HOW TO USE THIS MANUAL

Follow the Maintenance Schedule (Section 3) recommendations to ensure that the vehicle is in peak operating condition and the emission levels are with the standards set by the U.S. Environmental Protection Agency. Performing the first scheduled maintenance is very important. It compensates for the initial wear that occurs during the break-in period.

Sections 1 through 3 apply to the whole motorcycle, while sections 4 through 20 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 page give detailed procedures.

If you don't know the source of the trouble, go to section 22, TROUBLESHOOTING.

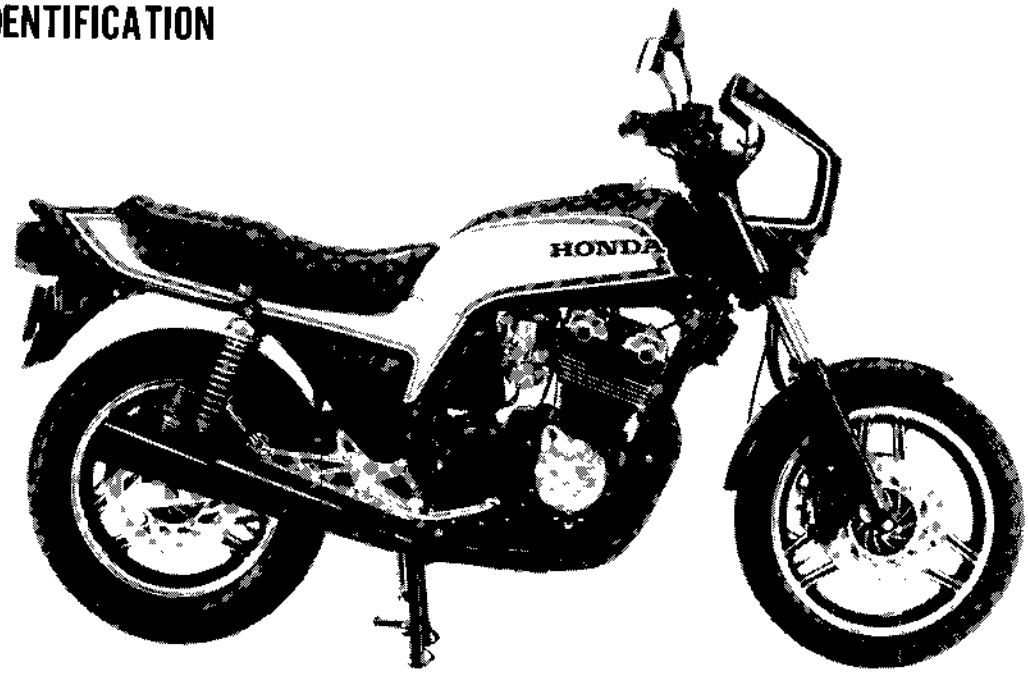
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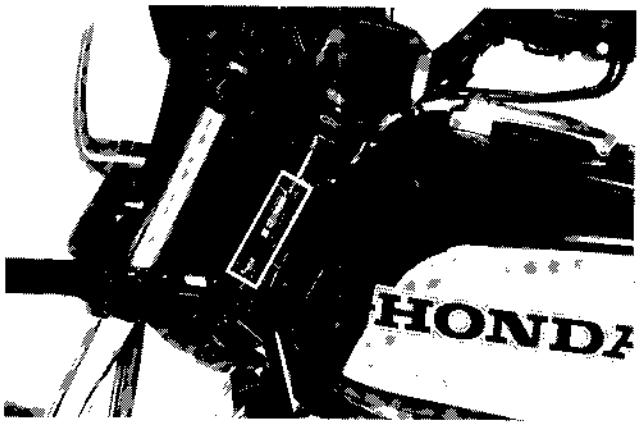
MODEL IDENTIFICATION



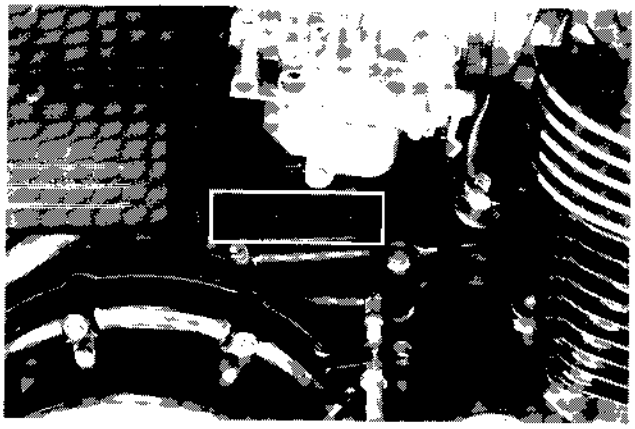
BEGINNING F NO. SC110*DM000001
E NO. SC11E–2000001



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



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



The engine serial number is stamped on top of the right crankcase.



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

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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 exahust 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 electrolyte gets in your eyes.

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 genuine HONDA or HONDA-recommended parts and lubricants or their equivalents. 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 the 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.

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SPECIFECATIONS

Item			
DIMENSIONS	Overall length		2,175 mm (85.6 in)
	Overall width		810 mm (31.9 in)
	Overall height		1,200 mm (47.2 in)
	Wheelbase		1,520 mm (59.8 in)
	Seat height		820 mm (32.3 in)
	Foot peg height		335 mm (13.2 in)
	Ground clearance		145 mm (5.7 in)
	Dry weight		243 kg (536 lb)
	Curb weight		264 kg (582 lb)
FRAME	Type		Double cradle
	Front suspension, travel		Telescopic air forks, 150 mm (5.9 in)
	Rear suspension, travel		Swing arm/Shock absorber 110 mm (4.3 in)
	Gross vehicle weight rating		431.5 kg (950 lb)
	Vehicle capacity load		168 kg (370 lb)
	Front tire size		100/90 V-18, Universal pattern
	Rear tire size		130/90 V-17, Universal pattern
	Cold tire pressures	Up to 90 kg (200 lbs) load Front	250 kPa (2.50 kg/cm^2, 36 psi)
		Up to 90 kg (200 lbs) load Rear	250 kPa (2.50 kg/cm^2, 36 psi)
		Up to vehicle capacity load Front	250 kPa (2.50 kg/cm^2, 36 psi)
		Up to vehicle capacity load Rear	290 kPa (2.90 kg/cm^2, 42 psi)
	Front brake, lining swept area		Double disc, 904 cm^2 (140 sq in)
	Rear brake, lining swept area		Single disc, 490 cm^2 (76 sq in)
	Fuel capacity		20 liters (5.3 US gal, 4.4 Imp gal)
	Fuel reserve capacity		3.5 liters (0.9 US gal, 0.8 Imp gal)
	Caster angle		28°30′
	Trail		120 mm (4.7 in)
	Front fork oil capacity		280 cc (9.5 ozs)
ENGINE	Type		Air cooled 4-stroke, DOHC
	Cylinder arrangement		Vertical in-line four
	Bore and stroke		70 x 69 mm (2.76 x 2.72 in)
	Displacement		1,062 cm^3 (64.8 cu in)
	Compression ratio		9.7 : 1
	Valve train		Chain driven DOHC, 4 Valves per cylinder
	Maximum horsepower		108 BHP/8,500 rpm
	Maximum torque		9.4 kg-m (68.0 ft-lb)/7,500 rpm
	Oil capacity		4.5 liters (4.8 US qt, 4.0 Imp qt) after disassembly
			3.5 liters (3.7 US qt, 3.0 Imp qt) after draining
	Lubrication system		Forced pressure and wet sump
	Air filtration		Paper filter
	Cylinder compression		12.0 ± 2.0 kg/cm^2 (170 ± 28 psi)
	Intake valve Opens		15° (BTDC) at 1 mm lift, 63° (BTDC) at 0 lift
	Intake valve Closes		35° (ABDC) at 1 mm lift, 98° (ABDC) at 0 lift
	Exhaust valve Opens		40° (BBDC) at 1 mm lift, 70° (BBDC) at 0 lift
	Exhaust valve Closes		10° (ATDC) at 1 mm lift, 93° (ATDC) at 0 lift
	Valve clearance (Cold)	IN:	0.06 – 0.13 mm (0.002 – 0.005 in)
		EX:	0.06 – 0.13 mm (0.002 – 0.005 in)
	Engine weight		92 kg (203 lb)
	Idle speed		1,000 ± 100 rpm

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Item		
CARBURETION	Carburetor type	CV, 33 mm (1.30 in) venturi bore
	Identification number	VB56A
	Pilot screw initial setting	1-3/4
	Idle speed	1,000 ± 100 rpm
	Main jet	122
	Float level	15.5 mm (0.61 in)
DRIVE TRAIN	Clutch	Wet, multi-plate
	Transmission	5-speed constant-mesh
	Primary reduction	1.000/2.042
	Final reduction	2.471
	Gear ratio I	2.533 : 1
	Gear ratio II	1.789 : 1
	Gear ratio III	1.391 : 1
	Gear ratio IV	1.160 : 1
	Gear ratio V	1.000 : 1
	Gearshift pattern	Left foot operated return system, 1-N-2-3-4-5
	Drive chain	D.I.D. 50ZL or RK 50LO
ELECTRICAL	Ignition	Transistorized
	Ignition timing "F-1" mark	10° BTDC at idle
	Full advance	38.5° BTDC at 3,500 rpm
	Starting system	Starting motor
	Alternator	Three phase Alternator 260 W/5,000 rpm
	Battery capacity	12V–14AH
	Spark plug	Standard : DR8ES (NGK), X27ESR-U (ND) Optional (for high speed riding): X31ESR-U (ND)
	Spark plug gap	0.6 – 0.7 mm (0.024 – 0.028 in)
	Firing order	1-2-4-3
	Fuse/Main fuse	15A/30A (Main)
LIGHTS	Headlight (high/low beam)	60/55W H4 BULB (MATSUSHITA (E4) 222 or equivalent)
	Tail/stoplight	8/27W 3/32 cp SAE NO. 1157
	Front turn signal/running light	23/8W 32/3 cp SAE NO. 1034
	Rear turn signal	23W 32 cp SAE NO. 1073
	Speedometer light	3.4W 2 cp SAE NO. 57
	Tachometer light	3.4W 2 cp SAE NO. 57
	Neutral indicator	3.4W 2 cp SAE NO. 57
	Turn signal indicator	3.4W 2 cp SAE NO. 57
	High beam indicator	3.4W 2 cp SAE NO. 57
	Oil pressure warning light	3.4W 2 cp SAE NO. 57

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TORQUE VALUES

- ENGINE

Item	Q'ty	Thread Dia (mm)	Torque N·m (kg-m, ft-lb)	Remarks
Cylinder head cover bolts	8	6	8–12 (0.8–1.2, 6–9)	
Cam holder bolts	24	6	12–16 (1.2–1.6, 9–12)	
Cylinder head bolts	12	10	36–40 (3.6–4.0, 26–29)	Apply engine oil to threads and underside of nuts.
Cam sprocket bolts	4	7	18–20 (1.8–2.0, 13–14)	
Spark plugs	4		12–19 (1.2–1.9, 9–14)	
Crankcase bolts	17	8	21–25 (2.1–2.5, 15–18)	Apply engine oil to threads and underside of bolts.
Alternator	1	12	80–100 (8.0–10.0, 58–72)	
Primary shaft	1	12	80–100 (8.0–10.0, 58–72)	
Mainshaft	1	16	38–42 (3.8–4.2, 28–30)	
Drive sprocket	1	10	45–55 (4.5–5.5, 33–40)	
Connecting rod nuts	8		32 (3.2, 23)	
Oil filter center bolt	1		28–32 (2.8–3.2, 20–23)	
Oil pressure switch	1		15–20 (1.5–2.0, 11–14)	Apply liquid sealant.
Neutral switch	1		16–20 (1.6–2.0, 12–14)	
Oil drain plug	1	14	35–40 (3.5–4.0, 25–29)	
Oil hose bolts	2	10	21–25 (2.1–2.5, 15–18)	
Spark advancer bolt	1	8	33–37 (3.3–3.7, 24–27)	Apply LOCTITE® 271 to the threads.
Starting clutch	3	8	26–30 (2.6–3.0, 19–22)	

- CHASSIS

Item	Q'ty	Thread Dia (mm)	Torque N·m (kg-m, ft-lb)	Remarks
Steering stem nut	1	24	80–120 (8.0–12.0, 58–87)	
Steering top thread nut	1	26	14–16 (1.4–1.6, 10–12)	
Handlebar holder bolts	4	8	25–30 (2.5–3.0, 18–22)	
Handlebar pinch bolt	2	8	25–30 (2.5–3.0, 18–22)	Apply grease to threads.
Front fork bridge	2	8	9–13 (0.9–1.3, 7–9)	
Front fork cap bolts	2	31	15–30 (1.5–3.0, 11–22)	
Steering stem pinch bolts	4	8	45–55 (4.5–5.5, 33–40)	
Front acle holder nuts	4	10	30–40 (3.0–4.0, 22–29)	
Front axle nut	1	12	55–65 (5.5–6.5, 40–47)	
Front fork socket bolt	2	8	15–25 (1.5–2.5, 11–18)	
Front fork drain bolt	2	6	6–9 (0.6–0.9, 4.3–7)	
Front fork joint air tube connector	1	8	4–7 (0.4–0.7, 2.9–5.1)	
Front fork air valve	1	8	4–7 (0.4–0.7, 2.9–5.1)	

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Item	Q'ty	Thread Dia (mm)	Torque N·m (kg-m, ft-lb)	Remarks
Brake hose bolts	7	10	25–35 (2.5–3.5, 18–25)	
Front/rear brake disc	5	8	27–33 (2.7–3.3, 20–24)	UBS
Brake caliper carrier	2	10	30–40 (3.0–4.0, 22–29)	
Caliper bolt	3	8	22–25 (2.2–2.5, 16–18)	
Caliper pivot bolt	3	10	25–30 (2.5–3.0, 18–22)	
Rear master cylinder bolts	2	6	30–40 (3.0–4.0, 22–29)	
Rear axle nut	1	18	80–100 (8.0–10.0, 58–72)	
Final driven sprocket	4	12	80–100 (8.0–10.0, 58–72)	UBS
Swing arm pivot nut	1	14	60–70 (6.0–7.0, 43–51)	
Rear brake torque link nut	1	8	18–25 (1.8–2.5, 13–18)	
Rear shock absorber nuts	4	10	30–40 (3.0–4.0, 22–29)	
Engine hanger bolts	4	10	35–45 (3.5–4.5, 25–33)	
	2	8	18–25 (1.8–2.5, 13–18)	
Right sub-frame pinch bolt	1	10	35–45 (3.5–4.5, 25–33)	
Right sub-frame bolts	2	8	18–25 (1.8–2.5, 13–18)	

Torque specifications listed above are for important fasteners. Others should be tightened to the 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	35–40 (3.5–4.0, 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

Description	Part No.	Alternate	Part No.	Ref Page
Vacuum gauge set	07404–0020000	Carburetor Vacuum Gauge Set (U.S.A. only)	M937B–021–XXXXX	3-12
Oil pressure gauge	07506–3000000			2-5
Oil pressure gauge attachment	07510–4220100			2-5
Primary gear holder	07924–4250000	Use commercially available holder (Grabbit in U.S.A.)		6-6, 6-7
Rotor puller	07933–4250000			8-3
Race remover	07953–4250002			14-36, 14-37
Carburetor adjusting wrench	07908–4220100			3-13
Carburetor pilot screw wrench	07908–4220201			4-19
Snap ring pliers	07914–3230001			14-23, 14-30 16-8, 16-15
Steering stem socket	07916–3710100			14-36, 14-38
Hex wrench, 6 mm	07917–3230000	Commercially available in U.S.A.		14-23, 14-29
Race remover	07946–3710500			14-37
Steering stem driver	07946–MB0000	Steering Stem Driver	07946–3710600	14-37
Piston base (2 required)	07958–3000000			10-8
Tappet holder set	07946–4220001	Valve Adjusting Tool Set (U.S.A. only)	M9501–277–94752	3-9
Valve guide reamer, 5.5 mm	07984–2000000			9-14, 9-16
Piston ring compressor (2 required)	07954–2830000			10-8
Valve lifter bore protector	07999–4220000			9-12, 9-17
Valve seat cutter, 27.5 mm	07780–0010200	Equivalent commercially available in U.S.A.		9-17
Valve seat cutter, 29 mm	07780–0010300			
Valve seat flat cutter, 25 mm	07780–0012000			
Valve seat flat cutter, 30 mm	07780–0012200			
Valve seat interior cutter, 30 mm	07780–0014000			
Valve seat cutter holder, 5.5 mm	07781–0010100			
Clutch center holder	07923–3710000	Clutch Center Holder	07923–4610000	6-4, 6-9
Bearing driver	07936–4250001			15-13
Bearing driver attachment		Attachment U.S.A. only	M9310–277–91775	15-13
Bearing remover	07936–4250101	Bearing remover U.S.A. only	M9310–277–91774	15-12
Fork seal driver	07947–4630100			14-30
Attachment	07946–3710701	Attachment	07946–3710700	
Hex bit, 10 mm	07917–3710000	Commercially available in U.S.A.		

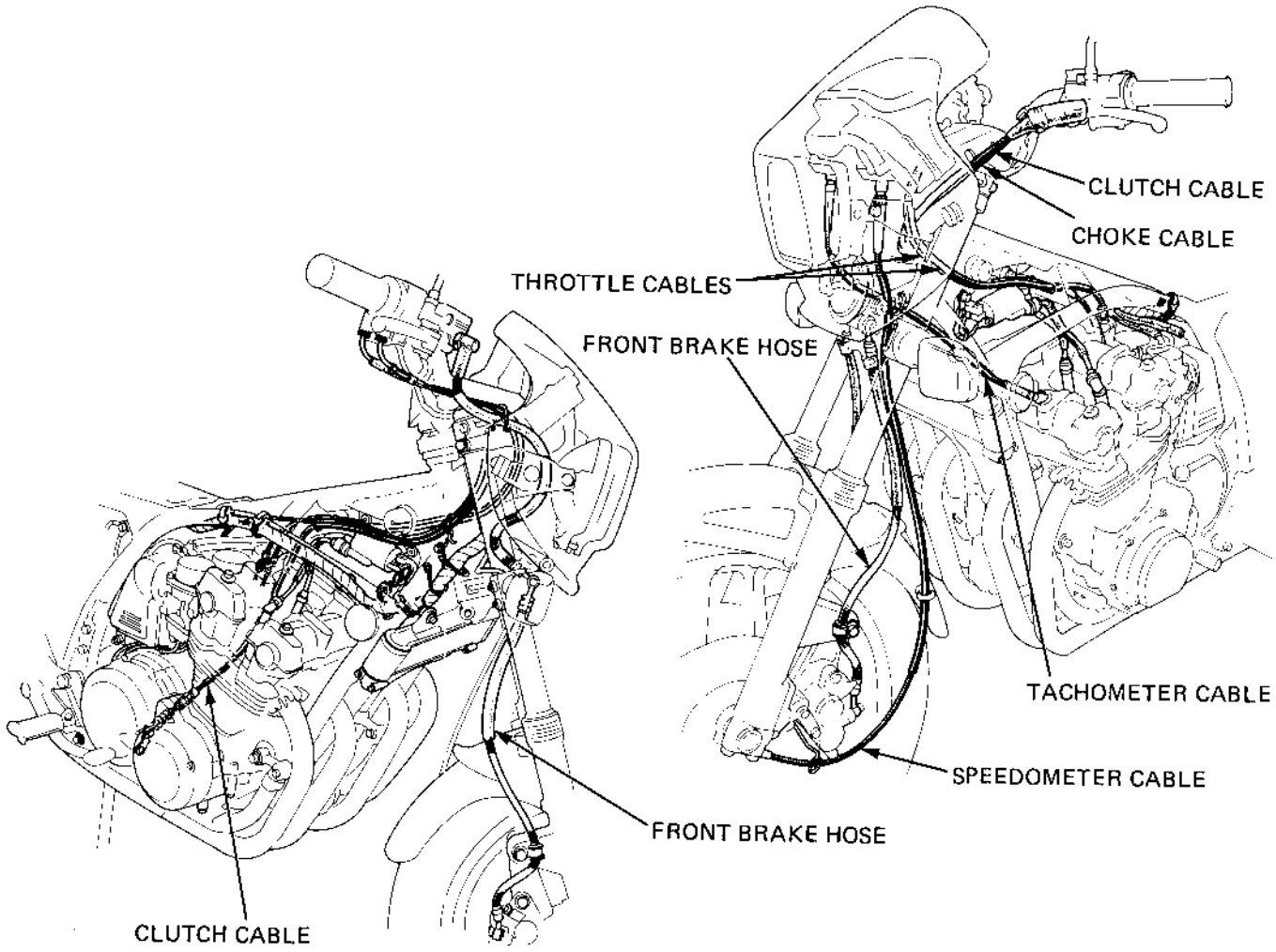
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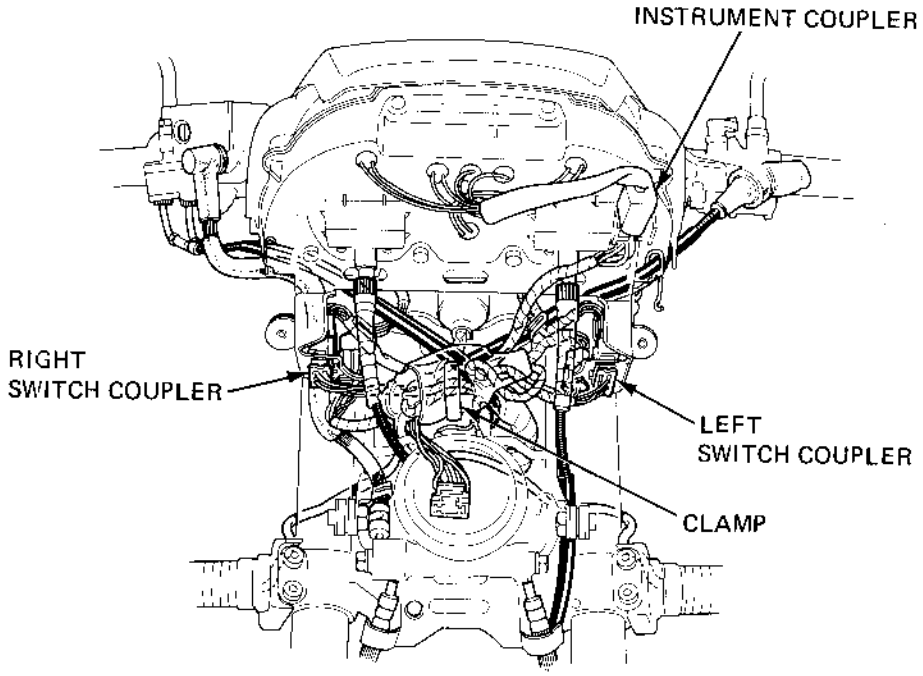
- COMMON

Description	Part No.	Alternate	Part No.	Ref Page
Float level gauge	07401–0010000			4-8
Lock nut wrench socket 30 x 32 mm	07716–0020400	Commercially available in U.S.A.		14-35, 14-39
Lock nut wrench, 20 x 24 mm	07716–0020100	Lock nut wrench	07916–3710000	6-4, 6-9
Extension bar	07716–0020500	Commercially available in U.S.A.		6-4, 14-39
Valve guide remover, 5.5 mm	07742–0010100	Valve guide driver	07942–3290100	9-15
Valve guide driver B	07742–0020200	Valve guide driver	07942–3290200	9-15
Attachment, 42 x 47 mm	07746–0010300	Attachment	07945–3330100	14-16, 14-38
Attachment, 52 x 55 mm	07746–0010400	Attachment	07946–9370100 or 07946–3290000	14-38, 15-6
Attachment, 62 x 68 mm	07746–0010500	Attachment	07946–3600000	15-6
Driver	07749–0010000	Driver	07949–6110000	14-16, 14-38, 15-6 15-13
Driver	07746–0020100	Driver	07945–3230201	12-14
Driver	07746–0030100			13-8
Attachment, 25 mm I.D.	07746–0030200	Driver	07945–3710200	12-14, 13-8
Valve spring compressor	07757–0010000	Valve spring compressor	07957–3290001	9-12, 9-17
Pilot, 15 mm	07746–0040300			14-16
Pilot, 20 mm	07746–0040500			15-6
Pilot, 25 mm	07746–0040600	Attachment	07946–3600000	15-6
Shock absorber compressor	07959–3290001			15-9
Attachment	07746–0020400			12-14

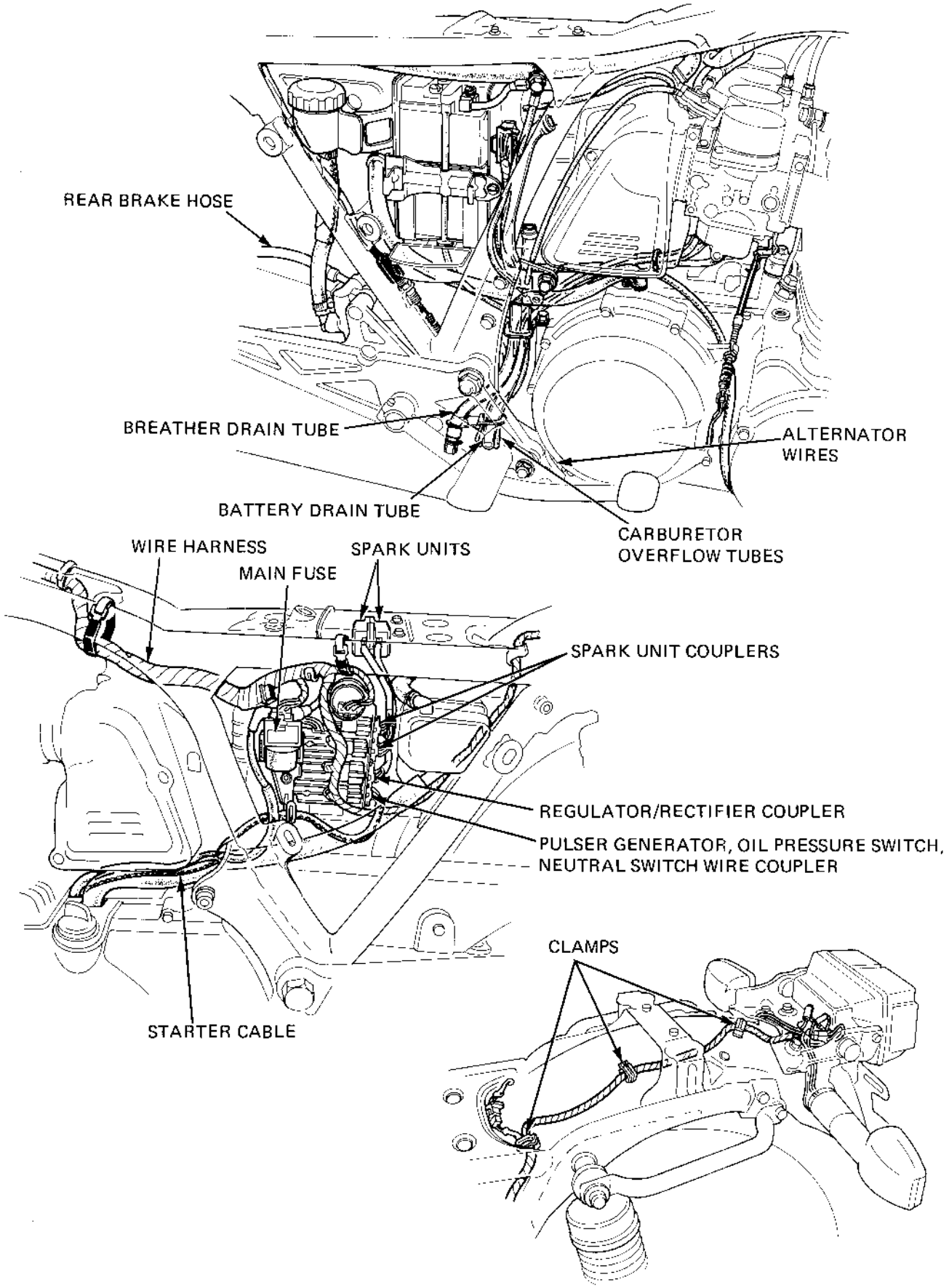
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CABLE & HARNESS ROUTING





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EMISSION CONTROL SYSTEM

The 1100F is equipped with two Emission Control Systems.

EXHAUST EMISSION CONTROL SYSTEM

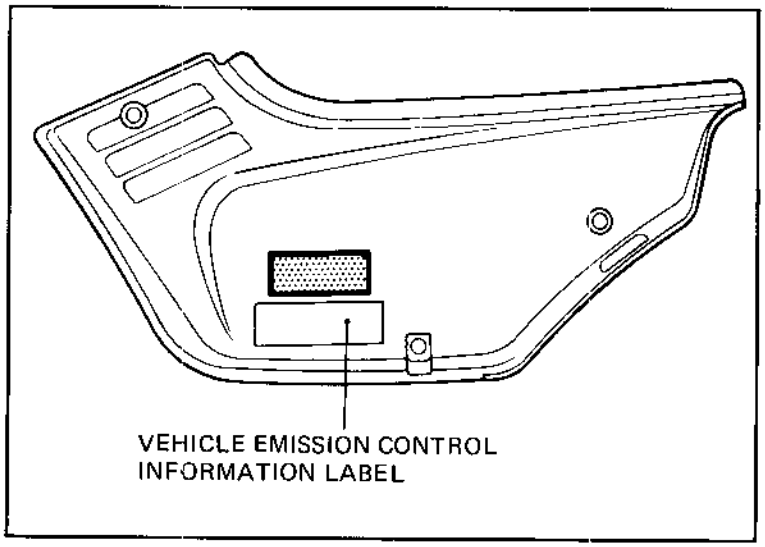
The exhaust emission control system is composed of lean carburetor settings, and no adjustments should be made except idle speed adjustment with the throttle stop screw.
The exhaust emission control system is separate from the crankcase emission control system.

CRANKCASE EMISSION CONTROL SYSTEM

The engine is equipped with a closed crankcase system which routes crankcase emissions through the air cleaner and into the combustion chamber. Condensed crankcase vapors are accumulated in a storage tank which must be emptied periodically. See the Maintenance Schedule in section 3.

EMISSION CONTROL INFORMATION LABEL

An Emission Control Information Label is located inside the right side cover.
If contains basic tune-up specifications.

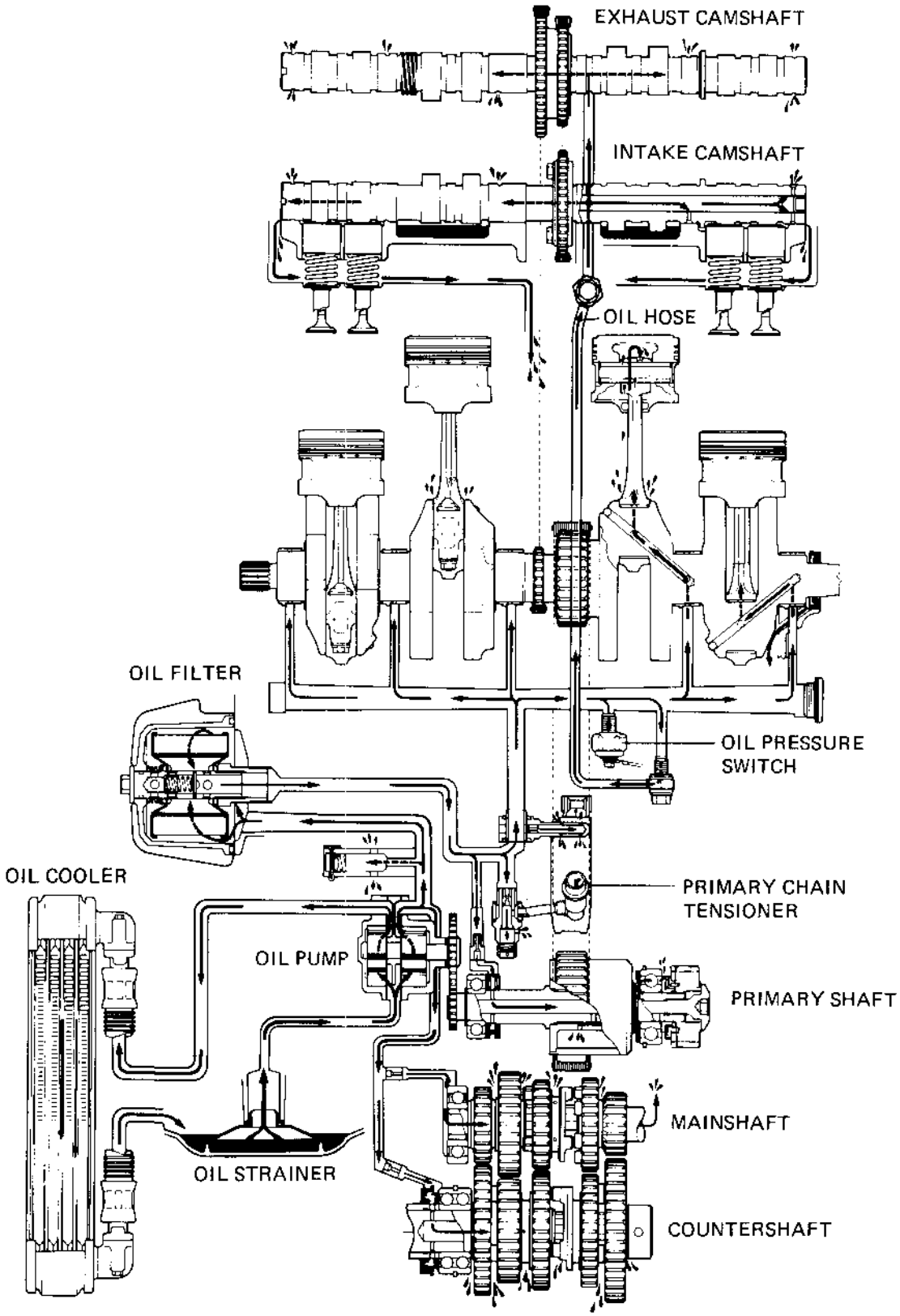


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MEMO

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ENGINE LUBRICATION DIAGRAM



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2. LUBRICATION

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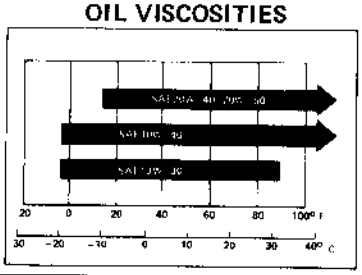
SERVICE INFORMATION

GENERAL

Oil pressure relief valve: See Section 12 (Crankshaft/Primary Shaft).

SPECIFICATIONS

Engine oil

Oil capacity	3.5 lit (3.7 US qt, 3.0 Imp qt) at change 4.5 lit (4.8 US qt, 3.9 Imp qt) at disassembly
Oil recommendation	Use Honda 4-Stroke Oil or equivalent. API Service Classification: SE or SF Viscosity: SAE 10W-40 Other viscosities shown in the chart may be used when the average temperature in your riding area is within the indicated range. OIL VISCOSITIES 
Oil pump delivery	Engine: 41 lit (43 US qt, 36 Imp qt)/min. at 7,000 rpm Cooler: 18 lit (19 US qt, 16 Imp qt)/min. at 7,000 rpm
Oil pressure (at oil pressure switch)	5.5 kg/cm^2 (78 psi) at 7,000 rpm (80°C/176°F)

Oil pump service data

	Standard		Service limit
Rotor tip clearance (Engine/Cooler)	0.15 mm	(0.006 in)	0.20 mm (0.008 in)
Pump body clearance (Engine/Cooler)	0.15–0.22 mm	(0.006–0.009 in)	0.35 mm (0.014 in)
Pump end clearance (Engine/Cooler)	0.02–0.07 mm	(0.001–0.003 in)	0.10 mm (0.004 in)

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TORQUE VALUES

Engine oil drain plug	35–40 N·m (3.5–4.0 kg-m, 25–29 ft-lb)
Engine oil filter bolt	28–33 N·m (2.8–3.3 kg-m, 20–23 ft-lb)
Oil pressure switch	15–20 N·m (1.5–2.0 kg-m, 11–14 ft-lb) Apply Loctite®

TOOLS

Special

Oil Pressure Gauge	07506–3000000
Oil Pressure Gauge Attachment	07510–4220100

TROUBLESHOOTING

Oil level too low
1. External oil leaks.
2. Worn piston rings.
3. Worn valve guides or seals.

Oil contamination
1. Oil or filter not changed often enough.
2. Head gasket faulty.
3. Worn piston rings.

High oil pressure
1. Pressure relief valve stuck open.
2. Plugged oil filter, gallery, or metering orifice.
3. Incorrect oil being used.

No oil pressure
1. Oil level low.
2. Oil pump drive gear broken.
3. Oil pump faulty.
4. Internal oil leak.

Low oil pressure
1. Oil level low.
2. Pressure relief valve stuck open.
3. Plugged oil pick-up screen.
4. Oil pump worn.

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<ENGINE LUBRICATION>

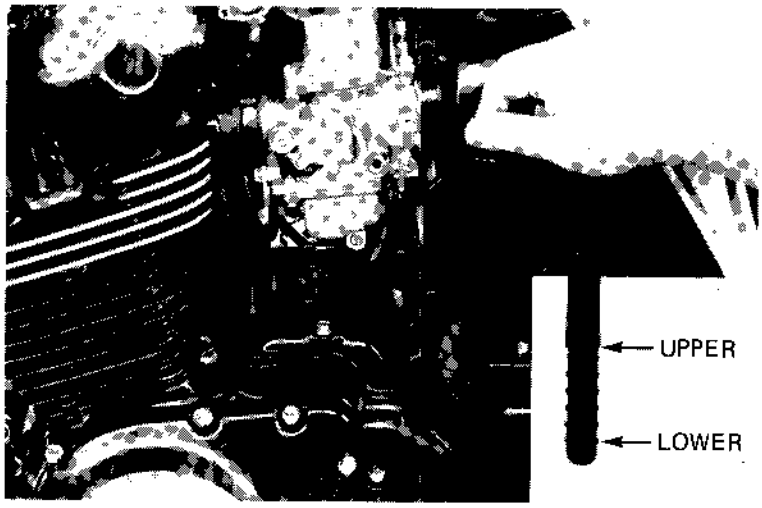
ENGINE OIL LEVEL

Run the engine and allow to idle for 2–3 minutes.

Stop the engine and support the motorcycle on the center stand. Check the oil level with the filler cap/dipstick after a few minutes. Do not screw in the cap when making this check.

If the level is below the lower level mark on the dipstick, fill to the upper level mark with the recommended oil (page 2-1).

Check the oil pressure warning light. This light should go off when the engine starts.
If it does not, check the oil pump function and/or oil circuit.



DRAIN PLUG
35–40 N·m (3.5–4.0 kg-m, 25–29 ft-lb)

ENGINE OIL & FILTER CHANGE

NOTE:

> Change engine oil with the engine warm and the mortorcycle on its center stand to assure complete and rapid draining.

Warm the engine to normal operating temperature.

Stop the engine and place the motorcycle on its center stand.
Remove the oil filler cap, drain plug and oil filter bolt and drain the oil.

Make sure that the sealing washer on the drain plug and the O-rings on the oil filter bolt and oil filter cover are in good condition.

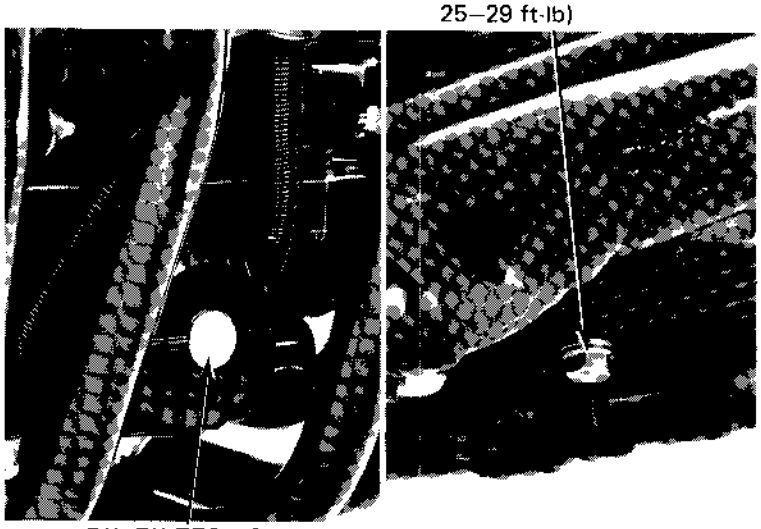
After completely draining, replace the oil filter and install the oil filter bolt and drain plug.

Fill the crankcase with 3.5 lit (3.7 US qt, 3.0 Imp qt) of the recommended oil (page 2-1).

Install the oil filler cap and start the engine and let it idle for 2–3 minutes.
Stop the engine and wait a few more minutes.

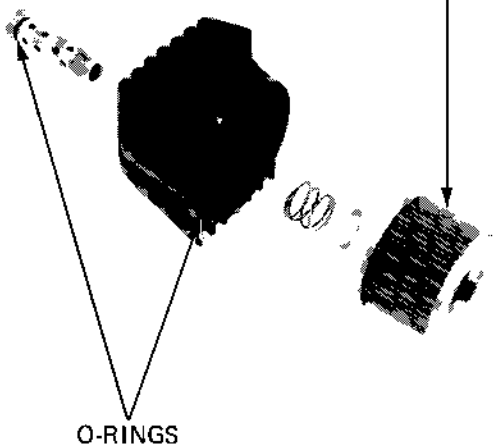
Then check the oil level and add oil if necessary.

Make sure that there are no oil leaks.



OIL FILTER BOLT
28–33 N·m (2.8–3.3 kg-m, 20–23 ft-lb)

OIL FILTER



O-RINGS

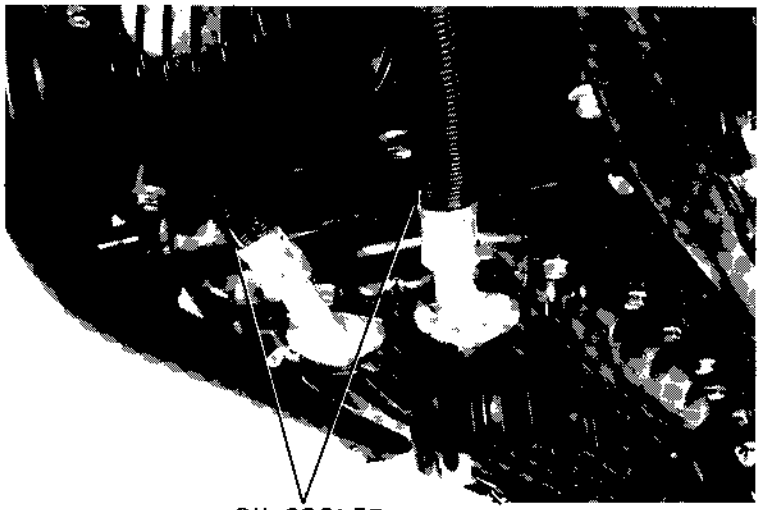
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OIL STRAINER CLEANING

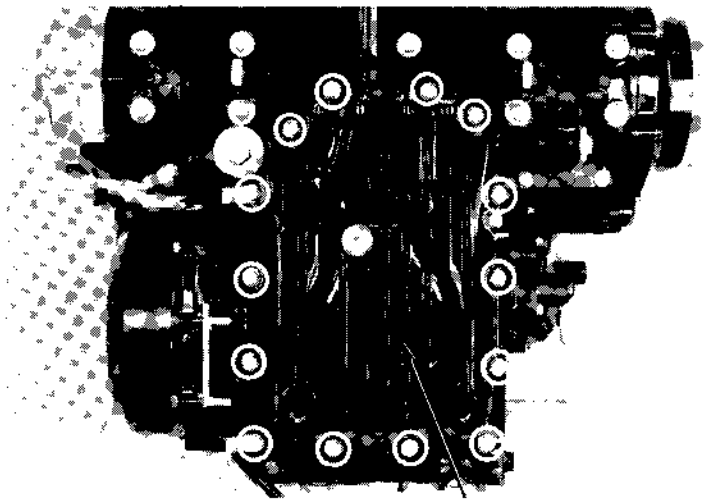
NOTE:

> The oil strainer can be removed with the engine mounted in the frame.

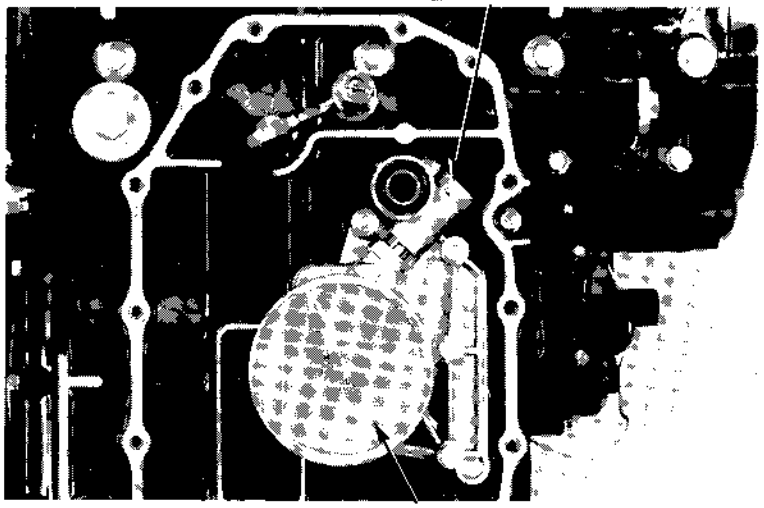
Remove the oil filler cap, drain plug, oil filter bolt, and filter.
Remove the exhaust pipes.
Disconnect the oil cooler hoses.



Remove the oil pan bolts and oil pan.



Remove and clean the oil strainer.
Check the operation of the pressure relief valve, making sure it is not sticking.



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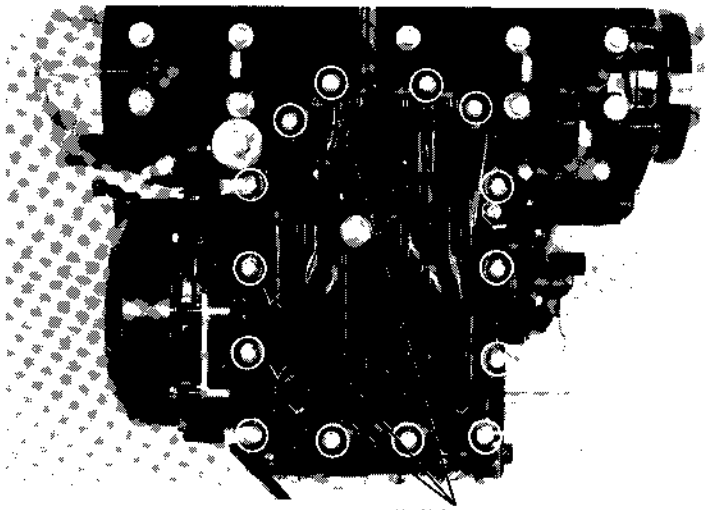
Install the oil strainer and oil pan.

Use sealing washers where indicated by the "△" marks.

Install the exhaust pipes and connect the oil cooler hoses.

Install the oil filter.

Fill the crankcase (page 2-3).



"△" MARKS

OIL PRESSURE CHECK

Warm the engine up to normal operating temperature (approximately 80°C/176°F).
Stop the engine and remove the oil pressure switch.
Connect an oil pressure gauge to the pressure switch hole.
Check the oil level.

Start the engine and check the oil pressure at 7,000 rpm.

OIL PRESSURE:
5.5 kg/cm² (78 psi) at 7,000 rpm (80°C/176°F)

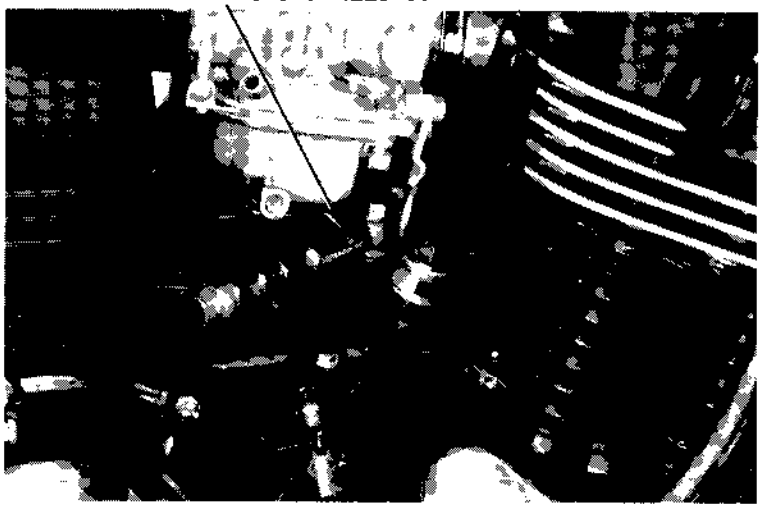
Stop the engine.
If the oil pressure is not within specification, refer to Troubleshooting on page 2-2.

Apply Loctite® to the pressure switch threads and install.

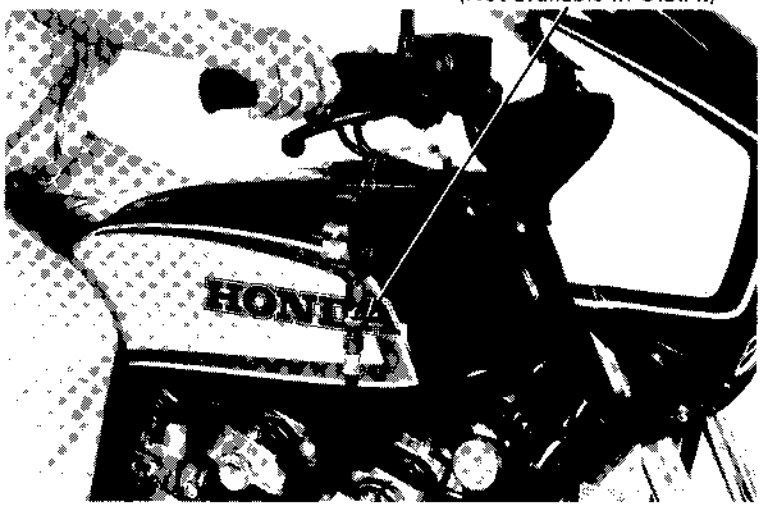
TORQUE: 15–20 N·m
(1.5–2.0 kg-m, 11–14 ft-lb)

Connect the oil pressure switch and start the engine.
Check that the oil pressure warning light goes out.
If the oil pressure warning light stays on, stop the engine immediately and determine the cause.
Refer to page 20-2 for warning switch inspection.

OIL PRESSURE GAUGE
ATTACHMENT **07510–4220100**



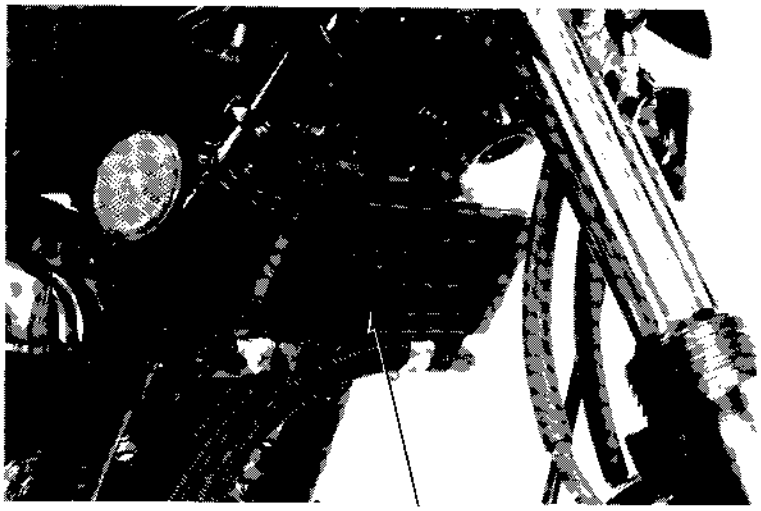
OIL PRESSURE GAUGE
07506–3000000
(Not available in U.S.A.)



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OIL COOLER INSPECTION

Check for damage to the oil cooler core.
Clean the core if necessary.



OIL COOLER

OIL PUMP

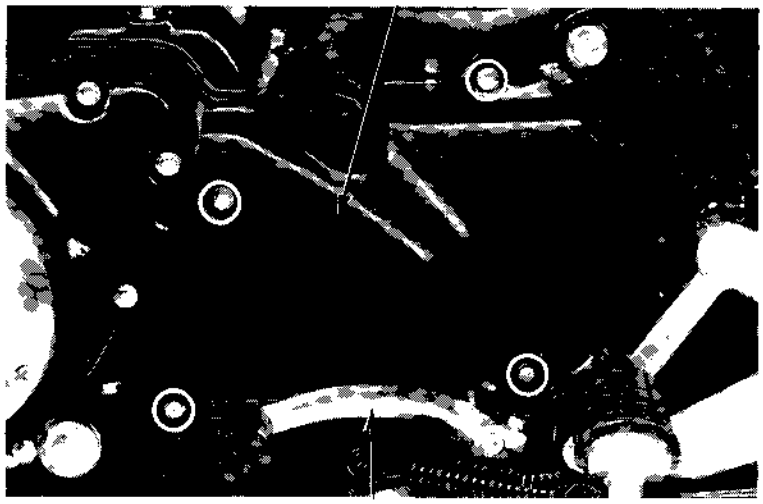
REMOVAL

NOTE:

> The oil pump can be removed with the engine mounted in the frame.

Drain the engine oil.
Remove the gearshift pedal and the left crankcase rear cover.

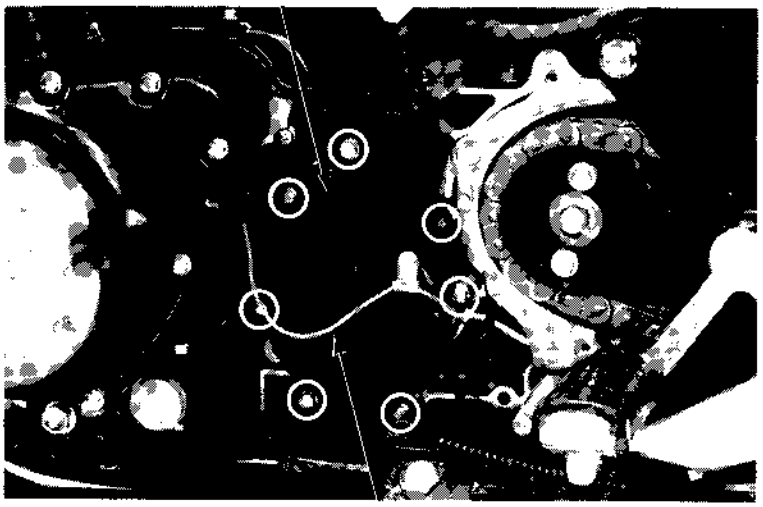
LEFT CRANKCASE REAR COVER



GEARSHIFT PEDAL

Disconnect the neutral switch wire.
Remove the oil pump cover bolts and oil pump cover.

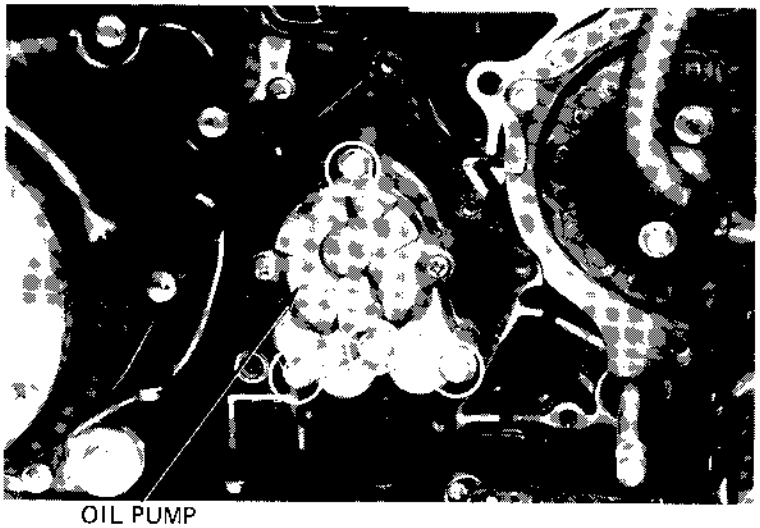
OIL PUMP COVER



NEUTRAL SWITCH WIRE

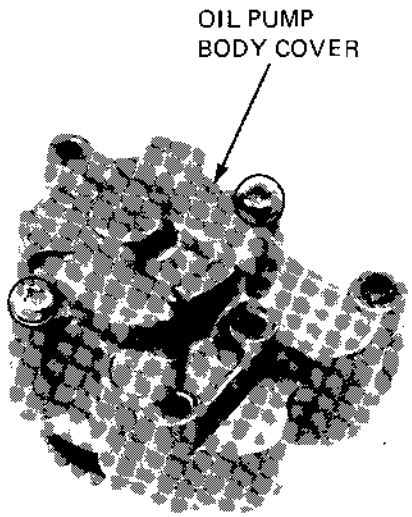
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Remove the oil pump mounting bolts and pump.

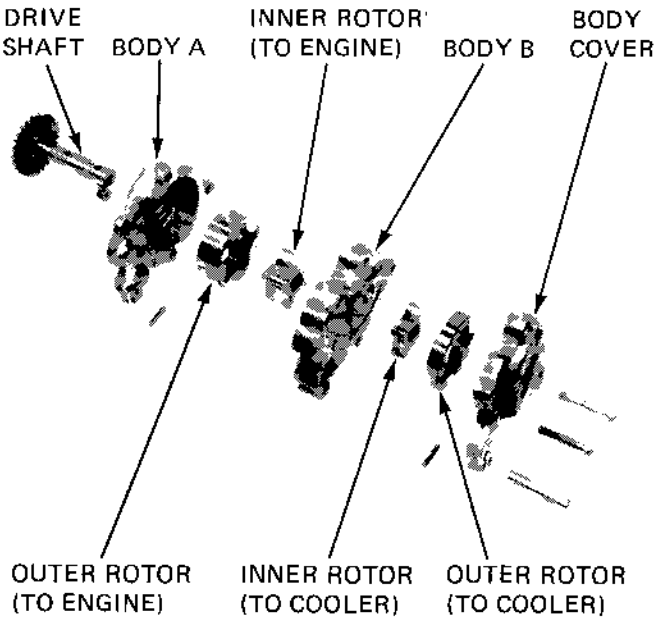


DISASSEMBLY

Remove the oil pump body cover screws and cover.



Remove both rotors, drive pin and drive shaft.



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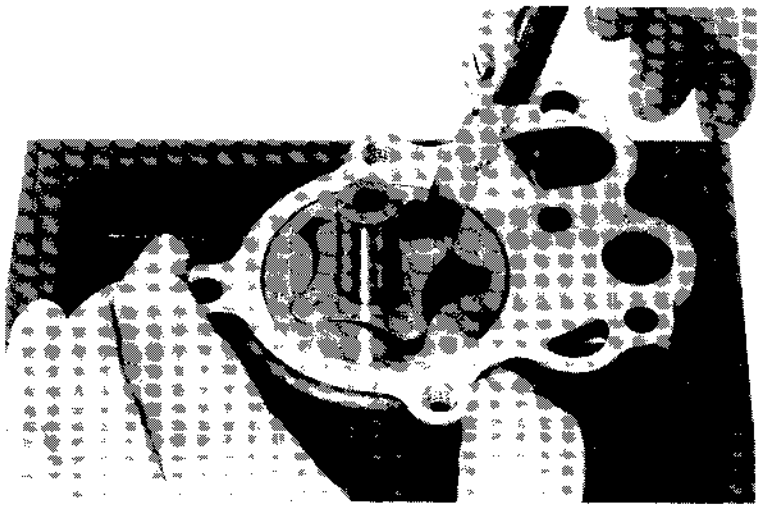
INSPECTION

Measure the rotor tip clearance.

NOTE:

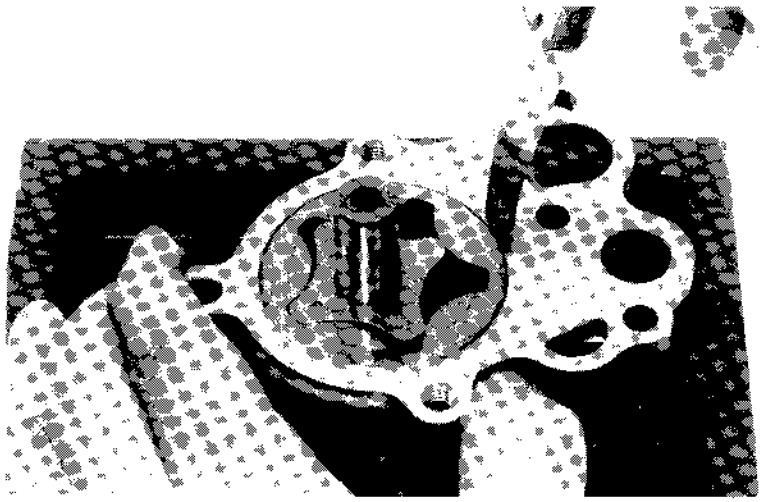
> Specifications are the same for the engine and cooler pumps.

SERVICE LIMIT: 0.20 mm (0.008 in)



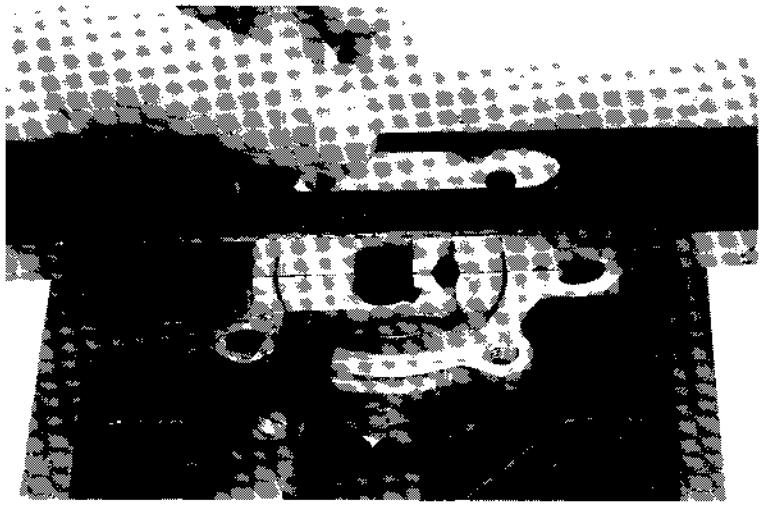
Measure the pump body clearance.

SERVICE LIMIT: 0.35 mm (0.014 in)



Measure the pump end clearance.

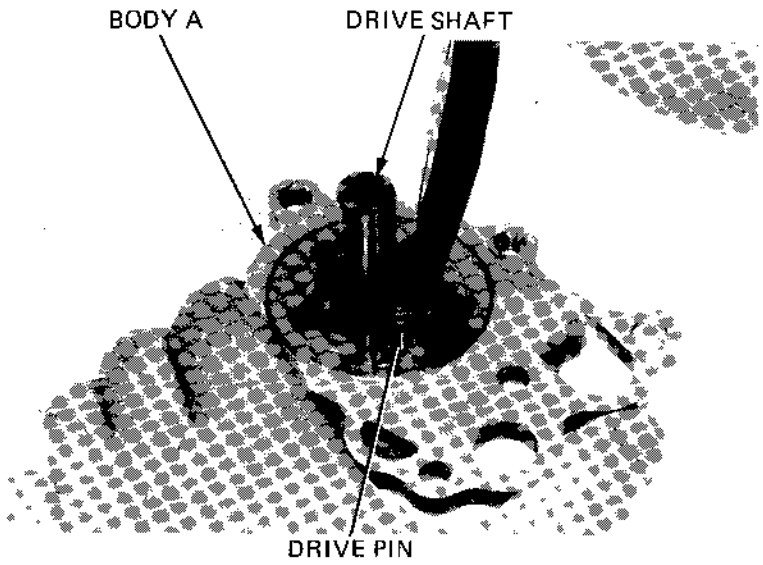
SERVICE LIMIT: 0.10 mm (0.004 in)



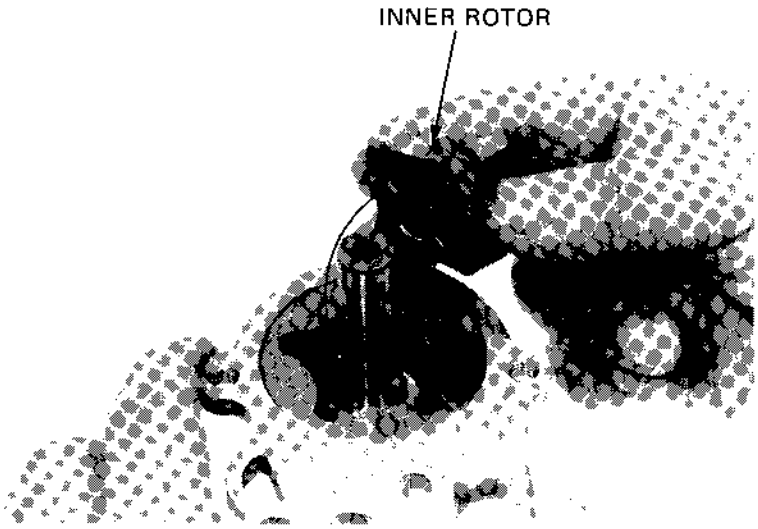
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ASSEMBLY

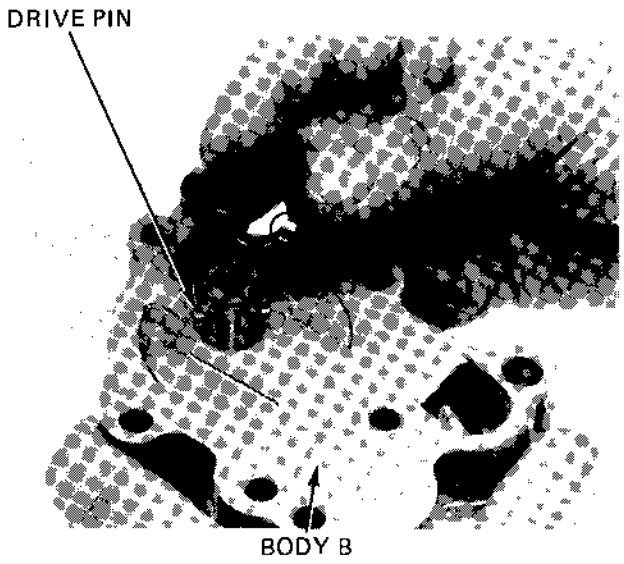
Install the outer rotor into body A and insert the drive shaft.
Insert the drive pin into the drive shaft.



Aligh the slots in the inner rotor with the drive pin and install the inner rotor.



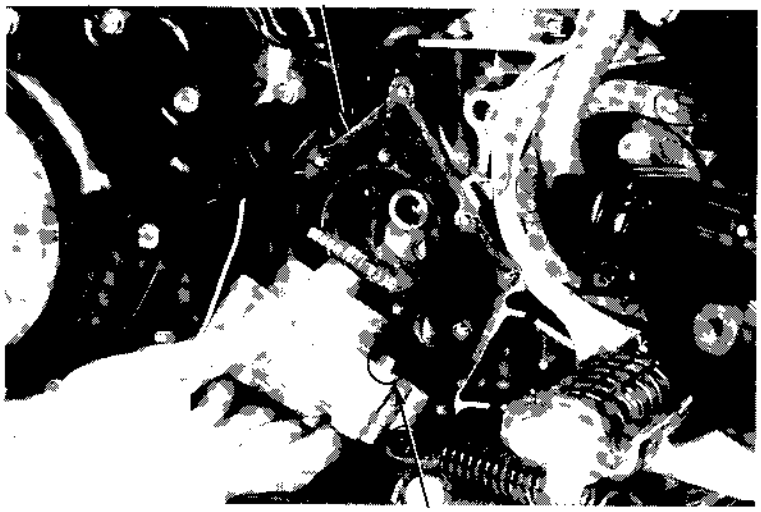
Install body B and insert the drive pin into the shaft.
Align the slot in the inner rotor with the drive pin.
Install the side covers and tighten the screws.



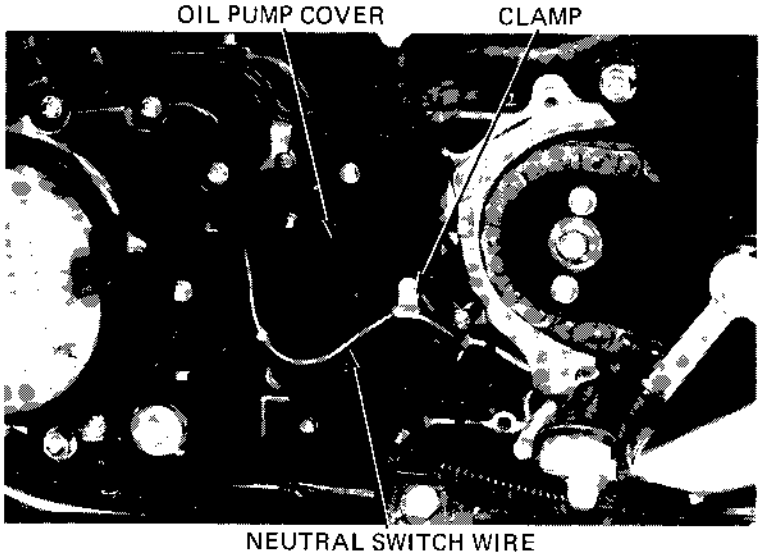
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INSTALLATION

Install a new gasket.
Engage the oil pump drive and driven gears.
Install the dowel pin.
Install the oil pump and tighten the mounting bolts.



Install the oil pump cover and tighten the oil pump cover bolts.
Route the neutral switch wire as shown.
Install the left crankcase rear cover and gearshift pedal.
Fill the crankcase with the recommended oil (page 2-1 and 2-3).

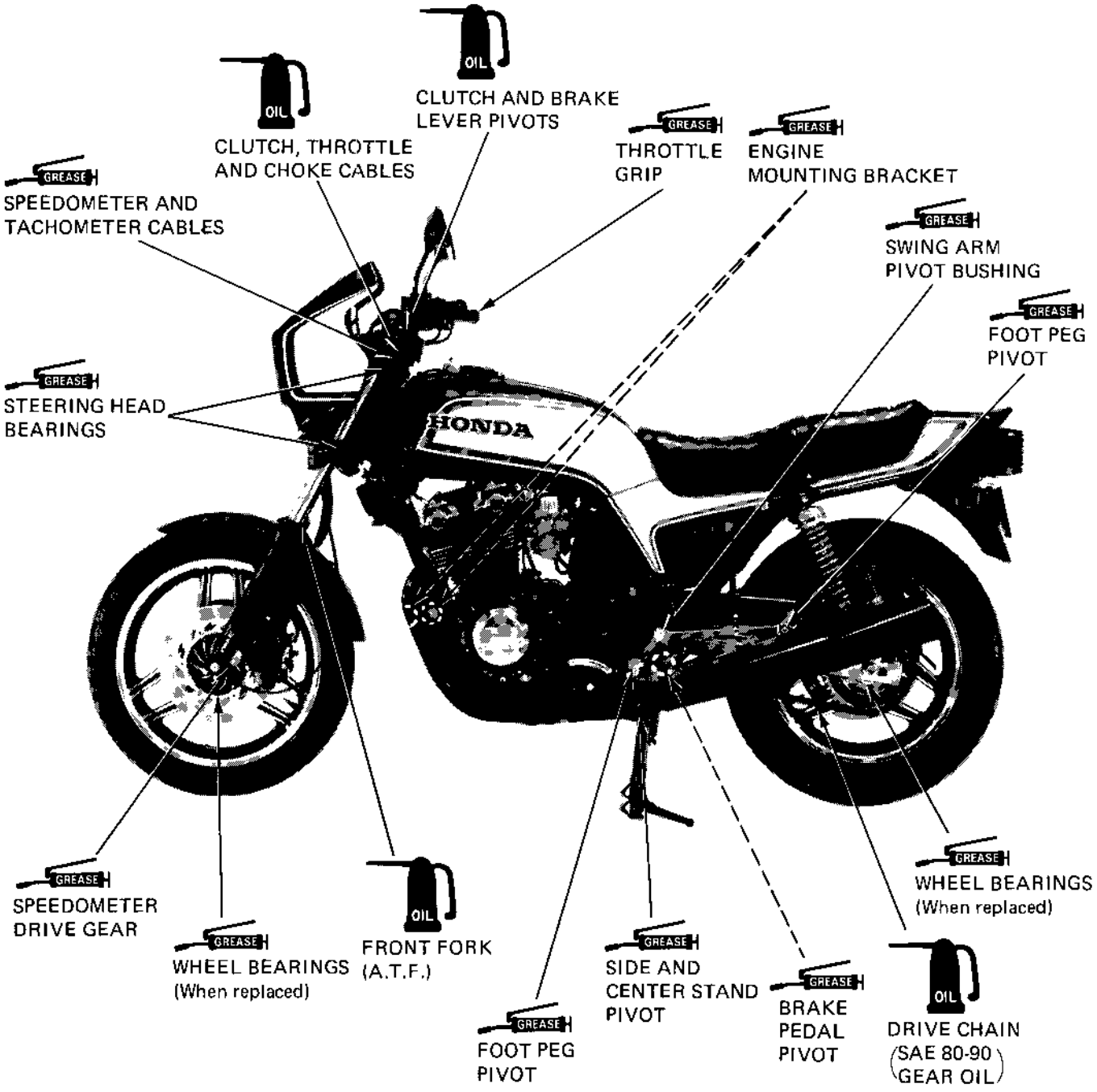


<CHASSIS LUBRICATION>
CONTROL CABLE LUBRICATION

Periodically, disconnect the throttle and clutch calbes at their upper ends.
Thoroughly lubricate the cables and their pivot points with a commercially available cable lubricant.

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LUBRICATION POINTS



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MEMO

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3. MAINTENANCE

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3

SERVICE INFORMATION

GENERAL

- Engine oil See page 2-3
- Engine oil filter See page 2-3

SPECIFICATIONS

<Engine>

Spark plug: Recommended spark plug

Standard		For extended high speed riding
ND	NGK	ND
X27ESR-U	DR8ES	X31ESR-U

Plug gap 0.6–0.7 mm (0.02–0.03 in)

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Ignition timing

At idle	:	10°BTDC
Advance starts	:	1,700 rpm
Full advance	:	38°30' BTDC at 3,500 rpm

Valve clearance:

Cold (Below 35°C/95°F) Intake/Exhaust : 0.06–0.13 mm (0.002–0.005 in)

Idle speed : 1,000 ± 100 rpm

Carburetor synchronization : All carburetors within 60 mm Hg (2.4 in Hg) of each other

Cylinder compression : 12 ± 2 kg/cm² (170 ± 28 psi)

Throttle grip free play : 2–6 mm (1/8–1/4 in)

<CHASSIS>

Clutch lever free play : 10–20 mm (3/8–3/4 in)

Tire

Tire size		Front	Rear
		100/90 V-18	130/90 V-17
Cold tire pressures kg/cm² (psi)	Up to 90 kg (200 lbs) load	2.50 (36)	2.50 (36)
	90 kg (200 lbs) load to vehicle capacity load	2.50 (36)	2.90 (41)
Tire brand	BRIDGESTONE	L303	G508
	DUNLOP	F11	K627

Front fork air pressure : 0–0.6 kg/cm² (0–8 psi)

TOOLS

Special

Valve adjusting tool set	M9501–277–94752
Vacuum gauge	07404–0020000 or M937B–021–XXXXX (U.S.A. only)
Carburetor adjusting wrench	07908–4220100

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MAINTENANCE SCHEDULE

Perform the PRE-RIDE INSPECTION lin 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 3) 600 mi (1,000 km)	4,000 mi (6,400 km)	8,000 mi (12,800 km)	12,000 mi (19,200 km)	16,000 mi (25,600 km)	20,000 mi (32,000 km)	Refer to page
EMISSION RELATED ITEMS	*	FUEL LINES			I	I	I	I	I	3-4
	*	FUEL STRAINER		C	C	C	C	C	C	3-4
	*	THROTTLE OPERATION		I	I	I	I	I	I	3-5
	*	CARBURETOR-CHOKE			I	I	I	I	I	3-6
		AIR CLEANER	NOTE 1		C	R	C	R	C	3-6
		CRANKCASE BREATHER	NOTE 2		C	C	C	C	C	3-7
		SPARK PLUGS			R	R	R	R	R	3-7
	*	VALVE CLEARANCE		I	I	I	I	I	I	3-8
		ENGINE OIL	YEAR	R	R	R	R	R	R	2-3
		ENGINE OIL FILTER	YEAR	R	R	R	R	R	R	2-3
	*	CAM CHAIN TENSION		A	A	A	A	A	A	3-12
	*	CARBURETOR-SYNCHRONIZATION		I	I	I	I	I	I	3-12
	*	CARBURETOR-IDLE SPEED		I	I	I	I	I	I	3-13
NON-EMISSION RELATED ITEMS		DRIVE CHAIN		I, L Every 300 mi (500 km)						3-15
		BATTERY	MONTH	I	I	I	I	I	I	3-17
		BRAKE FLUID	MONTH I 2 YEARS*R	I	I	I	*R	I	I	3-17
		BRAKE PAD WEAR		I	I	I	I	I	I	3-18
		BRAKE SYSTEM		I	I	I	I	I	I	3-18
	*	BRAKE LIGHT SWITCH		I	I	I	I	I	I	3-19
	*	HEADLIGHT AIM		I	I	I	I	I	I	3-19
		CLUTCH		I	I	I	I	I	I	3-20
		SIDE STAND			I	I	I	I	I	3-21
	*	SUSPENSION		I	I	I	I	I	I	3-21
	*	NUTS, BOLTS, FASTENERS		I	I	I	I	I	I	3-25
	**	WHEELS		I	I	I	I	I	I	3-24
	**	STEERING HEAD BEARINGS		I		I		I		3-25

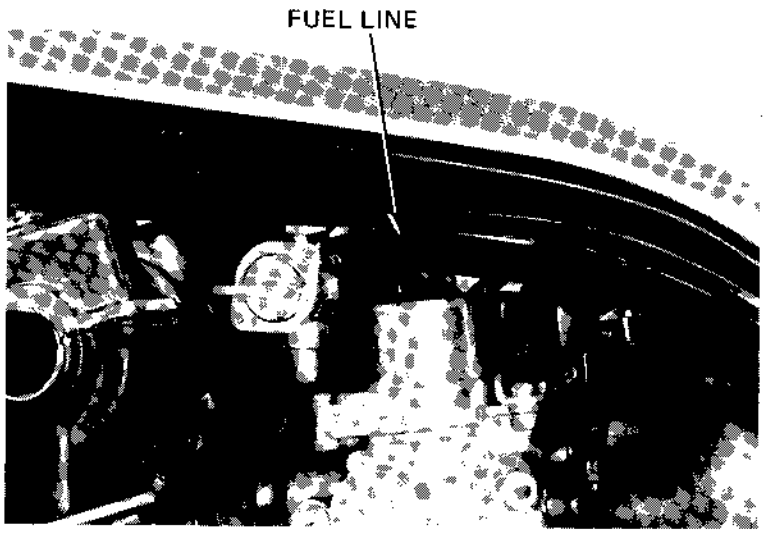
* Should be serviced by an authorized Honda dealer, unless the owner has proper tools and service data and is mechanically qualified.
** In the interest of safety, we recommend these items be serviced ONLY by an authorized HONDA dealer.

NOTES: 1. Service more frequently when riding in dusty areas.
2. Service more frequently when riding in rain or at full throttle.
3. For higher odometer readings, repeat at the frequency interval established here.

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<ENGINE>
FUEL LINES

Replace any parts which show deterioration, damage or leakage.



FUEL STRAINER

Turn the fuel valve OFF.

Remove the fuel cup, O-ring and strainer, draining the gasoline into a suitable container.

WARNING

Gasoline is flammable and is explosive under certain conditions. Do not smoke or allow flames or sparks near the equipment while draining fuel.

Wash the cup and filter screen in clean non-flammable or high flash point solvent.

Reinstall the screen, aligning the index marks on the fuel valve body and filter screen. Install a new O-ring into the fuel valve body. Reinstall the fuel cup, making sure the new O-ring is in place.

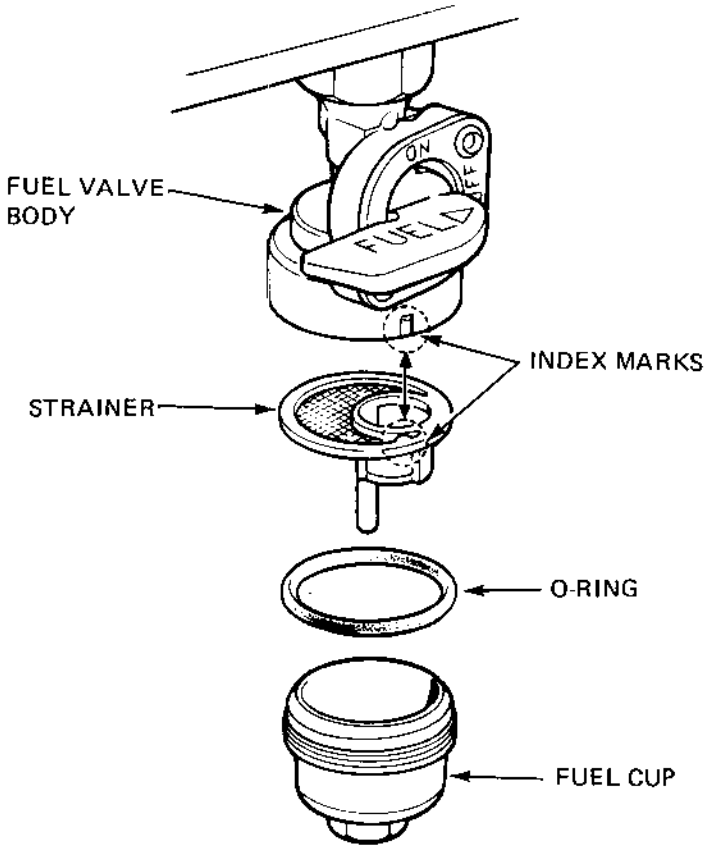
Hand tighten the fuel cup and torque to specification.

CAUTION:

Do not overtighten the fuel cup.

TORQUE: 3–5 N·m (0.3–0.5 kg-m, 2–4 ft-lb)

After installing and filling the tank, turn fuel valve ON and check that there are no fuel leaks.



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THROTTLE OPERATION

NOTE:

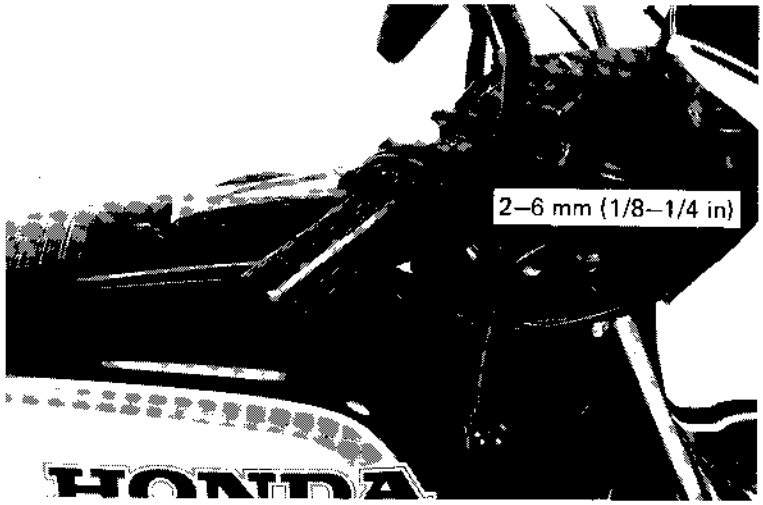
> The accelerator pump may flood the carburetors during this inspection.

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

Lubricate the throttle cables (page 2-10) if throttle operation is not smooth.

Measure throttle grip free play at the throttle grip flange.

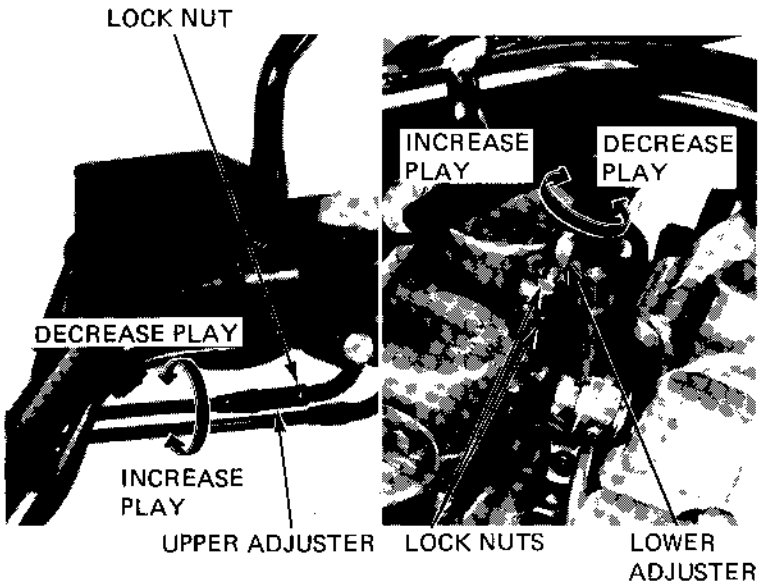
FREE PLAY: 2–6 mm (1/8–1/4 in)



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, after removing the fuel tank.

Adjust by loosening the lock nut and turning the adjuster to obtain the specified free play.
Tighten the lock nut(s) and recheck throttle operation.

Install the fuel tank.



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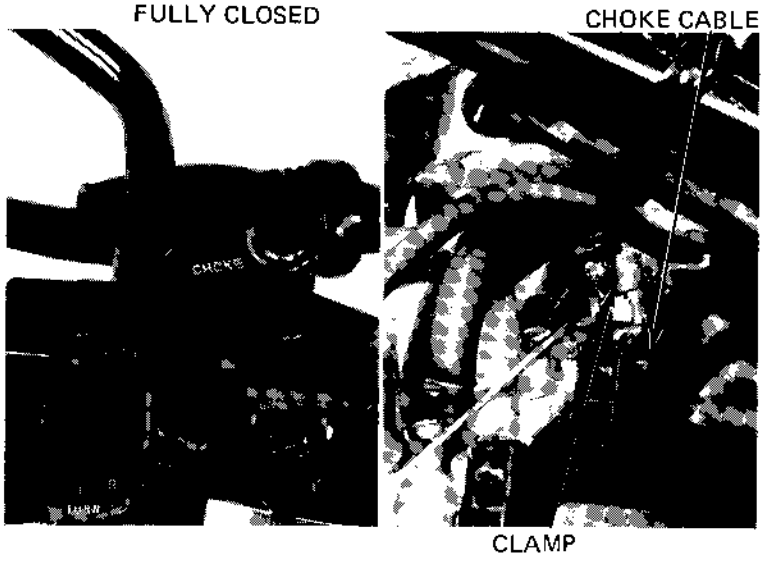
CARBURETOR CHOKE

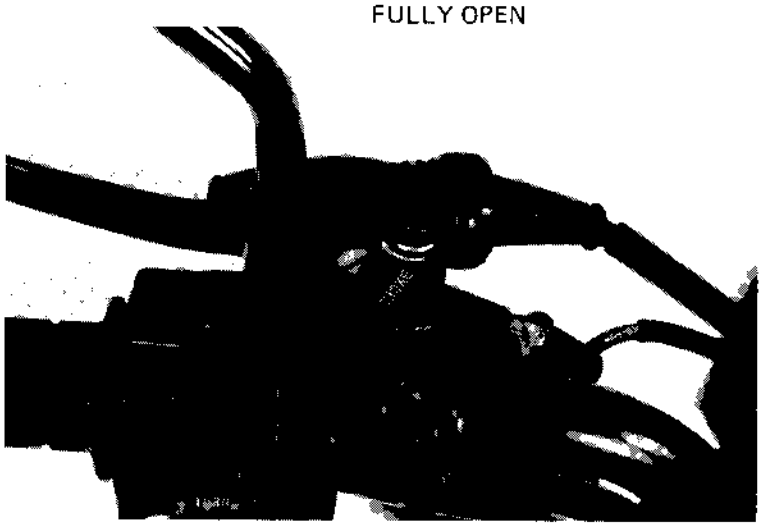
Remove the fuel tank.
Operate the choke lever and check for smooth operation.
Lubricate the choke cable if the operation is not smooth.

Push the choke lever on the handlebar all the way forward to fully closed. Make sure that the choke valve is closed by moving the choke lever on the carburetor.

Adjust by loosening the choke cable clamp on the carburetor and moving the choke cable casing so the choke lever is fully closed.
Tighten the clamp, holding the choke lever fully closed.

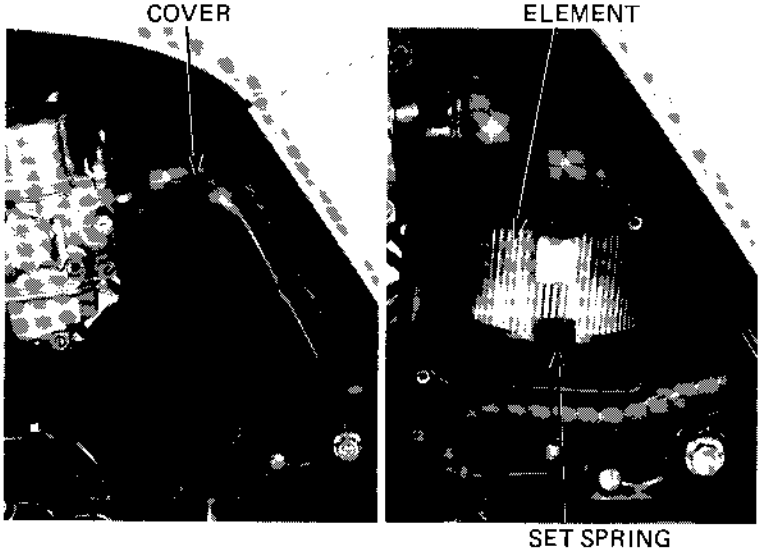
Pull the choke lever all the way back to fully open. Make sure the choke valve is fully open by checking for free play in the cable between the lever on the carburetor and cable casing.
Install the fuel tank.





AIR CLEANER

Remove the two air cleaner cover screws and cover.
Pull out the air cleaner element set spring and remove the element.

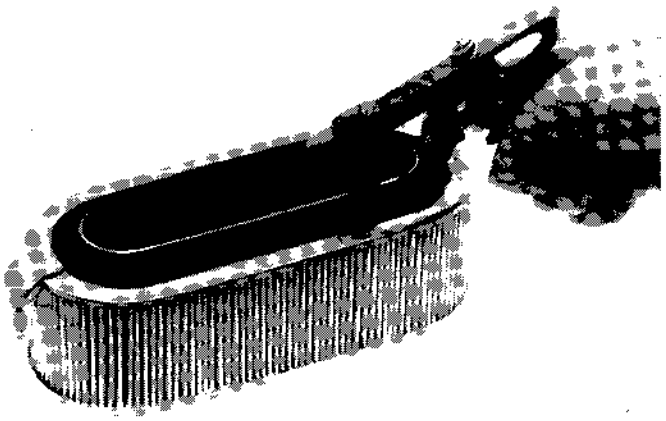


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Clean the element by tapping it lightly to loosen dust. Blow away the remaining dust by applying compressed air from inside the element.

Replace the element if it is excessively dirty, torn or damaged.

Install the element, element set spring and air cleaner cover.

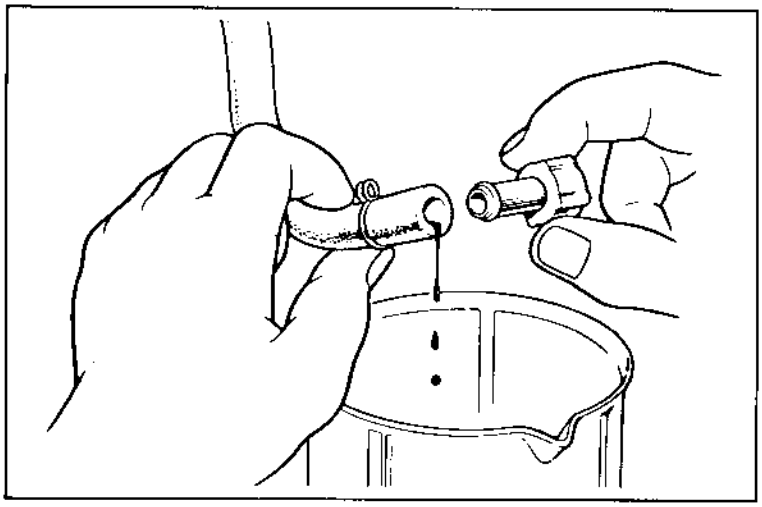


CRANKCASE BREATHER

Remove the plug from the drain tube to empty any deposits.
Install the drain plug.

NOTE:

> Service more frequently when ridden in rain, or at full throttle or if the deposit level can be seen in the transparent section of the drain tubes.



SPARK PLUGS

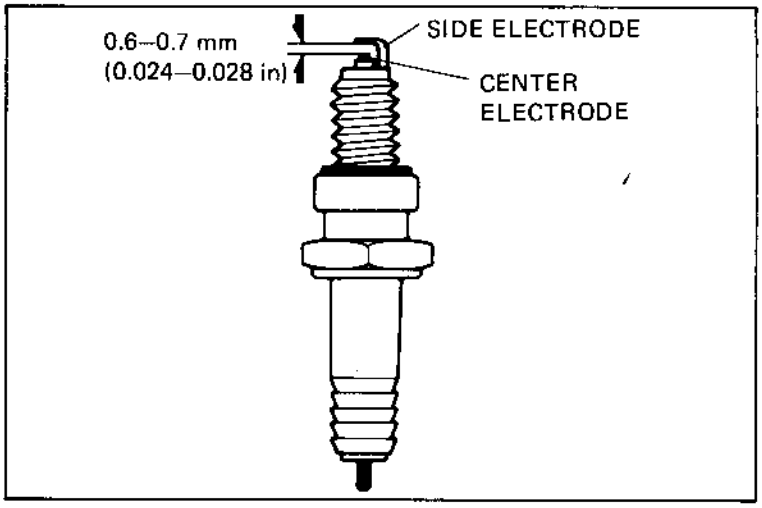
RECOMMENDED SPARK PLUGS

Standard	ND	X27ESR-U
	NGK	DR8ES
For extended high speed riding	ND	X31ESR-U

Disconnect the spark plug caps.
Clean any dirt from around the spark plug bases.
Remove and discard the spark plugs.
Measure the new spark plug gaps using a wire-type feeler gauge.

SPARK PLUG GAP: 0.6–0.7 mm (0.025–0.028 in)

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



Connect the spark plug caps.

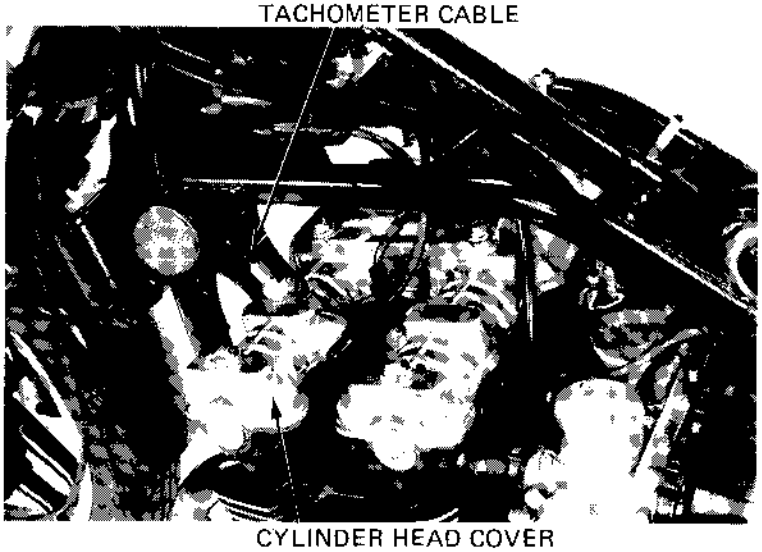
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VALVE CLEARANCE

NOTE:

- Inspect and adjust valve clearance while the engine is cold. (Below 35°C, 95°F).
- Lean the motorcycle right and left to drain residual oil from the cylinder head.

Remove the frame right and left side covers and seat. Turn the fuel valve OFF and remove the fuel tube and fuel tank.
Remove the tachometer cable and disconnect the spark plug caps.
Remove the cylinder head cover bolts and cylinder head cover.
Remove the alternator cover.



INSPECTION

Rotate the crankcshaft clockwise to align index mark # 1 on the exhaust camshaft right end with the front cylinder head mating surface.

Measure and record the clearances of the No. 1 and No. 3 exhaust valves by inserting a ffeler gauge between the camshaft and the valve lifter shim.

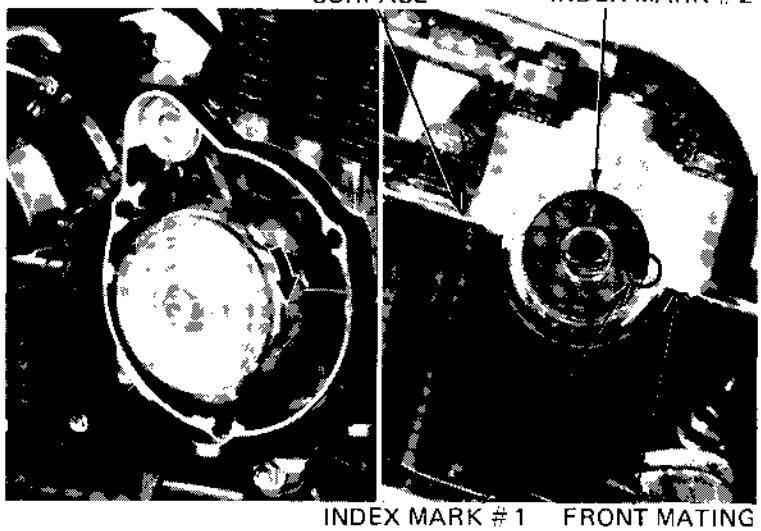
Rotate the camshaft 105° clockwise to align index mark # 2 with the front cylinder head mating surface. Check and record the clearances of the No. 1 and No. 3 intake valves.

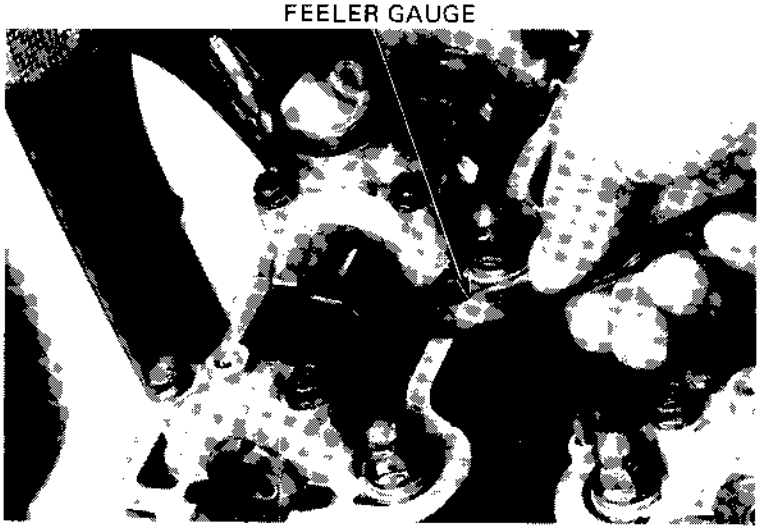
Rotate the camshaft 75° clockwise to align index mark #1 with the rear cylinder head mating surface. Measure and record the clearances of the No. 2 and No. 4 exhaust valves.

Rotate the camshaft 105° clockwise to align index mark # 2 with the rear cylinder head mating surface. Measure and record the No. 2 and No. 4 intake valve clearances.

VALVE CLEARANCE (cold):
0.06–0.13 mm (0.002–0.005 in)

If any clearance is not within specification, perform the adjustment procedures on the next page.





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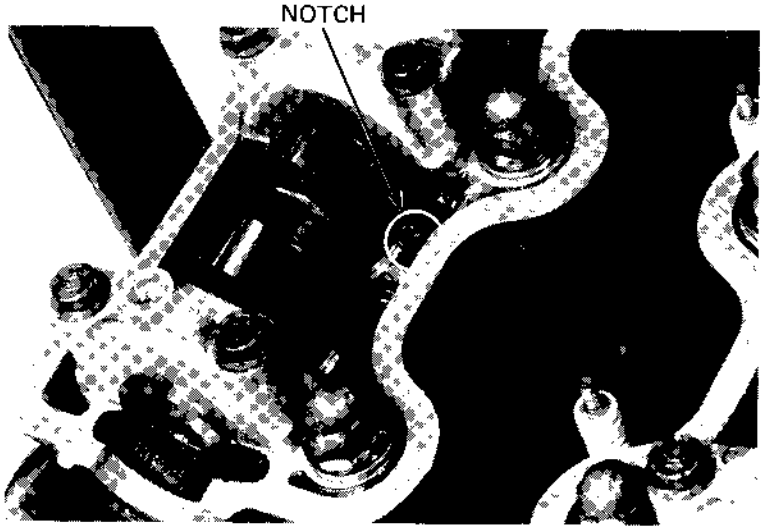
ADJUSTMENT

NOTE:

- Adjustment shims are available in 0.05 mm increments, from 2.30 to 3.50 mm.
- The No. 2 EX. shim must be removed from the front.

Select a replacement shim to achieve the specified valve clearance, using the following procedures.

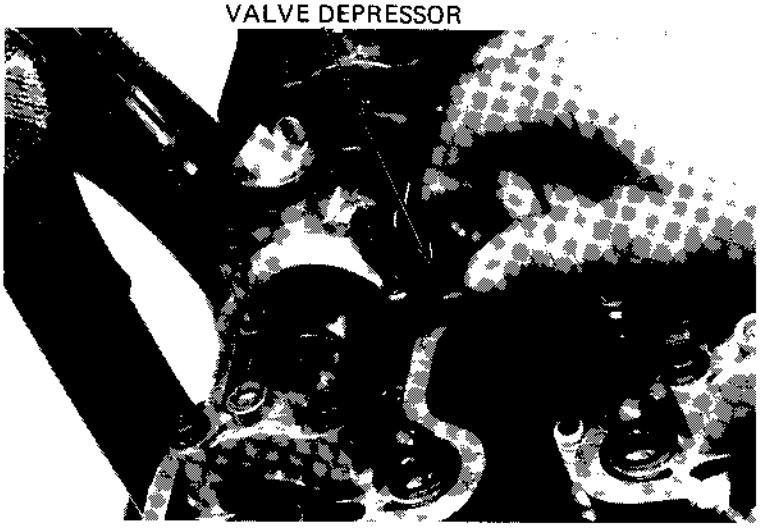
Rotate the valve lifter until the notch is facing the spark plug.



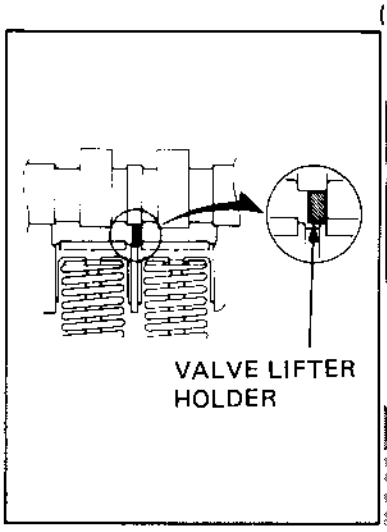
Rotate the crankshaft so that the cam lobe faces away from the valve lifter. Insert the Valve Depressor between the cam and shim. It should be pushed into place. It has a ramp which will open the valve.

CAUTION:

Use the Depressor as a wedge, not as a pry bar, or the lifter and camshaft will be damaged.



Position the end of the valve lifter holder under the camshaft so it rests on the edge of the depressed lifter and contacts the side of the adjacent lifter. Do not let the lifter holder contact the shim or you will not be able to remove it.



VALVE ADJUSTING TOOL SET
(U.S.A. only) M9501–277–94752



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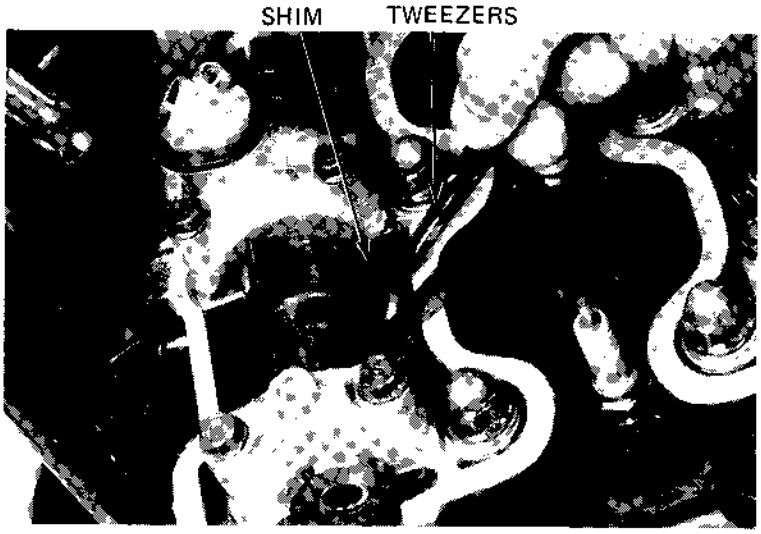
Pull out the Valve Depressor and remove the shim with tweezers or a magnet. The valve depressor can also be used to lift the shim out.

NOTE:

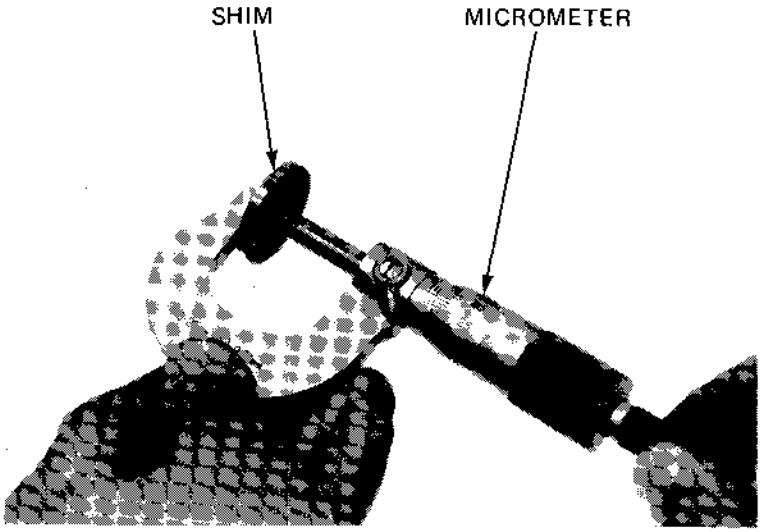
If more clearance is needed to remove the shim, reinsert the valve depressor and invert the valve lifter holder. Pull out the valve depressor and remove the shim.

CAUTION:

If the valve lifter holder is inverted, don't let it damage the cylinder head cover mating surface.



Measure the thickness of the removed shim with a micrometer. Select a replacement shim using the chart on page 3-11.
Insert the replacement shim.



To remove the valve lifter holder, reinstall the valve depressor. First remove the Holder and then remove the depressor.
Rotate the crankshaft several times to fully seat the replacement shims and recheck the valve clearance.
Install the following:
- Alternator cover.
- Cylinder head cover.
- Tachometer cable.
- Spark plug caps.
- Fuel tank.
- Seat and side covers.

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EXAMPLE: 1. Measure valve clearance = 0.16 mm
2. Measure present shim size = 2.50 mm
3. Refer to chart. (See shaded columns)
4. Replacement shim size = 2.55 mm

VALVE SHIM SELECTION CHART

STANDARD VALVE CLEARANCE = 0.06–0.13 mm (0.002–0.005 in)

EX ⇩

VALVE CLEARANCE mm	SHIM mm	PRESENT SHIM SIZE mm																								
		2.30	2.35	2.40	2.45	**2.50**	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50
0.01–0.05			2.30	2.35	2.40	**2.45**	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45
0.06–0.13		SPECIFIED CLEARANCE					NO CHANGE REQUIRED																			
EX ⇩ **0.14–0.16**		**2.35**	**2.40**	**2.45**	**2.50**	**2.55**	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	
0.17–0.21		2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50		
0.22–0.26		2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50			
0.27–0.31		2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50				
0.32–0.36		2.55	2.65	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50					
0.37–0.41		2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50						
0.42–0.46		2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50							
0.47–0.51		2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50								
0.52–0.56		2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50									
0.57–0.61		2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50										
0.62–0.66		2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50											
0.67–0.71		2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50												
0.72–0.76		2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50													
0.77–0.81		3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50														
0.82–0.86		3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50															
0.87–0.97		3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50																
0.92–0.96		3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50																	
0.97–1.01		3.20	3.25	3.30	3.35	3.40	3.45	3.50																		
1.02–1.06		3.25	3.30	3.35	3.40	3.45	3.50																			
1.07–1.11		3.30	3.35	3.40	3.45	3.50																				
1.12–1.16		3.35	3.40	3.45	3.50																					
1.17–1.21		3.40	3.45	3.50																						
1.22–1.26		3.45	3.50																							
1.27–1.31		3.50																								

REPLACE WITH THIS SHIM

NOTE:
1. Measure the valve clearance while the engine is cold (below 35°C, 95°F).
2. For shim replacement, see page 3-9.
3. Measure old and new shims with a micrometer.
4. The chart is for reference purposes only. After installing new shims, recheck the valve clearance and adjust if necessary. Before rechecking, rotate the camshafts several times to seat the shims in the lifters.
5. If the shim thickness required exceeds 3.5 mm, there is carbon build-up on the valve seat. Remove the carbon and reface the seat.

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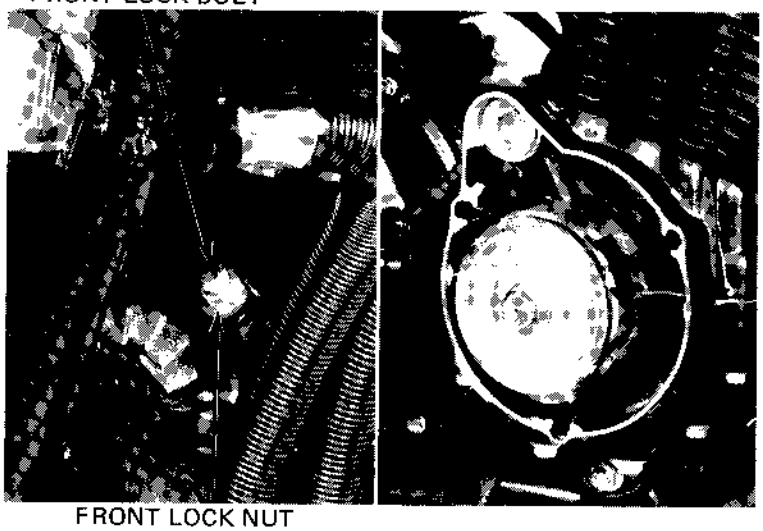
CAM CHAIN TENSION

NOTE:

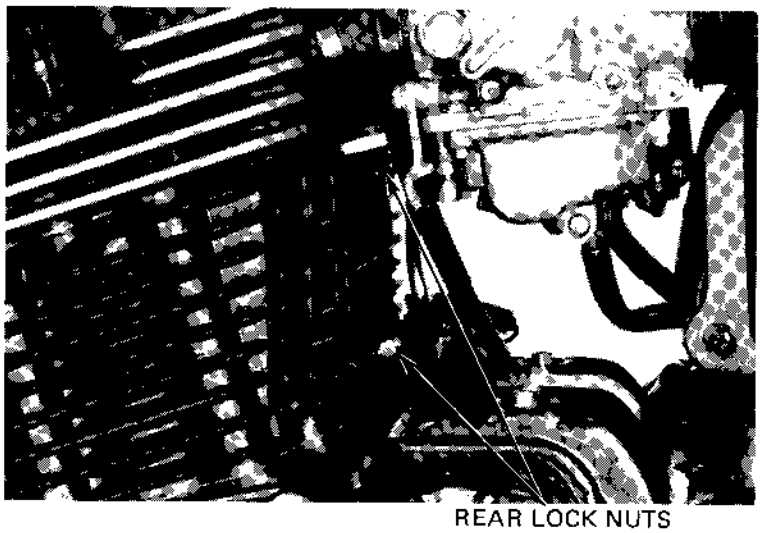
> Adjust cam chain tension while the engine is cold (below 35°C, 95°F).

Remove the alternator cover.

Loosen the front cam chain tensioner lock nut and bolt at the front of the cylinder head.
Tighten the bolt while rotating the crankshaft clockwise. Tighten the lock nut.



Loosen both top and bottom lock nuts on the rear cam chain tensioner. Tighten the lock nuts while rotating the crankshaft clockwise.
The tensioner will automatically position itself to provide the correct tension when the lock nuts and bolt are loosened.



CARBURETOR SYNCHRONIZATION

NOTE:

> Synchronize the carburetors with the engine at normal operating temperature, transmission in neutral and motorcycle on the center stand.

Remove both side covers and seat.
Turn the fuel valve OFF and remove the fuel line and fuel tank.

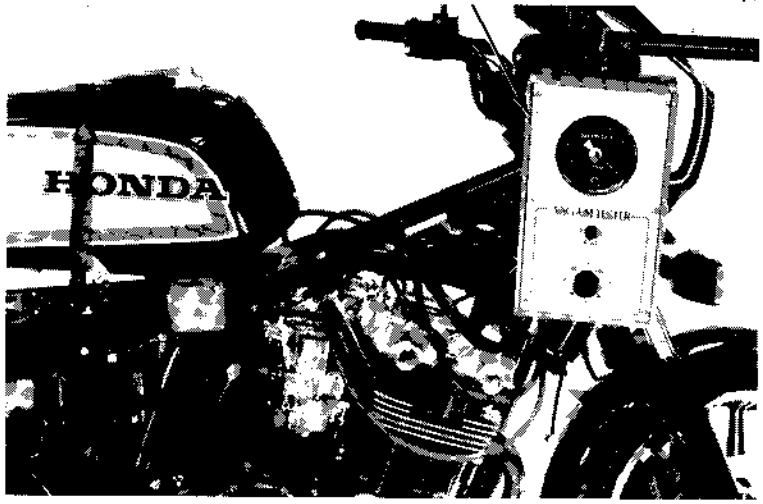
Prepare a longer fuel line and connect it between the fuel tank and carburetor.

Position the fuel tank higher than normal.

Remove the plugs from the cylinder head ports and install the vacuum gauge adapters.

Connect the vacuum gauges.

VACUUM GAUGE
07404–0020000 or M937B–021-XXXXX (U.S.A. only)

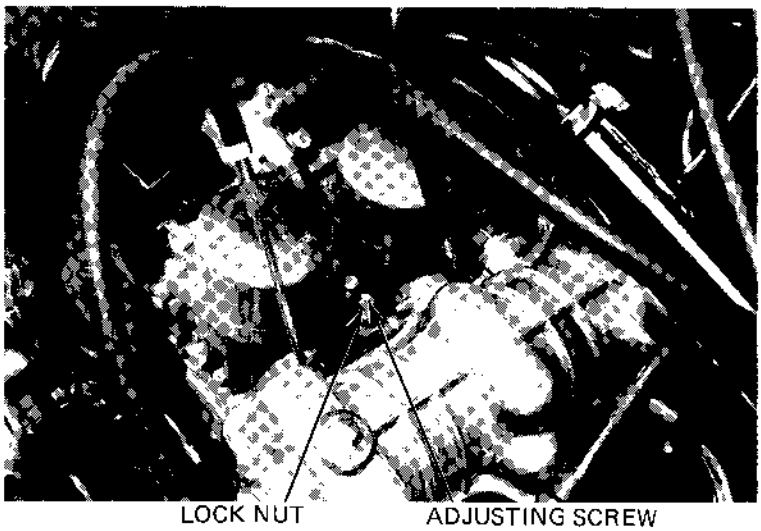


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Start the engine and adjust the idle speed.

IDLE SPEED: 1,000 ± 100 rpm

Check that all carburetors are within 60 mm Hg (2.4 in Hg) of each other.



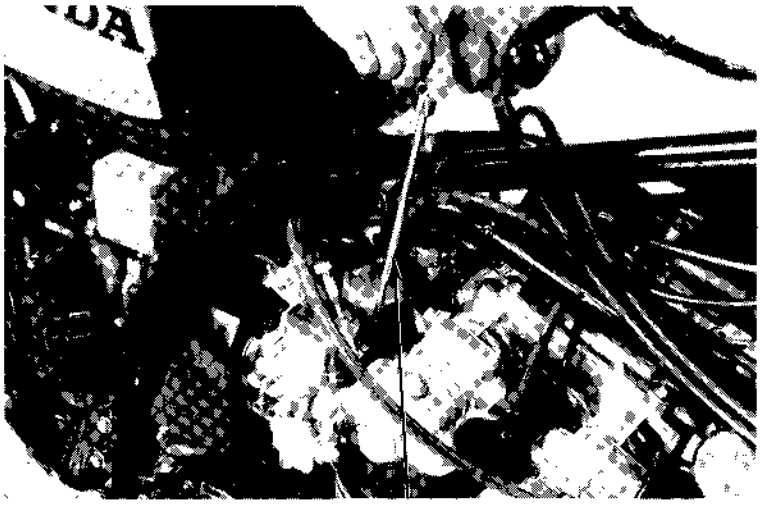
ADJUSTMENT

NOTE:

> The No. 2 carburetor cannot be adjusted; it is the base carburetor.

Adjust within specifications by loosening the lock nuts and turning the adjusting screws with the carburetor adjusting wrench. Hold the adjusting screws and tighten the lock nuts.
Recheck the idle speed and synchronization.
Remove the gauge and install the plugs.

Install the fuel tank, fuel line, seat and both side covers.



CARBURETOR ADJUSTING WRENCH
07908–4220100

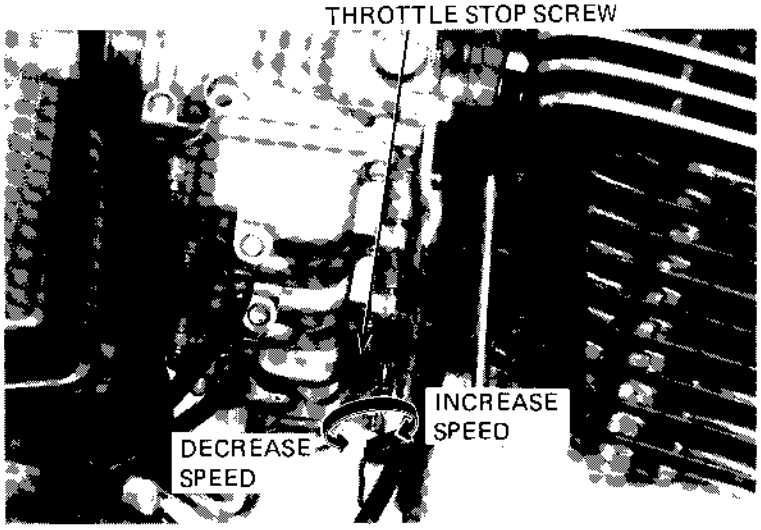
CARBURETOR IDLE SPEED

NOTE:

> - Inspect and adjust idle speed after all other engine adjustments are within specifications.
> - The engine must be warm for accurate idle adjustment. Ten minutes of stop-and-go riding is sufficient.

Warm up the engine, shift to neutral, and place the motorcycle on its center stand. Turn the throttle stop screw as required to obtain the specified idle speed.

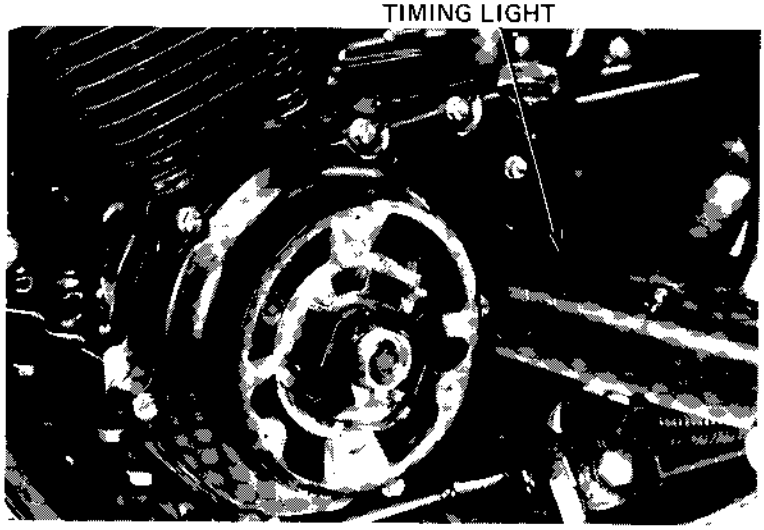
IDLE SPEED: 1,000 ± 100 rpm



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IGNITION TIMING

TIMING LIGHT



• DYNAMIC

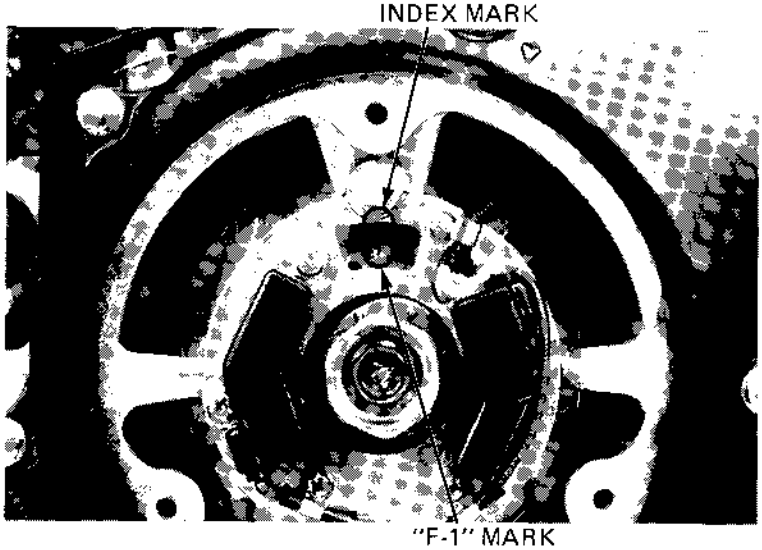
Remove the pulse generator cover. Connect a stroboscopic timing light to the No. 1 cylinder's spark plug wire.

Start the engine and let it idle.

IDLE SPEED: 1,000 ± 100 rpm

Aim the timing light at the timing mark. The "1.4 F-1" mark should align with the index mark.

INDEX MARK

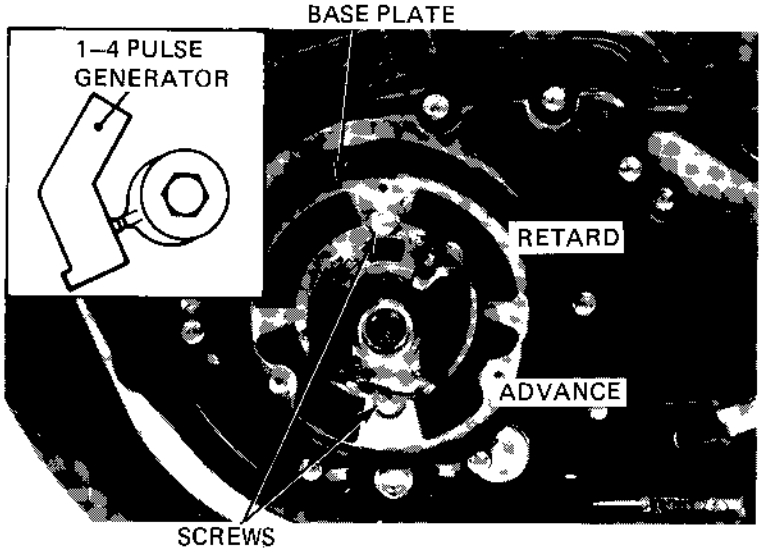


"F-1" MARK

ADJUSTMENT

Adjust by loosening the two pulse generator base plate screws and rotating the plate. Tighten the screws and recheck the timing.

BASE PLATE



SCREWS

• STATIC

Remove the pulse generator cover. Rotate the crankshaft counterclockwise and align the "1.4 S-F" mark with index mark.

NOTE:

> Either No. 1 or No. 4 piston must be near T.D.C. of the compression stroke at this time.

The timing is correct if the narrow projection of "1-4" pulse generator aligns with the rotor tooth.

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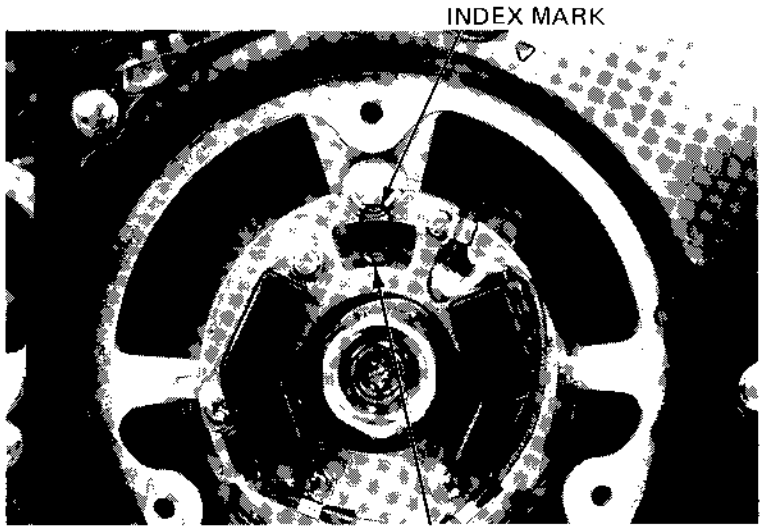
SPARK ADVANCER

Remove the pulse generator cover. Connect a timing light to the No. 1 spark plug wire.
Start the engine.
Bring engine speed to 3,500 rpm or above and check that the index mark is between the full advance marks.

CAUTION:

Do not allow engine speed to exceed 8,500 rpm or engine damage may result.

Replace the advancer assembly if it is not functioning properly. Install the pulse generator cover.



