

Engine Removal / Installation

Sea-Doo Supercharged 4TEC

Step 1

Battery / Line Removal

1.1 Remove rear tray, disconnect the vent tube and wires of the battery, negative terminal first, and remove it from the ski. Now is a good time to check the water levels and fully charge the battery.



Step 2

Engine Removal Prep

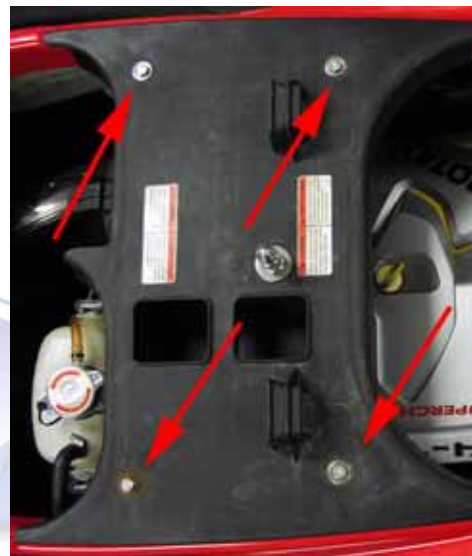
2.1 Unclip the rear vent hose from the seat support plate and remove it.



2.2 Slide the coolant reserve tank up, off the mounts and swing it rearward out of the way.



2.3 Remove the four 12mm bolts securing the seat support plate and remove it.



2.4 Remove the coolant drain plug from the rear of the ride plate. Remove the reservoir cap and let the system drain as much as possible into a container.



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2.5 Remove the pump assembly. Remove the steering, trim and reverse cables, cable bracket and 4 hull nuts. Pull/wiggle the pump backwards, off the hull.



2.6 Slide the driveshaft back, out of the hull.



2.7 Loosen/remove the clamps for the supercharger and rear hoses as shown.



2.8 Undo the oil pressure sensor under the intake manifold at the right rear.



2.9 Remove all cables and harnesses & the dipstick.



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2.10 Remove the intake manifold.
All the screws are hidden.



2.11 Remove the supercharger using the special wrench. The two bottom bolts are hidden.



2.12 Remove the cooling hoses.



2.13 Remove the motor mounts the 3rd mount is hidden.



2.14 Hoist the engine with a cherry picker 6" for access. Remove the grounds and starter cables.



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2.15 Remove the exhaust pipe and lines.



2.16 Remove the exhaust pipe and baffle.



2.17 Lift the engine out of the hull, twisting it to clear as needed. Set it on a bench or better yet, and engine stand. Remove the oil filler cap and filter.



Step 3

Accessory Removal

3.1 Remove the plug coil packs and plugs.



3.2 Remove the front and rear motor mount brackets. Remove the PTO housing.



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2.20 Remove the magneto cup bolts, the cup, ring gear and bendix.



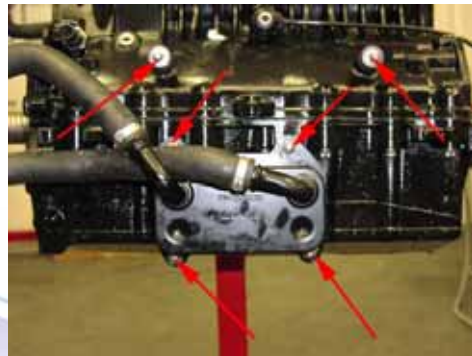
2.21 Remove the oil pump.



2.22 Remove the exhaust manifold.



2.23 Remove the oil radiator and intake manifold mounts.



2.24 Remove the cam inspection plate and position sensor.



2.25 Remove the rear lift bracket



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2.26 Remove the front lift bracket, knock sensor, oil pressure sensor and temp sensor.



