

100 SERIES



CASE STUDIES (References)

Performance **Reliability** Simplicity

Case Study 132: **Fast Interceptor Craft (FIC)**

SPECIFICATIONS

Waterjet:	DJ170HP x2
Engine:	CAT C18 ACERT 847 bkW @ 2300 rpm
Gearbox:	ZF 550 1.237:1
Vessel:	18.13m L.O.A 14.2m LWL 22.0 tonne (laden)
Performance:	45 knots (laden) 48 knots (light)



A Jewel from Sapphire Marine – 18m High Speed Monohull

Launched in March 2011, this 18.0m Fast Interceptor Craft (FIC) has been built by Sapphire Marine in Oman. It is powered by twin CAT 847 bkW diesel engine coupled to the **DOEN DJ170HP** waterjets. Designed for high-speed patrol and interception activities this vessel has seating for six and forward accommodation and sleeping for the crew.

The **DJ170HP** is a 17" (432mm) single stage compact high performance waterjet that uses Doen's latest impeller technology that delivers mixed flow type, high-speed performance, within an axial build. This approach combines the key benefits of excellent high-speed efficiency with superior cavitation margins and efficiency at lower speeds and cruise conditions. This waterjet model incorporates many innovative features that enhance its application into high-speed craft such as the lightweight fabricated intake tunnel, providing scope for design customization and efficiency optimisation

Steering is by conventional helm using a power assisted hydraulic steering system. Inboard cylinders are mechanically connected to the waterjets inboard steering tiller. This provides the vessel with exceptional and easy control at all speeds, especially for pursuit and high-speed maneuvers. A simple mechanical tie bar is used to connect the waterjets providing synchronized steering at all times.

The **DJ170HP** waterjets are fitted with Doen's Rotary Servo Control (RSC) unit; which is a mechanical follow up hydraulic control system providing simple and exact control of the waterjets reverse buckets. The fully integrated hydraulic system uses jet mounted hydraulic pumps, in built oil cooling and completely inboard mounted reverse cylinders and hydraulic lines. Operation is by conventional marine control levers using push pull cables operate this system.

Case Study 101: **Fast Interceptor Craft (FIC)**

SPECIFICATIONS

Waterjets:	DJ170HP (Twin)
Engines:	MTU 12V 183 TE93 846kW @ 2400 rpm
Gearboxes:	ZF BW190
Vessel:	17.7m L.O.A 14.2m L.W.L 19.6 tonne
Performance:	46 knots



High performance FIC for Royal Malaysian Navy

DOEN DJ170HP waterjets drive this high-speed aluminium 17.7m FIC monohull designed by Australian Naval Architect Greg Cox and built to DNV Class in Malaysia. This vessel is the start of a new FIC class and its design is in response to a growing requirement for fast response inshore patrol boats. Launched in 2001 this vessel has demonstrated excellent reliability and has proven to be an extremely cost effective, high-speed craft, providing sustained performance over its many years of use.

The DJ170HP is a 17" (432mm) single stage compact high performance waterjet that uses Doen's latest impeller technology to delivers mixed flow type, high speed performance, within an axial build. This approach combines the key benefits of excellent high-speed efficiency with superior cavitation margins and efficiency at lower speeds and cruise conditions. This waterjet model incorporates many features innovative features that enhance its application into high-speed craft eg. lightweight fabricated intake tunnel, providing scope for design customization and efficiency optimisation.

Steering is by conventional helm using a power assisted hydraulic steering system. Inboard cylinders are mechanically connected to the waterjets inboard steering tiller. This provides the vessel with exceptional and easy control at all speeds, especially for pursuit and high-speed maneuvers. A simple mechanical tie bar is used to connect the waterjets providing synchronized steering at all times.

The DJ170HP waterjets were fitted with Doen's ECS electronic control system. This fully electronic control provides single lever function, which combines control of the engine throttle and waterjet reverse bucket into one simple and reliable system. The reverse function provides full follow up control of the reverse bucket by way of the jet mounted hydraulic system incorporating a proportional solenoid valve. Control of the marine transmission is by way of separate, simple to use, touch pad.

