YAMAHA
YF200 R1

Owners Manual - V1.7

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1-1-2007

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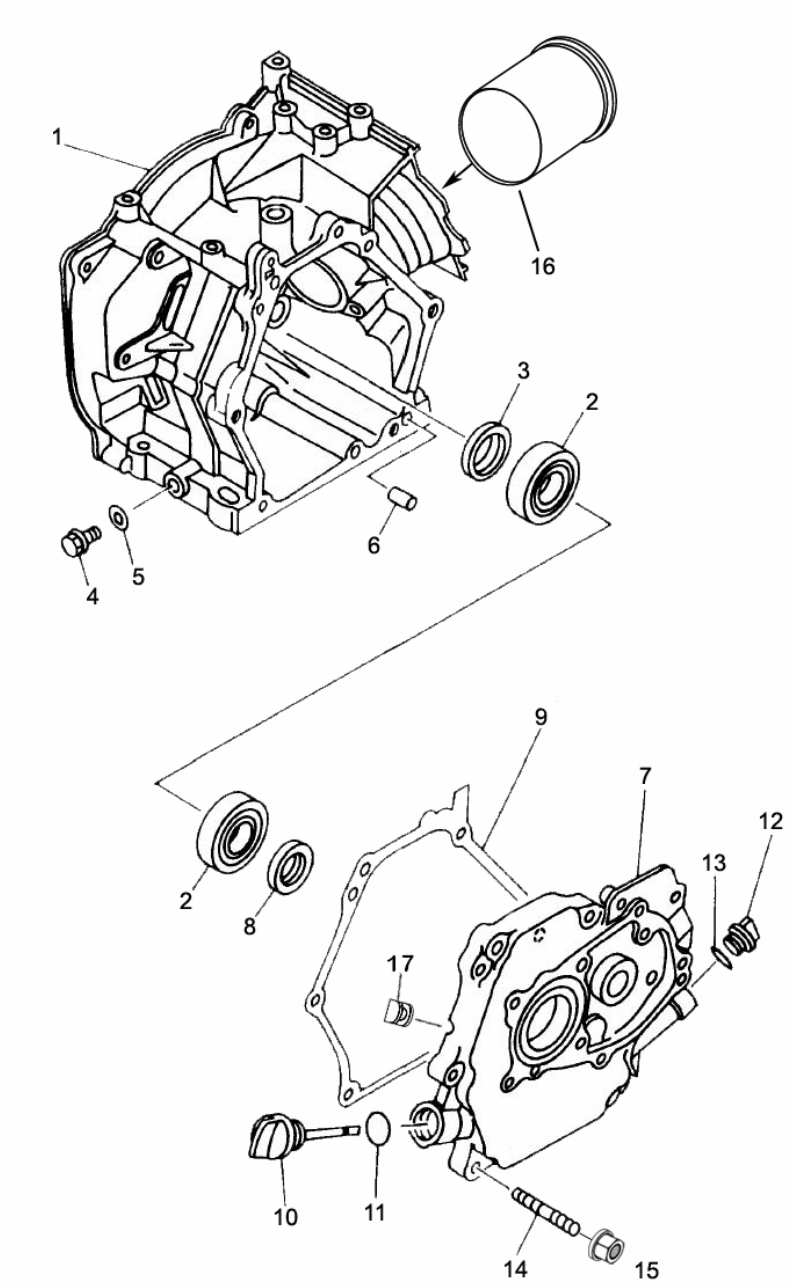
For more information about the F200 Concept and Rules or to find Resources for your YF200 R1 please visit:

www.Speedway-Karting.com

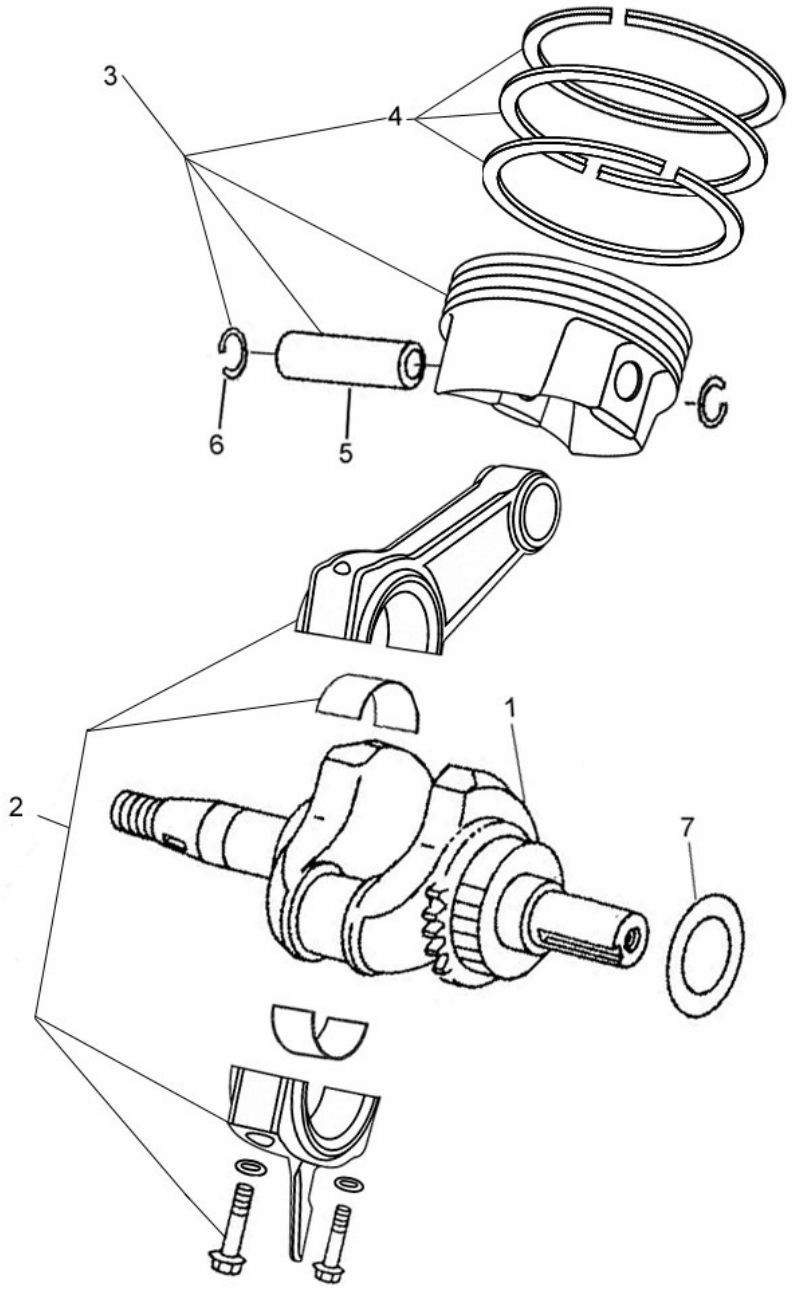
Items in Blue are upgrades or XR (Extended Range) products

