



YAMAHA

XT550J

Service Manual

INDEX

This manual has been combined with previous service manuals to provide complete service information for: **XT 550 K**

Please read and give special consideration to the "NOTICE" on the preceding page for your safety.

XT 550 K SUPPLEMENTARY

K

XT 550 J SERVICE MANUAL

J

NOTICE

This manual has been written by Yamaha Motor Company for use by Authorized Yamaha Dealers and their qualified mechanics. In light of this purpose it has been assumed that certain basic mechanical precepts and procedures inherent to our products are already known and understood by the reader.

Without such basic knowledge, repairs or service to this model may render the motorcycle unsafe, and for this reason we must advise that all repairs and/or service be performed by an Authorized Yamaha Dealer who is in possession of the requisite basic product knowledge.

This Research, Engineering and Overseas Service Department of Yamaha are continually striving to further improve all models manufactured by the company. Modifications are therefore inevitable and significant changes in specifications or procedures will be forwarded to all Authorized Yamaha Dealers and will, where applicable, appear in future editions of this manual.

Particularly important information is distinguished in this manual by the following notations:

NOTE: A NOTE provides key information to make procedures easier or clearer.

CAUTION: A CAUTION indicates special procedures that must be followed to avoid damage to the machine.

WARNING: A WARNING indicates special procedures that must be followed to avoid injury to a machine operator or person inspecting or repairing the machine.

XT550K SERVICE MANUAL

1st Edition - April 1983 JEM D151/57

2nd Printing - February 1985

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YAMAHA MOTOR CORPORATION, U.S.A.
CYPRESS, CALIFORNIA 90630

LIT-11616-XT-51

Being a Yamaha owner, you obviously prefer
a quality product.

gēn·ū·īne

adj. 1. Real 2. Authentic,
not artificial 3. Yamaha.

GENUINE **YAMAHA** PARTS & ACCESSORIES

Don't compromise the quality and
performance of your Yamaha with off-brand
alternatives. You'll be getting exactly what
you're paying for.



YAMAHA

XT550K

Supplementary
Service Manual

K

FOREWORD

This Supplementary Service Manual has been prepared to introduce new service and new data for the XT550K. For complete information on service procedure, it is necessary to use this Supplementary Service Manual together with the following manuals:

XT550J Service Manual (LIT-11616-03-00)

**SERVICE DEPT.
INTERNATIONAL DIVISION
YAMAHA MOTOR CO., LTD.**

NOTICE

This manual was written by the Yamaha Motor Company primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to put an entire mechanic's education into one manual, so it is assumed that persons using this book to perform maintenance and repairs on Yamaha motorcycles have a basic understanding of the mechanical concepts and procedures inherent to motorcycle repair technology. Without such knowledge, attempted repairs or service to this model may render it unfit for use and/or unsafe.

This model has been designed and manufactured to perform within certain specifications in regard to performance and emissions. Proper service with the correct tools is necessary to ensure that the motorcycle will operate as designed. If there is any question about a service procedure it is imperative that you contact a Yamaha dealer before continuing. Before attempting any service, check with your Yamaha dealer for any service information changes that apply to this model: This policy is intended to provide the customer with the most satisfaction from his motorcycle and to conform with federal environmental quality objectives.

Yamaha Motor Company, Ltd. is continually striving to further improve all models manufactured by Yamaha. Modifications and significant changes in specifications or procedures will be forwarded to all Authorized Yamaha dealers and will, where applicable, appear in future editions of this manual.

Starting Serial Number

XT550K	JYA5Y100 *DA100101 (*Check digit)
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PERIODIC INSPECTIONS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information applies to vehicles already in service and to new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

MAINTENANCE INTERVALS CHARTS

Proper periodic maintenance is important. Especially important are the maintenance services related to emissions control. These controls not only function to ensure cleaner air but are also vital to proper engine operation and maximum performance. In the following maintenance tables, the services related to emissions control are grouped separately.

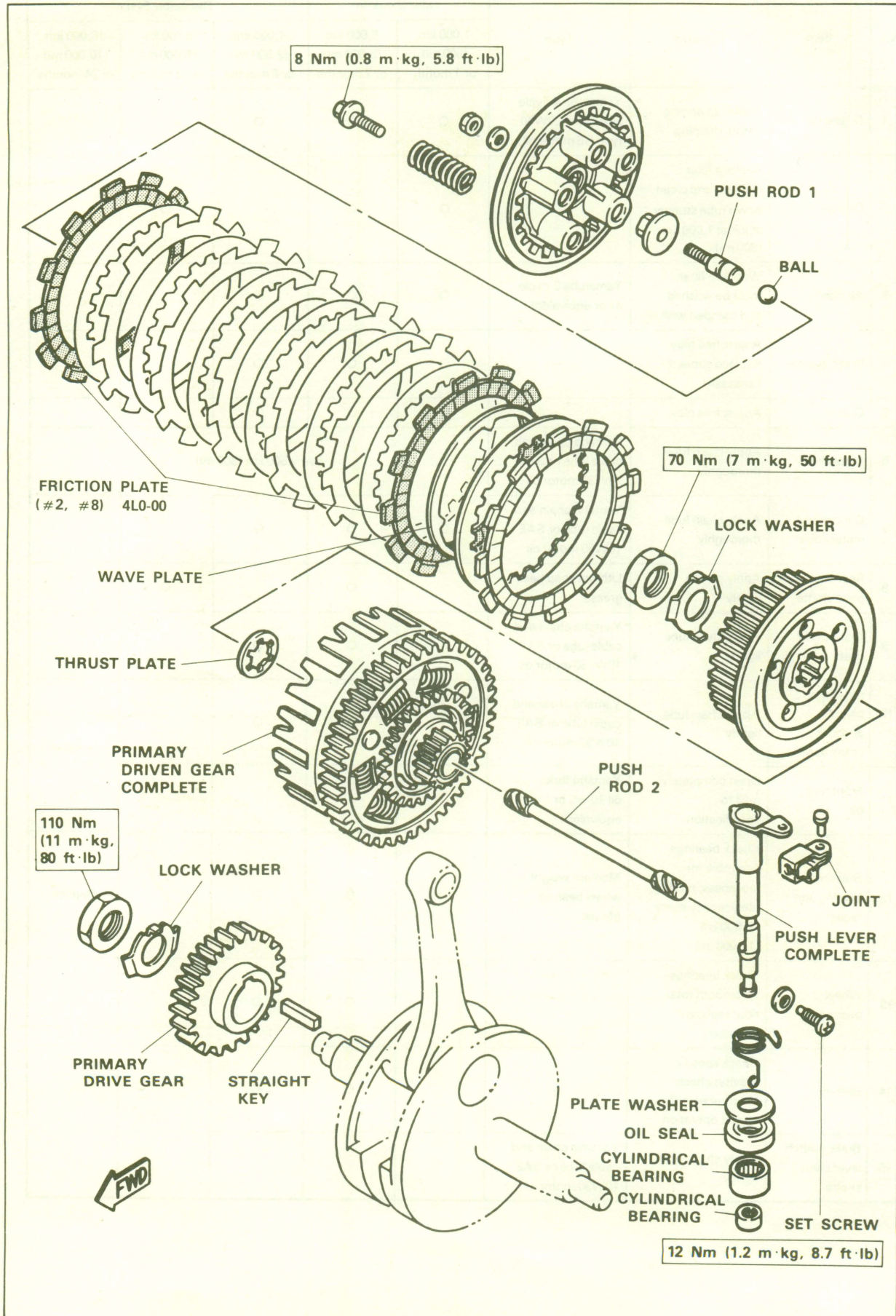
PERIODIC MAINTENANCE EMISSION CONTROL SYSTEM

No.	Item	Remarks	Initial Break-In		Thereafter Every	
			1,000 km (600 mi) or 1 month	5,000 km (3,000 mi) or 7 months	4,000 km (2,500 mi) or 6 months	8,000 km (5,000 mi) or 12 months
1	Valve clearance	Check and adjust valve clearance when engine is cold		○	○	
2	Spark plugs	Check condition; adjust gap/clean; replace after initial 13,000 km (8,000 mi)		○	○	Replace
3	Crankcase ventilation system	Check ventilation hose for cracks or damage; replace if necessary		○		○
4	Fuel line	Check fuel hose for cracks or damage; replace if necessary		○		○
5	Exhaust system	Check for leakage; retighten if necessary replace gasket (s) if necessary		○	○	
6	Idle speed	Check and adjust engine idle speed; adjust cable free play if necessary		○	○	
7	Decompression	Check and adjust decomp-cable free play after valve clearance maintenance		○	○	

GENERAL MAINTENANCE/LUBRICATION

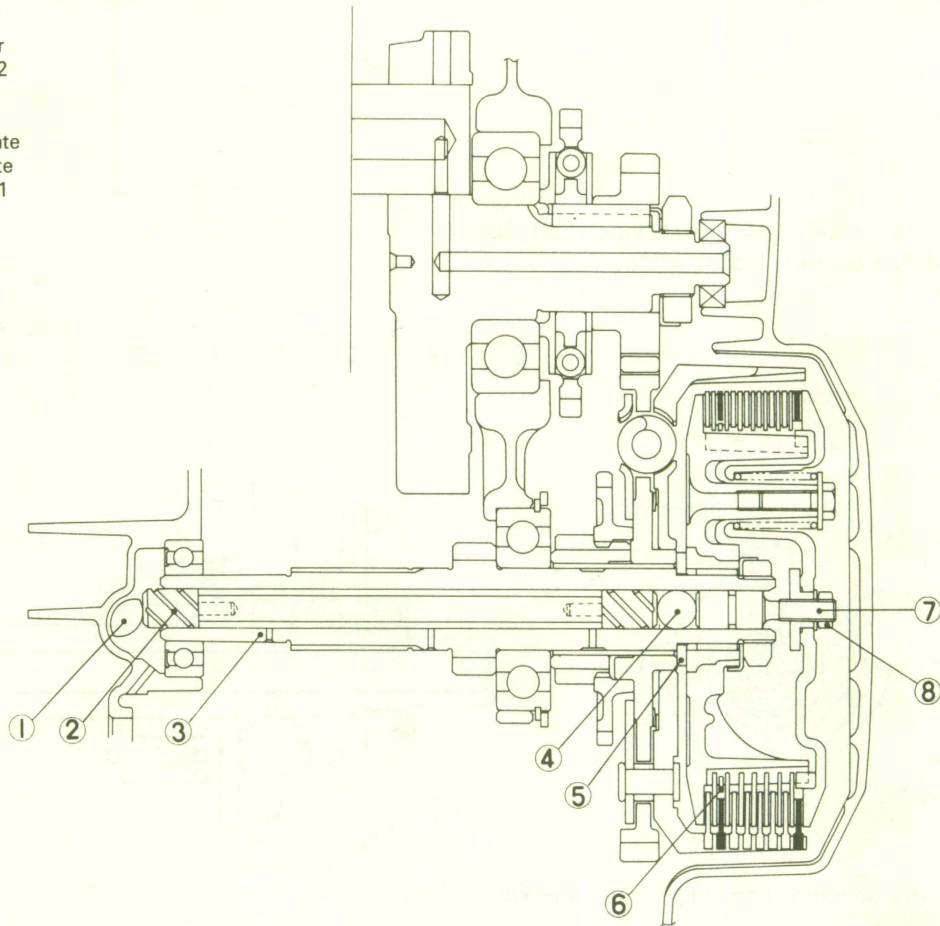
No.	Item	Remarks	Type	Initial Break-In		Thereafter Every		
				1,000 km (600 mi) or 1 month	5,000 km (3,000 mi) or 7 months	4,000 km (2,500 mi) or 6 months	8,000 km (5,000 mi) or 12 months	16,000 km (10,000 mi) or 24 months
1	Engine oil	Warm-up engine before draining	Yamalube 4-cycle oil or SAE 20W40 type SE motor oil	○	○	○		
2	Oil filter	Replace filter element and clean down tube strainer at initial 1,000 km (600 mi)	—	○	○		○	
3	Air filter	Wet type filter must be washed and damped with oil	Yamalube 2-cycle oil or equivalent	○	○	○		
4	Brake system	Adjust free play. Replace shoes if necessary	—	○	○	○		
5	Clutch	Adjust free play	—	○	○	○		
6	Drive chain	Apply chain lube thoroughly	Yamaha chain and cable lube or SAE 10W30 motor oil	Every 500 km (300 mi)				
7	Control and meter cable	Apply chain lube thoroughly	Yamaha chain and cable lube or SAE 10W30 motor oil	○	○	○		
8	Rear arm pivot shafts	Apply grease lightly	Lithium soap base grease		○		○	
9	Brake pedal shaft	Apply chain lube lightly	Yamaha chain and cable lube or SAE 10W/30 motor oil		○	○		
10	Side stand pivots and kick crank boss	Apply chain lube lightly	Yamaha chain and cable lube or SAE 10W30 motor oil		○	○		
11	Front fork oil	Drain completely; refill to specification	Yamaha fork oil 10 wt. or equivalent					○
12	Steering bearing and races	Check bearings assembly for looseness; moderately repack every 16,000 km (10,000 mi)	Medium weight wheel bearing grease		○	○		Repack
13	Wheel bearings	Check bearings for smooth rotation; replace if necessary	—		○	○		
14	Battery	Check specific gravity; check breather pipe for proper operation	—		○	○		
15	Brake/clutch lever pivot shafts	Apply chain lube lightly	Yamaha chain and cable lube or SAE 10W30 motor oil					

PRIMARY GEARS AND CLUTCH



CLUTCH

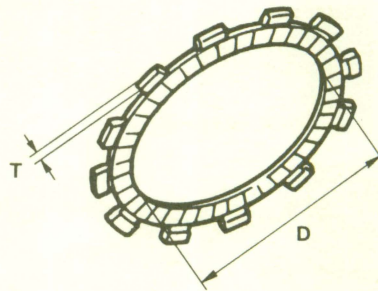
1. Push lever
2. Push rod 2
3. Main axle
4. Ball
5. Thrust plate
6. Wave plate
7. Push rod 1
8. Locknut



CAUTION:

When installing the friction plates, pay careful attention to the inside diameter.

1. The friction plate with the larger of the inside diameters must be installed in the 2nd and last places.
2. The wave plate must be placed on the inside of the 2nd friction plate.

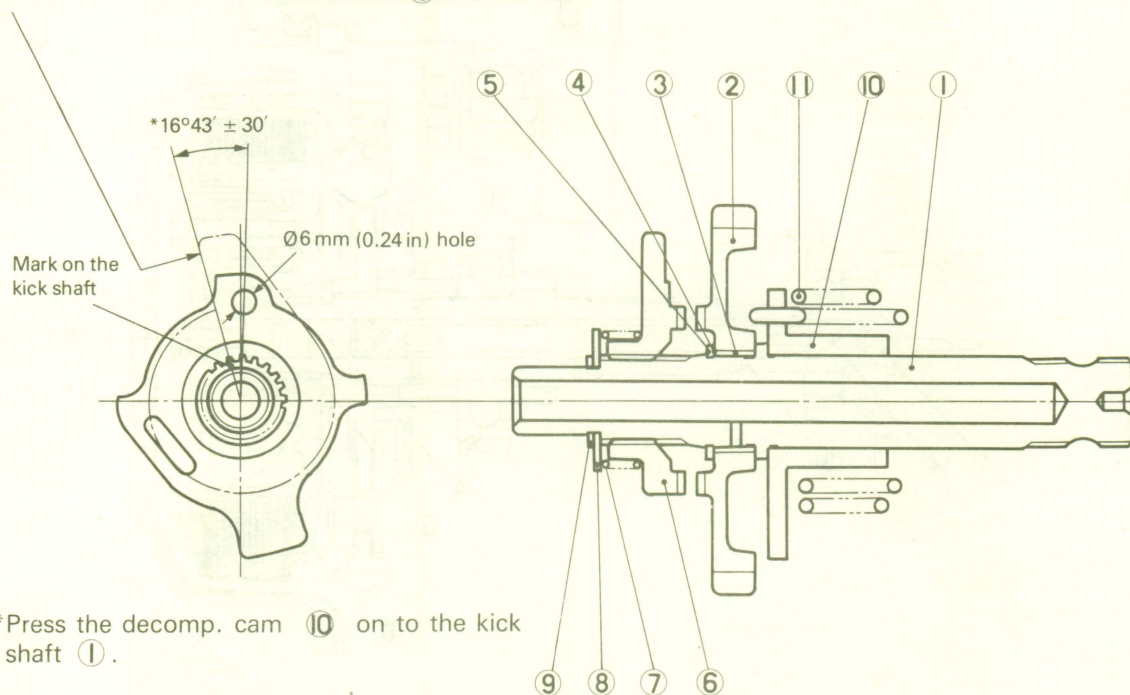


	Quantity	Inside dia. (D)	Thickness (T)
#2 and #8 friction plate (4L0-00)	2 pcs.	116 mm (4.57 in)	3.0 mm (0.12 in)
The other friction plate (583-00)	6 pcs.	113 mm (4.45 in)	2.8 mm (0.11 in)

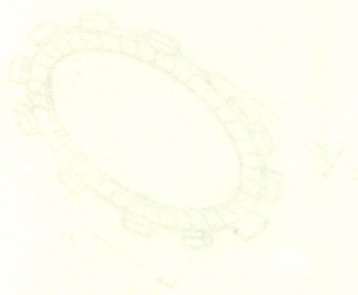
KICK SHAFT ASSEMBLY

837010

Align the punched mark on the kick shaft ① with this line on the ratchet wheel ⑥.



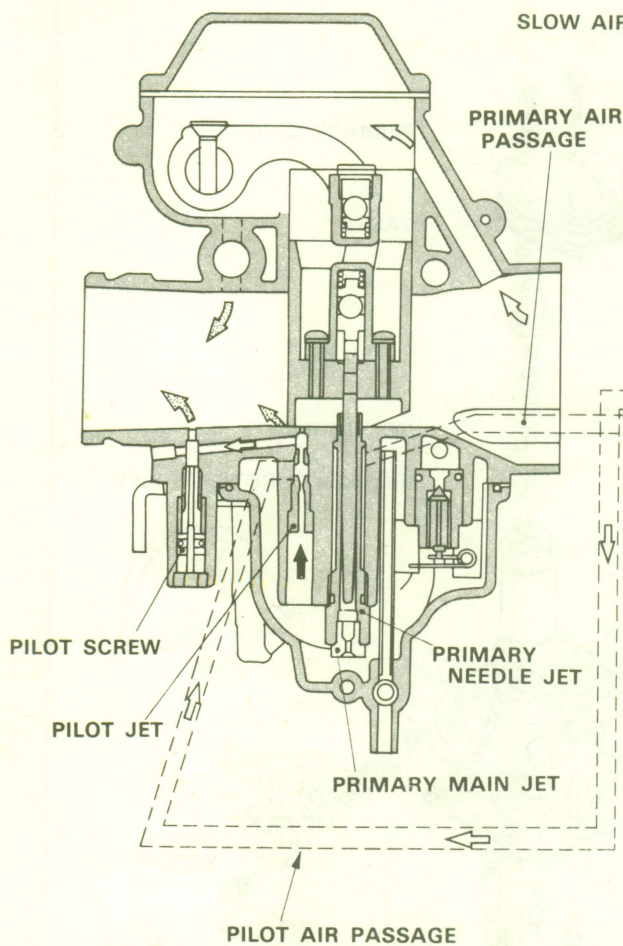
*Press the decomp. cam ⑩ on to the kick shaft ①.



1. KICK SHAFT
2. KICK GEAR
3. BUSH
4. PLATE WASHER
5. CIRCLIP
6. RATCHET WHEEL
7. COMPRESSION SPRING
8. SPRING COVER
9. CIRCLIP
10. DECOMP. CAM
11. TORSION SPRING

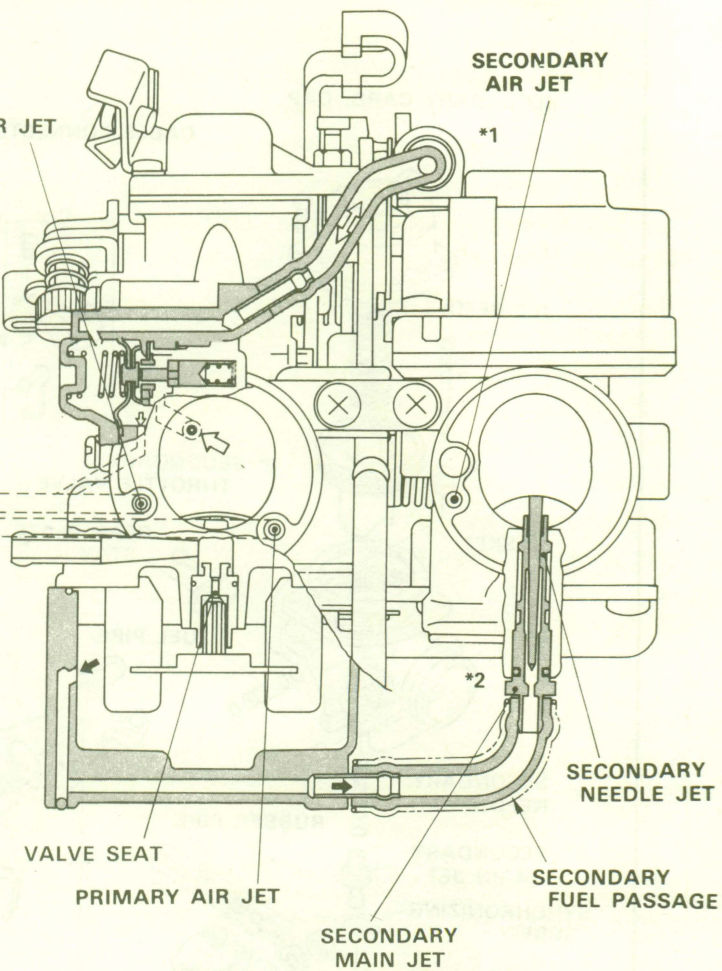
SECTION VIEW

PRIMARY SYSTEM

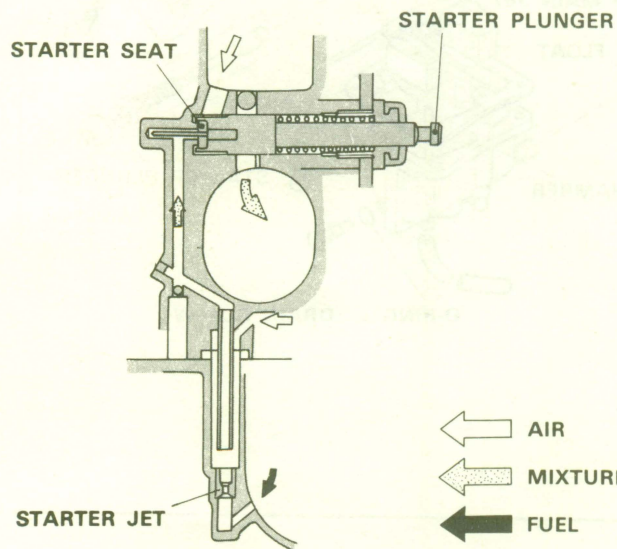


PRIMARY CARB.

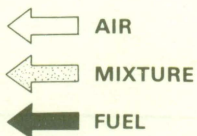
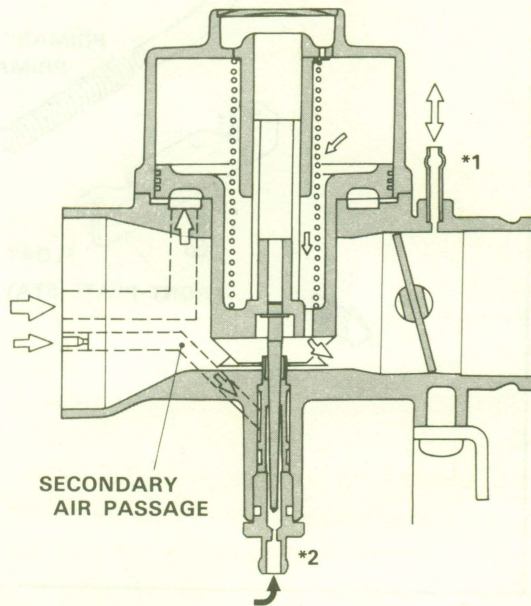
SECONDARY CARB.



STARTER SYSTEM



SECONDARY SYSTEM



COASTING ENRICHER

This model is equipped with an afterburning protection device (coasting enricher).

Afterburning is a phenomenon typical of the internal combustion engine. If throttle is precipitously closed on an engine revolving at high speed, a large amount of air mixed fuel spurts out of the pilot outlet (P.O.), resulting in incomplete burning in the combustion chamber. Such unburned elements are expelled together with exhaust gases and build up in the exhaust pipe or muffler. These elements, accumulated to the point of being inflammable, suddenly gets ignited and burned in contact with expelled gases of high temperature. This phenomenon is referred to "afterburning", which is basically accompanied with a loud explosive sound.

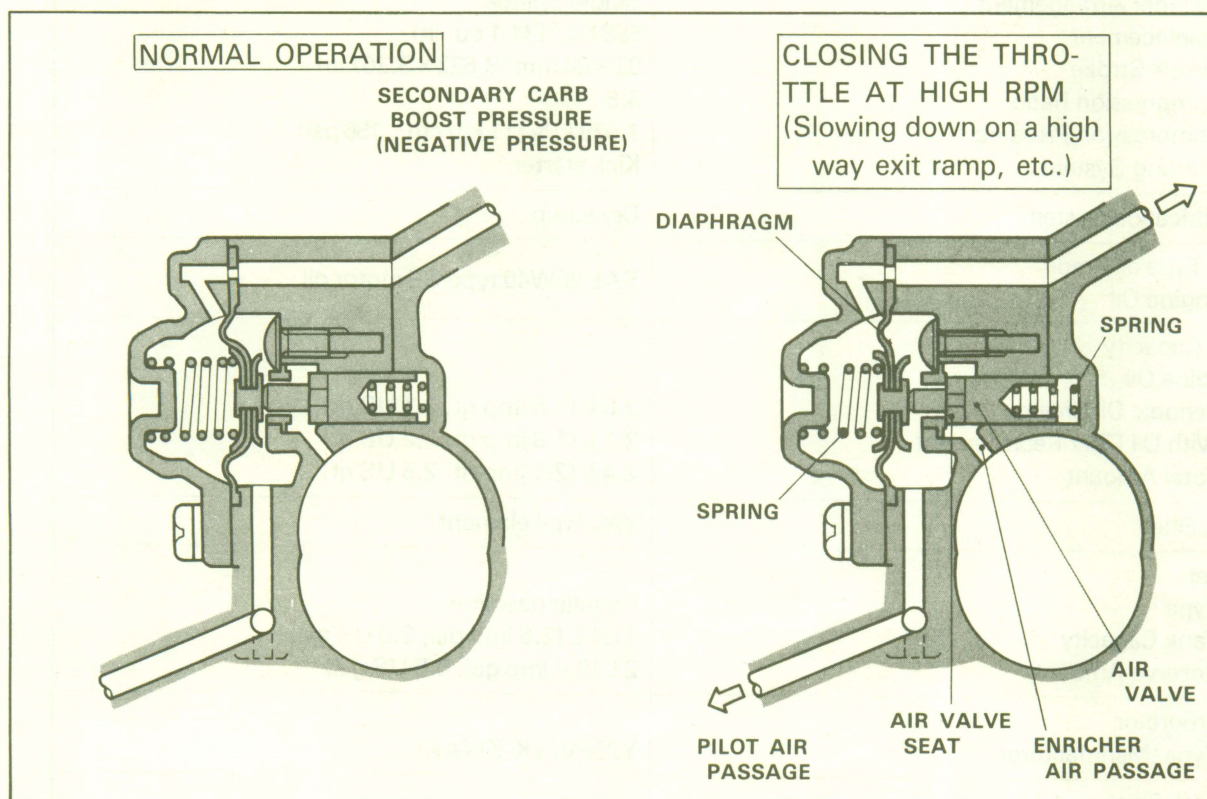
COASTING ENRICHER

Operation of enricher

In the illustration, the air valve is pulled left by the negative pressure developed as the result of the sudden closing of the throttle valve.

Thus, the enricher air passage is closed at the air valve seat and the air which flows into the pilot air passage is stopped, enabling only the air from the slow air jet to flow into the pilot air passage.

This makes the air-fuel mixture flow to the pilot outlet and bypass port now relatively richer.



Maintenance

Each individual spring is rigorously tested for its preload and therefore must not be broken down or adjusted in any way. If an afterburning sound is heard during normal riding, clean the pilot air jet, pilot jet, and bypass port by blowing air into them.

APPENDICES

SPECIFICATIONS

I. GENERAL SPECIFICATIONS

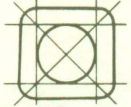
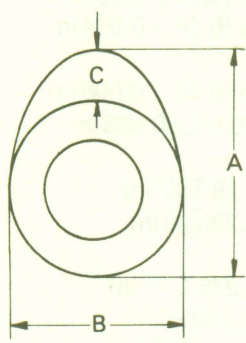
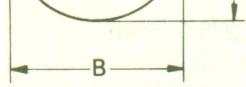
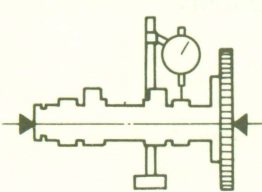
Model	XT550K
Model Code Number	5Y1
Starting Federal V.I.N. Number	JYA5Y100 *DA100101 (*Check digit)
Engine Starting Number	5Y1-100101
Dimensions:	
Overall Length	2,210 mm (87.0 in)
Overall Width	865 mm (34.1 in)
Overall Height	1,180 mm (46.5 in)
Seat Height	860 mm (33.9 in)
Wheelbase	1,405 mm (55.3 in)
Minimum Ground Clearance	250 mm (9.8 in)
Basic Weight:	
With Oil and Full Fuel Tank	143 kg (315 lb)
Minimum Turning Radius	2,300 mm (90.6 in)
Engine:	
Engine Type	4-stroke, gasoline, SOHC, 4-valve
Cylinder Arrangement	Single cylinder
Displacement	558 cm ³ (34.1 cu. in)
Bore × Stroke	92 × 84 mm (3.622 × 3.307 in)
Compression Ratio	8.5 : 1
Compression Pressure	1,079 kPa (11 kg/cm ² , 156 psi)
Starting System	Kick starter
Lubrication System	Dry sump
Oil Type or Grade	SAE 20W40 type SE motor oil
Engine Oil	
Oil Capacity	
Engine Oil	
Periodic Oil Change	2.0 L (1.8 Imp qt, 2.1 US qt)
With Oil Filter Replacement	2.1 L (1.8 Imp qt, 2.2 US qt)
Total Amount	2.4 L (2.1 Imp qt, 2.5 US qt)
Air Filter	Wet type element
Fuel	
Type	Regular gasoline
Tank Capacity	11.4 L (2.5 Imp gal, 3.0 US gal)
Reserve Amount	2 L (0.4 Imp gal, 0.5 US gal)
Carburetor	
Type/Manufacturer	Y26PV/TK-KIKAKI
Spark Plug	
Type/Manufacturer	D7EA/NGK
Gap	0.6 ~ 0.7 mm (0.024 ~ 0.028 in)
Clutch Type	Wet, multiple-disc
Transmission:	
Primary Reduction System	Helical gear
Primary Reduction Ratio	76/30 (2.533)

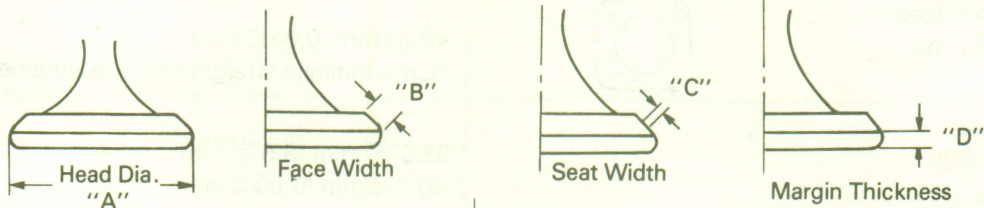
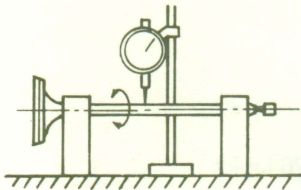
Model	XT550K					
Secondary Reduction System	Chain drive					
Secondary Reduction Ratio	42/15 (2.800)					
Transmission Type	Constant mesh, 5-speed, Dog type					
Operation	Left foot operation					
Gear Ratio						
1st	30/13 (2.307)					
2nd	27/17 (1.588)					
3rd	24/20 (1.200)					
4th	21/22 (0.954)					
5th	21/27 (0.777)					
Chassis:						
Frame Type	Diamond					
Caster Angle	28° 10'					
Trail	115 mm (4.53 in)					
Tire						
Type	With tube					
Size (F)	3.00S21 - 4PR					
Size (R)	4.60S18 - 4PR					
Tire Pressure (Cold tire)	Front Tire			Rear Tire		
	kPa	kg/cm ²	psi	kPa	kg/cm ²	psi
One Rider	147	1.5	21	147	1.5	21
Off-Road Riding	98.1	1.0	14	98.1	1.0	14
High-Speed Riding	147	1.5	21	147	1.5	21
Brake						
Front Brake Type	Drum brake					
Operation	Right hand operation					
Rear Brake Type	Drum brake					
Operation	Right foot operation					
Suspension						
Front Suspension	Telescopic fork (Pneumo-mechanical)					
Rear Suspension	Unit swing, (Monocross suspension)					
Shock Absorber						
Front Shock Absorber	Air & Coil spring, Oil damper					
Rear Shock Absorber	Gas & Coil spring, Oil damper					
Wheel Travel						
Front Wheel Travel	205 mm (8.1 in)					
Rear Wheel Travel	190 mm (7.5 in)					
Electrical:						
Ignition System	C.D.I. Magneto					
Generator System	Flywheel magneto, A.C. generator					
Battery Type or Model	12N5-3B					
Battery Capacity	12V 5AH					
Headlight Type	Sealed beam					

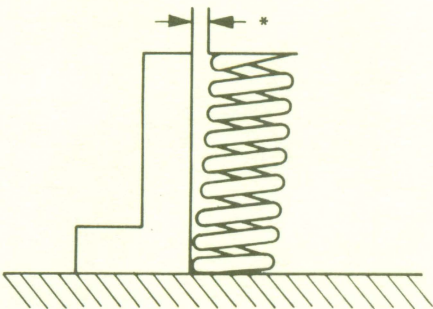


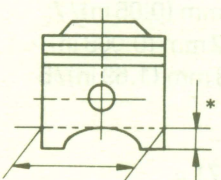


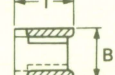
Model	XT550K
Bulb Wattage/Quantity	
Headlight	45W/40W
Tail/ Brake Light	8W/27W
Flasher Light	27W x 4
Indicator light Wattage/Quantity	12V 3.4W x 3
"METER LIGHT"	3.4W x 2
"NEUTRAL"	3.4W
"HIGH BEAM"	3.4W
"TURN"	3.4W

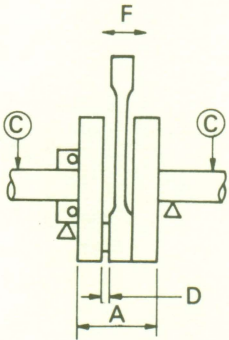
II. MAINTENANCE SPECIFICATIONS (4 Cycle Engine)

A. ENGINE

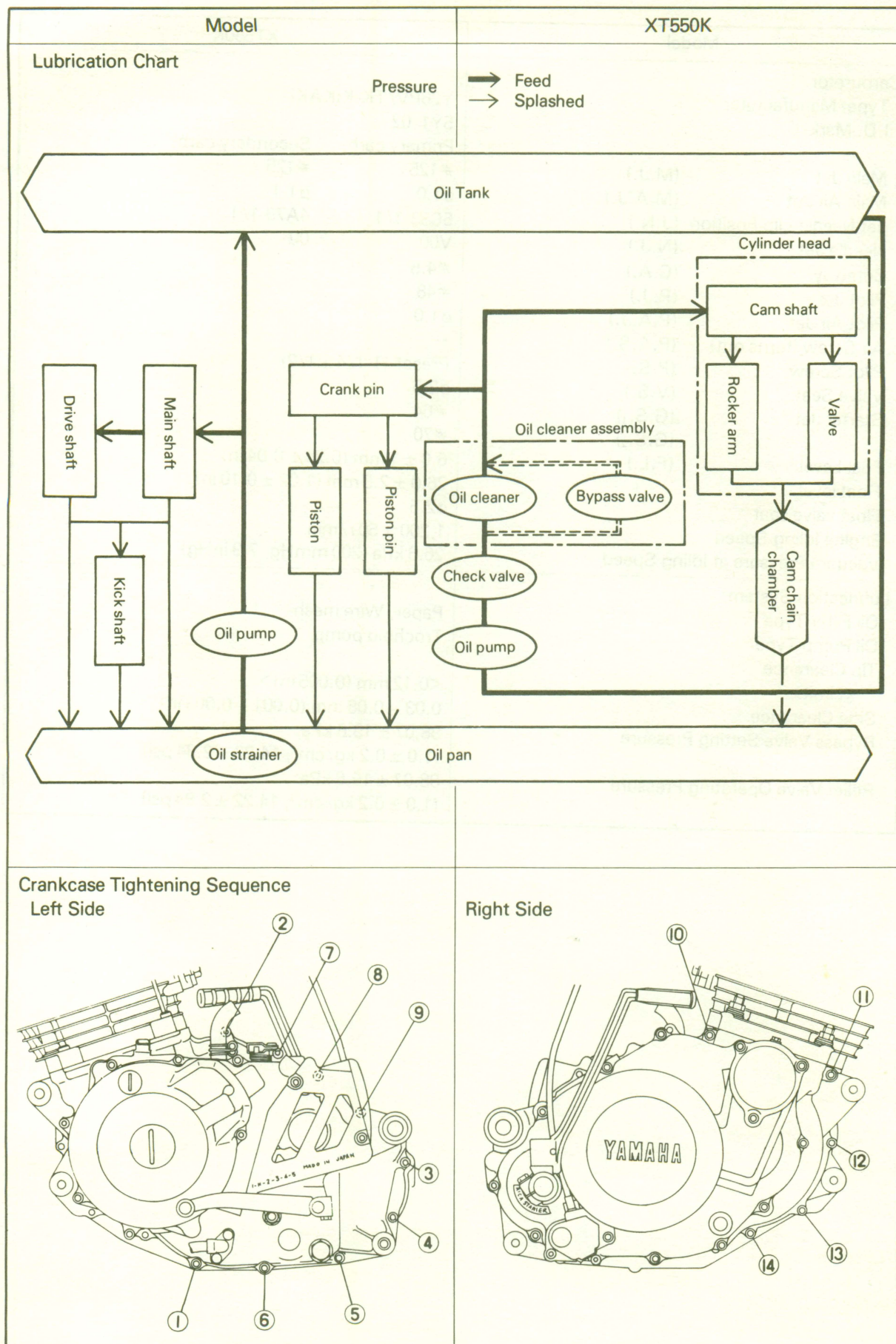
Model	XT550K
Cylinder Head Warp Limit 	$<0.03 \text{ mm (0.0012 in)}>$ *Lines indicate straightedge measurement.
Cylinder: Bore Size Taper Limit	$92.0^{+0.02}_0 \text{ mm (3.6}^{+0.007}_0 \text{ in)}$ $<0.005 \text{ mm (0.0002 in)}>$
Camshaft Drive Method Cam Cap Inside Diameter Camshaft Outside Diameter <Cap Clearance Limit> Cam Dimensions Intake  Exhaust 	Chain (Left) $\phi 23^{+0.021}_0 \text{ mm (}\phi 0.91 + 0.0008 \text{ in)}$ $\phi 23^{-0.020}_{-0.033} \text{ mm (}\phi 0.91^{-0.0008}_{-0.0013} \text{ in)}$ $<0.020 \sim 0.054 \text{ mm (0.0008} \sim 0.002 \text{ in)}>$ "A" $36.55 \pm 0.05 \text{ mm (1.44} \pm 0.002 \text{ in)}$ <Limit> "B" $30.12 \pm 0.05 \text{ mm (1.19} \pm 0.002 \text{ in)}$ <Limit> "C" $6.55 \text{ mm (0.26 in)}$ "A" $36.72 \pm 0.05 \text{ mm (1.45} \pm 0.002 \text{ in)}$ <Limit> "B" $30.14 \pm 0.05 \text{ mm (1.19} \pm 0.002 \text{ in)}$ <Limit> "C" $6.72 \text{ mm (0.26 in)}$
Camshaft Runout Limit 	$<0.03 \text{ mm (0.001 in)}>$
Cam Chain Type/Number of Links Cam Chain Adjustment Method	75-010/ 126 Links Automatic
Rocker Arm/Rocker Arm Shaft Bearing Inside Diameter <Limit> Shaft Outside Diameter <Limit> Arm-to-shaft Clearance	$12^{+0.018}_0 \text{ mm (0.47}^{+0.0007}_0 \text{ in)}$ $<12.05 \text{ mm (0.47 in)}>$ $12^{-0.009}_{-0.024} \text{ mm (0.47}^{-0.0004}_{-0.009} \text{ in)}$ $<11.95 \text{ mm (0.47 in)}>$ $0.009 \sim 0.042 \text{ mm (0.0004} \sim 0.002 \text{ in)}$
Valve, Valve Seat, Valve Guide Valve Clearance (Cold) IN. EX.	 $0.05 \sim 0.10 \text{ mm (0.002} \sim 0.004 \text{ in)}$ $0.12 \sim 0.17 \text{ mm (0.005} \sim 0.007 \text{ in)}$

Model		XT550K
Valve Dimensions		
		
"A" Head Dia.	IN.	$36 \pm 0.1 \text{ mm } (1.42 \pm 0.004 \text{ in})$
	EX.	$30 \pm 0.1 \text{ mm } (1.18 \pm 0.004 \text{ in})$
"B" Face Width	IN.	$2.26 \text{ mm } (0.09 \text{ in})$
	EX.	$2.26 \text{ mm } (0.09 \text{ in})$
"C" Seat Limit Width	IN.	$1.1 \pm 0.1 \text{ mm } (0.04 \pm 0.004 \text{ in})$
	EX.	$1.1 \pm 0.1 \text{ mm } (0.04 \pm 0.004 \text{ in})$
"D" Margin Thickness Limit	IN.	$1.2 \pm 0.2 \text{ mm } (0.05 \pm 0.008 \text{ in})$
	EX.	$1 \pm 0.2 \text{ mm } (0.04 \pm 0.008 \text{ in})$
Stem Outside Diameter	IN.	$7_{-0.025}^{-0.010} \text{ mm } (0.28_{-0.001}^{-0.0004} \text{ in})$
	EX.	$7_{-0.045}^{-0.030} \text{ mm } (0.28_{-0.002}^{-0.001} \text{ in})$
Guide Inside Diameter	IN.	$7_{+0}^{+0.012} \text{ mm } (0.276_{+0}^{+0.0005} \text{ in})$
<Limit>	EX.	$<7.10 \text{ mm } (0.280 \text{ in})>$
Stem-to-guide Clearance	IN.	$0.010 \sim 0.037 \text{ mm } (0.0004 \sim 0.0015 \text{ in})$
	EX.	$0.030 \sim 0.057 \text{ mm } (0.001 \sim 0.002 \text{ in})$
Stem Runout Limit		$<0.01 \text{ mm } (0.0004 \text{ in})>$
		
Valve Seat Width Standard		$1.3 \pm 0.1 \text{ mm } (0.051 \pm 0.004 \text{ in})$
Valve Spring Free Length		
Inner Spring	IN.	$40.1 \text{ mm } (1.58 \text{ in})$
	EX.	$40.1 \text{ mm } (1.58 \text{ in})$
Outer Spring	IN.	$43.8 \text{ mm } (1.72 \text{ in})$
	EX.	$43.8 \text{ mm } (1.72 \text{ in})$

Model		XT550K	
Compressed Length (Valve Closed)			
Inner Spring	IN.	22.7 mm (0.89 in)	
	EX.	22.7 mm (0.89 in)	
Outer Spring	IN.	25.7 mm (1.01 in)	
	EX.	25.7 mm (1.01 in)	
Tilt Limit*			
Inner Spring	IN. & EX.	2.5° or 1.7 mm (0.067 in)	
Outer Spring	IN. & EX.	2.5° or 1.9 mm (0.074 in)	
			
Direction of Winding (Top view)		Inner Spring	Outer Spring
		Left	Right
			
Piston			
Piston Size/ Measuring Point* 		$92_{-0.055}^{+0.035}$ mm ($3.62_{-0.002}^{+0.001}$ in) / *6 mm (0.24 in) (From bottom line of piston skirt)	
Piston Clearance		0.045 ~ 0.065 mm (0.0018 ~ 0.0026 in)	
Oversize		0.25 mm (0.01 in)	
		0.50 mm (0.02 in)	
		0.75 mm (0.03 in)	
		1.00 mm (0.04 in)	
Piston Ring			
Sectional Sketch			
Top Ring			Plain
			$B = 1.2_{-0.03}^{+0.01}$ mm ($0.05_{-0.001}^{+0.0004}$ in)
			$T = 3.8 \pm 0.1$ mm (0.15 ± 0.004 in)
2nd Ring			Plain
			$B = 1.5_{-0.03}^{+0.01}$ mm ($0.06_{-0.001}^{+0.0004}$ in)
			$T = 4 \pm 0.1$ mm (0.16 ± 0.004 in)
Oil Ring			Exponder

Model	XT550K
End Gap (Installed) Top Ring 2nd Ring Oil Ring Side Clearance Top Ring 2nd Ring Oil Ring	0.2 ~ 0.4 mm (0.008 ~ 0.016 in) 0.2 ~ 0.4 mm (0.008 ~ 0.016 in) 0.3 ~ 0.9 mm (0.01 ~ 0.035 in) 0.04 ~ 0.08 mm (0.0016 ~ 0.0031 in) 0.03 ~ 0.07 mm (0.001 ~ 0.003 in) 0.02 ~ 0.06 mm (0.0008 ~ 0.002 in)
Crankshaft  Crank Width "A" Assembly Width "B" Runout Limit "C" Small End Free Play "F"	75 ⁰ _{-0.05} mm (2.95 ⁰ _{-0.002} in) 74.95 ~ 75.00 mm (2.951 ~ 2.953 in) <0.03 mm (0.001 in)> 0.8 mm (0.031 in)
Balancer Drive Method	Gear
Clutch Friction Plate Thickness/Quantity Wear Limit Clutch Plate Thickness/Quantity Warp Limit Clutch Spring Free Length/Quantity Clutch Spring Minimum Length Primary Reduction Gear Backlash Tolerance Clutch Release Method Push Rod Bending Limit	3.0 ± 0.1 mm (0.12 ± 0.004 in)/1 2.8 ± 0.08 mm (0.11 ± 0.003 in)/7 <2.8 mm (0.11 in)> <2.6 mm (0.10 in)> 1.2 mm (0.05 in)/7 <0.2 mm (0.008 in)> 42.8 mm (1.69 in)/5 7 ~ 71 μ Inner push (Cam push) <0.5 mm (0.02 in)>
Kick Starter Kick Starter Type	Ratchet
Decompression Device Type Cable Free Play	Kick synchronous 0.5 mm (0.02 in)
Air Filter Oil Grade (Oiled Filter)	SAE 10W30 SE motor oil

Model	XT550K
Carburetor	
Type/Manufacturer	Y26PV/TK-KIKAKI
I.D. Mark	5Y1 02
	Primary carb. Secondary carb.
Main Jet (M.J.)	#125 #125
Main Air Jet (M.A.J.)	ø1.0 ø1.1
Jet Needle-clip Position (J.N.)	5C33-1/1 4A70-1/1
Needle Jet (N.J.)	V00 00
Cutaway (C.A.)	#4.5
Pilot Jet (P.J.)	#48
Pilot Air Jet (P.A.J.)	ø1.0
Air Screw (turns out) (P.A.S.)	—
Pilot Screw (P.S.)	Preset (1-1/4 ± 1/2)
Valve Seat (V.S.)	ø2.5
Starter Jet (G.S. ₁)	#64
(G.S. ₂)	#70
Fuel Level (F.L.)	6.0 ± 1 mm (0.24 ± 0.04 in)
Float level	26.0 ± 2.5 mm (1.02 ± 0.10 in)
Float valve seat	ø2.5
Engine Idling Speed	1,200 ± 50 r/min
Vacuum Pressure at Idling Speed	26.6 kPa (200 mmHg, 7.9 inHg)
Lubrication System:	
Oil Filter Type	Paper, Wire mesh
Oil Pump Type	Trochoid pump
Tip Clearance	
<Limit>	<0.12 mm (0.005 in)>
Side Clearance	0.03 ~ 0.08 mm (0.001 ~ 0.003 in)
Bypass Valve Setting Pressure	98.07 ± 19.6 kPa (1.0 ± 0.2 kg/cm ² , 14.22 ± 2.84 psi)
Relief Valve Operating Pressure	98.07 ± 19.6 kPa (1.0 ± 0.2 kg/cm ² , 14.22 ± 2.84 psi)



II. MAINTENANCE SPECIFICATIONS

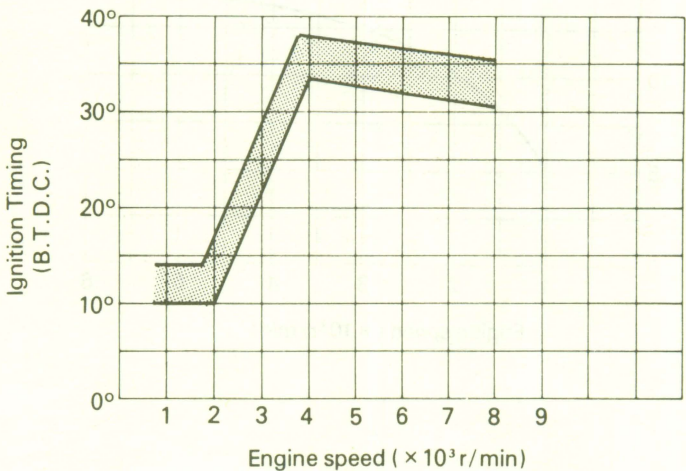
B. CHASSIS

Model		XT550K
Steering System		
Steering Bearing Type		Taper roller bearing
Front Suspension		
Front Fork Travel		205 mm (8.1 in)
Fork Spring Free Length		$\ell_1 = 88 \text{ mm } (\ell_1 = 3.5 \text{ in}),$ $\ell_2 = 348.5 \text{ mm } (\ell_2 = 13.7 \text{ in})$
Spring Rate/Stroke		$K_1 = 3.4 \text{ N/mm } (0.35 \text{ kg/mm}, 19.6 \text{ lb/in})$ 0 ~ 115 mm (0 ~ 4.5 in) $K_2 = 5.5 \text{ N/mm } (0.56 \text{ kg/mm}, 31.3 \text{ lb/in})$ 115 ~ 205 mm (4.5 ~ 8.1 in)
Oil Capacity or Oil Level		369 cm ³ (12.5 Imp oz, 13.0 US oz) 158 mm (6.2 in) (From top of inner tube fully compressed without spring.)
Oil Grade		KAYABA G-10
Enclosed Air Pressure		39.2 kPa (0.4 kg/cm ² , 5.7 psi)
Rear Suspension		
Shock Absorber Travel		100 mm (3.9 in)
Spring Free Length <Limit>		293 mm (11.5 in)
Fitting length		
Spring Rate/Stroke taper coil		$K_1 = 39.7 \sim 93.2 \text{ N/mm } (4.05 \sim 9.5 \text{ kg/mm},$ 226.7 ~ 531.8 lb/in) 0 ~ 120 mm (0 ~ 4.7 in)
Enclosed Gas Pressure		1,176.8 kPa (12 kg/cm ² , 170.6 psi)
Rear Arm		
Swing Arm Free Play Limit		
End		<1.0 mm (0.04 in)>
Side		<1.0 mm (0.04 in)>
Wheel		
Front Wheel Type		Spoke Wheel
Rear Wheel Type		Spoke Wheel
Front Rim Size/Material		1.60 × 21/ Aluminum
Rear Rim Size/Material		2.15 × 18/ Aluminum
Rim Runout Limit		
Vertical		<1.0 mm (0.04 in)>
Lateral		<0.5 mm (0.02 in)>
Drive Chain		
Type/Manufacturer		520DS/ DAIDO
Number of Links		97 links + Joint
Chain Free Play		60 ~ 70 mm (2.4 ~ 2.8 in)
Drum Brake		
Type	Front	Leading and trailing
	Rear	Leading and trailing
Drum Inside Dia <Limit>	Front	150 mm (5.91 in) <151 mm (5.94 in)>
	Rear	150 mm (5.91 in) <151 mm (5.94 in)>