CYLINDER COMPRESSION

Warm up the engine. Stop the engine and remove the fuel tank.
Disconnect the spark plug caps and remove the spark plugs.
Insert the compression gauge. Open the choke and throttle valves fully and crank the engine with the starter motor.

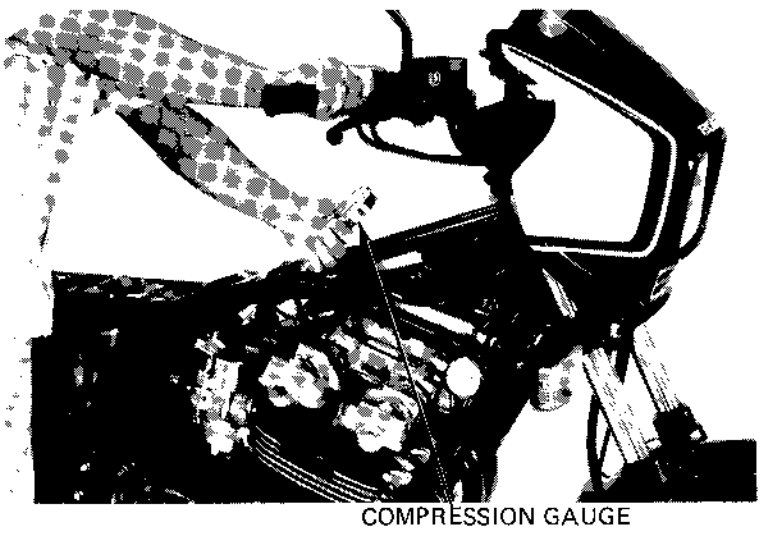
NOTE:

Crank the engine until the gauge reading stops rising. The maximum reading is usually reached within 4—7 seconds.

COMPRESSION PRESSURE:
12 ± 2 kg/cm² (170 ± 28 psi)

If compression is low, check the following:
- Leaky valves.
- Improper valve clearance.
- Leaking cylinder head gasket.
- Worn piston/ring/cylinder.

If compression is high, it indicates that carbon deposits have accumulated on the combustion chamber or the piston crown.

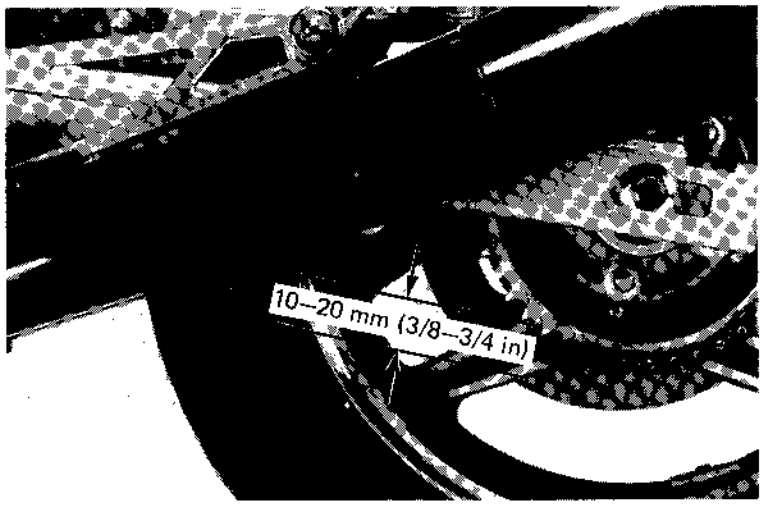

COMPRESSION GAUGE

<CHASSIS>

DRIVE CHAIN

Turn the engine off, place the motorcycle on its center stand and shift the transmission into neutral. Check slack in the lower drive chain run midway between the sprockets.

SLACK: 10—20 mm (3/8—3/4 in)



CAUTION:

Excessive chain slack, 40 mm (1-1/2 in) or more, may damage the frame.

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Adjust as follows:
Loosen the rear axle nut.
Loosen the lock nuts on both adjusters.
Turn both adjusting nuts an equal number of turns until the correct drive chain slack is obtained.

CAUTION:

Make sure the chain adjuster index marks align with the corresponding scale graduation on both sides of the swingarm.

Tighten the lock nuts.

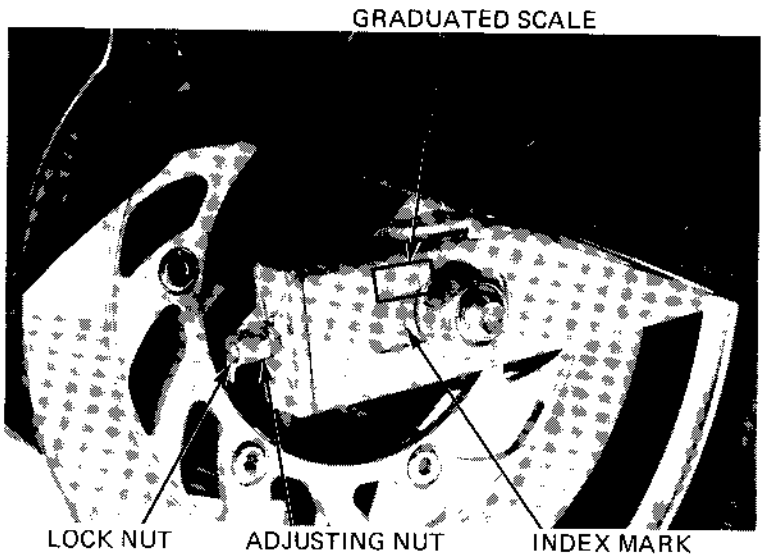
Tighten the rear axle nut.

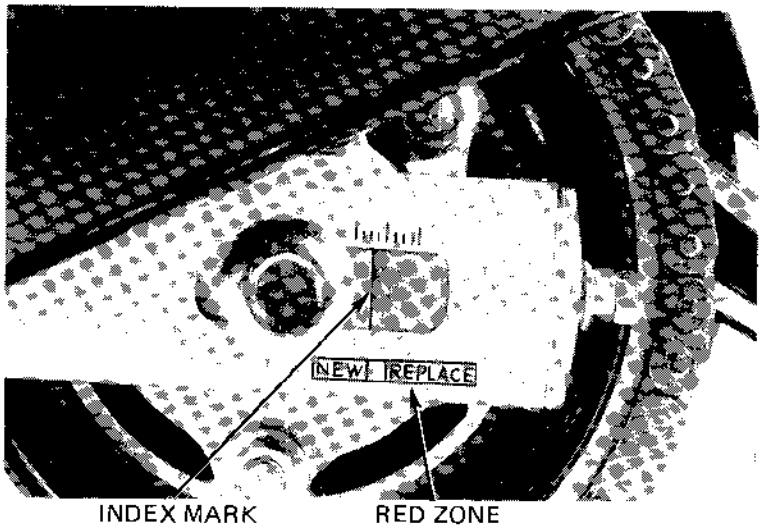
TORQUE: 80–100 N·m (8.0–10.0 kg-m, 58–72 ft-lb)

Recheck chain slack and free wheel rotation.
Lubricate the drive chain with SAE 80 or 90 gear oil.

Check the chain wear label. If the red zone on the label aligns with the index mark on the adjuster after the chain has been adjusted, the chain must be replaced.

REPLACEMENT CHAIN: D.I.D. 50ZL or RK 50L0

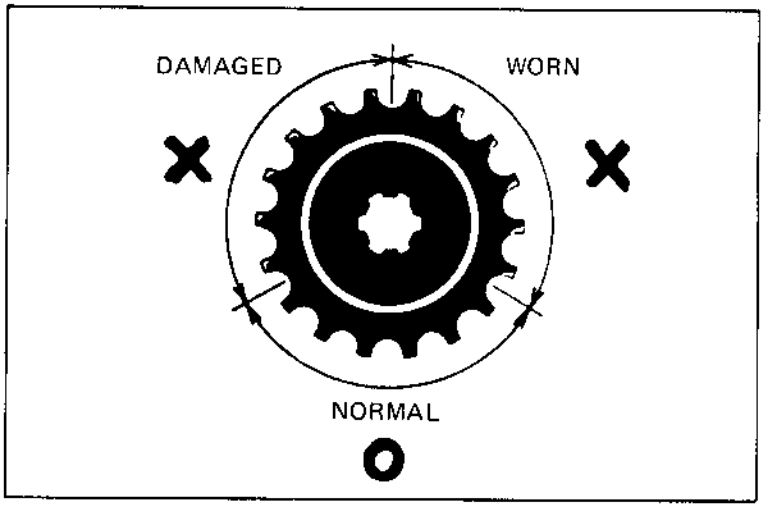




Inspect the drive chain and sprockets for damage or wear. A drive chain with damaged rollers, loose pins, or missing O-rings must be replaced. Replace any sprocket which is damaged or excessively worn.

NOTE:

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



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BATTERY

Remove the right and left side covers and remove the seat.
Disconnect the ground cable at the battery terminal. Then disconnect the positive calbe at the starter relay.
Remove the battery holder plate bolt and the battery.
Inspect the battery fluid level. When the fluid level nears the lower level, refill with distilled water to the upper level.

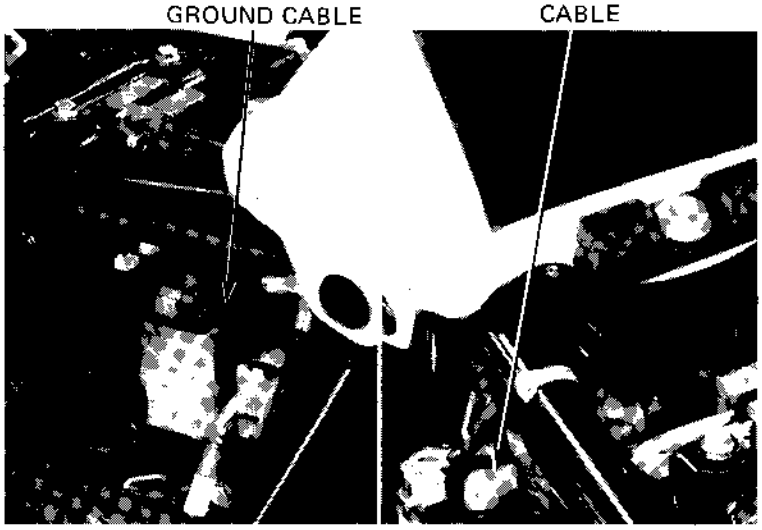
NOTE:

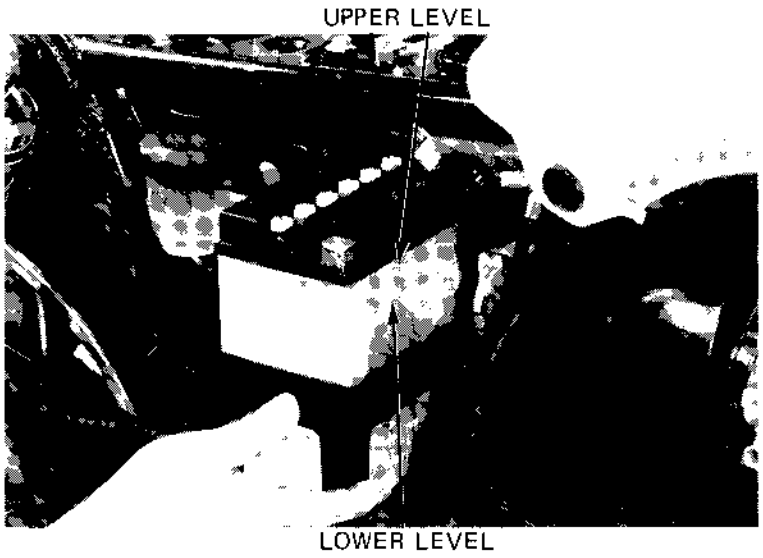
> Add only distilled water. Tap water will shorten the service life of the battery.

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.





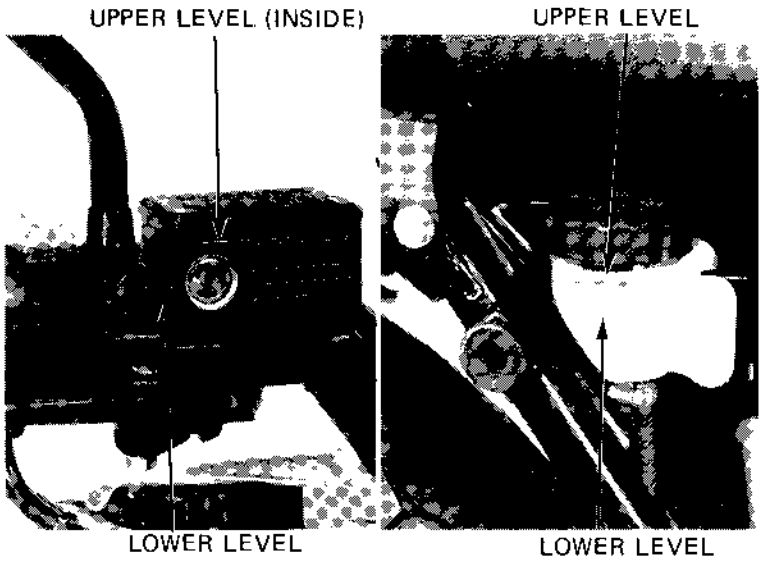
BRAKE FLUID

Check the front and rear brake fluid reservoir level. If the level nears the lower level mark, remove the cap and fill the reservoir with DOT-3 brake fluid to the upper level mark. The upper level mark is inside the reservoir.

Check the entire system for leaks, if the level is low.

CAUTION:

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



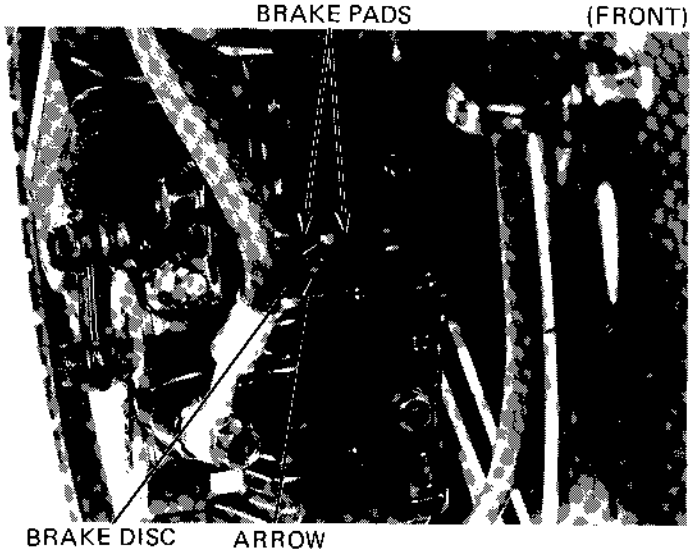
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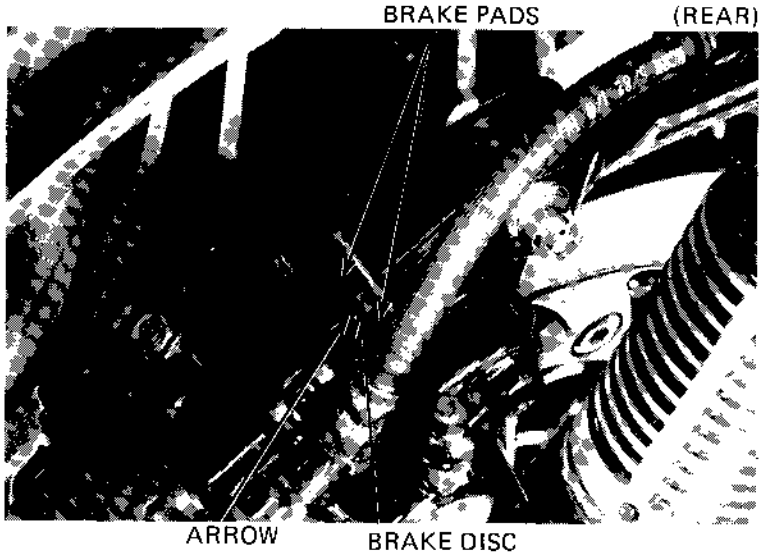
BRAKE PAD WEAR

Check the brake pads for wear by looking through the slot pointed to by the cast arrow on the caliper assembly.
Replace the brake pads if the pads are worn to the wear line. (page 16-5).

CAUTION:

Always replace the brake pads as a set to assure even disc pressure.





BRAKE SYSTEM

Check that there is no deterioration, damage or leaks in brake lines or fittings.

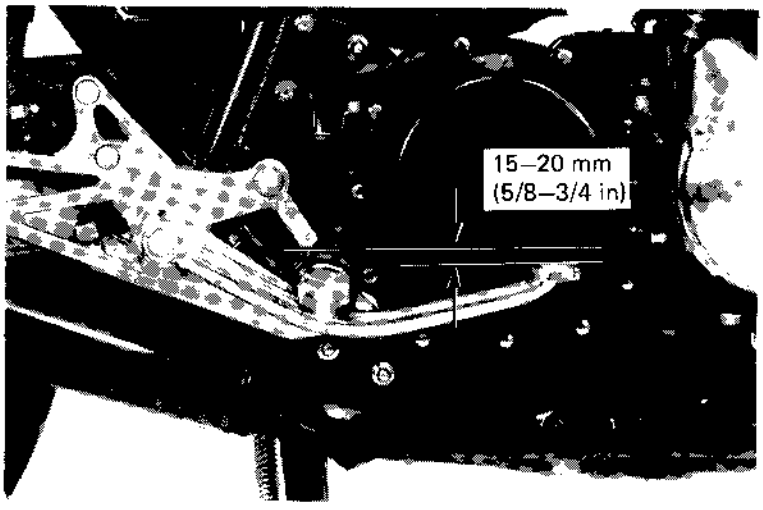
REAR BRAKE PEDAL HEIGHT

Adjust the pedal height so that the distance between the pedal and upper face of the footpeg is correct.

PEDAL HEIGHT: 15–20 mm (5/8–3/4 in)

CAUTION:

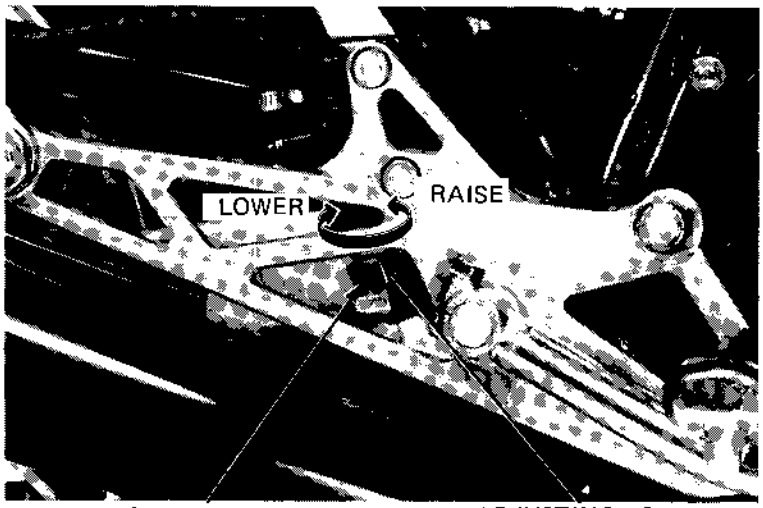
Improper brake pedal height adjustment can cause brake drag.



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Adjust as follows;
Loosen the adjusting bolt lock nut. Turn the adjusting bolt until the correct pedal height is obtained.
Tighten the lock nut securely.

After adjusting pedal height, adjust the brake light switch.



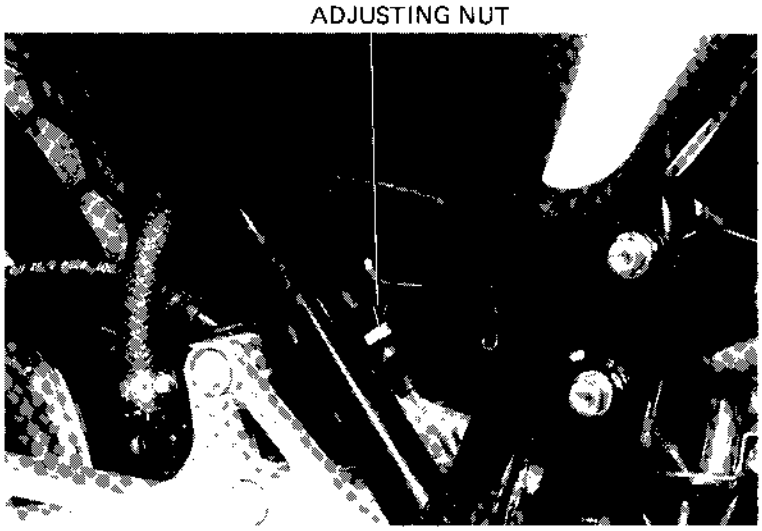
BRAKELIGHT SWITCH

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 switch body.
- The front brake light switch does not require adjustment.

Adjust by turning the switch adjusting nut as shown.



HEADLITGHT AIM

Adjust vertically by turning the vertical adjusting screw.

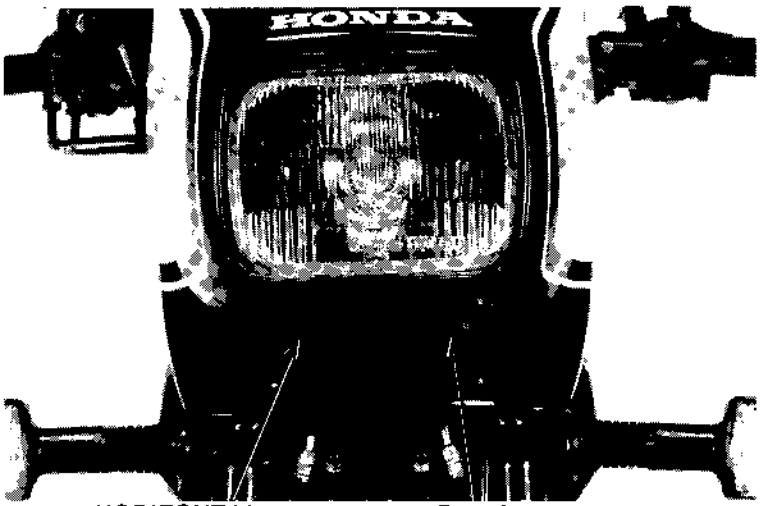
Adjust horizontally by turning the horizontal adjusting screw. Turn it clockwise to direct the headlight beam toward the right side of the rider.

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.

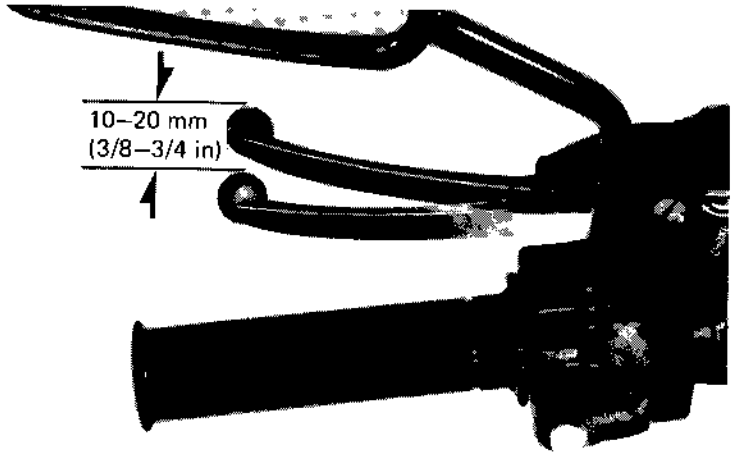


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CLUTCH

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

FREEPLAY: 10–20 mm (3/8–3/4 in)



ADJUSTMENT

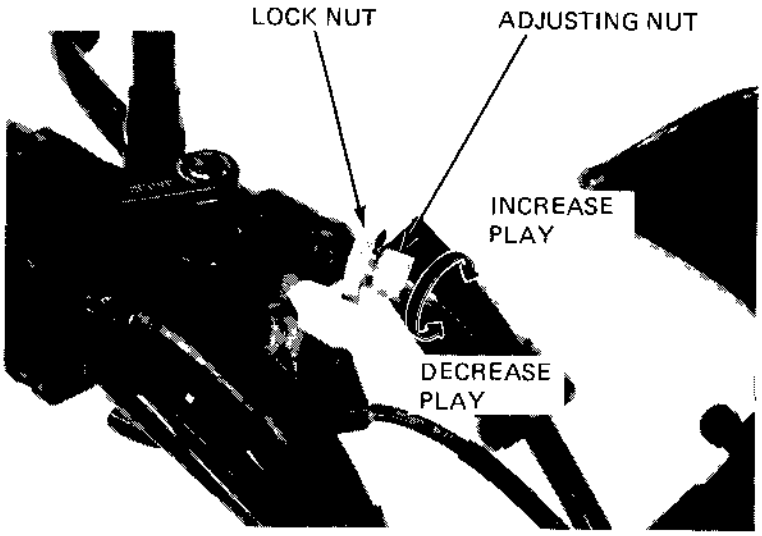
Loosen the upper adjusting bolt's lock nut and turn the adjusting nut until the correct free play is obtained.

Tighten the lock nut.

NOTE:

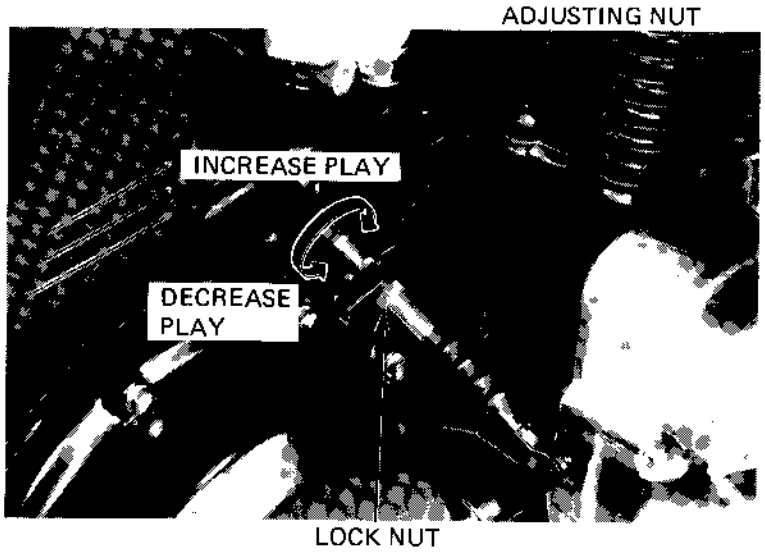
> Do not expose the adjusting bolt threads more than 8 mm (5/16 in).

If adjustment cannot be made with the clutch lever adjusting bolt, screw the adjusting bolt all the way in and back it out 1 turn.



Loosen the lower adjusting lock nut and turn the lower adjusting nut so that there is 10–20 mm (3/8–3/4 in) of free play at the end of the clutch lever. Tighten the lock nut.

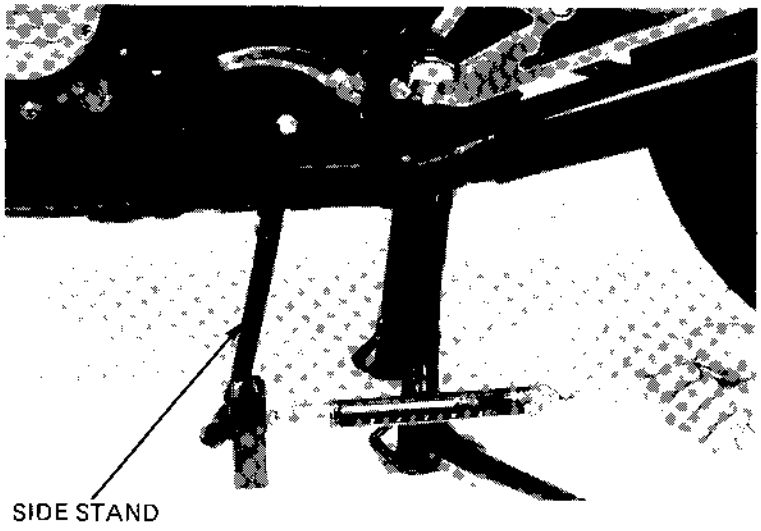
After adjustment, be sure all lock nuts are tightened securely. Check to see that the clutch is not slipping and is properly disengaging.



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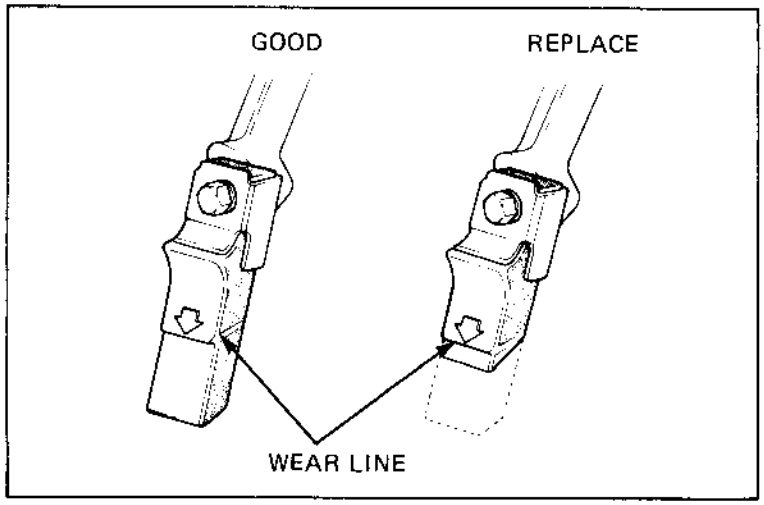
SIDE STAND

Check the rubber pad for deterioration or wear. Replace if any wear exceeds to the wear line as shown.
Check the side stand spring for damage and loss of tension, and the side stand assembly for freedom of movement and bending.



NOTE:

When replacing, use a rubber pad with the mark "OVER 260 lbs ONLY".
Spring tension is correct if the measurements fall within 1.5–2.5 kg (3.3–5.5 lb) when pulling the side stand lower end with a spring scale.



SUSPENSION

WARNING

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

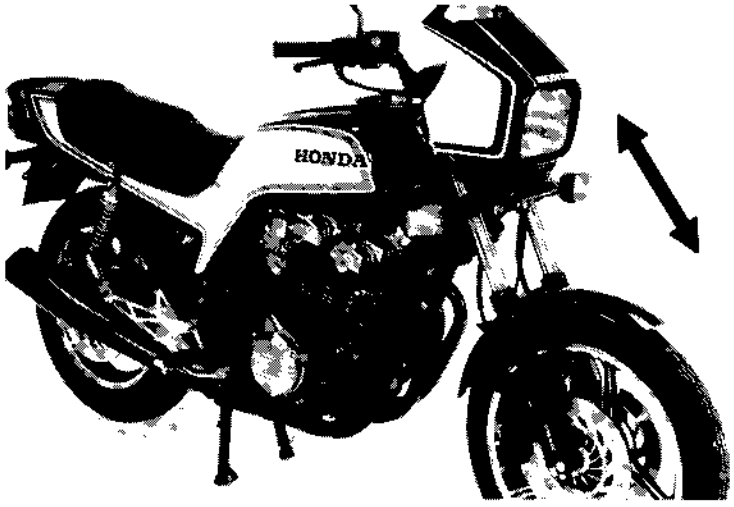
FRONT

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.



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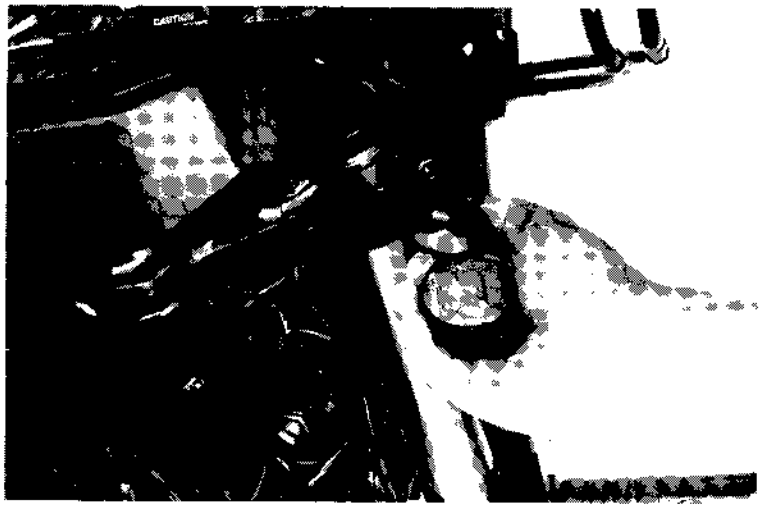
Place the vehicle on its center stand.

Remove the valve cap and measure the front fork air pressure.

FRONT FORK AIR PRESSURE:
0–0.6 kg/cm^2 (0–8 psi)

NOTE:

Check the front fork air pressure when the front forks are cold.



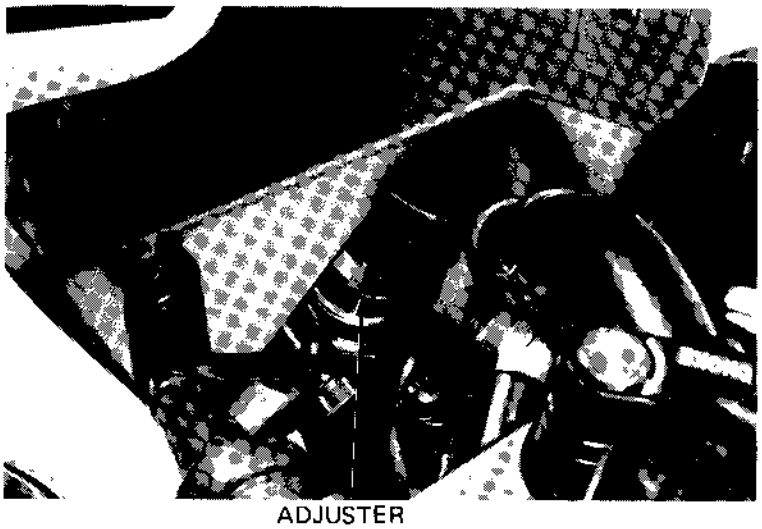
ADJUSTMENT OF AIR PRESSURE

Set the damping adjuster to a position so that the selected number of damping force faces outward.

NOTE:

- Be sure the damping adjuster is not between positions but is firmly located in a detent.
- Adjust both damping adjusters to the same positions.

Rebound Damping Adjuster	Riding Conditions
1	Around town
2	Highways or winding roads
3	Rough or uneven



ADJUSTER

ANTI-DIVE SYSTEM INSPECTION

WARNING

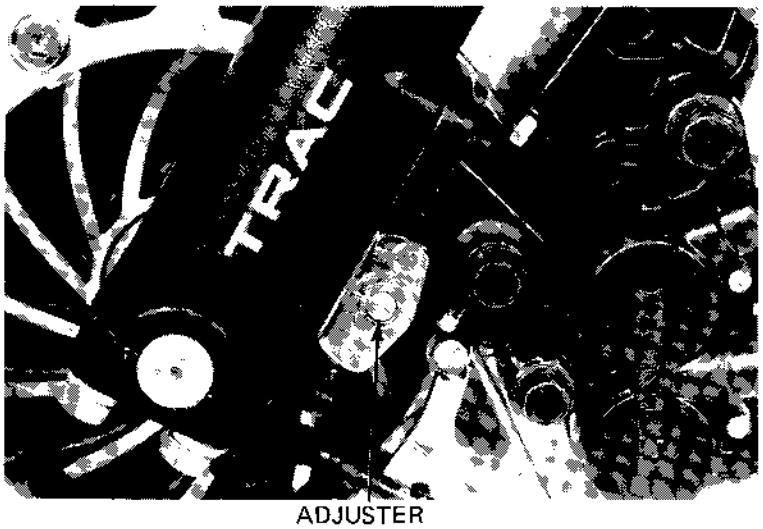
Select a safe place away from traffic to perform this inspection.

Check the operation of the anti-dive system by riding the motorcycle and firmly applying the brakes.

Position	Anti-dive damper force
1	LIGHT ANTI-DIVE
2	MEDIUM
3	HARD
4	MAXIMUM ANTI-DIVE

Inspect and if necessary, repair the system (Refer to section 14).

Make sure to set the right and left adjusters in the same position.



ADJUSTER

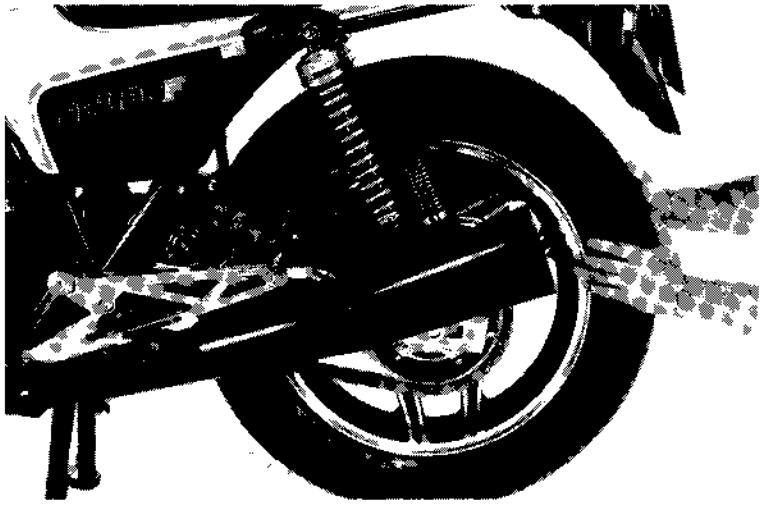
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REAR

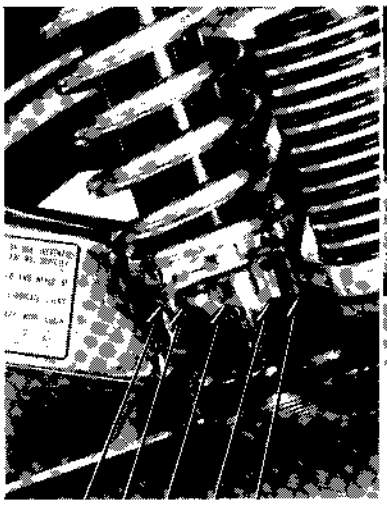
Place the motorcycle on its center stand.
Move the rear wheel sideways with force to see if the swing arm bearings are worn.
Replace the bearings if excessively worn (page 15-12).

Check the shock absorbers for leaks or damage.

Tighten all rear suspension nuts and bolts to their specified torque values (page 1-4).



The adjustable VHD shock absorbers have three adjustments to provide the desired ride with various rider/cargo weights.
The spring adjuster adjusts spring preload. The rebound damping adjuster and compression damping adjuster adjusts damping.
Adjust spring preload first, using the hook spanner to rotate the spring adjuster. Position I is for light loads and position II to V progressively increase preload for heavier loads.



I II III IV V



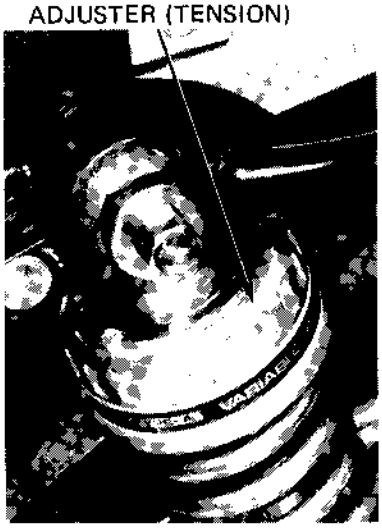
ADJUSTING SPRING PRELOAD

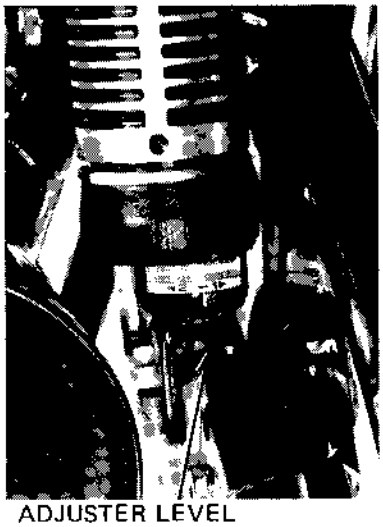
Rotate the rebound damping adjuster to select one of the three positions.

Move the compression damping adjuster lever to position "1" or "2". Damping force increases as you select a higher number.

Be sure to adjust both shock absorbeers equally.

ADJUSTER (TENSION)





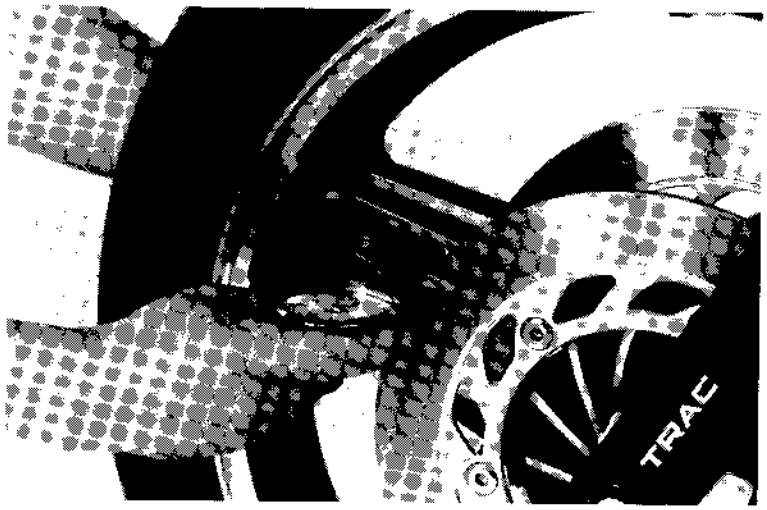
ADJUSTER LEVEL
(COMPRESSION)

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RECOMMENDED DAMPING ADJUSTER POSTIONS:

Rebound Damping Adjuster (2)	Compression Damping Adjuster (3)	Conditions	
		Riders/Load	Riding Conditions
1	1	One	Around town
2	1	One	Highways or winding roads
3	1	One	Rough or uneven roads
1	2	One/two	Around town
2	2	One/Two or carrying load	Highways or winding roads
3	2	One/Two or carrying load	Rough or uneven roads

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:

		Front	Rear
		100/90V-18	130/90V-17
Cold tire pressures kg/cm² (psi)	Up to 90 kg (200 lbs) load	2.50 (36)	2.50 (36)
	Up to vehicle capacity load	2.50 (36)	2.90(41)
Tire brand	BRIDGE-STONE	L303	G508
	DUNLOP	F11	K627

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 service limits.

Minimum tread depth:
Front: 1.5 mm (1/6 in)
Rear: 2.0 mm (3/32 in)

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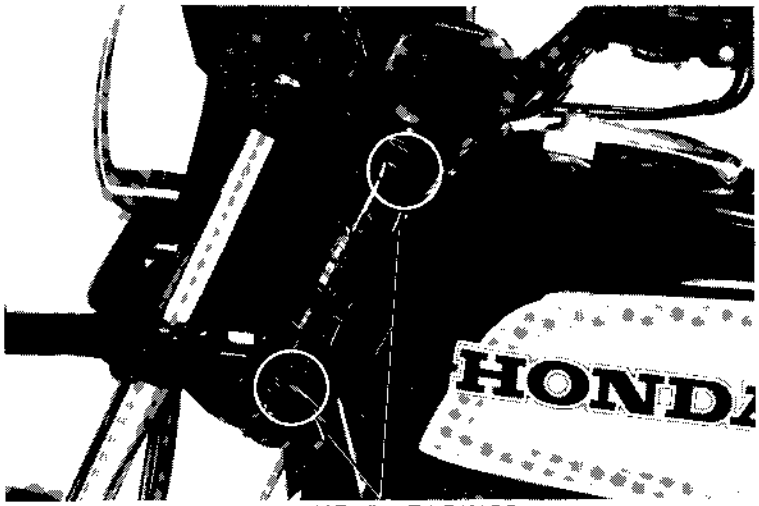
STEERING HEAD BEARINGS

NOTE:

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

Raise the front wheel off the ground and 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 14-36).



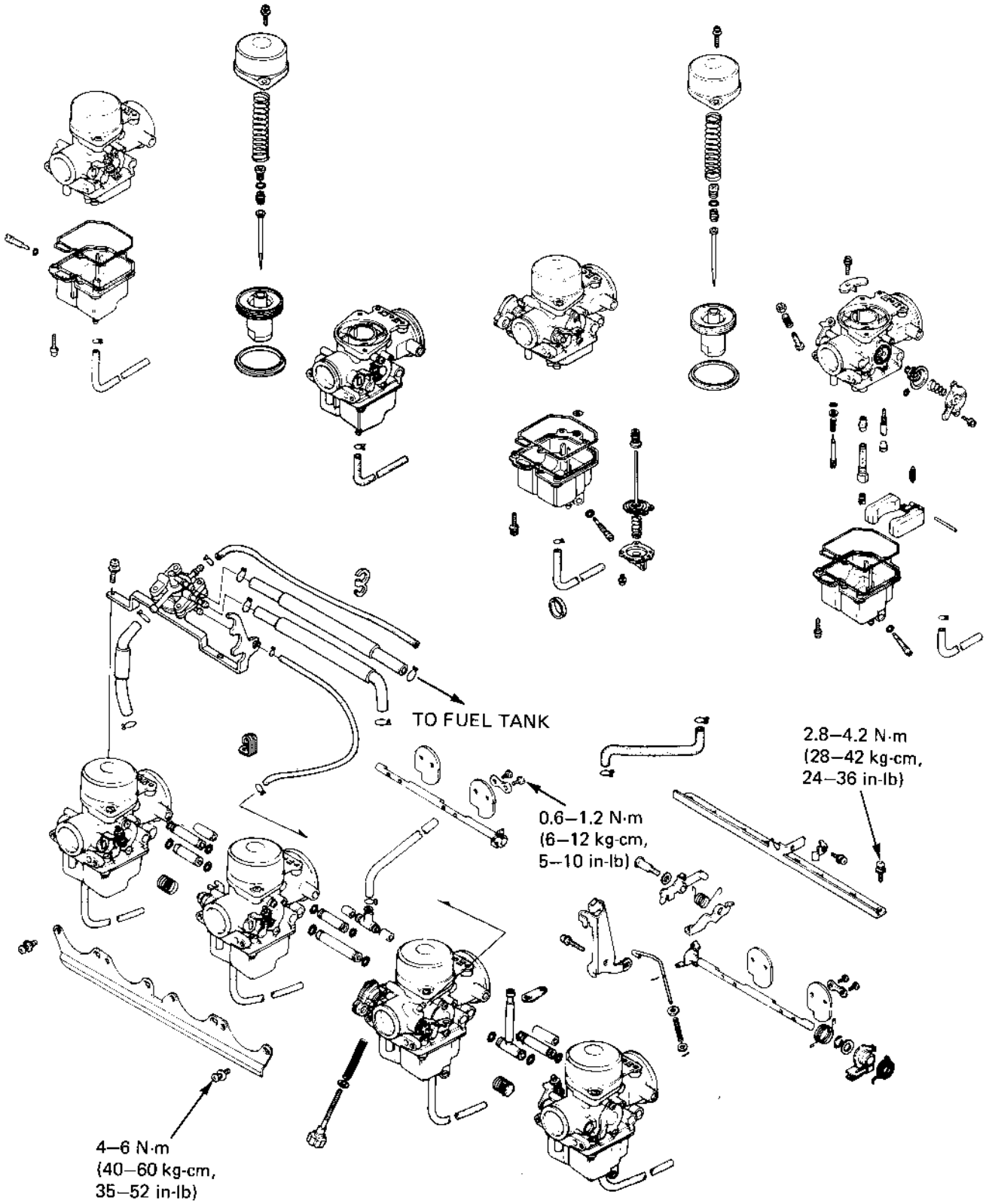
HEAD BEARINGS

NUTS, BOLTS, FASTENERS

Check that all chassis nuts and bolts are tightened to correct torque values (page 1-4).

Check all cotter pins and safety clips.

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4. FUEL SYSTEM

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CARBURETOR REMOVAL	4–3	FUEL LINE DIAPHRAGM	4–16
VACUUM CYLINDER DISASSEMBLY	4–3	CARBURETOR TUBE ROUTING	4–16
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FLOAT LEVEL	4–8	FUEL TANK	4–21
CARBURETOR SEPARATION	4–8	AIR CLEANER CASE	4–21

4

SERVICE INFORMATION

GENERAL

- Use caution when working with gasoline. Always work in a well-ventilated area and away from sparks or open flames.
- When disassembling fuel system parts, note the locations of the O-rings. Replace them with new ones on reassembly.
- The float bowls have drain plugs that can be loosened to drain residual gasoline.
- The carburetors are equipped with a fuel line diaphragm. After carburetor overhaul, it is necessary to crank the engine for 2-3 seconds, three times with the throttle fully closed to fill the float chambers.
- The pilot screws are factory pre-set and should not be removed unless the carburetor is overhauled.

SPECIFICATIONS

Venturi dia.	33 mm (1.3 in)
Identification No.	VB56A
Float level	15.5 mm (0.61 in)
Main jet	122
Idle speed	1,000 ± 100 rpm
Throttle grip free play	2–6 mm (1/8–1/4 in)
Fast idle	1,000–2,700 rpm (after break-in)
Pilot screw initial opening	1-3/4

TORQUE VALUES

Front bracket	4–6 N·m (40–60 kg-cm, 35–52 in-lb)
Rear bracket	2.8–4.2 N·m (28–42 kg-cm, 24–36 in-lb)
Choke valve	0.6–1.2 N·m (6–12 kg-cm, 5–10 in-lb)

TOOLS

Special

Carburetor Pilot Screw Wrench	07908–4220201

Common

Float gauge	07401–0010000

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TROUBLESHOOTING

Engine cranks but won't start
1. No fuel in tank
2. No fuel to carburetor
3. Engine flooded with fuel
4. No spark at plug (ignition malfunction)
5. Air cleaner clogged
6. Intake air leak
7. Improper choke operation
8. Improper throttle operation

Hard starting or stalling after starting
1. Improper choke operation
2. Ignition malfunction
3. Fast idle speed incorrect
4. Carburetor malfunction
5. Fuel contaminated
6. Intake air leak
7. Idle speed incorrect

Rough idle
1. Ignition malfunction
2. Idle speed incorrect
3. Incorrect carburetor synchronization
4. Carburetor malfunction
5. Fuel contaminated

Misfiring during acceleration
1. Ignition malfunction
2. Faulty air-cutoff valve

Backfiring
1. Ignition malfunction
2. Carburetor malfunction
3. Faulty air-cutoff valve

Poor performance (driveability) and poor fuel economy
1. Fuel system clogged
2. Ignition malfunction

Lean mixture
1. Clogged fuel jets
2. Piston stuck closed
3. Faulty float valve
4. Float level low
5. Fuel cap vent blocked
6. Fuel strainer screen clogged
7. Restricted fuel line
8. Air vent tube clogged
9. Intake air leak

Rich mixture
1. Clogged air jets
2. Faulty float valve
3. Float valve too high
4. Chole stuck closed
5. Air-cutoff valve sticking closed
6. Dirty air cleaner

Fuel not reaching carburetors
1. Fuel line diaphragm vent tube clogged.
2. Fuel line diaphragm vacuum tube clogged.
3. Clogged fuel line diaphragm.
4. Clogged fuel line diaphragm check valve.

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CARBURETOR REMOVAL

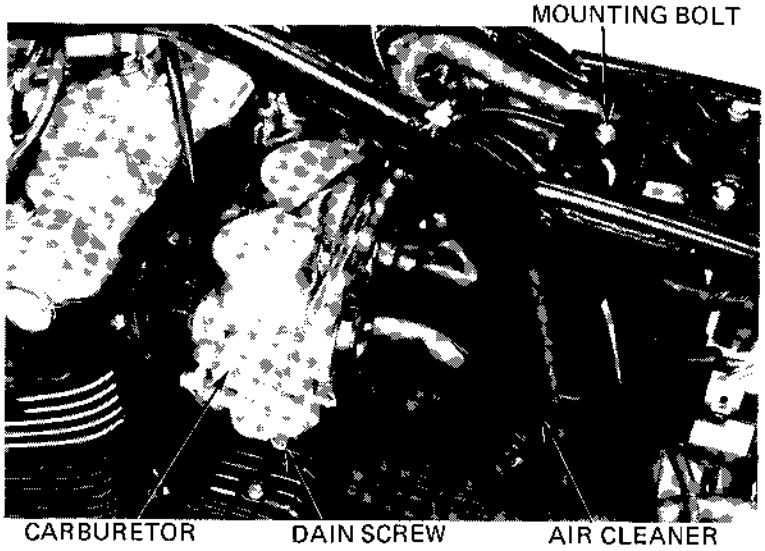
Remove the left and right frame side covers and the seat.
Turn the fuel valve "OFF" and disconnect the fuel line.
Remove the fuel tank (page 4-21).

Drain residual fuel into a container by loosening each drain screw.

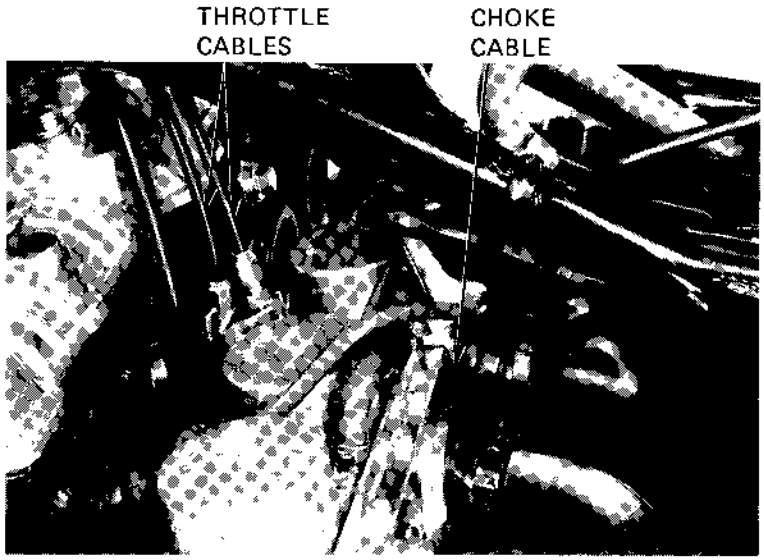
Loosen the air cleaner mouning bolt.

Loosen the air cleaner tube connecting bands.
Move the air cleaner to the rear.

Loosen the carburetor intake pipe bands.



Remove the carburetor assembly from the intake pipes.
Disconnect the throttle and choke cables.



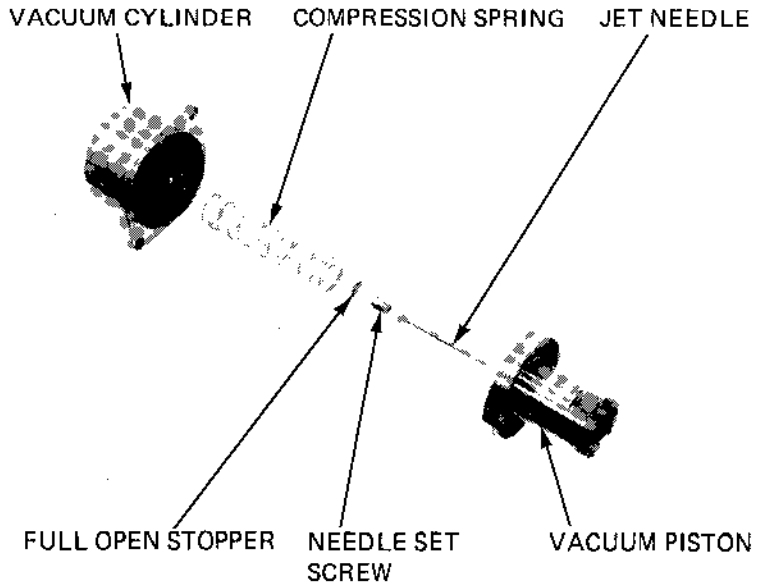
VACUUM CYLINDER DISASSEMBLY

Remove the vacuum cylinders from the carburetor bodies. Carefully lift the vacuum piston out with the needle and compression spring.

Inspect the vacuum piston and cylinder for wear, nicks, scratches or other damage. Make sure that the piston and jet needle move up and down freely in the cylinder.

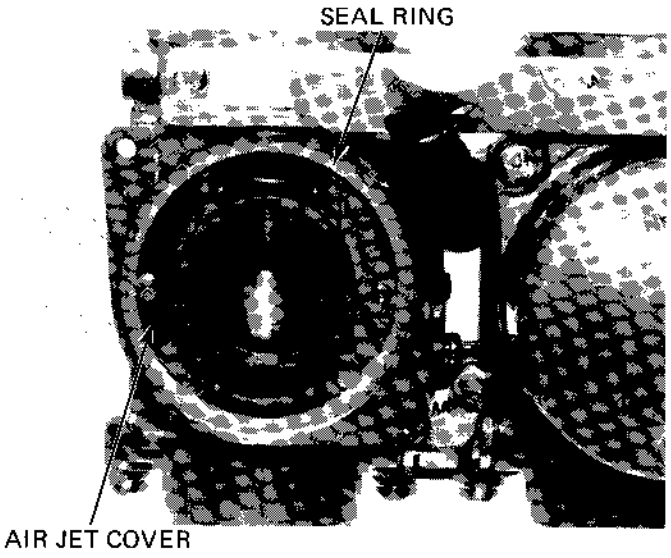
Remove the full open stopper and the needle set screw.
Separate the jet needle from the piston.

Inspect the needle and seat for deposits, bending, grooves, or other damage.

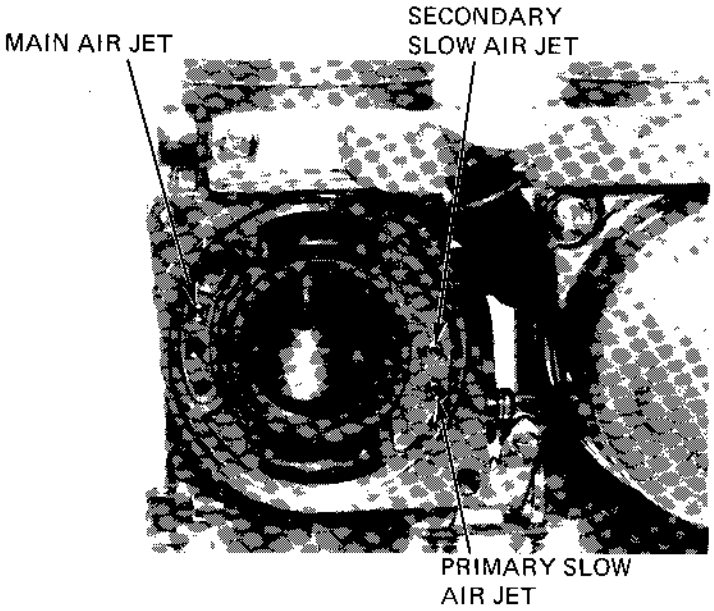


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Carefully lift the seal ring off the carburetor body and remove the air jet cover.



Blow open the main air jet and slow air jet with compressed air.



PILOT SCREW

REMOVAL

NOTE

The pilot screws are factory pre-set and should not be removed unless the carburetor is overhauled.

Remove the float chambers.

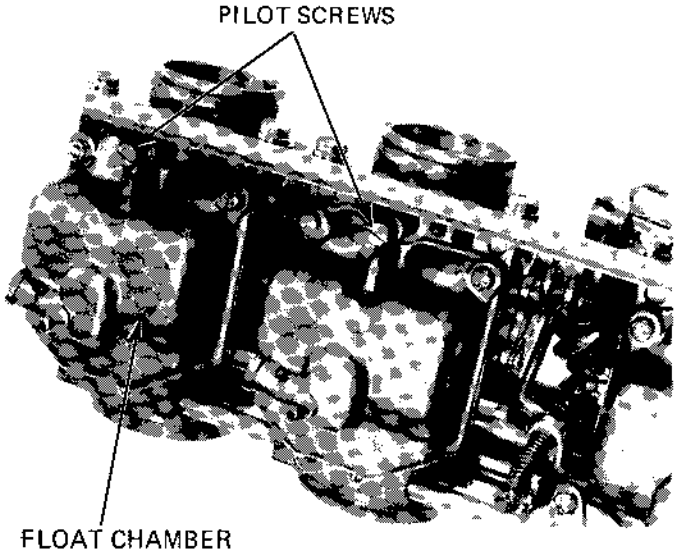
Turn the pilot screw in and carefully count the number of turns before it seats lightly.
Make a note of this to use as a reference when reinstalling the pilot screw.

CAUTION:

Damage to the pilot screw seat will occur if the pilot screw is tightened against the seat.

Remove the pilot screw.

Inspect the pilot screw and replace if worn or damaged.



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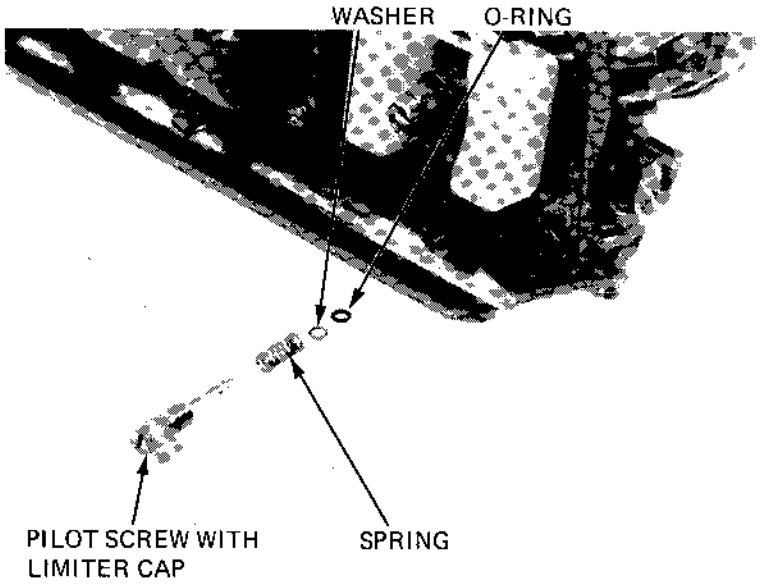
INSTALLATION

Install the pilot screw and return it to its original position as noted during removal.

Perform pilot screw adjustment if a new pilot screw is installed (page 4-18).

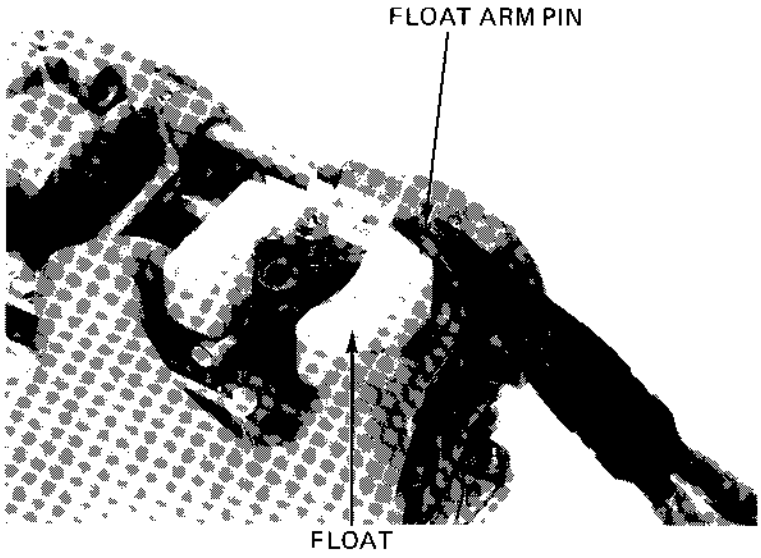
NOTE

> Do not install limiter caps on new pilot screws until after adjustment has been made.

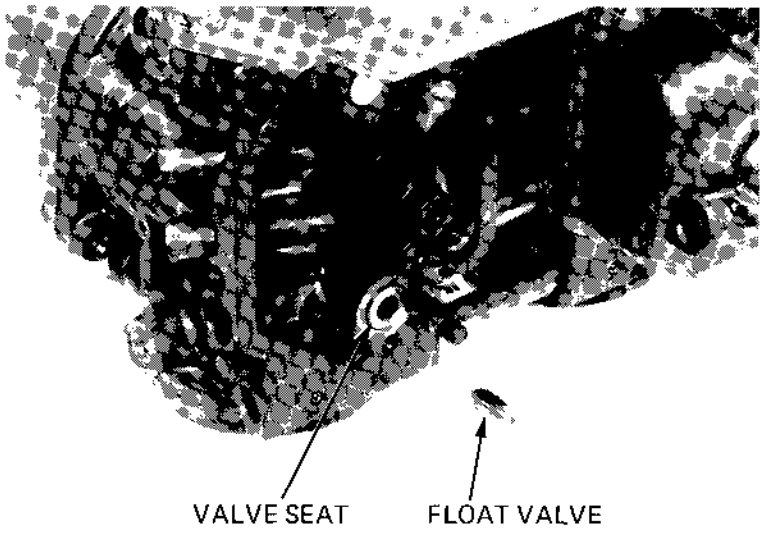


FLOAT AND JETS

Press out and remove the float arm pin.
Remove the float and float valve.

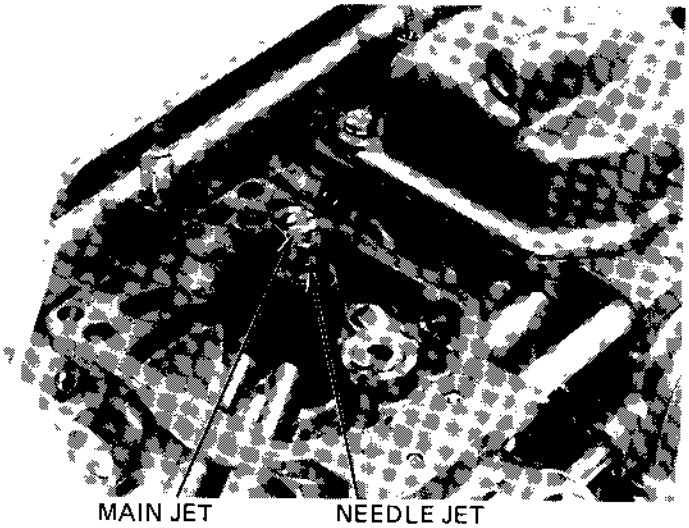


Inspect the float valve and seat for grooves, nicks or deposits.
Inspect the float valve operation to be sure it is not sticking.



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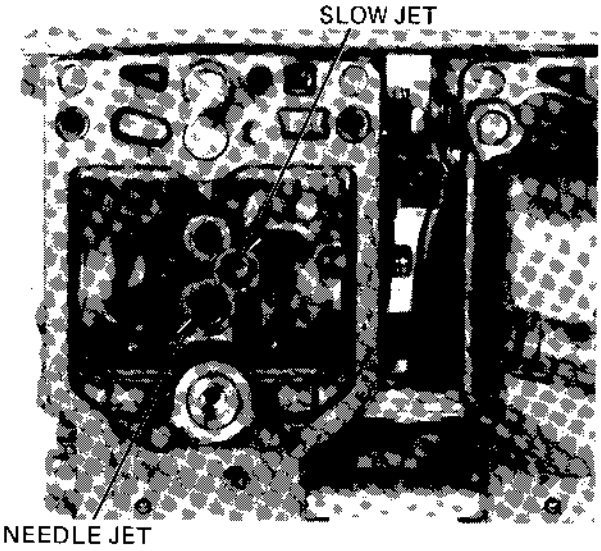
Remove the main jet and needle jet holder.



Remove the slow jet.
Tilt the carburetor to remove the needle jet.
Blow through all jets and body passages with compresed air.

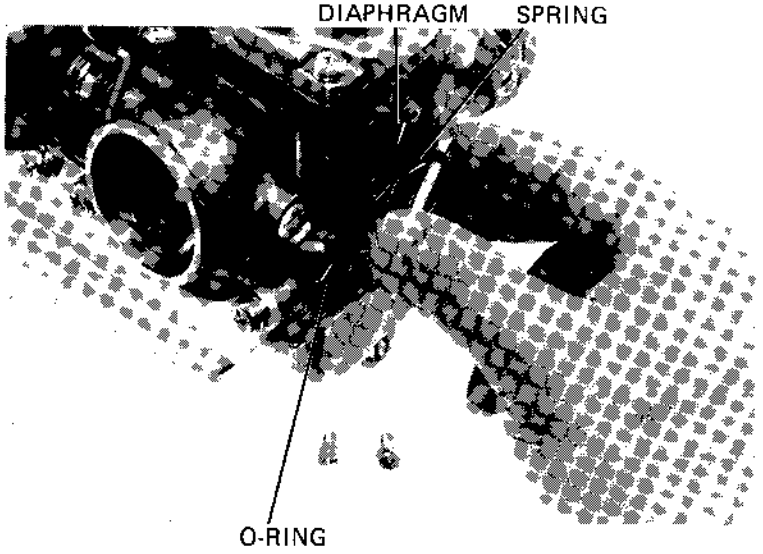
NOTE

If the needle jet is difficult to remove, carefully press the needle jet from the cylinder side with a soft object to prevent damage to the needle jet.



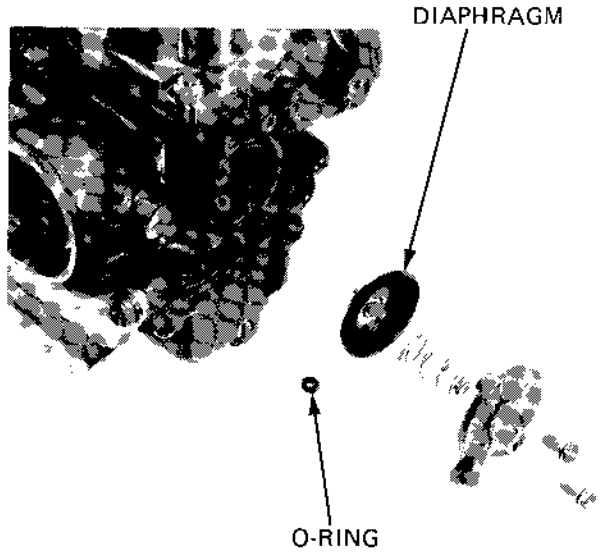
AIR CUTOFF VALVE DISASSEMBLY

Remove the air-cutoff valve cover and spring.
Remove the diaphragm and O-ring.



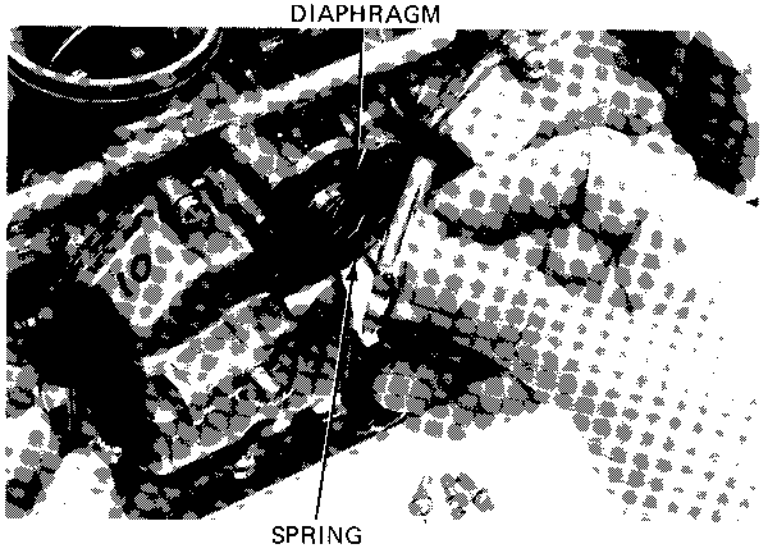
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Inspect the diaphragm and valve for cracks and brittleness. Replace if there are cracks or if it is brittle.



ACCELERATOR PUMP DISASSEMBLY

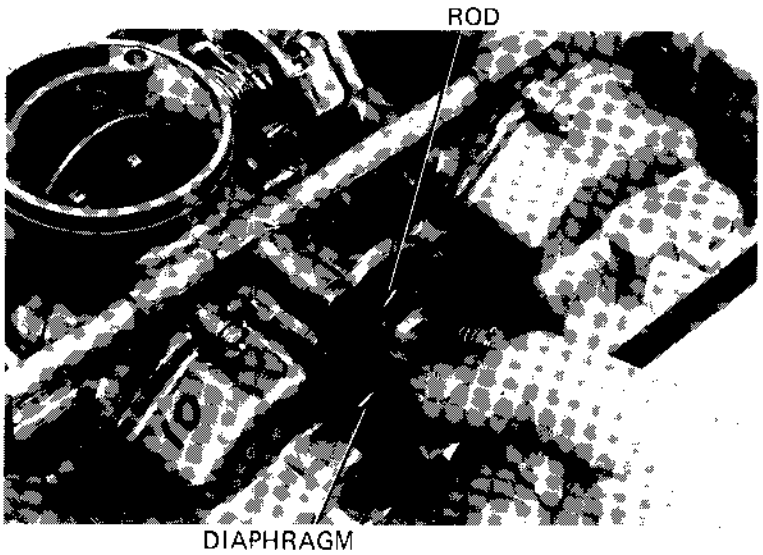
Remove the accelerator pump cover and spring.



Remove the diaphragm. Inspect the diaphragm for cracks and brittleness. Replace if there are cracks or brittleness.

NOTE

Be sure the pump rod is not bent.



COMPONENT ASSEMBLY

To assemble the accelerator pump, air-cutoff valve, float chamber and vacuum cylinder, reverse the disassembly procedure.

NOTE

When installing the air-cutoff valve O-ring, make sure the flat surface is toward the body.

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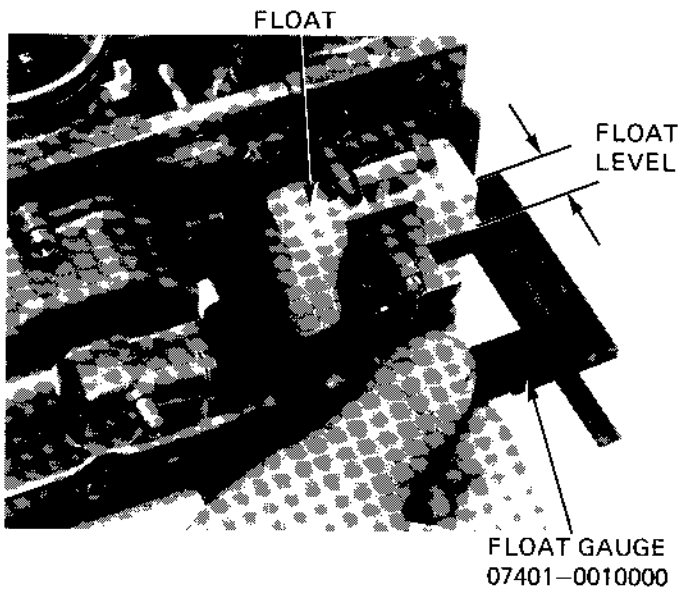
FLOAT LEVEL

Remove the float chamber.

Measure the float level with the float tip just contacting the float valve and the carburetor tilted 15° ~ 45° from vertical.

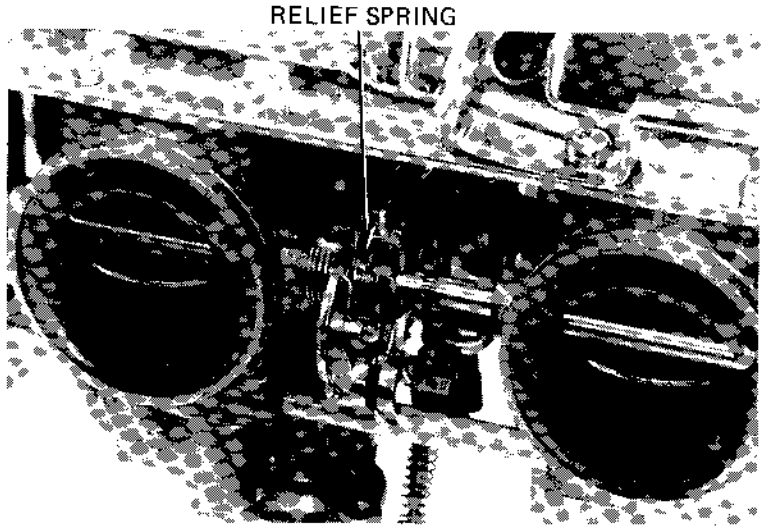
FLOAT LEVEL: 15.5 ± 1 mm (0.61 ± 0.04 in)

Replace the float, if the float level is not within the specification.



CARBURETOR SEPARATION

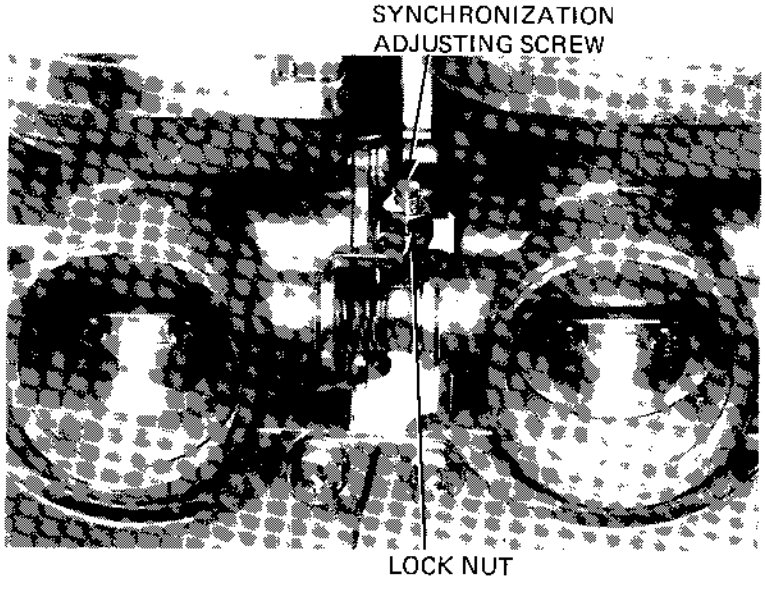
Unhook the choke relief spring from the choke shaft arm of the No. 2 and No. 3 carburetors.



Loosen the synchronization adjusting screw lock nuts and adjusting screws until there is no tension.

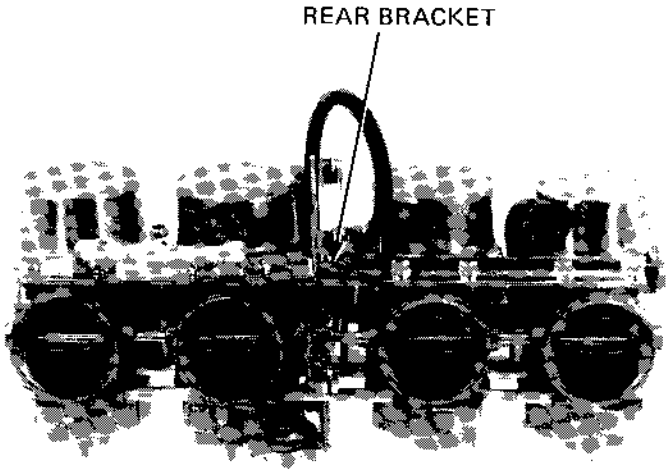
NOTE

> Turn the synchronization screws in until they seat and note the number of turns to ensure original positioning.

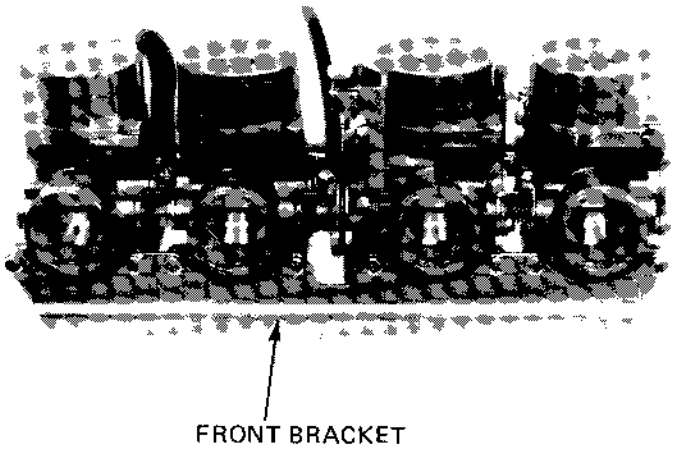


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Remove the rear bracket.



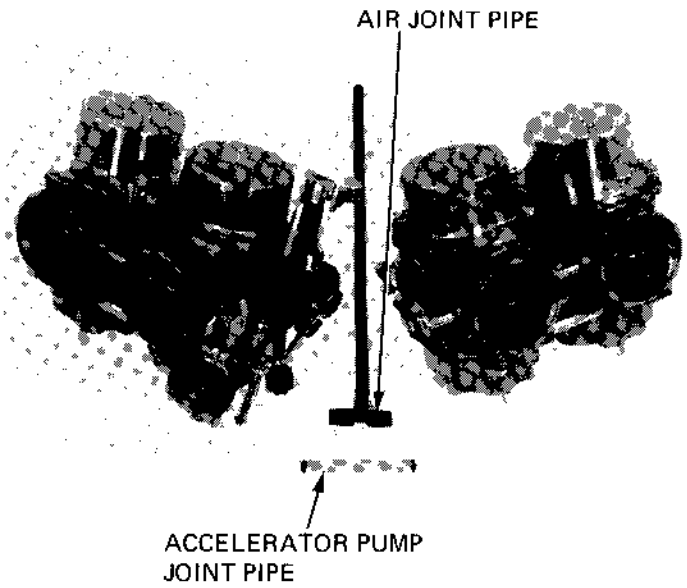
Remove the front bracket.



Carefully separate the carburetors into pairs; No. 1, 2 and No. 3, 4.

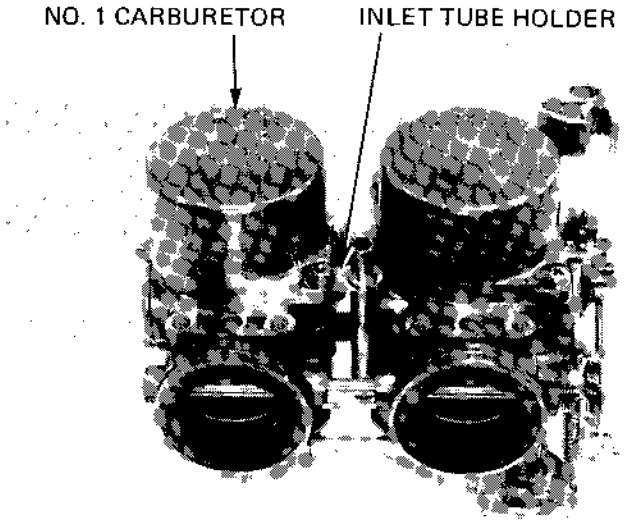
CAUTION:

Separate the carburetors horizontally to prevent damage to the joint pipes and choke linkage.



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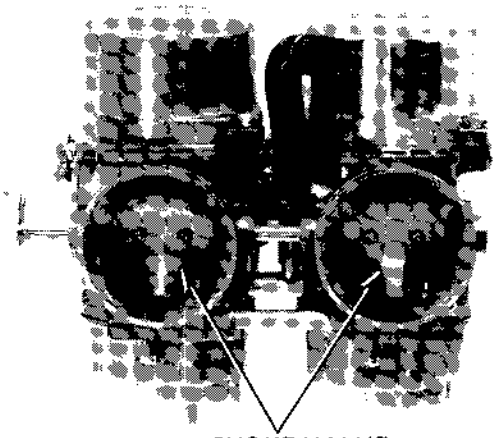
Remove the fuel inlet tube holder from the No. 1 carburetor.



Grind off the staked ends of the choke valve screws with a rotary grinder.
Remove the choke valves and discard the screws.

NOTE

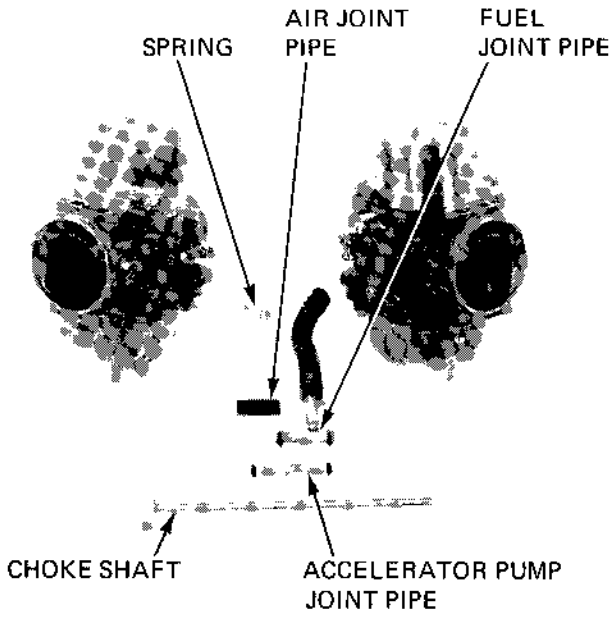
Do not allow grindings to enter the carburetors.



Carefully separate the individual carburetors.

CAUTION:

Separate the carburetors horizontally to prevent damage to the joint pipes and choke linkage.



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LINKAGE

DISASSEMBLY

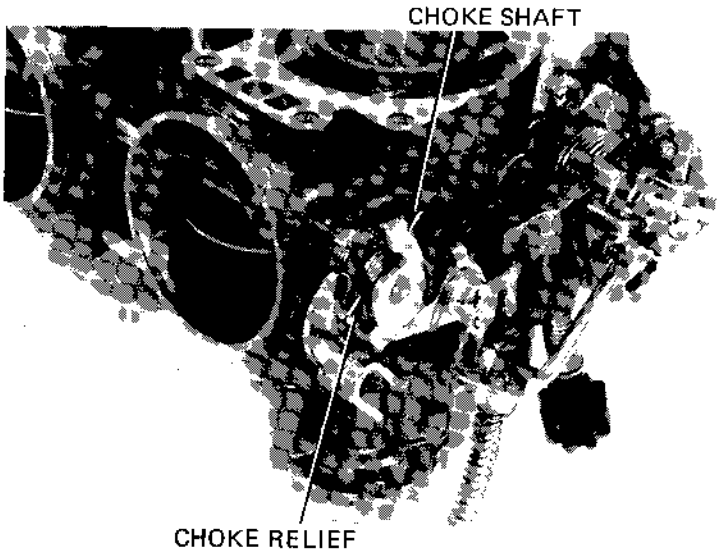
Note the spring positions.

Remove the choke valves.

Remove the choke relief spring from the choke link and pull the choke shaft out.

CATUION:

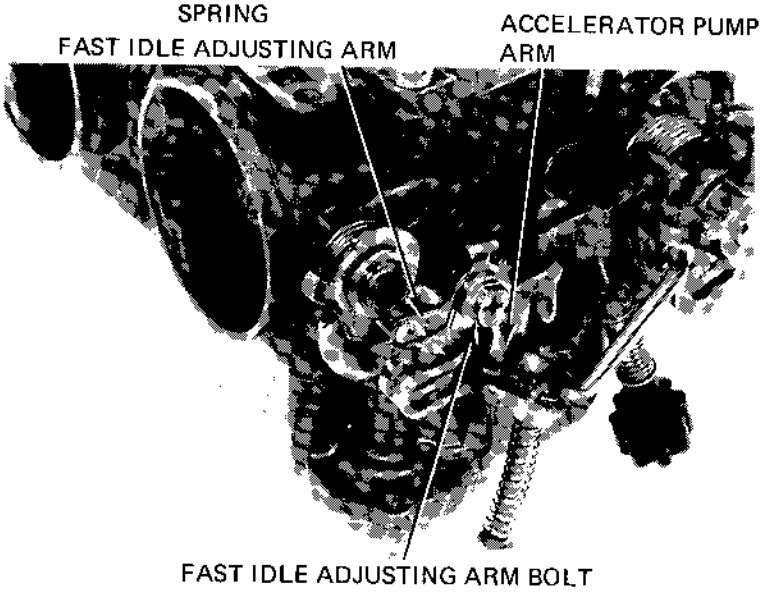
Do not reuse the choke shaft, or choke valves and screws.



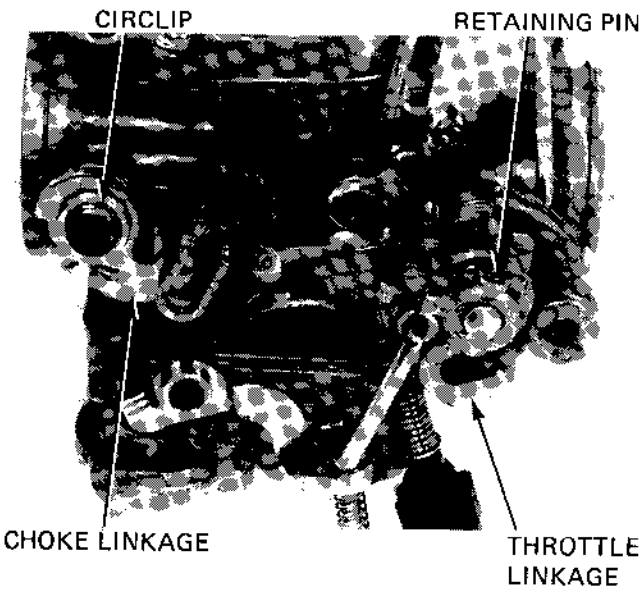
Remove the fast idle adjusting arm bolt.

Remove the fast idle adjusting arm and springs.

Remove the accelerator pump arm.



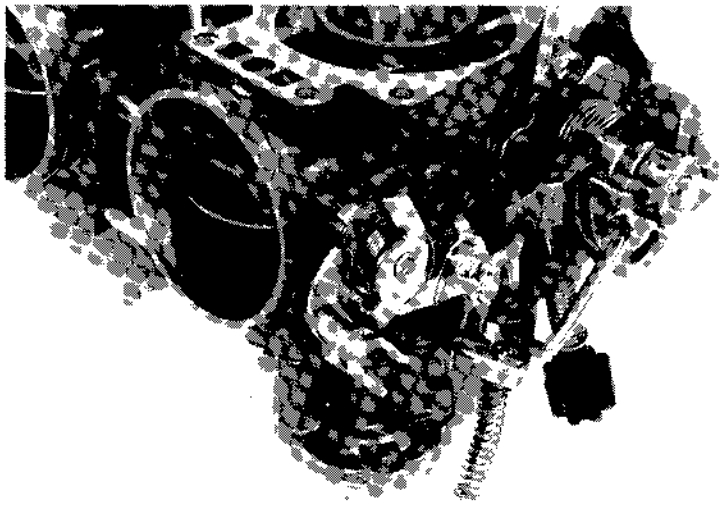
Drive out the retaining pin and remove the throttle linkage.
Remove the circlip and the choke linkage.



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ASSEMBLY

To assemble the carburetor linkage, reverse the disassembly procedure.



CARBURETOR ASSEMBLY

NOTE

Assemble one pair of carburetors at a time.

Install new O-rings on the fuel joint pipes.

NOTE

Apply a thin coating of oil to the O-rings.

Install the fuel joint, accelerator pump joint and air vent pipes.

Loosen the synchronization adjusting screw so there is no tension when assembling the carburetors.

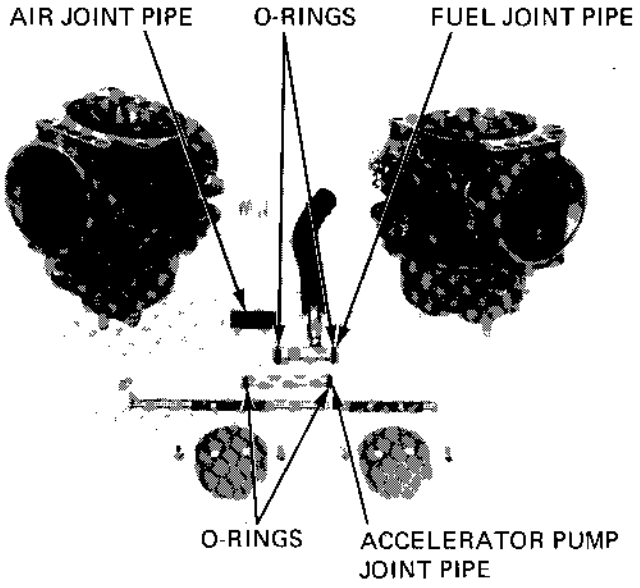
Insert the No. 3 carburetor throttle link between the plain washers. Assemble the No. 3 and No. 4 carburetors, pressing them together carefully.

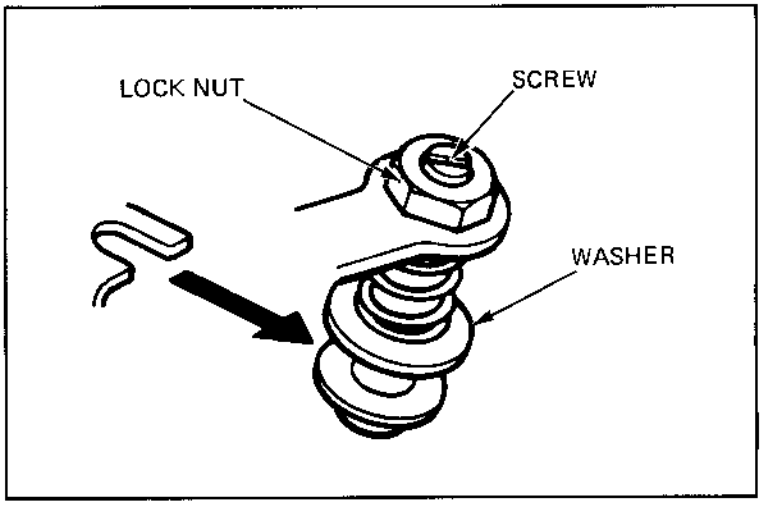
NOTE

The large washer should be positioned on the spring side.

Assemble the No. 1 and No. 2 carburetors using the same procedure above for the No. 3 and 4 carburetors.

Insert new choke shafts and assemble the carburetor linkage.





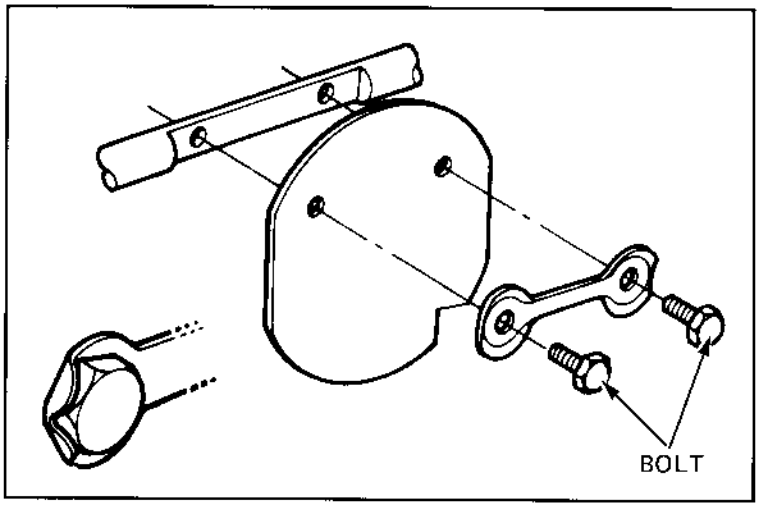
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Tighten the choke valve bolts.

TORQUE: 0.6–1.2 N·m
(6–12 kg-cm, 5–11 in-lb)

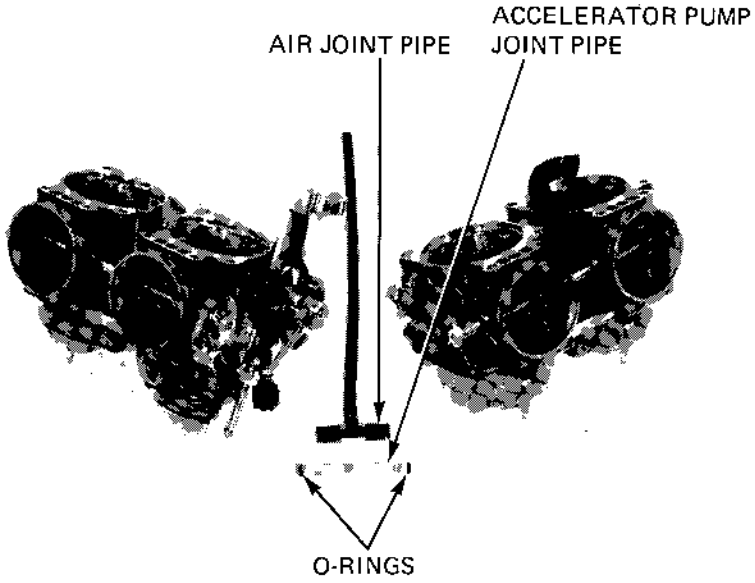
Fold the tabs of the lock washer up.

Check the throttle and choke operation.



Apply a thin coating of oil to new O-rings and put them on the fuel joint pipes.

Loosen the synchronization adjusting screw until there is no tension.
Assemble the two sets of carburetors together.

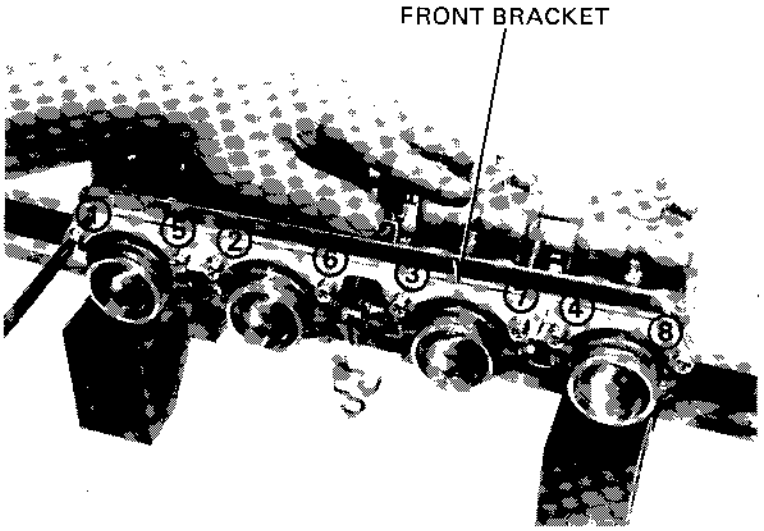


Install the front bracket loosely.
Place the carburetors on a flat surface with the float chamber up. Press the carburetors together carefully and evenly tighten the screws in the sequence shown in two or more steps to prevent carburetor misalignment.

TORQUE: 4–6 N·m
(0.4–0.6 kg-m, 35–52 in-lb)

NOTE

> Check for smooth choke shaft operation. If it is not smooth, recheck the carburetor alignment.

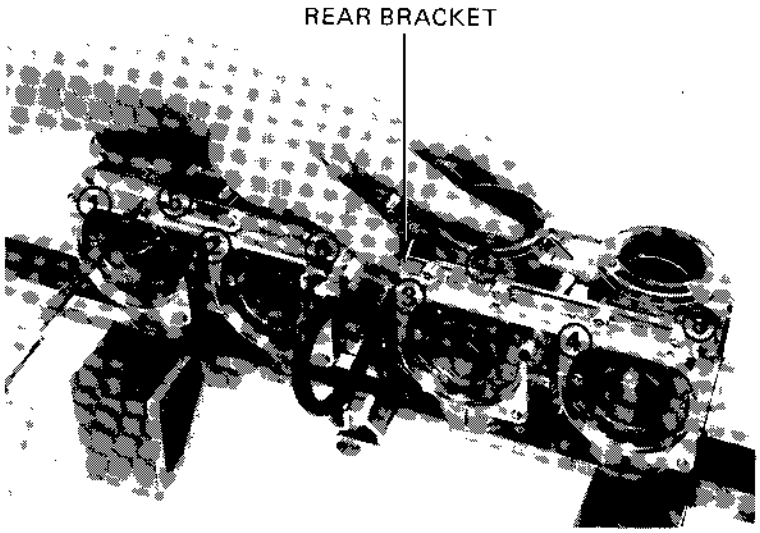


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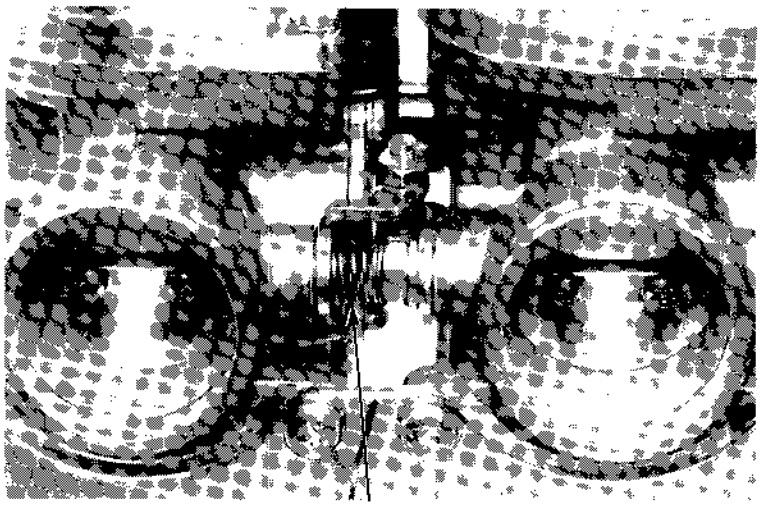
Install the rear bracket using the same procedure as for the front bracket.

TORQUE: 2.8–4.2 N·m
(0.28–0.42 kg-m, 2–3 ft-lb)

Install the throttle cable holder.

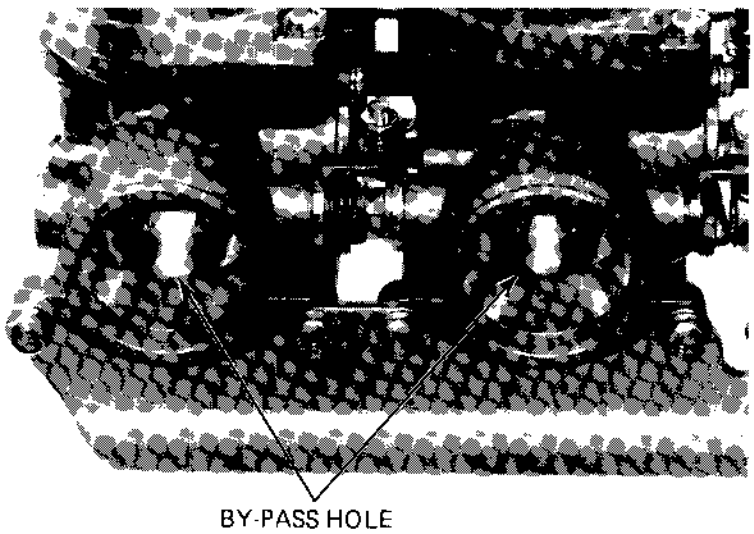


Install the thrust springs between the No. 1 and 2, and No. 3 and 4 carburetor throttle links.



Turn each synchronization adjusting screw to its original position as noted during disassembly.

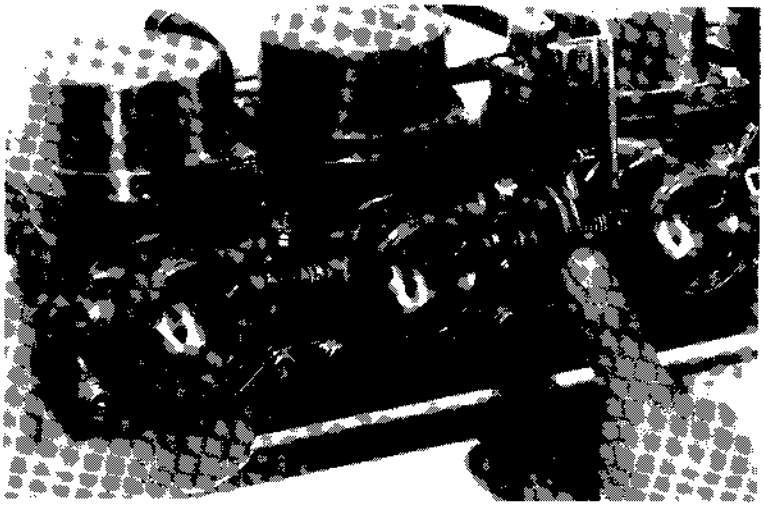
Make sure the distance between each by-pass hole and throttle valve equal.



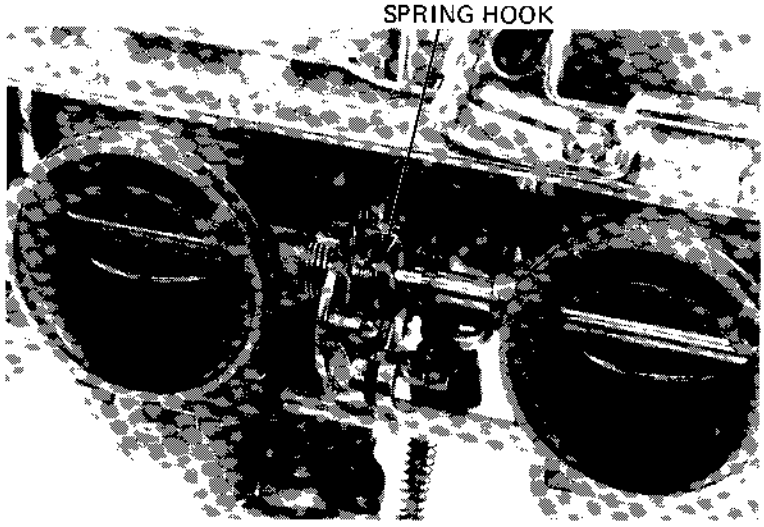
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Inspect throttle operation as described below:

- Open the throttle slightly by pressing the throttle linkage. Then relase the throttle.
- Make sure that it returns smoothly.
- Make sure that there is no drag when opening and closing the throttle.

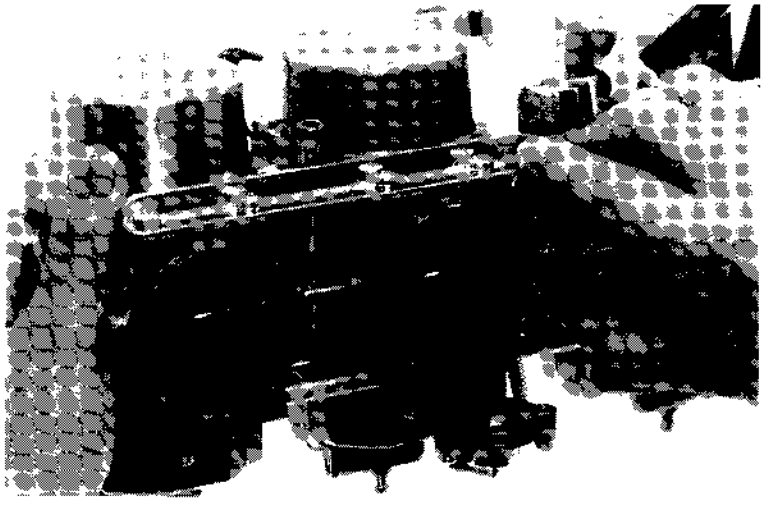


Hook the choke relief spring to the chole shaft arm of the No. 3, 4 carburetors.
Install the choke valves, but do not tighten the bolts.



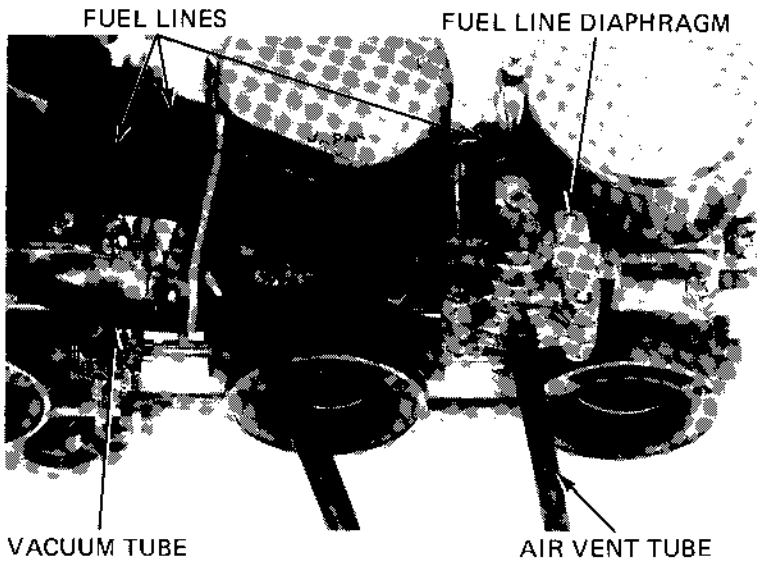
Make sure that choke valve operation is smooth by moving the choke linkage.

Close the choke valve by turning the choke linkage. Release the choke linkage and make sure that it returns smoothly.



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FUEL LINE DIAPHRAGM



REMOVAL

Turn the fuel valve off. Remove the seat and fuel tank.
Disconnect the fuel line, vacuum tube and air vent tube.
Unscrew the screws attaching the fuel line diaphragm to the carburetors. Remove the fuel line diaphragm.

INSPECTION

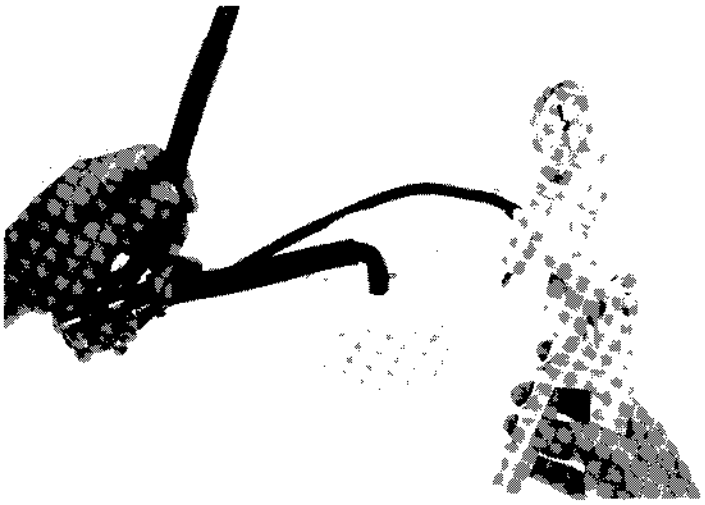
Remove the fuel line diaphragm (see above).

Disconnect the inlet fuel line from the diaphragm, and connect a longer tube to the fuel tank.

Place a suitable drainage container under the outlet fuel tube.

Turn the fuel valve on. Fuel should not flow from the outlet tube.

Connect a vacuum pump with gauge to the diaphragm vacuum outlet. Fuel should flow out from the outlet tubes when 10–20 mm Hg (0.4–0.8 in Hg) of vacuum is applied. If the flow is restricted, replace the fuel line diaphragm.

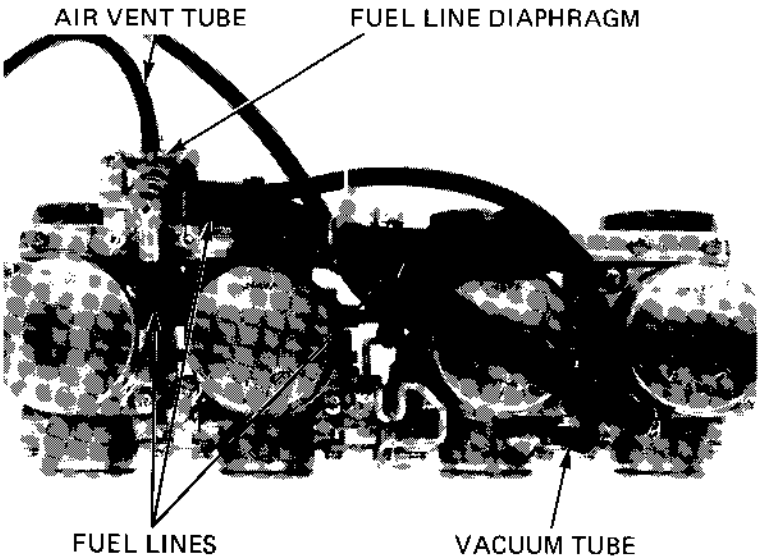


INSTALLATION

Installation of the fuel line diaphragm is the reverse order of removal.

NOTE

> Check that air or gasoline is not leaking past the fuel tube joints or connections.



CARBURETOR TUBE ROUTING

Route the carburetor tubes as shown.

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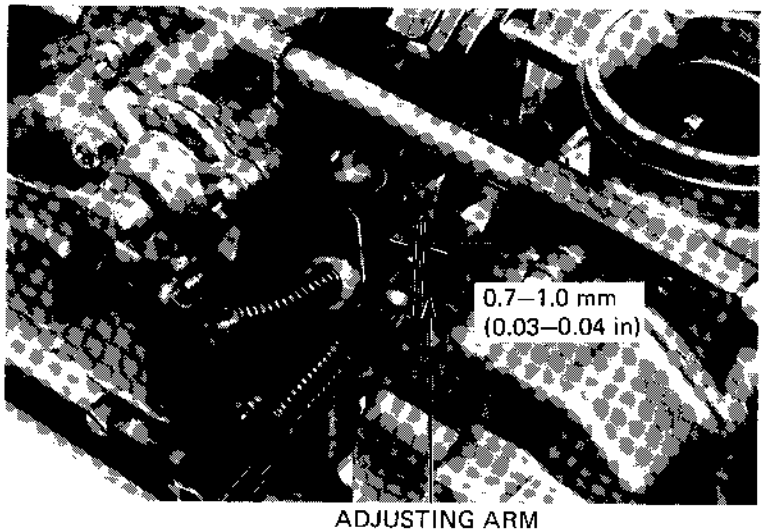
FAST IDLE ADJUSTMENT

FAST IDEL: 1,000–2,500 rpm

Close the throttle valve and open the choke valve. Measure the clearance between the throttle link and fast idle adjusting arm pin.

CLEARANCE: 0.7–1.0 mm (0.03–0.04 in)

Adjust by opening and closing the fork end of the fast idle adjusting arm.



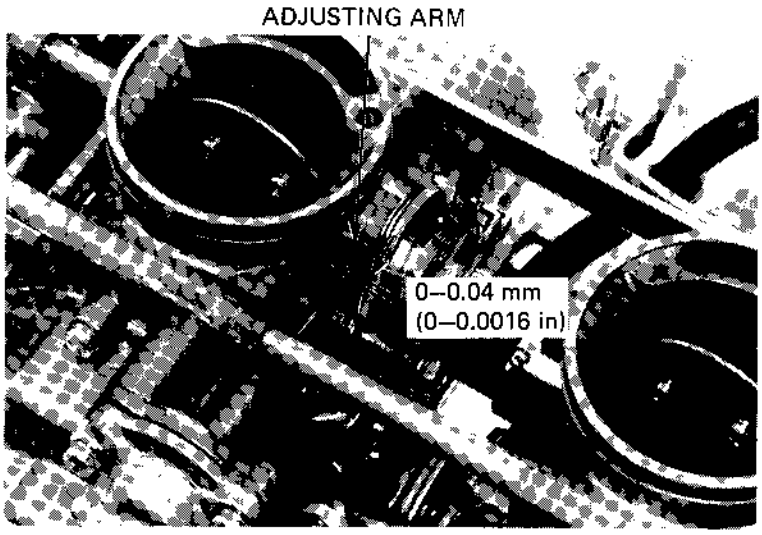
ADJUSTING ARM

ACCELERATOR PUMP ADJUSTMENT

Measure the clearance between the accelerator pump rod and adjusting arm with the throttle valve closed.

CLEARANCE: 0–0.04 mm (0–0.0016 in)

Adjust by bending the adjusting arm.



CARBURETOR INSTALLATION

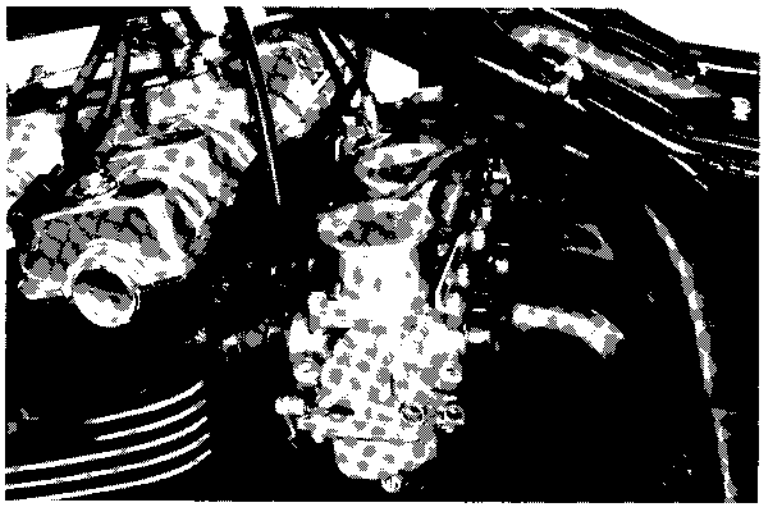
The installation sequence is essentially the reverse of removal.

NOTE

> Route the throttle and choke cables properly (page 1-8 to 1-9).

Perform the following inspections and adjustments.

- Throttle operation (page 3-5)
- Carburetor choke (page 3-6)
- Carburetor idle speed (page 3-13)



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PILOT SCREW ADJUSTMENT

IDLE DROP PROCEDURE (U.S.A. ONLY)

NOTE

- The pilot screws are factory pre-set and no adjustment is necessary unless the pilot screw is replaced (See removal).
- Use a tachometer with graduations of 50 rpm or smaller that will accurately indicate a 50 rpm change.

1. Turn each pilot screw clockwise until it seats lightly and back it out to the specification given. This is an initial setting prior to the final pilot screw adjustment.

   INITIAL OPENING: 1-3/4 turns out

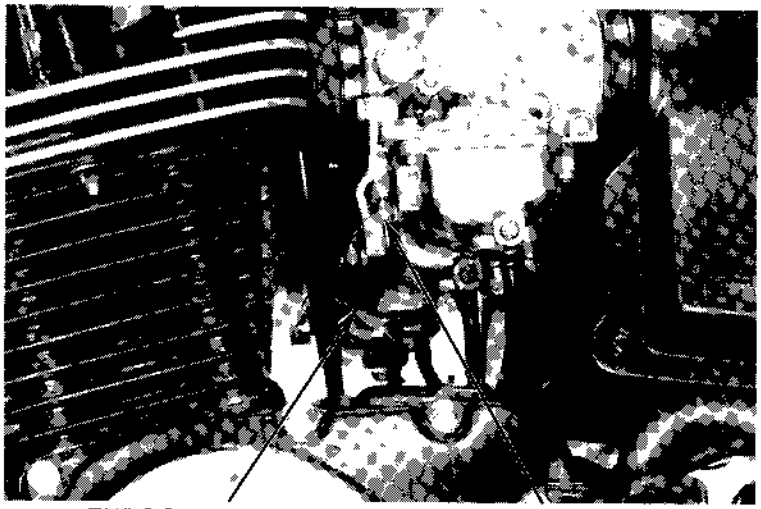
   CAUTION:

   Damage to the pilot screw seat will occur if the pilot screw is tightened against the seat.

2. Warm up the engine to operating temperature. Stop and go driving for 10 minutes is sufficient.
3. Attach a tachometer.
4. Adjust the idle speed with the throttle stop screw.

   IDLE SPEED: 1,000 rpm

5. Turn each pilot screw 1/2 turn out from the initial setting.
6. If the engine speed increases by 50 rpm or more, turn each pilot screw out by a continual 1/2 turn until it drops by 50 rpm or less.
7. Adjust the idle speed with the throttle stop screw.
8. Turn the No. 1 carburetor pilot screw in until the engine speed drops 50 rpm.
9. Turn the No. 1 carburetor pilot screw 1 turn out from the position obtained in step 8.
10. Adjust the idle speed with the throttle stop screw.
11. Perform steps 8, 9 and 10 for the No. 2, 3 and 4 carburetor pilot screws.



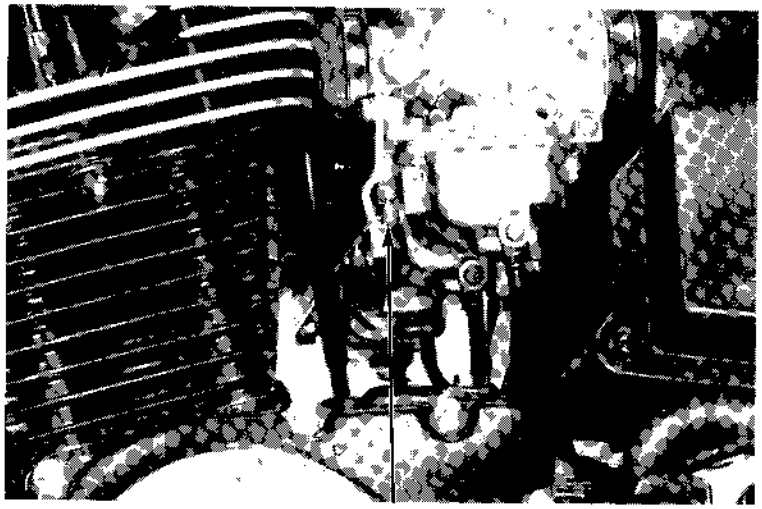
THROTTLE STOP SCREW PILOT SCREW

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After adjustment, cement the limiter cap over the pilot screw, using Loctite ® 601 or equivalent. The limiter cap should be placed against its stop, preventing further adjustment that would enrich the fuel mixture (limiter cap position permits clockwise rotation and prevents counterclockwise rotation).

NOTE

- Do not turn the pilot screws when installing the limiter caps.
- A pilot screw limiter cap must be installed. It prevents misadustment that could cause poor performance and increase exhaust emissions.



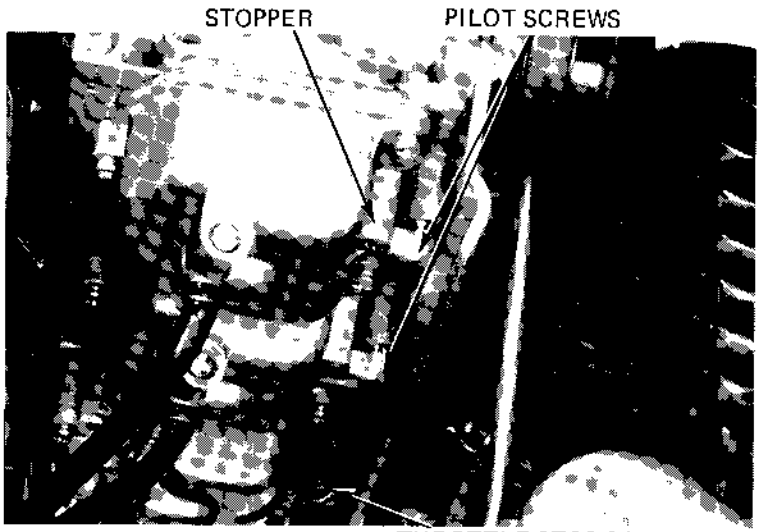
LIMITER CAP

HIGH ALTITUDE ADJUSTMENT

When the vehicle is to be operated continuously above 6,500 feet (2,000 m), the carburetors must be readjusted as described below to improve driveability and decrease exhaust emissions.

Warm up the engine to operating temperature.

Stop-and-go driving for 10 minutes is sufficient to warm the engine.

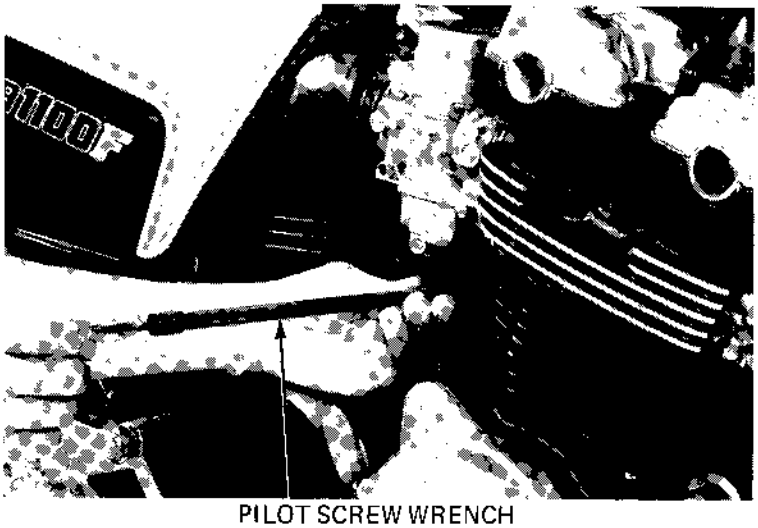


THROTTLE STOP SCREW

Turn each pilot screw clockwise 1/2 turn. Adjust the idle speed to 1,000 ± 100 rpm with the throttle stop screw.

NOTE

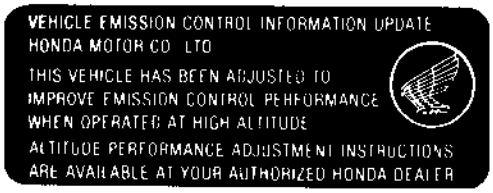
These adjustments must be made at high altitude to ensure proper high altitude operation.



PILOT SCREW WRENCH
07908–4220201

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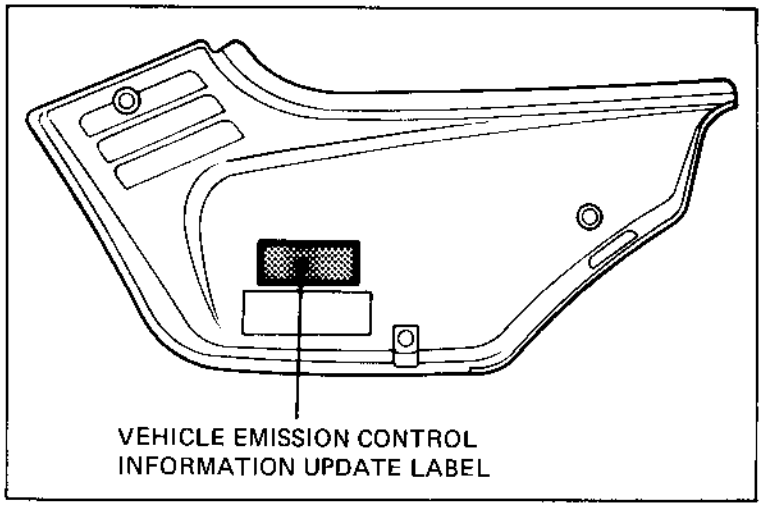
Attach the Vehicle Emission Control Information Update label as shown. Refer to Service Letter #132. (U.S.A. only)



WARNING

Operation at an altitude lower than 5,000 feet (1,500 m) with the carburetors adjusted for high altitudes may cause the engine to idle roughly and stall.

