

YAMAHA TY80

CIRCA 1975

OWNERS SERVICE/MANUAL

PART 1 - 0 → 61 pg
PART 2 62 → pg

IQMM TRAINING?

Parker L90
Load Sensing Valves
02-02-12
Van Tech

YAMAHA

1480

1073-1975-2

FOREWORD

Yamaha's TY80A Trials is a completely new model designed solely for the rigors of Trials competition. Production is limited. Each unit is assembled and checked according to the same rigorous principles as our championship road racing and motocross models.

This Owner's Service Manual is included with your TY80A to provide basic information for operation and maintenance. Additional information regarding major repairs, such as crankcase disassembly, can be found within the GT80A Service Manual and various other information and training manuals available from your Authorized Yamaha Dealer.

YAMAHA MOTOR COMPANY, LTD.
EXPORT SERVICE DIVISION
IWATA, JAPAN

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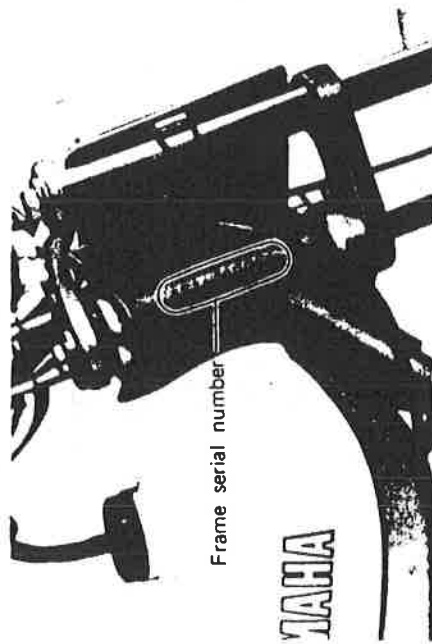
CHAPTER I MACHINE IDENTIFICATION

MACHINE IDENTIFICATION

~~001~~ # 451 = 7480

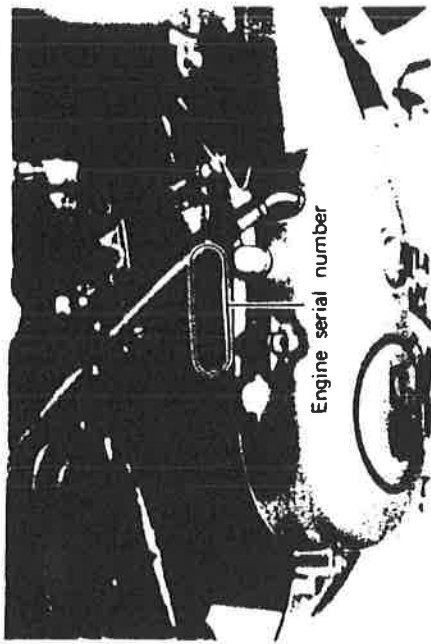
The frame serial number is located on the right-hand side of the headstock assembly. The first three digits identify the model. This is followed by a dash. The remaining digits identify the production number of the unit. Yamaha production begins -000101.

The engine serial number is located on a raised boss on the upper left-hand side of the engine. Engine identification follows the same code as frame identification.



FRAME SERIAL NUMBER

Normally, both serial numbers are identical; however, on occasion they may be two or three numbers off.



ENGINE SERIAL NUMBER

* -NOTE-

Always check your registration papers against the actual machine serial numbers. If any discrepancy is found, have it corrected immediately.

CHAPTER II SPECIFICATIONS

These specifications are for general use. For a more complete list refer to Maintenance Specifications and/or the GT80A Service Manual.

DIMENSIONS/WEIGHTS	
OVERALL LENGTH	1560 mm (61.4 in.)
OVERALL WIDTH	690 mm (27.2 in.)
OVERALL HEIGHT	890 mm (35.0 in.)
WHEELBASE	1025 mm (40.4 in.)
MINIMUM GROUND CLEARANCE	220 mm (8.7 in.)
SEAT HEIGHT (UNLOADED)	600 mm (23.6 in.)
MACHINE NET WEIGHT	54 kg (119 lbs.)
ENGINE	
TYPE	2-stroke, Gasoline, "Torque Induction"
BORE/STROKE	47 x 42 mm (1.575 x 1.563 in.)
DISPLACEMENT	72 cc (2.99 cu.in.)

STARTING SYSTEM		Primary Kick
LUBRICATING SYSTEM		Separate Lubrication (Yamaha Autolube)
CARBURETION		
MANUFACTURER/TYPE/EFFECTIVE VENTURI DIA.		<i>TK 45160 - 16mm SPEED SOLENOID ON SIDE</i>
IDLE RPM		T.K. V16P-3 16 mm-dia
MAIN JET		1,250 - 1,350 r.p.m.
NEEDLE JET	<i>Pilot Jet #34</i>	#86
JET NEEDLE#/CLIP POSITION		2.080
AIR JET (TURNS OUT)		049-2, 2
FLOAT LEVEL		1½
CUT AWAY		23.0 mm
AIR CLEANER TYPE		1.0
		Wet, Molt plain
CLUTCH		
TYPE		Wet, Multiple-disk
PRIMARY DRIVE SYSTEM		Gear
PRIMARY DRIVE RATIO		68/19 (3.578)
TRANSMISSION		
TYPE		Constant Mesh, 4-speed Forward
REDUCTION RATIO	1st	39/12 (3.250)
	2nd	34/17 (2.000)
	3rd	30/21 (1.428)
	4th	27/24 (1.125)

SECONDARY DRIVE TYPE/SIZE REDUCTION RATIO	DK420/92L 41/12 (3.417)
ELECTRICAL IGNITION TYPE/TIMING SPARK PLUG/MFR/TYPE/GAP	Magneto Ignition, 1.8 mm B.T.D.C. N.G.K. B-6HS
CHASSIS FRAME TYPE FRONT SUSPENSION/TYPE/TRAVEL REAR SUSPENSION/TYPE/TRAVEL STEERING LOCK-TO-LOCK (DEGREES) FRONT CASTER/TRAIL TIRE/SIZE/TREAD TYPE NOMINAL PRESSURE	Double cradle type Telescopic fork 100 mm Swing arm 65 mm 70° 63° 30' 74 mm 2.50-16-4PR Trials Universal 1.4 kg/cm ² (20 lbs/in ²)

REAR TIRE SIZE/TREAD TYPE	3.00-14-4PR Trials Universal
NOMINAL PRESSURE	2.0 kg/cm ² (28 lbs/in ²)
FRONT BRAKE TYPE/ACTUATING METHOD	Internal Expansion Right hand operation
REAR BRAKE TYPE/ACTUATING METHOD	Internal Expansion Right ahdn operation
VOLUMES/TYPE FLUID	
GASOLINE TANK/TYPE	2.5 ℓ Low-Lead Gasoline
OIL TANK/TYPE	0.22 ℓ SAE "SE" 10w/30wt
TRANSMISSION/TYPE	500 - 550 cc SAE "SE" 10w/30wt
FRONT FORK (EACH)/TYPE	85 cc Non-foaming Hydraulic Fluid
	10, 20, 30 wt

NOTE: The Research and Engineering Departments of Yamaha are continually striving to further perfect all models. Improvements and modifications are therefore inevitable.

In light of this fact, all specifications within this manual are subject to change without notice to the owner. Information regarding changes is forwarded to all Authorized Yamaha Dealers as soon as available. If a discrepancy is noted, please consult your dealer.

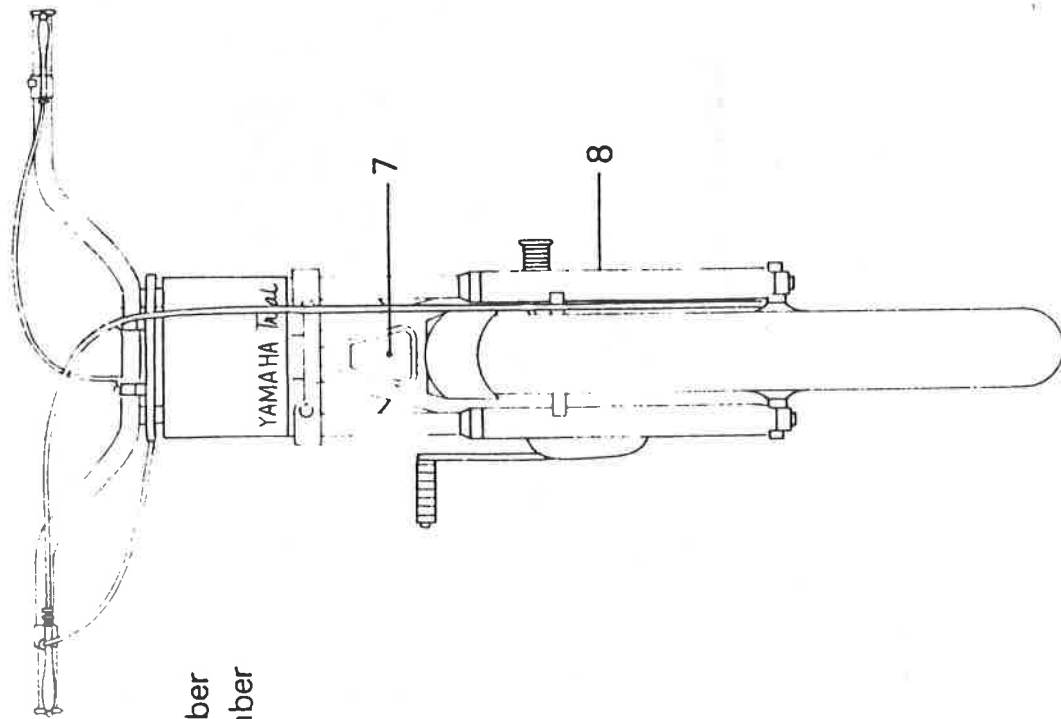
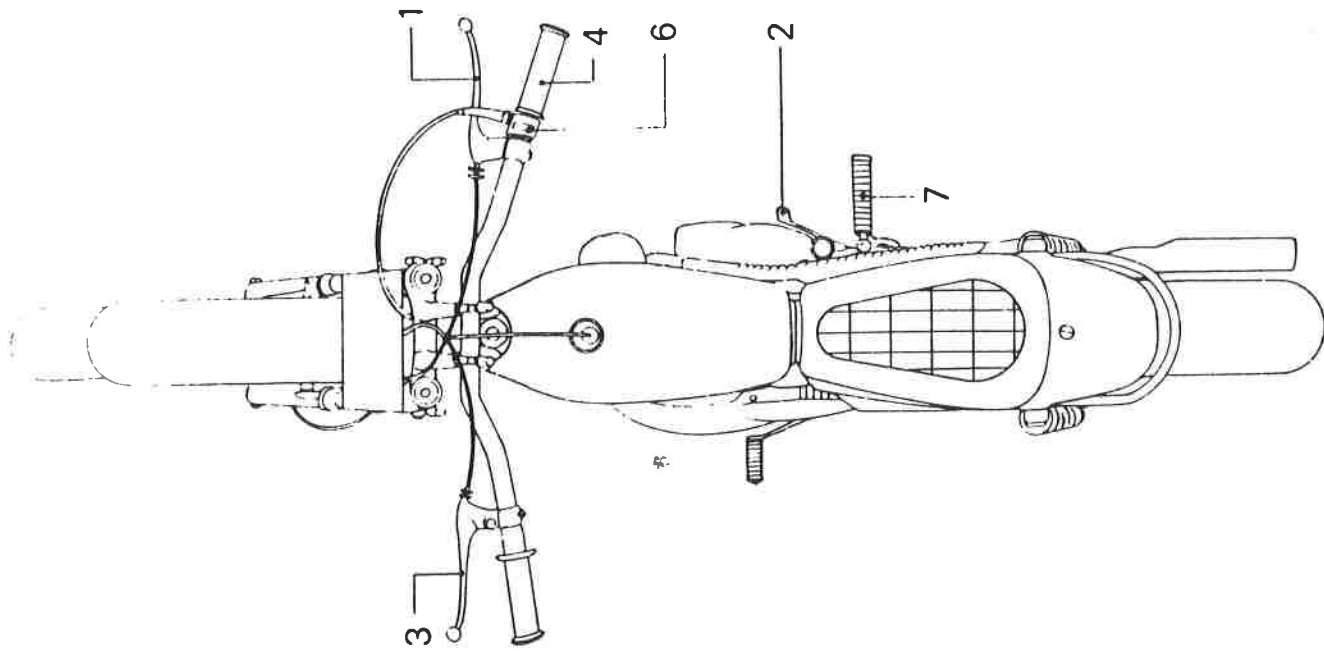
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CHAPTER III MAINTENANCE SPECIFICATION

