DURAPAC
ENGINEERED FOR RELIABILITY

Instruction Manual

Square Drive Hydraulic Torque Wrenches
Model – TW Series
(Serial No. 2004XXXX & above)

Maximum Operating Pressure – 700 bar

ABSOLUTE EQUIPMENT PTY LTD – 73 Northlink Place, VIRGINIA QLD 4014 – Australia
sales@absoluteequipment.com.au Phone: +61 7 3865 4006

This is a safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid injury or death

1.0 Product Information

DURAPAC – Torque Wrenches are certified to Industrial Standards for Performance and Safety. The TW Series square drive hydraulic torque wrenches are compact, easy to use and versatile. The titanium-aluminium alloy and super high strength steel alloy construction means increased strength and durability while minimising weight. The TW Series torque wrenches are available in ¾" to 2½" square drive models with a torque range from 112 to 72,000 Newton Metres.

- All models are supplied with a calibration certificate of accuracy, traceable to international standards
- 360° x 180 ° swivel with screw couplings
- Reversible square drive for tightening and loosening applications
- Titanium aluminium alloy and super high strength steel construction
- Accuracy within +/- 3%
- Reaction pawl design for enhanced efficiency and accuracy
- An extended reaction arm is available as an optional extra

Special skill, knowledge and training may be required for a specific task and the product may not be suitable for all jobs. The user must ultimately make the decision regarding suitability of the product for any given task and assume the responsibility of safety for all in the work area. Contact a Durapac representative if you are unsure of your torque wrenches' suitability for a particular application.

2.0 Receiving Instructions

It is recommended prior to use that an inspection be done by qualified personnel and that any missing or damaged parts, decals, warning/safety labels or signs are replaced with Durapac authorised replacement parts only. Any torque wrench that appears to be damaged in any way, is worn, leaking or operates abnormally should be removed from service immediately until such time as repairs can be made. Any torque wrench that has been or suspected to have been subject to a shock load should be removed from service immediately until inspected by a Durapac authorised service centre. Owners and operators of this equipment should be aware that the use and subsequent repair of this equipment may require specialised training and knowledge.

3.0 Safety

Save these instructions. For your safety, read and understand the information contained within. The owner and operator should understand this product and safe operating procedures before attempting to use this product. Instructions and safety information should be conveyed in the operator's native language before use of this product is authorised. Make certain that the operator thoroughly understands the inherent dangers associated with the use and misuse of the product. If any doubt exists as to the safe and proper use of this product as outlined in this factory authorised manual, remove from service immediately.

DANGER:

- To avoid personal injury keep hands and feet away from work area during operation
- **Do NOT** handle pressurised hoses. Escaping oil under pressure can penetrate the skin causing serious injury. If oil is injected under the skin, see a doctor immediately
- Stay clear of loads supported by hydraulics. A cylinder, when used as a load lifting device, should never be used as a load holding device. After the load has been raised or lowered, it must always be supported mechanically

WARNING:

- The system operating pressure must not exceed the pressure rating of the lowest rated component in the system. Install pressure gauges in the system to monitor operating pressure. It is your window to what is happening in the system
- Always wear appropriate *personal protective equipment* (*PPE*) when operating hydraulic equipment. The operator must take precaution against injury due to failure of the tool or work piece(s)
- **Do NOT** hold or stand directly in line with any hydraulic connections while pressurising
- **Do NOT** attempt to disconnect hydraulic connections under pressure. Release all line pressure before disconnecting hoses
- All personnel must be clear before lowering load or depressurising the system
- **Do NOT** attempt to lift a load weighing more than the capacity of the cylinder

IMPORTANT:

- If at any stage, the safety related decals become hard to read, these must be replaced
- Minimum age of the operator must be 18 years. The operator must have read and understood all instructions, safety issues, cautions and warnings before starting to operate the equipment. The operator is responsible for this activity towards other persons
- **Do NOT** lift hydraulic equipment by the hoses or couplers. Use the carrying handle or other means of safe transport
- Hydraulic equipment must only be serviced by a qualified hydraulic technician. For repair service, contact the Durapac authorised service centre in your area. To protect your warranty, use only high-quality hydraulic oil

CAUTION:

- **KEEP HYDRAULIC EQUIPMENT AWAY FROM FLAMES AND HEAT.** Hydraulic fluid can ignite and burn. Excessive heat will soften packings and seals, resulting in fluid leaks. Heat also weakens hose materials and packings. For optimum performance do not expose equipment to temperatures of 65°C (150°F) or higher. Protect all equipment from weld spatter
- No alteration should be made to this device

3.1 Torque Wrenches

- **Do** use a gauge or other load measuring instrument to verify load
- **Do NOT** exceed the rated capacity of the torque wrench or any equipment in the system. Burst hazard exists if connection pressure exceeds rated pressure
- **Do NOT** operate the system with bent or damaged couplers or damaged threads
- **Do NOT** subject the torque wrench and its components to shock loads
- Use only Durapac approved accessories and components
- **Do NOT** remove the shroud from the hydraulic torque wrench
- **Do NOT** adjust the hydraulic torque wrench safety relief valve located inside the swivel couplings
- **Always** use a pin to lock the socket with the square drive-in order to avoid the socket from falling off
- An incorrect system connection may cause failure and injury. Before connection, make sure the swivel couplings have been cleaned. After application, return the dust caps to the swivel couplings
- Use only high-quality sockets that meet the relevant ISO, DIN or ASME Standards. **Do NOT** use the wrong sized sockets
- Torque wrenches should be stored where protected from the elements, abrasive dust, and damage. These devices may be stored in virtually any position
- **Never** pressurize uncoupled couplers. Use only hydraulic equipment in a coupled system

3.2 Hydraulic Hoses & Fluid Transmission Lines

- Avoid short runs of straight-line tubing. Straight line runs do not provide for expansion and contraction due to pressure and/or temperature changes
- Reduce stress in tube lines. Long tubing runs should be supported by brackets or clips. Before operating the power unit, connections should be tightened securely and leak-free. Over tightening can cause premature thread failure or high-pressure fittings to burst
- Should a hydraulic hose ever rupture, burst or need to be disconnected, immediately shut off the power unit and release all pressure. Never attempt to grasp a leaking pressurised hose with your hands. The force of escaping hydraulic fluid can inflict injury
- **Do NOT** subject the hose to potential hazard such as fire, sharp objects, extreme heat or cold or heavy impact
- **Do NOT** allow the hose to kink, twist, curl, crush, cut or bend so tightly that the fluid flow within the hose is blocked or reduced. Periodically inspect the hose for wear

- Hose material and coupler seals must be compatible with the hydraulic fluid used. Hoses also must not come in contact with corrosive materials such as battery acid, creosote-impregnated objects and wet paint. Never paint a coupler or hose

FAILURE TO HEED THESE WARNINGS MAY RESULT IN PERSONAL INJURY AS WELL AS PROPERTY DAMAGE.

4.0 Installation

⚠ **IMPORTANT:** Always secure threaded port connections with high grade, non-hardening pipe thread sealant. Teflon tape can be used if only one layer of tape is used and it is applied carefully, two threads back, to prevent the tape from being introduced into hydraulic system, which could cause jamming of precision-fit parts

4.1 Familiarise yourself with the specifications and illustrations in this owner's manual. Know your torque wrench, its limitations and how it operates before attempting to use. If in doubt, contact a Durapac representative.

4.2 Make hydraulic connections – Ensure the advance line of the power unit is connected to the "A" port of the tool and the retract line of the power unit is connected to the "B" port of the tool.

⚠ **IMPORTANT:** Fully hand-tighten all couplers. Loose coupler connections will block the flow of oil between the power unit and the cylinder

⚠ The tools are fitted with a safety pressure relief valve in the coupling swivel assembly which will bleed to atmosphere if the retract hose is not correctly connected, or if the hoses are not correctly installed

4.3 Remove air from the system – Position the torque wrench so that the piston rod is pointed down and the wrench is lower than the power unit. Advance and retract the cylinder several times, avoiding pressure build-up. Air removal is complete when the cylinder motion is smooth.

