FOR COMPETITION USE ONLY per US EPA regulations

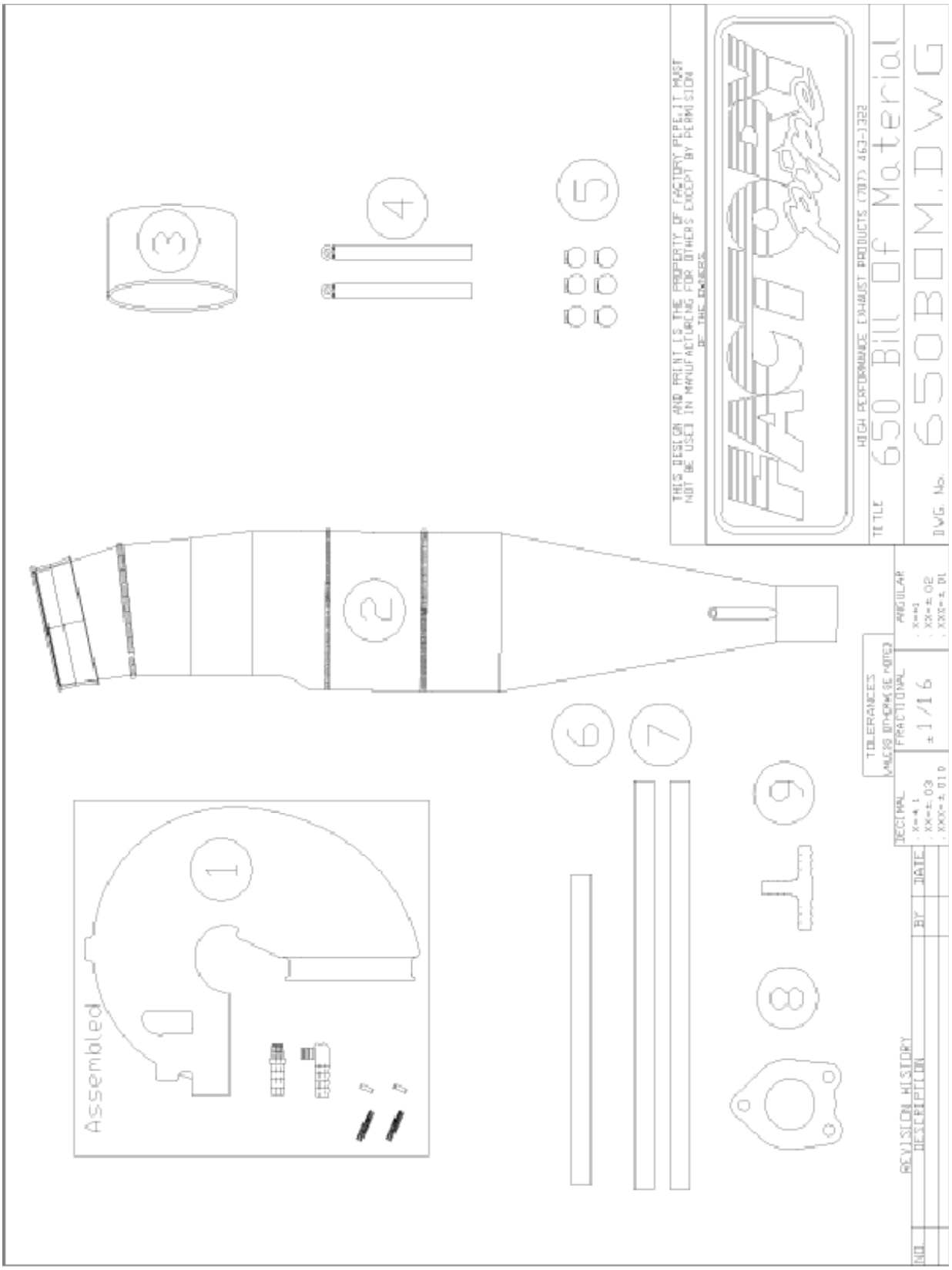
Factory Pipe
Bill of Materials
650 SX/X2 Limited & Mod

