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MODEL: XQ140/12YA (Formerly XYQ12A)

HYDRAULIC POWER TONG

MAINTENANCE AND OPERATION MANUAL

Safety Instruction

1. Operators must read and know this manual well.

2. Operators must wear work uniform, safety shoes, safety helmet, safety gloves, etc.

3. Tie the back guy according to the instruction. Don't tie it in the wrong direction

4. Operate at the side of the tong body opening.

5. The safety door must be closed as making-up or breaking-out.

6. Don't touch the running parts with hands when the tong is running.

7. Keep sundries out of the working area.

8. The pump should be off or the hydraulic tong power shut down as maintaining or changing the jaw plates, die seats or tong dies.

9. Over-pressure and over-torque are forbidden.

10. Don't add or dismount any parts to the tong.

11. Original parts made by should be used.

Legend

Serious Warning

Warning

Recommendation or Suggestion

SAFETY FIRST,STANDARD OPERATION PROBLEMS MAY OCCUR IF BUGS ARE NOT RID OF.

TABLE OF CONTENTS

1. Summary

Model XYQ12A hydraulic power tong is a mouth opening power tong which can quickly make-up or break-out pipe strings in well service. It is used in making-up or breaking-out tubing, small drilling pipe and small casing with diameters from $2^{7}/_{8}''$ $5^{1}/_{2}''$ (73mm to 140mm). Compared with the same type of tongs by other tong makers, it features simple structure, convenient operation, reliable performance, long life, broad application range and large torque. It is widely used in onshore or offshore oilfields. It can reduce workload, improve work efficiency and the well service quality.

2 Structure Characteristics and Working Principle

Hydraulic power tong consists of two main parts----master tong and backup tong. The backup tong clips coupling or joints, (It can also clip the pipe body by lengthening the front and back guide poles as required.) and the master tong clips pipe string, turns clockwise or counter-clockwise, in this way, it completes making-up or breaking-out operations.

2.1 Transmission System

Hydraulic power tong has four shifts to reduce speed, as shown in figure 1.

Low Gear Engagement: Z2, Z1, Z3, Z5, Z6, Z7, Z11, Z12, Z13

Second Low Gear Engagement: Z2, Z1, Z3, Z5, Z10, Z11, Z12, Z13

Second High Gear Engagement: Z2, Z4, Z6, Z7, Z11, Z12, Z13

High Gear Engagement: Z2, Z4, Z8, Z9, Z10, Z11, Z12, Z13

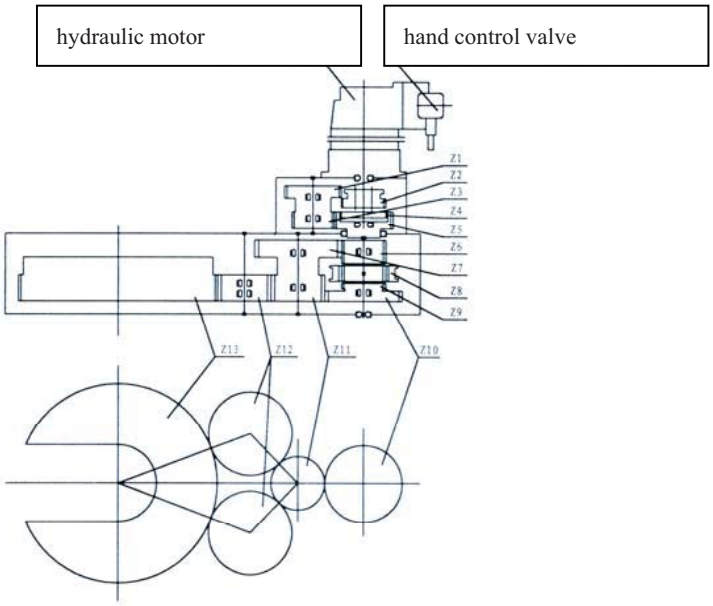


Fig 1 Transmission Diagram

2.2 Tong Head Assembly (Fig.2, Fig.3, Fig.4)

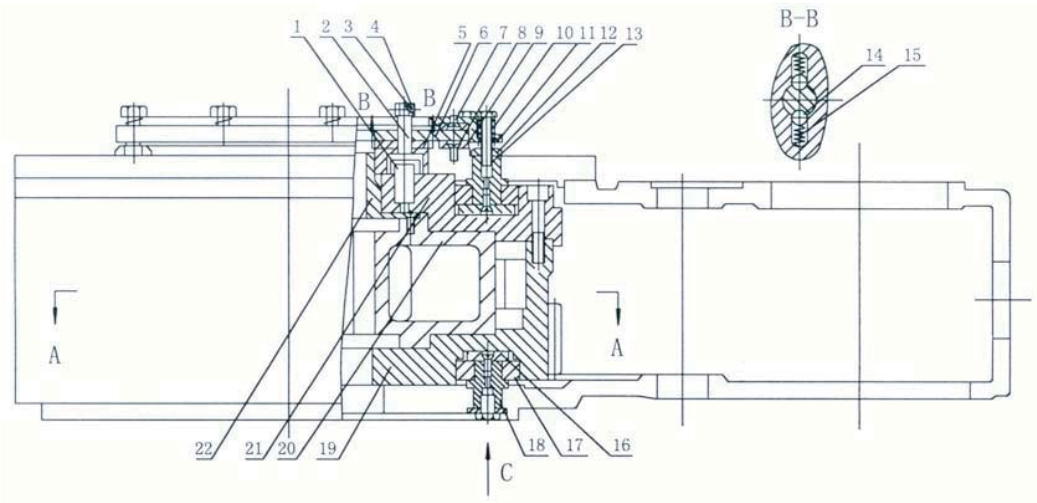


Fig 2 Main View of Tong Head Assembly

1.stopper pin 2. reset knob axle 3.cylindrical pin 4.reset knob 5.spline connection plate 6.braking disc 7.slotted countersunk head screw 8.countersunk screw 9.friction disc 10.spring 11.braking plate 12. lock nut 13. hexagon socket head screw 14.steel ball 15.spring 16.roller support frame 17.centralizing roller 18.centralizing roller axle 19.open gear 20.jaw plate frame 21.open gear cover 22.spline plate

2.2.1 Clamping Mechanism (Fig.2, Fig.3)

The clamping mechanism adopts inner curved bilateral clamping mechanism. It consists of ramp plate, roller, roller axle, jaw plate, die seats, tong dies and jaw plate frame assembly. The jaw plate frame assembly is fixed in the inner side of the open gear. The spline on the board matches the spline on the connection plate of braking mechanism. When the transmission system starts to drive the open gear to turn, the jaw plate frame assembly doesn't turn first at all under the braking force from the braking mechanism, the curved ramp plate turns together with the open gear, the roller on the jaw plate climbs along the curved surface of the ramp, moving jaw plate assembly towards the center, thus the preliminary clamping is achieved.

As the torque increases and exceeds the braking moment, the open gear drives the spline connection plate, braking disc, jaw plate frame assembly and the jaw plate in the braking mechanism to turn together with the pipe string. The backup tong clamping mechanism is the same as that of the master tong. The hydraulic oil drives rack plunger to make reciprocating movement and also drives the duplex gear and the jaw plate frame to turn inside the main body of the backup tong, which drives the roller to climb, finally clips or looses the pipe string.

2.2.2 Braking Mechanism (Fig.2)

Jaw plate frame assembly must be braked to drive roller and ramp to move in opposite directions (i.e. climbing and resetting). The braking mechanism consists of braking plate, braking steel disc, spline connection board, upper and lower friction disc, adjusting screw, spring and lock nut. It can change braking moment by adjusting the compress force from the spring.

2.2.3 Reset Mechanism (Fig.2)

The initial working position of hydraulic power tong refers to the jaw plate frame and the open gear face the opening of the shell body of the master tong, the jaw plate frame of the back-up tong faces the opening of backup tong main body. The openings of master and backup tongs should be in alignment. After one making-up and breaking-out operation ends, operate the hand control valve in the opposite direction to return the hydraulic power tong to its initial working position, allowing the pipe string in or out through the tong opening smoothly. During making-up and breaking-out, reset knobs on the master and backup tongs should be in the same direction.

2.2.4 Centralizing Mechanism (Fig.2 and Fig.4)

The centralizing mechanism centralizes from up and down, inside and outside. It consists of roller support frame, centralizing roller, centralizing roller axle and roller, which are respectively installed on the shell body and the cover of the tong head. They match the open gear and the groove on the cover of the open gear to guarantee the open gear turns along the original axle central line to avoid deflection and axial running-out, thus the tong head is centralized.

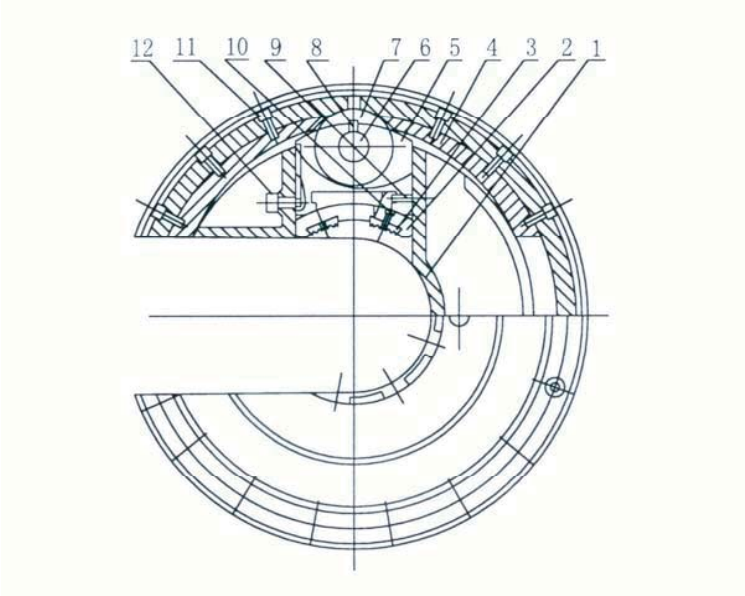
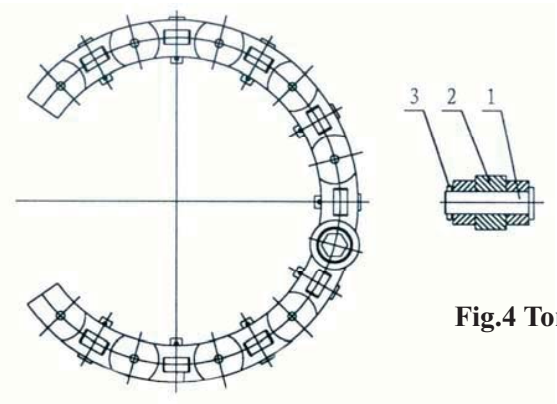


Fig.3 A-A Cutaway View of Tong Head Assembly

1. jaw plate frame 2.die seat 3.dies 4.ramp plate 5.jaw plate 6.roller axle 7.roller 8.cone point fastening screw 9.cylindrical pin 10.screw stopper 11.hexagon socket head screw 12.positioning screw



1.pin axle
2.roller
3.cotter Pin

Fig.4 Tong Head Assembly C-Side View

2.3 Hydraulic System

Hydraulic system consists of hydraulic source, bucket valve, hydraulic bucket, hand control valve, hydraulic motor, hydraulic oil cylinder, pressure gauge, quick coupler, pipe line, etc.

Corresponding Relationship Between Input Pressure and Output Torque From Tong Head(Fig.5)

A: Low Gear

B: Second Low Gear

C: Second High Gear

D: Higher Gear

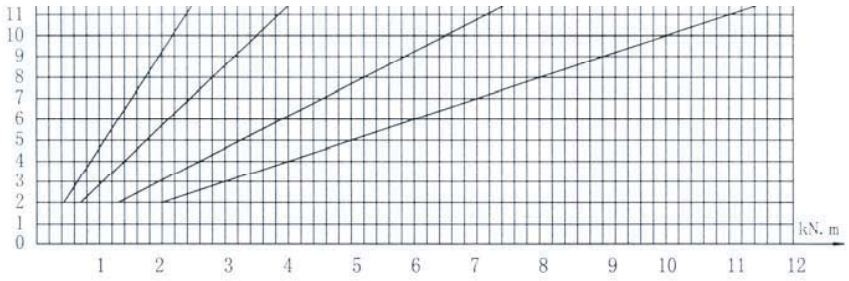


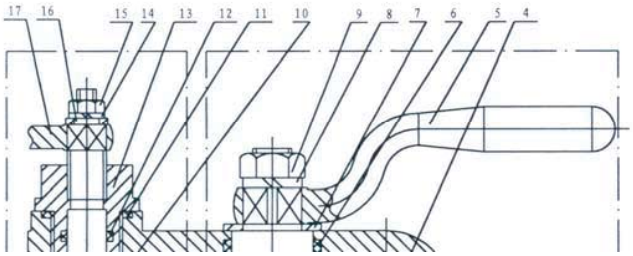
Fig.5 Corresponding Table Between Pressure and Torque

2.3.1 Hydraulic Source

It mainly provides high-pressure oil for power tong, which should be prepared by the users themselves.

2.3.2 Bucket Valve (Purchase No. see Fig.6)

It consists of main body, throttle valve core, valve cap, handle, cutoff valve core, retaining ring, handle, oil passage bolt, etc. Its main function is controlling the up or down of the piston rod of the hydraulic bucket.



1. axle purpose retaining ring 2.nut 3. flat washer 4. main body of valve 5.handle 6.O ring 7. flat washer 8. spring washer 9. nut 10. valve core 11. O ring 12. O ring 13. valve cap 14. spring washer 15.nut 16.flat washer 17.handle.

Fig. **6 Bucket Valve**

2.3.3 Hydraulic Bucket (Fig.7 either hydraulic bucket or spring bucket may be equipped according to customers' requirements)

It consists of bucket body, cylinder, spring, piston rod, piston, throttle valve, joints, ect. (see Fig 8) Its main function is to guarantee the free movement of the hydraulic power tong and adjust its suspension height in making-up and breaking-out operation.(see the adjusting methods in 5.2) The stroke of the piston rod is 20 inches (508mm.).

