Thrustmaster

Z-DRIVE AZIMUTHING THRUSTERS

Z-Drives for Towboats operating in the Inland Waterways

LET US INTRODUCE OURSELVES

For over 30 years, Thrustmaster of Texas has been designing, manufacturing and supporting marine propulsion systems for a global network of customers. Thrustmaster is the largest manufacturer of marine thrusters in the U.S.A.

Thrustmaster propulsion units are manufactured in Houston, TX in a variety of configurations including self-contained and portable deck-mounted propulsion units, thru-hull azimuthing thrusters, Z-drives, water jets, retractable thrusters and tunnel thrusters.

Special expertise has been developed in designing and manufacturing equipment for maneuvering, navigating and positioning of slow-speed marine craft and barges in shallow water.

Thrustmaster builds a complete line of Z-Drive azimuthing thrusters from 500 HP to 8,000 HP for the inland towboat industry specifically designed to endure the demanding conditions when operating in brown water. Using Z-drives on towboats results in substantially improved fuel efficiency, shorter trip times, decreased maintenance downtime and higher customer satisfaction when compared to traditional shaft and rudder installations.

THRUSTERS MADE IN THE USA & SERVICED WORLDWIDE

Z-DRIVE AZIMUTHING THRUSTERS

Vastly improved maneuverability without rudders

A Z-drive replaces the propeller, shaft, stern tube, marine gear, rudder and steering gear all with a single unit. Z-Drive azimuthing thrusters provide maximum thrust in any direction, independent of vessel speed, offering superior pinpoint maneuverability under all conditions. Rudders are completely eliminated. Rudder drag no longer exists. Troublesome operations such as stopping while pushing a tow downstream are easy when piloting a towboat equipped with Z-Drives. It facilitates quick switching of barges and parallel parking. And all of this can be done with a lot less power. A 1,500 HP Z-drive boat can replace a 2,000 HP conventional towboat and a 3000 HP Z-drive boat can replace a 4,000 HP conventional towboat.

