SAIVS®
赛维思

Operation Instructions

SDW/SHW Series Hydraulic Torque Wrench

Please read these instructions carefully before operating. And keep instructions properly for future reference.

CE

These instructions contain warnings, precautions, operation practices, and troubleshooting for SDW (torque wrench) and SHW (hollow wrench).

I. Receiving Notice (Unpacking Inspection)

Visually inspect all components for shipping damage. Shipping damage is not covered by warranty. If shipping damage is found, notify carrier at once. The carrier is responsible for all repair and replacement costs resulting from damage in shipment.

II. Warnings and Precautions

Safety First

The hydraulic torque wrench is a kind of power tool. Before operations, please carefully read all instructions, warnings, and precautions and abide by the safety measures to prevent personal injuries and equipment damages during operations. SAIVS will not be liable for any damage arising from unsafe or incorrect operations.

Warning: To prevent personal injuries and possible equipment damage, ensure that every hydraulic unit can bear 70MPa working pressure.

Warning: Do not operate under the load beyond rated load. Whenever possible, avoid the overload danger. The operating load is indicated by the pressure gauge in the system. The pressure gauge indicates the current pressure of the pump station. While operating a hydraulic torque wrench, do not exceed its permissible maximum torque.

Warning: Replace the damaged parts with genuine parts.

Notice: During the operations, avoid the excessive bending and winding of the oil hoses whenever possible, otherwise it will generate excessive backpressure for the system. The serious bending and winding will cause internal damage and earlier scrap of the oil hoses. Do not place any weight onto the oil hoses or hoist other hydraulic part or weight by oil hoses. Do not fall or compress any weight on oil hoses. The serious impact will damage the internal metal wires of oil hoses so that the damaged oil hoses will probably burst at the application of pressure. Do not drag or hoist other hydraulic parts (such as pump, hydraulic torque wrench, and valve) by oil hoses.

Notice: To prevent damaging the equipment and causing personal injuries, the user is

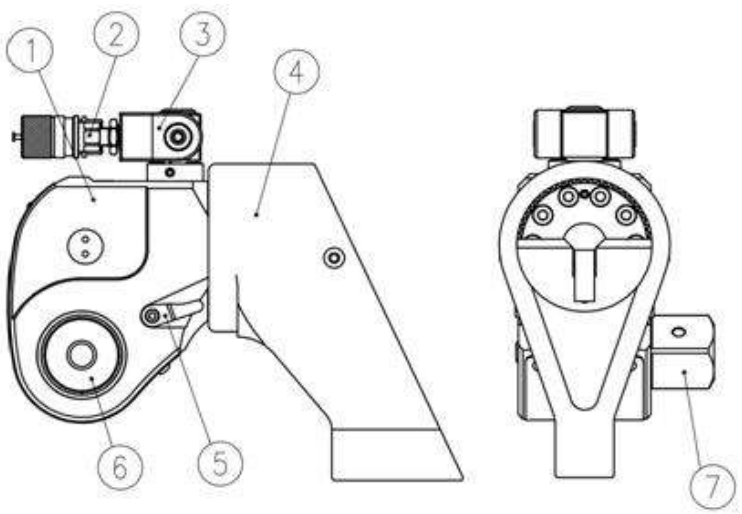
prohibited to remove the shield form wrench or modify the wrench or its accessories.

Warning: Use the genuine sockets whenever possible. Check the sizes and units of sockets, nuts, and bolts. Do not tighten imperial nuts or bolts by metric sockets and vice versa.

III. Product Overview

SDW/SHW hydraulic torque wrench is made of super strength aviation aluminum and various super strength alloys and adopts manual control and double-acting hydraulic design to tighten and loosen bolted connections. It's applied for the tightening and disassembling of high torque bolts. The torque is accurate and adjustable, with the error no more than ±3%.

Overview of SDW hydraulic torque wrench parts:



No.	Name
1	Wrench work head
2	Quick coupling
3	360°×180° swivel connector
4	360° fine-tuning reaction arm
5	Quick release trigger
6	Drive shaft locker
7	Square drive

Figure (1)

Overview of SHW hydraulic hollow wrench parts:

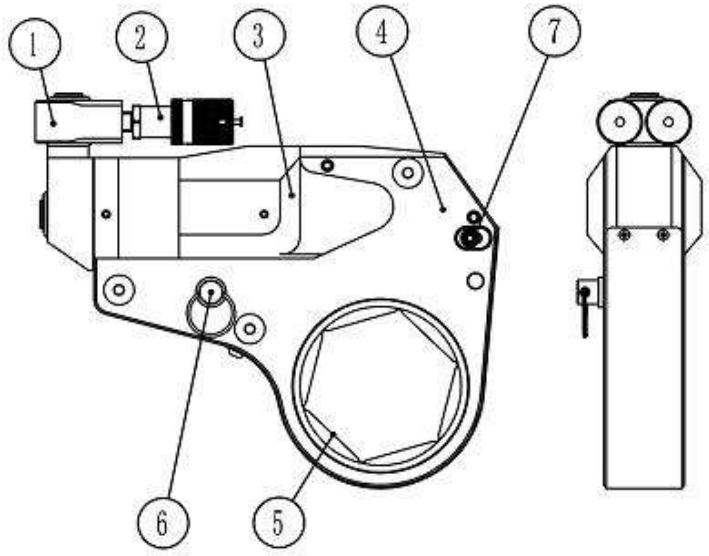
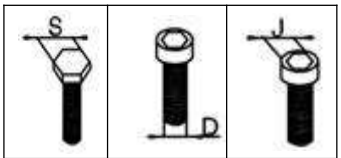


Figure (2)

No.	Name
1	360°×360° swivel connector
2	Quick coupling
3	Drive unit
4	Work head
5	Ratchet
6	Quick combination pin
7	Quick release trigger

VI. Table of Recommended Tightening Torque for Bolts

Determine the maximum operating torque of wrench based on the size and strength grade of the bolts and nuts. Please verify with the operation specification of the engineering manufacturer while handling specific connections.

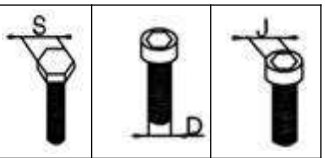


Hex size S (mm)	Thread size D (mm)	Hex size J (mm)
17	M10	8
19	M12	10
22	M14	12
24	M16	14
27	M18	14
30	M20	17
32	M22	17
36	M24	19
41	M27	19
46	M30	22
50	M33	24
55	M36	27
60	M39	27(30)
65	M42	32
70	M45	-
75	M48	36
80	M52	36
85	M56	41
90	M60	46
95	M64	46
100	M68	50
105	M72	55
110	M76	60
115	M80	65
120	M85	70
130	M90	70(75)
135	M95	-
145	M100	85
150	M105	-
155	M110	-
165	M115	-
170	M120	-
180	M125	-
185	M130	-
200	M140	-
210	M150	-

Importance Notice:

The hex sizes listed in the table below are for reference only.

