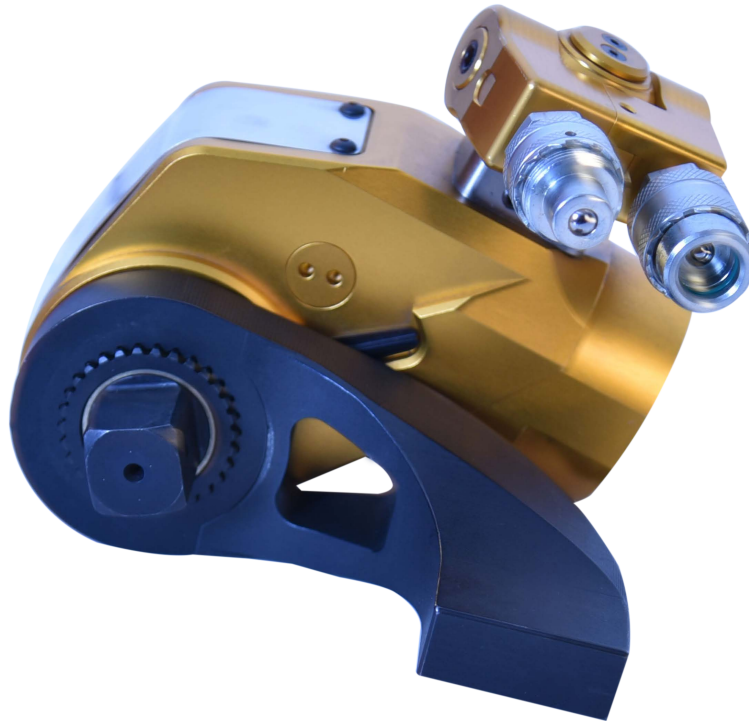


AVANTI SERIES

HYDRAULIC TORQUE WRENCH

OPERATING MANUAL



OPERATION AND MAINTENANCE MANUAL

AVANTI HYDRAULIC TORQUE WRENCHES

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

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.

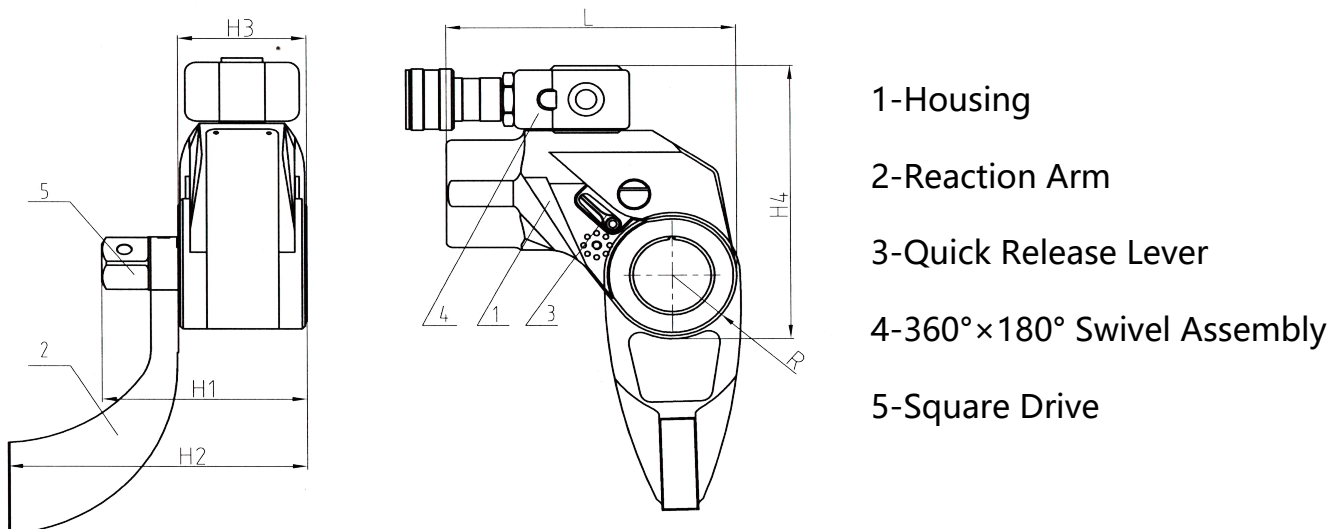
SAFETY FIRST!

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 responsible for damage to the tool caused by unsafe and/or faulty operations.

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 for larger torque bolt and disassembly, High repeatability, a precise design is with accuracy $\pm 3\%$.

AVANTI series, Square Drive Torque Wrenches



Model	Min Torque (N.m)	Max Torque (N.m)	Precision	Wight (kg)	Square Drive	R (mm)	L (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)
AVANTI07	100	1005	±3%	1.4	3/4"	25.0	104	76	108	46	102
AVANTI1	174	1741	±3%	2.0	3/4"	29.0	128	89	130	56	121
AVANTI3	410	4104	±3%	4.3	1"	41.0	175	121	177	74	167
AVANTI5	725	7253	±3%	7.0	1.1/2"	48.0	201	150	205	87	192
AVANTI8	1044	10449	±3%	11	1.1/2"	52.5	224	164	235	100	228
AVANTI10	1596	15961	±3%	15	1.1/2"	60.3	252	177	257	110	249

WARNING AND CAUTION

SAFETY FIRST!

WARNING

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

WARNING

Do not exceed the rated load of the 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

Immediately replace any worn or damaged parts of the tool with genuine WREN replacement parts.

