



Pro-Series Billet Cylinder Head Kit (66V)

PART# - RY 100320

INSTALLATION INSTRUCTIONS

PARTS LIST

<u>PART #</u>	<u>QTY</u>	<u>DESCRIPTION</u>
RY100320-A	3	GIRDLED HEAD COVER (66V)
RY100320-B	3	GIRDLED HEAD BODY (66V)
RY100320-H	1	GIRDLED HARDWARE KIT
RY100320-O	1	O-RING KIT
RY10024-P	6	DOWEL PIN
RY100288-M	4	EXHAUST MOUNT & WASHER
N/A	2	ALUMINUM SPACER
N/A	2	1/2" WATERLINE
N/A	3	3/8" BARBED X 1/4" NPT 90° BRASS FITTING
N/A	2	1/2" BARBED X 1/4" NPT 90° BRASS FITTING
N/A	1	1/2" BARBED X 1/4" NPT STRAIGHT BRASS FITTING
N/A	1	1/2" BARBED 'T' FITTING
N/A	4	HOSE CLAMP

NOTE: This is a Riva Yamaha racing component. It is designed for competition use only. Failures caused by the use of this component are not covered by the Yamaha limited warranty.

WARNING! DISCONNECT BATTERY AND TURN FUEL OFF BEFORE PERFORMING WORK!

**** NO SMOKING ****

Gasoline and gasoline fumes are highly flammable and explosive. Handle with care!

1. Disconnect battery cables from battery and turn fuel cock valve to off position.
2. Disconnect all waterlines attached to the cylinder head and remove spark plug caps.
3. Remove hardware holding O.E. exhaust brackets in place. Carefully remove cylinder head. Cover the pistons with clean rags to prevent any foreign objects from entering the motor. Carefully clean any gasket material from cylinder-cylinder head mating surface. ***NOTE: Take care not to scratch cylinder-cylinder head mating surface when removing cylinder head and cleaning.***
4. Remove one of the twelve OE cylinder bolts holding cylinder to upper crankcase and replace with one of the twelve supplied 10mm X 70 MM studs, 10mm washers and hex cap nuts. Torque hex cap nuts to 40 Nm (4.0m/kg • 29ft/lbs). Repeat for remaining 11 OE cylinder bolts. ***NOTE: It is recommended that studs have 12-13mm of thread showing out of cylinder base without the hex cap nut or washer installed. Use Loctite 572 on all studs and hex cap nuts.***
5. With all hex cap nuts installed and torqued, loosely install twelve supplied 8mm X 132mm studs (longer thread side down) into the hex cap nuts. ***NOTE: Use Loctite 572 on studs.***

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INSTALLATION INSTRUCTIONS (CONT.)

INSTALLING WATER FITTINGS:

- 6a. **OE EXHAUST HEAD PIPE APPLICATIONS:** Install one supplied 1/2" barbed X 1/4" npt straight brass fitting into one cylinder head cover (**Refer to illustration #1**). Then, install two supplied 1/2" barbed X 1/4" npt 90° brass fittings into remaining two cylinder head covers (**Refer to illustration #2&3**). The two 1/2" barbed X 1/4" npt 90° brass fittings should face each other when installed correctly as there will be a 1/2" 'T' fitting installed between them later (**Refer to illustration #2&3**). **NOTE: Use Threebond 1211 on the threads to prevent leaking. Do not over tighten!**
- 6b. **TRIPLE PIPE EXHAUST APPLICATIONS:** Install one supplied 3/8" barbed X 1/4" npt 90° brass fitting into each cylinder head cover so they are pointing in the direction of your bypasses (**Refer to illustration #5**). **NOTE: Use Threebond 1211 on threads to prevent leaking. Do not over tighten! We recommend they point to the front of the motor and that you install water by-passes in the front top-deck area of craft to ensure cooling system is functioning.**

NOTE: Be sure to have a clean working surface when installing O-rings.

