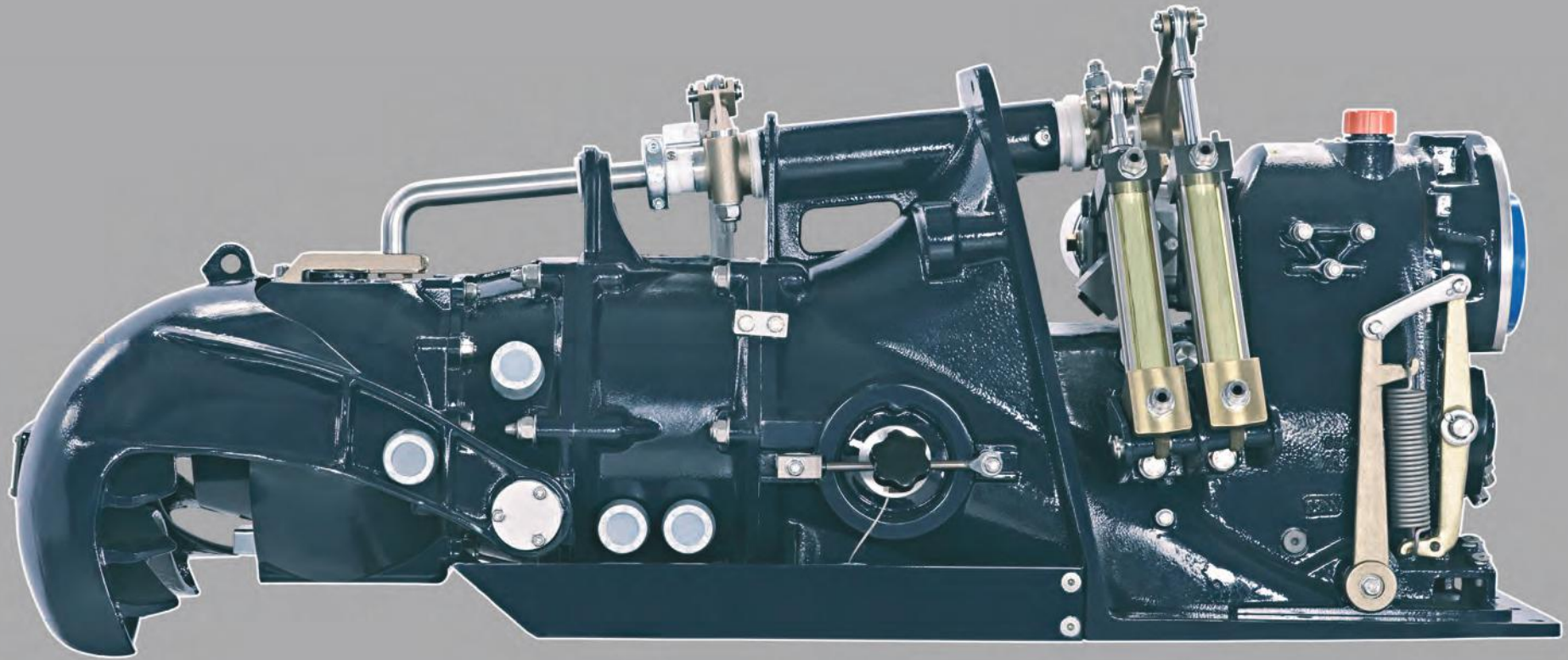
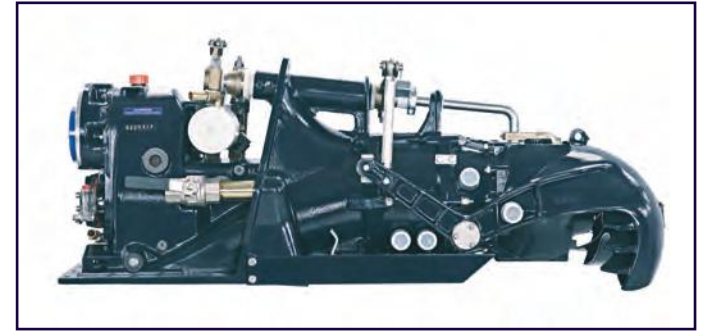
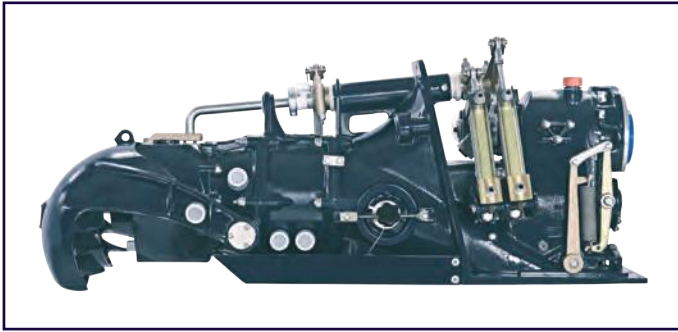