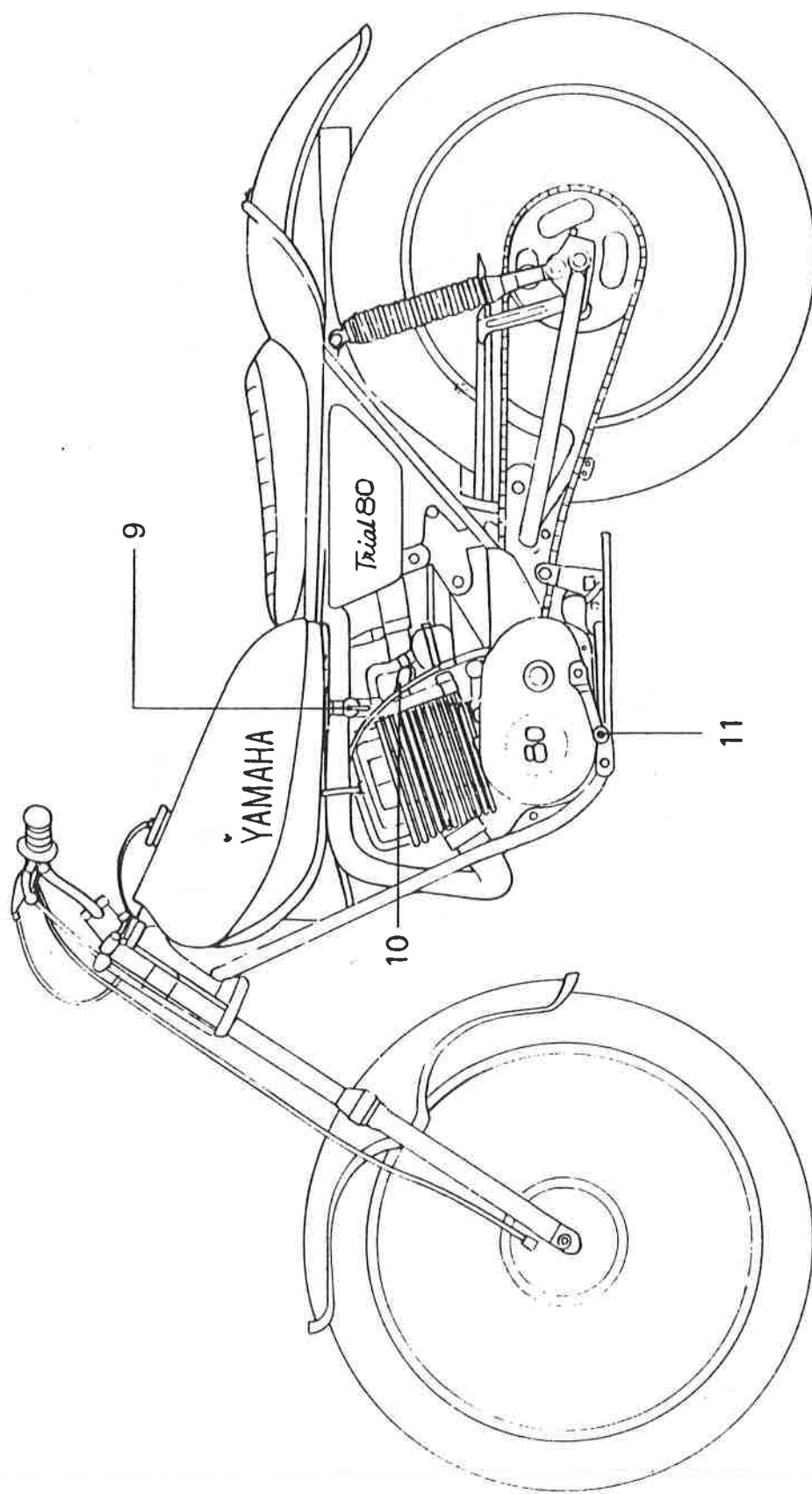
PAGE	ITEM	NOMINAL (NEW)	MINIMUM (ALLOWABLE)	MAXIMUM (ALLOWABLE)
30~32	AUTOLUBE			
	Minimum Pump Stroke (At Idle)	—	0.30mm	0.35mm
	Maximum Pump Stroke (At Full Throttle)	—	1.65mm	1.80mm
	MAGNETO/IGNITION			
	Ignition Source Coil Resistance	1.5Ω	—	—
119	Secondary Ignition Coil Resistance (Primary)	1.7Ω	—	—
119	Secondary Ignition Coil Res. (Secondary)	6.0KΩ	—	—
34~36	Ignition Timing	-1.8mm	—	—
34•75	Ignition Point Gap	—	0.3mm	0.4mm
120	Condenser Capacity	0.3μF		
	ENGINE—TOP END			
64	Cylinder Taper	0.008mm	—	0.05mm
64	Cylinder Out of Round	—	—	0.005mm
67	Piston Clearance	—	0.035mm	0.040mm
65	Top Ring End Gap (Free)	approximately 7.5mm	—	—
65	Top Ring End Gap (Installed)	—	0.15mm	0.35mm
65	2nd Ring End Gap (Free)	approximately 14mm	—	—
65	2nd Ring End Gap (Installed)	—	0.15mm	0.35mm
66	Ring/Ring Groove Clearance	—	0.03mm	0.08mm
70	Connecting Rod Axial Play	—	0.8mm	2.0mm
70	Connecting Rod/Crank Web Clearance	—	0.4mm	0.5mm
71	Compression Pressure	5.5 kg/cm ² (650 - 700 r.p.m.)	—	—

PAGE	ITEM	NOMINAL (NEW)	MINIMUM (ALLOWABLE)	MAXIMUM (ALLOWABLE)
80 82	ENGINE—CLUTCH Friction Plate Thickness Clutch Plate Warp Allowance	3.5mm	3.2mm	0.05mm
84 84 84	ENGINE—CLUTCH (Continued) Spring Free Length Spring Set Length Difference Primary Driven Gear (Clutch Hsg.) End Play	31.5mm 0.15mm	30.5mm 0.10mm	1mm 0.30mm
100 104 106 106 — —	CHASSIS Front Brake Shoe Diameter Rear Brake Shoe Diameter Wheel Run-out Limits Vertical Wheel Run-out Limits Lateral Front Fork Spring Free Length Rear Shock Spring Free Length	95mm 110mm 302.5mm 214mm	90mm 105mm	2mm 2mm
20 110 — 28 62 75 83 92 92	TORQUE VALUES See, also Torque Chart, Page Transmission Drain Plug Front Fork Cap Bolt Front Axle Securing Nut Rear Axle Securing Nut Cylinder Head Nut Flywheel Securing Nut Clutch Securing Nut Drive Sprocket Securing Nut Driven Sprocket Securing Bolt(s)	3.5 - 4.0 kg-m 3.5 - 4.0 kg-m 3.5 - 4.0 kg-m 4.0 - 4.5 kg-m 1.0 kg-m 3.5 - 4.0 kg-m 4.0 - 4.5 kg-m 4.0 - 4.5 kg-m 2.0 kg-m		

1. Front Brake Lever
2. Rear Brake Pedal
3. Clutch Lever
4. Throttle
5. Kick Crank
6. Kill Button
7. Frame Serial Number
8. Engine Serial Number



- 9. Fuel Petcock
- 10. Starter Jet
- 11. Shift Lever

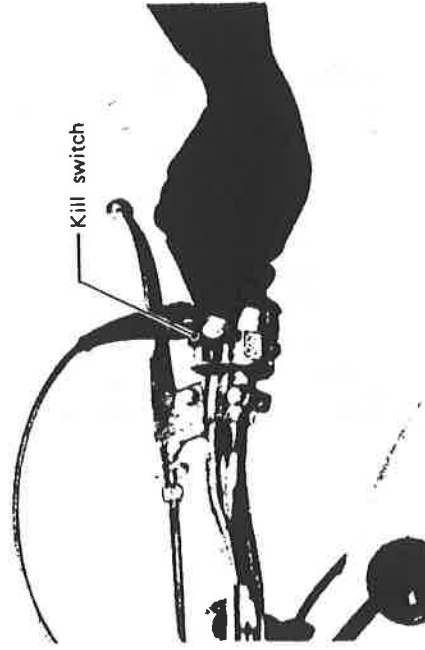


CHAPTER V BASIC INSTRUCTIONS

A. CONTROL FUNCTIONS

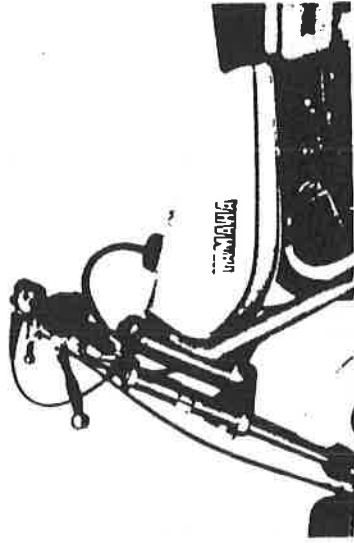
1. KILL SWITCH

The Kill switch is the positive type. Push the switch forward for ignition off. Pull the switch toward you on.

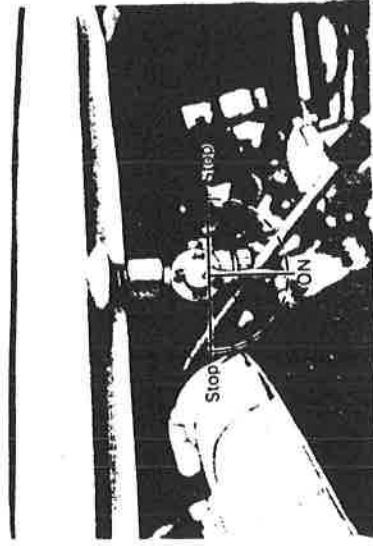


3. FUEL TANK AND PETCOCK

The fuel tank incorporates a threaded plastic filler cap. The cap has a vent tube which is routed to the front of the tank and down alongside a frame down tube.

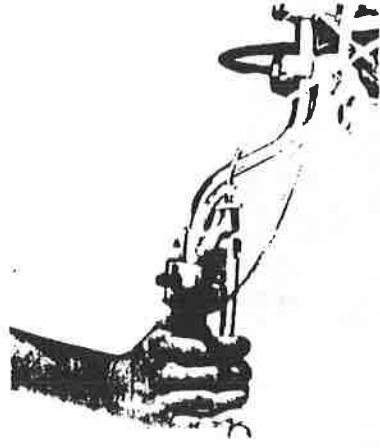


The fuel tank petcock is situated to the left side of the fuel tank. Turn the petcock lever to the vertical position and fuel will flow to the carburetor. Turn lever to the horizontal position to shut off fuel supply to the carburetor.



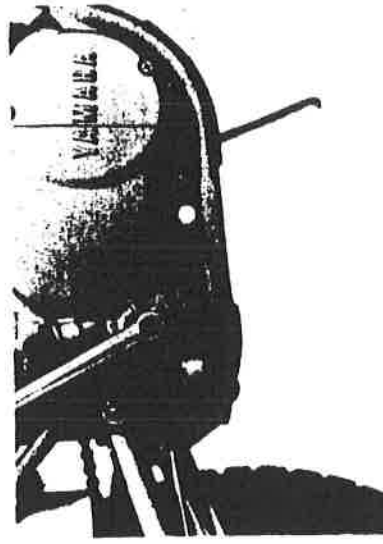
4. FRONT BRAKE LEVER

Located on the right handlebar. The front brake lever actuates the single leading-shoe front brake when brake lever is squeezed.