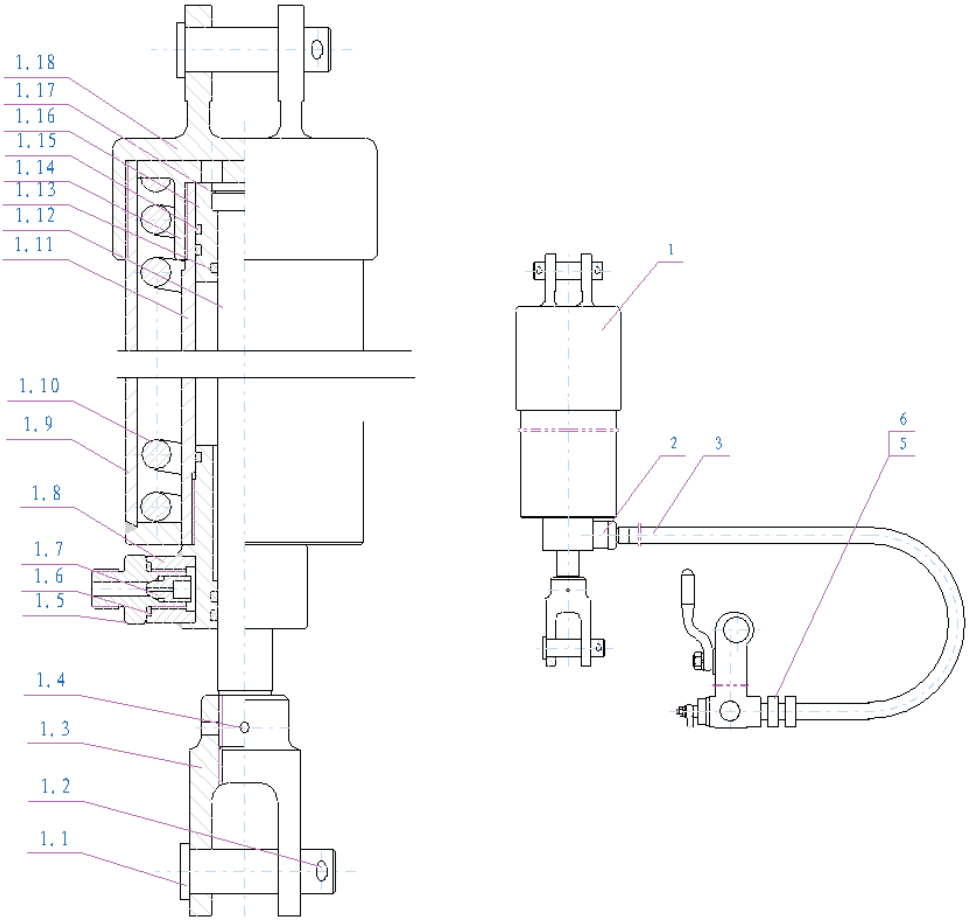


Fig.7 Hydraulic Bucket Assembly

1.hydraulic bucket (1.1 Pin Axle 1.2 Cotter pin 1.3 suspension head 1.4 cotter pin 1.5 connector 1.6 O ring 1.7 throttle valve core 1.8 cylinder end connector 1.10 spring 1.12 piston rod 1.11 cylinder liner 1.13 O ring 1.15 O ring end connector 1.16 piston 1.17 hole purpose retaining ring 1.18 bucket end connector)2.copper shim 3. high pressure hose 4. bucket valve 5. quick coupler 6.copper shim

2.3.4Hydraulic Motor

It is a low speed , big torque cycloid hydraulic motor. The model is 6K-625.

2.3.5Oil Cylinder Of Backup Tong (Fig.8)

It consists of cylinder liner, rack plunger, cover plate, Yx-sealing ring, cylinder cover etc. See Fig 11. High pressure oil enters the cylinder liner through the cylinder cover , pushes the rack plunger to drive the duplex gear and the backup tong jaw plate frame to move.

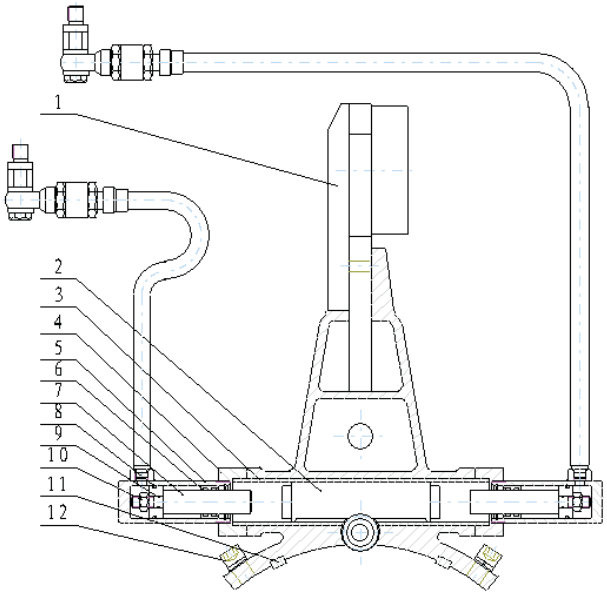


Fig. 8 Oil Cylinder of Backup Tong

1.tail part of main body of backup tong 2.duplex gear 3. cylinder liner 4. cylinder cover 5. cylinder liner 6. O-ring 7.load cell rod 8. load cell piston 9. O-ring 10. hexagon socket head screw 11.flat key 12. hexagon socket head screw

2.3.6 Hydraulic Oil

The hydraulic oil used for power tong must be effectively filtrated to prevent sand, iron scraps entering to guarantee the efficient oil usage. Oil filtration accuracy mustn't be lower than 0.025mm (10mil).

Recommended hydraulic oil is as follows:

(1) YC-N46 low temperature solidification hydraulic oil, the appropriate environmental temperature is 20 ℃----+40 ℃;

(2) YB-N46 abrasion resistant hydraulic oil, the appropriate environmental temperature is -10 ℃----+40 ℃;

(3) YA-N46 hydraulic oil, the appropriate environmental temperature is 0 ℃----+40 ℃ .

3.Main Technical Parameters

Main Technical Parameter of XYQ12A Hydraulic Power Tong			
1	Pipe string diameter suitable for main tong	mm	Ø73-140
		inch	2 7/8″ -5 1/2
2	The biggest torque at low gear	KN•m	12
		Ft-1bs	8843
3	The biggest torque at the second low gear	KN•m	7.8
		Ft-1bs	5748
4	The biggest torque at the second high gear	KN•m	4.2
		Ft-1bs	3095
5	The biggest torque at high gear	KN•m	2.6
		Ft-1bs	1916
6	The highest speed at low gear	rpm	14
7	The highest speed at the second low gear	rpm	24
8	The highest speed at the second high gear	rpm	42
9	The highest speed at high gear	rpm	72
10	The max pressure of oil supply	MPa	12
		psi	1740
		bar	122
11	The max quantity of oil supply	Lpm	120
		gpm	32
12	Weight (including backup tong)	kg	480
		1bs	1057
13	Overall size (including backup tong) (length ×width×height)	mm	1024×582×539
		inch	40.3×22.9×21.2

4. Installing, Testing and Relative Requirement

Installing procedures are as follows when hydraulic power tong is used on well site.

4.1 Check Before Installation

- Check power tong damaged or not during transportation. If damaged, it should be repaired.
- Check the fastening parts loose or not, tighten any loose parts.
- Check jaw plate, die seats and dies complete or not. (Fig.5.1)

4.2 Lifting

Lifting operation at the drilling rig or work-over rig is shown as Fig.9,

4.2.1 Connect hydraulic bucket to the suspension bar of master tong by bolts.

4.2.2 Install a pulley on the mast, which can bear load of 4400bf or more.

4.2.3 Lift hydraulic power tong by a soft steel wire of 1/2″ or bigger, put this wire through the pulley on the mast, one end connecting hydraulic bucket and the other end fixed at the mast. Make dies of backup tong directly face the pipe string coupling or the drilling pipe tool joint .

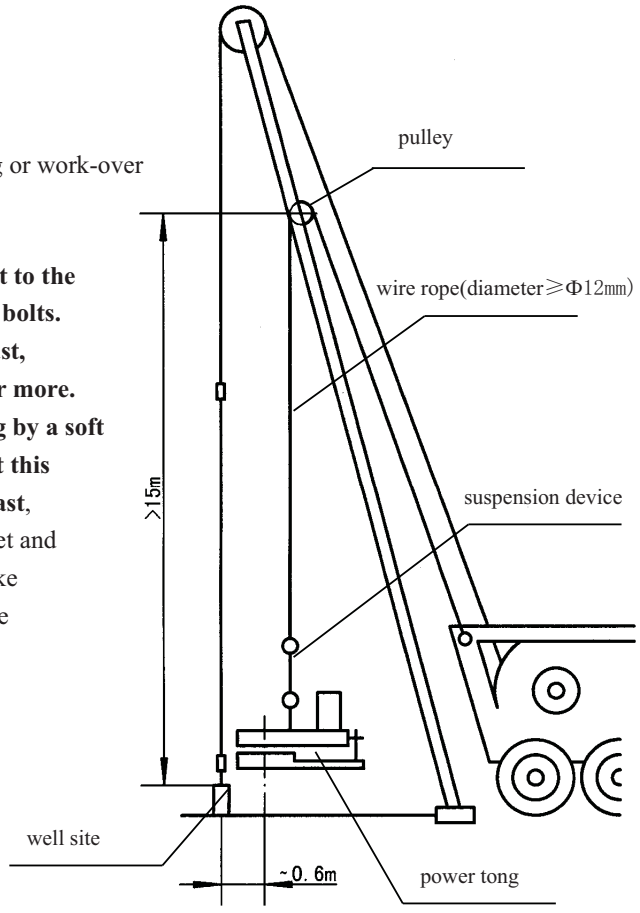


Fig. 9 Lifting Illustration

□The support point of the pulley must be installed 15 meters above the well head.

□Central line of the power tong head is located at 0.6m away from the vertical line of the well head in free suspension state.

□Avoid breaking the hose due to twisting in use.

□The piston rod extends and faces downward when installing the bucket.

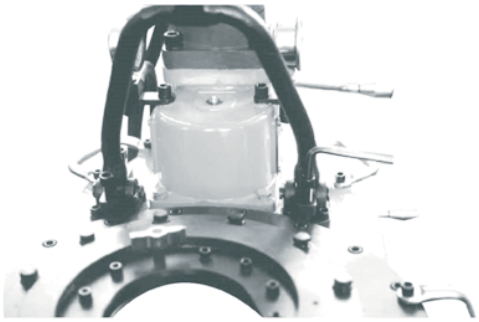
□When the backup tong directly faces the pipe string coupling or the drilling pipe joint, the piston rod of the bucket should be located at half of the stroke

□The suspension height of the hydraulic tong can be adjusted easily with the hydraulic bucket.

4.3Leveling (Fig.10)

- Push hydraulic power tong to the clamping position
- Check whether tong head level or not. If it is not level, keep master tong level by adjusting four screws on the suspension bar.

Fig 10



Check whether the backup tong parallel to the master tong or not, if not, adjust them

□ Power tong leveling is very important, if not level, the tong head clamping will fail to work.

□ Four screws should be adjusted in coordination.

4.4 Tie Back Guy (See Fig.14)

□ Back guy should be tied well after leveling the tong. One end of the back guy should be tied to the pin axle at the tail of the tong; the other end should be tied to the mast.

□ The height of the end of back guy tied to the mast should be same as that of the tong. The back guy should be vertical with the central line of tong body and also be pulled tightly.

□ Pay attention to the direction of the guy, the back guy should be tied to the right hand side of the tong in the making-up operation, but it should be on the left in the breaking-out operation when observed from the front of the tong head. Don't tie it in the wrong direction（All above-mentioned are suitable for Right Hand thread, as for Left Hand thread, on the contrary.）

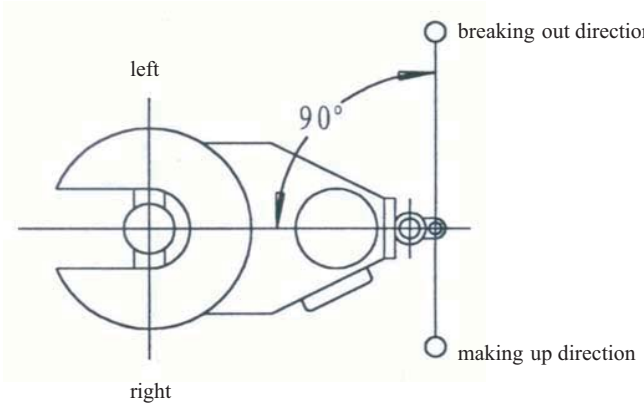


Fig 14 Illustration of Back Guy

□ Back guy, which is usually soft wire rope, must be able to bear load of over 6600bf.

4.5 Runnin-in Operation

- **Supply hydraulic power tong with oil.**
- **Control the lifting bucket; adjust the height of power tong.**
- **Keep free-load running at low gear for 1 to 2 minutes.**
- **Keep free-load running at high gear for 1 to 2 minutes.**
- **Test tong head running in clockwise and counter-clockwise directions, watch whether master tong and backup tong being synchronous or not. Adjust the direction of reset knob if they are not synchronous. The adjusting procedure is shown at 5.4.**
- **Open the safety door, deliver tong to the well head, watch whether the space between master tong and backup tong suitable or not. Adjust the space between them if not suitable.**
- **Try to clamp the pipe string at high gear, adjust system oil supply pressure by adjusting the overflow valve in the hydraulic system according to the table of the making-up torque value, shifts, torque and pressure parameter (See Fig. 5) recommended by API.**

□ Don't disassemble hydraulic pipe at high pressure, otherwise, accidents may occur and the equipment may be damaged.

☐ Don't approach the running part of hydraulic power tong by your body or clothes.

☐ Only operators are allowed to approach hydraulic tong to avoid any trouble caused by turning the operating lever.

☐ The hand control valve may be slightly operated to realize gear shifting at low gear to avoid damaging the gear.

4.6 Making-up Or Breaking-out Operation

See 5.4 5.5 for recommended steps.

☐ The temperature of the hydraulic oil should not be over 65 °C. Over heating can make hydraulic system seal fail to work and slow down the running speed of tong.

4.7 Treatment After Use

Operate as the following procedures after the work is finished.

- Cut off power source.
- Remove the high-pressure hose.
- Protect oil inlet and outlet to prevent sand or iron scraps getting in.
- Check fastening parts, fasten the loose parts.
- Put down power tong, place it in an even place, otherwise the tong will be damaged if the place is not even.
- Clean and maintain power tong as (6).

☐ Proper treatment prolongs the life of power tong after use.