CASTOLDIJET

**ADVANCED HIGH EFFICIENT
MARINE PROPULSION SYSTEM**

TURBODRIVE
240 H.C.
WATER JET UNIT





The Castoldi “Turbodrives 240 H.C.” is not only what is led to all the experiences gained since 1955 with the supply of more than 30.000 water jet units all around the world.

It is the outcome of specific intensive research and development activities aimed to further improve the high efficiency of the Castoldi waterjet drives and pursued through self propulsion trials (of really No. 24 scale models) performed by means of an instrumented laboratory boat.

The Castoldi “Turbodrives 240 H.C.” turns out, therefore, as an advanced waterjet unit of the best efficiency at high speed, fitted with a single stage axial flow impeller which can be driven by an engine developing a power up to 309 KW according to the boat speed.

“Turbodrives 240 H.C.” is a mass produced unit in high strength marine aluminium alloy casting to hit the target of light and strong propulsion system. It is protected by the most updated and sophisticated anti-corrosion treatments. The impeller, the shafts, the gear wheels and all the other metal items not in aluminium alloy are made of high grade stainless steel, steel, titanium and bronze aluminium alloy.

“Turbodrives 240 H.C.” is equipped with exclusive particulars which make this model a complete, unique and real marine propulsion unit as: the built-in multiratio gear box to fine match the power and r.p.m. characteristics of the engine to the jet unit, the hydraulic multi-disc disconnecting clutch for engaging and disengaging the unit with engine idling, the flush mounted movable grid for avoiding the aspiration of debris into the jet duct and for cleaning the jet water intake.

It is also fitted with special developed controls and equipment which allow to best perform its great manoeuvrability characteristics.

TECHNICAL SPECIFICATIONS

INPUT FLANGE: SUITS UP TO 5,9” (150 MM) DIAMETER DRIVE SHAFT FLANGE.

IMPELLER TYPE: THREE BLADES, SINGLE STAGE, AXIAL FLOW.

IMPELLER DIAMETER: 238 MM - AT THE INLET.

BUILT-IN GEAR BOX: WITH N. 18 GEAR WHEELS-RATIOS AVAILABLE.

WATER JET’S IMPELLER DISCONNECTING SYSTEM: BUILT-IN MULTI-DISC HYDRAULIC CLUTCH, ELECTRICALLY OPERATED.

UNIT WEIGHT - DRY: KG 130 INCLUDING: GEAR BOX, HYDRAULIC CLUTCH, WATER INTAKE, DUCT, ANODES, LEVERS.

HYDRAULICS WEIGHT: KG 21 INCLUDING: OIL PUMP, HYDRAULIC ACTUATORS, BRACKETS, VALVES AND PIPES.

VOLUME OF WATER JET OIL: LT 6 (GEAR BOX AND HYDRAULICS)

VOLUME OF ENTERTAINED WATER: LT 26

TRANSOM ANGLE: 12°

ROTATION: CLOCKWISE VIEWED ON INPUT SHAFT.

INSPECTION HATCH: OUTBOARD.

HYDRAULIC ACTUATORS: INBOARD, MOUNTED ON JET UNIT INTEGRATED BRACKETS FOR REVERSING AND STEERING.

NOZZLE: N. 5 BLADES.

WATER PICK-UP FOR ENGINE COOLING: SUIT 1”^{1/4} GAS.

HYDRAULIC: OIL PUMP DIRECTLY DRIVEN BY THE WATER JET INPUT SHAFT.

REVERSING SYSTEM: SPECIAL MULTI-DUCT TYPE BUCKET. (65% OF THE FORWARD STATIC THRUST) HYDRAULICALLY ACTUATED.

STEERING SYSTEM: BALANCED STEERING NOZZLE HYDRAULICALLY ACTUATED.

WATER INTAKE PROTECTION: DEBRIS SCREEN GRID WITH HYDRODYNAMICALLY PROFILED MOVABLE BARS, HYDRAULICALLY ACTUATED.

B.P.R.: ADDITIONAL WATER INTAKE FOR SLOW AND/OR HEAVY VESSELS. (OPTIONAL)

INPUT POWER: FOR PLANING BOATS UP TO 309KW (420 HP) INTERMITTENT DUTY; UP TO 258KW (350HP) CONTINUOUS DUTY. FOR DISPLACEMENT BOATS: UP TO 96KW (130HP).

