

# Outboard Survey Findings

By Keith Thatcher, Shrimper 144 (March 2009)

The idea for this survey came from questions asked via the Shrimper the Forum back in 2005, the most common being, “will this engine fit into a Shrimper outboard well” and, “can I stow it in the aft locker”. Four-stroke outboards were just being introduced and there seemed some doubt as to whether these could be used. In a moment of enthusiasm I volunteered to set up a database of engines so that owners would know which might best suit their needs. The information that follows has been derived from returns received following requests in Spring and Autumn 2008 issues of *The Shrimper*, and, although certainly not definitive, will, I hope, provide some guidance to anyone contemplating a new outboard.

I have split the database into two sections covering two-stroke and four-stroke outboards respectively. Each section contains a tabulated list of engines by make and horsepower, a few general observations and a round-up of owners’ comments by manufacturer. “Age” refers to the outboards covered by the survey replies and not when the model was being manufactured.

## Two-stroke Engines

Since 2006, it has been illegal to import new two-stroke outboards into the EU unless they meet stringent emission standards (which most do not). Any new engines imported before 2006 can still legally be sold and second hand outboards can continue to be used for as long as they remain serviceable.

Make	HP (No cyl)	Weight (Kg)	Age	Stowage Options
Johnson	6 (2)	25	1990 to 2000	Well, Cabin, Cockpit
Mariner	4 (1)	21	Unspecified	Port locker, well, cabin, cockpit
Mariner	5 (1)	21	1983 to 2006	Port locker, well, cabin, cockpit
Mercury	5 (1)	21	2005	Port locker, well, cabin, cockpit
Tohatsu	3.5 (1)	13	Unspecified	Port locker, well, cabin, cockpit
Tohatsu	8 (2)	25.6	Unspecified, stated as “old”	Port locker, well, cabin, cockpit
Suzuki	4 (1)	20	2002	Port locker, well, cabin, cockpit
Yamaha	5 (1)	21	1996 to 2002	Port locker, well, cabin, cockpit
Yamaha	8 (2)	27	2005	Port locker, well, cabin, cockpit

Two-stroke outboards have been around for many years and are frequently acquired with the boat. They are robust, simple and easy to maintain and, with spares readily available, can easily last 25 years or more - provided you can stand the noise.

## Lifting and Stowage

All two-strokes are smaller and lighter than an equivalent four-stroke, but even a 4 hp outboard, probably the smallest realistic Shrimper engine, weighs 21 kg (44lb), so manhandling is never going to be easy. All two-stroke outboards up to 5 hp (plus two larger ones; Tohatsu 8 and Yamaha 8) will fit into the port aft locker on both Mk 1 and Mk 2 boats, but only a minority of owners actually do it. Most prefer to leave their engine in the well or lift off and stow in the cockpit or cabin (starboard side seems favourite). The

larger engines are more commonly left in the well, being rather heavy to lift off single-handed. Outboards left in the well over the season should have the leg protected against fouling. (See comments under four-stroke engine below).

## **Owners Comments**

### **Mariner (4 & 5)**

Very reliable but rather noisy. 5 hp gives adequate power but 4 hp is too small for sailing areas where strong tides prevail. Fuel consumption is reasonable (my 5 hp uses about 3 L/hr at cruising speed). Astern performance poor, with little direction control. Spares for all ages easy to find but expensive and servicing is easy. Battery charging available as an extra. All 4 hp and later 5 hp models are fitted with an integral fuel tank with the filler in the centre of the hood that has been known to foul the tiller. For many years the Mariner 5 was the standard engine offered by Cornish Crabbers.

### **Johnson (6)**

Good power and reliable when running properly, but can stall on tick-over, making manoeuvring interesting. Smelly and noisy. Exhaust breather fumes can fill the outboard well and stop the engine. Heavy to lift and will not fit into locker. Battery charging available as an extra. Spares readily available and servicing easy.