5. Detailed Operation Methods

5.1 **Selecting And Dismounting Jaw Plate, Die Seat And Dies** (state any special specification in your order)

5.1.1 The assembly of jaw plate, die seat and die. (see fig 12).

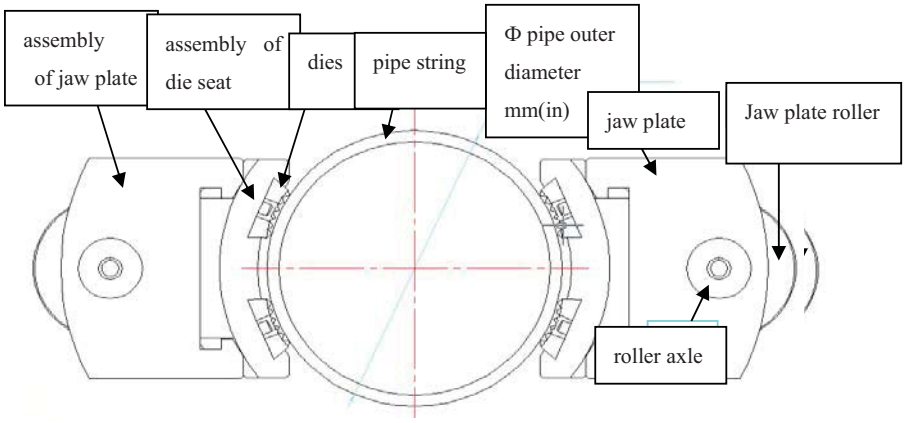


Fig.12 Assembly schematic diagram

5.1.1.1 Jaw plate assembly consists of jaw plate, roller, roller axle and stopper pin etc.

5.1.1.2 Die Seat Specification

Table 1 Die Seat Specification

Serial NO.	Purchase Number	Part Name	Mark (steel mark)	Note
1	12AZ-107.1	Die Seat 1	60	purchased by user.
2	12AZ-107.2	Die Seat 2	73-70	
3	12AZ-107.3	Die Seat 3	93-86	
4	12AZ-107.4	Die Seat 4	107-102	
5	12AZ-107.5	Die Seat 5	114-109	
6	12AZ-107.6	Die Seat 6	127-122	
7	12AZ-107.7	Die Seat 7	143-138	

5.1.1.3 Dies Specification

Table 2 Dies Specification

Serial No.	Part No.	Part Name	Mark (Steel Mark)
1	XYQ12.Z-110.1	Die 1	73-78
2	XYQ12.Z-110.2	Die 2	89-114
3	XYQ12.Z-110.3	Die 3	121-140

5.1.1.4 The corresponding table of die seat, die and pipe string

Table 3 The corresponding table of die seat, die and pipe string

Pipe string type	O.D Mm(inch)	Die seat (stamp mark)	Dies (stamp mark on the backside)
Tubing	60($2^3/_8$″)	60	73-70
Tubing	89($3\ ^1/_2$″)	93-86	114-89
Tubing	102 (4″)	107-102	
Drilling	105($2^7/_8$″)		
Tubing	114($4^1/_2$″)	114-109	
Tubing			
Tubing	127(5″)	127-122	156-121

5.1.2 Die Seats, Dies Selection And Their Mounting / Dismounting

5.1.2.1 Jaw plate Mounting /Dismounting

- When dismounting jaw plate, take out two die seats first, then turn the tong head, expose the positioning screw on the jaw plate frame from the opening of the tong head, loose the positioning screw, then the jaw plate can be taken out from the center of the tong head. Mounting operation procedure is just on the contrary .(See Fig.13)

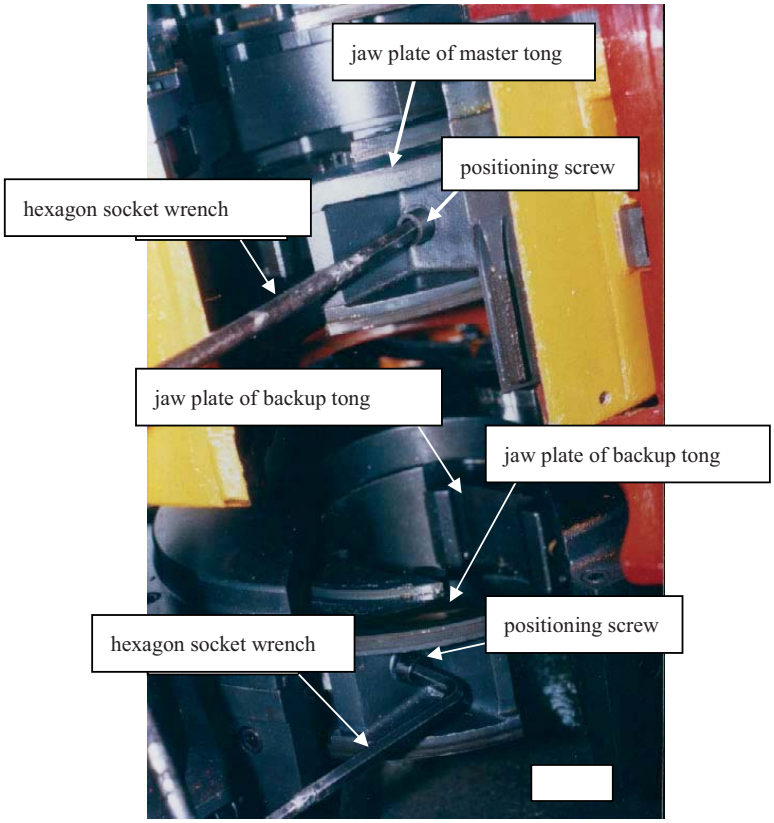


Fig.13

5.1.2.2 Die Seats Mounting /Dismounting

Dismounting Die Seat Assembly: Pull one die seat assembly to the center of tong head, lift it upward out of tong head directly, take out the other one in the same way. Mounting operation is the other way round. (See Fig.14)

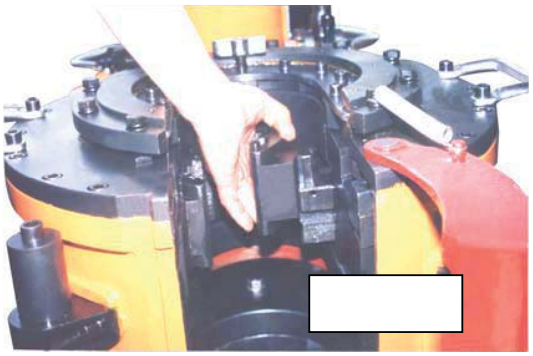


Fig.14

5.1.2.3 Dies Mounting /Dismounting

Take out die seat and loose the screw pin on one end, then take out dies. Mounting operation is the other way round, tighten the screw pin after mounting. (See Fig.15.)

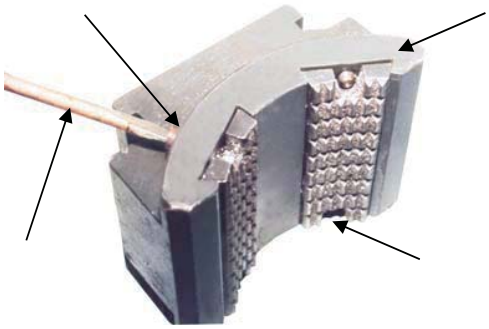


Fig.15

☐ **Die seats and dies must be changed in pairs.**

☐ **The hydraulic power source must be cut off when changing jaw plates, die seats and dies.**

Please select the proper die seat and die to clamp the different pipe string!

5.2 Adjusting The Suspension Height Of The Power Tong With The Hydraulic Bucket

5.2.1 Lifting The Power Tong

Turn off the throttle valve of the bucket valve, then turn on the cutoff valve of the bucket valve, the power tong is lifted slowly.(see Fig 20, which shows the position of the bucket valve handle while lowering the power tong)

5.2.2 Lowering The Power Tong

Turn on the throttle valve of the bucket valve, then turn on the cutoff valve, the power tong lowers slowly.(see Fig 20)

5.2.3 Lock The Height

When the power tong is lifted or lowered to the intended height, turn off the cutoff valve, the height is locked. Then turn on the throttle valve, the power tong enters normal making-up or breaking-out state. (see Fig 16)

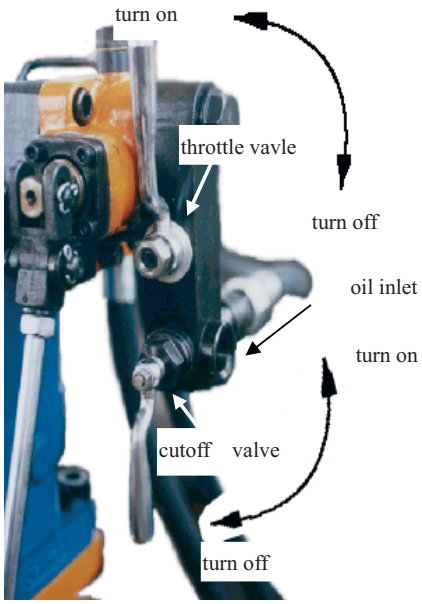


Fig16

□ Note: Withdraw the extended part of the piston rod into the bucket when it's not working to avoid bump.

5.3Adjusting Braking Torque

□Lower the braking torque: add lubricating cream to the friction disc or loose the braking spring to lower the braking torque to prolong the life of the friction disc;

□Increase the braking torque: loose lock nut (12AZ-67), wrench each screw evenly (12AZ-67),

Properly press braking spring (12AZ-32), finally tighten the lock nut.(see Fig 17, this method applies only to install adjustable braking mechanism).

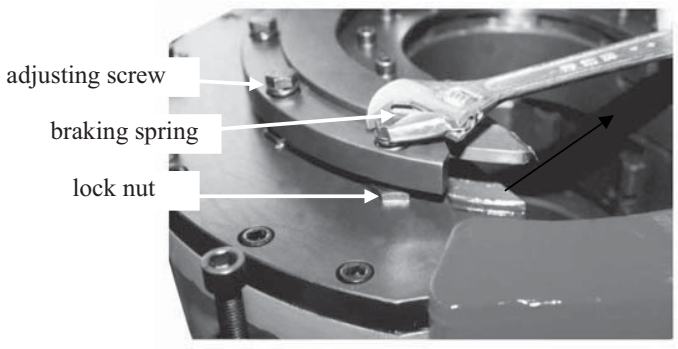


Fig17

☞ ☐ **Master tong may slip if the braking spring fails to work, too loose or insufficient number of springs.**

☞ ☐ **Tighten the braking screws with the lock nut or link the screws with iron wires to prevent the braking spring from getting loose or falling off.**

5.4 Recommended Making-up Operation Steps (This manual is suitable for making-up or breaking-out direction with right hand thread, but the left hand thread is on the contrary.)

- Hydraulic power tong does racing, make it back to preliminary working state. Select proper gear according to actual requirement (usually high gear).
- Turn the reset knobs of the master tong and backup tong to the making-up direction, make sure the knobs point in the same direction. (Fig18)
- Open the safety door, push hydraulic power tong towards the pipe string, and make sure the clamping position by master tong and backup tong is right.
- Close the safety door.
- Push the tong tail to make the tong turn around the rotating center, tighten the guy.
- Push hand control valve lever gently to begin the making-up operation.

- Continue the making-up operation until power tong stops and releases the lever.
- Make up at low gear according to the requirement until the making-up torque meets the demand
- Pull the lever of the hand control valve to make tong back to the initial working position.
- Open the safety door, push tong back to the preliminary position. One making-up operation is over.

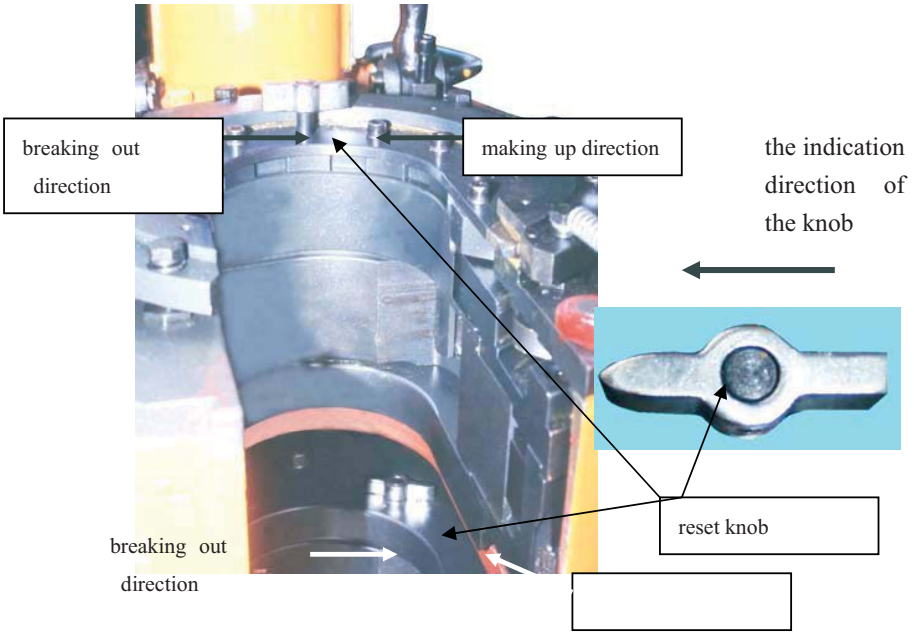


Fig18

☐ **Making up under over torque circumstances can damage tubing as well as the hydraulic power tong!**

☐ **In case of insufficient braking springs or spring failure, make up the number or change the springs.**

☐ **Please make-up according to recommended API torque value**.

5.5 Recommended Breaking-out Operation Steps (based on right hand thread, left hand thread is on the contrary.)

Hydraulic power tong does racing, make it back to preliminary working state. Select proper

- gear according to actual requirement（usually low gear）.
- Turn the reset knobs of the master tong and backup tong to breaking-out direction, make sure the knobs point in the same direction.
- Open the safety door, push hydraulic power tong towards the pipe string, and make sure the clamping position of master tong and backup tong is proper.
- Close the safety door.
- Pull the tong tail to make tong turn around the rotating center, tighten the back guy.
- Pull the hand control valve operating lever gently to start breaking-out operation.
- Continue breaking-out operation till all screws thread out, then release operating lever.
- Push hand control valve operating lever to make tong back to the preliminary working state.
- Open the safety door, push tong back to the preliminary position. One breaking-out operation is finished.

□ Over torque can damage casing as well as the hydraulic power tong!

□ Don't make-up or break-out before the safety door is closed well !

□ During the breaking-out operation, the max length of the backup tong moving downward should be longer than the length of the screw extended out, otherwise the front and back guide pole should be repaired.

□ Keep the operating area of the power tong clean to prevent sundries in. Tidy the hydraulic hose, electric wire, and signal line to avoid twisting or getting cut off.

5.6 Repairing Gear Disengagement

The gear mechanism must be repaired when the gear is disengaged. The method is: dismount locating seat (12AZ-39) or tail seat (12AZ-29), take out the positioning block (ZQ-38) and spring from the positioning seat or tail seat, temporarily install a proper shim at the joint between the positioning seat and the spring, then remount.

