# ABOUT THRUSTMASTER OF TEXAS, INC.

Thrustmaster of Texas, Inc. is based in Houston, Texas USA with offices in Rotterdam, Dubai, Singapore, Brazil, and India. As the world's leading manufacturer of marine thrusters Thrustmaster has maintained its reputation over the years by strictly adhering to its mission statement of both quality and customer service.

Thrustmaster is ISO 9001 certified by the ABS. Thrustmaster field service engineers and technicians provide worldwide support 24 hours a day. Thrustmaster maintains a large inventory of all essential spare parts in Houston, Texas, backed up by a computer controlled inventory system, ensuring same-day shipping of breakdown spares to any destination in the world.

Agent Locations: Argentina - Australia - Brazil - Canada - Colombia – Egypt - England - Greece - India - Korea
Mexico - New Zealand - Pakistan - Peru - South Africa - Taiwan - Turkey - Venezuela

## OTHER THRUSTMASTER PRODUCTS

**Contact your Thrustmaster agent for help in choosing the correct thruster for you**

**Standard L-Drive Tunnel Thrusters** range from 16in (406) to 84in (2134) diameter and 35hp (26kW) to 2000hp (1,500kW) and can be built for aluminum or steel hulls. Electric motors and complete VFD assemblies can be provided and classed.

**Underwater Demountable Azimuth L-Drive Thrusters** for semi-submersible and large vessels available up to 10,750hp (8MW) for Dynamic Positioning.

**Bottom Mount and Drop-In Azimuth Z-drive and L-drive** configured thrusters range from 74hp (55kW) to 10,750hp (8MW). These powerful Z and L-drives use electric or diesel prime movers and are perfect for tractor tugs and work vessels needing power and control in all directions.

**Hydraulic Tunnel Thrusters** up to 2000hp (1490kW) offer wider flexibility to the industry. Hydraulic thrusters as a whole allow the prime mover to be located anywhere on the vessel. The prime mover can be a diesel or electric motor driven.

**Retractable Azimuth Thrusters** with electric (shown) or hydraulic drives are available in a range from 74hp (55kW) to 3017hp (2250kW). Retractable thrusters can be retracted for high speed vessels and then extended upon arrival for Dynamic Positioning or used for emergency get home power.

The **Portable Dynamic Positioning System** is a Thrustmaster exclusive delivering dynamic positioning in a portable package to include 360° azimuth thrusters, HPU's and Control Van.


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Designers and Manufacturers of
Advanced Marine Propulsion Systems

Thrustmaster

# Hydraulic Outboard Propulsion

**Propulsion and Positioning For Barges, River Ferries, Modular Float Systems, Dredges, Workboats, Bridge and Windfarm Maintenance**

# HYDRAULIC OUTBOARD DRIVE

## ADVANTAGES OF HYDRAULIC PROPULSION

| THRUSTMASTER OUTBOARD PROPULSION | CONVENTIONAL PROPULSION |
|---|---|
| Mounted on deck; no hull penetrations; can be installed easily and quickly while the vessel is in the water; no rudders required; thrusters can be freely located on deck for optimum efficiency with thrust and weight distribution. | Requires through-the-hull construction in a shipyard. Location of propellers, drives, engines, and rudders are restricted by vessel design. |
| 360º steering of propeller provides omnidirectional thrust for unequaled maneuverability at any vessel speed. | Propeller not steerable. Rudder only deflects thrust to a limited degree. Poor maneuverability at slow speeds. |
| Standard tilt feature allows inspections and repairs to be made while the vessel is in the water. If desired, the entire unit may easily be removed from the vessel and repaired separately. | Inspections require a diver. Even modest repairs to rudders and propellers require expensive dry docking. |
| Units are portable and adaptable to any hull configuration. Ideal for application on existing vessels. Propeller tilt feature allows for shallow water operations. | Once installed conventional systems offer very little adaptability in application or portability for use on different vessels. |
| Completely self contained package is equivalent to a fully equipped engine room. Relatively expensive unit allows for extremely inexpensive installation on any standard hull. | Less expensive main components require tailor engineering of vessel design, logistics, support systems, and control systems. Total installed cost of rudder, propeller, gears, engine and support systems should be considered. |

Thrustmaster's model OD Outboard Drive assemblies include the steering motor, drive and stem rotation mechanisms, outboard stem, hydraulic tilt cylinders, hydraulic motor, propeller, and the optional propeller depth adjustment mechanism if fitted. Routine servicing of the outdrive does not require disassembly of the unit.

