MAXDRV® Torque Wrenches

Operation and Maintenance Manual

MAXDRV Series Square Drive Torque Wrenches are engineered to deliver both exceptional power and precise control. With a compact build and an industry-leading strength-to-weight ratio, MAXDRV Series offers a torque range of 64 ft-lbs. to 32,523 ft-lbs. (86 Nm to 44,095 Nm). This manual applies only to the TorsionX MAXDRV Torque Wrenches Series. TorsionX reserves the right to change this document at any time without notice.

TorsionX® EXTREME BOLTING FORCE

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Carrier Damage Inspection

Upon receipt of this tool, inspect the package for damage.

Carefully inspect all components of tool for damage incurred during shipping. If any damage is found, notify the carrier at once. Shipping damage is NOT covered by warranty. The carrier is responsible for all repair or replacement costs resulting from damage in shipment.

Introduction to Safety Precautions

Use MAXDRV Series Torque Wrenches to install and remove large bolts. TorsionX wrenches provide precision torque during bolt makeup and maximum torque for bolt breakout. Safety procedures and proper operating practices must be followed to avoid equipment damage, equipment failure, and personal injury or death.

Read and understand this Operation and Maintenance Manual prior to use. Replace worn or damaged parts with genuine TorsionX replacement parts. Use of other parts may result in safety hazards, decreased tool performance, increased maintenance, and may invalidate warranty.

This document assumes that the operator of the MAXDRV Hydraulic Torque Wrench and associated products is trained and competent to do so. Only qualified operators should be allowed to operate equipment. This manual does not replace in-person training, nor does it cover every situation encountered while installing, operating, or maintaining the product. Training is imperative to safely handle and operate hydraulic torque tools.

TorsionX is not responsible for any damage to the equipment from improper use. Nor is TorsionX responsible for injury or death resulting from improper/unsafe use or a lack of equipment maintenance. For questions or concerns, contact TorsionX directly or a trained distributor of TorsionX products.

Warnings

Work Area Safety:

- Ensure work areas are clean and well-lit.
- Only trained operators or authorized persons should be near the task site.
- NEVER operate tools in the presence of flammable liquids, gases, or material.

Hydraulic Safety Precautions:

Personal Protection Equipment:

- When operating or performing maintenance on hydraulic equipment, ALWAYS use proper safety equipment and clothing. Consult with your company's safety representative for this information.

Before Operating Hydraulic Torque Tools:

- Read all instructions, warnings, and precautions before every operation. Comply with the safety precautions to avoid personal injury or equipment damage while operating this power tool.
    - DO NOT remove any labels from products. Replace any unreadable labels immediately.
- Always inspect the hydraulic hose assembly for damage before using it.
- Confirm there is a hydraulic gauge before operating hydraulic tools. Never use a hydraulic torque wrench without a hydraulic gauge to indicate the working pressure.
- To avoid personal injuries and/or equipment damage, be sure that all hydraulic components are rated for 10,000PSI (700bar) operating pressure.
- Make sure the hydraulic torque wrench swivel couplings, hose couplings, and hydraulic power pack couplings are clean/free of debris prior to connecting the hydraulic torque wrench and hydraulic hose assembly to the assembled power pack. Loose or dirty couplers will cause tool to not operate properly.
- Ensure the tool is correctly and securely coupled to the pump with both hydraulic hoses.
    - NEVER pressurize uncoupled couplers.
- **To avoid personal injuries, equipment damage and/or warranty invalidation:**
    - DO NOT remove the shroud from the hydraulic torque wrench.
    - DO NOT modify any component of the hydraulic torque wrench.
    - DO NOT adjust the hydraulic torque wrench safety relief valve located inside the swivel couplings.

During Hydraulic Torque Tool Operation:

- NEVER exceed the maximum rated pressure of any hydraulic equipment.
    - For hydraulic systems that have different pressure ratings, do not exceed the pressure rating of the lowest-rated component in the system.
- NEVER handle a pressurized hydraulic hose.
    - This could lead to an oil injection injury which needs immediate medical attention.
- NEVER connect or disconnect hydraulic equipment that is pressurized.
- ALWAYS ensure that there is a proper reaction point before operating equipment.
- When there are multiple operators, ensure that there is clear communication between the parties.
- If a problem arises during use, shut off the power immediately and consult your TorsionX distributor.
    - Neither TorsionX nor its distributors are responsible for damage caused by unsafe and/or faulty operations.
- If a tool becomes damaged, immediately stop usage and have the part repaired or replaced.

