

Engine Removal / Installation

Yamaha 701T / 760

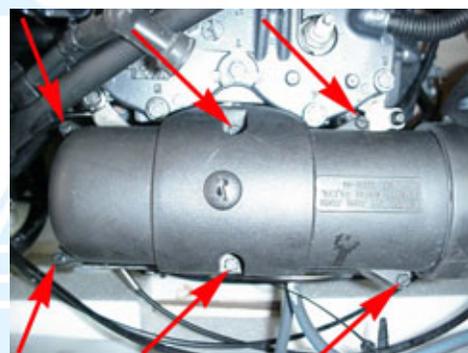
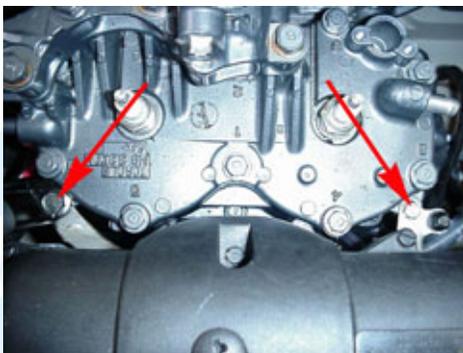
Step 1

Battery Removal

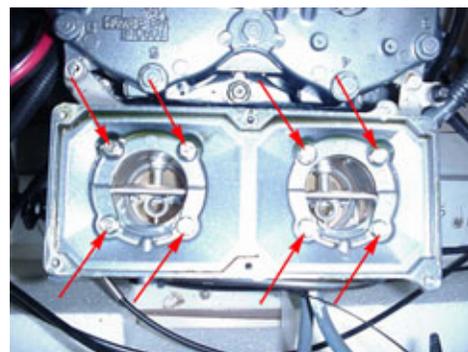


1.1 (Above) Remove the two retaining straps, disconnect the battery and remove it from the hull. Disconnect the negative (black) cable first, then the positive (red).

2.2 (Below) Remove the two bolts securing the carb stack brace to the block, using a 12mm and a 10mm socket.



2.3 (Right) Remove the six 8mm bolts from the air intake with a socket and screwdriver then remove the cover, exposing the two flame arrestor screens. Remove the screens and the eight 10mm bolts securing the flame arrestor base to the carburetors.



Step 2

Intake Removal

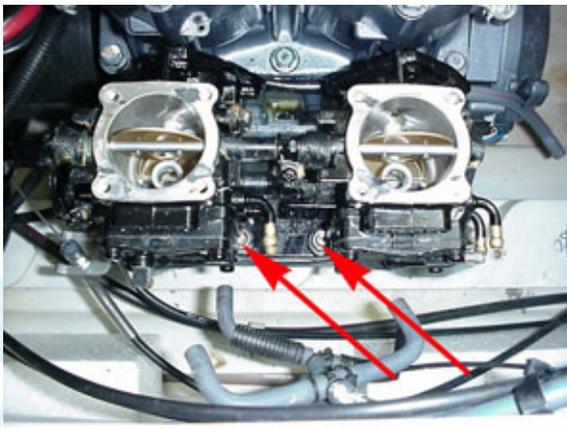
2.1 (Right) Remove the two head cooling lines and spark plug boots. Loosen the clamp and remove the exhaust pipe cooling hose.



