

*** FOR COMPETITION USE ONLY per US EPA regulations ***

Factory Pipe
Bill of Materials
Sea-Doo 720 HX

<u>Item#</u>	<u>Qty.</u>	<u>Part Number</u>	<u>Part Description</u>
-	1	COMASM0300	Sea-Doo XP HX hardware kit (including all but 15,20-22, & 27)
1	5	COMCLP0010	#6 SS hose clamp (3/8")
2	2	COMGAS0080	Sea-Doo cylinder / manifold gasket
3	4	COMFAS0023	8mm x 1.25 x 35mm Socket head SS
4	1	COMTUB0002	5/8" OD x 1/2" Long dowel pin
5	1	COMGAS0070	Sea-Doo manifold to headpipe gasket
6	1	COMGAS0005	4.8" OD x .25 Silicone o-ring
7	1	COMHOS0110	5" Silicone coupler (2-3/8")
8	2	COMCLP0030	#88 SS Hose clamp (5")
9	1	COMBRK0110	Sea-Doo stainless front mount
10	3	COMFAS0005	6mm x 1 x 25mm Hex head bolt
11	3	COMFAS0007	6mm Ext. tooth washer S.S.
12	2	COMFAS0086	3/8" Flat washer w/1" OD S.S.
13	1	COMFAS0035	8mm x 1.25 Nylock nut S.S.
14	2	COMHOS00691	1/2" x 4" Waterline
15	1	COMASM0154	650/720 Filter solenoid assy
16	1	COMFTG0065	1/2" x 1/2" x 3/8" Plastic T
17	1	COMGAS0006	4.32" OD x .25 Silicone o-ring
18	1	COMMNT0050	#J-11729-168 Lord mount
19	1	COMFAS0205	Fiber washer w/1-1/2" OD
20	1	COMIGN0003	580/650/720 Sea-Doo rev limiter
21	1	COMCST0300	720 Sea-Doo -Y- manifold
22	1	COMCST0310	Sea-Doo finished headpipe casting
23	1	COMFAS0095	3/8"-16 Nylock nut S.S.
24	1	COMHOS0046	3/8" x 14" Waterline
25	1	COMFTG0070	3/8" x 3/8" x 1/4" Plastic T
26	1	COMTOL0000	Modified 6mm allen wrench for Sea-Doo
27	1	COMCH72002	720 HX Sea-Doo chamber
28	1	COMHOS0005	3/8" x 5" Waterline
29	1	COMFTG0007	.775" OD x .375 Waterline restrictor
30	3	COMFAS0210	4" Plastic zip tie
31	1	COMFTG0100	1/2" OD x .281 Waterline restrictor
32	2	COMFAS0211	15" Zip tie
33	6	COMCLP0012	SS Hose clamp (1/2")

NOTE: Item numbers 25, 28 & 29 will not be used in this installation.

< **CHECK CONTENTS AGAINST BILL OF MATERIALS. REPORT ANY SHORTAGES WHERE YOU PURCHASED YOUR FACTORY PIPE.**

< **READ ALL INSTRUCTIONS CAREFULLY BEFORE STARTING INSTALLATION.**

< **WATER INJECTION SET SCREWS ON TUNABLE HEADPIPES ARE PRE-ADJUSTED AND LUBRICATED. HOWEVER, YOU SHOULD DOUBLE CHECK ADJUSTMENT PRIOR TO INSTALLATION AND RE-LUBRICATE THEM ON A REGULAR BASIS TO PREVENT BINDING IN HEADPIPE.**

Factory Pipe
Instructions
Sea-Doo 720 HX

These carburetor adjustments/changes **must** be done prior to running the engine with the pipe installed. Failure to do so can and will result in serious engine damage. If you are not familiar with tuning carburetors, consult a qualified technician.

CARBURETOR ADJUSTMENTS

These carburetor recommendations are for 730 feet above sea level on a completely stock engine. All of our testing was performed on a stock engine with stock flame arrestors. No claims are made by Factory Pipe for the performance, reliability or function of this exhaust system on a modified (aftermarket flame arrestors, high compression cylinder head, altered ignition/timing, etc) engine. Carburetor adjustments **WILL** vary depending on engine modifications, fuel, altitude and other variables. **PLEASE CONSULT A QUALIFIED TECHNICIAN IF YOU ARE NOT FAMILIAR WITH TUNING YOUR CARBURETOR (S).** These carburetor adjustments **MUST** be done prior to running the engine with this exhaust system. The Rotax is a high performance engine and damage can and will occur if the carburetor(s) are not tuned properly. Factory Pipe does not recommend altering the stock cylinder compression, airbox or ignition timing of this engine with our exhaust system. Make sure you check the stock jets, some units have been found to be incorrect.