CAUTION

Avoid damage to hydraulic hoses

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 replaced immediately. **Do not use hydraulic hoses to pull and lift other hydraulic components (eg pumps, hydraulic wrenches, valves, etc.).**

CAUTION

DO NOT drop heavy objects, crush, or drive over the hydraulic hose assembly. A sharp impact may cause internal damage to the 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 hydraulic 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

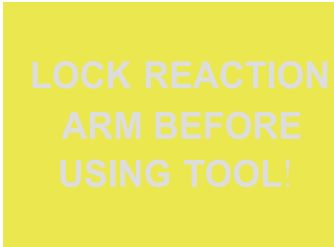
Always use a pin to lock the socket with the square drive in order to avoid the socket from falling off.

WARNING

In order to avoid damage to equipment and personal injury, the guard plate on the wrench must not be removed, the wrench and accessories must not be modified, and the safety valve on the swivel joint must not be changed.

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

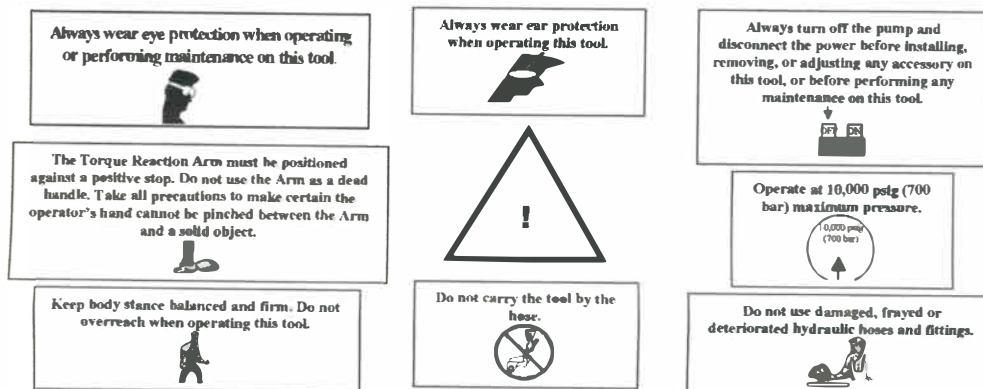
BOLTING TIGHTENING FORCE RECOMMENDED CHART

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 $4704 \times 80\% = 3763\text{Nm}$
4. The recommended loosening torque is 150%(200%) of the tightening torque. For example; the tightening torque is $3763 \times 150\%(200\%) = 5645(7526)\text{ Nm}$.



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.

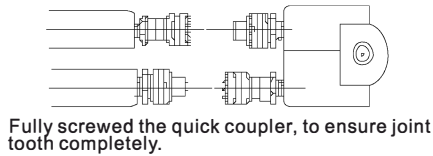


FIG (3)

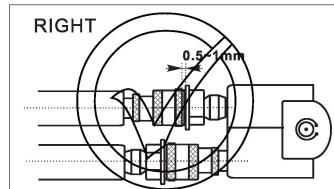


FIG (4)

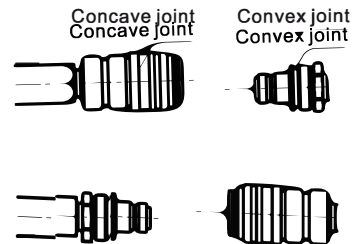
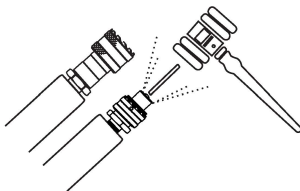
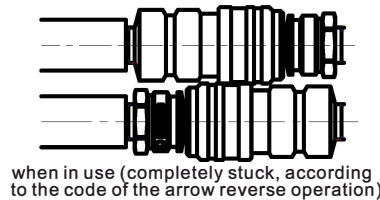


FIG (5)

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)



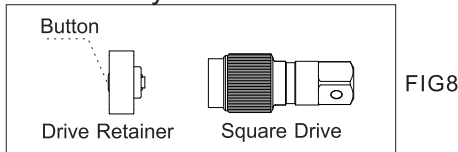
FIG(7)

on the coupler, put the male coupler into the female coupler directly.

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 15 minutes 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 exist after proper visual inspection. **WREN** suggests changing the hose regularly for smoothing use. When using, try to avoid bending the hose in sudden.

FOR AVANTI SERIES

To remove the square, disengage the drive retainer assembly by depressing the center round button and gently pulling on the square end of the square drive. The square drive will slide easily out.

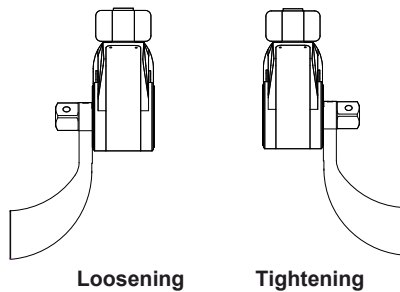


To insert the square drive in the tool (FIG8), place the drive in the desired direction, engage drive and bushing splines, then twist drive and bushing until ratchet spline can be engaged. Push drive through ratchet. Depress drive retainer button, engage retainer with drive and release button to lock.

Preparation

Determine whether to loosen or lock the nut

By pressing the drive Retainer; take out the square drive : reversing the left and right according to the figure, attaching the drive retainer, pulling down the force arm clamp on the reaction arm, and loading the reaction arm in the appropriate orientation. . When the direction of the square drive is removed, see the IBT hydraulic torque wrench selection diagram (9).



Loosen in Left and Tighten in Right
Figure(9)

Connect to Hydraulic 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, respectively, with a hose. When connecting, the quick connector on the hose should be inserted all the way, then tighten the fixing nut by hand. Carefully check that the hose connections are securely connected and that there is oil in the pump. Plug the pump's power plug into the power source.

Warning Do not operate without enough oil!

Try to operate

- 1、 Place the wrench on the open ground.
- 2、 Turn on the power ,start the pump, and then press the power button (self-locking button) to check that the pump is functioning properly.

