KOBELT

HELM PUMP

7003

Owner's Operation, Installation & Maintenance Manual

February 2026
(Rev A)

NOTES:

RECORD DATA BEFORE INSTALLATION FOR FUTURE REFERENCE	
Model #:	
Serial #:	
Date of Purchase:	
Date of Installation:	

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1 INTRODUCTION

1.1 CONTACT

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This document is intended to clearly present comprehensive product data and provide technical information to assist the end user in design applications. Kobelt reserves the right, without notice, to change the design, or construction, of any products and to discontinue or limit distribution of any products. Kobelt also reserves the right to change, or update, without notice, any technical information contained within this document.

Kobelt recommends that customers visit our website to check for updates to this Manual. Once a product has been selected for use, it should be tested by the user to ensure proper function in all possible applications. For further instructions, please contact our distributors or visit our website.

1.2 COMPLIANT USE

This device is only intended for use by persons trained in operating marine systems.

The installer shall:

- Only use non-defective products.
- Check the safety of operation and the condition of the device before each use.
- Verify that the product is operational at all times and keep it in good working conditions.

Only Kobelt Manufacturing Co. Ltd. Authorized Dealers or Authorized Technicians are to repair Kobelt products.

1.3 COPYRIGHTS & TRADEMARKS

2 SAFETY

2.1 SAFETY ALERTS

Throughout this manual, the following symbols, and their accompanying explanation, are used to alert the user to special instructions concerning a service or operation that may be hazardous if performed incorrectly or carelessly. The associated risk levels are stated below.

⚠ DANGER	This symbol indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	This symbol indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	This symbol indicates a hazardous situation, which if not avoided, could result in minor or moderate injury.
NOTICE	This symbol informs the reader of events not related to personal injury but which there is a risk of damage to property or equipment.
SAFETY INSTRUCTIONS	This symbol informs the reader of safety-related instructions or procedures.

2.2 NOTICE TO INSTALLER

Disregarding the following safety measures can result in an accident causing severe injury to personnel and damage to material assets.

- Only use the product as directed in this manual.
- Never put the product into service if there is evidence of visible damage.
- Never put the product into service before fully completing installation and commissioning.
- Do not carry out any modifications to the product.
- Only use authentic Kobelt spare parts.
- Observe all local regulations, directives and laws during the installation of this product.
- All installation, commissioning, and maintenance work must only be conducted by qualified personnel. (For the purpose of this manual, qualified personnel are persons who are familiar with the assembly, installation, commissioning, and operation of the product and who have the qualifications necessary for their occupation.)
- Observe all specifications in this manual. If these guidelines are not followed and damage occurs, the warranty will be voided.

3 ABOUT HELM PUMP

3.1 PRODUCT DESCRIPTION

Kobelt Manufacturing produces various Helm Pumps, all of which are based on an axial piston pump design. The pistons are operated by an anti-friction thrust, and radial ball bearings support the shaft. These Helm Pumps can be installed in any location on the vessel owing to their bronze and stainless-steel construction. The Helm Pumps incorporate lock valves, filler plugs and interconnecting plugs for multi station applications. A front mounting plate is available as an option for all pumps, when the pump is to be mounted behind the console surface.

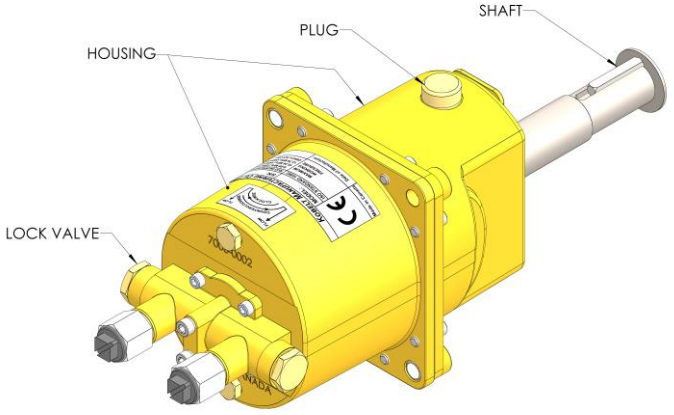


Figure 1: Product Overview Diagram

For manual hydraulic systems, under normal conditions, the load on the steering wheel rim should not exceed 36 ft. lbs. [16 kg], and generally the hydraulic system pressure should not exceed 650 psi [45 bar]. When used as emergency steering, the steering angle that must be maintained manually, in case the power fails, is maximum 15° to either side. Ensure that the helm pump is sized with consideration to the amount of human effort that is required to produce the required pressure and volume continuously.

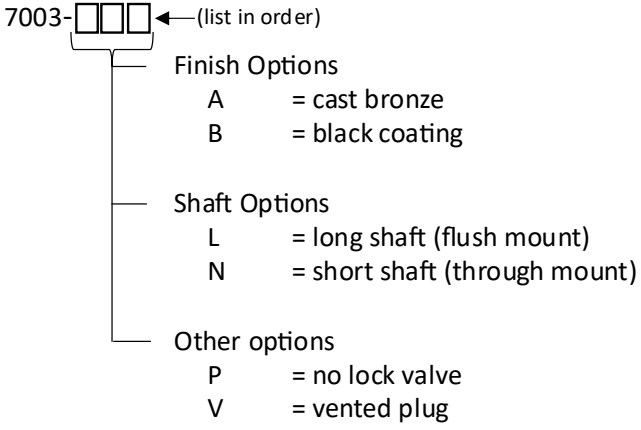
3.2 TECHNICAL SPECIFICATIONS

Table 1: Technical Specifications

MODEL	7003			
KOBELT P/N	7003-L	7003-LT	7003-N	7003-NT
DISPLACEMENT PER TURN	1 - 3 in^3 [16 - 49 cc]			