5.0 Operation

5.1 Connecting the Tool

The wrench and power unit are connected by a 700-bar operating pressure, twin-line hose assembly. Each end of the hose will have one male and one female connector to ensure proper interconnection between power unit and wrench.

5.1.1 Ensure the connectors are fully engaged, screwed snugly and completely together

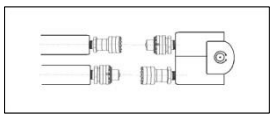


Figure 1 – Connecting the Tool

5.2 Drive Direction Change

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

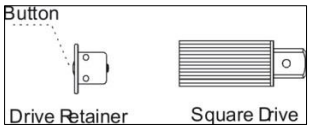


Figure 2 – Drive Direction Change

5.2.2 To insert the drive in the tool, 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 the ratchet. Depress drive retainer button, engage retainer with drive and release button to lock.

5.3 Setting the Reaction Arm

All Durapac torque wrenches are equipped with a universal reaction arm. These reaction arms are employed to absorb and counteract forces created as the unit operates. The reaction arm should extend in the same direction of the square drive; however, slight adjustments may be made to suit your application.

The function of a reaction device is to hold the tool in a position against the forces generated to tighten or loosen bolts or nuts.

Hydraulic wrenches generate tremendous force. The reaction arm can be positioned in numerous places within a 360° circle. However, for the arm to be correctly positioned, it must be set within a 90° quadrant of that circle. That quadrant is the area located between the protruding square drive and the bottom of the housing away from the swivel inlets. It will always be toward the lower half of the housing and on one side of the housing when tightening and the other side when loosening.

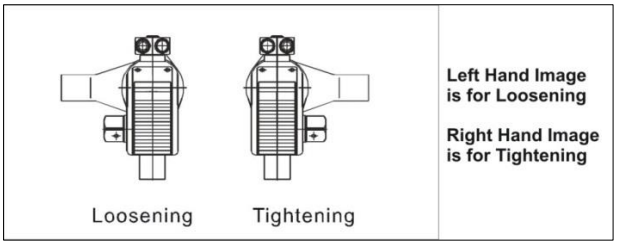


Figure 3 – Setting the Reaction Arm

5.4 Setting the Square Drive for Rotation

The position of the square drive when looking toward the shroud will determine if the tool is set to tighten or loosen the nut. When the square drive extends to the left (when looking at the shroud with the inlets away from you), the tool is set to loosen the nut. When the square drive extends to the right, the tool is set to tighten the nut. To change the direction of rotation for TW Series wrenches, simply push the square drive into the housing until the drive projects out the opposite side of the tool (see Figure 3).

5.5 Setting the Torque

After determining the desired torque, refer to the torque conversion table contained in Section 8.0 to determine the pressure that is necessary to achieve that torque.

5.5.1 Connect the tool to the power supply and turn the power unit on.

5.5.2 Depress the advance remote-control button. The pressure will be shown on the gauge.

5.5.3 Adjust the pressure by first loosening the nut that locks the pressure adjustment handle and then rotate the handle clockwise to increase the pressure and counterclockwise to decrease the pressure. When decreasing pressure, always lower the pressure below the desired point and then bring the pressure gauge back up to the desired pressure.

5.5.4 When the desired pressure is reached, retighten the lock nut and cycle the tool again to confirm that the desired pressure setting has been obtained.

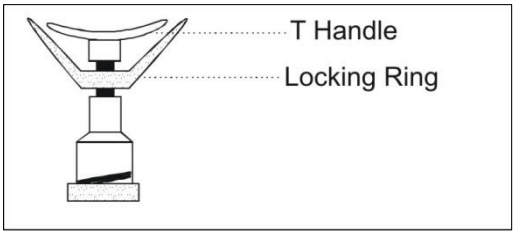


Figure 4 – Setting the Torque

5.6 Operating the Wrench

5.6.1 Place the square drive in the socket; insert the socket retainer ring and pin and place the socket on the nut. Make certain the square drive and socket are the correct size for the nut and that the socket fully engages the nut.

5.6.2 Position the reaction arm against an adjacent nut, flange or solid system component. Make certain that there is clearance for the hoses and swivel couplings. Do not allow the tool to react against the hoses, or swivel

couplings. When reacting directly off the tool body with the reaction arm removed, do not react off the exposed end plug spigot.

5.6.3 After having turned the power unit on and presetting the pressure for the correct torque, depress the remote-control advance button to advance the piston assembly.

5.6.4 When the wrench is started, the reaction surface of the wrench or reaction arm will move against the contact point and the nut will begin to turn. Once the piston reaches the end of its stroke, release the remote-control advance button to retract the piston.

5.6.5 Continue this cycling operation of advance and retract until the nut is no longer turning and the power unit gauge reaches the preset pressure. The piston rod will retract when the advance button is released, under normal conditions an audible “click” will be heard as the tool resets itself.

5.6.6 Continue to cycle the tool until it stalls, and the preset torque has been attained.

5.6.7 Once the nut stops rotating, cycle the tool one last time to achieve total torque.

⚠ **CAUTION:** During the operation, if the tool locks onto the nut, press the advance button on the remote and build pressure. Continue to press down on the remote while pushing down on the reaction pawl. Release the remote’s advance button while continuing to push down on reaction pawl. The tool will then be released from the nut.

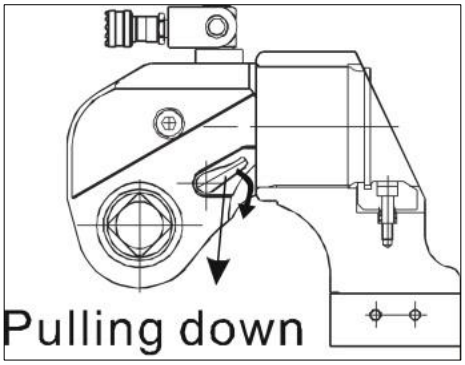


Figure 5 – Releasing the Nut

6.0 Maintenance

IMPORTANT:

- Use only good quality hydraulic fluid. **Do NOT** use brake fluid, transmission fluid, turbine oil, motor oil, alcohol, glycerine etc. Use of anything other than good quality hydraulic oil will void warranty and damage the power unit, hose, and application. We recommend Durapac Hydraulic Oil or equivalent
- Equipment must only be serviced by a qualified hydraulic technician. For repair service, contact your local Durapac authorised service centre
- Damage to hydraulic hoses may not be detected during visual inspections. For this reason, Durapac recommends that hydraulic hoses be replaced on a regular basis
- Tighten connections as needed. Use non-hardening pipe thread compound when servicing connections

Dirt, sand, etc. will quickly ruin any hydraulic system. Ensure that couplings are clean and free of foreign matter. After each use, clean couplings and attach dust caps.

Maintenance is required when wear or leakage is noticed. Periodically inspect all components to detect any problem that may require service and maintenance.

