XS 750 (650) RACING SPECIAL

Displacement: 743cc
Bore and Stroke: . . . . . 80 x 74mm
Number of Cylinders: 2
Use: . . . . . Class C type racing (Mile, 1/2 Mile and T.T.)
Cylinder Head Volume: 36.5cc
P/N Modified Standard
Compression Ratio: . . . . . 11.19 to 1
Carburetor Size: . . . . . VM 34 SC (Modified Standard)
P/N 328-14101-00
Ignition Timing: . . . . . 36° to 38° BTDC
Spark Plug Heat Range: . . . Champion E-55 installed with 2 copper gaskets
Oil: . . . . . Castrol R40 or equivalent
Oil Capacity: . . . . . 2 Quarts
Gear Ratios:
1/2 Mile – 7.19 to 1
1 Mile – 5.60 to 1
Sprockets machined to accept Diamond 1/4
Maximum Engine Speed: . . . . . 9,000 rpm
Maximum Engine Power: . . . . . 8,600 rpm

Special Parts:

Rods: . . . . . Special forged racing type
P/N RAC-00000-23-00
Piston Kit: . . . . . Special forged racing type
P/N RAC-00000-19-00
Cylinder Sleeves:
P/N RAC-00000-18-00
Cam Shaft: . . . . . Special racing type
P/N RAC-00000-24-00
Valves: . . . . . Standard
Valve Springs: . . . . . Kit
P/N RAC-00000-25-00 (1971 & 1972)
P/N RAC-00000-25-01 (1973)
Ignition System: . . . . . Total Loss Type
12 Volt Battery
Ignition Coil, Honda CB 160 Type
Condenser, Mallory P/N 25010
Ignition Points – Standard
Clutch:
Barnett P/N YPK-4

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Optional Equipment:

NOTE

Consult your YAMAHA RACING PARTS Manual (LIT-11140-00-73) for additional engine and chassis parts.

Frame: . . . . . Special Chrome-Moly racing type with swing arm
P/N RAC-00000-12-00
Front Wheel Dual Disc Brake:
P/N RAC-00000-09-00
Front Wheel Spool:
P/N RAC-00000-11-00
Rear Wheel Single Disc Brake:
P/N RAC-00000-08-00
Rear Wheel Spool:
P/N RAC-00000-10-00
Front Forks: . . . . . Optional

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NOTE

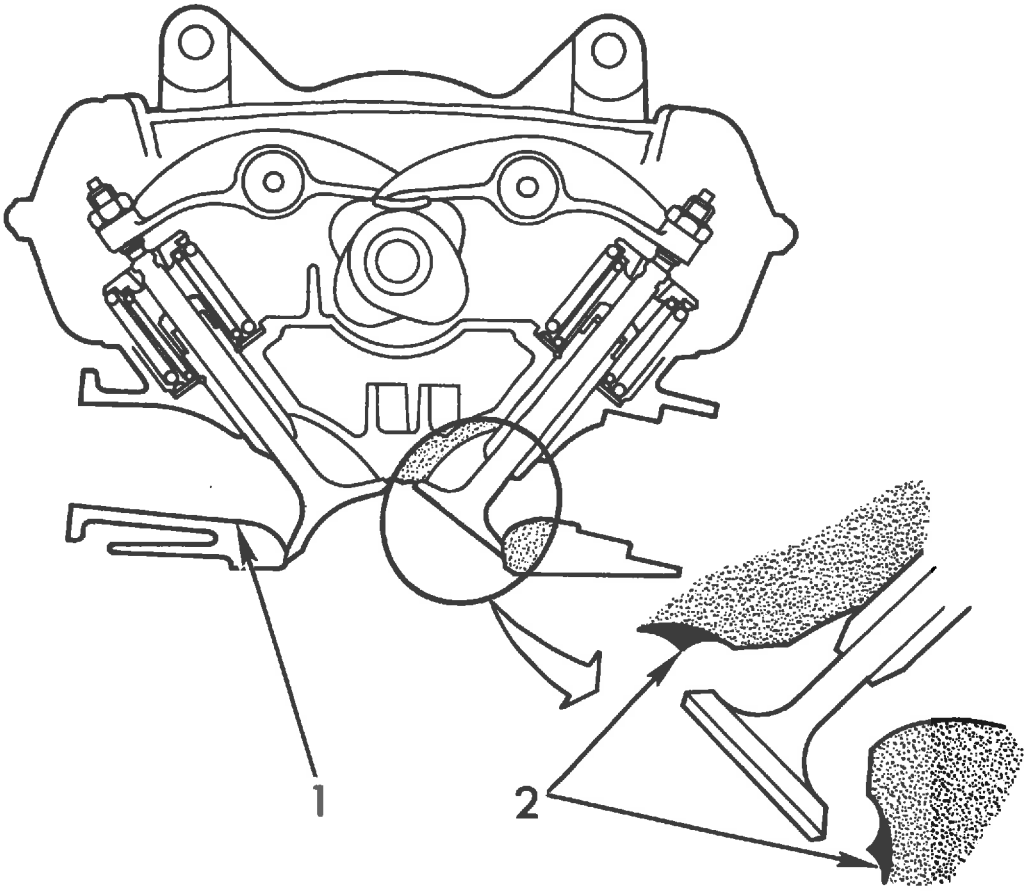
Engine disassembly and assembly must be performed as per service manual instructions.

