT14.1.1.1. (7)	Jaw set assembly 7 (8 5/8)	2
	KT14000-37	KHT14.1.1.1. (8)	Jaw set assembly 8 (7 5/8)	2
	KT14000-38	KHT14.1.1.1. (9)	Jaw set assembly 9 (7)	2
	KT14000-39	KHT14.1.1.1. (10)	Jaw set assembly 10 (6 5/8)	2
	KT14000-40	KHT14.1.1.1. (11)	Jaw set assembly 11 (5 1/2)	2
	KT14000-41	KHT14.1.1.1. (12)	Jaw set assembly 12 (5)	2
	KT14000-42	KHT14.1.1.1. (13)	Jaw set assembly 13 (4 1/2)	2
	KT14000-43	KHT14.1.1.1. (14)	Jaw set assembly 14 (4)	2
	KT14000-44	KHT14.1.1.1. (15)	Jaw set assembly 15 (9 7/8)	2
17	KT14000-116	KHT14.1.1-3	Lower jaw set bracket	1
18	KT14000-117	KJD9625.1.2-2	Die	
19	KT14000-118	GB/T1152	oil cup M6	2
20	KT14000-119	KD20/50.1.2-2 (2)	roller shaft	2
21	KT14000-120		Hexagon socket head cap screws 5/16"UNC×1/2"	8

P/N	Drawing No.	Description	Qty	P/N
22	KT14000-121	KHT14.1.1.1-1(1)	Jaw set 1 (14)	2
	KT14000-122	KHT14.1.1.1-1(2)	Jaw set 2 (13 5/8)	2
	KT14000-123	KHT14.1.1.1-1(3)	Jaw set 3 (13 3/8)	2
	KT14000-124	KHT14.1.1.1-1(4)	Jaw set 4 (11 3/4)	2
	KT14000-125	KHT14.1.1.1-1(5)	Jaw set 5 (10 3/4)	2
	KT14000-126	KHT14.1.1.1-1(6)	Jaw set 6 (9 5/8)	2
	KT14000-127	KHT14.1.1.1-1(7)	Jaw set 7 (8 5/8)	2
	KT14000-128	KHT14.1.1.1-1(8)	Jaw set 8 (7 5/8)	2
	KT14000-129	KHT14.1.1.1-1(9)	Jaw set 9 (7)	2
	KT14000-130	KHT14.1.1.1-1(10)	Jaw set 10 (6 5/8)	2
	KT14000-131	KHT14.1.1.1-1(11)	Jaw set 11 (5 1/2)	2
	KT14000-132	KHT14.1.1.1-1(12)	Jaw set 12 (5)	2
	KT14000-133	KHT14.1.1.1-1(13)	Jaw set 13 (4 1/2)	2
	KT14000-134	KHT14.1.1.1-1(14)	Jaw set 14 (4)	2
	KT14000-135	KHT14.1.1.1-1(15)	Jaw set 15 (9 7/8)	2
23	KT14000-136	KD20/50.1.2-3 (2)	Roller	2

7.4 Shell and accessories (Fig 4, Table 4)

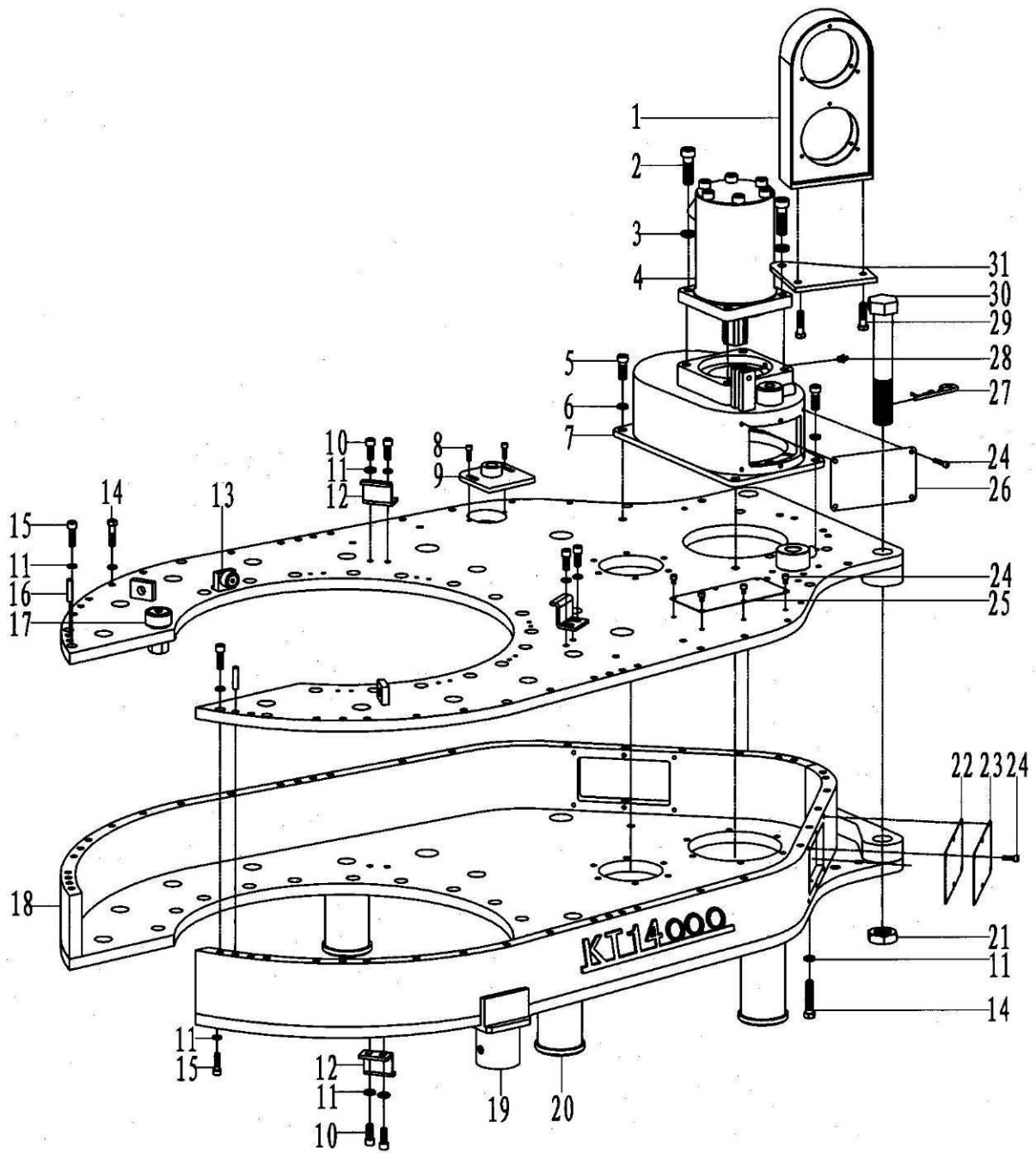


Fig 4

Table 4 List of shell and accessories

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-140	KJD9625.11(2)	Gauge seat	1
2	KT14000-141		Hexagon socket head cap screws 5/8"×2"	4
3	KT14000-142		Spring washer 5/8"	4
4	KT14000-40		Cycloid hydraulic motor 6K-625 (tube type)	1
	KT14000-40B		Cycloid hydraulic motor 6K-625 (plate type)	1
5	KT14000-143		Hexagon socket head cap screws 1/2"×1 1/4"	4
6	KT14000-144		Spring washer 1/2"	4
7	KT14000-46	KHT14.1.7.1	Small cabinet assembly	1
8	KT14000-145		Hexagon socket head cap screws 1/4"×3/4"	2
9	KT14000-146	KJD9625.16	Speed measuring gear seat	1
10	KT14000-147		Hexagon socket head cap screws 3/8"×1/2"	4
11	KT14000-101		Spring washer 3/8"	54
12	KT14000-148	TQ340/35Y.1.3-02	Brake card	4
13	KT14000-47	TQ508/70Y.2.3	Support roller assembly	8
14	KT14000-149		Hexagon bolt 3/8"×1 3/4"	50
15	KT14000-150		Hexagon socket head cap screws 3/8"×1 1/4"	20
16	KT14000-151	KHT9625.1.2-9	locating pin	12
17	KT14000-48	TQ508/70Y.2.2	Centering roller assembly (2)	34
18	KT14000-22	KHT14.1.2	Shell	1
19	KT14000-154	KT14.1.2.2	Front guide pole	2
20	KT14000-155	TQ508/70Y.8.1	Supporting leg	4
21	KT14000-156		nut 1 1/4"	2
22	KT14000-157	KHT9625.1.2-7	Baffle plate	1
23	KT14000-158	KHT9625.1.2-11	Gear grade plate	1
24	KT14000-159		Hexagon socket head cap screws 1/4"×5/16"	18
25	KT14000-160	KHT14.1.2-6	data plate	1
26	KT14000-161	KHT9625.1.7-1	Retaining plate	1
27	KT14000-162	TQ245-2	Clamp spring	2
28	KT14000-163		Oil cupNPT1/8"	1
29	KT14000-164		Hexagon socket head cap screws 3/8"×1"	2
30	KT14000-165	TQ508/70Y.8-7	Clamp spring	2
	KT14000-165B	KHT14.1.2-9	Tail rope bolt	2
31	KT14000-166	KJD9625-4	Fixing plate for table seat	1

7.5 Assembly of small idle gear (Fig 5, Table 5)

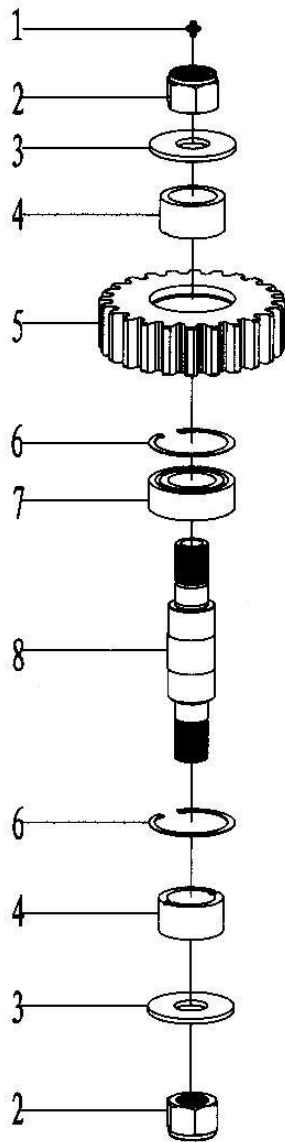


Fig 5

Table 5 List of small idle gear

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-163		Oil cupNPT1/8"	2
2	KT14000-180	TQ508/70Y.3.1	Hexagon nut	4
3	KT14000-181	KHT14.1.3-1	Gasket	4
4	KT14000-182	KHT14.1.3-3	Lining ring	4
5	KT14000-183	KHT14.1.3-4	Small idle gear shaft	2
6	KT14000-184	GB/T893.1	Circlip for hole 100	4
7	KT14000-185	GB/T296	Single row cylindrical roller bearing 3211	2
8	KT14000-186	KHT14.1.3-2	Small idle gear shaft	2

7.6 Assembly of big idle gear (Fig 6. Table 6)

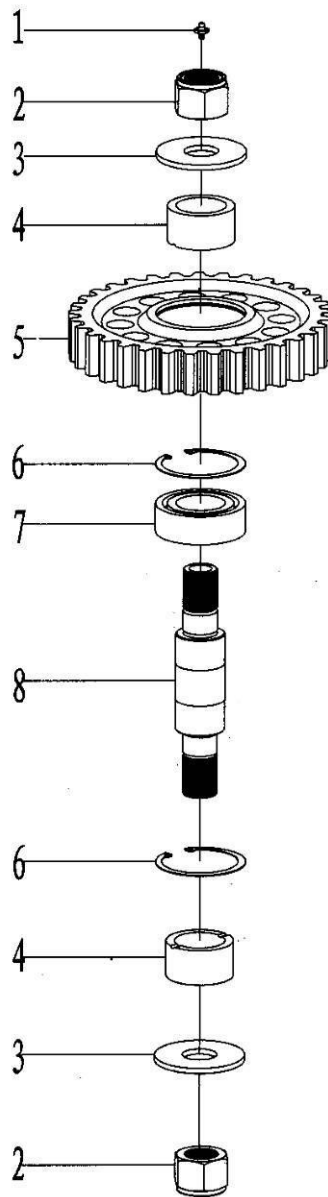


Fig 6

Table 6. List of big idle gear

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-163		Oil cupNPT1/8"	2
2	KT14000-180	TQ508/70Y.3.1	Hexagon nut	4
3	KT14000-181	KHT14.1.3-1	Gasket	4
4	KT14000-182	KHT14.1.3-3	Lining ring	4
5	KT14000-188	KHT14.1.4-1	Big idle gear	2
6	KT14000-184	GB/T893.1	Circlip for hole 100	4
7	KT14000-185	GB/T296	Single row cylindrical roller bearing 3211	2
8	KT14000-186	KHT14.1.3-2	Small idle gear shaft	2