Note: The shim should not be too thick, otherwise it will be hard or unable to shift gears.(Fig.19)

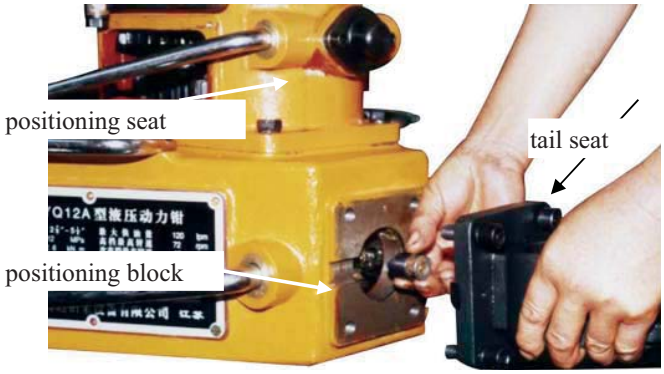


Fig19

5.7 Gear shifting operation

There are two shifting handles, upper-handle and lower handle. Four shifts are available by changing handle positions. Each handle position at different shifts is shown below as in Fig. 20

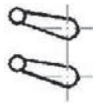
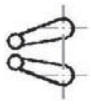
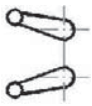
gears	low gear	second low gear	second high gear	high gear
highest rotating speed	14	24	42	72
handle positions				

Fig20

5.8 Installing Rack Plunger

Remove the upper cover of the backup tong (12AB-1), duplex gear (12AB-9) and cylinder cover (12AB-100), push out the rack plunger, install Yx seals at two ends of the cylinder liner, then push rack plunger to the center of cylinder liner, finally install duplex gear and other parts when the jaw plate frame faces the opening of the backup tong. (Fig. 21)

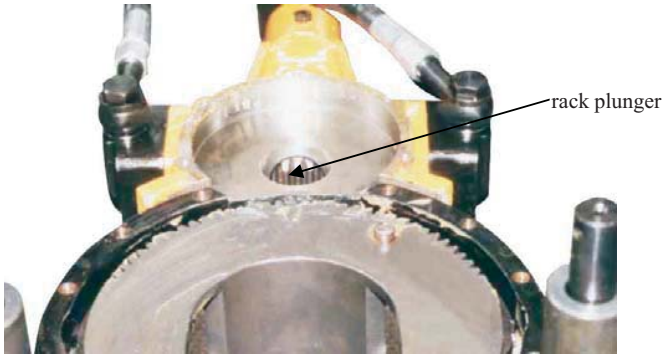


Fig21

6 Maintenance

6.1 Daily Maintenance

☐ Fill 25ml of lubricating grease to each grease nipple of the master axle, idle gear-axle, and duplex gear axle. (Grease nipple positions are shown in Fig.22 and Fig .23)

☐ Fill 25ml of engine oil to each of the following points: transmission pin, friction disc, centralizing roller and jaw plate roller.

☐ Clean sundries from dies by wire brush.

☐ Clean up water and oil stain inside the tong.

☐ Check all parts (including jaw plate, die seat, dies and ramp plate), change or repair if they are over-worn, damaged, rusted or leaking.

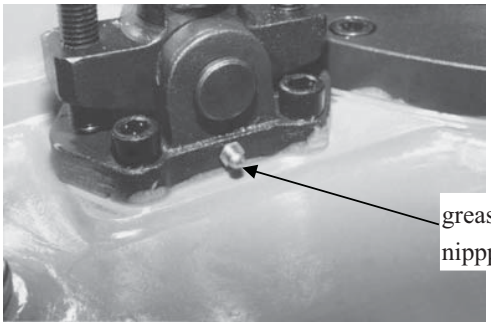


Fig22

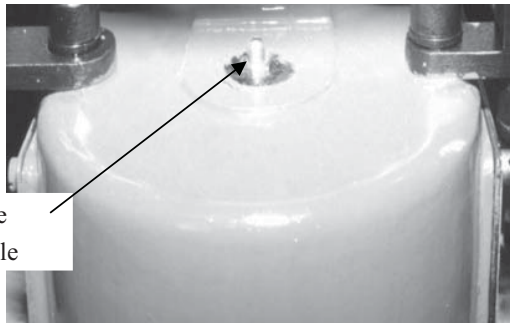


Fig23

6.2 Monthly Maintenance

☐ Clean the hydraulic bucket and the tong head of master tong and backup tong by kerosene or diesel oil after one month or one well operation is finished. (Including ramp plate, roller, jaw plate, jaw plate frame, open gear), then cover one layer of grease.

☐ Dismount power tong, clean up oil stain, sand and clay, change over-worn or damaged parts, fill lubricating grease or lubricating oil to each sliding and rotating surface, finally mount it carefully.

☐ Don't clean bearing or oil nipple by steam, otherwise, parts like bearing may get rusted and damaged.

☐ Don't clean pressure sensor by steam, otherwise it may be damaged.

6. Common Troubles and Troubles Shooting Guide

Common troubles	causes	Remedy
Master tong or backup tong slips	1、wrong selection of die seat.	Replace proper die seats in pairs.
	2、hard subjects full of the dies groove.	Clean up the subjects in the dies groove.
	3、wrong selection of die.	Replace the die properly.
	4、die over-worn	Replace new dies.
	5、uneven power tong body.	Adjusting level in accordance with 4.3.
	6、jaw plate roller or roller shaft damaged or get stuck.	Clean up parts or replace.
	7、Ramp plate worn out or damaged.	Replace ramp plate.
	8、pipe string hardness ≥ 340HB	Purchase special dies.
Master tong clamp normally but backup tong slips	Tong head break torqure is insufficient.	1、replace the worn out parts, such as friction disc, etc.
		2、adjusting tightly or replace brake spring.
	Wrong connection of hose between master and backup tongs.	Connection the hose properly.
	Oil passage of master and backup tong blocked.	Clean up oil passage and filter core.
	The above mentioned 8 causes for slippage of Master tong and backup tong.	Remedy as the above mentioned methods.
The openings of Master tong and backup tong don't align	1、the direction of reset knob is wrong.	Turn the reset knob 180°, then reset the position.
	2、jaw plate frame deformed or damaged.	Repair or replace.
	3、reset bumper pin is broken.	Replace reset bumper pin.
Rotation speed is slow	Low discharge of hydraulic pump.	Adjusting oil supply to 120L/min
	The check valve of snap joint couldn't open completely or pipeline get stuck.	Replace snap joint or clean up pipeline.
Rotation speed of master tong is not stable.	No enough oil for hydraulic pump suck, air gets into the oil passage.	Clean up filter core or add sufficient hydraulic oil.
Motor is moving, but tong head don't moving.	Transmission shaft or gear damaged.	replace the damaged parts.
backup tong only clamp in one direction.	Rack plunger not in the central position when jaw plate frame and the opening of backup tong main body are in alignment.	Dismount the backup tong and reassemble in accordance with 5.8.
Gear engagement not fast, disengagement occurs easily.	No enough pressure on the positioning seat 12AZ-38 from spring12AZ-32.	Add shim in back of spring or replace the spring.

Output torque is lower.	Low system pressure.	Adjust system pressure in Fig5.
Hydraulic system seal part is leaking.	1、system pressure＞12Mpa	Adjust system pressure
	2、return oil pressure＞4Mpa	clean up return oil passage.
	3、oil temperature＞65℃	Cool the oil.
	4、seal parts damaged.	Replace seal parts.
Torque meter don't work properly.	1、lack of oil in the sensor cylinder.	Add oil to sensor cylinder.
	2、torque meter damaged.	Replace the torque meter.
Torque control system don't work properly.	The signal wire connecting the hydraulic tong broken.	Replace the signal wire.
	See the operation manual of the torque control system for further information.	
In case troubles still can't be solved, please contact our service staff, the contact methods in 8.4.		

8. Portage, Storage And After Sales Service

8.1 Portage

When moving the hydraulic power tong, you should handle it smoothly and keep it from moisture, don't put it upside down, keep it from damage. Lift it with steel wire rope with the diameter of 1/2″ or bigger, keep balance of the tong. Don't incline or swing it too much to avoid getting damaged by hitting other things.

8.2 Storage

XYQ12A hydraulic power tong should be stored in a cool, dry place with good ventilation and the environment temperature should be below 45 ^{0}c. Don't store it in a muddy place or outdoors. Protect oil inlet and outlet well to keep sundries out. The storage period is generally one year after delivery for new hydraulic power tong. It can be used after one-year storage but the sealing parts and hoses must be changed according the the actual condition.

8.3 Unpacking

Check the appearance of hydraulic power tong , check and accept according to the packing list.

8.4 After Sales Service

Our company has special professional after sales service team and customer service network. SERVICE PROMISE: free round the clock service, field maintenance and repair on work site,.

TELEPHONE: 086-0515-6582548; 086-0515-6583024

FAX: 086-0515-6582386

E-mail: hjzhjz12@263.net

9. Attachment And Quick-wearing Accessory

9.1 Optional Accessory

9.1. 1High Pressure Hose (See Fig 21)

9.1.2 Quick Coupler (see Fig 21)

9.1.3 Model. YD160 Hydraulic Power Station

Main technical parameter:

Max pressure: 31.5MPa

Nominal discharge: 160mL/r

Power: 37kW

9.2 **Table of Quick-wearing Accessory** (recommended storage for one tong, actual figures may vary according to the purchase period and the optional parts.)

Table 5 Quick-wearing Accessory List

Serial No.	Purchase No.	Accessory name	Recommend-ed storage quantity
1	12AZ-32	Braking spring	12
2	12AZ-54	Friction Disc	4
3	12AZ-58/59/7	Resetting knob assembly	1 set
4	12AZ-61/63	Centralizer roller assembly	20 sets
5	12AZ-114	Jaw plate roller	4
6	12AZ-119	XYQ 12Z-48 roller	18
7	12AZ-118	XYQ 12Z-49 pin axle	18
8	12AZ-101	Bumper pin	1
9	12AZ-109	Screw bumper pin	8
10	12AZ-110.1	Dies (1)	20
11	12AZ-110.2	Dies (2)	20
12	12AZ-110.3	Dies(3)	20
13	12AZ-3/12/13 etc.	Backup tong reset knob assembly	1 set
14	12AB-4	Bumper pin	1
15	12AB-103	FA dustproof ring 25×33×5	2
16	12AB-101	Y ring for piston rod 33×25×5	2
17	12AZ-245	O-Ring 15×2.4	1
18	12AZ-247	O-Ring 25×2.4	1
19	12AB-108	O-Ring 31.5×3.55	2
20	12AB-110	O-Ring 10×1.8	2
22	12AY-1.14	O-Ring 32×3.5	3

10. Figs and parts table

1	Fig 24	Safety door
2	Fig 25	Tong Shell
3	Fig 26	Master Tong Head
4	Fig 27	Centralizing mechanism
5	Fig 28	Braking and resetting mechanism
6	Fig 29	Idle gear axle
7	Fig 30	suspension bar
8	Fig 31	Duplex gear axle(upper)
9	Fig 32	Duplex gear axle(lower)
10	Fig 33	Hydraulic motor
11	Fig 34	Detailed table for Hydraulic valve bank
12	Fig 35	Bucket valve
13	Fig 36	Tong body
14	Fig 37	Master axle
15	Fig 38	Gear shifting mechanism assembly (upper)
16	Fig 39	Gear shifting mechanism assembly (lower)
17	Fig 40	Backup Tong Head
18	Fig 41	Tail Seat Of Back-up Tong
19	Fig 42	Front Guide Pole Assembly
20	Fig 43	Hydraulic Bucket Assembly

☞ **□ When purchasing parts, you may choose to purchase assemblies directly instead of purchasing individual parts for assembling by yourself**

☞ **□ For instance: one jaw plate assembly of the master tong consists of one jaw plate of the master tong, one roller, one roller axle, two ø6×18 cylindrical pins, two M8×12 fastening screws at the cone point.**

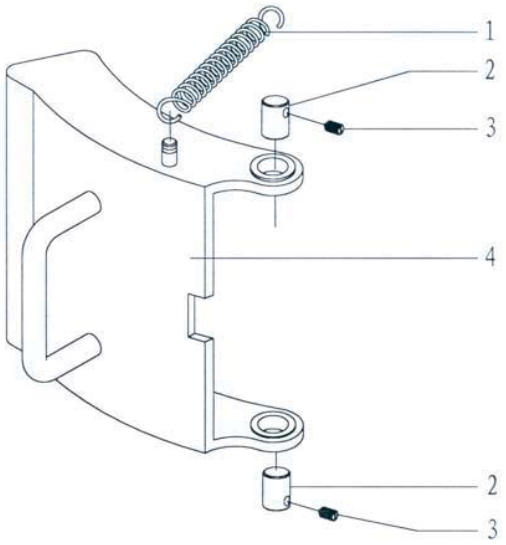


Fig 24 Safety Door

Table For Safety Door Parts

Serial No.	Purchase No.	Model No.	Name and specification	Quantity
1	12AZ-94	Spring For Bike Model 18	Pulling Spring (Diameter ø 17, Length 95)	1
2	12AZ-96	XYQ12.Z-55	Door axle	2
3	12AZ-95	GB71-85	Slotted Cone Point Fastening Screw M8×15	2
4	12AZ-93	XYQ12.Z-51.00A	Safety Door	1

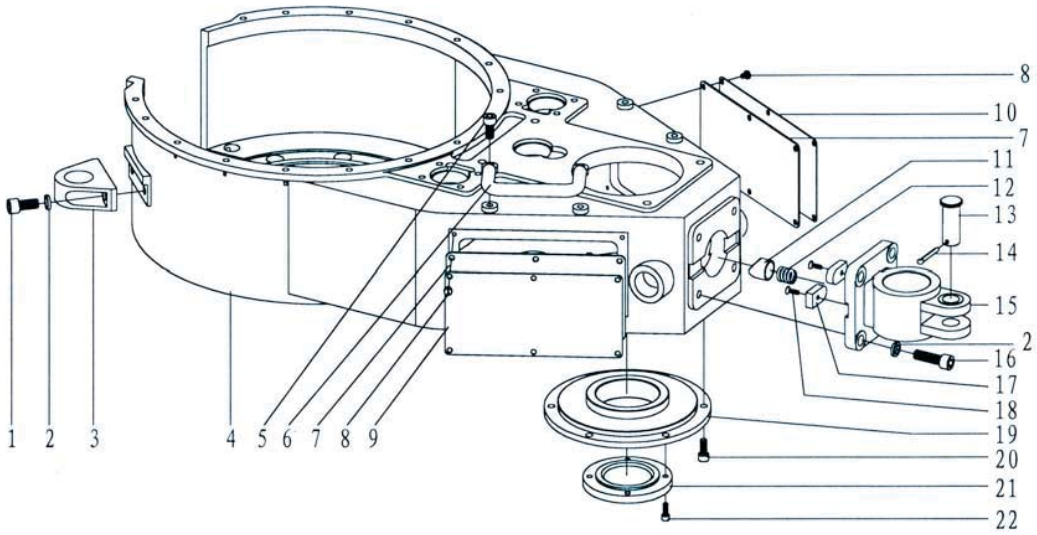


Fig 25 Tong Shell

Tong Shell

Serial No.	Purchase No.	Model No.	Name and Specification	Quantity
1	12AZ-76	GB70-85	Hexagon Socket Head Screw M12×25	4
2	12AZ-27	GB93-87	Spring Washer12	6
3	12AZ-59	XYQ12.Z-59	Front Support Seat	2
4	12AZ-1	XYQ12.Z-02A	Tong Shell	1
5	12AZ-91	GB70-85	Hexagon Socket Head Screw M10×20	4
6	12AZ-92	XYQ3B.Z-34	Rear Handle	2
7	12AZ-85	XYQ12.Z-46	Baffle (2)	2
8	12AZ-82	GB68-85	Slotted Cylindrical Head Screw M6×10	12
9	12AZ-267	XYQ12.Z-61A	Torque Indicating Plate	1
10	12AZ-268	XYQ12.Z-56A	Product Mark Plate	1
11	12AZ-38	XYQ12.Z-21	Positioning Block	1
12	12AZ-32	XYQ3B.Z-6	Braking Spring	1
13	12AZ-30	XYQ12.Z-62	Guy Pin	1
14	12AZ-31	GB91-86	Cotter Pin5×35	1
15	12AZ-29	XYQ12.Z-54	Tail Seat	1
16	12AZ-28	GB70-85	Hexagon Socket Head Screw M12×40	4
17	12AZ-34	XYQ12.Z-58	flat Key	2
18	12AZ-26	GB68-85	Slotted Countersunk Screw M5×16	2
19	12AZ-24	XYQ12.Z-20	Bottom Cover	1
20	12AZ-25	GB70-85	Hexagon Socket Head Screw M8×20	6
21	12AZ-20	XYQ12.Z-17	End plate	1
22	12AZ-23	GB70-85	Hexagon Socket Head Screw M6×15	4

