



RIVA RACING
PERFORMANCE PRODUCTS & ACCESSORIES

Darton Pro-Series Cylinder Sleeves

PART# - RY10040-SLV-470



APPLICATION(S): Yamaha 1.8L Engine

The following specifications are provided as a guide only. We strongly recommend that only an experienced machine shop prepare and install these sleeves. Failure to properly prep and install these sleeves falls on the installer and end user. Due to the nature of performance applications these sleeves are sold without any express warranty or any implied warranty of merchantability or fitness for a particular purpose. RIVA Racing shall not, under any circumstances, be liable for any special, incidental or consequential damages, including, but not limited to damage, or loss of profits or revenue, cost of purchased or replacement goods, or claims of customers of the purchaser, which may arise and/or result from sale, installation or use of these sleeves. Installation of these sleeves will adversely affect the vehicle manufacturer's warranty coverage.

IMPORTANT:

Because of the tight bore-to-bore tolerance required (plus or minus .0005") attempting to install these sleeves using an automotive style air-float boring bar is not recommended. Machining is best done on a flood-coolant CNC in order to maintain a stable temperature from start to finish of machining operations. If done slowly and carefully, a manual mill with digital readout will work, but will be somewhat time consuming.

We highly recommend new castings be vibratory stress relieved. Because these castings are fairly low mass, this can be done after the sleeves are installed prior to decking and rough boring. Vibratory stress relief will stabilize the casting eliminating or greatly reducing bore distortion when block goes through several heat & cool cycles.

- INSTALLATION INSTRUCTIONS -

1. Fixture block on machine table with crankshaft axis parallel to machine table. **NOTE: Block must be held in place securely. Half rounds that fit into bearing bore or a mounting plate may be used to secure block.**
2. Indicate centerline of cylinder one (front). This is your machine work offset. The bores are 95.5 mm center to center (3.760"). You must be able to hold this spacing within plus or minus .0005". Sleeves have flats on flanges that must not press against each another. Cylinder bores will not stay round if this occurs.
3. Measure sleeve body diameters. Sleeve specifications call for an upper body diameter of 3.685" and a lower body diameter of 3.675". **NOTE: Sizes may vary slightly. Size the bores to sleeves provided. Measure sleeve diameters again at 90-degrees from your first measurement and average the two measurements.**

BORING BLOCK FOR DARTON SLEEVES

4. Bore cylinders to a diameter of 3.555" and to a depth of 5.500" from deck surface. This is for honing stone clearance at maximum bore diameter.
5. Bore cylinders to a diameter of 3.6765" nominally and to a depth of 5.025" from deck surface. **NOTE: Acceptable range for machined bore size is .001" ~ .0015" larger than lower body diameter of sleeves. Target clearance is .00125".**
6. Bore cylinders to a diameter of 3.6865" nominally and to a depth of 3.025" from deck surface. **NOTE: Acceptable range for machined bore size is .001" ~ .0015" larger than lower body diameter of sleeves. Target clearance is .00125".**
7. Machine recess for sleeve flange. This can be accomplished by boring or circular interpolation on a CNC. Machine to a diameter of 3.960" to a depth of .495". When fitted sleeves will sit proud of the surface .005" to facilitate firmly clamping them in place.
8. File edge at top of cylinders at flange counter-bore with a fine half round file to knock off sharp edge.
9. Remove block from machine and clean in preparation for sleeve installation.

DARTON SLEEVE INSTALLATION

IMPORTANT:

**Do not attempt to press sleeves into block!!!
Doing so will either crack the block or distort the bore diameter.**

Do not apply Loctite to sleeves.

Do not allow Loctite to permeate into flange seating surface or else failure will occur.

