Official

HONDA

SHOP MANUAL
MB5

'82

6116600
Ⓐ Ⓨ A50508107C
PRINTED IN JAPAN

IMPORTANT SAFETY NOTICE

WARNING *Indicates a strong possibility of severe personal injury or loss of life if instructions are not followed.*

CAUTION: *Indicates a possibility of personal injury or equipment damage if instructions are not followed.*

NOTE: Gives helpfull information.

Detailed description of standard workshop procedures, safety principles and service operations are not included. It is important to note that this manual contains *some* warnings and caution against some specific service methods which could cause **PERSONAL INJURY** to service personal or could damage a vehicle or render it unsafe. Please understand that those warnings could not cover all conceivable ways in which service, whether or not recommended by Honda might be done or of the possible hazardous consequences of each conceivable way, nore could Honda investigate all such ways. Anyone using service procedures or tools, whether or not recommended by Honda *must satisfy himself thoroughly* that neither personal safety nor vehicle safety will be jeopardized by the service method or tools selected.

HONDA MB5

HOW TO USE THIS MANUAL

This shop manual describes the technical features and servicing procedures for the HONDA MB5.

Section 1 through 3 apply to the whole motorcycle, while section 4 through 13 describe parts of the motorcycle, grouped according to location.

Find the section you want on this page, then turn to the table of contents on page 1 of that section.

Most sections start with an assembly or system illustration, service information and troubleshooting for the section. The subsequent pages give detailed procedures.

If you are not familiar with this motorcycle, read the TECHNICAL FEATURES in section 15.

If you don't know the source of the trouble, go to section 14, TROUBLESHOOTING.

ALL INFORMATION, ILLUSTRATIONS, DIRECTIONS AND SPECIFICATIONS INCLUDED IN THIS PUBLICATION ARE BASED ON THE LATEST PRODUCT INFORMATION AVAILABLE AT THE TIME OF APPROVAL FOR PRINTING. HONDA MOTOR CO., LTD. RESERVES THE RIGHT TO MAKE CHANGES AT ANY TIME WITHOUT NOTICE AND WITHOUT INCURRING ANY OBLIGATION WHATEVER.

HONDA MOTOR CO., LTD.
SERVICE PUBLICATIONS OFFICE

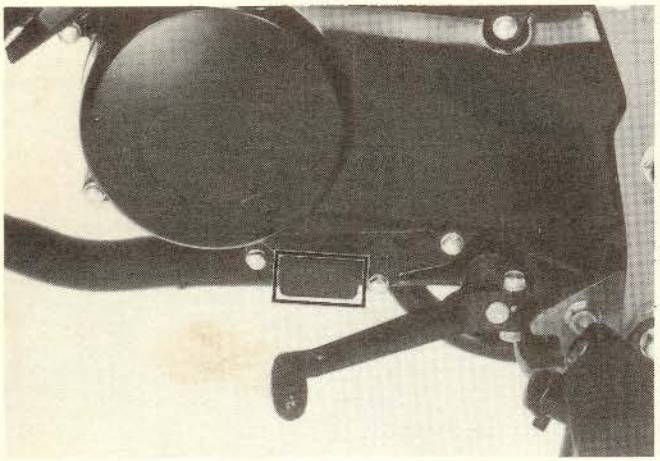
Date of Issue: July, 1981

MODEL IDENTIFICATION

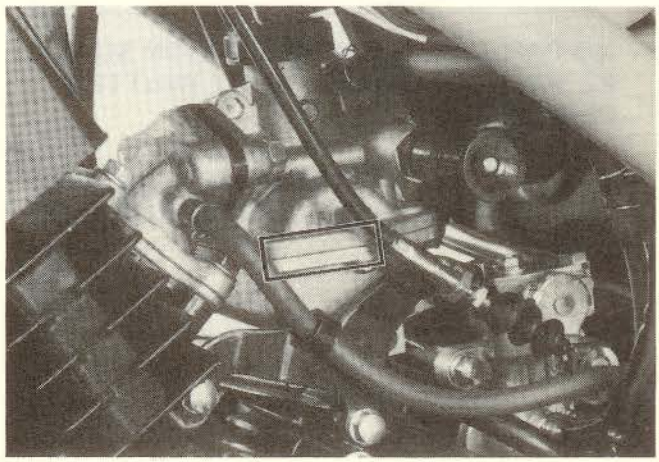
BEGINNING WITH F No. AC010 * CK000011

The frame serial number is stamped on the steering head right side.

The vehicle identification number (VIN) is near the steering head left side.



The engine serial number is stamped on the left crankcase.



The carburetor identification number is on the carburetor body left side.

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HONDA MB5 1. GENERAL INFORMATION

GENERAL SAFETY

WARNING

If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in a closed area. The exhaust contains poisonous carbon monoxide gas.

WARNING

Gasoline is extremely flammable and is explosive under certain conditions. Do not smoke or allow flames or sparks in your working area.

WARNING

The battery electrolyte contains sulfuric acid. Protect your eyes, skin and clothing. In case of contact, flush thoroughly with water and call a doctor if your eyes were exposed.

WARNING

The battery generates hydrogen gas which can be highly explosive. Do not smoke or allow flames or sparks near the battery especially while charging it.

SERVICE RULES

1. Use geniune HONDA or HONDA-recommended parts and lubricants or their equivalent. Parts that do not meet HONDA's design specifications may damage the motorcycle.
2. Use the special tools designed for this product.
3. Use only metric tools when servicing this motorcycle. Metric bolts, nuts, and screws are not interchangeable with English fasteners. The use of incorrect tools and fasteners may damage the motorcycle.
4. Install new gaskets, O-rings, cotter pins, lock plates, etc. when reassembling.
5. When tightening bolts or nuts, begin with larger-diameter or inner bolts first, and tighten to the specified torque diagonally, unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.

SPECIFICATIONS

ITEM		
DIMENSIONS	Overall length	1,880 mm (74.0 in)
	Overall width	705 mm (27.8 in)
	Overall height	1,025 mm (40.4 in)
	Wheelbase	1,215 mm (47.8 in)
	Seat height	750 mm (29.5 in)
	Foot peg height	310 mm (12.2 in)
	Ground clearance	160 mm (6.3 in)
	Dry weight	79 kg (174 lb)
	Curb weight	90 kg (198 lb)
FRAME	Type	Cross line backbone
	Front suspension, travel	Telescopic fork, 125 mm (4.9 in)
	Rear suspension, travel	Swingarm/shock absorber 90 mm (3.5 in)
	Gross vehicle weight rating	189 kg (416.7 lb)
	Vehicle capacity load	100 kg (220.5 lb)
	Front tire size	2.50-18-4PR Rib pattern
	Rear tire size	2.50-18-4PR Block pattern
	Cold tire pressures Front	175 kPa (1.75 kg/cm^2, 25 psi)
	Rear	225 kPa (2.25 kg/cm^2, 32 psi)
	Front brake, lining swept area	Single disc brake, 384 cm^2 (59.6 sq in)
	Rear brake, lining swept area	Internal expanding shoe, 86.4 cm^2 (13.4 sq in)
	Fuel capacity	9.0 liters (2.4 US gal)
	Fuel reserve capacity	2.0 liters (0.5 US gal)
	Caster angle	25°
	Trail	70 mm (2.8 in)
	Front fork oil capacity	75 cc (2.54 ozs)
ENGINE	Type	Air cooled 2-stroke, reed valve
	Cylinder arrangement	Single cylinder 40° incline
	Bore and stroke	39.0 x 41.4 mm (1.54 x 1.63 in)
	Displacement	49 cc (2.98 cu in)
	Compression ratio	7.6 : 1
	Maximum horsepower	7.0 BHP/9,000 rpm
	Maximum torque	5.6 N·m (0.56 kg-m, 4.05 ft-lb)
	Oil capacity Transmission	1.0 liters (1.1 US qt)
	Oil tank	1.1 liters (1.2 US qt)
	Lubrication system	Forced and wet sump
	Air filtration	Oiled polyurethane foam
	Cylinder compression	1,275 kPa (13.0 kg/cm^2, 185 psi)
	Engine weight	17.5 kg (38.6 lb)
	Idle speed	1,400 rpm
CARBURETION	Carburetor type	PF 15, 16 mm (0.63 in) venturi bore
	Identification number	PF 15A
	Air screw initial setting	1 3/8 turns out
	Float level	13.5 mm (0.53 in)

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ITEM		
DRIVE TRAIN	Clutch	Wet, multi-plate
	Transmission	5-speed constant-mesh
	Primary reduction	4.117
	Final reduction	3.307 (43/13)
	Gear ratio I	3.083
	Gear ratio II	1.882
	Gear ratio III	1.400
	Gear ratio IV	1.130
	Gear ratio V	0.960
	Gear shift pattern	Left foot operated return system, 1-N-2-3-4-5
ELECTRICAL	Ignition	C.D.I.
	Ignition timing "F" mark	19° ± 3° BTDC at 3,000 rpm
	Full retard	10° ± 5° BTDC at 7,000 rpm
	Starting system	Primary kickstarter
	Generator	AC generator 66W/5,000 rpm
	Battery capacity	12V – 2.5 AH
	Spark plug	
	Standard	NGK BR8HS, ND W24FSR
	For extended high speed riding	NGK BR9HS, ND W27FSR
	For cold climate below 5°C (41°F)	NGK BR7HS, ND W22FSR
	Spark plug gap	0.6 – 0.7 mm (0.024 – 0.028 in)
	Fuse	7A
LIGHTS	Headlight (high/low beam)	31.5/30 W
	Tail/stoplight	8/27 W 3/32 cp SAE NO. 1157
	Front turn signal	23W 32 cp SAE NO. 1073
	Rear turn signal	23W 32 cp SAE NO. 1073
	Speedometer light	3.4W 2 cp SAE NO. 158
	Tachometer light	3.4W 2 cp SAE NO. 158
	Neutral indicator	3.4W 2 cp SAE NO. 158
	Turn signal indicator	3.4W 2 cp SAE NO. 158
	High beam indicator	1.7W 1 cp SAE NO. 53

TORQUE VALUES

- ENGINE

Item	Q'ty	Thread Dia (mm)	Torque N·m (kg-m, ft-lb)	Remarks
Cylinder head	4	8	18–22 (1.8–2.2, 13–16)	
Alternator rotor	1	12	50–60 (5.0–6.0, 36–43)	
Primary drive gear	1	12	45–55 (4.5–5.5, 33–40)	
Drain plug	1	12	20–25 (2.0–2.5, 14–18)	

- CHASSIS

Item	Q'ty	Thread Dia (mm)	Torque N·m (kg-m, ft-lb)	Remarks
Steering stem nut	1	22	60–90 (6.0–9.0, 43–65)	
Handleber holder	4	6	8–12 (0.8–1.2, 6– 9)	
Fork pinch bolts (top)	2	7	9–13 (0.9–1.3, 7– 9)	
Fork pinch bolts (bottom)	2	8	20–30 (2.0–3.0, 15–22)	
Front fork bolt	2	20	60–70 (6.0–7.0, 43–51)	
Front fork inner bolt	2	–	34–42 (3.4–4.2, 25–30)	
Front axle nut	1	12	55–65 (5.5–6.5, 40–48)	
Engine mounting bolts	3	10	30–40 (3.0–4.0, 22–29)	
Rear axle nut	1	12	55–65 (5.5–6.5, 40–48)	
Final driven sprocket	3	10	55–65 (5.5–6.5, 40–48)	
Rear brake torque link	2	8	18–25 (1.8–2.5, 13–18)	
Rear shock absorber	4	10	30–40 (3.0–4.0, 22–29)	
Foot peg	2	10	25–35 (2.5–3.5, 18–25)	
Gearshift pedal	1	6	8–12 (0.8–1.2, 6– 9)	
Kickstarter pedal	1	6	8–12 (0.8–1.2, 6– 9)	
Swingarm pivot nut	1	12	55–65 (5.5–6.5, 40–48)	Self-locking nut
Front brake disc	3	8	27–33 (2.7–3.3, 20–24)	
Front brake master cylinder	2	6	10–14 (1.0–1.4, 7–10)	
Front brake master cylinder reservoir cap	4	4	1– 2 (0.1–0.2, 0.7–1.5)	
Brake hose bolt	2	10	25–35 (2.5–3.5, 18–25)	
Brake caliper bracket	2	8	24–30 (2.4–3.0, 17–22)	
Brake caliper	1	8	20–25 (2.0–2.5, 15–18)	
Brake caliper pin bolt	3	8	15–20 (1.5–2,0, 11–15)	

Torque specifications listed above are for important fasteners. Others should be tightened to standard torque values below.

- STANDARD TORQUE VALUES

Item	Torque N·m (kg-m, ft-lb)	Item	Torque N·m (kg-m, ft-lb)
5 mm bolt and nut	4– 6 (0.4–0.6, 3– 4)	5 mm screw	3– 5 (0.3–0.5, 3– 4)
6 mm bolt and nut	8–12 (0.8–1.2, 6– 9)	6 mm screw	7–11 (0.7–1.1, 5– 8)
8 mm bolt and nut	18–25 (1.8–2.5, 13–18)	6 mm flange bolt and nut	10–14 (1.0–1.4, 7–10)
10 mm bolt and nut	30–40 (3.0–4.0, 22–29)	8 mm flange bolt and nut	20–30 (2.0–3.0, 14–22)
12 mm bolt and nut	50–60 (5.0–6.0, 36–43)	10 mm flange bolt and nut	30–40 (3.0–4.0, 22–29)

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TOOLS

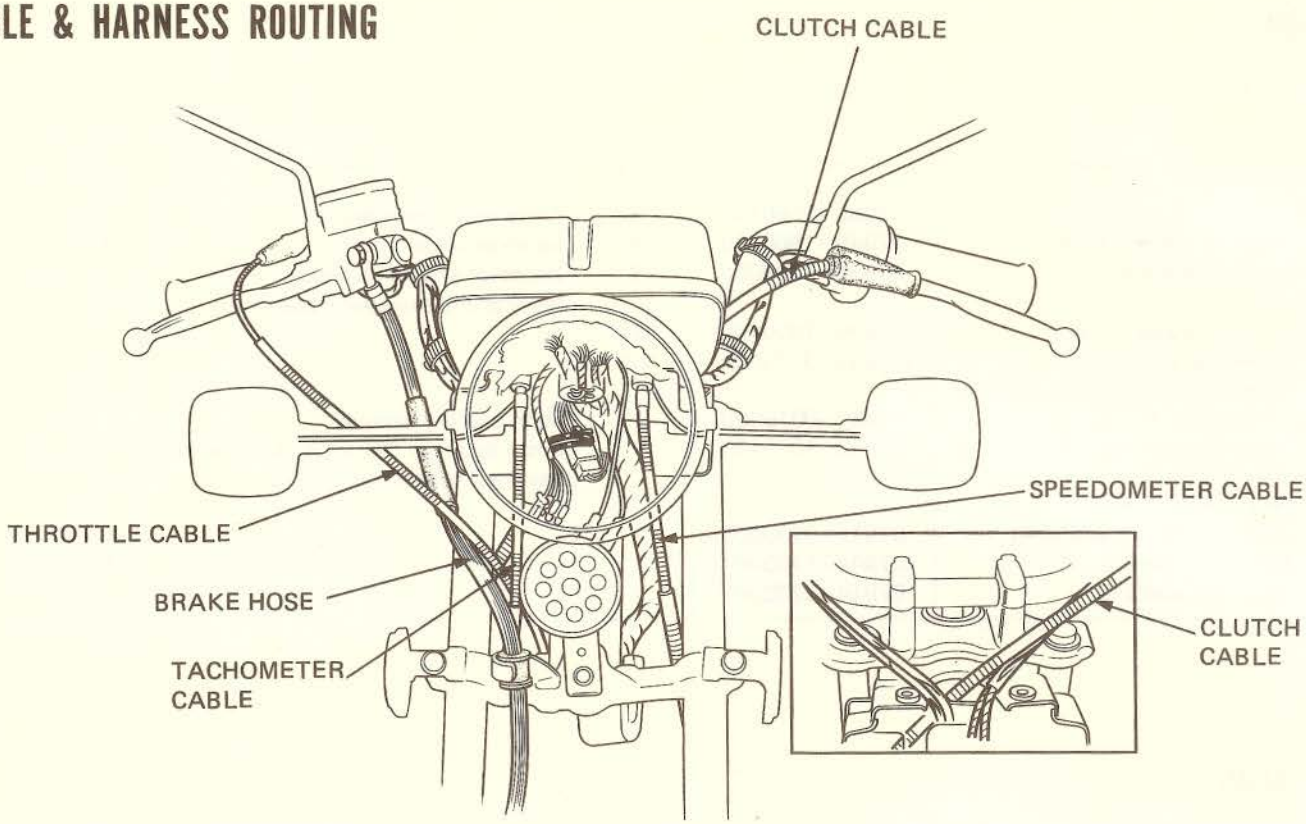
SPECIAL

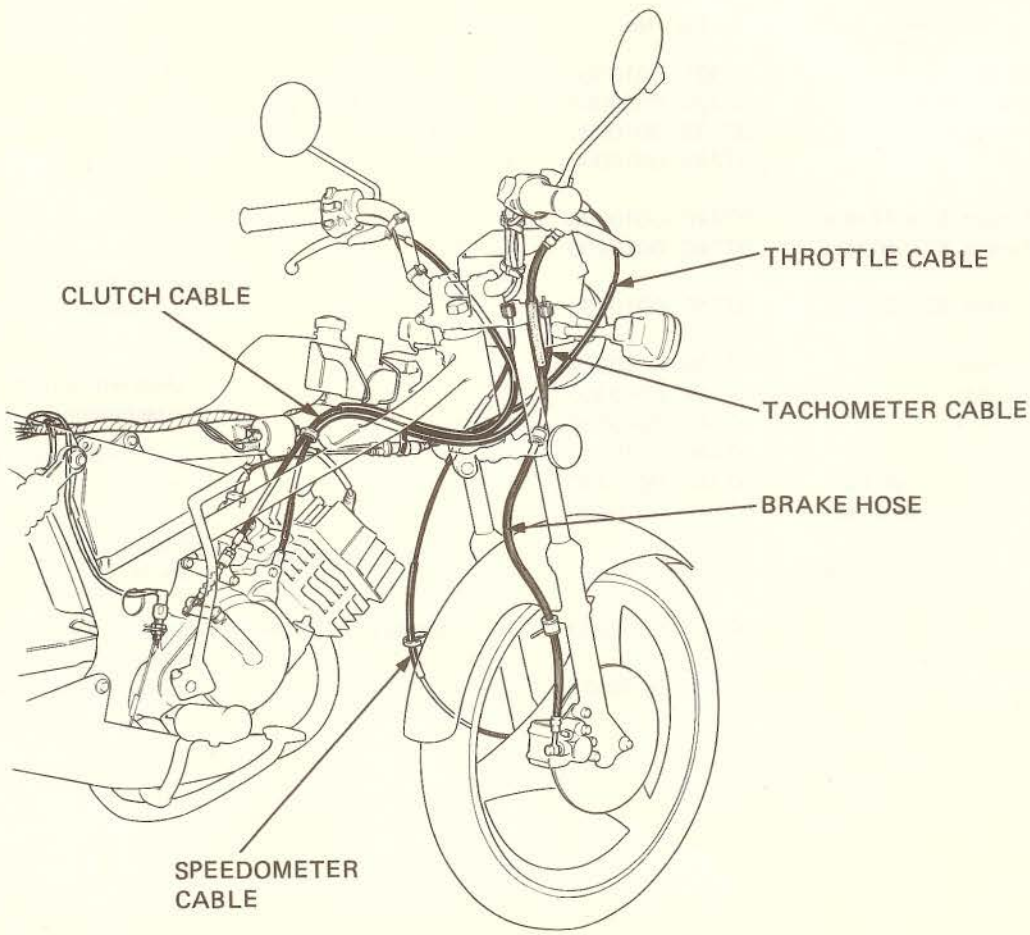
Tool Name	Tool No.	Q'ty	Remarks	Ref. page
Crankshaft assembly tool	07965–1660100	1	Crankshaft installation	9-11
Balancer weight driver	07945–1660000	1	Balancer installation	9-11
Bearing remover set	07936–1660000	1	Removal of small balancer bearing and mainshaft bearing	9-6
(Spindle assembly)	(07936–1660100)	(1)		
(Sliding weight)	(07936–3710200)	(1)		
Bearing puller (commercially available)	07631–0010000	1	Main bearing removal	9-9
Bearing driver 28 x 30 mm	07946–1870100	1	Small balancer bearing and mainshaft bearing installation	9-7
Hex wrench 6 mm (commercially available)	07917–3230000	1		10-13, 10-15
Ball rece driver	07944–1150001	1		10-18, 10-19
Snap ring pliers	07914–3230001	1		12-10, 12-17

COMMON

Tool Name	Part No.	Q'ty	Alternate Tool	Remarks	Ref. page
Float level gauge	07401–0010000	1		Float level	4-7
Universal holder	07725–0030000	1	07725–0010101	Flywheel removal	7-7, 8-2, 8-4
Flywheel puller	07733–0010000	1	07933–0010000		8-2
Driver A	07749–0010000	1		Used with driver attachment	9-7, 9-10, 11-5, 10-10
Attachment 42 x 47 mm	07746–0010300	1			9-7, 9-10, 11-5
Attachment 37 x 40 mm	07746–0010200	1		Installation of front wheel bearing	10-10
Attachment 32 x 35 mm	07746–0010100	1		Installation of crankshaft oil seal	9-10
Pilot 12 mm	07746–0040200	1		Used with driver attachment	9-7, 10-10
Pilot 17 mm	07746–0040400	1			9-7, 11-5
Pilot 20 mm	07746–0040500	1			9-10
Driver B	07746–0010600	1		Installing crankshaft bearing	9-10
Attachment 20 mm I.D.	07746–0020400	1			9-10
Front fork oil seal driver body	07747–0010100	1	07947–1180001	Installing fork seal in slider	10-16
Fork seal driver attachment B	07747–0010300	1			
Pin spanner	07702–0010000	1	M9361–412–099788	Steering head bearing adjustment	10-18, 10-19
Shock compressor	07959–3290001	1		Installing rear shock spring	11-10, 11-11

CABLE & HARNESS ROUTING





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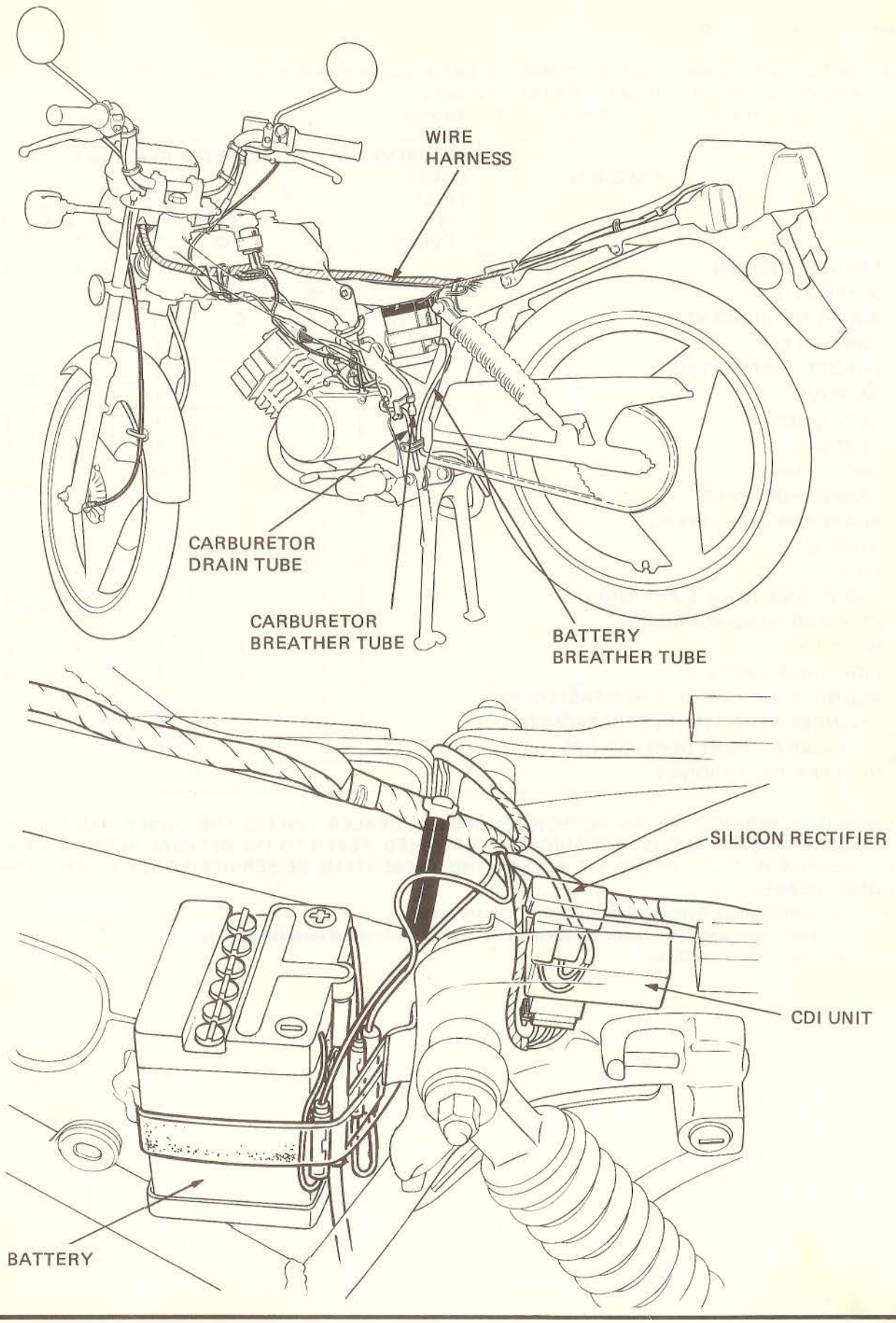

MAINTENANCE SCHEDULE

Perform the Pre-ride Inspection in the Owner's Manual at each scheduled maintenance period.
I : Inspect and Clean, Adjust, Lubricate or Replace if necessary.
C : Clean R : Replace A : Adjust L : Lubricate

	ITEM \ FREQUENCY	WHICHEVER COMES FIRST ↓ EVERY	ODOMETER READING [NOTE (2)] 300 mi (500 km)	1,800 mi (3,000 km)	3,600 mi (6,000 km)	5,400 mi (9,000 km)	Refer to
	TRANSMISSION OIL		R			R	2-3
	SPARK PLUG		C·A	R	C·A		3-5
	AIR FILTER ELEMENT	NOTE (1)		C	C	C	3-4
*	CARBURETOR		I		I		3-5
*	THROTTLE OPERATION		I	I	I	I	3-3
**	OIL PUMP		I	I	I	I	3-6
*	FUEL LINES				I		3-3
	CLUTCH		I		I		3-10
	DRIVE CHAIN	NOTE (3)	I, L		I·L		3-10
	BRAKE SHOES/PADS		I		I		3-7, 3-8
	BRAKE CONTROL LINKAGE		I		I		
**	WHEELS		I		I		3-12
	TIRES		I	I	I	I	3-12
*	FRONT AND REAR SUSPENSION		I		I		3-12
**	STEERING HEAD BEARINGS					I	3-13
	BATTERY		I	I	I	I	3-7
*	LIGHTING EQUIPMENT		I	I	I	I	3-9
*	ALL NUTS, BOLTS AND OTHER FASTENERS		I	I	I	I	3-13
**	CYLINDER HEAD, PISTON DECARBONIZE				C		6-2
**	CYLINDER EX. PORT DECARBONIZE				C		6-5
**	MUFFLER DECARBONIZE					C	3-14

* SHOULD BE SERVICED BY AN AUTHORIZED HONDA DEALER, UNLESS THE OWNER HAS PROPER TOOLS AND SERVICE DATA AND IS MECHANICALLY QUALIFIED. REFER TO THE OFFICIAL HONDA SHOP MANUAL.
** IN THE INTEREST OF SAFETY, WE RECOMMEND THESE ITEMS BE SERVICED ONLY BY AN AUTHORIZED HONDA DEALER.

NOTES: (1) Service more frequently when riding in dusty areas.
(2) For higher odometer readings, repeat at the frequency interval established here.
(3) Every 300 mi (500 km)

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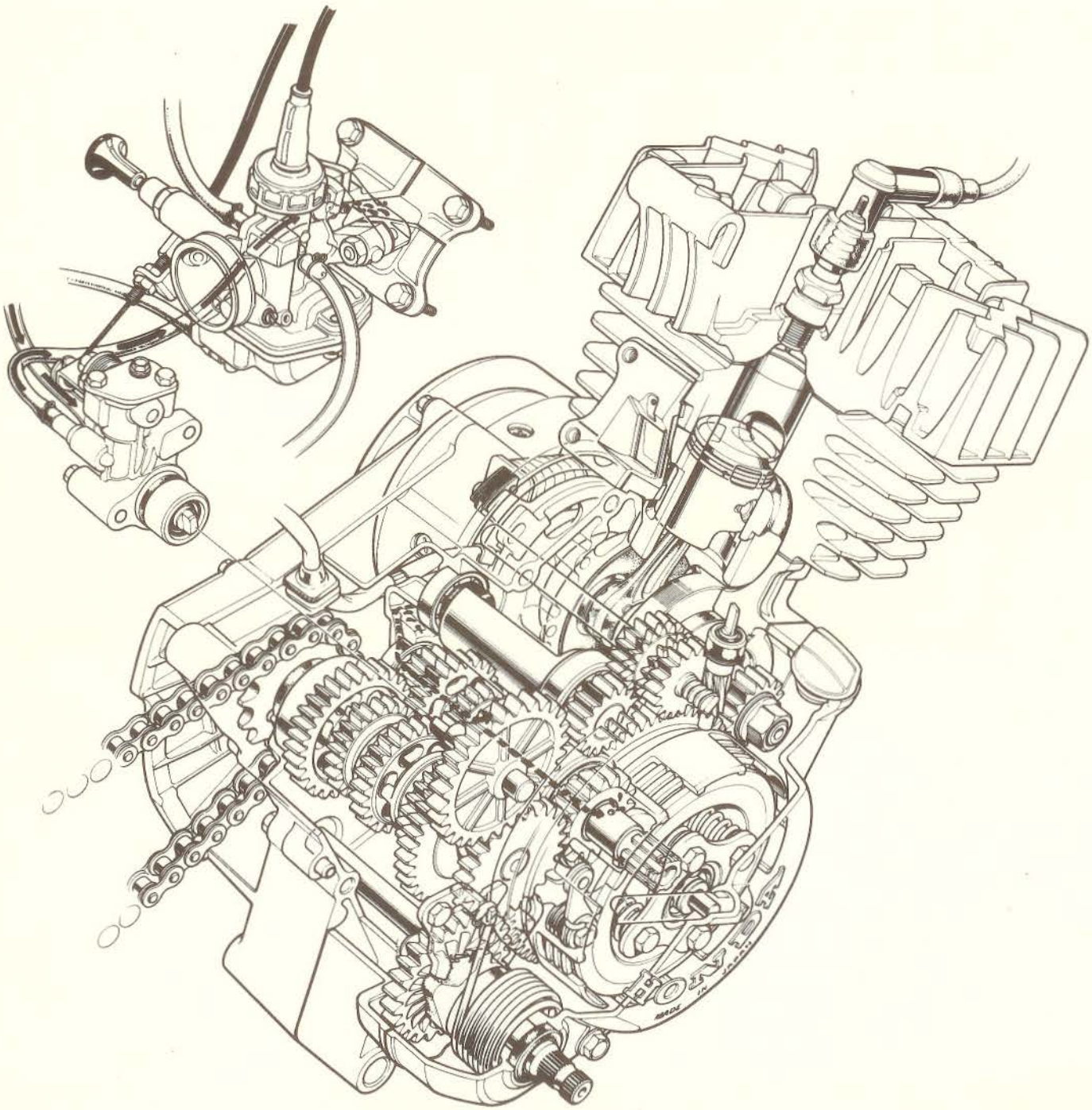
MEMO

OIL FLOW



Engine oil

Transmission oil

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2. LUBRICATION

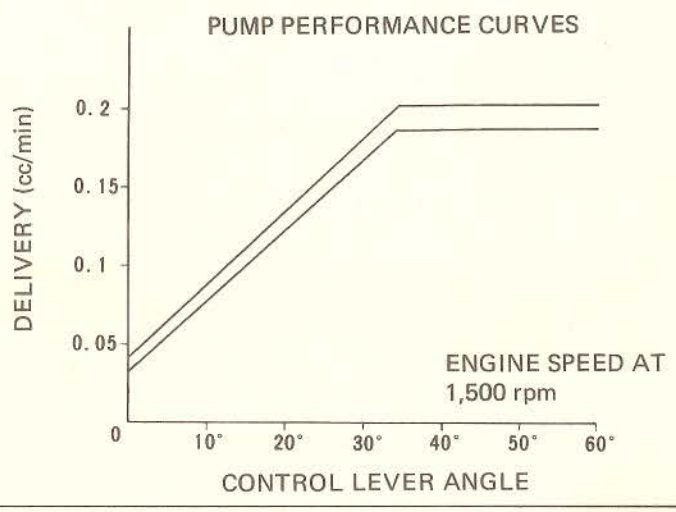
SERVICE INFORMATION

GENERAL INSTRUCTIONS

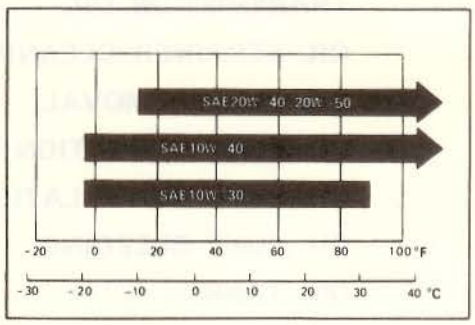
- Use utmost care when removing and installing the oil pump to keep dust and dirt from entering the engine.
- Do not attempt to disassemble the oil pump.
- Bleed air from the oil pump if there is air in the oil pipe from the oil tank to the oil pump or if the oil pipe has been disconnected.
- Bleed air from the oil pass tube (from the oil pump to the inlet pipe) if the tube has been disconnected.

SPECIFICATIONS

INJECTOR OIL

Oil capacity	1.1 lit (0.3 US gal)
Oil recommendation	Honda 2 Stroke Injector Oil or its equivalent
Oil pump delivery	

TRANSMISSION OIL

Oil capacity	1 lit (1.1 US qt) at disassembly 0.9 lit (1.0 US qt) at change
Oil recommendation	Use HONDA 4-STROKE OIL or equivalent. API SERVICE CLASIFICATION: SE or SF VISCOSITY: SAE 10W-40 OIL VISCOSITIES 

TROUBLESHOOTING

Excessive smoke/excessive carbon buildup in plug
1. Pump not properly synchronized (excessive oil)
2. Low quality of engine oil

Overheating
1. Oil pump not synchronized properly (insufficient oil)
2. Low quality of engine oil

Seized or burnt piston
1. No oil in tank or clogged oil pipe
2. Pump not properly synchronized (insufficient oil)
3. Air in oil pipe
4. Defective oil pump

Oil not flowing out from tank
1. Clogged oil tank cap breather hole
2. Clogged oil tank filter screen

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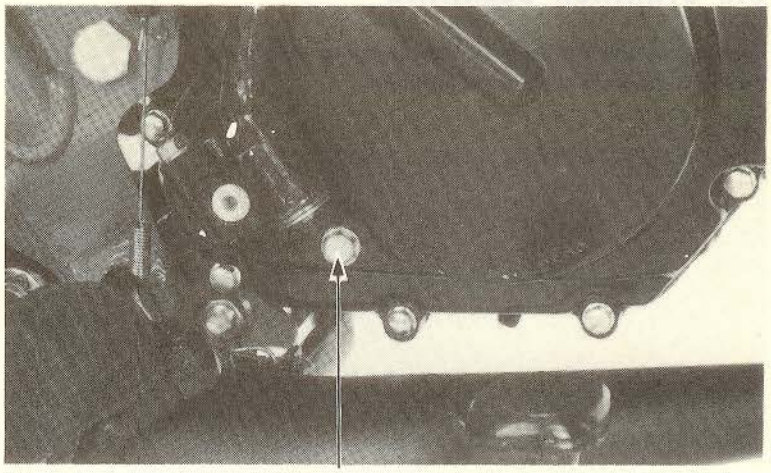
TRANSMISSION OIL

OIL LEVEL CHECK

Before checking the oil level run the engine and allow to idle for a few minutes.
Support the motorcycle upright on level ground.

Stop the engine and remove the oil level check bolt from the right crankcase cover.

A small amount of oil should flow out of the oil level bolt hole.



OIL LEVEL CHECK BOLT

OIL CHANGE

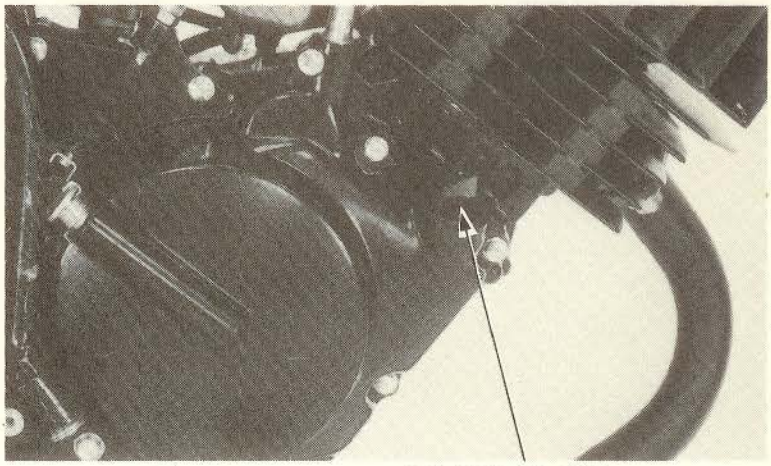
Warm the engine to normal operating temperature.

Remove the oil filler cap.
Remove the oil drain plug and drain the oil.

Reinstall the drain plug.
TORQUE: 20–25 N·m (2.0–2.5 kg-m, 14–18 ft-lb)

CAUTION

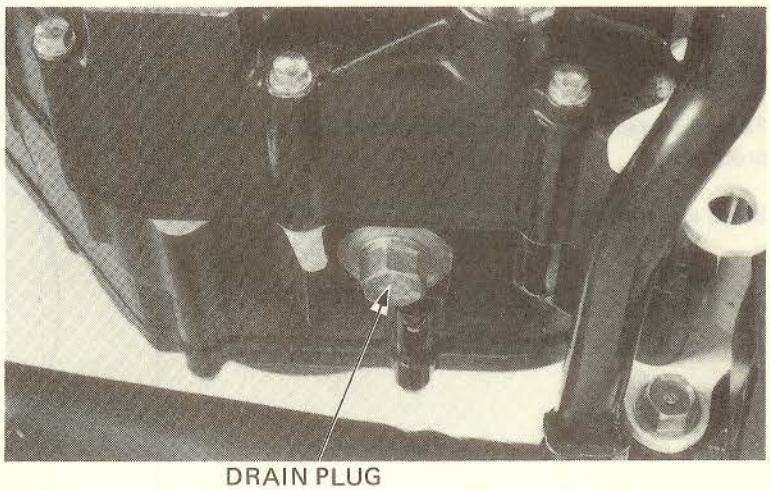
Make sure that the sealing washer on the drain plug is in good condition.



OIL FILLER CAP

Refill the engine up to the proper level.
OIL CAPACITY: 0.9 lit (1.0 US qt) at change
SPECIFIED OIL: 10W–40 or equivalent

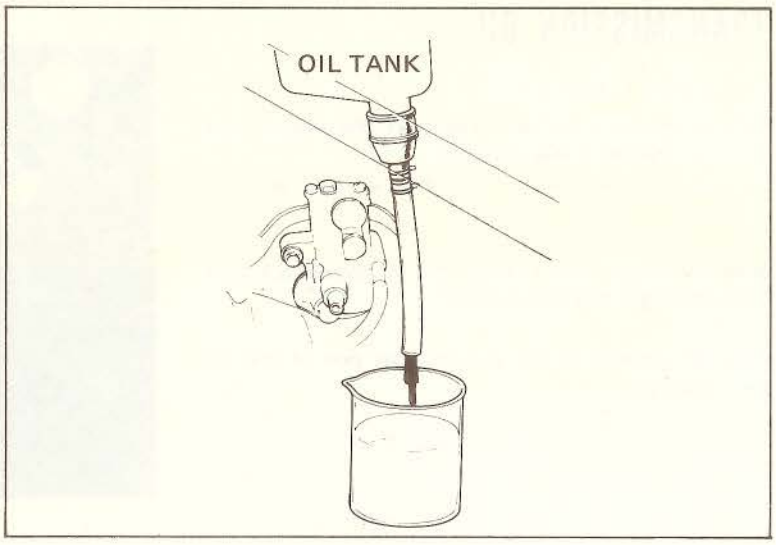
Start the engine and check for leaks. Stop the engine and recheck the oil level.



DRAIN PLUG
20–25 N·m (2.0–2.5 kg-m, 14–18 ft-lb)

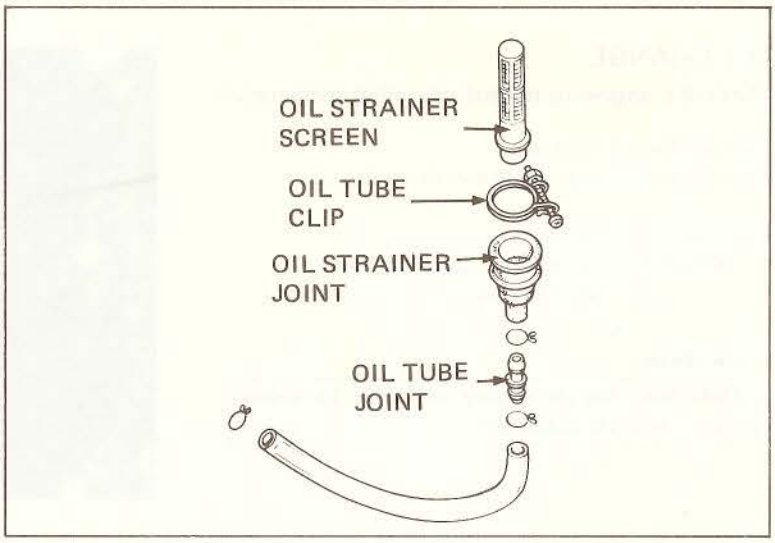
OIL STRAINER CLEANING

Disconnect the oil pipe at the oil pump and allow the oil to drain into a clean container.



Loosen the tube clip and disconnect the oil tube joint under the oil tank.

Remove the oil strainer screen.



Clean the oil strainer screen with compressed air.

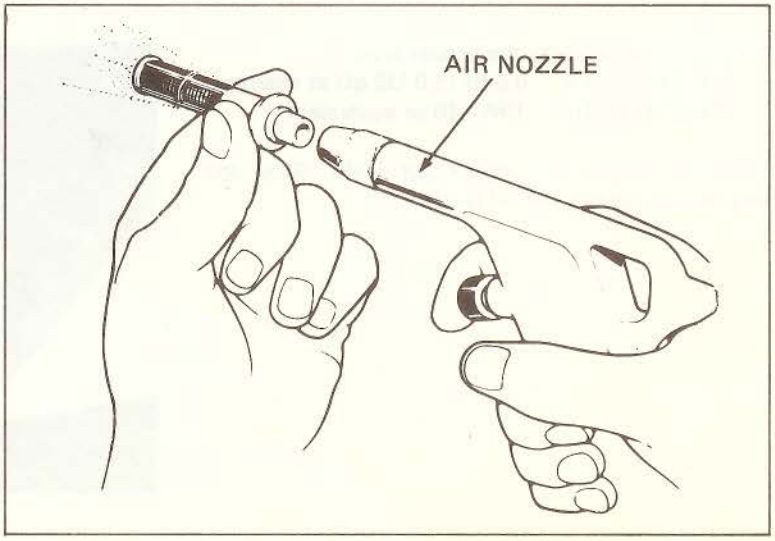
Installation of the oil strainer is the reverse order of removal.

Fill the oil tank with the recommended oil up to the proper level.

Bleed air from the oil pump and oil pipe (Page 2-7).

CAUTION

- *Connect the oil pipe securely.*
- *Check for leaks.*



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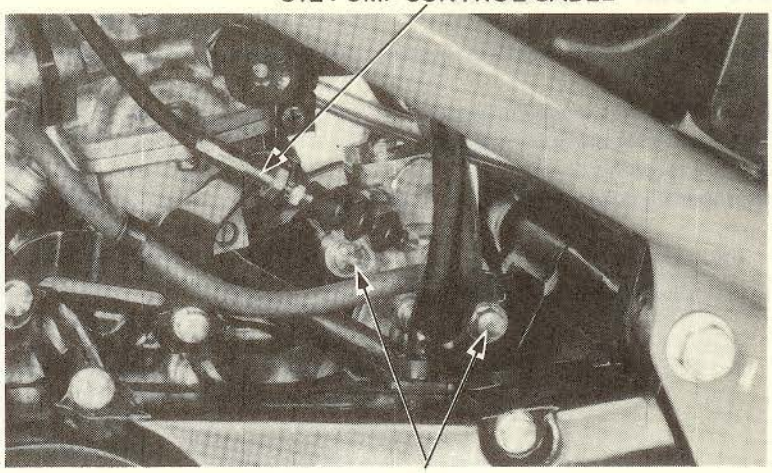
OIL PUMP REMOVAL

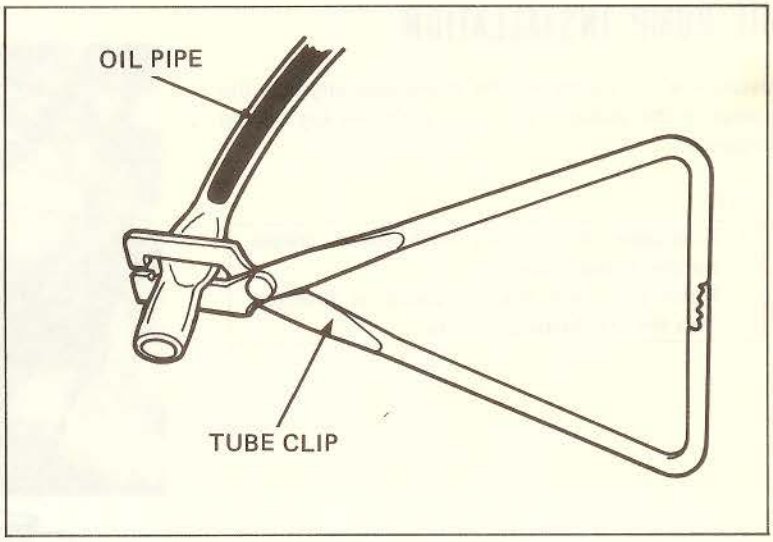
NOTE

Before removing the oil pump, clean the oil pump and crankcase.

Disconnect the oil pump control cable.
Remove the two bolts attaching the oil pump and remove the oil pump.



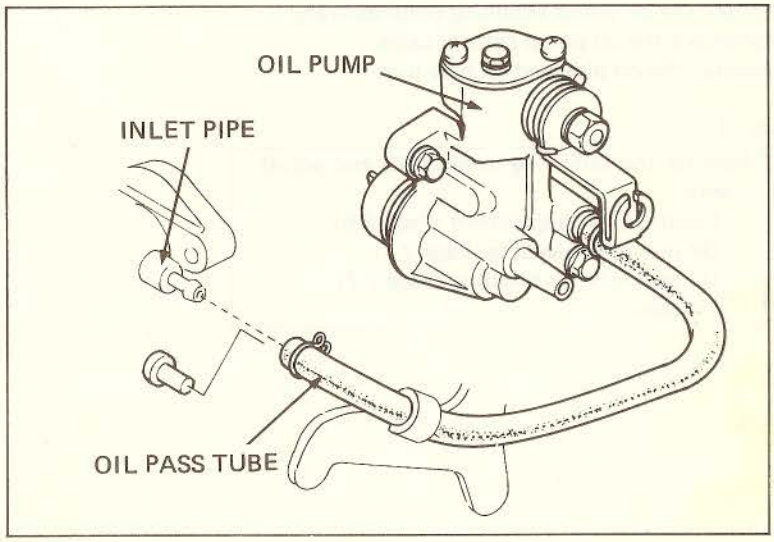
Disconnect the oil pipe from the oil pump, and pinch the end of the oil pipe to prevent oil from flowing out.



Disconnect the oil pass tube from the inlet pipe.

NOTE

Use care not to allow oil to flow out of the oil pass tube.

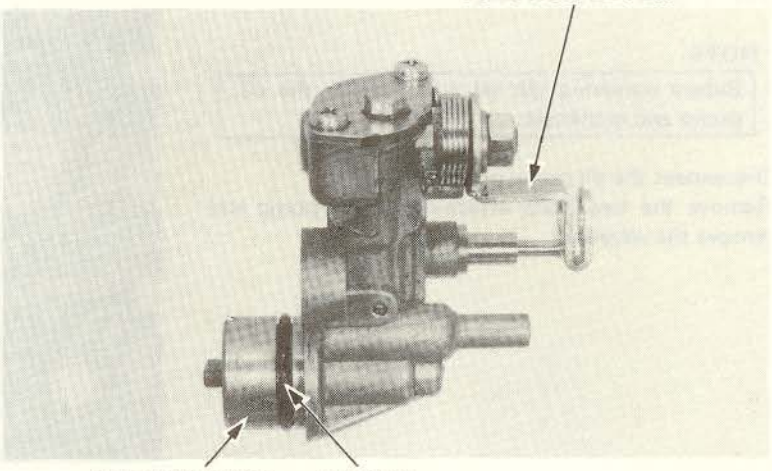


OIL PUMP INSPECTION

Remove the oil pump and inspect the following items:
Damaded or weakened O-rings.
Damage to crankcase mating face.
Damage to pump body.
Improper oil control lever.

CAUTION

Do not disassemble the oil pump.

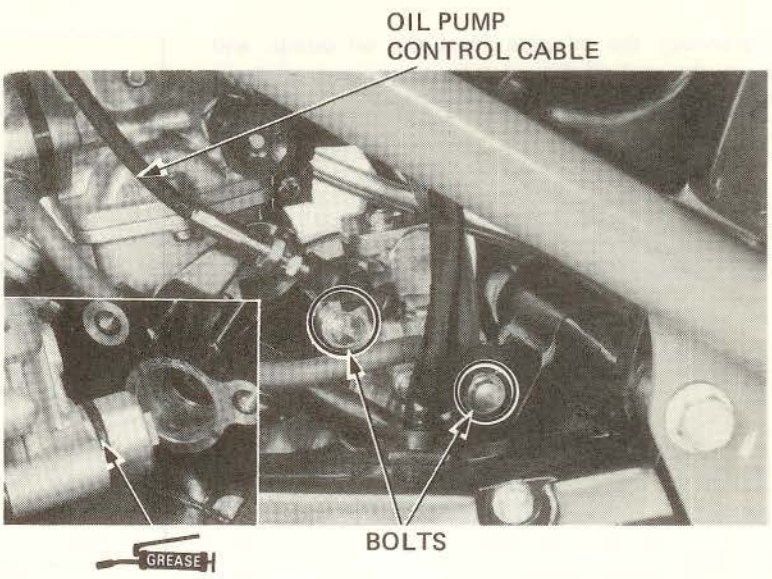


OIL PUMP INSTALLATION

Install the oil pump to the crankcase aligning the groove in the pump drive shaft with the lug on the oil pump.

NOTE

- Lubricate the O-ring with clean grease before installation.
- Make sure that the oil pump is inserted into the crankcase properly.



Tighten the oil pump attaching bolts securely.
Reconnect the oil pump control cable.
Reinstall the oil pipe and oil pass tube.

NOTE

Perform the following inspections and adjustments:

- Control cable adjustment (Page 3-6).
- Oil pump air bleeding (Page 2-7).
- Oil pass tube air bleeding (Page 2-7).
- Oil leaks.

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OIL PUMP BLEEDING

NOTE

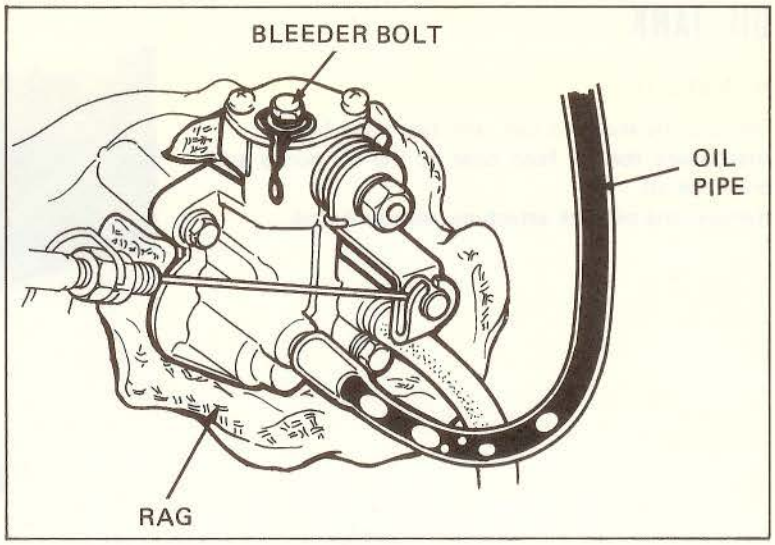
- Bleed air from the oil lines as it will block or restrict oil flow, resulting in severe engine damage.
- Bleed air from the oil pipe and oil pump first, then bleed air from the oil pass tube.

OIL PIPE/OIL PUMP

NOTE

Bleed air from the oil pipe and oil pump when the oil pipe has been disconnected or there is air in the oil pipe.

Stop the engine.
Fill the oil tank with engine oil.
Place a rag around the oil pump as shown.



Unscrew the bleeder bolt at the top of the oil pump. Tighten the bleeder bolt when the oil is free of air bubbles.

OIL PASS TUBE

NOTE

Bleed air from the oil pass tube when the tube is disconnected or there is air in the oil pipe and oil pump.

Make sure that there is fuel in the fuel tank (25–50 parts fuel to 1 part lubricant).

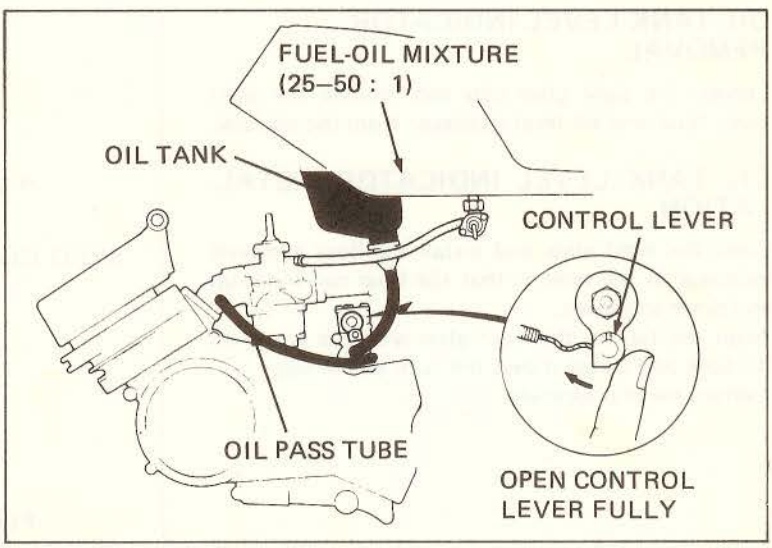
Start the engine and run it for about 10 minutes with the oil pump control lever in the fully open position so as to force air out of the oil pass tube with the oil.

WARNING

Perform this operation in a well ventilated area.

CAUTION

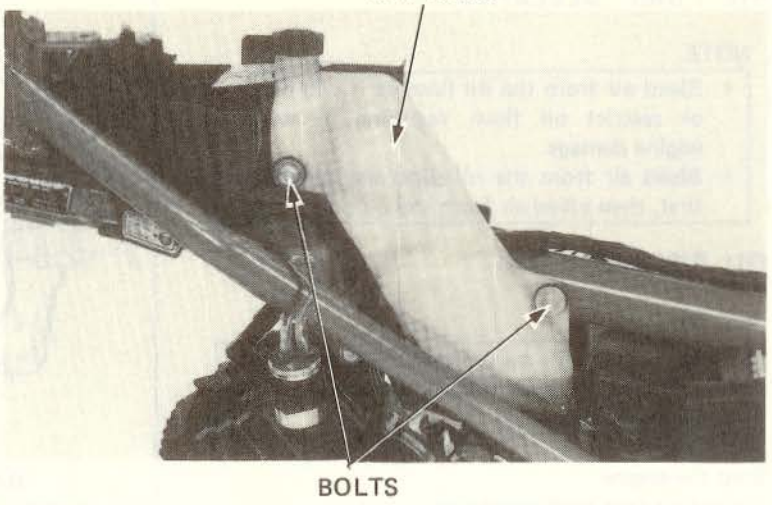
- *Use the recommended engine oil.*
- *Do not race the engine.*

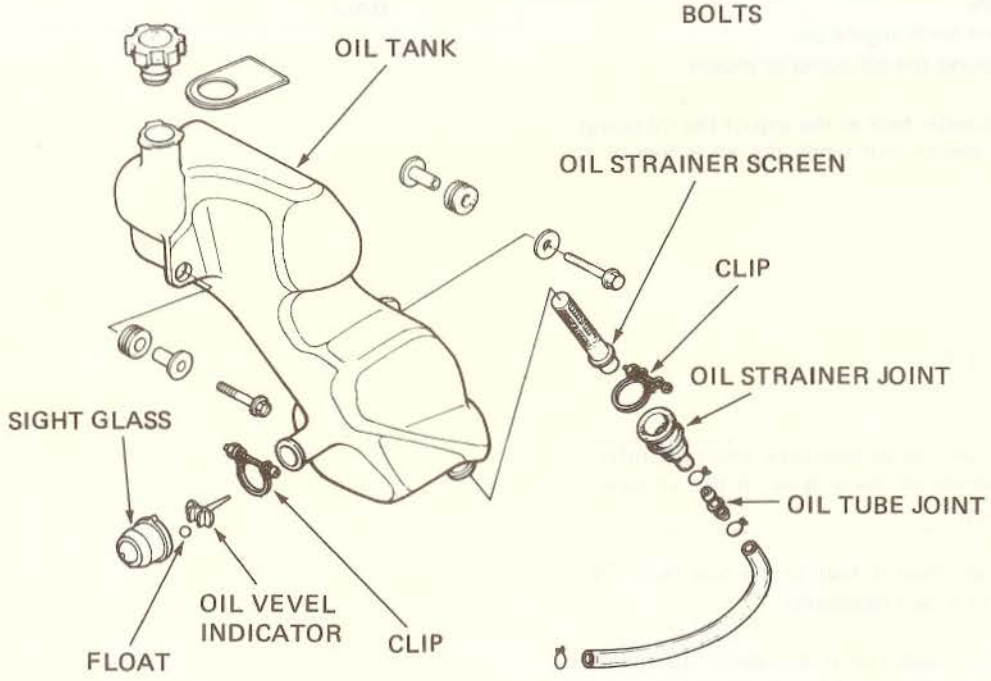


OIL TANK

REMOVAL

Remove the seat and fuel tank (see page 4-9).
Disconnect the oil feed tube at the oil pump and drain the oil.
Remove the oil tank attaching bolts and tank.



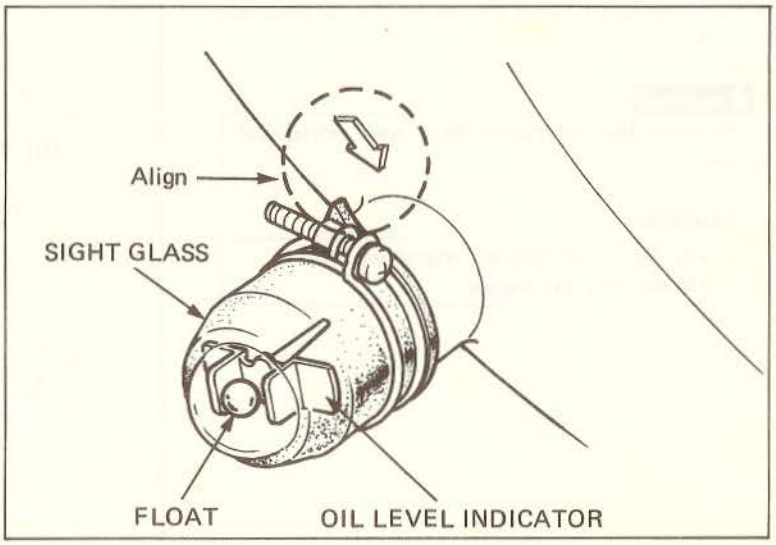


OIL TANK LEVEL INDICATOR REMOVAL

Loosen the sight glass clip and remove the sight glass, float and oil level indicator from the oil tank.

OIL TANK LEVEL INDICATOR INSTALLATION

Clean the sight glass and install the float and level indicator in the tank so that the float can move up and down as shown.
Align the tab on the sight glass with the arrow on the tank and install it over the tank all the way.
Tighten the clip securely.



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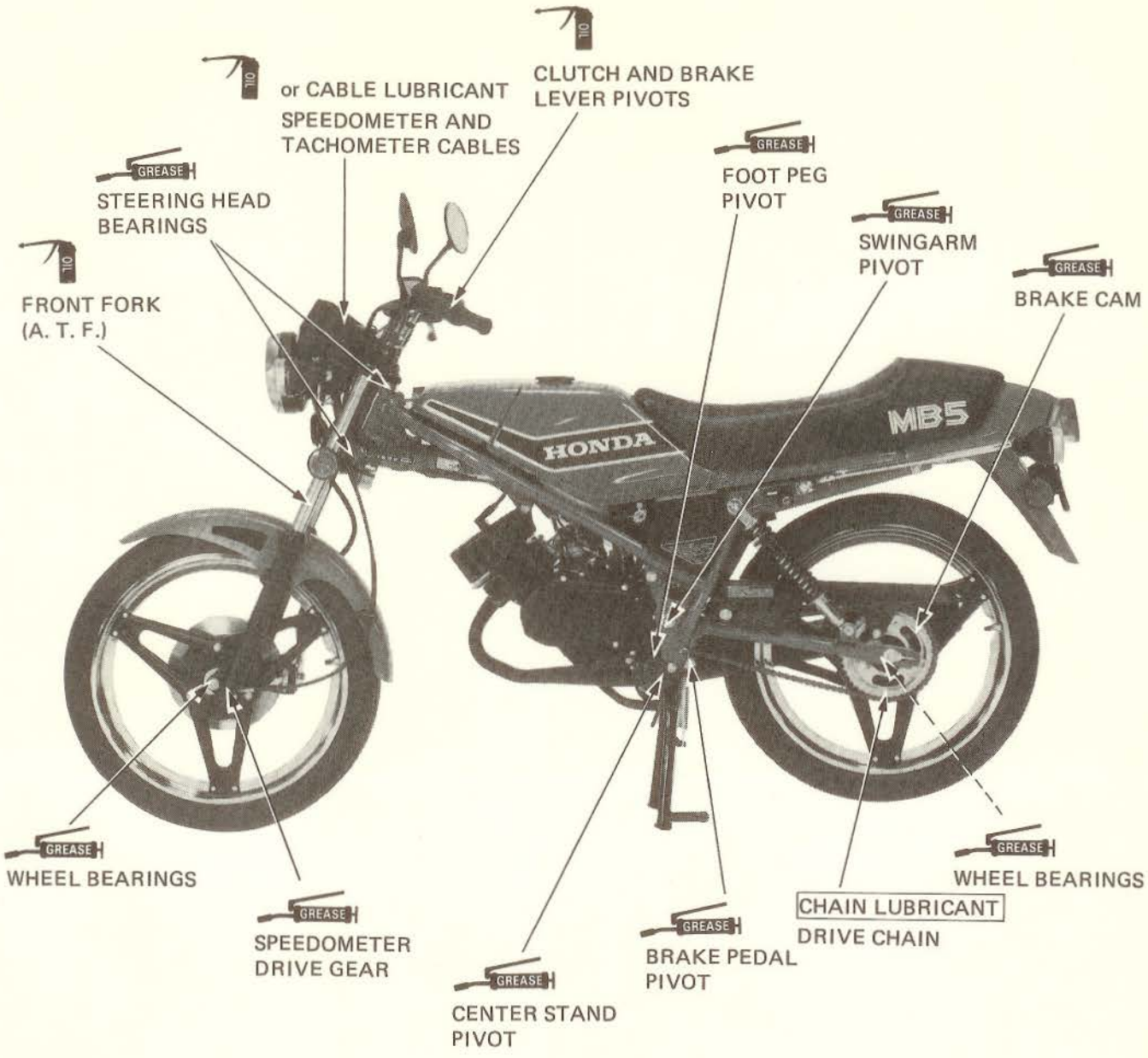
CHASSIS LUBRICATION POINTS



MEMO

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3. INSPECTION AND ADJUSTMENT

SERVICE INFORMATION

GENERAL INSTRUCTIONS

- Transmission oil See page 2-3.
- Oil pump See page 2-4.
- Cylinder head and piston decarbonizing See page 6-2.
- Cylinder exhaust port decarbonizing See page 6-5.

SPECIFICATIONS

< Engine >

Spark plug: Recommended spark plug

For cold climate below 5°C (41°F)		Standard		For extended high speed riding	
ND	NGK	ND	NGK	ND	NGK
W22FSR	BR7HS	W24FSR	BR8HS	W27FSR	BR9HS

Plug gap 0.6 – 0.7 mm (0.02 – 0.03 in)

Ignition timing

"F" mark	19° ± 3° BTDC at 3,000 rpm
Retard start	5,000 – 7,000 rpm
Full retard	10° ± 5° BTDC at 9,000 rpm
Idle speed	1,400 rpm
Air screw opening	1-3/8 turns out
Cylinder compression	130 kPa (13.0 kg/cm^2, 185 psi)
Throttle grip free play	2–6 mm (1/8–1/4 in)

< CHASSIS >

Rear brake pedal free play		20 – 30 mm (3/4 – 1-1/4 in)
Clutch lever free play		10 – 20 mm (3/8 – 3/4 in)
Drive chain slack		10 – 20 mm (3/8 – 3/4 in)
Tire		
Tire size Front		2.50-18-4PR
Rear		2.50-18-4PR
Colt tire pressure	Front	175 kPa (1.75 kg/cm^2, 25 psi)
	Rear	225 kPa (2.25 kg/cm^2, 32 psi)
Minimum tread depth	Front	0.8 mm (1/32 in)
	Rear	0.8 mm (1/32 in)

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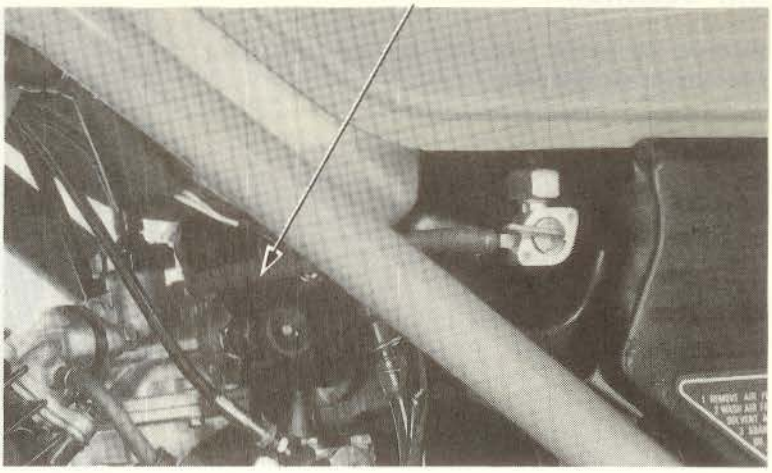
<ENGINE>

FUEL LINES

Replace any parts which show deterioration, damage or leakage.



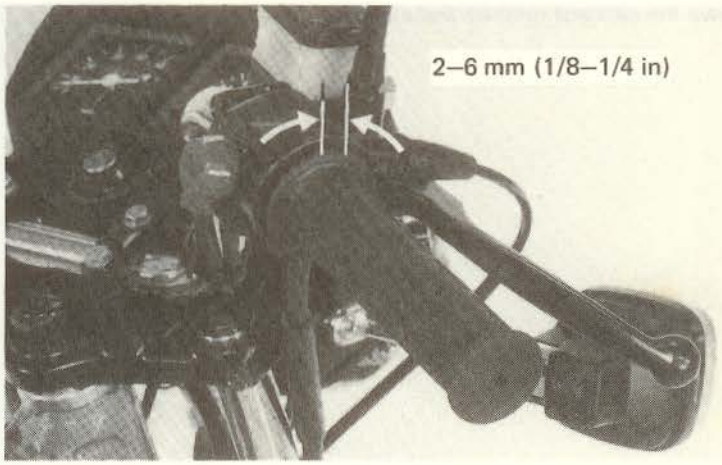
THROTTLE OPERATION

Check for smooth throttle grip full opening and automatic full closing in all steering positions. Check the throttle cables and replace if deteriorated, kinked or damaged.

Lubricate the throttle cable (Page 2-9) if throttle operation is not smooth.

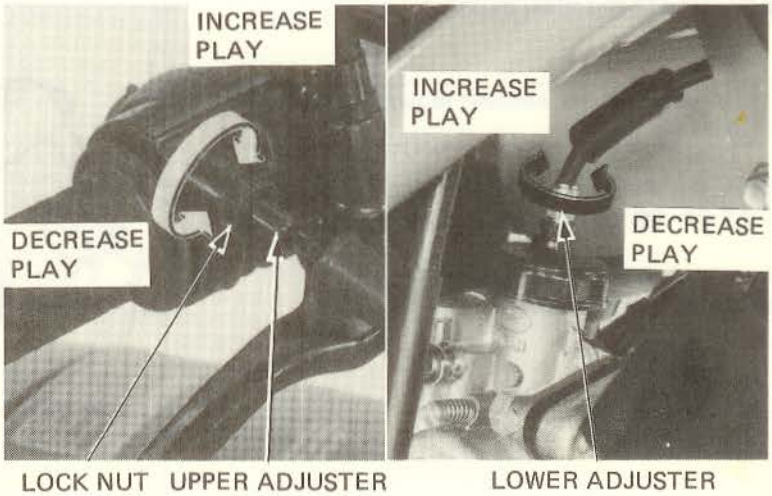
Measure throttle grip free play at the throttle grip flange.

FREE PLAY: 2–6 mm (1/8–1/4 in)



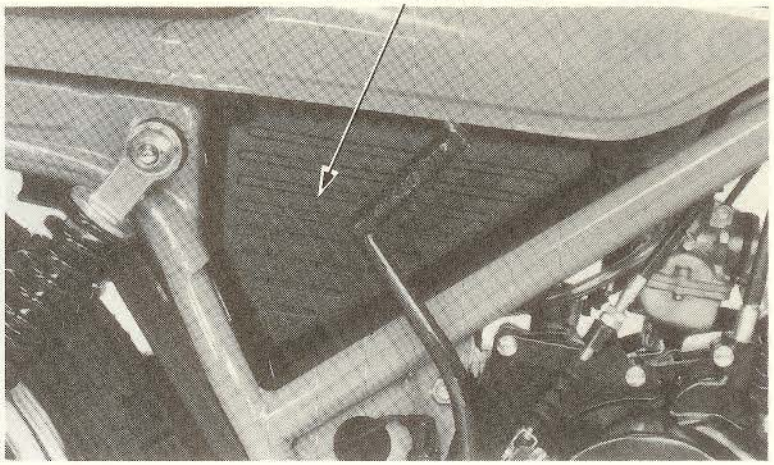
Adjustment can be made at either end of the throttle cable. Minor adjustments are made at the upper end and major adjustments are made at the lower end.

Adjust by loosening the lock nut and turning the adjuster.
Tighten the lock nut.
Recheck throttle operation.

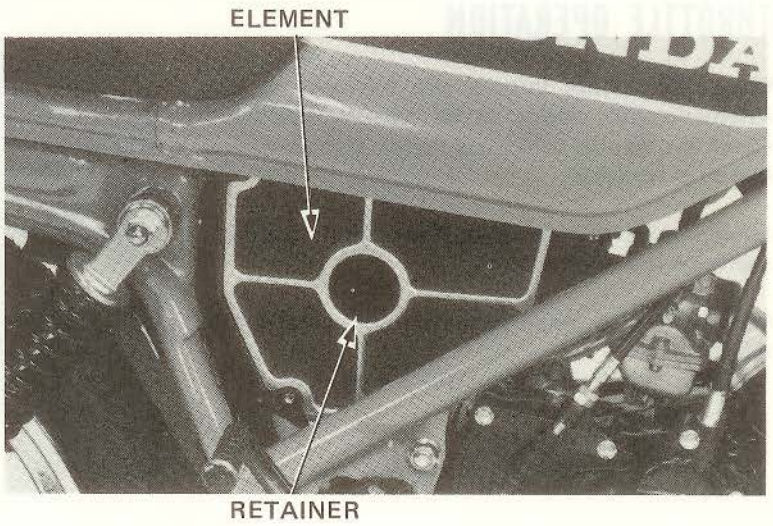


AIR CLEANER

Remove the screws attaching the right side cover and remove the side cover.



Remove the element retainer and element.



