



Yamaha SHO Engine Cooling Upgrade Kit

RY10041-ECUK-PC



Applications: Yamaha 1.8L SHO 2008-2016

Approximate Installation Time: 3.0 Hrs.

Recommended Specialty Tools:

Oetiker Clamp Installation Tool

Part #

C-48550347

Required Materials:

RIVA Gen 3 Power Cooler

Part #

RY17081-PC-TV

We strongly recommend the use of a service manual to familiarize yourself with the various components and procedures involved with this installation. Please note that some of the original hardware removed in the disassembly process will be used in the installation process. These instructions have been written in step-by-step format and refer to illustrations. Read through instructions entirely before performing installation. Please follow these step-by-step instructions and illustrations carefully.

***** ALLOW ENGINE TO COOL COMPLETELY BEFORE PERFORMING INSTALLATION *****

***** NO SMOKING *** NO SMOKING *** NO SMOKING *****



RY10041-ECUK-PC SHO Engine Cooling Upgrade Kit

COMPONENT LIST

<u>Item</u>	<u>Description</u>	<u>RIVA Part #</u>	<u>Qty. Req.</u>
A	SHO Strainer Body	RY1013-WS-40	1
B	SHO Strainer Cover		
C	21/64" HSS Black Oxide Jobber Length Drill Bit,	DWDN21/64	1
D	Block-Off Assembly		1
E	Engine Block Anode Fitting,	QCA-RY10080-ZA-1	1
F	Billet Tee Fitting, Black Ano	QCA-RY10040-T	1
G	3/8" BARBED x 1/8" NPT STR	220E	1
H	Splicer, 3/8 x 5/8, Brass	BM5-3	1
I	Bulkhead Fitting, 1/2" ID Alum	RY1013-TH-1/2	1
J	Hose Clamp, 1/2" SS	67004-0006-052	7
K	Oeitker, 18.5	16700020	7
L	Oeitker, 22.6	16700026	3
M	Bolt, 6MM X 25MM, HHCS	830158SS	4
N	SS HHCS M8X1.25X25	0096825	1
O	Washer flat 6MM	369021SS	4
P	Washer, Flat 8MM	369023SS	1
Q	Green Stripe 1/2" Black, Water Line (16'6")	28439-1	17
R	Safety Stripe 3/8" Black, Water Line	28409-1	2.5

Packed with pride by: _____

Your kit was inspected and verified before being carefully packaged by our staff. Please check package contents before beginning assembly. If you have a question about missing or damaged items please contact RIVA Technical Support directly at (954) 247-0705 or by e-mail at tech_support@rivamotorsports.com

- INSTALLATION INSTRUCTIONS -

Installation of this kit requires RIVA Powercooler RY17081-PC-TV. Reference to that kit is made in these instructions.

Refer to RIVA RY17081-PC-TV Power Cooler Kit instructions to remove OEM intercooler, supercharger and intake manifold at this time.

Remove bolts at indicated locations securing grab rail and deck beam to hull (FZR/S 7 bolts, FX 4 bolts). (Figures 1 and 2) **Note: Do not drop deck beam nuts into hull.** Retain hardware for re-installation. Remove grab rail and deck beam.

Figure 1

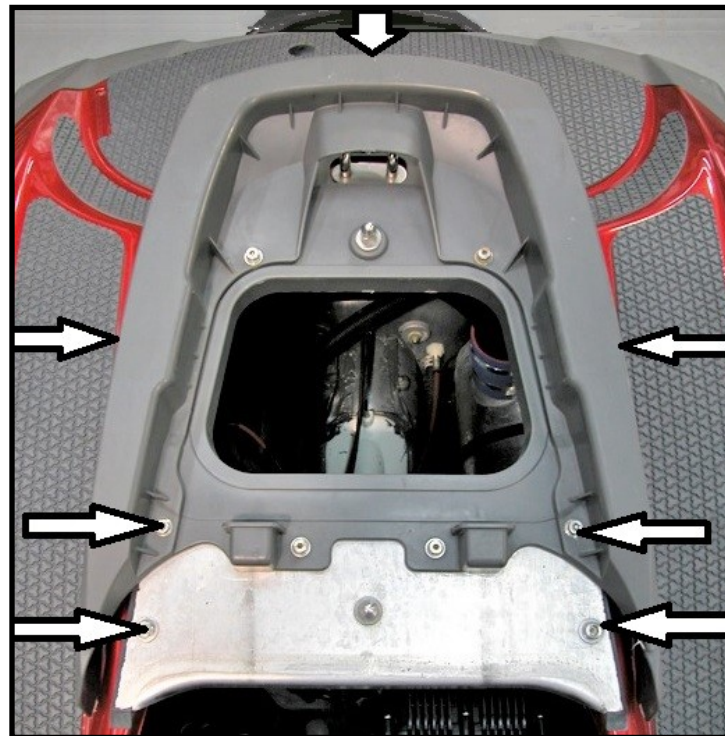
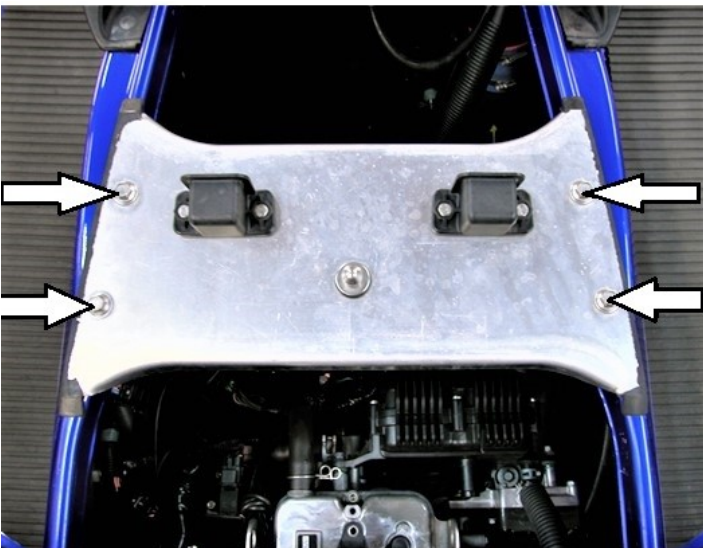


Figure 2

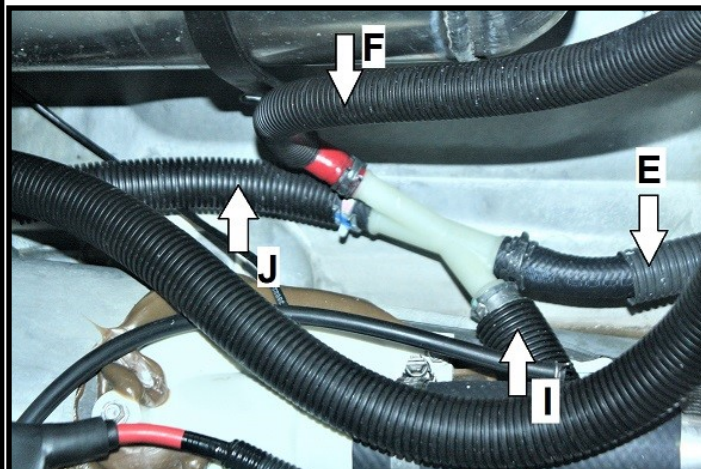


Locate 4 way water joint inside rear of hull near waterbox. Note location of hoses on joint. (Figure 3)