6.1 Check for loose connections and leaks.

6.2 Replace damaged parts immediately.

6.3 Do not exceed oil temperature above 60°C.

6.4 Keep all hydraulic components clean.

6.5 Use dust caps when wrench is disconnected from the hose. Keep entire wrench clean to prolong wrench life.

6.6 Wipe clean, thoroughly and store in clean, dry environment. Avoid temperature extremes.

6.7 Change hydraulic oil in your system as recommended in the power unit instruction sheet.

6.8 Use Molykote G-n Metal Assembly Paste to regrease the ratchet and drive components.

7.0 Troubleshooting

Problem	Cause	Solution
Piston will not advance or retract	Couplers not securely attached to the tool or power unit	• Check the coupler connections and make certain that they are connected
	Defective coupler	• Contact a Durapac authorised service centre for replacement
	Defective remote-control unit	• Replace button and/or control pendant
	Dirt in the direction-control valve of the power unit	• Disassemble the power unit and clean the direction-control valve
Piston will not retract	Hose connections reversed	• Make certain the advance on the power unit is connected to the advance on the tool and retract on the power unit 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 pressure	Leaking piston seal and/or end plug seal	• Replace any defective o-ring(s)
	Defective coupler	• Contact a Durapac authorised service centre for replacement
Square drive will not turn	Grease or dirt build up in teeth of the ratchet and segment pawl	• Disassemble the ratchet and clean the grease or dirt out of the teeth
	Worn or broken teeth on Ratchet and/or Segment Pawl	• Replace any worn or damaged parts
Power unit will not build pressure	Defective relief valve	• Inspect, adjust or replace the relief valve
	Electric power source is too low	• Make certain the amperage, voltage and any extension cord size comply with the power unit's manual requirements
	Defective gauge	• Replace the gauge
	Low oil level	• Check and fill the power unit reservoir
	Clogged filter	• Inspect, clean and/or replace the power unit filter
Nut returns with retract stroke	Ball plungers are not engaging the drive sleeves	• Thread the ball plungers to the correct depth in the housing

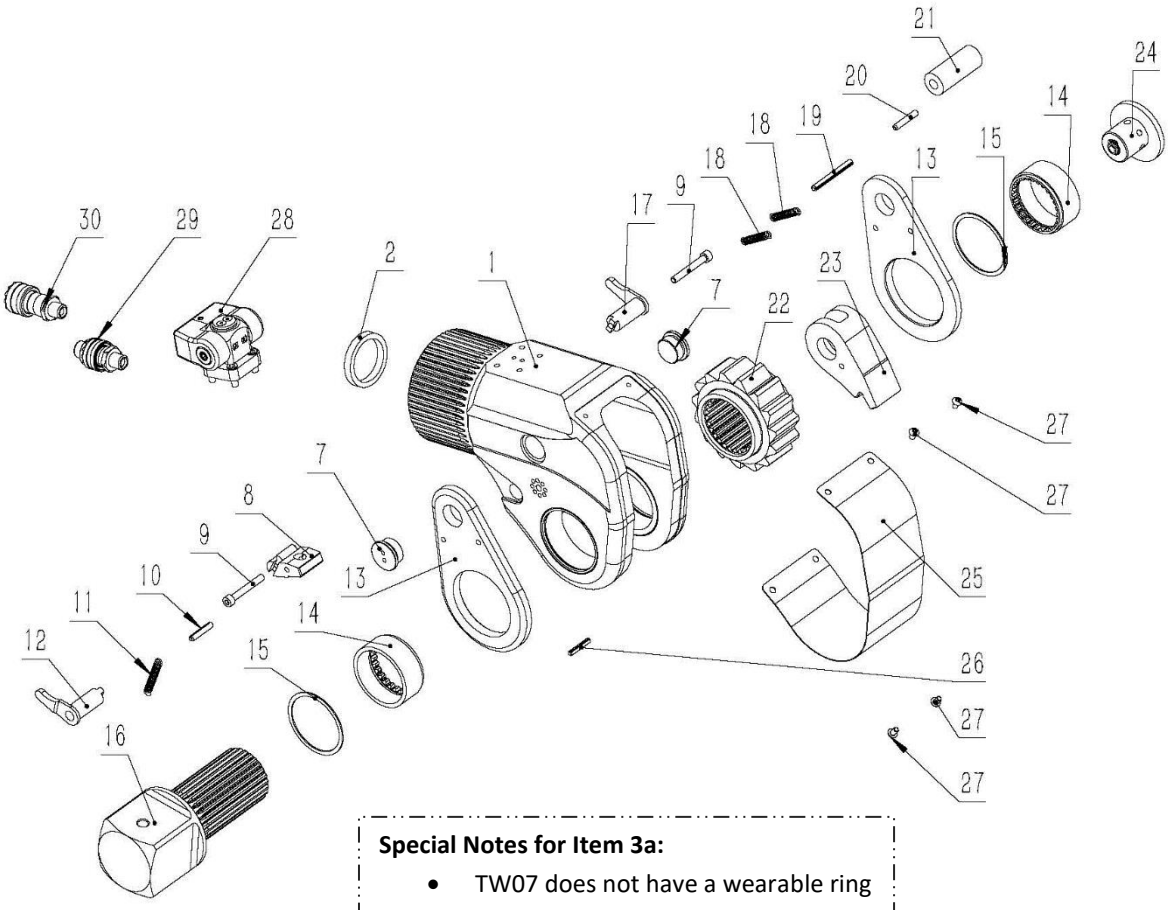
8.0 Torque Conversion Tables

TW Series Hydraulic Torque Wrench PressureChart (PSI/Ft.lbs)										
Model	TW07	TW1	TW3	TW5	TW8	TW10	TW20	TW25	TW35	TW50
PSI	Ft.lbs	Ft.lbs	Ft.lbs	Ft.lbs	Ft.lbs	Ft.lbs	Ft.lbs	Ft.lbs	Ft.lbs	Ft.lbs
1,000	81	134	328	547	783	1,127	1,937	2,523	3,535	5,230
1,200	97	161	394	656	940	1,352	2,324	3,028	4,242	6,276
1,400	114	188	459	766	1,096	1,578	2,712	3,532	4,949	7,322
1,600	130	215	525	875	1,253	1,803	3,099	4,037	5,656	8,368
1,800	146	242	590	985	1,409	2,029	3,487	4,541	6,363	9,414
2,000	162	268	656	1,094	1,566	2,254	3,874	5,046	7,070	10,460
2,200	179	295	721	1,203	1,723	2,480	4,261	5,550	7,777	11,506
2,400	195	322	787	1,313	1,879	2,705	4,649	6,055	8,485	12,552
2,600	211	349	852	1,422	2,036	2,931	5,036	6,559	9,192	13,598
2,800	228	376	918	1,532	2,193	3,156	5,424	7,064	9,899	14,644
3,000	244	403	984	1,641	2,349	3,381	5,811	7,568	10,606	15,690
3,200	260	430	1,049	1,750	2,506	3,607	6,198	8,073	11,313	16,736
3,400	276	457	1,115	1,860	2,662	3,832	6,586	8,577	12,020	17,782
3,600	293	483	1,180	1,969	2,819	4,058	6,973	9,082	12,727	18,828
3,800	309	510	1,246	2,079	2,976	4,283	7,361	9,586	13,434	19,874
4,000	325	537	1,311	2,188	3,132	4,509	7,748	10,091	14,141	20,920
4,200	341	564	1,377	2,297	3,289	4,734	8,135	10,595	14,848	21,966
4,400	358	591	1,443	2,407	3,446	4,959	8,523	11,100	15,555	23,012
4,600	374	618	1,508	2,516	3,602	5,185	8,910	11,604	16,262	24,058
4,800	390	645	1,574	2,626	3,759	5,410	9,298	12,109	16,970	25,104
5,000	407	672	1,639	2,735	3,915	5,636	9,685	12,613	17,677	26,150
5,200	423	698	1,705	2,844	4,072	5,861	10,072	13,118	18,384	27,196
5,400	439	725	1,770	2,954	4,229	6,087	10,460	13,622	19,091	28,242
5,600	455	752	1,836	3,063	4,385	6,312	10,847	14,127	19,798	29,288
5,800	472	779	1,901	3,173	4,542	6,538	11,235	14,631	20,505	30,334
6,000	488	806	1,967	3,282	4,699	6,763	11,622	15,136	21,212	31,380
6,200	504	833	2,033	3,391	4,855	6,988	12,009	15,641	21,919	32,426
6,400	521	860	2,098	3,501	5,012	7,214	12,397	16,145	22,626	33,472
6,600	537	887	2,164	3,610	5,168	7,439	12,784	16,650	23,333	34,518
6,800	553	914	2,229	3,720	5,325	7,665	13,172	17,154	24,040	35,564
7,000	569	940	2,295	3,829	5,482	7,890	13,559	17,659	24,747	36,610
7,200	586	967	2,360	3,938	5,638	8,116	13,946	18,163	25,454	37,656
7,400	602	994	2,426	4,048	5,795	8,341	14,334	18,668	26,162	38,702
7,600	618	1,021	2,491	4,157	5,951	8,567	14,721	19,172	26,869	39,748
7,800	635	1,048	2,557	4,267	6,108	8,792	15,109	19,677	27,576	40,794
8,000	651	1,075	2,623	4,376	6,265	9,017	15,496	20,181	28,283	41,840
8,200	667	1,102	2,688	4,485	6,421	9,243	15,883	20,686	28,990	42,886
8,400	683	1,129	2,754	4,595	6,578	9,468	16,271	21,190	29,697	43,932
8,600	700	1,155	2,819	4,704	6,735	9,694	16,658	21,695	30,404	44,978
8,800	716	1,182	2,885	4,814	6,891	9,919	17,046	22,199	31,111	46,024
9,000	732	1,209	2,950	4,923	7,048	10,145	17,433	22,704	31,818	47,070
9,200	748	1,236	3,016	5,032	7,204	10,370	17,820	23,208	32,525	48,116
9,400	765	1,263	3,082	5,142	7,361	10,595	18,208	23,713	33,232	49,162
9,600	781	1,290	3,147	5,251	7,518	10,821	18,595	24,217	33,939	50,208
9,800	797	1,317	3,213	5,361	7,674	11,046	18,983	24,722	34,647	51,254
10,000	814	1,344	3,278	5,470	7,831	11,272	19,370	25,226	35,354	52,300