MAXIMUM PRESSURE		1000 PSI [69 bar]			
RECOMMENDED FLUID		ISO VG 32, VI 60 hydraulic oil			
LOCK VALVE PORT SIZES		-06 SAE ORB			
CASE PORT SIZE		1/4" NPT			
FILLER CAP THREAD SIZE		5/8" UNF			
STEERING WHEEL DIAMETER		13.5" to 18" [343 mm to 457 mm]			
PHYSICAL DIMENSIONS	L	11.64" [296 mm]	10.50" [267 mm]	12.75" [325 mm]	10.65" [270 mm]
	W	4.25" [108 mm]			
	H	4.88" [124 mm]			
MOUNTING DIMENSIONS (L x W)		4.00" x 3.38" [102 mm x 86 mm] 4x 0.33" [8.4 mm] THRU-HOLES			
PRODUCT WEIGHT		12 lbs [5.4 kg]			
SHIPPING DIMENSIONS (L x W x H)		12.0" x 6.0" x 8.0" [305 mm x 152 mm x 152 mm]			

3.3 MODEL CODE KEY



For example, a 7003-BNP, is a Helm pump with black epoxy finish, a short, tapered ended steering shaft and no lock valve.

4 INSTALLATION

4.1 RECEIPT

Upon receipt of the device ensure that the model number and serial number are noted in the table on page 2 of this manual. The serial number can be found in the location noted at right.

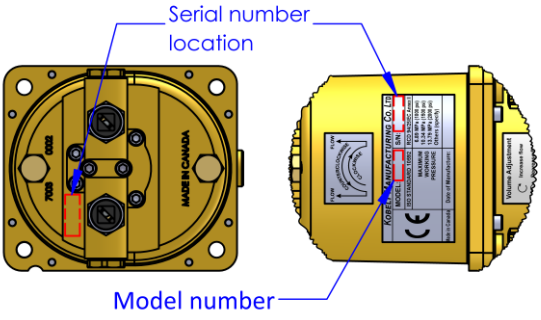


Figure 2: Pump Identification

4.2 MECHANICAL

The helm pump must be mounted on a flat surface strong and stiff enough to withstand the operating forces generated when operating at maximum pressure without excessive flexing. Ideally, helm pumps are installed with the shaft on a horizontal plane. Choose a location that has sufficient room for the operator to turn the helm wheel without risk of obstruction.

The helm pumps are supplied with either short shaft or long shafts to allow either through the console or under console mounting. The short shaft version would normally be mounted in the thru-console mode and the long shaft version for concealed, under console mounting.

When installing the pump under the console, ensure adequate access to the filling plug. Alternatively, install small header tank (Kobelt item 7002) with a hose from the pump to a position convenient for topping up with oil.

4.2.1 Through Console

Use the template in Appendix E to provide the correct cut-out to allow the front half of the pump to protrude through the console with the flange butting up against the back or front face of the console.

The helm pump is equipped with (4) four clearance holes for 5/16” [M8] screws or bolts at the four corners of the pump flange. Ensure the unit is securely fastened, preferably with an anaerobic thread locker such as Loctite 243.

4.2.2 Behind Console

Use the template in Appendix C to provide the correct cut-out to allow the pump shaft through the console and for the drilling of four holes to secure the pump to the back face of the console.

The helm pump is equipped with (4) four threaded holes for ¼ UNC screws. Ensure the unit is securely fastened to 64 in-lbs [7.2 Nm] maximum, preferably with an anaerobic thread locker such as Loctite 243.

If the variable flow facility of the helm pump is to be used, cut the hole for access to the adjusting screw.

4.2.3 Adaptor Plate

An adaptor plate is optionally available to simplify mounting of the pump. This plate can be installed on either side of the console. A template is provided to drill the necessary holes. Two bolts with washers are required in this case to secure the pump to the bulkhead.

Ordering number: 7003-0011A (cast bronze finish)
7003-0011B (black epoxy finish)

4.3 PIPING

The helm pump is equipped with a ¼ NPT ports located on the back face of the pump. The unit is shipped with these two ports capped. Ensure this cap remains in place until the plumbing is ready for connection. All hoses and piping must also be plugged or capped until ready for connection. All piping and hoses must be flushed prior to connection. Failure to do so can result in damaged components and seals.

NOTICE	All piping and hoses must be flushed prior to connection. Failure to do so can result in damaged components and seals.

The recommended oil for helm pump systems is ISO #32 mineral based Hydraulic Oil. If using any other type of fluid, ensure that the fluid is compatible with the helm pump seals. Consult the factory before switching fluids.

The piping to the steering cylinders should be minimum 1/2" nominal size and ¾" for longer runs with a suitable wall thickness to safely withstand the operating pressure. Copper or Stainless-Steel tubing is preferred for the piping material. Secure the piping against vibration with pipe clamps spaced every 3 feet [1 m]. Ensure the lines have a steady rise to the highest point to permit effective air bleeding.

The use of Teflon tape for pipe sealing is not recommended. The tape often rolls over the edge of the fitting and is cut off on installation; it then circulates in the plumbing. It is recommended that liquid Teflon sealant or its equivalent is used. It is easier to ensure that none of this type of sealant gets into the system.

4.3.1 Expansion Tanks

Expansion Tanks installed on the uppermost station, to provide an additional reservoir of oil are required. Kobelt recommends that approximately 1 Quart [1 Litre] minimum volume

should be used for this application. The vent line from the expansion tank to the helm pump should protrude approximately 1" from the bottom of the expansion tank into the tank itself. This avoids dirt and condensed water from entering the steering system. The expansion tank must have a vented plug arranged in such a fashion to prevent water spray and rain from entering the tank. (See

Figure 3). All other filler plugs on the steering stations must be of a non-vented type.

If an expansion tank is not used, the uppermost steering station must have a vented filler plug on the Helm Pump.

