Official

HONDA

SHOP MANUAL

CBX

'81~'82

PRINTED IN JAPAN

61MA200
Ⓜ Ⓨ A50508107B

HOW TO USE THIS MANUAL

Follow the Maintenance Schedule recommendations to ensure that the vehicle is in peak operating condition and the emission levels are within the U.S. Environmental Protection Agency standards. 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 19 describe parts of the motorcycle, grouped according to location.

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

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

If you are not familiar with this motorcycle, read the TECHNICAL FEATURES in section 20.

If you don't know the source of the trouble, go to section 21, TROUBLESHOOTING.

This Shop Manual is based on the 1981 model. Refer to Section 22 for 1982 service information.

HONDA MOTOR CO., LTD.
SERVICE PUBLICATIONS OFFICE

CONTENTS

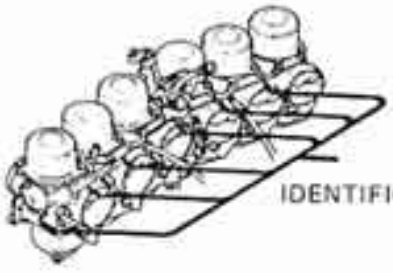
Date of Issue: May, 1981

MODEL IDENTIFICATION

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

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

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



IDENTIFICATION NUMBER

8422-08

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

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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 exhaust contains poisonous carbon monoxide gas.

WARNING

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

WARNING

- *The battery electrolyte contains sulfuric acid. Protect your eyes, skin and clothing. In case of contact, flush thoroughly with water and call a doctor if your eyes were exposed.*
- *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 equivalent. Parts that do not meet HONDA's design specifications may damage the motorcycle.
2. Use the special tools designed for this product.
3. Install new gaskets, O-rings, cotter pins, lock plates, etc. when reassembling.
4. When torquing bolts or nuts, begin with larger-diameter or inner bolt first, and tighten to the specified torque diagonally, unless a particular sequence is specified.
5. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
6. When installing a new oil seal, make sure that the sealing lip is lubricated with grease. If an oil seal and related parts have been washed, apply proper grease to the lip of the oil seal.
7. After reassembly, check all parts for proper installation and operation.
8. 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.

SPECIFICATIONS

ITEM			
DIMENSIONS	Overall length		2365 mm (93.1 in)
	Overall width		780 mm (30.7 in)
	Overall height		1360 mm (53.5 in)
	Wheelbase		1535 mm (60.4 in)
	Seat height		810 mm (31.9 in)
	Foot peg height		335 mm (13.2 in)
	Ground clearance		155 mm (6.1 in)
	Dry weight		287 kg (633 lb)
FRAME	Type		Diamond
	Front suspension, travel		Telescopic air forks 160 mm (6.3 in)
	Rear suspension, travel		Swingarm 105 mm (4.1 in)
	Front tire size		3.50V19 (4PR)
	Rear tire size		130/90V18
	Cold tire pressures	Up to 90 kg (200 lbs) load	Front : 250 kPa (2.5 kg/cm², 36 psi) Rear : 250 kPa (2.5 kg/cm², 36 psi)
		Up to vehicle capacity load	Front : 250 kPa (2.5 kg/cm², 36 psi) Rear : 290 kPa (2.9 kg/cm², 41 psi)
	F. brake, lining swept area		Double disc brake, 22 cm² x 4 (3.4 sqin x 4)
	R. brake, lining swept area		Single disc brake, 22 cm² x 2 (3.4 sqin x 2)
	Fuel capacity		22.0 liters (5.8 US gal)
	Fuel reserve capacity		3.0 liters (0.8 US gal)
	Caster angle		62°30'
	Trail		120 mm (4.7 in)
	Front fork oil capacity		345 cc (11.7 ozs)
	Front fork air pressure		70 ± 20 kPa (0.7 ± 0.2 kg/cm², 10 ± 3 psi)
	Rear suspension oil capacity		618 cc (20.9 ozs) at disassembly
	Rear suspension air pressure		200–400 kPa (2.0–4.0 kg/cm², 28–57 psi)
ENGINE	Type		Air cooled 4-stroke
	Cylinder arrangement		Vertical parallel six
	Bore and stroke		64.5 x 53.4 mm (2.54 x 2.10 in)
	Displacement		1047 cc (63.89 cu in)
	Compression ratio		9.3 : 1
	Valve train		Chain driven DOHC 4 valve/cylinder
	Maximum horsepower		100 BHP/9,000 rpm
	Maximum torque		8.5 kg-m (60.8 ft-lb)/7,500 rpm
	Oil capacity		5.5 liters (5.8 US qt) after disassembly 4.0 liters (4.2 US qt) after draining
	Lubrication system		Wet sump dual pump with oil cooler
	Air filtration		Paper
	Cylinder compression		12.0 ± 1.0 kg/cm² (170 ± 14 psi)
	Intake valve	Opens	5° (BTDC) at 1 mm lift, 78° (BTDC) at 0 lift
		Closes	35° (ABDC) at 1 mm lift, 110° (ABDC) at 0 lift
	Exhaust valve	Opens	40° (BBDC) at 1 mm lift, 94° (BBDC) at 0 lift
		Closes	5° (ATDC) at 1 mm lift, 71° (ATDC) at 0 lift
	Valve overlap		149°
	Valve clearance (Cold)		IN: / EX: 0.06–0.13 mm (0.002–0.005 in)
	Engine weight		108 kg (238.1 lb)
	Idle speed		900 ± 100 rpm

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ITEM		
CARBURETION	Carburetor type	VB 28 mm (1.1 in) venturi bore
	Identification number	VB64A
	Pilot screw	Refer to page 4-28
	Float level	15.5 mm (0.61 in)
DRIVE TRAIN	Clutch	Wet, multi-plate
	Transmission	5-speed constant-mesh
	Primary reduction	2.269
	Gear ratio I	2.438
	Gear ratio II	1.750
	Gear ratio III	1.391
	Gear ratio IV	1.200
	Gear ratio V	1.037
	Final reduction	2.333 (18/42)
	Gear shift pattern	Left foot operated return system 1–N–2–3–4–5
ELECTRICAL	Ignition	Transistorized
	Ignition timing "F" mark	10° BTDC static
	Full advance	41° BTDC at 8,000 rpm
	Firing order	1–5–3–6–2–4
	Starting system	Electric starter
	Alternator	Three phase Alternator 350 W/5,000 rpm
	Battery capacity	12V – 18AH
	Spark plug ( ): Canada Model USA Model with radio installed.	For cold climate below 5°C, 41°F: ND X22ES-U (X22ESR-U), NGK D7EA (DR7ES) Standard: ND X24ES-U (X24ESR-U), NGK D8EA (DR8ES-L) For extended high speed riding: ND X27ES-U (X27ESR-U), NGK D9EA (DR8ES)
	Spark plug gap	0.6–0.7 mm (0.024–0.028 in)
LIGHTS	Headlight (high/low beam)	60/55W H4 BULB (Philips 12342/99, or equivalent)
	Tail/stoplight	8/27W, 3/32 cp SAE NO. 1157
	Turn signal Front	8/23W, 3/32 cp SAE NO. 1034
	Rear	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
	Rear suspension air pressure warning light	3.4W, 2 cp SAE NO. 57
	Running light	8W, 3 cp SAE NO. 1034

TORQUE VALUES

- ENGINE

Item	Q'ty	Thread Dia (mm)	Torque N.m (kg-m, ft-lb)	Remarks
Cylinder head cover	8	6	8–12 (0.8–1.2, 6– 9)	
Cam holder	32	6	12–16 (1.2–1.6, 9–12)	
Cylinder head	12	10	33–35 (3.3–3.5, 24–25)	
Cylinder head	4	8	19–21 (1.9–2.1, 14–15)	
Cam sprocket	4	7	14–18 (1.4–1.8, 10–13)	
Spark plug	6	—	12–16 (1.2–1.6, 9–12)	Apply molybdenum disulfide base grease to threads and bottom of bolts
Crankcase	—	8	23–27 (2.3–2.7, 17–20)	
A.C. generator	1	14	36–44 (3.6–4.4, 26–32)	
Primary shaft	1	22	40–50 (4.0–5.0, 29–36)	
Mainshaft	1	25	45–55 (4.5–5.5, 33–40)	
Drive sprocket	1	10	50–54 (5.0–5.4, 36–39)	
Connecting rod nut	12	8	30–34 (3.0–3.4, 22–25)	
Oil filter center bolt	1	20	27–33 (2.7–3.3, 20–24)	
Oil pressure switch	1	—	15–20 (1.5–2.0, 11–14)	Apply THREE–BOND
Neutral switch	1	10	11–15 (1.1–1.5, 8–11)	
Oil drain bolt	1	12	28–32 (2.8–3.2, 20–23)	
Oil pipe	1	8	18–22 (1.8–2.2, 13–16)	
Oil pipe	1	10	20–24 (2.0–2.4, 14–17)	