Model	XT550K
Brake Lever & Brake Pedal	
Brake Lever Free Play/position	10 ~ 20 mm (0.39 ~ 0.79 in) / at lever pivot
Brake Pedal Position	20 ~ 30 mm (0.79 ~ 1.18 in)
Brake Pedal Free Play	20 mm (0.79 in) (Vertical height below footrest top.)
Clutch Lever Free Play/position	2 ~ 3 mm (0.08 ~ 0.12 in) / at lever pivot

II. MAINTENANCE SPECIFICATIONS

C. ELECTRICAL

Model	XT550K
Voltage	12V
Ignition System Ignition Timing (B.T.D.C.) Advanced Timing (B.T.D.C.) Advancer Type	$12 \pm 2^\circ$ at 1,200 r/min $35 \pm 2^\circ$ at 6,000 r/min Electrical
 <p>Ignition Timing (B.T.D.C.)</p> <p>Engine speed ($\times 10^3$ r/min)</p>	
C.D.I. Magneto-Model/ Manufacture Pickup Coil Resistance (Color)	5Y1-81400-51/NIPPONDENSO $90 \sim 130\Omega$ at 20°C (68°F) (G — W/R) (G — W/G)
Charge Coil Resistance (Color)	$160 \sim 240\Omega$ at 20°C (68°F) (Br — R)
C.D.I. Unit-Model/ Manufacturer	5Y1-85540-51/NIPPONDENSO
Ignition Coil -Model/ Manufacturer Minimum Spark Gap	5Y1-82310-50/NIPPONDENSO 17 kV or more at 300 r/min 25 kV or more at 1,000 ~ 2,500 r/min 17 kV or more at 6,500 r/min
Primary Winding Resistance	$0.5\Omega \pm 20\%$ at 20°C (68°F)
Secondary Winding Resistance	$6\text{K}\Omega \pm 20\%$ at 20°C (68°F)
Charging System/ Type	A.C. Magneto Generator
F.W. Magneto	6.3A or more at 1,500 r/min 10A or less at 5,000 r/min
Lighting Voltage -DC lighting	12.6V or more at 1,500 r/min 13.6V or less at 7,000 r/min

Model	XT550K														
Lighting Coil Resistance (Color)	0.2 ~ 0.6Ω at 20°C (68°F) (W — W)														
<p>Charging Current (A)</p> <p>Engine speed (× 10³ r/min)</p> <table border="1"> <caption>Approximate data points from the graph</caption> <thead> <tr> <th>Engine speed (× 10³ r/min)</th> <th>Charging Current (A)</th> </tr> </thead> <tbody> <tr><td>1</td><td>5.0</td></tr> <tr><td>2</td><td>10.0</td></tr> <tr><td>3</td><td>12.5</td></tr> <tr><td>4</td><td>13.5</td></tr> <tr><td>5</td><td>14.2</td></tr> <tr><td>6</td><td>14.5</td></tr> </tbody> </table>		Engine speed (× 10 ³ r/min)	Charging Current (A)	1	5.0	2	10.0	3	12.5	4	13.5	5	14.2	6	14.5
Engine speed (× 10 ³ r/min)	Charging Current (A)														
1	5.0														
2	10.0														
3	12.5														
4	13.5														
5	14.2														
6	14.5														
Voltage Regulator -Type -Model/ Manufacture -No Load Regulated Voltage	Semi Conductor Short Control SH222-12C/ SHINDENGEN 14.5V														
Rectifier -Model/ Manufacturer	SH222-12C/ SHINDENGEN														
Battery Capacity Specific Gravity	12V 5AH 1.260														
Horn Type/ Quantity Model/ Manufacturer Maximum Amperage	Plain type × 1 MF-12/ NIKKO 1.5A														
Flasher Relay Type Model/ Manufacturer Flasher Frequency Wattage	Condenser type FU257SD/ NIPPONDENSO 85 ± 10 cycle/min 27W × 2 + 3.4W														
Circuit Breaker Type Amperage for Individual Circuit/ Quantity Main	Non fuse breaker 15A × 1														

TIGHTENING TORQUE

ENGINE

Tightening torque	Thread Size	Q'ty	Nm	m · kg	ft · lb
Cylinder head: flange bolt	M8	2	22	2.2	16
: flange bolt	M6	1	10	1.0	7.2
Spark plug	M12	1	17.5	1.75	12
Cylinder head cover: Internal hex. bolt	M6	2	10	1.0	7.2
: Internal hex. bolt	M6	4	10	1.0	7.2
: Internal hex. bolt	M6	3	10	1.0	7.2
: Internal hex. bolt	M6	7	10	1.0	7.2
Cylinder head side cover: Internal hex. bolt	M6	2	10	1.0	7.2
Gear unit assembly: Internal hex. bolt	M6	1	10	1.0	7.2
Tachometer cable: stopper flat head Internal hex. screw	M6	1	7	0.7	5.1
Cylinder body: nut	M8	2	20	2.0	14
: nut	M10	2	37.5	3.75	27
: nut	M10	2	37.5	3.75	27
: Internal hex. bolt	M6	2	10	1.0	7.2
Gear balance weight: nut	M16	1	60	6.0	43
A.C.G. Rotar: nut	M14	1	90	9.0	65
Valve clearance: nut	M6	4	13.5	1.35	9.4
Stopper guide 2: hex. bolt	M6	2	8	0.8	5.8
Cam sprocket	M7	2	20	2.0	14
Tensioner assembly: Internal hex. bolt	M6	2	10	1.0	7.2
Tensioner spring retainer: plug	M16	1	20	2.0	14
Decompression cam: bolt	M6	1	8	0.8	5.8
Rocker shaft stopper bolt	M6	2	10	1.0	7.2
Oil pump assembly: Internal hex. bolt	M6	3	10	1.0	7.2
Cover 2: panhead screw	M6	1	7	0.7	5.1
Strainer housing: panhead screw	M6	2	7	0.7	5.1
Drain plug: straight screw plug	M14	1	30	3.0	22
Element cover: Internal hex. bolt	M6	1	10	1.0	7.2
: Internal hex. bolt	M6	2	10	1.0	7.2
Element cover stud bolt: bind screw	M5	1	5	0.5	3.6
Oil hose 1: Internal hex. bolt	M6	2	10	1.0	7.2
: union nut	M16	1	50	5.0	36
Oil hose 2: Internal hex. bolt	M6	2	10	1.0	7.2
: union nut	M16	1	50	5.0	36
Caburetor joint: Internal hex. bolt	M6	4	10	1.0	7.2

Tightening torque	Thread Size	Q'ty	Nm	m · kg	ft · lb
Caburetor assembly: hose clamp	M4	2	2	0.2	1.4
Exhaust pipe: nut	M6	4	10	1.0	7.2
Exhaust pipe protector: bind screw	M6	2	7	0.7	5.1
Muffler protector 1: bind screw	M6	4	7	0.7	5.1
Outlet pipe: panhead W/W screw	M6	1	7	0.7	5.1
Exhaust pipe muffler joint: hex. bolt	M8	2	20	2.0	14
Muffler mounting: flange bolt	M8	2	20	2.0	14
Case 1 and 2: Internal hex. bolt	M6	9	10	1.0	7.2
: Internal hex. bolt	M6	4	10	1.0	7.2
: Internal hex. bolt	M6	1	10	1.0	7.2
Crank case 1	M10	2	20	2.0	14
Clamp (lead): panhead screw	M6	1	7	0.7	5.1
Crank case 2	M10	2	20	2.0	14
Crank case cover 1: Internal hex. bolt	M6	6	10	1.0	7.2
: Internal hex. bolt	M6	1	10	1.0	7.2
: Internal hex. bolt	M6	1	10	1.0	7.2
: Internal hex. bolt	M6	1	10	1.0	7.2
Crank case cover 2: Internal hex. bolt	M6	2	10	1.0	7.2
: bolt	M6	1	10	1.0	7.2
Crank case cover 3: Internal hex. bolt	M6	7	10	1.0	7.2
: Internal hex. bolt	M6	1	10	1.0	7.2
: Internal hex. bolt	M6	2	10	1.0	7.2
Cover 1: Internal hex. bolt	M6	2	10	1.0	7.2
Plate bridge cover: flat head screw	M6	3	7	0.7	5.1
Ratchet wheel guide: hex. bolt	M6	2	10	1.0	7.2
Cable lever: hex. nut	M6	1	8	0.8	5.8
Kick crank boss: hex. bolt	M8	1	20	2.0	14
Clutch spring: W/W screw	M6	5	8	0.8	5.8
Clutch boss: nut	M20	1	70	7.0	50
Primary drive gear: nut	M20	1	110	11.0	80
Push lever assembly: stopper screw	M8	1	12	1.2	8.7
Push lever positioning: nut	M6	1	8	0.8	5.8
Drive sprocket: hex. bolt	M6	2	10	1.0	7.2
Oil seal cover: hex. bolt	M6	2	10	1.0	7.2
Stopper lever: W/W screw	M6	1	10	1.0	7.2
Shift pedal: bolt	M6	1	10	1.0	7.2
Coil: panhead W/W screw	M6	4	7	0.7	5.1

Tightening torque	Thread Size	Q'ty	Nm	m · kg	ft · lb
Pulser: panhead W/W screw	M6	2	7	0.7	5.1
Neutral switch: neutral switch assembly	M10	1	20	2.0	14
Cylinder head side cover 1	M32	2	12	1.2	8.7
Kick crank: screw	M6	1	7	0.7	5.1

CHASSIS

Tightening torque	Thread Size	Nm	m · kg	ft · lb
Front wheel shaft and nut	M14	100	10.0	72
Outer tube and cover	M6	10	1.0	7.2
Handle crown and inner tube	M8	23	2.3	17
Handle crown and steering shaft	M14	95	9.5	68
Under handle holder and Upper handle holder	M8	20	2.0	14
Front engine stay and engine	M10	58	5.8	42
Front engine stay and frame	M10	58	5.8	42
Engine top stay and engine	M10	58	5.8	42
Engine top stay and frame	M10	58	5.8	42
Rear engine and frame	M10	58	5.8	42
Nipple hose and frame	M22	90	9.0	65
Oil tank drain plug	M8	18	1.8	13
Pivot shaft and nut	M16	100	10.0	72
Rear wheel shaft and nut	M16	100	10.0	72
Rear cushion and frame	M10	48	4.8	35
Lever cam shaft and cam shaft (Front, Rear)	M6	10	1.0	7.2
Sprocket wheel holder	M10	62	6.2	45
Steering shaft and ring nut	M25	38	3.8	27
Under bracket and Inner tube	M8	23	2.3	17
Inner tube cap	M34	23	2.3	17
Front fork cylinder compressor and outer tube	M12	37	3.7	27
Foot rest and frame	M10	45	4.5	32
Bead stopper and rim	M8	100	10.0	72
Steering lock and handle crown	M6	7	0.7	5.1
Spoke	—	2	0.2	1.4
Seat bracket securing bolt	M6	7	0.7	5.1

CONSUMER INFORMATION

Stopping Distance

This figure indicates braking performance that can be met or exceeded by the vehicles to which they apply, without locking the wheels, under different conditions of loading and with partial failures of the braking system. The information presented represents **results obtained** by skilled drivers under controlled road and vehicle conditions and the information may not be correct under other conditions.

Description of vehicles to which this table applies: Yamaha motorcycle XT550K.

A. Fully Operational Service Brake

Load

Light

179

Maximum

191

0 100 200 300 (Feet)

NOTE:

The statement above is required by U.S. Federal law. "Partial failures" of the braking system do not apply to this chart.

Stopping distance in feet from 60 mi/h

GENERAL TORQUE SPECIFICATIONS

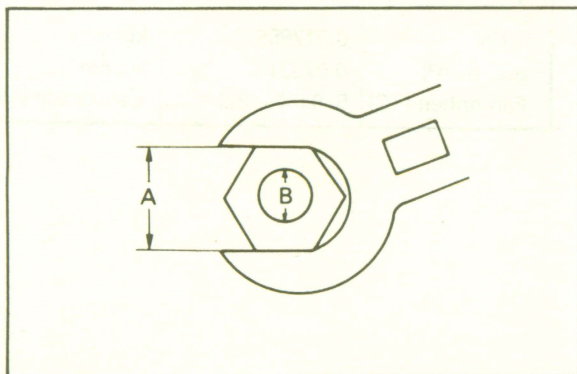
This chart specifies torque for standard fasteners with standard I.S.O. pitch threads. Torque specifications for special components or assemblies are included in the applicable sections of this book. To avoid warpage, tighten multi-fastener assemblies in a crisscross fashion, in progressive stages, until full torque is reached. Unless otherwise specified, torque specifications call for clean, dry threads. Components should be at room temperature.

A (Nut)	B (Bolt)	General torque specifications		
		Nm	m · kg	ft · lb
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	61
22 mm	16 mm	130	13.0	94

COLOR CODE

R Red
B Black
Sb Sky blue
Br. Brown
Ch Chocolate
Dg Dark green
L Blue
Y Yellow
O Orange
G Green
P Pink
W White

B/W Black/White
Y/R Yellow/Red
B/Y Black/Yellow
G/Y Green/Yellow
L/W Blue/White
Br/W Brown/White
R/W Red/White
L/B Blue/Black
L/Y Blue/Yellow
L/R Blue/Red
W/R White/Red
W/G White/Green



- A. Distance across flats
B. Outside thread diameter

DEFINITION OF UNITS

Unit	Read	Definition	Measure
mm	millimeter	10^{-3} meter	Length
cm	centimeter	10^{-2} meter	Length
kg	kilogram	10^3 gram	Weight
N	Newton	$1 \text{ kg} \times \text{m}/\text{sec}^2$	Force
Nm	Newton meter	$\text{N} \times \text{m}$	Torque
m · kg	Meter kilogram	$\text{m} \times \text{kg}$	Torque
Pa	Pascal	N/m^2	Pressure
N/mm	Newton per millimeter	N/mm	Spring rate
L	Liter	_____	Volume
cm^3	Cubic centimeter	_____	or Capacity
r/min	Rotation per minute	_____	Engine Speed

CONVERSION TABLES

Metric to inch system		
Known	Multiplier	Result
m · kg	7.233	ft · lb
m · kg	86.80	in · lb
cm · kg	0.0723	ft · lb
cm · kg	0.8680	in · lb
kg	2.205	lb
g	0.03527	oz
km/lit	2.352	mpg
km/hr	0.6214	mph
km	0.6214	mi
m	3.281	ft
m	1.094	yd
cm	0.3937	in
mm	0.03937	in
cc (cm^3)	0.03382	oz (US liq)
cc (cm^3)	0.06102	cu in
lit (liter)	2.1134	pt (US liq)
lit (liter)	1.057	qt (US liq)
lit (liter)	0.2642	gal (US liq)
kg/mm	56.007	lb/in
kg/cm^2	14.2234	psi (lb/in^2)
Centigrade ($^{\circ}\text{C}$)	$9/5 (^{\circ}\text{C}) + 32$	Fahrenheit ($^{\circ}\text{F}$)

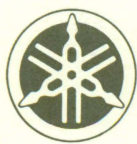
Inch to metric system		
Known	Multiplier	Result
ft · lb	0.13826	m · kg
in · lb	0.01152	m · kg
ft · lb	13.831	cm · kg
in · lb	1.1521	cm · kg
lb	0.4535	kg
oz	28.352	g
mpg	0.4252	km/lit
mph	1.609	km/hr
mi	1.609	km
ft	0.3048	m
yd	0.9141	m
in	2.54	cm
in	25.4	mm
oz (US liq)	29.57	cc (cm^3)
cu in	16.387	cc (cm^3)
pt (US liq)	0.4732	lit (liter)
qt (US liq)	0.9461	lit (liter)
gal (US liq)	3.785	lit (liter)
lb/in	0.017855	kg/mm
psi (lb/in^2)	0.07031	kg/cm^2
Fahrenheit ($^{\circ}\text{F}$)	$5/9 (^{\circ}\text{F} - 32)$	Centigrade ($^{\circ}\text{C}$)



YAMAHA MOTOR CO.,LTD.

IWATA, JAPAN

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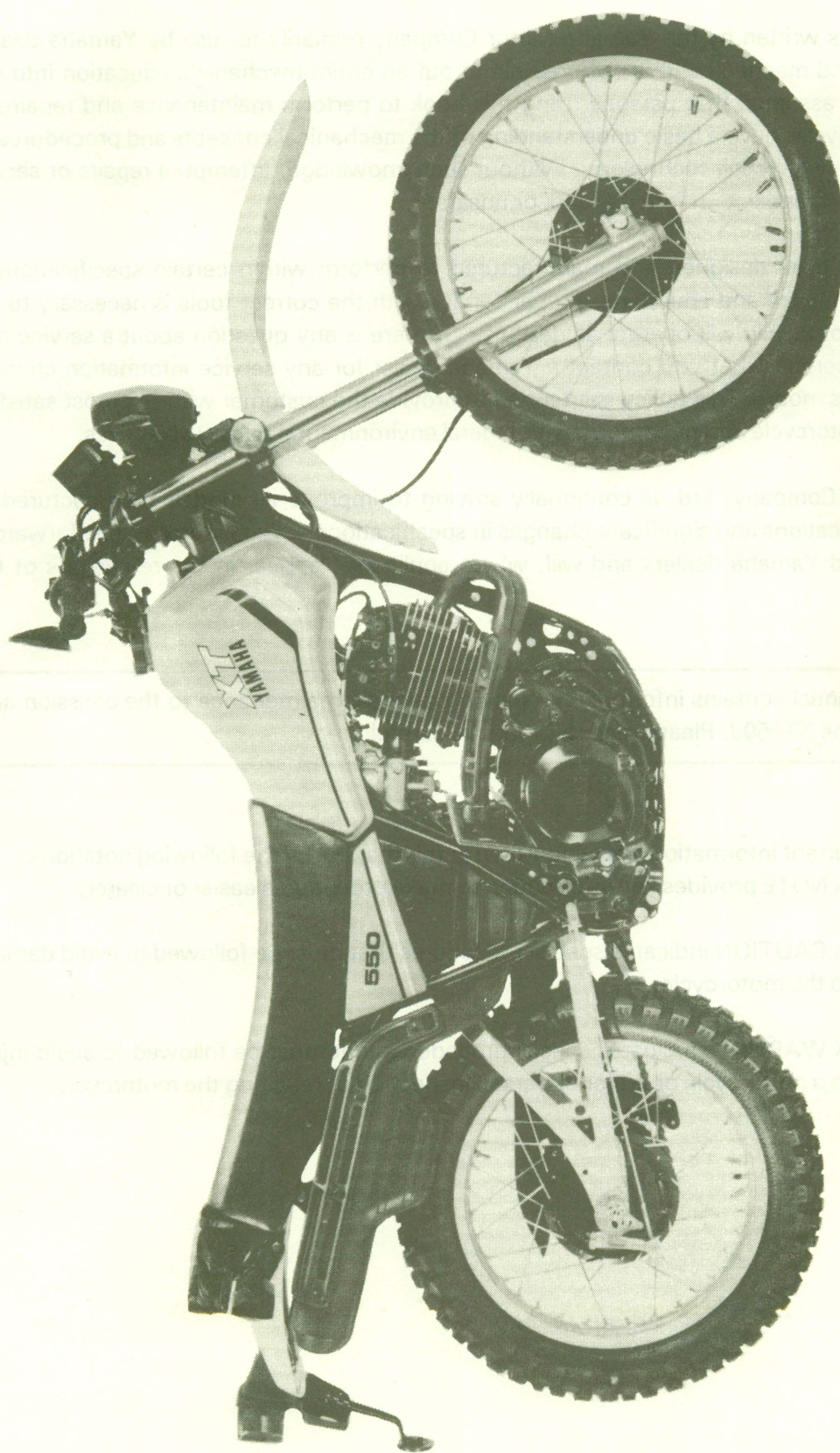


YAMAHA

XT550J

Service Manual

J



NOTE:

Designs and specifications are subject to change without notice.

NOTICE

This manual was written by the Yamaha Motor Company primarily for use by Yamaha dealers and their *qualified* mechanics. It is not possible to put an entire mechanic's education into one manual, so it is assumed that persons using this book to perform maintenance and repairs on Yamaha motorcycles have a basic understanding of the mechanical concepts and procedures inherent to motorcycle repair technology. Without such knowledge, attempted repairs or service to this model may render it unfit to use and/or unsafe.

This model has been designed and manufactured to perform within certain specifications in regard to performance and emissions. Proper service with the correct tools is necessary to ensure that the motorcycle will operate as designed. If there is any question about a service procedure, it is imperative that you contact a Yamaha dealer for any service information changes that apply to this model. This policy is intended to provide the customer with the most satisfaction from his motorcycle and to conform with federal environmental quality objectives.

Yamaha Motor Company, Ltd. is continually striving to improve all models manufactured by Yamaha. Modifications and significant changes in specifications or procedures will be forwarded to all Authorized Yamaha dealers and will, where applicable, appear in future editions of this manual.

NOTE:

This Service Manual contains information regarding periodic maintenance to the emission control system for the XT550J. Please read this material carefully.

Particularly important information is distinguished in this manual by the following notations:

NOTE: A NOTE provides key information to make procedures easier or clearer.

CAUTION: A CAUTION indicates special procedures that must be followed to avoid damage to the motorcycle.

WARNING: A WARNING indicates special procedures that must be followed to avoid injury to a motorcycle operator or person inspecting or repairing the motorcycle.

SERVICE DEPT.
INTERNATIONAL DIVISION
YAMAHA MOTOR CO., LTD.

GENERAL INFORMATION

1

**PERIODIC INSPECTIONS AND
ADJUSTMENTS**

2

ENGINE OVERHAUL

3

CARBURETION

4

CHASSIS

5

ELECTRICAL

6

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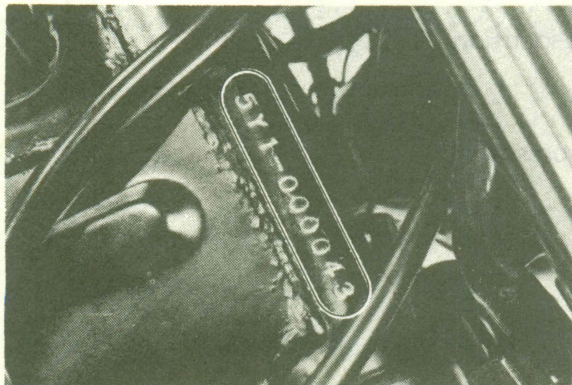


GENERAL INFORMATION

MOTORCYCLE IDENTIFICATION

A. Frame Serial Number

The frame serial number is stamped into the right side of the steering head pipe.



1. Frame Serial Number

Starting Serial Number:

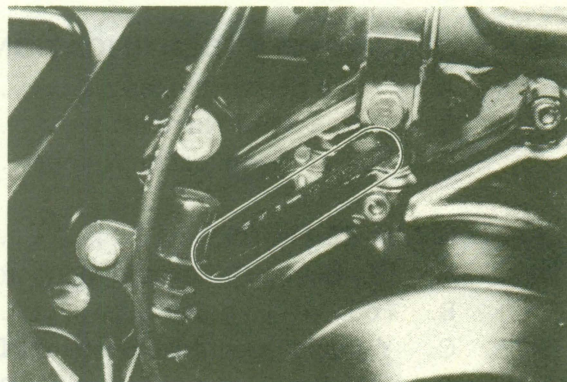
XT550J 5Y1-000101

B. Engine Serial Number

The engine serial number is stamped into the elevated part of the right section of the engine.

NOTE: _____

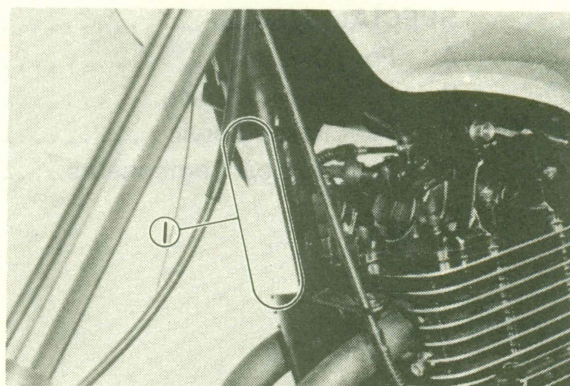
The first three digits of these numbers are for model identification; the remaining digits are the unit production number.



1. Engine Serial Number

C. Vehicle Identification Number

The vehicle identification number is on the left side of the steering head pipe.

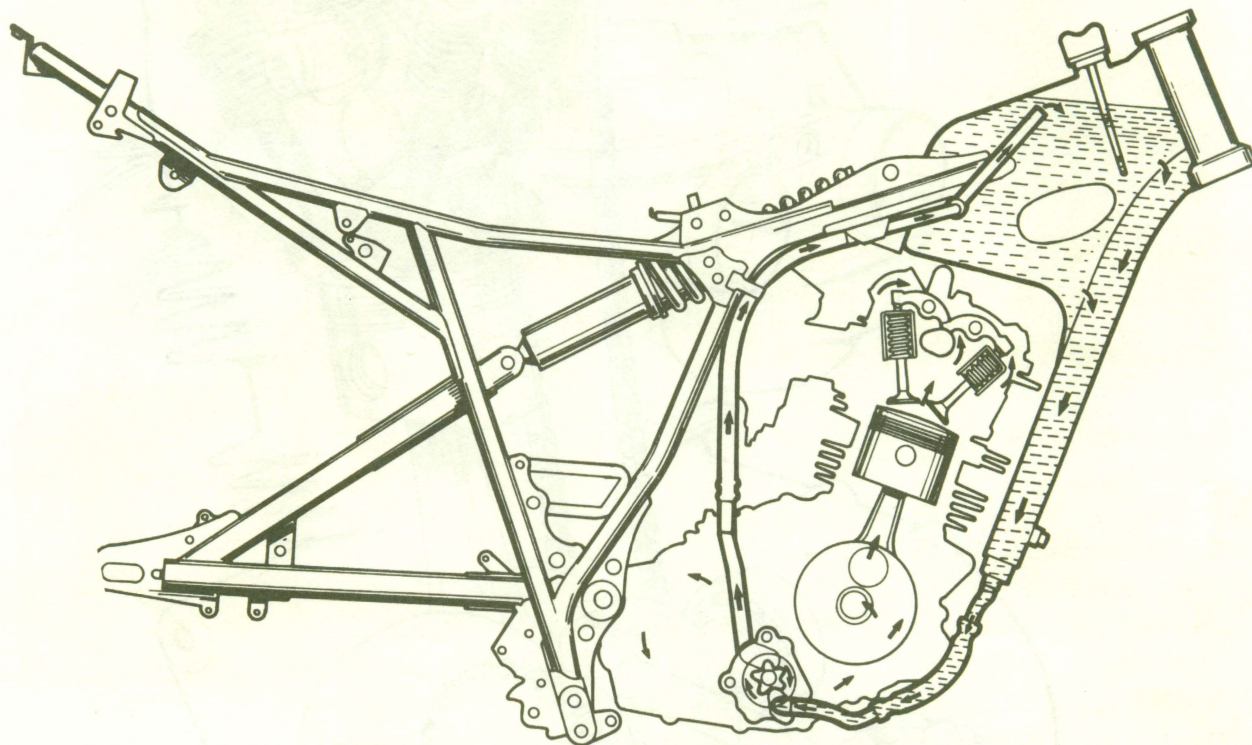


1. Vehicle Identification Number



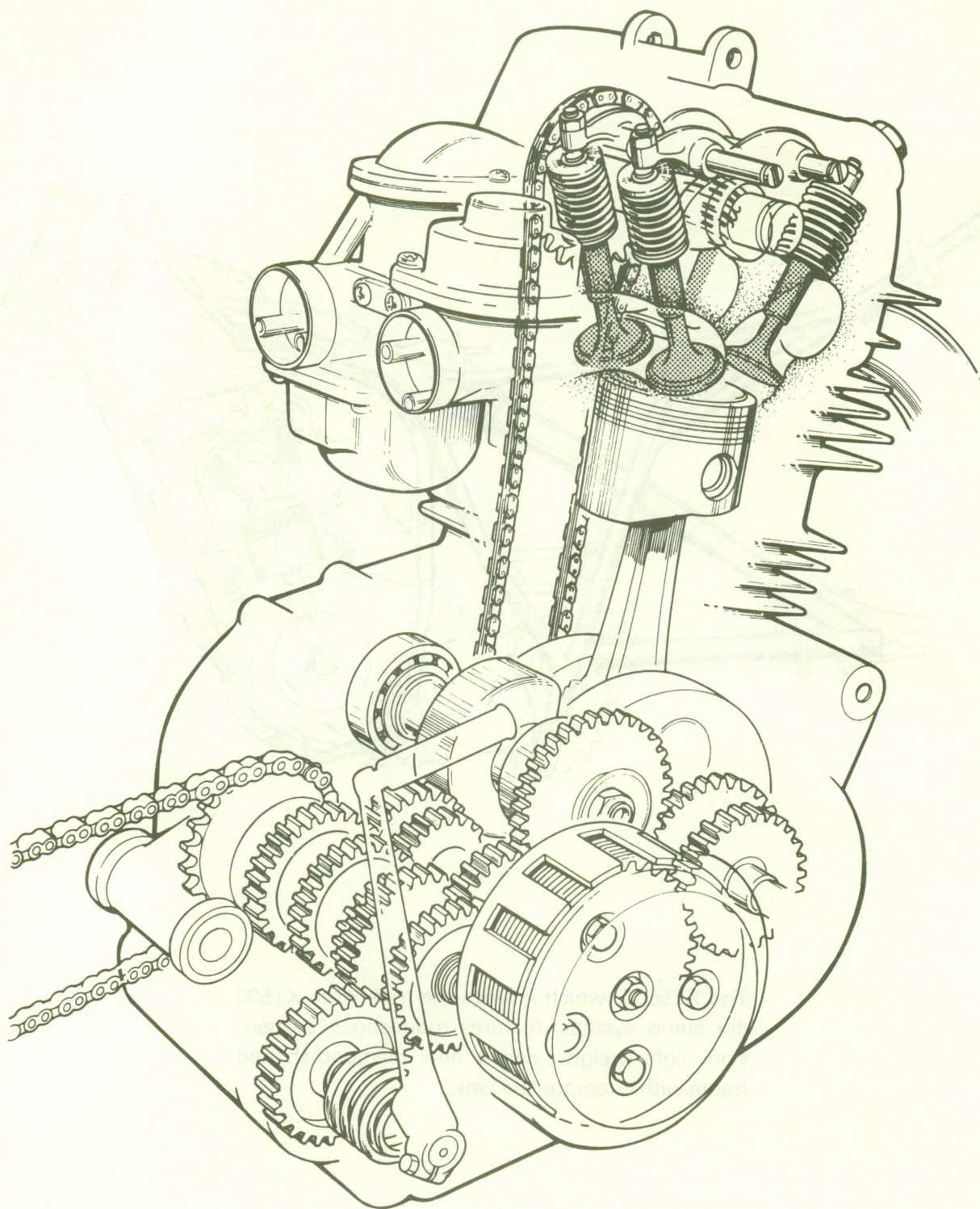
MAIN FEATURES

A. Dry Sump System and Monocross Suspension



The XT550J, which inherits the traditional XT500 dry sump system, features monoshock suspension, light weight, and a new diamond-shaped frame with integrated oil tank.

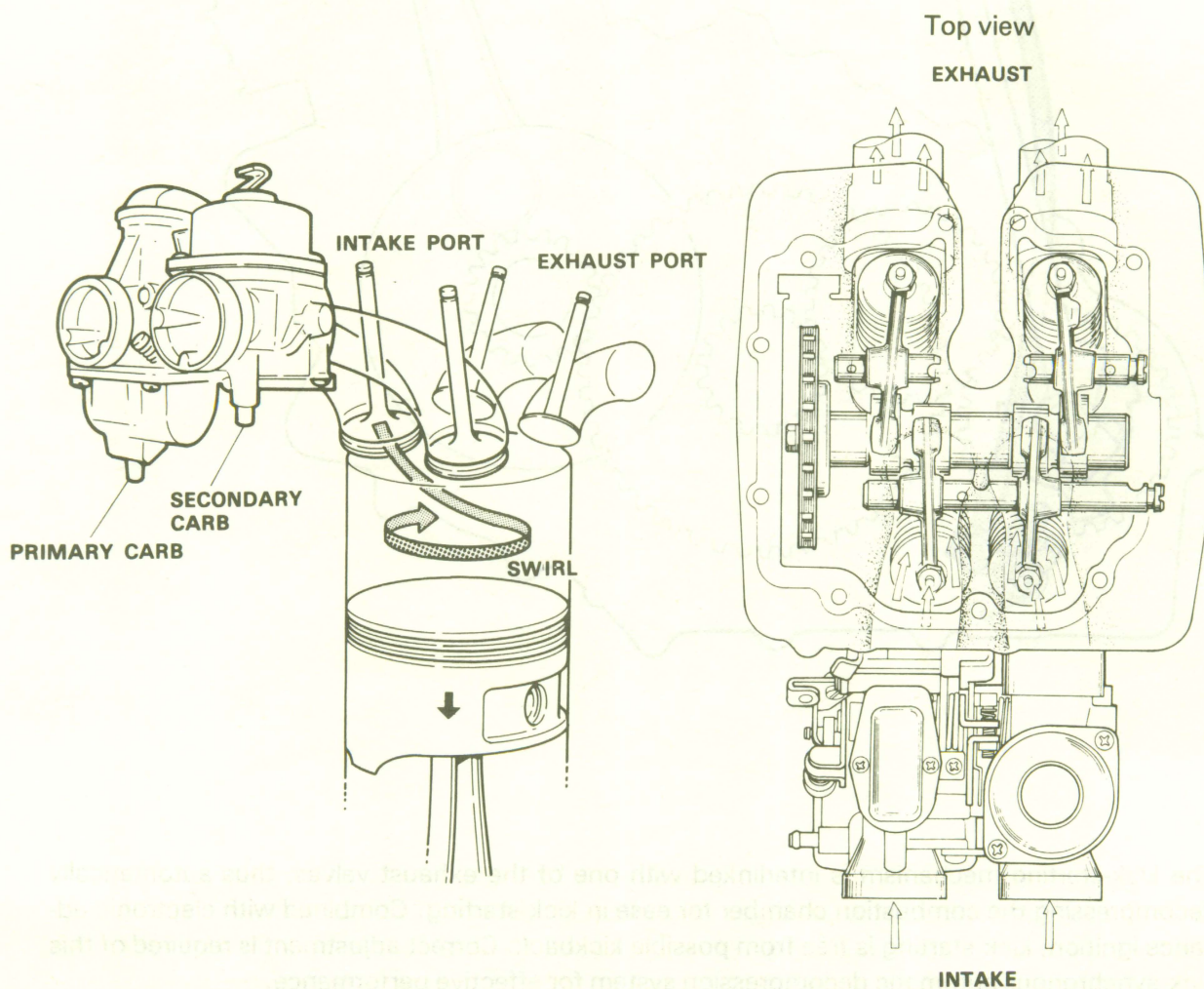
B. Four-Valve Engine



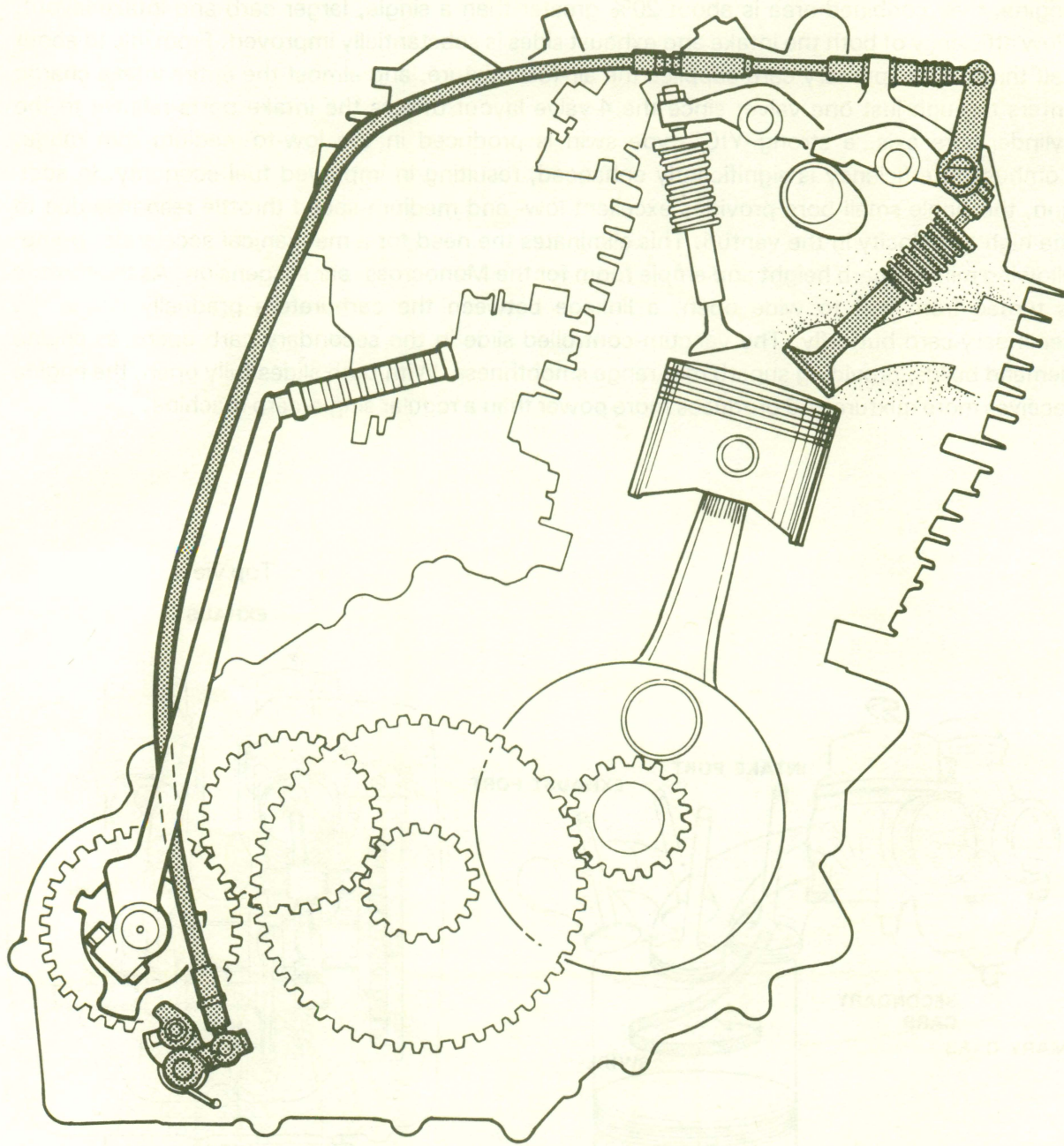
Newly designed compact engine equipped with:
S.O.H.C., 4-Valve head, Dual intake and dual ex-
haust ports, gear-driven balancer, Yamaha Duo In-
take System (YDIS), and 5-speed transmission

C. Yamaha Duo Intake System (YDIS)

For this system, the primary carburetor and the secondary carburetor are equipped as a unit: A cable-operated-slide type functions as the primary carb, and a vacuum-controlled-slide type provides a secondary bore. The engine has a 4-valve head, and each carb has its own intake port and valve. Although each carb bore and intake port is smaller than that of a more conventional engine, their combined area is about 20% greater than a single, larger carb and intake layout. Flow efficiency of both the intake and exhaust sides is substantially improved. From idle to about half throttle, the primary carb supplies the air-fuel mixture, and almost the entire intake charge enters through just one valve; since the 4-valve layout offsets the intake ports relative to the cylinder-bore axis, a strong YICS-type swirl is produced in the low-to-medium rpm range. Combustion efficiency is significantly enhanced, resulting in improved fuel economy. In addition, the single small bore provides excellent low- and medium-speed throttle response due to the high air velocity in the venturi. This eliminates the need for a mechanical accelerator pump, allowing minimal carb height and ample room for the Monocross rear suspension. As the throttle is turned from half to wide open, a linkage between the carburetors gradually opens the secondary-carb butterfly. The vacuum-controlled slide in the secondary carb opens as engine demand builds, providing superb mid-range smoothness. With both slides fully open, the engine receives more mixture and produces more power than a regular single-carb machine.



D. Kick Synchronous Automatic Decompression

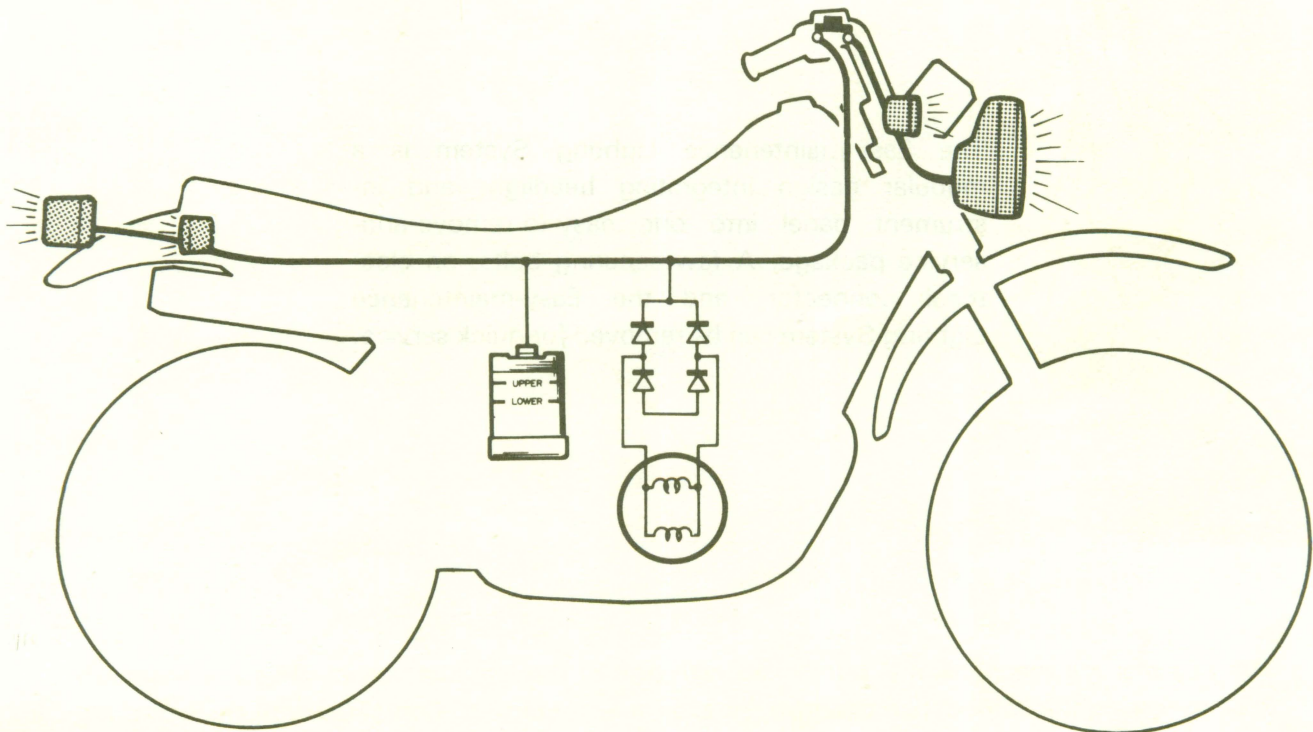
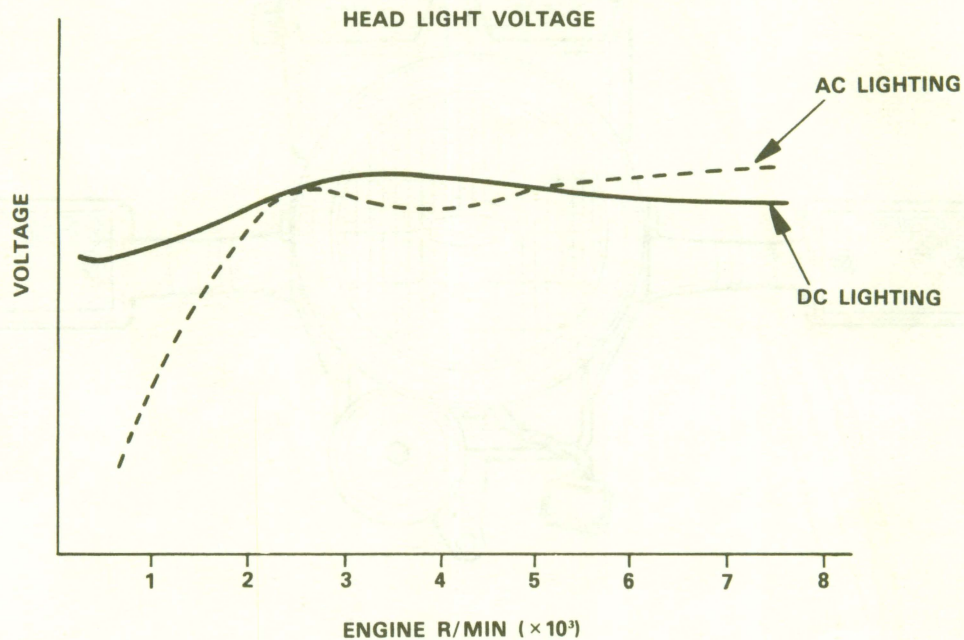


The kick-starting mechanism is interlinked with one of the exhaust valves, thus automatically decompressing the combustion chamber for ease in kick-starting. Combined with electronic advance ignition, kick-starting is free from possible kickback. Correct adjustment is required of this kick-synchronous automatic decompression system for effective performance.

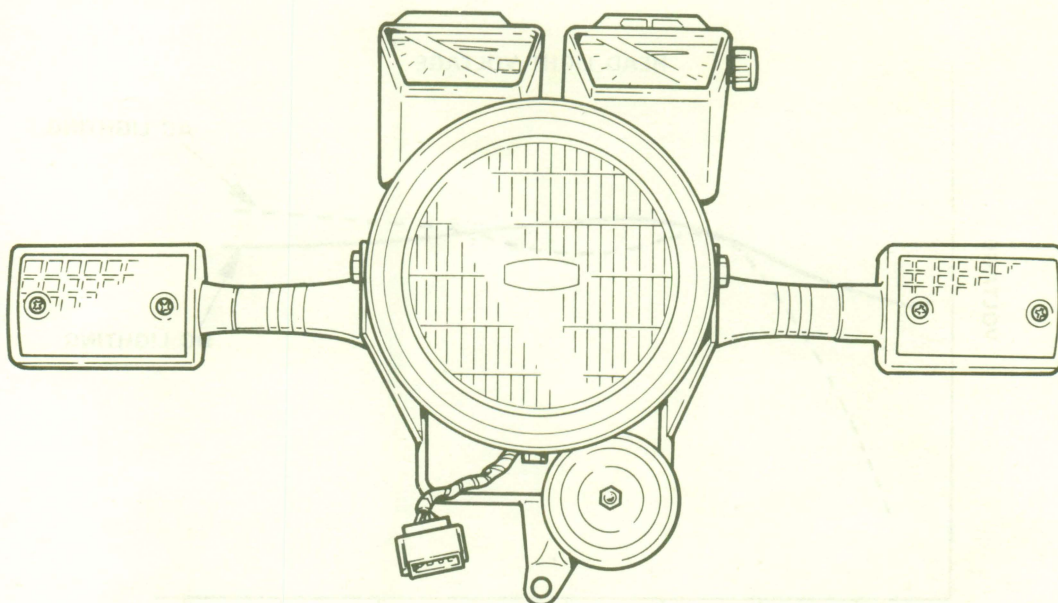
E. DC Lighting System (12V 45/45 Watt with sealed beam)

The DC lighting system provides a steady power source, enabling all lights to keep bright even at low RPM.

This system also offers a safety advantage in that it keeps lights shining even when the engine is stalled.

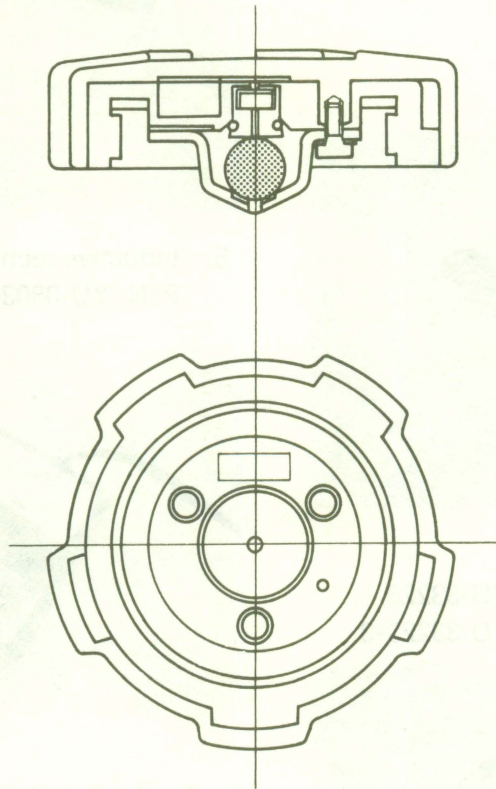


F. Easy-maintenance Lighting System



The Easy-maintenance Lighting System is a modular design integrating headlight and instrument panel into one easy-to-remove-and-service package. A few securing bolts, an electrical connector, and the Easy-maintenance Lighting System can be removed for quick service.

G. Fuel Tank Cap with Check Valve



The fuel cap has a free steel ball inside it to prevent fuel from spilling out through the cap breather should the machine turnover.

This steel ball normally settles at the bottom, but when the machine is inclined to less than 30° from the ground as in a turnover, the ball is made to roll accordingly while at the same time pushing up on the valve seat (see drawing).

When the machine is laid flat on the ground, the O-ring on the valve contacts the tapered wall of the cap, thereby closing the breather passage completely.

SPECIAL TOOLS

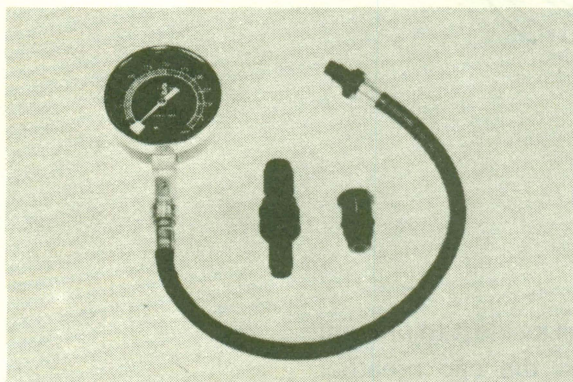
The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques.

