

Tuning a Barefoot Sanger DX II wake

Introduction

The [2024 Barefoot Water Ski National Championships](#) will be pulled by three Sanger Barefooter DX II's in Helena, Montana. We had many very positive comments after the 2023 US Barefoot Nationals about how nice the wakes were on all the boats. This was an amazing compliment considering the two of the boats used were 8.1-liter big block and they pulled all the slalom events. I hope we can share some of our experiences with you.

There are many variables that can make a boat ski well and easy to drive. In this document we hope to explore some of the key issues to enhance the Inboard Sanger DX II Barefooter, whether it is new or 20+ years old. The goal of this discussion is to optimize the boat for ski-ability (Barefooting) and then top speed.

Testing the boats

There are many variables that can be changed, and our first suggestion is that you only change one variable at a time. When testing the boat ensure the

1. Boat has a clean hull
2. same skier about 175 pounds is used for all tests
3. skier is always on a 23-meter (75-foot) ski line
4. boat is level (left to right)
5. boat crew is the same for all the tests
6. boat ramp is near by because you will be pulling the boat out of the water to make changes
7. clipboard and pencil is in the boat to document changes

Weight and Balance

How the boat is loaded has a huge impact on the “ski-ability” of the boat. The first thing to understand about the Sanger DX II offers the best wake and speed if most of the weight is in the rear of the boat. This is demonstrated because the wake doesn't change from a full tank of gas or an empty tank. This is why all three judges at Nationals sat in the back of the boat at the 2023 US Barefoot Nationals. If you have only one judge in the boat, that judge and the videographer will sit in the back seat together. Secondly you may need to adjust who sits where to balance the boat left and right.

Hint - one of the hidden problems can be where a boom, and other heavy objects are stored under the bow of the boat. Excess items in the bow will slow the boat and degrade the wake quality.

Prop selection and prop puller

Prop selection performance has several variable including but not limited to:

1. Pitch & cupping
2. Diameter
3. Number of blades
4. Manufacturer
5. Altitude
6. Big block vs small block

Most of the Barefoot Sangers DX II with a small block would use a

- ACME 449™ 13.00" x 12.625" 3-Blade Propeller
- ACME 425™ 13.00" x 13.00" 3-Blade Propeller

Most Big Block would use:

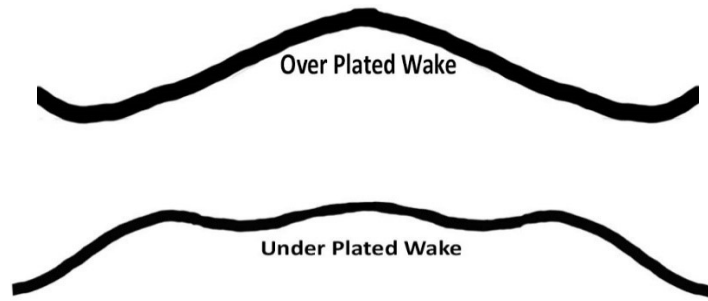
- ACME 425™ 13.00" x 13.00" 3-Blade Propeller
- ACME 1595 13.00" x 14.00" 3-Blade Propeller

The shallower the pitch typically the smoother the table after adjusting the plate for a flat table. I would use the attached spreadsheet to track your results for each prop and boat. This can be a little time consuming because you need to document the top speed and wake conditions for each prop. In ideal conditions the boat should bump the rev limiter alarm with out and skier and should not bump the rev limiter alarm with the skier. Using the table below you can create your data. Remember 2 props labeled the same can give different performances particularly if they are from different manufacturers.

Boat Desc	Boat Crew	Prop	Top Speed	Top RPM	Time To Buoy	Speed a Buoy	Weight of Skier
	Judges & Vid						
	Judges & Vid						
	Judges & Vid						
	Judges & Vid						

Barefoot Plate Adjustment

The plate adjustment will take a couple of tools and is the most important change you can make to a boat for barefoot wake slalom. This adjustment will change the shape of the wake and will vary depending on boat speed. The more the plate is driven down the more it will fill (raise) the middle of the wake and slow the boat down. If the plate is not driven down enough the wake will be low and uneven in the middle of the wake and we call this “under-plated”. If the plate is driven down too much the wake becomes a round bump (which is hard) in the middle of the wake and this is called over-plated. Please see the drawing below.



The first item to check that the barefoot plate is flush with the bottom. If it is not flush with the bottom of the boat you can purchase thin “shim stainless steel shim stock” at any good hardware store. It will come in thickness from 0.010 to 0.040 of an inch thickness and you can insert it between the bracket and the plate as needed to make it flush as shown in the photo.