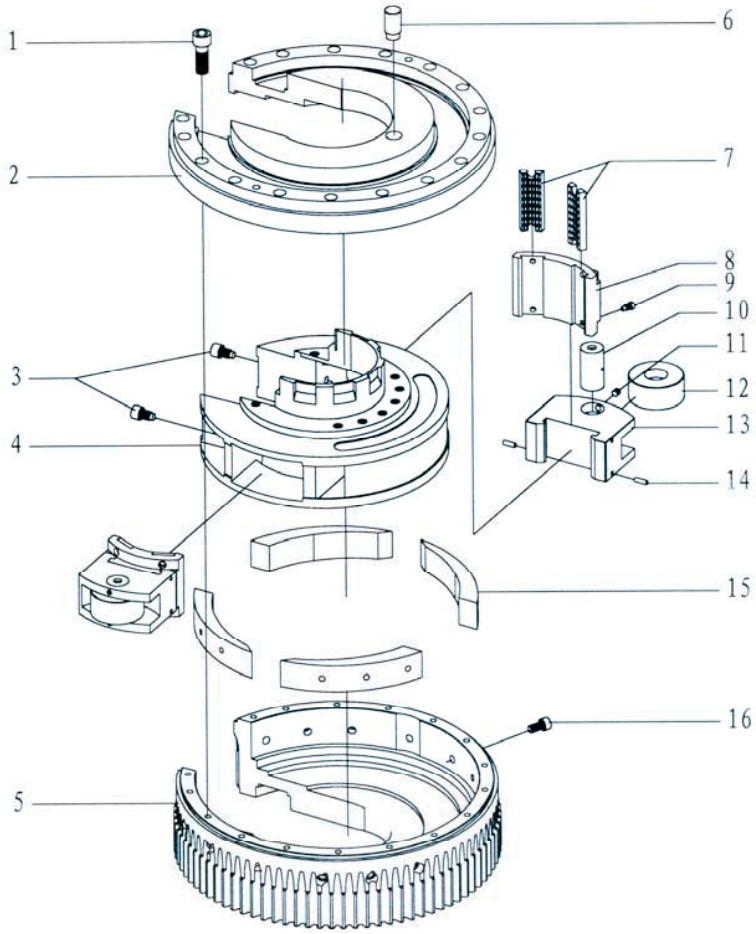


Fig 26 Master Tong Head

Master Tong Head

Serial No.	Purchase No.	Model No.	Name and Specification	Quantity
1	12AZ-105	GB70-89	Hexagon Socket Head Screw M10×45	17
2	12AZ-103	XYQ12.Z-01.01A	Open Gear Cover	1
3	12AZ-115	XYQ12.B-10	Positioning Screw	2
4	12AZ-104	XYQ12.Z-01.04A	Jaw Plate Frame	1
5	12AZ-106	XYQ12.Z-01.05A	Open Gear	1
6	12AZ-101	XYQ12.Z-01.02A	Stopper Pin	1
7	12AZ-110.1	XYQ12.Z-01.12A	Dies(1)	4
	12AZ-110.2		Dies(2)	4
	12AZ-110.3		Dies(3)	4

8	12AZ-107.1	XYQ12.Z-01.10	Die Seat (1)	2
	12AZ-107.2		Die Seat (2)	2
	12AZ-107.3		Die Seat (3)	2
	12AZ-107.4		Die Seat (4)	2
	12AZ-107.5		Die Seat (5)	2
	12AZ-107.6		Die Seat (6)	2
	12AZ-107.7		Die Seat (7)	2
	12AZ-107.8		Die Seat 8)	2
	12AZ-107.9		Die Seat (9)	2
	12AZ-107.10		Die Seat (10)	2
9	12AZ-109	XYQ12.Z-01.11	Screw Bumper pin	8
10	12AZ-1	XYQ12.Z-01.08	Roller Axle	2
11	12AZ-113	GB71-85	Slotted Cone Point fastening Screw M8×12	4
12	12AZ-114	XYQ12.Z-01.06	Roller	2
13	12AZ-111	XYQ12.Z-01.09	Jaw Plate	2
14	12AZ-108	GB119-86	Cylindrical Pin	4
15	12AZ-116	XYQ12.Z-01.07B	Ramp Plate	4
16	12AZ-91	GB70-85	Hexagon Socket Head ScrewM10×20	12

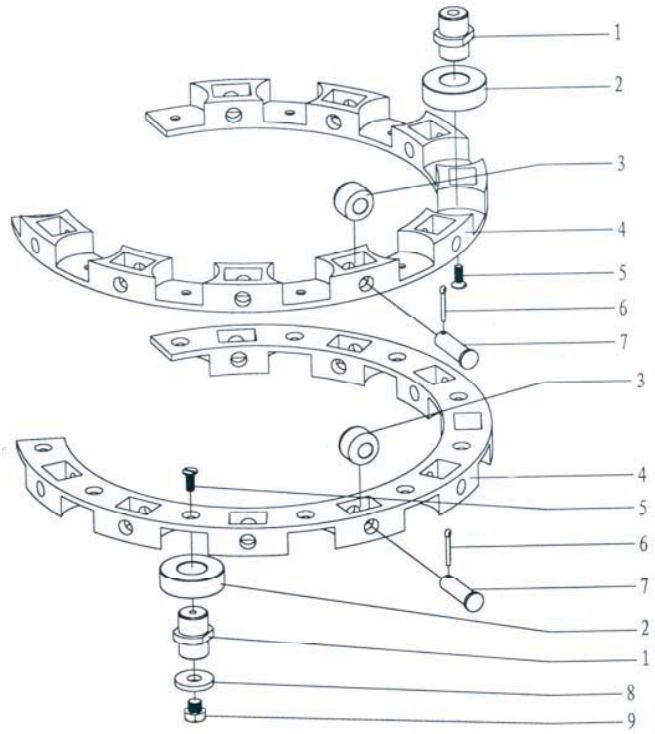


Fig 27 Centralizing Mechanism

Centralizing Mechanism

Serial No.	Purchase No.	Model No.	Name and Specification	Quantity
1	12AZ-63	XYQ12.Z-05	Centralizing Roller Axle	20
3	12AZ-119	XYQ12.Z-48	Roller	18
4	12AZ-120	XYQ12.Z-04	Roller Support Frame	2
5	12AZ-55	GB68-85	Slotted Countersunk Screw M6×15	20
6	12AZ-121	GB91-86	Cotter Pin 3×20	18
7	12AZ-118	XYQ12.Z-49	Pin Axle	18
8	12AZ-65	XYQ12.Z-06	Washer	10
9	12AZ-64	GB5781-86	Hexagon Head Bolt M10×15	10

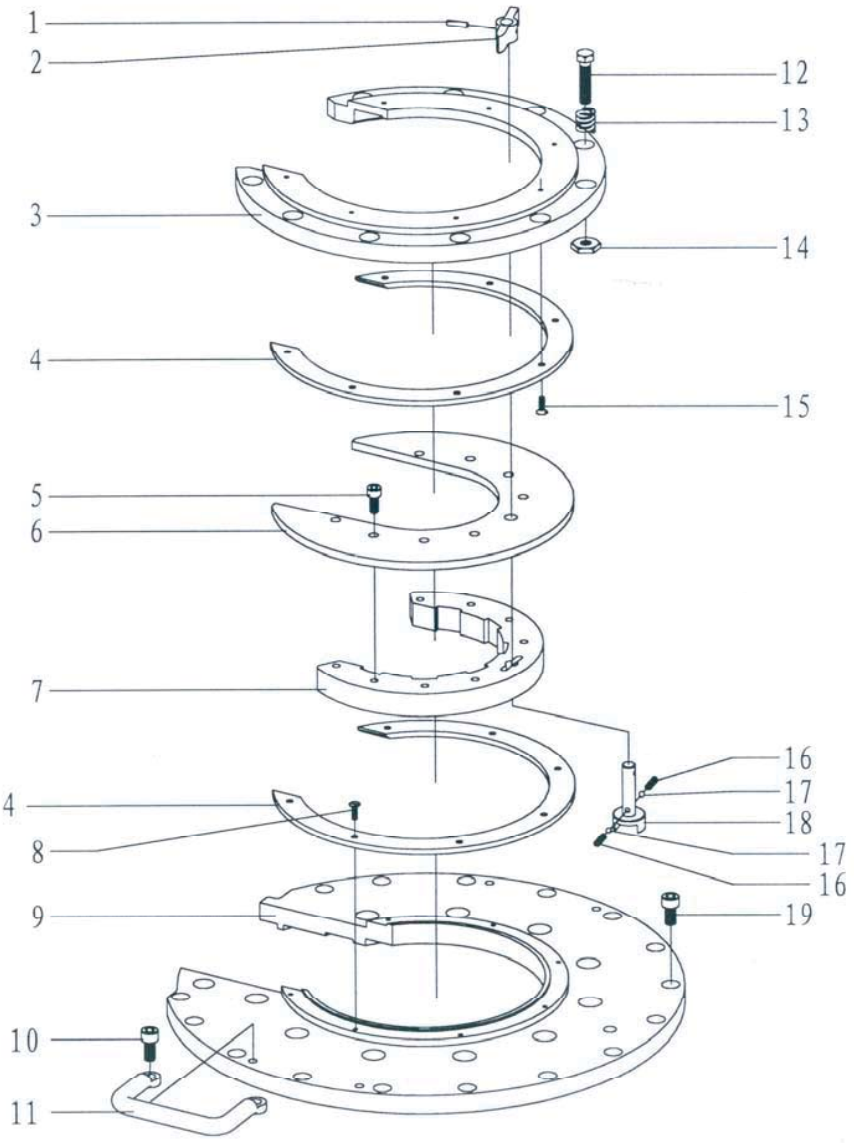


Fig 28 Breaking And Resetting Mechanism

Braking And Resetting Mechanism

Serial No.	Purchase No.	Model No.	Name and Specification	Quantity
1	12AZ-58	GB119-86	Cylindrical Pin5×20	1
2	12AZ-59	XYQ3C.Z-32	Reset Knob	1
3	12AZ-53	XYQ12.Z-35	Braking Plate	1
4	12AZ-54	XYQ12.Z-36	Friction Disc	2
5	12AZ-25	GB70-85	Hexagon Socket Head Screw M8×20	8
6	12AZ-57	XYQ12.Z-38	Steel Braking Disc	1
7	12AZ-60	XYQ12.Z-37A	Connection plate	1
8	12AZ-55	GB68-85	Slotted Countersunk Screw M5×10	7
9	12AZ-52	XYQ12.Z-33A	Tong Head Cover	1
10	12AZ-91	GB70-85	Hexagon Socket Head Screw M10×20	4
11	12AZ-92	XYQ3C.Z-37	Front Handle	2
12	12AZ-66	GB5781-86	Hexagon Head Bolt M10×45	10
13	12AZ-32	XYQ3C.Z-21	Braking Spring	10
14	12AZ-67	XYQ12.Z-34	Locking Nut	10
15	12AZ-56	GB68-85	Slotted Countersunk Screw M5×6	7
16	12AZ-68	XYQ3C.Z-35	Spring	2
17	12AZ-69	GB308-89	Steel Ball S5	2
18	12AZ-70	XYQ12.Z-39A	Reset Knob Axle	1
19	12AZ-90	GB70-85	Hexagon Socket Head Screw M10×25	16

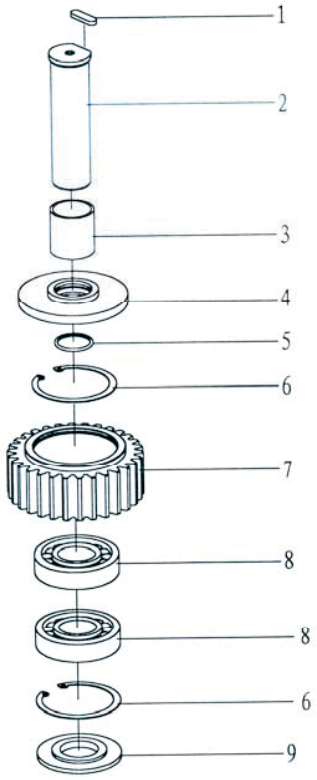


Fig 29Idle Gear Axle

Idle Gear Axle

Serial No.	Purchase No.	Model No.	Name and Specification	Quantity
1	12AZ-84	XYQ12.Z-45	Positioning Plate	2
2	12AZ-122	XYQ12.Z-53	Idle Gear Axle	2
3	12AZ-123	XYQ12.Z-42	Sleeve	2
4	12AZ-125	XYQ12.Z-41	Water Proof Cover	2
5	12AZ-124	GB1235-76	O-Ring Ø50×3.5	2
6	12AZ-127	GB893.1-86	Hole Purpose Elastic Retaining Ring 100	4
7	12AZ-129	XYQ12.Z-43	Idle Gear	2
8	12AZ-126	GB283-87	Cylindrical Roller Bearing42309	4
9	12AZ-128	XYQ12.Z-52	Support Plate	2

