

Sea Doo 951 Exhaust Upgrade Kit

(Part # SDE951)



At **JETWORKS** we've been listening. Many of you have called us with questions and we have been tracking them. Here we have posted the questions and answers most commonly asked.

Q Why is your top speed claim of 3 to 5 mph hard to believe on an otherwise stock craft?

A the top speed gained varies from boat to boat because of the differences in manufacturing tolerances such as carb tuning, impeller pitches, etc. A stock craft with a set of aftermarket air filters and our jetting specs should yield a 3 mph increase on radar and approximately 5 mph on the factory speedometer. More can be gained by careful pipe temperature monitoring and correct carburetor tuning. All these figures are based on stock impeller and stock compression.

Q What modifications could effect the performance potential of this kit?

A Improperly jetted carbs from previous modifications. Top loader scoop grates (especially on the XPL). Over pitched impellers including re-pitched OEM's.

Q What kind of RPM gains can I expect out of this kit?

A From our research, we have found the factory tach's and inexpensive aftermarket tach's to be inaccurate. Because of this, we can't claim a particular RPM for each particular craft. The differences in reed condition and/or type, impeller variations (even between same models), carb jetting and adjustments, air temperature, air density and humidity will all have an effect. We have customers who swear their stock craft are turning 7180 to 7200 RPM, stock. Most stock crafts turn between 6790 and 6850 RPM. The typical RPM gains with this kit based on a stock craft reading of 6850 will be an increase to 7080 RPM.

Q Why is it that you don't recommend an increase in compression or aftermarket impellers with this kit?

A It's not that we don't, we just don't think that the increased compression and an aftermarket impeller would yield more acceleration or more top speed gain than our kits. If you figure out the cost of an aftermarket impeller and an aftermarket cylinder head or modifications to the OEM head, you have exceeded the cost of the **JETWORKS** exhaust upgrade kit. If you are looking to increase acceleration as much as possible, as in closed course racing, then these two additional items will be of benefit. An o-ring head always seals better, in our opinion.

Q I have been afraid to modify my 951 based on some stories I have heard of seized motors and water ingestion.

A Other tuners may not agree with us on this but practically every seized and scored top end attributed to water ingestion has been a direct result of a head gasket failure to seal. We have seen countless cases where a GTX or a 3

seater has been riding on smooth water with no water leaking from the head pipe or entering into the hull. You would have to be continuously ingesting water for a period of time for this to take place. It would have to be at top end speed, otherwise you would sense the water at lower speeds. Sea Doo used o-rings to seal all previous engines. The 951 uses a metal gasket. Here is what happens. The metal gasket does not allow compressibility at or after installation. In other words, once the engine heats up and cools down a few cycles, the studs and bolts recess and lose some ability to compress the gasket to factory specs. We must remember that the base gasket is compressible and the thru studs go into the case. Any loss or settling of the gaskets and fasteners decrease the head gasket seal. The typical 10 hour service does not see the head bolts re-torqued. If they were re-torqued, you would see the paint chipped from the nuts and bolts on the head. YOU MUST LOOSEN the fastener first and then re-torque to specs. If you check torque without loosening first, you will achieve torque specs without tightening the fastener. The paint on the bolts and nuts will increase the holding of the fastener and give a false reading. Most engines see a 45 degree turning of the head fastener with a few fasteners turning a full 90 degrees before reaching specs.

The 951 Sea Doo's have more water pressure than previous models. What happens is at higher speeds, when the engine is at or near full throttle, the water pressure actually forces some water into the combustion chamber. The engine can tolerate small doses of water, but this water literally steam cleans away the lubrication. When the amount of water is greater it will also start to show up as a decrease in top speed RPM, or a 'laying down' feeling at top end. It is not uncommon to see one perfectly good piston and one very badly damaged piston. Unfortunately, most of these incidents are routinely diagnosed as water ingestion through the carburetors and not thru the head gasket. When you back off the throttle slightly, the water pressure drops. What happens now is small amounts of combustion gas enter the water jacket. This could lead to localized hot spots which increase the likelihood of a larger head gasket leak. If we had visible bypasses, we might pick this up as air bubbles or intermittent water flow through the outlet.

We have plenty of customers with many hours on their 951's with our kits. The head gasket problem never occurs if you re-torque every 30 hours of operation.

Q What is your opinion on cylinder porting and increases in compression in regards to octane requirements?