7.7 Assembly of triple gear (Fig 7, Table 7)

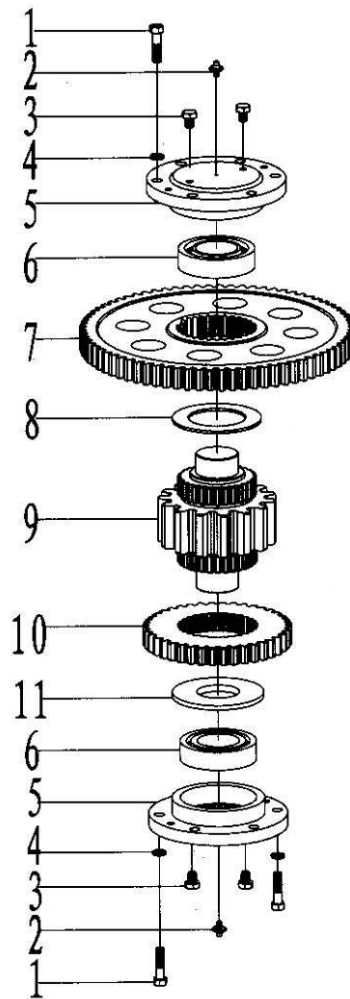


Fig 7

Table 7 List of big idle gear

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-190		Hexagon bolt 3/8"×1 1/2"	12
2	KT14000-163		Oil cup NPT 1/8"	2
3	KT14000-191		Hexagon bolt 3/8"×1/2"	4
4	KT14000-101		Spring washer 3/8"	12
5	KT14000-192	KHT14.1.5-1	Bearing cover	2
6	KT14000-193	GB/T283	Cylinder roller bearing 32510E	2
7	KT14000-194	KHT14.1.5-3	Large gear	1
8	KT14000-195	KHT14.1.5-2	Gasket	1
9	KT14000-196	KHT14.1.5-4	Gear shaft	1
10	KT14000-197	KHT14.1.5-5	Small gear	1
11	KT14000-198	KHT14.1.5-6	Supporting plate	1

7.8 Assembly of power input (Fig 8, Table 8)

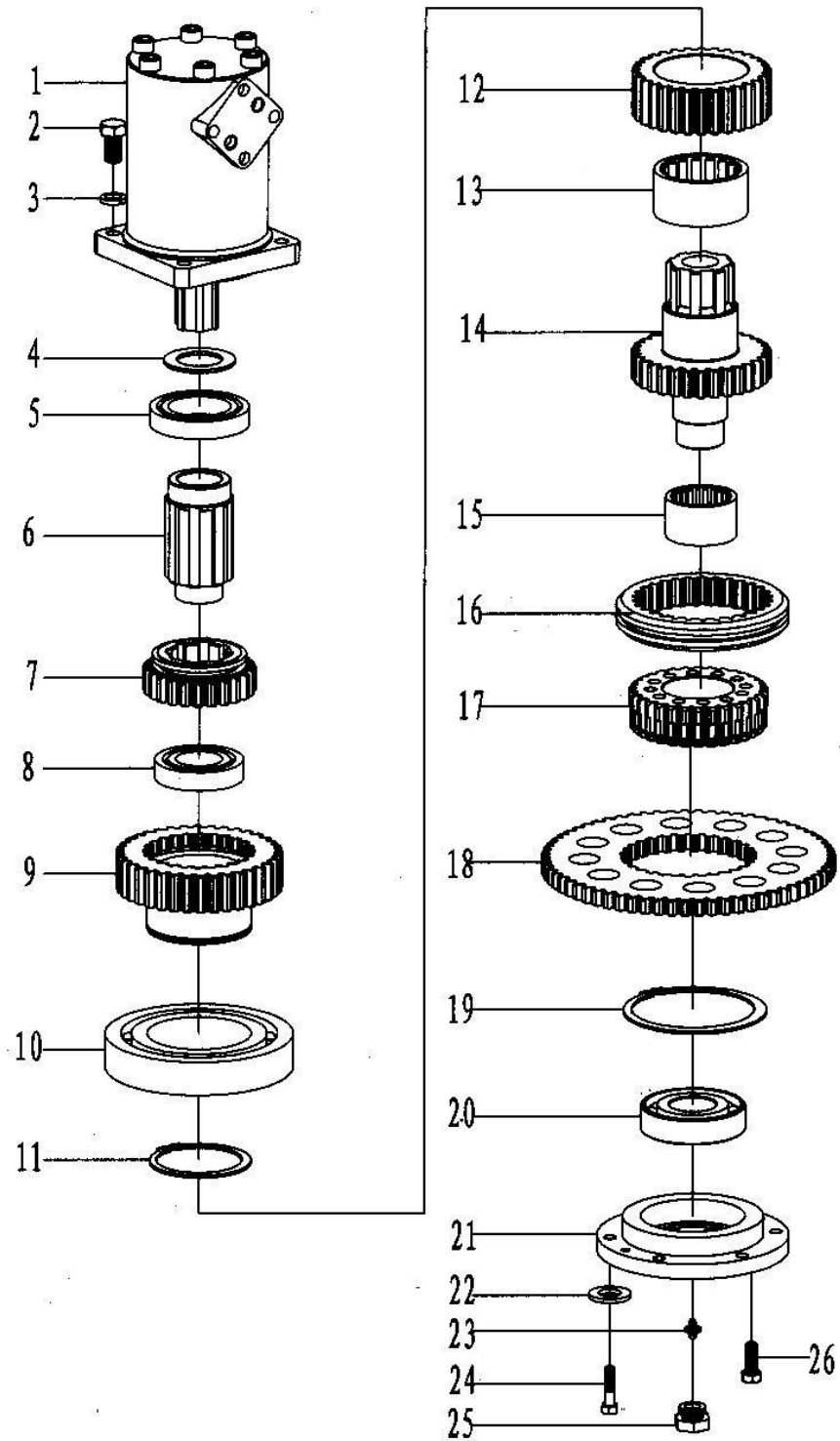


Fig 8

Table 8 List of power input

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-40		Cycloid hydraulic motor 6K-985tube type)	1
	KT14000-40B		Cycloid hydraulic motor 6K-985 (plate type)	1
2	KT14000-136		Hexagon socket head cap screws 5/8"×2"	4
3	KT14000-137		Spring washer 5/8"	4
4	KT14000-210	XYQ12.Z-23	filler piece	1
5	KT14000-211	GB/T276	Ball bearing 112	1
6	KT14000-212	KHT14.1.6-1	Spline shaft	1
7	KT14000-213	KHT14.1.6-2	Shift gear (upper)	1
8	KT14000-214	GB/T276	Ball bearing 209	1
9	KT14000-215	KHT14.1.6-3	Main shaft gear	1
10	KT14000-216	GB/T276	Ball bearing 220	1
11	KT14000-217	GB/T893.1	Circlip for shaft 100	1
12	KT14000-218	KHT14.1.6-4	Clutch gear (upper)	1
13	KT14000-219	GB/T309-2000	needle bearingΦ9×45	28
14	KT14000-220	KHT14.1.6-5	Main shaft	1
15	KT14000-221	GB/T5801	Needle roller bearing without inner ring RNA6909	1
16	KT14000-222	KHT14.1.6-6	Inner gear sleeve	1
17	KT14000-223	KHT14.1.6-7	Small gear clutch	1
18	KT14000-224	KHT14.1.6-8	Clutch gear	1
19	KT14000-225	GB/T893.1	Circlip for shaft 125	1
20	KT14000-226	GB/T276	Ball bearing 309	1
21	KT14000-227	KHT14.1.6-9	Bearing cover	1
22	KT14000-101		Spring washer 3/8"	6
23	KT14000-163		Oil cup NPT1/8"	1
24	KT14000-228		Head screw 3/8"×1 1/4"	6
25	KT14000-229	TQ508/70Y.6-8	Head screw	1
26	KT14000-191		Head screw 3/8"×1/2"	2

7.9 Gear shifting assembly(upper) (Fig 9. Table 9)

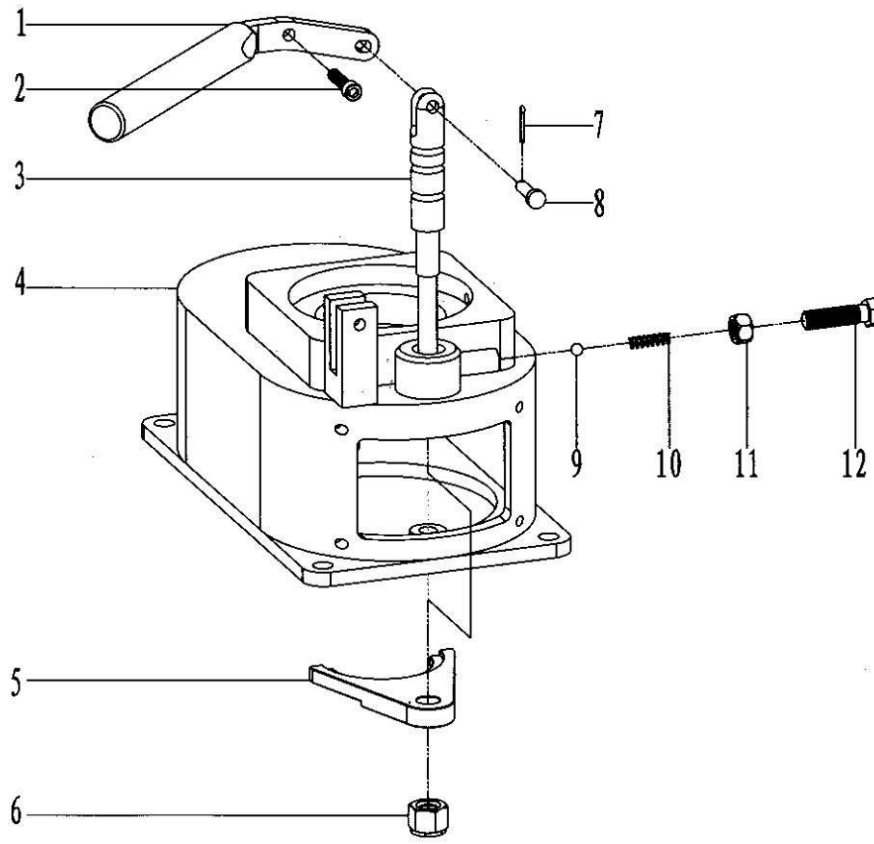


Fig 9

Table 9 List of gear shifting assembly(upper)

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-240	KHT9625.1.14-1	Control lever	1
2	KT14000-241		Hexagon socket cap head screws 5/16"×1 1/4"	1
3	KT14000-242	KHT14.1.12-1	Upper fork shaft	1
4	KT14000-46	KHT14.1.7.1	Small cabinet	1
5	KT14000-243	KHT14.1.12-2	Shift fork(upper)	1
6	KT14000-244		locknut 5/8"	1
7	KT14000-245	GB91-86	Cotter pin 2.5×12	1
8	KT14000-246	GB882-86	Pin shaft B8×28	1
9	KT14000-247		Steel ball 3/8"	1
10	KT14000-248	TQ245.8-2	Positioning spring	1
11	KT14000-249		Hexagon nut 7/16"-20UNF	1
12	KT14000-250		Hexagon bolt 7/16"-20UNF×1 1/2"	1

7.10 Double gear assembly (Fig 10. Table 10)

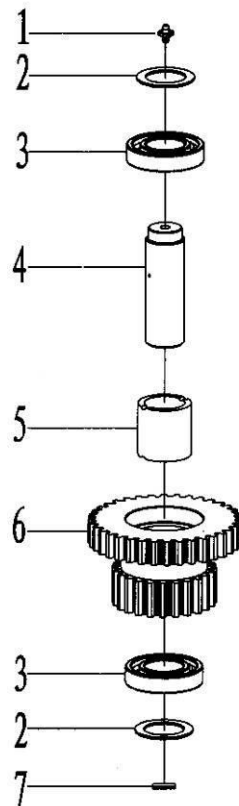


Fig 10

Table 10 Double gear assembly

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-163		Oil cup NPT1/8"	1
2	KT14000-260	KHT14.1.8-2	Gasket	2
3	KT14000-261	GB/T276	Ball bearing 208	2
4	KT14000-262	KHT14.1.8-1	Mandrel	1
5	KT14000-263	KHT14.1.8-4	Lining ring	1
6	KT14000-264	KHT14.1.8-3	Double gear	1
7	KT14000-265	XYQ12.Z-45	Positioning plate	1

