

# Engine Removal / Installation

Yamaha 800

## Step 1

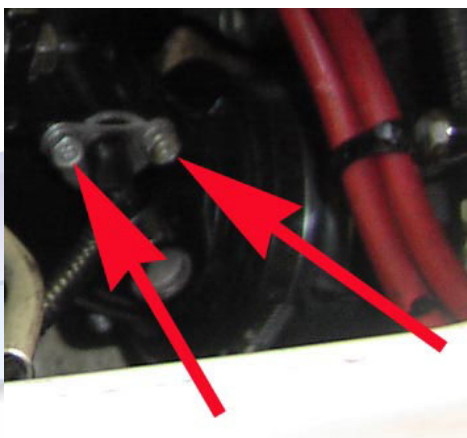
### Battery Removal



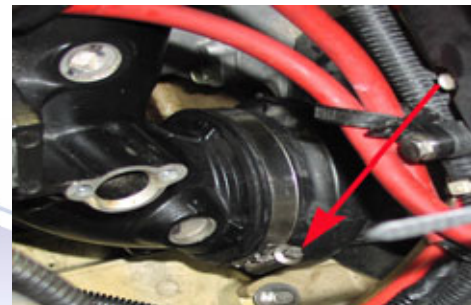
1.1 (Above) Remove the two retaining straps, disconnect the battery and remove it from the hull. Disconnect the negative (black) cable first, then the positive (red).

1.2 Remove the spark plug wires and spark plugs.

2.2 (Below) Remove the two 10mm bolts from the temperature sensor mount at the bottom of the stinger pipe and remove the sensor.



2.4 (Below) Loosen the waterbox coupler with a screwdriver and pry off the rubber fitting from the stinger pipe.



2.5 (Below) Remove the pipe water cooling lines.



2.3 (Below) Detach the pipe exit line from the fitting. Using a flat-head screw driver loosen the two hose clamps and slide the exhaust coupler back from the stinger pipe. Loosen the two clamps underneath the first exhaust coupler.

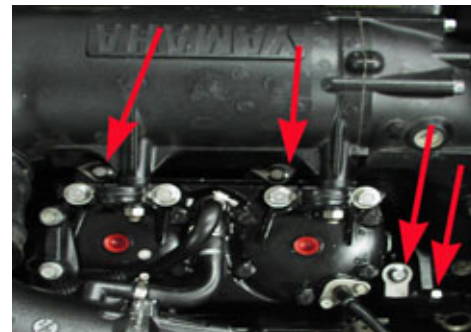
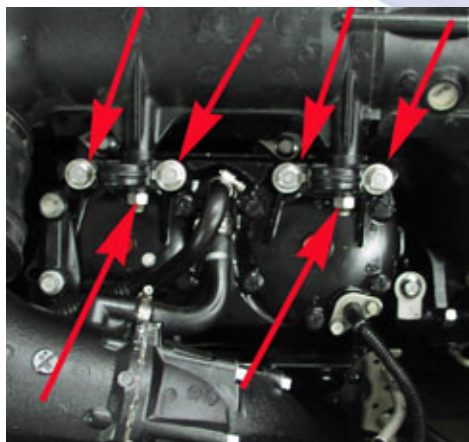


2.6 (Below) Remove the two 12mm bolts securing the stinger pipe to the cylinders. Remove the two 12mm bolts from the stinger piep brace. Wiggle the pipe towards the front of the boat and pull it up and out of the hull.

## Step 2

### Exhaust Removal

2.1 (Below) Remove the six 14mm bolts from the exhaust braces.



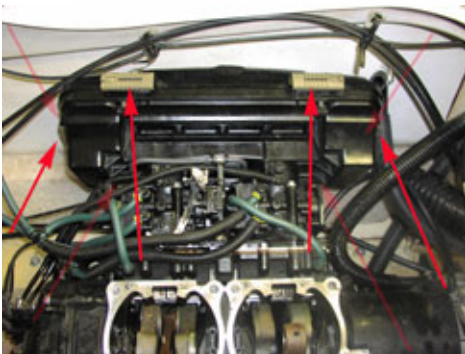
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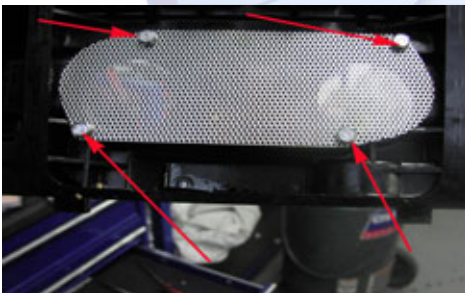
## Step 3

### Intake Removal

3.1 (Below) Slide back the six clamps holding the intake cover on. Remove the two 10mm bolts from the cover. Tilt the cover and pull it up and out.