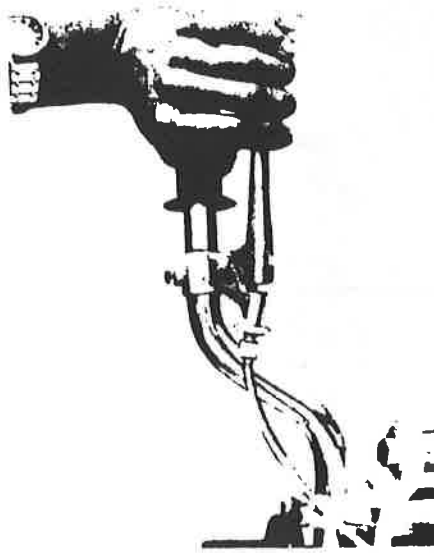
5. REAR BRAKE PEDAL

Located directly in front of the right-hand rider's foot rest. The rear brake pedal actuates the single leading-shoe rear brake when the pedal is depressed.



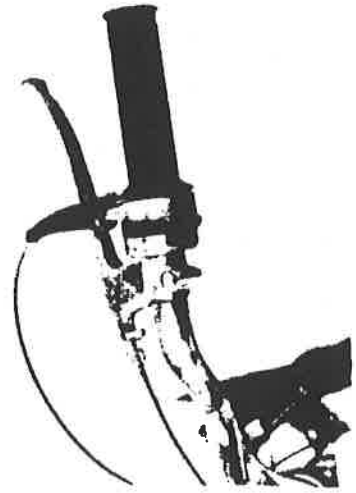
6. CLUTCH LEVER

Located on the left handlebar. The clutch lever will disengage the clutch when the lever is squeezed.



7. THROTTLE

The throttle is the positive-return, type, and is located on the right handlebar.



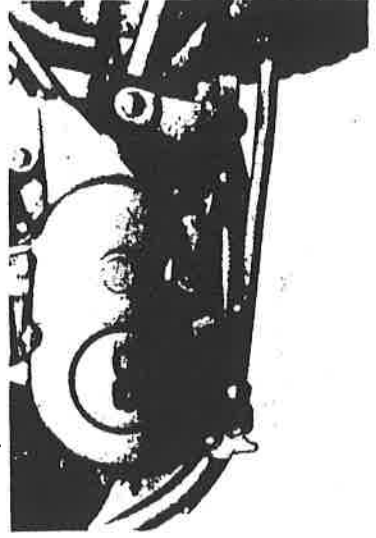
8. KICK CRANK

The kick starter crank is located on the right, rear side of the engine. Set up the right foot-rest. Rotate the crank lever out, press your foot upon it firmly, push down until the gears engage the primary drive train and kick briskly to start the engine.



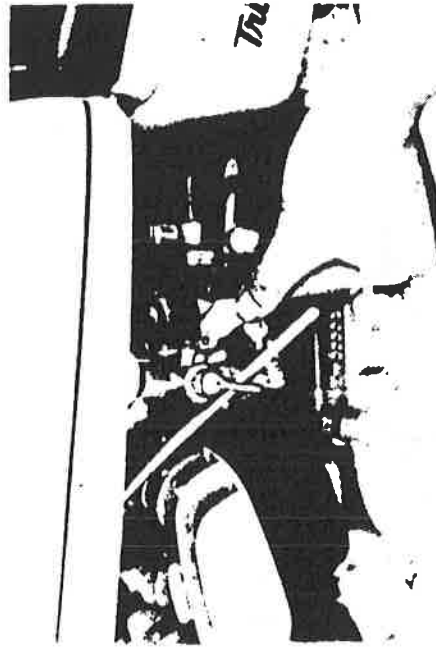
9. SHIFT LEVER

The transmission shift lever is located on the left-hand side of the machine directly in front of the rider's foot rest. The shift mechanism is of the ratcheting type and controls gear selection for the 4-speed transmission.



10. CARBURETOR STARTER JET

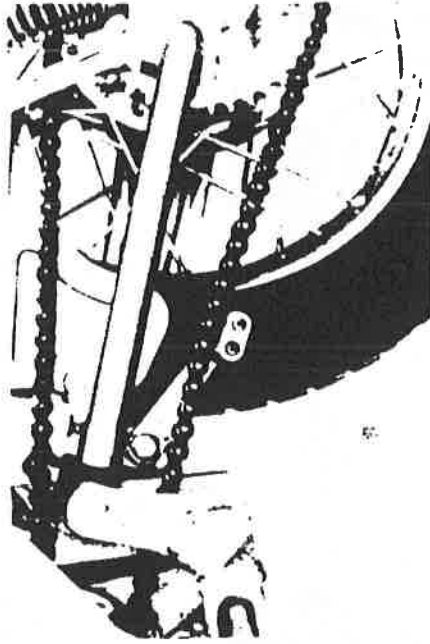
The carburetor starter jet is located on the left side of the carburetor assembly. The jet is designed to supply an extra rich fuel/air mixture for cold engine starts. It is actuated by a lever. Push the lever down to turn the jet on. Always disengage the lever after the engine is running smoothly. Never ride the machine with the lever down.



11. DRIVE CHAIN TENSIONER

The drive chain tensioner is located on the underside of the drive chain midway between the drive and driven sprockets.

The tensioner is designed to remove small amounts of excessive chain slack, thereby reducing the "lurch" caused by rapid throttle changes.



B. GASOLINE AND OIL

1. GASOLINE

Use gasoline with an octane rating of 86+.

Some regular gasolines and most midrange gasolines have such ratings. High-test or Ethyl grade gasolines usually have octane ratings in excess of 94.

Always use fresh, name-brand gasoline.

Low-lead or unleaded gasolines are suitable provided they meet the minimum (86+) octane requirements.

CAUTION:

WITH THE AUTOLUBE FEATURE IT IS UNNECESSARY AND EVEN HARMFUL TO THE ENGINE TO MIX OIL WITH THE GASOLINE. NEVER MIX OIL WITH THE GASOLINE. ALWAYS USE STRAIGHT GASOLINE.

2. OIL

A. Autolube Oil

We recommend that your first choice be Yamalube which can be purchased from any Authorized Yamaha Dealer. If for any reason you should use another type, the oil should meet or exceed BIA certification "TC-W". Check container top or Label for service specification.

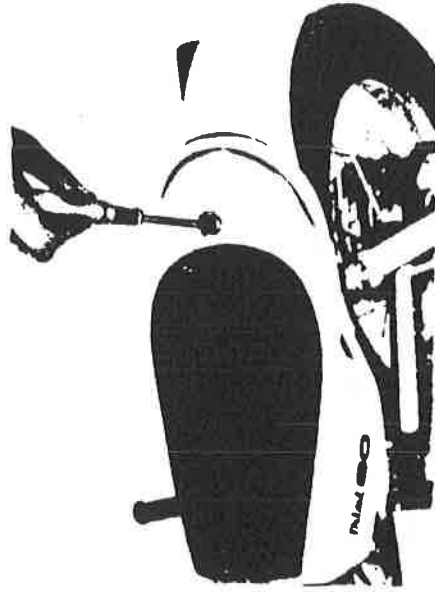
CAUTION:

UNDER EXTREMELY COLD CONDITIONS (+32 degrees Fahrenheit or below) SOME OILS BECOME VERY THICK AND WILL NOT FLOW AS READILY TO THE AUTO-LUBE PUMP. THIS MAY CAUSE OIL PUMP STARVATION. YAMALUBE WILL FLOW NORMALLY TO THE PUMP AT AMBIENT TEMPERATURES TO ZERO DEGREES FAHRENHEIT.

3. AUTOLUBE TANK

Always check Autolube tank oil level before operating machine.

A. Remove seat.



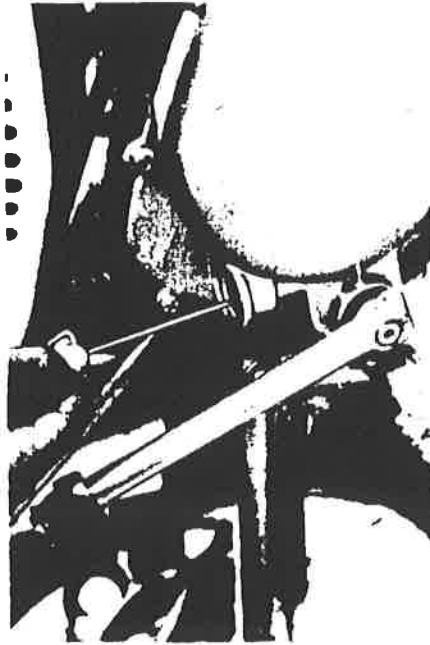
B. Remove cap.



C. Top off tank. Re-install cap and seat.

5. TRANSMISSION

To check level, start the engine and let it run for several minutes to warm and distribute oil. Clean the dipstick. Set it on the case threads in a level position. Remove and check level.



NOTE:
BE SURE THE MACHINE IS LEVEL AND ON
BOTH WHEELS.

The stick has Minimum and Maximum marks. The oil level should be between the two. Top off as required.

Recommended Oil: Motor Oil, SAE 10W-30wt.
Type "SE".

A drain bolt is located on the bottom of the crankcase. With the engine warm, remove the plug and drain oil. Re-install plug and add fresh oil.

Transmission Drain Plug Torque: 3.5 ~ 4.0 kg-m
(300 ~ 350 In-lbs)

Transmission Oil Quantity: 500 cc (0.53 U.S.qt.)

Transmission oil should be replaced several times during the break-in period. If the unit is used for competition, oil replacement should also be often. See Maintenance Chapter.

CAUTION

Under no circumstances should any additives be included with the transmission oil. This oil also lubricates and cools the clutch. Many additives will cause severe clutch slippage.

CHAPTER VI OPERATION

CAUTION

1. Before riding this motorcycle, become thoroughly familiar with all operating controls and their function. Consult your Yamaha dealer regarding any control or function you do not thoroughly understand.
2. This model is designed for competition use only. It is not equipped with government approved lighting, mirrors, horn or directional signals. In most instances, it is illegal to ride this model (either day or night) on any public street or highway.

PRE-OPERATION CHECK CHART

ITEM	ROUTINE	PAGE
BRAKES	Check operation/adjustment	26
CLAUTCH	Check operation/lever adjustment	27
AUTOLUBE TANK	Check oil lever/top-off as required	19
TRANSMISSION	Check oil lever/top-off as required	20
DRIVE CHAIN	Check alignment/adjustment/lubrication	28
SPARK PLUG	After bread-in-check color/cond'n weekly/500 mi.	33
THROTTLE	Check for proper cable operation (incl. Autolube cable)	—
AIR FILTER	Foam type - must be clean and damp w/oil always	44 • 45
WHEELS & TIRES	Check pressure/runout/spoke tightness/axle nuts	—
FITTINGS/FASTENERS	Check all - tighten as necessary	—

Pre-operation checks should be made each time the machine is used. Such an inspection can be thoroughly accomplished in a very short time; and the added safety it assures is more than worth the time involved.

CHAPTER VI OPERATION

1. STARTING AND OPERATION

CAUTION:

PRIOR TO OPERATING THE MACHINE, PERFORM STEPS LISTED IN PREOPERATION CHECK LIST.

Turn fuel petcock lever to open (vertical) position. Check ignition kill switch. Kill switch must be on "RUN" position to complete ignition circuit.

A. Starting Cold

Depress the starter lever. Keep the throttle completely closed. Engage the kick starter and start the engine.



B. Starting with Engine Warm

Do not engage starter lever. Open throttle slightly ($\frac{1}{4}$ turn). Engage the kick starter and start the engine.

C. Warm-up

Run the engine at idle or between idle and $\frac{1}{8}$ th throttle using the starter lever as required until the engine is warm.

This procedure normally takes 2 to 3 minutes. To check, see if the engine responds normally to throttle with starter lever off.