YAMAHA YF200 R1



BLOCK & SIDE COVER

Ref #	Burris P/N	Description	Qty
1	F21-101-00	Block / Crankcase with Sleeve	1
2	F21-102-00	Main Bearing	2
3	F21-103-00	Seal -Flywheel Side	1
4	F21-104-00	Oil Drain Plug - 10X16mm	1
5	F21-105-00	Oil Drain Plug Gasket	1
6	F21-106-00	Side Cover Dowel Pin -8mm (Solid)	2
7	F21-107-10	Side Cover Complete	1
		Includes 2,7,8,10,11,12,13, & 17	
8	F21-108-00	Seal - PTO (Side Cover) Side	1
9	F21-317-10	Side Cover Gasket	1
10	F21-110-00	Front Oil Filler Plug/Dip Stick	1
11	F21-111-00	Front Oil Filler Plug Gasket	1
12	F21-112-00	Rear Oil Filler Plug	1
13	F21-113-00	Rear Oil Filler Plug O-Ring	1
14	F21-114-20	Side Cover Stud - 8X44mm A-1	6
15	F21-115-10	Side Cover Flange Nut - 8mm 10.9	6
16	F21-116-00	Cylinder Sleeve	1
17	F21-117-00	Rubber Side Cover Plug	1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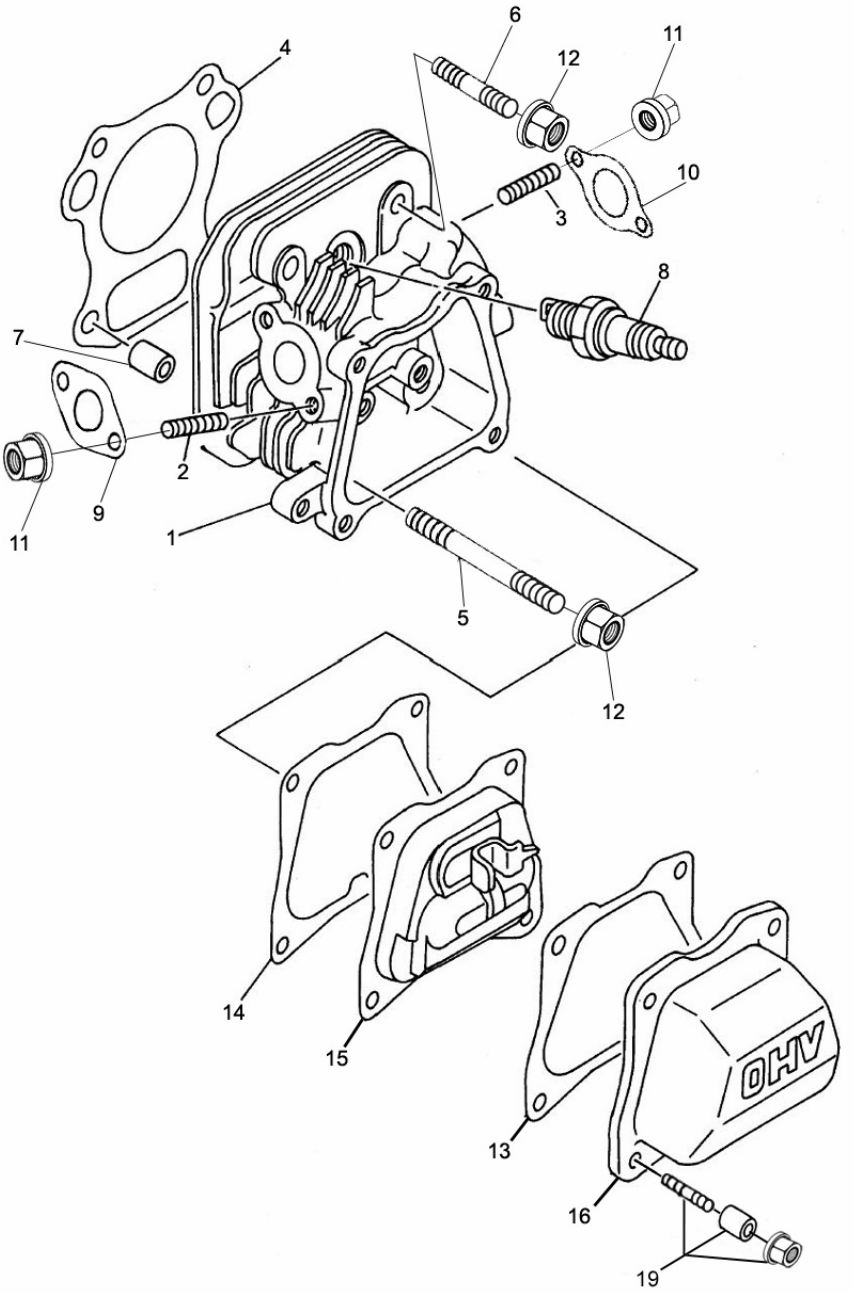
CRANK, PISTON & ROD

