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MODEL: TQ340-35Y

CASING TONG

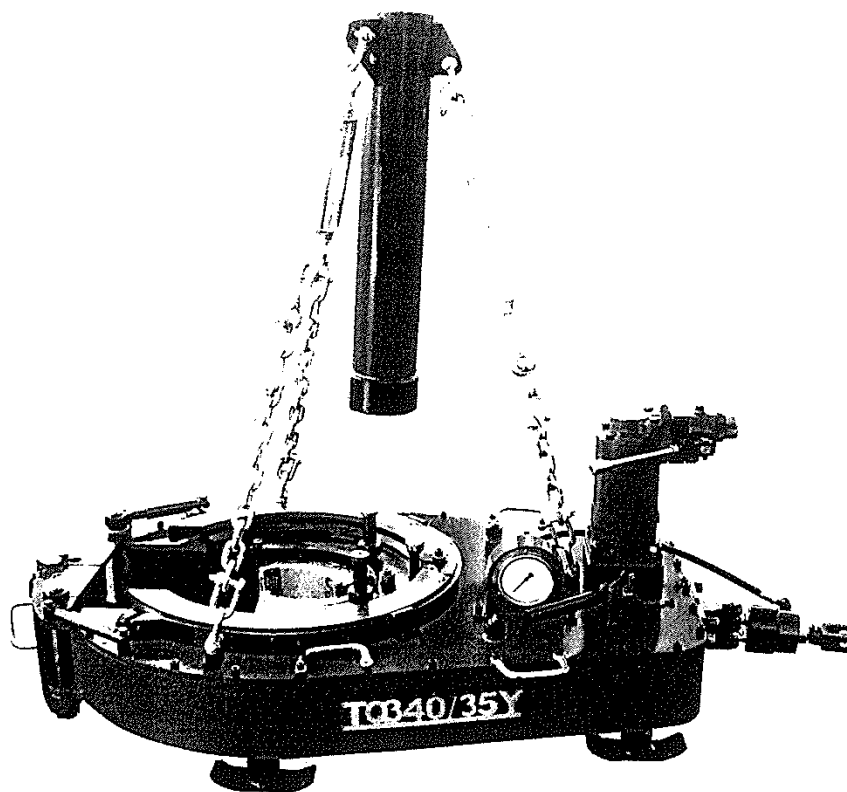
MAINTENANCE AND OPERATION MANUAL



YANCHENG TEDA

DRILLING AND PRODUCTION EQUIPMENT CO., LTD.

MODEL TQ340/35Y
CASING TONG



Ver200605

**MAINTENANCE
AND OPERATION MANUAL**

SAFETY CAUTION

1. Operators should read and understand this manual before operation.
2. Operators should wear protective clothing, hard hat and safety boots.
3. Tie the back guy according to the instructions.
4. Make sure to operate at the side of the tong opening.
5. Close the safety door in make-up/break-out operation.
6. Keep hands away from rotating parts.
7. Keep sundries out of the operation range.
8. Cut off the hydraulic source and move the tong off the wellhead during maintenance, changing dies or other parts.
9. Never use the power tong under over-pressure or over-torque conditions, otherwise the tubing will be damaged and so the planetary gear of the tong will be damaged.
10. Keep the tong turning center according to the center of tubing before make-up/break-out, otherwise the planetary gear of the tong would be damaged.
11. Don't dismantle or add parts to the tong.
12. Please adopt the original fitting parts made by TEDA.

**If the manual is changed or revised later, we have no obligation to notify any person.
If the pictures vary from the practicality, please accept the practicality.**

1. Summary

TQ340/35Y 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:

- Opening type, convenient and prompt to enter and slide off the working position; with an integral tong head of great strength and rigidity.
- Double swing head jaws, convenient to assemble and disassemble.
- Brake belt assembly, easy to operate and convenient to maintain and replace.
- Open gear supporting structure, improving the strength and rigidity.
- Wholly hydraulic mode and mechanical gear shift.
- The jaws are cast with precise technology, artistic and strong.
- With optional torque control system to display, record and control the make-up torque.

2. Technical parameters

(1) Application Range $4\frac{1}{2}"$ 、 $5"$ 、 $5\frac{1}{2}"$ 、 $6\frac{5}{8}"$ 、 $7"$ 、 $8\frac{5}{8}"$ 、 $9\frac{5}{8}"$ 、 $10\frac{3}{4}"$ 、 $13\frac{3}{8}"$ Casing

(2) Torque Range @ 2320 psi / 16 Mpa

High gear:3540ft-lbs./4800Nm

Low gear: 25810 ft-lbs. /350000Nm

(3) Maximum RPM @ 32 GPM / 120 LPM

High gear:42 rpm

Low gear: 6 rpm

(4) Oil Flow 32 GPM @ 2320 psi / 120 LPM @ 16 Mpa

(5) Overall Dimension 1580×900×850 mm/62.2"×35.5"×33.5"

(6) Weight 750 kg/1650 lbs

3. Installation

3.1 Hang the tongs

- a) Fix the single pulley (3 ton) under beam of the crown block.
- b) Get a wire rope (at least $1\frac{1}{2}"$) through the pulley, with one end fixed on the base beam. The height of the tong should be at the same level as the average height of joint when making up and breaking out casing.

3.2 Level the tongs

The tongs must be leveled when hung up, or the gears will be easy to slide.

- a) Front and back level - adjust the two screws at the joint where the tongs are connected with their hanger.
- b) Crosswise level - turn the screw rod at the top of the hanger.

3.3 Tie the back guy

The wire, at least 5/8", is connected with the ring of the oil tank at the end of the tongs, the other end fixed on the derrick or the drilling platform.



□The wire should be almost at the same level of the tongs, and be at an angle of 90° with the tong central line.

3.4 Filling oil into pulling cylinder

When the piston rod is pulled out long, oil must be filled. Use the hand oiling pump equipped with the tong to oil the torque cylinder until the hand of torque gauge acts.

3.5 Connect the pipes

High pressure oil hose joint connects with high-pressure hose from the power station.

Low-pressure return hose joint connects with low pressure hose from the power station.

