Factory Pipe
Bill of Materials
650 Super Jet

Item#	Qty.	Part Description
1	1	Factory Pipe tunable cast aluminum headpipe
2	1	Factory Pipe aluminum chamber
3	1	Factory Pipe tuned exhaust manifold
4	2	100-120mm stainless steel hose clamp
5	1	3/8" plastic "T"
6	1	Aluminum side squirter
7	1	3/8" x 3" waterline
8	1	3/8" x 10" waterline
9	1	3/8" x 13" waterline
10	1	3/8" x 25" waterline
11	8	#6 hose clamp
12	1	1/8" rubber cap and zip tie
13	3	10 x 1.25 x 40mm long flanged bolt/washer
14	1	650 headpipe gasket
15	1	4" Silicone coupler
16	1	Exhaust manifold gasket
17	1	Instructions

- **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 TUNEABLE 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
Yamaha 650 Super Jet

Check to insure you have received all the parts listed in your bill of materials. Please report any shortages to the dealer where you purchased your exhaust system.

Remove the stock exhaust system. If you are going to replace your stock waterbox do so now, if not, do not remove it. Factory Pipe offers a performance waterbox to compliment this system. Remove the battery, battery box and the empty fuel tank.

Note - You may be tempted to install the pipe without removing the gas tank and battery, it's not worth it.

Cut the stock hose that goes to the waterbox as per drawing "sjethose". Reinstall the hose. If your Super Jet did not come with a stock side squirter drill a 1/2" hole in the left side of the ski about 3" above the bond line and about 6" behind the front of the hood. Install the 90° side squirter. (item #6)

Clean all gasket material from cylinder. Install the manifold gasket (item# 17) using two of the stock 8mm bolts in the top 2 inside holes and loctite 242. Turn these bolts in about 1/2" from the gasket surface. Attach the cooling line from pump to the barbed fitting on the Factory Pipe manifold (item# 3) and secure with a #6 hose clamp (item# 12). Install the Factory Pipe exhaust manifold using the stock manifold bolts and loctite. Torque to 15 ft./lb.
Clean the Factory Pipe headpipe (item #1) and the 4" silicone coupler (item # 16). Install the 4" silicone coupler on the headpipe and secure with one of the 100-120mm hose clamps (item #4). The clamps should be installed at an angle that will make them accessible after installation into the hull. Install the 3/8" x 25" waterline (item #9) to the 90° fitting in the bottom of the headpipe. Secure with a #6 hose clamp. (item #12) Install the 3/8" "T" (item #5) to the other end of the 25" hose as per drawing "TIPS AND TRICKS".

Now would be the best time to check the water injection screw settings. For the 650 Super Jet we recommend closing the middle and bottom screws and opening the top screw 1 1/4 turns. You may adjust this later on to suit your riding style. See important note at end of instructions for tuning pipe to proper temperature.

Warning - Never close all 3 screws simultaneously this will cause the pipe to overheat and may cause damage.

Install the Factory Pipe headpipe using the 650 headpipe gasket (item #15) and the supplied 10 x 1.25 x 40mm bolts and washers (item #14). Use loctite 242 and torque to 30 ft/lb.

Note: Never use oil on hoses or couplers during assembly. Make sure they are free of oil and dirt.

Slip the remaining 100-120mm clamp over the 4" coupler. Slide the chamber (item# 2) into the 4" silicone coupler until the chamber contacts the headpipe.

The headpipe and chamber must fit flush inside the coupler. Otherwise, loss of performance and coupler failure may result.

Insert the stinger into the hose going to the waterbox. Rotate the chamber body until it clears the side of the hull and the motor mount. (the pipe should clear the motor mount by a 1/4" or better) If the pipe is too close to the motor mount it will eventually wear a hole in the pipe. You can usually get more clearance by raising the stinger of the pipe where it enters the hose that goes to the waterbox. If the chamber body is too close to anything, you can put a dent in the pipe without adversely affecting performance or your warranty. Tighten the 100-120 clamp onto the 4" silicone coupler and the stock clamp on the stinger hose. Check the clearances around the chamber.

Install the 3/8" x 10" waterline (item #7) from the cylinder head to the top fitting on the headpipe. Secure with a #6 clamp. Install the 3/8" waterline from the stinger to the middle leg of the "T" as per drawing "TIPS AND TRICKS". Install the 3/8" x 3" waterline (item #8) from the "T" to the side squirter. Install the remaining #6 hose clamps to the 3/8" hoses. Install the 1/8" cap on to the vent on the cylinder head, fasten with the supplied zip tie (item #13).