7.11 Control valve bank assembly (Fig 11, Table 11)

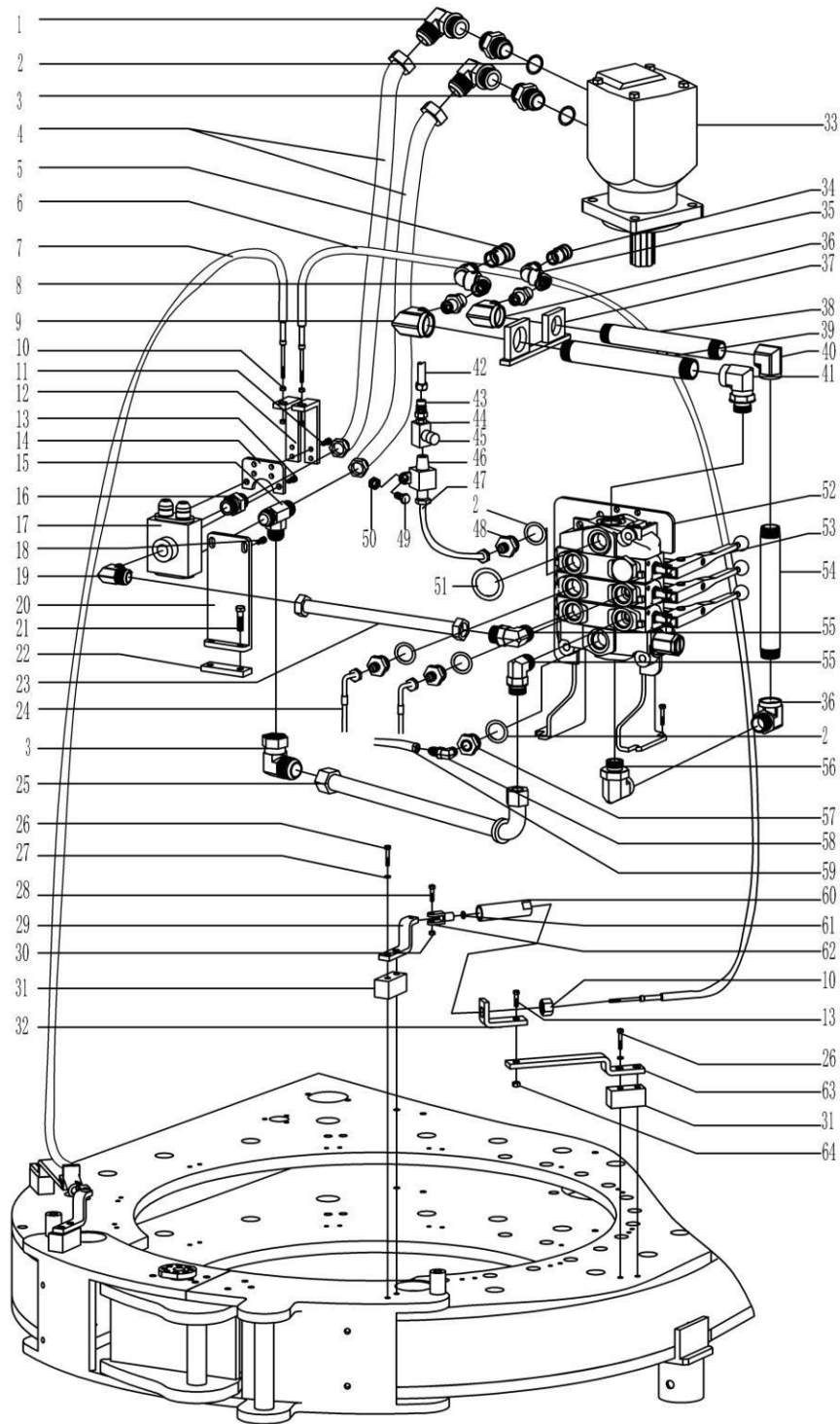


Fig 11

Table 11 Control valve bank assembly

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-750	TQ508/70Y.10.8.4	Combined joint 1 5/16-12UN	3
2	KT14000-751	as568	O-Ring 29.75×2.95	6

3	KT14000-752	TQ508/70Y.10.8-2	Buckle join 1 5/16-12UN	2
4	KT14000-753	KHT13625.1.8-1	High-pressure hose 25 II -580 (1 5/16-12UN)	2
5	KT14000-754	KJD9625.18.3	Buckle join 2 1/8"-12UN	1
6	KT14000-755	173-LTT-1-58	Flexible shaf (2)	1
7	KT14000-756	173-LTT-1-75	Flexible shaf	1
8	KT14000-757		Universal joint NPT1 1/4	1
9	KT14000-758	KJD9625.18-7	NPT1 1/4 Bent joint	1
10	KT14000-759		Hex nut 5/8-18UNF	6
11	KT14000-760		hexagon headed bolt 5/16-18UNC×3/4	4
12	KT14000-761	KHT13625.1.8-8	Valve plate 2	2
13	KT14000-762		hexagon headed bolt 3/8-16UNC×3/4	4
14	KT14000-763	KHT13625.1.8-7	Valve plate 1	1
15	KT14000-764	KHT5500.1.15C.1-8	Tee coupling(1 5/16-12UN-NPT1)	1
16	KT14000-765	KHT5500.1.15C.1-9	Buckle join (1 5/16" -12UN/NPT1)	1
17	KT14000-766	RHF (S) .0	Double shaft control valve	1
18	KT14000-767		hexagon headed bolt 5/8" ×1 "	2
19	KT14000-768	KHT5500.1.15C.1-11	Combined joint (1 5/16" -12UN-NPT1)	1
20	KT14000-769	KHT14.1.9-3	Buckle joint (1 5/16" -12UN/NPT1)	1
21	KT14000-770		hexagon headed bolt 5/8" ×3/4 "	2
22	KT14000-771	KHT14.1.9-4	backing board	1
23	KT14000-772	TQ508/70Y.10.8.5	Hose 1 5/16-12UN 短	1
24	KT14000-773		Hose 10 II -1400 (3/4-16UNF, 90°)	2
25	KT14000-774		Hose 1 5/16-12UNC,320×85	1
26	KT14000-775		hexagon headed bolt 5/16"-18UNC×3"	8
27	KT14000-776		Spring washer 5/16"	8
28	KT14000-777		hexagon headed bolt 1/4"-20UNC×1 1/2"	2
29	KT14000-778	KHT5500.1.15C.1-2	Connecting plate1	2
30	KT14000-779		Hex nut 1/4"-20UNC	2
31	KT14000-780	KHT14000.1.9(2)-6	backing board	4
32	KT14000-781	KHT5500.1.15C.1-4	Rotating plate	2
33	KT14000-782		Cycloid hydraulic motor 6K-985 (tube type)	1
34	KT14000-280	KJD9625.18.4	Valve plate 1 7/8"-12UN	1

35	KT14000-783		Universal joint NPT1	1
36	KT14000-784	KJD9625.18-8	Combined joint (NPT1)	2
37	KT14000-785	KJD9625.18.7	tubing clip	1
38	KT14000-786	KJD9625.18-9	Oil tube (NPT1)	1
39	KT14000-787	KJD9625.18-6	Oil tube (NPT1 1/4)	1
40	KT14000-788	KJD9625.18-10	Combined joint (NPT1)	1
41	KT14000-789	KJD9625.18.5	Combined joint (NPT1 1/4-1 5/8-12UN)	1
42	KT14000-790		Hose 10 II -2500 (3/4-16UNF, 90°, NPT1/2)	1
43	KT14000-791		Quick-change joint NPT1/2	1
44	KT14000-792	YG-72	One-way connection (NPT1/2)	1
45	KT14000-793	DV10	Quick coupling	1
46	KT14000-794	KHT9625.1.9-2	Buckle join (NPT1/2-3/4UNF)	1
47	KT14000-795		Hose 10 II -850 (3/4-16UNF, 90°)	1
48	KT14000-796	KHT5500.1.8-6	Buckle join (1 5/16 -12UN-3/4-UNF)	3
49	KT14000-797		Hex nut 3/8	3
50	KT14000-798		Spring washer 3/8	1
51	KT14000-799	as568	O-Ring 37.46×3.0	2
52	KT14000-800	KHT5500.1.18.1(2)	The connection plate assembly	1
53	KT14000-801	VG35-3-004	Multitandem valve assembly(five-way)	1
54	KT14000-802	KJD9625.18-9(2)	Oil tube (NPT1)	1
55	KT14000-803	KJD9625.18.2	Combined joint (1 5/16-12UN)	2
56	KT14000-804	KJD9625.18.6	Combined joint (NPT1 内-1 5/16-12UN 外)	1
57	KT14000-805	TQ508/70Y.10-10	Buckle join 1 5/16	1
58	KT14000-806	TQ508/70Y.10.10	Combined joint 7/16-20UNF	1
59	KT14000-807		Hose 8 II -1200 (7/16-20UNF, M20×1.5)	1
60	KT14000-808	XQ4.5.Z.6-6	Protective sleeve	2
61	KT14000-809		Hex nut 1/4-28UNC	2
62	KT14000-783	KHT5500.1.15C.1-3	Universal joint	2
63	KT14000-784	KHT5500.1.15C.1-5	Connecting plate 2	2
64	KT14000-785		Hex nut 3/8-16UNC	2

7.12 Torque test assembly (Fig 12, Table 12)

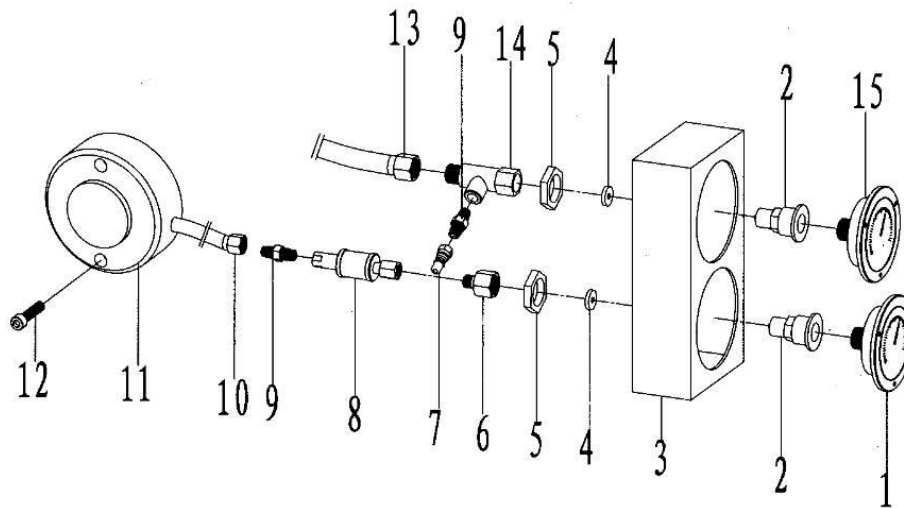


Fig 12

Table 12 List of torque test assembly

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-670	KHT14.2.6-1	torque indicator	1
2	KT14000-671	KJD9625.11 (2) -1	Gauge adapter	2
3	KT14000-140	KJD9625.11 (2)	Gauge seat	1
4	KT14000-313		Teflon washer	4
5	KT14000-672	KJD9625.11 (2) -2	Check nut	2
6	KT14000-673	YG-52	Buckle joint (M20-NPT1/4)	1
7	KT14000-674		Quick male connector	1
8	KT14000-323		Quick male connector	1
9	KT14000-676	YG-68	Adapter NPT1/4"	2
10	KT14000-677		Hose 6 II -1500	1
11	KT14000-678		pressure cylinder (Φ60)	1
12	KT14000-679		Hexagon socket head cap screws 5/16"×3/4"	2
13	KT14000-312		Hose 10 II -2500(3/4-16UNF、90°、M20×1.5)	1
14	KT14000-681	KHT5500.1.8.1-1	Oil filled three way connector	1
15	KT14000-314		Y-100ZT Pressure gauge (0-3600PSI)	1

7.13 Hydraulic valve bank (five connection valve) (Fig 13, Table 13)

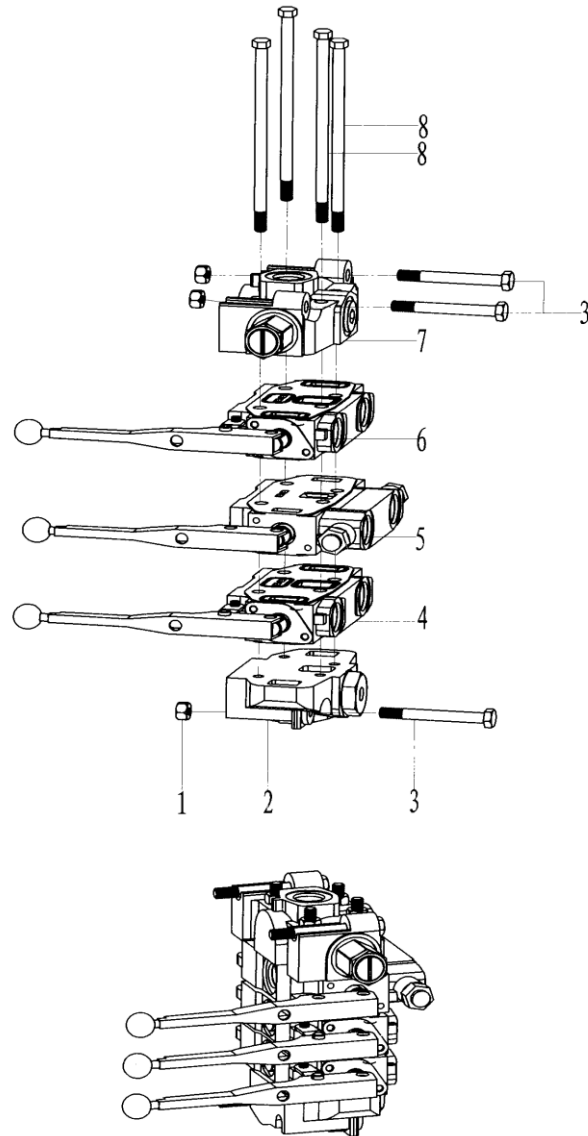


Fig 13

Table 13 Detailed table for Hydraulic valve bank (five connection valve)