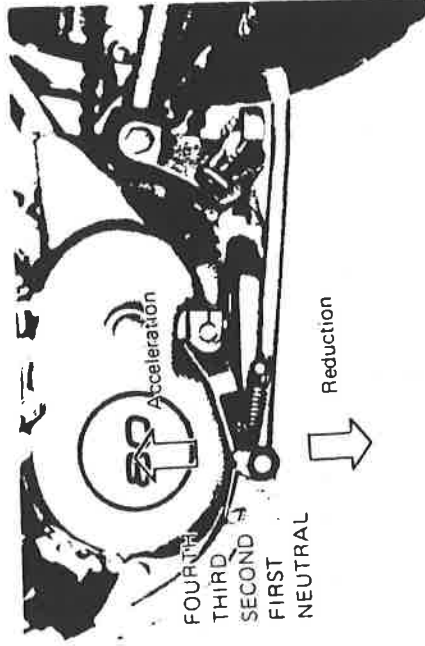
CAUTION:

SEE "BREAK-IN SECTION" PRIOR TO OPERATING ENGINE FOR FIRST TIME.

The kick mechanism is of the primary type.

Therefore, the engine may be started in any gear. Provided clutch is disengaged. The engine may be started in neutral with clutch engaged or disengaged.

A 4-speed transmission is employed. Neutral is at the bottom of the shift pattern; high gear at the top of the shift pattern;



The shift mechanism is of the ratcheting type common to most motorcycles. Allow the lever to return to its "at rest" position prior to selecting another gear. Neutral is selected by shifting "down" to the bottom of the pattern.

With the engine running in the neutral position, disengage the clutch (pull in clutch lever), pull up on the shift lever until first gear is engaged, remove foot from shift lever, increase engine speed slightly, slowly release clutch lever while advancing throttle. Repeat procedure for remaining gears. Except during competition, shift the transmission when engine speed is approximately 3,000 to 4,000 rpm. This can be interpreted as approximately one-half throttle. (SEE "BREAK-IN")

WARNING

Model TY80A is not[®] equipped with highway-approved lighting. This model is designed solely for competition use and should not be used on streets or highways at any time. In most instances, it is illegal to drive this model on any public streets or highways.

BREAK-IN

You must not put an excessive load on the engine during the first ten to twenty hours of operation. If speedometer mileage is maintained, use the following break-in procedure:

0 to 50 miles (3 Hrs.)

Avoid operation above one half throttle.

50 to 100 miles (3~6 Hrs.)

Avoid full throttle operation. Allow the motorcycle to rev freely through the gears but do not use full throttle at any time.

100 to 250 miles (6~15 Hrs.)

Avoid prolonged full throttle operation.

Avoid cruising speeds in excess of one half throttle. Vary speeds occasionally.

250 miles and beyond (15 + Hrs.)

Avoid full throttle operation. Avoid cruising speeds in excess of 60 mph.

CHAPTER VII MECHANICAL ADJUSTMENTS

1. BRAKES

A. Front Brake

Front brake should be adjusted to suit rider preference with a minimum cable slack of 5~8 mm play at the brake lever pivot point.

Adjustment is accomplished at one of two places; either the handle lever holder or the front brake hub.

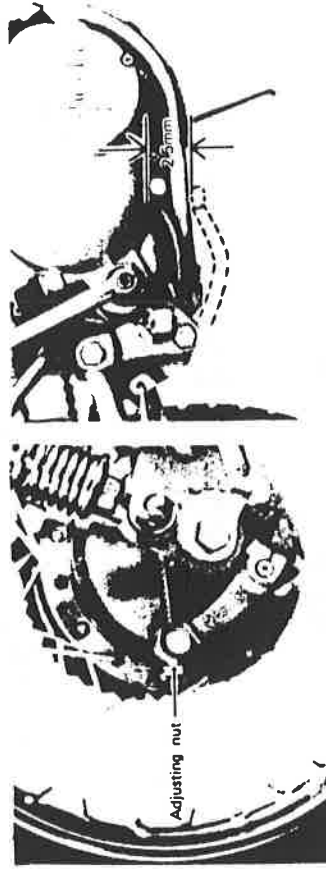
- Loosen the adjustor locknut.
- Turn the cable length adjustor in or out until adjustment is suitable.
- Tighten the adjusting bolt locknut.



B. Rear Brake

Adjust rear brake pedal play to suit, providing a minimum of 25mm freeplay. Adjustment is accomplished as follows:

- Using a 13mm wrench, turn the adjusting nut on the rear brake ferrule in or out until brake pedal freeplay is suitable (25mm minimum freeplay).

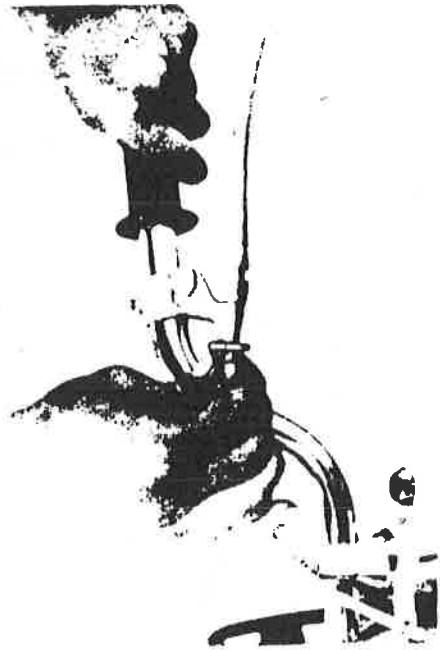


NOTE: Rear brake pedal adjustment must be checked whenever chain is adjusted or rear wheel is removed and then reinstalled.

2. CLUTCH ADJUSTMENT

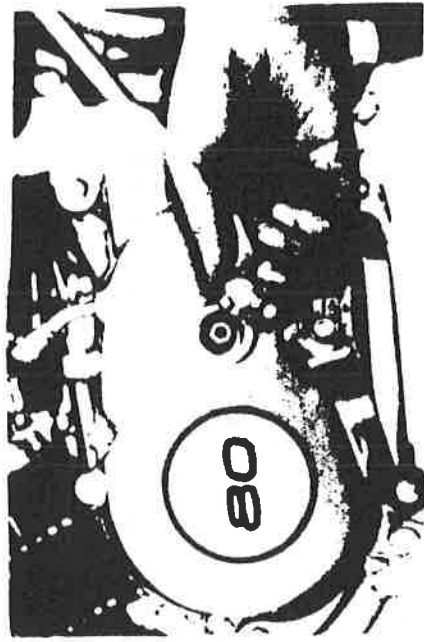
Proper clutch adjustment requires two separate procedures.

- A. Loosen cable, adjust screw locknut.
- B. Turn clutch cable adjustor (at lever) all the way into the lever.



NOTE: The above procedure provides for maximum cable freeplay to allow for proper clutch actuating mechanism adjustment.

- C. Remove cover cap on left crankcase cover.
- D. Loosen adjustor locknut.
- E. Using a Phillips screwdriver, turn adjust screw in or out until clutch arm (located under the engine directly below the adjust screw), is directly in line with the main axle center line.



- F. Tighten locknut.
- G. At clutch lever assembly, left handlebar, turn cable length adjustor in or out until freeplay at lever pivot equals 2~3mm.
- H. Tighten adjusting bolt locknut.
- I. Re-install cover cap.

3. DRIVE CHAIN ADJUSTMENT

To adjust drive chain, proceed as follows:

- A. Remove rear axle cotter pin.
- B. Loosen rear axle securing nut.

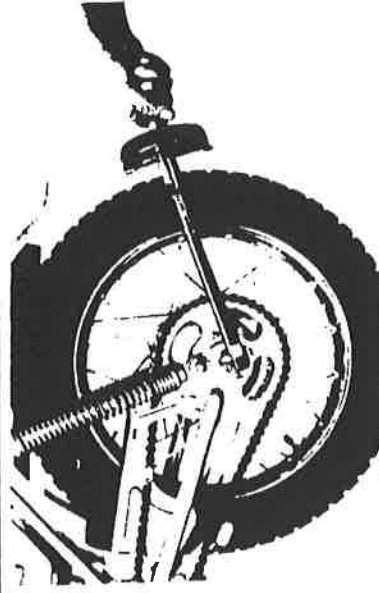


- C. With rider in position on machine, both wheels on ground, set axle adjusters until there is $\frac{3}{4}$ to 1 inch slack in the drive chain at the bottom of the chain at a point midway between the drive and driven axles.

- D. Turn cam adjusters both left and right until axle is situated in same cam slot position.

- E. Tighten the rear axle securing nut. Rear axle tightening torque equals

Axle Nut Torque: 4.0~4.5 kg-m
(350~400 In-lbs)



- F. Install a new cotter pin, bend the ends.

G. Check brake pedal free play.

CAUTION:

Whenever the chain is adjusted and/or the rear wheel is removed, always check during reassembly:

1. Rear axle alignment
2. Brake pedal freeplay

4. CARBURETOR

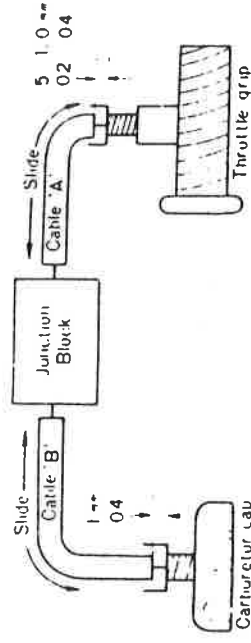
Under normal operating conditions, there are only three adjustments to be made to the carburetor.

A. Throttle cable adjustment:

- 1) Lift the rubber mixing chamber cap cover from the top of the carburetor.
- 2) Grasp outer cable housing. Lift up.

Slack should equal 1mm. If slack is incorrect, loosen adjusting bolt locknut and turn adjusting bolt in or out as required to achieve correct slack. Tighten adjusting bolt locknut. Reinstall cap cover.

- 3) Grasp throttle cable housing at throttle assembly at right handlebar. Pull out. Slack should equal 1mm. If not, loosen cable length adjuster locknut and adjust cable length accordingly.



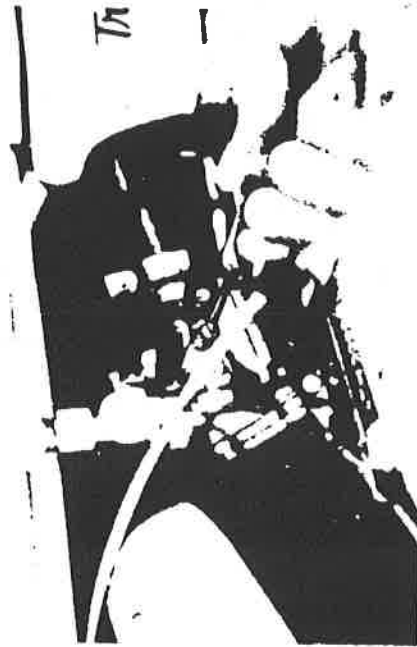
- 4) Tighten adjuster locknut.

B. Idle speed and idle air adjustments:

- 1) Turn idle air screw in until lightly seated.
- 2) Back out 1½ turns.



- 3) Turn idle speed adjust screw until idle is approximately 1250 to 1350 rpm.



Idle Air Screw: 1½ turns out
Idle Speed: 1250~1350 rpm

NOTE:

Idle air mixture and idle speed adjustment screws should be so adjusted that engine response to throttle changes from idle position is rapid and without hesitation.

If the engine, when warm, hesitates or "bogs", after adjusting as described, turn idle air mixture screw in or out in ¼ turn increments until bogging problem decreases.

Readjust idle speed, recheck throttle cable slack.