Ref #	Burris P/N	Description	Qty
1	F21-200-00	Crankshaft	1
2	F21-201-01	Billet Rod Assy - Billet w/insert	1
	F21-201-02	Bearing Insert For Billet Rod	1
	F21-201-03	Rod Bolt & Washer Set	2
3	F21-202-00	Piston Assy. Std. (71.00mm)	1
	F21-202-05	Piston Assy. +.002" (71.05mm)	1
	F21-202-10	Piston Assy. +.004" (71.10mm)	1
	F21-202-15	Piston Assy. +.006" (71.15mm)	1
	F21-202-20	Piston Assy. +.008" (71.20mm)	1
	F21-202-25	Piston Assy. +.010" (71.25mm)	1
4	F21-203-00	Ring Set Std. thru +.004" (71.00mm-71.10mm)	1
	F21-203-25	Ring Set +.006" thru +.010" (71.15mm-71.25mm)	1
5	F21-204-00	Piston Wrist Pin	1
6	F21-205-00	Circlip (set of 2)	1
7	F21-206-01	Crank Shim - .008 (0.2mm)	1
	F21-206-02	Crank Shim - .012 (0.3mm)	1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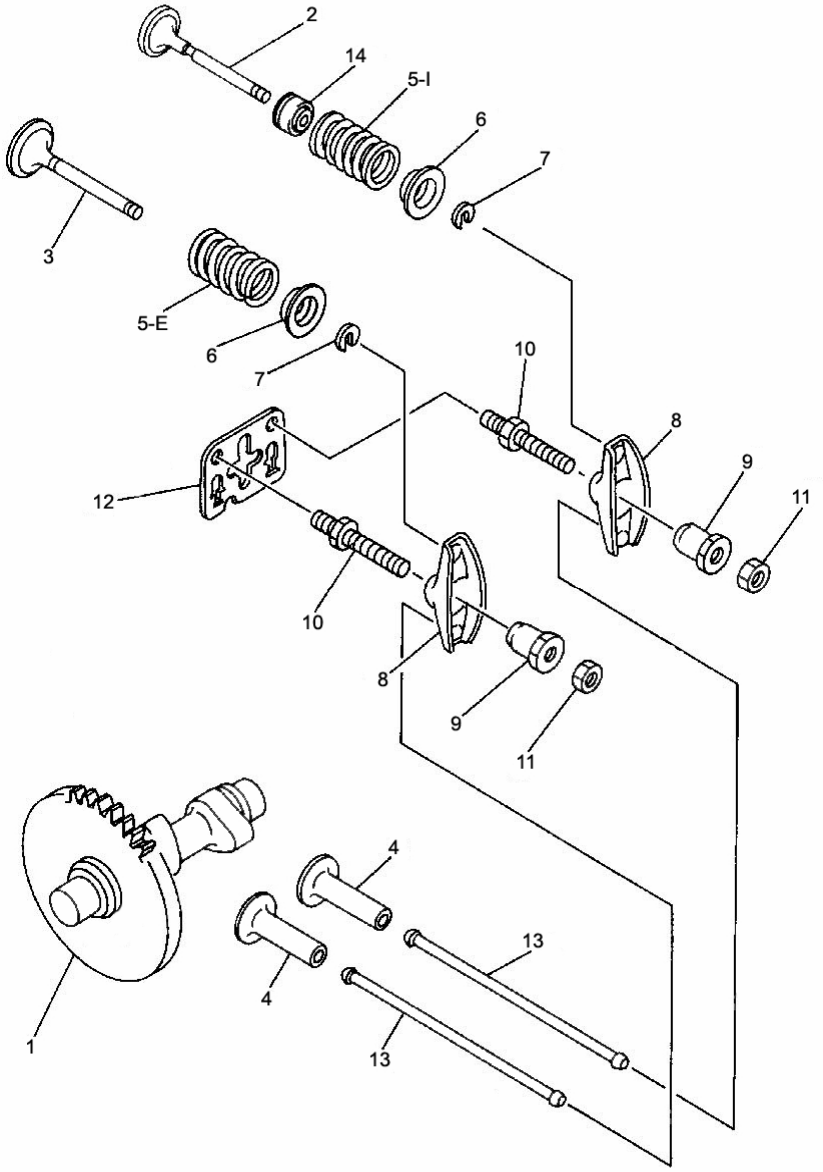
CYLINDER HEAD

