

Tork-Mor Standard Series Actuators

Maintenance Instructions & Parts List

Provide Model Number and Serial Number When Ordering Spare Parts.

*The vane and stator should **NEVER** be used for a positive stop. See below Section #1 STOPS.*

Tork-Mor Series actuators have been carefully designed to provide long, trouble-free life given that the unit has been correctly installed and operated within specifications.

The following lists factors relevant to service life and should be read before actuator installation.

1. STOPS

The vane and stator should never be used as a positive stop. For light to medium loads a taper lock stop (TLS) option is available. Alternately, external stops mounted securely to machine framework are recommended. For high inertia or high speed loads, externally mounted valving should be used to minimize system shocks.

2. SURGE PRESSURES

Surge or shock pressure in excess of the actuator rated pressure are detrimental to unit life and must be avoided. Crossover relief valves mounted adjacent to the actuator can help reduce these abnormal pressure peaks.

3. ANGULAR VELOCITY

Angular velocity can be controlled by metering the flow into or out of the actuator ports. This is best accomplished by the use of flow control valves. The actuators are fitted with standard port sizes to provide optimum operating speeds with reasonable pressure drops.

4. DRAINS

The actuators are fitted with drain ports to minimize external leakage possibilities. These drain ports should be connected directly back to the oil reservoir with a minimum of back pressure.

5. THRUST LOADS

External thrust bearings are required for actuators subjected to axial or thrust loads. These bearings are also recommended where large actuators are mounted in the vertical plane since for all practical purposes the shaft assembly is floating on the seals and can lead to accelerated seal wear.

6. RADIAL LOADS

Tork-Mor Series actuators are fitted with ball or roller bearings to support the shaft assembly, but they should not be subjected to external loads. External bearings should be used to support overhung or radial loads.

Supplementary Data

FLUID MEDIUM

For hydraulic usage a clean, filtered, mineral based oil with 150 to 400 SUS viscosity at 100°F is recommended for use with standard Buna seals. The correct filters can be provided by your Parker Distributor.

Air service units, including filter, regulator and lubricator will ensure correctly conditioned compressed air is available for pneumatically operated systems.

VANE POSITION

The vane is always positioned on the centerline of the keys with an "0" marking on the shaft end in line with a single vane.

ACTUATOR SIZE

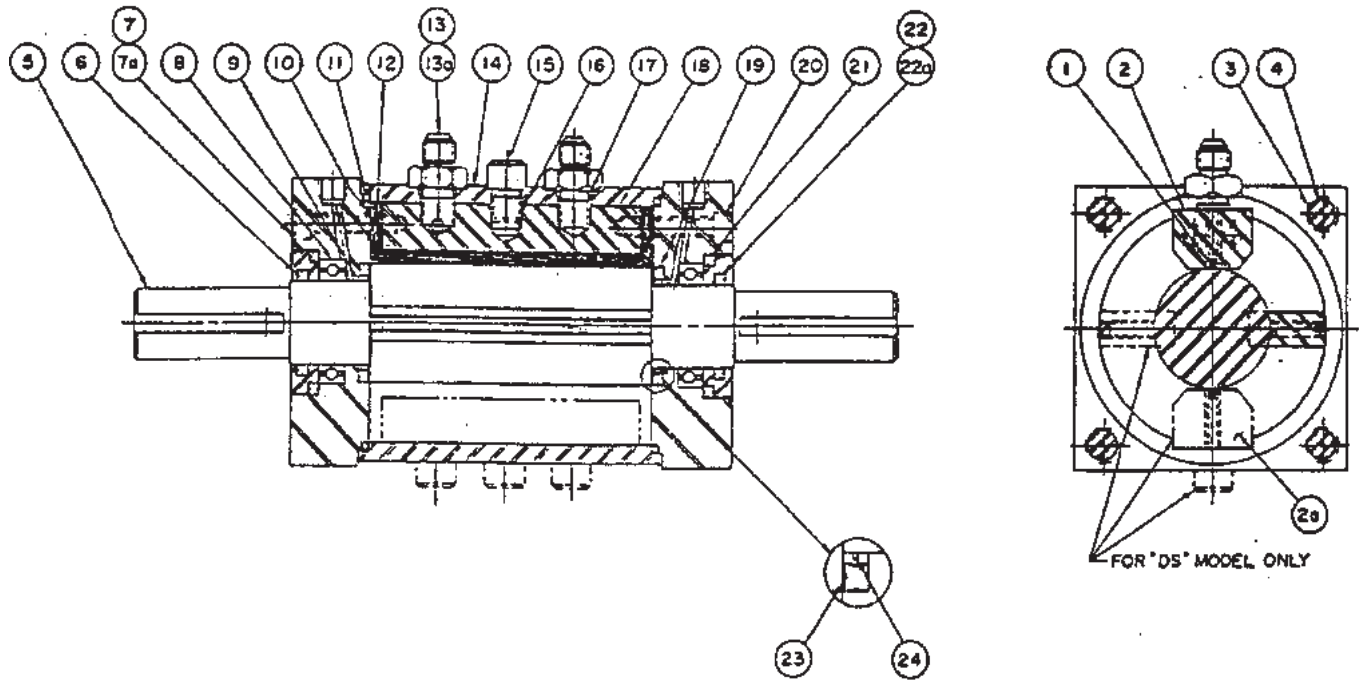
Selection of the correct actuator is achieved by determining the available system pressure then selecting a unit with 20% to 50% reserve capacity of the application load requirements.

