

Engine Removal / Installation

Kawasaki 440 / 550

Step 1

Battery Removal

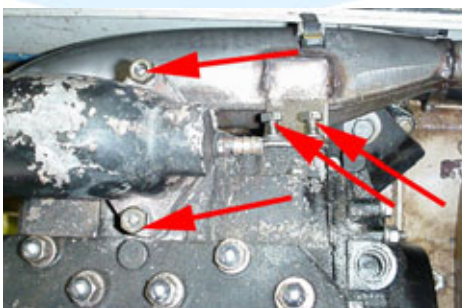


1.1 (Above) Remove the two retaining straps, disconnect the battery and remove it from the hull. Disconnect the negative (black) cable first, then the positive (red).

2.2 (Below) Remove the water by-pass line from the pipe.



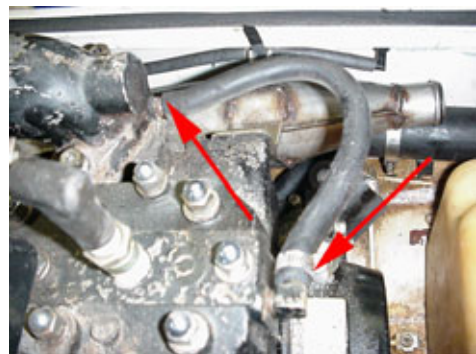
2.3 (Below) Remove the four 10mm nuts / bolts from the exhaust manifold and bracket. Remove the exhaust pipe from the hull.



Step 2

Exhaust Removal

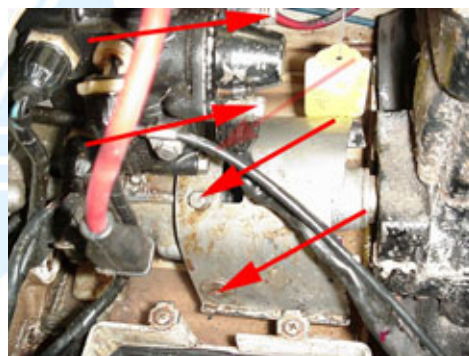
2.1 (Below) Remove the exhaust hose from the end of the pipe. Remove the water line from the pipe and the head.



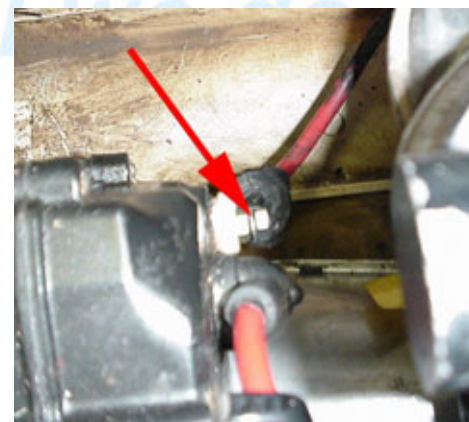
Step 3

Engine Removal

3.1 (Below) Remove the three 10mm bolts securing the PTO shield and remove it. Remove the two 10mm bolts securing the flywheel electrical wire cap. Open the cap and disconnect the harness. **NOTE: DO NOT CUT THE WIRES!**



3.2 (Below) Disconnect the starter positive wire at the relay box with a 10mm socket.

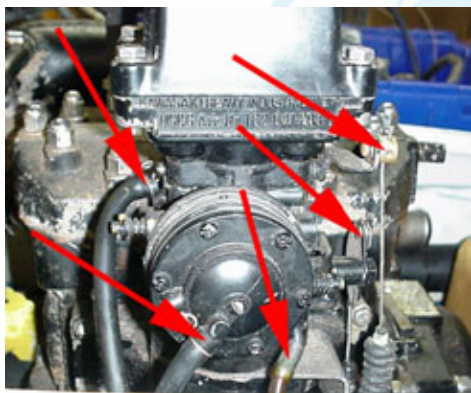


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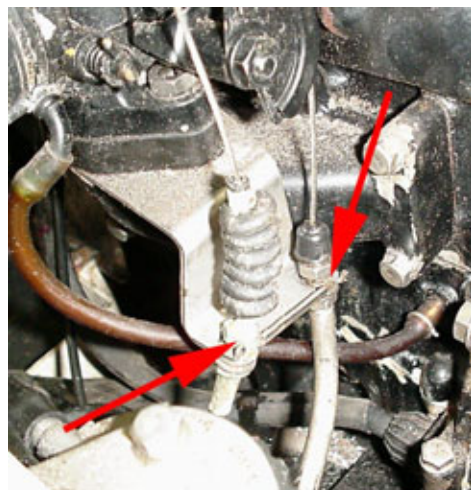
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Loosen the gas tank cap to relieve pressure. Be sure the fuel switch is turned to the "OFF" position, and be aware of any fuel that may spill from the hoses. Make sure the hull is cleared of any gasoline fumes before continuing work, especially with power tools.