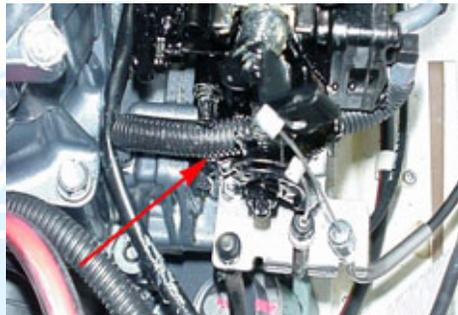
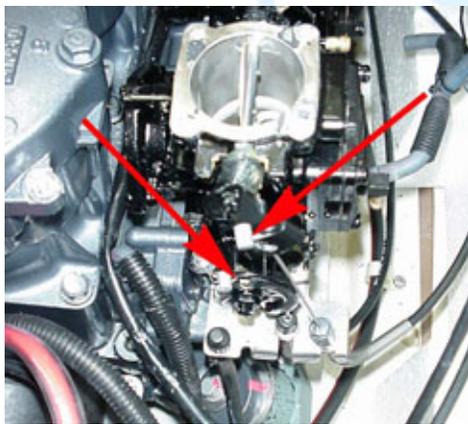
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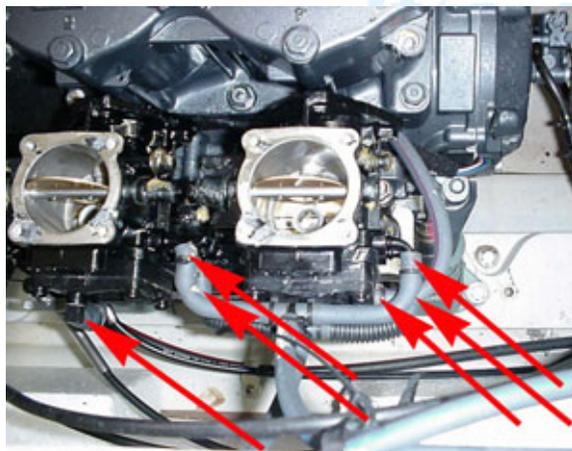
2.4 (Below) Remove the carburetor brace from the assembly, then remove the choke and throttle cables from the carbs.



2.6 (Left, Below) Remove the 4 carb base mounting bolts with a 12mm wrench and remove the carb assembly from the hull.

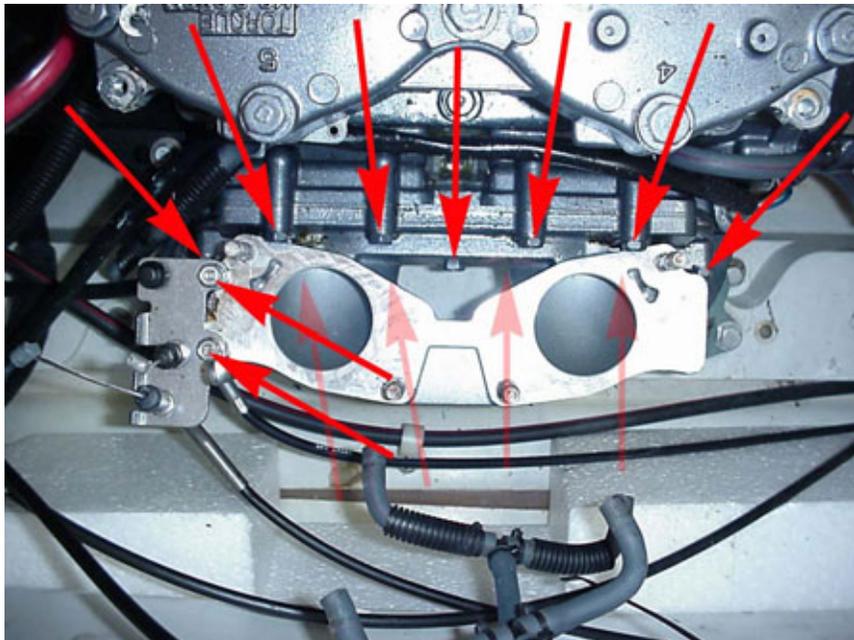


2.5 (Right) Loosen the gas tank cap to relieve pressure. Be sure the fuel switch is turned to the "OFF" position, and be aware of any fuel that may spill from the hoses. Make sure the hull is clear of any gasoline fumes before continuing work, especially with power tools. Disconnect the pulse lines, fuel in & fuel return lines from both carbs. Mark each line so you can replace them later to the correct position.