- 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 handlebar	2	8	28–32 (2.8–3.2, 20–23)	
Front fork bridge	2	7	9–13 (0.9–1.3, 7– 9)	
Front fork cap bolt	2	34	15–30 (1.5–3.0, 11–22)	
Front axle nut	1	12	55–65 (5.5–6.5, 40–47)	
Front/rear brake disc	10	8	27–33 (2.7–3.3, 20–24)	UBS
Brake hose bolt	5	10	25–35 (2.5–3.5, 18–25)	
Rear axle	1	18	85–105 (8.5–10.5, 62–76)	"U" nut
Final driven sprocket	5	12	80–100 (8.0–10.0, 58–72)	UBS
Swingarm pivot nut	1	16	80–110 (8.0–11.0, 58–80)	"U" nut
Seat strap	2	6	8–9.5 (0.8–0.95, 6– 7)	
Engine hanger nut	3	14	90–100 (9.0–10.0, 65–72)	"U" nut
Air cleaner inlet duct	2	5	3– 6(0.3–0.6, 2– 4)	
Steering stem adjusting nut	1	26	11–13 (1.1–1.3, 8– 9)	
Rear suspension link bolt and nut	—	10	40–50 (4.0–5.0, 29–36)	

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

STANDARD TORQUE VALUES

Type	Torque N.m (kg-m ft-lb)	Type	Torque N.m (kg-m, ft-lb)
5 mm bolt, nut	4.5–6.0 (0.45–0.6, 3.5–4.5)	5 mm screw	3.5–5.0 (0.35–0.5, 2.5–3.6)
6 mm bolt, nut	8–12 (0.8–1.2, 6– 9)	6 mm screw	7–11 (0.7–1.1, 5– 8)
8 mm bolt, nut	18–25 (1.8–2.5, 13–18)	6 mm flange bolt, nut	10–14 (1.0–1.4, 7–10)
10 mm bolt, nut	30–40 (3.0–4.0, 22–29)	8 mm flange bolt, nut	24–30 (2.4–3.0, 17–22)
12 mm bolt, nut	50–60 (5.0–6.0, 36–43)	10 mm flange bolt, nut	30–40 (3.0–4.0, 22–29)
14 mm bolt, nut	90–100 (9.0–10.0, 65–72)		

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TOOLS

- SPECIAL

Tool Name	Part No.	Q'ty	Ref. page
Oil seal driver	07965–MA10100	1	14–13
Oil seal driver attachment	07965–MA10200	1	14–13
Seal driver	07947–4630100	1	13–33
Vacuum gauge set	07504–0020000	1	3–8
	(H/C No. 47978)	1	
	or M937B–021–XXXXX		
Oil pressure gauge	07506–3000000	1	2–3
Snap ring pliers	07914–3230001	1	15–1, 14–14
Steering stem socket	07916–3710100	1	13–38
6 mm hollow set wrench	07917–3230000	1	13–30
Race bearing remover	07946–3710500	1	13–37
Steering stem driver	07946–3710600	1	13–37
Bearing driver attachment	07946–3710700	1	13–38
Piston base	07958–2500000	1	7– 8
Valve guide reamer (5.5 mm)	07984–2000000	1	6–14, 6–16
Oil pressure gauge attachment	07510–4220100	1	2–3
Carburetor throttle wrench	07908–4220100	1	3–9, 4–14
	07908–4600000	1	3–9
Carburetor pilot screw wrench	07908–4220200 or	1	4–29
	07908–4220201	1	
Lock nut wrench	07916–4220000	1	8–4
Primary gear holder	07924–4250000	1	8–7
Piston ring compressor	07954–4220000	1	7–8
Valve lifter holder	07964–4220002 or	1	3–11, 3–12
	M9501–277–94752 (USA only)	1	
Degree wheel	07974–4220000 or	1	3–5
	07974–4220002		
Lifter hole protector	07999–4220000	1	6–12, 6–18
Lock nut wrench	07908–4690001	1	14–22
Retainer wrench	07910–4690100 or	1	
	KS-HBA–08–469 (USA only)	1	14–20
Bearing driver (needle bearing)	07946–4690100 or	1	
	07946–3710300	1	14–19
Bearing driver (angular bearing)	07946–4690200	1	14–20
Dust seal driver	07948–4690100	1	14–20
Driver handle	07949–3710000	1	14–18, 14–19
Pin spanner, 55 mm	07902–4220000	1	12–18
Primary shaft holder	07924–6340300	1	12–18
Steering race remover	07953–4250002	1	13–38

• COMMON

Tool Name	Part No.	Q'ty	Alternate Tools (Common tool → Special tool)	Ref. Page
Float level gauge	07401–0010000	1		4–11
Retainer wrench attachment	07710–0010100	1	07910–2830000&07910–3600000	14–5, 14–8
Retainer wrench attachment	07710–0010300	1	Bearing retainer wrench 07910–3230101	13–23, 13–26
Retainer wrench body	07710–0010400	1		13–23, 13–26
Lock nut wrench socket (26 x 30 mm)	07716–0020202	1		13–26
Extension bar	07716–0020500	1	Commercially available	13–26
Universal holder	07725–0010101	1	Flywheel holder 07923–0400000	8–3
Valve guide remover (5.5 mm)	07742–0010100	1	Valve guide driver 07942–3290100	6–15, 6–16
Attachment (32 x 35 mm)	07746–0010100	1	Bearing driver 07945–4150200	16–8, 16–9
Attachment (37 x 40 mm)	07746–0010200	1	Bearing driver 07946–2880200	12–15, 16–9
Attachment (42 x 47 mm)	07746–0010300	1	Bearing driver 07946–9350200	13–25
Attachment (52 x 55 mm)	07746–0010400	1	Bearing driver 07946–9370100 Bearing driver 07946–3710200	12–15, 14–7
Attachment (62 x 68 mm)	07746–0010500	1	Bearing driver 07946–3600000	14–7
Driver	07746–0030100	1		11–3, 12–15
Attachment (25 mm)	07746–0030200	1		12–15
Attachment (30 mm)	07746–0030300	1		11–3
Pilot (15 mm)	07746–0040300	1		13–25
Pilot (20 mm)	07746–0040500	1		14–7
Pilot (25 mm)	07746–0040600	1		12–14, 12–15, 14–7
Driver (A)	07749–0010000	1	Driver 07949–6110000	12–14, 13–25, 14–7, 14–20, 16–8, 16–9
Valve spring compressor	07757–0010000	1	Valve spring compressor 07957–3290001	6–12, 6–18