Inspect the special sizes separately in the specific system.



Hex size S (inch)	Thread size D (inch)	Hex size J (inch)
1 1/16”	5/8”	1/2”
1 1/4”	3/4”	5/8”
1 7/16”	7/8”	3/4”
1 5/8”	1”	3/4”
1 13/16”	1 1/8”	7/8”
2”	1 1/4”	7/8”
2 3/16”	1 3/8”	1”
2 3/8”	1 1/2”	1”
2 9/16”	1 5/8”	-
2 3/4”	1 3/4”	1 1/4”
2 15/16”	1 7/8”	1 3/8”
3”	2”	1 1/2”
3 1/8”	2”	1 5/8”
3 3/8”	2 1/4”	1 3/4”
3 1/2”	2/1/4”	1 3/4”
3 3/4”	2 1/2”	1 3/4”
3 7/8”	2 1/2”	1 7/8”
4 1/8”	2 3/4”	2”
4 1/4”	2 3/4”	2”
4 5/8”	3”	2 1/4”
5”	3 1/4”	2 1/4”

The heavy-duty sockets must conform to:

S02725, S01174, DN3129
DN3121, ASME_B107 2/1995

Please ensure to notice the loosening torque at choice of wrench.

Strength grade		4.8	6.8	8.8	10.9	12.9
Minimum breaking strength		392MPa	588MPa	784MPa	941MPa	1176MPa
Material		General structural steel	Machinery structural steel	Ni-Cr alloy steel	Ni-Cr alloy steel	Ni-Cr alloy steel
Bolt	Across flats of nut	Torque	Torque	Torque	Torque	Torque
M14	22	69	98	137	165	225
M16	24	98	137	206	247	353
M18	27	137	206	284	341	480
M20	30	176	296	402	569	480
M22	32	225	333	539	765	911
M24	36	314	470	686	981	1176
M27	41	441	637	1029	1472	1764
M30	46	588	882	1225	1962	2352
M33	50	735	1127	1470	2060	2450
M36	55	980	1470	1764	2453	2940
M39	60	1176	1764	2156	2943	3626
M42	65	1519	2352	2744	3826	4606
M45	70	1764	2744	3136	4415	5390
M48	75	2254	3430	3920	5592	6664
M52	80	2744	4116	4704	6573	8330
M56	85	3528	5149	5978	8437	10290
M60	90	4018	5978	7742	10791	13230
M64	95	4998	7448	8820	12600	-
M68	100	5684	8526	10780	15400	-
M72	105	6468	9800	12642	18060	-
M76	110	7350	10780	14700	21000	-
M80	115	8143	12250	18130	25900	-
M85	120	8820	13720	22050	31500	-
M90	130	10854	16170	24500	35000	-
M100	145	13720	20090	-	-	-
M110	155	16366	24990	-	-	-
M120	175	19894	29890	-	-	-

V. Operations

1. Connections of oil hoses:

The wrench and the hydraulic pump are connected by wire braided compound hoses with working pressure at 70MPa. Every oil hose contains one male connector and one female connector for connecting the pump station and the hydraulic torque wrench. At the time of connections, notice to connect the port A on the pump station with the port A on the wrench and connect the port R with port Ron the wrench. Align the female connector 2 (or male connector 1) with male connector 1 (or female connector 2), insert it properly, and tighten the sleeve 3 to lock the quick coupling.

To disassemble the quick coupling, loosen the lock cap 3 and unplug female connector 2 (or male connector 1) in reverse direction of insertion.

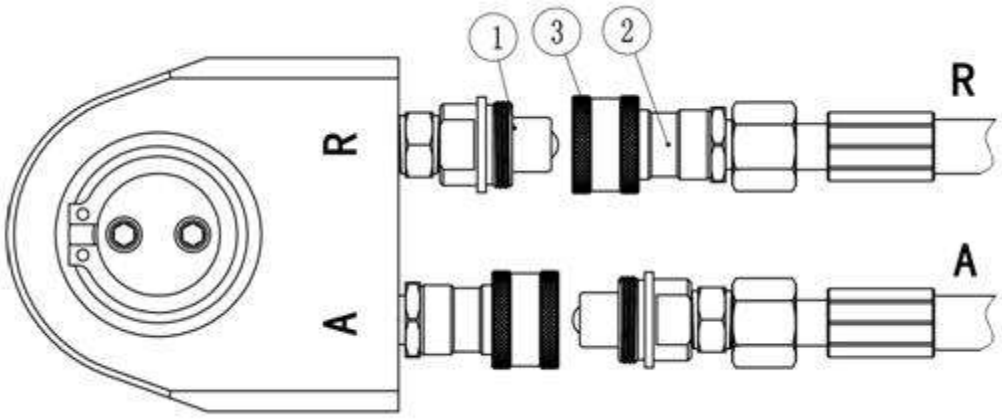


Figure (3)

2. SDW series

Change of drive direction

Press and hold the middle round button of the locker and slightly pull the drive shaft to disengage the drive shaft and locker and pull out the drive shaft.

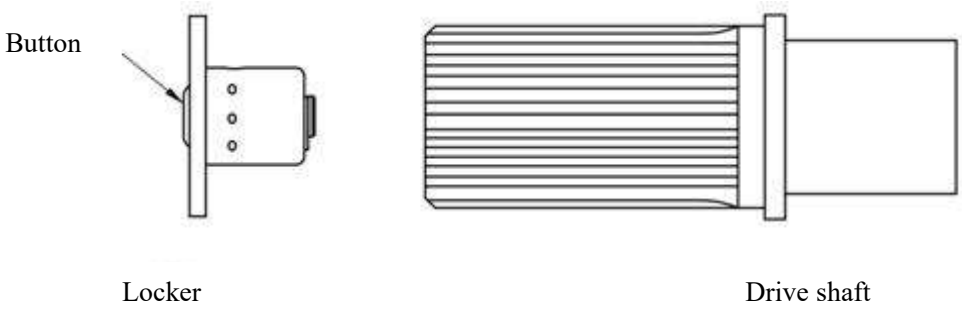


Figure 4

Place the drive shaft into the wrench, determine its orientation to ensure complete engagement with spline sleeve, and rotate the drive shaft to engage it with spline sleeve and ratchet slot so that the drive shaft is driven by the ratchet.