When the vehicle is to be operated continuously below 5,000 feet (1,500 m), turn each pilot screw counterclockwise to its original position against its stop. Adjust the idle speed to 1,000 ± 100 rpm. Be sure to do these adjustments at low altitude.



VEHICLE EMISSION CONTROL INFORMATION UPDATE LABEL

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FUEL TANK

WARNING

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

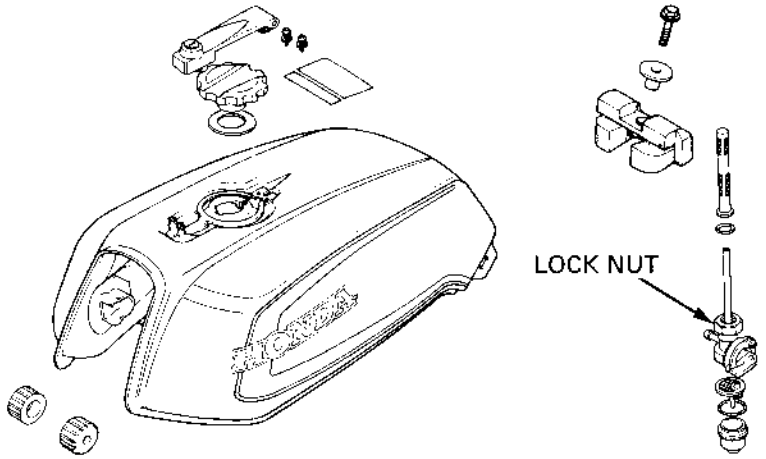
Check the vent hole of the filler cap for blockage.

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.



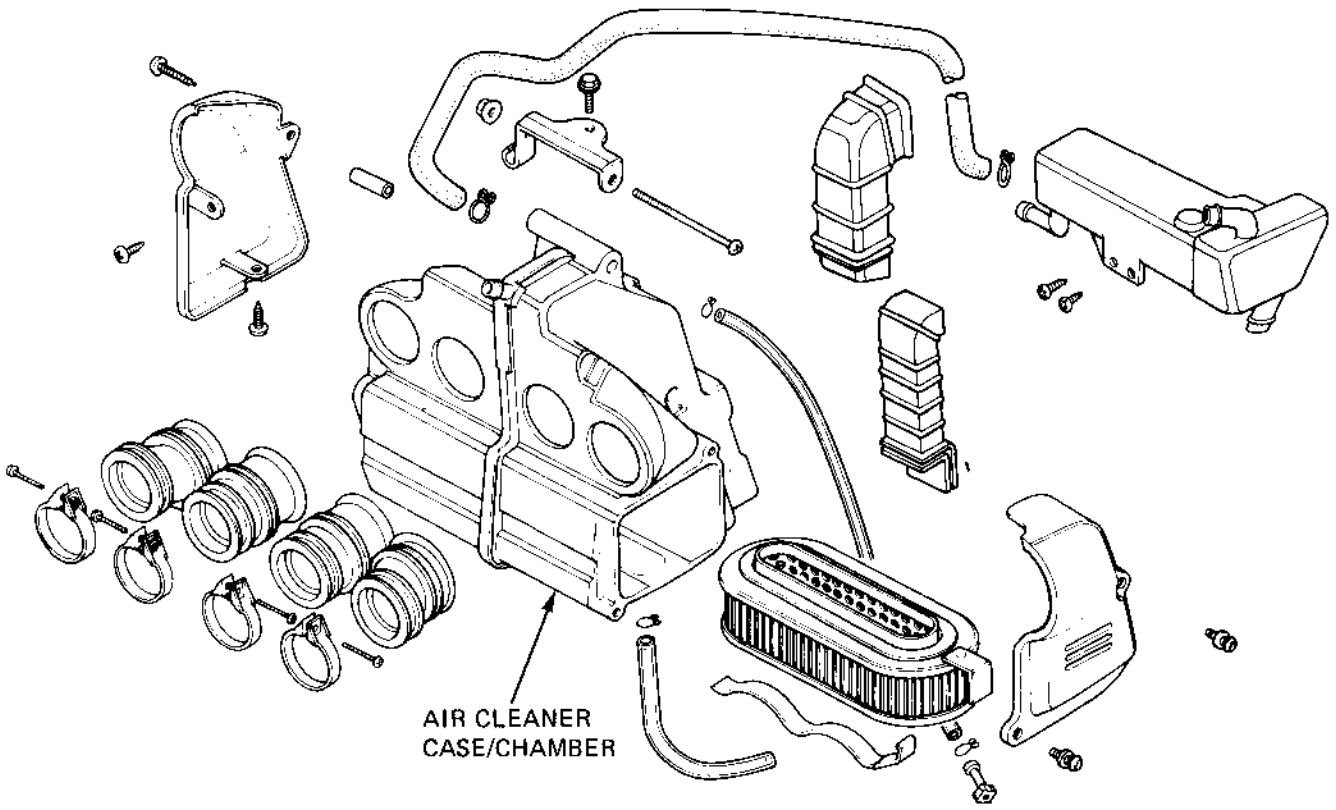
AIR CLEANER CASE

CASE/CHAMBER

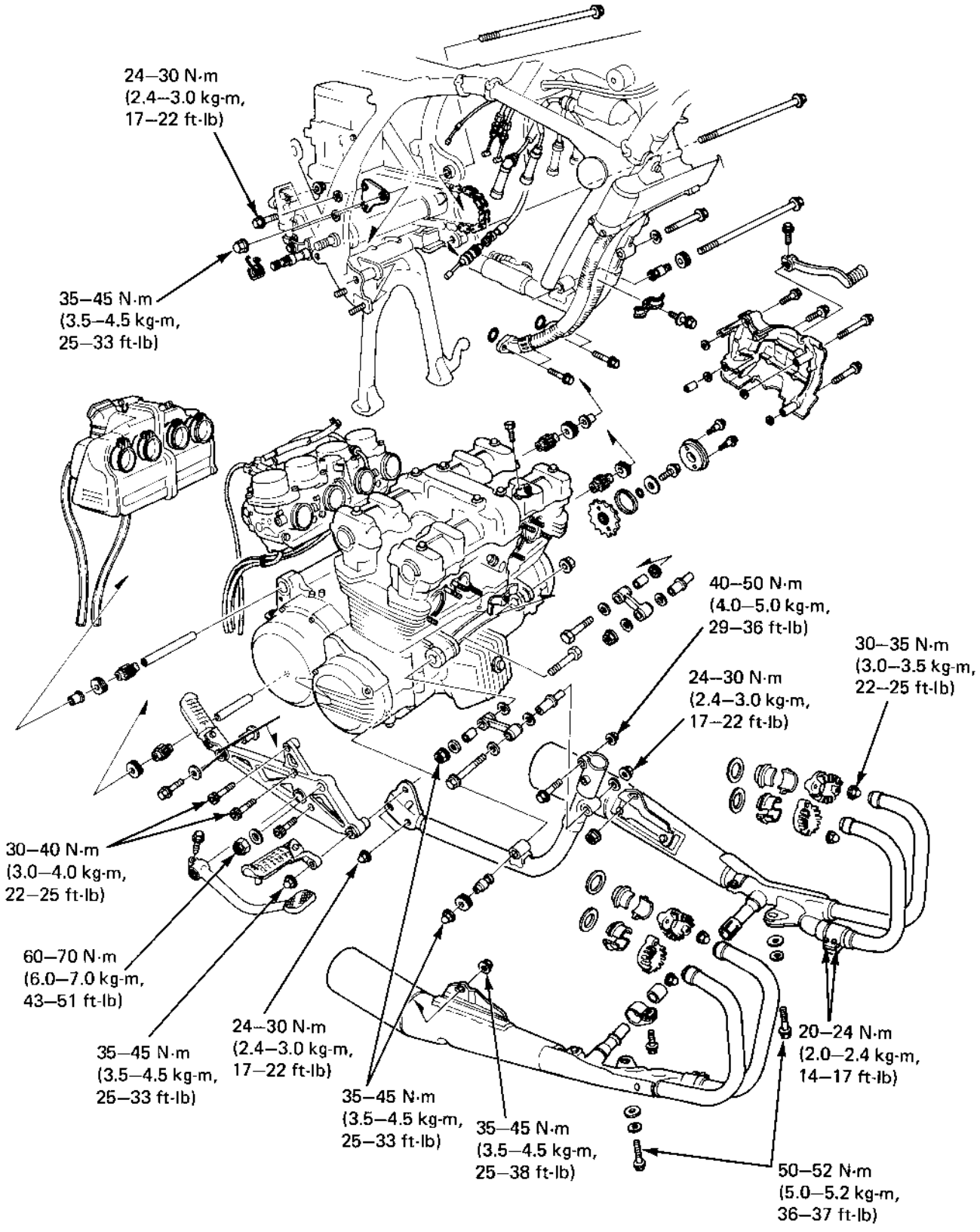
Check the air cleaner case for deterioration.

CRANKCASE VENTILATION SYSTEM

Check that the breather tube is not restricted.



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5. ENGINE REMOVAL/INSTALLATION

SERVICE INFORMATION	5–1
ENGINE REMOVAL	5–2
ENGINE INSTALLATION	5–7

SERVICE INFORMATION

GENERAL

- The following parts or components can be serviced with the engine in the frame:
  - Clutch
  - Gear shift linkage
  - Camshaft
  - Alternator
  - Starter motor
  - Carburetor

SPECIFICATIONS

Engine dry weight	92 kg (203 lb)
Oil capacity	4.5 lit (4.7 US qt) at engine assembly 3.5 lit (3.7 US qt) at change

TORQUE VALUES

Engine mounting bolt	
10 mm bolt (1)	35–45 N·m (3.5–4.5 kg-m, 25–33 ft-lb)
10 mm bolt (2)	40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)
Rear axle nut	80–100 N·m (8.0–10.0 kg-m, 58–72 ft-lb)
Swingarm pivot nut	60–70 N·m (6.0–7.0 kg-m, 43–51 ft-lb)
Rear brake master cylinder mounting bolt	30–40 N·m (2.0–4.0 kg-m, 22–29 ft-lb)
Exhaust pipe cap nuts	30–35 N·m (3.0–3.5 kg-m, 22–25 ft-lb)
Exhaust pipe oil pan mount bolts	50–52 N·m (5.0–5.2 kg-m, 36–37 ft-lb)
Rear muffler mounting bolts	35–45 N·m (3.5–4.5 kg-m, 25–33 ft-lb)
Exhaust pipe connecting band bolts	20–25 N·m (2.0–2.5 kg-m, 14–18 ft-lb) Apply grease

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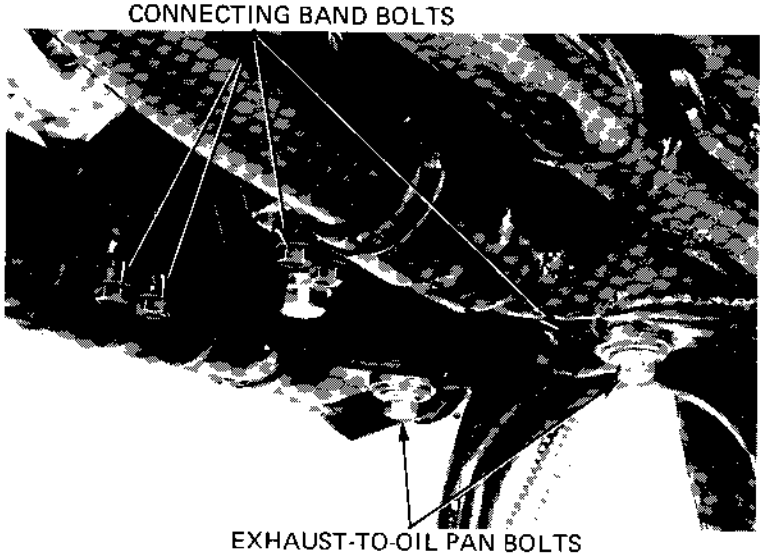
ENGINE REMOVAL

Place the motorcycle on its center stand.

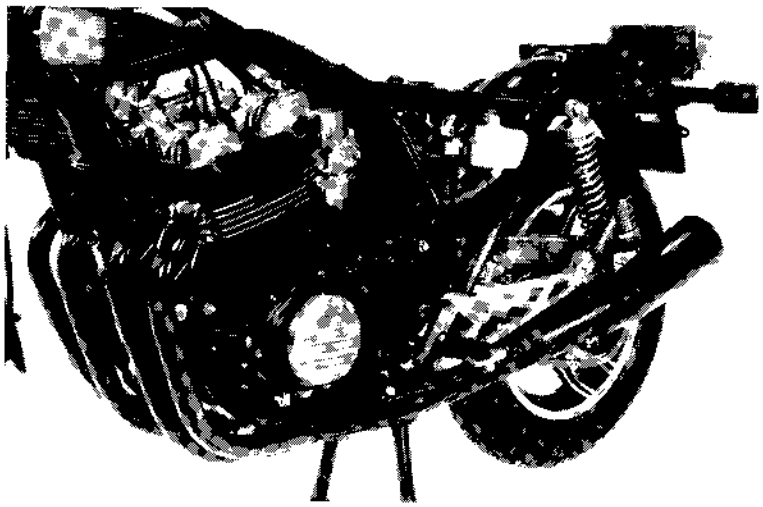
Drain the engine oil.

Remove the seat, fuel tank, left and right side covers.
Remove the exhaust pipe-to-oil-pan mounting bolts.

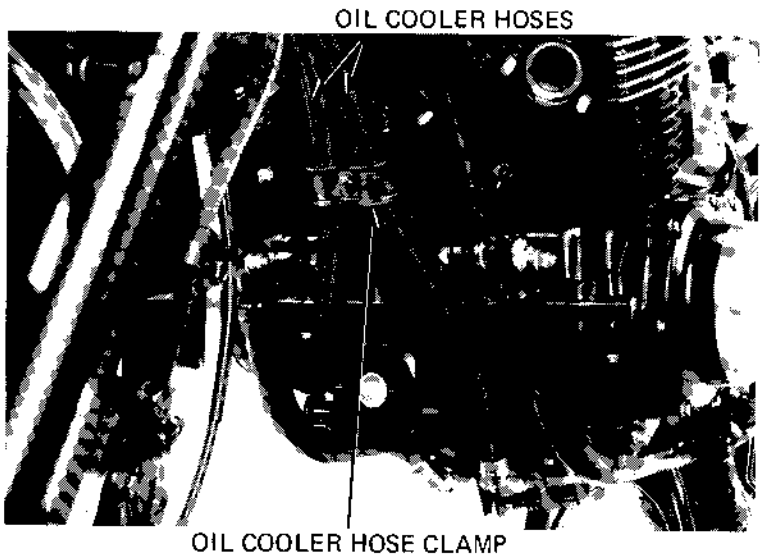
Loosen the exhaust pipe connecting band bolts.



Remove the exhaust pipe cap nuts.
Remove the muffler rear mounting bolts and remove the exhaust system.

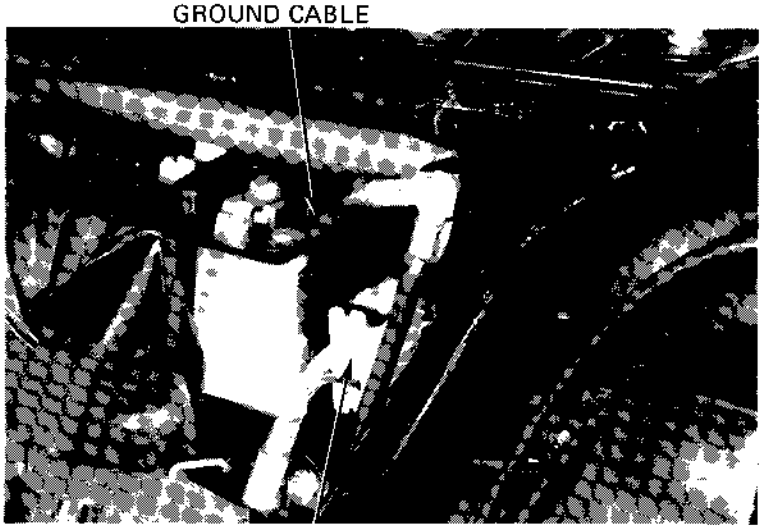


Disconnect the oil cooler hoses from the engine.
Remove the oil cooler hose clamp bolts and clamps.

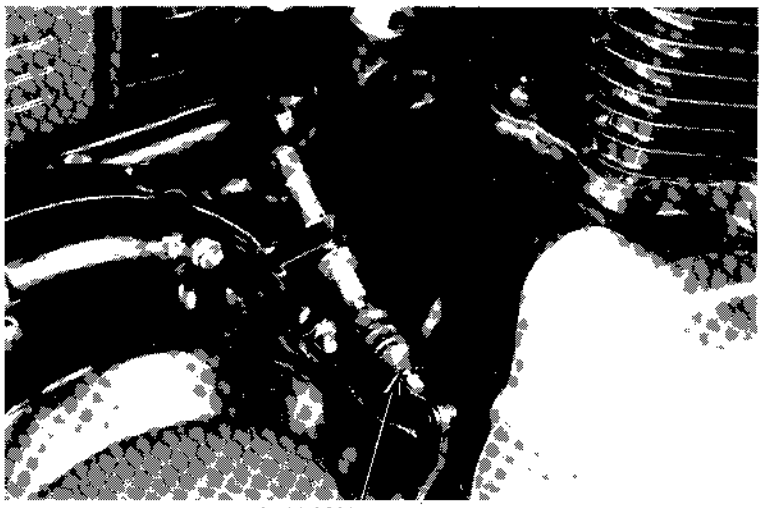


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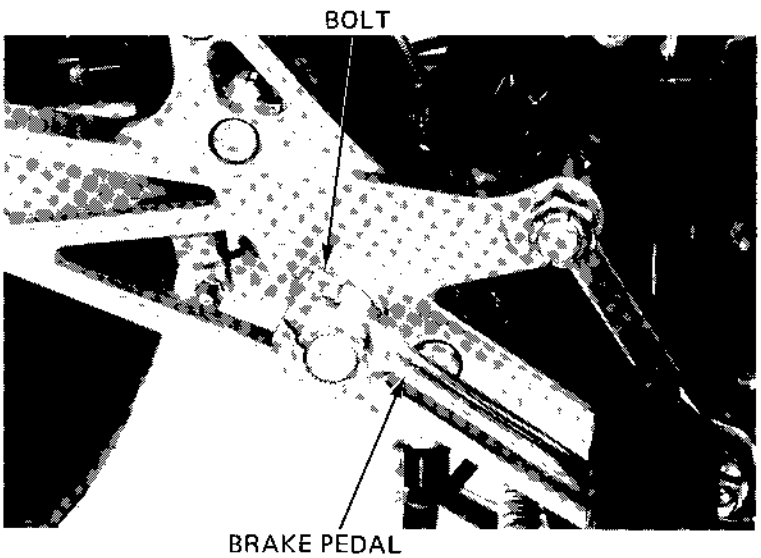
Disconnect the ground cable from the battery and frame.
Disconnect the alternator coupler.



Disconnect the clutch cable at its lower end.

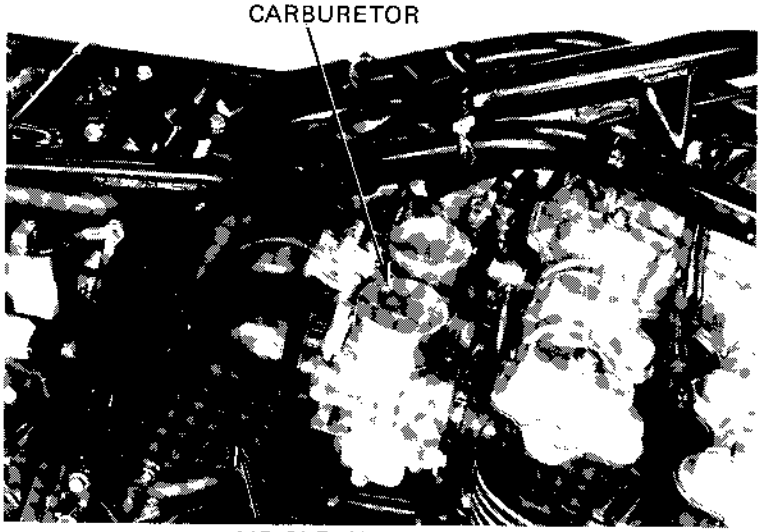


Remove the brake pedal bolt and pedal.

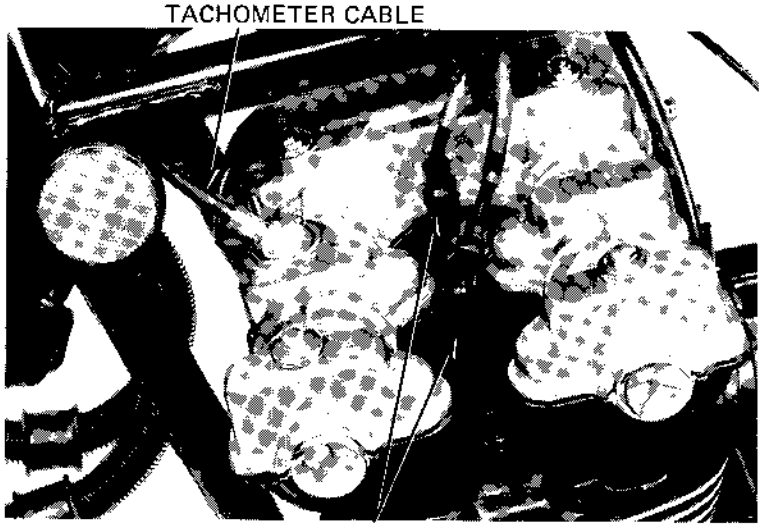


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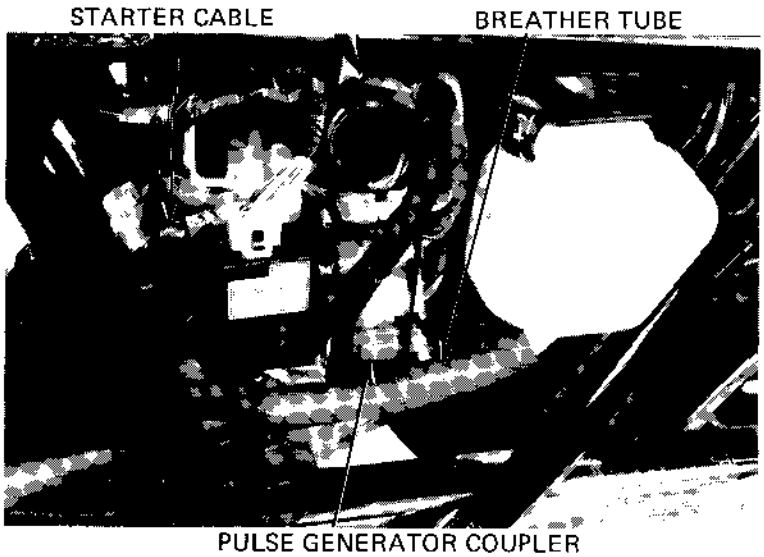
Remove the air cleaner assembly and carburetors (page 4-3).



Disconnect the tachometer cable and spark plug caps.

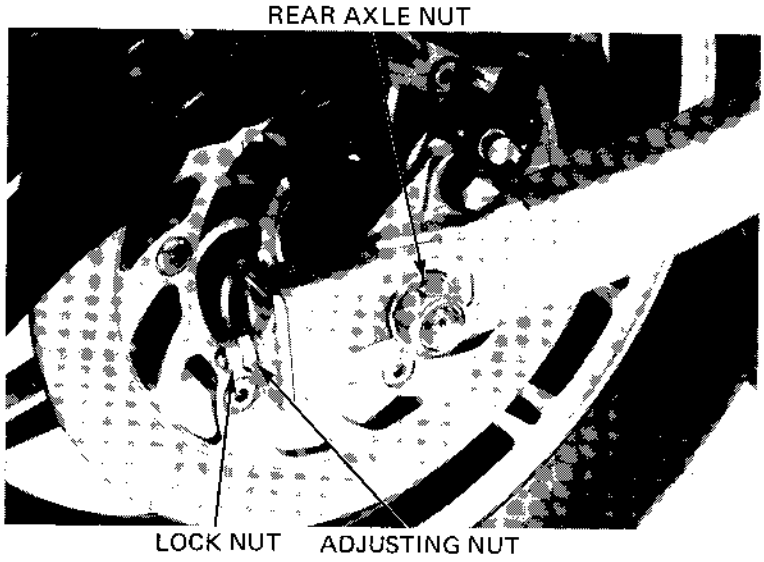


Disconnect the starter motor cable, pulse generator coupler and breather tube.



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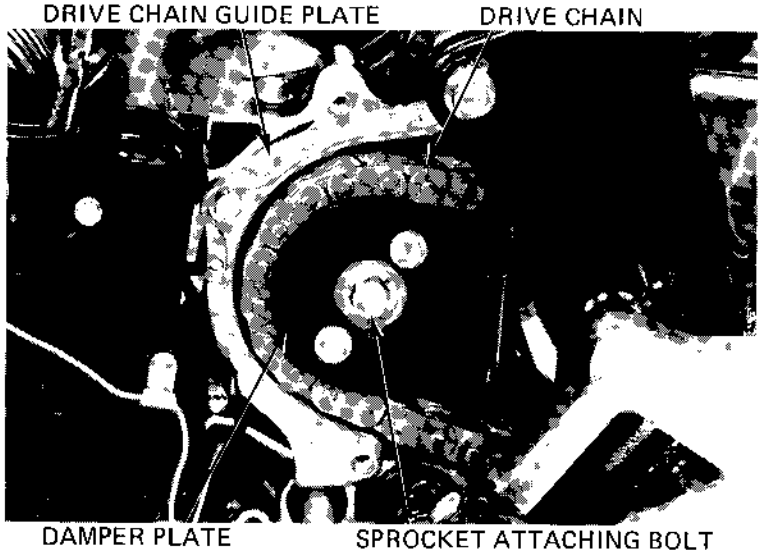
Loosen the lock nuts on both adjusters.
Loosen the rear axle nut.
Push the rear wheel forward.



Remove the gearshift pedal and the drive sprocket cover.



Remove the drive chain guide plate.
Remove the sprocket damper mounting bolts, damper plate and damper rubber.
Remove the sprocket attaching bolt and sprocket.

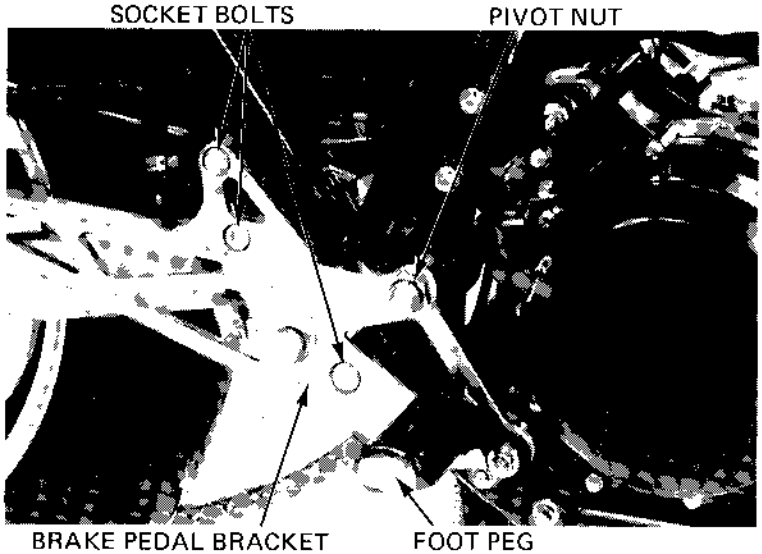


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Remove the rear brake master cylinder mounting socket bolts.

Remove the brake pedal bracket mounting socket bolt and swingarm pivot nut.

Remove the right foot peg.

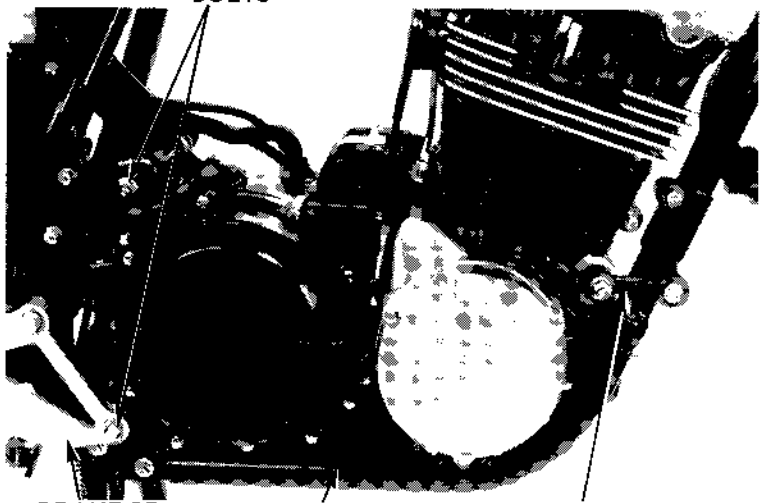


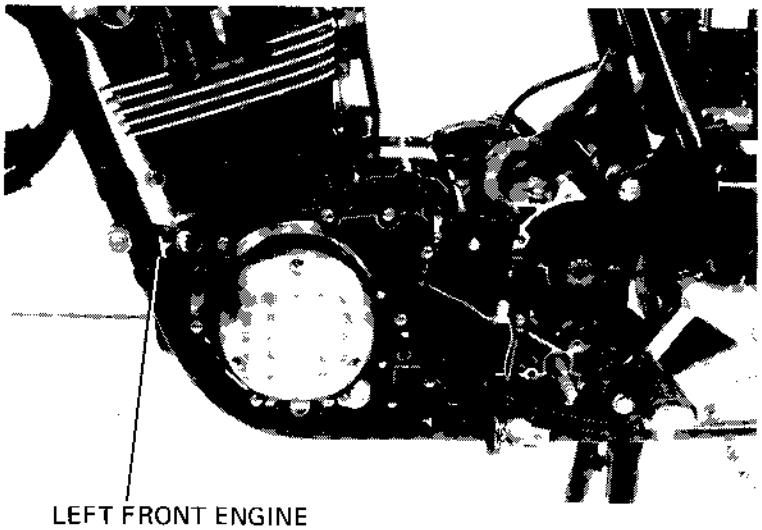
Pull the rear brake pedal bracket out.
Place a jack under the engine.

Remove the right and left front engine mounting brackets.
Remove the lower front and rear engine mounting bolts. Note the position of the outer damper plates.

Remove the rear engine mounting bolt.

Remove the lower right frame tube and remove the engine from the right side.

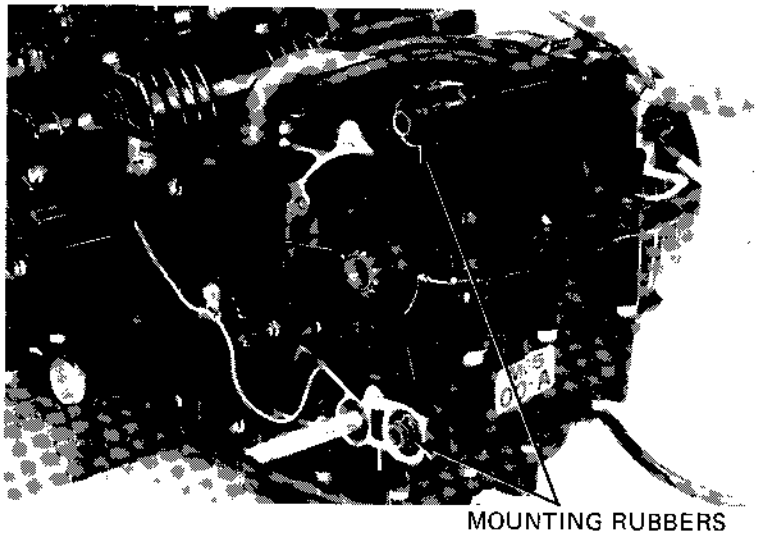




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ENGINE INSTALLATION

Check the engine mounting rubbers for damage and replace if necessary.



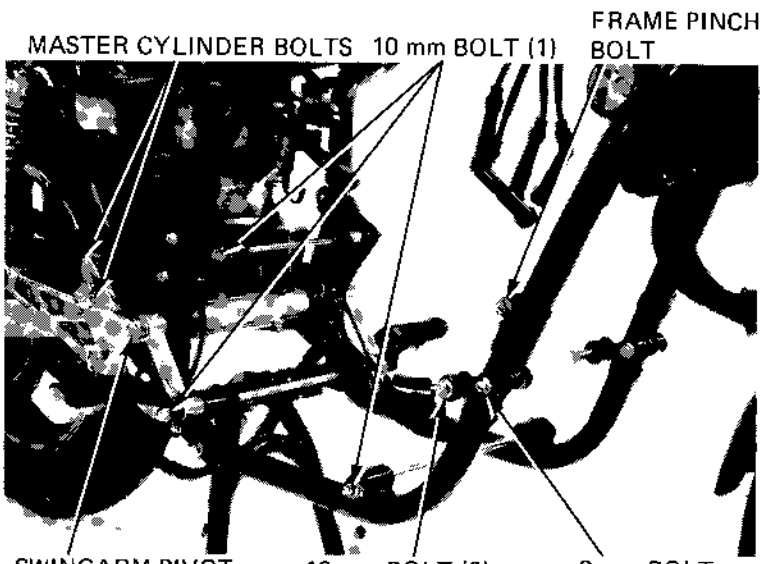
Install the engine into the frame. Installation is essentially the reverse order of removal with these exceptions:

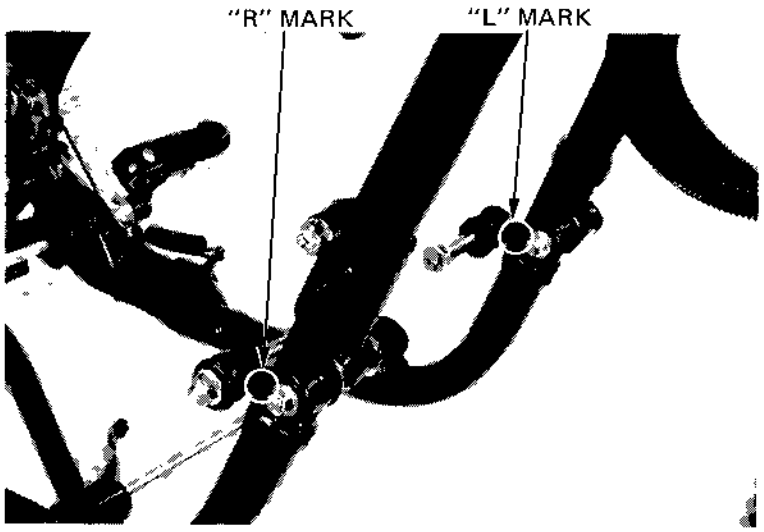
Position the lower front and rear engine mount outer damper plates as noted during removal. They must be positioned correctly for low vibration levels.

TORQUE:

Engine hanger bolts:	
10 mm bolt (1):	**35–45 N·m (3.5–4.5 kg-m, 25–33 ft-lb)**
10 mm bolt (2):	**40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)**
8 mm bolt:	**24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)**
Swingarm pivot:	**60–70 N·m (6.0–7.0 kg-m, 43–51 ft-lb)**
Master cylinder bolt:	**30–40 N·m (3.0–4.0 kg-m, 22–25 ft-lb)**
Lower right frame tube pinch bolt:	**40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)**
Lower right frame mount bolts:	**24–30 N·m (2.4–3.0 kg-m, 17–22 ft-lb)**

Note the "R" and "L" mark on the front engine mounting brackets.

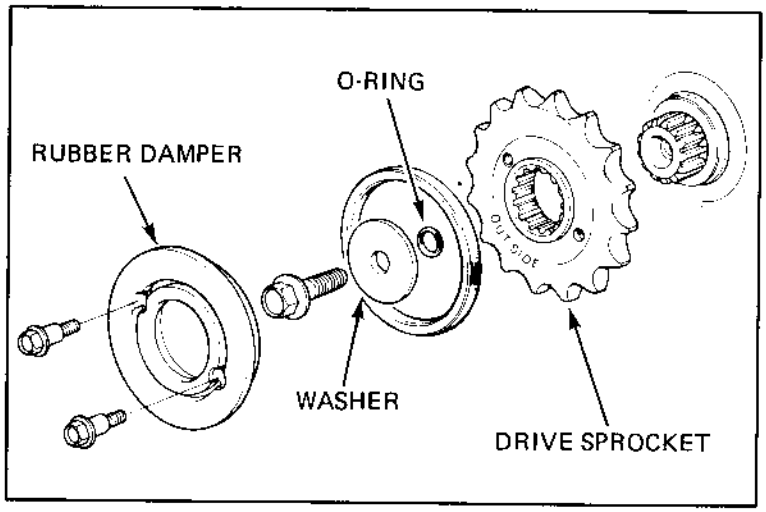




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Check the drive sprocket O-ring and rubber damper for damage and replace if necessary.

Then install the drive sprocket as shown.



Assemble the exhaust system keeping 120 mm (4-3/4 in) between the right and left oil pan mounting holes.

Install the exhaust system loosely.

Tighten the following in the order listed:

– exhaust to cylinder head flange nuts.

TORQUE: 30–50 N·m (3.0–3.5 kg-m, 22–25 ft-lb)

– exhaust pipe-to-oil pan mounting bolts.

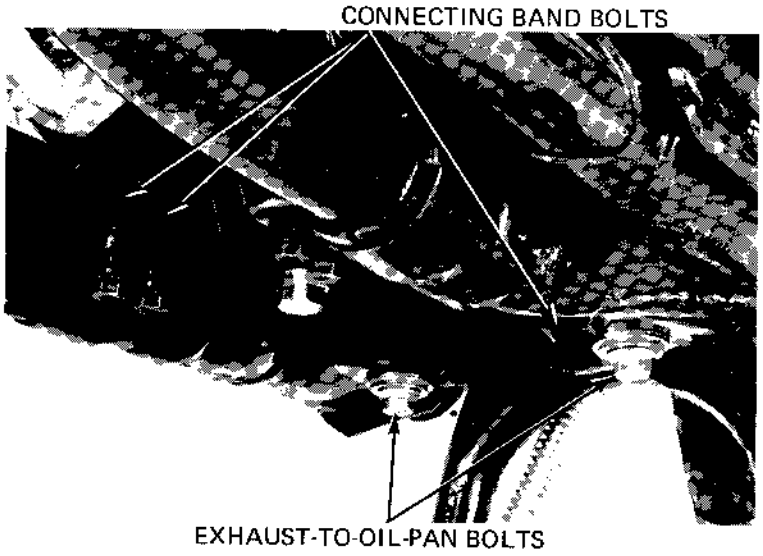
TORQUE: 50–52 N·m 5.0–5.2 kg-m, 36–37 ft-lb)

– rear muffler mounting bolts.

TORQUE: 35–45 N·m (3.5–4.5 kg-m, 25–38 ft-lb)

– No. 2 and No. 3 exhaust pipe connecting band bolts.

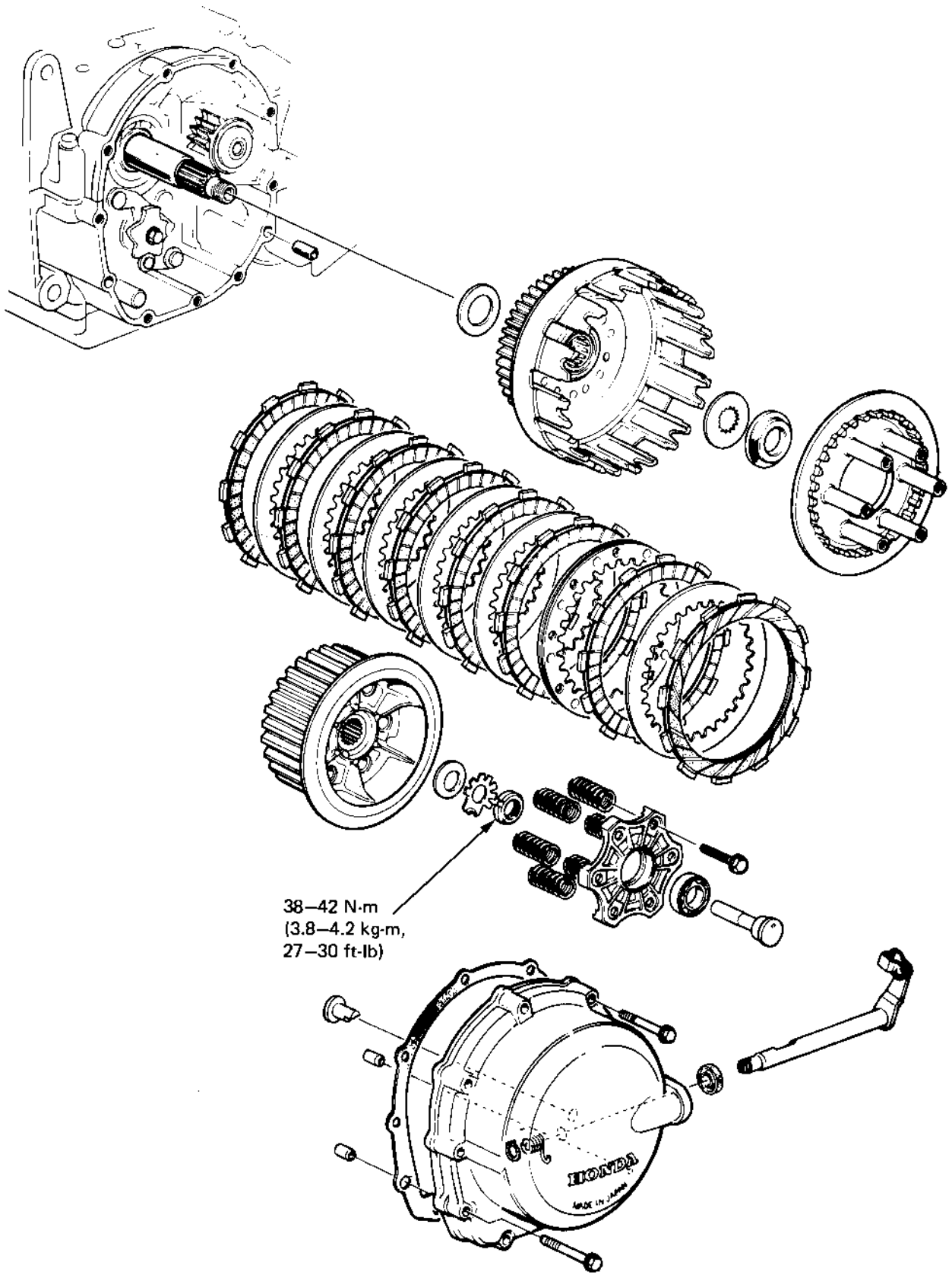
TORQUE: 20–24 N·m (2.0–2.4 kg-m, 14–17 ft-lb)



Route all wires and cables properly (page 1-8).
Fill the crankcase to the proper level with the recommended oil (page 2-2).
Perform the following inspections and adjustments:

– Throttle operation (page 3-5).
– Clutch (page 3-20).
– Drive chain (page 3-15).

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6. CLUTCH SYSTEM

SERVICE INFORMATION	6–1	CLUTCH INSTALLATION	6–7
TROUBLESHOOTING	6–2	CLUTCH COVER INSTALLATION	6–10
CLUTCH COVER REMOVAL	6–3	STARTER CLUTCH DISASSEMBLY	6–11
CLUTCH REMOVAL	6–3	STARTER CLUTCH ASSEMBLY	6–13

SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the clutch and starter clutch.
- Clutch maintenance can be done with the engine in the frame.

SPECIFICATIONS

			STANDARD	SERVICE LIMIT
Clutch	Lever free play (at lever end)		10–20 mm (3/8–3/4 in)	———
	Spring free length		41.2 mm (1.62 in)	39.6 mm (1.56 in)
	Spring preload/length		20.7–22.5 kg/27.4 mm (46.00–50.00 lbs/1.08 in)	20 kg/27.4 mm (44.44 lbs/1.08 in)
	Disc thickness	A	3.72–3.88 mm (0.146–0.153 in)	3.4 mm (0.13 in)
		B	3.72–3.88 mm (0.146–0.153 in)	3.4 mm (0.13 in)
	Plate warpage		———	0.30 mm (0.012 in)
Starter clutch	Driver gear O.D.		42.275–42.300 mm (1.6644–1.6654 in)	42.255 mm (1.6636 in)
Ignition timing	Refer to Section 3.			

TORQUE VALUES

Clutch lock nut	38– 42 N·m (3.8– 4.2 kg-m, 27–30 fr-lb)
Primary drive gear lock bolt	80–100 N·m (8.0–10.0 kg-m, 60–72 ft-lb)
Starter clutch locking bolt	26– 30 N·m (2.6– 3.0 kg-m, 19–22 ft-lb)
Spartk advancer bolt	33– 37 N·m (3.3– 3.7 kg-m, 24–27 ft-lb)

TOOLS

Special

Primary gear holder	07924–4250000 or Commercially available holder in U.S.A.
Clutch center holder	07923–3710000 or 07923–4610000
Hex bit, 10 mm	07917–3710000 or Commercially available in U.S.A.

Common

Lock nut wrench, 20 x 24 mm	07716–0020100 or 07916–3710000
Handle	07716–0020500 or Commercially available in U.S.A.

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TROUBLESHOOTING

Clutch

Faulty clutch operation can usually be corrected by adjusting the free play.

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

Clutch will not disengage
1. Too much free play
2. Plates warped

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

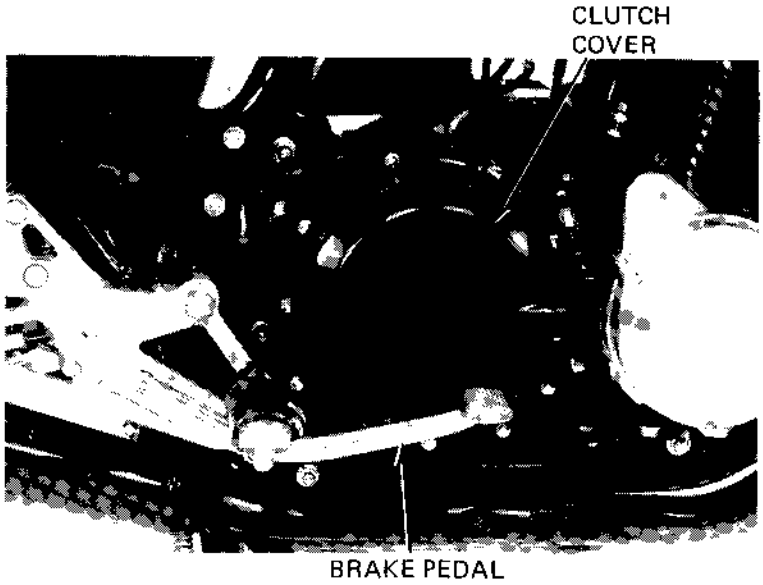
Excessive lever pressure
1. Clutch cable kinked, damaged or dirty
2. Lifter mechanism damaged

Clutch operation feels rough
1. Outer drum slots rough

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CLUTCH COVER REMOVAL

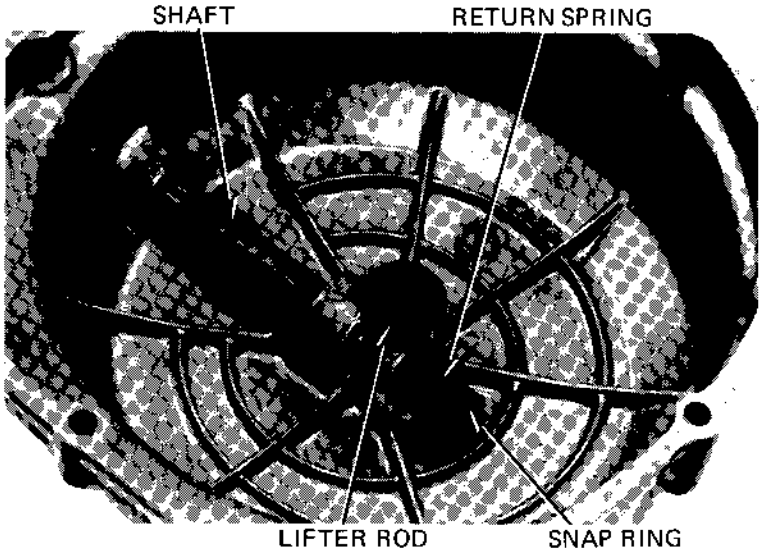
Drain the engine oil thoroughly.
Disconnect the clutch cable at the lower adjuster.
Remove the rear brake pedal.
Remove the clutch cover, gasket and dowel pins.



CLUTCH LIFTER REMOVAL

Remove the clutch lifter rod.

Remove the snap ring, return spring and clutch lifter shaft.



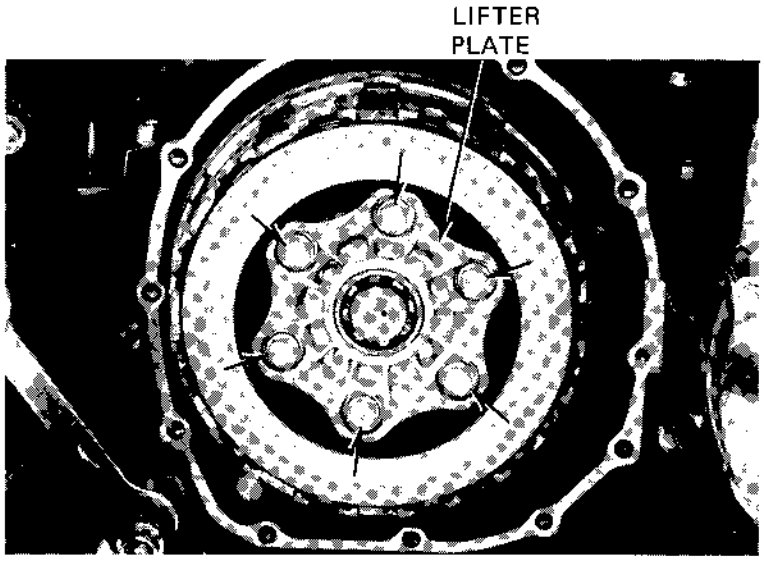
CLUTCH REMOVAL

Remove the bolts and lifter plate with the clutch lifter guide and release bearing.

NOTE

> Loosen the bolts in a crisscross pattern in 2-3 steps.

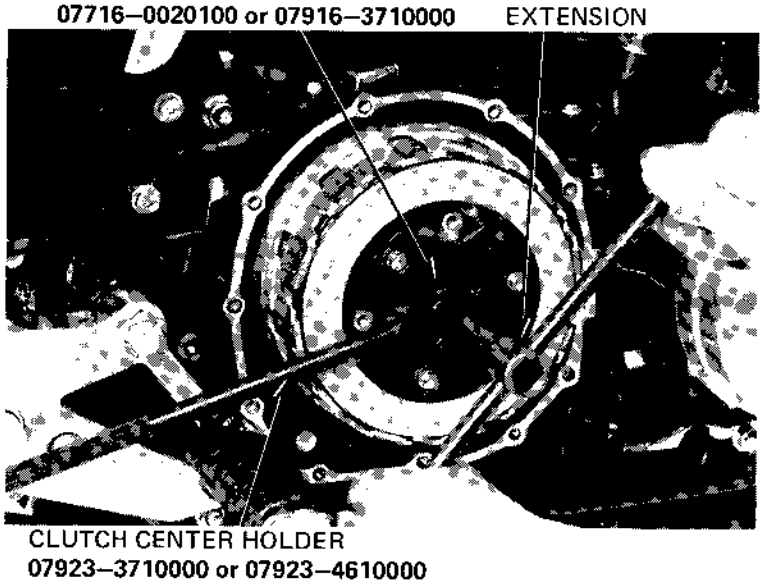
Remove the clutch springs.



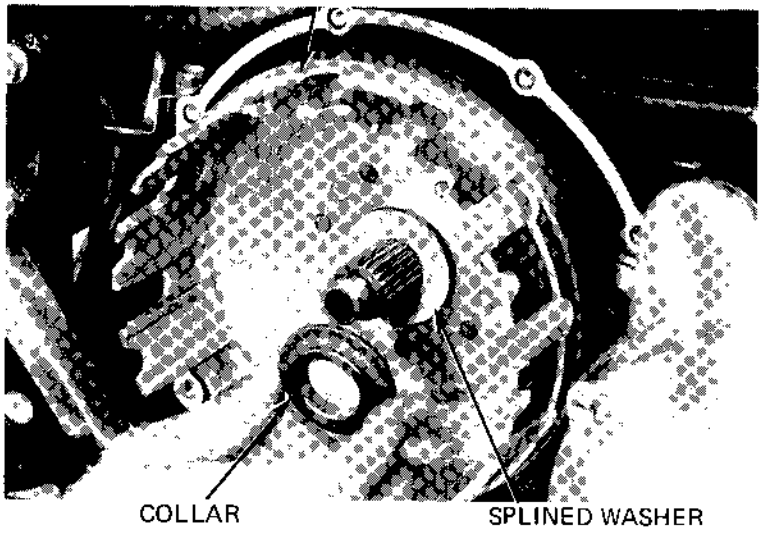
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Straighten the lock washer tab.

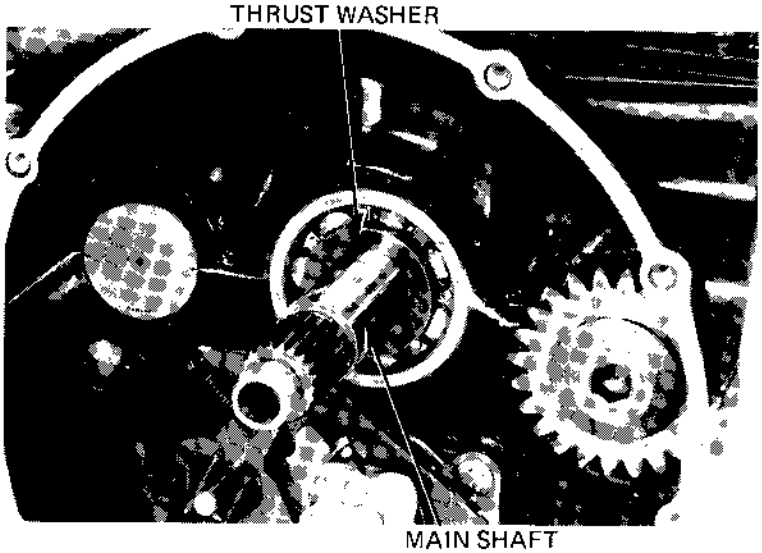
Installa the clutch holder on the clutch center with three, 6 mm bolts.
Remove the lock nut, lock washer and washer.
Remove the pressure plate, discs, plates and clutch center as a unit.



Remove the collar, splined washer and clutch outer.



Remove the thrust washer from the mainshaft.

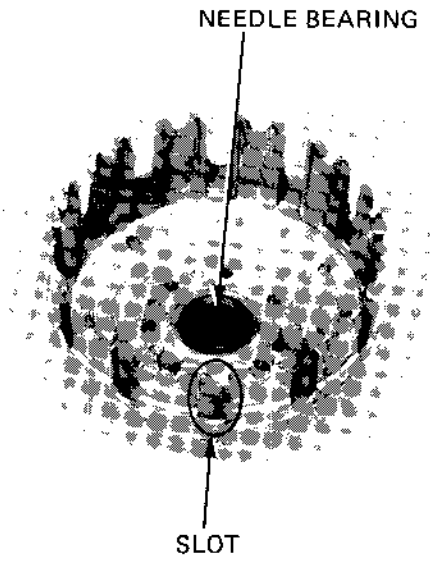


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CLUTCH OUTER INSPECTION

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

Check the needle bearing for excessive play or damage.

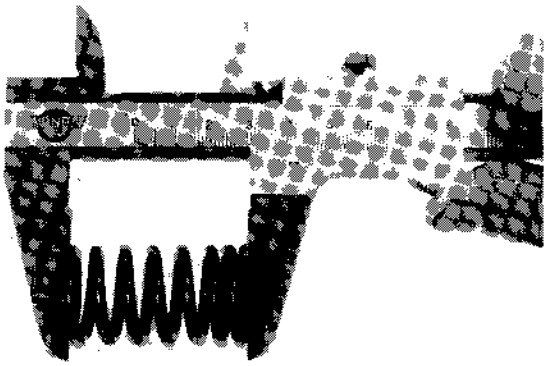


CLUTCH SPRING INSPECTION

Measure the clutch spring free length.

SERVICE LIMIT: 39.6 mm (1.56 in)

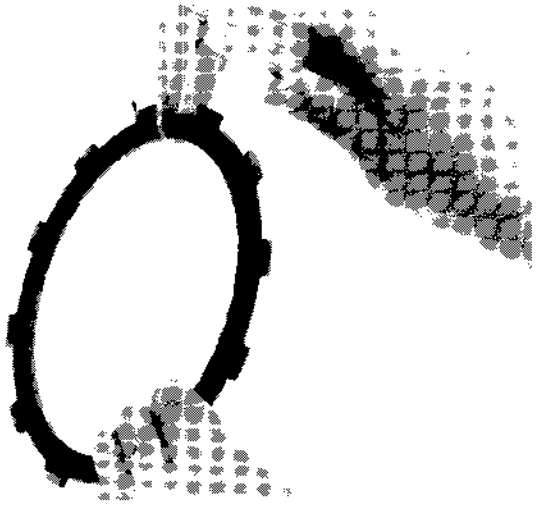
Replace the spring if it is shorter than the service limit.



CLUTCH DISC INSPECTION

Replace the clutch discs if they show signs of scoring or discoloration.
Measure disc thickness and replace any that are thinner than the service limit.

SERVICE LIMIT: 3.4 mm (0.13 in)

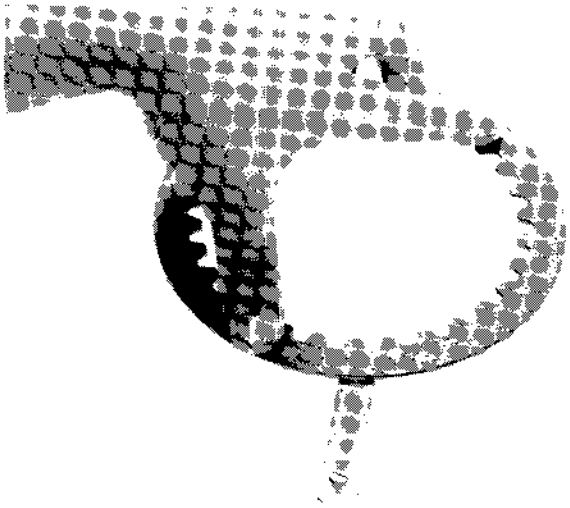


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PLATE INSPECTION

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

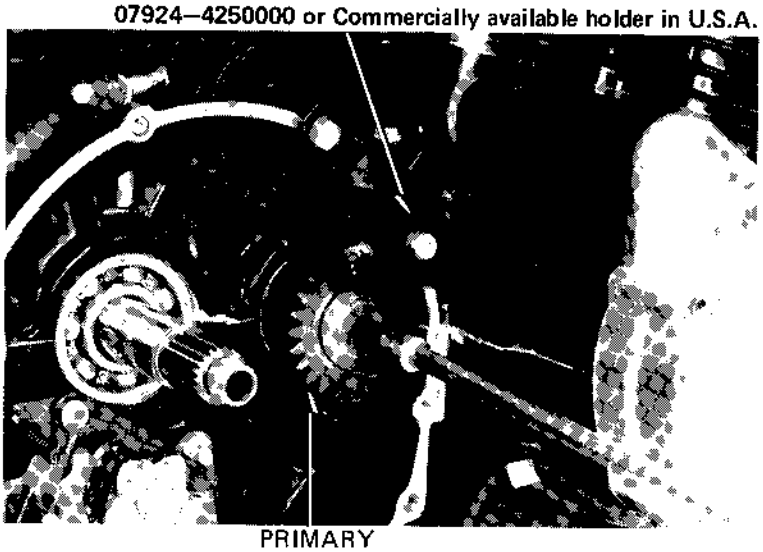
SERVICE LIMIT: 0.30 mm (0.012 in)



PRIMARY DRIVE GEAR REMOVAL

Hold the primary drive gear with the primary gear holder as shown and loosen the lock bolt.

PRIMARY GEAR HOLDER
07924—4250000 or Commercially available holder in U.S.A.

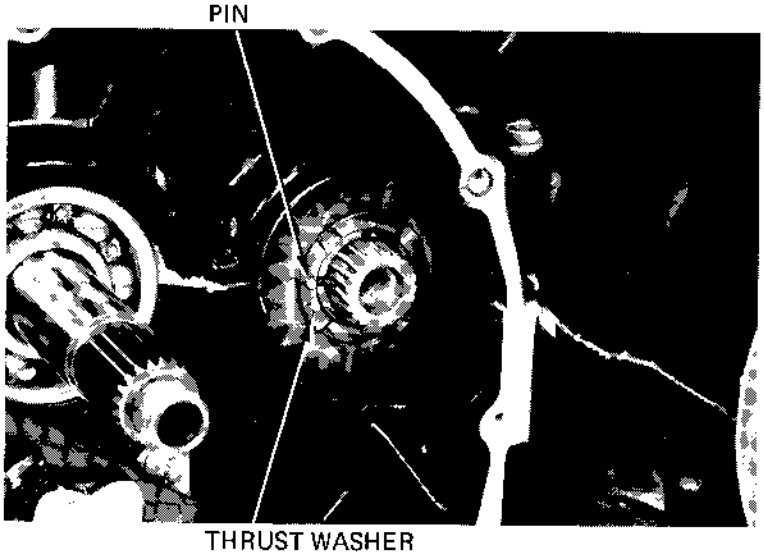


Remove the primary drive gear.

PRIMARY DRIVE GEAR

Remove the pin and thrust washer.

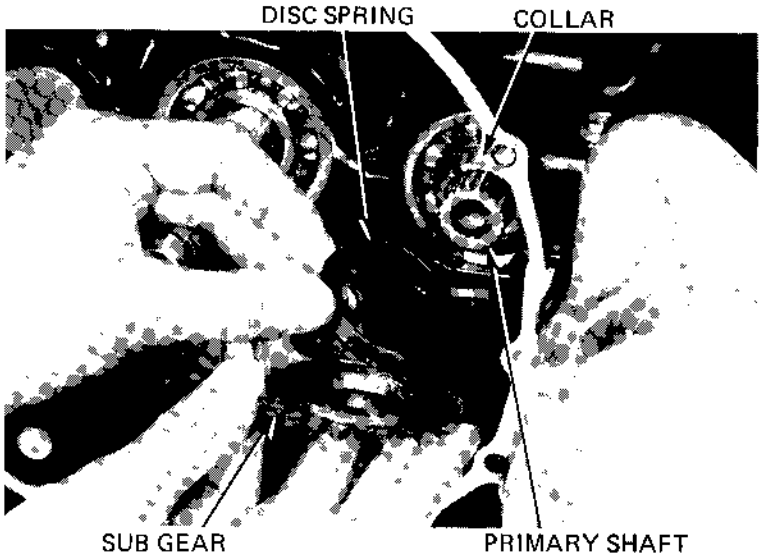
PIN



THRUST WASHER

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Remove the sub gear, disc spring and collar from the primary shaft.



CLUTCH INSTALLATION

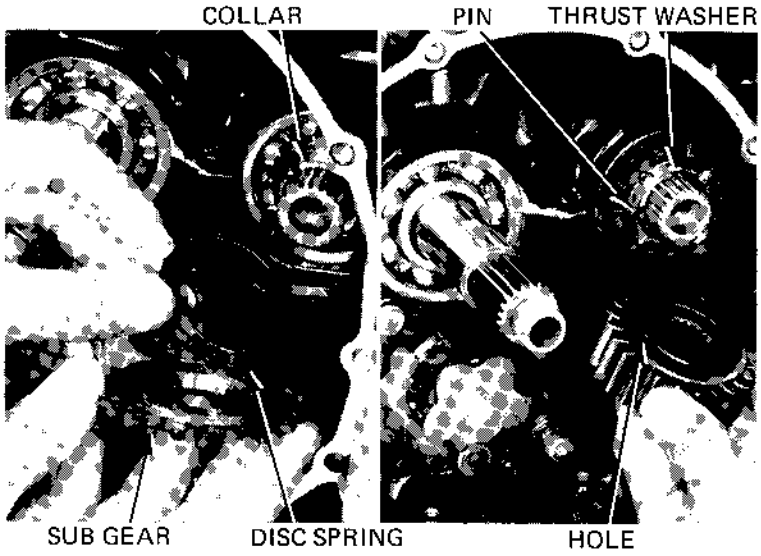
Install the collar, disc spring and sub gear over the primary shaft.

NOTE

Install the disc spring with the dished side facing out.

Install the thrust washer and pin.

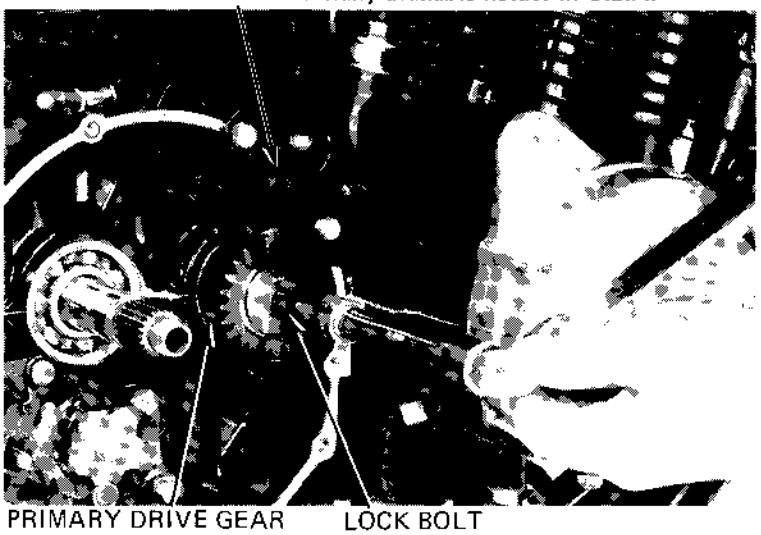
Aligh the hole in the primary gear with the pin on the thrust washer and install the primary gear.



PRIMARY GEAR HOLDER
07924–4250000 or Commercially available holder in U.S.A.

Tighten the lock bolt.

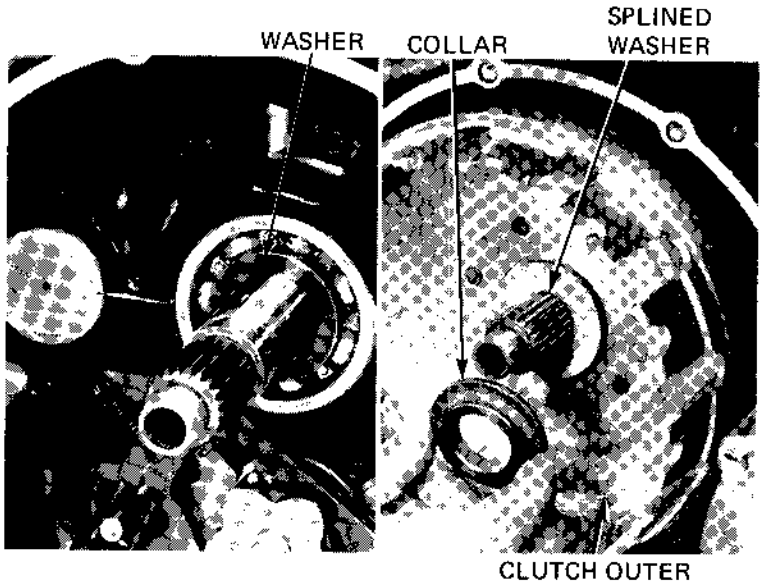
TORQUE: 80–100 N·m
(8.0–10.0 kg-m, 60–72 ft-lb)



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Install the washer and clutch outer.

Install the splined washer and collar.

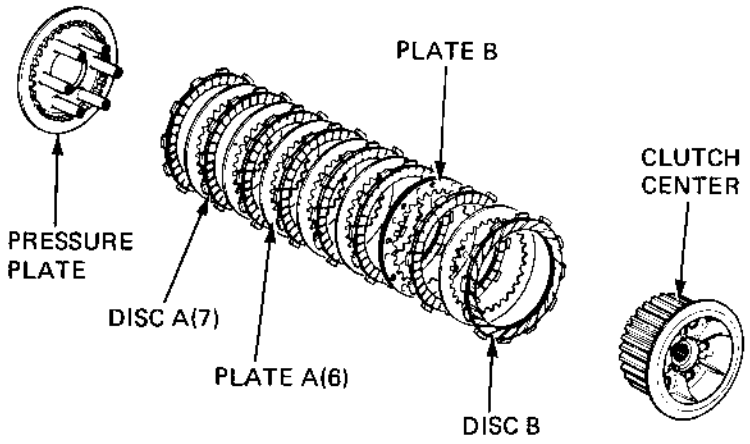


Assemble clutch discs A and B, plate A and B, clutch pressure plate, and clutch center.

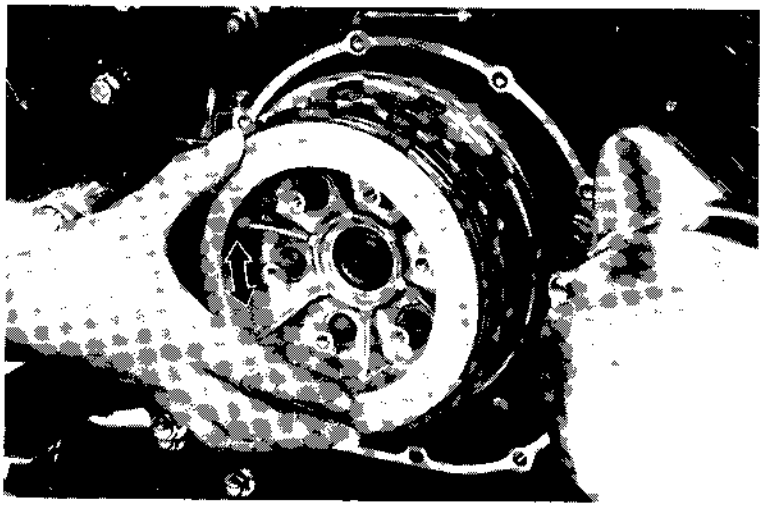
NOTE

- Before installing the clutch, coat the discs and plates with engine oil.
- Install disc B with the grooves facing in the direction shown.



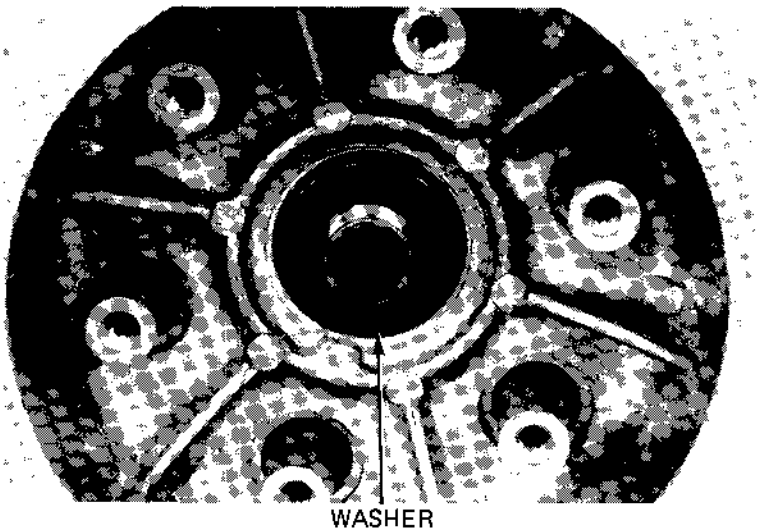


Install the above assembly, by rotating the clutch center.



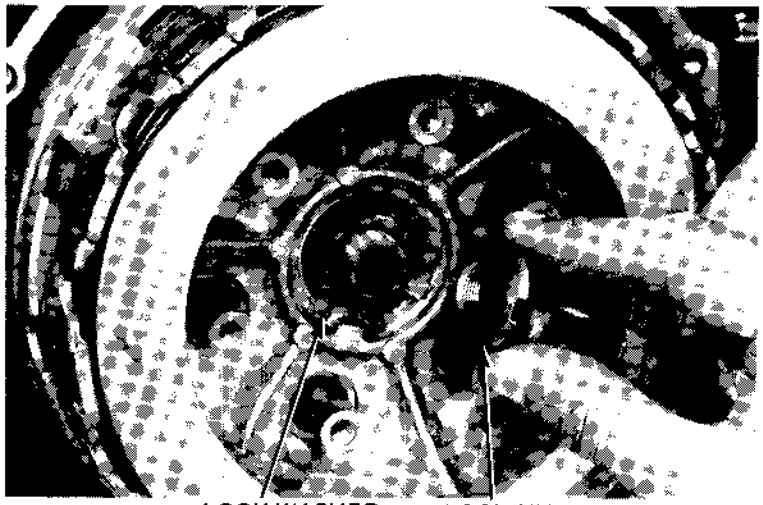
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Install the washer with the "OUTSIDE" mark facing out.



WASHER

Position the lock washer as shown.
Install the lock nut with the chamfer facing in.



LOCK WASHER LOCK NUT

CLUTCH CENTER HOLDER
07923–3710000 or 07923–4610000

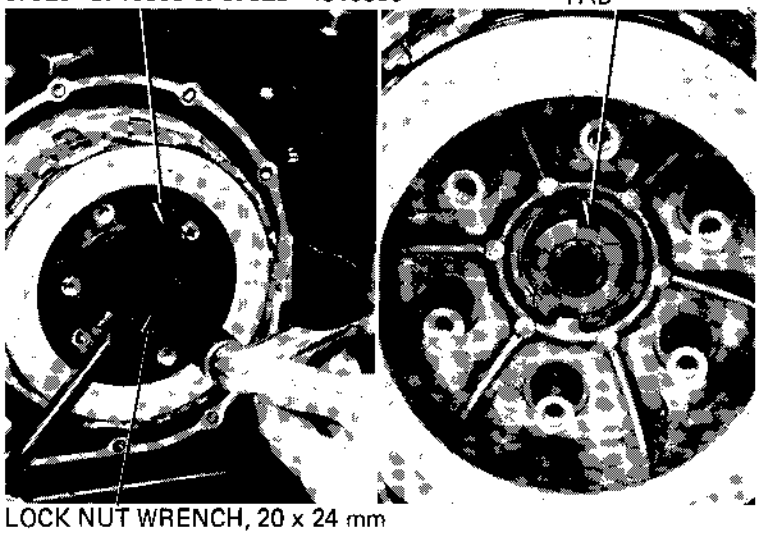
LOCK WASHER TAB

Install the clutch holder on the clutch center with three 6 mm bolts.

Tighten the lock nut.

TORQUE: 38–42 N·m
(3.8–4.2 kg-m, 27–30 ft-lb)

Bend the lock washer tab as shown.

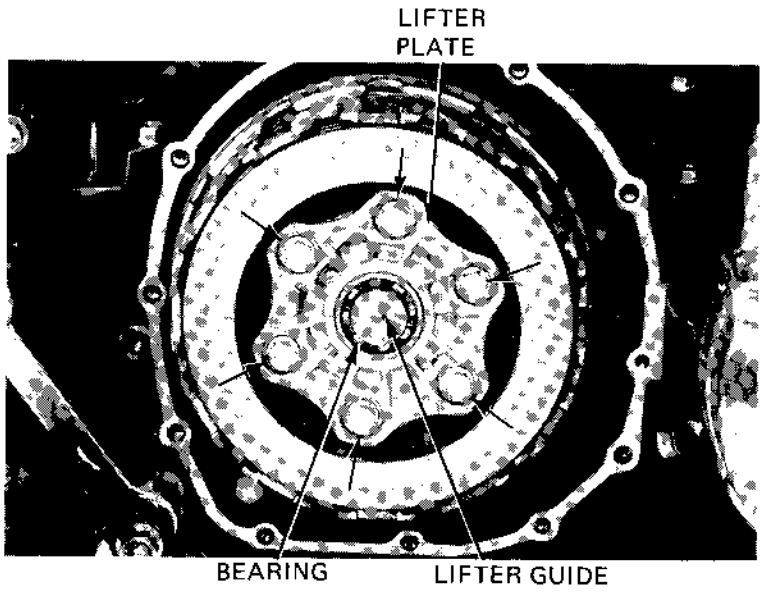


LOCK NUT WRENCH, 20 x 24 mm
07716–0020100 or 07916–3710000

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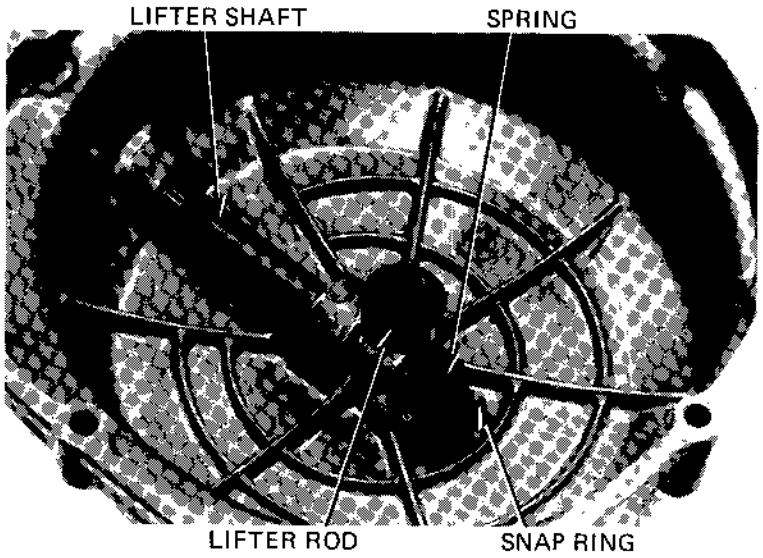
Install the clutch springs, lifter plate, bearing and lifter guide.

Tighten the bolts.



CLUTCH COVER INSTALLATION

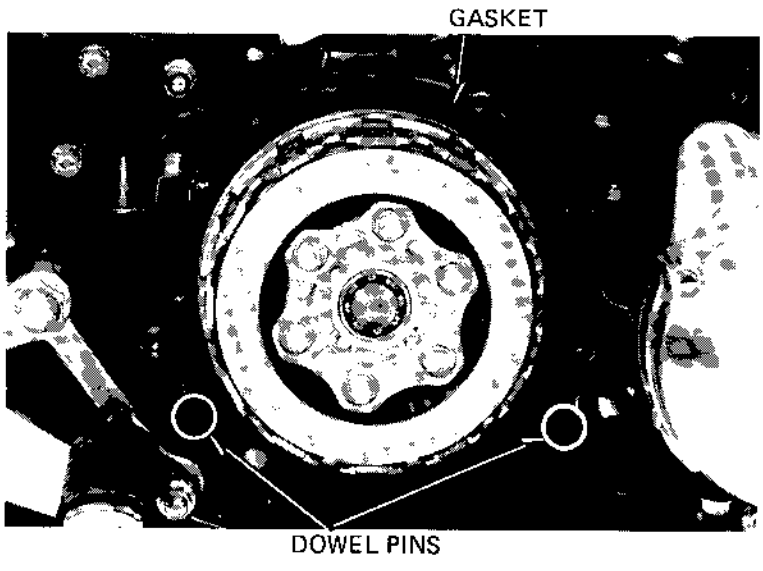
Install the clutch lifter shaft, spring and snap ring.
Install the clutch lifter rod.



Install the dowel pins and gasket, and then install the cover.

Install the brake pedal.
Fill the crankcase with the recommended oil (page 2-1).

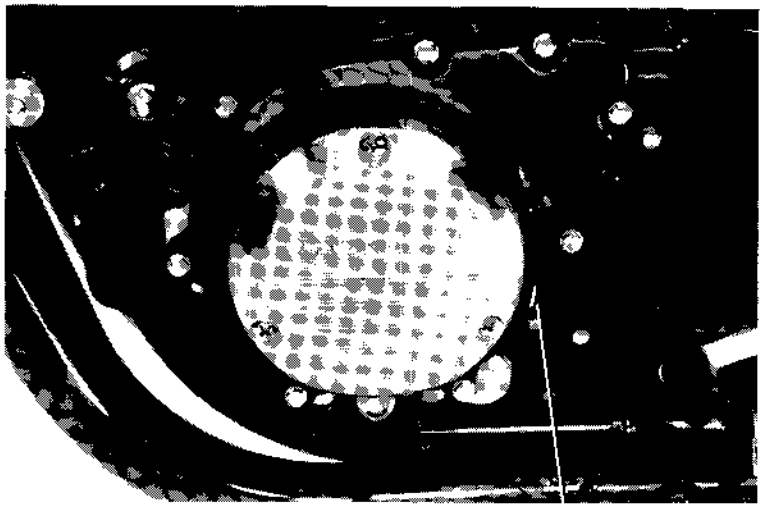
Adjust the clutch (page 3-20).



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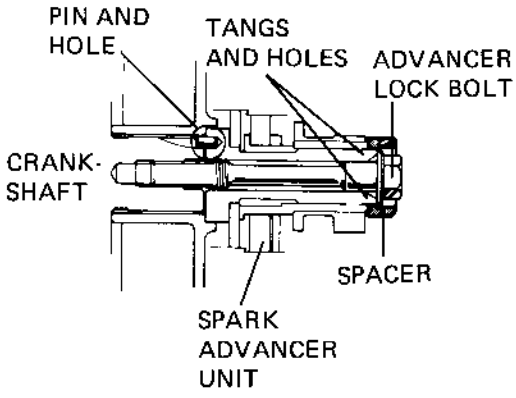
STARTER CLUTCH DISASSEMBLY

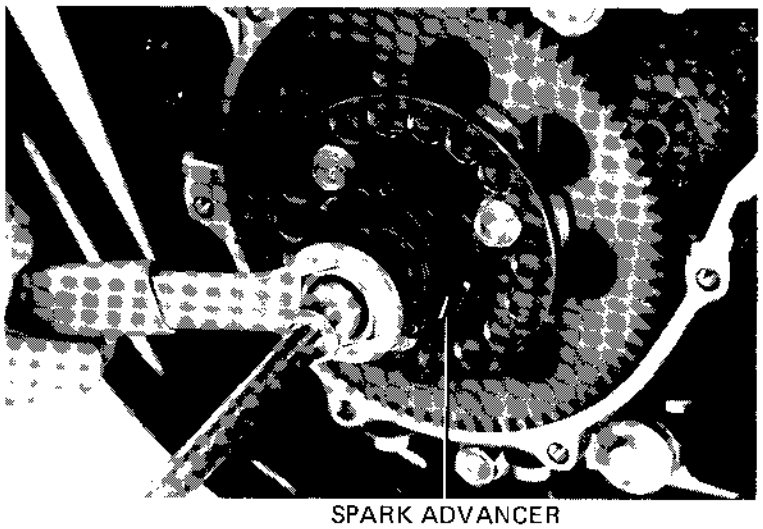
Remove the left crankcase cover with the pulse generator assembly.



LEFT CRANKCASE COVER

Remove the spark advancer unit.

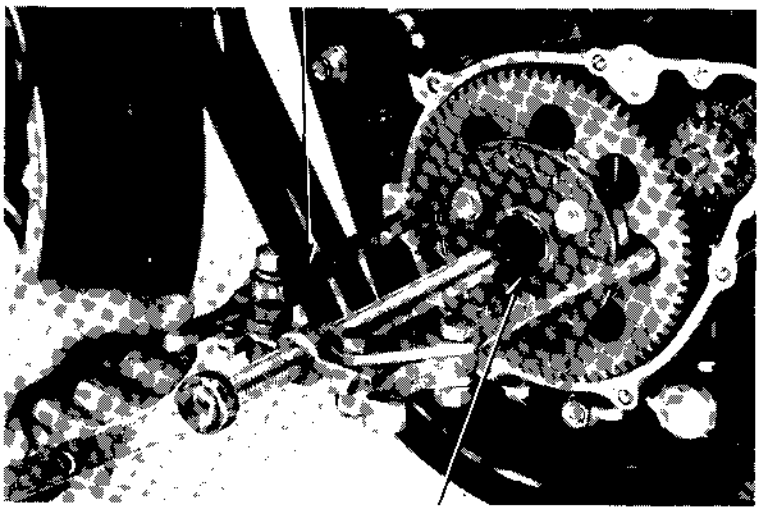




SPARK ADVANCER

BEARING PULLER

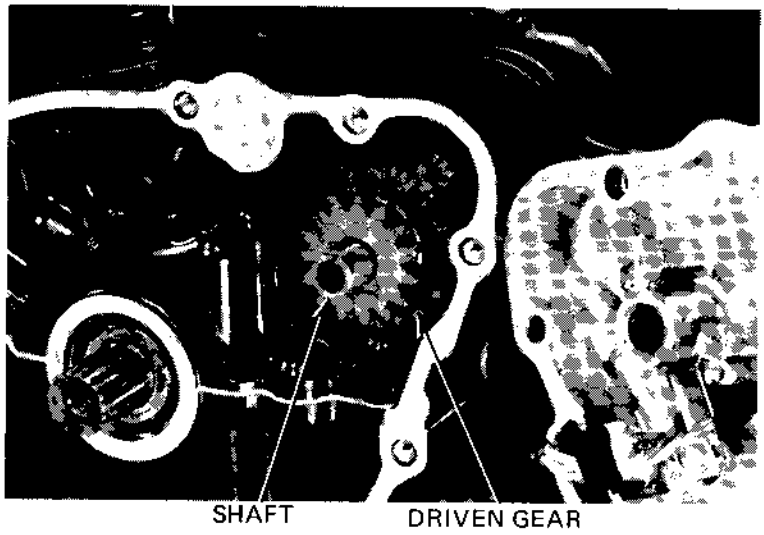
Use a bearing puller to remove the starter clutch assembly.



STARTER CLUTCH

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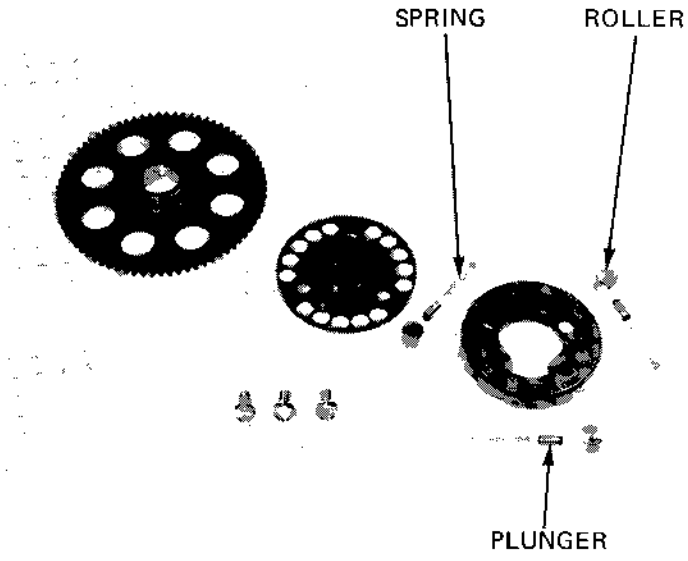
Remove the starter driven gear and shaft.



Inspect the rollers for smooth operation.

Remove the rollers and check for excessive wear.

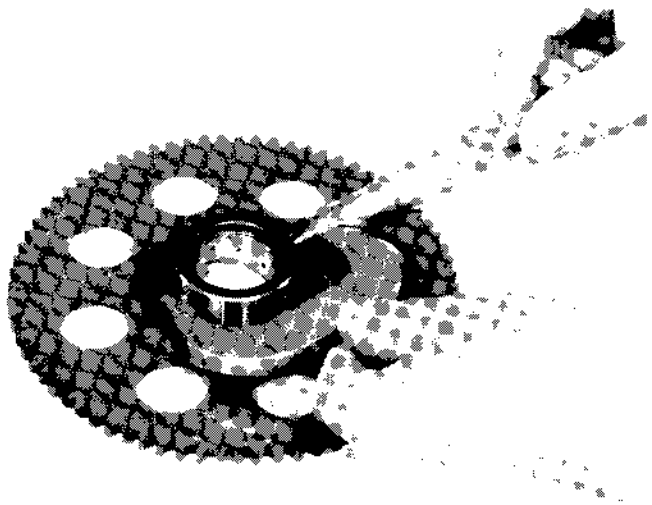
Clean all parts with non-flammable or high flash point solvent.



STARTER DRIVER GEAR INSPECTION

Inspect the drive gear for damage or excessive wear. Measure the O.D., replace the gear if the O.D. is smaller than the service limit.

SERVICE LIMIT: 42.255 mm (1.6636 in)



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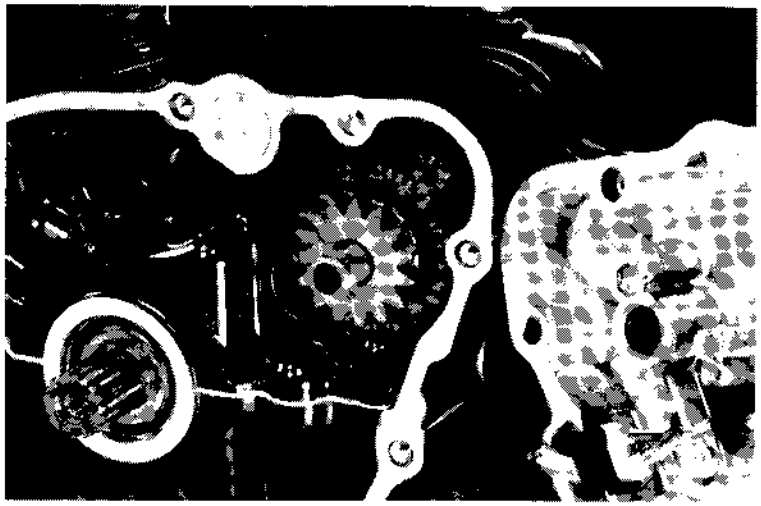
STARTER CLUTCH ASSEMBLY

Install the springs, plungers and rollers.
Tighten the locking bolts to the specified torque.

TORQUE: 26–30 N·m
(2.6–3.0 kg-m, 19–22 ft-lb)

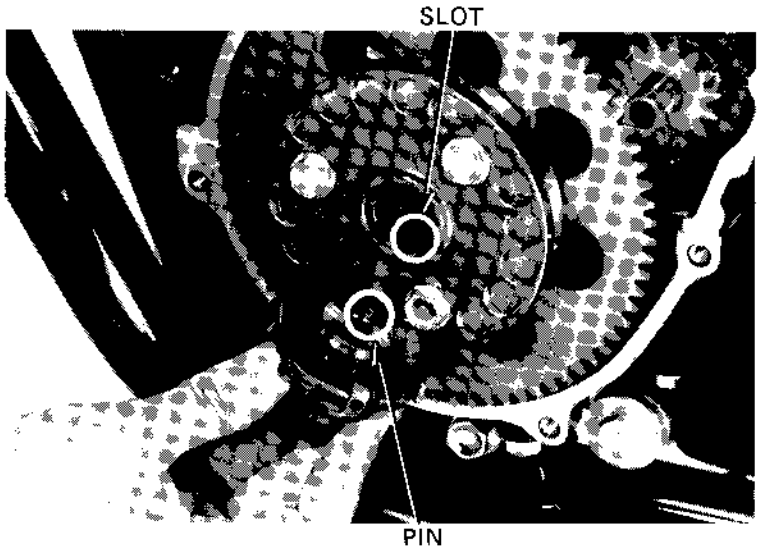
NOTE

Apply a locking agent to the locking bolt threads.



Install the advancer assembly.

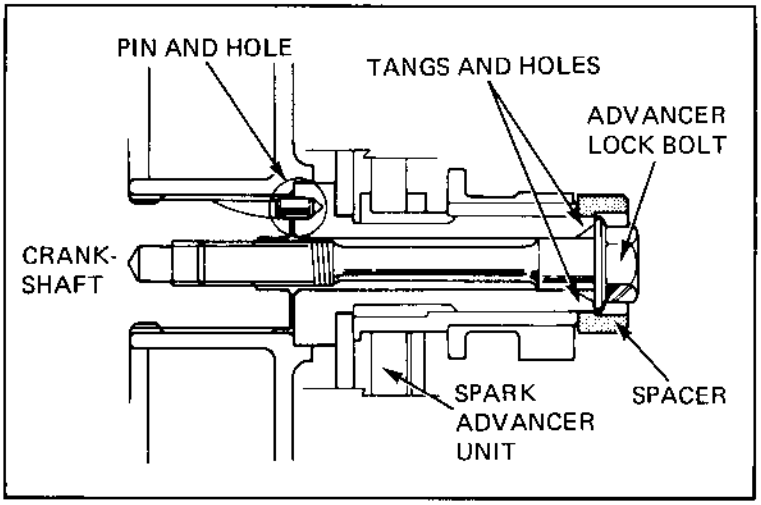
Align the pin on the spark advancer unit with the slot on the crankshaft.



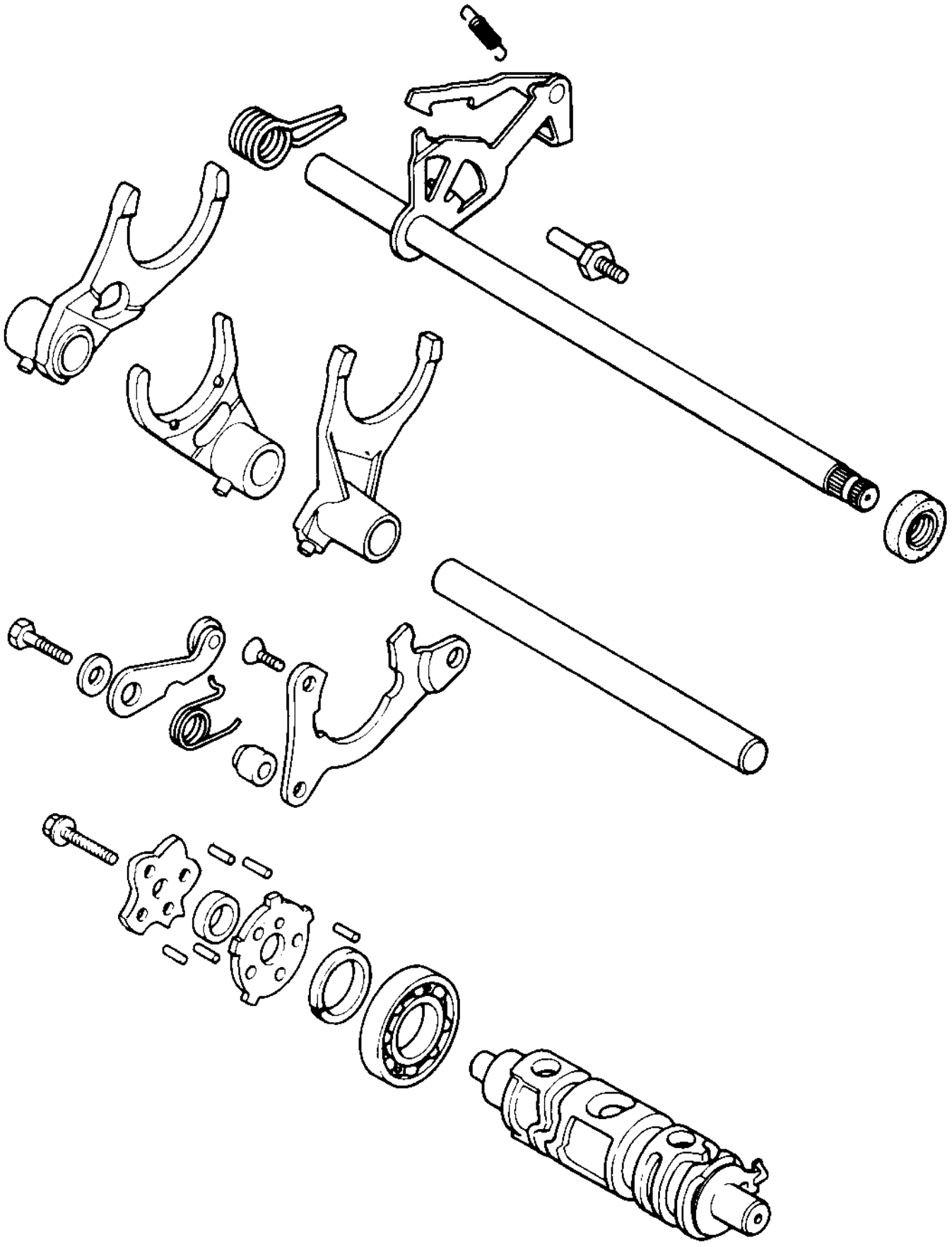
Install the spacer aligning the tangs with the holes, and tighten the advancer lock bolt to the specified torque.

TORQUE: 33–37 N·m
(3.3–3.7 kg-m, 24–27 ft-lb)

Install the left crankcase cover.



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7. GEARSHIFT LINKAGE

SERVICE INFORMATION	7–1
TROUBLESHOOTING	7–1
GEARSHIFT LINKAGE REMOVAL	7–2
GEARSHIFT LINKAGE INSTALLATION	7–3

SERVICE INFORMATION

GENERAL

- The gearshift spindle and stopper arms can be serviced with the engine in the frame.
- If the shift forks, drum or transmission require servicing, remove the engine and separate the crankcase.

TROQUE VALUE

Neutral switch	16–20 N·m (1.6–2.0 kg-m, 12–14 ft-lb)

TROUBLESHOOTING

Hard to shift

1. Improper clutch adjustment; too much free play
2. Shift forks bent
3. Shift shaft bent
4. Shift claw bent
5. Shift drum cam grooves damaged

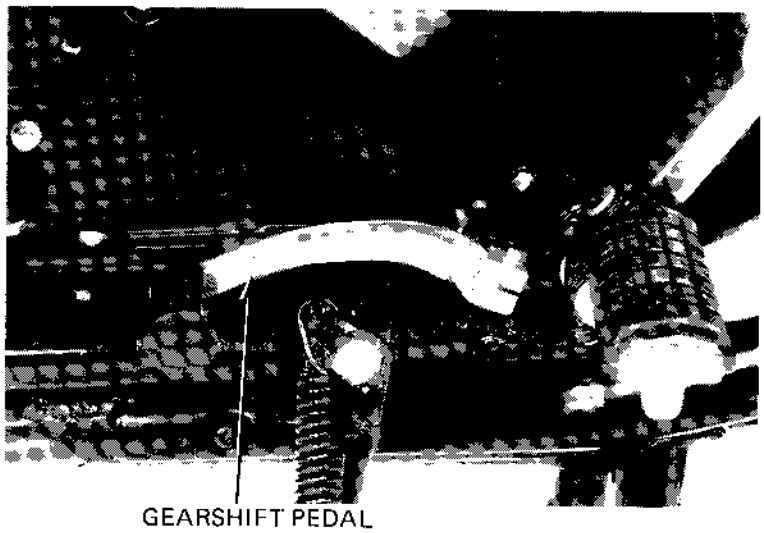
Transmission jumps out of gear

1. Gear dogs worn
2. Shift shaft bent
3. Shift drum stopper broken
4. Shift forks bent

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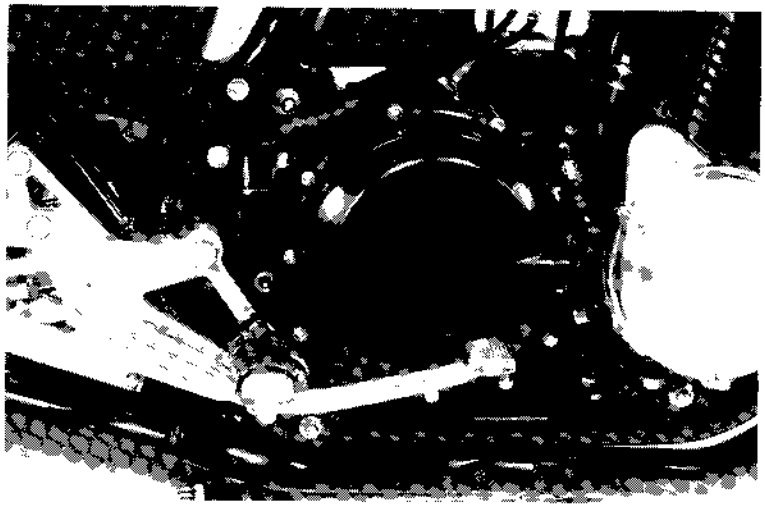
GEARSHIFT LINKAGE REMOVAL

Drain the engine oil.
Remove the gearshift pedal.

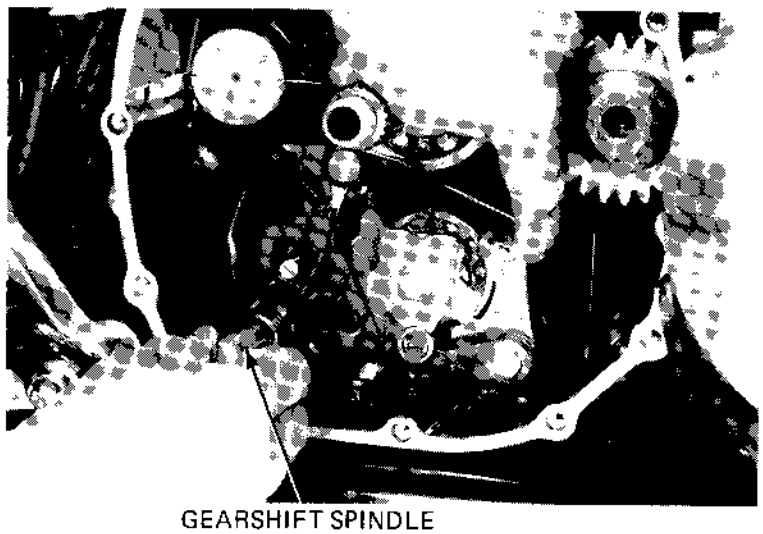


GEARSHIFT PEDAL

Remove the clutch cover and clutch assembly. (page 6-3).



Pull the gearshift spindle assembly out of the crankcase.

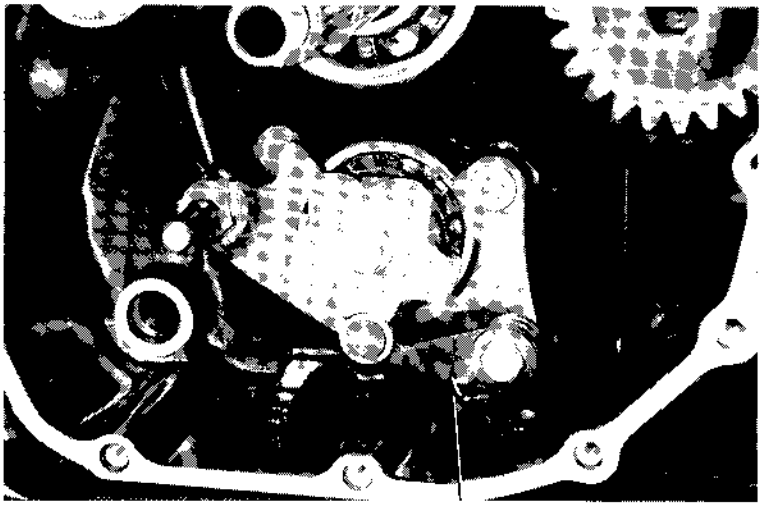


GEARSHIFT SPINDLE

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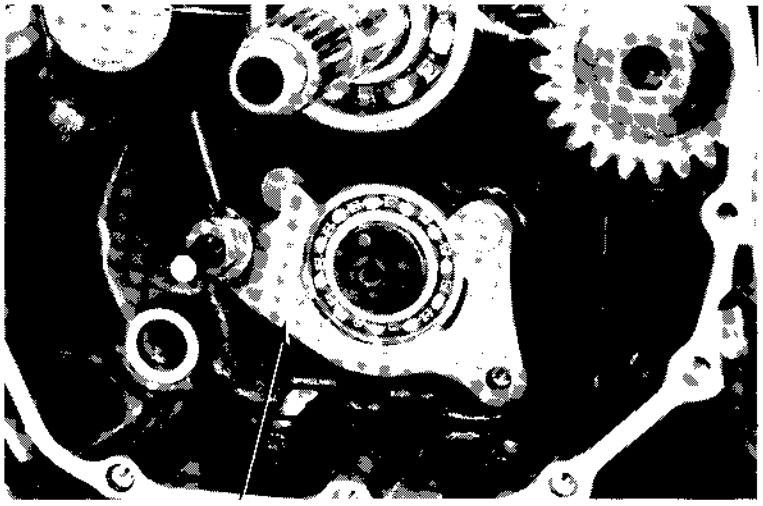
Remove the drum stopper arm bolt, arm and spring.

Remove the roller stopper plate bolt and plate.



DRUM STOPPER ARM

If bearing removal is necessary, remove the bearing stopper plate.



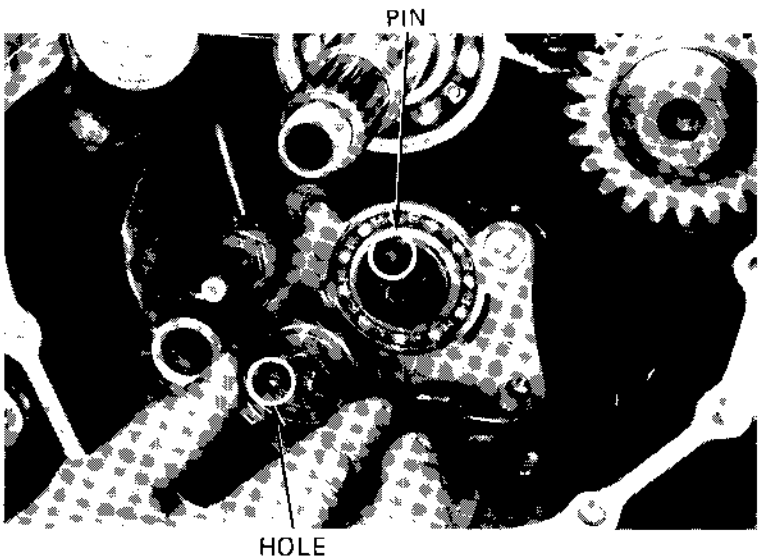
STOPPER PLATE

GEARSHIFT LINKAGE INSTALLATION

Align the hole in the roller stopper base plate with the pin on the shift drum.

NOTE

> If bearing replacement is necessary, apply a locking agent to the stopper plate screw threads.

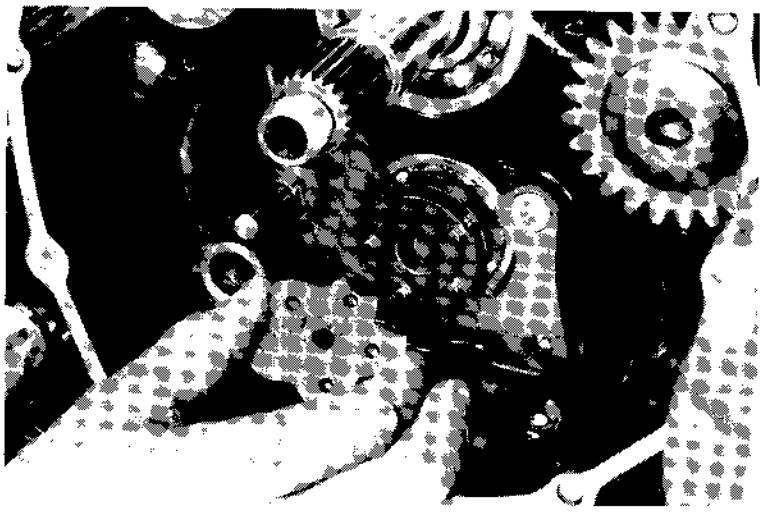


PIN

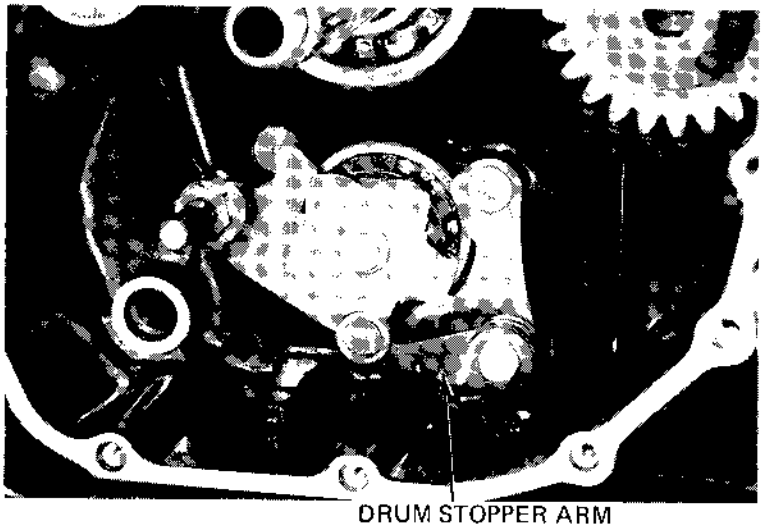
HOLE

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Install the roller stopper pins, plate and bolt.
Tighten the bolt securely.



Install the drum stopper arm, bolt and return spring.
Tighten the bolt securely.

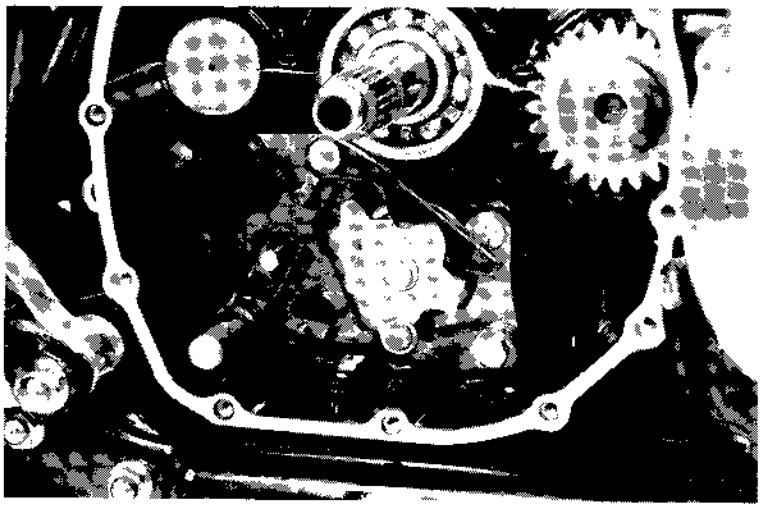


DRUM STOPPER ARM

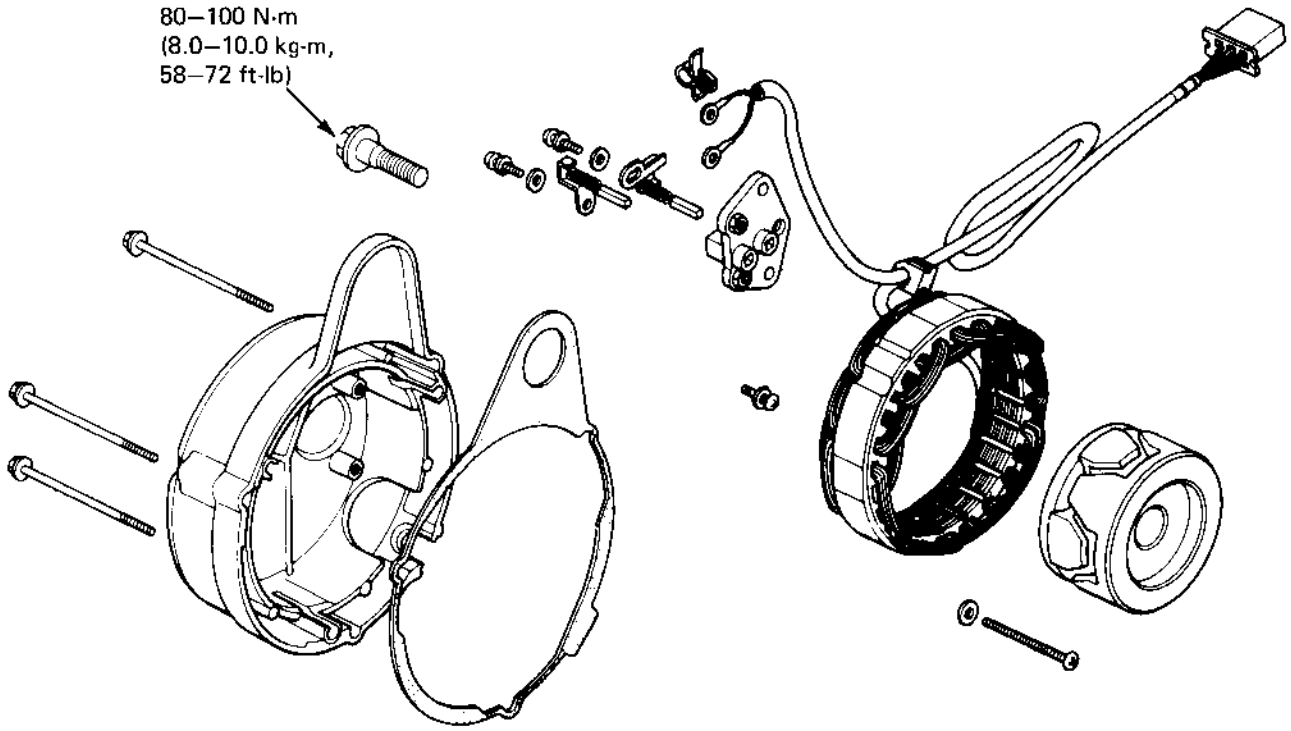
Assemble the gear shift spindle and return spring.
Install as shown.
Rotate the gearshift spindle and check the linkage for smooth operation.

Install the clutch assembly and cover (Section 6).

Install the gearshift pedal.



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8. ALTERNATOR

SERVICE INFORMATION	8–1
REMOVAL	8–2
INSTALLATION	8–4

SERVICE INFORMATION

GENERAL

- This section covers removal and installation of the alternator.
- Refer to Section 17 for troubleshooting and inspection of the alternator.

TORQUE VALUE

Alternator rotor/Flywheel bolt	80–100 N·m (8.0–10.0 kg-m, 58–72 ft-lb)

TOOLS

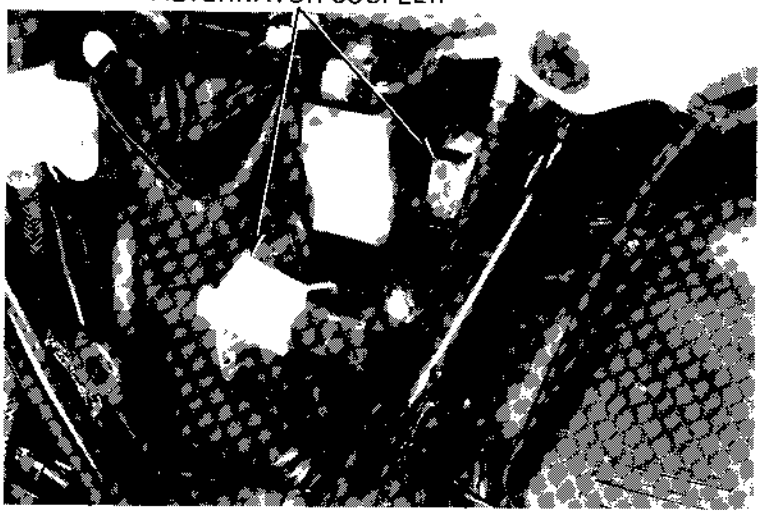
Special

Rotor puller	07933–4250000

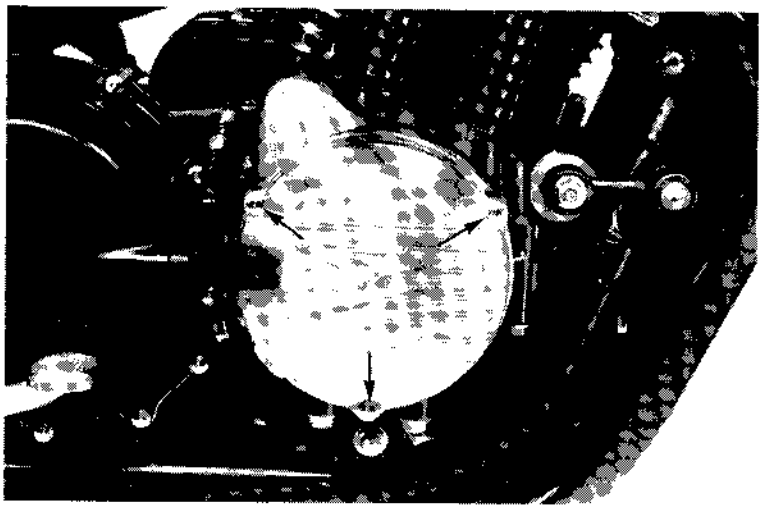
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REMOVAL

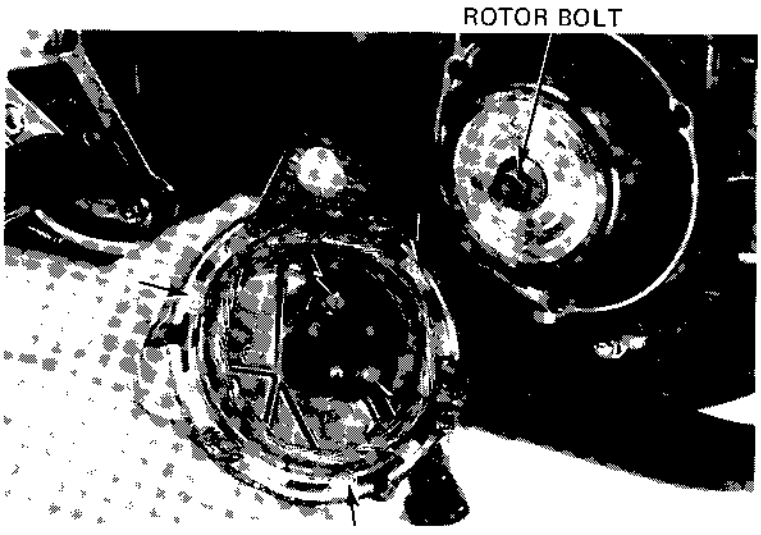
Remove the right side cover and disconnect the alternator coupler.



Remove the alternator cover by loosening the three bolts.

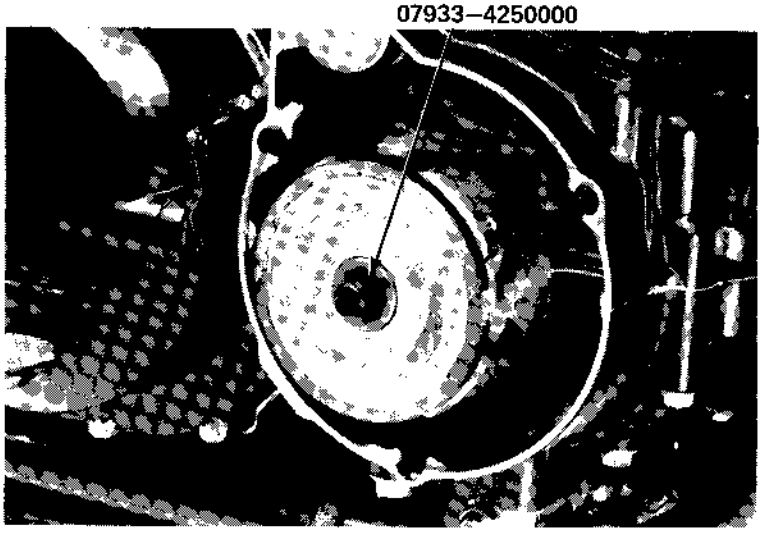


Remove the stator with the brush holder by loosening the screws and bolts.
Shift the transmission into high gear and apply the rear brake.
Remove the rotor bolt.



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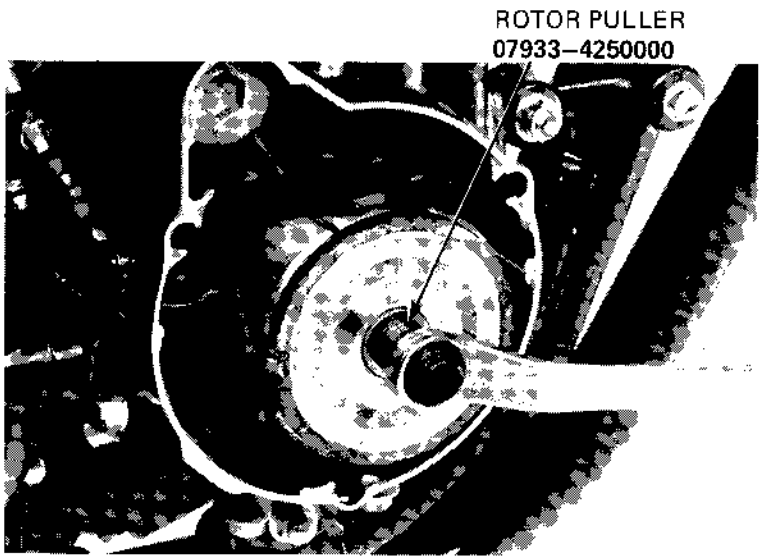
Screw the rotor puller inner bolt into the crankshaft.



Screw the rotor puller into the threads of the rotor. Tighten the rotor while applying the rear brake; Tap on the end of the puller with a brass hammer and then tighten the puller. Repeat tapping and tightening until rotor is removed.

NOTE

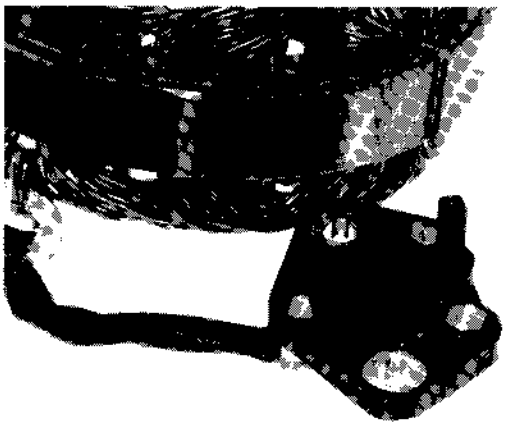
Hold the rotor when tapping the puller to keep the rotor from falling off.



INSPECTION

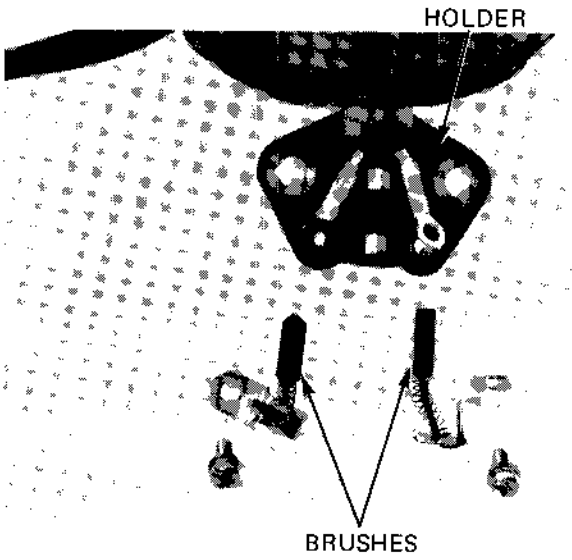
Inspect the length of each brush as shown. If it shows wear to the scribed service limit line, replace the brush.

SERVICE LIMIT: Scribed line



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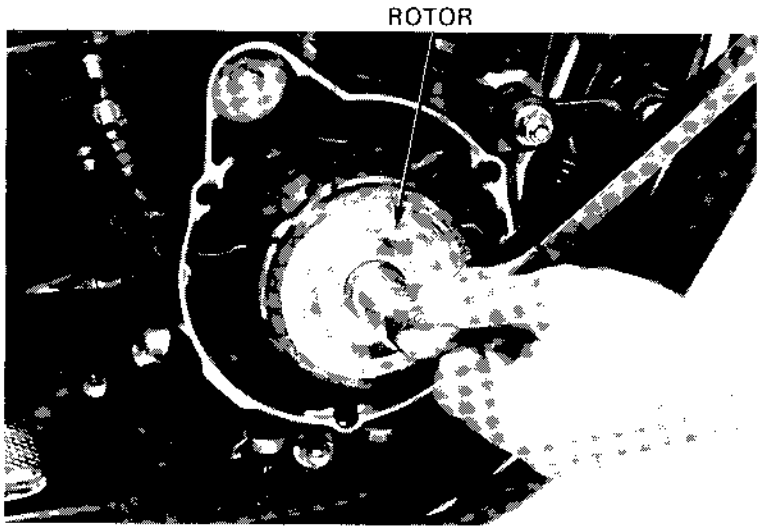
Remove and replace the brushes by removing the mounting screws.



INSTALLATION

Install the rotor and tighten the rotor bolt.

