# OPERATION AND MAINTENANCE MANUAL

ATW CR series Hydraulic Torque Wrench

It is operating manual of ATW CR series Torque Wrench, please read carefully with following instruction, warning and Caution before using Tool.

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## 1. IMPORTANT INSTRUCTIONS ON RECEIPT (OPEN PACKAGE INSPECTION)

Carefully inspect all components for shipping damages. If any shipping damage is found, notify the carrier at once. Shipping damage is NOT covered by warranty.
The carrier is responsible for all repairs.

### SAFETY FIRST!

The hydraulic torque wrench is a power tool. read all the instructions, warnings and caution before every operation. Comply with the safety precautions to avoid personal injury or equipment damage while operating this tool,Neither WREN, nor its distributors are respons -ible for damage to the tool caused by unsafe and/or faulty operations.

## 2. PRODUCTIONS DESCRIPTION

alloy and super high strength alloy steel for increased strength, intensity and durability of the tool. Double acting hydraulic design, Can lock and loosen the bolt connection, widely suitable fo larger torque bolt and disassembly, High repeatability, a precise design is with accuracy ±3%.

ATW CR , LOW Torque Wrenches:

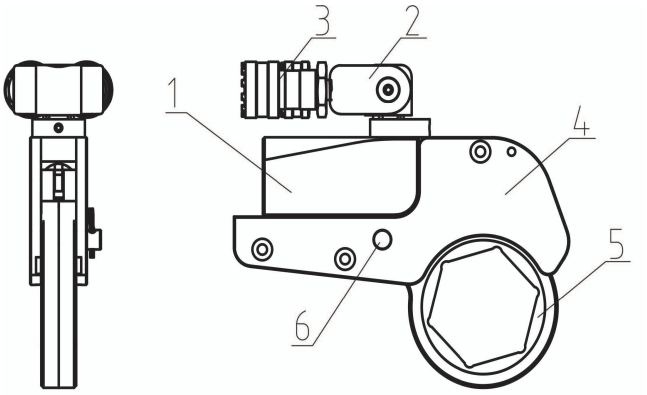



Figure 2

| ITEM | NAME |
|---|---|
| ① | POWER HEAD |
| ② | 360°×180° SWIVEL ASSEMBLY |
| ③ | QUICK COUPLING |
| ④ | CASSETTE LINK |
| ⑤ | HEX RATCHET |
| ⑥ | LINK PIN |

## 3. WARNING AND CAUTION

### SAFETY FIRST!

**WARNING**

To avoid personal injuries and/or equipment damage, be sure that every hydraulic compon -ent of the hydraulic torque wrench, hydraulic hose assembly, hydraulic power pack and gauge are rated for 10,000 PSI (700kg/cm2) operating pressure.

**WARNING**

**D**o not e**x**ceed t**h**e rated load of t**h**e equipment To minimize the danger of injury and damage to equipment: Never use a hydraulic torque wrench without a hydraulic gauge to indicate the working pressure. The hydraulic gauge is a window to show what is happening in the hydraulic system.

**DO NOT exceed the allowable maximum torque of the hydraulic torque wrench.**

**WARNING**

**I**mmediately **r**eplace any **w**or**r** damaged pa**r**ts of t**h**e tool **w**it**h** genuine **WREN r**eplaceme -ntap**r**ts

**CAUTION**

**A**void damage to **h**ydraulic **h**oses Reduce damage to the hydraulic hose assembly by avoiding sharp bends and kinks when routing the hydraulic hose assembly. Using a bent or kinked hydraulic hose assembly will cause severe back-pressure. Also, sharp bends and kinks will internally damage the hose leading to premature failure. A kinked or damaged hydraulic hose assembly should be **D**o not use **h**yd**r**aulic **h**oses to pull and lift ot**h**e**r** **h**yd**r**aulic components (eg pumps, **h**yd**r**aulic **wr**enc**h**es, valves, etc.).

replaced immediately.

**CAUTION**

**DO NOT** drop heavy objects, crush, or drive over the hydraulic hose assembly. A sharp impact may cause internal damage to t he hose wire strands. Applying pressure to a damaged hose may cause it to rupture. A crushed hydraulic hose assembly should be replaced immediately.

**CAUTION**

Avoid high temperature exposure to the hydraulic hose assembly.

**ALWAYS INSPECT THE HYDRAULIC HOSE ASSEMBLY FOR DAMAGE AND WEAR PRIOR TO USE.**

**WARNING**

To avoid personal injuries, equipment damage and/or warranty invalidation:

**DO NOT:** Remove the shroud from the hydraulic torque wrench. Modify any component of the hydraulic torque wrench. Adjust the hydraulic torque wrench safety relief valve located inside the swivel couplings.

**CAUTION**

The incorrect system connection may cause failure and injury. Before connecting the hydra -ulic torque wrench and hydraulic hose assembly to the assembled power pack, make sure the hydraulic torque wrench swivel couplings, hose couplings and hydraulic power pack couplings are clean and free of debris.

**LOOSE OR DIRTY COUPLERS WILL CAUSE TOOL NOT TO OPERATE PROPERLY**
**CAUTION**
**DO NOT** use old or damaged sockets. use the wrong size sockets.

**WARNING**
Only use a high quality socket.

**WARNING**
Always use a pin to lock the socket with the square drive in order to avoid the s ocket from falling off.

## WARNING SIGN

Warning signs are shown in the following table

| warning table | Meaning | Affixed Position |
|---|---|---|
|  | PROHIBIT USING BY HAND | Reaction Arm |
|  | THE SQUARE DRIVE IN POSITION, LEFT LOOSEN, RIGHT TIGHTEN | Cassette Link |
|  | PRIOR TO USE, FIXED THE REACTION ARM | REVERSING LEVER |