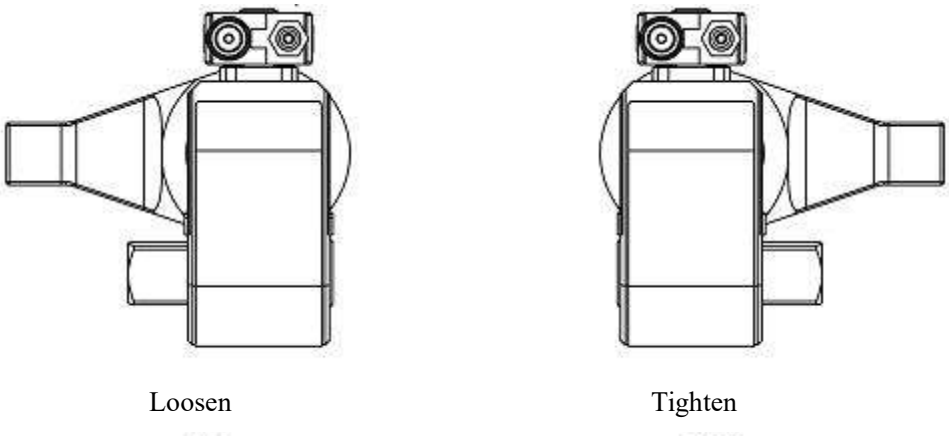


Figure (5)

Preparations

1) Determine the loosening or tightening of nut: Push down the locker and take out the drive shaft. Change the direction laterally as per Figure (5) and install the drive shaft and locker.
2) Determine the application point of reaction arm: Push down the locating seat hook on the reaction arm, find out a fixing face, select an application point, and install the reaction arm as per appropriate orientation, as shown in Figure (7).
3) Connect the pump station: Connect the high pressure oil port A of the pump to high pressure oil port A of SDW and connect low pressure oil port R of pump to low pressure oil port R of SDW, as shown in Figure (3). Then, carefully check the oil hose connectors for reliable connections and check oil tank for sufficient oil. Then, connect the power connector of pump to the power supply.

Warning: It's prohibited to operate without oil.

Notice: Ensure all hydraulic connectors are properly connected. Check hydraulic oil hoses for presence of winding and ensure that the drive shaft and the locker are safely and reliably connected. Ensure that all connectors, elbows, and swivel connectors are free of deformation and damage.

Notice: Ensure the reliable installation of reaction arm. After the application of system pressure, if the wrench bounces or trembles, stop the operations and readjust the reaction arm to ensure better reliability and safety.

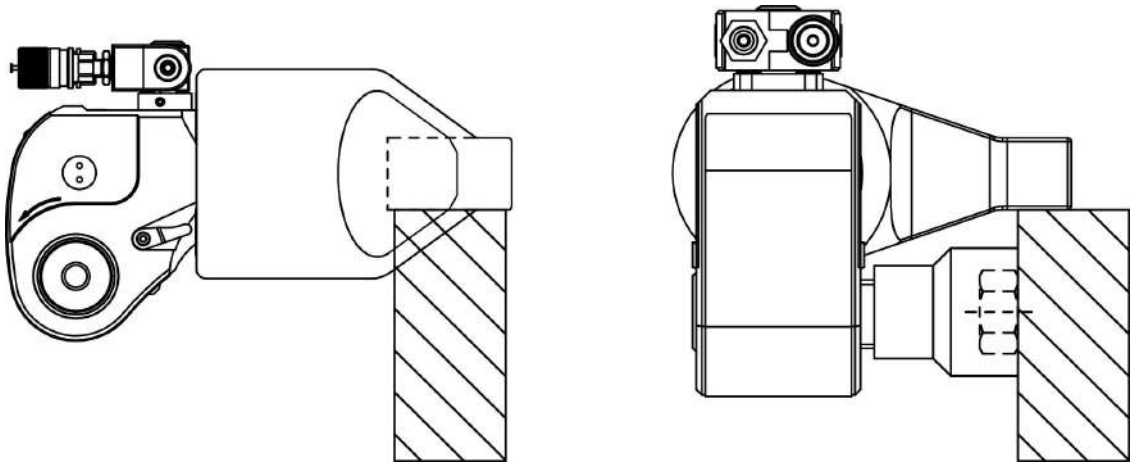


Figure (7)

Pilot Run

1) Place the wrench on a spacious area.
2) Turn on the power switch of pump to start the pump and check the pump for normal running.
3) Press any button on the wire control switch. The drive shaft starts rotation. When a “clap” sound is heard, namely the reset trigger bounces once, the wrench is in place and stops rotation and the reading of pressure gauge increases sharply from “0” to regulated pressure. Upon release of the button, the wrench returns automatically. When another “flap” sound is heard, the wrench returns in place automatically and the reading of pressure gauge increases sharply from “0” to 8MPa. Press the button again to rotate the wrench and start the next cycle. Repeat for several times to idle the wrench for several times and observe the rotation direction of the wrench, in order to ensure the placement of wrench on the socket.

Notice: Immediately cut off the power supply of oil pump whenever the wrench is not in use.

Operations

1) Adjustment of pressure

Push down the wire control switch button by one hand. When a "flap” sound is heard, the reset trigger bounces once and the wrench is in place and stops rotation. The reading of pressure gauge increases sharply from “0”. Adjust the pressure regulator valve of oil pump by other hand to the required pressure.

2) Loosening

Adjust the pressure of pump station to 70MPa, determine that the rotation direction of the wrench is loosening direction, place the wrench onto the nut, find out and lean against the reaction fulcrum stably, and repeat the pilot run motions, till the nut is disassembled.

3) Tightening

Torque setting:

Firstly set up the torque as per the design requirements: If no design torque is specified, it’s recommended to set up the torque as per the data listed in the table of tightening torque for bolts.
Detailed method: Torque setting = (data listed in the table) × (70~80%)

For instance: As the recommended tightening torque listed in the table is 3,920N.m for grade 8.8 M48 bolt, the torque setting is 3920 X 80% = 3136 N.M.

Pressure setting of pump station:

Set up the pump station pressure as per the required torque and model of wrench used.

As the torque setting is 3,136N.m for the above-mentioned grade 8.8 M48 bolt and the SDW3 wrench is selected, the lookup to the SDW torque-pressure comparison table indicates that the pump pressure corresponding to the 3,136N.m torque is 31MPa. Therefore, the pump station pressure shall be set as 31MPa.

Determine the rotation direction of wrench:

Ensure that the wrench is in tightening direction, place the wrench onto the nut, and repeat the pilot run motions, till the nut is tightened.

In event of seizure of wrench during operations

After the bolt is tightened during operations, if the wrench is seized and can't be detached, it's prohibited to knock by a hammer. Press and hold the button of wire control switch and at the same time press and hold the quick release trigger (Figure 6) and then release the button. In such case, the wrench will loosen automatically for detachment. Alternatively, increase the pump pressure slightly and tighten the bolt further and then loosen.