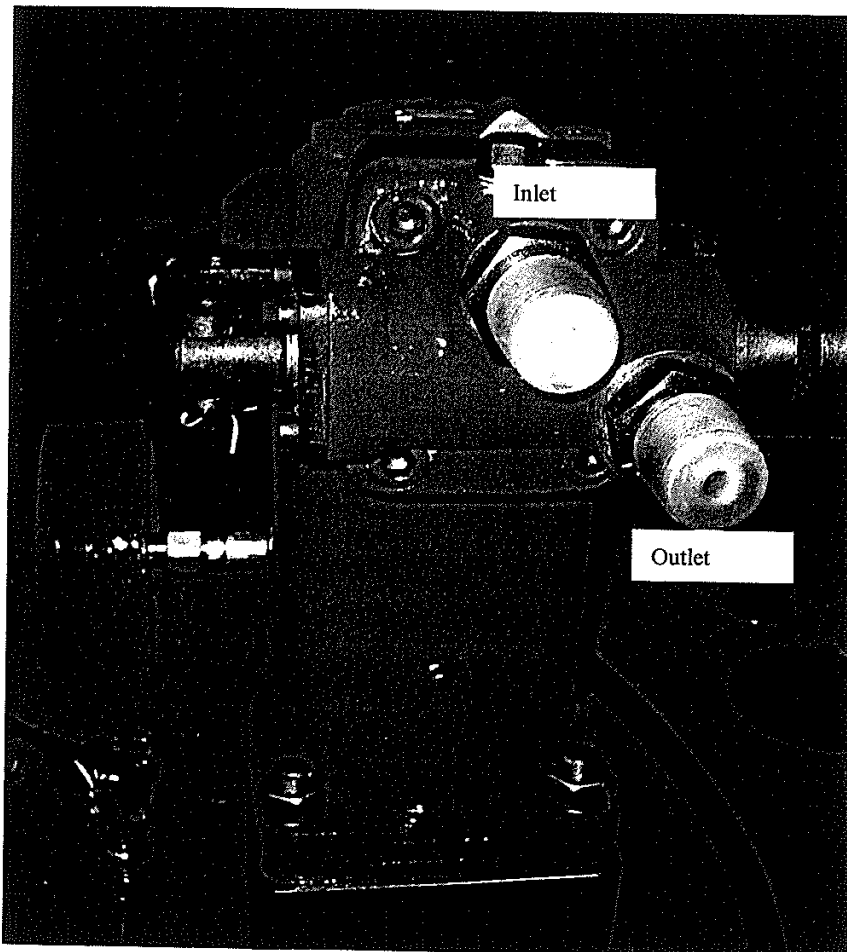


Fig. 1

4. Operation

4.1 Requirements

- a) The operator should know the tong structure and the properties.
- b) The operator should know the use of the hydraulic hand-reversing valve and of the speed change gas valve.
- c) The operator should know the operation sequence and safety requirements.
- d) The operator should know the functions of the gauge.

4.2 Preparation for the operation .

- a) Install the jaws that go with the casing pipe. Note that the two jaws are different, and should be installed correctly.
- b) Put the handles of the hydraulic hand-reversing valve and the speed change gas valve at neutral position.
- c) Start the hydraulic power station.
- d) Push or pull the handle of the hydraulic hand-reversing valve, and you will hear the hydraulic motor while the tong head notched gear remains still.
- e) Set the handle of the speed changer gas valve at high or low gear. Push or pull the handle of the hydraulic reversing valve, and the notched gear turns smoothly in forward and reverse direction.

4.3 Working process

- a) Align the gear's notch with the jaw rack's notch.
- b) Set the reverse shaft into "make up " or "break out" hole, and adjust the brake band.
- c) Align the gear notch with the case notch.
- d) Draw open the safety door, push the tongs to working position and close the door.

□ Making up

a. High gear operation: Set the handle of speed change air valve at high speed position and the handle of hydraulic reversing valve at "make up" position. Jaws clamp the casing tightly and drive the casing rotate in "make up" direction. At the same time watch the torque gauge. When the reading is not up to the needed, change to low gear.

b. Low gear operation: Stop the motor and put the speed change air valve at low gear, and operate the direction-reversing valve, the casing pipe will turn slowly. Watch the torque gauge at the same time. When the reading reaches the needed value, put the handle of hydraulic reverse valve at mid position.

c. Set the handle of hydraulic reverse valve at "break out" position, then choose low gear according to the proficiency of operator and the position of notched gear. Jaws loose. The rotary gear turns in "break out" position. When it aligns with the case notch, set the handle of hydraulic reverse valve at mid position.

d. Open the safety door and draw back the tong. That is one make-up.

□ **Breaking out**

- a. Low gear operation: set the handle of the speed shift gas valve at low gear position, the handle of the hydraulic reversing valve at “break out” position, and the casing turns slowly in the direction to break out.
- b. High gear operation: When the casing turns to a certain angle it can turn at high gear, stop the tong and set the handle of the reversing gas valve at high gear position, and then the casing turns at high speed in the direction to break out.
- c. When the screw threads are apart, the operator may choose a proper position for the handle of the speed shift gas valve according to his own proficiency and the gear notch position. Push the handle of the hydraulic reversing valve to “make up” position. When the gear notch and the case notch are aligned, set the handle of the hydraulic reversing valve in the middle position.
- d. Open the safety door, and slide the tong off the casing. A break-out is done.



- Never dismount hydraulic hoses under high pressure, or serious accidents or equipment failure may occur!
- Keep hand or clothes off the running part of the hydraulic tong!
- Nobody but operators is allowed to approach the power tong, in case accidental harm should be caused due to turning the control handle!



- The casing string will be damaged at over torque!
- The casing tong will be damaged if used at over pressure!



- Carry out the make-up operation at torque recommended by API.

5. Trouble shooting (Tablet)

Trouble	Causes	Remedy
The head doesn't turn	1. No pressure from hydraulic station. 2. Damage of the hydraulic reversing valve. 3. Gear changing system fails.	1. Check the station. Add pressure. 2. Replace the valve. 3. Repair
No neutral gear	1. Damage of hand-reversing valve. 2. Damage of dial fork	1. Change a new valve 2. Repair the fork.
Speed is not enough	1. Low pressure or low flow from the power station. 2. Bad leakage loss from oil motor or hand-reversing valve.	1. Check the station pressure. 2. Replace the motor or hand-reversing valve.
Head slide	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.	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	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.	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	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.	1. Repair or change. 2. Repair or change the motor and the valve. 3. Check or repair the gearbox.

6. Lubrication

6.1 Maintenance after each workover

- Wrap each oil nipple with clean plastic film after the hose is removed to keep sundries out.
- Clear dirty objects outside the tong body and clean with kerosene or diesel oil.
- Dismount the baffle, fill enough molybdenum disulfide grease to each gear .
- Fill enough engine oil 20# to the rotating axle and the gears of the master tong and backup tong.
- Clear all the sundries inside the groove of the die,.
- Carry out maintenance according to the daily maintenance requirement.

6.2 Check the hydraulic motor every half year, supply oil according to the specified oil supply amount, increase the break-out system pressure slowly, if the pressure fails to arrive at 16MPa , replace the hydraulic motor at once.

6.3 The hydraulic oil for the power tong must be effectively filtered to keep sand or iron scraps out, the filter precision should be above 0.025mm (10mil). The following hydraulic oils are recommended:

- (1) hydraulic oil L-HS32 , application ambient temperature: -30°C-+40°C;
- (2) hydraulic oil L-HM46 , application ambient temperature: 0°C-+40°C.



- Don't clean bearing or oil nipple with steam, otherwise, parts like bearing may get dusted and damaged!
- Don't rinse the pressure sensor with steam, or it may be damaged!



- The hydraulic oil temperature should be lower than 65°C, the sealing may fail and the rotation speed of the power tong will be slower due to the high temperature of the oil!



- Recommended summer brand: hydraulic oil L-HM46 , for winter use or for both summer and winter use: hydraulic oil L-HS32.
- When replacing oil, the sediment at the bottom of the oil tank should be cleared.

7 Carry, store , opening the box and after-sales service

7.1 Carry

- Handle hydraulic power tong steadily and smoothly, keep from getting damp, upside down or damaged.
- Suspend hydraulic power tong with wire over $\Phi 12\text{mm}$, keep the tong body balanced.
- Keep the tong balanced and horizontal not to swing so as to avoid bumping or damaging.