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-108	locknut1/2"	3	
2	KT14000-48	Connection board assembly	1	
3	KT14000-338	hexagon headed bolt 1/2"UNC×4 1/2 "	3	
4	KT14000-49	Hand control valve assembly (Y)	1	
5	KT14000-50	Hand control valve assembly (O)	1	
6	KT14000-51	Hand control valve assembly (Y)	1	
7	KT14000-52	Overflow valve assembly	1	
8	KT14000-339	Bolt 1/2"UNC	4	

7.14 Quick exchange adaptor adaptor(2 1/8-12UN) (Fig 14, Table 14)

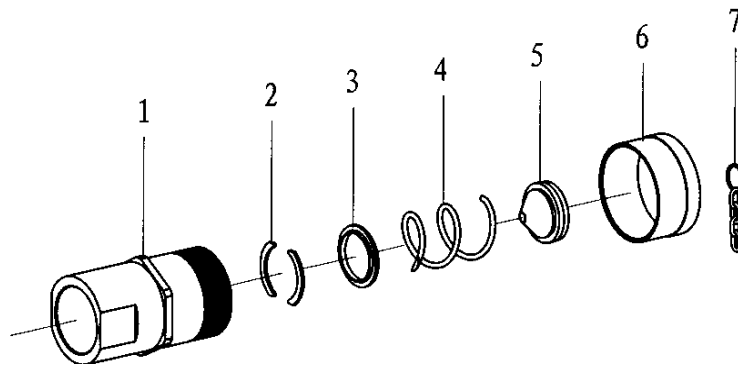


Fig 14

Table 14 Quick exchange adaptor adaptor(2 1/8-12UN)

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-340	KJD9625.18.3.1-2	Adaptor body	1
2	KT14000-341	KJD9625.18.3.1-5	Clip	2
3	KT14000-342	KJD9625.18.3.1-4	Washer	1
4	KT14000-343	KJD9625.18.3.1-3	Spring	1
5	KT14000-344	KJD9625.18.3.1.1	Core	1
6	KT14000-345	KJD9625.18.3.1-1	End cover	1
7	KT14000-346	KJD9625.18.3.1.2	Combination chain	1

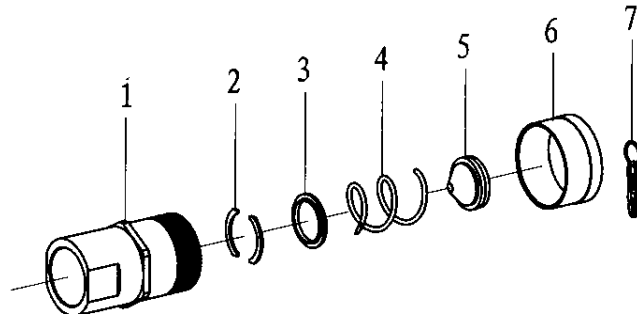


Fig 15

Table 15 Quick exchange adaptor adaptor(1 7/8-12UN)

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-347	KJD9625.18.4.1-2	Adaptor body	1
2	KT14000-348	KJD9625.18.4.1-5	Clip	2
3	KT14000-349	KJD9625.18.4.1-4	Washer	1
4	KT14000-350	KJD9625.18.4.1-3	Spring	1
5	KT14000-351	KJD9625.18.4.1.1	Core	1
6	KT14000-352	KJD9625.18.4.1-1	End cover	1
7	KT14000-346	KJD9625.18.3.1.2	Combination chain	1

7.16 Assembly of Safety door (Fig 16, Table 16)

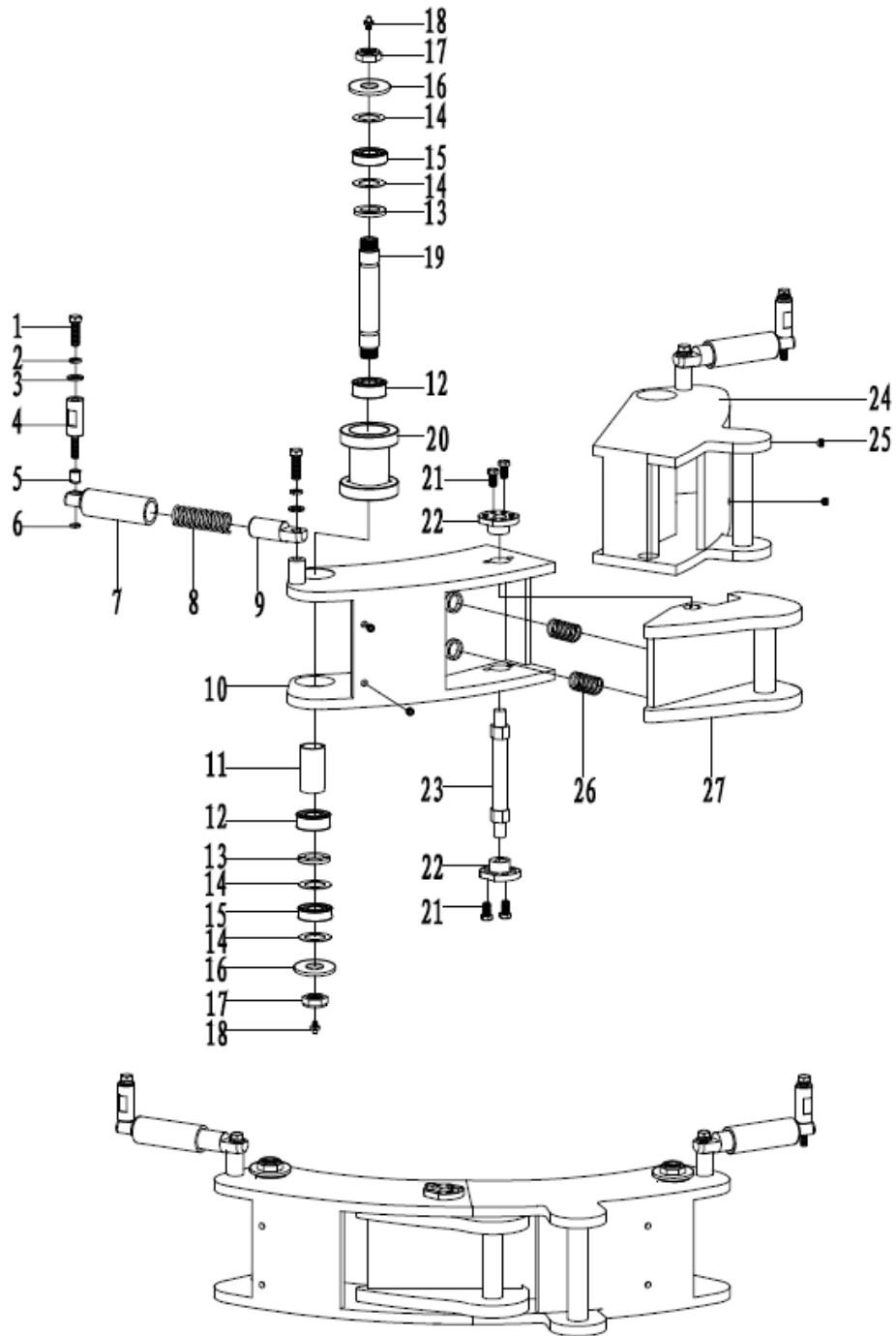


Fig 16

Table 16 List of safety door

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-360		Hexagon bolt1/2"×1 1/2"	4
2	KT14000-144		Spring washer1/2"	4
3	KT14000-361		Plain washer1/2"	4
4	KT14000-362	TQ508/70Y.9-1	Sleeve fixed pole	2
5	KT14000-363	TQ508/70Y.9-2	Lining sleeve	4
6	KT14000-101		Spring washe 3/8"	2
7	KT14000-364	TQ508/70Y.9-3	Sleeve	2
8	KT14000-365	TQ508/70Y.9-4	Sleeve spring	2
9	KT14000-366	TQ508/70Y.9-5	Sleeve pole	2
10	KT14000-367	KHT14.1.10.2	Door body(left)	1
11	KT14000-368	TQ508/70Y.2.1-3	Support roller spacer	2
12	KT14000-369	GB/T281	1206 Support roller bearing	4
13	KT14000-370	TQ508/70Y.2.1-2	Roller bearing spacer	4
14	KT14000-371	TQ508/70Y.9-6	washerΦ50×Φ32×1	8
15	KT14000-372	GB/T276	6206 Door pivot bearing	4
16	KT14000-373	TQ508/70Y.2.1-1	Plain washer	4
17	KT14000-374	TQ508/70Y.2.1.1	1"-12UNF Thin nylock nut	4
18	KT14000-118	GB/T1152	oil cup M6	4
19	KT14000-376	TQ508/70Y.9-7	Rotation shaft	2
20	KT14000-377	TQ508/70Y.2.1-4	Support roller	2
21	KT14000-100		Unbrako flat point 3/8"×1" set screw	2
22	KT14000-385	TQ508/70Y.9.1-3	Door latch cam	2
23	KT14000-389	TQ508/70Y.9.1-4	Door latch shaft	1
24	KT14000-378	KHT14.1.10.1	Door body(right)	1
25	KT14000-390		Unbrako flat point 3/8"×1" set screw	2
26	KT14000-388	TQ508/70Y.9.1-5	Spring	2
27	KT14000-387	KHT14.1.10.2.1	Latch weldment	1

7.17 Gear shifting assembly(below) (Fig 17, Table 17)

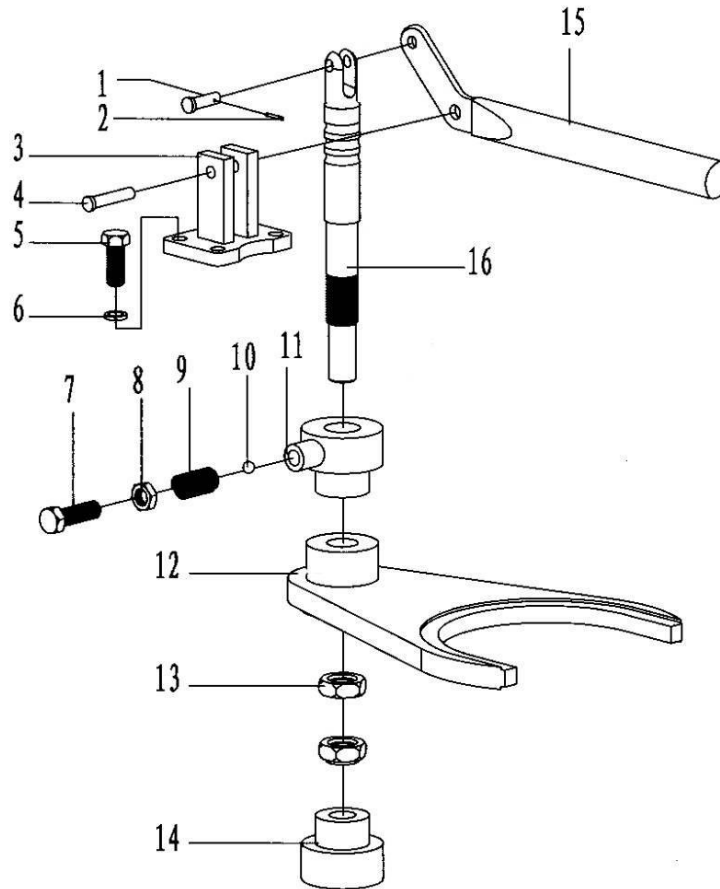


Fig 17

Table 17 List of gear shifting assembly(below)

