



# 1WHCD

## Hollow Hydraulic Torque Wrench Operation & Maintenance Manual



Pingyuan Jingke Hydraulic Co., Ltd.

# Catalogue

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# Operation & Maintenance Manual of Hydraulic Torque Wrench

This operating manual includes operating procedures, warnings and precautions, and troubleshooting of the WHCD series hydraulic torque wrench. Before use, please read this manual carefully, thoroughly understand its content and keep it properly. This manual is only for the end user's reference.

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## I. Acceptance notice (unpacking inspection)

Check carefully whether there is any damage to the appearance of the product and whether there is any transportation damage. Transportation damage is not covered by the warranty. If it is found to be damaged due to cargo transportation, it should be reported to the freight forwarder in time. The freight forwarder shall pay for all repair and replacement costs caused by transportation damage.

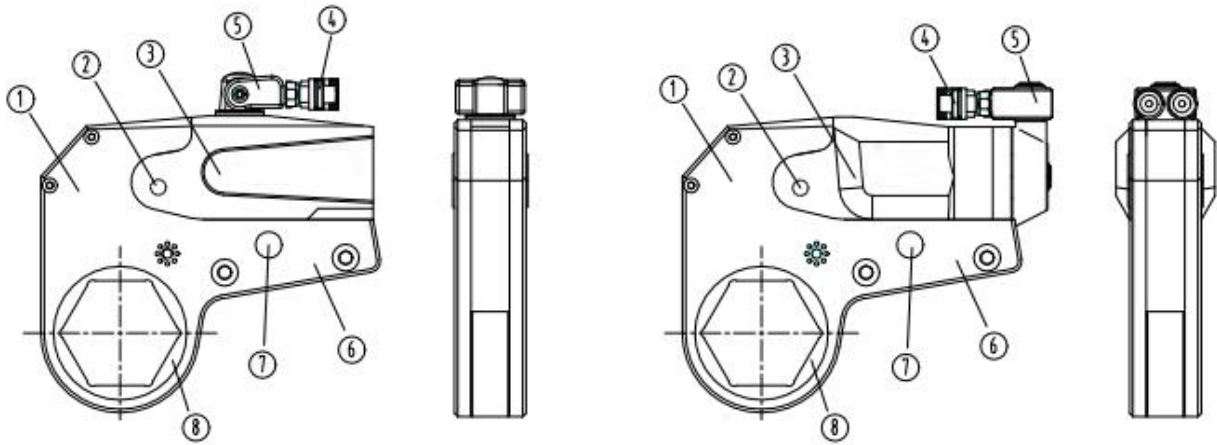
### **Safety first**

Hydraulic torque wrench is a power tool. Read all instructions, warnings and precautions carefully before use, and follow safety measures to avoid personal or equipment damage when operating the equipment! We are not responsible for damage caused by unsafe operation and wrong operation.

## II. Product description

The WHCD hydraulic torque wrench is made of aluminum-titanium alloy and ultra-high-strength alloy materials. It is manually controlled and has a double-acting hydraulic design, which can tighten and loosen bolt connections. It is widely used for the dis-assembly of high torque bolts, the torque is accurately adjustable, and the error does not exceed  $\pm 3\%$ .

## WHCD Hydraulic Torque Wrench:

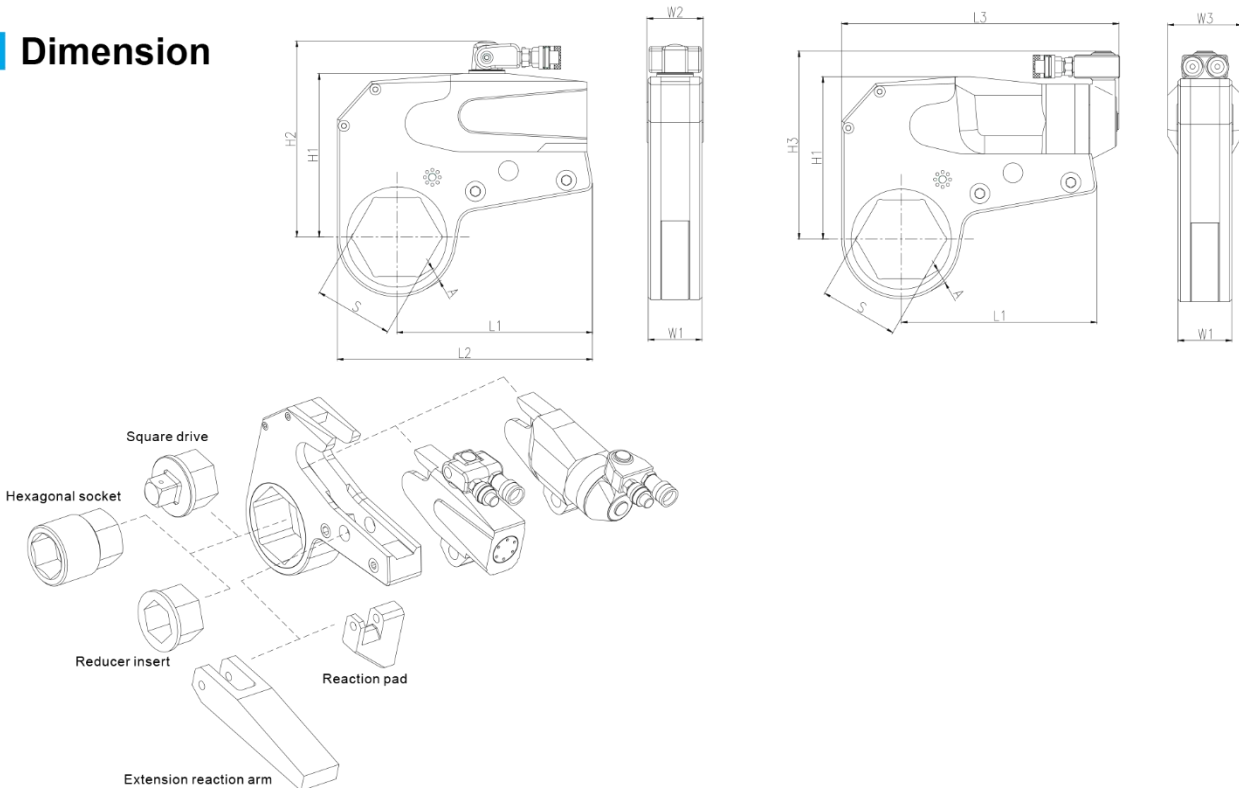


F (2)