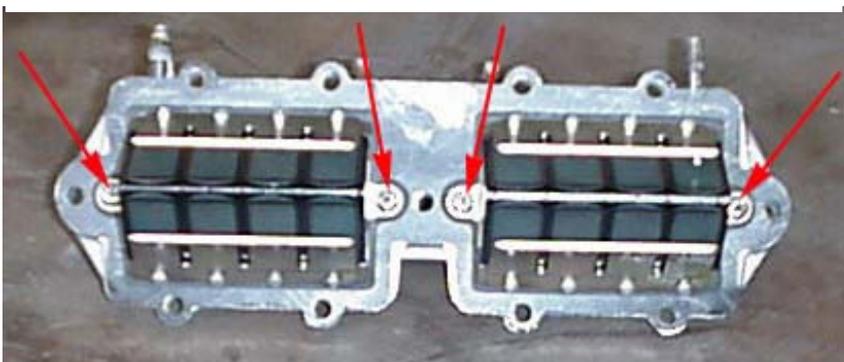
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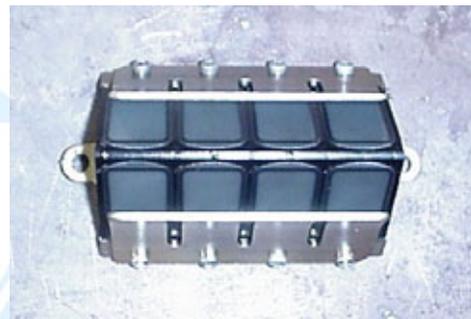


2.7 (Above) Use a 10mm socket to remove the two bolts securing the cable bracket, then remove the 11 10mm bolts from the intake manifold. Remove the manifold from the hull.

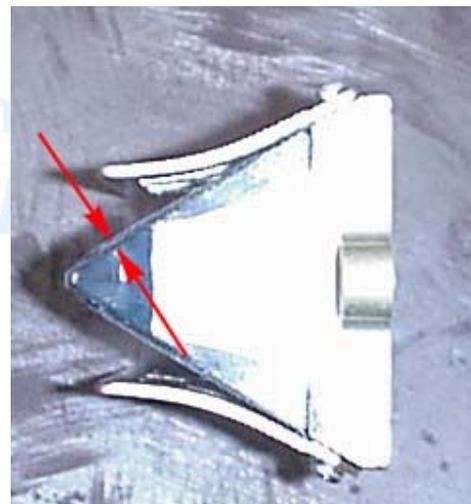
2.8 (Below) Remove the four screws holding the reed cage assemblies and remove them from the intake manifold.



2.9 (Below) Inspect each reed assembly for damage and wear. Look at each reed petal and inspect the edges for signs of cracking, chipping or any missing parts. If any damage is present, replace the petals.



2.10 (Below) Look at each petal-to-cage surface and check for gap. If a gap of more than 0.015" is present, replace the petals.



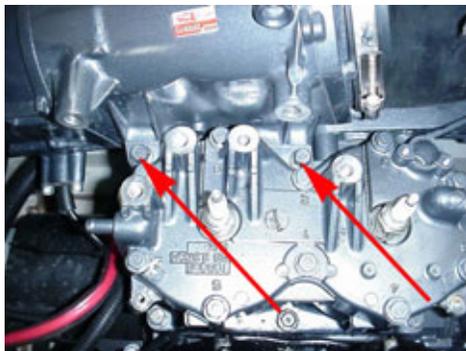
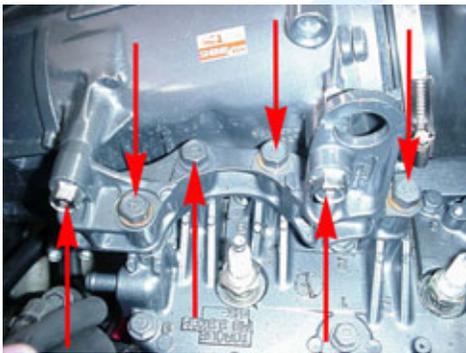
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Step 3

Exhaust Removal

3.1 (Below) Remove the two 14mm bolts securing the pipe to the mounting bracket, then the four bolts securing the bracket to the head. Remove the bracket from the hull.