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 : 125
Pilot Jet : 115
High speed screw : 1 ½ turns out from closed
Low speed screw : 1 ½ turns out from closed
Needle & Seat : Stock
Spring : 95 gram

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. 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 "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.**

Factory Pipe
Tuning Your Exhaust System

Most Factory Pipe systems have our exclusive "tuneable" 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 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.**

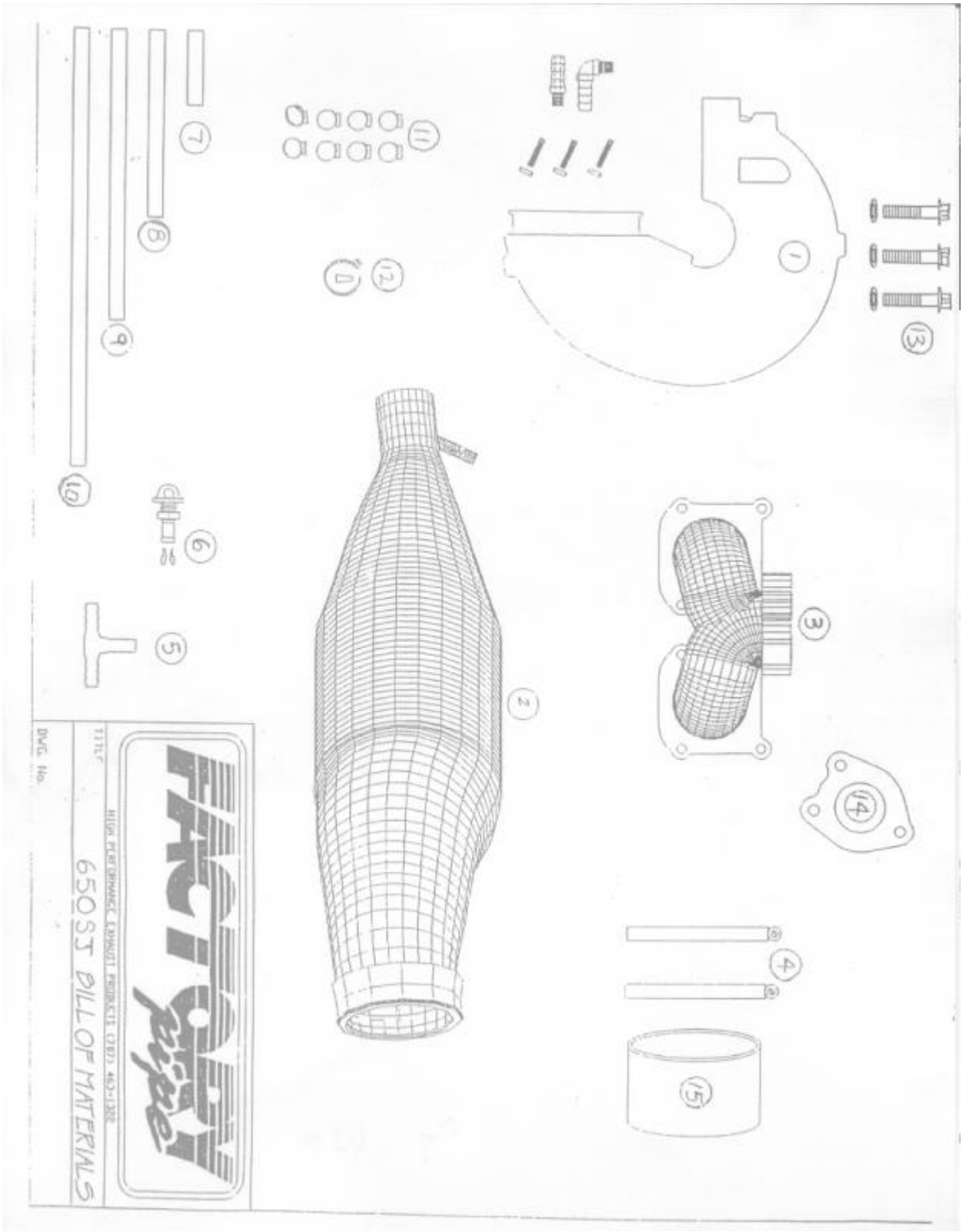
If the water **<u>does not</u>** sizzle, close the bottom adjustment screw 1/8 turn and retest. If the water **<u>sizzles rapidly,</u>** open the bottom screw 1/4 turn and retest.