After Operating a Hydraulic Torque Tool:

- NEVER disconnect a hose from a pressurized hydraulic system.
- NEVER loosen a coupler that is pressurized.
    - This could lead to an oil injection injury which needs immediate medical attention.

Cautions

- Do NOT expose the hydraulic hose assembly to high temperatures.
- Keep all hydraulic torque wrench components away from excessive heat, flame, moving machine parts, sharp edges and chemicals.
- Do NOT use a damaged hydraulic hose assembly. Replace it immediately.
    - Avoid sharp bends and kinks when routing the hydraulic hose assembly. This will cause severe backpressure and damage the internal lining of the hose leading to premature failure.
    - DO NOT drive over or drop heavy objects onto the hydraulic hose assembly. These forces may damage hose wire strands and applying pressure to a damaged hose assembly may cause it to rupture.
- NEVER lift, carry, or move any hydraulic components by the hose.

Operation

To operate the TorsionX MAXDRV Series Hydraulic Torque Wrench, a Hydraulic Torque Wrench Pump is required. Reference the PWRPAX Series Operation and Maintenance Manual before beginning use.

NOTE: Only use equipment that properly fits the nut/bolt. Any accessories used should be recommended or manufactured by TorsionX.

Preparation

Prior to use:

Determine:

- Nut or bolt head size
- Material and strength grade
- The desired torque

Ensure that you know:

- How to properly operate the Hydraulic Torque Wrench Pump
- The maximum working pressure of the MAXDRV Series
- The maximum torque the stud/bolt can withstand
- The required working pressure that will be applied to the MAXDRV Series
- The torquing sequence/procedure for the job

Inspect:

- All components of the hydraulic torque wrench system to ensure everything is clean and clear of damage
- The hydraulic hose assembly to verify it is not kinked or damaged

Appendix VII - presented for reference only - gives typical torque values specified for the most commonly encountered fasteners. You should always abide by established procedures for the job site.

Setting the Pressure on the Hydraulic Power Pack

Refer to PWRPAX Operating Manual

Operating the MAXDRV Series Square Drive Torque Wrench

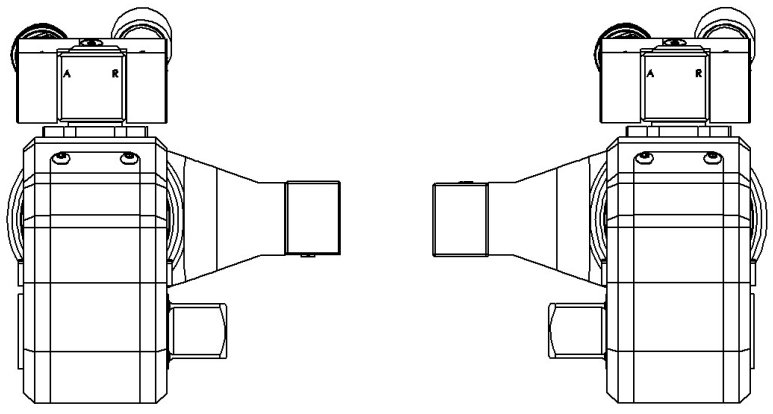
Pre-Operation Steps:

1. Place the socket on the nut/bolt to ensure it is the correct size and fully engaged. Remove socket from nut/bolt.
    a. Refer to Appendix V: “Using the Square Drive” to learn about removing and inserting the drive.
2. Connect the hydraulic torque wrench, hydraulic hose, assembly, and the hydraulic power pack to a hydraulic circuit.
    a. Refer to Appendix I: “Connecting & Disconnecting the Hydraulic Torque Wrench” for an in-depth explanation for using couplers.
3. Cycle the hydraulic torque wrench before placing the tool & socket on the application to ensure proper engagement.
4. Adjust pressure to the desired torque:
    a. With the tool OFF the nut/bolt:
        i. Hold the Advance Button on the remote control.
        ii. Adjust the pressure regulator on the pump to the desired pressure.
5. Attach and secure the socket to the square drive with a socket retainer.