3.2 (Above) Remove the two 12mm bolts securing the exhaust pipe to the cylinders.

3.3 (Below) Remove the thermo sensor from the exhaust pipe by removing the two 10mm bolts.



3.4 (Below) Loosen the clamp around the waterbox coupler and slide the waterbox back, out of the boot.



3.5 (Above) Remove the three 12mm bolts from the pipe brace and remove the brace from the hull.

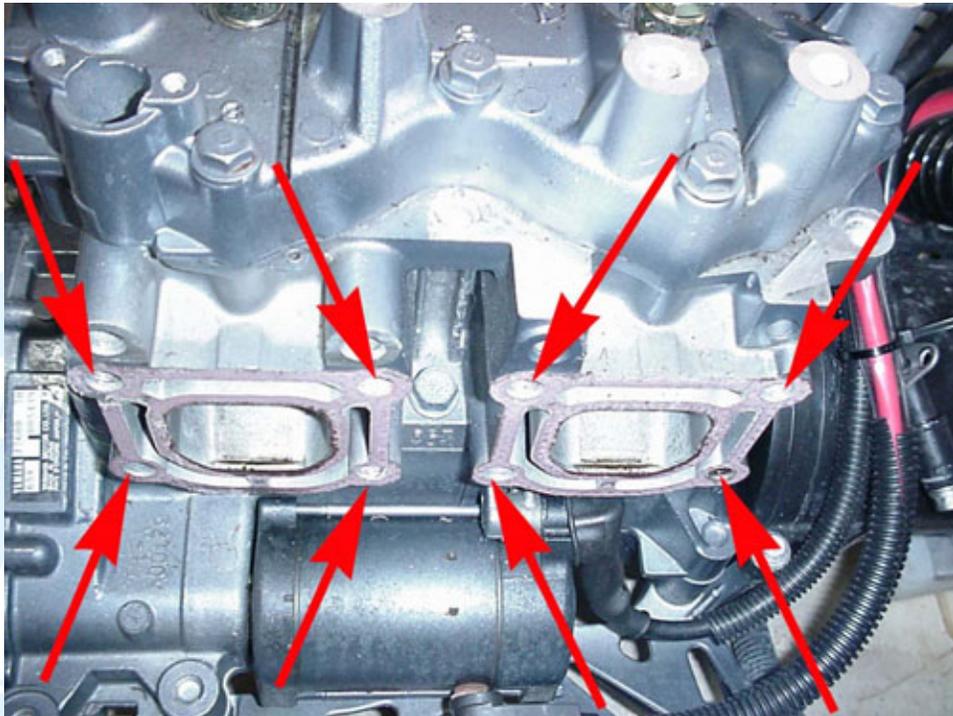
3.6 (Below) Remove the exhaust outlet hose from the pipe.



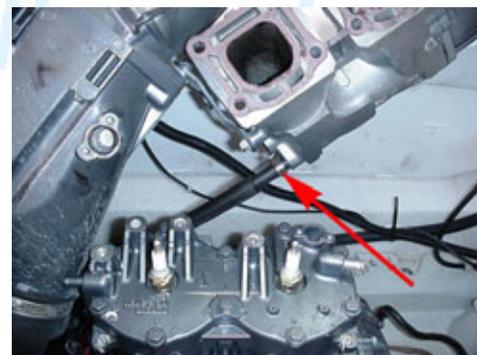
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3.7 (Right, Below) Using a 12mm socket and wrench, remove the eight exhaust manifold bolts securing the manifold and pipe to the hull. The bolts are not all visible with the pipe installed, so a shot of the manifold already removed has been used to illustrate bolt placement. The bottom center bolts are extra long and will not be able to be removed until the pipe is lifted out of the hull. Simply loosen them so they clear the block threads. A wrench will need to be used on the front bottom bolt; all others are accessible with a socket, some also needing an extension.