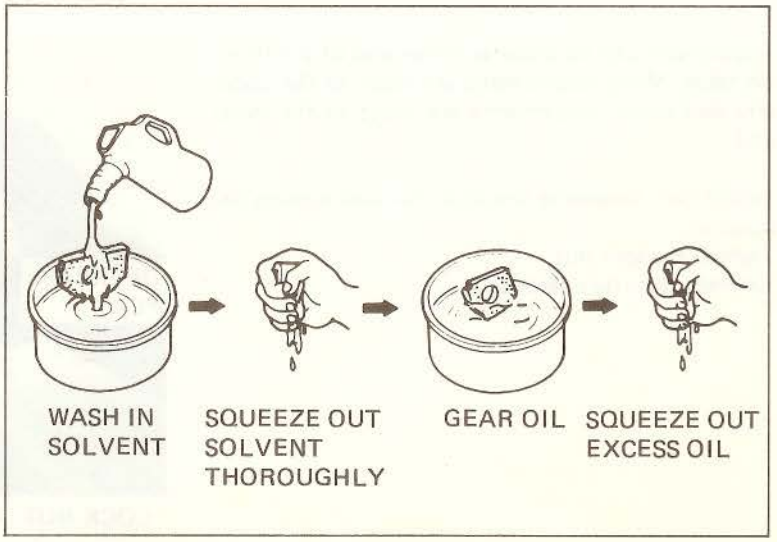
Wash the element in non-flammable or high flash point solvent and allow to dry.

NOTE

Do not wash the element in gasoline or vegetable oil.

Soak the element in clean engine oil or gear oil (SAE 80–90) and squeeze out any excess.

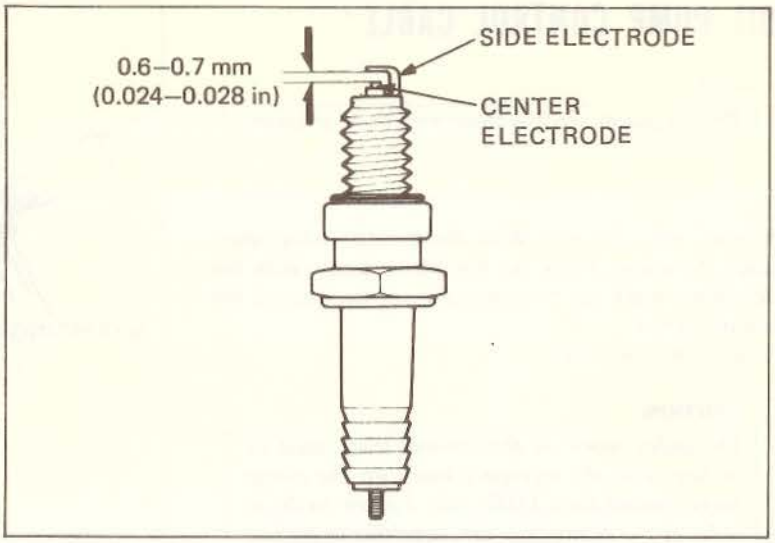
Install the element and retainer.
Install the right side cover.



SPARK PLUG

RECOMMENDED SPARK PLUG

Standard	ND	W24FSR
	NGK	BR8HS
For cold climate below 5°C (41°F)	ND	W22FSR
	NGK	BR7HS
For extended high speed riding	ND	W27FSR
	NGK	BR9HS



Disconnect the spark plug cap.
Clean any dirt from around the spark plug base.
Remove and discard the spark plug.
Measure the new spark plug gap using a wire-type feeler gauge.

SPARK PLUG GAP: 0.6–0.7 mm (0.024–0.028 in)

Adjust by bending the side electrode carefully.
With the plug washer attached, thread the spark plug in by hand to prevent crossthreading.
Tighten the spark plug another 1/2 turn with a spark plug wrench to compress the plug washer.
Connect the spark plug cap.

CARBURETOR IDLE SPEED

NOTE

The engine must be warm for accurate idle adjustment.

Attach an engine tachometer.
Turn the throttle stop screw to obtain the specified idle speed.

IDLE SPEED: 1,400 rpm

When the engine misses or runs erratically, proceed as follows:

Screw in the air screw until it lightly seats, then turn it out 1 3/8 turns.

Reset idle speed with the throttle stop screw.
Turn the air screw to find the highest idle speed.
Reset idle speed with the throttle stop screw.
Make sure that the engine does not miss or run erratically. If necessary, repeat the above steps.

OIL PUMP CONTROL CABLE

NOTE

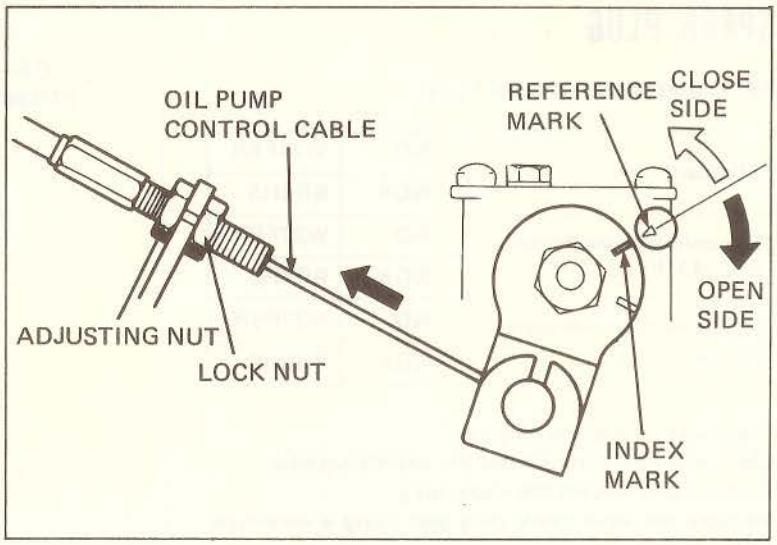
The oil pump control cable should be adjusted after the throttle grip free play has been adjusted.

Loosen the lock nut. With the throttle fully open, align the index mark on the pump body with the reference mark on the control lever by turning the adjusting nut.
Tighten the lock nut.

CAUTION

The index mark on the control lever must be in line with the reference mark on the pump body toward the CLOSE side. Failure to do so reduces the pump delivery, resulting in serious engine damage. When adjusting the index mark, it may be within 1 mm (0.04 in) out of line with the reference mark toward the OPEN region.

Excessive white smoke or hard starting:
Pump control lever excessively open
Burnt piston: Pump control lever not opened properly

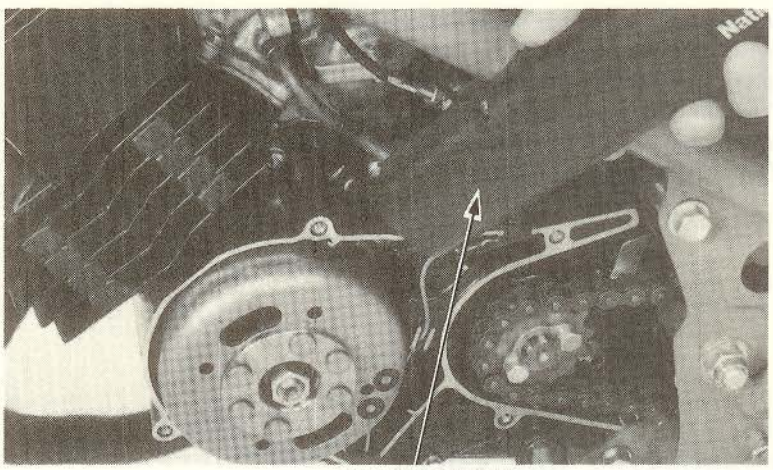


IGNITION TIMING

NOTE

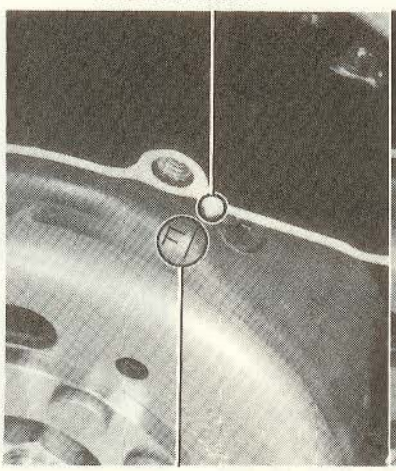
The CDI ignition timing is not adjustable. If the ignition timing is incorrect, check the CDI unit and alternator and replace any faulty parts.

Remove the left crankcase cover.
Connect a stroboscopic timing light to the high tension wire.
Start the engine and bring engine speed to 3,000 rpm.
Aim the timing light at the timing mark.
The "F" mark should align with the index mark.
Bring engine speed to 6500–7500 rpm and check that the index mark is between the full retard marks.



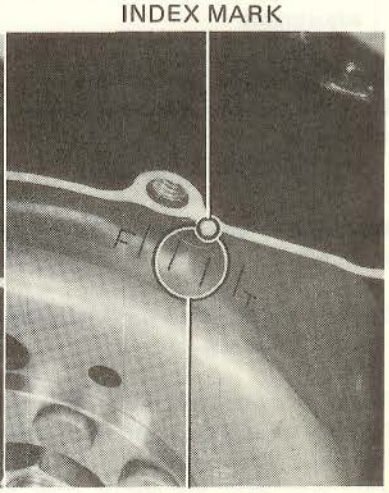
TIMING LIGHT

INDEX MARK



"F" MARK

INDEX MARK



RETARD MARKS

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CYLINDER COMPRESSION

Warm up the engine.
Stop the engine and remove the spark plug.
Insert a compression gauge.

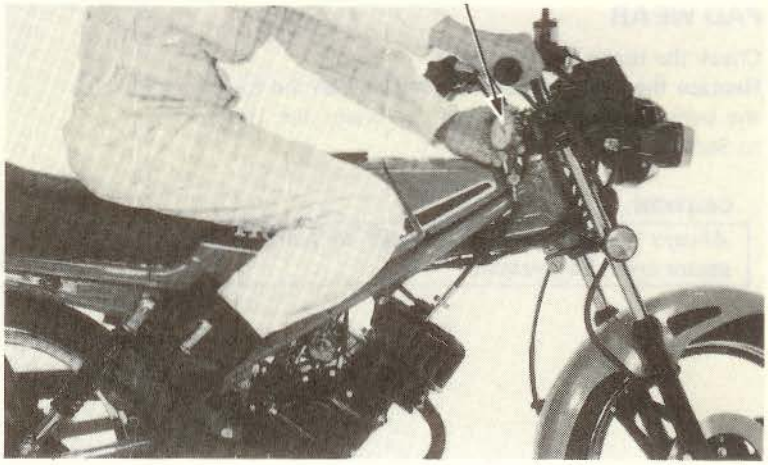
Open the choke and throttle grip fully and operate the starter pedal several times.

COMPRESSION: 130 kPa (13.0 kg/cm² 185 psi)

Low compression can be caused by:
- Blown cylinder head gasket
- Worn piston rings
- Worn cylinder

High compression can be caused by:
- Carbon deposits in combustion chamber or on piston head

COMPRESSION GAUGE



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BATTERY

Remove the left side cover.
Inspect the battery fluid level.
When the fluid level nears the lower level, remove the battery and refill with distilled water to the upper level.

NOTE

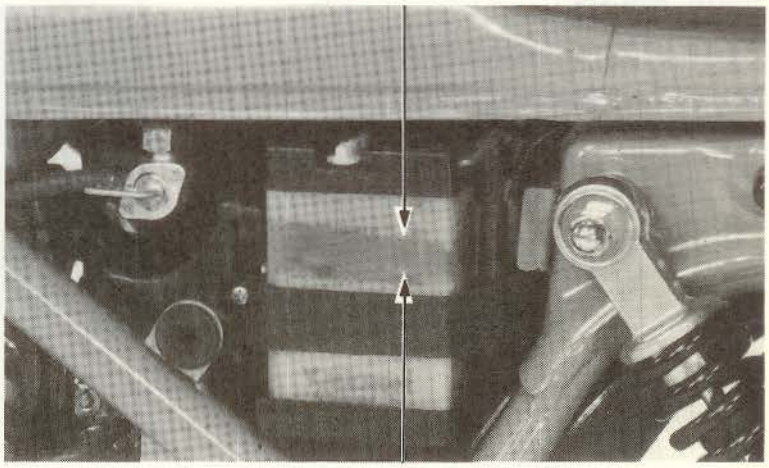
Add only distilled water. Tap water will shorted the service life of the battery.

WARNING

The battery electrolyte contains sulfuric acid. Protect your eyes, skin and clothing. In case of contact, flush thoroughly with water and call a doctor if electrolyte gets in your eyes.

Replace the battery, if sulfation forms or sediments accumulate on the bottom.

UPPER LEVEL



LOWER LEVEL

FRONT BRAKE

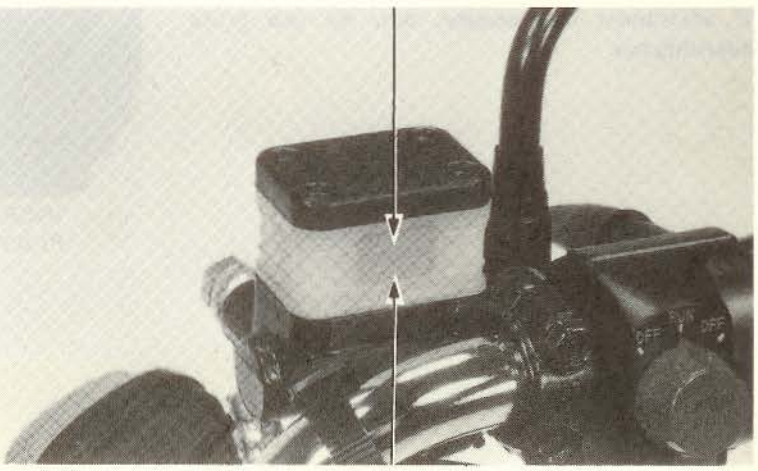
FLUID LEVEL

Check the front brake fluid reservoir level.
If the level nears the lower level mark, fill the reservoir with SAE J1703 or DOT–3 BRAKE FLUID to the upper level mark.
Check the entire system for leaks, if the level is low.

CAUTION

- *Do not remove the cover until the handleber has been turned so that the reservoir is level.*
- *Avoid operating the brake lever with the cap reinoved. Brake fluid will squirt out if the lever is pulled.*

UPPER LEVEL



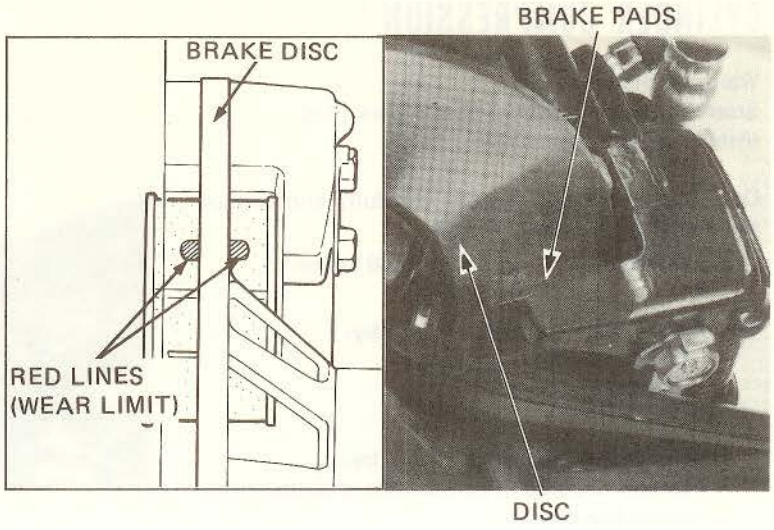
LOWER LEVEL

PAD WEAR

Check the brake pads for wear.
Replace the brake pads if the red line on the top of the pads reaches the edge of the brake disc (Refer to Section 12).

CAUTION

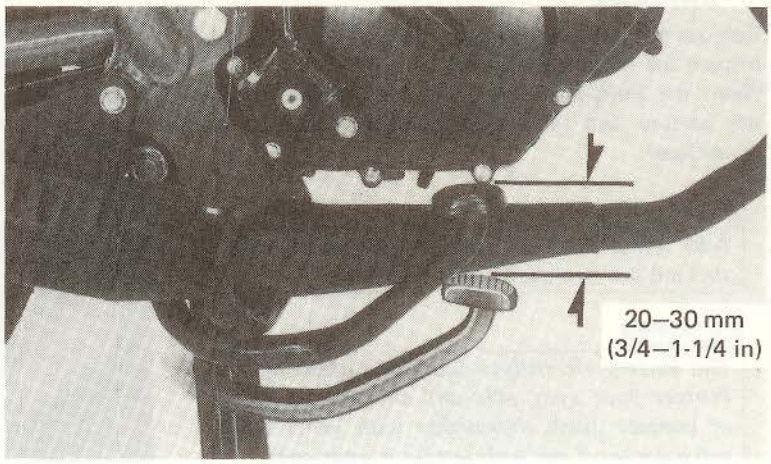
Always replace the brake pads in pairs to assure even disc pressure.



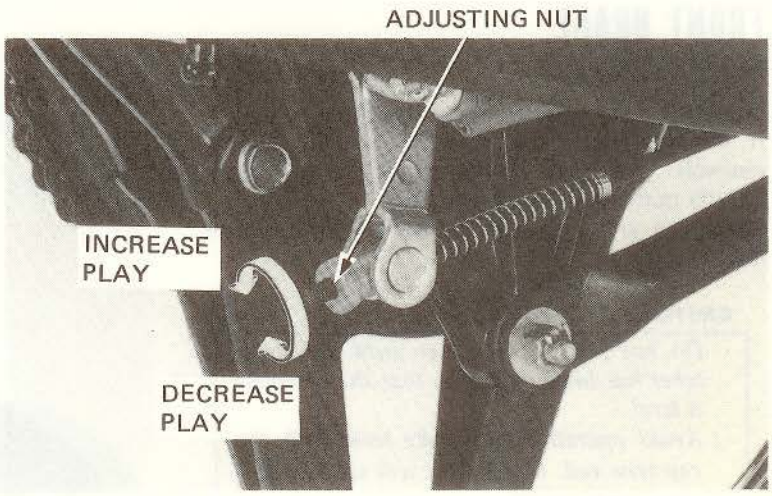
REAR BRAKE

REAR BRAKE PEDAL PLAY

Measure the brake pedal free play.
FREE PLAY: 20–30 mm (3/4–1-1/4 in)



If adjustment is necessary, turn the rear brake adjusting nut.



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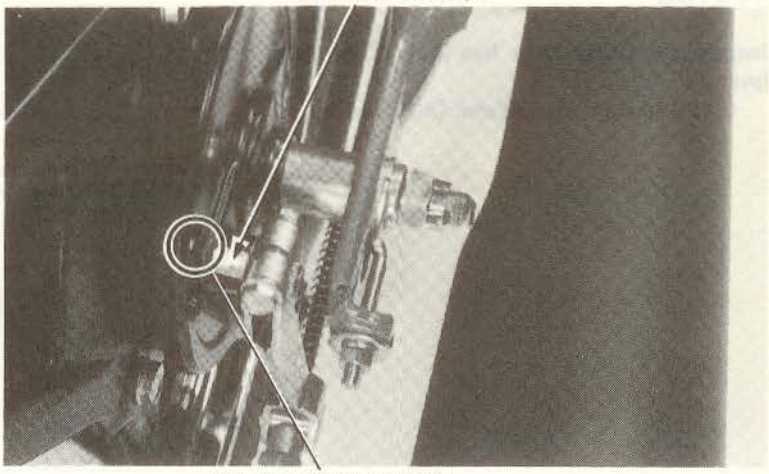
BRAKE SHOE INSPECTION

Replace the brake shoes if the arrow on the brake arm aligns with the reference mark " △ " on full application of the rear brake (Page 11-7).



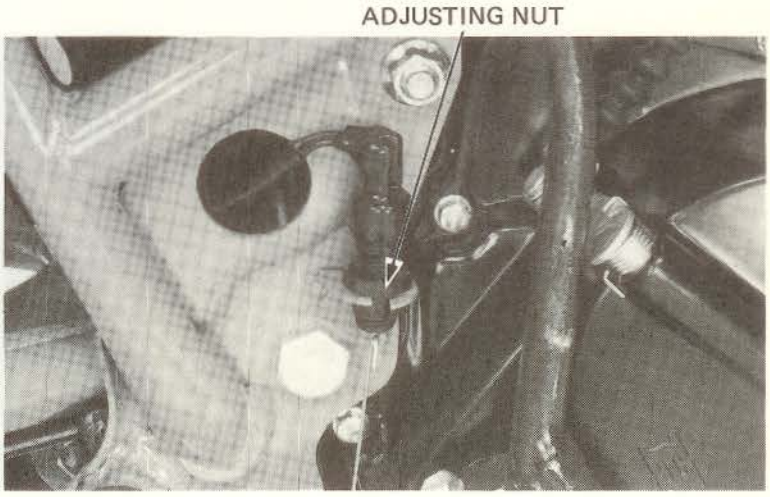
BRAKE LIGHT SWITCH

Adjust the brake light switch so that the brake light will light when the brake pedal is depressed and the brake begins engagement.

NOTE

- Do not turn the swtch body.
- The front brake light switch does not require adjustment.

Adjust by turning the switch adjusting nut as shown.



HEADLIGHT AIM

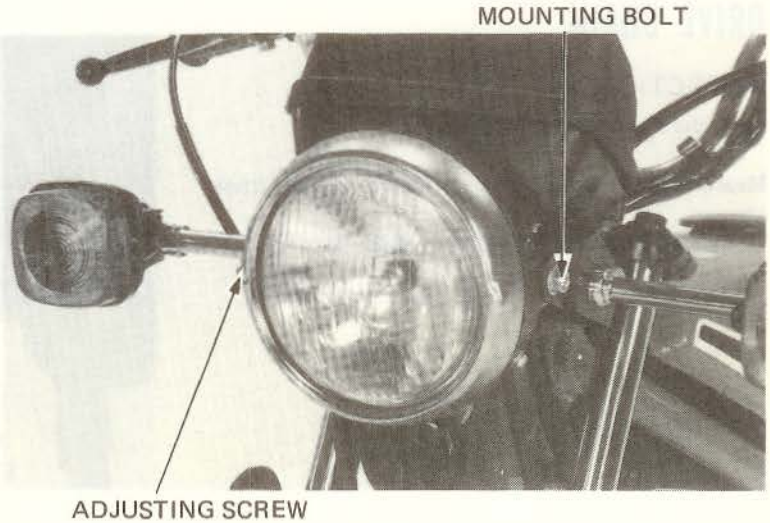
Adjust vertically by loosening both headlight case mounting bolts.
Adjust horizontally by turning the adjusting screw on the headlight rim.
Turn the adjusting screw clockwise to direct the beam toward the left side of the rider.

NOTE

Adjust the headlight beam as specified by local laws and regulations.

WARNING

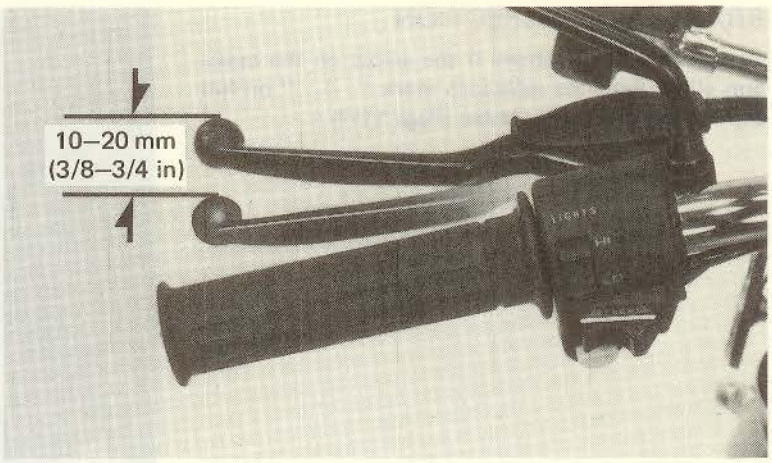
An improperly adjusted headlight may blind oncoming drivers, or it may fail to light the road for a safe distance.



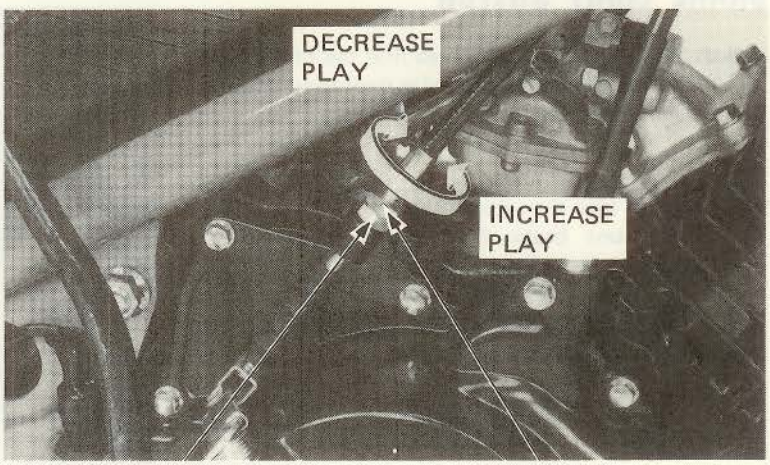
CLUTCH

Inspect the clutch lever free play at the end of the lever.

FREE PLAY: 10–20 mm (3/8–3/4 in)



Adjust free play by loosening the lock nut and turning the adjusting nut until the free play is 10–20 mm (3/8–3/4 in).



ADJUSTING NUT LOCK NUT

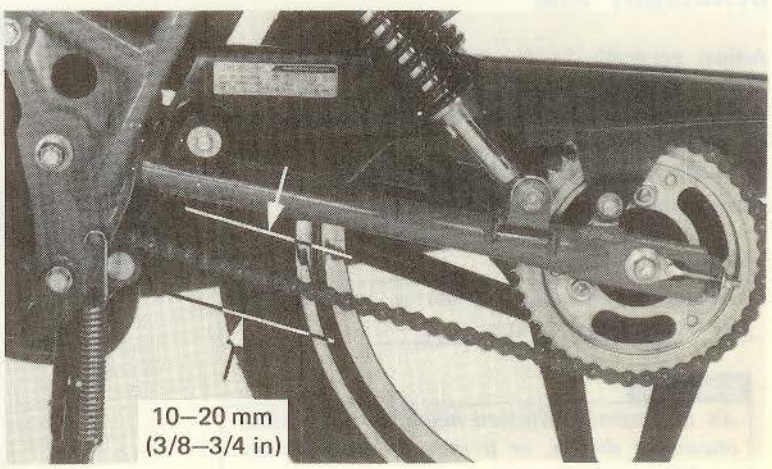
DRIVE CHAIN

INSPECTION

Shift the transmission into neutral.

Measure the drive chain slack between the sprockets.

CHAIN SLACK: 10–20 mm (3/8–3/4 in)



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ADJUSTMENT

To adjust the drive chain tension, remove the cotter pin from the rear axle nut, and loosen the nut.

Tighten both adjusting nuts.

WARNING

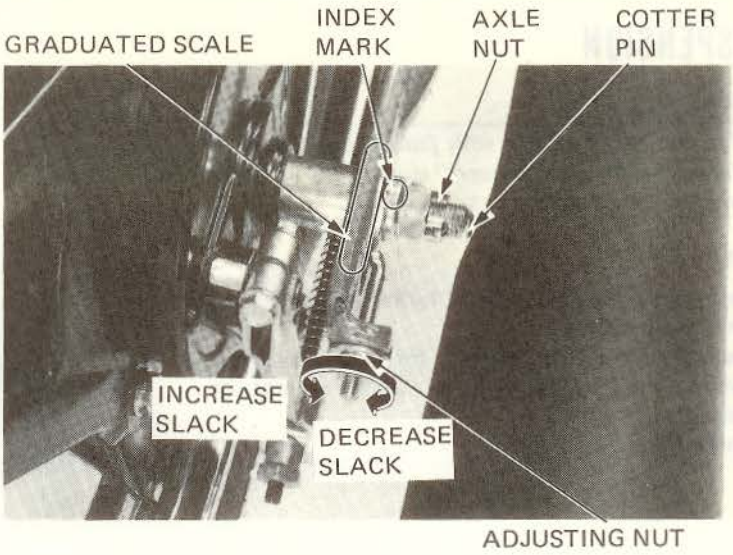
Be sure that the index mark aligns with the same graduation on the scale on both sides. Tighten the axle nut and install a new cotter pin.

TORQUE: 55–65 N·m (5.5–6.5 kg-m, 40–47 ft-lb)

Retighten both adjusting nuts.

WARNING

Check the rear brake pedal play after the drive chain tension has been adjusted.



CLEANING/LUBRICATION

If the drive chain is excessively dirty, it should be removed and cleaned prior to lubrication.

Remove the master link retaining clip with pliers.

NOTE

Do not bend or twist the clip.

Remove the master link and drive chain.

Clean the drive chain with non-flammable or high flash point solvent and brush and allow to dry.

Inspect the drive chain for possible wear or damage. Replace any chain that is damaged or excessively worn.

Inspect the sprocket teeth for excessive wear or damage. Replace if necessary.

CAUTION

Never install a new drive chain on worn sprockets or a worn chain on new sprockets. Both chain and sprockets must be in good condition, or the new replacement chain or sprockets will wear rapidly.

NOTE

Commercial aerosol type drive chain lubricants are recommended.

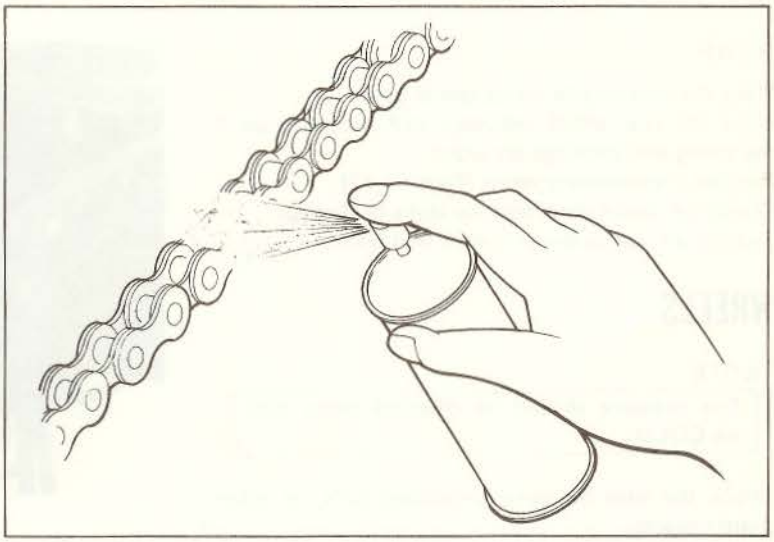
Lubricate the drive chain, saturating each chain link joint.

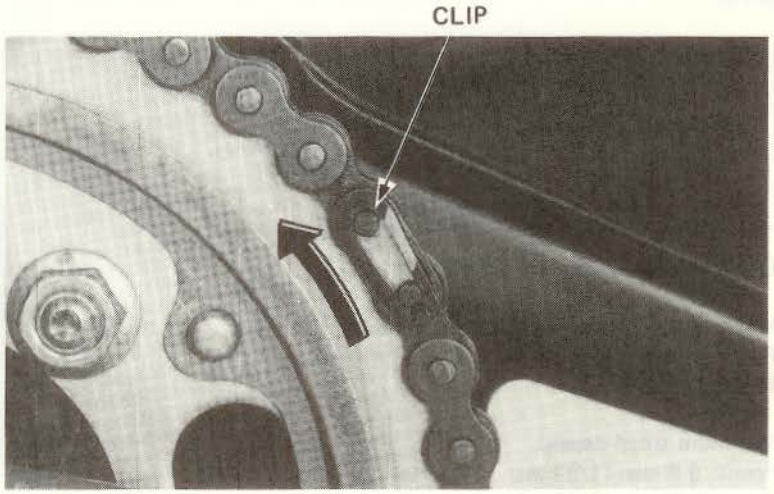
Install the drive chain and master link.

Install the master link retaining clip so that the closed end faces the direction of forward wheel rotation.

Master links are reusable if they remain in excellent condition, but it is recommended that a new master link be installed whenever the drive chain is reassembled.

Adjust the drive chain, and check rear brake adjustment.





SUSPENSION

WARNING

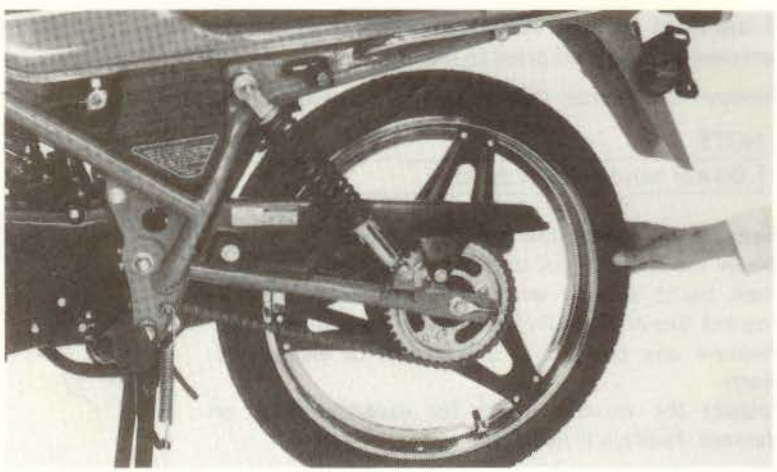
Do not ride a vehicle with faulty suspension. Loose, worn or damaged suspension parts impair vehicle stability and control.

FRONT

Check the action of the front forks by compressing them several times.
Check the entire fork assembly for leaks or damage.
Replace damaged components which cannot be repaired.
Tighten all nuts and bolts.

REAR

Place the motorcycle on its center stand.
Move the rear wheel sideways with force to see if the swing arm bearings are worn.
Replace if excessively worn (Page 11-12).
Check the shock absorbers for leaks or damage.
Tighten all rear suspension nuts and bolts.



WHEELS

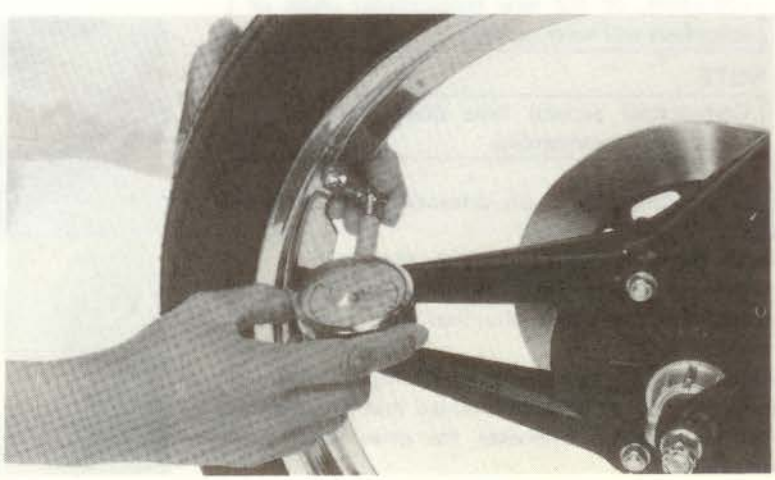
NOTE

Tire pressure should be checked when tires are **COLD.**

Check the tires for cuts, imbedded nails, or other sharp objects.

RECOMMENDED TIRE PRESSURE AND TIRE SIZE:

Cold tire Pressures kPa (kg/cm^2, psi)	Front: 175 (1.75, 25) Rear 225 (2.25, 32)
Vechicle capacity load	100 kg (220 lbs)
Tire size	Front: 2.50-18-4PR
	Rear: 2.50-18-4PR



Check the front and rear wheels for trueness.

Measure the tread depth at the center of the tires. Replace the tires if the tread depth reaches the following limit.

Minimum tread depth:
Front: 0.8 mm (1/32 in)
Rear: 0.8 mm (1/32 in)

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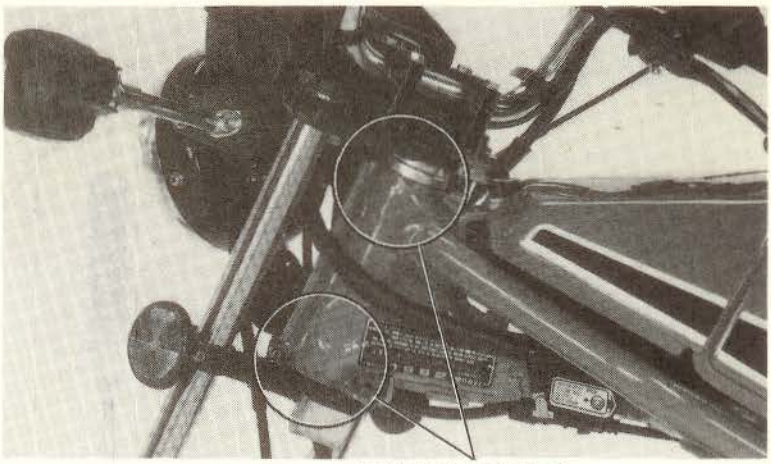
STEERING HEAD BEARINGS

NOTE

Check that the control cables do not interfere with handlebar rotation.

Raise the front wheel off the ground.
Check that the handlebar rotates freely.

If the handlebar moves unevenly, binds, or has vertical movement, adjust the steering head bearing by turning the steering head adjusting nut (Page 10-19).



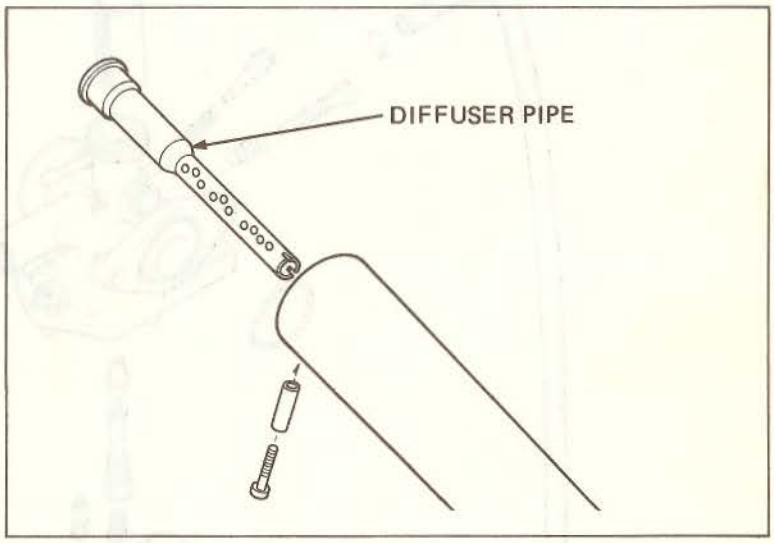
HEAD BEARINGS

NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to correct torque values.
Check all cotter pins and safety clips.

MUFFLER DECARBONIZING

Remove the diffuser pipe attaching screw and collar.
Remove the diffuser pipe from the muffler.



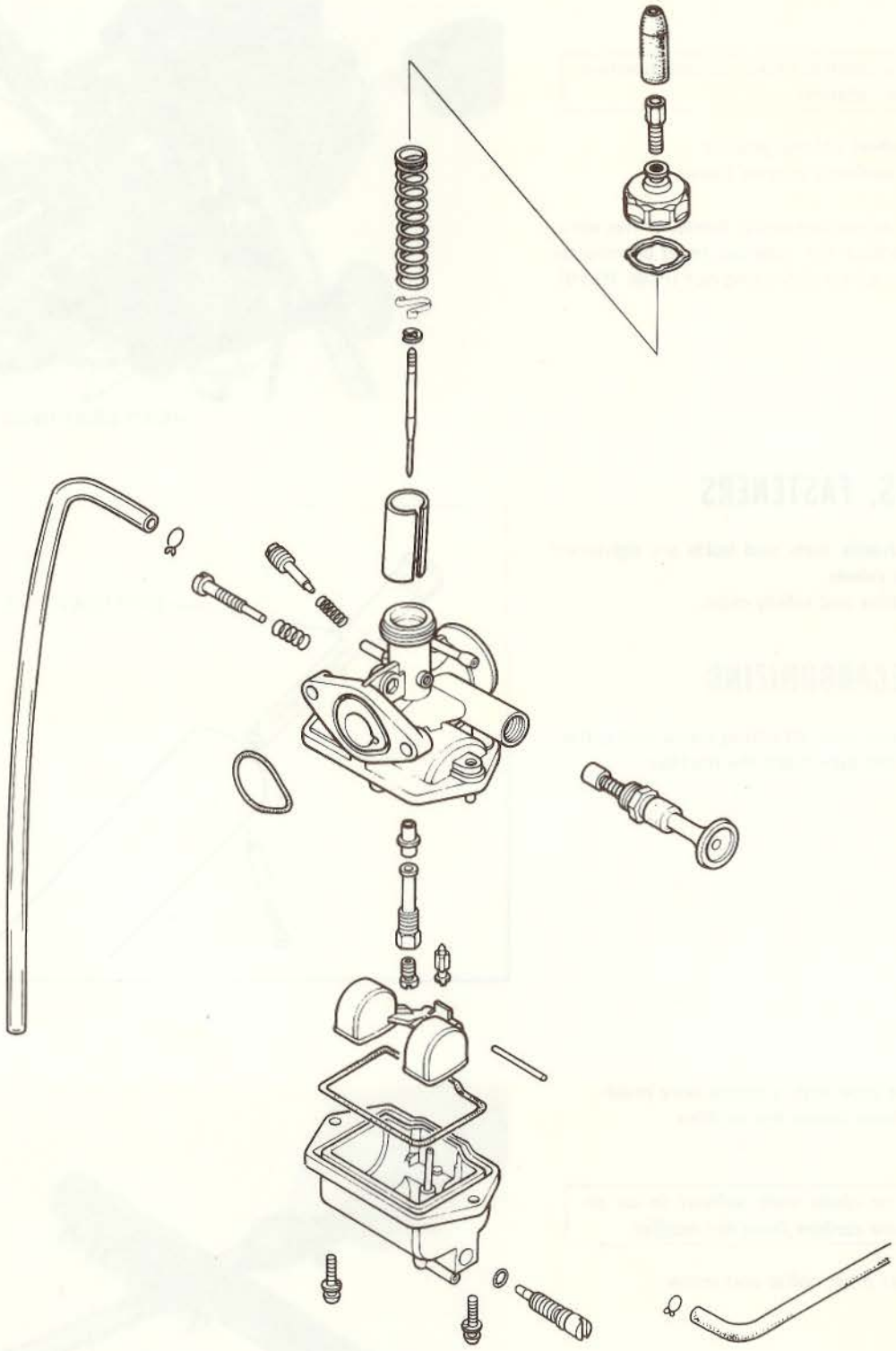
Clean the diffuser pipe with a bristle wire brush.
Remove carbon from inside the muffler.

CAUTION

Do not heat or clean with solvent in an attempt to remove carbon from the muffer.

Install the diffuser pipe, collar and screw.

DIFFUSER PIPE



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4. FUEL SYSTEM

SERVICE INFORMATION

GENERAL INSTRUCTIONS

- Use caution when working with gasoline. Always work in a well-ventilated area and away from sparks or flames.
- The float bowl has a drain plug that can be loosened to drain residual fuel.
- When disassembling fuel system parts, note the locations of the O-rings. Replace them during assembly.

TOOL

Common	
Float Level Gauge	070401–0010000

SPECIFICATIONS

Venturi dia.	16 mm (0.63 in)
Setting mark	PF15A
Main jet	#105
Main air jet	#210
Jet needle	37B – 2nd groove
Slow jet	#38
Float level	13.5 mm (0.53 in)
Air screw opening	1-3/8 turns out
Idle speed	1400 rpm
Throttle grip free play	2 – 6 mm (1/8 – 1/4 in)

TROUBLESHOOTING

Engine cranks but won't start
1. No fuel in tank
2. No fuel to carburetor
3. Too much fuel getting to cylinder
4. No spark at plug (ignition malfunction)
5. Air cleaner clogged

Engine Idles roughly, stalls, or runs poorly
1. Idle speed incorrect
2. Ignition malfunction
3. Low compression
4. Rich mixture
5. Lean mixture
6. Air cleaner clogged
7. Air leaking into inlet pipe
8. Fuel contaminated

Lean mixture
1. Carburetor fuel jets clogged
2. Fuel cap vent clogged or blocked
3. Fuel filter clogged
4. Fuel line kinked or restricted
5. Float valve faulty
6. Float level too low
7. Air vent tube clogged

Rich mixture
1. Choke stuck closed
2. Faulty float valve
3. Float level too high
4. Carburetor air jets clogged

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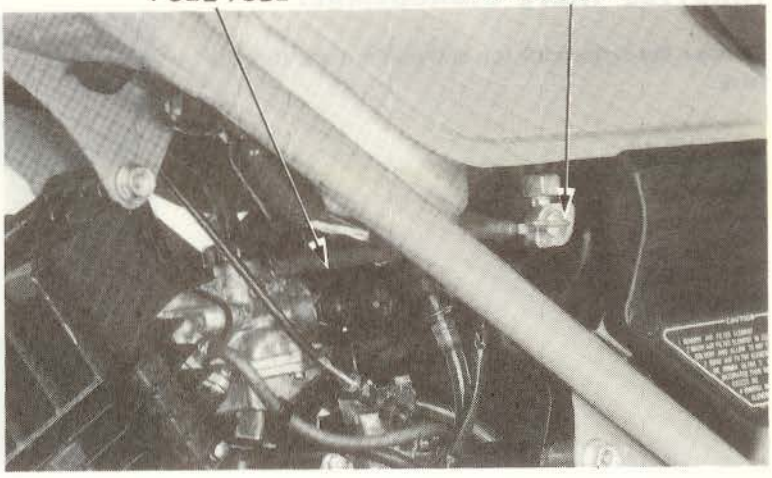
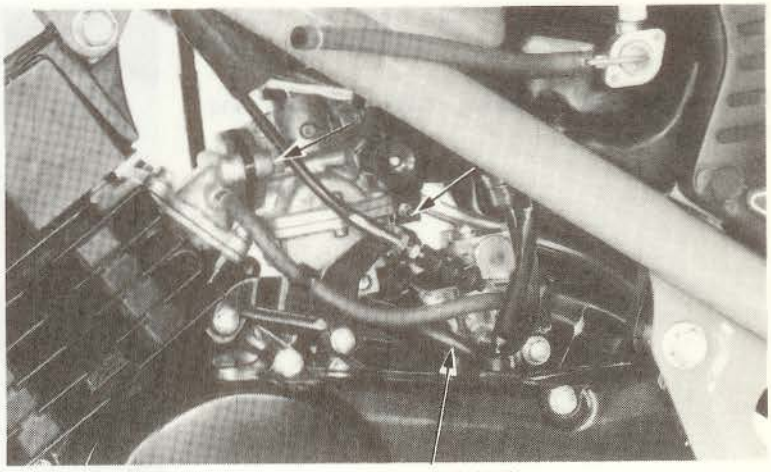
CARBURETOR REMOVAL

Clean the carburetor and its surrounding area thoroughly.
Turn the fuel valve to OFF and drain fuel from the tank through the drain tube.

Disconnect the fuel line.
Disconnect the drain tube.



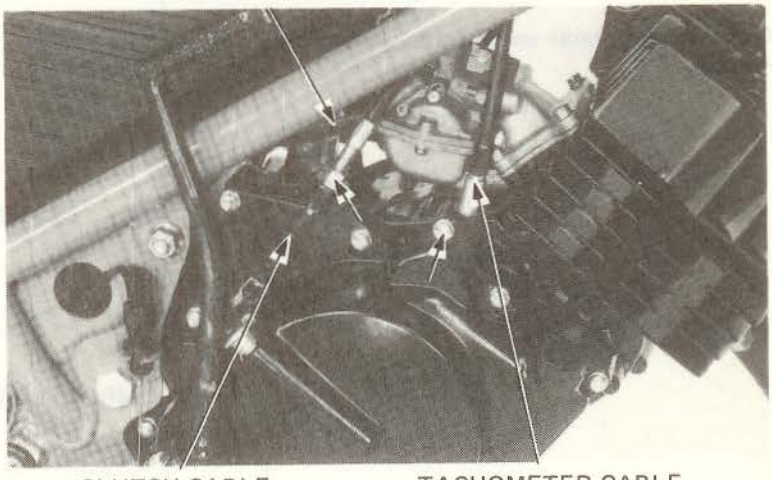
Loosen the tube band.
Remove the nuts attaching the carburetor to the engine inlet pipe.



Disconnect the clutch cable.
Disconnect the tachometer cable.
Disconnect the air vent tube.
Remove the carburetor from the engine.

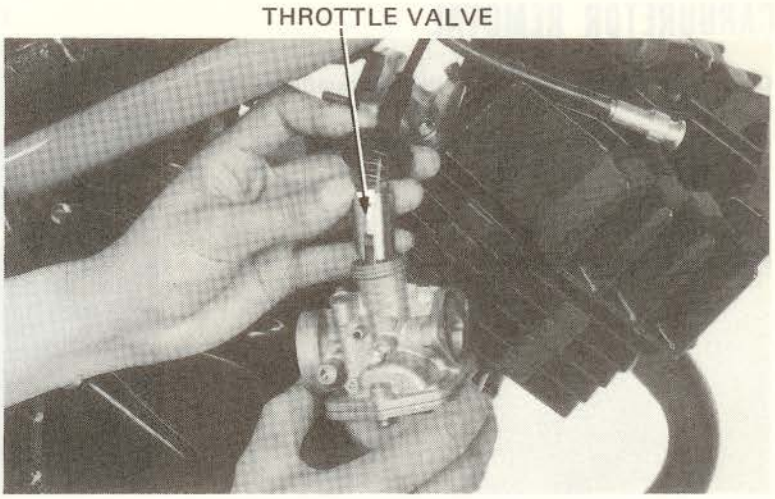
NOTE

Keep dust and dirt from entering the carburetor and cylinder.



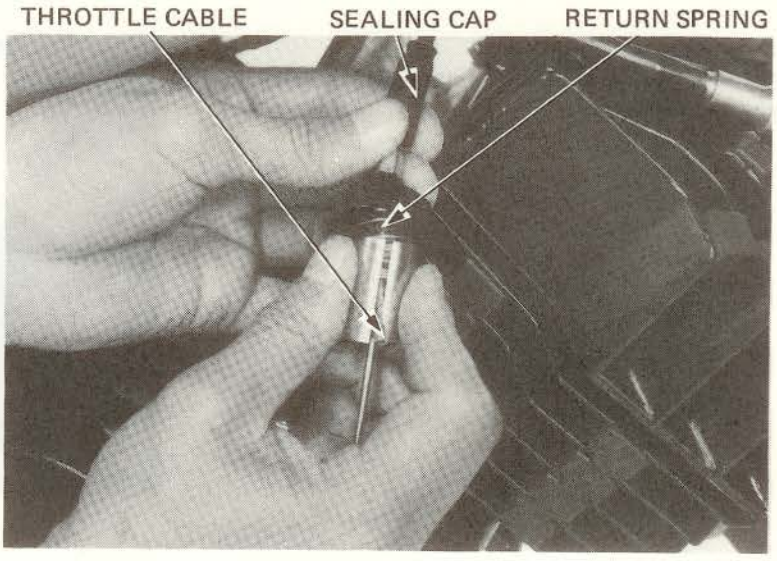
THROTTLE VALVE DISASSEMBLY

Remove the carburetor top and pull out the throttle valve.



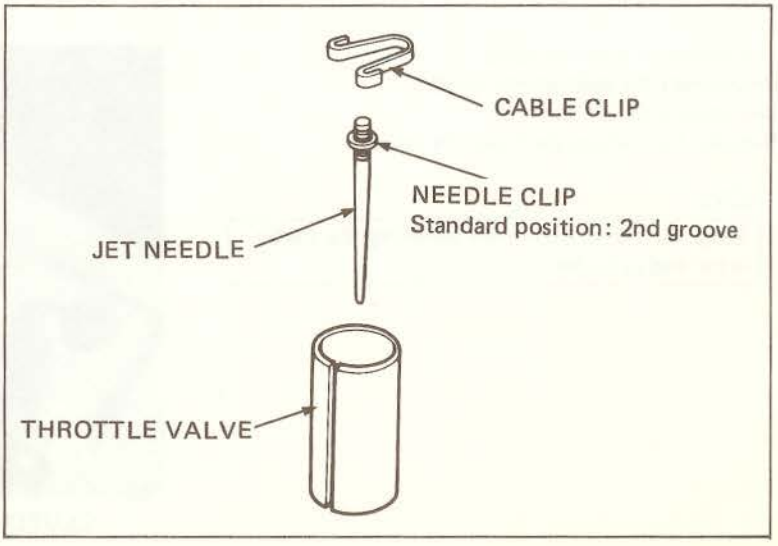
Disconnect the throttle cable from the throttle valve.

Remove the return spring, carburetor top and sealing cap.



Pry off the cable clip and remove the jet needle.

Check the jet needle and throttle valve for wear or damage.



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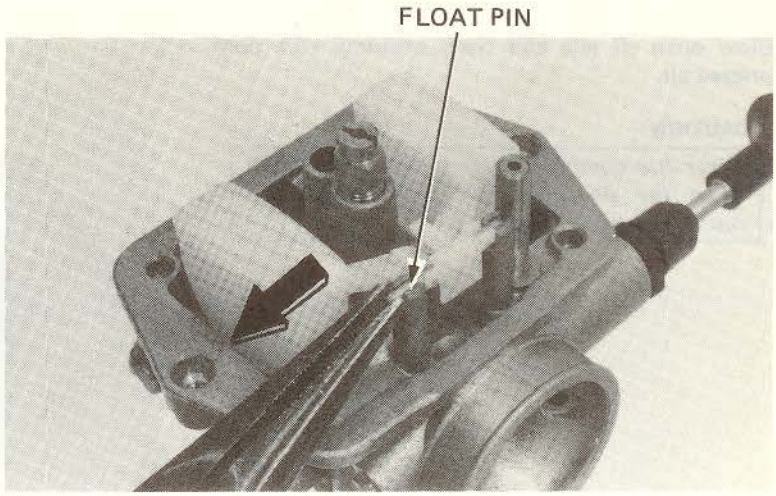
FLOAT/FLOAT VALVE/JET DISASSEMBLY

Remove the float chamber and pull the float pin off the chamber.

CAUTION

Remove the float pin in the arrow direction.

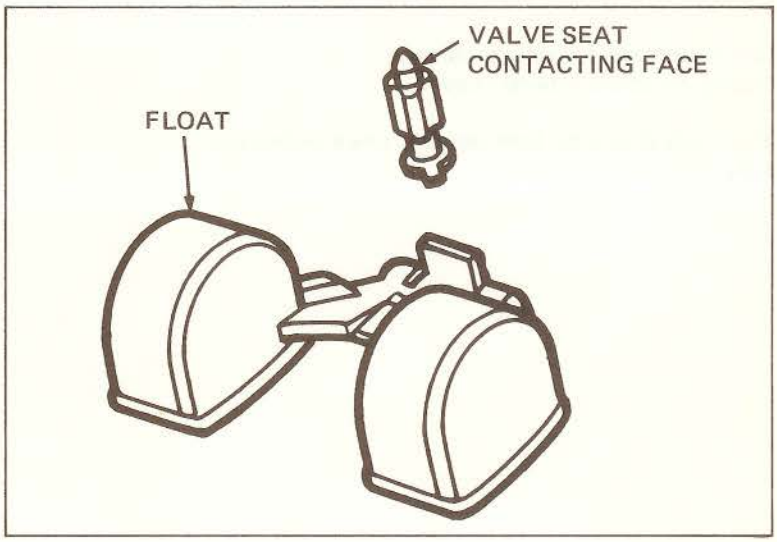
Remove the carburetor float and float valve.



FLOAT/FLOAT VALVE INSPECTION

Check the valve seat for wear or damage.

Check the float for deformation or presence of fuel.

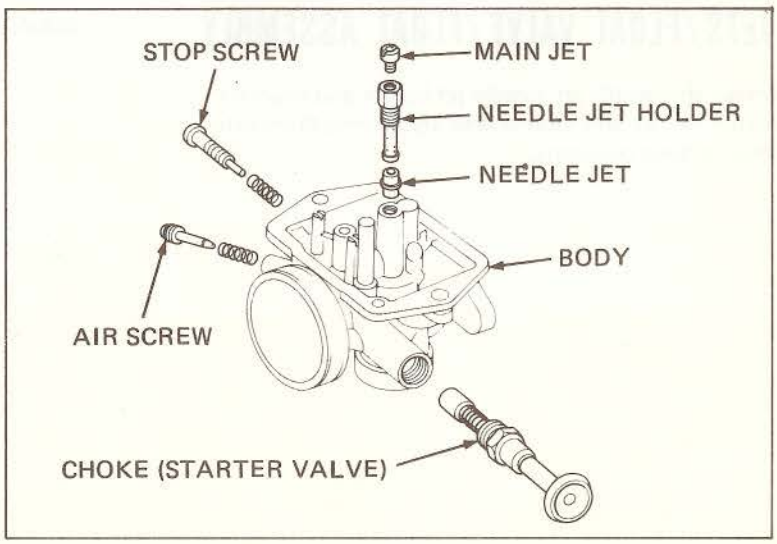


Remove the main jet, needle jet holder and needle jet.
Remove the stop screw and air screw.

NOTE

Before removing either screw, record the number of turns until the screw lightly rests (bottoms). This allows the screw to be rest to its original position.

Remove the choke (starter) valve.



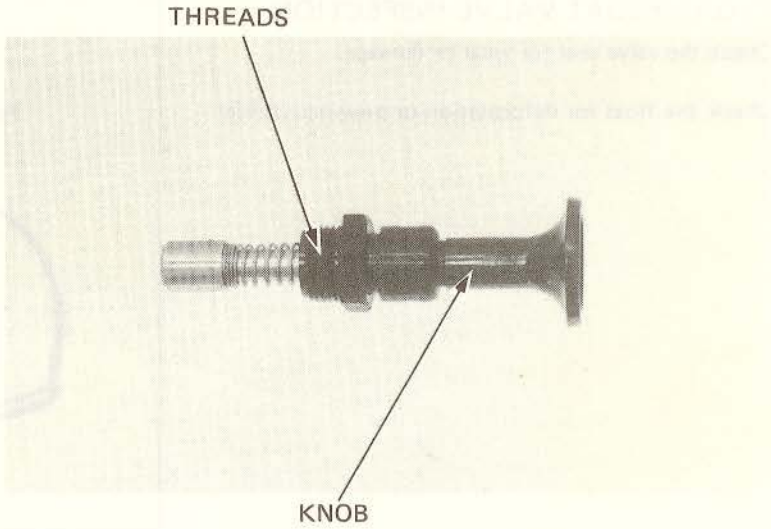
Blow open all jets and body openings with compressed air.

CAUTION

Never use compressed air to clean the body when the float assembly is installed. This could damage the floats.

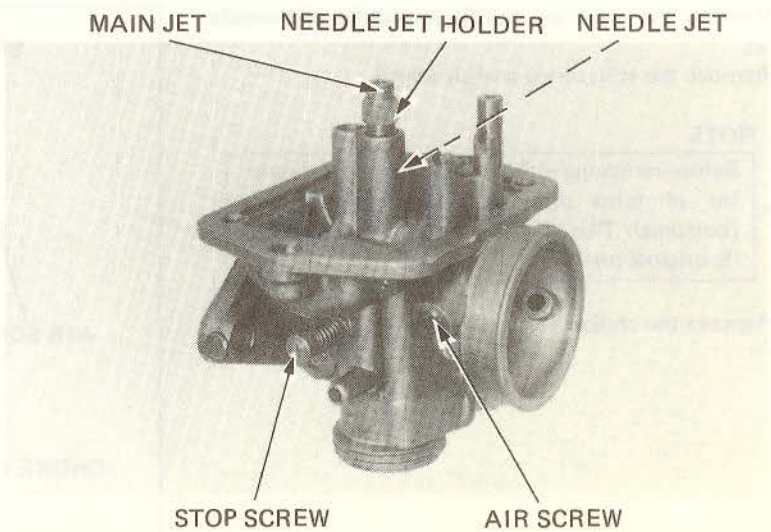
Check each part for wear or damage.
Inspect the choke (starter) valve.

The knob should be held securely when pulled out fully.



JETS/FLOAT VALVE/FLOAT ASSEMBLY

Install the needle jet, needle jet holder and main jet. Install the air and stop screws by turning them into their original positions.



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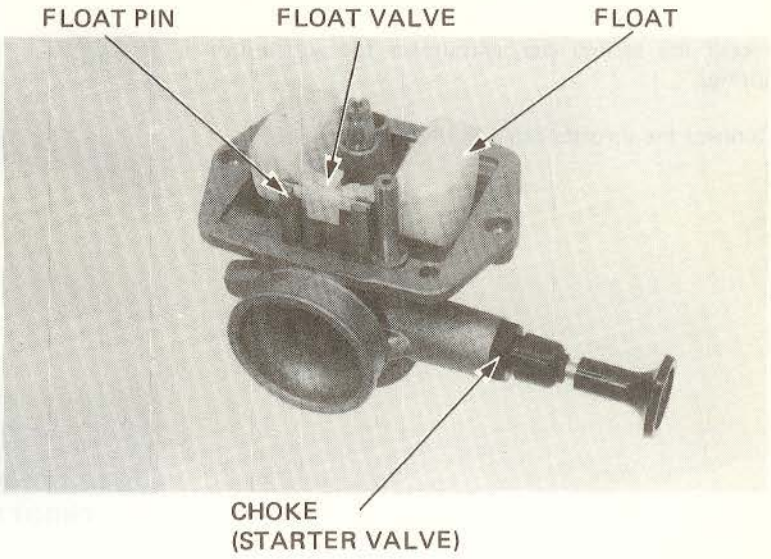
Install the choke (starter) valve.
Install the float valve, float and float pin.

CAUTION

Insert the float pin in the arrow direction.

Check the float for operation. Install the float chamber.

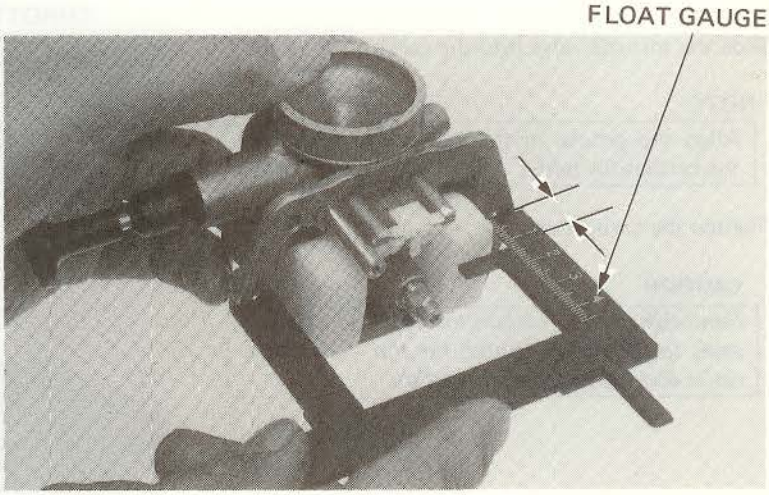


FLOAT LEVEL ADJUSTMENT

Measure the float level with the float tip just contacting the float valve.

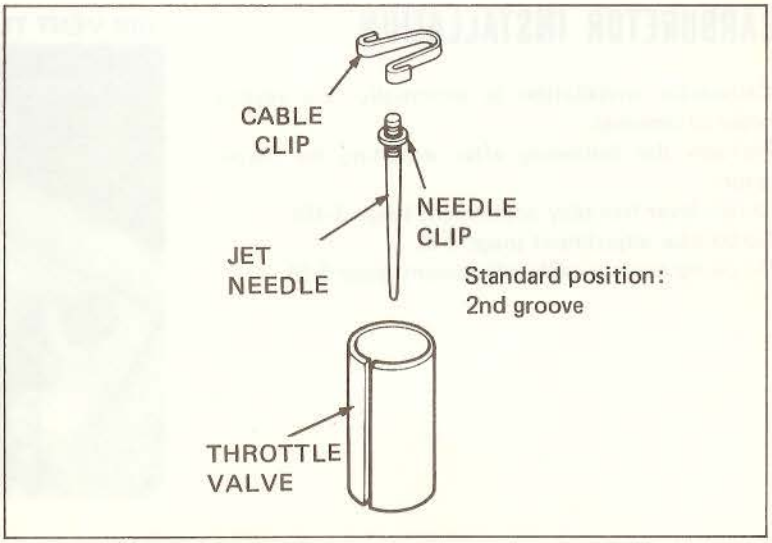
FLOAT LEVEL: 13.5 mm (0.53 in) ±1.0 mm

Replace the float assembly if not within specification.



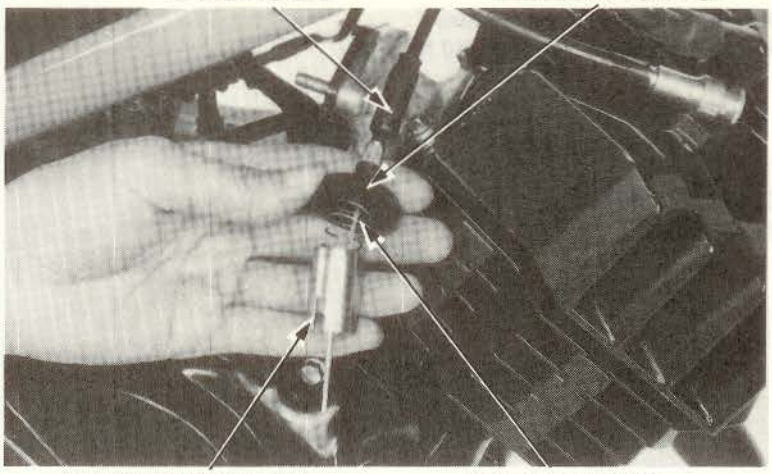
THROTTLE VALVE/CABLE INSTALLATION

Install the jet needle on the throttle valve and secure with the cable clip.



Install the sealing cap, carburetor top and return spring.

Connect the throttle cable to the throttle valve.



Slide the throttle valve into the carburetor body.

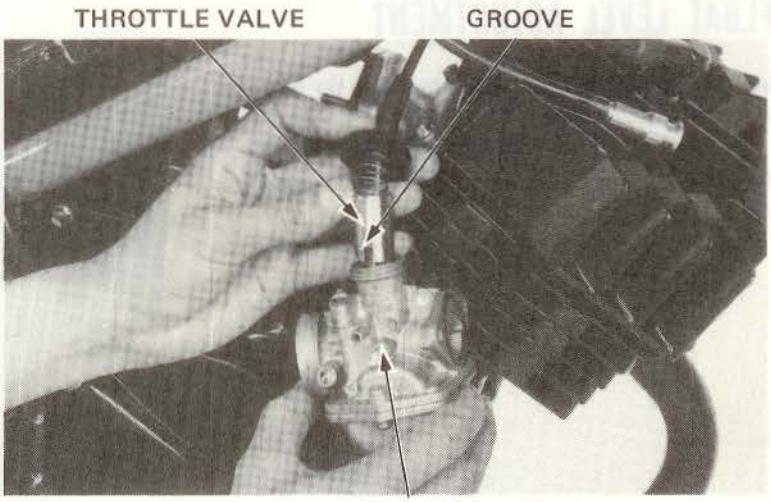
NOTE

Align the groove in the valve with screw on the carburetor body.

Tighten the carburetor.

CAUTION

Hand-tighten the carburetor top. Do not use tools to forcefully tighten the top. This could cause distortion and malfunction.



CARBURETOR INSTALLATION

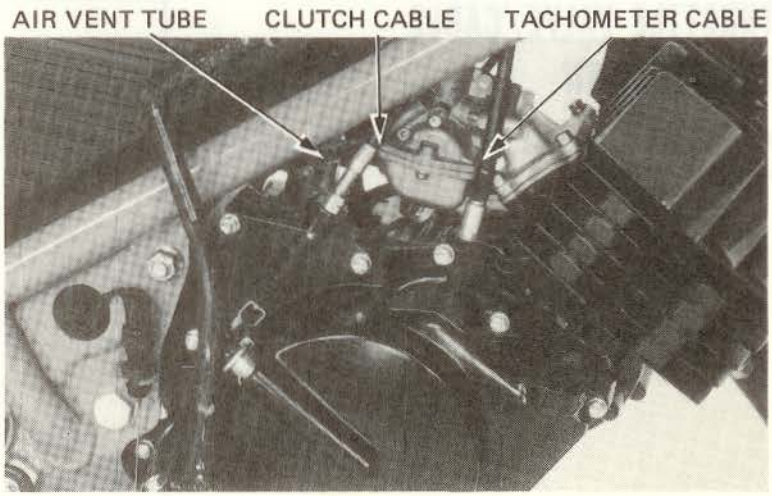
Carburetor installation is essentially the reverse order of removal.

Perform the following after installing the carburetor:

Clutch lever free play adjustment (page 3-10).

Carburetor adjustment (page 3-5).

Oil pump control cable adjustment (page 3-6).



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FUEL TANK

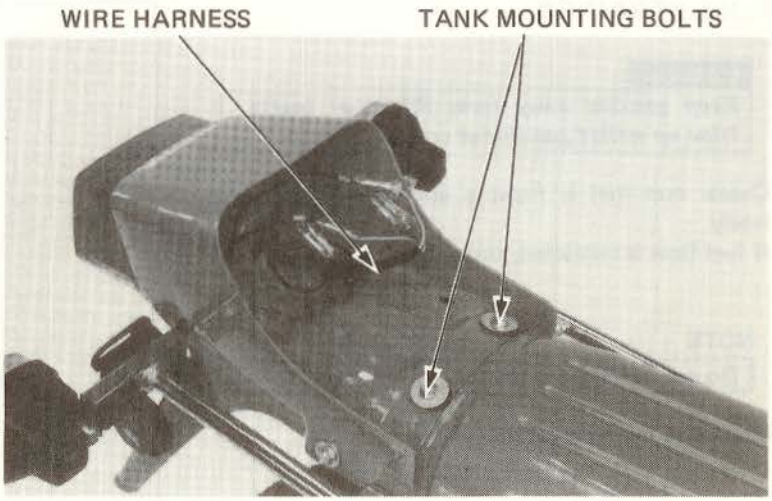
WARNING

Do not allow flames or sparks near gasoline. Wipe up spilled gasoline at once.

REMOVAL

Remove the seat attaching nuts and remove the seat.
Free the wire harness from the clamp under the fuel tank.

Disconnect the tail/stoplight and rear turn signal wires from the wire harness at the connector.
Remove the fuel tank rear mounting bolts.



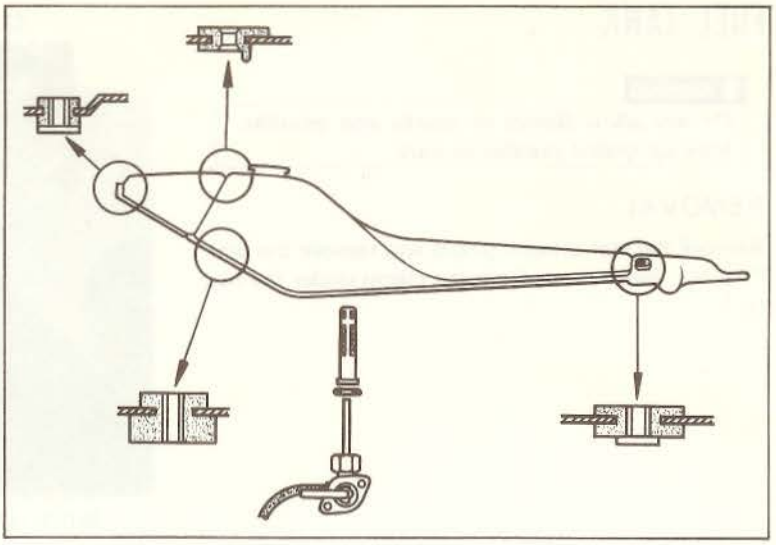
Remove the oil tank cover.
Remove the fuel tank front mounting bolts.
Turn the fuel cock to OFF and disconnect the fuel line.
Remove the fuel tank.

INSPECTION

Check the vent hole of the filler cap for blockage.

INSTALLATION

Install the fuel tank mount rubber dampers as shown.
Tighten the fuel tank mount bolts by shifting a wrench from one bolt to another in two or more steps.



FUEL STRAINER

WARNING

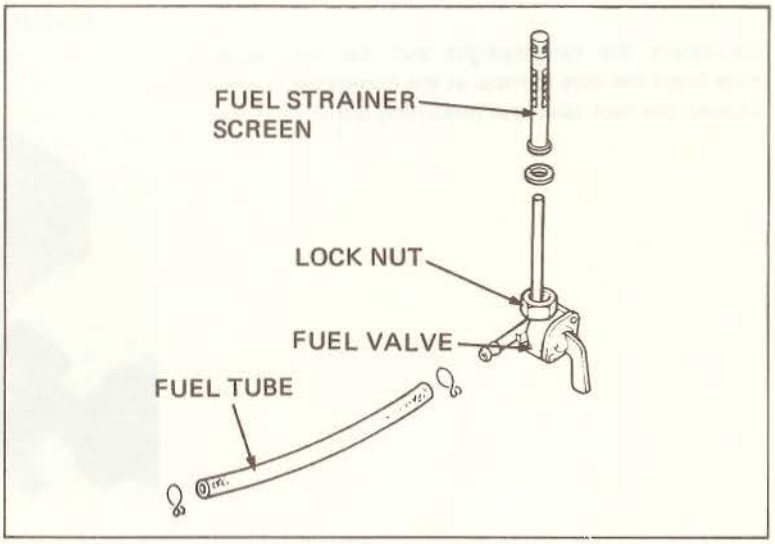
Keep gasoline away from flames or sparks. Wipe up spilled gasoline at once.

Check that fuel is flowing out of the fuel valve freely.
If fuel flow is restricted, clean the fuel strainer.

NOTE

Do not overtighten the fuel valve lock nut.

Make sure there are no fuel leaks.