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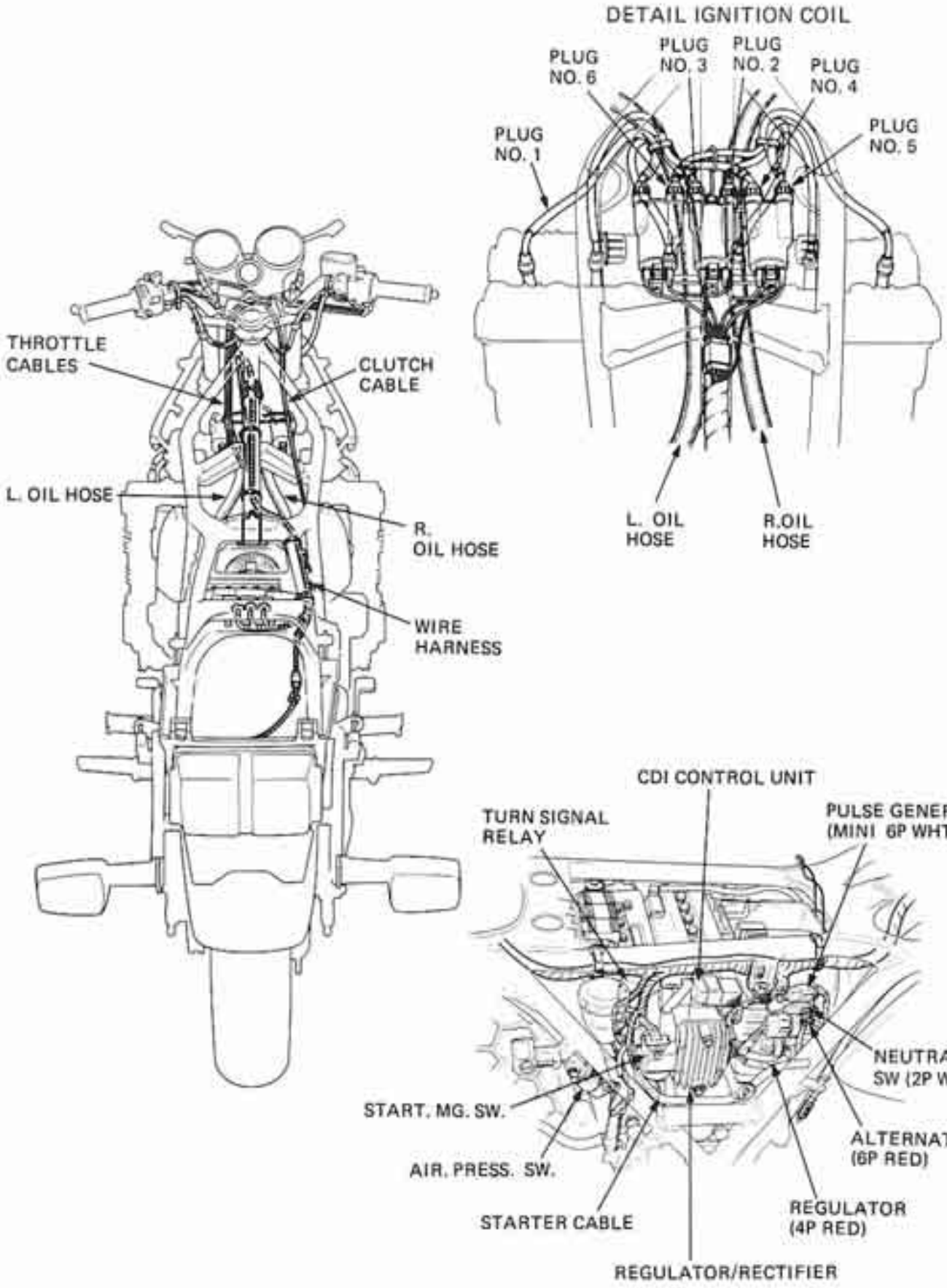


EMISSION CONTROL SYSTEM

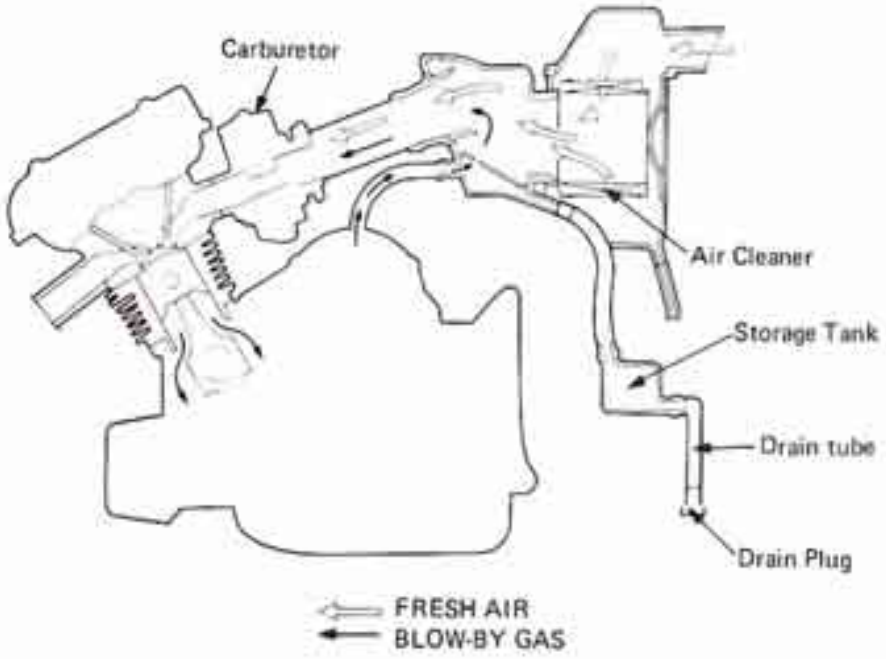
The CBX is equipped with two Emission Control Systems.

EXHAUST EMISSION CONTROL SYSTEM

The exhaust emission control system is composed of a factory pre-set carburetor.
No. adjustment should be made except to the idle speed with the throttle stop screw.

CRANKCASE EMISSION CONTROL SYSTEM

The engine is equipped with a "Closed Crankcase System" to prevent crankcase emissions entering the atmosphere.
Blow-by gas is returned to the combustion chamber through the air cleaner and carburetor. Liquids are collected in the drain tube.



EMISSION CONTROL INFORMATION LAVEL

An Emission Control Information Label is located on the frame as shown. It contains basic tune-up specifications.

EMISSION CONTROL INFORMATION LABEL

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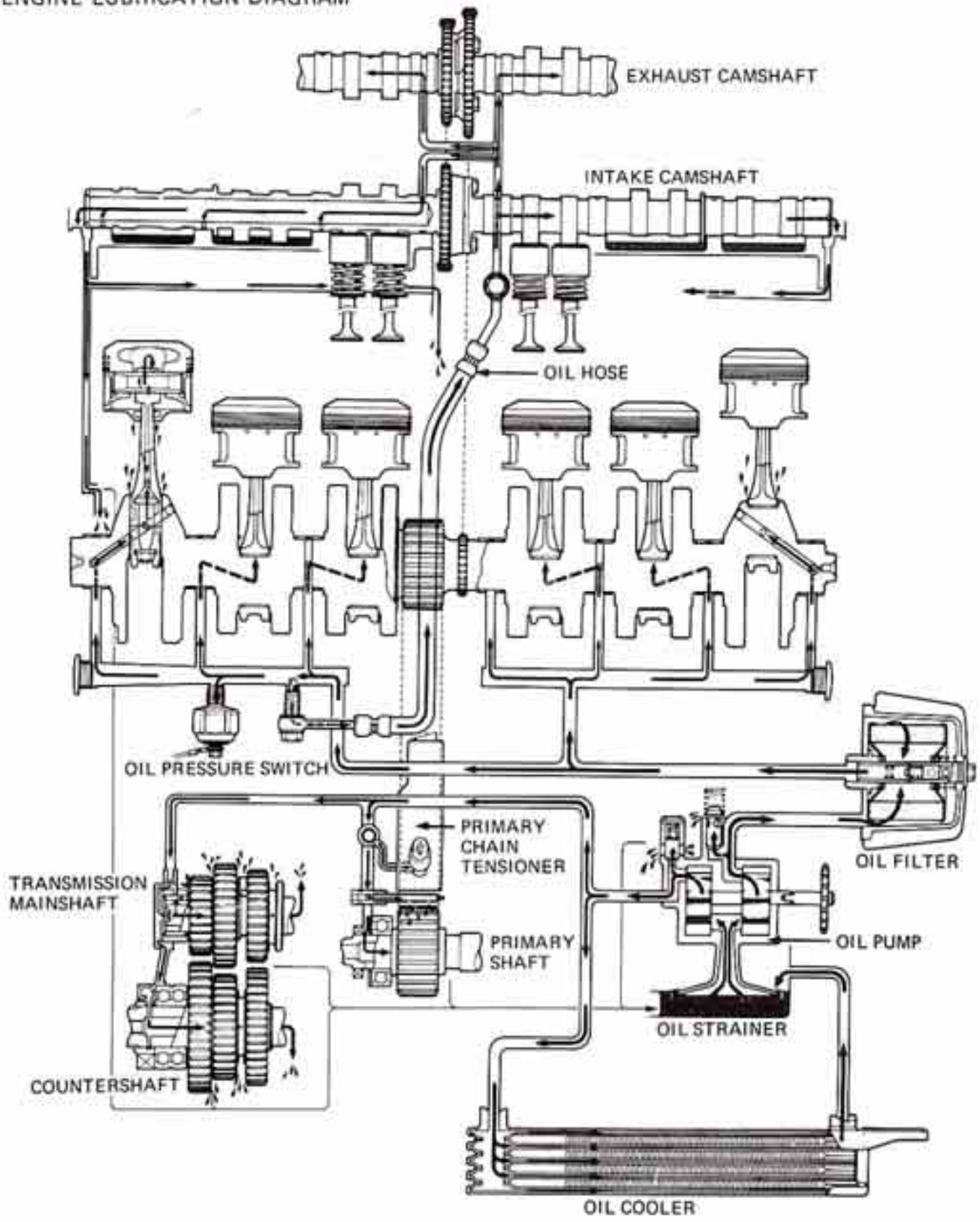
ENGINE LUBRICATION DIAGRAM