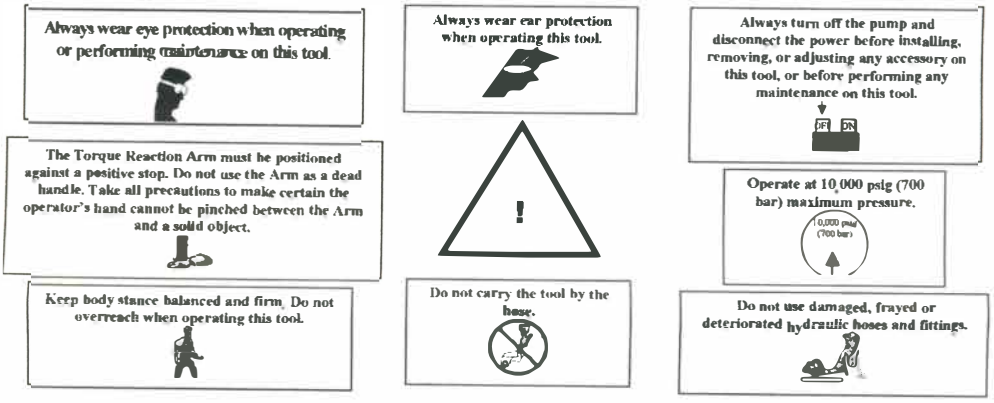
## 4. BOLTING TIGHTENING FORCE RECOMMENTED CHART

FORM 1

| Strength Grade | | 4.8 | | 6.8 | | 8.8 | | 10.9 | | 12.9 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Min breaking strength | | 392MPa | | 588MPa | | 784MPa | | 941MPa | | 1176MPa | |
| Material | | General structural steel | | Mechanical construction steel | | Chrome-molybdenum alloy steel | | Nickel-chromium-molybdenum alloy steel | | | |
| Bolting | Thread | Torque values | | Torque values | | Torque values | | Torque values | | Torque values | |
| M | mm | KGM | N.m | KGM | N.m | KGM | N.m | KGM | N.m | KGM | N.m |
| 14 | 22 | 7 | 69 | 10 | 98 | 14 | 137 | 17 | 165 | 23 | 225 |
| 16 | 24 | 10 | 98 | 14 | 137 | 21 | 206 | 25 | 247 | 36 | 363 |
| 18 | 27 | 14 | 137 | 21 | 206 | 29 | 284 | 35 | 341 | 49 | 480 |
| 20 | 30 | 18 | 176 | 28 | 296 | 41 | 402 | 58 | 569 | 69 | 680 |
| 22 | 32 | 23 | 225 | 34 | 333 | 55 | 539 | 78 | 765 | 93 | 911 |
| 24 | 36 | 32 | 314 | 48 | 470 | 70 | 686 | 100 | 981 | 120 | 1176 |
| 27 | 41 | 45 | 441 | 65 | 637 | 105 | 1029 | 150 | 1472 | 180 | 1764 |
| 30 | 46 | 60 | 588 | 90 | 882 | 125 | 1225 | 200 | 1962 | 240 | 2352 |
| 33 | 50 | 75 | 735 | 115 | 1127 | 150 | 1470 | 210 | 2060 | 250 | 2450 |
| 36 | 55 | 100 | 980 | 150 | 1470 | 180 | 1764 | 250 | 2453 | 300 | 2940 |
| 39 | 60 | 120 | 1176 | 180 | 1764 | 220 | 2156 | 300 | 2943 | 370 | 3626 |
| 42 | 65 | 155 | 1519 | 240 | 2352 | 280 | 2744 | 390 | 3826 | 470 | 4606 |
| 45 | 70 | 180 | 1764 | 280 | 2744 | 320 | 3136 | 450 | 4415 | 550 | 5390 |
| 48 | 75 | 230 | 2254 | 350 | 3430 | 400 | 3920 | 570 | 5592 | 680 | 6664 |
| 52 | 80 | 280 | 2744 | 420 | 4116 | 480 | 4704 | 670 | 6573 | 850 | 8330 |
| 56 | 85 | 360 | 3528 | 530 | 5149 | 610 | 5978 | 860 | 8437 | 1050 | 10290 |
| 60 | 90 | 410 | 4018 | 610 | 5978 | 790 | 7742 | 1100 | 10791 | 1350 | 13230 |
| 64 | 95 | 510 | 4998 | 760 | 7448 | 900 | 8820 | | | | |
| 68 | 100 | 580 | 5684 | 870 | 8526 | 1100 | 10780 | | | | |
| 72 | 105 | 660 | 6468 | 1000 | 9800 | 1290 | 12642 | | | | |
| 76 | 110 | 750 | 7350 | 1100 | 10780 | 1500 | 14701 | | | | |
| 80 | 115 | 830 | 8143 | 1250 | 12250 | 1850 | 18130 | | | | |
| 85 | 120 | 900 | 8820 | 1400 | 13720 | 2250 | 22050 | | | | |
| 90 | 130 | 1080 | 10584 | 1650 | 16170 | 2500 | 24500 | | | | |
| 100 | 145 | 1400 | 13720 | 2050 | 20090 | | | | | | |
| 110 | 155 | 1670 | 16366 | 2550 | 24990 | | | | | | |
| 120 | 175 | 2030 | 19894 | 3050 | 29890 | | | | | | |

**REMARKS:**

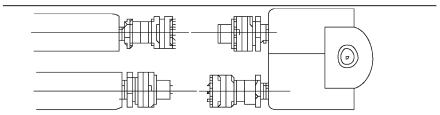
1. All recommendations above are in accordance with the Germany standard (DIN).
2. The figures above represent the maximum bolt torque; the recommended torque is 80% of these chart figures.
3. The recommended tightening torque is 80% of the chart figure above. For example; for bolt M52 the strength grade is 8.8 therefore, the torque is 4704*80% = 3763Nm
4. The recommended loosening torque is 150%(200%) of the tighting torque. For example; the tight -ening torque is 3763*150%(200%) = 5645(7526) Nm.



## 5. OPERATION

Connect:

The wrench and the hydraulic pump are steel wire braided compound tubing connections with a rated working pressure of 700 Bar. The bottom end of each tubing has bump connectors to ensure proper connection between the pump and the wrench. Do not arbitrarily change any bolts on the swivel joint. This is set by the manufacturer for safety and can only be adjusted by professional trainers.



Fully screwed the quick coupler, to ensure joint tooth completely

FIG (3)

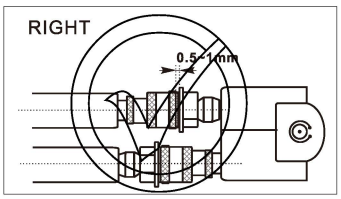



FIG (4)

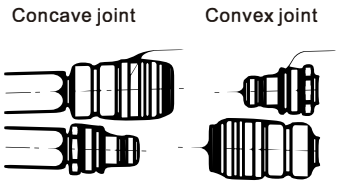



FIG (5)

When the quick connector is interconnected, it must be ensured that there is no gap after the throat is connected. (Figure 4) 'This is the only way to ensure the connection. Open the check valve in the quick connector to make the oil passage clear. Otherwise, after the connection, the steel ball in the joint does not have a top, and the check valve in the joint cannot be opened. After the oil passage is blocked, the joint will be filled with pressure, and the wrench will not operate, and the automatic drain port on the rotating body of the wrench will come out. Oil and other phenomena.At this point, it is necessary to disassemble all the hose joints, check that all the quick joints include the steel balls in the wrench joints, and whether the steel balls can be pressed by hand or not. If you can't press it, you need to find the hammer to hit the steel ball in the joint (Figure 6), release the pressure in the joint, please note that there will be hydraulic oil spray when hitting the steel ball, although it is not dangerous, it will stain your clothes. Until you can press the steel ball in the joint by hand. Reconnect again.

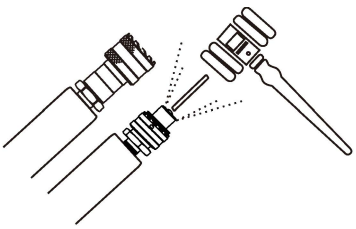
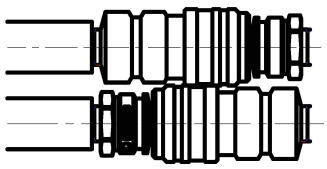


FIG (6)



when in use (completely stuck, according to the code of the arrow reverse operation)

FIG (7)

Please stand away from the position where the hydraulic oil may be spurt out; hydraulic oil may penetrate your hand and hurt you.If the hydraulic oil splashed in your eyes, please immediately wash your eyes about 15minutes with clean water, then you must go to hospital for help right now.Please do not touch the pressurized hose; if the hydraulic oil splashed out, it will cause serious injury.Hydraulic hose is consumable part, the crack and pinholes might still existing inside after proper visual inspection. WREN suggests changing the hose regularly for smoothing use.When using,try to avoid bending the hose in sudden.

ATW series

The connect and separation between Power Head and Cassette Link

Place the fixed upper pin on the power head into the of end hook of the Cassette Link, make sure the direction of the hook is correct (vertically downward), then press the power head, push the drive plate of Cassette Link into the side plate, insert the link pin

Pull out the link pin, pull up on the power head, then separate the power head from the Cassette Link in the direction of the groove

Direction and Position

Tighten in right side and loosen in left side for LOW wrench's operation. When moving, ensure that the reaction arm or right angle is placed on a firm reaction supporting point, and the ring of link pin is outside.

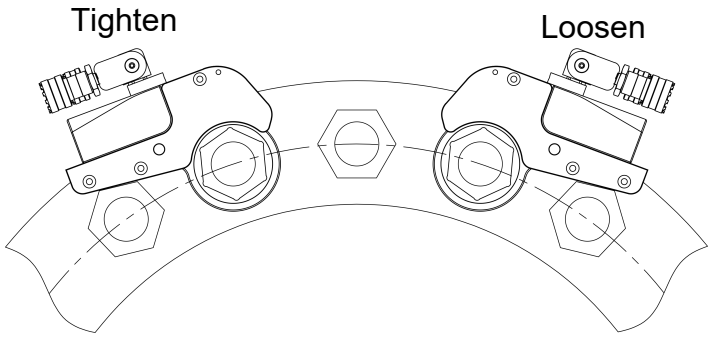



Figure 8

Preparation: Determine the size of the nut to be loosened and select the appropriate power head, cassette link and
adapter. Connect to Pump
Connect the high pressure outlet (H or A) of the pump to the high pressure outlet (H or A) of the hydraulic wrench, the
low pressure outlet (L or R) of the pump, and the low pressure outlet (L or R) of the hydraulic wrench to each other with a hose. When connecting, the quick coupler should be connected tightly.
Carefully check if the quick couplers are fully connected and if there is enough oil in Pump Tank.
Connect the Pump to power source.
WARNING: Do not run the pump if the oil is not enough.

## Try to operate

1. Put the wrench on the empty ground, the first start is completed, check whether the hex ratchet normally during the return trip. If the rotation is not normal, there is a possibility that the power head and the rod end hook do not fit fully, then inspect.
2. . Turn on the power, start the pump, then press the button on remote control to checkif the pump is working properly.
3. Press the button on the remote control, then the hex ratchet starts to rotate. When you hear a "click", the wrench will run in place and stop rotating. The pressure gauge will rise rapidly from "0" to the set pressure, release the button. The wrench automatically returns; when it hears a "click", the wrench automatically returns to the position, and the pressure gauge rises rapidly from "0" to 9Mpa. Press the button again and the wrench will turn and a new cycle will begin. Repeat several times to make the wrench idling several times, observe whether the wrench is abnormal, then need to loosen or tighten according to the working condition, put the wrench on the nut.

Note: When the wrench is not used temporarily, you can use the button to turn off the motor. If it is not used for a long time, you should turn off the power immediately!

## Operation

Adjust Pressure

Press the button on remote control in one hand. When you see the releasing lever coming down, the wrench stops in position, the force meter rises rapidly from "0", the other hand adjusts the pressure to the desired value by pressure regulating valve. Adjust the pressure to the highest position, confirm the steering of the wrench, confirm the direction of the loosening, put the wrench on the nut, find the reaction fulcrum, stabilize, and repeat the third action in the test run until the nut is removed.