J= Water from Jet Pump F= Water from Flush Fitting

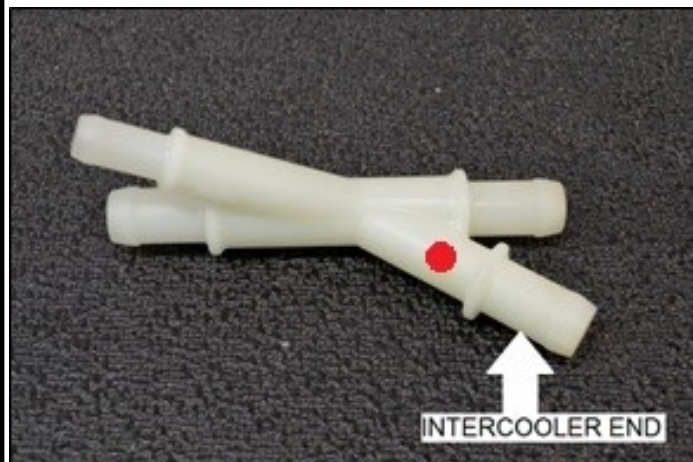
E= Water to Engine I= Water to Intercooler

Figure 3



Mark intercooler connection on joint. Disconnect joint from hoses. Save clamps for reinstallation. (Figure 4)

Figure 4



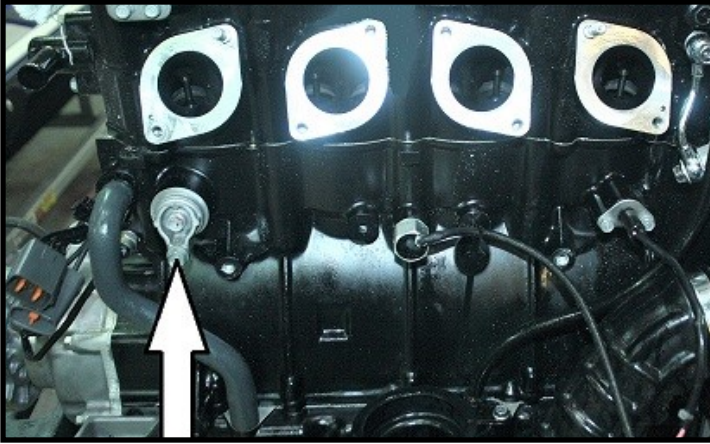
Using supplied drill bit, drill out intercooler end opening. **Note: Use care not to drill too deep. This may result in damaging the fitting.** Clean any plastic shavings / debris that may be inside the fitting.

Reinstall 4 way fitting & reconnect waterlines. Secure waterlines using existing spring clamps. Make sure waterlines are reinstalled in the correct location.

Locate cylinder block anode on the right rear of the engine block, just below intake manifold. Remove bolt holding anode cover in place & remove anode assembly. (Figure 5)

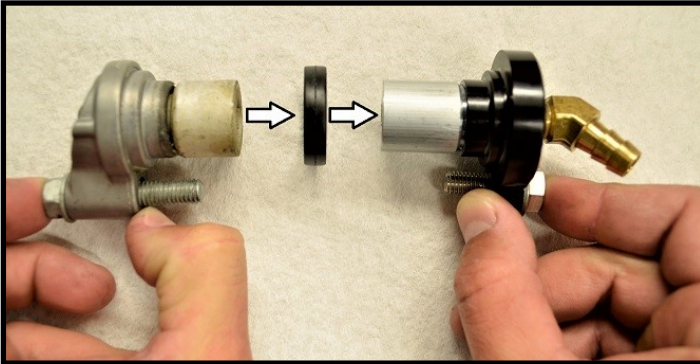
- INSTALLATION INSTRUCTIONS -

Figure 5



Transfer o-ring seal from OEM anode assembly to supplied anode with water fitting. (Figure 6) **Note:** If o-ring is warped or damaged, replace with OE part # 67F-11328-00-00.

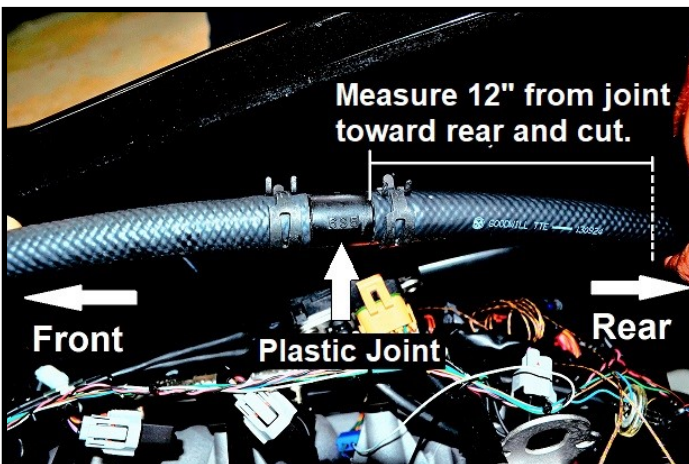
Figure 6



Apply a light film of grease to the o-ring & install supplied anode with seal into engine using supplied 8x25mm bolt and flat washer. **Note: Apply blue loctite to bolt threads.** Torque bolt to 14.8 lb.ft.

Follow intercooler inlet cooling hose (previously removed from intercooler) toward rear of craft. Locate black plastic joint. (Figure 7) Measure 12 inches along hose from joint toward rear of craft. Cut hose at this point. Discard forward portion with joint.

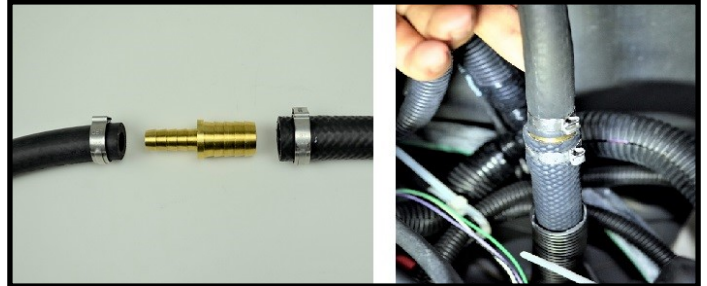
Figure 7



Install supplied 5/8" to 3/8" brass reducer into rear portion of cooling hose. Secure with supplied 22.6 Oetiker clamp.