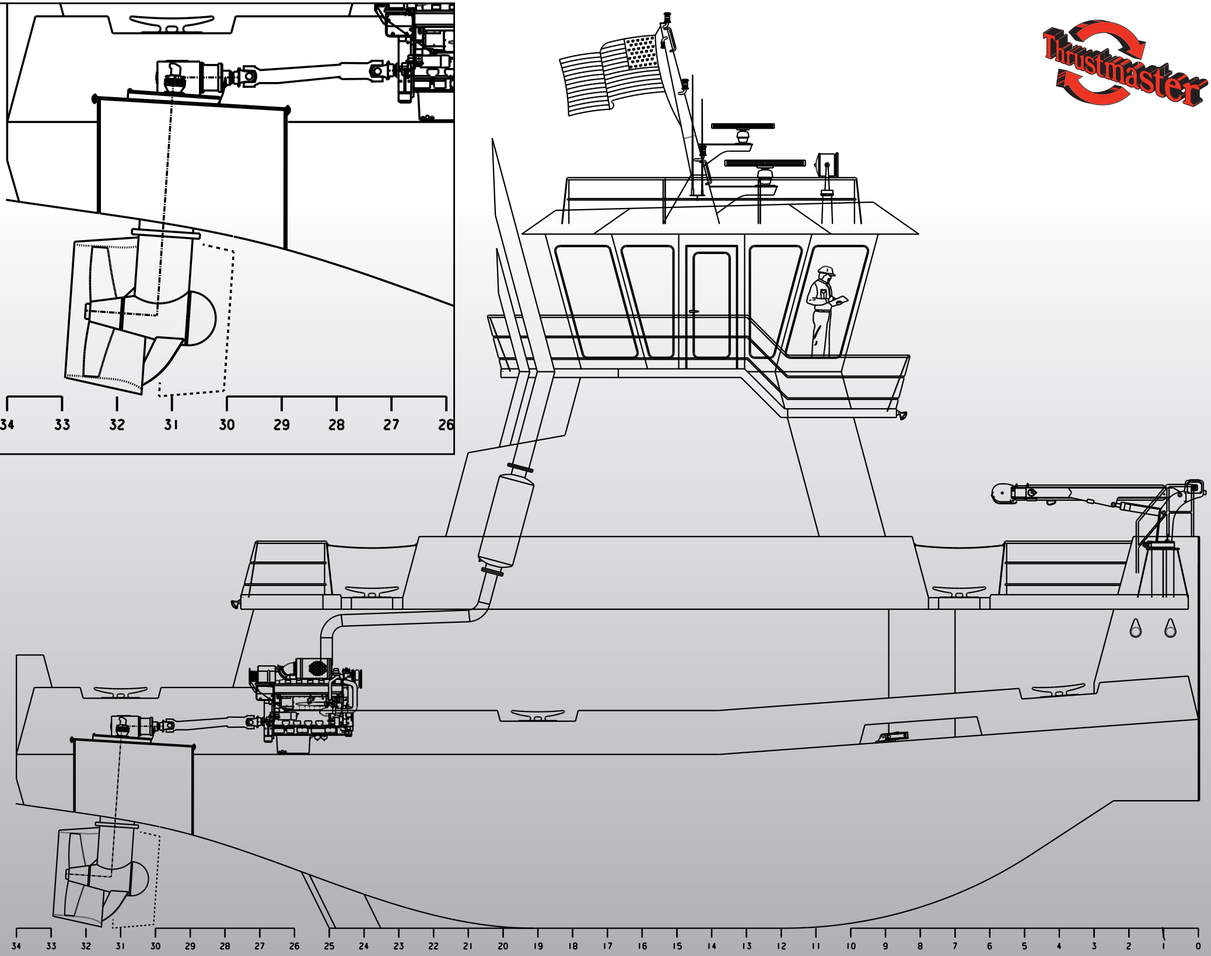
Safer, faster, using less fuel

Due to the greatly improved maneuverability with Z-drives, costly collisions can be avoided. There is no longer any need to slow down in turns and bends in the river. Trip times are reduced and require a lot less fuel. A study conducted by The Shearer Group, Inc. showed an average of 28% fuel savings and 11% trip time savings during a set of controlled experiments with unit tows when using Z-Drives instead of conventional shafts and rudders.

Simple and clean towboat design

Z-drives require little space. The complete Z-drives drop in from the top. The absence of long propeller shafts, shaft alleys, steering gears and rudders greatly reduces the required machinery space and weight, thus increasing the usable volume and payload of the vessel. The need for propeller shaft alignment is eliminated.

Towboats with Z-drives are not significantly more expensive than conventional towboats. The initial cost of the Z-Drives is significantly offset by reduced construction costs and installation man-hours. Shipyards have reported that the cost of building Z-drive boats is actually less than building conventional boats.



* Drawing Courtesy of CT Marine, Inc.

TECH SPECS

Model	Input Power	Motor RPM	Propeller Diameter	Thruster Weight
	HP		in	lbs
TH500MZN	500	1800	51	13,000
TH750MZN	750	1800	57	17,000
TH1000MZN	1100	1800	57	21,000
TH1500MZN	1700	1600 / 1800	78	35,000
TH2000MZN	2250	1000 / 1600 / 1800	83	43,000

Robust and Reliable. Designed and built in America.

Thrustmaster knows and understands brown water applications. We have been building brown water propulsion equipment for more than 30 years. Thrustmaster Z-drives are designed based on conservative American standards observing ample safety margins. They are built to last even in the harshest operating environment. The units are built in our headquarters facility in Houston, Texas, using American materials, American components and American labor.

Each Z-drive is equipped with a husky stainless steel propeller running in a nozzle with stainless steel internals. The gears and transmission shafts are generously sized and are protected by a quick release coupling at the input shaft of the Z-drive. This quick release coupling acts as a mechanical fuse whenever the drive line is blocked, for instance when the propeller ingests a log, a tire or a rope. The mechanical fuse can be reset manually after the obstruction is removed out of the propeller.

Easy Maintenance

Routine maintenance is limited to periodic replacement of filter elements for the lubricating oil and the steering hydraulic fluid. Whenever major maintenance or repair is required, the complete Z-drive is lifted out of the vessel while the vessel is afloat. A replacement Z-drive can be dropped in and the boat is back to work within hours

PRODUCT SUPPORT

Support throughout the entire life of the product.

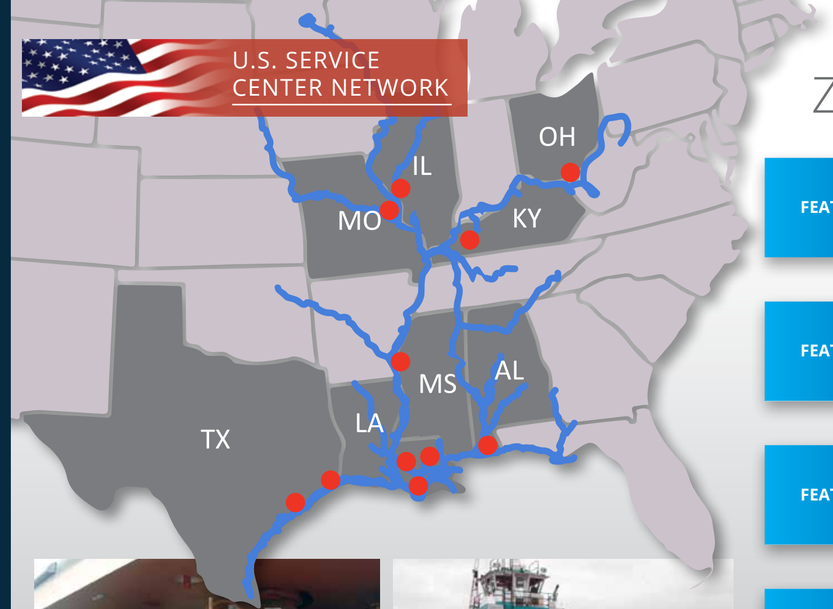
Thrustmaster offers comprehensive support throughout the entire product life-cycle.

The focus is always on customer satisfaction, efficient operation of the Thrustmaster product, and on short repair and maintenance times.