Tighten

1. Set up Torque

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 table (1)

The specific method is: Torque = (the data in the table) X (80%-90%)

For example: 8.8 grade, M48 bolt, the recommended pre-tightening torque in the table is 3920N.m, then the set torque is: 3920X90%=3528N.m.

2.Set up pressure on Pump

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

or example, the class 8.8 and M48 bolt set torque is 3528N.m, and the 4LOW type wrench is used.

The pressure at the pump is 460bar when the torque is 3,528 N.m, so the pump pressure should be set to 460 bar.

3.Make sure that the turn direction of the wrench is in the direction of tightening. Place the wrench on the nut and repeat the third action in the test run until the nut does not move.

When the wrench can not be taken down in using:

during operation,after tightenning,if the wrench is stucked,please do not use hammer to hit.Just keep pressing down the "on" button of the pump,at the same time press down the reaction pawl,then release the pump button,the reaction pawl one by one.Under this process,the wrench can be easily taken off from the bolt.

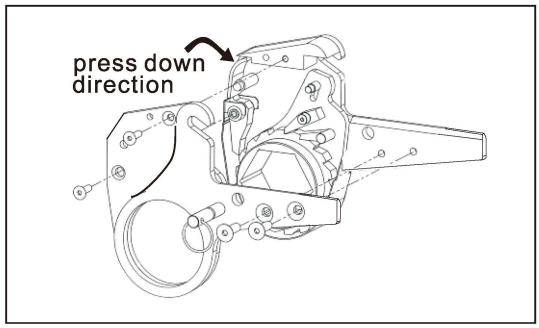


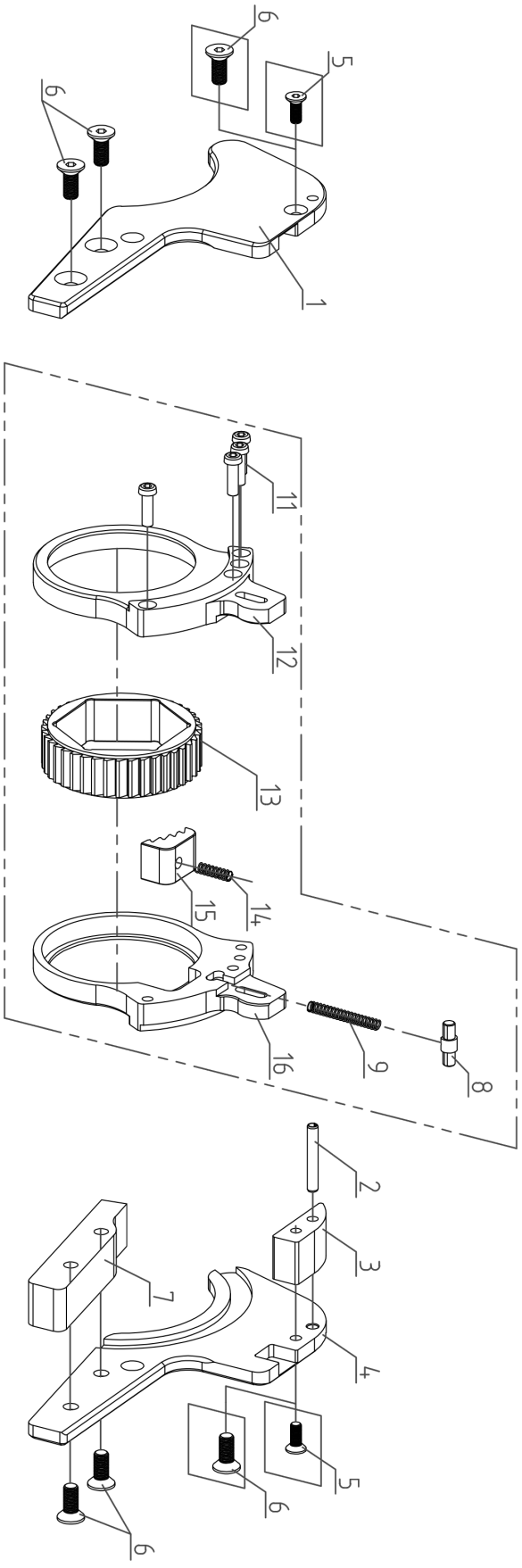

FIG 9

6. ATW CR-(55-85) Torque -Pressure chart

| Pressure（MPa) | Torque（N.m) | Pressure（MPa) | Torque（N.m) |
|---|---|---|---|
| 7 | 504 | 39 | 2810 |
| 8 | 576 | 40 | 2882 |
| 9 | 649 | 41 | 2954 |
| 10 | 721 | 42 | 3026 |
| 11 | 793 | 43 | 3098 |
| 12 | 865 | 44 | 3171 |
| 13 | 937 | 45 | 3243 |
| 14 | 1009 | 46 | 3315 |
| 15 | 1081 | 47 | 3387 |
| 16 | 1153 | 48 | 3459 |
| 17 | 1225 | 49 | 3531 |
| 18 | 1297 | 50 | 3603 |
| 19 | 1369 | 51 | 3675 |
| 20 | 1441 | 52 | 3747 |
| 21 | 1513 | 53 | 3819 |
| 22 | 1585 | 54 | 3891 |
| 23 | 1657 | 55 | 3963 |
| 24 | 1729 | 56 | 4035 |
| 25 | 1801 | 57 | 4107 |
| 26 | 1873 | 58 | 4179 |
| 27 | 1946 | 59 | 4251 |
| 28 | 2018 | 60 | 4323 |
| 29 | 2090 | 61 | 4395 |
| 30 | 2162 | 62 | 4468 |
| 31 | 2234 | 63 | 4540 |
| 32 | 2306 | 64 | 4612 |
| 33 | 2378 | 65 | 4684 |
| 34 | 2450 | 66 | 4756 |
| 35 | 2522 | 67 | 4828 |
| 36 | 2594 | 68 | 4900 |
| 37 | 2666 | 69 | 4972 |
| 38 | 2738 | 70 | 5044 |