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-430	GB/T882	Pin shaft B8×32	1
2	KT14000-245	GB/T91	Cotter pin 2.5×12	2
3	KT14000-431	KHT14.1.11.1	Seat	1
4	KT14000-432	GB/T882	Pin shaft B8×40	1
5	KT14000-100		Hexagon bolt 3/8"×1"	4
6	KT14000-101		Spring washe 3/8"	4
7	KT14000-250		Hexagon bolt 7/16"-20UNF×1 1/2"	1
8	KT14000-249		Hexagon nut 7/16"-20UNF	1
9	KT14000-248	TQ245.8-2	Positioning spring	1
10	KT14000-247		Steel ball 3/8"	1
11	KT14000-433	KHT14.1.2.1	Positioning seat	1
12	KT14000-434	KHT14.1.11.2	Shift fork(below)	1
13	KT14000-435		Hexagon nut 7/8"-14UNF	2
14	KT14000-436	KHT14.1.2-8	Lower shaft sleeve	1
15	KT14000-437	TQ245.8-1	Control lever	1
16	KT14000-438	KHT14.1.11-1	Lower shift fork shaft	1

7.18 Assembly of brake band (Fig 18, Table 18)

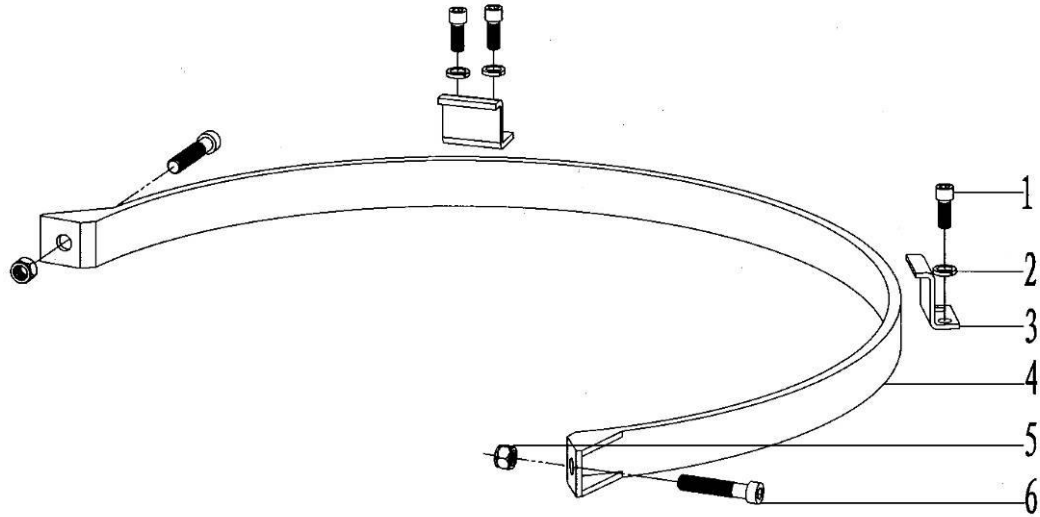


Fig 18

Table 18 List of brake band assembly

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-147		Hexagon socket cap head screws 3/8" x 1/2"	4
2	KT14000-101		Spring washer 3/8"	4
3	KT14000-148	TQ340/35Y.1.3-02	Restrict block	2
4	KT14000-445	KHT14.1.13.1	Brake band	1
5	KT14000-108		locknut 1/2"	2
6	KT14000-446		Hexagon socket cap head screws 1/2" x 2 1/2"	2

7.19 Suspension Bar (Fig 19, Table 19)

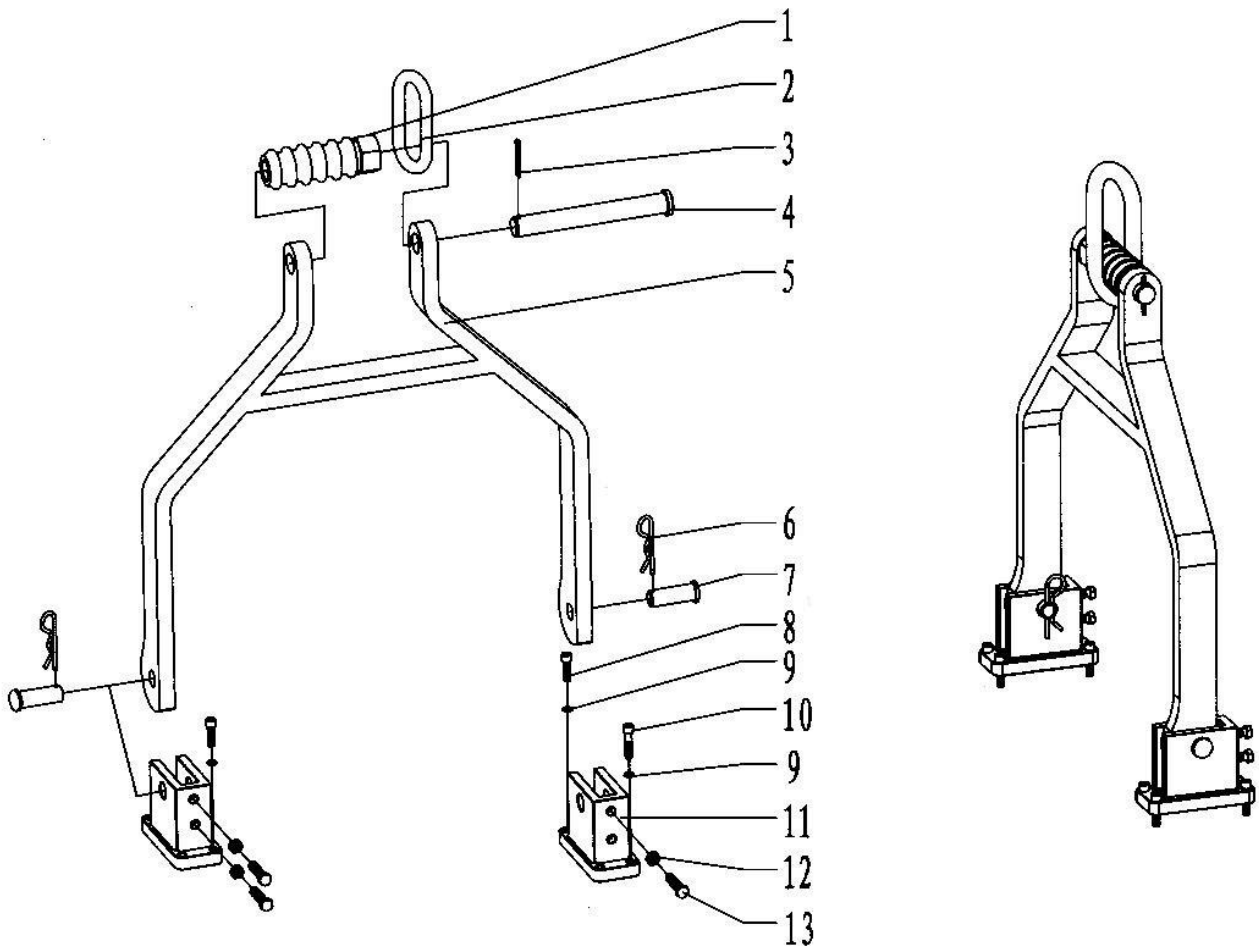


Fig 19

Table 19 Suspension Bar assembly

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-450	TQ245.15(2)-1	Spiral rod	1
2	KT14000-451		Flying ring (4.7T)	1
3	KT14000-452	GB/T91	Cotter pin 6×45	1
4	KT14000-453	TQ245.15(2)-2	Pin shaft,,	1
5	KT14000-454	KHT14.1.14.1	Suspension Bar	1
6	KT14000-162	TQ245-2	Snap Spring	2
7	KT14000-455	GB/T882	Pin shaft,,B25×95	2
8	KT14000-456		Hexagon Socket Head Screw 3/8"×1 1/2"	4
9	KT14000-101		Spring washer3/8"	8
10	KT14000-457		Hexagon Socket Head Screw 3/8"×2 3/8"	4
11	KT14000-458	KHT14.1.14-1	Suspension seat	2
12	KT14000-459		Hex-thin nut1/2"	4
13	KT14000-460		Hexagon Head Bolt 1/2"×2"	4

7.20 Pull cylinder assembly (Fig 20, Table 20)

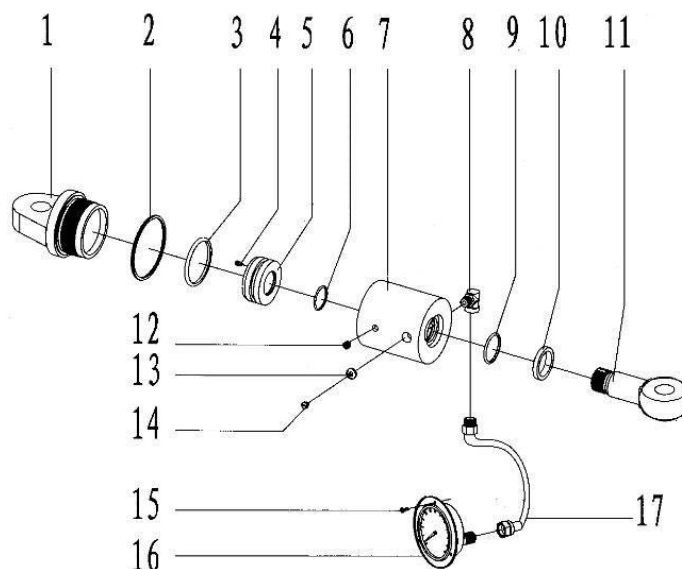


Fig 20

Table 20 Pull cylinder assembly

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-465	TQ508/70Y.14.1-1	Cylinder end joint	1
2	KT14000-466	TQ20.17-2	adjusting ring	1
3	KT14000-467	GB1235-76	O ring 70×5.7	1
4	KT14000-468		Hexagon socket set screw with flat point 1/4"×3/8"	1
5	KT14000-469	TQ20.17-4	Piston	1
6	KT14000-470	GB3452.1	O ring 35.5×2.65	1
7	KT14000-471	TQ20.17-3	cylinder body	1
8	KT14000-472	TQ20.17-5	elbow connection	1
9	KT14000-473	GB1235-76	O ring 44×3.5	1
10	KT14000-474	FD00641A0	dust ring DK1 38 50 7 10	1
11	KT14000-475	TQ20.17-6	piston rod	1
12	KT14000-476		Hexagon socket set screw with flat point 3/8"×1/2"	2
13	KT14000-313		Ptfe gasket Φ16×Φ6.5×3	1
14	KT14000-478		slotted round head screw 1/4"×3/8"	1
15	KT14000-479		cross recessed countersunk flat head screw	3
16	KT14000-480	KHT14.1.15-1	torque meter	1
17	KT14000-481		Hose 8 II -700(one end M20×1.5 , one end outer NPT 1/4)	1

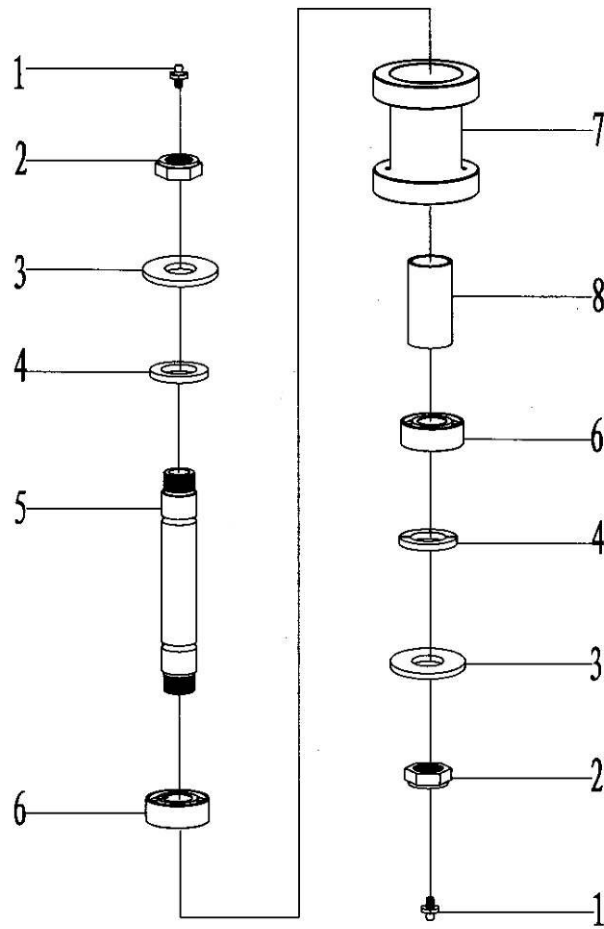


Fig 21

Table 21 Centering roller assembly(1)

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-118	GB1152	oil cup M6	2
2	KT14000-374	TQ508/70Y.2.1.1	stop nut 1"-12UNF	2
3	KT14000-373	TQ508/70Y.2.1-1	base plate	2
4	KT14000-370	TQ508/70Y.2.1-2	washer	2
5	KT14000-485	TQ508/70Y.2.1-5	roller shaft	1
6	KT14000-369	GB/T281-1994	aligning bearing 1206TN1	2
7	KT14000-377	TQ508/70Y.2.1-4	Centering roller	1
8	KT14000-368	TQ508/70Y.2.1-3	bush	1