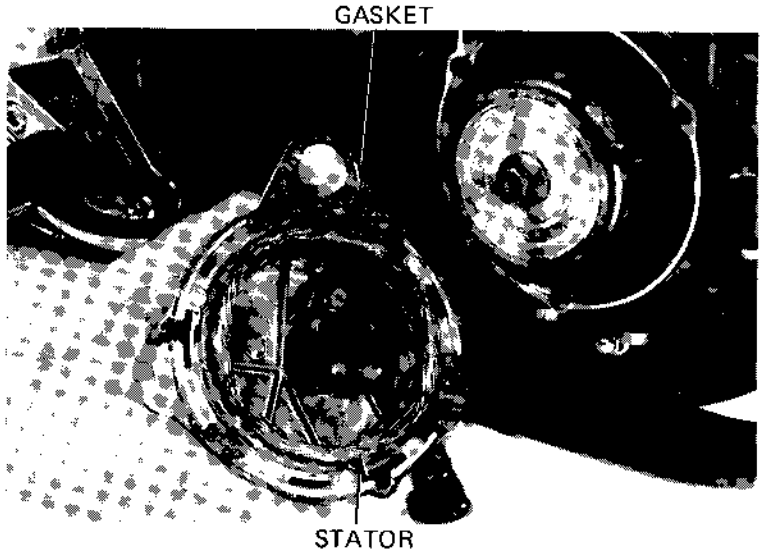
TORQUE: 80–100 N·m
(8.0–10.0 kg-m, 58–72 ft-lb)



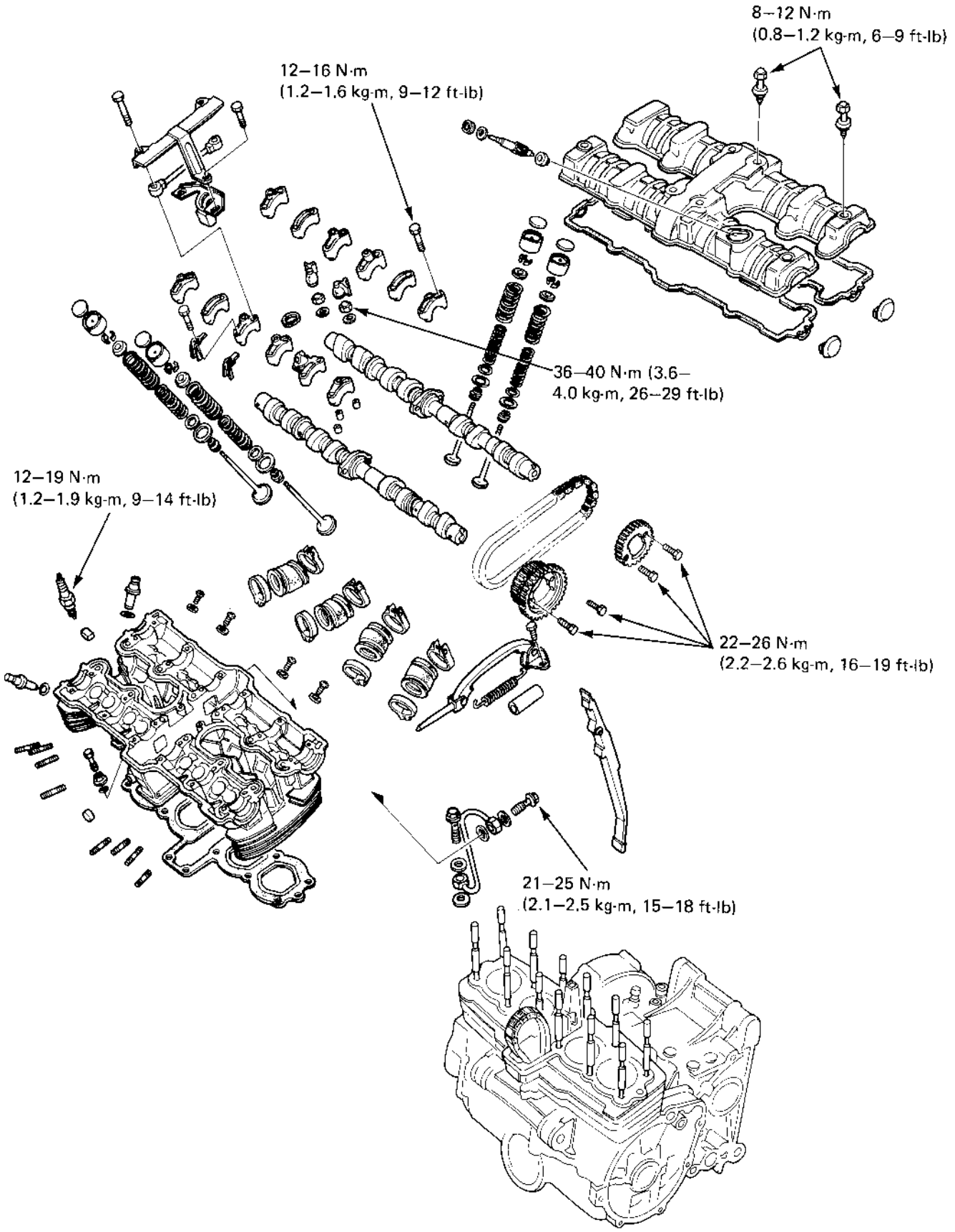
Install the stator and a new gasket on the alternator cover.

Install the alternator cover and tighten the bolts securely.

Route the alternator leads properly (page 1-9).



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9. CYLINDER HEAD/VALVE

SERVICE INFORMATION	9– 1	VALVE GUIDE REPLACEMENT	9–15
TROUBLESHOOTING	9– 2	VALVE SEAT INSPECTION/ REFACING	9–16
CAMSHAFT REMOVAL	9– 3	CYLINDER HEAD ASSEMBLY	9–17
CYLINDER HEAD REMOVAL	9– 9	CYLINDER HEAD INSTALLATION	9–19
CYLINDER HEAD DISASSEMBLY	9–11	CAMSHAFT INSTALLATION	9–20

SERVICE INFORMATION

GENERAL

- The engine must be removed from the frame to remove the cylinder head.
- Camshaft lubricating oil is fed through an oil line. Be sure the hole in the oil line is not clogged.
- During assembly, apply molybdenum disulfide to the camshaft bearings to provide initial lubrication. Pour clean engine oil into the oil pockets in the cylinder head to lubricate the camshafts.
- Marks A thru L on the camshaft holders indicate installation positions. A to E are for teh EX. side and F to L are for the IN. side from left to right respectively. When installing, be sure the mark " △" faces forward.

SPECIFICATIONS

			STANDARD	SERVICE LIMIT
Compression pressure			12 ± 2 kg/cm² (171 ± 28 psi)	———
Camshaft	Cam height	IN.	38.0–38.160 mm (1.496–1.502 in)	37.9 mm (1.49 in)
		EX.	39.0–39.160 mm (1.535–1.542 in)	38.9 mm (1.53 in)
	Oil clearance	A and F	0.040–0.082 mm (0.0016–0.0032 in)	0.13 mm (0.005 in)
		Tachometer gear holder and G	0.062–0.109 mm (0.0024–0.0043 in)	0.16 mm (0.006 in)
		B and H	0.085–0.139 mm (0.0033–0.0055 in)	0.19 mm (0.007 in)
		C and J	0.085–0.139 mm (0.0033–0.0055 in)	0.19 mm (0.007 in)
		D and K	0.062–0.109 mm (0.0024–0.0043 in)	0.16 mm (0.006 in)
		E and L	0.040–0.082 mm (0.0016–0.0032 in)	0.13 mm (0.005 in)
	Run out		———	0.05 mm (0.002 in)
	Side clearance		0.05 –0.25 mm (0.002 –0.10 in)	0.4 mm (0.02 in)
Valve lifter	Valve lifter O.D.		27.972–27.993 mm (1.1013–1.1021 in)	27.96 mm (1.1008 in)
	Valve lifter bore I.D.		28.000–28.016 mm (1.1023–1.1029 in)	28.04 mm (1.1039 in)
	Lifter to cylinder head clearance		———	0.07 mm (0.003 in)
Valve spring	Free length	IN. Outer	44.1 mm (1.736 in)	42.7 mm (1.681 in)
		IN. Inner	39.4 mm (1.551 in)	38.5 mm (1.515 in)
		EX. Outer	44.1 mm (1.736 in)	42.7 mm (1.681 in)
		EX. Inner	39.4 mm (1.551 in)	38.5 mm (1.515 in)
	Preload/length	IN. Outer	14.6–16.6 kg/37.5 mm (32.44–36.89 lbs/1.48 in)	14.0 kg/37.5 mm (31.11 lbs/1.48 in)
		IN. Inner	5.9–7.3 kg/34.5 mm (13.11–16.22 lbs/1.36 in)	5.5 kg/34.5 mm (12.22 lbs/1.36 in)
		EX. Outer	14.6–16.6 kg/37.5 mm (32.44–36.89 lbs/1.48 in)	14.0 kg/37.5 mm (31.11 lbs/1.48 in)
		EX. Inner	5.9–7.3 kg/34.5 mm (13.11–16.22 lbs/1.36 in)	5.5 kg/37.5 mm (12.22 lbs/2.36 in)

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			STANDARD	SERVICE LIMIT
Valve guide and valve	Valve stem O.D.	IN.	5.475–5.490 mm (0.2156–0.2161 in)	5.47 mm (0.215 in)
		EX.	5.455–5.470 mm (0.2148–0.2154 in)	5.44 mm (0.214 in)
	Valve guide I.D.	IN.	5.500–5.515 mm (0.2165–0.2171 in)	5.54 mm (0.2181 in)
		EX.	5.500–5.515 mm (0.2165–0.2171 in)	5.54 mm (0.2181 in)
	Stem-to-guide clearance	IN.	———	0.07 mm (0.0027 in)
		EX.	———	0.10 mm (0.0035 in)
	Valve seat width		0.85–1.10 mm (0.0334–0.044 in)	1.5 mm (0.059 in)
Cylinder head	Warpage		———	0.10 mm (0.0039 in)
Cam chain	Length		175.70–175.92 mm (6.917–6.926 in)	177.3 mm (6.98 in)

TORQUE VALUES

Cam chain tensioner bolts	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
Cam chain tensioner lock nut	11–15 N·m (1.1–1.5 kg-m, 8–11 ft-lb)
Cylinder head cover bolts	8–12 N·m (0.8–1.2 kg-m, 6– 9 ft-lb)
Camshaft holder bolts	12–16 N·m (1.2–1.6 kg-m, 9–12 ft-lb)
Cylinder head nuts	36–40 N·m (3.6–4.0 kg-m, 26–29 ft-lb)
Cam sprocket bolts	22–26 N·m (2.2–2.6 kg-m, 16–19 ft-lb)
Spark plugs	12–19 N·m (1.2–1.9 kg-m, 9–14 ft-lb)
Oil pipe	21–25 N·m (2.1–2.5 kg-m, 15–18 ft-lb)

TOOLS

Special

Valve guide reamer	07984–2000000
Valve lifter bore protector	07999–4220000

Common

Valve guide remover, 5.5 mm	07742–0010100 or 07942–3290100
Valve guide driver	07742–0020200 or 07942–3290200
Valve spring compressor	07757–0010000

TROUBLESHOOTING

Engine top-end problems are usually performance-related and can be diagnosed by a compression test, or are engine noises which can be traced to the top-end with a sounding rod or stethoscope.

Low compression or Uneven compression

1. Valves
   - Incorrect valve adjustment
   - Burned or bent valves
   - Incorrect valve timing
   - Broken valve springs
2. Cylinder head
   - Leaking or damaged head gasket
   - Warped or cracked cylinder head
3. Cylinder and piston (Refer to Section 10)

Compression too High

1. Excessive carbon build-up on piston head or combustion chamber

Excessive Noise

1. Incorrect valve adjustment
2. Sticking valve or broken valve spring
3. Damaged or worn camshaft
4. Loose or worn cam chain
5. Worn or damaged cam chain tensioner
6. Worn cam sprocket teeth

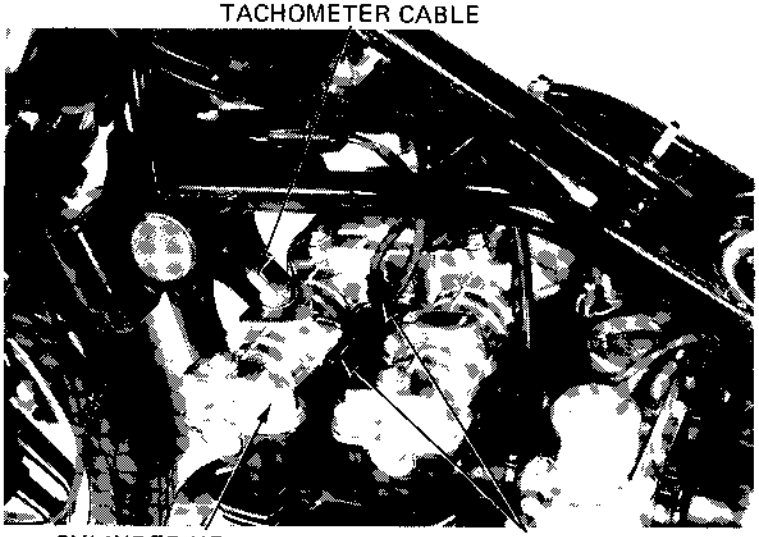
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CAMSHAFT REMOVAL

Place the motorcycle on its center stand.
Remove the seat and the fuel lines and fuel tank.

Disconnect the tachometer cable, and remove the spark plug caps.

Remove the cylinder head cover bolts and the cylinder head cover.

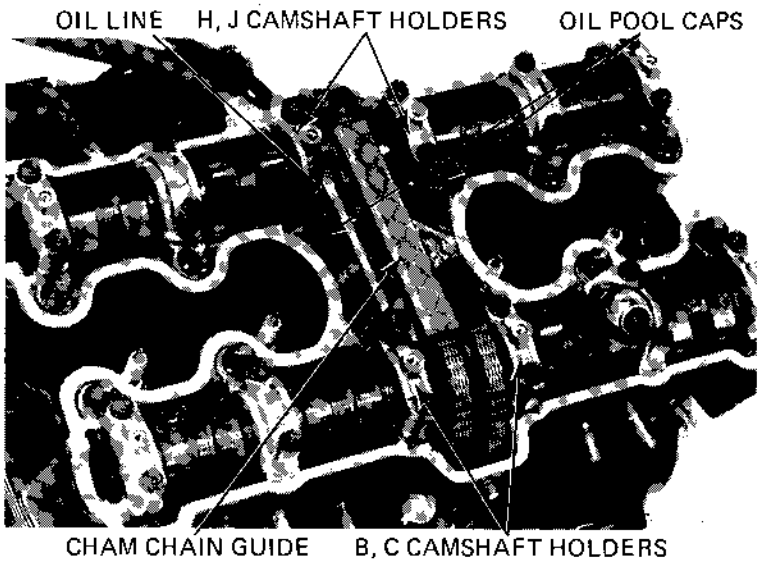


Remove the oil line and cam chain guide.

Remove the B, C, H and J camshaft holders.

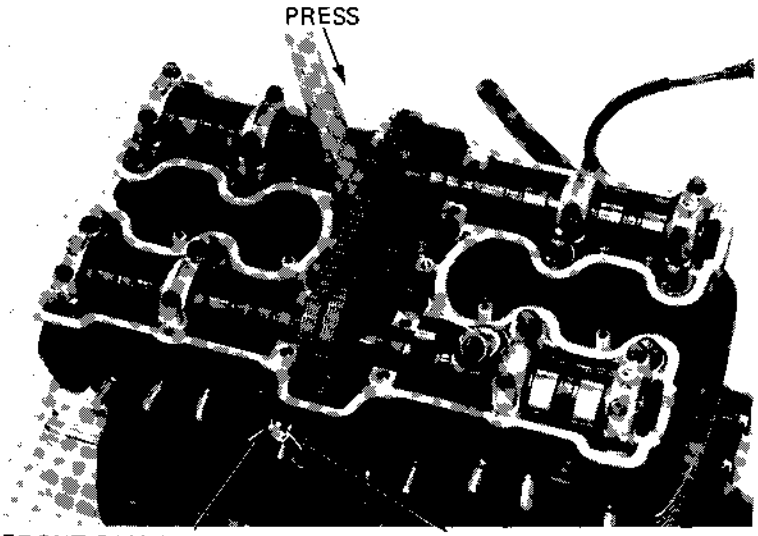
Remove the oil pool caps and rear cam chain guide attaching plate.

Remove the dowel pins.



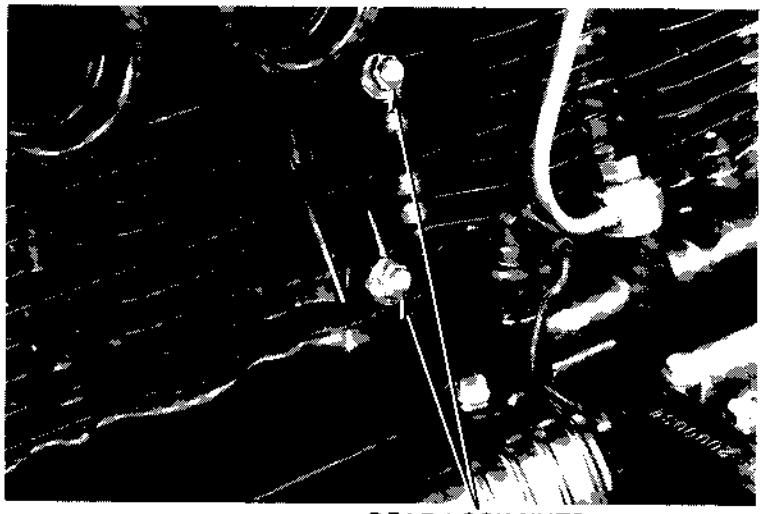
Loosen the front cam chain tensioner lock nut and bolt.

Press the cam chain tensioner down to reduce chain tension and tighten the lock bolt and nut.



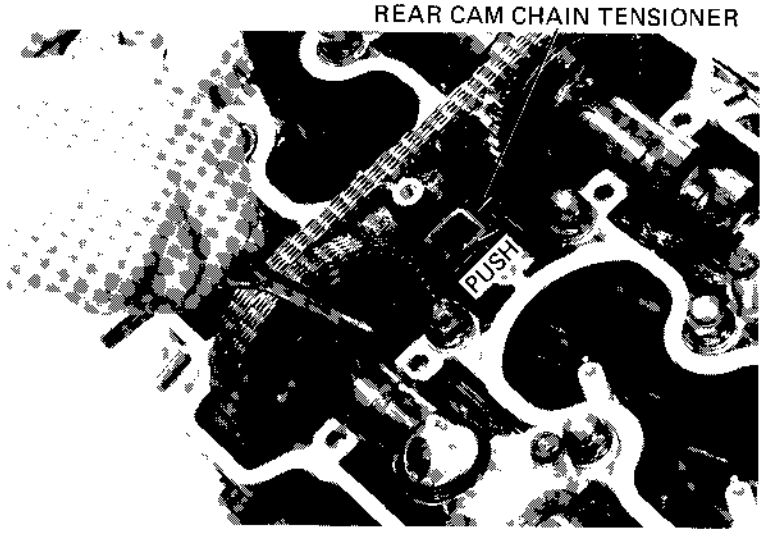
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Loosen the rear chain tensioner lock nuts.



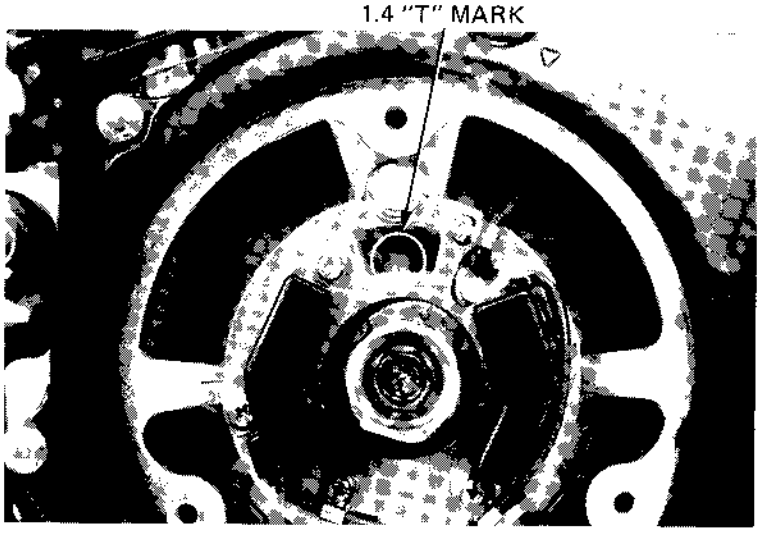
REAR LOCK NUTS

Push the rear cam chain tensioner rearward to reduce chain tension and tighten the lock nuts.



Remove the pulse generator cover.

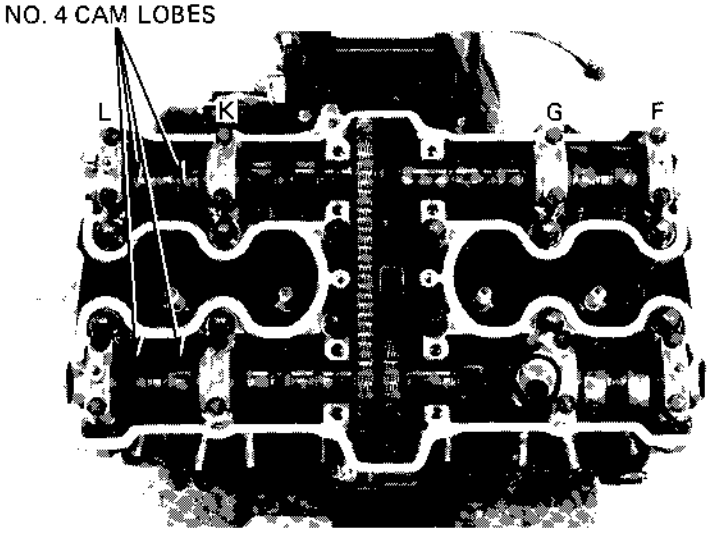
Turn the crankshaft counterclockwise until the "1.4T" mark aligns with the index mark.



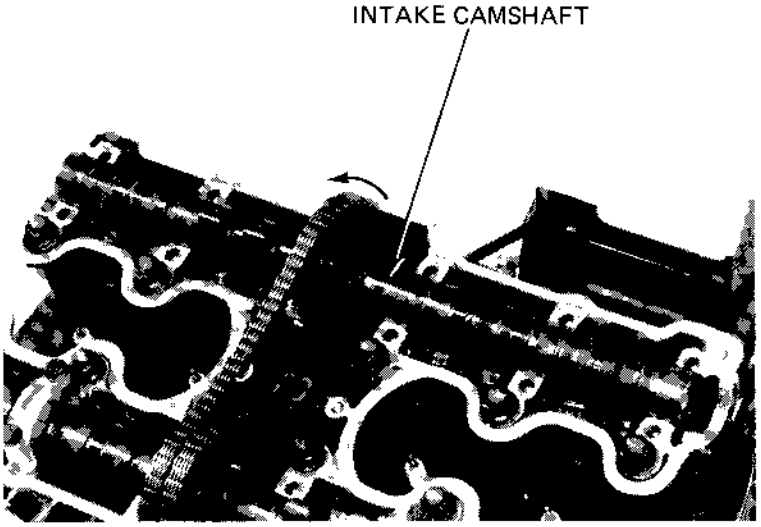
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Make sure the No. 1 or 4 cylinder intake and exhaust cam lobes face the spark plug.

Remove the G, K, F and L camshaft holders.
Remove the dowel pins.



Remove the intake camshaft.

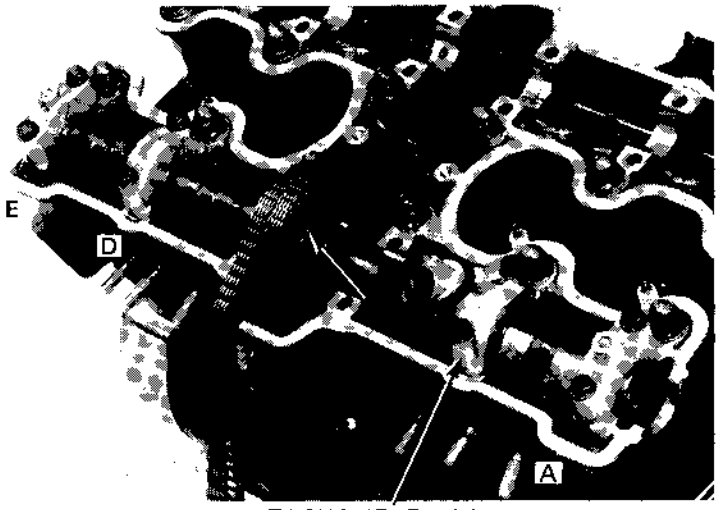


Loosen the exhaust cam sprocket bolt.

Turn the crankshaft counterclockwise until cam lift is minimal and the other cam sprocket bolt can be removed.

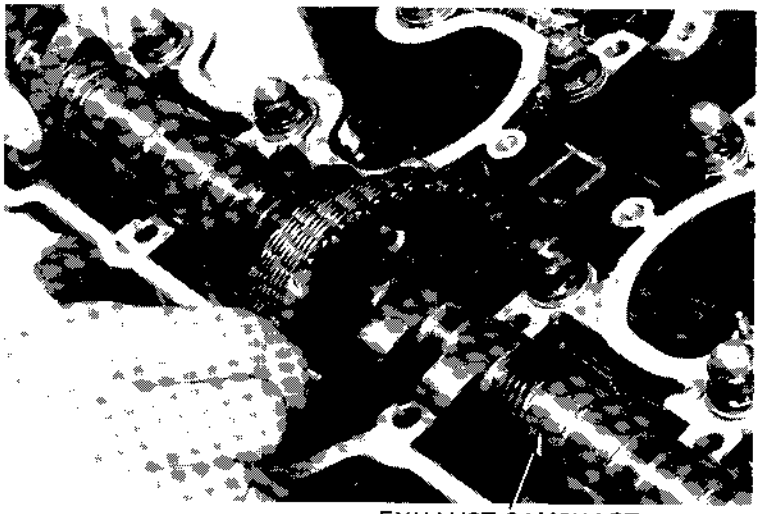
Remove the D and tachometer gear camshaft holders.

Remove the A and E holders.
Remove the dowel pins.



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Remove the exhaust camshaft.



EXHAUST CAMSHAFT

NOTE:

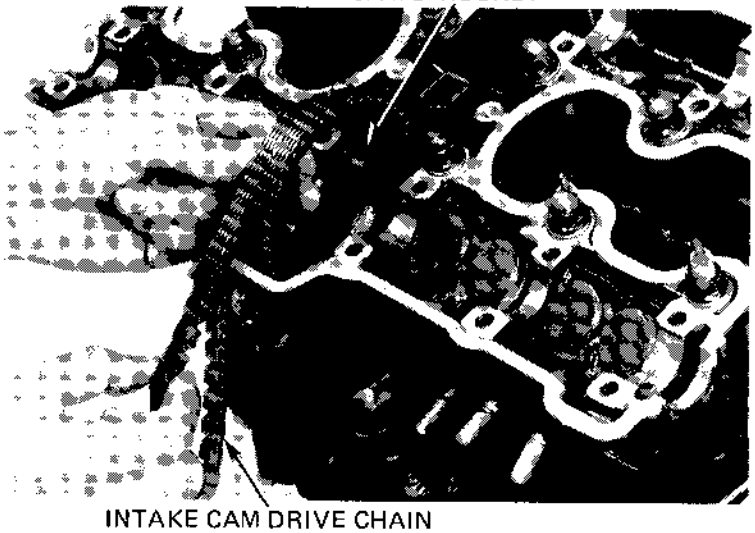
Suspend the cam chain with a piece of wire to keep it from falling into the engine.

Remove the cam sprocket and intake cam drive chain.

NOTE:

After removing the camshaft, the valve clearance adjusting shims and valve lifters can be removed.

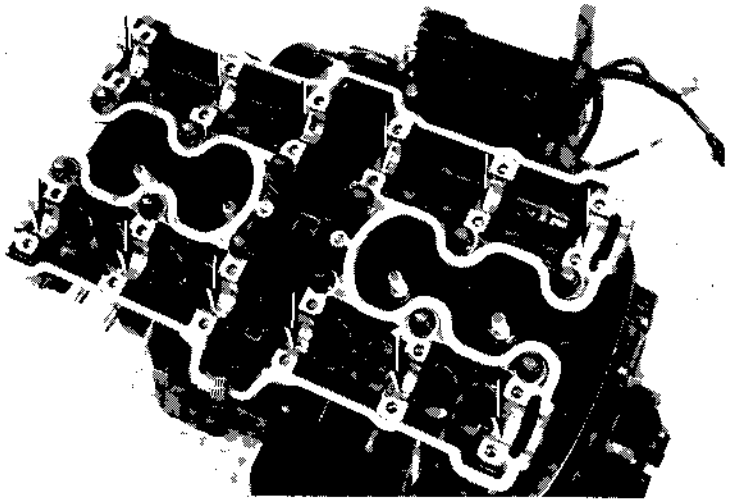
CAM SPROCKET



INTAKE CAM DRIVE CHAIN

CAM BEARING SURFACE INSPECTION

Inspect the cam bearing surfaces for scoring, scratches, or evidence of insufficient lubrication. Inspect the bearing surfaces of the camshaft holders.

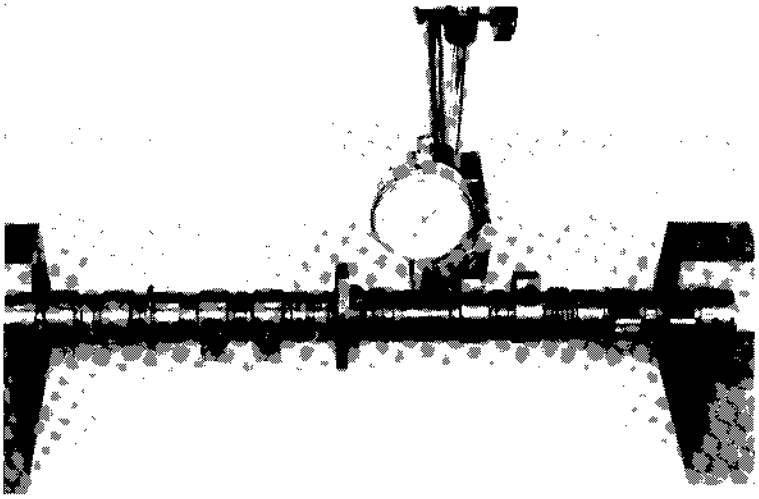


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CAMSHAFT RUNOUT

Check camshaft runout with a dial indicator.
Support both ends of the camshaft with V-blocks.

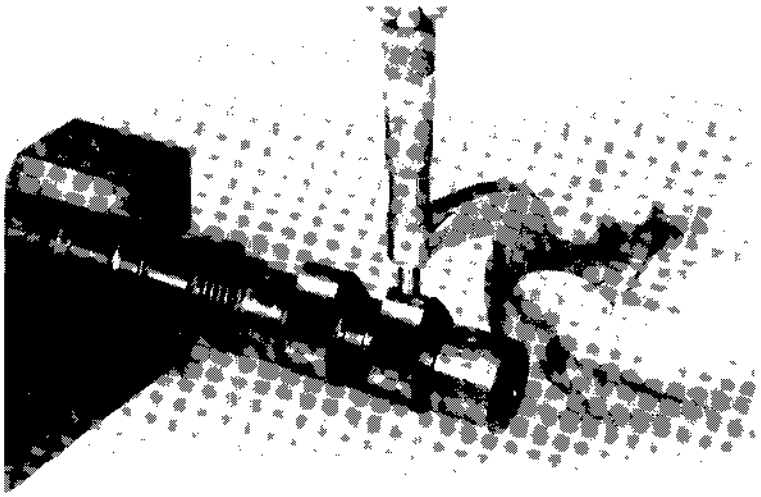
SERVICE LIMIT: 0.05 mm (0.002 in)



CAM LOBE HEIGHT

Using a micrometer, measure each cam lobe.
Check for wear or damage.

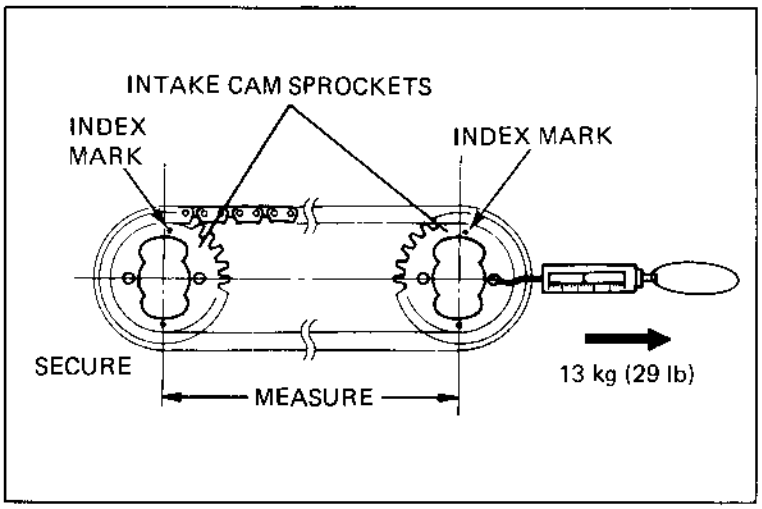
SERVICE LIMITS: IN: 37.9 mm (1.49 in)
EX: 38.9 mm (1.53 in)



CAM CHAIN LENGTH

Place the cam chain over the intake camshaft sprockets. Secure one sprocket and apply 13 kg (29 lb) of tension with a spring scale.
Measure the distance between the crankshaft index marks as shown.

SERVICE LIMIT: 177.3 mm (6.98 in)



CAM CHAIN GUIDE

Inspect the upper cam chain guide for damage or excessive wear.

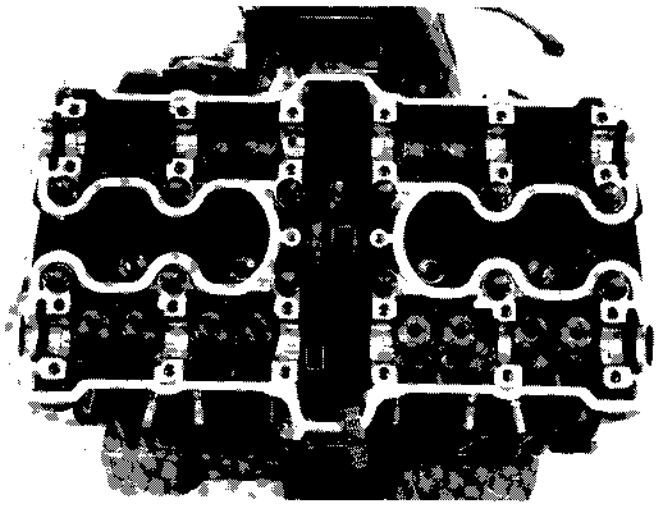
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CAMSHAFT OIL CLEARANCE

Remove the adjusting shims and the valve lifters.

NOTE:

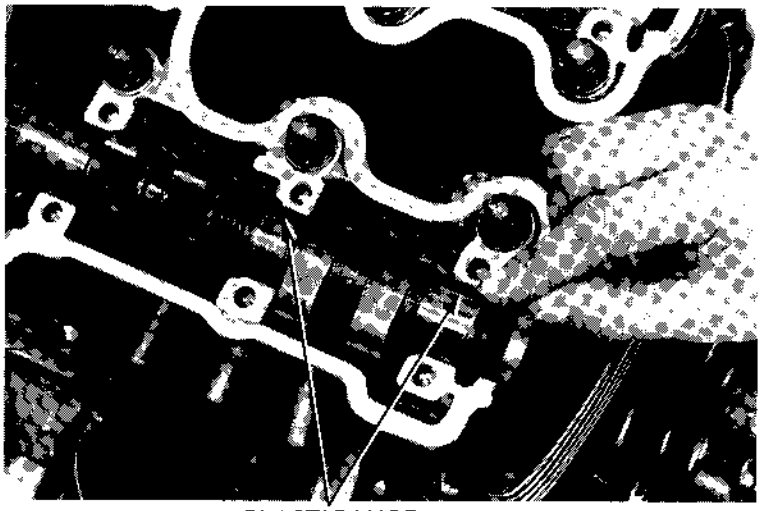
Mark each part to ensure correct reassembly.



Lay a strip of plastigauge lengthwise on top of each camshaft journal.

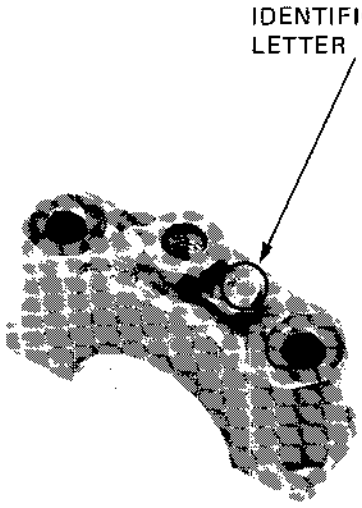
NOTE:

Wipe any oil from the journals before using plastigauge.



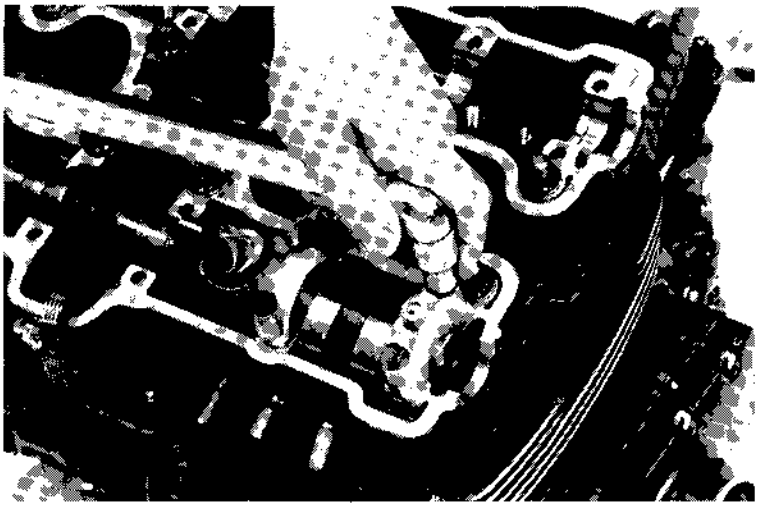
PLASTIGAUGE

Check the camshaft holder identification letter before installing.



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Install the camshaft holders in their correct positions and tighten in a crisscross pattern (see General, page 9-1).



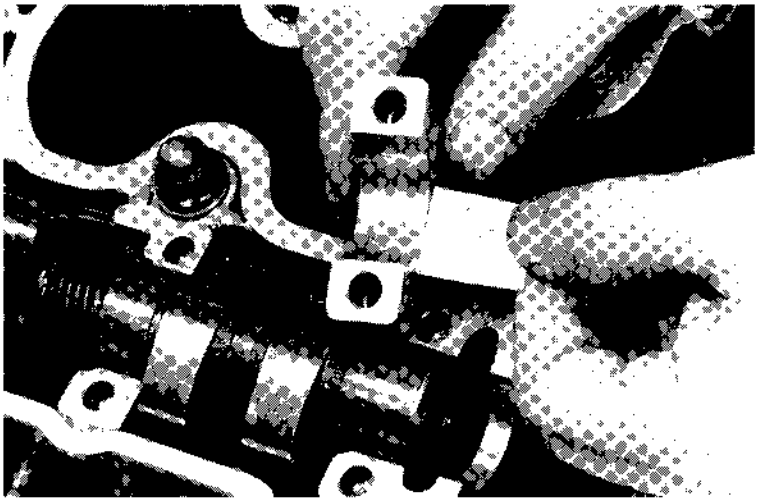
NOTE:

Do not rotate the camshaft when using plastigauge.

TORQUE: 12–16 N·m (1.2–1.6 kg-m, 9–12 ft-lb)

Remove the camshaft holders and measure the width of each plastigauge. The widest thickness determines the oil clearance.

SERVICE LIMITS:
A, E, F and L: 0.13 mm (0.005 in)
Gear holder, D, G and K: 0.16 mm (0.006 in)
B, C, H and J: 0.19 mm (0.007 in)

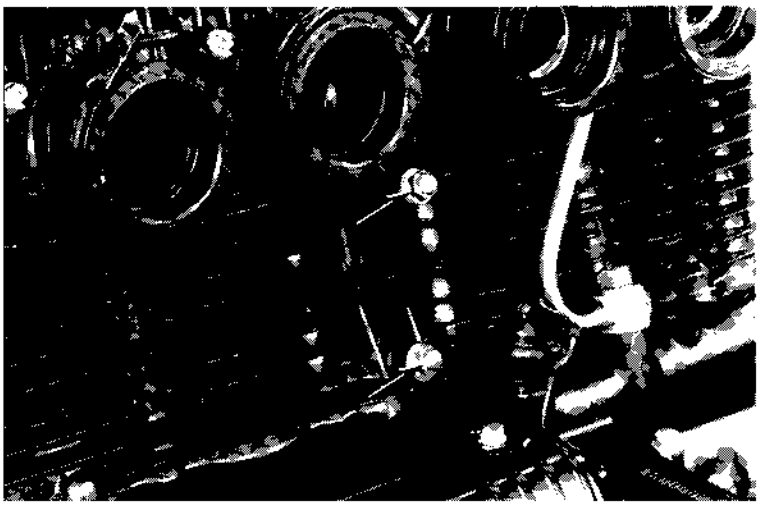


When the service limits are exceeded, replace the camshaft and recheck the oil clearance.

Replace the cylinder head and camsahft holders if the clearance still exceeds service limits.

CYLINDER HEAD REMOVAL

Remove the two rear cam chain tensioner lock nuts.



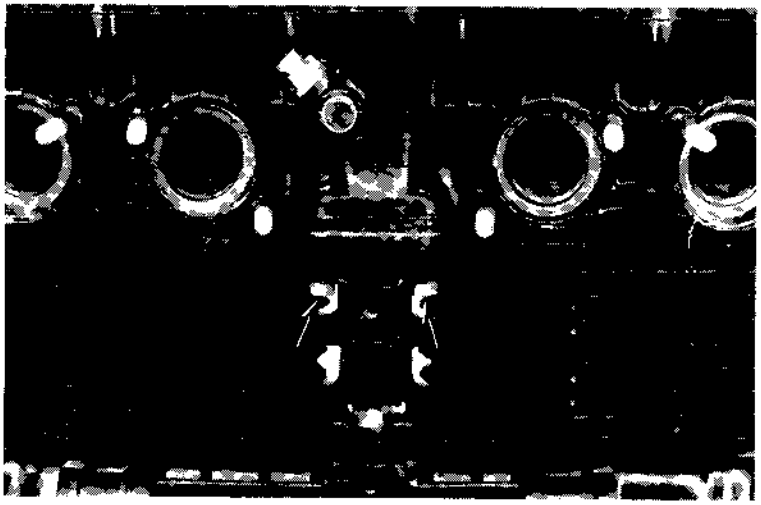
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Remove the oil line bolts and oil line.

OIL LINE



Remove the two bolts at the front cam chain housing.

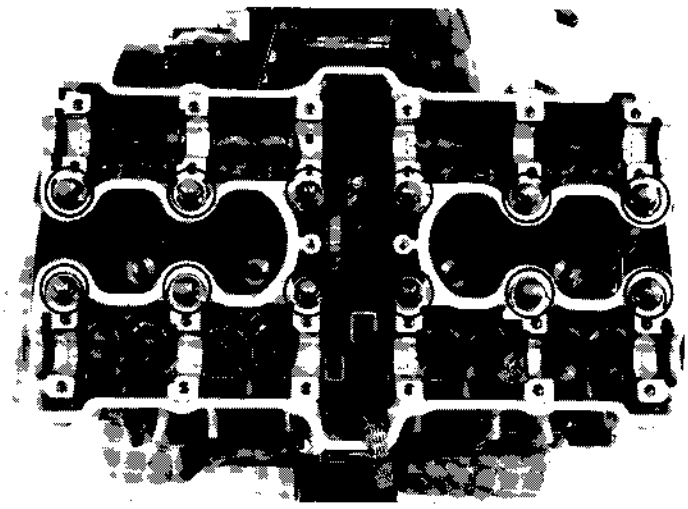


Remove the 12 cylinder head cap nuts.

NOTE:

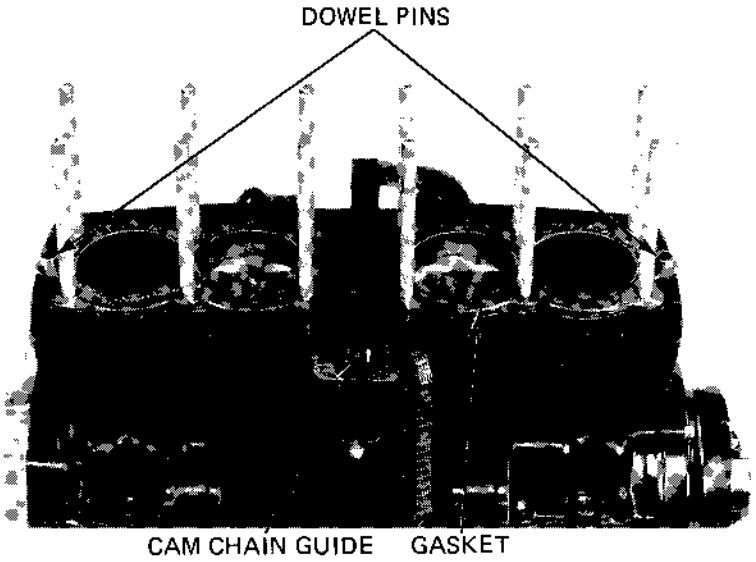
> Remove the nuts in 2-3 steps in a crisscross pattern to prevent warpage.

Remove the cylinder head.



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Remove the cylinder head gasket, dowel pins, and cam chain guide.

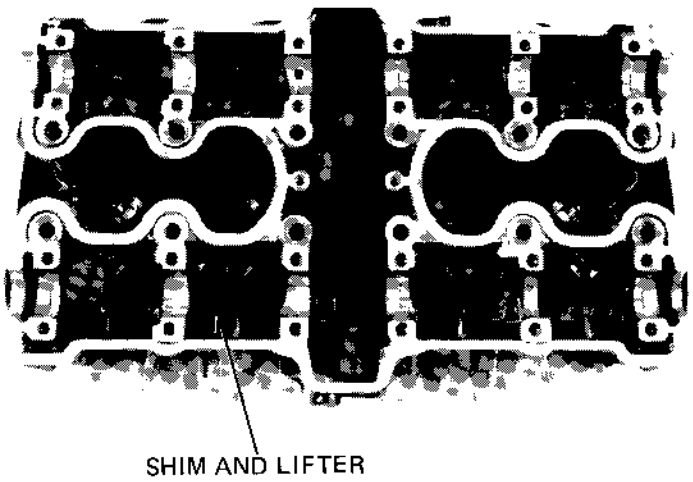


CYLINDER HEAD DISASSEMBLY

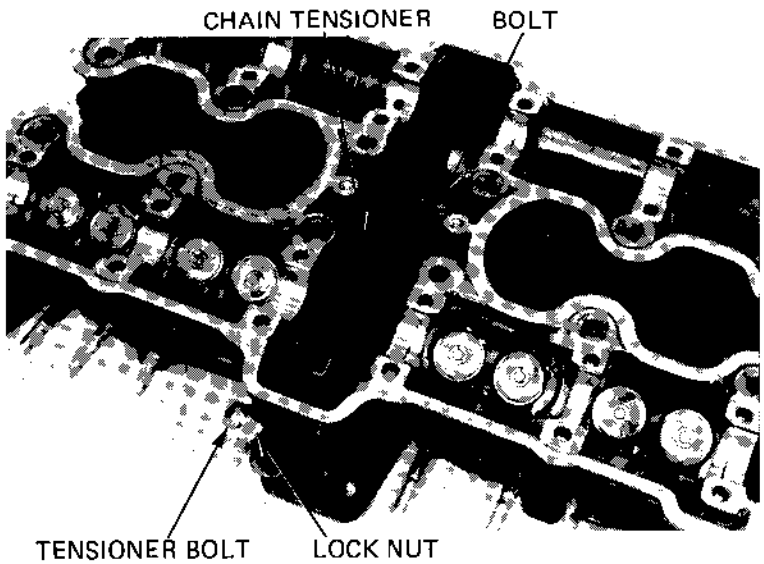
Remove the valve clearance adjusting shims and the valve lifters.

NOTE:

> Mark all disassembled parts to ensure correct reassembly.



Loosen the cam chain tensioner lock nut and bolts. Remove the bolt in the cylinder head and pull the chain tensioner back and remove.



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Remove the valve spring cotters, retainers, springs and valves.

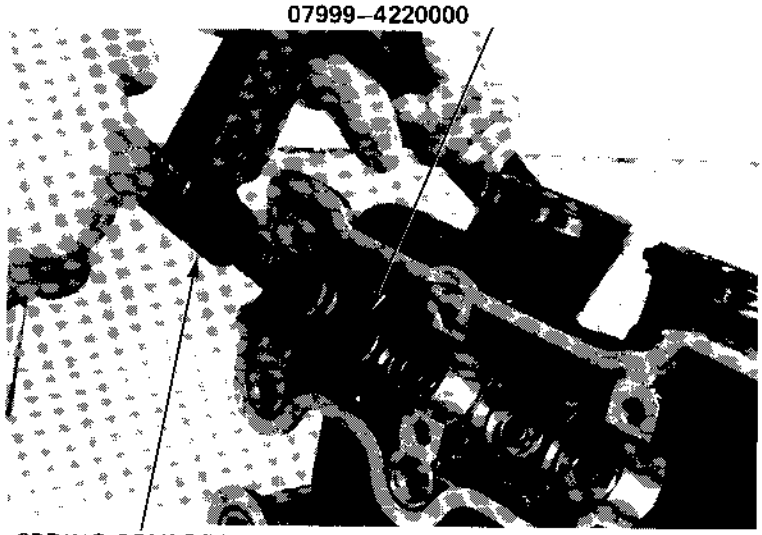
CAUTION:

- *Use the Valve lifter bore protector tool to prevent bore surface damage during valve disassembly.*
- *To prevent loss of tension, do not compress the valve springs more than necessary to remove the cotters.*

NOTE:

Mark all disassembled parts for correct reassembly.

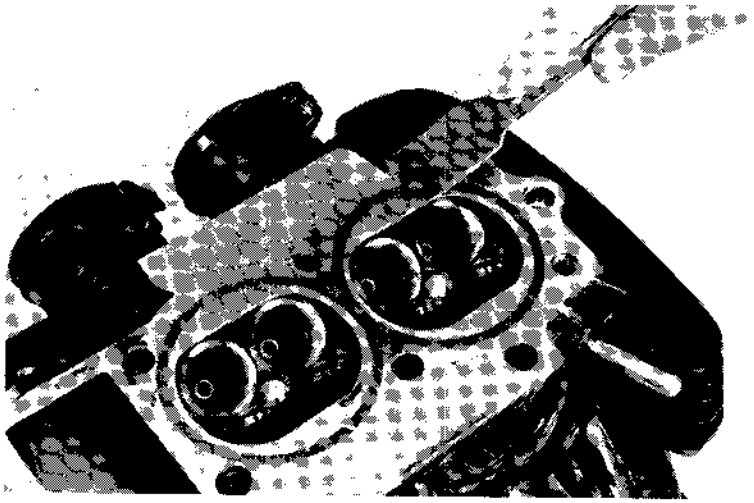
Remove the valve stem seals.



Remove carbon deposits from the combustion chamber.
Clean off the head gasket surfaces.

NOTE:

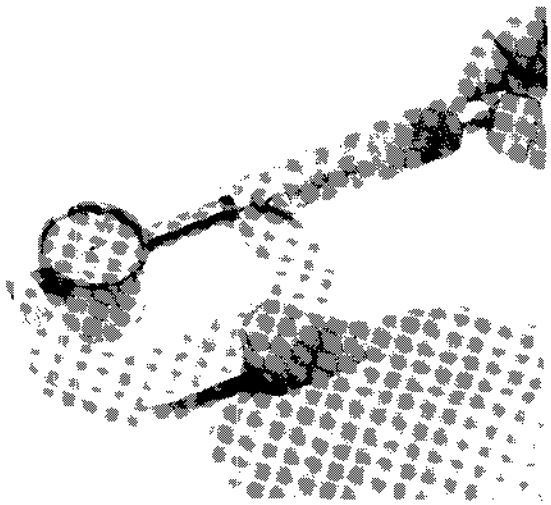
- Avoid damaging the gasket surfaces.
- Gasket material will come off easier if soaked in solvent.



VALVE LIFTER O.D.

Measure valve filter O.D.

SERVICE LIMIT: 27.96 mm (1.101 in)



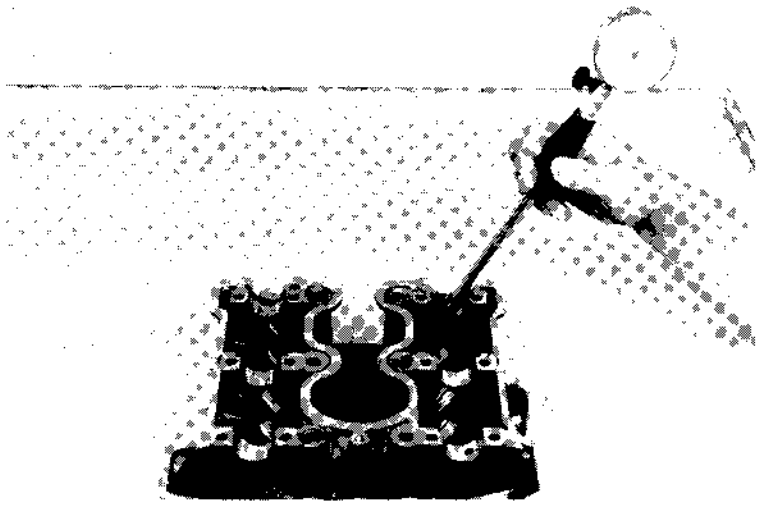
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VALVE LIFTER BORE

Measure valve lifter bore I.D.

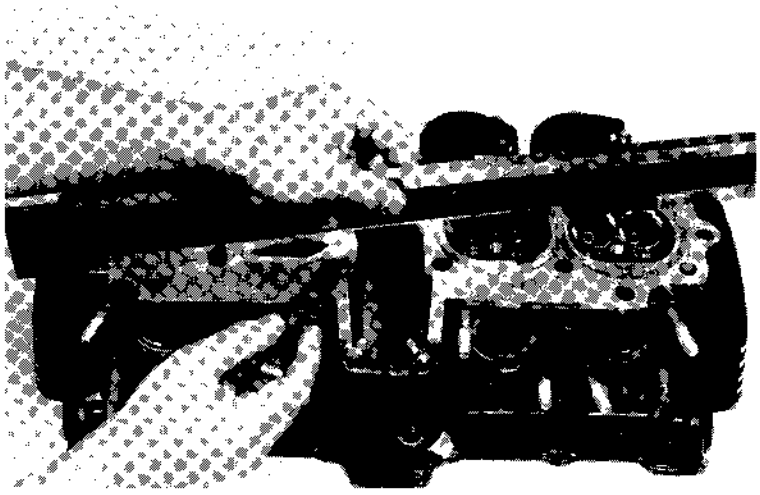
SERVICE LIMIT: 28.04 mm (1.1039 in)

Inspect the valve lifter for scoring, scratches, or evidence of insufficient lubrication.



Check the spark plug hole and valve areas for cracks.
Check the cylinder head for warpage with a straight edge and a feeler gauge.

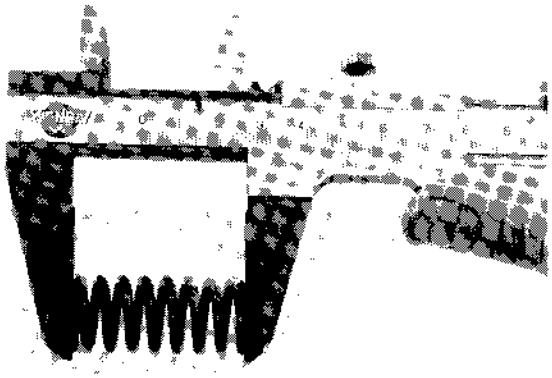
SERVICE LIMIT: 0.10 mm (0.0039 in)



VALVE SPRING FREE LENGTH INSPECTION

Measure the length of the inner and outer valve springs.

SERVICE LIMITS:
Inner: IN/EX 38.5 mm (1.515 in)
Outer: IN/EX 42.7 mm (1.681 in)

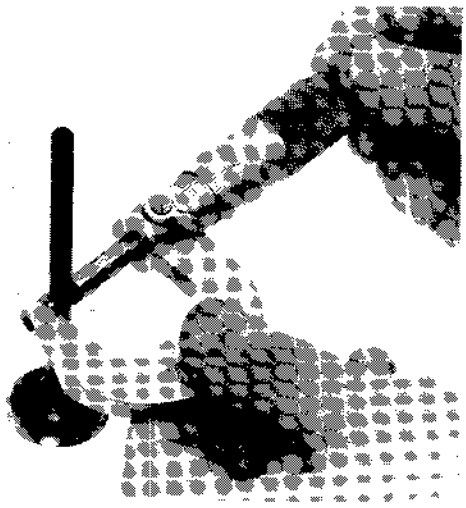


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VALVE STEM-TO-GUIDE CLEARANCE

Inspect each valve for bending, burning, scratches or abnormal stem wear.
Check valve movement in the guide.
Measure and record each valve stem O.D.

SERVICE LIMITS: IN: 5.47 mm (0.215 in)
EX: 5.44 mm (0.214 in)



NOTE:

> Ream the guides to remove any carbon build-up before checking clearance.

Measure and record each valve guide. I.D. using a ball gauge or inside micrometer.

SERVICE LIMIT: IN/EX. 5.54 mm (0.218 in)

Subtract each valve stem O.D. from the corresponding guide I.D. to obtain the stem to guide clearances.

SERVICE LIMITS: IN: 0.07 mm (0.003 in)
EX: 0.10 mm (0.004 in)



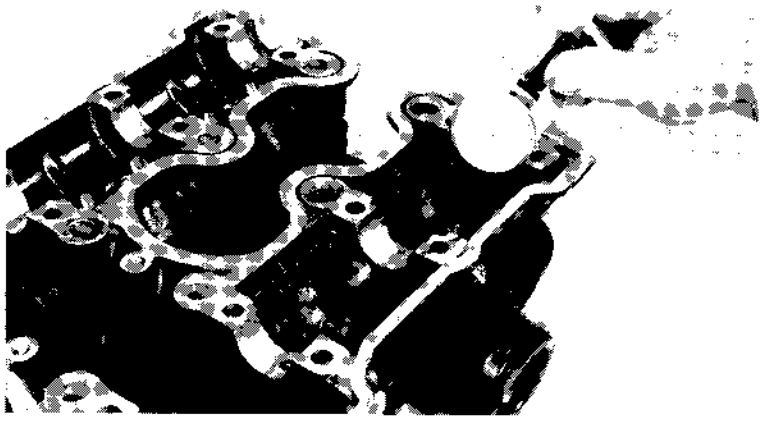
VALVE GUIDE REAMER
07984–2000000

In the stem-to-guide clearance exceeds the service limits, determine if a new guide with standard dimensions would bring the clearance within tolerance. If so, replace any guides as necessary and ream to fit.

If the stem-to-guide clearance exceeds the service limits with new guides, replace the valves.

NOTE:

> Reface the valve seats whenever the valve guides are replaced (page 9-16).



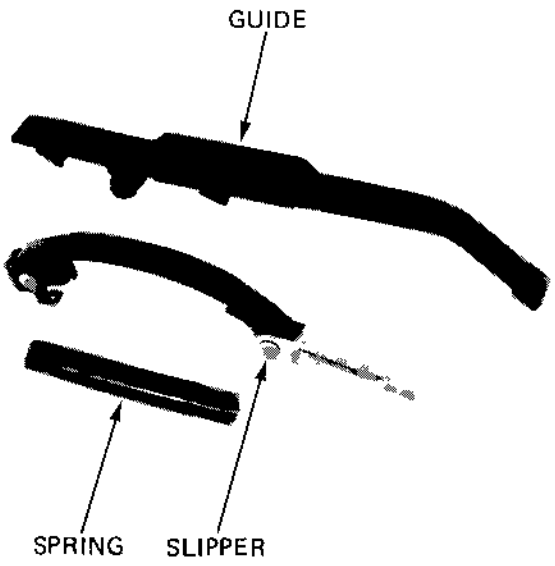
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CAM CHAIN GUIDE AND CAM CHAIN TENSIONER INSPECTION

Inspect the cam chain guide for damage or excessive wear.

Inspect the cam chain tensioner slipper for damage or excessive wear.

Inspect the spring for tension.

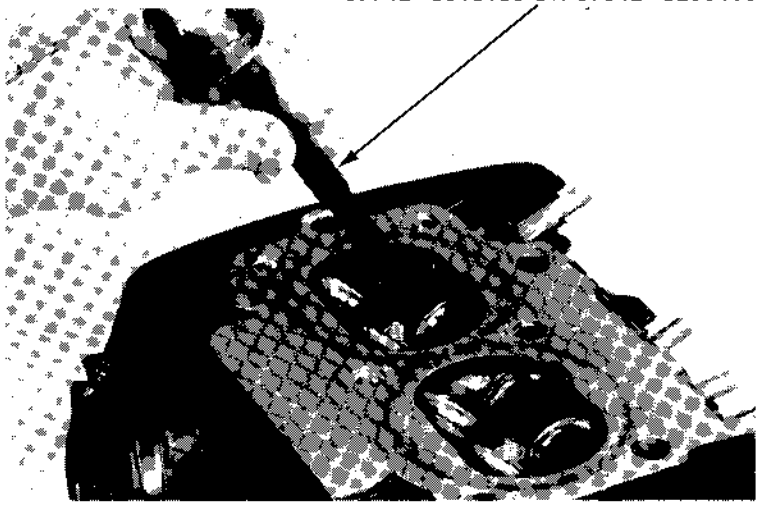


VALVE GUIDE REPLACEMENT

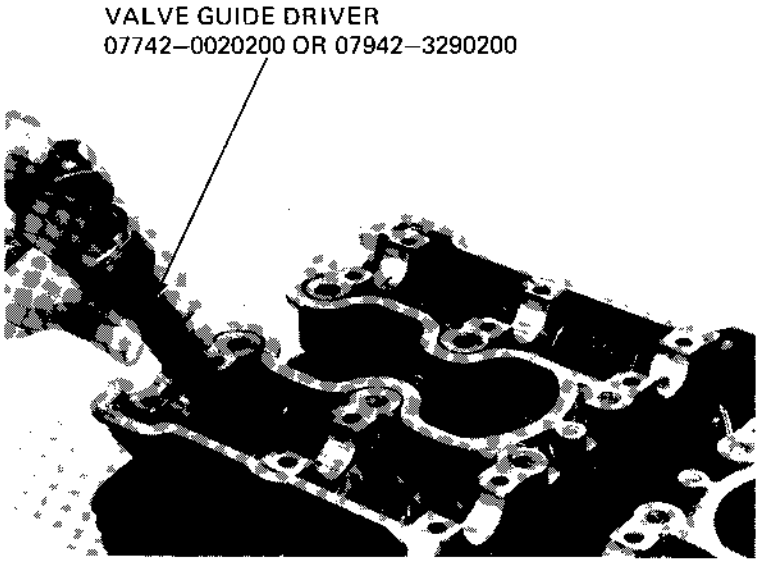
Support the cylinder head and drive out the guide from the valve port.

NOTE:

> When driving out the valve guide, do not damage the head.



Install an oversize valve guide from the top of the head.



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Ream the new valve guide after installation.

NOTE:

- Use cutting oil on the reamer during this operation.
- Rotate the reamer when inserting and removing it.

Reface the valve seat.
Clean the cylinder head throughly to remove any metal particles.



VALVE GUDIE REAMER
07984–2000000

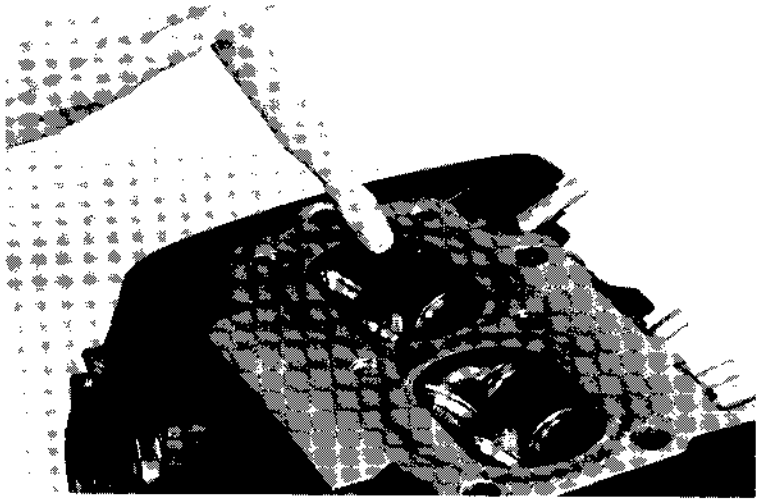
VALVE SEAT INSPECTION/ REFACING

Clean all intake and exhaust valves thoroughly to remove carbon deposits.

Apply a light coating of valve lapping compound to each valve face. Lap each valve and seat using a rubber hose or other hand-lapping tool.

NOTE:

Take care not to allow the compound to enter between the valve stem and guide. After lapping, wash out the compound completely and apply a coat of engine oil to the valve face and seat.



Remove the valve and inspect the face.

CAUTION:

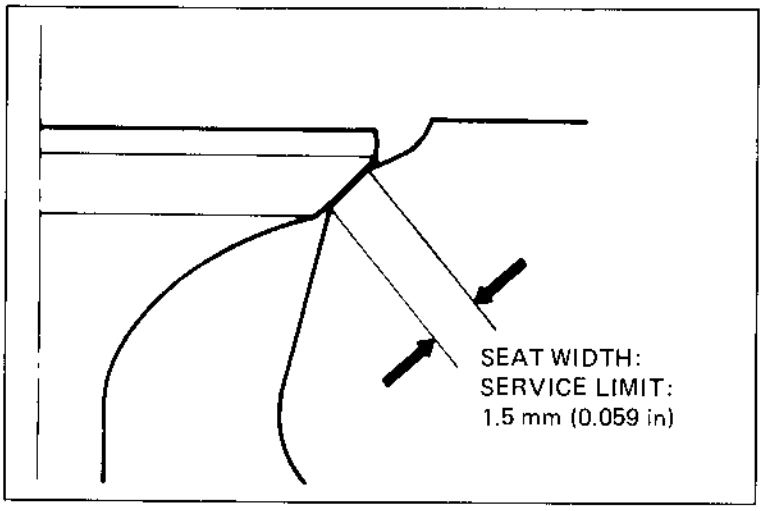
The valves cannot be ground. If the valve face is rough, worn unevenly, or contacts the seat improperly, the valve must be replaced.

Inspect the valve seat.

If the seat is too wide, too narrow, or has low spots, the seat must be ground.

NOTE:

Follow the refacer manufacturer's operating instructions.

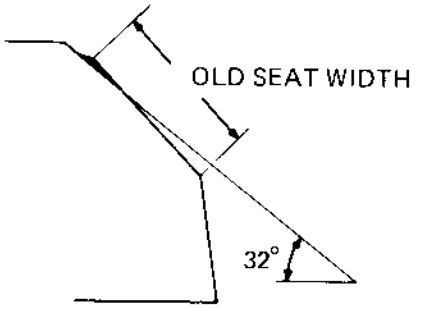


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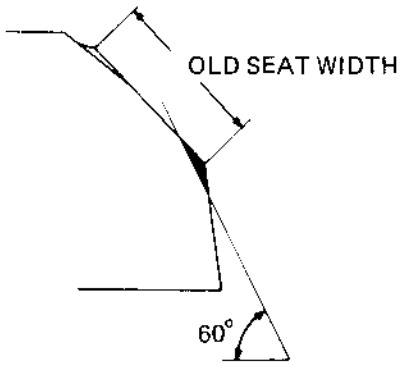
After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure.

After lapping, wash any residual compound off the cylinder head and valve.

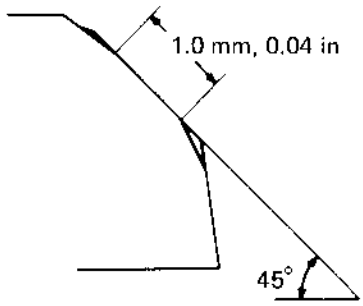
IN: CUTTER, 30 ϕ
EX: CUTTER, 28 ϕ



IN, EX: CUTTER, 30 ϕ



IN: CUTTER, 27.5 ϕ
EX: CUTTER, 24.5 ϕ



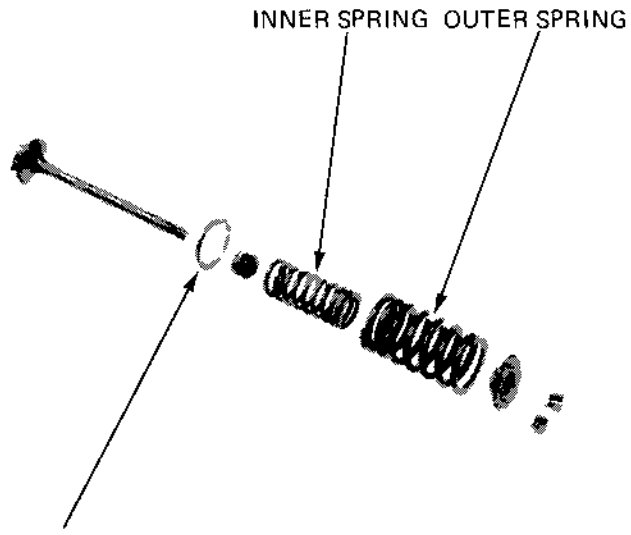
CYLINDER HEAD ASSEMBLY

Lubricate each valve stem with molybdenum disulfide grease and insert the valve into the valve guide.

NOTE:

- Install new valve stem seals when assembling.
- To avoid damage to the stem seal, turn the valve slowly when inserting.

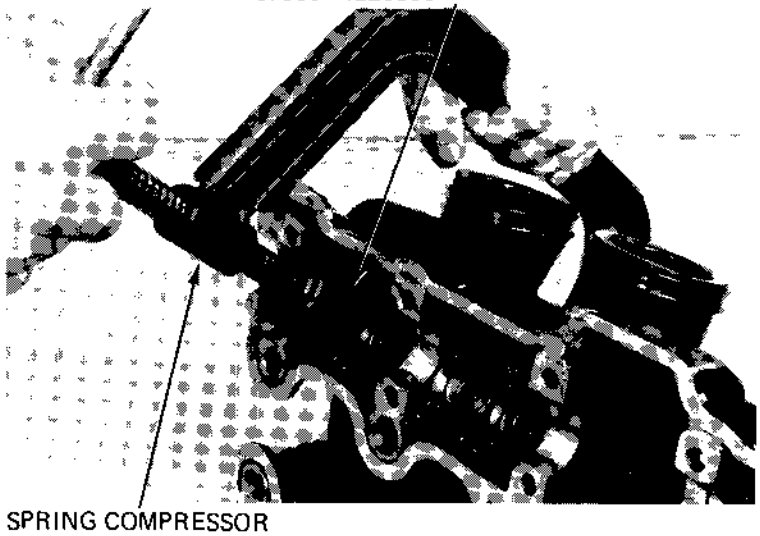
Install the valve spring and retainers. The valve springs with the tightly wound coils should face the cylinder head.



Install the valve cotters.

CAUTION:

To prevent loss of tension, do not compress the valve springs more than necessary to install the valve cotters.

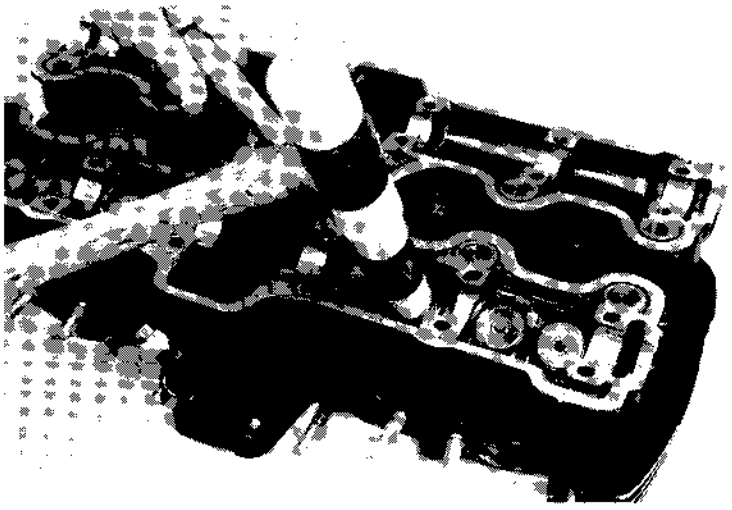


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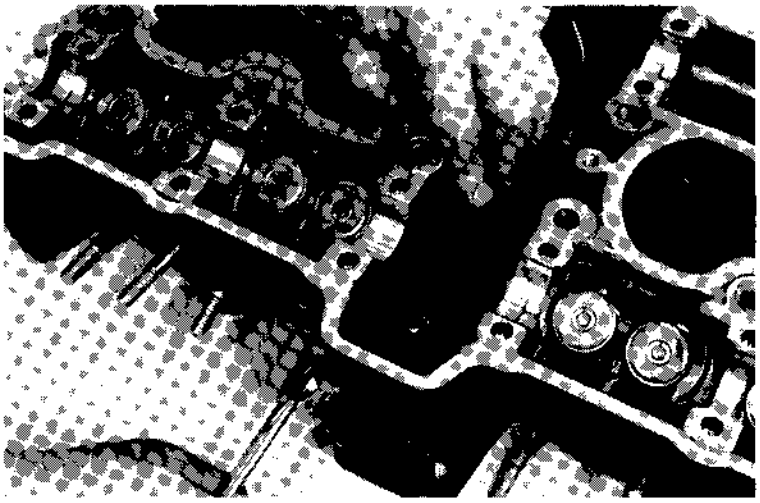
Tap the valve stems gently with a soft hammer to fimrly seat the valve cotters.

NOTE:

Support the cylinder head above the work bench surface to prevent possible valve damage.



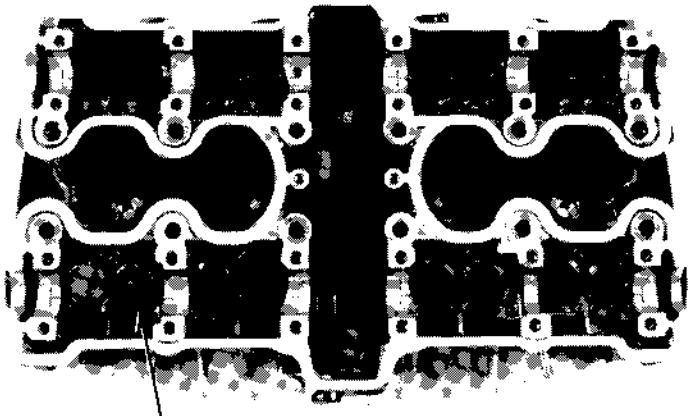
Install the front cam chain tensioner. Push the chain tensioner down and tighten the lock bolt and nut.



Install the valve lifters and adjustment shims.

NOTE:

Make sure that the valve lifters and shims are in their original position.

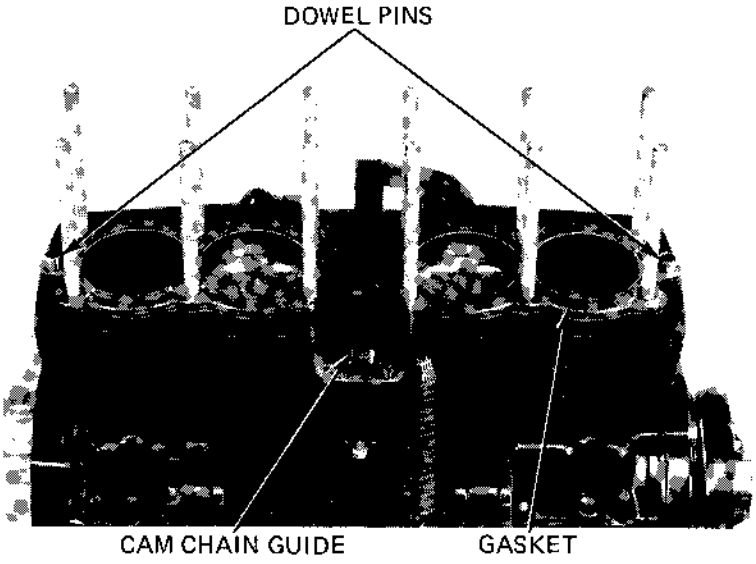


SHIM AND LIFTER

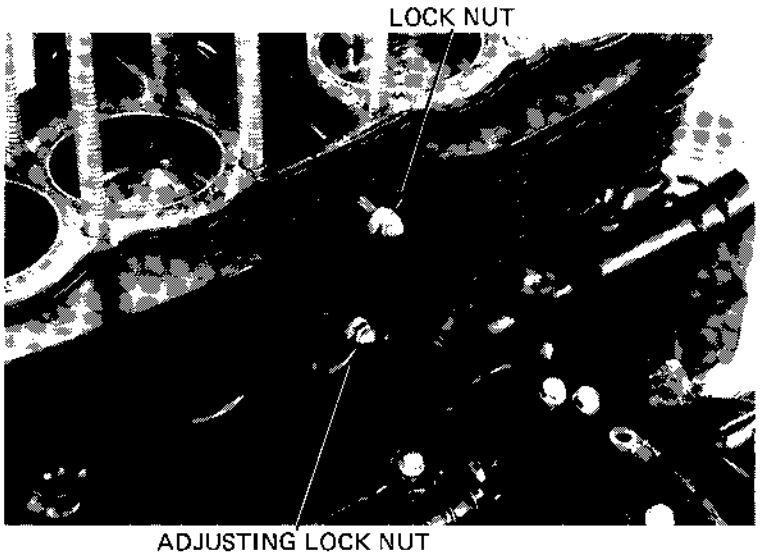
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CYLINDER HEAD INSTALLATION

Clean the cylinder head surfaces of any gasket material.
Install the dowel pins and the cam chain guide. Install a new cylinder head gasket with the 5 mm wide side of the bore grommet up.



Install the two cam chain tensioner lock nuts loosely.

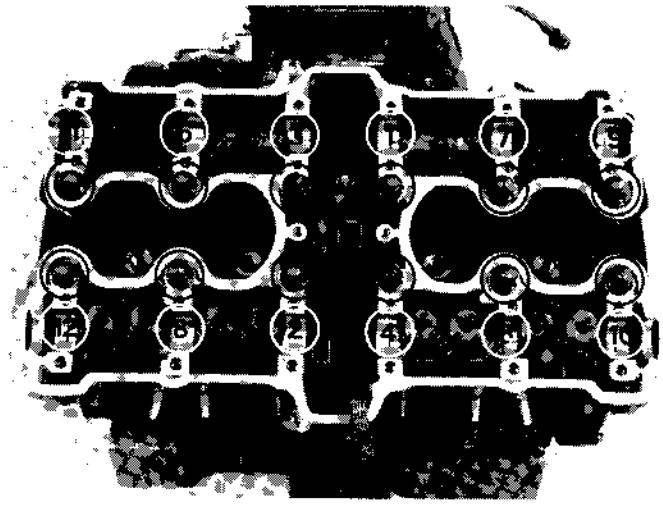


Install the cylinder head assembly.
Tighten the cap nuts in the sequence shown.

TORQUE:
10 mm cap unt: 36–40 N·m (3.6–4.0 kg-m, 26–29 ft-lb)

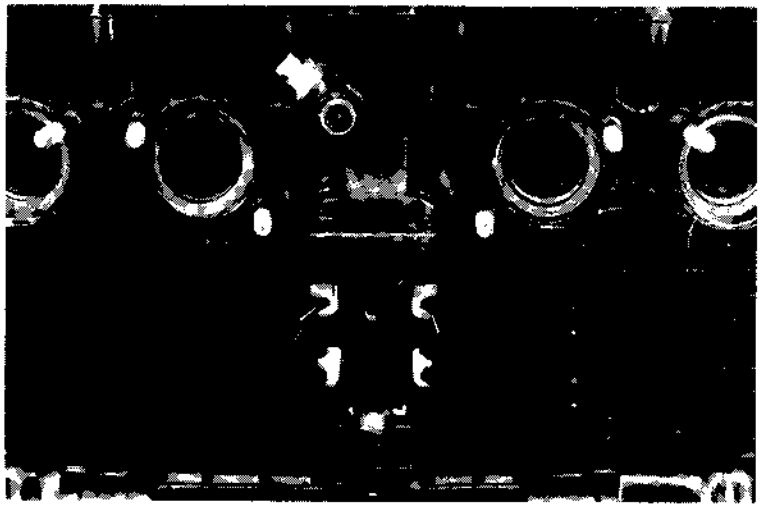
NOTE:

Apply molybdenum disulfide grease to the threads of the cylinder bolts.



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Tighten the two bolts at the front cam chain housing.

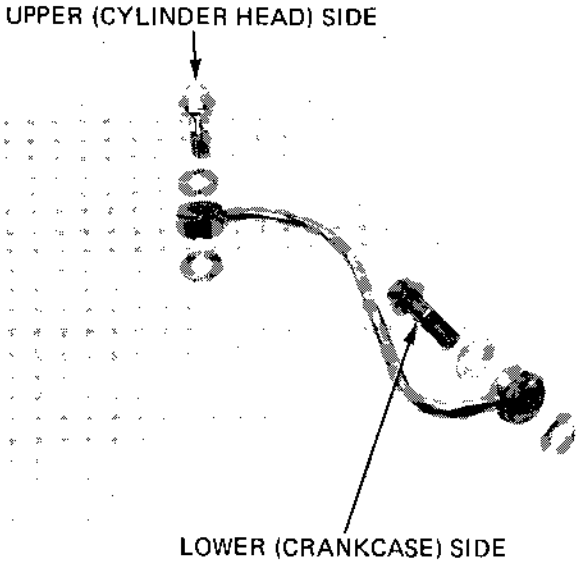


Install the oil cooler hose setting plate and tighten the two oil line bolts.

NOTE:

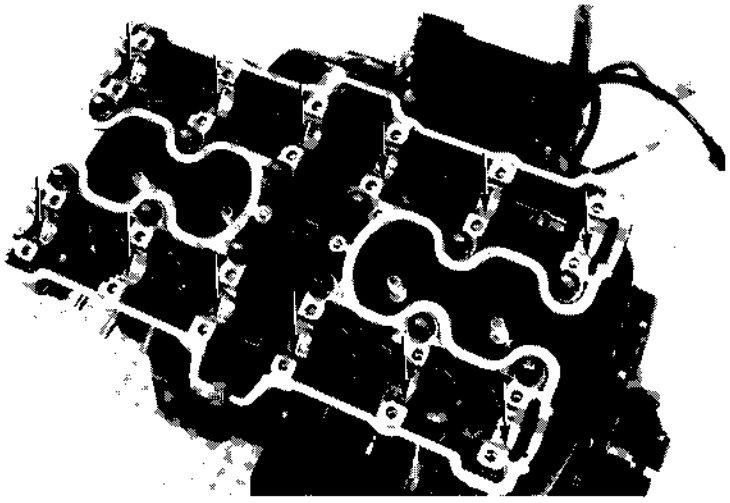
> Use the bolt with the big hole to tighten the upper oil line.

TORQUE: 21–25 N·m (2.1–2.5 kg-m, 15–18 ft-lb)



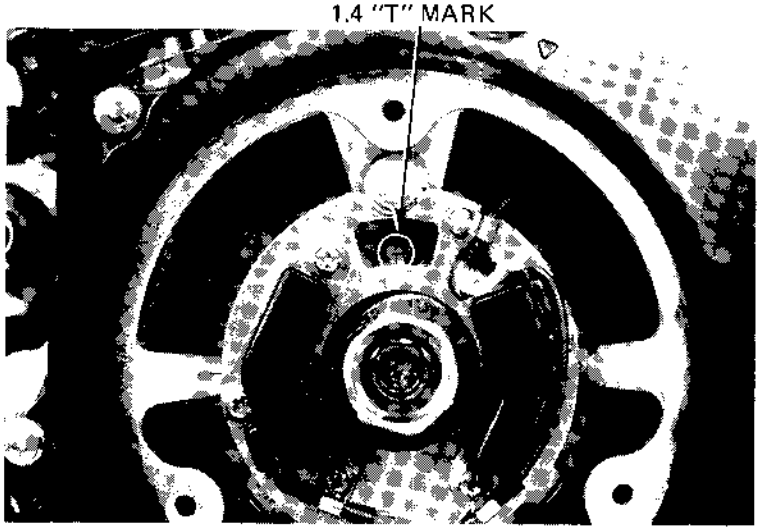
CAMSHAFT INSTALLATION

Lubricate the camshaft bearings with molybdenum disulfide grease.

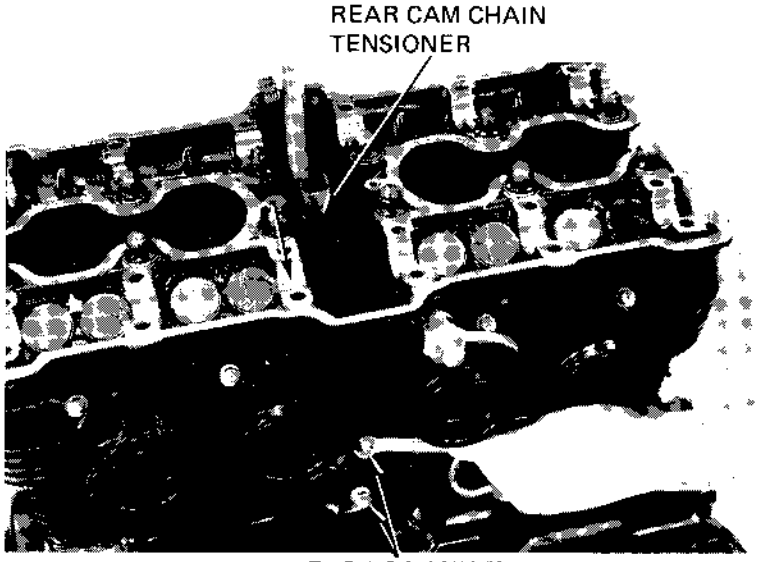


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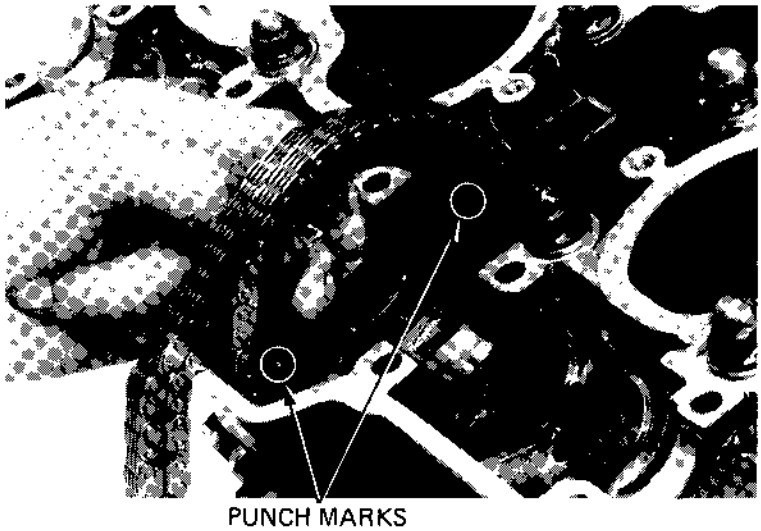
Turn the crankshaft counterclockwise until the "1.4T" and index marks align.



Push the rear cam chain tensioner rearward to provide maximum cam chain slack.
Tighten the rear lock nuts.



Place the intake and exhaust cam chains over the exhaust camshaft sprocket, aligning the sprocket punch marks with the cylinder head surface.



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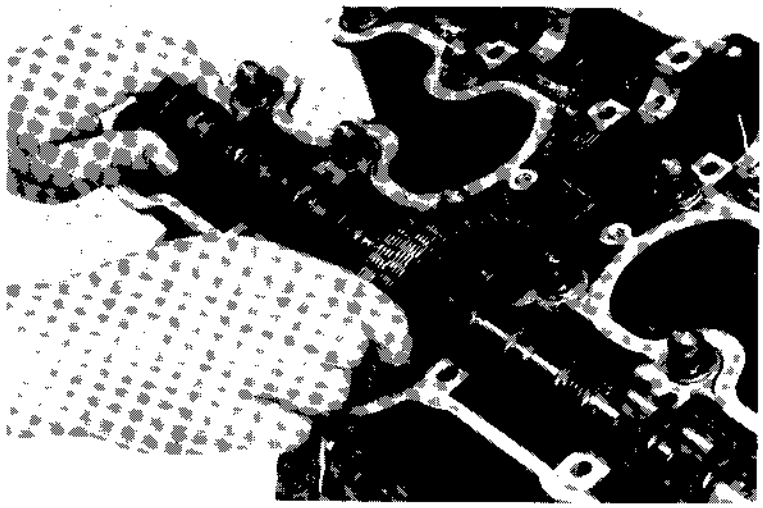
Turn the crankshaft 180° and place the exhaust camshaft through the exhaust camshaft sprocket.

Realign the 1.4 "T" mark with index mark. Position the No. 1 (or 4) cam lobes towards the spark plug.

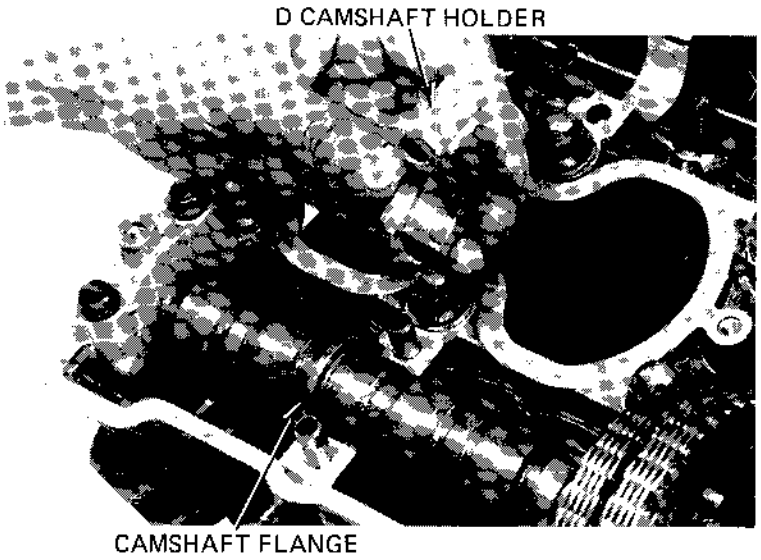
Install the A and E camshaft holders loosely.

NOTE:

> Install all camshaft holders with directional arrows pointing towards the front of the engine.



Loosely install the D camshaft holder and the tachometer drive gear/camshaft holder. Position the camshaft so its flange fits into the D holder slot.



Position the camshaft sprocket over the exhaust camshaft shoulder and install the cam sprocket bolt.

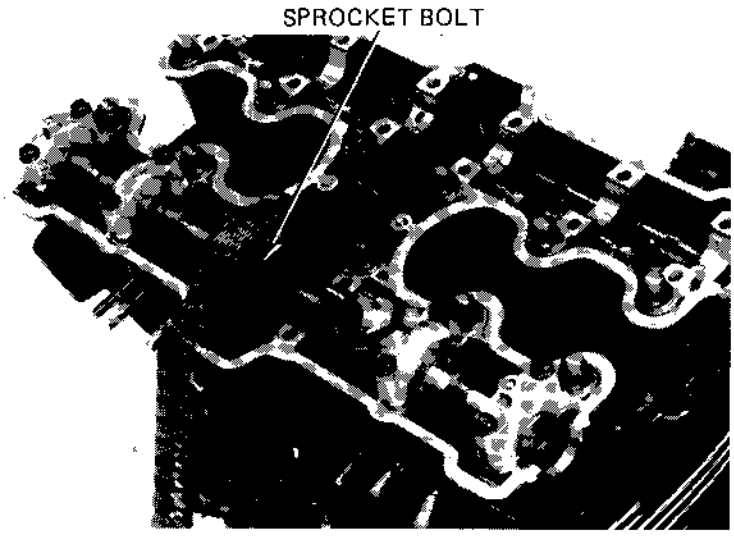
Turn the crankshaft counterclockwise 360° and install the other camshaft sprocket bolt and tighten to the specified torque. Turn the crankshaft another 360° and tighten the sprocket bolt which was installed earlier.

TORQUE: 18–20 N·m (1.8–2.0 kg-m, 13–15 ft-lb)

Tighten the camshaft holder bolts in a crisscross pattern.

TORQUE: 12–16 N·m (1.2–1.6 kg-m, 9–12 ft-lb)

Make sure that the "1.4T" and index marks are aligned as shown on page 9-21 and the No. 1 (or 4) cam lobes face toward the spark plug. Recheck the position of the exhaust camshaft sprocket; the punch marks must align with the cylinder head surface.



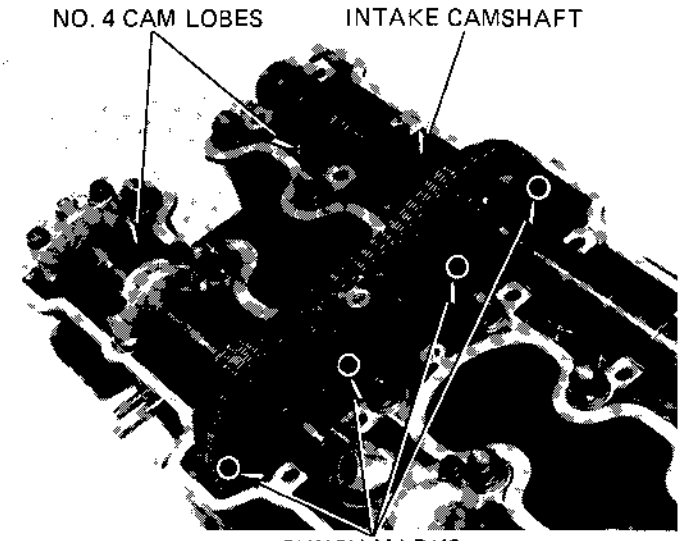
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Place the intake cam chain over the intake camshaft and sprocket, aligning the sprocket punch marks with the cylidner head surface.

Install the intake camshaft, positioning the cam lobes for the No. 1 (or 4) cylinder toward the spark plugs. Install a camshaft sprocket bolt, but do not tighten yet.

NOTE:

> If the sprocket was not removed from the camshaft during disassembly, then reinstall as an assembled set.

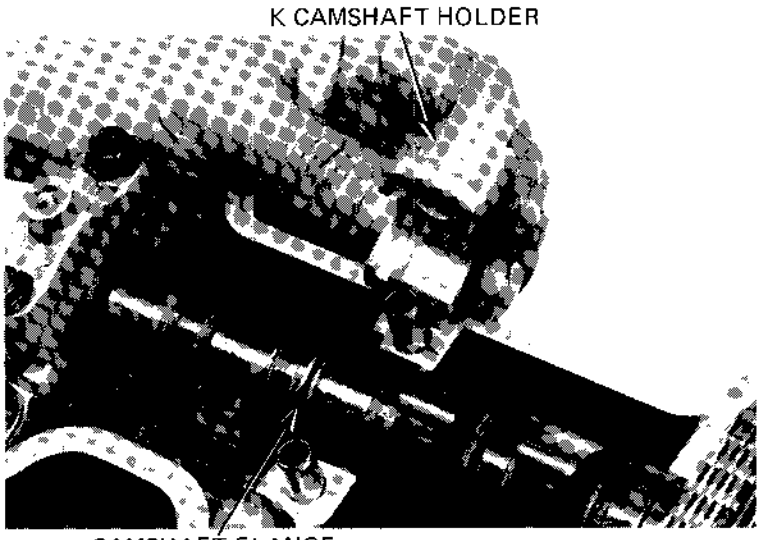


Loosely install the F and L camshaft holders. Install the G and K holders loosely, positioning the camshaft so its flange fits into the slot in the K holder.

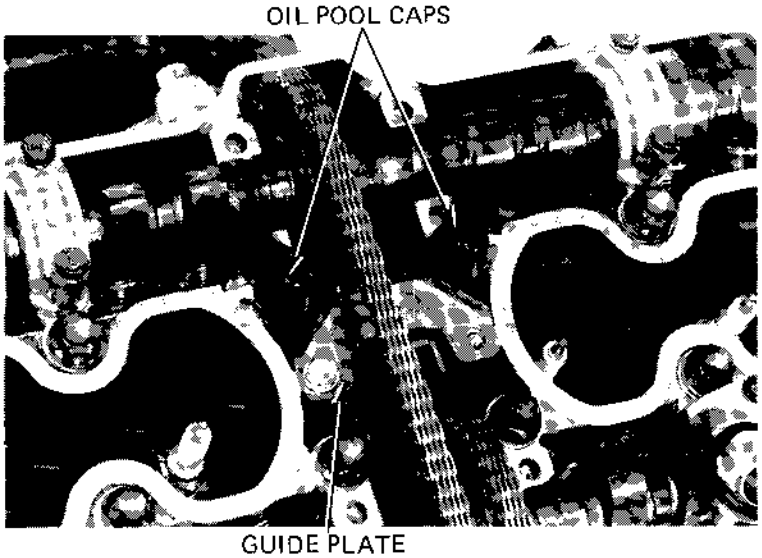
Install and tighten the camshaft sprocket bolts, following the same procedures described for exhaust camshaft installation.

Tighten the camshft holder bolts in a crisscross pattern.

Recheck the crankshaft and camshaft sprocket alignment.

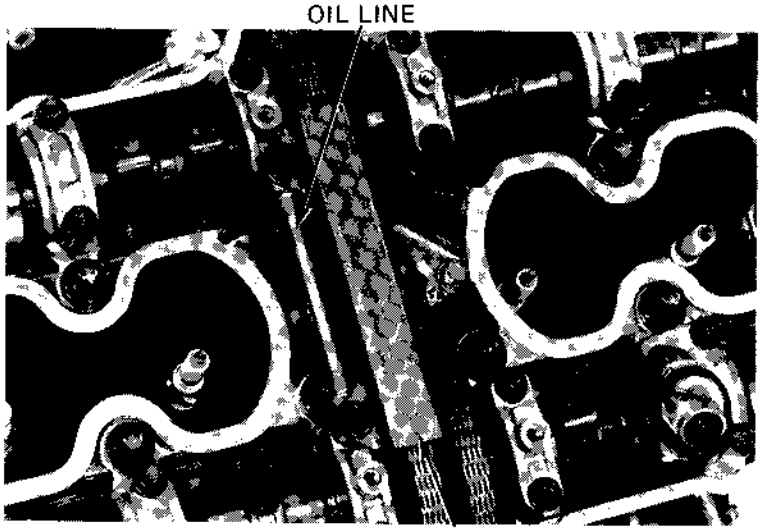


Install the exhaust cam chain guide plate and oil pool caps.



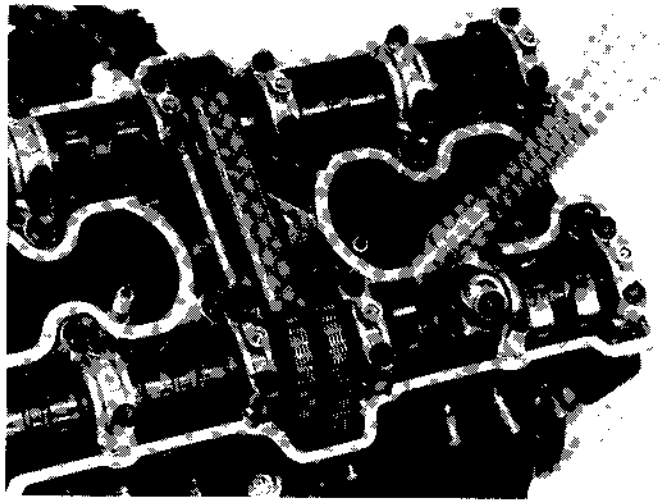
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Install the oil line and cam chain guide with the B, C, H and J holders. Tighten in a crisscross pattern.



Fill the oil pockets in the head with oil so that the cam lobes are submerged.

Adjust the valve clearance (page 3-8).

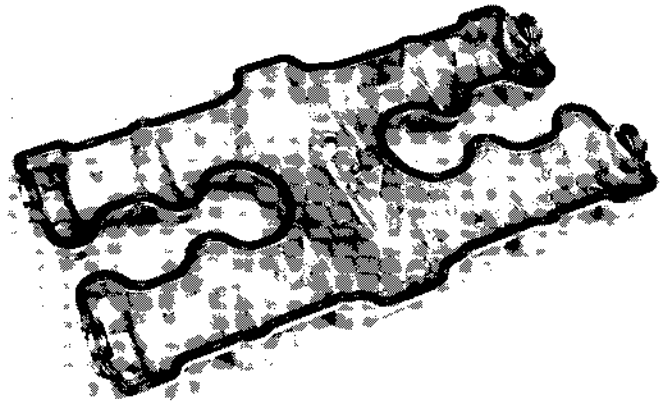


Inspect the cylinder head cover gasket for damage or deterioration.

Apply a sealant on the cylinder gasket at eight paices as shown.

NOTE:

Clean the gasket before applying sealant.



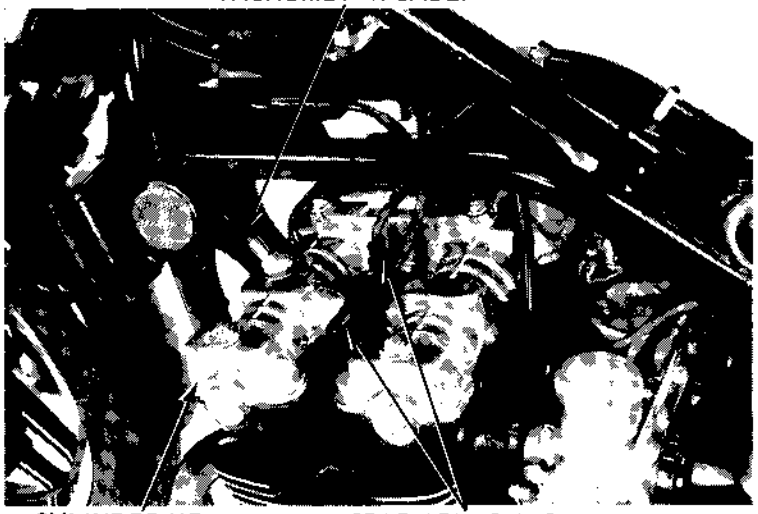
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Install the cylinder head cover.

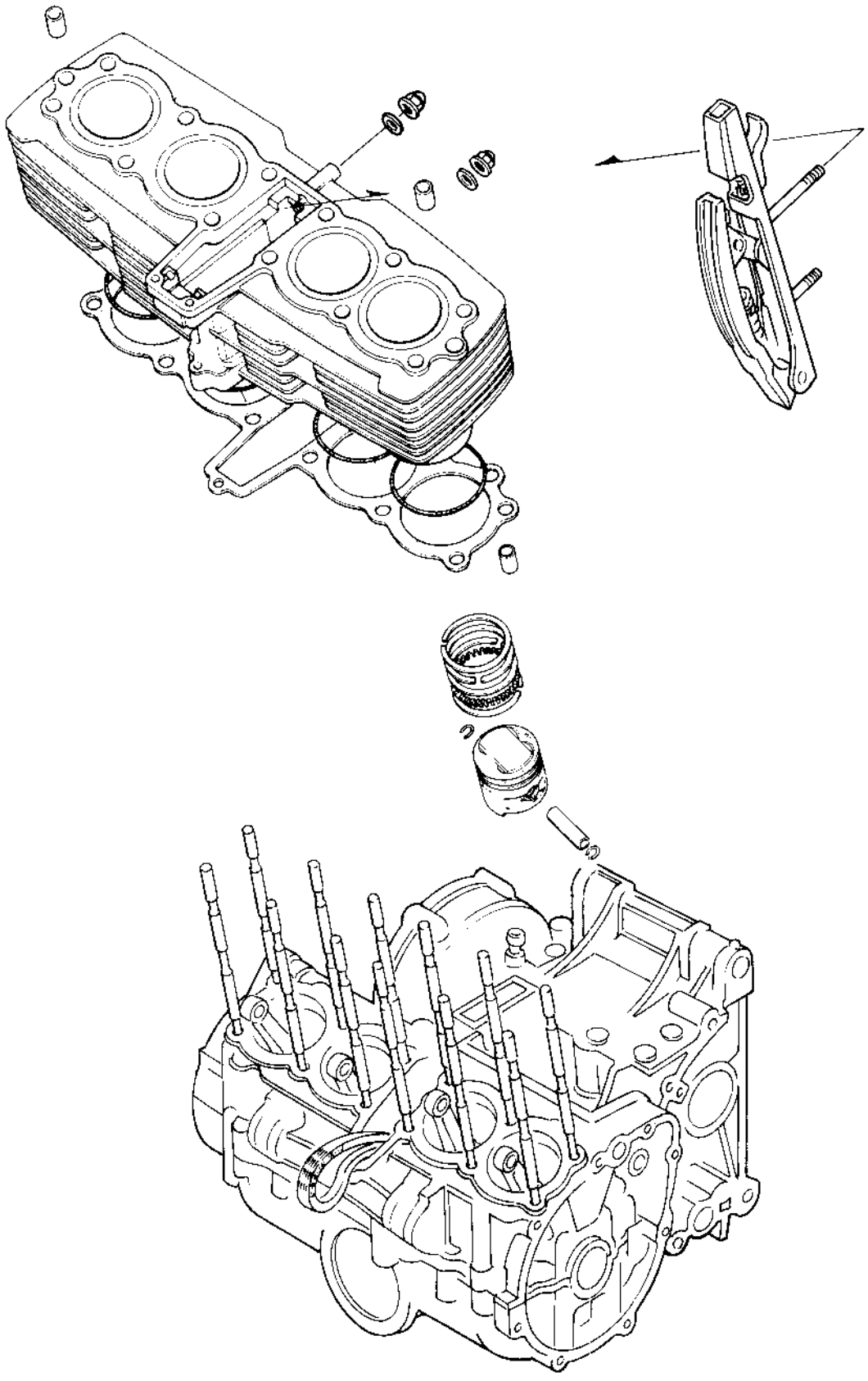
Connect the tachometer cable.
Install the spark plug caps.

Install the pulse generator cover.

Adjuster cam chain tension (page 3-12).



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10. CYLINDER/PISTON

SERVICE INFORMATION	10–1	PISTON REMOVAL	10–3
TROUBLESHOOTING	10–1	PISTON INSTALLATION	10–7
CYLIDER REMOVAL	10–2	CYLINDER INSTALLATION	10–7

SERVICE INFORMATION

GENERAL

- The engine must be removed to perform cylinder/piston maintenance and inspection.

SPECIFICATIONS

			STANDARD	SERVICE LIMIT
Cylinder	I.D.		70.000–70.010 mm (2.7559–2.7563 in)	70.10 mm (2.760 in)
	Warpage		—	0.10 mm (0.0039 in)
Piston, piston rings and piston pin	Piston ring-to-ring groove clearance	TOP	0.025–0.055 mm (0.0009–0.0021 in)	0.09 mm (0.0035 in)
		SECOND	0.015–0.045 mm (0.0006–0.0018 in)	0.09 mm (0.0035 in)
	Ring end gap	TOP	0.15–0.35 mm (0.0059–0.0138 in)	0.5 mm (0.02 in)
		SECOND	0.15–0.35 mm (0.0059–0.0138 in)	0.5 mm (0.02 in)
		OIL (SIDE RAIL)	0.30–0.90 mm (0.018–0.0354 in)	1.1 mm (0.043 in)
	Piston O.D.		69.970–69.990 mm (2.7547–2.7555 in)	69.91 mm (2.7524 in)
	Piston pin bore		17.002–17.008 mm (0.6693–0.6696 in)	17.03 mm (0.6704 in)
	Connecting rod small end I.D.		17.016–17.034 mm (0.6699–0.6706 in)	17.05 mm (0.6712 in)
	Piston pin O.D.		16.994–17.000 mm (0.6690–0.6692 in)	16.98 mm (0.6685 in)
	Piston-to-piston pin clearance		—	0.04 mm (0.0016 in)
	Cylinder-to-piston clearance		—	0.10 mm (0.0039 in)
	Piston pin-to-connecting rod clearance		0.016–0.040 mm (0.0006–0.0016 in)	0.060 mm (0.0024 in)

TOOLS

Special

Piston Base (2 required)	07958–3000000
Piston Ring Compressor (2 required)	07954–2830000

TROUBLESHOOTING

Compression low
1. Worn cylinder
2. Worn piston rings

Excessive smoke
1. Worn cylinder or piston
2. Improper installation of piston rings
3. Scored or scratched piston or cylinder wall

Overheating
1. Excessive carbon build-up on the piston or combustion chamber wall.

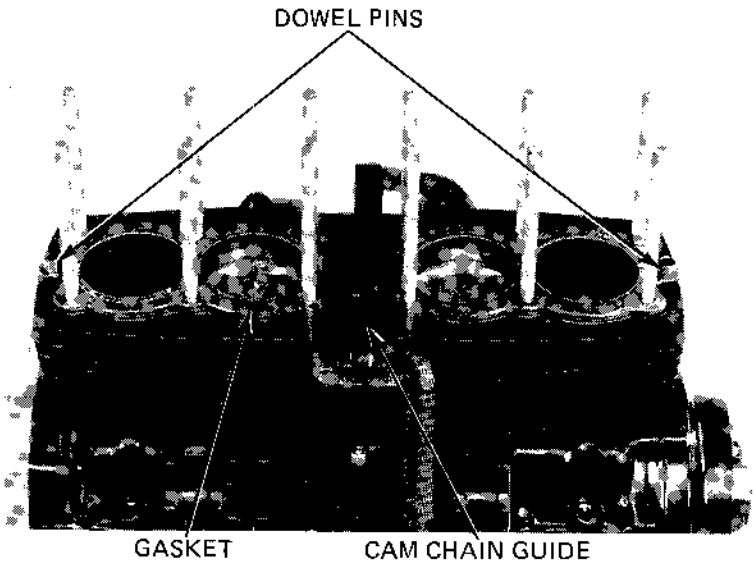
Knocking or abnormal noise
1. Worn piston and cylinder
2. Excessive carbon build-up

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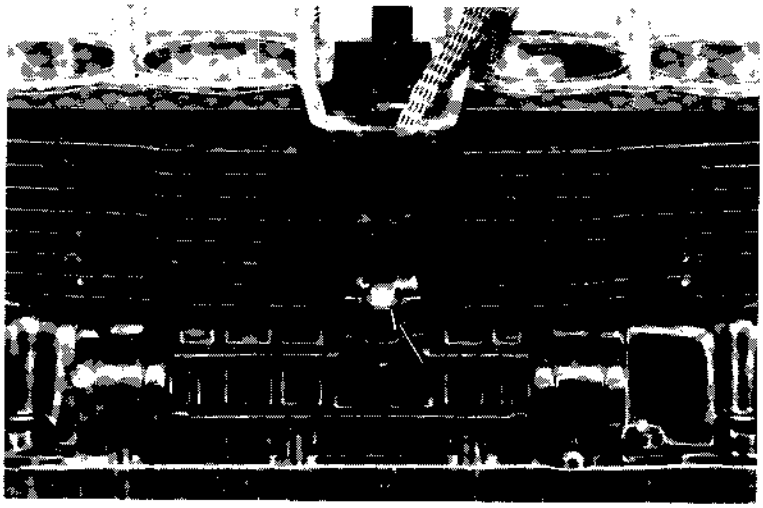
CYLINDER REMOVAL

Remove the cylinder head (Section 9).
Remove the cylinder gasket and dowel pins.

Remove the cam chain guide from the cylinder.



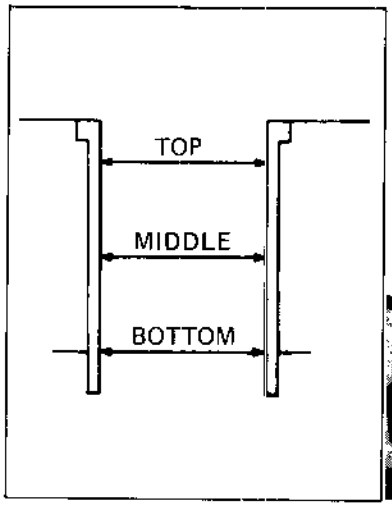
Remove the bolt at the middle of the front cylinder base.
Remove the cylinder.
Remove the cam chain tensioner lock nuts and tensioner.

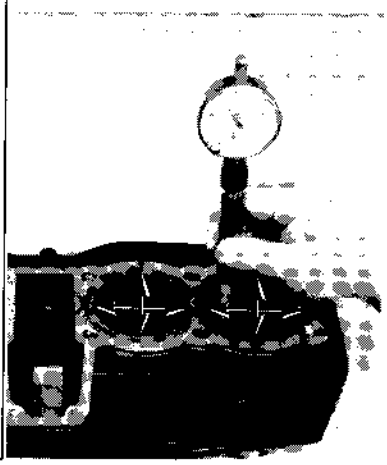


INSPECTION CYLINDER

Inspect the cylinder bores for wear or damage. Measure the cylinder I.D. at three levels in an X and Y axis.

SERVICE LIMIT: 70.10 mm (2.760 in)

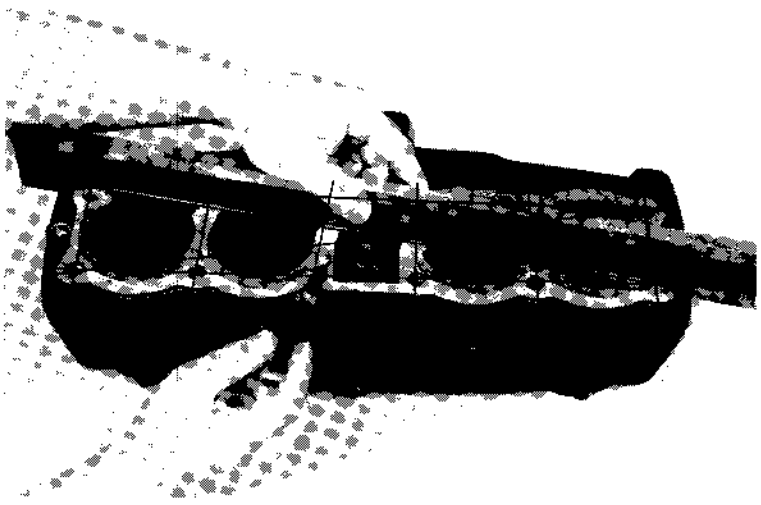




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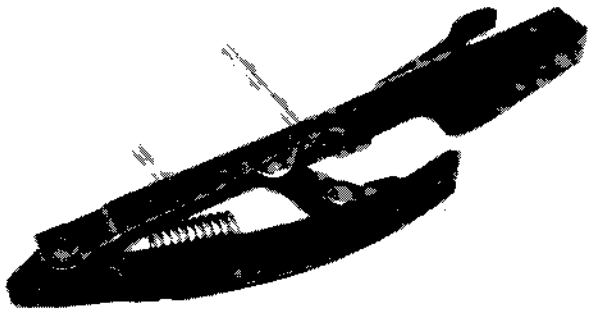
Inspect the top of the cylinder for warpage. Check in an X pattern as shown.

SERVICE LIMIT: 0.10 mm (0.0039 in)



CAM CHAIN TENSIONER

Inspect the slipper of the cam chain tensioner for damage or excessive wear.
Inspect the tension of the spring.



PISTON REMOVAL

Remove each piston pin clip with needle nose pliers.

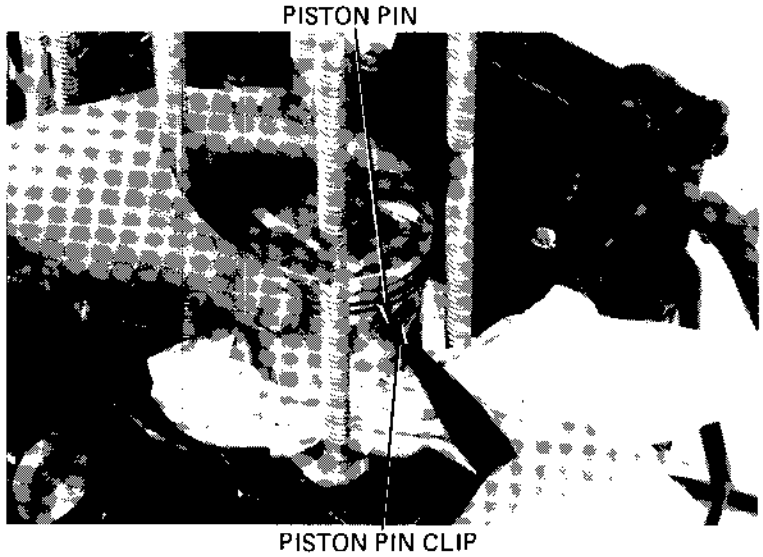
NOTE:

> Do not allow clips to fall into the crankcase. Place a shop towel into the crankcase holes.

Press the piston pin out.

NOTE:

> Mark the pistons to indicate their cylinder positions for correct reassembly.



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PISTON/PISTON RING INSPECTION

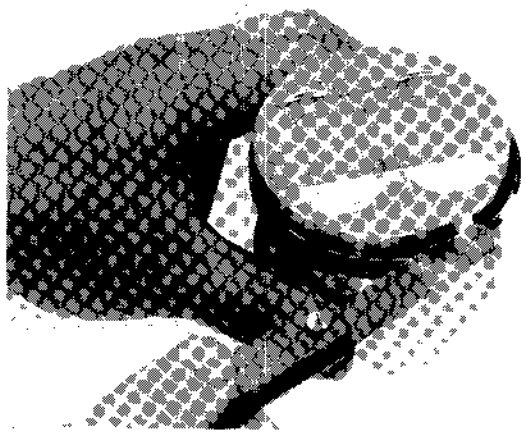
Inspect the piston ring-to-groove clearances.

SERVICE LIMIT: TOP 0.09 mm (0.0035 in)
SECOND 0.09 mm (0.0035 in)

NOTE:

Mark the rings so that they can be returned to their original locations.

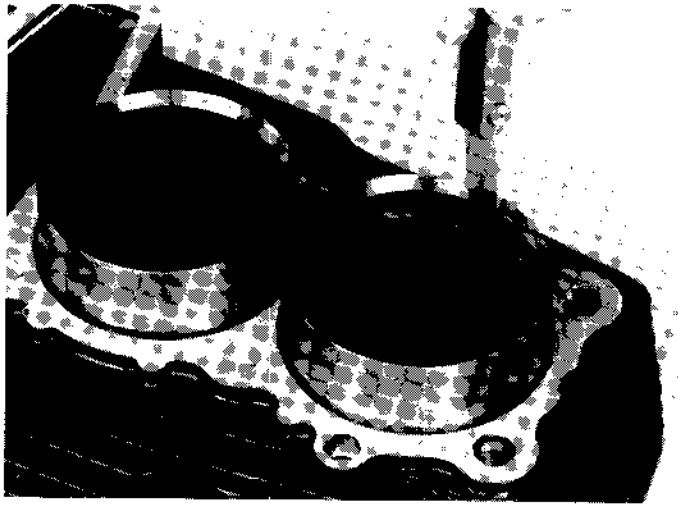
Inspect the pistons for damage and ring grooves for wear.



Insert each piston ring into the cylinder, and measure the end gap.

SERVICE LIMITS:
TOP: 0.5 mm (0.02 in)
SECOND: 0.5 mm (0.02 in)
OIL (Side rail): 1.1 mm (0.043 in)

Replace the rings if the gaps are larger than the service limits.

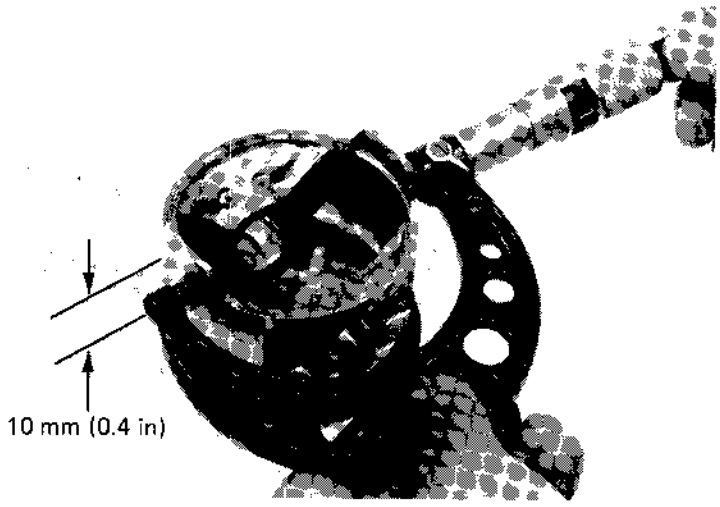


Measure the piston O.D. 90° to the piston pin hole and 10 mm (0.4 in) from the bottom.

SERVICE LIMIT: 69.91 mm (2.7524 in)

Calculate the cylinder-to-piston clearance.

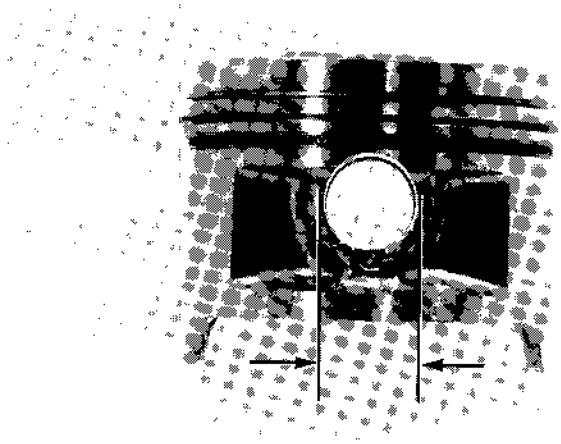
SERVICE LIMIT: 0.10 mm (0.0039 in)



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Measure the piston pin hole I.D.

SERVICE LIMIT: 17.03 mm (0.6704 in)

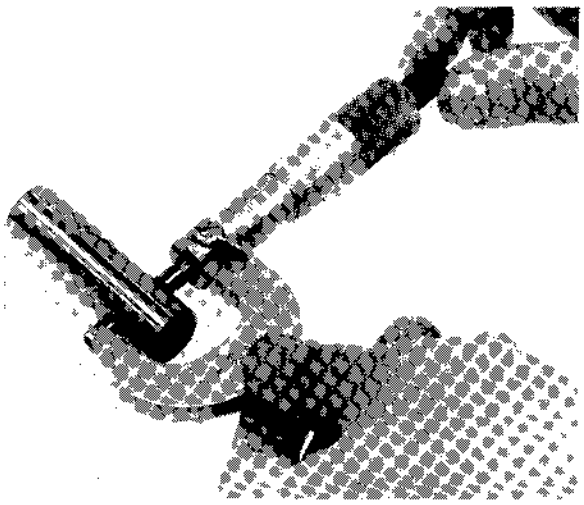


Measure the piston pin O.D.

SERVICE LIMIT: 16.98 mm (0.6685 in)

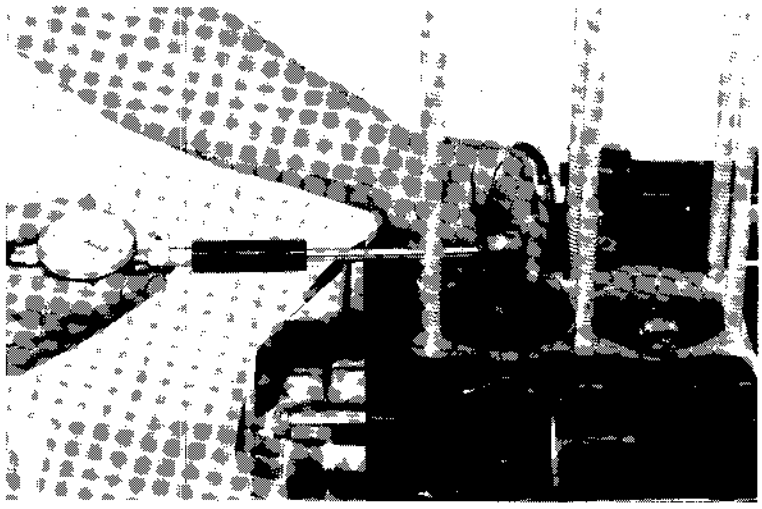
Determine the piston-to-piston pin clearance.

SERVICE LIMIT: 0.04 mm (0.0016 in)



Measure the connecting rod small end I.D.

SERVICE LIMIT: 17.050 mm (0.6712 in)

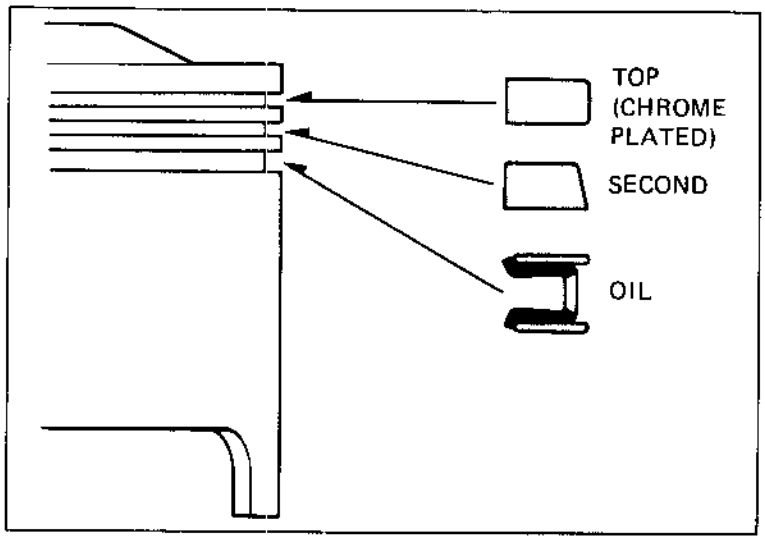


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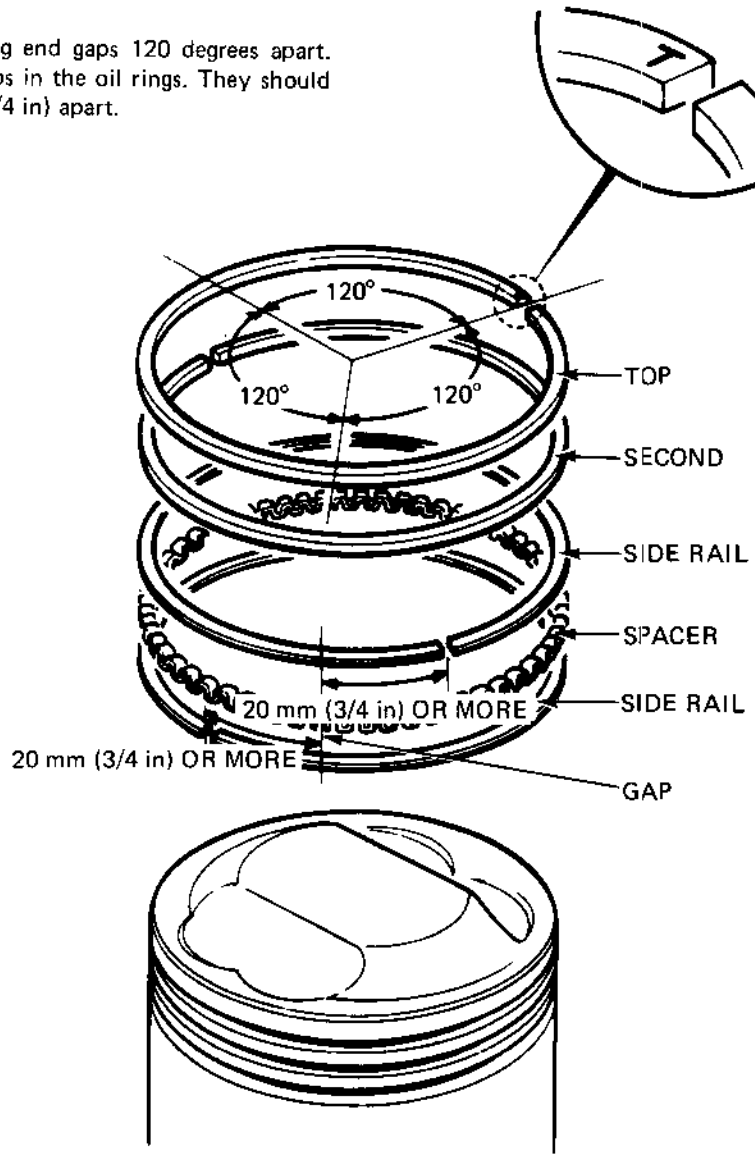
PISTON RING INSTALLATION

NOTE:

- Install the piston rings with the markings facing up.
- After installation, the rings should rotate freely.