7. ATW CR Assembly Drawing for Ratchet Link

2ATW CR 4ATW CR 8ATW CR 14ATW CR 30ATW CR



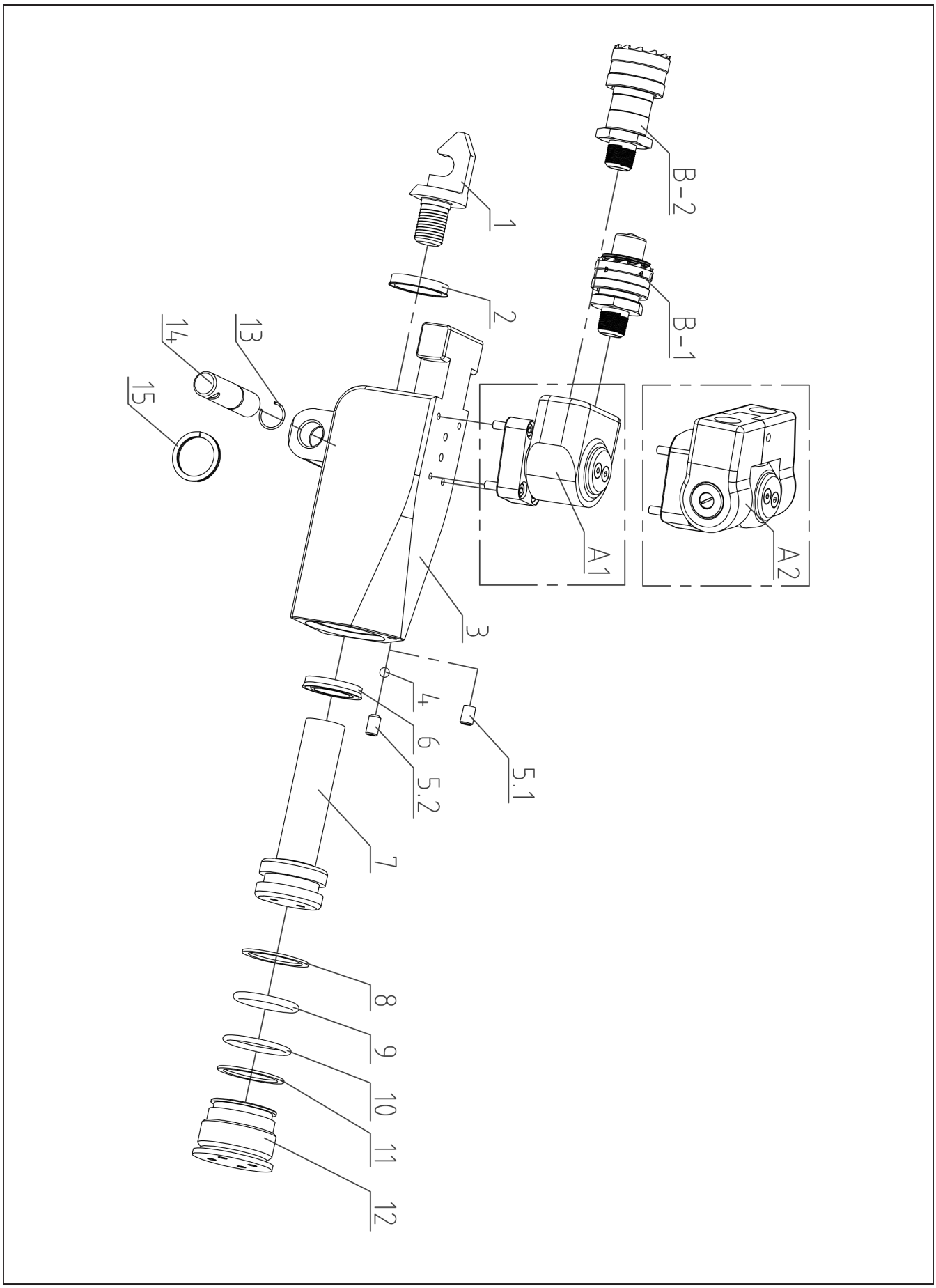
8. ATW CR Part Drawing

2ATW CR 4ATW CR 8ATW CR 14ATW CR 30ATW CR

| Item | Name | 2ATW CR | 4ATW CR | 8ATW CR | 14ATW CR | 30ATW CR |
|---|---|---|---|---|---|---|
| | | QTY | QTY | QTY | QTY | QTY |
| 1 | Right Side Plate | 1 | 1 | 1 | 1 | 1 |
| 2 | Spring Pin | 1 | 1 | 1 | 1 | 1 |
| 3 | Top spacer | 1 | 1 | 1 | 1 | 1 |
| 4 | Left side plate | 1 | 1 | 1 | 1 | 1 |
| 5 | Screw | 2 | 2 | 2 | 2 | 2 |
| 6 | Screw | 4 | 4 | 4 | 4 | 4 |
| 7 | Reaction block extension | 1 | 1 | 1 | 1 | 1 |
| 8 | Drive Pin | 1 | 1 | 1 | 1 | 1 |
| 9 | Compression Spring | 1 | 1 | 1 | 1 | 1 |
| | | | | | | |
| 11 | Screw | 4 | 4 | 4 | 4 | 4 |
| 12 | Right Drive Plate | 1 | 1 | 1 | 1 | 1 |
| 13 | Hex Ratchet | 1 | 1 | 1 | 1 | 1 |
| 14 | Compression Spring | 1 | 1 | 1 | 1 | 1 |
| 15 | Drive Pawl | 1 | 1 | 1 | 1 | 1 |
| 16 | Lfte Drive Plate | 1 | 1 | 1 | 1 | 1 |

## 9. ATW CR series Assembly Drawing for Power head

2ATWHCR 4ATWHCR 8ATWHCR 14ATWHCR 30ATWHCR



## 10. ATW CR series Part Drawing for Power head

2ATW CR 4ATW CR 8ATW CR 14ATW CR 30ATW CR

| Item | Name | 2ATWHCR | 4ATWHCR | 8ATWHCR | 14ATWHCR | 30ATWHCR |
|---|---|---|---|---|---|---|
| | | QTY | QTY | QTY | QTY | QTY |
| 1 | Hook | 1 | 1 | 1 | 1 | 1 |
| 2 | Copper Sleeve | 1 | 1 | 1 | 1 | 1 |
| 3 | Housing | 1 | 1 | 1 | 1 | 1 |
| 4 | Ball Steel | 1 | 1 | | | |
| 5.1 | Plug Screw | | | 1 | 1 | 1 |
| 5.2 | Fixing Screw | 1 | 1 | | | |
| 6 | U-Ring | 1 | 1 | 1 | 1 | 1 |
| 7 | Piston rod | 1 | 1 | 1 | 1 | 1 |
| 8 | Retaining Ring | 1 | 1 | 1 | 1 | 1 |
| 9 | O-Ring | 1 | 1 | 1 | 1 | 1 |
| 10 | O-Ring | 1 | 1 | 1 | 1 | 1 |
| 11 | Backup Ring | | | | | 1 |
| 12 | End Cap | 1 | 1 | 1 | 1 | 1 |
| 13 | Steel Clip | 1 | 1 | 1 | 1 | 1 |
| 14 | Link Pin | 1 | 1 | 1 | 1 | 1 |
| 15 | Draw Ring | 1 | 1 | 1 | 1 | 1 |
| A1 | 360° Swivel Assembly | 1 | 1 | 1 | 1 | 1 |
| A2 | 183°X360° Swivel Assembly | 1 | 1 | 1 | 1 | 1 |
| B-1 | Quick Coupler | 1 | 1 | 1 | 1 | 1 |
| B-2 | | 1 | 1 | 1 | 1 | 1 |
| Note: A1 and A2 are the options, they can be interchanged each other | | | | | | |

## 11. TROUBLE SHOOTING GUIDE

| TROUBLE | PROBABLE CAUSE | SOLUTION |
|---|---|---|
| Piston will not advance or retract | Couplers are not securely attached to the tool or pump | Check the coupler connections and make certain that they are connected |
| | Coupler is defective | Replace any defective Coupler |
| | Defective remote control unit | Replace the button and/or control pendent |
| | Dirt in the direction-contol valve o the pump unit | Disassemble the pump and clean the direction-control valve |
| Piston will not retract | Hose connections reversed | Make certain the advance on the pump is connected to the advance on the tool and retract on the pump is connected to the retract on the tool |
| | Retract hose not connected | Connect the retract hose securely |
| | Retract pin and/or spring broken | Replace the broken pin and/or spring |
| Cylinder will not build up pressure | Piston Seal and/or End Plug Seal | Replace any defective o-ring |
| | leaking Coupler is defective | Replace any defective Coupler |
| Square Drive will not turn | Grease or dirt build up in the teeth of the Ratchet and Segment Pawl | Disassemble the Ratchet and clean the grease or dirt out of te teeth |
| | Worn or broken teeth on Ratchet an/or Segment Pawl | Replace any worn or damaged parts |
| Pump will not build up pressure | Defective relief valve | Inspect,adjust or replace the relief vale |
| | Electric power source is too low | Make certain the amperage,voltage and any extension aord size comply with the pump manual requirements |
| | Defective Gauge | Replace the Gauge |
| | Low oil level | Check and fill the pump reservoir |
| | Clogged filter | Inspect,clean and/or replace the pump filter |
| Nut Returns with retract stroke | The ratchet does not compatible with reaction pawl | Change the drive pawl and the compressed spring of drive pawl |

## 12. ROUTINE MAINTENANCE AND TRANSPORT OF HYDRAULIC TORQUE WRENCH

### MAINTENANCE OF THE HYDRAULIC TORQUE WRENCH

1. Before and after use, should check the screws are loose or not on the torque wrench, if loose should be tightened. If you do not tighten, it may cause damage to the equipment.
2. Inside of the Torque Wrench, all parts should be regularly smear NLGI # 2, in complex environmental conditions, should be cleaned and lubricated.
3. The coupler should be kept clean after work, tighten the dust cap to prevent dust entering the hydraulic system failure to make the equipment damage.
4. Connecting devices, switch direction control valves, check the pressure with or without exception.
5. Check for leakage, if a similar situation, please identify the reasons and processed.
6. The parts of inside torque wrench are connected, if one part fails, it is bound to affect other parts caused by wear, so regular inspection and maintenance are very important.

### HYDRAULIC TORQUE WRENCH NOISE DECLARATION

Hydraulic torque wrench noise value: ≤70db.

### HYDRAULIC TORQUE WRENCH TRANSPORT INFORMANTION

1. Handle with care.
2. The shipment should be vertical upward, as shown in the figure 9-1.

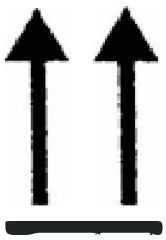


FIG 9-1

3. Product handling, generally using portable, car handling and lifting and moving, as shown in the figure 9-2.

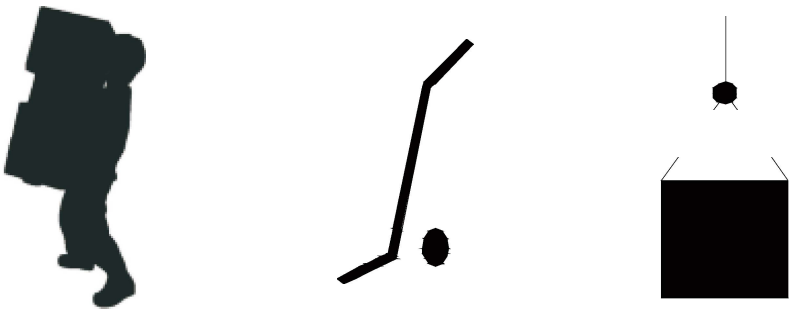


FIG 9-2


All Wren products are guaranteed against defects in workmanship and materials for as long as you own them. Under this guarantee, free repair or replacement will be made to your satisfation.