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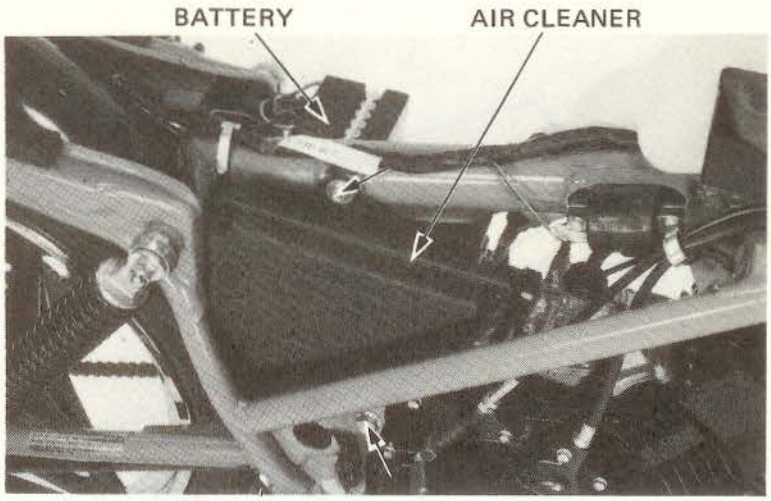
AIR CLEANER

NOTE

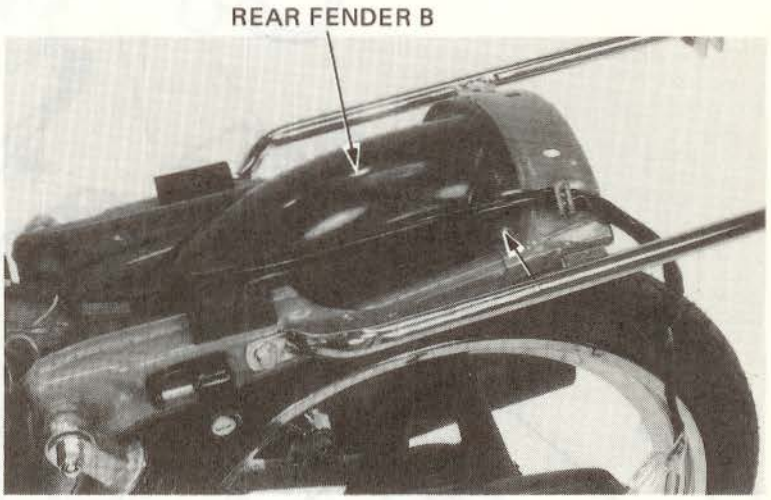
The air cleaner case can be removed by removing the attaching bolts when the engine is out of the motorcycle.

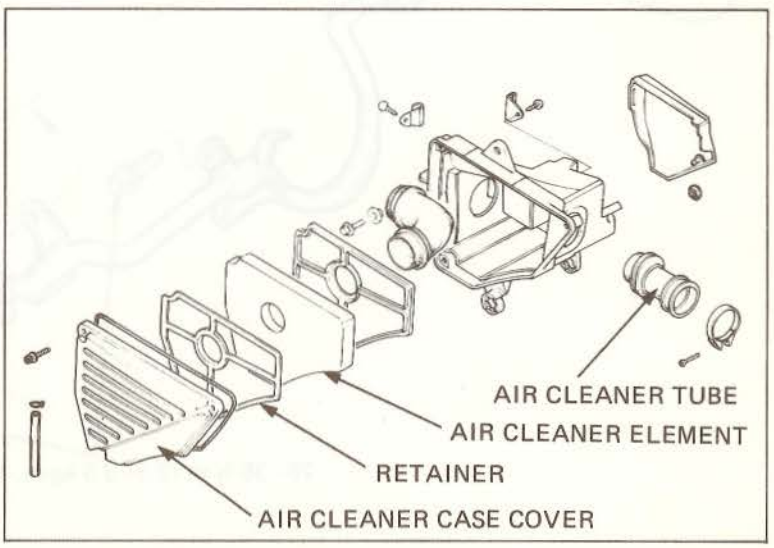
Remove the seat.
Remove the fuel tank (Page 4-9).
Remove the battery.
Remove the air cleaner case cover.
Remove the carburetor tube band.
Remove the rear engine hanger bolt and collar.

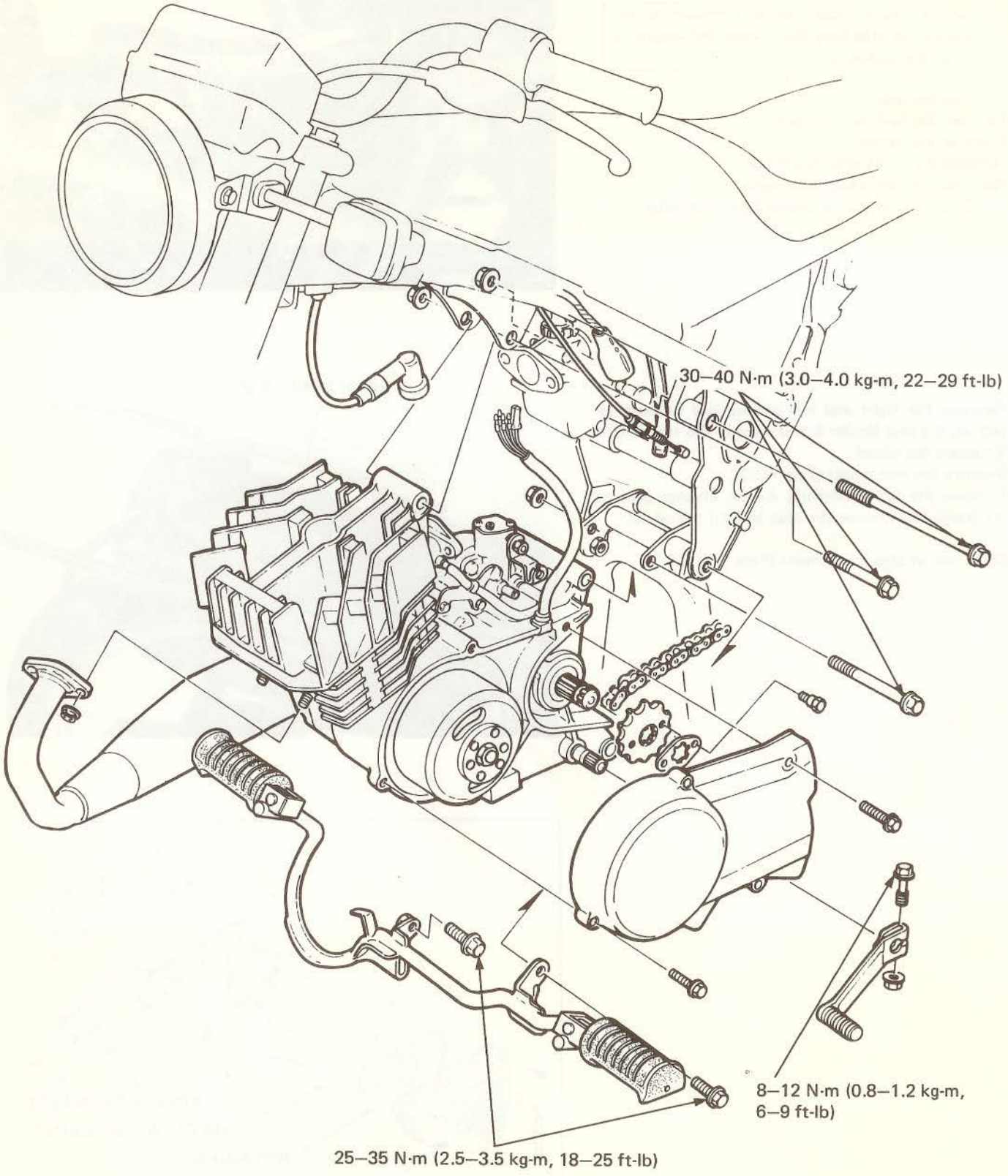


Remove the right and left screws and washers attaching the rear fender B and remove the rear fender B toward the wheel.
Remove the rear wheel (Page 12-3).
Remove the bolt attaching the air cleaner case to the frame and remove the case toward the wheel.

Clean the air cleaner element (Page 3-4).







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5. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION

GENERAL INSTRUCTION

The following parts or components can be serviced with the engine installed in the frame:

- Clutch
- Gearshift linkage
- Kickstarter
- Alternator
- Carburetor

SPECIFICATIONS

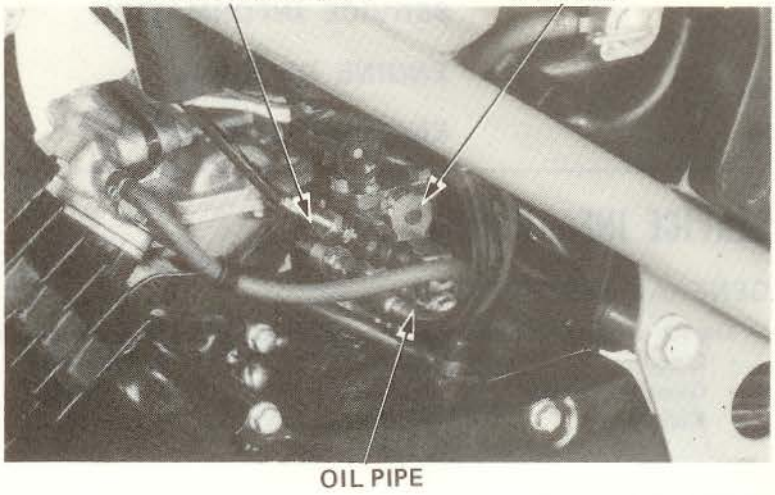
Engine dry weight	17.5 kg (38.6 lb)
Transmission oil capacity	1.0 lit (1.1 US qt) at engine assembly 0.9 lit (1.0 US qt) at change

TORQUE VALUES

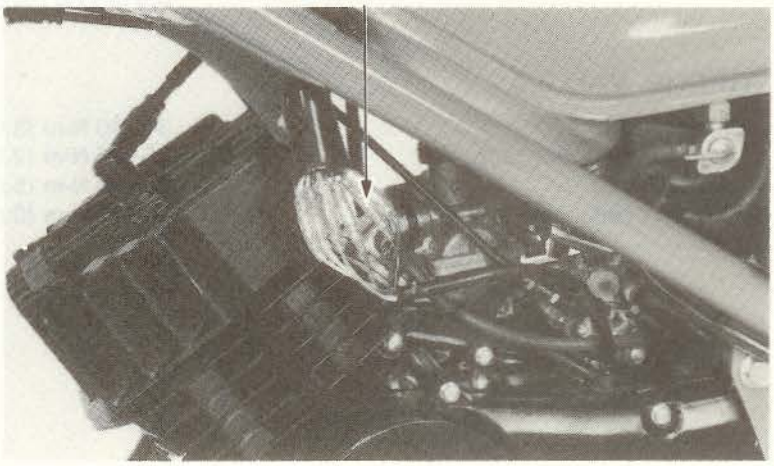
Engine hanger bolt	30–40 N·m (3.0–4.0 kg-m, 22–29 ft-lb)
Foot peg mounting bolt	25–35 N·m (2.5–3.5 kg-m, 18–25 ft-lb)
Rear axle nut	55–65 N·m (5.5–6.5 kg-m, 40–48 ft-lb)
Gearshift pedal bolt	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)

ENGINE REMOVAL

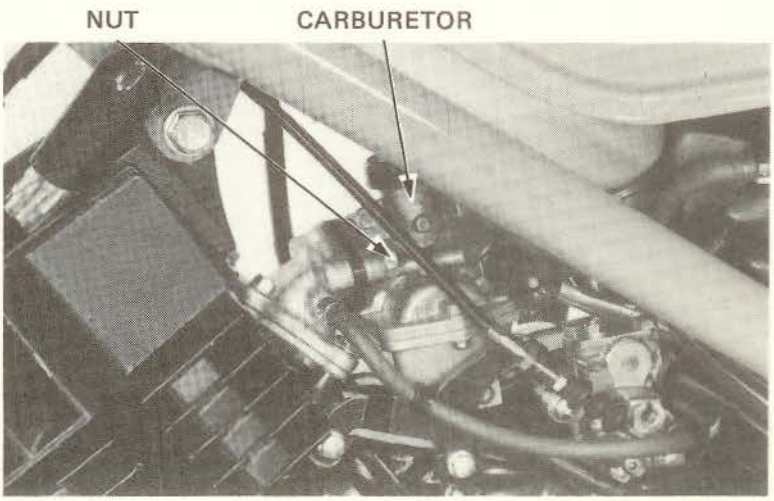
Place the motorcycle on its center stand.
Drain the transmission oil.
Disconnect the oil control cable.
Disconnect the oil pipe from the oil pump and pinch the end of the oil pipe to prevent oil from flowing out.



Disconnect the alternator wire connectors.



Remove the carburetor flange nuts.



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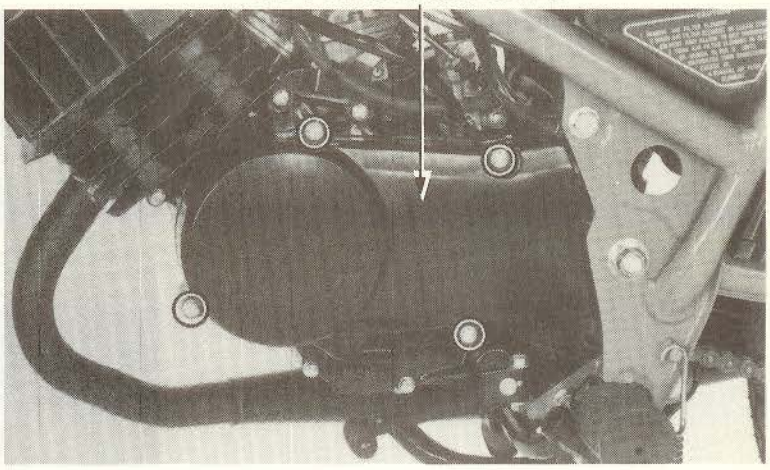
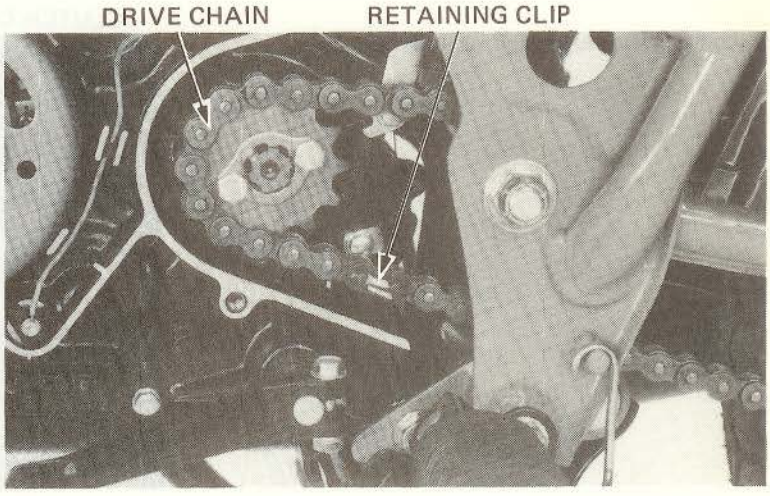
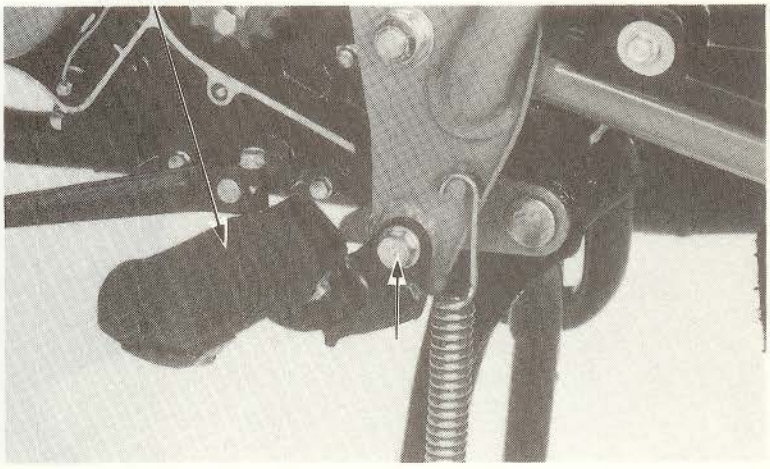
Remove the left crankcase cover.



Loosen the drive chain adjusting nuts.
Remove the rear axle nut cotter pin and loosen the axle nut.
Carefully remove the drive chain master link retaining clip and remove the drive chain.

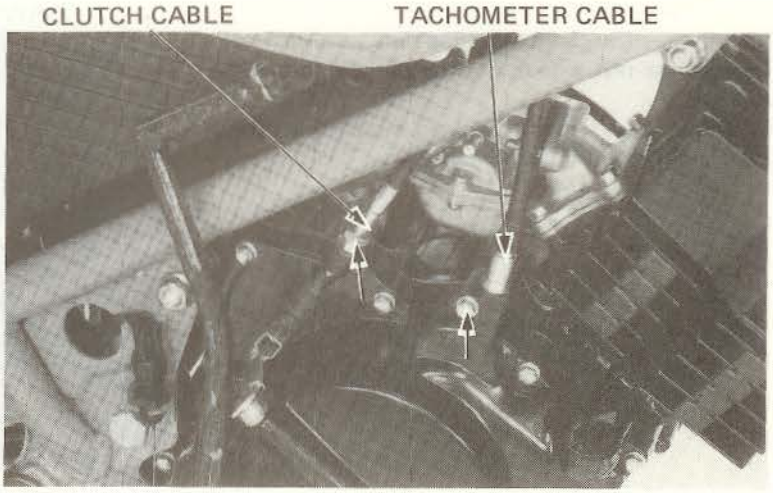


Remove the brake pedal return spring.
Remove the foot peg by removing the two mounting bolts.

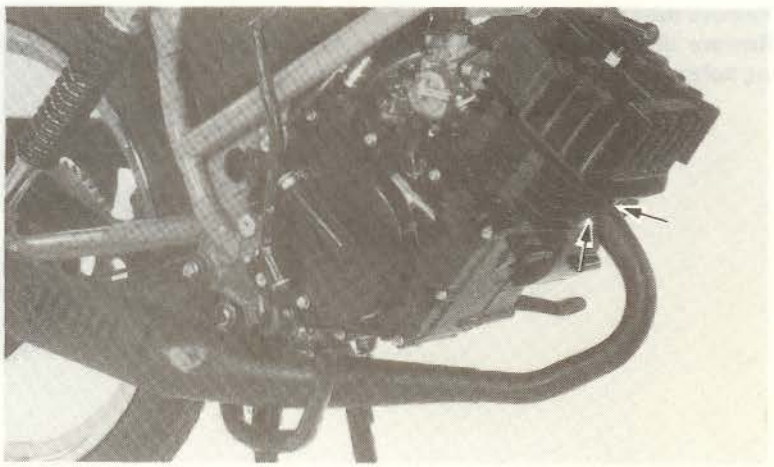


Remove the spark plug cap.

Disconnect the clutch and tachometer cables.



Remove the muffler.



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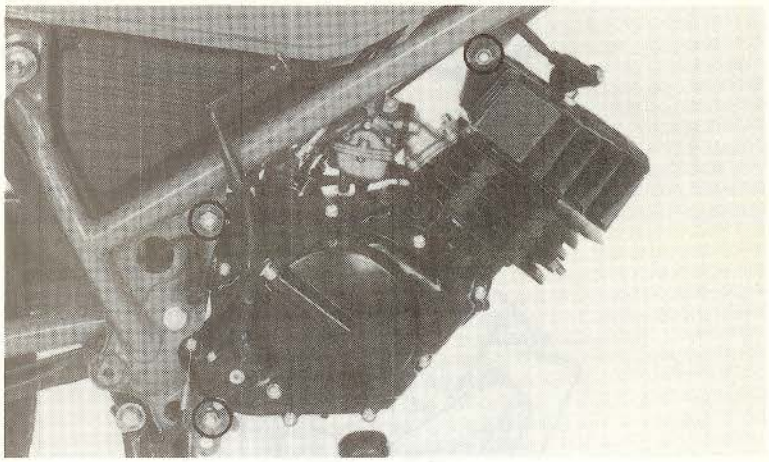
Place a jack under the engine.
Remove the engine mounting bolts and remove the engine.



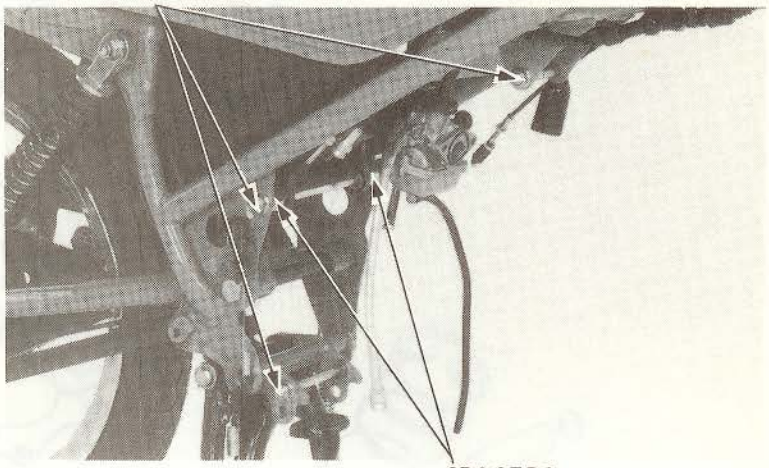
ENGINE INSTALLATION

Install the engine in the reverse order of removal.

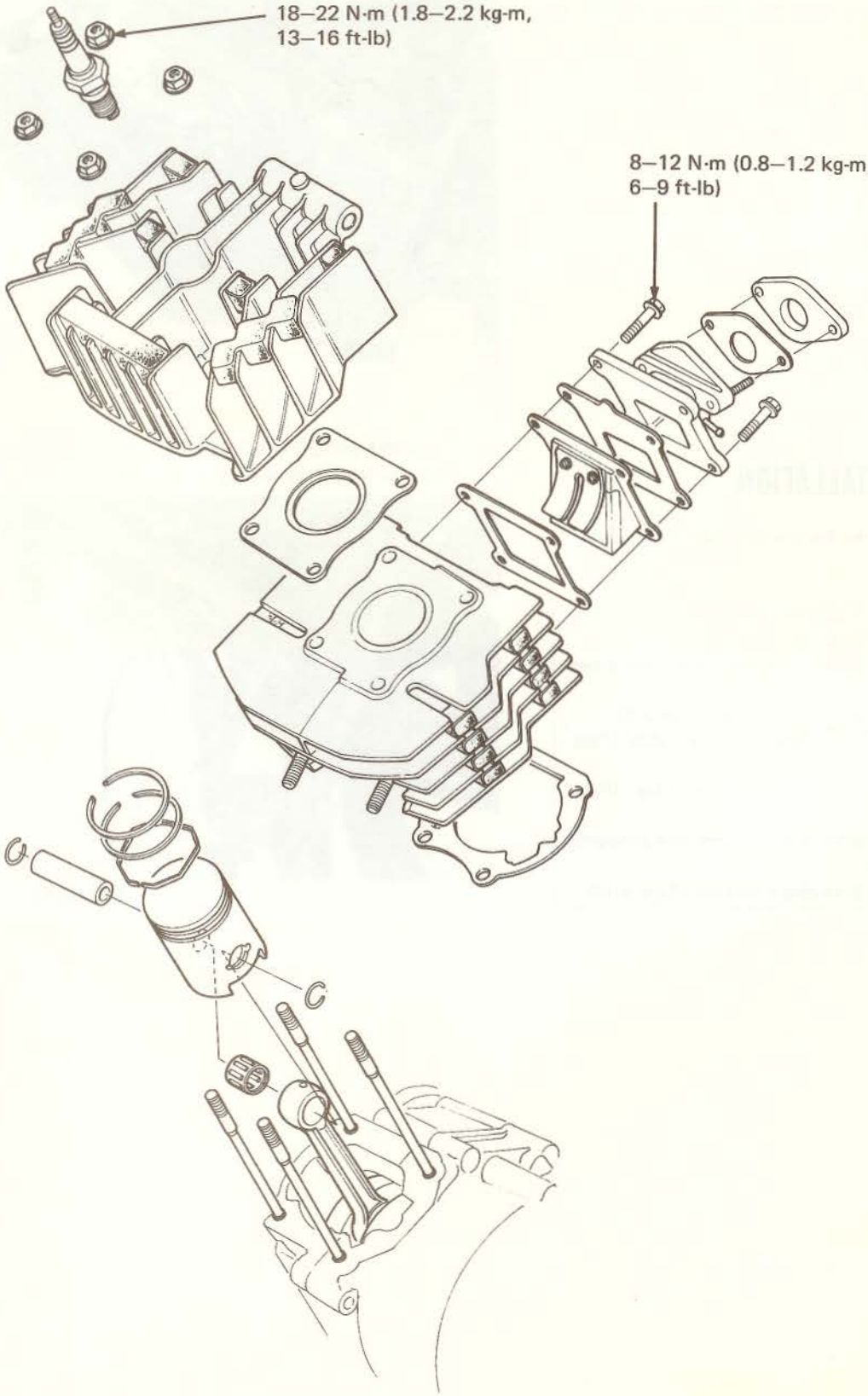
NOTE

- Fill the transmission with the recommended oil (Page 2-3).
- Check the locations of the cables and pipes (Page 1-6).
- Bleed air from the oil pump (Page 2-8).
- Adjust the oil pump control cable (Page 3-6).
- Adjust the clutch lever free play (Page 3-10).
- Install the drive chain master link properly (Page 3-11).
- Adjust the drive chain tension (Page 3-10).

ENGINE MOUNTING BOLTS
30–40 N·m (3.0–4.0 kg-m, 22–29 ft-lb)



SPACERS



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6. CYLINDER HEAD/CYLINDER/PISTON

SERVICE INFORMATION

GENERAL INSTRUCTIONS

- All cylinder head maintenance and inspection can be accomplished with the engine installed.
- Before disassembling the engine, clean the engine thoroughly to prevent dirt and dust to fall into the cylinder and crankcase.
- Remove all traces of gasket material from the mating surfaces of the cylinder head, cylinder and crankcase.
- Use caution when servicing the cylinder and piston to preven damage to them.
- Before assembling, apply clean engine oil to all sliding surfaces of parts.

TORQUE VALUE

Cylinder head nut	18–22 N·m (1.8–2.2 kg-m, 13–16 ft-lb)

SPECIFICATIONS

ITEM	STANDARD mm (in)		SERVICE LIMIT mm (in)	
Cylinder head warpage			0.10	(0.004)
Cylinder bore	39.000–39.020	(1.5354–1.5362)	38.070	(1.5382)
Piston O. D. (10 mm (3/8 in) from piston skirt)	38.955–38.970	(1.5337–1.5343)	38.920	(1.5323)
Cylinder-to-piston clearance	0.030–0.060	(0.0012–0.0024)	0.100	(0.0039)
Piston pin bore	12.002–12.008	(0.4725–0.4728)	12.030	(0.4736)
Piston pin O. D.	11.994–12.000	(0.4722–0.4724)	11.980	(0.4717)
Piston-to-piston pin clearance	0.002–0.014	(0.0001–0.0006)	0.040	(0.0016)
Piston ring end gap (top/second)	0.10–0.25	(0.004–0.010)	0.35	(0.014)
Connecting rod small end I. D.	17.005–17.017	(0.6695–0.6700)	17.030	(0.6705)

TROUBLESHOOTING

Compression too low, hard starting or poor performance at low speed

1. Blown cylinder head gasket
2. Loose spark plug
3. Worn, stuck or broken piston rings
4. Worn or damaged cylinder and piston
5. Faulty reed valve

Compression too high, overheating or knocking

1. Excessive carbon buildup in cylinder head or on piston top

Abnormal noise–piston

1. Worn cylinder and piston
2. Worn piston pin or piston pin hole
3. Worn connecting rod small end bearing

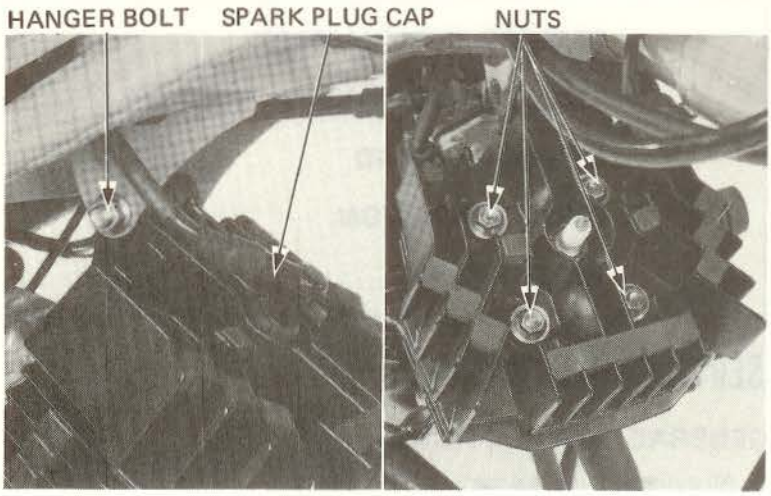
Abnormal noise–piston rings

1. Worn, stuck or broken piston rings
2. Worn or damaged cylinder

CYLINDER HEAD

REMOVAL

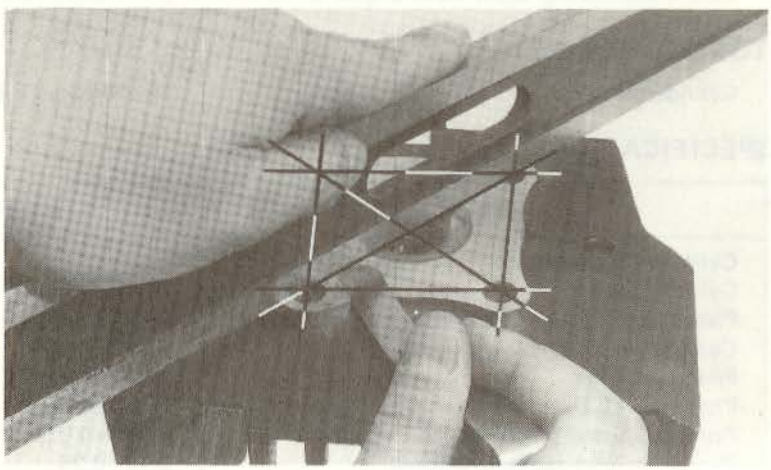
Remove the cylinder head hanger bolt.
Remove the spark plug cap.
Remove the four flange nuts attaching the cylinder head to the cylinder.



INSPECTION

Check the cylinder head for warpage with a straight edge and feeler gauge in the directions shown.

SERVICE LIMIT: 0.10 mm (0.004 in)



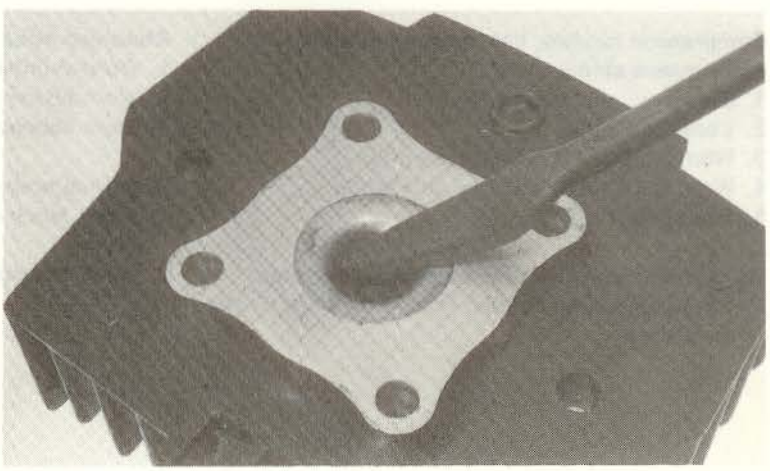
DECARBONIZING

Remove the carbon deposits from the combustion chamber.

Clean the head gasket surface of any gasket material.

NOTE

Avoid damaging the gasket surfaces.



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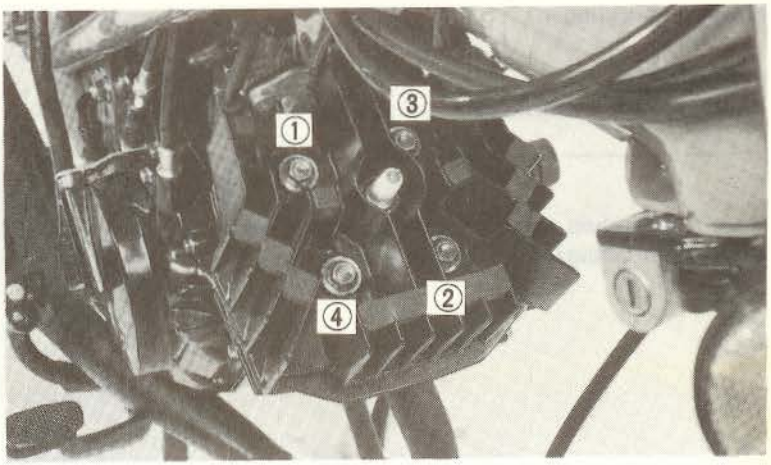
INSTALLATION

Install the cylinder head using a new cylinder head gasket.

Install the four flange nuts and tighten to the specified torque in the sequence shown.

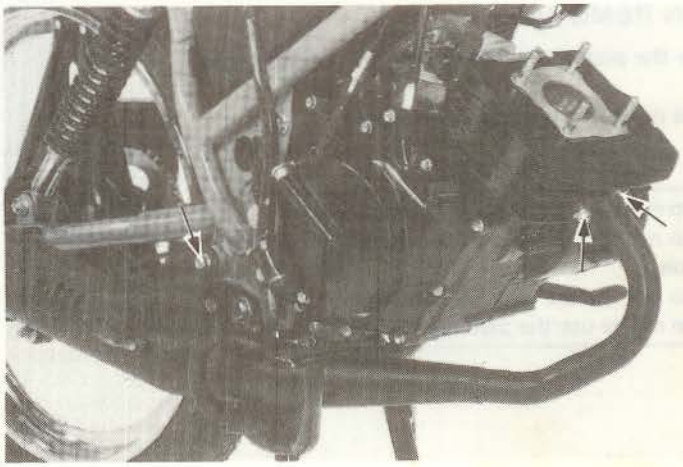
TORQUE: 18–22 N·m (1.8–2.2 kg-m, 13–16 ft-lb)



CYLINDER/PISTON

CYLINDER REMOVAL

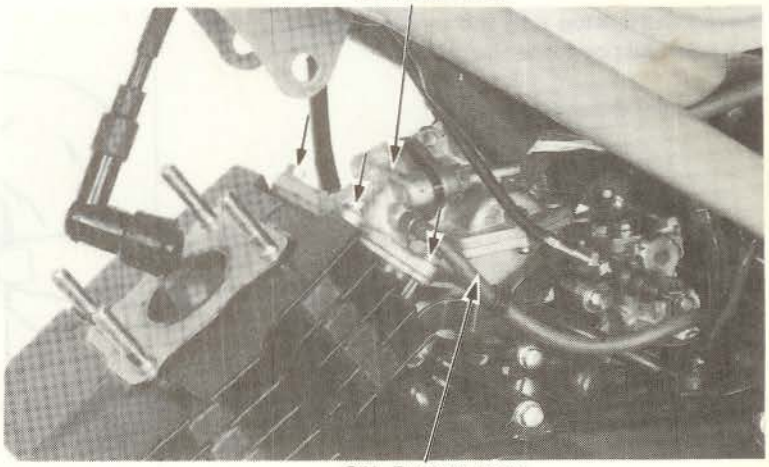
Remove the cylinder head (Page 6-2) and exhaust pipe.



Remove the four flange bolts attaching the intake pipe to the cylinder.

NOTE

Do not remove the oil pass tube or locate the end of the tube lower than the oil pump. Bleed air from the oil pass tube when it has been disconnected or the end has been located lower than the oil pump.

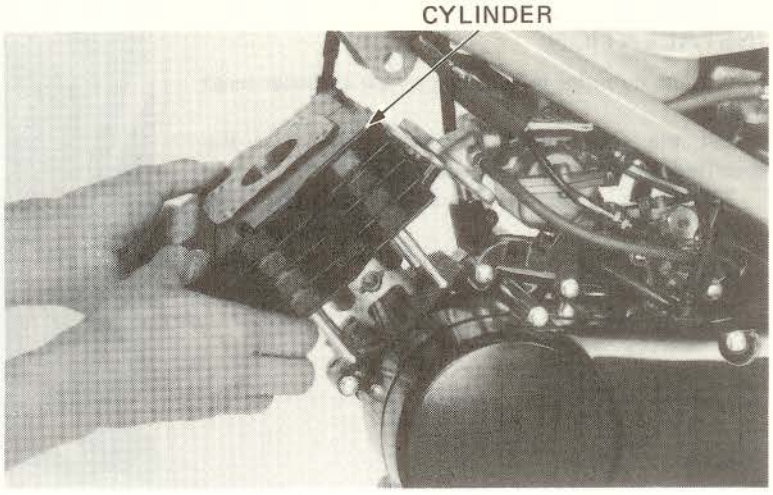


Remove the cylinder.

CAUTION

Do not pry or strike the cylinder or cooling fins.

Place a clean shop towel into the crankcase to keep debris from falling in.

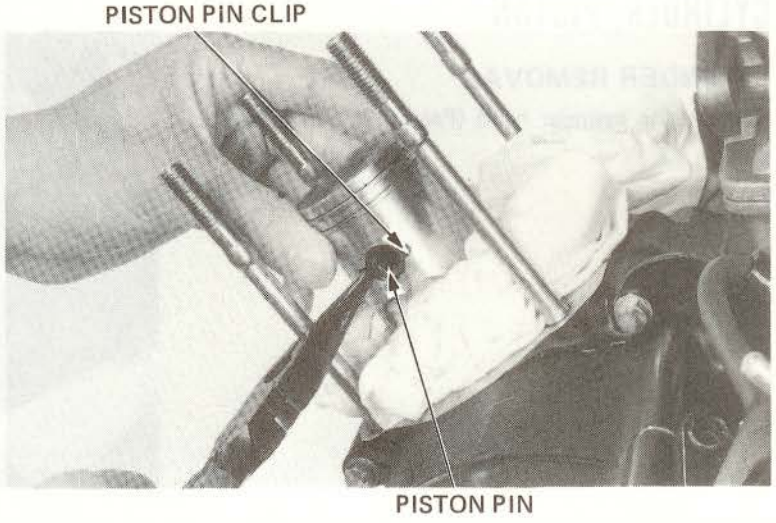


PISTON REMOVAL

Remove the piston pin clip using a pair of long-nose pliers.
Press the piston pin free of the piston.

NOTE

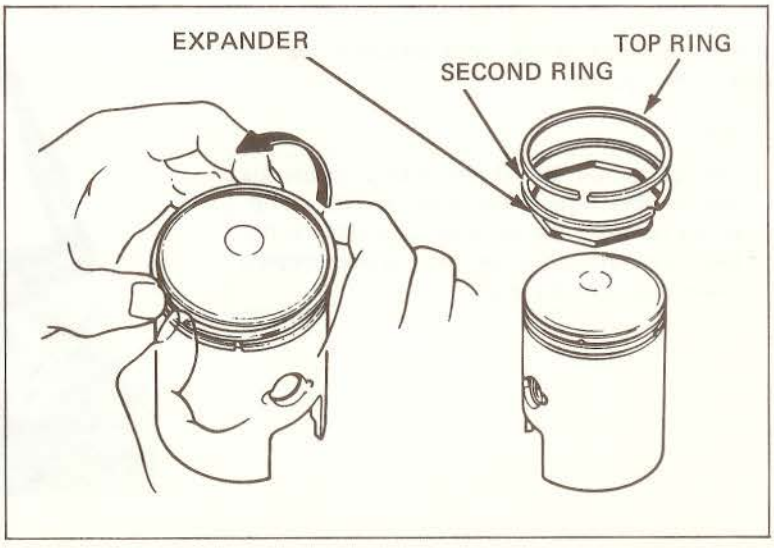
- Do not damage or scratch the piston.
- Do not apply force in the piston pin direction.
- Do not let the clip fall into the crankcase.
- Do not re-use the piston pin clips.



PISTON RING/EXPANDER REMOVAL

Spread each piston ring and remove by lifting it up at a point just opposite the gap.

Remove the expander.



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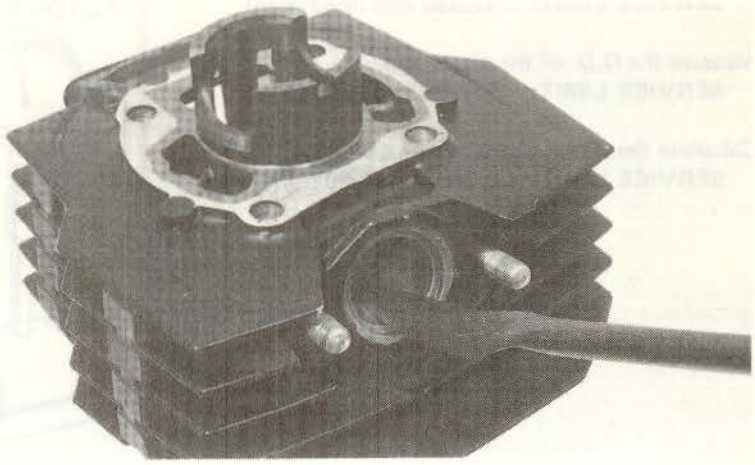
CYLINDER/PISTON INSPECTION

Check the cylinder and piston for wear or damage.

Clean carbon deposits from the exhaust port area.

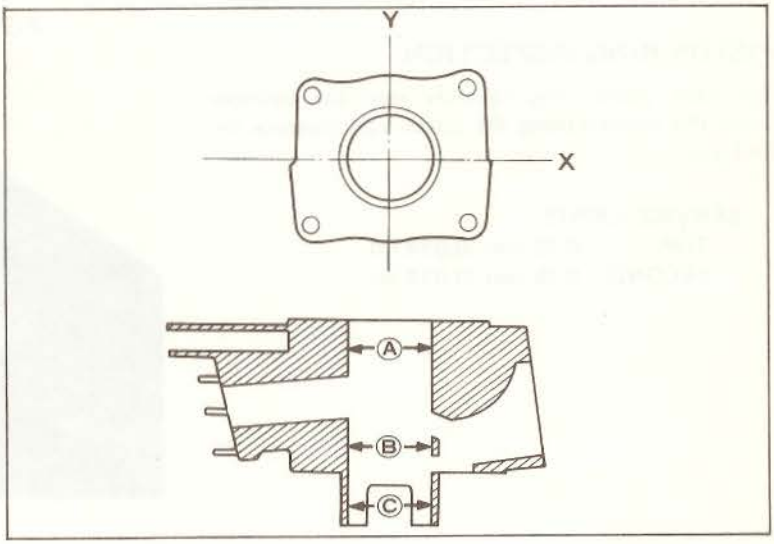
CAUTION

Do not damage the cylinder.



Inspect the cylinder bores for wear at three levels in X and Y directions. Take the minimum figure measured to determine the cylinder wear. Avoid the port area.

SERVICE LIMIT: 39.070 mm (1.5382 in)

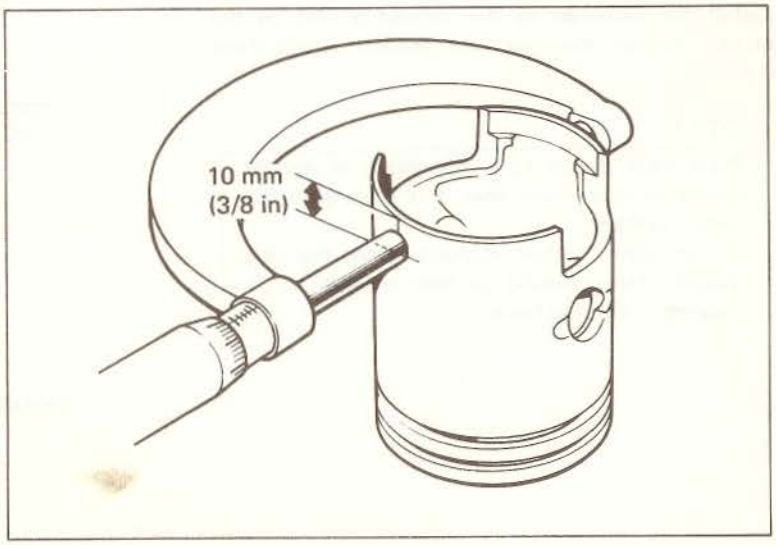


Measure the O.D. of the piston at a point 10 mm (3/8 in) from the end of the skirt.

SERVICE LIMIT: 38.920 mm (1.5323 in)

Calculate the piston-to-cylinder clearance.

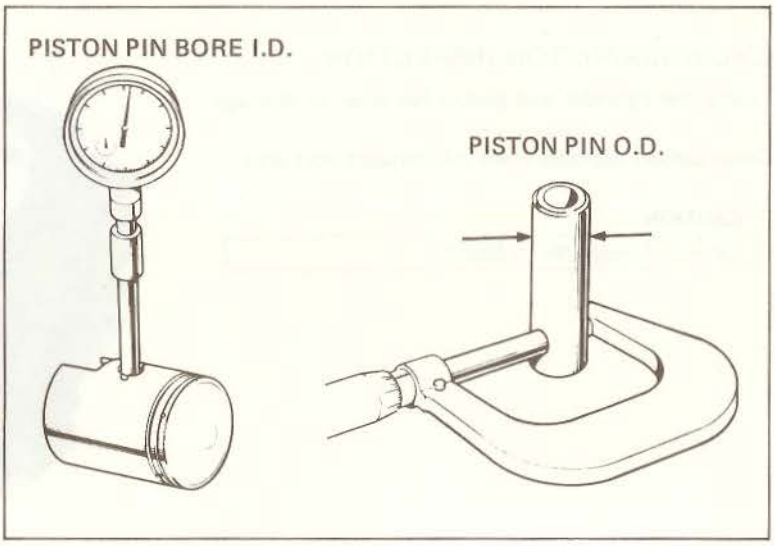
SERVICE LIMIT: 0.100 mm (0.0039 in)



Measure the I.D. of the piston pin bore.
SERVICE LIMIT: 12.030 mm (0.4736 in)

Measure the O.D. of the piston pin.
SERVICE LIMIT: 11.980 mm (0.4717 in)

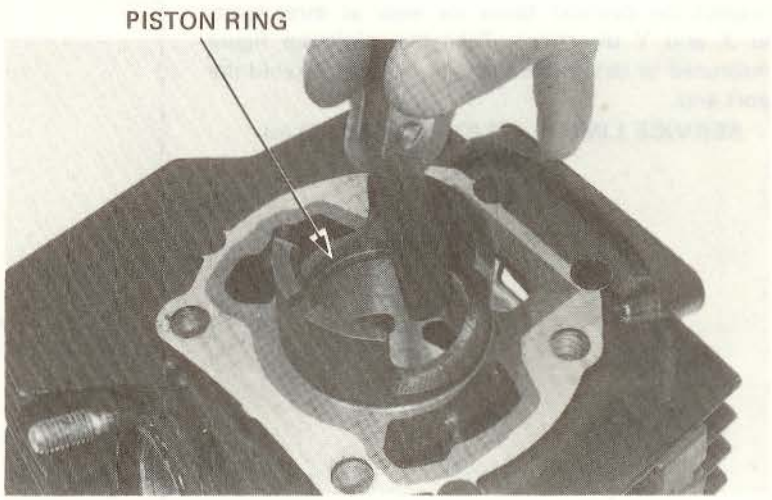
Calculate the piston pin-to-piston clearance.
SERVICE LIMIT: 0.040 mm (0.0016 in)



PISTON RING INSPECTION

Set each piston ring squarely into the cylinder from the bottom using the piston and measure the end gap.

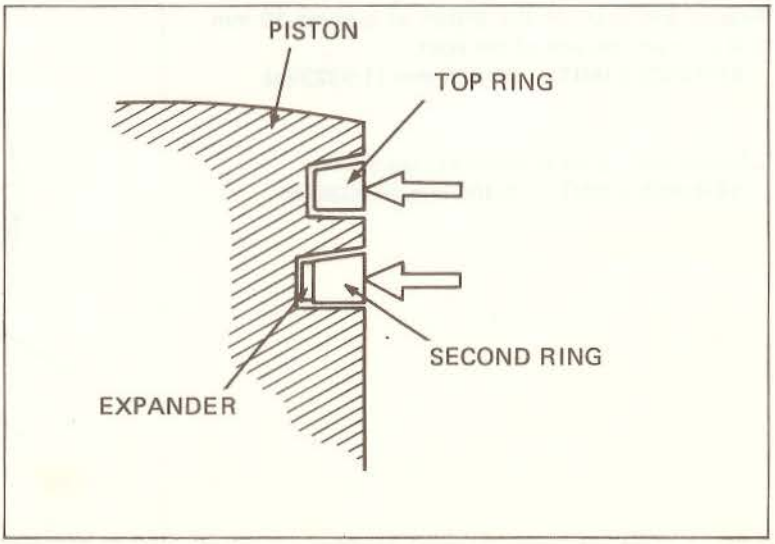
SERVICE LIMITS:
TOP: 0.35 mm (0.014 in)
SECOND: 0.35 mm (0.014 in)



Install the expander in the second groove of the piston. Install the top and second rings (Page 6-7).

NOTE

Press each piston ring into place at several points to make sure that it is flush with the piston surface.
If not, clean carbon deposits from the ring groove. They should be free enough to be rotated in the ring lands.



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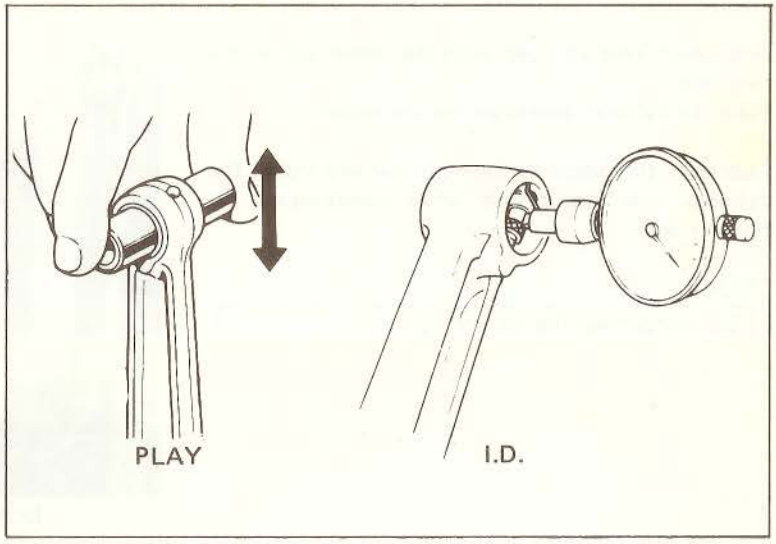
CONNECTING ROD INSPECTION

Install the bearing and piston pin in the connecting rod small end and check for excessive play.

Measure the connecting rod small end I.D.
SERVICE LIMIT: 17.030 mm (0.6705 in)

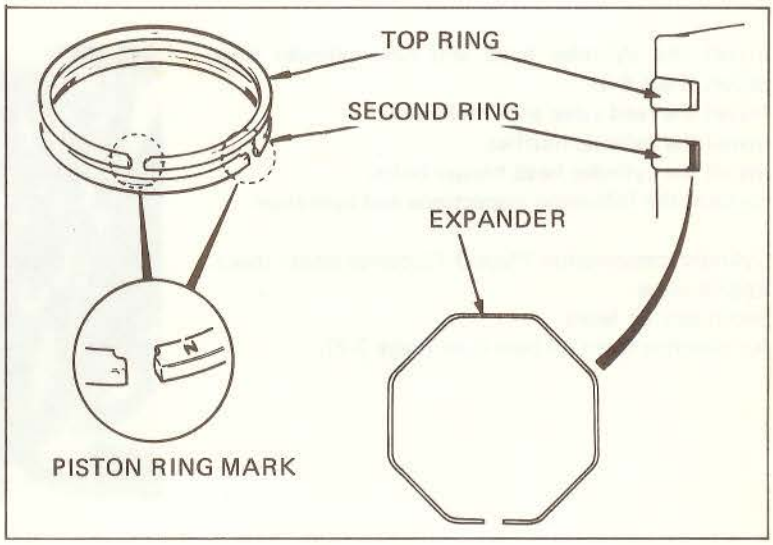


PISTON/CYLINDER INSTALLATION

Install the expander and piston rings.

NOTE

- Install the rings with the marking facing up.
- The top and second rings are interchangeable with each other.
- Do not mix different brands of rings in an engine. Do not replace one without replacing another.



Install the connecting rod small end bearing, piston and piston pin.

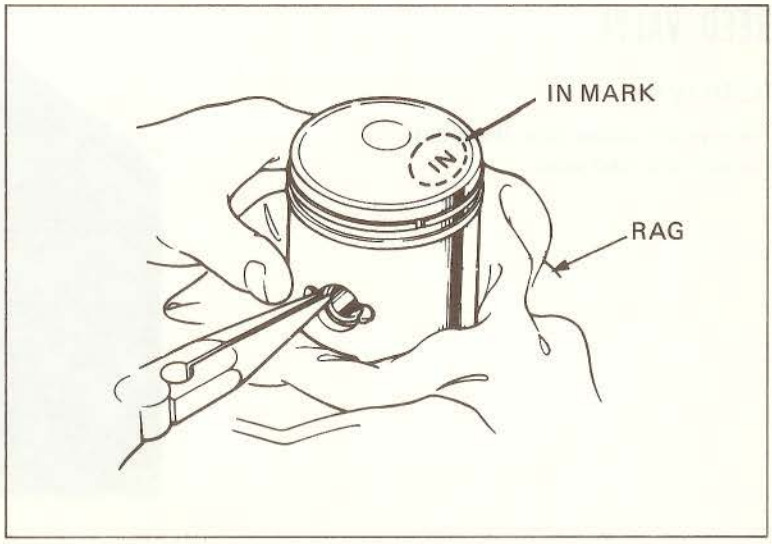
NOTE

- Install the piston with the "IN" marking facing the inlet side.
- Dip the small end bearing and piston pin in clean oil before installation.

Install new piston pin clips.

NOTE

Do not let the clip fall into the crankcase.

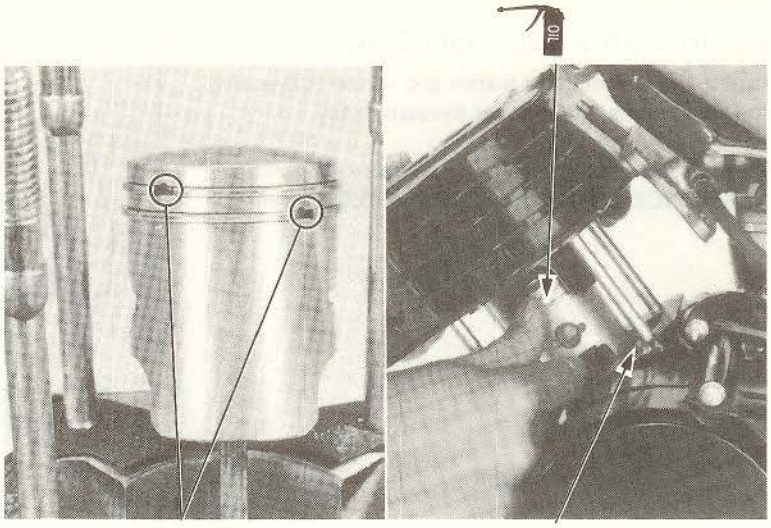


Align each ring end gap with the dowel pin in the ring land.
Place the cylinder gasket on the crankcase.

Lubricate the piston with engine oil and install the cylinder over the piston while compressing the piston rings.

NOTE

Do not damage the piston.

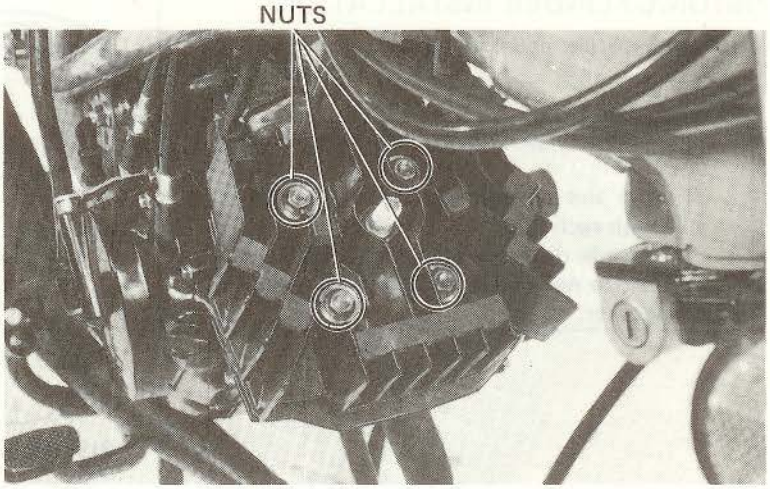


DOWEL PINS

CYLINDER GASKET

Install the cylinder head and new cylinder head gasket (Page 6-3).
Install the reed valve and intake pipe.
Install the exhaust muffler.
Install the cylinder head hanger bolts.
Perform the following inspections and operation:

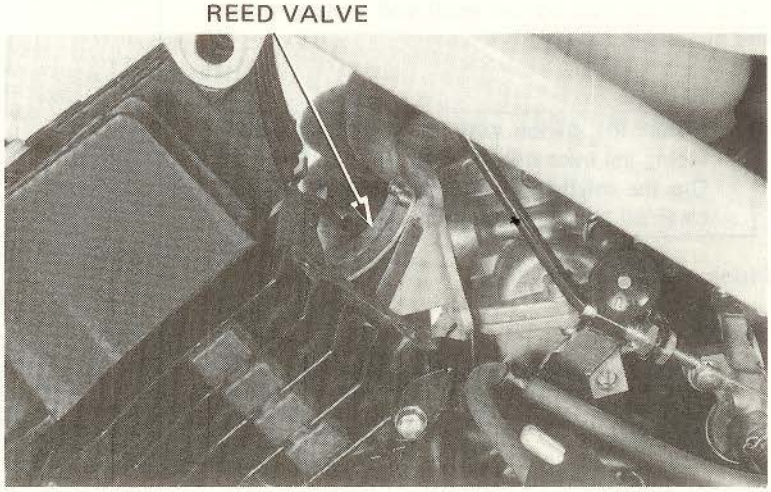
Cylinder compression (Page 3-7); compression leaks.
Engine noise.
Secondary air leaks.
Air bleeding from oil pass tube (Page 2-7).



REED VALVE

REMOVAL

Remove the intake pipe (Page 6-3).
Remove the reed valve.



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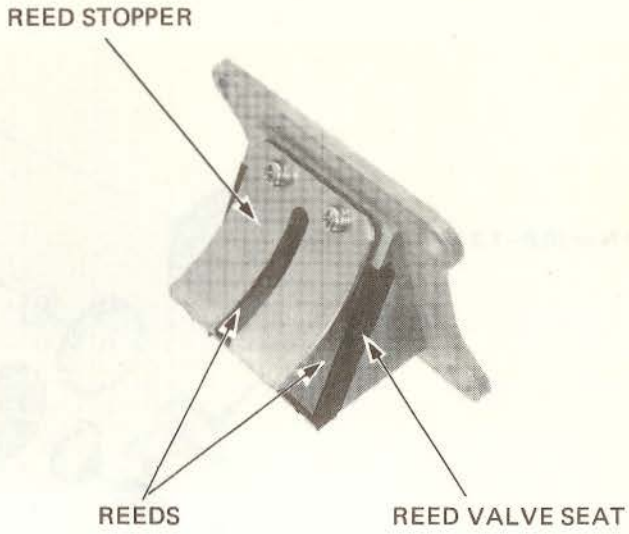
INSPECTION

Check the reeds for damage or fatique and replace if necessary. Replace the valve with a new one if the seat rubber is cracked or damaged, or if there is clearance between the reed and seat.

CAUTION

Do not disassemble or bend the reed stopper as this may cause improper engine performance. The reed valve must not be disassembled. If the stopper, reed or seat is defective, replace all as a unit.



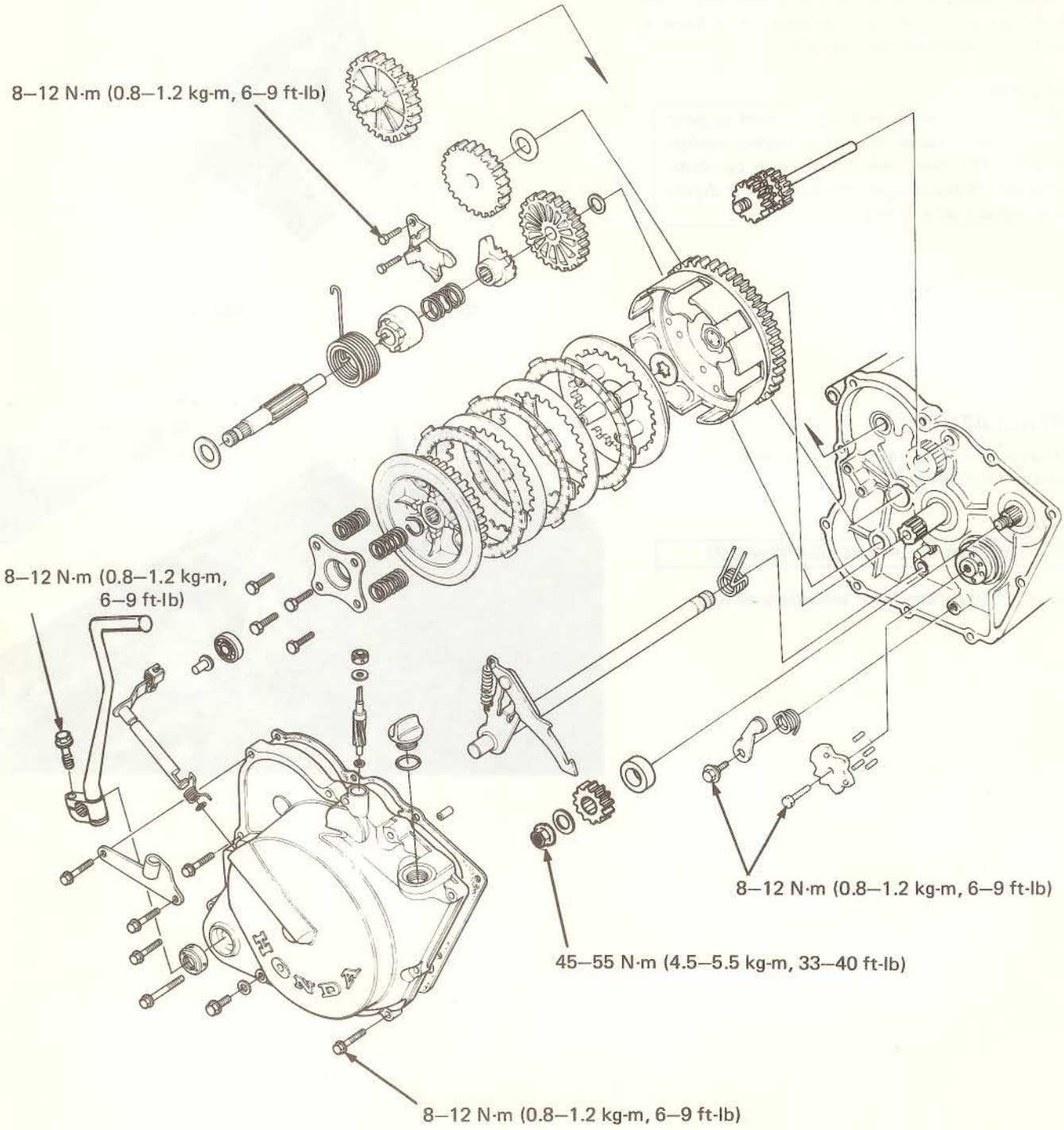
INSTALLATION

Installation of the reed valve is essentially the reverse order of removal.

CAUTION

Bleed air from the oil pass tube (Page 2-7).

After installation, check for secondary air leaks.



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7. CLUTCH/KICKSTARTER/ SHIFT LINKAGE

SERVICE INFORMATION

GENERAL INSTRUCTIONS

- All clutch and kickstarter maintenance and inspections can be accomplished with the engine installed.
- Make balancer timing adjustment when the clutch outer and primary drive gear are removed.
- Use the UNIVERSAL HOLDER to remove and install the primary drive gear.
- Remove all gasket materials from the mating faces of the cases.
- Do not allow dust and dirt to enter into the cylinder and crankcase.
- Avoid damaging or scratching the case mating surfaces.
- Before inspecting, clean all removed parts in solvent; dip the parts in clean transmission oil before installation.

TOOL

Common Universal Holder	07725–0010101 or 07725–0030000

TORQUE VALUE

Primary drive gear	45–55 N·m (4.5–5.5 kg-m, 33–40 ft-lb)

SPECIFICATIONS

ITEM	STANDARD mm (in)	SERVICE LIMIT mm (in)
Clutch spring free length/preload	30.2/19–21 kg (1.19/41.9–46.3 lb)	28.5/17 kg (1.12/37.5 lb)
Clutch disc thickness	2.9–3.0 (0.114–0.118)	2.5 (0.098)
Clutch plate warpage	———	0.2 (0.008)
Clutch outer I. D.	17.000–17.018 (0.6693–0.6700)	17.060 (0.6717)
Kickstarter spindle O. D.	11.966–11.984 (0.4711–0.4718)	11.950 (0.4704)
Kickstarter pinion I.D.	12.016–12.034 (0.4731–0.4738)	12.070 (0.4752)
Kickstarter idle gear Countershaft O.D.	15.000–15.018 (0.5906–0.5913)	14.940 (0.5882)
Gear I. D.	15.032–15.050 (0.5918–0.5925)	15.100 (0.5945)
Oil pump driven gear shaft O. D.	9.965–9.987 (0.3923–0.3932)	9.930 (0.3909)
Balancer idler gear shaft O.D.	9.972–9.987 (0.3926–0.3932)	9.930 (0.3909)

TROUBLESHOOTING

Clutch slips when accelerating
1. No free play
2. Discs worn
3. Springs weak

Clutch operation feels rough
1. Outer drum slots rough

Abnormal engine vibration
1. Balancer out of time

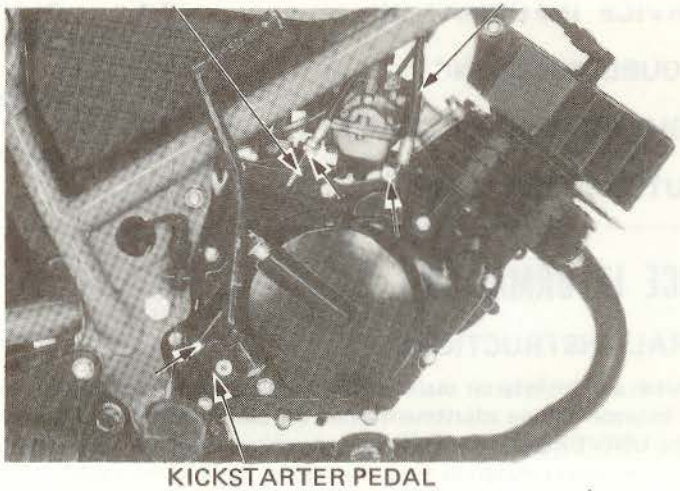
Motorcycle creeps with clutch disengaged
1. Too much free play
2. Plates warped

Excessive lever pressure
1. Clutch cable kinked, damaged or dirty
2. Lifter mechanism damaged
3. Clutch cable not routed properly

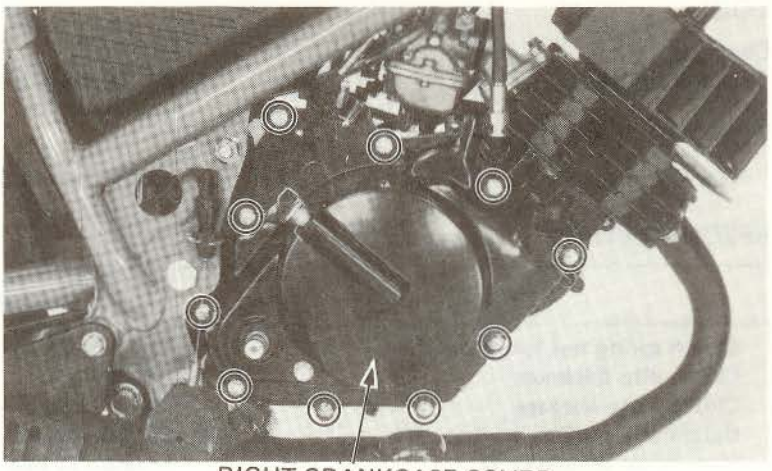
RIGHT CRANKCASE COVER

REMOVAL

Drain oil from the transmission.
Remove the kickstarter pedal.
Disconnect the clutch cable from the clutch arm.
Disconnect the tachometer cable.

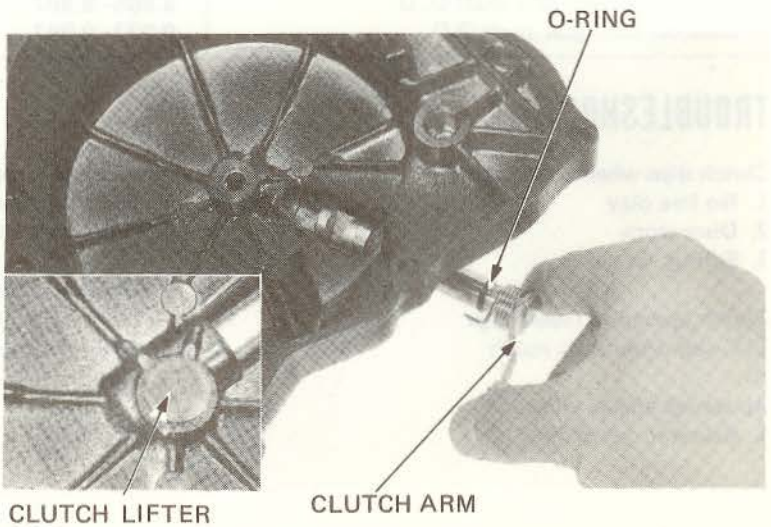


Remove the bolts attaching the right crankcase cover, and remove the right crankcase cover.



DISASSEMBLY

Remove the clutch lifter rod, then remove the clutch arm.
Check the O-ring for damage, fatigue or other faults. Check the clutch arm for bending.



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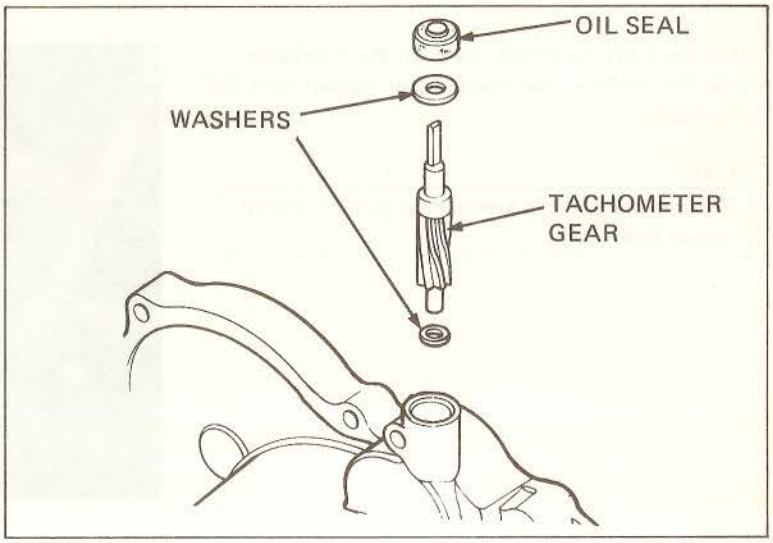
Remove the tachometer gear.

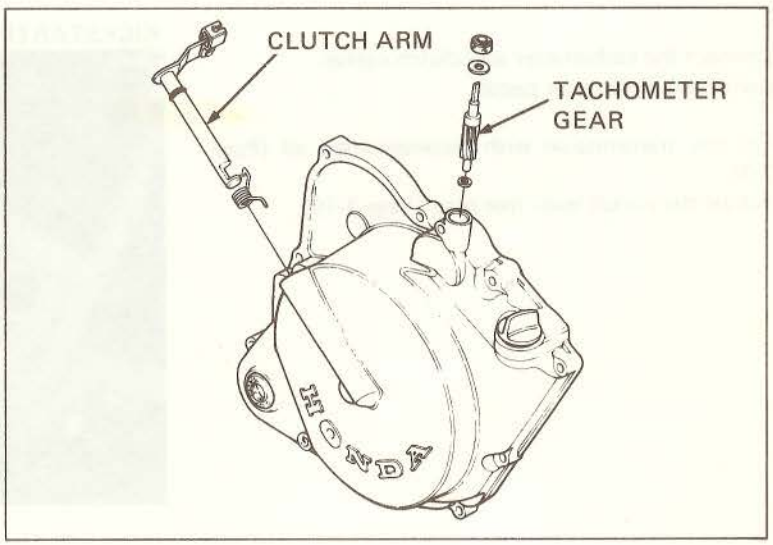
NOTE

Do not forget to install the washer.