The Thrustmaster Model OD Deck Mount units are configured with an integral full-skid mounting for an integrated diesel-hydraulic power unit (HPU) and can accommodate the hydraulic propeller depth adjustment option.

The main pump for each thruster is a hydrostatic transmission, over-center, variable-displacement axial piston pump with an electric swashplate controller and operating in a closed-loop system, providing non-stepping, infinitely variable propeller speed control in both the forward and reverse directions without the use of a reversing gear or clutch.

A fuel day tank is incorporated in the subbase of the engine mounting skid. The tank provides a fuel capacity of up to 12 hours of operation at full power.

The Model OD-series propulsion unit is provided with a hydraulic power tilt system capable of elevating the outboard drive assembly through an arc of 90 or 180 degrees depending on the unit ordered. Hydraulic oil supply for the power tilt mechanism is supplied by a steering and tilt hydraulic pump. Power tilt hydraulic cylinders and piston rods are constructed of suitable alloys to prevent marine atmospheric corrosion. The cylinders are of sufficient volume and stroke to provide the full 90 degree arc of the outboard drive while subjected to full propeller thrust loading. The hydraulic power tilt system incorporates cross-port relief valves that allow the outdrive assembly to kick up in the event it encounters a subsurface obstruction or in the case of grounding.

A diesel-hydraulic power unit (HPU) is provided. The HPU is typically integrated with the outdrive mounting skid. The HPU consists of an industrial radiator-cooled diesel prime mover, a hydrostatic main hydraulic pump operating in a

# SPECIFICATIONS

**Hydradrive** - Hydradrive™- Non-Azimuth Hydraulic Thruster
**Thrustmaster** - Self Contained All In One Deck Mount - 360° Steering - Nozzle with Kaplan Propeller
**Workmaster** - Self Contained All In One Deck Mount - 180° Steering - Open Propeller
**Mini-Skid** - Deck or Porch Mount Thruster with a Separate HPU Mounted Elsewhere
**Stern Mount** - Affixed to Stern Of Vessel with a Separate HPU Mounted Elsewhere