**RECYCLED PAPER**

www.wrenchina.com

# 液压扭矩扳手操作保养手册

本操作手册内容包括 ATW CR系列的液压扭矩扳手操作规程、警告和注意事项以及故障排除。
使用前，请仔细阅读本手册，彻底理解其内容并妥善保管。本说明书仅作为最终用户参考。

## 一、收货须知(开箱检查)

仔细检查产品外观有无损伤，是否有运输损坏。运输损坏不包括在保修范围内。如果发现因货运受损，应及时向货运商申报。货运商应支付运输损坏带来的所有维修和更换费用。

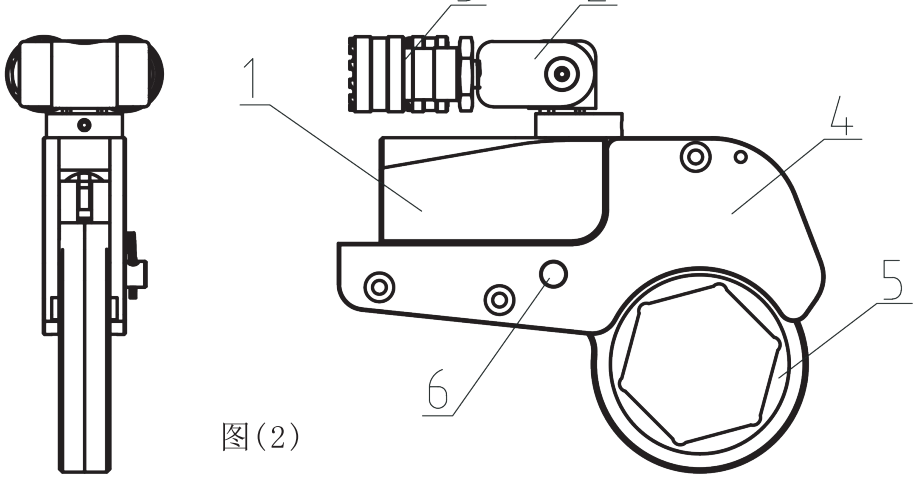
**安全第一**

液压扭矩扳手是一种动力工具，使用前应仔细阅读所有的说明、警告和注意事项，遵守安全操作以避免在操作设备发生人身或设备的损伤！ WREN对因为不安全操作及错误操作导致的损坏不负责任。

## 二、产品描述

WREN ATWCR 液压扭矩扳手采用超高强度合金材料制造，为双作用的液压设计，可以锁紧松开螺栓连接，广泛适合用于扭矩螺栓拆卸，扭矩精准可调，误差不超过±3%。

ATW CR 型液压扭矩扳手:




图(2)

| 序号 | 名 称 |
|---|---|
| 1 | 动力头部件 |
| 2 | 旋转接头 |
| 3 | 快速接头 |
| 4 | 工作头 |
| 5 | 棘轮部件 |
| 6 | 快速组合销 |

# 三 警告事项及警告标志

## 一、警告事项

警告　为避免人身伤害及可能的设备损伤，要确保每一个液压单元能够承受700bar的工作压力。

警告　不要超过设备的额定负荷
尽量减少超载的危险;在系统中使用压力表以显示系统压力。压力表是系统内发生情况的窗口。
使用液压扳手时不得超过其允许的最大扭矩。

警告　尽快用WREN原厂零件替换损坏的零件

注意　避免损坏液压油管
使用中应该避免液压油管严重弯曲和缠绕。使用弯曲或缠绕的油管将产生过大的背压。严重弯曲和缠绕使油管内部损坏，从而过早报废。
防止重物掉到或压到油管上。严重冲击可引起油管内部金属线损坏，加压时损坏的油管可能破裂。
不能用液压油管拖拉及吊拿其它液压部件(如:泵、液压扳手、阀等)。

警告　为避免损坏设备及人身伤害，不得拆掉扳手上的护板，不得改动扳手及附件，不得改变旋转接头上的安全阀。

注意　不正确的连接会导致故障及危险。连接前应保持快速接头清洁，使用后旋上防尘帽。

注意　不得使用破损的套筒和插头。不得用公制套筒扭英制的螺母和螺栓，反之亦然。

警告　使用WREN 原厂高性能的套筒。

警告　用插销将套筒驱动头紧固以避免套筒脱落。

## 二、警告标志

警告标志如下表所示

| 警告标志 | 意义 | 粘贴位置 |
| --- | --- | --- |
|  | 禁止用手触摸 | 反力臂 |
|  | 驱动轴右紧左松 | 工作头 |
|  | 使用前固定好反力臂 | 反力臂 |

## 四 螺栓预紧力推荐表

表(1)

| 强度等级 | | 4.8 | | 6.8 | | 8.8 | | 10.9 | | 12.9 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 最小破断强度 | | **392MPa** | | **588MPa** | | **784MPa** | | **941MPa** | | **1176MPa** | |
| 材质 | | 一般构造用钢 | | 机械构造用钢 | | 铬钼合金钢 | | 镍铬钼合金钢 | | 镍铬钼合金钢 | |
| 螺栓 | 螺母 | 扭距值 | | 扭距值 | | 扭距值 | | 扭距值 | | 扭距值 | |
| M | mm | KGM | N.m | KGM | N.m | KGM | N.m | KGM | N.m | KGM | N.m |
| 14 | 22 | 7 | 69 | 10 | 98 | 14 | 137 | 17 | 165 | 23 | 225 |
| 16 | 24 | 10 | 98 | 14 | 137 | 21 | 206 | 25 | 247 | 36 | 363 |
| 18 | 27 | 14 | 137 | 21 | 206 | 29 | 284 | 35 | 341 | 49 | 480 |
| 20 | 30 | 18 | 176 | 28 | 296 | 41 | 402 | 58 | 569 | 69 | 680 |
| 22 | 32 | 23 | 225 | 34 | 333 | 55 | 539 | 78 | 765 | 93 | 911 |
| 24 | 36 | 32 | 314 | 48 | 470 | 70 | 686 | 100 | 981 | 120 | 1176 |
| 27 | 41 | 45 | 441 | 65 | 637 | 105 | 1029 | 150 | 1472 | 180 | 1764 |
| 30 | 46 | 60 | 588 | 90 | 882 | 125 | 1225 | 200 | 1962 | 240 | 2352 |
| 33 | 50 | 75 | 735 | 115 | 1127 | 150 | 1470 | 210 | 2060 | 250 | 2450 |
| 36 | 55 | 100 | 980 | 150 | 1470 | 180 | 1764 | 250 | 2453 | 300 | 2940 |
| 39 | 60 | 120 | 1176 | 180 | 1764 | 220 | 2156 | 300 | 2943 | 370 | 3626 |
| 42 | 65 | 155 | 1519 | 240 | 2352 | 280 | 2744 | 390 | 3826 | 470 | 4606 |
| 45 | 70 | 180 | 1764 | 280 | 2744 | 320 | 3136 | 450 | 4415 | 550 | 5390 |
| 48 | 75 | 230 | 2254 | 350 | 3430 | 400 | 3920 | 570 | 5592 | 680 | 6664 |
| 52 | 80 | 280 | 2744 | 420 | 4116 | 480 | 4704 | 670 | 6573 | 850 | 8330 |
| 56 | 85 | 360 | 3528 | 530 | 5149 | 610 | 5978 | 860 | 8437 | 1050 | 10290 |
| 60 | 90 | 410 | 4018 | 610 | 5978 | 790 | 7742 | 1100 | 10791 | 1350 | 13230 |
| 64 | 95 | 510 | 4998 | 760 | 7448 | 900 | 8820 | | | | |
| 68 | 100 | 580 | 5684 | 870 | 8526 | 1100 | 10780 | | | | |
| 72 | 105 | 660 | 6468 | 1000 | 9800 | 1290 | 12642 | | | | |
| 76 | 110 | 750 | 7350 | 1100 | 10780 | 1500 | 14701 | | | | |
| 80 | 115 | 830 | 8143 | 1250 | 12250 | 1850 | 18130 | | | | |
| 85 | 120 | 900 | 8820 | 1400 | 13720 | 2250 | 22050 | | | | |
| 90 | 130 | 1080 | 10584 | 1650 | 16170 | 2500 | 24500 | | | | |
| 100 | 145 | 1400 | 13720 | 2050 | 20090 | | | | | | |
| 110 | 155 | 1670 | 16366 | 2550 | 24990 | | | | | | |
| 120 | 175 | 2030 | 19894 | 3050 | 29890 | | | | | | |