2.27 Install the crank lockup tool, then use the PTO tool to remove the PTO.



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Engine Installation

Paper Gaskets

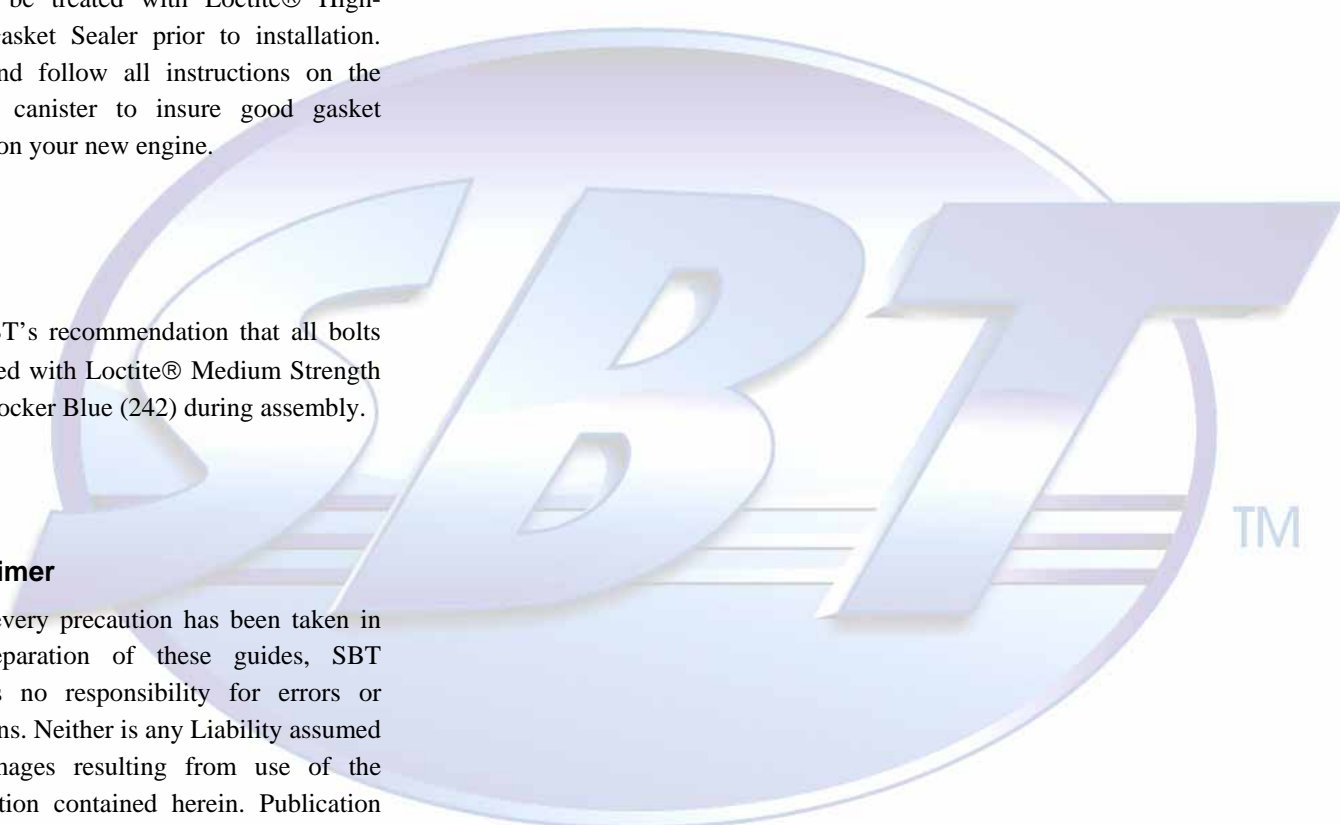
It is SBT's recommendation that all paper gaskets be treated with Loctite® High-Tack Gasket Sealer prior to installation. Read and follow all instructions on the product canister to insure good gasket sealing on your new engine.

Bolts

It is SBT's recommendation that all bolts be treated with Loctite® Medium Strength Threadlocker Blue (242) during assembly.

Disclaimer

While every precaution has been taken in the preparation of these guides, SBT assumes no responsibility for errors or omissions. Neither is any Liability assumed for damages resulting from use of the information contained herein. Publication of the procedures in these guides does not imply approval of the manufacturers of the products covered. Persons engaging in the procedures herein do so at their own risk



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Follow the removal steps in reverse order to install your new SBT short block assembly:

3.10 Using a 6mm allen and 16mm open end wrench, remove the cap and install the crank lockup tool to snug. Install PTO with 1" socket to 184 ft. lbs. Torque cap to 13 ft. lbs.

3.9 Install front lift bracket with E-8 socket to 7.5 ft. lbs. install knock sensor to 18 ft. lbs., oil pressure (rear) sensor with 6mm allen to 7.5 ft. lbs. Install Temp sensor (top rear) with 19mm wrench to 13 ft. lbs.

