

MATERIALS:

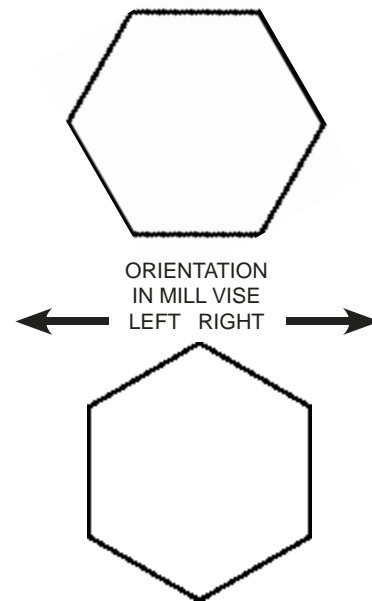
Quantity	Material	Where Used	Item
1	1/2" x 1/2" Steel round	Thrust Washer	1
1	7/8" x 4" hex rod – aluminum or brass	Crankshaft, Front & Rear Plates	2
1	5/8" x 3" Turned Ground Polished (TGP) round rod	Front & Rear Crankshaft	3
1	1/2" x 1" aluminum round rod	Venturi	4
2	3/32" diameter x 5/8" dowel pin	Crank Pins	5
2	1/16" x 0.200" steel round	Propeller Drive Pins	6
1	Propeller	8 x 6 or 9 x 4 Propeller. (not shown)	7
12	4-40 – 1/4" hex screws	Front & Rear Cover	8
1	1/4-20 nut steel or brass	Propeller Nut	9
1	1/4" steel washer	Propeller Washer	10
2	COX® .049 engine	Cylinders, Cylinder Heads, Pistons & Connecting Rods	11
1	Cox Needle Valve Assembly from COX donor engine	Carburetor (not shown)	12

NOTE: If you do not have an Rotary Table you can drill the holes using X and Y coordinate positions. Center the hex rod under the milling head, position X=0 and Y=0, and use the following x and y positions to drill the holes:

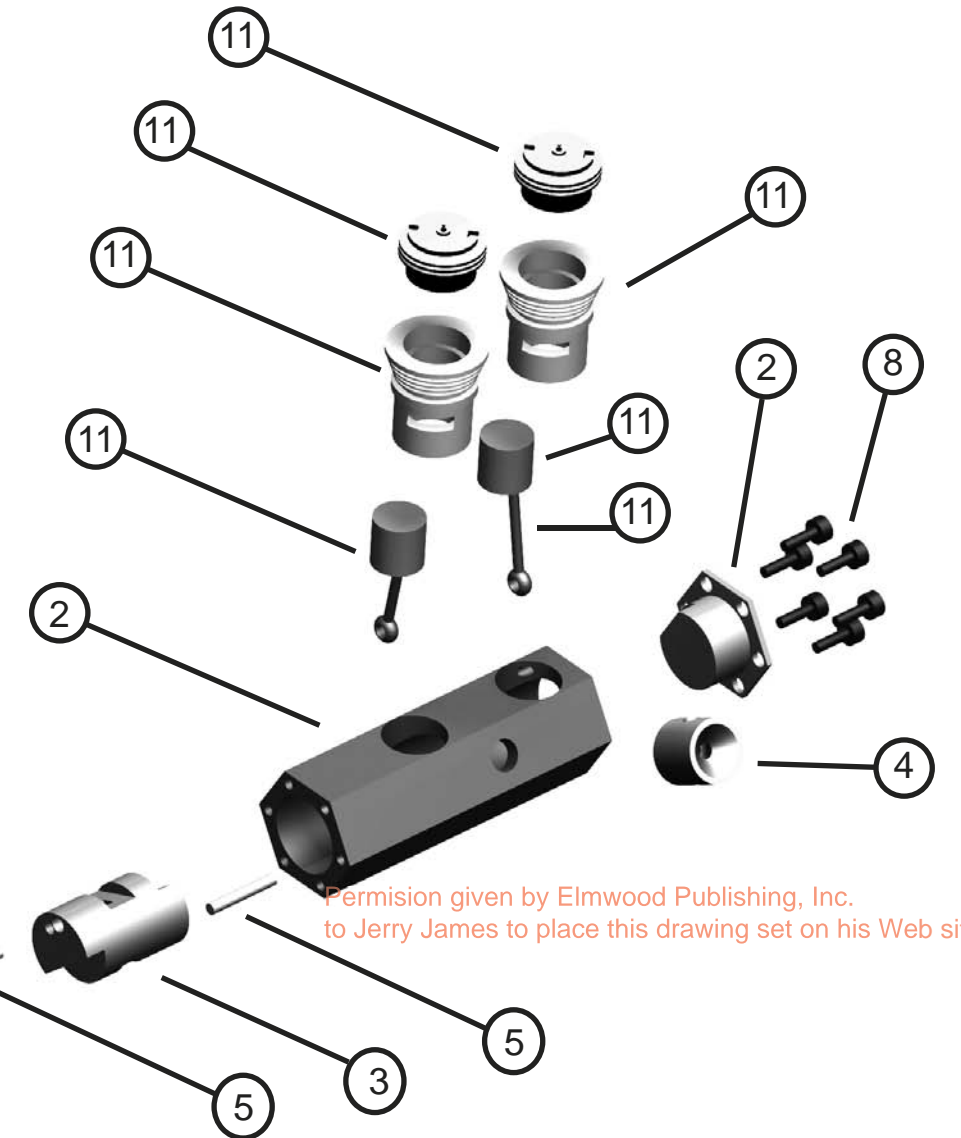
	X	Y
Center	0.0000	0.0000
1	0.4000	0.0000
2	0.2000	0.3464
3	-0.2000	0.3464
4	-0.4000	0.0000
5	-0.2000	-0.3464
6	0.2000	-0.3464