Space the piston ring end gaps 120 degrees apart. Do not align the gaps in the oil rings. They should be at least 20 mm (3/4 in) apart.



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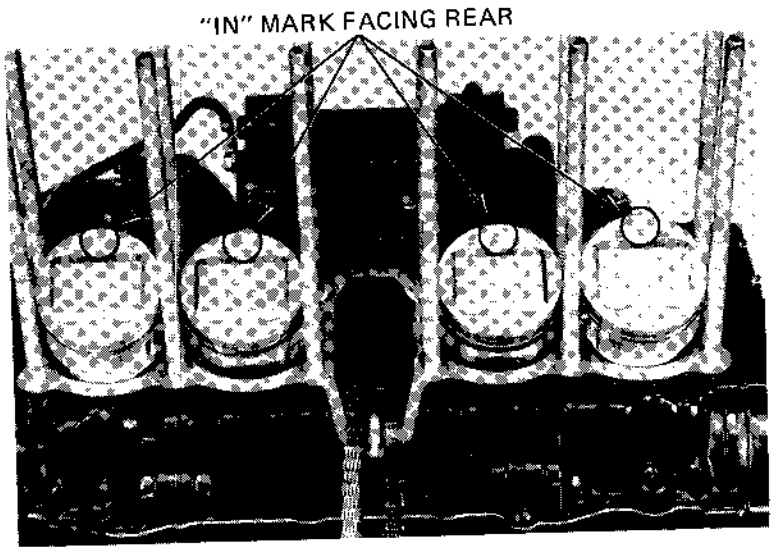
PISTON INSTALLATION

Apply molybdenum disulfide grease to the connecting rod small ends.

Install the pistons, piston pins and clips.

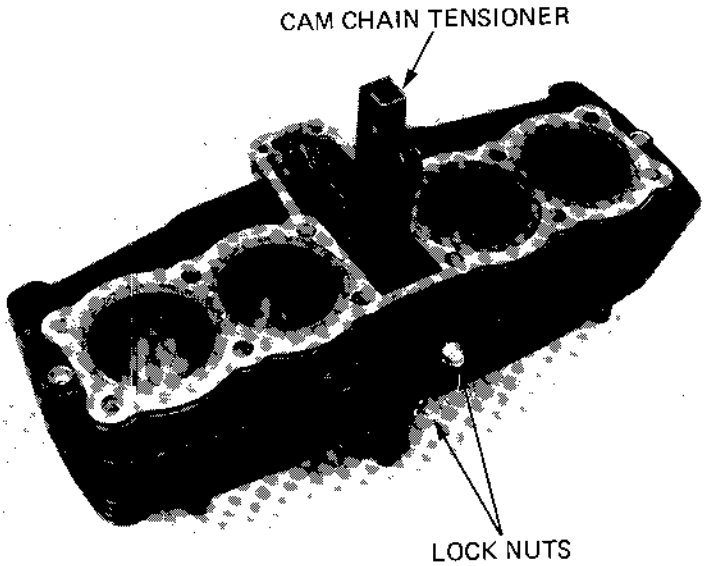
NOTE:

- Position the mark "IN" on the piston to the intake side.
- Install the pistons in their original positions.
- Do not allow piston pin clips to fall into the crankcase.

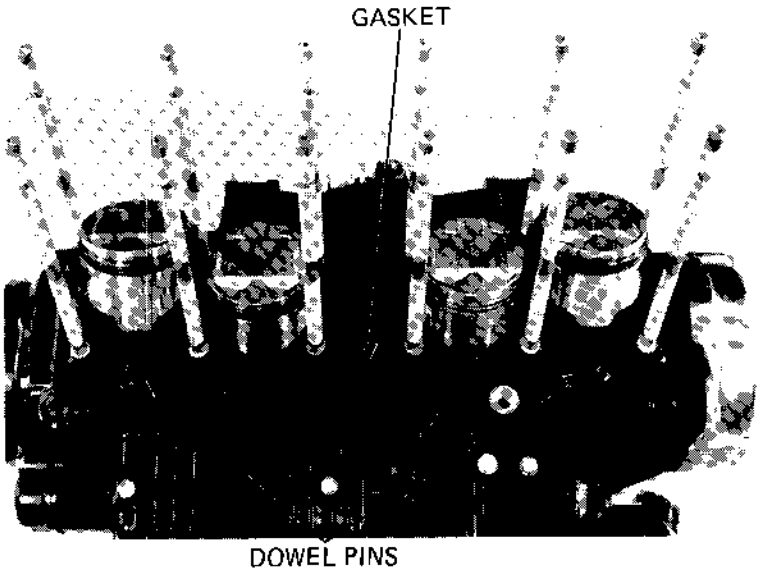


CYLINDER INSTALLATION

Install the cam chain tensioner and lock nuts.

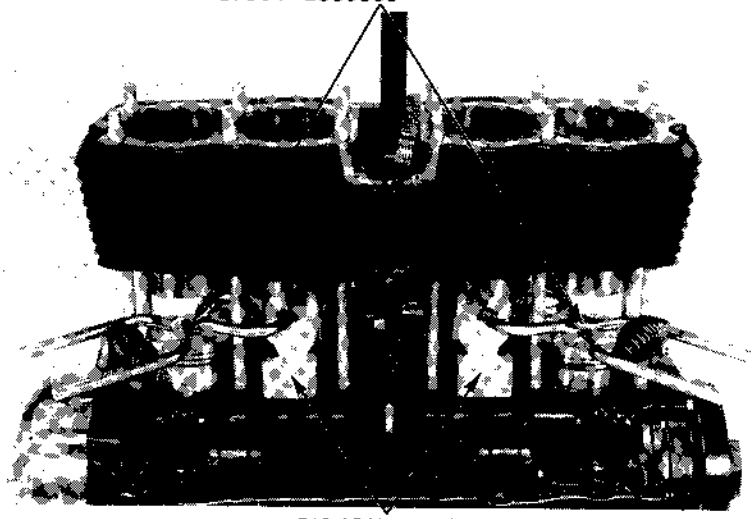


Install the dowel pins and gasket.



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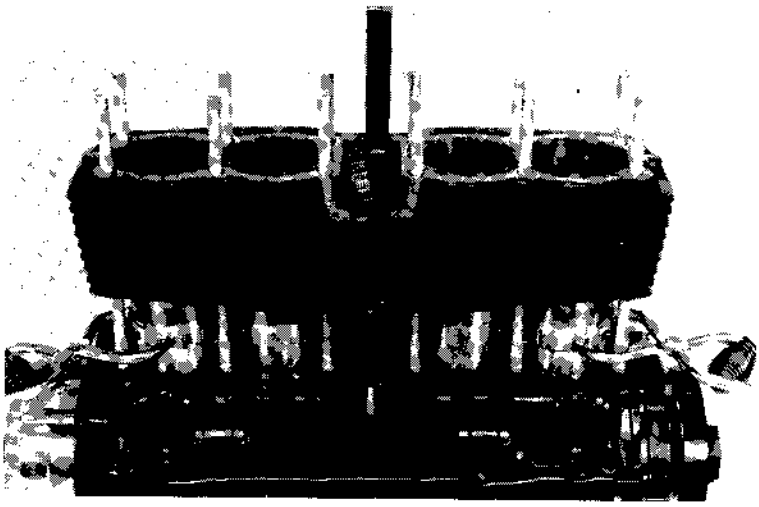
Place the No. 2 and 3 pistons at Top Dead Center. Attach the piston ring compressors to the No. 2 and 3 pistons and install the cyliner.
After the cylinder is over the No. 2 and 3 pistons, attach the compressors onto the No. 1 and 4 pistons.



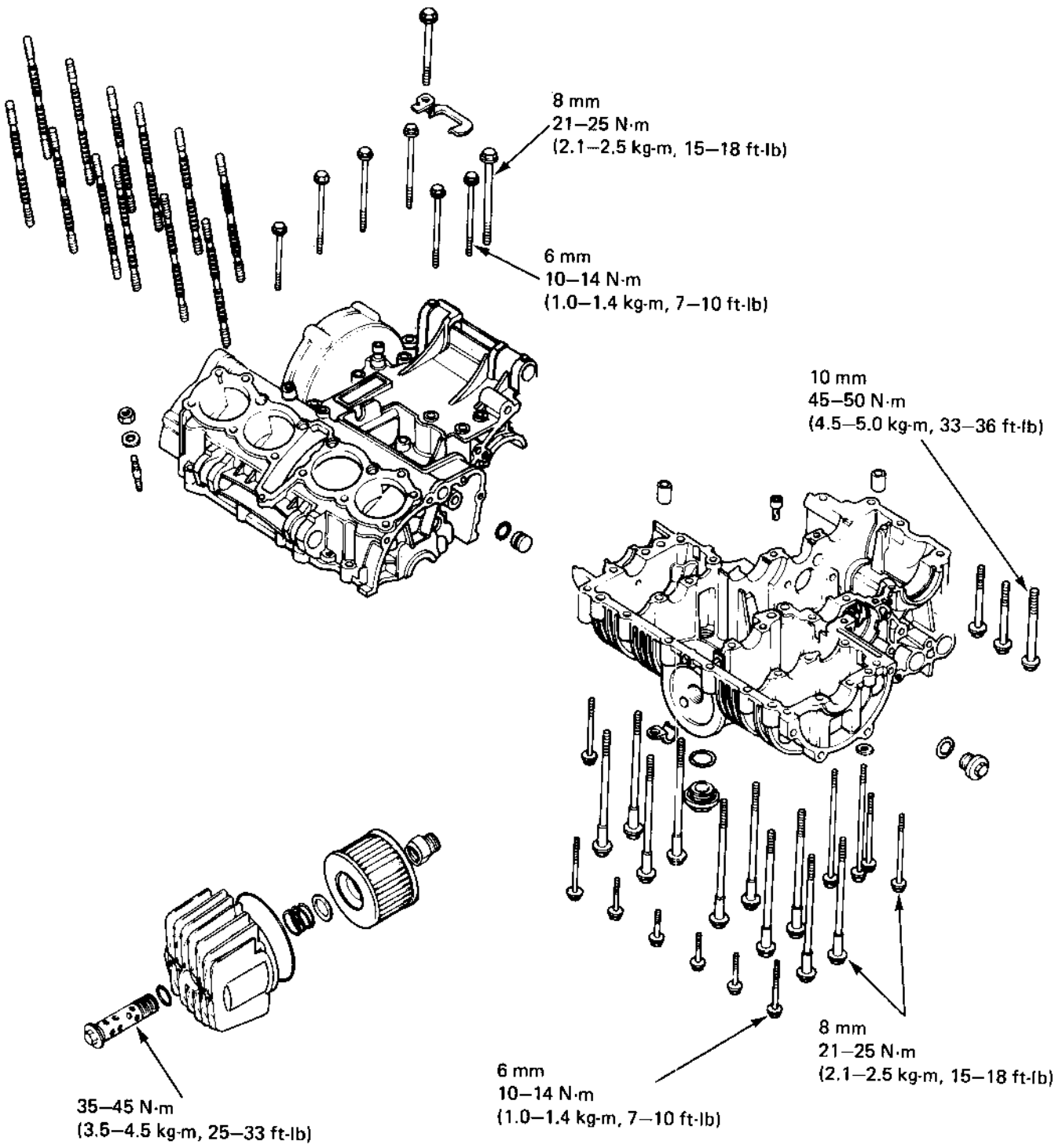
Tighten the cylinder base bolt securely after installation.

Install a new cylinder head gasket, dowel pins and cam chain guide.

Install the cylinder head (page 9-19).



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11. CRANKCASE

SERVICE INFORMATION	11–1
CRANKCASE DISASSEMBLY	11–2
CRANKCASE ASSEMBLY	11–3

SERVICE INFORMATION

GENERAL

- To repair the crankshaft, connecting rod, primary shaft and the transmission including the shift fork and drum, it is necessary to separate the crankcase halves.
- The following parts must be removed before disassembling the crankcase.

• Oil pan	See section 2
• Oil pump	See section 2
• Clutch and starter clutch	See section 6
• Gear shfit linkage	See section 7
• Alternator	See section 8
• Cylinder head	See section 9
• Cylinder/piston	See section 10
• Starter motor	See section 19

11

TORQUE VALUES

8 mm bolt (Crankshaft)	21–25 N·m (2.1–2.5 kg-m, 15–18 ft-lb)
8 mm bolt (Crankcase)	21–25 N·m (2.1–2.5 kg-m, 15–18 ft-lb)
6 mm bolt	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
10 mm bolt	45–50 N·m (4.5–5.0 kg-m, 33–36 ft-lb)

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CRANKCASE DISASSEMBLY

Remove the components listed under General on page 11-1.

Remove the upper crankcase bolts.

Turn the engine upside-down and remove the lower crankcase bolts.

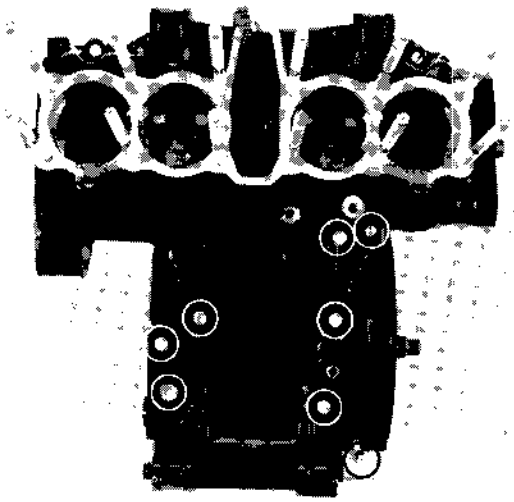
NOTE:

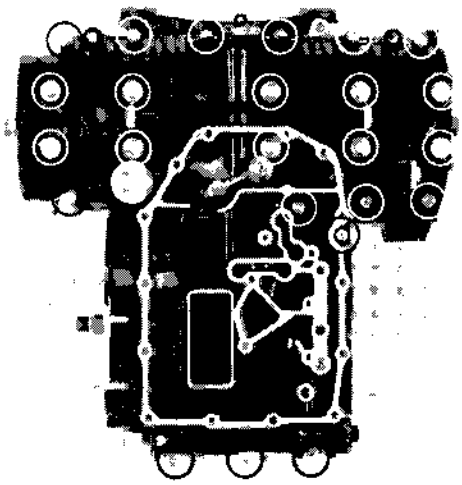
> Remove the bolts in two or more steps and in a crisscross pattern to prevent warpage.

Separate the crankcase halves.

CAUTION:

> *Do not pry between the upper and lower cases.*





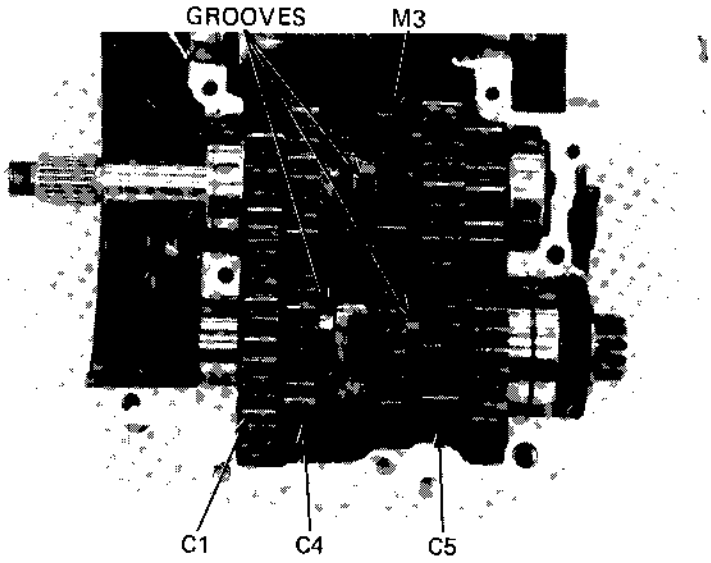
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CRANKCASE ASSEMBLY

Slide the transmission C4 gear into the C1 gear. Make sure that the other gears are not engaged.

Apply molybdenum disulfide grease to the grooves of the M3, C4 and C5 gears.

Apply molybdenum disulfide grease to the crankshaft main bearings.

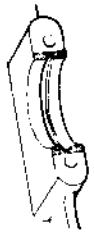


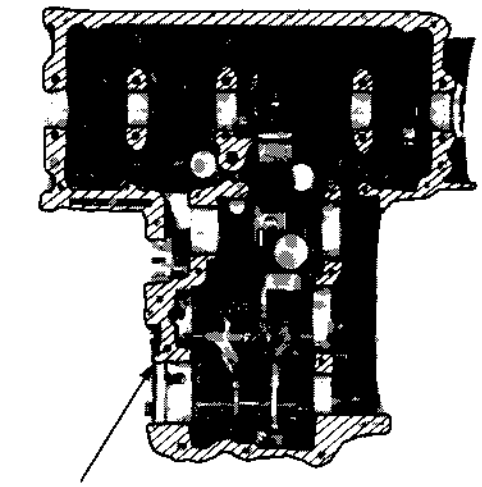
LOWER CRANKCASE

Clean the crankcase mating surfaces.
Apply liquid sealant to the mating surfaces of the crankcase halves.

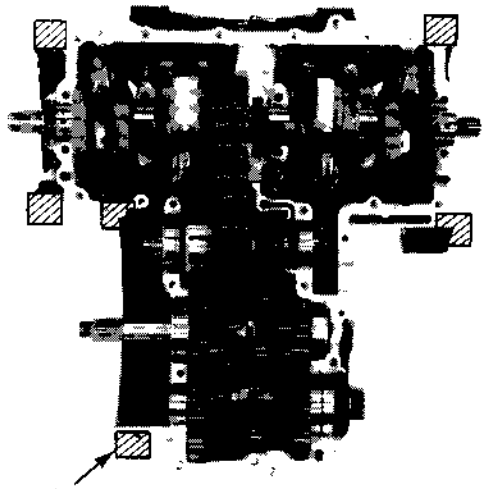
CAUTION:

Do not apply sealant to the area near the main bearings.





UPPER CRANKCASE

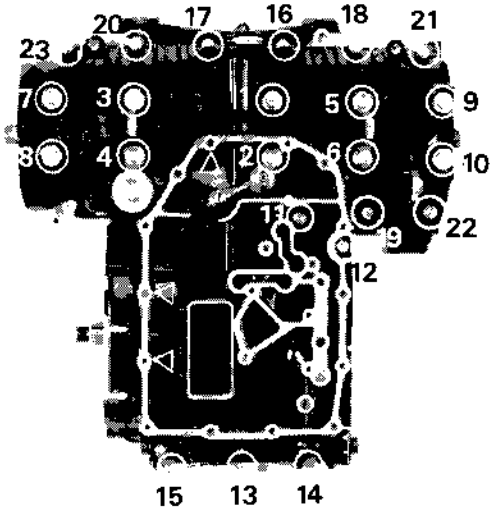


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Assemble the crankcase halves, aligning the shift fork claws with the gears.
Tighten the bolts to the specified torque values in the sequence shown.

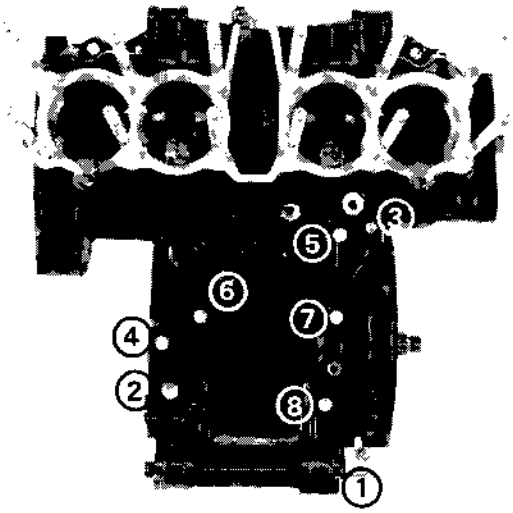
TORQUE VALUES:

8 mm bolt (Crankshaft):
21–25 N·m (2.1–2.5 kg-m, 15–18 ft-lb)
8 mm bolt (Crankcase):
21–25 N·m (2.1–2.5 kg-m, 15–18 ft-lb)
6 mm bolt
10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
10 mm bolt
45–50 N·m (4.5–5.0 kg-m, 33–36 ft-lb)



NOTE:

- Make sure that the plain washers are under the bolt head of the ten crankshaft bearing bolts.
- Apply engine oil to the threads and head of the ten crankshaft holding bolts.
- Use the sealing washers under the bolt heads for holes with the mark "Δ" on the crankcase.

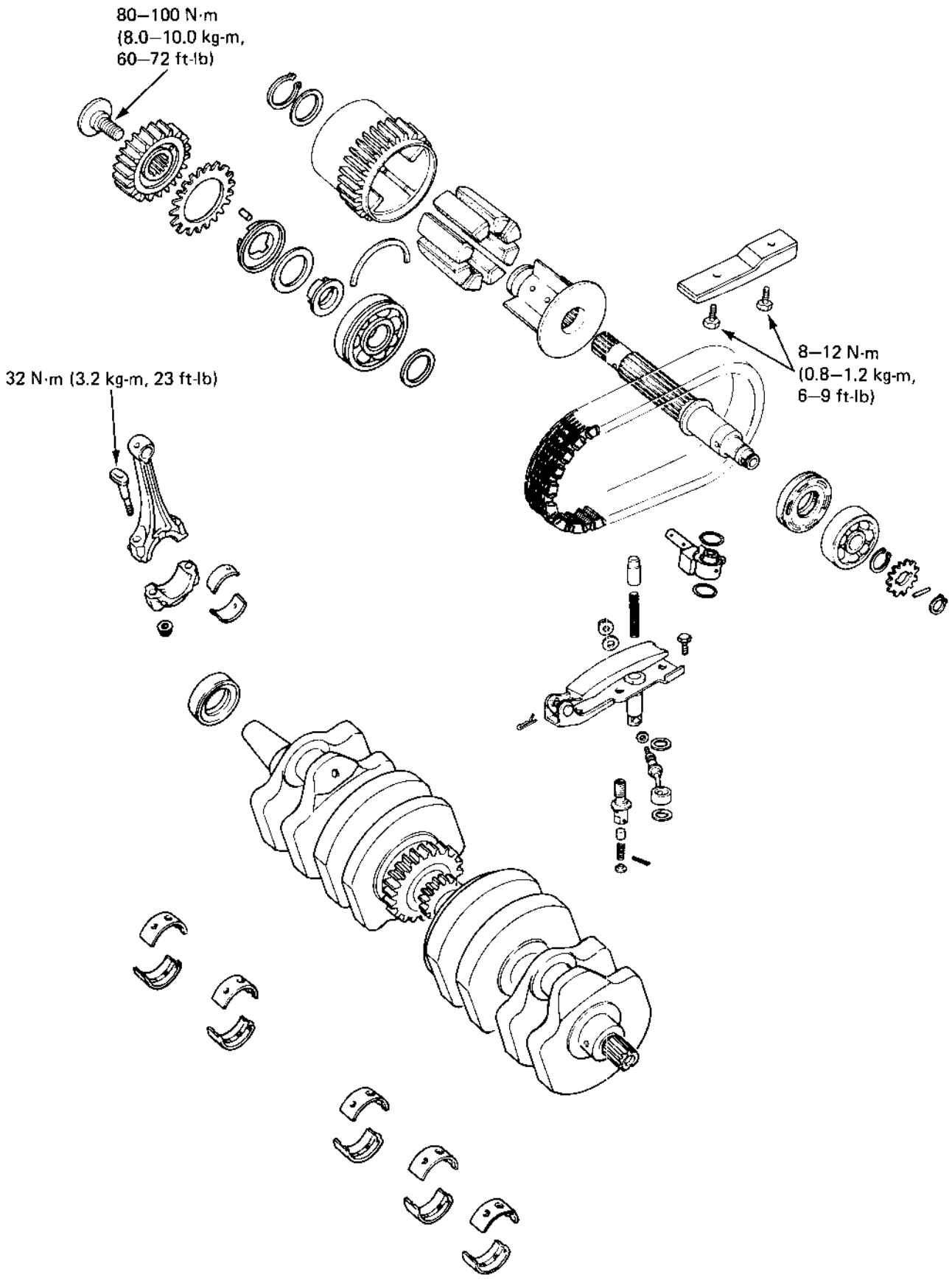


Tighten the upper crankcase bolts to the specified torque, proceeding front to rear.

NOTE:

If the oil galley cap is removed, apply molybdenum disulfide grease to the threads before installing.

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12. CRANKSHAFT/PRIMARY SHAFT

SERVICE INFORMATION	12–1	BEARING INSPECTION	12–8
TROUBLESHOOTING	12–2	BEARING SELECTION	12–10
PRIMARY SHAFT REMOVAL	12–3	CONNECTING ROD INSTALLATION	12–13
PRIMARY SHAFT DISASSEMBLY	12–3	PRIMARY SHAFT ASSEMBLY	12–14
PRIMARY CHAIN TENSIONER DIASSEMBLY	12–5	PRIMARY CHAIN TENSIONER ASSEMBLY	12–15
CONNECTING ROD REMOVAL	12–7		

SERVICE INFORMATION

GENERAL

- All bearing inserts are select fit and identified by color code. Select replacement bearings from the code tables. After installing new bearings, recheck them with plastigauge to verify clearance.
- Apply molybdenum disulfied grease to the main journals and crankpins during assembly.

SPECIFICATIONS

		STANDARD	SERVICE LIMIT
Electric Starter	Drive gear O.D.	47.175–47.200 mm (1.8573–1.8583 in)	47.155 mm (1.8565 in)
	Idle gear I.D.	10.000–10.015 mm (0.3937–0.3943 in)	10.04 mm (0.395 in)
	Idle gear shaft O.D.	11.966–11.984 mm (0.4711–0.4718 in)	11.95 mm (0.470 in)
	Idle gear-to-shaft clearance	—	0.10 mm (0.004 in)
Crankshaft	Connecting rod big end side clearance	0.05–0.20 mm (0.002–0.008 in)	0.3 mm (0.01 in)
	Runout	—	0.05 mm (0.002 in)
	Crankpin oil clearance	0.025–0.055 mm (0.0010–0.0022 in)	0.065 mm (0.0026 in)
	Main journal oil clearance	0.030–0.060 mm (0.0012–0.0024 in)	0.07 mm (0.0028 in)
Cam chain	Length at 13 kg tension	315.30–315.74 mm (12.417–12.430 in)	318.2 mm (12.53 in)
Primary chain	Length at 36 kg tension	139.3–139.5 mm (5.48–5.49 in)	140.9 mm (5.55 in)

TORQUE VALUES

Crankpin	32 N·m (3.2 kg-m, 23 ft-lb)
Crankshaft	21–25 N·m (2.1–2.5 kg-m, 15–18 ft-lb)
Primary chain tensioner bolt	8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)
Primary shaft lock bolt	80–100 N·m (8.0–10.0 kg-m, 60–72 ft-lb)

TOOLS

Common

Driver	07746–0020100
Attachment, 20 mm I.D.	07746–0020400

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TROUBLESHOOTING

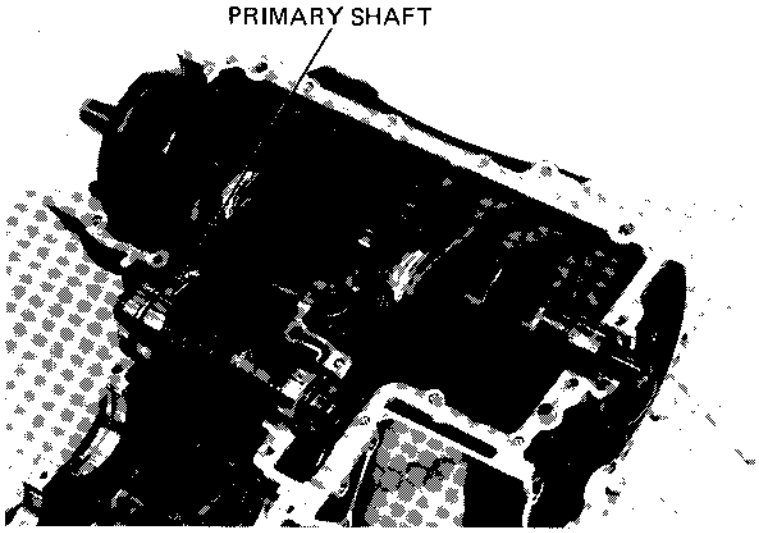
Excessive noise

1. Worn main journal bearing
2. Worn crank pin bearing

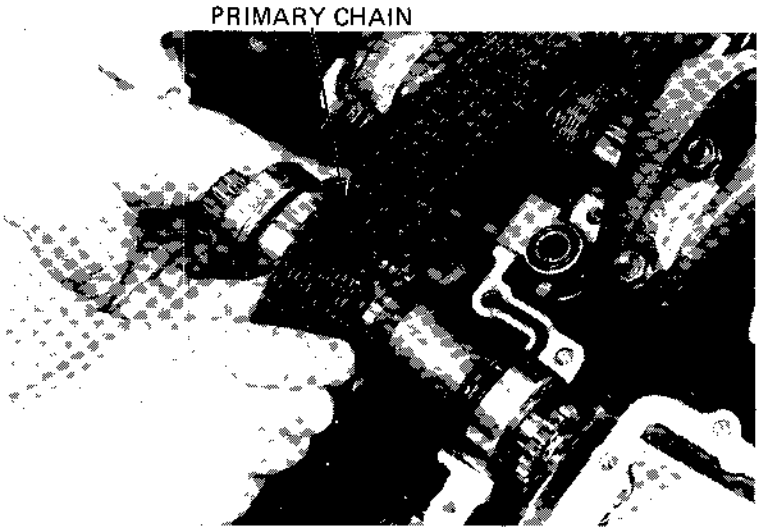
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PRIMARY SHAFT REMOVAL

Remove the starting motor (Section 19).
Remove the alternator (Section 8).
Remove the primary shaft drive gear (Section 6).
Disassemble the crankcase (Section 11) and remove the transmission assembly (Section 13).

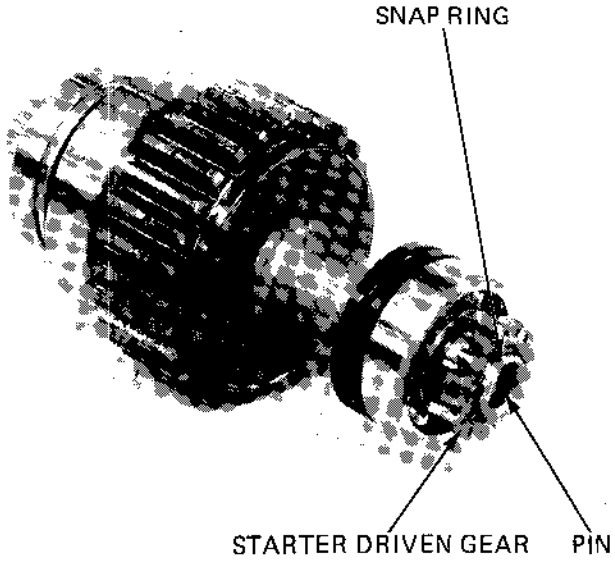


Raise the primary shaft assembly and remove the primary chain.



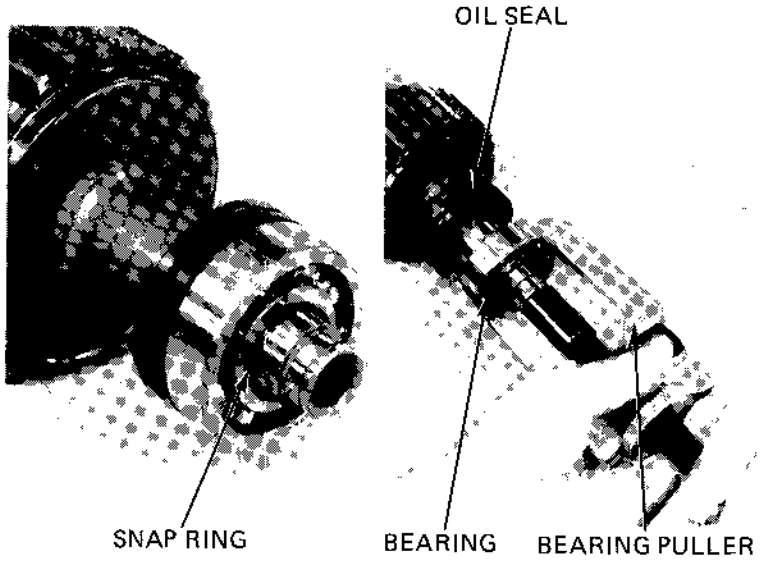
PRIMARY SHAFT DISASSEMBLY

Remove the snap ring, starter driven gear and pin.

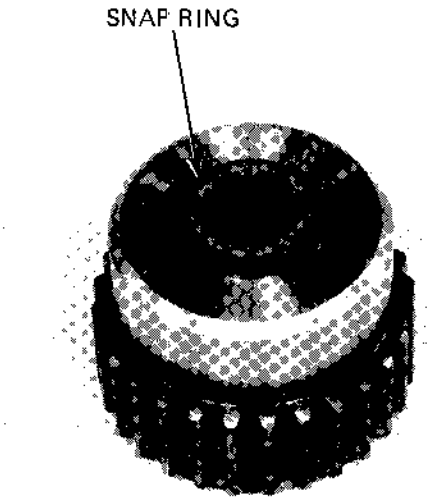


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Remove the bearing snap ring.
Remove the bearings with a bearing puller.
Remove the oil seal.

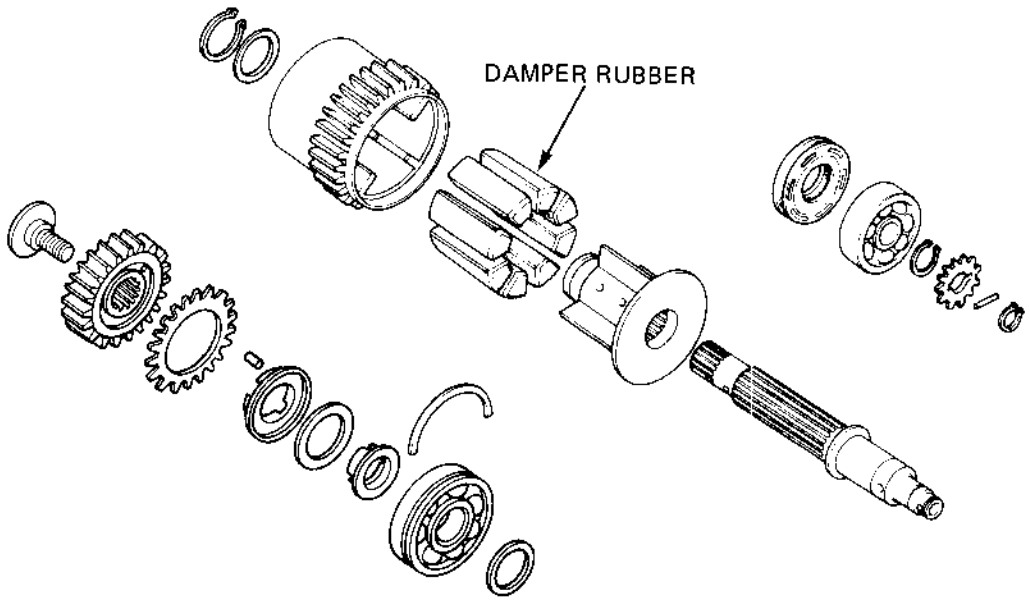


Remove the damper assembly from the primary shaft.
Remove the snap ring and disassemble the damper.



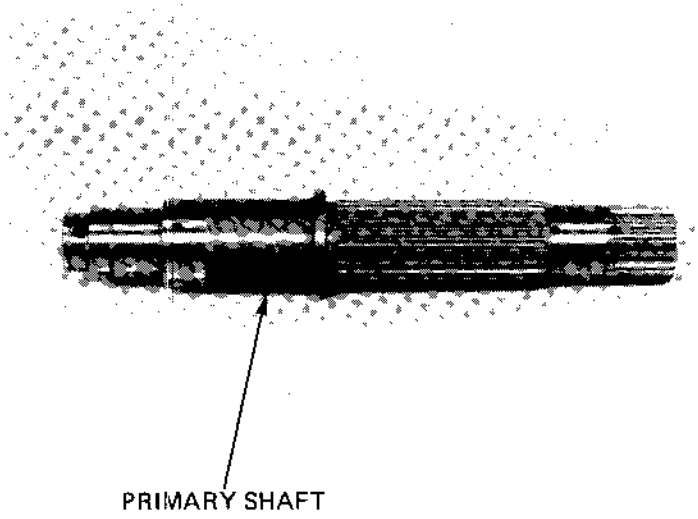
INSPECTION

Check the damper rubbers for wear or deterioration.
Replace if they are worn or deteriorated.



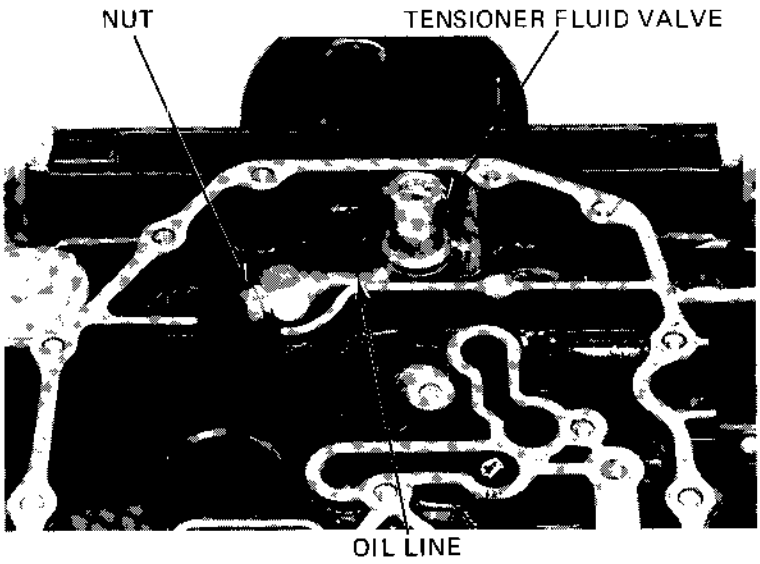
© HONDA MOTOR CO., LTD.

Check the primary shaft for scoring, wear or other damage.

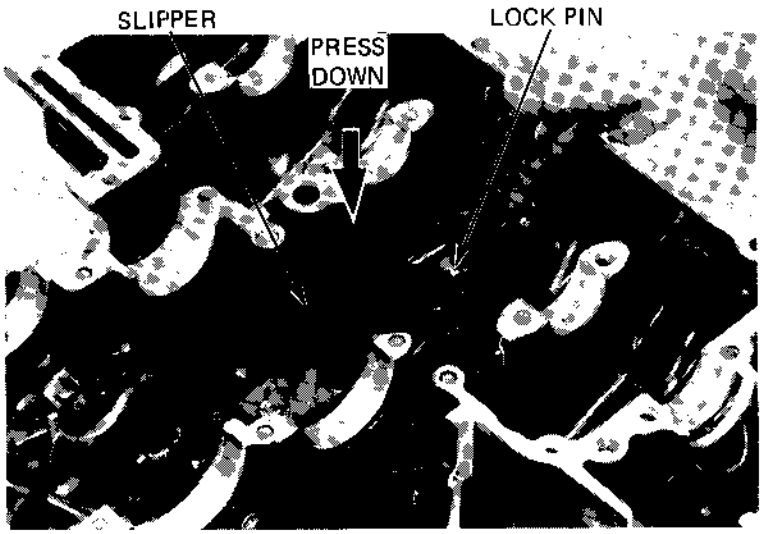


PRIMARY CHAIN TENSIONER DISASSEMBLY

Remove the nut, tensioner fluid valve and oil line.

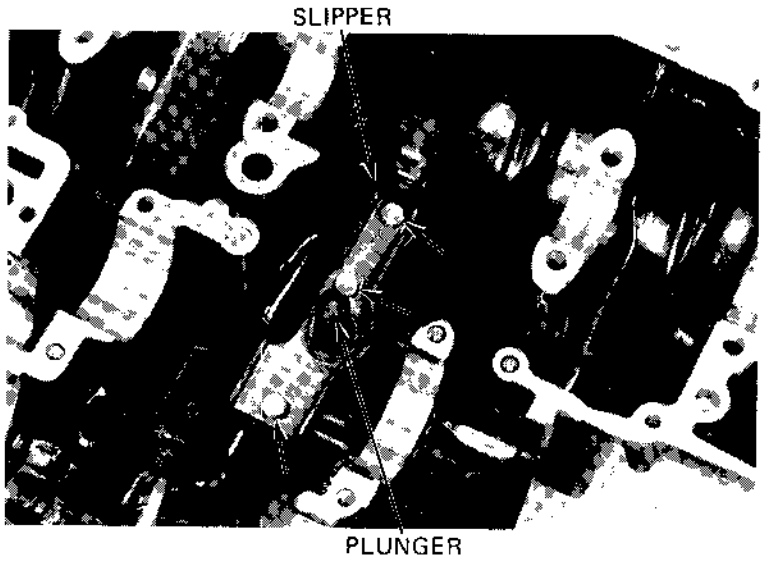


Press the slipper down and remove the lock pin.



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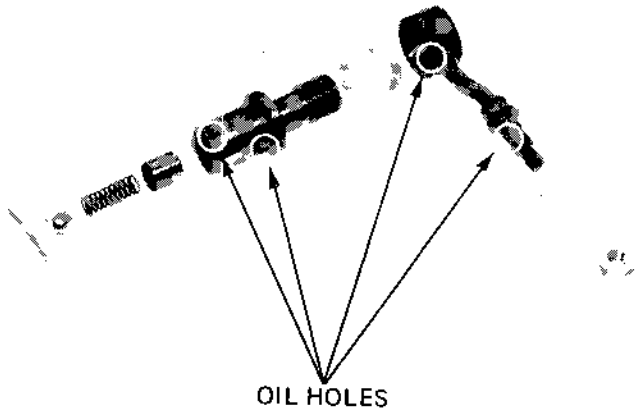
Remove the plunger and spring.
Remove the three slipper mounting bolts and slipper.



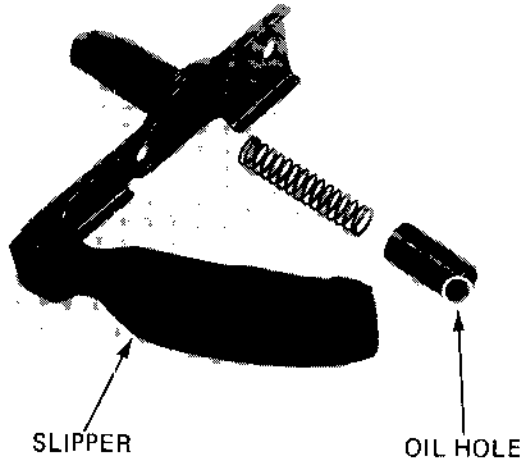
INSPECTION

Check the holes in the oil line and plunger for blockage.

Clean all parts with non-flammable or high flash point solvent.



Inspect the slipper for damage or excessive wear.



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CONNECTING ROD REMOVAL

Check the connecting rod side clearance.

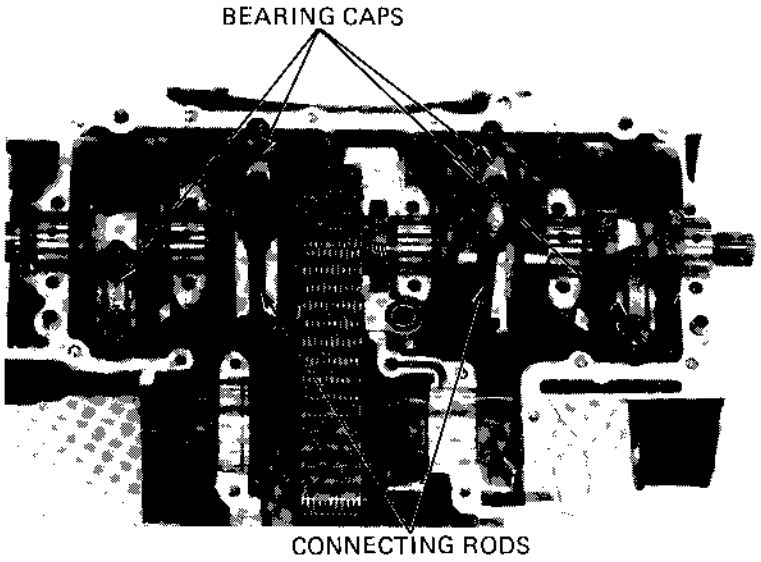
SERVICE LIMIT: 0.3 mm (0.01 in)



Remove the bearing caps and rods.

NOTE:

> Mark the rods, bearings and bearing caps to indicate cylinder position for correct re-assembly.



CRANKSHAFT INSPECTION

Remove the cam chain and primary chain.

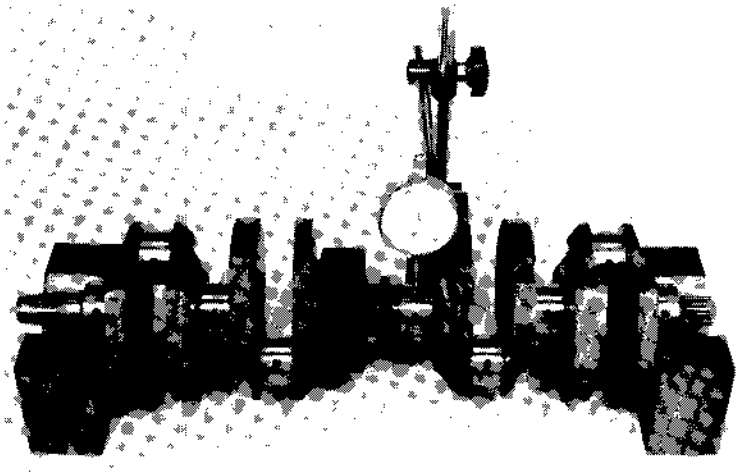
Set the crankshaft on a stand or V blocks.

Set a dial indicator on the center main journal.

Rotate the crankshaft two revolutions and read runout at the center journal.

Actual runout is 1/2 of the Total Indicator Reading.

SERVICE LIMIT: 0.05 mm (0.002 in)

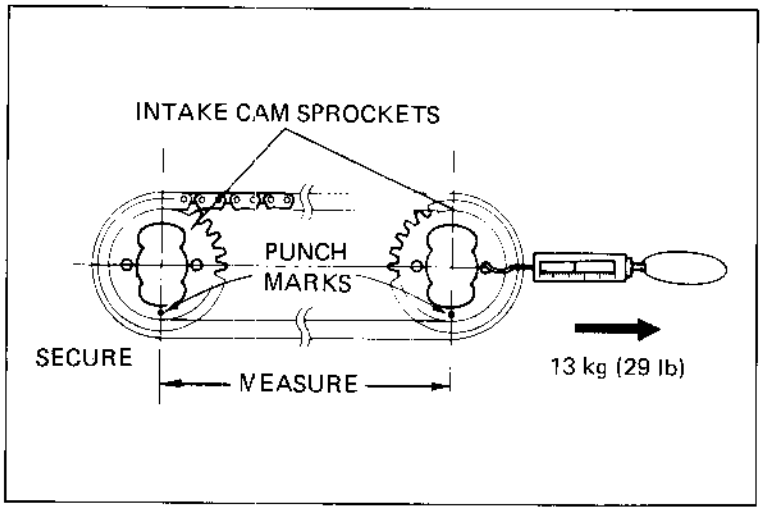


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CAM CHAIN LENGTH MEASUREMENT

Place the cam chain over the intake cam sprockets. Secure one sprocket. Apply 13 kg (29 lb) of tension with a spring scale to the other sprocket.
Measure the chain length between the sprocket punch marks as shown.

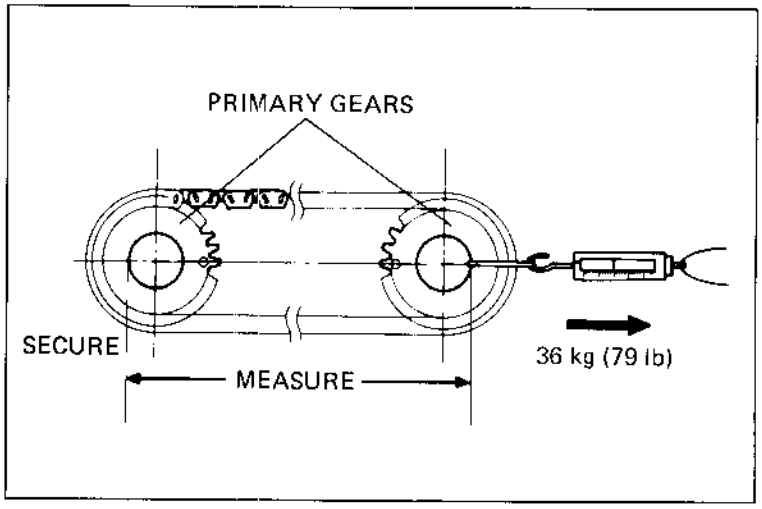
SERVICE LIMIT: 318.2 mm (12.53 in)



PRIMARY CHAIN LENGTH MEASUREMENT

Place the primary chain over the primary driven gears. Secure one gear.
Apply 36 kg (79 lb) of tension with a spring scale to the other gear. Measure the chain length as shown.

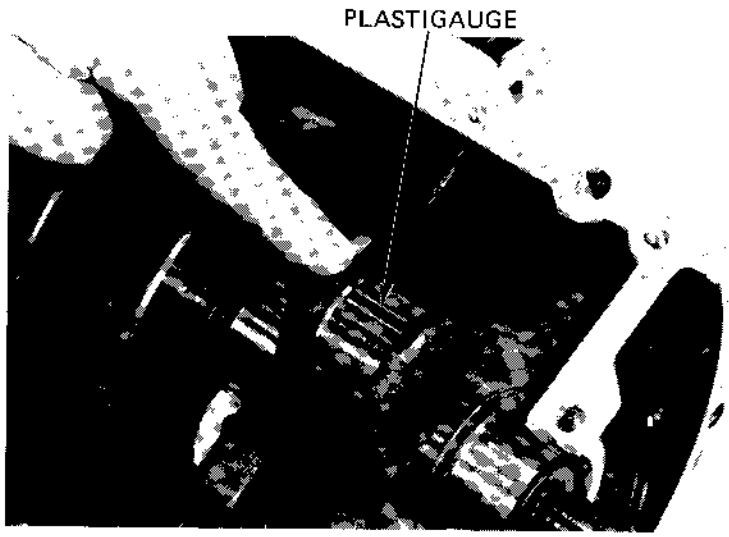
SERVICE LIMIT: 140.9 mm (5.55 in)



BEARING INSPECTION

CONNECTING RODS

Inspect the bearing inserts for damage or separation. Clean all oil from the bearing inserts and crankpins. Put a piece of plastigauge on each crankpin avoiding the oil holes.



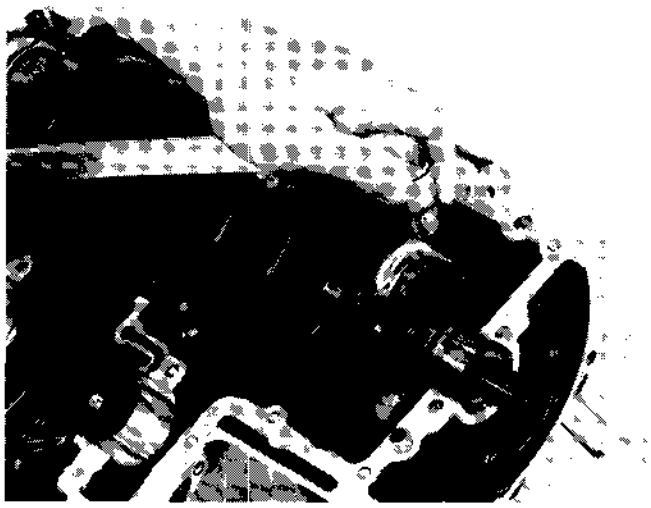
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Install the bearing caps and rods on the correct crankpins, and tighten them evenly.

TORQUE: 32N·m (3.2 kg-m, 23 ft-lb)

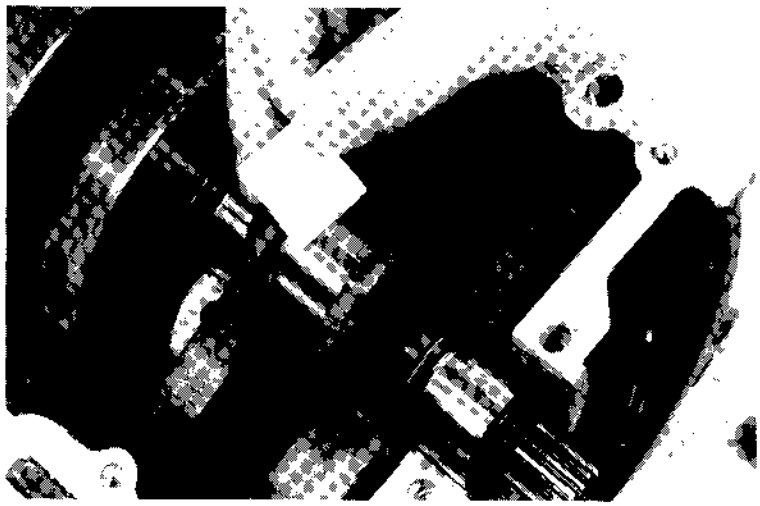
NOTE:

Do not rotate the crankshaft during inspection.



Remove the caps and measure the compressed plastigauge on each crankpin.

OIL CLEARANCE SERVICE LIMIT:
0.065 mm (0.0026 in)

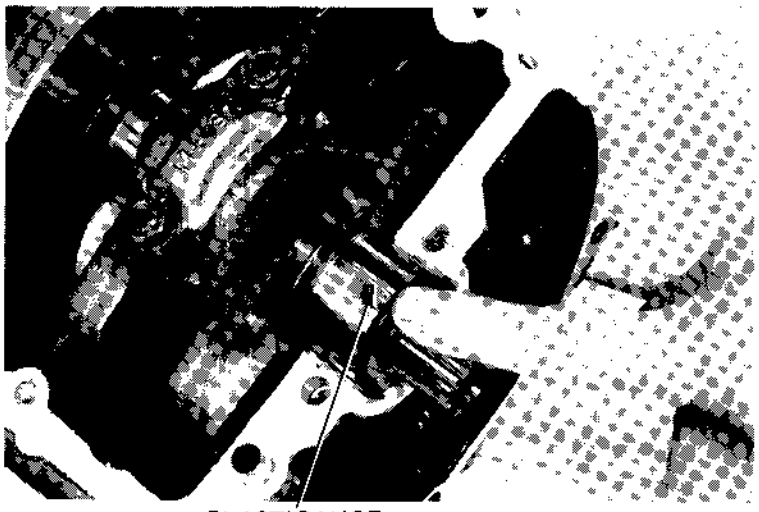


MAIN BEARINGS

Inspect the bearing inserts for damage or separation.

Clean all oil from the bearing inserts and journals.

Put a piece of plastigauge on each journal, avoiding the oil holes.



PLASTIGAUGE

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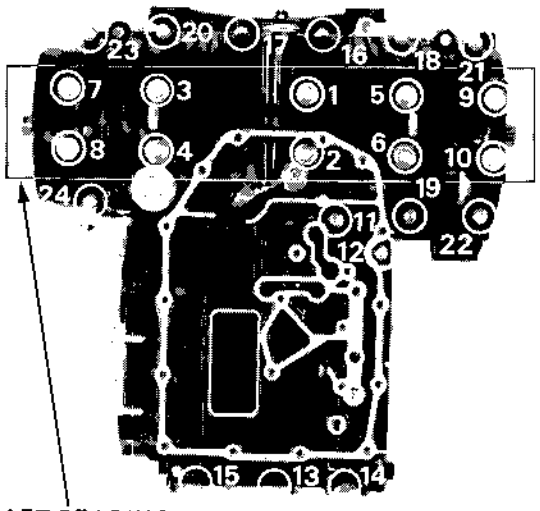
Install the main bearings on the correct journals on the lower crankcase and tighten them evenly in the sequence shown and in 2-3 steps.

TORQUE VALUES:

8 mm bolt (Crankshaft)
21–25 N·m (2.1–2.5 kg-m, 15–18 ft-lb)
8 mm bolt (Crankcase)
21–25 N·m (2.1–2.5 kg-m, 15–18 ft-lb)
6 mm bolt
10–14 N·9m (1.0–1.4 kg-m, 7–10 ft-lb)
10 mm bolt
45–50 N·m (4.5–5.0 kg-m, 33–36 ft-lb)

NOTE:

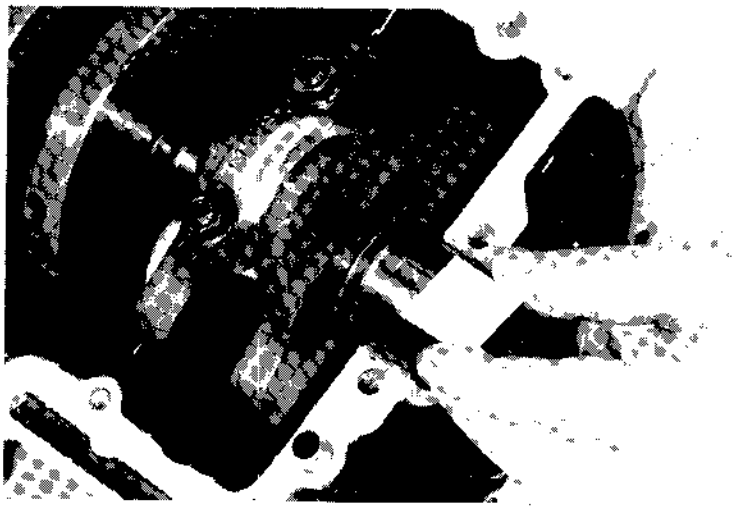
Do not rotate the crankshaft during inspection.



CRANKSHAFT BEARING BOLTS

Remove the lower crankcase and measure the compressed plastigauge on each journal.

OIL CLEARANCE SERVICE LIMIT:
0.07 mm (0.0028 in)

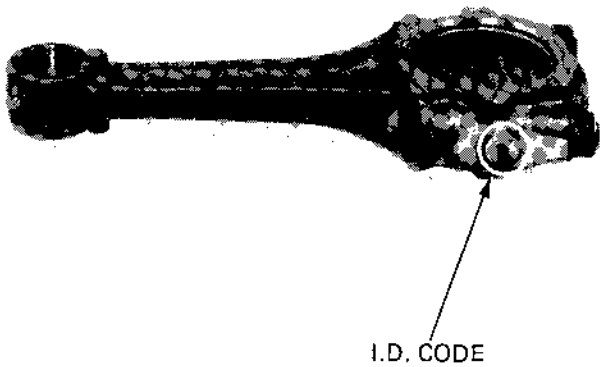


BEARING SELECTION

If rod bearing clearance is beyond tolerance, select replacement bearings as follows:

CONNECTING ROD BEARING INSERTS

Determine and record the corresponding rod I.D. code number.



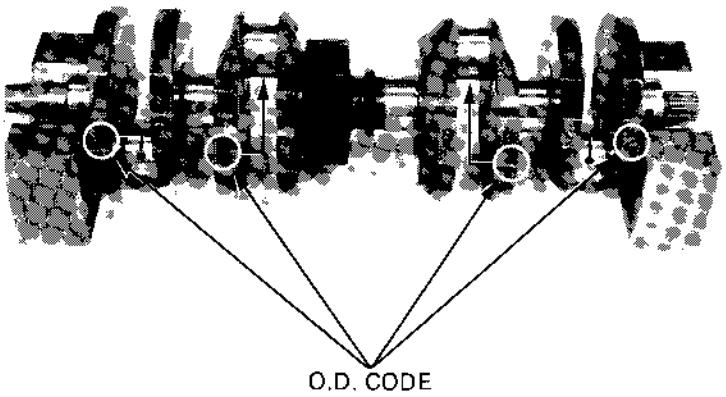
I.D. CODE

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Determine and record the corresponding crankpin O.D. code number (or measure the crankpin O.D.).

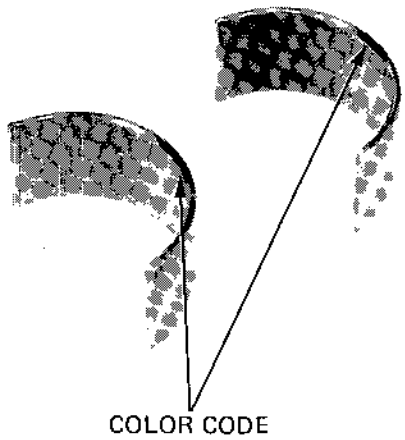
NOTE:

Number 1, 2 or 3 on each crank weight is the code for each crankpin O.D.



Cross reference the crankpin and rod codes to determine the replacement bearing color.

CONNECTING ROD I.D. CODE NO.		CRANKPIN O.D. CODE NO. 1: 35.992–36.000 mm	CRANKPIN O.D. CODE NO. 2: 35.984–35.992 mm	CRANKPIN O.D. CODE NO. 3: 35.975–35.984 mm
1	39.000–39.008 mm	E (Yellow)	D (Green)	C (Brown)
2	39.008–39.016 mm	D (Green)	C (Brown)	B (Black)
3	39.016–39.024 mm	C (Brown)	B (Black)	A (Blue)



BEARING INSERT THICKNESS:

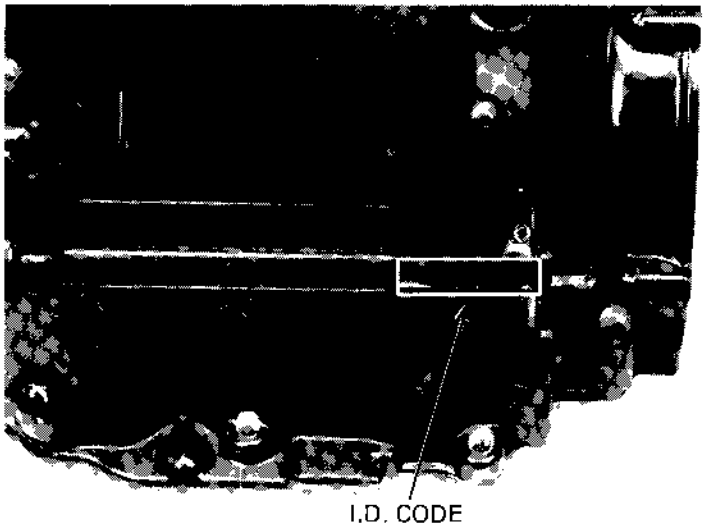
A (Blue): 1.502–1.506 mm (0.0591–0.0593 in)
B (Black): 1.498–1.502 mm (0.0590–0.0591 in)
C (Brown): 1.494–1.498 mm (0.0588–0.0590 in)
D (Green): 1.490–1.494 mm (0.0587–0.0588 in)
E (Yellow): 1.486–1.490 mm (0.0585–0.0587 in)

MAIN BEARING

Determine and record crankcase I.D. code numbers.

NOTE:

Letters A, B or C on the upper rear crankcase are the codes for the main journal I.D. from left to right; I.D. code for the third main journal from left to right is B in the example shown.

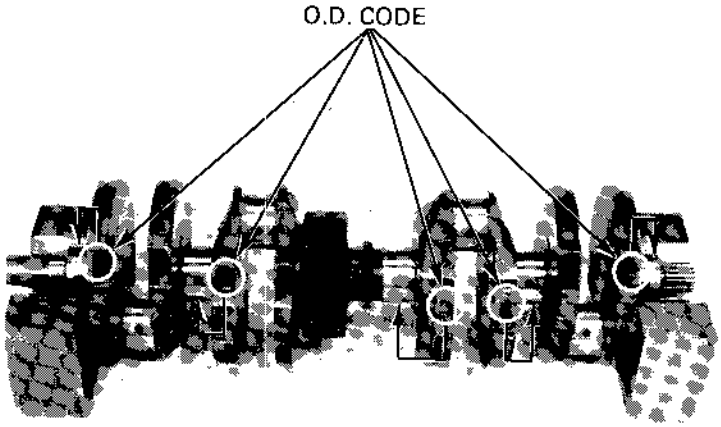


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Determine and record the corresponding main journal O.D. code letters (or measure the main journal O.D.).

NOTE:

Letters A, B or C on each crank weight is the code for the adjacent main journal O.D.

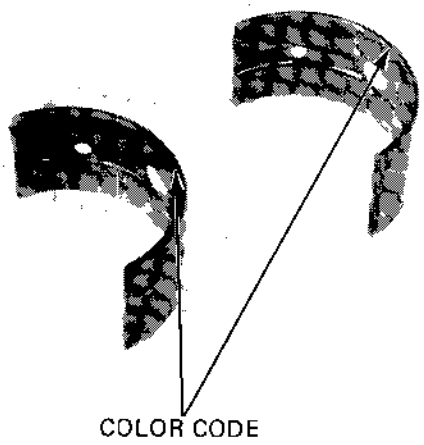


Cross reference the case and journal codes to determine the replacement bearing.

CASE I.D. CODE NO.		MAIN JOURNAL O.D. CODE NO. A: 35.992– 36.000 mm	B: 35.984– 35.992 mm	C: 35.975– 35.984 mm
	A: 39.000– 39.008 mm	D (Yellow)	C (Green)	B (Brown)
	B: 39.008– 39.016 mm	C (Green)	B (Brown)	A (Black)
	C: 39.016– 39.024 mm	B (Brown)	A (Black)	E (Blue)

MAIN BEARING INSERT THICKNESS:

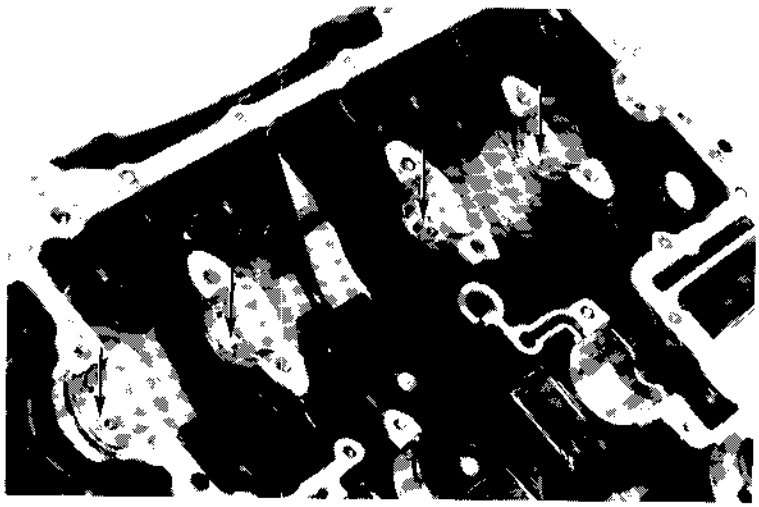
A (Black): 1.498–1.502 mm (0.0590–0.0591 in)
B (Brown): 1.494–1.498 mm (0.0588–0.0590 in)
C (Green): 1.490–1.494 mm (0.0587–0.0588 in)
D (Yellow): 1.486–1.490 mm (0.0585–0.0587 in)
E (Blue): 1.502–1.506 mm (0.0591–0.0593 in)



Install the main bearings into the upper crankcase.

Apply molbdenum disulfide grease to the upper and lower main bearings.

Install the crankshaft with the cam chain and primary chain.

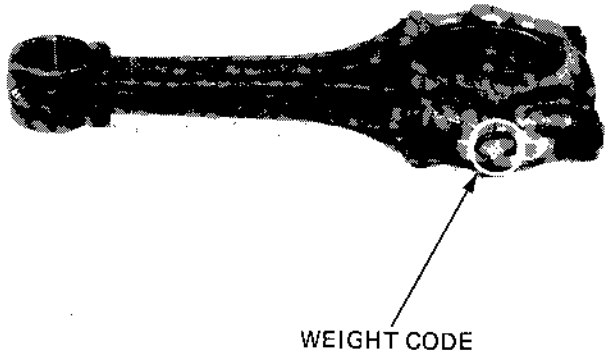


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CONNCTING ROD INSTALLATION

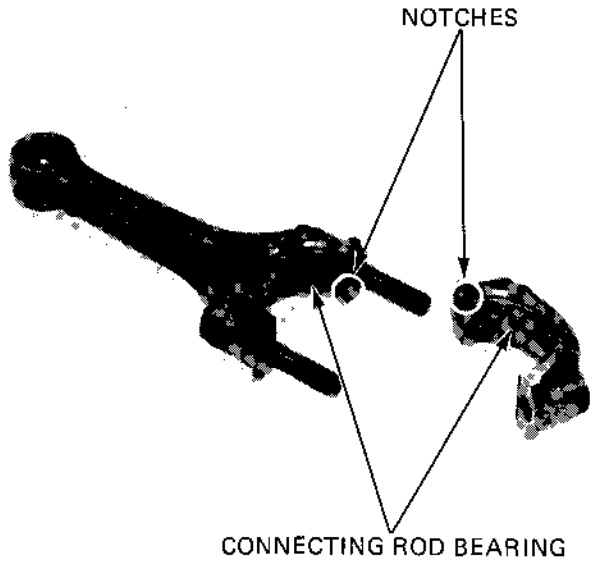
Before installing the connecting rods, make sure that the weight code combination is properly made:

Factory set code	Available code
A	B
B	
C	D
D	
E	
F	F
G	



Install the connecting rod and cap bearing inserts aligning the notches with the slots.

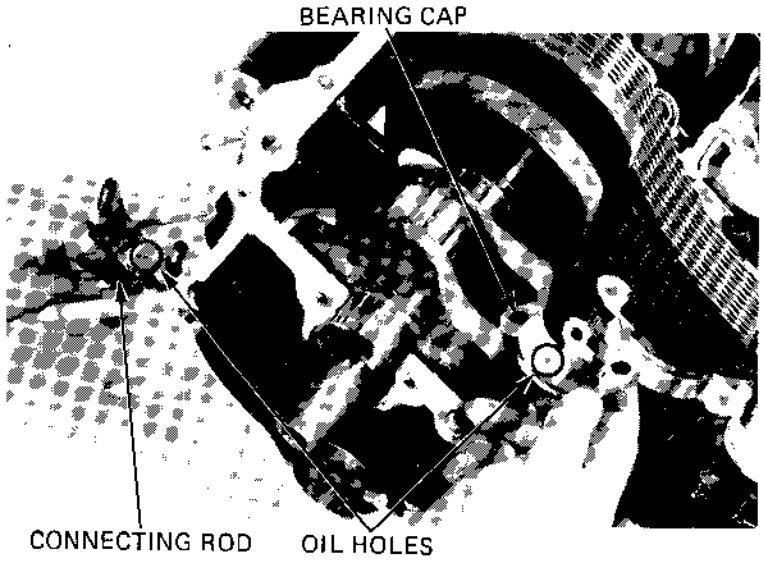
Apply molybdenum disulfied grease to the connecting rod bearings.



Install the connecting rods and bearing caps.

NOTE:

- Be sure connecting rods are installed in their correct position and the oil holes point to the rear.
- Cross reference the rod and cap I.D. codes for correct reassembly.



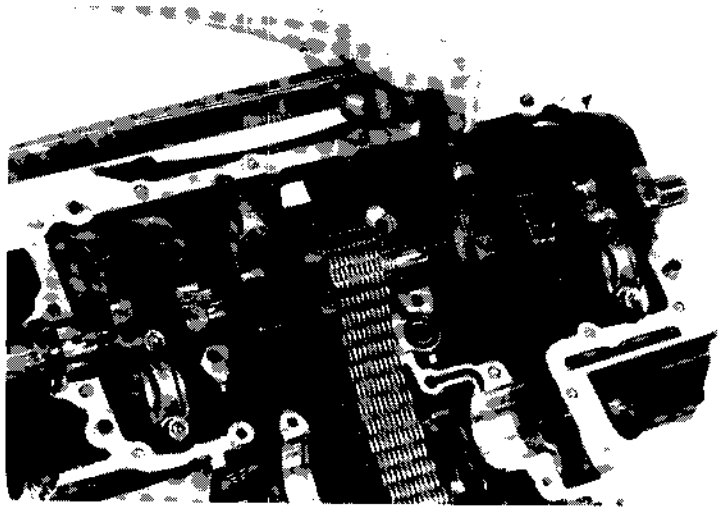
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Tighten the connecting rod bearing cap bolts.

TORQUE: 32 N·m (3.2 kg-m, 23 ft-lb)

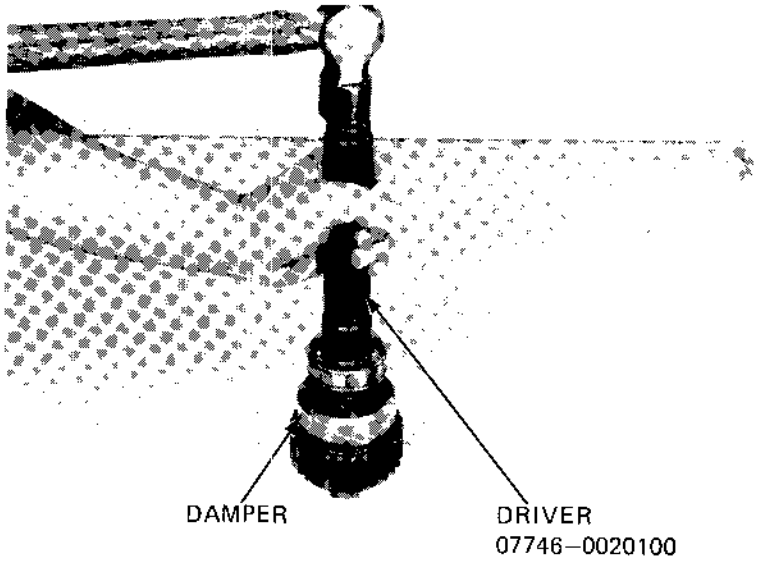
NOTE:

- Tighten the rod bearing cap bolts in two or more steps.
- After tightening the bolts, check that the rod moves freely without binding.

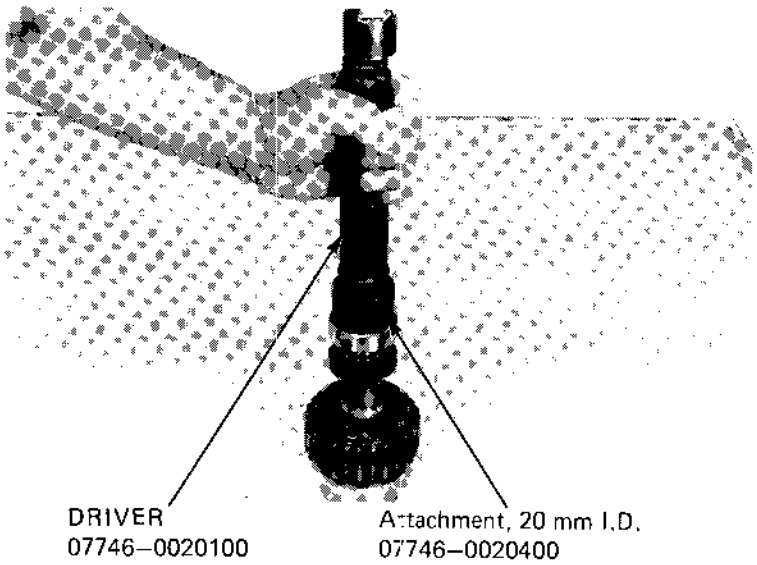


PRIMARY SHAFT ASSEMBLY

Install the damper assembly, plain washer and snap ring over the primary shaft.
Install the plain washer and drive the right bearing over the shaft.

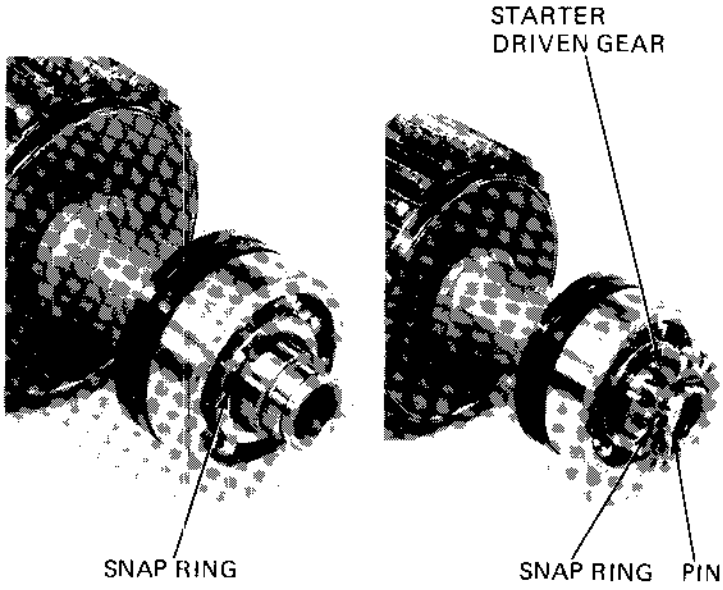


Install the oil seal and drive the left bearing over the primary shaft.



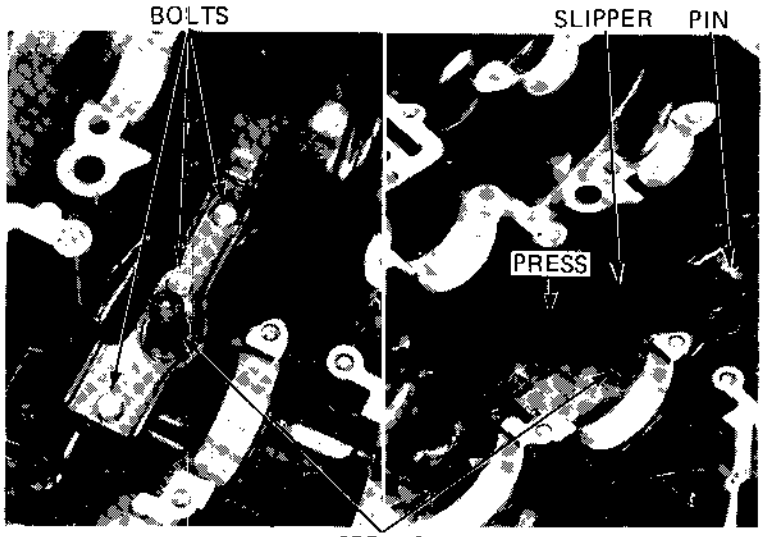
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Install the snap ring, starter driven gear and pin.
Install the other snap ring.

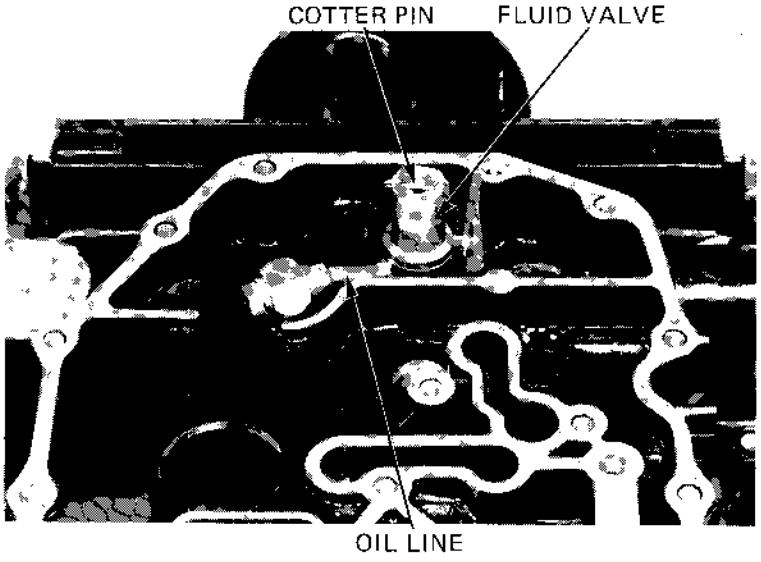


PRIMARY CHAIN TENSIONER ASSEMBLY

Install the sliper base tightening the bolts securely.
Insert the spring and plunger.
Press the slipper down and install the pin.

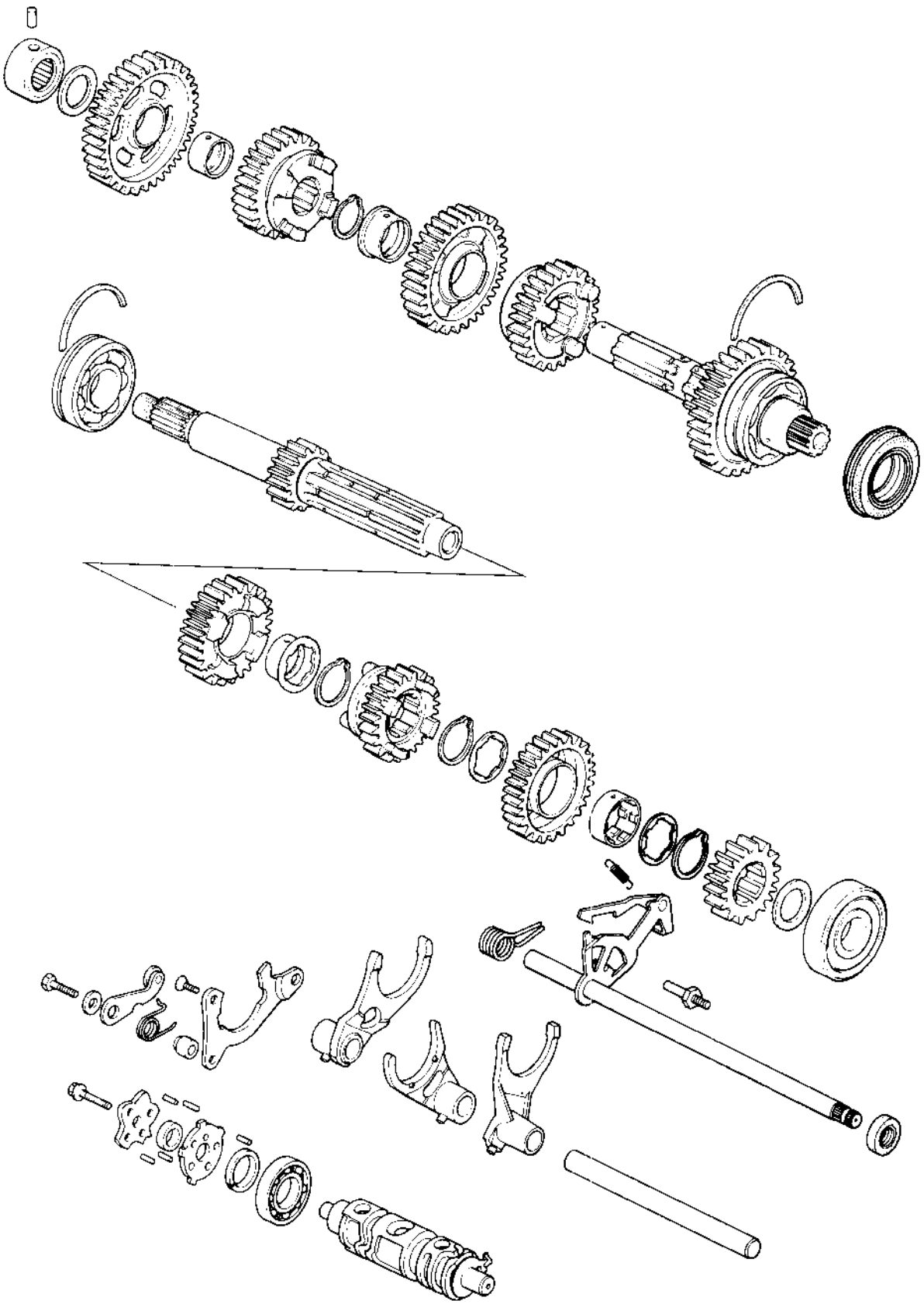


Install the fluid valve and oil line. Tighten the nut.
Insert the plunger, spring and spring seat.
Install the cotter pin as shown.



Assemble the crankcase halves (Section 11).
Install the removed parts;
- Primary shaft drive gear.
- Alternator.
- Starting motor.

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Date of Issue: August, 1982
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13. TRANSMISSION

SERVICE INFORMATION	13–1
TROUBLESHOOTING	13–2
TRANSMISSION DISASSEMBLY	13–3
SHIFT FORK AND SHIFT DRUM	13–5
TRANSMISSION ASSEMBLY	13–8

SERVICE INFORMATION

GENERAL

- The gear shift linkage can be serviced with the engine in the frame (Section 7).
- For internal transmission repairs, the crankcase must be separated (Section 11).

SPECIFICATIONS

			STANDARD	SERVICE LIMIT
Transmission	Backlash	low, 2nd	0.023–0.117 mm (0.0009–0.0046 in)	0.13 mm (0.0051 in)
		3rd, 4th, 5th	0.023–0.117 mm (0.0009–0.0046 in)	0.13 mm (0.0051 in)
	Gear I.D.	M4 gear	31.025–31.050 mm (1.2215–1.2224 in)	31.07 mm (1.223 in)
		M5 gear	31.025–31.050 mm (1.2215–1.2224 in)	31.07 mm (1.223 in)
		C1 gear	25.000–25.021 mm (0.9843–0.9851 in)	25.06 mm (0.987 in)
		C3 gear	31.025–31.050 mm (1.2215–1.2224 in)	31.07 mm (1.223 in)
	Gear bushing	M4 O.D.	30.950–30.975 mm (1.2185–1.2195 in)	30.93 mm (1.218 in)
		M5 O.D.	30.950–30.975 mm (1.2185–1.2195 in)	30.93 mm (1.218 in)
		C1 O.D.	24.959–24.980 mm (0.9826–0.9835 in)	24.93 mm (0.981 in)
		C1 I.D.	22.000–22.021 mm (0.8661–0.8669 in)	22.04 mm (0.8677 in)
		C3 O.D.	30.950–30.975 mm (1.2185–1.2194 in)	30.93 mm (1.2177 in)
	Countershaft O.D.	at C1 bushing	21.987–22.000 mm (0.8656–0.8661 in)	21.930 mm (0.8634 in)
	Gear to bushing or shaft clearance	M4 to M4 bushing	0.050–0.10 mm (0.0019–0.0039 in)	0.12 mm (0.0047 in)
		M5 to M5 bushing	0.050–0.100 mm (0.0020–0.0039 in)	0.12 mm (0.005 in)
		C1 to C1 bushing	0.020–0.062 mm (0.0007–0.0024 in)	0.08 mm (0.0031 in)
		C1 bushing to shaft	0–0.034 mm (0–0.0013 in)	0.045 mm (0.0017 in)
		C3 to C3 bushing	0.050–0.010 mm (0.0019–0.0039 in)	0.12 mm (0.0047 in)
Shift fork	Claw thickness		6.43–6.50 mm (0.253–0.256 in)	6.1 mm (0.24 in)
	I.D.	Center	13.000–13.018 mm (0.5118–0.5125 in)	13.04 mm (0.513 in)
		Left and right	13.000–13.018 mm (0.5118–0.5125 in)	13.04 mm (0.513 in)
Fork shaft	O.D.		12.996–12.984 mm (0.5116–0.5111 in)	12.90 mm (0.508 in)

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TOOLS

Common

Driver	07746–0030100	or 07945–3710200
Attachment, 25 mm I.D.	07746–0030200	

TROUBLESHOOTING

Hard to shift

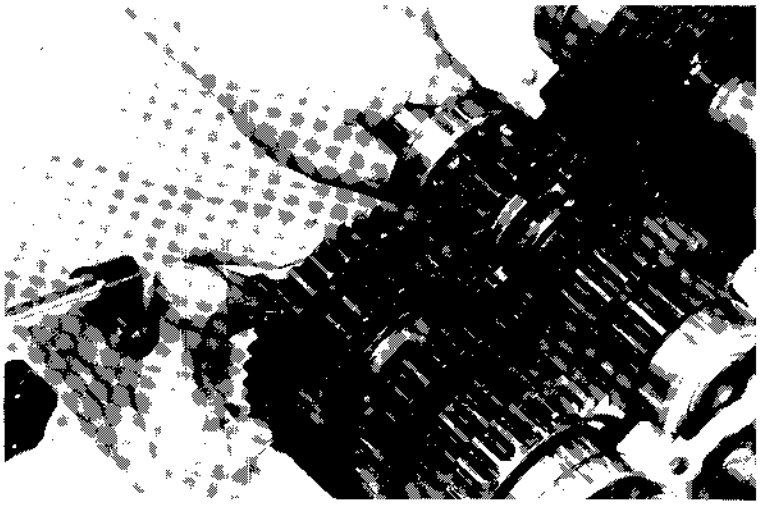
1. Improper clutch adjustment: too much free play
2. Shift fork bent
3. Shift shaft bent
4. Shift claw bent
5. Shift drum cam grooves damaged

Transmission jumps out of gear

1. Gear dogs worn
2. Shift shaft bent
3. Shift drum stopper broken
4. Shift forks bent

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For servicing of the gearshift linkage, see Section 7.



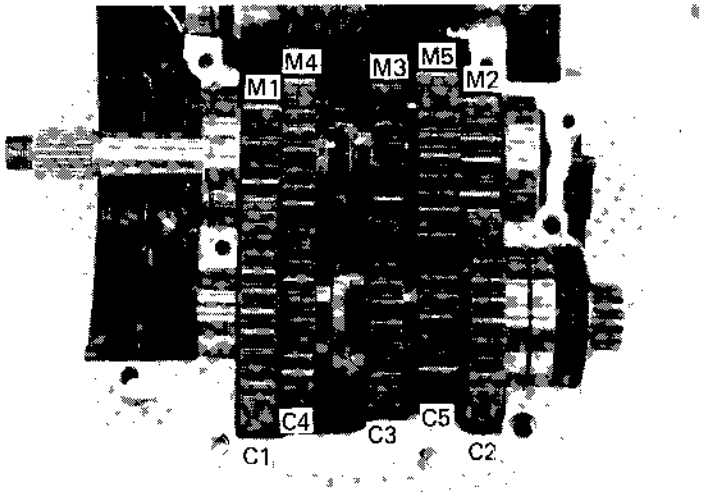
TRANSMISSION DISASSEMBLY

Separate the crankcase (Section 11) and inspect the backlash of each gear.

SERVICE LIMIT: 0.13 mm (0.0051 in)

Remove the mainshaft and countershaft.

Remove the dowel pins from the crankcase.



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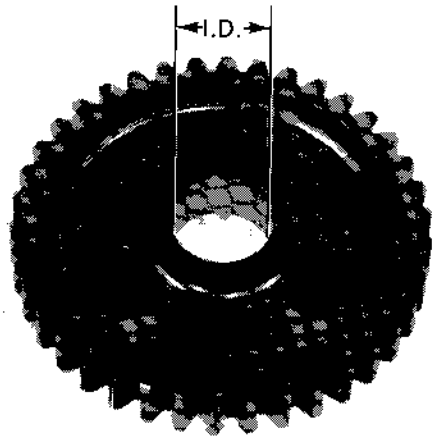
TRANSMISSION INSPECTION

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

Measure the I.D. of each gear.

SERVICE LIMITS:

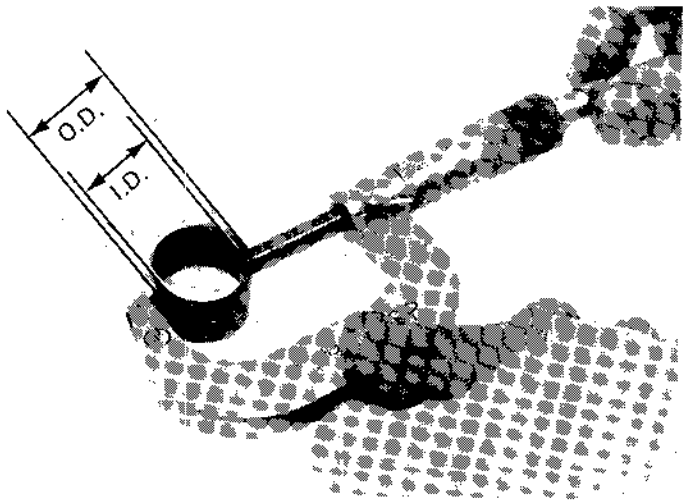
M4 gear:	31.07 mm (1.223 in)
M5 gear:	31.07 mm (1.223 in)
C1 gear:	25.06 mm (0.987 in)
C3 gear:	31.07 mm (1.223 in)



Measure the I.D. and O.D. of the gear bushings.

SERVICE LIMITS:

M4 O.D.:	30.93 mm (1.218 in)
M5 O.D.:	30.93 mm (1.218 in)
C1 O.D.:	24.93 mm (0.981 in)
C1 I.D.:	22.04 mm (0.868 in)
C3 O.D.:	30.93 mm (1.218 in)



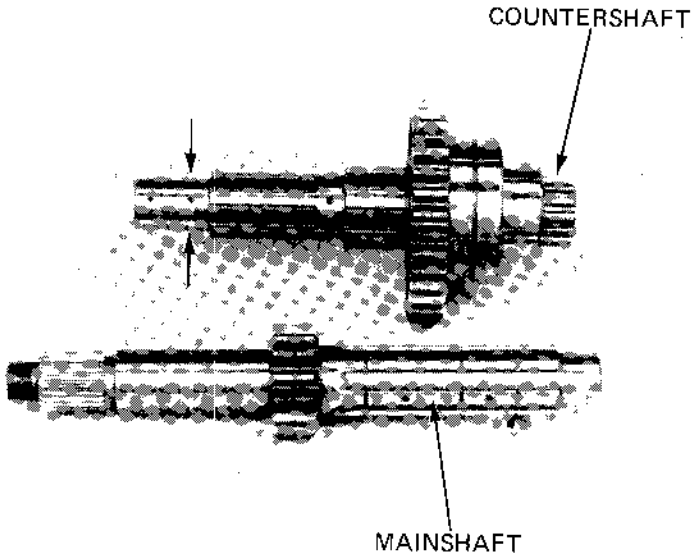
Measure the O.D. of the countershaft at the C1 bushing.

SERVICE LIMITS: 21.930 mm (0.8634 in)

Calculate the clearance between the gears and shaft or bushings.

SERVICE LIMITS:

M5 to M5 bushing:	0.12 mm (0.005 in)
M4 to M4 bushing:	0.12 mm (0.005 in)
C1 to C1 bushing:	0.08 mm (0.003 in)
C1 bushing to shaft:	0.045 mm (0.002 in)
C3 to C3 bushing:	0.12 mm (0.005 in)

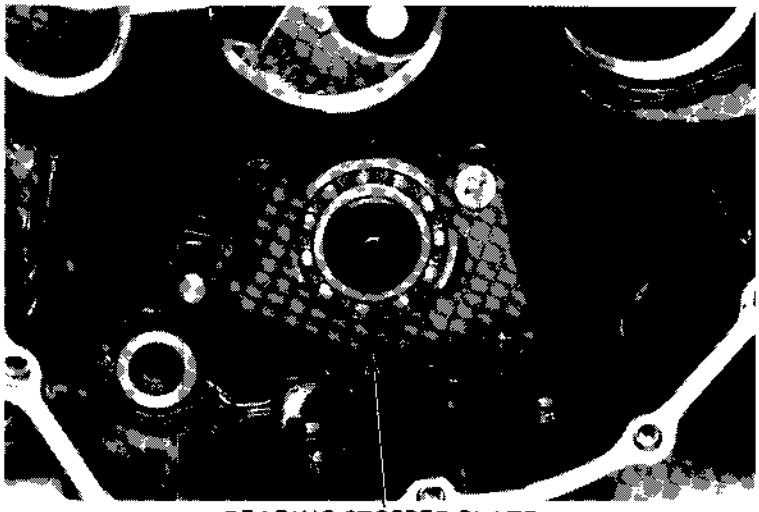


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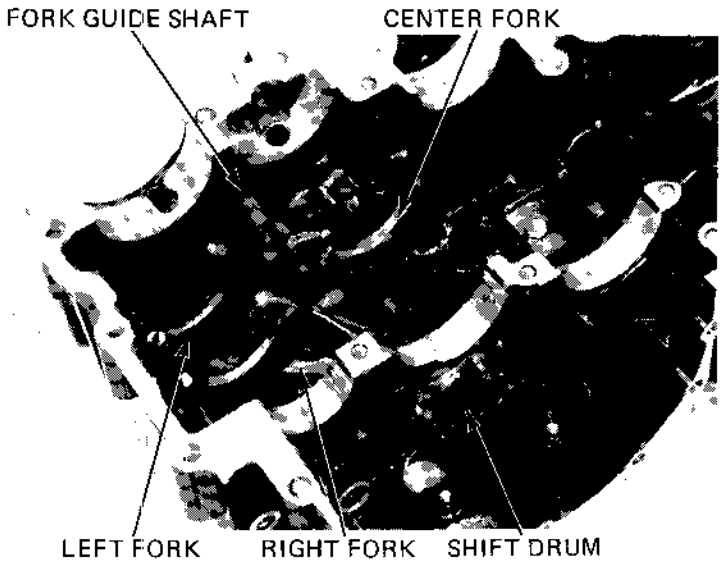
SHIFT FORK AND SHIFT DRUM

REMOVAL

Remove the bearing stopper plate.



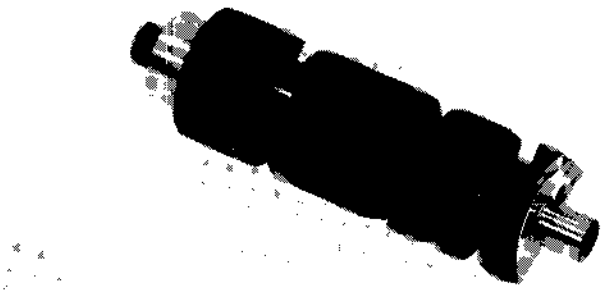
Remove the shift fork shaft and shift forks.
Remove the shift drum.



GEAR SHIFT DRUM AND SHIFT FORK INSPECTION

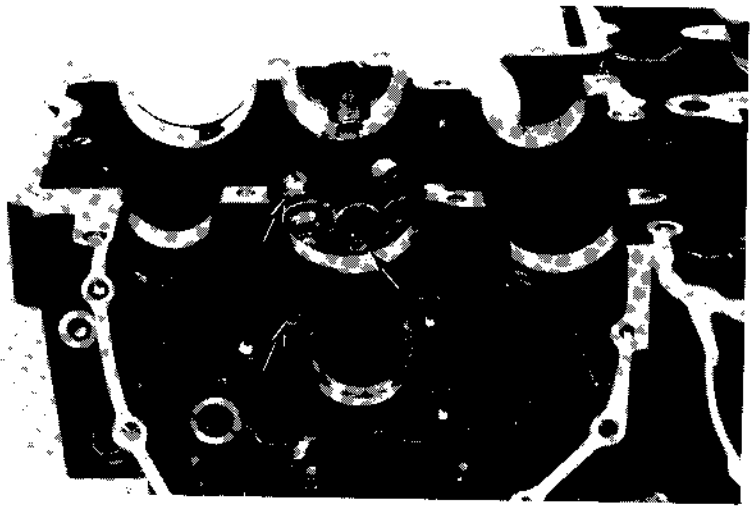
Inspect the shift drum end for scoring, scratches, or evidence of insufficient lubfication.

Check the shift drum grooves for damage.



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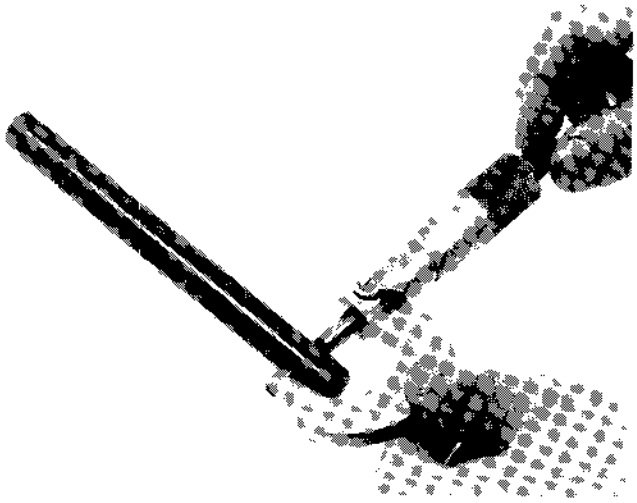
Inspect the shift drum hole and shift fork shaft holes for scoring or scratches.



Measure the shift fork shaft O.D.

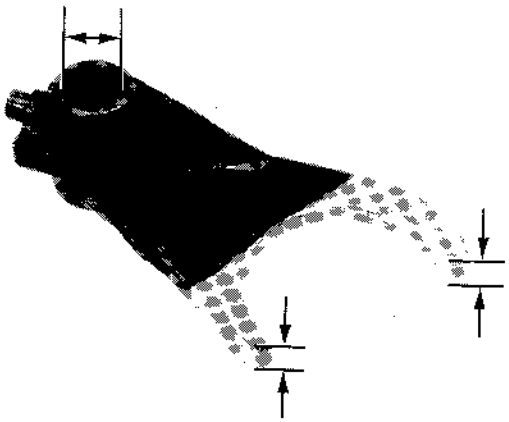
SERVICE LIMIT: 12.90 mm (0.508 in)

Check for scratches, scoring, or evidence of insufficient lubrication.



Measure the shift fork I.D. and claw thickness.

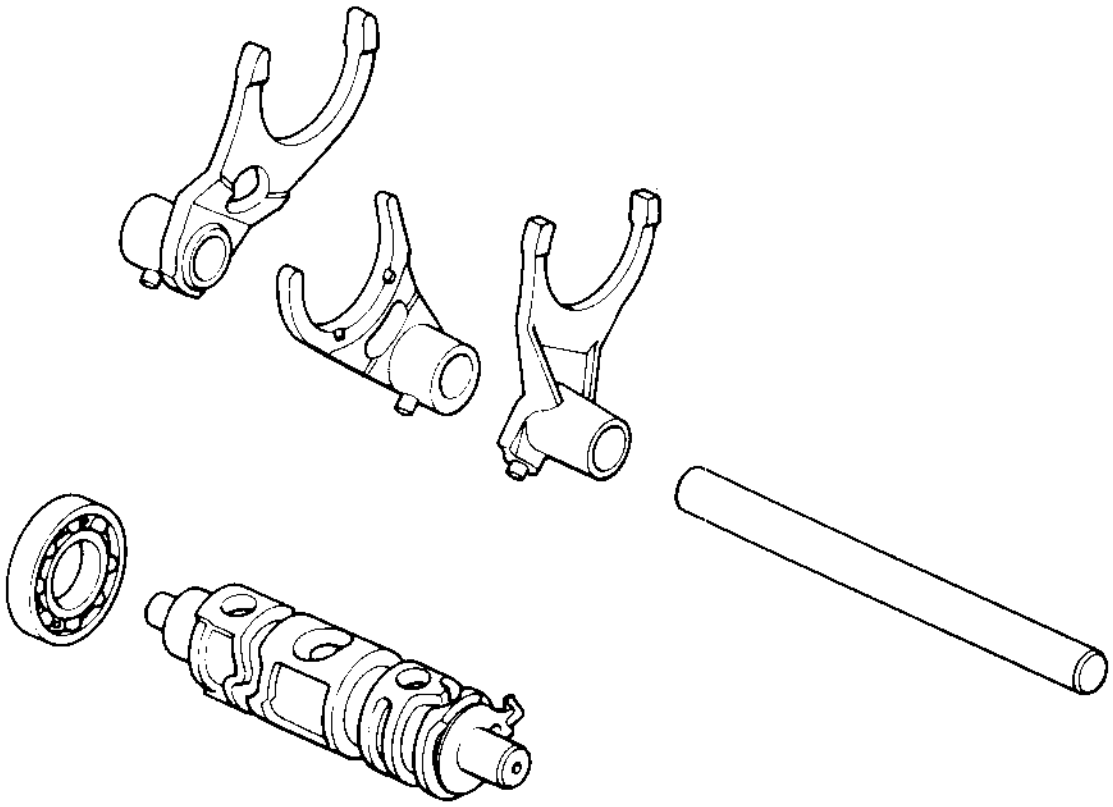
SERVICE LIMITS:
I.D.: 13.04 mm (0.513 in)
CLAW THICKNESS: 6.1 mm (0.24 in)



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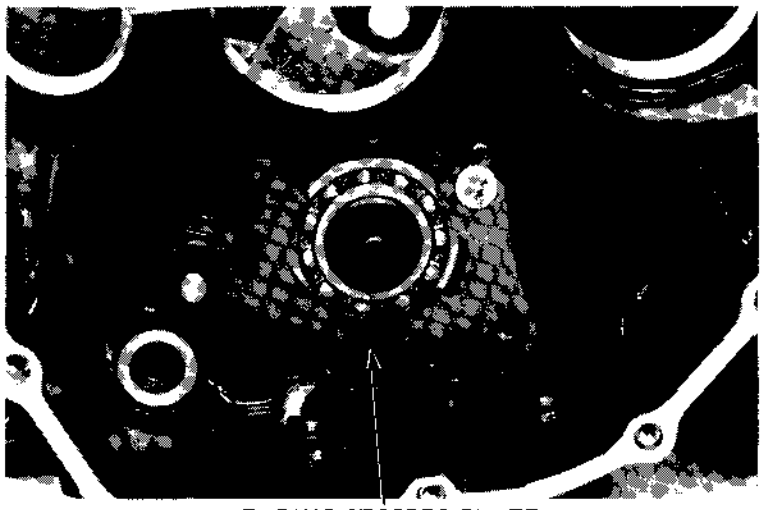
INSTALLATION

Install the shift drum and shift fork, by reversing the removal procedure.



CAUTION:

When installing the bearing stopper plate, apply a locking agent to the screw threads.



BEARING STOPPER PLATE

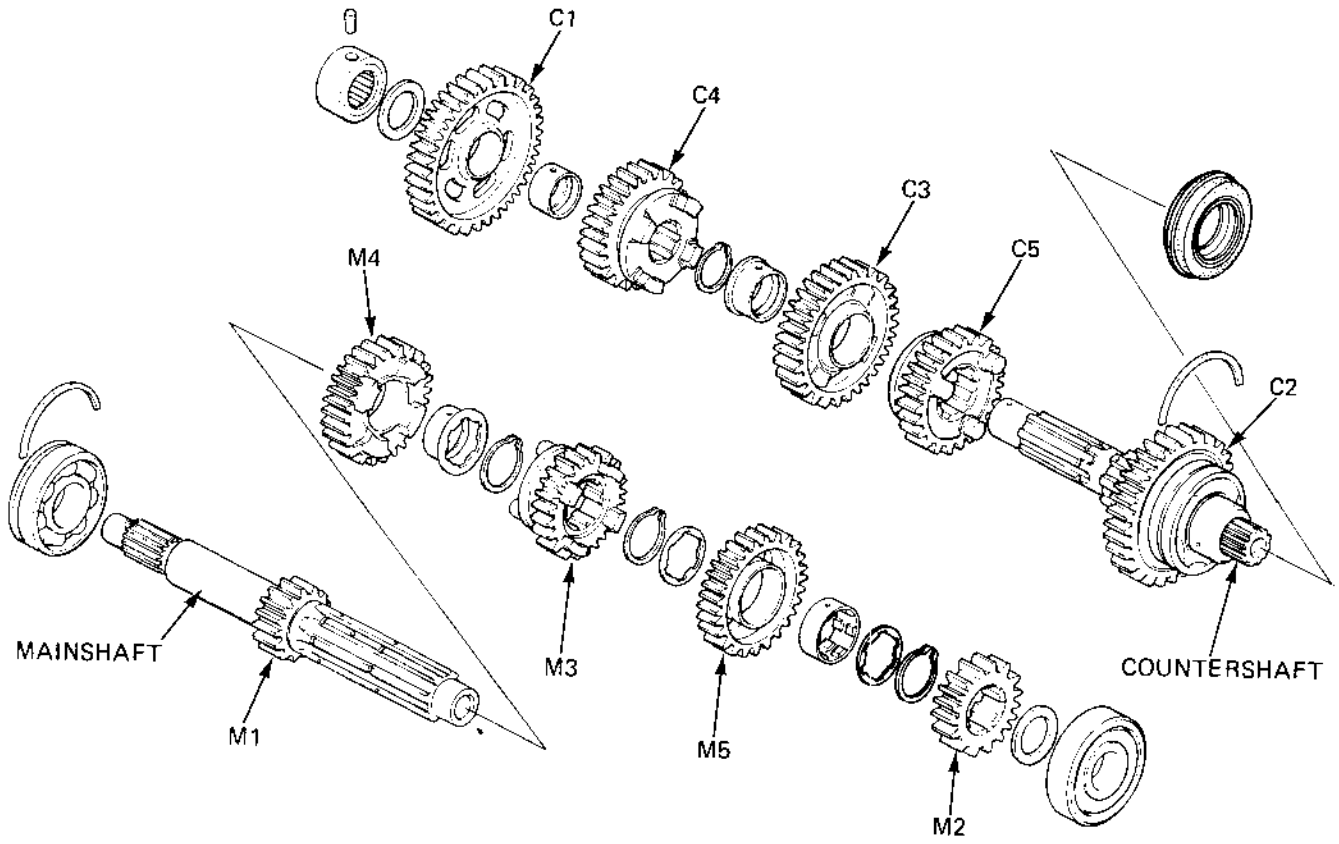
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TRANSMISSION ASSEMBLY

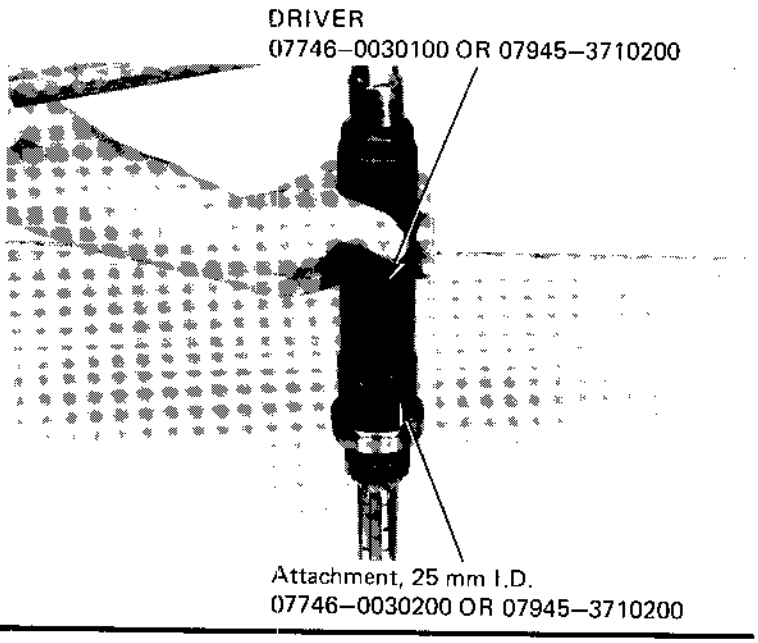
Assemble the mainshaft and countershaft.

NOTE:

- Check the gears for freedom of movement or rotation on the shaft.
- Check that the snap rings are seated in the grooves.

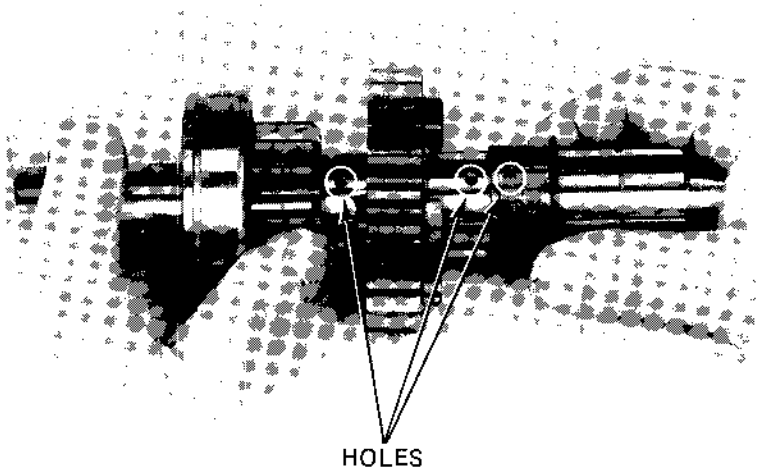


Install the mainshaft bearing with the tools.

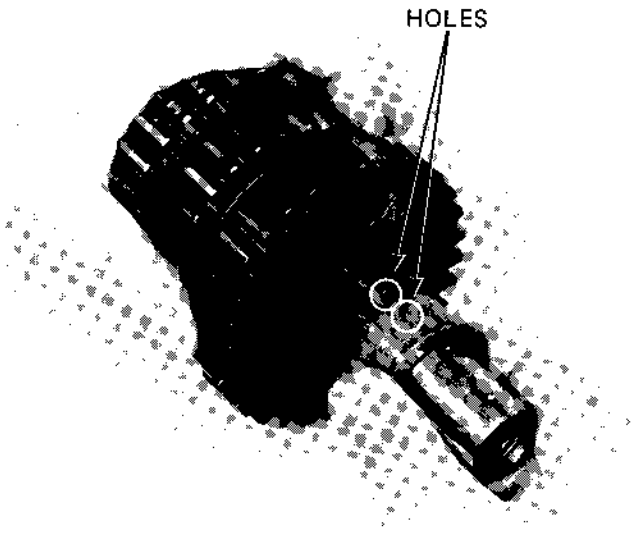


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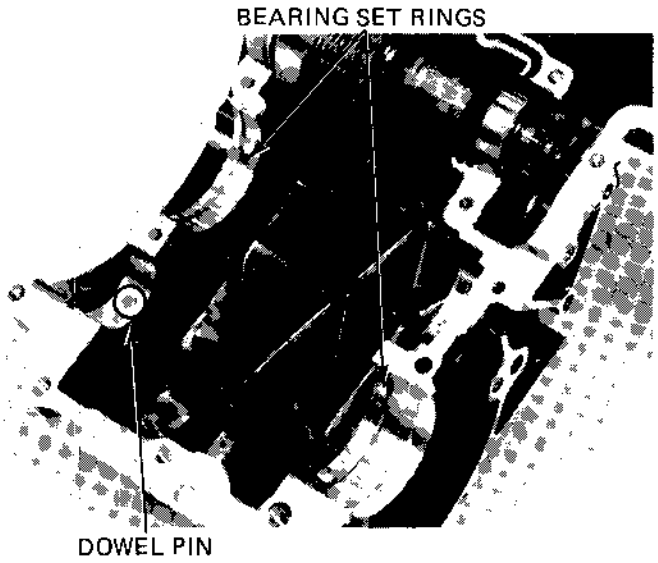
Align the holes in the M4 and M5 gear bushings with the hole in the mainshaft.



Align the hole in the C3 gear bushing with the hole in the countershaft.

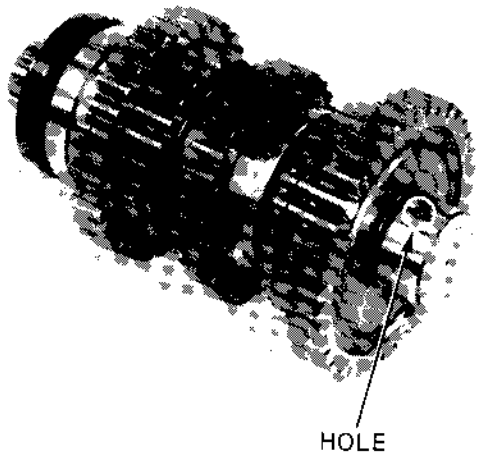


Insert the dowel pin and bearing set rings.



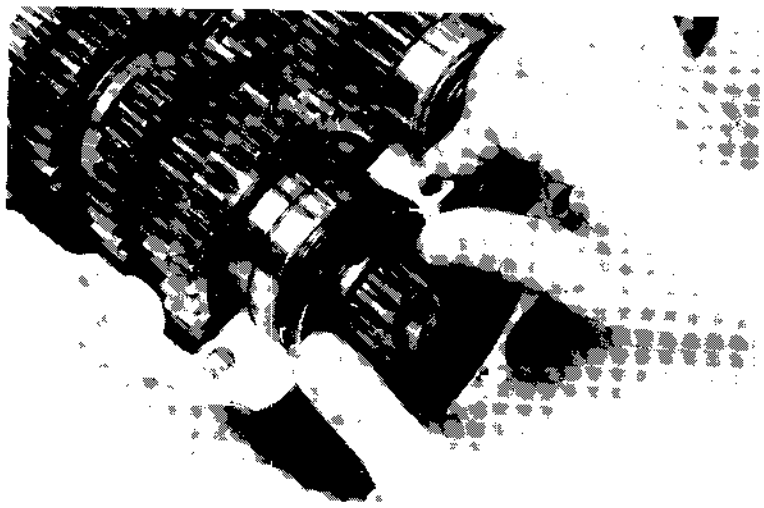
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Align the hole in the countershaft bearing with the dowel pin.



NOTE:

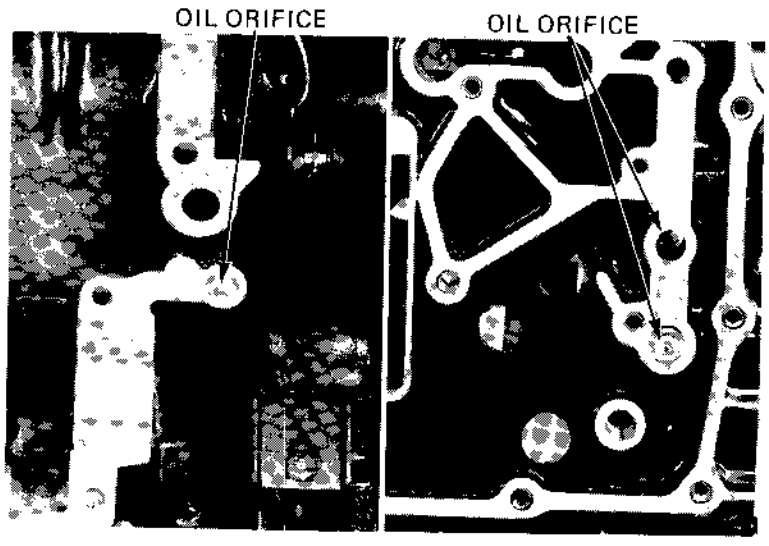
Push the countershaft oil seal in until the oil seal lip is seated completely on the bearing before assembling the lower crankcase to prevent oil leakage.



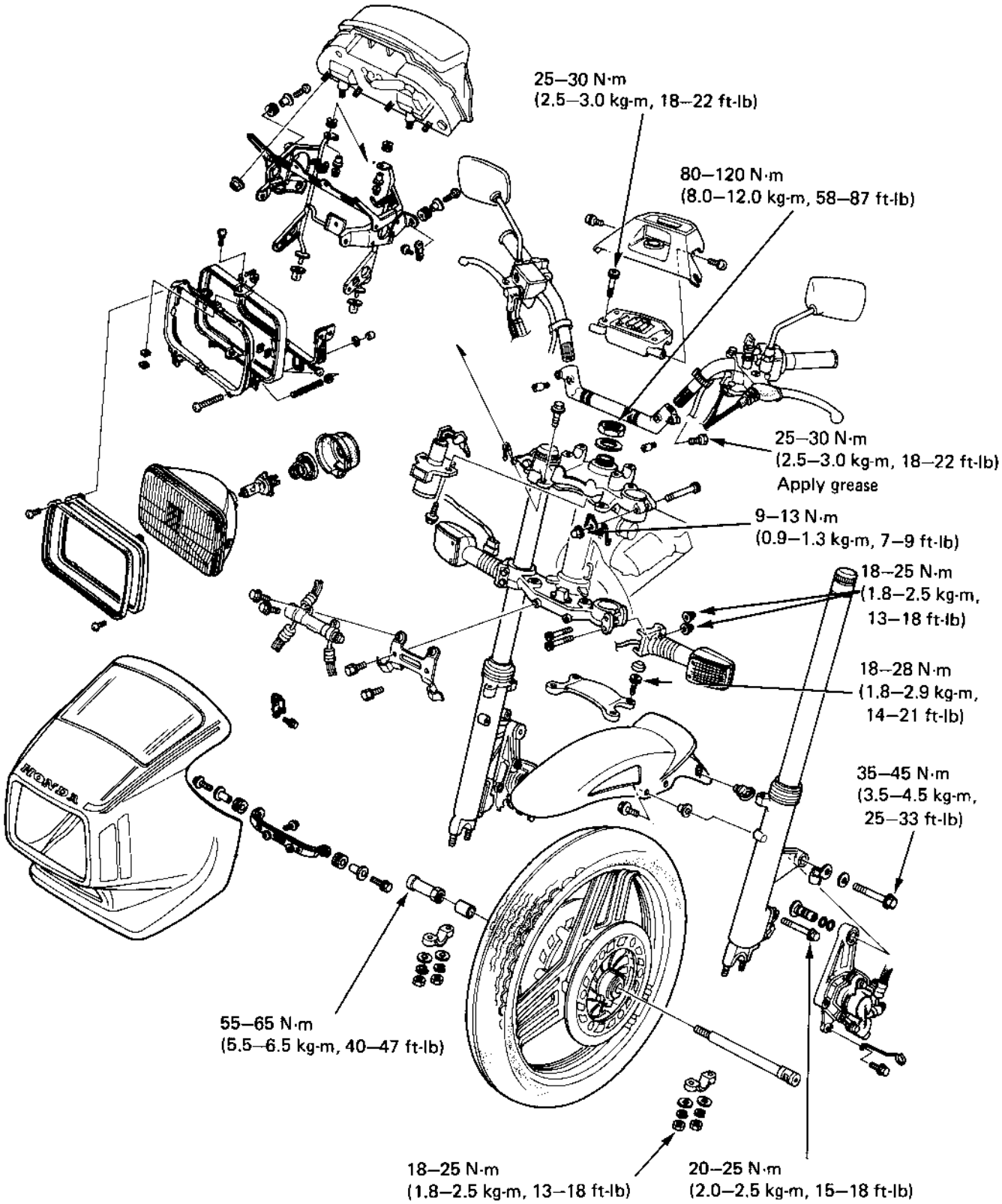
Install the lower crankcase (Refer to Section 11).

NOTE:

Check the oil orifice for clogging, before installing the lower crankcase.



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14. FRONT WHEEL/SUSPENSION

SERVICE INFORMATION	14–1	HANDLEBAR	14–8
TROUBLESHOOTING	14–2	FRONT WHEEL	14–13
HEADLIGHT	14–3	FRONT FORK	14–20
INSTRUMENTS	14–4	STEERING STEM	14–35
IGNITION SWITCH	14–7		

SERVICE INFORMATION

GENERAL INSTRUCTIONS

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

SPECIFICATIONS

		STANDARD	SERVICE LIMIT
Axle shaft runout		—	0.2 mm (0.01 in)
Front wheel rim runout	Radial	—	2.0 mm (0.08 in)
	Axial	—	2.0 mm (0.08 in)
Fork spring free length		564 mm (22.20 in)	553 mm (21.77 in)
Fork tube run out		—	0.2 mm (0.01 in)
Front fork tube O.D.		38.950–38.975 mm (1.533–1.534 in)	38.90 mm (1.531 in)
Front fork fluid capacity		281 ± 2.5 cc (9.5 ± 0.08 oz)	—
Front fork air pressure		0–0.6 kg/cm^2 (0–9 psi)	—

14

TORQUE VALUES

Front brake disc		30–35 N·m (3.0–3.5 kg-m, 22–25 ft-lb)
Front brake caliper shaft		25–30 N·m (2.5–3.0 kg-m, 18–22 ft-lb)
Front brake caliper		20–25 N·m (2.0–2.5 kg-m, 15–18 ft-lb)
Anti-dive pivot bolt		35–45 N·m (3.5–4.5 kg-m, 25–33 ft-lb)
Front axle nut		55–65 N·m (5.5–6.5 kg-m, 40–47 ft-lb)
Steering stem nut		80–120 N·m (8.0–12.0 kg-m, 58–87 ft-lb)
Steering top thread nut		11–13 N·m (1.1–1.3 kg-m, 8–9 ft-lb) Apply oil to the threads
Fork top bridge bolt		9–13 N·m (0.9–1.3 kg-m, 7–9 ft-lb)
Steering stem pinch bolts		45–55 N·m (4.5–5.5 kg-m, 33–40 ft-lb)
Fork cap bolt		15–30 N·m (1.5–3.0 kg-m, 11–22 ft-lb)
Fork drain bolt		6–9 N·m (0.6–0.9 kg-m, 4–7 ft-lb)
Fork socket bolt		15–25 N·m (1.5–2.5 kg-m, 11–18 ft-lb)
Air hose	Right	15–20 N·m (1.5–2.0 kg-m, 11–14 ft-lb)
	Left	4–7 N·m (0.4–0.7 kg-m, 3–5 ft-lb)
Air hose connector		4–7 N·m (0.4–0.7 kg-m, 3–5 ft-lb)
Air valve		4–7 N·m (0.4–0.7 kg-m, 3–5 ft-lb)
Axle holder		18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)

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TOOLS

Special		
Snap ring pilers	07914–3230001	
Steering stem socket wrench	07916–3710100	
Hex wrench, 6 mm	07917–3230000	or Commercially avaliable in U.S.A.
Race remover	07946–3710500	
Steering stem driver	07946–MB00000	or 07946–3710601
Attachment	07946–3710700	or 07946–3710701
Race remover	07953–4250002	
Fork seal driver	07947–4630100	
Common		
Attachment 52 x 55 mm	07746–0010400	
Attachment 42 x 47 mm	07746–0010300	or 07946–9350200
Pilot 15 mm	07746–0040300	
Lock nut wrench socket 30 x 32 mm	07716–0020400	or Commercially available in U.S.A.
Driver	07749–0010000	or 07949–6110000
Extension bar	07716–0020500	or Commercially available in U.S.A.
Lock nut wrench socket 17 x 27 mm	07716–0020300	
Front fork oil seal driver body	07749–0010100	or 07947–4630100
Front fork oil seal attachment E	07747–0010600	

TROUBLESHOOTING

Hard steering
1. Steering stem nut too tight
2. Faulty steering stem bearings
3. Damaged steering stem bearings
4. Insufficient tire pressure

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

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

Soft suspension
1. Weak fork spring
2. Insufficient fluid in front forks
3. Front fork air pressure incorrect

Hard suspension
1. Incorrect fluid weight in front forks
2. Front fork air pressure incorrect
3. Bent fork tubes
4. Clogged fluid passage
5. Clogged anti-dive orifice

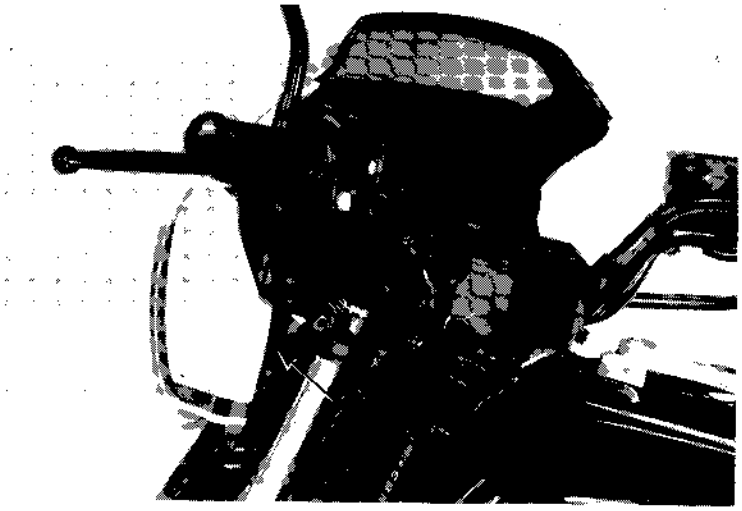
Front suspension noise
1. Worn slider or guide bushings
2. Insufficient fluid in forks
3. Loose front fork fasteners
4. Lack of grease in speedometer gear box

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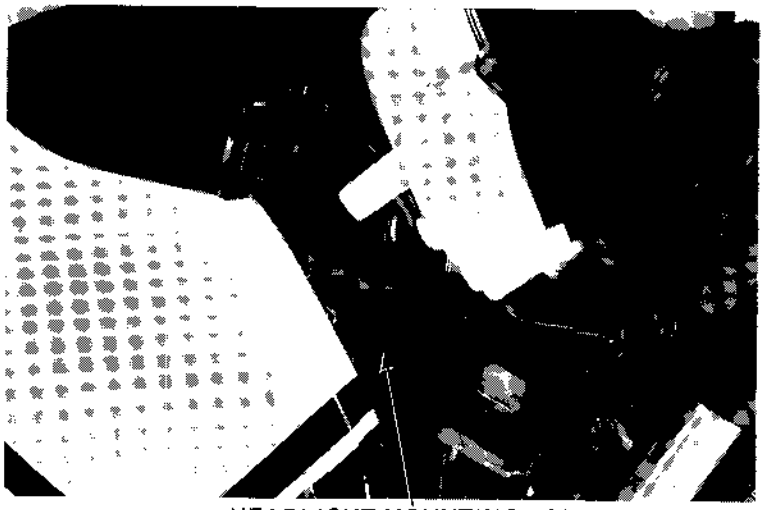
HEADLIGHT

REMOVAL

Remove the upper fairing mounting bolts.
Loosen the lower fairing mounting bolts and tilt the fairing forward.