A. For Tune-up

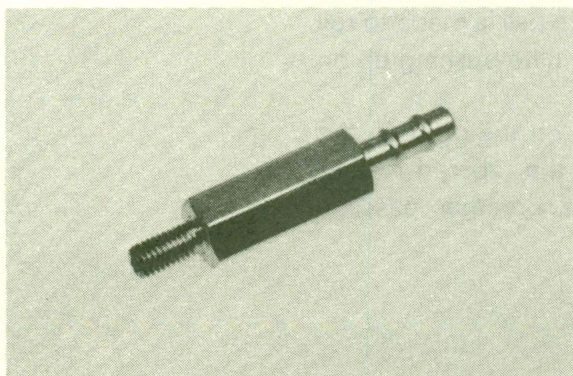
1. Valve adjusting tool
P/N. YM-08035



2. Compression gauge set
Adapter (M12) P/N. YU-33223
P/N. YU-33223-3

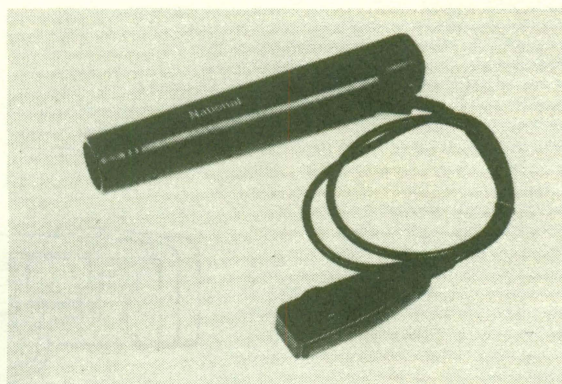


3. Oil pressure gauge adapter
P/N. YU-08030-1



This adapter is attached at the top of the oil filter cover after removing the air bleed screw.

4. Inductive timing light
P/N. YU-08037

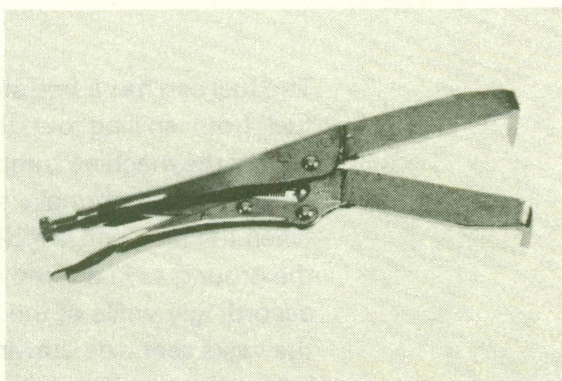


5. Inductive tachometer
P/N. YU-08036



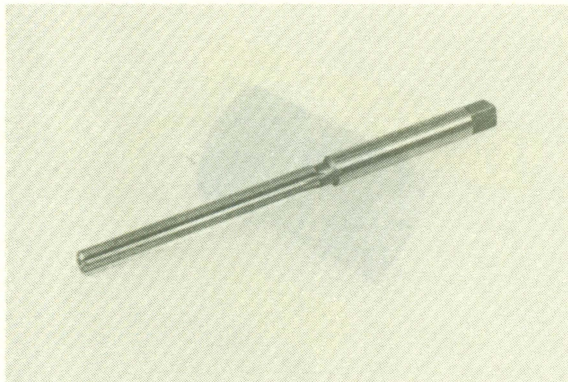
B. For Engine Service

1. Universal clutch holder
P/N. YM-91042



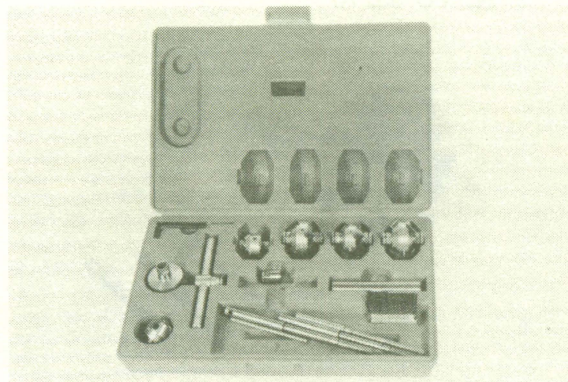
This tool is used to hold the clutch when removing or installing the clutch boss lock nut.

2. Valve guide reamer
P/N. YM-01227



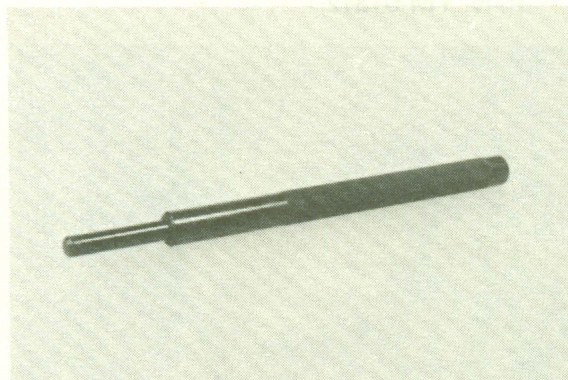
This must be used when replacing the valve guide.

3. Valve seat cutter
P/N. YM-91043



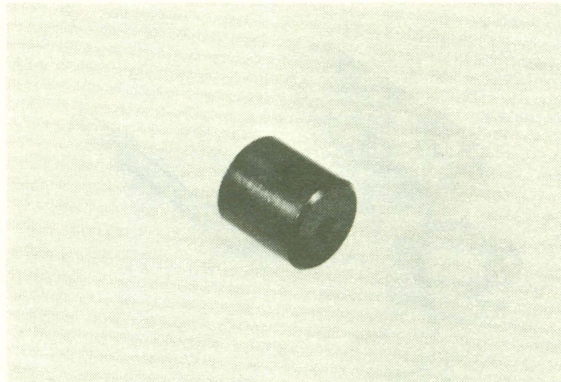
This tool is needed to resurface the valve seat.

4. Valve guide remover
P/N. YM-01225



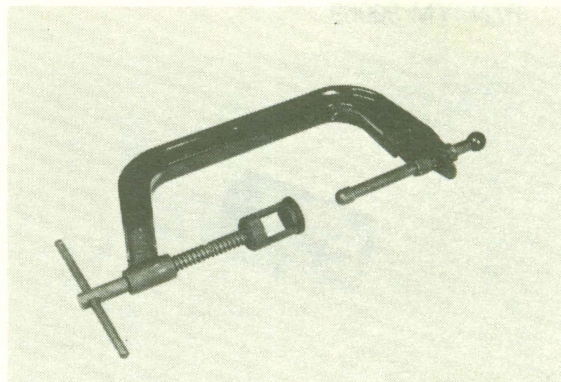
This must be used to remove the valve guides.

5. Valve guide installer
P/N. YM-04017



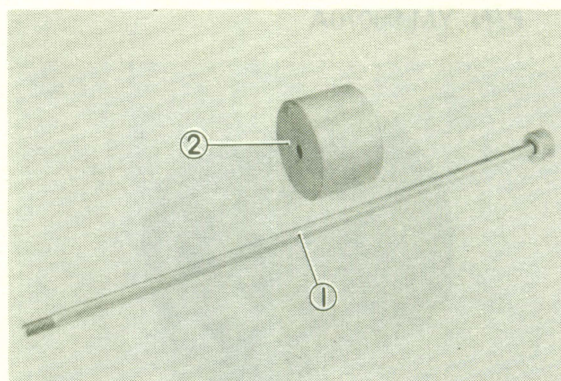
This tool is needed for proper installation of the valve guides.

6. Valve spring compressor
P/N. YM-04019



This tool must be used for removing and installing the valve assemblies.

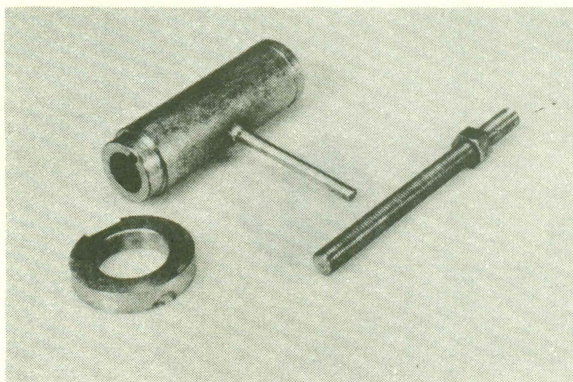
7. Slide hammer set
P/N. YU-01083



These tools are used when removing the rocker arm shaft.

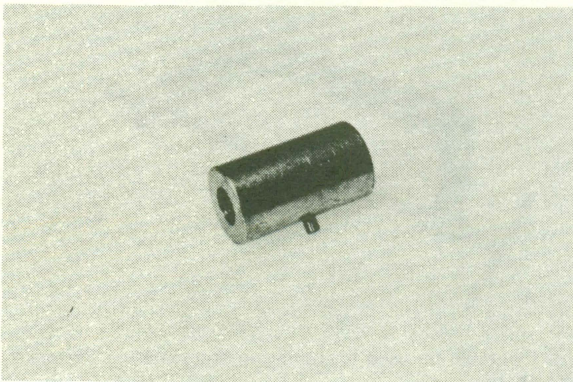
1. Bolt P/N. YU-01083-1
2. Weight P/N. YU-01083-3

8. Crankshaft installing set
P/N. YU-90050



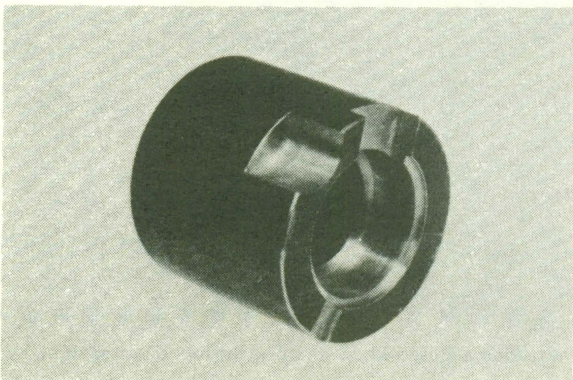
This tool is used when installing the crankshaft.

9. Adapter #10 crankshaft installing bolt
(M14)
P/N. YM-90069



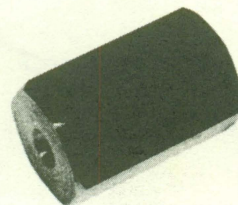
14 mm × 1.5 adapter for installing the crankshaft, and removing the final-gear drive pinion.

10. Crank pot spacer
P/N. YM-90070A



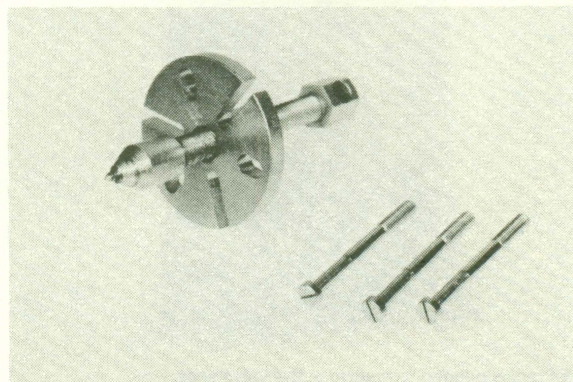
This tool is used when installing the crankshaft.

11. Crank protector
P/N. YM-04063



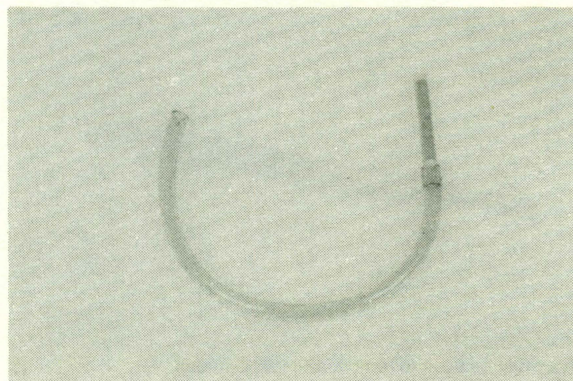
This tool protects the threads on the crankshaft.

12. Flywheel puller
P/N. YU-33270



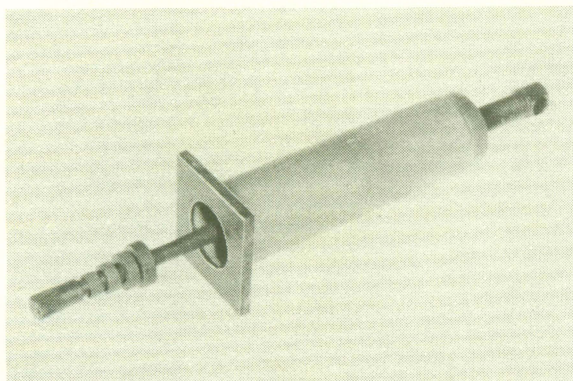
This tool is used for removing the CDI rotor.

13. Fuel level gauge
P/N. YM-01312



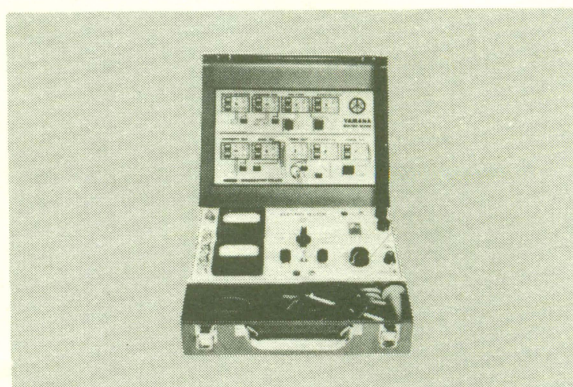
This tool is needed for checking the carburetor fuel level.

14. Piston pin puller
P/N. YU-01304

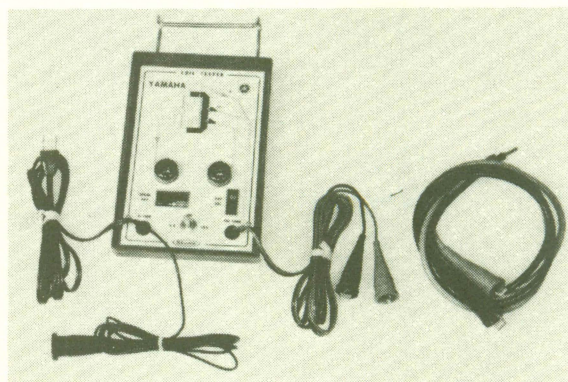


This tool is used when removing the tight piston pin.

2. Electro tester
P/N. YU-03021

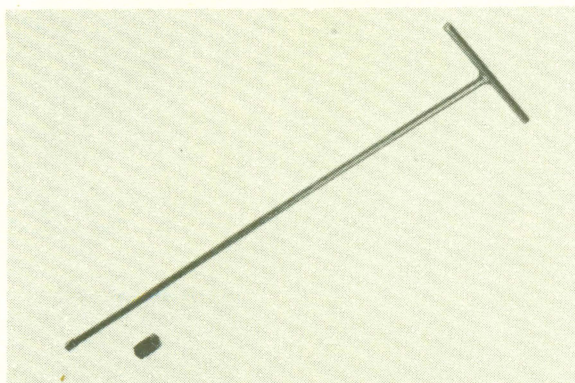


3. Coil tester
P/N. YU-33261



C. For Chassis Service

1. Front-fork-cylinder holder
P/N. YM-01327
T-handle
P/N. YM-01301 or YM-01326

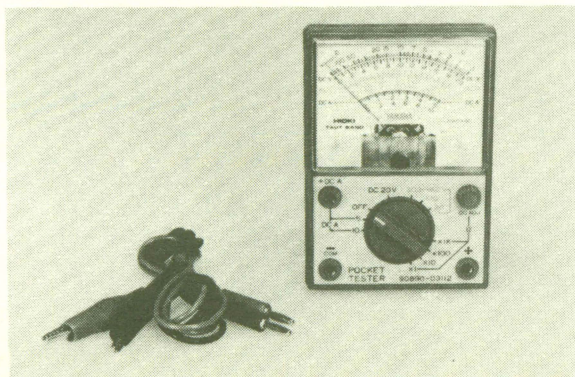


This tool is used to loosen and tighten the front-fork-cylinder bolt.

D. For Electrical Components

The uses of these tools are described in Chapter 6.

1. Pocket tester
P/N. YU-03112



CHAPTER 2.

PERIODIC INSPECTIONS AND ADJUSTMENTS

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PERIODIC INSPECTIONS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information applies to vehicles already in service and to new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

MAINTENANCE INTERVALS CHARTS

Proper periodic maintenance is important. Especially important are the maintenance services related to emissions control. These controls not only function to ensure cleaner air but are also vital to proper engine operation and maximum performance. In the following maintenance tables, the services related to emissions control are grouped separately.

PERIODIC MAINTENANCE EMISSION CONTROL SYSTEM

No.	Item	Remarks	Initial Break-In		Thereafter Every	
			1,000 km (600 mi) or 1 month	5,000 km (3,000 mi) or 7 months	4,000 km (2,500 mi) or 6 months	8,000 km (5,000 mi) or 12 months
1	Valve clearance	Check and adjust valve clearance when engine is cold		○	○	
2	Spark plugs	Check condition; adjust gap/clean; replace after initial 13,000 km (8,000 mi)		○	○	Replace
3	Crankcase ventilation system	Check ventilation hose for cracks or damage; replace if necessary		○		○
4	Fuel line	Check fuel hose for cracks or damage; replace if necessary		○		○
5	Exhaust system	Check for leakage; retighten if necessary replace gasket (s) if necessary		○	○	
6	Idle speed	Check and adjust engine idle speed; adjust cable free play if necessary		○	○	
7	Decompression	Check and adjust decomp-cable free play after valve clearance maintenance		○	○	

GENERAL MAINTENANCE/LUBRICATION

No.	Item	Remarks	Type	Initial Break-In		Thereafter Every		
				1,000 km (600 mi) or 1 month	5,000 km (3,000 mi) or 7 months	4,000 km (2,500 mi) or 6 months	8,000 km (5,000 mi) or 12 months	16,000 km (10,000 mi) or 24 months
1	Engine oil	Warm-up engine before draining	Yamalube 4-cycle oil or SAE 20W40 type SE motor oil	○	○	○		
2	Oil filter	Replace filter element and clean down tube strainer at initial 1,000 km (600 mi)	—	○	○		○	
3	Air filter	Wet type filter must be washed and damped with oil	Yamalube 2-cycle oil or equivalent	○	○	○		
4	Brake system	Adjust free play. Replace shoes if necessary	—	○	○	○		
5	Clutch	Adjust free play	—	○	○	○		
6	Drive chain	Apply chain lube thoroughly	Yamaha chain and cable lube or SAE 10W30 motor oil	Every 500 km (300 mi)				
7	Control and meter cable	Apply chain lube thoroughly	Yamaha chain and cable lube or SAE 10W30 motor oil	○	○	○		
8	Rear arm pivot shafts	Apply grease lightly	Lithium soap base grease		○		○	
9	Brake pedal shaft	Apply chain lube lightly	Yamaha chain and cable lube or SAE 10W/30 motor oil		○	○		
10	Side stand pivots and kick crank boss	Apply chain lube lightly	Yamaha chain and cable lube or SAE 10W30 motor oil		○	○		
11	Front fork oil	Drain completely; refill to specification	Yamaha fork oil 10 wt. or equivalent					○
12	Steering bearing and races	Check bearings assembly for looseness; moderately repack every 16,000 km (10,000 mi)	Medium weight wheel bearing grease		○	○		Repack
13	Wheel bearings	Check bearings for smooth rotation; replace if necessary	—		○	○		
14	Battery	Check specific gravity; check breather pipe for proper operation	—		○	○		
15	Brake/clutch lever pivot shafts	Apply chain lube lightly	Yamaha chain and cable lube or SAE 10W30 motor oil					

ENGINE

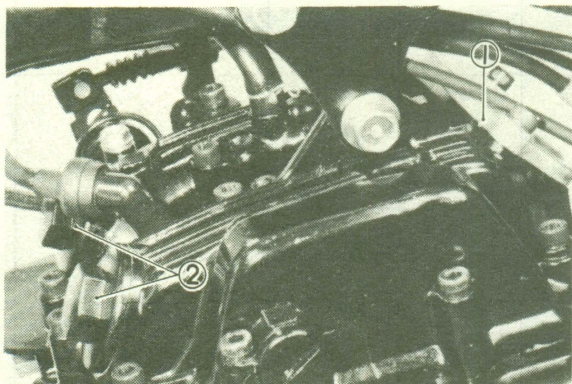
A. Valve Clearance

Adjust the valve clearance as follows:

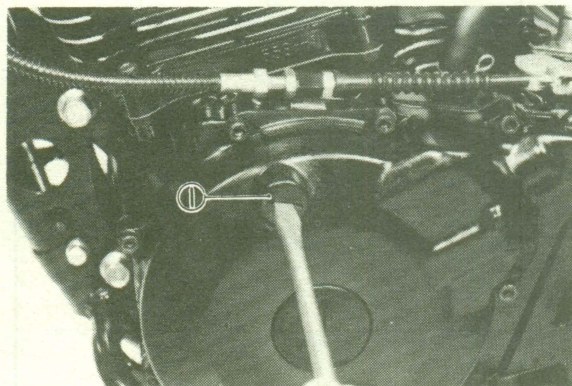
NOTE:

Valve clearance must be measured when the engine is cool to the touch.

1. Remove intake and exhaust tappet covers and two blind plugs on the left crankcase cover.

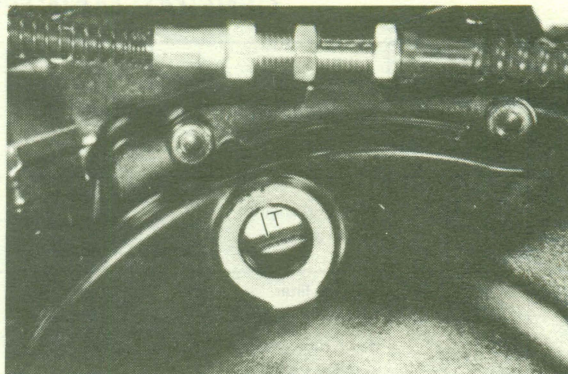


1. Intake tappet cover 2. Exhaust tappet covers



1. Blind plug

2. Align the "T" mark on the flywheel with the timing mark on the crankcase cover. This places the piston at the Top Dead Center and the valve clearance should be checked and adjusted at T.D.C. on the compression stroke by observing when the valve adjusters have clearance.



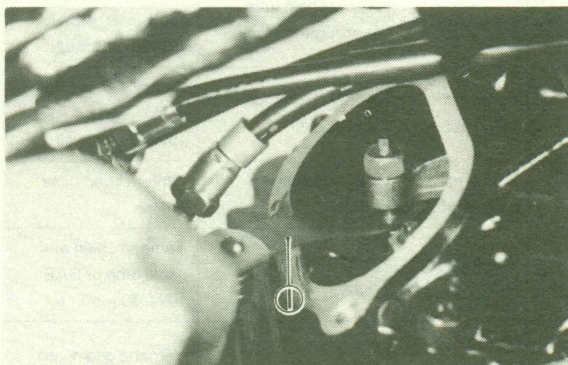
3. Use a feeler gauge to determine the clearance.

Intake valve (cold):

0.05 ~ 0.10 mm (0.002 ~ 0.004 in)

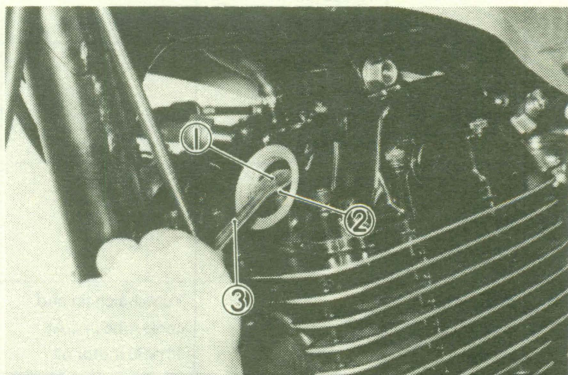
Exhaust valve (cold):

0.12 ~ 0.17 mm (0.005 ~ 0.007 in)



1. Feeler gauge

4. Loosen the valve adjuster locknut. Turn the adjuster in or out to obtain the correct clearance. Hold the adjuster to prevent it from moving and thoroughly tighten the locknut. Recheck the clearance after tightening.



1. Adjuster 2. Locknut 3. Valve adjusting tool

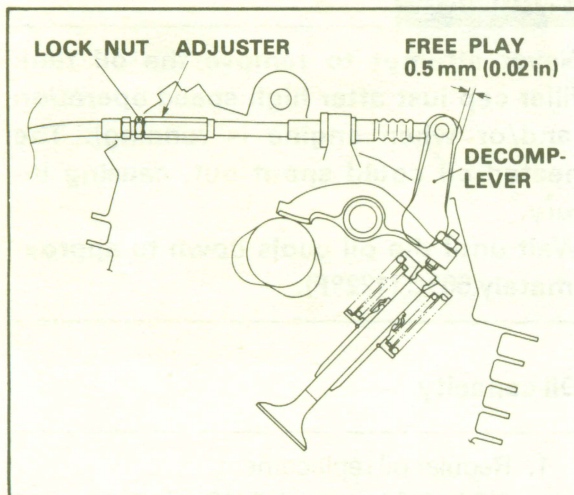
5. Reinstall the intake and exhaust tappet covers and two blind plugs on the left crankcase cover.

B. Decompression System

NOTE:

Decomp-cable adjustment must follow the valve clearance adjustment.

1. Remove the two blind plugs on the left crankcase cover.
2. Align the "T" mark on the flywheel with the timing mark on the crankcase cover. This places the piston at Top Dead Center, and the decomp-cable adjustment should be checked and adjusted with the piston at T.D.C. on the compression stroke.
3. Loosen the locknut on the decomp-cable adjuster. Then turn the adjuster so 0.5 mm (0.02 in) free play can be provided for the end of the decomp-lever.



1. Adjuster
 2. Lock nut
 3. Decomp-lever
4. After the above adjustment, tighten the locknut on the decomp-cable adjuster.
 5. Reinstall the two blind plugs on the left crankcase cover.

C. Spark Plug

1. Check electrode condition and wear, insulator color and electrode gap.
2. Clean the spark plug with a spark plug cleaner if necessary.
Use a wire gauge to adjust the plug gap to the specification.
3. If the electrodes become too worn, replace it.
4. When installing the plug, always clean the gasket surface, wipe off any grime that might be present on the surface of the spark plug, and torque the spark plug properly.

Standard spark plug: NGK D7EA

Spark plug gap:

0.6 ~ 0.7 mm (0.024 ~ 0.028 in)

Spark plug tightening torque:

20 Nm (2.0 m · kg, 14 ft · lb)

D. Crankcase Ventilation System

Check ventilation pipe from cylinder head cover to oil tank and breather assembly from crankcase to air cleaner for cracks or damage; replace if necessary.

E. Fuel Line

Check fuel pipe from fuel petcock to carburetor for cracks or damage; replace if necessary.

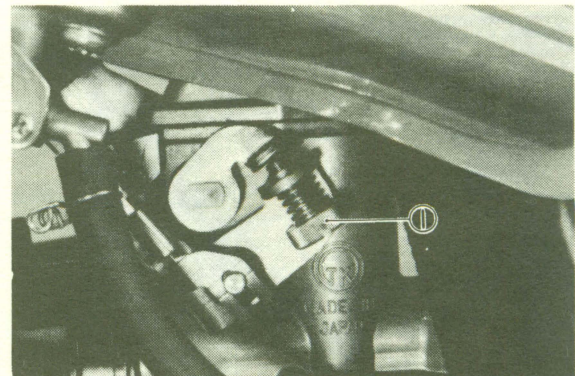
F. Exhaust System

1. Replace the joint gasket(s) if necessary.
2. Tighten the joint bolt and nuts.

G. Idle Speed

1. Start the engine and warm it up for a few minutes.
2. Set the engine idle speed to the specified level by adjusting the throttle stop screw on the carburetor. Turning the throttle stop screw in (clockwise) increases the engine speed; turning it out (counterclockwise) decreases the engine speed. Use a tachometer for checking and adjusting the engine speed.

Engine Idle: 1,150 ~ 1,250 r/min



1. Throttle stop screw

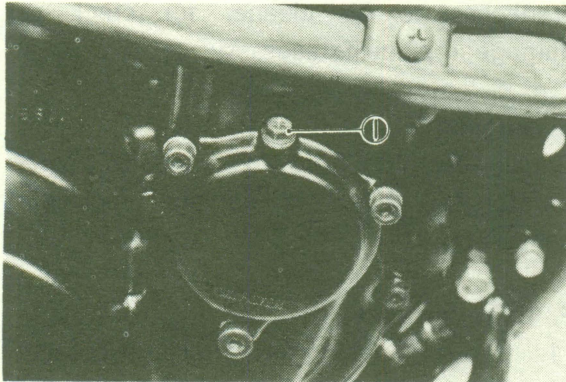
H. Engine Oil

Recommended oil

Yamalube 4-cycle oil or SAE
20W40 type SE motor oil

Oil level measurement

1. Loosen the air bleed screw on the oil filter cover.

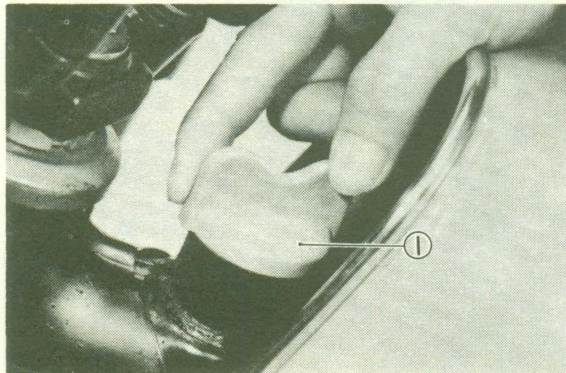


1. Air bleed screw

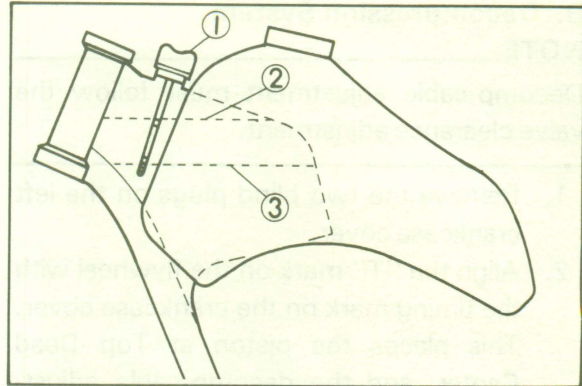
2. Start the engine and let it idle.
3. If no oil comes out of the bleed bolt after 30 seconds, immediately turn off the engine and add engine oil.
4. If oil comes out of the bleed bolt, tighten the bleed bolt, and warm up the engine for several minutes.
5. Stop the engine, remove the oil filler cap, and check the oil level.

NOTE:

Be sure the motorcycle is positioned straight up when checking the oil level; a slight tilt toward the side can produce false readings.



1. Oil filler cap



1. Oil filler cap 2. Maximum oil level 3. Minimum oil level

6. The oil should be between the maximum and minimum marks on the filler cap gauge.

If the level is lower, add sufficient oil to raise it to the proper level.

WARNING:

Never attempt to remove the oil tank filler cap just after high speed operation (and/or when engine is running). The heated oil could spout out, causing injury.

Wait until the oil cools down to approximately 50°C (122°F).

Oil capacity

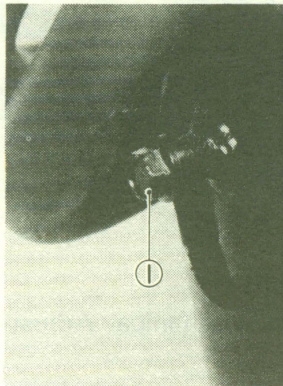
1. Regular oil replacement
1.8 L (1.6 Imp qt, 1.9 US qt)
2. Oil filter replacement
1.9 L (1.7 Imp qt, 2.0 US qt)
3. Total amount
2.2 L (1.9 Imp qt, 2.3 US qt)

I. Oil Filter Replacement

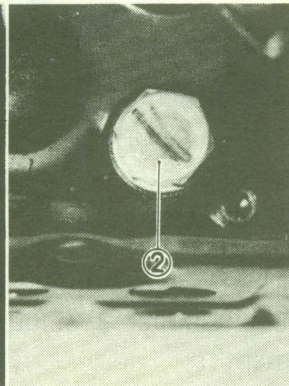
1. Start the engine. After a few minutes of warm-up, stop the engine.
2. Place oil pans under the engine and under the down tube.
3. Remove the oil tank filler cap, drain plugs (at two places), air bleed screw attached to the oil filter cover, and drain the engine oil.

NOTE:

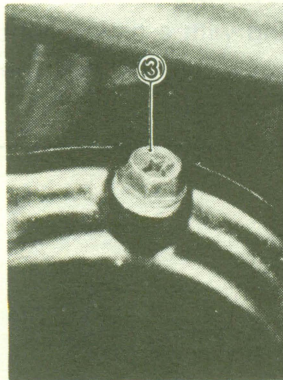
The oil filter cover is secured by three screws. The lower one should be loosened until the threaded portion comes out completely.



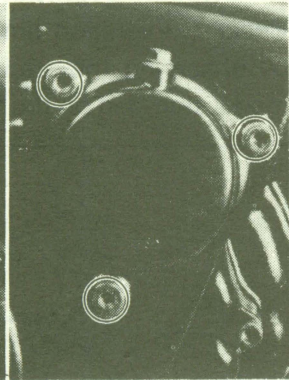
1. Drain plug



2. Drain plug



3. Air bleed screw

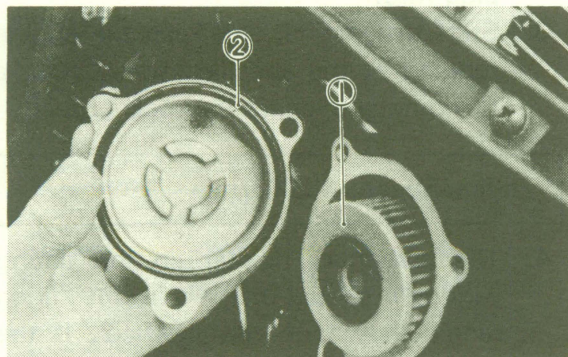


Filter cover screw

NOTE:

When removing the drain plug on the down tube, take care not to get stained by the oil that spouts out.

4. Remove the oil filter cover, and replace the filter element.

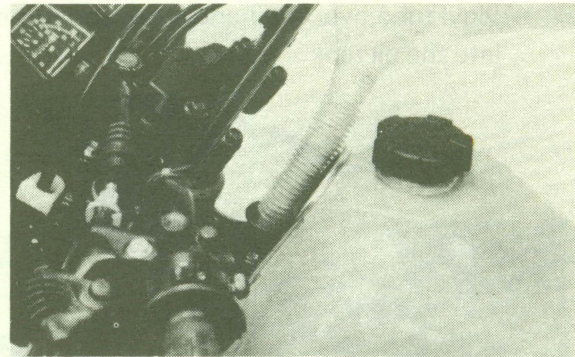


1. Oil filter element

2. "O"-ring

5. Check the O-rings. If damaged, replace.
6. Install the drain bolts, air bleed screw, oil filter, and oil filter cover.

7. Add 1.8 L (1.6 Imp qt, 1.9 US qt) of engine oil. Install the oil tank filler cap and tighten. Use 20W40 type SE oil.



8. Start the engine and allow a few minutes of warm-up. While warming up, check for oil leakage. If oil leaks, stop the engine immediately, and check for the cause.
9. After warm up, stop the engine and check the oil level. (Refer to page 2-5, "Engine Oil".)

J. Engine Oil Replacement (without replacing filter)

1. Start the engine and stop after a few minutes of warm-up.
2. Place an oil receiver under the engine.
3. Remove the oil tank filter cap, drain plugs (at two places), and air bleeder screw attached to the oil filter cover.

NOTE:

The oil filter cover is secured by three screws. The lower one should be loosened until the threaded portion comes out completely.

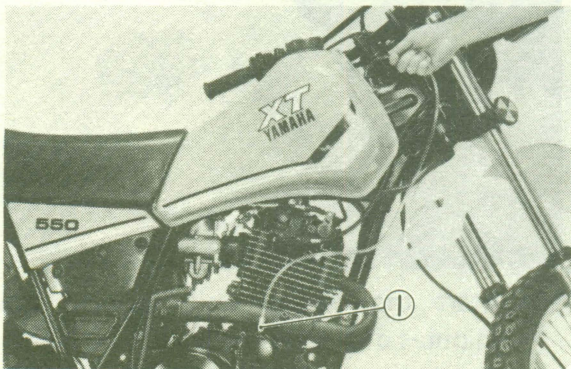
4. Check each O-ring. If damaged, replace.
5. Install the drain bolts (at two places) and the bleed screw, oil filter and filter cover.
6. Fill with 1.8 L (1.6 Imp qt, 1.9 US qt) of engine oil. Install the oil tank filler cap and tighten.

K. Oil Pressure Check

Oil pressure can be checked using the following procedure:

1. Start the engine and let it idle for a few minutes.
2. Stop the engine.
3. Remove the air bleed screw from the oil filter cover.
4. Remove the exhaust pipe protector.

5. Install the oil pressure gauge adapter (special tool P/N. YU-04083).
6. Install a oil pressure gauge or pass a vinyl tube over the handle bar and put it into the oil tank.



1. Oil pressure gauge adapter

7. Start the engine.
8. If oil pressure is below the specified range or if oil does not flow into the oil tank, stop the engine immediately, and check for the cause.

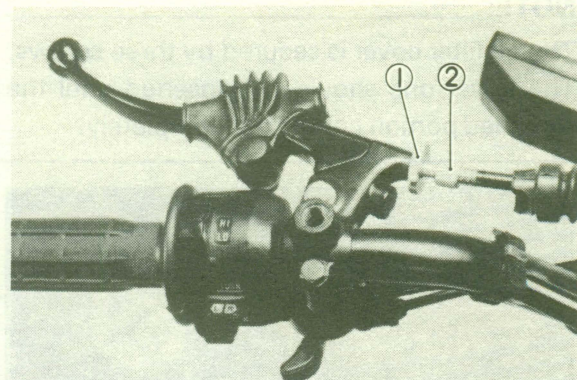
Specified oil pressure: 9.81 ~ 19.6 kPa
(0.1 ~ 0.2 kg/cm², 1.42 ~ 2.84 psi)

L. Clutch Adjustment

This model has two clutch cable length adjusters and a clutch mechanism adjuster. Cable length adjusters are used to take up slack from cable stretch and to provide sufficient free play for proper clutch operation under various operating conditions. The clutch mechanism adjuster is used to provide the correct amount of clutch "throw" for proper disengagement. Normally, once the mechanism is properly adjusted, the only adjustment required is maintenance of free play at the clutch handle lever.

Free play adjustment

Loosen either the handle lever adjuster lock nut or the cable in-line length adjuster lock nut. Next, turn the length adjuster either in or out until proper lever free play is achieved.



1. Adjuster lock nut

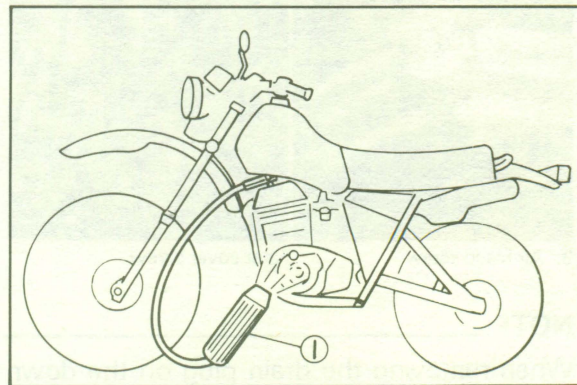
2. Adjuster

Mechanism adjustment

See Chapter 3 "Clutch Mechanical Adjustment".

M. Checking Ignition Timing

Check the ignition timing with a timing light by observing the stationary pointer and the marks stamped on the flywheel.

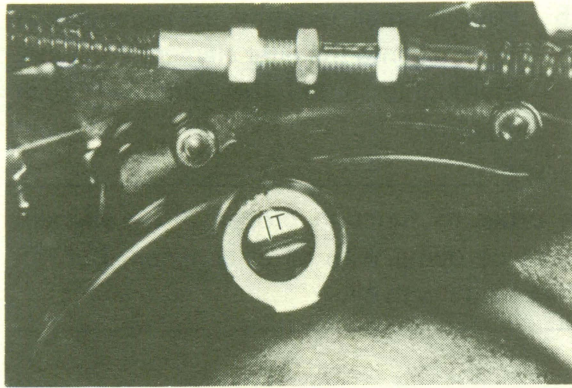


1. Timing light

1. Remove the upper blind plug on the left crankcase cover.
2. Connect the timing light to the spark plug wire.
3. Start the engine, and keep the engine running at the specified speed. Use a tachometer to check the engine speed.

Engine Speed: 1,200 r/min

4. The stationary pointer (in the timing window) should be within the firing range shown on the flywheel. If the pointer is not within the range or if it is not steady, check the flywheel and/or pickup assembly for tightness and/or damage. (See "Chapter 6: Electrical" for further information.)



5. Reinstall the blind plug.

N. Compression Pressure Measurement

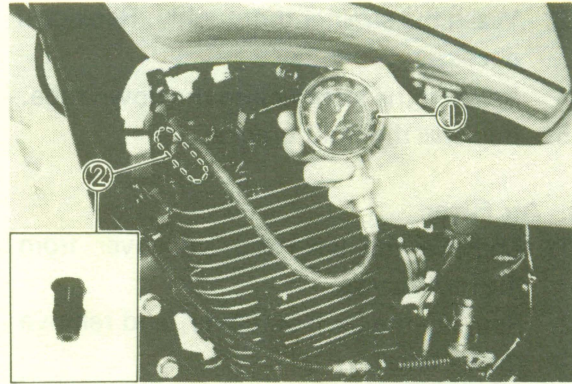
Insufficient compression pressure will result in performance loss and may indicate leaking valves or worn or damaged piston rings.

1. Make sure the valve clearance is correct.
2. Warm up the engine for 2 ~ 3 minutes; stop the engine.
3. Remove the spark plug.
4. Install a compression gauge.
5. Turn over the engine with the kick starter with the throttle wide open until the pressure indicated on the gauge does not increase further. The compression should be within the specified levels.

Compression pressure (at seal level):
 Standard.....
 1,079 kPa (11 kg/cm², 156 psi)
 Minimum.....
 883 kPa (9 kg/cm², 128 psi)
 Maximum.....
 1,177 kPa (12 kg/cm², 171 psi)

WARNING:

When cranking the engine, ground the spark plug wires to prevent sparking.



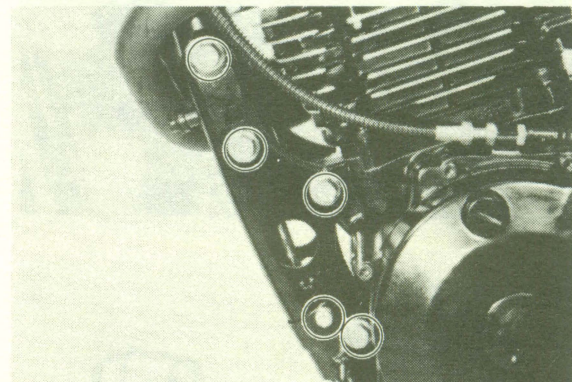
1. Compression gauge set (special tool P/N. YU-33358)
2. Compression gauge adapter (special tool P/N. YU-33358-3)

6. If the pressure is too low, squirt a few drops of oil into the cylinder. Measure compression again. If there is a higher reading than before (without oil), the piston rings may be worn or damaged. If the pressure remains the same after measuring with the oil, one or both rings and valves may be the source of the problem.

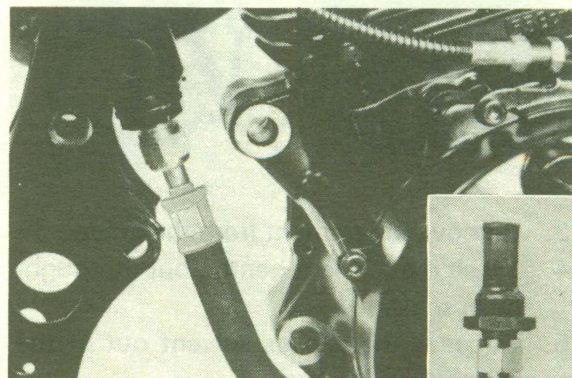
CHASSIS

A. Down Tube Strainer

1. Remove the front bracket.



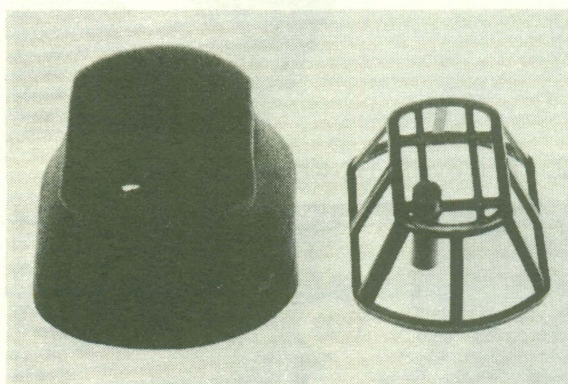
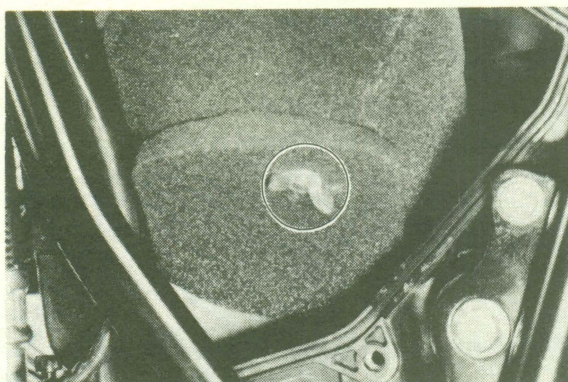
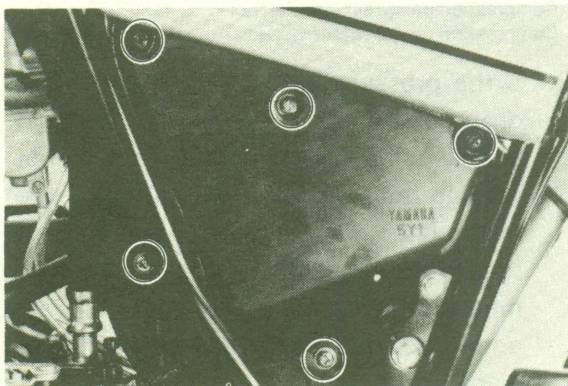
2. Remove the strainer.



3. Wash the strainer thoroughly. Replace if necessary.
4. Reinsert the strainer into the down tube.
5. Reinstall the front bracket.

B. Air Filter

1. Remove the left-hand sidecover from the motorcycle.
2. Remove the air filter cover, and remove the air filter.

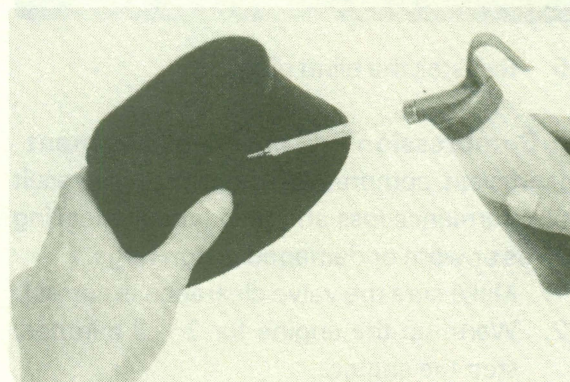


3. Remove the element from the guide.
4. Wash the element gently, but thoroughly, in solvent.
5. Squeeze the excess solvent out of the element and let dry.

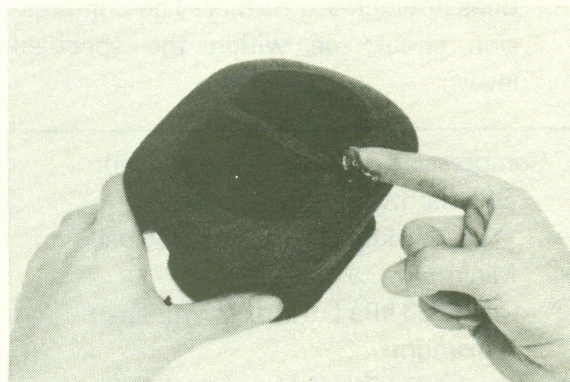
6. Pour a small quantity of Yamalube 2-cycle oil onto the filter element and work thoroughly into the porous foam material.

NOTE:

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



7. Reinsert the guide into the element.
8. Coat the mating surface of the filter with all-purpose grease for an airtight seal between the filter case and filter seat.



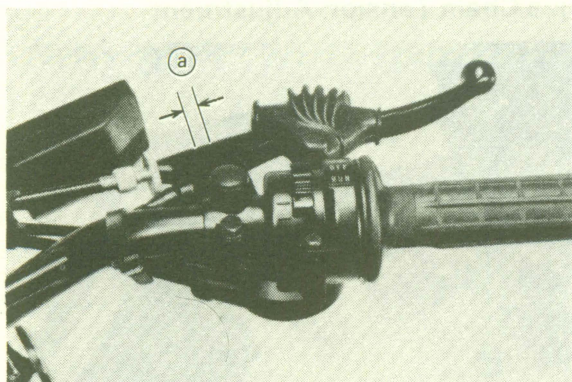
9. Install the filter element into the case.
10. Install the filter cover and sidecover.

C. Front and Rear Brake

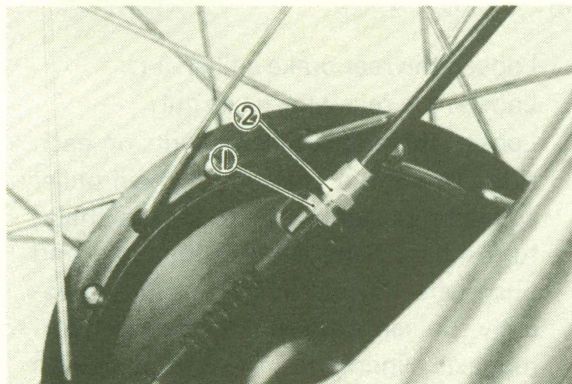
Front-brake-lever free play adjustment

The brake can be adjusted by simply adjusting the free play of the brake lever. Adjustment is accomplished at one of two places, either the handle lever holder or the front brake hub.

1. Loosen the adjuster locknut.
2. Turn the cable length adjuster in or out until adjustment is suitable.



a. 5 ~ 8 mm (0.2 ~ 0.3 in)



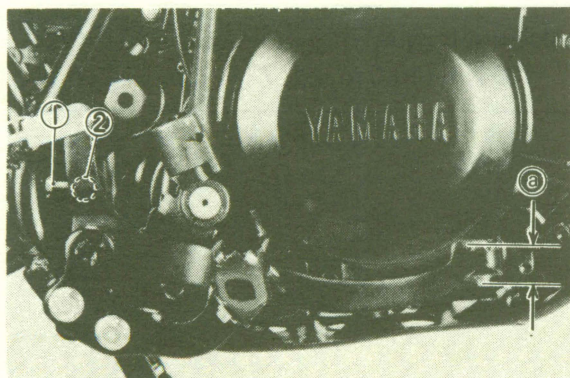
1. Locknut
2. Adjuster
3. Tighten the adjuster locknut.

Rear-brake-pedal height adjustment

1. Loosen the adjuster locknut (for pedal height).
2. By turning the adjuster bolt clockwise or counterclockwise, adjust the brake pedal position so that its top end is flush with the top of the footrest.
3. Secure the adjuster locknut.

WARNING:

After adjusting the pedal height, the brake-pedal free play should be adjusted.



