WAGNER

# 700 Series Hydraulic Steering

## 700 Series Helm Pumps

■ **Performance.**

The 701 is a positive displacement axial piston pump based on the same design found in larger Wagner helm pumps. The pistons are ground and honed, then hand assembled for a precise fit resulting in the most efficient manual hydraulic helm pump available.

■ **Dependable.**

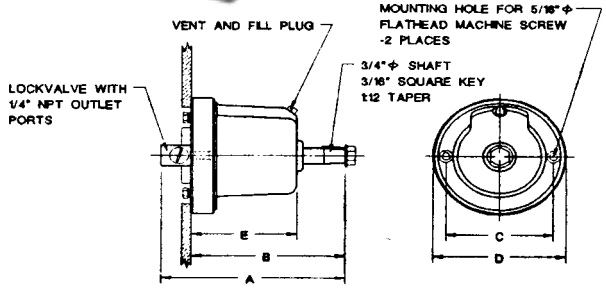
The pump is a rugged all metal construction with a hard baked-on enamel finish. The brass shaft is supported at both ends for extra strength. A replaceable external shaft seal is used.

■ **Multiple steering stations.**

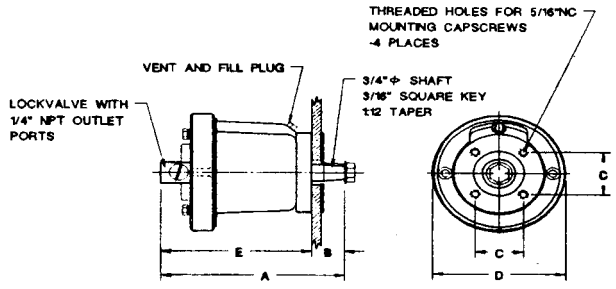
Multiple helm pumps are easily connected. Each pump operates independently and has full rudder control. A lockvalve on each pump prevents the wheels not in use from "motoring" as well as eliminating the wheel effort required to maintain rudder position.

■ **Simple installation.**

Pumps have a simple two bolt mounting and may be located in front or behind the dash panel. An optional trim ring provides the perfect finish for a through dash panel mounting.




701 HELM PUMP




702 FACEMOUNT HELM PUMP

| PUMP MODEL | DIMENSIONS | | | | | PUMP DISPLACEMENT (IN³/REV) | WEIGHT (lbs) |
|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | | |
| 701 | 7" | 5-3/4" | 4-3/8" | 5-5/8" | 4-3/8" | 1.95 | 9.5 |
| 702 | 9" | 2-3/4" | 2.30" | 5-5/8" | 6-1/4" | 1.95 | 9.5 |

## 700 Series Cylinders

■ **Strong and compact design.**

700 series systems offer pleasure boaters and yachtsmen the same high quality design and construction found in larger commercial Wagner systems. Cylinders are a double acting, balanced displacement design.

■ **Flexibility.**

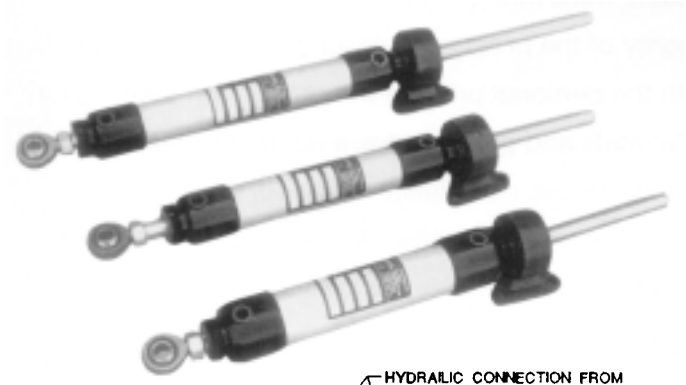
Standard systems use a 1¼ or 1½ cylinder with a 7" stroke. For outboard and inboard/outboard applications there is a 1¼ cylinder with a 9" stroke.

