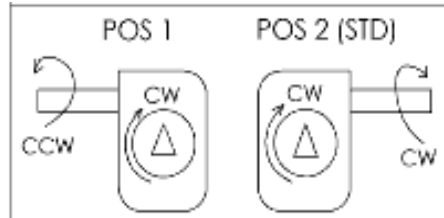


IOM FOR DYNATORQUE™ QUARTER-TURN WORM GEAR (DT TYPE)

Scope:

It is the purpose of this document to provide general installation, operation, storage, and maintenance instructions for DYNATORQUE™ manual quarter-turn worm gear operator.



Installation Tips:

All Cameron DYNATORQUE operators & accessories have been designed to transmit the rated output torque of the operator. When designing mounting kits, torque transmission devices, or specifying mounting hardware the operator rating should be considered. Cameron recommends using grade 5 and higher bolts with lock washers for mounting DYNATORQUE devices to valve actuators, valve mounting flanges and/or valve adaptation kits. DYNATORQUE components should not be installed in areas where those components will be subjected to high temperatures, corrosive atmospheres, or high pressures without prior knowledge by Cameron or unless originally designed for that purpose. Doing so may affect the product warranty.

Installation:

Before assembly has begun please ensure that the output bore and mounting bolt patterns have been machined correctly. The following steps should be taken to install the DYNATORQUE DT manual quarter-turn operator.

Cameron recommends a watertight seal be established between the bottom of the DYNATORQUE operator and the valve bonnet or mounting pad at time of installation. Apply a liberal amount of a liquid gasket material (Cameron recommends Dow Corning 732 multi-purpose silicone adhesive / sealant) on the valve bonnet or mounting pad prior to operator installation. Make sure to surround the mounting holes to assure a complete seal.

1. Cameron recommends mounting the operator on the valve prior to valve installation in the pipeline. Valve should be oriented in the closed position.
 - a. Check to ensure that the valve and operator are in the same orientation (open/closed). If the positions do not correspond, rotate the operator handwheel either clockwise or counterclockwise until the correct orientation is achieved.
2. For applications where the valve stem includes a keyway, install the key in the valve stem making sure that it is fully seated in the keyway.
3. The operator has adjustable travel stops that have been factory set to approximately 90 degrees of travel. It may be necessary to back the stops out of factory set position by rotating counterclockwise before installation.
4. Before installing the operator, liberally grease the valve stem and operator bore. This will reduce the possibility of corrosion between the two components.

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5. Align the operator with the valve stem and lower the operator into position on the valve flange or mounting kit.
6. To align the bolt holes in the operator with the holes in the valve flange or mounting kit rotate the operator input shaft until the holes align.
7. Tighten the valve to operator with mounting bolts and lock washers. **Note: Mounting holes on some quarter-turn operators may break into the housing cavity creating a grease leak path. The use of Teflon tape is recommended for all valve side bolt installations.**
8. Verify correct valve orientation relative to gear position by visually verifying the disc, ball, or plug position.
9. Rotate the operator handwheel moving the valve from the starting position to the opposite end of the intended travel making sure the operator turns smoothly through the complete cycle. Visually verify that the opposite end position has been achieved.
10. Rotate the valve from closed to open several times to ensure proper operation.

Safety:

The use of handwheels larger than recommended by the factory, cheater bars, etc. will void the override warranty and may cause damage to the operator, valve stem, drive shafts, or other torque transmitting devices as well as being dangerous to the user. Additionally, the use of chainwheels on operators that are not recommended for those applications will result in voiding operator warranty.

Operation:

Once the valve assembly has been installed, operation of the quarter-turn manual gear operator is very simple. Assuming a clockwise to close valve, rotating the handwheel clockwise will result in clockwise output rotation or clockwise to close. Reversing rotation of the handwheel, counterclockwise, will result in counterclockwise rotation of the output or counterclockwise to open.

Maintenance:

- A. **Storage:** For best results, DYNATORQUE operators should be stored in a clean, dry area in their original factory shipping containers. If operators are stored in high humidity areas, steps should be taken to reduce the amount of moisture the units will be exposed to. Operator input shafts are plated or stainless steel to prevent corrosion. If operators are being stored for a long period of time, operator mounting surfaces should be lightly greased to prevent corrosion.
- B. **Maintenance:** DYNATORQUE manual operators do not require periodic maintenance. They are, for most applications, lubricated for life, with all components designed to have a life equal to or exceeding the wear life of the operator gearing.

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C. Lubrication: If for any reason, lubrication replacement is necessary, Cameron recommends replacement of that lubrication with:

<u>DYNATORQUE Standard Grease Specification:- Nanomech Evermax Premium Performance</u>	
Operating Temperature, °F	-40 to +400
NLGI Grade	1
Thickener Type	Lithium Complex
Color	Dark Brown
Texture	Smooth & Tacky
Base Oil Viscosity, ASTM D445, cSt @ 40 °C	150
ASTM D-217 Worked Penetration, 60 strokes @ 25 °C	320
ASTM D-2265 Dropping Point, °F	510
ASTM D-1743 Rust Preventive, 48 hrs. @ 52°C	Pass
ASTM D-4048 Copper Corrosion, 24 hrs. @ 100°C	1B
ASTM D-2266 Four-Ball Wear Test, mm	0.4
ASTM D-2596 Four-Ball Extreme Pressure, Weld Load, kg	400
Four-ball COF (Coefficient of Friction) 0.06	0.06

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- D. Spare Parts: Cameron warrants work performed by the factory or by factory trained personnel only. Please consult the factory or your local DYNATORQUE representative to arrange assistance. Cameron modifies a great percentage of its DYNATORQUE operators to meet specific customer requirements. Please refer to the operator part list number as supplied on the shipping document, acknowledgement, or invoice, when ordering spare parts.
- E. Spare Parts: For your records, please enter the operator part number from your shipping documents, acknowledgement, or invoice here:

Part Number: _____

Date Stamp: _____ (Located on the bottom of the operator housing.)

Purchase / Sales Order Number: _____

Please Note:
When assembling Cameron DYNATORQUE products to a valve or to an automated valve package, standard engineering practices must be utilized to assure proper mounting orientation, configuration, and distribution of weights and forces. Failure to do so could cause product damage and/or malfunction, **and void warranty consideration**. If there are any questions please contact the factory at info-dyt@c-a-m.com.