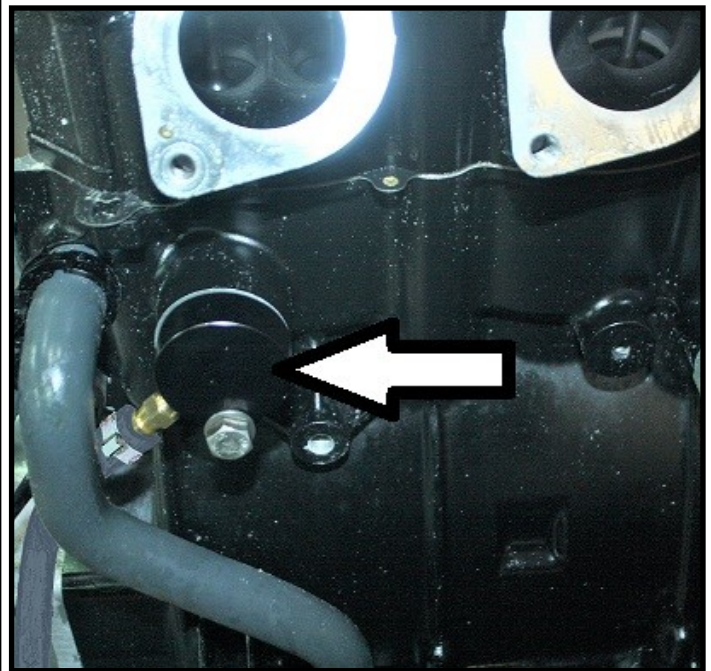
Cut a 10" length of supplied 3/8" cooling hose. Install onto small barb of brass reduce and secure with supplied 18.5 Oetiker clamp. (Figure 8)

Figure 8



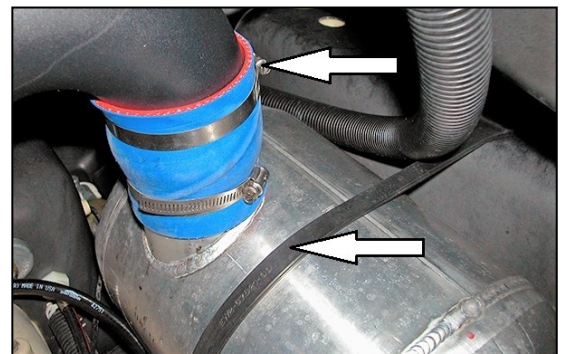
IMPORTANT: Do not install clamp just yet. Inspect waterline & make sure there are no tight bends or kinks that could cause loss of water flow. If necessary, cut hose to desired length. Once inspected/adjusted, secure waterline to anode fitting using supplied #18.5 Oetiker. (Figure 9)

Figure 9



Remove strap securing water box in place. Loosen upper coupler clamp and remove exhaust outlet tube. (figure 10)

Figure 10



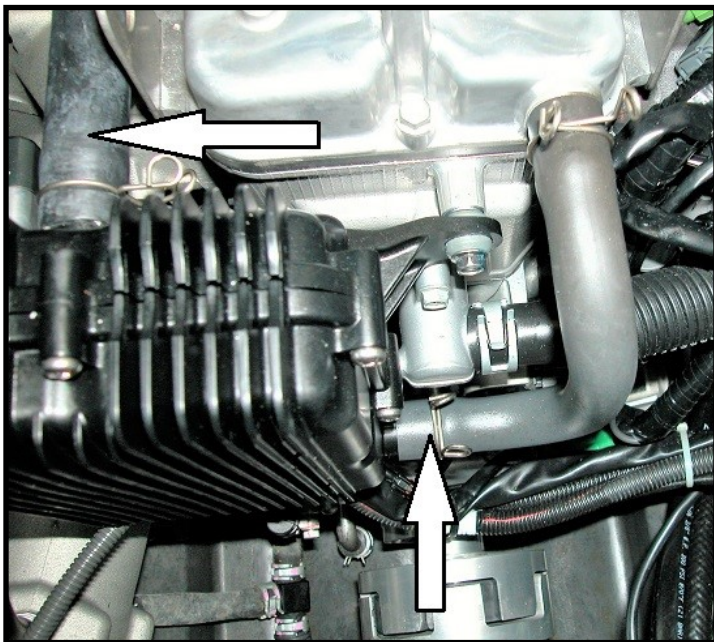
- INSTALLATION INSTRUCTIONS -

Breather box removal. 2008-2011 Models Only

(2012 –2013 do not have a breather box. Proceed with Regulator removal.)

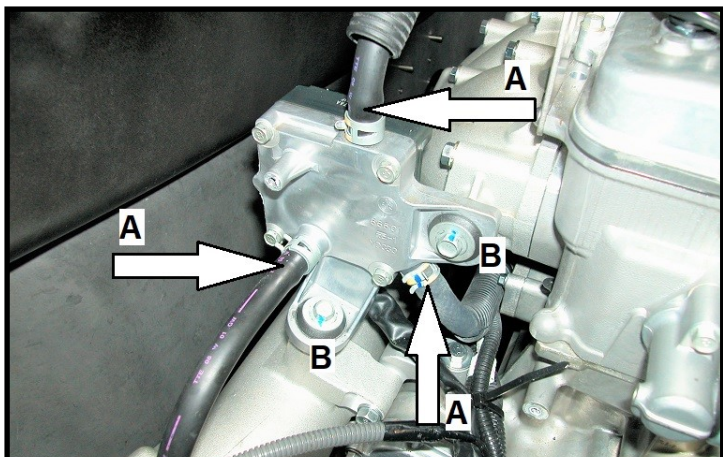
Remove engine breather hoses (2) and bolts (3) from engine breather box. (Figure 11) Remove engine breather box and set aside.

Figure 11



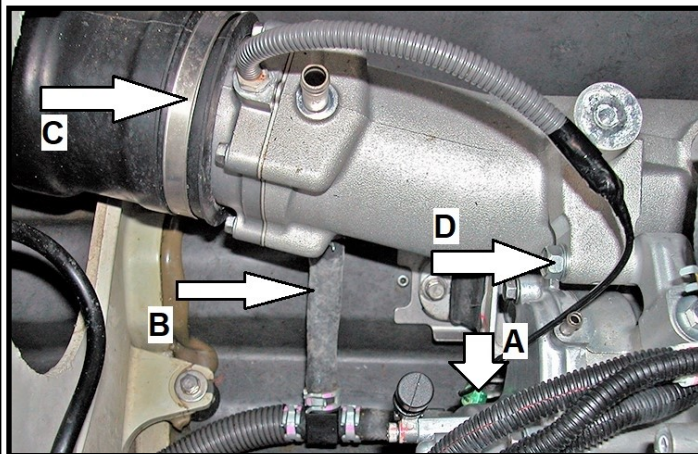
Remove cooling lines (3) (A in Figure 12) from rectifier regulator. Remove bolts (2) (B in figure 12) securing rec/reg to engine and move rec/reg aside.