OR

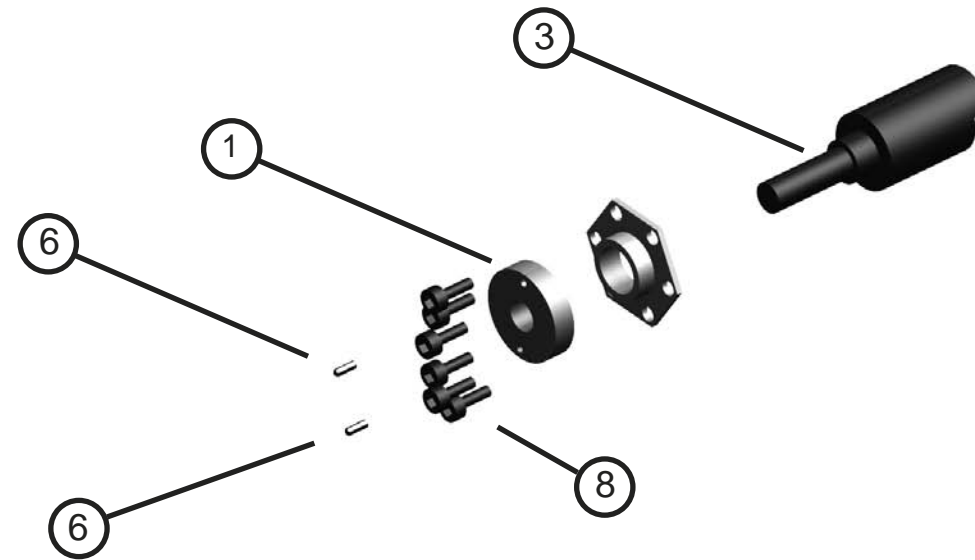
	X	Y
Center	0.0000	0.0000
1	0.3464	0.2000
2	0.0000	0.4000
3	-0.3464	0.2000
4	-0.3464	-0.2000
5	0.0000	-0.4000
6	0.3464	-0.2000



Calculated using the **Virtual Rotary Table** calculator found on the *Model Engine Builder* Web site in the Subscriber's Area <http://www.modelenginebuilder.com/currentsubs.htm>



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Patent Pending

You have been granted a license to build a James Engine Hex-2 for yourself. You may not sell the engine or engine parts except for the Cox engine parts for commercial purposes.