Cylinder Head

The cylinder head is modified by removing ridges [2] in the valve pocket area.

Care must be used to remove only enough material to smooth the valve pocket area. Cylinder head volume should be 36.5cc with valves installed.

Casting irregularities such as ridges, steps and lips should be removed from the passages [1] of the intake and exhaust ports.



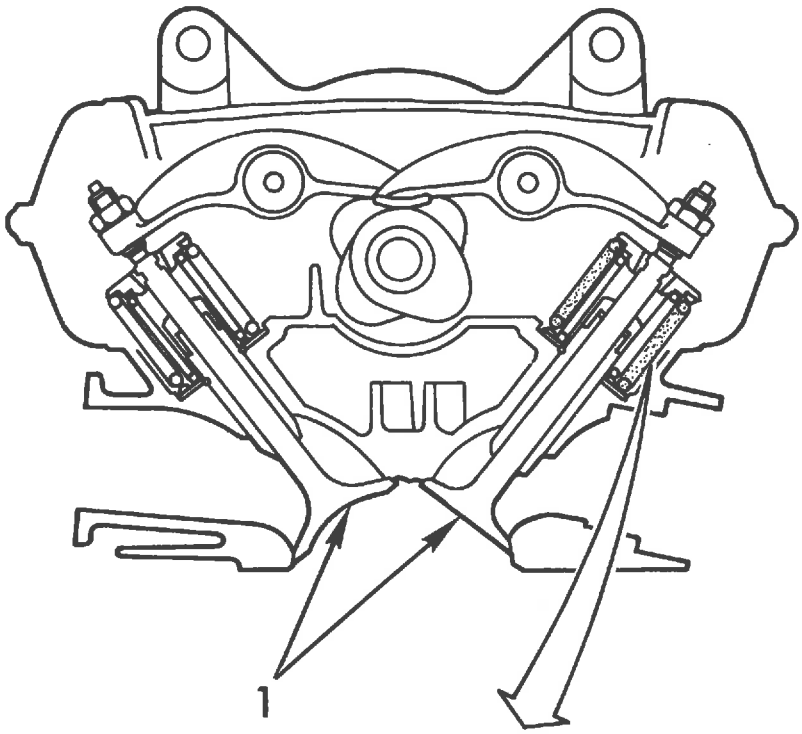
XS 750 (650) RACING SPECIAL

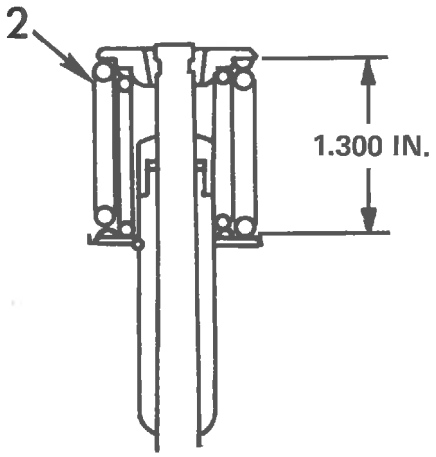
Valves

Valves [1] should be ground as per service manual instructions. The valve springs [2] should be installed with a height of 1.300-inch.

Valve Clearances: Cold

Intake: 0.006-inch
Exhaust: 0.012-inch





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Cylinder Sleeves

After the old cylinder sleeves [1] have been removed and new ones installed, the top of the cylinder [2] should be flush with top of sleeve.