3.2 (Below) Remove the four 10mm bolts holding the intake cover base to the carbs. Remove the intake cover base.

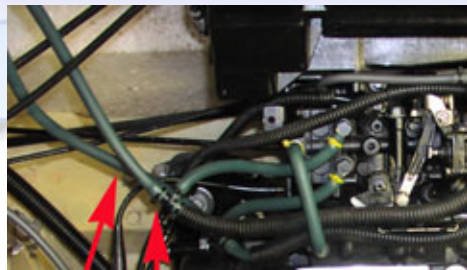


## Step 4

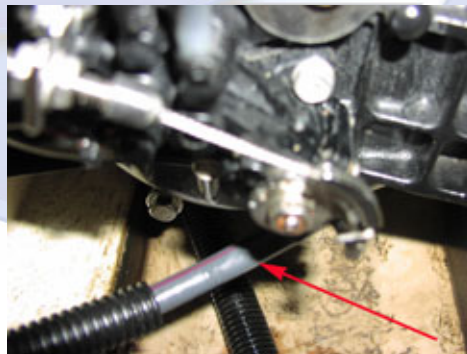
### Engine Removal

4.1 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.

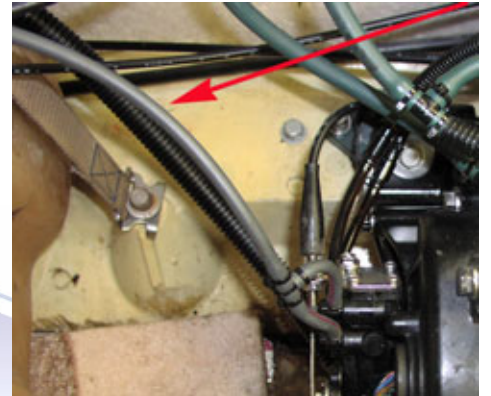
4.2 (Below) Disconnect the fuel inlet and return lines.



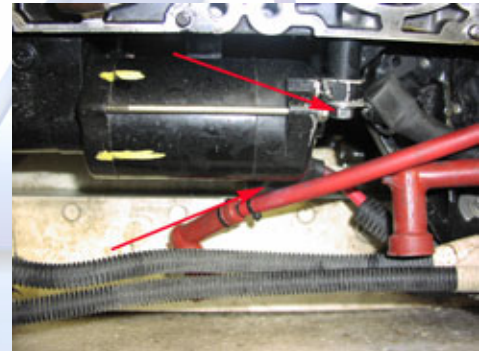
4.3 (Below) Disconnect the oil injection line and place it above the oil tank to prevent oil from leaking into the hull.



4.4 (Below) Disconnect the oil return line from the oil tank.



4.5 (Below) Remove the 10mm nut from the starter and remove the positive cable. Remove the 12mm bolt from the starter mount and remove the negative cable.



4.6 (Below) Pull the two rubber PTO shroud mounts out and slide the PTO shroud forward and remove it from the hull.