TW Series Hydraulic Torque Wrench Pressure Chart (Bar/Nm)										
Model	TW07	TW1	TW3	TW5	TW8	TW10	TW20	TW25	TW35	TW50
Bar	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm
70	112	183	451	752	1,078	1,551	2,666	3,472	4,866	7,200
80	128	209	515	860	1,232	1,773	3,047	3,968	5,561	8,229
90	144	236	580	967	1,386	1,994	3,428	4,464	6,256	9,257
100	160	262	644	1,075	1,540	2,216	3,809	4,960	6,952	10,286
110	176	288	709	1,182	1,694	2,438	4,190	5,456	7,647	11,314
120	192	314	773	1,290	1,848	2,659	4,571	5,952	8,342	12,343
130	208	341	838	1,397	2,002	2,881	4,952	6,448	9,037	13,371
140	224	367	902	1,505	2,156	3,103	5,332	6,945	9,733	14,400
150	240	393	967	1,612	2,310	3,324	5,713	7,441	10,428	15,429
160	256	419	1,031	1,720	2,464	3,546	6,094	7,937	11,123	16,457
170	272	446	1,096	1,828	2,618	3,768	6,475	8,433	11,818	17,486
180	288	472	1,160	1,935	2,772	3,989	6,856	8,929	12,514	18,514
190	304	498	1,225	2,043	2,926	4,211	7,237	9,425	13,209	19,543
200	320	524	1,289	2,150	3,080	4,433	7,618	9,921	13,904	20,571
210	336	551	1,353	2,258	3,234	4,654	7,999	10,417	14,599	21,600
220	352	577	1,418	2,365	3,388	4,876	8,380	10,913	15,295	22,629
230	368	603	1,482	2,473	3,542	5,098	8,761	11,409	15,990	23,657
240	384	629	1,547	2,580	3,696	5,319	9,142	11,905	16,685	24,686
250	400	656	1,611	2,688	3,850	5,541	9,523	12,401	17,380	25,714
260	416	682	1,676	2,796	4,004	5,763	9,903	12,898	18,076	26,743
270	432	708	1,740	2,903	4,158	5,984	10,284	13,394	18,771	27,771
280	448	734	1,805	3,011	4,312	6,206	10,665	13,890	19,466	28,800
290	464	761	1,869	3,118	4,466	6,428	11,046	14,386	20,161	29,829
300	480	787	1,934	3,226	4,620	6,649	11,427	14,882	20,856	30,857
310	496	813	1,998	3,333	4,774	6,871	11,808	15,378	21,552	31,886
320	512	839	2,063	3,441	4,928	7,093	12,189	15,874	22,247	32,914
330	528	866	2,127	3,548	5,082	7,314	12,570	16,370	22,942	33,943
340	544	892	2,191	3,656	5,236	7,536	12,951	16,866	23,637	34,971
350	560	918	2,256	3,764	5,390	7,758	13,332	17,362	24,333	36,000
360	576	944	2,320	3,871	5,544	7,979	13,713	17,858	25,028	37,029
370	592	971	2,385	3,979	5,698	8,201	14,094	18,354	25,723	38,057
380	608	997	2,449	4,086	5,852	8,423	14,475	18,850	26,418	39,086
390	624	1,023	2,514	4,194	6,006	8,644	14,855	19,347	27,114	40,114
400	640	1,049	2,578	4,301	6,160	8,866	15,236	19,843	27,809	41,143
410	656	1,076	2,643	4,409	6,314	9,088	15,617	20,339	28,504	42,171
420	672	1,102	2,707	4,516	6,468	9,309	15,998	20,835	29,199	43,200
430	688	1,128	2,772	4,624	6,622	9,531	16,379	21,331	29,895	44,229
440	704	1,154	2,836	4,732	6,776	9,753	16,760	21,827	30,590	45,257
450	720	1,181	2,900	4,839	6,930	9,974	17,141	22,323	31,285	46,286
460	736	1,207	2,965	4,947	7,084	10,196	17,522	22,819	31,980	47,314
470	752	1,233	3,029	5,054	7,238	10,418	17,903	23,315	32,676	48,343
480	768	1,259	3,094	5,162	7,392	10,639	18,284	23,811	33,371	49,371
490	784	1,286	3,158	5,269	7,546	10,861	18,665	24,307	34,066	50,400
500	800	1,312	3,223	5,377	7,700	11,083	19,046	24,803	34,761	51,429
510	816	1,338	3,287	5,484	7,854	11,304	19,427	25,299	35,456	52,457
520	832	1,364	3,352	5,592	8,008	11,526	19,807	25,796	36,152	53,486
530	848	1,391	3,416	5,700	8,162	11,748	20,188	26,292	36,847	54,514
540	864	1,417	3,481	5,807	8,316	11,969	20,569	26,788	37,542	55,543
550	880	1,443	3,545	5,915	8,470	12,191	20,950	27,284	38,237	56,571
560	896	1,469	3,610	6,022	8,624	12,413	21,331	27,780	38,933	57,600
570	912	1,496	3,674	6,130	8,778	12,634	21,712	28,276	39,628	58,629
580	928	1,522	3,738	6,237	8,932	12,856	22,093	28,772	40,323	59,657
590	944	1,548	3,803	6,345	9,086	13,078	22,474	29,268	41,018	60,686
600	960	1,574	3,867	6,452	9,240	13,299	22,855	29,764	41,714	61,714
610	976	1,601	3,932	6,560	9,394	13,521	23,236	30,260	42,409	62,743
620	992	1,627	3,996	6,668	9,548	13,743	23,617	30,756	43,104	63,771
630	1,008	1,653	4,061	6,775	9,702	13,964	23,998	31,252	43,799	64,800
640	1,024	1,679	4,125	6,883	9,856	14,186	24,378	31,749	44,495	65,829
650	1,040	1,706	4,190	6,990	10,010	14,408	24,759	32,245	45,190	66,857
660	1,056	1,732	4,254	7,098	10,164	14,629	25,140	32,741	45,885	67,886
670	1,072	1,758	4,319	7,205	10,318	14,851	25,521	33,237	46,580	68,914
680	1,088	1,784	4,383	7,313	10,472	15,073	25,902	33,733	47,276	69,943
690	1,104	1,811	4,448	7,420	10,626	15,294	26,283	34,229	47,971	70,971
700	1,120	1,837	4,512	7,528	10,780	15,516	26,664	34,725	48,666	72,000