3.8 (Right) Slide the pipe up enough to reach the exhaust inlet water line. Loosen the clamp with a screwdriver and remove the line. Remove the exhaust from the hull.



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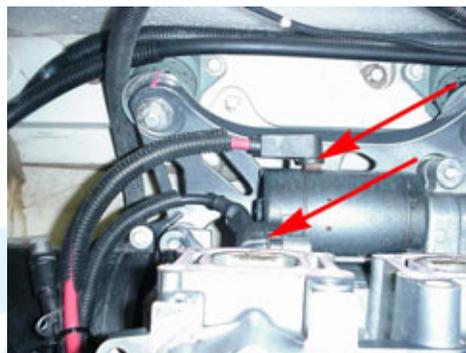
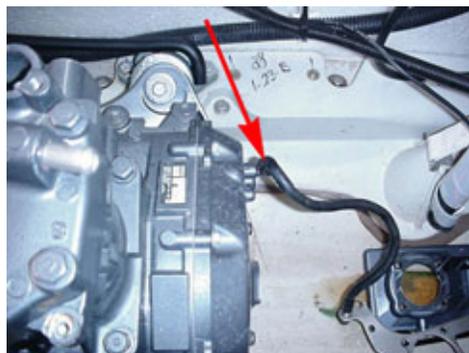
Step 4

Engine Removal

4.1 (Below) Remove the oil pump from the flywheel housing by removing the two 10mm bolts. It is SBT's recommendation that the oil pump be left off the new engine, and a block-off plate be installed at this time.

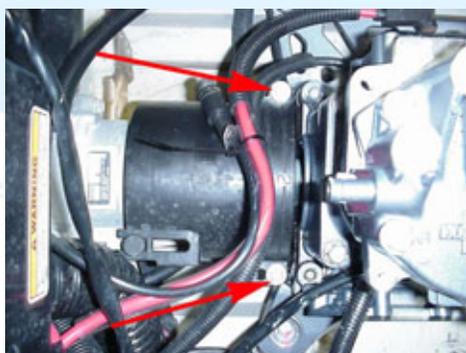


4.2 (Below) Remove the grease line from the flywheel housing.

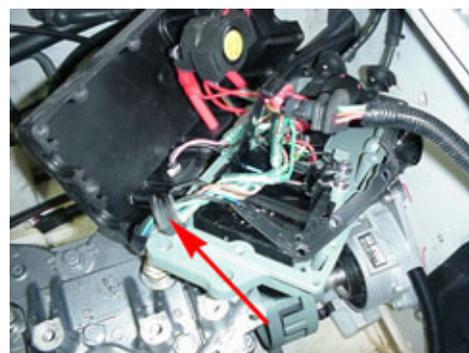


4.3 (Above) Remove the starter lead nut & washer with a 10mm socket and block ground bolt with a 12mm socket.

4.4 (Below) Remove the two 10mm bolts from the PTO coupler shield and remove it from the hull.



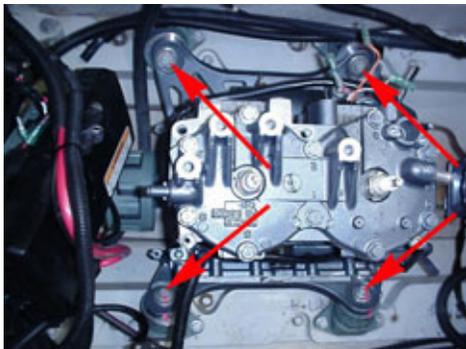
4.5 (Below) Remove the three 13mm bolts securing the electrical box to the hull. Open the box by removing the 14 screws and detach all the flywheel electrical wires. Remove the flywheel harness grommet from the electrical box. **NOTE: DO NOT CUT THE WIRES!**