Operation Steps:

6. Place the torque wrench on the nut/bolt.
    a. The nut turns clockwise for tightening and counterclockwise for loosening. The position of the square drive when looking at the shroud will determine if the hydraulic torque wrench is set to loosen or tighten.

Tighten **Loosen**



    b. **NOTE: If the nut/bolt does not loosen with the above procedures, the job will require a larger hydraulic torque wrench to loosen the nut/bolt.**

7. Position the reaction surface against an adjacent nut/bolt, flange, or solid system component.
    a. Make certain that there is clearance for the hydraulic hose assembly, swivels, and couplings.
    b. **Do not** allow the tool to react against the hydraulic hose assembly, swivels, or couplings.
8. Check to make sure all body parts are safely out of harm's way before applying pressure to the hydraulic wrench.
    a. **This tool has massive power and can cause SERIOUS physical harm.**
9. Depress the remote-control advance button to advance the square drive.
    a. The nut/bolt will begin to turn when you apply hydraulic pressure to the hydraulic torque wrench and the reaction surface moves against the reaction point.
10. Once the piston reaches the end of its stroke, release the remote button and the tool will automatically retract the piston.
    a. NOTE: each "advance and retract" is considered one cycle.
11. Listen for a "click".
    a. This indicates that you can push the remote-control button again and the ratchet link will turn.
12. Continue cycling the hydraulic torque wrench until it "stalls" and the preset PSI/Torque has been attained.
    a. IMPORTANT: The reading of full preset pressure after the cylinder is extended **DOES NOT INDICATE** this pressure (torque) is applied to the nut/bolt. It only indicates that the cylinder is fully extended and cannot turn the socket further until the tool automatically resets itself.
13. Cycle the tool one last time to ensure total torque.
    a. Refer to Appendix II: "Locked-On" below to release a tool that is stuck after the final cycle.

The Loosening Process:

1. Set the hydraulic power pack to 10,000 PSI.
2. Reposition the tool so the reaction surface abuts squarely on a solid reaction point.
3. Press and hold hydraulic power pack's remote control advance button.
4. Pressure will decrease as the nut/bolt begins to turn.
5. When the cylinder is fully extended, you will hear an audible "click".
6. Release the remote-control advance button and the hydraulic torque wrench's cylinder will automatically retract.
7. Listen again for the audible "click".
8. Repeat this process until you can remove the fastener by hand.

After the Operation:

1. Upon completing the project, turn off the power to the hydraulic power pack.
2. Disconnect the hydraulic power pack from the power source.
3. Disconnect the coupler connections between the hydraulic torque wrench and hydraulic hose assembly.
4. Disconnect the hose assembly from the hydraulic power pack.
5. Loosen the locking ring below the Adjustment Knob on the hydraulic power pack external pressure regulator.
6. Turn the Adjustment Knob counterclockwise until it turns freely and easily.
7. When not in use, store tools and accessories properly to avoid damage.

APPENDIX

I. Connecting & Disconnecting the Hydraulic Torque Wrench

Use a twin-line hydraulic hose assembly with a 10,000 PSI operating pressure to connect the wrench to the hydraulic pump.

IMPORTANT
To avoid hydraulic torque wrench malfunction:

- DO NOT reverse connectors.
- DO NOT tamper with the set screw in the swivel assembly. It is factory preset for safety purposes and adjustments should only be made by trained personnel.
- Both the advance and retract couplers must be securely connected to the pump before operating. NEVER pressurize the pump if there are disconnected couplers.
- Ensure all couplers are clean before connecting.

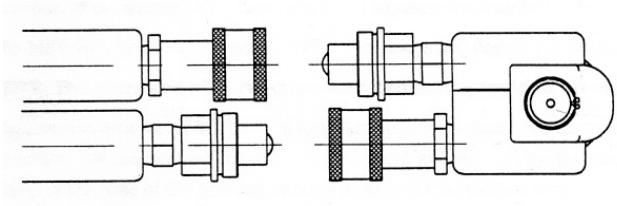
To connect:

1. Press the male coupler into the female coupler until no gap between them exists.
2. Twist the band on the female coupler until tight.
3. Repeat for fittings on pump.