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SERVICE INFORMATION

GENERAL INSTRUCTIONS

Oil pump: See Section 11
Oil pressure relief valve: See Section 11

SPECIFICATIONS

Oil capacity		Approximately 4.0 liter (4.2 US qt) at change 5.5 liter (5.8 U.S. qt) at engine assembly	
Recommended oil		HONDA 4-stroke oil or equivalent General, all temperature −20°C to +35°C (68°F to 95°F) above −20°C (68°F) above −10°C (50°F)	API service classification-SE SAE 10W–40 SAE 10W–30 SAE 10W–40 SAE 20W–40, 20W–50
Oil pump delivery	Right	36.5 liters/min/4,000 rpm	(38.6 qt/min/4,000 rpm)
	Left	27.0 liters/min/4,000 rpm	(28.5 qt/min/4,000 rpm)
Oil pressure (at oil pressure switch)		400–500 kPa (4.5–5.0 kg/cm², 64–71 psi)/4,000 rpm 80°C (176°F)	

TOOLS

Special

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

TORQUE VALUES

Oil drain plug	28–32 N·m (2.8–3.2 kg-m, 20–23 ft-lb)	Pressure switch	15–20 N·m (1.5–2.0 kg-m, 11–14 ft-lb)
Oil filter bolt	28–32 N·m (2.8–3.2 kg-m, 20–23 ft-lb)	Oil bolt (Cylinder head)	18–22 N·m (1.8–2.2 kg-m, 13–16 ft-lb)
Oil pan bolt	8–12 N·m (0.8–1.2 kg-m, 6– 9 ft-lb)	Oil bolt (Crankcase)	20–24 N·m (2.0–2.4 kg-m, 14–17 ft-lb)

TROUBLESHOOTING

Oil Level Too Low
1. External oil leaks
2. Worn piston rings
3. Worn valve guide or seal

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

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

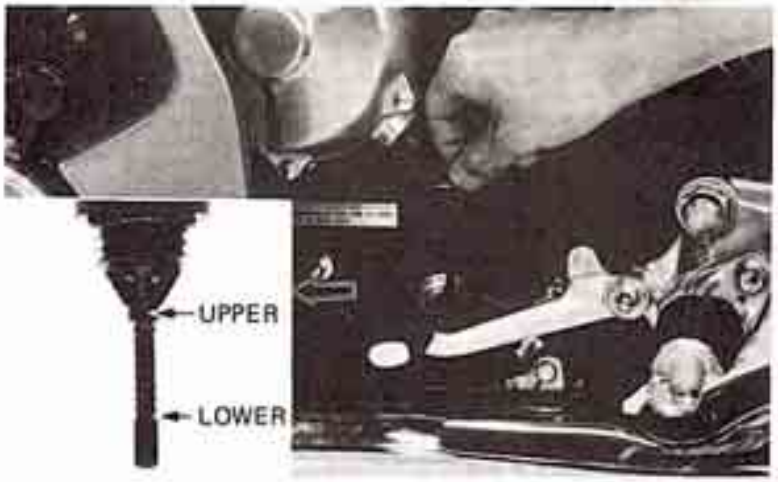
High Oil Pressure
1. Pressure relief valve stuck closed
2. Plugged oil filter, gallery, or metering orifice
3. Incorrect oil being used

No Oil Pressure
1. Oil level low
2. Oil pump drive chain broken
3. Oil pump faulty
4. Internal oil leakage

ENGINE OIL LEVEL

Run the engine and allow to idle for a few minutes.
Stop the engine and place the motorcycle on its 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.

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



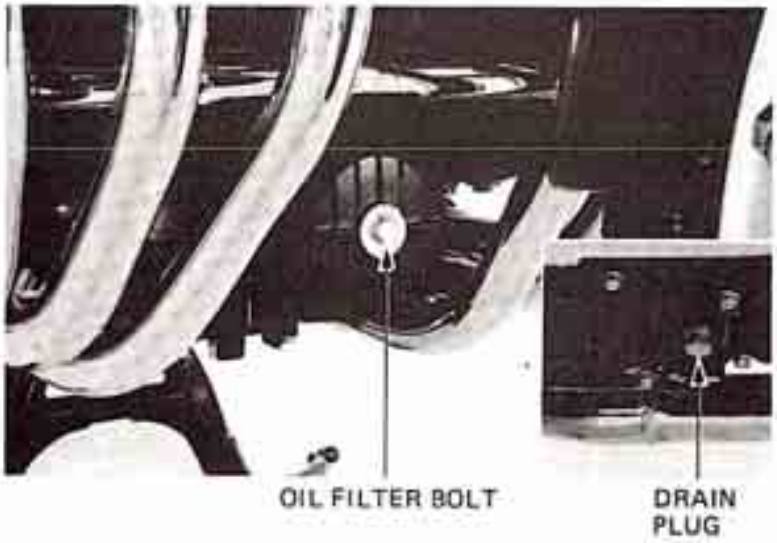
ENGINE OIL & FILTER CHANGE

Warm the engine to normal operating temperature.

Stop the engine.
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 case are in good condition.
Replace the oil filter and install the oil filter bolt and drain plug.

CAUTION

Do not interchange the oil filter with those for other models as it has a greater rate of oil flow.



Fill the crankcase with 4. 0 lit (4.2 US qt) of the recommended oil.

Reinstall the oil filler cap.
Start the engine and idle it for a few minutes.
Stop the engine.

Add the recommended oil to the upper level on the dipstick.
Make sure that there are no oil leaks.

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OIL STRAINER CLEANING

NOTE

Perform this maintenance before filling the engine with oil.

Remove the oil filler cap, drain plug and oil filter bolt.
Remove the oil pan bolts and oil pan.
Remove and clean the oil strainer.
Install a new oil pan gasket and install the oil strainer and oil pan.
Fill the crankcase with the recommended oil (Page 2-2).

OIL PRESSURE

Connect the oil pressure gauge.
Check the oil level.
Warm the engine up to normal operating temperature (approximately 80° C= 176° F).
Check the pressure at 4,000 rpm.

STANDARD:
450-500kPa (4.5–5.0 kg/cm², 64–71 psi)
at 4,000 rpm and 80°C (176°F)

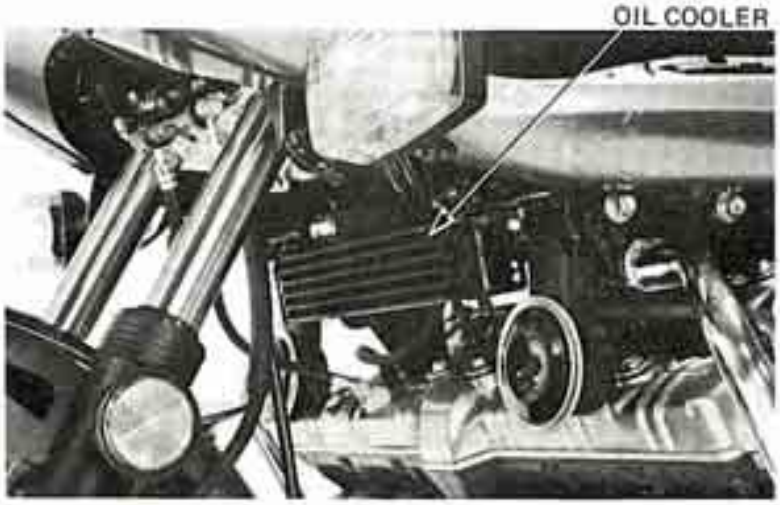
NOTE

Before installing the pressure switch, apply a liquid sealant to the thread.