No.	Item	No.	Items
①	Working head	⑤	360° × 360° rotary joint
②	Pin shaft	⑥	Reaction arm
③	Power head	⑦	Quick combination pin
④	Quick connector	⑧	Ratchet










## 1WHCD Technical Parameters:

### Dimension



Model	Torque (Nm)	A/F (mm)	Weight (kg)	L1 (mm)	L2 (mm)	L3 (mm)	H1 (mm)	H2 (mm)	H3 (mm)	W1 (mm)	W2 (mm)	W3 (mm)	A (mm)
1 WHCD	233 2326	36-60	2.1	120.5	156	191	100	144.5	142	34	36	50	8.3

### III. Warning

-  Warning: To avoid personal injury and possible equipment damage, ensure that each hydraulic component can withstand a working pressure of 700bar.
-  Warning: Do not exceed the rated load of the equipment  
Minimize the risk of overloading; use a pressure gauge in the system to display the operating load. The pressure gauge is a window of what happens in the system.  
Do not exceed the maximum allowable torque when using a hydraulic wrench.
-  Warning: Try to replace worn-out parts with original Jingke parts
-  Note: Avoid damage to hydraulic tubing  
Avoid serious bending and entanglement of hydraulic tubing during use. The use of bent or wound tubing will produce excessive back pressure. Severe bending and entanglement will damage the inside of the tubing and cause it to be scrapped prematurely.  
Do not drop or press heavy objects on the oil pipe. Severe impact can cause damage to the metal wires inside the tubing, and the damaged tubing may rupture when pressurized.  
Do not use hydraulic tubing to pull or lift other hydraulic components (such as pumps, hydraulic wrenches, valves, etc.).
-  Warning: In order to avoid damage to the equipment and personal injury, do not remove the protective plate on the wrench, do not modify the wrench and accessories, and do not change the safety valve on the rotary joint.
-  Note: Incorrect connection will cause malfunction and danger. Keep the quick connector clean before connecting, and screw on the dust cap after use
-  Note: Do not use worn-out sockets and plugs. Do not use metric sockets to twist inch nuts and bolts, and vice versa.
-  Warning: Use Jingke original high-performance sockets.
-  Warning: Fasten the drive head of the socket with a pin to prevent the socket from falling off.

#### IV. Recommendation table of bolt pre-tightening force

Table (1)

Strength grade		4.8		6.8		8.8		10.9		12.9	
Minimum breaking strength		400MPa		600MPa		800MPa		1000MPa		1200MPa	
Material		General structural steel		Steel for mechanical structure		Chrome Molybdenum Alloy Steel		Nickel-chromium-molybdenum alloy steel		Nickel-chromium-molybdenum alloy steel	
Bolt	Nut opposite side	Torque value		Torque value		Torque value		Torque value		Torque value	
M	S	KGM	NM	KGM	NM	KGM	NM	KGM	NM	KGM	NM
16	24	9	87	13	131	18	174	25	245	30	294
18	27	13	128	20	192	26	256	37	360	44	432
20	30	17	170	26	256	35	341	49	479	59	575
22	34	24	232	36	348	47	465	69	653	80	784
24	36	30	294	45	442	60	589	84	828	101	994
27	41	44	432	66	647	88	863	124	1214	149	1457
30	46	60	585	89	877	119	1171	168	1646	201	1975
33	50	81	796	122	1195	162	1593	228	2240	274	2688
36	55	104	1023	157	1535	209	2046	294	2878	352	3453
39	60	135	1324	203	1986	270	2649	380	3725	456	4469
42	65	167	1638	251	2457	334	3277	470	4608	564	5529
45	70	209	2045	313	3068	417	4090	587	5752	704	6903
48	75	251	2461	376	3691	502	4921	706	6921	847	8305
52	80	325	3181	487	4771	649	6362	913	8946	1095	10736
56	85	404	3956	605	5934	807	7912	1135	11127	1362	13352
60	90	504	4932	755	7398	1006	9864	1415	13871	1698	16645
64	95	608	5960	912	8940	1216	11920	1710	16762	2052	20115
68	100	738	7230	1107	10845	1475	14460	2075	20335	2450	24401
72	105	885	8669	1327	13003	1769	17337	2488	24381	2985	29257
76	110	1050	10287	1574	15430	2099	20573	2952	28931		34717
80	115	1234	12094	1851	18141	2468	24188	3471	34014		40815
85	120	1493	14636	2240	21953	2987	29271		41163		49395
90	130	1787	17510	2680	26266	3573	35021		49248		59098
100	145	2484	24341	3726	36512		48683		68460		82152
110	155	3342	32751		49126		65501		92111		110533
120	175	4378	42902		64354		85805		120663		144795
125	180		48683		73024		97366		136920		164304

Note: The values in the table are measured when the bolt reaches 60% of the yield limit.