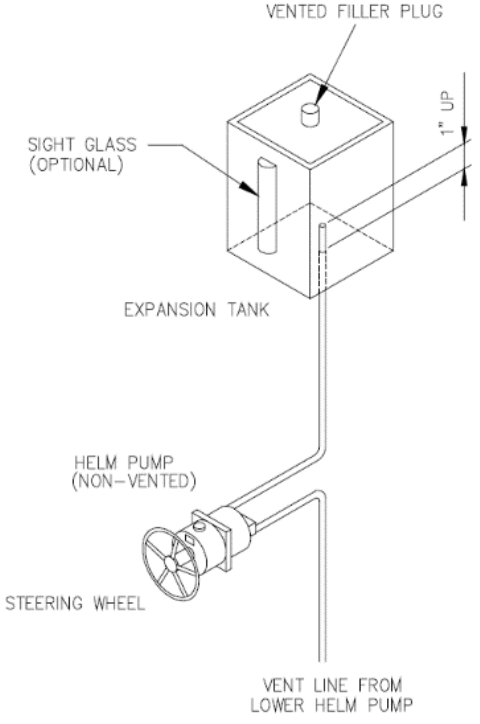


Figure 3: Expansion Tank Installation

4.3.2 Non-Vented and Vented

If no Header / expansion tank is installed, a Vented Plug is required at the highest pump. These can be ordered from the factory (see Figure 4).

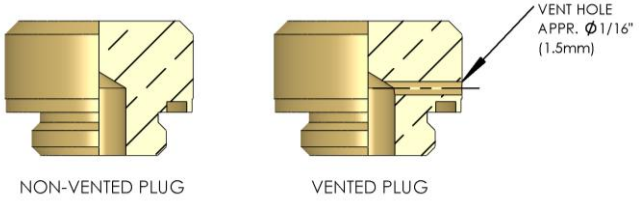


Figure 4: Vented vs. Non-vented plug

NOTICE	Installers should familiarize themselves with the equipment and their instructions. Operators should fully understand how the system works

5 COMMISSIONING

5.1 HYDRAULIC FILL & BLEED

5.1.1 Filling a Single Station System

1. The pump(s) should be set to maximum volume prior to filling and bleeding the system (see section Calibration and Adjustment).
2. Fill the helm pump with hydraulic oil using a funnel or filling tube. Be sure to re-install all filler plug. If a header tank is installed, fill the header tank to about ½ full.
3. Turn the wheel slowly in one direction until the pump starts to operate, at which point the level in the helm pump/header tank will go down.
4. Check the oil level frequently and top up as required.
5. Continue to turn the wheel in the same direction, until some resistance is felt.
6. At this point, the cylinder may be observed to move.
7. Open the bleed fitting on the cylinder on the side into which the oil is passing.
8. Continue to turn the wheel once again at about one turn per second and ensuring a good head of oil on the pump until clear oil and no air emerges from the bleed fitting on the cylinder.
9. Close the bleed fitting and do not turn the steering wheel in the opposite direction.
10. Provided the head of oil has been maintained and the wheel has been turned slowly, this side of the system should now be reasonably free of air.
11. Continue to turn the wheel until the cylinder moves to the hard over position.
12. There should, at this point, be a significant resistance to further turning.
13. Now turn the wheel in the opposite direction. There may be, at this point, a blow-back of air up the tubing into the pump, which can expel oil with some force from the funnel, or filling tube. A rag held over the top will prevent the oil from splashing over onto the surrounding area. If the oil level in the funnel has dropped, refill to ensure that the head of oil is maintained.
14. Open the bleed fitting on the pressure side (opposite side) of the cylinder and continue to pump until clear oil and no air is issuing from the bleed fitting.
15. Close the bleed fitting.
16. Fill the helm pump/header tank to the correct level.

The system should now be reasonably free of air and the cylinder should operate in both directions when the wheel is turned to either starboard or port.

Residual air may be removed from the system as follows:

Put the wheel hard over in one direction and apply pressure to the wheel. On breaking the hydraulic lock and turning the steering wheel in the opposite direction, air may be observed coming up the funnel or filling tube (Sometimes with considerable force).

Repeat this procedure in both directions several times.

Allow a period of several hours for any air bubbles in the system to group together and then repeat the hard over to hard over procedure.

While there is still air trapped in the system, the pump may be quite stiff to turn and on reversing the wheel, there is quite a distinct noise as the lock valve moves across. Once air is out of the system, the pump should turn smoothly, and the lock valve will move quietly from one side to the other on reversing the rotation of the wheel.

5.1.2 Filling a Two Station System

1. Fill the system from the top Helm Pump or Header Tank.
2. At the lower helm, follow steps (3) to (15) in section "Filling a Single Station System", keeping a head of oil at the top pump.

⚠WARNING	Do not use other types of fluids such as automotive transmission fluid or brake fluid. They contain additives that are harmful to oil seals used in steering systems.
⚠CAUTION	All hydraulic lines in the steering system must be thoroughly cleaned prior to filling the system. Ensure all hydraulic lines are secured and fittings are tight.

5.2 CALIBRATION AND ADJUSTMENT

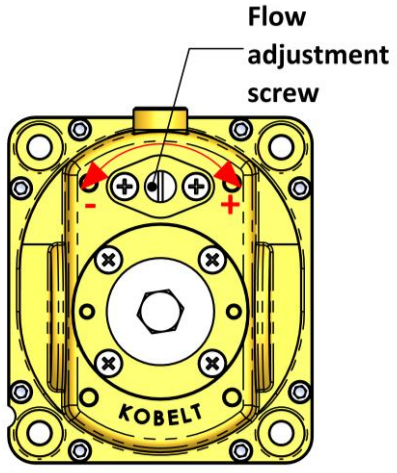
The Kobelt Model 7004 helm pumps outputs are adjustable. These Helm Pump have a variable output. This enables the pump to be set at the optimum number of turn's hard over to hard over, either during or after installation.