This engine is experimental and therefore you assume all risk and liabilities associated with building and/or running this engine.

TOOLS:

Lathe with appropriate cutting tools
 4 – Jaw Chuck if single-point cutting Cylinder threads in Crankcase
 Boring bar for lathe if machining Crankcase bore

Milling Machine with appropriate cutting tools

0.0626" Machine or hand reamer for Crankcase bore if not using Boring Bar
 90° counter sink
 4-40 - starting and bottoming taps
 1/4-28 & 1/4-20 Dies
 Drill Bits #43, #41, #31, #7, #21, 1/8", 1/2"
 17/32-40 Tap if not single-point cutting Cylinder threads in Crankcase
 Tap can be found at www.jamesengine.com
 Hack Saw
 Files
 Abrasive paper

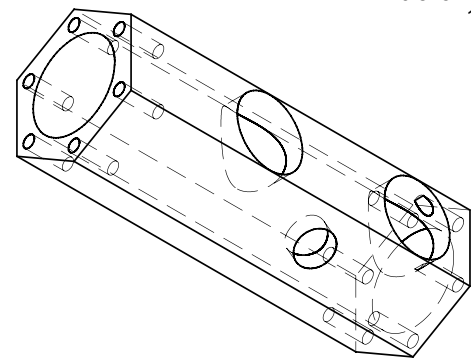
Break or deburr edges unless otherwise specified

DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED

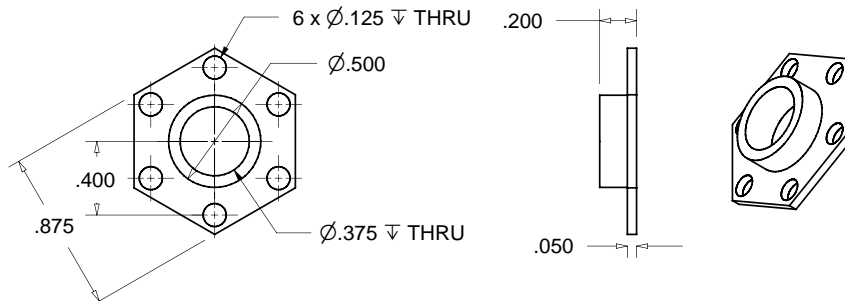
METRIC	IMPERIAL
1 PLACE ±0.3	2 PLACE ±0.01
2 PLACE ±0.03	3 PLACE ±0.001
3 PLACE ±0.005	4 PLACE ±0.0005

	HEX-2	
	DESIGNED BY Jerry James	
Edited by Mike Rehmus © 2006 by Elmwood Publishing, Inc.	Do Not Scale	DWG 1 OF 2 Checked by Tom Hare