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.
Also, touch the oil cooler.
It should be warm, indicating that oil is flowing through it from the auxiliary oil pump.

OIL COOLER INSPECTION

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



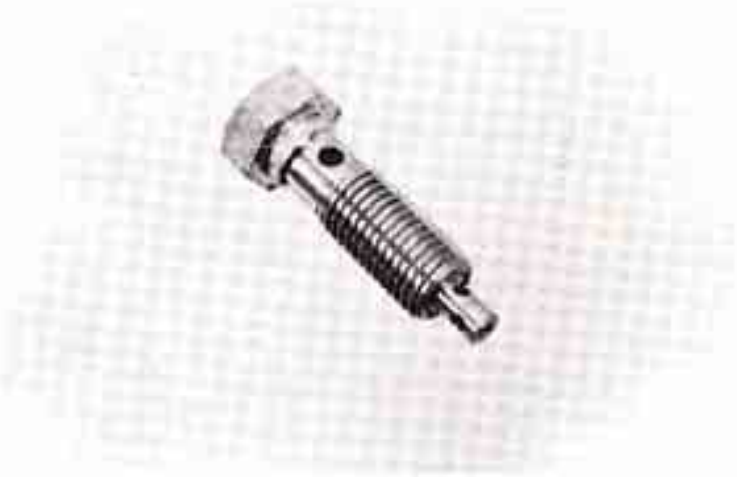
OIL HOSE AND BOLT INSPECTION

Check for oil leaks at hose connections.
Check the oil hoses for deterioration.

NOTE

- Install new sealing washers, if the hose is removed.
- Install the oil with the oil orifice on the crankcase side.

Check that the oil orifice is not clogged.



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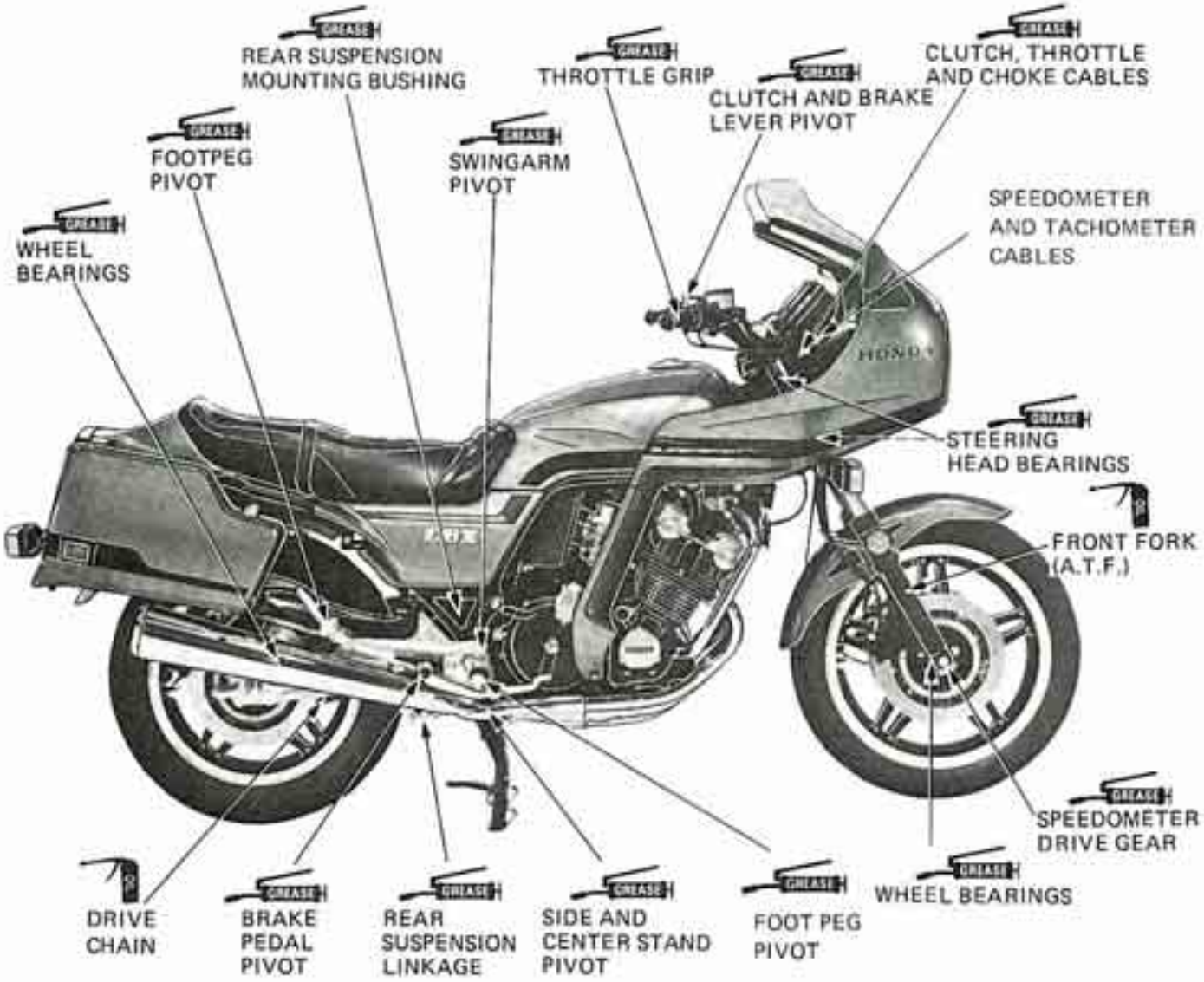
LUBRICATION POINTS



DRIVE CHAIN

Clean the drive chain with kerosene and wipe dry.

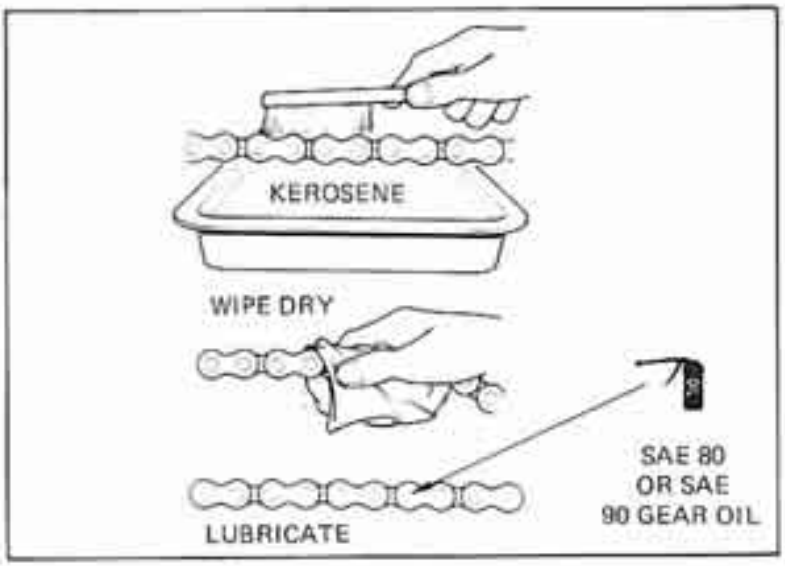
CAUTION

Do not use a steam cleaner, high pressure washers or solvents as these will damage the O-rings.

Lubricate the drive chain with SAE 80 or 90 gear oil.

CAUTION

Do not use commercial aerosol chain lubricants. They contain solvents which could damage the O-rings.



SERVICE INFORMATION

GENERAL INSTRUCTIONS

Engine oil level check	See page 2-2
Engine oil change	See page 2-2
Oil strainer screen cleaning	See page 2-3

SPECIFICATION

< ENGINE>

Spark plug gap	0.6–0.7 mm (0.024–0.028 in)
Spark plug type	

U.S.A. model

For cold climate below 5°C (41°F)		Standard		For extending high speed riding	
ND	NGK	ND	NGK	ND	NGK
X22ES-U (X22ESR-U)	D7EA (DR7ES)	X24ES-U (X24ESR-U)	D8EA (DR8ES-L)	X27ES-U (X27ESR-U)	D9EA (DR8ES)

Type in parenthesis ( ) for CANADA model or U.S. model with radio installed.