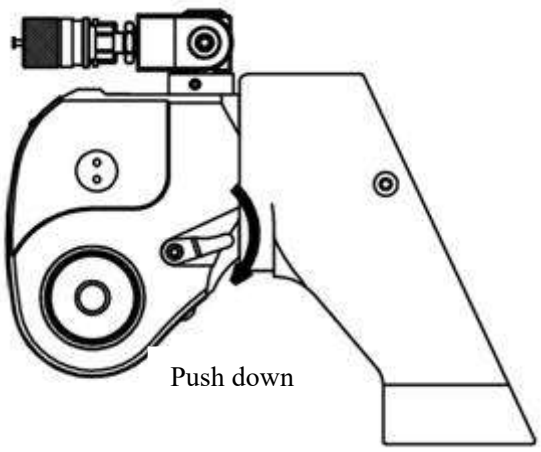


Figure (6)

3. SHW series

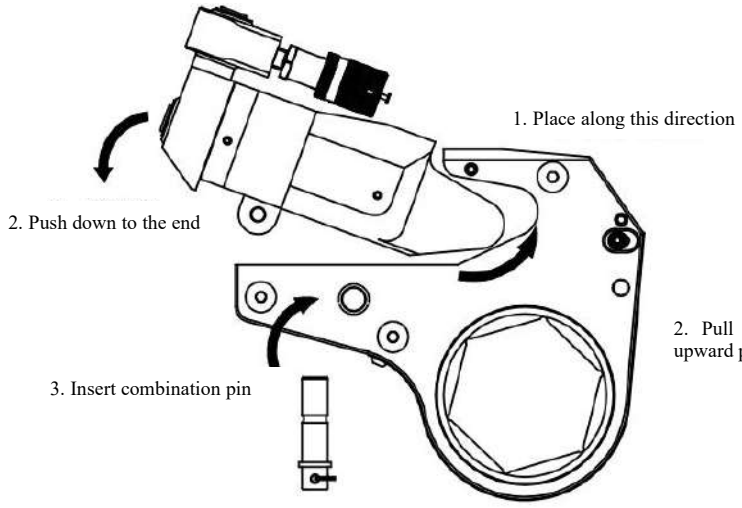


Figure (8)

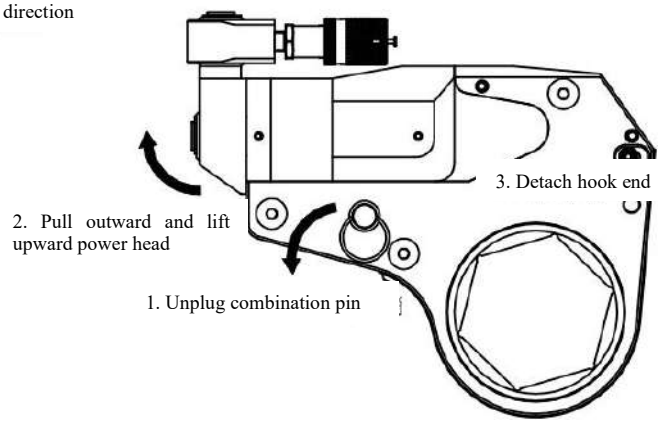


Figure (9)

Assembling and disassembling of work head and Drive unit

Place the Drive unit (See Figure 8) into work head, push down the Drive unit to fit in place completely, and insert the combination pin. During the operations of the wrench, the power head is hooked automatically to realize coupling. Unplug the combination pin, pull backward and lift upward the Drive unit, and finally detach the hook end from the spring pin to separate the work head from Drive unit.

Tightening and loosening directions and positions

The hollow wrench is loosening in leftward direction and tightening in rightward direction. During the operations, ensure that the reaction arm or the right-angle structure is leaned against a secure reaction fulcrum.

Tightening Loosening

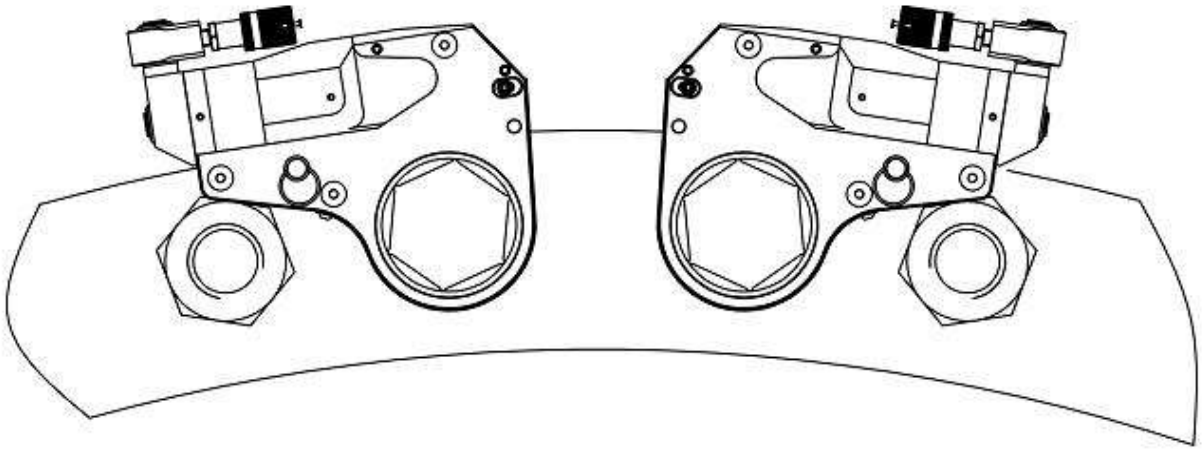


Figure (10) Directional Diagram of Hollow Wrench

Preparations

1) Determine the loosening or tightening of nut: Change the leftward or rightward direction as per Figure (10).
2) Determine the application point of reaction arm: Ensure that the reaction arm or right-angle structure is leaned against a secure reaction fulcrum, as shown in Figure (10).
3) Connect the pump station: Connect the high pressure oil port A of the pump to high pressure oil port A of SHW and connect low pressure oil port R of pump to low pressure oil port R of SHW. Then, carefully check the oil hose connectors for reliable connections and check oil tank for sufficient oil. Then, connect the power connector of pump to the power supply.

⚠ **Warning:** It's prohibited to operate without oil.

⚠ **Notice:** Ensure all hydraulic connectors are properly connected. Check hydraulic oil hoses for presence of winding and ensure that the drive shaft and the locker are safely and reliably connected. Ensure that all connectors, elbows, and swivel connectors are free of deformation and damage.

⚠ **Notice:** Ensure the reliable installation of reaction arm. After the application of system pressure, if the wrench bounces or trembles, stop the operations and readjust the reaction arm to ensure better reliability and safety.

Pilot Run

1) Place the wrench on a spacious area.
2) Turn on the power switch of pump to start the pump and check the pump for normal running.
3) Press any button on the wire control switch. The drive shaft starts rotation. When a “clap” sound is heard, namely the reset trigger bounces once, the wrench is in place and stops rotation and the reading of pressure gauge increases sharply from “0” to regulated pressure. Upon release of the button, the wrench returns automatically. When another “flap” sound is heard, the wrench returns in place automatically and the reading of pressure gauge increases sharply from “0” to 8MPa. Press the button again to rotate the wrench and start the next cycle. Repeat for several times to idle the wrench for several times and observe the rotation direction of the wrench, in order to ensure the placement of wrench on the socket.