7.2 Store

- Store in places free of sunshine, rain and moist, with excellent ventilation and ambient temperature below 45°C .
- Don't leave the tong on muddy ground or in the open air
- Protect the oil entrance in storage to prevent dirt or dust.
- Valid storage time for new hydraulic power tong is one year since delivery. Replace part or all of the sealing pieces and hoses after expiration.

7.3 Opening the box

- After opening the box, check the appearance of the power tong, check goods according to the packing list.

7.4 Service

 Service line: 86-515-6585387 86-515-6582548 86-515-6583024

 FAX: 86-515-6582386

 E-mail: hjzhjz12@263.net

8 Figures and detailed part tables

8.1 Master tong (Fig2. Table2)

8.2 Spring lift bucket (Fig3. Table3)

8.3 Tong head assembly(Fig4. Table4)

8.4 Safety door(Fig5. Table5)

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8.7 Idler gear assembly (1) (Fig8. Table8)

8.8 Idler gear assembly (2) (Fig9. Table9)

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8.10 Power input shaft assembly(Fig11. Table11)

8.1 Master tong (Fig2. Table2)

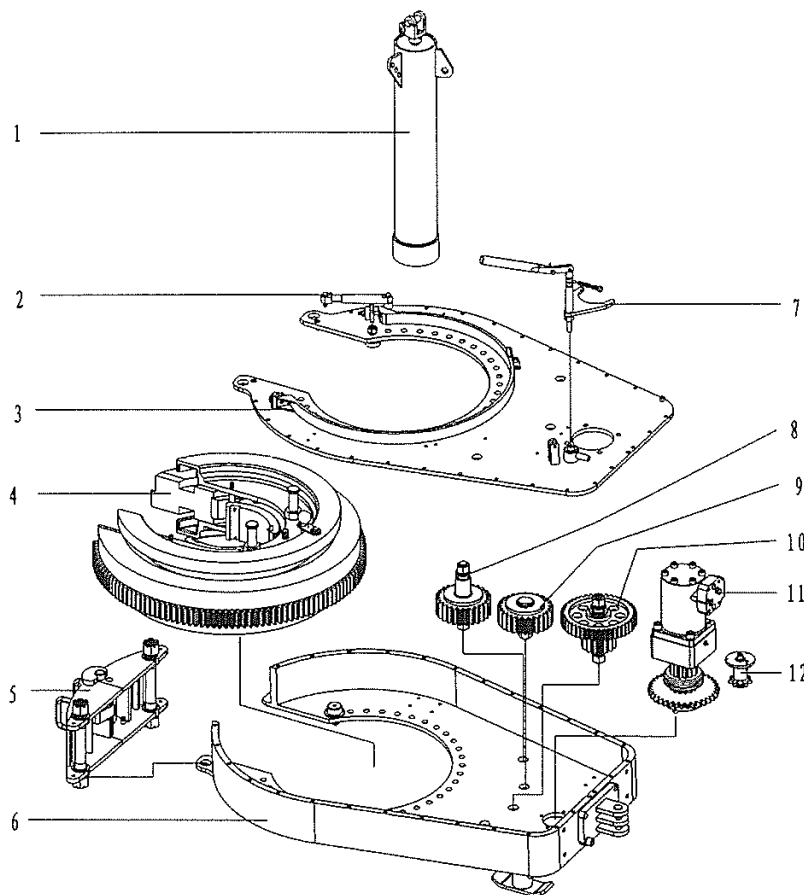


Table 2 . Detailed table for master tong

Item	P/ N	Drawing No.	Description	Qty
1	TQ340-10	TQ340/35Y.1.13	Spring lift bucket	1
2	TQ340-11	TQ340/35Y.1.2-04	Spring seat	1
3	TQ340-12	TQ340/35Y.1.3	Brake belt	1
4	TQ340-13	TQ340/35Y.1.5	Tong head assembly	1
5	TQ340-14	TQ340/35Y.1.1	Safety door	1
6	TQ340-15	TQ340/35Y.1.4	Case body assembly	1

7	TQ340-16	TQ340/35Y.1.10	Shifting gear	1
8	TQ340-17	TQ340/35Y.1.6	Idler gear assembly (1)	2
9	TQ340-18	TQ340/35Y.1.7	Idler gear assembly (2)	2
10	TQ340-19	TQ340/35Y.1.8	Duplex gear assembly	2
11	TQ340-20	TQ340/35Y.1.9	Power input shaft assembly	1
12	TQ340-21		Measure speed gear	1

8.2 Spring lift bucket (Fig3. Table3)

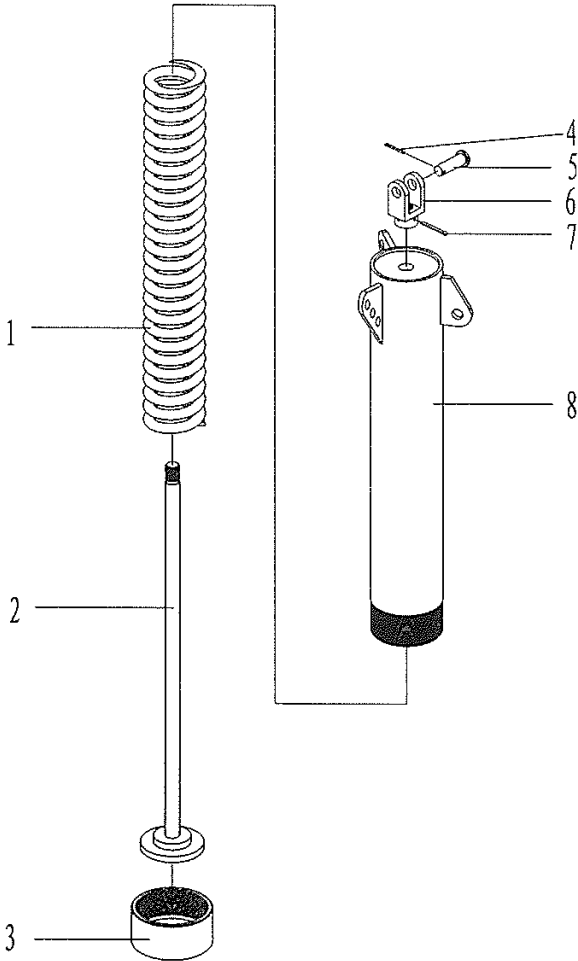


Table 3. Detailed table for spring lift bucket

Item	P/ N	Drawing No.	Description	Qty
1	TQ340-30	TQ340/35Y.1.13-01	Spring	1
2	TQ340-31	TQ340/35Y.1.13.1	Lift rod	1
3	TQ340-32	TQ245.14-4	End cover	1
4	TQ340-33	GB91	Cotter pin 4*40	1
5	TQ340-34	GB882	Pin shaft 20*60	1

