

Oil Injection

- See Figures 43, 44 and 45

Most outboard manufacturers use a mechanically driven oil pump mounted to the powerhead that is connected to the throttle by way of a linkage arm. The system is powered by the crankshaft, which drives a gear in the pump, creating oil pressure. As the throttle lever is advanced to increase engine speed, the linkage arm also moves, opening a valve that allows more oil to flow into the oil pump.

Most mechanical-injection systems incorporate low-oil warning alarms that are also connected to an engine-overheating sensor. Also, these systems may have a built-in speed limiter. This sub-system is designed to reduce engine speed automatically when oil problems occur. This important feature goes a long way toward preventing severe engine damage in the event of an oil injection problem.

The procedure for filling these systems is simple. Most Yamaha motors, except some of the V6 engines, utilize a powerhead mounted oil reservoir. Many V6 motors are also equipped with a remote, boat mounted, oil tank (a larger tank designed to hold more oil than a powerhead mounted unit). In either case, the tank contains a filler cap that is removed in order to add oil to the tank. Be sure to check the oil level EVERY time the motor is operated. Whenever oil is added, place a piece of tape on the tank to mark the level and watch how fast it drops in relation to engine usage (hours and fuel consumption). Watch for changes in usage patterns that could indicate under or over oiling. Especially with a system that suddenly begins to deliver less oil, you could save yourself significant engine damage by discovering a problem that could have starved the motor for lubrication.

Should the oil hose become disconnected or suffer a break/leak, the oil prime might be lost. If so, the system should be primed **before** priming the fuel system and starting the engine. More details on servicing the oiling system are found in the Lubrication section of this manual.

- It is highly advisable to carry a few spare bottles of 2-stroke oil with you onboard. Even in the event of an oil system failure, oil can be added to a fuel tank (in the proper ratio) in order to limp the boat and motor safely home.

CHECKING FOR WATER OR CONTAMINANTS

- See Figure 46

To protect the powerhead from potential damage should contaminants enter the oil system (instead of oil), you should ALWAYS perform a quick check of the oil tank before every outing. Powerhead mounted oil tanks are normally equipped with a water and contaminant trap (usually a short length of dead-end hose on the bottom of the tank, but some models may be equipped with a drain hose that is run up and attached to the filler neck).

If water or contaminants are found, they must be removed in order to protect the motor. If large amounts are present, the tank should be drained and thoroughly cleaned. Also, if large amounts of water or contaminants are

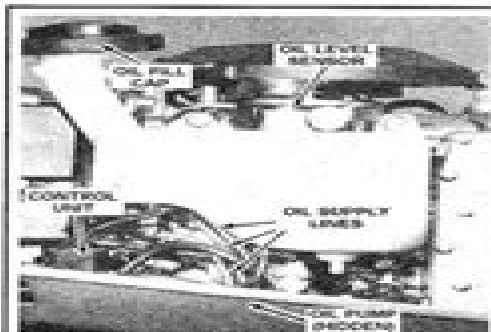


Fig. 43 Most Yamaha motors use a powerhead mounted oil reservoir...

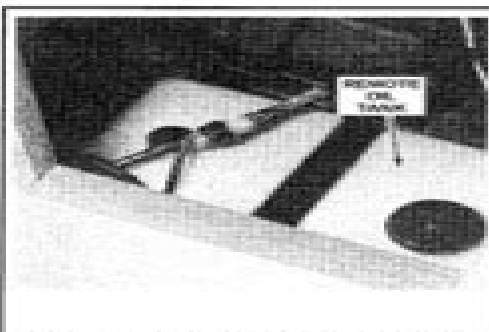


Fig. 44... but many V6 motors utilize a boat mounted remote oil tank.



Fig. 45 In both cases, check the oil EVERY outing and add when necessary

present, you'd do well to discover the source. What gremlin is sneaking onto your boat at night, opening the cap and putting them there?

Engine Oil and Filter (4-Stroke)

OIL RECOMMENDATIONS

For all 4-stroke motors through 1995, Yamaha recommends the use of a high quality 4-stroke motor oil of SAE 10W-30 or 10W-40 viscosity with an API rating of SE or higher (SF, SG or SH is acceptable). However, if the engine is to be operated only in conditions of ambient temperatures above 68°F (20°C), using SAE 20W-40 is also acceptable.

The Society of Automotive Engineers (SAE) grade number indicates the viscosity of the engine oil; its resistance to flow at a given temperature. The lower the SAE grade number, the lighter the oil. For example, the mono-grade oils begin with SAE 5 weight, which is a thin light oil, and continue in viscosity up to SAE 80 or 90 weight, which are heavy gear lubricants. These oils are also known as "straight weight", meaning they are of a single viscosity, and do not vary with engine temperature.

Multi-viscosity oils offer the important advantage of being adaptable to temperature extremes. These oils have designations such as 10W-40, 20W-50, etc. The 10W-40 means that in winter (the "W" in the designation) the oil acts like a thin 10 weight oil, allowing the engine to spin easily when cold and offering rapid lubrication. Once the engine has warmed up, however, the oil acts like a straight 40 weight, maintaining good lubrication and protection for the engine's internal components. A 20W-50 oil would therefore be slightly heavier than and not as ideal in cold weather as the 10W-40, but would offer better protection at higher rpm and temperatures because when warm it acts like a 50 weight oil. Whichever oil viscosity you choose when changing the oil, make sure you are anticipating the temperatures your engine will be operating in until the oil is changed again.

The American Petroleum Institute (API) designation indicates the classification of engine oil used under certain given operating conditions. Only oils designated for use "Service SG, SH" or greater should be used. Oils of the SG, SH or its superseding oil type perform a variety of functions inside the engine in addition to the basic function as a lubricant. Through a balanced system of metallic detergents and polymeric dispersants, the oil prevents the formation of high and low temperature deposits and also keeps sludge and particles of dirt in suspension. Acids, particularly sulfuric acid, as well as other by-products of combustion, are neutralized. Both the SAE grade number and the API designation can be found on top of the oil bottle.

CHECKING OIL LEVEL

- See Figure 47, 48 and 49

One of the most important service items for a 4-stroke engine is maintaining the proper level of fresh, clean engine oil in the crankcase. Be certain to check the oil level both before and after each time the boat is used. In order to check the oil level the motor must be placed in the full

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Kalton C. Lahue



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