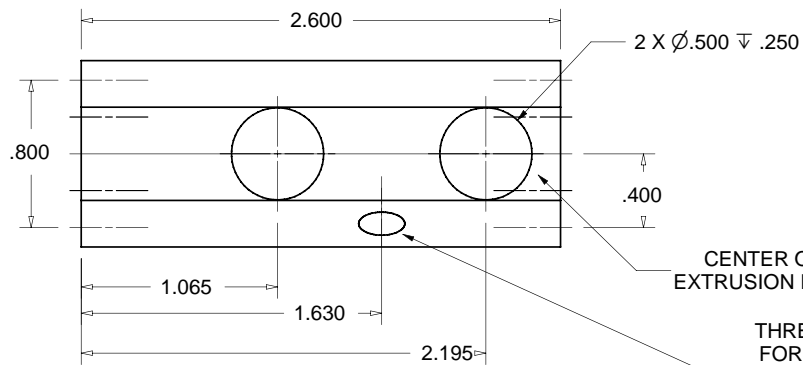
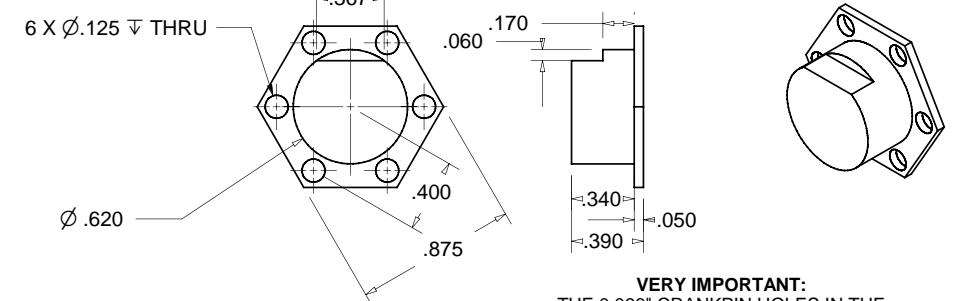
CRANKCASE
0.875" HEX ALUMINUM
1 REQ'D