7.22 Centering roller assembly(2) (Fig 22, Table 22)

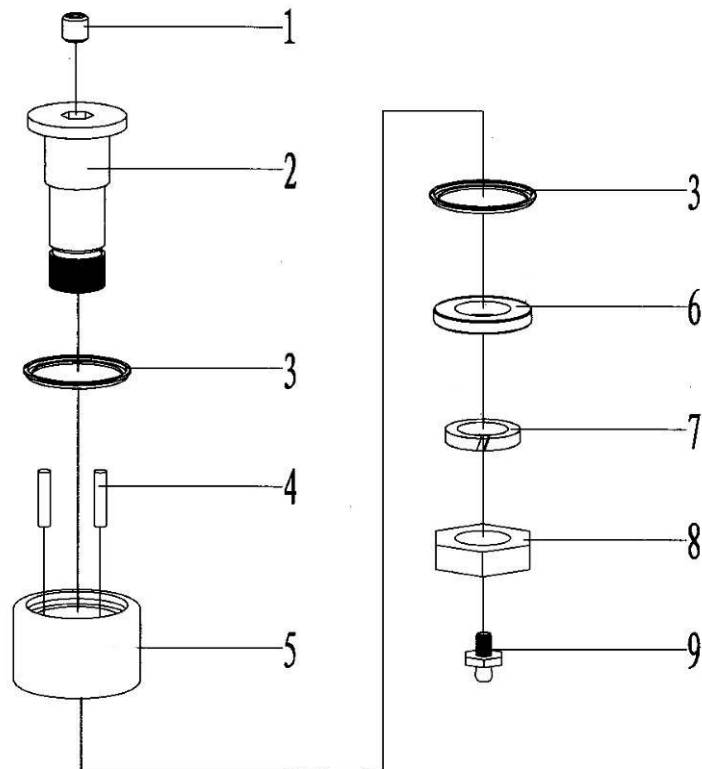


Fig 22

Table 22 Centering roller assembly(2)

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-490	GB1155	oil cup $\Phi 8$	1
2	KT14000-491	TQ508/70Y.2.2-1	centralizer shaft	1
3	KT14000-492	TQ508/70Y.2.2-4	sealing gasket	2
4	KT14000-493		rolling needle 3/16"×7/8"	20
5	KT14000-494	TQ508/70Y.2.2-2	Centering roller	1
6	KT14000-495	TQ508/70Y.2.2-3	retainer ring	1
7	KT14000-496		Spring washer 7/8	1
8	KT14000-497		hexagon nut 7/8"-14UNF	1
9	KT14000-118	GB1152	oil cup M6	1

7.23 Support roller assembly (Fig 23, Table 23)

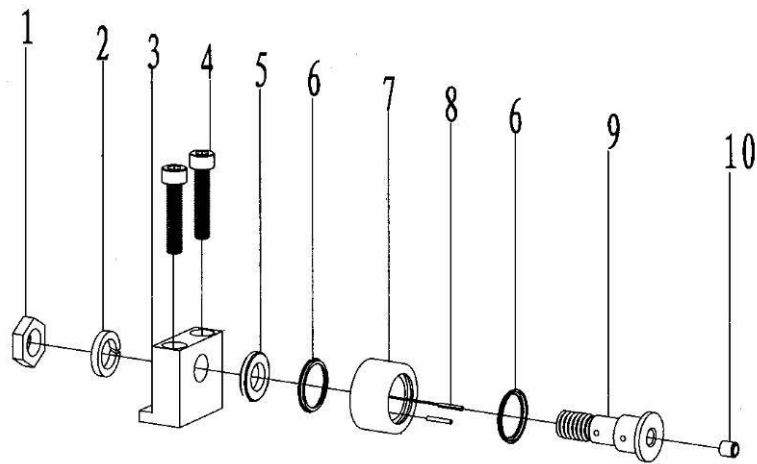


Fig 23

Table 23 Support roller assembly

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-249		hexagon nut 7/16"-20UNF	1
2	KT14000-500		Spring washer 7/16	1
3	KT14000-501		Socket head cap screw cylinder head screw 1/4"×1 1/4"	2
4	KT14000-502	TQ508/70Y.2.3-1	Roller bracket	1
5	KT14000-503	TQ508/70Y.2.3-2	retainer ring	1
6	KT14000-504	TQ508/70Y.2.3-4	seal ring	2
7	KT14000-505	TQ508/70Y.2.3-3	Support roller	1
8	KT14000-506		rolling needle 1/16"×7/16"	32
9	KT14000-507	TQ508/70Y.2.3-5	Support roller shaft	1
10	KT14000-490B	GB1155	oil cup Φ6	1

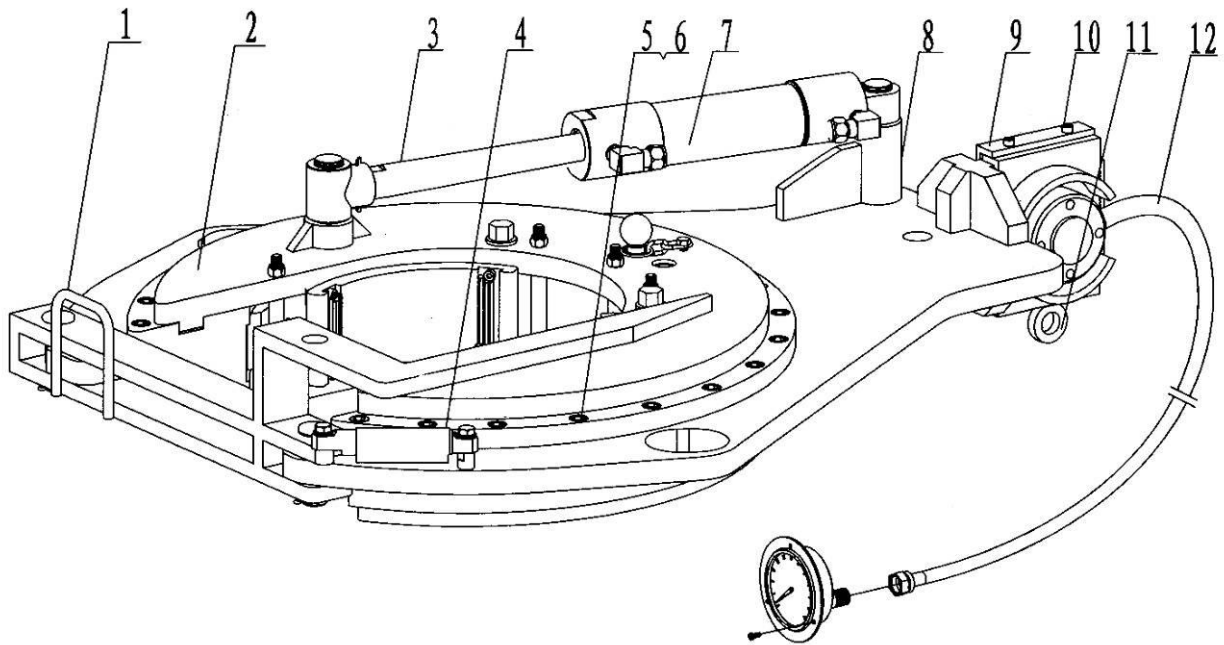


Fig 24

Table 24 List of backup tong assembly

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-55	KHT14.2.8	Backup tong safety door assembly	1
2	KT14000-56	KHT14.2.1	Backup tong head	1
3	KT14000-57	KHT14.2.3	Clamp hydraulic cylinder	1
4	KT14000-58	KHT14.2.7	Spring sleeve assembly	1
5	KT14000-600		Hexagon socket head cap screws 5/8"×2 1/4 "	21
6	KT14000-142		spring washer 5/8"	21
7	KT14000-601		Hose 10 II -400(3/4-16UNF 扩口式)	2
8	KT14000-60	KHT14.2.2	Backup tong main body	1
9	KT14000-61	KHT14.2.4	Butterfly bolt	1
10	KT14000-603		Hexagon socket head cap screws 5/16"×1 1/4"	2
11	KT14000-62	KHT14.2.5	connecting seat	1
12	KT14000-63	KHT14.2.6	Torque cylinder connecting seat	1
13	KT14000-604	GB/T825	Eyebolts M12	1