The recommended tightening torque is: the value in the table × (70-80)%

For example: M52, 8.8 grade bolt, the tightening torque is 6362 × (70-80)% = 4453-5090 N.m

The loosening torque is 1.5-2 times the tightening torque

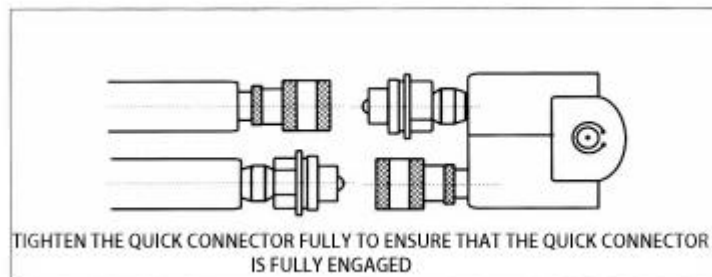
For example: in the above example, the tightening torque is 4453 N.m, then the loosening torque is 4453 × 2 = 8906 N.m

## V. Operation and Use

**Connect:** The wrench and the hydraulic pump are connected by the compound oil pipe woven with steel wire with working pressure of 700bar.

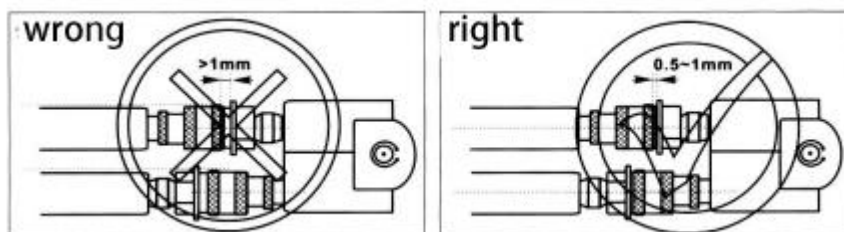
The bottom end of each oil pipe has a female connector and a male connector to ensure the correct connection between the pump and the wrench.

Do not change any bolts on the rotary joint at will. This is set by the manufacturer for safety. Only those who have received professional training can adjust.



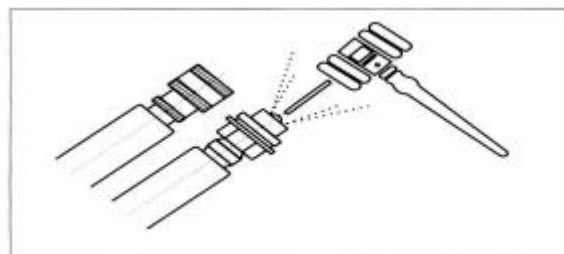
F (3)

When the quick connectors are interconnected, the distance between the gaps after engagement must be less than 1mm (Figure 4). Only in this way can the one-way valve in the connector be opened to make the oil path unblocked. Otherwise, after the connection, the steel ball in the joint does not match up, and the one-way valve in the joint cannot be opened and the oil circuit is blocked. Then the joint will be full of pressure, and the wrench will not work and the oil will be discharged from the automatic drain port on the wrench rotating body, etc.



F (4)

At this time, you need to disassemble all the hose joints, check all the steel balls in the quick joints, including the wrench joints, and check whether the steel balls can be pressed with your hands and are flexible. If you can't press it, you need to find a hammer to hit the steel ball in the joint (Figure 5) to release the pressure in the joint (please note that hydraulic oil will spray out when you hit the steel ball. Although it is not dangerous, it will stain your Clothes!) until the steel ball in the joint can be pressed by hand. Then reconnect again.

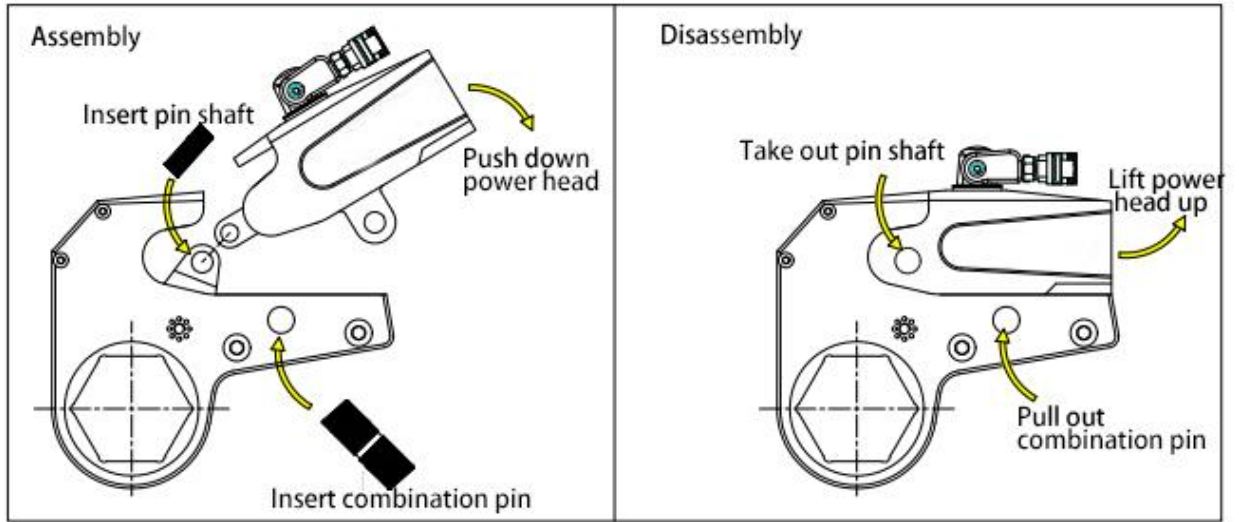


F (5)

**Combination and dis-assembly of working head and power head**

First push out the piston, then insert the power head pin control into the working head pin control and insert the pin shaft, then press down the power head, align the combination pin opening, and then insert the quick combination pin for positioning (Figure 8).