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

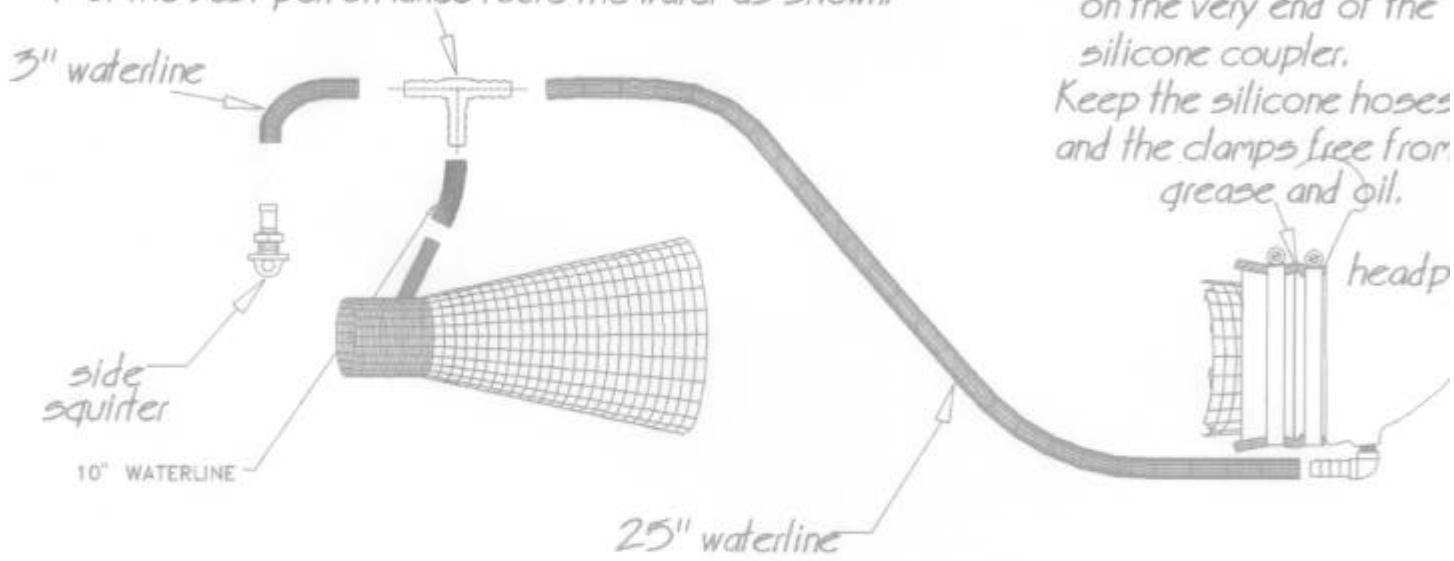
Jet we found that we gained top end performance by running the top screw open and the others closed. You may use any combination of the three screws to achieve the desired performance. However, **AT LEAST ONE SCREW MUST REMAIN OPEN AT ALL TIMES TO PREVENT DAMAGE TO THE PIPE.**


FACTORY
TITLE
650SJ BILL OF MATERIALS
DWG. No.

FOR A STOCK OR LIMITED 650 SUPERJE
RECOMMEND THE FOLLOWING JETTING:
LOW SPEED JET: #115 1-1/2 TURNS O
HIGH SPEED JET: #125 1-1/2 TURNS
1.5 (STOCK) NEEDLE & SEAT WITH A 9
SPRING. THIS SHOULD NET A 39 LBS. F

The rotation of this "T" is very important.
For the best performance route the water as shown!

Do not put these clam
on the very end of the
silicone coupler.
Keep the silicone hoses
and the clamps free from
grease and oil.



TIPS & TRICKS

A good way to clean the silicone hoses and clamps is to throw them into the Washing machine. This will insure they dont slide off while riding. Keep an eye on the pipe temperature, you should NOT be quite able to hold your hand on the pipe after a hard ride.

FACTORY PIPE offers a SUPERJET aluminum waterbox.