3.8 Install rear lift bracket with T-8 socket to 7.5 ft. lbs.

3.7 Install cam inspection plate and position sensor with E-8 socket to 5 ft. lbs.

3.6 Install oil radiator with E-8 socket to 7.5 ft. lbs. Use 1 1/2" clamps on lines. Install intake manifold mounts with E-8 socket to 7.5 ft. lbs.

3.5 Install exhaust manifold with E-8 socket to 7.5 ft. lbs. Use a thin bead of Permatex The Right Stuff or Threebond 1211 on the mounting surfaces. Use a 1" clamp on the line.



3.4 Install the oil pump with an E-8 socket to 7.5 ft. lbs. Use High Tach gasket treatment on gasket. Pivot the pump on the bracket first. Use 1 1/2" clamp on lines.

3.3 Install flywheel and bendix & washers with 13mm socket to 18 ft. lbs. being sure to align the dowel pin. Make sure the washers are beveled out.



3.2 Install the front motor mount with a T-10 socket to 18 ft. lbs. Install the rear motor mount with a E-10 socket to 18 Ft. Lbs. Install the PTO housing with an E-8 socket to 7.5ft. lbs. and install the oil lines.

3.1 Install the spark plugs and coil packs.

2.17 Install the oil drain plug with an 8mm allen to 13 ft. lbs. Install the oil filler cap with an E-10 socket to 7.5 ft. lbs. Install the starter to the block with an E-8 socket to 7.5 ft. lbs.

2.15-16 Lift the engine on the hoist and hover over the hull low enough to attach the starter cables and rear exhaust manifold line. Install the exhaust pipe and lines.

2.14 Install the motor mounts with a wobble socket or universal joint and 13mm socket to 18 ft. lbs.

2.13 Install the cooling hoses and ground cables with an 10mm socket to 7.5 ft. lbs.

2.11 Install the supercharger using the special SC wrench and an E-8 socket to 7.5 Ft. Lbs.

2.10 Install the intake manifold with an E-8 socket to 7.5 ft.lbs.

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2.9 Install the oil dipstick, all cables and harnesses.

Fill the engine with 4.8 quarts of oil and fill the coolant tank to the high mark. Start and idle the engine for 5 seconds, then stop. Check oil level and top off.

2.8 Install the oil pressure sensor to 7.5 ft. lbs.

- IMPORTANT -

2.7 Install the supercharger clamps to 9 ft. lbs. with a 10mm deep socket, and rear hoses.

DO NOT run the engine any more than the 5 seconds at this point, follow these guidelines exactly!

2.6 Have someone wiggle the driveshaft forward into the PTO while you twist it to engage the splines.

At this point the engine coolant needs to be topped off before normal running. The thermostat needs to open to allow full circulation. The ski must be idled around in the water or strapped to the trailer for 2-3 minutes AT MOST. Then either with the ski in the water or on a trailer out of the water on a level surface, top off the coolant and recheck the oil level.

2.5 Install the pump to the hull with a 17mm socket to 23 ft. lbs. Install the pump bracket with a 13mm socket to 18 ft. lbs. Install all cables and hoses.

2.4 Install the coolant drain plug in the ride plate.

2.3 Install the seat support bracket with a 12mm socket to 12 ft. lbs.

2.2 Snap the coolant tank on.

2.1 Install the vent hose.

1.1 Install the rear tray and battery.

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Tools Needed:

Sockets

- 1" socket
- 10mm socket
- 13mm socket
- 17mm socket
- 10mm deep well socket
- 21mm deep well socket
- E-8 socket
- E-10 socket
- 8mm Allen socket
- 6mm Allen socket
- 5mm Allen socket

Wrenches

- 10mm wrench
- 19mm wrench
- Torque wrench
- Supercharger wrench (Sea-Doo part # 529-035-938)

Sealers / Lubricants

- Loctite® Medium Thread locker (Blue) 242
- Loctite® High-Tach
- Sea-Doo XP-S 10w-40 4 Stroke Oil (Non-Synthetic)
- Copper high-temp RTV

Misc.

- Ratchet
- Universal joint
- Long socket extension
- Short socket extension
- Screwdrivers
- Universal flywheel puller (Available at most major auto parts stores for rent/lend/purchase)
- PTO tool (Sea-Doo part # 529-035-820)
- Teflon pipe tape
- Crank Lockup Tool (Sea-Doo part # 529-035-821)

Parts

- External Gasket Kit
- 1" Stainless steel hose clamps
- 1 1/2" Stainless steel hose clamps
- 2" Stainless steel hose clamps