Figure 12



Disconnect exhaust pipe overhear sensor connector (A) Disconnect cooling line (B) from underside of end of exhaust pipe. Loosen clamp (C) securing coupler to end of exhaust pipe. Remove bolt (1) (D) securing end of exhaust pipe to motor. (Figure 13)

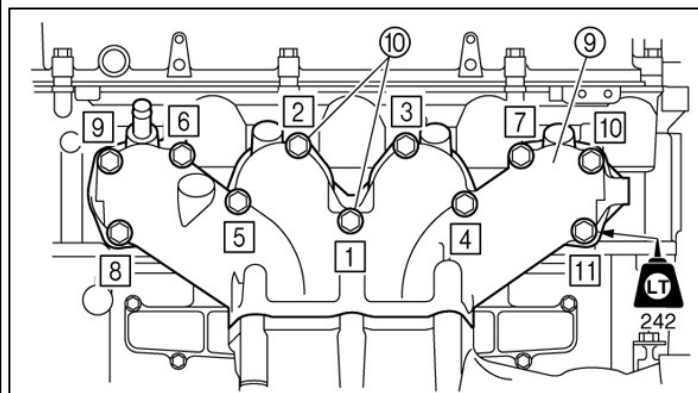
Figure 13



Slide water box towards rear of craft as far as it will go.

Remove bolts (11) securing exhaust pipe assembly to motor. (Figure 14)

Figure 14



Remove exhaust pipe assembly by rotating away from motor towards hull. While lifting up at front pull forward to remove tail pipe from water box inlet. (Figure 15)

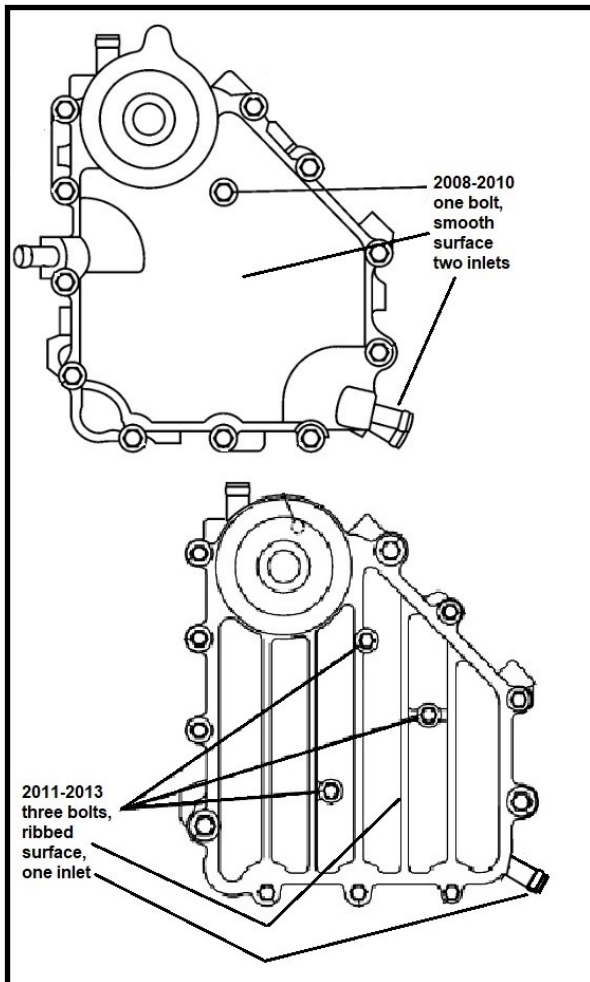
Figure 15



- INSTALLATION INSTRUCTIONS -

2008-2010 SHO Models have different oil coolers from 2011-2013 SHO Models. See comparison. (Figure 9)

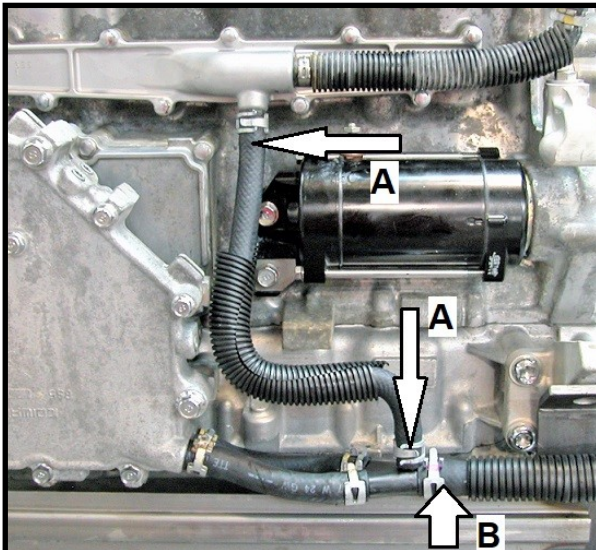
Figure 9



2008-2010 models only

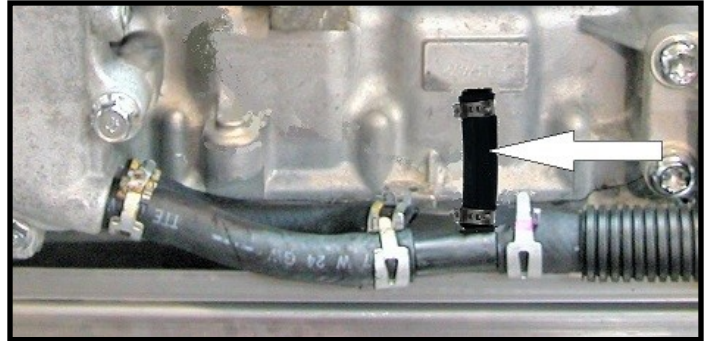
Completely remove line from plastic splitter to engine water inlet fitting (A). Remove cooling water supply hose from plastic splitter (B). (Figure 10)

Figure 10



Install supplied Block-Off Hose Assembly onto top fitting of splitter with supplied 18.5 Oetiker clamp. (Figure 11)

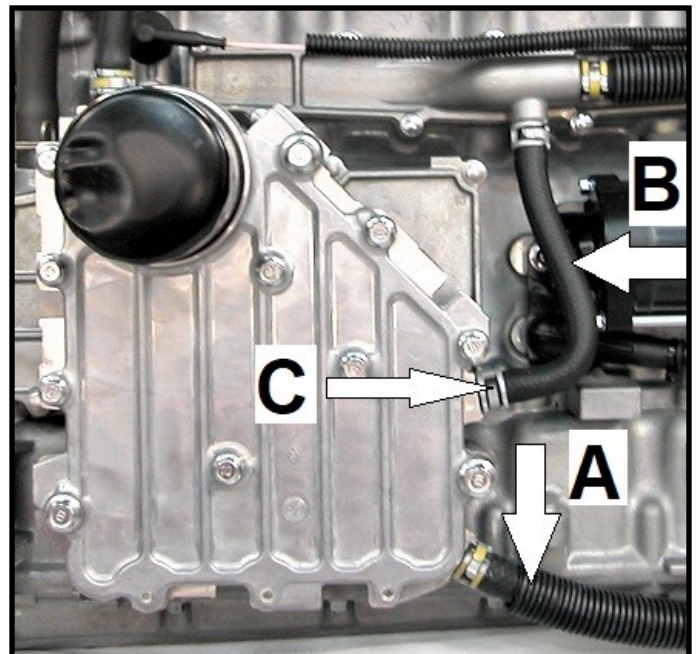
Figure 11



2011-2013 models only

Disconnect cooling inlet hose (A) from oil cooler. Remove cooling water supply hose (B) from oil cooler and engine. (Figure 12)