Ref #	Burris P/N	Description	Qty
0	F21-300-18	R1 Complete Gasket Kit w/.018" HG	1
	F21-300-27	R1 Complete Gasket Kit w/.027" HG	1
	F21-300-30	R1 Complete Gasket Kit w/.030" HG	1
	F21-300-36	R1 Complete Gasket Kit w/.036" HG	1
	F21-300-40	R1 Complete Gasket Kit w/.040" HG	1
1	F21-301-00	Cylinder Head - Bare	1
2	F21-302-10	Exhaust Header Stud - 6X27mm	2
3	F21-303-00	Intake Manifold Stud - 6X18mm	2
4	F21-304-18	Head Gasket - .018" Thick	1
	F21-304-27	Head Gasket - .027" Thick	1
	F21-304-30	Head Gasket - .030" Thick	1
	F21-304-36	Head Gasket - .036" Thick	1
	F21-304-40	Head Gasket - .040" Thick	1
5	F21-305-00	Cylinder Head Stud - 8X55mm	2
6	F21-306-00	Cylinder Head Stud - 8X40mm	2
7	F21-307-00	Cylinder Head Dowel Pin -10mm	2
8	F21-308-00	Spark Plug NGK BPR6ES	1
9	F21-309-00	Exhaust Gasket	1
10	F21-310-10	Intake Gasket	1
11	F21-311-10	Exhaust Flange Nut - 6mm Grade 10.9	2
	F21-311-20	Itntake Manifold Hex Nut 6mm	2
12	F21-312-00	Cylinder Head Flange Nut - 8mm	4
13	F21-313-00	Valve Cover Baffle Gasket	1
14	F21-314-00	Valve Cover Gasket	1
15	F21-315-00	Valve Cover Baffle Assy.	1
16	F21-316-00	Valve Cover	1
19	F21-319-00	Valve Cover Stud & Nut Kit	1
		(4) 6X15mm Stud, (4) 6mm Flange Nut, (4) Spacers	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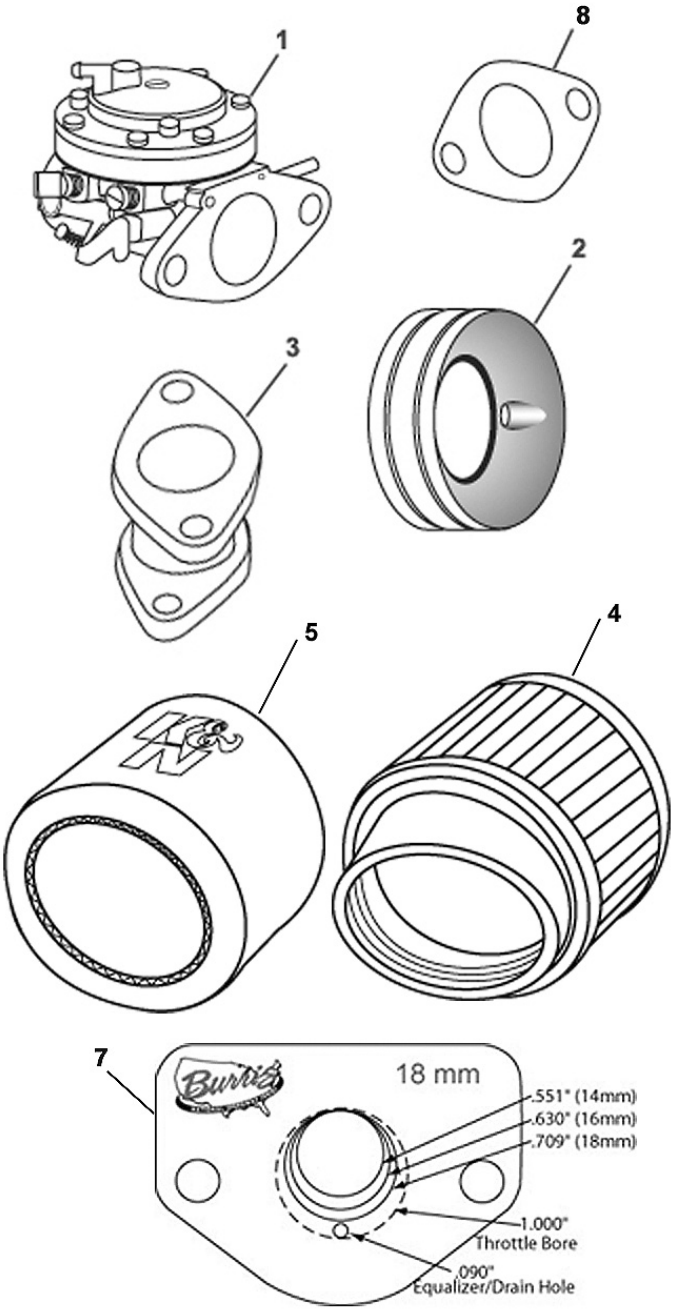
CAM & VALVE TRAIN

Ref #	Burris P/N	Description	Qty
1	F21-401-00	Camshaft - Unground Lobes	1
	F21-401-51	Camshaft - #51 Grind	1
2	F21-402-00	Intake Valve - 26mm	1
	F21-402-20	XR Intake Valve - 26mm Stainless	1
3	F21-403-00	Exhaust Valve - 24mm	1
	F21-403-20	XR Exhaust Valve - 24mm Stainless	1
4	F21-404-00	Valve Lifter	2
5-E	F21-405-00	Valve Spring - Red (OEM Exhaust)	1
5-I	F21-405-01	Valve Spring - Blue (OEM Intake)	1
5-E	F21-405-10	XR Valve Spring - Orange (Exhaust)	1
5-I	F21-405-11	XR Valve Spring - White (Intake)	1
6	F21-406-00	Valve Spring Retainer (OEM)	2
	F21-406-20	XR Aluminum Valve Spring Retainer	2
7	F21-407-00	Valve Spring Ratainer Lock	2
	F21-407-20	XR Valve Spring Ratainer Lock Set	2
8	F21-408-00	Rocker Arm	2
9	F21-409-00	Rocker Arm Pivot	2
10	F21-410-00	Rocker Arm Stud	2
11	F21-411-00	Rocker Arm Lock Nut	2
12	F21-412-00	Push Rod Guide Plate	1
13	F21-413-00	Push Rod (OEM)	2
	F21-413-10	XR Tubular Push Rod (For OEM Valve Length)	2
	F21-413-20	XR Tubular Push Rod (Extended Length For XR Valves)	2
14	F21-414-00	Intake Valve Stem Seal	1
15	F21-415-10	XR Intake & Exhaust Valve Kit	1
		Valves,Locks,Retainers,Shims, Springs & Push Rods	
16	F21-416-30	XR .030 Valve Spring Shim	2
17	F21-417-00	XR Stainless Valve Wear Caps	2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18 mm
.551" (14mm)
.630" (16mm)
.709" (18mm)
1.000"
Throttle Bore
.090"
Equalizer/Drain Hole