6	TQ340-35	XYQ12.YD-01.1	Suspending head	1
7	TQ340-36	GB91	Cotter pin 5*50	1
8	TQ340-37	TQ340/35Y.1.13.2	Lift bucket	1

8.3 Tong head assembly(Fig4. Table4)

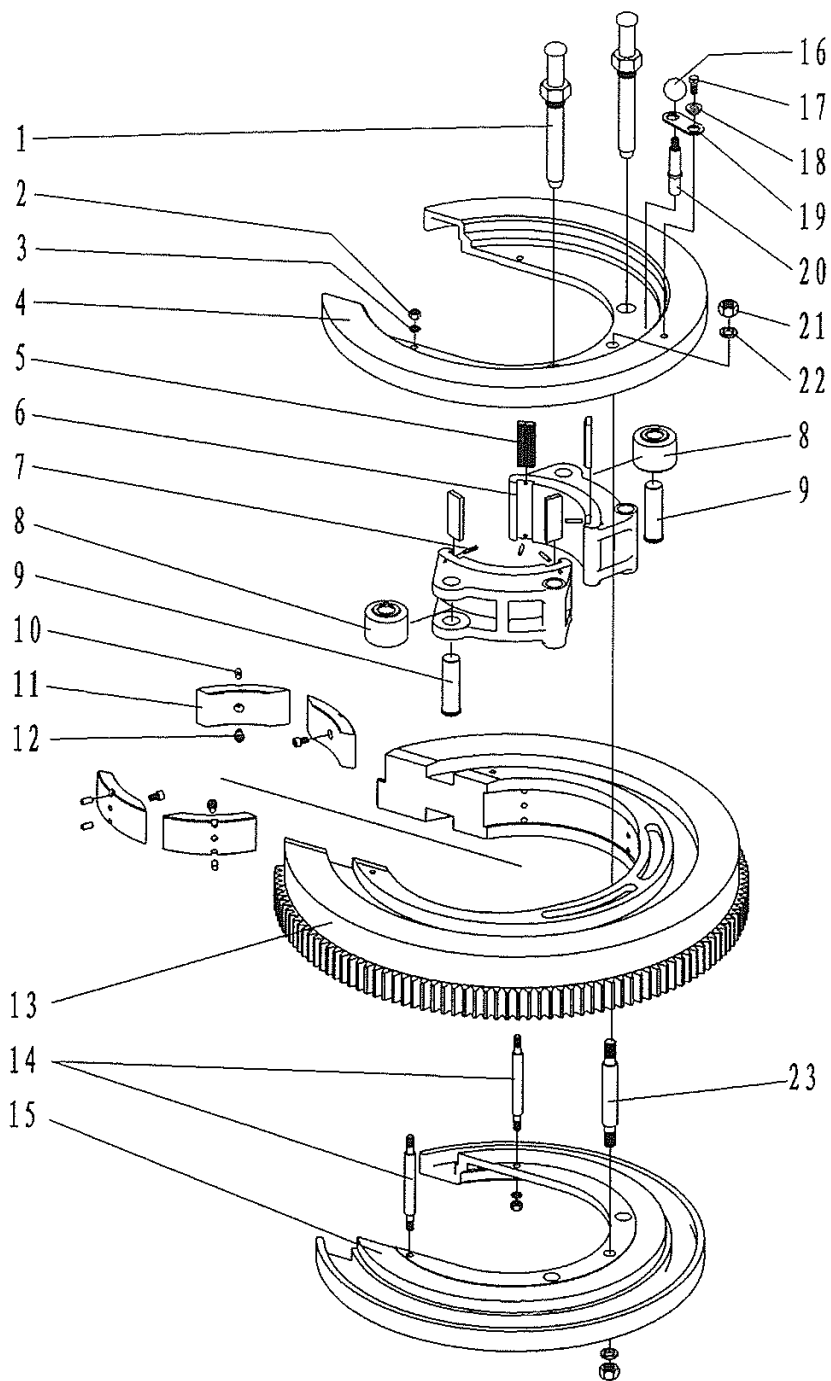


Table 4 . Detailed table for tong head assembly

Item	P/ N	Drawing No.	Description	Qty
1	TQ340-40	TQ340/35Y.1.5-05	Jaw set shaft	2
2	TQ340-41	GB6170-86	Nut M12	4
3	TQ340-42	GB93-97	Standard washer12	4
4	TQ340-43	TQ340/35Y.1.5.2	Upper jaw set bracket assembly	1
5	TQ340-44	TQ340/35Y.1.5.1(1)-04	Die	
6	TQ340-45	TQ340/35Y.1.5.1(1) -01	Jaw set 13 ³ / ₈ "	Each 2
	TQ340-46	TQ340/35Y.1.5.1(3) -01	Jaw set 10 ³ / ₄ "	Each 2
	TQ340-47	TQ340/35Y.1.5.1(4) -01	Jaw set 9 ⁵ / ₈ "	Each 2
	TQ340-48	TQ340/35Y.1.5.1(5) -01	Jaw set 8 ⁵ / ₈ "	Each 2
	TQ340-49	TQ340/35Y.1.5.1(7) -01	Jaw set 7"	Each 2
	TQ340-50	TQ340/35Y.1.5.1(8) -01	Jaw set 6 ⁵ / ₈ "	Each 2
	TQ340-51	TQ340/35Y.1.5.1(9) -01	Jaw set 5 ¹ / ₂ "	Each 2
	TQ340-52	TQ340/35Y.1.5.1(10) -01	Jaw set 5"	Each 2

	TQ340-53	TQ340/35Y.1.5.1(11) -01	Jaw set 4 $\frac{1}{2}$ "	Each 2
7	TQ340-54	GB879-86	Pin 6*30	4
8	TQ340-55	TQ340/35Y.1.5.1(1)-03	Roller	2
9	TQ340-56	TQ340/35Y.1.5.1(1)-02	Roller shaft	2
10	TQ340-57	GB70-85	Hexagon socket head cap screw M10×16	4
11	TQ340-58	TQ340/35Y.1.5-01	Ramp	4
12	TQ340-59	GB70-85	Hexagon socket head cap screw M10×16	4
13	TQ340-60	TQ340/35Y.1.5-04	Open gear	1
14	TQ340-61	TQ340/35Y.1.5-06	Screw rod	2
15	TQ340-62	TQ340/35Y.1.5-02	Lower jaw set bracket	1
16	TQ340-63	TB7271.1-94	Handle ball BM12*40	1
17	TQ340-64	GB5780-86	Bolt M12*25	1
18	TQ340-65	TQ340/35Y.1.5-04	Shaft sleeve	1
19	TQ340-66	TQ340/35Y.1.5-03	Connection plate	1
20	TQ340-67	TQ340/35Y.1.5-02	Pin	1
21	TQ340-68	GB93-97	Standard washer20	2
22	TQ340-69	GB6170-86	Nut M20	2
23	TQ340-70	TQ340/35Y.1.5-03	Bolt	1