If the cylinder is not flush with the sleeve, the cylinder should be surfaced. The surfacing of the cylinder may be done several ways such as grinding or milling.

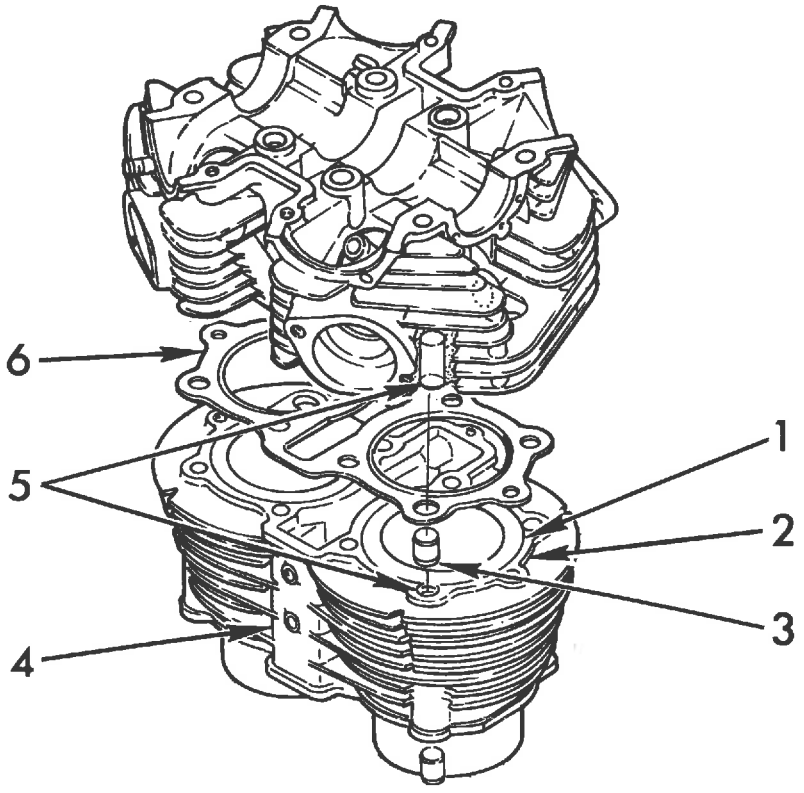
If the tops of cylinders are surfaced, dowel pin holes [5] should be drilled 0.005 to 0.010-inch deeper or dowel pins [3] should be shortened approximately 0.005 to 0.010-inch. This will prevent the pins from bottoming when cylinder head is installed.

If pins bottom when head is installed, the head to cylinder seal will not be tight and the gasket [6] may fail.

To qualify for Class C racing, it is mandatory that you do the following:

1. **Remove all traces of standard displacement from front [4] of cylinder.**

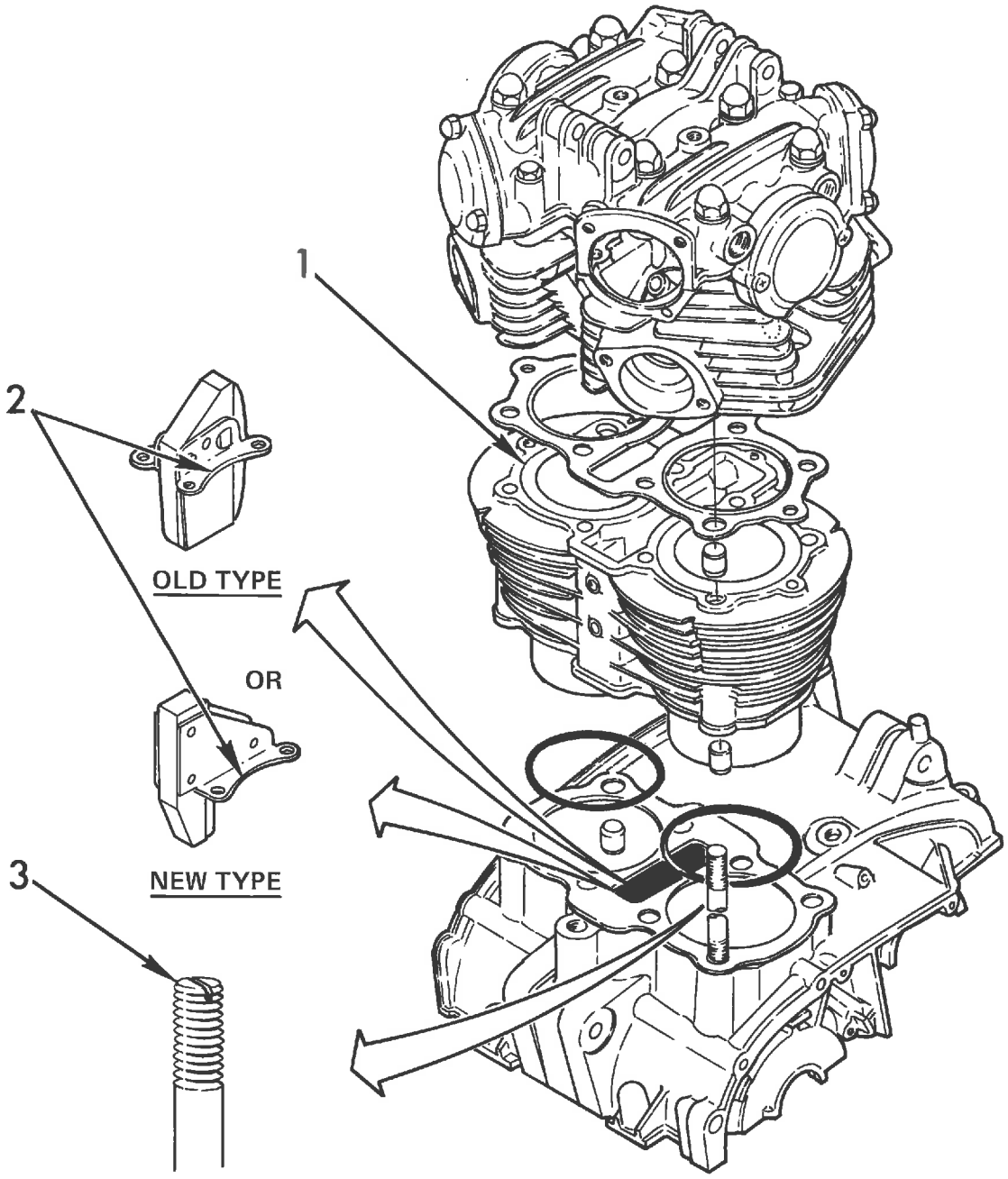
2. **Identify new displacement by stamping "743cc" on front of cylinder.**



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After installing cylinder sleeves [1], chain guide radius [2] must be reworked to fit between the sleeves.

Race track maintenance can be done more easily by slotting the cylinder studs [3] for easy removal. This will allow "Top End" work without removing the engine from the frame.



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Pistons and Rings

When installing pistons and rings, be sure that:

- Piston clearance is 0.005-inch
- Ring end gap is 0.012-inch

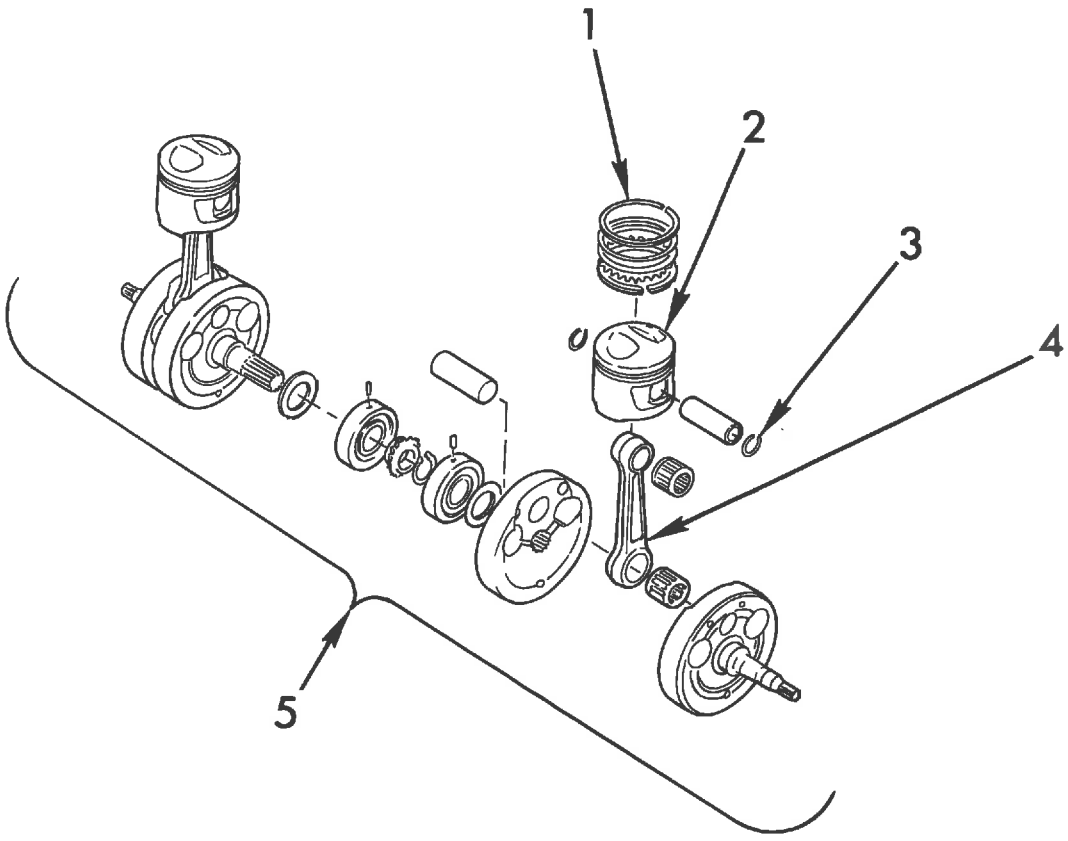
Connecting Rods and Crank Assembly

Connecting rods [4] must be installed as per service manual.

When assembling crank set [5], be sure to use a minimum force of 6 tons. If less than 6 tons of force is required to assemble crank set, crank is worn too much for racing purposes and should be replaced.

If following engine parts are installed as a set, crank set will not need rebalancing:

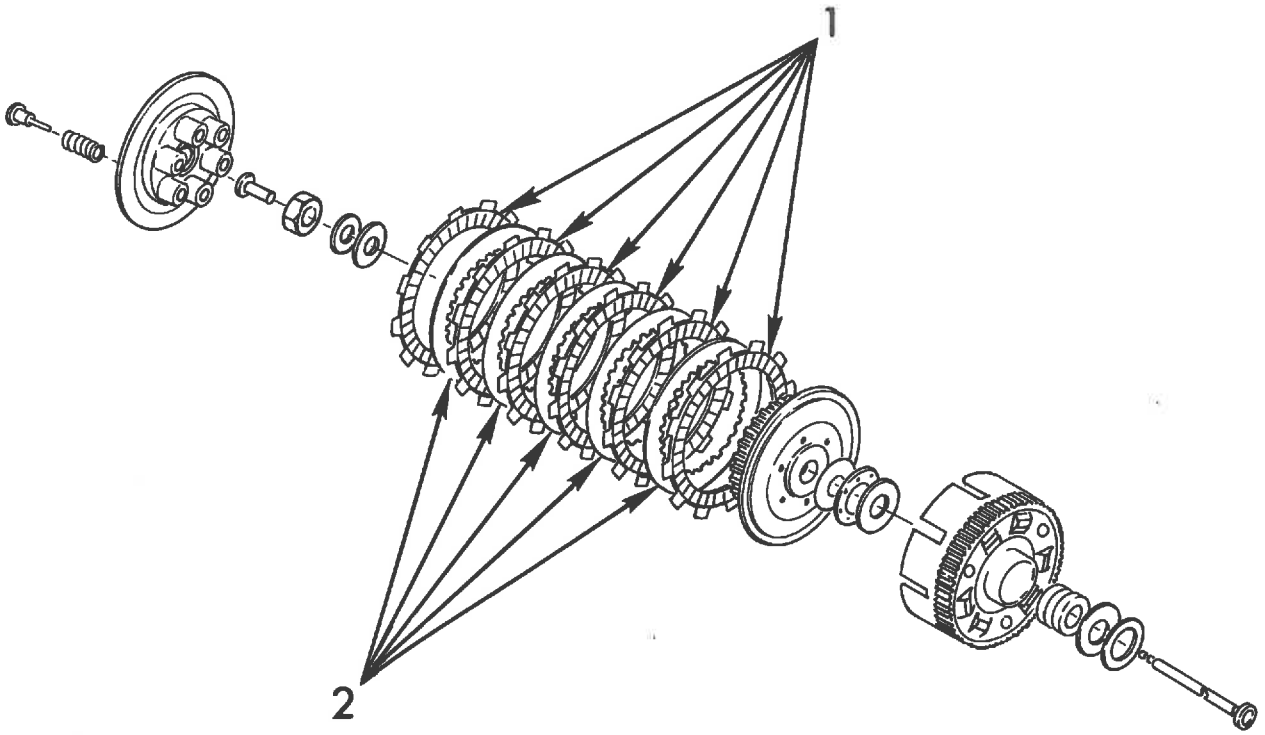
Rings [1]
Pistons [2]
Clips [3]
Rods [4]