Push out all the pistons, pull out the quick combination pin, pull up the power head, and then take out the pin shaft to separate the power head from the working head (Figure 9).

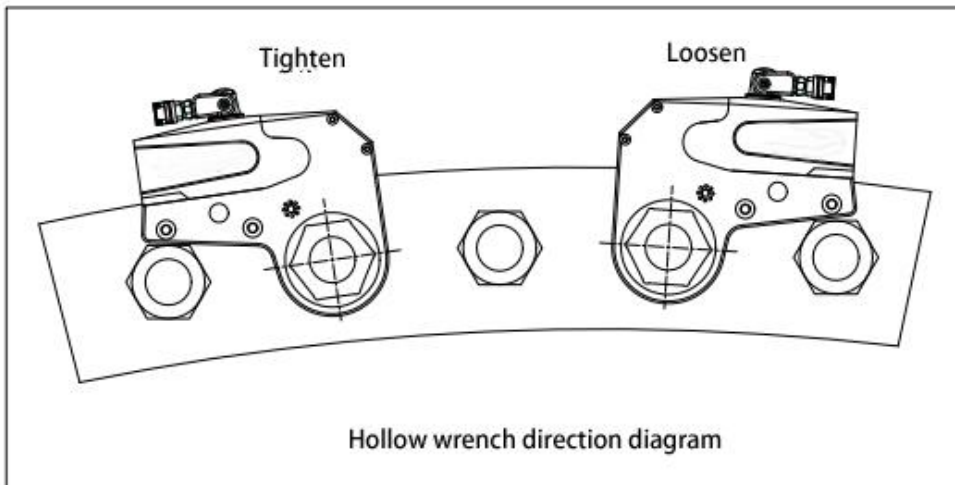


F (8)

F (9)

**Direction position**

The tightening procedure of the hollow wrench is also left loosening and right tightening. When working, ensure that the reaction arm or right angle is resting on a solid reaction fulcrum.



F (10)

**Preparation**

Determine the size of the nut to be loosened (tightened), and select the appropriate power head, working head and reducing socket accessories.

Connect pump station

Connect the high-pressure outlet (H or A) of the pump with the high-pressure outlet (H or A) of the hydraulic wrench, and connect the low-pressure outlet (B or R) of the pump with the low-pressure outlet (B or R) of the hydraulic wrench with high-pressure tubing respectively. When connecting, the quick connector on the oil pipe should be inserted to the end, and then tighten the fixing nut by hand.



Check carefully whether the oil pipe joints are connected reliably and whether there is oil in the pump.

Plug the power plug of the pump into the power source.

**Warning**    **Operation without oil is strictly prohibited!**

## Commissioning

Place the wrench on the open floor.

Turn on the power switch of the pump, start the pump, and check whether the pump is running normally.

Press any button on the wire control switch, the ratchet wheel starts to rotate at this time, when the piston is pushed to the full stroke, the ratchet wheel stops rotating, the pressure gauge rises rapidly from "0" to the set pressure, release the button, the wrench automatically returns;

When the wrench piston retracts, you will hear a "click" sound, the wrench will automatically return to position, and the pressure gauge will rise rapidly from "0" to 7.5MPa.

Note: Sometimes the piston retracts and the ratchet rotates in the opposite direction, and you can't hear the "click" sound; hold the ratchet with your hand and you will hear the "click" sound.

Press the button again, at this time the wrench turns, and a new cycle begins. Repeat several times, let the wrench run idly several times, and observe the direction of the wrench to determine whether the wrench can be placed on the nut.

**Note:** When the wrench is not in use, turn off the power of the oil pump immediately!

## Operating

### Adjust pressure

Press the line control switch button with one hand, the wrench stops rotating when the wrench is in place, and the pressure gauge increases rapidly from "0". Adjust the oil pump pressure valve with the other hand, and adjust the pointer in the pressure gauge to the required pressure.

### Loosening

Adjust the pumping station pressure to the highest, confirm the direction of the wrench, confirm the direction is to loosen, and put the wrench on the nut, find the reaction fulcrum, hold it firmly, and repeat the third action in the second item until the nut is removed.

### Tightening

#### 1. Torque setting

First, the torque can be set according to the design requirements; if there is no design torque, it is recommended to set the torque according to the data in the bolt pre-tightening force recommendation table.

The specific method is:  $\text{set torque} = (\text{value in the table}) \times (70\%-80\%)$

For example: 8.8 grade, M48 is a bolt, the recommended pre-tightening force in the table is 4921N.m, then the set torque is:  $4921 \times 75\% = 3691\text{N.m}$ .

#### 2. Pump station pressure setting

Set the pumping station pressure according to the required torque value and the type of wrench used.

For example, the bolt setting torque of the above 8.8 level and M48 is 3691N.m, and select the 4WHCD wrench. From the table, you can check that when the 4WHCD corresponds to the 3691N.m torque, the pump station pressure is 48Mpa, so the pump station pressure should be set to 48Mpa.