Increasing the output of the pump decreases the number of turn's hard over to hard over. The lower the number of turns, the stiffer the steering will feel. Larger diameters of wheel may be necessary at full pump output, depending on cylinder size. Consult our distributor or dealer.

Decreasing the output of the pump increases the number of turn's hard over to hard over. The steering will become lighter with the increased number of turns and this should allow the use of small diameter wheels.

To increase output, Turn the screw clockwise

To decrease output, Turn the screw counter clockwise



6 OPERATION

The operation of a manual hydraulic steering system is very simple. A steering wheel is fitted directly to the helm pump. Two hydraulic lines from the lock valve (or porting block) on the rear of the helm pump connect to a double acting balanced displacement steering cylinder. A tiller arm is clamped to the rudder shaft and the steering cylinder is bolted to the tiller arm.

Turning the steering wheel will pump hydraulic oil to one end of the steering cylinder. As the cylinder moves, oil from other end of the steering cylinder is push backed up to the opposite side of the helm pump. This called a two-line system.

When you stop turning the steering wheel, the hydraulic oil in both lines is “locked” by the rudder lock valve (sometimes called a non-return valve). The rudder will stay in place and not move until you start turn the steering wheel. Second function of the lock valve in a two or more-station system, - steering wheels not in use do not turn.

NOTICE	If helm pump order with **Porting Block** instead of lock valve, then the rudder will not stay in position and can move by water current. Some sailing boats use a porting block to feel rudder force on the wheel.

7 MAINTENANCE

7.1 PREVENTATIVE MAINTENANCE

Minimal maintenance is necessary. All Kobelt products are designed to provide many years of trouble-free operation Kobelt products are machined and assembled in-house and then put through comprehensive testing and quality assurance procedures before shipping.

- Monthly (12 times/year)
  - Check the oil level in pump. If a header tank (expansion tank) is installed, the oil level should be about ½ full.
  - Test Manual Mode to ensure proper hand-over and operation.
- Quarterly (4 times/year)
  - Inspect connections for leaks, and mounting bolts and nuts are tight for their functions.
- Every two years
  - Sample and analyze the oil in the steering lines.
  - Check for corrosion and excessive wear at all moving parts that could cause problems in normal operation.

7.2 RECOMMENDED SPARE PARTS

As a minimum Kobelt recommends the following spare parts are on-hand:

Table 2: Recommended Spares

RECOMMENDED SPARES		
QTY	**ITEM**	**KOBELT PART #**
1	REPAIR KIT FOR HELM PUMP 7003 • O-RINGS AND SEAL SHAFT	7003-RK

When purchasing spare parts refer to Appendix B: Parts List at the back of this manual for Kobelt component Part Numbers. See instructions at the end of this manual for shaft seal replacement.

NOTICE	It is recommended that any required service work on a Kobelt product be performed by a factory authorized service representative. Please contact the nearest Kobelt authorized distributor for assistance.

8 TROUBLESHOOTING

If you encounter problems with the operation of your product, please refer to the trouble-shooting suggestions before contacting Kobelt for assistance. If the steps below do not resolve your issue, please reach out either Kobelt directly or our Dealers in your area.

Table 3: Common Troubleshooting Problems

Problem (Issue encountered)	Cause (What it means)	Corrective Action (What to do)
Helm pump doesn't turn actuator in correct direction.	The tube connection from helm pump to cylinder is backward.	Switch PORT and STBD connection at helm pump or at the cylinder.
Cylinder movement is not smooth	Air did not bleed properly.	Refer to bleeding procedure in section 6.1.1.

9 WARRANTY

Kobelt Manufacturing Co. Ltd. ("Kobelt") warrants the Products and Parts manufactured by Kobelt to be free from defects in workmanship or material and that said products are designed mechanically and functionally to perform to specifications.

This warranty is effective providing:

- The equipment is used within the intended operating conditions and in accordance with Kobelt recommendations
- The equipment is installed according to equipment diagrams, specifications and recommendations which Kobelt has provided

This warranty becomes invalid if the factory supplied serial number has been removed or altered on the product. This warranty does not cover cosmetic damage or damage caused by an act of God, accident, misuse, abuse, negligence or modification of any part of the product. This warranty does not cover damage due to improper operation or maintenance, connection to inappropriate equipment or attempted repair by anyone other than an authorized Kobelt representative.

Upon identification of a potential issue or defect with a Kobelt Product or Part, the Warranty Applicant ("Applicant") must immediately contact Kobelt and describe the issue in writing, by letter, fax, email or other electronic conveyance. Kobelt will then assess the cause of the defect and determine warranty applicability and appropriate remediation.

If any part is found to be defective, Kobelt will replace said part FOB the Kobelt factory provided that any such defective part is returned by the Buyer with freight and applicable forwarding charges prepaid by the Buyer. Kobelt's sole obligation to the Applicant will be to repair or replace the defective part with same or similar product, to a maximum value of the list price of the product or part. The Kobelt warranty does not cover labour charges, travel or any other associated expenses.

All Products and Parts manufactured by Kobelt, are subject to a warranty against manufacturer's defects in materials or workmanship for a period of two (2) years from the date of purchase.

Kobelt will be responsible for all Products or Parts sold by Kobelt but manufactured by 3rd party manufacturing companies. However, these products and parts are subject to applicable 3rd party warranties and may not be the same as the Kobelt warranty.