3. Press the work button on the remote control (self-resetting button), then the square drive starts to rotate. When you hear a click, the releasing lever jumps, the wrench stops to rotate, and the pressure gauge rises rapidly from "0" to the tone. When the pressure is fixed, the button is released, and the wrench automatically returns. When the "click" sound is heard again, 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 idle several times. Observe the steering of the wrench to determine whether it is loose or tighten the nut. If there is no abnormality, put the wrench on the socket and loosen and tighten the bolt. Note that when the wrench is temporarily not in use, you can use the power button (self-locking button) to turn off the motor. If it is not used for a long time, immediately turn off the power to the pump!

Operation

Pressure Regulating

Press the remote control button in one hand. When you hear the wrench "Click", the releasing lever jumps, the wrench stops in position, the pressure gauge rises rapidly from "0", the other hand adjusts the pressure regulating valve, regulate pressure to the desired value and tighten the locknut to prevent pressure changes.

Loosen

Adjust the pressure of the pumping to the highest, and tighten the locknut to confirm the steering of the wrench. Confirm that the loosening of the wrench is always used. Place the wrench on the nut, find the reaction fulcrum, stabilize, and repeat the third action during 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) bolt pre-tightening torque recommendation table.

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: $3920 \times 90\% = 3528 \text{N.m}$.

2.Set up pressure on Pump

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

For example, the class 8.8 and M48 bolt set torque is 3528N.m, and the 3AVANTI type wrench is used.

The pressure at the pump is 540 bar when the torque is 3,528 N.m, so the pump pressure should be set to 540 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: The way of removing

In operation, after the bolt is tightened, if the wrench can not be taken down, please do not use the hammer; the correct solution is pressing switch (button) on remote control, and press the leasing lever at the same time (Fig. 10), then the solution is finished , the wrench will automatically release for removing the wrench! Or increase the pump pressure a little higher, tighten the bolts, that is also a way to solve.