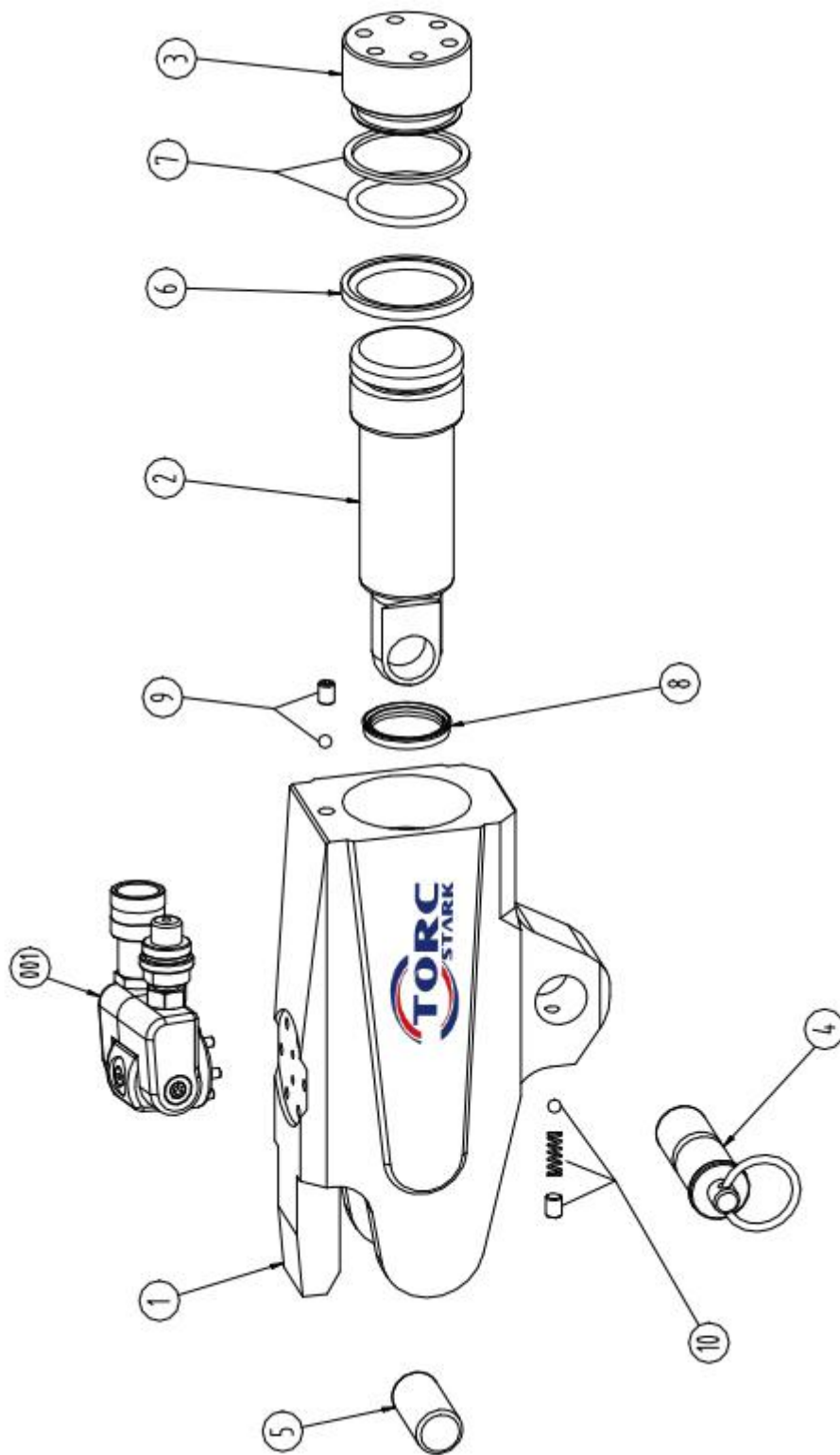
**3.** Make sure that the direction of the wrench is in the tightening direction, and place the wrench on the nut and repeat the actions of the third item in the second item until the nut does not move.

VI. **1WHCD Hydraulic Torque Wrench Pressure-torque comparison table**

Pressure	Pressure	Torque		Pressure	Pressure	Torque (Nm)
7	1015	3363		39	5655	18736
8	1160	3843		40	5800	19217
9	1305	4324		41	5945	19697
10	1450	4804		42	6090	20178
11	1595	5285		43	6235	20658
12	1740	5765		44	6380	21138
13	1885	6245		45	6525	21619
14	2030	6726		46	6670	22099
15	2175	7206		47	6815	22580
16	2320	7687		48	6960	23060
17	2465	8167		49	7105	23541
18	2610	8648		50	7250	24021
19	2755	9128		51	7395	24501
20	2900	9608		52	7540	24982
21	3045	10089		53	7685	25462
22	3190	10569		54	7830	25943
23	3335	11050		55	7975	26423
24	3480	11530		56	8120	26904
25	3625	12011		57	8265	27384
26	3770	12491		58	8410	27864
27	3915	12971		59	8555	28345
28	4060	13452		60	8700	28825
29	4205	13932		61	8845	29306
30	4350	14413		62	8990	29786
31	4495	14893		63	9135	30266
32	4640	15373		64	9280	30747
33	4785	15854		65	9425	31227
34	4930	16334		66	9570	31708
35	5075	16815		67	9715	32188
36	5220	17295		68	9860	32669
37	5365	17776		69	10005	33149
38	5510	18256		70	10150	33629