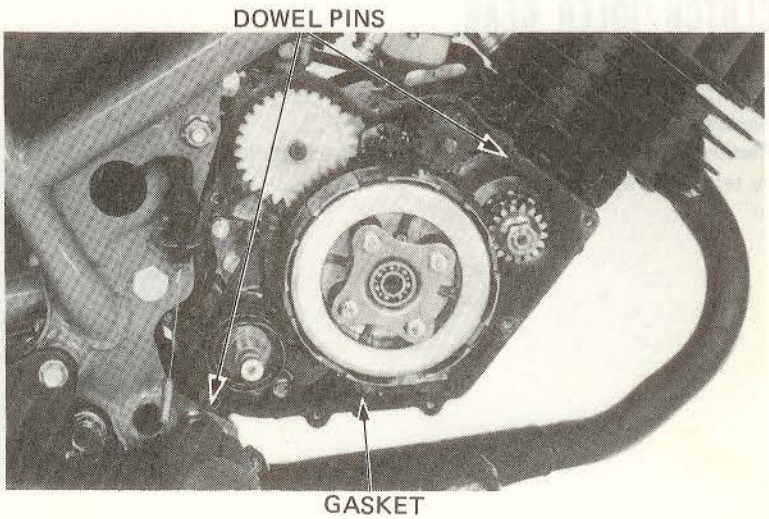


INSTALLATION

Install the clutch arm and clutch lifter rod.
Install the tachometer gear on the right crankcase cover.



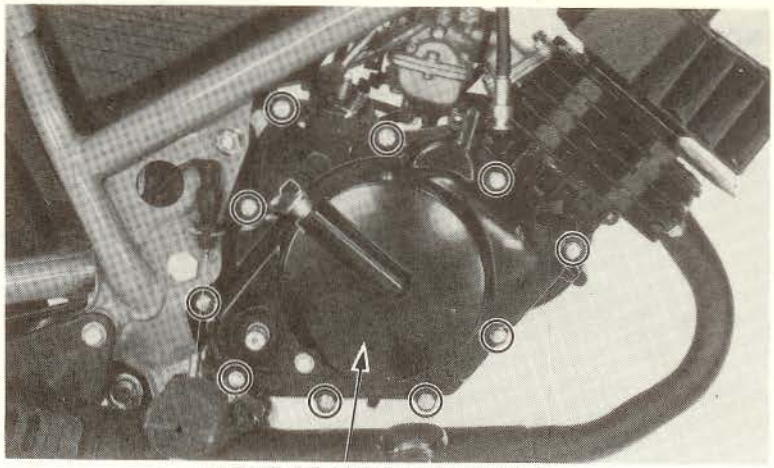
Install the dowel pins and gasket on the crankcase.



Install the right crankcase cover on the crankcase.
Install the clutch cable bracket and tighten with the flange bolt.

NOTE

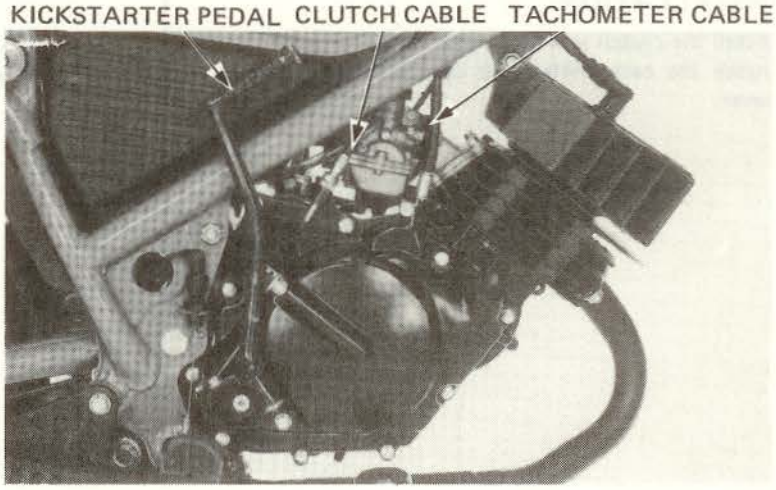
Tighten the bolts in a crisscross pattern and in two or three steps.



RIGHT CRANKCASE COVER

Connect the tachometer and clutch cables.
Install the kickstarter pedal.

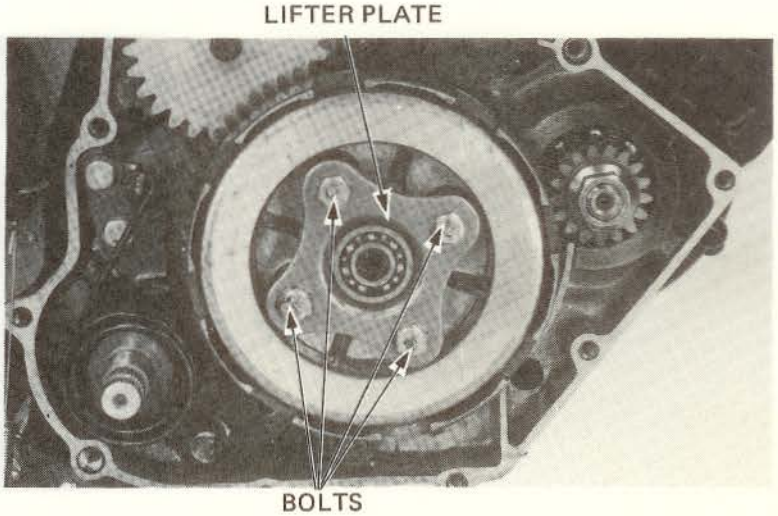
Fill the transmission with recommended oil (Page 2-3).
Adjust the clutch lever free play (Page 3-10).



CLUTCH/IDLER GEAR

CLUTCH REMOVAL

Remove the right crankcase cover (Page 7-2).
Remove the clutch lifter plate and clutch springs by removing the bolts.



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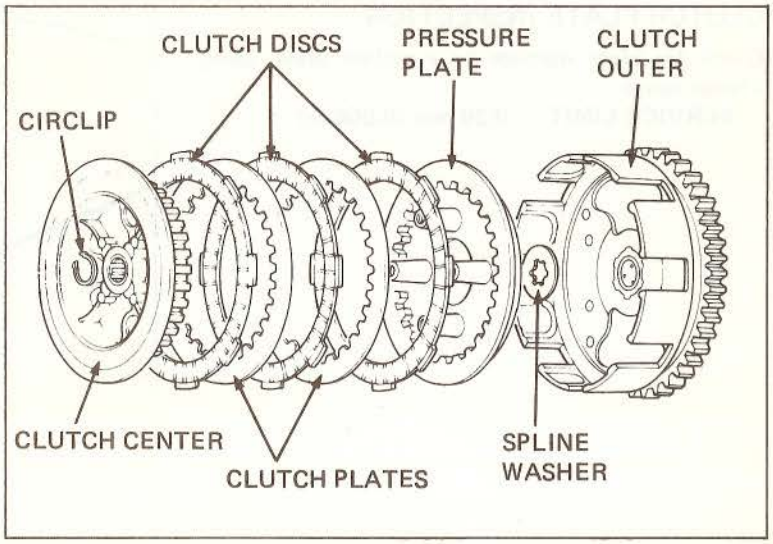
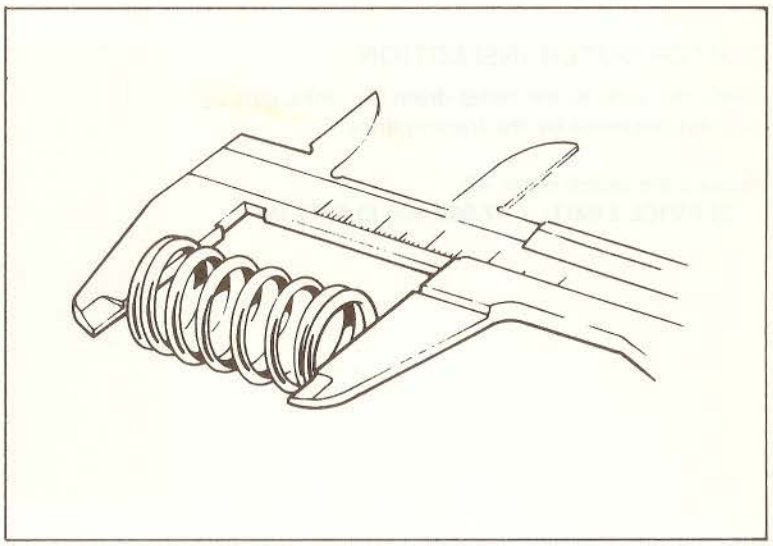
Remove the circlip.
Remove the clutch center, clutch discs, clutch plates, and clutch pressure plate.
Remove the spline washer and remove the clutch outer.



CLUTCH SPRING INSPECTION

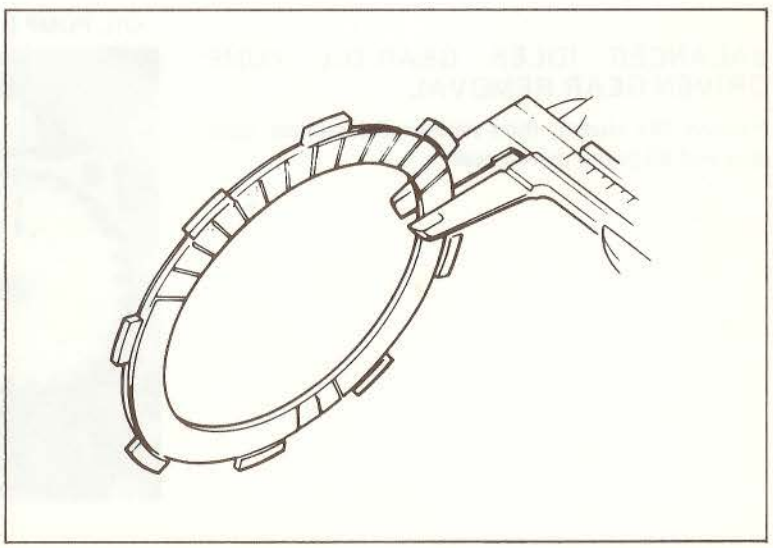
Measure each clutch spring free length.
SERVICE LIMIT: 28.5 mm (1.12 in)



CLUTCH DISC INSPECTION

Replace the clutch discs if they show signs of scoring or discoloration.

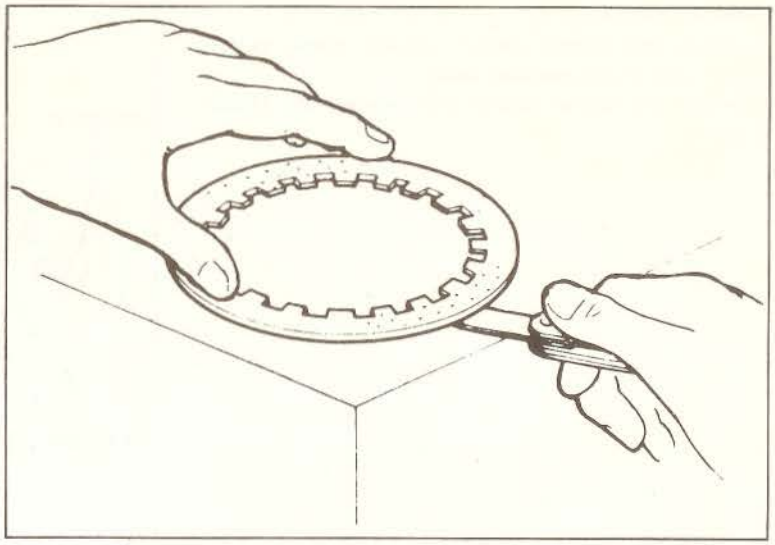
Measure each clutch disc thickness.
SERVICE LIMIT: 2.50 mm (0.098 in)



CLUTCH PLATE INSPECTION

Check for plate warpage on a surface plate, using a feeler gauge.

SERVICE LIMIT: 0.20 mm (0.008 in)

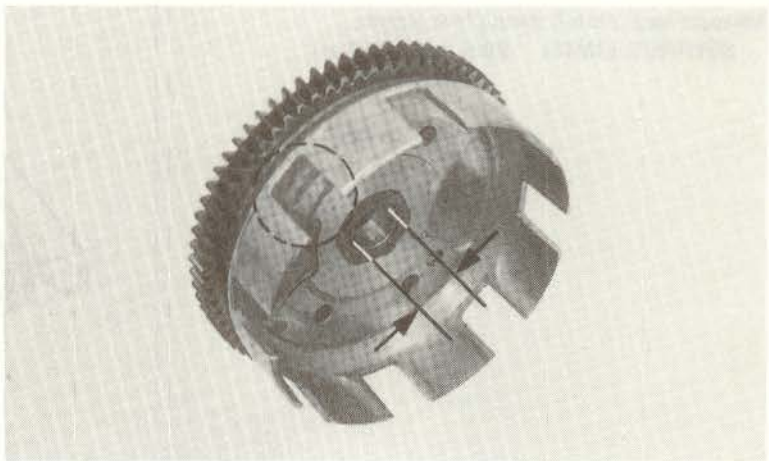


CLUTCH OUTER INSPECTION

Check the slots in the outer drum for nicks, cuts or indentations made by the friction discs.

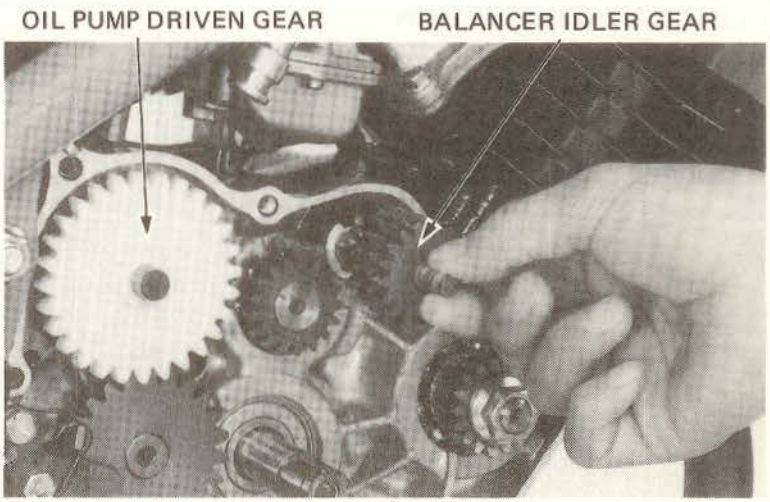
Measure the clutch outer I.D.

SERVICE LIMIT: 17.060 mm (0.6717 in)



BALANCER IDLER GEAR/OIL PUMP DRIVEN GEAR REMOVAL

Remove the clutch, then remove the balncer idler gear and oil pump driven gear.



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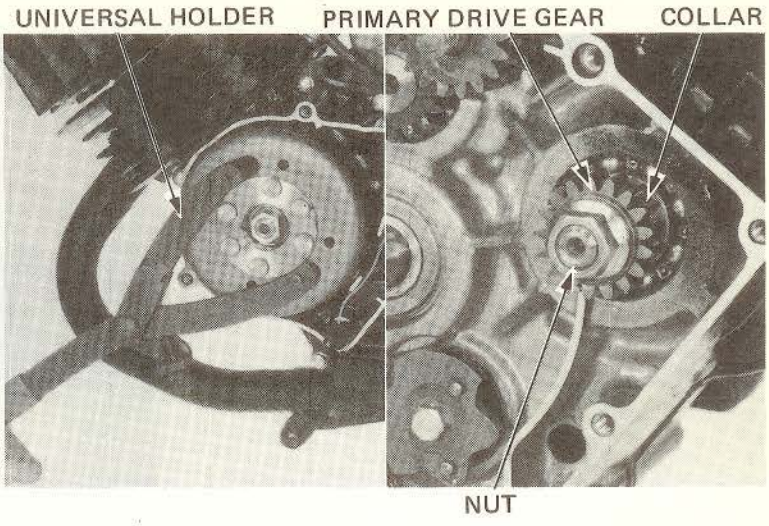
PRIMARY DRIVE GEAR REMOVAL

Remove the left crankcase cover.

Hold the flyweel with the UNIVERSAL HOLDER and remove the 12 mm nut, drive gear, and collar.

NOTE

Use the UNIVERSAL HOLDER to prevent the crankshaft from being turned during operation.



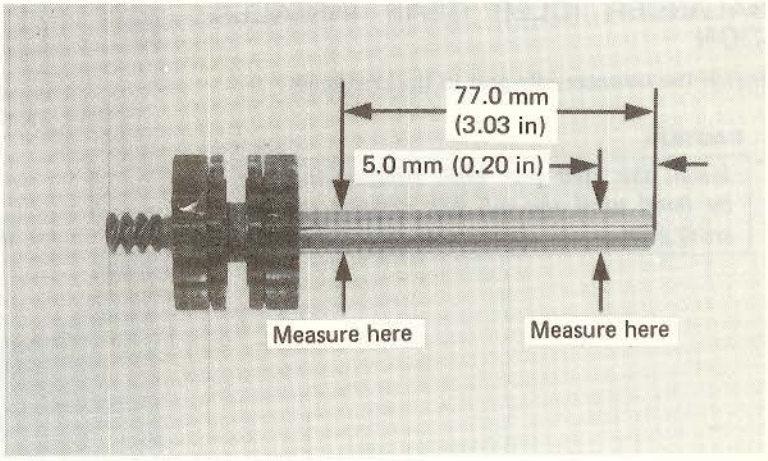
BALANCER IDLER GEAR INSPECTION

Check the balancer idler gear for wear or damage.

Check the idler gear shaft for bending, wear or damage.

Measure the balancer idler gear shaft O.D. at two places as shown.

SERVICE LIMIT: 9.930 mm (0.3909 in)



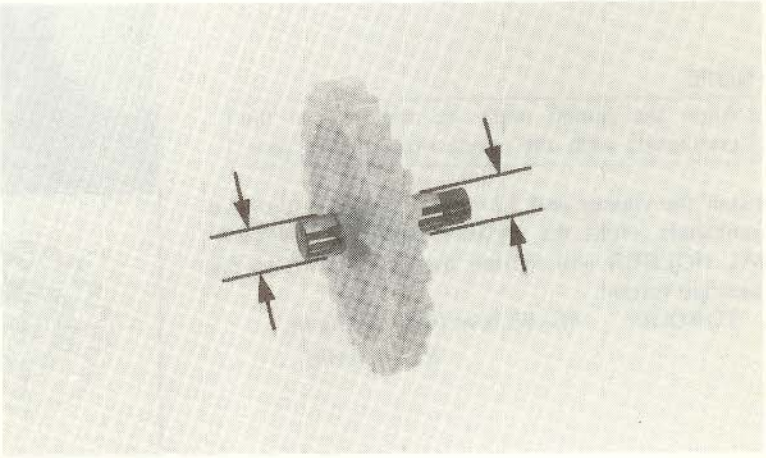
Check the oil pump driven gear for wear or damage.

Check the oil pump driven gear shaft for cracks or other defects.

Replace the shaft and gear with new ones if cracked.

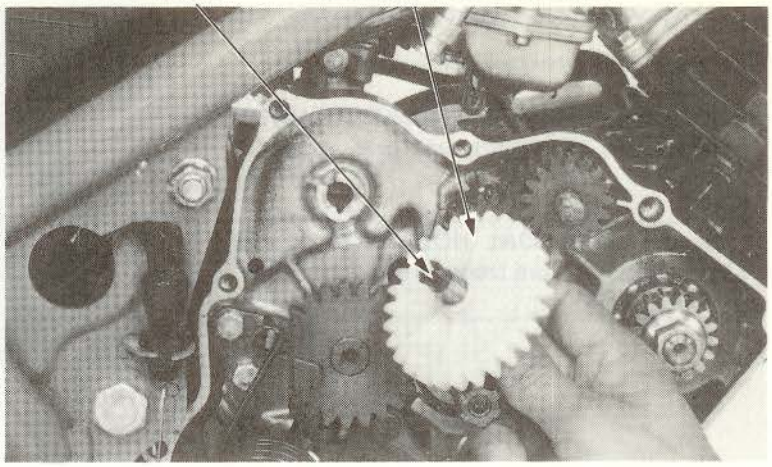
Measure the oil pump driven gear shaft O.D.

SERVICE LIMIT: 9.930 mm (0.3909 in)



OIL PUMP DRIVEN GEAR INSTALLATION

Install the oil pump driven gear aligning the slot in the gear shaft with the blade in the pump.

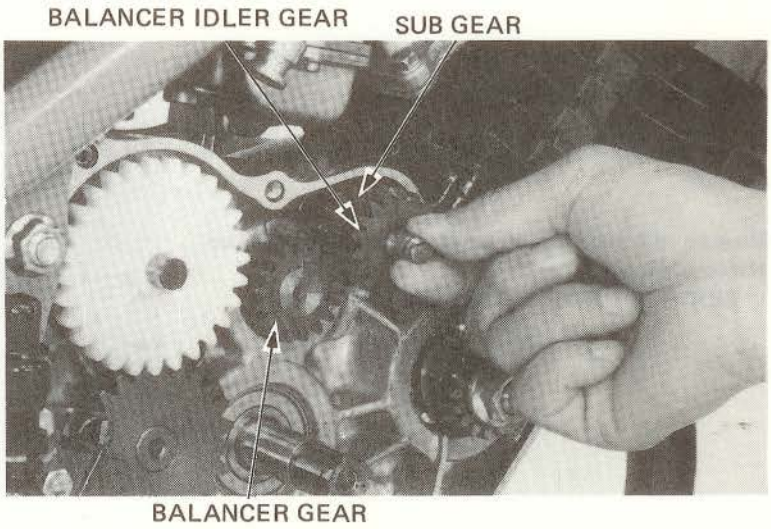


BALANCER IDLER GEAR INSTALLATION

Install the balancer idle gear in the crankcase.

CAUTION

Install the idler gear while rotating the gear by hand until the sub gear engages the balancer gear.



PRIMARY DRIVE GEAR INSTALLATION

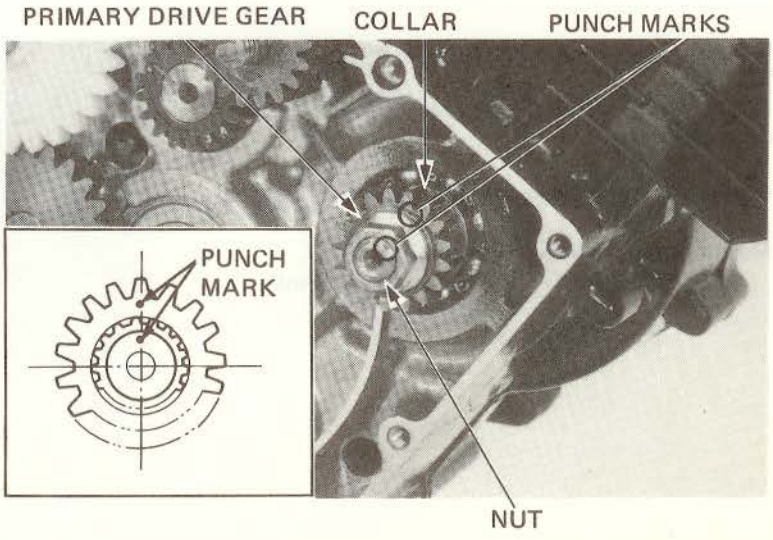
Install the collar on the crankshaft, then install the primary drive gear.

NOTE

Align the punch mark on the end of the crankshaft with the punch mark on the gear.

Install the washer and 12 mm nut on the end of the crankshaft. Hold the flywheel with the UNIVERSAL HOLDER and tighten the 12 mm nut to the specified torque.

TORQUE: 45–55 N·m (4.5–5.5 kg-m, 33–40 ft-lb)



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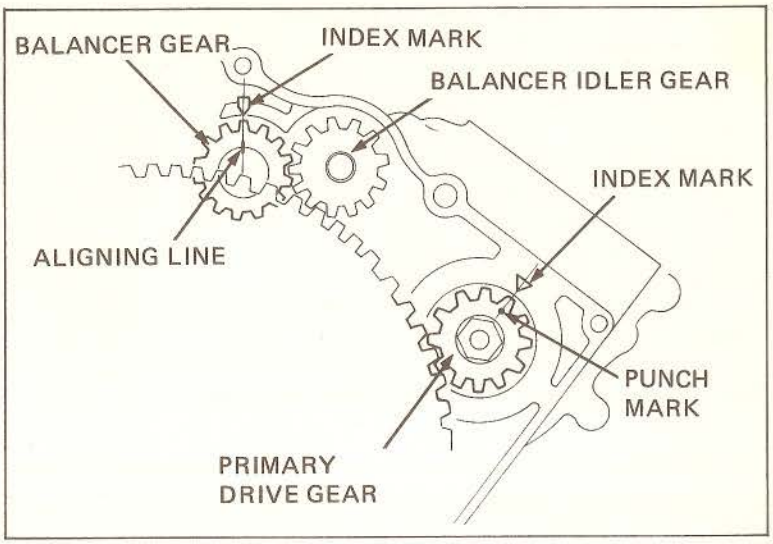
BALANCER TIMING/ CLUTCH INSTALLATION

[1] Align the punch mark on the primary drive gear with the index mark on the crankcase.

[2] Align the line on the balancer gear with the index mark on the crankcase.

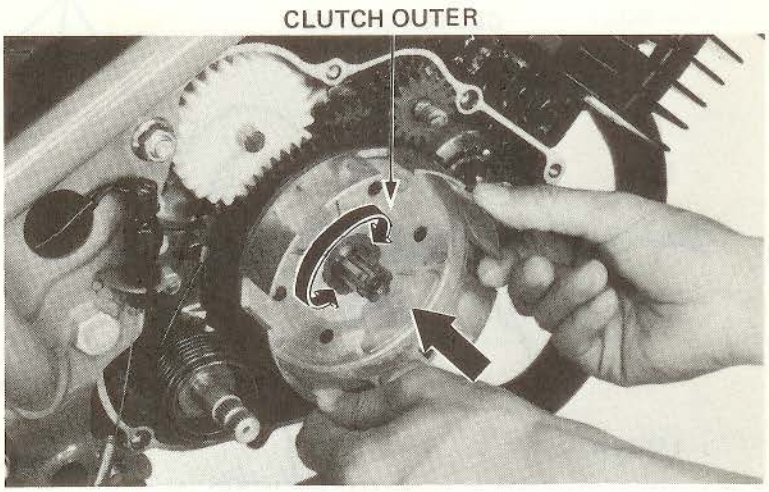


CAUTION

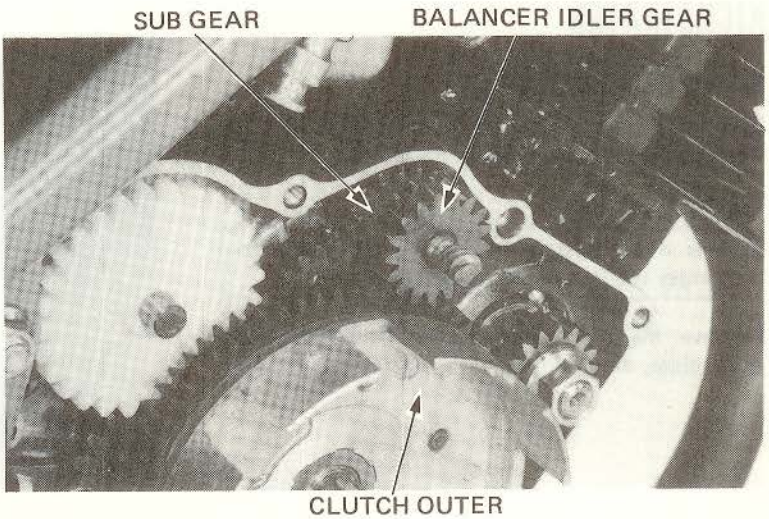
Make sure that the aligning line on the balancer gear is in line with the mating line on the shaft.

Install the clutch outer without disturbing the setups in steps [1] and [2].

Rotate the clutch outer right or left until the gear engages the sub gear, then push it in the crankcase.



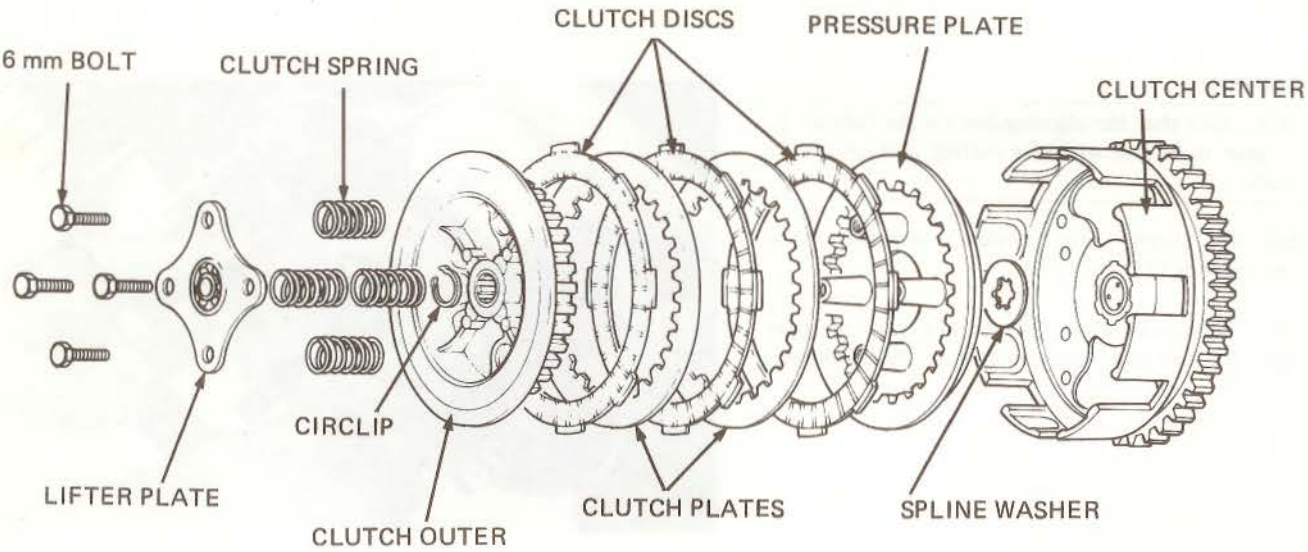
Make sure that the sub gear engages the clutch outer gear properly.



Install the following parts in the clutch outer:
- Spline washer
- Pressure plate
- Clutch discs and clutch plates
- Clutch center
- Circlip
- Clutch springs
- Clutch lifter plate
- 6 mm bolts

After assembling, install the right crankcase cover (Page 7-3).

Pour in the recommended transmission oil (Page 2-3).



KICKSTARTER

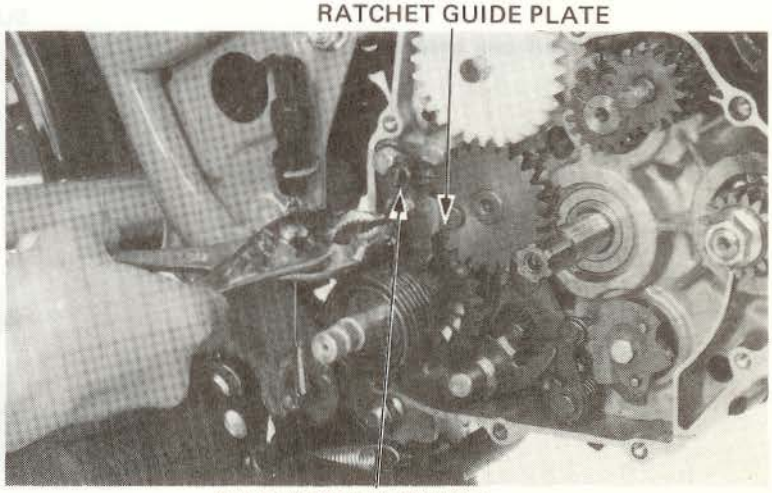
SPINDLE REMOVAL

Remove the right crankcase cover (Page 7-2).
Remove the clutch assembly (Page 7-4).

NOTE

It is not necessary to remove the clutch to remove the kickstarter spindle.

Remove the kick return spring from the ratchet guide plate, then remove the kickstarter spindle.



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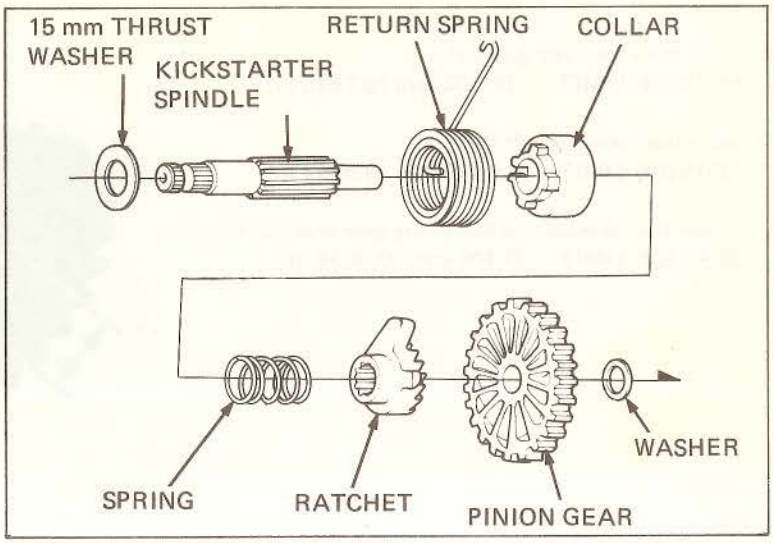
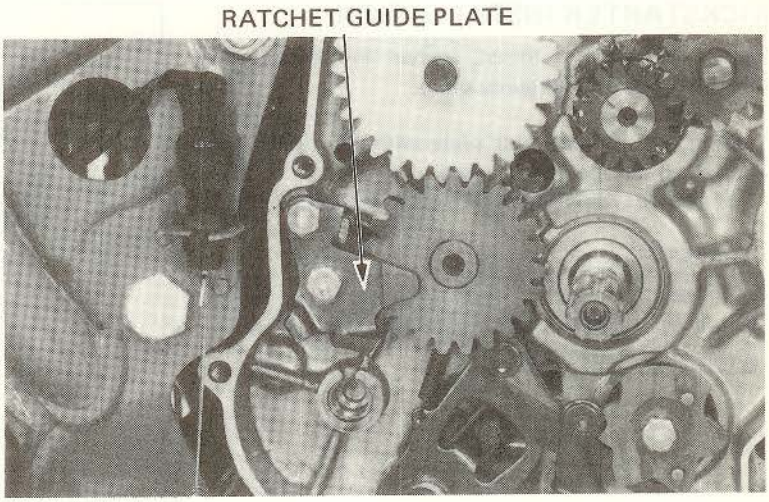
Disassemble the kickstarter.



IDLER GEAR REMOVAL

Remove the two attaching bolts and remove the ratchet guide plate.

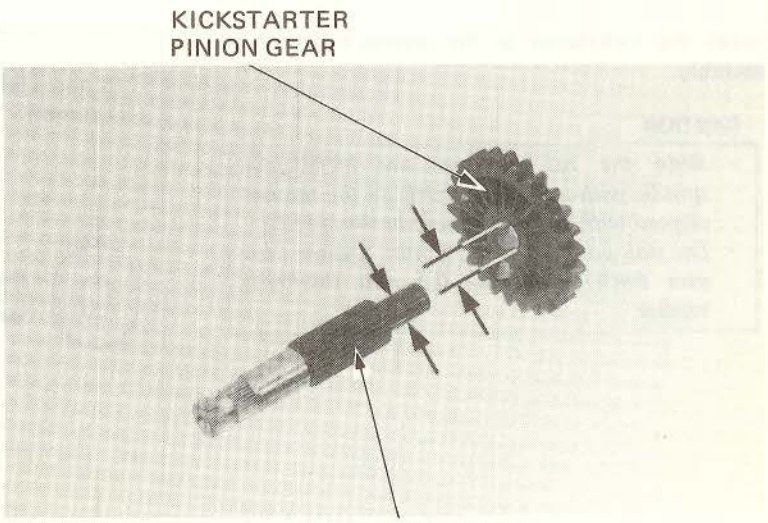
Remove the kickstarter idler gear and 15 mm thrust washer.



INSPECTION

Measure the kickstarter spindle O.D.
SERVICE LIMIT: 11.950 mm (0.4704 in)

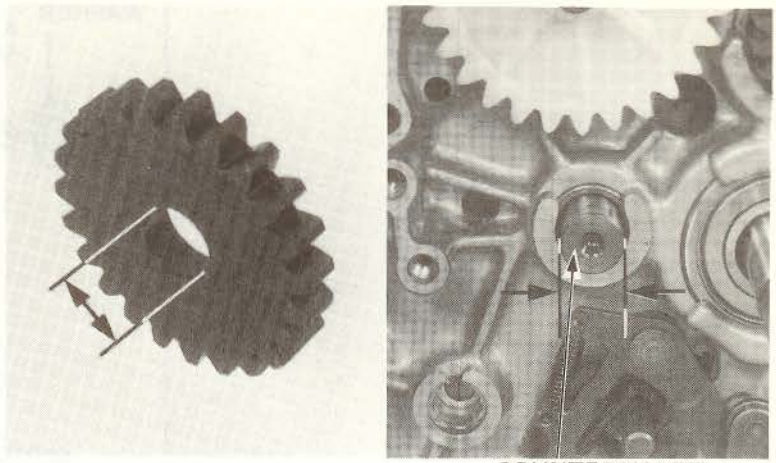
Measure the kick pinion gear I.D.
SERVICE LIMIT: 12.070 mm (0.4752 in)



Measure the kick idler gear I.D.
SERVICE LIMIT: 15.100 mm (0.5945 in)

Measure the countershaft O.D.
SERVICE LIMIT: 14.940 mm (0.5882 in)

Calculate the clearance between the gear and shaft.
SERVICE LIMIT: 0.100 mm (0.0039 in)



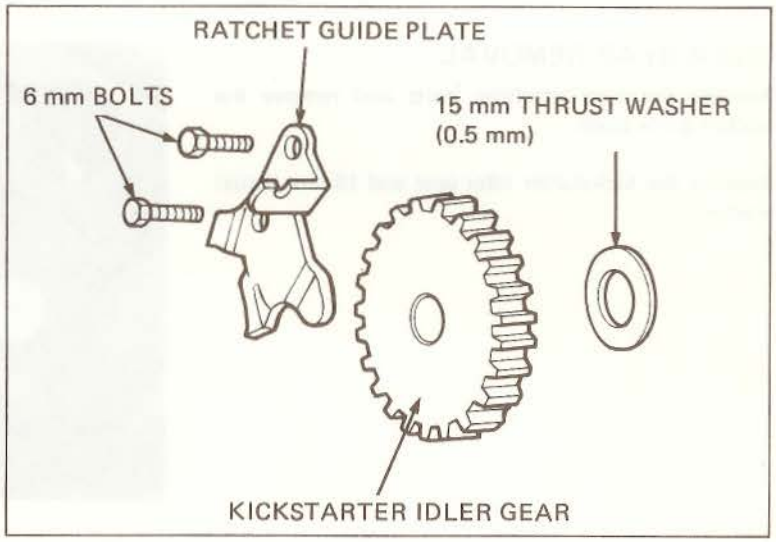
KICKSTARTER INSTALLATION

Install the 15 mm thrust washer and kickstarter idler gear and ratchet guide plate.

Tighten the ratchet guide plate with the two bolts. Tighten to the specified torque.
TORQUE: 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)

CAUTION

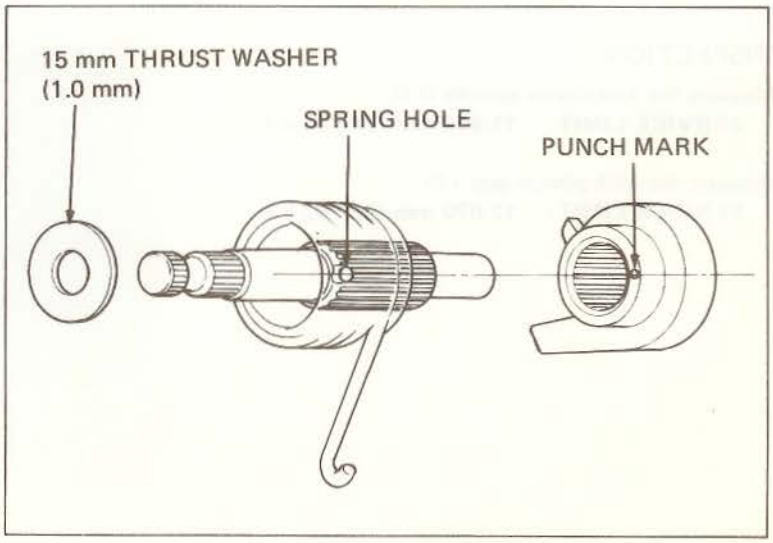
Do not mix the 15 mm thrust washer (0.5 mm thick) and kick spindle 15 mm thrust washer (1.0 mm thick).



Install the kickstarter in the reverse order of disassembly.

CAUTION

- *Slide the ratchet over the kickstarter spindle with the punch mark on the ratchet aligned with the spring hole in the spindle.*
- *Do not confuse the 15 mm washer (1.0 mm thich) with the 0.5 mm thickness washer.*



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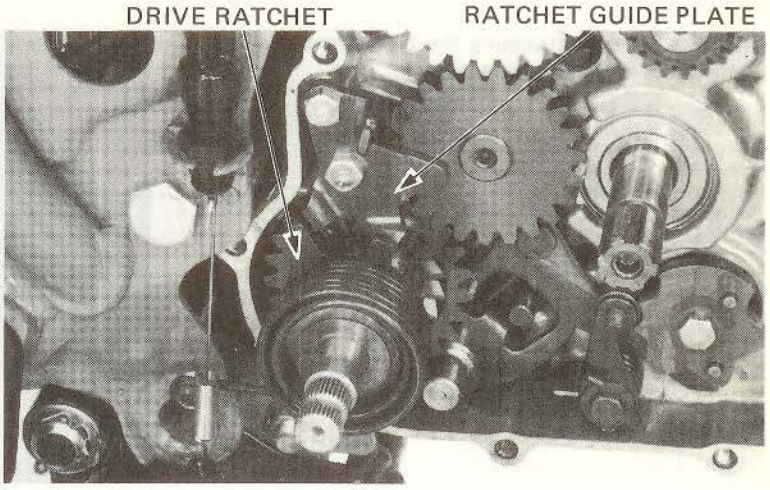
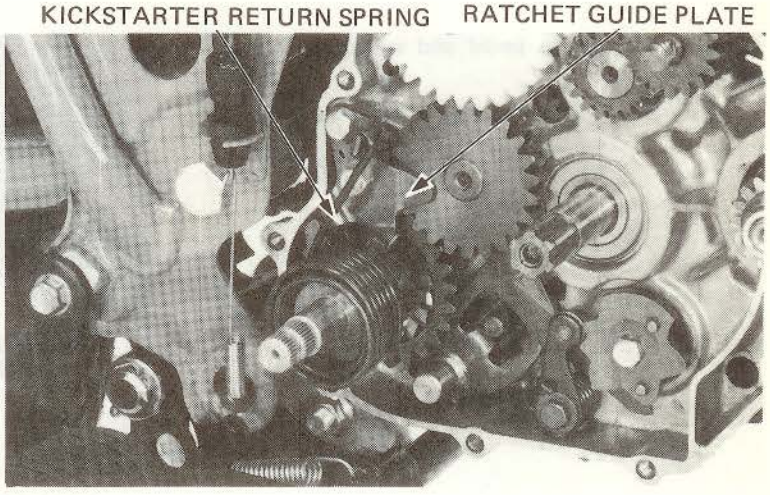
Install the kickstarter in the crankcase with the drive ratchet resting against the guide plate stopper as shown.



Install the kick return spring.
With the balancer properly timed, install the clutch (Page 7-9).

Install the right crankcase cover (Page 7-3).
Fill the transmission with the recommended oil up to the proper level (Page 2-3).

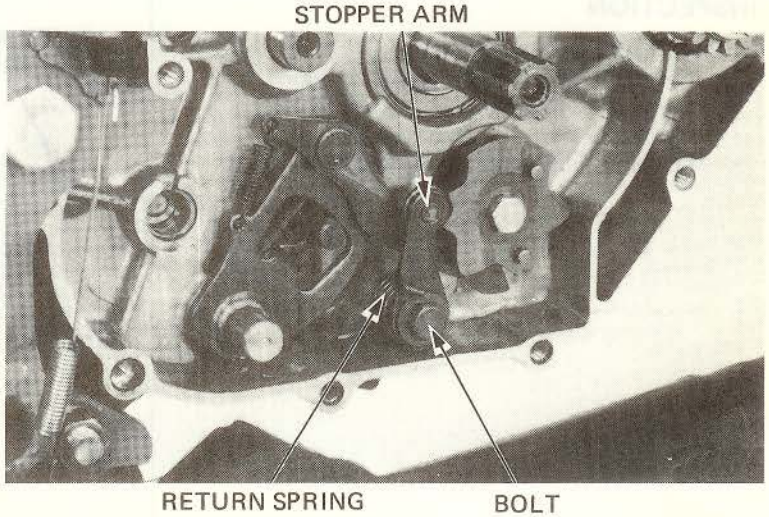
Check the operation of the kickstarter.



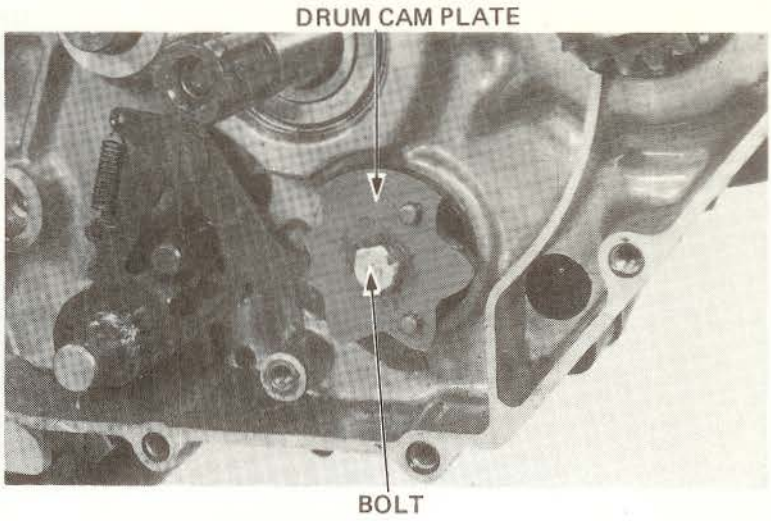
SHIFT LINKAGE

REMOVAL

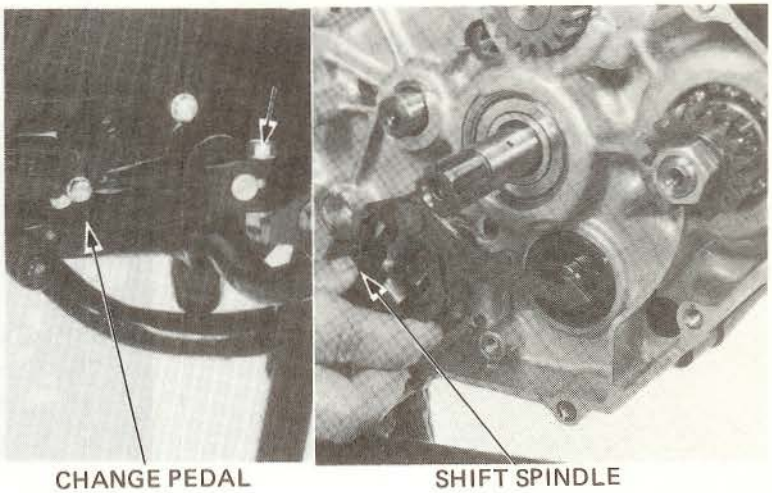
Remove the clutch (Page 7-4).
Remove the kickstarter idler gear (Page 7-12).
Remove the bolt attaching the clutch stopper arm and remove the stopper arm and spring.



Remove the bolt attaching the drum cam plate and remove the plate and roller pins.



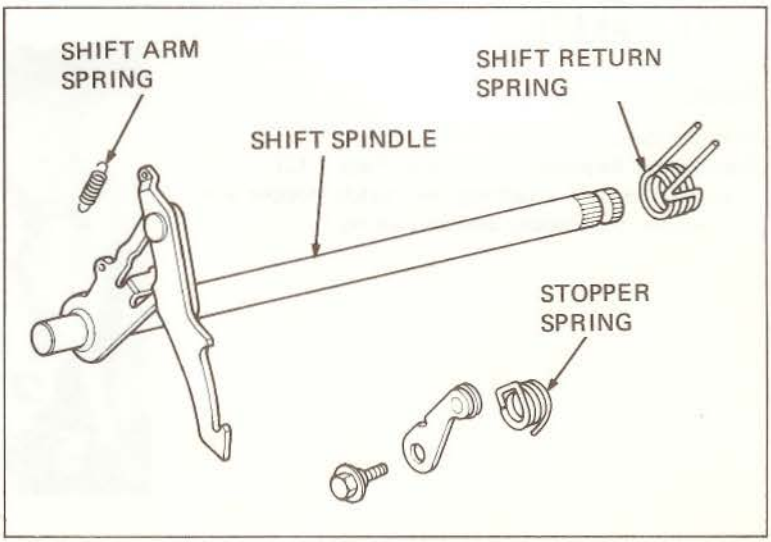
Remove the change pedal and withdraw the shift spindle.



INSPECTION

Perform the following operations:

- Check the shift arm spring for weakness.
- Check the shift return spring for weakness.
- Check the stopper spring for weakness.
- Check the shift spindle for wear or bending.



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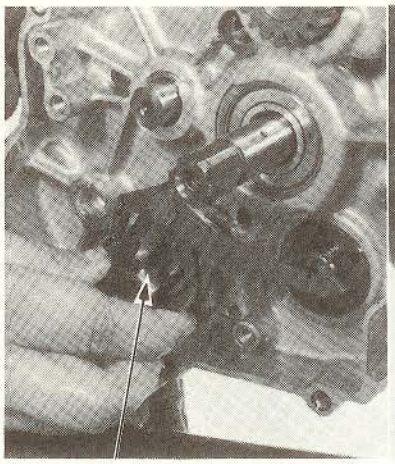
INSTALLATION

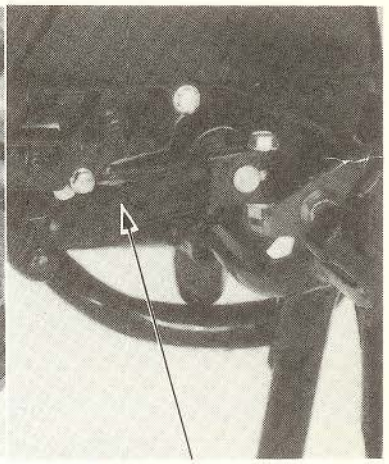
Installation of the shift linkage is the reverse order of removal.

Install the shift spindle and change pedal.
Tighten the change pedal bolt to the specified torque.

TORQUE: 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)



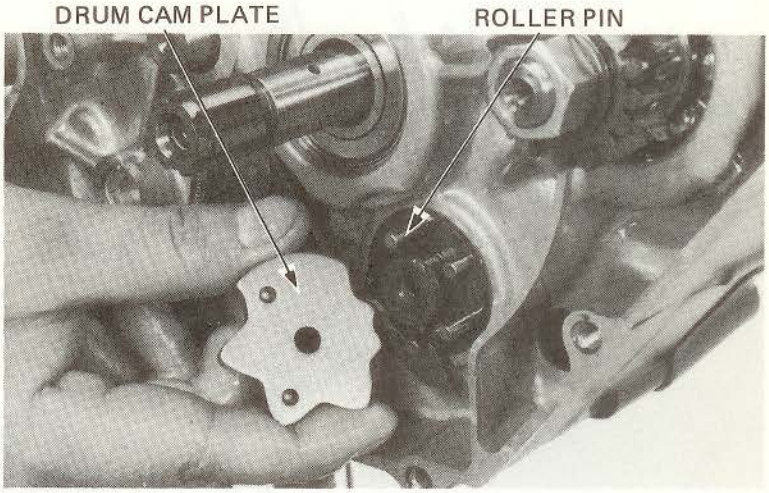
SHIFT SPINDLE



CHANGE PEDAL

Insert the roller pins into holes in the shift drum.
Position the drum cam plate on the pins with the concaves in the plate with the higher pins.
Apply locking agent to the bolt threads and undersides of the bolt and install the plate with the bolt.
Tighten the bolt to the specified torque.

TORQUE: 8–10 N·m (0.8–1.2 kg-m, 6–9 ft-lb)

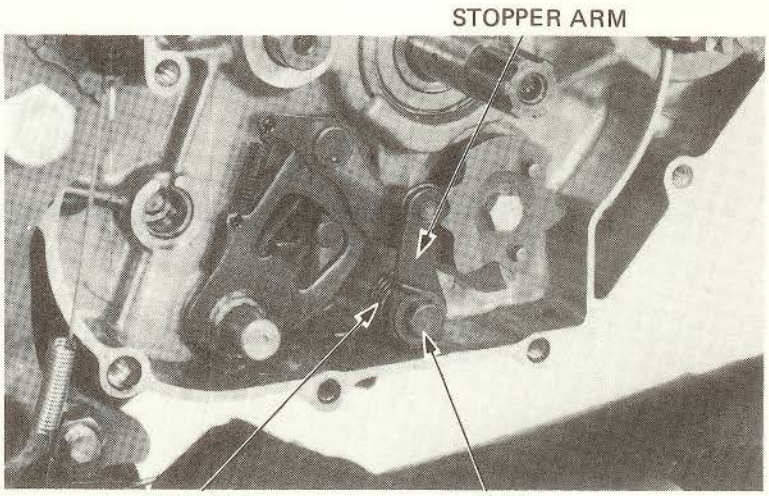


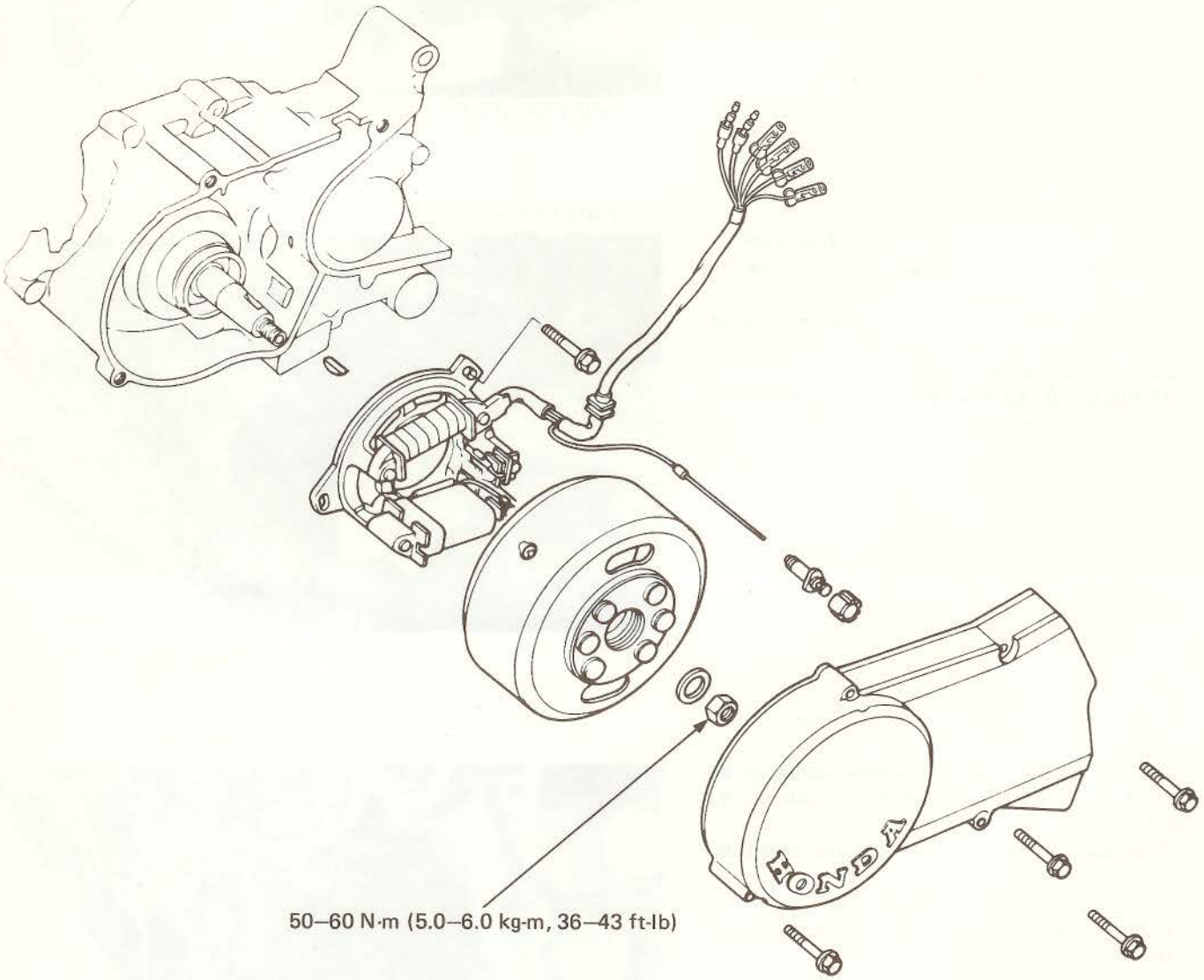
Install the stopper arm and stopper spring in the crankcase and tighten the attaching bolt to the specified torque.

TORQUE: 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)

Check the operation of the shift linkage.
With the balancer properly timed, install the clutch (Page 7-9).

Install the right crankcase cover (Page 7-3).
Fill the transmission with the recommended oil up to the proper level (Page 2-3).





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8. ALTERNATOR

SERVICE INFORMATION

GENERAL INSTRUCTIONS

- The alternator can be serviced without removing it from the motorcycle. Do not remove the pulse generator from the stator base.
- For alternator inspection, refer to Section 13.

TOOLS

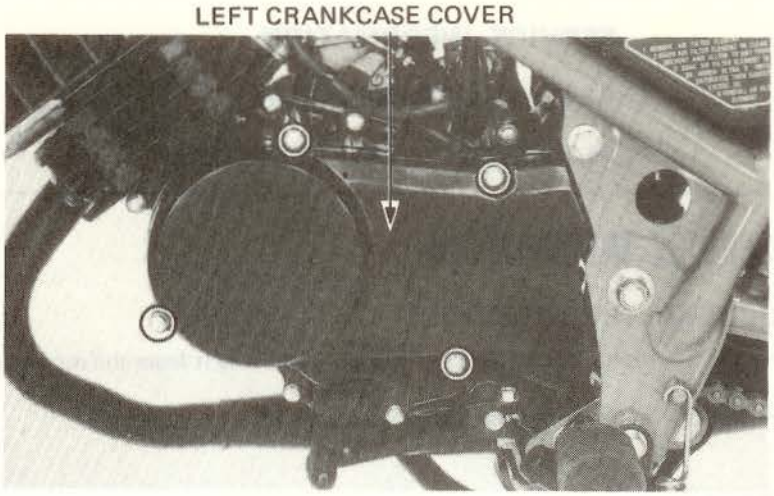
Common	
Universal Holder	07725–0010101 Alternate tool 07725–0030000
Flywheel Puller	07733–0010000

TORQUE VALUE

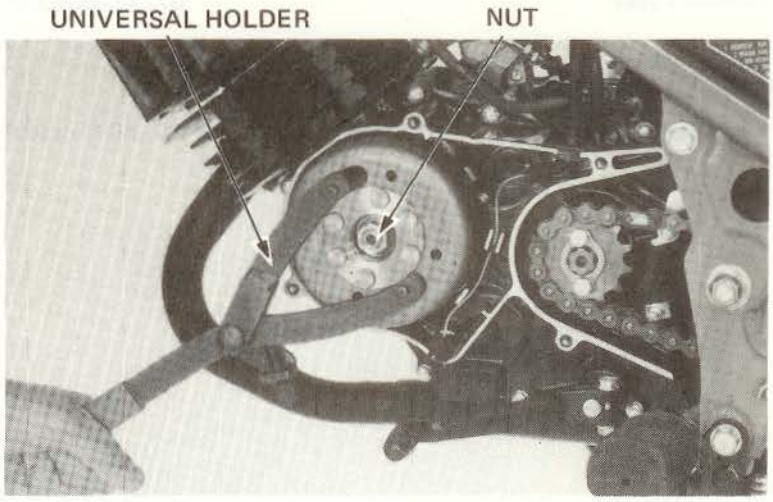
Alternator rotor nut	50–60 N·m (5.0–6.0 kg-m, 36–43 ft-lb)

ALTERNATOR REMOVAL

Remove the flange bolts and remove the left crankcase cover.



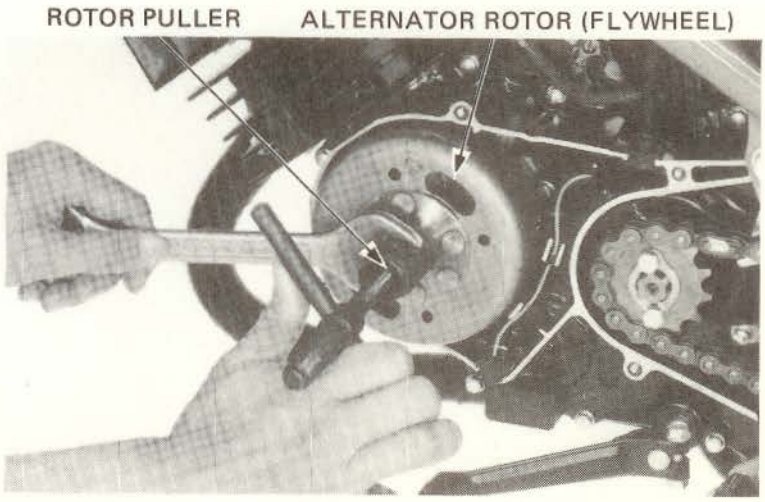
Remove the 12 mm nut attaching the flywheel.



Remove the flywheel.

NOTE

Keep the woodruff key in a parts rack so it is not lost.



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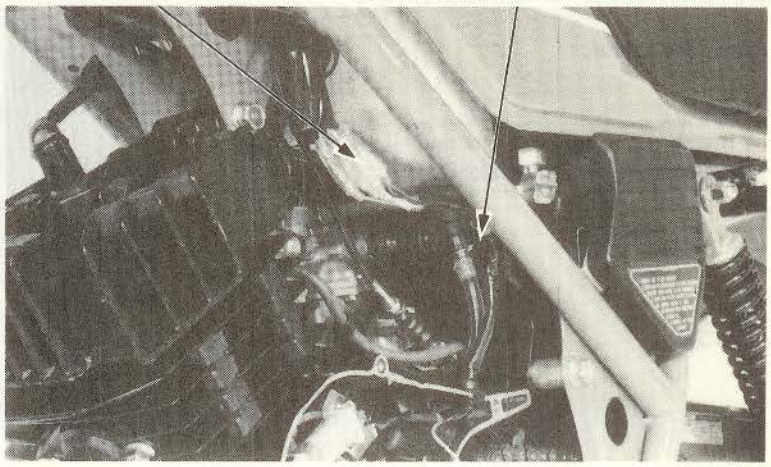
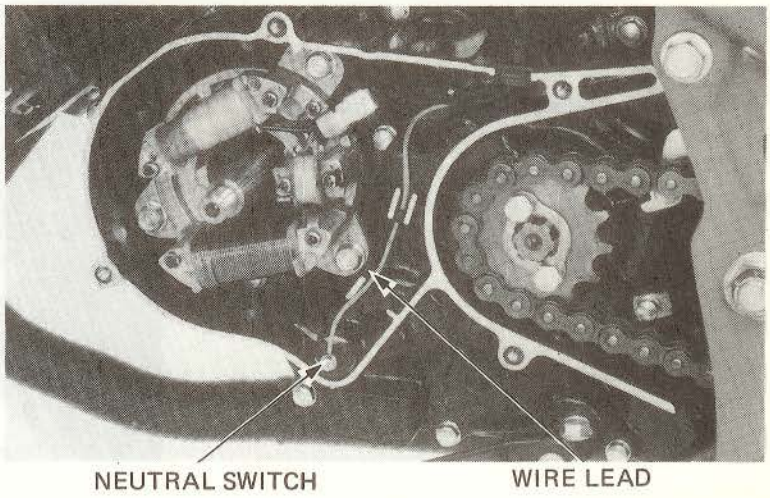
Disconnect the alternator wire connectors and neutral switch wire.



NOTE

Do not remove the neutral switch.
Oil will flow out when the switch is removed.

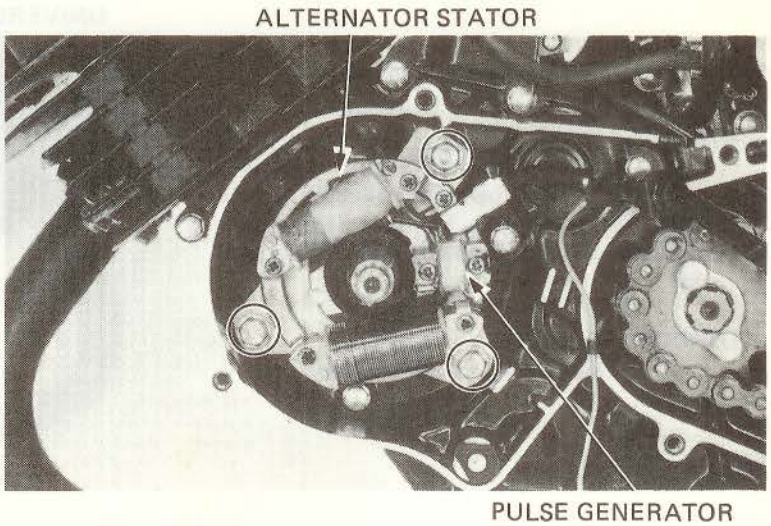


Remove the alternator.

CAUTION

- *Do not separate the pulse generator from the stator base.*
- *Keep the coils in a parts rack to prevent damaging the coil.*

For alternator inspection, refer to page 13-5 and 13-7.

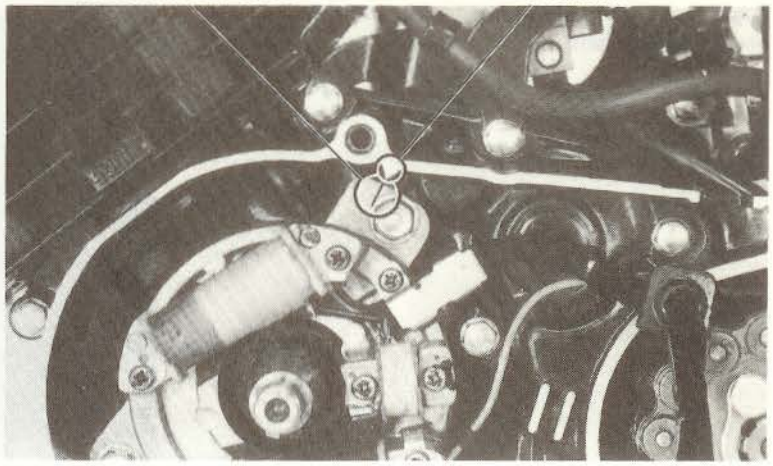


ALTERNATOR INSTALLATION

Install the stator.

NOTE

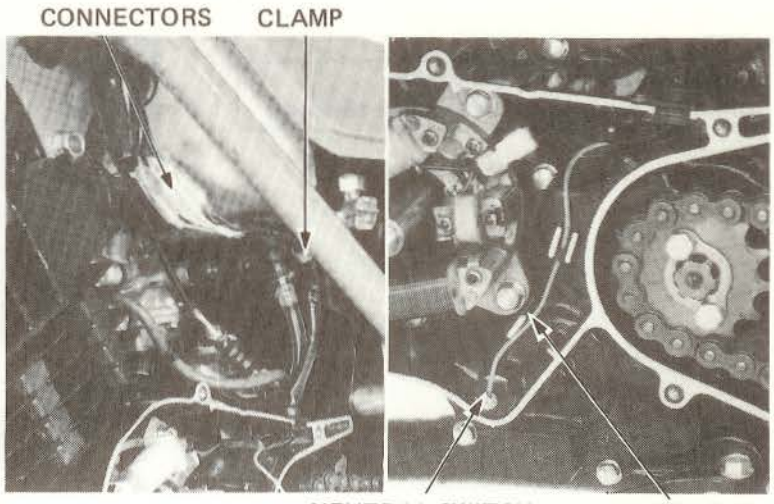
Install the stator with the line aligned with the index mark on the crankcase.



Connect the alternator and neutral switch wires.

NOTE

Secure the alternator wires to the frame. Press down on the neutral switch terminal to install the wire.

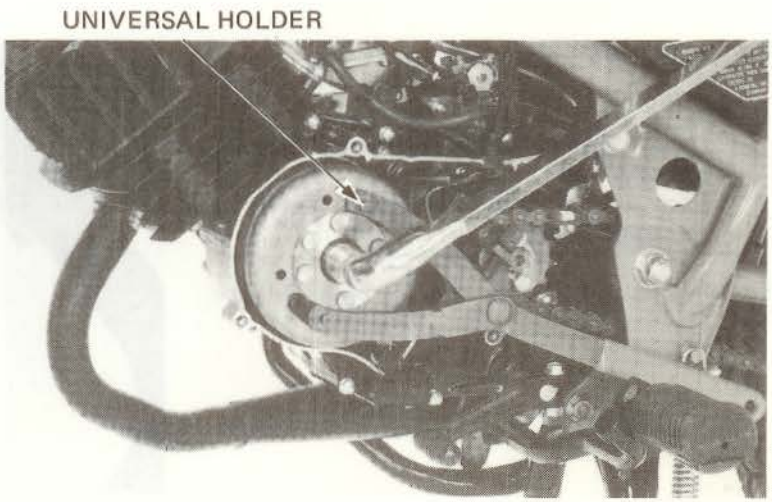


Install the woodruff key in the crankshaft keyway, then install the flywheel on the crankshaft.

NOTE

- Check that there are no foreign materials inside the flywheel before installation.
- Clean the taper hole in the flywheel of burrs and other damage and repair if necessary.

TORQUE: 50–60 N·m (5.0–6.0 kg-m, 36–43 ft-lb)



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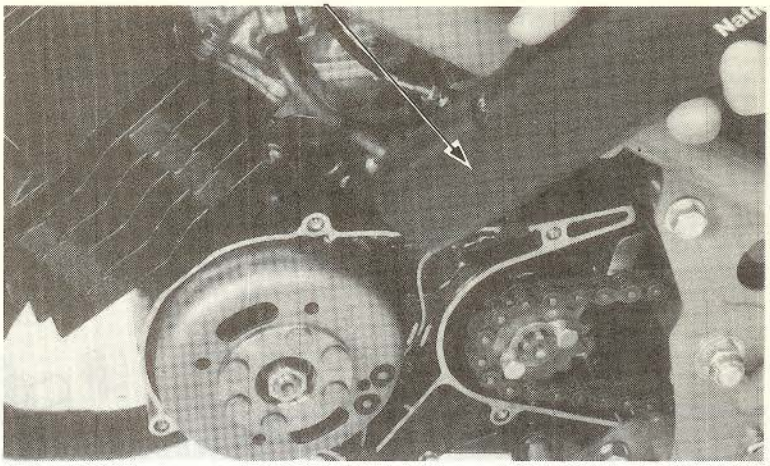
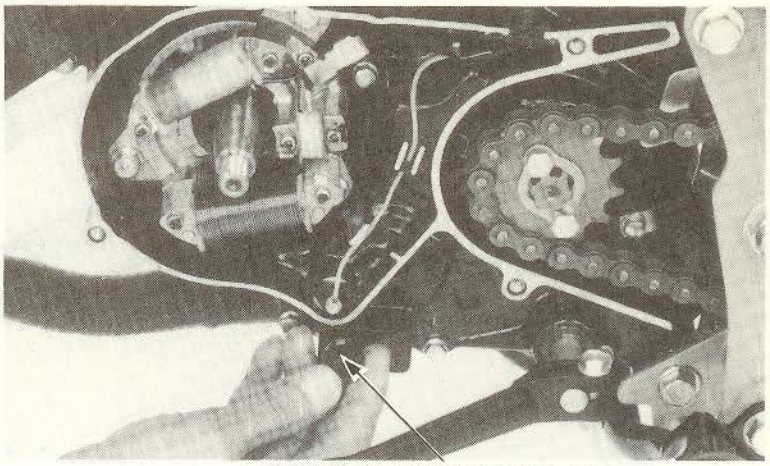
After installing the flywheel, start the engine and inspect the ignition timing (Page 3-6).

TIMING LIGHT



Install the neutral switch collar over the switch.