Manufacturer
ND: Nippondenso Co., Ltd.
NGK: NGK Spark Plug Co., Ltd.

Ignition timing	Initial 10° BTDC (Static)
Valve clearance: IN. and EX.	0.06–0.13 mm (0.0022–0.005 in)
Idle speed	900 ± 100 rpm
Synchronization vacuum	Difference between each cylinder 40 mm Hg (1.6 in Hg)
Compression	1200 ± 100 kPa (12 ±1 kg/cm², 170 ± 14 psi)
Firing order	1–5–3–6–2–4

TOOLS

Special

Valve lifter holder	07964–4220002 or M9501–277–94052 (USA only)
Carb. throttle wrench	07908-4220100 07908-4600000
Degree wheel	07974-4220001
Vacuum gauge	07404-0020000 or M9378–021–XXXXX (USA only)

< CHASSIS >

Drive chain free play	15–25 mm (5/8 in)
Clutch free play	10–20 mm (3/8–3/4 in)

Tire

Cold tire pressure kPa (kg/cm², psi)	Front 250 (2.5, 36) Rear 250 (2.5, 36) At maximum load 290 (2.9, 4.1)
Vehicle capacity load limit	175 kg (385 lbs)
Tire size	Front 350-V19 (4PR) Rear 130/90V18
Tire brand (Tubeless only)	Front GOLD SEAL F11 (DUNLOP) MAG. MOPUS-S706 (BRIDGESTONE)
	Rear GOLD SEAL K127 (DUNLOP) MAG. MOPUS-G508 (BRIDGESTONE)

TORQUE VALUES

Front axle holder nut	18–25 N·m (1.8–2.5 kg·m, 13–18 ft·lb)
Rear axle nut	85-105 N·m (8.5–10.5 kg·m, 62–76 ft·lb)

MAINTENANCE SCHEDULE

Perform the PRE-RIDE INSPECTION in the Owner's Manual at each scheduled maintenance.
I: INSPECT AND CLEAN, ADJUST, LUBRICATE, OR REPLACE IF NECESSARY.
C: CLEAN A: ADJUST
R: REPLACE 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
EMISSION RELATED ITEMS	*	FUEL LINES			I	I	I	I	I	Page 3-4
	*	THROTTLE OPERATION		I	I	I	I	I	I	Page 3-7
	*	CARBURETOR CHOKE			I	I	I	I	I	Page 3-10
		AIR CLEANER	NOTE 1			R		R		Page 3-3
		CRANKCASE BREATHER	NOTE 2		C	C	C	C	C	Page 3-4
		SPARK PLUGS			R	R	R	R	R	Page 3-4
	*	VALVE CLEARANCE		I	I	I	I	I	I	Page 3-11
	*	IGNITION TIMING		I	I	I	I	I	I	Page 3-5
		ENGINE OIL	YEAR	R	R	R	R	R	R	Pages 2-2 3-8
		ENGINE OIL FILTER	YEAR	R	R	R	R	R	R	Page 2-2
	*	ENGINE OIL SCREEN					C			Page 2-3
	*	CAM CHAIN TENSION		A	A	A	A	A	A	Page 3-15
	*	CARBURETOR-SYNCHRONIZE		I	I	I	I	I	I	Page 3-8
	*	CARBURETOR-IDLE SPEED		I	I	I	I	I	I	Page 3-10
NON-EMISSION RELATED ITEMS		DRIVE CHAIN		I, L EVERY 300 mi. (500 km)						Pages 2-5, 3-17
		BATTERY	MONTH	I	I	I	I	I	I	Page 3-18
		BRAKE FLUID	MONTH I 2 YEARS *R	I	I	I	*R	I	I	Page 3-18
		BRAKE PAD WEAR			I	I	I	I	I	Page 3-19
		BRAKE SYSTEM		I	I	I	I	I	I	Page 3-19
	*	BRAKE LIGHT SWITCH		I	I	I	I	I	I	Page 3-20
	*	HEADLIGHT AIM		I	I	I	I	I	I	Page 3-20
		CLUTCH		I	I	I	I	I	I	Page 3-22
		SIDE STAND			I	I	I	I	I	Page 3-23
	*	SUSPENSION		I	I	I	I	I	I	Page 3-24
	*	NUTS, BOLTS, FASTENERS		I	I	I	I	I	I	Page 3-25
	**	WHEELS		I	I	I	I	I	I	Page 3-25
	**	STEERING HEAD BEARING		I		I		I		Page 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 (USA ONLY).
3. FOR HIGHER ODOMETER READINGS, REPEAT AT THE FREQUENCY INTERVAL ESTABLISHED HERE.

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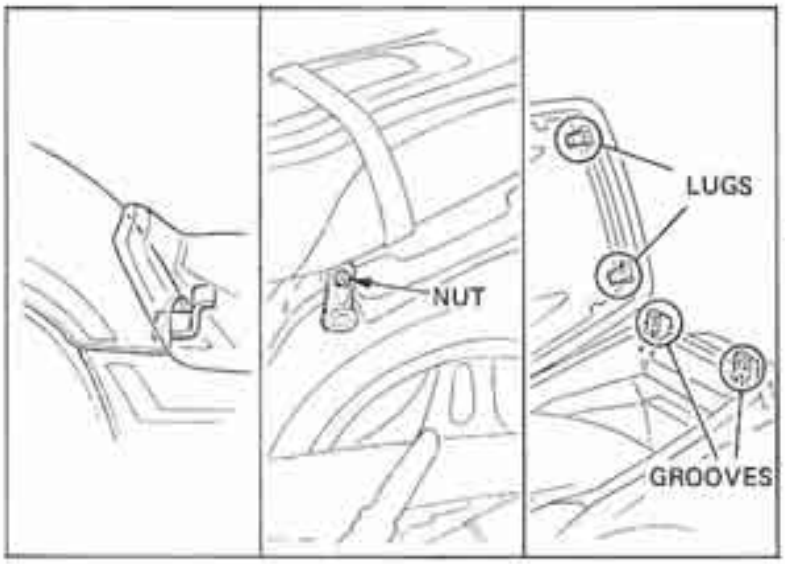
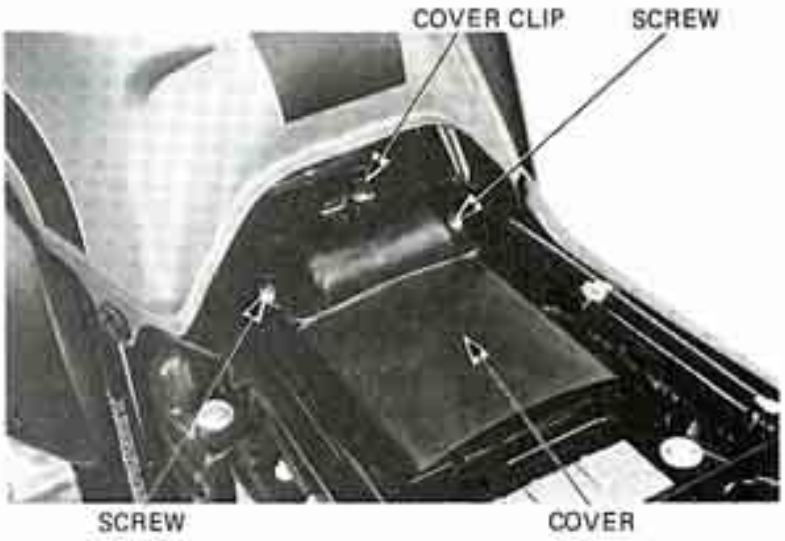
AIR CLEANER

Remove the seat by loosening the nuts on the sides of the seat and lifting the seat to the rear.