## VII. WHCD Exploded Diagram

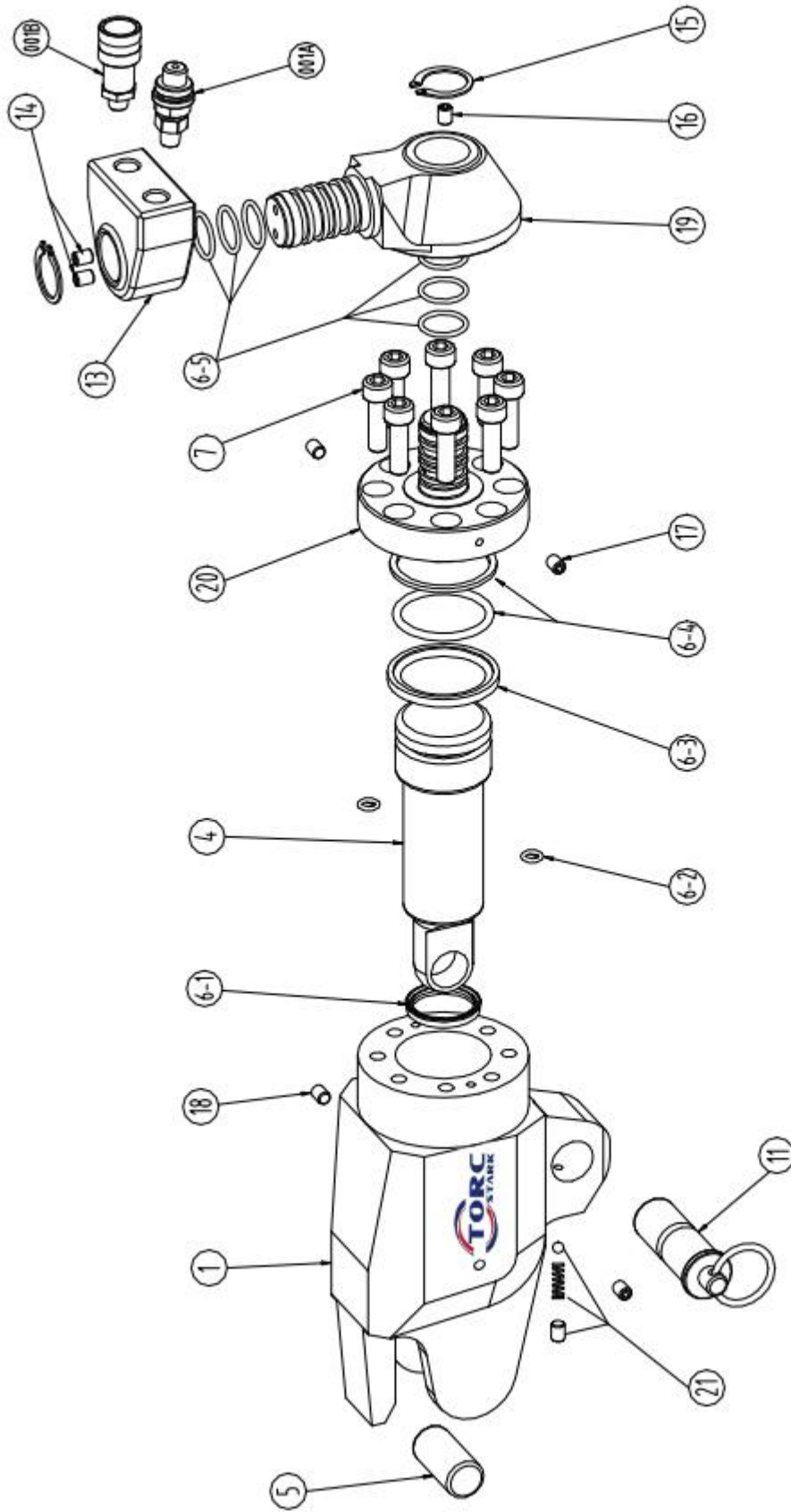
H – Cylinder



## H - Cylinder – details

No	Item	Qty	Model								
			1WHC D	3WHC D	4WHC D	6WHC D	8WHC D	15WHC D	25WHC D	35WHC D	50WHC D
1	cylinder	1	1H-1	3H-1	4H-1	6H-1	8H-1	15H-1	25H-1	35H-1	50H-1
2	Piston rod	1	1H-2	3H-2	4H-2	6H-2	8H-2	15H-2	25H-2	35H-2	50H-2
3	Bottom cover	1	1H-3	3H-3	4H-3	6H-3	8H-3	15H-3	25H-3	35H-3	50H-3
4	Combination pin shaft	1	1H-4	3H-4	4H-4	6H-4	8H-4	15H-4	25H-4	35H-4	50H-4
5	Pin shaft	1	1H-5	3H-5	4H-5	6H-5	8H-5	15H-5	25H-5	35H-5	50H-5
6	Seals	1	1H-6	3H-6	4H-6	6H-6	8H-6	15H-6	25H-6	35H-6	50H-6
7	Seals	1	1H-7	3H-7	4H-7	6H-7	8H-7	15H-7	25H-7	35H-7	50H-7
8	Seals	1	1H-8	3H-8	4H-8	6H-8	8H-8	15H-8	25H-8	35H-8	50H-8
9	Plug/ball	1	1H-9	3H-9	4H-9	6H-9	8H-9	15H-9	25H-9	35H-9	50H-9
10	Plug/spring/ball	1	1H-10	3H-10	4H-10	6H-10	8H-10	15H-10	25H-10	35H-10	50H-10
001	Connector group	1	1H-001	3H-001	4H-001	6H-001	8H-001	15H-001	25H-001	35H-001	50H-001