Item#	Qty.	Part Number	Part Description
1	1	COMCST0010	Reg headpipe-750 SX/650 SX-X2/650 SJ
2 or	1	COMCH65002	650 SX/X2 Ltd chamber only
2	1	COMCH65001	650SX/X2 Mod chamber only
-	1	COMASM0030	650 SX/X2 Hardware kit (includes items 3-10)
3	1	COMHOS0100	4" Silicone coupler (2-1/6")
4	2	COMCLP0050	100-120mm SS hose clamp (4")
5	6	COMCLP0010	#06 SS Hose clamp (3/8")
6	1	COMHOS0030	3/8" x 10" Waterline
7	2	COMHOS0045	3/8" x 13" Waterline
8	1	COMGAS0010	3 Bolt headpipe gasket
9	1	COMFTG0070	3/8" x 3/8" x 1/4" Plastic T
10	1	COMBRK0217	Drain bracket, bent sst

< **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.**


Assembled
1
2
3
4
5
6
7
8
9
THIS DESIGN AND PRINT IS THE PROPERTY OF FACTORY PIPE.IT MUST NOT BE USED IN MANUFACTURING FOR OTHERS EXCEPT BY PERMISSION OF THE OWNER
HIGH PERFORMANCE EXHAUST PRODUCTS (707) 463-1322
TITLE 650 Bill Of Material
DWG No. 650BOM.DWG
TOLERANCES
UNLESS OTHERWISE NOTED
FRACTIONAL ±1/16
DECIMAL
ANGULAR
REVISION HISTORY
NO DESCRIPTION BY DATE

Factory Pipe
Instructions
650SX/X2 Limited / Mod

Remove your stock exhaust system except the waterbox and manifold. If you have a pre-1991 ski, it has cast aluminum 90 degree "elbows" going in and out of the stock waterbox. These bend so tight that they are very restrictive and reduce performance. Although they are not required for installation of your Factory Pipe we recommend replacing these with the hoses used on the 1991 and later models.

Check your hoses for chafing, leaks, or internal blistering. Cut the top hose to 9" long from the center of the waterbox inlet to the end of the hose that attaches to the tailcone (SX only, the X2 requires a different length depending on the year). Install the hoses.

Do not use any type of oil lubricant on rubber couplers or hoses. They must be clean and oil free. Use only windex or water if required.

Install the 4" coupler (item #3) onto the Factory Pipe headpipe (item #1) and secure with a 100-120mm clamp (item #4). Position the clamp so it will be accessible after installation in the hull. Install the 3/8" x 13" waterline (item #7) to the bottom fitting on the headpipe and secure with a #06 clamp (item #5). Now would be the best time to check the water injection screws in the headpipe. For the 650 system start with the bottom screw open 3/4 of a turn and the other two screws closed. You may adjust this later on to suit your riding style. Install the Factory Pipe chamber (item #2) into the ski sliding the small end into the waterbox hose. Slide the remaining 100-120mm clamp (item #4) over the large end of the chamber. Install the Factory Pipe headpipe sliding the end of the chamber in the 4" coupler. Install the supplied headpipe gasket (item #8) and secure with the stock bolts using Loctite 242, torque to 32 ft.-lbs. Push the chamber in the coupler until it fits flush against the headpipe.

If headpipe and chamber are not flush coupler failure or lack of performance may result.

Rotate the chamber for maximum clearance. It is very important that the chamber does not hit anything in the ski. If the chamber hits, or is close (1/16"), to some part of the ski, you can dent the pipe with a hammer without affecting performance or reliability, just don't get carried away. Tighten all the clamps now.

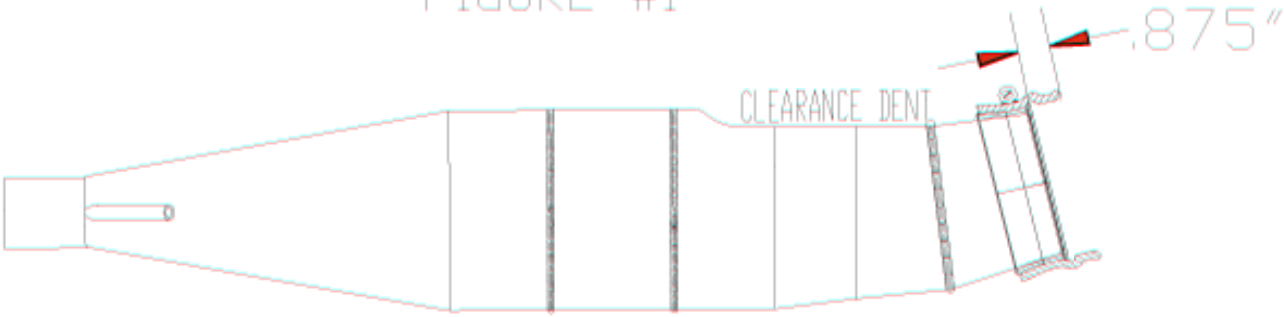
Install the 3/8" x 10" waterline (item #6) to the fitting on the cylinder head and the top fitting on the Factory Pipe headpipe, secure both with #06 clamp (item #5). Install the 3/8" plastic T (item #9) to the remaining end of the 3/8" x 13" waterline from the headpipe and secure with a #06 hose clamp (item #5). Attach the remaining 3/8" x 13" waterline (item #7) to the T and the inlet on the end of the chamber, secure both. Attach the stock 1/4" by-pass line to the middle leg of the T.