Figure 12



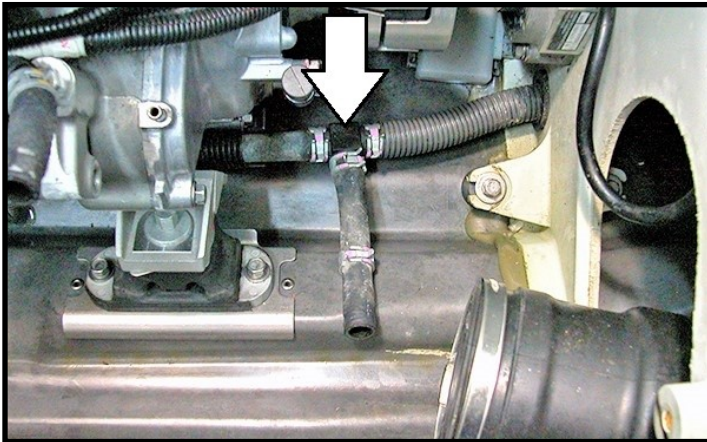
Install supplied Block-Off Hose Assembly onto oil cooler at location C in Figure 12. Secure with supplied 18.5 Oetiker clamp.

- INSTALLATION INSTRUCTIONS -

All models

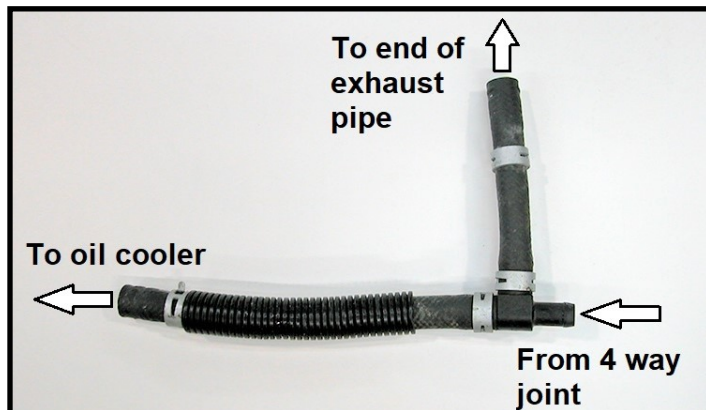
At rear of engine compartment on exhaust side locate plastic T fitting in cooling hose from 4 way water joint (see page 3) previously removed from oil cooler (see page 6). (Figure 13)

Figure 13



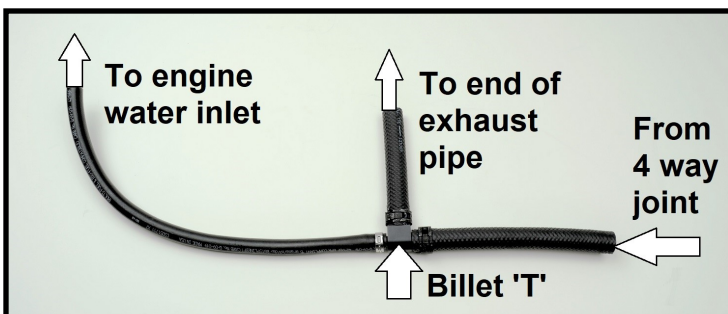
Remove plastic "T" fitting with two connected hoses. (Figure 14)

Figure 14



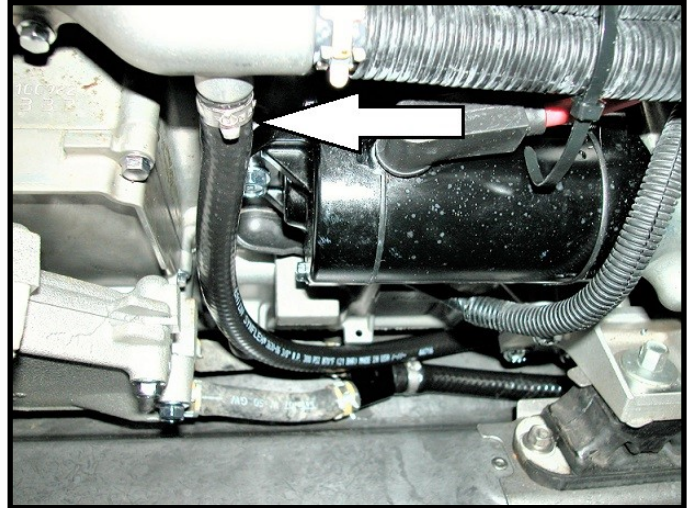
Transfer shorter cooling hose (To End of Exhaust Pipe) to supplied billet 'T' fitting. Install supplied billet 'T' fitting into incoming cooling line. Secure with stock spring clamps. Measure 19 inches of the 3/8" supplied waterline & cut. Attach one end of the waterline to the 3/8" side of the supplied black billet T fitting. Secure using supplied size 18.5 Oetiker clamp. (Figure 15)

Figure 15



Install the black billet T fitting in the same location as the plastic "T" fitting previously removed. Connect the waterline (supply line from 4 way fitting) to the black billet T fitting. Secure using the existing stock spring clamp. Connect free end of 3/8" hose to engine water manifold on left side of block. (Figure 16)

Figure 16



IMPORTANT: Do not install clamp just yet. Inspect waterline & make sure there are no tight bends or kinks that could cause loss of water flow. If necessary, cut hose to desired length. Once inspected/adjusted, secure waterline to water manifold using supplied 18.5 Oetiker.

Measure 60" of supplied 1/2" waterline & cut.

2008-2010 models with plastic splitter (B in figure 10), secure one end of hose to plastic splitter inlet with 22.6 Oetiker clamp.

2011-2013 models secure one end of hose to oil cooler water inlet (A in figure 12) with 22.6 Oetiker clamp.

All models loop hose toward rear of ski then to front left side of engine. (This hose will connect to intercooler water outlet after intercooler is installed.)

Reinstall exhaust assembly. **NOTE: Make sure the "6S5" marking on the exhaust gasket is facing out. If exhaust gasket is damaged, warped or corroded do not reuse.** Replace with Yamaha part number 6S5-14613-00-00 if needed.

Apply Blue Loctite to bolt threads. Torque in two stages following sequence shown in Figure 14 (page 5).

First: 14 lbf•in / 20 N•m

Second: 25 lbf•in / 35 N•m

Tighten hose clamp on exhaust outlet hose at tail pipe.

Connect waterline from black billet T fitting to underside of exhaust tail section. Secure using stock spring clamp.