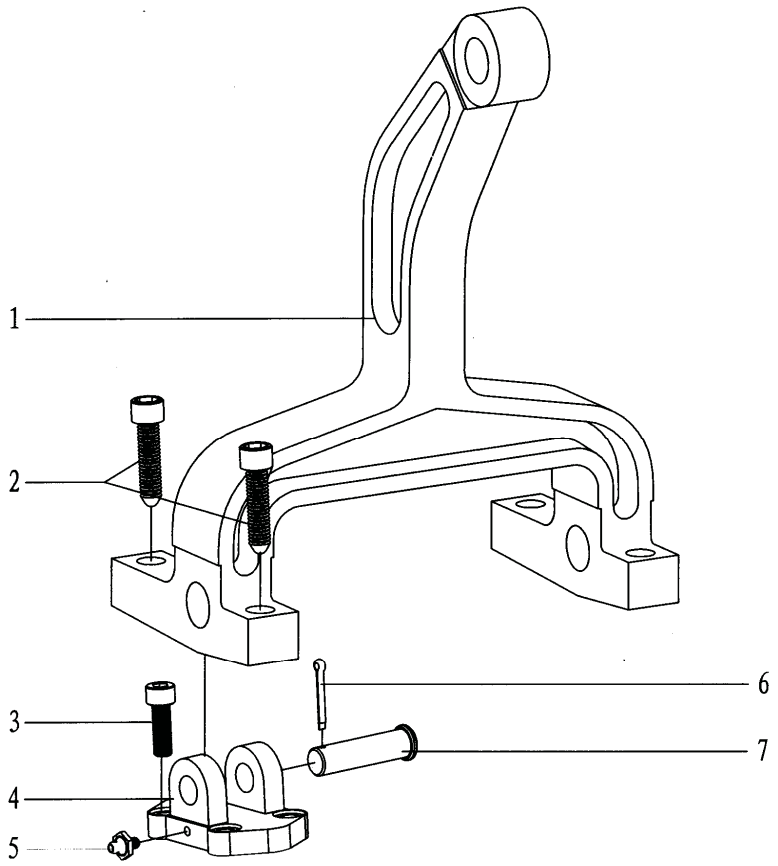


Fig 30 Suspension Bar

Suspension bar

Serial No.	Purchase No.	Model No.	Name and Specification	Quantity
1	12AZ-300	XYQ12.Z-32A	Suspension Bar	1
2	12AZ-89	XYQ12.Z-65	Top Screw	4
3	12AZ-90	GB70-85	Hexagon Socket Head Screw M10×25	8
4	12AZ-86	XYQ12.Z-47	Suspension Seat	2
5	12AZ-99	GB1152-89	Grease Nipple M6×1	2
6	12AZ-87	GB91-86	Cotter Pin4×30	2
7	12AZ-88	XYQ12.Z-63	Suspension Pin Axle	2

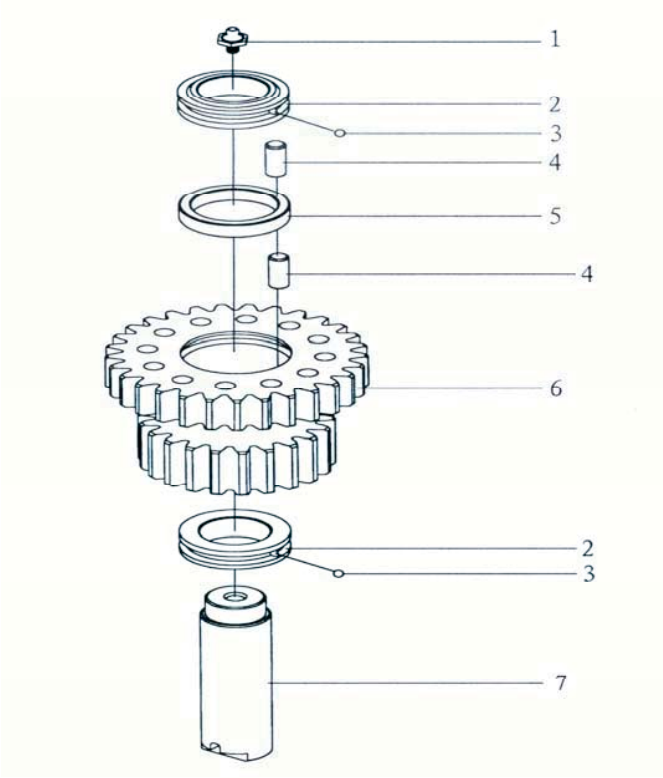


Fig 31. Duplex Gear (upper)

Duplex Gear (upper)

Serial No.	Purchase No.	Model No.	Name and Specification	Serial No.	Quantity
1	12AZ-8	GB1152-89	Grease Cup M10×1	1	1
2	12AZ-48	XYQ12.Z-27	Support Ring (2)	2	2
3	12AZ-5	GB308-89	Steel Ball S6	3	58
4	12AZ-16		Roller Ø10×24.8	4	28
5	12AZ-47	XYQ12.Z-29	Spacer Ring	5	1
6	12AZ-49	XYQ12.Z-30	Duplex Gear (Upper)	6	1
7	12AZ-46	XYQ12.Z-28	Stem	7	1

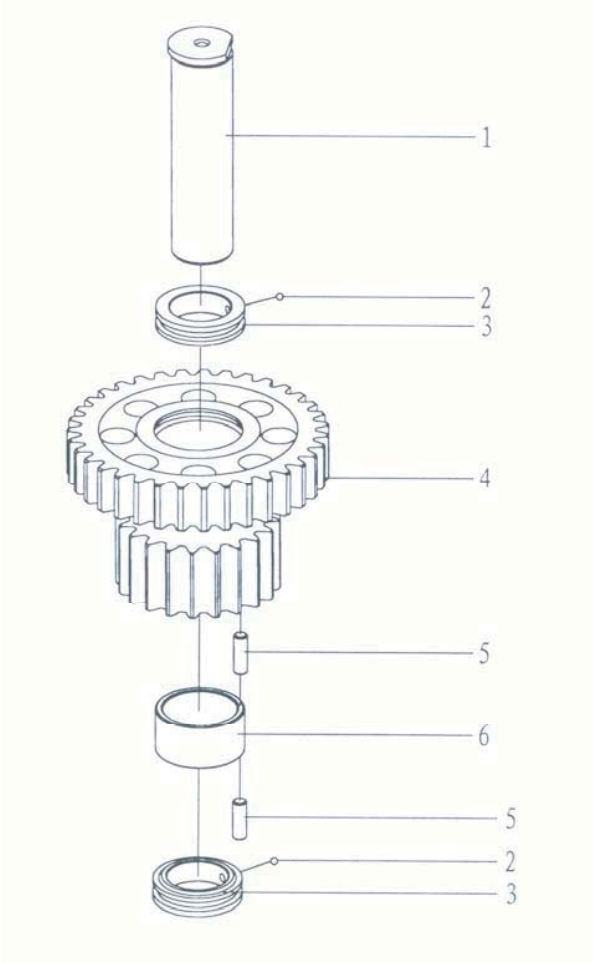


Fig 32 Duplex Gear Axle (Lower)

Duplex Gear Axle (Lower)

Serial No.	Purchase No.	Model No.	Name and Specification	Quantity
1	12AZ-7	XYQ12.Z-10	Stem	1
2	12AZ-5	GB308-89	Steel Ball S6	68
3	12AZ-6	XYQ12.Z-09	Support Ring	2
4	12AZ-3	XYQ12.Z-08	Duplex Gear (Lower)	1
5	12AZ-4		Roller Ø10×30	34
6	12AZ-2	XYQ12.Z-07	Distance Collar	1

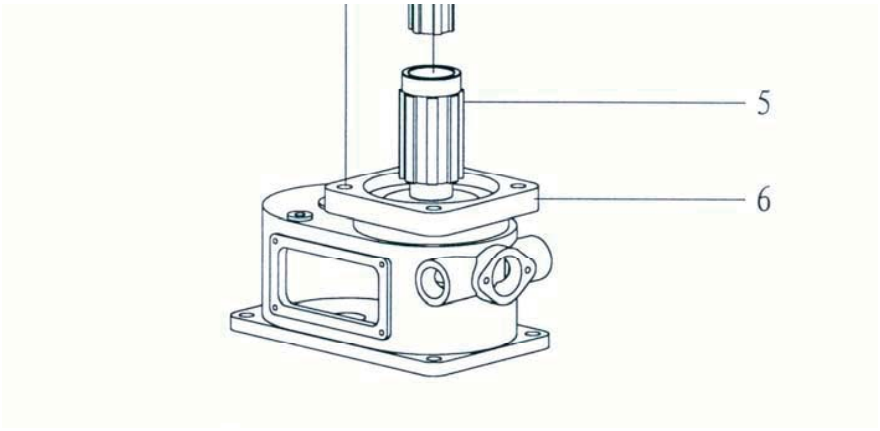


Fig 33 Hydraulic Motor

Hydraulic Motor

Serial No.	Purchase No.	Model No.	Name and Specification	Quantity
1	12AZ-73		Hydraulic Motor	1
2	12AZ-71	GB70-85	Hexagon Socket Head Screw M16×58	4
3	12AZ-72	GB93-87	Spring Washer16	4
4	12AZ-80	XYQ12.Z-50	Transitional Connection plate	1
5	12AZ-43	XYQ3B.Z-26	Splined Shaft	1
6	12AZ-50	XYQ12.Z-31A	Tong body	1

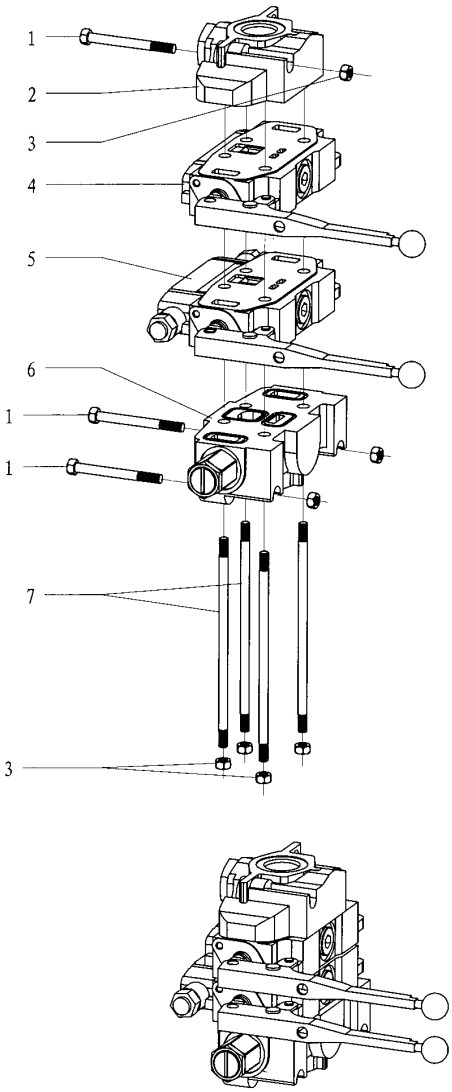


Fig 34 Detailed table for Hydraulic valve bank

Table 6. Detailed table for Hydraulic valve bank (four connection valve)

Item	P/ N	Description	Qty
1	12 AY-100	Hex head bolt 1/2″ UNC×4 1/2″	4
2	12 AY -101	Connection board assembly	1
3	12 AY -102	Nylon nut 1/2″	8
4	12 AY -103	Hand control valve assembly	1
5	12 AY -104	Backup valve assembly	1
6	12 AY -105	Overflow valve assembly	1
7	12 AY -106	Bolt 1/2″ UNC	4

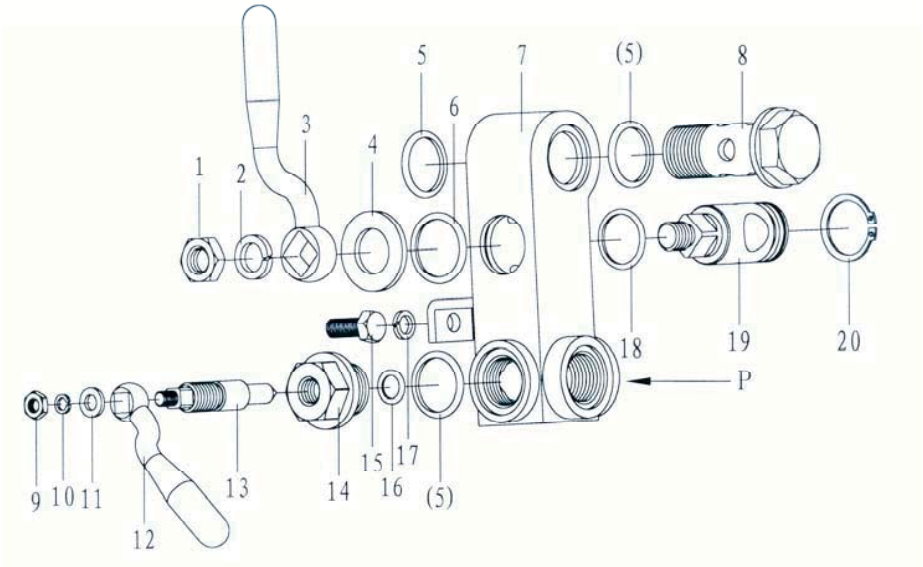


Fig 35 Bucket Valve

Bucket Valve

Serial No.	Purchase No.	Model No.	Name and Specification	Quantity
1	12AZ-230	GB6172-86	Nut M12	1
2	12AZ-231	GB93-87	Spring Washer 12	1
3	12AZ-232	XYQ12.YD-02.1	Handle	1
4	12AZ-233	GB97.1-85	Washer 18	1
5	12AZ-234	GB1235-76	O-Ring 28×3.1	3
6	12AZ-235	GB1235-76	O-Ring 30×3.1	1
7	12AZ-236	XYQ12.YD-02.4	Valve Main Body	1
8	12AZ-237	XYQ12.YD-02.5	Oil Passage Bolt	1
9	12AZ-238	GB6172-86	Nut M6	1
10	12AZ-239	GB93-87	Spring Washer 6	1
11	12AZ-240	GB97.1-85	Washer 6	1
13	12AZ-242	XYQ12.YD-02.3	Valve Core (2)	1
14	12AZ-243	XYQ12.YD-02.7	Valve Cap	1
15	12AZ-244	GB5781-86	Bolt M8×20	1
16	12AZ-245	GB1235-76	O-Ring 16×2.4	1
17	12AZ-246	GB93-87	Washer 8	1
18	12AZ-247	GB1235-76	O-Ring 25×2.4	1
19	12AZ-248	XYQ12.YD-02.2	Valve Core (1)	1
20	12AZ-249	GB894.1-86	Axle-purpose Elastic Retaining Ring25	1

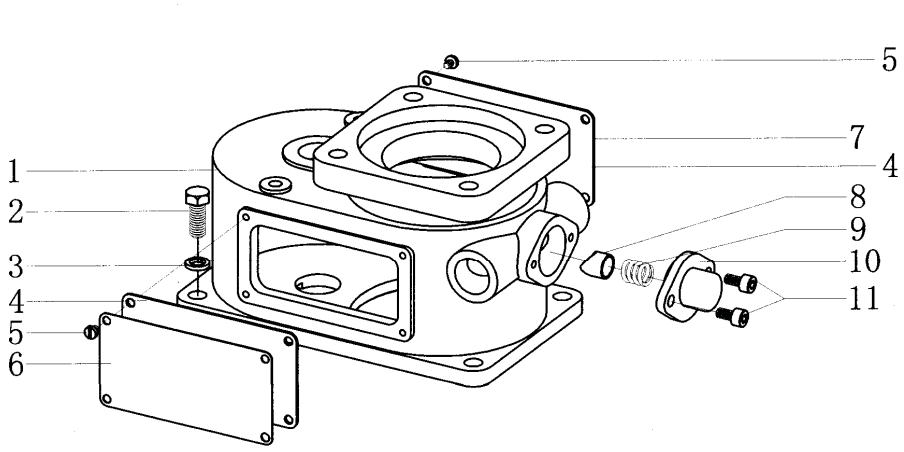


Fig 36 Tong Body

Tong Body

Serial No.	Purchase No.	Model No.	Name and Specification	Quantity
2	12AZ-83	GB5781-86	Hexagon Head Bolt M12×30	4
3	12AZ-27	GB93-87	Spring Washer12	4
4	12AZ-85	XYQ12.Z-46	Hole Covering Plate (2)	2
5	12AZ-82	GB68-85	Slotted Cylindrical Head Screw M6×10	8
6	12AZ-262	XYQ12.Z-57	Gear Indicating Plate	1
7	12AZ-263	XYQ12.Z-61A	Quality Certificate Plate	1
8	12AZ-38	XYQ12.Z-21	Positioning Block	1
9	12AZ-32	XYQ3B.Z-6	Braking Spring	1
10	12AZ-39	XYQ12.Z-60	Positioning Seat	1
11	12AZ-37	GB70-85	Hexagon Socket Head Screw M8×15	2