5. ADJUSTING AUTOLUBE

Cable Adjustment

1. Remove Autolube pump cover, which is located on forward portion of crankcase cover (R).

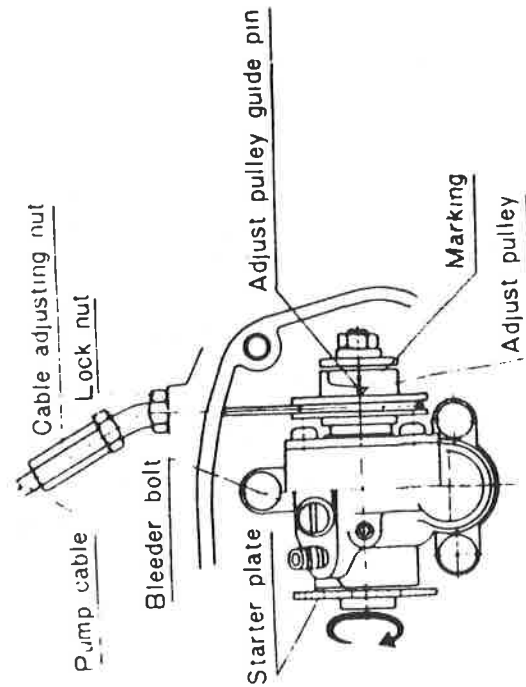


2. Rotate throttle until all slack is removed from all cables. Hold this position.

3. Check to see that Autolube pump plunger pin is aligned with the mark on the Autolube pump pulley.



4. If the mark and pin are not in alignment, loosen cable length adjuster lock nut on upper edge of crankcase cover and adjust cable length until alignment is achieved.
Tighten adjuster locknut.



Pump Stroke Adjustment

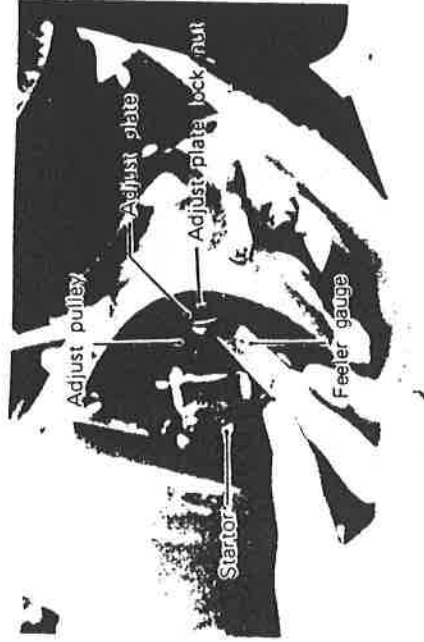
NOTE:

Autolube pump stroke adjustment requires special tool. This tool, Autolube Pump Feeler Gauge, may be purchased from your Authorized Yamaha Dealer.

1. Rotate plastic bleed wheel until the pump plunger moves fully out and away from the pump body to its outermost limit.



2. Measure gap between raised boss on pump cable pulley and pump stopper plate. Clearance should equal 0.30 to 0.25mm. If clearance is incorrect, remove adjust plate locknut and adjust plate.



Minimum Pump Stroke: 0.30~0.35mm
(0.012~0.014 in)

3. Remove or add an adjustment shim as required.



4. Reinstall adjust plate and locknut. Tighten the locknut. Re-measure gap. Repeat procedure as required.



6. SPARK PLUG

The spark plug in your machine indicates how the engine is operating. If the engine is operating correctly, and the machine is being ridden correctly, then the tip of the white insulator around the positive electrode of the spark plug will be a medium to light tan color. If the porcelain "donut" around the positive electrode is a very dark brown or black color, than a plug with a hotter heat range might be required. This situation is quite common during the engine break-in period.

If the insulator tip shows a very light tan or white color or is actually pure white or if electrodes show signs of melting, then a spark plug with a colder heat range is required.

Remember, the insulator area surrounding the positive electrode of the spark plug must be a medium-to-light tan color. If it is not, check carburetion, timing and ignition adjustments. If the situation persists, consult your Authorized Yamaha Dealer.

Your machine is equipped with a relatively hot spark plug to insure clean, smooth low speed operation. If the machine is to be operated at higher R.P.M. ranges for extended periods, install the next colder spark plug.

The spark plug must be removed and checked prior to using the machine. Check electrode wear, insulator color, and negative to positive electrode gap.

Spark Plug Gap: 0.5 ~0.6mm (0.20~0.24 in)

It is alright for you, as the owner, to exchange the standard plug. Engine conditions will cause any spark plug to slowly break down and erode. If erosion begins to increase, or if the electrodes finally become too worn, or if for any reason you believe the spark plug is not functioning correctly, replace it.

Standard Spark Plug: B-6HS

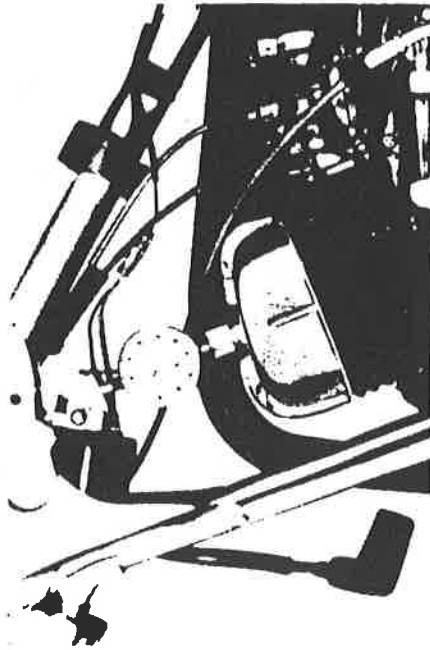
When installing the plug, always clean the gasket surface, use a new gasket, wipe off any grime that might be present on the surface of the spark plug, torque the spark plug properly.

Spark Plug Tightening Torque: 2.7~2.9 kg-m
(230~250 In-lbs)

7. IGNITION TIMING

Ignition timing must be set with a dial indicator (to determine piston position) and a low-range ohmmeter (to determine exactly when contact breaker points begin to open). Proceed as follows:

- A. Remove spark plug and screw Dial Gauge Stand into spark plug hole.
- B. Insert Dial Gauge Assembly into spark plug stand.



- C. Remove left crankcase cover to gain access to contact breaker assembly (ignition points).
- D. Connect red lead of Point Checker to black wire in wire harness coming from magneto.
- E. Connect black lead of Point Checker to unpainted surface of cylinder fin or crankcase bolt or screw.

F. Rotate magneto flywheel until piston is at top-dead-center (T.D.C.). Tighten set screw on dial gauge stand to secure dial gauge assembly. Set the zero on dial indicator face to line up exactly with dial indicator needle. Rotate flywheel back and forth to be sure that indicator needle does not go past zero.

G. Starting at T.D.C. rotate flywheel clockwise until dial indicator reads approximately 1.8mm (0.07") before top-dead-center (B.T.D.C.).

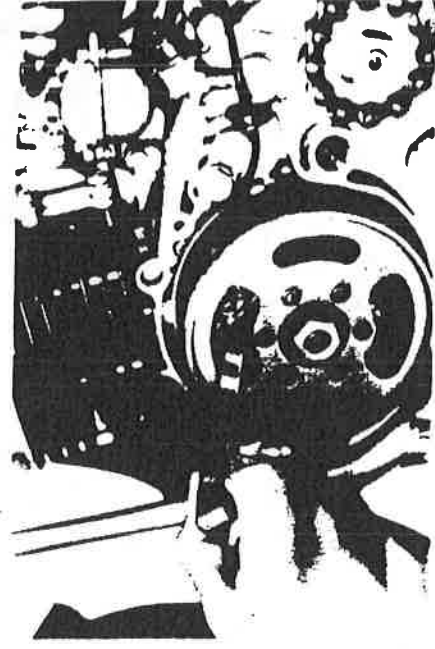
H. Slowly turn flywheel counter-clockwise until gauge indicates correct timing figure. At this time, the ohmmeter needle should swing from "CLOSED" to "OPEN" position, indicating the contact breaker (ignition points) have just begun to open.



Ignition Timing: 1.8mm B.T.D.C.

K. When correct ignition timing has been accomplished, check maximum point gap by turning flywheel until maximum point opening occurs. Measure point gap with thickness gauge.

Maximum Allowable Point Gap: 0.3 ~0.4mm
(0.012~0.016 in.)



I. Repeat step H to verify point opening position. If points do not open within specified tolerance, they must be adjusted.

J. Adjust ignition points by barely loosening Phillips-head screw and carefully rotating contact breaker assembly with a slotted screwdriver until point checker indicates points "OPEN". Re-tighten Phillips-head screw. Repeat steps F thru H.



NOTE:

If the maximum point gap is over tolerance the point rubbing block is probably worn and the contact breaker assembly should be replaced. Do not attempt to bend the fixed point bracket to decrease maximum point gap. This will only result in point misalignment, difficulty in setting timing and premature point failure. See "Magnet Flywheel Removal" for point replacement procedure.

L. Remove dial gauge assembly and dial gauge stand.
Replace spark plug.

Spark Plug Torque: 2.7~2.9 kg-m
(230~250 in-lbs.)



M. Disconnect point checker.
N. Replace crankcase cover (L).

CHAPTER VIII MAINTENANCE AND MINOR REPAIRS

The following sections provide information for the disassembly, troubleshooting and maintenance of various components of the motorcycle. If you do not have the necessary tools and an understanding of the mechanical principles involved, please refrain from attempting repairs. The use of improper tools and/or procedures can cause major damage to the unit with resultant additional repair costs.

To properly understand the procedures outlined we suggest you consult the GT80A Service Manual (1974) and the various other technical publications produced by Yamaha Motor Company or Yamaha International Corporation.

Finally, we suggest you consult your Yamaha Dealer prior to attempting any repair procedures. This is particularly important during the first ninety days the machine is in use.

PERIODIC MAINTENANCE INTERVALS

Page	Item	Remarks	Initial (miles)			Thereafter every (miles)		
			250	500		500	1,000	
26	Brake System (Complete)	Check/Adjust as required-Repair as required	○			○		
27	Clutch	Check/Adjust as required	○			○		
33	Spark Plug	Inspect/Clean or replace as required	○	○		○		
—	Wheels and Tires	Pressure/Spoke Tension/Roundout	○	○		○		
—	Fittings and Fasteners	Tighten before each trip and/or	○	○		○		
—	Throttle	Cable Oper./Adj. (incl. Autolube)	○	○		○		○
28	Drive Chain	Tension/Alignment	○	○		○		
20	Transmission Oil Level	Includes Trans./Autolube tank (See Note 1)	○	○		○		
44 45	Check	Foam Type (See Service Notes 2 & 4)	○	○		○		○
—	Air Filter	Clean/Flush tank as required	○	○		○		○
—	Fuel Petcock	Adjust/Clean/Replace points as required		○		○		○
34 35 36	Ignition timing	Check Operation/Synch./Fittings		○		○		○
29 30	Carburetor Adjustment	Clean/Repair as required/Refit/Adjust		○		○		○
46 ~ 54	Carburetor Overhaul	Preventive Maintenance check		○		○		○
—	Cylinder Compression	Includes Exhaust System		○		○		○
—	Decarbonize Engine							

SERVICE NOTES:

1. Check Autolube tank level before each ride. Top off when oil level shows at the sight glass or before any prolonged use. See "Lubrication Intervals" for type oil to use.
2. Foam element air filters must be damp with oil at all times to function properly. Remove, clean, and oil filter at least once per month or every 250~500 miles; whichever occurs first. (If extremely hard usage, such as dirt riding, clean and lube daily.) See "Lubrication Intervals" for additional details.
3. Pre-operational checks should be made each time the machine is used. Such an inspection can be thoroughly accomplished in a very short time, and the added safety it assures the rider is more than worth the minimal time involved.
4. For additional information regarding drive chain, engine oil level, wet-type air filter, see "Lubrication Intervals".