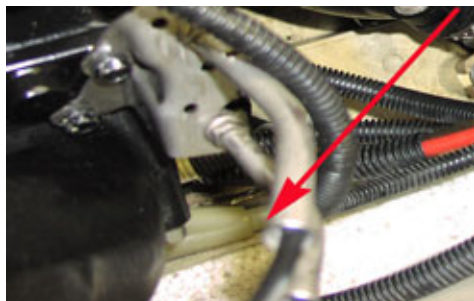




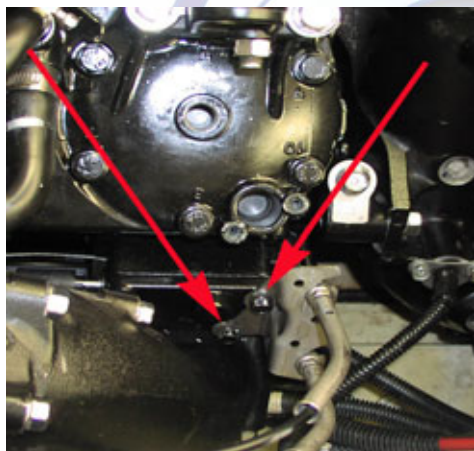
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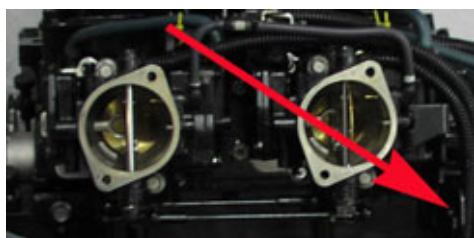
4.7 (Below) Disconnect the water line from the bottom of the stinger pipe.



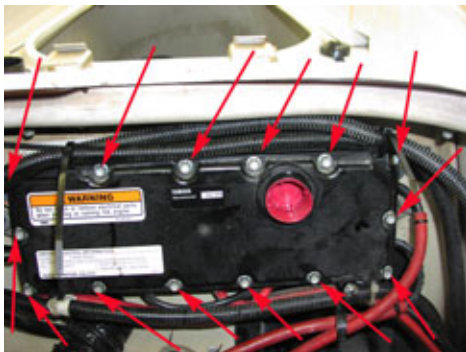
4.8 (Below) Using a 10mm socket remove the two bolts securing the power valve control cables to the cylinders. Gently remove the cables. Replace the bolts to return them with your core.



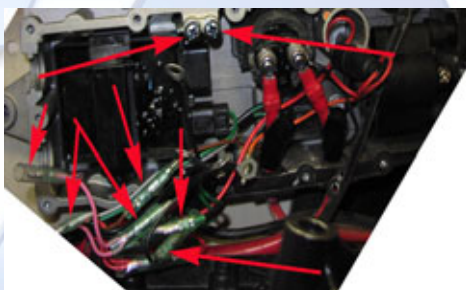
4.9 (Below) using a 10mm wrench, disconnect the throttle cable from the carbs.



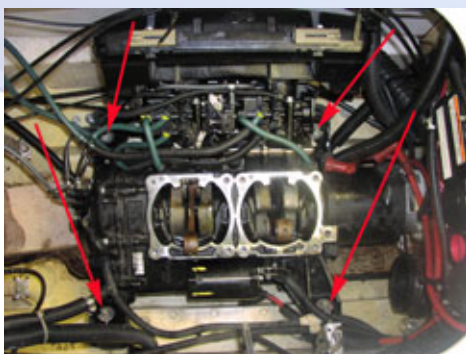
4.10 (Below) Remove the 14 10mm bolts and remove the electrical box cover.



4.11 (Below) Unscrew the two ground cable screws and disconnect the quick connects. Remove the cable from the box.



4.12 (Below) Using a 12mm socket, remove the four engine mount bolts and slide the engine forward and then up and out of the hull.



## Step 5

### External Accessory Removal

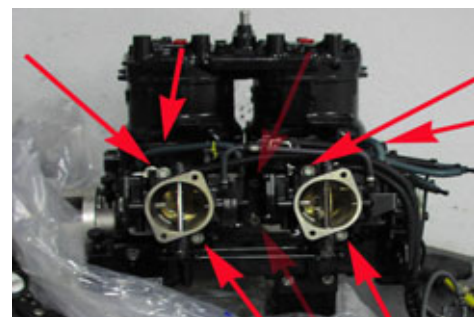
5.1 (Below) Remove the nine 12mm bolts and two oil lines to the carbs and remove the flywheel housing.



5.2 (Below) Remove the flywheel nut using a 17mm socket. Remove the flywheel using a universal flywheel puller. Remove the flywheel and bendix.



5.3 (Below) Remove the four 10mm bolts and two 5mm allen head bolts from the carbs. Remove the two puls lines and remove the carburetors.