Remove the two headlight mounting bolts.
Disconnect the headlight coupler and remove the headlight.



HEADLIGHT MOUNTING BOLT

DISASSEMBLY/ASSEMBLY

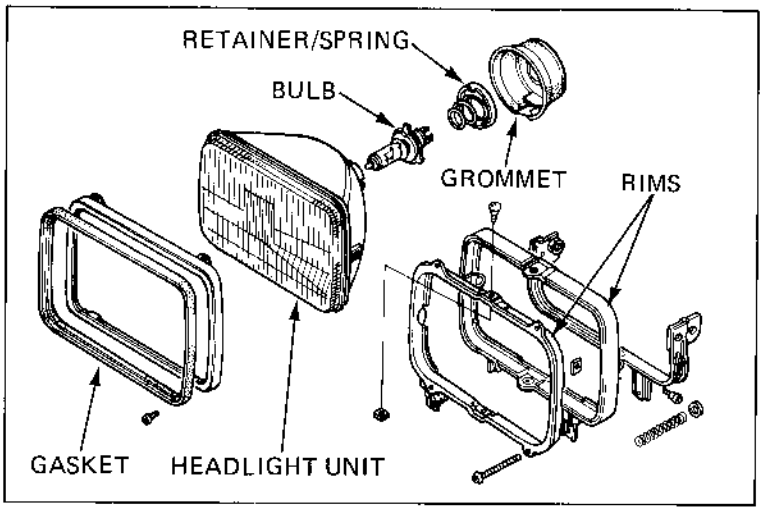
Remove the retaining screws and horizontal and vertical adjusting screws from the rim.
Remove the four unit retaining screws, and remove the rim and gasket.

Unfasten the bulb retainer and remove the spring.
Remove the bulb from the headlight unit and install a new bulb.

CAUTION:

Wear clean gloves when installing the halogen bulb. If you touch the bulb with your bare hands, clean it with a clotch moistened with alcohol to prevent hot spots and its early failure.

Assemble in the reverse order of disassembly.
After assembly, adjust the headlight beam (Page 3-19).



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INSTRUMENTS

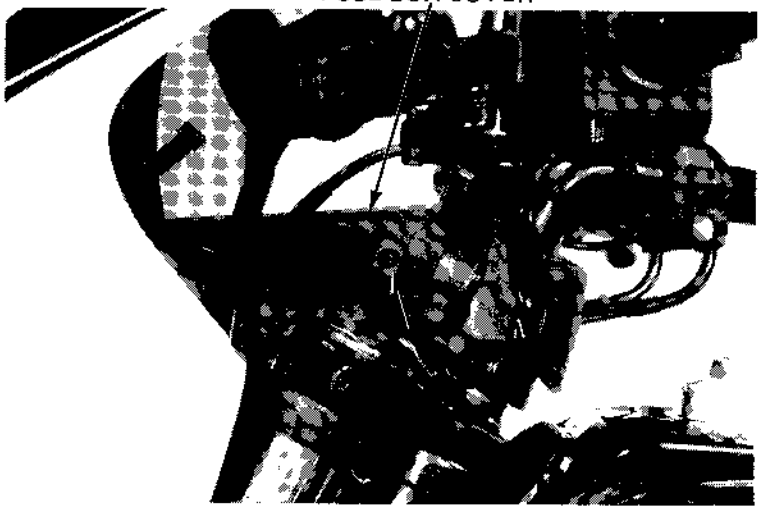
INDICATOR LIGHT BULB REPLACEMENT

Tilt the fairing forward (page 14-3).
Replace the faulty bulb.
If a replacement bulb does not light, check the wiring for a short or open circuit, or loose wire connections.

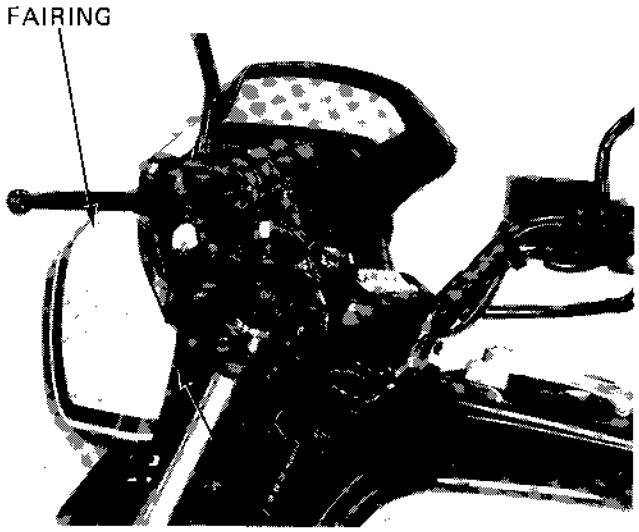


REMOVAL

Remove the fuse box cover.



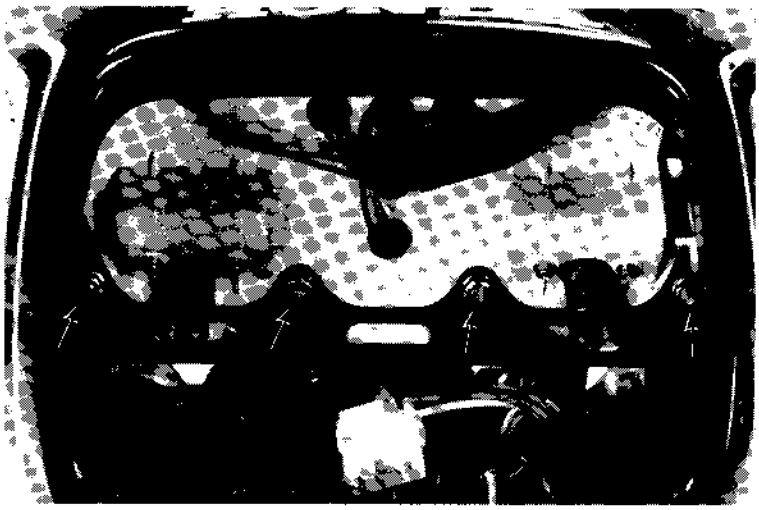
Tilt the fairing forward and remove the headlight unit (page 14-3).



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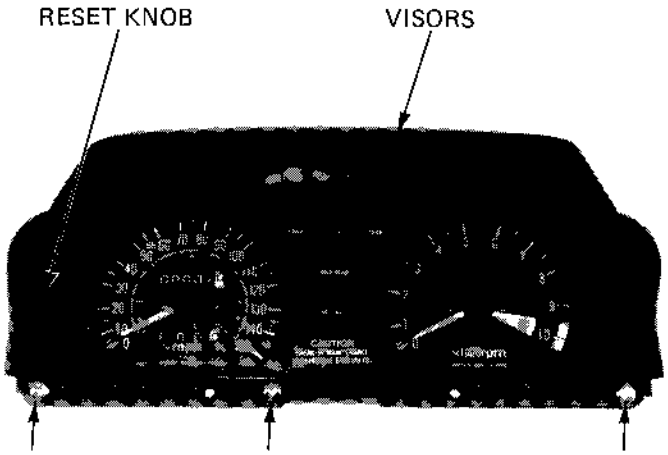
Disconnect the speedometer and tachometer cables from the instruments.

Disconnect the instrument wire coupler.
Remove the instrument mounting nuts and the instruments.

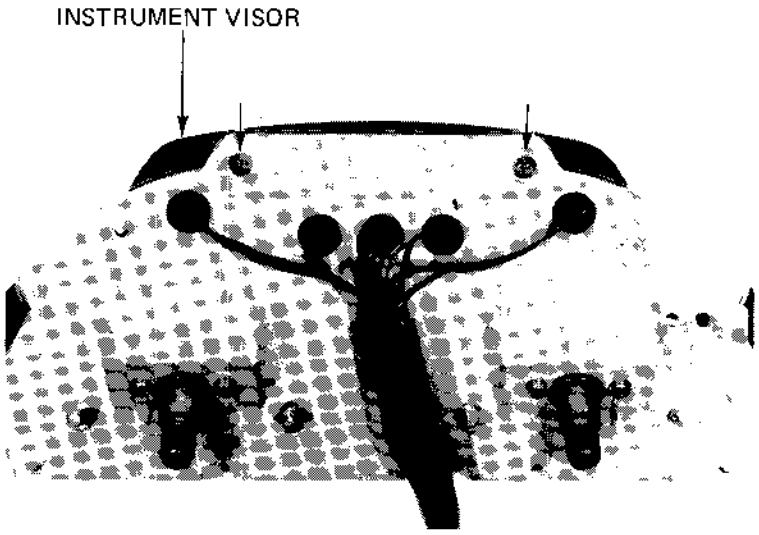


DISASSEMBLY

Remove the screw attaching the tripmeter reset knob and knob.
Remove the instrument visors three front screws.

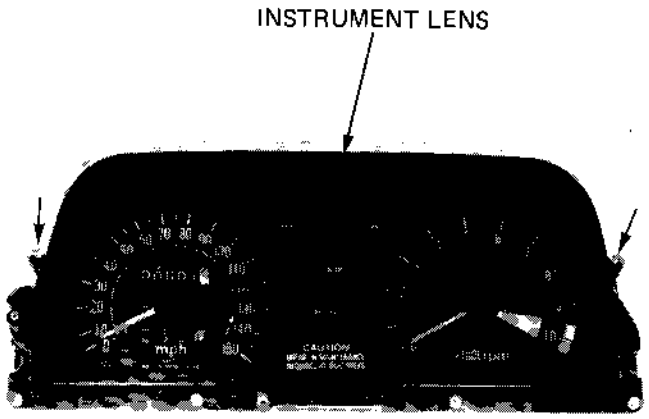


Remove the rear two screws attaching the instrument visor and remove the visor.

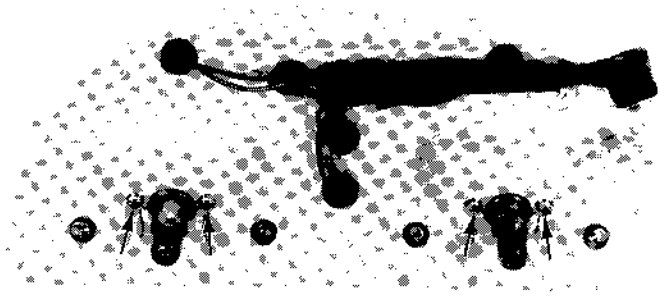


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Remove the screws attaching the instrument lens and remove the lens.

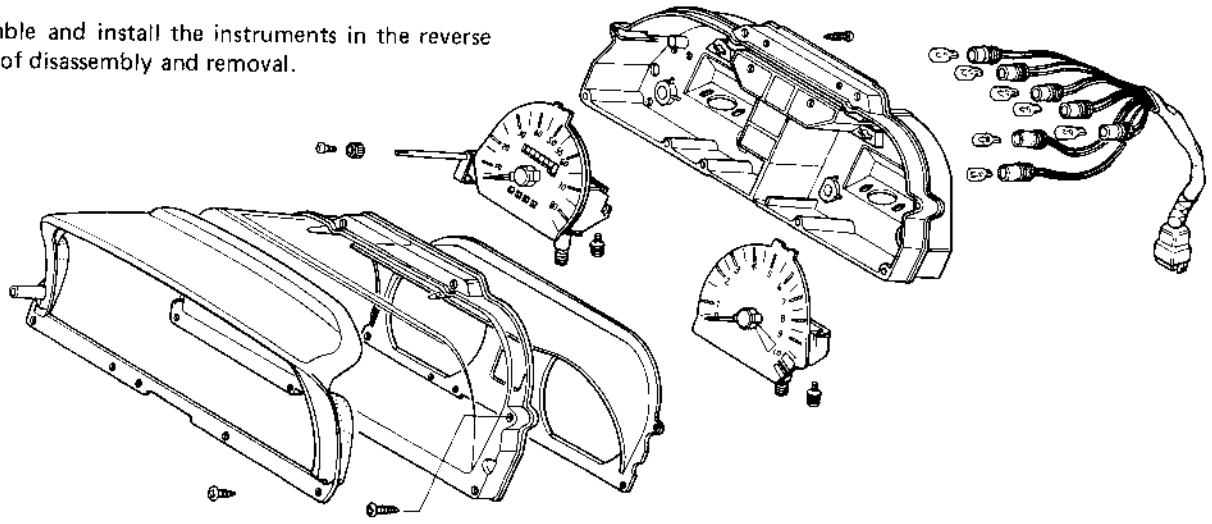


Remove the screws mounting the speedometer and tachometer and remove the instruments from the case.



ASSEMBLY/INSTALLATION

Assemble and install the instruments in the reverse order of disassembly and removal.

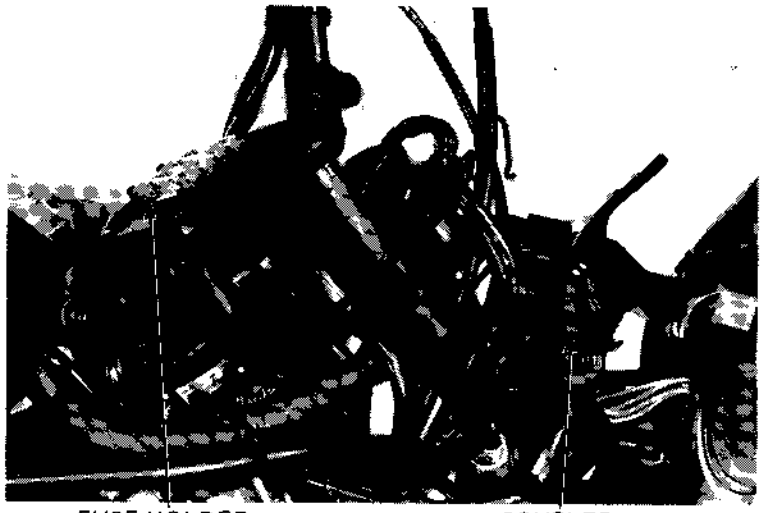


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FUSE HOLDER REPLACEMENT

Remove the fuse cover.
Remove the headlight (page 14-3) and instruments (page 14-5).
Disconnect the wire coupler.

Release the fuse holder pawls and remove the fuse holder.



FUSE HOLDER COUPLER

IGNITION SWITCH

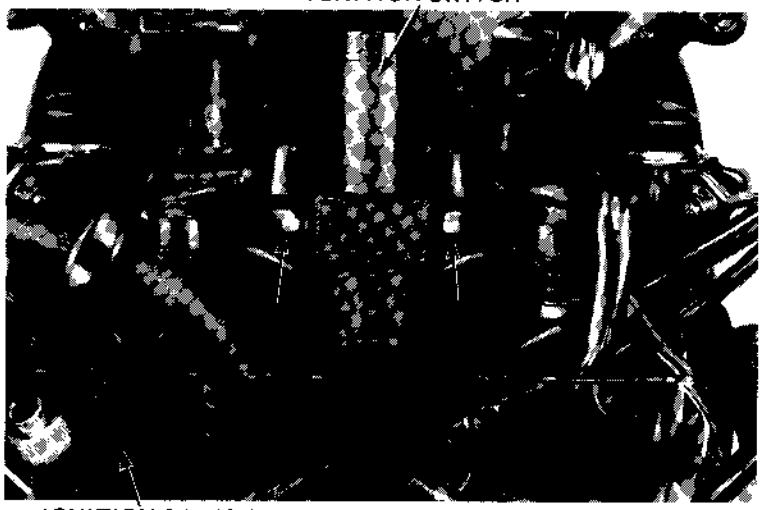
REMOVAL/INSTALLATION

Remove the headlight (page 14-3).

Disconnect the ignition switch wire coupler.

Remove the ignition switch mounting bolts, and ignition switch.

Install the ignition switch in the reverse order of removal.



IGNITION SWITCH

IGNITION SWITCH COUPLER

DISASSEMBLY/ASSEMBLY

Remove wire clamp.
Insert the ignition key and turn it to between the ON and OFF detent positions.

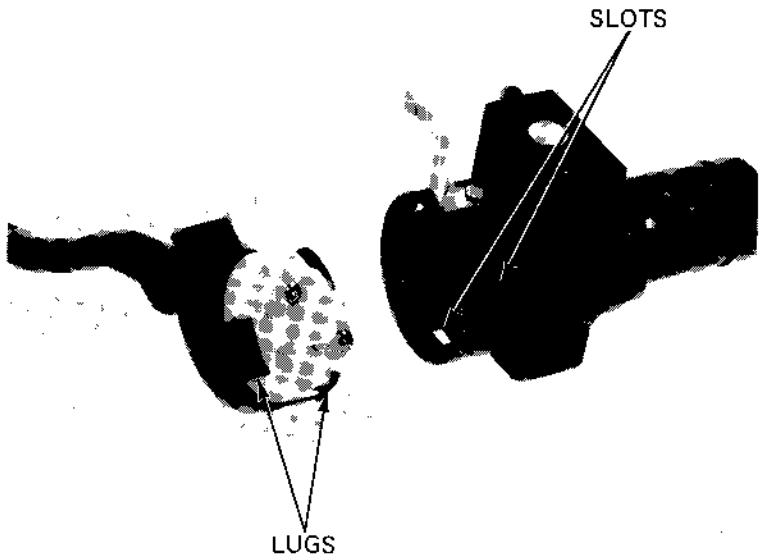


WIRE CLAMP BETWEEN "ON" AND "OFF"

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Push in the lugs in the slots and pull the contact base from the switch.

Assemble the ignition switch in the reverse order of disassembly.



HANDLEBAR

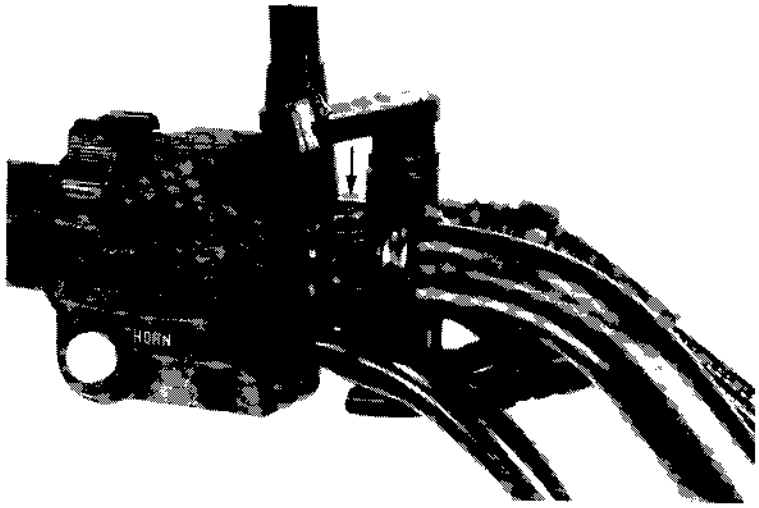
REMOVAL

Remove the headlight and instruments (pages 14-3, 14-5).

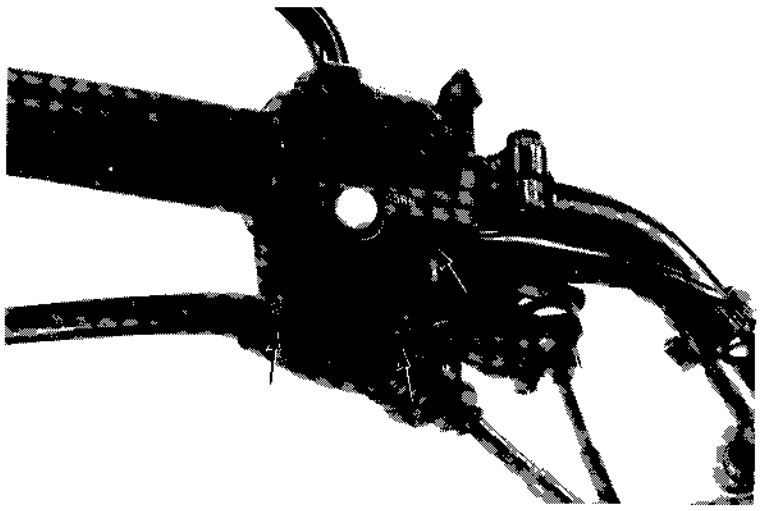
Disconnect the right and left switches and fuse holder wires.

Remove the handlebar wire bands.

Loosen the clutch lever bracket pinch bolt.

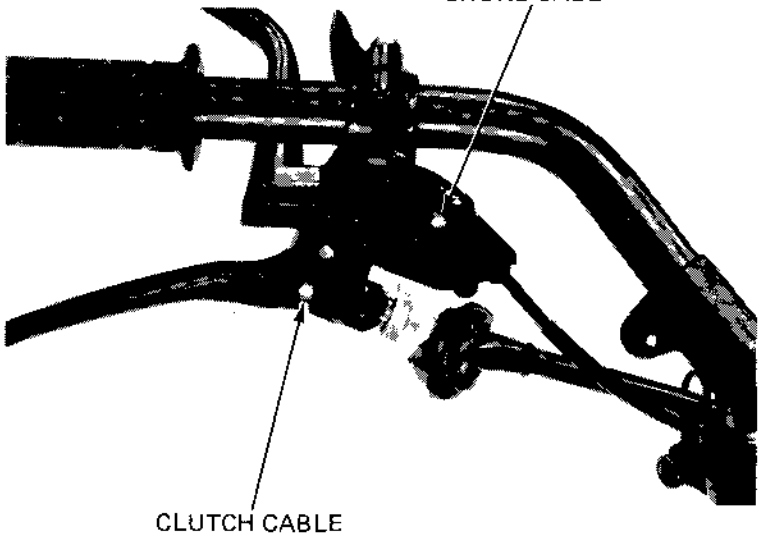


Disconnect the clutch switch wires and remove the left handlebar switch.

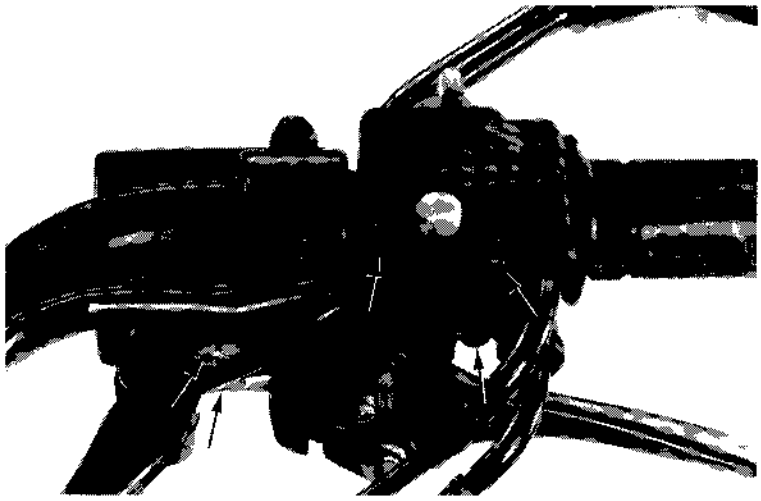


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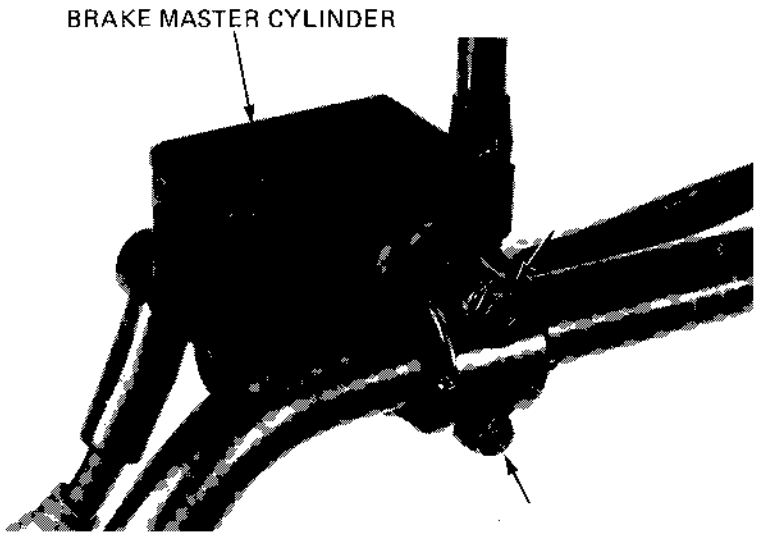
Disconnect the clutch and choke cables.



Disconnect the brakelight swtich wires.
Remove the right handlebar switch and throttle grip.

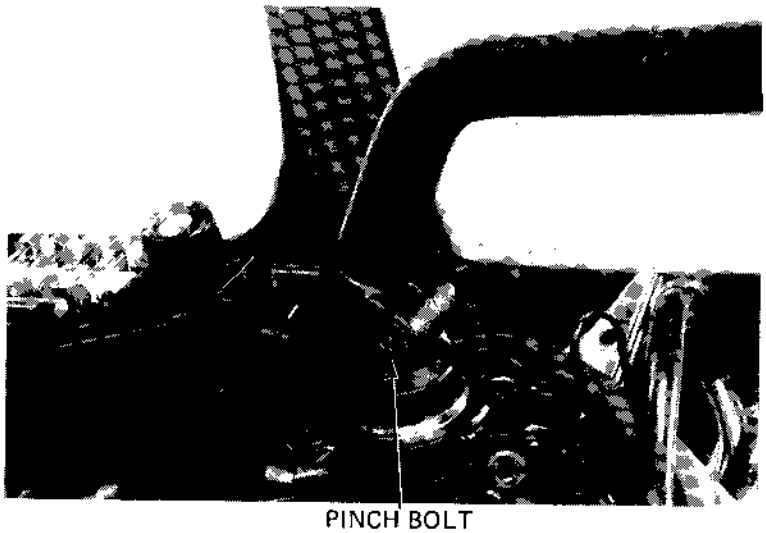


Remove the front brake master cylinder with the brake lever.

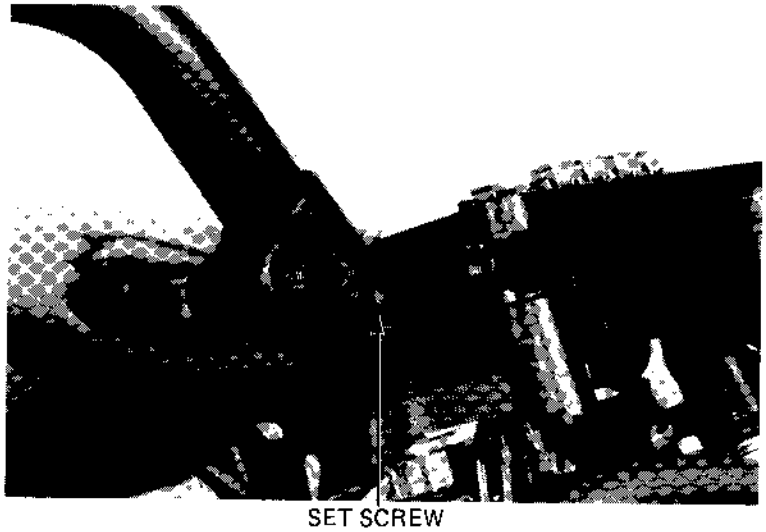


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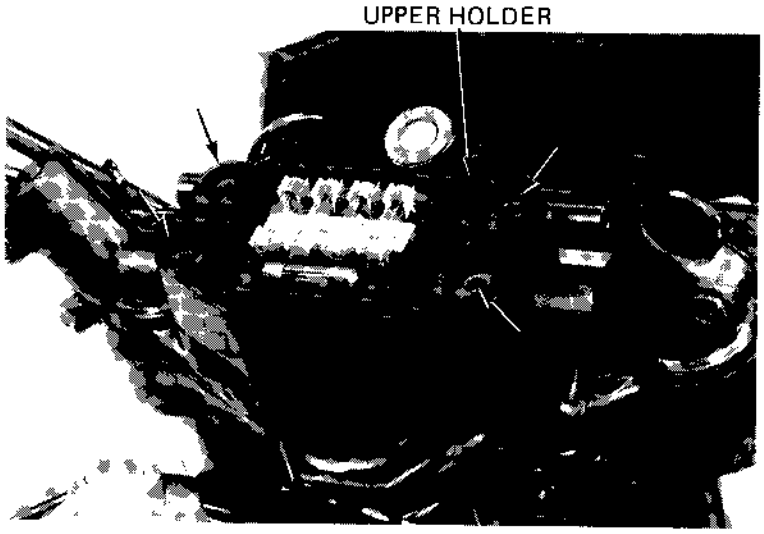
Remove the right and left handlebar pinch bolt caps.
Remove the pinch bolts.


PINCH BOLT

Remove the handlebar set screw and the handlebars.


SET SCREW

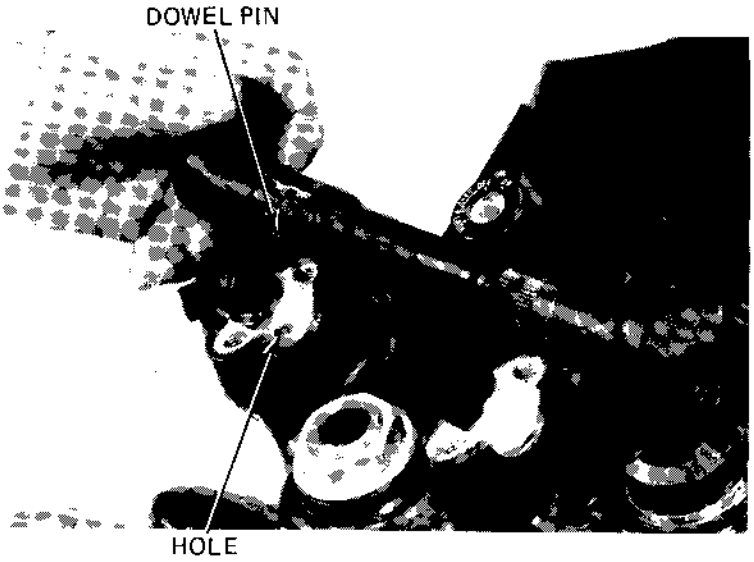
Remove the handlebar upper holder bolts.
Remove the handlebar upper holder and the center handlebar.


UPPER HOLDER

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INSTALLATION

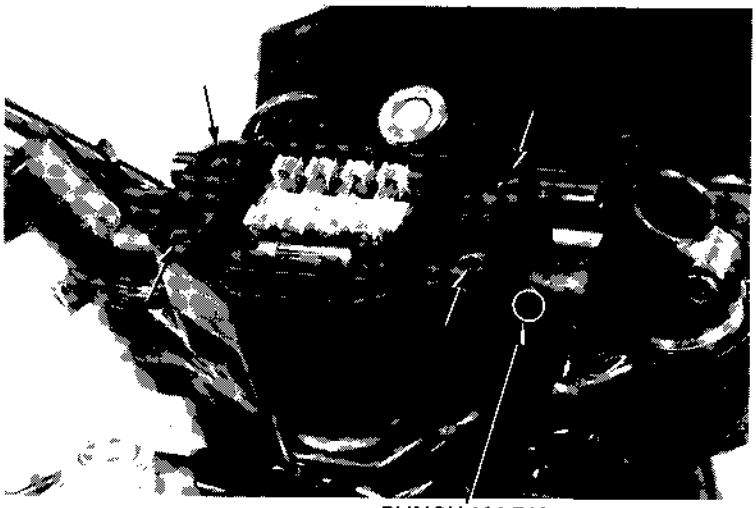
Place the center handlebar aligning the dowel pin with the hole on the handlebar lower holder.



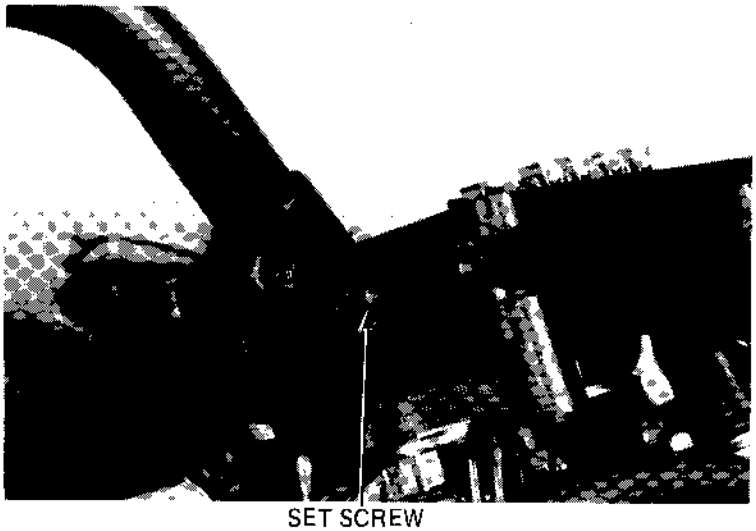
Place the upper holder onto the lower holder aligning the center handlebar punch mark with the upper face of the lower holder.

Tighten the forward bolts first, then tighten the rear bolts.

TORQUE 25–30 N·m (2.5–3.0 kg-m, 18–22 ft-lb)



Install the right and left handlebars with the set screws.

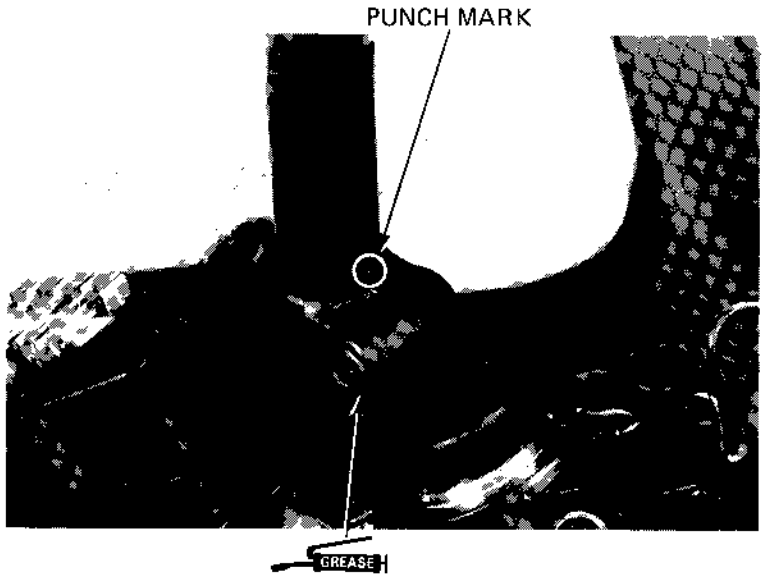


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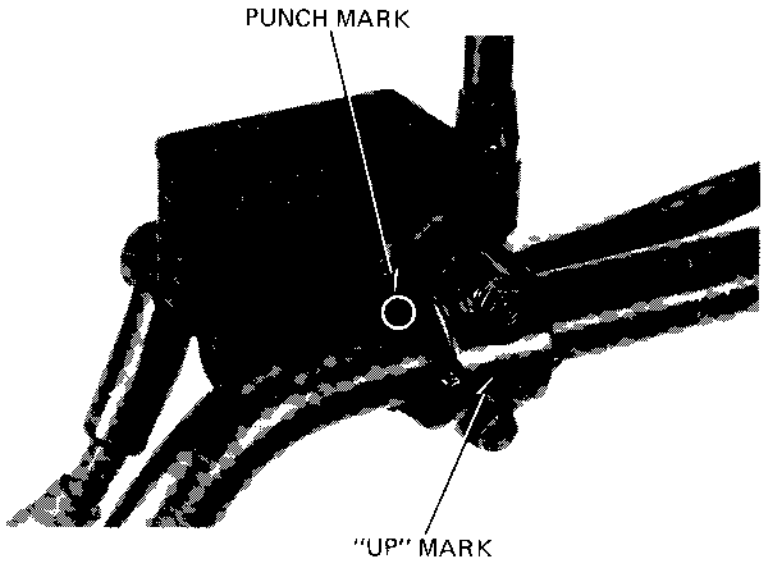
Apply grease to the handlebar pinch bolts.
Tighten the pinch bolts aligning the punch marks with the slits on the center handlebar.

TORQUE: 25–30 N·m (2.5–3.0 kg-m, 18–22 ft-lb)

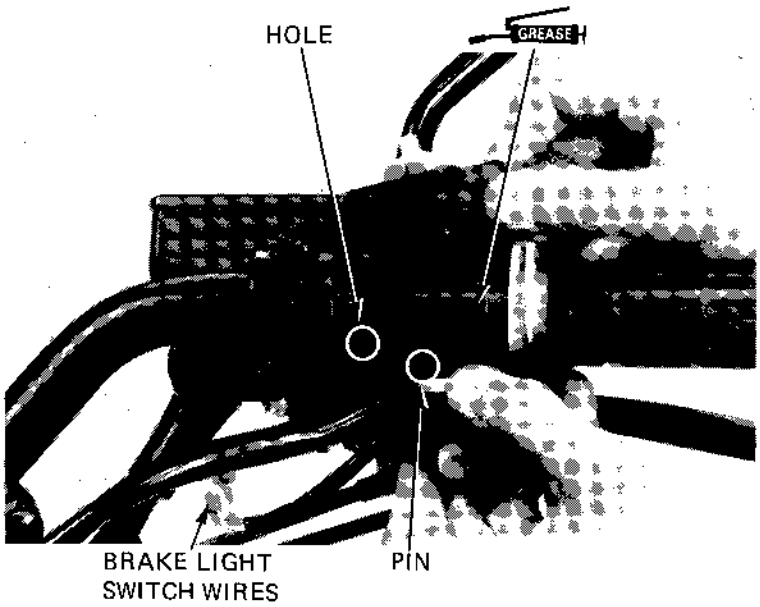
Install the pinch bolt caps.



Install the front brake master cylinder with "UP" mark facing up.
Align the end of the holder with the handlebar punch mark.
Tighten the upper bolt first, then the lower bolt.

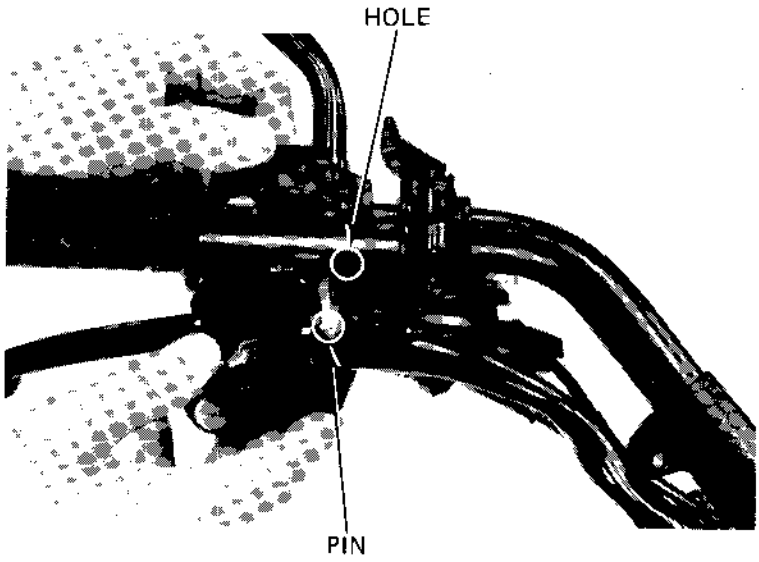


Apply grease to the throttle grip sliding surface.
Align the right switch locating pin with the hole in the handlebar and install the right switch.
Connect the brakelight switch wires.



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Install the handlebar switch.
Align the locating pin on the switch housing with the hole in the handlebar.

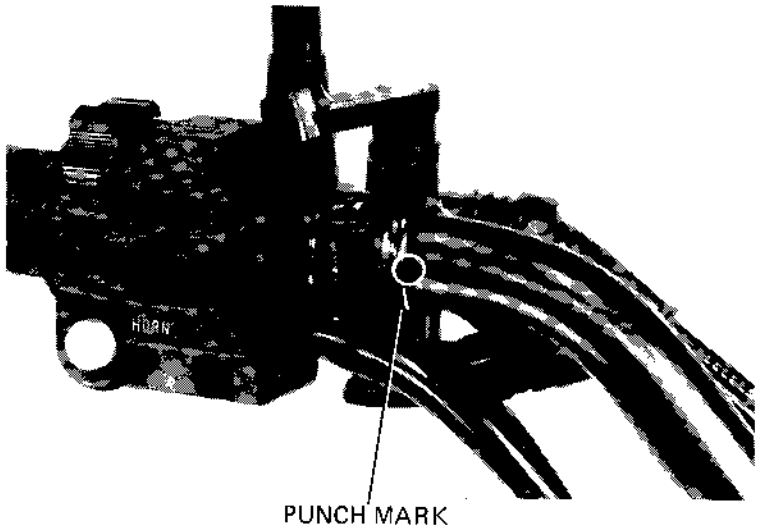


Tighten the clutch lever bracket pinch bolt by aligning the slit of the bracket with the punch mark on the handlebar.

Connect the clutch switch wires.

Connect the clutch and choke cables.

Install the handlebar wire bands.



FRONT WHEEL

REMOVAL

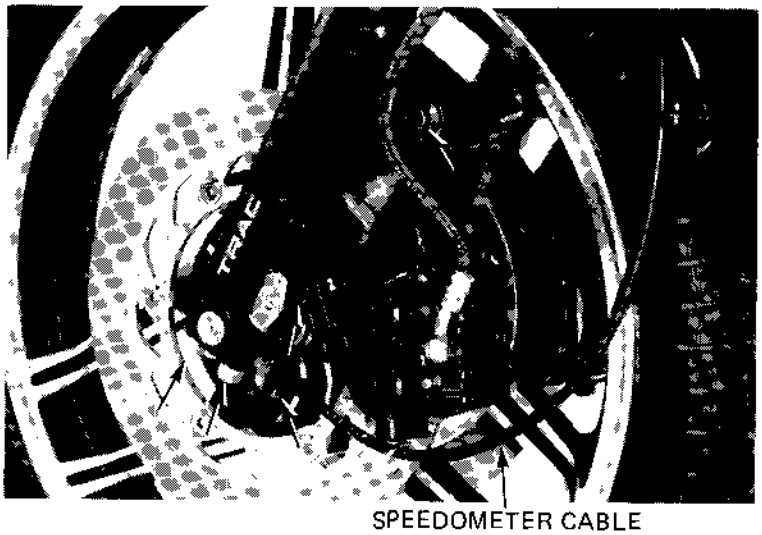
Remove the speedometer cable set screw and the speedometer cable.

Remove the left side caliper assemblies by loosening the bolts.

NOTE:

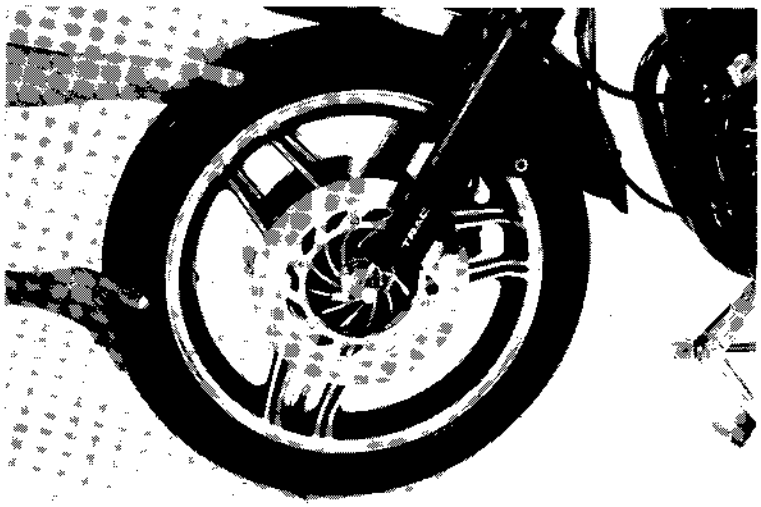
> Do not operate the front brake lever after removing the front wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.

Remove the right and left axle holders.



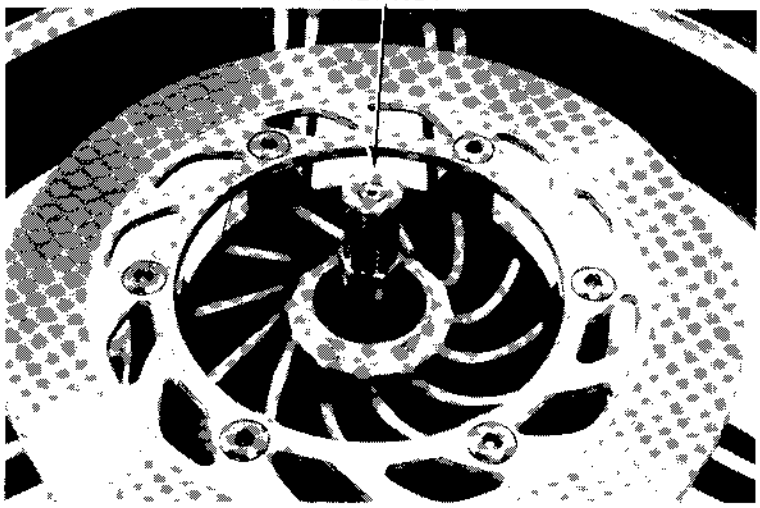
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Jack up the engine until the forks clear the front axle and remove the front wheel.



DISASSEMBLY

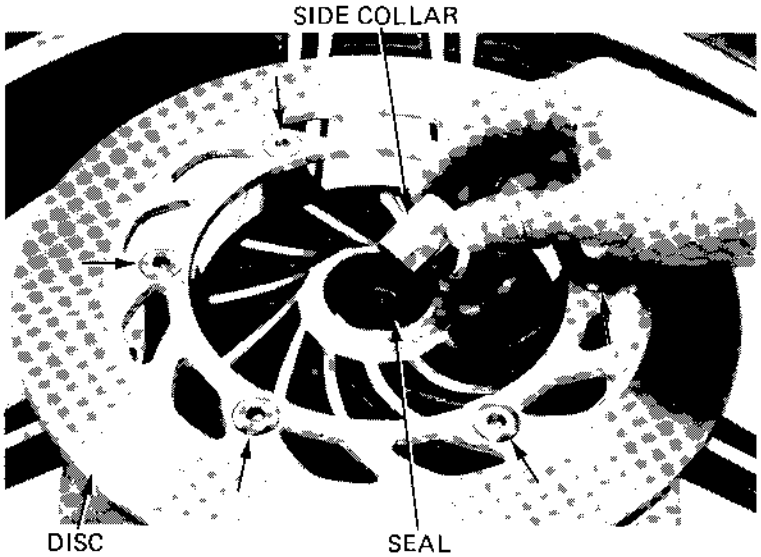
Remove the front axle nut and axle.



Remove the side collar and right seal.
Remove the brake disc mounting bolts, and discs.
Remove the left seal and speedometer gear retainer.
Remove the wheel bearings and the distance collar from the hub if the bearings need replacement. See bearing inspection (page 14-15) before removing bearings.

NOTE:

> If the bearings are removed, they must be replaced with new ones.



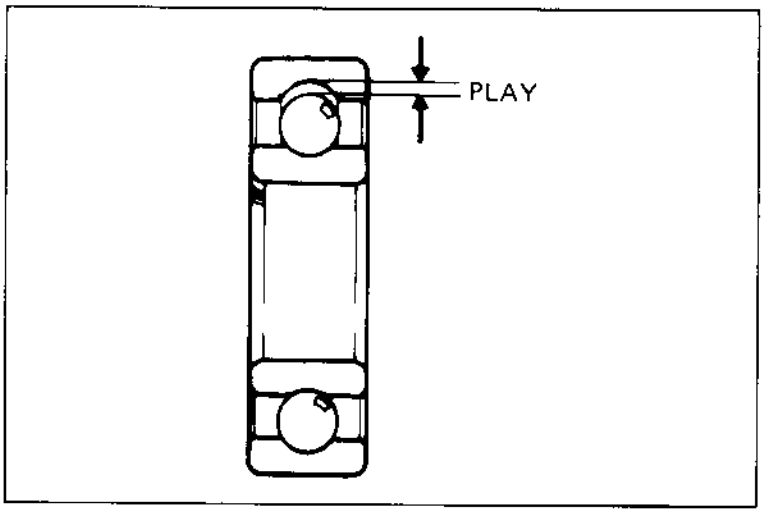
Date of Issue: August, 1982
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INSPECTION

WHEEL BEARING

Check wheel bearing play by placing the wheel in a truing stand and spining the wheel by hand. Replace the bearings with new ones if they are noisy or have excessive play.

SERVICE LIMIT: 0.03 mm (0.001 in)



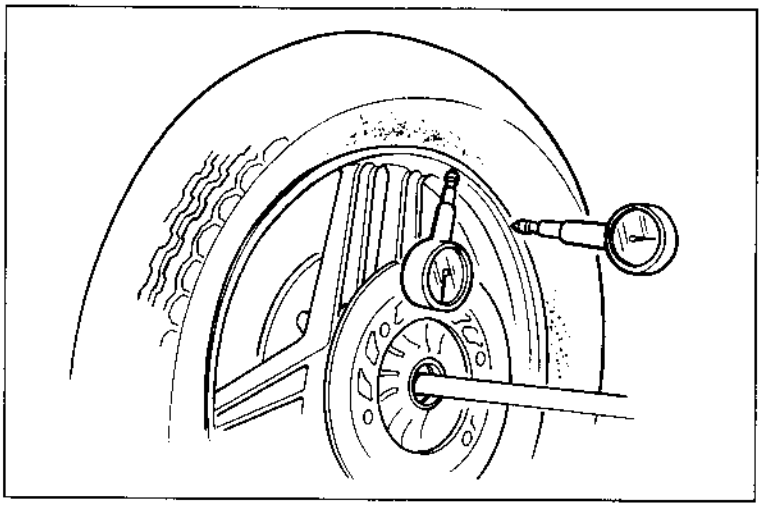
WHEEL

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

SERVICE LIMITS:
RADIAL RUNOUT: 2.0 mm (0.08 in)
AXIAL RUNOUT: 2.0 mm (0.08 in)

NOTE:

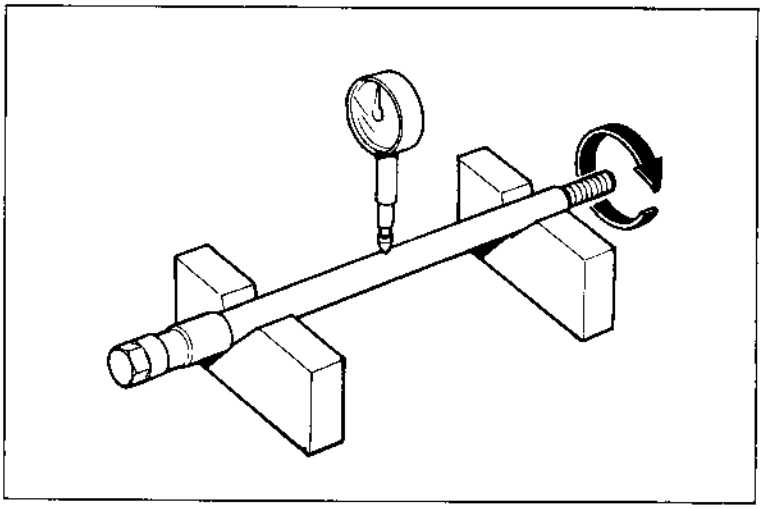
> The wheel cannot be repaired and must be replaced with a new one if the service limits are exceeded.



AXLE

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

SERVICE LIMIT: 0.2 mm (0.01 in)

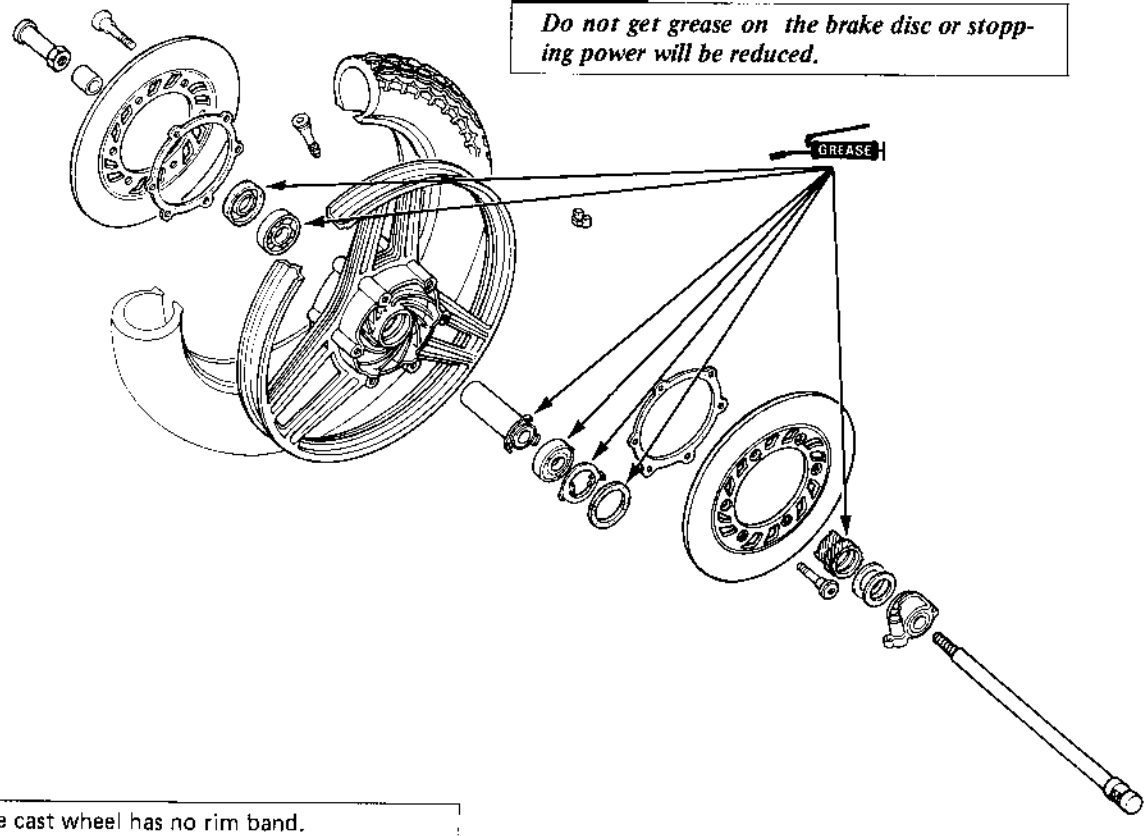


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ASSEMBLY

WARNING

Do not get grease on the brake disc or stopping power will be reduced.



NOTE:

- The cast wheel has no rim band.
- The front wheel uses a tubeless tire. For tubeless tire repair, refer to the Honda Tubeless Tire Manual.

Pack all bearing cavities with grease.
Drive in the right bearing first and press the distance collar into place.

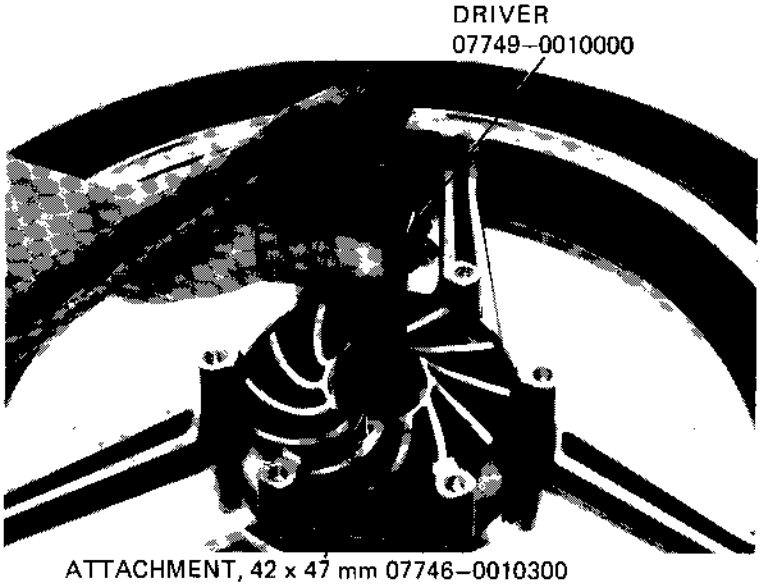
NOTE:

Be certain the distance collar is in position before installing the bearings.

Drive in the left bearing squarely.

NOTE:

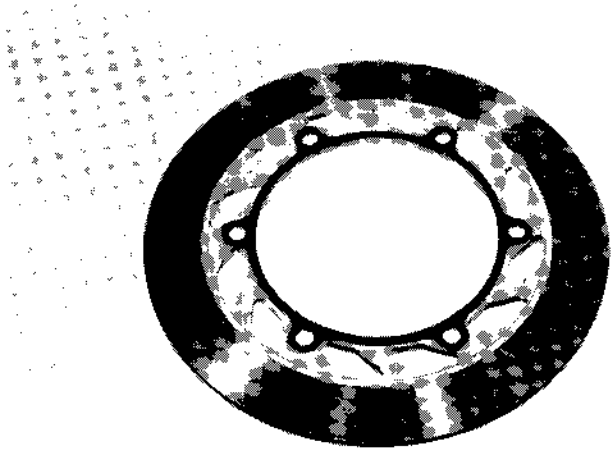
Drive the bearing into position, making sure that it is fully seated and that the sealed side is facing out.



ATTACHMENT, 42 x 47 mm 07746–0010300
PILOT, 15 mm 07746–0040300

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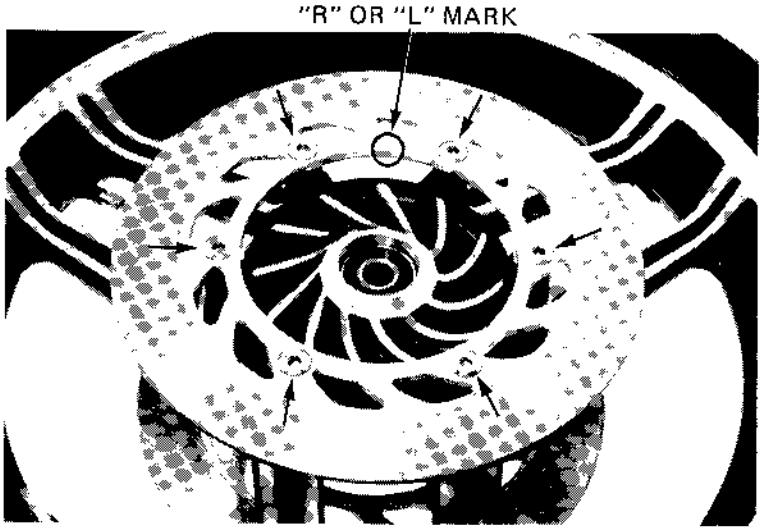
Install a new gasket onto each brake disc.



Install the brake disc with the "R" mark on the right and the disc with the "L" mark on the left.

TORQUE: 30–35 N·m (3.0–3.5 kg-m, 22–25 ft-lb)

Clean the brake discs with a high quality degreasing agent.

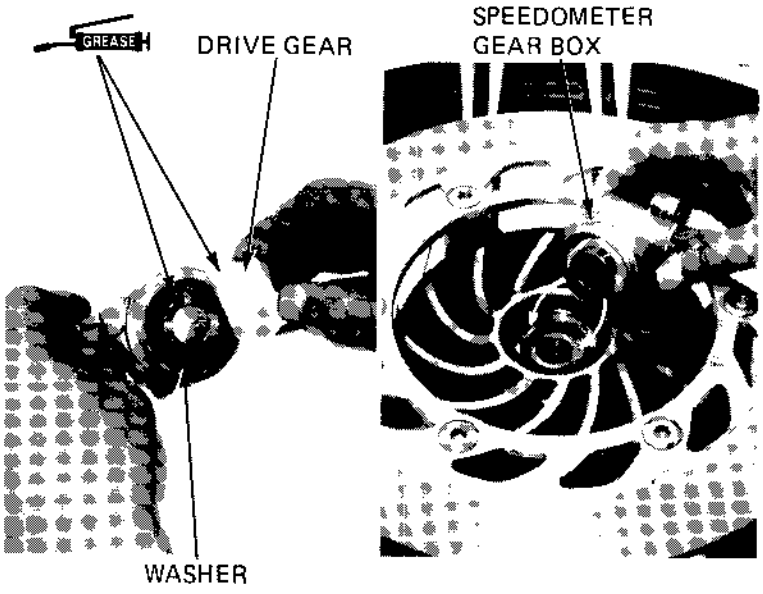


Install the speedometer gear retainer in the wheel hub, aligning the tangs with the slots.

Install the left seal all the way.

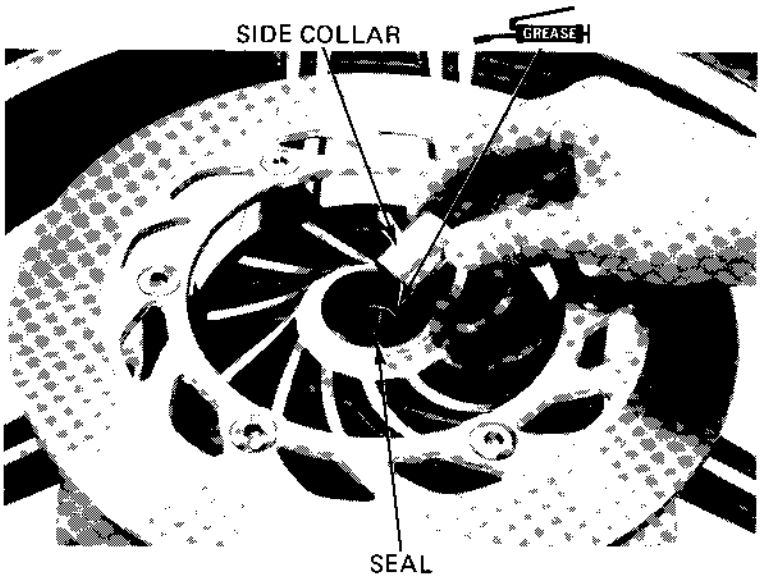
Fill the speedometer gearbox with grease and install the plain washer and drive gear.

Install the speedometer gearbox in the wheel hub, aligning the tangs with the slots.



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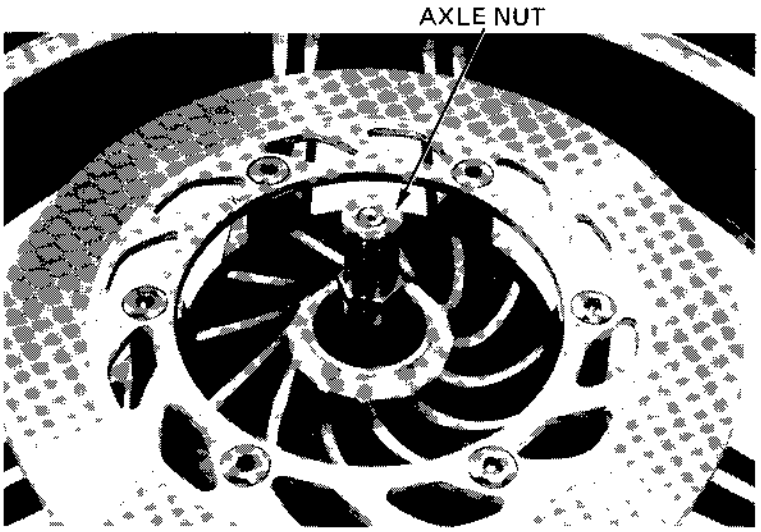
Install the right seal and side collar.



Install the front axle and axle nut.

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

Clean the brake discs with a high quality degreasing agent.



INSTALLATION

Position the wheel between the fork legs.
Lower the engine so the fork legs rest on the top of the axle.

CAUTION:

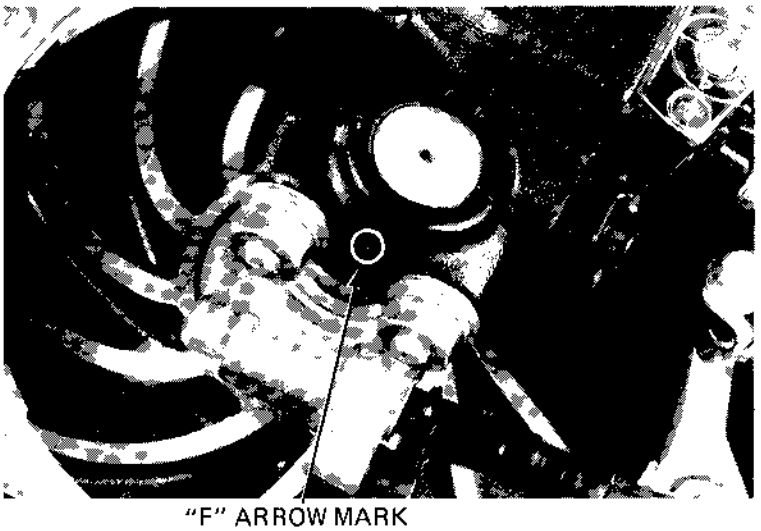
When installing the wheel, fit the right brake disc carefully between the brake pads to avoid damaging the pads.

TORQUE: 18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)

Install the caliper bolt and anti-dive pivot bolt.

TORQUE: 35–45 N·m (3.5–4.5 kg-m, 25–33 ft-lb)

Loosely install the axle holders with the "F" arrow forward.

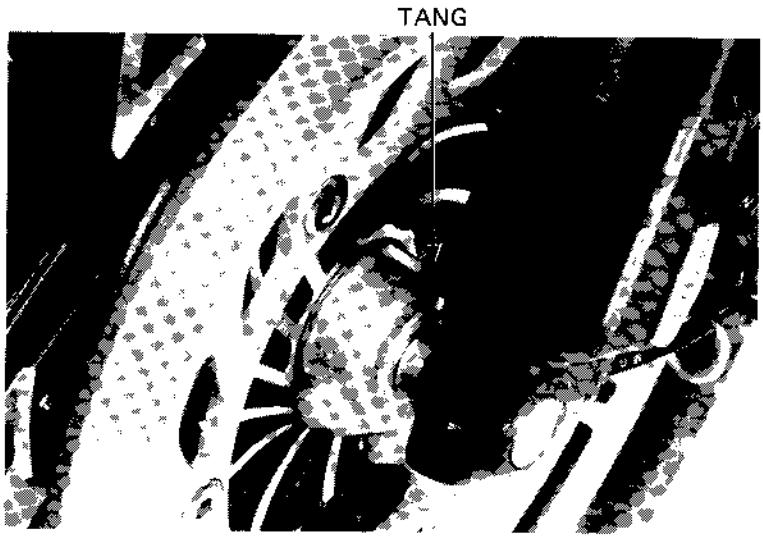


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Position the tang on the speedometer gear box against the lug on the left fork leg.

Tighten the right axle holder nuts to the specified torque, starting with the forward nuts.

TORQUE: 18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)



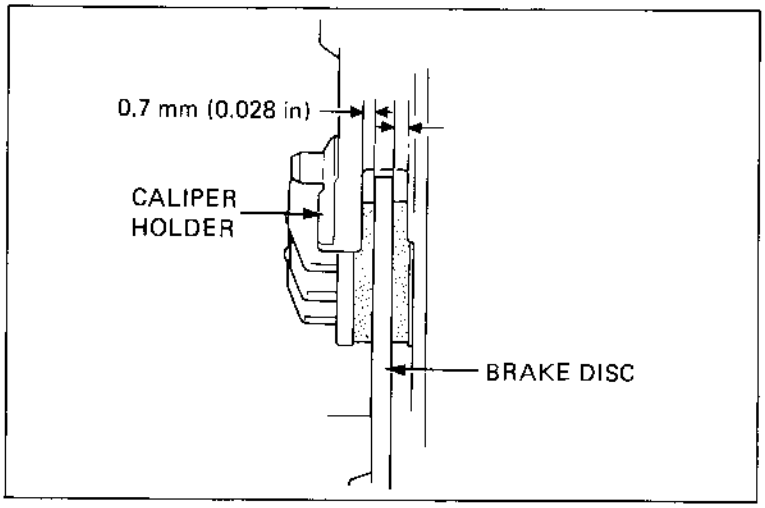
Measure the clearance between each surface of the left brake disc and the left caliper holder with a 0.7 mm (0.028 in) feeler gauge. If the gauge inserts easily, tighten the forward left axle holder nut to the specified torque, then tighten the rear nut.

If the feeler gauge cannot be inserted easily, pull the left fork out or push it in until the gauge can be inserted.

After installing the wheel, apply the brake several times, then recheck both discs for caliper holder to disc clearance.

WARNING

Failure to provide adequate disc to caliper holder clearance may damage the brake disc and impair brake efficiency.

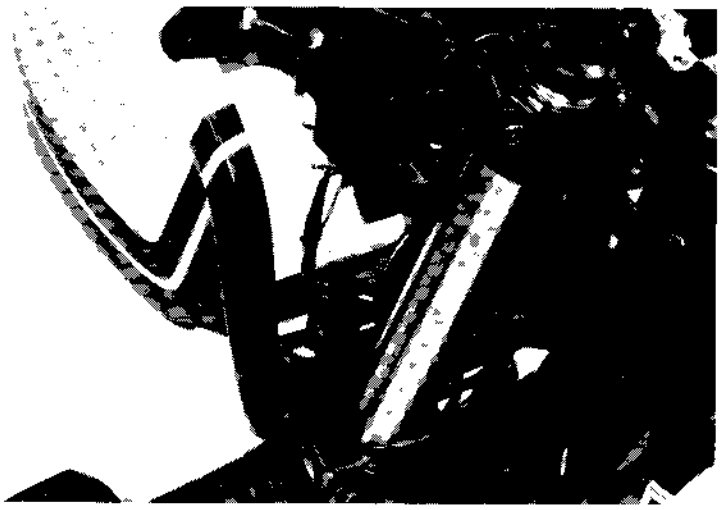


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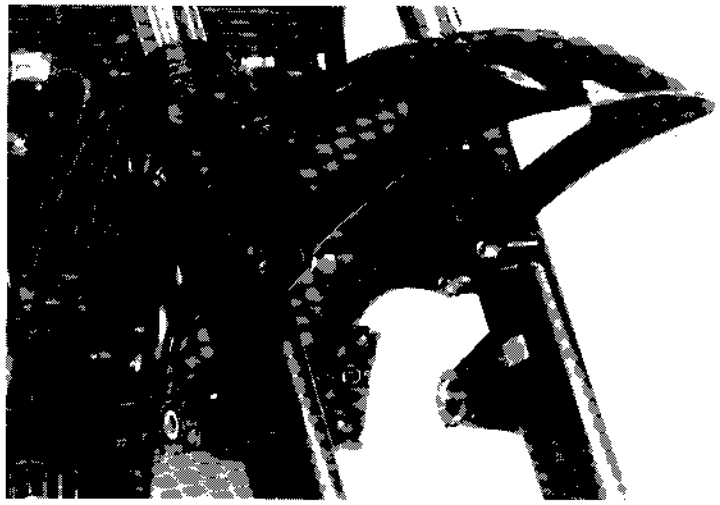
FRONT FORK

REMOVAL

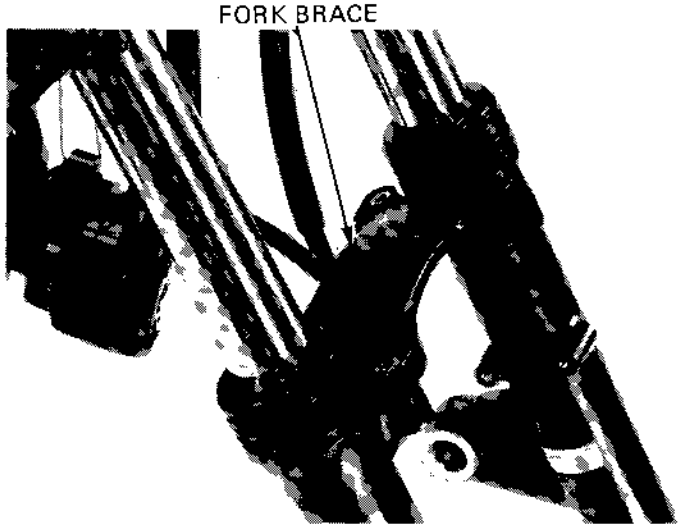
Remove the brake caliper (page 16-11).
Remove the front wheel (page 14-14).
Open the fairing.



Remove the front fender mounting bolts and fender.

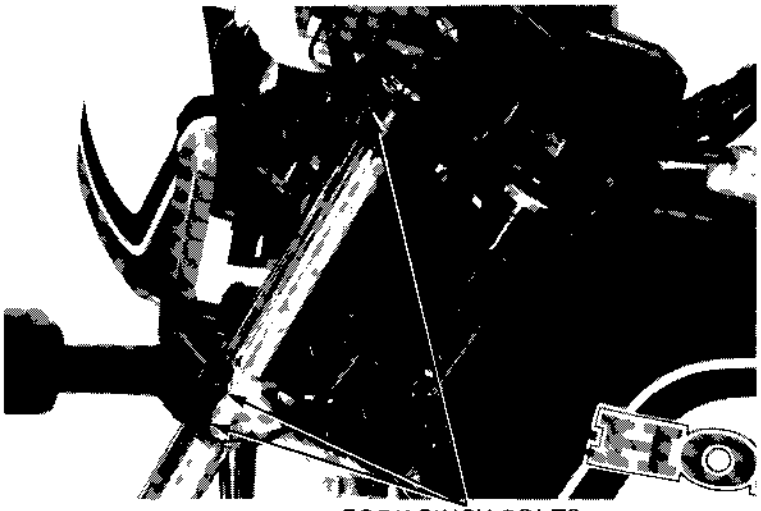


Remove the front fork brace bolt caps, bolts and brace.



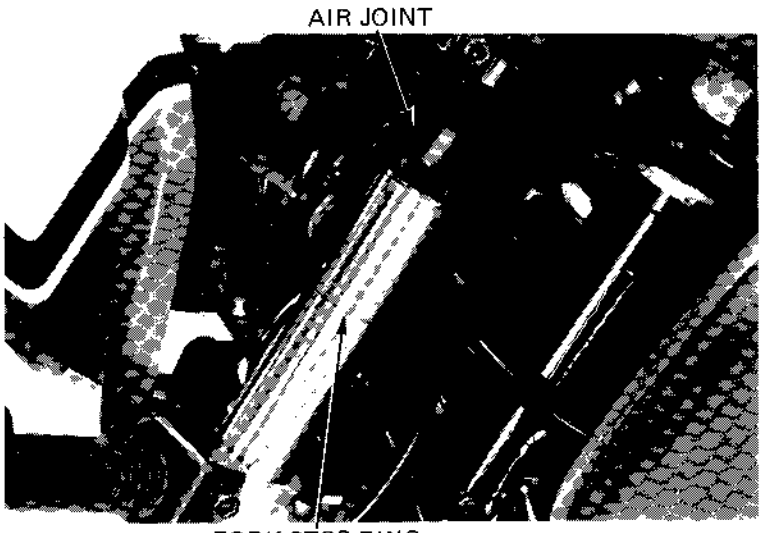
Date of Issue: August, 1982
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Loosen the fork upper and lower pinch bolts.



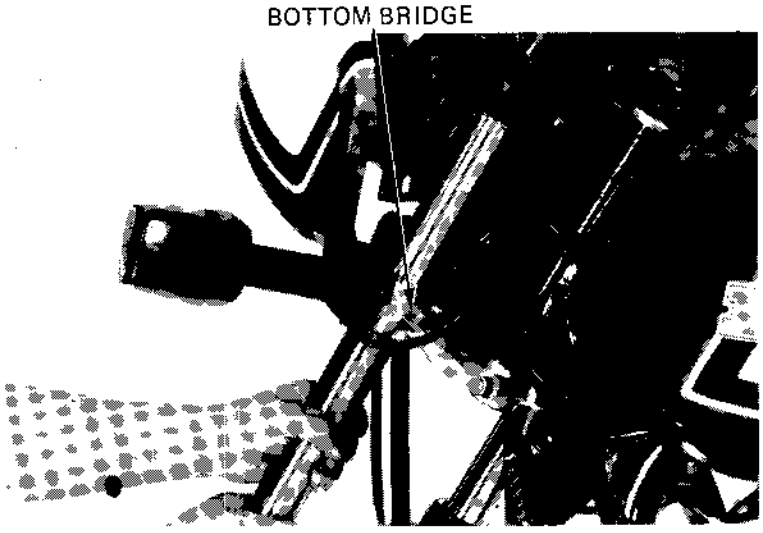
FORK PINCH BOLTS

Pull down each fork pipe out of the fork top bridge and the air joints while turning it.
Remove the fork stop rings.



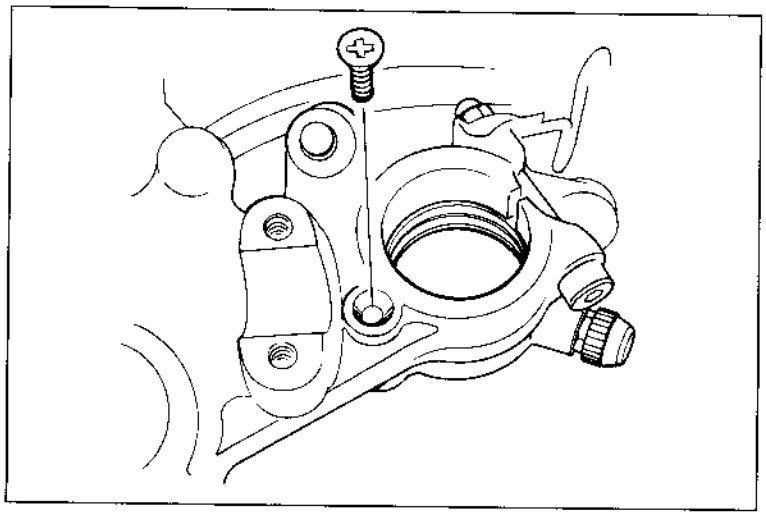
FORK STOP RING

Pull each fork pipe out of the fork bottom bridge.

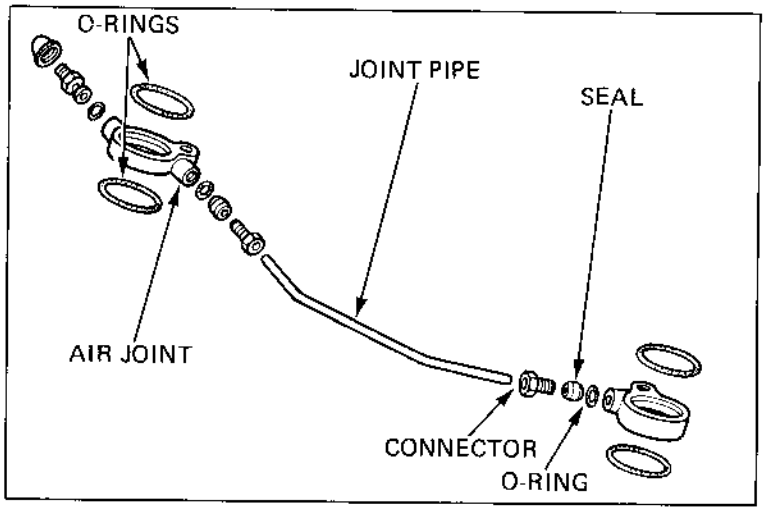


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If the service of the air joints is necessary, remove the handlebar (page 14-8) and remove the two screws attaching the fork air joints to the fork top bridge.



Loosen the air joint pipe connectors and remove the joint pipe.



DISASSEMBLY

Depress the air valve and release front fork air pressure.

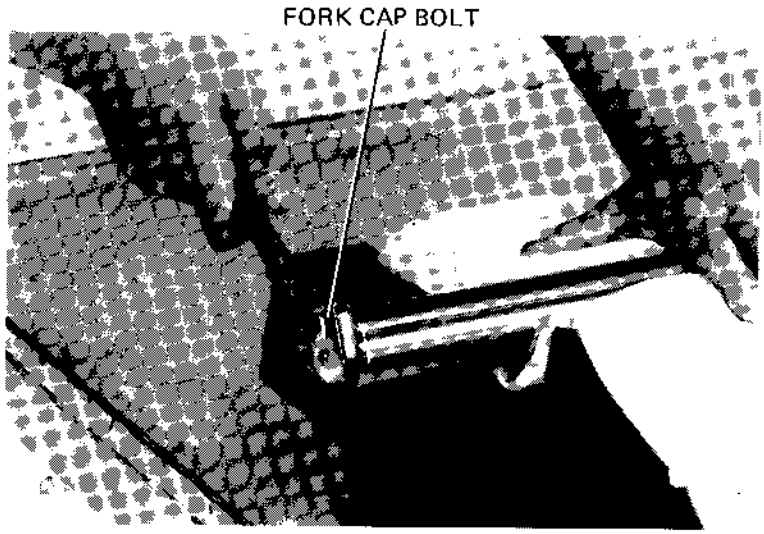
CAUTION:

- *If air pressure is not released before disassembling, the fork tube cap may become a projectile.*
- *The cap is also under spring pressure. Use care when removing and wear eye and face protection.*

Hold the fork tube in a vise, with soft jaws or s shop towel and remove the fork tube cap.

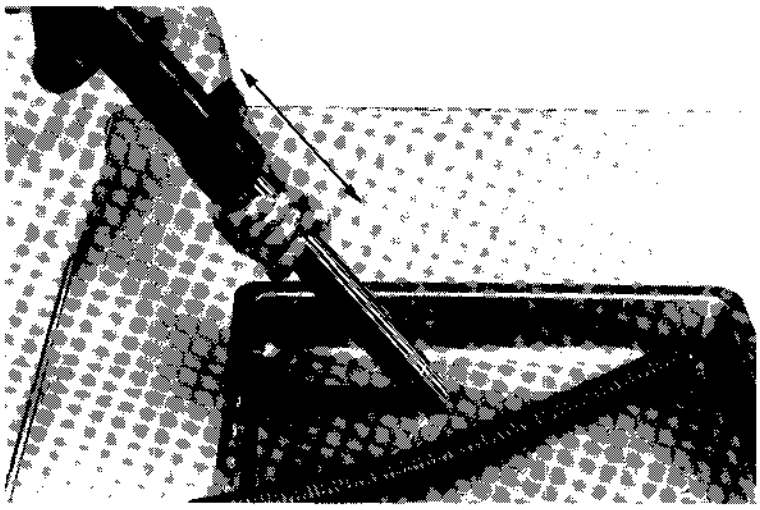
CAUTION:

Be careful not to damage the sliding surface.



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Remove the fork spring.
Pour out fork fluid by pumping the fork up and down several times.

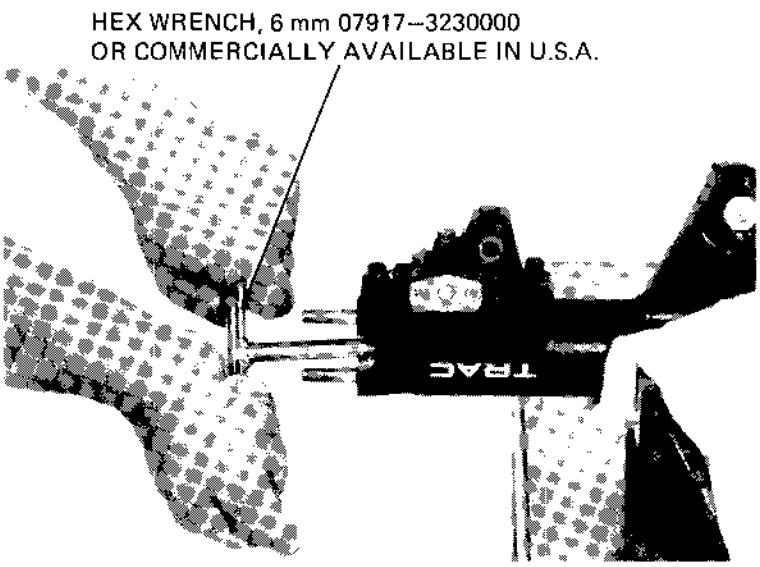


Hold the fork slider in a vise with soft jaws or a shop towel.
Remove the socket bolt with a hex wrench.

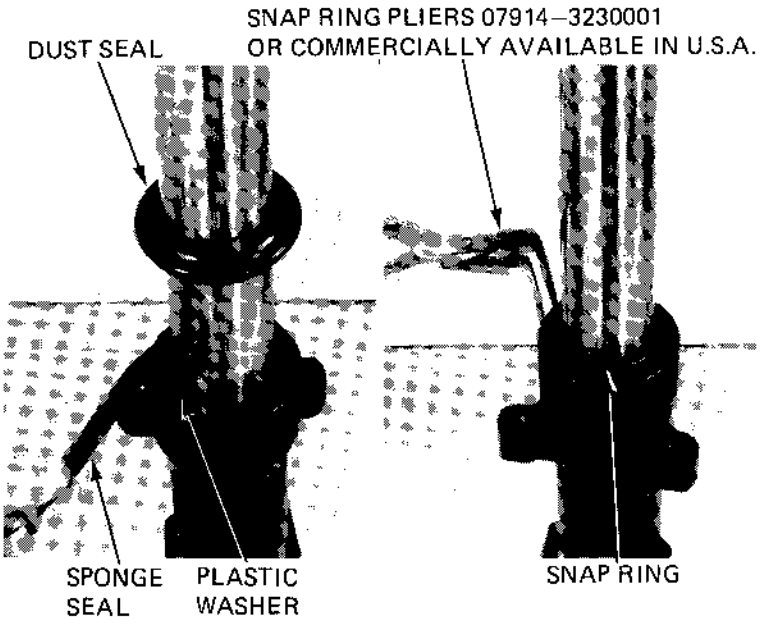
NOTE:

> Temporaily install the spring and fork bolt if difficulty is encountered in removing the socket bolt.

The piston and rebound spring can now be removed from the fork.



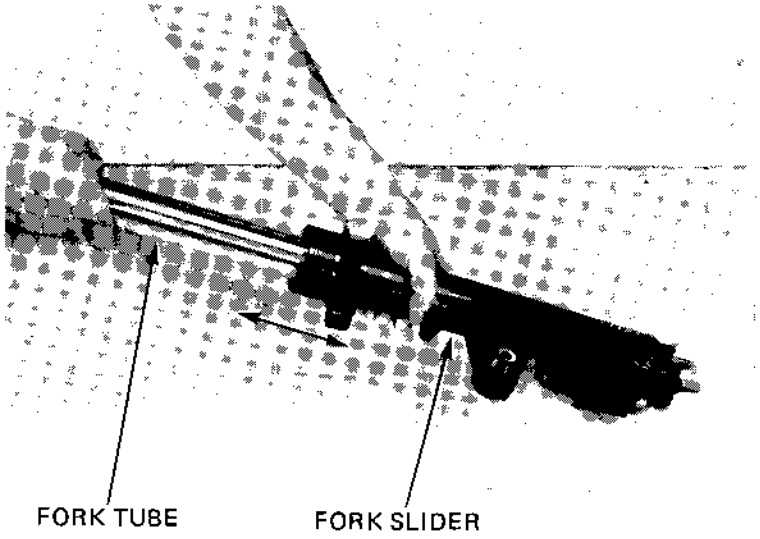
Remove the dust seal, sponge seal and plastic washer.
Remove the snap ring.



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Pull the fork tube out until resistance from the slider bushing is felt. Then move it in and out, tapping the bushing lightly until the fork tube separates from the slider. The slider bushing will be forced out by the fork tube bushing.

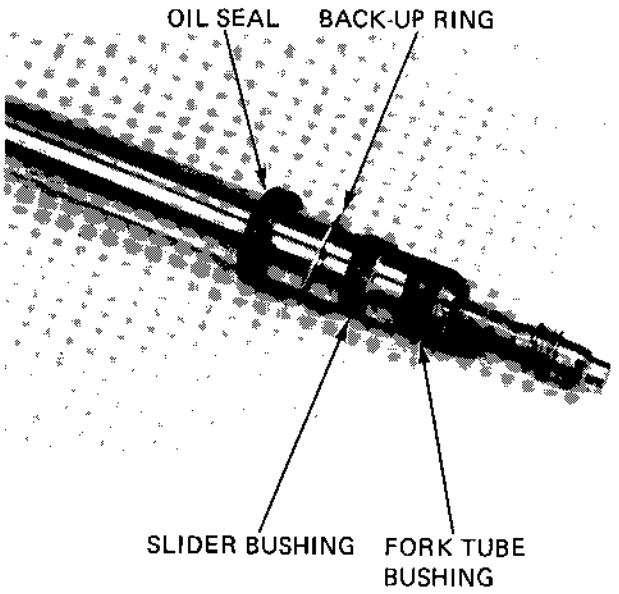
Remove the oil lock piece from inside the slider.



Remove the oil seal, back-up ring and slider bushing from the fork tube.

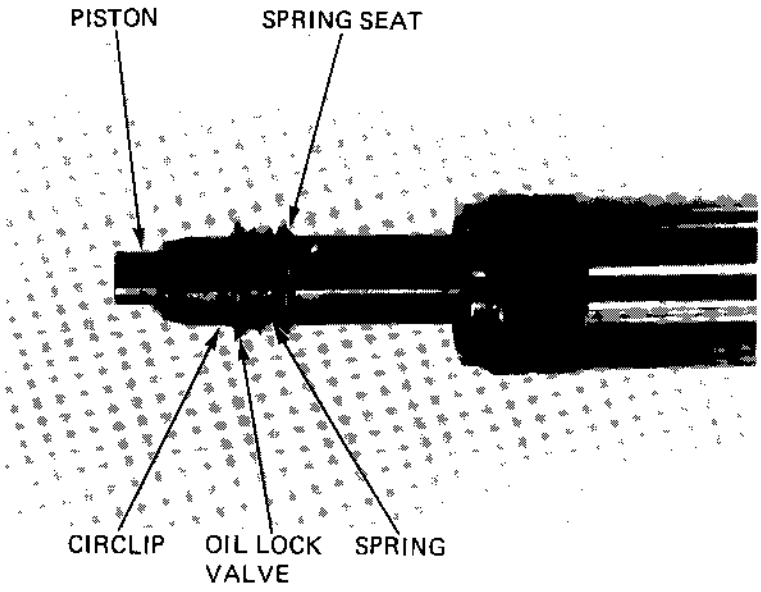
NOTE:

> Do not remove the fork tube bushing unless it is necessary to replace it with a new one.



Remove the circlip, oil lock valve, spring, and spring seat from the piston.

Remove the piston and rebound spring from the fork tube.



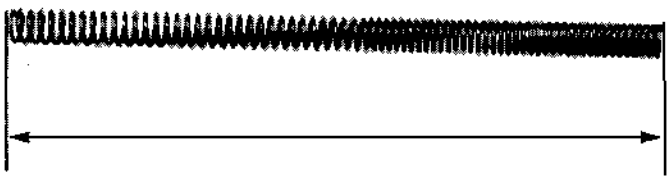
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INSPECTION

FORK SPRING FREE LENGTH

Measure the fork spring free length.

SERVICE LIMIT: 553 mm (21.77 in)

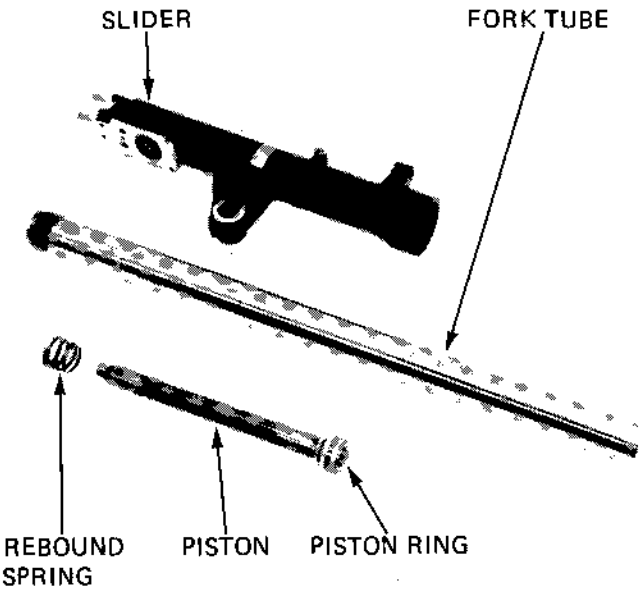


FORK TUBE/FORK SLIDER/PISTON

Check the fork tube, fork slider and piston for score marks, scratches, or excessive or abnormal wear. Replace may components which are worn or damaged.

Check the fork piston ring for wear or damage.

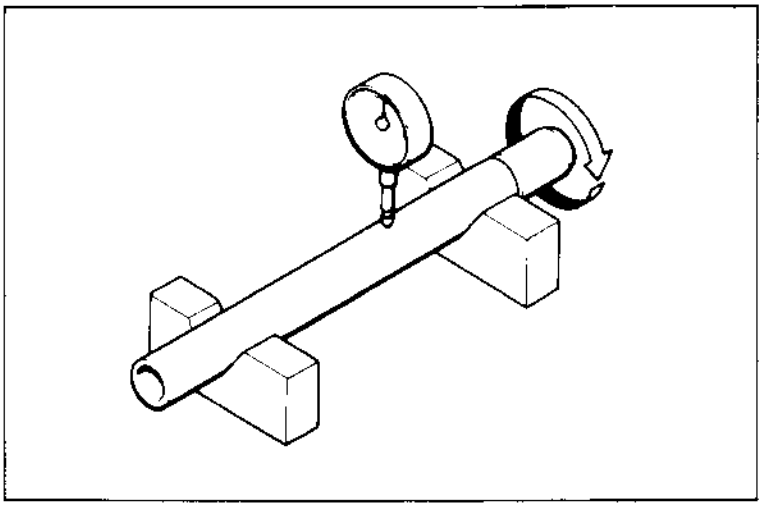
Check the rebound spring for fatigue or damage.



FORK TUBE

Set the fork tube V blocks and read the runout. Use 1/2 the total indicator reading to determine the actual runout.

SERVICE LIMIT: 0.20 mm (0.008 in)

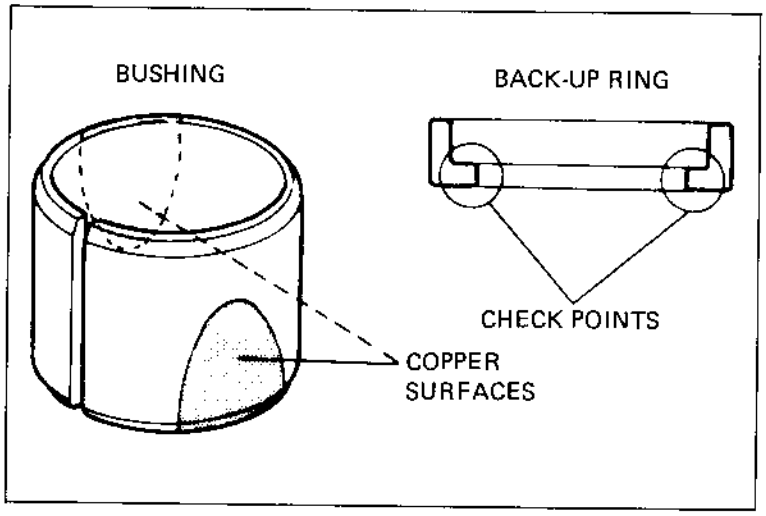


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BUSHING/BACK-UP RING

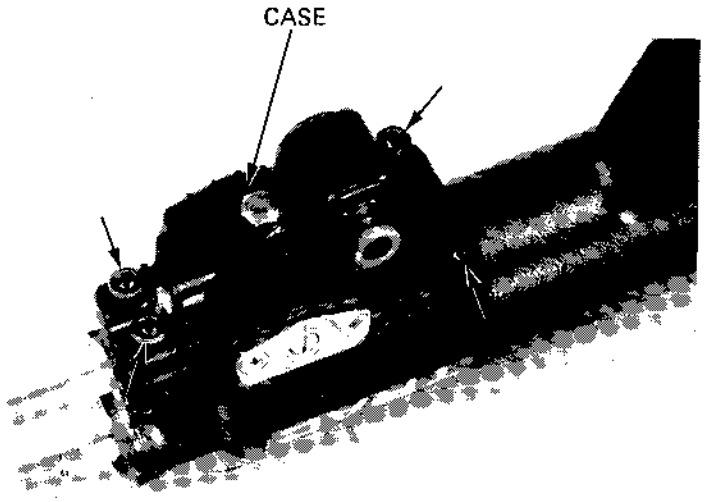
Visually inspect the slider and fork tube bushings. Replace the bushings if there is excessive scoring or scratching, or if the teflon is worn so that the copper surface appears on more than 3/4 of the entire surface.

Check the back-up ring; replace it if there is any distortion at the points shown.

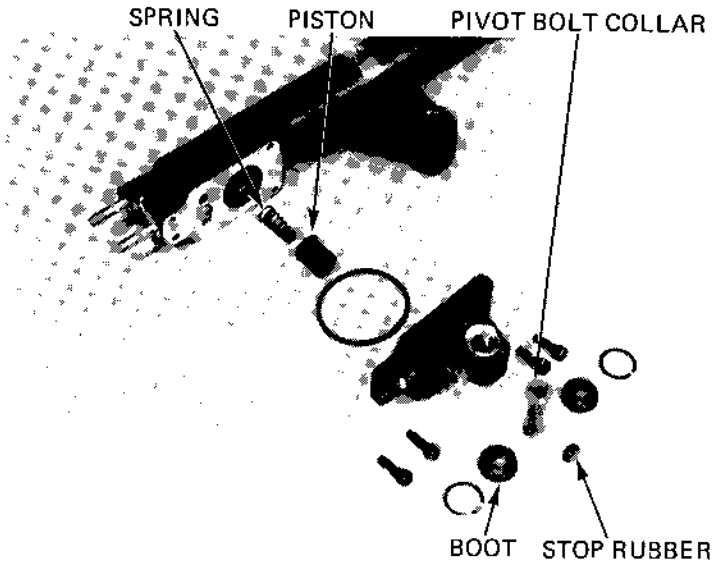


ANTI-DIVE CASE

Remove the four socket bolts and remove the anti-dive case.

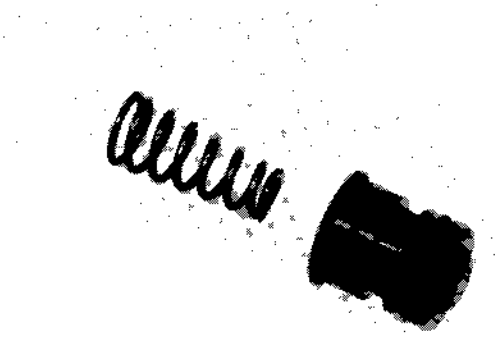


Remove the piston and spring.
Remove the boots, pivot bolt collar and stop rubber.



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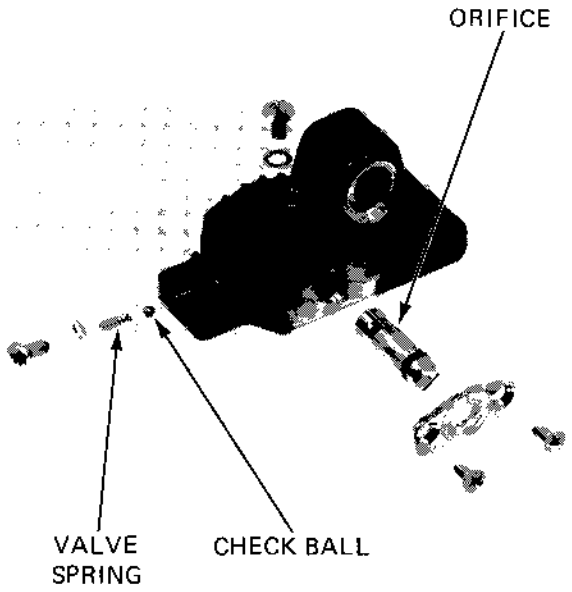
Check the spring and piston for wear of damage.



Remove the orifice setting plate screws, setting plate and orifice.

Check the orifice for clogging by applying compressed air. Also check the orifice for damage and replace if necessary.

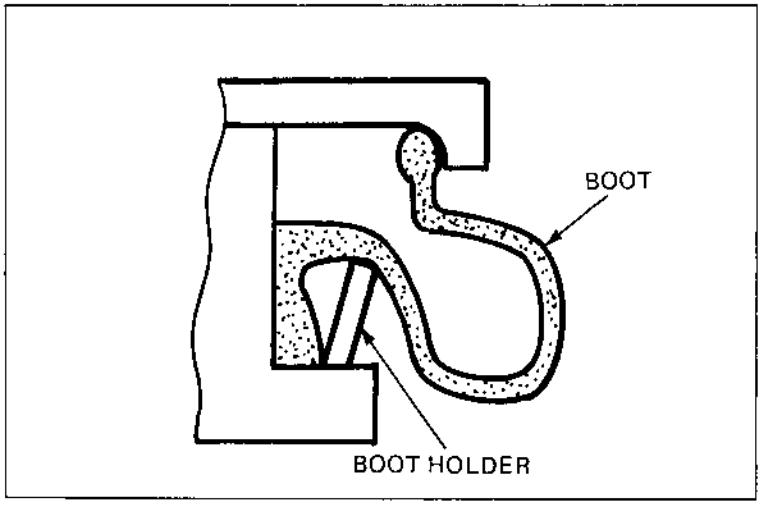
Remove the check valve setting screw, valve spring and check ball.



Assemble the anti-dive case in the reverse order of disassembly.

NOTE:

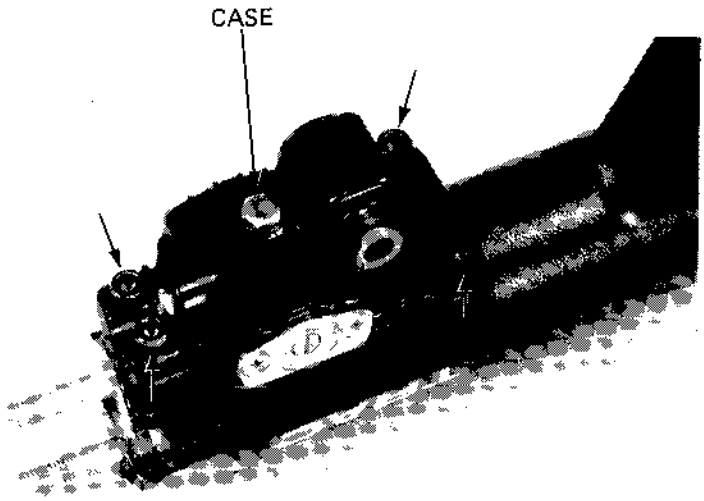
- Apply a Thread Lock Agent to the threads of the screws and socket bolts before assembly.
- Apply ATF to the piston and piston O-ring.
- Apply silicone grease to the pivot bolt collar.
- Install the pivot bolt collar boot holder as shown.



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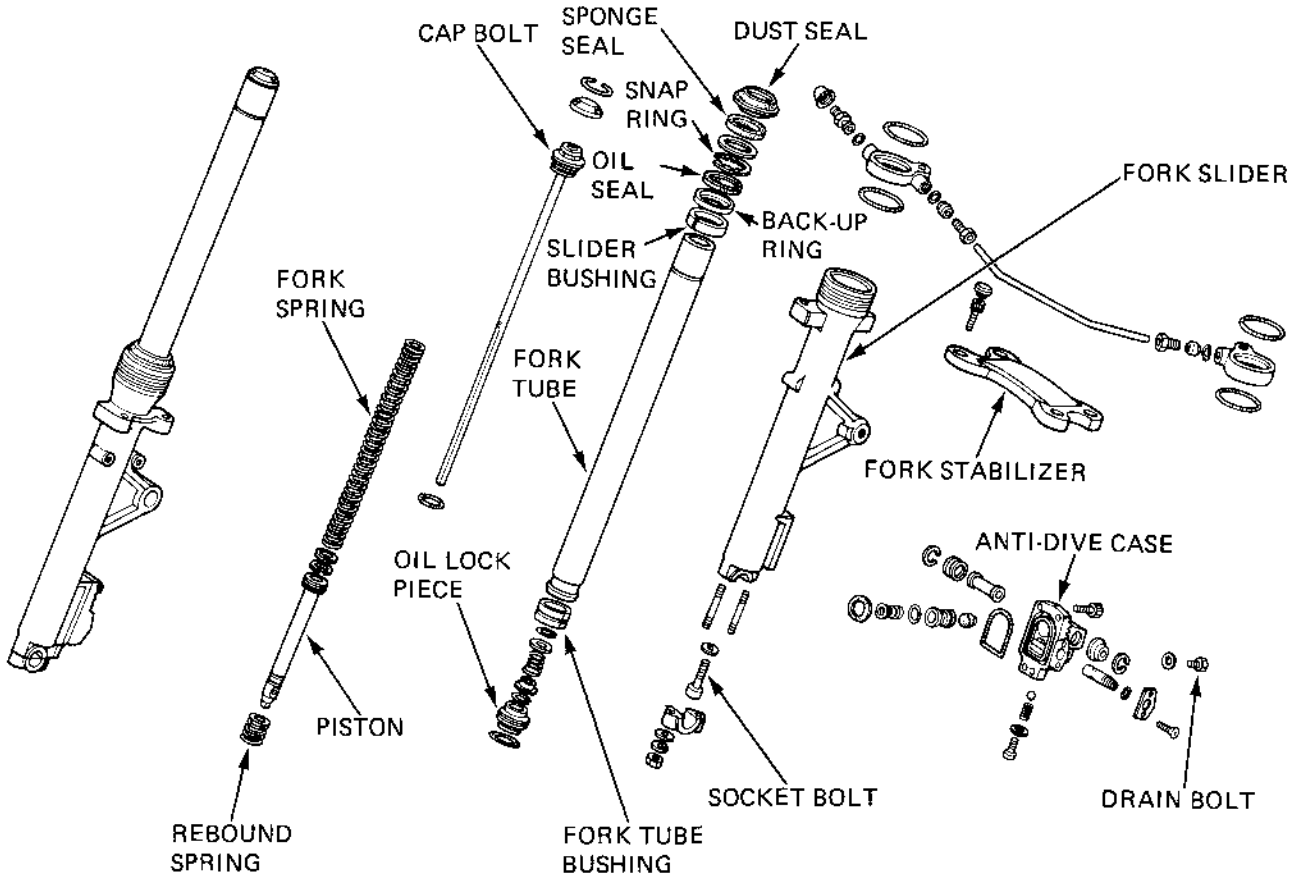
Check the operation of the collar and piston.

STANDARD PISTON STROKE: 2 mm (0.08 in)



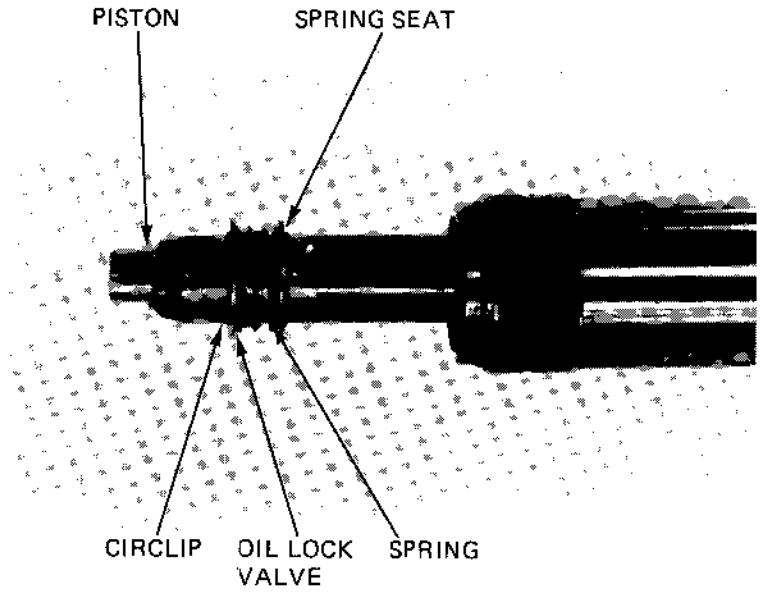
ASSEMBLY

Before assembly, wash all parts with a high flash point or non-flammable solvent and wipe them off completely.

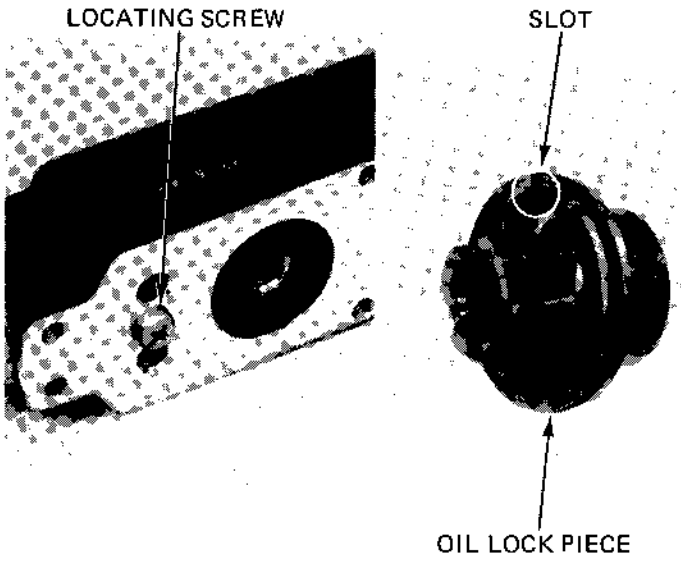


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Insert the rebound spring and piston into the fork tube.
On the left fork, install the spring seat, valve spring, oil lock valve and circlip on the piston.



Remove the locating screw from the fork slider.
Install the oil lock piece and piston into the fork tube and insert the tube into the slider.
Align the slot in the oil lock piece with the screw hole and install the locating screw.
Install the TRAC cover.



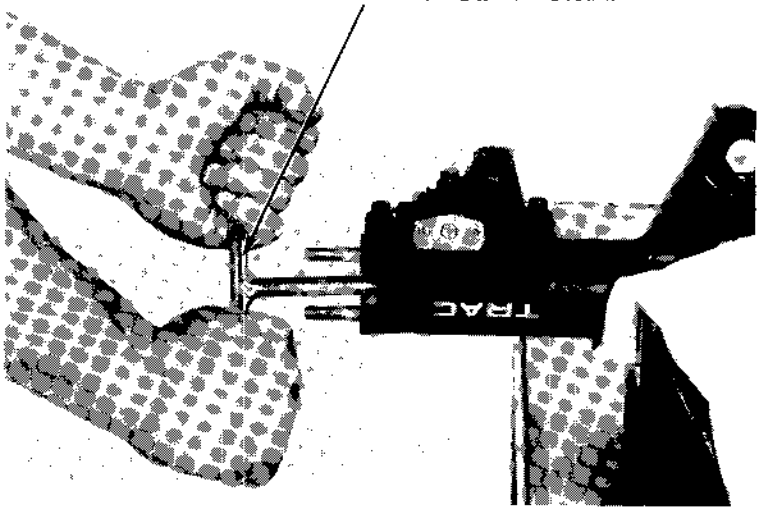
Place the fork slider in a vise with soft jaws or a shop towel.

Apply a locking agent to the socket bolt and thread it into the piston. Tighten with a 6 mm hex wrench.

NOTE:

> Temporaily install the fork spring and fork cap bolt to tighten the socket bolt.

TORQUE: 15–25 N·m (1.5–2.5 kg-m, 11–18 ft-lb)



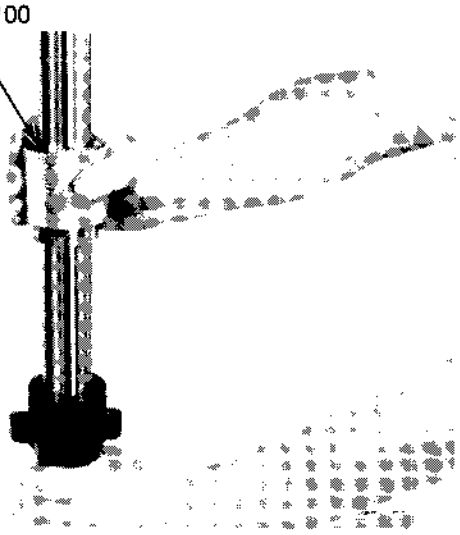
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Place the slider bushing over the fork tube and rest it on the slider. Put the back-up ring and an old bushing or equivalent tool on top.

Drive the bushing into place with the seal driver and remove the old bushing or equivalent tool.

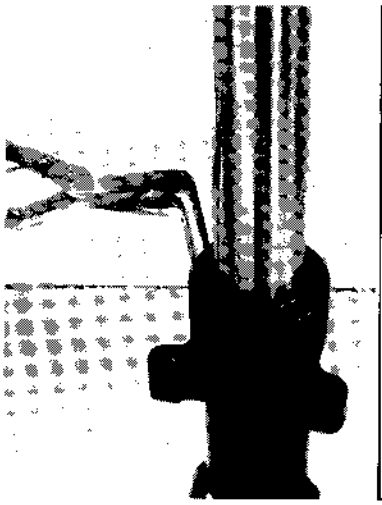
Coat a new oil seal with ATF and install it with the seal markings facing up. Drive the seal in with the seal driver.

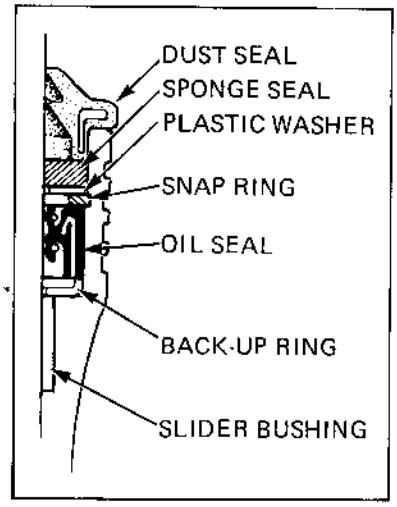
FORK SEAL DRIVER
07947–4630100



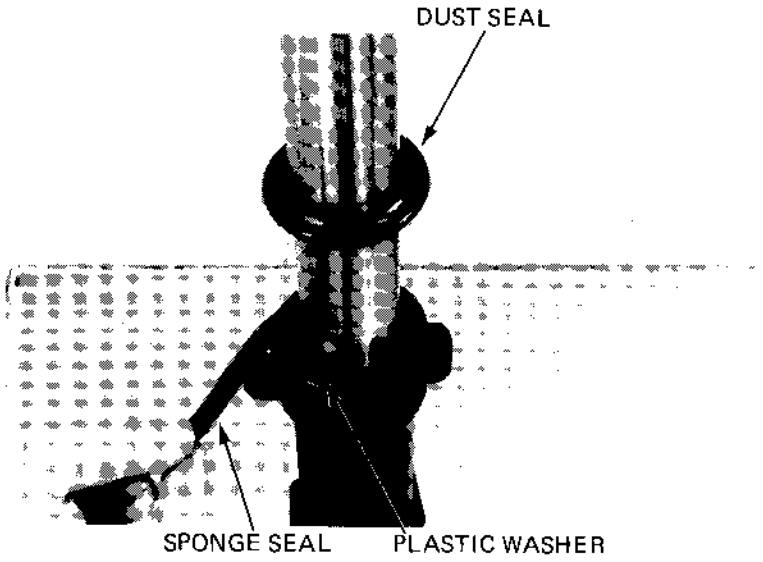
Install the snap ring with its radiused edge facing down.

SNAP RING PLIERS
07914–3230001





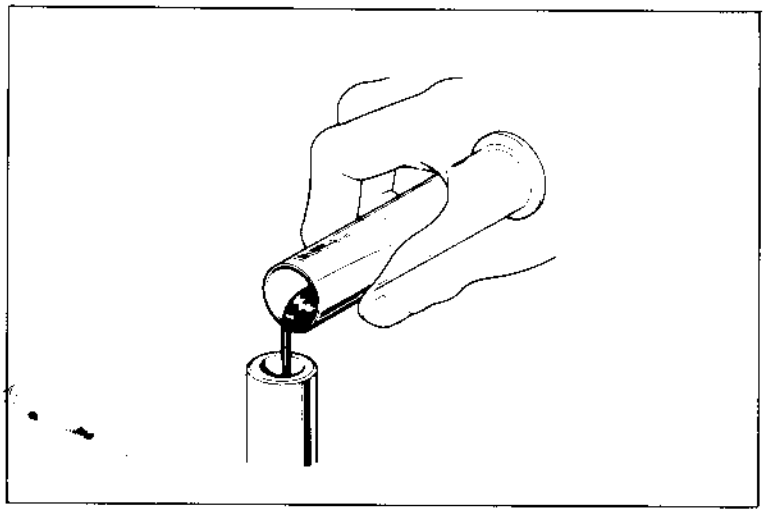
Install the plastic washer, sponge seal and dust seal.



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Pour the specified amount of ATF into the fork tube.

CAPACITY: 281 cc (9.5 oz)





Install the fork spring, spring seat and spacer in the fork tube.

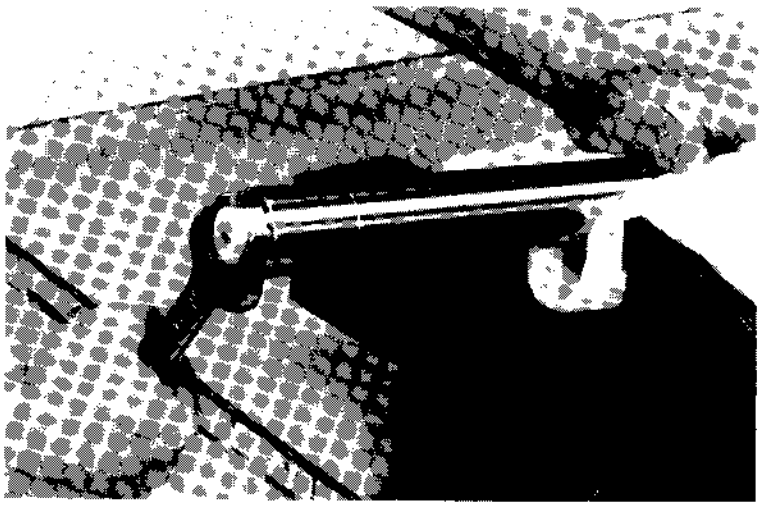
NOTE:

> Note the spring direction, the narrow pitches should face toward the top.



Install and torque the fork tube cap.

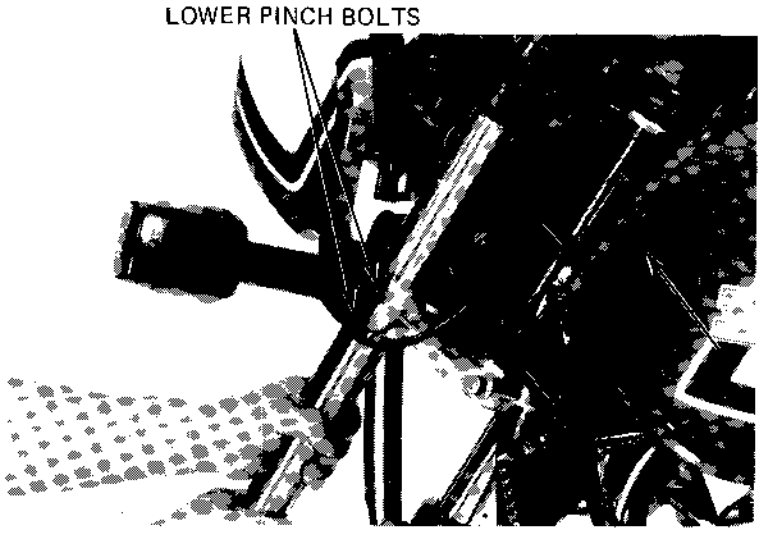
TORQUE: 15–30 N·m (1.5–3.0 kg-m, 11–22 ft-lb)



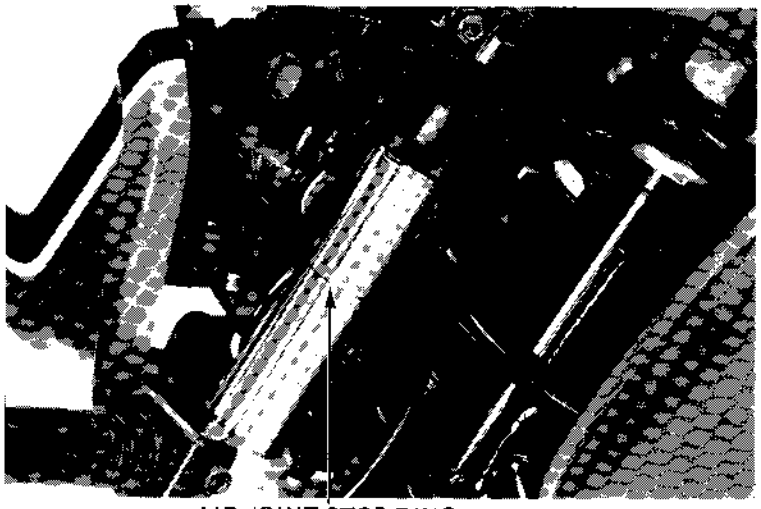
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INSTALLATION

Install the front forks and temporarily tighten the lower fork pinch bolts.

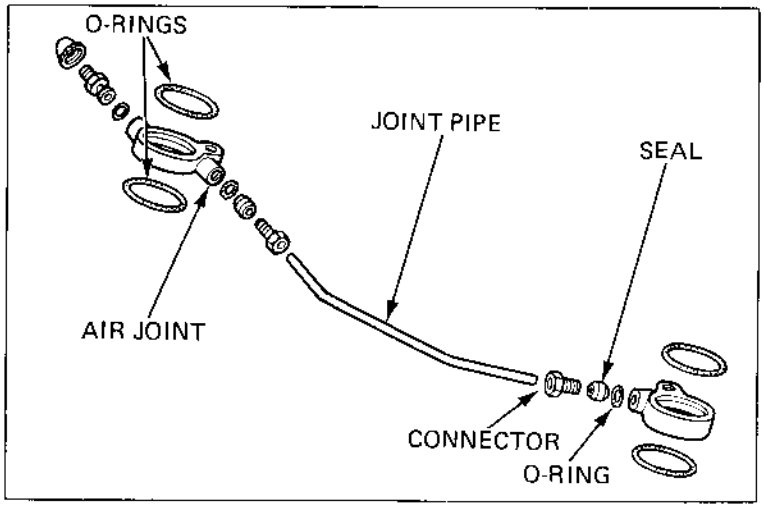


Install the air joint stop rings in the grooves in the fork tubes.



Install new O-rings in the grooves of the air joints.

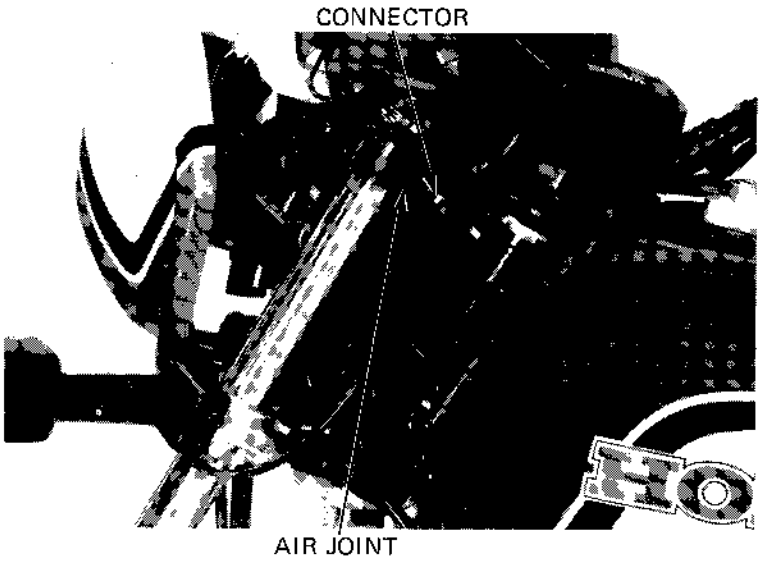
Install the air joint pipe connectors, seals, O-rings over both ends of the air joint pipe.