7.25 Backup tong head assembly (Fig 25, Table 25)

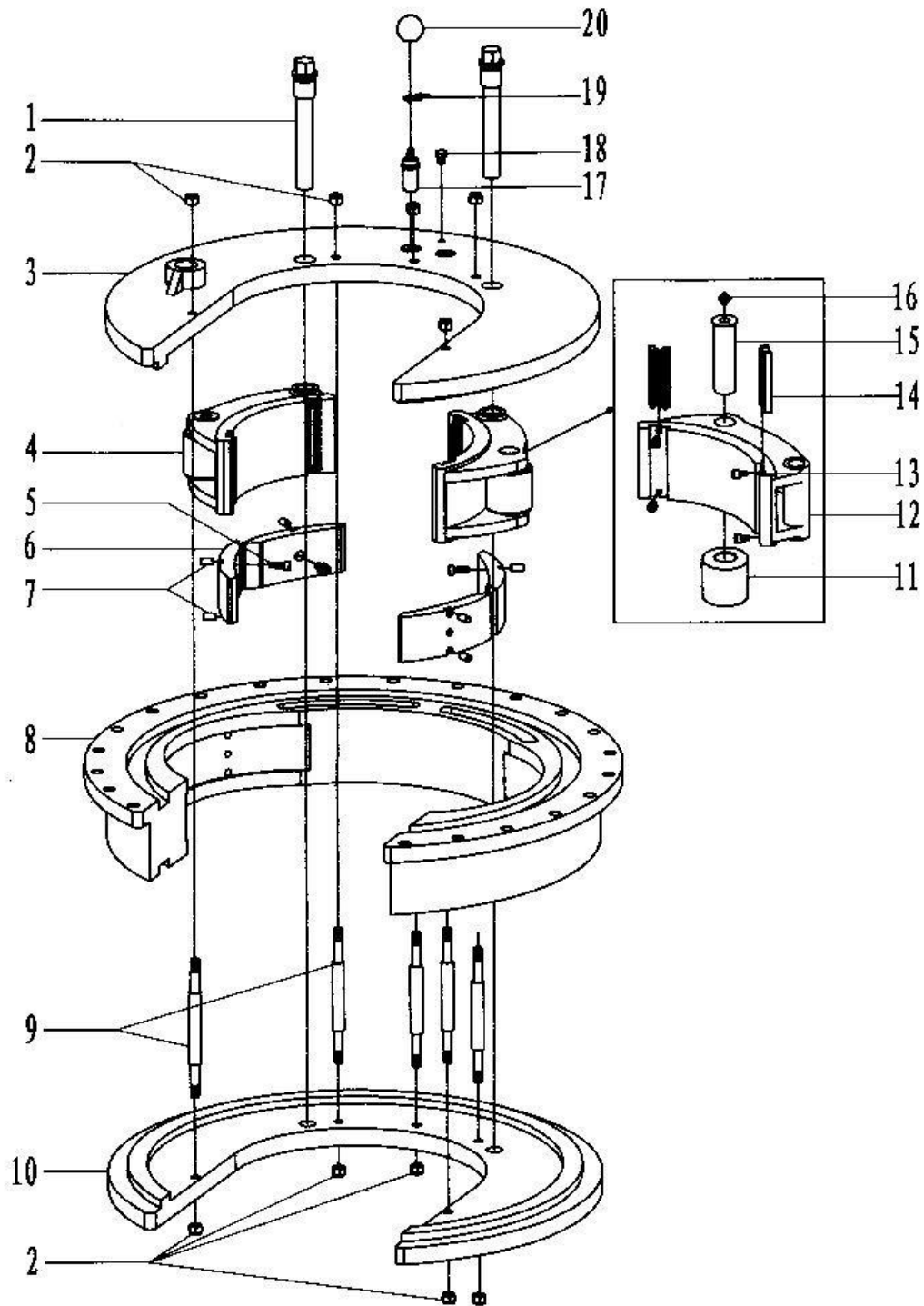


Fig 25

Table 25 List of backup tong head assembly

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-610	KHT14.2.1-5	Jaw set bolt	2
2	KT14000-108		Hexagon locknut 1/2"	10
3	KT14000-611	KHT14.2.1-1	Upper jaw set bracket	1
4	KT14000-65	KHT14.2.1.1(1)	Jaw set assembly 1 (15 1/2)	2
	KT14000-66	KHT14.2.1.1(2)	Jaw set assembly 2 (14)	2
	KT14000-67	KHT14.2.1.1(3)	Jaw set assembly 3 (13 5/8)	2
	KT14000-68	KHT14.2.1.1(4)	Jaw set assembly 4 (13 3/8)	2
	KT14000-69	KHT14.2.1.1(5)	Jaw set assembly 5 (9 5/8)	2
	KT14000-70	KHT14.2.1.1(6)	Jaw set assembly 6 (7)	2
	KT14000-71	KHT14.2.1.1(7)	Jaw set assembly 7 (5 1/2)	2
	KT14000-72	KHT14.2.1.1(8)	Jaw set assembly 8 (5)	2
	KT14000-73	KHT14.2.1.1(9)	Jaw set assembly 9 (4 1/2)	2
	KT14000-74	KHT14.2.1.1(10)	Jaw set assembly 10 (4)	2
5	KT14000-612		Hexagon socket head cap screws 3/8"-16UNC×5/8"	4
6	KT14000-613	KHT14.2.1-9	slope board	4
7	KT14000-113	GB/T119	pin 10×20	8
8	KT14000-614	KHT14.2.1-2	Hand hank	1
9	KT14000-615	KHT14.2.1-3	Hexagon bolt	5
10	KT14000-616	KHT14.2.1-4	Combination chain	1
11	KT14000-136	KD20/50.1.2-3 (2)	Roller	2
12	KT14000-617	KHT14.2.1.1(1)	Jaw set 1 (15 1/2)	2
	KT14000-618	KHT14.2.1.1(2)	Jaw set 2 (14)	2
	KT14000-619	KHT14.2.1.1(3)	Jaw set 3 (13 5/8)	2
	KT14000-620	KHT14.2.1.1(4)	Jaw set 4 (13 3/8)	2
	KT14000-621	KHT14.2.1.1(5)	Jaw set 5 (9 5/8)	2
	KT14000-622	KHT14.2.1.1(6)	Jaw set 6 (7)	2
	KT14000-623	KHT14.2.1.1(7)	Jaw set 7 (5 1/2)	2
	KT14000-624	KHT14.2.1.1(8)	Jaw set 8 (5)	2
	KT14000-625	KHT14.2.1.1(9)	Jaw set 9 (4 1/2)	2
	KT14000-626	KHT14.2.1.1(10)	Jaw set 10 (4)	2
13	KT14000-120		Hexagon socket head cap screws 5/16"UNC×1/2"	4
14	KT14000-117	KJD9625.1.2-2	Die plate	4
15	KT14000-119	KD20/50.1.2-2 (2)	roller shaft	2
16	KT14000-118	GB/T1152	oil cup M6	2
17	KT14000-627	KHT14.2.1-6	reversing shaft	1
18	KT14000-628		hexagon bolt 3/8"×1/2"	1
19	KT14000-629	KJD9625.2.1-7	chain	1
20	KT14000-103	TQ508/70Y.1.1-4	ball knob	1

7.26 Clamp cylinder assembly (Fig 26, Table 26)

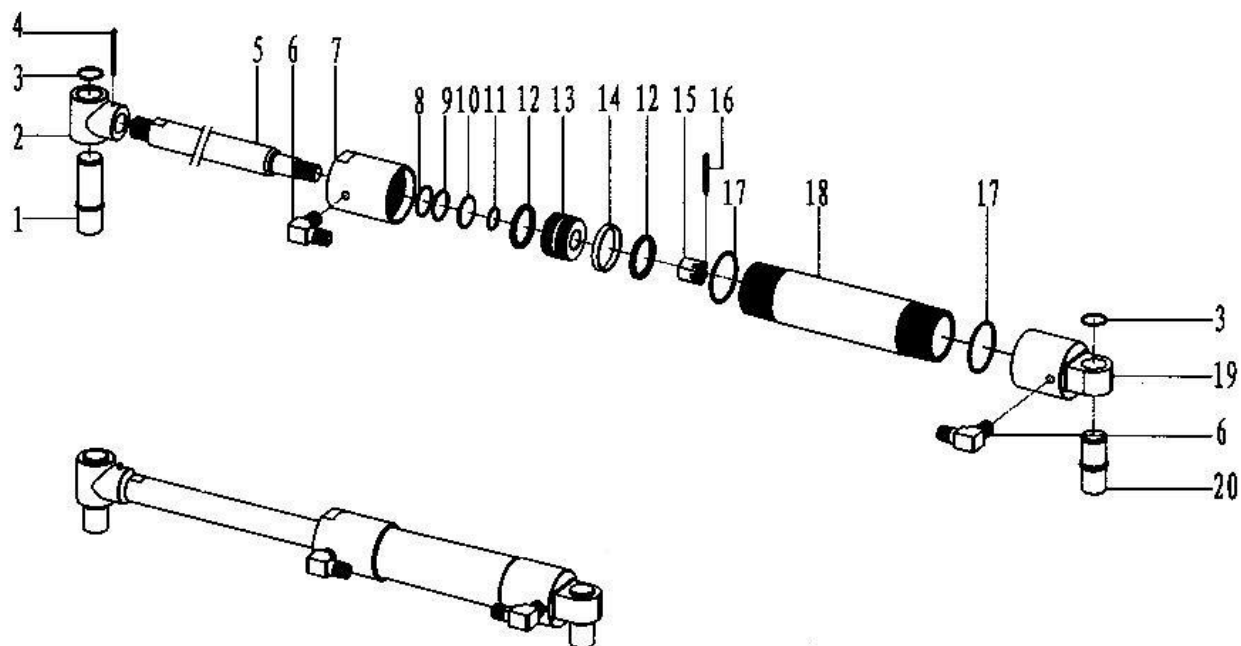


Fig 26

Table 26 Clamp cylinder assembly

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-630	KHT9625.2 (2) .3-1	Shaft pin (1)	1
2	KT14000-631	KHT9625.2 (2) .3-2	Rod joint	1
3	KT14000-632	GB/T894.1	circlip for shaft 35	2
4	KT14000-633	GB/T91	cotter pin5×65	1
5	KT14000-634	KHT14.2.3-1	piston rod	1
6	KT14000-635	KJD9625.18-3	angle coupling (NPT1/2)	2
7	KT14000-636	KHT9625.2 (2) .3-4	Cylinder end joint (1)	1
8	KT14000-637	GB/T10708.3	dust-proof sealing ring FA48×40×5	1
9	KT14000-638	GB/T3452.1	O ring 41.2×3.55	1
10	KT14000-639	GB/T3452.1	retainer ring A40.5×45.5×1.5	1
11	KT14000-640	GB/T3452.1	O ring 28×2.65	1
12	KT14000-641	GB/T10708.1	Y ring Y63×53×6.3	2
13	KT14000-642	KHT9625.2 (2) .3-6	Piston1	1
14	KT14000-643	GB/T15242.2	support ring: SD 0630C- II A	1
15	KT14000-644	GB/T91	cotter pin5×40	1
16	KT14000-645	GB/T6178	hexagon slotted and castle nutM24	1
17	KT14000-646	GB/T3452.1	O RING 69×3.55	2
18	KT14000-647	KHT14.2.3-2	oil cylinder	1
19	KT14000-648	KHT9625.2 (2) .3-7	Cylinder end joint (2)	1
20	KT14000-649	KHT9625.2 (2) .3-8	Pin shaft (2)	1

7.27 Backup Tong Safety door assembly (Fig 27, Table 27)

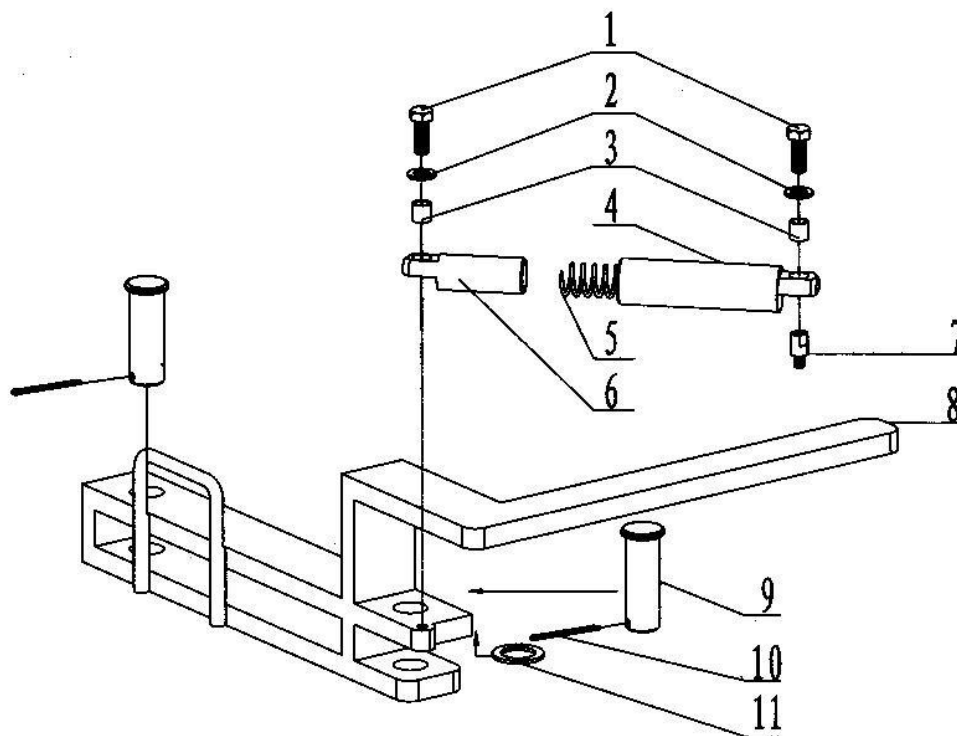


Fig 27

Table 27 Backup Tong Safety door

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-360		Hexagon Socket Head Screw 1/2"×1 1/2"	4
2	KT14000-144		Spring washer 1/2"	2
3	KT14000-403	TQ508/70Y.9-2	Sleeve (1)	2
4	KT14000-404	TQ508/70Y.9-3	Sleeve	1
5	KT14000-405	TQ508/70Y.9-4	Spring	1
6	KT14000-406	TQ508/70Y.9-5	Sleeve rod	1
7	KT14000-655	KHT14.2.7-1	support	1
8	KT14000-656	KHT14.2.8.1	Safety door	1
9	KT14000-657	GB/T882	Pin shaft32×90	2
10	KT14000-658	GB/T91	Cotter Pin6.3×50	2
11	KT14000-659	KHT9625.2 (2) .5-1	Circlip for Shaft	1

7.28 Rear guide rod assembly (Fig 28, Table 28)

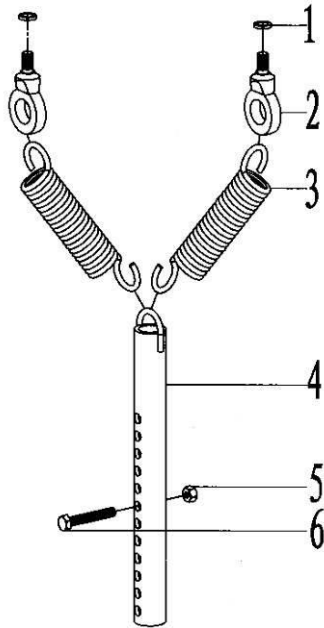


Fig 28

Table 28 Rear guide rod assembly

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-140		Spring washer 1/2"	2
2	KT14000-604	GB/T825	Eyebolts M12	2
3	KT14000-685	TQ340.4-1	tension spring	2
4	KT14000-686	TQ340.4.1	Rear guide rod	1
5	KT14000-687		hexagon nut 3/8"	1
6	KT14000-688		Hexagon socket head cap screws 3/8"×2 1/2 "	1

7.29 Fore guide pole assembly (Fig 29, Table 29)

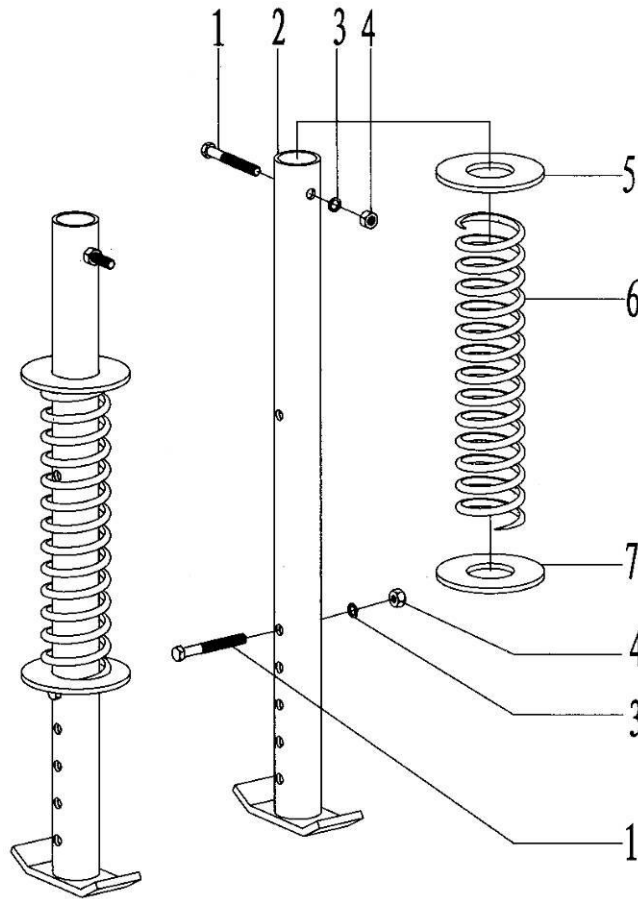


Fig 29

Table 29 Fore guide pole assembly

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-690		hexagon bolt 1/2" -13UNC×4"	2
2	KT14000-691	KD13375.3.1	Fore guide pole	2
3	KT14000-361		washer 1/2"	2
4	KT14000-108		hexagon nut 1/2"	2
5	KT14000-692	KD13375.3-1	washer	1
6	KT14000-693	TQ340/35Y.2.5-2	spring	2
7	KT14000-694	TQ340/35Y.2.5-1	washer	2