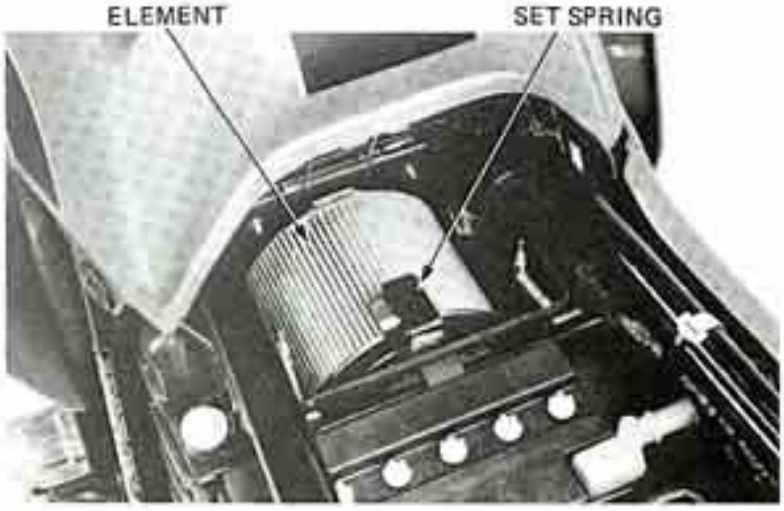
Lift the air cleaner cover clip up.
Remove the two air cleaner cover screws and the air cleaner cover.



Remove the air cleaner set spring.
Replace the element with a new one according to the maintenance schedule.
Install the holder, set spring and air cleaner cover.
When replacing the seat, align the grooves with the lugs and push down firmly. Install the nuts and tighten them to the recommended torque.

Torque specification: 3-4 N-m
(3.0-4.0 kg-m, 22-29 ft-lbs)

Lift the seat to make sure the latches are secure.



CRANKCASE BREATHER

For U.S.A. model

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

NOTE

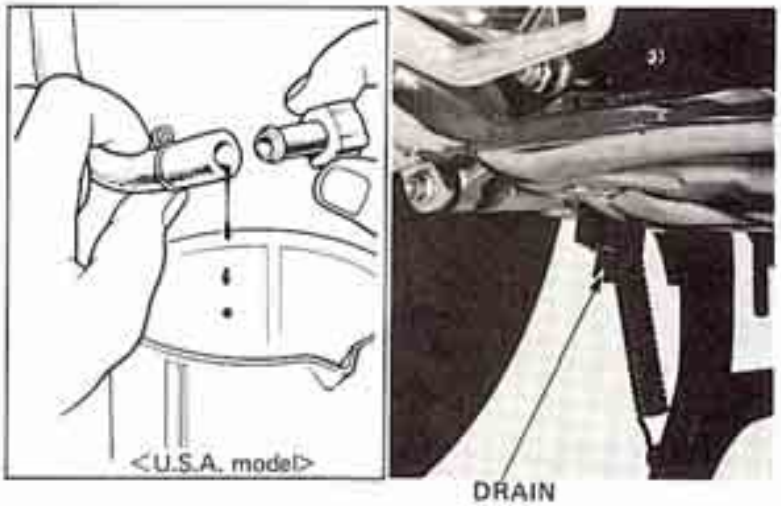
Service more frequently when ridden in rain or at fully throttle, or if the deposit level can be seen in the transparent section of the drain tube.

For Canada model

Squeeze to open the lower end of the drain tube.
Remove any oil or water which may have accumulated.

CAUTION

Check the drain tube for clogging and routing.



FUEL LINES

Check the fuel lines for deterioration, damage, or leakage. Replace any parts which show deterioration, damage or leakage.

SPARK PLUGS

Disconnect the spark plug caps.
Clean any dirt from around the spark plug bases.
Remove and discard the spark plugs.

RECOMMENDED SPARK PLUG

( ) Canada model
US. optional

For cold climate below 5°C (41°F)		Standard		For extending high speed riding	
ND	NGK	ND	NGK	ND	NGK
X22ES-U (X22ESR-U)	D7EA (DR7ES)	X24ES-U (X24ESR-U)	D8EA (DR8ES-L)	X27ES-U (X27ESR-U)	D9EA (DR8ES)

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Measure the new spark plug gaps using a wire-type feeler gauge.

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

Adjust by bending the side electrode carefully.

With the plug washer attached, thread the new spark plugs in by hand to prevent crossthreading.

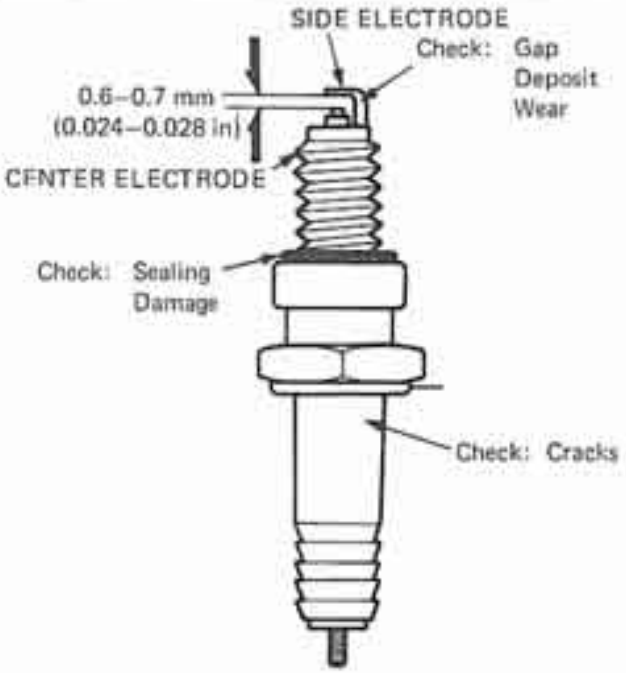
Tighten the spark plugs another 1/2 turn with a spark plug wrench to compress the plug washer.

TORQUE:
12–14 N·m (1.2–1.4 kg·m, 9–12 ft·lb)

Connect the spark plug caps.

NOTE

First tighten the spark plug finger tight, then tighten 1/2 turn with a spark plug wrench.



IGNITION TIMING CHECK

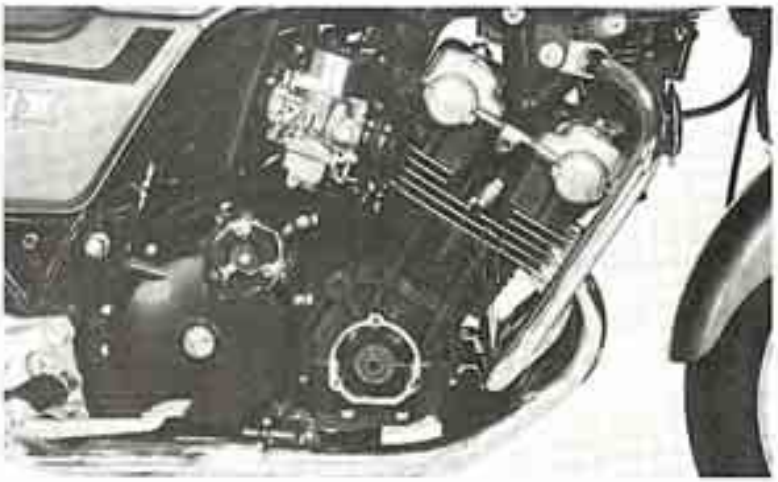
- DYNAMIC

NOTE

Drain oil from engine for this inspection method. Place an oil drain pan under the right crankshaft end.

Remove all spark plug caps and either No. 6 spark plug or No. 1 spark plug.
Connect the removed plug with the spark plug cap and ground the plug to the cylinder head.

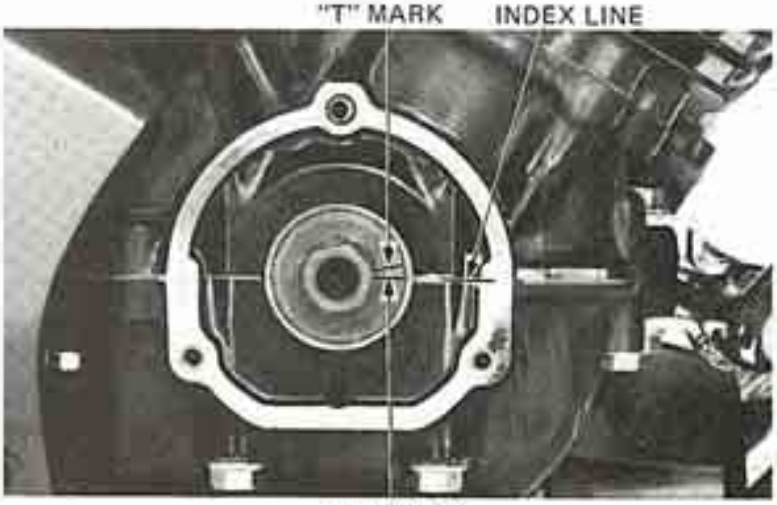
Remove the right crankshaft cap.
Connect a stroboscopic timing light to the grounded high tension wire.
Operate the starter motor while aiming the timing light at the right crankshaft end.
The "F" mark should align with the front crankcase mating surfaces.