10 APPENDIX A: INSTALLATION DIMENSIONS

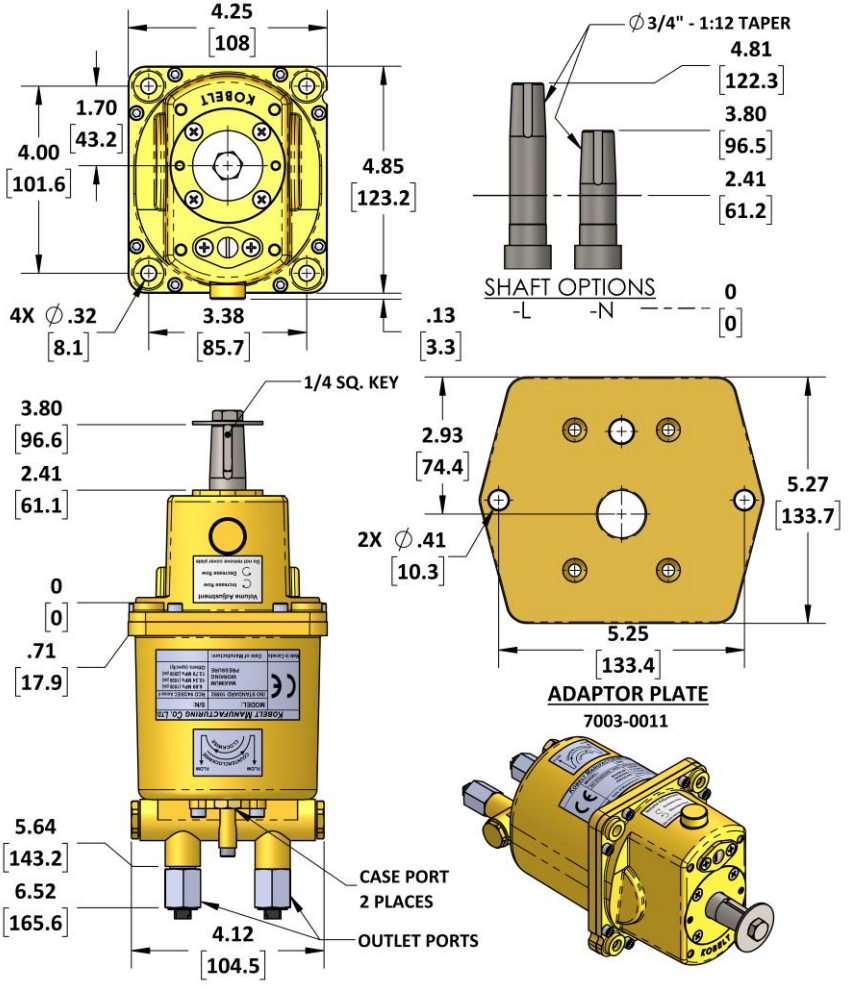


Figure 5: General Arrangement View (Straight Short Shaft)

11 APPENDIX B: PARTS LIST

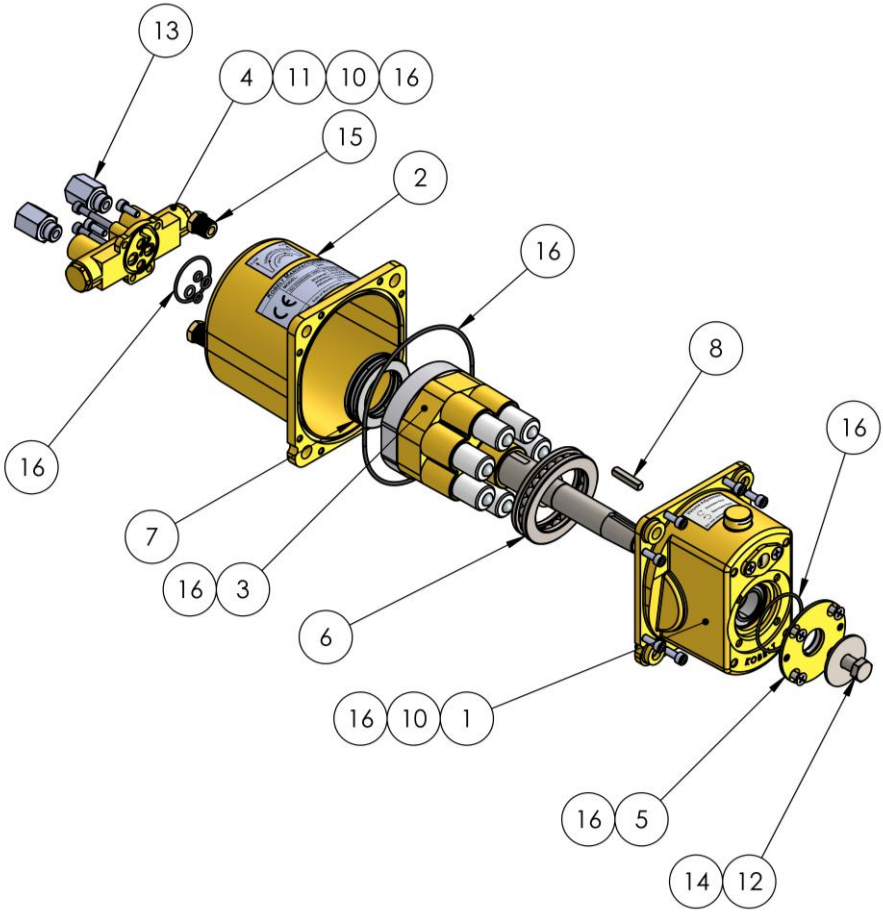


Figure 6: Parts Diagram

Table 4: Parts List

	Model No.:		7003	
	Part No.:		7003-AL	7003-AN
ITEM	DESCRIPTION	QTY	ITEM PART NO.	
1	FRONT HOUSING SUB-ASSEMBLY	1	7003-5001	
2	REAR HOUSING	1	7003-0002	
3	ROTOR SUB-ASSEMBLY	1	7003-5002-L	7003-5002-S
4	LOCK VALVE SUB-ASSEMBLY	1	7003-5004	
5	FRONT SEAL RETAINER SUB-ASSEMBLY	1	7003-5005	
6	BEARING, THRUST	1	7003-51110	
7	BEARING, RADIAL	1	7003-51107	
8	SQUARE KEY	1	7005-0019	
9	FLAT HEAD SCREW	4	1009-0806	
10	SOCKET HEAD SCREW	12	1002-0808	
11	SOCKET HEAD SCREW	2	1002-1024	
12	HEX HEAD SCREW	1	1001-1216	
13	FITTING, ADAPTER	2	7039-0140	
14	WASHER	1	1023-0245	
15	FITTING, HEX HD PLUG	2	7039-1342	
16	HELM PUMP REPAIR KIT	1	7003-RK	