Case Study 125: **Fast Patrol Boat**

SPECIFICATIONS

Waterjets:	DJ170HP (Twin)
Engines:	CAT C18 747kW @ 2300 rpm
Gearboxes:	ZF 550
Vessel:	15.1m L.O.A 13.4m L.W.L 19.5 tonne
Performance:	45 knots



A high speed Aluminium monohull operating in the Red Sea off Saudi Arabia

DOEN DJ170HP waterjets propels this aluminium 15.1m monohull designed and built to BV Class Rules. This vessel is one of five built for use by a Saudi Arabian Security Company that provides harbour patrol and surveillance activities for oil company asset protection.

Power is provided by twin CAT 747kW diesel engines, which are coupled to the DOEN waterjets through ZF marine transmissions. A reduction ratio is used to optimise the waterjet impeller selection and the gearbox also provides the vessel with disengagement and a back flushing capability.

The DOEN 17.0-inch (432mm) diameter high volume axial flow impellers provide excellent cruise capability allowing long range patrol at reduced fuel consumption whilst delivering an uncompromised top speed of 45 knots.

The DOEN balanced steering nozzle gives fast and precise response. These are controlled using a conventional helm power assisted hydraulic steering system. Inboard cylinders are mechanically connected to the waterjets inboard steering tiller. This provides the vessel with exceptional easy control at all speeds and especially when maneuvering around rigs and alongside other vessels. A simple mechanical tie bar is used to connect the waterjets providing synchronized steering at all times.

The DJ170HP waterjets are fitted with an electronic control system. This fully electronic control provides single lever function, which combines control of the engine throttle and waterjet reverse bucket into one simple and reliable system. The reverse function provides full follow up control of the reverse bucket by way of the jet mounted hydraulic system incorporating a proportional solenoid valve. Control of the marine transmission is by way of separate, simple to use, touch pad.

Case Study 126: **Water Taxi**

SPECIFICATIONS

Waterjet:	DJ170HP x2
Engine:	CAT C18 533kW @ 2100 rpm
Gearbox:	ZF 550
Vessel:	18.5m L.O.A 16.3m LWL 22 tonne
Performance:	25 knots



Five Nigel Gee 18.5m Water Taxis for service in Nigeria

Estaleiros Navais de Peniche yard on Portugal's Atlantic Coast built five of these BMT Nigel Gee designed 18.5m catamarans ordered for a Rivers State Water Taxi Service in Nigeria to carry up to 70 passengers. The vessels are used to provide transport to remote riverine regions where low draft was required. In these regions there is extensive oil and gas industry but little or poorly developed road infrastructure exists to provide access.

Power is provided by twin CAT 533kW diesel engines, which are coupled to the DOEN waterjets through ZF marine transmissions. A reduction ratio is used to optimise the waterjet impeller selection and the gearbox also provides the vessel with disengagement and a back flushing capability.

The DOEN 17.0-inch (432mm) diameter high volume axial flow impellers provide highly efficient propulsion that delivers excellent cruise performance and extended range in this application under all load conditions.

The DOEN balanced steering nozzles are controlled using a conventional helm power assisted hydraulic steering system. Inboard cylinders are mechanically connected to the waterjets inboard steering tiller. This provides the vessel with simple and easy control at all speeds and especially when docking. A simple mechanical tie bar is used to connect the waterjets providing synchronized steering at all times.

The DJ170HP waterjets are fitted with DOEN's Rotary Servo Control (RSC), which is a proportional hydraulic control system providing simple and exact follow up control of the waterjets reverse buckets, by conventional lever. This system has fully integrated hydraulics with in built cooling; bulkhead mounted steering and reverse cylinders and all connections inboard and protected from corrosion. Conventional control levers using push pull cables operate this system.