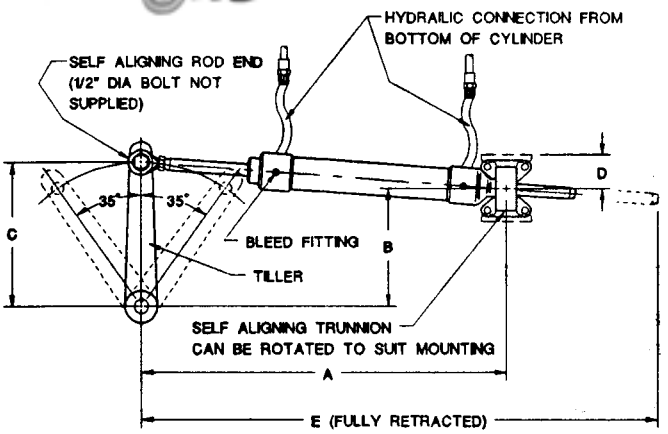
■ **Corrosion free construction.**

Cylinder barrels are manufactured using anodized marine grade aluminum and honed to provide a smooth surface for longer seal life. The piston rods are constructed using stainless steel.

■ **Simple installation.**

Self-aligning rod end and trunnion mounting pad allow for easy installation and less critical alignment. Bleed fittings installed in the cylinders ensure easy filling of the system.






| CYLINDER MODEL | BORE | TORQUE (ft-lbs) 2 X 35°② | STROKE (Inches) | CYLINDER DISPLACEMENT (IN³) | WHEEL TURNS① | DIMENSIONS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | A | B | C | D | E |
| 1-1/4 X 7 | 1-1/4" | 384 | 7" | 6.44 | 3-1/4 | 16-3/8" | 5" | 6-1/8" | 1-5/16" | 22-3/4" |
| 1-1/4 X 9 | 1-1/4" | 492 | 9" | 8.28 | 4-1/4 | 19-3/8" | 6-7/16" | 7-7/8" | 1-5/16" | 27-3/4" |
| 1-1/2 X 7 | 1-1/2" | 610 | 7" | 10.22 | 5-1/4 | 16-3/8" | 5" | 6-1/8" | 1-5/16" | 22-3/4" |

① WHEEL TURNS BASED ON USING WAGNER MODEL 701 OR 702 HELM PUMPS.
② TORQUE RATINGS DEVELOPED IN THE HARDOVER POSITION AT 1000 PSI PRESSURE.

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# Type N Hydraulic Steering

Wagner Type "N" Steering Systems offer effortless control for all types of vessels from 20 to 150 ft in length. They are exceptionally tough and reliable and provide long and virtually maintenance-free performance. Type N Steering systems are available in 12 progressive sizes to ensure the systems selection matches each application. The basic manual system includes a helm pump, with lock valve and a steering cylinder. Optional power steering and autopilots are easily added to the system by teeing into the hydraulic helm lines.

Type N Cylinders are specifically designed for marine use. A larger than common bore and a shorter stroke provide a more compact installation, more resistant to failure caused by overload. Cylinders are made of corrosion free bronze, brass and stainless steel. Cylinder barrels are honed and polished to provide a smooth surface for longer seal life. Piston heads, rod bearings and spherical bearing are larger than competitive units, providing more strength and longer life. U-cups, which provide better sealing than O-rings, are used as dynamic seals.

Self aligning spherical bearings at the rod end and trunnion mounting pad allow for easy installation and less critical alignment. Bleed fittings ensure easy filling of the system.

Cylinders are supplied with a high strength tiller bolt designed for an accurate fit in the cylinder rod end and tiller. Flex hoses are supplied with large diameter ports to minimize hydraulic restrictions.

Wagner Helm Pumps are high efficiency axial piston pumps with fixed, positive displacements from 1.95 cu. in./rev. to 13.4 cu.in./rev. They are matched to cylinder size to give the optimum number of wheel turns according to rudder torque.