1. Locknut 2. Adjuster a. 20 ~ 30 mm (0.8 ~ 1.2 in)

Rear-brake-pedal free play adjustment

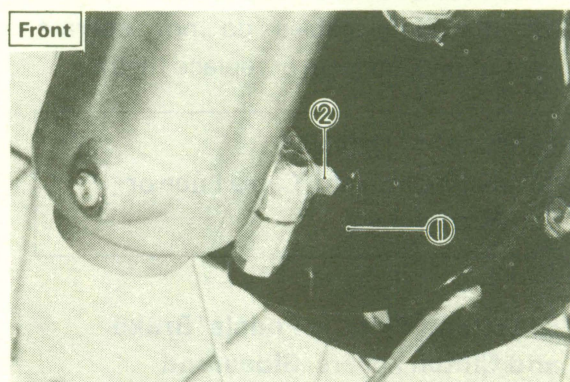
1. Turn the adjuster on the brake rod clockwise or counterclockwise to provide the brake pedal end with a free play of 20 ~ 30 mm (0.8 ~ 1.2 in).

WARNING:

Check to see whether or not the brake light operates correctly after adjusting.

Front brake shoe lining check

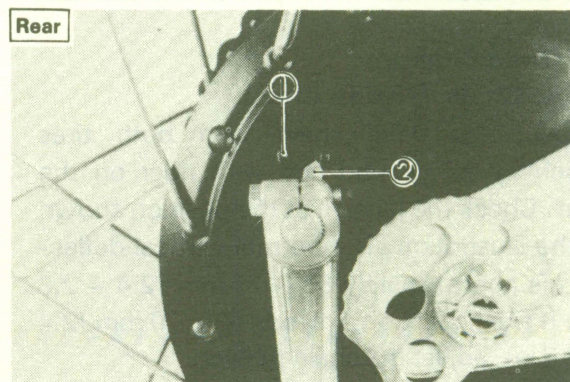
To check, examine the wear indicator position while pulling in the brake lever. If the indicator reaches to the wear limit line, replace the shoes.



1. Wear limit 2. Wear indicator

Rear brake shoe lining check

To check, examine the wear indicator position while depressing the brake pedal. If the indicator reaches to the wear limit line, replace the shoes.



1. Wear limit 2. Wear indicator

D. Cable Inspection and Lubrication

The throttle twist grip assembly should be greased when the cable is lubricated, since the grip must be removed to get at the end of the throttle cable. Two screws clamp the throttle housing to the handlebar. Once these two are removed, the end of the cable can be held high to pour in several drops of lubricant. With the throttle grip disassembled, coat the metal surface of the grip assembly with a suitable all-purpose grease to cut down friction.

1. Damage to the outer housing of the various cables may cause corrosion. Often free movement will be obstructed. An unsafe condition may result. Replace such cables as soon as possible.
2. If the inner cables do not operate smoothly, lubricate or replace them.

Recommended lubricant:

Yamaha Chain and Cable Lube or
10W30 motor oil

E. Brake and Change Pedals/Brake and Clutch Levers/Sidestand

Lubricate the pivoting parts of the lever, pedal, and sidestand.

Recommended lubricant:

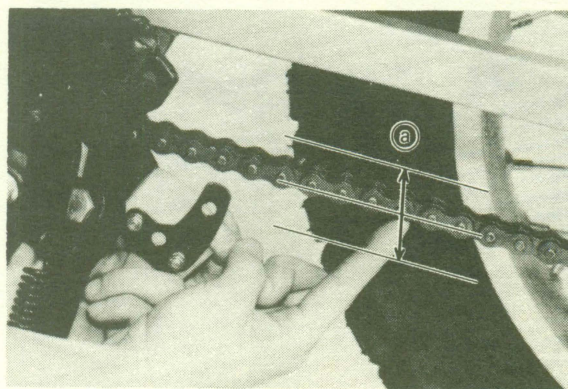
Yamaha Chain and Cable Lube or
10W30 motor oil

F. Drive Chain

Drive Chain Tension Check

Inspect the drive chain with both tires touching the ground and with rider on the seat. Check the tension at the position shown in the illustration. The normal vertical deflection is approximately 60 ~ 70 mm (2.4 ~ 2.8 in). If the deflection exceeds 60 ~ 70 mm (2.4 ~ 2.8 in), adjust the chain tension.

Drive Chain Tension Adjustment



a. 60 ~ 70 mm (2.4 ~ 2.8 in)

1. Loosen the rear brake adjust nut.
2. Loosen the rear wheel axle nut.
3. Loosen the adjust bolt locknuts on each side. To tighten chain, turn chain puller adjust bolts clockwise. To loosen chain, turn adjust bolts counterclockwise and push wheel forward. Turn each bolt exactly the same amount to maintain correct axle alignment. (There are marks on each side of rear arm and on each chain puller; use them to check for proper alignment).

Drive chain slack:

60 ~ 70 mm (2.4 ~ 2.8 in)

NOTE:

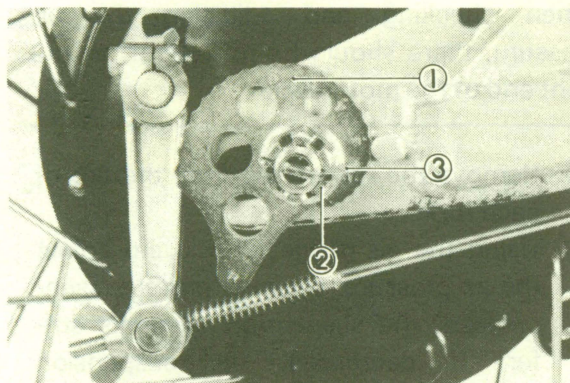
Before adjusting, rotate rear wheel through several revolutions and check tension several times to find the tightest point. Adjust chain tension with rear wheel in this "tight chain" position.

4. After adjusting be sure to tighten the locknuts and the rear wheel axle nut.

Axle nut torque:

100 Nm (10.0 m · kg, 72 ft · lb)

5. Insert the cotter pin into the rear wheel axle nut and bend the end of the cotter pin as shown in the photo (if the nut notch and the cotter pin hole do not match, tighten the nut slightly to match).



1. Chain puller 2. Axle nut 3. Cotter pin

6. In the final step, adjust the play in the brake pedal.

Drive chain lubrication

1. First, remove dirt and mud from the chain with a brush or cloth and then spray the lubricant between both rows of side plates and on all center rollers.
2. To clean the entire chain, first remove the chain from the motorcycle, dip it in solvent and clean out as possible. Then take the chain out of the solvent and dry it. Immediately lubricate the chain to prevent the formation of rust.

Recommended lubricant:

YAMAHA CHAIN AND CABLE
LUBE, or SAE 10W30 type SE
motor oil

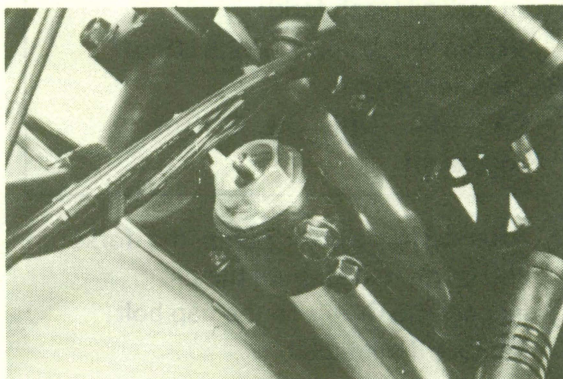
G. Front Fork Oil Change

WARNING:

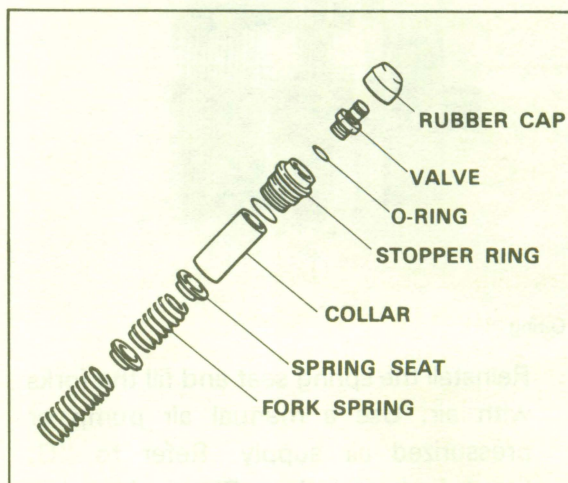
Securely support the motorcycle so there is no danger of it falling over.

1. Raise the motorcycle or remove the front wheel so that there is no weight on the front end of the motorcycle. Remove the handlebar if necessary.

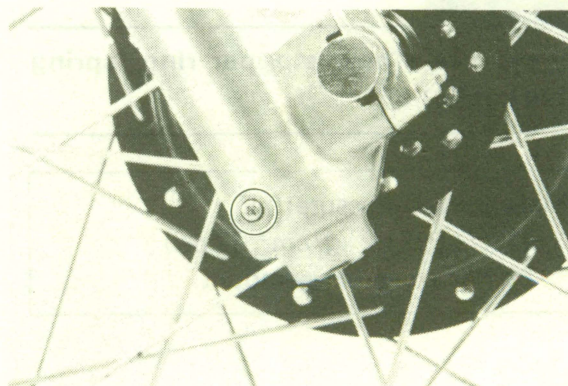
2. Remove the rubber cap from the top of each fork.
3. Keep the valve open by pressing it for several seconds so that the air can be let out of the inner tube.



4. Remove the cap bolt.



5. Place an open container under each drain hole. Remove the drain screw from each outer tube.



6. When most of the oil has drained, slowly raise and lower the outer tubes to pump out the remaining oil.

7. Inspect the drain screw gasket. Replace if damaged. Reinstall the drain screw.
8. Pour the specified amount of oil into the fork inner tube.

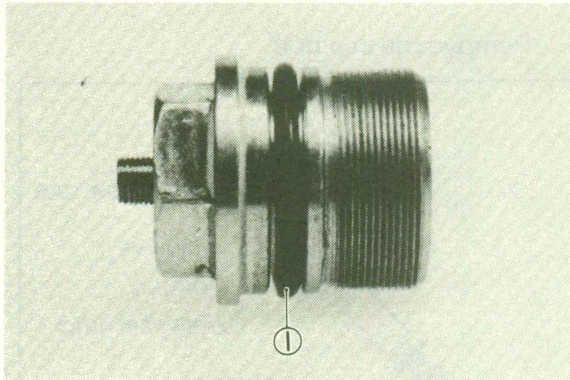
Front fork oil (each fork):

369 cm³ (13.0 Imp oz, 12.5 US oz)

Recommended oil:

KAYABA FORK OIL G-10 or equivalent

9. After filling, slowly pump the forks up and down to distribute the oil.
10. Inspect the O-ring on the cap bolt. Replace if damaged.



1. O-ring

11. Reinstall the spring seat and fill the forks with air. Use a manual air pump or pressurized air supply. Refer to "G. Front Fork and Rear Shock Absorber Adjustment" for proper air-pressure adjusting procedures.

CAUTION:

Always use a new stopper ring (spring cable circlip).

Maximum air pressure:

117.7 kPa (1.2 kg/cm², 17 psi)

Do not exceed this amount.

H. Front Fork and Rear Shock Absorber Adjustment

Front fork

1. Place the motorcycle on the stand, and elevate the front wheel.

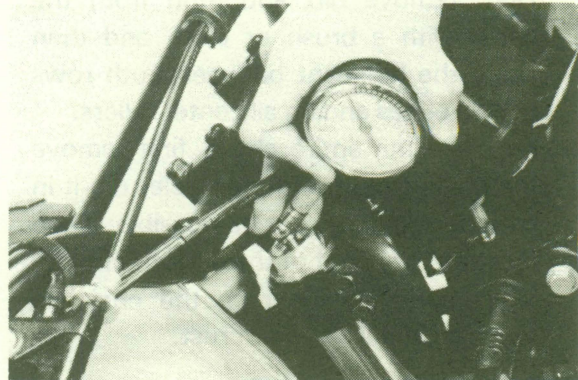
NOTE:

When checking and adjusting the air pressure, there should be no weight on the front end of the motorcycle.

2. Remove the rubber cap from the top of each fork.
3. Using the air gauge, check and adjust the air pressure. If the air pressure is increased, the suspension becomes stiffer; if decreased, the suspension becomes softer.

To increase air pressure: Use a manual air pump or pressurized air supply.

To decrease air pressure: Release the air by pushing the valve pin.



Standard air pressure:

39.2 kPa (0.4 kg/cm², 5.7 psi)

Maximum air pressure:

117.7 kPa (1.2 kg/cm², 17 psi)

Minimum air pressure: Zero

* Never exceed the maximum pressure or oil seal damage may occur.

* The difference between both the left and right tubes should be 9.8 kPa (0.1 kg/cm², 1.4 psi) or less.

4. Reinstall the rubber cap.

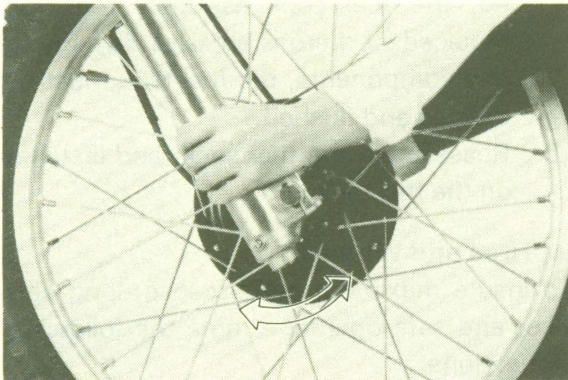
Rear shock absorber

See Chapter 5 "Rear Shock Absorber".

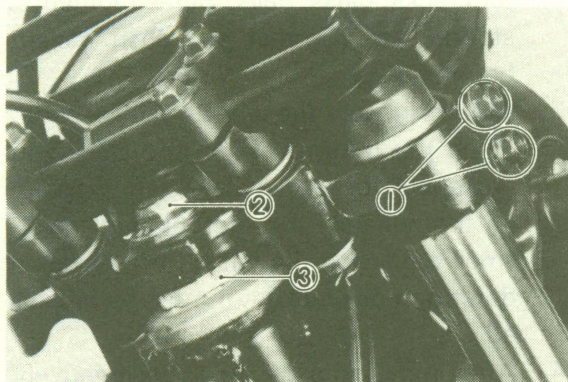
I. Steering Head Adjustment

The steering assembly should be checked periodically for looseness.

1. Raise the front end of the motorcycle so that there is no weight on the front wheel.
2. Grasp the bottom of the forks and gently rock the fork assembly backward and forward, checking for looseness in the steering assembly bearings.



3. If the steering head is loose, adjust it. Loosen the steering fitting bolt and front fork pinch bolts.

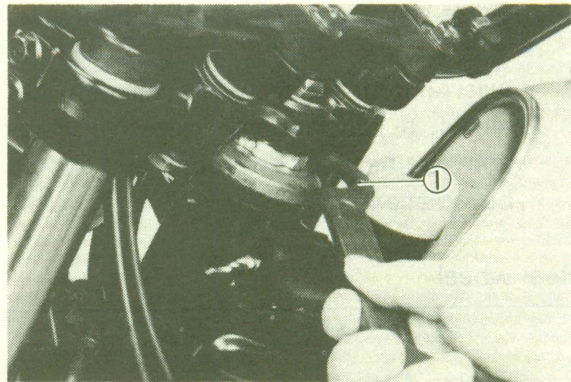


1. Front fork pinch bolt 2. Steering fitting bolt
3. Steering ring nut.

4. Using the ring nut wrench, adjust the steering ring nut until steering head is tight without binding when the forks are turned.

NOTE:

Excessive tightening of this nut will cause rapid wear of the bearings and races. Recheck for looseness and freedom of movement.



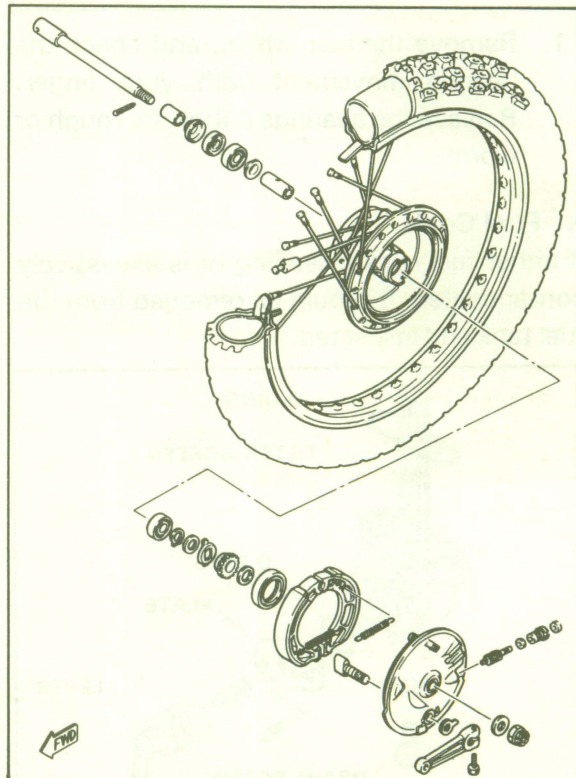
1. Ring nut wrench

5. Retighten the top steering fitting nut, steering fitting bolt, and steering stem, and the front fork pinch bolts in that order.
6. Recheck steering adjustment to make sure there is no binding when the forks are moved from lock to lock. If necessary, repeat the adjustment procedure.

J. Wheel Bearings

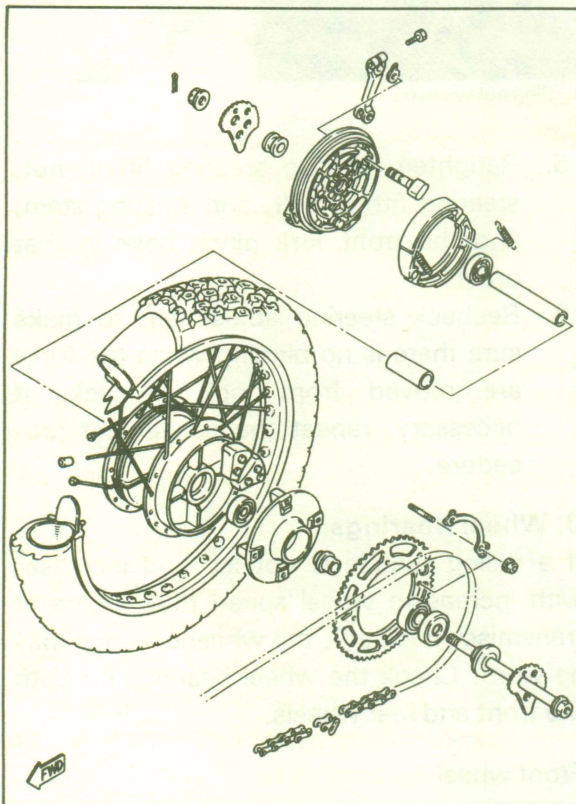
If a rolling rumble is noticed and increases with increasing wheel speed (not engine or transmission speed), the wheel bearings may be worn. Check the wheel bearings on both the front and rear wheels.

Front wheel



1. Raise the front end of the motorcycle, and spin the wheel by hand. Touch the axle or front fender while spinning the wheel. If you feel any excessive vibration, the bearings are rough and should be replaced.

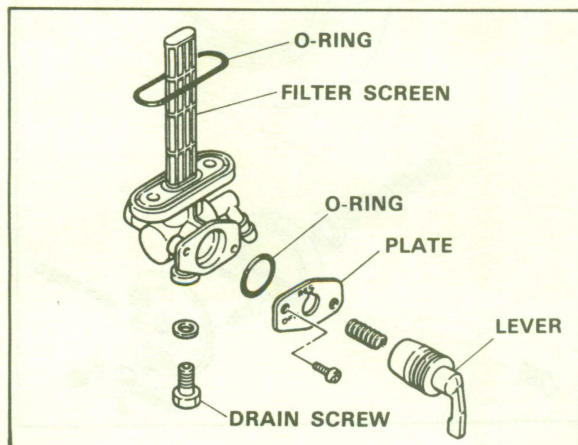
Rear wheel



1. Remove the rear wheel, and check the bearing movement with your finger. Replace the bearings if they are rough or worn.

K. Fuel Cock

If either fuel cock is leaking or is excessively contaminated, it should be removed from the fuel tank and inspected.



1. Remove the fuel tank and position it so that fuel will not spill when the fuel cock is removed.
2. Remove the fuel cock and inspect the filter screen. Replace the fuel cock assembly if it is seriously contaminated.
3. Remove the screws on the front and rear of the fuel cock; remove the plate, gaskets, lever, and O-rings.
4. Inspect all components, and replace any that are damaged. If the O-rings are damaged in any way or if the fuel cock gasket surfaces are scratched or corroded, the fuel cock assembly must be replaced. If there is abrasive damage to any components, the fuel tank must be drained and flushed.
5. Reassemble the fuel cock, and install it on the fuel tank.

L. Tires and Wheels

To insure maximum performance, long service, and safe operation, note the following precautions:

1. Check tire pressure before riding; adjust as necessary.
2. Before operation, always check the tire surfaces for wear and/or damage; look for cracks, glass, nails, metal fragments, stones, etc. Correct any such hazard before riding.
3. Always inspect the wheels before a ride. Place the motorcycle on the sidestand and check for cracks, bends, or warpage of the wheels. Do not attempt even small repairs to the wheel. If a wheel is deformed or cracked, it must be replaced.
4. After installing a tire, ride conservatively to allow the tire to seat itself on the rim properly. Failure to allow proper seating may cause tire failure resulting in damage to the motorcycle and injury to the rider.
5. After repairing or replacing a tire, check to be sure the bead stopper locknut is securely fastened. If not, torque it as specified.

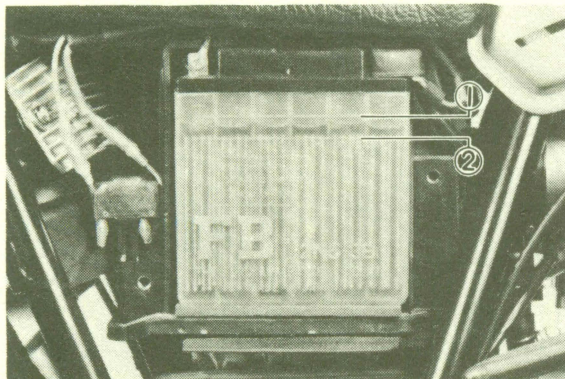
TIGHTENING TORQUE:

10 Nm (1.0 m · kg, 7.2 ft · lb)

ELECTRICAL

A. Battery

1. The fluid level should be between the upper and lower level marks. Use only distilled water if refilling is necessary.



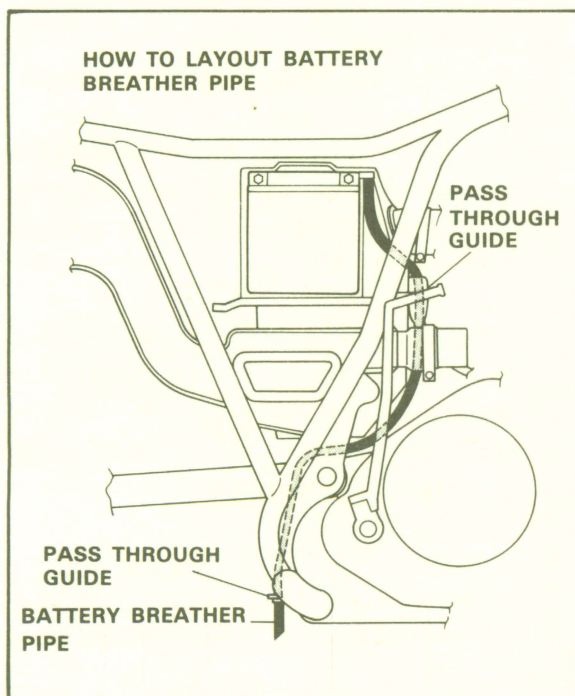
1. Upper level

2. Lower level

CAUTION:

Normal tap water contains minerals which are harmful to a battery; therefore, refill only with distilled water.

2. Always make sure the connections are correct when installing the battery. Make sure the breather pipe is properly connected, properly routed, and is not damaged or obstructed.



CAUTION:

The battery must be charged before using to ensure maximum performance. Failure to charge the battery properly before first use or a low electrolyte level will cause premature failure of the battery. Charging current: 1.6 amps/10 hrs. or until the specific gravity reaches 1.280 at 20°C (68°F).

WARNING:

Battery electrolyte is poisonous and dangerous, causing severe burns, etc. It contains sulfuric acid. Avoid contact with skin, eyes, or clothing.

Antidote: EXTERNAL — Flush with water.

INTERNAL — Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call physician immediately.

Eyes: Flush with water for 15 minutes and get prompt medical attention. Batteries produce explosive gases. Keep sparks, flame, cigarettes, etc. away. Ventilate when charging or using in closed space. Always shield eyes when working near batteries.

KEEP OUT OF REACH OF CHILDREN.

B. Circuit Breaker

This model is equipped with the circuit breaker.

The circuit breaker is located at the rear side of the battery.



1. Circuit breaker

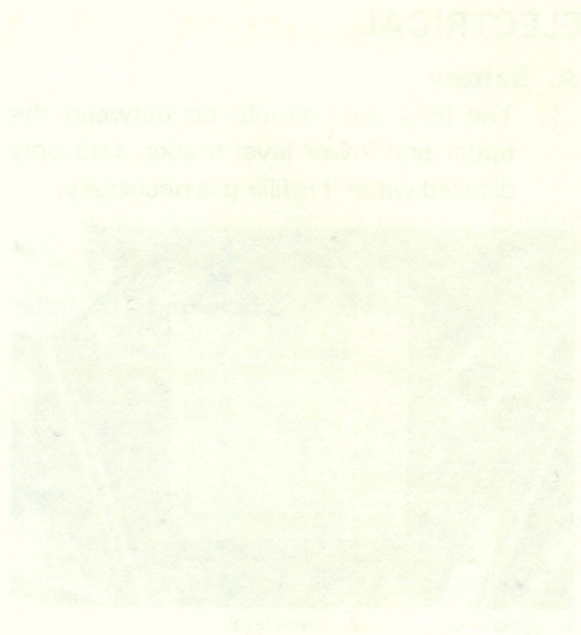
If the breaker is open, turn off the ignition switch and the switch in the circuit in question; reset the breaker. Turn on the switches, and see if the electrical device operates. If the breaker immediately opens again, check the circuit in question. (See Chapter 6. "ELECTRICAL".)

CAUTION:

Wait 30 seconds before resetting the circuit breaker.

Battery electrolyte is corrosive and dangerous, causing severe burns. It contains sulfuric acid. Avoid contact with skin, eyes or clothing. Antidote: EXTERNAL - Flush with water. INTERNAL - Drink large amounts of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call physician immediately. Eyes: Flush with water for 15 minutes and get prompt medical attention. First aid: Remove clothing, jewelry, etc. Keep patient calm. Do not induce vomiting. Ventilate when charging or working in close space. Always shield eyes when working near batteries. KEEP OUT OF REACH OF CHILDREN

B. Circuit Breaker
This model is equipped with the circuit breaker. The circuit breaker is located at the rear of the battery.



Normal tap water contains impurities and harmful to a battery. Distilled, tap or only with distilled water.

1. Always make sure the connections are correct when making the battery. Make sure the positive pole is properly connected, properly coated, and is not damaged or corroded.



CHAPTER 3. ENGINE OVERHAUL

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ENGINE OVERHAUL

ENGINE REMOVAL

NOTE: _____

It is not necessary to remove the engine in order to remove the clutch and/or the AC magneto.

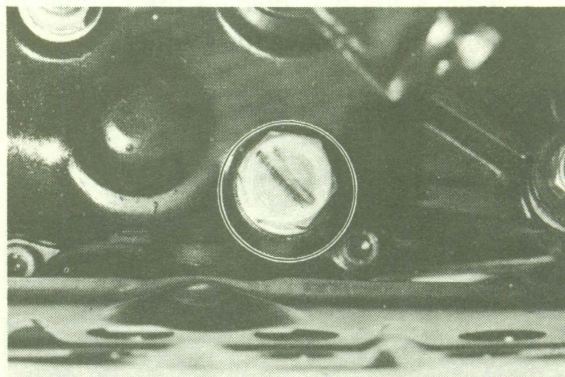
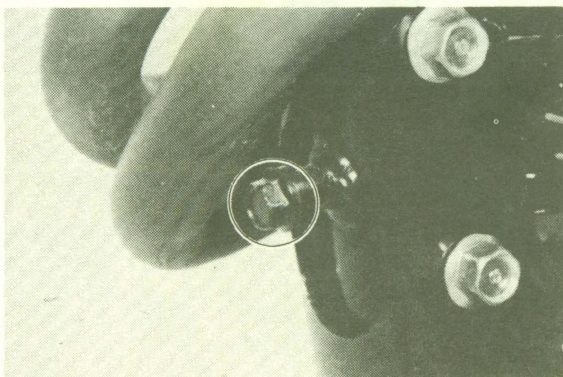
A. Preparation for Removal

1. All dirt, mud, dust, and foreign material must be removed from the engine before removal and disassembly. This will help keep foreign material out of the engine oil.
2. Before engine removal and disassembly, be sure that you have the proper tools and cleaning equipment. With them, you can perform a clean and efficient job.

NOTE: _____

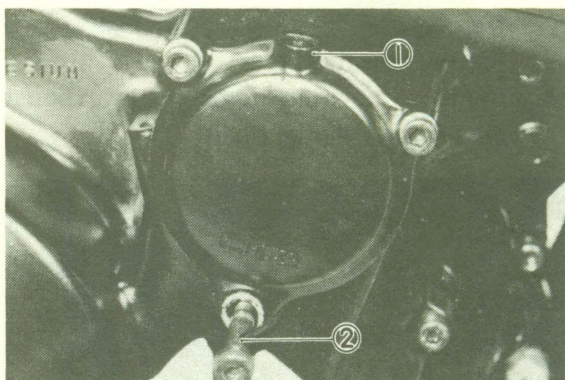
When disassembling the engine, keep mated parts together. This includes gears, cylinders, pistons, and other parts that have been "mated" through normal wear. Mated parts must be reused as an assembly or replaced.

3. During engine disassembly, clean all parts and place them in trays in the order of disassembly. This will speed up assembly time and help assure that all parts are correctly reinstalled in the engine.
4. Start the engine and let it warm-up. Stop the engine and drain the engine oil.



NOTE: _____

Remove the air bleed screw and then loosen the filter cover screw.

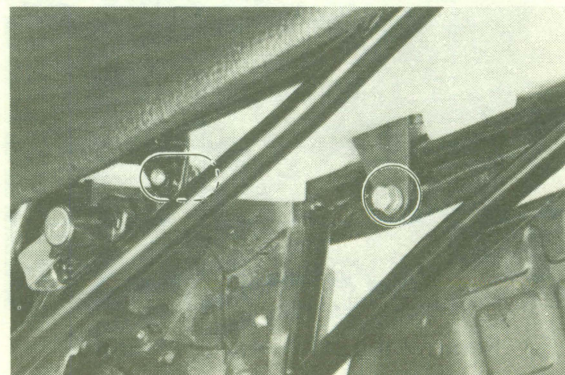


1. Air bleed screw 2. Filter cover screw

5. Remove the left and right sidecovers.

B. Seat and Fuel Tank

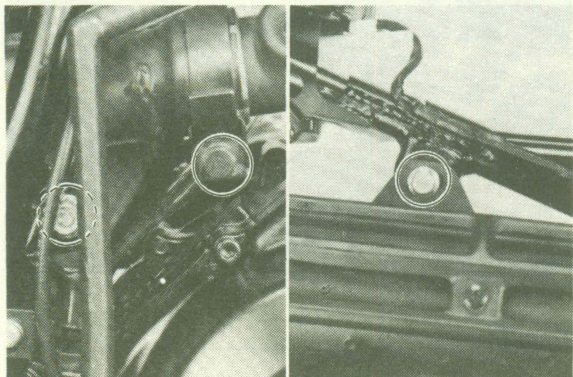
1. Turn the fuel cock to "OFF".
2. Loosen the seat securing bolts and remove the seat.



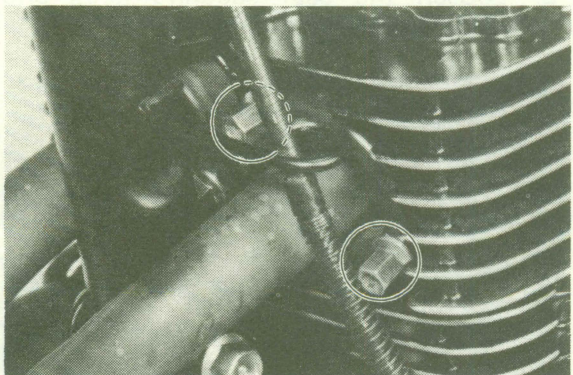
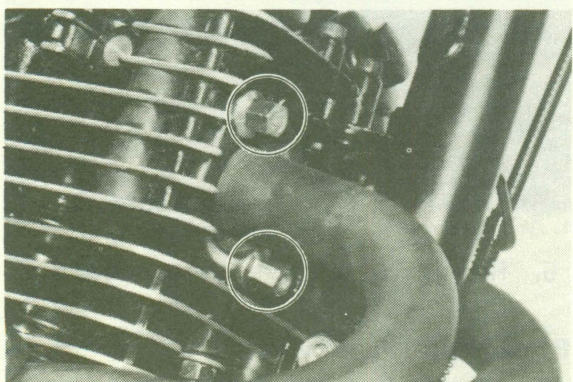
3. Loosen the fuel tank securing bolt and remove the fuel tank.

C. Muffler, Footrest and Brake Pedal

1. Loosen the muffler band bolt and remove the bolt holding the muffler to the frame. Remove the muffler.



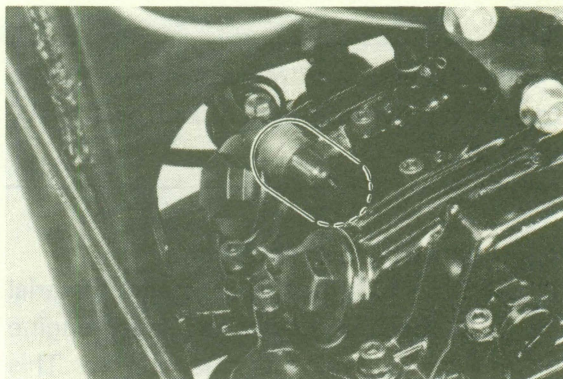
2. Loosen and remove the bolts holding the air cleaner and mud guard to the frame.
3. Remove the muffler.
4. Remove the nuts holding the exhaust pipe to the cylinder head.



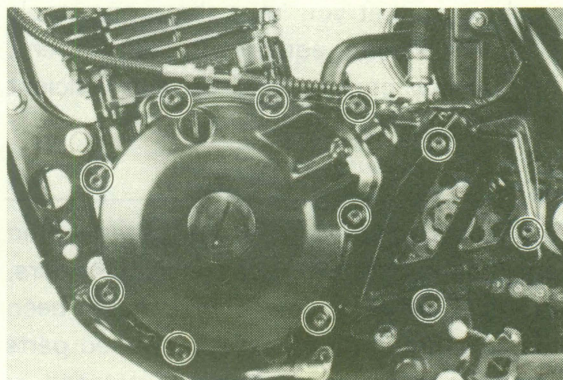
5. Remove the exhaust pipe assembly.
6. Remove the right side footrest with the brake pedal.

D. Oil Hoses

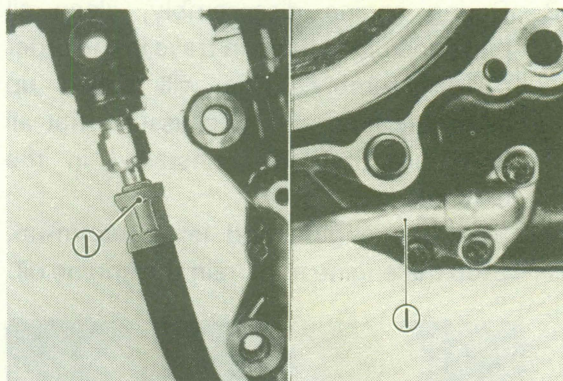
1. Remove the spark plug cap.
2. Remove the breather pipe.



3. Remove change pedal.
4. Remove the left crankcase cover.

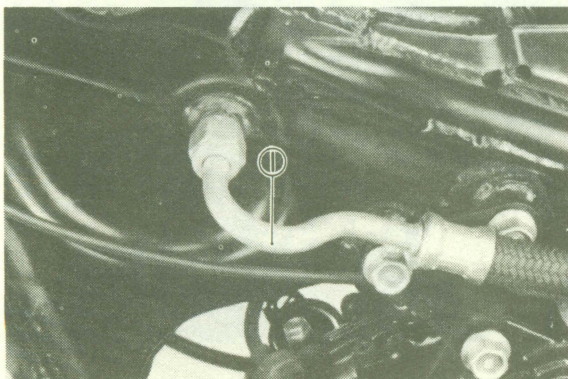


5. Remove the oil hose (Inlet).



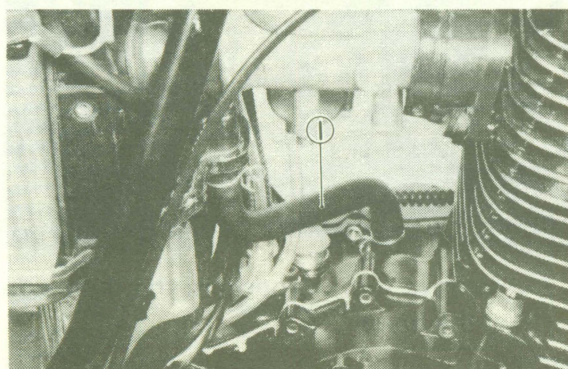
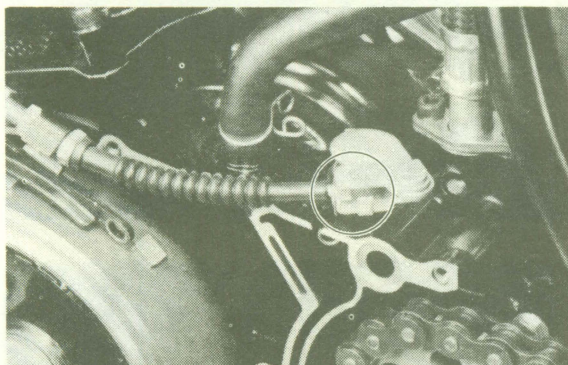
1. Oil hose (inlet)

6. Remove the oil hose (Outlet) and ventilation hose.



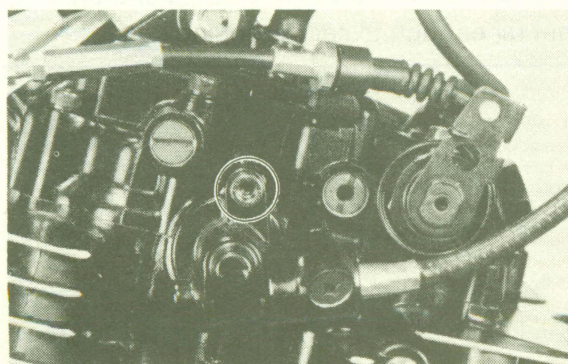
1. Oil hose (outlet) 2. Ventilation hose

7. Remove the clutch cable at handle lever first and then at clutch-push lever. Next, remove breather assembly.



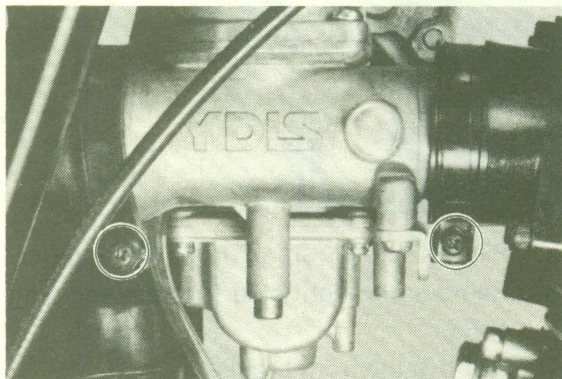
1. Breather pipe

8. Remove the tachometer gear unit assembly.

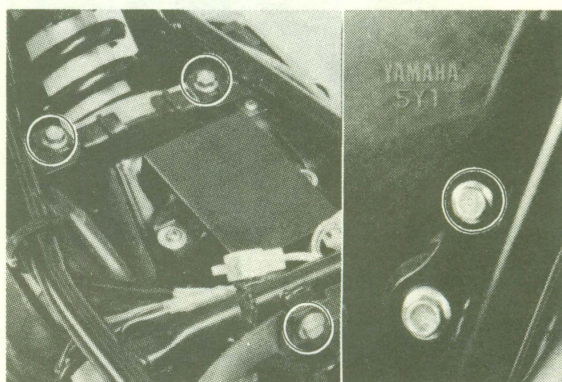


E. Carburetor

1. Remove the throttle cables and starter cable.
2. Remove the carburetor joint holding bolts (2) and loosen carburetor hose clamp (air cleaner side) as shown in the photo.



3. Remove the mud guard securing bolt.
4. Remove the air cleaner case securing bolts and move the case backward.



5. Remove carburetor assembly, pulling carburetor toward you.

NOTE:

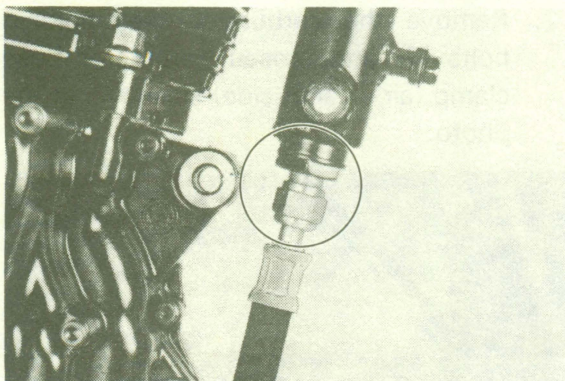
Noting the presence, location, and routing of all vent and overflow tubes, remove carburetor.

F. Drive Chain and Drive Sprocket

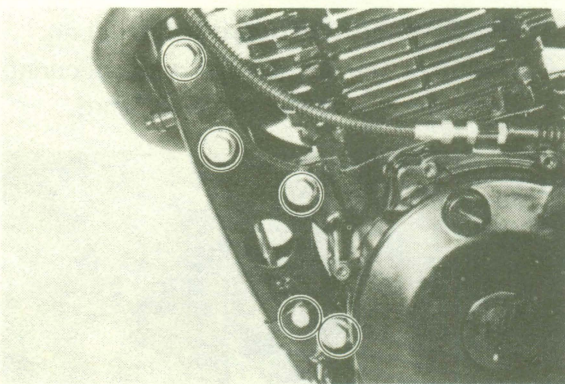
1. Bring master link clip slightly before the sprocket wheel, and remove the chain joint clip and joint plate.
2. Using a chain cutter, separate the chain.

G. Engine Mounting Bolts

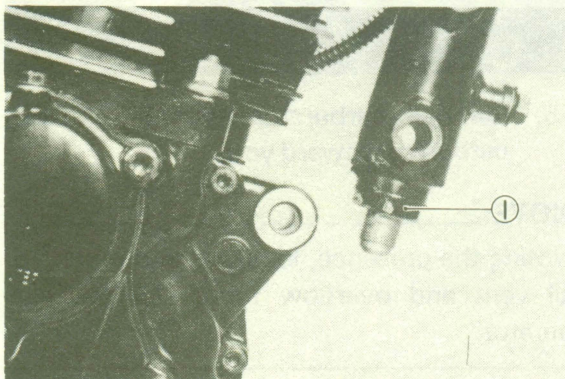
1. Loosen the engine protector securing bolts and remove the engine protector.



2. Place a suitable stand under the engine.
3. Remove the right side footrest securing bolts.
4. Remove the front bracket.

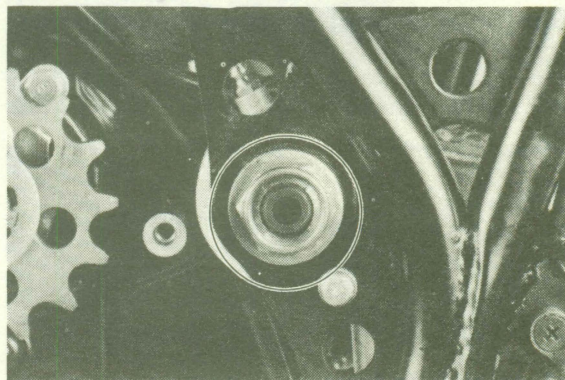
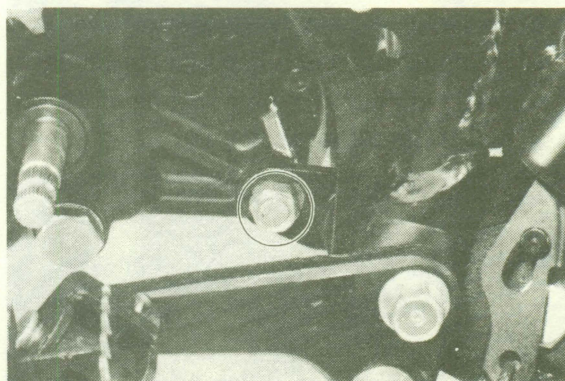
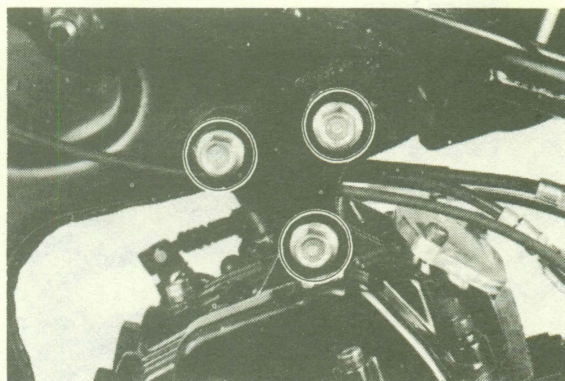


5. Remove the down tube strainer.



1. Down tube strainer.

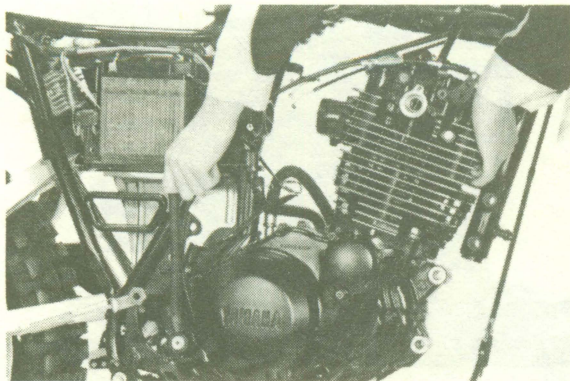
6. Remove the engine mounting bolts.



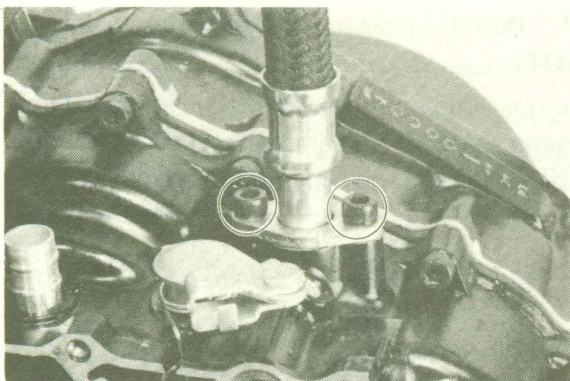
7. Remove the engine from the right side of the frame.

NOTE:

The engine and rear arm are installed using the same pivot shaft. Therefore, take care so that the pivot shaft is not pulled entirely out, but far enough to set the engine free.

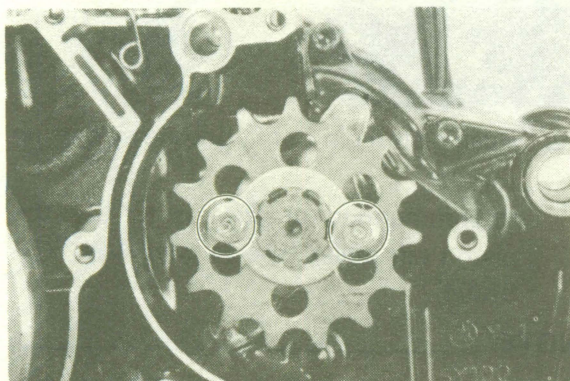


8. Remove oil hose.

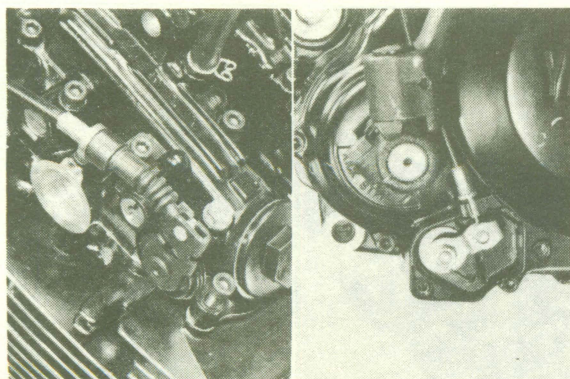


1. Oil hose (outlet)

9. Loosen the sprocket securing bolts and remove the holder plate.



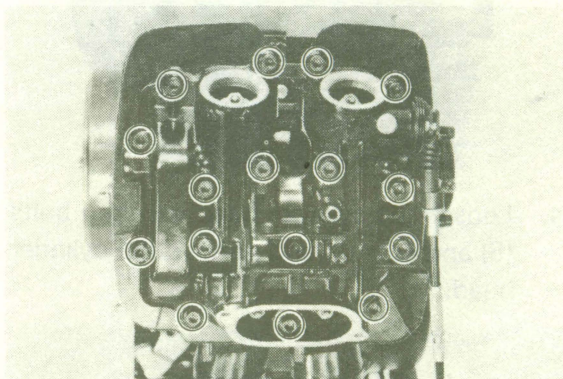
10. Remove decompression wire.



DISASSEMBLY

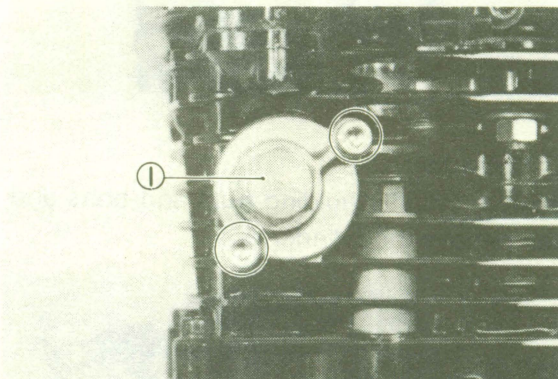
A. Cylinder Head Cover

1. Remove the spark plug.
2. Remove the inlet and exhaust valve covers.
3. Loosen the cylinder head cover securing bolts (16) and remove the cylinder head cover.



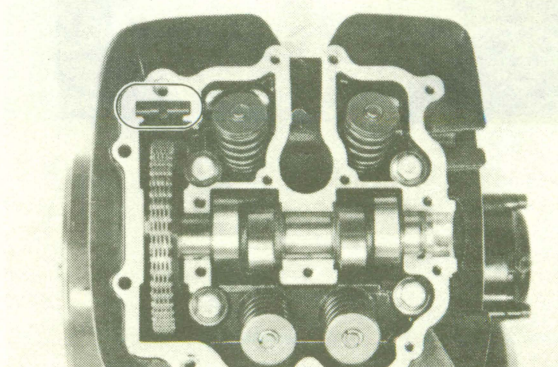
B. Cylinder Head

1. Loosen the cam chain tensioner end plug and tensioner securing bolts, and remove the cam chain tensioner assembly.

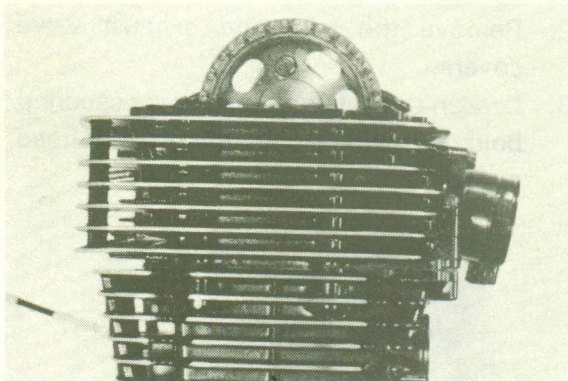


1. End plug

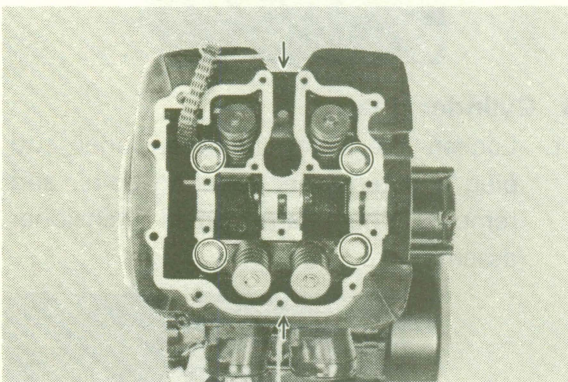
2. Remove the cam chain guide stopper (Front).