7003-5001

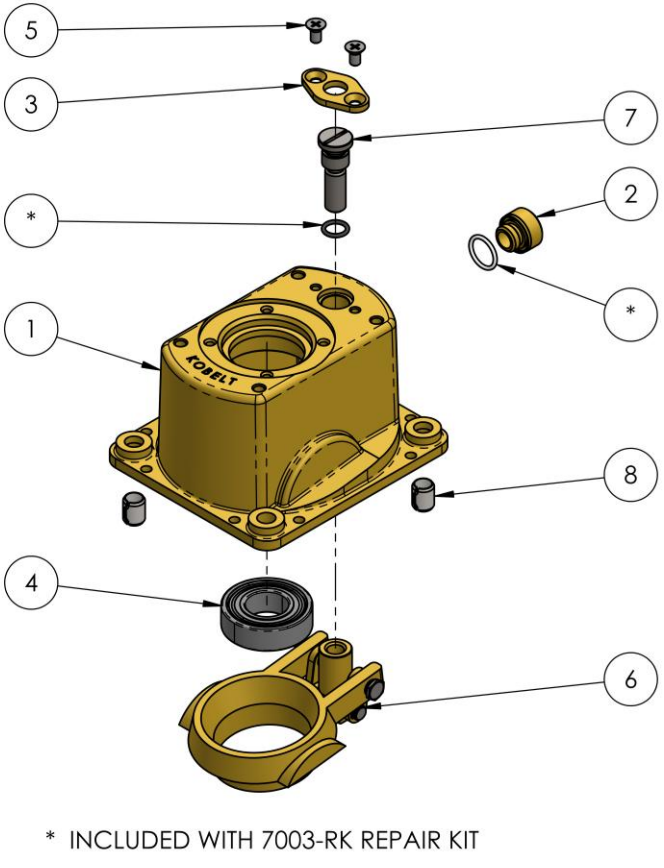


Figure 7: Front housing sub-assembly parts diagram

ITEM	DESCRIPTION	QTY	PART NO.
1	FRONT HOUSING	1	7003-0001
2	FILLER PLUG	1	7003-0028
3	ADJUSTMENT SCREW COVER	1	7003-0008
4	BALL BEARING	1	7005-6006
5	FLAT HEAD SCREW	2	1009-0806
6	ADJUSTMENT BLOCK SUB-ASSEMBLY	1	7003-0007-SA
7	ADJUSTMENT SCREW	1	7003-0023
8	DOWEL PIN	2	7012-0030
*	O-RING	1	1101-0012
*	O-RING	1	1101-0015

*Items included in 7005-RK repair kit

⚠CAUTION	Front housing of the pump is spring loaded. Opening and closing of front housing for repair or maintenance needs extra caution.

NOTICE	At the time of installation leave the adjustment screw (item 4) all the way out at minimum displacement position.

7003-0007-SA

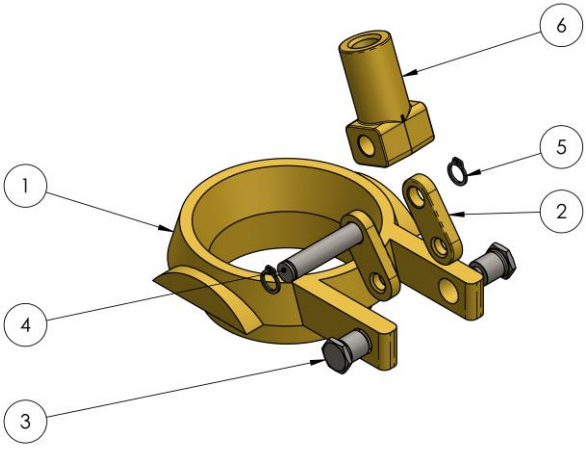


Figure 8: Adjustment block sub-assembly

	Part No.:	7003-0007-SA
ITEM	**DESCRIPTION**	
1	THRUST BEARING RETAINER	7003-0007
2	ADJUSTMENT LINK	7005-0009
3	SHOULDER BOLT	7005-0022
4	PIN	7005-0021
5	RETAINING RING	1029-1025
6	ADJUSTING BLOCK	7003-0010