LUBRICATION INTERVALS

Item	Remarks	Period				
		Initial (miles)		Thereafter Every (miles)		
		250	500	1,000	500	1,000
Autolube	P See Service Notes	No. 1		See Service Notes		
Transmission oil	E Warm engine before draining	No. 2	○	CHK	○	○
Drive Chain	O Lube/Adjust as required	No. 3		See Service Notes		
Drive Chain	P Remove/Clean/Lube/Adjust	No. 3		○	○	○
Air Filter	H Foam type	No. 9		See Service Notes		
Control & Meter Cables	K All-Apply Thoroughly	No. 4		○		○
Throttle Grip & Housing		No. 5		○		○
Rear Arm Pivot Shaft	Light Application	No. 6		○		○
Brake Pedal Shaft	Zirc-Apply until shows	No. 5		○		○
Change Pedal Shaft	Light Application	No. 5		○		○
Front Forks	Drain Completely-Ck Specs	No. 3	CHK	○		○
Steering Ball Races	Inspect Thoroughly/Med. Pack	No. 7		○		○
Point Cam Lubr. Wick	Very Light Application	No. 8		○		○
Wheel Bearings	Do not Over-Pack	No. 7		○		○

No. 1 Check tank level before each ride. Top off when oil level is at sight glass or before any prolonged use. Use the following lubricant (in order of preference):

Yamalube, or; two-stroke oil labeled "BIA certified for service TC-W"

No. 2 At ambient temperatures of 45-90° F. use 10W/30 "SE". Do not use "additives" in oil.

No. 3 Use 10W/30 "SE" motor oil. (If desired, specialty type lubricants of quality manufacture may be used.)

"Drive Chains" — Lube every 150-200 miles. If severe usage, every

50-100 miles or after every event.

No. 4 Use graphic base type (specialty types available use name-brand, quality manufacturer).

No. 5 Light duty: smooth, light-weight, "white" grease. Heavy duty: standard 90wt. lube grease (do not use lube grease on throttle/housing).

No. 6 Use standard 90wt. lube grease - smooth, not coarse.

No. 7 Medium-weight wheel bearing grease of quality manufacturer - preferably waterproof.

No. 8 Light-weight machine oil.

No. 9 Air filters - foam element air filters must be damp with oil at all times to function properly. Clean and lube monthly or per mileage. If hard usage, clean and lube daily. Do not over-oil. Use SAE 10W/30 "SE".

MAINTENANCE AND LUBRICATION INTERVALS

These charts should be considered strictly as a guide to general maintenance and lubrication intervals. You must take into consideration that weather, terrain, geographical locations, and a variety of individual uses all tend to demand that each owner alter this time schedule to match his environment. For example, if the motorcycle is continually operated in an area of high humidity, then all parts must be lubricated much more frequently than shown on the chart to avoid the damage caused by water to metal parts. If you are in doubt as to how closely you can follow these time recommendations, check with the YAMAHA dealer in your area.

COMPETITION

The serious competitor will no doubt already have a maintenance and lubrication schedule of his own. However, until one can be established according to individual usage, we suggest the following:

1. Cut the mileage recommendations by one-half. If no speedometer; estimate 10-15 mph average speed.

2. Immediately preceding each competition, pay particular attention to the following:

1. A thorough Pre-operation check.
2. Clean and lubricate air filter.
3. Lubricate all controls, cables and rear arm pivot.

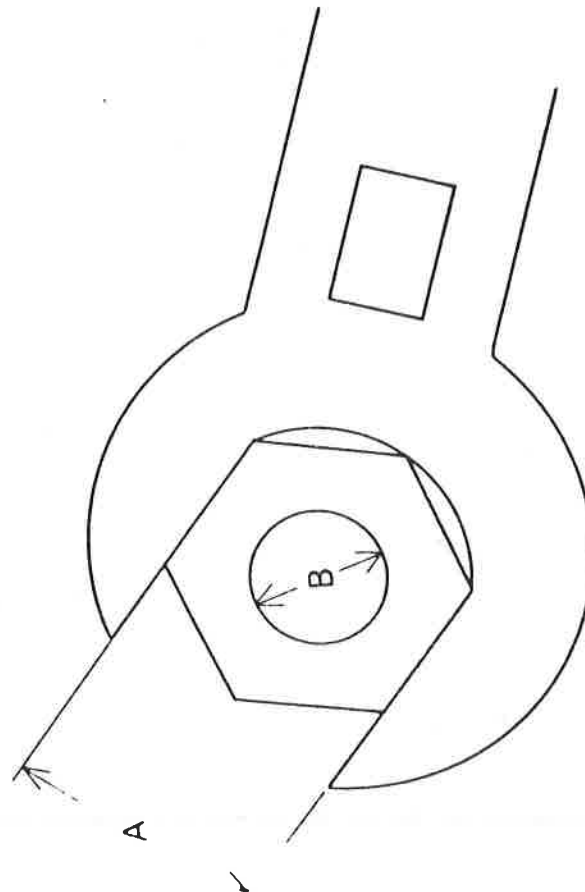
3. Every other competition, perform the steps outlined in No. 2, and:

1. Disassemble top end and inspect.
2. Replace piston rings.
3. Decarbonize as required.
4. Service carburetor.
5. Replace transmission oil.
6. Check front fork operation and steering adjustment.
7. Remove chain; clean, oil and re-install.
8. Remove wheel assemblies and service brakes.
9. Check rear shock and swing arm operation.
10. Adjust Autolube pump stroke and cable.

TORQUE SPECIFICATIONS

The list below covers those stud/bolt sizes with standard I.S.O. pitch threads. Torque specifications for components with thread pitches other than standard are given within the applicable chapter.

Torque specifications call for dry, clean threads. Components such as the cylinder or cylinder head should be at room temperature prior to torquing. A cylinder head or any other item with several fasteners should be torqued down in a cross-hatch pattern in successive stages until torque specification is reached. The method is similar to installing an automobile wheel and will avoid warping the component.



A (NUT)	B (BOLT)	TORQUE SPECIFICATION		
		Kg-m	Ft-lbs	In-lbs
10mm	6mm	1.0	7.2	85
13mm	8mm	2.0	15	175
14mm	8mm	2.0	15	175
17mm	10mm	3.5 - 4.0	25 - 29	300 - 350
19mm	12mm	4.0 - 4.5	29 - 33	350 - 400
22mm	14mm	4.5 - 5.0	33 - 36	400 - 440
26mm	17mm	5.8 - 7.0	42 - 50	500 - 600
27mm	18mm	5.8 - 7.0	42 - 50	500 - 600
30mm	20mm	7.0 - 8.3	50 - 60	600 - 700
SPARK	PLUG	2.7 - 2.9	19 - 21	230 - 250

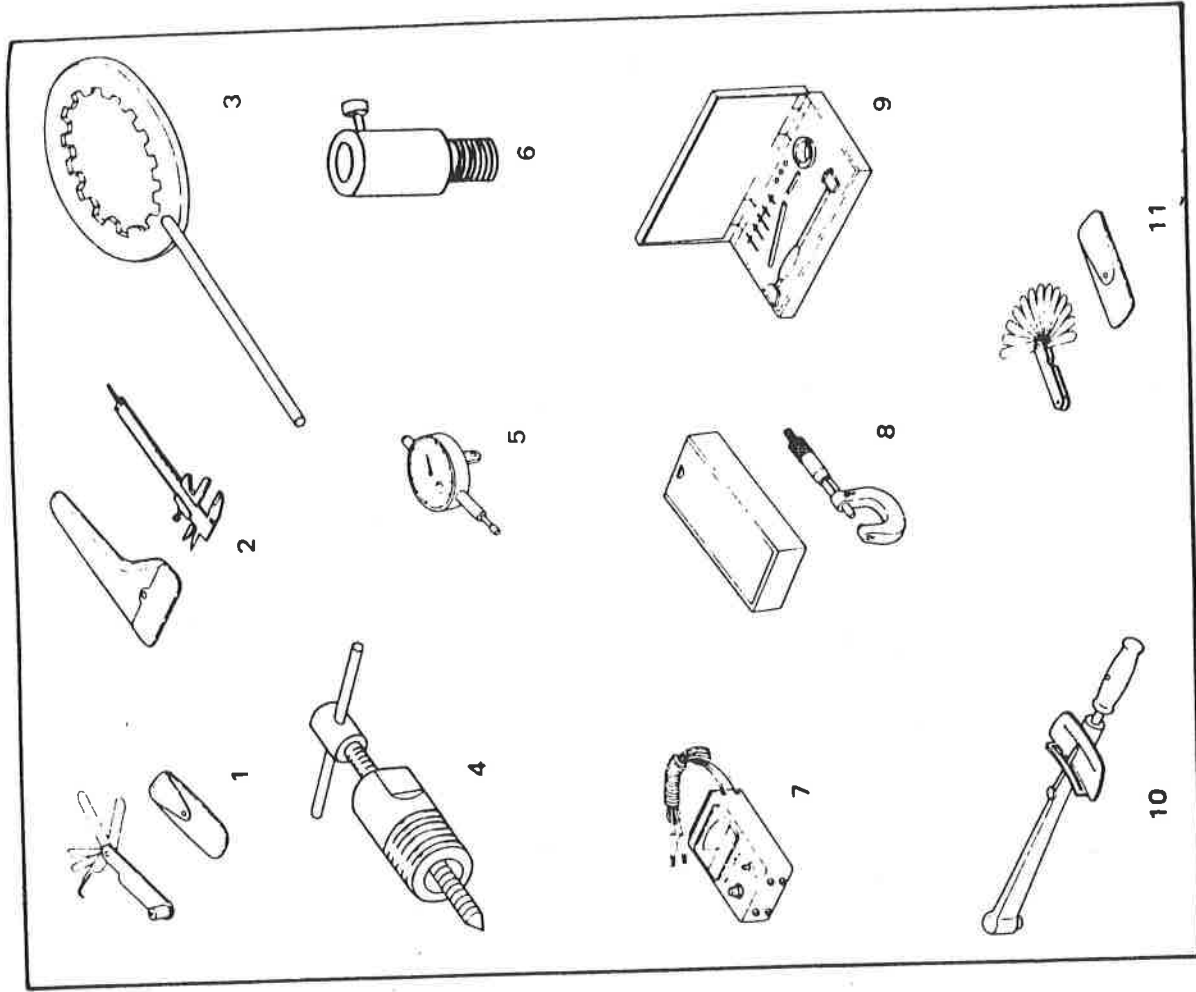
TOOLS

The Owner's Tool Kit supplied with the machine provides the minimum tools required for emergency repairs and minor maintenance. The maintenance procedures outlined within this manual require additional special tools and instruments. A comprehensive list of the special tools is given below. For your convenience, we have also included a list of additional recommended hand tools and supplies.

SPECIAL TOOLS AND INSTRUMENTS

- *1. Autolube Feeler Gauge
- *2. Vernier Calipers (0-150mm)
- *3. Clutch Holding Tool
- *4. Magneto Flywheel Puller (YGI)
- *5. Dial Gauge (mm)
- *6. Dial Gauge Stand
- *7. Point Checker (or continuity checker)
- *8. Outside Micrometer (50-75mm)
- *9. Cylinder Gauge (50-100mm)
10. Torque Wrench (0-10 Kg-m or 0-600 in-lb)
11. Feeler Gauge Set