SEALS

Standard seal compound is nitrile for mineral based hydraulic fluid. Other seal materials can be provided for most operating fluids. To ensure correct seal compound please provide name and type of operating fluid.

SHAFT COUPLINGS

Couplings should engage the full length of shaft keyway and should only be pressed on after support has been provided on the opposite end of the shaft.



Item No.	Description	S33	DS33	S42	DS42	S44	DS44	S46	DS46	S74	DS74	S77	DS77	S105	DS105	S108	DS108	S112	DS112
● 1	PTFE Backup	4	8	4	8	4	8	4	8	4	8	4	8	4	8	4	8	4	8
2	Stator, Standard	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2a	Stator, Dummy	—	1	—	1	—	1	—	1	—	1	—	1	—	1	—	1	—	1
3	Allen Nut	—	—	—	—	4	4	4	4	4	4	4	4	4	4	4	4	4	4
4	Tie Rod	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
5	Shaft Assembly	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
● 6	Seal, Retainer Nut Inner	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1
7	Head, Threaded	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7a	Head, C'bored	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	Bearing	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
9	Thrust Bearing	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
● 10	Seal, Stator	4	4	4	4	4	4	4	4	4	4	4	4	4	10	5	12	7	14
● 11	Seal, Head	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
● 12	"U" Seal	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	4	4
● 13	Male Connector	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
13a	Female Connector	See Note 2																	
14	Body	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	Bolt, Stator	1	2	—	2	1	4	3	6	—	2	1	4	—	2	1	4	3	6
● 16	Seal, Stator Bolt	1	2	—	2	1	4	3	6	—	2	1	4	—	2	1	4	3	6
17	Seal, Connector	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
18	Gasket	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
● 19	Seal, Shaft	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
20	Socket Head Cap Screw	4	4	4	4	4	4	4	4	4	4	4	4	4	8	4	8	4	8
● 21	Seal, Retainer Nut Outer	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
22	Retainer Nut, Standard ¹	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1
22a	Retainer Nut, Solid ¹	—	—	—	—	—	—	—	—	1	1	1	1	1	1	1	1	1	1
23	Shaft, PTFE Glass Filled	—	—	—	—	—	—	—	—	2	2	2	2	2	2	2	2	2	2
● 24	Seal Thrust Bearing	—	—	—	—	—	—	—	—	2	2	2	2	2	2	2	2	2	2

● Recommended spare parts (seals)
 1 On single end shaft units, (1) of Item #22 and (1) of Item #22a.
 2 On units with female connector, quantity for Item #13a is (2).

GENERAL

Tork-Mor Actuators, if properly installed, will give many thousand cycles of uninterrupted service. In due time the seals should be replaced and, if correctly installed, new actuator performance will be obtained. We recommend that Tork-Mor Actuators be returned to the factory for repairs. The cost is low and one-day service is our policy. Our trained personnel will see to it that "new actuator" performance is obtained.

In the event that field maintenance is required, the following steps outlined should be followed.

A. DISASSEMBLY AND INSPECTION OF ACTUATOR

1. Remove Bearing Retainer Nuts (#22) from Heads (#7).
2. Remove Tie Rods (#4) from Heads (#7).
3. Remove Socket Head Screws (#20) from Heads (#7).
4. Remove Heads (#7) from Body (#14).
5. Remove Shaft (#5) from Body (#14).
6. Remove Ball Bearings (#8) from Heads (#7).
7. Remove Stator Bolts (#15) from Body (#14) and Connector Fittings (#13). On OS models also remove Stator Bolts (#15) from bottom of unit.
8. Remove all seals and clean all parts.

B. REPLACEMENT OF SEALS AND RE-ASSEMBLY OF ACTUATOR

It is recommended that a suitable oil or O-ring lube be used on all seals and mating parts to facilitate assembly.

1. Install U-Seal (#12) and **PTFE** Back-Ups (#1) in Stator(s) (#2).
2. Replace Stator(s) (#2) with Gasket (#18) and Stator Bolt Seal(s) (#16) into Body (#14).
3. Replace Stator Bolt (#15) and Connectors (#13) with Seals (#17) but DO NOT tighten. (Stator bolts are not used on S-4-2 models.)