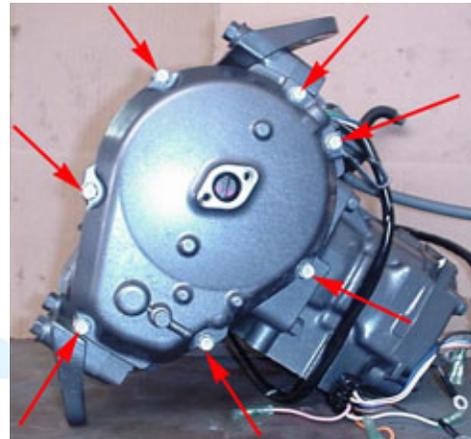
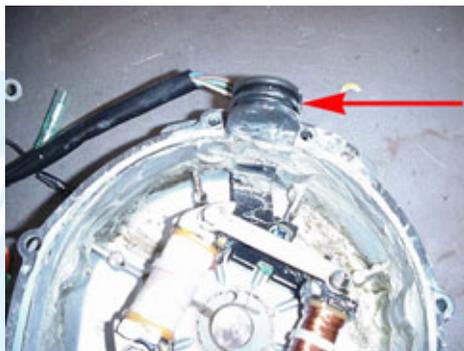
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4.6 (Below) Remove the four 12mm engine mount bolts. Note the number and position of all engine mount shims.



5.2 (Below, Right) Remove the 7 10mm bolts from the flywheel housing and remove the cover. If the cover grommet stays with the gasket, bend it free and remove the old gasket.



Step 5

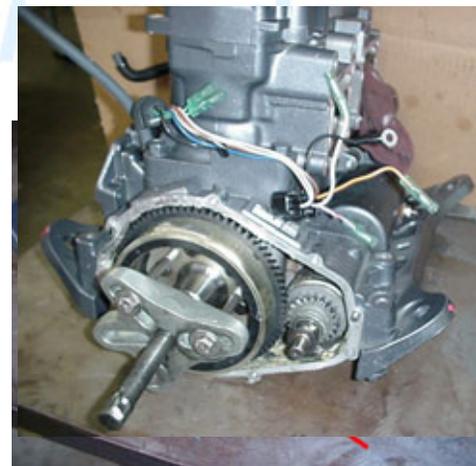
Accessory Removal

With the engine on the ground, workbench or some other solid surface, begin removing the external accessories that will NOT be shipped with the core.

5.1 (Below) Remove the four 14mm bolts securing the rubber engine support to the case and remove the support. Replace the bolts.



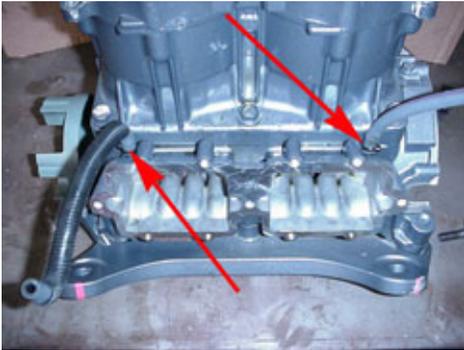
5.3 (Above, Right) Stuff a rag into an open exhaust port. This will prevent the engine from turning over while removing the flywheel and PTO coupler. Remove the flywheel nut with a 17mm socket. Use a universal flywheel puller to remove the flywheel from the shaft. Do not ship the flywheel key to SBT. Pull the starter gears out of the housing.



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5.4 (Below) Remove the pulse lines from the case.



5.5 (Below) Remove the remaining starter bolt with a 12mm socket.



5.6 (Below) Use a chain wrench to unscrew the PTO coupler. After it spins free, remove the rag from the exhaust port.



5.7 Remove the spark plugs, and with all of the external accessories removed, the engine is now ready to be packaged and shipped to SBT! NOTE: the bottom engine braces stay on the block to be shipped back. Removal is not necessary.

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Engine Installation

Oil Injection

It is SBT's recommendation that the oil injection pump be disabled, and block-off plate(s) be installed prior to use of the new engine in your ski. This is only recommended to insure reliable lubrication and extended engine life for all our customer's PWCs. Re-use of your functioning oil injection pump, if so equipped, does not void your warranty.