7.30 Back seat assembly (Fig 30, Table 30)

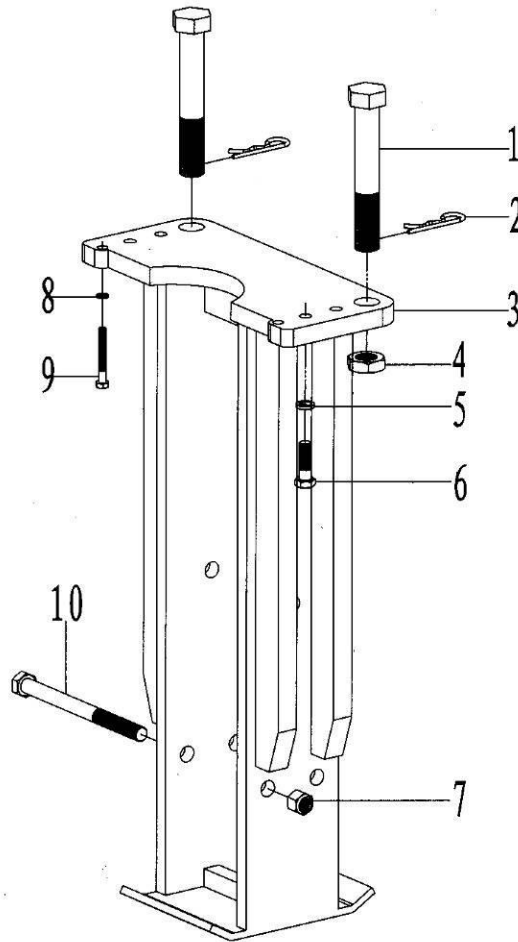


Fig 30

Table 30 Back seat assembly

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-165	TQ508/70Y.8-7	Tail guy bolt	2
	KT14000-165B	KHT14.1.2-9	Tail guy bolt	2
2	KT14000-162	TQ245-2	Circlip	2
3	KT14000-75	KHT14.3.1	Back seat	1
4	KT14000-156		Nut 1 1/4"	2
5	KT14000-142		Spring washer 5/8"	4
6	KT14000-700		Hex bolt 5/8"-11UNC×2"	4
7	KT14000-701		locknut 3/4"	3
8	KT14000-101		Spring washer 3/8"	2
9	KT14000-702		Hex bolt 3/8"-16UNC×2 1/2"	2
10	KT14000-703		Hex bolt 3/4"-10UNC×10"	3

7.31 Spring lift assembly (Fig 31, Table 31)

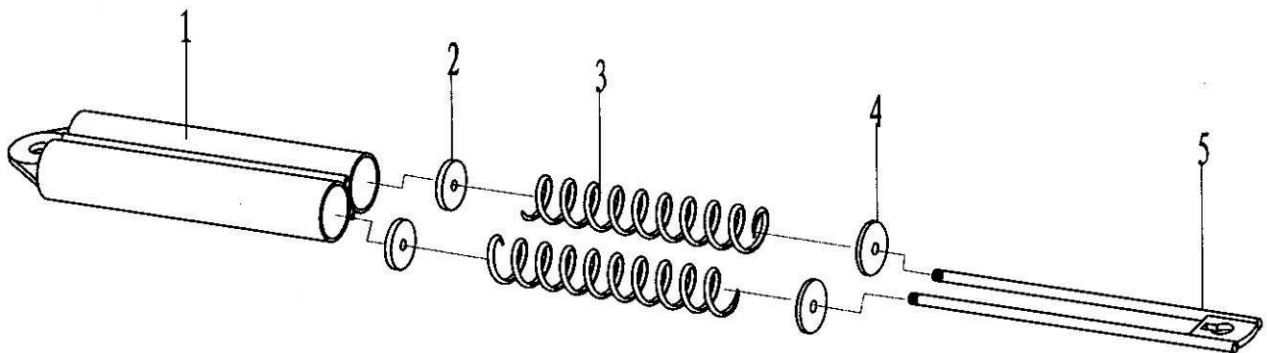


Fig 3 1

Table 31 Spring lifter

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-710			1
2	KT14000-711	TQ20.6-6	TQ20.6-6	2
3	KT14000-712	TQ20.6-5	TQ20.6-5	2
4	KT14000-713	TQ20.6-3	TQ20.6-3	2
5	KT14000-714			1

7.32 Hydraulic spring suspending device (Fig 32, Table 32)

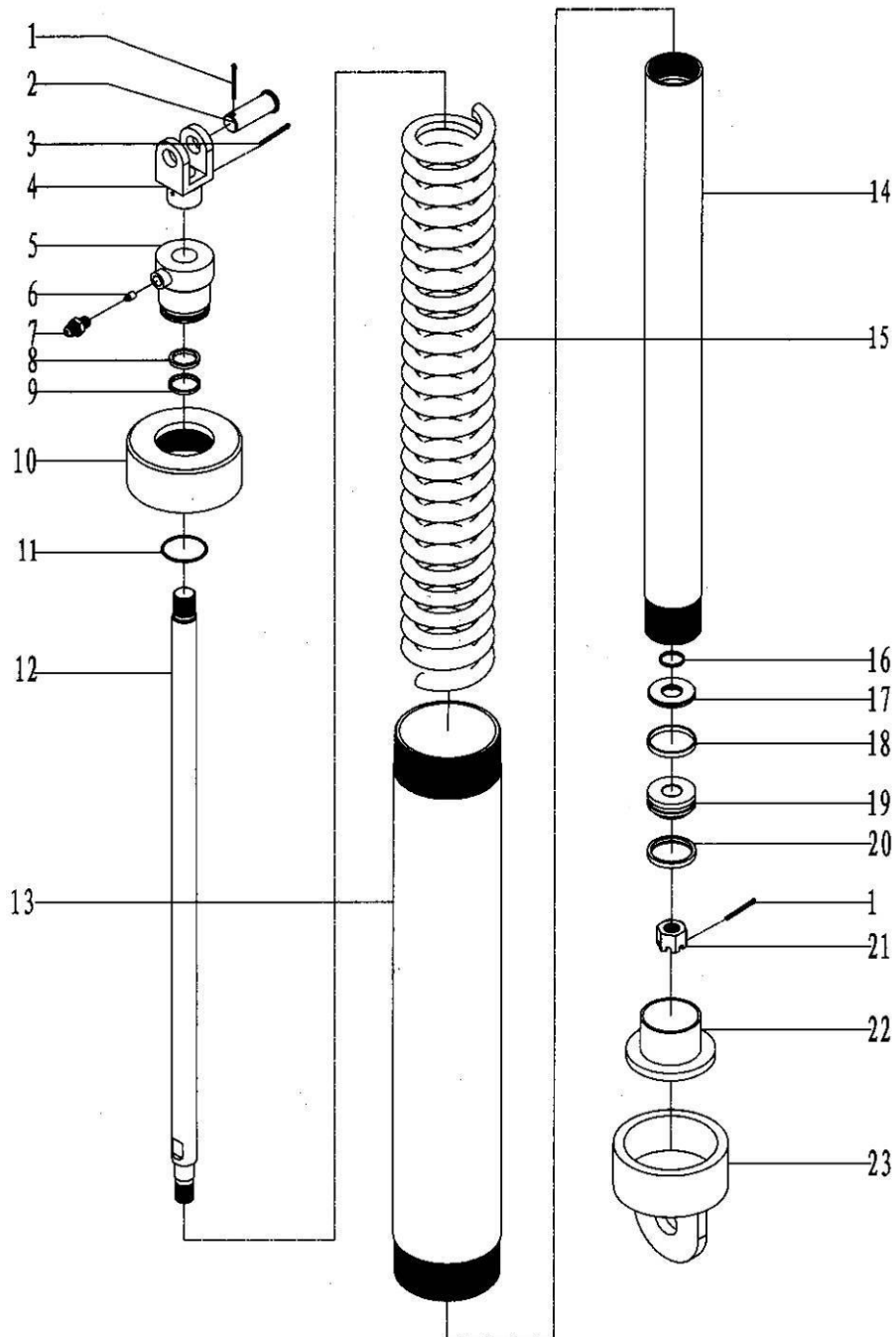


Fig 3 2

Table 3 2 Hydraulic spring suspending device

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-658	GB/T91	Cotter pin 6.3×50	2
2	KT14000-657	GB/T882	Pin shaft 32×90	1
3	KT14000-720	GB/T91	Cotter pin 6.3×80	1
4	KT14000-721	TQ340/35YA.1.16-1	Suspended head	1
5	KT14000-722	KHT9625.1.17.1	Cylinder end joint 1	1
6	KT14000-723	XYQ12.YD-01.3	Throttle spool	1
7	KT14000-724	YG-54	Joint (M18×1.5 -3/4UNF)	1
8	KT14000-725	GB/T10708.1	Dustproof Ring FA40×48×5	1
9	KT14000-726	GB/T10708.1	Y-Ring Y40×50×6.3	1
10	KT14000-727	KHT9625.1.17-1	Cylinder cover	1
11	KT14000-728	GB/T3452.1	O-Ring 69×5.3	1
12	KT14000-729	KHT9625.1.17-5	Piston Rod	1
13	KT14000-730	KHT9625.1.17-3	Bucket body	1
	KT14000-731	KHT9625.1.17-3(2)	Bucket body	1
14	KT14000-732	KHT9625.1.17-4	Cylinder body	1
15	KT14000-733	KHT9625.1.17-2	Spring	1
	KT14000-734	KHT9625.1.17-2(2)	Spring	1
16	KT14000-735	GB/T3452.1	O-Ring 32.5×3.55	1
17	KT14000-736	KHT9625.1.17-6	Check Ring	1
18	KT14000-737	GB/T10708.1	Y-Ring Y80×65×9.5	1
19	KT14000-738	KHT9625.1.17-7	Piston	1
20	KT14000-739	GB/T15242.2	SD0800C- II A	1
21	KT14000-740	GB/T6178	Slotted Nut M30	1
22	KT14000-741	KHT9625.1.17-8	Cylinder end joint2	1
23	KT14000-742	KHT9625.1.17.2	Bucket end joint	1

8. Table of quick-wearing or spare parts(recommended for the one-year storage of one tong actual figures may vary according to the purchase period and the optional pieces)

P/N	Drawing No.	Description	Qty	P/N
1	KT14000-11	KHT14.1.13	The brake assembly	10
2	KT14000-47	TQ508/70Y.2.3	Support roller assembly	20
3	KT14000-48	TQ508/70Y.2.2	Centering roller assembly (2)	34
4	KT14000-106	TQ508/70Y.1.1-2	reverse shaft	5
5	KT14000-107	TQ508/70Y.1-6	Bolt	10
6	KT14000-117	KJD9625.1.2-2	Die	100
7	KT14000-119	KD20/50.1.2-2 (2)	roller shaft	5
8	KT14000-136	KD20/50.1.2-3 (2)	Roller	5
9	KT14000-637	GB/T10708.3	dust-proof sealing ring FA48×40×5	10
10	KT14000-638	GB/T3452.1	O ring 41.2×3.55	10
11	KT14000-639	GB/T3452.1	retainer ring A40.5×45.5×1.5	10
12	KT14000-640	GB/T3452.1	O ring 28×2.65	10
13	KT14000-641	GB/T10708.1	Y ring Y63×53×6.3	10
14	KT14000-643	GB/T15242.2	support ring: SD 0630C- II A	10
15	KT14000-646	GB/T3452.1	O ring 69×3.55	10
16	KT14000-725	GB/T10708.1	Dustproof Ring FA40×48×5	10
17	KT14000-726	GB/T10708.1	Y ring Y40×50×6.3	10
18	KT14000-728	GB/T3452.1	O ring 69×5.3	10
19	KT14000-735	GB/T3452.1	O ring 32.5×3.55	10
20	KT14000-737	GB/T10708.1	Y ring Y80×65×9.5	10
21	KT14000-739	GB/T15242.2	SD0800C- II A	5