3. Loosen the cam sprocket securing bolts (2) and remove the cam sprocket and the cam shaft.

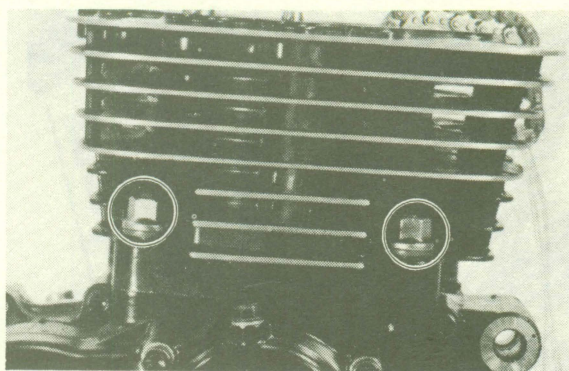
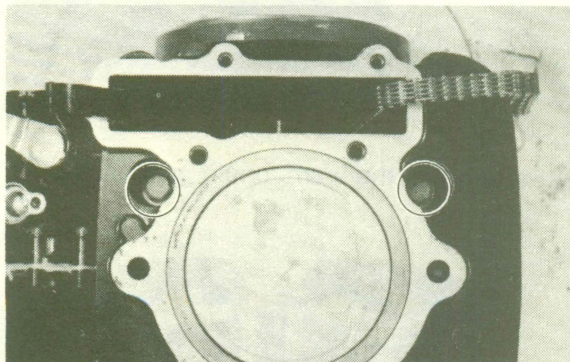


4. Loosen the cylinder head securing bolts (5) and nuts (2) and remove the cylinder head.



C. Cylinder

Remove cylinder holding nuts and bolts and then remove the cylinder.

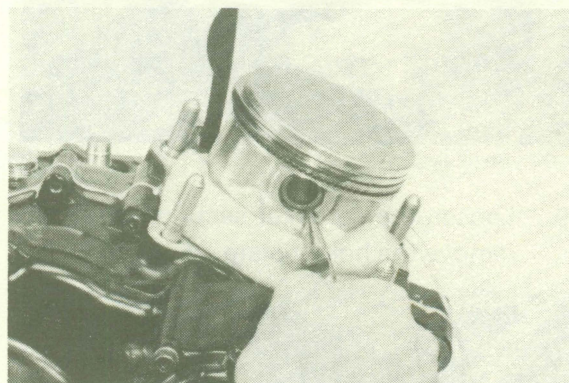


D. Piston Pin and Piston

1. Remove piston pin clip (1) from piston.

NOTE:

Before removing the piston pin clip, cover the crankcase with a clean rag so you will not accidentally drop the clip into the crankcase.



2. Push piston pin from opposite side, then pull out.

Recommended practice is to use the piston pin puller (special tool P/N. YU-01304).

NOTE:

Before removing piston pin, deburr clip groove and pin hole area.

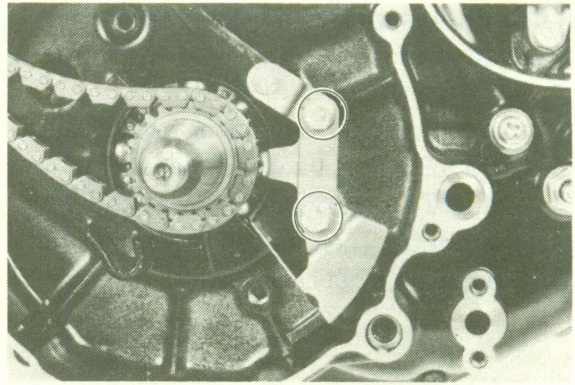


E. Kick Crank

Loosen the kick crank securing bolt and remove the kick crank.

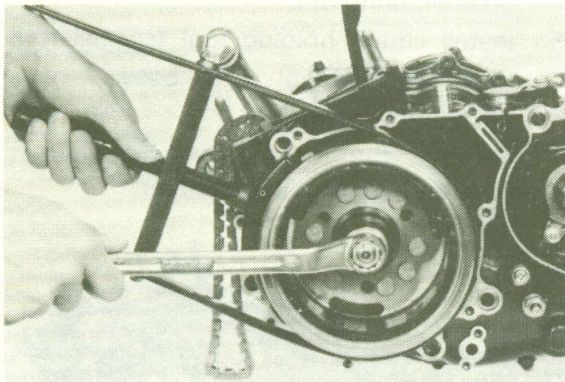
NOTE:

The bolt must be completely removed from the kick crank.



F. C.D.I. Rotor

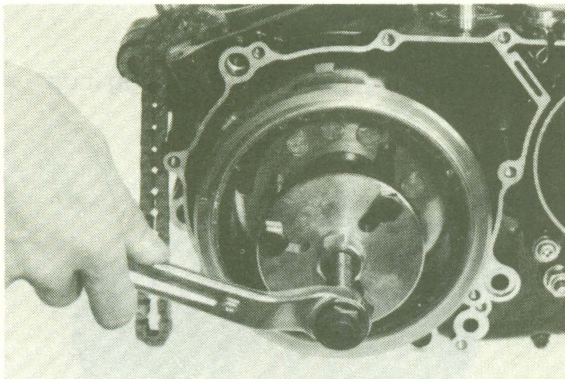
1. Loosen the rotor securing nut by using the rotor holding tool (special tool P/N. YS-01880 (90890-01701)).



NOTE:

Don't allow the tool to touch the projections.

2. Remove the rotor by using the rotor puller (special tool P/N. YU-90105).

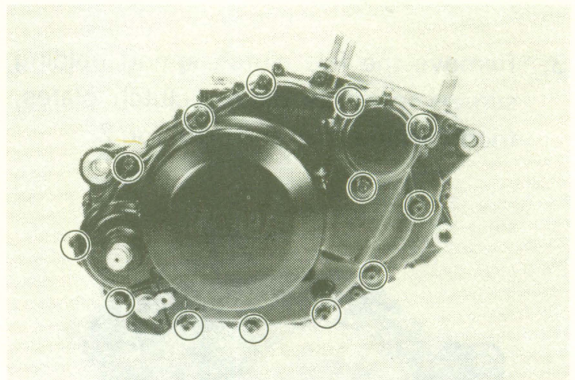


G. Cam Chain and Guide Stopper

Loosen the guide stopper securing bolts and remove the guide stopper, baffle plate, and cam chain.

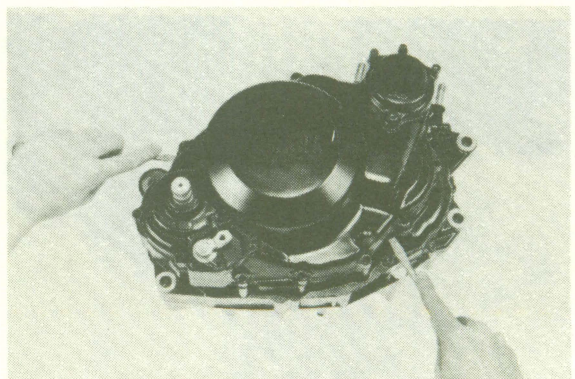
H. Crankcase Cover (Right)

1. Remove the oil filter cover holding bolts (3) and the cover.
2. Remove the oil filter element.
3. Remove the crankcase cover holding bolts and the cover.



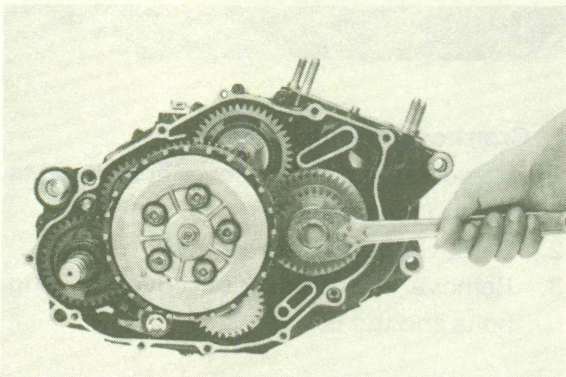
NOTE:

For this removal, slits in the crankcase can be used as shown in the photo.

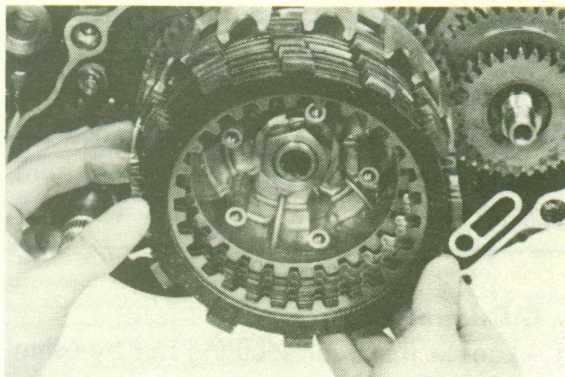
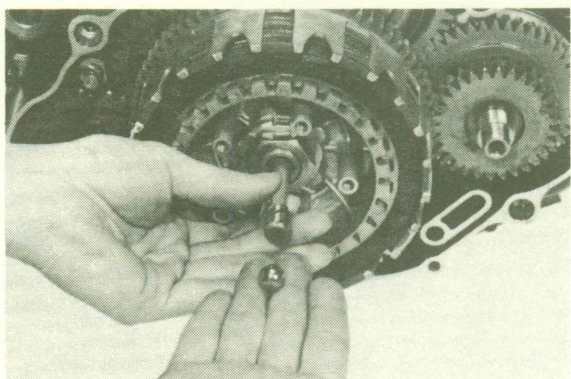
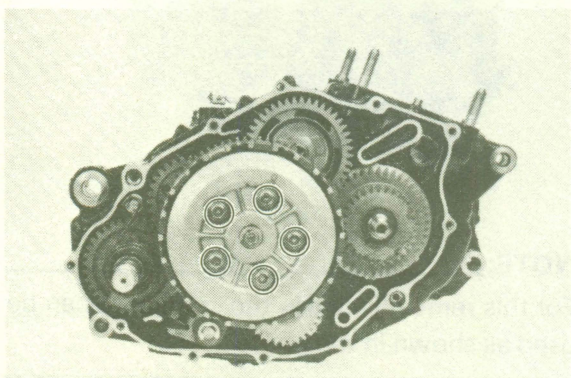


I. Clutch Assembly and Drive Gear

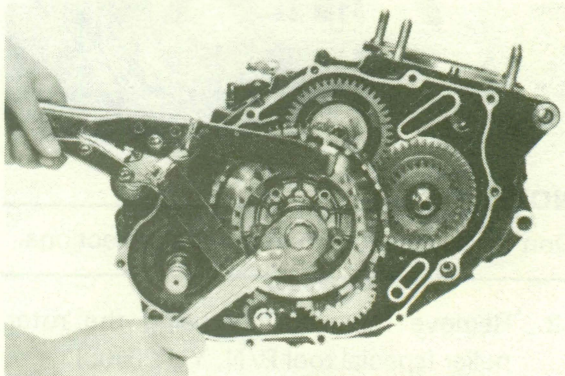
1. Flatten the lock washer on the primary drive gear.
2. Loosen primary drive gear by first placing a folded rag between the teeth of the primary gears to lock them as shown in the photo. Then loosen drive gear nut. Remove the nut and washer.



3. Remove the five clutch spring holding screws, pressure plates, clutch plates, friction plates, ball and push rod 2.

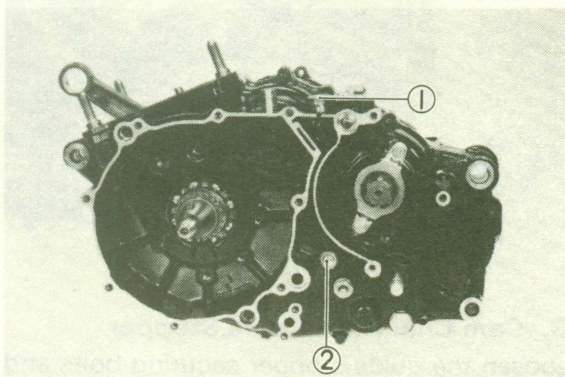


4. Flatten the lock washer on the clutch boss securing nut.
5. Install clutch holding tool (special tool P/N. YM-91042) on clutch boss. Loosen the locknut. Remove the locknut, washer, clutch boss and housing in that order.



J. Clutch Push Lever Axle

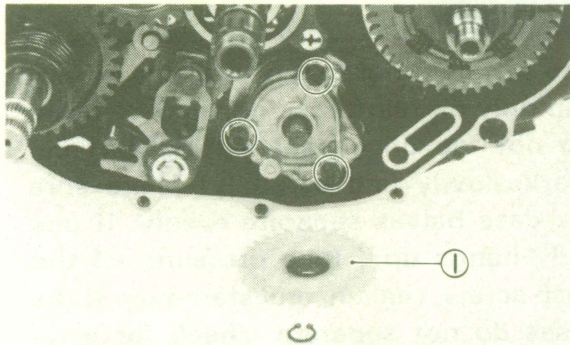
Remove the push lever axle by pulling it up.



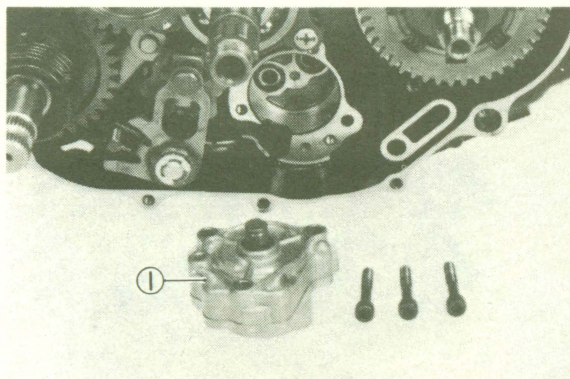
1. Push lever
2. Set screw

K. Oil Pump Assembly

Remove the pump idle gear clip and then loosen the pump cover securing bolts and remove the oil pump assembly.



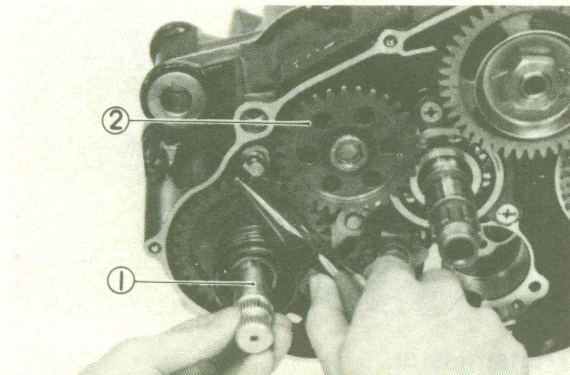
1. Pump gear



1. Oil pump assembly

L. Kick Axle Assembly

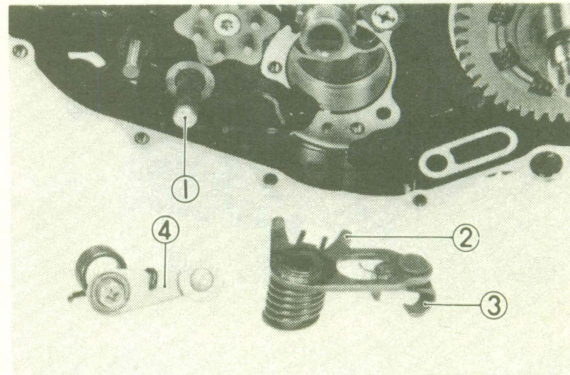
1. Remove the kick axle assembly by pulling toward you.
2. Remove the kick idle gear.



1. Kick axle assembly 2. Kick idle gear

M. Change Shaft Assembly

1. Pull the shift shaft out from the right-hand side.
2. Remove the shift lever 2 with the shift lever 3 as an assembly, and then remove the stopper lever assembly with the torsion spring.

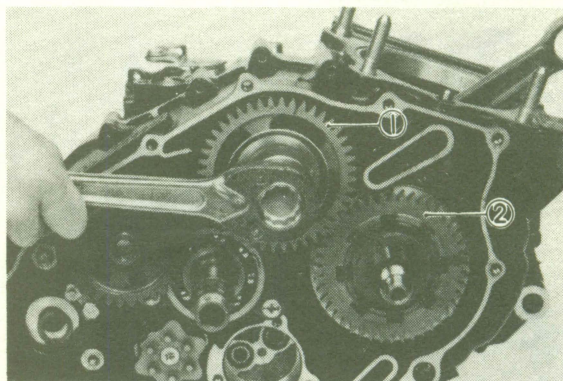


1. Shift shaft
2. Shift lever 2

3. Shift lever 3
4. Stopper lever assembly

N. Balancer Gear

1. Flatten the lock washer on the balancer gear shaft.
2. First place a folded rag between the teeth of the drive gear and balancer gear to lock them. Then loosen the balancer gear securing nut.
3. Remove the balancer gear, the washers, and the key.
4. Remove the drive gear and the key.

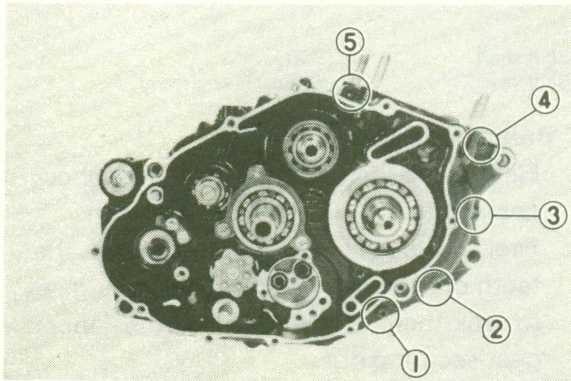
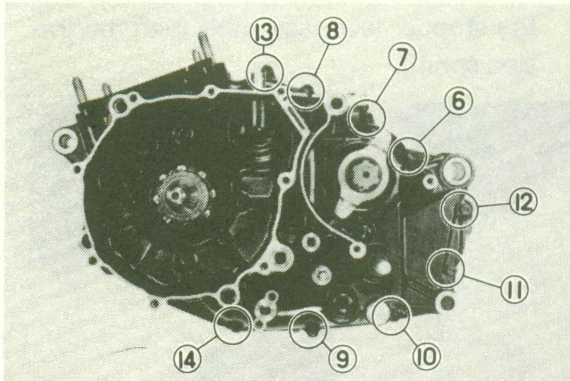


1. Balancer gear

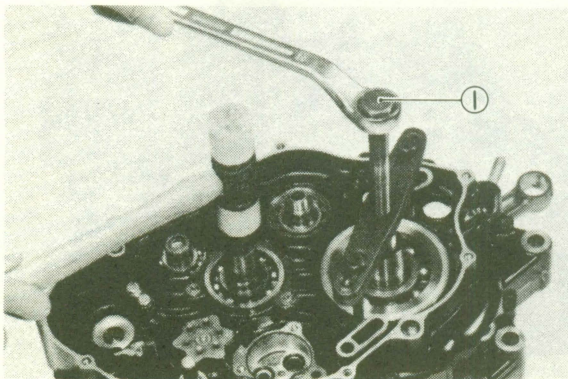
2. Drive gear

O. Crankcase

1. Working in a crisscross pattern, loosen hexagon bolts 1/4 turn each. Remove them after all are loosened.



2. Remove the right crankcase with the crankcase separation tool. (Special tool P/N. YU-01135).



1. Crankcase separation tool

NOTE:

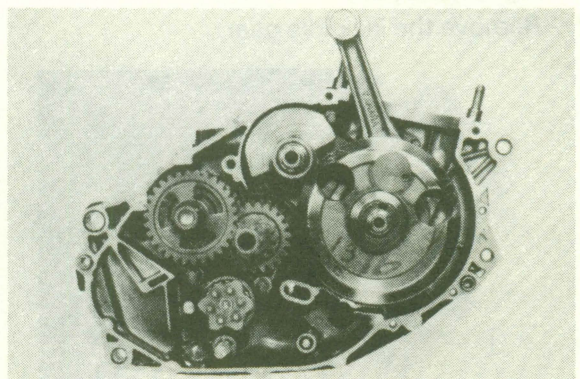
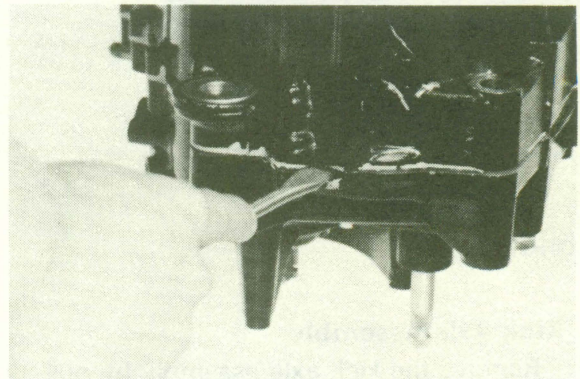
Fully tighten the tool securing bolts, but make sure the tool body is parallel with the case. If necessary, one screw may be backed out slightly to level tool body.

3. As pressure is applied, alternately tap on the front engine mounting boss, the transmission shafts, and the shift drum.

CAUTION:

Use soft hammer to tap on the case half. Tap only on reinforced portions of case. Do not tap on gasket mating surface. Work slowly and carefully. Make sure the case halves separate evenly. If one end "hangs up," take pressure off the push screw, realign, and start over. If the cases do not separate, check for a remaining case screw or fitting. Do not force.

For this removal, slits in the crankcase can be used as shown in the photo.

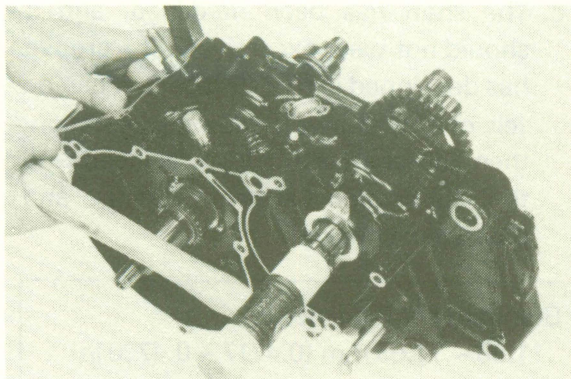


P. Transmission

Remove the transmission shaft, shift forks, and shift cam. Tap lightly on the transmission drive shaft with a soft hammer to remove.

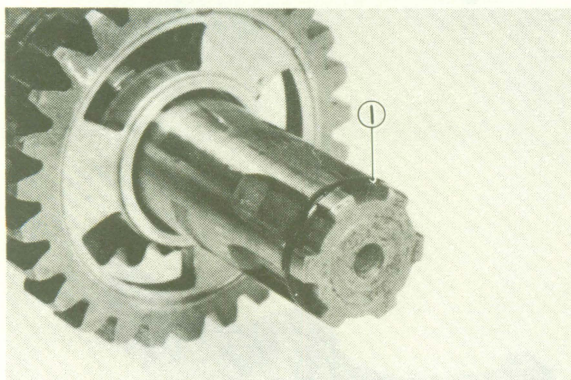
NOTE:

Remove assembly carefully. Note the position of each part. Pay particular attention to the location and direction of shift forks.



NOTE:

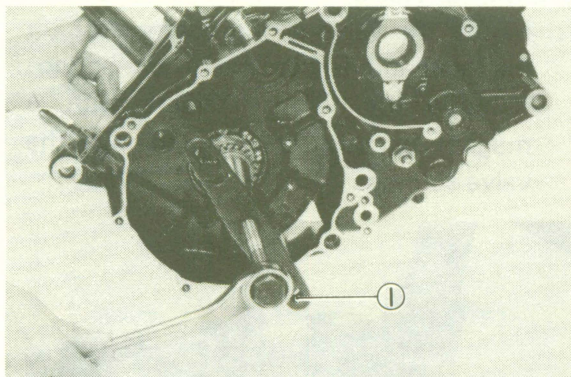
While removing the drive axle from the crankcase, pay careful attention to the oilseal lip. A recommended practice is to fit the O-ring and to apply grease over the fitted area.



1. O-ring

Q. Crankshaft

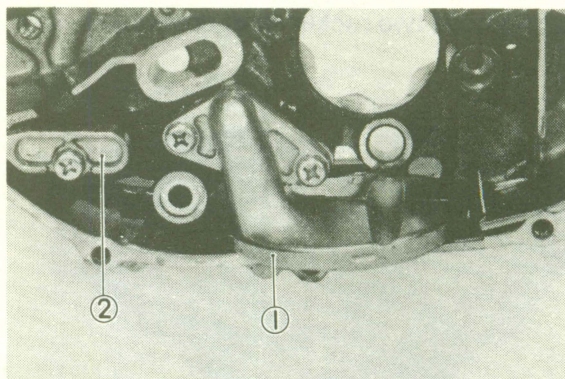
Remove crankshaft assembly with the crankcase separation tool. (Special tool P/N. YU-01135).



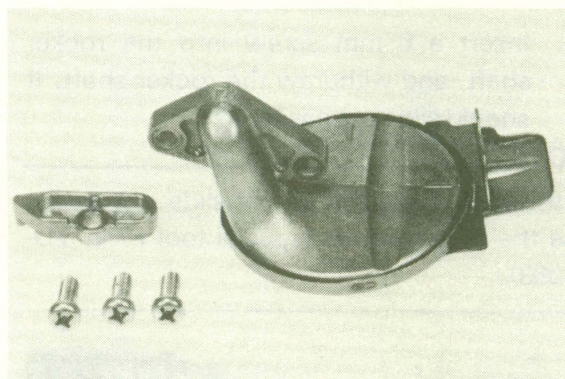
1. Crankcase separation tool

R. Oil Strainer Assembly

Remove the oil strainer and oil passage cover.



1. Oil strainer 2. Oil passage cover



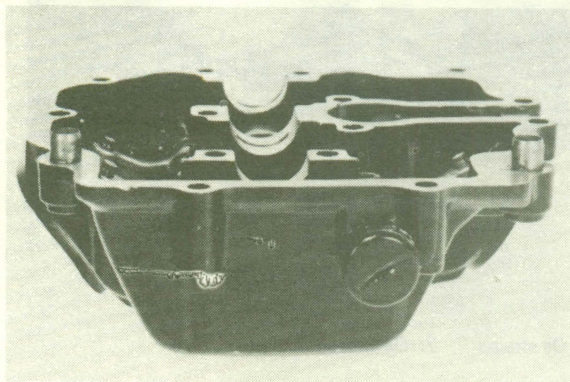
NOTE:

It is recommended that the oil strainer be replaced whenever the engine is disassembled.

INSPECTION AND REPAIRING

A. Cylinder Head Cover

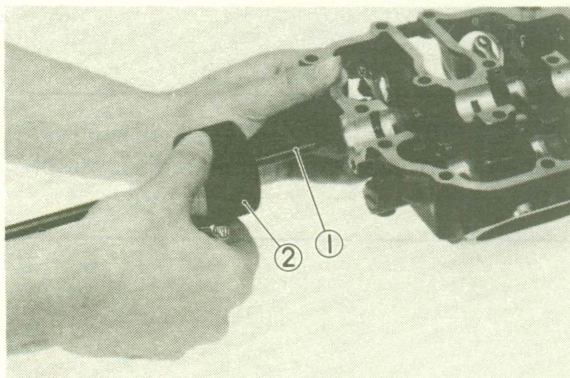
1. Remove two rocker shaft covers.



2. Insert a 6 mm screw into the rocker shaft, and withdraw the rocker shaft. It should slide out easily.

NOTE:

If the rocker shaft does not slide out easily, use the slide hammer (special tool P/N. YU-01083).



1. Bolt P/N YU-01083-1 2. Weight P/N YU-01083-3

3. Rocker arm and rocker shaft
 - a. The rocker arm usually wears at two locations: (1) at the rocker shaft hole; (2) at the cam lobe contacting surface.
 - b. Measure the rocker shaft hole in the rocker arm.

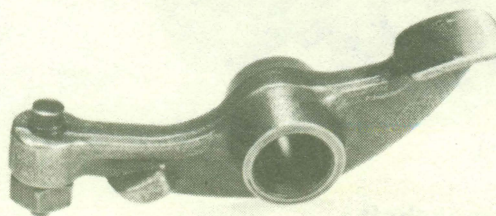
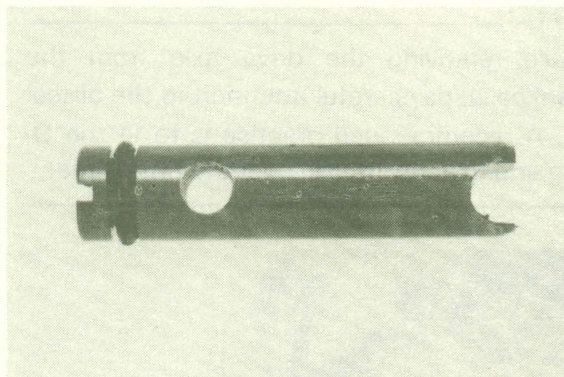
Standard size:

12.000 ~ 12.018 mm (0.472 ~ 0.473 in)

- c. The shaft has been hardened, and it should not wear excessively. If a groove has developed in this surface that can be felt or if it shows a blue discoloration, then the shaft should be replaced and the lubrication system (pump and passages) checked.

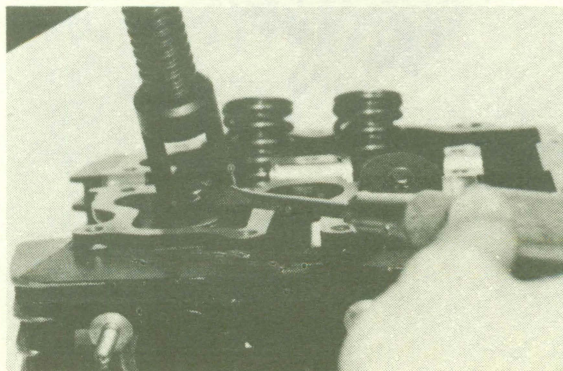
Standard shaft diameter:

11.98 ~ 11.99 mm (0.4717 ~ 0.4720 in)



B. Cylinder Head

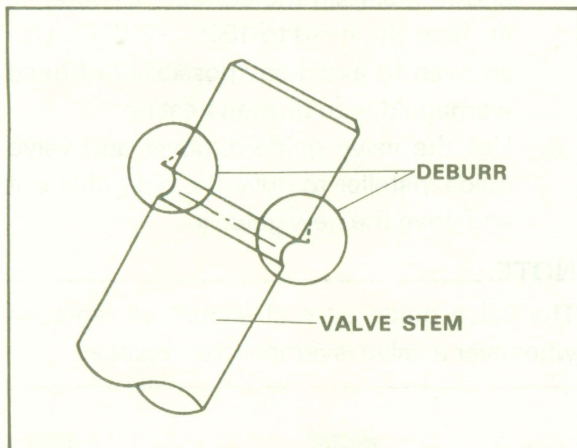
1. Mount the valve spring compressor on the head and depress each valve spring. Remove the valve retainers with a magnet or tweezers, and remove the valve springs.



2. Remove the valves. Mark each valve so it will be reinstalled in the same cylinder head.

NOTE:

Deburr any deformed valve stem end. Use an oil stone to smooth the stem end. This will help prevent damage to the valve guide during valve removal.



3. Using a rounded scraper, remove the carbon deposits from the combustion chamber. Take care to avoid damaging the spark plug threads and valve seats. Do not use a sharp instrument. Avoid scratching the aluminum.

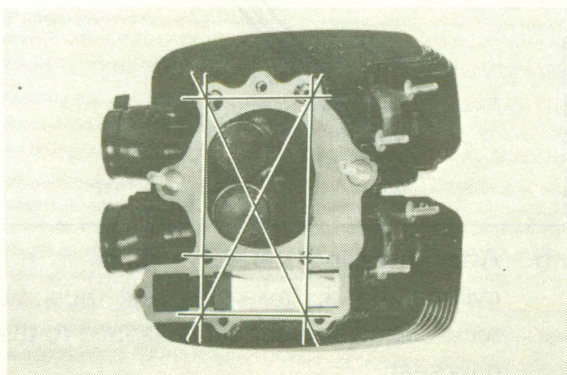
4. Check the cylinder head warpage with a straightedge as shown.

The warpage should not exceed the specified limit; if necessary, resurface the cylinder head. If the warpage exceeds allowable limit, the cylinder head should be replaced with a new one.

Cylinder head warpage:

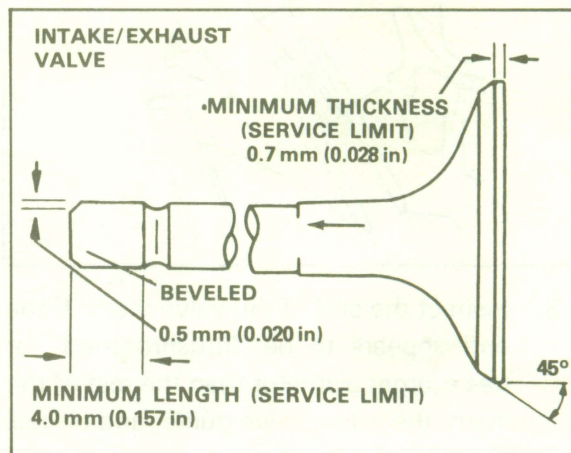
less than 0.03 mm (0.0012 in)

Allowable limit: 0.25 mm (0.010 in)



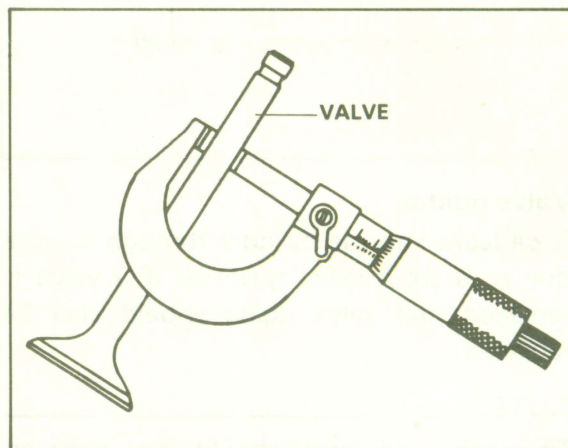
C. Valves, Valve Guides, Valve Seats, and Valve Springs

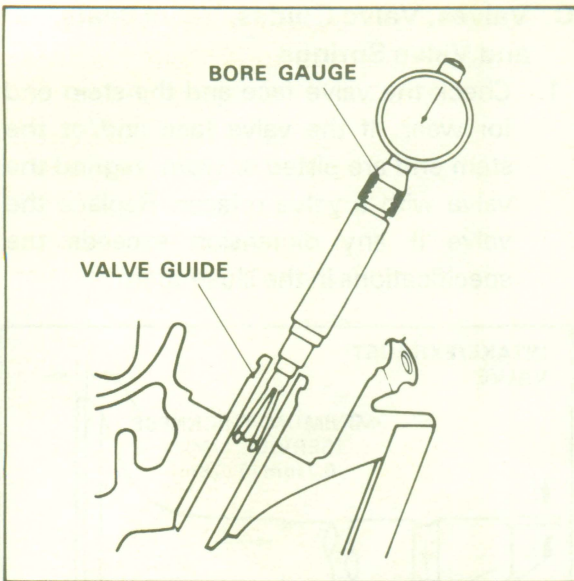
1. Check the valve face and the stem end for wear. If the valve face and/or the stem end are pitted or worn, regrind the valve with a valve refacer. Replace the valve if any dimension exceeds the specifications in the illustration.



2. Valve stem wear must be measured and then combined with valve guide measurements to obtain guide clearance. This clearance must be within tolerances. If it exceeds the maximum limit, then replace either or both valve and guide as necessary.

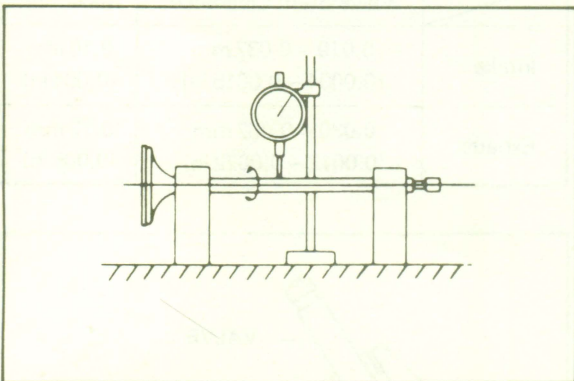
	Valve Stem Clearance	Maximum
Intake	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.10 mm (0.004 in)
Exhaust	0.030 ~ 0.057 mm (0.0012 ~ 0.0022 in)	0.12 mm (0.005 in)





3. Inspect the end of the valve stem. If the end appears to be "mushroomed" or has a larger diameter than the rest of the stem, the valve, valve guide, and oil seal should be replaced.
4. Place the valve on V-blocks, and measure the amount of stem runout with a dial gauge. If it exceeds the maximum limit, replace the valve.

Maximum valve stem runout:
0.01 mm (0.0004 in)



Valve guides

If oil leaks into the cylinder through a valve due to a worn valve guide or if a valve is replaced, the valve guide should also be replaced.

NOTE:

The valve oil seal should be replaced whenever a valve is removed or replaced.

1. Measure the valve guide *inside diameter* with a small bore gauge. If it exceeds the limit, replace it with an oversize valve guide.

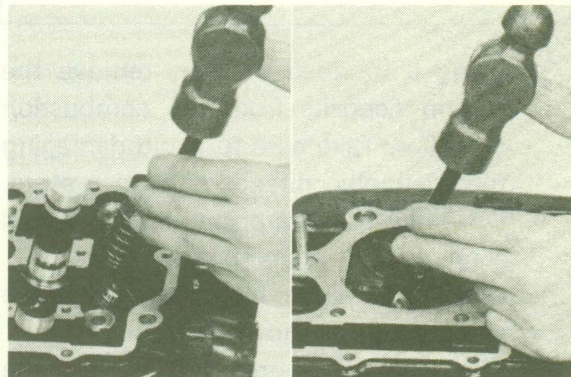
Guide diameter (I.D.):

Limit: 7.10 mm (0.280 in)

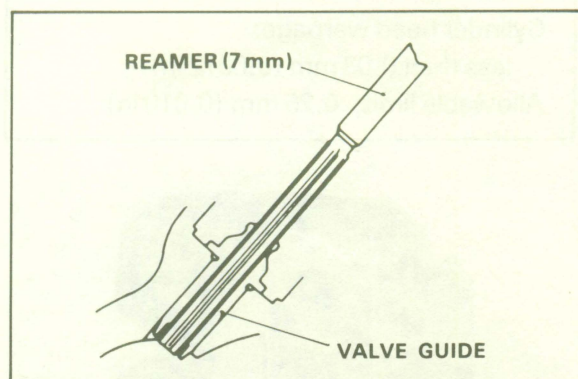
2. To ease guide removal and reinstallation and to maintain the correct interference fit, heat the head to 100°C (212°F). Use an oven to avoid any possibility of head warpage due to uneven heating.
3. Use the valve guide remover and valve guide installer to drive the old guide out and drive the new guide in.

NOTE:

The valve guide oil seal should be replaced whenever a valve is removed or replaced.



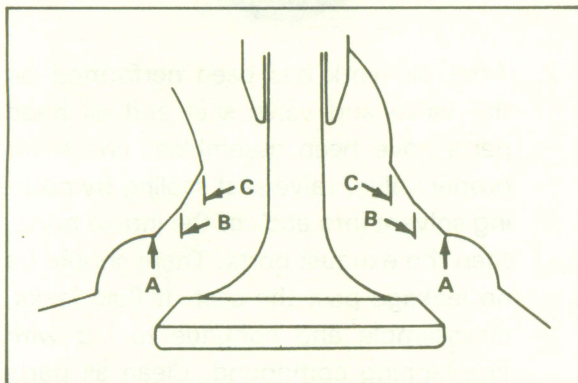
4. After installing the valve guide, use the 7 mm reamer (special tool P/N. YM-01227) to obtain the proper valve-guide-to-valve-stem clearance.



5. After installing the valve guide in the cylinder head, the valve seat must be recut. The valve should be lapped to the new seat.

Valve seat

1. The valve seat is subject to severe wear. Whenever the valve is replaced or the valve face is resurfaced (see caution), the valve seat should be resurfaced at a 45° angle. If a new valve guide has been installed, the valve seat must be recut to guarantee complete sealing between the valve face and seat.



CAUTION:

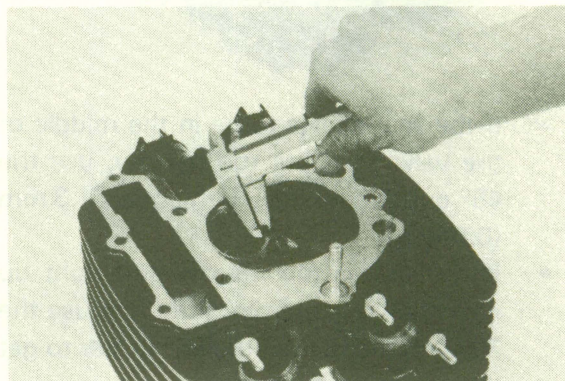
If the valve seat is obviously pitted or worn, it should be cleaned with a valve seat cutter. Use the 45° cutter. When twisting the cutter, keep an even downward pressure to prevent chatter marks.

If cutting section A of the valve seat, use a 30° cutter. If cutting section B, use the 45° cutter. If cutting section C, use the 60° cutter.

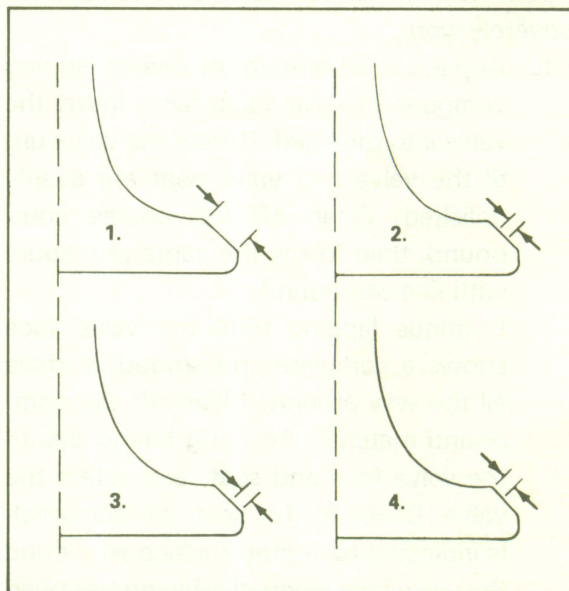
2. Measure the valve seat width. Apply mechanic's bluing dye (such as Dykem) to the valve face and valve seat, apply a very small amount of fine grinding compound around the surface of the valve face, insert the valve into position, and spin the valve quickly back and forth. Lift the valve, clean off all grinding compound, and check valve seat width. The valve seat and valve face will have removed the bluing wherever they contacted each other. Measure the seat width with vernier calipers. It should measure approximately 1.3 mm (0.051 in). The valve-seat contact area should be one uniform width. If valve seat width varies or if pits still exist, further

cutting will be necessary. Remove just enough material to achieve a satisfactory seat.

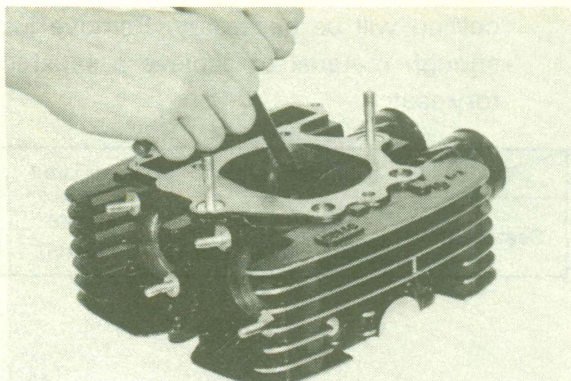
	Standard Width	Wear Limit
Seat width	1.3 ± 0.1 mm (0.051 ± 0.0039 in)	2.0 mm (0.080 in)



3. If the valve seat is uniform around the perimeter of the valve face but is too wide or not centered on the valve face, it must be altered. Use either the 30°, 45°, or 60° cutters to correct the improper seat location in the manner described below:



- If the valve face shows that the valve seat is centered on the valve face but is too wide, then lightly use both the 30° and the 60° cutters to reduce the seat width to 1.3 mm (0.051 in).



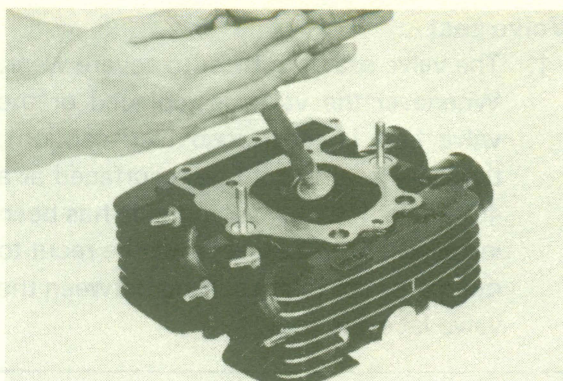
- If the seat shows to be in the middle of the valve face but too narrow, use the 45° cutter until the width equals 1.3 mm (0.051 in).
- If the seat is too narrow and right up near the valve margin, then first use the 30° cutter and then the 45° cutter to get the correct seat width.
- If the seat is too narrow and down near the bottom edge of the valve face, then first use the 60° cutter and then the 45° cutter.

Lapping

The valve/valve seat assembly should be lapped if neither the seat nor the valve face are severely worn.

1. Apply a small amount of coarse lapping compound to the valve face. Insert the valve into the head. Rotate the valve until the valve and valve seat are evenly polished. Clean off the coarse compound, then follow the same procedure with fine compound.

Continue lapping until the valve face shows a complete and smooth surface all the way around. Clean off the compound material. Applying bluing dye to the valve face and seat, and rotate the valve. Check for full seat contact which is indicated by a grey surface all around the valve face where the bluing has been rubbed away.

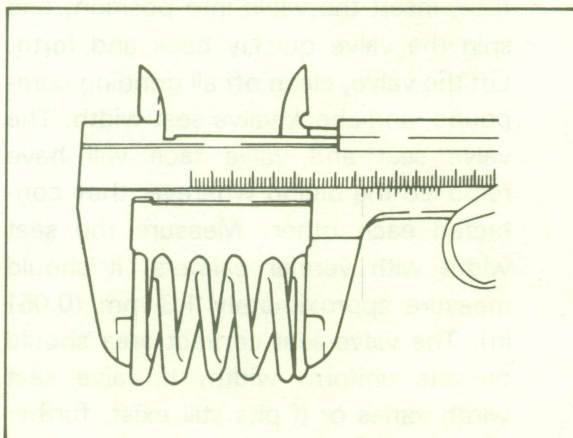


2. After all work has been performed on the valve and valve seat and all head parts have been assembled, check for proper valve/valve seat sealing by pouring solvent into each of the intake ports, then the exhaust ports. There should be no leakage past the seat. If fluid leaks, disassemble and continue to lap with fine lapping compound. Clean all parts thoroughly; reassemble and check again with solvent. Repeat this procedure as often as necessary to obtain a satisfactory seal.

Valve springs

This engine uses two springs of different sizes to prevent valve float or surging. The valve spring specifications show the basic value characteristics.

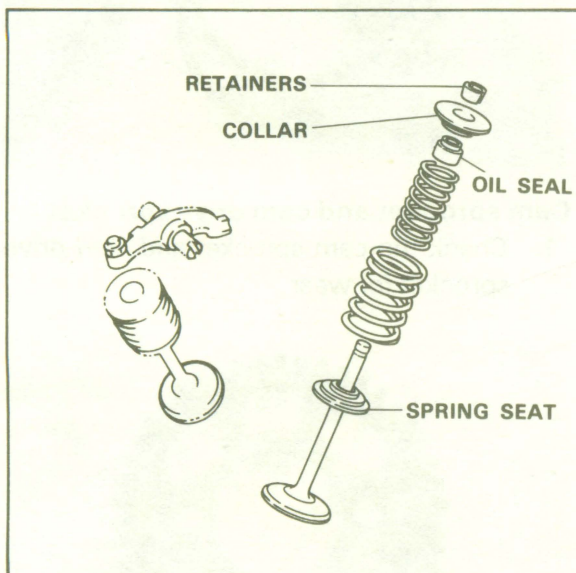
1. Even though the spring is constructed of durable spring steel, it gradually loses some of its tension. This is evidenced by a gradual shortening of free length. Use a vernier caliper to measure spring free length. If the free length of any spring has decreased more than 2 mm (0.080 in) from its specification, replace it.



- Another symptom of spring fatigue is insufficient spring pressure. This can be checked with a valve-spring-compression-rate gauge. Test each spring individually. Place a spring in the gauge and note the spring pressure when the spring is compressed to the installed length (valve closed). If the pressure does not equal the specified value, replace the spring.

Valve Spring Specifications		
	Outer Spring	Inner Spring
Free length	43.8 mm (1.72 in)	40.1 mm (1.58 in)
Installed length (valve closed)	34.2 mm (1.346 in)	31.2 mm (1.228 in)
Installed pressure (valve closed)	16.0 kg (37.3 lb)	8.1 kg (17.9 lb)
Allowable tilt from vertical	2.5° (1.9 mm)	2.5° (1.7 mm)

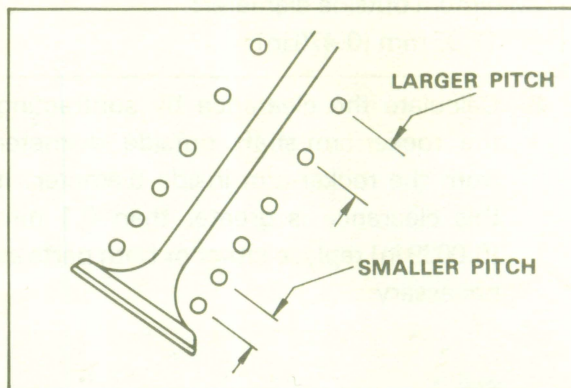
Valve installation



- Lubricate the valve stem and the oil seal with a high-quality molybdenum disulfide motor oil or molybdenum disulfide grease.
- Insert the valve in the cylinder head, and install the oil seal. Carefully fit the oil seal over the valve stem and push it into position on top of the valve guide.
- Install the spring seat, and install both valve springs.

NOTE:

All valve springs must be installed with the larger pitch upward as shown.



- Install the collar. Be sure it is properly seated on the valve springs.
- Install the valve spring compressor, and compress the springs.
- Install the valve retainers. Be sure the retainers properly engage the valve stem.
- Carefully remove the valve spring compressor.

WARNING:

Proceed slowly. If a retainer has not been properly installed, it could be ejected from the cylinder head.

- Gently tap the end of the valve stem with a plastic mallet. This will ensure that the retainers are properly seated in the collar.