The pumps are a rugged all metal construction with a hard baked-on enamel finish. The brass shaft is supported by large bearings for greater strength and longer life. A replaceable external shaft seal is used. The pistons are ground and honed, then hand assembled for a precise fit, resulting in smooth operation and producing the most efficient manual hydraulic helm pump available.

Multiple steering stations are easily connected. Each pump operates independently and has full rudder control. A lock-valve on each pump prevents the wheels not in use from "motoring" and eliminates the wheel effort required to maintain rudder position. A helm control valve is available for sailboat installation. This three position valve allows the helmsman to select "locked rudder / unlocked rudder" to allow rudder feel; and "cylinder bypass" for use with a hand tiller.

Wagner Helm Pumps have a simple two bolt mounting and are designed to be located behind the dash panel. Some models are available with an optional front mount. The system is simply filled by pouring the recommended oil into the helm pump filler port. External pressurization is not required.

## Application Guide

| SYSTEM MODEL | DISPLACEMENT HULLS | | | | | | | | PLANING HULLS | |
|---|---|---|---|---|---|---|---|---|---|---|
| | TUG BOATS | | WORK AND PLEASURE BOATS | | SAILBOATS | | | | | |
| | | | | | BALANCED RUDDER | | UNBALANCED RUDDER | | | |
| | •LENGTH | HP | •LENGTH | HP | •LENGTH | ▲AREA | •LENGTH | ▲AREA | •LENGTH | HP |
| NX1-63 | 16-30 | 125 | 26-40 | 140 | 26-40 | 3-10 | 26-36 | 3-7 | 26-46 | 400 |
| NX1-100 | 20-30 | 130 | 30-40 | 150 | 33-46 | 5-13 | 30-40 | 4-8.5 | 33-50 | 450 |
| NX2-126 | 23-30 | 140 | 40-46 | 160 | 40-50 | 9-15 | 36-50 | 6.5-9.5 | 40-52 | 500 |
| NX1-160 | 26-40 | 160 | 40-50 | 170 | 46-56 | 14-17 | 40-50 | 8.5-12 | 43-55 | 600 |
| NX2-200 | 26-40 | 180 | 40-60 | 180 | 50-60 | 15-19 | 43-52 | 9.5-15 | 46-60 | 650 |
| NX1-250 | 26-40 | 200 | 40-65 | 190 | 50-65 | 16-21 | 46-60 | 11-16 | 46-62 | 700 |
| NX2-320 | 30-40 | 250 | 50-72 | 200 | 52-68 | 17-25 | 50-62 | 12-18 | 56-68 | 750 |
| NX1-400 | 33-46 | 300 | 60-80 | 250 | 52-72 | 19-30 | 50-66 | 13-19 | 60-72 | 850 |
| NX2-500 | 36-52 | 350 | 60-82 | 300 | 56-79 | 20-32 | 52-72 | 14-21 | 60-79 | 900 |
| NX1-630 | 45-60 | 400 | 65-85 | 350 | | | | | 65-82 | 950 |
| NX2-800 | 50-65 | 500 | 65-98 | 400 | | | | | 72-88 | 1000 |
| NX2-1260 | 65-85 | 800 | 82-121 | 650 | | | | | 85-115 | 1200 |

• Overall length in feet.
▲ Area in square feet.

**This is a reference guide only and system selection must be decided by a torque calculation. Minimum information required: description of boat, rudder dimensions and hull speed.*