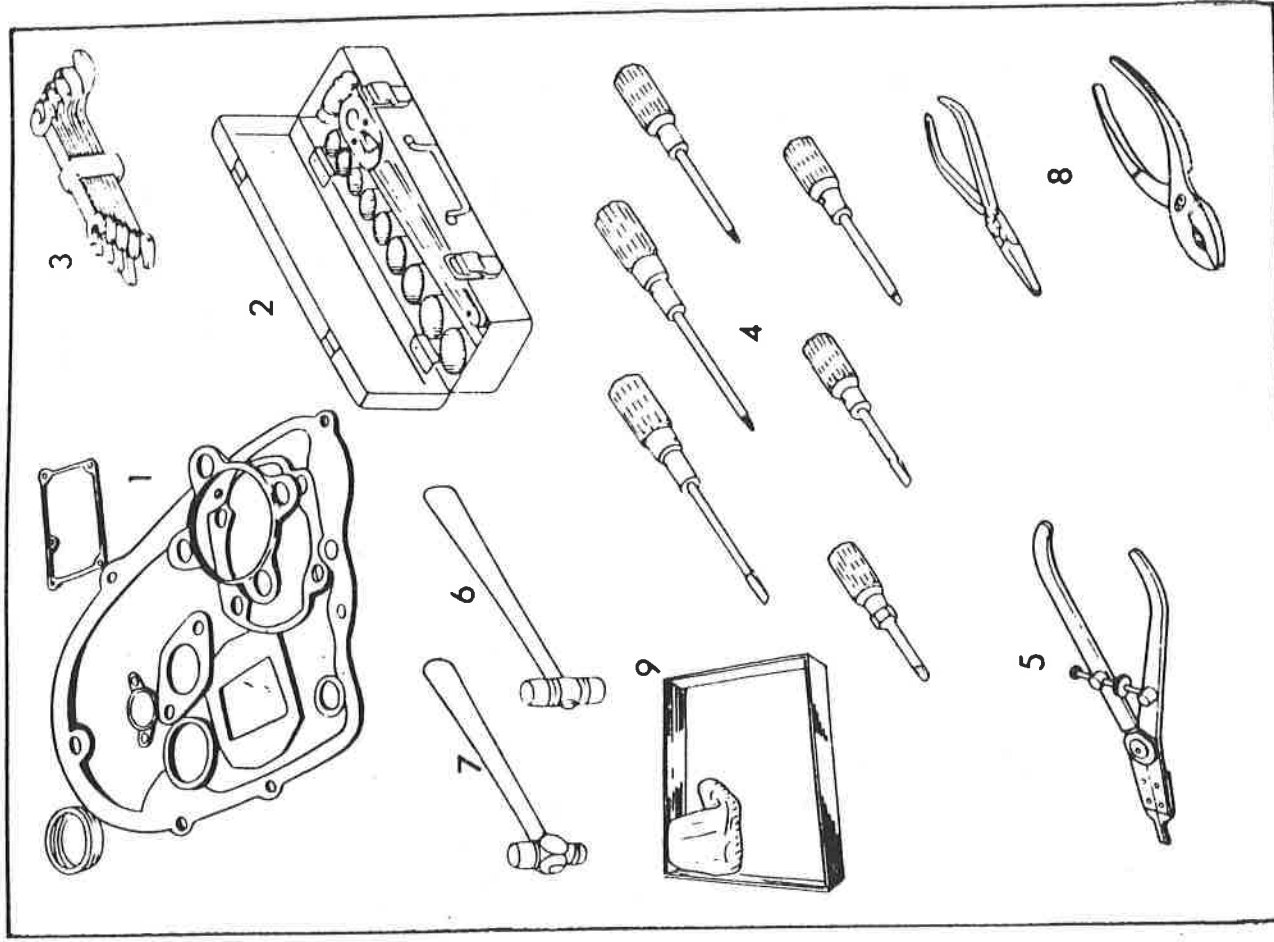
NOTE: Those items marked with an asterick () available from your Yamaha dealer.



GENERAL TOOLS AND MATERIALS

1. TY80A Gasket Kit
- *2. Socket Wrench Set (mm)
- *3. Combination Wrench Set (mm)
4. Selection of Phillips and Standard Screwdrivers
5. Circlip Pliers (outside)
6. Soft faced Hammer
7. Steel Hammer
8. Selection of pliers and wire cutters
9. Several Parts Trays and Shop Rags

*NOTE: See torque chart for sizes required.

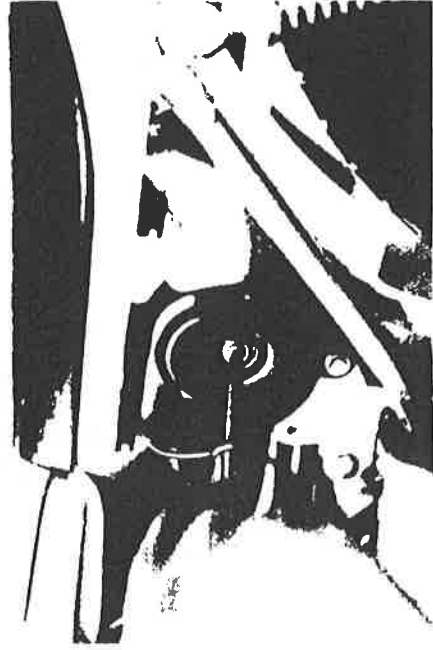


AIR FILTER

1. Remove the lefthand side cover.



2. Remove the Phillips-head screw holding the air filter case cover in place. Remove the cover.



3. Remove the air filter element.



4. Slip the element off the wire mesh guide.



5. Wash the element gently, but thoroughly, in solvent.

6. Squeeze excess solvent out of element and dry.



7. Pour a small quantity of motor oil onto filter element and work thoroughly into the porous foam material.

NOTE: In order to function properly, the element must be damp with oil at all times..... but not "dripping" with oil.

8. Re-insert the wire mesh filter element guide into the element.

9. Coat the ends of the filter element with 90wt. lube grease. This will provide an air-tight seal between the filter case cover and filter seat.

10. Re-install the element, case cover and seat.

NOTE: Each time filter element maintenance is performed, check the air inlet to the filter case for obstructions. Check the air cleaner joint rubber to the carburetor and manifold fittings for an air-tight seal. Tighten all fittings thoroughly to avoid the possibility of unfiltered air entering the engine.

CAUTION

Never operate the engine with the air filter element removed. This will allow unfiltered air to enter causing rapid wear and possible engine damage. Additionally, operation without the filter element will affect carburetor jetting with subsequent poor performance and possible engine over-heating.

CARBURETOR

1. Turn fuel petcock lever to the "STOP" position.
2. Remove the gasoline tank fuel line from fitting at carburetor.

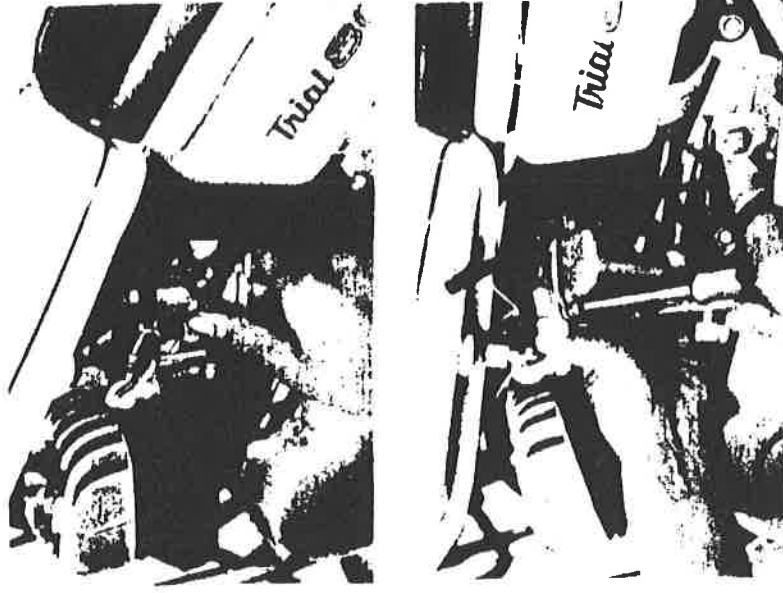


3. Loosen the carburetor body fitting screw and inlet joint band (hose clamp).

NOTE: For carburetor main jet replacement only, follow steps 1 through 3; then:

1. Remove carburetor.
2. Remove four (4) screws that secure float chamber body.

Remove float chamber body.



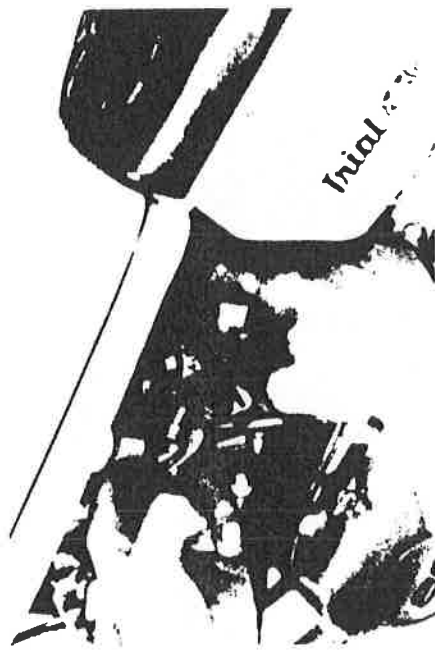
CAUTION

Removing the float chamber body will allow fuel to drain. Do not remove if engine is hot. Place a rag under carburetor to catch overflow. Remove float chamber body in well-ventilated area. Do not remove near open flame. Always clean and dry machine after reassembly.

3. Main jet screws into main nozzle body. Remove main jet. Change as required. Re-install float chamber body and reassemble, reversing steps 1 through 3.

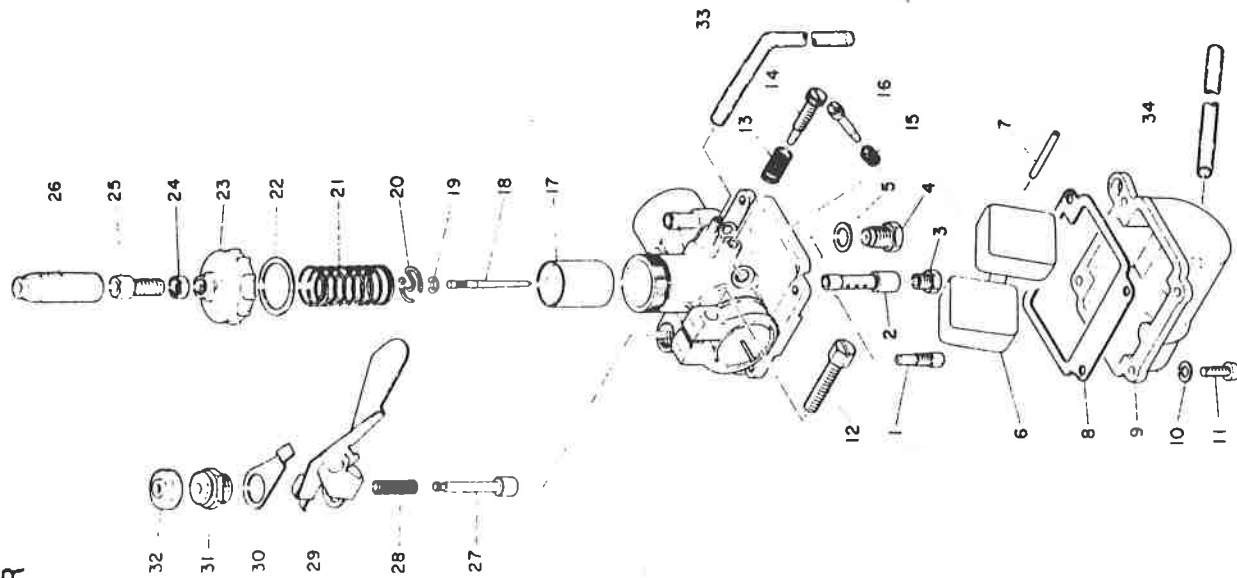
Main Jet: # 86

4. Push the air cleaner joint (hose) off the carburetor inlet.



CARBURETOR

SOME HAVE 12-12 SPEED
AND gear on top,
next to cable -



1. Pilot jet
2. Main nozzle
3. Main jet
4. Valve seat ass'y
5. Valve seat washer
6. Float
7. Float pin
8. Gasket
9. Float chamber body
10. Spring washer
11. Panhead screw
12. Body fitting screw
13. Pilot adjusting spring
14. Pilot adjusting screw
15. Air adjusting spring
16. Air adjusting screw
17. Throttle valve
18. Needle
19. Clip
20. spring seat
21. Throttle valve spring
22. Packing
23. Mixing chamber cap
24. Wire adjusting nut
25. Wire adjusting screw
26. Cap
27. Starter plunger
28. Plunger spring
29. Starter lever
30. Stopper
31. Plunger cap
32. Plunger cap cover
33. Pipe
34. Over flow pipe

5. Rotating the carburetor body, work it off the cylinder manifold joint.



7. Unscrew the mixing chamber top. Remove the slide and needle assembly.



6. Nothing the presence, location and routing of all vent and overflow tubes, pull the carburetor toward you.



8. Remove the Phillips screws (4) holding float bowl to body. With carburetor in upright position, remove float chamber body. Pour float chamber body into suitable container.