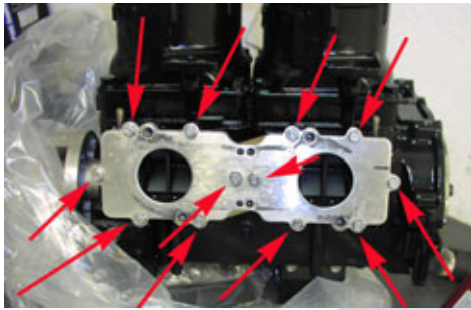




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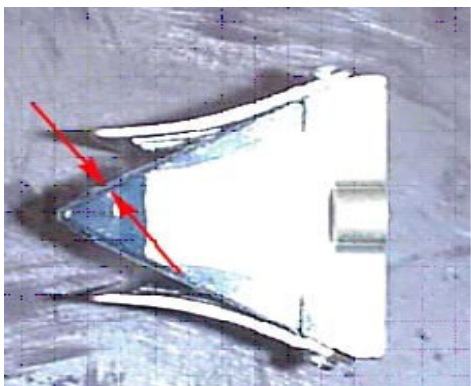
5.4 (Below) Remove the twelve 10mm bolts from the reed valve plate. Remove the plate and then remove the reeds.



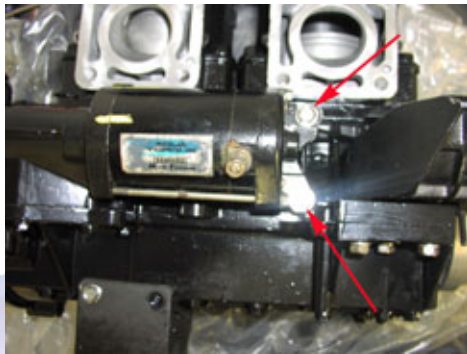
5.5 (Below) Inspect each reed assembly for damage and wear. Look at each reed petal and inspect the edges for signs of cracking, chipping or any missing parts. If any damage is present, replace the petals.



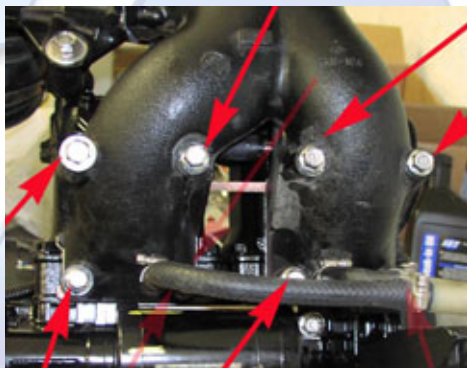
5.6 (Below) Look at each petal-to-cage surface and check for gap. If a gap of more than 0.015" is present, replace the petals.



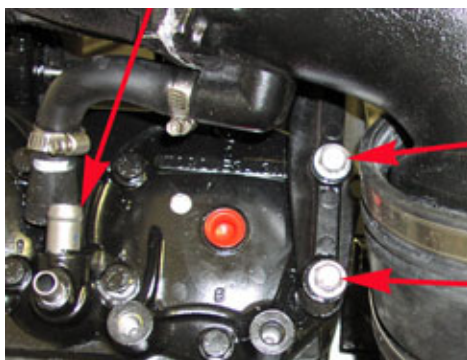
5.7 (Below) Remove the two 12mm bolts and pull the starter straight out.



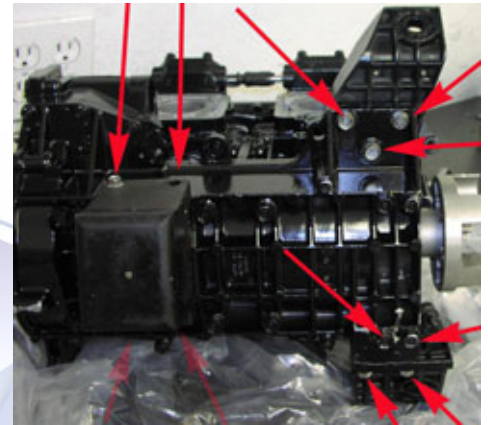
5.8 (Below) Remove the eight 12mm bolts from the exhaust manifold.



5.9 (Below) Remove the two 12mm bolts from the exhaust mount. Remove the cooling line from the head pipe to the head. Remove the exhaust manifold and head pipe. **Replace the head bolts** to return with your core.



5.10 (Below) Remove the seven 12mm bolts from the rear engine supports and four 10mm bolts from the center support. Remove the supports.



5.11 (Below) Stop the engine from turning over by blocking the cylinder with rope or a rag thru the exhaust ports. Use a chain wrench around the diameter of the PTO and spin the PTO counter-clockwise to break it free. If you are unable to break it free with a chain wrench, place a metal bar between the fingers of the PTO and spin the PTO counter-clockwise to break it free being very careful not to break the fingers of the PTO. Spin the PTO off.