### **Mercury (5)**

Essentially a Mariner with a different paint scheme. Only one user responded and for a fairly new engine (2005). Quite noisy but no other reported problems. This engine has the integral fuel tank filler in the hood, but there was no mention of tiller fouling.

### **Tohatsu (3.5; 8)**

3.5 hp is light, easily handled and reliable with good fuel consumption. Has neutral but no reverse gear and this together with its low power probably makes it too small for most cruising owners. 3.5 hp is the smallest engine allowed by racing rules.

8 hp has more than enough power, is generally reliable and for a twin, is small and light. For some years this engine was the high power option offered by Cornish Crabbers, so there are probably more in service than the single return suggests.

### **Suzuki (4)**

Very reliable but slightly underpowered for strong tidal areas. Owner does not stow in locker although it will fit. Only has small integral fuel tank.

### **Yamaha (5; 8)**

5 hp is essentially a Mariner with a different paint scheme. All models have remote fuel tank, but more recent versions also have an integral fuel tank with filler cap on top of the hood, which can foul the tiller. One owner reported that he had solved this problem by removing the tank & filler and tape over the hole in the hood – not pretty but it works.

8 hp is very reliable with plenty of power but noisy. Will fit into aft locker, but at 27 kg this engine is on the handling limit for one man, so getting into and out of the locker is a struggle. Owner considers it too dangerous on a swinging mooring but feasible in marina berth. Spares easy to find.

## Four-stroke Engines

Make	HP (No cyl)	Weight (Kg)	Age	Stowage Options
Honda	5 (1)	27	1999	well, cabin, cockpit
Mariner	5 (1)	25	2004 to 2006	Port locker, well, cabin, cockpit
Mariner	6 (1)	25	2007 to 2008	Port locker, well, cabin, cockpit
Mariner	8 (2)	38	Unspecified	Well
Tohatsu	5 (1)	25	2007	Port locker, well, cabin, cockpit
Yamaha	8 (2)	37	2005 to 2008	Well

## Noise & Fuel Consumption

Four-stroke outboards are generally quieter than two-strokes and use about 30% less fuel. At Shrimper speeds two cylinder units are quieter than singles, possibly because they are inherently better balanced and not working so hard.

## Stowage

All four-stroke engines have a wet sump, so to avoid oil leakage must only be stowed in specific orientations, generally on one side and upright. For all 5 & 6 hp engines, except for Honda, the stowage orientation is port (i.e. handle) side down, which is also the correct way for stowage in the aft locker when clamped to the post. The Honda 5 must be stowed starboard side down, so the locker cannot be used. Correct orientation also applies if laid down elsewhere on the boat (cockpit or cabin). The survey indicates that 8 hp engines are generally left in the well all season, so stowage orientation is less of an issue. Any engine left in the well needs to be protected against fouling and there are different views as to which product gives best protection. Perhaps the subject for a future survey?

## Propeller Selection

A marine propeller has three main design parameters, diameter, blade area and pitch. When correctly formulated these will produce a propeller capable of absorbing all the power generated by the engine whilst allowing the boat to achieve its desired speed. (For a Shrimper this will be maximum hull speed – about 6 knots). In practice, designers usually try to achieve full speed at some point just below maximum engine rpm as this will provide a power margin for adverse weather. Incorrect specification of any one parameter, but particularly pitch, which is speed related, will result in impaired performance.

Outboards of the size used on a Shrimper are generally fitted with a standard propeller more suited to a lightweight skiff than a heavy displacement yacht. Diameter is often too small and the pitch specified for a boat speed of around 8 knots – not ideal for a boat limited in speed by virtue of its hull shape. As a consequence, standard fit outboard propellers rarely allow the engine to develop its full power potential when used on a heavy displacement boat.