**** DO NOT USE SILICONE SEALANT ON O-RINGS ****

7. Using selected size dome for your application, apply a small amount of provided grease to O-rings 'A' and 'B' (**Refer to illustration #8**). Install O-ring's into corresponding O-ring grooves in each dome (**Refer to illustration #9**). Set domes aside and cover with a clean rag (Domes will be installed later).
8. Apply a small amount of grease to O-ring 'C' and install into corresponding O-ring groove in cylinder head body (**Refer to illustration #10**). **NOTE: Be sure not to stretch the O-rings when installing.** Next, apply a small amount of grease to one of O-ring 'D' and install into corresponding O-ring groove on cylinder head cover-cylinder head body mating surface (**Refer to illustration #11**). When you have installed O-ring 'D' completely, cut the excess material evenly with a sharp razor blade so the ends meet flush. **NOTE: Do not leave a gap between O-ring ends. Be sure not to stretch the O-rings when installing. There will be excess material even when installed properly!**
9. Apply a small amount of grease onto installed O-ring 'C' (**Refer to illustration #10**). Install dome into cylinder head body. **NOTE: Be sure the locking flanges on the dome are aligned with the locking flanges on the cylinder head body (Refer to illustration #9). Do not force the dome into the head body.**
10. Install two supplied dowel pins into cylinder head body (**Refer to illustration #11**). **NOTE: It may be necessary to lightly tap dowel pins into position.** Apply a small amount of grease onto installed O-rings 'D' (cylinder head cover side), 'A' and 'B'. With dome installed in cylinder head body, carefully slide cylinder head cover onto cylinder head body. The cover should slide on easily with little or no force. **NOTE: Proper position is indicated when cylinder head cover exhaust mount locations are on the same side as 1/8" npt brass fitting in the side of cylinder head body.**
11. Next, apply a small amount of grease to one of O-ring 'D' and install into corresponding O-ring groove on cylinder head body-cylinder mating surface (**Refer to illustration #12**). When you have installed O-ring 'D' completely, cut the excess material evenly with a sharp razor blade so the ends meet flush. **NOTE: Do not leave a gap between O-ring ends. Be sure not to stretch the O-rings when installing. There will be excess material even when installed properly!**
12. Apply a generous amount of grease to one of O-ring 'E' and install into corresponding O-ring groove on dome-cylinder mating surface (**Refer to illustration #12**).

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INSTALLATION INSTRUCTIONS (CONT.)

13. Remove rag from the cylinder. Carefully slide assembled cylinder head over the four 8mm X 132mm studs and onto cylinder taking care not to dislodge any O-rings. The proper position is indicated when the 1/8" brass fitting on the side of the cylinder head body is on the intake manifold side of motor. **NOTE: DO NOT USE OE CYLINDER HEAD GASKET.**
14. Repeat steps 7 through 12 for each of the two remaining cylinder head bodies, covers and domes.

INSTALLING CYLINDER HEAD BOLTS:

15. Loosely install twelve of the supplied 8mm X 65mm bolts with washers into locations 1-6 in the center and rear cylinder heads (**Refer to illustration #6**). Tighten and torque bolts in three-step order sequence as shown in illustration # 6. **NOTE: Use Loctite 572 on all bolts.**
- 16a. **OE EXHAUST HEAD PIPE APPLICATIONS:** Loosely install four of the remaining supplied 8mm X 65mm bolts into holes 1,3,4 &6 on the front cylinder head (**Refer to illustration #6**). Next, install the front OE exhaust bracket using the two OE exhaust bracket/cylinder head bolts and the two supplied aluminum barrel spacers (install barrel spacers under exhaust bracket on cylinder head cover) in locations 2 & 5. Tighten and torque all bolts in two-step order sequence as shown in illustration # 6. **NOTE: Use Loctite 572 on all bolts.**
- 16b. **TRIPLE PIPE EXHAUST APPLICATIONS:** Loosely install the remaining six supplied 8mm X 65mm bolts with washers into locations 1-6 (**Refer to illustration #6**) in front cylinder head. Tighten and torque bolts in two-step order sequence as shown in illustration # 6. **NOTE: Use Loctite 572 on all bolts.**
17. Loosely install the twelve supplied 8mm washers and nuts onto 8mm studs in locations 1-4 of each cylinder head (**Refer to illustration #5**). Tighten and torque bolts in two-step order sequence as shown in illustration # 5. **NOTE: Use Loctite 572 on all bolts.**

INSTALLING COOLING LINES

- 18a. **OE EXHAUST HEAD PIPE APPLICATIONS:** Install supplied 1/2" barbed 'T' fitting between the two 1/2" barbed X 1/4" npt 90° brass fittings installed in front and center cylinder head covers using the two sections of supplied 1/2" waterline and supplied hose clamps. Next, attach 1/2" OE waterline from the side of the OE exhaust head pipe to the 1/2" barbed 'T' fitting using the OE hose clamp. Then, attach 1/2" OE waterline from rear of OE exhaust head pipe to the 1/2" barbed straight brass fitting in the rear cylinder head cover using the OE hose clamp. **NOTE: Do not over tighten hose clamps!**
- 18b. **TRIPLE PIPE EXHAUST APPLICATIONS:** Attach and secure your 3/8" waterline to each 3/8" barbed X 1/4" npt 90° brass-fitting using enclosed hose clamps. **NOTE: Do not over tighten hose clamps!**

