

## PRODUCT OVERVIEW

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### New Engine Break-In

As with all reciprocating engines, the way your engine is operated during its first 50 hours of operation plays a very significant role in determining how long it will last and how well the engine will perform over its lifetime.

A new Yanmar diesel engine must be operated at suitable speeds and power settings during the break-in period to allow bearing surfaces and other friction-related components, such as piston rings and valve guides, to wear in properly in order to stabilize engine lubrication and combustion.

During the break-in period, the engine coolant temperature gauge should be monitored closely. The temperature should remain between 71° and 87°C (160° and 190°F).

During the first 10 hours of operation, the engine should be operated at maximum rpm minus 400 to 500 rpm (approximately 60 to 70% of load) most of the time. This will ensure the sliding parts break in properly.

**NOTICE:** *During this period, avoid operating at maximum engine speed and load to avoid damaging or scoring sliding parts.*

**NOTICE:** *NEVER operate at WOT (wide open throttle) for more than a minute at a time during the first 10 hours of operation.*

Do not operate the engine at low idle or at low speed and light load for more than 30 minutes at a time. Since unburned fuel and engine oil will adhere to the piston rings when operating at low speeds for long periods, this will interfere with proper movement of the rings and the diesel fuel consumption may increase. Low idle speed does not allow break-in of sliding parts.

If operating the engine at low speed and light load, you must race the engine to clean the carbon from the cylinders and the fuel injection valve.

Perform this procedure in open waters:

- With the clutch in NEUTRAL, accelerate from the low speed position to the high speed position briefly.
- Repeat this process five times.

Once past the initial 10 hours until 50 hours, the engine should be used over its full operating range, with special emphasis on running at relatively high power settings. This is not the time for an extended cruise at idle or low speed. The boat should be operated at maximum speed minus 400 rpm most of the time (approximately 70% load), with a 10-minute run at maximum minus 200 rpm (approximately 80% load) every 30 minutes and a 4 to 5 minute period of operation at WOT (wide open throttle) once every 30 minutes. During this period, be sure not to operate the engine at low speed and light load for more than 30 minutes. If operating engine at low speed and light load is necessary, race the engine after low idle operation.

To complete engine break-in, perform *After Initial 50 Hours* maintenance procedures. See *After Initial 50 Hours of Operation* on page 49.