**Phone: 800-225-0004 ☎ Fax: 908-486-1056**
**e-mail: sales@sealandpower.com**

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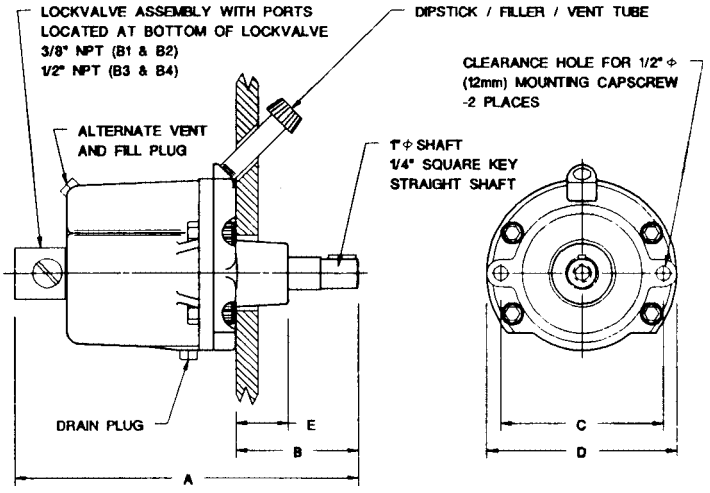
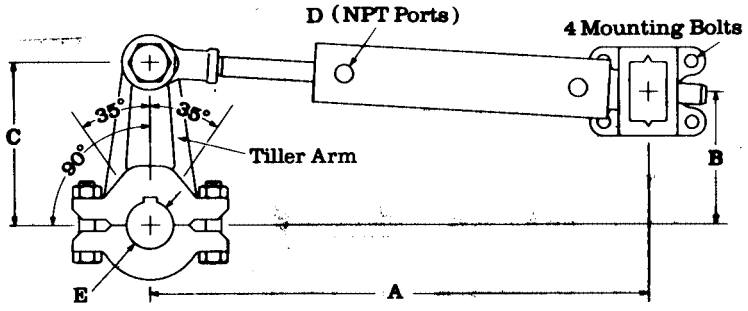
# Type N Hydraulic Steering

| PUMP MODEL | DIMENSIONS A | B | C | D | E | PUMP DISPLACEMENT (IN³/REV) | WEIGHT |
|---|---|---|---|---|---|---|---|
| B1 | 12-1/16" (322) | 5" (127) | 5-1/2" (140) | 6-1/2" (165) | 1-7/8" (48) | 2.95 | 15.5 lbs (7.3 kg) |
| B2 | | | | | | 4.02 | |
| B3 | 15-1/4" (387) | 5-1/2" (140) | 7" (178) | 8-1/2" (203) | 1-1/8" (29) | 6.33 | 34 lbs (15.6 kg) |
| B4 | | | | | | 9.89 | |




SYSTEM MODEL CODE
NX1-63
- Torque (kg.m) @ 7000 kPa
- '1': One cylinder '2': Two cylinders
- Use 'A': Single rudder Use 'B': Twin rudder Use 'X': if unknown

N 40-120
- Stroke (mm)
- Bore (mm)

| SYSTEM MODEL | TORQUE *2 x 35° kg-m | lb.ft | SUGGESTED HELM PUMP MODEL | TURNS | TYPE N STEERING CYLINDER MODEL | DISPLACEMENT cm³ | in³ | OVERALL DIMENSIONS (in.) A | B | C | D | E MAXIMUM TILLER ARM BORE mm | in. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NX1-63 | 63 | 456 | B1 | 3.0 | N40-120 | 127 | 7.7 | 15.8 | 3.3 | 4.1 | ¼ | 48 | 1.89 |
| NX1-100 | 100 | 723 | B1 | 4.7 | N40-190 | 200 | 12.2 | 20.0 | 5.3 | 6.5 | ¼ | 56 | 2.20 |
| NX2-126 | 126 | 912 | B2 | 3.8 | N40-120 | 254 | 15.5 | 15.8 | 3.3 | 4.1 | ¼ | 48 | 1.89 |
| NX1-160 | 160 | 1157 | B2 | 4.8 | N50-190 | 314 | 19.1 | 21.3 | 5.3 | 6.5 | ⅜ | 65 | 2.56 |
| NX2-200 | 200 | 1446 | B2 | 6.1 | N40-190 | 400 | 24.5 | 20.0 | 5.3 | 6.5 | ¼ | 56 | 2.20 |
| NX1-250 | 250 | 1808 | B3 | 4.8 | N50-300 | 495 | 30.2 | 27.8 | 8.4 | 10.3 | ⅜ | 75 | 2.95 |
| NX2-320 | 320 | 2314 | B3 | 6.0 | N50-190 | 628 | 38.3 | 21.3 | 5.3 | 6.5 | ⅜ | 65 | 2.56 |
| NX1-400 | 400 | 2893 | B3 | 7.7 | N80-190 | 802 | 49.0 | 25.4 | 5.3 | 6.5 | ½ | 88 | 3.46 |
| NX2-500 | 500 | 3616 | B3 | 9.5 | N50-300 | 990 | 60.4 | 27.8 | 8.4 | 10.3 | ⅜ | 75 | 2.95 |
| NX1-630 | 630 | 4557 | B4 | 7.8 | N80-300 | 1267 | 77.3 | 31.9 | 8.4 | 10.3 | ½ | 100 | 3.94 |
| NX2-800 | 800 | 5786 | B4 | 9.9 | N80-190 | 1604 | 97.9 | 25.4 | 5.3 | 6.5 | ½ | 88 | 3.46 |
| NX2-1260 | 1260 | 9114 | B4 | 15.6 | N80-300 | 2534 | 154.6 | 31.9 | 8.4 | 10.3 | ½ | 100 | 3.94 |