9. Invert carburetor body and inspect float. Note its installation position.



10. Remove float pivot pin and float. If fuel has entered a float, or if the float is damaged in any fashion, replace.



11. Remove the inlet needle directly beneath the float arm tang. Inspect the needle and seat for signs of excessive wear or attached foreign particles. Replace as required. Always replace inlet needle and inlet valve seat as an assembly.



12. Remove, in order, the following components:

1. Main Jet



2. Pilot Jet



3. Main Nozzle



4. Throttle Screw (Idle Speed Screw)

5. Air Adjusting Screw (Idle Mixture Screw)

12. Push down on the Starter Jet lever to open the circuit.

13. Wash the carburetor in mild petroleum base solvent. Wash all associated parts.

NOTE: It is rarely necessary to "boil" the carburetor in a warm or hot carburetor bath. If deposits warrant this procedure, remove the Starter Jet Assembly to avoid damaging the jet's neoprene valve seat.

14. Using high pressure air, blow out all passages and jets.



NOTE: Never direct high pressure air into carburetor with float chamber body installed. Damage to floats may occur.

15. Re-install all components with the exception of the float chamber body.

16. Using a vernier caliper, measure the distance from the bottom of the float to the float chamber gasket surface (gasket removed).



Float Level: 23mm

NOTE: Hold the float so that tang is just resting on, but not depressing, the spring loaded inlet needle.

To correct float height, remove the assembly and bend the tang a slight amount as required. Both the right and left float sides should measure identically. Correct as required.

18. Install the float chamber body.

19. Moving to machine, push needle out of seat in throttle valve (slide). Inspect for signs of bending, scratches or wear. Replace if damages.

20. Check needle clip position. Clip position is counted starting with the first clip groove at the top of the needle.

Jet Needle Type:	049-2
Clip Position:	2

21. Check throttle valve (slide) for signs of wear. Insert into carburetor body and check for free movement. If slide, or body, is out of round causing slide to stick, replace as required.

22. Install throttle valve and needle assembly in carburetor mixing chamber. Tighten mixing chamber top as tight as possible by hand. Do not use pliers or vice-grips as they may deform the mixing chamber shape, causing the throttle valve to stick during operation.

23. Push down mixing chamber top cover and install all overflow and vent tubes. Re-install carburetor. Check position and routing of all tubes. Check tightness of all fittings. Make sure carburetor is mounted in a level position.

24. After installation, re-adjust throttle cable and Autolube pump cable per directions in "Mechanical Adjustments."

TROUBLESHOOTING

A Trials machine requires immediate, predictable throttle response over a wide operating range.

Cylinder porting, combustion chamber compression, ignition timing, muffler design, and carburetor size and component selection are all balanced to achieve this goal. However, variations in temperature, humidity and altitude, to name a few, will affect carburetion and consequently, engine performance.

The following list gives each of the major components of the TY80A carburetor that can be readily changed in order to modify carburetor performance if required. If you are unfamiliar with carburetor theory, we suggest you refrain from making changes. Quite often, a performance problem is caused by another related component, such as the exhaust system, ignition timing or combustion chamber compression.

NOTE: See "Mechanical Adjustments" for additional carburetor adjustments.

IDLE AIR MIXTURE SCREW:

Controls the ratio of air to fuel in the idle circuit. Turning the screw in decreases the air supply giving a richer mixture. Normally, for Trials competition, the idle mixture screw is backed out to a lean position. OPERATING RANGE MOST AFFECTED BY THIS ADJUSTMENT: ZERO TO 1/8 THROTTLE.

PILOT JET:

Controls the ratio of fuel to air in the idle circuit. Changing the jet to one with a higher number supplies more fuel to the circuit giving a richer mixture. OPERATING RANGE MOST AFFECTED BY THIS JET: ZERO TO 1/8 THROTTLE.

THROTTLE VALVE (Slide):

The throttle valve (slide) has a portion of the base cut away to control air flowing over the main nozzle. A wider angle (more "cutaway") will create a leaner mixture. Throttle valves are numbered according to the angle of the cutaway. The higher the number, the more cutaway, the leaner the mixture.

OPERATING RANGE MOST AFFECTED BY THE THROTTLE VALVE: 1/8 to 1/2 (+) THROTTLE.

JET NEEDLE:

The jet needle is fitted within the throttle valve. The tapered end of the needle fits into the main nozzle outlet. Raising the needle allows more fuel to flow out of the nozzle outlet giving a richer mixture. There are five circlip grooves at the top of the needle. Moving the needle clip from the first, or top groove, through the fifth, or bottom groove, will give a correspondingly richer mixture.

OPERATING RANGE MOST AFFECTED BY THE
JET NEEDLE: 1/8 TO 3/4 (+) THROTTLE.

MAIN JET:

The main jet controls overall fuel flow through the main nozzle. Changing the jet to one with a higher number supplies more fuel to the main nozzle giving a richer mixture.

OPERATING RANGE MOST AFFECTED BY THE
MAIN JET: 3/4 TO FULL THROTTLE.

NOTE: Excessive changes in main jet size can affect overall performance.

CAUTION

The fuel/air mixture ratio is a governing factor upon engine operating temperature. Any carburetor changes, whatsoever, must be followed by a thorough spark plug test.

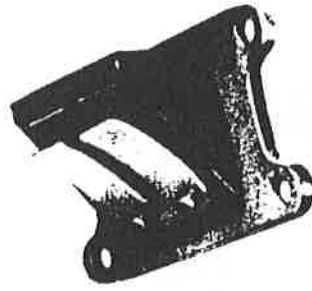
REED VALVE

With carburetor removed, proceed as follows:

1. Remove oil line from fitting on manifold.
2. Remove the bolts (4) holding the intake manifold and reed valve assembly to cylinder.
Remove assembly.

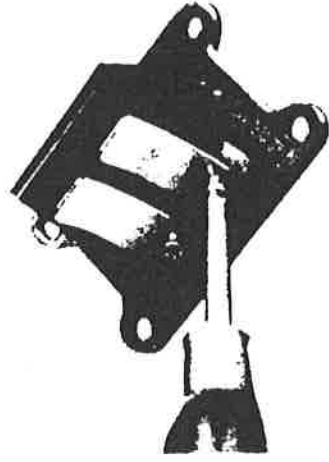


3. Inspect reed petals for signs of fatigue cracks. Reed petals should fit flush or nearly flush against neoprene seats. If in doubt as to sealing ability, apply suction to carburetor side of assembly. Leakage should be alight to moderate.



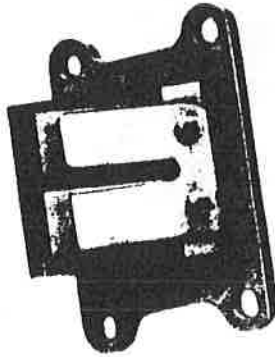
4. If disassembly of the reed valve assembly is required, proceed as follows:

1. Remove Phillips screws (2) securing stopper plate and reed to reed block. Handle reed carefully. Avoid scratches and do not bend. Note from which side of the reed block the reed and stopper plate were removed. Re-install on same side.



2. During reassembly, clean reed block, reed, and stopper plate thoroughly. Apply a holding agent, such as "Lock-Tite", to threads of Phillips screws. Tighten each screw gradually to avoid warping. Tighten the screws thoroughly.

NOTE: During reassembly, note the cut in the lower corner of the reed and stopper plate. Use as aid to direction of reed installation.



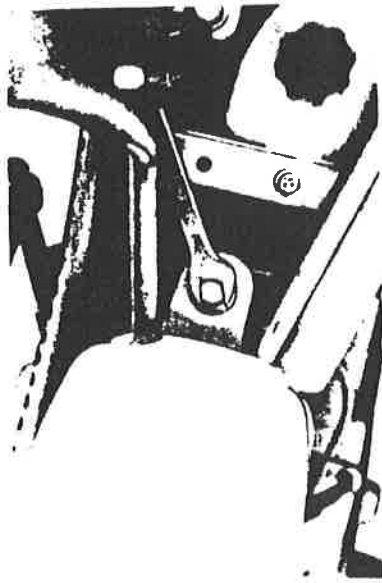
5. During reassembly of the reed valve assembly and manifold, install new gaskets and torque the securing bolts gradually and in pattern. Tighten thoroughly.

TOP END AND MUFFLER

With the carburetor removed, proceed as follows:

MUFFLER AND CYLINDER HEAD REMOVAL

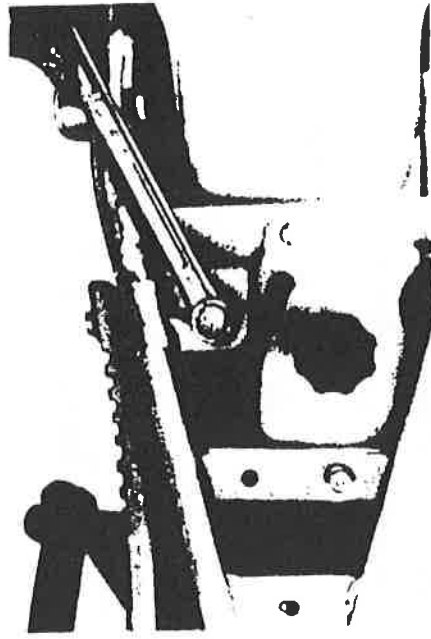
1. Remove seat assembly.
2. Remove securing bolt at rear of fuel tank.



3. Lift rear of fuel tank up and pull back to clear frame mounts.



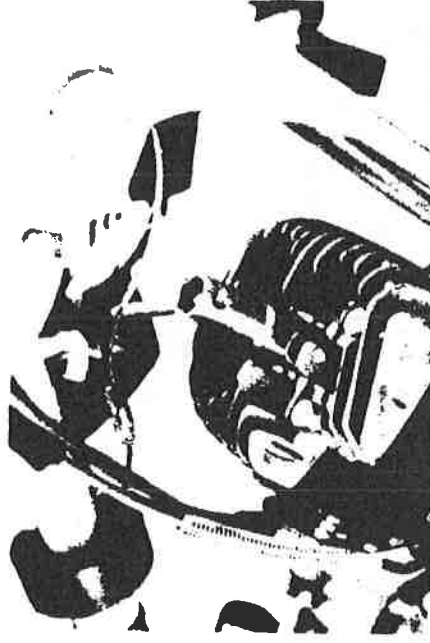
4. Remove bolt which secures rear of muffler to frame.



5. Using special ring nut wrench, remove ring nut holding muffler to cylinder. Remove muffler.

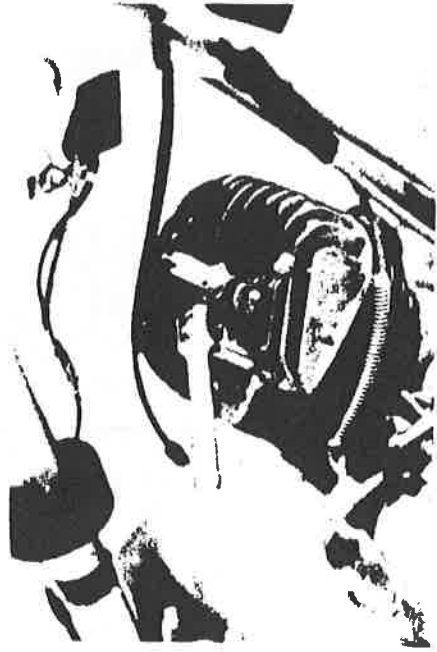


6. Remove spark plug lead wire. Loosen, but do not remove spark plug.



7. Remove nuts (4) securing cylinder head to cylinder.
Remove cylinder head and gasket.

NOTE: Break each nut loose (1/4 turn) prior to removing.



CYLINDER AND PISTON REMOVAL

1. With piston at Top Dead Center, raise cylinder until cylinder skirts clear crankcase. Stuff a clean shop rag into crankcase cavity, around rod, to prevent dirt and other foreign particles from entering. Remove cylinder.



2. Remove wrist pin clip (1) from piston. Push wrist pin out from opposite side. Remove piston.