Manufacturers recognise this by including in their range a “Saildrive” model intended as yacht auxiliary. These are fitted with a propeller having a larger blade area and less pitch, enabling the engine to rev more freely and hence generate full power, without excess blade slip, or “cavitation”. “Saildrive” models all have long or extra long shaft lengths, making them unsuitable for a Shrimper, but the propeller used is generally available as an option for both 5 & 6 hp and 8 hp sizes. A number of owners have reported fitting these “high thrust” propellers to good effect. Your local outboard dealership should be able to provide advice on the most suitable propeller for use with a Shrimper. High thrust propellers are also available for two-stroke outboards, but to date I know of only one owner having fitted one.

## Owners Comments

### Honda (5)

Only a few replies, but known to be popular across the fleet. Reliable and quiet with good power, but heavy to lift and often left in well all season. As indicated above, stowage orientation prevents this engine from being stowed in the aft locker. The only 5 hp outboard fitted with a battery charging facility as standard.

### Mariner (5; 6 & 8)

The 5 hp & 6 hp models are essentially the same engine, the 6 hp deriving its extra power from modified carburettor jetting that raise the maximum rpm from 5500 to 6000. Both provide good power, excellent reliability and are reasonably quiet. Good fit in the well on both Mk 1 & Mk 2 boats without modification to boat or engine. Fits into the aft locker and a dry weight of 25 kg makes lifting in and out feasible. Battery charging is available as an extra.

8 hp is powerful and reliable, but the hood is too tall to fit under the tiller. There is only one known user, who carried out significant alterations to both engine and boat to make it useable. Because of the modifications necessary this engine is not recommended for use on a Shrimper.

### Tohatsu (5) (& Mercury, but no replies for this make)

Essentially a Mariner in a different livery and available in same power ranges. See comments on Mariner engines above.

### Yamaha (8)

Highly regarded by users, having excellent power, quiet, reliable and economical on fuel. Heavy to lift, so generally left in the well. Will fit both Mk 1 & Mk2 boats, but a very tight fit in the Mk 1 well, with little clearance all round. All boats require adjustment of the mounting bracket position to allow the engine to fit in the well and clear the tiller. 6 amp battery charging fitted as standard.

## Conclusions & Omissions

The survey indicates that Honda and Mariner (plus derivatives) are the most popular small four-stroke engines (5 to 6 hp) with Yamaha finding favour as a larger (8 hp) alternative. A few Mariner 5 & 6 hp owners have fitted high thrust propellers and report improved speed and manoeuvrability as a consequence. A similar pattern also emerged for two-strokes, with Mariner again being the most popular, closely followed by Yamaha.

Significant omissions are the four-stroke Johnson/Evinrude range, Selva (two and four-stroke) and the new Chinese Parsun four-strokes. The latter seem very good value but I have information that the hood is too high to fit under a Shrimper tiller. It would be interesting to learn if this is true.

## Outboard brackets

Information received with outboard survey returns indicates that, in at least one case, the outboard mounting pad has been fitted on the wrong side of its attachment brackets. This moves the pad forward and, as a result, the engine fouls the front of the hull opening. Evidence suggest that this case is not unique and that the outboard bracket is an area where alterations are likely to have been carried out, particularly in older boats and/or when trying to fit larger engines. There is no information generally available for the standard location and even the kit completion instructions are no help as they simply direct the assembler to pre-drilled holes in the engine well moulding without giving any dimensions. Owners are therefore left in the dark when attempting to return their boats to standard. In time I plan to measure a representative sample to determine where the bracket should be fitted and provide this information via the Technical pages of website. In the meantime, the bracket on our boat, *Winkle* (144),

shows no obvious signs of having been moved and is therefore assumed to be at the standard location for a Mk 1 of her age (1984). I would be happy to forward measurements and photos to anyone who feels that their bracket is incorrect and wishes to check its location.

If you have any further comments or suggestions regarding this survey, or outboards in general, these can be placed on the Forum or emailed direct to: [kthatcher@talktalk.net](mailto:kthatcher@talktalk.net).