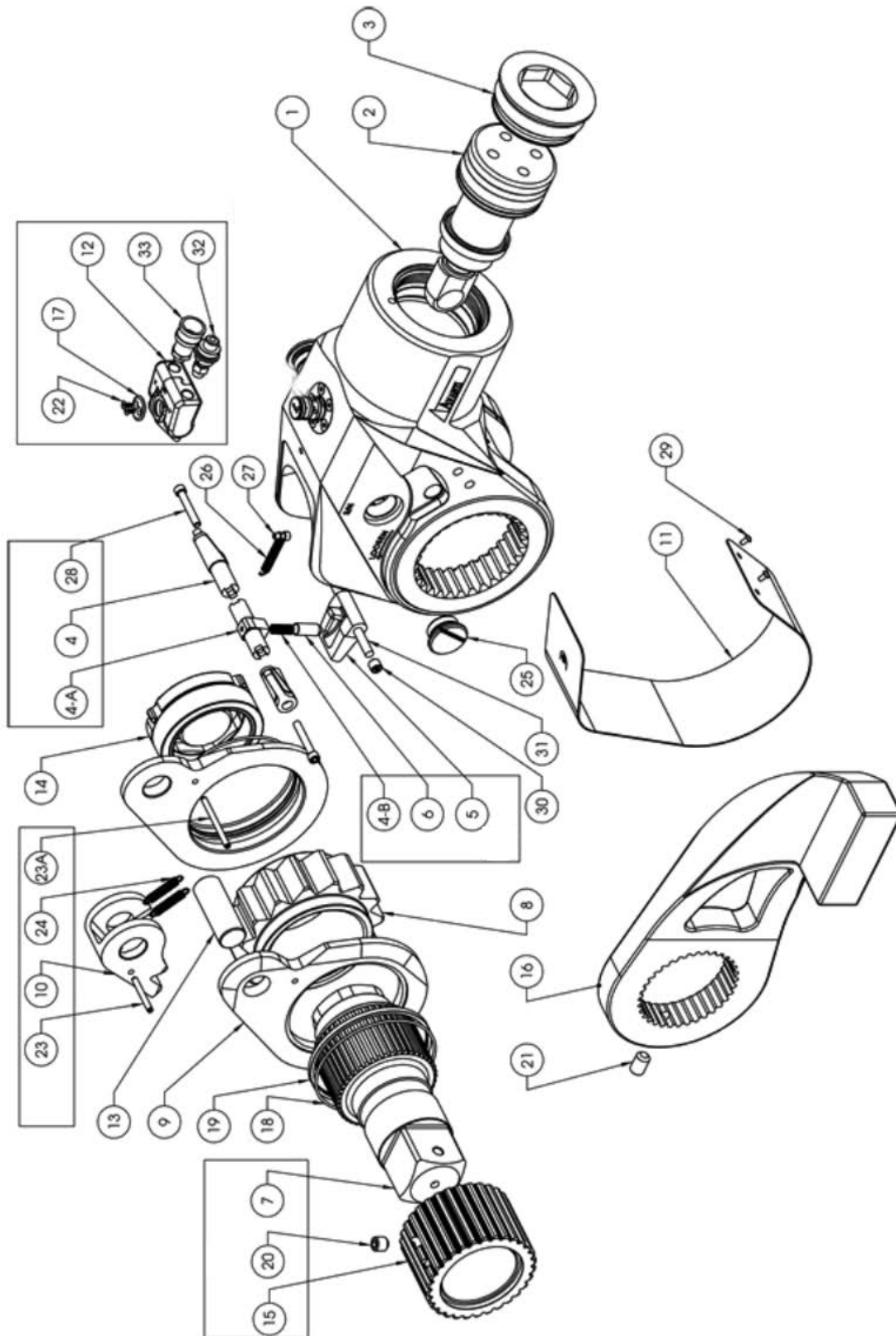
AVANTI SERIES HYDRAULIC TORQUE WRENCH PRESSURE -TORQUE CHART

FORM 2

Model		07AVANTI	1AVANTI	3AVANTI	5AVANTI	8AVANTI	10AVANTI
Bar	Mpa	N.m	N.m	N.m	N.m	N.m	N.m
70	7	101	174	410	725	1045	1596
80	8	115	199	469	829	1194	1824
90	9	129	224	527	933	1343	2052
100	10	144	249	586	1036	1493	2280
110	11	158	274	644	1140	1642	2508
120	12	172	298	703	1243	1791	2736
130	13	187	323	762	1347	1941	2964
140	14	201	348	820	1451	2090	3192
150	15	215	373	879	1554	2239	3420
160	16	230	398	938	1658	2388	3648
170	17	244	423	996	1761	2538	3876
180	18	258	448	1055	1865	2687	4104
190	19	273	473	1113	1969	2836	4332
200	20	287	497	1172	2072	2985	4560
210	21	302	522	1231	2176	3135	4788
220	22	316	547	1289	2280	3284	5016
230	23	330	572	1348	2383	3433	5244
240	24	345	597	1407	2487	3583	5472
250	25	359	622	1465	2590	3732	5700
260	26	373	647	1524	2694	3881	5928
270	27	388	672	1582	2798	4030	6156
280	28	402	696	1641	2901	4180	6384
290	29	416	721	1700	3005	4329	6612
300	30	431	746	1758	3108	4478	6840
310	31	445	771	1817	3212	4627	7068
320	32	459	796	1876	3316	4777	7296
330	33	474	821	1934	3419	4926	7524
340	34	488	846	1993	3523	5075	7752
350	35	503	871	2052	3627	5225	7981
360	36	517	895	2110	3730	5374	8209
370	37	531	920	2169	3834	5523	8437
380	38	546	945	2227	3937	5672	8665
390	39	560	970	2286	4041	5822	8893
400	40	574	995	2345	4145	5971	9121
410	41	589	1020	2403	4248	6120	9349
420	42	603	1045	2462	4352	6269	9577
430	43	617	1069	2521	4455	6419	9805
440	44	632	1094	2579	4559	6568	10033
450	45	646	1119	2638	4663	6717	10261
460	46	660	1144	2696	4766	6866	10489
470	47	675	1169	2755	4870	7016	10717
480	48	689	1194	2814	4973	7165	10945
490	49	704	1219	2872	5077	7314	11173
500	50	718	1244	2931	5181	7464	11401
510	51	732	1268	2990	5284	7613	11629
520	52	747	1293	3048	5388	7762	11857
530	53	761	1318	3107	5492	7911	12085
540	54	775	1343	3165	5595	8061	12313
550	55	790	1368	3224	5699	8210	12541
560	56	804	1393	3283	5802	8359	12769
570	57	818	1418	3341	5906	8508	12997
580	58	833	1443	3400	6010	8658	13225
590	59	847	1467	3459	6113	8807	13453
600	60	861	1492	3517	6217	8956	13681
610	61	876	1517	3576	6320	9106	13909
620	62	890	1542	3634	6424	9255	14137
630	63	905	1567	3693	6528	9404	14365
640	64	919	1592	3752	6631	9553	14593
650	65	933	1617	3810	6735	9703	14821
660	66	948	1642	3869	6839	9852	15049
670	67	962	1666	3928	6942	10001	15277
680	68	976	1691	3986	7046	10150	15505
690	69	991	1716	4045	7149	10300	15733
700	70	1005	1741	4104	7253	10449	15961

AVANTI SERIES DRAWING AND PARTS LIST

IAVANTI, 1IBT, 3IBT, 5IBT, 8IBT, 10IBT,



AVANTA Series Parts Detailed List

Serial number	Name of accessories	Serial number	Name of accessories
1	Body	17	Retaining ring
2	Piston Rod Assembly	18	Wire collar
3	End Cap	19	Ratchet collar
4	Button Lever	20	Set Screw
4A	Reset Axis	21	Set Screw
4B	Spring	22	Flat head screw
5	Backstop pawl	23	Flat head screw
6	Reaction Pawl	23A	Drive plate locating pin
7	Square Drive	24	Tension Spring for Reaction Pawl
8	Ratchet Spline	25	Screw
9	Drive Plate	26	Tension Spring
10	Drive Pawl Primary	27	Socket head screw
11	Shroud	28	Socket head screw
12	Swivel Assembly	29	Half Round head screw
13	Drive Pin	30	Set Screw
14	Drive Retainer	31	Stop Pin
15	Reaction Ratchet	32	Female Coupler
16	Reaction Arm	33	Male Coupler

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-control 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

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: $\leq 70\text{db}$.