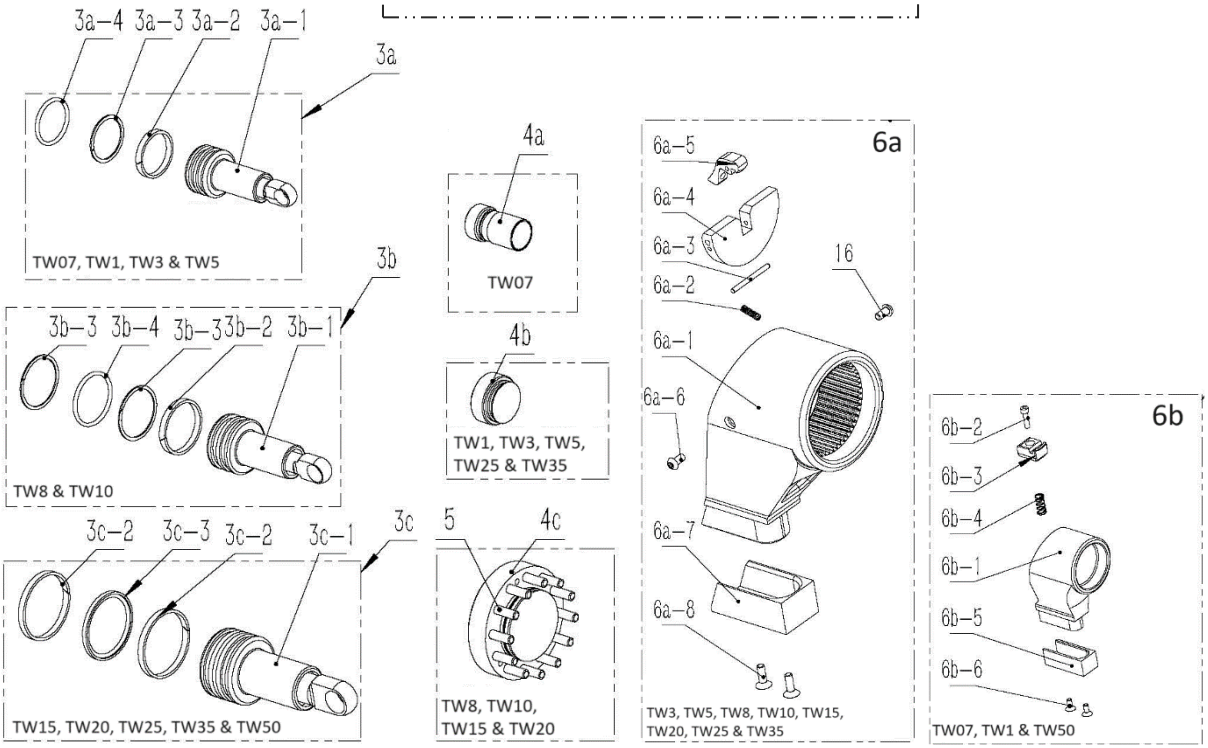
9.0 Parts Breakdown (corresponding lists on following pages)

9.1 Parts Breakdown for models TW07 – TW50



Special Notes for Item 3a:

- TW07 does not have a wearable ring
- The position of the wearable ring is on the left-hand side of the o- ring



Serial, model and part numbers need to be quoted when ordering parts.

9.2 Parts List for model TW07

Item	Display Name	Part No.	Qty
1	BODY	ZDB2260	1
2	U-RING	ZDB2261	1
3a	**PISTON ROD ASSEMBLY**	**ZDB2262**	**1**
3a-1	PISTON ROD	ZDB2263	1
3a-3	RETAINING RING	ZDB2264	1
3a-4	O-RING	ZDB2265	1
4a	END CAP	ZDB2266	1
6b	**REACTION ARM ASSEMBLY**	**ZDB2267**	**1**
6b-1	REACTION ARM	ZDB2268	1
6b-2	PLUGGING SCREW	ZDB2269	1
6b-3	FIXED BLOCK	ZDB2270	1
6b-4	COMPRESSED SPRING	ZDB2305	1
6b-5	REACTION ARM COVER	ZDB2271	1
6b-6	SCREW FOR BUTTON LEVER	ZDB2272	2
7	PLUG SCREW FOR BODY	ZDB2273	2
8	REACTION PAWL	ZDB2274	1
9	SCREW FOR BUTTON LEVER	ZDB2275	2
10	ROLL PIN FOR REACTION PAWL	ZDB2276	1
11	TENSION SPRING OF REACTION PAWL	ZDB2277	1
12	BUTTON LEVER (LEFT)	ZDB2278	1
13	DRIVE PLATE	ZDB2279	2
14	DRIVE SLEEVE SPLINE	ZDB2280	2
15	CIRCLIP	ZDB2281	2
16	SQUARE DRIVE	ZDB2282	1
17	BUTTON LEVER(RIGHT)	ZDB2283	1
18	TENSION SPRING OF DRIVE PAWL	ZDB2284	2
19	ROLL PIN FOR DRIVE PLATE	ZDB2285	1
20	ROLL PIN FOR DRIVE PAWL	ZDB2286	1
21	DRIVE PIN	ZDB2287	1
22	RATCHET SPLINE	ZDB2288	1
23	DRIVE PAWL	ZDB2289	1
24	DRIVE RETAINER	ZDB2290	1
25	SHROUD	ZDB2291	1
26	PIN FOR REACTION PAWL	ZDB2292	1
27	HEXAGON SOCKET FLAT ROUND HEAD SCREW	ZDB2293	4
28	SWIVEL ASSEMBLY	ZDB2325	1
29	MALE COUPLING	CH-4	1
30	FEMALE COUPLING	CR-4	1
	SEAL KIT	ZDB3600	1
	SWIVEL SEAL KIT	ZDB3617	1

9.3 Parts List for model TW1

Item	Display Name	Part No.	Qty
1	BODY	ZDB2294	1
2	U-RING	ZDB2295	1
3a	**PISTON ROD ASSEMBLY**	**ZDB2296**	**1**
3a-1	PISTON ROD	ZDB2297	1
3a-2	WEARABLE RING	ZDB2298	1
3a-3	RETAINING RING	ZDB2299	1
3a-4	O-RING	ZDB2300	1
4b	END CAP	ZDB2301	1
6b	**REACTION ARM ASSEMBLY**	**ZDB2302**	**1**
6b-1	REACTION ARM	ZDB2303	1
6b-2	PLUGGING SCREW	ZDB2269	1
6b-3	FIXED BLOCK	ZDB2304	1
6b-4	COMPRESSED SPRING	ZDB2305	1
6b-5	REACTION ARM COVER	ZDB2306	1
6b-6	SCREW FOR BUTTON LEVER	ZDB2272	2
7	PLUG SCREW FOR BODY	ZDB2307	2
8	REACTION PAWL	ZDB2308	1
9	SCREW FOR BUTTON LEVER	ZDB2309	2
10	ROLL PIN FOR REACTION PAWL	ZDB2310	1
11	TENSION SPRING OF REACTION PAWL	ZDB2311	1
12	BUTTON LEVER (LEFT)	ZDB2312	1
13	DRIVE PLATE	ZDB2313	2
14	DRIVE SLEEVE SPLINE	ZDB2314	2
15	CIRCLIP	ZDB2315	2
16	SQUARE DRIVE	ZDB1067	1
17	BUTTON LEVER(RIGHT)	ZDB2316	1
18	TENSION SPRING OF DRIVE PAWL	ZDB2317	2
19	ROLL PIN FOR DRIVE PLATE	ZDB2318	1
20	ROLL PIN FOR DRIVE PAWL	ZDB2319	1
21	DRIVE PIN	ZDB2320	1
22	RATCHET SPLINE	ZDB2321	1
23	DRIVE PAWL	ZDB2322	1
24	DRIVE RETAINER	ZDB1172	1
25	SHROUD	ZDB2323	1
26	PIN FOR REACTION PAWL	ZDB2324	1
27	HEXAGON SOCKET FLAT ROUND HEAD SCREW	ZDB2293	4
28	SWIVEL ASSEMBLY	ZDB2325	1
29	MALE COUPLING	CH-4	1
30	FEMALE COUPLING	CR-4	1
	SEAL KIT	ZDB3601	1
	SWIVEL SEAL KIT	ZDB3617	1