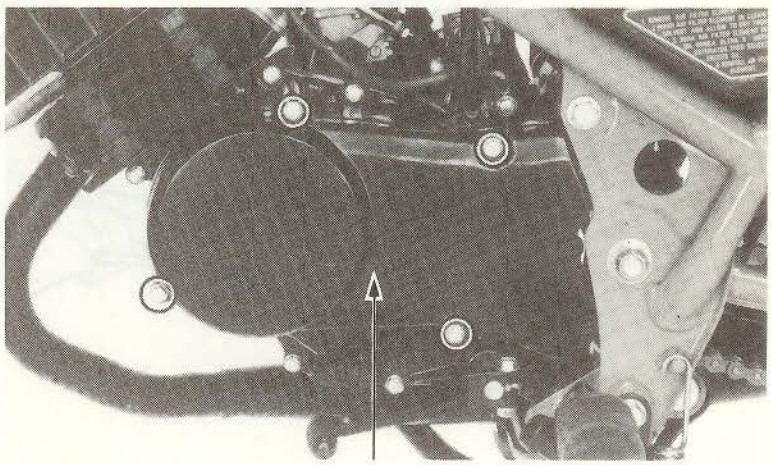


NEUTRAL SWITCH COLLAR

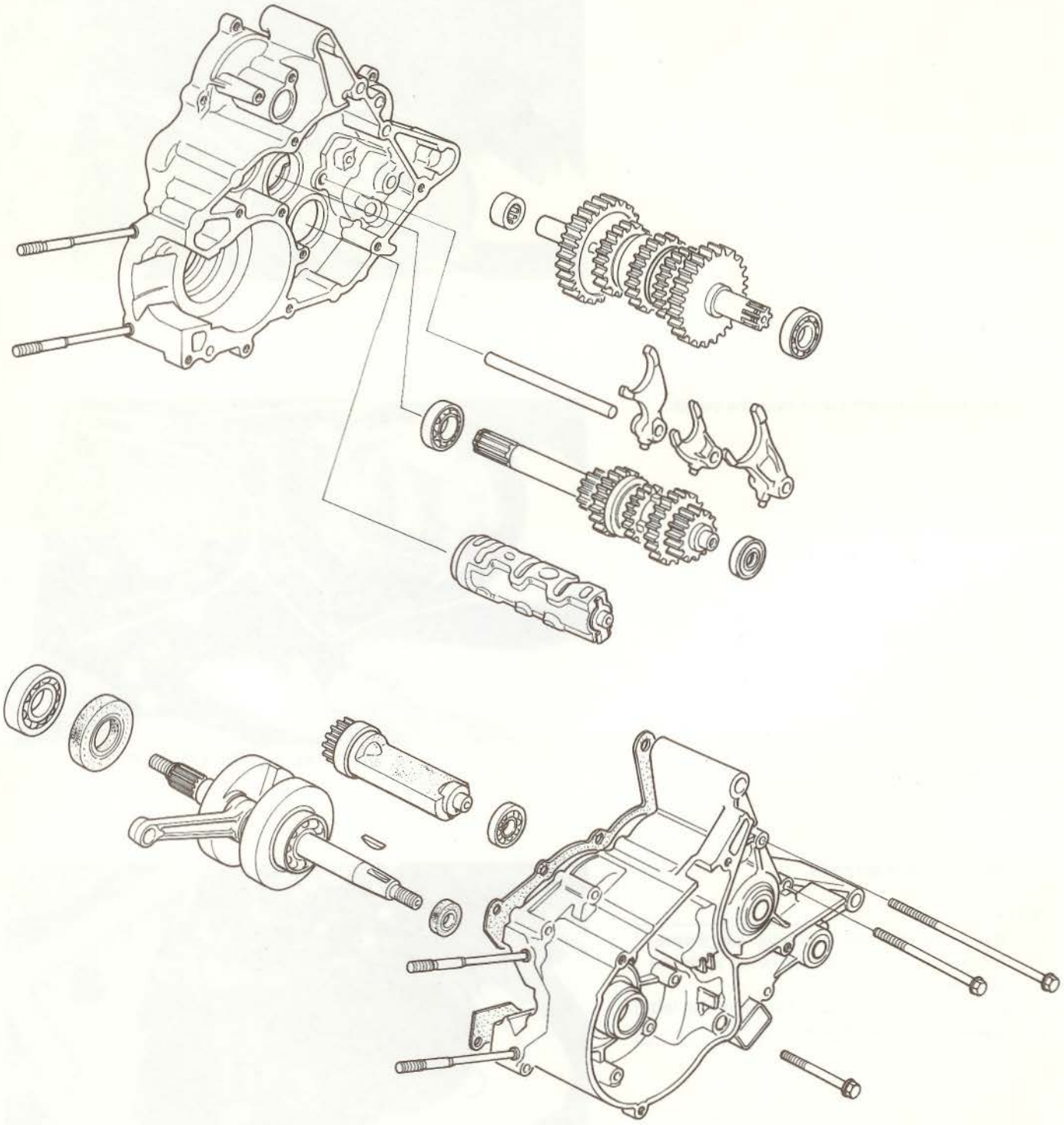
Install the left crankcase cover.

NOTE

- Make sure that the alternator and neutral switch wires are not interfering with the flywheel.
- Do not pinch the wires between the left crankcase cover and case.



LEFT CRANKCASE COVER



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SERVICE INFORMATION

GENERAL INSTRUCTIONS

- This section includes transmission and crankshaft repairs which require crankcase separation.
- The following parts must be removed before disassembling the crankcase.

• Oil pump	See section 2
• Cylinder head/cylinder/ piston	See section 6
• Clutch/kickstarter/gearshift linkage	See section 7
• Alternator	See section 8

TOOLS

Special	
Crankshaft Assembly Tool	07965–1660100
Balancer Weight Driver	07945–1660000
Bearing Remover Set	07936–1660000
Bearing Puller	07631–0010000 (Commercially available)
Attachment 28 x 30 mm	07746–1870100
Common	
Driver A	07794–0010000
Attachment 32 x 35 mm	07746–0010100
Attachment 42 x 47 mm	07746–0010300
Pilot 12 mm	07746–0040200
Pilot 17 mm	07746–0040400
Pilot 20 mm	07746–0040500
Driver B	07746–0010600
Attachment 20 mm I.D.	07746–0020400

SPECIFICATIONS

ITEM		STANDARD mm (in)		SERVICE LIMIT mm (in)	
Shift fork I. D.		10.000–10.018	(0.3937–0.3944)	10.05	(0.396)
Shift fork end thickness		4.93–5.00	(0.194–0.197)	4.50	(0.177)
Shift fork shaft O.D.		9.972–9.987	(0.3926–0.3932)	9.95	(0.392)
Gearshift drum O.D.	At 13 mm	12.934–12.984	(0.5092–0.5112)	12.85	(0.506)
	At 36 mm	35.950–35.975	(1.4154–1.4163)	35.90	(1.413)
Gear I.D.	M4 gear	17.016–17.034	(0.6699–0.6706)	17.10	(0.673)
	M5 gear	17.016–17.034	(0.6699–0.6706)	17.10	(0.673)
	C1 gear	16.522–16.543	(0.6505–0.6513)	16.60	(0.654)
	C2 gear	19.520–19.541	(0.7685–0.7693)	19.60	(0.772)
	C3 gear	19.020–19.041	(0.7488–0.7496)	19.10	(0.752)
Mainshaft O.D.		16.966–16.984	(0.6680–0.6687)	16.93	(0.667)
Countershaft O.D.	At 16.5 mm	16.466–16.484	(0.6483–0.6490)	16.44	(0.647)
	At 19 mm	18.959–18.980	(0.7464–0.7472)	18.93	(0.745)
	At 19.5 mm	19.459–19.480	(0.7661–0.7669)	19.43	(0.765)
Connecting rod big end side clearance		0.15–0.55	(0.006–0.022)	0.85	(0.033)
Connecting rod big end radial play			–	0.05	(0.002)
Crankshaft runout at journals			–	0.10	(0.004)

TROUBLESHOOTING

Engine noise
1. Main journal bearing worn
2. Crankpin bearing worn
3. Transmission bearing worn

Jumps out of gear
1. Gear dogs worn
2. Shift fork bent
3. Shift shaft bent
4. Shift drum stopper damaged

Hard shifting
1. Incorrect clutch adjustment
2. Shift forks bent
3. Shift shaft bent
4. Shift spindle pawl bent or damaged
5. Shift drum cam slot damaged

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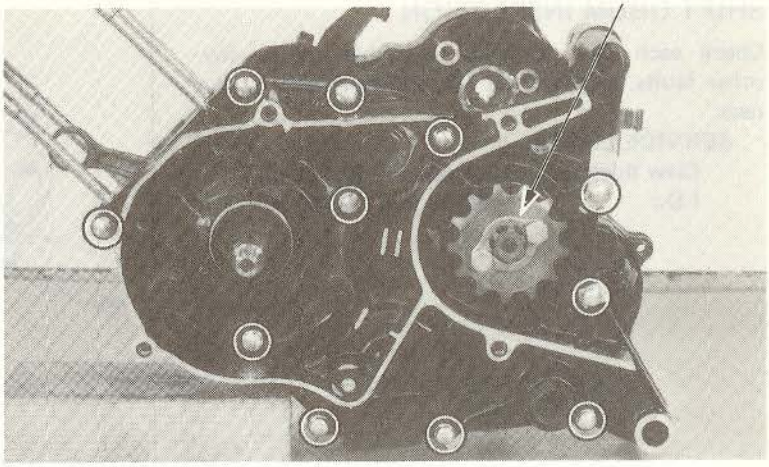
CRANKCASE SEPARATION

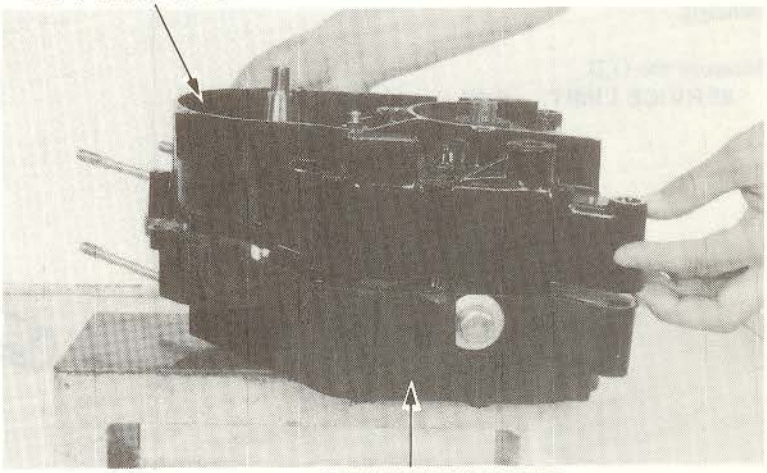
Remove the drive sprocket.
Remove the crankcase bolts.



Separate the left crankcase from the right crankcase.

CAUTION

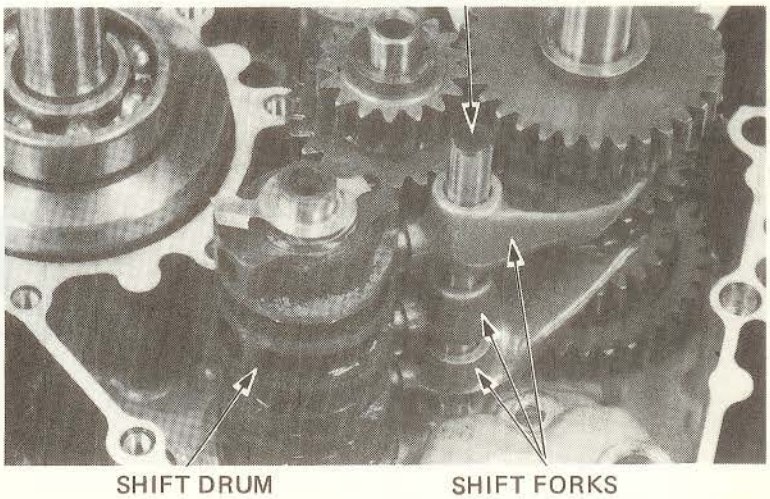
Do not pry between the right and left cases.



TRANSMISSION DISASSEMBLY

GEARSHIFT FORK/SHIFT DRUM

Remove the shift fork shaft from the right crankcase. Remove the shift drum and shift forks.

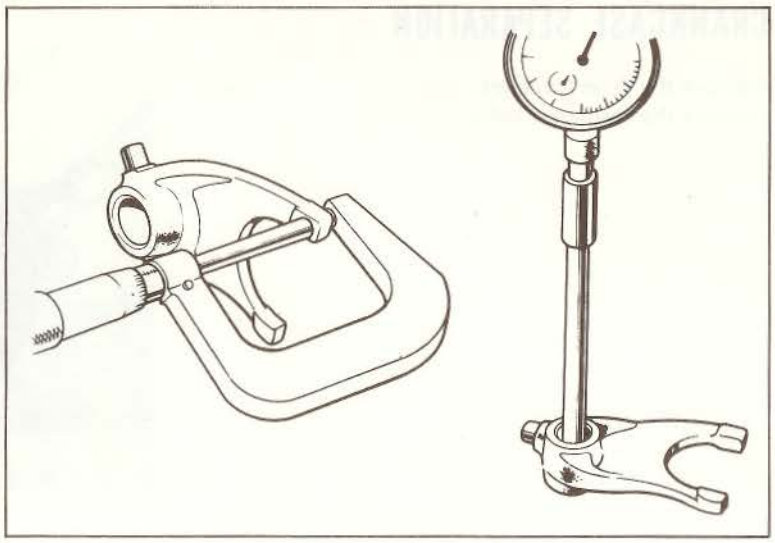


SHIFT FORK/SHIFT FORK SHAFT/ SHIFT DRUM INSPECTION

Check each shift fork for wear, bending or any other faults. Measure the I.D. and shift claw thickness.

SERVICE LIMITS:

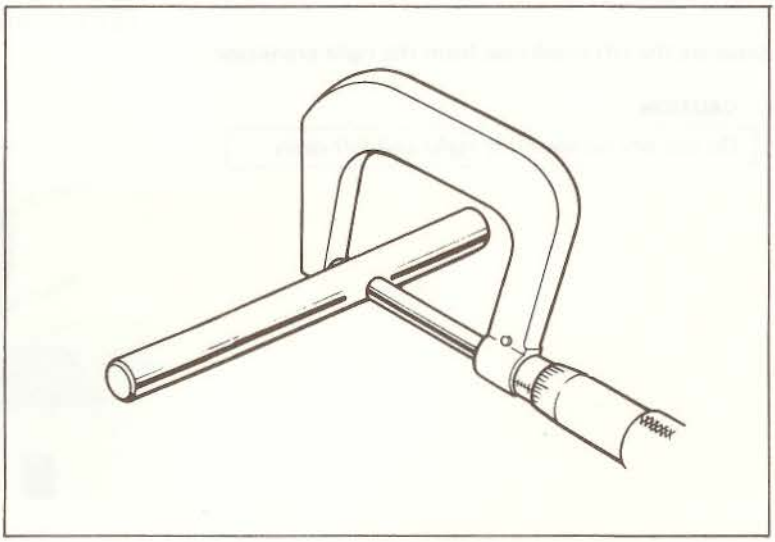
Claw thickness:	4.50 mm (0.177 in)
I.D.:	10.05 mm (0.396 in)



Check the shift fork shaft for wear, damage or bending.

Measure the O.D.

SERVICE LIMIT: 9.95 mm (0.392 in)

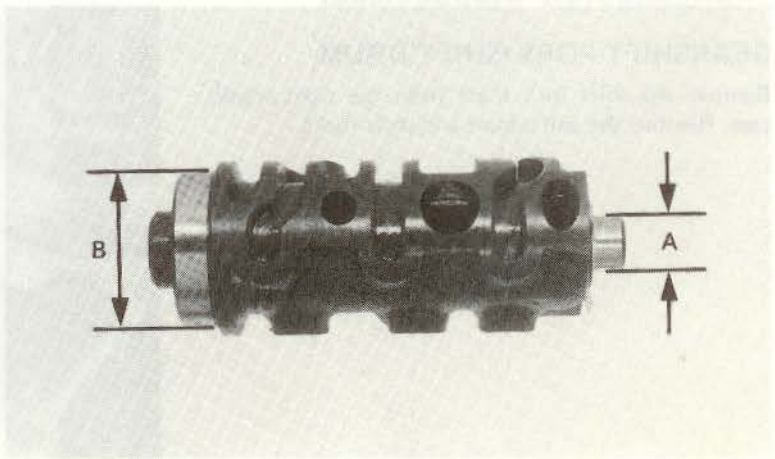


Inspect the shift drum grooves and replace the drum if they are damaged or show excessive wear.

Measure the shift drum O.D.

SERVICE LIMITS:

A: 12.85 mm (0.506 in)
B: 35.90 mm (1.413 in)



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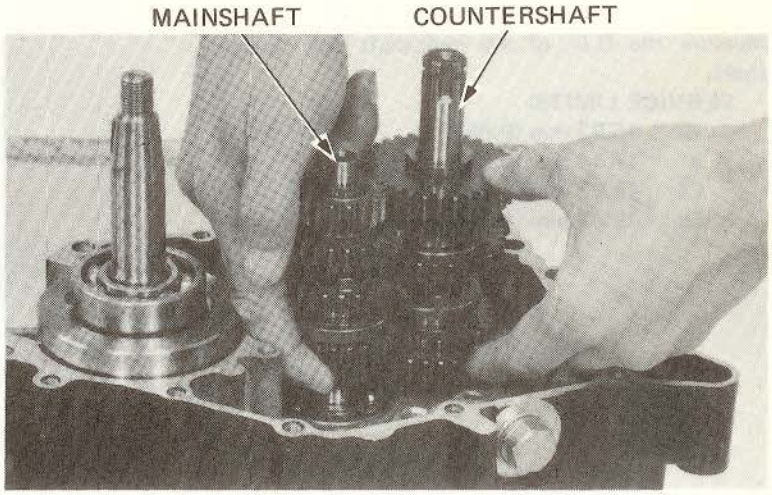
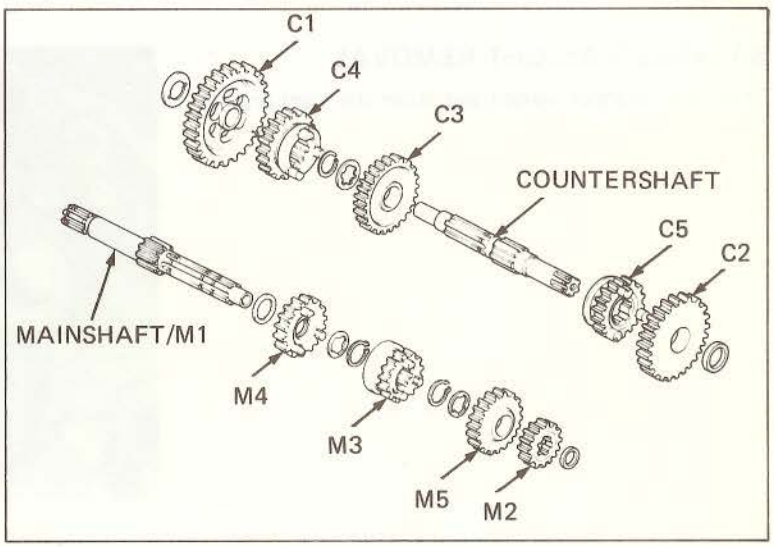
TRANSMISSION REMOVAL

Remove the mainshaft and countershaft.



TRANSMISSION INSPECTION

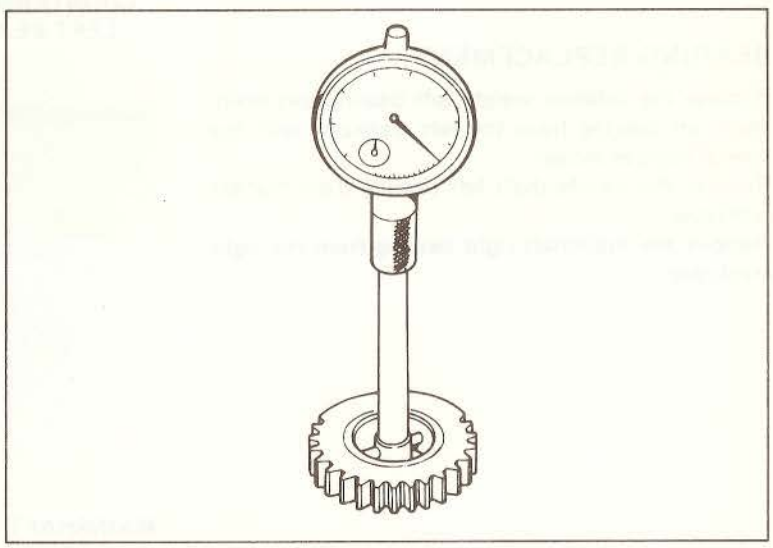
Check gear dogs, dog holes and teeth for excessive or abnormal wear, or evidence of insufficient lubrication.



Measure the I.D. of each gear.

SERVICE LIMIT:

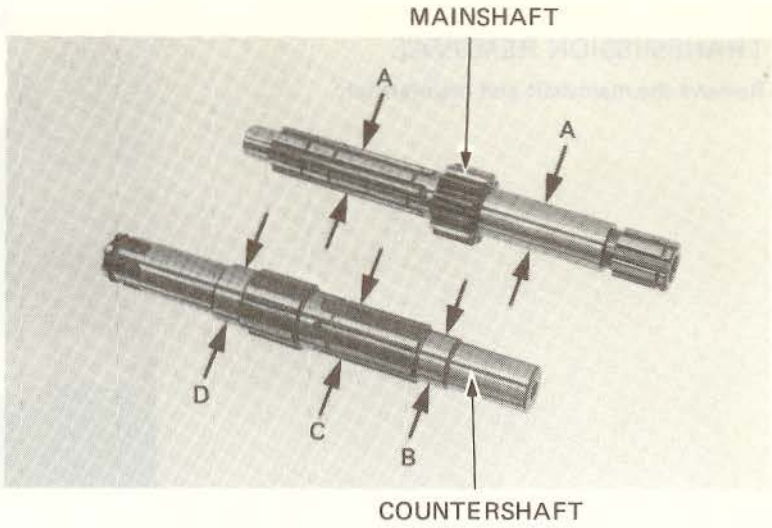
M4, M5, gears	:	**17.10 mm (0.673 in)**
C1 gear	:	**16.60 mm (0.654 in)**
C2 gear	:	**19.60 mm (0.772 in)**
C3 gear	:	**19.10 mm (0.752 in)**



Measure the O.D. of the mainshaft and countershaft.

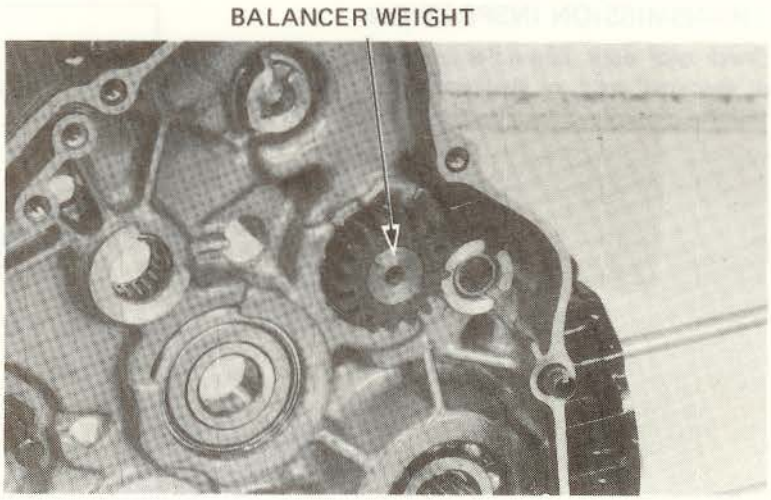
SERVICE LIMITS:

A:	16.93 mm (0.667 in)
B:	16.44 mm (0.647 in)
C:	18.93 mm (0.745 in)
D:	19.43 mm (0.765 in)



BALANCER WEIGHT REMOVAL

Drive the balancer weight out from the right crankcase.

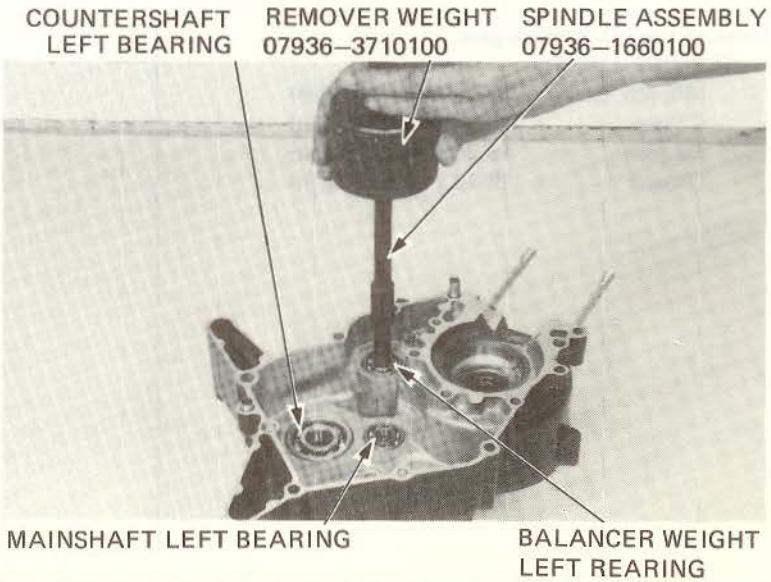


BEARING REPLACEMENT

Remove the balancer weight left bearing and mainshaft left bearing from the left crankcase with the special tools as shown.

Remove the countershaft left bearing from the left crankcase.

Remove the mainshaft right bearing from the right crankcase.



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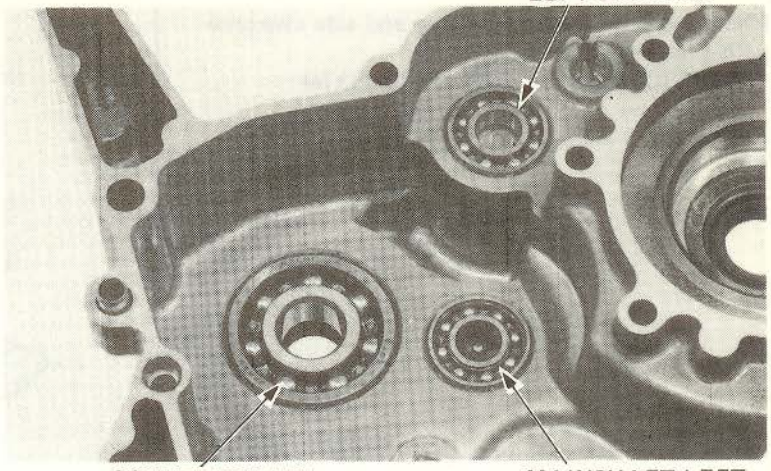
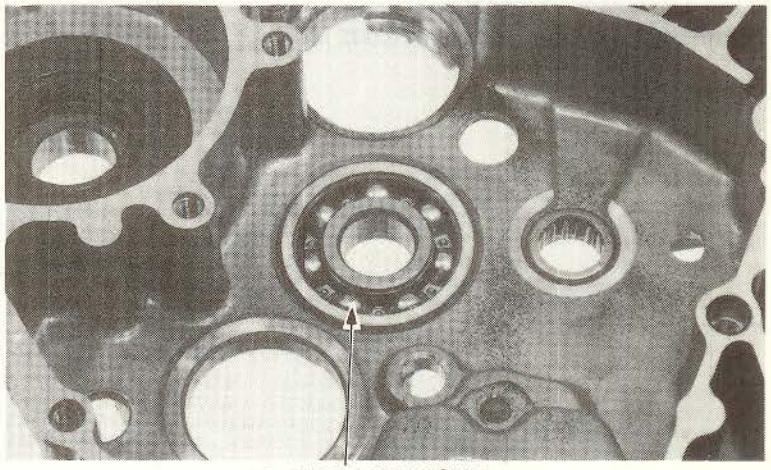
Drive in the bearings with the following common and special tools.

Balancer weight left bearing:
- Driver A
- Attachment 28 x 30 mm (07746–1870100)
- Pilot 12 mm

Mainshaft right and countershaft left bearings:
- Driver A
- Attachment 42 x 47 mm
- Pilot 17 mm

Mainshaft left bearing:
- Driver A
- Attachment 28 mm (07746–1870100)



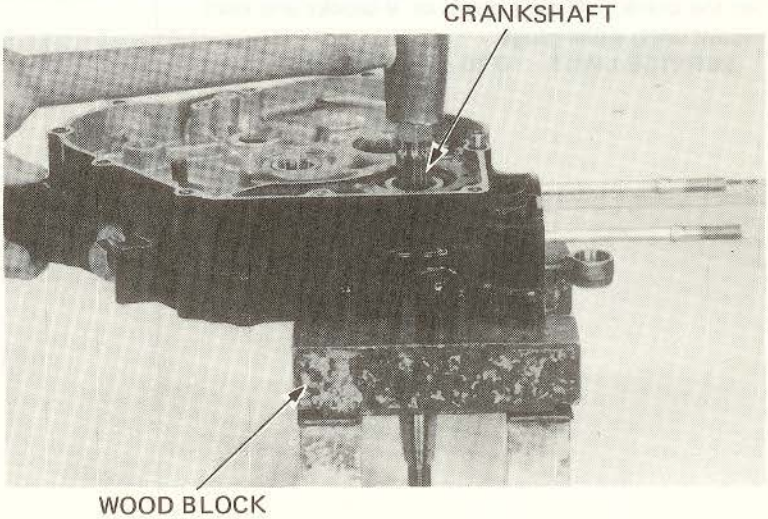


CRANKSHAFT REMOVAL

Drive the carnkshaft out of the right crankcase.

NOTE

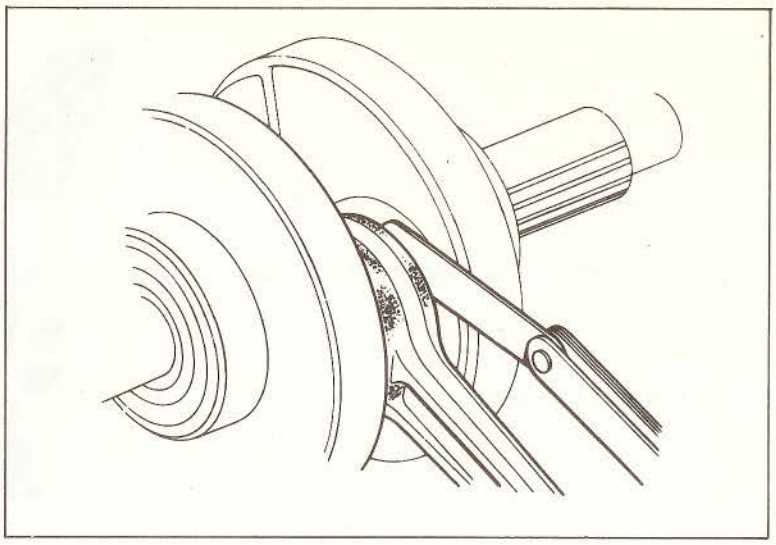
- Use a plastic or brass hammer.
- Screw a nut onto the crankshaft end to prevent damage.
- Protect the crankcase mating surface by resting it on a wooden block.



CRANKSHAFT INSPECTION

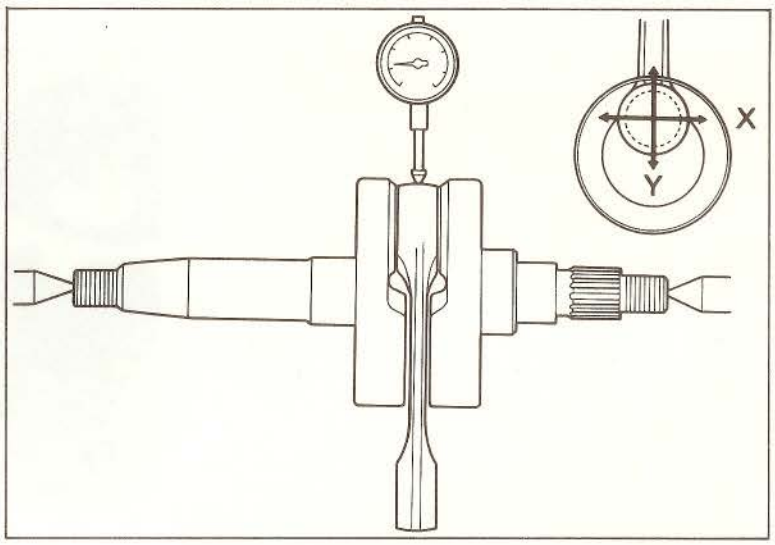
Measure the connecting rod big end side clearance with a feeler gauge.

SERVICE LIMIT: 0.85 mm (0.033 in)



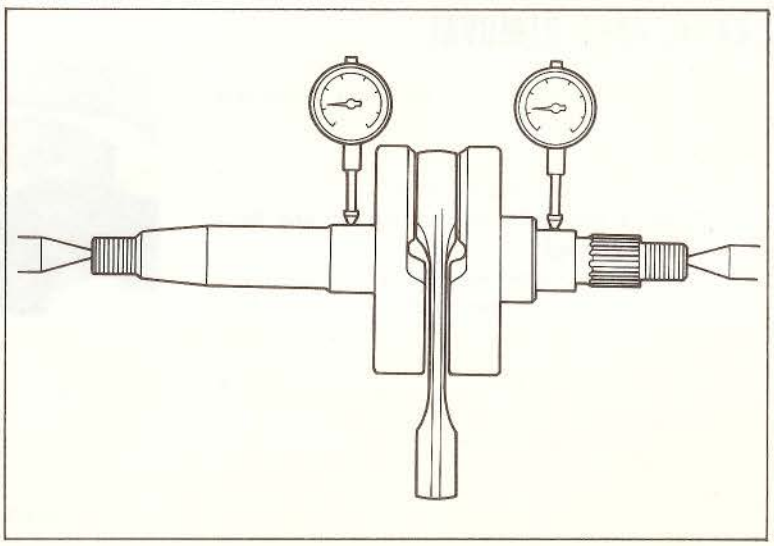
Measure the connecting rod big end radial clearance at two points in the X and Y directions.

SERVICE LIMIT: 0.05 mm (0.002 in)



Set the crankshaft on a stand or V-blocks and read runout using a dial gauge.

SERVICE LIMIT: 0.10 mm (0.004 in)



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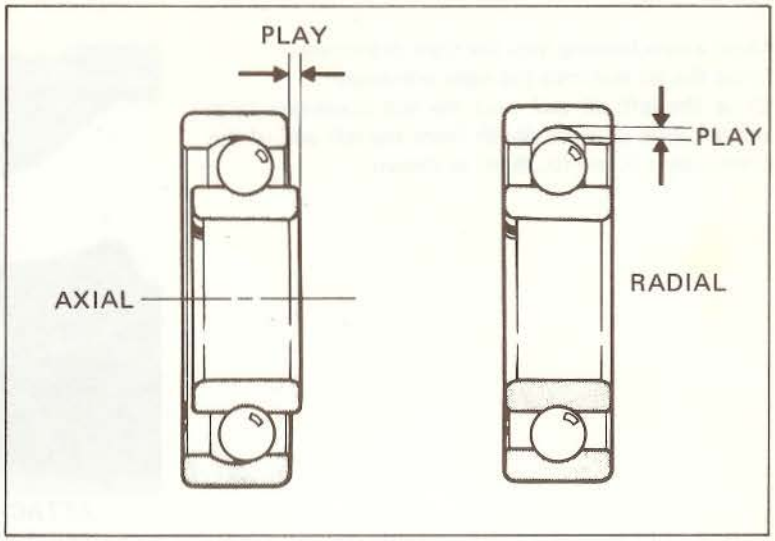
Spin the crankshaft bearing by hand and check for play. The bearing must be replaced if it is noisy or has excessive play.

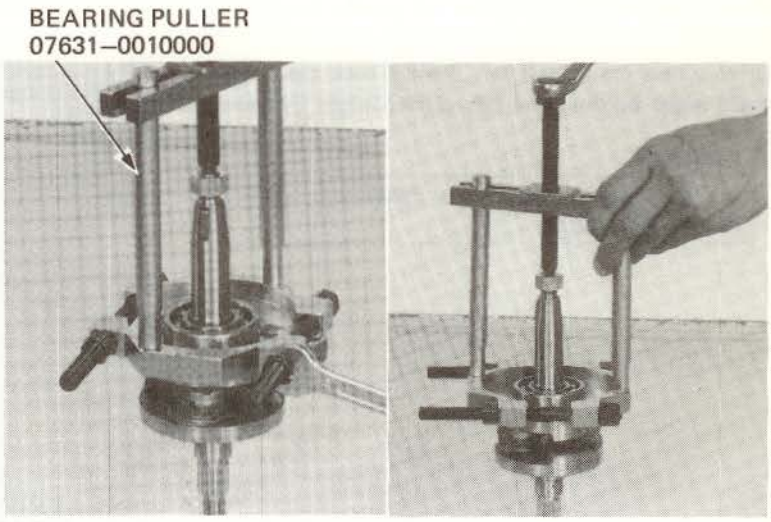


BEARING REPLACEMENT

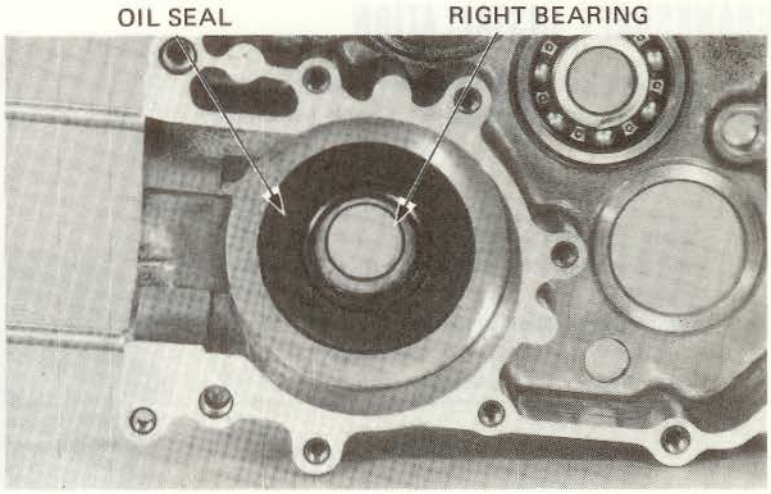
Set the special tool bearing puller under the bearing securely and pull the bearing off.

NOTE

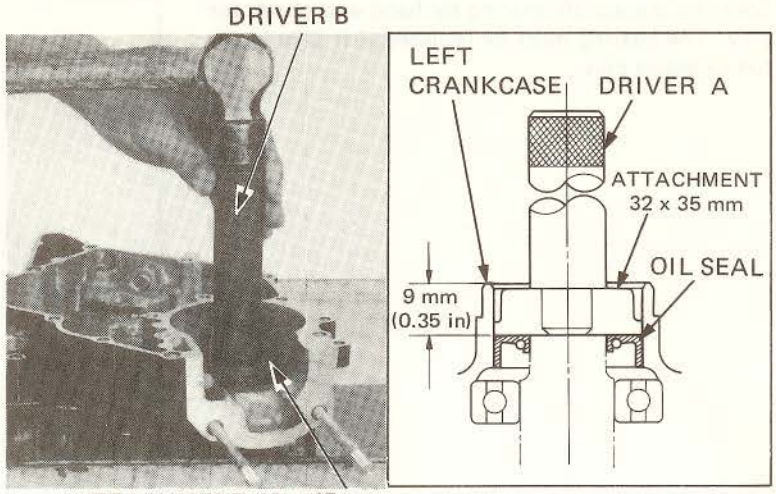
The bearing puller is commercially available.



Remove the oil seal and drive out the right bearing from the right crankcase.



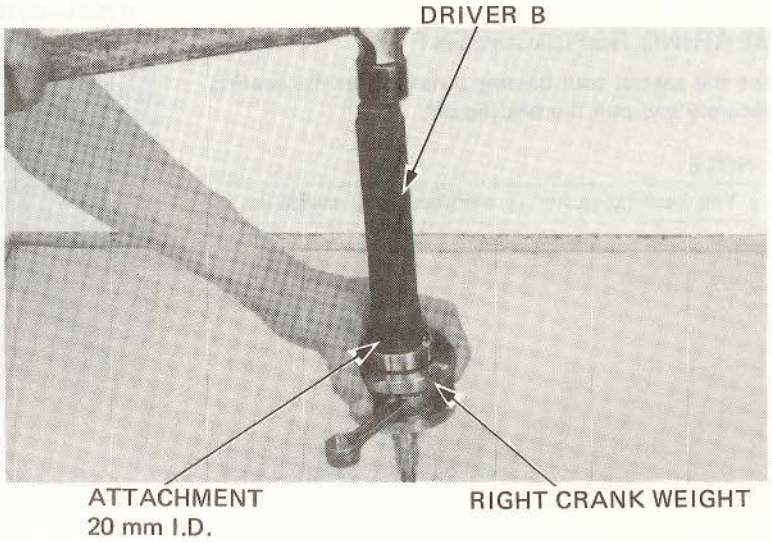
Drive a new bearing into the right crankcase.
Drive the oil seal into the right crankcase.
Drive the left oil seal into the left crankcase from the left side until its depth from the left end of the crankcase is 9 mm (0.35 in) as shown.



Drive a new crankshaft left bearing over the crankshaft while holding the left crank weight by hand.

CAUTION

Do not support the right crankshaft when driving the bearing.

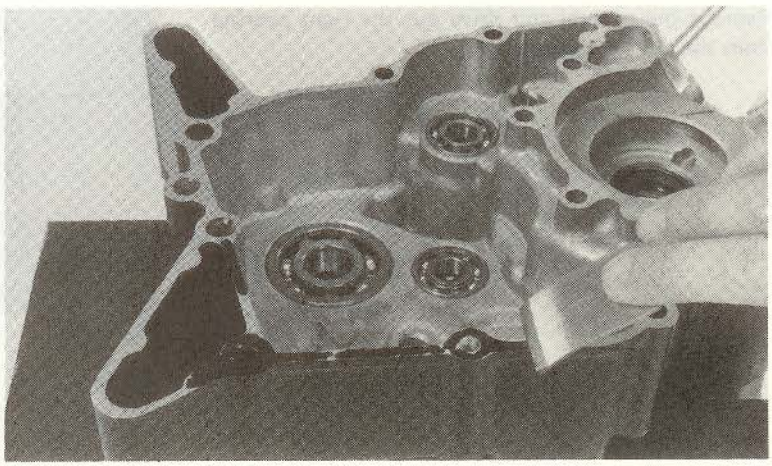


CRANKSHAFT INSTALLATION

Wash the right and left crankcases in solvent and blow dry with a compressed air. Check for cracks or other defects.

NOTE

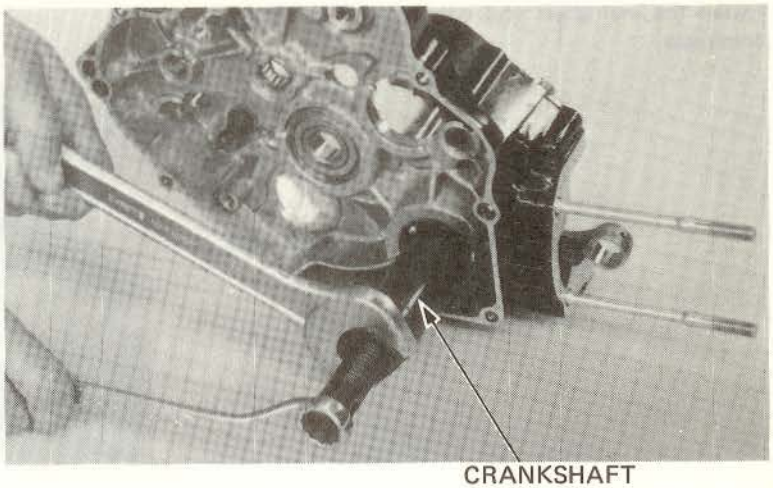
- Apply clean engine oil to all moving and sliding surfaces except those in the crank chamber.
- Remove all traces of gasket material from the gasket surfaces. Remove roughness or irregularities, if any, using an oil stone.



Install the crankshaft in the right crankcase.

NOTE

- Apply clean 2-cycle engine oil to the journal and crankpin bearings.
- Coat the sealing lips of each oil seal with grease.

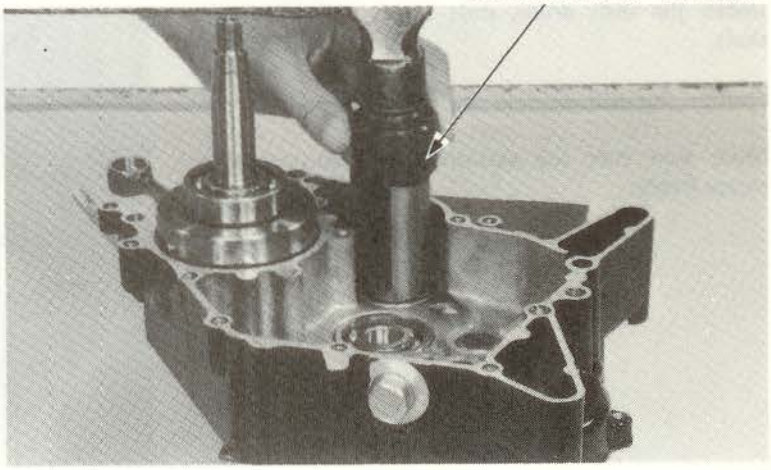


CRANKSHAFT
ASSEMBLY TOOL
07965–1660100

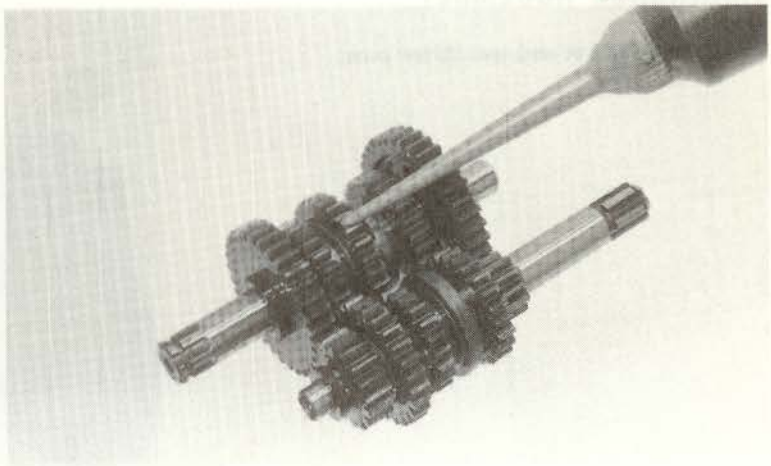
TRANSMISSION ASSEMBLY

Drive the balancer weight in the right crankcase while rotating the driver tool to prevent tilting the balancer bearing.

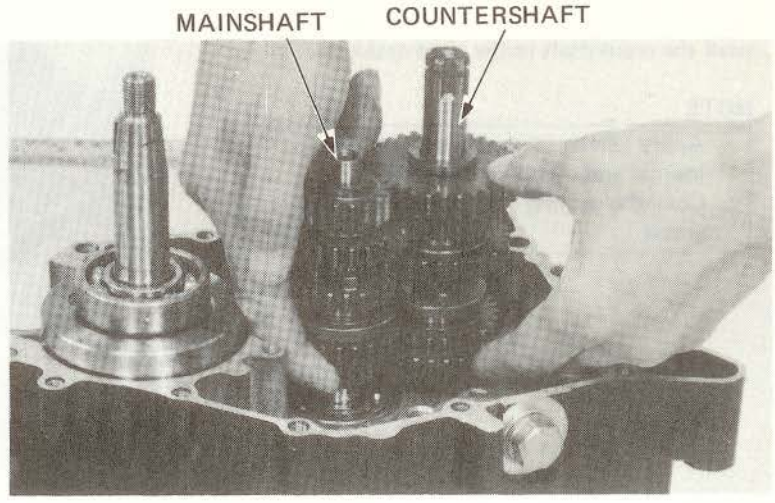
BALANCER WEIGHT
DRIVER 07945–1660000



Apply oil to the gears before installing the mainshaft and countershaft.
Make sure the gears rotate freely.



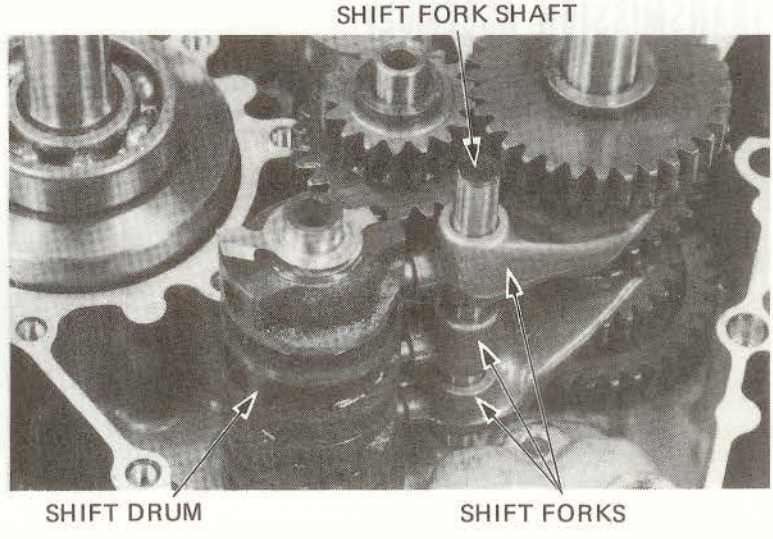
Install the mainshaft and countershaft in the right crankcase.



Install the shift drum, shift forks and shift fork shaft.

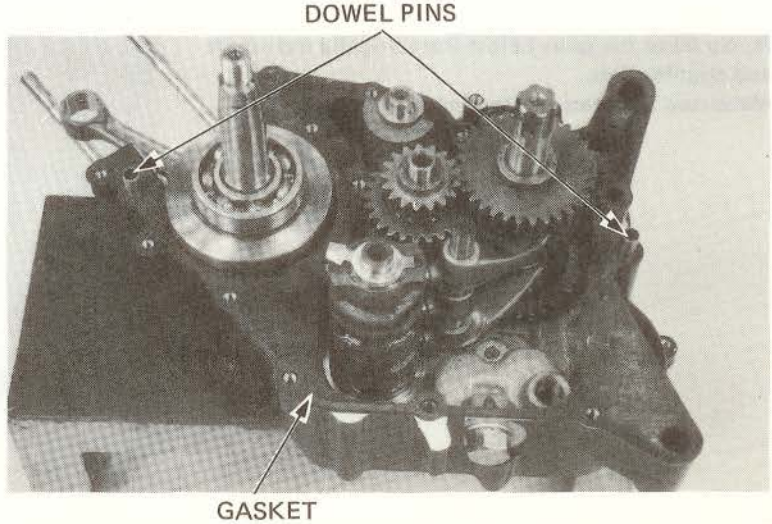
Position the shift drum in neutral as shown.

Make sure that the mainshaft and countershaft rotate freely.



CRANKCASE ASSEMBLY

Install a new gasket and two dowel pins.



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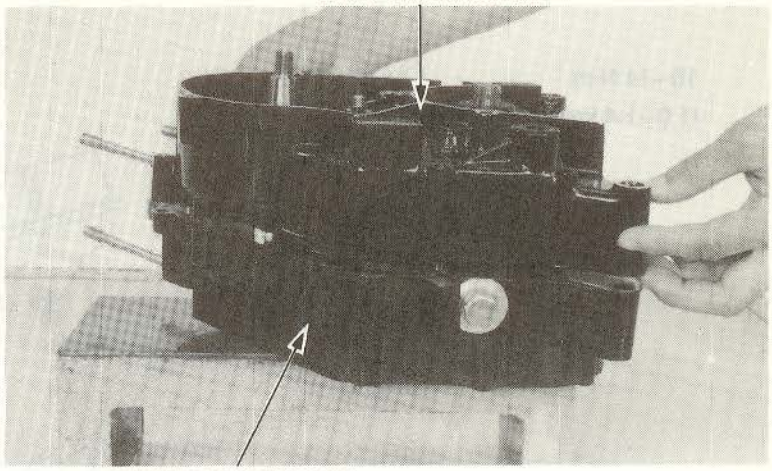
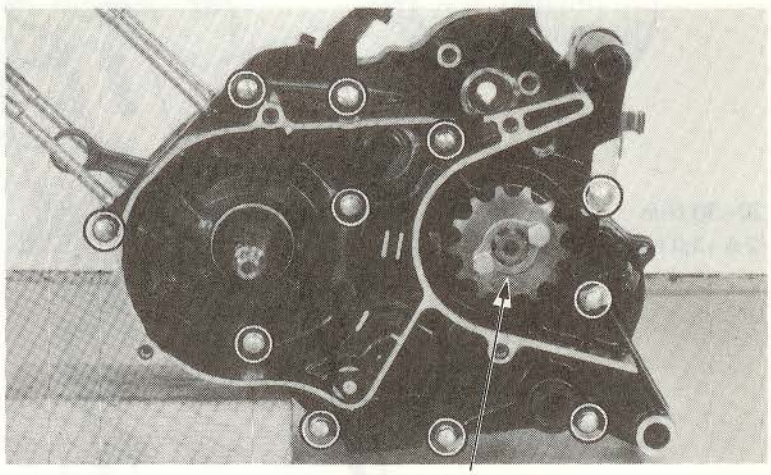
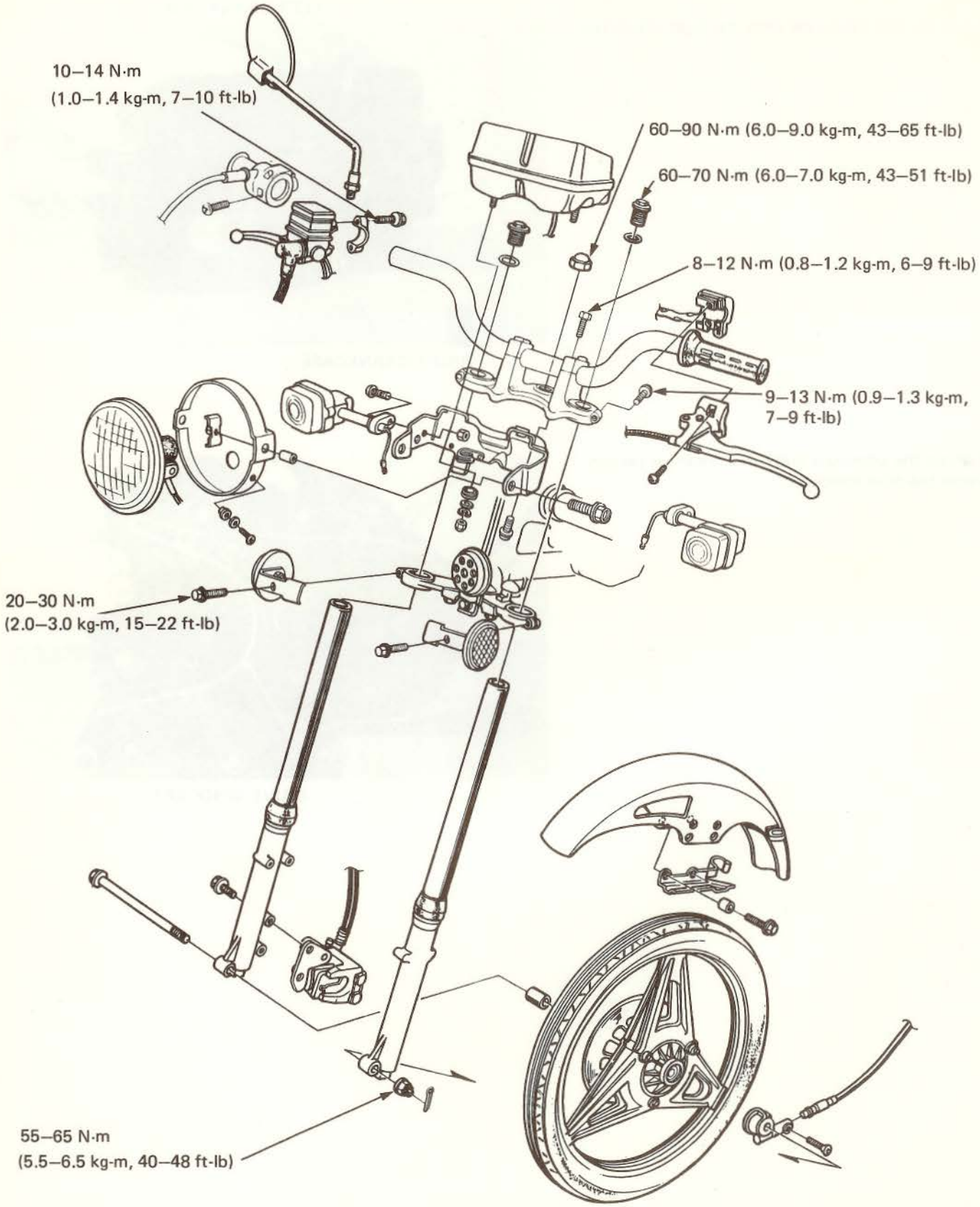
Place the left crankcase onto the right crankcase.



Tighten the crankcase bolts in a crisscross pattern.
Install the drive sprocket.





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10. FRONT WHEEL/SUSPENSION

SERVICE INFORMATION

- A jack or other support is required to support the motorcycle.
- Never ride on the rim or try to bend the wheel.

TOOLS

Special		Alternate
HEX Wrench 6 mm	07917–3230000	MP310–277–91774
Ball Race Driver	07944–1150001	
Common		
Driver A	07749–0010000	
Attachment 37 x 40 mm	07746–0010200	
Pilot 12 mm	07746–0040200	
Front Fork Oil Seal Driver Body	07747–0010100	07747–1180001
Fork Seal Driver Attachment (B)	07747–0010300	
Pin Spanner	07702–0010000	M9361–412–099788

TORQUE VALUES

Handlebar uppoer holder bolts	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)
Brake master cylinder bolts	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
Brake disc bolts	27–33 N·m (2.7–3.3 kg-m, 20–24 ft-lb)
Front axle nut	55–65 N·m (5.5–6.5 kg-m, 40–48 ft-lb)
Front fork socket bolt	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)
Front fork inner bolt	34–42 N·m (3.4–4.2 kg-m, 25–30 ft-lb)
Front fork bolt	60–70 N·m (6.0–7.0 kg-m, 43–51 ft-lb)
Top bridge pinch bolts	9–13 N·m (0.9–1.3 kg-m, 7–9 ft-lb)
Bottom bridge pinch bolts	20–30 N·m (0.2–0.3 kg-m, 15–22 ft-lb)
Steering stem nut	60–90 N·m (6.0–9.0 kg-m, 43–65 ft-lb)

SPECIFICATIONS

Front fork oil capacity: 72.5–77.5 cc (2.5–2.6 oz)

ITEM	STANDARD mm (in)	SERVICE LIMIT mm (in)
Front axle shaft bend	———	0.20 (0.008)
Front wheel rim runout Radial	———	2.0 (0.08)
Axial	———	2.0 (0.08)
Front shock absorber spring free length	475 (18.70)	465.0 (18.31)
Front fork pipe bend	———	0.20 (0.008)

TROUBLESHOOTING

Hard steering
1. Insufficient tire pressure
2. Steering adjustment nut too tight
3. Damaged steering stem bearings
4. Damaged steering ball races or cone races

Steers to one side or does not track straight
1. Unevenly adjusted right and left sock absorbers
2. Bent front forks
3. Bent front axle; wheel installed incorrectly

Front wheel wobbling
1. Axle not tightened properly
2. Distorted rim
3. Worn front wheel bearing
4. Distorted spoke
5. Faulty tire

Soft suspension
1. Weak fork spring
2. Weak fork spring
2. Insufficient fluid in front forks

Hard suspension
1. Incorrect fluid weight in front forks

Front suspension noise
1. Slider binding
2. Loose front fork fasteners
3. Insufficient fluid in forks

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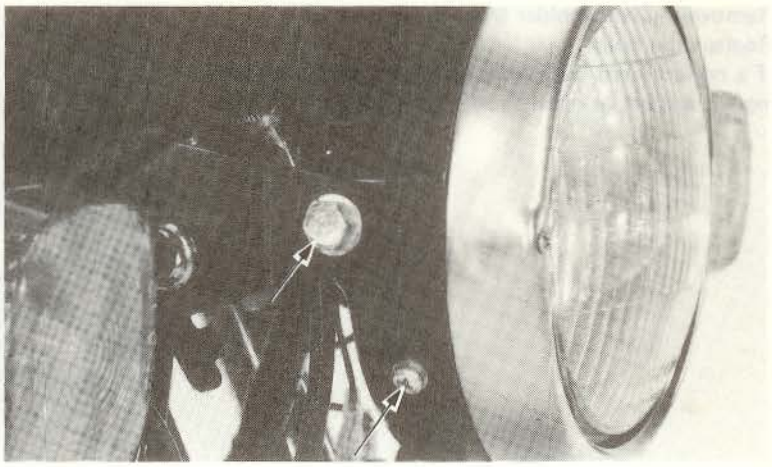
HEADLIGHT

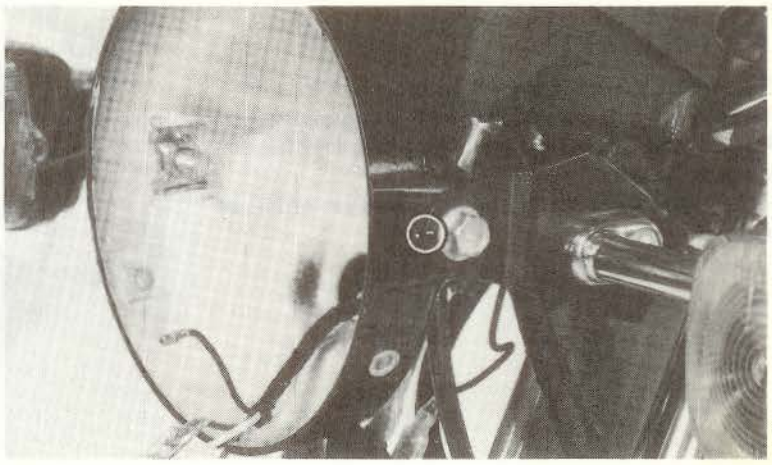
REMOVAL

Remove the headlight.
Remove the headlight case mounting bolts and headlight case.



INSTALLATION

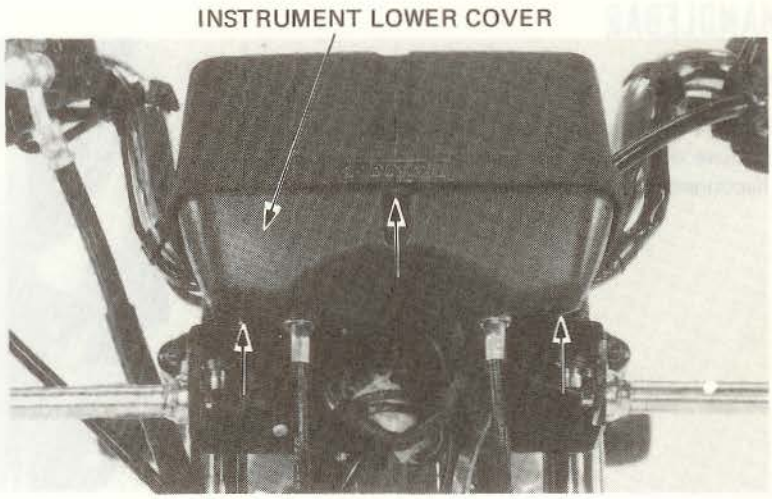
Align the punch marks on the headlight case with the index marks on the bracket.



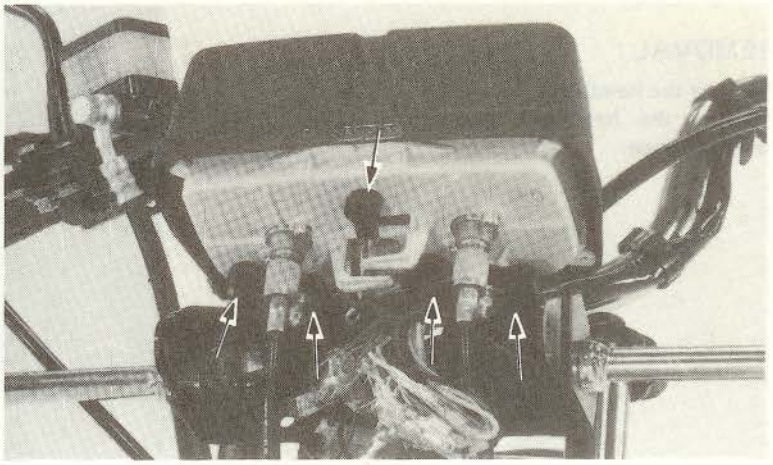
INSTRUMENTS

INDICATOR AND METER BULB REPLACEMENT

Remove the headlight and headlight case.
Remove the instrument lower cover attaching screws and lower cover.

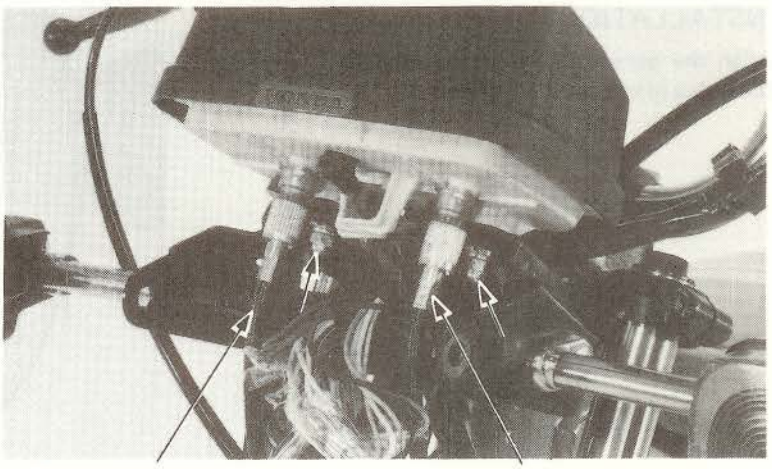


Remove the bulb holder from the instruments.
Replace the bulb.
If a replacement bulb does not light, check the wiring for a short or open circuit, or loose connections.



INSTRUMENT REMOVAL/ INSTALLATION

Disconnect the speedometer and tachometer cables.
Remove the bulb holders from the instruments.
Remove the instrument mounting nuts and remove the instruments.
Install the instruments in the reverse order of removal.



TACHOMETER CABLE SPEEDOMETER CABLE

HANDLEBAR

REMOVAL

Remove the headlight case (Page 10-3).
Remove the instrument lower cover (Page 10-3).
Disconnect the handlebar switch wires.

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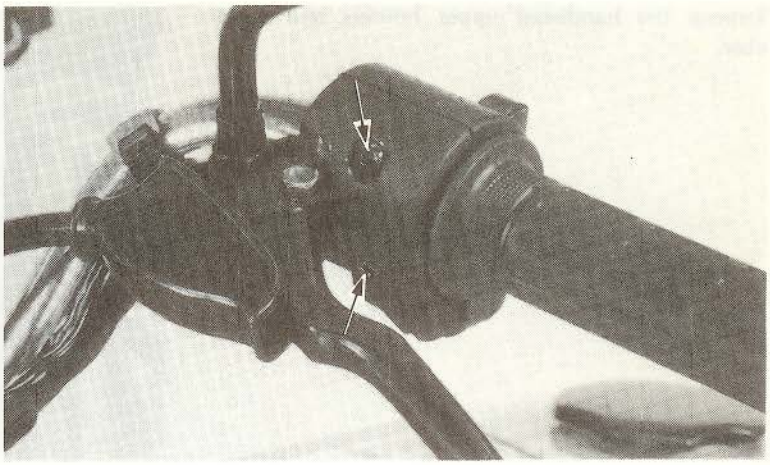
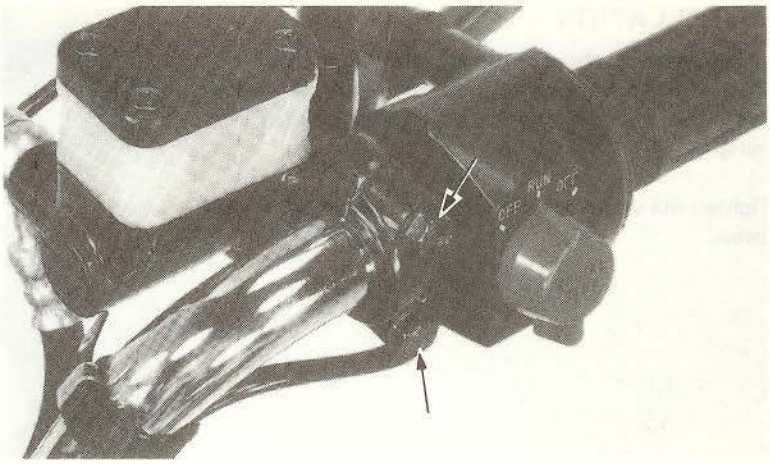
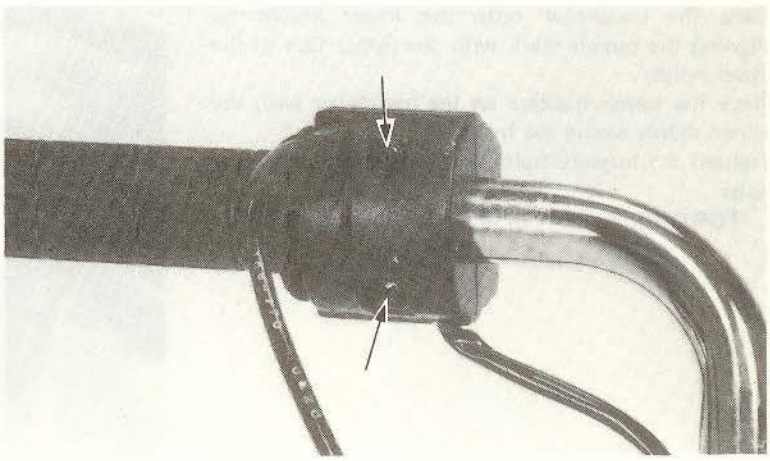
Remove the wire bands.
Remove the left handlebar switch.
Disconnect the clutch cable.



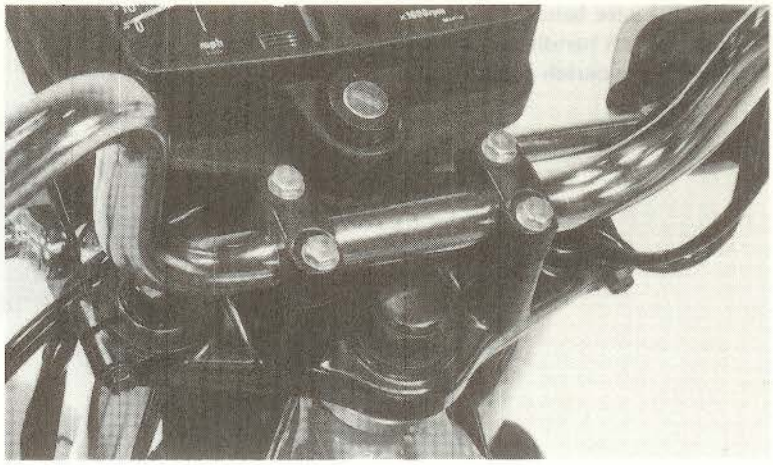
Remove the brake master cylinder.



Remove the right handlebar switch and throttle grip.



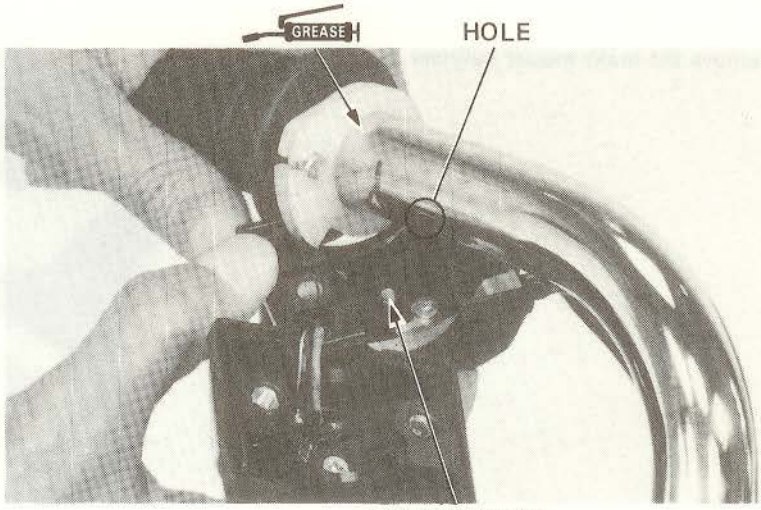
Remove the handlebar upper holders and handlebar.



INSTALLATION

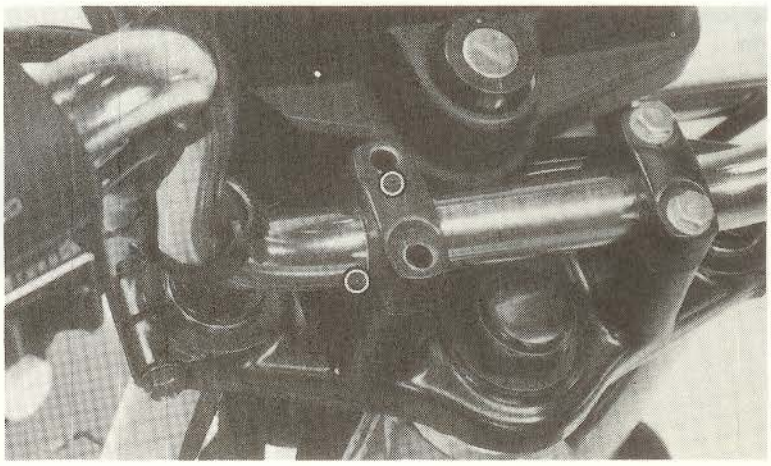
Apply grease to the throttle grip sliding surface.
Align the locating pin on the right handlebar switch with the hole in the handlebar and install the switch.

Tighten the upper screw first, then tighten the lower screw.



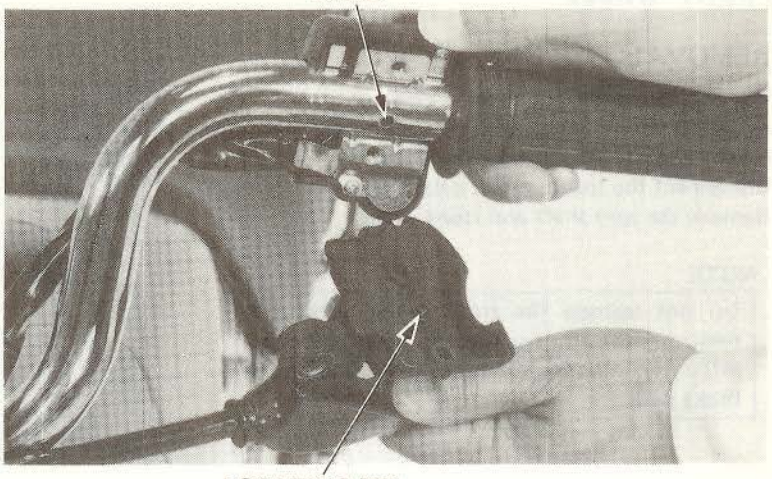
Place the handlebar onto the lower holder by aligning the punch mark with the upper face of the lower holder.
Place the upper holders on the handlebar with the punch marks facing the front.
Tighten the forward bolts first, then tighten the rear bolts.

