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Marine Diesel Engines Westerbeke W30 vs. W33

Carsten Nachtigahl CS 36T *Polaris*

Again and again, I hear people comparing the W30 with W33. I feel it is about time to clarify a few points. These two engines are completely different from each other and cannot be compared. This also applies to the cooling systems, oil pump, starter, fuel injection pump and propeller.

Both diesel engines are converted by Westerbeke for marine use and in certain boats use the same transmission and V drive. The confusing part is that both engines are installed in the CS 36T. I believe that up to 1984 they used the W30 and in 1985 switched to the W33.

Westerbeke W30

The Westerbeke W30 is a British Leland block, with the marine jewelry installed by Westerbeke.

It is difficult to get a shop manual for this engine, but I just learned that Westerbeke still has a shop manual available - for a price. Our local dealer, Summer-Equipment Ltd., will let you make photocopies if you ask for it. See Ron Read, Parts Department, who is always very helpful - phone: (604) 873-2382.

The W30 has approximately 30 hp. The maximum RPM is 2500. It has an internal oil pump and the oil level should always be at the dipstick level or above because of the slant of the engine, I was told. It is a very robust engine and I have heard nothing negative about it.

The cruising RPM is around 1900 to 2200 RPM. The rule for a diesel to be healthy is to drive it at 75 of maximum RPM. The W30 people seem to have no problems with that.

Westerbeke W33

The Westerbeke W33 is a Mitsubishi block, again modified for marine use by Westerbeke.

It is easy to get specifications and parts for this engine. I still have two sets of specifications available at cost.

The W33 has approximately 33hp with a maximum RPM at 3600. It has an external oil pump and the engine is installed almost level.

Except for the primary heat exchanger (saltwater/freshwater), all other cooling systems are freshwater. Using the same rule of cruising at 75 of maximum RPM, the W33 people should cruise at 2700 to 3000 RPM. This is the problem. It seems that W33 owners are reluctant to run their engines at the higher RPM.

With the right propeller and a clean bottom, you should achieve approximately the following performance:

1500 RPM - 4.5 to 5 knots

2000 RPM - 5.75 to 6 knots

2500 RPM - 6.75 to 7 knots

3000 RPM and up - 7 to 7.5 knots

These speeds can be considered only as ballpark figures because there are many other factors that limit speed.

To find out if you have the right propeller, you should do the following test:

1. warm up your engine to operating temperature;

2. find your maximum no load RPM. (not every knot meter is properly calibrated);

3. secure boat to the dock with extra lines before doing a load test;

4. shift into gear and open the throttle fully.

With the right kind of propeller and pitch you should get approximately 90% of your no load RPM without black smoke. If you do not get these results you may have an improper sized or pitched propeller and your engine is clogged with carbon.

To my knowledge, hardly anyone is cruising above 2500 RPM. Many of the W33 propellers are oversized or over pitched so as to get full hull speed with the same RPM as the W30. This works the W33 engine too hard. The first indication is black smoke and a carbonized engine and poor performance. This may have contributed to the piston and piston ring failures that we have had lately.

Since you run your W33 at a higher RPM than the W30, you also have to be more particular in aligning your shaft flange. The specifications require a tolerance of not more than .001". You could have abnormal vibration if your alignment is not correct.

Propellers

Now a brief word in regards to propellers. I am not a propeller expert and every make has different properties. You have to consult with your local expert if you have a problem. However, I will offer some guidelines based on my experience.

Since the W30 has a lower maximum RPM than the W33, the propeller is larger. It is in the range of 16 to 17 inches for a three bladed fixed propeller and 17 to 18 inches for a two bladed fixed propeller.

For a W33 with a higher RPM, the propeller needs to be smaller. For a three bladed fixed propeller, the range is 15 inches and for a two bladed it is 16 inches.

I finally found the right propeller and pitch for my boat with a W33 engine. It is a Campbell Sailor three bladed fixed propeller of l5 x 10 x l. Because of all the wood in local waters I prefer a fixed propeller. They are much less expensive to repair than folding or feathering propellers.

The correct propeller may also reduce "prop walk". It can have many causes but over sizing and over pitching are possibly the most common cause of prop walk in the CS 36T.