Case Study 124: **Bue Tekes Crew Boat**

SPECIFICATIONS

Waterjets:	DJ140Z (Twin)
Engines:	Caterpillar C12 480hp @ 2300 rpm
Gearboxes:	N/A direct drive
Vessel:	13.6m L.O.A 13.0m LWL 14 tonne
Performance:	27 knots



A 13 metre low draft crew boat from Australia's New Wave Catamarans

This aluminium 13.6m Catamaran crew boat, propelled by twin **DOEN DJ140** waterjets, operates in the Caspian Sea in Kazakhstan. Built by New Wave Cat in Queensland, the vessel was designed specifically to provide crew and equipment transportation for the oil and gas industry into remote regions where low draft was required. This vessel has a draft of only 500mm.

Power is provided by twin CAT C12, 480hp diesel engines, which are directly coupled to the DOEN DJ140, 14.0-inch (356mm) diameter high volume axial flow impellers. The vessel has a top speed of 27knots with 25 passengers and a cruise speed of 25knots.

The DOEN balanced steering nozzle gives fast, precise response. These are controlled using a joystick steering lever operating the power assisted hydraulic steering system. Inboard cylinders are mechanically connected to the waterjets inboard steering tiller. This provides the vessel with exceptionally easy control at all speeds and especially when maneuvering alongside other vessels and oil rigs. A simple hydraulic link is used to connect the waterjets thereby providing synchronized steering at all times.

The DJ140 waterjets are fitted with DOEN's Jogstick Reverse System (JRS); an electro hydraulic control system that provides non-follow up jog lever control of the waterjets reverse buckets. An analogue indicator is used to show the reverse bucket position. This robust, simple and cost effective system remains very popular with operators in remote locations and heavy duty applications.

Case Study 130: **Fishing Boat**

SPECIFICATIONS

Waterjets:	DJ140Z (Twin)
Engines:	Yanmar 6KYM-ETE 650hp @ 2200 rpm
Gearboxes:	N/A direct drive
Vessel:	15.0m L.O.A 13.5m LWL 20 tonne
Performance:	30 knots



A 15 metre Jet Cat Crab Boat

This aluminium 15m Catamaran boat, propelled by twin **DOEN DJ140** waterjets, operates as a purpose built fishing vessel. Used specifically for fishing Blue Swimmer crabs, the vessel operates as a day boat requiring a large deck area for hauling and working the fishing pots. The owner selected waterjets for their maneuverability, efficiency, higher speeds and the total purchase cost when compared to installing gearboxes and propellers.

Power is provided by twin Yanmar 650hp diesel engines, which are directly coupled to the DOEN DJ140, 14.0-inch (356mm) diameter high volume axial flow impellers. They easily propel the vessel to its top speed of 30 knots and provide a very economical cruise of 24knots. The other key benefit of the high volume axial flow waterjets is their ability to carry load with minimal loss of performance; something that was very important for the role of this vessel and this type of fishing.

The DOEN balanced steering nozzle gives fast and precise response. They are controlled using a conventional helm power, assisted hydraulic steering system. Inboard cylinders are mechanically connected to the waterjets inboard steering tiller. This provides the vessel with exceptional easy control at all speeds and especially when maneuvering alongside a moving ship for pilot transfer. A simple mechanical tie bar is used to connect the waterjets thereby providing synchronized steering at all times.

The DJ140 waterjets are fitted with DOEN's Jogstick Reverse System (JRS); an electro hydraulic control system that provides non-follow up jog lever control of the waterjets reverse buckets. An analogue indicator is used to show the reverse bucket position. This robust, simple and cost effective system remains very popular with operators typically in remote loaction and heavy duty applications.

Case Study 114: **Utility Response Boat**

SPECIFICATIONS

Waterjet:	DJ130 (Single)
Engine:	Caterpillar 3126 400hp @ 2800 rpm
Gearbox:	Twin Disc MG5075 SC
Vessel:	9.14m L.O.A 8.22m L.W.L 7 tonne
Performance:	27 knots



A tough, high speed response boat for Police use.

A **DOEN DJ130** waterjet propels this aluminium RHIB 9.14m designed and built by SeaArk, in Arkansas USA. This vessel was built for use by the Security Police whose activities include harbour patrol, homeland defence and surveillance activities.