MAIN PARTS’ MATERIALS

IMPELLER: AISI 316 STAINLESS STEEL

IMPELLER HOUSING: G.AI.SI.9 ALUMINIUM ALLOY

IMPELLER HOUSING WEAR RING: TITANIUM OR STAINLESS STEEL

IMPELLER SHAFT: AQUAMET 17 STAINLESS STEEL

INPUT SHAFT: 39 NI.CR.MO. 3 HIGH GRADE STEEL

STATOR: G.AI.SI.7 ALUMINIUM ALLOY

STEERING AND REVERSING DEFLECTORS: G.AI.SI.7 ALUMINIUM ALLOY

STEERING SHAFT: AISI 316 STAINLESS STEEL

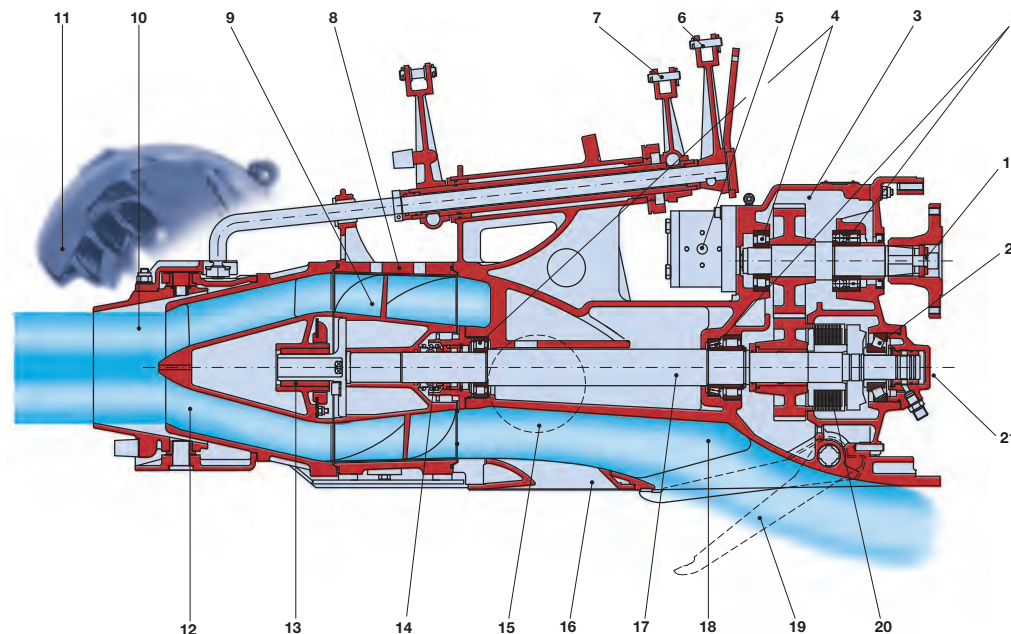
REVERSING SHAFT: AISI 316 STAINLESS STEEL

WATER JET BODY: G.AI.SI.9 ALUMINIUM ALLOY

GEAR WHEELS: SURFACE CARBO HARDENED HIGH GRADE 18 NI.CR.MO. 5 STEEL

ALL ALUMINIUM ALLOY PARTS ARE PROTECTED AGAINST MARINE CORROSION BY HARD ANODIZING TREATMENT (60 MICRONS), 3 LAYERS OF SPECIAL PAINT AND SACRIFICIAL ZINC ANODES.