To adjust the plate angle, you will need a 4-foot-long straight edge and a 3/16-inch drill bit (1/4-inch drill bit for a Big Block motor) to measure the downward angle at the apex of the plate as shown in the photo below. Remember to check this adjustment on both the left and right side of the plate. Also, it is important to understand how the turnbuckles are used to adjust the plate. After loosening the jam nut, you can move the turnbuckles to raise or lower the plate. For example, if the drill bit does not fit between the straight edge and the plate you would move the turnbuckle to push the plate down. If the drill bit fits loosely between the straight edge and the plate, then move the turnbuckle to raise the plate. The goal is to be able to feel a slight drag, or some resistance to the drill bit moving between the straight edge and plate when it is adjusted correctly. Don't forget to tighten up the jam nuts, and then double check both sides of the plate to ensure that they are still the same.

Note: The 4 foot level is flush with back of the plate and on the flat bottom of the boat

The plate must be flush with boat bottom & This is where you measure the change starting with a 3/16 inch drill bit



Remember this is a starting point. Now go ski the boat with a skier to evaluate the wake shape. Is the wave over plated or under plated. If so, make notes about the location and then add or remove the downward trim in the plate. If you have questions, please contact me.

Rudder adjustment

If the steering wheel is difficult to move, then you may need to replace the steering cable or lubricate the rudder bushing in the back of the boat. Secondly, if the boat wants to pull left, then right in a “twitchy” manner this also can be fixed by shaping the trailing edge of the rudder. If you have questions about this, please reach out to me and I can help you.

Basic Maintenance

Simple things will keep your boat skiing well and dependable, such keeping it clean, dry, and doing basic maintenance. I have an Excel Spreadsheet which helps me stay on schedule and tracks my maintenance. Again, if you would like a copy of this, please reach out to me.

Purchased 5/4/06	Part Number	Hours	50	100	150	200	250	300
Date			7/31/2006	9/222/06		9/24/2007		10/2/2008
Hour Meter		??	52	110		205		302
Actual Hours			52	110	0	205	0	302
Check Trailer Brakes and Fluid		50	Done	Done	Done	Done	Done	Done
Check Trailer Tire Pressure, Lug Nuts & bearing grease	50 PSI	50	Done	Done	Done	Done	Done	Done
Check Trailer winch, tongue jack, back straps and carpeting on bunks		50	Done	Done	Done	Done	Done	Done
Repack wheel bearing		300	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	- -
Check Trailer lights and wiring		50	Done	Done	Done	Done	Done	Done
Oil Teak Deck and clean/wax bottom		50	Done	Done	Done	Done	Done	Done
Check Closed System Cooling System Level	Dexcool 19 quart	50	Done	Done	Done	Done	Done	Done
Change Engine Oil and Filter	Bosch 3322 15W - 40 8 Quarts	100	changed	changed	XXXXXX	changed	XXXXXX	changed
Change Transmission	Modell 10-18-00 Velvet Drive 2 2 Quarts Dextron III	500	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
Check Battery level and clean		50	Done	Done	Done	Done	Done	Done
Clean flame arrestor and intake	Carborator cleaner	50	Done	Done	Done	Done	Done	Done
Change Raw Water pump impeller	Quick Silver 47-862232A 2 or 47-8M0104229	300	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	- -
Change Spark Plugs	AC Platinum (AC41983) or Denso TJ14R-P15	600	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
Change Fuel Filter	Quick Silver 35-8M0093688 and 35-892665	500	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
Inspect Serpentine belt		50	Done	Done	Done	Done	Done	Done
Inspect Drive Shaft and propeller		50	Done	Done	Done	Done	Done	Done
Inspect Propeller and shaft alignment		50	Done	Done	Done	Done	Done	Done
Grease Starter Bendix		200	Done	Done	XXXXXX	- -	XXXXXX	XXXXXX
Fall Jobs								
Grease Rudder		100	XXXXXX	Done	XXXXXX	Done	XXXXXX	Done
Fuel Stabizer		100	XXXXXX	Done	XXXXXX	Done	XXXXXX	Done
Touch up & paint corrotion on motor		100	XXXXXX	Done	XXXXXX	Done	XXXXXX	Done
	Boat Serial # DL109A606 Motor Serial# OW397214		Comments	Boat just came back from the 2006 World Championships. Windsheld was broken and replaced. 3 propellers damaged and repaired	Comments	Comments	Comments	New Water Pump Impeller and Fuel Filter