TORQUE: 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)



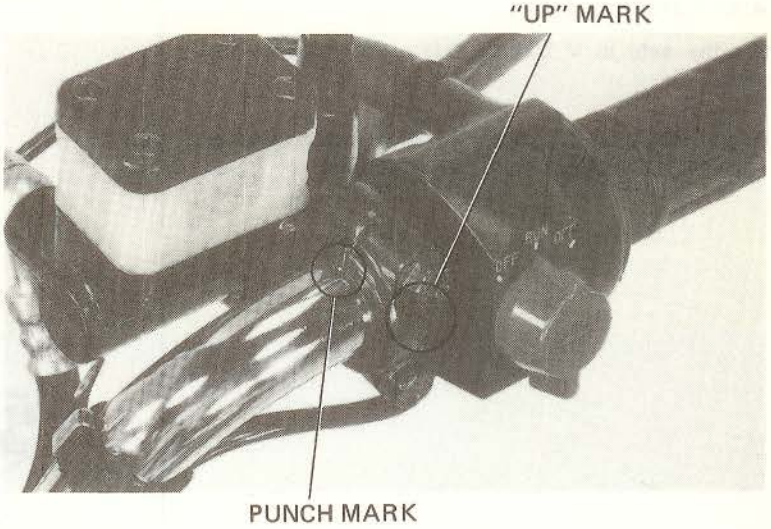
Connect the clutch cable.
Align the locating pin on the left handlebar switch with the hole in the handlebar and install the switch.

Tighten the upper screw first, then tighten the lower screw.

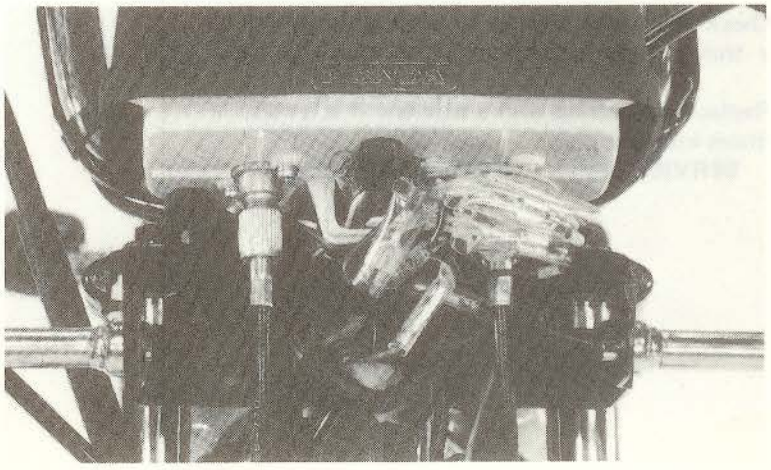


Install the front master cylinder with the "UP" mark facing up.
Align the end of the holder with the handlebar punch mark.

Tighten the upper bolt first, then the lower.
TORQUE: 10–14 N·m (1.0–1.4 kg-m, 7–9 ft-lb)



Route the switch wires (Page 1-6).
Connect the switch wires.
Install the instrument lower cover and headlight.



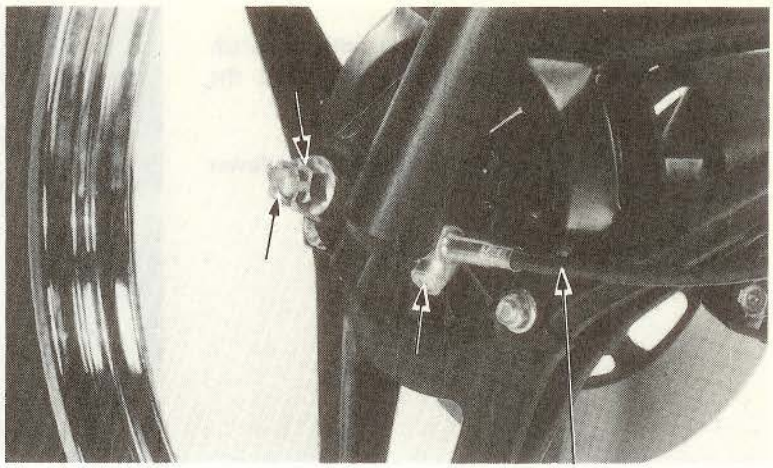
FRONT WHEEL

REMOVAL

Remove the cotter pin and the axle nut.
Raise the front wheel off the ground by placing a block or safety stand under the engine.
Disconnect the speedometer cable.
Remove the axle shaft and front wheel.

NOTE

Do not operate the front brake lever after removing the front wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.

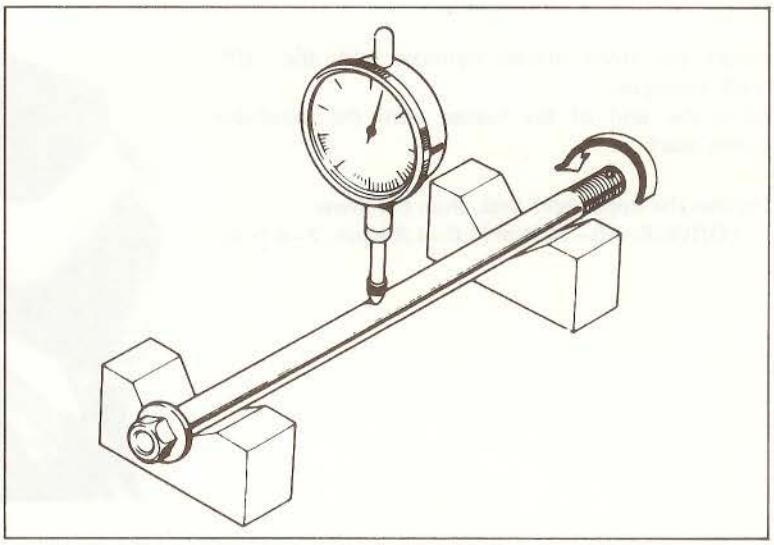


SPEEDOMETER CABLE

AXLE INSPECTION

Set the axle in V blocks, rotate and measure the runout.

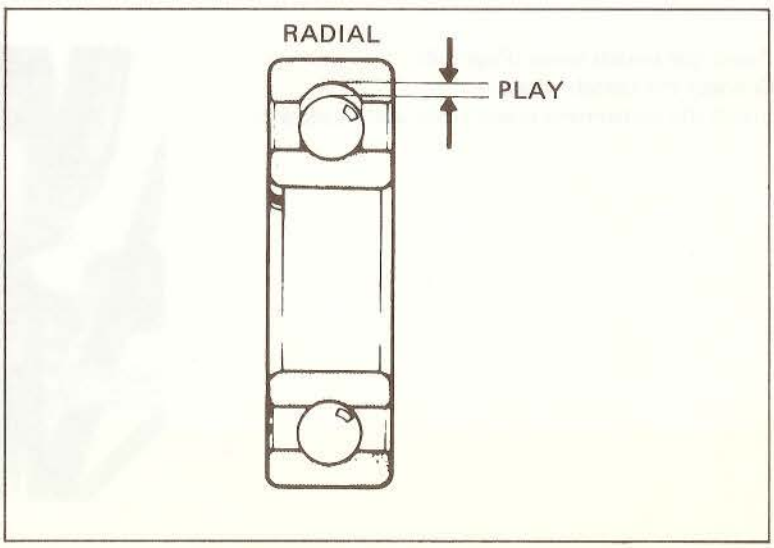
Actual runout is 1/2 of the total indicator reading.
SERVICE LIMIT: 0.20 mm (0.008 in)



WHEEL BEARING INSPECTION

Check the wheel bearing by placing the wheel on a truing stand and spinning the wheel by hand.

Replace the bearing with a new one if it is noisy or shows excessive play.
SERVICE LIMIT: 0.027 mm (0.0010 in)



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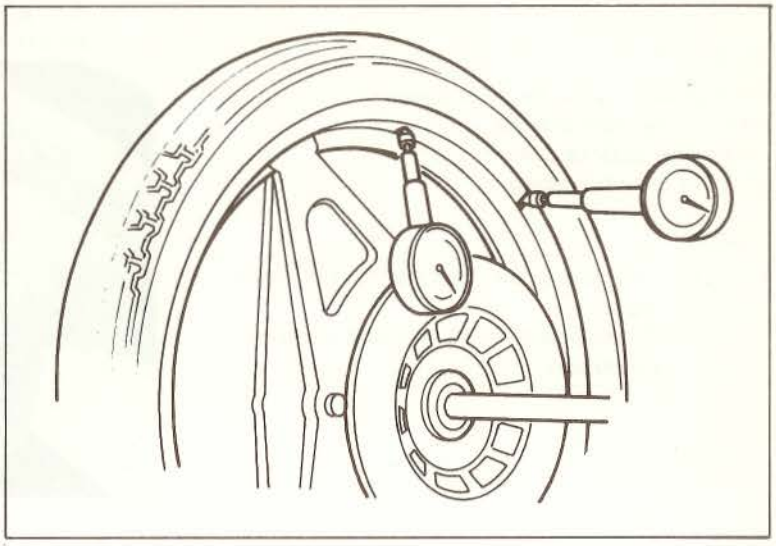
WHEEL RIM RUNOUT

Check the wheel rim for runout by placing the wheel in a truing stand. Spin the wheel by hand and read the rim runout using a dial indicator gauge.

SERVICE LIMIT:

Radial: 2.0 mm (0.08 in)
Axial: 2.0 mm (0.08 in)



NOTE

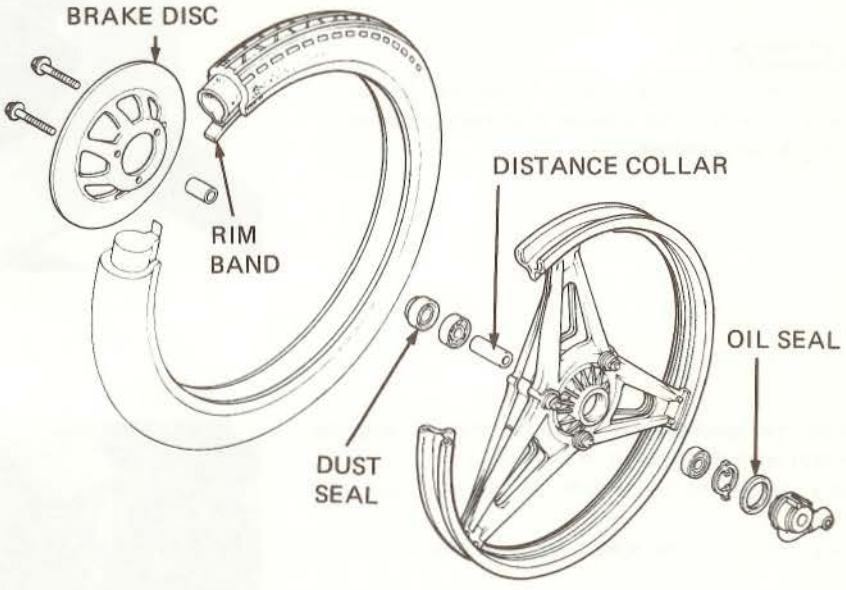
The COMSTAR TM WHEEL cannot be repaired and must be replaced with a new one if the service limits are exceeded.

DISASSEMBLY

Remove the dust seal, bearing and distance collar.

NOTE

Do not forget to install the rim band when replacing the tire or tube.



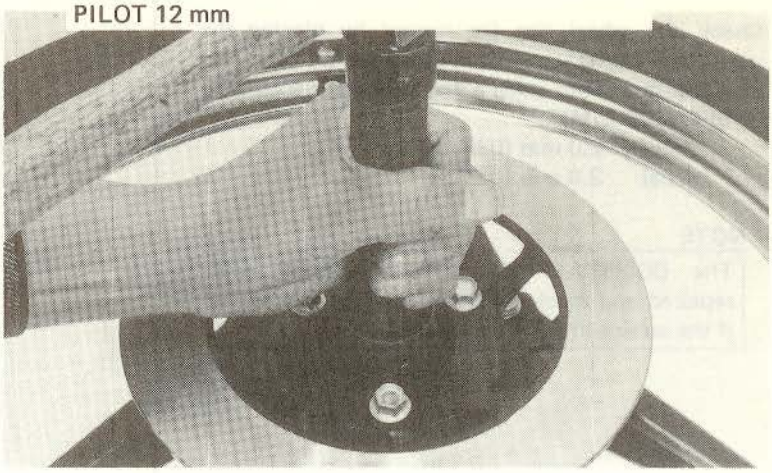
ASSEMBLY

Pack all bearing cavities with grease.
Drive in the right bearing.
Install the distance collar.
Drive in the left bearing.

NOTE

- Do not allow the bearing to tilt while driving it in.
- Install the bearing with the sealed end facing the outside.

DRIVER A
ATTACHMENT 37 X 40 mm
PILOT 12 mm

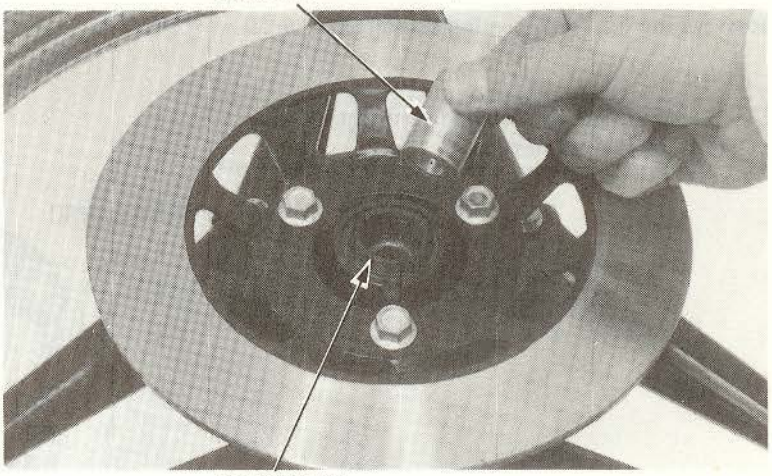


Install the brake disc.
TORQUE: 27–33 N·m (2.7–3.3 kg-m, 20–24 ft-lb)

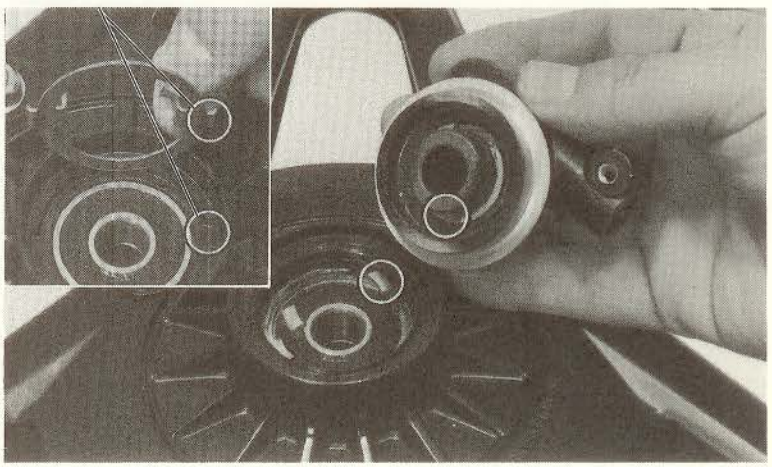
Apply grease to the inside of the dust seal.
Install the dust seal and distance collar in the right side of the wheel hub.

WARNING

Wipe off the excess grease. Grease on the disc will cause reduced braking efficiency and may lead to an accident.



Install the speedometer gearbox retainer, aligning the tabs with the grooves in the hub.
Apply grease to the inside of the dust seal and install.
Apply grease to the speedometer gearbox and hub retainer.
Install the speedometer gearbox, aligning the tabs on the gearbox with the grooves in the retainer.



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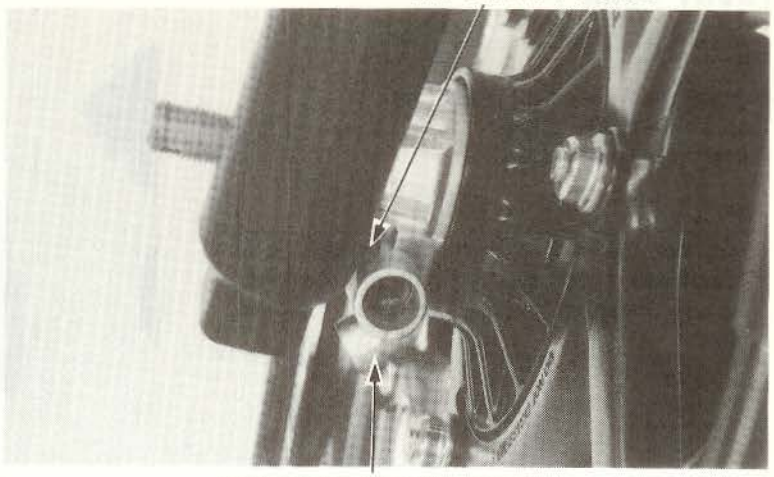
FRONT WHEEL INSTALLATION

Position the front wheel between the fork legs and insert the axle from the right side.
Position the speedometer gearbox as shown.



Connect the speedometer cable to the speedometer gearbox.

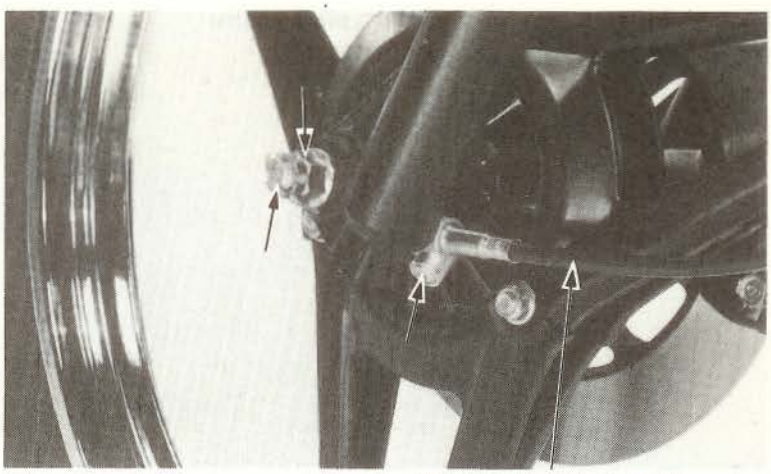
Install the axle nut and tighten to the specified torque.

TORQUE: 55–65 N·m (5.5–6.5 kg-m, 40–48 ft-lb)

Install a new cotter pin through the axle nut and axle.

NOTE

Pump the brake lever after the front wheel is installed to ensure full braking efficiency.



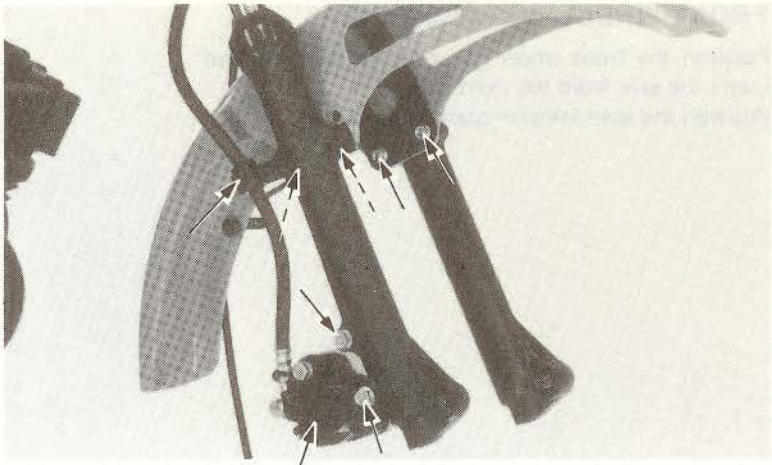
FRONT FORK

REMOVAL

Remove the front wheel (Page 11-8).
Remove the brake caliper.
Remove the front fender.

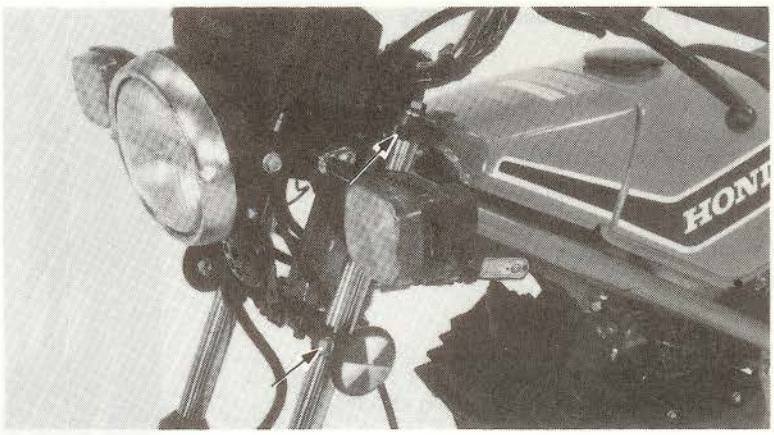
NOTE

Do not loosen the brake hose unless it is absolutely necessary. If the hose is loosened or disconnected, the brake system must be bled.



BRAKE CALIPER

Loosen the fork top and bottom pinch bolts.
Remove the front fork.



DISASSEMBLY

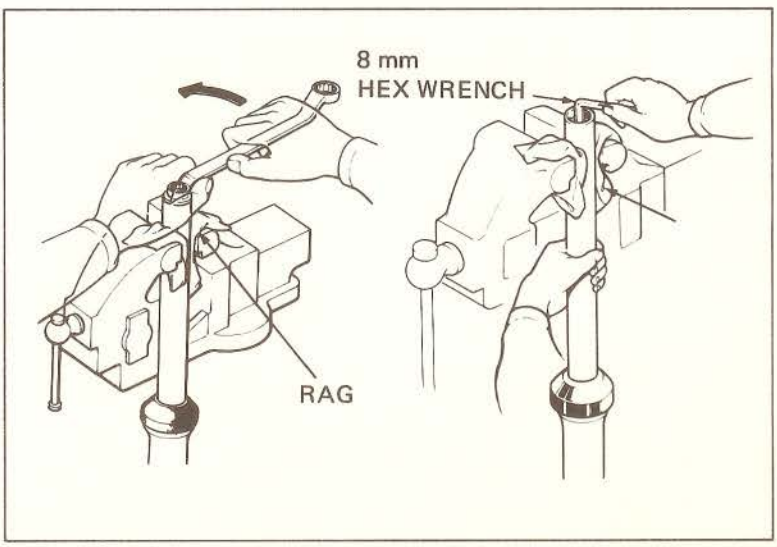
Remove the fork bolt.
Remove the inner bolt.

NOTE

- Hold the fork tube in a vise with rag or soft jaws avoiding the sliding surface as shown.

CAUTION

The inner bolt is under spring pressure. Cover the inner bolt and hex wrench during removal to prevent injury caused by the bolt, wrench, or spring flying upwards.



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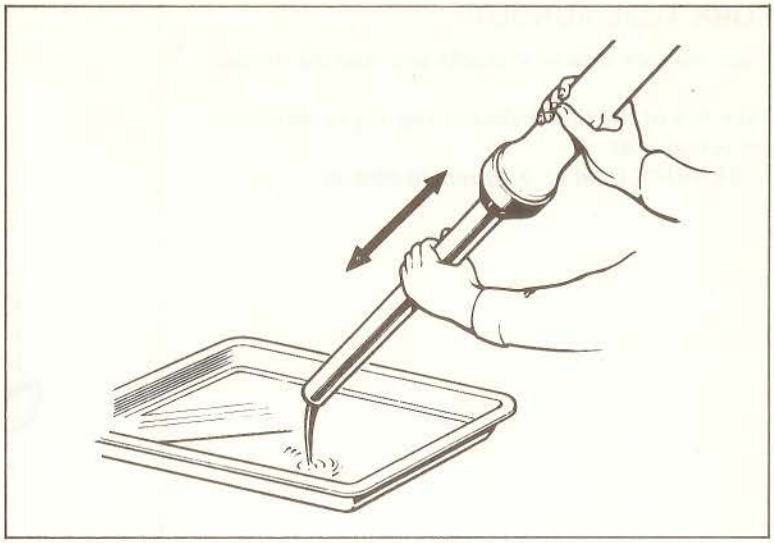
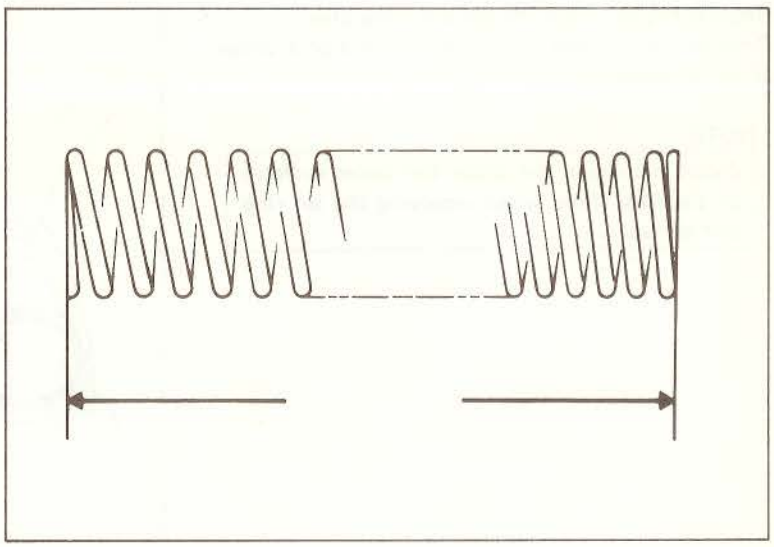
Drain the ATF (Automatic Transmission Fluid) from the fork by pumping it up and down slowly.



FORK SPRING INSPECTION

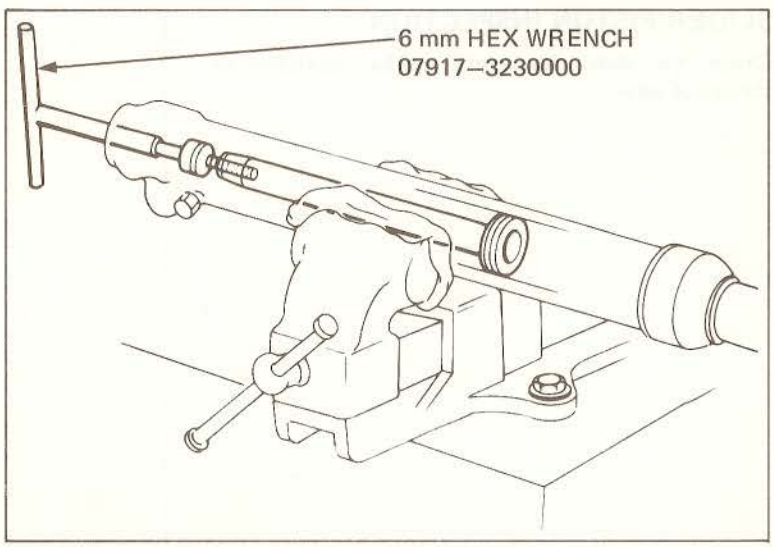
Measure the fork spring free length.
SERVICE LIMITS: 465.0 mm (18.31 in)



Remove the socket bolt.
Remove the fork tube and piston.

CAUTION

Do not distort the slider in a vise.

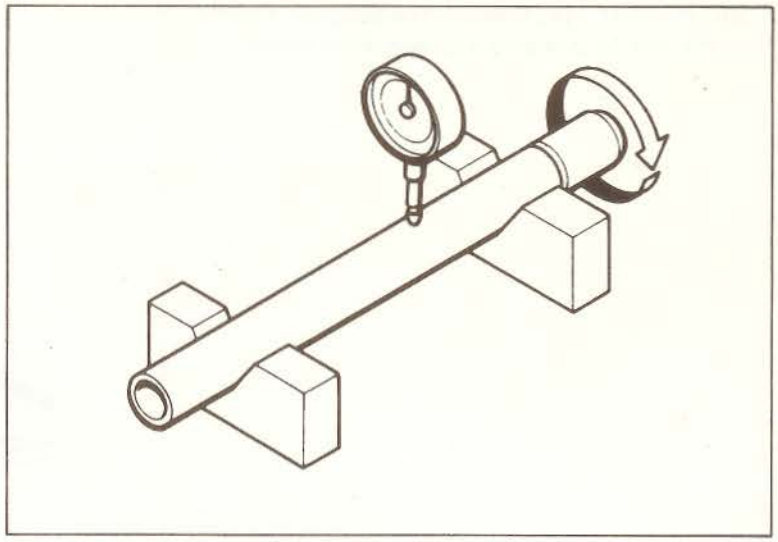


FORK TUBE RUNOUT

Place the fork tube in V blocks and read the runout.

Take 1/2 of the total indicator reading to determine the actual wear.

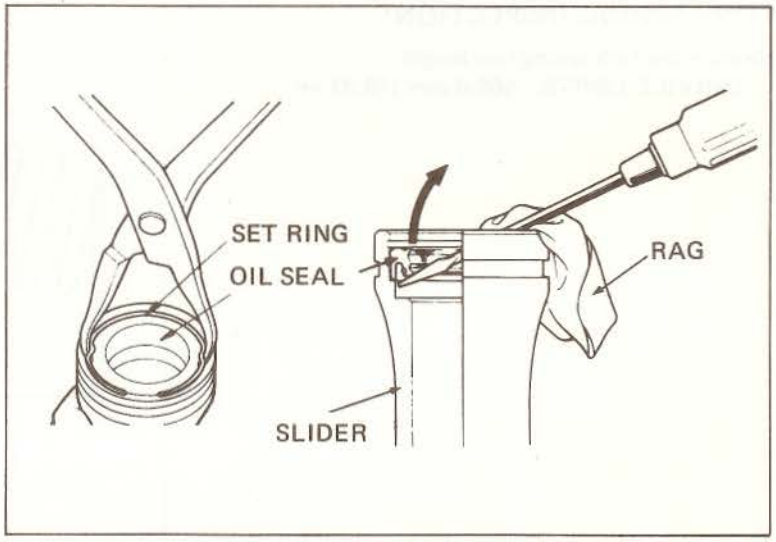
SERVICE LIMIT: 0.20 mm (0.008 in)



Remove the set ring with the snap ring pliers.
Remove the oil seal using the dull end of a screwdriver as shown.

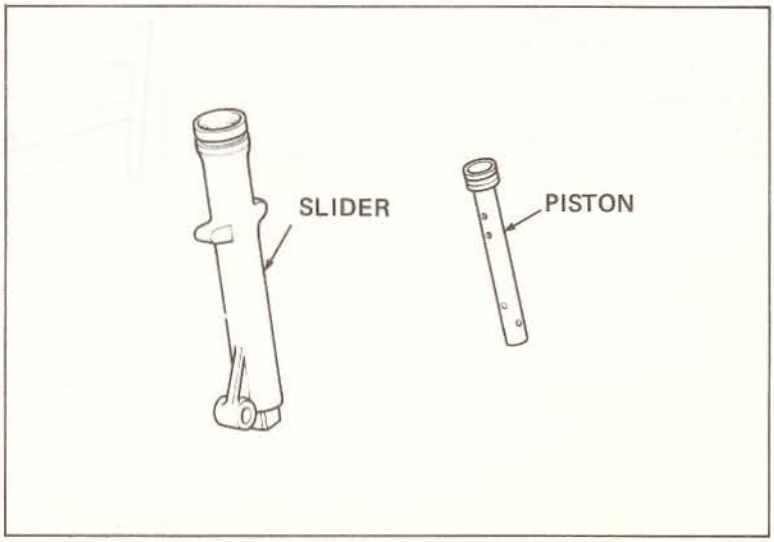
NOTE

Avoid damaging the inner and outer surfaces of the fork slider when removing the set ring and oil seal.



SLIDER/PISTON INSPECTION

Check the slider for score marks, scratches or abnormal wear.



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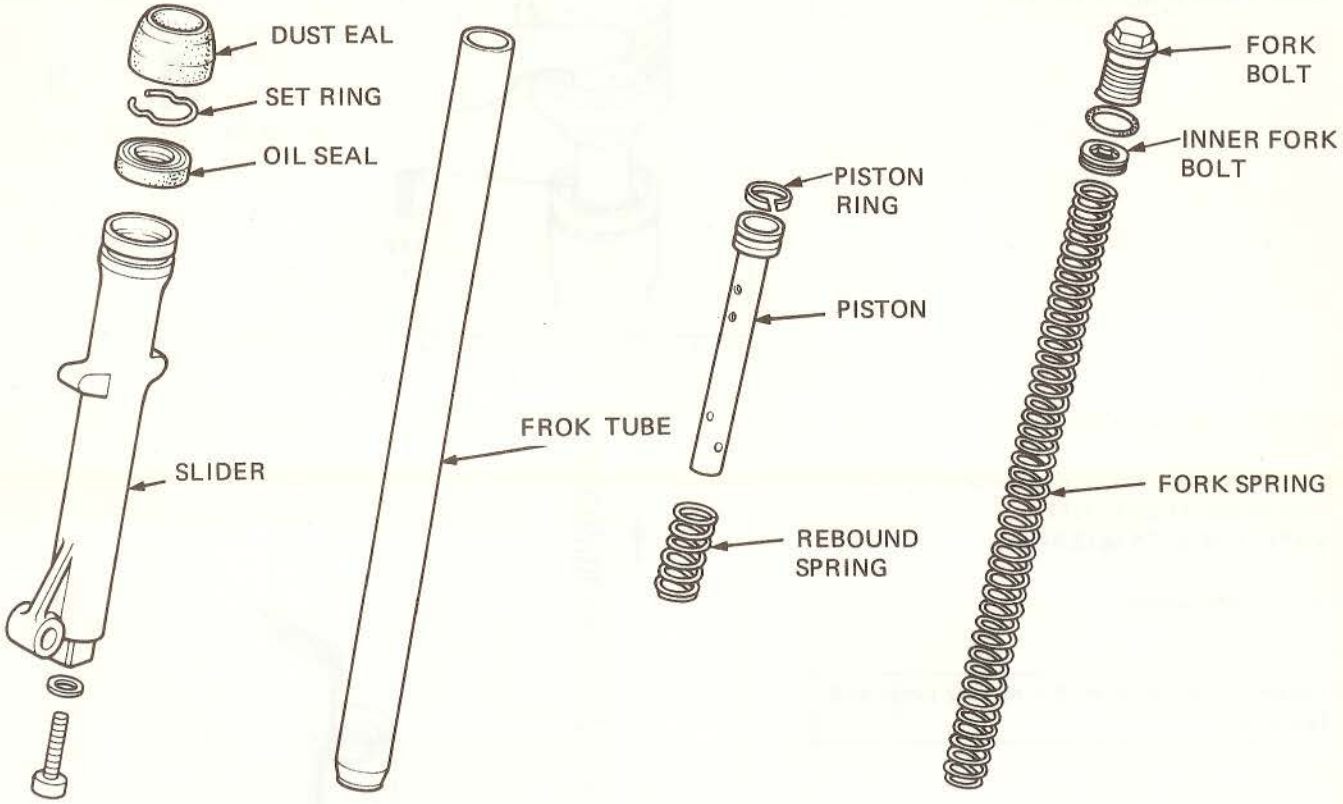
ASSEMBLY

NOTE

Wash all removed parts in solvent and wipe them off thoroughly before assembly.



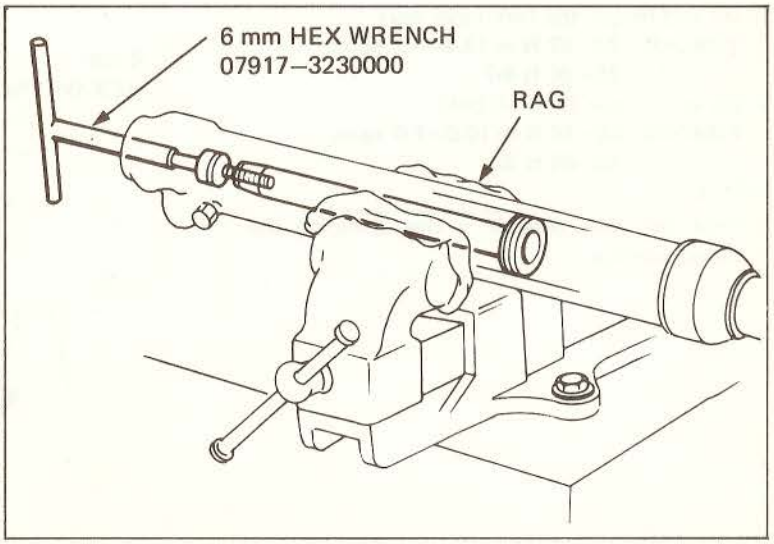
Install the piston ring on the piston.
Install the fork tube rebound spring and piston.

Apply locking agent to the socket bolt threads and underside o the bolt.

NOTE

- To tighten the socket bolt, it may be necessary to install the fork spring and tighten the fork bolt provisionally.
- Do not distort the slider in a vise.

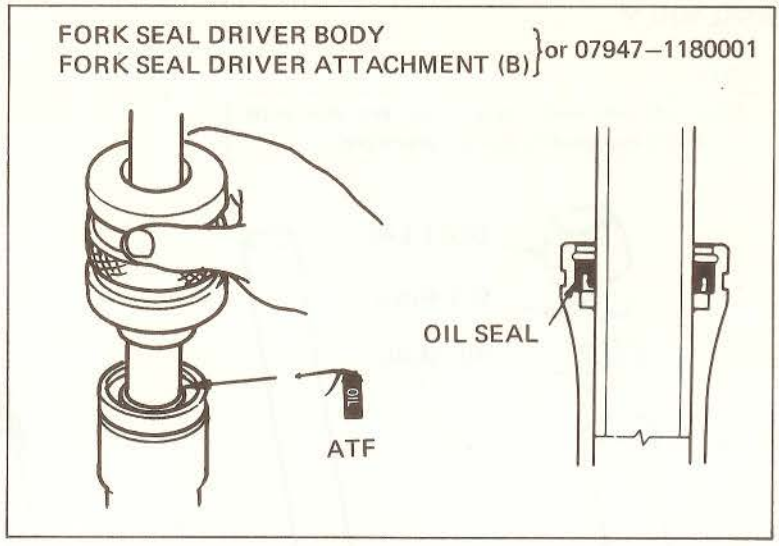
TORQUE: 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)



Install the oil seal into the top of the fork slider.

NOTE

Apply ATF to the oil seal and drive it in with the fork seal driver.
The oil seal is seated when the groove in the slider is seen at top of the seal.



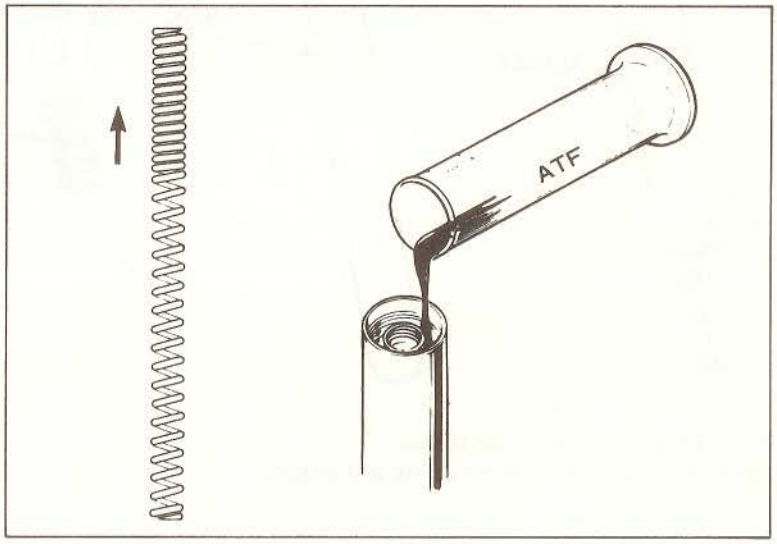
Install the set ring and dust seal.

Fill the forks with the specified amount of ATF.
SPECIFIED FLUID: ATF
CAPACITIES: 75 cc (2.54 oz)

Install the fork spring.

NOTE

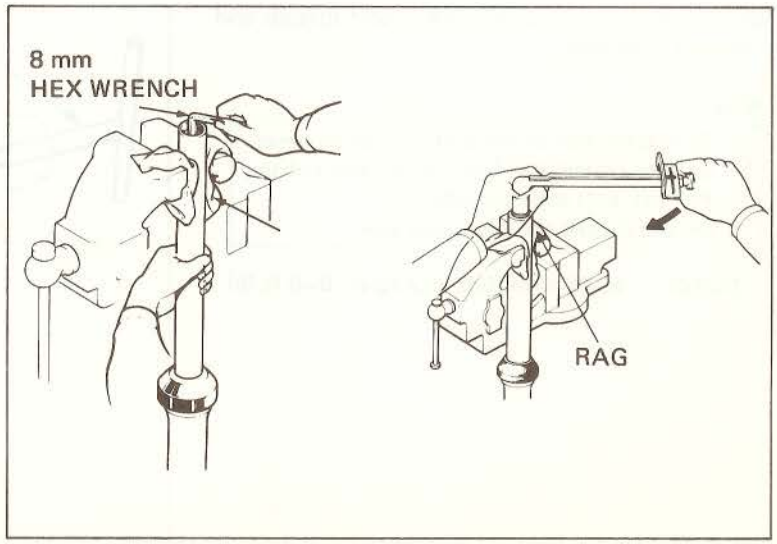
Install the spring with the narrow pitch end facing up.



Install and torque the fork inner bolt.
TORQUE: 34–42 N·m (3.4–4.2 kg-m, 25–30 ft-lb)
Install and torque the fork bolt.
TORQUE: 60–70 N·m (6.0–7.0 kg-m, 43–65 ft-lb)

NOTE

Hold the fork tube in a vise, avoiding the sliding surface.



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INSTALLATION

Install the front forks.
Tighten the top and bottom fork pinch bolts.

TORQUE:

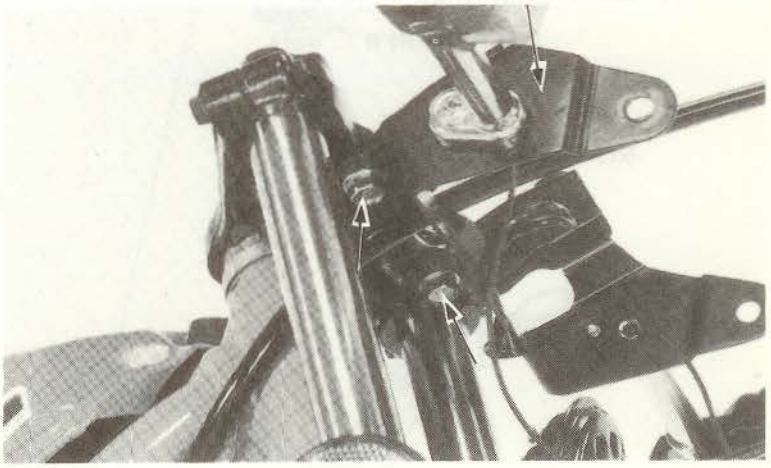
Top pinch bolts	**9–13 N·m (0.9–1.3 kg-m, 7–9 ft-lb)**
Bottom pinch bolts	**20–30 N·m (2.0–3.0 kg-m, 15–22 ft-lb)**

Install the removed parts in the reverse order of removal.

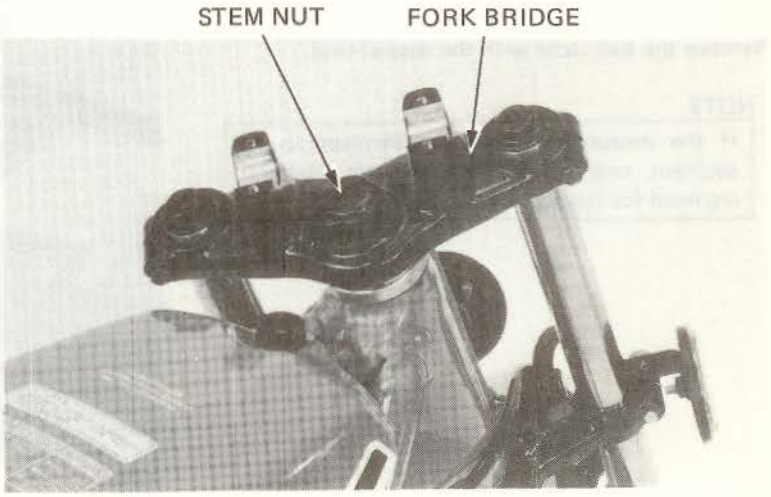
STEERING STEM

REMOVAL

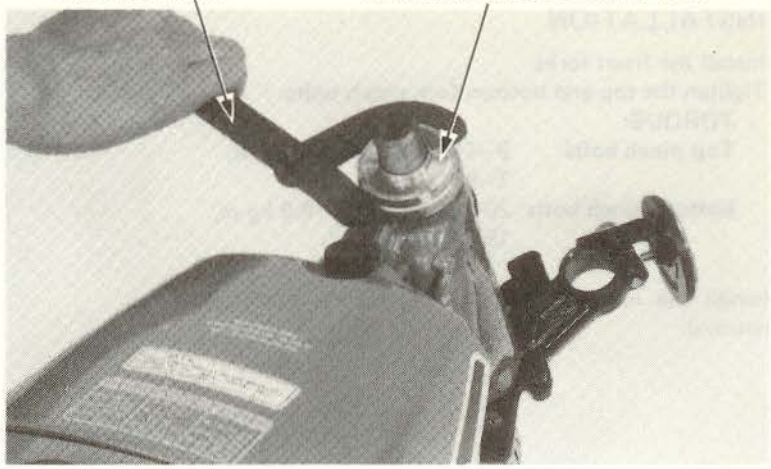
Remove the headlight case (Page 10-3).
Remove the instruments (Page 10-4).
Remove the handlebar (Page 10-5).
Remove the front wheel (Page 10-8).
Remove the headlight case bracket.

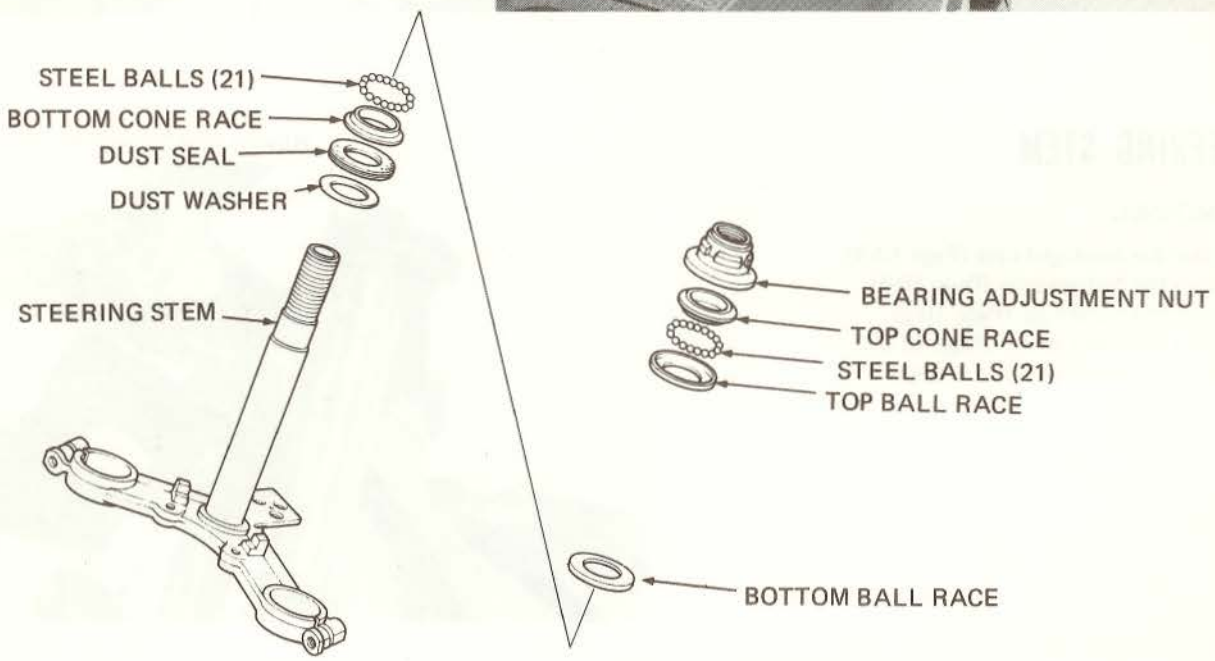


Remove the steering stem nut using a 29 mm socket wrench.
Remove the front forks (Page 10-12).
Remove the fork bridge.



Remove the bearing adjustment nut.
Remove the steering stem, top cone race, steel balls and bottom cone race.

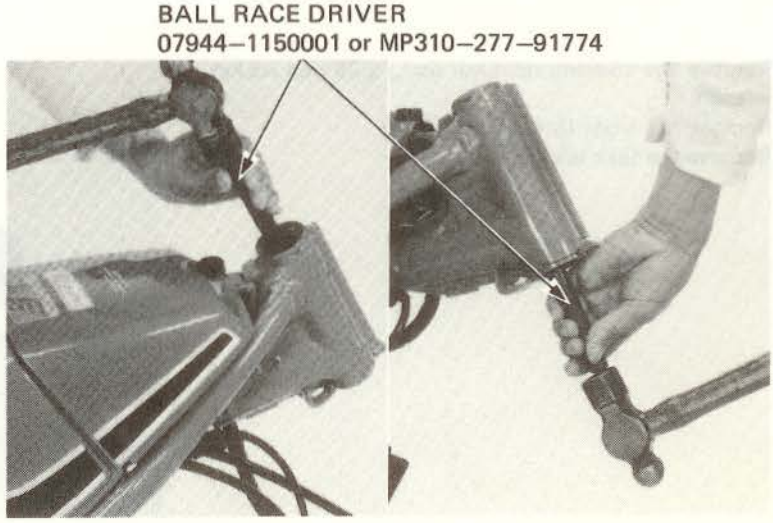




Remove the ball races with the special tool.

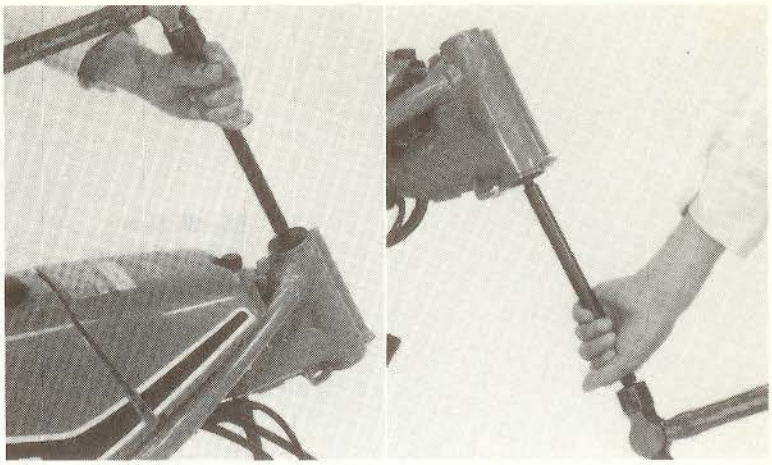
NOTE

If the motorcycle has been involved in an accident, examine the area around the steering head for cracks.



Drive the top and bottom ball races into the head pipe with the same tool, or use the following special tools:

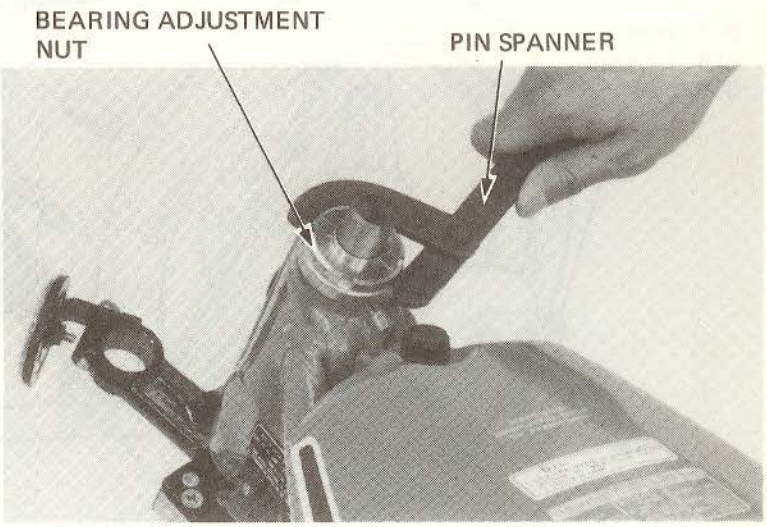
TOP RACE: Use 07945–3330100 and 07749–0010000
BOTTOM RACE: Use 07746–0010200 and 07749–0010000



STEERING STEM INSTALLATION

Install the washer and dust seal.
Grease the ball race, steel balls and cone race.
Install the steering stem.
Install the bearing adjustment nut in the frame neck and tighten it until snug against the top cone race, then back it out 1/8 turn.

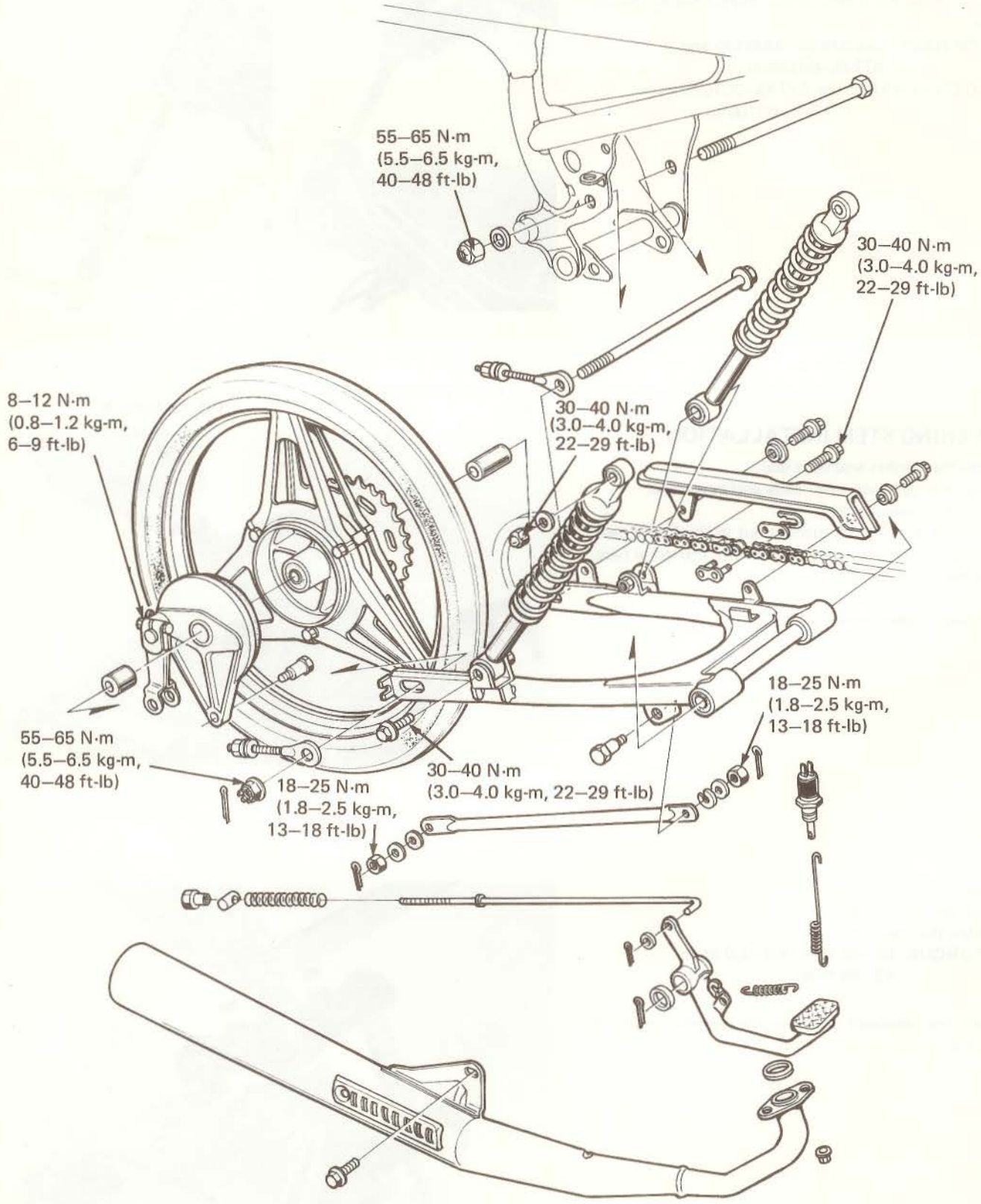
the stem rotates freely.



Install the front forks.
Install the top bridge.
Tighten the stem nut.

TORQUE: 60–90 N·m (6.0–9.0 kg-m, 43–65 ft-lb)

Install the removed parts in the reverse order of removal.



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11. REAR WHEEL/BRAKE/ SUSPENSION

SERVICE INFORMATION

GENERAL INSTRUCTIONS

- Do not remove rivets, nuts and pins from the rim, spoke plate and hub.
- Never ride on the rim or try to bend wheel.

TOOLS

Common	
Shock Compressor	07959–3290001
Attachment 37 x 40 mm	07746–0010200
Driver A	07749–0010000
Pilot 12 mm	07746–0040200

TORQUE VALUES

Final driven sprocket nuts	55–65 N·m (5.5–6.5 kg-m, 40–48 ft-lb)
Rear brake torque link nuts	18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)
Rear axle nut	55–65 N·m (5.5–6.5 kg-m, 40–48 ft-lb)
Rear brake arm bolt	8–12 N·m (0.8–1.2 kg-m, 6– 9 ft-lb)
Rear shock absorber lock nut	15–25 N·m (1.5–2.5 kg-m, 11–18 ft-lb)
Rear shock absorber mounting bolts and nuts	30–40 N·m (3.0–4.0 kg-m, 22–29 ft-lb)
Swingarm pivot bolt	55–65 N·m (5.5–6.5 kg-m, 40–48 ft-lb)

SPECIFICATIONS

ITEM		STANDARD mm (in)		SERVICE LIMIT mm (in)	
Axle runout		———		0.20	(0.008)
Rear wheel rim runout	Radial	———		2.0	(0.08)
	Axial	———		2.0	(0.08)
Rear brake drum I.D.		110.0	(4.33)	111.0	(4.37)
Rear brake lining thickness		4.0	(0.16)	2.0	(0.08)
Rear shock absorber spring free length		179.7	(7.07)	176.1	(6.93)

TROUBLESHOOTING

Wobble or vibration
1. Distorted rim
2. Loose wheel bearing
3. Distorted spoke
4. Faulty tire
5. Loose axle
6. Worn swingarm bushing
7. Loose swingarm pivot bolt

Soft suspension
1. Weak spring
2. Shock absorbers improperly adjusted

Hard suspension
1. Shock absorbers improperly adjusted

Suspension noise
1. Shock case binding
2. Loose fasteners

Poor brake performance
1. Brake not adjusted properly
2. Worn brake linings
3. Contaminated brake linings
4. Worn brake cam
5. Worn brake drum
6. Brake arm not properly installed
7. Worn brake shoes at cam contacting faces

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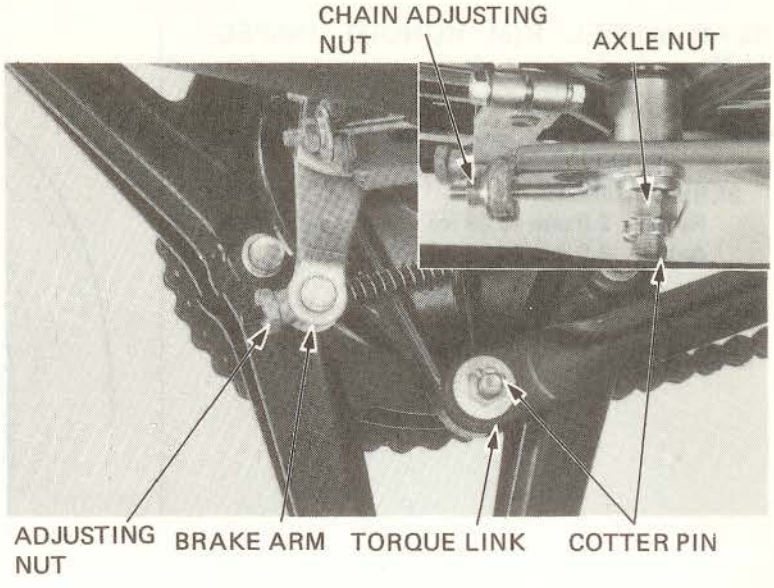
REAR WHEEL

REMOVAL

Remove the brake rod.
Remove the cotter pin and disconnect the torque link.

Remove the cotter pin and axle nut.
Loosen the lock nut and chain adjusting nut.

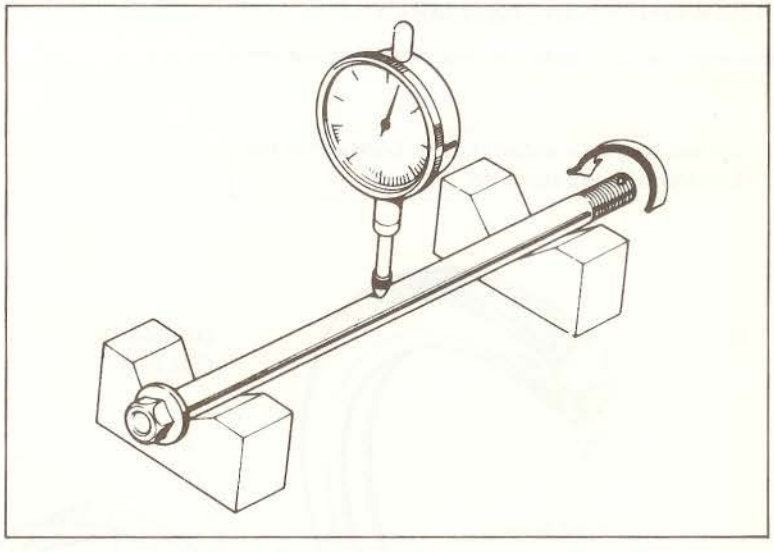
Withdraw the axle and remove the rear wheel.



AXLE INSPECTION

Set the axle in V blocks and read the axle bend.
The actual axle bend is 1/2 of the total indicator reading.

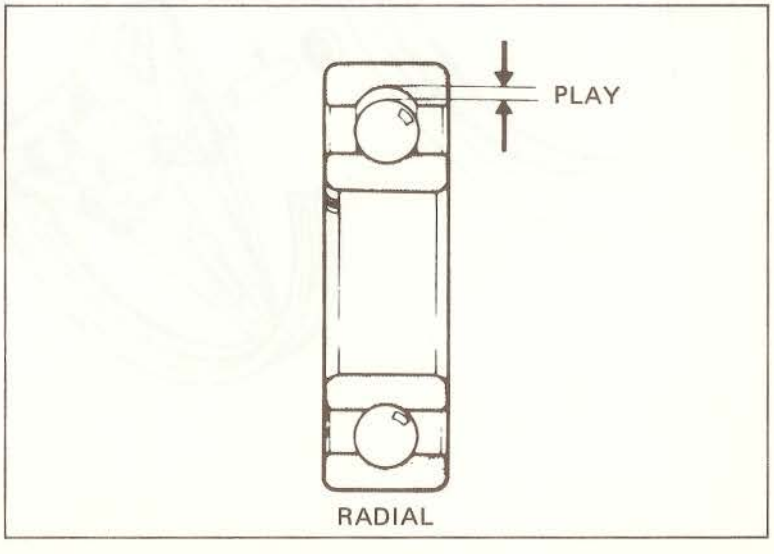
SERVICE LIMIT: 0.20 mm (0.008 in)



REAR WHEEL BEARING PLAY INSPECTION

Check the wheel bearing play by rotating the wheel by hand. Replace the bearings with new ones if they are noisy or have excessive play.

SERVICE LIMIT: 0.027 mm (0.0010 in)



REAR WHEEL RIM RUNOUT INSPECTION

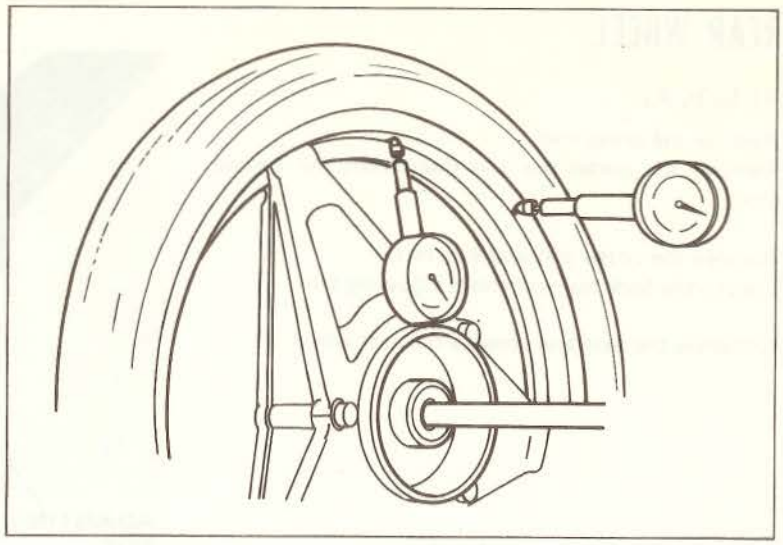
Check the rim for runout by placing the wheel in a truing stand. Spin the wheel by hand and read the runout using a dial indicator gauge.

SERVICE LIMITS:

Radial: 2.0 mm (0.08 in)
Axial: 2.0 mm (0.08 in)

NOTE

Do not attempt to repair the spokes.

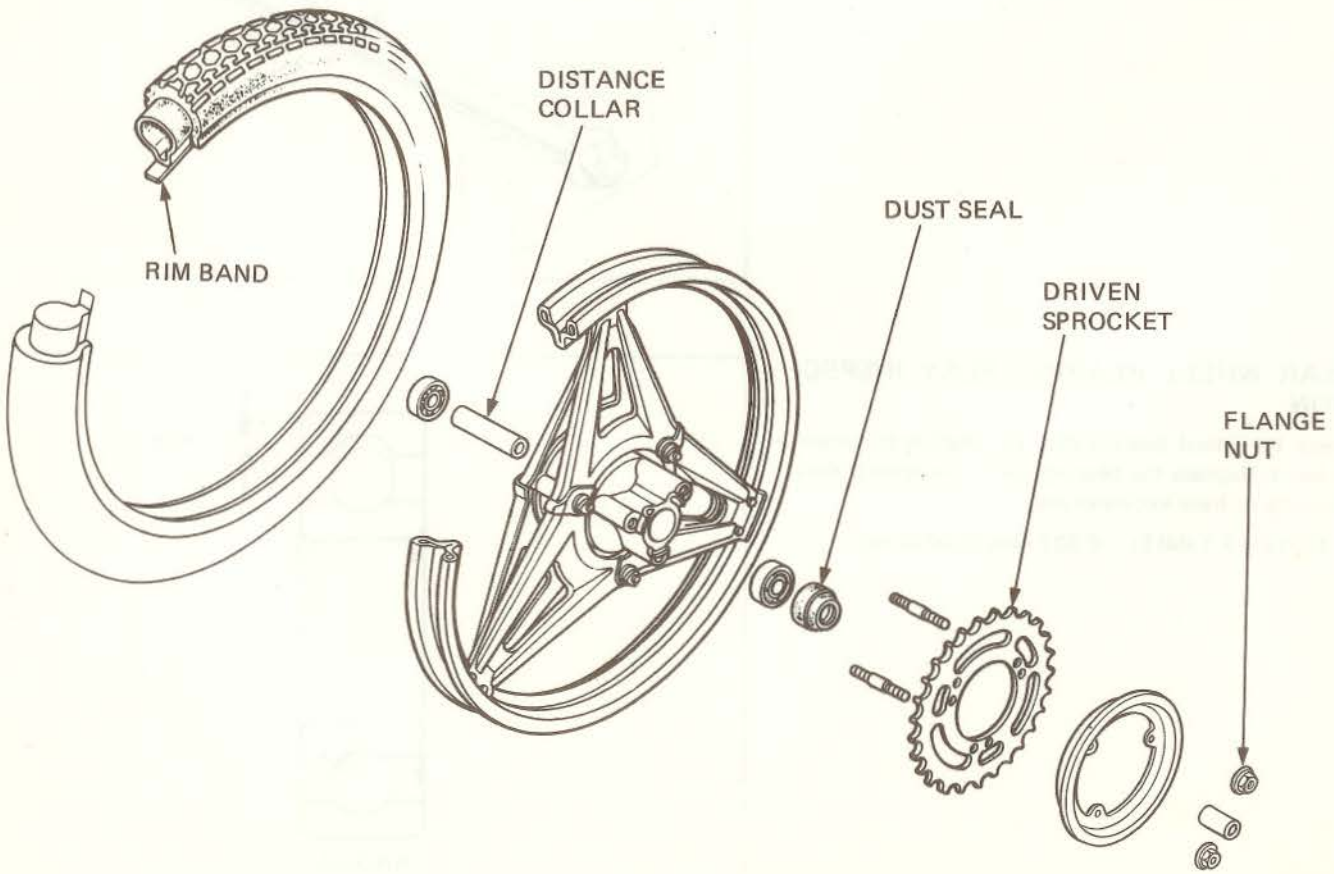


REAR WHEEL DISASSEMBLY

Remove the dust seal, bearings and distance collar.

NOTE

Do not forget to install the rim band when the tire and tube are replaced.



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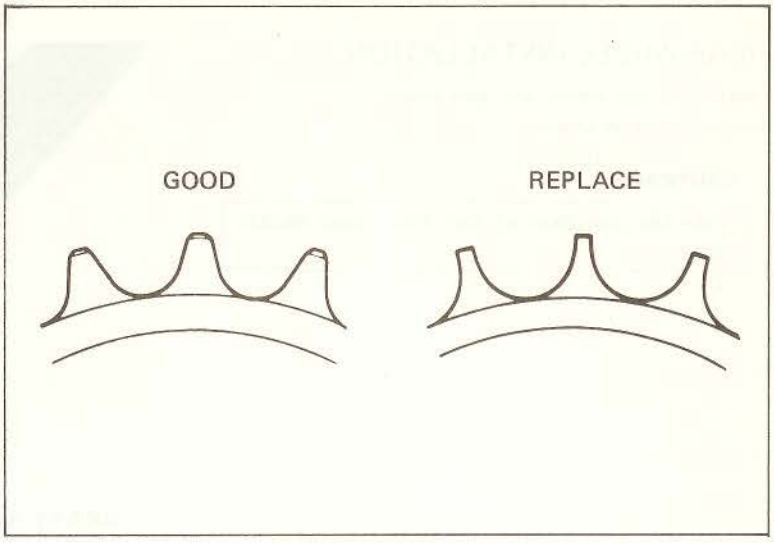
FINAL DRIVEN SPROCKET INSPECTION

Check the final driven sprocket for worn or damaged gear teeth.

NOTE

The drive chain and drive sprocket must also be inspected if the driven sprocket is worn.



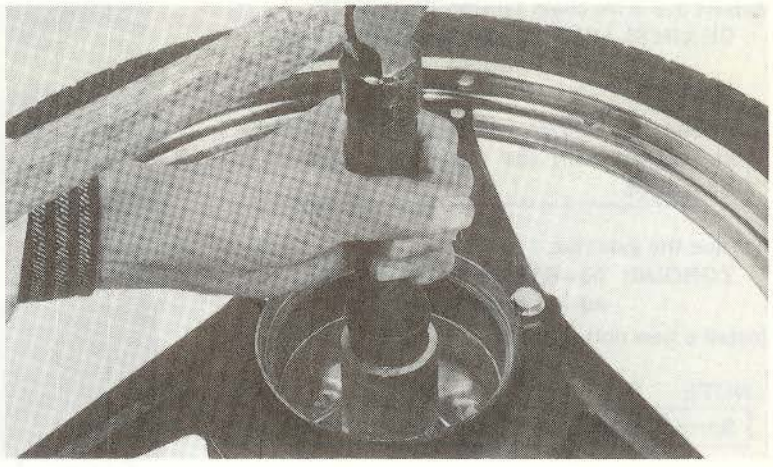
REAR WHEEL BEARING INSTALLATION

Pack all bearing cavities with grease.
Drive in the left bearing.
Insert the distance collar.
Drive in the right bearing.
Coat the inside of the dust seal with grease and install.

NOTE

- Drive in the bearings squarely.
- Install the bearings with the sealed end facing outside.

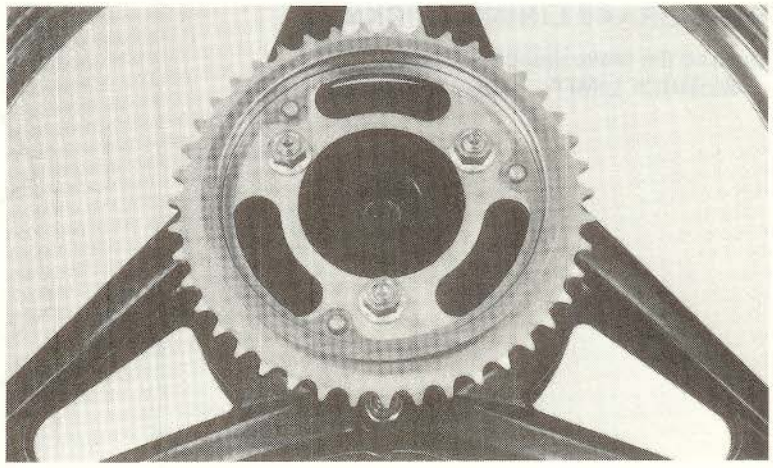
ATTACHMENT 37 x 40 mm
DRIVER A
PILOT 12 mm



FINAL DRIVEN SPROCKET INSTALLATION

Install the final driven sprocket with the chamfered end on the brake drum side.