Notice: Immediately cut off the power supply of oil pump whenever the wrench is not in use.

Operations

1) Adjustment of pressure

Push down the wire control switch button by one hand. When a "flap” sound is heard, the reset trigger bounces once and the wrench is in place and stops rotation. The reading of pressure gauge increases sharply from “0”. Adjust the pressure regulator valve of oil pump by other hand to the required pressure.

2) Loosening

Adjust the pressure of pump station to 70MPa, determine that the rotation direction of the wrench is loosening direction, place the wrench onto the nut, find out and lean against the reaction fulcrum stably, and repeat the pilot run motions, till the nut is disassembled.

3) Tightening

Torque setting:

Firstly set up the torque as per the design requirements: If no design torque is specified, it’s recommended to set up the torque as per the data listed in the table of tightening torque for bolts.

Detailed method: Torque setting = (data listed in the table) × (70~80%)

For instance: As the recommended tightening torque listed in the table is 3,920N.m for grade 8.8 M48 bolt, the torque setting is 3920 X 80% = 3136 N.M.

Pressure setting of pump station:

Set up the pump station pressure as per the required torque and model of wrench used.

As the torque setting is 3,136N.m for the above-mentioned grade 8.8 M48 bolt and the SDW20 wrench is selected, the lookup to the SDW torque-pressure comparison table indicates that the pump pressure corresponding to the 3,136N.m torque is 43MPa. Therefore, the pump station pressure shall be set as 43MPa.

Determine the rotation direction of wrench:

Ensure that the wrench is in tightening direction, place the wrench onto the nut, and repeat the pilot run motions, till the nut is tightened.

4) In event of seizure of wrench during operations

After the bolt is tightened during operations, if the wrench is seized and can't be detached, it's prohibited to knock by a hammer. Press and hold the button of wire control switch and at the same time press and hold the quick release trigger (Figure 11) and then release the button. In such case, the wrench will loosen automatically for detachment. Alternatively, increase the pump pressure slightly and tighten the bolt further and then loosen.

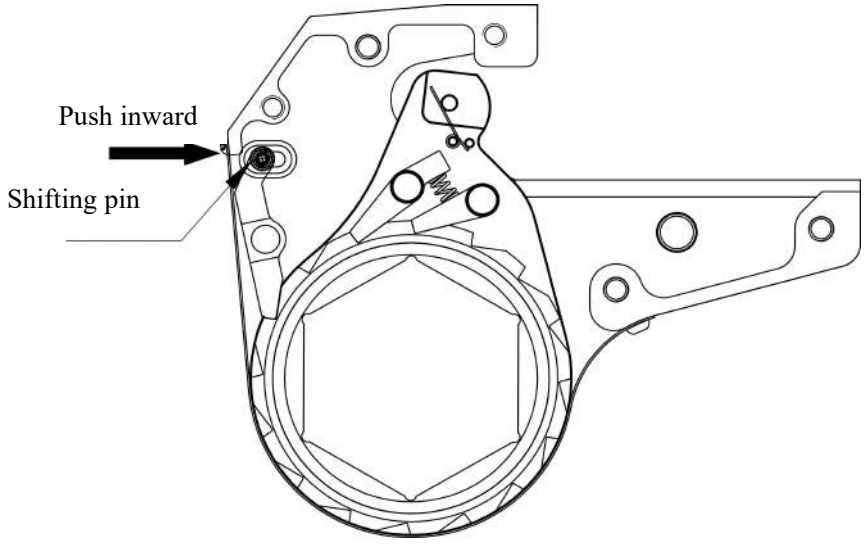


Figure (11)