3.3 (Below) Remove the fuel in, fuel return and pulse lines from the carb. Disconnect the throttle and choke cables from the carb.



3.4 (Below) Remove the throttle and choke cables from the mount with a 10mm wrench. Remove the engine from the hull.

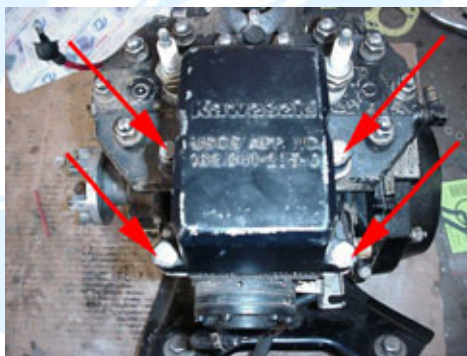


Step 4

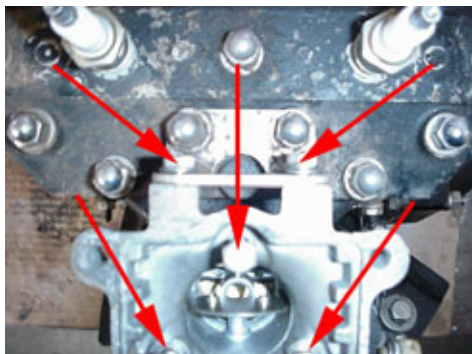
Accessory Removal

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.

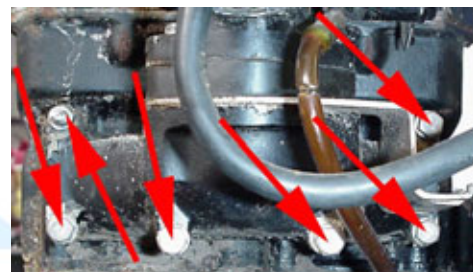
4.1 (Below) Remove the four 10mm bolts from the flame arrester cover. Remove the flame arrester screen.



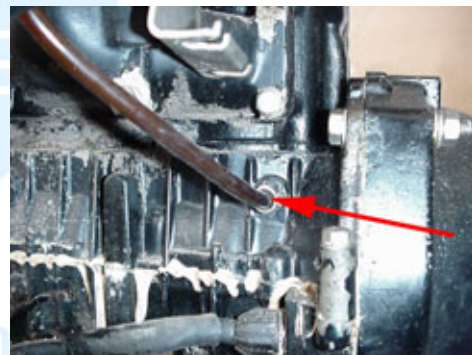
4.2 (Below) Remove the two 10mm bolts securing the carb to the brace. Remove the three 10mm bolts securing the carb to the manifold.



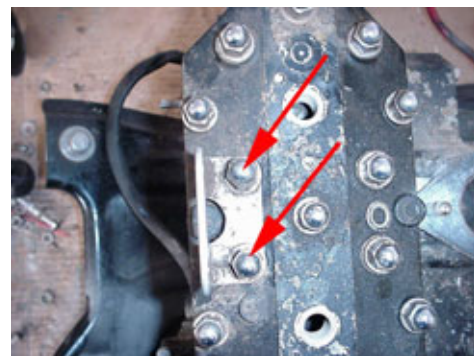
4.3 (Below) Remove the six 10mm bolts from the intake manifold. Remove the carb/manifold assembly.



4.4 (Below) Remove the pulse line hose from the case. Replace the hose if necessary.



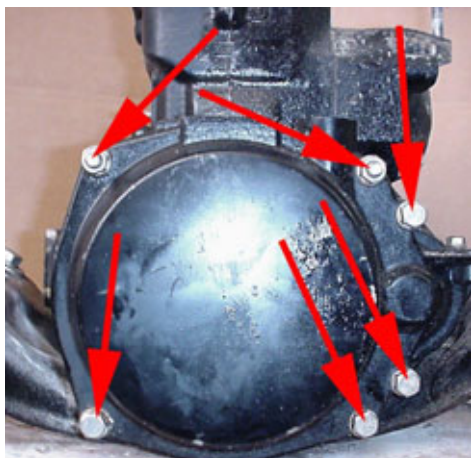
4.5 (Below) Remove the two 12mm nuts securing the carb brace to the head. Remove the brace and replace the nuts.