CARBURETOR / MANIFOLD

Ref #	Burris P/N	Description	Qty
1	F21-501-30	YF200 R1Carburetor .790 Venturi	1
2	F21-502-20	Filter Cup & Mounting Screws .790 Carb	1
3	F21-503-00	Intake Manifold Complete	1
4	F21-504-00	Air Filter	1
5	F21-505-00	Pre- Filter Wrap	1
6	F21-506-10	Yamaha YF200 R1 Thtottle Linkage Kit	1
7	F21-507-14	14mm - (.551) Jr. I Restrictor Plate	1
	F21-507-16	16mm - (.630) Jr. II Restrictor Plate	1
	F21-507-18	18mm - (.709) Jr. III Restrictor Plate	1
8	F21-318-10	Carburetor Flange Gasket	1
	DF-44	Mikuni Fuel Pump	1
	F21-508-00	YF200 R1 Fuel Pump Mounting Kit	1

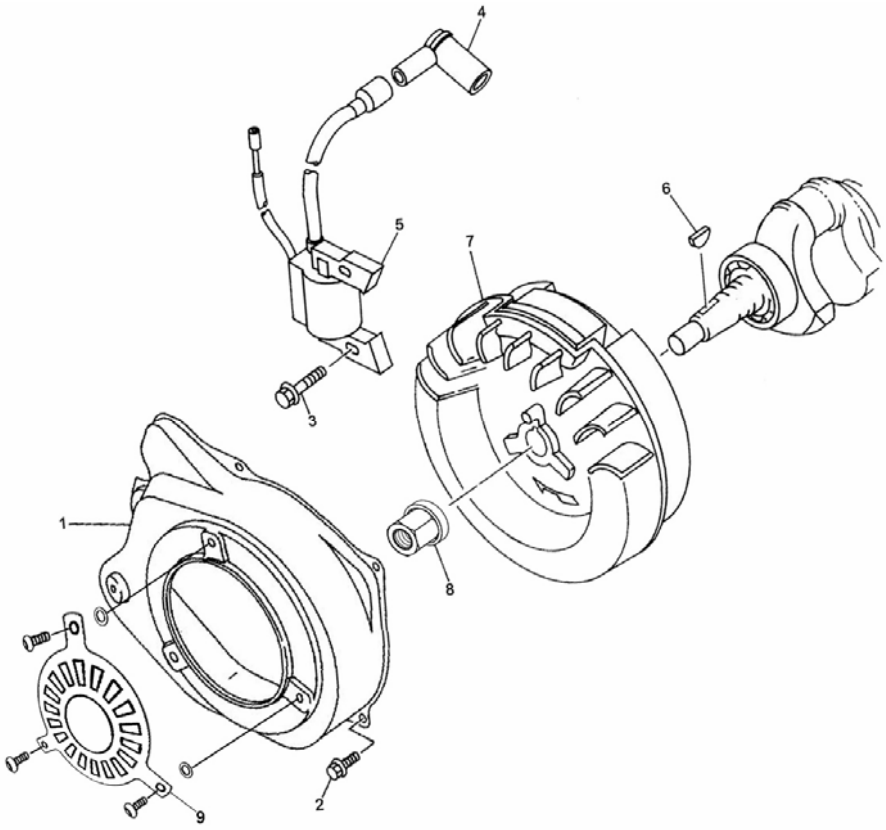
Recommended Carburetor Settings (Starting Point)

Model	Pop Off	Low speed	High Speed
Carburetor .790 Venturi	9/11 psi	2	1

Notes:

(1) When adjusting the linkage make sure the throttle shutter (butterfly) fully closes. Also, do not set the shutter adjusting screw to idle the engine as this will cause it to run rich when decelerating or on warm up/parade laps and make proper LS adjustments difficult. Start the engine about 1 minute before going onto the track and gently “crack” the throttle to keep the engine running.

(2) Adjust throttle linkage so it stops at the pedal, not the carburetor throttle shaft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FLYWHEEL & IGNITION

Ref #	Burris P/N	Description	Qty
1	F21-601-00	Fan Housing	1
2	F21-602-00	Fan Housing Flange Bolt - 6X12mm	4
3	F21-603-00	T.C.I. Mounting Flange Bolt - 6X20mm	2
4	F21-604-00	Spark Plug Cap	1
5	F21-605-00	T.C.I. Unit	1
6	F21-606-00	Flywheel (offse key) 6° Advance	1
	F21-606-10	Flywheel (straight key) Billet Flywheel	1
7	F21-607-00	Flywheel - OEM	1
	F21-607-10	Flywheel - Billet Adjsutable Timing Hub	1
8	F21-608-00	Flywheel Nut (Starter) 3/4" Hex	1
9	F21-609-00	Flywheel Screen	1
	NOTES:		