9.4 Parts List for model TW3

Item	Display Name	Part No.	Qty
1	BODY	ZDB2326	1
2	U-RING	ZDB2327	1
3a	**PISTON ROD ASSEMBLY**	**ZDB1089**	**1**
3a-1	PISTON ROD	ZDB2328	1
3a-2	WEARABLE RING	ZDB2329	1
3a-3	RETAINING RING	ZDB2330	1
3a-4	O-RING	ZDB2331	1
4b	END CAP	ZDB2332	1
6a	**REACTION ARM ASSEMBLY**	**ZDB2333**	**1**
6a-1	REACTION ARM	ZDB2334	1
6a-2	COMPRESSED SPRING	ZDB2335	1
6a-3	PIN	ZDB2336	1
6a-4	FIXED SEAT	ZDB2337	1
6a-5	POSITIONING HOOK	ZDB2338	1
6a-6	HEXAGON SOCKET FLAT ROUND HEAD SCREW	ZDB2339	2
6a-7	REACTION ARM COVER	ZDB2340	1
6a-8	SCREW	ZDB2341	2
7	PLUG SCREW FOR BODY	ZDB2342	2
8	REACTION PAWL	ZDB2343	1
9	SCREW FOR BUTTON LEVER	ZDB2344	2
10	ROLL PIN FOR REACTION PAWL	ZDB2345	1
11	TENSION SPRING OF REACTION PAWL	ZDB2346	1
12	BUTTON LEVER (LEFT)	ZDB2347	1
13	DRIVE PLATE	ZDB2348	2
14	DRIVE SLEEVE SPLINE	ZDB2639	2
15	CIRCLIP	ZDB2349	2
16	SQUARE DRIVE	ZDB1108	1
17	BUTTON LEVER(RIGHT)	ZDB2350	1
18	TENSION SPRING OF DRIVE PAWL	ZDB2351	2
19	ROLL PIN FOR DRIVE PLATE	ZDB2352	1
20	ROLL PIN FOR DRIVE PAWL	ZDB2353	1
21	DRIVE PIN	ZDB2354	1
22	RATCHET SPLINE	ZDB2355	1
23	DRIVE PAWL	ZDB2356	1
24	DRIVE RETAINER	ZDB1173	1
25	SHROUD	ZDB2357	1
26	PIN FOR REACTION PAWL	ZDB2358	1
27	HEXAGON SOCKET FLAT ROUND HEAD SCREW	ZDB2293	4
28	SWIVEL ASSEMBLY	ZDB2359	1
29	MALE COUPLING	CH-4	1
30	FEMALE COUPLING	CR-4	1
	SEAL KIT	ZDB3602	1
	SWIVEL SEAL KIT	ZDB3616	1

9.5 Parts List for model TW5

Item	Display Name	Part No.	Qty
1	BODY	ZDB2360	1
2	U-RING	ZDB2361	1
3a	**PISTON ROD ASSEMBLY**	**ZDB2362**	**1**
3a-1	PISTON ROD	ZDB2363	1
3a-2	WEARABLE RING	ZDB2364	1
3a-3	RETAINING RING	ZDB2365	1
3a-4	O-RING	ZDB2366	1
4b	END CAP	ZDB2367	1
6a	**REACTION ARM ASSEMBLY**	**ZDB2368**	**1**
6a-1	REACTION ARM	ZDB2369	1
6a-2	COMPRESSED SPRING	ZDB2370	1
6a-3	PIN	ZDB2511	1
6a-4	FIXED SEAT	ZDB2371	1
6a-5	POSITIONING HOOK	ZDB2372	1
6a-6	HEXAGON SOCKET FLAT ROUND HEAD SCREW	ZDB2373	2
6a-7	REACTION ARM COVER	ZDB2374	1
6a-8	SCREW	ZDB2375	2
7	PLUG SCREW FOR BODY	ZDB2376	2
8	REACTION PAWL	ZDB2377	1
9	SCREW FOR BUTTON LEVER	ZDB2378	2
10	ROLL PIN FOR REACTION PAWL	ZDB2379	1
11	TENSION SPRING OF REACTION PAWL	ZDB2380	1
12	BUTTON LEVER (LEFT)	ZDB2381	1
13	DRIVE PLATE	ZDB2382	2
14	DRIVE SLEEVE SPLINE	ZDB2383	2
15	CIRCLIP	ZDB2384	2
16	SQUARE DRIVE	ZDB2385	1
17	BUTTON LEVER(RIGHT)	ZDB2386	1
18	TENSION SPRING OF DRIVE PAWL	ZDB2387	2
19	ROLL PIN FOR DRIVE PLATE	ZDB2388	1
20	ROLL PIN FOR DRIVE PAWL	ZDB2379	1
21	DRIVE PIN	ZDB2390	1
22	RATCHET SPLINE	ZDB2391	1
23	DRIVE PAWL	ZDB2392	1
24	DRIVE RETAINER	ZDB2393	1
25	SHROUD	ZDB2394	1
26	PIN FOR REACTION PAWL	ZDB2395	1
27	HEXAGON SOCKET FLAT ROUND HEAD SCREW	ZDB2293	4
28	SWIVEL ASSEMBLY	ZDB2359	1
29	MALE COUPLING	CH-4	1
30	FEMALE COUPLING	CR-4	1
	SEAL KIT	ZDB3603	1
	SWIVEL SEAL KIT	ZDB3616	1

9.6 Parts List for model TW8

Item	Display Name	Part No.	Qty
1	BODY	ZDB2396	1
2	U-RING	ZDB2397	1
3b	**PISTON ROD ASSEMBLY**	**ZDB2398**	**1**
3b-1	PISTON ROD	ZDB2399	1
3b-2	WEARABLE RING	ZDB2400	1
3b-3	RETAINING RING	ZDB2401	2
3b-4	O-RING	ZDB2402	1
4c	END CAP	ZDB2403	1
5	HEXAGON SOCKET HEAD CAP SCREW	ZDB2404	10
6a	**REACTION ARM ASSEMBLY**	**ZDB2405**	**1**
6a-1	REACTION ARM	ZDB2406	1
6a-2	COMPRESSED SPRING	ZDB2407	1
6a-3	PIN	ZDB2511	1
6a-4	FIXED SEAT	ZDB2408	1
6a-5	POSITIONING HOOK	ZDB2409	1
6a-6	HEXAGON SOCKET FLAT ROUND HEAD SCREW	ZDB2546	2
6a-7	REACTION ARM COVER	ZDB2410	1
6a-8	SCREW	ZDB2411	2
7	PLUG SCREW FOR BODY	ZDB2412	2
8	REACTION PAWL	ZDB2413	1
9	SCREW FOR BUTTON LEVER	ZDB2414	2
10	ROLL PIN FOR REACTION PAWL	ZDB2415	1
11	TENSION SPRING OF REACTION PAWL	ZDB2416	1
12	BUTTON LEVER (LEFT)	ZDB2417	1
13	DRIVE PLATE	ZDB2418	2
14	DRIVE SLEEVE SPLINE	ZDB2419	2
15	CIRCLIP	ZDB2420	2
16	SQUARE DRIVE	ZDB2421	1
17	BUTTON LEVER(RIGHT)	ZDB2422	1
18	TENSION SPRING OF DRIVE PAWL	ZDB2423	2
19	ROLL PIN FOR DRIVE PLATE	ZDB2388	1
20	ROLL PIN FOR DRIVE PAWL	ZDB2424	1
21	DRIVE PIN	ZDB2425	1
22	RATCHET SPLINE	ZDB2426	1
23	DRIVE PAWL	ZDB2427	1
24	DRIVE RETAINER	ZDB2428	1
25	SHROUD	ZDB2429	1
26	PIN FOR REACTION PAWL	ZDB2602	1
27	HEXAGON SOCKET FLAT ROUND HEAD SCREW	ZDB2293	4
28	SWIVEL ASSEMBLY	ZDB2359	1
29	MALE COUPLING	CH-4	1
30	FEMALE COUPLING	CR-4	1
	SEAL KIT	ZDB3604	1
	SWIVEL SEAL KIT	ZDB3616	1