Clutch Assembly

Be sure to disassemble and assemble clutch as per service manual instructions.

- Always sandblast all bare metal clutch plates [2] before assembling clutch..
- Friction plates [1] should be replaced with Barnett type friction plates for heavy usage.



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For easy race track maintenance, and greater reliability, the total loss ignition system has been adopted, using standard dual point ignition and certain nonstandard parts.

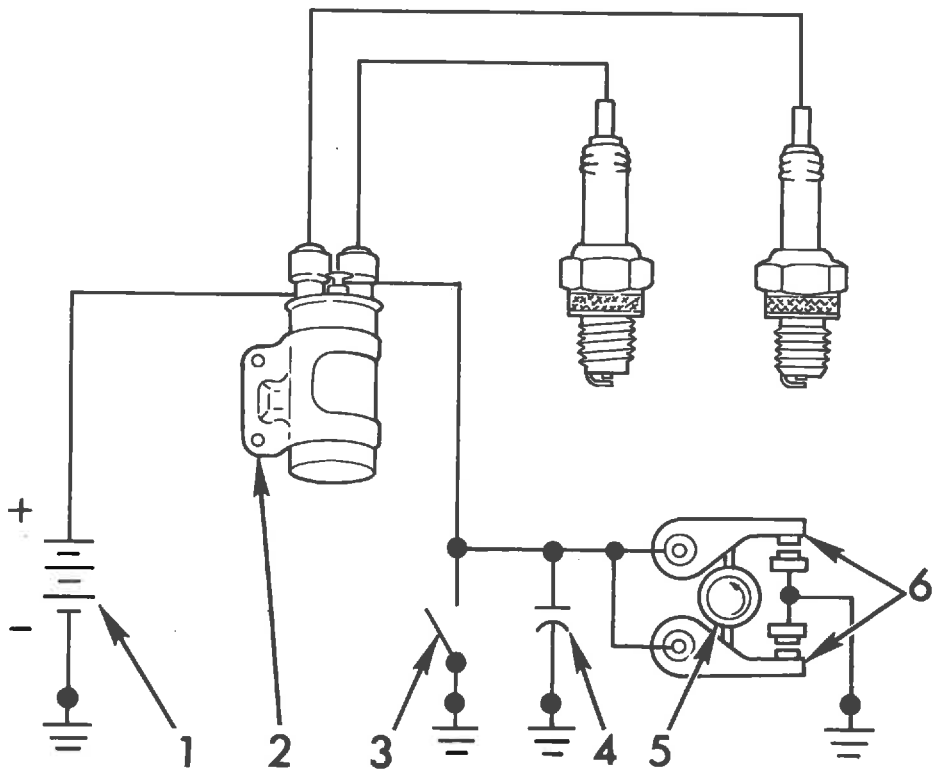
The total loss system will fire both cylinders at the same time.

To convert the standard dual point ignition system to total loss system, your standard ignition must be removed and replaced with the following parts:

12 volt battery [1]
Honda CB 160 coil [2]
Mallory condenser [4]
Standard distributor cam [5]
Standard set of ignition points [6]
Kill switch [3]

To use the standard ignition point set, point springs must be shimmed 0.020-inch to prevent point float at high rpm.

Ignition timing should be adjusted to 36° to 38° BTDC.