*Torque ratings at 7000 kPa (1000 psi)

24.5 mm = 1 inch

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WAGNER

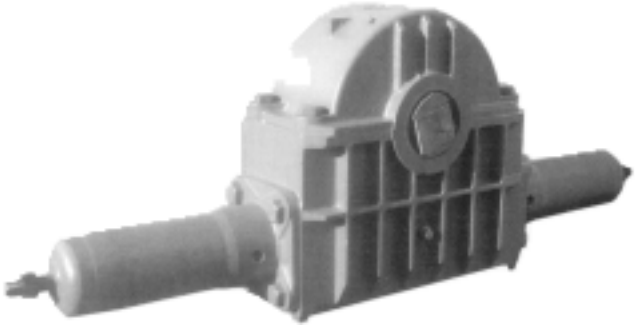
# Type T Hydraulic Steering

Wagner Type T hydraulic steering systems are exceptionally tough and reliable. Available in 16 models, ranging from 820 to 37,500 foot-pounds torque, they provide trouble free installations on all types of commercial vessels, 25 to 200 ft in length. The Type T actuator utilizes the "Rapson Slide" principle in which ability to generate torque increases with increasing rudder angle. This matching of ram capacity to rudder torque enables the Type T system to provide the most effective steering at the least cost. Rapson slide T-rams require fewer turns on hand steering (producing the same torque as an equivalent cylinder/tiller configuration). Less power is consumed in an electrically driven pump set. Rudder angles from 2 x 35° to 2 x 45° are standard.

All moving parts are hand fitted and encased in a grease filled, heavy, ductile iron housing. Protected from corrosion and mechanical damage the T-ram provides years of maintenance free service. Internal bearing surfaces are 5 to 10 times larger than necessary for strength alone, reducing wear to a minimum even after many years of service.

The T-ram is easier to install and more tolerant to shock than any other rudder actuator. The integral tiller simply clamps onto the rudder post and the whole assembly self-aligns to it. Time consuming alignment with shims, and preparation of flat mounting beds are not necessary. The steering torque is transmitted to the vessel by two torque arms made of standard angle bar. Due to the construction of the T-ram, the clamp fitted tiller provides an integral rudder carrier bearing. The mounting of the T-ram allows it to "float" on the rudder stock. When mounted this way, it is almost impossible to damage the steering, should the vessel go aground or hit some obstruction.

Wagner Type T steering systems are available in standard rudder stock diameters or can be custom bored and keyed to suit a specific project.