D. Rocker Arms and Rocker Arm Shafts

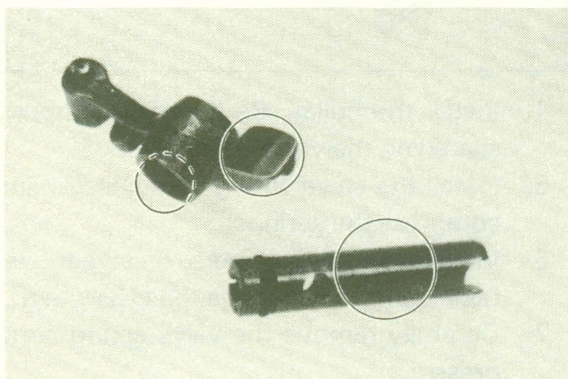
- The rocker arm usually wears at two locations: at the rocker shaft hole and at the cam-lobe-contact surface. Check these areas for signs of unusual wear.
- Measure the rocker arm inside diameter. If it exceeds specification, replace the rocker arm.

Maximum inside diameter:
12.05 mm (0.474 in)

3. Measure the outside diameter of the rocker arm shaft. If it is less than the specified value, replace the rocker arm.

Minimum outside diameter:
11.95 mm (0.470 in)

4. Calculate the clearance by subtracting the rocker-arm-shaft outside diameter from the rocker-arm inside diameter. If this clearance is greater than 0.1 mm (0.0039 in) replace either or both parts as necessary.



5. The rocker arm shaft has been hardened; it should not wear excessively. If a groove can be felt in the bearing surface or if the shaft shows a blue discoloration, the shaft should be replaced and the lubrication system checked.

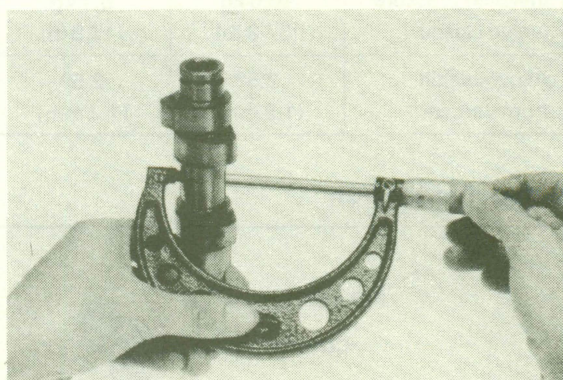
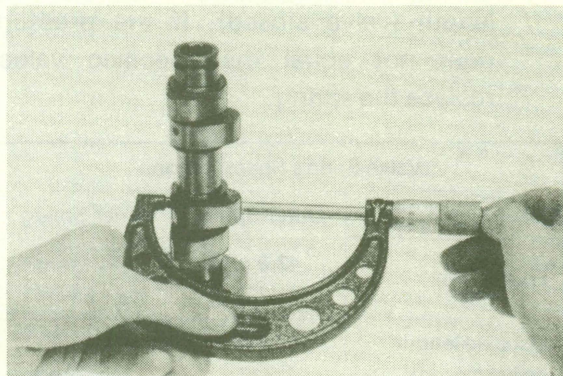
E. Camshafts, Cam Chains, and Cam Sprockets

Camshaft

The cam lobe metal surface may have a blue discoloration due to excessive friction. The metal surface could also start to flake off or become pitted.

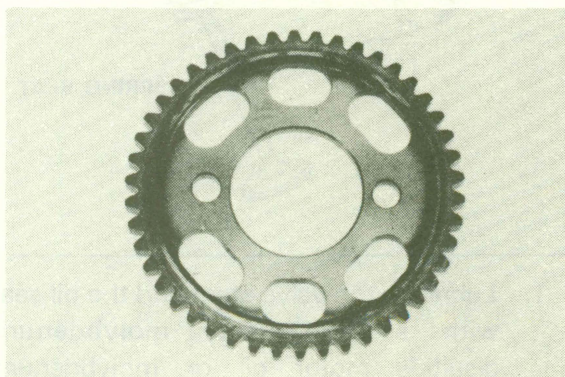
1. If any of the above wear conditions are readily visible, the camshaft should be replaced.
2. Even though the cam lobe surface appears to be in satisfactory condition, the lobes should be measured with a micrometer. Cam lobe wear can occur without scarring the surface. If this wear exceeds the wear limit, valve timing and lift are affected. Replace the camshaft if wear exceeds the limit.

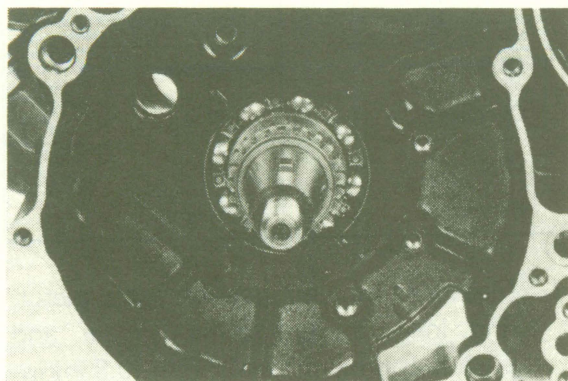
Wear Limit	A	B
Intake	36.40 mm (1.4331 in)	28.97 mm (1.1405 in)
Exhaust	36.57 mm (1.4398 in)	28.99 mm (1.1413 in)



Cam sprocket and cam drive sprocket

1. Check the cam sprocket and cam drive sprocket for wear.



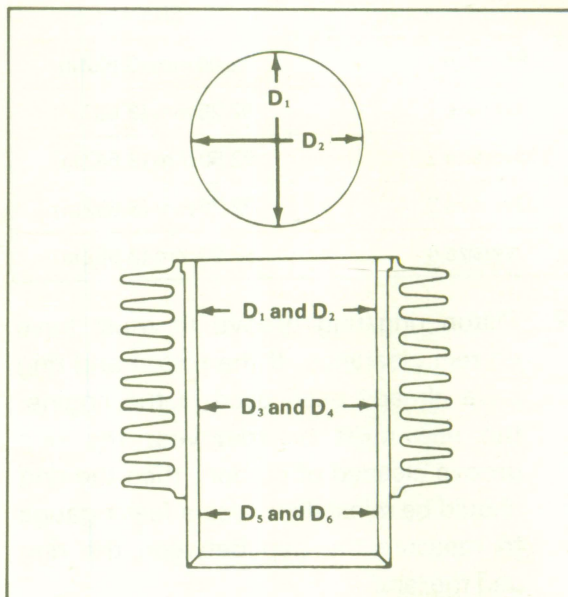
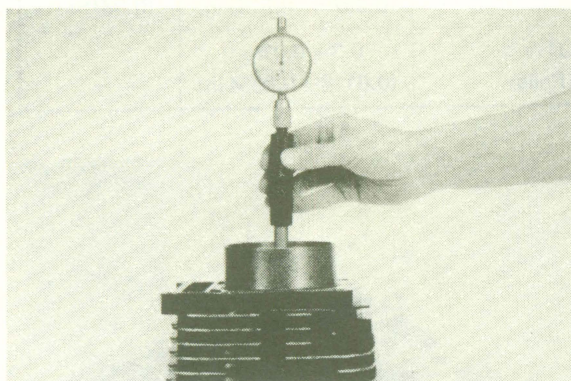


F. Cylinder

1. Visually check the cylinder walls for scratches. If vertical scratches are evident, the cylinder wall should be rebored or the cylinder should be replaced.
2. Measure cylinder wall wear in the manner as shown. If wear is excessive, compression pressure will decrease, and engine trouble will occur. Rebore the cylinder wall, and replace the piston and piston rings.

Cylinder wear should be measured at three depths by placing the measuring instrument parallel to and at right angles to the crankshaft. (See the illustration.)

If the cylinder wall is worn beyond the wear limit, it should be rebored.



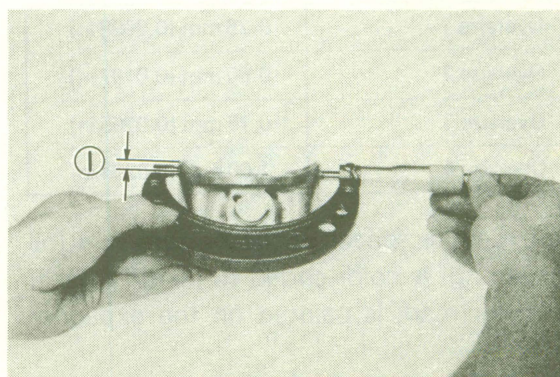
	Standard	Wear limit
Cylinder bore	92 mm (3.622 in)	92.1 mm (3.626 in)
Cylinder taper	—	0.005 mm (0.0002 in)

G. Piston and Piston Rings

Piston

1. Using the micrometer, measure the outside diameter of the piston at the piston skirt. Measurement should be made at a point 9.5 mm (0.37 in) above the bottom edge of the piston by placing the micrometer parallel to and at right angles to the piston pin.

Piston clearance: 0.045 ~ 0.065 mm
(0.0018 ~ 0.0026 in)



1. 6.0 mm (0.236 in)

	Size A
Standard	92.00 mm (3.622 in)
Oversize 1	92.25 mm (3.632 in)
Oversize 2	92.50 mm (3.642 in)
Oversize 3	92.75 mm (3.652 in)
Oversize 4	93.00 mm (3.662 in)

2. Piston ring/ring groove fit must have correct clearance. If the piston and ring have already been used in the engine, the ring must be removed, the ring groove cleaned of carbon, then the ring should be reinstalled. Use a feeler gauge to measure the gap between the ring and the land.

Side clearance	Top	0.04 ~ 0.08 mm (0.0016 ~ 0.0031 in)
	2nd	0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in)
	Oil ring	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)



Piston ring

The oversize top and middle ring sizes are stamped on top of the ring.

Oversize 1	0.25 mm (0.0098 in)
Oversize 2	0.50 mm (0.0197 in)
Oversize 3	0.75 mm (0.0295 in)
Oversize 4	1.00 mm (0.0394 in)

The expander spacer of the bottom ring (oil control ring) is color-coded to identify sizes. The color mark is painted on the expander spacer.

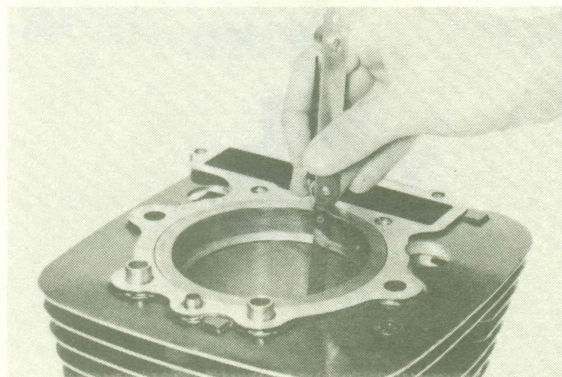
Size	Color
Oversize 1	Brown
Oversize 2	Blue
Oversize 3	Black
Oversize 4	Yellow

1. Measure the end gap of each piston ring. Insert a ring into the cylinder, and push it approximately 20 mm (0.8 in) into the cylinder. Push the ring with the piston crown so the ring will be at a right angle to the cylinder bore.
2. Measure the ring end gap with a feeler gauge. If the end gap exceeds tolerance, replace the whole set of rings.

NOTE:

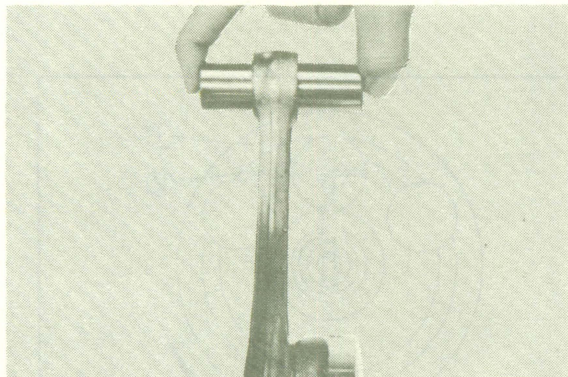
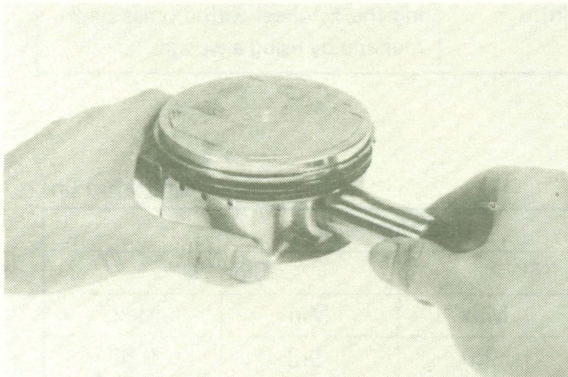
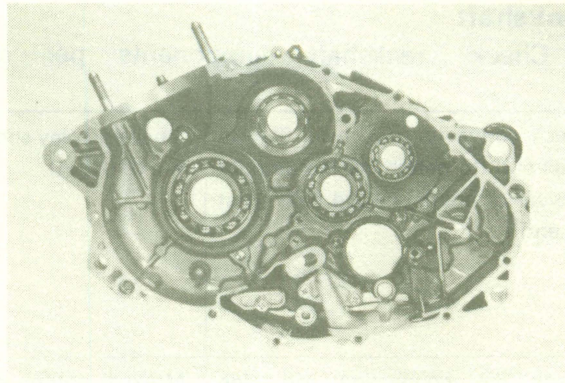
You cannot measure the end gap on the expander spacer of the oil control ring. If the oil-control-ring rails show excessive gap, replace all three rings.

	Standard	Limit
Top ring	0.2 ~ 0.4 mm (0.0079 ~ 0.0157 in)	0.80 mm (0.0315 in)
2nd ring	0.2 ~ 0.4 mm (0.0079 ~ 0.0157 in)	0.80 mm (0.0315 in)
Oil ring (Rails)	0.3 ~ 0.9 mm (0.0118 ~ 0.0354 in)	—



Piston pin

1. Lightly oil the piston pin, and install it in the small end of the connecting rod.
2. Check the free play. There should be no noticeable vertical play. If any free play exists, check the connecting rod for wear. Replace the pin and connecting rod as required.
3. Insert the piston pin in the piston, and check the free play. There should be no noticeable free play when the pin is in place in the piston. If the piston pin is loose, replace the pin and/or the piston as required.



H. Crankshaft and Connecting Rod

Crankshaft bearing

1. Bearings should be cleaned, dried, and the races visually checked for pits, rust spots, or chatter marks where the balls have dragged. If any of these conditions exist, the bearings should be replaced.

NOTE:

Lubricate the bearings immediately after examining them to prevent rust.

Crankshaft

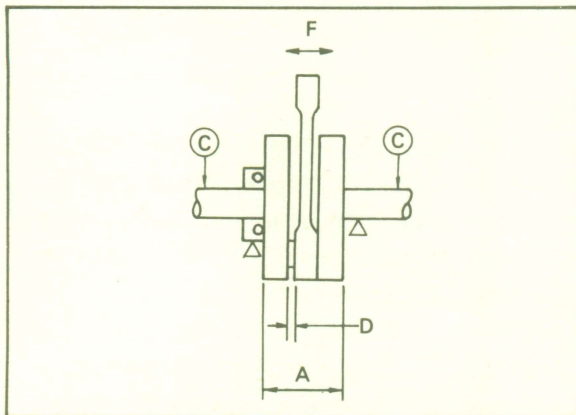
1. Check crankshaft components per chart.

Check connecting rod axial play at small end (to determine the amount of wear of crank pin and bearing at big end).	Small end play should not exceed 2 mm (0.079 in).	If small end play exceeds 2 mm (0.079 in) disassemble crankshaft, check connecting rod, crank pin and big end bearing. Replace defective parts. Play after reassembly should be within 0.8 ~ 1.0 mm (0.031 ~ 0.039 in).
Check the connecting rod side clearance at big end.	Move the connecting rod to one side and insert a feeler gauge. Big end axial play should be within 0.35 ~ 0.65 mm (0.014 ~ 0.026 in).	If excessive axial play is present, 0.7 mm (0.028 in) or more, disassemble the crankshaft and replace any worn parts.
Check crankshaft assembly runout. (Misalignment of crankshaft parts.)	Dial gauge readings should be within 0.03 mm (0.00118 in).	Correct any misalignment by tapping the flywheel with a brass hammer and by using a wedge.

Crankshaft Specifications

Unit: mm (in)

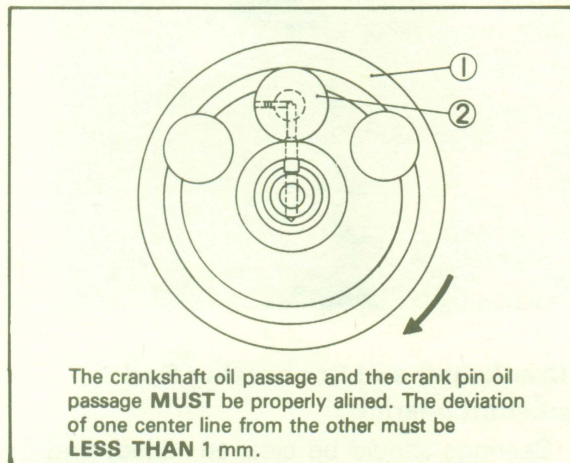
Runout limit	Assembly width	Rod clearance			
		Axial "F"		Side "D"	
C	A	Min.	Max.	Min.	Max.
0.03 (0.0012)	74.95 ~ 75.00 (2.951 ~ 2.953)	0.8 (0.03)	2.0 (0.08)	0.3 (0.0118)	0.65 (0.0256)



2. In disassembling and reassembling the crank, follow the illustration.

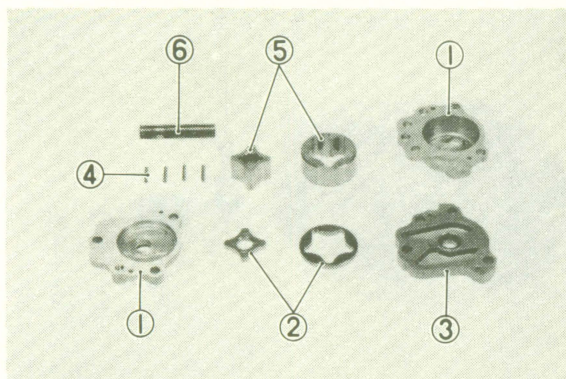
NOTE:

Make sure oil passages of crank and crank pin are lined up during assembly.



1. Crank assembly 2. Crank pin

I. Oil Pump



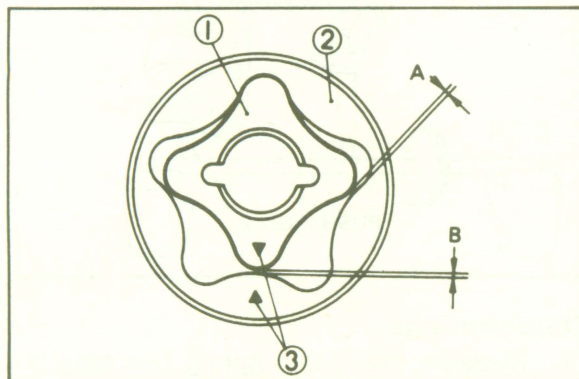
- | | |
|--------------------|-------------------------|
| 1. Pump cover | 4. Dowel pin |
| 2. Feed pump rotor | 5. Scavenger pump rotor |
| 3. Rotor housing | 6. Pump shaft |

1. Oil Pump Rotor Width

Feed pump: 4 mm (0.16 in)
Scavenger pump: 18 mm (0.71 in)

2. Inner and Outer Rotor Dimensions

Clearance between "A" and "B"
Standard:
0.03 ~ 0.09 mm (0.0012 ~ 0.0035 in)
Limit: 0.15 mm (0.006 in)



1. Inner rotor 2. Outer rotor 3. Match marks

J. Primary Drive

The drive gear is mounted on the crankshaft; the driven gear is mounted on the transmission and is integrated with the clutch assembly.

1. Check the drive gear and the driven gear for obvious signs of wear or damage from foreign material within the primary case.

2. If the primary drive is excessively noisy during operation, replace both the drive and the driven gears.

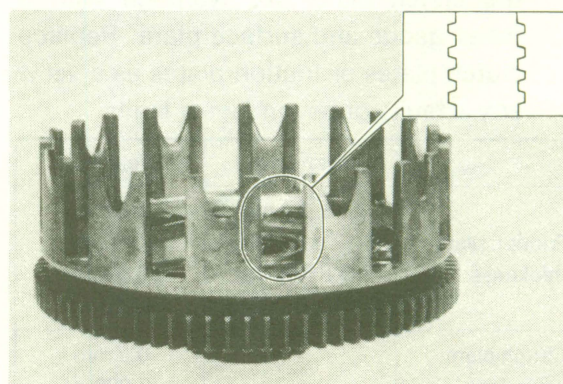
K. Clutch

Clutch housing

1. Check the dogs on the clutch housing. Look for cracks and signs of galling on the edges. If damage is moderate, deburr; if severe, replace the clutch.

NOTE:

Galling on the clutch plate splines will cause erratic operation.



2. Check the clutch housing bearing for damage. If damaged, replace the bearing.

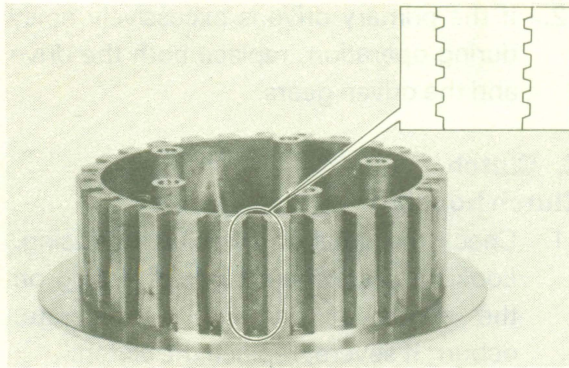
Clutch boss

The clutch boss contains a built-in damper beneath the first clutch plate (clutch plate 2). It is not normally necessary to remove the circlip and disassemble the built-in damper unless there is serious clutch chattering.

1. Check the splines on the clutch boss for galling. If damage is slight to moderate, deburr; if it is severe, replace the clutch boss.

NOTE:

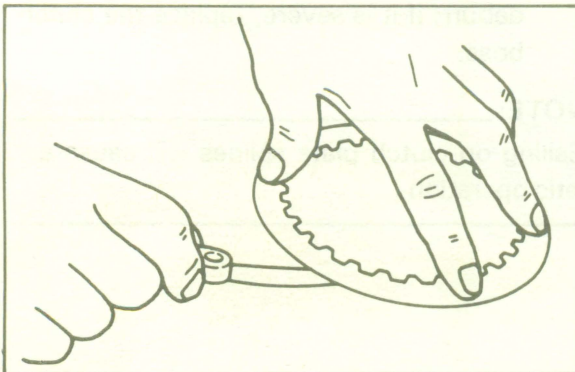
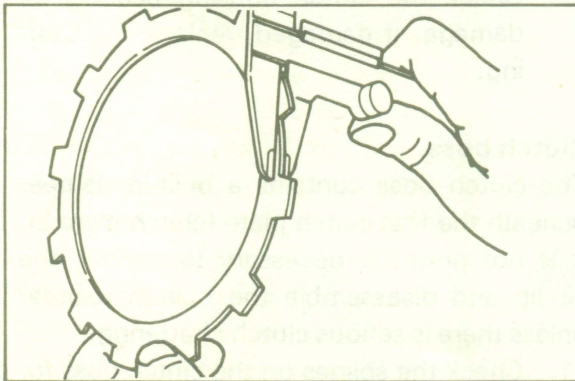
Galling on clutch plate splines will cause erratic operation.



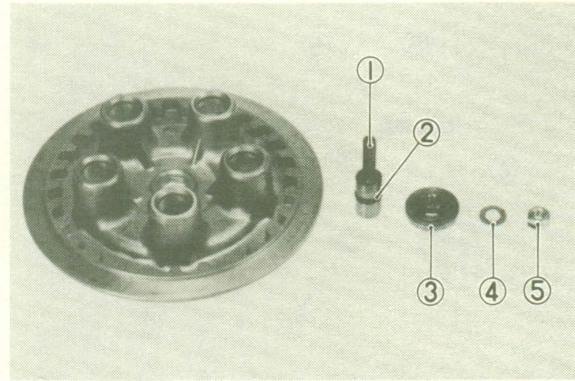
Friction and clutch plates

1. Check the clutch plates and friction plates for heat damage. Measure friction plate thickness at 3 or 4 points. Measure the clutch plates for warpage with a feeler gauge and surface plate. Replace clutch plates or friction plates as a set if any is faulty or beyond wear limits.

	Standard	Wear limit
Friction plate thickness	$3.0 \pm 0.1 \text{ mm}$ ($0.12 \pm 0.004 \text{ in}$)	2.8 mm (0.11 in)
	$2.8 \pm 0.08 \text{ mm}$ ($0.11 \pm 0.003 \text{ in}$)	2.6 mm (0.10 in)
Clutch plate warp limit	—	0.2 mm (0.008 in)



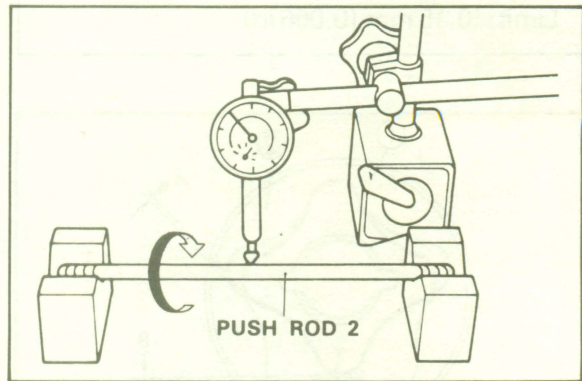
Clutch actuating mechanism



1. Push rod 1
2. O-ring
3. Push plate
4. Plain washer
5. Locknut

1. Check the push rod 1 for wear and damage; replace if damaged.
2. Check the short-push-rod thrust bearing for damage; replace if damaged.
3. By rolling the push rod 2 on the V-blocks, check for bends. If any bend is found, replace the push rod.

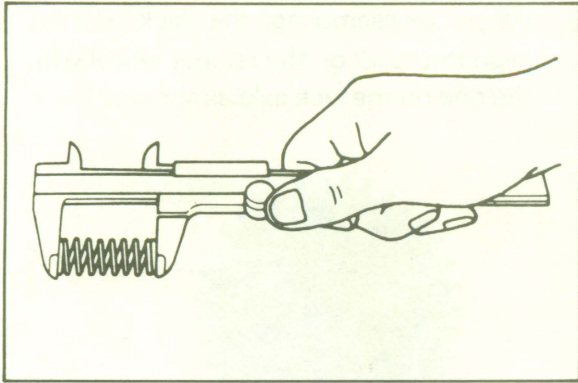
Bend limit: 0.5 mm (0.02 in)



Clutch springs

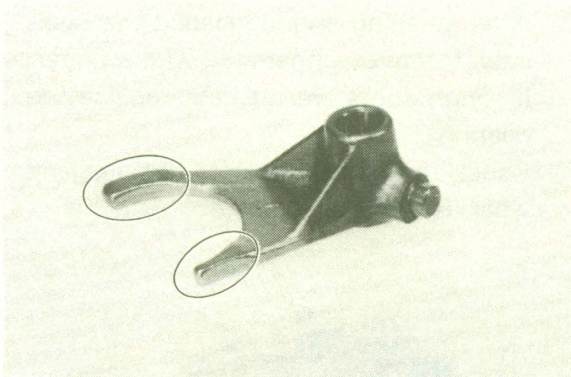
1. Measure the clutch spring free length. Replace the springs as a set if any is less than minimum free length.

Clutch spring minimum length:
40.2 mm (1.583 in)

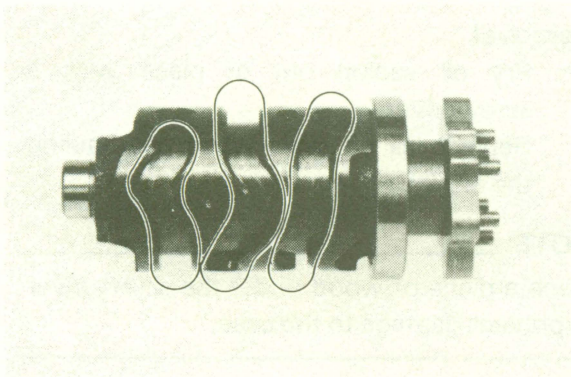


L. Transmission

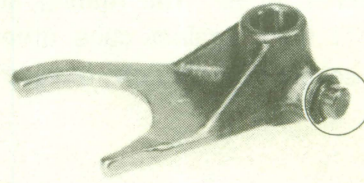
1. Inspect each shift fork for signs of galling on the gear contact surfaces. Check for bending. Make sure each fork slides freely on its guide bar.



2. Roll the guide bar across a surface place. If the bar is bent, replace it.
3. Check the shift cam grooves for signs of wear or damage. If any profile has excessive wear and/or damage, replace the cam.



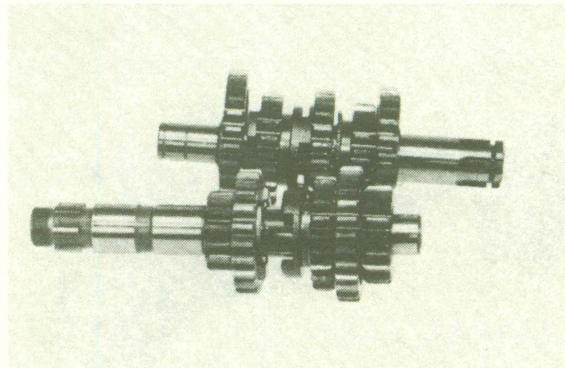
4. Check the cam followers on each shift fork for wear. Check the ends that ride in the grooves in the shift cam. If they are worn or damaged, replace the shift fork.



5. Check the shift cam dowel and side plate for looseness, damage, or wear. Replace as required.
6. Check the shift-cam stopper plate, circlip, and stopper for wear. Replace as required.
7. Check the transmission shafts using a centering device and dial gauge. If any shaft is bent beyond the specified limit, replace the shaft.

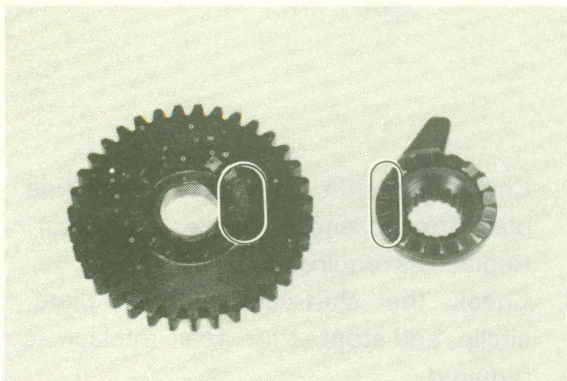
Maximum runout: 0.08 mm (0.0031 in)

8. Carefully inspect each gear. Look for signs of obvious heat damage (blue discoloration). Check the gear teeth for signs of pitting, galling, or other extreme wear. Replace as required.
9. Check to see that each gear moves freely on its shaft.
10. Check to see that all washers and clips are properly installed and undamaged. Replace bent or loose clips and bent washers.
11. Check to see that each gear properly engages its counterpart on the shaft. Check the mating dogs for rounded edges, cracks, or missing portions. Replace as required.



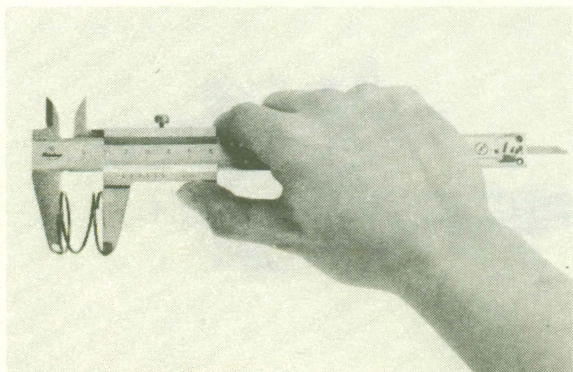
M. Kick Starter

1. Check the ratchet teeth on the kick gear and ratchet wheel. The mating edges should fit flush against each other. If there is severe rounding off, replace as a set.

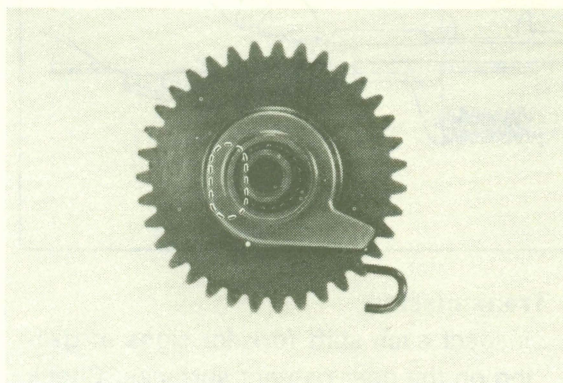


2. Check to see that the kick gear spins freely on the kick axle. If not, replace either or both as required. Replace if any signs of galling are found.
3. Check to see that the ratchet wheel (splined) slides freely on the kick axle. Check for burrs or other damage. Replace as required.
4. Check axle and wheel splines for wear. The ratchet wheel is a fairly loose fit on splines. However, if the wheel is so loose it catches on the shaft keeping the ratchet wheel spring from forcing it out, replace the wheel.
5. Check the ratchet wheel spring for fatigue. If the free length shows the spring has collapsed beyond specification, replace the spring.

Ratchet wheel spring free length	
Standard	Minimum
17.2 mm (0.677 in)	15.0 mm (0.591 in)

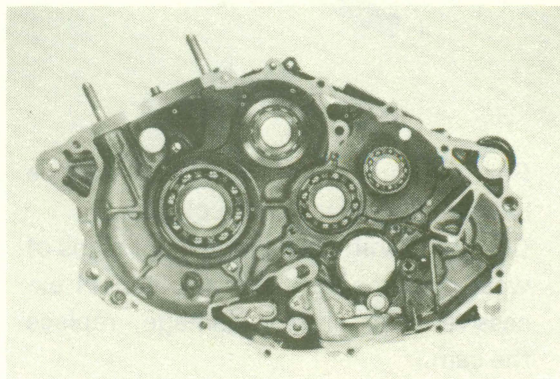


6. When reassembling the kick starter, align the mark on the ratchet wheel with the one on the kick axle as shown.



N. Bearings and Oil Seals Inspection

1. After cleaning and lubricating the bearings, rotate the inner race with a finger. If rough spots are noticed, replace the bearing.
2. Check the oil seal lips for damage and wear. Replace as required.



Removal

1. Pry oil seal(s) out of place with a screwdriver.
Replace all oil seals when overhauling the engine.

NOTE: _____
Place a piece of wood under the screwdriver to prevent damage to the case.

2. Drive out the bearing(s) with a socket and hammer or with a hydraulic press.

NOTE: _____

Bearing(s) are most easily removed or installed if the cases are first heated to approximately 95° ~ 125°C (205° ~ 257°F). Bring the case up to proper temperature slowly. Use an oven.

O. Installation

See next ENGINE ASSEMBLY "Important Information."

CAUTION: _____

The right side crankshaft oil seal in the right crankcase cover must be installed with the guide plate side facing in toward the engine.

ENGINE ASSEMBLY AND ADJUSTMENT

A. Important Information

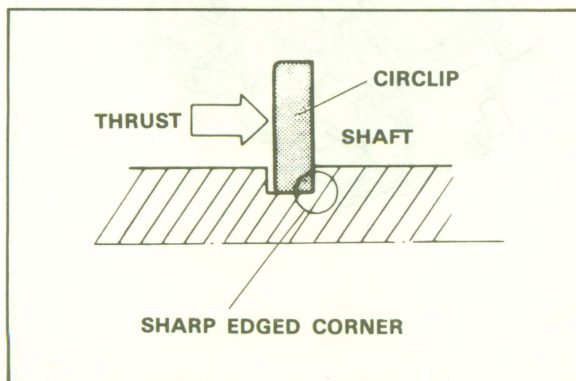
Gaskets and seals

1. All gaskets and seals should be replaced when an engine is overhauled. All gasket surfaces and oil seal lips must be cleaned.
2. Properly oil all mating parts and bearings during reassembly.

Circlips

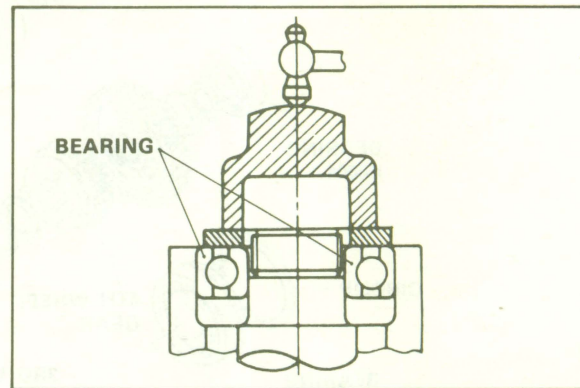
1. All circlips should be inspected carefully before reassembly. Always replace piston pin clips after one use. Replace distorted circlips.

When installing a circlip, make sure that the sharp edged corner is positioned opposite to the thrust it receives. See the sectional view below.



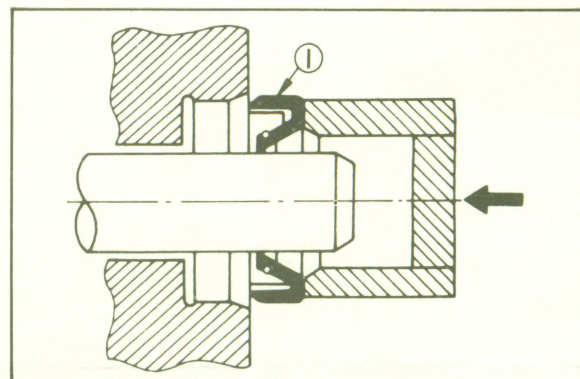
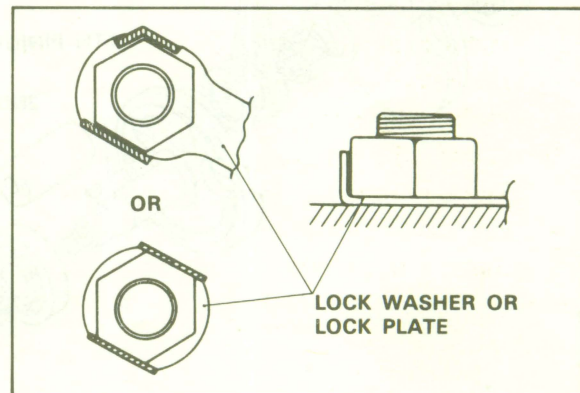
Bearings and oil seals

1. Install the bearing(s) and oil seal(s) with their manufacturer's marks or numbers facing outward. (In other words, the stamped letters must be on the side exposed to view.) When installing oil seal(s), apply a light coating of light-weight lithium base grease to the seal lip(s). When installing bearings liberally oil the bearings.

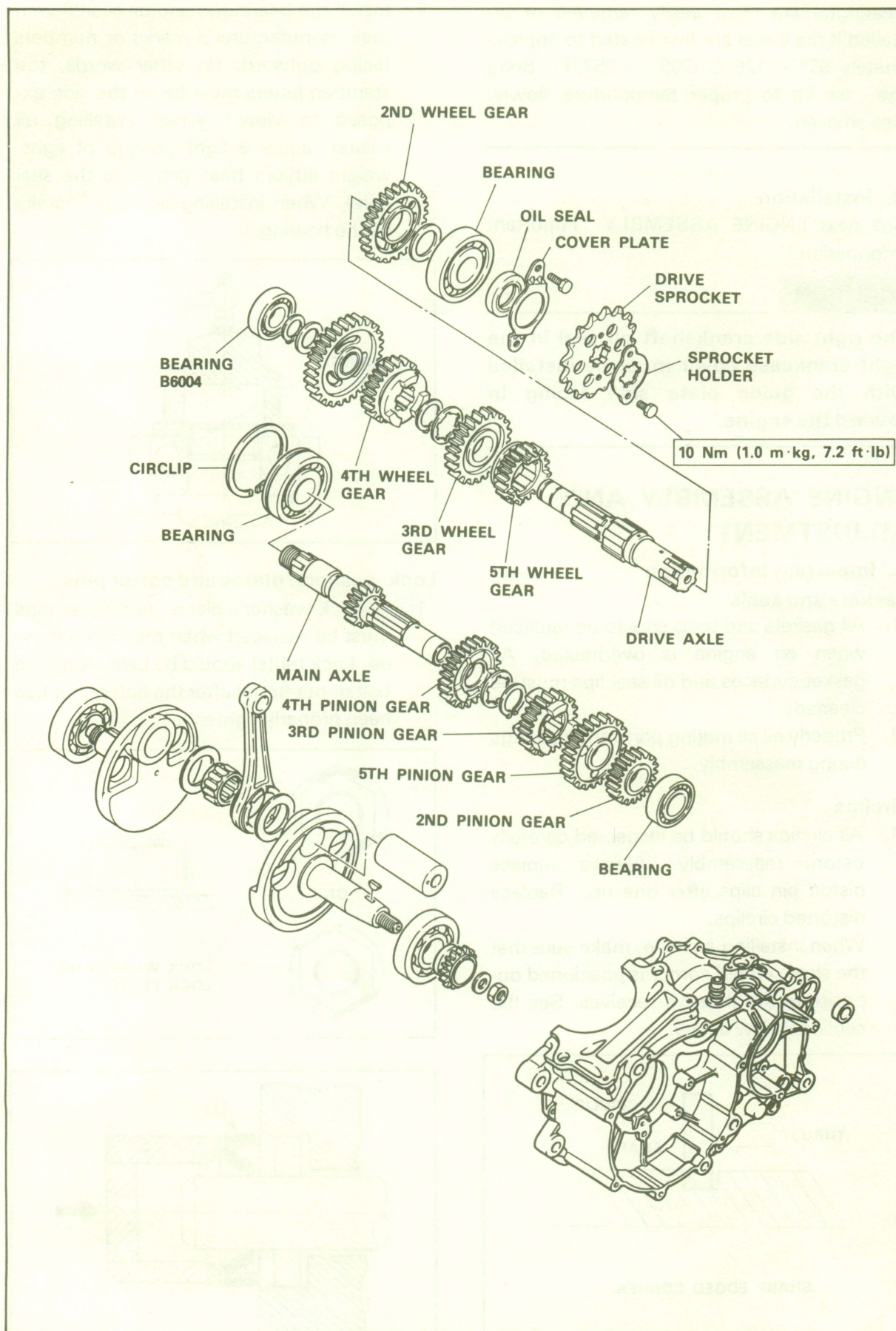


Lock washers/plates and cotter pins

1. All lock washers/plates and cotter pins must be replaced when they are removed. Lock tab(s) should be bent along the bolt or nut flat(s) after the bolt or nut has been properly tightened.



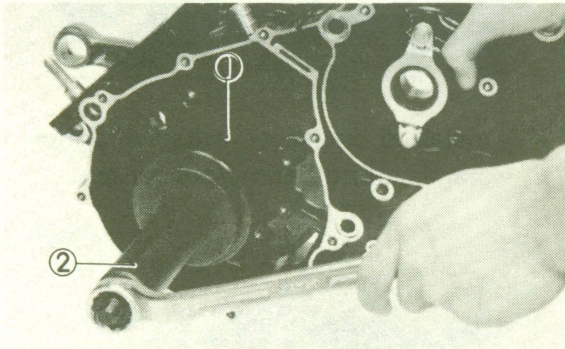
B. Left-Side Crankcase



C. Crankshaft Installation

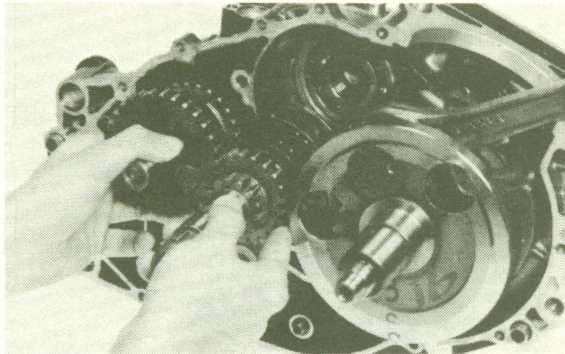
After all bearings and seals have been installed in both crankcase halves, install crankshaft as follows:

1. Set the crankshaft into left case half using the crankshaft installing tool (special tool P/N. YU-90050, YM-90069) and pot spacer (P/N. YM-90070A).



1. Pot spacer 2. Crankshaft installing set

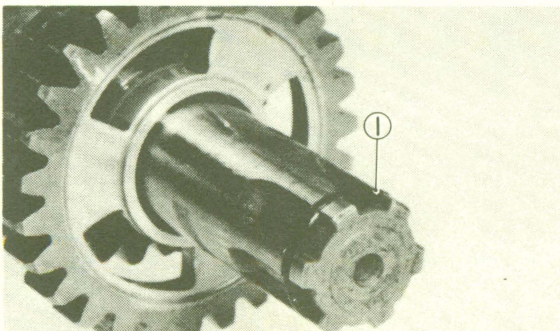
2. Hold the connecting rod at top dead center with one hand while turning the handle of the installing tool with the other. Operate tool until crankshaft bottoms against bearing.
3. Install the drive axle and main axle.



NOTE: _____

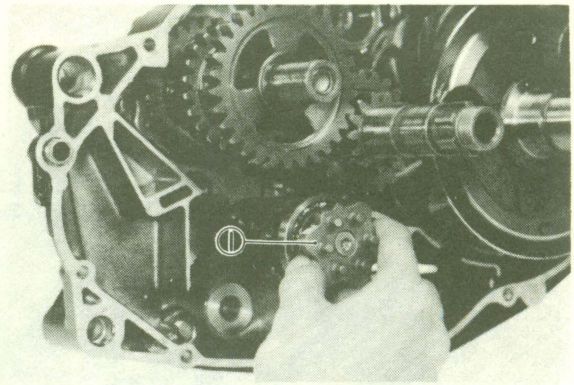
While installing the drive axle into the crankcase, pay careful attention to the oil seal lip.

It is recommended to set a suitable O-ring into the drive axle groove.



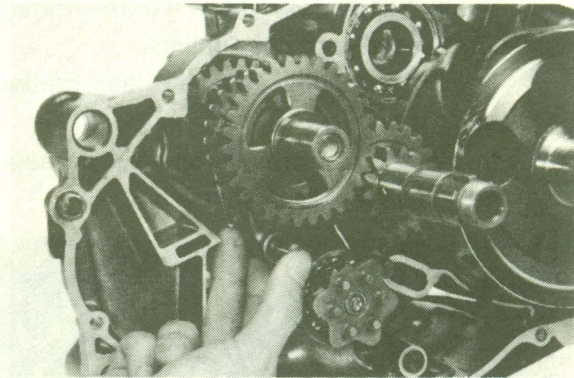
1. O-ring

4. Install the shift cam.



1. Shift cam assembly

5. Install the shift forks 1, 2 and 3.



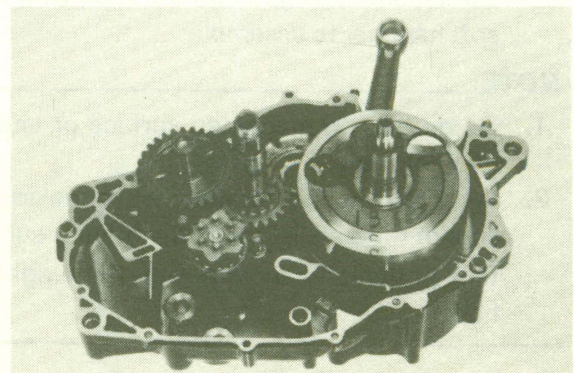
NOTE: _____

The figure on the shift forks is the location sequence from left to right.

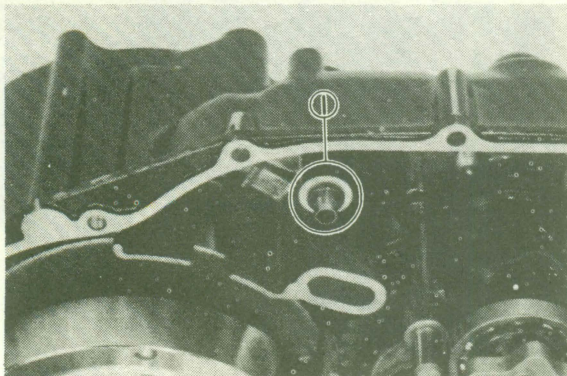
6. Check to see that all parts move freely prior to installing right case half. Check for correct transmission operation and make certain that all loose shims are in place.

NOTE: _____

Oil each gear and bearing thoroughly.

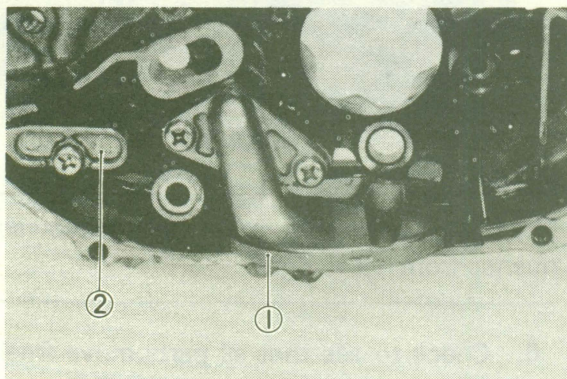


7. Install the O-ring to the inlet oil passage and engine mount spacer.



1. O-ring

8. Apply Yamaha Bond No. 4 to the mating surfaces of both case halves. Apply thoroughly over all case mating surfaces.
9. Install the oil strainer and oil passage cover to the right crankcase.



1. Oil strainer 2. Oil passage cover

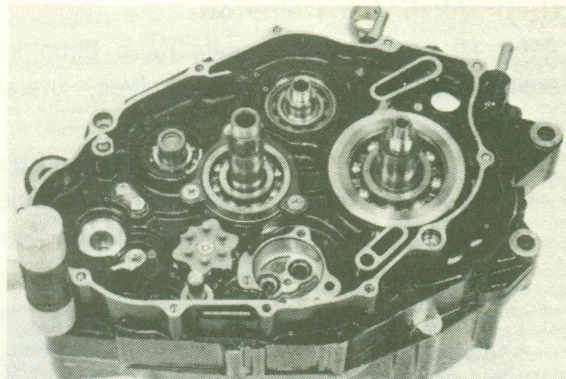
NOTE:

It is recommended that the oil strainer be replaced whenever the engine is disassembled.

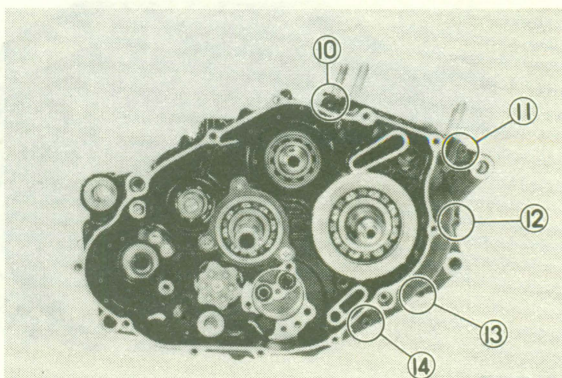
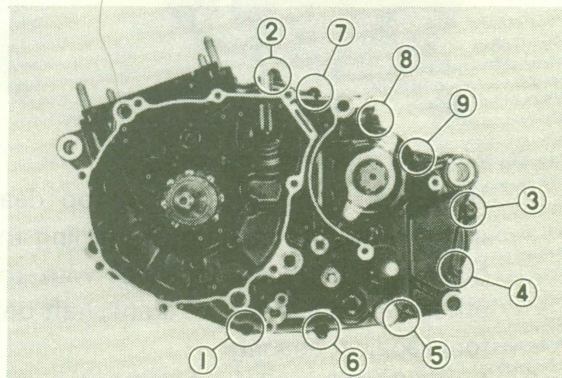
10. Set the right half crankcase onto the shafts, and tap lightly on the case with a soft hammer to assemble.

NOTE:

1. Do not tap on machined surface or end of crankshaft.
2. Work slowly and carefully while making sure of the parallelism of the mating surface of the left half with that of the right half.



