



Confirmation of Product Type Approval

Please refer to the "Service Restrictions" shown below to determine if Unit Certification is required for this product.

This certificate reflects the information on the product in the ABS Records as of the date and time the certificate is printed.

Pursuant to the Rules of the American Bureau of Shipping (ABS), the manufacturer of the below listed product held a valid Manufacturing Assessment (MA) with expiration date of 17/DEC/2018. The continued validity of the Manufacturing Assessment is dependent on completion of satisfactory audits as required by the ABS Rules.

And; a Product Design Assessment (PDA) valid until 26/FEB/2020 subject to continued compliance with the Rules or standards used in the evaluation of the product.

The above entitle the product to be called Product Type Approved.

The Product Design Assessment is valid for products intended for use on ABS classed vessels, MODUs or facilities which are in existence or under contract for construction on the date of the ABS Rules used to evaluate the Product.

ABS makes no representations regarding Type Approval of the Product for use on vessels, MODUs or facilities built after the date of the ABS Rules used for this evaluation.

Due to wide variety of specifications used in the products ABS has evaluated for Type Approval, it is part of our contract that; whether the standard is an ABS Rule or a non-ABS Rule, the Client has full responsibility for continued compliance with the standard.

Product Name: Thruster, Tunnel Hydraulic Thruster

Model Name(s): (36-inch) 36TT150H, 36TT150L, 36TT175L, 36TT175H, 36TT200L, 36TT200H, 36TT225M, 36TT225L, 36TT250L

Presented to:

THRUSTMASTER OF TEXAS, INC.
6900 THRUSTMASTER DR.
United States

Intended Service:

Bow and stern thrusters for athwartship maneuvering and dynamic positioning service.

Description:

Each tunnel thruster, Series 36TT, is equipped with a hydraulic motor, a fixed pitch propeller, and a 36 inch (nominal) outer diameter tunnel with optional steel or aluminum tunnel material.

Tier:

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Ratings:

Model: 36TT150H: Thrust (lbf/kN) 3200/14.3, Hydraulic Power Required (hp/kW) 124/92, Flow (usgpm/(liter/min)) 85/322, Pressure (psi/bar) 3000/205 Model: 36TT150L: Thrust (lbf/kN) 3200/14.3, Hydraulic Power Required (hp/kW) 149/111, Flow (usgpm/(liter/min)) 109/410, Pressure (psi/bar) 2350/140 Model: 36TT175L: Thrust (lbf/kN) 3750/16.7, Hydraulic Power Required (hp/kW) 177/132, Flow (usgpm/(liter/min)) 132/500, Pressure (psi/bar) 2300/160 Model: 36TT175H: Thrust (lbf/kN) 3750/16.7, Hydraulic Power Required (hp/kW) 174/130, Flow (usgpm/(liter/min)) 115/432, Pressure (psi/bar) 2600/180 Model: 36TT200L: Thrust (lbf/kN) 4300/19.2, Hydraulic Power Required (hp/kW) 201/150, Flow (usgpm/(liter/min)) 138/520, Pressure (psi/bar) 2500/170 Model: 36TT200H: Thrust (lbf/kN) 4300/19.2, Hydraulic Power Required (hp/kW) 210/157, Flow (usgpm/(liter/min)) 120/454, Pressure (psi/bar) 3000/205 Model: 36TT225M: Thrust (lbf/kN) 4750/21.2, Hydraulic Power Required (hp/kW) 226/169, Flow (usgpm/(liter/min)) 125/475, Pressure (psi/bar) 3100/210 Model: 36TT225L: Thrust

(lbf/kN) 4750/21.2, Hydraulic Power Required (hp/kW) 225/168, Flow (usgpm/(liter/min)) 143/540, Pressure (psi/bar) 2700/185 Model: 36TT250L: Thrust (lbf/kN) 5250/23.4, Hydraulic Power Required (hp/kW) 251/187, Flow (usgpm/(liter/min)) 148/560, Pressure (psi/bar) 2900/200

Service Restrictions: For rule requirements concerning unit certification of thrusters, see 4-3-5/1.1 of the ABS Rules for Building and Classing Steel Vessels. Consult the manufacturer for each installation and application.

Comments: 1) Upon completion of installation performance tests are to be carried out in the presence of an ABS Surveyor in a sea trial. 2) ABS Certificates of vendor supplied propellers and gear units are to be made available to the Surveyor. 3) When supplied with optional hydraulic hose assemblies, the rated burst pressure of each hose assembly is to be at least four times the maximum allowable working pressure and each flexible hose type is to be fire resistant as per 4-6-2/5.7 of the ABS Rules for Building and Classing Steel Vessels. Welding procedures and welding are to be to the satisfaction of the attending Surveyor.

Notes / Documentation: Drawing No. B120716-14, Hub prop rope cutter, Revision: 0, Pages: 1 Calculations, 49713291, Calculations, Pages: 1 Drawing No. E120720, Propeller left hand, Revision: A, Pages: 1 Correspondence, E-mail dated 20 Nov. 14 Correspondence, E-mail dated 21 Nov. 14, Subj.: Calculations Correspondence, E-mail dated 30 Oct. 14 Correspondence, Declaration of Conformity Correspondence, Purchase Order Correspondence, ABS TA Application form Correspondence, E-mail dated 03 Nov. 14 Drawing No. A101439, Modification-propeller, Revision: C Drawing No. B120379-29, AY, 36TT-CS @36, Revision: A Drawing No. D116837, Housing thruster, machining, Revision: 0 Drawing No. D120352, Tunnel, weldment, 36, Revision: 0 Drawing No. E114097, Propeller, right hand, Revision: A Calculations, Web Calc Machinery P02034, WC for section modulus Calculations, Web Calc Machinery P02034, WC for blade thickness

Term of Validity: This Product Design Assessment (PDA) Certificate 14-HS1296672-PDA, dated 27/Feb/2015 remains valid until 26/Feb/2020 or until the Rules or specifications used in the assessment are revised (whichever occurs first). This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product. Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA. Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

ABS Rules: 2015 Steel Vessels Rules 1-1-4/7.7, 3-2-2/7, 4-3-5, 1-1-A3, 1-1-A4 2015 Steel Vessel Rules (the Under 90M Rules) 4-1-1/7.23, 4-1-1/29, 1-1-A3, 1-1-A4

National Standards:
International Standards:
Government Authority:
EUMED:
Others:

Model Certificate	Model Certificate No	Issue Date	Expiry Date
PDA	14-HS1296672-PDA	04/MAR/2015	26/FEB/2020



ABS Programs

ABS has used due diligence in the preparation of this certificate and it represents the information on the product in the ABS Records as of the date and time the certificate was printed. Type Approval requires Drawing Assessment, Prototype Testing and assessment of the manufacturer's quality assurance and quality control arrangements. Limited circumstances may allow only Prototype Testing to satisfy Type Approval. The approvals of Drawings and Products remain valid as long as the ABS Rule, to which they were assessed, remains valid. ABS cautions manufacturers to review and maintain compliance with all other specifications to which the product may have been assessed. Further, unless it is specifically indicated in the description of the product; Type Approval does not necessarily waive witnessed inspection or survey procedures (where otherwise required) for products to be used in a vessel, MODU or facility intended to be ABS classed or that is presently in class with ABS. Questions regarding the validity of ABS Rules or the need for supplemental testing or inspection of such products should, in all

cases, be addressed to ABS.