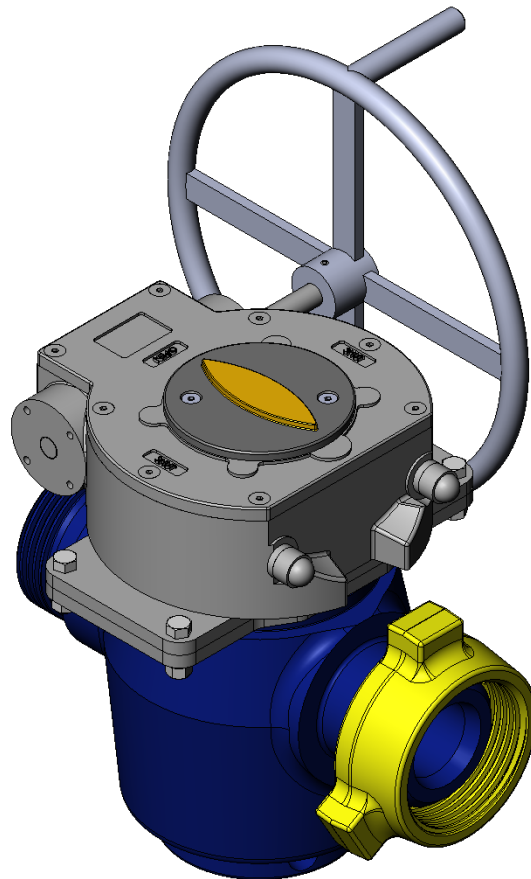




Technical Manual AA4000 Gear Operator

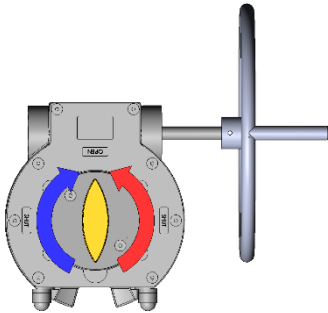


**MSI – A Division of Dixie Iron Works, Ltd.
300 W. Main St.
Alice, TX 78332
www.diwmsi.com
(800) 242-0059**

The intent of this guide is to familiarize people with the recommended procedure to add or reinstall the AA4000 gear operator on MSI plug valves. Proper alignment is crucial for correct valve operation. Improperly aligned installation of gear operators may lead to valves that do not fully open or shut. A partially opened valve will cause premature wear and possible failure of valve internals. A valve that does not close fully will not provide proper fluid isolation and should be considered a safety risk.

Usage Note: The primary function of MSI plug valves is to direct/isolate the flow of pressurized fluids within a system. Plug valves in general are not to be used to throttle the flow of fluid. In systems where this is required, appropriate style throttling valves and/or chokes should be used in conjunction with plug valves.

Initial offerings of the AA4000 gear operator utilized a left hand helix. These were labeled Q-4000-S. These were replaced with a gear operator utilizing a right hand helix which are labeled as Q-4000-S-DI. Please refer to technical bulletin (TECH053) for details. There are no external distinctions to identify whether a gear operator is Q-4000-S or Q-4000-S-DI. Other than removing the cover and inspecting the direction of worm, the best option is to actuate the gear operator, and note which way the indicator rotates.



With the gear operator in the OPEN position, rotate the handwheel in the clockwise (CW) direction to close the operator. Pay attention to the rotation direction of the indicator. Gear operator identification for indicator rotation is as follows:

CW direction (Blue arrow) is Q-4000-S-DI gear operator
CCW direction (Red arrow) is Q-4000-S gear operator

Instructions for gear operator installation and alignment on a plug valve:

Note – Always use high quality graphite grease or copper-based anti-seize lubricant during assembly.

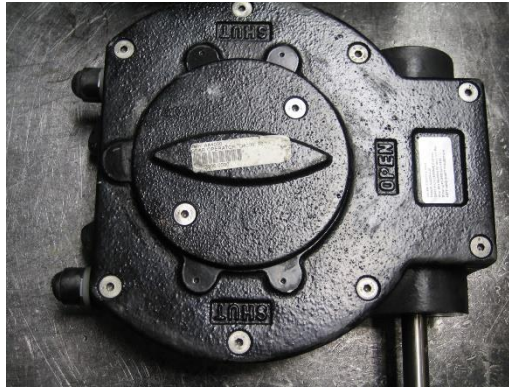
1. Ensure the valve is open, drifted and has been greased.