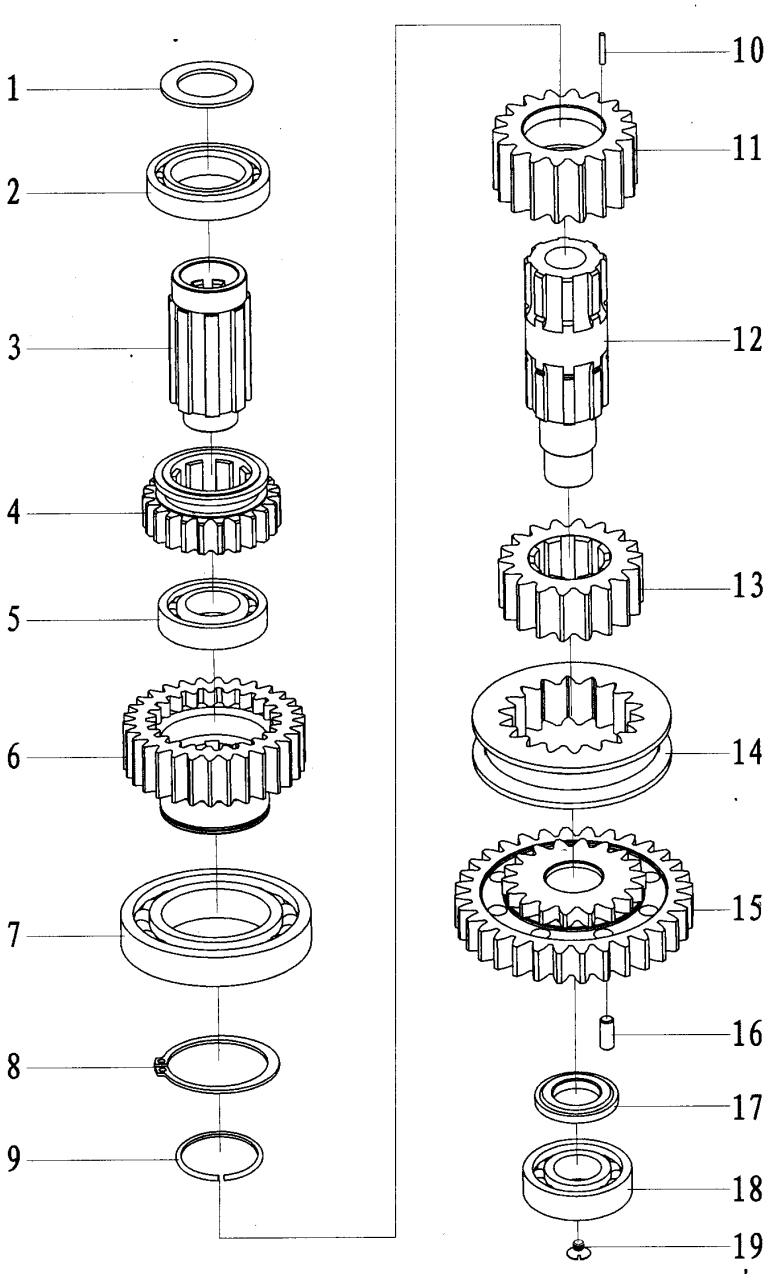


Fig 37 Master Axle

Master Axle

Serial No.	Purchase No.	Model No.	Name and Specification	Quantity
1	12AZ-42	XYQ12.Z-23A	Washer	1
2	12AZ-45	GB276-89	Deep Groove Ball Bearing 111	1
3	12AZ-43	XYQ12.Z-26	Splined Axle	1
4	12AZ-44	XYQ12.Z-25	Inner Splined Gear (1)	1
5	12AZ-41	GB276-89	Deep Groove Ball Bearing 208	1
6	12AZ-40	XYQ12.Z-24	Master Axle Gear	1
7	12AZ-35	GB276-89	Deep Groove Ball Bearing 216	1
8	12AZ-36	GB895.2-86	Axle-purpose Elastic Retaining Ring 80	1
9	12AZ-10	GB895.2-86	Axle-purpose Wire Retaining Ring 60	1
10	12AZ-11	GB309-84	Needle Roller Ø4×25.8	50
11	12AZ-9	XYQ12.Z-11	Shifting Gear	1
13	12AZ-14	XYQ12.Z-14	Inner Splined Gear (2)	1
14	12AZ-12	XYQ12.Z-12	Inner Gear Sleeve	1
15	12AZ-13	XYQ12.Z-13	Big Clutching Gear	1
16	12AZ-16		Roller Ø10×24.8	16
17	12AZ-21	XYQ12.Z-18	Support Plate	1
18	12AZ-17	GB276-89	Deep Groove Ball Bearing 307	1
19	12AZ-19	GB68-85	Slotted Countersunk Head Screw M8×10	1

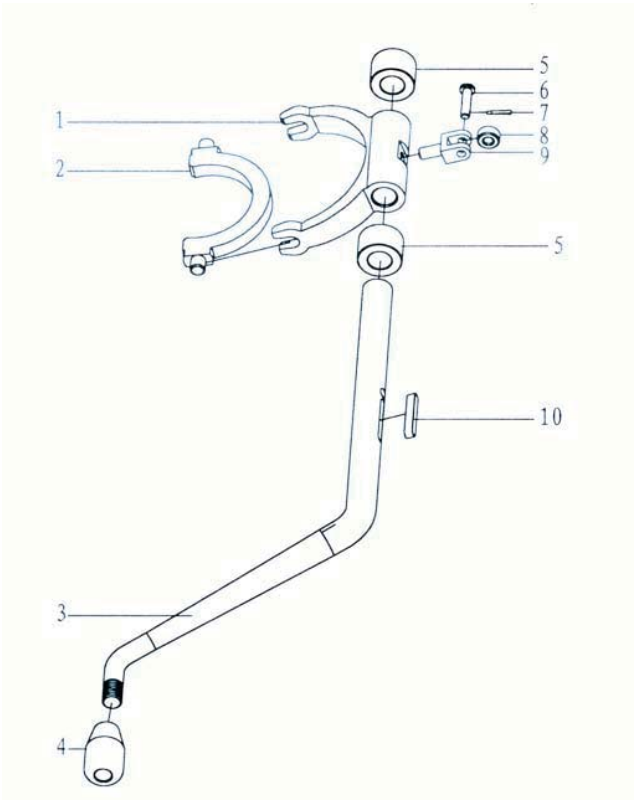


Fig 38 Gear Shifting Mechanism Assembly (upper)

Gear Shifting Mechanism Assembly (upper)

Serial No.	Purchase No.	Model No.	Name and Specification	Quantity
1	12AZ-131	XYQ12.Z-22.02	Shifting Fork	1
2	12AZ-138	XYQ12.Z-22.03	Shifting Ring	1
3	12AZ-137	XYQ3B.Z.6-7	Shifting Fork Axle	1
4	12AZ-212	XYQ3B.Z.5-10	Ball Knob	1
5	12AZ-130	XYQ12.Z-22.01	Axle Sleeve	2
6	12AZ-133	XYQ3B.Z.6-4	Roller Axle	1
7	12AZ-134	GB91-86	Cotter Pin2×10	1
8	12AZ-132	XYQ3B.Z.6-3	Roller	1
9	12AZ-135	XYQ3B.Z.6-5	Roller Support Seat	1
10	12AZ-136	XYQ3B.Z.6-6	Flat Key	1

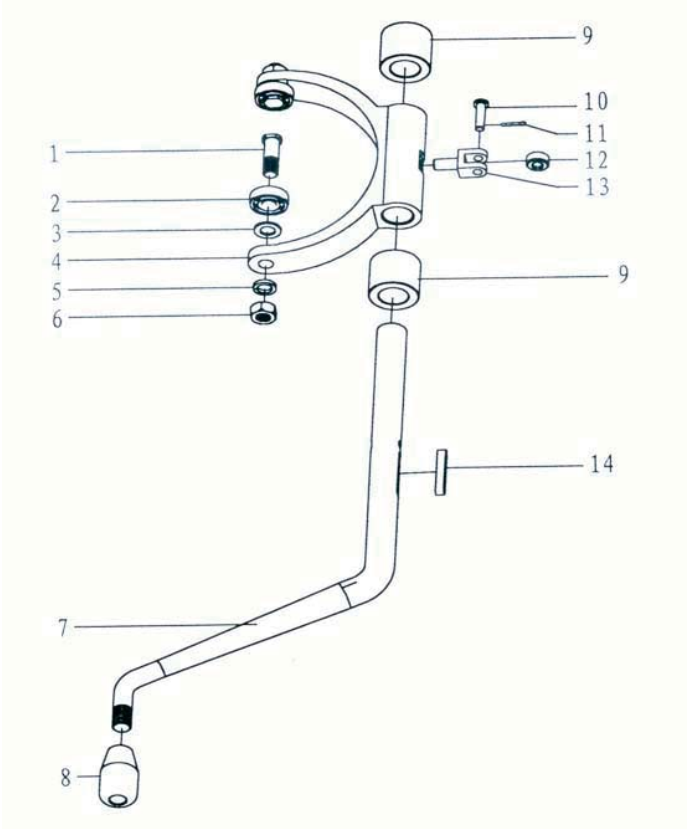


Fig 39 Gear Shifting Mechanism Assembly (Lower)

Gear Shifting Mechanism Assembly (Lower)

Serial No.	Purchase No.	Model No.	Name and Specification	Quantity
1	12AZ-145	XYQ12.Z-19.04	Bolt Axle	2
2	12AZ-143	GB276-89	Ball Bearing100	2
3	12AZ-144	GB848-85	Washer10-200HV	2
4	12AZ-140	XYQ12.Z-19.02	Shifting Fork	1
5	12AZ-146	GB93-87	Spring Washer 10	2
6	12AZ-147	GB6170-86	Nut M10	2
7	12AZ-142	XYQ12.Z-19.03	Shifting Fork Axle	1
8	12AZ-212	XYQ3B.Z.5-10	Ball Knob	1
9	12AZ-139	XYQ12.Z-19.01	Axle Sleeve	2
10	12AZ-133	XYQ3B.Z.6-4	Roller Axle	1
11	12AZ-134	GB91-86	Cotter Pin2×10	1
12	12AZ-132	XYQ3B.Z.6-3	Roller	1
13	12AZ-135	XYQ3B.Z.6-5	Roller Support Seat	1
14	12AZ-141	GB1096-79	Flat Key 6×6×40	1