| Name | Power | | Std. Stem Length | | Prop RPM | Propeller Diameter | |
|---|---|---|---|---|---|---|---|
| | HHP | kW | Ft. | M | | In. | mm |
| OD35 | 34 | 25 | 10 | 3 | 590 | 26 x 19 | 660 x 483 |
| OD50 | 45 | 36 | 10 | 3 | 600 | 28 x 19 | 711 x 483 |
| OD75 | 69 | 51 | 10 | 3 | 630 | 30 x 20 | 762 x 508 |
| OD100 | 95 | 71 | 10 | 3 | 500 | 36 x 25 | 915 x 635 |
| OD100N | 100 | 75 | 10 | 3 | 937 | 24 x 21 | 610 x 533 |
| OD125 | 114 | 85 | 10 | 3 | 525 | 36 x 25 | 914 x 635 |
| OD150 | 139 | 104 | 10 | 3 | 525 | 38 x 26 | 965 x 660 |
| OD150N | 150 | 112 | 10 | 3 | 820 | 28 x 24 | 711 x 610 |
| OD200 | 185 | 138 | 10 | 3 | 430 | 44 x 32 | 1118 x 813 |
| OD200N | 200 | 149 | 10 | 3 | 600 | 32 x 25 | 813 x 635 |
| OD250 | 243 | 181 | 10 | 3 | 400 | 48 x 34 | 1219 x 864 |
| OD250N | 250 | 186 | 10 | 3 | 600 | 35 x 34 | 889 x 864 |
| OD300 | 270 | 201 | 10 | 3 | 493 | 44 x 31 | 1118x 787 |
| OD300N | 300 | 224 | 10 | 3 | 540 | 39 x 39 | 991 x 991 |
| OD400 | 367 | 274 | 10 | 3 | 372 | 56 x 39 | 1422 x 991 |
| OD400N | 400 | 298 | 10 | 3 | 495 | 43 x 44 | 1092 x 1118 |
| OD500 | 456 | 340 | 10 | 3 | 332 | 62 x 44 | 1575 x 1118 |
| OD500N | 500 | 373 | 10 | 3 | 420 | 49 x 51 | 1245 x 1295 |
| OD600 | 537 | 400 | 10 | 3 | 417 | 56 x 39 | 1422 x 991 |
| OD600N | 600 | 447 | 10 | 3 | 416 | 51 x 54 | 1295 x 1372 |
| OD750 | 702 | 523 | 10 | 3 | 335 | 66 x 48 | 1676 x 864 |
| OD750N | 750 | 559 | 10 | 3 | 416 | 55 x 55 | 1397 x 1397 |
| OD850 | 811 | 605 | 10 | 3 | 370 | 66 x 44 | 1676 x 1118 |
| OD850N | 850 | 634 | 10 | 3 | 370 | 59 x 63 | 1499 x 1600 |
| OD1000 | 947 | 706 | 10 | 3 | 370 | 68 x 45 | 1727 x 1143 |
| OD1000N | 1000 | 746 | 10 | 3 | 370 | 63 x 62 | 1600 x 1575 |
| OD1500N | 1500 | 1119 | 10 | 3 | 305 | 73*** | 1850 |
| OD1800N | 1810 | 1350 | 35 | 10 | 305 | 75*** | 1905 |
| OD2000N | 2000 | 1491 | 35 | 10 | 279 | 81*** | 2058 |

*** The thruster unit is equipped with a Kaplan accelerator series nickel-alumiminum bronze, four-blade, high-thrust, monoblock propeller contained in a Kort 19A nozzle. The nominal diameter of the propeller shown and the blade pitch and disk area ratio shall be such that maximum static bollard thrust is achieved.

Notes:
1. "N" indicates nozzle (i.e., ODXXXN)
2. Stem length is defined by the customer up to maximum length for that unit.
3. Workmaster (WM) are comparable but with 180° steering only.

Notes/Disclaimer:
1. Values shown are for General Arrangements Only. Many conditions will affect your engineered thruster(s). Only the values and conditions under written contract will apply. All values are subject to change without notice or consent. Contact Thrustmasters highly qualified engineers to determine your project parameters.
2. Contact your regional agent or info@thrustmastertexas.com for more information on models or sizes between those shown.

# FEATURES

The Model OD-N propulsion unit is provided with a fixed-displacement, bi-directional, variable-speed hydraulic motor directly driving the propeller shaft. The hydraulic motor is installed inside the fabricated steel thruster housing. The propeller shaft is supported by large, oil-lubricated taper roller bearings. The motor is capable of complete direction reversal at full speed and torque in less than five (5) seconds. Propeller speed controlled non-stepping in both forward and reverse directions providing excellent performance equivalent to controllable pitch propellers. The hydraulic propeller drive provides superior low-speed maneuvering. The hydraulic motor's ability to deliver almost full torque at stall ensures precise, lag-free control of maneuvering thrust.

**Cab-Over (Optional)**
Cab-Over feature allows operator protection in inclimate weather. They can maneuver the vessel from a better position for safer operation and more precise control. Steering, speed controls, and operating gages are mounted on a sturdy steel dash.

**Lift Feature (Optional-Not Shown)**
Adjust depth up and down for shallow water or normal operations.

**Kick-Up / Tilt Feature**
Thruster kicks up reducing potential for damage when striking an underwater obstacle.

Available in 90º or 180º tilt, the power tilt feature allows for inspection, maintenance, or protection while docked.