The DOEN DJ130, 13.0-inch (330mm) diameter high volume axial flow impeller provides this vessel with an excellent cruise performance; allowing long range patrols at reduced fuel consumption with high top speed capability under all load conditions. Additionally the large diameter pumps ensures high thrust at low speed and high bollard pull which is essential for this vessels towing capability.

Power is provided by a single CAT 3126 coupled to the DOEN waterjet through a Twin Disc marine transmission. A reduction ratio is used to optimise the waterjet impeller selection and the gearbox also provides the vessel with disengagement and a back flushing capability.

The DOEN balanced steering nozzle gives fast, precise response with minimal input force. This is simply controlled using a conventional manual hydraulic steering system with inboard cylinder , which is mechanically connected to the waterjets inboard steering tiller. This provides the vessel with exceptionally easy control at both high and low speeds.

The DJ130 waterjet is fitted with an electronic control system. This fully electronic control provides single lever function which combines control of the engine throttle and waterjet reverse bucket into one simple and reliable system. The reverse function provides full follow up control of the reverse bucket by way of the jet mounted hydraulic system incorporating a proportional solenoid valve. Control of the marine transmission is by way of separate, simple to use, touch pad.

Case Study 104: **Johor Port Pilot Boat**

SPECIFICATIONS

Waterjets:	DJ130 (Twin)
Engines:	Cummins 6BTM3 315hp @ 2800 rpm
Gearboxes:	ZF 220
Vessel:	12.4m L.O.A 11.2m L.W.L 9.8 tonne
Performance:	30 knots



A fast and reliable workhorse operating in Malaysian waters

Launched in 2002 this 12.4m pilot vessel, propelled by twin **DOEN DJ130** waterjets, operates in the waters of Malaysia. This boat commonly works more than 12 hours per day, and has been operating continuously with only minimal maintenance required.

Power is provided by twin Cummins 6BTM3, 315hp diesels coupled to DOEN waterjets through ZF marine transmissions. A reduction ratio is used to optimise the waterjet impeller selection and the gearbox also provides the vessel with disengagement and a back flushing capability. The DOEN DJ130, 13.0-inch (330mm) diameter high volume axial flow impellers provide excellent cruise capability and fuel economy with un-compromised top speed under arduous sea and varying load conditions; all of which are extremely important for a pilot vessel.

The DOEN balanced steering nozzle gives fast and precise response. These are controlled using a conventional helm power assisted hydraulic steering system. Inboard cylinders are mechanically connected to the waterjets inboard steering tiller. This provides the vessel with exceptional easy control at all speeds and especially when maneuvering alongside a moving ship for pilot transfer. both high and low speeds. A simple mechanical tie bar is used to connect the waterjets providing synchronized steering at all times.

The DJ130 waterjets are fitted with DOEN's Jogstick Reverse System (JRS); an electro hydraulic control system that provides non-follow up jog lever control of the waterjets reverse buckets. An analogue indicator is used to show the reverse bucket position. This robust, simple and cost effective system remains very popular with operators in remote and rugged use applications.

Case Study 131: Eco Tourism Vessel

SPECIFICATIONS

Waterjets:	DJ120Z (single)
Engines:	Yanmar 6LY3AM-UTP 380hp @ 3100rpm
Gearboxes:	ZF280-1
Vessel:	9.0m L.O.A 8.0m L.W.L 4.8 tonne
Performance:	36 knots



Another hard working tourism boat from Australia's Calibre Marine

This aluminium 9.0m monohull, propelled by a single **DOEN DJ120** waterjet, is the first of a new and innovative vessel design to take passengers on day and night time rides through spectacular eco-sensitive areas. Built by Calibre Marine in South Australia, the vessel was designed specifically to transport up to 12 paying passengers quickly and efficiently across open water to the tourist area. Then, using its shallow draft capability navigate and maneuver through the eco-sensitive shallow mangrove areas.

A DOEN DJ120 jet, coupled via ZF transmissions, to the Yanmar 380hp engine is ideally suited to the task. The 310mm diameter, high volume axial flow impellers, provides this vessel with a 36knot top speed and cruise efficient cruise capability at full load. The high volume pump ensures full control and excellent maneuverability even at low engine idle when exploring shallow waters.