FRONT PLATE
0.875" HEX ALUMINUM
1 REQ'D, BRASS OPTIONAL



REAR PLATE
0.875" HEX ALUMINUM
1 REQ'D, STEEL OPTIONAL



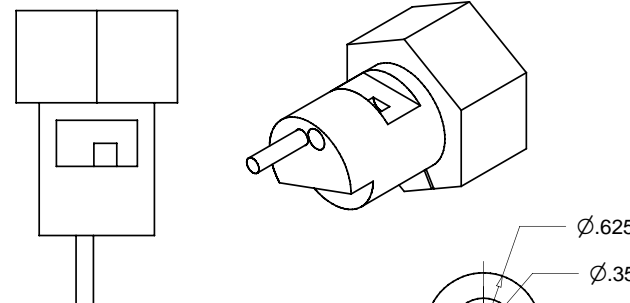
6 X 4-40 UNC THRU .300
EACH END

NOTE:
BOLT HOLE
PATTERNS
SAME ON
BOTH ENDS

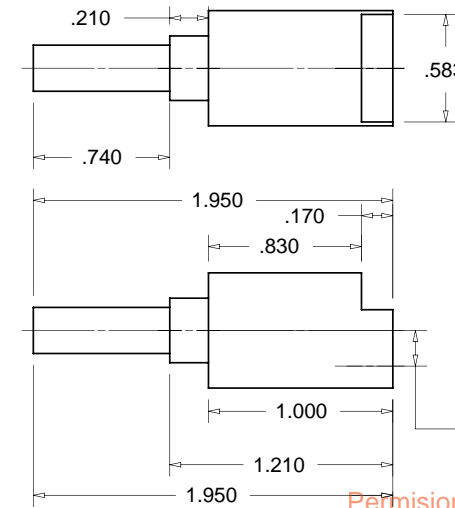
CENTER ON
EXTRUSION FACE

THREAD 1/4-28
CENTERED
ON HEX FACE

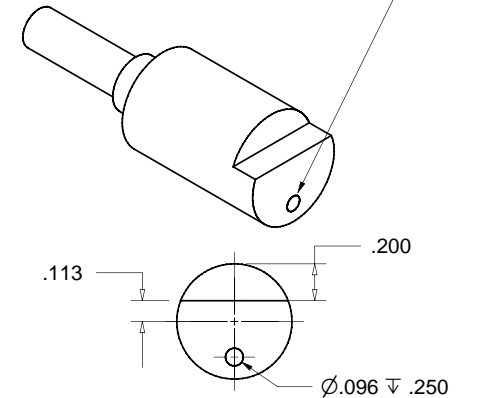
INTAKE SLOT FIXTURE ALIGNMENT



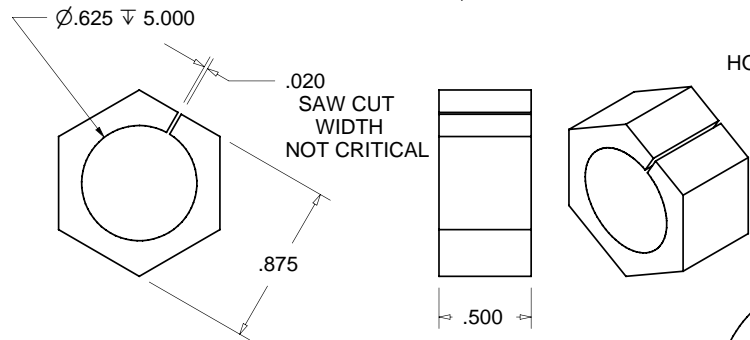
FRONT CRANKSHAFT
TGP 0.625" STEEL
1 REQ'D



VERY IMPORTANT:
THE 0.096" CRANKPIN HOLES IN THE
FRONT AND REAR CRANKSHAFTS
MUST BE LOCATED THE SAME
DISTANCE FROM THE CRANKSHAFT
CENTERLINE