HYDRAULIC TORQUE WRENCH TRANSPORT INFORMANTION

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

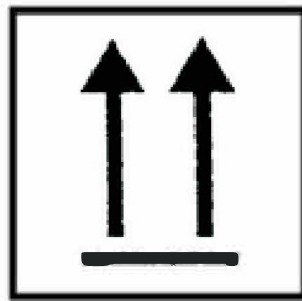


FIG 9-1

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

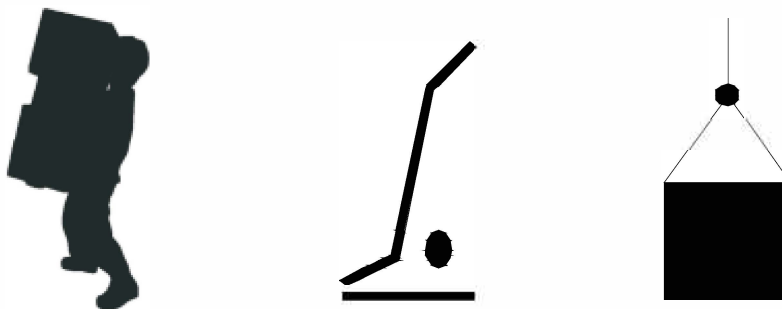


FIG 9-2



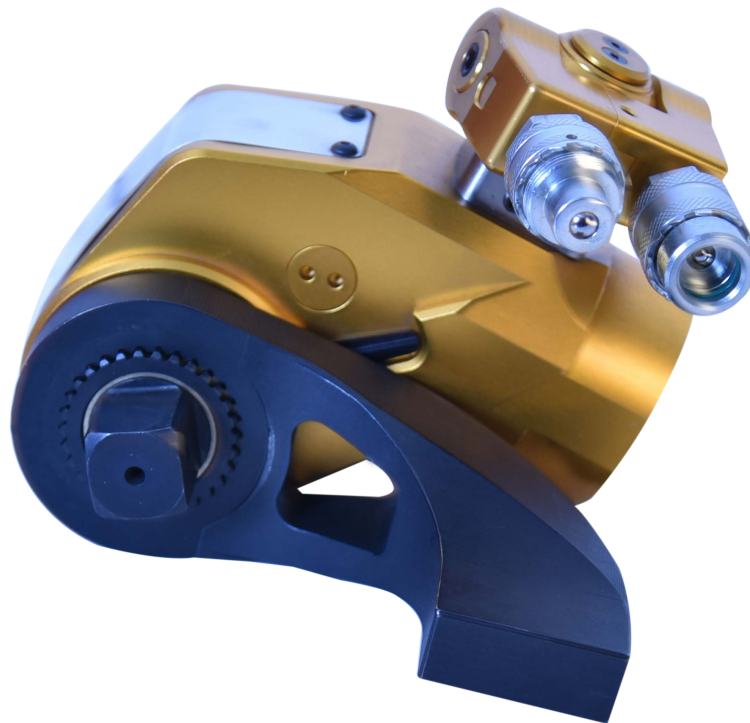
All Wren products are guaranteed against defects in workmanship and materials for as long as you own them. Under this guarantee, free repair or replacement will be made to your satisfaction.

**RECYCLED
PAPER**



www.wrenchina.com

AVANTI系列 液压扭矩扳手操作手册



液压扭矩扳手操作保养手册

本操作手册内容包括**AVANTI** 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。

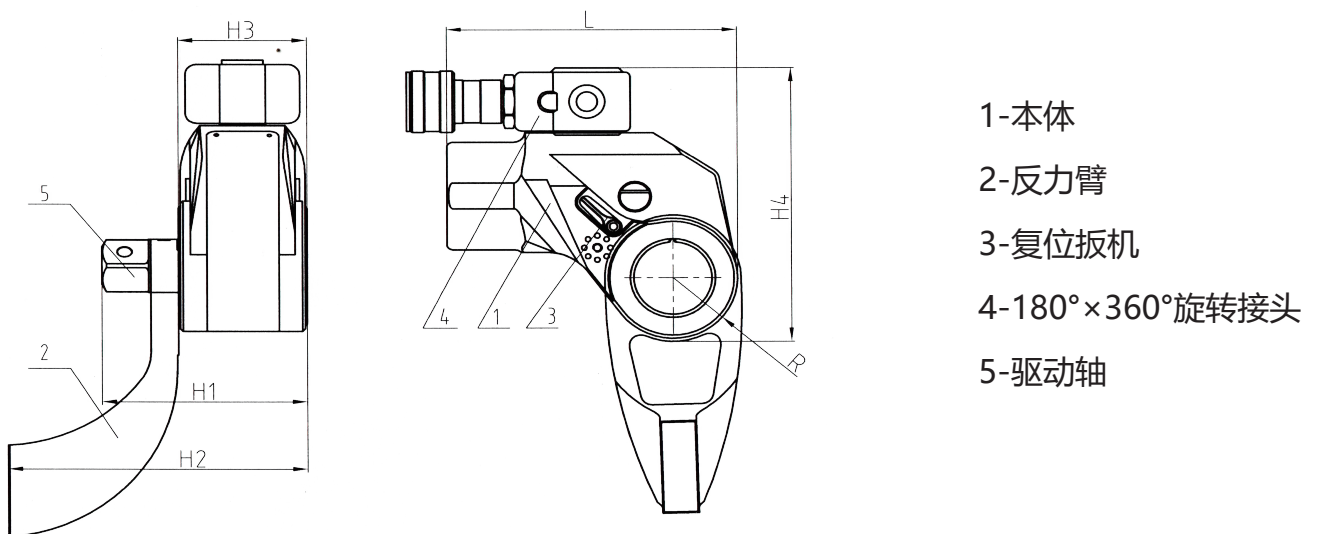
安全第一

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 AVANTI 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，可以锁紧及松开螺栓连接，广泛适合用于扭矩螺栓拆卸，扭矩精确可调，误差不超过±3%。

AVANTI 型液压扭矩扳手：



图(2)

型号	最小扭矩 (N.m)	最大扭矩 (N.m)	精度	重量 (kg)	驱动轴	R (mm)	L (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H4 (mm)
AVANTI07	100	1005	±3%	1.4	3/4"	25.0	104	76	108	46	102
AVANTI1	174	1741	±3%	2.0	3/4"	29.0	128	89	130	56	121
AVANTI3	410	4104	±3%	4.3	1"	41.0	175	121	177	74	167
AVANTI5	725	7253	±3%	7.0	1.1/2"	48.0	201	150	205	87	192
AVANTI8	1044	10449	±3%	11	1.1/2"	52.5	224	164	235	100	228
AVANTI10	1596	15961	±3%	15	1.1/2"	60.3	252	177	257	110	249

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。

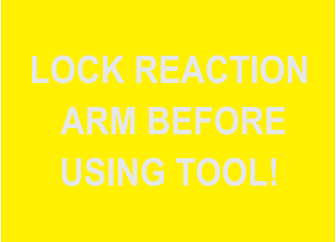
 **注意** 不得使用破损的套筒和插头。不得用公制套筒扭英制的螺母和螺栓，反之亦然。

