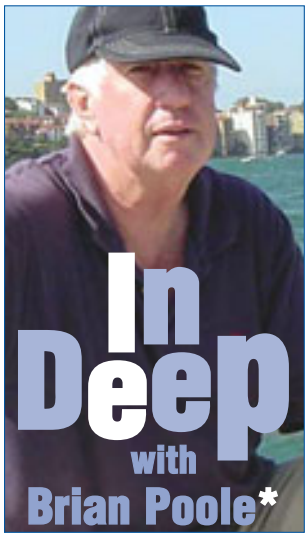

Determining Safe Powering For Outboard Motor Powered Craft

We all have a duty of care to ensure that no one is injured or killed as a result of a negligent action on our part, irrespective of whether proving it in court is possible. In the first place, it is a matter of do unto others what you would wish them to do to you.

Sure you can be a real bastard if you want to, and claim caveat emptor or "let the buyer beware since he buys without recourse". For some, this may be OK - providing it does not happen to them.

The Australian Builders Plate requirement put new emphasis on any alteration to a power boat irrespective of size. Although it is unlikely that a retailer or private owner will be prosecuted under the ABP regulations for changing a craft's particulars, it is still open for an injured party to take legal action against the person who changed the boat and did not revise the ABP particulars.

Boat repairers and retailers of second hand craft, who claim to be professionally competent, may well have to have a good legal look at the contractual terms of any dealings with customers.

Safe outboard powering and re powering is one such area that the industry must understand. I shall attempt to broadly explain what is involved for the knowledge of both the industry operatives, including boating journalists, and the consumer.

What the ABP Requirements Say.

Displayed Information

For outboard craft both less than 6.0 metres and longer than 6.0 metres, the maximum power rating for which the boat has been designed and tested expressed in kilowatts or horsepower.

Standards For Determining the Information.

The outboard power rating information shall be determined in accordance with the ABYC, ISO, AS799, or a relevant national or international standard that is not one of the above.

The three main standards use the same underlying formula for calculating maximum outboard power capacity with adjustments for the methodology of the unit's measurements. In other words, ABYC use horsepower and feet, whilst Australia's long serving standard AS1799, and the international ISO use metric units. This does make the formulas look different, but gives identical results when converted to respective units of power.

These calculations are only part of the process. All standards now require an on water test to verify the calculated power. This leads to some confusion, as the requirements have only been introduced into the ABYC in recent years.

AS1799 always required the test, and a test was part of ISO requirements when first introduced in about 2000.

This means that if an Australian Builders Plate states the power has been determined in accordance with a stated standard, that the information given has been determined, tested, and validated in accordance with that standard.

Standards have different requirements for non-chine craft, chine craft with tiller steering, and remote (wheel helm) steering. I do not intend to get involved in this detail, and shall address only conventional chine planing craft.

Work It Out Yourself

It is not difficult for an owner to calculate and carry out an on water test to satisfy himself or herself that their craft conforms.

Let's say the plate nominates ABYC, which seems all the go at the moment.

The first part of the procedure is to calculate the maximum power. I shall only address the requirements for remote steering outboard planing craft with a minimum of 500mm or 20 inch transom height motor.

The following is a typical calculation for a conventional outboard powered chine monohull using AS1799. The dimensions that are used are the length of the vessel (as defined in the standard) that is the length

over the main deck, and the transom width at the waterline.

The standard requires a factor be determined from a table. The factor varies with the type of craft.

The 'factor' is determined by multiplying the length (as defined) by the transom width at the water plane. Example:

For a 6.0m trailable craft at about 2.45 maximum beam the transom width at the waterline would be about 2.2 metres. Let's say the factor for this design is 13.2. ie the length 6.0m by the waterline beam of 2.2 m = 13.2. So the formula is

(16 x factor) minus 67

The calculation is (16 x 13.2) minus 67

Which works out to 142 kilowatts

(To convert Kw to Horsepower multiply by 1.32)

142 x 1.32 = 187 hp

Most responsible manufacturers recommend a maximum power rating of 150 hp on a well designed 6.0m craft. It follows that any trailable 6.0 metre craft is over powered in accordance with the standard if fitted with a 200hp outboard motor or two 100hp motors.

The next stage of the verification process is the on water testing. The various standards have different test courses.

For AS1799 the course consists of two turning buoys set sufficiently apart for the craft to reach top speed during transit between buoys.

The first test is conducted in smooth water with the driver only. Two lap runs are made, one turning to port the other to starboard. The vessel is run first at maximum speed and at the buoy given a sharp full speed turn, similar to taking evasive action in an emergency. If this test is satisfactory further tests are undertaken gradually increasing the passenger loading. An additional straight run is made at top speed with maximum passengers and the throttle reduced rapidly to engine idle.

Each test is evaluated. The boat should not ship water during any part of the test. It shall not have excessive cavitations leading to a excessive loss of planing speed, and shall not exhibit any loss of directional stability ie, the craft is fully controllable at all times.

If it is judged that the craft does not satisfy this criteria, the maximum power rating shall be reduced to that which will enable the craft to meet the criteria.

This is only an explanation of the procedures involved.

Boatbuilders and retailers undertaking tests MUST have a copy of the relevant standards and follow and document them exactly. They shall not use this article as an authorities text. F&B magazine and the author take no responsibility for the detail correctness of the procedures described in this article. The purpose of this article is to inform readers of the general approach only.

Retailers have had adequate time to become familiar with these requirements. However, there appears to be a trend by some sales staff to dismiss the Australian Builders Plate as just another Government requirement that the builder has to comply with.

The reason for the Australian Builders Plate is to provide essential safety information about the boat to the purchaser and owner so that he is better informed.

If the retailer's staff cannot provide you with a satisfactory explanation you should seek further advice from Ms. Maureen Horder of the National Marine Safety Council. Email **mhorder@nmsc.gov.au**.

F&B

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