In order to ensure optimum service with minimal response times, Thrustmaster has an extensive service network with service centers strategically located along the major rivers in the USA. Experienced service technicians are available to provide installation, commissioning, maintenance, repairs and upgrades on our propulsion and control products. Thrustmaster maintains a large inventory of spare parts at all times. Current parts inventory in our Houston plant is almost 30 million dollars.

Thrustmaster Services Include:

- 24/7 Service Response Hot line
- Propulsion System Trouble Shooting
- Mechanical, Hydraulic & Electrical Repairs
- Emergency Service Tiger Teams
- System Installation & Commissioning
- Technical Services & Field Engineering
- Upgrades & Modifications Equipment
- Efficiency Improvements
- Operational Training



Z-DRIVE FEATURES & BENEFITS

FEATURE	360° steering of propeller provides omni-directional thrust for unequaled maneuverability at any vessel speed.	Collisions can be avoided. Much greater control of the tow going through turns and river bends. Quick switching of barges when going through locks. Downstream stopping and docking.	BENEFITS
FEATURE	No need for steering and flanking rudders.	No rudder drag. Substantial fuel savings. Tows move faster, shortening trip durations.	BENEFITS
FEATURE	Z-drive towboats can get equivalent performance with smaller power output allowing tug fleets to use smaller engines.	Lower capital investment and reduced fuel consumption.	BENEFITS
FEATURE	The mechanical fuse instantly relieves any transmission overloads.	It protects the mechanical drive train when foreign objects are ingested by the thruster, preventing expensive downtime and repairs.	BENEFITS
FEATURE	Z-drives can be installed and removed topside with a crane while the vessel is afloat.	In the event of a serious breakdown, the Z-drive can be replaced in a matter of hours.	BENEFITS
FEATURE	Thrustmaster Z-drives are made in the USA.	American design using American parts readily available from Thrustmaster or from local parts distributors. American service technicians available 24/7. A network of support centers along all major rivers.	BENEFITS

HYDRAULIC Z-DRIVES for FLEET BOATS

Thrustmaster's hydraulic azimuthing Z-drive thrusters are especially suitable for fleet boats. A hydraulic Z-drive consists of a high-thrust, fixed pitch propeller on a husky propeller shaft directly coupled to Thrustmaster's exclusive podded hydraulic motor.

Simple, Efficient & Reliable
The diesel engine drives a hydrostatic transmission pump at constant RPM. The propeller is driven by a variable speed hydraulic motor. In between are fluid conductors. There are no drive shafts, gears, bearings, or other mechanical components to fail. The drive is an infinitely variable torque converter. The hydraulics are virtually maintenance free and provide many years of reliable operation while performing in the harshest marine environments, as long as the hydraulic fluid is kept in clean and cool condition.

Highly Resistant to Damage
The hydraulic drive is extremely resistant to damage. Foreign objects ingested by the thruster are unlikely to damage the hydraulic drive train, as the hydraulic system instantly relieves any transmission overloads.

TECH SPECS

Model	Input Power	Propeller Diameter	Thruster Weight
	HP	in	lbs
TH500N	500	49	17,000
TH750N	750	57	21,000
TH1000N	1000	63	35,000

HYDRAULIC Z-DRIVE FEATURES & BENEFITS

FEATURE	No clutch required. When the hydrostatic pump goes to neutral (zero swashplate angle), the propeller comes to a complete standstill regardless of engine RPM.	No clutch wear. No clutch maintenance. There is no clutch.	BENEFITS
FEATURE	Propeller speed can be infinitely controlled from zero to maximum regardless of engine RPM.	Incredible maneuverability when combining azimuthing steering with infinite thrust control by virtue of propeller speed control.	BENEFITS
FEATURE	Engine runs at constant RPM, just like a generator.	Full engine torque available at any vessel speed for fast acceleration and stopping of the vessel. Low engine maintenance, just like a generator engine. Low emissions and no coking.	BENEFITS
FEATURE	No shafts to align. The hydrostatic pump is installed on the bell housing of the engine and the only connection between the engine driven pump and the Z-drive is hydraulic hoses.	Very easy and quick installation. No alignment required. Equipment runs very smooth. No vibrations.	BENEFITS
FEATURE	The engine driven pump, hydraulic reservoir and accessories can be installed at any convenient location.	Allows optimum utilization of space and weight distribution.	BENEFITS
FEATURE	Complete system is supplied by Thrustmaster.	Single point of contact, single point of responsibility.	BENEFITS
FEATURE	Thrustmaster hydraulic azimuth thrusters use a podded design concept. The propeller shaft is directly driven by the hydraulic motor in the thruster .	High propulsion efficiency, no gear losses. Reliable due to its simplicity & limited number of moving parts. Lateral & torsional critical speeds are far above operating speeds. Runs smooth, no vibration.	BENEFITS
FEATURE	The hydraulic drive train can instantly relieve any transmission overloads making the Z-drive extremely resilient and durable.	Foreign objects ingested by the thruster are unlikely to damage the hydraulic drive train as the hydraulic system instantly relieves any transmission overloads.	BENEFITS

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