ASSEMBLY & 6 PACKS

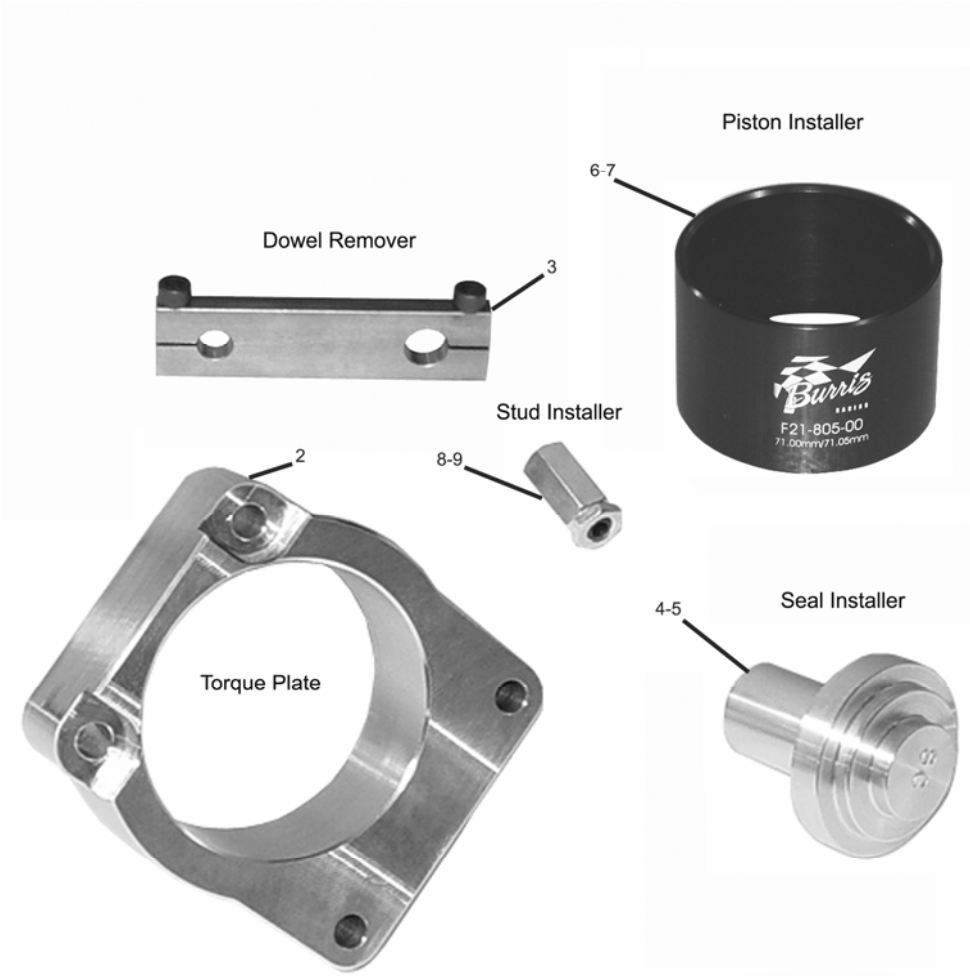
Ref #	Burris P/N	Description	Qty
1	F21-701-00	Exhaust Stud & Flange Nut (kit)	1
		(2) 6X15mm Stud, (2) 6mm Flange Nut	
2	F21-702-00	Intake Stud & Flange Nut (kit)	1
		(2) 6X27mm, (2) 6mm Flange Nut	
3	F21-703-00	Cylinder Head Stud & Flange Nut (kit)	1
		(2) 8X40mm Stud, (2) 8X55mm Stud, (4) 8mm Flange Nut	
4	F21-704-00	Valve Cover Stud (kit)	1
		(4) 6X15mm Stud, (4) 6mm Flange Nut, (4) Spacers	
5	F21-705-00	Side Cover Stud & Flange Nut (kit)	1
		(6) 8X44mm Stud, (6) 8mm Flange Nut	
6	F21-706-00	Fan Houseing Flange Bolt (kit)	1
		(4) 6X12mm Flange Bolt	
7	F21-707-00	T.C.I. Mounting Flange Bolt (kit)	1
		(2) 6X20mm Flange Bolt	
Ref #	**Burris P/N**	**Description**	**Qty**
8	F21-708-00	Cylinder Head & Side Cover Flange Nut	6
		8mm Flange Nut (six pack)	
9	F21-709-00	Intake & Exhaust Flange Nut	6
		6mm Flange nut (six pack)	
10	F21-710-00	Cylinder Head Stud	6
		8X40mm Stud (six pack)	
11	F21-711-00	Cylinder Head Stud	6
		8X55mm Stud (six pack)	
12	F21-712-10	Side Cover Stud	6
		8X44mm Stud (six pack)	
13	F21-713-00	Intake Stud	6
		6X18mm Stud (six pack)	
14	F21-714-10	Exhaust Stud	6
		6x27mm Stud (six pack)	
15	F21-715-00	Cylinder Head Dowel Pin	6
		10mm Dowel Pin (six pack)	
16	F21-716-00	Side Cover Dowel Pin	6
		8mm Dowel Pin (six pack)	

TORQUE VALUES

Item	in-lbs	ft-lbs	Nm	m-kg
Connecting Rod Bolts*	150	12.5	17.3	1.7
Side Cover Nuts	240	20.0	27.6	2.8
Flywheel Nut	564	47.0	65.0	6.5
Cylinder Head Nuts	220	18.3	25.3	2.5
Rocker Arm Stud	85	7.1	9.8	1.0
Rocker Arm Lock Nut	75	6.2	8.6	0.9
Valve Cover Nuts	50	4.2	5.8	0.6
T.C.I. Flange Bolts	85	7.1	9.8	1.0
Flywheel Shroud	85	7.1	9.8	1.0
Oil Drain Plug	150	12.5	17.3	1.7
Intake Manifold Nuts	85	7.1	9.8	1.0
Exhaust Manifold Nuts	85	7.1	9.8	1.0
Spark Plug	160	13.3	18.4	1.8

Note—Torque values listed above take into account using 30 wt oil or equivalent lube on threads.

SPECIAL TOOLS



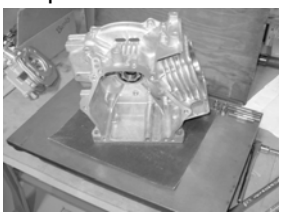
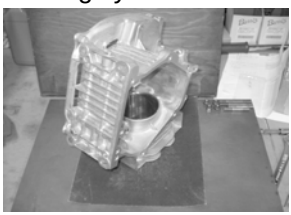
SPECIAL TOOLS

Ref #	*Burris P/N*	*Description*	*Qty*
1	F21-800-00	Complete Tool Kit	1
		Includes items 2,3,4,5,6,8 & 9	
2	F21-801-00	Torque Plate	1
3	F21-802-00	Dowel Remover (8mm & 10mm)	1
4	F21-803-00	Seal Installer (Side Cover)	1
5	F21-804-00	Seal Installer (Block)	1
6	F21-805-00	Piston Installer (71.0mm & 71.05mm)	1
7	F21-805-10	Piston Installer (71.1mm & 71.20mm)	1
8	F21-806-00	6mm Stud Installer	1
		Intake, Exhaust, & Valve Cover	
9	F21-807-00	8mm Stud Installer	1
		Side Cover & Head	