7003-5002

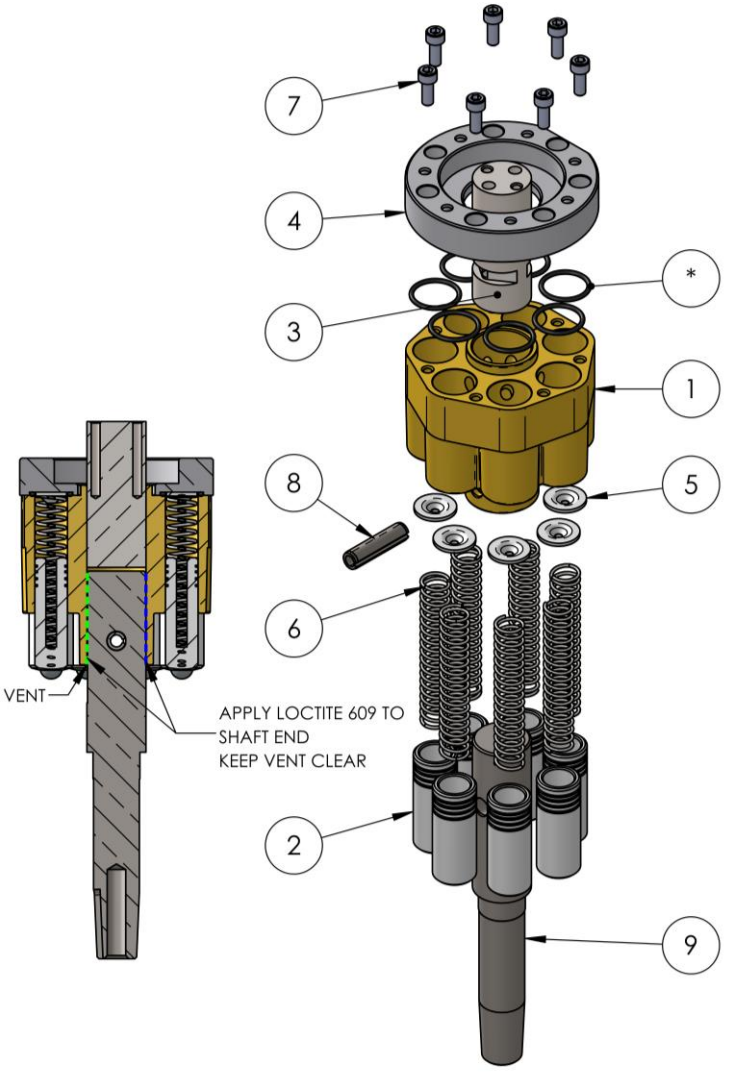
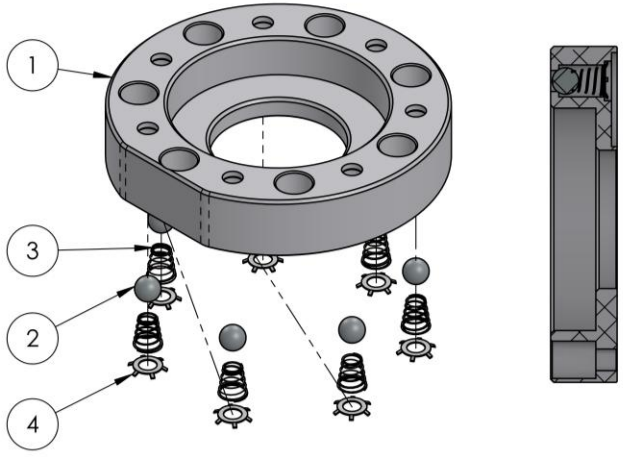


Figure 9: Rotor sub-assembly

	Model No.:		7003-5002-L	7003-5002-S
ITEM	**DESCRIPTION**	**QTY**	**PART NO.**	
1	ROTOR	1	7005-0005	
2	PISTON	7	7005-0012	
3	PINTLE	1	7005-0013	
4	SUCTION PLATE ASSEMBLY	1	7003-5003	
5	SPRING SEAT	7	7003-0032	
6	SPRING	7	1201-0170	
7	SOCKET HEAD CAP SCREW	7	1002-0808	
8	PIN	1	1024-1120	
9	SHAFT	1	7003-0016	7003-0015
*	O-RING	7	1101-0018	

**Item supplied with 7003-RK repair kit.*

7003-5003



ITEM	DESCRIPTION	QTY	PART NO.
1	CHECK VALVE BODY	1	7003-0004
2	BALL	7	1301-0108
3	SPRING	7	1201-0163
4	RETAINING RING	7	1029-6037

12 APPENDIX C: SHAFT SEAL REPLACEMENT

7003-5005

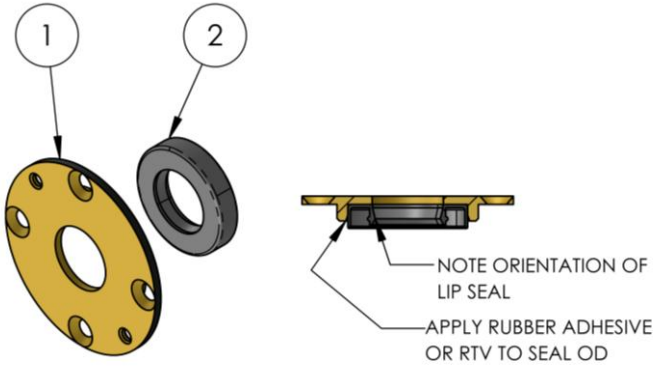


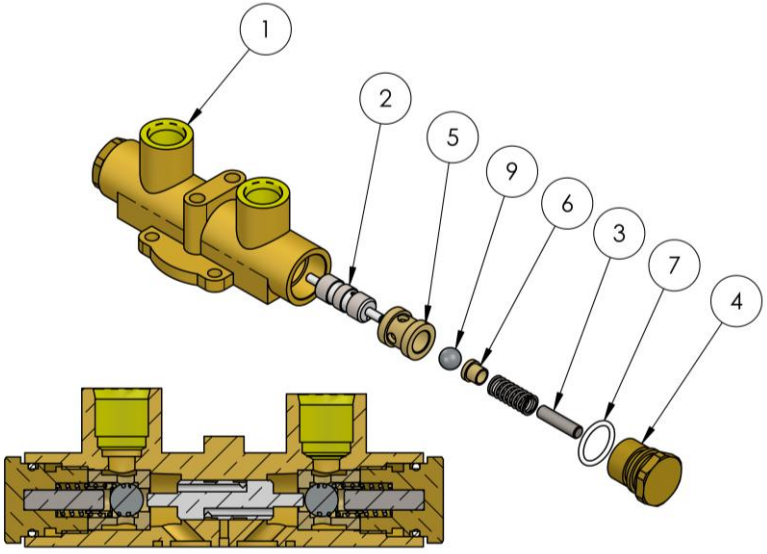
Figure 10: Front Seal Retainer sub-assembly

	Model No.:	7012-5005
ITEM	**DESCRIPTION**	
1	FRONT SEAL RETAINER	7003-0003
2*	SHAFT SEAL	7003-7831

*Item supplied in 7003-RK repair kit.