Main Jet: 140

Pilot Jet: 75

High speed screw: 1/4 turns out from closed

Low speed screw: 1 turn out from closed

Needle & Seat: 1.2 (stock)

Spring: 65 gram - Pop Off- 44 PSI

Remove the stock exhaust pipe and exhaust manifold. Do not remove stock hoses or clamps from waterbox. Retain the following stock items: rubber mount and bolt from the chamber body, V-band clamp, 1/8" NPT x 90 degree barbed fitting (stamped #16) from the bottom of the stock exhaust manifold, four (4) of the stock exhaust manifold bolts and (6) lock washers. If you do not have these stock items they may be purchased through your local Sea-Doo dealer.

Note: While the manifold is off, we highly recommend to inspect the pistons and cylinder bore with a mirror and flashlight for scuffing, heavy scratches and/or dark scars on the pistons or cylinders, if any of these are visible the pistons MUST be replaced and cylinders honed or bored to the next oversize before continuing with the pipe installation. Failure to do so can and will result in severe engine damage!

Carefully remove the electrical box from the snap mount. Open the box and install the supplied rev limiter/ECWI module (item #20) as per the supplied instructions.

Install the 1/8" NPT x 90 (stamped #16) degree fitting retained from the stock manifold onto the Factory Pipe manifold. Connect the clear 5/16" waterline that was removed from the stock exhaust manifold to this fitting and secure with a #6 hose clamp (item #1).

Use the modified 6mm hex key wrench (item# 26) to install the four center manifold bolts per the following instructions. Clean all gasket material from the cylinders. Use medium strength threadlock on all manifold bolts. Install the new manifold gaskets (item #2) to the cylinder using two of the 8mm x 35mm hex socket bolts (item #3) in the bottom two center holes. Thread these bolts in about a third of the way to match the slots in the Factory Pipe manifold. With the Factory Pipe logo facing up, slip the manifold onto the two bolts being careful of the gaskets. Position gaskets, install the four retained stock manifold bolts/lock washers in the outer four manifold holes. Install the two remaining 8mm x 35mm bolts (item #3) /lock washers in the top two center manifold holes. Torque manifold bolts to 17 ft.-lb. Slip the retained stock V-band clamp over the flange on the manifold with stud pointing up and toward cylinder.

Install the retained stock rubber chamber body mount (remove aluminum shims if installed) into the Factory Pipe headpipe (item #22) mount. Install the 5/8" locating pin (item #4) into the 5/8" hole in headpipe flange. **Make sure this pin is seated completely into the hole. Do not use a solid pin in this location as water flows through the hole.**

Install the headpipe gasket (item #5) over locating pin and into headpipe flange. Without removing the V-band clamp, align the locating pin on the headpipe with the hole in the manifold and install the headpipe onto the manifold. Push the headpipe and manifold together. There will be a 1/32" to 1/16" gap between the two flanges but no gasket should be showing. Tighten the V-band clamp with the stud pointing toward the cylinder head. Torque clamp to 7 ft.-lb.

Install the 1/4" x 14-1/4" red silicone O-ring (item #6) with liquid soap into the groove of the headpipe coupler. Install the 5" silicone coupler (item #7) over the headpipe coupler. Secure silicone coupler with a #88 hose clamp (item #8). Slip the remaining #88 hose clamp over the silicone coupler and leave loose.

Remove three of the stock bolts from the left side of the mag cover (front of engine). Install the mag cover bracket (item #9) in this location using the three supplied 6mm x 25mm bolts and 6mm lock washers (item #10,11) (do not reuse the stock bolts). Torque to 4 ft.-lb. using threadlock. Install the retained stock 8mm x 40mm bolt through the rubber mount in headpipe and mag cover bracket. Secure back of bolt with 3/8" flat washer (item #12) and 8mm nylock nut (item #13). Tighten securely.

Attach one of the 1/2" x 4" blue waterlines (item #14) to the 1/2" barbed fitting on the headpipe and secure with a 1/2" hose clamp (item #33). Attach the remaining 1/2" x 4" waterline (item #14) to the 1/2" outlet on the cylinder head and secure with a 1/2" hose clamp (item #33). Slide a 1/2" hose clamp (item #33) over each of the open ends of the 1/2" x 4" waterline and leave loose. Install each end of the filter solenoid assembly (item #15) into the remaining ends of the 1/2" x 4" waterlines (the filter is non-directional so it does not matter which end goes where) and turn the assembly so the 3/8" x 9" silicone hose is pointed toward the 3/8" spray bar fitting in the manifold. Once the filter solenoid assembly is positioned secure the clamps. Slide a #6 hose clamp (item #1) over the 3/8" x 9" silicone hose on the filter solenoid assembly; attach the remaining end of this hose to the 3/8" spray bar fitting in the manifold and then secure the clamp. Connect the ECWI solenoid black electrical plug to the Factory Pipe ECWI module plug coming from the electrical box.