Reinstall exhaust tail pipe mounting bolt. **Apply blue Loctite to bolt. Torque to 31 lbf•in / 42 N•m.**

- INSTALLATION INSTRUCTIONS -

Reinstall rectifier regulator. **NOTE: Make sure rubber grommets and metal collars are in place. Apply blue Loctite to bolts. Torque to 19 lbf·in / 26 N·m.**

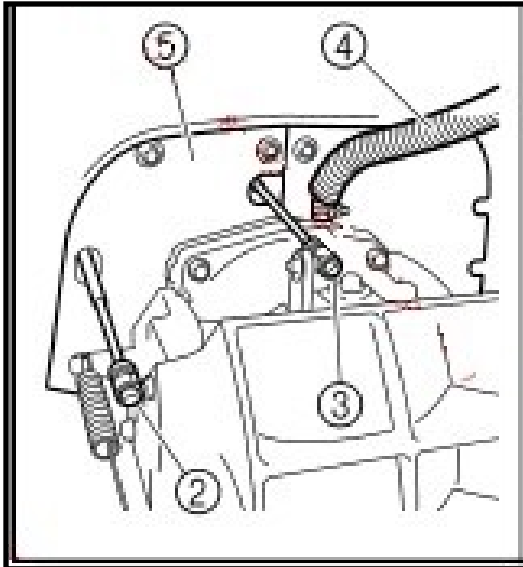
Reconnect rectifier regulator cooling lines. Secure using OEM spring clamps.

Reconnect exhaust thermosensor on exhaust tail pipe. (green connector).

2008-2011 models only Reinstall breather box and hoses.

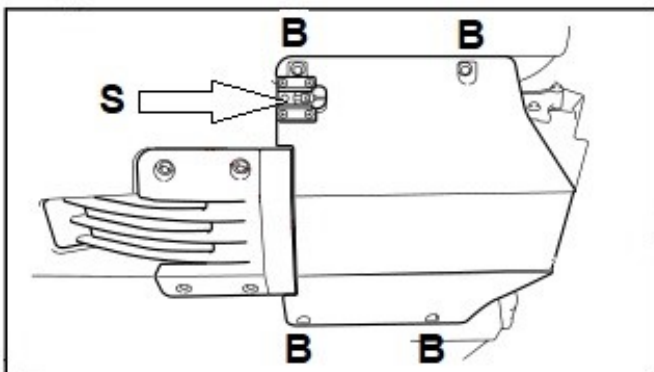
In jet pump area locate and remove bolts (6) holding two rubber flaps around jet pump unit, #5 in Figure 17. Remove flaps.

Figure 17



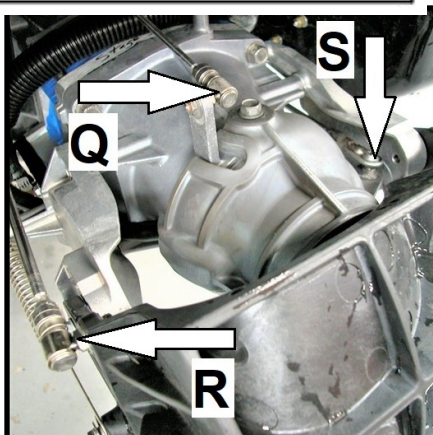
Remove bolts (4) securing speedo sensor to ride plate (S in figure 18). Remove bolts (4) securing ride plate to hull (B in figure 18). Remove ride plate.

Figure 18



Disconnect steering, reverse cables and Q.S.T.S. trim rod. (Figure 19)

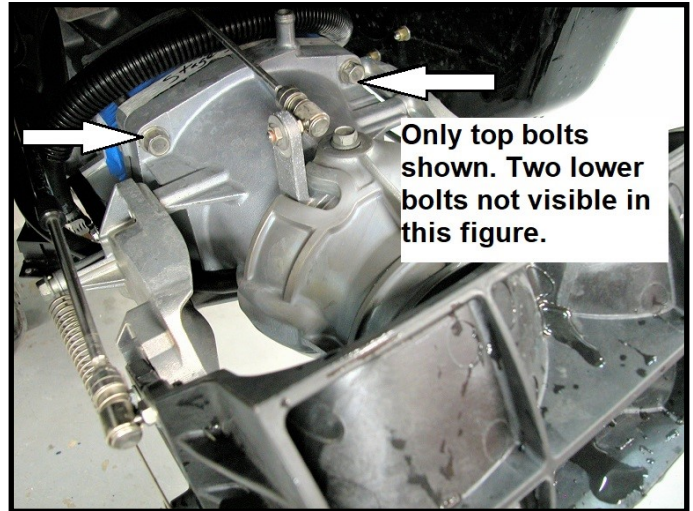
Figure 19



Disconnect visibility spout hose from top of reduction nozzle (4 in figure 17) and stock bilge siphon hose from left side of reduction nozzle.

Remove the M10 bolts (4) securing reduction nozzle and reverse bucket assembly to jet pump. (Figure 20)

Figure 20

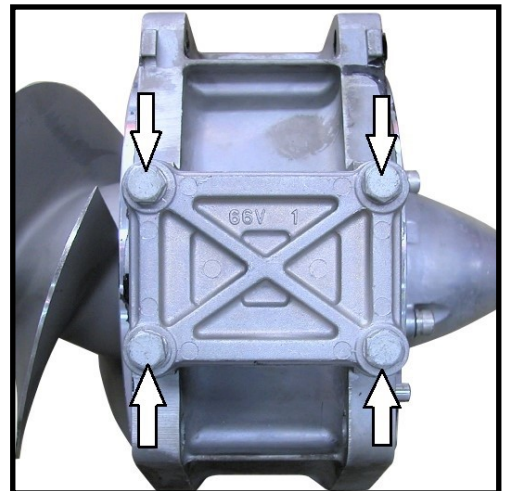


Remove reduction nozzle assembly.

Remove jet pump assembly. **NOTE: Take care not to damage splines at end of drive shaft.**

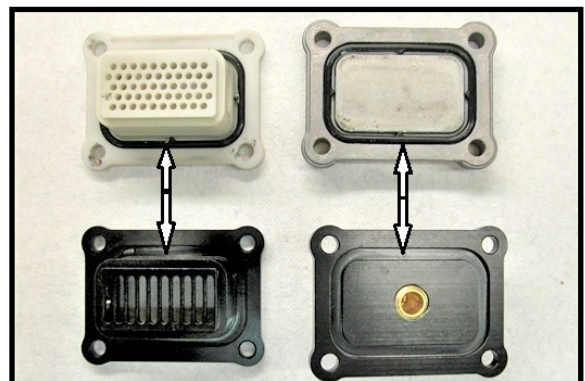
On left side of pump remove the bolts (4) securing water strainer assembly to pump. Remove cover and strainer. (Figure 21)

Figure 21



Transfer o-ring from stock strainer to supplied billet strainer and cover. Install supplied o-ring on strainer. Apply a thin layer of waterproof grease to o-rings. (Figure 22)