To disconnect:

1. Ensure that the pump is turned off and the pressure has been released.
2. Twist the band on the female coupler until loose.
3. Pull female and male couplers apart.

Coupler Placement



Tool	Advance Side-Male Retract Side-Female
Hose	Advance Side-Female to Female Retract Side-Male to Male
Pump	Advance Side-Male Retract Side-Female

II: “Locked-On”

Release Lever

Should the hydraulic torque wrench be “locked-on” after the final cycle:

1. Push the remote-control advance button to build pressure.
2. Maintain this pressure and push the release lever located on the side of the tool.
3. Release the remote-control advance button, while continuing to push down on the release lever.
4. Remove the hydraulic torque wrench.

III: Maintenance

IMPORTANT: Maintenance should only be performed by a qualified technician. Otherwise, ship tools to a TorsionX-certified repair center.

Lubrication:

- Periodically coat all moving parts with a good quality lubricant.
- Under harsh environmental conditions perform cleaning and lubricating more frequently.

Hydraulic Hose Assembly:

- Inspect the hydraulic hose assembly for damage (cracks, burns, kinks, etc.) and leaks after each job.
- Replace the hydraulic hose assembly immediately if you find any damage.

Connectors:

- Keep hydraulic fittings clean and do not allow them to drag on the ground. Even small particles of dirt can cause the internal valves to malfunction.

Cylinder Seals:

- If the cylinder requires disassembly, replace cylinder seals at the same time.
- Seal kits are readily available.

Structural Members:

- Inspect all structural parts on the tool periodically for cracks, chips or deformities. If found, replace the part immediately.

Calibration:

- Calibrate all hydraulic torque wrenches and gauges annually or as required.

IV: Trouble Shooting Chart

SYSTEM	PROBABLE CAUSE	REMEDY
Cylinder will not advance	Couplers are loose or damaged Directional control valve on pump Couplers not mated securely	Tighten/Replace Assemble and clean Tighten
Cylinder will not retract	See above	See above
Cylinder will not build pressure	Piston seal leaks Pump coupling may be broken, not mated properly or coupler is defective Gauge	Replace seals Replace coupling Replace gauge
Cylinder leaks	Leaking seals	Replace housing seal kit
Cylinder operates backwards	Couplers are reversed on hoses, pump or tool	Reverse couplers
Ratchet returns on retract stroke	Broken reaction pawl Defective reaction pawl spring	Replace Replace
Ratchet will not make successive strokes	Defective drive pawl spring Defective drive pawl Cylinder is not retracting completely	Replace Replace Remove tool from job, cycle freely once or twice, and return to job
Tool cannot be removed from nut/bolt	Reaction pawl is engaged	Begin forward cylinder stroke. While applying pressure, push the reaction pawl release (on front ratchet link). While pressing release mechanism, allow the cylinder to retract. Remove tool
No pressure reading on gauge	Gauge not tight Pump coupling broken Gauge defective Defective cylinder seals	Tighten gauge coupler Replace Replace Inspect and replace all cylinder seals
Pump will not build pressure	Defective high pressure relief valve Power source is too low Gauge	Inspect and replace Ensure suitable power Replace
Pressure reading erratic	Defective gauge Differential Control Valve	Replace Replace

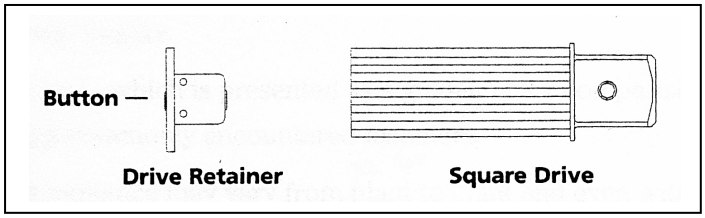
V: Using the Square Drive

Removing the Square Drive:

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 out.

Inserting the Drive:

1. Place the drive in the desired direction and engage the drive and bushing splines.



2. Twist the drive and bushing until the ratchet spline can be engaged.
3. Push the drive through the ratchet.
4. Depress drive retainer button, engage retainer with drive and release button to lock.