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.

Special Gaskets

It is SBT's recommendation that all exhaust gaskets be sealed with Loctite® Copper Gasket Adhesive 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.

Break-In Oil

It is SBT's requirement that the new engine be broken-in with additional oil in the fuel supply for the first tank. Follow the mixing chart on the back of the bottle to determine quantity needed.

Electrical Connections

It is SBT's recommendation that all electrical connections be sanded, cleaned and secured during the assembly process. It is a common problem to not have solid connections due to corrosion, paint, poor wire condition, etc.

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:

5.7 Install new spark plugs.

5.6 Insert a rag into an open exhaust port. Install the PTO coupler.

- Torque to 27 ft. lbs.

5.5 Install the starter and the bottom bolt.

- Torque to 17 ft. lbs.

5.4 Install the pulse line hoses on the case.

5.3 Insert the starter gears into the housing. Place the flywheel key into the shaft slot and install the flywheel.

- Torque to 50 ft. lbs.

5.2 Using a new gasket, install the flywheel cover and bolts.

- Torque to 11 ft. lbs.

5.1 Install the rubber engine support.

- Torque to 12 ft. lbs.

4.6 Spin the engine mount bolts into the mounts, and rock them back & forth with your hands; try to break them. If any mount(s) fails, replace it before installing the new engine. Place the engine in the hull. Place it on the mounts in a forward position, sliding it back into the coupler.

- Torque to 12 ft. lbs.

Your new engine may require re-shimming. Shims are necessary between the engine mounts and brackets to properly align the engine and pump shafts. If you do not have enough factory shims with your hull, very thin, wide washers may be substituted.



Take a small straight edge and place it on the coupler. You are looking for an even match all the way around the coupler. Place shims where necessary to align the couplers.

4.5 re-attach the electrical wires inside the CDI box. Replace the cover and re-attach the box to the hull.

Torque to 12 ft. lbs.

4.4 replace the PTO shield.

Torque to 4 ft. lbs.

4.3 Attach the starter wire, nut & washer. Attach the engine ground bolt.

- Torque to 3.6 ft. lbs.

4.2 Re-attach the flywheel grease line to the housing.

4.1 Using a new gasket, install the oil pump, if so equipped. Open the bleed screw and allow the line to bleed for at least one minute to remove air pockets.

- Torque to 12 ft. lbs.

3.8 Place the exhaust in the hull. Re-attach the rear exhaust inlet line.

3.7 Using a new gasket, re-install the exhaust assembly to the engine. NOTE: the two bottom center bolts (long) must be in the pipe before placing it all the way in the hull.

- Torque to 29 ft. lbs.

3.6 Attach the exhaust outlet hose.

3.5 Replace the pipe brace and install the three bolts.

- Torque to 38 ft. lbs.

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3.4 Replace the waterbox coupling and clamp.

3.3 Replace the thermo sensor in the pipe.

- Torque to 11 ft. lbs.

3.2 Re-install the exhaust to engine bolts.

- Torque to 29 ft. lbs.

3.1 Re-attach the exhaust brace and bolts.

- Torque to 29 ft. lbs.

2.8 Using a new gasket, re-install the reed cages to the intake manifold.

- Torque to 12 ft. lbs.

2.7 Re-attach the intake manifold to the engine.

- Torque to 13 ft. lbs.

Re-attach the cable bracket to the manifold.

- Torque to 5.8 ft. lbs.

2.6 Using a new gasket (rings up), install the carb assemblies and 4 nuts.

- Torque to 13 ft. lbs.