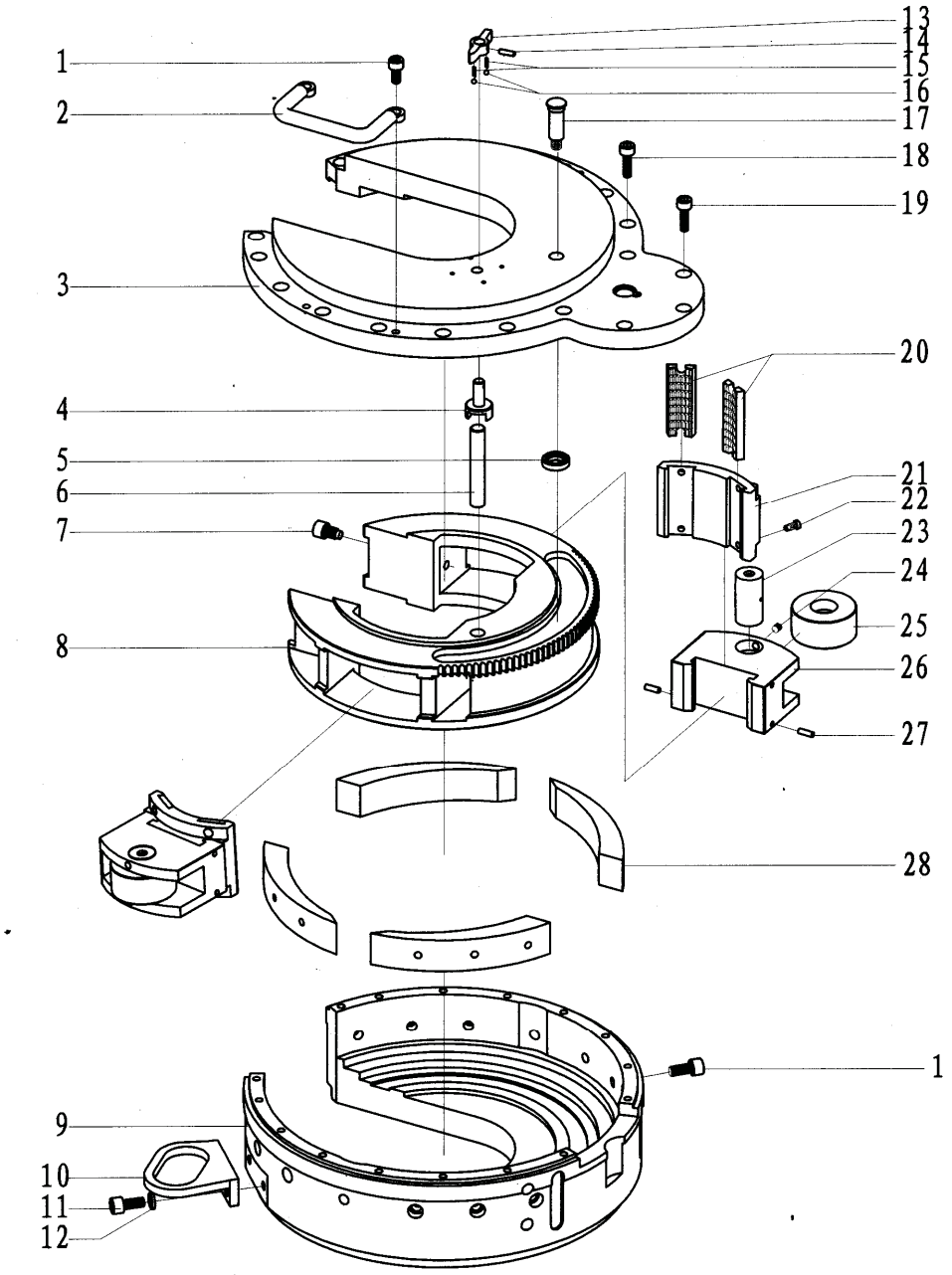


Fig 40 Backup Tong Head

Backup Tong Head

Serial No.	Purchase No.	Model No.	Name and Specification	Quantity
2	12AB-19	XYQ3B.Z-34	Rear Handle	2
3	12AB-1	XYQ12.B-01	Backup Tong Upper Cover	1
4	12AB-3	XYQ12.B-02	Backup Tong Reset Knob Axle	1
5	12AB-72	XYQ12.B-35	Roller	1
6	12AB-4	XYQ12.B-03	Bumper Pin	1
7	12AB-24	XYQ12.B-10	Positioning Screw	2
8	12AB-5	XYQ12.B-04	Jaw Plate Frame of Backup Tong	1
9	12AB-21	XYQ12.B-08.1	Main Body of Backup Tong	1
10	12AB-1	XYQ12.B-07A	Front Support Seat（L R）	2
11	12AB-18	GB70-85	Hexagon Socket Head Screw M12×25	4
12	12AZ-27	GB93-87	Spring Washer 12	4
13	12AB-12	XYQ3C.B-2	Reset Knob of Backup Tong	1
14	12AZ-58	GB119-86	Cylindrical Pin5×20	1
15	12AB-11	XYQ3C.B-20	Spring	2
16	12AZ-69	GB308-89	Steel Ball S5	2
17	12AB-71	XYQ12.B-34	Axle	1
18	12AB-20	GB70-85	Hexagon Socket Head Screw M10×30	17
19	12AZ-90	GB70-85	Hex Socket Head Screw M10×25	2
20	12AZ-110.1	XYQ12.Z-01.12A	Dies (1)	4
	12AZ-110.2		Dies (2)	4
	12AZ-110.3		Dies (3)	4
21	12AZ-107.1	XYQ12.Z-01.10	Die Seat (1) Φ60	2
	12AZ-107.2		Die Seat (2) Φ73-70	2
	12AZ-107.3		Die Seat (3) Φ93-86	2
	12AZ-107.4		Die Seat (4) Φ107-102	2
	12AZ-107.5		Die Seat (5) Φ114-109	2
	12AZ-107.6		Die Seat (6) Φ127-122	2
	12AZ-107.7		Die Seat (1) Φ143-138	2
22	12AB-109	XYQ12.Z-01.11	Screw Bumper Pin	8
23	12AB-112	XYQ12.Z-01.08	Roller Axle	2
24	12AZ-113	GB71-85	Slotted Cone Point Fastening Screw M8×12	4
25	12AB-114	XYQ12.Z-01.06	Roller	2
26	12AZ-111	XYQ12.Z-01.09	Jaw Plate	2
27	12AZ-108	GB119-86	Cylindrical Pin 6×18	4
28	12AB-23	XYQ12.B-09A	Ramp Plate	4

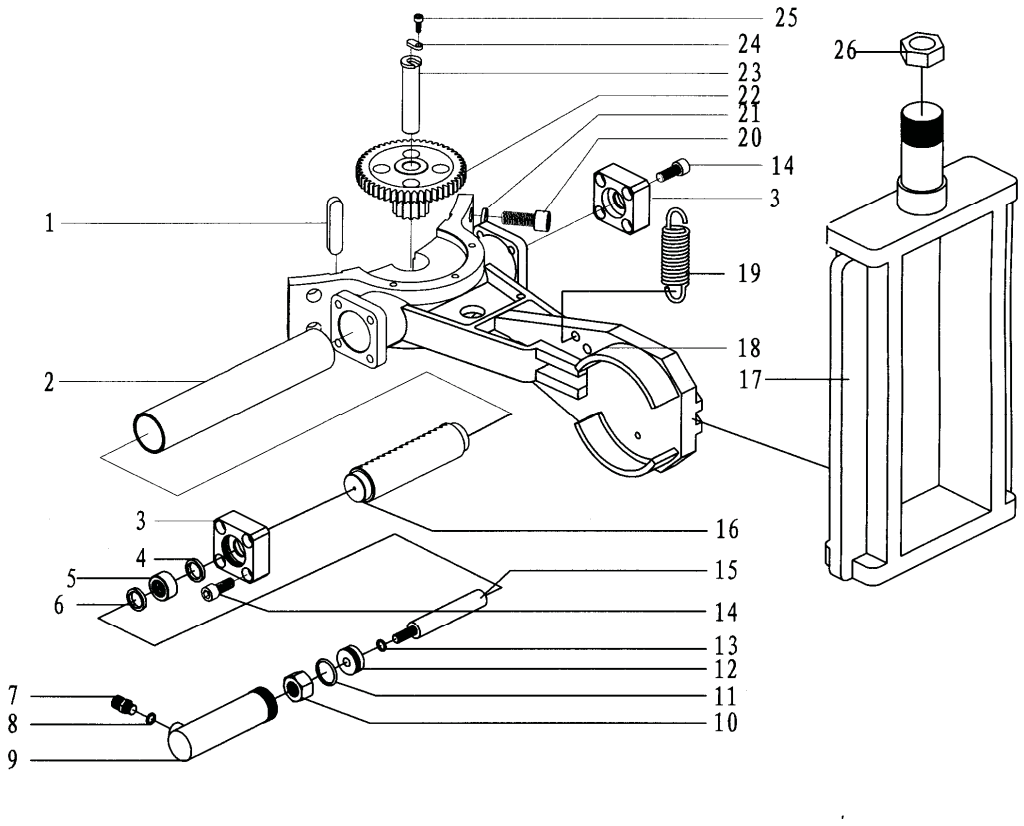


Fig 41 Tail Seat Of Back-up Tong

Tail Seat Of Back-up Tong

Serial No.	Purchase No.	Model No.	Name and Specification	Quantity
1	12AB-35	XYQ12.B-08.3	Flat Key	1
2	12AB-38	XYQ12.B-13	Cylinder Liner	1
3	12AB-100	XYQ12.B.2-5	Cylinder Cover	2
4	12AB-101	GB/T10708.1	Y ring for piston rod 33×25×5	2
5	12AB-102	XYQ140/12A.B.2-4	Dustproof sleeve	2
6	12AB-103	GB/T10708.1	Dustproof ring FA25×33×5	2
7	12AB-104	XYQ140/12A.B.2-1	transpositional adaptor	2
8	12AB-37	GB1235-76	O-Ring 12.5×1.8	2
9	12AB-106	XYQ140/12A.B.2.1	Cylinder Liner	2
10	12AB-107		lock nut 1/2-13UNC	2
11	12AB-108	GB3452.1	O-Ring 31.5×3.55	2
12	12AB-109	XYQ140/12A.B.2-3	Load cell piston	2
13	12AB-110	GB3452.1	O-Ring 10×1.8	2
14	12AB-36	GB70-85	Hexagon Socket Head Screw M12×30	8
15	12AB-111	XYQ140/12A.B.2-2	Load cell rod	2
16	12AB-43	XYQ12.B-16	Rack Plunger	1
17	12AB-112	XYQ140/12A.HD	Back leg assembly	1
18	12AB-113	XYQ140/12A.B.1	Tail Part of Backup Tong Main Body	1
19	12AB-114	XYQ140/12A-1	Pulling Spring	1
20	12AB-34	GB70-85	Hexagon Socket Head Screw M16×40	4
21	12AZ-72	GB93-87	Spring Washer 16	4
22	12AB-9	XYQ6B.B-8	Duplex Gear	1
23	12AB-8	XYQ6B.B-7	Turning Axle	1
24	12AB-6	XYQ6B.Z-20	Positioning Block	1
25	12AB-23	Gb70-85	Hexagon Socket Head Screw M6×15	1
26	12AB-115	XYQ140/12A.HD-5	nut	1

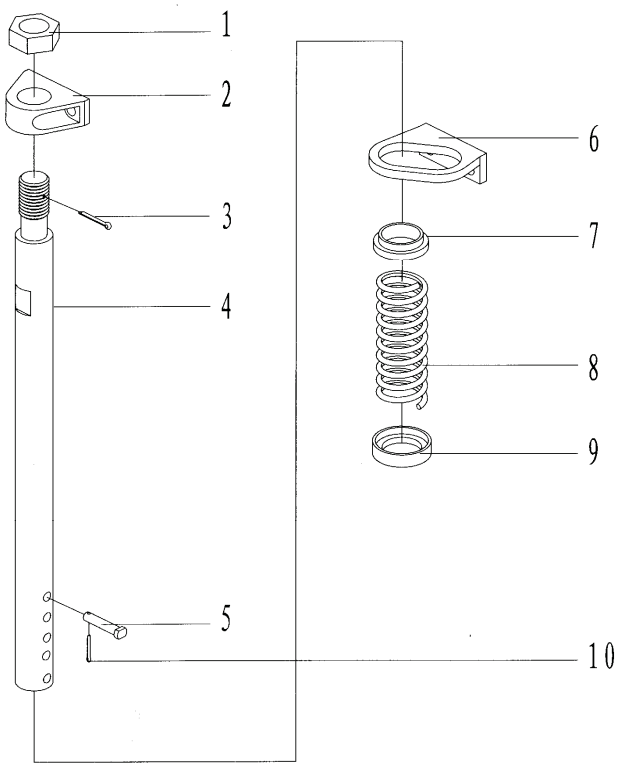


Fig 42 Front Guide Pole Assembly

Front Guide Pole Assembly

Serial No.	Purchase No.	Model No.	Name and Specification	Quantity
1	12AZ-320	XYQ12.QD(2)-5	nut	2
2	12AZ-59	XYQ12.Z-59(2)	Front Support Seat	2
3	12AZ-322	GB91	Cotter Pin4×40	2
4	12AZ-323	XYQ12.QD(2)-1	Front Guide Pole	2
5	12AZ-324	XYQ12.QD(2)-3	Pin Axle	2
6	12AZ-325	XYQ12.B-07A	Front Support Seat（3）(L R)	1 pair
7	12AZ-326	XYQ12.B-06	Front support seat washer	2
8	12AZ-327	XYQ12.QD(2)-4	Spring	2
9	12AZ-328	XYQ12.QD(2)-2	Spring seat	2
10	12AZ-329	GB91	Cotter Pin 2.5×20	1

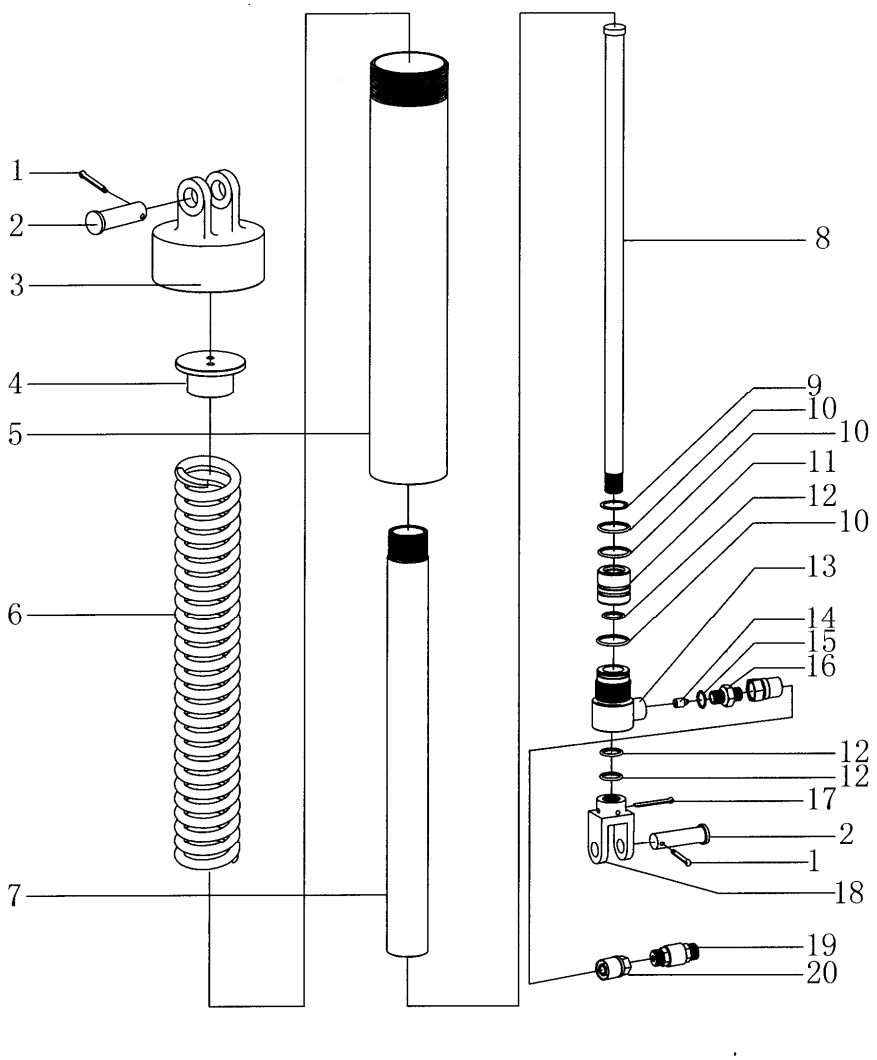


Fig 43 Hydraulic Bucket Assembly

Hydraulic Bucket Assembly

Serial No.	Purchase No.	Model No.	Name and specification	Quantity
1	12AY-1.2	GB91-86	Cotter Pin 3.2×20	2
2	12AY-1.1	GB882-86	Pin Axle B10×40	2
3	12AY-1.19	Q12.YD-01.11	Bucket End Joint	1
4	12AY-1.15	Q12.YD-01.9	Cylinder End Joint	1
5	12AY-1.10	Q12.YD-01.5	Bucket Body	1
6	12AY-1.11	Q12.YD-01.6	Spring	1
7	12AY-1.12	Q12.YD-01.7	Cylinder Body	1
8	12AY-1.13	Q12.YD-01.8	Piston Rod	1
9	12AY-1.18	GB893.1-86	Hole-purpose Elastic Retaining Ring	1
10	12AY-1.16	GB1235-76	O-Ring 45×3.5	3
11	12AY-1.17	Q12.YD-01.10	Piston	1
12	12AY-1.14	GB1235-76	O-Ring 32×3.5	3
13	12AY-1.9	Q12.YD-01.4	Cylinder End Joint	1
14	12AY-1.7	Q12.YD-01.3	Throttle Valve Core	1
15	12AY-1.6	GB1235-76	O-Ring 24×2.4	1
16	12AY-1.5	Q12.YD-01.2	Connector	1
17	12AY-1.4	GB91-86	Cotter Pin	1
18	12AY-1.3	Q12.YD-01.1	Suspension Head	1
19	12AY-7	JB/ZQ4434-86	quick coupler M24×1.5	1
20	12AY-3	JB/ZQ4427-86	Hose Connector6 Ⅱ -1100	1