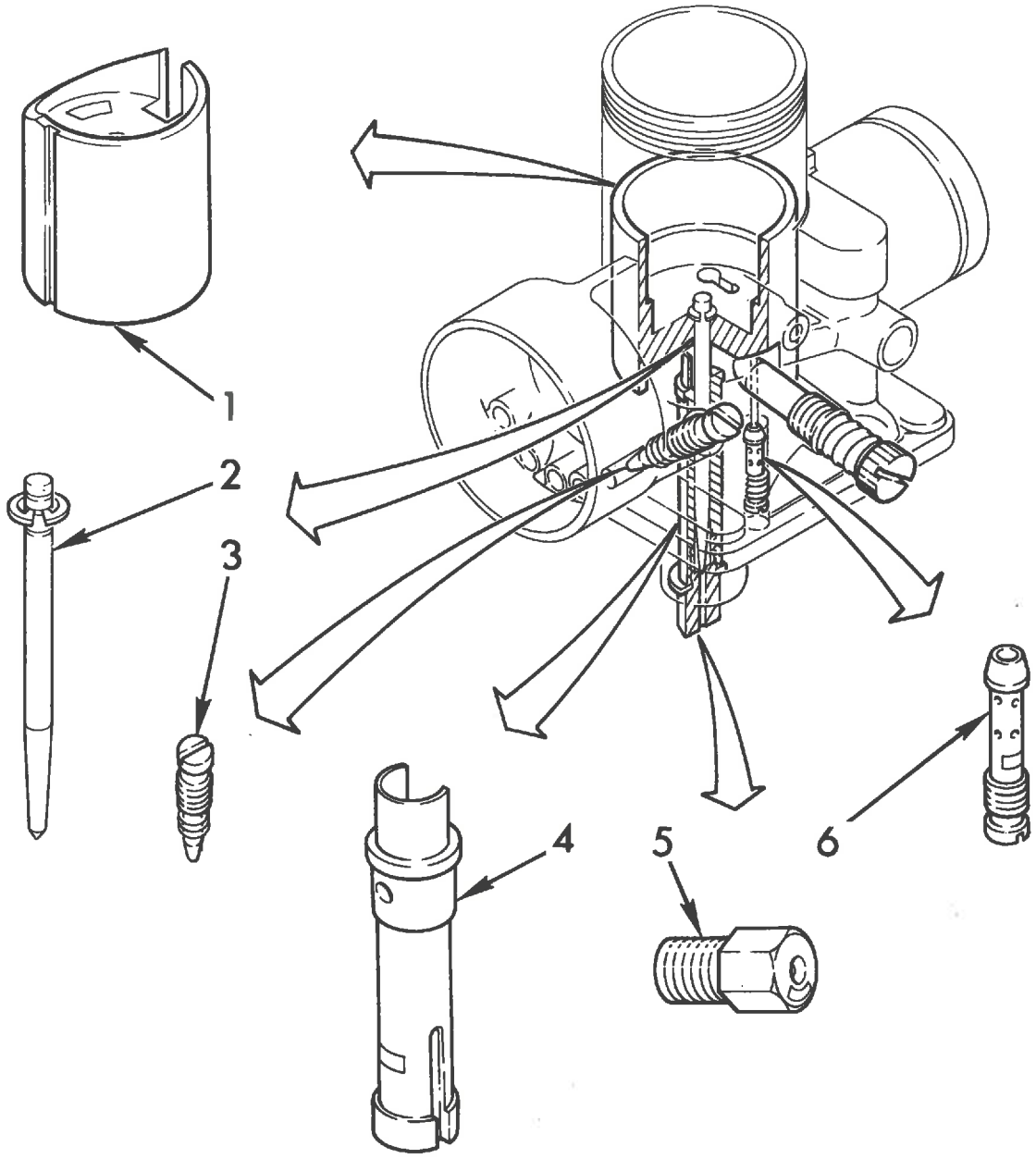
XS 750 (650) RACING SPECIAL

Carburetor

The VM 34 SC carburetor performs well on the modified engine. The following adjustments will be required:

Cutaway [1]	1.5
Jet needle [2]	6F9-2
Air screw [3]	1-1/2 turns
Needle jet [4]	0.2
Main jet [5]	180
Pilot jet [6]	25

Fuel consumption under mile racing conditions will be about 18 mpg.



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Exhaust System

Part numbers for exhaust pipe and megaphones are available in YAMAHA RACING PARTS manual LIT 11140-00-73.

- Exhaust pipes are made of steel tubing 1.75-inch OD and 29-inch long. Exhaust pipes perform well for T.T. racing.
- Megaphones give a better power curve for 1/2 mile and mile racing.