 **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。

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						

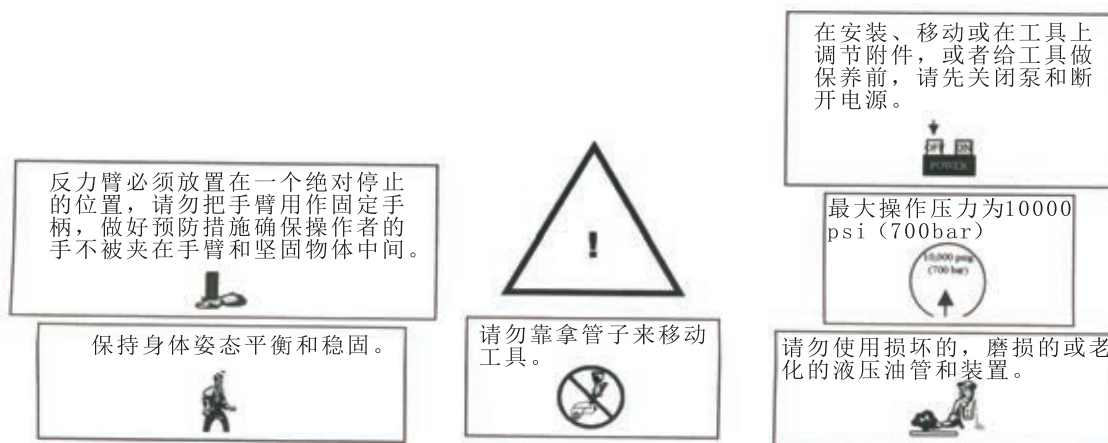
注：表中数值为德国工业标准，在螺栓达到屈服极限的80%时所测定的。

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 $4704 \times 80\% = 3763 \text{ N} \cdot \text{m}$

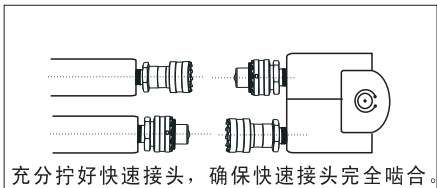
拆松力矩为锁紧力矩的1.5-2倍。

例如：上例锁紧力矩为 $3763 \text{ N} \cdot \text{m}$, 则其拆松力矩为 $3763 \times 1.5(2) = 5645(7526) \text{ N} \cdot \text{m}$

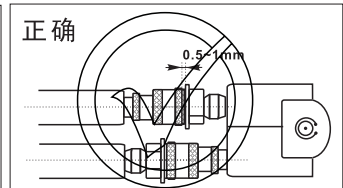


五 操作使用

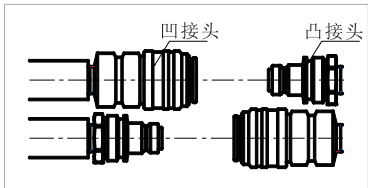
连接 扳手及液压泵是由额定工作压力均为700Bar的钢丝编织的复式油管连接。每根油管的底端均有凹凸接头，以保证泵与扳手之间的正确连接。不得随意变动旋转接头上的任何螺栓。这是厂家为了安全而设定的，只有受过专业培训者才能去调节。



图(3)



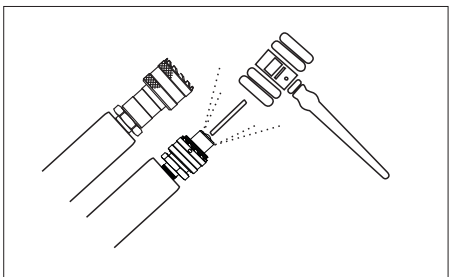
图(4)



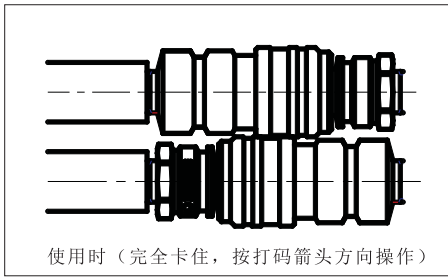
图(5)

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。

AVANTI 系列

驱动换向 按住锁紧器中间的圆型按钮，并轻拉驱动轴，以解开驱动轴与锁紧器的啮合，驱动轴就可以拉出。

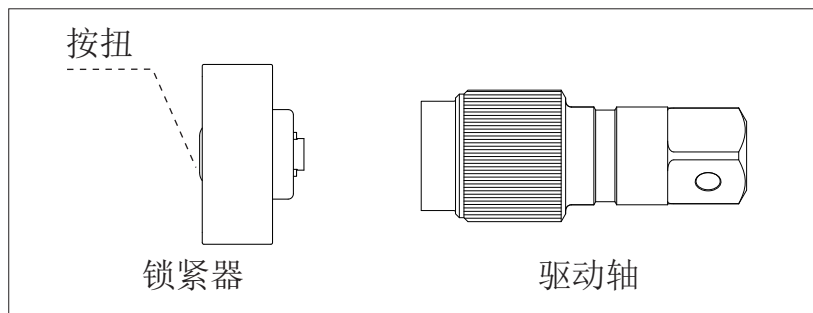
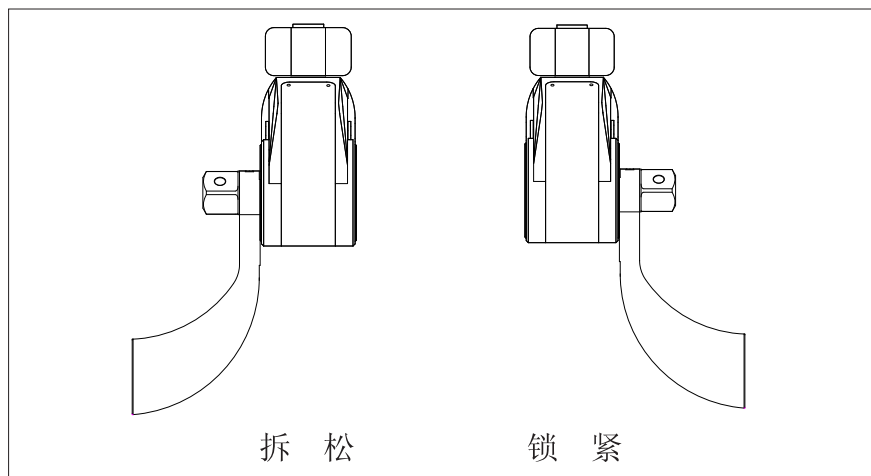