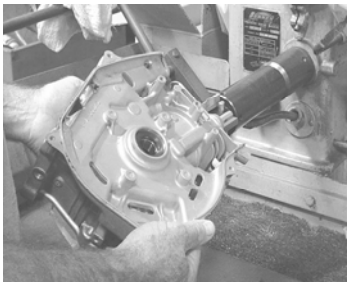
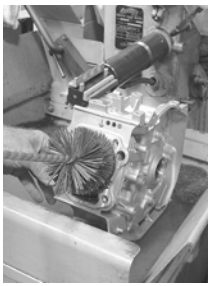
Note: It is strongly recommended you purchase the Complete Tool Kit (F21-800-00) when building your YF200 R1 engine. Possible component damage can occur during assembly without the proper tools.

Pre-Assembly

- *Thoroughly clean and inspect parts prior to assembly for damage and compatibility*
-
- **Crank & Rod Prep:** Check the crank journals for any nicks or scratches and remove them with a fine stone to prevent damage to the bearing seat areas. Check the rod bolt holes to be sure the bolts seat properly and burr or lap mating edges of connecting rod insert bearing to insure proper clearance.
-
- **Cam Prep:** Inspect the cam gear and lobes for burrs. If necessary, deburr & polish these areas. Thoroughly clean the cam to remove scale or blasting media left from the heat-treating process.

Lapping the Block: Lap the cylinder head and motor mount surfaces on a surface plate to remove any burrs or irregularities. This will insure proper sealing for the head and also keep from binding the crank when the engine is attached to the motor mount.

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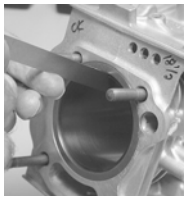
- **Fitting the Piston:** Remove all sharp edges from piston with a deburring wheel or fine sand paper. Hone the block using a 280/400 grit stone to achieve .0035 - .0055” piston to cylinder clearance (measure the piston 90° from the wrist pin and ¼” from the bottom). Finish the bore with a plateau hone using about 15/20 strokes. After the piston has been fitted clean the block with hot soapy water and spray the bore and bearing with WD-40 to prevent rust.

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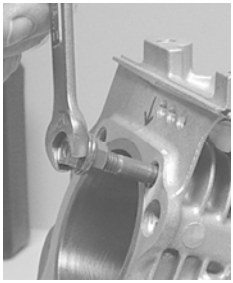
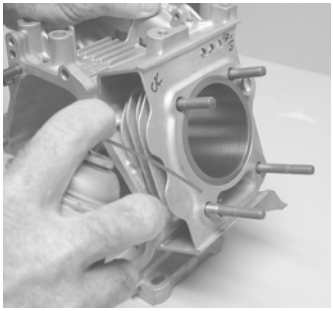
- **Setting the Ring Gap:** Note it is very important to follow the manufacturers recommended ring gap settings. Running too tight of a gap on the top and second rings will result in cylinder damage and cutting the expander on the oil ring will result in a loss in oil control. We have run the top 2 rings at .010+ gap and the oil rings as supplied for a full season with excellent results. (*See piston ring instructions supplied with piston)*

Pre-Assembly

- **Seal Installation:** The face of the seal should be .290 below the aluminum boss surface on the block and .200 on the side cover. When installing the seals it is important to apply grease on the O.D. to prevent scuffing or tearing of the seal. We have tools available (*see "Special Tools"*) to install these seals that seat them at these predetermined depths.



- **Stud Installation:** Apply a small amount of (blue) Loctite to the threads of the dimpled end of the stud and install using a stud driver as shown. (*see "Special Tools")* Note-there are two different ends to the studs; dimpled and rounded— install the dimpled end in the block. Run the stud down until it lightly bottoms and **tighten it ¼ turn more**. (An alternative method to the stud driver is to use a nut and jam nut)



- **Dowel Installation:** When installing the dowels be sure the holes are clean and they slide in easily. Place a small amount of grease on the dowels before installing them in the block, head and side cover. When removing the dowels, use the removal tool to eliminate the possibility of damage. (*see "Special Tools"*).

Cylinder Head Prep & Assembly

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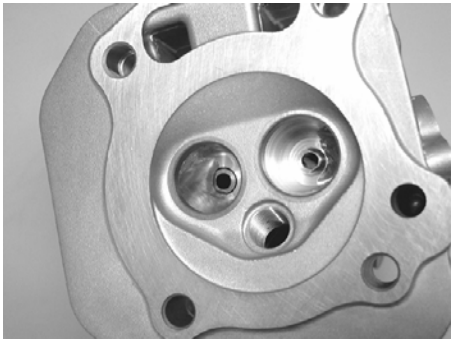
• **Cylinder Head Prep:** Match and blend intake and exhaust ports with the valve bowls. Pay special attention to the intake runner where it enters the bowl as it is offset to promote swirl and needs to retain the offset in order to maintain the swirl characteristics. Next mount the intake manifold to the head and blend the junction. The outlet of the manifold has been purposely left a little undersize so that it can be increased to match the head.



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• **Note:** the valve seats are finished at the factory so care must be taken not to damage or nick them during the porting operation. (You can mask them with duct tape) (Go to www.goodson.com or www.ruffstuff.com for porting tools.)