The DOEN balanced steering nozzle gives fast, precise response with minimal input force allowing simple light duty steering system to be used. An electric power steering system is used to provide small turn ratio's with little effort. The heart of the package is the microprocessor controlled pump unit which senses loads and instantly delivers flow and pressure when loads are applied, reverting to minimum current draw when no load is sensed. This provides the vessel with precise control for the quick and aggressive maneuvers that this boat has to perform many times in daily operations

The DJ120 waterjet is fitted with DOEN's Rotary Servo Control (RSC), which is an proportional hydraulic control system providing simple and exact follow up control of the waterjets reverse buckets, by conventional lever. This system has fully integrated hydraulics with in built cooling; bulkhead mounted steering and reverse cylinders and all connections inboard and protected from corrosion. This system interfaces with the standard Yanmar engine control system providing a simple single lever throttle and reverse bucket control.

Case Study 128: **Hel-a-va Jet – Thrill Ride Boat**

SPECIFICATIONS

Waterjets:	DJ120Z (Twin)
Engines:	Yanmar 6LY3AM-STP 337hp @ 3100rpm
Gearboxes:	ZF280-1
Vessel:	10.1m L.O.A 9.0m L.W.L 5.6tonne
Performance:	45 knots



Third in a series of hard working thrill ride boats from Australia's Calibre Marine

The brief for this boat was full-throttle hard-turning operation, 7 days a week all year round, up to 45 knot performance with 12 passengers, Captain and a full load of fuel. This boat gets put through a series of full throttle, hard turning, spin and crash stop maneuvers during every one of the many 20 minute rides it takes passengers on every day.

A pair of Doen DJ120 jets, coupled via ZF transmissions, to Yanmar 337hp engines are ideally suited to the task. The 310mm diameter, high volume axial flow impellers, providing the immediate high thrust that is needed even under extreme acceleration, white water and hard cornering conditions.

The DOEN balanced steering nozzle gives fast, precise response with minimal input force allowing simple light duty steering system to be used. An electric power steering system is used to provide small turn ratio's with little effort. The heart of the package is the microprocessor controlled pump unit which senses loads and instantly delivers flow and pressure when loads are applied, reverting to minimum current draw when no load is sensed. This provides the vessel with precise control for the quick and aggressive maneuvers that this boat has to perform many times in daily operations

The DJ120 waterjets are fitted with DOEN's Rotary Servo Control (RSC), which is an proportional hydraulic control system providing simple and exact follow up control of the waterjets reverse buckets, by conventional lever. This system has fully integrated hydraulics with in built cooling; bulkhead mounted steering and reverse cylinders and all connections inboard and protected from corrosion. This system interfaces with the standard Yanmar engine control system providing a simple single lever throttle and reverse bucket control.

Case Study 120: **U.S. Navy RIB Tender**

SPECIFICATIONS

Waterjets:	DJ110Z (Twin)
Engines:	Cummins QSB-380 380hp @ 3000 rpm
Gearboxes:	Twin Disc MG5075
Vessel:	11.0m L.O.A 10.0m L.W.L 8.5 tonne
Performance:	36 knots



11m Standard Navy R.I.B.

Twin **DOEN DJ110Z** waterjets propel this 11.0m aluminium RHIB. Since 2003 more than seventy units of this ongoing US Navy spec. vessel have been built by both Willard Marine and Zodiac Hurricane to U.S. Navy Standards. This version of the 11m Standard Navy RIB makes a comfortable and fast patrol boat providing protection for the crew during long patrols.

The Doen DJ110Z 11.0-inch (279.5mm) diameter high volume axial flow impeller provides excellent cruise capability and fuel economy with un-compromised top speed under varying load conditions

Power is provided by twin Cummins QSB 380hp diesel engines, which are coupled to the Doen waterjets through Twin Disc marine transmissions. A reduction ratio is used to optimise the waterjet impeller selection and the gearbox also provides the vessel with disengagement and a back flushing capability.