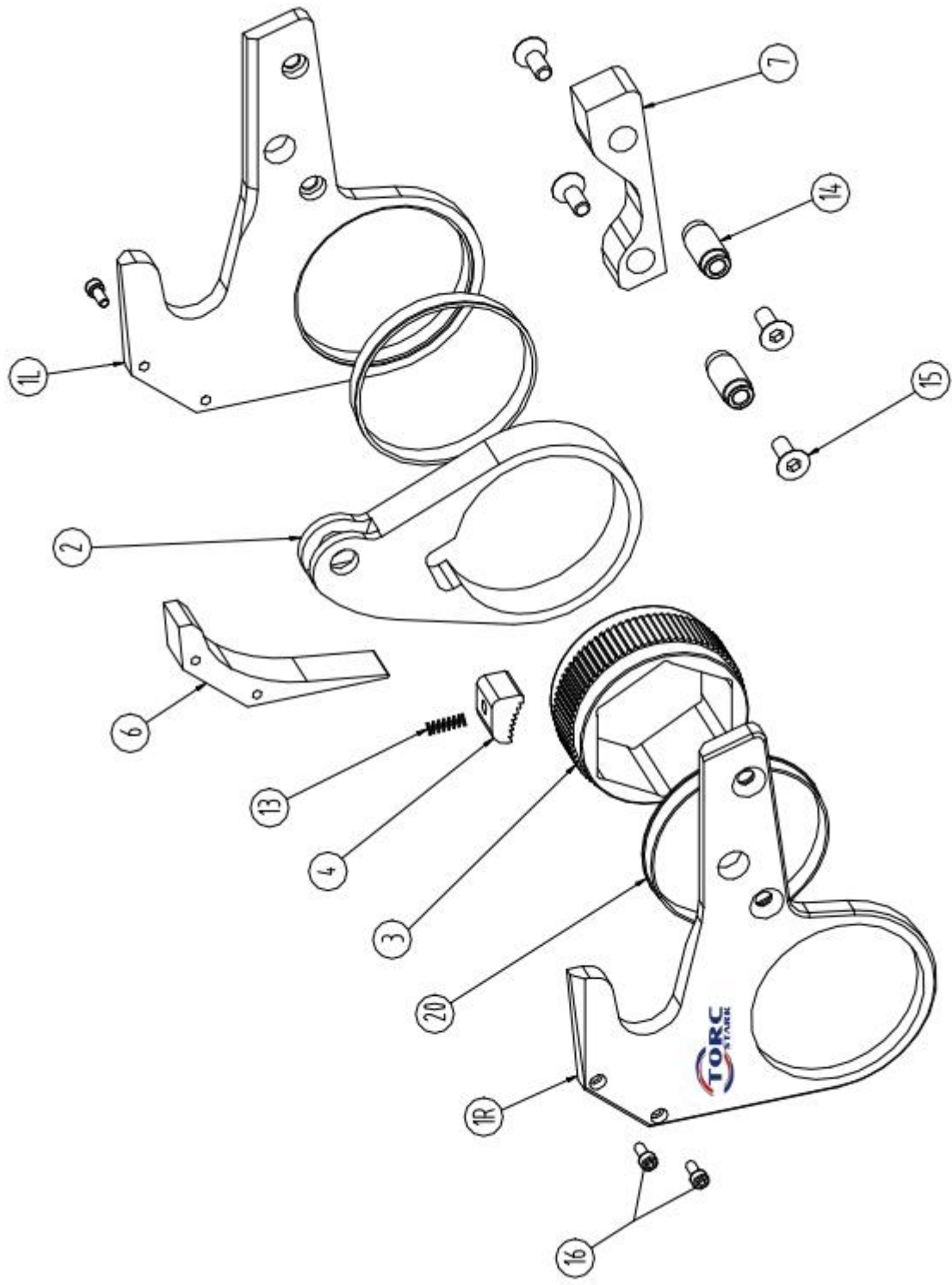
# W Cylinder — Exploded diagram



## W Cylinder - details

No	Item	Qty.	Model								
			1WHCD	3WHC D	4WHC D	6WHC D	8WHC D	15WHC D	25WHC D	35WHC D	50WHC D
1	cylinder	1	1W-1	3W-1	4W-1	6W-1	8W-1	15W-1	25W-1	35W-1	50W-1
4	Piston rod	1	1W-4	3W-4	4W-4	6W-4	8W-4	15W-4	25W-4	35W-4	50W-4
5	Pin shaft	1	1W-5	3W-5	4W-5	6W-5	8W-5	15W-5	25W-5	35W-5	50W-5
6-1	Seals	1	1W-6-1	3W-6-1	4W-6-1	6W-6-1	8W-6-1	15W-6-1	25W-6-1	35W-6-1	50W-6-1
6-2	O-ring	2	1W-6-2	3W-6-2	4W-6-2	6W-6-2	8W-6-2	15W-6-2	25W-6-2	35W-6-2	50W-6-2
6-3	Seals	1	1W-6-3	3W-6-3	4W-6-3	6W-6-3	8W-6-3	15W-6-3	25W-6-3	35W-6-3	50W-6-3
6-4	Seals	1	1W-6-4	3W-6-4	4W-6-4	6W-6-4	8W-6-4	15W-6-4	25W-6-4	35W-6-4	50W-6-4
6-5	Seals	6	1W-6-5	3W-6-5	4W-6-5	6W-6-5	8W-6-5	15W-6-5	25W-6-5	35W-6-5	50W-6-5
7	Screw	8	1W-7	3W-7	4W-7	6W-7	8W-7	15W-7	25W-7	35W-7	50W-7
11	Combinati on pin	1	1W-11	3W-11	4W-11	6W-11	8W-11	15W-11	25W-11	35W-11	50W-11
13	Connector body	1	1W-13	3W-13	4W-13	6W-13	8W-13	15W-13	25W-13	35W-13	50W-13
14	Plug	2	1W-14	3W-14	4W-14	6W-14	8W-14	15W-14	25W-14	35W-14	50W-14
15	Snap ring	2	1W-15	3W-15	4W-15	6W-15	8W-15	15W-15	25W-15	35W-15	50W-15
16	Plug	1	1W-16	3W-16	4W-16	6W-16	8W-16	15W-16	25W-16	35W-16	50W-16
17	Plug	2	1W-17	3W-17	4W-17	6W-17	8W-17	15W-17	25W-17	35W-17	50W-17
18	Plug	2	1W-18	3W-18	4W-18	6W-18	8W-18	15W-18	25W-18	35W-18	50W-18
19	Joint body base	1	1W-19	3W-19	4W-19	6W-19	8W-19	15W-19	25W-19	35W-19	50W-19
20	Bottom cover	1	1W-20	3W-20	4W-20	6W-20	8W-20	15W-20	25W-20	35W-20	50W-20
21	Plug/spring /ball	1	1W-21	3W-21	4W-21	6W-21	8W-21	15W-21	25W-21	35W-21	50W-21
00 1A	Push-in connector	1	1W- 001A	3W- 001A	4W- 001A	6W- 001A	8W- 001A	15W- 001A	25W- 001A	35W- 001A	50W- 001A
00 1B	Push-in connector	1	1W- 001B	3W- 001B	4W- 001B	6W- 001B	8W- 001B	15W- 001B	25W- 001B	35W- 001B	50W- 001B