VI. Pressure - Torque Comparison Table of SHW Hollow Wrench

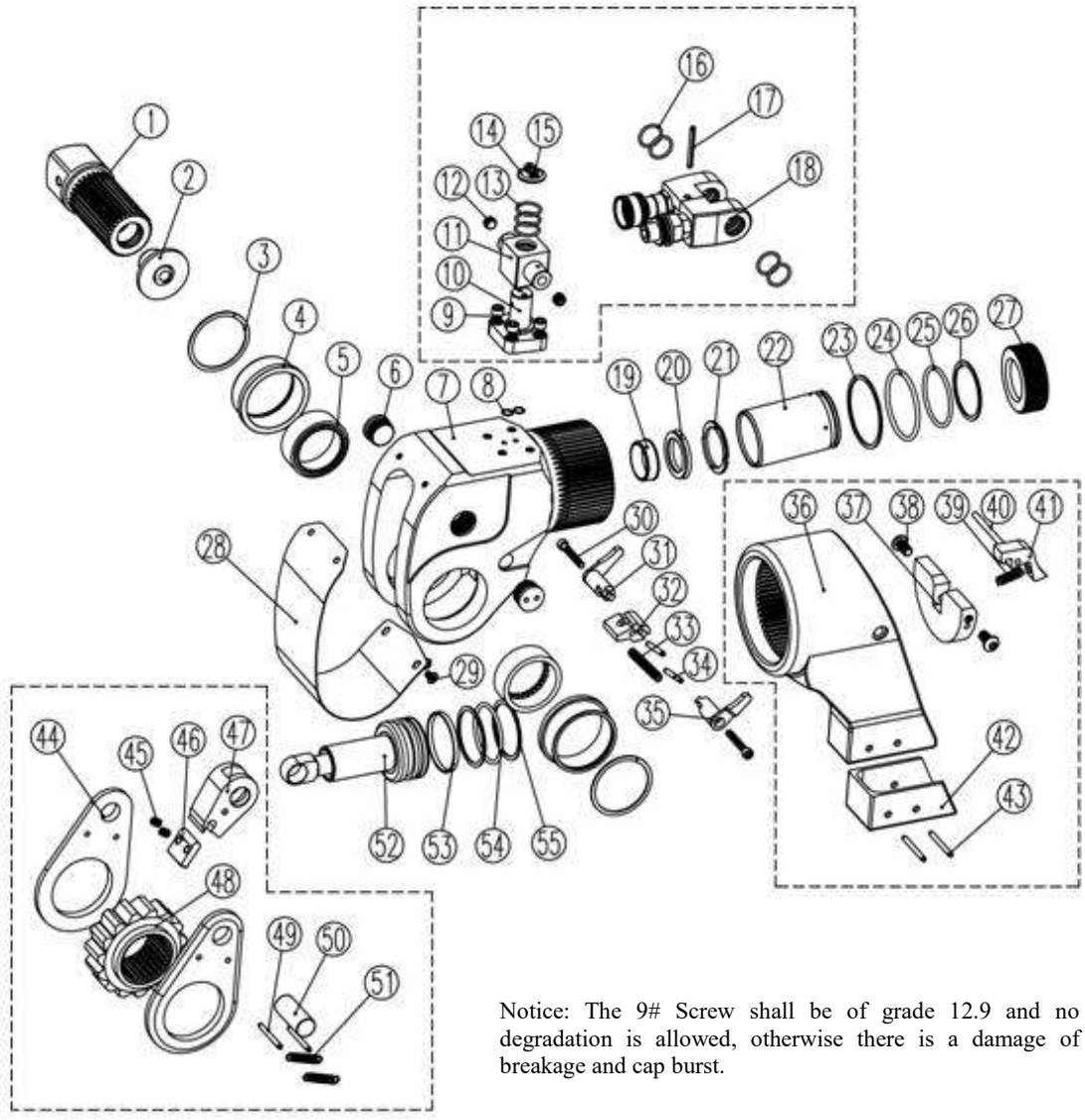
MODEL	SHW10	SHW20	SHW30	SHW40	SHW50	SHW60
Mpa	N.M	N.M	N.M	N.M	N.M	N.M
7	235	505	942	1557	2196	3846
8	268	578	1077	1779	2510	4396
9	302	650	1212	2001	2823	4945
10	336	722	1346	2224	3137	5495
11	369	794	1481	2446	3451	6044
12	403	866	1615	2668	3765	6594
13	436	939	1750	2891	4078	7143
14	470	1011	1885	3113	4392	7693
15	503	1083	2019	3335	4706	8242
16	537	1155	2154	3558	5019	8792
17	570	1227	2288	3780	5333	9341
18	604	1300	2423	4002	5647	9890
19	638	1372	2558	4225	5961	10440
20	671	1444	2692	4447	6274	10989
21	705	1516	2827	4670	6588	11539
22	738	1588	2962	4892	6902	12088
23	772	1661	3096	5114	7215	12638
24	805	1733	3231	5337	7529	13187
25	839	1805	3365	5559	7843	13737
26	872	1877	3500	5781	8157	14286
27	906	1949	3635	6004	8470	14836
28	940	2022	3769	6226	8784	15385
29	973	2094	3904	6448	9098	15935
30	1007	2166	4038	6671	9411	16484
31	1040	2238	4173	6893	9725	17034
32	1074	2310	4308	7115	10039	17583
33	1107	2383	4442	7338	10353	18133
34	1141	2455	4577	7560	10666	18682
35	1175	2527	4712	7783	10980	19232
36	1208	2599	4846	8005	11294	19781
37	1242	2671	4981	8227	11607	20330
38	1275	2744	5115	8450	11921	20880
39	1309	2816	5250	8672	12235	21429
40	1342	2888	5385	8894	12549	21979
41	1376	2960	5519	9117	12862	22528
42	1409	3032	5654	9339	13176	23078
43	1443	3105	5788	9561	13490	23627
44	1477	3177	5923	9784	13803	24177
45	1510	3249	6058	10006	14117	24726
46	1544	3321	6192	10228	14431	25276
47	1577	3393	6327	10451	14745	25825
48	1611	3466	6461	10673	15058	26375
49	1644	3538	6596	10896	15372	26924
50	1678	3610	6731	11118	15686	27474
51	1711	3682	6865	11340	15999	28023
52	1745	3754	7000	11563	16313	28573
53	1779	3827	7135	11785	16627	29122
54	1812	3899	7269	12007	16941	29671
55	1846	3971	7404	12230	17254	30221
56	1879	4043	7538	12452	17568	30770
57	1913	4115	7673	12674	17882	31320
58	1946	4188	7808	12897	18195	31869
59	1980	4260	7942	13119	18509	32419
60	2013	4332	8077	13341	18823	32968
61	2047	4404	8211	13564	19137	33518
62	2081	4476	8346	13786	19450	34067
63	2114	4549	8481	14009	19764	34617
64	2148	4621	8615	14231	20078	35166
65	2181	4693	8750	14453	20391	35716
66	2215	4765	8885	14676	20705	36265
67	2248	4837	9019	14898	21019	36815
68	2282	4910	9154	15120	21333	37364
69	2315	4982	9288	15343	21646	37914
70	2349	5054	9423	15565	21960	38463

VII. Pressure - Torque Comparison Table of SHW Torque Wrench

Model	SDW1	SDW2	SDW3	SDW4	SDW5	SDW6	SDW7	SDW8
MPa	N.M	N.M	N.M	N.M	N.M	N.M	N.M	N.M
7	180	428	724	1036	1479	2504	3358	4725
8	206	489	828	1184	1690	2362	3837	5399
9	232	550	931	1333	1901	3220	4317	6074
10	258	611	1035	1481	2192	3577	4797	6749
11	293	673	1138	1629	2324	3935	5277	7424
12	309	734	1242	1777	2535	4293	5756	8099
13	335	795	1345	1925	2746	4650	6236	8774
14	361	856	1449	2073	2057	5008	6716	9449
15	386	917	1552	2221	3169	5366	7195	10124
16	412	978	1656	2369	3380	5724	7675	10799
17	438	1039	1759	2517	3591	6081	8155	11474
18	464	1011	1863	2665	3802	6439	8634	12149
19	489	1162	1996	2813	4014	6797	9114	12824
20	515	1223	2070	2961	4225	7155	9594	13499
21	541	1284	2173	3109	4436	7512	10073	14174
22	567	1345	2277	3257	4647	7870	10553	14848
23	592	1406	2380	3405	4859	8228	11033	15520
24	618	1467	2484	3553	5070	8585	11512	16198
25	644	1529	2587	3701	5281	8943	11992	16873
26	670	1590	2691	3849	5492	9301	12472	17548
27	695	1651	2794	3998	5704	9659	12952	18223
28	721	1712	2898	4146	5915	10016	13431	18898
29	747	1773	3001	4294	6126	10374	13911	19573
30	773	1834	3105	4442	6337	10732	14391	20248
31	798	1895	3208	4500	6549	11090	14870	20928
32	824	1957	3312	4738	6760	11447	15350	21598
33	850	2018	3415	4886	6971	11805	15830	22273
34	876	2079	3519	5034	7182	12163	16309	22948
35	902	2140	3622	5182	7394	12521	16789	23628
36	927	2201	3725	5330	7605	12878	17269	24297
37	953	2262	3829	5478	7816	13286	17748	24972
38	979	2323	3932	5626	6027	13594	18228	25647
39	1005	2385	4036	5774	8238	13951	18708	26322
40	1030	2446	4139	5922	8450	14309	19187	26997
41	1056	2507	4243	6070	8661	14667	19667	27672
42	1082	2568	4346	6218	8372	15025	20147	28347
43	1108	2629	4450	6366	9083	15382	20626	29022
44	1133	2690	4553	6515	9205	15740	21106	29697
45	1159	2751	4657	6663	9506	16098	21586	30373
46	1185	2813	4760	6811	9717	16456	22066	31047
47	1211	2874	4864	6959	9928	16813	22545	31722
48	1236	2935	4967	7107	10440	17171	23025	32397
49	1262	2996	5071	7255	10351	17529	23505	33072
50	1288	3057	5174	7403	10562	17886	23984	33746
51	1314	3118	5278	7551	10773	18244	24464	34421
52	1339	3179	5381	7699	10985	18602	24944	35096
53	1365	3241	5485	7847	11196	18960	25423	35774
54	1391	3302	5588	7995	11407	19317	25903	36446
55	1417	3363	5692	8143	11618	19675	26383	37121
56	1442	3424	5795	8291	11830	20033	26862	37796
57	1468	3485	5899	8439	12041	20391	27342	38471
58	1494	3546	6002	8587	12252	20748	27822	39146
59	1520	3607	6106	8735	12463	21106	28301	39821
60	1545	3669	6209	8883	12675	21464	28781	40496
61	1571	3730	6313	9031	12886	21821	20261	41171
62	1597	3791	6416	9180	13097	22179	29741	41846
63	1623	3852	6520	9328	13308	22537	30220	43521
64	1648	3913	6623	9476	13520	22895	30700	43195
65	1674	3974	6727	9624	13731	23252	31180	43870
66	1700	4035	6830	9772	13942	23610	31659	44545
67	1726	4097	6934	9920	14153	23968	32139	45220
68	1751	4158	7037	10068	14365	24326	32619	45895
69	1777	4219	7141	10216	14576	24683	33098	46570
70	1803	4280	7244	10364	14787	25041	33578	47245