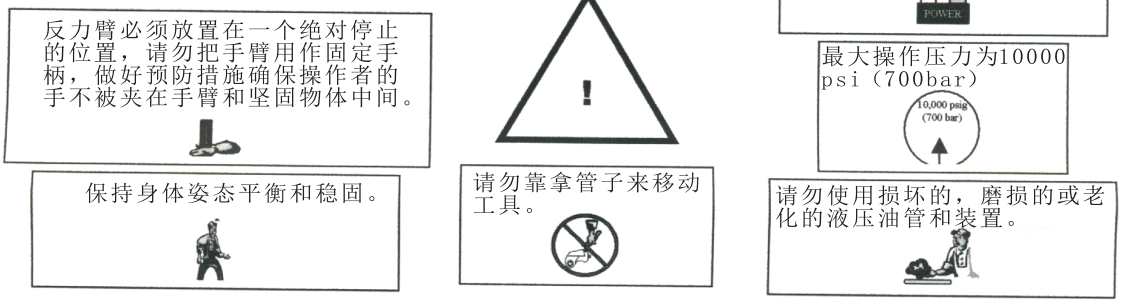
注：表中数值为德国工业标准，在螺栓达到屈服极限的80%时所测定的。

建议锁紧扭矩为：表中数值×80%

例如：M52,8.8级螺栓，则锁紧力矩为4704×80%=3763N.m

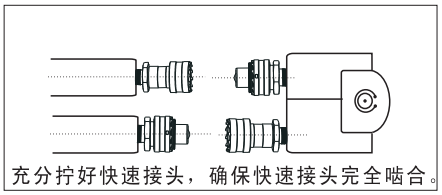
拆松力矩为锁紧力矩的1.5-2倍。

例如：上例锁紧力矩为3763N.m,则其拆松力矩为3763×1.5(2)=5645(7526)N.m

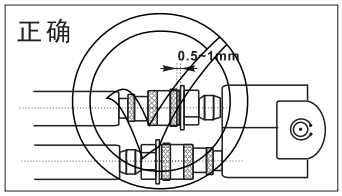


## 五 操作使用

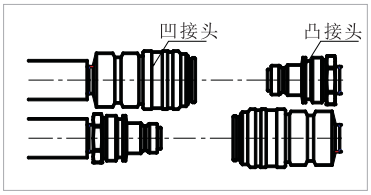
**连接**　扳手及液压泵是由额定工作压力均为700Bar的钢丝编织的复式油管连接。每根油管的底端均有凹凸接头，以保证泵与扳手之间的正确连接。
不得随意变动旋转接头上的任何螺栓。这是厂家为了安全而设定的，只有受过专业培训者才能去调节。



图(3)



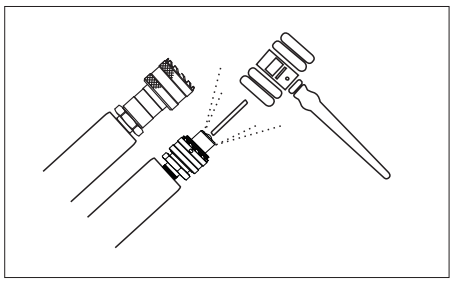
图(4)

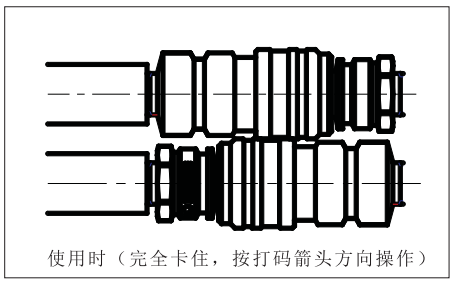


图(5)

快速接头互连时，必须保证啮合后无间隙图(4)，只有这样才能确保连接。使快速接头内单向阀打开，使油路畅通。否则，连接后，接头内钢珠没有相顶，接头内单向阀无法打开，致使油路不通后，接头内将充满压力，会出现扳手无法运转、从扳手旋转体上的的自动泄油口出油等现象。

此时需要拆开所有软管接头，检查所有快速接头内包括扳手接头内钢珠，用手是否可以按动钢珠，有弹性。如果不能按动，此时需要找锤去敲打接头内的钢珠(图6)，释放接头里的压力，请注意敲击钢珠时会有液压油喷出，虽然没有危险，但会弄脏您的衣服!直至用手可以按动接头内钢珠为止。再重新连接。


图(6)



图(7)

远离超高压液压油可能喷出的位置;高压液压油泄漏可能穿透你的手，导致严重受伤。
如果液压油喷到你的眼睛里，立即用清水冲洗大约15分钟，然后去医院清洗眼睛。
不要碰带压力的软管;如果液压油喷出，会导致严重伤害。
液压软管是消耗性配件，经过肉眼检查没有问题，内部也可能有破裂和针孔;考虑到良好使用状况，应定期更换软管，且使用时应避免出现急弯。

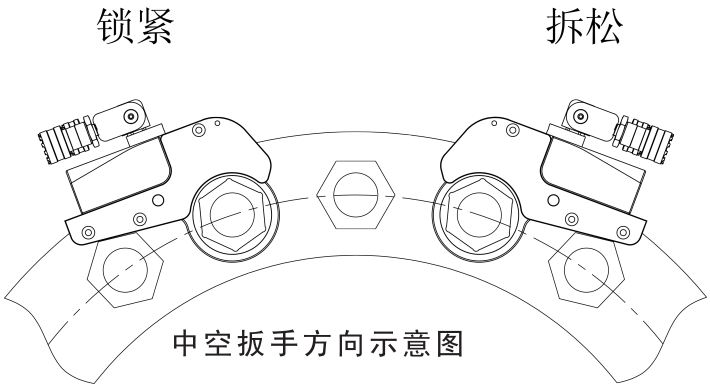
## ATW 系列

### 工作头与动力头的组合与拆分

将动力头卡入工作头内，然后按下动力头，对齐组合销口，再插入快速组合销定位从上插入，防止脱落。最后将棘轮式部件沿工作头内侧的圆弧槽方向卡入，当听到“啪”一声，棘轮式部件的台阶销卡入活塞杆勾头内，即安装完成。
拉出快速组合销，向上拉起动力头，将动力头和工作头分开，最后将棘轮式部件沿圆弧槽拆下。

### 方向位置

中空扳手的松紧程序也是左松右紧，工作时移动要确保反作用力臂或直角靠在一个牢靠的反作用支点上，组合销的拉环在外面。




中空扳手方向示意图

图( 8 )

**准备** 确定要拆松(锁紧)螺母的大小，选择适合的动力头、工作头及变径套附件。

### 连接泵站

将泵的高压出口(H或A)与液压扳手的高压出口(H或A)、泵的低压出口(L或R)附与液压扳手的低压出口(L或R)分别用高压油管连接起来。连接时油管上的快速接头应插到底，然后用手拧紧固定螺母。

仔细检查油管接头是否连接可靠,泵中是否油量足够。
将泵的电源插头插入电源。

**警告** 严禁油量不足运转!

## 试运转

1.将扳手组合置于空地上，第一次启动完成，回程时检查棘轮式部件是否正常摆动，如果摆动不正常，有可能动力头和工作头勾头位置不对应，拆开检查。
2.打开泵的电源开关，启动泵，然后按下开机按钮（自锁式按钮），检查泵是否运转正常。
3.按线控开关上的工作按钮（自复式按钮），此时棘轮开始转动，当听到“啪”的一声，扳手运转到位停止转动，压力表由“0”急速上升至调定压力，松开按钮，扳手自动回程;当又听到“啪”的一声，扳手自动回程到位，压力表由“0”急速上升至9Mpa。重新按下按钮，此时扳手转动，一个新的循环开始。反复几次，使扳手空转数次，观察扳手有无异常，然后根据工况是需要拆松还是锁紧，把扳手放在螺母上。
**注意**:扳手临时不用时，可使用开机按钮（自锁式按钮）关闭电机运转，如果长时间不用，应即时关闭油泵电源!

## 操作

### 调整压力

一手将线控开关按钮按下，当听到扳手“啪”一声，扳手到位停止转动，
压力表由“0”急速上升，另一只手调整油泵压阀，调整压力表中指针至所需压力。

### 拆松

将泵站压力调整到最高，确认扳手转向，确认为拆松方一向，将扳手放到螺母上，
找好反作用支点，靠稳，反复执行试运转中第三条动作，直至将螺母拆下。

### 锁紧

1、力矩设定
首先可根据设计要求设定力矩;如无设计力矩，建议按表(1)螺栓预紧力推荐表中数据来设定力矩。
具体方法为:设定力矩二(表中数矩)X （80%-90%）
例如:8．8级、M48是螺栓，表中建议预紧力为3920N．m，则设定力矩为:
3920X90%=3528N.m。
2、泵站压力设定
根据所需的力矩值及所用扳手型号来设定泵站压力。
如上述8．8级、M48是螺栓设定力矩为3,528N m 选用4ATWCR下型扳手，则查表中4ATWCR一列，查出对应于 力矩时泵站的压力为460bar ，所以泵站压力应设定至 460bar
3、确定扳手转向确为锁紧方一向，将扳手放在螺母上反复执行试运转中第三条的动作，直至螺母不动为止。

## 使用中扳手卡紧取不下时:

在操作中，螺栓锁紧后，取扳手时如扳手卡紧取不下，切忌用锤打;而应将工作按钮(自复式按钮)按下不松，同时按下快速释放杆保持，然后放开按钮，接着放开复位扳机，
此时扳手会自动松开，取下扳手!