The Doen balanced steering nozzle gives fast, precise response with minimal input force. This is simply controlled using a conventional manual hydraulic steering system with inboard cylinder, which is mechanically connected to the waterjets inboard steering tiller. This provides the vessel with exceptional easy control at both high and low speeds. A simple mechanical tie bar is used to connect the waterjets providing synchronized steering at all times.

Each waterjet has its own hydraulic reverse system. The hydraulic reverse system uses gearbox mounted PTO driven hydraulic pumps in conjunction with compact aluminium canister reservoirs, with filters and 316# stainless steel sea water - oil coolers.

For reverse bucket control the DJ110Z waterjets are fitted with DOEN's Rotary Servo Control (**RSC**). The RSC is a hydraulic control system providing simple and exact mechanical follow up control of the waterjets reverse buckets. Operation of the system by way of conventional hand control levers using push pull cables; bucket position follows and is relative to the control lever position.

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Case Study 119: **Thursday Island Reef Pilot**

SPECIFICATIONS

Waterjets:	DJ110 (Twin)
Engines:	Cummins 6CTA 8.3M 430hp @ 2600 rpm
Gearboxes:	N/A direct couple
Vessel:	12.6m L.O.A 10.2m L.W.L. 9.2 tonnes
Performance:	35 knots



Launched in 1998, this pilot vessel is still going strong on her second set of engines

Launched in 1998 this aluminium RHIB 12.6m pilot vessel, propelled by twin **DOEN DJ110** waterjets, operates in the warm tropical waters around Thursday Island off the far North Australian coast. During this time it has logged more than 15,000 hours and has provided exceptional reliability at all times.

Originally launched with Volvo 420hp diesels these engines were subsequently replaced by twin Cummins 6CTA 8.3M 430hp diesels after many years of hard work. The current engines are direct coupled to the DOEN DJ110 11.0-inch (279.5mm) diameter high volume axial flow impellers. The waterjet units provides excellent cruise capability and fuel economy with un-compromised top speed under arduous sea and varying load conditions; all of which are extremely important for a pilot vessel.

The DOEN balanced steering nozzle gives fast, precise response with minimal input force. This is simply controlled using a conventional manual hydraulic steering system with inboard cylinder, which is mechanically connected to the waterjets inboard steering tiller. This provides the vessel with exceptional easy control at all speeds and especially when maneuvering alongside a moving ship for pilot transfer. both high and low speeds. A simple mechanical tie bar is used to connect the waterjets providing synchronized steering at all times.

The DJ110 waterjets are fitted with DOEN's Jogstick Reverse System (JRS); an electro hydraulic control system that provides non-follow up jog lever control of the waterjets reverse buckets. An analogue indicator is used to show the reverse bucket position. This robust, simple and cost effective system remains very popular with operators in remote and rugged use applications.

Case Study 129: **Sea Truck**

SPECIFICATIONS

Waterjets:	DJ105 (Twin)
Engines:	Cummins 6BTA 5.9M 315hp @ 2800 rpm
Gearboxes:	N/A direct couple
Vessel:	12.0m L.O.A 10.3m L.W.L 7 tonne
Performance:	30 knots



More than 150 Sea Truck vessels work the river delta in Indonesia

Twin **DOEN DJ105** waterjets propel these fiberglass and aluminium Sea Truck vessels. With several operators involved in this business, Doen has provided more than 150 ship sets of equipment for this application into this region. These vessels are designed specifically to provide reliable crew and equipment transportation for the oil and gas industry in the shallow river delta regions where low draft is paramount because of the shallow waters and submerged debris that has to be negotiated.

Power is provided by twin Cummins 6BTA 315hp diesel engines, which are directly coupled to the DOEN waterjets. The DOEN DJ105 10.5-inch (267mm) diameter high volume axial flow impeller provides excellent cruise capability and fuel economy with un-compromised top speed under varying load conditions.

The DOEN balanced steering nozzle gives fast, precise response with minimal input force. This is simply controlled using a conventional manual hydraulic steering system with inboard cylinder, which is mechanically connected to the waterjets inboard steering tiller. This provides the vessel with exceptional easy control at both high and low speeds. A simple mechanical tie bar is used to connect the waterjets providing synchronized steering at all times.