8.4 Safety door(Fig5. Table5)

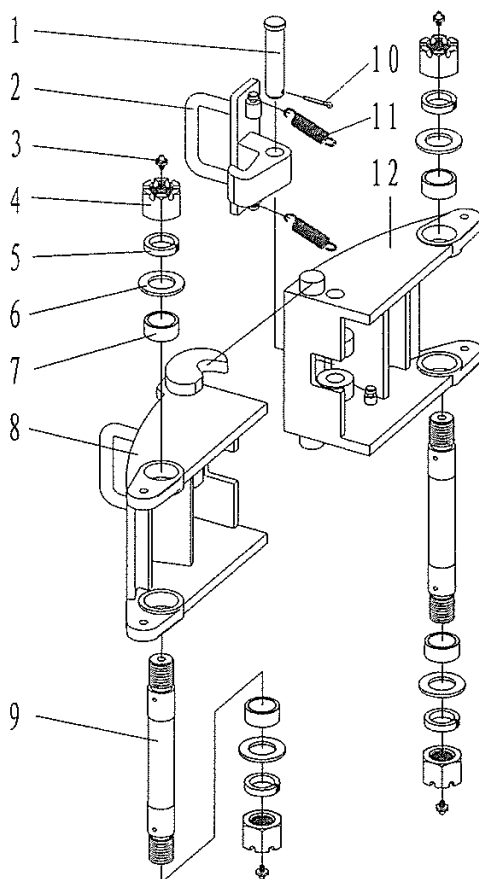


Table 5. Detailed table for safety door

Item	P/ N	Drawing No.	Description	Qty
1	TQ340-80	TQ340/35Y.1.1-04	Pin shaft	1
2	TQ340-81	TQ340/35Y.1.1-03	Handle	2
3	TQ340-82	JB/T7940.1	Oil cup M10*1	4
4	TQ340-83	GB/T6178	Nut M30	4
5	TQ340-84	GB/T93	Washer30	4
6	TQ340-85	GB/T95	Washer30	4

7	TQ340-86	TQ340/35Y.1.1-05	Shaft sleeve	4
8	TQ340-87	TQ340/35Y.1.1.1	Right door	1
9	TQ340-88	TQ340/35Y.1.1-06	Door shaft	2
10	TQ340-89	GB/T91	Pin 4*36	1
11	TQ340-90	TQ340/35Y.1.1-01	Spring	2
12	TQ340-91	TQ340/35Y.1.1.3	Left door	1

8.5 Case body assembly(Fig6. Table6)

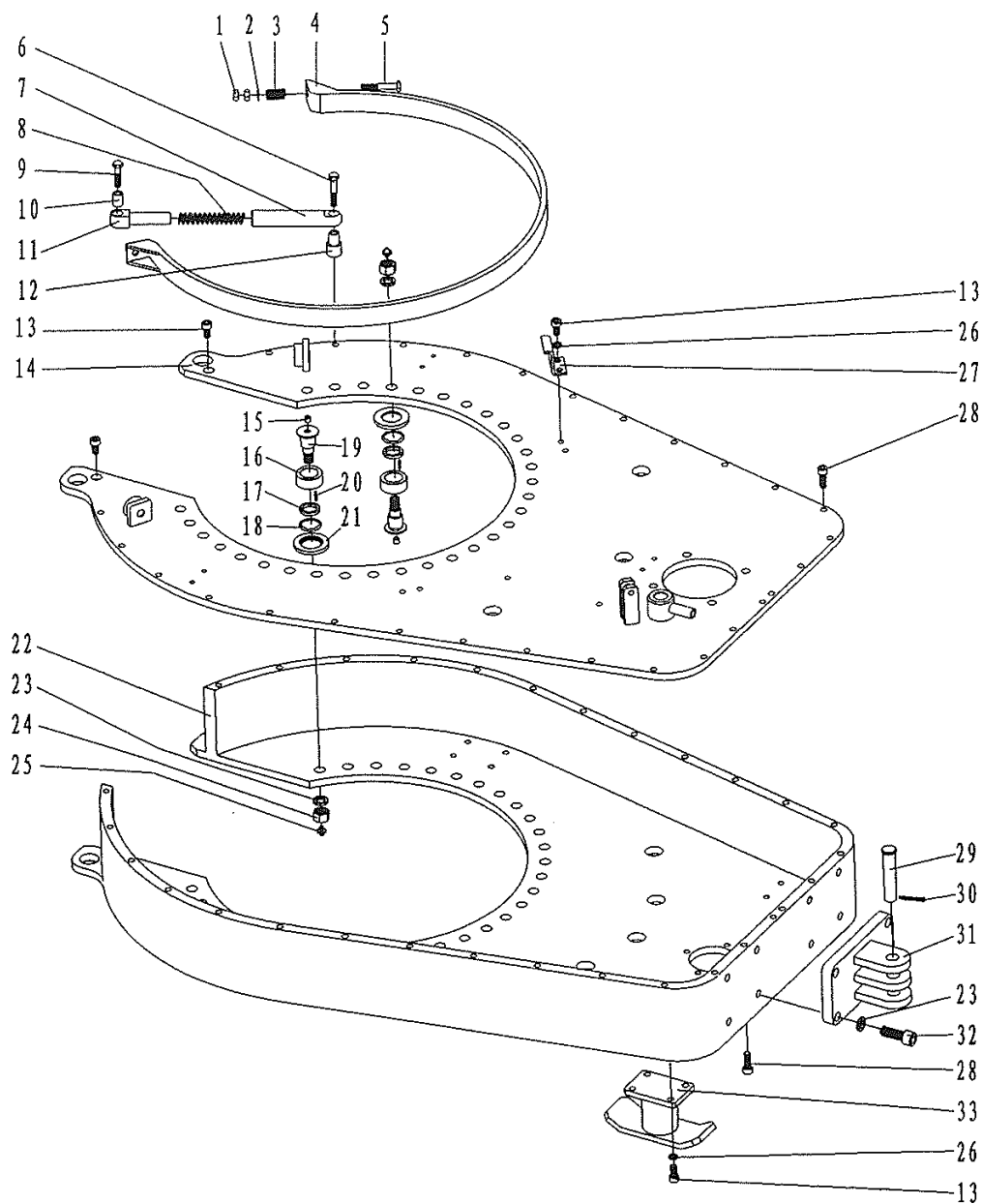


Table 6. Detailed table for case body assembly

Item	P/ N	Drawing No.	Description	Qty
1	TQ340-100	GB/T5780-2000	Nut M10	4
2	TQ340-101	GB/T96.2-2003	Washer10	2
3	TQ340-102	TQ340/35Y.1.3-03	Brake spring	2
4	TQ340-103	TQ340/35Y.1.3.1-01	Triangle muscle plate	4
5	TQ340-104	GB/T5780-2000	Bolt M10*60	2
6	TQ340-105	GB5780-86	Bolt M10*55	1
7	TQ340-106	TQ340/35Y.1.2-04	Spring seat	1
8	TQ340-107	TQ340/35Y.1.2-03	Spring	1
9	TQ340-108	GB5780-86	Bolt M10*40	1
10	TQ340-109	TQ340/35Y1.2-01	Shaft sleeve	1
11	TQ340-110	TQ340/35Y.1.2-02	Mandril	1
12	TQ340-111	TQ340/35Y.1.2-05	Shaft sleeve	1
13	TQ340-112	GB70-85	Hexagon socket head cap screw M10*20	4
14	TQ340-113	TQ340/35Y.1.4-01	Upper face plate	1
15	TQ340-114	GB1155	Pressure oil cup8	1
16	TQ340-115	TQ340/35Y.1.4.2-02	Roller	1
17	TQ340-116	TQ340/35Y.1.4.2-03	Washer (1)	1
18	TQ340-117	GB1235	O ring 40*3.1	1
19	TQ340-118	TQ340/35Y.1.4.2-01	Centralizing shaft	1
20	TQ340-119	GB/T309	Roller3*19.8	28