** Due to continuous update and upgrade of tools, the parameters listed in the torque table may contain errors and this table is provided for reference only.

VIII. Explosive View and Parts Overview of SDW Series



Notice: The 9# Screw shall be of grade 12.9 and no degradation is allowed, otherwise there is a damage of breakage and cap burst.

57			38	Screw	2	19	Copper sleeve	1
56			37	Locating seat	1	18	swivel connector	1
55	Retainer ring	2	36	Reaction arm	1	17	Spring round pin	1
54	O-ring	1	Reaction arm component (36~42)			16	O-ring	4
53	Guide belt	1	35	Right reset trigger	1	15	Screw	2
52	Piston component	1	34	Spring round pin	2	14	swivel connector cap	1
51	Pawl tension spring	2	33	Pawl tension spring	1	13	O-ring	3
50	Pin	1	32	Retaining pawl	1	12	Plug	2
49	Spring round pin	2	31	Left reset trigger	1	11	Rotary body	1
48	Ratchet	1	30	Screw	2	10	Rotary connector seat	1
47	Large pawl	1	29	Screw	2	9	Screw	4 (grade 12.9)
46	Small pawl	1	28	Protective cap	1	Swivel connector component (9~18)		

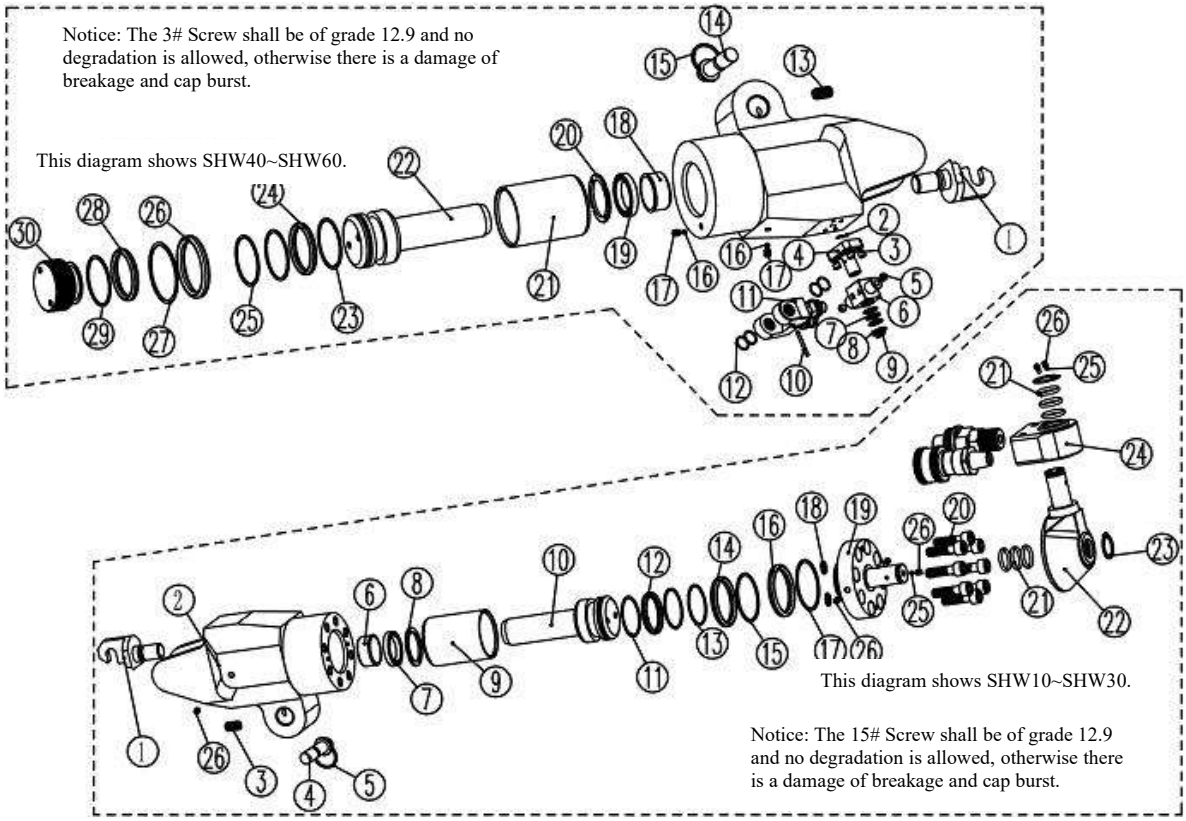
45	Small pawl spring	2	27	Wrench body cap	1	8	O-ring	2
44	Drive plate	2	26	Retainer ring	1	7	Wrench body	1
Ratchet component (46~53)			25	O-ring	1	6	Pin hole cap	2
43	Elastic cylindrical pin	2	24	O-ring	1	5	Drive shaft sleeve	2
42	Reaction protective sleeve	1	23	Retainer ring	1	4	Drive shaft sleeve seat	2
41	Locating seat hook	1	22	Cylinder sleeve	1	3	Inner snap ring	1
40	Locating seat pin	1	21	Retainer ring	1	2	Locker component	1
39	Locating seat spring	1	20	U-ring	1	1	Drive shaft	1
No.	Name	Quantity.	No.	Name	Quantity	No.	Name	Quantity

Figure (12)