The DJ105 waterjets are fitted with DOEN's Jogstick Reverse System (JRS); an electro hydraulic control system that provides non-follow up jog lever control of the waterjets reverse buckets. An analogue indicator is used to show the reverse bucket position. This robust, simple and cost effective system remains very popular with operators in remote locations and heavy-duty applications.

Case Study 116: Force Protection Boat

SPECIFICATIONS

Waterjets:	DJ105 (Twin)
Engines:	Cummins 6BTA 5.9M 315hp @ 2800 rpm
Gearboxes:	Twin Disc MG 5075 SC
Vessel:	9.8m L.O.A 8.5m L.W.L 8.5 tonne
Performance:	33 knots



SeaArk, Ram series RHIB, for Force Protection Role.

Twin **DOEN DJ105** waterjets propel this aluminium RHIB 9.8m designed and built by SeaArk, in Arkansas USA. This vessel is primarily designed for Force Protection activities, which include harbour and homeland defence, coastal surveillance, and special missions.

Power is provided by twin Cummins 6BTA's 315hp diesel engines, which are coupled to the DOEN waterjets through Twin Disc marine transmissions. A reduction ratio is used to optimise the waterjet impeller selection and the gearbox also provides the vessel with disengagement and a back flushing capability.

The DOEN DJ105 10.5-inch (267mm) diameter high volume axial flow impeller provides excellent cruise capability and fuel economy with un-compromised top speed under varying load conditions.

The DOEN balanced steering nozzle gives fast, precise response with minimal input force. This is simply controlled using a conventional manual hydraulic steering system with inboard cylinder, which is mechanically connected to the waterjets inboard steering tiller. This provides the vessel with exceptional easy control at both high and low speeds. A simple mechanical tie bar is used to connect the waterjets providing synchronized steering at all times.

The DJ105 waterjets are fitted with DOEN's Jogstick Reverse System (JRS); an electro hydraulic control system that provides non-follow up jog lever control of the waterjets reverse buckets. An analogue indicator is used to show the reverse bucket position. This robust, simple and cost effective system remains very popular with operators in remote and rugged use applications.

Case Study 127: **White Water River Boat**

SPECIFICATIONS

Waterjet:	DJ100G (Single)
Engine:	Yanmar 6LPAM-STP2 315hp @ 3800rpm
Gearbox:	1.25:1 Integral with Jet
Vessel:	25' (7.6m) LOA 21' (6.5m) LWL 5500lbs
Performance:	40+mph



A welded Aluminium white water riverboat from America's Custom Weld Boats

A single **DOEN DJ100G** waterjet propels this aluminium 25' (7.6m) craft designed and built by Custom Weld boats of Lewiston, Idaho in the USA. Designed specifically for recreational use in the white water rapids rivers typically found in North West USA; the high performance diesel jet package offers the same performance as a petrol engine options with outstanding fuel economy and range.

Power is provided by a single Yanmar 6LPAM-STP2 315hp diesel engine, which has been coupled to the transom mount DJ100G waterjet. The DJ100G's integral single step reduction gearbox ensures that the 10-inch (254mm) diameter high volume axial flow impeller is optimally matched to the engine. This provides the highest level of efficiency from the propulsion system providing unparalleled acceleration, load carrying and fuel economy with un-compromised top speed; even when fully loaded with people and cargo.

The DOEN balanced steering nozzle gives fast, precise response with minimal input force. This is simply controlled using Custom Welds center stick steering lever which is mechanically connected to the waterjets inboard steering tiller. This provides the vessel with exceptional control at both high and low speeds which is essential for navigating through the white water rapids.

This DJ100G waterjet is fitted with DOEN's Rotary Switch Box (RSB) reverse control utilizing a high force electric actuator to provide follow up, position sensing, control of the reversing bucket. The inboard mounted electric actuator simplifies the installation, set up and maintenance of the waterjet while retaining performance and reliability. This system simply interfaces with the standard Yanmar engine control system providing a simple single lever throttle and reverse bucket control.