13 APPENDIX D: LOCK VALVE SUB-ASSEMBLY

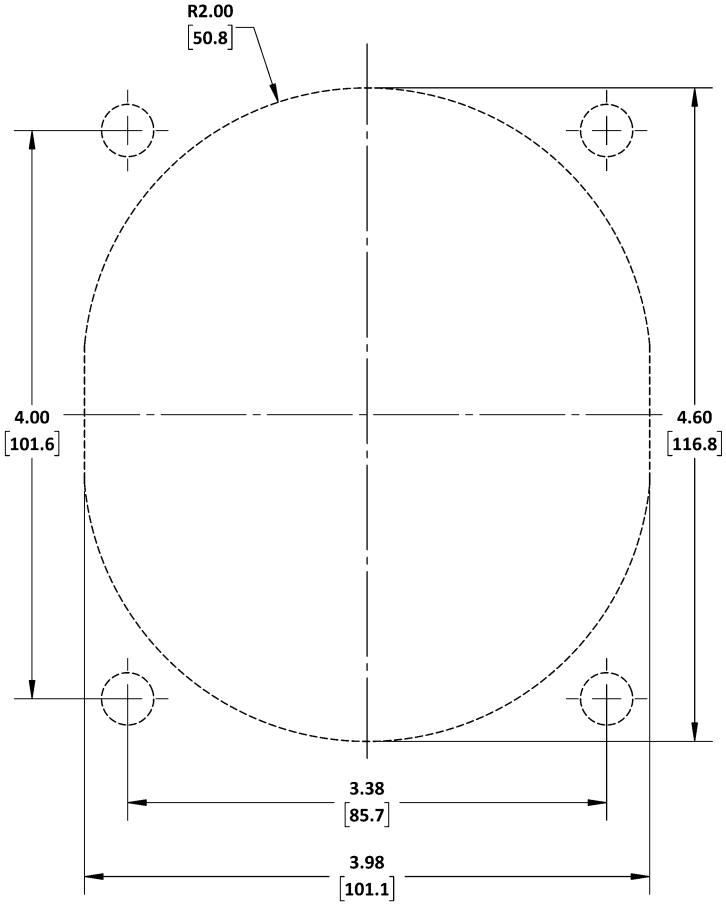
7003-5004



ITEM	DESCRIPTION	QTY	PART NO.
1	LOCK VALVE BODY	1	7003-0006
2	SHUTTLE	1	7003-0014
3	PIN	2	7003-0024
4	PLUG	2	7005-0025
5	BALL SEAT	2	7003-0026
6	SPRING SEAT	2	7003-0031
7*	O-RING	2	1101-0015
8	SPRING	2	1201-0171
9	BALL	2	1301-0110

*Item supplied in 7003-RK repair kit.

14 APPENDIX E: CUT-OUT TEMPLATE



SCALE: 1:1

15 APPENDIX F: TYPICAL SYSTEM ARRANGEMENT

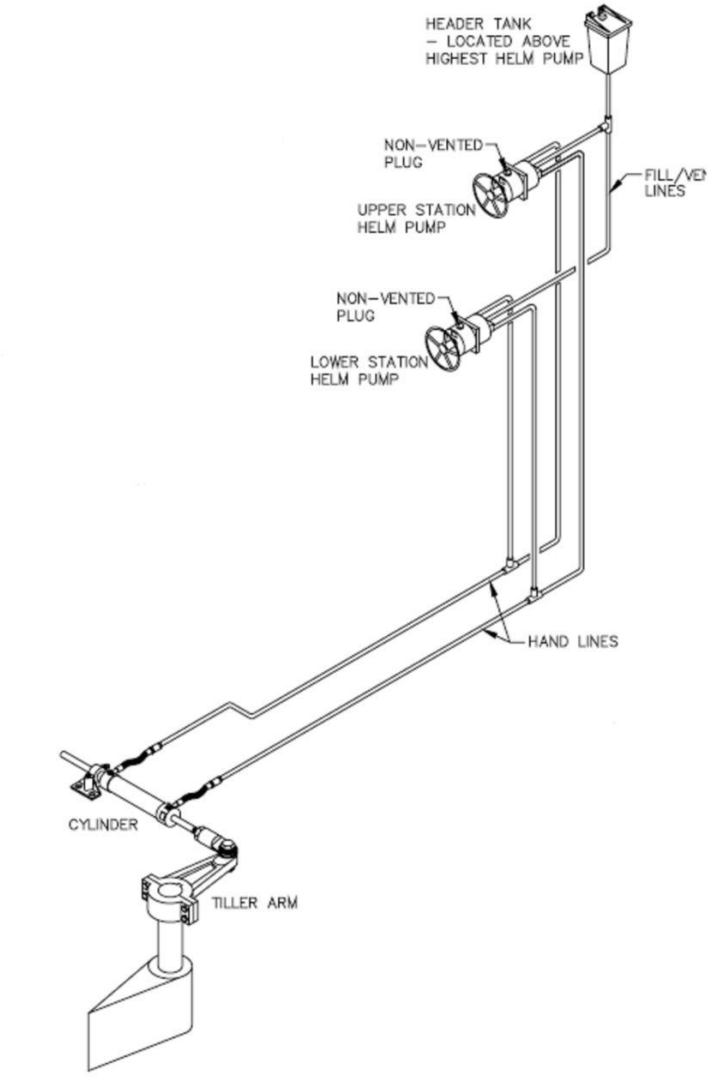


Figure 11: Typical system arrangement

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