2.5 Re-attach the carb lines.

2.4 Replace the carb stack brace and re-attach the carb cables.

2.3 Re-install the flame arrestor base and 8 bolts.

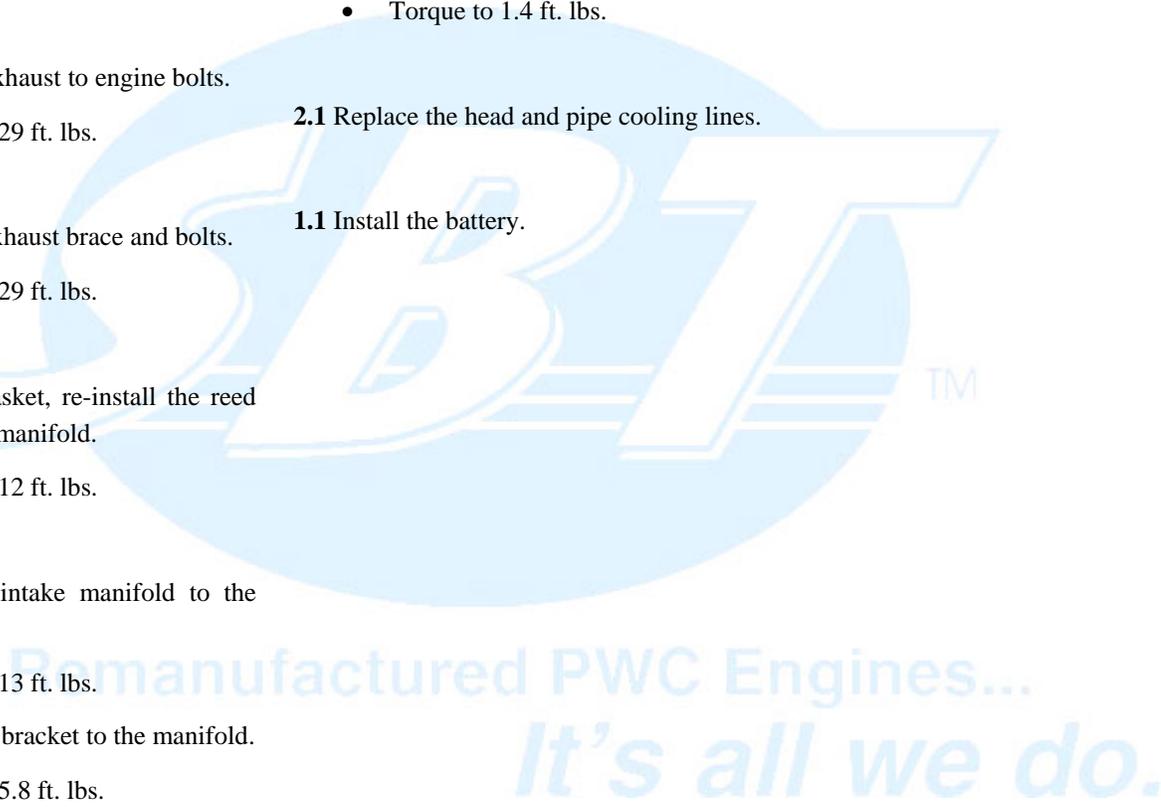
- Torque to 5.8 ft. lbs.

Replace the flame arrestor screens, cover and six bolts.

- Torque to 1.4 ft. lbs.

2.1 Replace the head and pipe cooling lines.

1.1 Install the battery.



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Tools Needed:

Sockets

- 17mm socket
- 14mm socket
- 13mm socket
- 12mm socket
- 10mm socket
- 8mm socket

Sealers / Lubricants

- Loctite® Copper Gasket Adhesive
- Loctite® 2 Gasket Sealer
- Loctite® Medium Threadlocker (Blue) 242
- Loctite® High-Tach
- SBT Break-In Oil

Misc.

- Ratchet
- Long socket extension
- Short socket extension
- Screwdrivers
- Universal flywheel puller
(Available at most major auto parts stores for rent/lend/purchase)

Parts

- External Gasket Kit
- Zip-Ties

Wrenches

- 12mm wrench
- 10mm wrench
- Torque wrench
- Chain wrench

Remanufactured PWC Engines...
It's all we do.