IX. Explosive View and Parts Overview of SHW Series

Explosive View of Drive unit

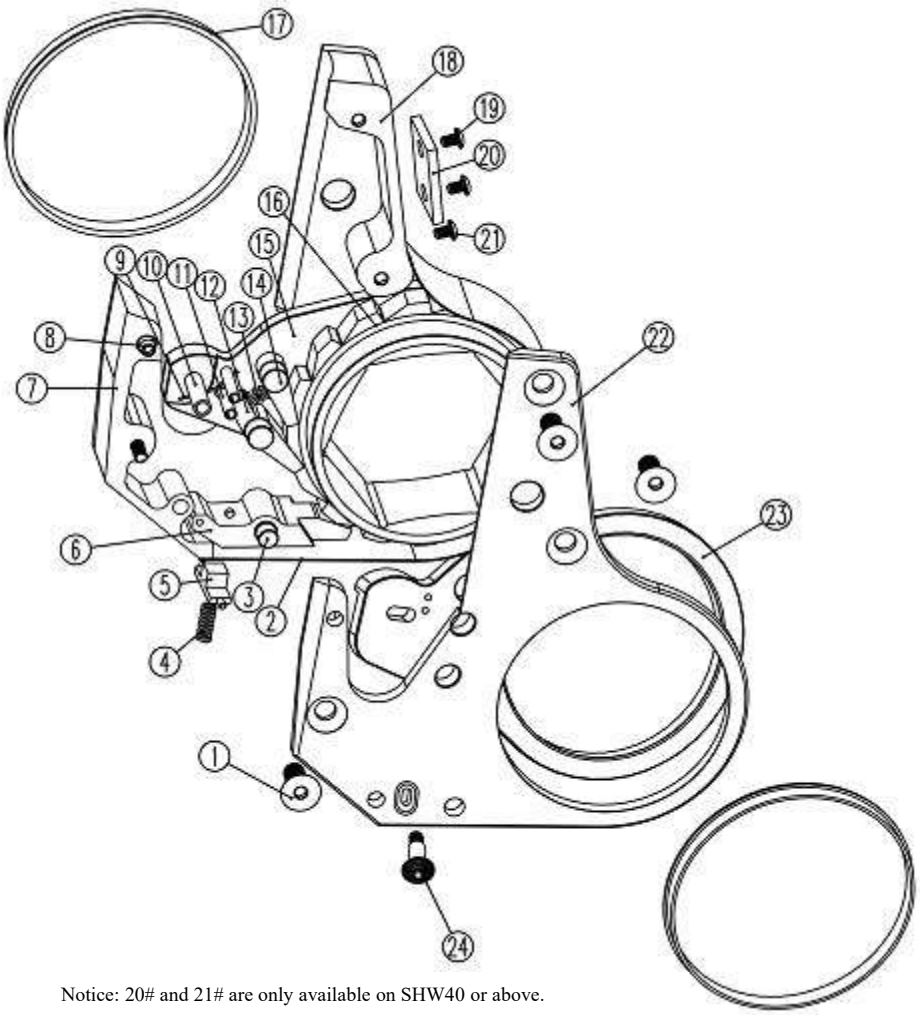
30	Cylinder head	1	15	Key ring	1
29	Retainer ring	1	14	Pin	1
28	O-ring	1	13	threaded ball spring plunger	1
27	Retainer ring	1	12	O-ring	4
26	O-ring	1	11	swivel connector	1
25	Guide belt	1	10	Spring round pin	1
24	O-ring	1	9	Screw	2
23	Retainer ring	2	8	swivel connector cap	1
22	Piston	1	7	O-ring	3
21	Cylinder sleeve	1	6	Rotary body	1
20	Retainer ring	2	5	Plug	2
19	U-ring	1	4	swivel connector seat	1
18	Copper sleeve	1	3	Screw	8 (grade 12.9)
17	Plug	2	2	O-ring	2
16	Steel ball	2	1	Hook	1
No.	Name	Quantity.	No.	Name	Quantity



26	Plug	**7**	13	Guide belt	1
25	Steel ball	3	12	O-ring	1
24	Oil hose connector	1	11	Retainer ring	2
23	Retainer ring for shaft	1	10	Piston	1
22	swivel connector	1	9	Cylinder sleeve	1
21	O-ring	6	8	Retainer ring	1
20	Screw	8 (grade 12.9)	7	U-ring	1
19	Cylinder head	1	6	Copper sleeve	1
18	O-ring	3	5	Key ring	1
17	Retainer ring	1	4	Pin	1
16	O-ring	1	3	Threaded ball spring plungers	1
15	Retainer ring	1	2	Cylinder	1
14	O-ring	1	1	Hook	1
No.	Name	Quantity.	No.	Name	Quantity

Figure (13)

Explosive View of Work Head



Notice: 20# and 21# are only available on SHW40 or above.

24	Left drive plate	1	12	Elastic cylindrical pin	2
23	Left wall panel	1	11	Round pin	1
22	Screw	1	10	Double torsion spring	1
21	Flange	1	9	Elastic cylindrical pin	1
20	Screw	2	8	Upper connecting block	1
19	Right wall panel	1	7	Screw	1
18	Ratchet socket	2	6	Retaining pawl	1
17	Ratchet	1	5	Spring seat	1
16	Right drive plate	1	4	Retaining pawl spring	1
15	Small pawl	1	3	Retaining pawl pin	1
14	Spring	1	2	Protective sleeve	1
13	Large pawl	1	1	Screw	3
No.	Name	Quantity.	No.	Name	Quantity

Figure (14)

X. Troubleshooting

Caused accident	Possible malfunction cause	Troubleshooting
No lifting or retraction of piston	Improper connections of quick couplings	Check quick couplings and ensure proper connections
	Defective quick couplings	Replace all defective quick couplings.
	Defective remote controller	Replace button or controller.
	Ingress of dirt into directional control valve on pump	Disassemble and thoroughly clean directional valve
Retraction failure of cylinder	Incorrect connections of hose connectors	Ensure that high pressure port on pump is connected with high pressure port on wrench and the low pressure port on pump is connected with low pressure port of wrench.
	Improper connection of oil return hose	Connect oil return hose safely and correctly.
No pressure build-up at wrench	Leakage of piston seals	Replace piston seals.
	Defective connectors	Replace all defective connectors.
Rotation failure of drive head	Oil or dirt between ratchet and pawl	Disassemble ratchet component and wipe clean oil or dirt.
	Old or damaged ratchet or pawl	Replace old or damaged parts
Pressure buildup failure of pump	Damage of relief valve	Check, adjust or replace relief valve.
	Low voltage	Ensure that the current, voltage, and some other values conform to pump requirements.
	Defective pressure gauge	Replace pressure gauge.
	Insufficient oil	Check and fill sufficient hydraulic oil.
	Filter blockage	Check, wipe clean, or replace pump filter.
Rotation of nut along return stroke	Disengagement between ratchet and retaining pawl	Replace tension spring of retaining ratchet or pawl.

Note:

1. **Our company reserves the modification right for these operation instructions of this hydraulic torque wrench without further notice.**
2. **For more detailed information, please contact our company.**

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