21	TQ340-120	TQ340/35Y.1.4.2-04	Washer (2)	1
22	TQ340-121	TQ340/35Y.1.4-02	Side plate	2
23	TQ340-122	GB93-87	Standard spring washer16	4
24	TQ340-123	GB41	Nut M16	1
25	TQ340-124	GB1152	Pressure oil cup M10*1	1
26	TQ340-125	GB/T96.2-2002	Washer10	2
27	TQ340-126	TQ340/35Y.1.3-02	Brake belt block	1
28	TQ340-127	GB70-85	Hexagon socket head cap screw M10*30	56
29	TQ340-128	TQ340/35Y.1.4-04	Pin shaft	1
30	TQ340-129	GB91-86	Cotter pin 5*35	1
31	TQ340-130	TQ340/35Y.1.4-07	Suspending seat	3
32	TQ340-131	GB70-85	Hexagon socket head cap screw M16*45	4
33	TQ340-132	TQ340/35Y.1.4-06	Baffle	2
34	TQ340-133	TQ340/35Y.1.4-03	Lower face plate	1

8.6 Shifting gear(Fig7. Table7)

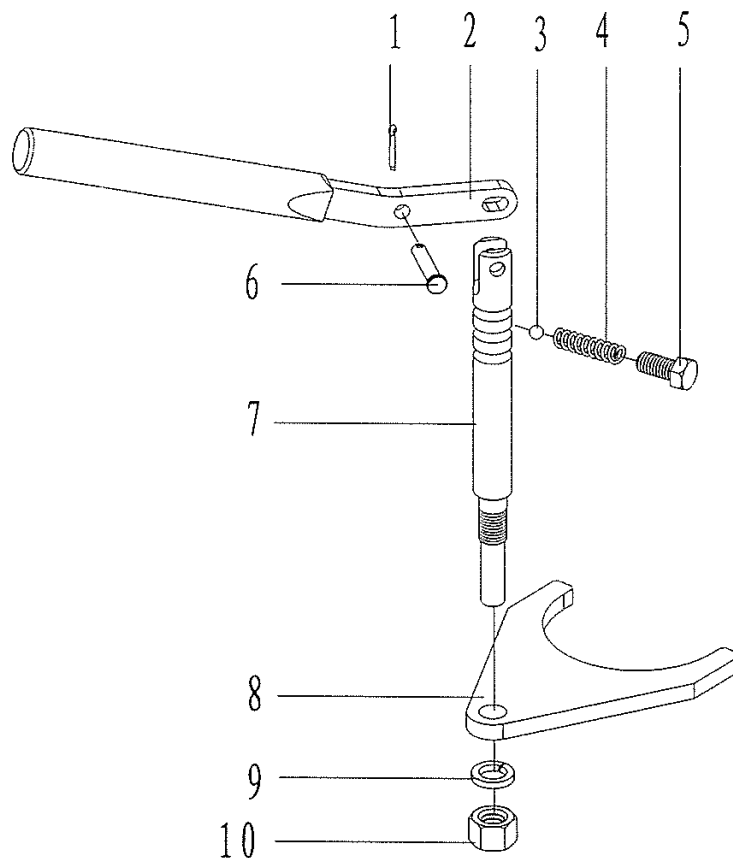


Table 7 . Detailed table for shifting gear

Item	P/ N	Drawing No.	Description	Qty
1	TQ340-140	GB91-86	Cotter pin 2 . 5 * 2 0	2
2	TQ340-141	TQ340/35Y.1.10.1	Operation handle	1
3	TQ340-142	GB308-89	Steel ballΦ8	1
4	TQ340-143	TQ340/35Y.1.10-03	Spring	1
5	TQ340-144	GB5781-86	Hex head bolt M12×25	1
6	TQ340-145	XYQ3C.HD-5	Pin shaft	2

7	TQ340-146	TQ340/35Y.I.10-02	Fork shaft	1
8	TQ340-147	TQ340/35Y.I.10-04	Fork	1
9	TQ340-148	GB93-87	Standard spring washer	1
10	TQ340-149	GB41-85	Nut M16	1

8.7 Idler gear assembly (1) (Fig8. Table8)

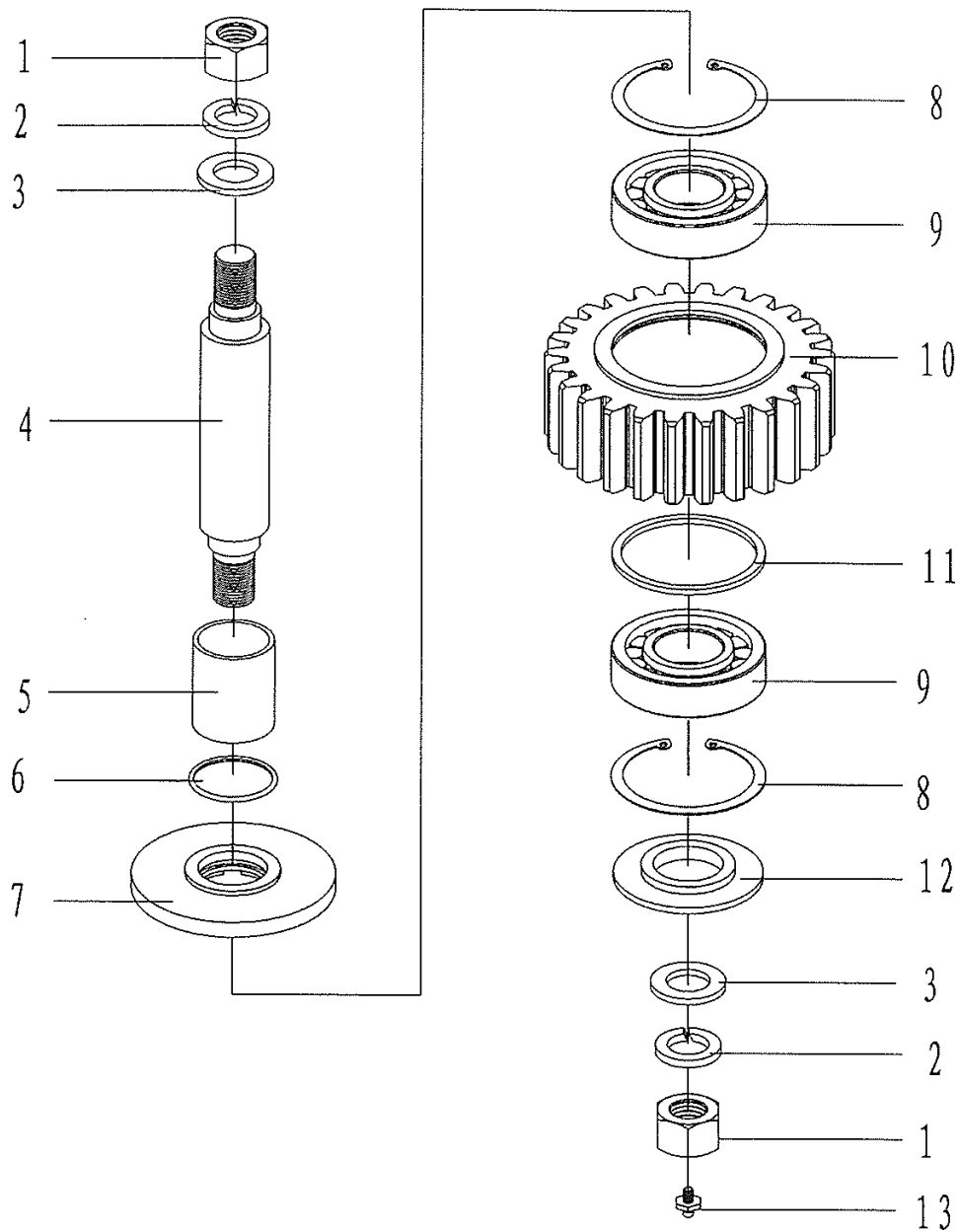


Table 8. Detailed table for idler gear assembly (1)