TORQUE: 55–65 N·m (5.5–6.5 kg-m, 40–48 ft-lb)

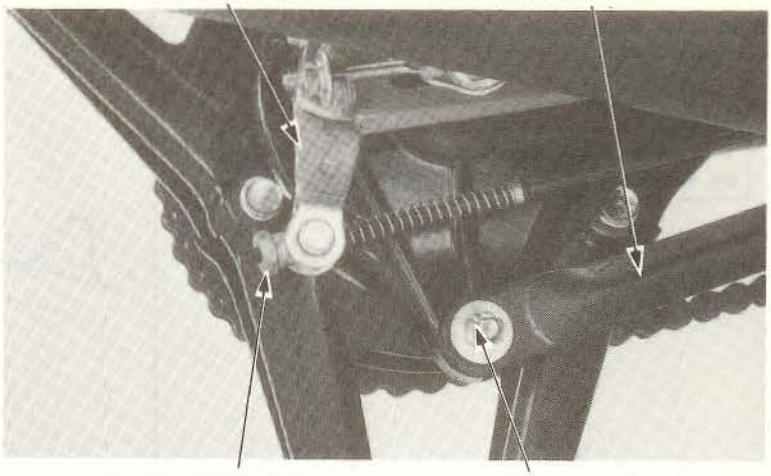


REAR WHEEL INSTALLATION

Install the rear wheel and axle shaft.
Install the drive chain.

CAUTION

Note the direction of the drive chain master link.



Install the brake rod and brake torque link.
TORQUE: 18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)
Adjust the drive chain tension (Page 3-10).
CHAIN SLACK: 10–20 mm (3/8–3/4 in)

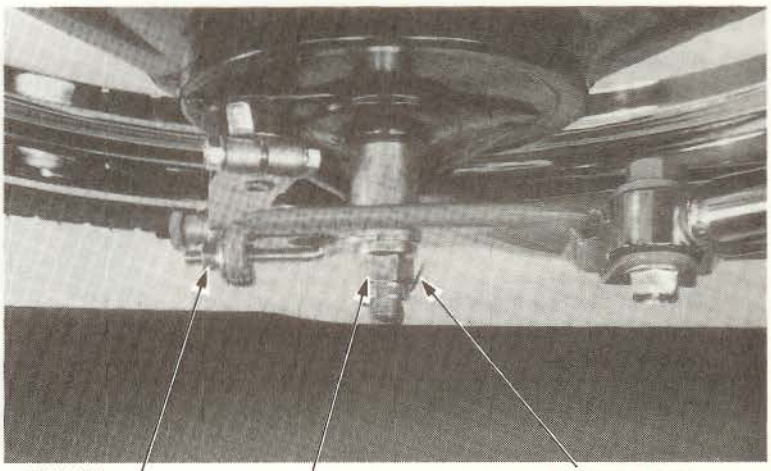
CAUTION

Rotate the adjusters so that the index marks are aligned with the same scale number on both sides.

Torque the axle nut.
TORQUE: 55–65 N·m (5.5–6.5 kg-m, 40–48 ft-lb)
Install a new cotter pin.

NOTE

Spread the ends of the cotter pin as shown.

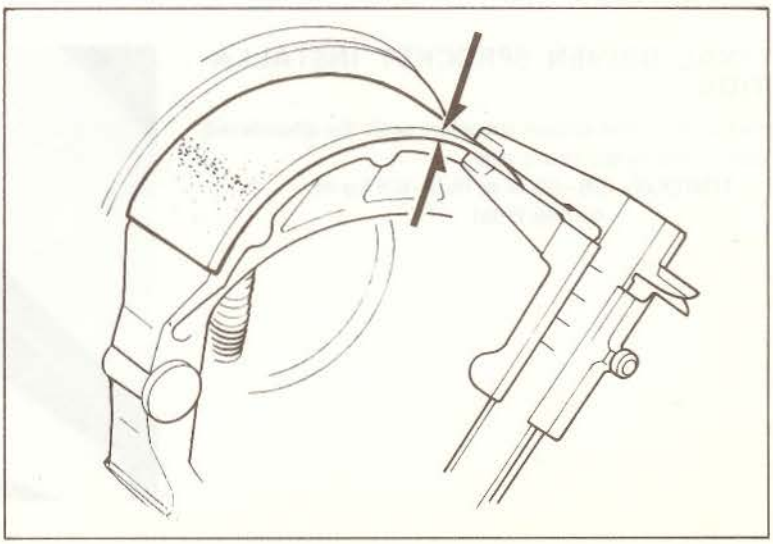


Lubricate the drive chain (Page 3-11).

REAR BRAKE

REAR BRAKE LINING THICKNESS

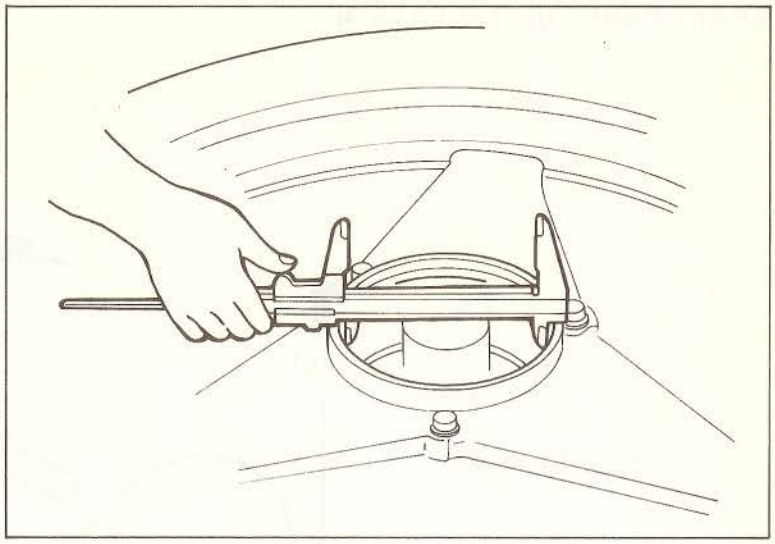
Measure the brake lining thickness.
SERVICE LIMIT: 2.0 mm (0.08 in)



REAR BRAKE DRUM INSPECTION

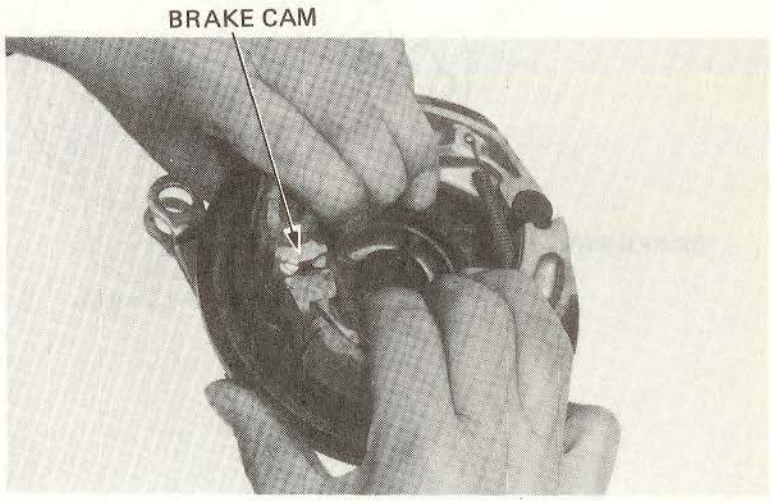
Measure the rear brake drum I.D.

SERVICE LIMIT: 111.0 mm (4.37 in)



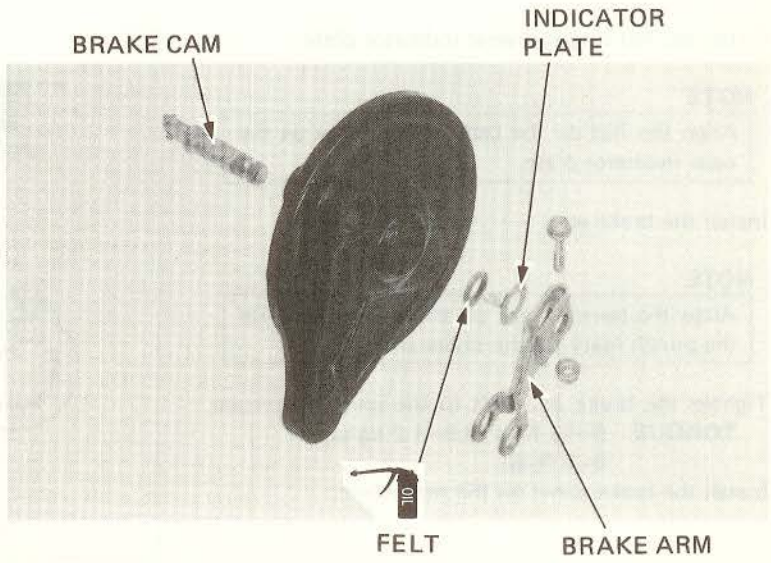
REAR BRAKE SHOE REPLACEMENT

Remove the brake shoes.
Replace the brake shoes with new ones.

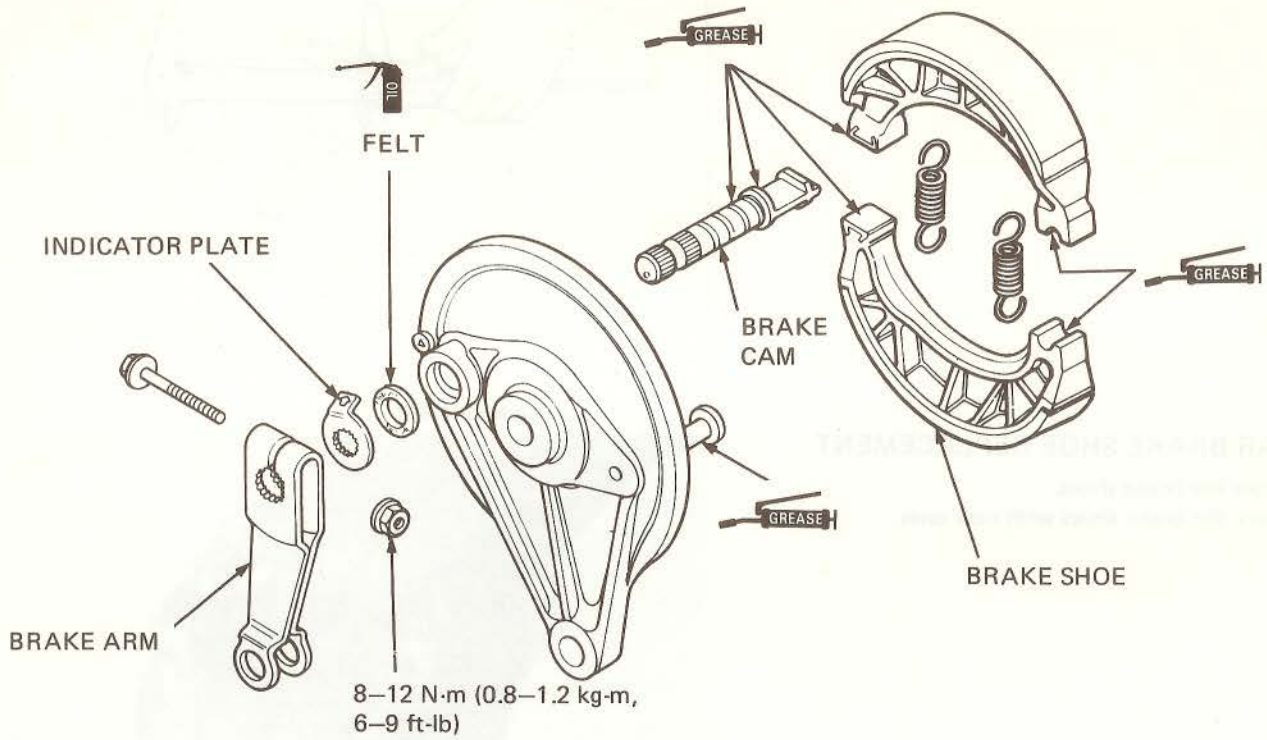


BRAKE CAM INSPECTION

Remove the brake arm.
Remove the indicator plate.
Remove the brake cam.
Remove the felt ring.
Clean the shoe contacting faces of the brake cam.



BRAKE PANEL INSTALLATION



Install the felt ring and wear indicator plate.

NOTE

Align the flat on the cam with the flat on the wear indicator plate.

Install the brake arm.

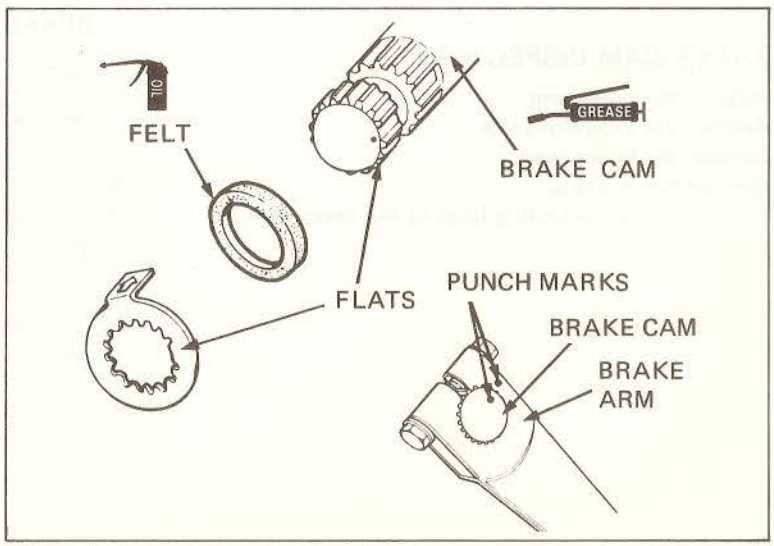
NOTE

Align the punch mark on the brake cam with the punch mark on the brake arm.

Tighten the brake arm bolt to the specified torque.

TORQUE: 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)

Install the brake panel on the rear wheel.



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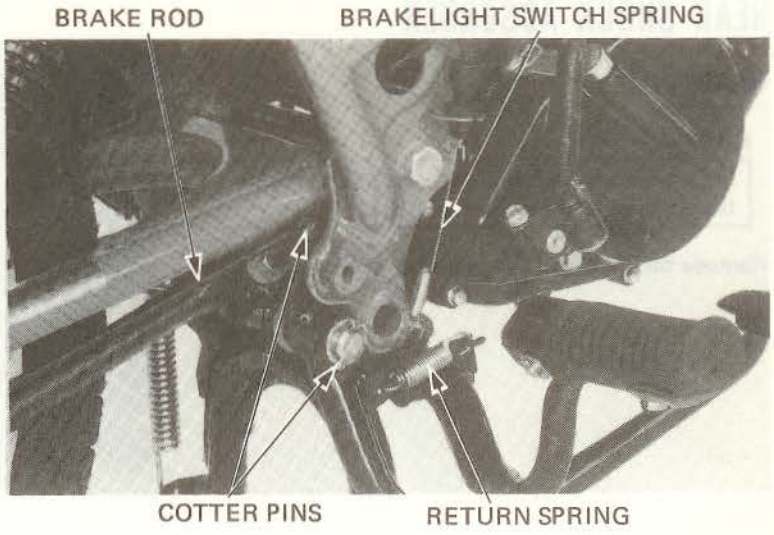
BRAKE PEDAL

Remove the exhaust pipe.
Remove the brake rod.
Remove the brakelight switch spring.
Remove the return spring.
Remove the cotter pin, then remove the brake pedal.

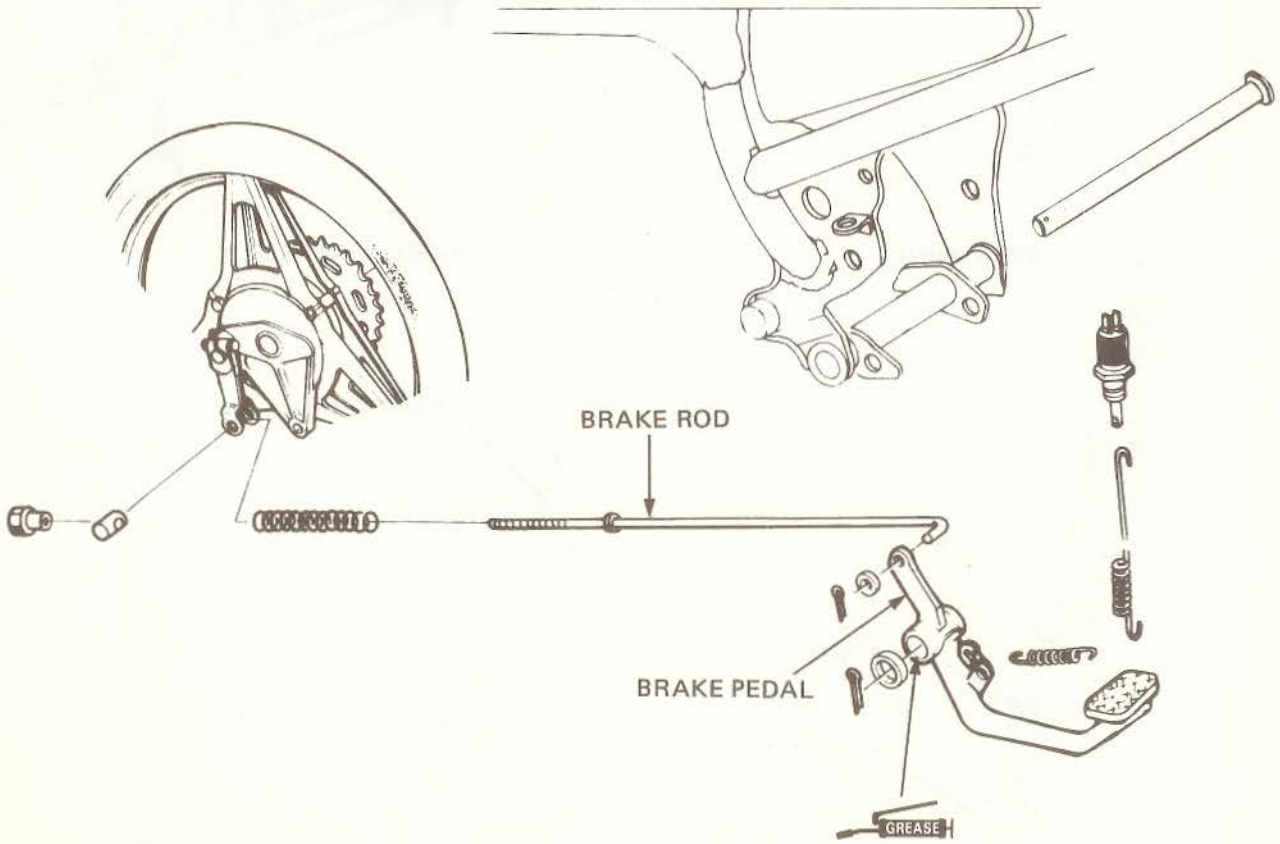


Assembly of the brake pedal is essentially the reverse order of removal.

CAUTION

Before installing the brake pedal, apply grease to the sliding surface.

Adjust the brake pedal free play (Page 3-8).



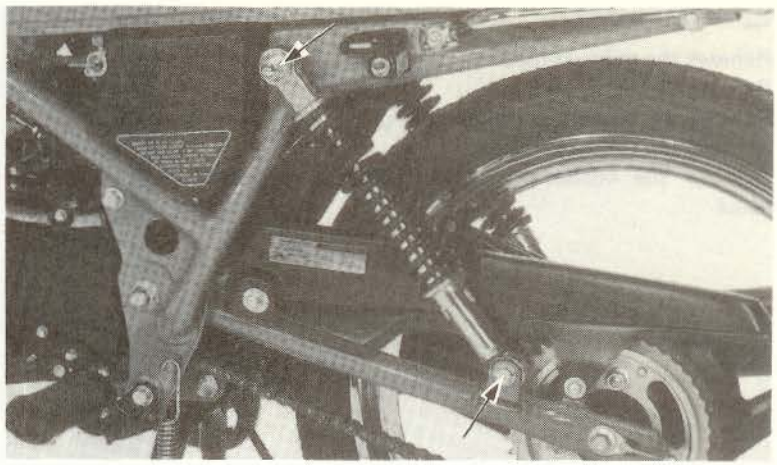
REAR SHOCK ABSORBER

REMOVAL

NOTE

Before removing the shock absorbers, rotate the adjuster to the softest position.

Remove the right and left rear shock absorbers.

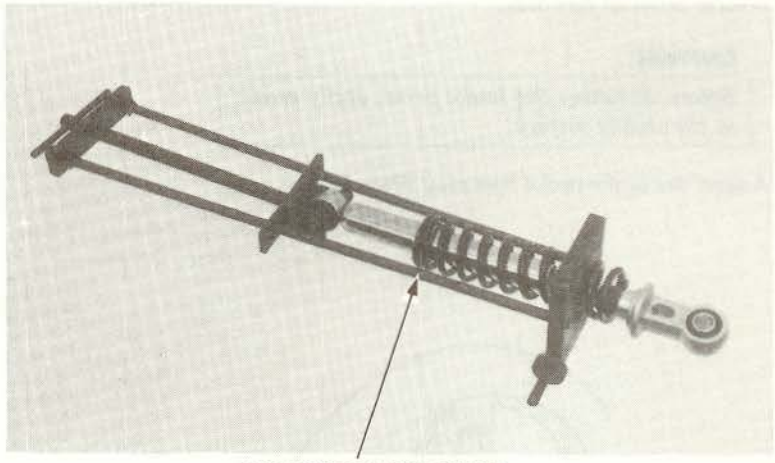


DISASSEMBLY

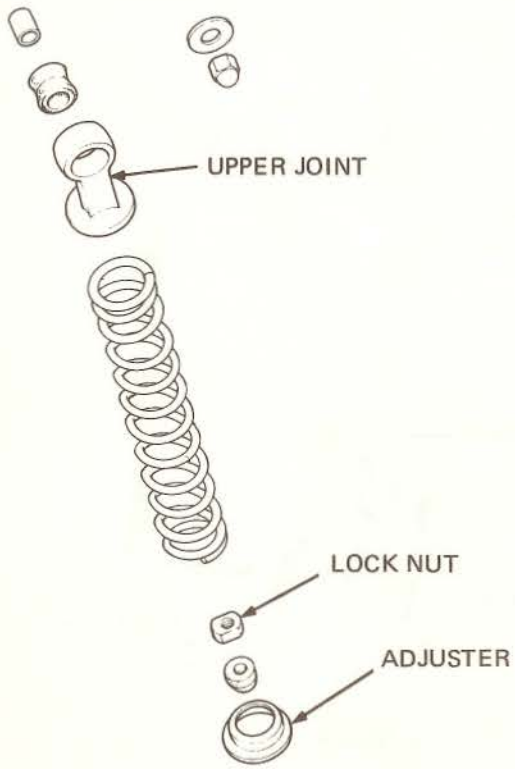
NOTE

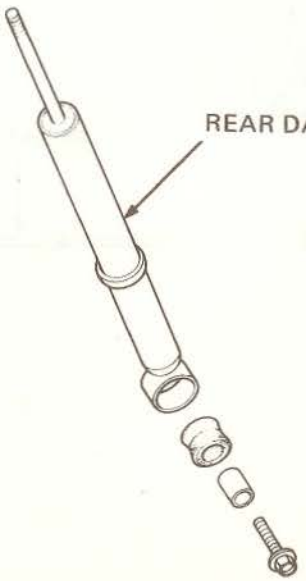
Before disassembling the shock absorbers, rotate the adjuster to the softest position.

Remove the upper joint.



SHOCK COMPRESSOR





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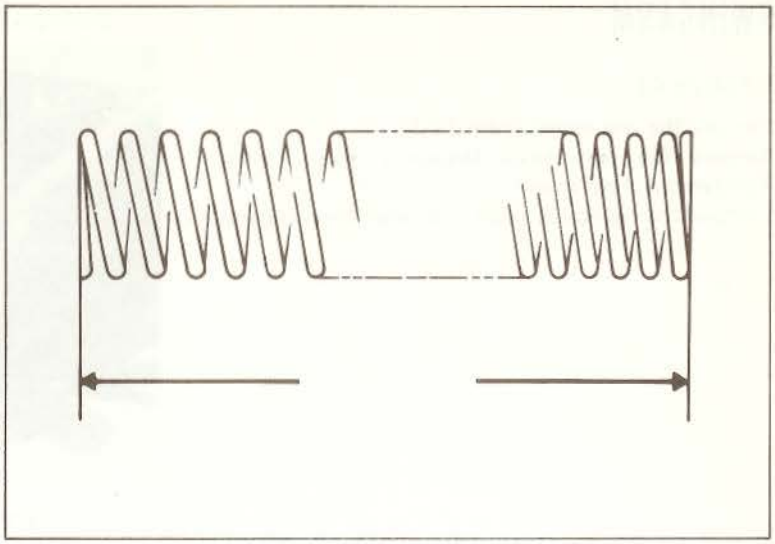
SPRING FREE LENGTH

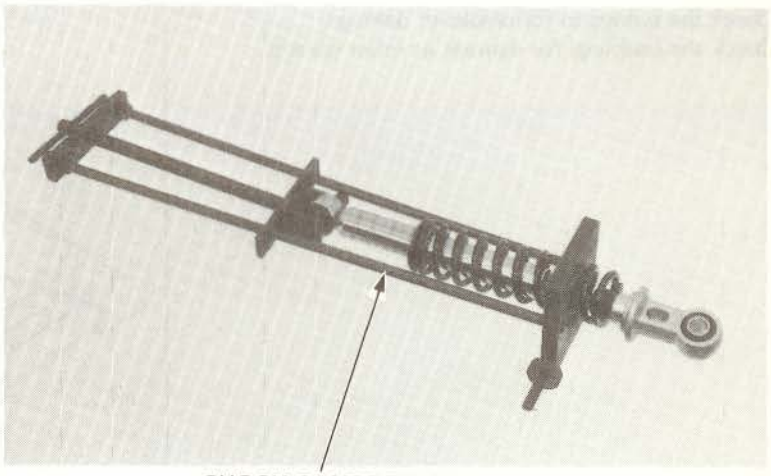
Measure the spring free length.

SERVICE LIMIT: 176.1 mm (6.93 in)



ASSEMBLY

Apply locking agent to the lock nut threads.



SHOCK COMPRESSOR

INSTALLATION

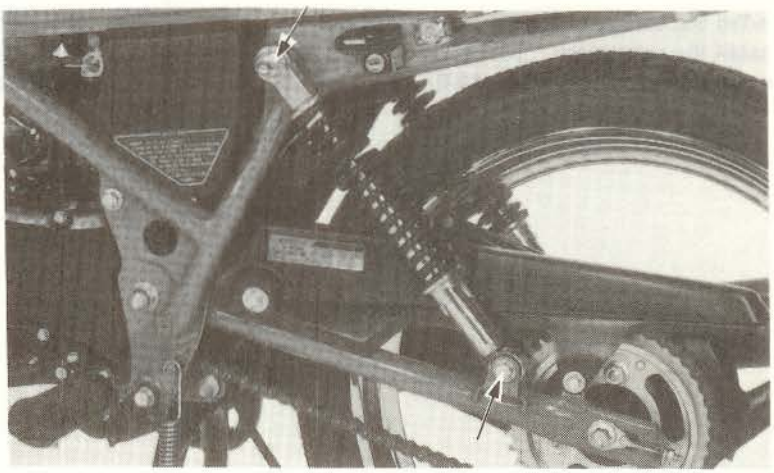
Install the right and left rear shock absorbers.
Torque the nuts and bolts.

TORQUE: 30–40 N·m
(3.0–4.0 kg-m, 22–29 ft-lb)

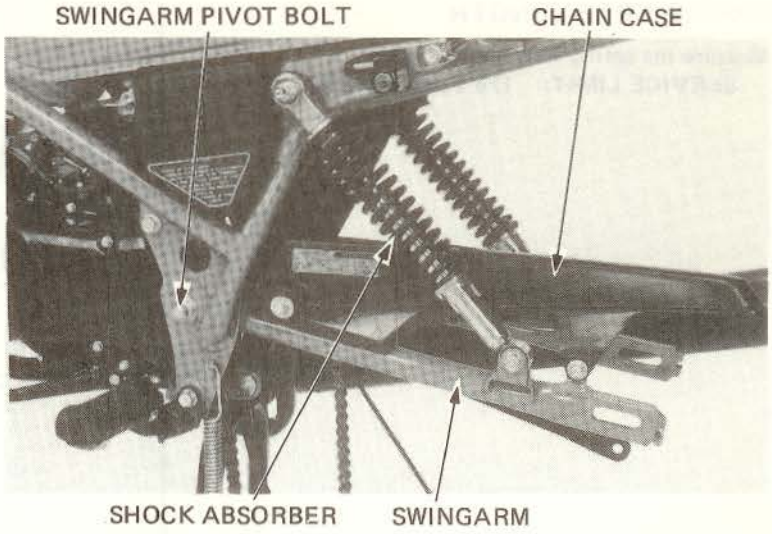
Check the operation of the shock absorbers by pressing down on the end of the frame several times by hand.

NOTE

Install the joints with the cutout end facing inside.



SWINGARM

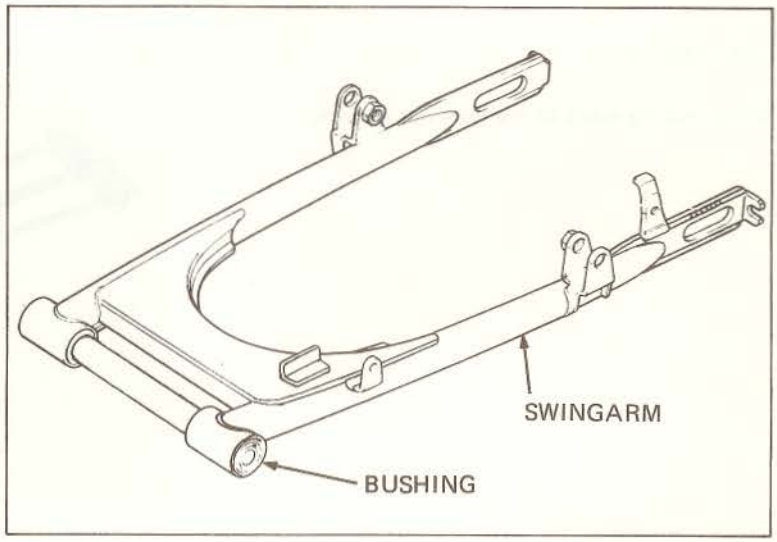


REMOVAL

Remove the rear wheel (Page 11-3).
Remove the rear shock absorbers (Page 11-10).
Remove the chain cover.
Remove the swingarm pivot bolt and the swingarm.

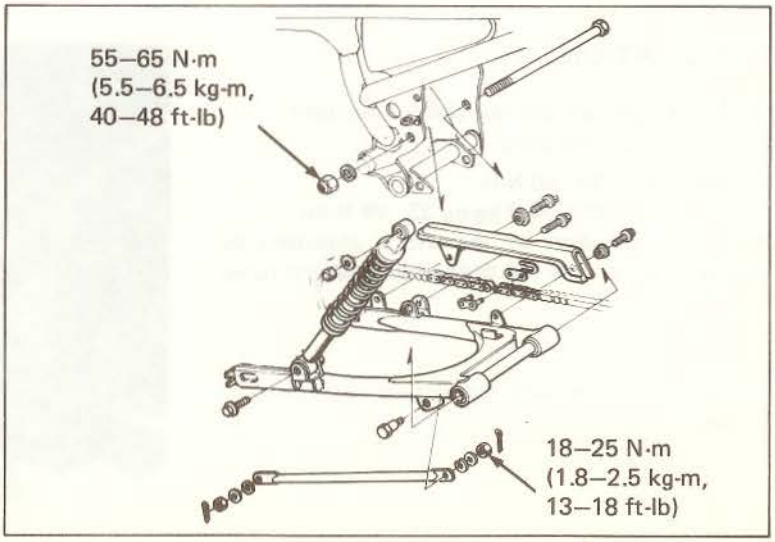
INSPECTION

Check the swingarm for cracks or damage.
Check the bushings for damage or other defects.



INSTALLATION

Install the torque link on the swingarm.
Install the swingarm.
Install the rear wheel (Page 11-6).



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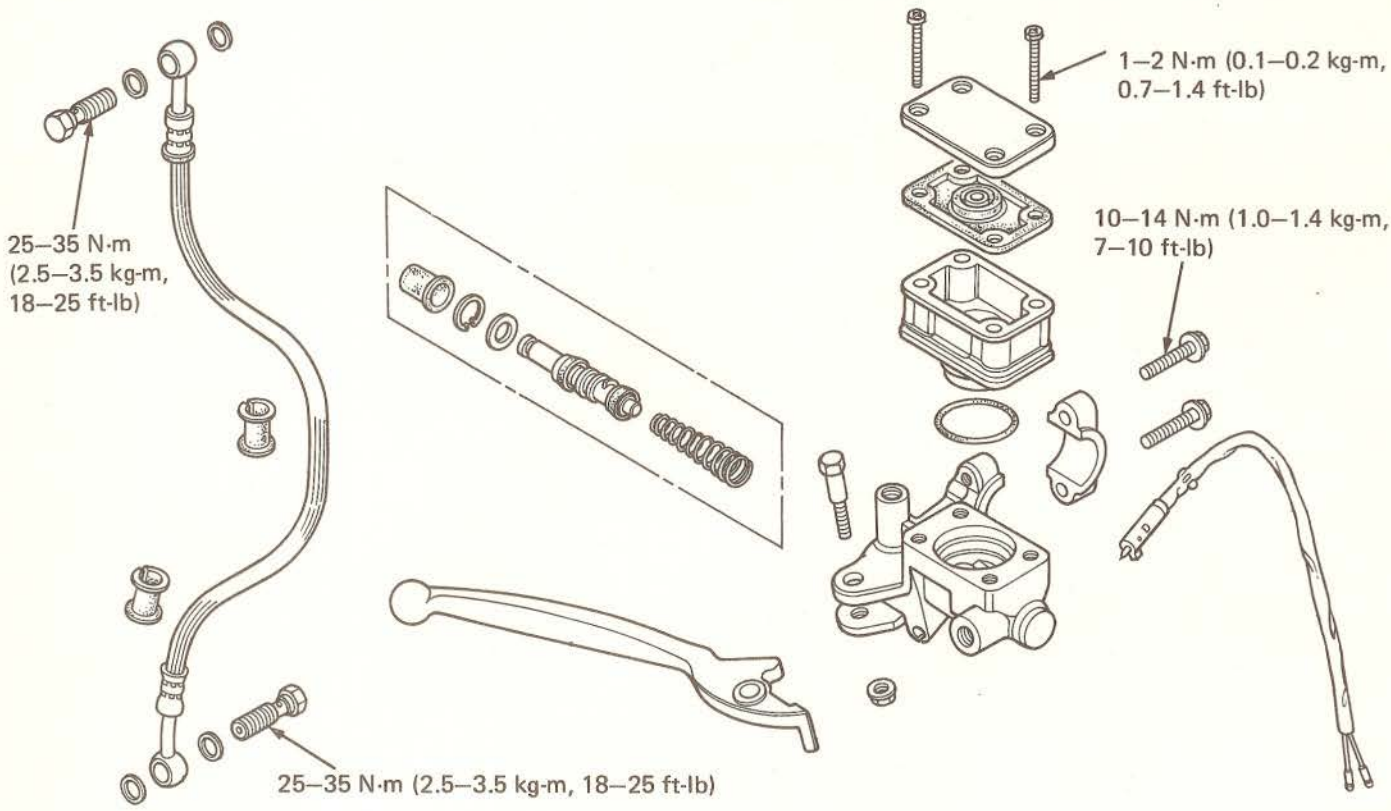
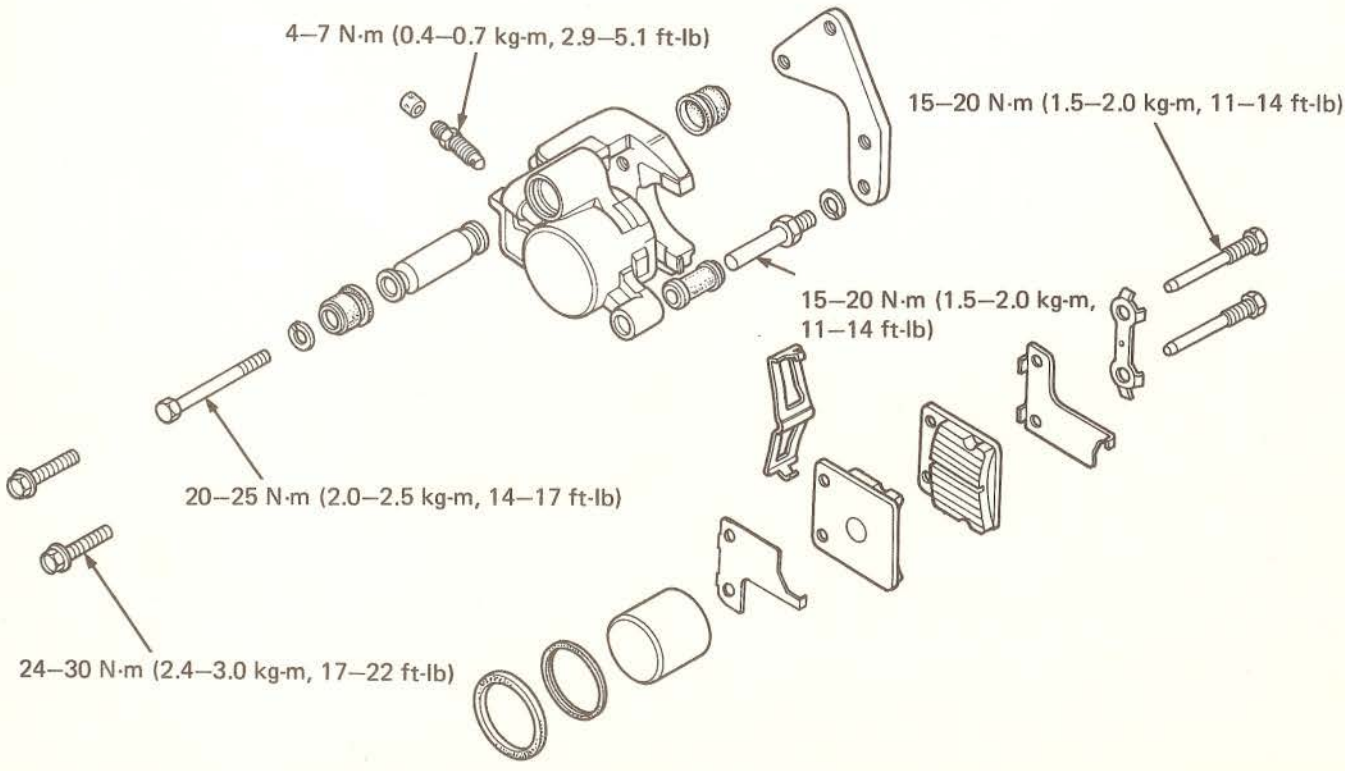
MEMO





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12. HYDRAULIC BRAKE

SERVICE INFORMATION

GENERAL INSTRUCTIONS

- The front brake pads can be replaced without disconnecting the brake hose. Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- The brake caliper should be disassembled before the master cylinder is disassembled.
- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling brake fluid on painted surfaces or instrument lenses, as severe damage will result.

TOOL

Special Snap Ring Pliers	07914–3230001

TORQUE VALUES

Brake fluid reservoir cap screws	1– 2 N·m (0.1–0.2 kg-m, 0.7–1.4 ft-lb)
Master cylinder mounting bolts	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
Brake hose bolts	25–35 N·m (2.5–3.5 kg-m, 18–25 ft-lb)
Bleeder valve	4– 7 N·m (0.4–0.7 kg-m, 2.9–5.1 ft-lb)
Brake pad pin bolts	15–20 N·m (1.5–2.0 kg-m, 11–14 ft-lb)
Brake caliper pin bolt	15–20 N·m (1.5–2.0 kg-m, 11–14 ft-lb)
Brake caliper bracket bolt	20–25 N·m (2.0–2.5 kg-m, 14–17 ft-lb)
Brake caliper bracket bolts	24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)

SPECIFICATIONS

ITEM	STANDARD mm (in)		SERVICE LIMIT mm (in)	
Disc thickness	3.80–4.20	(0.150–0.165)	3.0	(0.12)
Disc runout	0–0.15	(0–0.006)	0.3	(0.01)
Master cylinder I.D.	12.700–12.743	(0.5000–0.5017)	12.755	(0.5022)
Master piston O.D.	12.657–12.684	(0.4983–0.4994)	12.640	(0.4976)
Caliper cylinder I.D.	30.230–30.280	(1.1902–1.1921)	30.290	(1.1925)
Caliper piston O.D.	30.148–30.198	(1.1869–1.1889)	30.140	(1.1866)

TROUBLESHOOTING

Poor brake performance

1. Air bubbles in hydraulic system
2. Worn brake pads
3. Pads fouled or glazed
4. Hydraulic system leaking

BRAKE FLUID/AIR BLEEDING

Check the front brake lever free play. If the play is excessive, check the brake pad for wear and bleed air from the brake hydraulic system.

Remove the cap from the reservoir by removing the attaching screws. Remove the diaphragm.

CAUTION

Avoid spilling fluid on painted surfaces, plastic lenses or rubber parts as it can cause damage to them.

Fill the brake fluid reservoir up to the UPPER LEVEL mark.

CAUTION

Do not mix different brands of fluid since they are not compatible.
SPECIFIED BRAKE FLUID:
DISC BRAKE FLUID DOT 3

Connect an extension tube to the bleeder valve with the open end submerged in a glass jar.
With the brake lever pulled all the way back to the handlebar grip, turn the bleeder valve about 1/2 rotation out, then retighten.

NOTE

Do not release the brake lever until the bleeder valve has been closed.

Release the brake lever gradually and wait several seconds after it reaches the end of its travel.
Repeat the above steps until there are no air bubbles in the fluid flowing out of the bleeder valve.

NOTE

- Keep the reservoir filled while bleeding the system.
- Do not reuse brake fluid.

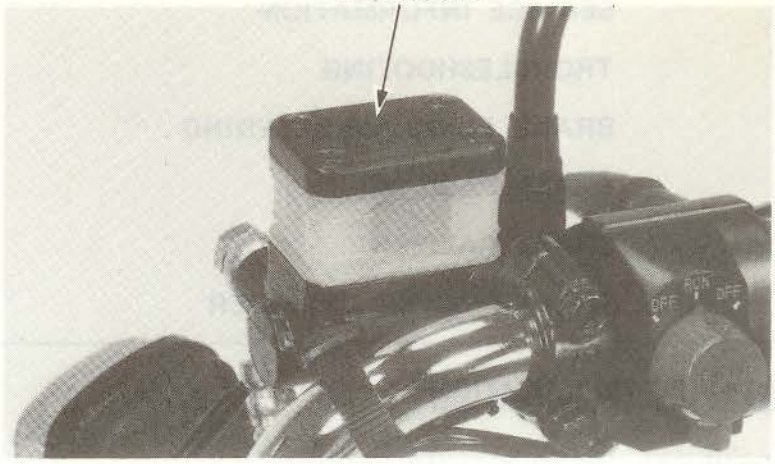
Clese the bleeder valve.
TORQUE: 4–7 N·m (0.4–0.7 kg-m, 2.9–5.1 ft-lb)

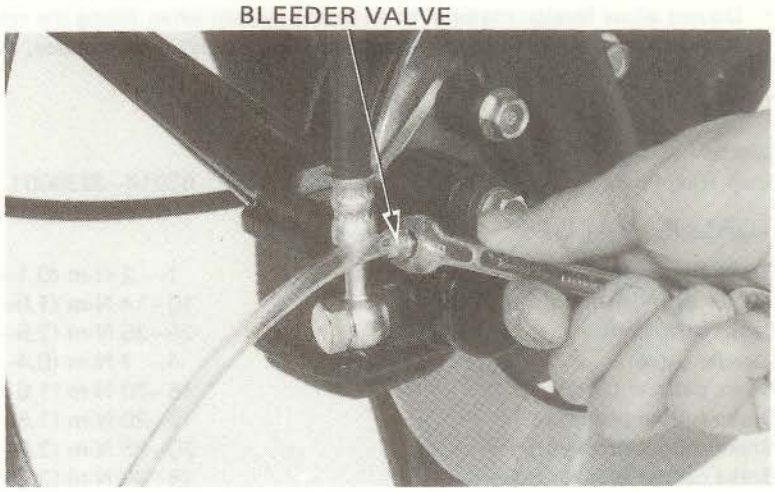
Fill the reservoir up to the UPPER FLUID LEVEL.

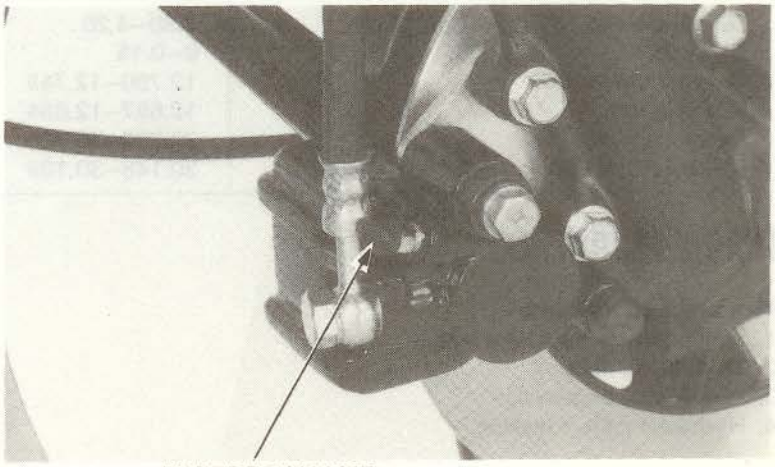
Check the entire system for leaks by operating the lever.

WARNING

A contaminated brake disc or pads reduces stopping power. Replace contaminated pads, and clean a contaminated disc with a good quality degreasing agent.



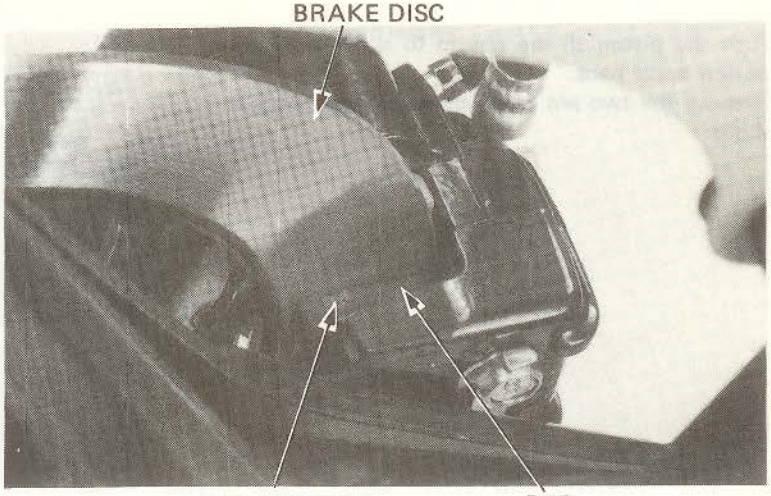




BRAKE PAD/DISC

BRAKE PAD INSPECTION

The front brake pads require replacement if the red groove in the sides of the pads reaches the edges of the brake disc.

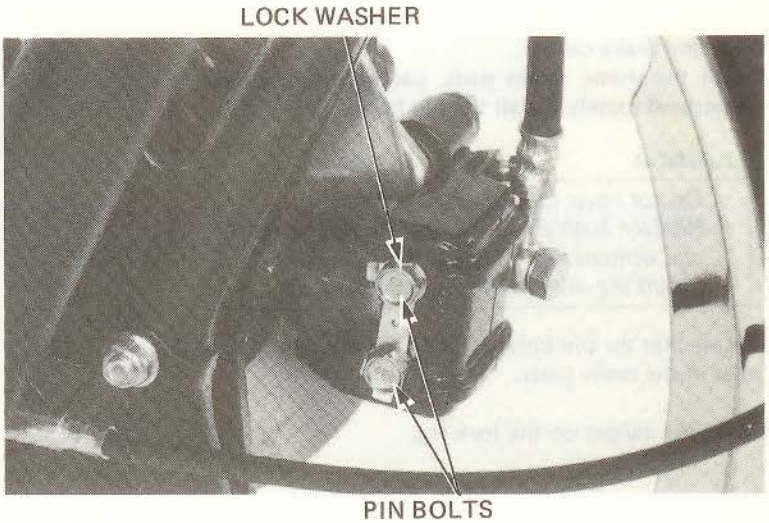


BRAKE PAD REPLACEMENT

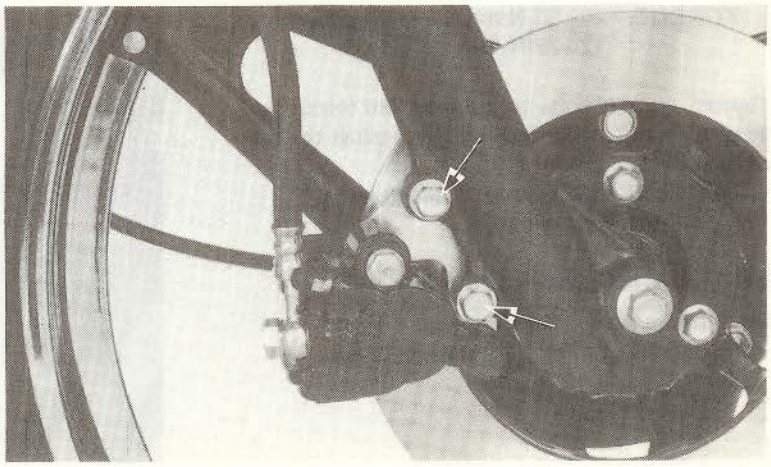
NOTE

Do not disconnect the brake hose when replacing the brake pads.

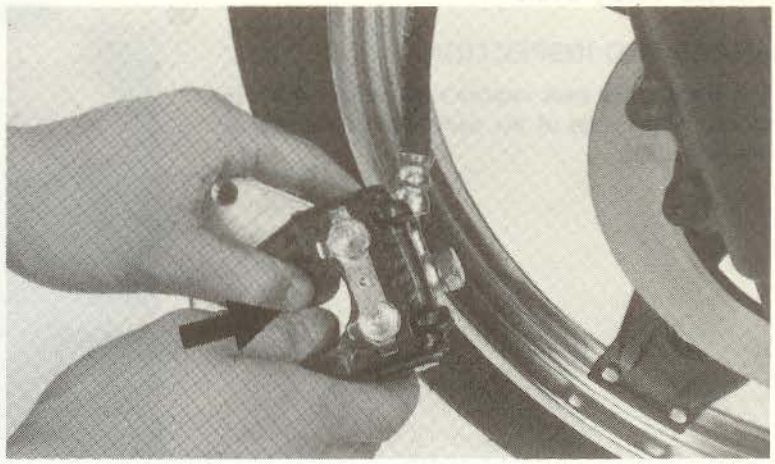
Straighten the tabs of the lock washer and loosen the pin bolts.



Remove the two caliper bolts and remove the caliper from the fork leg.



Push the piston all the way in to allow installation of new brake pads.
Remove the two pin bolts, then the brake pads and shims.



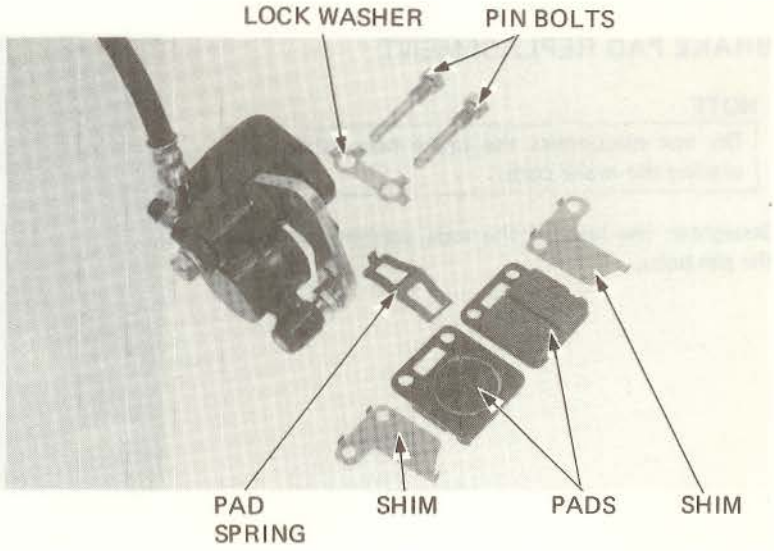
Clean the brake caliper.
Install the shims, brake pads, pad spring and lock washer and loosely install the pin bolts.

CAUTION

- *Do not reuse the old lock washer.*
- *Replace both pads as a set. Do not replace one without replacing another.*
- *Install the shim on the back of the pad.*

Ensure that the pin bolts are inserted throuth the holes in the brake pads.

Install the caliper on the fork leg.



TORQUE: 24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)

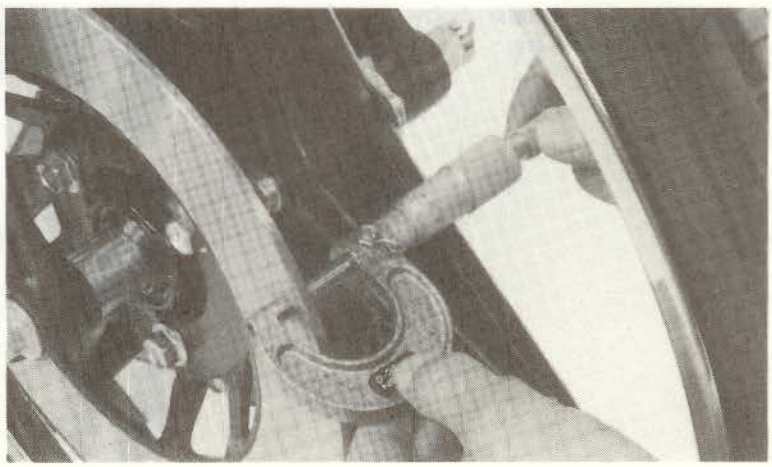
Tighten the pin bolts to the specified torque and bend the tabs of the lock washer against the side of each bolt.

TORQUE: 15–20 N·m (1.5–2.0 kg-m, 11–14 ft-lb)

BRAKE DISC INSPECTION

Measure the brake disc thickness.

SERVICE LIMIT: 3.0 mm (0.12 in)



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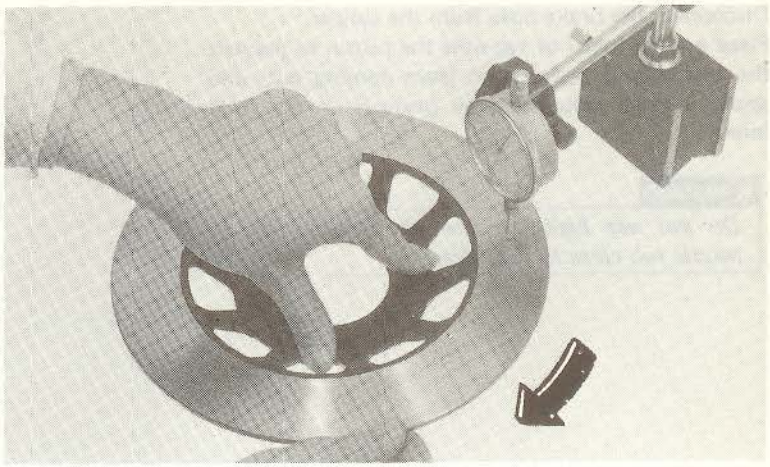
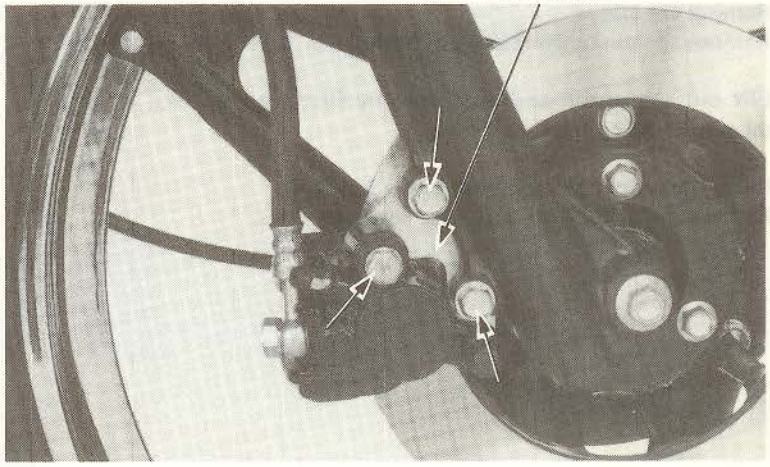
Measure the brake disc warpage.
SERVICE LIMIT: 0.3 mm (0.01 in)



BRAKE CALIPER

REMOVAL

Straighten the tabs of the lock washer and loosen the pin bolts.
Loosen the caliper bracket bolts.
Remove the two bolts attaching the caliper and remove the caliper from the fork leg.
Remove the bracket from the caliper.



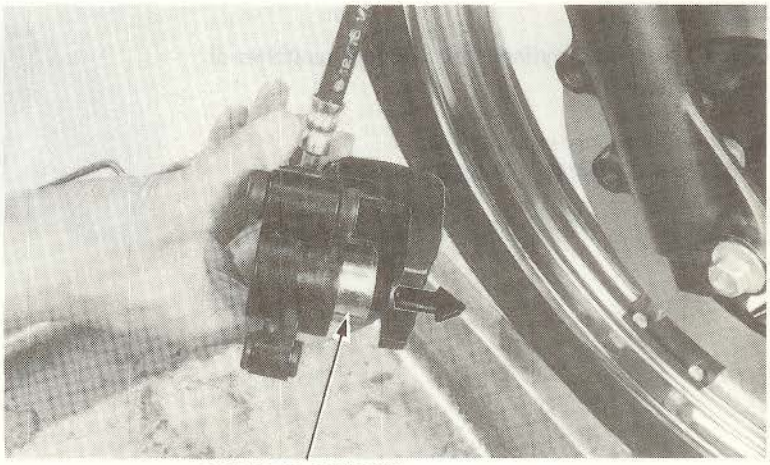
DISASSEMBLY

Remove the pads, shims and spring by removing the pin bolts.

Operate the brake lever to force the piston out of the cylinder.

NOTE
- Place an oil pan under the caliper to receive brake fluid drained.
- Avoid spilling brake fluid on painted surfaces, plastic lenses or rubber parts.

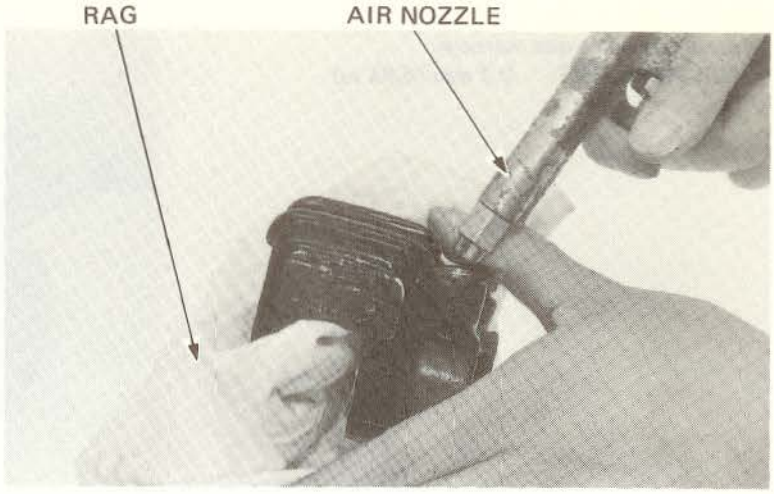
Disconnect the brake hose from the caliper.
If the piston is seized in the caliper, observe the following steps.



Disconnect the brake hose from the caliper.
Place a shop towel or rag over the piston to prevent the piston and brake fluid from coming out, and apply a small amount of air pressure to the fluid inlet.

WARNING

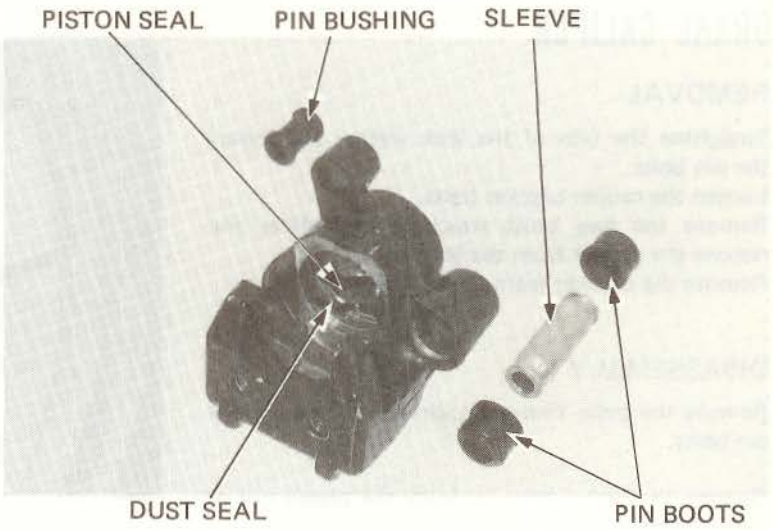
Do not use high pressure air or bring the nozzle too close to the inlet.



Remove the sleeve.
Remove the pin bushing and pin boots.

Lift out the piston and dust seals by first pushing them into the cylinder as shown.

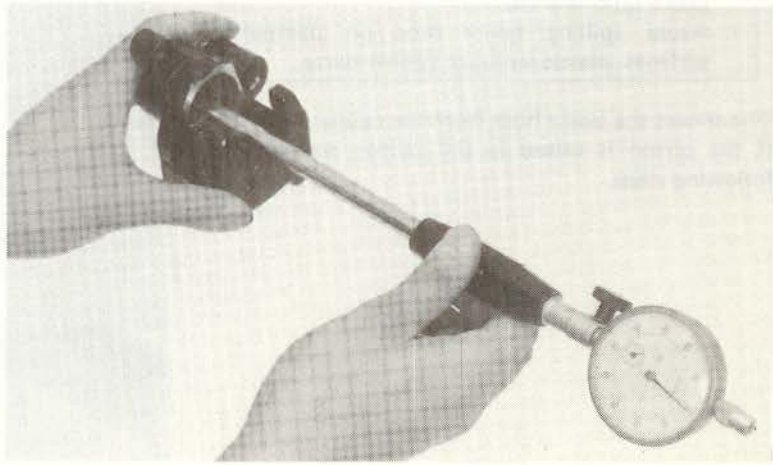
Clean the caliper grooves with brake fluid.
Replace the piston and dust seals with new ones.



INSPECTION

Check the caliper cylinder for scoring, scratches or other damage.

Measure the caliper cylinder I.D.
SERVICE LIMIT: 30.290 mm (1.1925 in)



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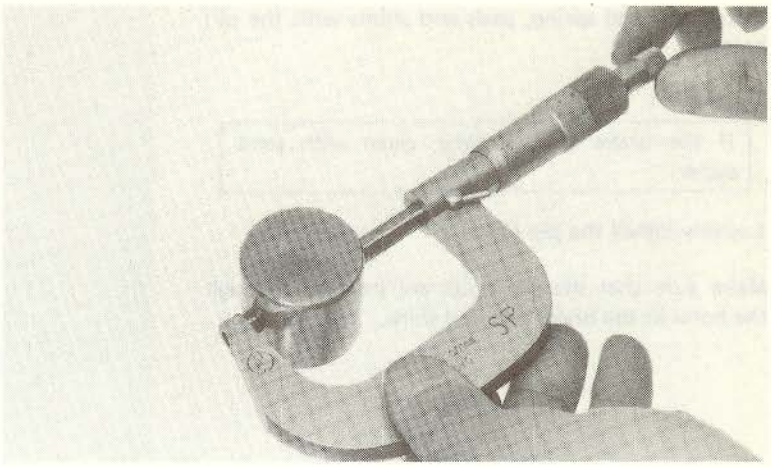
Check the piston for scoring, scratches or other defects.

Measure the caliper piston O.D.
SERVICE LIMIT: 30.140 mm (1.1866 in.)



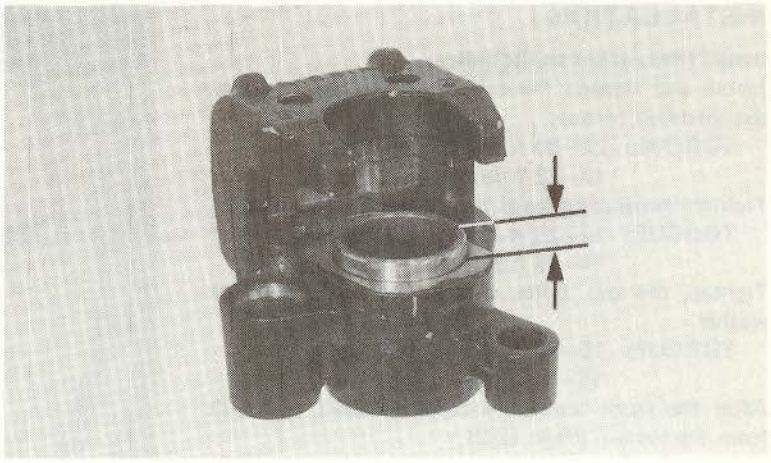
ASSEMBLY

Wash all the removed parts. Coat the piston and dust seals with silicon grease.

Lubricate the inside diameter of the caliper cylinder with brake fluid and install the piston with the concave end on the brake pad side.

NOTE

Install the piston with the end 3–5 mm (1/8–1/5 in) projecting above the caliper.



Install the brake hose and seal washer.
TORQUE: 25–35 N·m (2.5–3.5 kg-m, 18–25 ft-lb)

Wipe excess brake fluid off the caliper with a clean cloth.

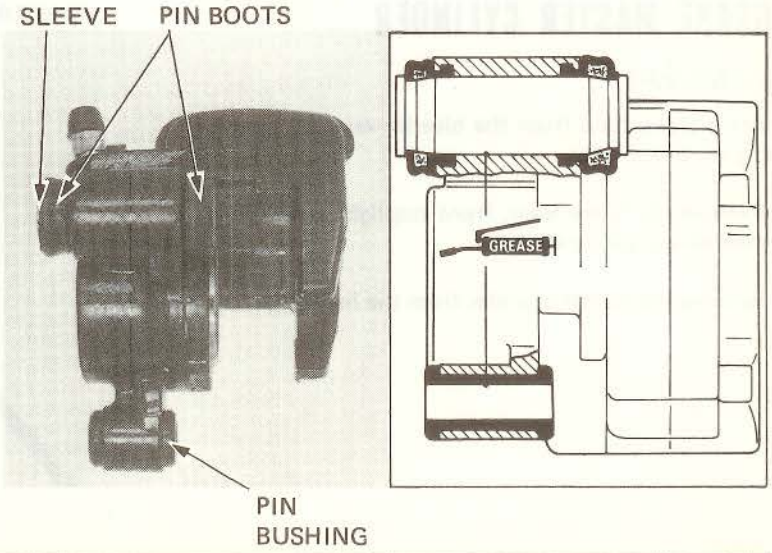
Lubricate the inside of the pin boot with silicon grease and install the bushing in the caliper.

Apply silicon grease to the sleeve contacting face of the caliper and install the pin boot in the caliper.

Install the sleeve, then the pin boots on the sleeve.

NOTE

Make sure that the pin boots are installed in the caliper and sleeve properly.



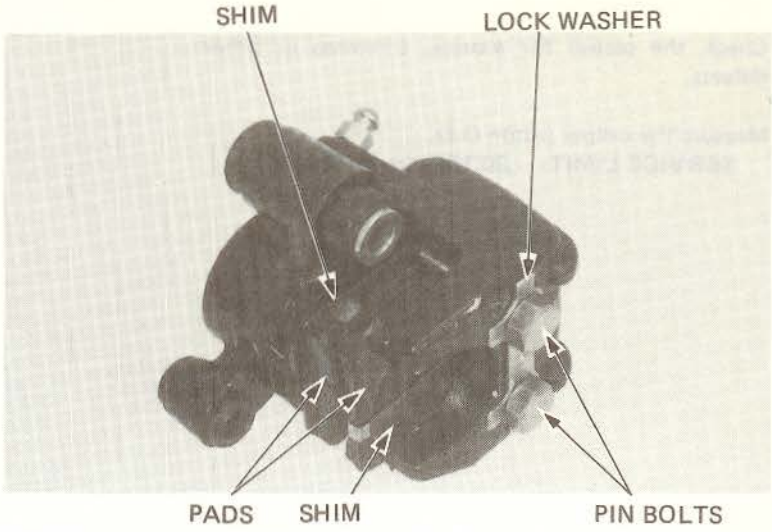
Install the pad spring, pads and shims with the pin bolts.

NOTE

If the brake pad is dirty, clean with sand paper.

Loosely install the pin bolts.

Make sure that the pin bolts are inserted through the holes in the brake pad and shim.



INSTALLATION

Install the bracket to the caliper.
Install and tighten the caliper to the front fork to the specified torque.

TORQUE: 24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)

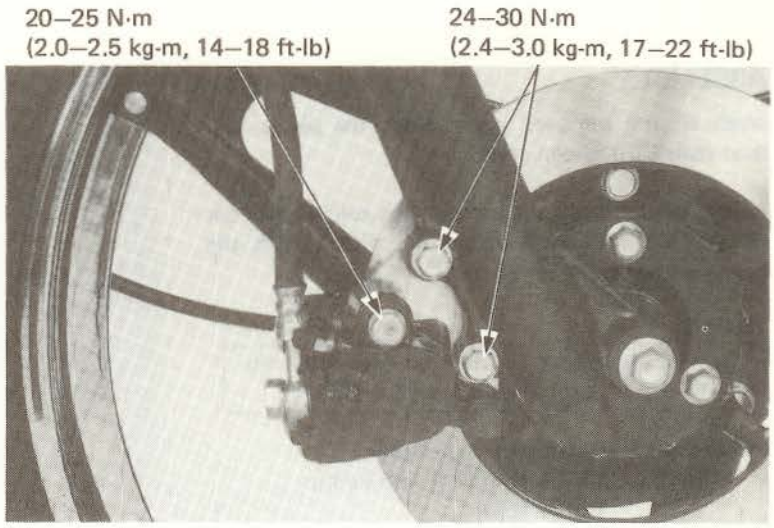
Tighten the bracket bolts to the specified torque.

TORQUE: 20–25 N·m (2.0–2.5 kg-m, 14–18 ft-lb)

Tighten the pin bolts and secure with the lock washer.

TORQUE: 15–20 N·m (1.5–2.0 kg-m, 11–14 ft-lb)

After the front brake has been installed, bleed air from the system (Page 12-2).



BRAKE MASTER CYLINDER

REMOVAL

Drain brake fluid from the bleeder valve by operating the brake lever.

Remove the brake lever, front stoplight switch, rear view mirror and brake hose.

Remove the master cylinder from the handlebar.

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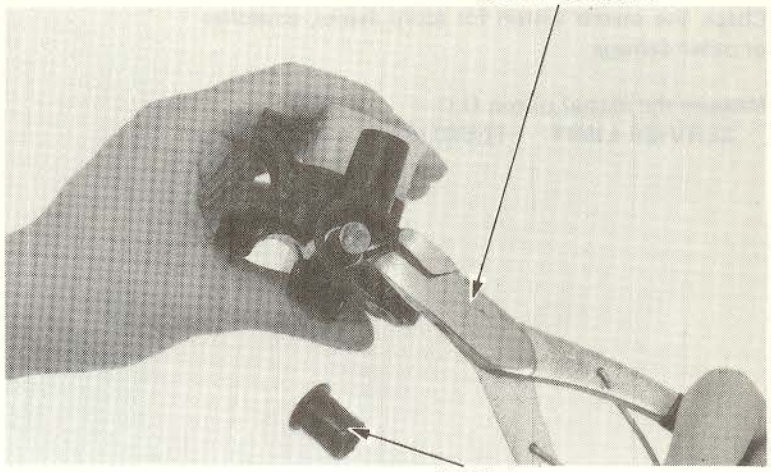
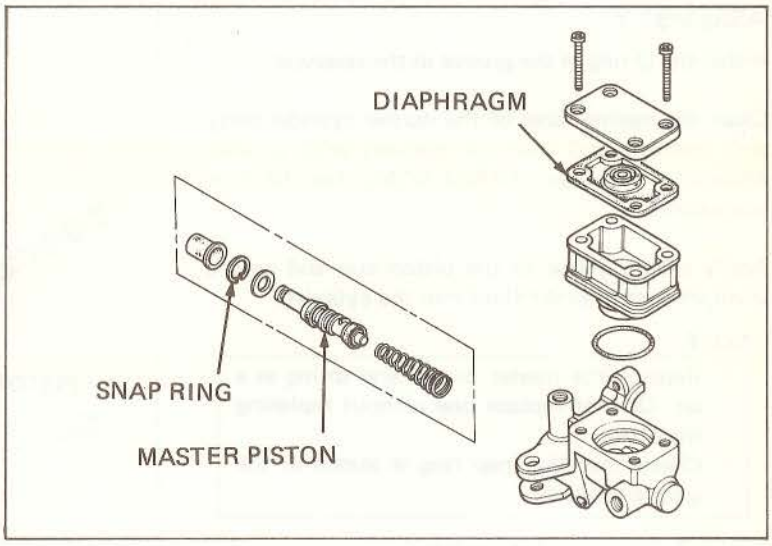
DISASSEMBLY

Remove the reservoir cap and diaphragm.
Remove the boot.
Remove the snap ring.
Remove the stopper plate, master cylinder piston and spring.