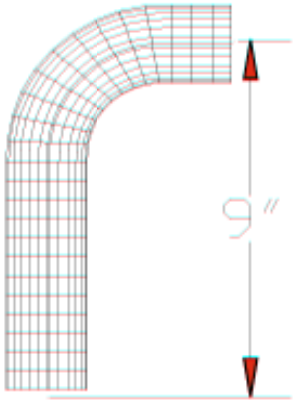
Recommended Carb Adjustments:

These adjustments are for sea level on a stock engine with aftermarket flame arrestors.Your specific adjustments may vary depending on modifications, fuel, altitude and other variables. Please consult a qualified technician if you are not familiar with tuning your carburetor

Main Jet : Stock
Pilot Jet : Stock
High speed screw : Add 1/8 turn to stock setting
Low speed screw : Stock
Needle & Seat : Stock
Spring : Stock

TOP VIEW
FIGURE #1





ON PRE 91 SKIS USE THE 91-93 STOCK
KAWASAKI HOSES FOR BETTER PERFORMANCE
TOP HOSE PART #92190-3731 $34.00 LIST
BOTTOM HOSE PART #92190-3732 $81.00 LIST

FACTORY pipe

HIGH PERFORMANCE EXHAUST PRODUCTS (707) 463-1302

TITLE FIGURE #1

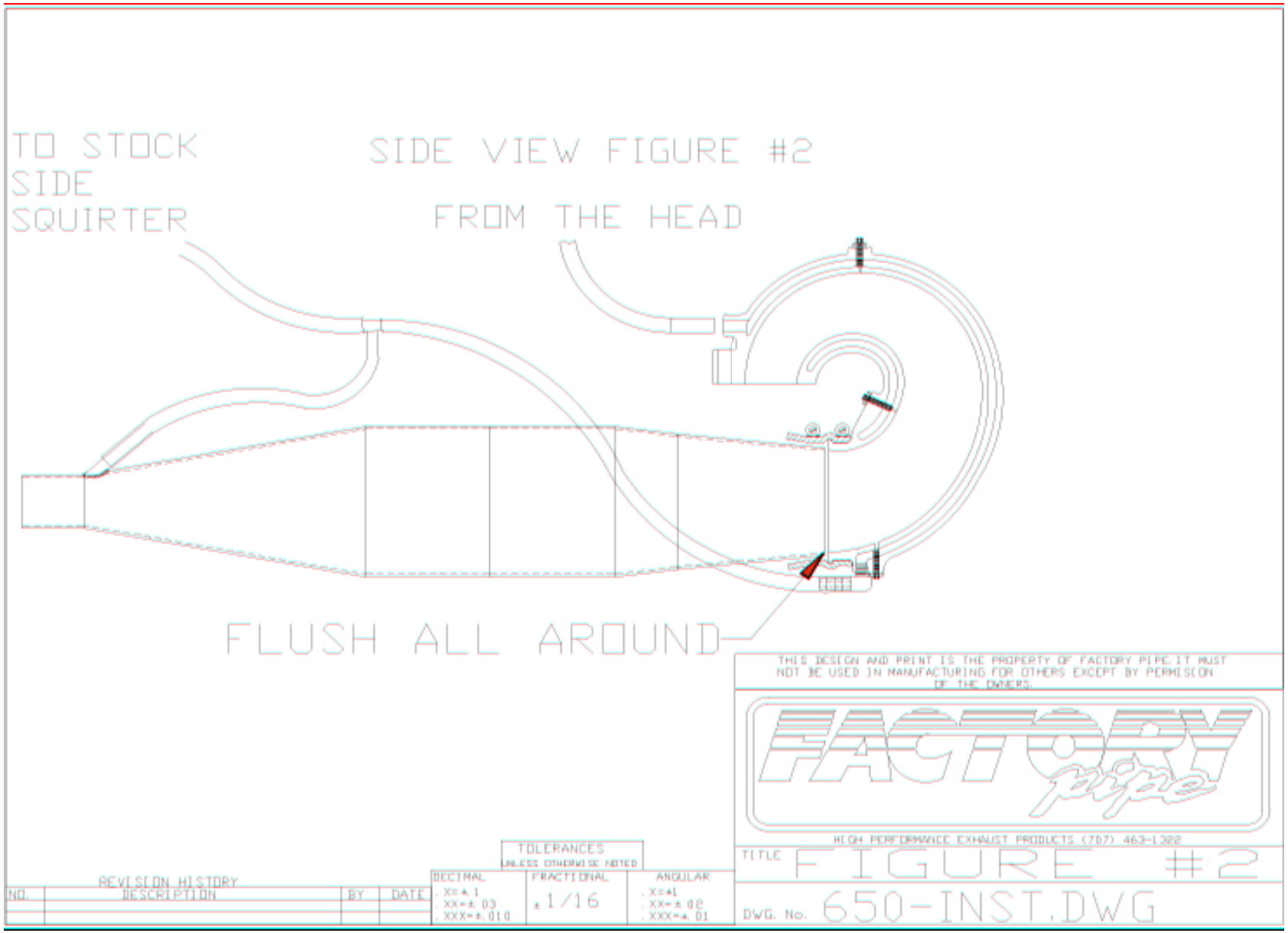
DWG. No. 650-INST.DWG

TOLERANCES
UNLESS OTHERWISE NOTED

DECIMAL	FRACTIONAL	ANGULAR
.X=±.1	±1/16	.X=±1
.XX=±.03		.XX=±.02
.XXX=±.010		.XXX=±.01

REVISION HISTORY

NO.	DESCRIPTION	BY	DATE


TO STOCK
SIDE
SQUIRTER
SIDE VIEW FIGURE #2
FROM THE HEAD
FLUSH ALL AROUND
THIS DESIGN AND PRINT IS THE PROPERTY OF FACTORY PIPE. IT MUST NOT BE USED IN MANUFACTURING FOR OTHERS EXCEPT BY PERMISION OF THE OWNERS.
FACTORY pipe
HIGH PERFORMANCE EXHAUST PRODUCTS (707) 463-1322
TOLERANCES
UNLESS OTHERWISE NOTED
DECIMAL
. X= ± .1
. XX= ± .03
. XXX= ± .010
FRACTIONAL
± 1/16
ANGULAR
. X= ±1
. XX= ± .02
. XXX= ± .01
REVISION HISTORY
NO.
DESCRIPTION
BY
DATE
TITLE
FIGURE #2
DWG. No.
650-INST.DWG

Factory Pipe
Performance Exhaust 101

The purpose of an Aexpansion chamber@ is to return to the exhaust port a negative sound wave then a positive sound wave at precisely the right time. If the pressure wave returns too late, you lose some of the fresh fuel charge in the combustion chamber and performance. If the wave