FACTORY PIPE
HIGH PERFORMANCE EXHAUST PRODUCTS (787) 4

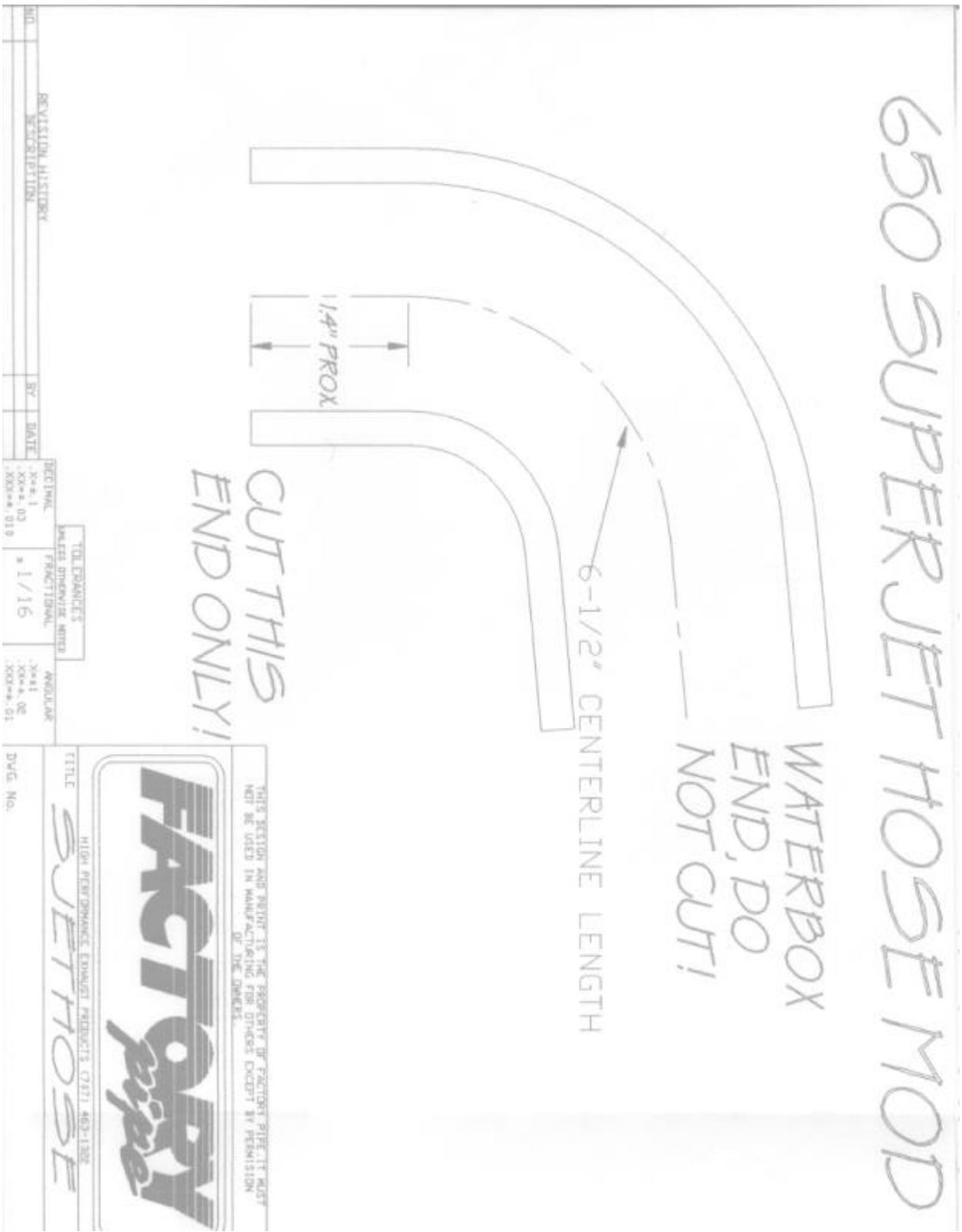
TIPS AND TRICK

REVISION HISTORY			
ID	DESCRIPTION	BY	DATE

TOLERANCES UNLESS OTHERWISE NOTED

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

DWG. No.


650 SUPERJET HOSE MOD
WATERBOX END, DO NOT CUT!
6-1/2" CENTERLINE LENGTH
1/4" PROX.
CUT THIS END ONLY!
REVISION HISTORY
NO.
DESCRIPTION
BY
DATE
DECIMAL
.X=±.1
.XX=±.03
.XXX=±.010
TOLERANCES
UNLESS OTHERWISE NOTED
FRACTIONAL
±1/16
ANGULAR
.X=±1
.XX=±.02
.XXX=±.01
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FACTORY pipe
HIGH PERFORMANCE EXHAUST PRODUCTS (787) 463-1302
TITLE
SUPERJET HOSE
DWG. No.