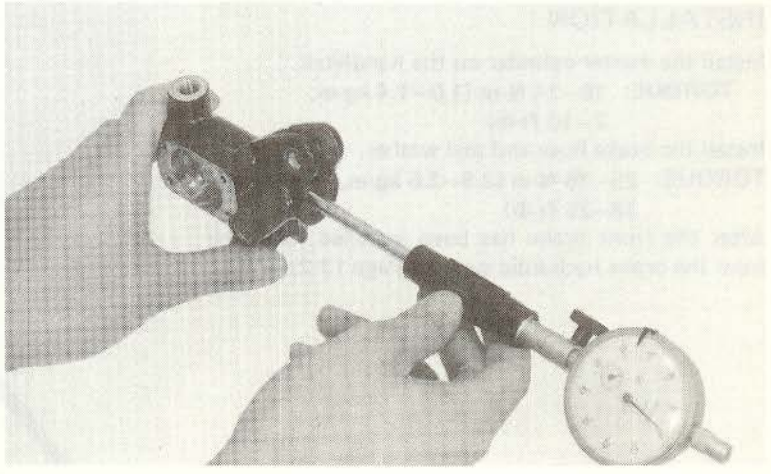
Remove the reservoir from the master cylinder.
Clean the master cylinder and reservoir in brake fluid.



INSPECTION

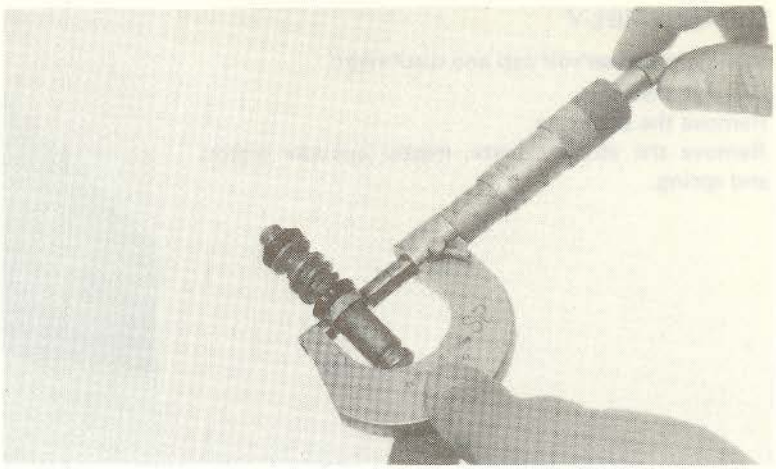
Check the master cylinder for score marks, scratches or other defects.

Measure the master cylinder I.D.
SERVICE LIMIT: 12.755 mm (0.5022 in)



Check the master piston for score marks, scratches or other damage.

Measure the master piston O.D.
SERVICE LIMIT: 12.640 mm (0.4976 in)



ASSEMBLY

Install the O-ring in the groove in the reservoir.

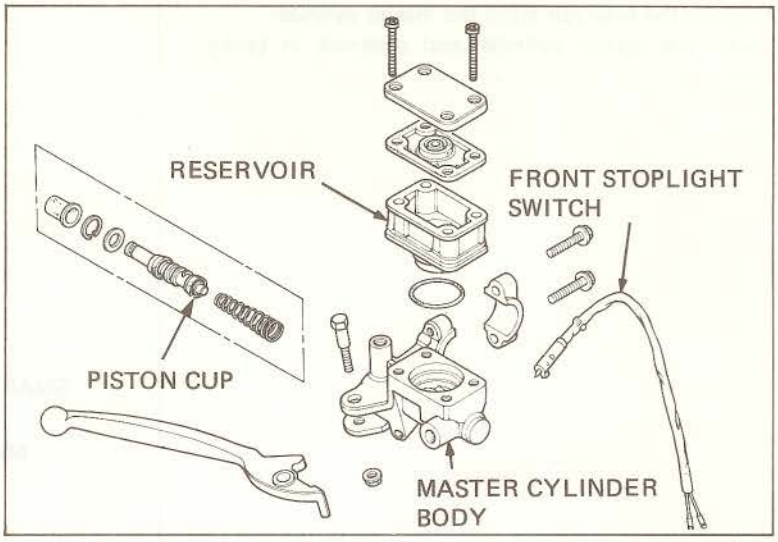
Clean the mating faces of the master cylinder body and reservoir and coat the surfaces with a small amount of adhesive (THREE-BOND No. 1211 or equivalent).

Apply silicon grease to the piston cup and pour a small amount of brake fluid into the cylinder.

NOTE

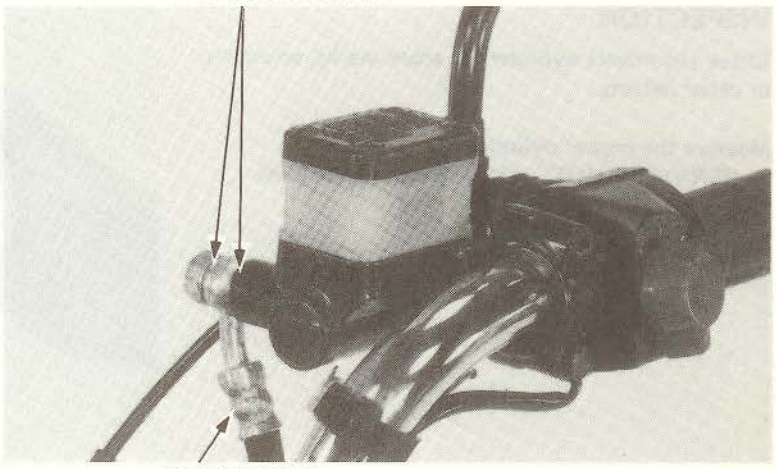
- Replace the master piston and spring as a set. Do not replace one without replacing the other.
- Check that the snap ring is seated in the groove properly.

Install the front stoplight switch.



INSTALLATION

Install the master cylinder on the handlebar.
TORQUE: 10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
Install the brake hose and seal washer.
TORQUE: 25–35 N·m (2.5–3.5 kg-m, 18–25 ft-lb)
After the front brake has been installed, bleed air from the brake hydraulic system (Page 12-2).



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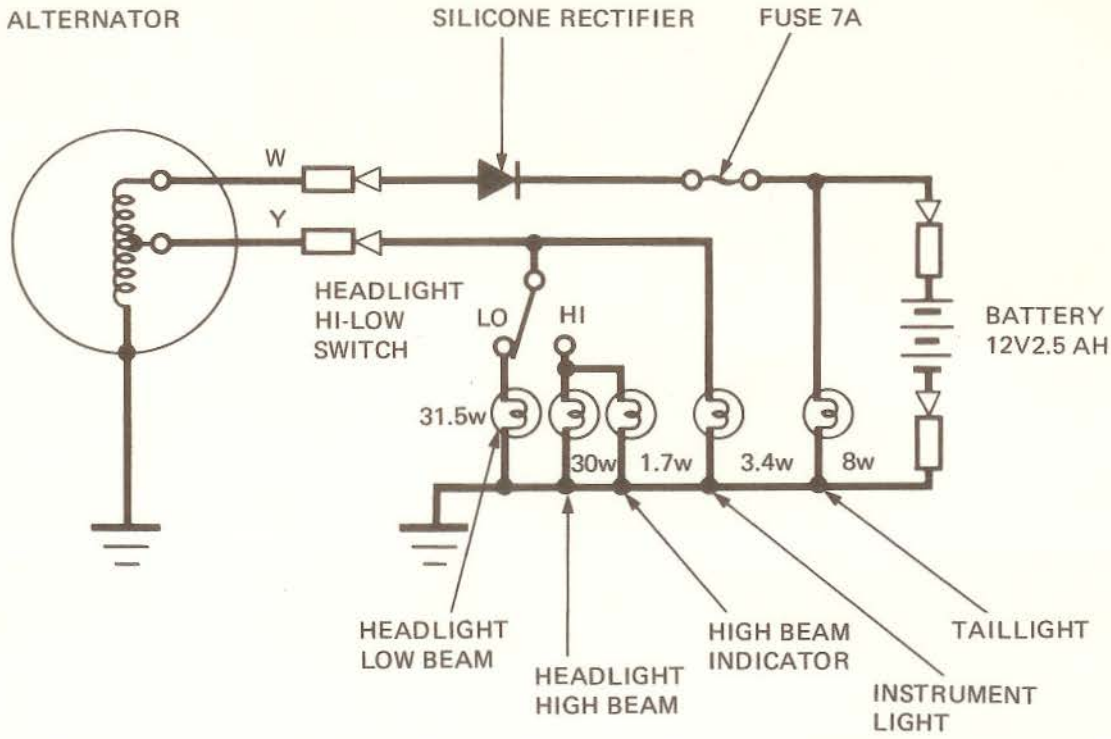
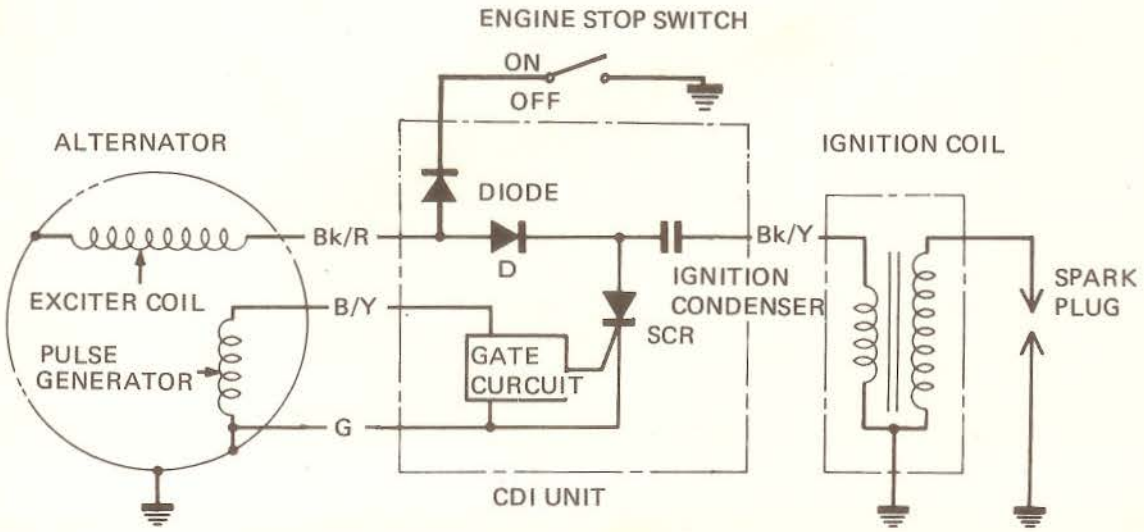
MEMO



BATTERY/CHARGING SYSTEM



IGNITION SYSTEM

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13. ELECTRICAL SYSTEM

SERVICE INFORMATION

GENERAL INSTRUCTIONS

- Battery fluid level should be checked regularly. Fill with distilled water when necessary.
- Do not quick charge a battery, except in an emergency. Slow-charging is preferred.
- Remove the battery from the motorcycle for charging. If the battery must be charged on the motorcycle, disconnect the battery cables.

WARNING

Do not smoke, and keep flames away from a charging battery. The gas produced by a battery will explode if a flame or spark is brought near.

- All charging system components can be tested on the motorcycle.
- Alternator removal, see section 8.
- A CDI IGNITION SYSTEM is used and no adjustments are to be made. If the timing is incorrect, inspect the CDI unit and alternator and replace any defective parts.
- For spark plug information, see page 3-5.
- Some wires have different colored bands around them near the connector. These are connected to other wires which correspond with the band color.
- All plastic plugs have locking tabs that must be released before disconnecting, and must be aligned when reconnecting.
- The following color codes used are indicated throughout this section and on the wiring diagram.

L = Blue	G = Green	Lg = Light Green	R = Red
B = Black	Gr = Grey	O = Orange	W = White
Br = Brown	Lb = Light Blue	P = Pink	Y = Yellow

- To isolate an electrical failure, check the continuity of the electrical path through the part. A continuity check can usually be made without removing the part from the motorcycle. Simply disconnect the wires and connect a continuity tester or volt-ohmmeter to the terminals or connections.
- A continuity tester is useful when checking to find out whether or not there is an electrical connection between the two points. An ohmmeter is needed to measure the resistance of a circuit, as when there is a specific coil resistance involved, or when checking for high resistance by corroded connections.

SPECIFICATIONS

Battery	Capacity		12V 2.5 AH	
	Specific gravity		1.280/20°C (68°F)	
	Charging rate		1.4 amperes maximum	
Alternator Capacity			1,500 rpm 6.5A min	5,000 rpm 18A min
Spark plug	ND	Standard	W24FSR	
		For cold climate Below 5°C (41°F)	W22FSR	
		For extended high speed riding	W27FSR	
	NGK	Standard	BR8HS	
		For cold climate Below 5°C (41°F)	BR7HS	
		For extended high speed riding	BR9HS	
Spark plug gap			0.6 – 0.7 mm (0.0024 – 0.028 in)	
Ignition timing	"F" mark		19° ± 3° BTDC at 3,000 rpm	
	Full retard		10° ± 5° BTDC at 7,000 rpm	
	Initial retard speed		3,000 – 5,000 rpm	

TROUBLESHOOTING

BATTERY/CHARGING SYSTEM

No power – key turned on:
1. Dead battery
   - Low fluid level
   - Low specific gravity
2. Disconnected battery cable
3. Fuse burned out
4. Faulty ignition switch

Low power – key turned on:
1. Weak battery
   - Low fluid level
   - Low specific gravity
   - Charging system failure
2. Loose battery connection

Low power – engine running:
1. Battery undercharged
   - Low fluid level
   - One or more dead cells
2. Charging system failure

Intermittent power:
1. Loose battery connection
2. Loose charging system connection
3. Loose connection or short circuit in ignition system
4. Loose connection or short circuit in lighting system

Charging system failure:
1. Loose, broken, or shorted wire or connection
2. Faulty rectifier
3. Faulty alternator

IGNITION SYSTEM

No spark at plug
1. Faulty spark plug
2. Poorly connected, broken or shorted wires
   - Between alternator and CDI unit
   - Between CDI unit and ignition coil
   - Between CDI unit and ignition switch
   - Between ignition coil and spark plug
3. Faulty ignition switch
4. Faulty ignition coil
5. Faulty CDI unit
6. Faulty alternator

Engine starts but runs poorly
1. Ignition primary circuit
   - Faulty ignition coil
   - Loose or bare wire or connector
   - Poor contact in ignition switch
2. Ignition secondary circuit
   - Faulty ignition coil
   - Faulty spark plug
   - Faulty high tension cord
   - Faulty plug cap
3. Improper ignition timing
   - Faulty alternator
   - Stator not installed properly
   - Faulty CDI unit

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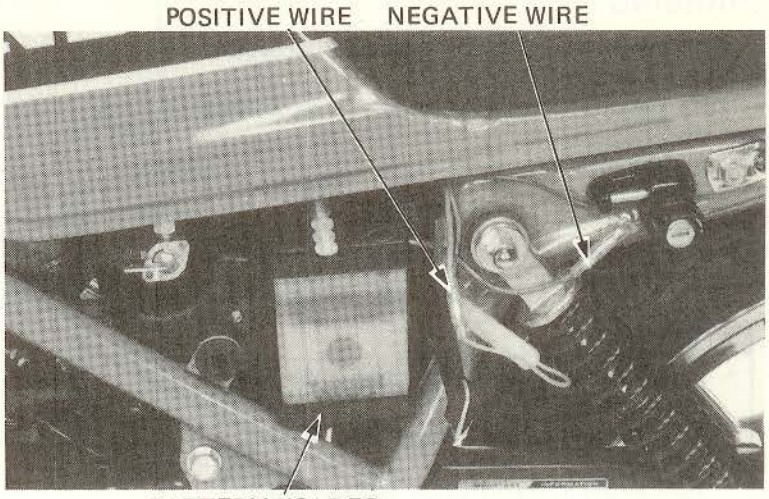
BATTERY

REMOVAL

Remove the left side cover.
Remove the battery holder.
Disconnect the negative and positive wires at the connectors.
Remove the battery.



TESTING SPECIFIC GRAVITY

Test each cell with a hydrometer.
SPECIFIC GRAVITY: 1.270–1.290 (20°C, 68°F)

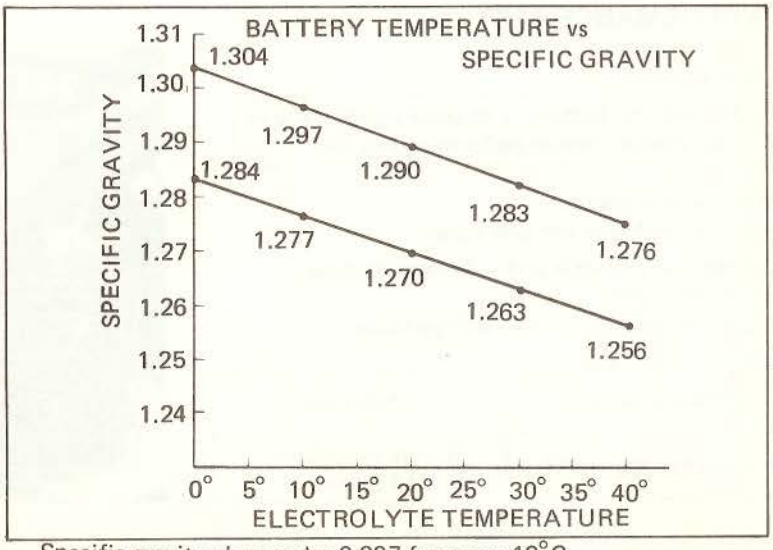
1.270–1.290	Fully charged
Below 1.260	Undercharged

NOTE

- The battery must be recharged if the specific gravity is below 1.260.
- The specific gravity varies with the temperature as shown in the accompanying table.
- Replace the battery if sulfation is evident or if the space below the cell plates is filled with sediment.

WARNING

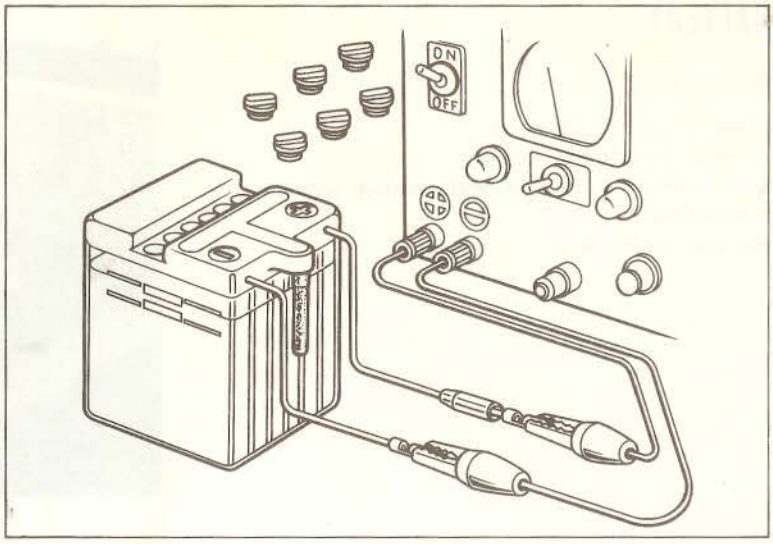
The battery contains sulfuric acid. Avoid contact with skin, eyes, or clothing. Antidote: Flush with water and get prompt medical attention.



Specific gravity changes by 0.007 for every 10°C.

CHARGING

Connect the charger positive (+) cable to the battery positive (+) terminal.
Connect the charger negative (–) cable to the battery nagative (–) terminal.
Charging current:
1.4 amperes max.
Charging:
Charge the battery until specific gravity is 1.270–1.290 at 20°C (68°F).



WARNING

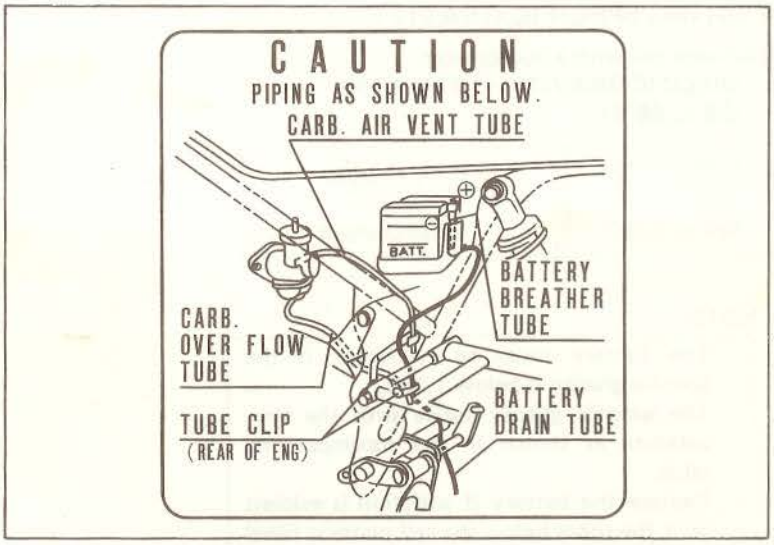
- *Before charging a battery, remove the cap from each cell.*
- *Keep flames and sparks away from a charging battery.*
- *Turn power ON/OFF at the charger, not at the battery terminals.*
- *Discontinue charging if the electrolyte temperature exceeds 45°C (113°F).*

CAUTION

Quick-charging should only be done in an emergency; slow-charging is preferred.

CAUTION

Route the breather tube as shown on the battery caution label.



CHARGING SYSTEM

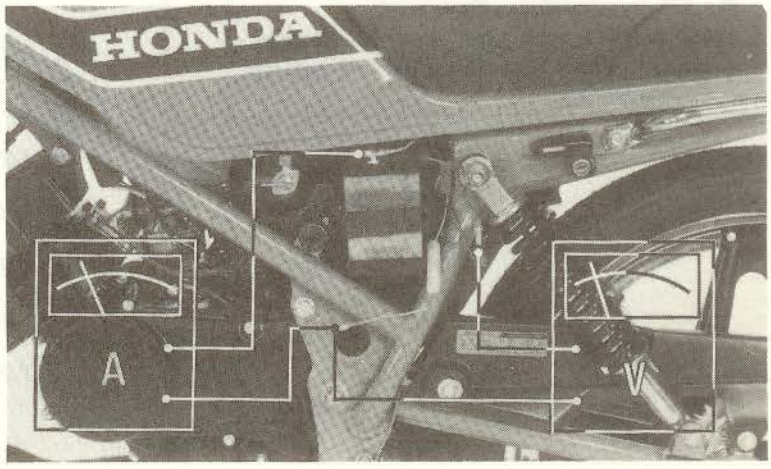
PERFORMANCE TEST

NOTE

Be sure the battery is in good condition and fully charged before performing this test.

Warm up the engine.
Remove the frame left side cover.
Connect an ammeter and voltmeter as shown.
Start the engine.
Turn the headlight switch to high beam.

CHARGING PRM	5,000 rpm
CHARGING RATE	5 amp. minimum/ 14.5 volts

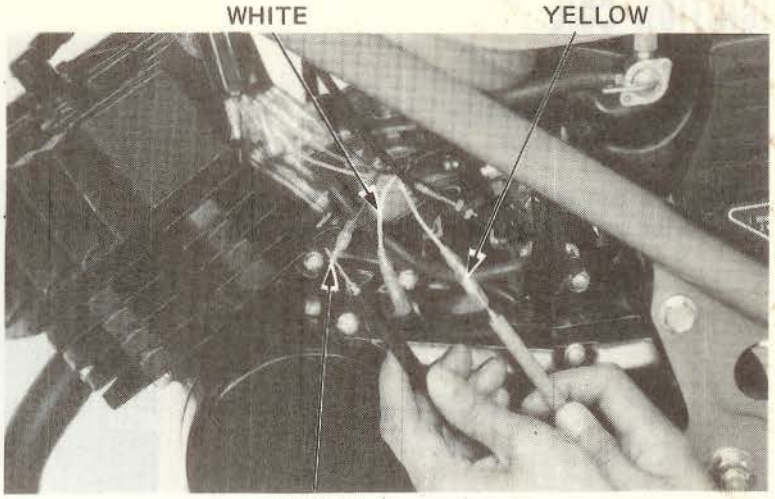


ALTERNATOR INSPECTION

Warm up the engine.
Stop the engine.
Disconnect the alternator connectors.
Check the resistances between the connectors.

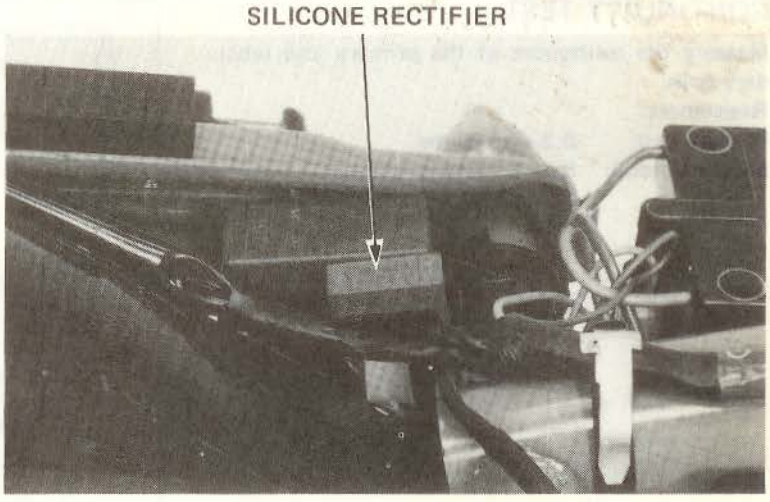
Yellow – Green: 0.1–1.0 Ohms
White – Green: 0.3–1.5 Ohms

Replace the stator and flywheel as a set if not within the specifications.



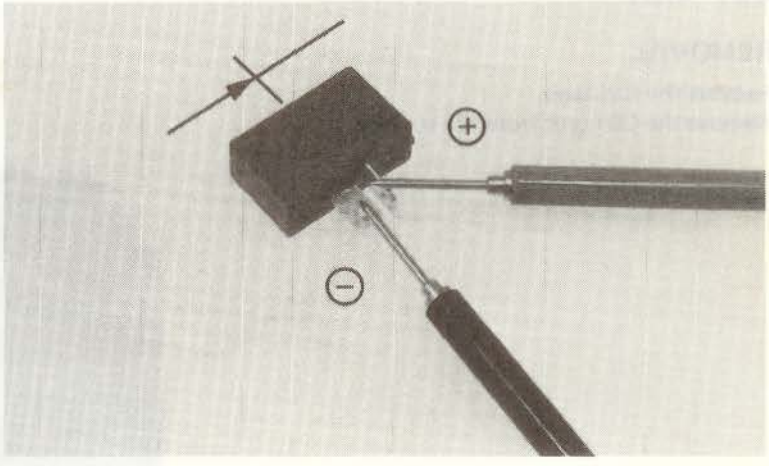
SILICONE RECTIFIER INSPECTION

Remove the seat.
Remove the fuel tank (see page 4-9).
Remove the silicone rectifier from the coupler.



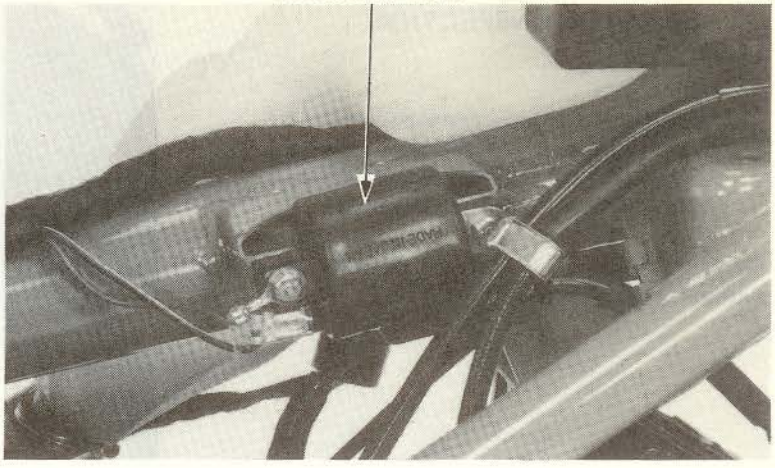
Check for continuity with an ohmmeter.

The rectifier is normal if there is continuity only in the direction shown.



IGNITION COIL

IGNITION COIL



REMOVAL

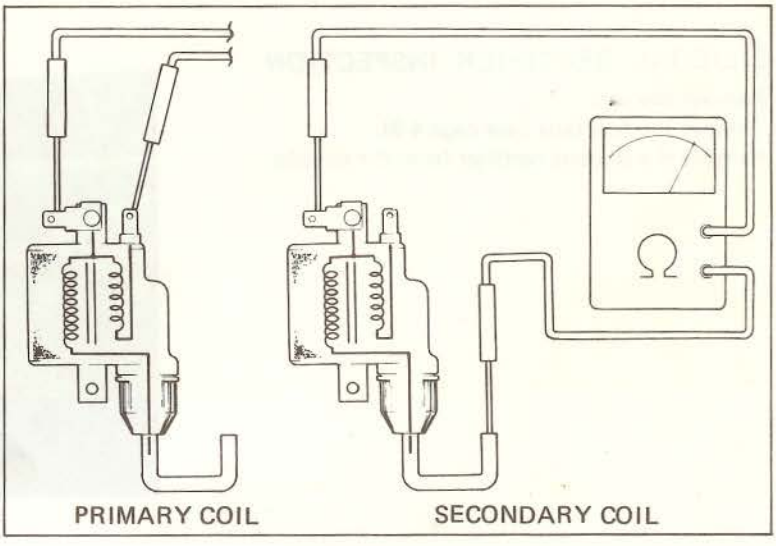
Remove the seat and fuel tank.
Disconnect the wire leads.

Remove the coil by removing the attaching bolts.
Remove the spark plug cap by rotating it by hand.

CONTINUITY TEST

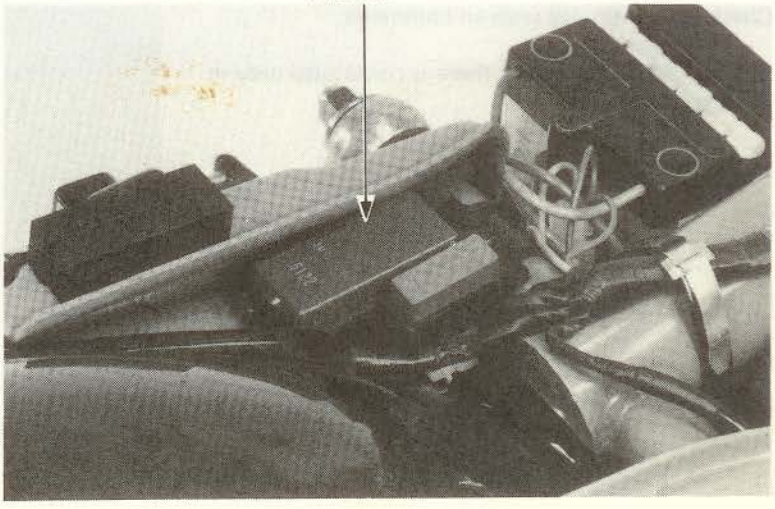
Measure the resistances of the primary and secondary coils.

Resistances:
Primary coil: 0.2–0.3 Ohms
Secondary coil: 3.4–4.2 Ohms



CDI UNIT

CDI unit



REMOVAL

Remove the fuel tank.
Remove the CDI unit from the coupler.

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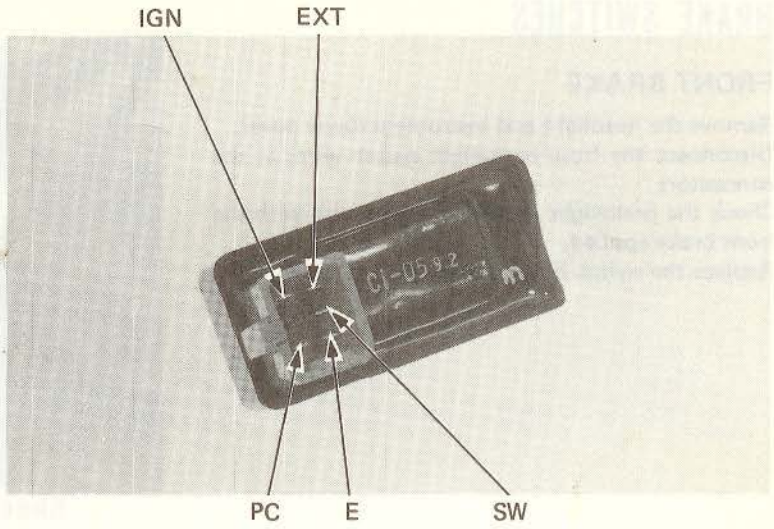
INSPECTION

Measure the resistances between the terminals.
Replace the CDI unit with a new one if the readings do not fall within the limits shown in the table.

NOTE

- The CDI is fully transistorized.
- For accurate testing, it is necessary to use a specified electric tester. Use of an improper tester or measurements in improper range may give a false readings.
- Use SANWA ELECTRIC TESTER (P/N 07308–0020000) or KOWA ELECTRIC TESTER (TH-5H).
- In the table, "Needle swings then returns" indicates that there is a charging currect in the condenser for the first time. The needle will then remain fixed unless the condenser is discharged.

Measuring ranges:
SANWA: x kΩ
KOWA: x 100Ω



Unit: kΩ

Tester positive (+) probe / Tester negative (–) probe	SW	EXT	PC	E	IGN
SW		∞	∞	∞	∞
EXT	0.1–20		∞	∞	Needle swings, then returns
PC	0.5–200	0.5–100		0.5–30	∞
E	0.2–60	0.1–20	∞		∞
IGN	∞	∞	∞	∞	

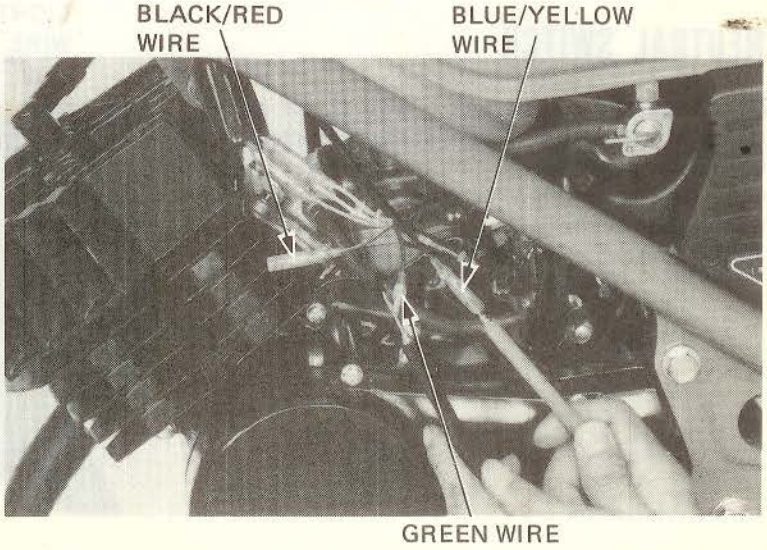
ALTERNATOR EXCITOR COIL/ PULSE GENERATOR

INSPECTION

Warm up the engine.
Stop the engine.
Disconnect the alternator connectors.
Measure the exciter coil and pulse generator resistances.

Black/Red – Green (Exciter coil):
50–300 Ohms
Blue/Yellow – Green (Pulse generator):
10–100 Ohms

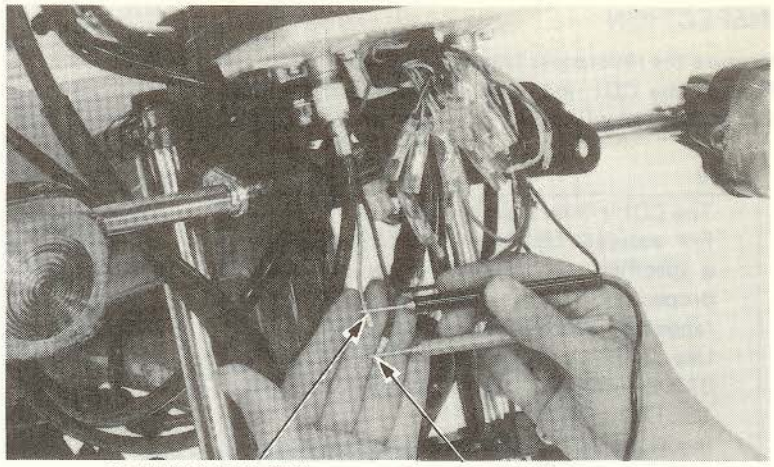
Replace the stator and flywheel as a set if not within the specifications.



BRAKE SWITCHES

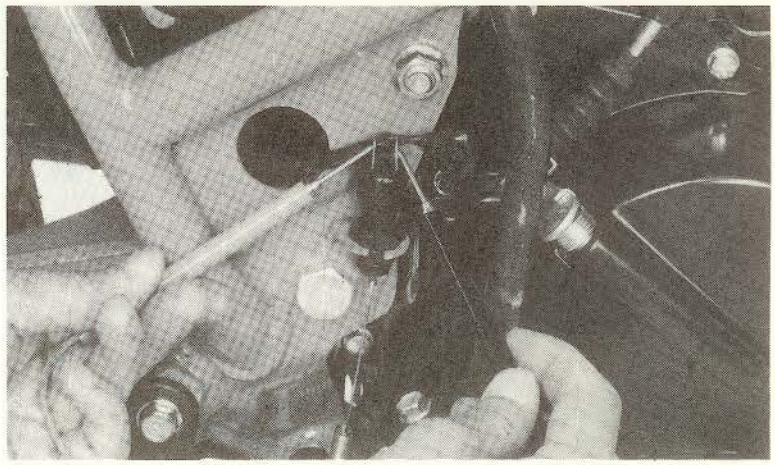
FRONT BRAKE

Remove the headlight and instrument lower cover.
Disconnect the front brakelight switch wires at the connectors.
Check the brakelight switch for continuity with the front brake applied.
Replace the switch if necessary.



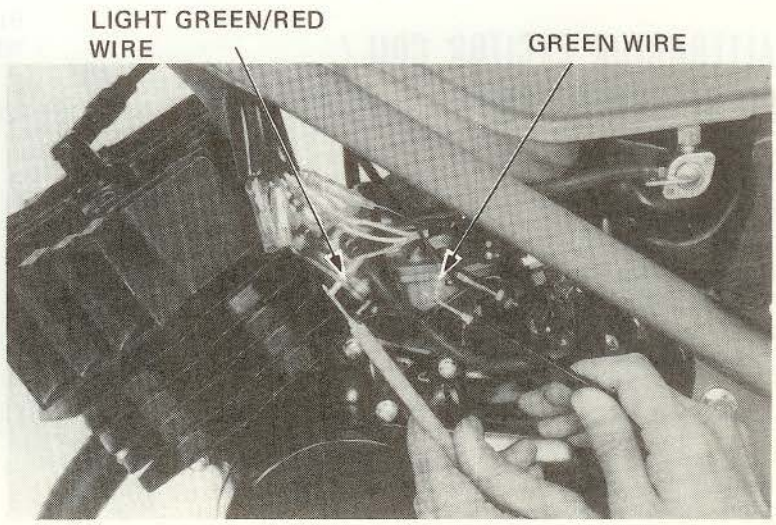
REAR BRAKE

Disconnect the wire leads from the brakelight switch terminals.
Check the switch for continuity with the rear brake applied.
Replace the switch if necessary.



NEUTRAL SWITCH

Disconnect the nuetral switch wire (Light green/ Red) and ground wire (Green) at the connector.
Check the switch for continuity between the wires with the transmission in neutral and with the transmission in any gear.
Replace the neutral switch if necessary.



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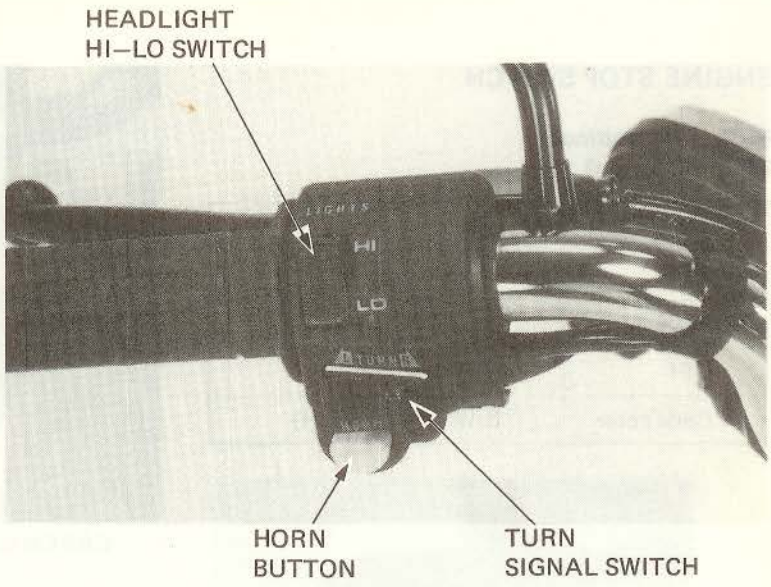
HANDLEBAR SWITCHES

The handlebar cluster switches (lights, turn signals, horn) must be replaced as assemblies.
Continuity tests for the components of the handlebar cluster switches follow:
Remove the headlight and instrument lower cover. Continuity should exist between the color coded wires on each chart.



HEADLIGHT HI – LOW SWITCH

HI: Y to L
MIDDLE: Y to W to L
LO: Y to W

Headlight Hi–Low Switch

	C_1	Hi	Lo
Hi	○——	——○	
(N)	○——	——○	——○
Lo	○——		——○
Code color	Y	L	W

TURN SIGNAL SWITCH

LEFT: Gr to O, Br/W to Lb/W
OFF: No continuity
RIGHT: Gr to Lb, Br/W to O/W

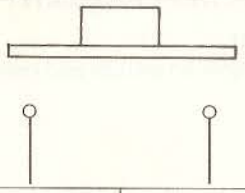
Turn Signal Switch

	W_R	L	R
LEFT	○——	——○	
OFF			
RIGHT	○——		——○
Code color	Gr	O	Lb

HORN BUTTON

B to G with button depressed
No continuity with button released

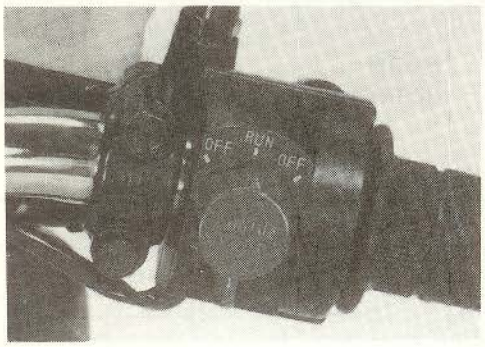
Horn Button

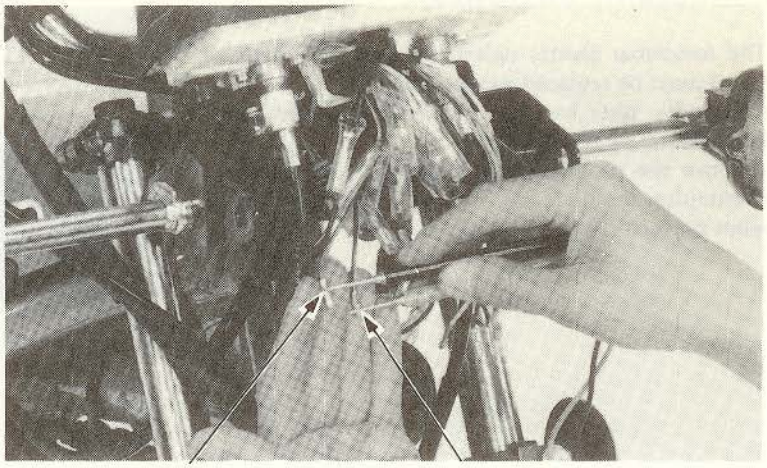
	Ho_1	E
		
Code color	B	G

ENGINE STOP SWITCH

RUN: **No continuity**
OFF: **B/W to G**

	IG	E
OFF	○———	———○
RUN		
OFF	○———	———○
Code color	B/W	G

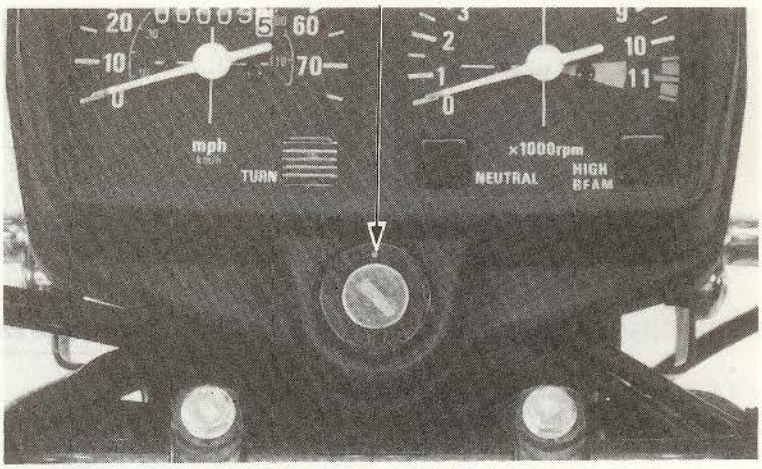




GREEN WIRE

BLACK/WHITE WIRE

IGNITION SWITCH



IGNITION SWITCH

Remove the headlight and instrument lower cover.
Disconnect the ignition switch coupler.
Check continuity of terminals on the coupler in each switch position.

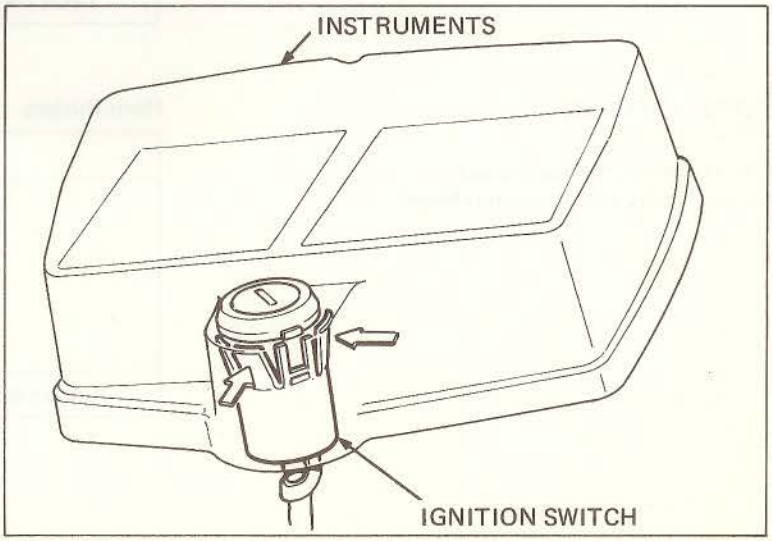
SWITCH POSITION

OFF: **B/W to G**
ON: **R to B**

Terminal / Position	IG	E	Eo	BAT
OFF	○———	———○		
ON			○———	———○

IGNITION SWITCH REPLACEMENT

Remove the instrument.
Push the tabs on the ignition switch and remove the switch.



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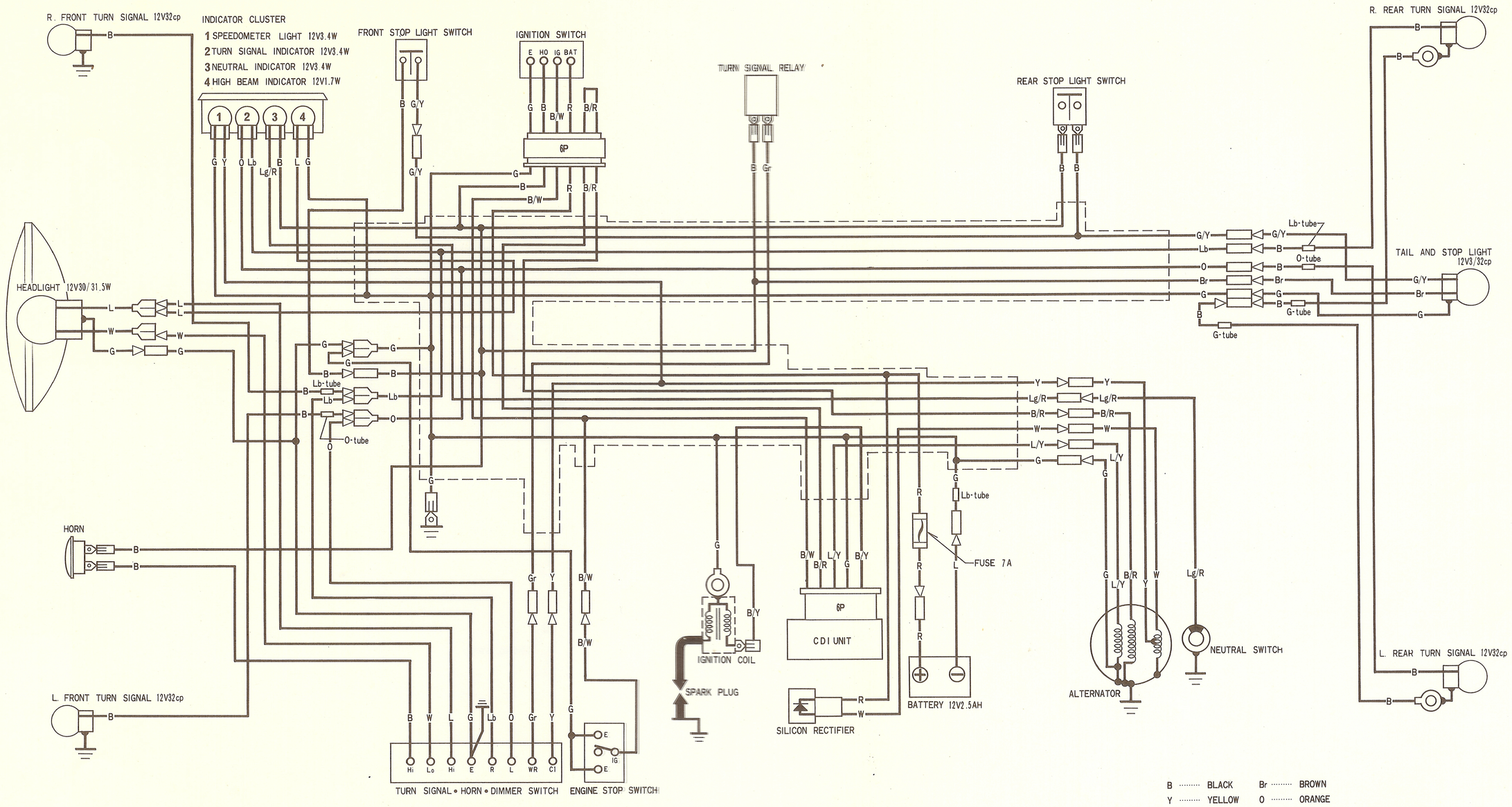
WIRING DIAGRAM



B ..... BLACK
Y ..... YELLOW
L ..... BLUE
G ..... GREEN
R ..... RED
W ..... WHITE
Br ..... BROWN
O ..... ORANGE
Lb ..... LIGHT BLUE
Lg ..... LIGHT GREEN
P ..... PINK
Gr ..... GRAY

SWITCH CONTINUITY

IGNITION SWITCH

	IG	E	HO	BAT
OFF	○	○		
ON			○	○

ENGINE STOP SWITCH

	IG	E
OFF	○	○
RUN		
OFF	○	○

DIMMER SWITCH

	Hi	Cl	Lo
Hi	○	○	
(N)	○	○	
Lo		○	○

TURN SIGNAL SWITCH

	R	WR	L
R	○	○	
N			
L		○	○

HORN SWITCH

	HO	E
FREE		
PUSH	○	○

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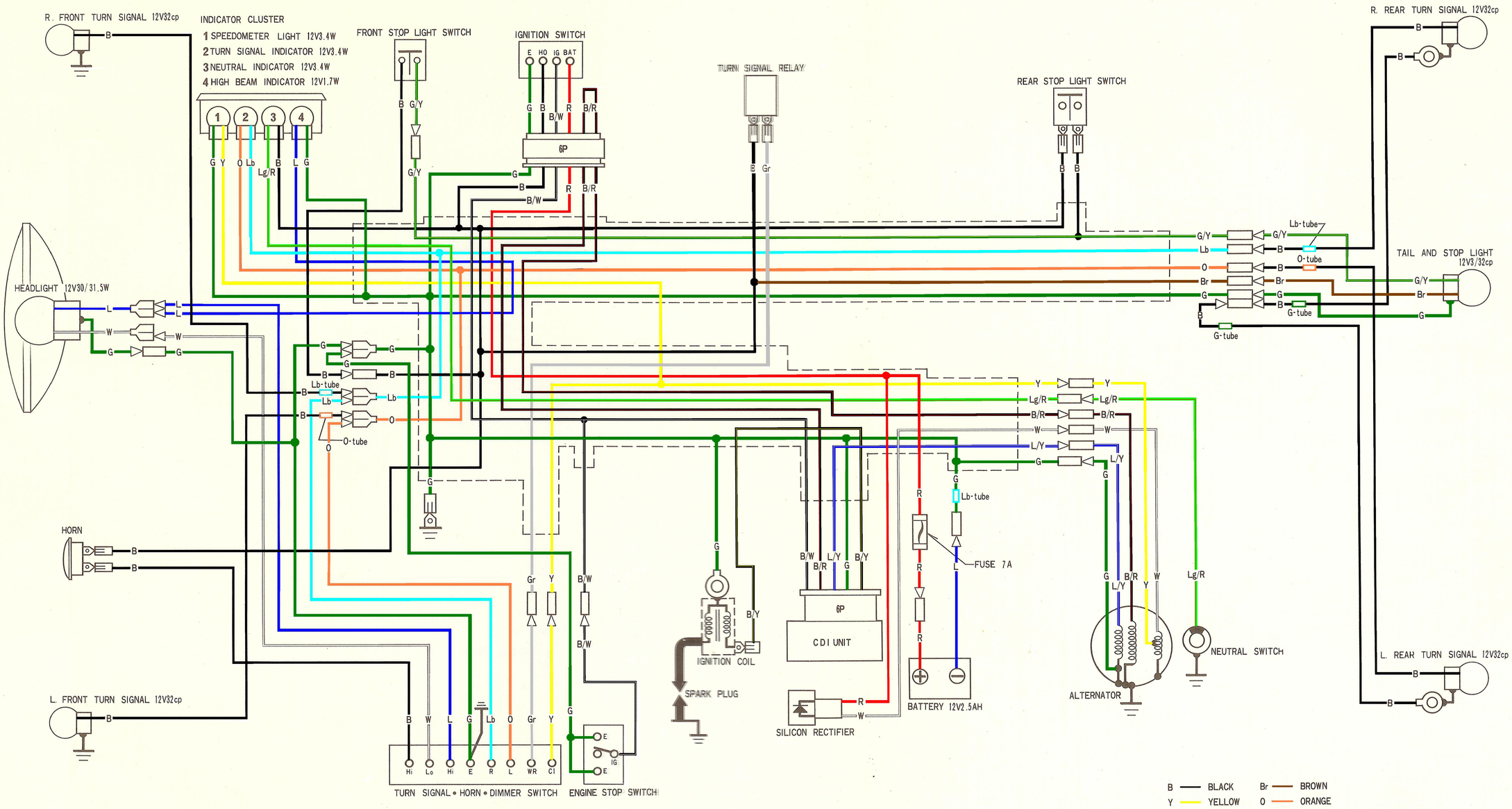
WIRING DIAGRAM



B — BLACK
Y — YELLOW
L — BLUE
G — GREEN
R — RED
W — WHITE
Br — BROWN
O — ORANGE
Lb — LIGHT BLUE
Lg — LIGHT GREEN
P — PINK
Gr — GRAY

SWITCH CONTINUITY

IGNITION SWITCH

	IG	E	HO	BAT
OFF	○—○			
ON			○—○	

ENGINE STOP SWITCH / DIMMER SWITCH / TURN SIGNAL SWITCH / HORN SWITCH

	IG	E		Hi	Cl	Lo		R	WR	L		HO	E
OFF	○—○		Hi	○—○			R	○—○			FREE		
RUN			(N)	○—○			N				PUSH	○—○	
OFF	○—○		Lo		○—○		L		○—○				

0030Z—166—6700

14. TROUBLESHOOTING

ENGINE DOES NOT START OR IS HARD TO START

CHECK		PROBABLE CAUSE
1. Check if fuel is reaching carburetor	NOT REACHING CARBURETOR →	(1) No fuel in fuel tank (2) Glogged fuel pipe from tank to carburetor (3) Clogged float valve in carburetor (4) Breather hole in fuel tank cap clogged
REACHING CARBURETOR ↓		
2. Remove spark plug and try spark test	SPARKS ARE WEAK OR DO NOT JUMP AT ALL →	(1) Faulty spark plug (2) Fouled spark plug (3) Foulty CDI unit (4) Broken or shorted high tension cord (5) Broken or shorted ignition coil (6) Faulty ignition switch
SPARK JUMPS ↓		
3. Test cylinder compression by operating kick pedal	LOSS OF COMPRESSION →	(1) Piston rings stuck in ring lands (2) Flaw in casting (3) Compression leak past crankcase (4) Faulty or clogged reed valve (5) Worn cylinder and piston rings (6) Blown cylinder head gasket
COMPRESSION IS NORMAL ↓		
4. Start by following normal starting procedure	ENGINE FIRES BUT STOPS SOON →	(1) Excessively open choke (2) Choke stuck closed (3) Air leaking past manifold (4) Ignition timing out of proper adjustment
ENGINE DOES NOT FIRE ↓		
5. Remove spark plug	WET →	(1) Carburetor flooded (2) Carburetor choke excessively closed (3) Throttle valve excessively opened
DRY ↓		
6. Restart with choke applied		

ENGINE LACKS POWER

CHECK		PROBABLE CAUSE
1. Raise wheel off ground WHEEL SPINS FREELY	WHEEL DOES NOT SPIN FREELY →	(1) Brake dragging (2) Worn or damaged wheel bearing (3) Wheel bearing not lubricated properly (4) Drive chain too tight
2. Check tire pressure with tire gauge TIRE PRESSURE IS NORMAL	TIRE PRESSURE IS TOO LOW →	(1) Punctured tire (2) Faulty tire valve
3. Try rapid acceleration from low to high ENGINE SPEED LOWERED WHEN CLUTCH IS RELEASED	ENGINE SPEED NOT CHANGED WHEN CLUTCH IS RELEASED →	(1) Clutch slipping (2) Worn clutch disc (3) Clutch disc warped
4. Lightly accelerate engine ENGINE SPEED INCREASES	ENGINE SPEED DOES NOT INCREASE SUFFICIENTLY →	(1) Carburetor choke closed (2) Restricted fuel flow (3) Air cleaner clogged (4) Clogged fuel tank breather (5) Clogged muffler
5. Check ignition timing using timing light IGNITION TIMING IS CORRECT	IGNITION TIMING IS INCORRECT →	(1) Improper ignition timing
6. Test cylinder compression by operating kick padal using compression gauge COMPRESSION IS NORMAL	COMPRESSION IS LOW →	(1) Worn cylinder and piston rings (2) Blown cylinder head gasket (3) Flaws in compression parts (4) Faulty or deteriorated reed valve
7. Check for clogged carburetor CARBURETOR IS NOT CLOGGED	CARBURETOR IS CLOGGED →	(1) Damaged fuel strainer (2) Caburetor not serviced frequently enough
8. Remove spark plug PLUG IS NOT FOULED OR DISCOLORED	PLUG IS FOULED OR DISCOLORED →	(1) Plug fouled (2) Use of plug with improper heat range

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CHECK		PROBABLE CAUSE
9. Check oil level. Also check oil for contamination	LEVEL IS TOO LOW OR TOO HIGH →	(1) Transmission oil level too high, resulting in lack of power (2) Transmission oil level too low (3) No engine oil in oil tank (4) Oil deteriorated or contaminated
CRANKCASE IS FILLED TO PROPER LEVEL		
10. Check if engine overheats	ENGINE OVERHEATS →	(1) Improperly adjusted oil pump (2) Excessive carbon build-up in combustion chamber (3) Use of improper quality fuel (4) Mixture too lean (5) Clutch slipping
ENGINE IS NOT OVERHEATED		
11. Accelerate or run at high speed	ENGINE KNOCKS →	(1) Worn piston rings and cylinder (2) Fuel air mixture too lean (3) Excessive carbon build-up in combustion chamber (4) Ignition timing too early (advanced)
ENGINE DOES NOT KNOCK		

POOR PERFORMANCE AT LOW AND IDLE SPEEDS

CHECK		PROBABLE CAUSE
1. Check ignition timing	INCORRECT →	(1) Foulty CDI unit (2) Foulty alternator
NORMAL		
2. Check carburetor air screw adjustment	INCORRECT →	(1) Fuel air mixture too lean (To correct, screw in) (2) Fuel air mixture too rich (To correct, screw out)
NORMAL		
3. Air is leaking past carburetor packing	LEAKING →	(1) Deteriorated insulator O-ring (2) Loose carburetor (3) Deteriorated carburetor packing
NOT LEAKING		
4. Remove spark plug and try spark test	WEAK OR INTERMITTENT SPARK →	(1) Defective, or carbon or wet fouled spark plug (2) Faulty alternator (3) Faulty ignition coil (4) Faulty CDI unit
GOOD SPARKS		

POOR PERFORMANCE AT HIGH SPEED

CHECK		PROBABLE CAUSE
1. Check ignition timing	IMPROPER →	(1) Faulty alternator (2) Faulty CDI unit
PROPER ↓		
2. Disconnect fuel tube at carburetor	FUEL FLOW IS RESTRICTED →	(1) Lack of fuel in tank (2) Clogged fuel tank cap breather hole (3) Clogged fuel line (4) Clogged fuel valve
FUEL FLOWS OUT FREELY ↓		
3. Remove carburetor and check	CLOGGED →	(1) Damaged fuel strainer
NOTE CLOGGED		

POOR HANDLING → Check tire pressure

	PROBABLE CAUSE
1. Steering heavy →	(1) Steering cone races excessively tightened (2) Damaged steering steel balls
2. Front or rear wheel is excessively wobbling →	(1) Excessive play in wheel bearing (2) Distorted rim (3) Improperly installed wheel hub (4) Rear fork pivot bushing excessively worn (5) Distorted frame (6) Improper drive chain adjustment
3. Pulls to one side →	(1) Unbalanced shock absorbers (right and left/front and rear) (2) Front and rear wheels not aligned (3) Bent front fork (4) Bent rear fork

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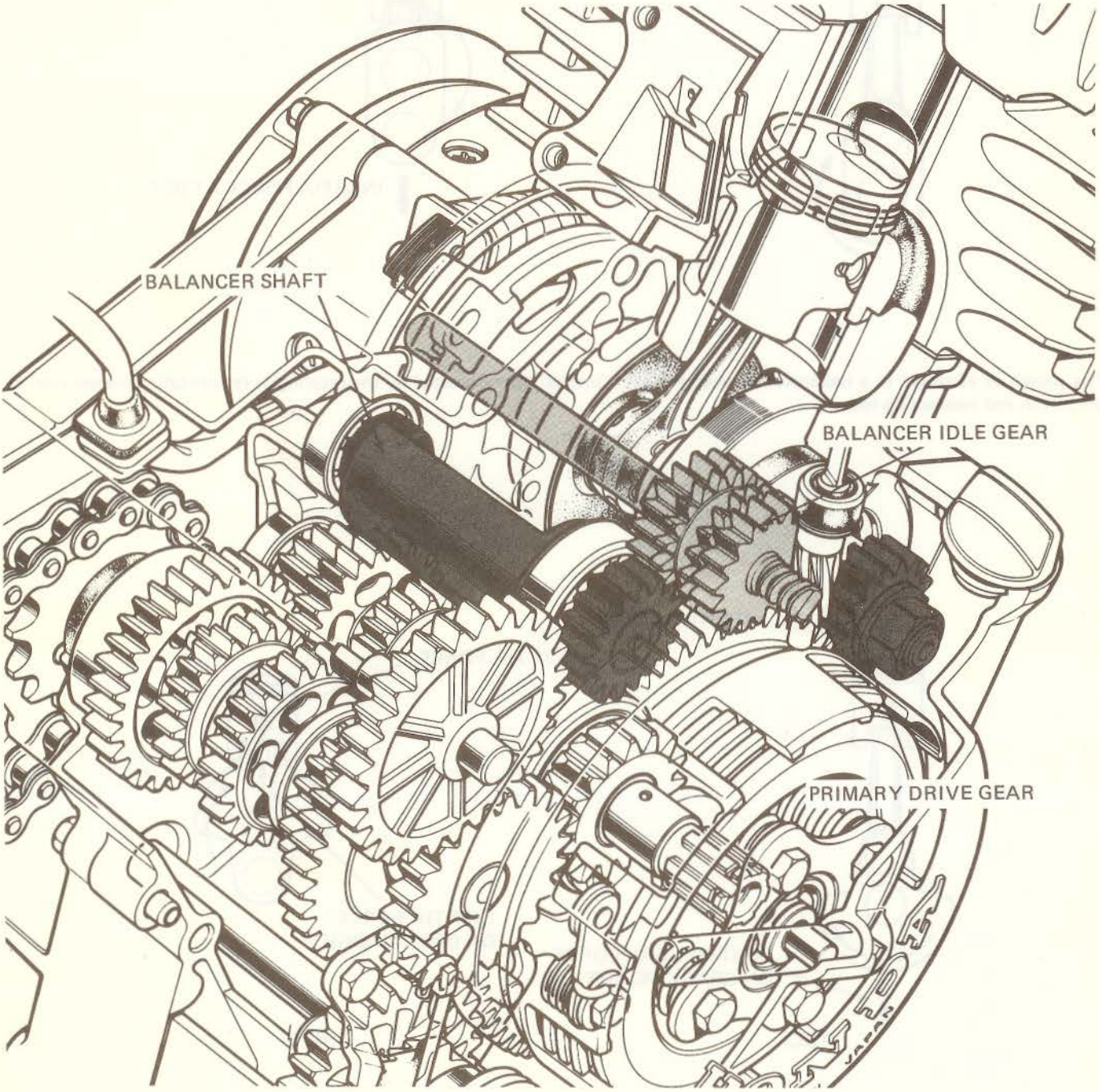
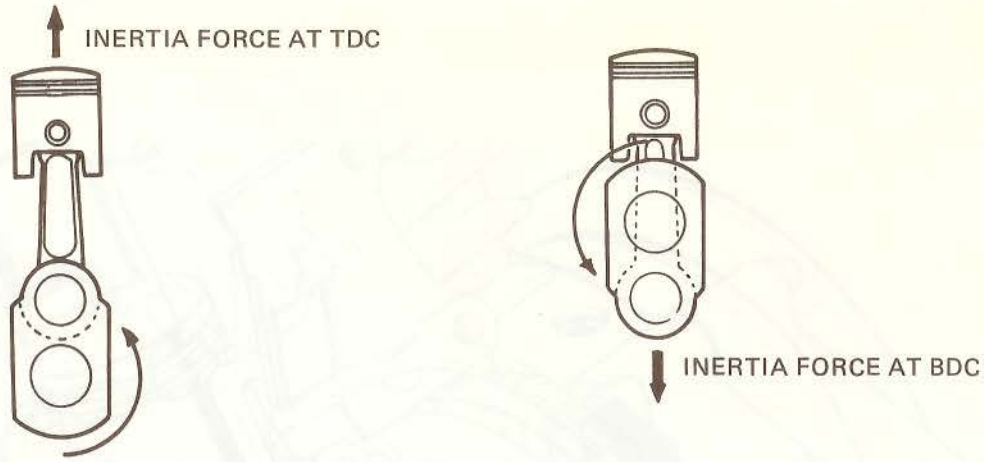
15. TECHNICAL FEATURE

BALANCER

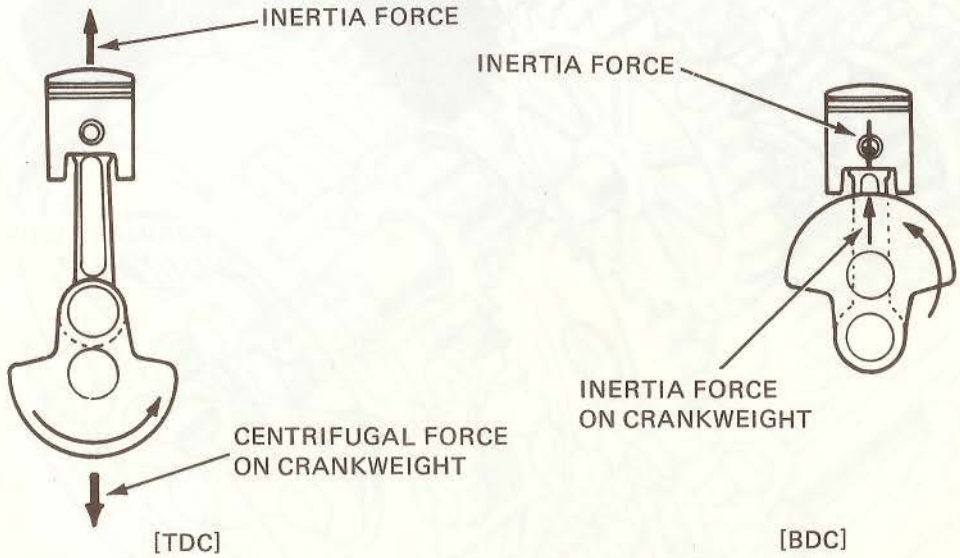
The motorcycle uses a single-shaft primary balancer to counteract the inertia inherent induced vibration in a single-cylinder 2-cycle engine.



OPERATING PRINCIPLE OF BALANCER



The source of vibration in a reciprocating engine is the "inertia" force created by the rotating or reciprocating masses such as the piston and connecting rod.



Inertia force created by the rotating mass is in general canceled by counterweights. Their use will reduce vibration caused by the primary inertia force which occurs once every crankshaft revolution. (Hereinafter, inertia force refers to this primary force).

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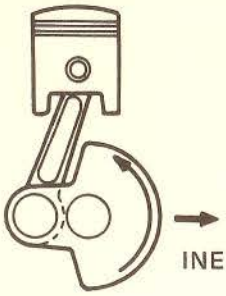
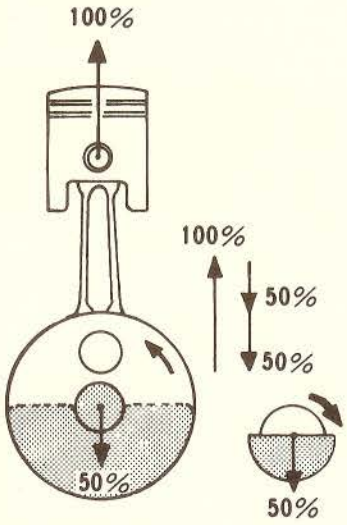
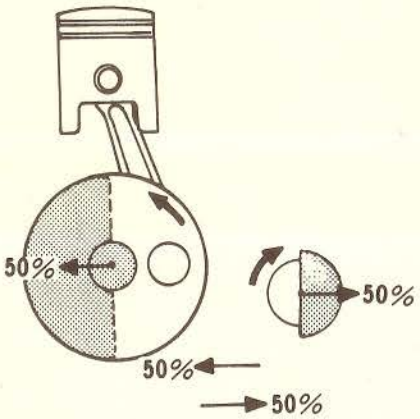


INERTIA FORCE AT TDC

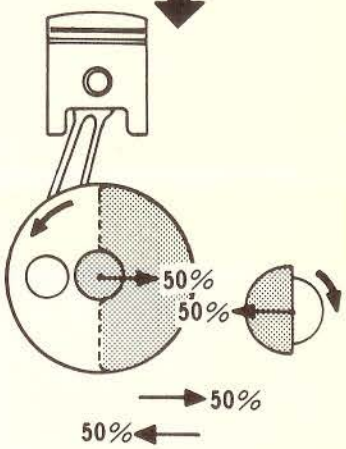
Although the counterweights will balance the inertia force at T.D.C. and B.D.C., they will create a corresponding horizontal imbalance of their own at 90° BTDC and 90° ATDC due to centrifugal force. The balancer is designed to counteract this force including the inertia force created by the reciprocating masses.



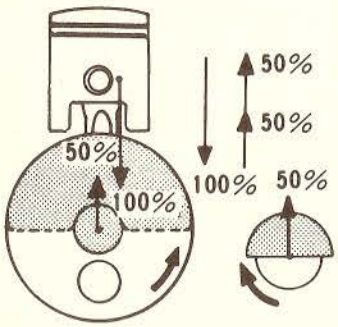
The counterweight creates a centrifugal force to neutralize one-half of the inertia force. The remaining inertia will be totally balanced by the balancer.



The centrifugal force on the counterweight is balanced by the balancer.



The inertia force is balanced by the counterweight. However, the centrifugal force acting on the counterweight is still present. The centrifugal force on the balancer cancels this remaining force.



The centrifugal force on the counterweight neutralizes one-half of the downward inertia force. The balancer counteracts the remainder.

MEMO

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