9.7 Parts List for model TW10

Item	Display Name	Part No.	Qty
1	BODY	ZDB2431	1
2	U-RING	ZDB2432	1
3b	**PISTON ROD ASSEMBLY**	**ZDB2433**	**1**
3b-1	PISTON ROD	ZDB2434	1
3b-2	WEARABLE RING	ZDB2435	1
3b-3	RETAINING RING	ZDB2436	2
3b-4	O-RING	ZDB2437	1
4c	END CAP	ZDB2438	1
5	HEXAGON SOCKET HEAD CAP SCREW	ZDB2404	10
6a	**REACTION ARM ASSEMBLY**	**ZDB2439**	**1**
6a-1	REACTION ARM	ZDB2440	1
6a-2	COMPRESSED SPRING	ZDB2441	1
6a-3	PIN	ZDB2442	1
6a-4	FIXED SEAT	ZDB2443	1
6a-5	POSITIONING HOOK	ZDB2444	1
6a-6	HEXAGON SOCKET FLAT ROUND HEAD SCREW	ZDB2546	2
6a-7	REACTION ARM COVER	ZDB2445	1
6a-8	SCREW	ZDB2375	2
7	PLUG SCREW FOR BODY	ZDB2446	2
8	REACTION PAWL	ZDB2447	1
9	SCREW FOR BUTTON LEVER	ZDB2448	2
10	ROLL PIN FOR REACTION PAWL	ZDB2449	1
11	TENSION SPRING OF REACTION PAWL	ZDB2450	1
12	BUTTON LEVER (LEFT)	ZDB2451	1
13	DRIVE PLATE	ZDB2452	2
14	DRIVE SLEEVE SPLINE	ZDB2453	2
15	CIRCLIP	ZDB2454	2
16	SQUARE DRIVE	ZDB2455	1
17	BUTTON LEVER(RIGHT)	ZDB2456	1
18	TENSION SPRING OF DRIVE PAWL	ZDB2457	2
19	ROLL PIN FOR DRIVE PLATE	ZDB2458	1
20	ROLL PIN FOR DRIVE PAWL	ZDB2459	1
21	DRIVE PIN	ZDB2460	1
22	RATCHET SPLINE	ZDB2461	1
23	DRIVE PAWL	ZDB2462	1
24	DRIVE RETAINER	ZDB2463	1
25	SHROUD	ZDB2464	1
26	PIN FOR REACTION PAWL	ZDB2499	1
27	HEXAGON SOCKET FLAT ROUND HEAD SCREW	ZDB2293	4
28	SWIVEL ASSEMBLY	ZDB2359	1
29	MALE COUPLING	CH-4	1
30	FEMALE COUPLING	CR-4	1
	SEAL KIT	ZDB3605	1
	SWIVEL SEAL KIT	ZDB3616	1

9.8 Parts List for model TW15

Item	Display Name	Part No.	Qty
1	BODY	ZDB2466	1
2	U-RING	ZDB2467	1
3c	**PISTON ROD ASSEMBLY**	**ZDB2468**	**1**
3c-1	PISTON ROD	ZDB2469	1
3c-2	WEARABLE RING	ZDB2470	2
3c-3	WEARABLE RING	ZDB2471	1
4c	END CAP	ZDB2472	1
5	HEXAGON SOCKET HEAD CAP SCREW	ZDB2473	12
6a	**REACTION ARM ASSEMBLY**	**ZDB2474**	**1**
6a-1	REACTION ARM	ZDB2475	1
6a-2	COMPRESSED SPRING	ZDB2476	1
6a-3	PIN	ZDB2511	1
6a-4	FIXED SEAT	ZDB2477	1
6a-5	POSITIONING HOOK	ZDB2478	1
6a-6	HEXAGON SOCKET FLAT ROUND HEAD SCREW	ZDB2546	2
6a-7	REACTION ARM COVER	ZDB2479	1
6a-8	SCREW	ZDB2375	2
7	PLUG SCREW FOR BODY	ZDB2480	2
8	REACTION PAWL	ZDB2481	1
9	SCREW FOR BUTTON LEVER	ZDB2482	2
10	ROLL PIN FOR REACTION PAWL	ZDB2483	1
11	TENSION SPRING OF REACTION PAWL	ZDB2484	1
12	BUTTON LEVER (LEFT)	ZDB2485	1
13	DRIVE PLATE	ZDB2486	2
14	DRIVE SLEEVE SPLINE	ZDB2487	2
15	CIRCLIP	ZDB2488	2
16	SQUARE DRIVE	ZDB2489	1
17	BUTTON LEVER(RIGHT)	ZDB2490	1
18	TENSION SPRING OF DRIVE PAWL	ZDB2491	2
19	ROLL PIN FOR DRIVE PLATE	ZDB2492	1
20	ROLL PIN FOR DRIVE PAWL	ZDB2493	1
21	DRIVE PIN	ZDB2494	1
22	RATCHET SPLINE	ZDB2495	1
23	DRIVE PAWL	ZDB2496	1
24	DRIVE RETAINER	ZDB2497	1
25	SHROUD	ZDB2498	1
26	PIN FOR REACTION PAWL	ZDB2499	1
27	HEXAGON SOCKET FLAT ROUND HEAD SCREW	ZDB2293	4
28	SWIVEL ASSEMBLY	ZDB2359	1
29	MALE COUPLING	CH-4	1
30	FEMALE COUPLING	CR-4	1
	SEAL KIT	ZDB3606	1
	SWIVEL SEAL KIT	ZDB3616	1

9.9 Parts List for model TW20

Item	Display Name	Part No.	Qty
1	BODY	ZDB2500	1
2	U-RING	ZDB2501	1
3c	**PISTON ROD ASSEMBLY**	**ZDB2502**	**1**
3c-1	PISTON ROD	ZDB2503	1
3c-2	WEARABLE RING	ZDB2504	2
3c-3	WEARABLE RING	ZDB2505	1
4c	END CAP	ZDB2506	1
5	HEXAGON SOCKET HEAD CAP SCREW	ZDB2507	10
6a	**REACTION ARM ASSEMBLY**	**ZDB2508**	**1**
6a-1	REACTION ARM	ZDB2509	1
6a-2	COMPRESSED SPRING	ZDB2510	1
6a-3	PIN	ZDB2511	1
6a-4	FIXED SEAT	ZDB2512	1
6a-5	POSITIONING HOOK	ZDB2513	1
6a-6	HEXAGON SOCKET FLAT ROUND HEAD SCREW	ZDB2546	2
6a-7	REACTION ARM COVER	ZDB2514	1
6a-8	SCREW	ZDB2583	2
7	PLUG SCREW FOR BODY	ZDB2515	2
8	REACTION PAWL	ZDB2516	1
9	SCREW FOR BUTTON LEVER	ZDB2482	2
10	ROLL PIN FOR REACTION PAWL	ZDB2517	1
11	TENSION SPRING OF REACTION PAWL	ZDB2518	1
12	BUTTON LEVER (LEFT)	ZDB2519	1
13	DRIVE PLATE	ZDB2520	2
14	DRIVE SLEEVE SPLINE	ZDB2521	2
15	CIRCLIP	ZDB2522	2
16	SQUARE DRIVE	ZDB2523	1
17	BUTTON LEVER(RIGHT)	ZDB2524	1
18	TENSION SPRING OF DRIVE PAWL	ZDB2525	2
19	ROLL PIN FOR DRIVE PLATE	ZDB2560	1
20	ROLL PIN FOR DRIVE PAWL	ZDB2526	1
21	DRIVE PIN	ZDB2527	1
22	RATCHET SPLINE	ZDB2528	1
23	DRIVE PAWL	ZDB2529	1
24	DRIVE RETAINER	ZDB2530	1
25	SHROUD	ZDB2531	1
26	PIN FOR REACTION PAWL	ZDB2602	1
27	HEXAGON SOCKET FLAT ROUND HEAD SCREW	ZDB2293	4
28	SWIVEL ASSEMBLY	ZDB2359	1
29	MALE COUPLING	CH-4	1
30	FEMALE COUPLING	CR-4	1
	SEAL KIT	ZDB3607	1
	SWIVEL SEAL KIT	ZDB3616	1