4. Install Head Seals (#11) Shaft Seals (#19) and Stator Seals (#10) in Heads (#7). On S-7, S-10, DS-7 and DS-10 series models, install Shaft PTFE (#23) on top of Shaft Seals (#19). On S-7 and S-10 series models, also install Thrust Bearing Seals (#24).
5. Place Body (#14) onto one Head (#17). Press lightly until body snaps into place. On DS models, install heads after shaft assembly is in place.
6. Replace Socket Head Screws (#20) in Head (#7) but DO NOT tighten.
7. Install U-Seal (#12) and PTFE Back-Ups (#1) into Shaft (#5).
8. Replace Shaft (#5) in Body (#14) and Head (#7). Vane should be located opposite Stator (#2).
9. Replace other Head (#7) into Body (#14). Press lightly until head snaps into place.
10. Replace Socket Head Screws (#20) in Head (#7) but DO NOT tighten.
11. Replace Tie Rods (#4) and tighten evenly.
12. Tighten Stator Bolt(s) (#15) and Socket Head Screws (#20).
13. Replace Bearings (#8) into Heads (#7). At this point the actuator may be pressurized to check Head Seals (#11) and Shaft Seals (#19) for leakage.
14. Install Outer Seals (#6) into Retaining Nuts (#22).
15. Install Inner Seals (#6) into Retaining Nuts (#22).
16. Screw Retainer Nuts (#22), into Heads (#7).

Additional information may be obtained from Pneumatic Division, Wadsworth, Ohio or from the nearest Pneumatic Division Representative.

Tightening Torques

MODEL SIZE	TIE ROD BOLT (#4)
33	13 ft. lbs.
42	25 ft. lbs.
44	25 ft. lbs.
46	25 ft. lbs.
74	130 ft. lbs.
77	130 ft. lbs.
105	500 ft. lbs.
108	500 ft. lbs.
1012	500 ft. lbs.

Notes



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2. Payment: Payment shall be made by Buyer net 30 days from the date of delivery of the items purchased hereunder. Amounts not timely paid shall bear interest at the maximum rate permitted by law for each month or portion thereof that the Buyer is late in making payment. Any claims by Buyer for omissions or shortages in a shipment shall be waived unless Seller receives notice thereof within 30 days after Buyer's receipt of the shipment.

3. Delivery: Unless otherwise provided on the face hereof, delivery shall be made F.O.B. Seller's plant. Regardless of the method of delivery, however, risk of loss shall pass to Buyer upon Seller's delivery to a carrier. Any delivery dates shown are approximate only and Seller shall have no liability for any delays in delivery.

4. Warranty: Seller warrants that the items sold hereunder shall be free from defects in material or workmanship for a period of 18 months from date of shipment from Parker Hannifin Corporation. **THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO ITEMS PROVIDED HEREUNDER. SELLER MAKES NO OTHER WARRANTY, GUARANTEE, OR REPRESENTATION OF ANY KIND WHATSOEVER. ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO, MERCHANTABILITY AND FITNESS FOR PURPOSE, WHETHER EXPRESS, IMPLIED, OR ARISING BY OPERATION OF LAW, TRADE USAGE, OR COURSE OF DEALING ARE HEREBY DISCLAIMED.**

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5. Limitation of Remedy: SELLER'S LIABILITY ARISING FROM OR IN ANY WAY CONNECTED WITH THE ITEMS SOLD OR THIS CONTRACT SHALL BE LIMITED EXCLUSIVELY TO REPAIR OR REPLACEMENT OF THE ITEMS SOLD OR REFUND OF THE PURCHASE PRICE PAID BY BUYER, AT SELLER'S SOLE OPTION. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY KIND OR NATURE WHATSOEVER, INCLUDING BUT NOT LIMITED TO LOST PROFITS ARISING FROM OR IN ANY WAY CONNECTED WITH THIS AGREEMENT OR ITEMS SOLD HEREUNDER, WHETHER ALLEGED TO ARISE FROM BREACH OF CONTRACT, EXPRESS OR IMPLIED WARRANTY, OR IN TORT, INCLUDING WITHOUT LIMITATION, NEGLIGENCE, FAILURE TO WARN OR STRICT LIABILITY.

6. Changes, Reschedules and Cancellations: Buyers may request to modify the designs or specifications for the items sold hereunder as well as the quantities and delivery dates thereof, or may request to cancel all or part of this order, however, no such requested modification or cancellation shall become part of the contract between Buyer and Seller unless accepted by Seller in a written amendment to this Agreement. Acceptance of any such requested modification of cancellation shall be at Seller's discretion, and shall be upon such terms and conditions as Seller may require.

7. Special Tooling: A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the items sold hereunder, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

8. Buyer's Property: Any designs, tools, patterns, materials, drawings confidential information or equipment furnished by Buyer, or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

9. Taxes: Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are held to be taxable.

10. Indemnity For Infringement of Intellectual Property Rights: Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets (hereinafter 'Intellectual Property Rights'). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that an item sold pursuant to this contract infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If an item sold hereunder is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using said item, replace or modify said item so as to make it noninfringing, or offer to accept return of said item and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to items delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Right.

If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgements resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

11. Force Majeure: Seller does not assume the risk of and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter 'Events of Force Majeure'). Events of Force Majeure shall include without limitation, accidents, acts of God, strikes or labor disputes, acts, laws, rules or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials and any other cause beyond Seller's control.

12. Entire Agreement/Governing Law: The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire Agreement concerning the items sold, and there are no oral or other representations or agreements which pertain thereto. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of the sale of the items sold hereunder of this Agreement may be brought by either party more than two (2) years after the cause of action accrues.





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