Item	P/ N	Drawing No.	Description	Qty
1	TQ340-160	GB41-86	Hex nut M24	2
2	TQ340-161	GB93-87	Spring washer24	2
3	TQ340-162	GB95-85	Flat washer 24	2
4	TQ340-163	TQ340/35Y.1.6-02	Shaft	1
5	TQ340-164	TQ340/35Y.1.6-03	Sleeve	1
6	TQ340-165	GB1235-76	O ring 45*3.1	1
7	TQ340-166	TQ340/35Y.1.6-04	Water proof guard	1
8	TQ340-167	GB893.1-86	Circlip for hole 90	2
9	TQ340-168	GB283-87	Roller bearing 42308E	2
10	TQ340-169	TQ340/35Y.1.6-01	Idler gear	1
11	TQ340-170	TQ340/35Y.1.6-05	Spacer	1
12	TQ340-171	TQ340/35Y.1.6-06	Bearing disc	1
13	TQ340-172	GB1152-89	Oil cup M10*1	1

8.8 Idler gear assembly (2) (Fig9. Table9)

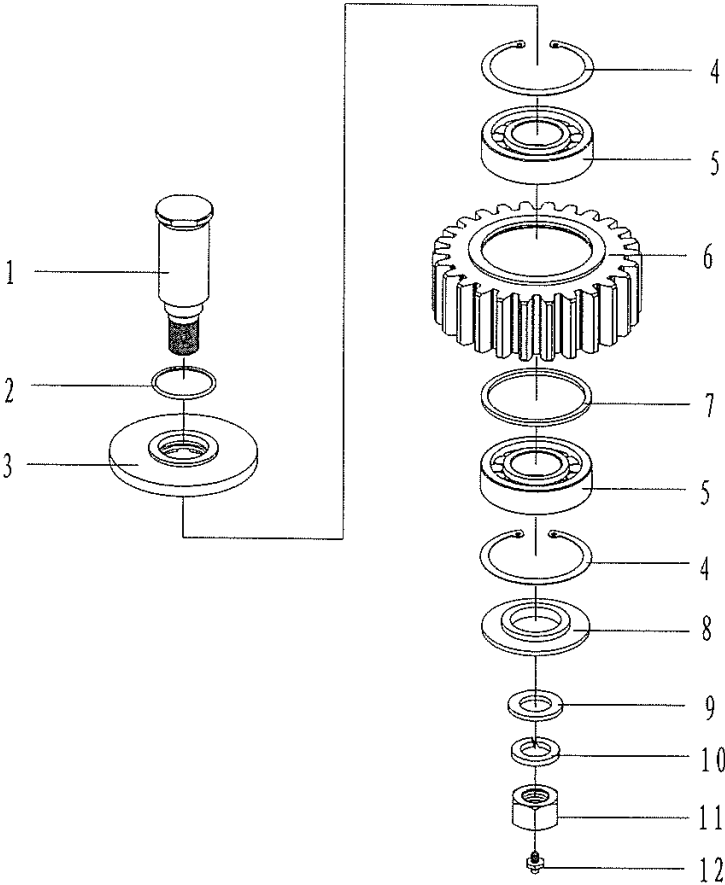


Table 9. Detailed table for idler gear assembly (2)

Item	P/ N	Drawing No.	Description	Qty
1	TQ340-180	TQ340/35Y.1.7-01	Shaft	1
2	TQ340-181	GB1235-76	O ring 45*3.1	1
3	TQ340-182	TQ340/35Y.1.6-04	Water proof guard	1
4	TQ340-183	GB893.1-86	Circlip for hole 90	2
5	TQ340-184	GB283-87	Roller bearing 42308E	2

6	TQ340-185	TQ340/35Y.1.6-01	Idler gear	1
7	TQ340-186	TQ340/35Y.1.6-05	Spacer	1
8	TQ340-187	TQ340/35Y.1.6-06	Bearing disc	1
9	TQ340-188	GB95-85	Flat washer 24	1
10	TQ340-189	GB93-87	Spring washer 24	1
11	TQ340-190	GB41-86	Hex nut M24	1
12	TQ340-191	GB1152-89	Oil cup M10*1	1