INSTALLING EXHAUST MOUNTS

- 19a. **OE EXHAUST HEAD PIPE APPLICATIONS:** Install the four supplied exhaust mounts and washers into center and rear cylinder head covers and torque to 40Nm (4.0m/kgf • 29ft/lbs) (**Refer to illustrations #2**). Install two remaining factory exhaust brackets and secure using original factory hardware. Torque to 40Nm (4.0m/kgf • 29ft/lbs).
- 19b. **TRIPLE PIPE EXHAUST APPLICATIONS:** Install two of the four supplied exhaust mounts and washers into rear cylinder head cover and torque to 40Nm (4.0m/kgf • 29ft/lbs) (**Refer to illustrations #2**). Install applicable brackets and hardware for your set-up and torque to manufacturer's specs.
20. Check bilge area for tools, loose lines and/or fittings. Reattach battery cables and turn fuel cock valve to on position.
21. Upon completing installation, run engine on flush kit and check for leaks.

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INSTALLATION INSTRUCTIONS (CONT.)

NOTE: Be sure to use 14mm X 1.25mm 3/4 " reach spark plugs. (e.g. BR8ES)

COMPRESSION CHART

STOCK CYLINDERS / VALVES DOWN

<u>PART #</u>	<u>DOMESIZE</u>	<u>COMPRESSION</u>	<u>SQUISH</u>
RY100277-D-31	31cc	N/A	N/A
RY100277-D-33	33cc	N/A	N/A
RY100277-D-35	35cc	175 psi	.058-.062 in
RY100277-D-37	37cc	160 psi	.058-.062 in
RY100277-D-41	41cc	145 psi	.058-.062 in

Riva Pro-Spec Superstock Flat Top Applications

RY100277-D-30	30cc	185 psi	.055-.060 in
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All specifications are at sealevel with cold engine and fully charged battery. (+/- 5%)

IMPORTANT: Technical Support

For answers to questions regarding installation or trouble shooting Riva Yamaha Pro-Series II Billet Cylinder Head contact:
Riva Yamaha Tech Line @ (954) 247-0705 or online at tech_support@rivayamaha.com
Or you're local Yamaha Dealer

Riva Yamaha Limited 1-Year Warranty

Riva Yamaha Pro-Series II Billet Cylinder Heads carry a one-year 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 billet aluminum components only. Anodized finish, wear marks in or on head body, head cover, and stroker plate, O-rings and hardware are not covered under this warranty.

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

Riva Yamaha 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 must accompany all warranty claims.

Warranted replacement parts will be returned freight collect.

Remember the water belongs to everyone!

Please ride responsibly!

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INSTALLATION IMAGES

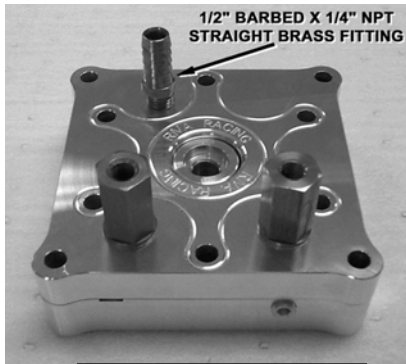


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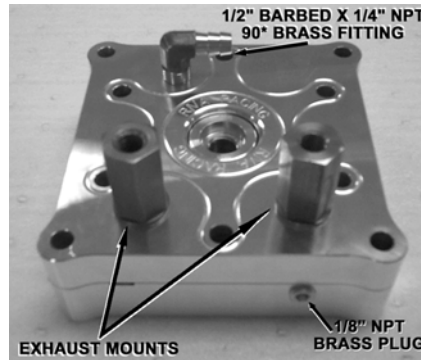


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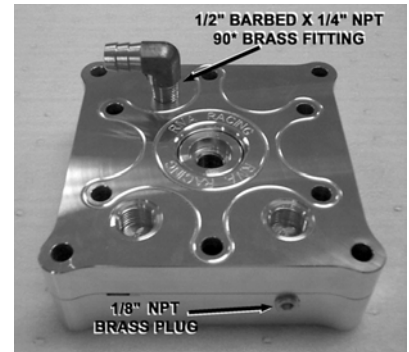


ILLUSTRATION 3

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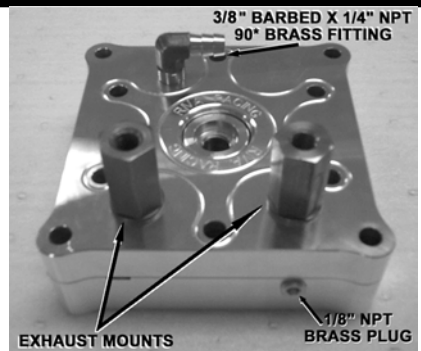