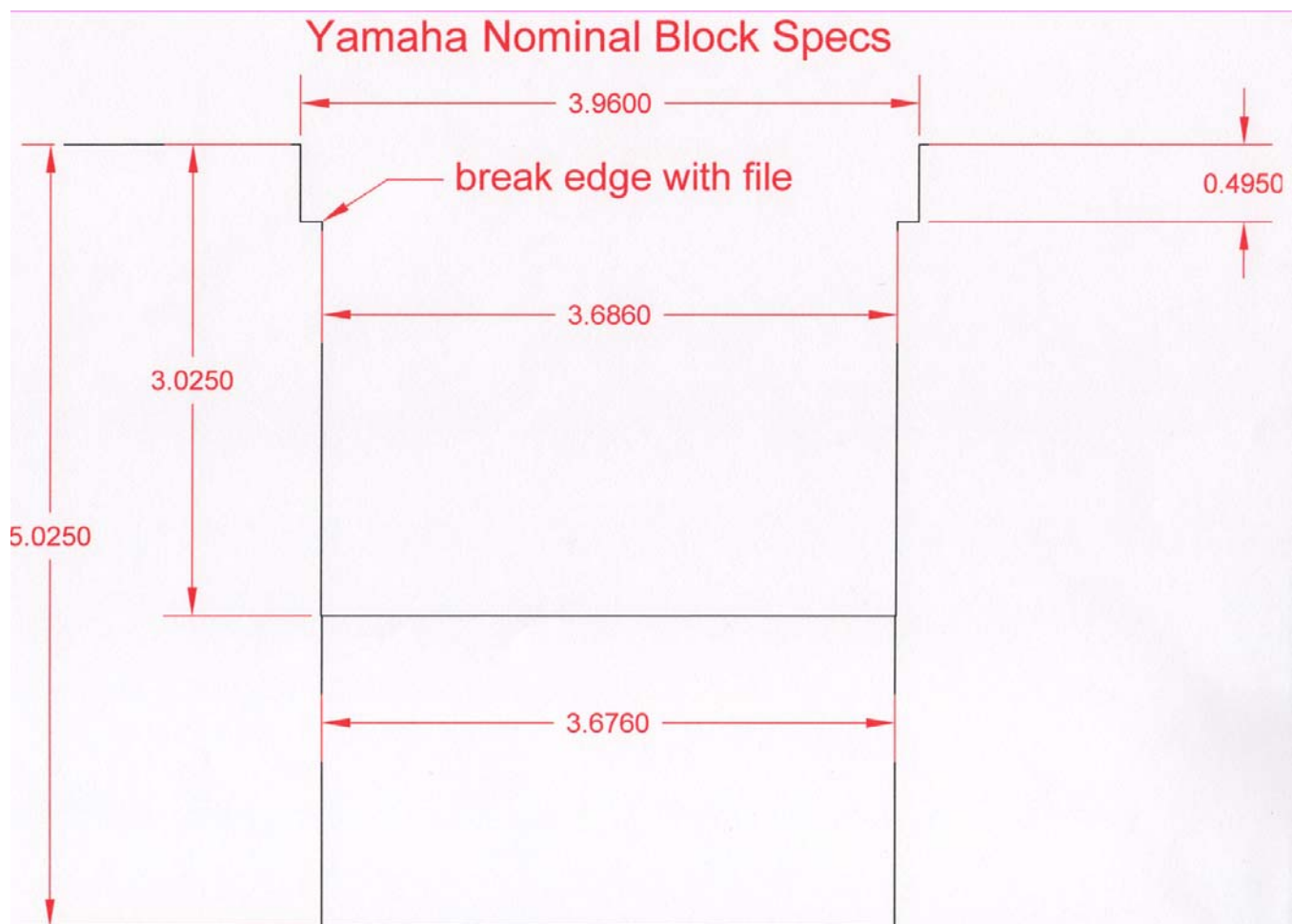
All work is to be performed at ambient temperature. Do not heat block or cool sleeves.

10. Apply a thin layer of Loctite 515 or 518 to lower bore of block. **NOTE: Do not apply Loctite to sleeves.**
11. Apply a thin layer of Loctite 620 to upper bore of block. **NOTE: Do not apply Loctite to sleeves. Do not allow Loctite to permeate flange seating surface or else a failure will occur.**
12. Carefully line up two sleeves and install part way into their respective bores. Align remaining two sleeves with the first two. Make certain flats are aligned squarely with adjacent sleeve (rotate sleeves as required).
13. Drive sleeves into block using a plastic, shot-filled hammer alternating between sleeves. **NOTE: Ensure sleeves remain aligned as you alternate between sleeves. If clearance was on the tight side you may need an aluminum plate and steel or brass hammer to get the sleeves down all the way. Clamp sleeves down using machine clamps via head bolt holes or to a machine table. We recommend using a brass hammer to hit the sleeve flanges after clamping to insure they are fully seated. Retighten clamping bolts as required.**
14. Let block sit for one hour.
15. Mount block on mill or resurfacing machine and resurface deck. **NOTE: Block must be held in place securely with crankshaft axis parallel to machine table. Deck must be flat and as smooth as possible.**
16. Determine finish bore size. Rough bore sleeves to a diameter .005" less than finish bore size and chamfer top edge of bores.
17. Finish hone sleeves to size. **NOTE: A honing plate and cylinder head gasket must be utilized. It is not recommended to hone any block without using a honing plate to simulate bore distortion.**

See honing specifications on next page.

FINISH HONING SPECIFICATIONS		
	Semi Finish	Plateau Finish
Stone	EHU 412 *	EHU-412 / C30 PHT 731 *
Top Over Stroke	5/8"	5/8"
Bottom Over Stroke	3/8"	3/8"
Spindle Speed (RPM)	170	170
Stroke Speed (SPM)	41	41
Honing Oil	MAN 845	MAN 845
Stroke Scale	2-3/4" PNP 1275	2-3/4" PNP 1275
Guide Shoes	CK-3070	CK-2070
Cross Hatch Angle	25-30	25-30
Load Meter	30%	20~30%
Time Cycle		45 seconds

* = Refer to Sunnen for honing stone specifications.



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.