

Yanmar Repowers Rejuvenate Sydney Harbour Ferries

Commercially rated Yanmar marine diesel engines have been selected and installed to re-power all four Supercat ferries, operating on Sydney Harbour. The vessels which were built in 2001, have each been repowered with a pair of Yanmar 6AY-WGT engines, boosting the power of each ferry by 200 hp.

The decision to repower the Supercat fleet operated by Harbour City Ferries was made on technical and economic grounds. The 14 year old original engines were due for major maintenance but it didn't make good commercial sense to have the engines re-built.



“We looked at the Supercat project from all different angles and on every measure the decision to repower with Yanmar came up as the best option,” said Roger Harradence, Technical Superintendent of Harbour City Ferries.

“Management also seized upon the re-power program as an opportunity to remedy a range of issues with the Supercats. We wanted to get back to basics and remove the fickle electronic management systems fitted to the original engines. Engine room access for routine maintenance was tough due to the narrow hulls and V configured cylinder blocks.”

Prior to the re-power program, Harbour City Ferries did not have a single Yanmar powered vessel in the fleet. However following an exhaustive review process, the choice of engines came down to Yanmar and one other brand. The Yanmar 6AY-WGT won out due to the six in-line configuration and mechanical control system.



“Cost was also a major consideration,” said Roger Harradence.

“We undertook a thorough analysis of the through-life costs of operating the engines and the Yanmar stacked up very favourably. The cost model extends far beyond the initial purchase price and fuel consumption data to include the routine 500 hour maintenance schedules and also the longer term costs that we can expect in five and ten years.”



The Yanmar 6AY-WGT is a six in-line cylinder engine with a displacement of 20.39 litres and a rated power output of 911 mhp (670kw) at 1,938 rpm. The versatile 6AY Series is extensively used in many applications including heavy displacement work boats but also in many high speed applications such as patrol craft and cray fishing boats. In Australia, the 6AY Series of engines has been exceptionally popular with ferry operators, both in new builds and re-power applications.

The Supercat ferries measure 34m long and have a beam of 9m. With a full load of 330 passengers and 4000 litres of fuel, the all alloy hull displaces 79 tonnes. The low draft of 1m and 9m high superstructure makes these vessels a handful for skippers in a stiff cross wind.

To achieve the tight requirements of the commuter timetable, the Supercat skippers need to quickly achieve and maintain 25 knots. With the original engines installed, the top speed of 25 knots provided virtually zero margin for error.

As each of the four Supercat ferries is identical, the Yanmar re-power program gained pace with each vessel in turn removed from service, re-powered then pressed back into action.

Harbour City Ferries engineers removed the old engines and installed the new Yanmar 6AY-WGT engines at their Balmain shipyard. It was immediately apparent that the new Yanmar 6AY-WGT engines were the right choice. With an in-line cylinder block configuration, the installation envelope of the Yanmar engine was considerably narrower than the original engines.

Through the re-power project, the opportunity was taken to replace the control systems and also swap the exhaust to a two stage wet system. The props were also re-pitched.

While the re-power project looked great on paper, the ultimate test was when the Supercat ferries went back into service. Gaining the endorsement of the Supercat skippers was a critical measure of success.

“The biggest change has been throttle response,” said Master Charles Johnson. “The Yanmar engines are very responsive to the throttle and this gives us much improved control over the Supercat vessel.”

“With the original engines there was a lag in throttle response and in reverse we only had 1000 rpm available to us. The new Yanmar 6AY-WGT provides us with the full rev range of 1970 rpm in reverse. The added bonus is that our top speed has increased to 27 knots.”

Producing an extra 100 hp per engine, the 12% power gain delivered by the Yanmar engines has proven to be the single most important factor which has transformed the performance of the Supercat ferries.

“The bigger capacity of the Yanmar engines gets us up to full speed in just 30 seconds,” said Master Charles Johnson.

“This helps us meet our stringent timetable obligations, but it’s also a big help in an emergency stop. Sydney Harbour can be a very congested waterway and we need to have the capability to stop very quickly.”

“Our high topsides and small rudders make the Supercat ferries difficult to operate under windy conditions. The additional power and control with the Yanmar 6AY-WGT engines has made our job so much easier.”

The Supercat ferries have an average fuel consumption of 70 litres per engine per hour over the course of a full day of operation. Skippers have noted that compared to the original engines, the new Yanmar 6AY-WGT engines perform better, are quieter and operate with less vibration.

Roger Harradence who oversaw the entire Supercat re-power program is a very happy man too.

“The Supercat vessels are very demanding on engines and transmissions,” said Roger Harradence.

“The skippers are mostly operating at full throttle, accelerating as hard as possible and some vessels have logged up to 1000 clutch engagements a day.”

“We’re thrilled with our new Yanmar engines and the support of Power Equipment. The technical and parts support has been well beyond our expectations.”

Harbour City Ferries operates exclusively on Sydney Harbour and is considered one of the largest passenger ferry operators in Australia. The company carries 15 million passengers annually and boasts a fleet of 28 vessels.

Relevant web links:

Power Equipment

www.powerequipment.com.au

Yanmar 6AY-WGT

<http://www.powerequipment.com.au/products/sailing-engines/commercial-engines/6ay-series-659-911mhp/>

Harbour City Ferries

<http://www.beyondthewharf.com.au/about-us/>

Power Equipment is the exclusive and authorised Australian, New Zealand, Papua New Guinea and South Pacific Distributor of Yanmar Marine and Industrial diesel engines, JCB DieselMax, MASE diesel marine generators, Gori high quality folding sailboat propellers, PSS Shaft Seals, and Northern Lights Gen Sets.

For more information contact:

Mark Butterfield

National Marine Sales Manager - Australia

Power Equipment Pty Ltd

Tel: (03) 9709 8509

Email: mark.butterfield@powerequipment.com.au



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