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Install the fork air joints over the fork tubes.

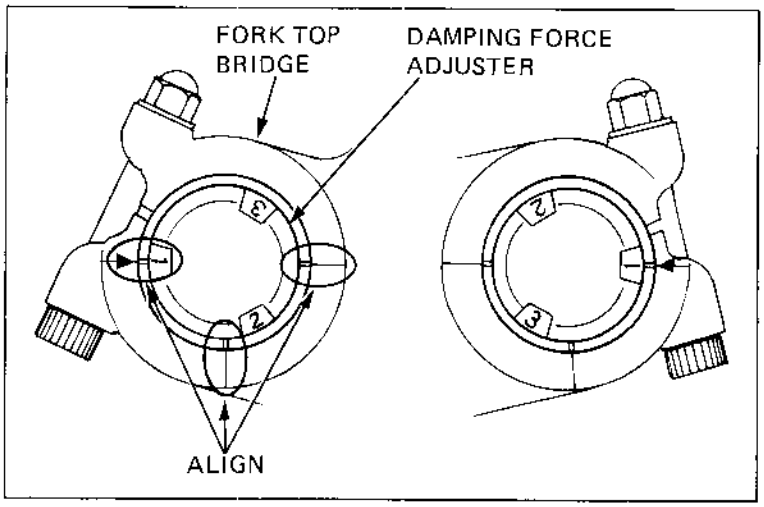
Install the air joint pipe and tighten the connectors.
TORQUE: 4–7 N·m (0.4–0.7 kg-m, 3–5 ft-lb)



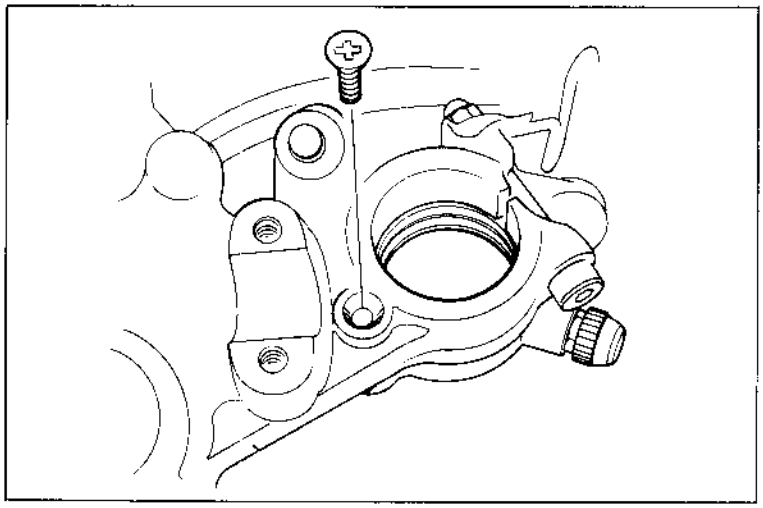
Loosen the lower fork pinch bolts and adjust the fork tube level so that the air joints touch the top bridge lower surface.
Align the three alignment marks on the fork cap bolt with the index marks on the fork top bridge.
Tighten the upper and lower fork pinch bolts.

TORQUE:
Upper: 9–13 N·m (0.9–1.3 kg-m, 7–9 ft-lb)
Lower: 18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)

Install the damping force adjuster over the fork cap bolt so that its adjustment mark 1, 2 or 3 aligns with the adjustment index mark on the fork top bridge.



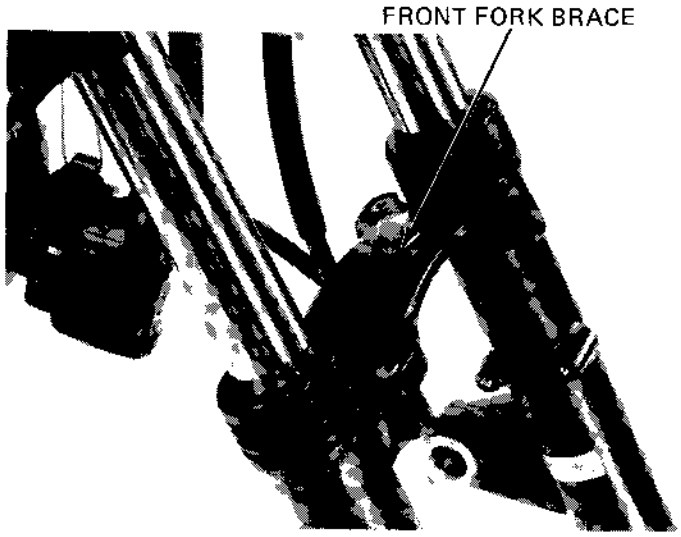
Tighten the air joint mounting screws.



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Loosely install the front fork brace.
Install the removed parts in the reverse order of removal.
— Front fender.
— Front wheel.
— Brake calipers.
With the front brake applied, pump the front forks up and down several times.
Tighten the front fork brace mounting bolts.

TORQUE: 18–28 N·m (1.8–2.8 kg-m, 14–21 ft-lb)

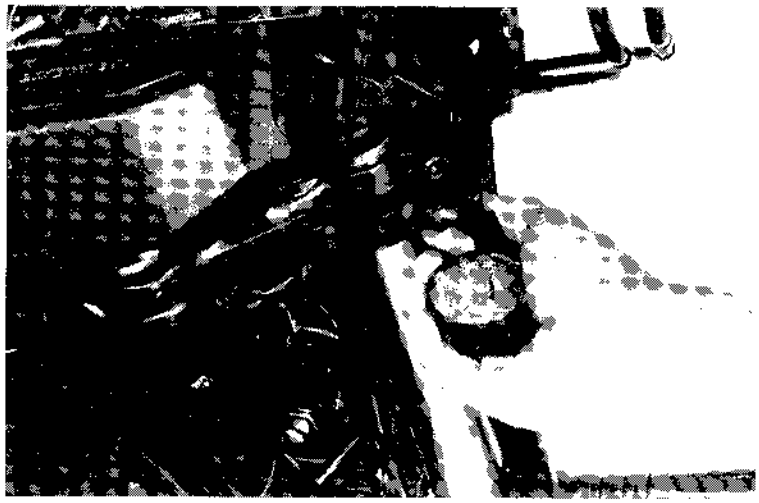


Fill the fork tubes with air to 0–6 kPa (0–0.6 kg/cm^2, 0–8 psi).

CAUTION:

- *Use only a hand operated air pump to fill the fork tubes. Do not use compressed air.*
- *Maximum pressure is 300 kPa (3 kg/cm^2, 43 psi). Do not exceed this or fork tube component damage may occur.*

With the front brake applied, pump the front forks up and down several times. Place the motorcycle on its center stand. Check the air pressure and adjust if necessary.



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STEERING STEM

REMOVAL

Remove the front wheel (page 14-13).

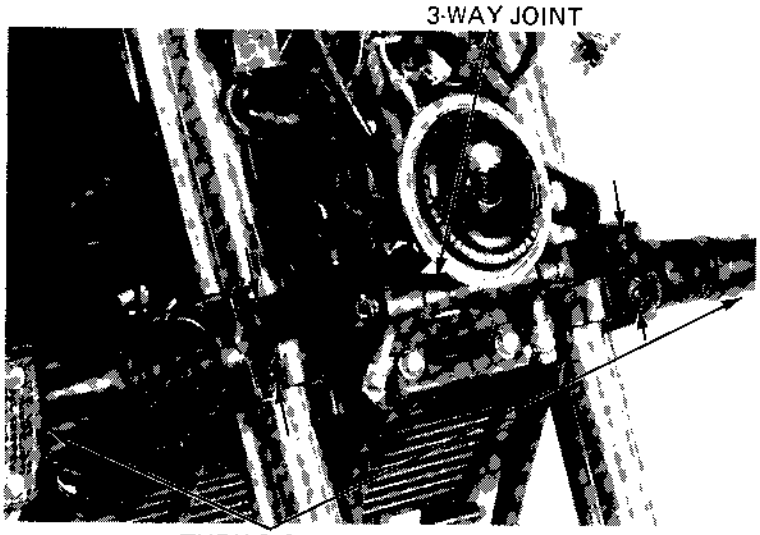
Remove the handlebar (page 14-8).

Remove the headlight (page 14-3) and instruments (page 14-4).

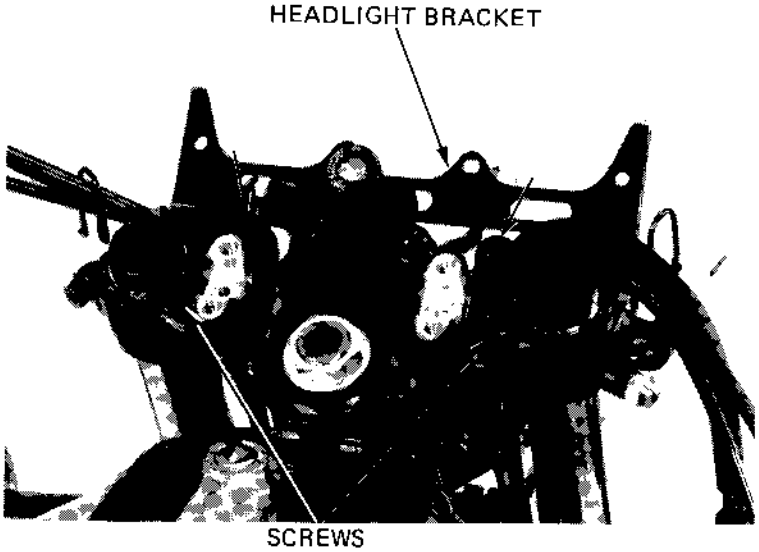
Remove the upper and lower bolts and remove the fairing.

Disconnect the ignition switch coupler.

Disconnect the horn wires at the coupler.
Remove the right and left front turn signals and brake hose 3-way joint.



Remove the two screws attaching the fork air joints to the fork top bridge.
Remove the headlight bracket bolts and the bracket.
Loosen the fork upper pinch bolts.



Remove the steering stem nuts.

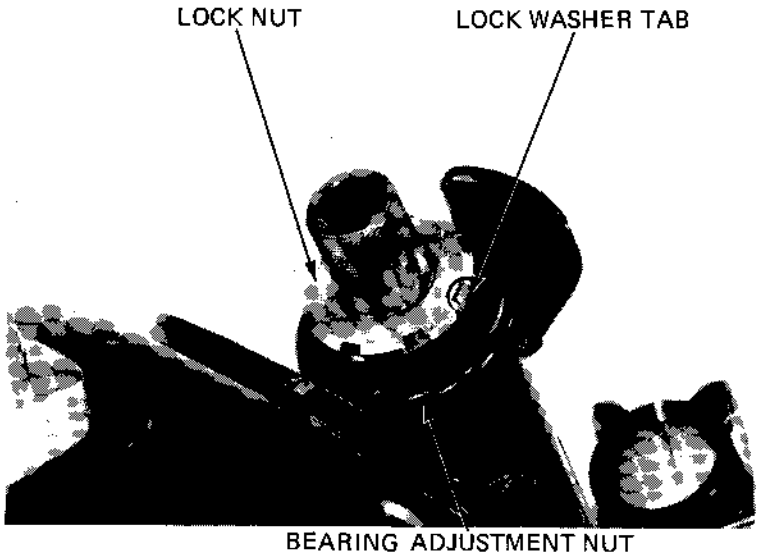
Remove the fork top bridge.

Remove the front forks (page 14-20).

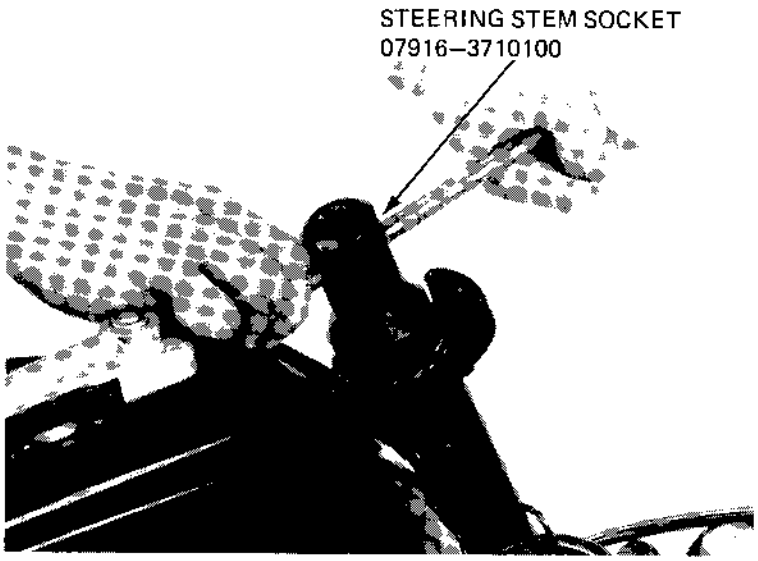


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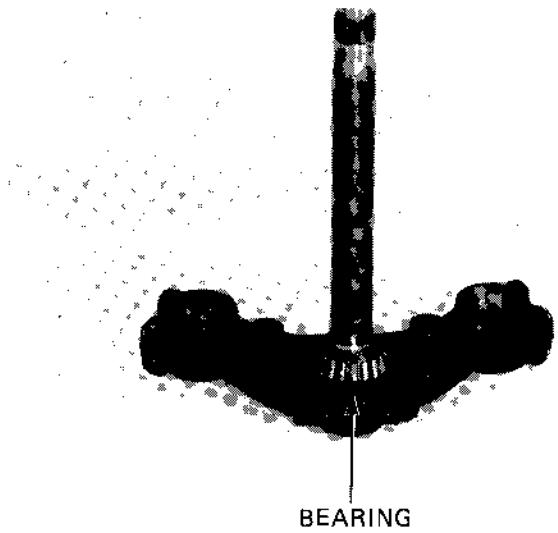
Straighten the stem's bearing adjustment nut lock washer tab. Remove the lock nut and lock washer.



Remove the bearing adjustment nut and the steering stem.
Check the steering stem bearing for damage or wear.



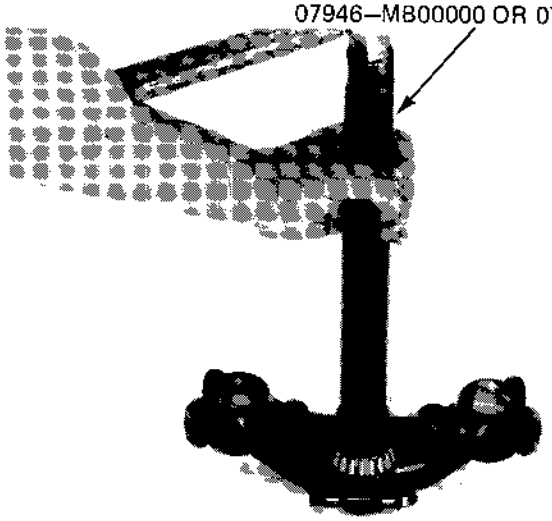
Check the steering stem bearing for damage or wear. Remove the bearing if necessary.



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INSTALLATION

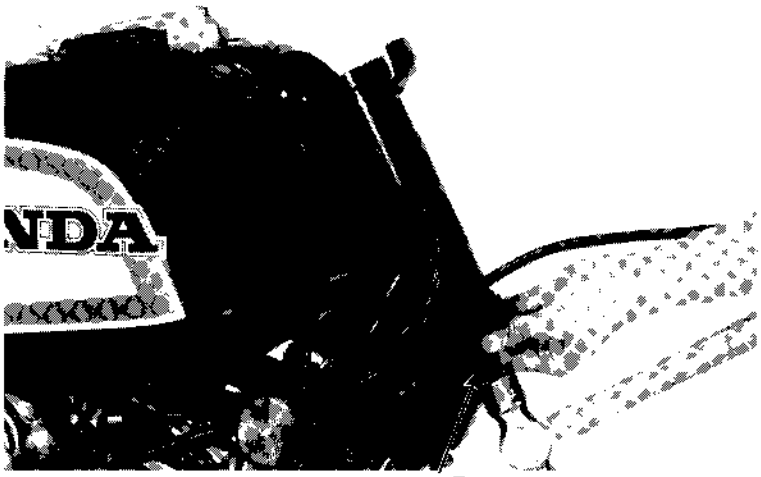
Install a dust seal onto the steering stem and drive the lower bearing inner race over the stem with the special tool.



NOTE:

Replace the bearing and bearing race as a set.

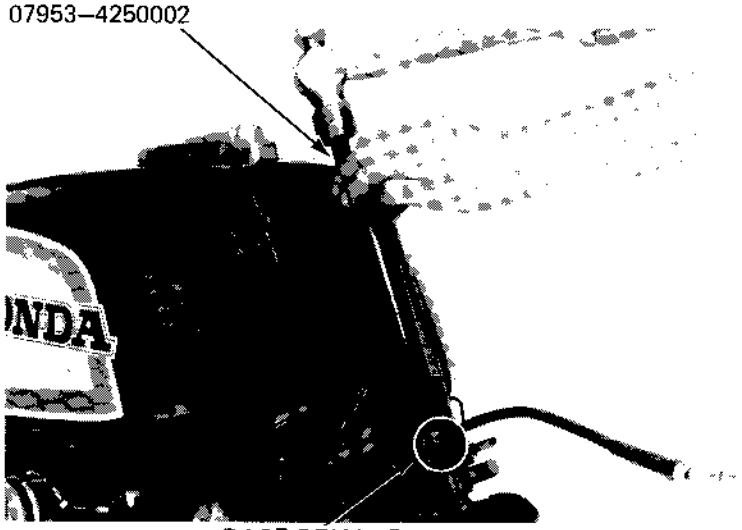
Remove the upper bearing race with the special tool.



Remove the lower bearing race with the special tool.

NOTE:

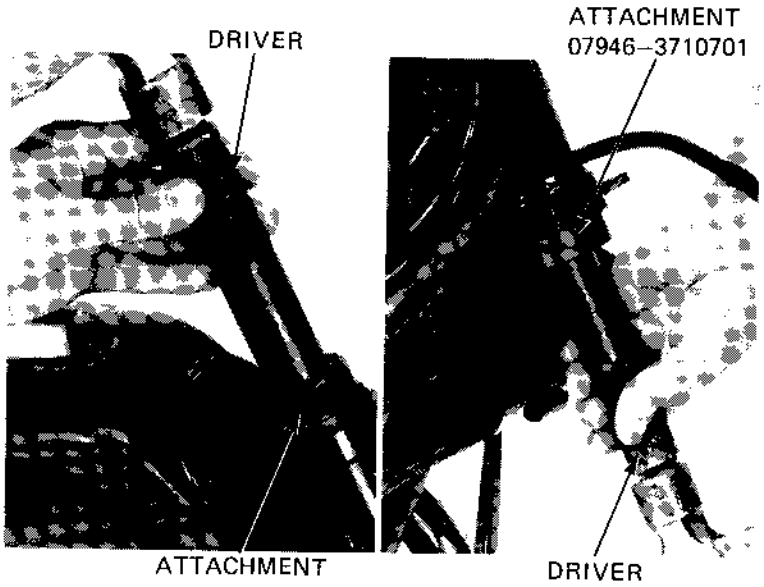
If the motorcycle has been involved in an accident, examine the area around the steering head for cracks.



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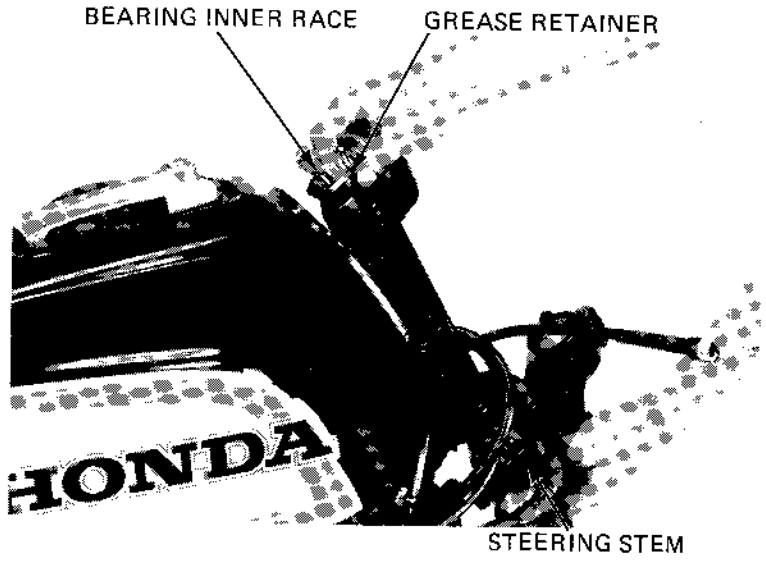
Drive the upper bearing outer race into the head pipe with the common tools.

Drive the lower bearing outer race into the head pipe with the common tools.



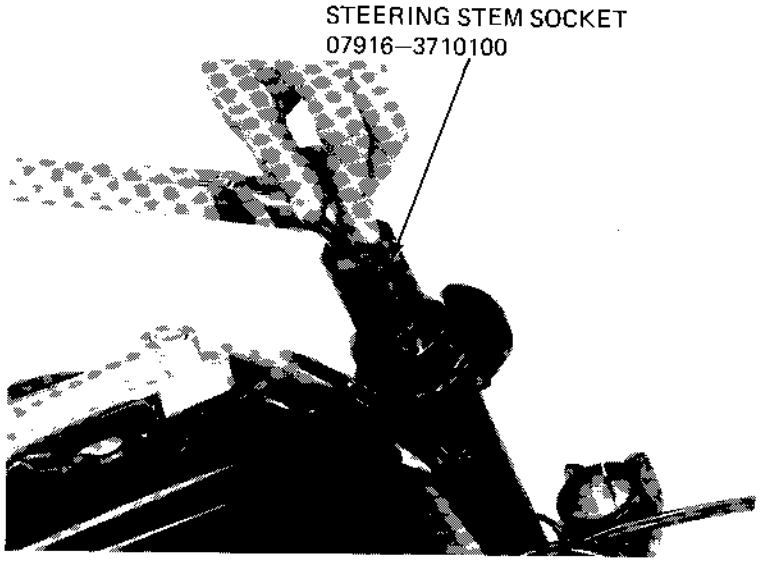
Pack the bearing cavites with bearing grease.

Insert the steering stem into the steering head pipe and install the grease retainer and upper bearing inner race.



Install and tighten the adjustment nut.

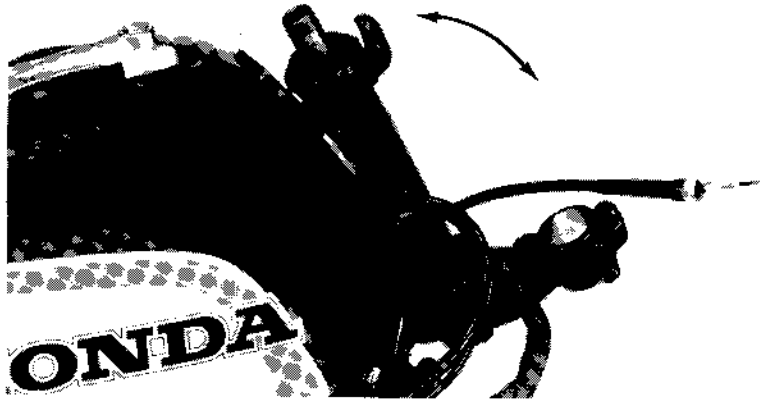
TORQUE: 11–13 N·m (1.1–1.3 kg-m, 8–9 lb-ft)



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Turn the steering stem lock-to-lock 5 times to seat the bearings. Repeat the bearing tightening and steering stem turning sequence twice.

If the nut does not tighten after turning the steering stem the first or second time, remove the nut and inspect it and the steering stem threads for dirt or burrs.



Install a new bearing adjustment nut lock washer aligning the tabs with the nuts grooves.

NOTE:

DO NOT install a used bearing adjustment nut lock washer.

Hand tighten the lock nut. Hold the adjustment nut and further tighten the lock nut only to align its grooves with the lock washer tabs.

NOTE:

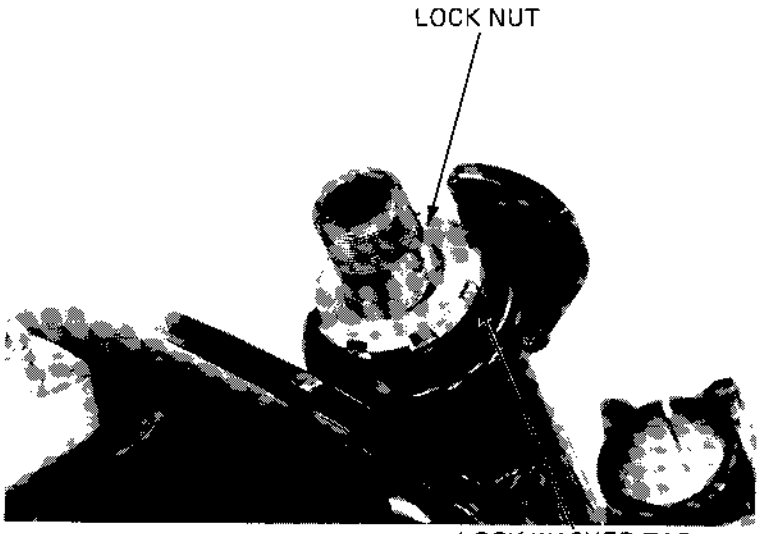
If the lock nut grooves cannot be easily aligned with the lock washer tabs, remove the nut, turn it over and reinstall.

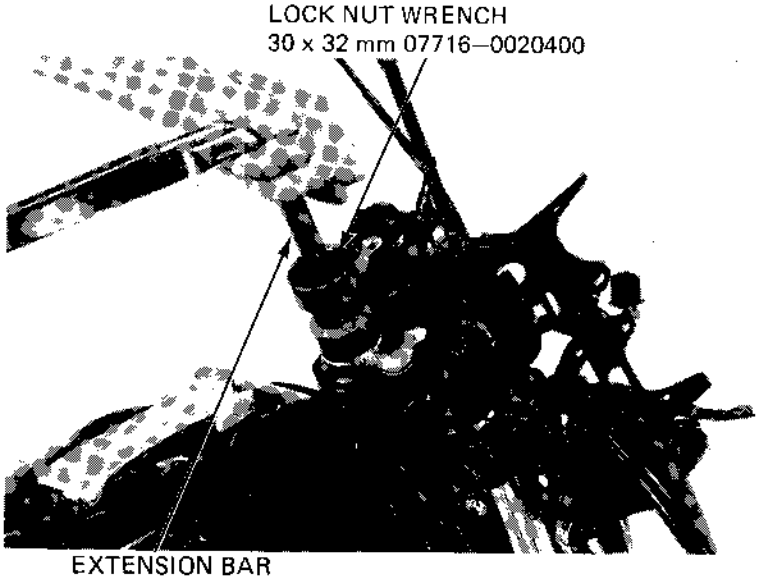
Bend the other two lock washer tabs up into the lock nut grooves.

Install the fork top bridge and tighten the steering stem nut.

TORQUE:
80–120 N·m (8.0–12.0 kg-m, 58–87 ft-lb)

Install the removed parts in the reverse order of removal.





15. REAR WHEEL/SUSPENSION

SERVICE INFORMATION	15–1
TROUBLESHOOTING	15–1
REAR WHEEL	15–2
SHOCK ABSORBER	15–9
SWING ARM	15–12

SERVICE INFORMATION

GENERAL

- The rear wheel uses a tubeless tire. For tubeless tire repairs, refer to the Tubeless Tire Manual.
- Never ride on the rim or try to bend the rim.

SPECIFICATIONS

		Standard	Service Limit
Axle runout		———	0.2 mm (0.01 in)
Rear wheel runout	Radial	———	2.0 mm (0.08 in)
	Axial	———	2.0 mm (0.08 in)
Shock absorber spring free length		238.0 mm (9.37 in)	233.0 mm (9.17 in)
Swing arm bushing	I.D.	21.500-21.552 mm (0.8465-0.8485 in)	21.7 mm (0.854 in)
Swing arm collar	O.D.	21.427-21.460 mm (0.8436–0.8449 in)	21.4 mm (0.843 in)

TORQUE VALUES

Rear brake disc	30–35 N·m (3.0–3.5 kg-m, 22–26 ft-lb)
Driven sprocket	80–100 N·m (8.0–10.0 kg-m, 58–72 ft-lb)
Rear axle nut	80–100 N·m (8.0–10.0 kg-m, 58–72 ft-lb)
Rear shock absorber	30–40 N·m (3.0–4.0 kg-m, 22–29 ft-lb)
Swing arm pivot nut	60–70 N·m (6.0–7.0 kg-m, 43–51 ft-lb)
Brake torque link	18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)

15

TOOLS

Special

Bearing remover (U.S.A. only)	M9310–277–91774
Attachment (U.S.A. only)	M9310–277–91775

Common

Driver	07749–0010000 or 07949–6110000
Attachment, 62 x 68 mm	07746–0010500
Attachenmt, 52 x 55 mm	07746–0010400
Pilot, 20 mm	07746–0040500
Pilot, 25 mm	07746–0040600
Rear shock absorber compressor	07959–3290001

TROUBLESHOOTING

Oscillation
1. Bent rim
2. Loose wheel bearings
3. Faulty tire
4. Loose axle
5. Tire pressure incorrect
6. Swingarm bearing worn

Soft suspension
1. Weak springs
2. Shock absorber improperly adjusted

Hard suspension
1. Shock absorber improperly adjusted
2. Bent shock absorber

Suspension noise
1. Shock case binding
2. Loose fasteners

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REAR WHEEL

REMOVAL

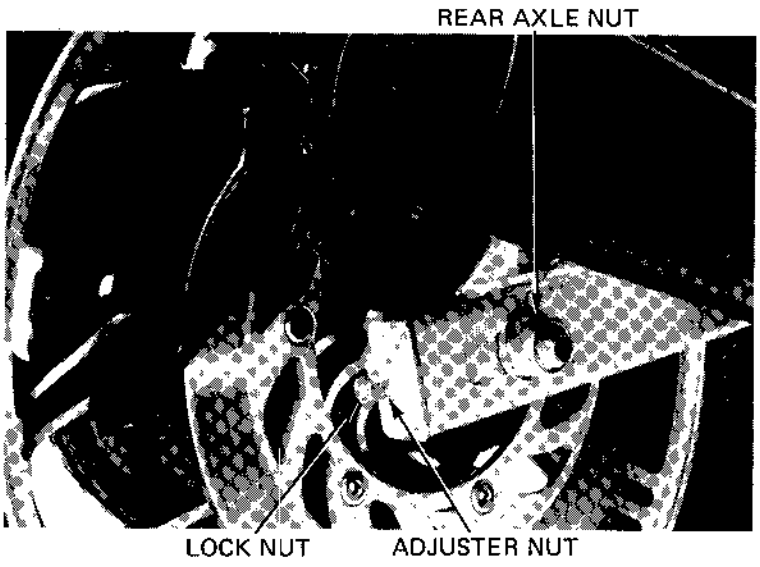
Place the motorcycle on its center stand.
Loosen the drive chain adjuster lock nuts.
Loosen the adjuster nuts.

Remove the rear axle nut and axle.

Push the wheel forward and remove the drive chain from the sprocket.
Pull the wheel out of the swingarm.

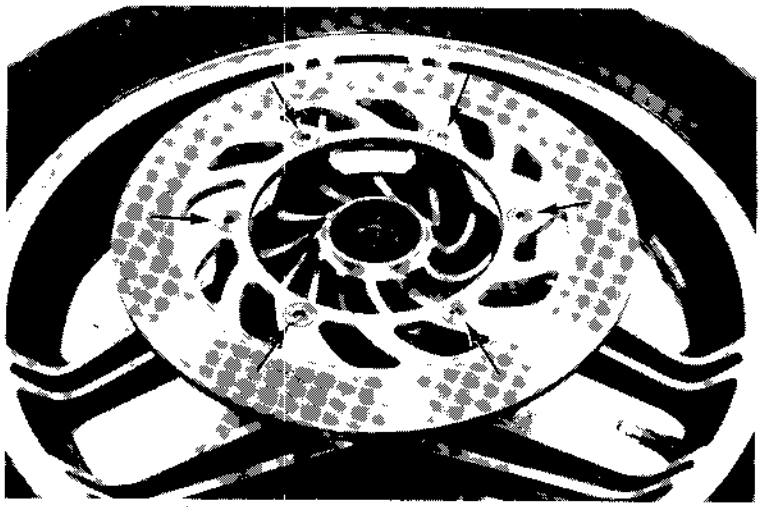
NOTE:

> Do not operate the rear brake pedal after removeing the rear wheel. To do so will cause difficulty in refitting the brake disc between the brake pads.

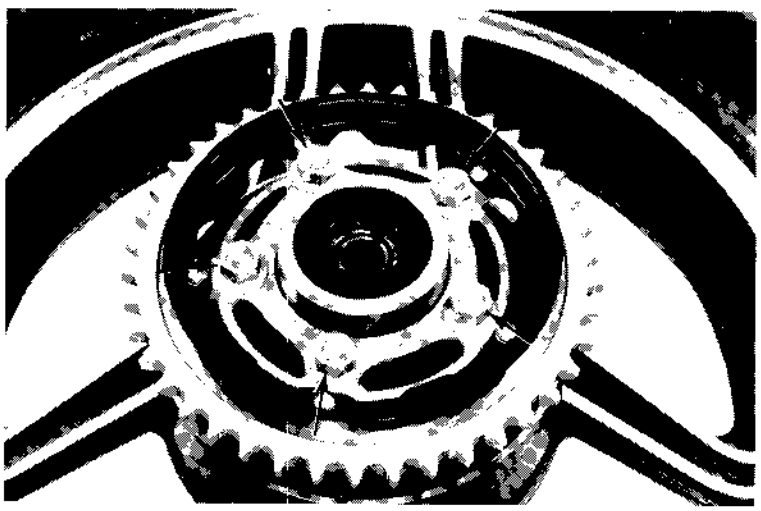


DISASSEMBLY

Remove the rear disc bolts and the disc.

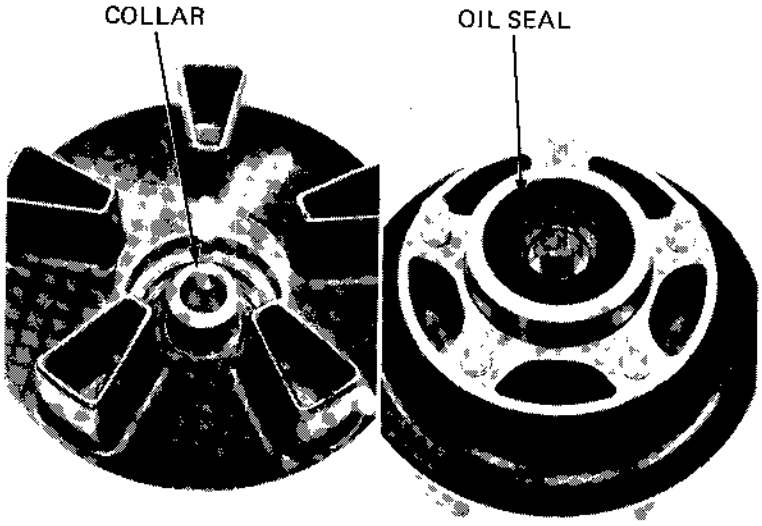


Loosen the driven sprocket nuts.
Remove the driven flange from the wheel hub and the driven sprocket.

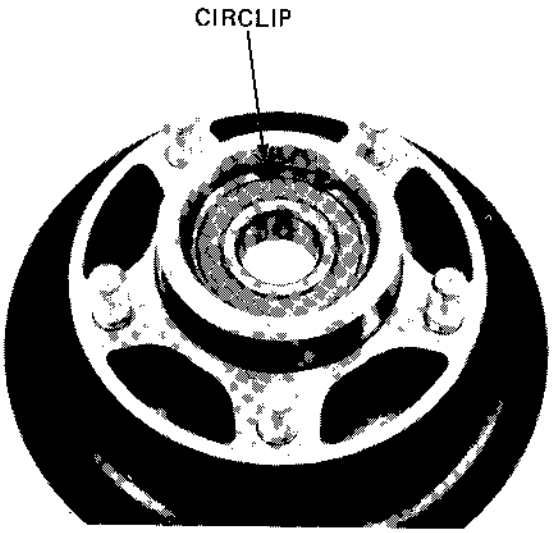


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Remove the collar and oil seal from driven flange.

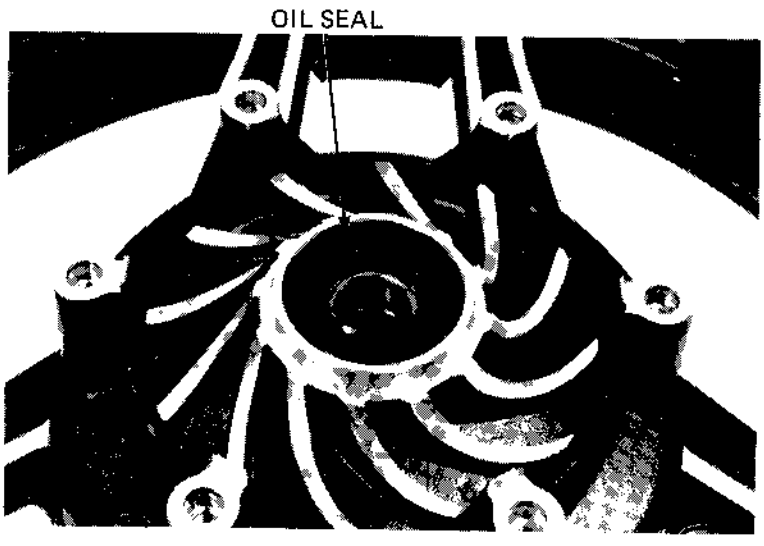


Remove the circlip and the left bearing.



Remove the oil seal from wheel hub.
Remove the bearings and distance collar.

See bearing inspection page 15-3 before removing. The bearing must be replaced with a new one if it is removed.



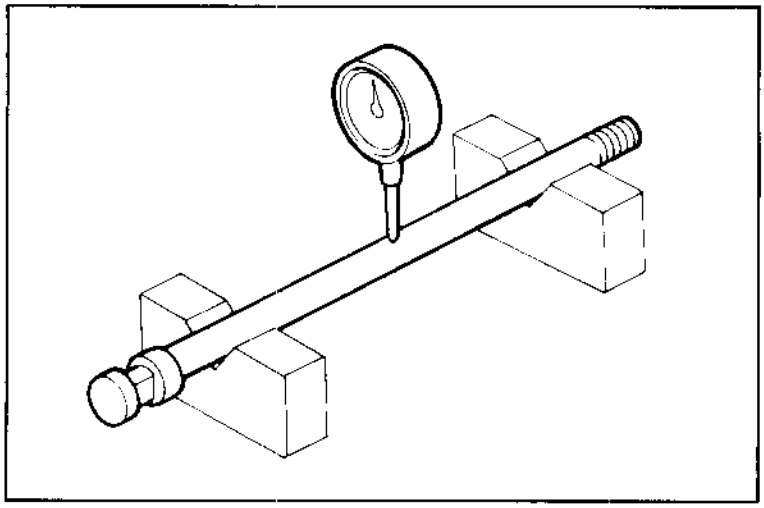
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INSPECTION

AXLE

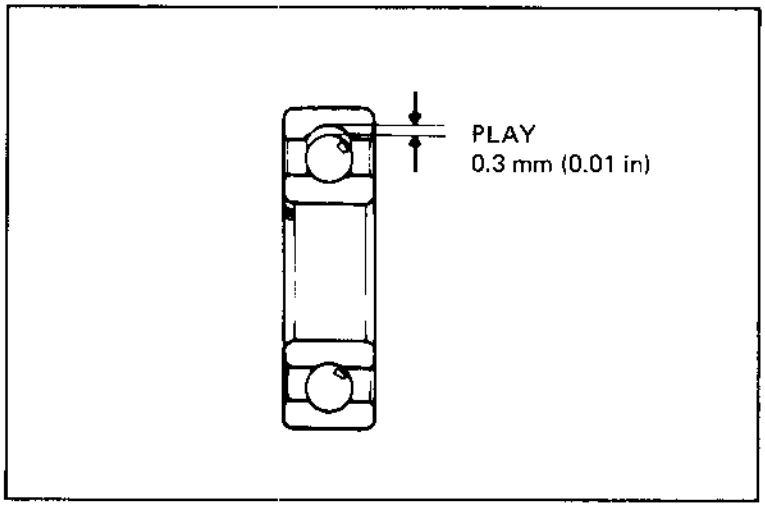
Set the axle in V blocks and read the axle runout with a dial indicator.
The actual axle runout is 1/2 of the total indicator reading.

SERVICE LIMIT: 0.2 mm (0.01 in)



REAR WHEEL BEARING

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.



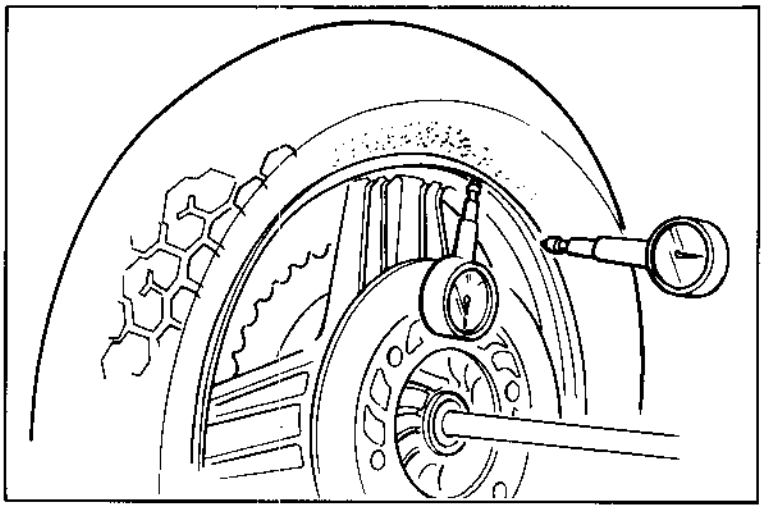
REAR WHEEL RIM RUNOUT

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

SERVICE LIMITS:
RADIAL RUNOUT: 2.0 mm (0.08 in)
AXIAL RUNOUT: 2.0 mm (0.08 in)

NOTE:

The wheel cannot be serviced and must be replaced if the above limits are exceeded.



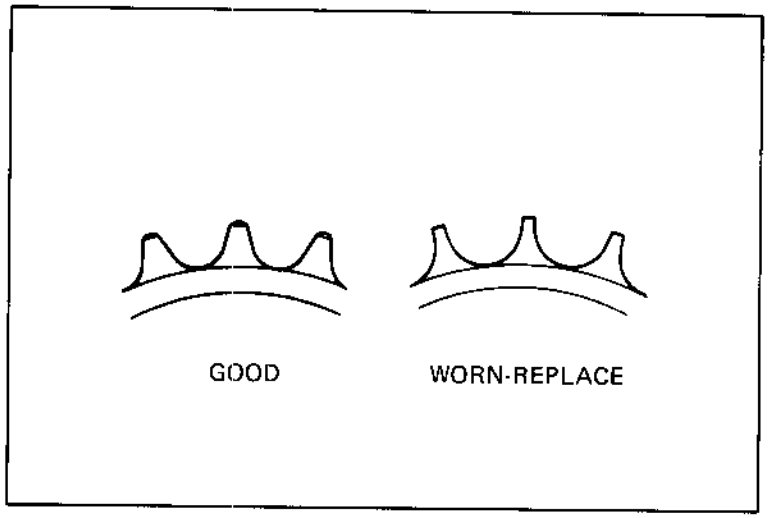
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FINAL DRIVEN SPROCKET

Check the condition of the final driven sprocket teeth. Replace the sprocket if worn or distorted.

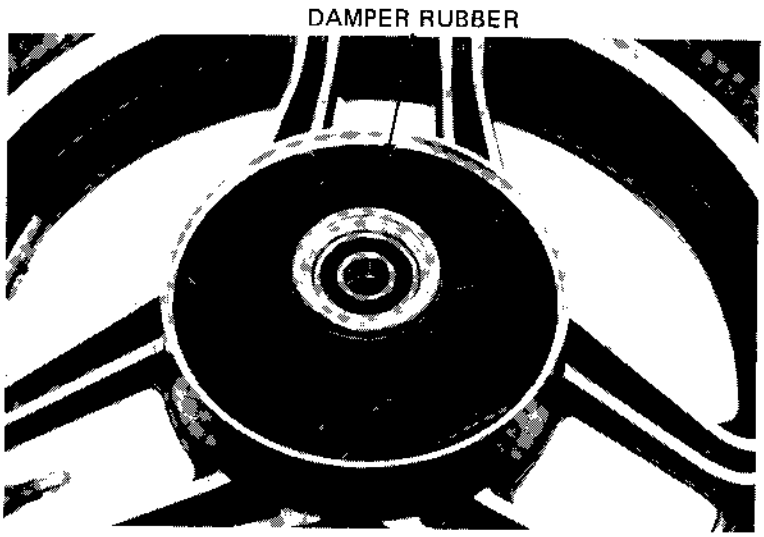
NOTE:

> If the final driven sprocket requires replacement, inspect the drive chain and drive sprocket.



DAMPER RUBBERS

Replace the damper rubbers if they are damaged or deteriorated.



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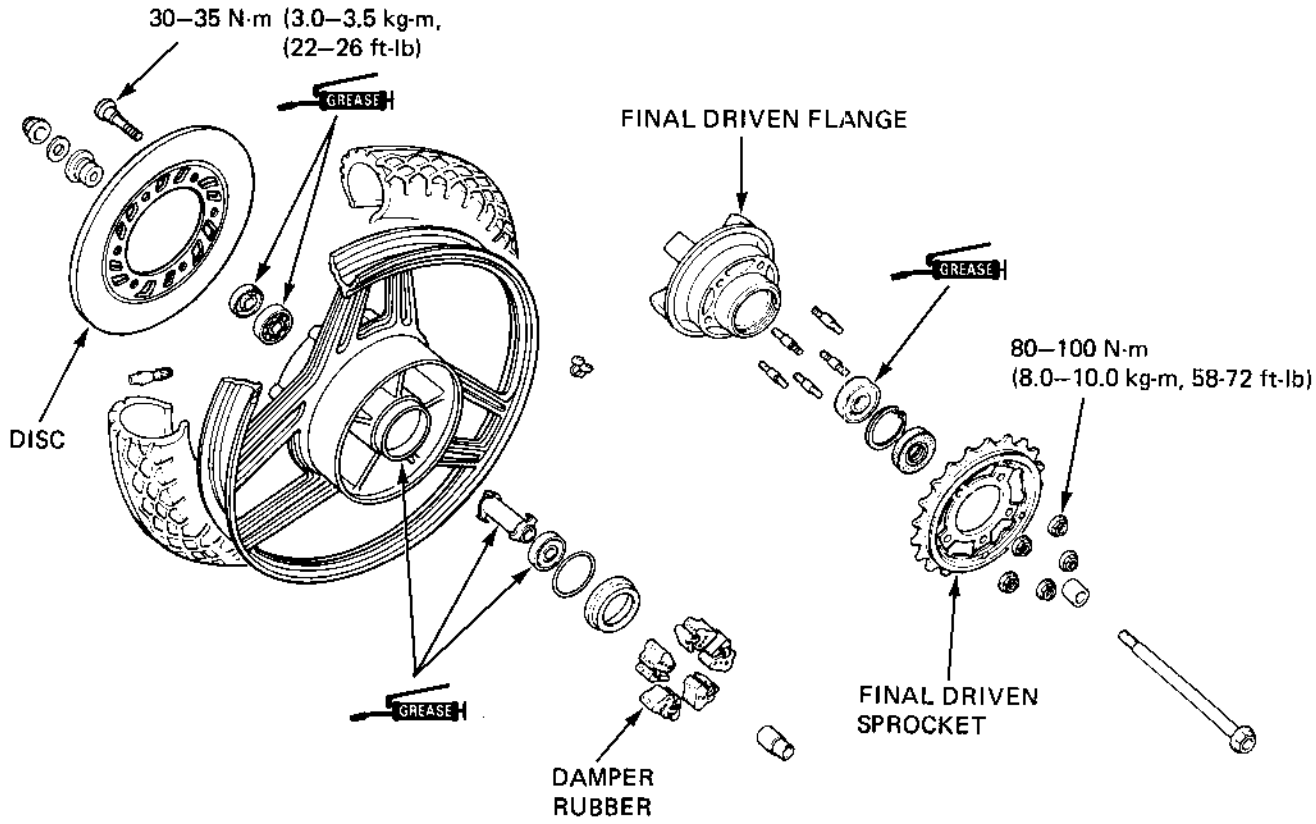
ASSEMBLY

NOTE:

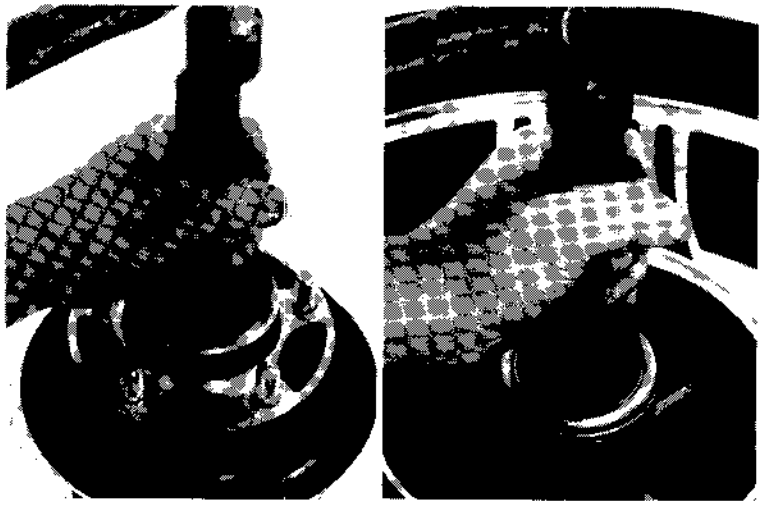
The rear wheel uses a tubeless tire. For tubeless tire repairs, refer to the Tubeless Tire Manual.

WARNING

Do not get grease on the brake disc or stoping power will be reduced.



DRIVEN FLANGE SIDE:
DRIVER 07749–0010000
ATTACHMENT, 62 x 68 mm 07746–0010500
PILOT, 25 mm 07746–0040600



Pack all bearing cavities with grease.
Press the distance collar into place from the left side.
Drive the right ball bearing in first, then the left ball bearing.

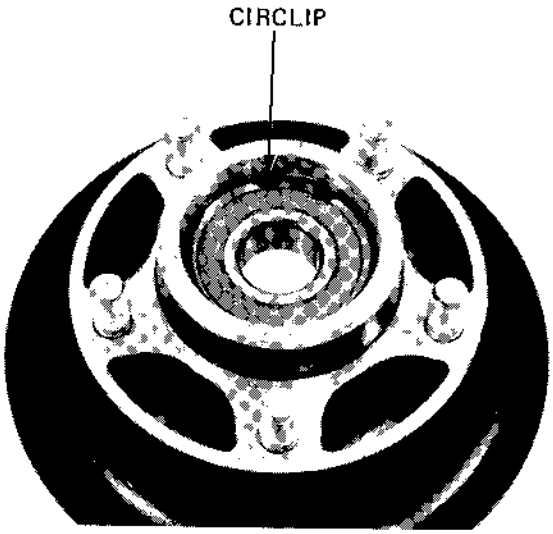
CAUTION:

Drive the bearings in squarely with the sealed end facing out, making sure they are fully seated.

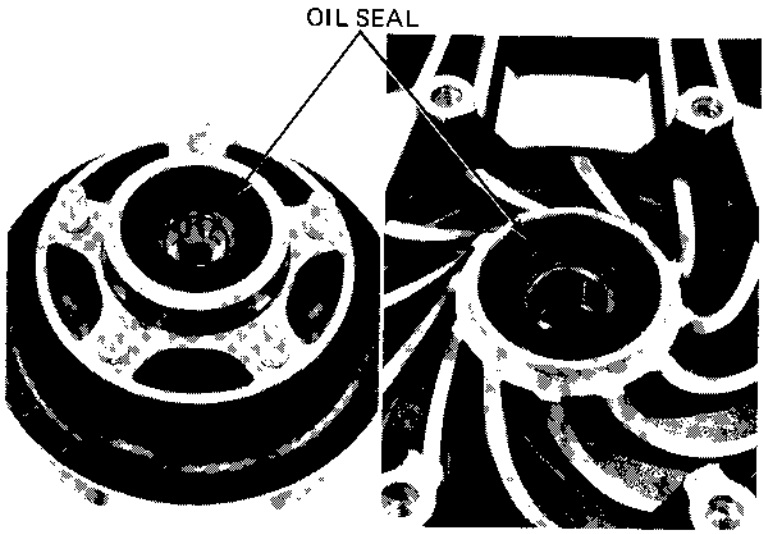
WHEEL HUB SIDE:
ATTACHMENT, 52 x 55 mm 07746–0010400
ATTACHMENT PILOT, 20mm 07746–0040500

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After driving the bearing into the driven flange install the circlip.

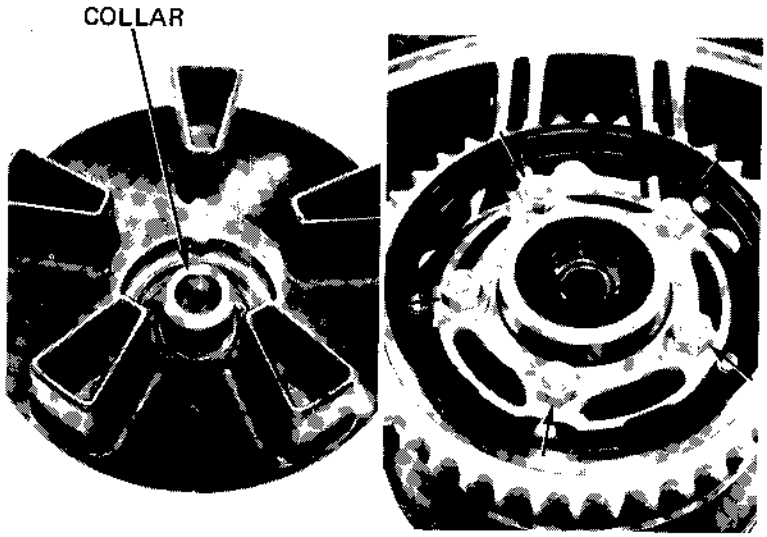


Install new oil seals into the driven flange and the wheel hub.



Install the collar into the final driven flange.
Install the final driven flange onto the wheel hub.
Install the final driven sprocket.

TORQUE: 80–100 N·m
(8.0–10.0 kg-m, 58–72 ft-lb)

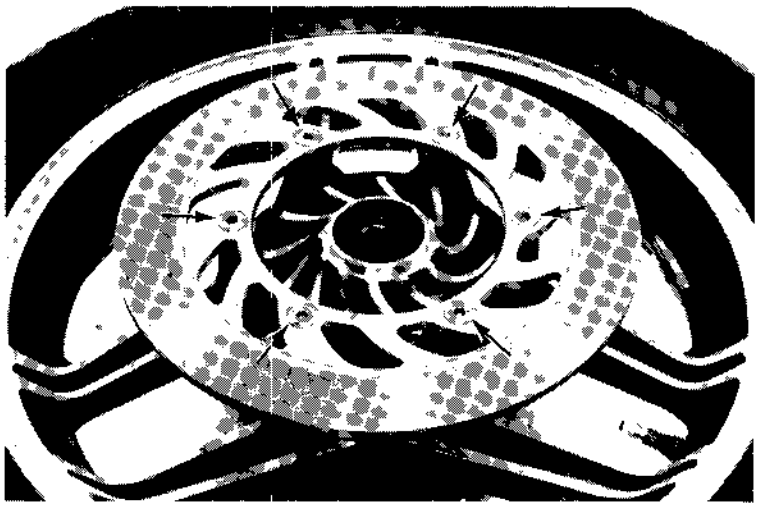


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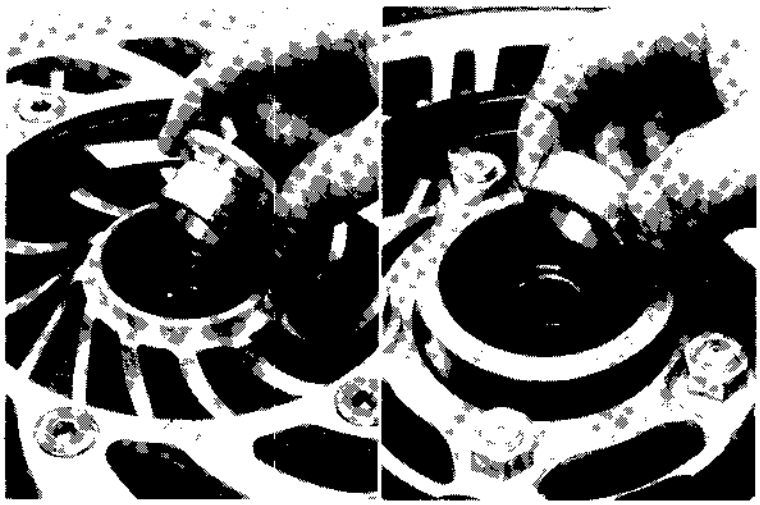
Install the rear brake disc.

TORQUE: 30–35 N·m (3.0–3.5 kg-m, 22–26 ft-lb)

Clean the brake disc with a high quality degreasing agent.



Place the collars into the wheel hub and driven flange oil seals.



INSTALLATION

Install the rear wheel in the reverse order of removal.

NOTE:

- When installing the wheel, carefully fit the brake disc between the brake pads.
- After installing the wheel, apply the brake several times. Then check that the wheel rotates freely. Recheck wheel installation if the brake drags or if the wheel does not rotate freely.

TORQUE: 80–100 N·m (8.0–10.0 kg-m, 58–72 ft-lb)

Adjust the drive chain slack (page 3–15).

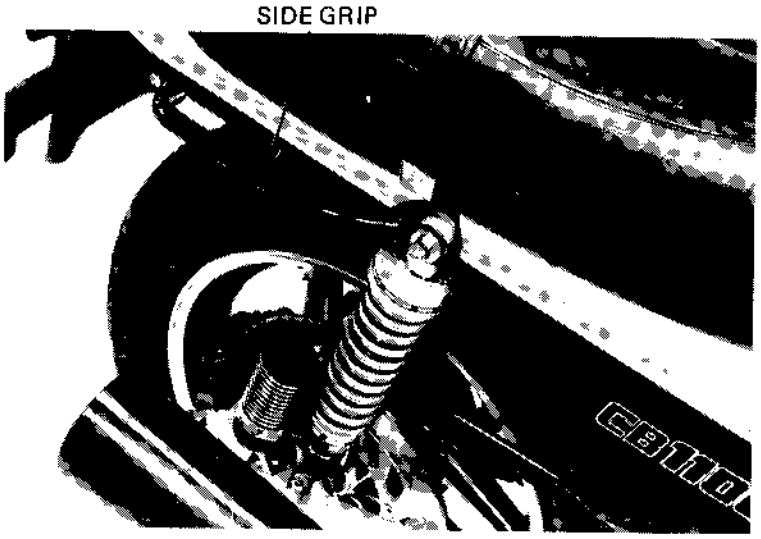


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SHOCK ABOSRBER

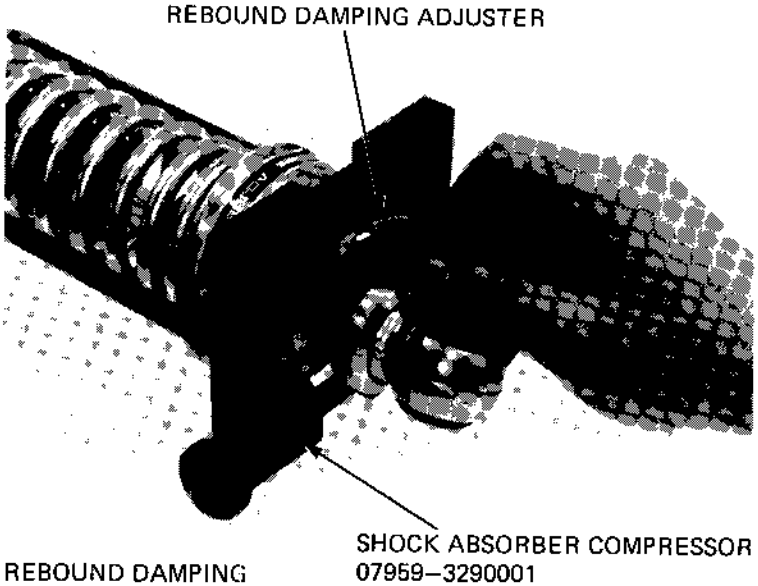
REMOVAL

Remove the side grip and shock absorber lower mounting bolt.
Remove the shock absorber.



DISASSEMBLY

Compress the spring with the shock abosrber compressor just enough to remove the rebound damping adjuster.
Remove the compressor, spring seat, case, spring and adjuster.

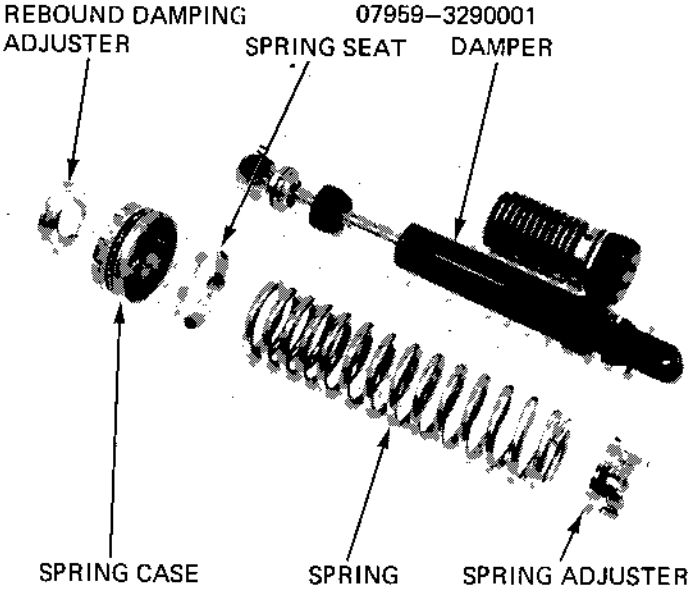


NOTE:

Do not try to disassemble the shock absorber any further.

WARNING

- *Before discarding the shock abosrber release the air pressure by removing the reservoir cap and depressing the valve core.*
- *Do not place the shock absorber near extreme heat or it will explode.*



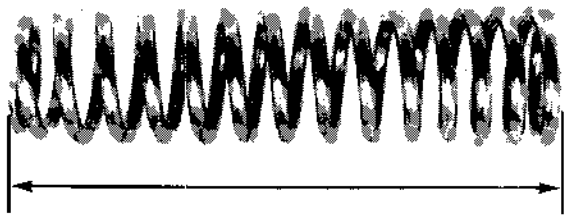
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INSPECTION

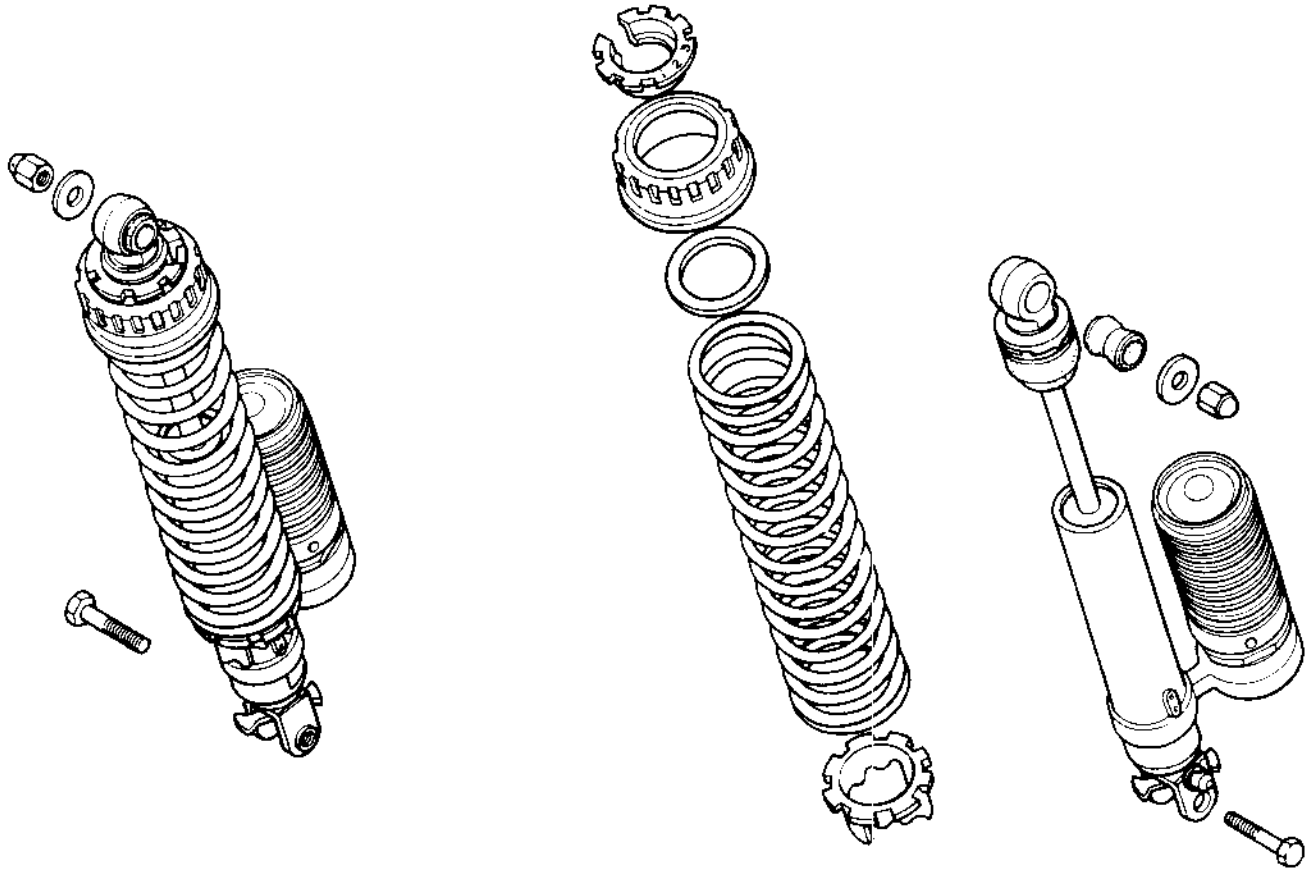
Check the shock absorber spring free length and replace the spring if shorter than the service limit.

SERVICE LIMIT: 233.0 mm (9.17 in)

Inspect the shock abosrber damper for damage or oil leaks. Replace the damper if it is damaged or leaking.



ASSEMBLY



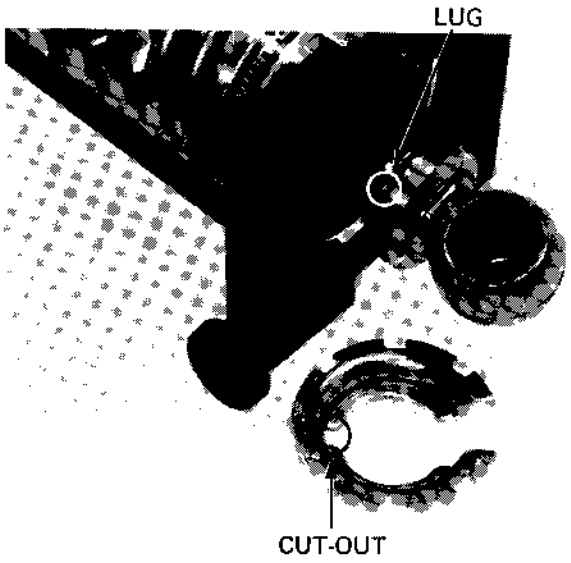
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Install the spring adjuster over the damper.

Install the shock abosrber spring over the spring adjuster and damper with the narrow coils toward the top.

Install the spring case and seat.

Install the rebound damping adjuster with the spring compressor, aligning the lug on the upper eye with the cutout in the adjuster.



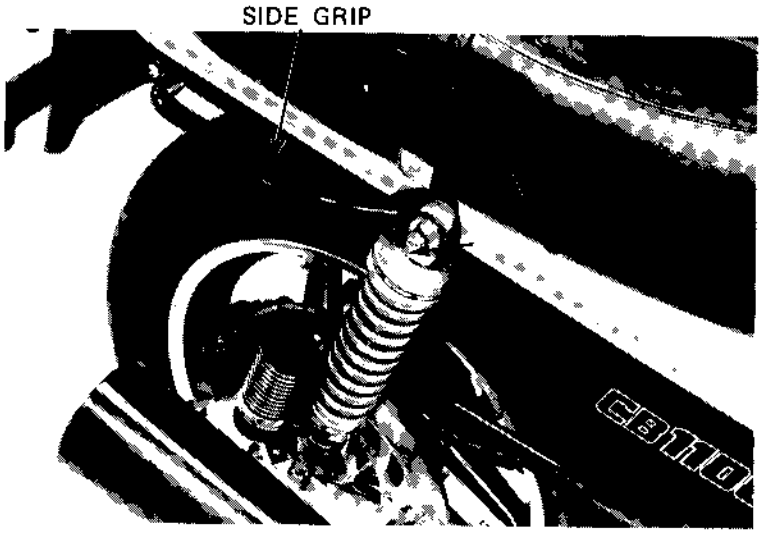
INSTALLATION

Install the shock absorber and lower mounting bolt.

Install the side grip and upper mounting nut.

Tighten the mounting bolt and nut.

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



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SWING ARM

REMOVAL

Remove the rear wheel (page 15-2).

Remove the chain guard.

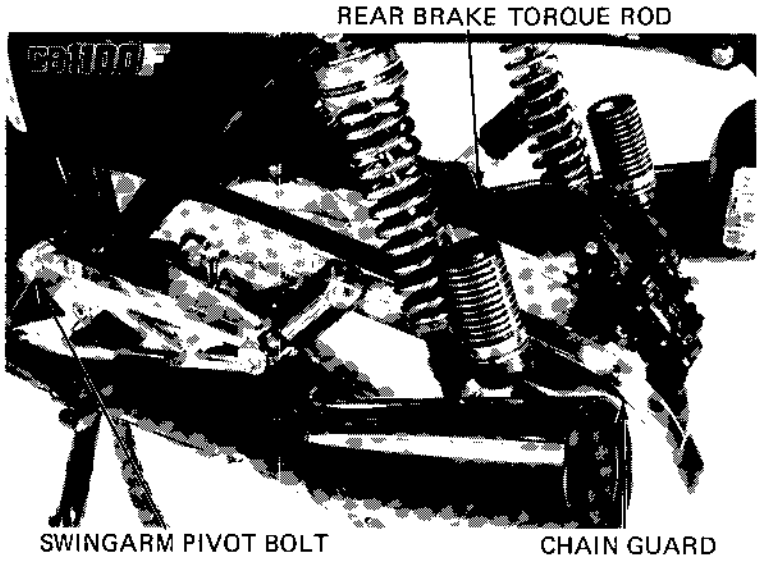
Disconnect the rear brake torque rod from the swingarm.

NOTE:

> To prevent damage to the caliper or brake hose, support the caliper with a piece of wire to the frame. Do not allow the caliper to hang by the brake hose.

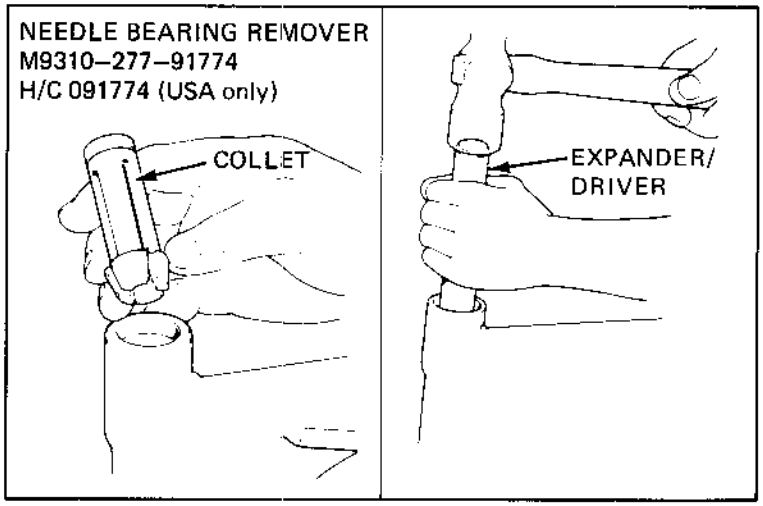
Remove the rear shock abosrber lower mounting bolts.

Remove the swingarm pivot bolt and remove the swingarm.



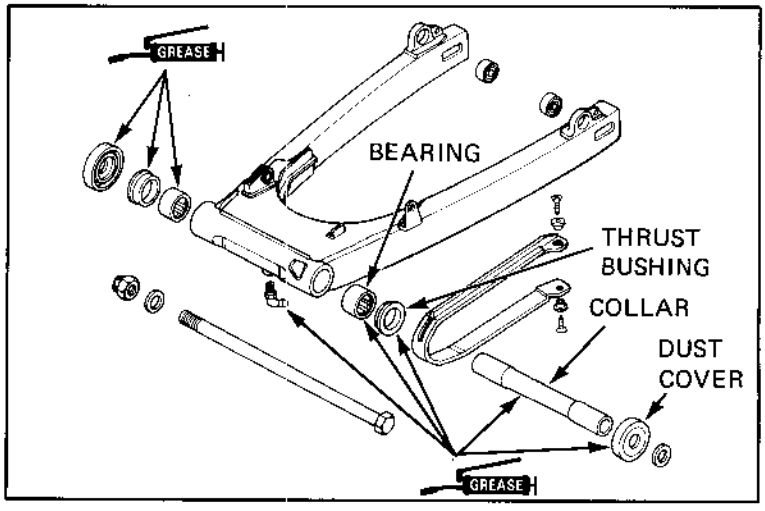
DISASSEMBLY

Remove the dust covers and the collar.
Remove the bearings and thrust bushings with the two piece bearing remover. Insert the collet into the bearing. Then insert the expander/driver into the collet from the other end of the swingarm and drive out the bearing.



INSPECTION

Inspect the collar and bearings.
Replace them if they have score marks, scratches, excessive or abnormal wear.



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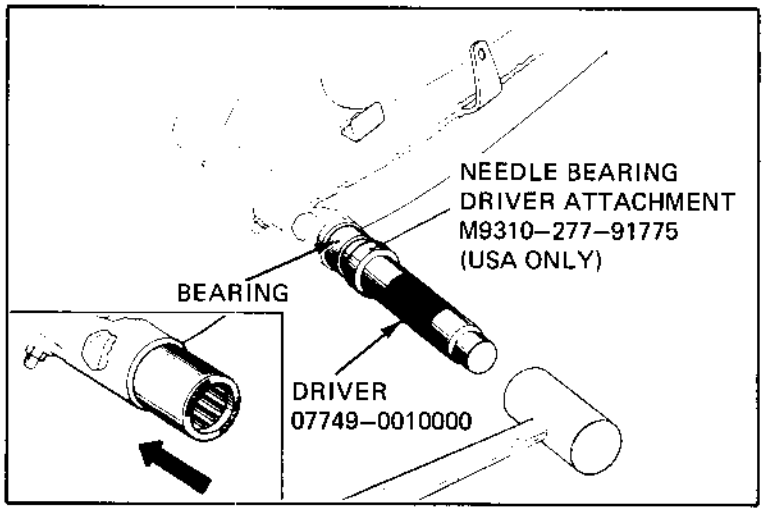
ASSEMBLY

Clean the bearings thoroughly, then lubricate them with grease.
Carefully drive the bearings into the swingarm with the special tool. Drive the thrust bushings into the swingarm with the same special tool.

NOTE:

> Install the bearings with the markings facing out.

Lubricate with grease after installation.
Install the collar.



INSTALLATION

Place the drive chain over the swingarm.

Tighten the swingarm pivot bolt.

TORQUE: 60–70 N·m
(6.0–7.0 kg-m, 43–51 ft-lb)

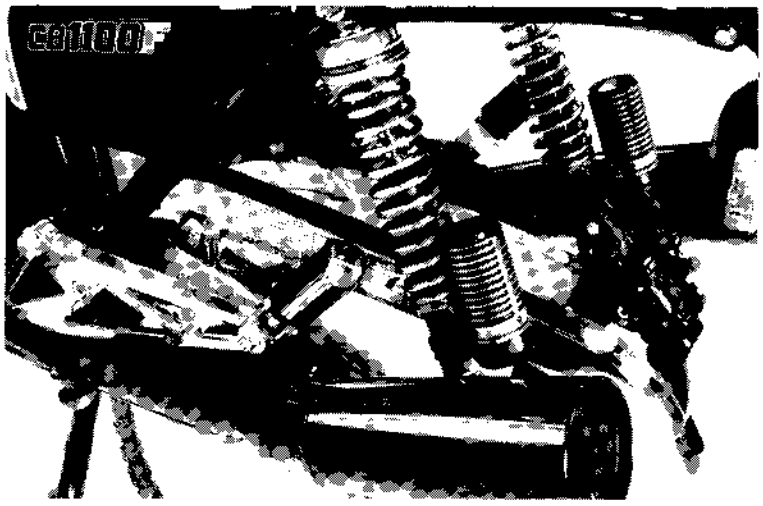
Install and tighten the rear shock abosrber lower mounting bolts.

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

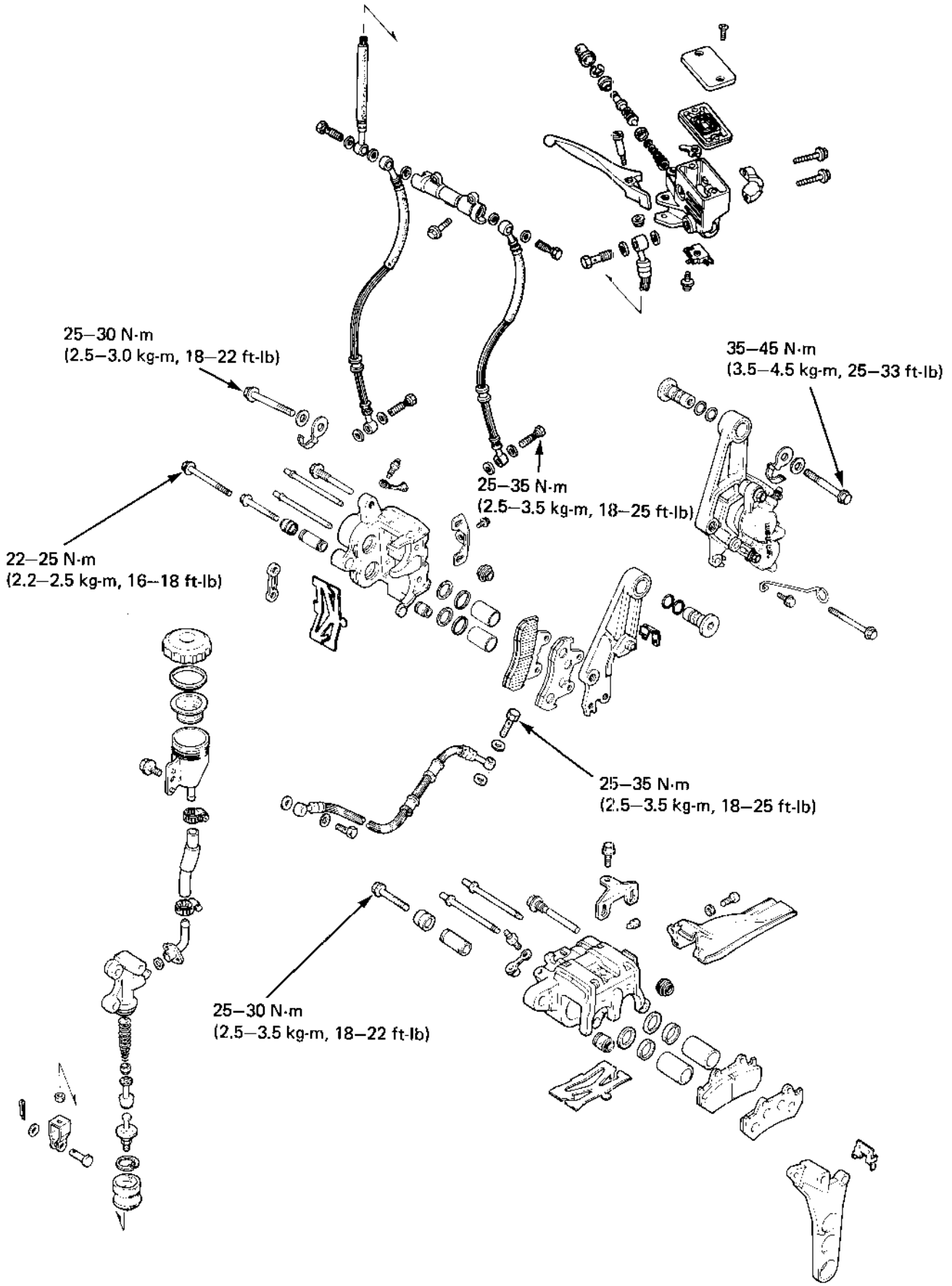
Connect the rear brake toque rod to the swingarm and tighten the nut.

TORQUE: 18–25 N·m
(1.8–2.5 kg-m, 13–18 ft-lb)

Secure the torque rod nut with a new cotter pin.
Install the chain guard.
Install the rear wheel (page 15-8).



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16. HYDRAULIC BRAKES

SERVICE INFORMATION	16–1
TROUBLESHOOTING	16–2
BRAKE FLUID REPLACEMENT AIR BLEEDING	16–3
BRAKE PAD/DISC	16–5
FRONT MASTER CYLINDER	16–8
BRAKE CALIPER	16–11
REAR MASTER CYLINDER	16–15
BRAKE PEDAL SHAFT	16–17

SERVICE INFORMATION

GENERAL

- The front and rear brakes can be removed without disconnecting the hydraulic system.
- Once the hydraulic systems have been opened, or if the brakes feel spongy, the system must be bled.
- Do not allow foreign material to enter the system when filling the reservoirs.
- Avoid spilling brake fluid on painted surfaces or instrument lenses, as severe damage will result.
- Always check brake operation before riding the motorcycle.

SPECIFICATIONS

	STANDARD	SERVICE LIMIT
Front disc thickness	4.8–5.2 mm (0.19–0.20 in)	4.0 mm (0.16 in)
Front disc runout	—	0.30 mm (0.012 in)
Front master cylinder I.D.	15.870–15.913 mm (0.6248–0.6265 in)	15.925 mm (0.6270 in)
Front master piston O.D.	15.827–15.854 mm (0.6231–0.6242 in)	15.815 mm (0.6226 in)
Front caliper piston O.D.	30.148–30.198 mm (1.1869–1.1889 in)	30.140 mm (1.1866 in)
Front caliper cylinder I.D.	30.23 –30.28 mm (1.1902–1.1921 in)	30.29 mm (1.1925 in)
Rear master cylinder I.D.	14.000–14.043 mm (0.5512–0.5529 in)	14.055 mm (0.5533 in)
Rear master piston O.D.	13.957–13.984 mm (0.5495–0.5506 in)	13.945 mm (0.5490 in)
Rear caliper cylinder I.D.	27.000–27.050 mm (1.0630–1.0650 in)	27.060 mm (1.0654 in)
Rear caliper piston O.D.	26.918–26.968 mm (1.0598–1.0617 in)	26.910 mm (1.0594 in)
Rear disc thickness	6.9–7.1 mm (0.272–0.280 in)	6.0 mm (0.24 in)
Rear disc runout	—	0.30 mm (0.012 in)

TORQUE VALUES

Brake hose bolt	25–35 N·m (2.5–3.5 kg-m, 18–25 ft-lb)
Front brake caliper bracket	35–45 N·m (3.5–4.5 kg-m, 25–33 ft-lb)
Brake caliper bolt	20–25 N·m (2.0–2.5 kg-m, 13–18 ft-lb)
Brake caliper pirot bolt	25–30 N·m (2.5–3.0 kg-m, 18–22 ft-lb)
Rear master cylinder	30–40 N·m (3.0–4.0 kg-m, 22–29 ft-lb)
Rear brake torque rod nut	18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)
Rear axle nut	80–100 N·m (8.0–10.0 kg-m, 58–72 ft-lb)

TOOL

Special	
Snap ring pliers	07914–3230001

16

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TROUBLESHOOTING

Brake Lever/Pedal Soft or Spongy
1. Air bubbles in hydraulic system
2. Low fulid level
3. Hydraulic system leaking

Brake Lever/Pedal Too Hard
1. Sticking piston(s)
2. Clogged hydraulic system
3. Pads glazed or worn excessively

Brakes Drag
1. Hydraulic system sticking
2. Incorrect adjustment of lever or pedal
3. Sticking piston(s)

Brakes Grab or Pull to One Side
1. Pads contaminated
2. One side front brake faulty
3. Disc or wheel misaligned

Brakes Chatter or Squeal
1. Pads contaminated
2. Excessive disc runout
3. Caliper installed incorrectly
4. Disc or wheel misaligned

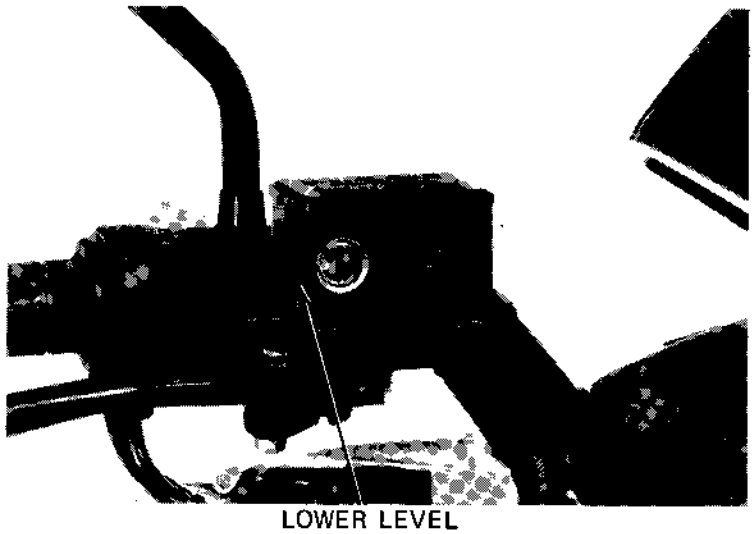
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BRAKE FLUID REPLACEMENT/ AIR BLEEDING

Check the fluid level with the fluid reservoir parallel to the ground.

CAUTION:

- *Install the diaphragm on the reservoir when operating the brake level/pedal. Failure to do so will allow brake fluid to squirt out of the reservoir during brake operation.*
- *Avoid spilling fluid on painted surfaces. Place a rag over the fuel tank whenever the system is serviced.*



LOWER LEVEL

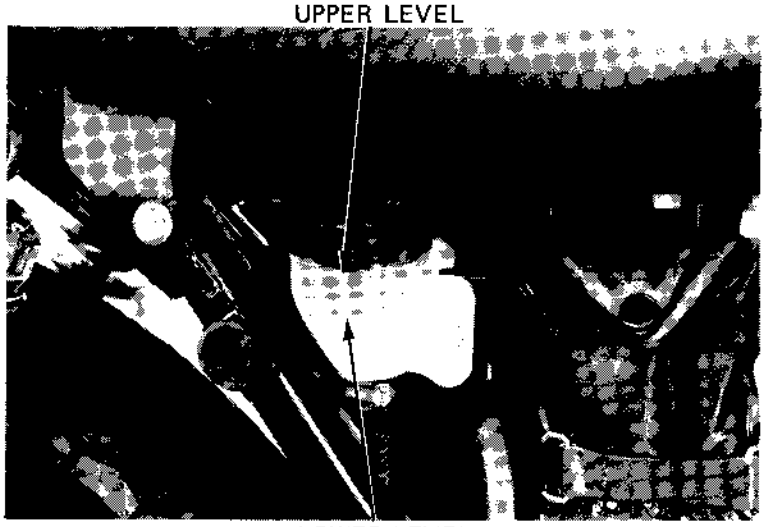
BRAKE FLUID DRAINING

Connect a bleed hose to the bleeder valve.
Loosen the caliper bleeder valve and pump the brake lever (or pedal).
Stop operating the lever (or pedal) when no fluid flows out of the bleeder valve.

WARNING

A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.

UPPER LEVEL



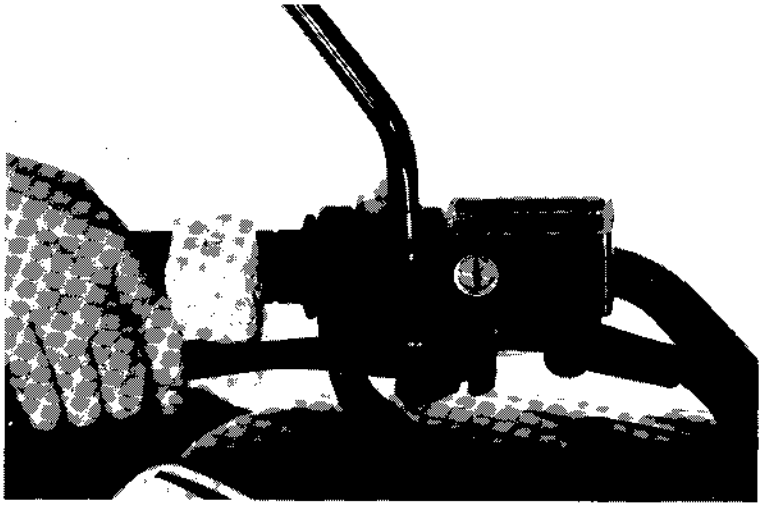
LOWER LEVEL

BRAKE FLUID FILLING

NOTE:

Do not mix different types of fluid, they are not compatible.

Close the bleeder valve, fill the reservoir, and install the diaphragm.
To prevent piston overtravel and brake fluid seepage, keep a 20 mm (3/4 in) space between the lever and the handlebar grip when bleeding the front brake system. Pump up the system pressure with the lever until there are no air bubbles in the fluid flowing out of the reservoir small hole and lever (or pedal) resistance is felt.

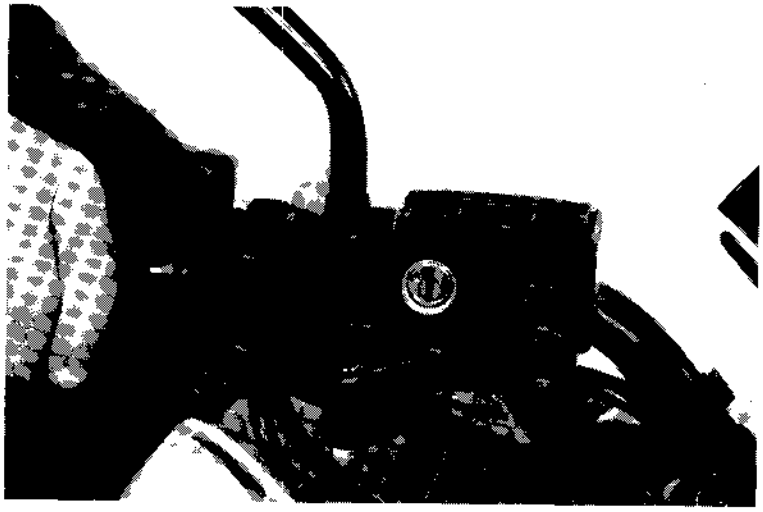


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AIR BLEEDING

NOTE:

- Use this procedure for the front and rear brakes.
- Check the fluid level often while bleeding the system to prevent air from being pumped into the system.
- Use only SAE J1703 or DOT 3 brake fluid from a sealed container.
- Do not mix brake fluid types and never re-use the contaminated fluid which has been pumped out during brake bleeding, because this will impair the efficiency of the brake system.

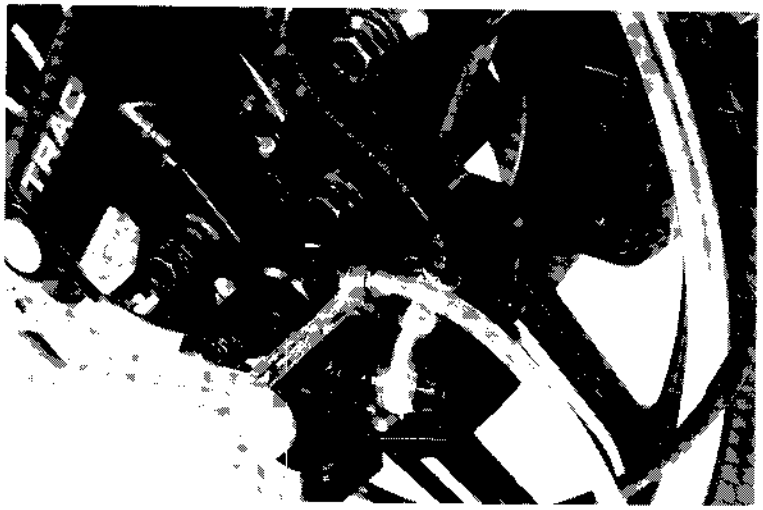


i) Pull the brake lever (or depress the brake pedal), open the bleeder valve 1/2 turn, then close the valve.

NOTE:

Do not release the brake lever (or pedal) until the bleeder, valve has been closed again.

ii) Release the brake lever (or pedal) slowly and wait several seconds after it reaches the end of its travel.



Repeat the above steps i) and ii) until bubbles cease to appear in the fluid at the end of the hose.

Fill the fluid reservoir to the upper level mark.

WARNING

A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.



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BRAKE PAD/DISC

FRONT PAD REPLACEMENT

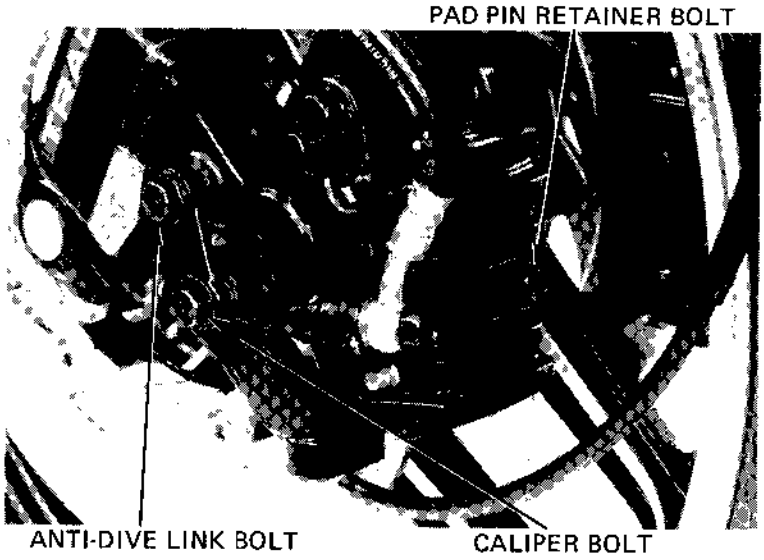
NOTE:

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

Remove the pad pin retainer bolt and the caliper bolt.

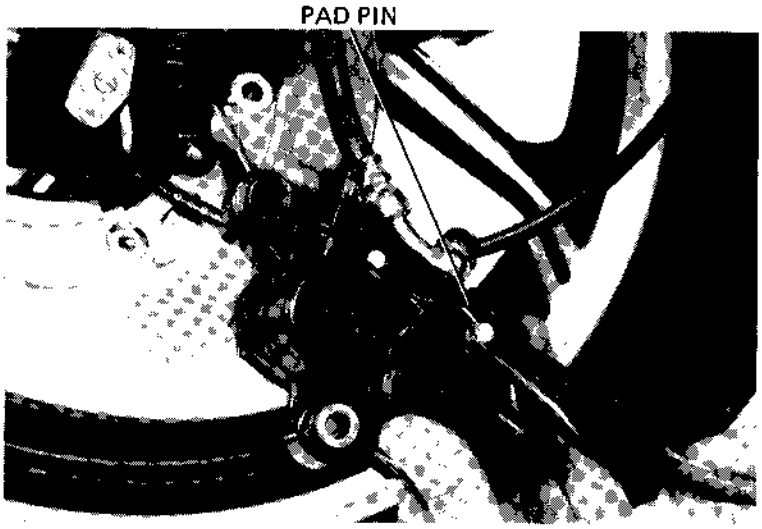
Loosen the anti-dive link bolt.

Pivot the caliper up out of the way and remove the caliper from the bracket.



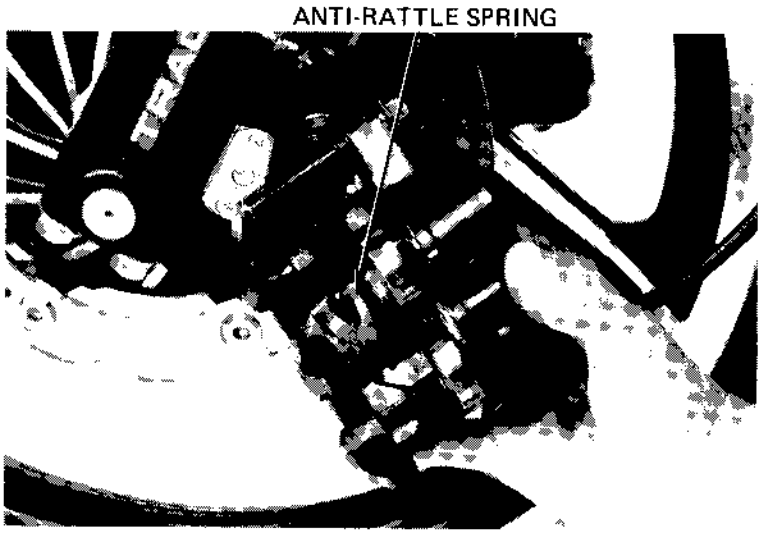
Remove the pad pin retainer and pull the pad pins out of the caliper.

Remove the brake pads.



Position the anti-rattle spring in the caliper as shown.

Push the caliper pistons in all the way.

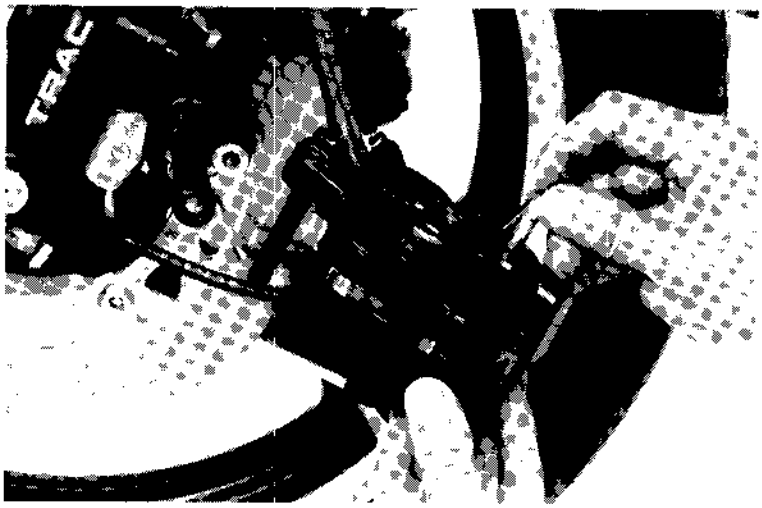


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Install the new pads in the caliper and install the pad pins.

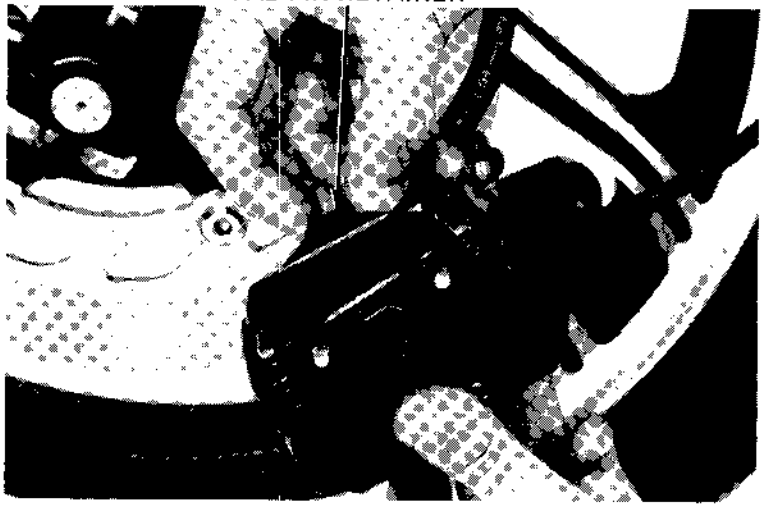
NOTE:

> Install one pad pin first then install the other pin by pushing the pads against the caliper to depress the anti-rattle spring.

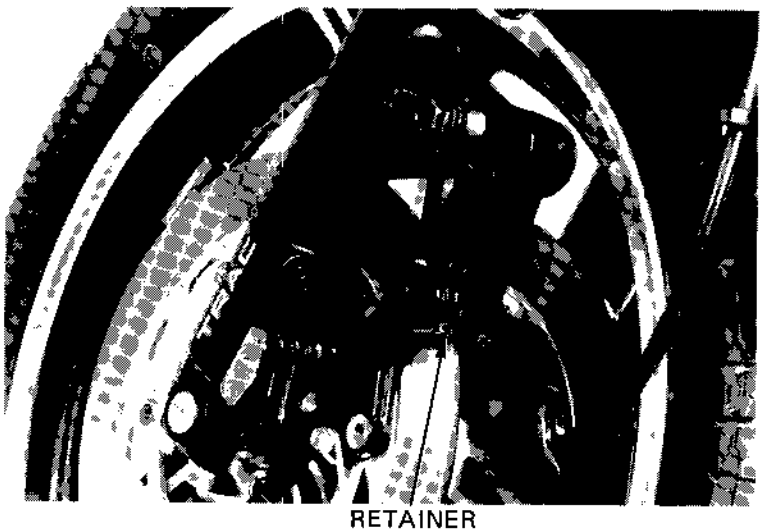


Place the pad pin retainer over the pad pins. Push the retainer down to secure the pins.

PAD PIN RETAINER



Install the retainer in the bracket.



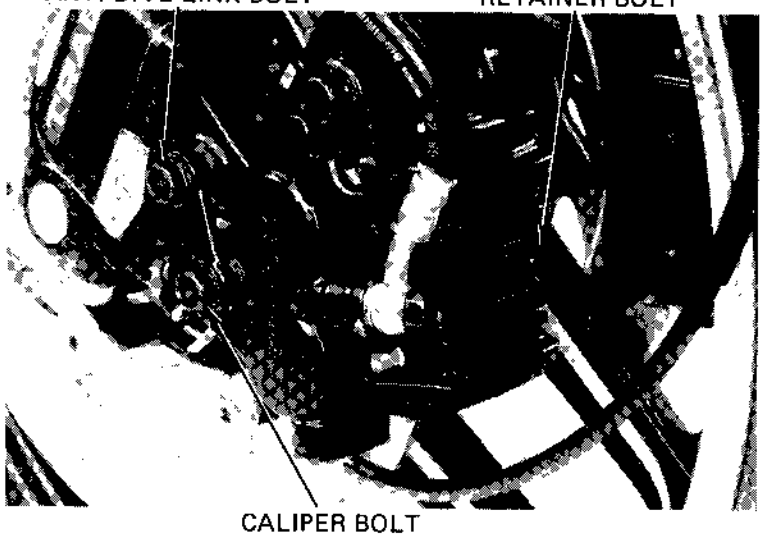
RETAINER

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Install the pad pin retainer bolt.
Pivot the caliper down so the brake disc is positioned between the pads, making sure not to damage the pads.
Install the caliper bolt and tighten it.

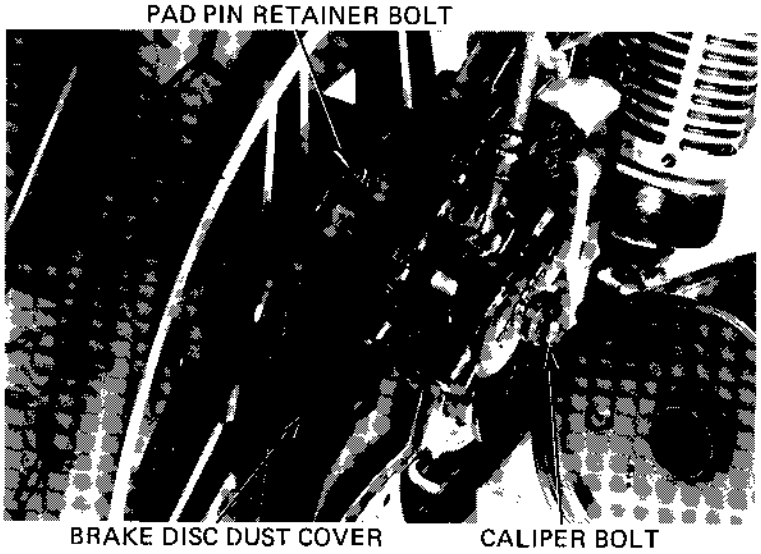
TORQUE: 20–25 N·m
(2.0–2.5 kg-m, 14–18 ft-lb)

Tighten the anti-dive link bolt.



REAR PAD REPLACEMENT

Remove the brake disc dust cover.
Replace the rear brake pads using the same method as used for front brake pad replacement (page 16-5).



DISC THICKNESS

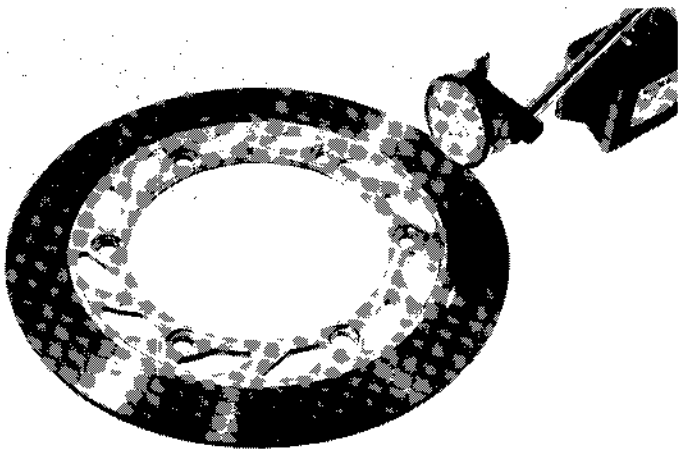
Measure the disc thickness with a micrometer.

SERVICE LIMIT:
FRONT: 4.0 mm (0.16 in)
REAR: 6.0 mm (0.24 in)

BRAKE DISC WARPAGE

Measure brake disc warpage on a surface plate with a feeler gauge.

SERVICE LIMIT: 0.3 mm (0.012 in)



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FRONT MASTER CYLINDER

DISASSEMBLY

Drain brake fluid from the hydraulic system.

Remove the brake lever and rear view mirror from the master cylinder. Disconnect the brake hose.

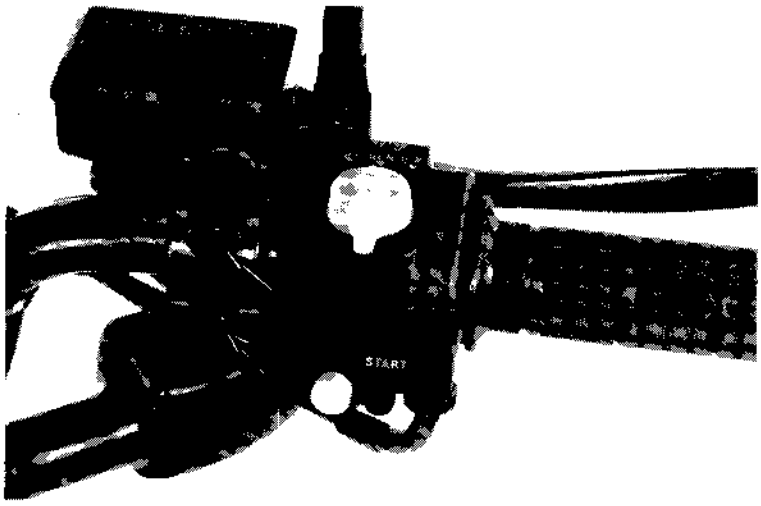
CAUTION:

Avoid spilling brake fluid on painted surfaces. Place a rag over the fuel tank whenever the brake system is serviced.

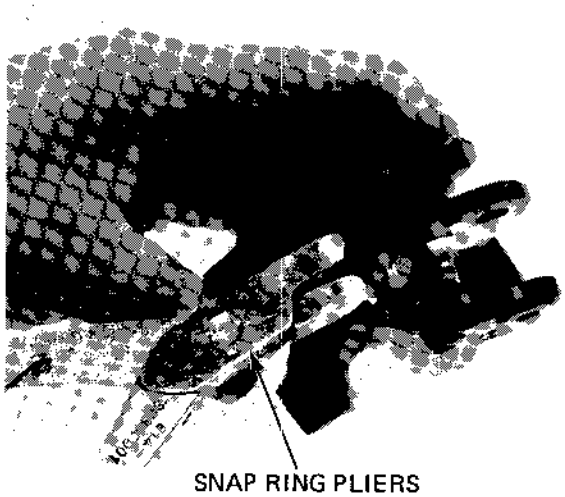
NOTE:

When removing the oil bolt, cover the end of the hose to prevent contamination and secure the hose.

Remove the master cylinder.



Remove the boot and circlip from the master cylinder body.

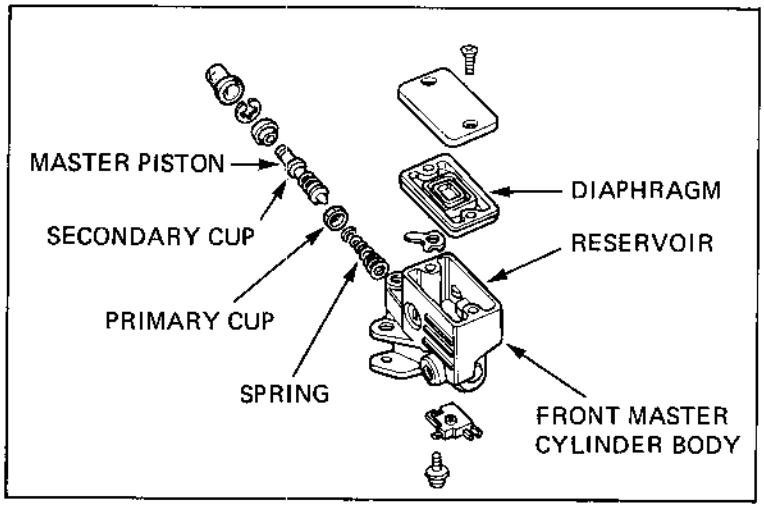


SNAP RING PLIERS
07914–3230001

Remove the stop plate, secondary cup and master piston. Then remove the primary cup and spring.

Remove the brake fluid reservoir from the master cylinder body, if necessary.

Clean the inside of the master cylinder and reservoir with brake fluid.

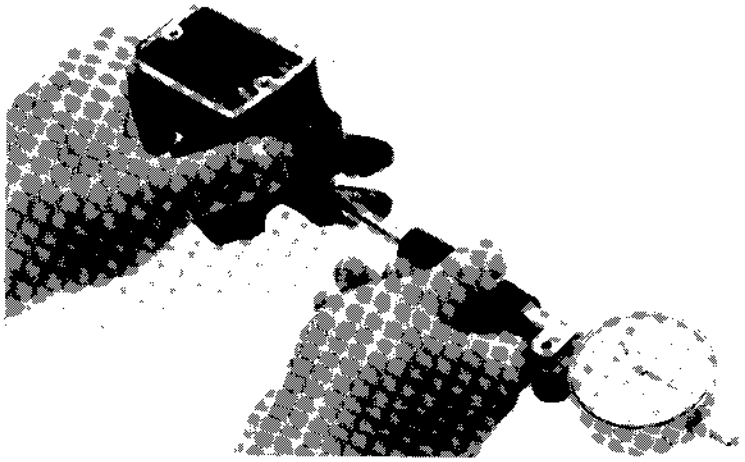


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FRONT MASTER CYLINDER I.D. INSPECTION

Measure the master cylinder I.D.
Check the master cylinder for scores, scratches or nicks.

SERVICE LIMIT: 15.925 mm (0.6270 in)

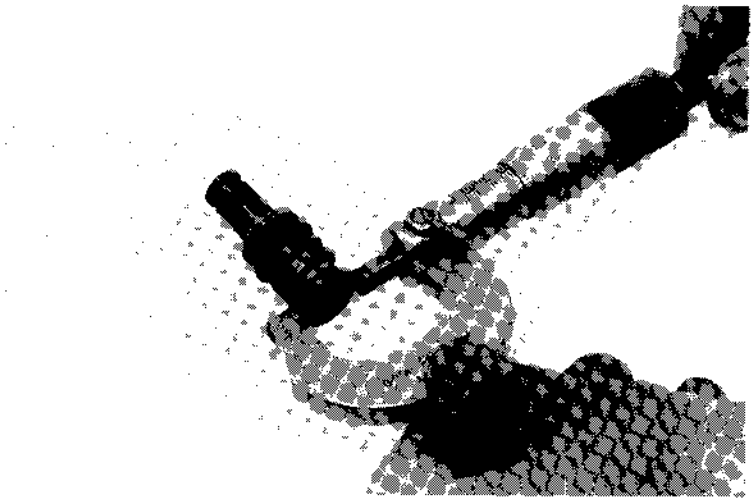


FRONT MASTER PISTON O.D. INSPECTION

Measure the master piston O.D.

SERVICE LIMIT: 15.815 mm (0.6226 in)

Check the primary cup and secondary cup for damage before assembly.



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ASSEMBLY

CAUTION:

Handle the master cylinder piston, cylinder and spring as a set.

Assemble the master cylinder. Coat all parts with clean brake fluid before assembly. Install the spring and valve together.

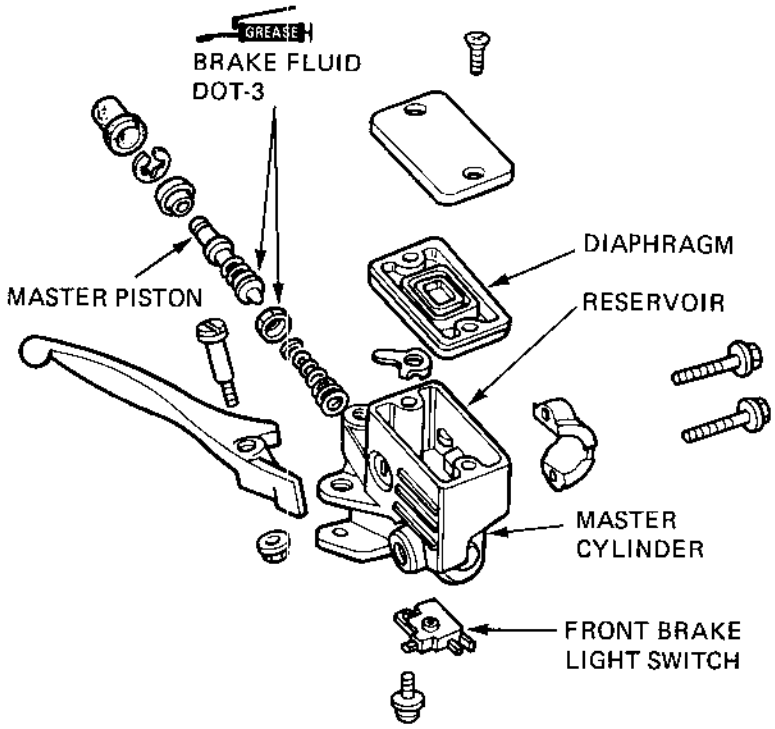
Dip the piston cup in brake fluid before assembly.

CAUTION:

When installing the cups, do not allow the lips to turn inside out. Be certain the circlip is seated fimly in the groove.

Install the boot, washer and clip.

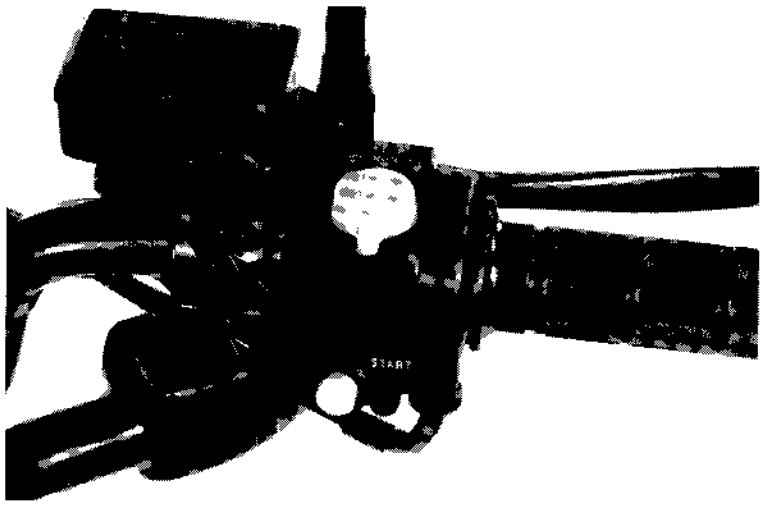
Install the reservoir on the master cylinder making sure that the O-ring is in good condition.



Place the master cylinder on the handlebar and install the holder and the two mounting bolts. Tighten the top bolt first. Install the oil hose with the bolt and its two sealing washers.

Install the brake lever. Before installing the lever nut, install the rubber tube from the bottom side of the cylinder, the plate, and nut.

Fill the reservoir to the upper level and bleed the brake system according to page 16-4.



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BRAKE CALIPER

FRONT BRAKE CALIPER REMOVAL

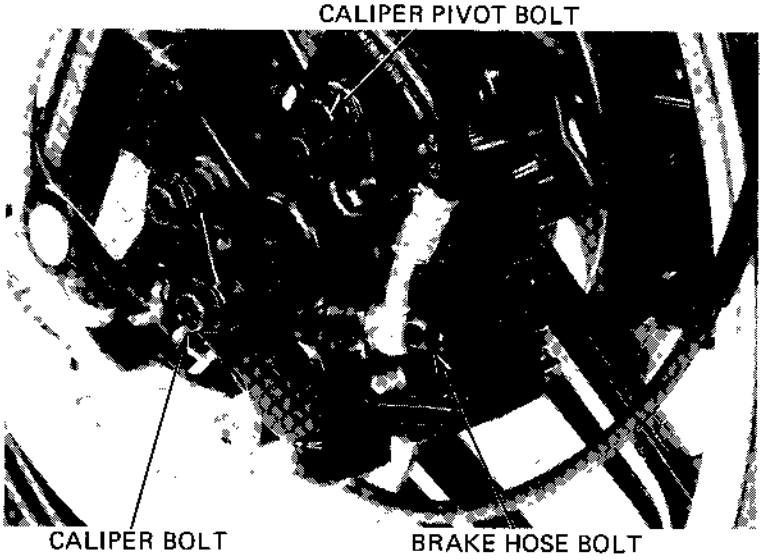
Place a clean container under the caliper and disconnect the brake hose from the caliper.

CAUTION:

Avoid spilling brake fluid on painted surfaces to prevent paint damage.

Remove the caliper bolt and caliper pivot bolt.

Remove the caliper.



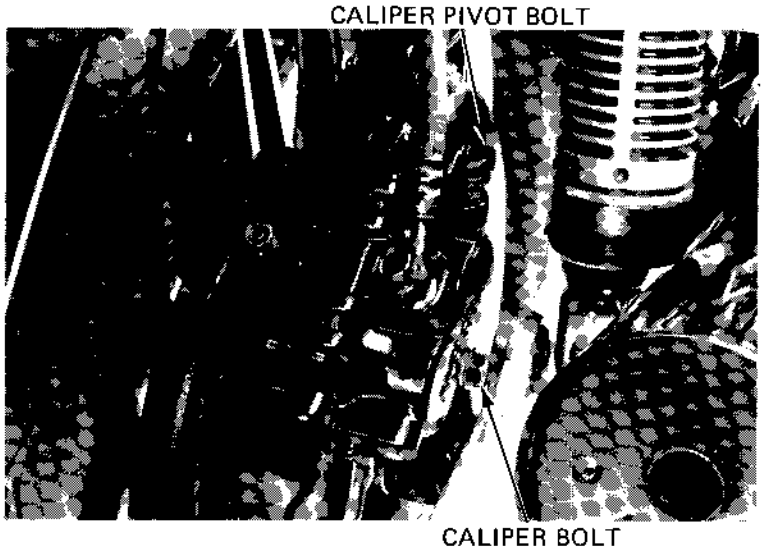
REAR BRAKE CALIPER REMOVAL

Remove the right rear shock absorber lower mounting bolt and move the shock absorber forward far enough to remove the caliper pivot bolt. Place a clean container under the caliper and disconnect the brake hose from the caliper.

CAUTION:

Avoid spilling brake fluid on painted surfaces to prevent paint damage.

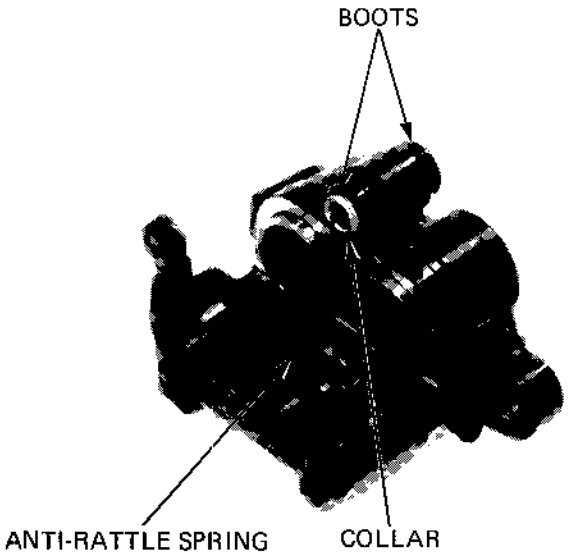
Remove the caliper and pivot bolts, and remove the caliper.



CALIPER DISASSEMBLY

Remove the pads and anti-rattle spring.

Remove the caliper pivot collar and boots.



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Position the caliper with the piston down and apply small squirts of air pressure to the fluid inlet.

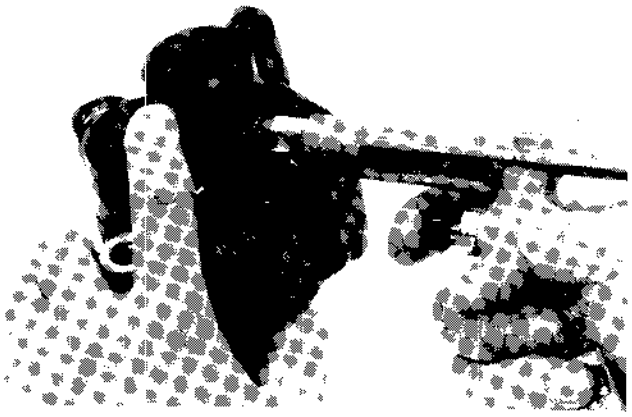
WARNING

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

NOTE:

Place a shop towel over the pistons to prevent the pistons from becoming projectiles.

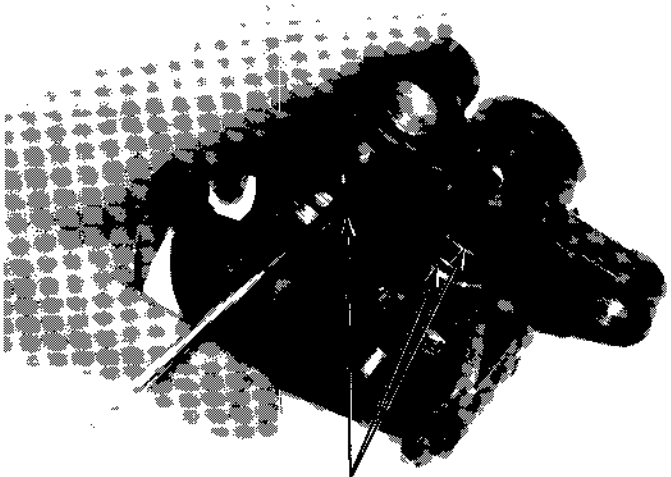
Examine the pistons and cylinders for scoring, scratches or other damage and replace if necessary.



Push the oil seals in and then lift them out. Clean the oil seal grooves with brake fluid.

CAUTION:

Do not damage the piston sliding surfaces.

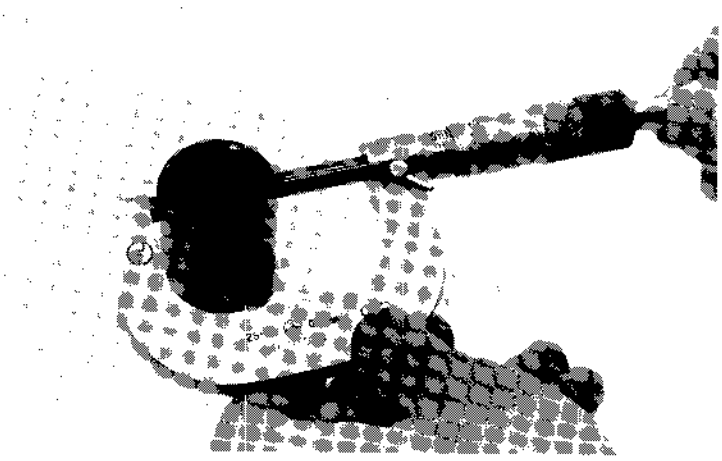


OIL SEALS

CALIPER PISTON O.D. INSPECTION

Check the piston for scoring, scratches or other faults. Measure the piston diameter with a micrometer.

SERVICE LIMIT: FRONT: 30.14 mm (1.187 in)
REAR: 26.91 mm (1.059 in)

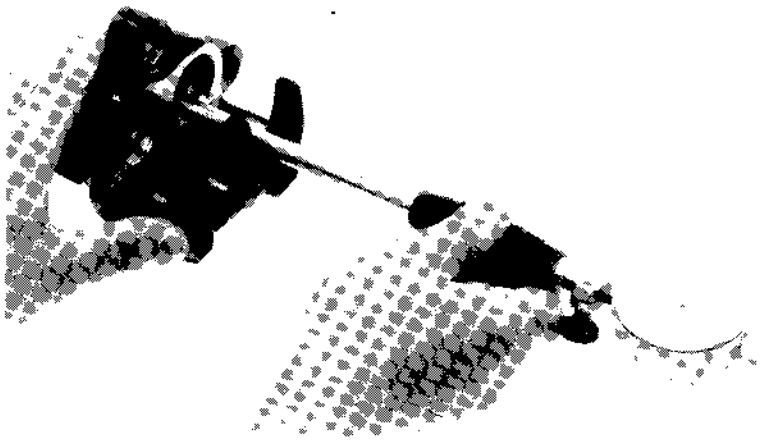


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CALIPER CYLINDER I.D. INSPECTION

Check the caliper cylinder for scoring, scratches or other faults. Measure the caliper cylinder bore.