Install the 1/4" x 13" red silicone o-ring (item #17) with liquid soap into the groove on the chamber body coupler. Install the Lord mount 168 (item #18) into the 3/8-16 threaded hole on the rear of the manifold. Do not use threadlock on Lord mount studs. Put the fiber washer (item #19) on top of the Lord mount.

Warning: do not use any type of oil lubricant on silicone couplers or waterlines. Use only water or dish soap if lubrication is required.

Before installing chamber body, unhook the right side of the stock waterbox straps and slide the waterbox back 2 to 3 inches. Spray the end of the chamber body with water or glass cleaner and slip into the stock hose from the waterbox. Push the waterbox forward while guiding the stock hose onto the chamber. It is important to push the stock exhaust hose about 2" onto the chamber body. Secure hose with stock clamp and secure waterbox straps. This last step is very difficult but it is possible. Spray some water or glass cleaner on both o-rings and the inside of the 5" silicone coupler. Install chamber body coupler into 5" silicone coupler on headpipe while aligning chamber body bracket with Lord mount on manifold.

Note: when chamber body coupler and headpipe coupler are seated properly the 5" silicone coupler will touch the ring on both the headpipe and chamber couplers.

After properly seated, secure the remaining #88 hose clamp (item #8) on the 5" silicone coupler. Secure chamber body bracket to Lord mount on manifold with the remaining 3/8" flat washer (item #12) and 3/8"-16 nylock nut (item #23).

Cut the stock 1/2" black hose coming from the right rear of the cylinder head about 2" after the stock flush fitting. Install one end of the 1/2 x 1/2 x 3/8 T (item #16) in the end of the line from the cylinder head and secure with a 1/2" hose clamp. Install the 3/8" middle leg of T in the 3/8" x 14" blue waterline (item #24) and secure with a #6 hose clamp. Attach remaining end of 3/8" x 14" waterline to water inlet tube on end of chamber and secure with a #6 hose clamp (item #1).

Install the 1/2" x .281 waterline restrictor (item #31) into the remaining end of the stock 1/2" black hose. Install the remaining end of the plastic T into this line and secure with a 1/2" hose clamp (item #33). Reroute the fuel lines behind the air inlet hoses and secure with the supplied zip ties.

IMPORTANT NOTES

- 1. You must run a resistor type spark plug to prevent interference with the rev limiter/ECWI module.**
- 2. You must run fuel with a minimum octane rating of 92 (premium pump fuel). Running a lower octane fuel can cause detonation and serious engine damage.**
- 3. Always warm up the engine prior to full throttle/high speed operation.**

CARBURETOR ADJUSTMENTS

These carburetor recommendations are for 730 feet above sea level on a completely stock engine. All of our testing was performed on a stock engine with stock flame arrestors. No claims are made by Factory Pipe for the performance, reliability or function of this exhaust system on a modified engine. Carburetor adjustments will vary depending on engine modifications, fuel, altitude and other variables. PLEASE CONSULT A QUALIFIED TECHNICIAN IF YOU ARE NOT FAMILIAR WITH TUNING YOUR CARBURETOR(S). These carburetor adjustments MUST be done prior to running the engine with this exhaust system. The Rotax is a high performance engine and damage can and will occur if the carburetor(s) are not tuned properly. Factory Pipe does not recommend altering the stock cylinder compression or ignition timing of this engine with our exhaust system. Note: If you remove the choke plates (not recommended) you will have to change the jetting.