Figure 22

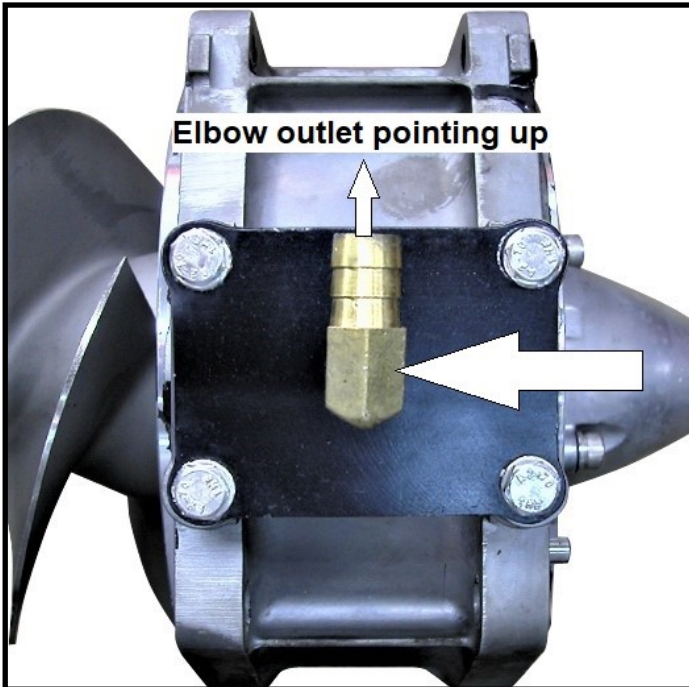


- INSTALLATION INSTRUCTIONS -

Install billet strainer into pump. Install billet strainer cover and secure using supplied bolts and washers. **NOTE: Apply blue Loctite to bolts. Do not over tighten bolts.**

Install supplied 1/2" barbed 90-degree fitting into billet strainer cover (pointing upward). **NOTE: Apply pipe thread sealant to fitting. Do not over tighten fitting.** (Figure 23)

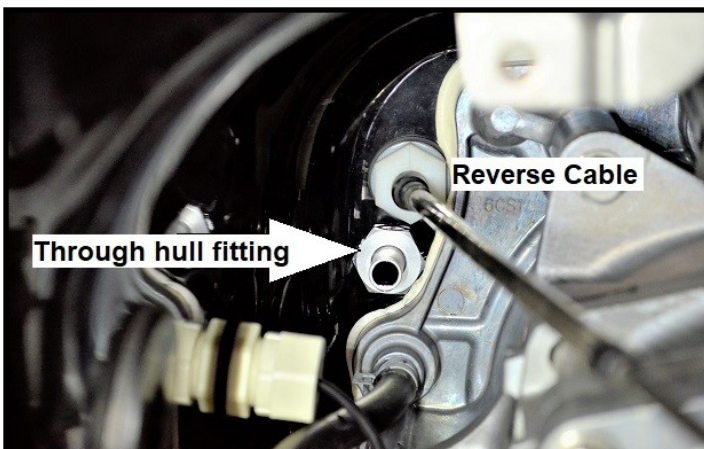
Figure 23



FX Models:

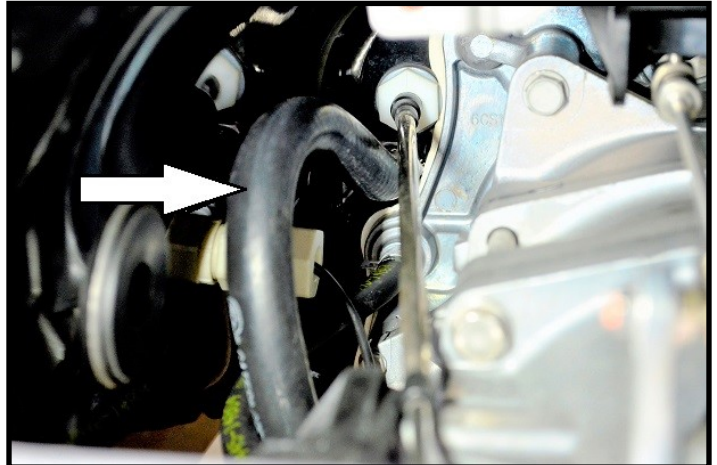
On left side of pump just below the reverse cable, drill a 5/8" hole. Install supplied 1/2" thru-hull fitting from pump side. **NOTE: Apply below waterline silicone sealant to fitting (including threads).** Install nut from inside and secure. (Figure 24)

Figure 24



Cut a 12 inch length of the supplied 1/2" waterline. Connect one end of waterline to the 1/2" thru-hull fitting & the other end to the 90 degree fitting on the pump strainer. Secure waterline to fittings with supplied hose clamps. **Do not over tighten clamps.** (Figure 25)

Figure 25



FZR/FZS Models:

On right side of pump area, locate the top rear nut of the exhaust outlet. Measure 1-1/2" inches back from nut. Mark location & drill a 5/8" hole. (Figure 26)

Figure 26



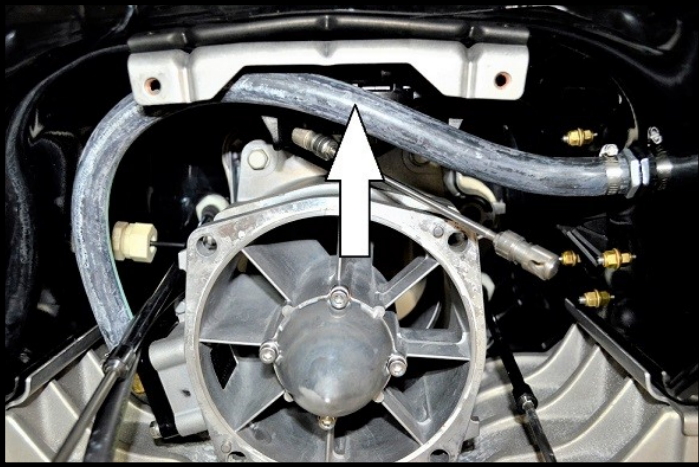
Install supplied 1/2" thru-hull fitting from pump side. **NOTE: Apply below waterline silicone sealant to fitting (including threads).** Install nut from inside and secure..

Cut 19 inch length of supplied 1/2" waterline. Connect waterline to 90 degree fitting on pump strainer & run waterline up & over pump. Connect other end to thru-hull fitting.

Note: Inspect waterline. Make sure there are no tight bends or kinks that could cause loss of water flow. If necessary, cut hose to desired length. Make sure waterline does not interfere with Q.S.T.S. trim rod. Once inspected/adjusted, secure waterline in place with supplied hose clamps. **Do not over tighten clamps.** (Figure 27)

- INSTALLATION INSTRUCTIONS -

Figure 27



All Models:

Apply below waterline silicone sealant to gasket mating surface on jet pump. Install nozzle onto pump and secure using stock hardware. **NOTE: Apply blue Loc-tite to bolts. Torque bolts to 40 N•m (30 ft•lb).**

Reconnect stock visibility spout hose and stock bilge siphon hose to reduction nozzle.

Reconnect reverse, steering cables and Q.S.T.S. trim rod.