图 (8)

将驱动轴放入扳手内，确定方向图(8)，使其与花键套完全啮合，然后转动驱动轴使之与花键套以及棘轮槽啮合，通过棘轮推动驱动轴转动。

准备 确定是拆松，还是锁紧螺母

通过按下驱动方轴锁紧器;取出方身驱动轴:按图进行左右换向，装上驱动轴锁紧器，拉下反作用力臂上的力臂夹，按合适方位装入反作用力臂。拆锁时方轴方向见 AVANTA 液压扭矩扳手选向图(9)所示。



左松右紧
图(9)

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)分别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，回程时检查棘轮是否转动正常，如果转动不正常，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，复位扳机跳下，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 = (表中数矩) × (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:

$3920 \times 90\% = 3528 \text{ N. m}$ 。

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3528N. m, 选用下型扳手, 则查表中一

列, 查出对应于3528N. m力矩时泵站的压力为42Mpa, 所以泵站压力应设定至42Mpa.

- 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:

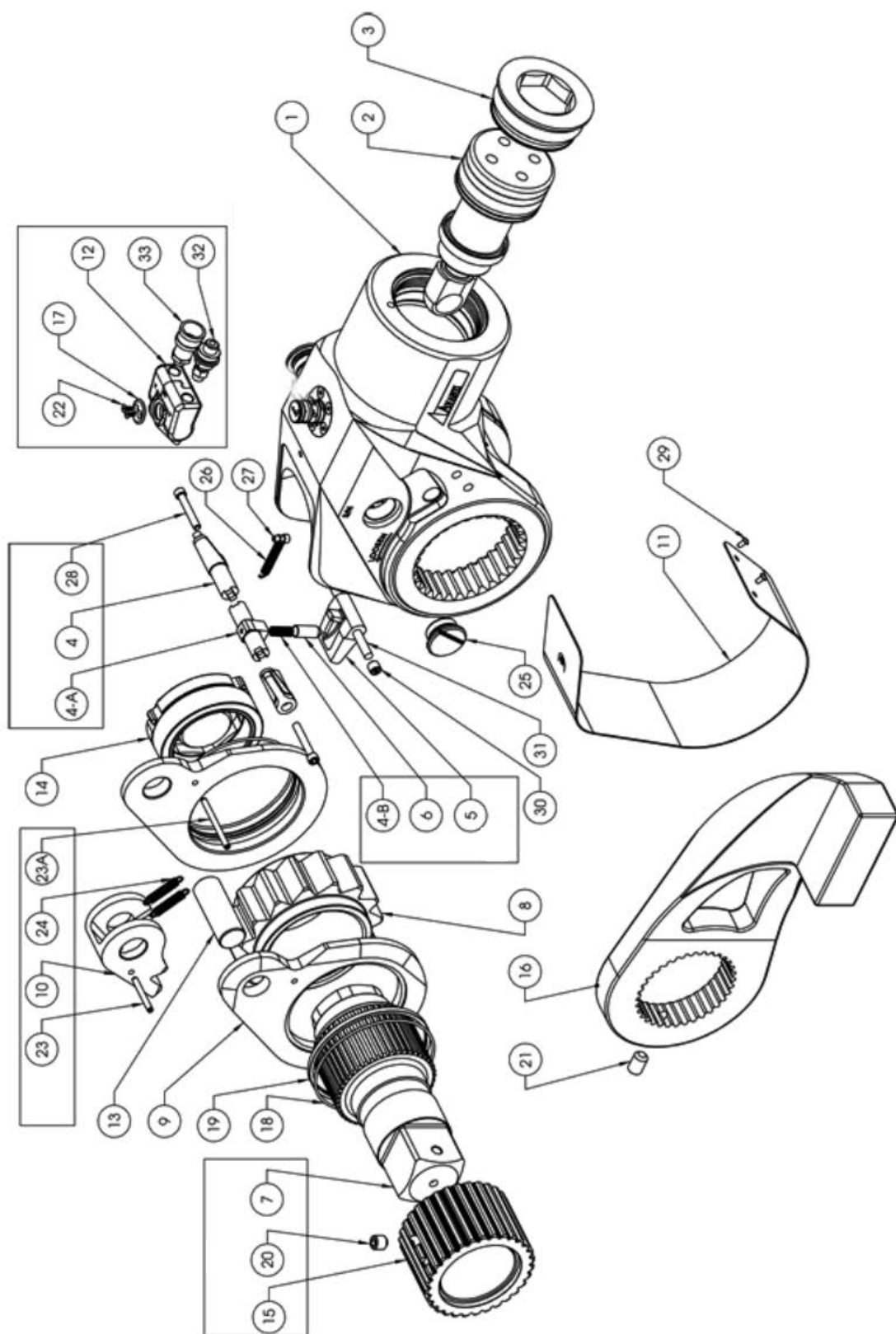
在操作中，螺栓锁紧后，取扳手时如扳手卡紧取不下，切忌用锤打;而应将工作按钮(自复式按钮)按下不松，同时按下快速释放杆保持着(图14), 然后放开按钮，接着放开复位扳机，此时扳手会自动松开，取下扳手!