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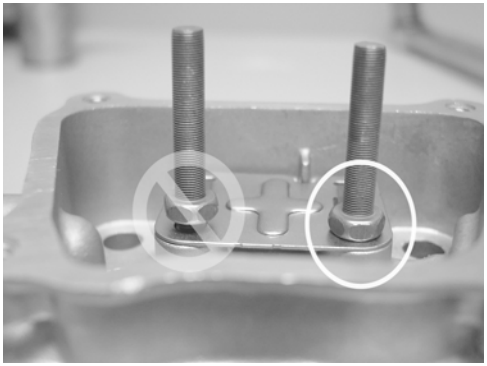
• **Valve Lapping and Seating:** The valves and seats are ground from the factory and can be run as is without any problems or they can be lightly lapped with a fine lapping compound. Either way is acceptable.



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Cylinder Head Assembly: Thoroughly clean the head to remove grinding dust and lapping compound (if used). Before installing the rocker arm studs run them down onto their threaded holes to make sure they seat correctly against the hex. If they do not seat on the hex it will be necessary to run a 6X1.0 mm tap into the hole to clean up the thread. After this has been performed lay the push rod guide plate on the head with the guide tangs facing the combustion chamber. Place a small amount of (blue) Loctite on the coarse threads and screw in the rocker studs torque to 85 in/lbs. Install the appropriate 6mm studs on the intake and exhaust flanges. Use (blue) Loctite and run the stud down until it lightly bottoms and tighten it a ¼ turn more. Next, press the intake valve seal in place and install the valve using the blue spring. Install the exhaust valve using the red spring. Be sure to use a high-grade assembly lube on the valve stems. Now the head is ready for fitting

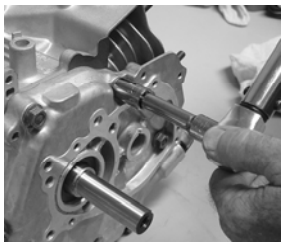
• Final Assembly

• *(From here until final assembly use an assembly lube on all sliding and rotating surfaces except the cylinder wall and rings which require normal crankcase oil.)*

• **Crankshaft:** Slide the crankshaft into the flywheel side bearing.

• **Rod to Piston:** Assemble the connecting rod to the piston and install the rings on the piston according to the manufacturer's instructions. (This procedure is very important to the performance and reliability of the engine and should be adhered to for best results.)

• **Install Piston in Bore:** Install the piston in the block using a solid piston installer (*see "Special Tools"*) making sure that the rod is in a position that the dipper and the index mark on the rod line up when the cap is attached. (Note-Due to the fragile nature of the rings, collapsible type piston installers are not recommended.) Attach the cap with the dipper pointing down and torque the rod bolts to 150 in/lbs. (Go in 25 in/lbs increments starting at 75 in/lbs.)



• **Install Lifters & Cam:** Place the lifters in the block and install the cam with the timing marks lined up as shown. **Note:** *The hole in the cam closest to the*

• *O/D of the gear aligns with the dot on crank.*

• **Side Cover:** Install the locating dowels and side cover. Torque the bolts in a crisscross manner to 230 in/lbs in 25 in/lbs increments starting at 100 in/lbs. (Check for excessive crank endplay. Maximum is .020")

Note: Thoroughly clean the gasket and gasket surfaces on the block and side cover prior to assembly. (Clean the gasket to remove any oil or lubricants with WD 40 and wipe clean. Brake Clean can be used on the block and side cover)

- **Final Assembly**
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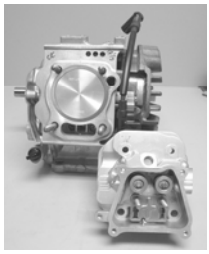

• **Cylinder Head:** Install the locating dowels and the head gasket over the studs. Put the cylinder head in place and torque in a crisscross manner to 220 in/lbs in 25 in/lbs increments starting at 100 in/lbs. Bring the piston to TDC on the compression stroke and drop in the pushrods. Install the rocker arms and set the lash at .004". Be careful not to over tighten the adjuster locknut (75 in/lbs) or back the stud off during adjustment. Place the valve cover assembly on the head, add the spacers to the studs and tighten to 50 in/lbs. Install the intake manifold, carburetor and exhaust header and tighten to 85 in/lbs.

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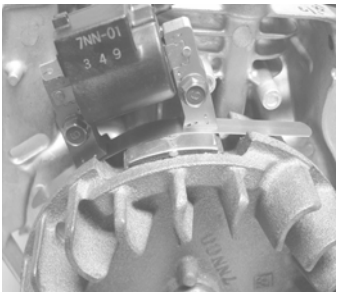
• **Note:** With the supplied .040 thick head gasket the installed combustion chamber volume should be approximately 24.3 to 24.6 cc. Thinner head gaskets are available to adjust this if necessary .036 less .5cc and .030 less 1.0cc . Check the cylinder head section of this book for part numbers.



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• **Coil, Shroud and Spark Plug:** Install the T.C.I.with a minimum of .022" air gap (use 3 different feeler gauges for example: .006-.007-.009=.022) torque coil mounting bolts to 85in/lbs. Install the shroud and tighten to 85 in/lbs. (Setting the air gap any closer **DOES NOT** improve performance and increases the risk of the flywheel magnets striking the coil.) Install the NKG BPR6ES spark plug and torque it to 160 in/lbs. (Note – If the conditions dictate you may want to use the colder NGK BPR7ES spark plug.)

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• **Oil and Start:** Add 14-16 oz of the supplied oil and start the engine running it between 1800 and 2200 rpm for about 10 to 15 minutes. Break-in under a load is not necessary. (It may be necessary to lean the carburetor down during this process.) Immediately drain the oil and let the engine cool down.

Final Assembly

Fuel: We recommend using 89/91 octane pump gas as these engines run well and tune easily with it. Higher octane race gas, besides being illegal, usually requires the timing to be advanced and carburetor to be leaned out to tune properly which in turn makes the engine run hotter and does not show an increase in power over the pump gas.

Mounting:

(1) We recommend the use of a 15° angle mount. This increases the flow of air to the cylinder head and also creates a “sump” for the oil to collect in.

(2) Fuel filter should be mounted low (on the frame rail) and near the gas tank

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