9.10 Parts List for model TW25

Item	Display Name	Part No.	Qty
1	BODY	ZDB2533	1
2	U-RING	ZDB2534	1
3c	**PISTON ROD ASSEMBLY**	**ZDB2535**	**1**
3c-1	PISTON ROD	ZDB2536	1
3c-2	WEARABLE RING	ZDB2537	2
3c-3	WEARABLE RING	ZDB2538	1
4b	END CAP	ZDB2539	1
6a	**REACTION ARM ASSEMBLY**	**ZDB2540**	**1**
6a-1	REACTION ARM	ZDB2541	1
6a-2	COMPRESSED SPRING	ZDB2542	1
6a-3	PIN	ZDB2543	1
6a-4	FIXED SEAT	ZDB2544	1
6a-5	POSITIONING HOOK	ZDB2545	1
6a-6	HEXAGON SOCKET FLAT ROUND HEAD SCREW	ZDB2546	2
6a-7	REACTION ARM COVER	ZDB2547	1
6a-8	SCREW	ZDB2583	2
7	PLUG SCREW FOR BODY	ZDB2548	2
8	REACTION PAWL	ZDB2549	1
9	SCREW FOR BUTTON LEVER	ZDB2550	2
10	ROLL PIN FOR REACTION PAWL	ZDB2517	1
11	TENSION SPRING OF REACTION PAWL	ZDB2552	1
12	BUTTON LEVER (LEFT)	ZDB2553	1
13	DRIVE PLATE	ZDB2554	2
14	DRIVE SLEEVE SPLINE	ZDB2555	2
15	CIRCLIP	ZDB2556	2
16	SQUARE DRIVE	ZDB2557	1
17	BUTTON LEVER(RIGHT)	ZDB2558	1
18	TENSION SPRING OF DRIVE PAWL	ZDB2559	2
19	ROLL PIN FOR DRIVE PLATE	ZDB2560	1
20	ROLL PIN FOR DRIVE PAWL	ZDB2526	1
21	DRIVE PIN	ZDB2562	1
22	RATCHET SPLINE	ZDB2563	1
23	DRIVE PAWL	ZDB2564	1
24	DRIVE RETAINER	ZDB2565	1
25	SHROUD	ZDB2566	1
26	PIN FOR REACTION PAWL	ZDB2602	1
27	HEXAGON SOCKET FLAT ROUND HEAD SCREW	ZDB2293	4
28	SWIVEL ASSEMBLY	ZDB2359	1
29	MALE COUPLING	CH-4	1
30	FEMALE COUPLING	CR-4	1
	SEAL KIT	ZDB3608	1
	SWIVEL SEAL KIT	ZDB3616	1

9.11 Parts List for model TW35

Item	Display Name	Part No.	Qty
1	BODY	ZDB2568	1
2	U-RING	ZDB2569	1
3c	**PISTON ROD ASSEMBLY**	**ZDB2570**	**1**
3c-1	PISTON ROD	ZDB2571	1
3c-2	WEARABLE RING	ZDB2572	2
3c-3	WEARABLE RING	ZDB2573	1
4b	END CAP	ZDB2574	1
6a	**REACTION ARM ASSEMBLY**	**ZDB2575**	**1**
6a-1	REACTION ARM	ZDB2576	1
6a-2	COMPRESSED SPRING	ZDB2577	1
6a-3	PIN	ZDB2578	1
6a-4	FIXED SEAT	ZDB2579	1
6a-5	POSITIONING HOOK	ZDB2580	1
6a-6	HEXAGON SOCKET FLAT ROUND HEAD SCREW	ZDB2581	2
6a-7	REACTION ARM COVER	ZDB2582	1
6a-8	SCREW	ZDB2583	2
7	PLUG SCREW FOR BODY	ZDB2584	2
8	REACTION PAWL	ZDB2585	1
9	SCREW FOR BUTTON LEVER	ZDB2586	2
10	ROLL PIN FOR REACTION PAWL	ZDB2517	1
11	TENSION SPRING OF REACTION PAWL	ZDB2588	1
12	BUTTON LEVER (LEFT)	ZDB2589	1
13	DRIVE PLATE	ZDB2590	2
14	DRIVE SLEEVE SPLINE	ZDB2591	2
15	CIRCLIP	ZDB2592	2
16	SQUARE DRIVE	ZDB2593	1
17	BUTTON LEVER(RIGHT)	ZDB2594	1
18	TENSION SPRING OF DRIVE PAWL	ZDB2595	2
19	ROLL PIN FOR DRIVE PLATE	ZDB2560	1
20	ROLL PIN FOR DRIVE PAWL	ZDB2526	1
21	DRIVE PIN	ZDB2597	1
22	RATCHET SPLINE	ZDB2598	1
23	DRIVE PAWL	ZDB2599	1
24	DRIVE RETAINER	ZDB2600	1
25	SHROUD	ZDB2601	1
26	PIN FOR REACTION PAWL	ZDB2602	1
27	HEXAGON SOCKET FLAT ROUND HEAD SCREW	ZDB2293	4
28	SWIVEL ASSEMBLY	ZDB2359	1
29	MALE COUPLING	CH-4	1
30	FEMALE COUPLING	CR-4	1
	SEAL KIT	ZDB3609	1
	SWIVEL SEAL KIT	ZDB3616	1

9.12 Parts List for model TW50

Item	Display Name	Part No.	Qty
1	BODY	ZDB2603	1
2	U-RING	ZDB2604	1
3c	**PISTON ROD ASSEMBLY**	**ZDB2605**	**1**
3c-1	PISTON ROD	ZDB2606	1
3c-2	WEARABLE RING	ZDB2607	2
3c-3	WEARABLE RING	ZDB2608	1
4b	END CAP	ZDB2609	1
6b	**REACTION ARM ASSEMBLY**	**ZDB2610**	**1**
6b-1	REACTION ARM	ZDB2611	1
6b-2	PLUGGING SCREW	ZDB2612	1
6b-3	FIXED BLOCK	ZDB2613	1
6b-4	COMPRESSED SPRING	ZDB2614	1
6b-5	REACTION ARM COVER	ZDB2615	1
6b-6	SCREW FOR BUTTON LEVER	ZDB2616	2
7	PLUG SCREW FOR BODY	ZDB2617	2
8	REACTION PAWL	ZDB2618	1
9	SCREW FOR BUTTON LEVER	ZDB2619	2
10	ROLL PIN FOR REACTION PAWL	ZDB2620	1
11	TENSION SPRING OF REACTION PAWL	ZDB2621	1
12	BUTTON LEVER (LEFT)	ZDB2622	1
13	DRIVE PLATE	ZDB2623	2
14	DRIVE SLEEVE SPLINE	ZDB2624	2
15	CIRCLIP	ZDB2625	2
16	SQUARE DRIVE	ZDB2626	1
17	BUTTON LEVER(RIGHT)	ZDB2627	1
18	TENSION SPRING OF DRIVE PAWL	ZDB2628	2
19	ROLL PIN FOR DRIVE PLATE	ZDB2629	1
20	ROLL PIN FOR DRIVE PAWL	ZDB2630	1
21	DRIVE PIN	ZDB2631	1
22	RATCHET SPLINE	ZDB2632	1
23	DRIVE PAWL	ZDB2633	1
24	DRIVE RETAINER	ZDB2634	1
25	SHROUD	ZDB2635	1
26	PIN FOR REACTION PAWL	ZDB2636	1
27	HEXAGON SOCKET FLAT ROUND HEAD SCREW	ZDB2293	4
28	SWIVEL ASSEMBLY	ZDB2359	1
29	MALE COUPLING	CH-4	1
30	FEMALE COUPLING	CR-4	1
	SEAL KIT	ZDB3610	1
	SWIVEL SEAL KIT	ZDB3616	1