

THE THIN GREEN LINE

4-strokes are considered top of the pile when it comes to fuel efficiency and cleanliness but has the 2-stroke been over looked? Simon Everett takes both engines to the thin green line to see which comes out ahead...



The rush to buy 4-stroke outboards over recent years has been fuelled by the belief amongst the buying public that 2-strokes will be made illegal and that the 4-stroke is more fuel efficient and cleaner than its 2-stroke equivalent. With brand new engines this might be marginally true, but has anyone given much thought to the future? Certainly the removal of 2-strokes is a myth and a couple of manufacturers are still developing the 2-stroke principle. If 2-strokes were to be removed completely, then the money currently being poured into R&D would not be wasted on such a dead end. I think much of the information available is a thinly veiled, green mist that is misleading consumers.

I would like to get you to think long term for a few moments; the majority of people who buy a new outboard are doing so on a long term basis, as it is after all, a fairly hefty investment. I would like you to consider how the two types of engine will compare in ten years time, when they have a fair bit of wear and tear under their belts and when the cleanliness and economy of the engines over that kind of time scale is rarely given any thought.

Regardless of the type, the majority of wear in an engine takes place during its warming up period when the tolerances are tight before the various moving parts expand to their working dimensions. This is when you have to call upon your oil to do its thing. A 4-stroke has a greater reciprocating mass that takes longer to warm up than its 2-stroke equivalent and is far more sensitive to the warm up period being properly completed. That in itself is a double edged sword. How many boaters fully warm up their engine before giving it the berries? Not that many actually. A 2-stroke can tolerate this kind of abuse far better, as the oil is delivered directly in the mixture according to



the running conditions and there is less engine mass to warm up. Any engine put under load before it reaches its optimum operating temperature wears very much faster, but it affects 2-strokes far less.

A 4-stroke, contrary to popular belief does burn oil, not much, but some. As it wears it burns more, so the wear factor is important as this is oil that is not designed to be burnt. A 2-stroke uses oil that is designed to be burnt in the mixture and still meet the emission standards. In time, and with use, 4-strokes become dirtier and burn more and more oil as the tolerances increase. Modern 2-strokes, on the other hand, actually use less oil as they wear because the management computers deliver the amount of oil required according to the running conditions, as the engine wears the friction is less and so less oil is injected. Also give consideration to the fact that once a 2-stroke has burned its oil that is the end of the matter. A 4-stroke, on the other hand, has a couple of litres of dirty oil to deal with at the service. Where does this evil concoction of acids, burned hydrocarbons and oil go? It has to be disposed of somehow and that is conveniently overlooked when calling 4-strokes cleaner. A big 4-stroke has a large oil capacity to dispose of.

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A further compounding of this situation occurs with people who use their engines for most of the time at slow running speeds, such as on inland waterways, as tenders in harbour areas or for extended trolling periods. An engine run in such a way often never fully reaches its optimum running temperature and so the wear factor is greatly accelerated and oil consumption increases with it as these engines are being run under the extreme wear situation for most of their lives. Some engines can be seen to be suffering from this already.

The difference in economy between the two is also misleading. At slow running speeds a 4-stroke is generally more efficient than a 2-stroke because of the positive scavenge of the exhaust, but the way it is portrayed can be misleading. If we take two similar size engines from the middle range, say 150hp, then the 4-stroke typically uses about 20% less fuel at slow running. That sounds a lot, but is that a difference of 1 litre/hour instead of 1.2 litres/hour then the actual difference in fuel used is minimal. At wide open throttle settings, modern fuel injected 2-strokes comes into their own and are generally more efficient than 4-strokes and can be more economical too. However, percentages are again misleading because if the

difference is reduced to just 12.5%, then at 40 litres/hour, the difference becomes 5 litres of fuel, which is significant in volume terms. How many of the 4-stroke engines are using fuel to cool the combustion chamber by overfuelling? This is a rhetorical question as I do not know the answer, manufacturers will not want to talk about it, but it is an easy way of overcoming the internal heat generated during high speed running, it does little for economy though.

The percentage difference at low running seems very great, but because it is on a very small amount of fuel, the economical advantage is minimised. At high revs the difference is reduced but because the actual fuel volume is quite large and so the difference in consumption is worth taking note of. I know which fuel bill I would rather have to pay! If you then consider the actual hours an engine spends at slow running compared to higher revs and the situation is merely exacerbated. Add in the higher initial purchase cost, the higher servicing cost with its attendant consumables to dispose of, the heavier weight on the transom, the slower throttle response and the more complicated engine internals and the 4-stroke begins to lose its appeal. That is before we even consider the additional energy required to build it in the first place.

Where the 4-stroke has an advantage is in the residual value, but as that is linked to peoples' perceptions, which have been formed by marketing departments doing a very good job. I would suggest that you don't discount the usefulness, and economical longevity of a 2-stroke outboard, especially if the environmental factors surrounding your engine are important to you.

Simon Everett