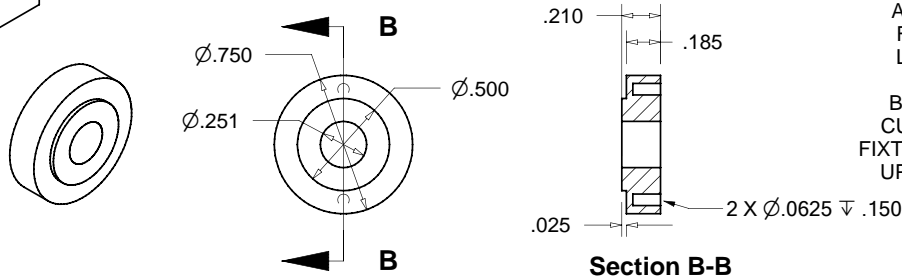
CRANKSHAFT HOLDING FIXTURE
0.875" HEX ALUMINUM, 1 REQ'D



CRANKSHAFT
HOLDING FIXTURE

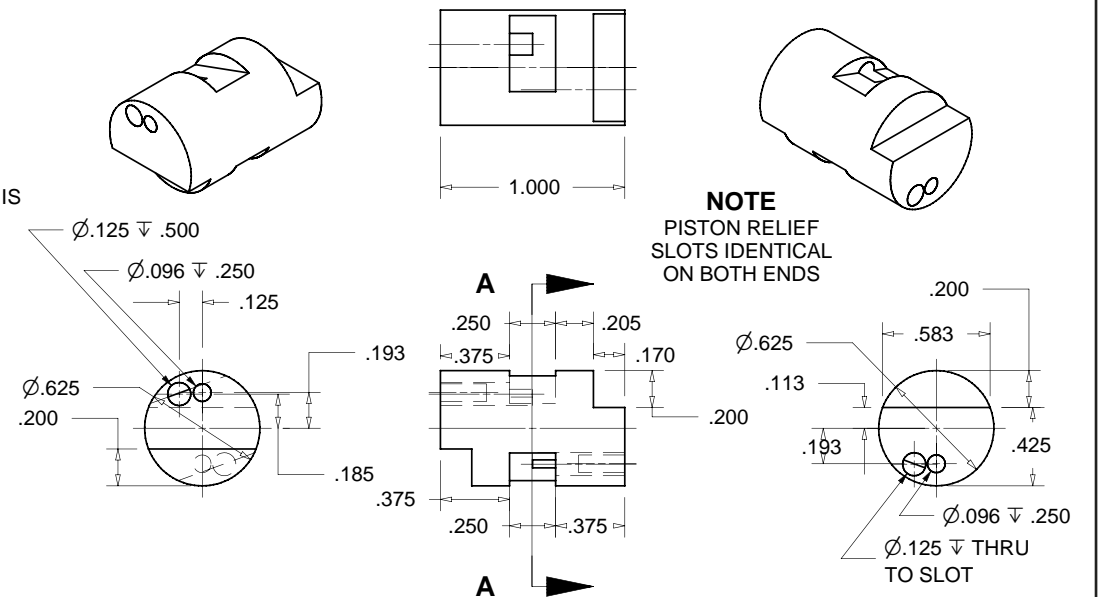
REAR CRANKSHAFT

THRUST WASHER
STEEL, 1 REQ'D



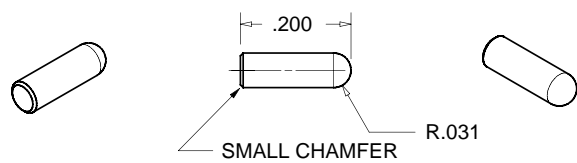
NOTE:
SETTING UP INTAKE TIMING
ALIGN REAR CRANKSHAFT IN HOLDING
FIXTURE. THEN CLAMP FIXTURE WITH
LONGITUDINAL AXIS OF CRANKSHAFT
VERTICAL. USE SAW TO CUT
BOTH INTAKE SLOTS. IF USING MILLING
CUTTER, CUT THE TOP SLOT THEN TURN
FIXTURE SO OTHER SIDE OF CRANKSHAFT IS
UPPERMOST AND CUT THE OTHER SLOT.

REAR CRANKSHAFT
0.625" TGP STEEL
1 REQ'D

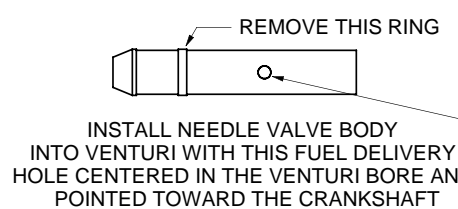


NOTE
PISTON RELIEF
SLOTS IDENTICAL
ON BOTH ENDS

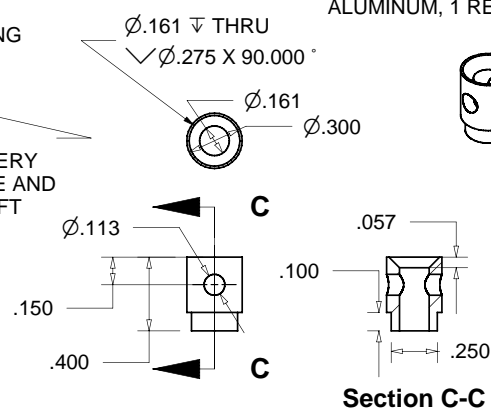
PROPELLER DRIVE PIN
0.0625 STEEL PIN, 2 REQ'D
2 X SCALE



NEEDLE VALVE BODY
REMOVE FROM COX
ENGINE, 1 REQ'D



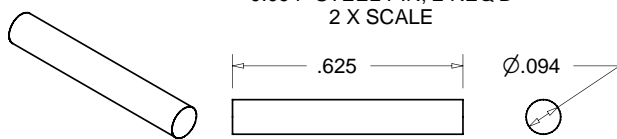
VENTURI
ALUMINUM, 1 REQ'D



Section A-A
TIMING SLOT DETAILS

Note
SCREW VENTURI INTO CRANKCASE
BEFORE MARKING FOR NEEDLE VALVE
BODY BORE. ALIGN BODY BORE WITH THE
CRANKSHAFT AXIS

CRANK PIN
0.094" STEEL PIN, 2 REQ'D
2 X SCALE



Break or deburr edges
unless otherwise specified

DIMENSIONAL TOLERANCES UNLESS
OTHERWISE SPECIFIED
METRIC IMPERIAL
1 PLACE ±0.3 2 PLACE ±0.01
2 PLACE ±0.03 3 PLACE ±0.001
3 PLACE ±0.005 4 PLACE ±0.0005

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