A Any time you increase port timing and at the same time increase compression, you will generate more heat and this puts your threshold, or margin of error, a little thinner. Since you will be producing more horsepower and more RPM, you will have more heat per power stroke and more power strokes per minute, and less time to get rid of the heat. In this type of situation, we strongly suggest a 50-50 mix of av-gas. Depending on the squish height, compression, port timing, ignition timing and RPM, a good octane booster may be sufficient.

Q Do you recommend adjusting the oil injection pump adjustment for more oil?

A NO. We feel that by advancing or increasing the oil volume, it only makes you smoke more at idle and lower speeds. The amount of oil at wide open throttle is relatively the same as if it were at the stock setting.

We do, however, recommend on ported engines, with more compression, and modified or larger carburetors, that you add oil to the gas tank in addition to the oil already being injected by the OEM injection system. A 120:1 or 150:1 oil ratio would be much better since the amount of fuel is large at high speed, you then end up with extra oil when and where you need it the most. You also get some lubrication on the carburetor throttle shafts and internals as well.

Q I have heard from friends that the stock carburetors have a lean spot at near full throttle and that no-one can get rid of it. They said it was a 'signal loss' problem.

A This is a rumor that is put out there by people who would intimidate you and say that they have the 'secret' and you have to buy it, because they won't tell you what it is unless you buy it. This does happen to a certain extent. Usually on engines that have a series of modifications like cylinder porting, milled head, etc. The reason this happens is this - The carburetors use an accelerator pump. the accelerator pump is used to tune the transition so the craft won't bog or hesitate. Since the carbs use a relatively small low speed jet, they rely on this extra fuel so as to not hesitate. When the throttle is backed off from full throttle to approximately 3/4 throttle, the air velocity drops through the carbs and one of the reasons it drops is due to the fact that the carburetors are of a relatively large diameter. If you look through the carburetor, you will notice the booster venturi, or 'bombsight' is of a blunt

design. Since you partially closed the throttle, the air velocity is insufficient to force the air through the booster venturi, it just flows around it. You couple this up with a 7/8 to 3/4 throttle opening and you end up with the small, low speed jet unable to supply enough fuel for the amount of air flowing around the large throttle plate. The carburetor is 46mm. They require a slow speed jet of around 85. Most aftermarket carbs without accelerator pumps usually run between 120-130 low speed jets and they don't have this problem.

What can be done to lessen this effect? Increase the slow speed jet and lessen the accelerator pump throw. This lessens the amount of fuel injected. OR Install a supplement circuit to flow at this throttle setting. You must remember that it is not a common situation that needs attention. There are plenty of people out there without any of these carb mods and they are running perfectly fine, even at this throttle opening and for extended times.

Q What kind of carburetor mods are available for the OEM carburetors if I do want more flow capacity without any problems?

A We offer two types of mods for the stock 461 carbs. We can retain the accelerator pump because the consumer usually doesn't believe it should be removed. It also helps engine starting. (see [OEM carb mods](#))

Stage 1 includes taper bore and radiused entry top with a 2mm increase in outer venturi diameter and a modified booster venturi to increase signal and add an upper mid-range circuit.

Stage 2 includes taper bore and radiused entry top with a outer venturi diameter increase of 2mm. A thin tube high speed atomizer and a two stage intermediate circuit.

The stage 2 is a competent race carburetor. It will perform along the most expensive aftermarket carburetors with no loading up or linkage problems or manifold problems associated with aftermarket setups.

Q What kind of a speed gain can I really expect with this kit if I port the cylinder, modify the carbs and tune the craft properly?

A That depends on the type of craft, and the level and quality of the porting.

It is not uncommon to see an honest 5,ph gain on a properly tuned boat running on octane booster and 92 octane pump fuel. It takes someone who knows tuning and has experience. One important thing to remember is that more RPM does not necessarily mean more speed. We have seen, in some instances, where people want to use higher RPM figures and they de-pitch the impeller and they gain RPM and lose some speed. This might work on an aftermarket exhaust system where the torque and horsepower curves are up higher. In fact, this might have to be done, otherwise you don't get the full benefit of the aftermarket exhaust system and this may be the only way to restore good acceleration. What you end up with is a higher revving engine that now requires you to purchase a \$290.00 rev limiter.

[Go to the tech page for the Sea Doo 951 Exhaust Upgrade Kit.](#)