VI: Accessories

Hydraulic Wrench Tool Handle
Part Number: 9001TH

Extended Reaction Arm
Part Number: #MD-2EXT

Direct Hex Drive
Ask your TorsionX Distributor
for the Part Number

Sleeve Reaction Arm
#MD-SLV

Alco Reaction Arm
#MD – ALC

VII: Recommended Torque for B7 Studs
(ASTM A193)
Based Upon 50% Yield

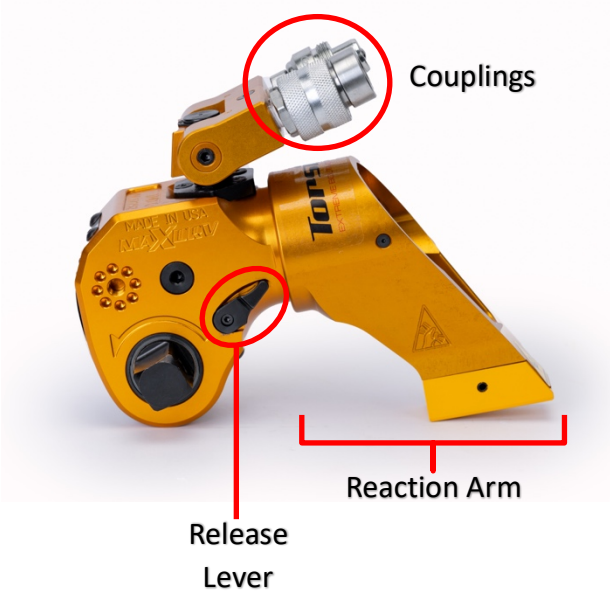
Bolt Diameter	Heavy Hex Nut Size (A.F.)	Lubricated torque using copper, graphite, or comparable lubricant with a coefficient of friction F-.100 (Both nut face and threads should be well lubricated)	Dry steel on steel, no lubricant, coefficient of friction F-.400
3/4"	1-1/4"	157	599
7/8"	1-7/16"	250	893
1"	1-5/8"	373	1332
1-1/8"	1-13/16"	538	1994
1-1/4"	2"	746	2720
1-3/8"	2-3/16"	1000	3678
1-1/2"	2-3/8"	1307	4837
1-5/8"	2-9/16"	1682	6260
1-3/4"	2-3/4"	2109	7888
1-7/8"	2-15/16"	2602	9775
2"	3-1/8"	3167	11942
2-1/8"	3-5/16"	3809	14408
2-1/4"	3-1/2"	4531	17191
2-3/8"	3-11/16"	5339	20310
2-1/2"	3-7/8"	6238	23786
2-3/4"	4-1/4"	7533	28846
3"	4-5/8"	9803	37670
3-1/4"	5"	12488	48129
3-1/2"	5-3/8"	15622	60365
3-3/4"	5-3/4"	19241	74516
4"	6--1/8"	22162	86146
4-1/4"	6-1/2"	23337	90720
4-1/2"	6-7/8"	26332	102513
4-3/4"	7-1/4"	30994	120831
5"	7-5/8"	36176	141210

VIII: MAXDRV Series Square Drive Torque Wrench Cheat Sheet

1) Place the socket on the nut/bolt to ensure it is the correct size and fully engaged
2) Remove socket from nut/bolt
3) Securely connect the hose assembly to the torque wrench and pump
4) Connect power to the pump
5) Cycle the torque wrench before adjusting pressure
6) Adjust pressure to the desired torque:
    a. With the tool OFF the nut/bolt:
        i. Hold the Advance Button on the remote control
        ii. Adjust the pressure regulator on the pump to the desired pressure
7) Attach and secure the square drive to a socket with a socket retainer
8) Place the square drive tool on the nut/bolt
9) Position the reaction surface against an adjacent nut/bolt, flange, or solid system component
10) Advance wrench with the remote control
    a. Release the remote advance button at end of stroke
    b. Allow the cylinder to reset
    c. Repeat until nut no longer turns
11) Turn off pump with remote control
12) Move to next bolt

Notes

- Refer to Appendix IV: Trouble Shooting Chart for any issues that arise
- If you are using an extension cord to power the hydraulic pump, use a heavy gauge cord (10 gauge or better)



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