WHCD working head— Exploded diagram

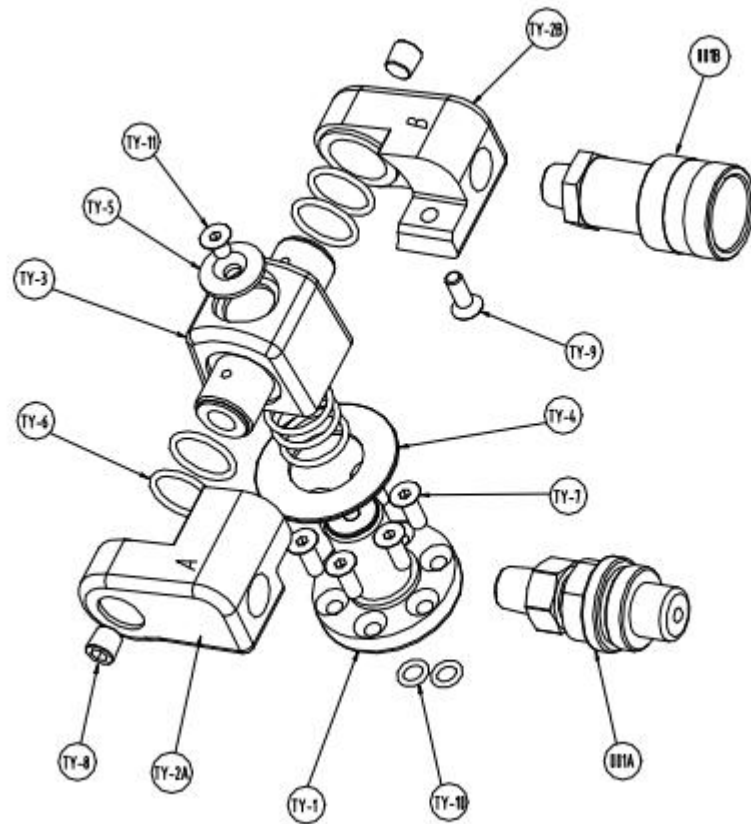


WHCD working head - details

No	Item	Qty	Model								
			1WHC D	3WHC D	4WHC D	6WHC D	8WHC D	15WHC D	25WHC D	35WHC D	50WHC D
1R	Outer baffle-right	1	1WH-1R	3WH-1R	4WH-1R	6WH-1R	8WH-1R	15WH-1R	25WH-1R	35WH-1R	50WH-1R
1L	Outer baffle-left	1	1WH-1L	3WH-1L	4WH-1L	6WH-1L	8WH-1L	15WH-1L	25WH-1L	35WH-1L	50WH-1L
2	Transmission plate	1	1WH-2	3WH-2	4WH-2	6WH-2	8WH-2	15WH-2	25WH-2	35WH-2	50WH-2
3	ratchet	1	1WH-3	3WH-3	4WH-3	6WH-3	8WH-3	15WH-3	25WH-3	35WH-3	50WH-3
4	pawl	1	1WH-4	3WH-4	4WH-4	6WH-4	8WH-4	15WH-4	25WH-4	35WH-4	50WH-4
6	Cushion	1	1WH-6	3WH-6	4WH-6	6WH-6	8WH-6	15WH-6	25WH-6	35WH-6	50WH-6
7	Reaction arm	1	1WH-7	3WH-7	4WH-7	6WH-7	8WH-7	15WH-7	25WH-7	35WH-7	50WH-7
13	Pawl spring	1	1WH-13	3WH-13	4WH-13	6WH-13	8WH-13	15WH-13	25WH-13	35WH-13	50WH-13
14	Screw fixed shaft	2	1WH-14	3WH-14	4WH-14	6WH-14	8WH-14	15WH-14	25WH-14	35WH-14	50WH-14
15	Screw	4	1WH-15	3WH-15	4WH-15	6WH-15	8WH-15	15WH-15	25WH-15	35WH-15	50WH-15
16	Screw	4	1WH-16	3WH-16	4WH-16	6WH-16	8WH-16	15WH-16	25WH-16	35WH-16	50WH-16
20	Copper sets	2	1WH-20	3WH-20	4WH-20	6WH-20	8WH-20	15WH-20	25WH-20	35WH-20	50WH-20



VIII. Exploded Diagram of connector group — 001



No.	Item	Qty.	Model
TY-1	Connector base	1	-
TY-2A	Connector-A	1	-
TY-2B	Connector-B	1	-
TY-3	Connector body	1	-
TY-4	Cover plate	1	-
TY-5	Cap	1	-
TY-6	O-ring	7	d18*2
TY-7	Screw	6	M5*14
TY-8	Plugging	2	NPT1/8
TY-9	Screw	1	M5*16
TY-10	O-ring	2	d4.15*1.9
TY-11	Screw	1	M5*8
00 1A	Quick connect plug-male	1	C701E-M
00 1B	Quick connect plug-female	1	C701E-F

## **IX. After-sales Service**

Please read this manual carefully before requesting Jingke after-sales service department to repair the wrench. Please do not repair the wrench by yourself without the approval of the authoritative department of our company.

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