# Rudder Angle Indicator Systems

### Model 150 Rudder Angle Indicator

This 3" diameter indicator is enclosed in a standard SAE housing for flush mount in consoles or pedestals. The front face of the indicator is completely watertight. The indicator draws less current than a pilot light and may be run off any boat's 12 to 40 volt DC current supply. Up to six stations may be used by simply connecting them is series. The indicator is fitted with internal, indirect illumination. An optional remote dimmer control allows for selection of a comfortable level of brightness. The indicator comes complete with a prewired cable, ready for installation.

### Universal Rudder Follow-up

This completely watertight transmitter contains an infinite resolution sensing device rated for 20 million operations, providing extremely long life, even under high vibration conditions. The slightest movement of the rudder generates an electrical signal which causes an accurate proportional movement of the indicator(s). This unit is mechanically linked to the rudder stock. It comes complete with a prewired cable, a brass linkage rod and a set of swivels.

### Universal Rudder Stock Clamp

This brass clamp fits rudder stocks up to 4˝ inches (115mm) maximum diameter. The lever of a rudder follow-up unit is mechanically linked to this clamp to provide rudder feedback to an indicator system. A series of connection points are predrilled in the clamp arm for various rudder angles.

***We can offer Wagner steering gear for just about any inboard pleasure or commercial vessel. Call us for a recommendation.***

***Phone: 800-225-0004 ☎ Fax: 908-486-1056***
***e-mail: sales@sealandpower.com***

# DATA SHEET hydraulic steering

NAME _____ BOAT NAME _____

ADDRESS _____ HULL NO. _____

_____ BOAT TYPE ☐YACHT ☐TOWBOAT ☐SAILBOAT ☐FISHBOAT ☐ _____

HULL DIMENSIONS LENGTH _____ BEAM _____ DRAFT _____

HULL TYPE PLANING HULL ☐DISPLACMENT HULL

RUDDER DIMENSIONS HEIGHT(OVERALL)____ WIDTH(OVERALL)____COUNTERBALANCE ____

RUDDER TYPE ☐FLAT ☐SINGLE SCREW ☐SINGLE RUDDER ☐OTHER _____
☐STREAMLINE ☐TWIN SCREW ☐TWIN RUDDER OTHER _____

☐NEW CONSTRUCTION
☐EXISTING BOAT

DEGREE OF STEERING DESIRED (MIDSHIP TO HARD OVER) ☐35 DEGREES ☐45 DEGREES

NUMBER OF STATIONS: ☐MANUAL ☐POWER

HULL SPEED ACTUAL MEASURED _____ KNOTS ESTIMATED _____ KNOTS

PROPELLER INFORMATION

PITCH _____

DIAMETER _____

RPM _____

REDUCTION GEAR RATIO _____

ENGINE MAKE _____

MODEL _____

RPM, IDLE _____

RPM, FULL _____

RPM, WORKING _____

POWER STEERING

HYDRAULIC POWER SOURCE DESIRED

☐ELECTRIC MOTOR DRIVE

☐ENGINE DRIVEN

AUTOMATIC PILOT

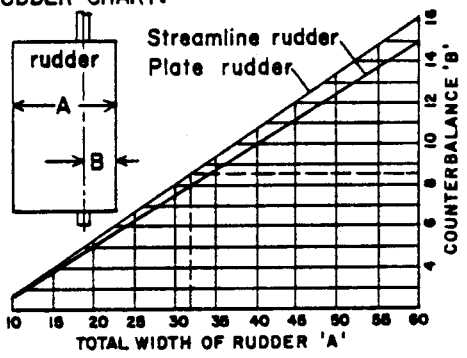
MAKE _____

MODEL _____

ELECTRICAL VOLTAGES AVAILABLE _____VOLTS AC _____VOLTS DC

RUDDER STOCK DIAMETER _____

RUDDER CHART:




*It is advantageous to use a rudder with a larger counterbalance than is normally used with a mechanical steering system. Reduced steering effort and better rudder efficiency can be obtained by adhering closely to the rudder proportions shown on the above graph.*

RUDDER SKETCH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