11. Install all crankcase bolts and tighten in stages, using a crisscross pattern.



12. Check crankshaft and transmission shafts for proper operation and freedom of movement.
13. Apply a liberal coating of 4-stroke engine oil to the crank pin and bearing.

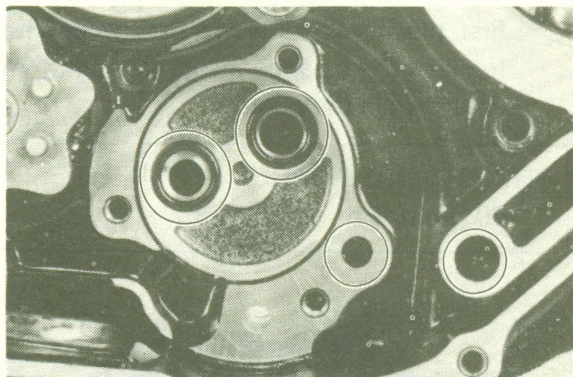
D. Oil Pump

CAUTION:

Apply a liberal amount of 4-stroke engine oil to the oil pump passages in the crankcase or the engine may be damaged.

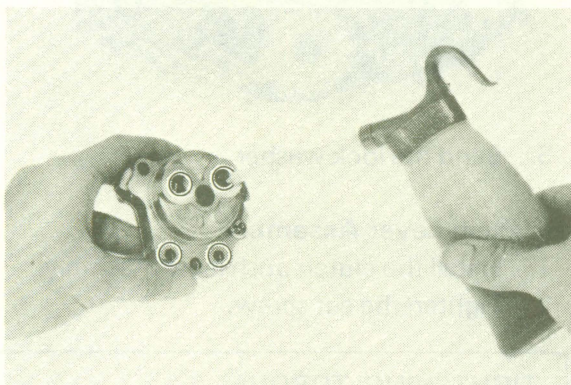
1. Install the two O-rings.

Apply a liberal amount of 4-stroke engine oil to the oil passages.



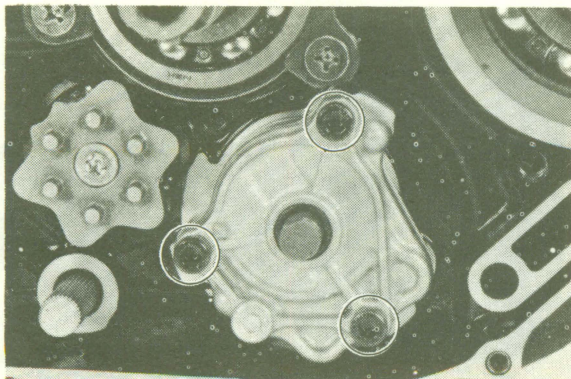
1. Oil passage

2. Apply a liberal amount of 4-stroke engine oil to both the scavenger pump and feed pump rotor assemblies.

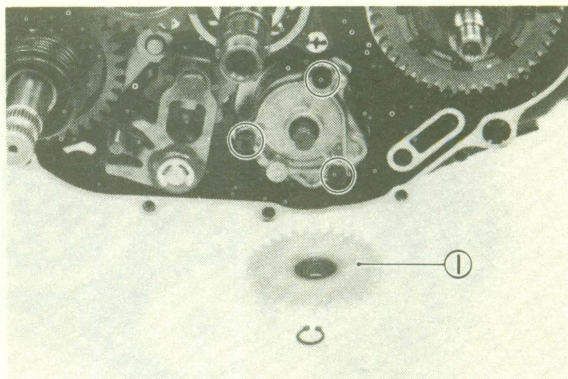


1. Oil passage

3. Install the oil pump assembly.

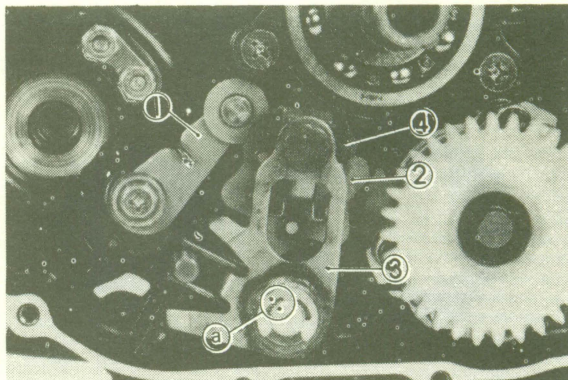


4. Install the oil pump gear.



E. Shifter

1. Set the stopper lever and then install the change shaft assembly.
2. During installation, note the index mark on change lever 2 and center of change lever 1. Align.



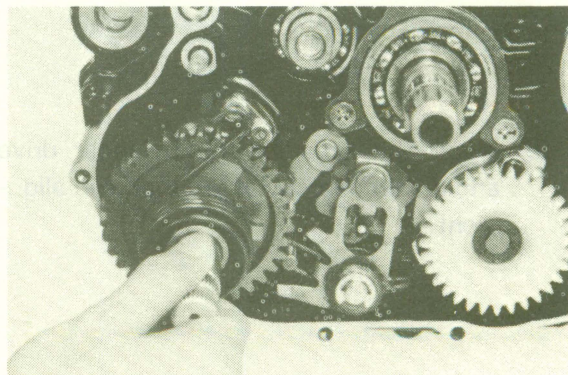
1. Stopper lever
2. Shift cam

3. Shift lever 1.
4. Shift lever 2.
a. Align the mark.

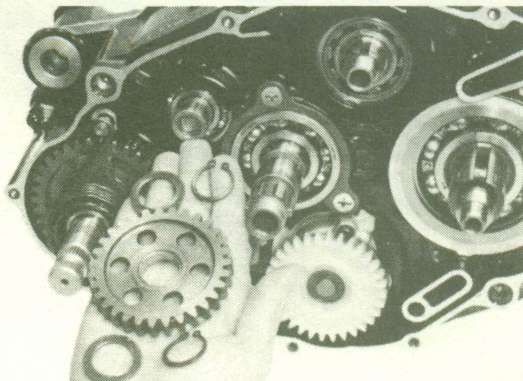
3. Install the pump gear and circlip.

F. Kick Starter

1. While pushing the kick starter assembly straight in, rotate kick axle counter-clockwise slightly from its home position and engage the stopper to the ratchet wheel guide.



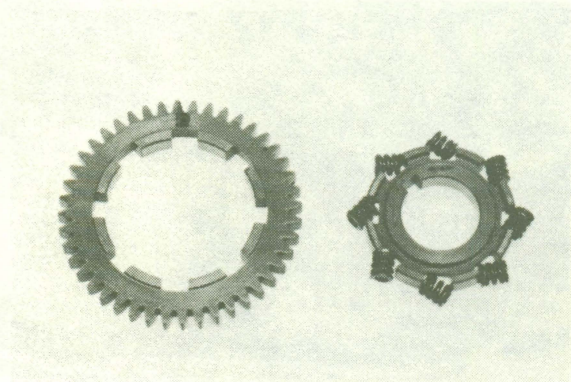
2. Hook the spring to the spring hook.
3. Install the kick idle gear.



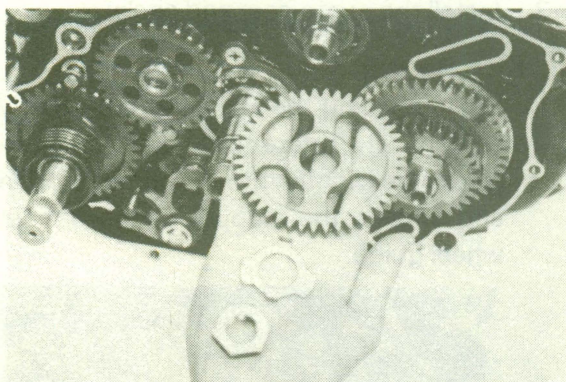
4. Install the decompression lever assembly.

G. Balancer Drive Gear and Driven Gear

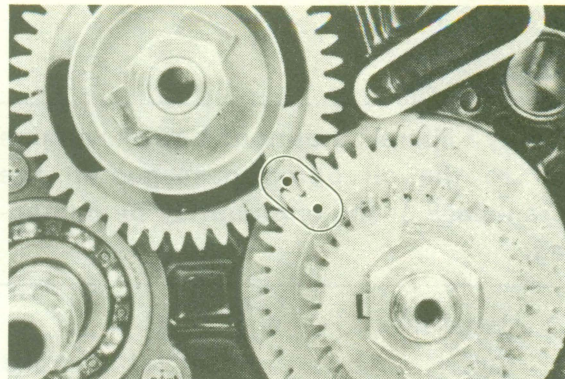
1. Install the damper assembly into the balancer gear.



2. Place bearing covers on both sides of the balancer gear and install.



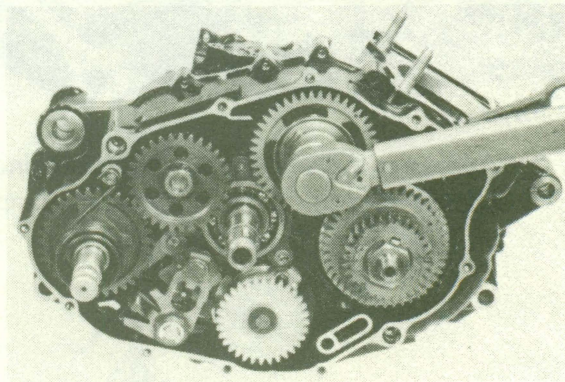
3. Install the keys for the balancer drive and driven gears with the marks in alignment.



4. Tighten the balancer gear locknut by first placing a folded rag between the teeth of the balancer gears to lock them as shown in the photo.

TIGHTENING TORQUE:

60 Nm (6.0 m · kg, 43 ft · lb)



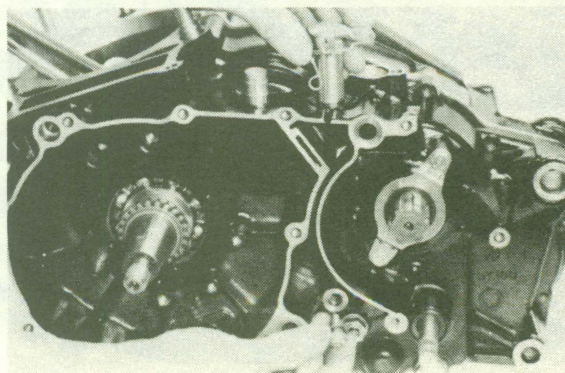
5. Bend the lock washer.

H. Push Lever Assembly

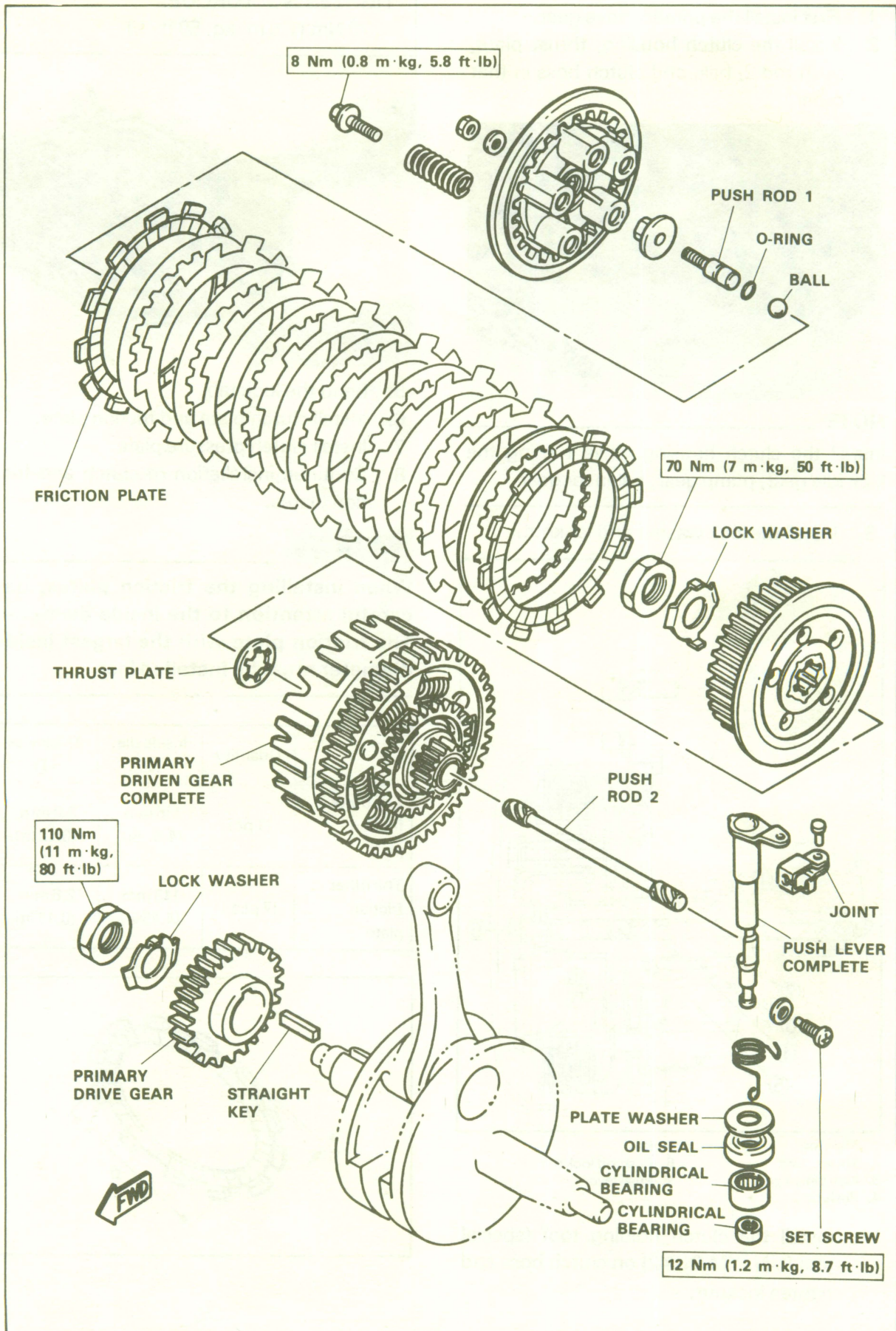
1. Install the clutch push lever assembly.
2. Tighten the set screw.

TIGHTENING TORQUE:

12 Nm (1.2 m · kg, 8.7 ft · lb)

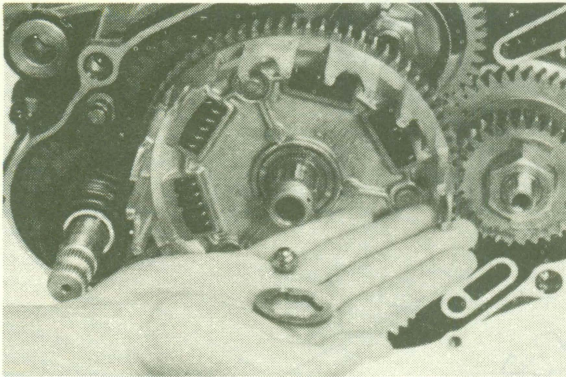


I. Primary Gears and Clutch



J. Clutch

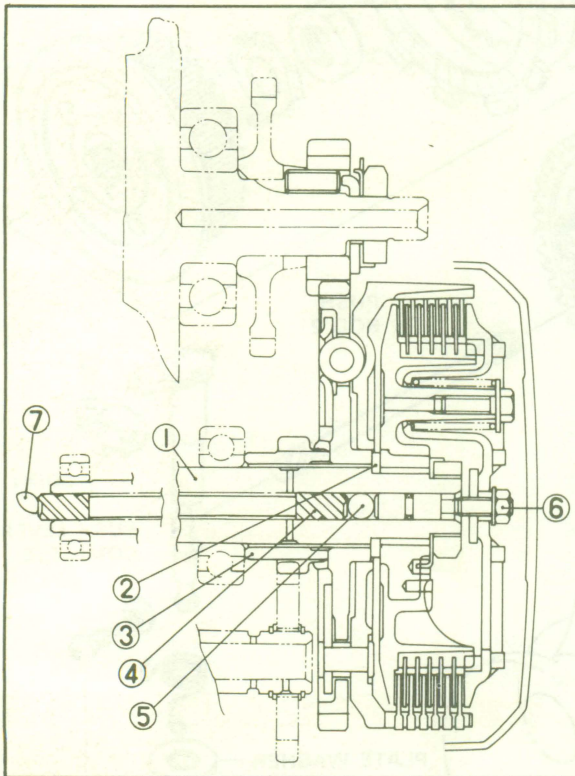
1. First install the primary drive gear.
2. Install the clutch housing, thrust plate, push rod 2, ball, and clutch boss in that order.



NOTE:

Install the clutch housing while turning the kick idle gear, pump gear, balancer gear.

3. Install the lock washer and locknut.

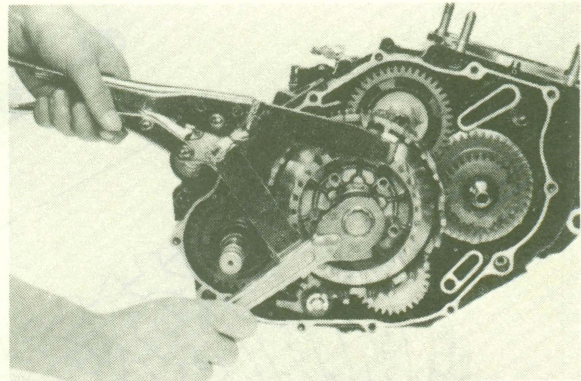


- | | |
|---------------------|---------------------|
| 1. Main axle | 5. Ball |
| 2. Thrust plate | 6. Pushrod lock nut |
| 3. Kick pinion gear | 7. Push lever |
| 4. Pushrod 2 | |

4. Install the clutch holding tool (special tool P/N. YM-91042) on clutch boss and tighten locknut.

TIGHTENING TORQUE:

70 Nm (7.0 m · kg, 50 ft · lb)

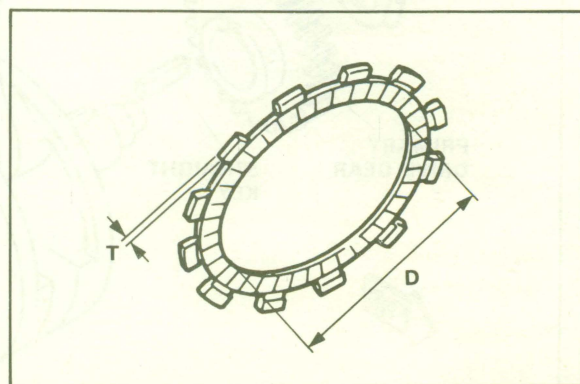


5. Bend the lock tab.
6. Install clutch plate and friction plate.
7. Install clutch pressure plate.
8. Continue installation of clutch and friction plates.

CAUTION:

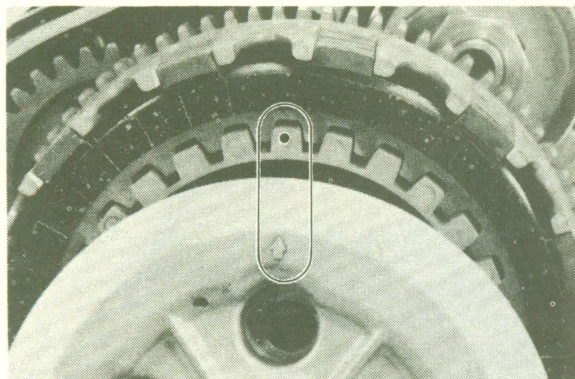
When installing the friction plates, pay careful attention to the inside diameter. The friction plate with the largest inside diameter must be installed last.

	Quantity	Inside dia. (D)	Thickness (T)
The outer friction plate	(1 pc)	116 mm (4.57 in)	3.0 mm (0.12 in)
The other friction plate	(7 pcs.)	113 mm (4.45 in)	2.8 mm (0.11 in)



NOTE: _____

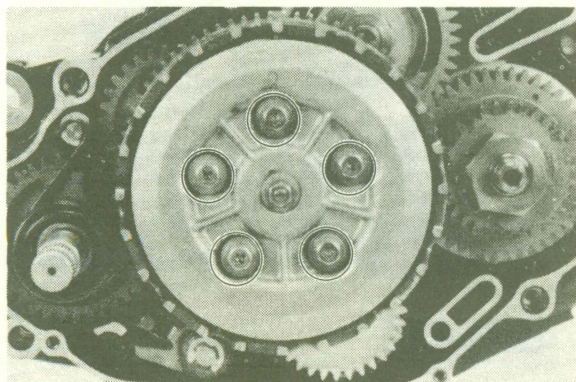
Align the arrow mark on the clutch boss and pressure plate mark.



9. Install the clutch pressure plate and the five clutch springs. Torque the clutch plate bolts to specification.

TIGHTENING TORQUE:

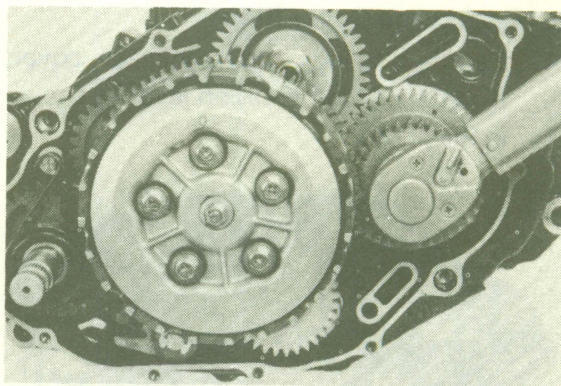
8 Nm (0.8 m · kg, 5.8 ft · lb)



10. Place a small piece of rolled rug or a piece of lead between the primary drive gears as shown in the photograph. It will hold the gears so you can tighten the primary-drive securing nut. Torque the nut to specification, and bend the lock tab against a nut flat.

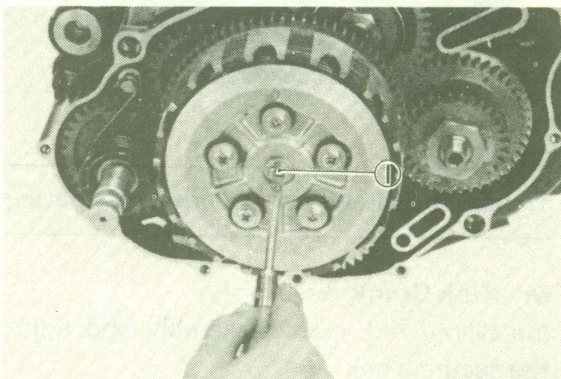
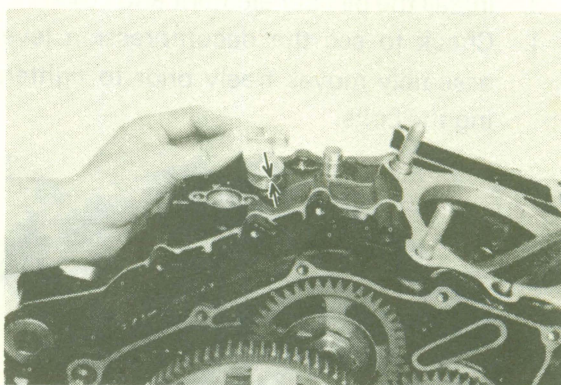
TIGHTENING TORQUE:

110 Nm (11.0 m · kg, 80 ft · lb)

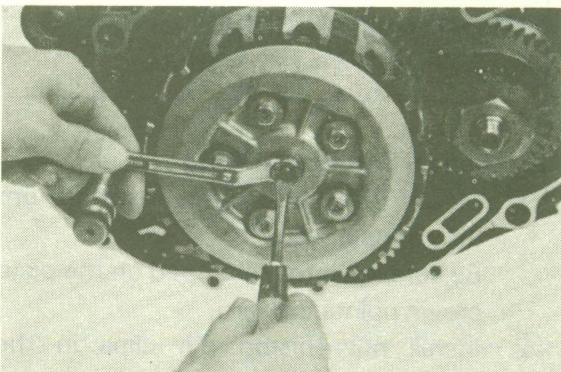


K. Clutch Mechanical Adjustment

With the crankcase index mark and the pointed end of the push lever in line with each other, adjust the pushrod and then secure it with the locknut.

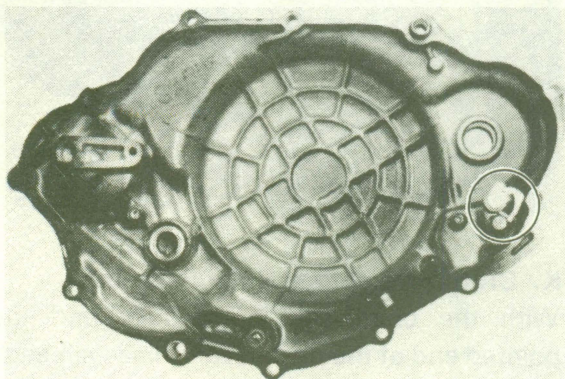


1. Locknut

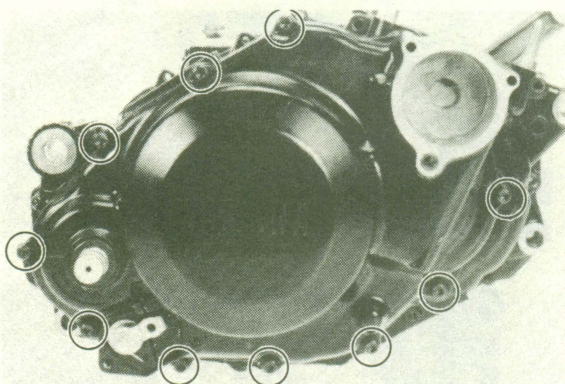


L. Crankcase Cover Right

1. Before installing the crankcase cover, place the decompression lever as shown in the photo.



2. Install the crankcase cover.
3. Install the oil filter element and cover.
4. Check to see the decompression lever assembly moves freely prior to tightening the bolts.



NOTE: _____
Tighten the screws using a crisscross pattern.

M. Kick Crank Assembly

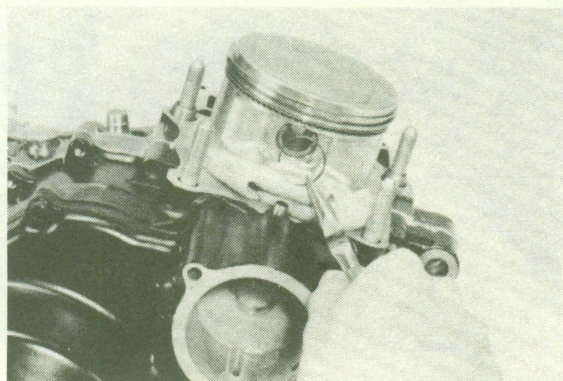
Install the kick crank assembly and tighten the securing bolt.

TIGHTENING TORQUE:
7 Nm (0.7 m · kg, 5.1 ft · lb)

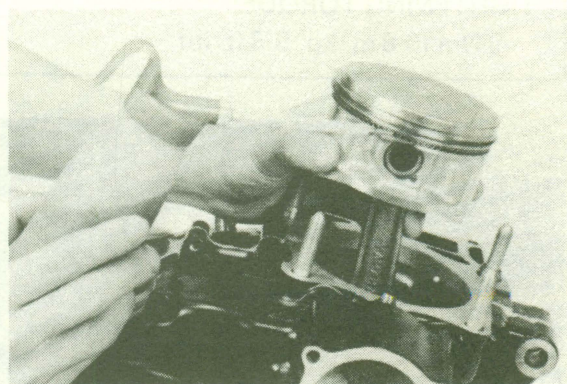
N. Piston and Piston Ring

1. Mount the piston (rings installed) onto the connecting rod.
Be sure the arrow stamped on the piston crown points forward.
2. Install new piston pin clips in their grooves.

NOTE: _____
Before installing the piston pin clips, cover the crankcase with a clean rag so you will not accidentally drop the clip into the crankcase.



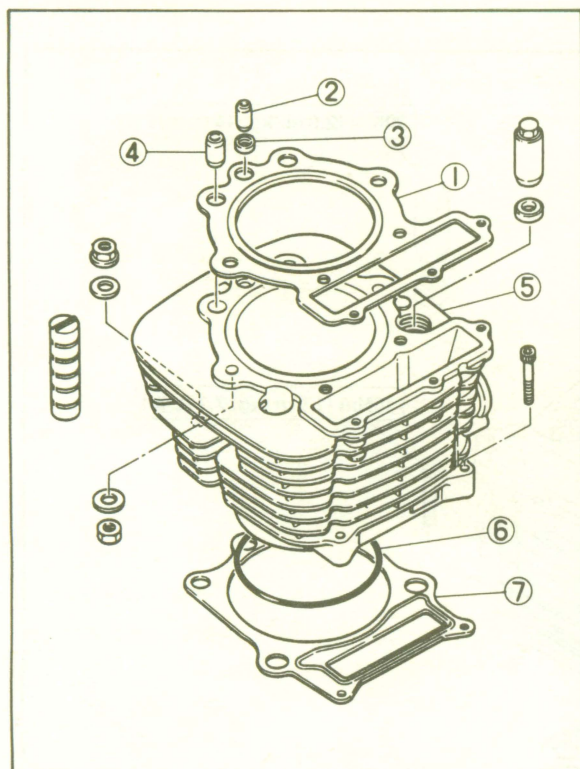
3. During reassembly, coat the piston ring grooves, piston skirt areas, and piston pin with 4-stroke engine oil.



CAUTION: _____
Be sure the ends of the oil ring expanders do not overlap.

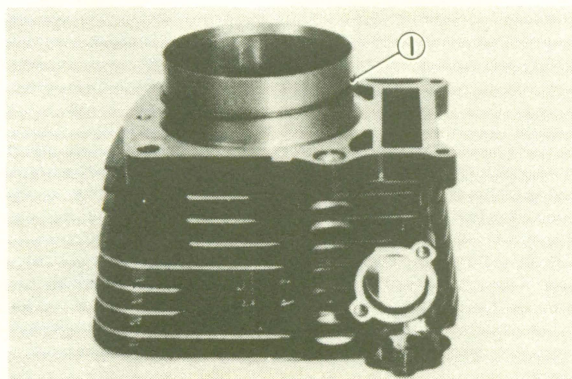
NOTE: _____
The manufacturer's marks or numbers stamped on the rings should be on the top of the rings.

O. Cylinder



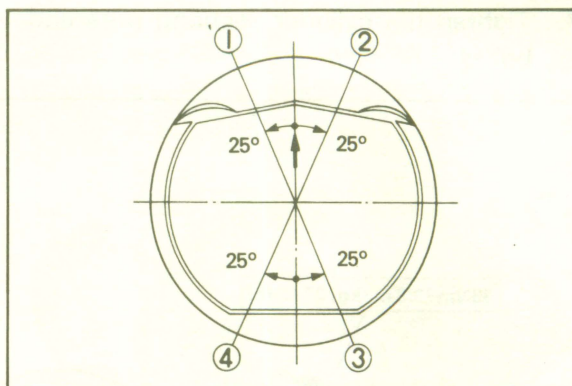
- | | |
|-------------------------|--------------------|
| 1. Cylinder head gasket | 5. Cylinder |
| 2. Dowel pin | 6. O-ring |
| 3. Rubber seal | 7. Cylinder gasket |
| 4. Dowel pin | |

1. Install the cam chain guide to the crankcase.
2. Install the new O-ring and cylinder base gasket.



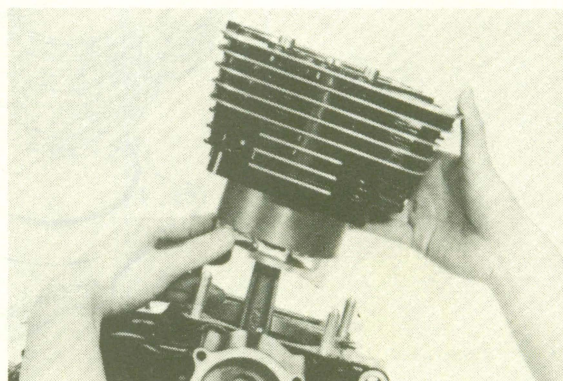
1. O-ring

3. Offset the three ring end gaps as shown.



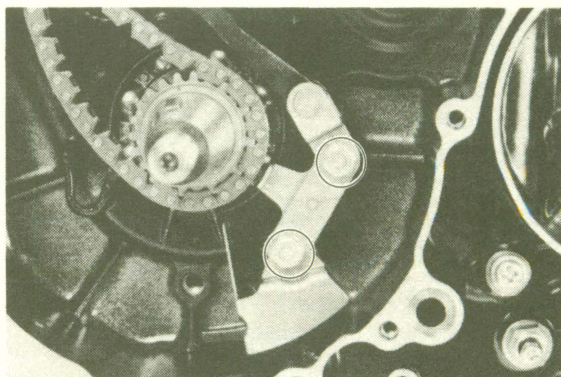
- | | |
|--------------------------|--------------------------|
| 1. Top | 3. 2nd |
| 2. Oil ring (Lower rail) | 4. Oil ring (Upper rail) |

4. Install the cylinder with one hand while compressing piston rings with other hand.

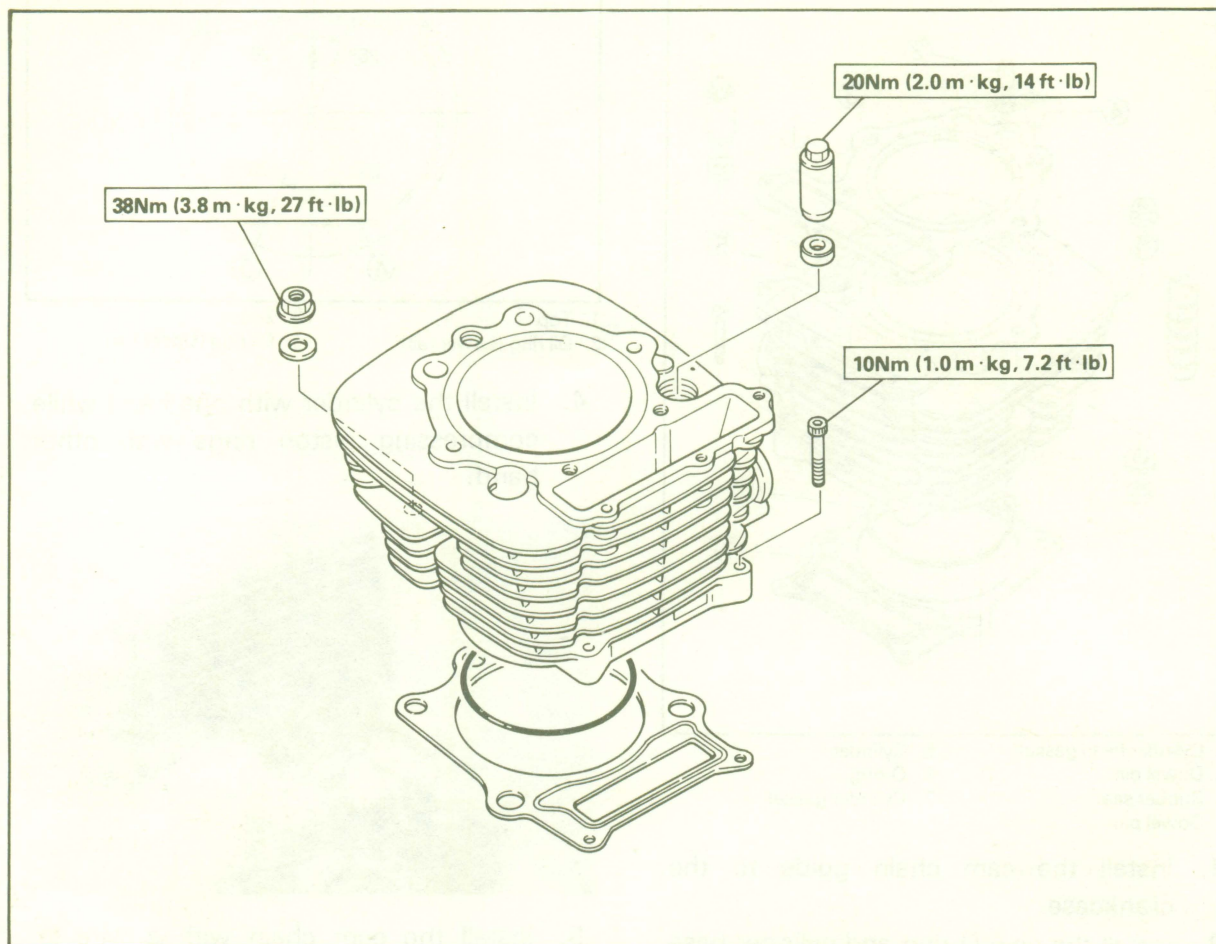


5. Install the cam chain with a wire installed.
6. Install the guide stopper and tighten the securing bolts.

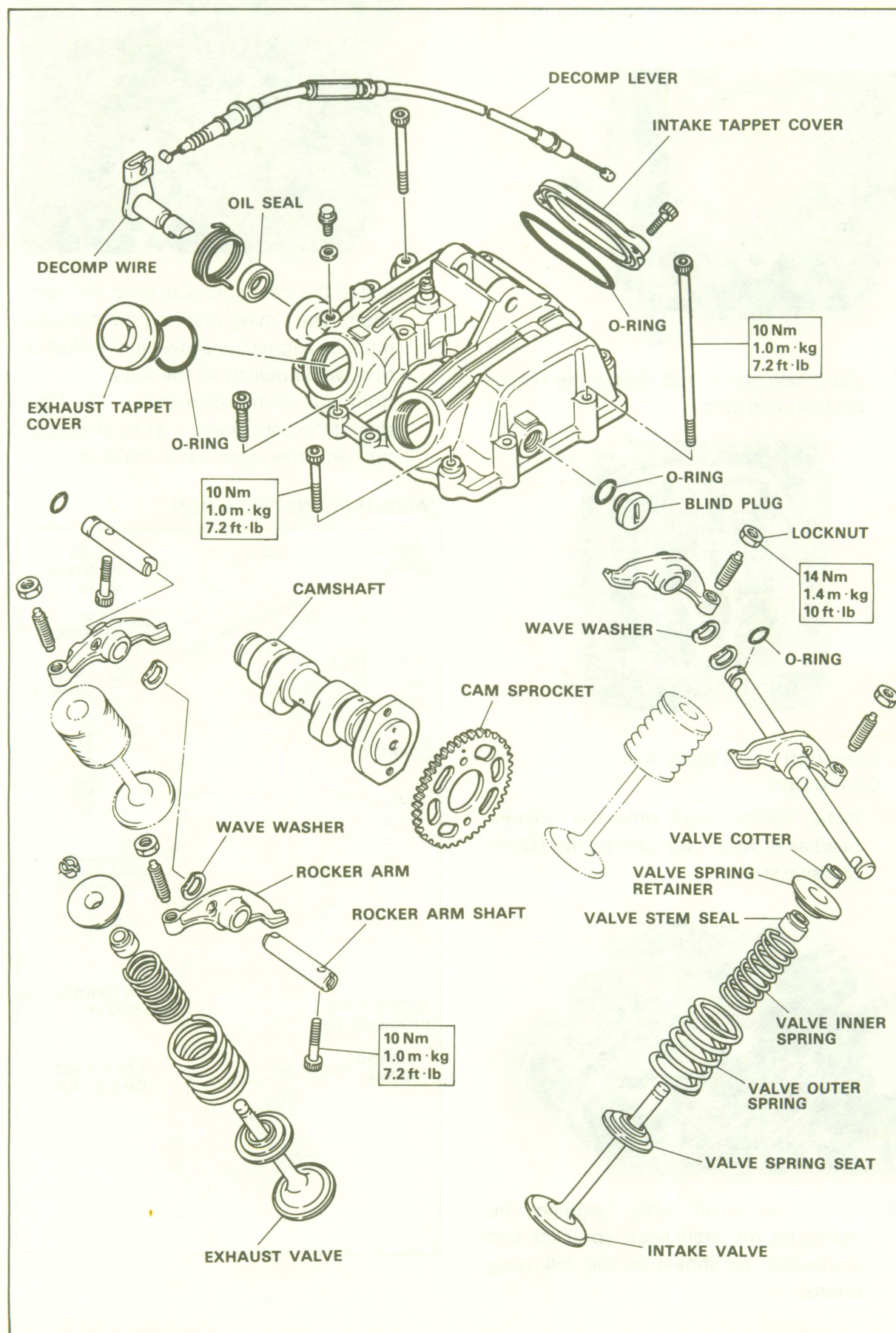
TIGHTENING TORQUE:
8 Nm (0.8 m · kg, 5.8 ft · lb)



7. Tighten the cylinder securing nuts and bolts.

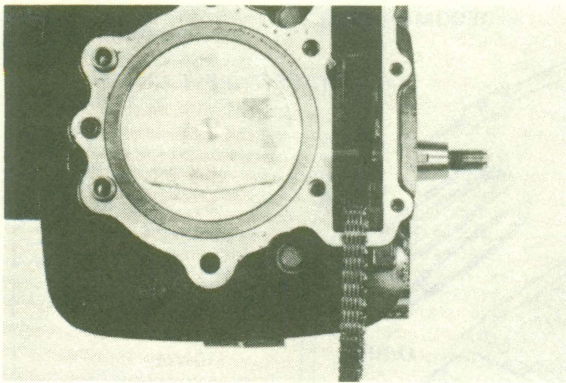


P. Cylinder Head, Rocker Arm, and Camshaft

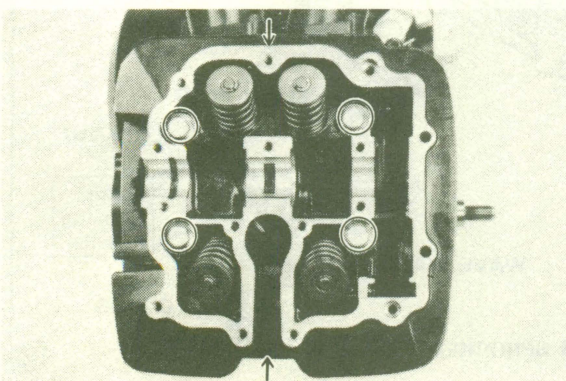


Q. Cylinder Head

1. Install the two dowels and O-ring in the cylinder.

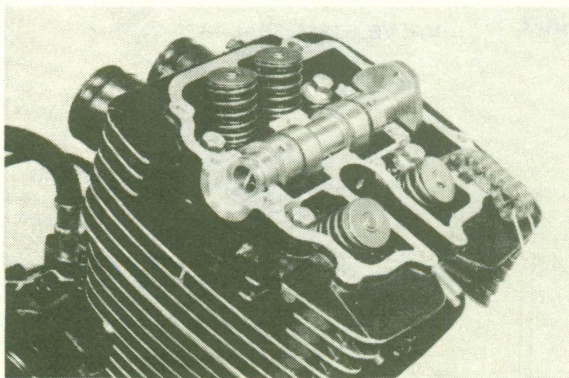


2. Use a new gasket and tighten the securing bolts and nuts.

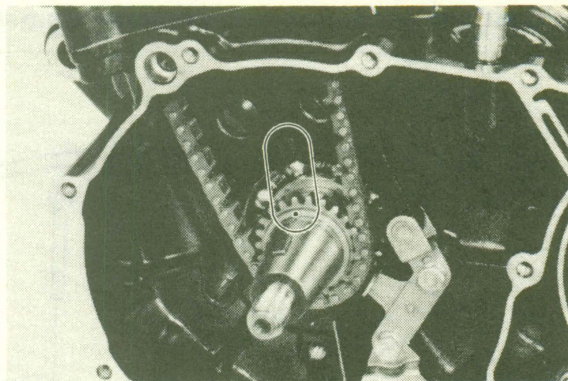


R. Camshaft, Cam Sprocket, Cam Chain

1. Install the camshaft onto the cylinder head as shown in the photograph (Compression stroke)

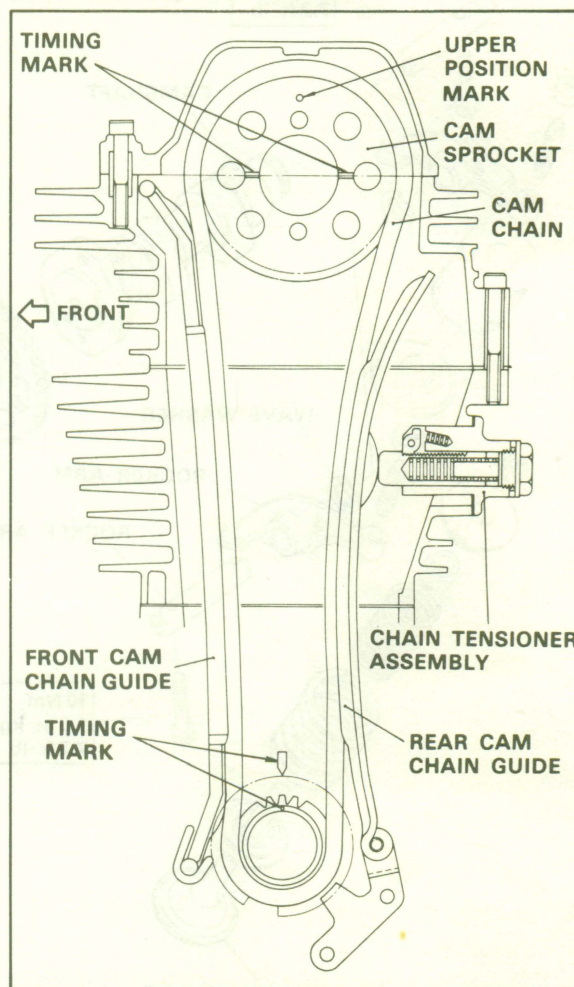


2. Install the chain while aligning the marks on the crankshaft sprocket and crankcase, as shown in the following photo.

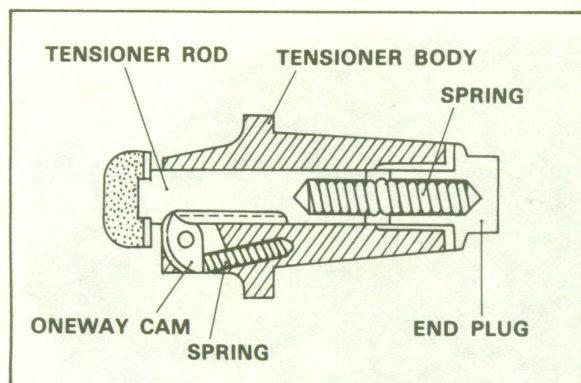
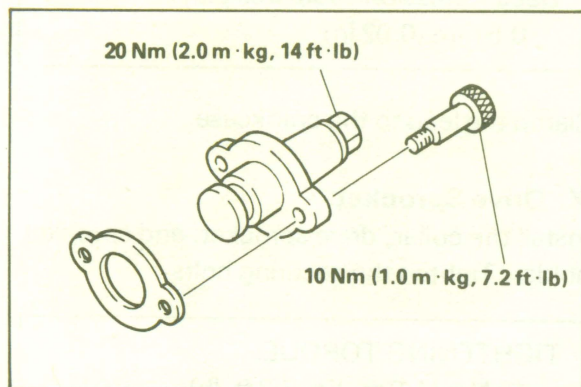


3. Install the cam sprocket onto the camshaft. The timing mark on the sprocket must be aligned as shown in the illustration, while pulling all the slack from the front side of the cam chain. The front side of the cam chain must be taut when the cam chain sprocket is installed.

CAMSHAFT INSTALLATION



S. CAM CHAIN TENSIONER



1. Insert the front cam chain guide in the cylinder.
2. Install the cam chain tensioner. First tighten the securing bolts. Then install and tighten the center bolt.
3. Install the tensioner to the cylinder and torque the bolts to the specification.

TIGHTENING TORQUE:

10 Nm (1.0 m · kg, 7.2 ft · lb)

4. Reinstall the spring and end plug with the gasket. Torque the end plug to the specification.

TIGHTENING TORQUE:

20 Nm (2.0 m · kg, 14 ft · lb)

T. Cylinder Head Cover

1. Install the O-ring and two dowels in the cylinder.
2. Use a new gasket and tighten the securing bolts.

TIGHTENING TORQUE:

10 Nm (1.0 m · kg, 7.2 ft · lb)

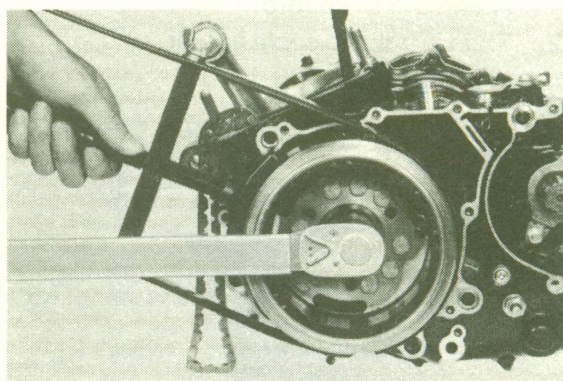
3. Adjust the valve clearance. (Refer to Chapter 2 "Valve clearance".)
4. Install the intake and exhaust tappet covers.

U. Flywheel

1. Install the woodruff key into the crankshaft keyway.
2. Install the flywheel assembly onto the crankshaft. The key in the crankshaft should engage the keyway in the flywheel.
3. Install the washer and the flywheel securing nut onto the crankshaft.
4. Install the rotor holding tool (special tool P/N. YS-01880 (90890-01701)) and tighten the securing bolt.

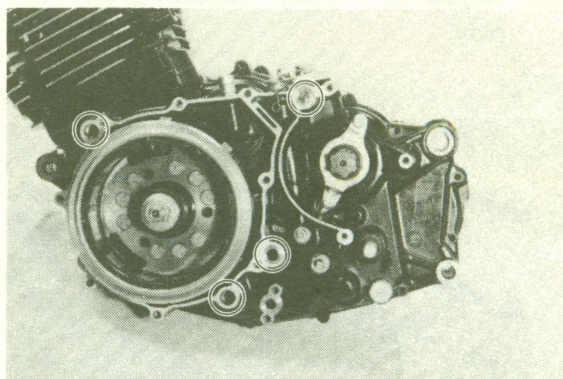
TIGHTENING TORQUE:

90 Nm (9.0 m · kg, 65 ft · lb)

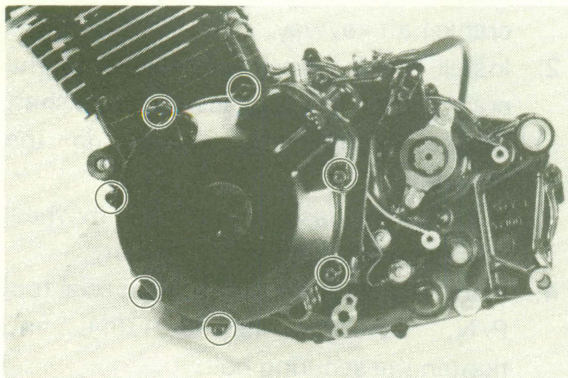


V. Crankcase Cover

1. Install the two dowels and two O-rings in the left side crankcase as shown in the photograph.

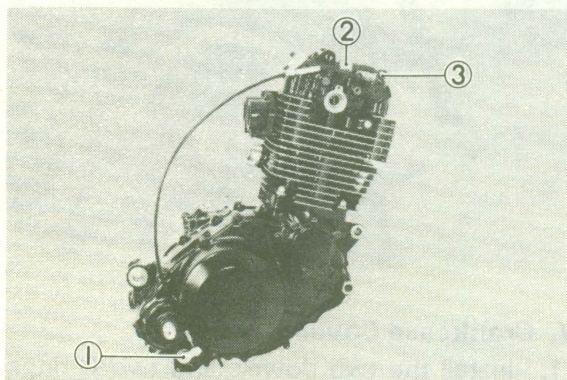


2. Set the neutral cable into the left-side crankcase ditch and connect the neutral cable to the neutral switch.
3. Install the left crankcase cover. Use a new gasket, and tighten the securing bolts.