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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:

5.11 Place a rag or rope into the exhaust port and install the PTO.

- Torque to 27 ft. lbs.

5.10 Replace the four 10mm bolts to the center engine support. Replace the the rear engine support with seven 12mm bolts.

- 10mm - Torque to 11 ft. lbs.
- 12mm – Torque to 20 ft. lbs.

5.8-5.9 Using new gaskets, place the exhaust manifold and head pipe on the engine. Replace the eight 12mm exhaust bolts and torque them down. Replace the two 12mm head pipe mount bolts.

- Exhaust manifold – first torque to 17 ft. lbs. then torque to 38 ft. lbs.
- Head pipe mount – 27 ft. lbs.

5.7 Replace the starter using two 12mm bolts leaving one loose to later connect the negative battery terminal wire.

- Torque to 12 ft. lbs.

5.4 Replace the reeds and using new gaskets, replace the reed valve plate.

- Torque to 70 in. lbs.

5.3 Using a new gasket, replace the carburetors using the four 10mm bolts and two 5mm allen head bolts. Hook up the pulse lines.

- 10mm – torque to 70 in. lbs.
- 5mm allen – torque to 70 in. lbs.

5.2 Replace the bendix and then the flywheel by lining up the flywheel key. Using a 17mm socket, replace the flywheel bolt.

- Torque to 50 ft. lbs.

5.1 Replace the flywheel cover using the nine 12mm bolts and a new o-ring. If you are using the oil pump, connect the oil lines to the carbs.

- First torque to 11 ft. lbs then torque to 20 ft. lbs.

4.12 Place the engine in the hull and slide backwards to connect the PTO couplers. Using four 12mm bolts, tighten down the engine mounts.

- Torque to 12 ft. lbs.

4.11 Replace the ground connections in the electrical box and connect the quick connects.

4.10 Replace the cover to the electrical box using the fourteen 10mm bolts

- Torque to 12 ft. lbs.

4.9 Replace the throttle cable to the carbs.

4.8 Remove the two 10mm mounting bolts for the power valve cable assembly. Place the cables on the power valve control arm and bolt the cable assembly back in place.

- Torque to 29 in. lbs

4.7 Connect the water line to the bottom of the stinger pipe.

4.6 Replace the PTO shroud.

4.5 Replace the positive cable to the starter with the 10mm nut. Replace the ground cable to the top starter mount bolt using a 12mm bolt.

- 10mm – Torque to 36 in. lbs.
- 12mm – Torque to 12 ft. lbs.

4.4 If you are still using the oil injection, replace the oil return line.

4.3 If you are still using the oil injection, replace the oil line and bleed the oil line. Replace the throttle cable to the oil injection and make sure the two marks on the front line up at idle.

4.2 Connect the fuel inlet and reutrn lines.

3.2 Replace the intake cover base using four 10mm bolts

- Torque to 70 in. lbs.

3.1 Replace the intake cover using two 10mm bolts and slide the clamps back in place.

- Torque to 70 in. lbs.

2.6 Replace the stinger pipe and bolt it in place to the cylinders using two 12mm bolts. Replace the stinger pipe brace using two 12mm bolts.

- Torque to 29 ft. lbs.

2.5 Replace the pipe water cooling lines.

2.4 Tighten the waterbox coupler with a screwdriver.

2.3 Tighten the exhaust clamps connecting the head pipe to the stinger pipe. Slide the Ehaust coupler back in place and tighten its two clamps. Replace the water inlet line to the clamp.



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2.2 Replace the temperature sensor at the bottom of the stinger pipe using two 10mm bolts.

- Torque to 60 in. lbs.

2.1 Replace the six 14mm exhaust brace bolts.

- Torque to 27 ft. lbs.

1.2 Replace the spark plugs and spark plug wires.

- Torque to 18 ft. lbs.

1.1 Replace the Battery.



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## **Tools Needed:**

### **Sockets**

- 8mm
- 10mm
- 12mm
- 14mm
- 17mm

### **Sealers / Lubricants**

- Loctite® Copper Gasket Treatment
- Loctite® Medium Threadlocker (Blue)
- Loctite® High-Tach Gasket Treatment
- SBT Break-In Oil

### **Misc.**

- Ratchet
- Long socket extension
- Short socket extension
- Screwdrivers

### **Parts**

- Installation Gasket Kit

### **Wrenches**

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