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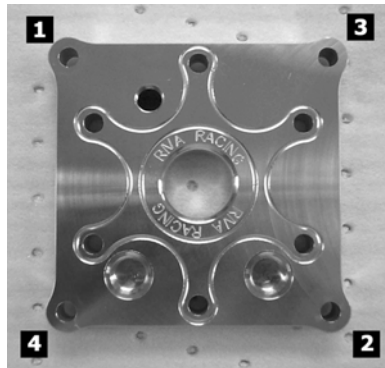
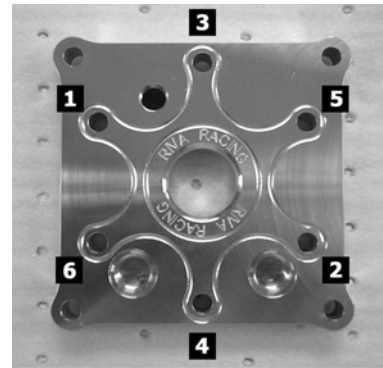


ILLUSTRATION 6



TORQUE PROCEDURES							
GIRDLED HARDWARE				CYLINDER HARDWARE			
Two step procedure							
	<u>Nm</u>	<u>m/kg</u>	<u>ft/lb</u>		<u>Nm</u>	<u>m/kg</u>	<u>ft/lb</u>
1st	15	1.5	11	1st	23	2.3	17
2nd	25	2.5	18	2nd	31	3.1	22

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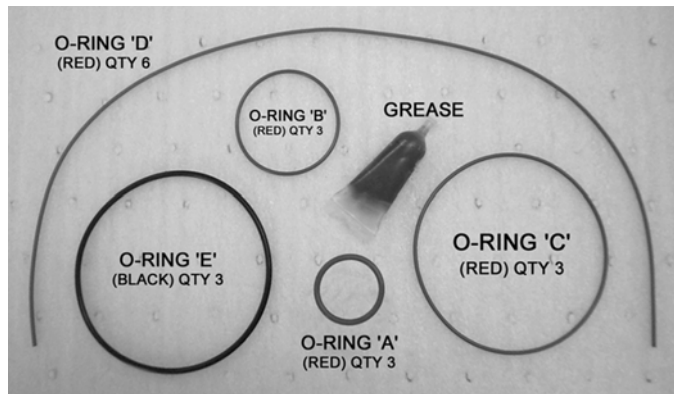


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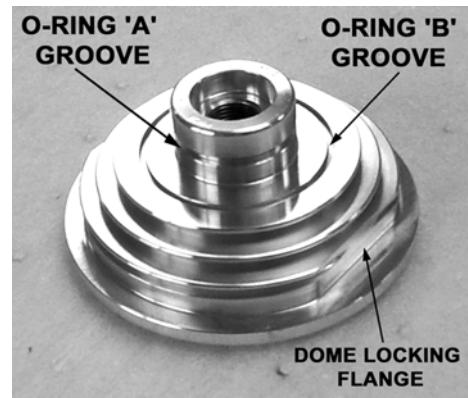


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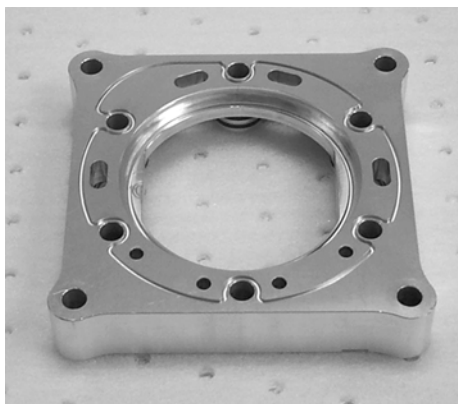


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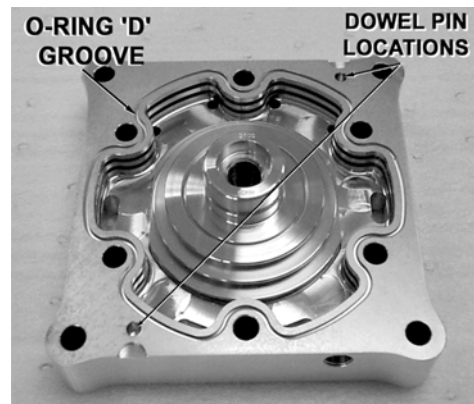


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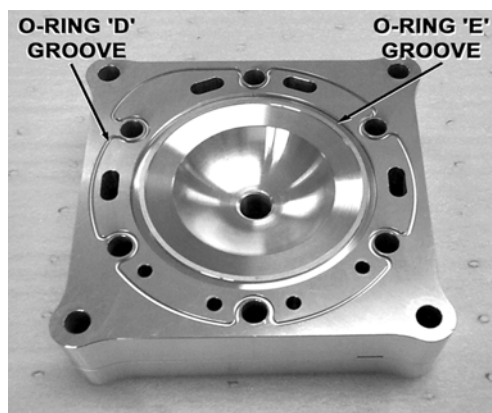


ILLUSTRATION 12