returns too soon, it pushes hot exhaust gas back into the combustion chamber contaminating the fresh charge and creating hot spots on the piston. The challenge to the pipe designer is to arrive at the proper exhaust tuning that will return the sonic waves at the correct time. This challenge 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 Acut 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.**

Factory Pipe
Tuning Your Exhaust System

Most Factory Pipe systems have our exclusive Atunable@ 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 Aon-water@ test of your new Factory Pipe we recommend closing the top and middle adjustment screws and opening the bottom screw 3/4 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 while varying the throttle position. 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 <u>should</u> lightly sizzle for the first few inches on the chamber body.**

If the water **<u>does not</u>** sizzle, close the bottom adjustment screw 1/8 turn and retest. If the water **<u>sizzles rapidly,</u>** open the bottom 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, open the top screw 1/4 turn. This will cool the exhaust in the headpipe 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.

If you want a change that is somewhere in the middle of the two settings, close the top screw and open the middle screw 1/4 turn or add another 1/8 turn to the bottom screw.

Some engines may react differently from the above. For example, while testing the 650 Super

Jet we found that we gained top end performance by running the top screw open and the others closed. You may use any combination of the three screws to achieve the desired performance. However, **AT LEAST ONE SCREW MUST REMAIN OPEN AT ALL TIMES TO PREVENT DAMAGE TO THE PIPE.**