**Noise Baffle (Optional)**
Radiator noise is substantially attenuated with an insulated baffle that points down toward the deck.

**Deck Mounted**
The standard configuration allows the fully integrated system to be mounted onto the deck using quick and easy right angle weld or bolt plates. The design also accommodates quick release options for more portable systems.

**Steering**
Allows 360º smooth and continuous rotation; with angle indicator on the control panel. (180º on the WorkMaster)

**Stem Length**
Available in any length to meet your outboard application. The stem is entirely supported from the top swivel housing; requiring no intermediate support on the hull.

**Open Propeller Or Nozzle**
Open propeller has anti-cavitation plate to reduce potential for vortex. Nozzle version (shown) uses Kaplan style propeller to increase thrust.

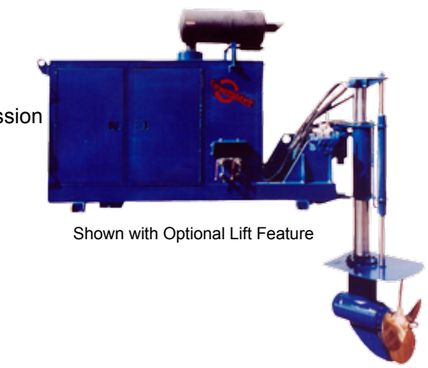
# STYLES

closed-loop system, auxiliary hydraulic pumps, hydraulic and engine cooling equipment, hydraulic reservoir, filters, hoses and piping, engine exhaust system and all other related parts and equipment.

Propeller Depth Adjustment Mechanism (Optional) - An optional propeller depth adjustment mechanism can be provided to vary the propeller depth for light and loaded draft conditions. Hydraulic oil supply for the mechanism is supplied by a steering and tilt hydraulic pump. When the vessel is in shallow water, the propeller can be lifted above or even with the baseline; when in deep water, the propeller can be lowered below the baseline for maximum propulsive efficiency.

**THRUSTMASTER HYDRAULIC OUTBOARD**
35hp (26kW) - 300hp (225 kW) - Deck Mounted On Vessel
Integrated diesel-hydraulic hydrostatic stepless transmission
360° non-stop stepless steering
90° Tilt-up or 180° Tilt-up models available
Nozzle or Open Wheel
Optional Lift Feature (with 90º Tilt-up Only)

**WORKMASTER HYDRAULIC OUTBOARD**
26 To 185 kW - Deck Mounted On Vessel
Integrated diesel-hydraulic hydrostatic stepless transmission
180° stepless steering
90° tilt-up only
Nozzle or Open Wheel
Optional Lift Available (for draft differences)



Shown with Optional Lift Feature

**TRANSOM MOUNT HYDRAULIC OUTBOARD**
26 To 375 kW - Weld Or Bolt To Stern
Remotely Mounted Separate Diesel Or Electric HPU (Skid or Containerized)
360° Stepless steering
90° Tilt-up
Nozzle Or Open Wheel
Optional Lift (For Draft Differences)

**MINI-SKID OUTBOARD THRUSTERS**
300hp (225kW) To 2000hp (1,500kW)
Outdrive Is Separate From The HPU
Fully Self Contained Fluid/Fuel With 24-Hour Day Tank
360° Steering
90° Tilt Up
Hydrostatic Stepless Transmissions
Internal Manual Control Panels
Custom Stem Lengths

**You Will Find Thrustmaster Of Texas, Inc. Units All Over The World**
Dredges - Inland Barges - Construction Projects - Inland Lakes - Offshore Drilling - US and Foreign Allied Military - Cable and Pipe Lay Vessels - Oyster and Fishing Boats - Ferries - Open Ocean Accommodation Barges - Pleasure Boats - Crew Boats - Sea Basing Operations - Experimental Testing Projects - Offshore Wind Farms

# LARGEST HYDRAULIC THRUSTERS

## Worlds Largest Hydraulic Thrusters

Thrustmaster produces the world's largest deck mounted hydraulic thrusters to be used for propulsion or dynamic positioning. Capable of propelling off-shore drill rigs and ships these units are also used in dynamic positioning systems for up to DP-3 class vessels.