SERVICE LIMIT: FRONT: 30.29 mm (1.193 in)
REAR: 27.06 mm (1.065 in)



CALIPER ASSEMBLY

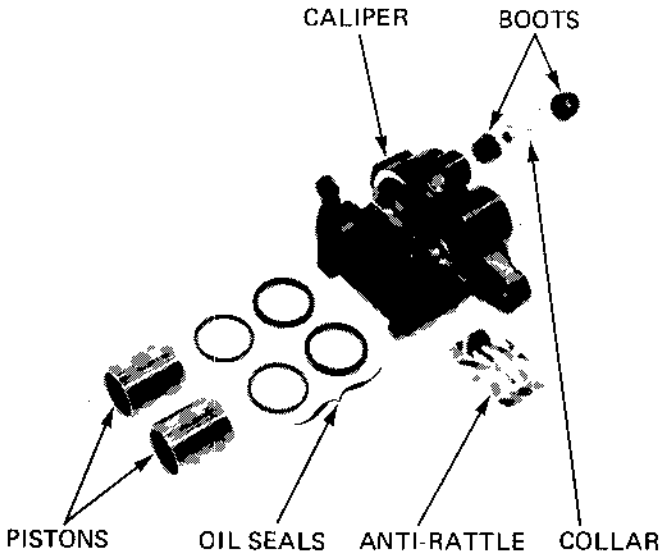
The oil seals must be replaced with new ones whenever they are removed.

Coat the oil seals with silicone grease or brake fluid before assembly.

Install the pistons with the dished ends toward the pads.

Install the boots and collar making sure that the boots are seated in the collar and caliper grooves properly.

Install the anti-rattle spring and pads.

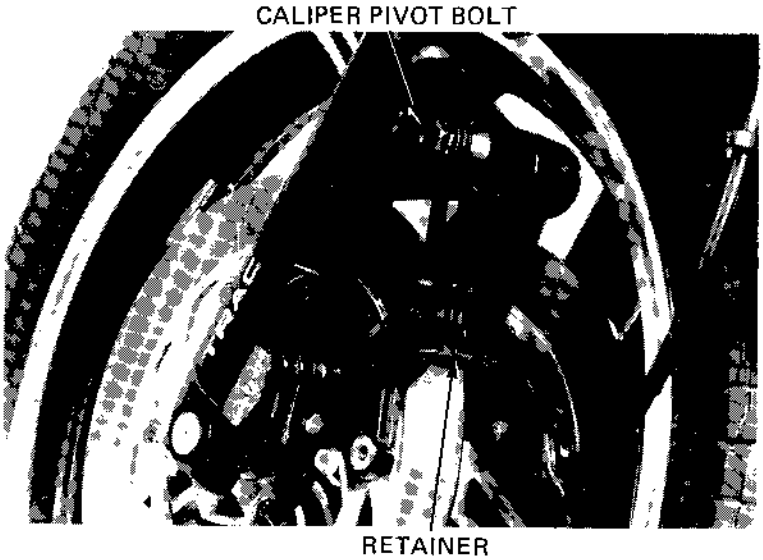


FRONT CALIPER INSTALLATION

Inspect the condition of the caliper pivot bolt boot. Apply silicone grease or brake fluid to the caliper pivot bolt.
Install the caliper assembly over the brake disc so that the disc is positioned between the pads.

CAUTION:

Be careful not to damage the pads.



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Install the caliper pivot bolt.

TORQUE: 25–30 N·m (2.5–3.0 kg-m, 18–22 ft-lb)

Install the caliper bolt.

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

Connect the brake hose and tighten the brake hose bolt.

TORQUE: 25–35 N·m (2.5–3.5 kg-m, 18–25 ft-lb)

Fill the brake fluid reservoir and bleed the front brake system (page 16-4).



CALIPER BOLT BRAKE HOSE BOLT RETAINER BOLT

REAR CALIPER INSTALLATION

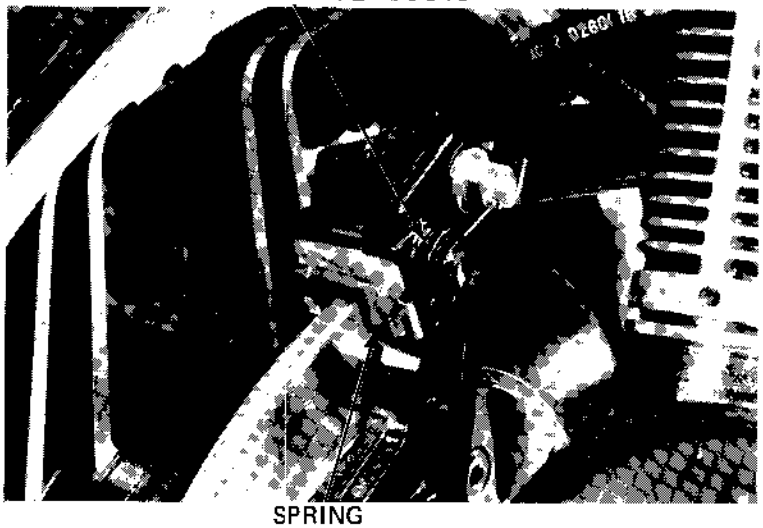
Inspect the condition of the caliper pivot bolt boot. Install the caliper assembly over the brake disc so that the disc is positioned between the pads.

CAUTION:

Be careful not to damage the pads.

Apply silicone grease or brake fluid to the caliper pivot bolt.

CALIPER PIVOT BOLT BOOTS



SPRING

Install the caliper pivot bolt.

TORQUE: 25–30 N·m (2.5–3.0 kg-m, 18–22 ft-lb)

Install the caliper bolt.

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

Connect the brake hose and tighten the brake hose bolt.

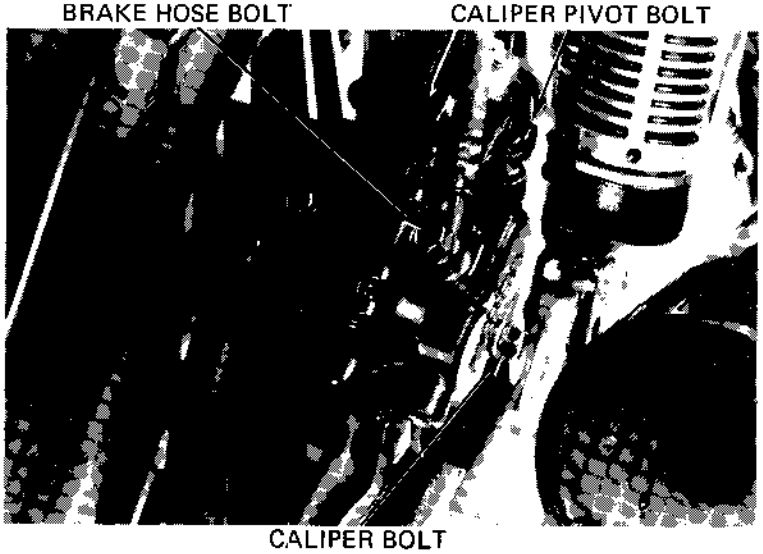
TORQUE: 25–35 N·m (2.5–3.5 kg-m, 18–25 ft-lb)

Fill the brake fluid reservoir and bleed the rear brake system (page 16-4).

Install the right rear shock absorber lower mounting bolt.

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

BRAKE HOSE BOLT CALIPER PIVOT BOLT



CALIPER BOLT

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REAR MASTER CYLINDER

REMOVAL

Remove the right side cover.

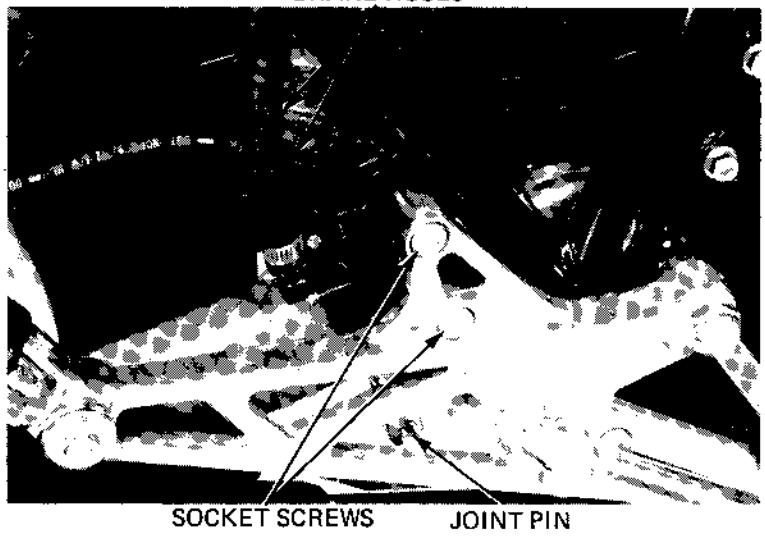
Place a clean drain pan under the master cylinder and disconnect the brake hoses from the master cylinder.

CAUTION:

Avoid spilling brake fluid on painted surfaces to prevent paint damage.

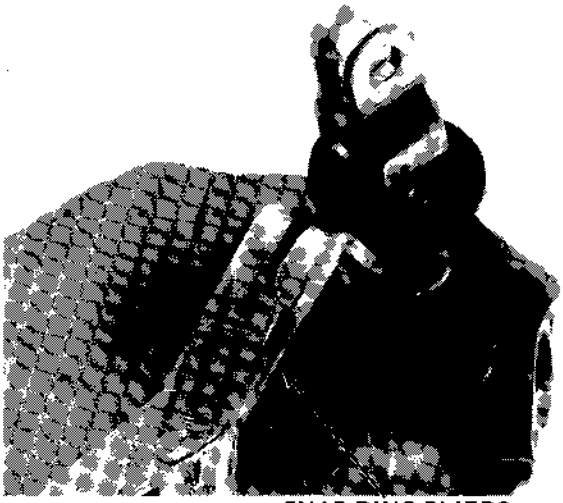
Remove the cotter pin and pull out the joint pin connecting the master cylinder push rod end and rear brake pedal shaft.

Remove the socket screws and the master cylinder.



DISASSEMBLY

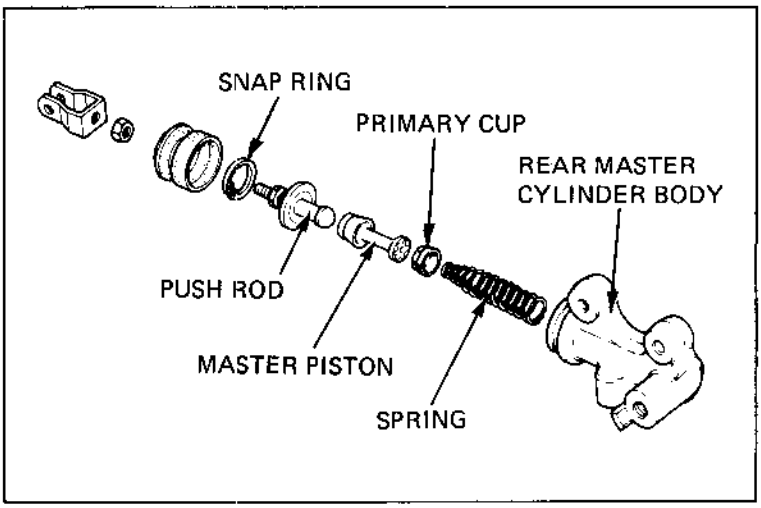
Remove the rubber cover.
Remove the snap ring and push rod from the master cylinder body.



Remove the master piston, primary cup and spring.

It may be necessary to apply a small amount of air pressure to the fluid outlet to remove the master piston and primary cup.

Clean all parts with brake fluid.



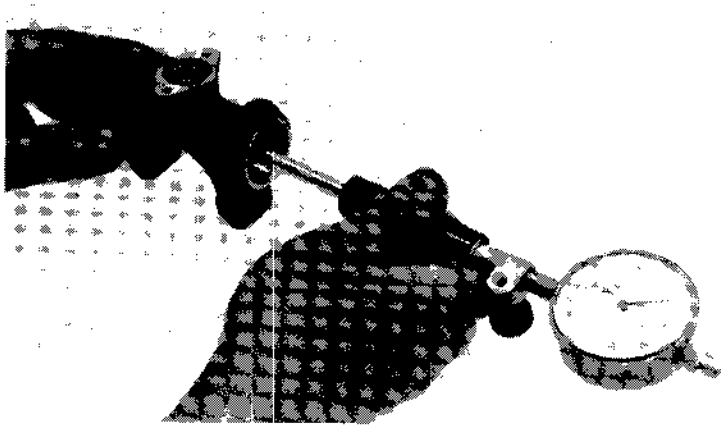
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REAR MASTER CYLINDER I.D. INSPECTION

Measure the inside diameter of the master cylinder bore.

SERVICE LIMIT: 14.055 mm (0.5533 in)

Check for scores, scratches or nicks.

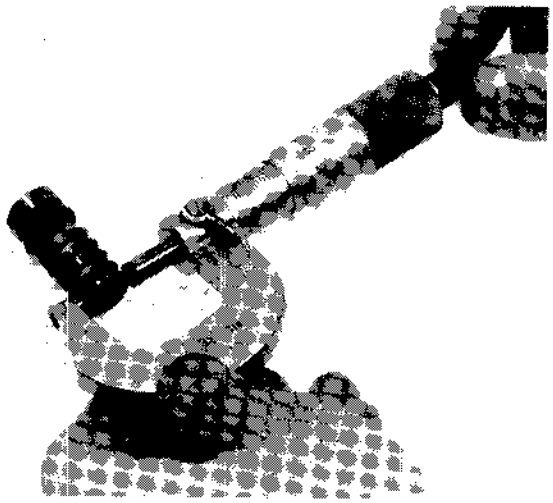


REAR MASTER PISTON O.D. INSPECTION

Measure the master piston O.D.

SERVICE LIMIT: 13.945 mm (0.549 in)

Check the primary cup and secondary cup for damage before assembly.



ASSEMBLY

CAUTION:

Handle the master cylinder piston, cylinder and spring as a set.

Assemble the master cylinder.
Coat all parts with clean brake fluid.

Dip the piston cup in brake fluid before assembly.

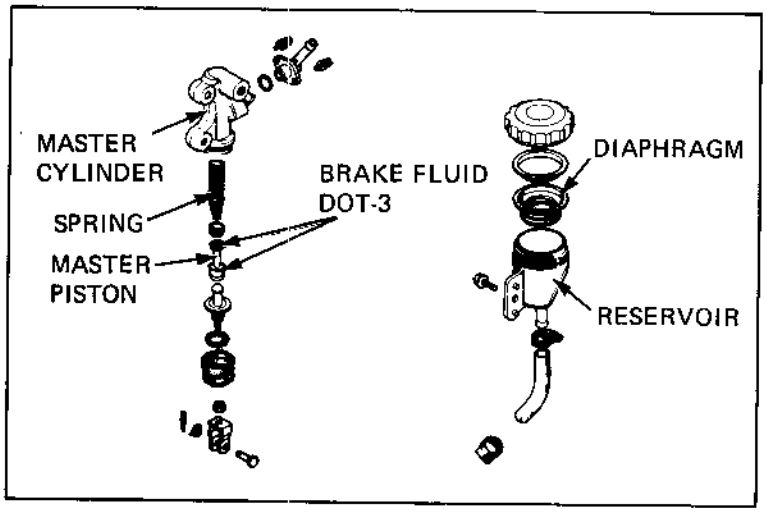
CAUTION:

When installing the cups, do not allow the lips to turn inside out. Be certain the snap ring is seated firmly in the groove.

Install the primary cup and piston.

Install the push rod and snap ring.

Install the boot, nut and rod eye.



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INSTALLATION

Install the master cylinder and tighten the socket screws.

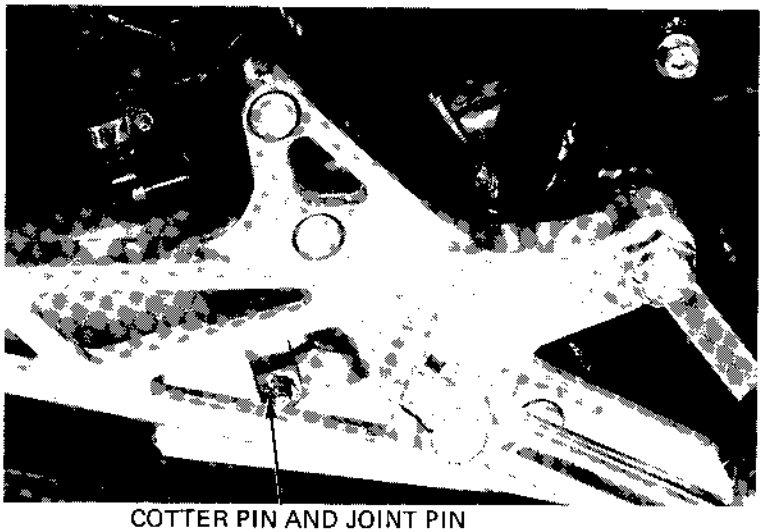
TORQUE: 30–40 N·m (3.0–4.0 kg-m, 22–29 ft-lb)

Connect the push rod end and brake pedal shaft with the joint pin. Secure the joint pin with a new cotter pin.
Connect the brake hose to the master cylinder and tighten the brake hose bolt.

TORQUE: 25–35 N·m (2.5–3.5 kg-m, 18–25 ft-lb)

Fill the brake fluid reservoir and bleed the rear brake system (page 16-4).

Install the right side cover.



COTTER PIN AND JOINT PIN

BRAKE PEDAL SHAFT

REMOVAL

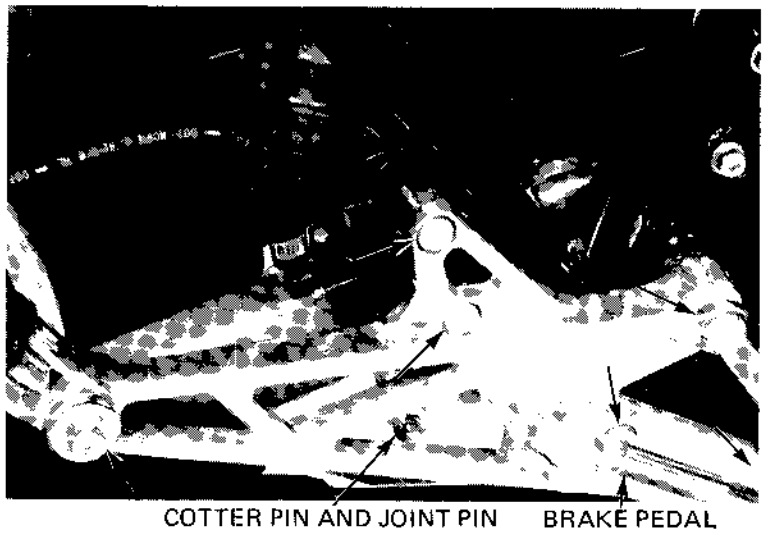
Remove the brake pedal.

Remove the cotter pin and joint pin, and then disconnect the pedal shaft from the master cylinder push rod end.

Unhook the brakelight switch spring and brake return spring.

Remove the right foot peg holder.

Remove the brake pedal shaft from the foot peg holder.

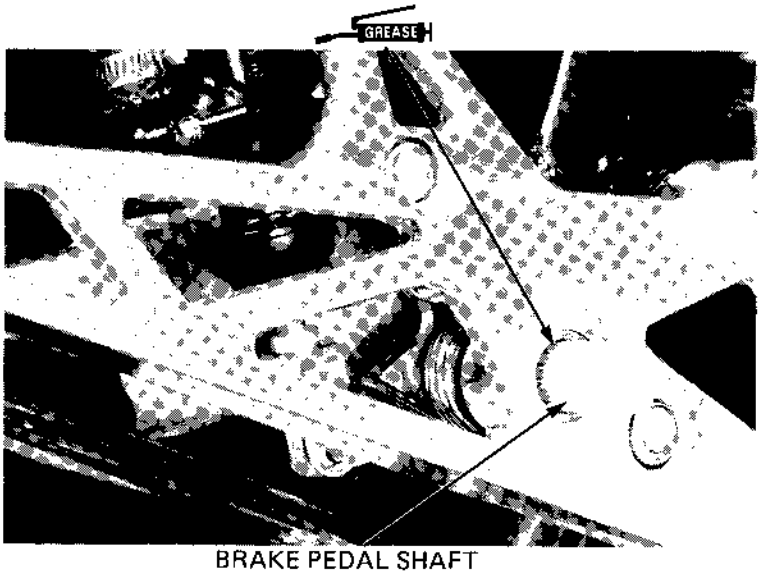


COTTER PIN AND JOINT PIN BRAKE PEDAL

INSTALLATION

Apply grease to the brake pedal shaft and install it in the foot peg holder.

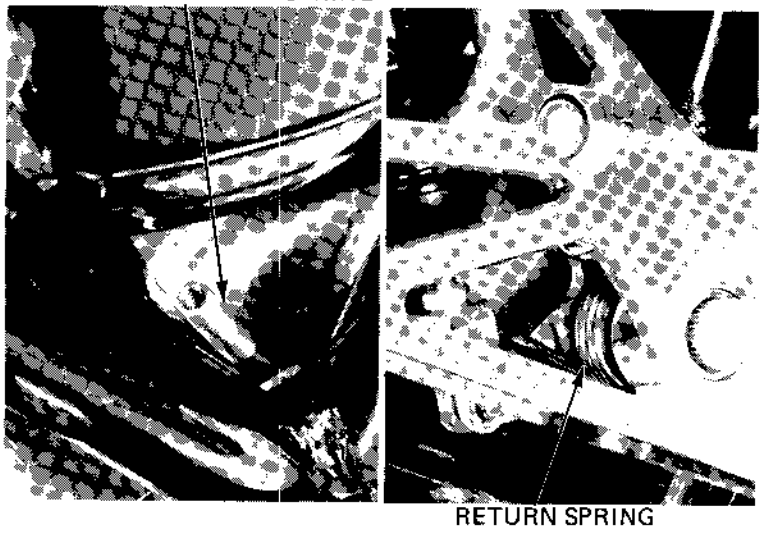
Install the foot peg holder.



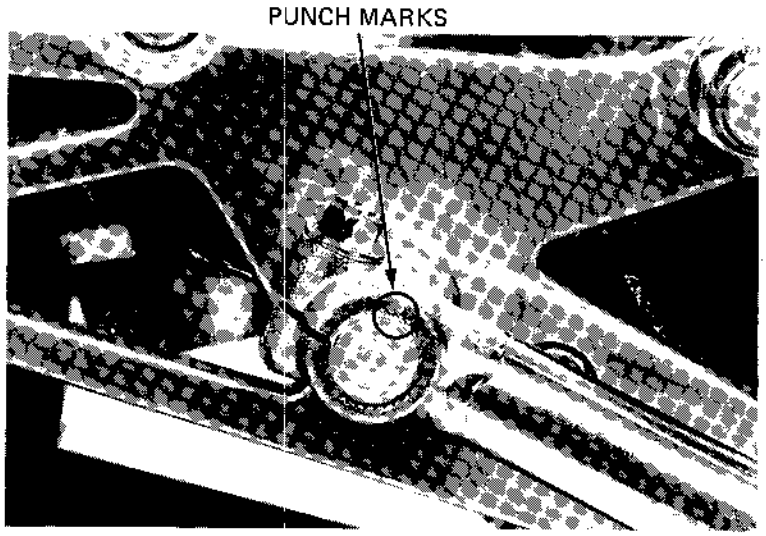
BRAKE PEDAL SHAFT

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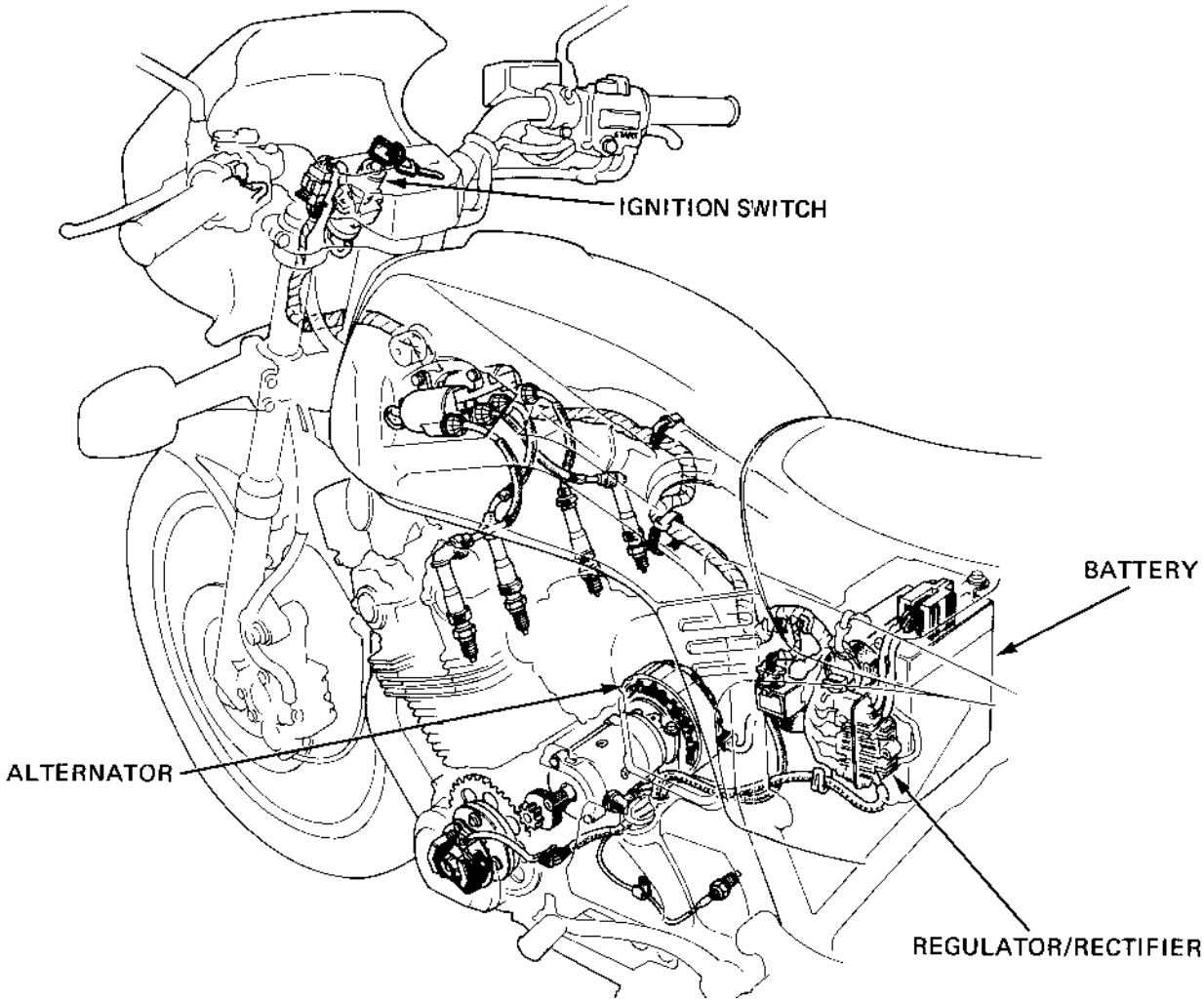
Hook the brakelight switch spring and return spring as shown.

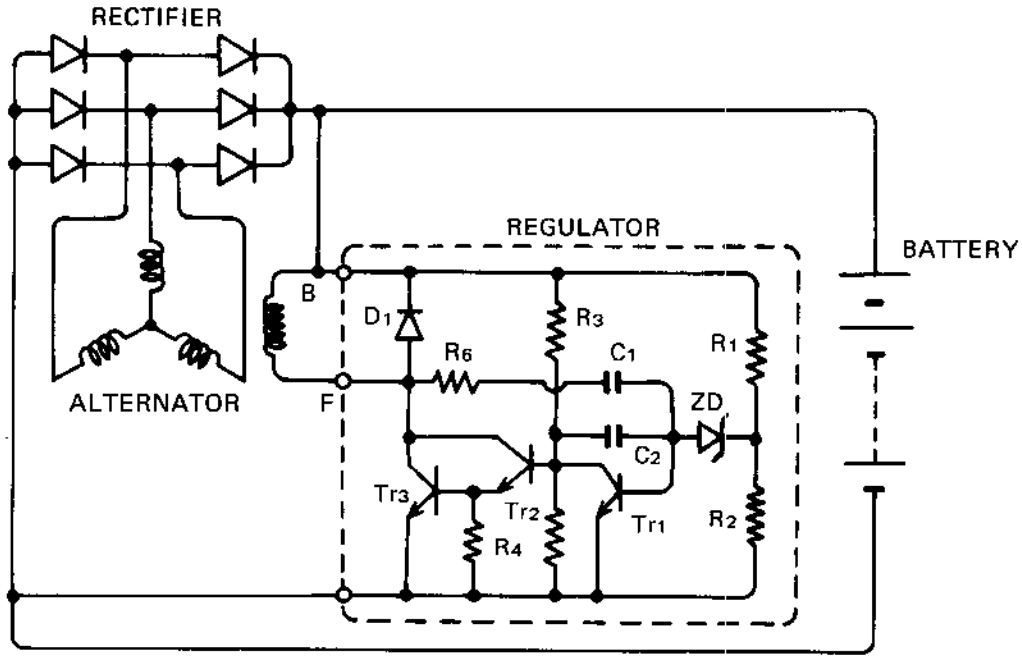


Connect the pedal shaft to the master cylinder push rod end and install the joint pin.
Secure the joint pin with a new cotter pin.
Install the brake pedal aligning the punch marks of the pedal and shaft.



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BATTERY/CHARGING SYSTEM

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17. BATTERY/CHARGING SYSTEM

SERVICE INFORMATION	17–1
TROUBLESHOOTING	17–2
BATTERY	17–3
CHARGING SYSTEM	17–4
STATOR/ROTOR	17–5
VOLTAGE REGULATOR/RECTIFIER	17–6

SERVICE INFORMATION

GENERAL

- Battery fluid level should be checked regularly. Fill with distilled water when necessary.
- Quick charge a battery, only 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 is in Section 8.

SPECIFICATIONS

Battery	Capacity	12V 14 AH	
	Specific gravity	1.280/20°C (68°F)	
	Charging rate	1.4 amperes maximum	
Alterantor	Capacity	1,500 rpm	5,000 rpm
		6.5A min	18A min
Voltage regulator		Transistorized non-adjustable regulator	

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TROUBLESHOOTING

No power – key turned on:
1. Dead battery
   – Low fluid level
   – Low specific gravity
   – Charging system failure
2. Disconnected battery cable
3. Main 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 starting system connection
4. Loose connection or short circuit in ignition system
5. Loose connection or short circuit in lighting system

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

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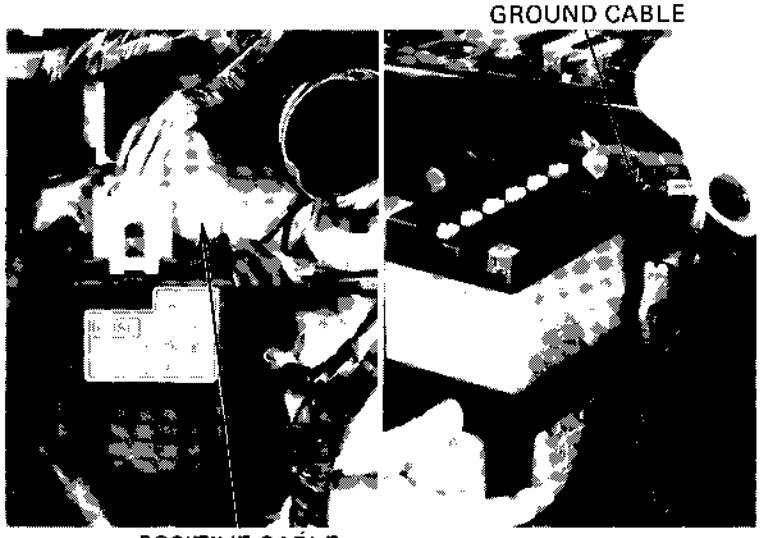
BATTERY

REMOVAL

Remove the frame right and left side covers.

Remove the seat and tool kit.
Disconnect the ground cable at the battery terminal. Then disconnect the positive cable at the starter relay.

Remove the battery holder.



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

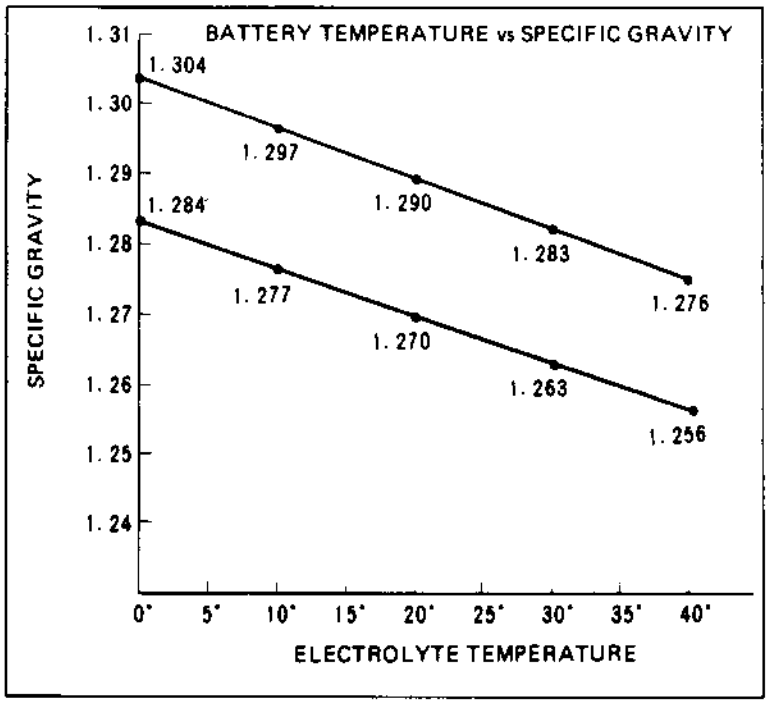
NOTE:

- The battery must be recharged if the specific gravity is below 1.230.
- 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.

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CHARGING

Connect the charger positive (+) cable to the battery positive (+) terminal. Then connect the charger negative (–) cable to the battery negative (–) 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).*

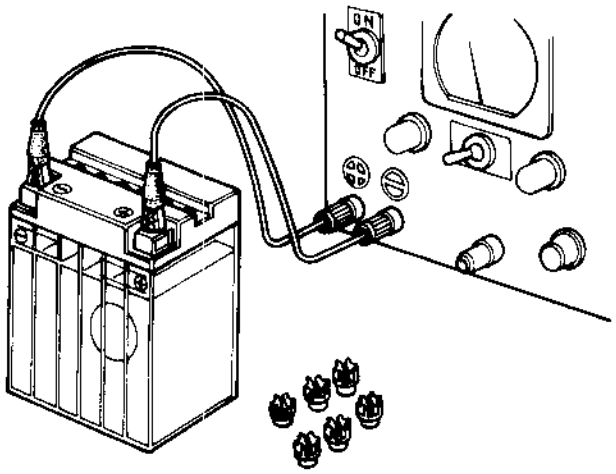
CAUTION:

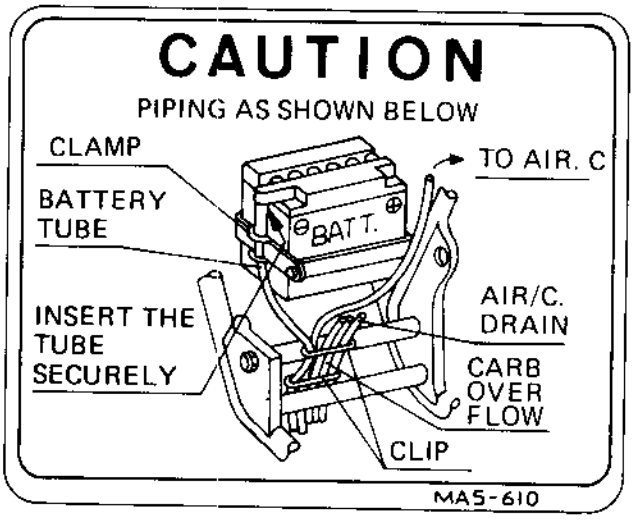
Quick-charging should only be done in an emergency; slow-charging is preferred.

After installing the battery, coat the terminals with clean grease.

CAUTION:

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





CHARGING SYSTEM

Current Test

NOTE:

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

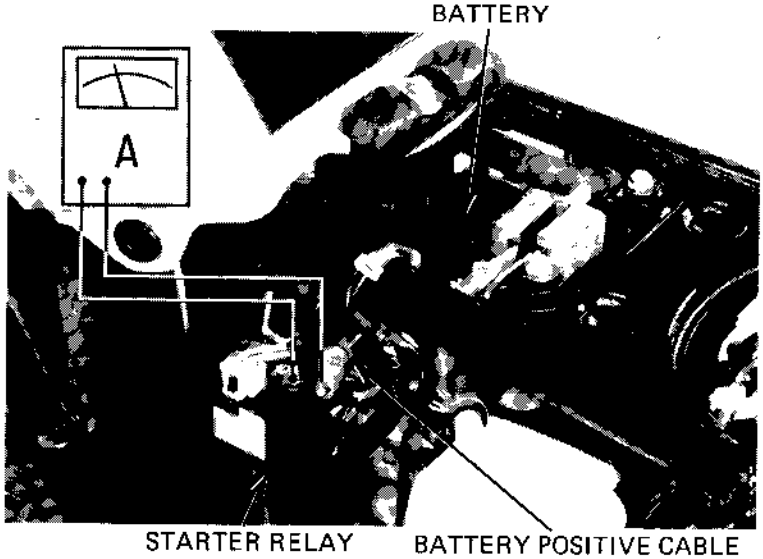
Warm up the engine and remove the frame left side cover.
Remove the seat.
Turn headlight high beam on and run the engine above 2,000 rpm.

Disconnect the battery positive cable at the starter relay and connect an ammeter between the battery cable and terminal.

Allow engine to idle.

Increase engine speed slowly.
Charging amperage should begin by 1,700 rpm and should be a minimum of 18 amperes at 5,000 rpm.

Check the stator (page 17-5) and then the regulator/rectifier (page 17-6), if the charging specifications are not met.



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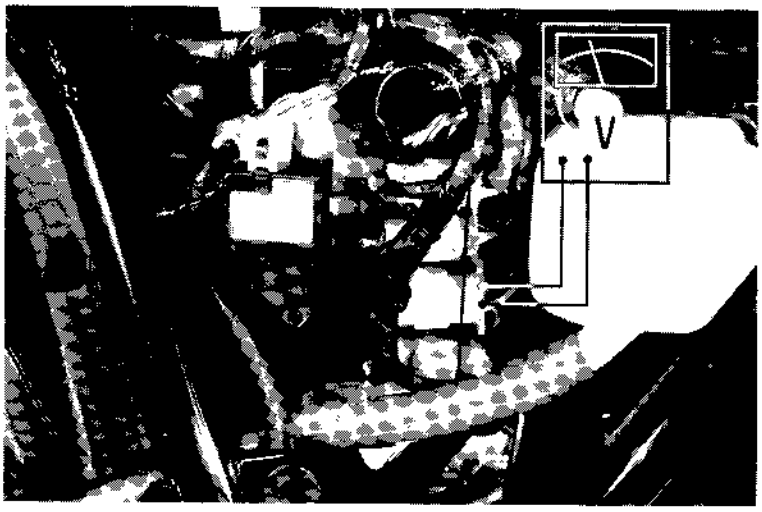
STATOR/ROTOR

INSPECTION

Remove the frame right and left side covers.
Turn the ignition switch on and measure battery voltage.

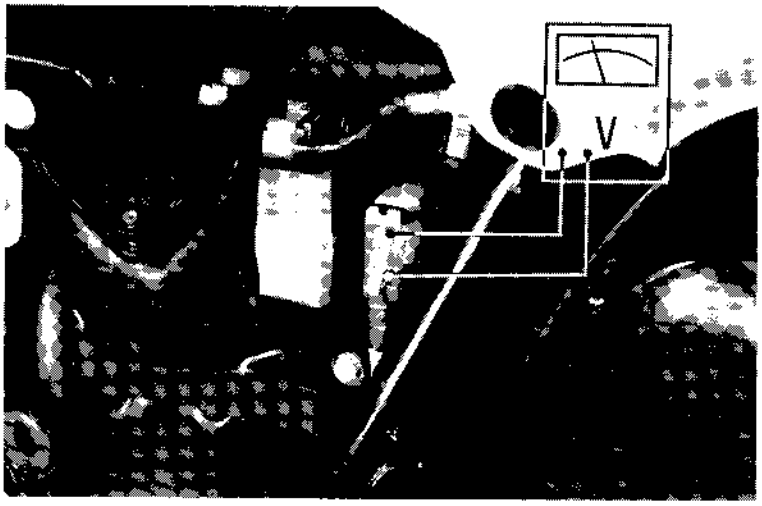
Connect a DC voltmeter to regulator Red/White wire and Green wire. Read the voltage, it should be equal to the battery voltage. Check wire and battery cable connections, if not.

Connect a DC voltmeter to the stator six pole connector Black and White wires, without disconnecting them. Read the voltage, it should be equal to the battery voltage. Check the wire and battery cable connections (photo), if battery voltage is not equal. Disconnect the DC voltmeter.



Warm up the engine. Disconnect the stator six pole connector.

Connect an AC voltmeter leads to any two Yellow wire leads. You should read 8-10 volts. Move one lead to the remaining Yellow wire. You should read 8-10 volts. Replace the stator if voltage output is not within specifications.



STATOR CONTINUITY TEST

Warm up the engine. After the engine is warm, stop the engine.

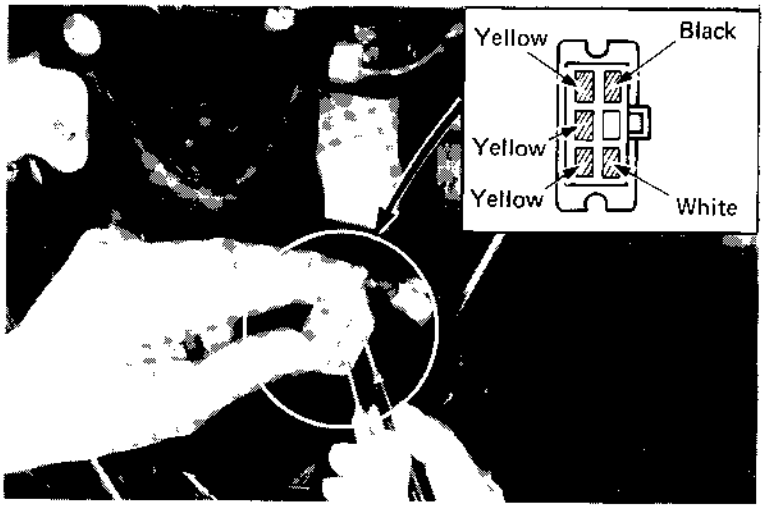
Remove the frame right side cover.

Check the resistance of the stator six pole connector wires.

Use the R x 1 ohmmeter scale.

Black-White: 10-12 Ω
Yellow-Yellow: 0.4-0.5 Ω
Yellow-ground: ∞

Replace the stator if not within specifications.



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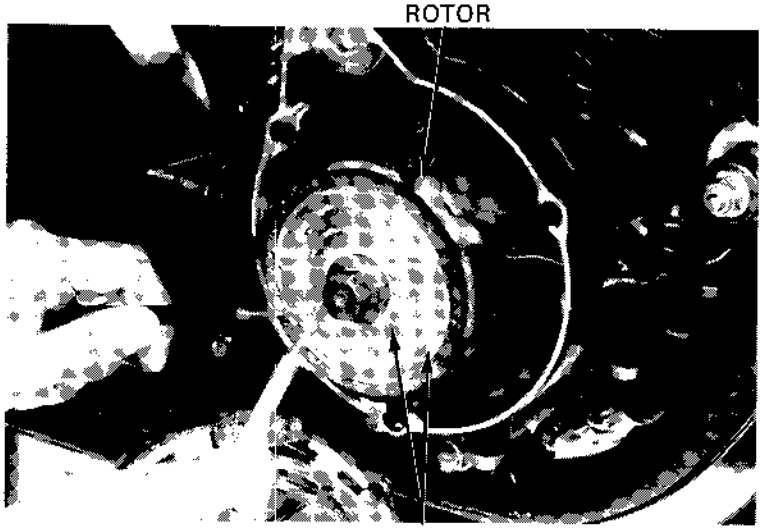
ROTOR CONTINUITY TEST

Remove the alternator cover.

Remove the brush assembly and check the resistance between the two rotor slip rings.

SLIP RING- TO - SLIP RING: 3.6–4.4 Ω

Replace the rotor, if not within specifications.



VOLTAGE REGULATOR/RECTIFIER

VOLTAGE REGULATOR TEST

Remove the frame left side cover and the seat.

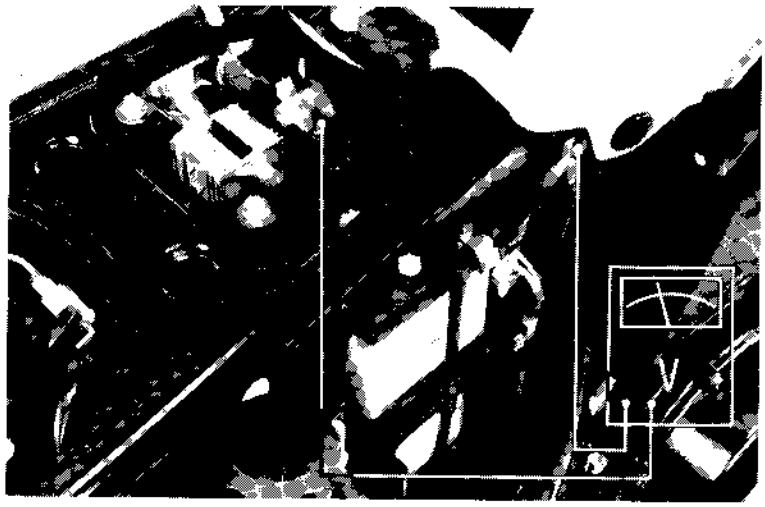
Start the engine.

Connect a DC voltmeter; positive lead to battery positive and negative lead to a frame ground.

Increase engine speed to 3,000 rpm.

MAXIMUM VOLTAGE: 14–15 V

Replace the voltage regulator, if not within specifications.

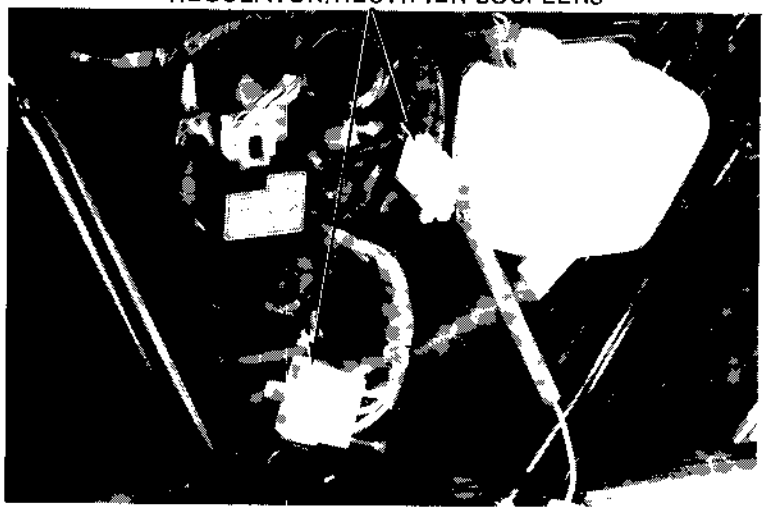


RECTIFIER TEST

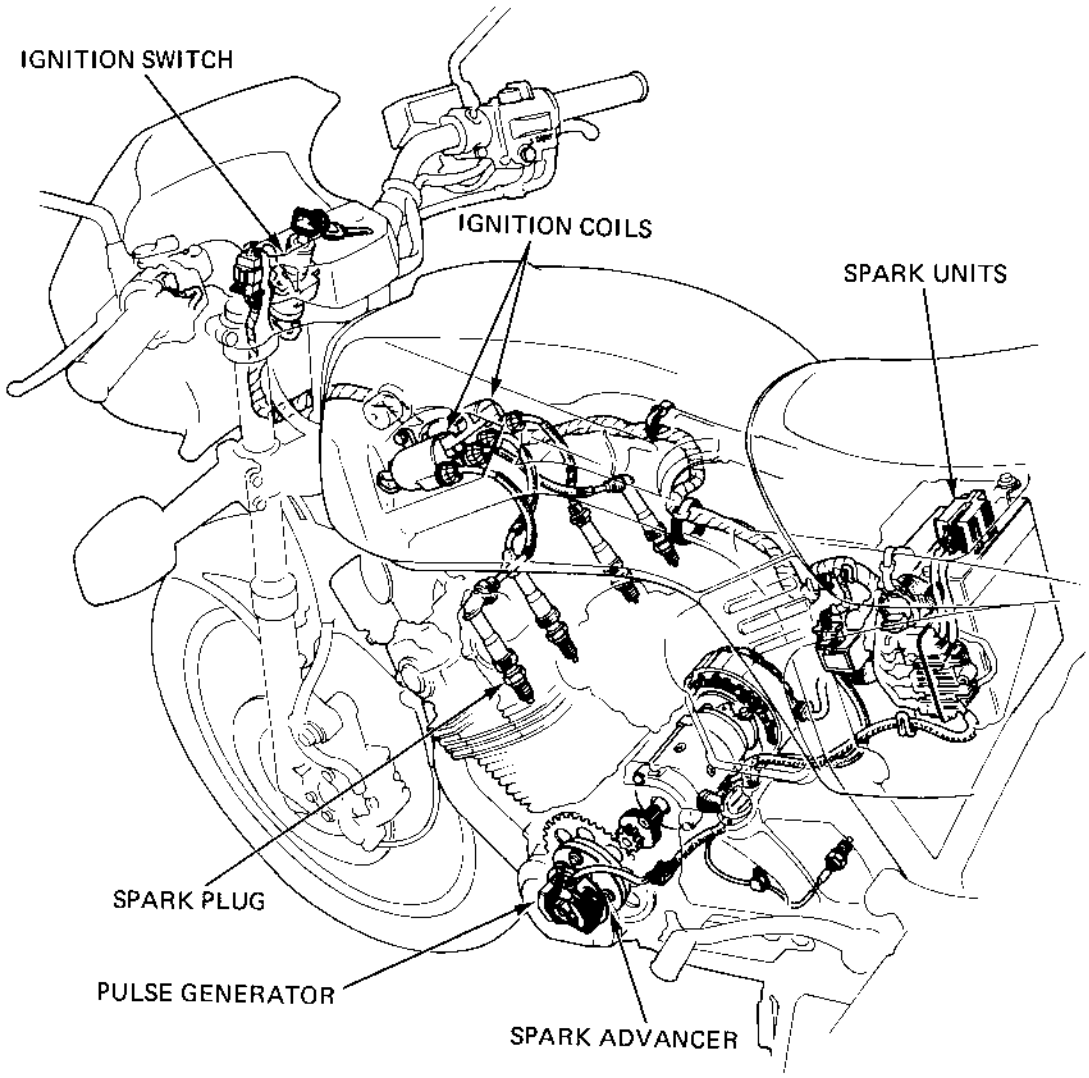
Check the resistance between the leads with an ohmmeter.

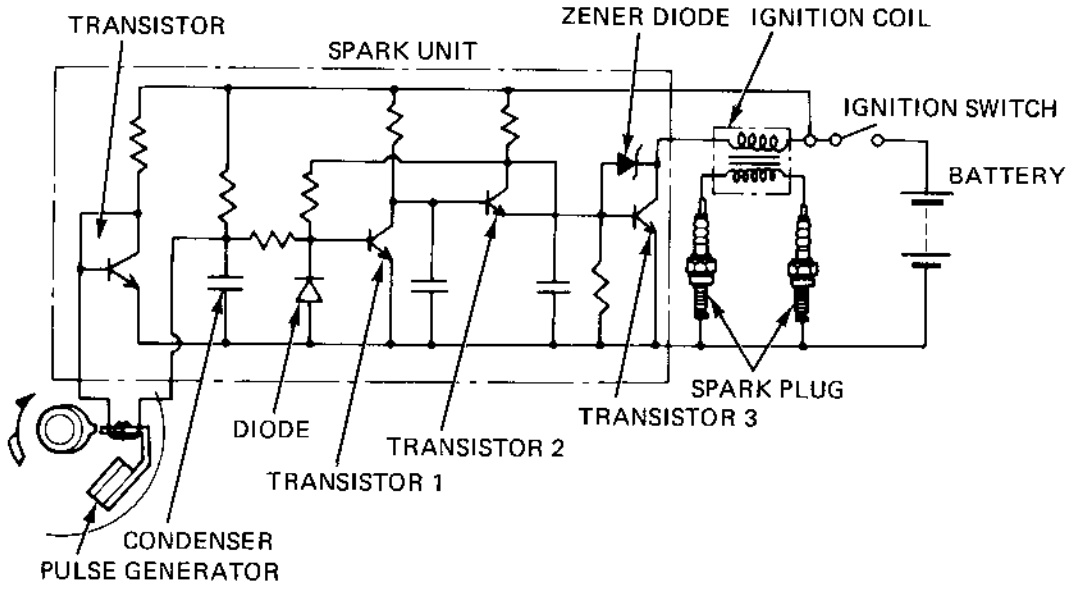
RESISTANCE IN ONE DIRECTION:
Green and any yellow: 5–40 Ω
Red/white and any yellow: 5–40 Ω
RESISTANCE IN THE OTHER DIRECTION:
Red/white and any yellow: 2000 Ω min.
Green and any yellow: 2000 Ω min.

REGULATOR/RECTIFIER COUPLERS



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18. IGNITION SYSTEM

SERVICE INFORMATION	18–1
TROUBLESHOOTING	18–2
IGNITION COIL	18–3
TRANSISTORIZED IGNITION SYSTEM (Pulse Generator, Spark Unit)	18–4
SPARK ADVANCER	18–6

SERVICE INFORMATION

GENERAL

- A Transistorized Ignition System is used and no adjustments are to be made unless the pulse generator screws are loosened. If these screws are loosened, ignition timing for either the No. 1 or No. 4 cylinder must be adjusted.
- For spark plug information, see page 3-7.

SPECIFICATIONS

Spark plug	ND	Standard	X27ESR-U	
		Optional (for high speed riding)	X31ESR-U	
	NGK	Standard	DR8ES	
Spark plug gap			0.6–0.7 mm (0.024–0.028 in)	
Ignition timing			At idle	10° (BTDC)
			Full advance	38.5° BTDC/3,500
Ignition coil			3-point spark test	6 mm (1/4 in) minimum

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TROUBLESHOOTING

The ignition system has two sub-systems; one for the No. 1 and No. 4 cylinders and one for No. 2 and No. 3 cylinders. Determine which sub-system is faulty, then proceed to the detailed tests below.

Engine cranks but will not start
- Engine stop switch off
- No spark at plugs
- Faulty transistorzed spark unit
- Faulty pluse generator

No spark at plug
1. Engine stop switch OFF
2. Poorly connected, broken or shorted wires
   - Between ignition switch and engine stop switch
   - Between spark unit and engine stop switch
   - Between spark unit and ignition coil
   - Between ignition coil and plug
   - Between spark unit and pulse generator
3. Faulty ignition coil
4. Faulty ignition switch
5. Faulty spark unit
6. Faulty pulser generator

Engine starts but runs poorly
1. Igntiion primary circuit
   - Faulty ignition coil
   - Loose or bare wire
   - Intermittent short circuit
2. Secondary circuit
   - Faulty plug
   - Faulty spark plug wire

Timing advance incorrect
- Centrifugal advancer faulty

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IGNITION COIL

REMOVAL

Remove the fuel tank.

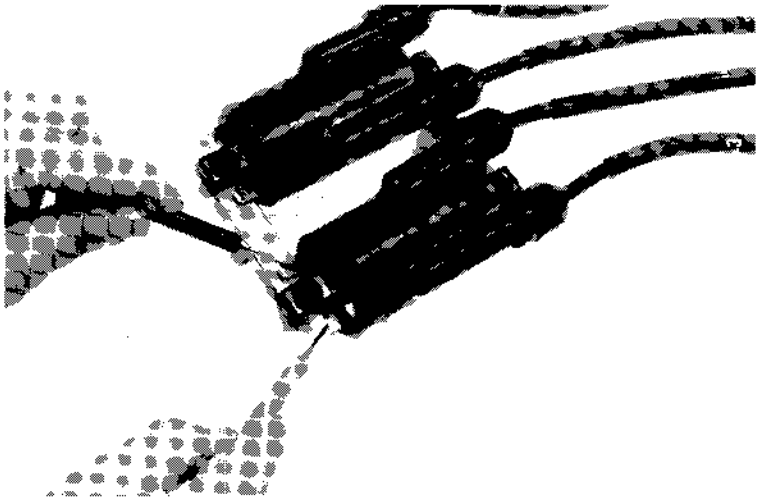
Disconnect the ignition coil wire leads.
Remove the coils by removing the attaching bolts.



CONTINUITY TEST

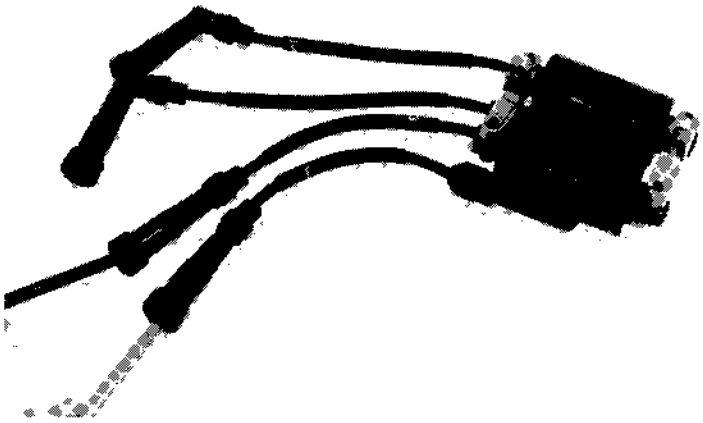
Measure the primary coil resistance of the coils.

RESISTANCE: 2.8 ohms (Ω)



Measure the secondary coil resistance with the spark plug caps in place.

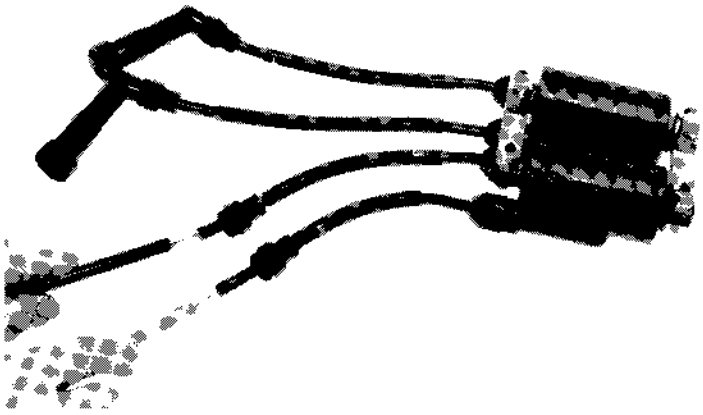
RESISTANCE: 21–28 k ohms (Ω)



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Remove the spark plug caps and measure the secondary coil resistance.

RESISTANCE: 13.6–15.5 ohms (Ω)



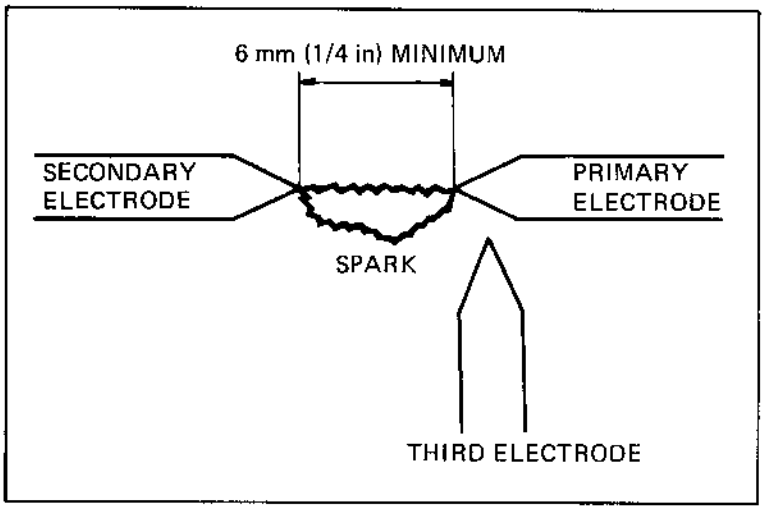
PERFORMANCE TEST

Perform the 3-point spark test with a coil tester.

SERVICE LIMIT: 6 mm (1/4 in) min.

NOTE:

Follow the coil tester manufacturers instructions.



TRANSISTORIZED IGNITION SYSTEM

INSPECTION

System

Disconnect the No. 1 and 2 plugs.

Hold each plug against any convenient engine ground.

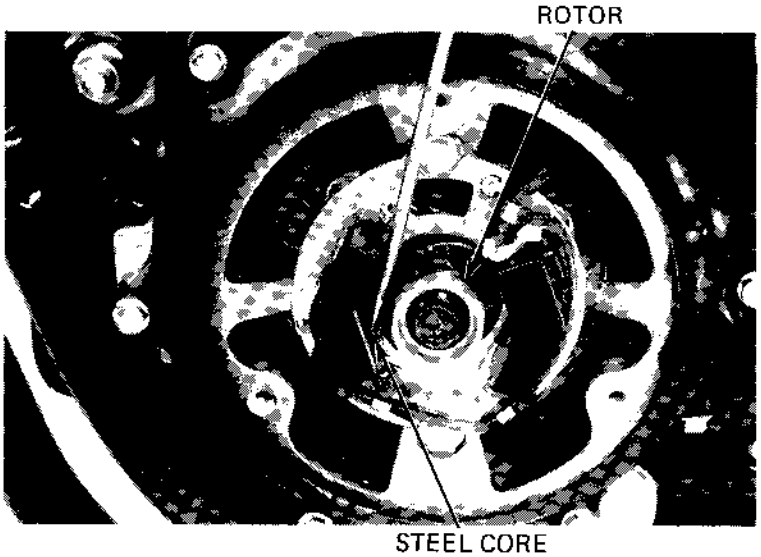
Remove the pulse generator cover and turn the ignition switch on.

Touch the end of a screwdriver to the rotor and one pulse generator steel core.

Repeat this operation several times.

A good spark to the plug means that the ignition system for that cylinder is in good shape.

Repeat the above for the other pulse coil.



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Pulse generator

Measure the coil resistance.

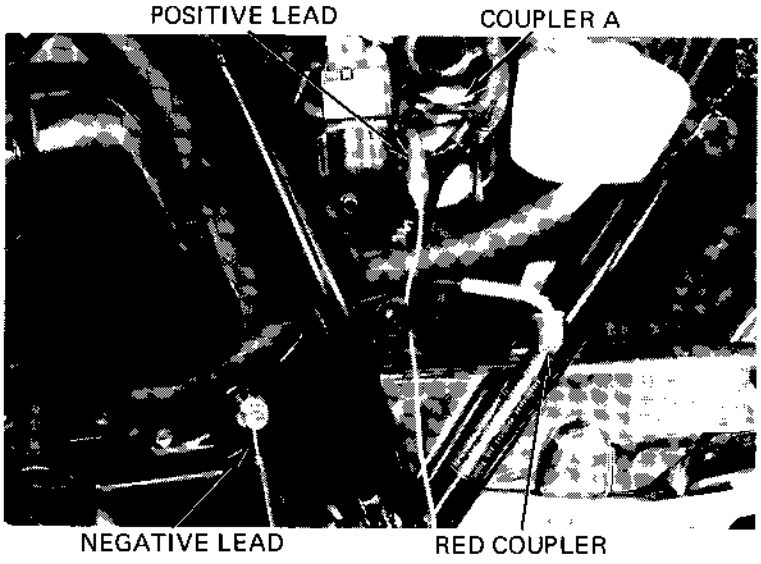
COIL RESISTANCE: 530 ± 50Ω (20°C, 68°F)
Between yellow leads (2, 3 cylinders)
Between yellow leads (1, 4 cylinders)



Spark unit

Disconnect the red coupler. Turn the ignition switch on. Set a voltmeter to the 0–25V DC scale.

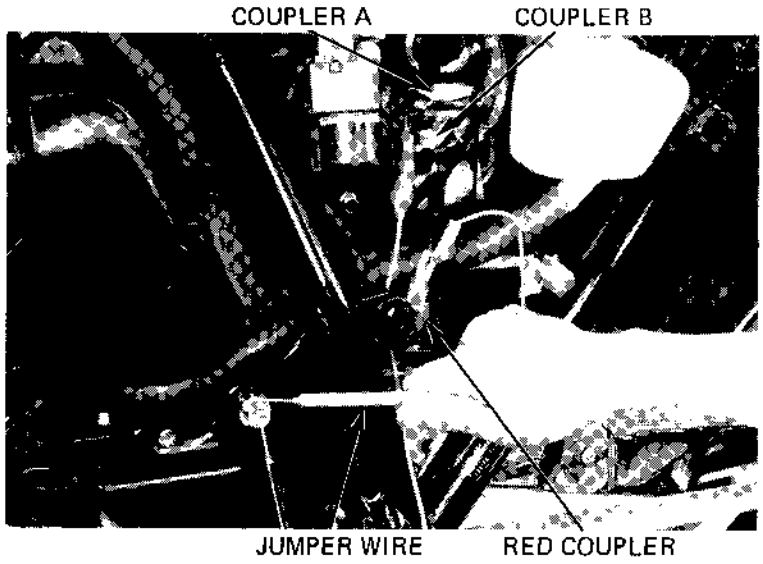
Touch the positive meter lead to the blue wire (with yellow tube) of coupler A; ground the negative lead. The meter should read 12V (battery voltage).



With the voltmeter leads in place, use a jumper wire to ground the blue wire (with white tube) terminal on the male (spark unit) side of the red coupler. Voltage should drop to 0–2V DC.

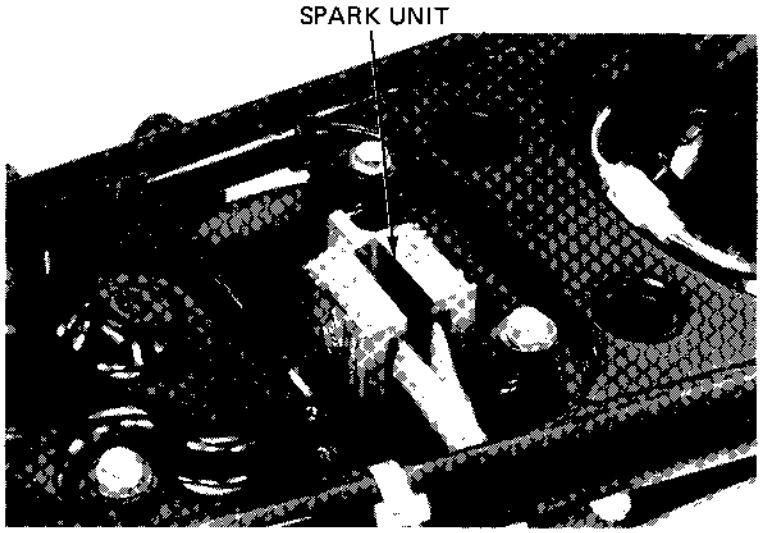
Move the positive voltmeter lead to the yellow wire of coupler B. Voltage should be 12V DC.

Move the jumper lead from the blue wire (with white tube) to the yellow wire (with white tube) terminal of the red coupler. Voltage should drop to 0–2V DC.



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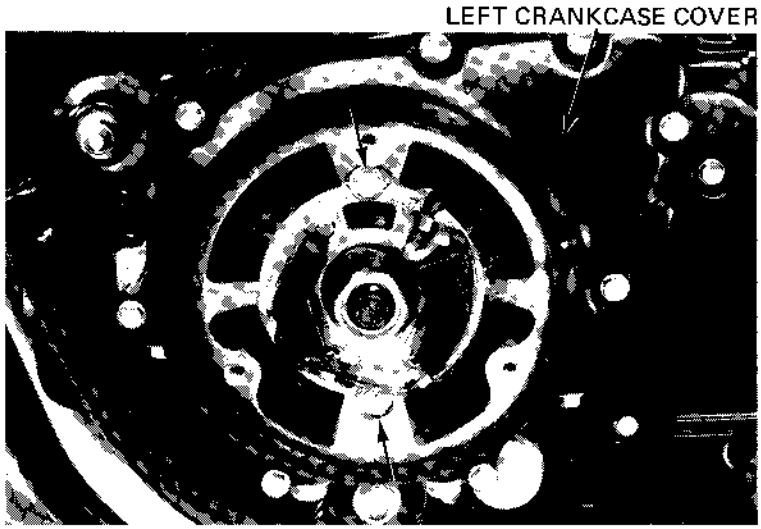
Replace the spark units if they are faulty.



PULSE GENERATOR REPLACEMENT

If pulse generator remplacement is necessary, loosen the two base plate screws.
Remove the left crankcase cover.
Remove the left rear crankcase and pulse generator assembly.

Adjust the ignition timing (Page 3-14).

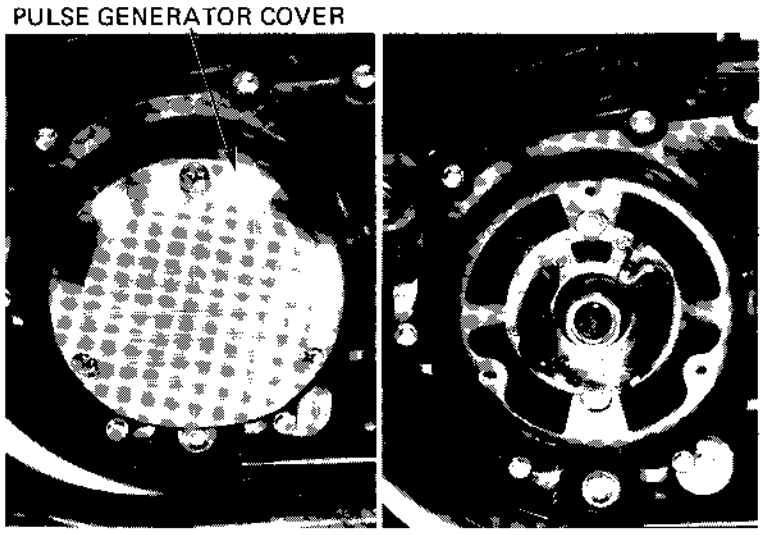


SPARK ADVANCER

For advancer function test, see page 3-15.

Remove the pulse generator cover screws and cover.

Remove the left crankcase cover screws and cover.

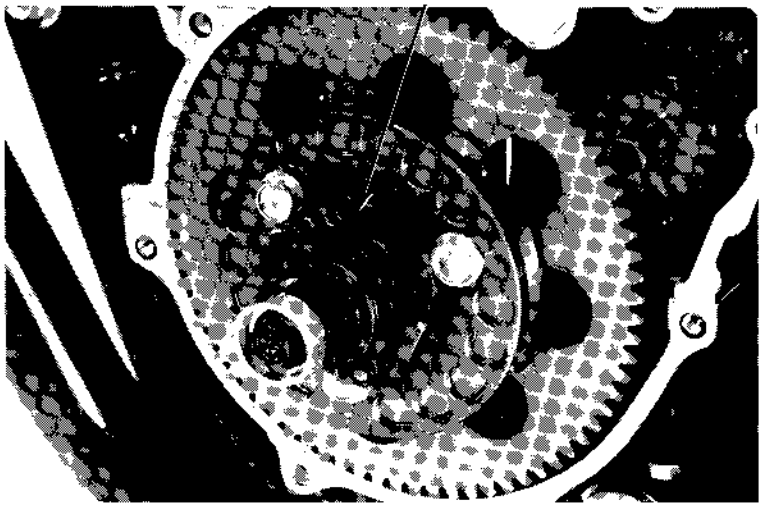


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ADVANCER VISUAL INSPECTION

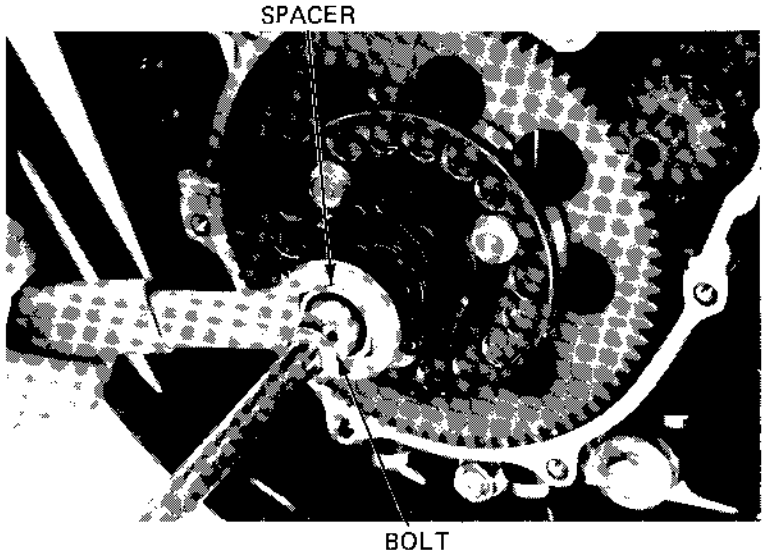
Check the mechanical advancer cam for sticking.

Lubricate the sliding surfaces, and check the spring for loss of tension and advancer pin for excessive wear if the advancer fails to return.



ADVANCER REPLACEMENT

Remove the bolt by holding the spacer and remove the advancer.

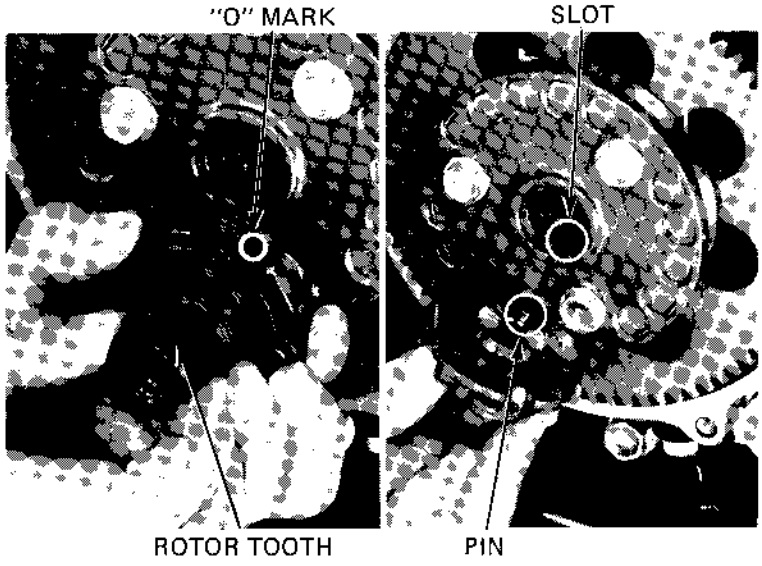


Align the rotor tooth with the "O" mark on the advancer.

Align the pin on the advancer with the slot in the crankshaft.

Tighten the hex head bolt.

TORQUE: 33–37 N·m (3.3–3.7 kg-m, 24–27 ft-lb)



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19. ELECTRIC STARTER

SERVICE INFORMATION	19–1
TROUBLESHOOTING	19–1
STARTER MOTOR	19–2
STARTER RELAY SWITCH	19–5
DIODE/RECTIFIER	19–6

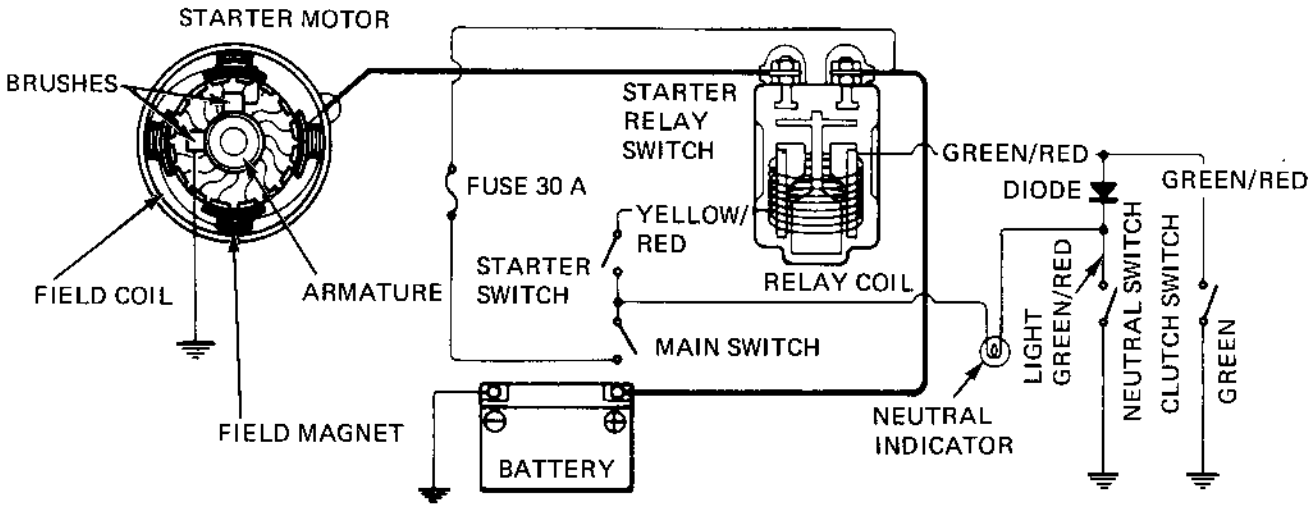
SERVICE INFORMATION

GENERAL

- The starter motor can be removed with the engine in the frame.

SPECIFICATIONS

		STANDARD	SERVICE LIMIT
Starter motor	Brush spring tension	560 g–680 g (19.75–23.89 oz)	560 g (19.75 oz)
	Brush length	12.0 – 13.0 mm (0.47–0.51 in)	7.5 mm (0.03 in)



19

TROUBLESHOOTING

Starter motor will not turn:
- Battery discharged
- Faulty ignition switch
- Faulty starter switch
- Faulty neutral switch
- Faulty starter relay switch
- Loose or disconnected wire or cable
- Neutral diode open

Starter motor turns engine slowly
- Low specific gravity
- Excessive resistance in circuit
- Binding in starter motor

Starter motor turns, but engine does not turn:
- Faulty starter clutch
- Faulty starter motor gears
- Faulty starter motor or idle gear

Starter motor and engine turns, but engine does not start
- Faulty ignition system
- Engine prpblems

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STARTER MOTOR

REMOVAL

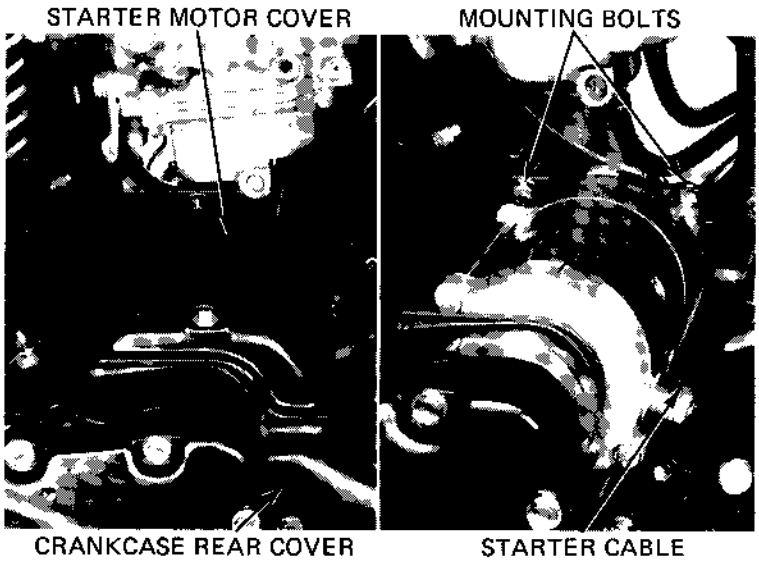
WARNING

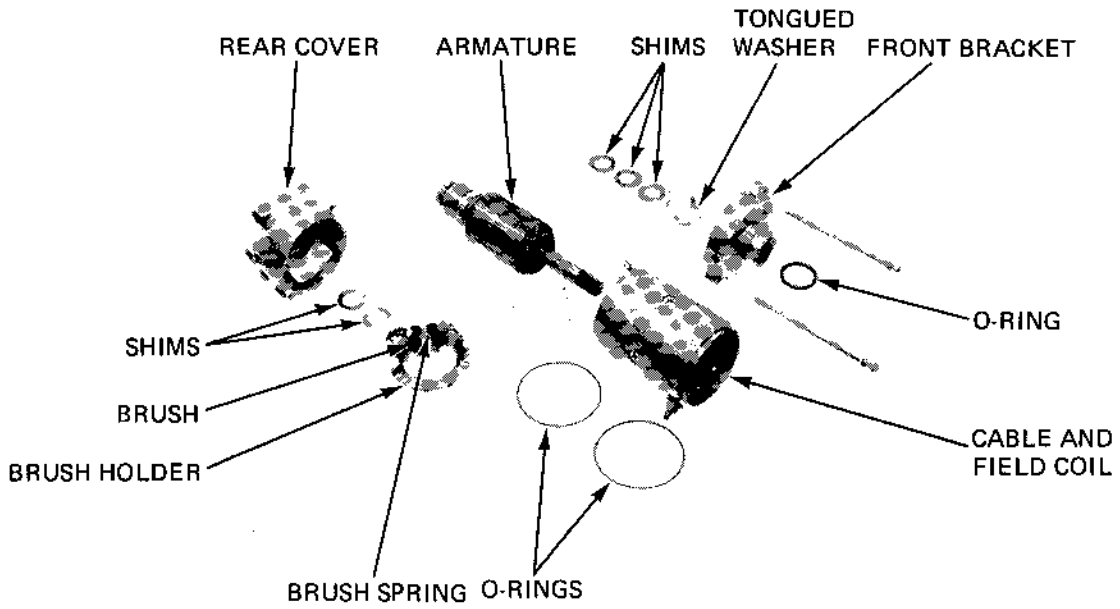
With the ignition switch OFF, remove the negative cable at the battery before servicing the starter motor.

Remove the starter motor cover and left crankcase rear cover.

Disconnect the starter cable at the starter motor.

Remove the starter motor mounting bolts and the starter motor.





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BRUSH INSPECTION

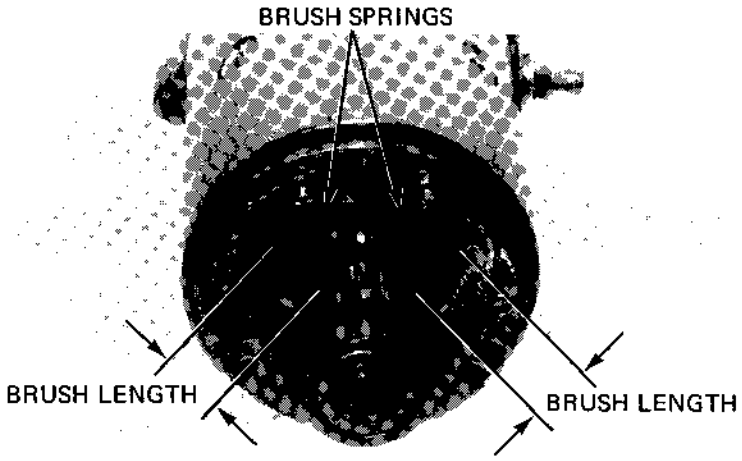
Remove the starter motor case screws.

Inspect the brushes and measure the brush length.

Measure brush spring tension with a spring scale.

SERVICE LIMITS:

Brush length:	**7.5 mm (0.30 in)**
Brush spring tension:	**560 g (19.75 oz)**



COMMUTATOR INSPECTION

Remove the starter motor case.

NOTE:

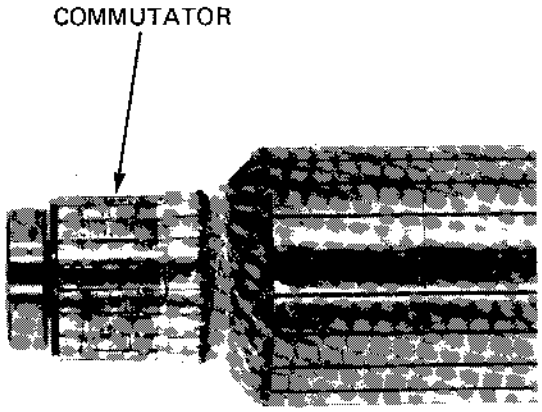
> Record the location and number of thrust washers.

Inspect the commutator bars for discoloration.

Bars discolored in pairs indicate grounded armature coils.

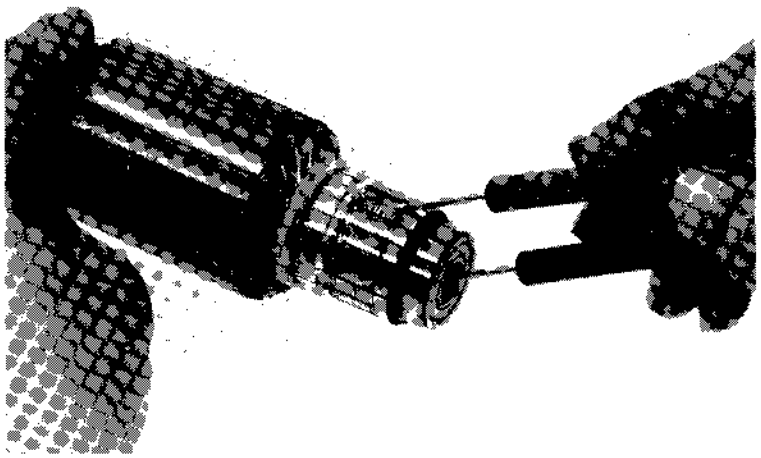
NOTE:

> Do not use emery or sand paper on the commutator.



COMMUTATOR BAR PAIRS
CONTINUITY: NORMAL

Check for continuity between pairs of commutator bars, and also between commutator bars and armature shaft.



ARMATURE SHAFT-COMMUTATOR BARS
NO CONTINUITY: NORMAL

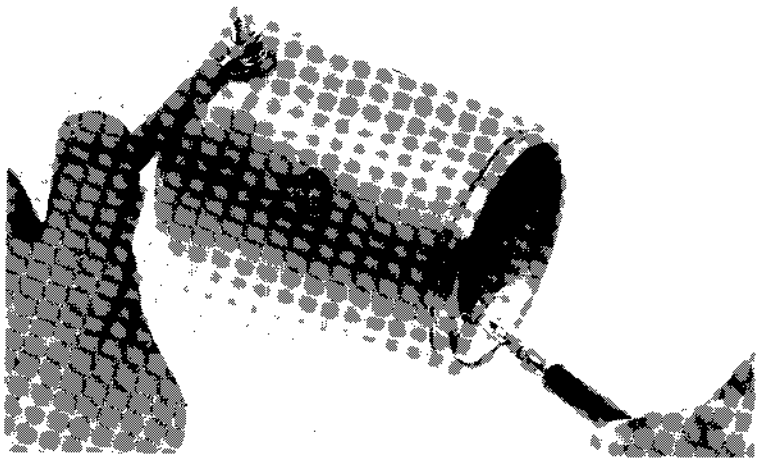
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FIELD COIL INSPECTION

Check for continuity from the cable terminal to the motor case and from the cable terminal to the brush wire.

Replace the starter motor if the field coil is not continuous or if it is shorted to the motor case.

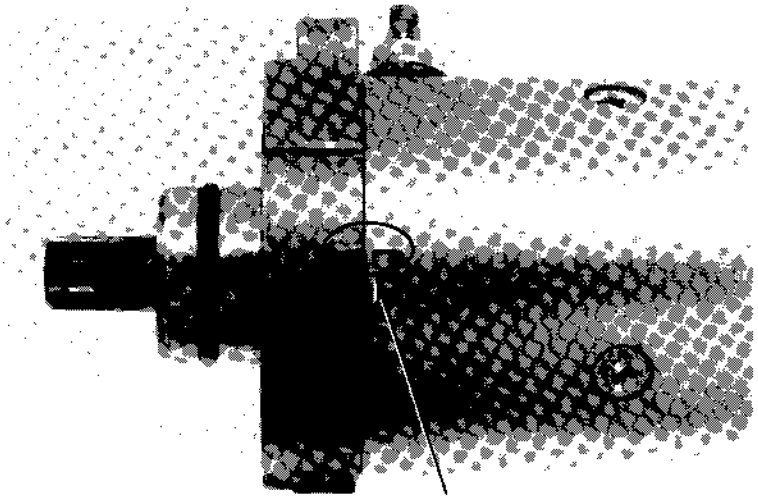
CABLE TERMINAL-MOTOR CASE
NO CONTINUITY: NORMAL



CABLE TERMINAL-BRUSH WIRE
CONTINUITY: NORMAL

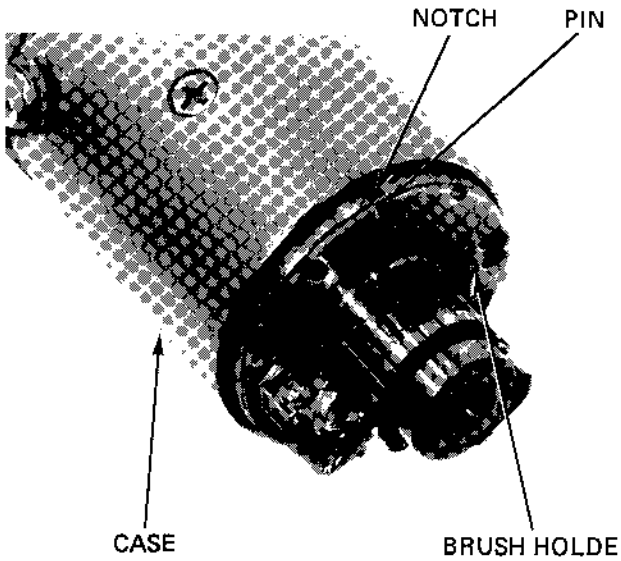
ASSEMBLY/INSTALLATION

Install the front bracket into the starter motor case aligning the index marks.



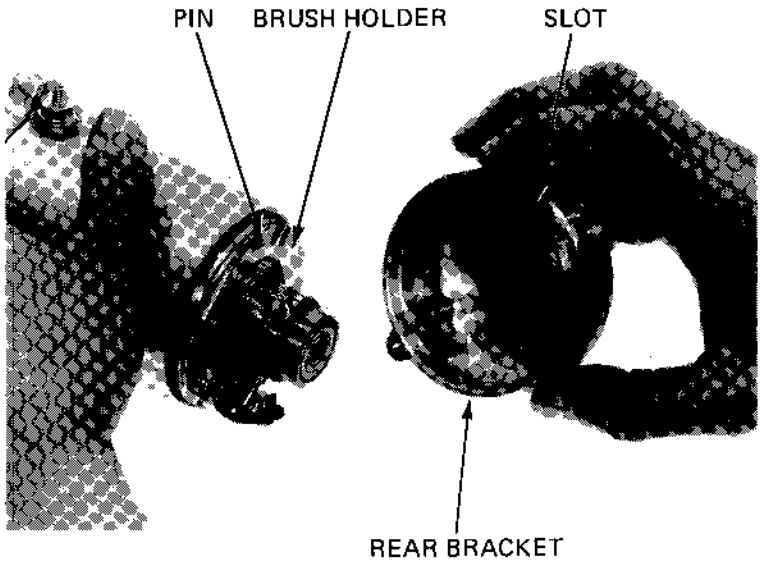
Assemble the starter motor.

Align the case notch with the brush holder pin.



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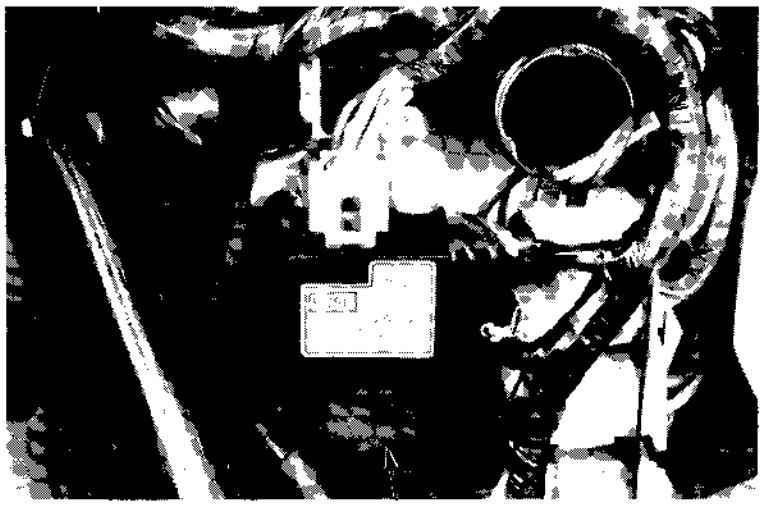
Install the rear cover aligning its slot with the brush holder pin.



STARTER RELAY SWITCH

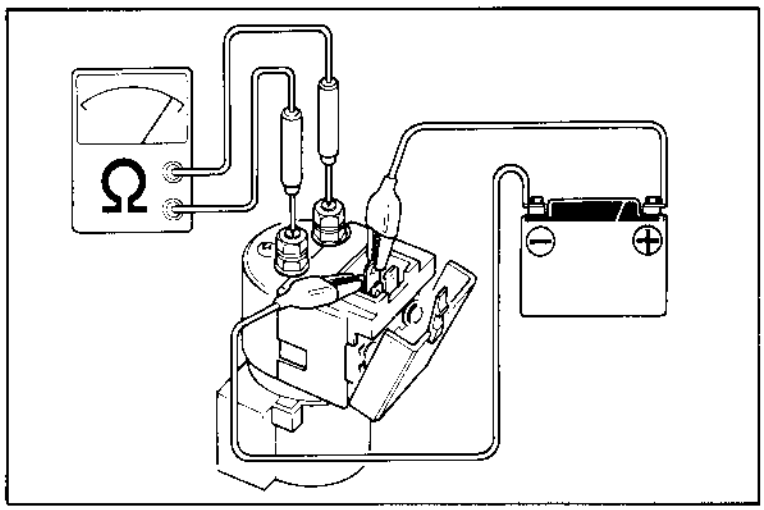
INSPECTION

Depress the starter switch button with the ignition ON.
The coil is normal if the starter relay switch clicks.



STARTER RELAY

Connect an ohmmeter to the starter relay switch terminals.
Connect a 12 V battery to the switch cable terminals.
The switch is normal if there is continuity.



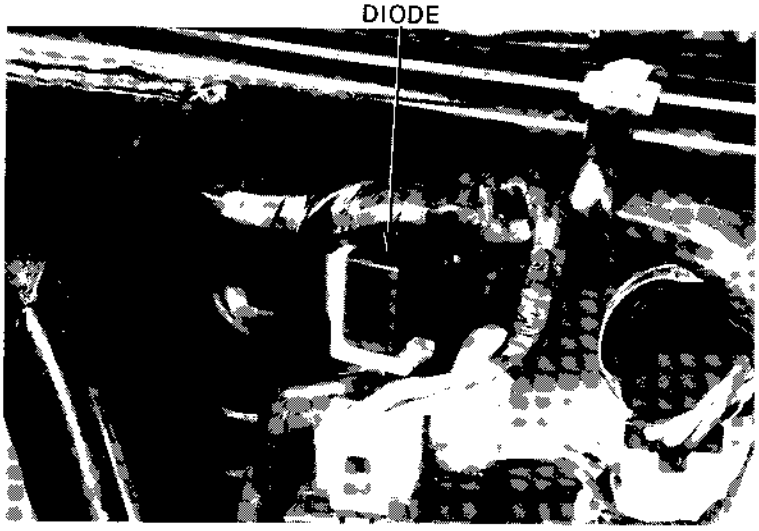
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DIODE/RECTIFIER

REMOVAL

Remove the left side cover.

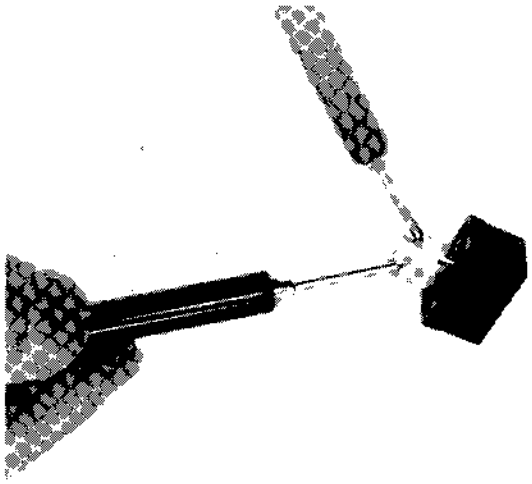
Remove the diode from the wire harness.



INSPECTION

Check for continuity with an ohmmeter.

NORMAL DIRECTION: CONTINUITY
REVERSE DIRECTION: NO CONTINUITY



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20. SWITCHES

SERVICE INFORMATION	20–1	HANDLEBAR SWITCHES	20–3
OIL PRESSURE WARNING SWITCH	20–2	IGNITION SWITCH	20–5
BRAKE SWITCHES	20–2	CLUTCH SWITCH	20–5
NEUTRAL SWITCH	20–2		

SERVICE INFORMATION

GENERAL

- 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.

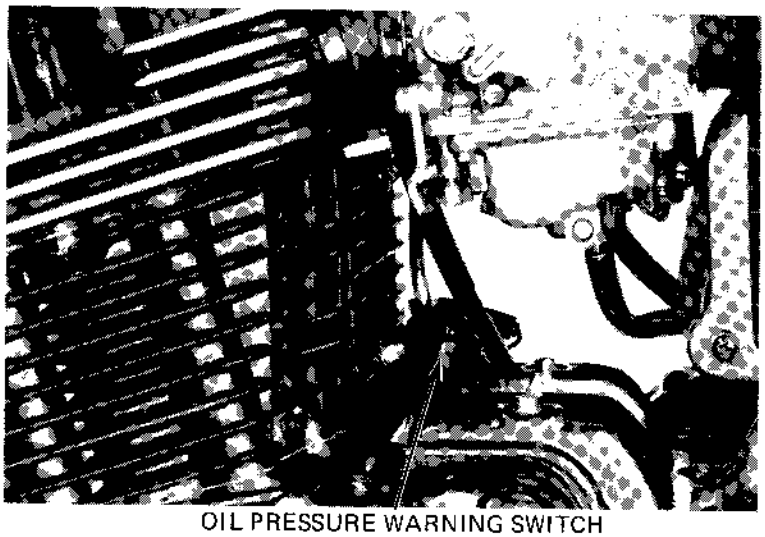
B =Blue	G =Green	LG =Light Greeb	R =Red
Bk =Black	Gr =Grey	O =Orange	W =White
Br =Brown	LB =Light Blue	P =Pink	Y =Yellow

- 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 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.

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OIL PRESSURE WARNING SWITCH

Check for continuity while applying pressure to the switch. Replace the switch if necessary.
Apply a liquid sealant to the switch threads.



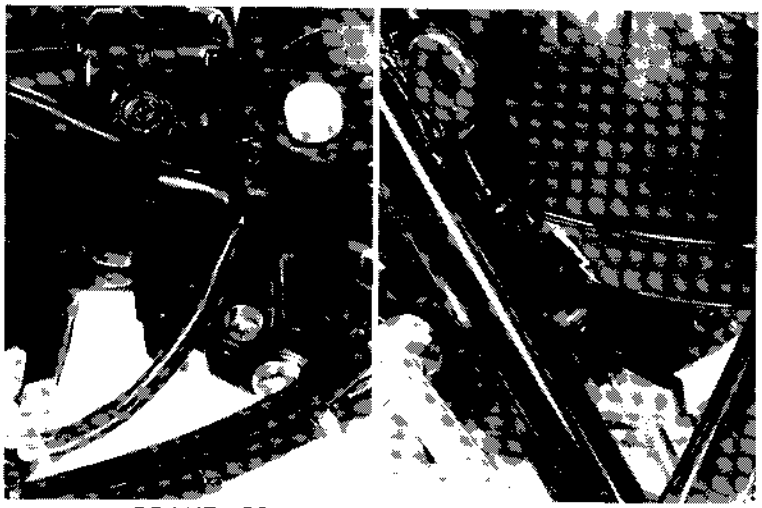
OIL PRESSURE WARNING SWITCH

BRAKE SWITCHES

Check the rear brakelight switch for continuity with the rear brake applied.

Check the front brakelight switch for continuity with the front brake applied.

Replace the switches if necessary.



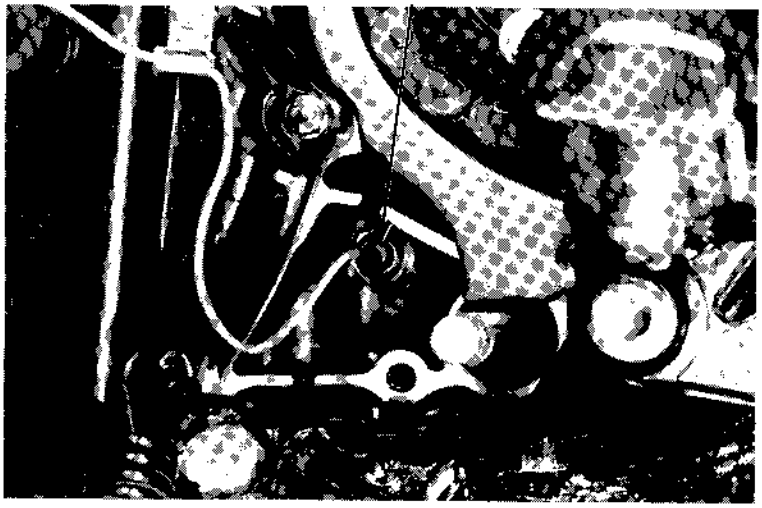
BRAKE APPLIED: CONTINUITY
BRAKE NOT APPLIED: NO CONTINUITY

NEUTRAL SWITCH

Remove the foot pegs, gearshift pedal and left rear crankcase cover.

Check the switch for continuity between the switch terminal (wire removed) and ground with the transmission in neutral and with the transmission in any gear.

Replace the neutral switch if necessary.



NEUTRAL SWITCH

IN NEUTRAL: CONTINUITY
IN ANY GEAR: NO CONTINUITY

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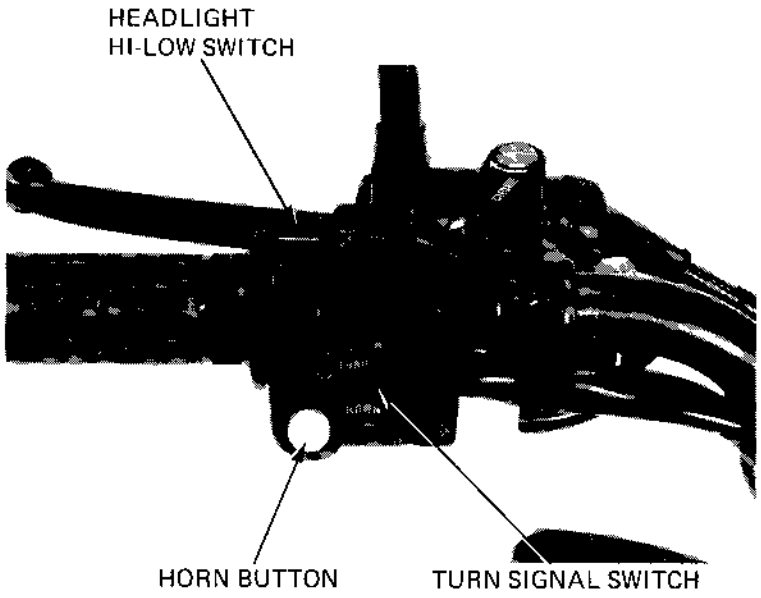
HANDLEBAR SWITCHES

Remove the fairing and head light (page 14-3).

The handlebar cluster switches (lights, turn signals, horn) must be replaced as assemblies.

Continuity tests for the components of the handlebar cluster switches follow:

Continuity should exist between the color coded wires on each chart.



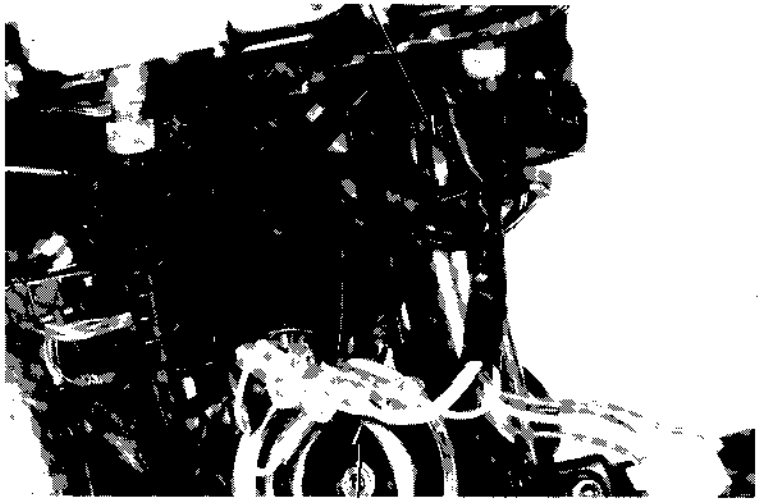
HEADLIGHT HI-LOW SWITCH

HI: B/W to B
MIDDLE (N): B/W to W to B
LO: B/W to W

Headlight Hi-Low Switch

	HL	Hi	Lo
Hi	○	○	
(N)	○	○	○
Lo	○		○
Code Color	B/W	B	W

L HANDLEBAR SWITCH COUPLER



L HANDLEBAR SWITCH CONNECTORS

TURN SIGNAL SWITCH

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

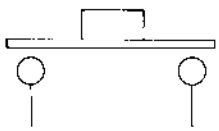
Turn Signal Switch

	W	L	R
LEFT	○	○	
OFF			
RIGHT	○		○
Code color	Gr	O	LB

HORN BUTTON

LG to G with button depressed
No continuity with button released

Horn Button

	Ho	E
		
Code color	LG	G

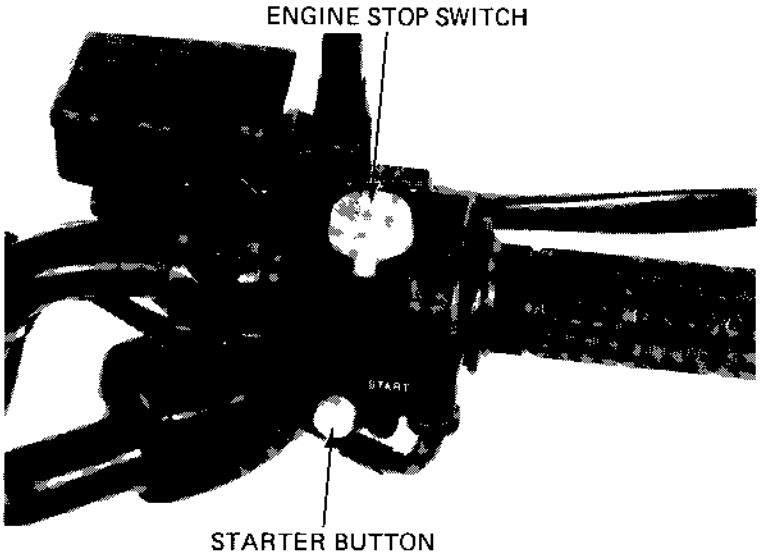
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STARTER BUTTON

Bk to Y/R with button depressed

Starter Button

	BAT_2	ST
FREE (OUT)		
START	○	○
Code color	Bk	Y/R

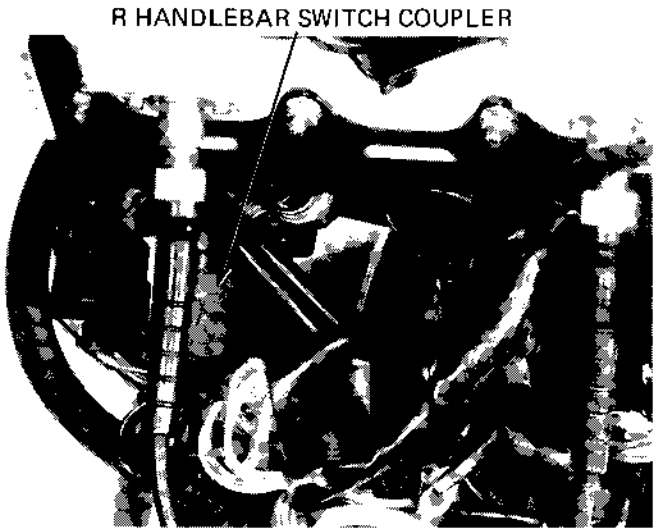


ENGINE STOP SWITCH

RUN: Bk to Bk/w
OFF: No continuity

Engine Stop Switch

	BAT_2	IG
OFF		
RUN	○	○
OFF		
Code color	Bk	Bk/W



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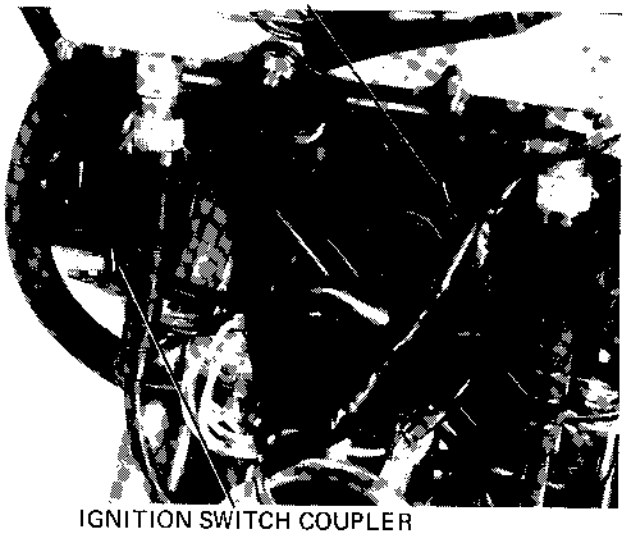
IGNITION SWITCH

Remove the instrument cluster (page 14-4) and disconnect the coupler.

Remove the ignition switch.

Check continuity of terminals on the ignition switch in each switch position.

IGNITION SWITCH

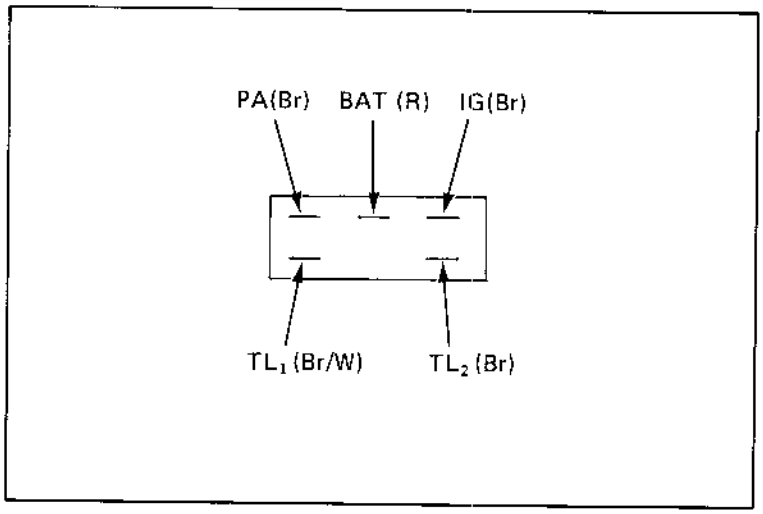


IGNITION SWITCH COUPLER

SWITCH POSITION

LOCK:	No continuity
OFF:	No continuity
ON:	BAT_1 to IG, TL_1 to TL_2
PARK:	PA to BAT_1

Terminal / Position	PA	BAT_1	IG	TL_1	TL_2
P	○—○				
ON		○—○		○—○	
OFF					
LOCK					



CLUTCH SWITCH

Check continuity of the clutch lever (safety) switch with the clutch released and applied.
Replace if necessary.

REMOVAL

Unplug the wires.

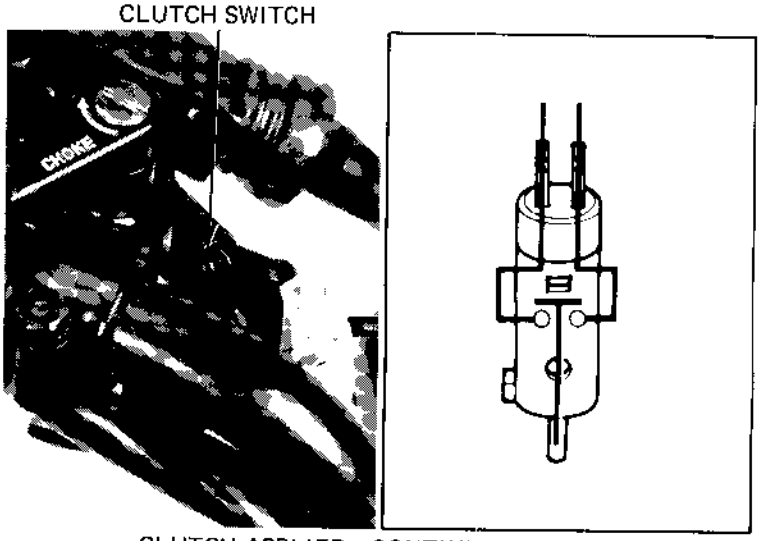
Remove the clutch lever and cable.

Remove the switch.

NOTE:

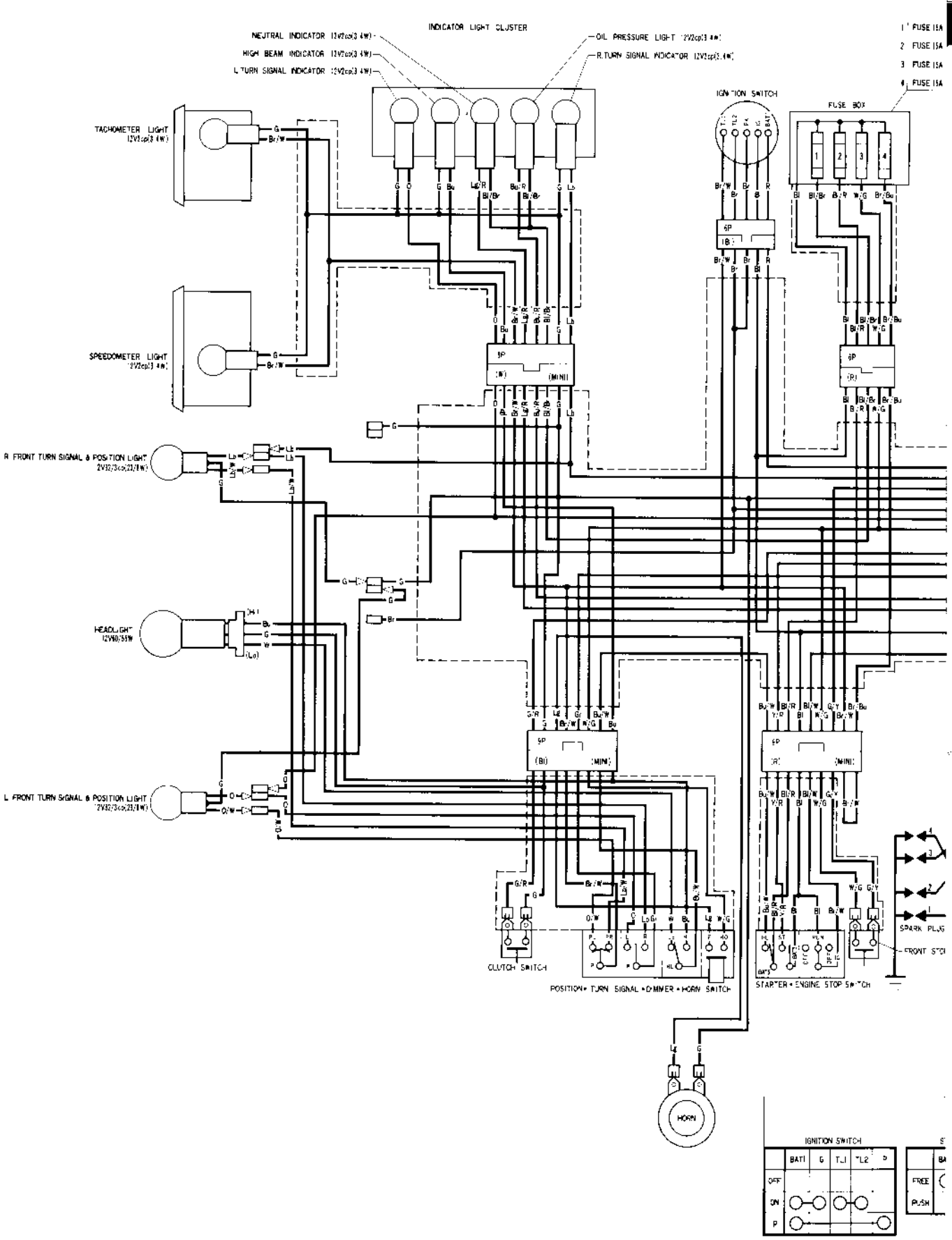
> The switch case has a small protrustion that must point toward the handlebar when installed.

CLUTCH SWITCH



CLUTCH APPLIED: CONTINUITY
CLUTCH RELEASED: NO CONTINUITY

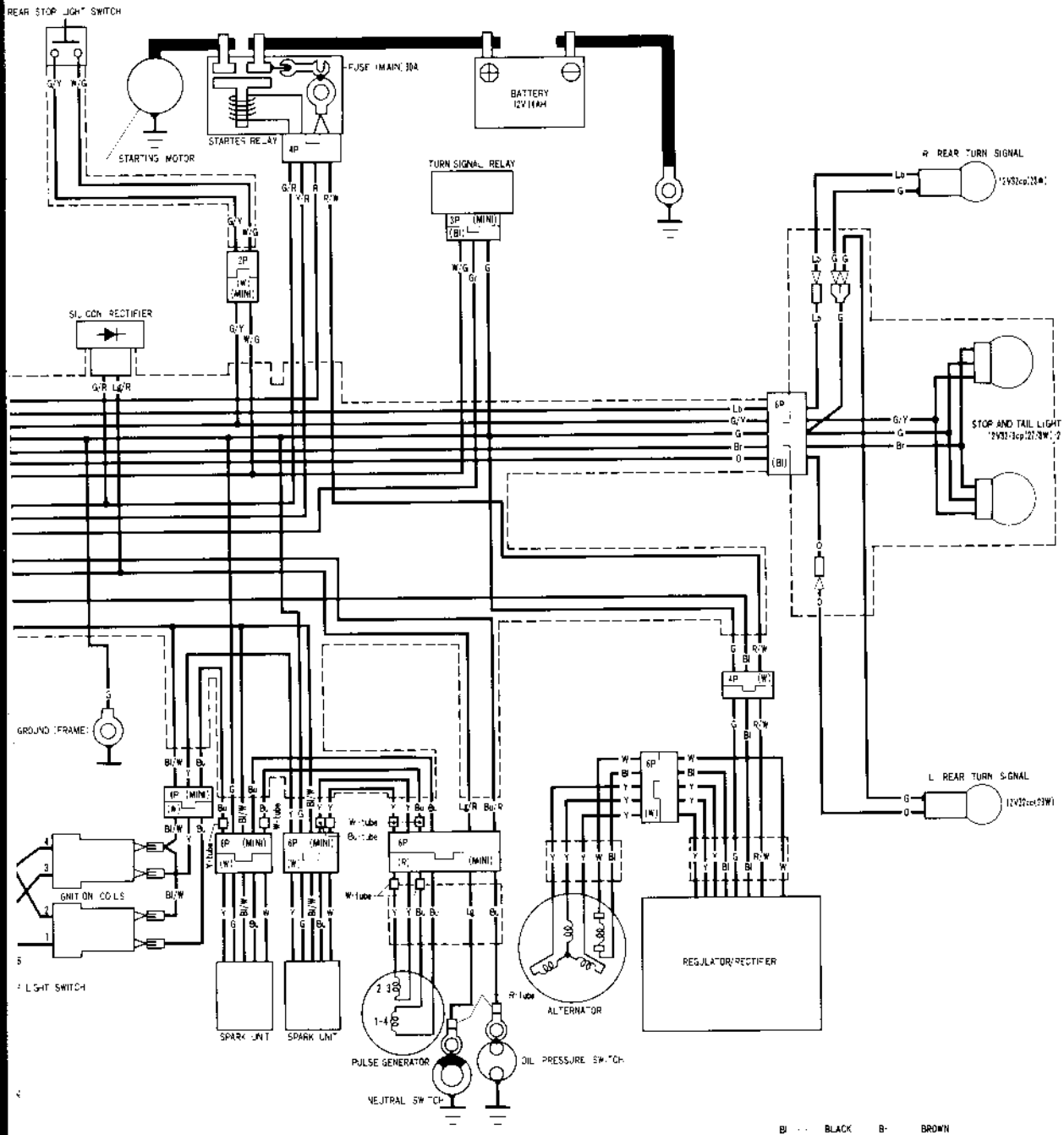
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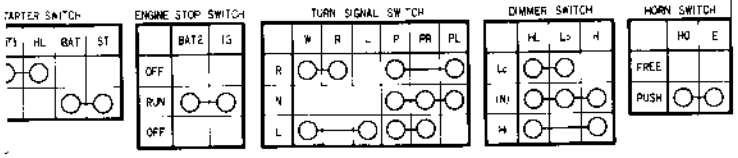
21. WIRING DIAGRAM

(NEUTRAL · OIL)
(HEADLIGHT)
(TURN SIGNAL · FRONT · REAR BRAKE · HORN)
(FRONT POSITION · METER LIGHT · TAIL)



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

SWITCH CONTINUITY



0030Z—MG5—6700

22. TROUBLESHOOTING

ENGINE DOES NOT START OR IS HARD TO START

		POSSIBLE CAUSE
1. Check fuel flow to carburetor	NOT REACHING CARBURETOR →	(1) Fuel tank empty (2) Clogged fuel line or fuel filter or screen (3) Sticking float valve (4) Clogged fuel tank cap breather hole
REACHING CARBURETOR ↓		
2. Perform spark test	WEAK OR NO SPARK →	(1) Faulty spark plugs (2) Fouled spark plugs (3) Faulty spark unit (4) Broken or shorted high tension wires (5) Faulty alternator (6) Broken or shorted ignition coil (7) Faulty ignition switch (8) Faulty pulse generator
GOOD SPARK ↓		
3. Test cylinder compression	LOW COMPRESSION →	(1) Low battery charge (2) Improper valve clearance (3) Valve stuck open (4) Worn cylinder and piston rings (5) Damaged cylinder head gasket (6) Seized valve (7) Improper valve timing
COMPRESSION NORMAL ↓		
4. Start by following normal procedure	ENGINE FIRES BUT STOPS →	(1) Improper choke operation (2) Carburetor incorrectly adjusted (3) Intake pipe leaking (4) Improper ignition timing (Spark unit or pulse generator) (5) Incorrect fast idle (6) Fuel contaimnated
ENGINE DOES NOT FIRE ↓		
5. Remove and inspect spark plug	WET PLUG →	(1) Carburetor flooded (2) Choke closed (3) Throttle valve open (4) Air cleaner dirty

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ENGINE LACKS POWER

		POSSIBLE CAUSE
1. Raise wheels off ground and spin by hand WHEEL SPINS FREELY	WHEELS DO NOT SPIN FREELY →	(1) Brake dragging (2) Worn or damaged wheel bearings (3) Wheel bearing needs lubrication (4) Final gear bearing damaged
2. Check tire pressure PRESSURE NORMAL	PRESSURE LOW →	(1) Punctured tire (2) Faulty tire valve
3. Accelerate rapidly from low to second ENGINE SPEED LOWERED WHEN CLUTCH IS RELEASED	ENGINE SPEED CHANGED WHEN CLUTCH IS RELEASED →	(1) Clutch slipping (2) Worn clutch disc/plate (3) Warped clutch disc/plate
4 Accelerate lightly ENGINE SPEED INCREASES	ENGINE SPEED NOT INCREASED →	(1) Carburetor choke closed (2) Clogged air cleaner (3) Restricted fuel flow (4) Clogged fuel tank breather tube (5) Clogged muffler
5. Check ignition timing CORRECT	INCORRECT →	(1) Faulty spark unit (2) Faulty pulse generator (3) Faulty ignition advancer
6. Check valve clearance CORRECT	INCORRECT →	(1) Improper valve adjustment (2) Worn valve seat
7. Test cylinder compression NORMAL	TOO LOW →	(1) Valve stuck open (2) Worn cylinder and piston rings (3) Leaking head gasket (4) Improper valve timing
8. Check carburetor for clogging NOT CLOGGED	CLOGGED →	(1) Carburetor not serviced frequently enough
9. Remove spark plug NOT FOULED OR DISCOLORED	FOULED OR DISCOLORED →	(1) Plugs not serviced frequently enough (2) Spark plug with incorrect heat range
10. Check oil level and condition CORRECT	INCORRECT →	(1) Oil level too high (2) Oil level too low (3) Contaimnated oil
11. Remove cylinder head cover and inspect lubrication VALVE TRAIN LUBRICATED PROPERLY	VALVE TARIN NOT LUBRICATED PROPERLY →	(1) Clogged oil passage (2) Clogged oil control orifice
12. Check for engine overheating NOT OVERHAETING	OVERHEATING →	(1) Excessive carbon build-up in combustion chamber (2) Use of poor quality fuel (3) Clutch slipping
13. Accelerate or run at high speed ENGINE DOES NOT KNOCK	ENGINE KNOCKS →	(1) Worn piston and cylinder (2) Wrong type of fuel (3) Excessive carbon build-up in combustion chamber (4) Ignition timing too advanced (Faulty spark unit or advancer)

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