- 1 • **Input shaft.**
- 2 • **Combined set of oil lubricated radial-axial bearings.**
- 3 • **Gear box** with n. 18 gear weels ratio available for the best engine matching.
- 4 • **Radial oil lubricated roller bearings.**
- 5 • **Hydraulic oil pump** directly mounted on the input shaft for water jet unit control (steering, reversing and hydraulic multi disc clutch).
- 6 • **Hydraulic actuator for steering control.**
- 7 • **Hydraulic actuator for reversing control.**
- 8 • **Impeller housing** easy replaceable titanium or stainless steel wear ring.
- 9 • **Axial flow impeller** - designed for operating with a high flow rate and a low pressure volume has a unique three blades profile design free from direct engine matching constraints, to meet the best efficiency and cavitation resistance over the full power and boat speed operation range. Increased blades' tip clearance due to wear does not compromise impeller efficiency because of its volume design. Made in AISI 316 stainless steel by lost wax casting process, the impeller has good mechanical tough and strong resistance to corrosion and erosion.
- 10 • **Steering nozzle** - Balanced steerable nozzle hydraulically actuated for the best control and maneuvering of the craft. It allows 30° steering each side both in ahead and astern regardless of the reversing bucket position.
- 11 • **Reversing bucket** - Compact multi-duct type of special Castoldi design, hydraulically actuated for continuous and effective thrust from full ahead to full astern (more than 65% of forward static thrust). Strong design to permit emergency crash stop at full power; it does not turn together with the nozzle thus allowing high steering efficiency even with bucket full down. It allows to perform sideways movements in multiple installations avoiding the need of bow-thrusters. A vectorial 360° direction maneuvering force can be controlled by unison operation of both reversing and steering deflectors.
- 12 • **Discharge nozzle with integrated blades stator** - Five blades stator for recovering of the flow water swirling induced by the impeller to improve propulsion efficiency and to null any torque effects.
- 13 • **Impeller rubber dumper** - It dumps vibrations if cavitation should occur at the impeller. Because this device has no shaft bearing basic function (all oil lubricated roller bearings are provided for this) it can withstand a large wear without affecting water jet integrity.
- 14 • **Impeller shaft mechanical seal** - High quality silicon-carbide face type mechanical seal.
- 15 • **Inspection hatch** for impeller, duct and inlet grid outboard inspection.
- 16 • **B.P.R.** - This unique device gives an auxiliary by-pass water flow to improve the main intake water suction. It increases the power yield range and thrust on low-speed vessels, nevertheless it kicks the take-off of middle speed heavy boats without affecting their full speed efficiency.
- 17 • **Impeller shaft** - Fully protected inside the fin's oil chamber; no twining problem caused by fishing lines or plastics can affect the shaft. The shaft runs only on safe oil lubricated roller bearings granting long life also in sandy waters.
- 18 • **Inlet duct** - Special designed with computer aid. Developed and optimized through several models trials on Castoldi laboratory boat with many water intake shapes for a wide range of power and boat speed operations. Its design is superior for rejecting air suction and improving cavitation resistance.
- 19 • **Movable water intake protection grid** - This grid protects the water intake against debris suction and performs self cleaning operations by the shift opening of the two alternated racks of bars by a helm handle control. The flush mounted grid's bars have smooth hydrodynamic profile, able to control the water flow without losses. This is absolutely the most efficaceous anti-clogging system as it prevents that debris may enter into the jet duct, driving it away.
- 20 • **Disconnecting multi-disc hydraulic clutch** - The lightest and most effective device for disengaging the water jet for: warming-up the engine, checking that all controls are working well, performing several daily stops and patrol alert operation while maintaining the boat perfectly standstill without debris or sand suction when mooring in dirty or shallow waters. It can be engaged with engine idling.
- 21 • **Oil level.**
- 22 • **Taper thrust oil lubricated roller bearing.**



BENEFITS

PERFORMANCE

- ✓ The highest efficiency in the 25 to 60 knots speed range
- ✓ Much higher top speed versus fixed pitch propeller system, higher top speed versus pod-drives and competitors water jet drives and consequent better fuel economy (from 25 knots, up)
- ✓ Acceleration
- ✓ No interference in multiple installations
- ✓ Jet power absorption insensitive to boat speed means keeping full thrust when boat drag change

SAFETY

- ✓ Absence of open rotating blades
- ✓ Absence of any appendage under hull
- ✓ Unrivalled emergency crash stop capability
- ✓ Almost invulnerable to floating debris and to unexpected boat grounding

PRACTICALITY

- ✓ Maximum endurance and protection from marine corrosion
- ✓ Ease of installation and alignment
- ✓ Operation in shallow waters and easy beaching
- ✓ Minimum service requirement
- ✓ Ease of maintenance
- ✓ Limited in-board room requirement
- ✓ Lower weight compared to any other propulsion system fitted with marine transmission
- ✓ Reduced magnetic signature
- ✓ More uniform engine loading allows for longer engine's life

COMFORT

- ✓ Absence of vibrations and reduced internal noise

MANOEUVRABILITY

- ✓ Outstanding maneuverability at all speed
- ✓ Easier handling for docking (zero speed with high thrust availability all around 360°)
- ✓ In multiple installation, vessel can even move sideways (no need of bow thruster)

Castoldi S.p.A. withhold the right to introduce, at any time and without previous notice, such modifications of components and accessories as might be deemed necessary for technical or commercial reasons, without any obligation to bring up-to-date this leaflet.

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www.castoldijet.it