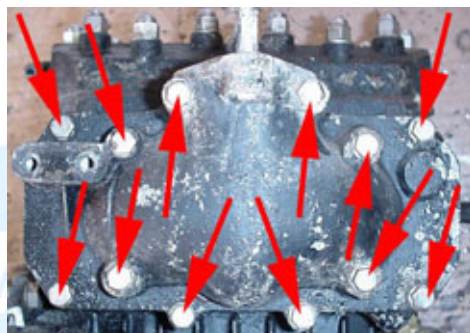
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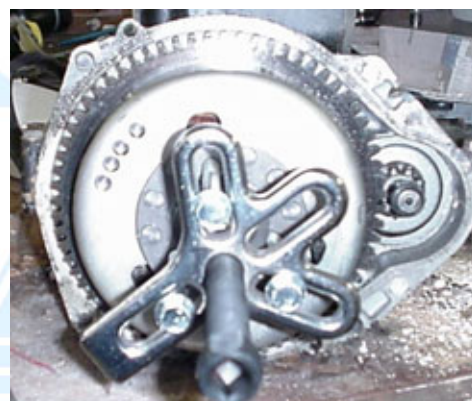
4.6 (Below) Remove the six 10mm bolts / nuts from the flywheel cover plate. Remove the cover.



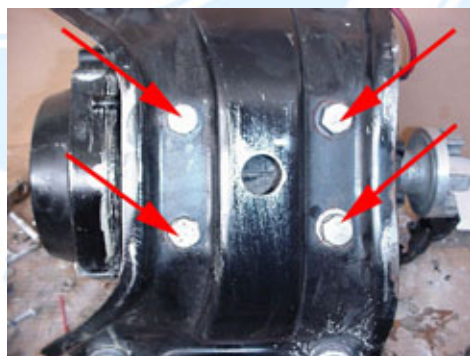
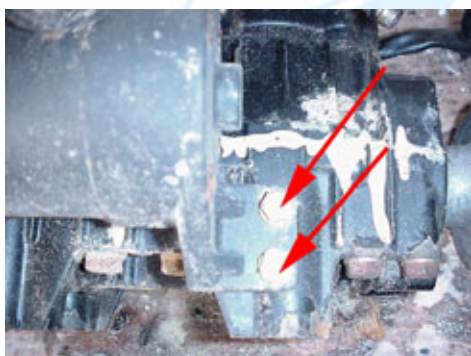
4.8 (Below) Remove the 12 10mm bolts securing the exhaust manifold to the cylinders. Remove the manifold.



4.11 (Below) Use a flywheel puller to remove the flywheel. **CAUTION:** Do not screw the puller screws into the flywheel more than 5 complete turns or damage to the stator may occur. Remove the bendix. Remove the two mounting screws and the stator.



4.9 (Below) Remove the four 17mm bolts securing the engine mount plate and separate it from the engine.



4.7 (Above) Remove the two 10mm bolts securing the starter motor. Pull the starter motor firmly back and out of the flywheel housing.



4.10 (Below) Tap the nut retaining tabs back to gain access to the nut. Remove the flywheel nut with a 19mm socket.



4.12 (Above) Using a chain wrench, remove the PTO coupler.

The engine is now ready to be sent to SBT!

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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:

4.12 Install the PTO coupler.

- Torque to 20 ft. lbs.

4.11 Install the bendix. Install the stator. Line the timing mark up with the case split.

4.10 Install the flywheel and nut.

- Torque to 115 ft. lbs.

4.9 Install the engine mount plate.

- Torque to 35 ft. lbs.

4.8 Using a new gasket, install the exhaust manifold.

- Torque to 8 ft. lbs.

4.7 Install the starter.

- Torque to 12 ft. lbs.

4.6 Using a new gasket, install the flywheel cover.

- Torque to 12 ft. lbs.

4.5 Install the carb brace.

- Torque to 12 ft. lbs.

4.4 Install the pulse line hose to the case.

4.3 Using a new gasket on both sides of the reeds, install the intake manifold.

- Torque to 52 in. lbs.

4.2 Secure the carb to the manifold and brace.

- Torque to 16 ft. lbs.

4.1 Install the Flame arrestor screen and cover.

- Torque to 52 in. lbs.

3.4 Place the engine in the hull. Install the engine mount bolts. Attach the carb control lines to the brace.

- Torque to 27 ft. lbs.

3.3 Connect the carb fuel lines, and control cables to the carb.

3.2 Attach the positive starter wire to the relay.

- Torque to 52 in. lbs.

3.1 Install the PTO coupler shield. Attach the electrical harness and replace the cover.

2.3 Install the exhaust bracket and pipe.

- Torque to 12 ft. lbs.

2.2 Attach the water by-pass line to the stinger.

2.1 Attach the water inlet line and rubber coupler.

1.1 Attach the battery.

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Tools Needed:

Sockets

- 10mm
- 12mm
- 17mm
- 19mm

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

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

Wrenches

- Torque wrench
- Chain wrench
- 10mm
- Allen wrenches