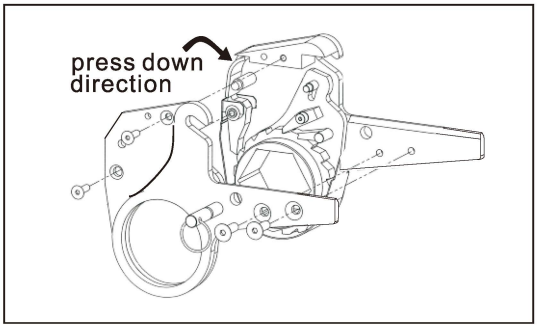


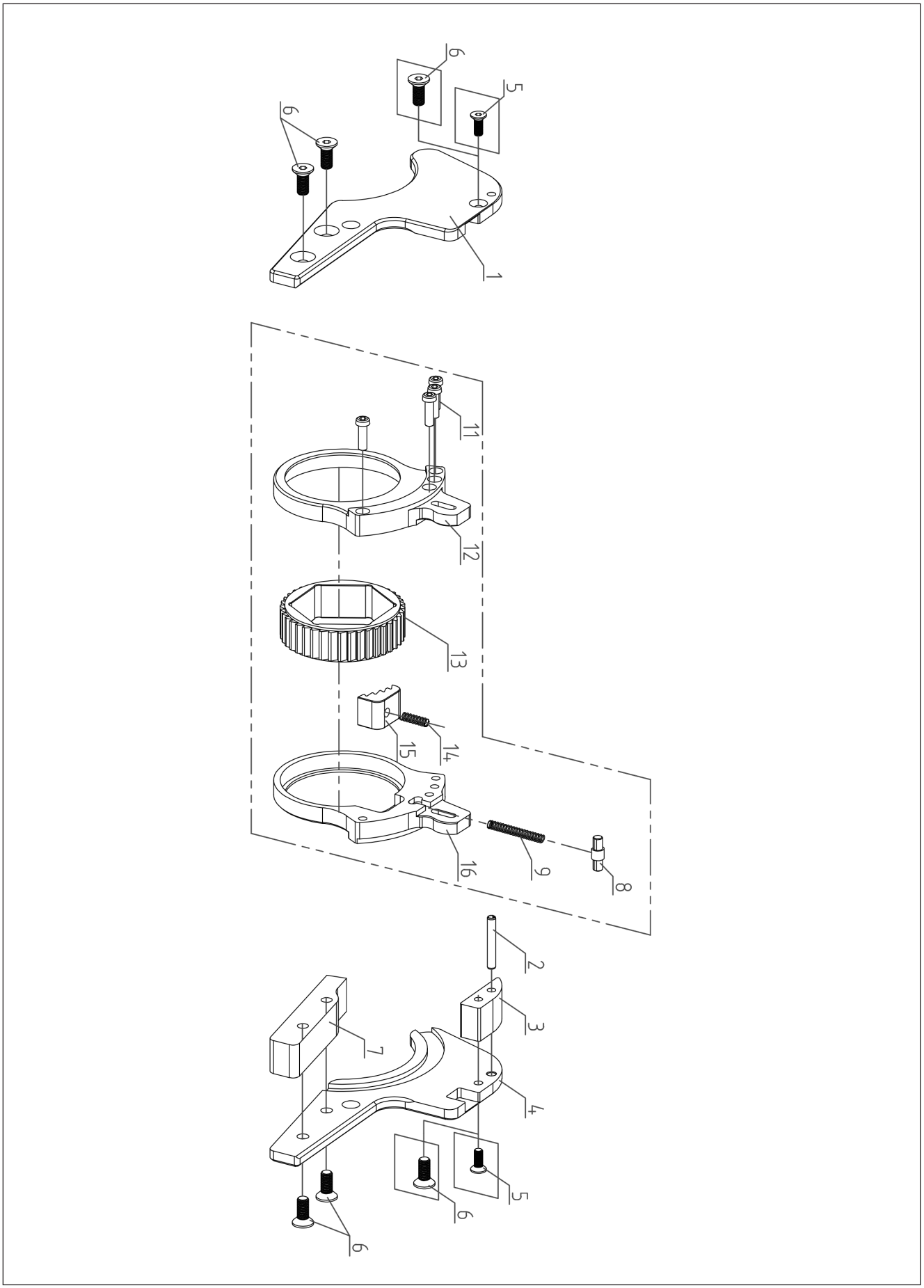

FIG 9

六、ATW CR-(55-85)液压扭矩扳手压力--扭矩对照表

| 压力（MPa) | 扭矩（N.m) | 压力（MPa) | 扭矩（N.m) |
|---|---|---|---|
| 7 | 504 | 39 | 2810 |
| 8 | 576 | 40 | 2882 |
| 9 | 649 | 41 | 2954 |
| 10 | 721 | 42 | 3026 |
| 11 | 793 | 43 | 3098 |
| 12 | 865 | 44 | 3171 |
| 13 | 937 | 45 | 3243 |
| 14 | 1009 | 46 | 3315 |
| 15 | 1081 | 47 | 3387 |
| 16 | 1153 | 48 | 3459 |
| 17 | 1225 | 49 | 3531 |
| 18 | 1297 | 50 | 3603 |
| 19 | 1369 | 51 | 3675 |
| 20 | 1441 | 52 | 3747 |
| 21 | 1513 | 53 | 3819 |
| 22 | 1585 | 54 | 3891 |
| 23 | 1657 | 55 | 3963 |
| 24 | 1729 | 56 | 4035 |
| 25 | 1801 | 57 | 4107 |
| 26 | 1873 | 58 | 4179 |
| 27 | 1946 | 59 | 4251 |
| 28 | 2018 | 60 | 4323 |
| 29 | 2090 | 61 | 4395 |
| 30 | 2162 | 62 | 4468 |
| 31 | 2234 | 63 | 4540 |
| 32 | 2306 | 64 | 4612 |
| 33 | 2378 | 65 | 4684 |
| 34 | 2450 | 66 | 4756 |
| 35 | 2522 | 67 | 4828 |
| 36 | 2594 | 68 | 4900 |
| 37 | 2666 | 69 | 4972 |
| 38 | 2738 | 70 | 5044 |