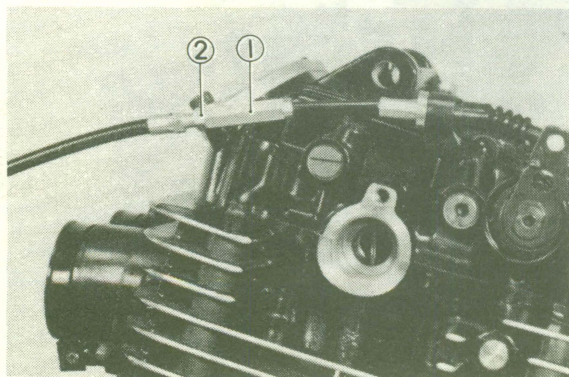
W. Decompression Cable

1. First install the decompression cable to the decompression levers. (1 and 2 in the photo.)
2. Then install the cable holder. (3 in the photo.)



1. Decompression lever 2. Decompression lever
3. Cable holder

3. Adjust the decompression cable free play.



1. Adjuster 2. Lock nut

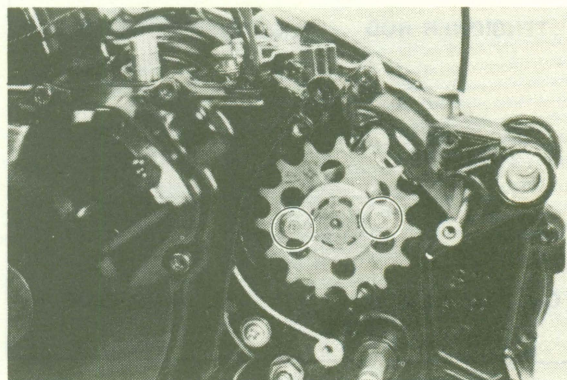
Decompression cable free play:
0.5 mm (0.02 in)

Clamp the lead to the crankcase.

X. Drive Sprocket

Install the collar, drive sprocket, and sprocket holder. Tighten the securing bolts.

TIGHTENING TORQUE:
10 Nm (1.0 m · kg, 7.2 ft · lb)



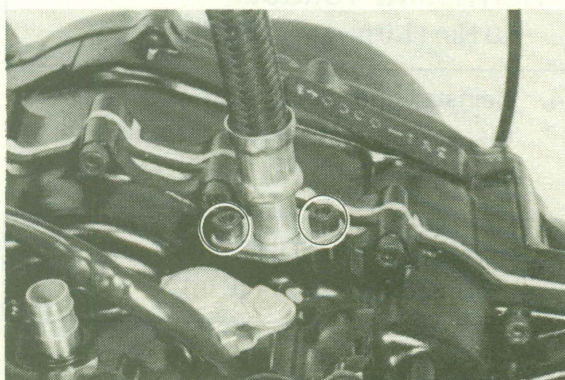
Y. Oil Delivery Pipe

Install the oil delivery pipe onto the crankcase.

Install and finger tighten the securing bolts.

NOTE:

If the O-ring is deteriorated, replace it.

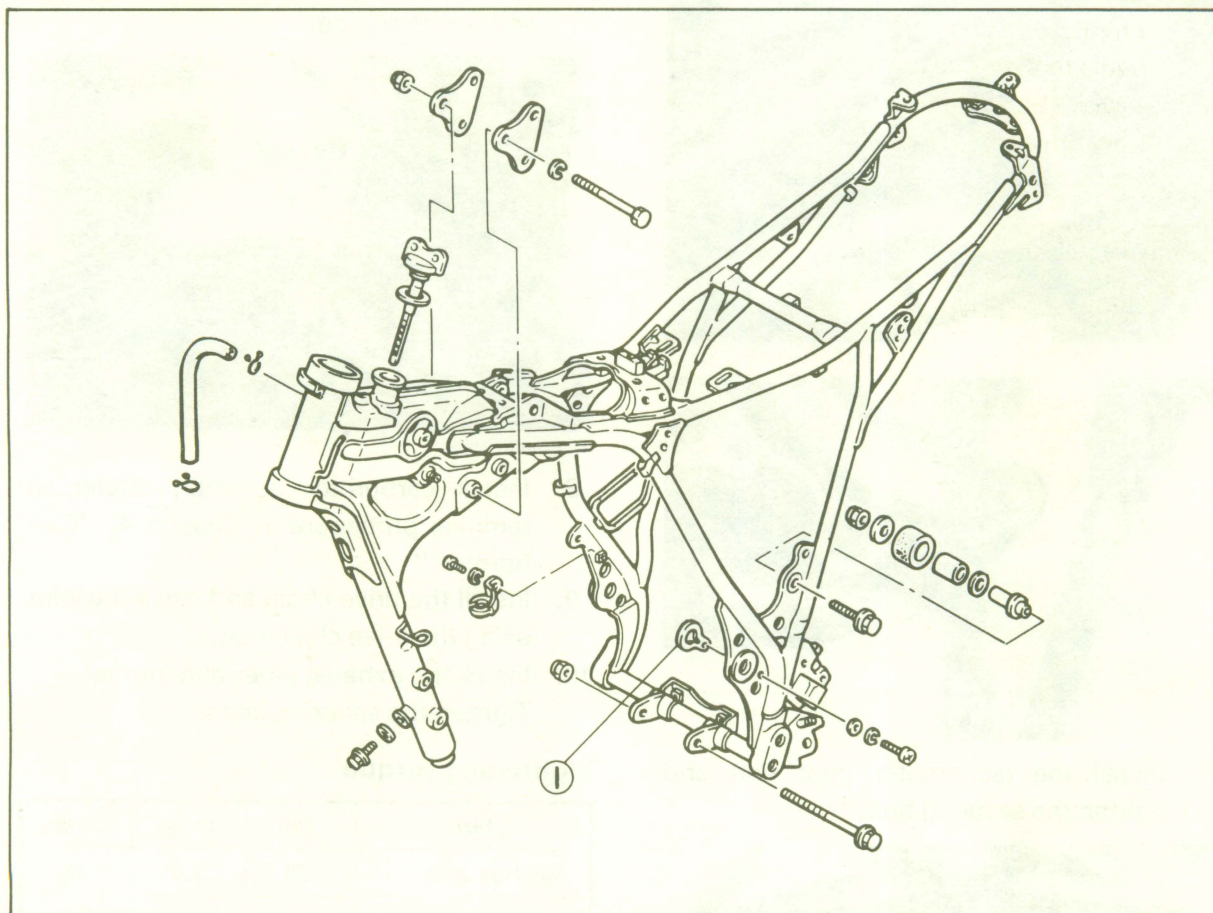


Z. Drain Plug

Install the drain plug using new gasket.

TIGHTENING TORQUE:
30 Nm (3.0 m · kg, 22 ft · lb)

ENGINE MOUNTING



1. Support plate

Refer to "ENGINE REMOVAL".

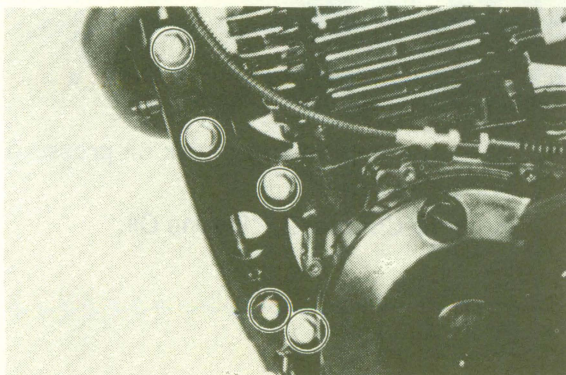
Reverse the engine removal procedure.

1. Mount the engine in the frame from the right side.

NOTE: _____

1. Place a suitable stand under the engine.
2. Take care the left side swingarm collar is in the support plate.

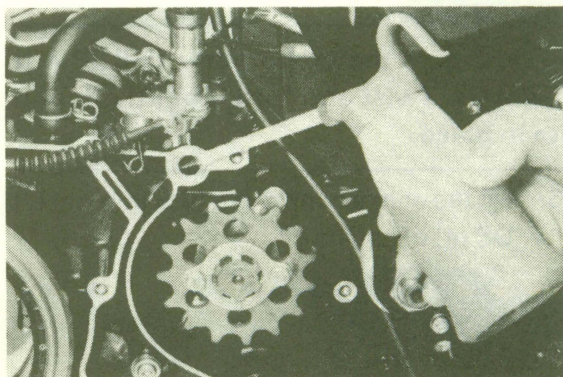
2. Install the engine mounting bolts and nuts.
3. Install the engine protector and tighten the securing bolts.

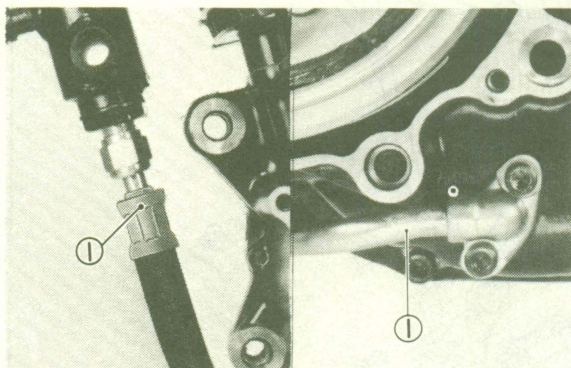
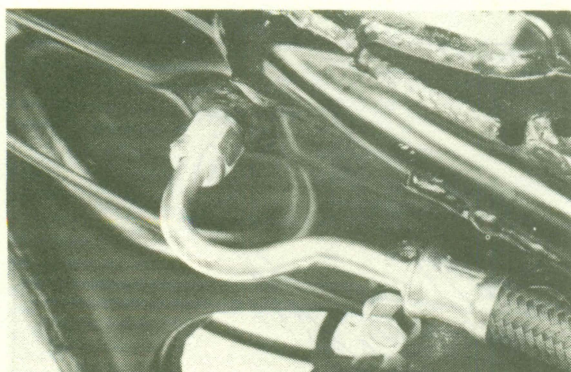


4. Install the inlet and outlet hose and tighten the securing bolts and nuts.

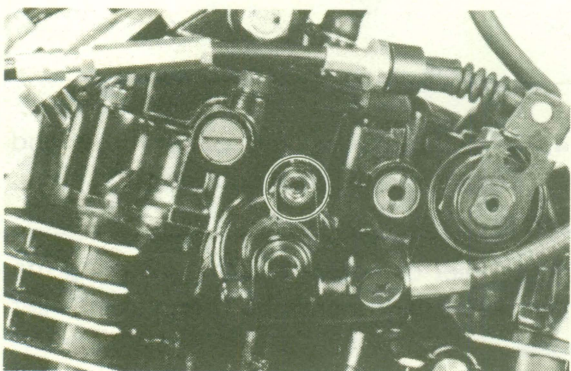
NOTE: _____

Oil the inlet oil passage before installing the inlet oil hose and install the O-ring to the inlet hose.





5. Install the tachometer gear unit and tighten the securing bolt.



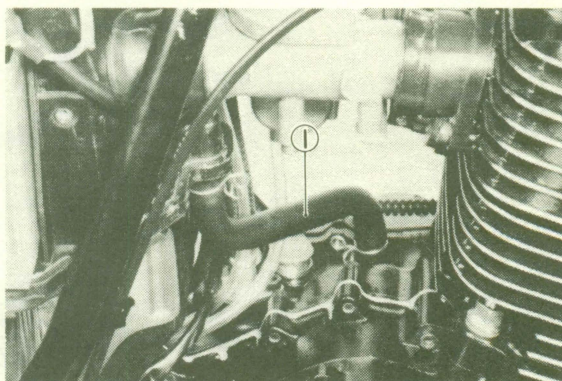
CAUTION:

Do not force the tachometer unit. Put it in slowly. Twist and turn it gently until it fits in place.

6. Fill the engine with 1.0 L (0.9 Imp qt, 1.1 US qt) of engine oil.



7. Install the lead, clutch cable, plug cap, and breather pipe.



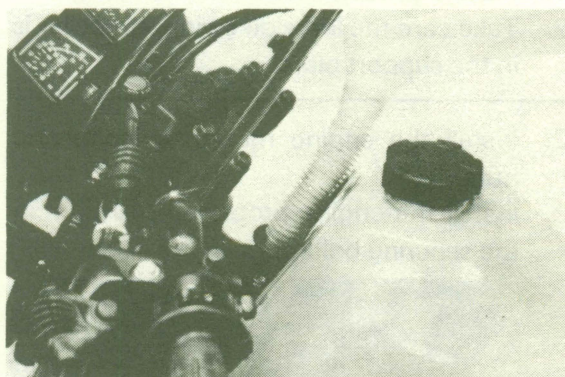
1. Breather pipe

8. Install carburetor assembly. Refer to removal procedure in Chapter 4, "Carburetor."
9. Install the drive chain and caulk the joint using the drive chain cutter.
10. Install the exhaust pipes and muffler. Tighten the securing bolts.

Tightening torque

Size	Nm	m·kg	ft·lb
M8 Hex. bolt	20	2.0	14
M6 Nut	10	1.0	7.2

11. Clamp the decompression cable to the frame.
12. Install the fuel tank and seat. Tighten the securing bolt.
13. Add 1.2 L (1.1 Imp qt, 1.3 US qt) of engine oil to the oil tank.



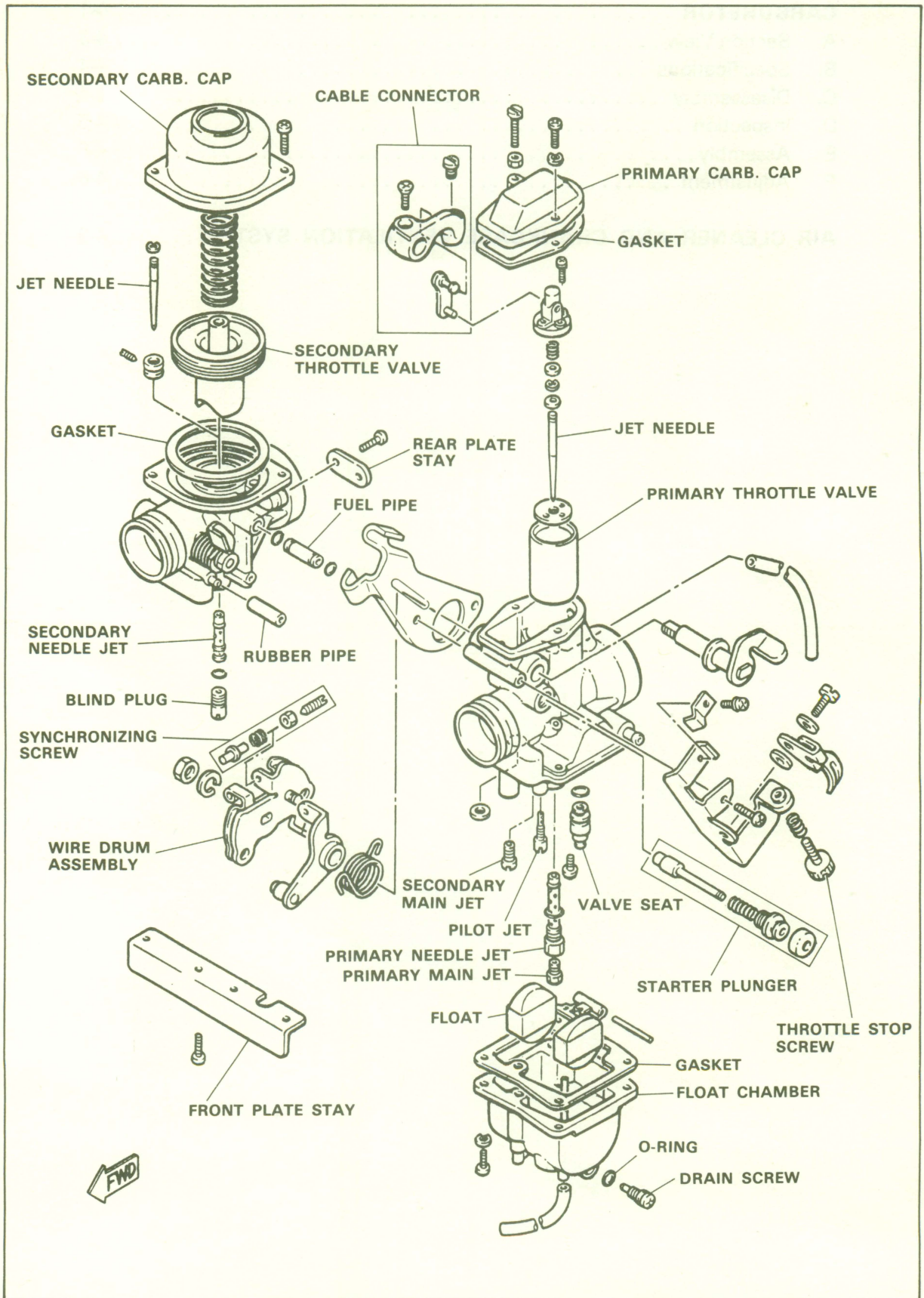
14. Start the engine and check oil pressure and oil leakage. Refer to Chapter 2, "Engine Oil."

CHAPTER 4. CARBURETION

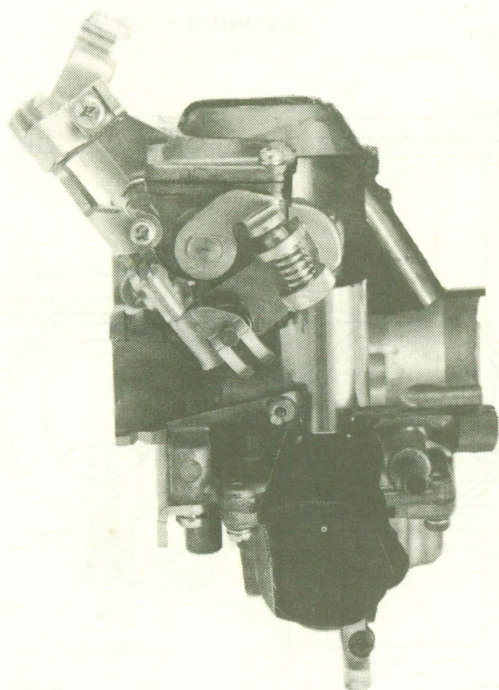
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CARBURETION

CARBURETOR

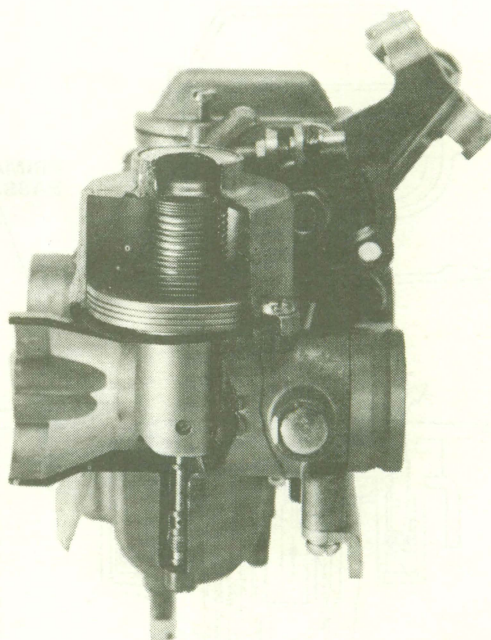


Primary Carb.

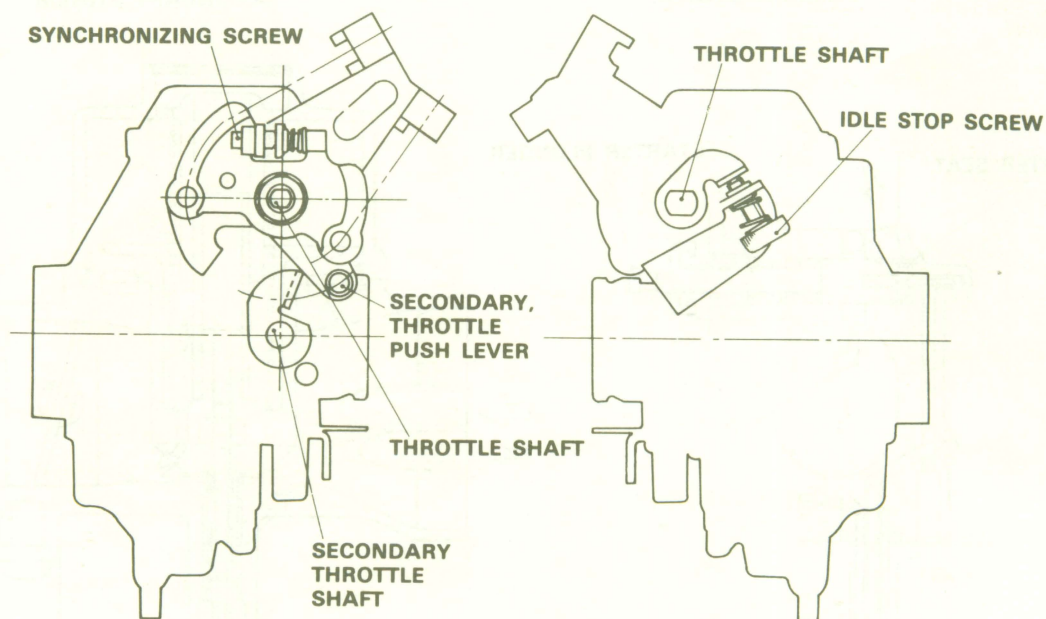


VM type
(Cable — operated slide type)

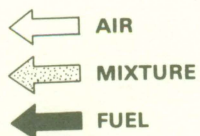
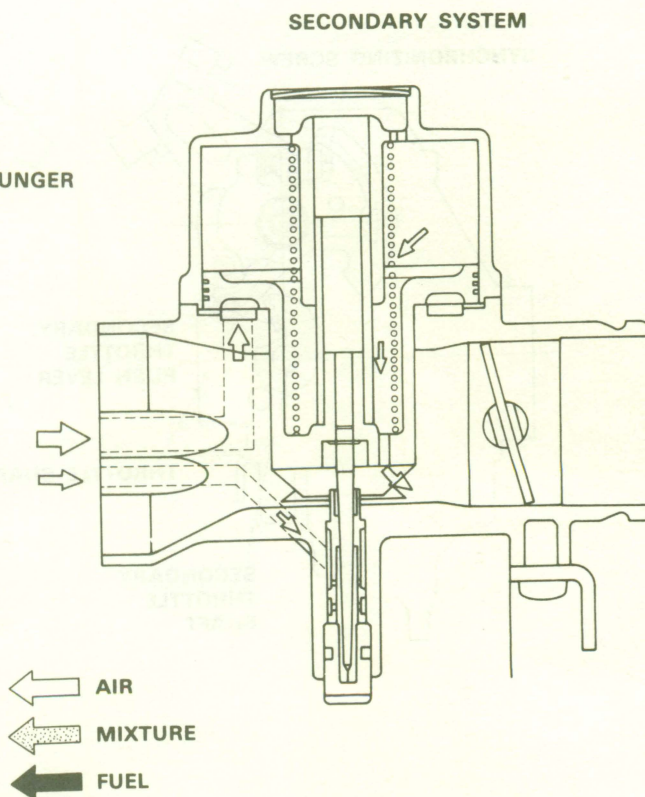
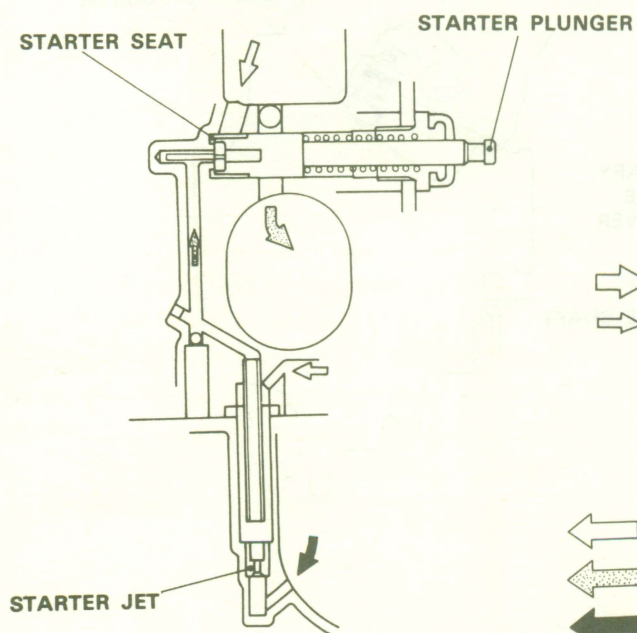
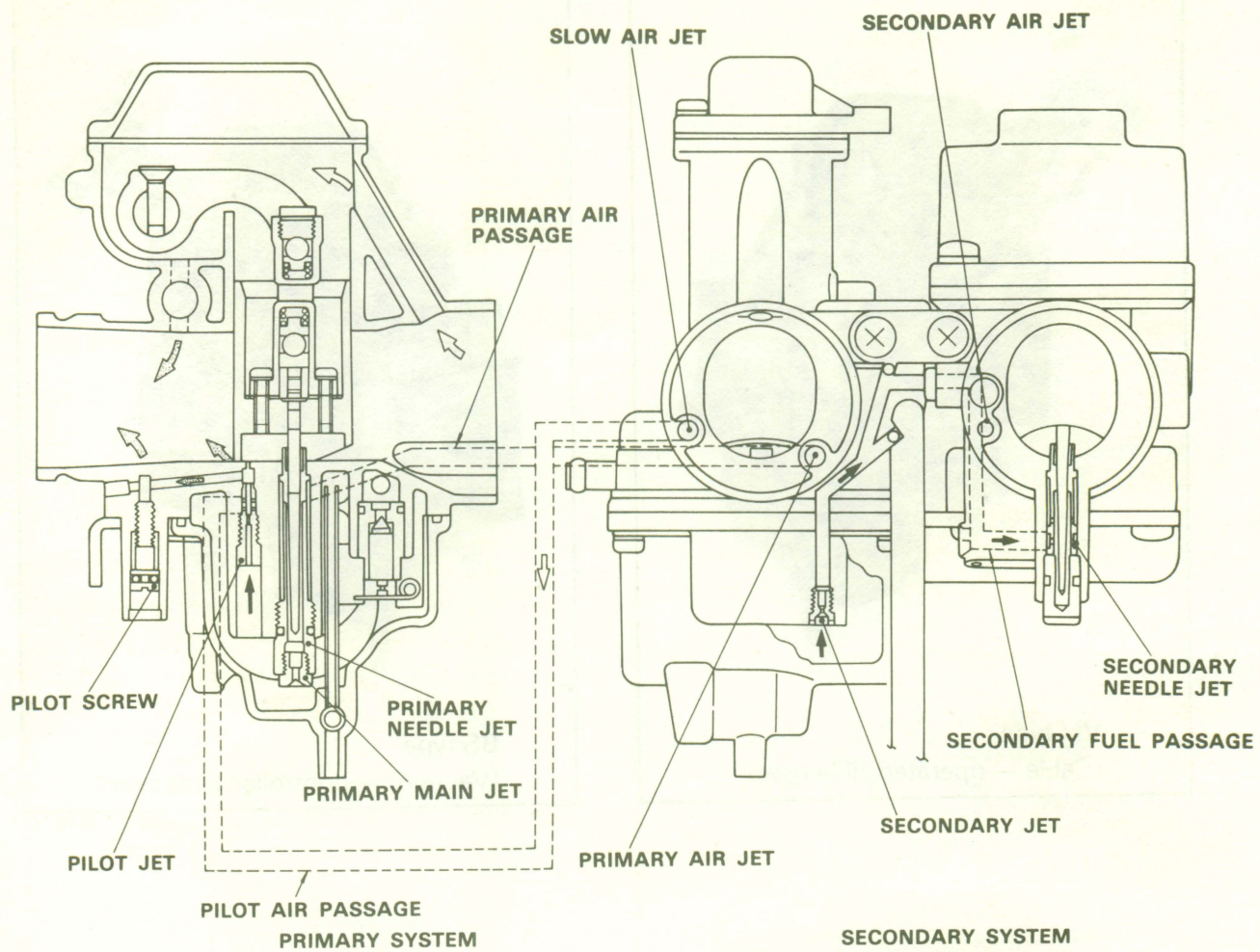
Secondary Carb.



BS type
(Vacuum — controlled slide type)



A. Section View



B. Specifications

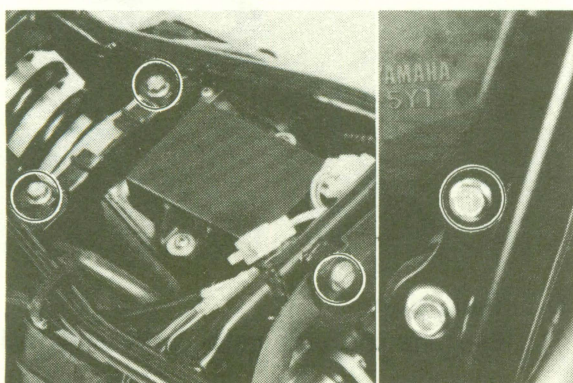
	Primary Carb	Secondary Carb
Main jet	#130	#125
Jet needle	5C30-1/1	4A70-1/1
Starter jet (GS ₁)	#64	—
(GS ₂)	#70	—
Pilot screw	Preset	—
Float valve seat	ø2.5	—
Engine idle speed	1,200 ± 50 r/min	

WARNING:

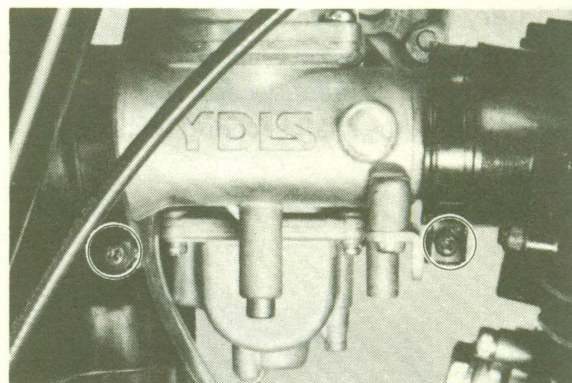
The pilot screw settings are adjusted for maximum performance at the factory with special equipment. **DO NOT** attempt to change these settings. If all other engine systems are functioning correctly, any changes will decrease performance and cause increased exhaust emissions.

C. Disassembly

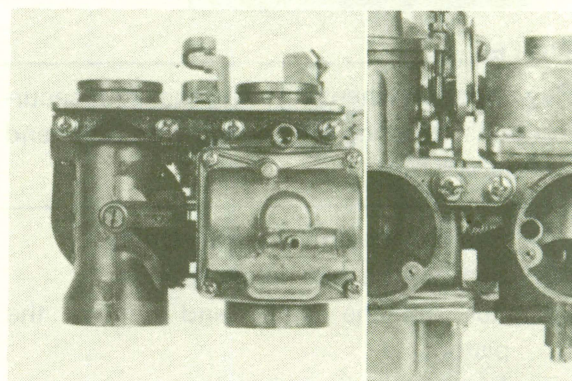
1. Remove the seat.
2. Turn the fuel cock to "OFF", and remove the fuel hose and the fuel tank.
3. Remove the throttle cables and the starter cable.
4. Loosen the four bolts securing the air cleaner case.



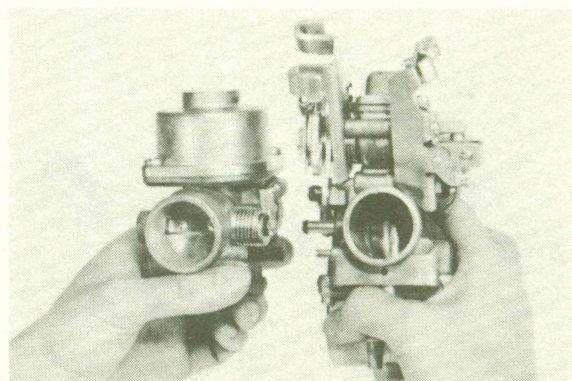
5. Loosen the four bolts securing the rubber joint band.



6. Remove the carburetor.
7. Remove the rear and front plate stays from the carburetors.



8. Separate the primary carburetor and the secondary carburetor.

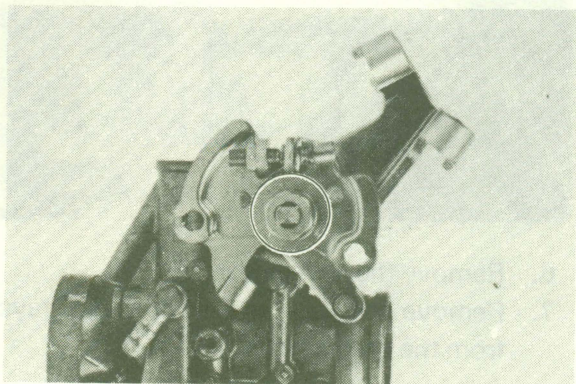


NOTE:

The primary and secondary carburetors are connected by a rubber balance pipe and a metal fuel line. To separate the carburetors, pull them apart, applying an equal amount of force on each carburetor; see the photograph.

Primary carburetor

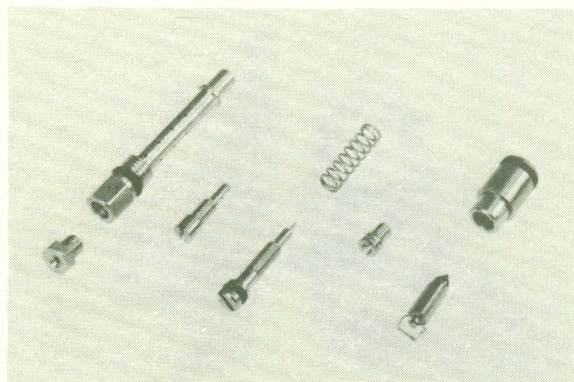
1. Remove the starter plunger.
2. Remove the primary carb. cap.
3. Remove the shaft securing bolts.



NOTE:

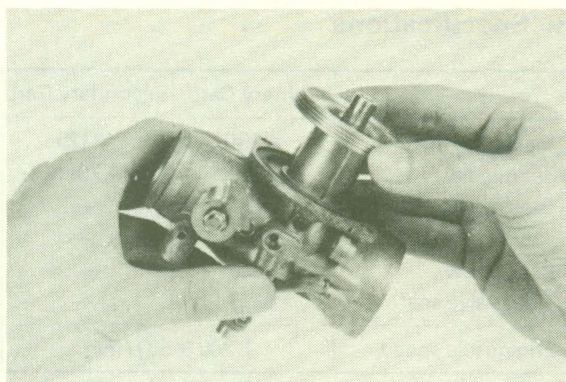
Pay attention when removing the shaft securing bolts, pressing the springs with one hand as they will turn.

4. Remove the drum wire assembly.
5. Remove the wire holder springs.
6. Pull out the shaft, and remove the piston.
7. Remove the float chamber.
8. Remove the valve seat, the needle jet, the main jet, and the pilot jet.



Secondary carburetor

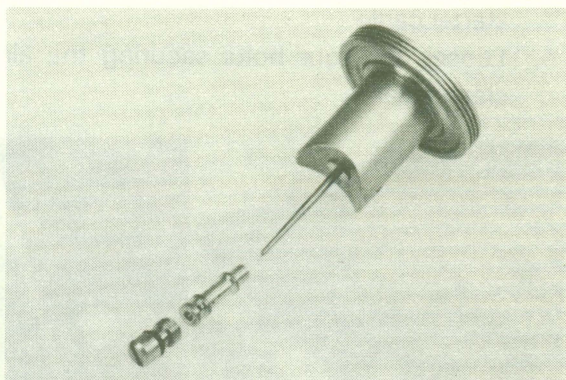
1. Remove the secondary carb. cap.
2. Remove the secondary piston.



3. Remove the needle jet out of the suction piston.

NOTE:

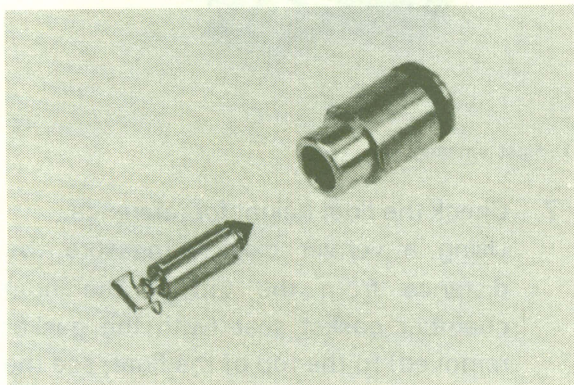
1. Loosen the jet needle tightening screw and pull out the jet needle, then they can be pulled out with the needle holder.
2. Pay close attention to the small spring supporting the jet needle; it may jump out when the jet needle is removed from the secondary piston.
4. Assemble the secondary carb. cap and the secondary piston, then move and inspect them.
5. Remove the blind plug and the needle jet.



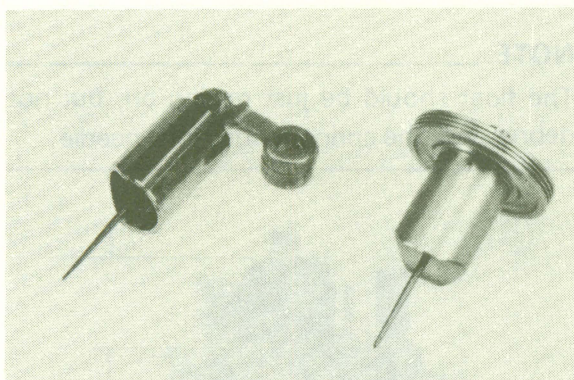
D. Inspection

1. Examine the carburetor body and fuel passages. If they are contaminated, wash the carburetor in a petroleum-based solvent. Do not use any caustic carburetor cleaning solutions. Blow out all passages and jets with compressed air.

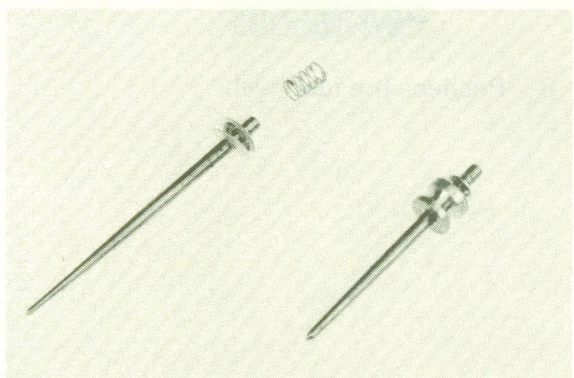
2. Examine the condition of the floats. If the floats are damaged, they should be replaced.
3. Inspect the float needle valve and seat for wear or contamination. Replace these components as a set.



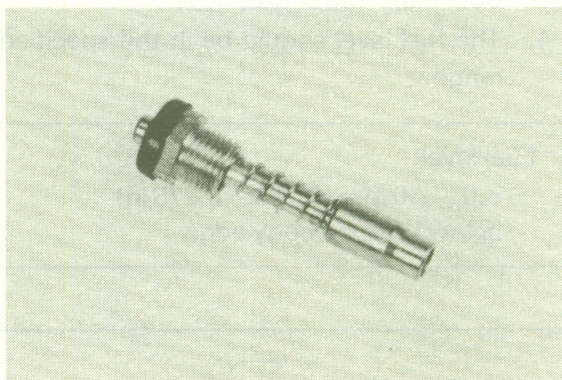
4. Inspect the primary and secondary pistons. If the piston is scratched, it must be replaced.



5. Inspect the jet needle for bends or wear. If the needle is bent or severely worn, replace it.



6. Inspect the starter plunger. If it is worn or damaged, replace it.



E. Assembly

1. To assemble the carburetors, reverse the disassembly procedures.

NOTE:

1. The suction top has no set direction.
2. When tightening the secondary cap securing panhead screws, make sure that the suction piston moves smoothly. Gradually tighten the two screws, alternating between them. Move the piston while the screws are tightened, ensuring that the piston does not bind.
3. Be sure that the suction piston moves smoothly after tightening the screws.

F. Adjustment

Fuel Level

NOTE:

Before checking the fuel level, note the following:

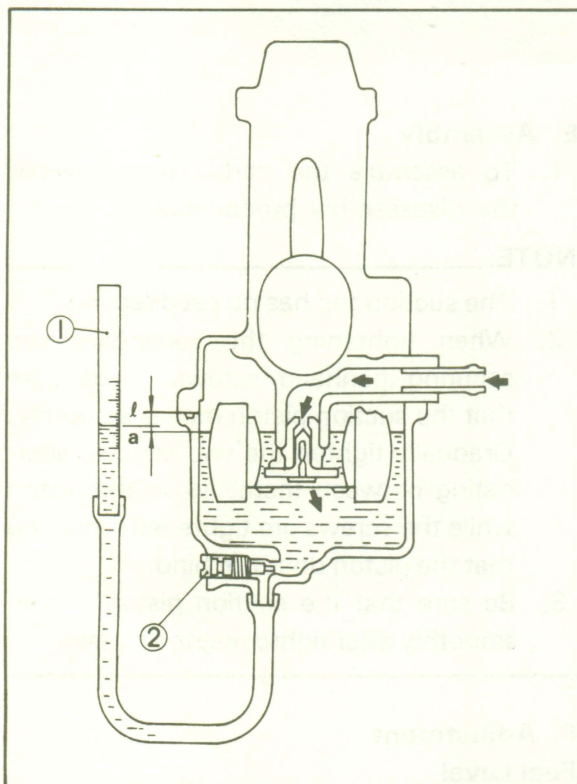
1. Place the motorcycle on a level surface.
2. Adjust the motorcycle position by placing a suitable stand or a garage jack under the engine so that the carburetor is positioned vertically.

1. Connect the level gauge (special tool P/N. YM-01312) or a vinyl pipe of 6 mm (0.24 in) in inside diameter to the float bowl nozzle on the carburetor.
2. Set the gauge as shown and loosen the drain screw.

3. Start the engine and stop it after a few minutes. This procedure is necessary to obtain the correct fuel level.
4. The fuel level should be in the specified range.

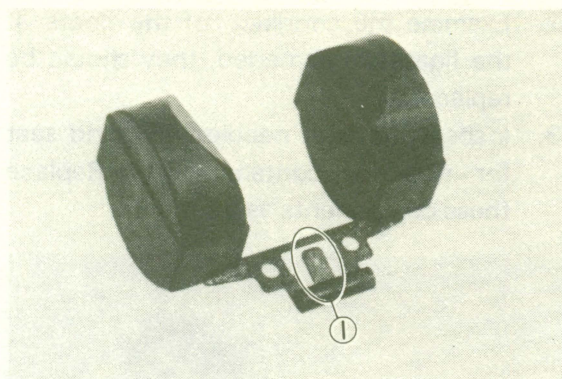
Fuel level:

5.0 ~ 7.0 mm (0.197 ~ 0.276 in)
below the carb body edge



- | | |
|---------------------|--------------------------------------|
| 1. Fuel level gauge | l. Fuel level (7.5 mm, 0.295 in) |
| 2. Drain screw | a. Surface tension (2.0 mm, 0.08 in) |

5. If the fuel level is incorrect, remove the carburetor from the motorcycle and check the fuel valve and float assembly for damage. Replace if damaged.
6. If no damage is found, correct the fuel level by slightly bending the float arm tang.



1. Float arm tang

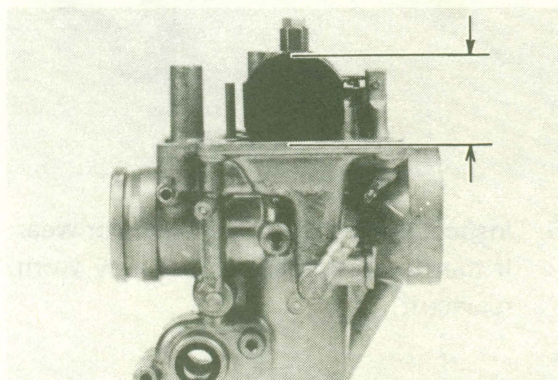
7. Check the float height for reference.
Using a vernier caliper, measure the distance from the top of the float chamber gasket seat (with the gasket removed) to the top of the float; see the photograph.

Float level:

26.0 ± 2.5 mm (1.02 ± 0.10 in)

NOTE:

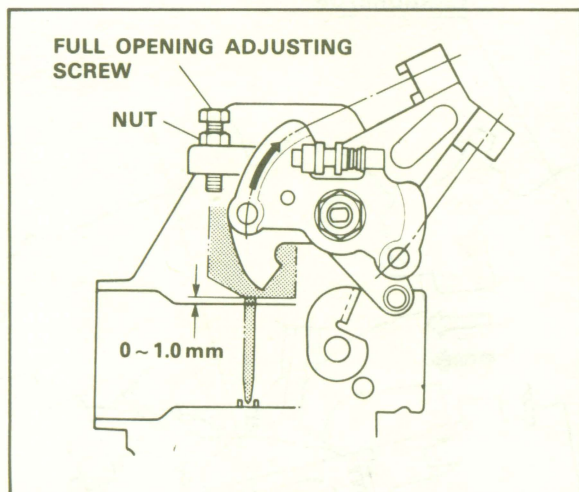
The float should be just resting on, but not depressing, the spring-loaded inlet needle.



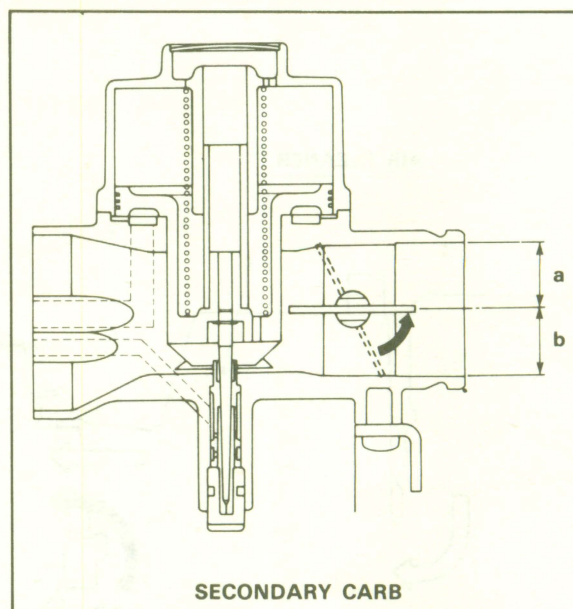
8. Recheck the fuel level.

Primary carb full-open adjustment

Turn the grip to move the drum-wire assembly to the full-throttle position. Then turn the full-open adjusting screw in or out so the carb valve bottom is positioned within the limits as specified, then secure the locknut on it.

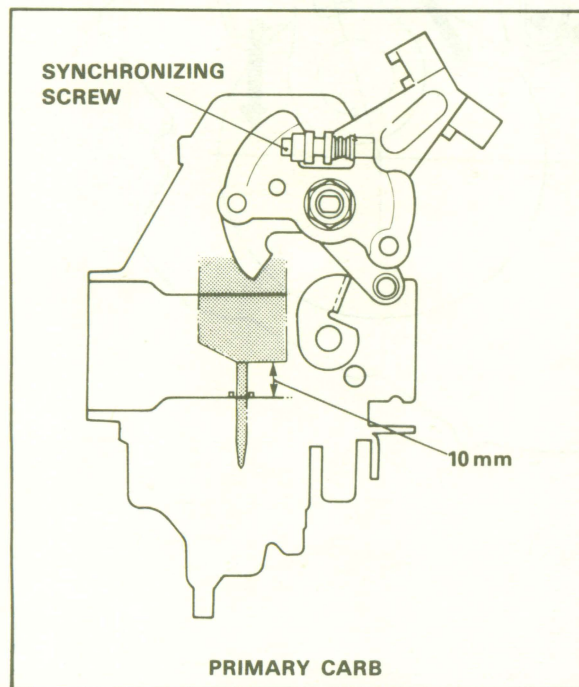


As the primary carb valve is further opened, the secondary butterfly valve will finally be opened to its full horizontal position. (a = b)

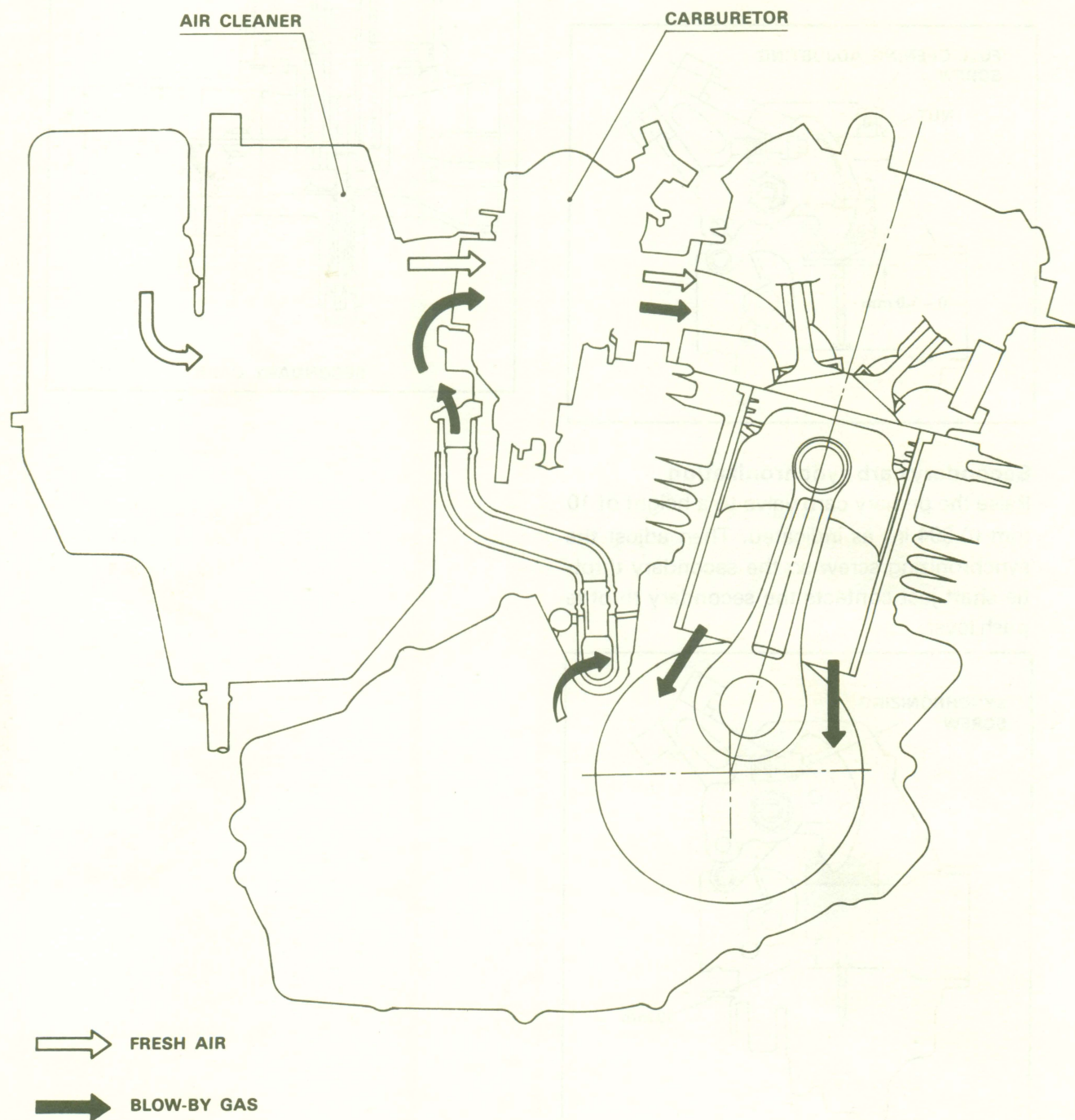


Secondary carb synchronization

Raise the primary carb valve to a height of 10 mm (0.394 in) as indicated. Then adjust the synchronizing screw so the secondary throttle shaft just contacts the secondary throttle push lever.



AIR CLEANER AND CRANKCASE VENTILATION SYSTEM



CHAPTER 5. CHASSIS

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