Replace ride plate and secure using stock bolts. **NOTE: Apply blue Loctite to bolts. Torque bolts to 12.5 lb-ft (17Nm).**

Reinstall speedo sensor and secure using stock screws. **NOTE: Apply blue Loctite to bolts. NOTE: Do not over tighten bolts.**

Measure 120" of supplied ½" waterline & cut. Connect this cut piece of ½" waterline to the ½" thru-hull fitting from the inside of the hull. Secure waterline with supplied hose clamp. **Do not over tighten clamp.**

Run waterline along the bottom of hull, through the bulkhead on right side (battery side) of hull. Use the same access hole in the bulkhead that the steering cable passes through. Continue waterline along the bottom of hull and around front of engine. This hose connects to the water inlet fitting on the intercooler with supplied clamp.

Complete installation of RIVA RY17081-PC-TV Power Cooler Kit following instructions to install intercooler, and reinstall intake manifold and supercharger at this time.

Connect 1/2" waterline from thru-hull fitting to intercooler water inlet fitting. **IMPORTANT:** Do not install clamp just yet. Inspect waterline & make sure there are no tight bends or kinks that could cause loss of water flow. If necessary, cut hose to desired length. Secure waterline with supplied hose clamp. **Do not over tighten clamp.**

Reinstall rear grab handle & deck beam.

Reinstall engine cover.

Reconnect battery cables. **NOTE: Positive (red) first. Negative (black) second.**

Thoroughly inspect engine compartment and bilge for tools, rags, parts, etc. Run craft on stand using flush kit to check for proper operation.

Remember, the water belongs to everyone.

Please ride responsibly and respect the environment!

Technical Support

For answers to questions regarding installation or trouble shooting RIVA Performance Products contact:

RIVA Technical Support directly at (954) 247-0705 or by e-mail at tech_support@rivamotorsports.com.

Limited Warranty

RIVA Engine Cooling Upgrade Kits carry a 90 day limited warranty to the original purchaser. They are warranted to be free of defects in materials and workmanship under normal use and service. Customer modified components will be void of warranty. This warranty is limited to defects in the primary components only. Finish and/or wear marks in or on primary components are not covered under this warranty.

RIVA Racing's liability is expressly limited to the repair or replacement of the components contained within or associated with this kit. RIVA Racing agrees to repair or at RIVA's option, replace any defective unit without charge, if product is returned to RIVA Racing freight prepaid within the warranty period. Any equipment returned which, in RIVA's opinion, has been subjected to misuse, abuse, overheating or accident shall not be covered by this warranty.

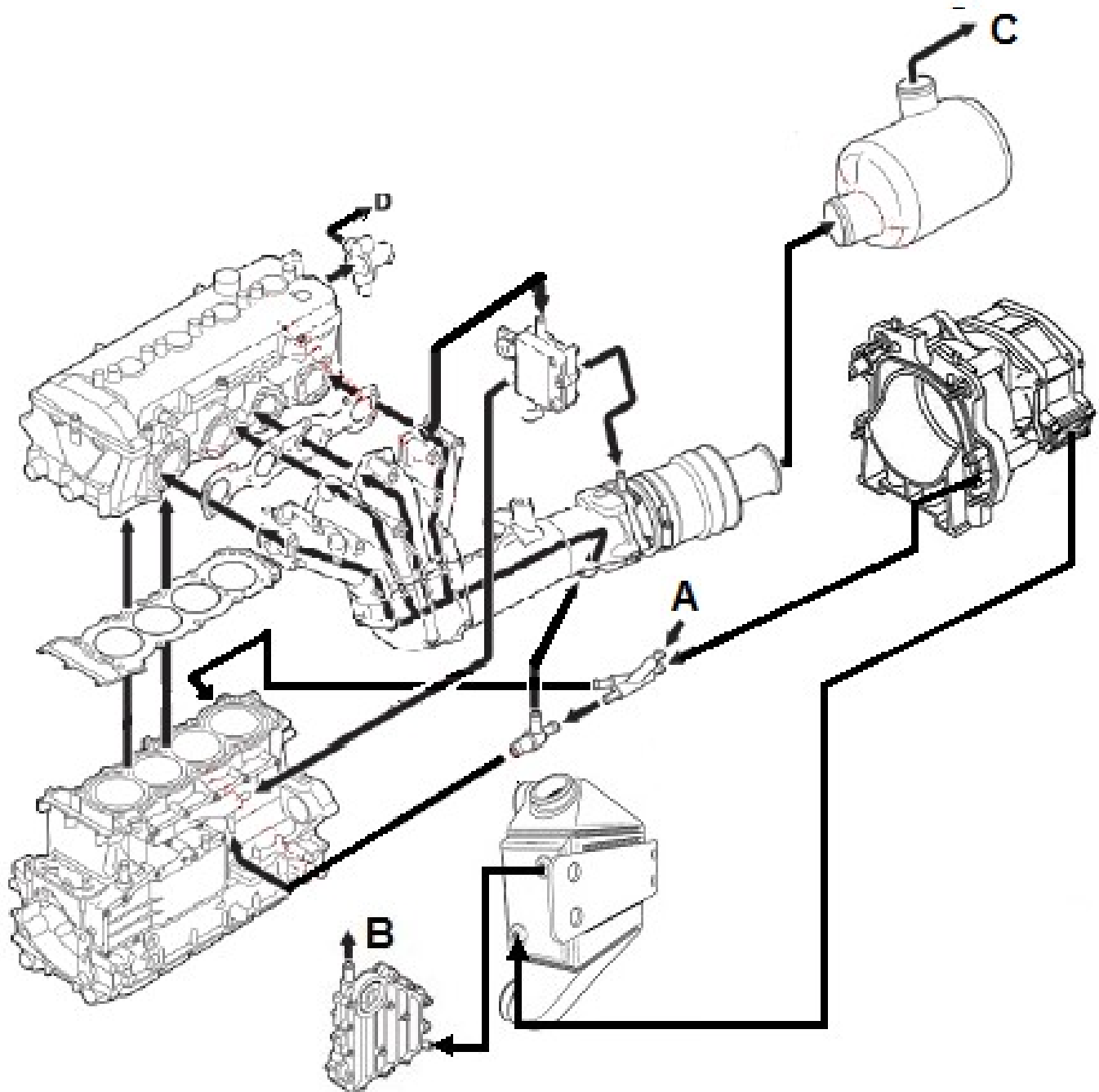
RIVA Racing shall have no liability for special, incidental or consequential damages or injury to persons or property from any cause arising from the sale, installation or use of this product.

No other warranty, express or implied, including, but not limited to the implied warranties of merchantability and fitness for a particular purpose, applies. Various states do not allow for the limitation of incidental or consequential damages and therefore the above exclusion or limitation may not apply to you.

Warranty does not include the expenses related to freight or transportation of parts or compensation for any inconvenience or loss of use while being repaired. A copy of the original invoice and a Return Authorization Number (RA#) must accompany all warranty claims.

Warranted replacement parts will be returned freight collect.

Waterflow Diagram RY17081 with Engine Cooling Upgrade Kit



- A. Flush Hose**
- B. To Through Hull Bypass Fitting**
- C. Exhaust**
- D. To Drain Joint**