# 七 ATW CR 系列工作头装配图

2ATW CR  4ATW CR  8ATW CR  14ATW CR  30ATW CR



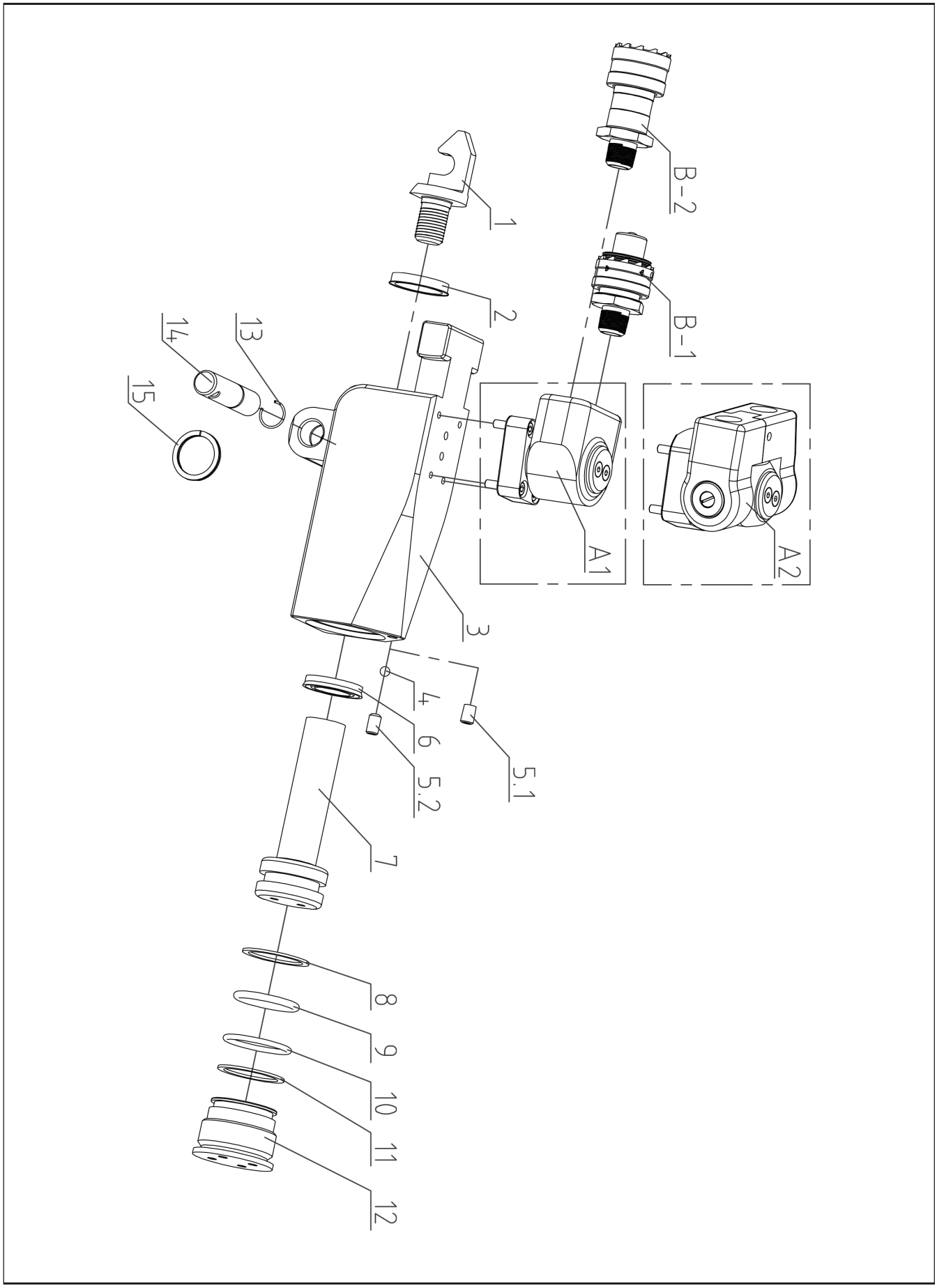
八、ATW　CR 系列工作头零件详图

**2ATW CR　4ATW CR　8ATW CR　14ATW CR　30ATW CR**

| 序号 | 名称 | 2ATW CR | 4ATW CR | 8ATW CR | 14ATW CR | 30ATW CR |
|---|---|---|---|---|---|---|
| | | 数量 | 数量 | 数量 | 数量 | 数量 |
| 1 | 右墙板 | 1 | 1 | 1 | 1 | 1 |
| 2 | 弹性销 | 1 | 1 | 1 | 1 | 1 |
| 3 | 连接垫板 | 1 | 1 | 1 | 1 | 1 |
| 4 | 左墙板 | 1 | 1 | 1 | 1 | 1 |
| 5 | 螺钉 | 2 | 2 | 2 | 2 | 2 |
| 6 | 螺钉 | 4 | 4 | 4 | 4 | 4 |
| 7 | 反力支板 | 1 | 1 | 1 | 1 | 1 |
| 8 | 驱动销 | 1 | 1 | 1 | 1 | 1 |
| 9 | 压簧 | 1 | 1 | 1 | 1 | 1 |
| 10 | | | | | | |
| 11 | 螺钉 | 4 | 4 | 4 | 4 | 4 |
| 12 | 右驱动板 | 1 | 1 | 1 | 1 | 1 |
| 13 | 棘轮 | 1 | 1 | 1 | 1 | 1 |
| 14 | 压簧 | 1 | 1 | 1 | 1 | 1 |
| 15 | 棘爪 | 1 | 1 | 1 | 1 | 1 |
| 16 | 左驱动板 | 1 | 1 | 1 | 1 | 1 |

# 九 ATW CR 系列动力头装配图零件详图

2ATW CR　4ATW CR　8ATW CR　14ATW CR　30ATW CR



## 十、ATW CR 系列动力头零件详图

**2ATW CR　4ATW CR　8ATW CR　14ATW CR　30ATW CR**

| 序号 | 名称 | 2ATW CR | 4ATW CR | 8ATW CR | 14ATW CR | 30ATW CR |
|---|---|---|---|---|---|---|
| | | 数量 | 数量 | 数量 | 数量 | 数量 |
| 1 | 勾头 | 1 | 1 | 1 | 1 | 1 |
| 2 | 铜套 | 1 | 1 | 1 | 1 | 1 |
| 3 | 本体 | 1 | 1 | 1 | 1 | 1 |
| 4 | 钢球 | 1 | 1 | | | |
| 5.1 | 堵头 | | | 1 | 1 | 1 |
| 5.2 | 紧定螺钉 | 1 | 1 | | | |
| 6 | U 型圈 | 1 | 1 | 1 | 1 | 1 |
| 7 | 活塞杆 | 1 | 1 | 1 | 1 | 1 |
| 8 | 挡圈（活塞杆） | 1 | 1 | 1 | 1 | 1 |
| 9 | O 型圈（活塞杆） | 1 | 1 | 1 | 1 | 1 |
| 10 | O 型圈（油缸盖） | 1 | 1 | 1 | 1 | 1 |
| 11 | 挡圈（油缸盖） | | | | | 1 |
| 12 | 油缸盖 | 1 | 1 | 1 | 1 | 1 |
| 13 | 钢丝卡圈 | 1 | 1 | 1 | 1 | 1 |
| 14 | 销轴 | 1 | 1 | 1 | 1 | 1 |
| 15 | 钥匙圈 | 1 | 1 | 1 | 1 | 1 |
| A1 | 360° 旋转接头 | 1 | 1 | 1 | 1 | 1 |
| A2 | 183° X360° 旋转接头 | 1 | 1 | 1 | 1 | 1 |
| B-1 | 快速接头 | 1 | 1 | 1 | 1 | 1 |
| B-2 | | 1 | 1 | 1 | 1 | 1 |
| 说明：旋转接头 A1 和 A2 为选配件，可以互换。 | | | | | | |

## 十一 故障与排除

| 引起的故障 | 可能引起故障的原因 | 解决方法 |
|---|---|---|
| 活塞不顶升或回缩 | 快速接头没有被连接到位 | 检查快速接头，确保快速接头连接到底 |
| | 快速接头有缺陷 | 替换任何有缺陷的快速接头 |
| | 遥控器有缺陷 | 替换按钮或控制器 |
| | 污垢进入泵上的方向控制阀 | 拆开泵，把方向控制阀擦干净 |
| 活塞不回缩 | 管子接头连接错误 | 确保泵上的高压接口与工具上的高压接口相连接以及泵上的低压接口与工具上的低压接口相连接 |
| | 回油管没有连接好 | 安全正确的连接回油管 |
| | 返回销或弹簧损坏 | 替换弹簧或销子 |
| 油缸不能建立起压力 | 活塞密封发生泄漏 | 替换任何有缺陷的密封圈 |
| | 接头有缺陷 | 替换任何有缺陷的接头 |
| 方头驱动轴不转动 | 油渍或污垢存在于棘齿和棘爪间 | 拆开棘轮部件，擦污垢或油渍 |
| | 棘齿或棘爪破旧或损坏 | 替换任何破旧或损坏的部件 |
| 泵不能建立起压力 | 有缺陷的泄压阀 | 检查，调节或替换泄压阀 |
| | 电压太低 | 确保电流，电压和其他一些数值符合泵的操作要求 |
| | 压力表有缺陷 | 替换压力表 |
| | 油太少 | 检查和加入足够的泵用油 |
| | 过滤器堵塞 | 检查，擦干净或替换泵用过滤器 |
| 螺母随着回程回转 | 棘轮和止退棘爪未吻合 | 更换棘爪或更换棘爪的压簧 |
| | | |

# 十二 液压扳手的日常保养及运输

## 一、液压扳手的保养

1.使用前后应检查扳手上各螺钉是否松动，发现有松动，应将拧紧，如不及及时处理导致脱落可能造成设备严重损坏。

2.扳手内部所有运动部件都应定期涂上优质的NLGI#2硫化二钼，在混杂的环境条件下，清洗和润滑都应进行。

3.快速接头应保持清洁，工作结束后拧上防尘帽，禁止灰尘进入液压系统导致内部阀的失效，造成设备损坏。

4.连接各设备，切换方向控制阀，加压检查有无异常。

5.检查配管或设备是否有漏油现象，如有此类情况发生，请查明原因并对此进行处理。

6.扳手内部结构件都是相连的，如果有一个零件出现故障，势必会对其他零部件造成磨损，所以要定期检查，及时保养。

## 二、液压扳手噪音/振动声明

液压扳手使用噪声值为: ≤70db

## 三、液压扳手运输信息

1、搬运时注意轻拿轻放。

2、装运时应将产品立式向上，如图9-1所示。

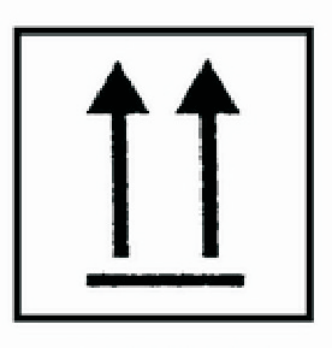


图9-1

3、产品搬运一般采用手提式或小车搬运移动、吊装移动，如图9-2所示。

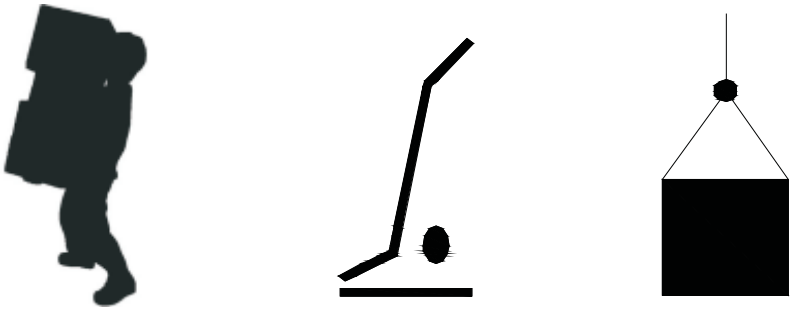


图9-2

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