Main jet: 140

Pilot Jet: 75

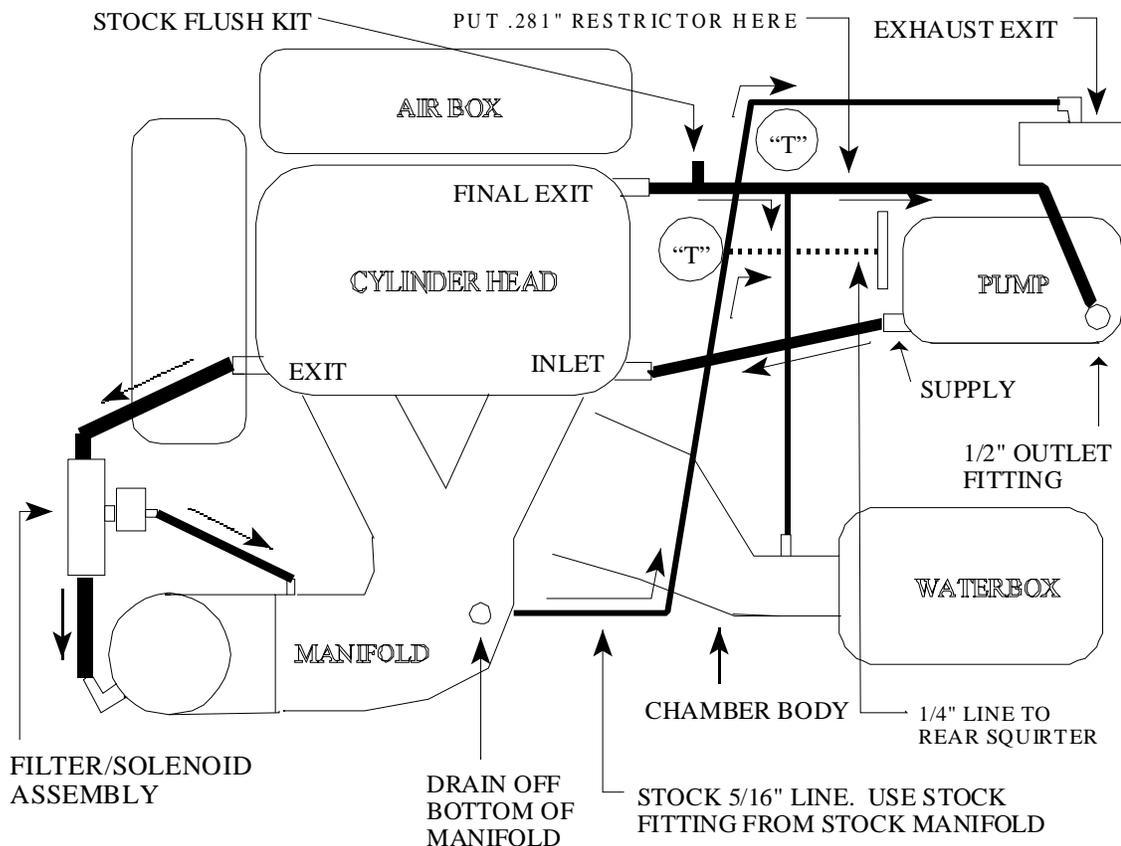
High speed screw: 1/4 turn out from closed

Low speed screw: 1 turn out from closed

Needle & Seat: 1.2 (Stock)

Spring: 65 gram spring - Pop-Off 44 PSI

SEA-DOO 720 HX WATER ROUTING



Factory Pipe Performance Exhaust 101

The purpose of an expansion chamber is to return to the exhaust port a negative sound wave then a positive sound wave at precisely the right time. This is made all the harder by many impeller/nozzle combinations, engine configurations, riding conditions and rider preferences.

Traditionally, if you wanted low RPM torque and high RPM horsepower, it required several pipes. A few of our competitors cast rings into their pipes to achieve pipe tuning by cut and try. In 1992 Factory Pipe introduced the first truly tunable pipe using our variable water injection system. This system allows you to modify where and how much water injects into the exhaust by the turn of a set screw. Where our competition had you change the length of the pipe, the Factory Pipe allows you to vary the exhaust gas temperature which in turn changes the sonic wave speed within the pipe. **Changing the sonic wave speed within the pipe has the same tuning affect as changing the length of the pipe.**

Tuning Your Exhaust System

Note: There is only one (1) water injection screw on the Sea-Doo system located on the headpipe (There is no adjustment on the ECWI solenoid) Most Factory Pipe systems have our exclusive tunable headpipe which allows you to custom tune the pipe to your riding style. The following page gives a general overview of how this system works and how each adjustment will affect the performance of your watercraft.

Double check all hoses bolts and clamps from your installation. For the first on-water test of your new Factory Pipe we recommend 3/8 of a turn out from closed. This setting will be more water than is required but will provide a good starting point to test the pipe.

Ride the watercraft for several minutes above 5800 RPM while varying the throttle position. (The ECWI system injects water from 2500 to 5600 RPM which will cool the pipe and give a false reading) Open the engine cover as quick as possible after the ride and check the pipe temperature by splashing water on the chamber body directly after the headpipe coupler. **The water should lightly sizzle for the first few inches on the chamber body.**

If the water **does not** sizzle, close the adjustment screw 1/8 turn and retest. If the water **sizzles rapidly**, open the screw 1/4 turn and retest.

This set up will provide the best top end performance of your watercraft. With the pipe adjusted as stated above. Opening the adjustment screw another 1/4 turn will cool the exhaust in the chamber and provide better bottom end performance at the expense of some top-end. This would be an ideal setting for running slalom or a tight buoy course. **Warning - Do not completely close the injection screw as this will overheat the pipe and cause damage.**