The Mini-Skid style (shown right) had two thrusters mounted onto porches that were custom built at Thrustmaster in Texas and shipped to the rig for fitting. The HPU's were mounted on deck and connections are made with pipe or flexible hose. Two units are used to propel this offshore rig between drill sites where other options are not feasible.

As stated each thruster comes with its own self-contained diesel hydraulic power unit (HPU). The HPU produces the hydraulic power to drive the propeller, provide steering, and operate the swing-up functions of the thruster. The HPU is a fully enclosed design for outdoor installation. Alarm systems, fire suppression, shut down, noise abatement, and control panels can be also be customized to meet customer needs.

## Durable Hydraulic Thrusters

These Thrustmaster Outboards (shown right and below) where built for the British Ministry of Defense. The units are mounted directly onto the deck of modular barges and with a quick check of the fluids and filling of the fuel tank the thrusters are ready to go. The engine is radiator cooled eliminating the need for external piping and water pumps that often clog with debris from battlefield conditions.

A variable speed hydraulic motor in the foot of the thruster directly drives the propeller. It is a podded hydraulic sealed motor eliminating the need for the right-angle gear transmissions and drive shafts used on conventional thrusters. Relief valves in the system allow the motor to immediately stop in the event the propeller encounters an obstruction, thereby reducing the potential for damage.

As shown on this model, if the propeller becomes tangled with rope or fishing line the thruster can be tilted up 180 degrees and the operator can then clear the prop quickly and safely.

**Thrustmaster Outdrives offer 180° tilt-up and 360° steering to allow the operator access to clear or repair the propeller without having to remove the thruster from the vessel.**

# ADVANTAGES OF THRUSTMASTER

## Options

Thrustmaster Hydraulic Propulsion Units take into consideration the harsh environment of heavy construction projects and the rigid demands of military units.

Recognizing that each customer has different needs Thrustmaster engineers are ready to design options ranging from customer specified engines to platforms that fit your specific vessel. Items such as nozzle shapes and sizes that match one operators desire for speed while anothers requiring more thrust are common.

*British Navy Commandos Use Remote Cable Controls To Steer and Change Propeller Speed.*

## Ease Of Installation

Installation of thrusters and HPU's is accomplished dock side by the use of cranes or hoists. The equipment is modular and can be transported by truck, plane, or barge to even the most remote locations. Installation and mobilization can be accomplished in as little as a few days.

If required a Thrustmaster service technician can oversee mobilization of the system. The service technician supervises installation, commissioning, start-up, and dock trials. Once the system is calibrated at the dock, a brief sea trial is required to test and fine-tune the system.

## Simplicity

The hydrostatic transmission is a smoother, more reliable alternative to mechanical transmissions and is the driving force behind Thrustmaster's hydraulic propulsion systems.

In the hydrostatic system there are no gears, drive shafts, clutches or other complicated parts. The engine operates at a constant speed and there is no need to slow the engine in order to reverse. The propeller goes from full forward to full reverse and back again with full power available right at the source. Additionally, if full thrust is needed in the opposing direction the 360° style thrusters can be turned 180° within seconds.

Full engine speed means that full power is always available for immediate acceleration. In addition to eliminating the energy loss of gear transmissions these hydraulic drives also reduce engine noise. Thrustmaster's smoothly operating transmission separates and dampens engine and propeller vibrations. The hydraulic drive also offers greater design freedom. No longer must the engine be near the outdrive. Weight distribution can now be optimized for any vessel design.

## Flexibility In Design

Every vessel has unique design requirements. The decks footprint requirements, freeboard, head-logs, draft, and even control locations are major issues related to the effectiveness of the propulsion system. Thrustmaster can build-to-order to meet these challenges.

From concerns such as turning the HPU sideways, to providing a custom mounting for the lower unit, Thrustmaster engineers will work with you to deliver what your specific application needs.