8.9 Duplex gear assembly(Fig10. Table10)

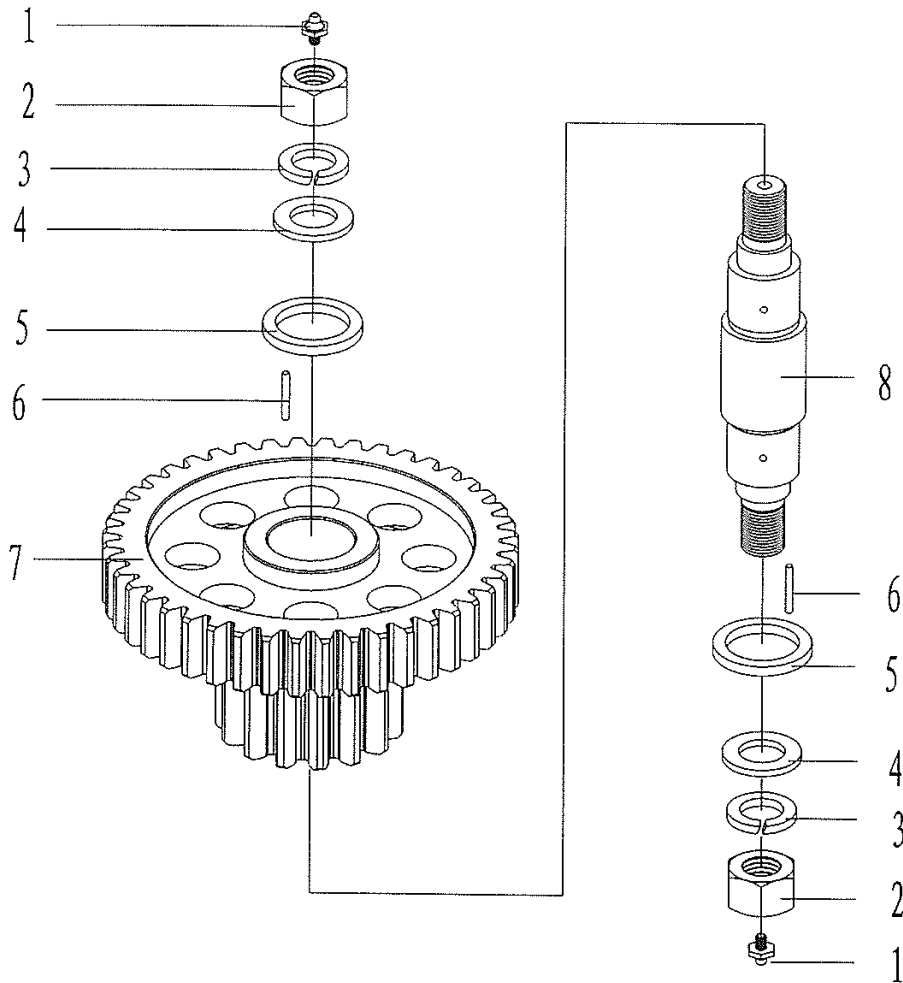


Table 10. Detailed table for duplex gear assembly

Item	P/ N	Drawing No.	Description	Qty
1	TQ340-200	GB1152-89	Oil cup M10*1	2
2	TQ340-201	GB41-86	Hex nut M24	2
3	TQ340-202	GB93-87	Spring washer24	2
4	TQ340-203	GB95-85	Flat washer24	2

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5	TQ340-204	TQ340/35Y.1.8-03	Shim	2
6	TQ340-205	GB/T309-2000	Needle rollerΦ4×29.8	68
7	TQ340-206	TQ340/35Y.1.8-01	Duplex gear	1
8	TQ340-207	TQ340/35Y.1.8.-02	Shaft	1

8.10 Power input shaft assembly(Fig11. Table11)

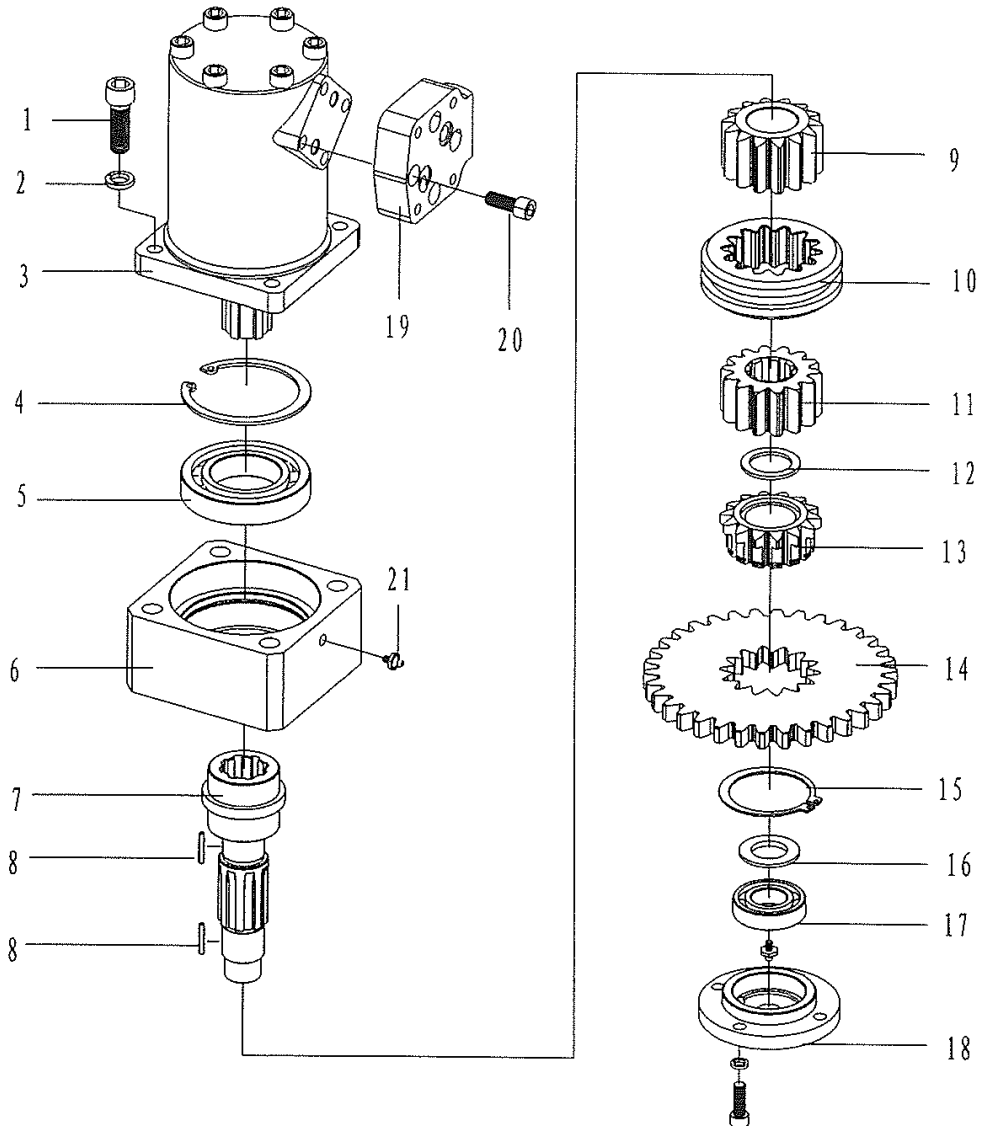


Table 11. Detailed table for power input shaft assembly

Item	P/ N	Drawing No.	Description	Qty
1	TQ340-220	GB73-85	Hexagon socket head cap screw M16*50	4
2	TQ340-221	GB93-87	Standard spring washer 16	4
3	TQ340-222		6K-625 Cycloid hydraulic motor	1
4	TQ340-223	GB893.1-86	Circlip for hole	1
5	TQ340-224	GB/T276-1994	Deep groove ball bearing 212	1
6	TQ340-225	TQ340/35Y.1.9-01	Motor connection seat	1
7	TQ340-226	TQ340/35Y.1.9-02	Power input shaft	1
8	TQ340-227	GB/T309-2000	Needle roller $\Phi 4 \times 29.8$	60
9	TQ340-228	TQ340/35Y.1.9-03	Shifting gear	
10	TQ340-229	TQ340/35Y.1.9-04	Interior gear sleeve	1
11	TQ340-230	TQ340/35Y.1.9-05	Spline gear	1
12	TQ340-231	TQ340/35Y.1.9-06	shim	1
13	TQ340-232	TQ340/35Y.1.9-07	Clutch small gear	1
14	TQ340-233	TQ340/35Y.1.9-08	Cluth big gear	1
15	TQ340-234	GB894.1-86	Circlip for shaft	1
16	TQ340-235	TQ340/35Y.1.9-09	Bearing disc	1
17	TQ340-236	GB/T276-1994	Deep groove ball bearing 206	1
18	TQ340-237	TQ340/35Y.1.9-10	Bearing cover	1
19	TQ340-238	XYQ3C.Z.5	Hand control valve	1
20	TQ340-239	GB70-85	Hexagon socket head cap screw M12*30	8
21	TQ340-240	GB1152-89	Oil cup M10*1	2