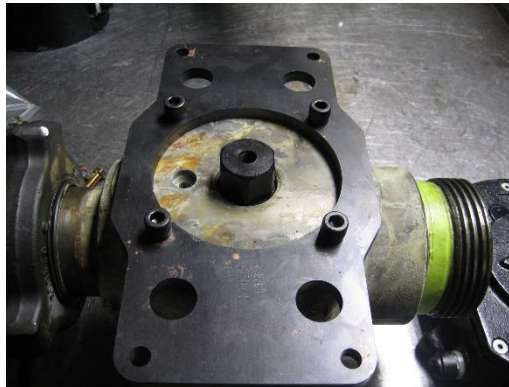
2. Position valve such that when installed, the gear operator hand wheel is facing you.



3. Ensure the gear operator is in OPEN position.



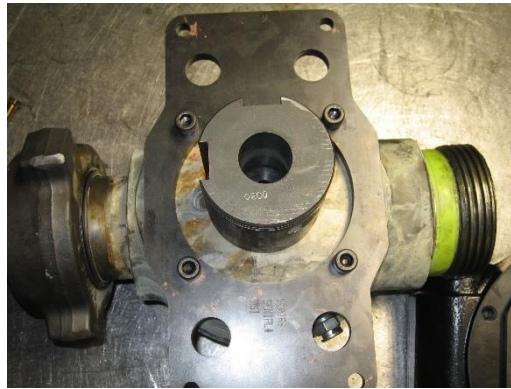
4. Lubricate socket head caps screws with thread anti-seize, place on lock washers and install lower mounting plate to valve. Ensuring the longer side of plate is perpendicular to flow bore.



5. Lubricate the hex head bolts with thread anti-seize and install upper mounting plate to gear operator. Ensuring the longer side of the mounting plate is parallel to the gear operator shaft.



6. Install the adapter onto the valve plug. **NOTE: If the gear operator is a Q-4000-S-DI then the keyway used will need to be on the left (9 O'clock position), if the gear operator is Q-4000-S then the keyway used will need to be directly away from installer i.e. top (12 O'clock position).**



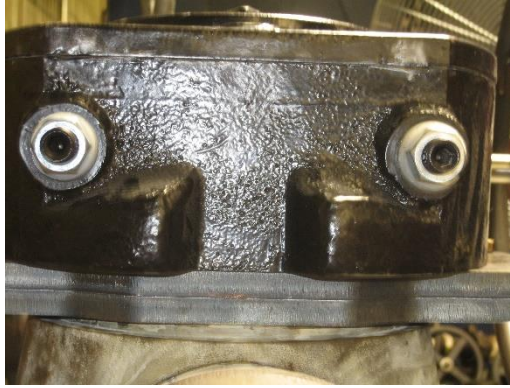
7. Lubricate the keyway and install key.



8. Carefully position the gear operator over the keyed adapter until fully seated.
9. Lubricate with thread anti-seize and install hex head bolts through holes in upper and lower mounting plates. **NOTE: Rotate the hand wheel CW and CCW as needed to get the holes in the upper and lower mounting plates to align.**
10. Install lock washers and tighten nuts.
11. Verify that valve is still open and drifted.



12. Set gear operator OPEN position stop. When facing the two stops, for Q-4000-S-DI gear operators this will be on the left. For Q-4000-S this will be on the right.



- a. Loosen the position stop locking nut
- b. Tighten the socket head set screw
- c. Tighten the position stop locking nut



13. Operate gear operator to SHUT valve as indicated by indicator. Visually verify valve is closed using a flashlight and inspecting the bore on both ends of valve. Wipe excess grease away to improve visibility as needed.
14. Once confirmed that valve is shut, set gear operator SHUT position stop. This will be the opposite position of the OPEN stops as listed in step 12.
15. Operate the valve a few OPEN-SHUT cycles, to verify that the valve opens and closes fully. Adjust the position stops as needed.

You may contact an MSI representative at sales@diwmsi.com or engineering@diwmsi.com if you have any further questions or concerns.



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MSI is a division of Dixie Iron Works, Ltd
300 W. Main St.
Alice, Texas 78332, USA
Phone: 800-242-0059
Fax: 361-664-4840
www.diwmsi.com