六 AVANTI 液压扭矩扳手压力--扭矩对照表

表 (4)

型号		07AVANTI	1AVANTI	3AVANTI	5AVANTI	8AVANTI	10AVANTI
Bar	Mpa	N.m	N.m	N.m	N.m	N.m	N.m
70	7	101	174	410	725	1045	1596
80	8	115	199	469	829	1194	1824
90	9	129	224	527	933	1343	2052
100	10	144	249	586	1036	1493	2280
110	11	158	274	644	1140	1642	2508
120	12	172	298	703	1243	1791	2736
130	13	187	323	762	1347	1941	2964
140	14	201	348	820	1451	2090	3192
150	15	215	373	879	1554	2239	3420
160	16	230	398	938	1658	2388	3648
170	17	244	423	996	1761	2538	3876
180	18	258	448	1055	1865	2687	4104
190	19	273	473	1113	1969	2836	4332
200	20	287	497	1172	2072	2985	4560
210	21	302	522	1231	2176	3135	4788
220	22	316	547	1289	2280	3284	5016
230	23	330	572	1348	2383	3433	5244
240	24	345	597	1407	2487	3583	5472
250	25	359	622	1465	2590	3732	5700
260	26	373	647	1524	2694	3881	5928
270	27	388	672	1582	2798	4030	6156
280	28	402	696	1641	2901	4180	6384
290	29	416	721	1700	3005	4329	6612
300	30	431	746	1758	3108	4478	6840
310	31	445	771	1817	3212	4627	7068
320	32	459	796	1876	3316	4777	7296
330	33	474	821	1934	3419	4926	7524
340	34	488	846	1993	3523	5075	7752
350	35	503	871	2052	3627	5225	7981
360	36	517	895	2110	3730	5374	8209
370	37	531	920	2169	3834	5523	8437
380	38	546	945	2227	3937	5672	8665
390	39	560	970	2286	4041	5822	8893
400	40	574	995	2345	4145	5971	9121
410	41	589	1020	2403	4248	6120	9349
420	42	603	1045	2462	4352	6269	9577
430	43	617	1069	2521	4455	6419	9805
440	44	632	1094	2579	4559	6568	10033
450	45	646	1119	2638	4663	6717	10261
460	46	660	1144	2696	4766	6866	10489
470	47	675	1169	2755	4870	7016	10717
480	48	689	1194	2814	4973	7165	10945
490	49	704	1219	2872	5077	7314	11173
500	50	718	1244	2931	5181	7464	11401
510	51	732	1268	2990	5284	7613	11629
520	52	747	1293	3048	5388	7762	11857
530	53	761	1318	3107	5492	7911	12085
540	54	775	1343	3165	5595	8061	12313
550	55	790	1368	3224	5699	8210	12541
560	56	804	1393	3283	5802	8359	12769
570	57	818	1418	3341	5906	8508	12997
580	58	833	1443	3400	6010	8658	13225
590	59	847	1467	3459	6113	8807	13453
600	60	861	1492	3517	6217	8956	13681
610	61	876	1517	3576	6320	9106	13909
620	62	890	1542	3634	6424	9255	14137
630	63	905	1567	3693	6528	9404	14365
640	64	919	1592	3752	6631	9553	14593
650	65	933	1617	3810	6735	9703	14821
660	66	948	1642	3869	6839	9852	15049
670	67	962	1666	3928	6942	10001	15277
680	68	976	1691	3986	7046	10150	15505
690	69	991	1716	4045	7149	10300	15733
700	70	1005	1741	4104	7253	10449	15961

七 AVANTI 系列装配图



AVANTI系列零件详表

序号	配件名称	序号	配件名称
1	本体	17	挡圈
2	活塞杆	18	钢丝挡圈
3	缸盖	19	棘轮挡圈
4	复位扳机	20	紧定螺钉
4A	复位轴	21	紧定螺钉
4B	弹簧	22	平头螺钉
5	止退棘爪	23	弹性销
6	弹簧套	23A	驱动板定位销
7	驱动轴	24	拉簧
8	棘轮	25	螺钉
9	驱动板	26	拉簧
10	棘爪	27	圆柱头螺钉
11	盖板	28	圆柱头螺钉
12	旋转体	29	半圆头螺钉
13	销轴	30	紧定螺钉
14	锁紧器	31	止退销
15	反力棘轮	32	凸接头
16	反力臂	33	凹接头

八 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

九 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： $\leq 70\text{db}$

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。

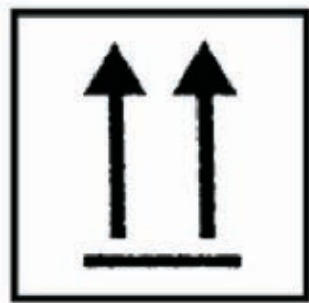


图9-1

- 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。

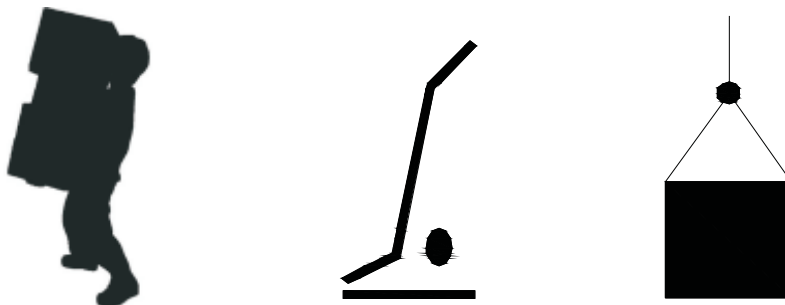


图9-2



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