ADJUSTMENT

Remove the pulse generator cover.
Adjust by loosening the three pulse generator base plate locking screws and rotating the plate.
Turn the base plate counterclockwise to advance and turn it clockwise to retard the timing.
Tighten the base plate locking screws and recheck the timing.

Install the removed parts in the reverse order of disassembly. Add the correct amount of engine oil.



ALTERNATIVE METHOD

- STATIC

NOTE

This check can be done with oil in the engine.

Remove the right crankcase cap and pulse generator cover.

Rotate the crankshaft clockwise and align the "F" mark with the crankcase front upper and lower mating surface.

Either No. 6 or No. 1 piston must be near TDC of the compression stroke.

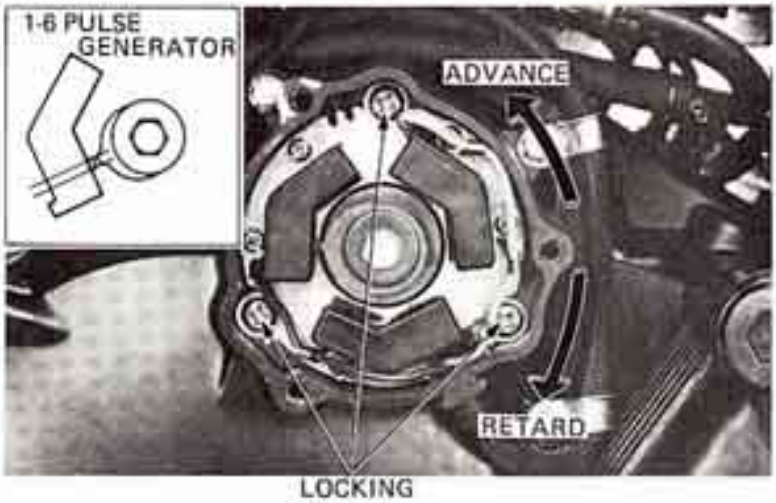
The timing is correct if the narrow projection of the 1,6 pulse generator is aligned with the rotor tooth.

If the ignition timing is incorrect, loosen the three pulse generator base plate locking screws.
Rotating the base plate counterclockwise will advance the ignition timing.

Rotating the base plate clockwise will retard the ignition timing.

Tighten the base plate locking screws and recheck the ignition timing.

Install the removed parts in the reverse order of disassembly.

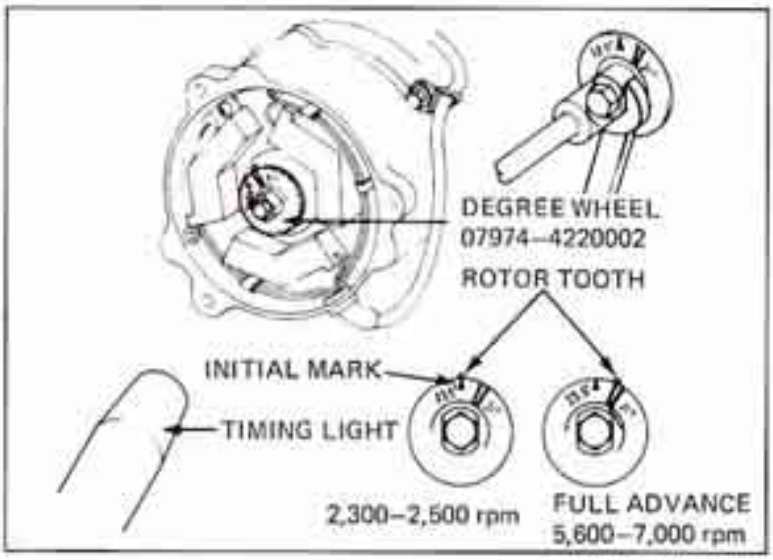


SPARK ADVANCER

NOTE

- Check the spark advancer only if engine performance difficulties occur.
- A high quality stroboscopic timing light designed for transistorized ignition systems must be used. It should also be capable of accurate operation at 9,000 rpm.

Remove the pulse generator cover.
Remove the rotor bolt and install the special degree wheel. (07974–4220002).
Align the initial mark on the degree wheel with the rotor tooth and tighten the rotor bolt.
Connect a timing light to the No. 6 high tension wire.



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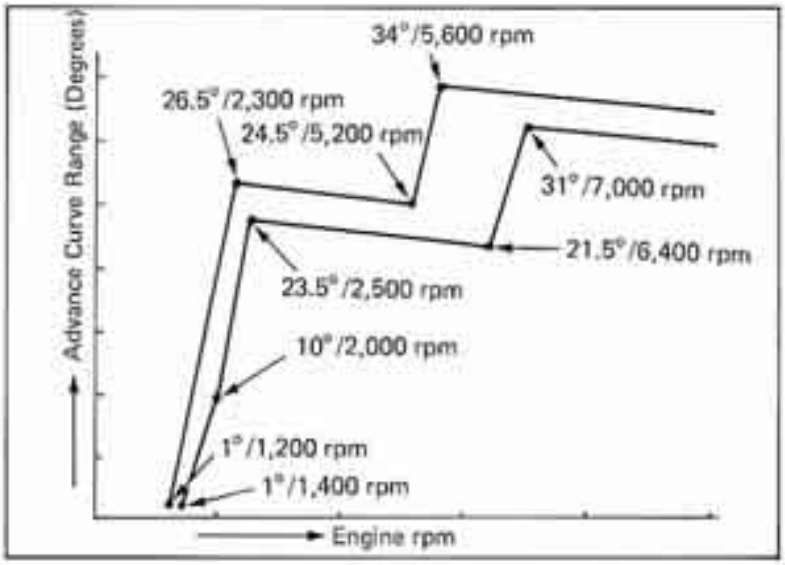
Start the engine.
Check that the initial mark remains aligned with the rotor tooth at idle.
Increase engine speed and check that the 23.5° mark aligns with the rotor tooth at 2,300–2,500 rpm.
And then check that the 31° mark aligns with the rotor tooth at 5,600–7,000 rpm.

CAUTION

Do not allow engine speed to exceed 8,000 rpm or engine damage may result.

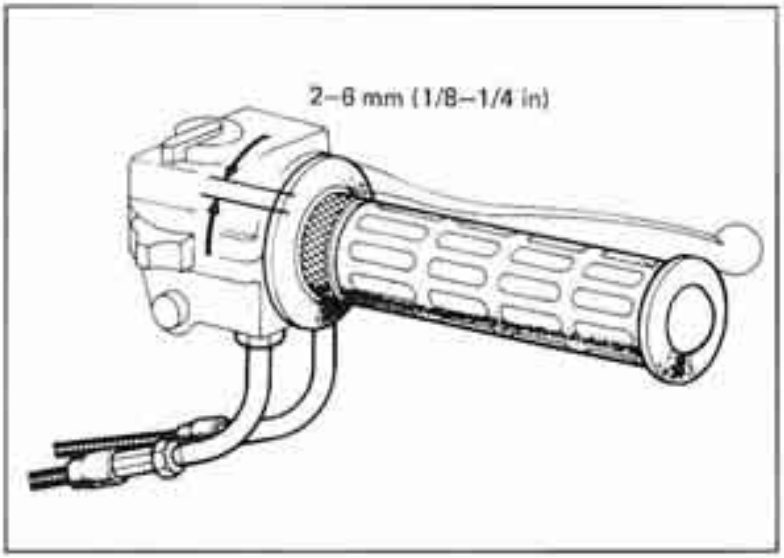
Replace the advancer assembly if it is not functioning properly.
Install the pulse generator cover.



THROTTLE OPERATION

Make sure that there is no deterioration, damage, or kinks in the throttle cables, and that the throttle grip free play is 2–6 mm (1/8–1/4) on the outer edge of the throttle grip flange. Replace any damaged parts.

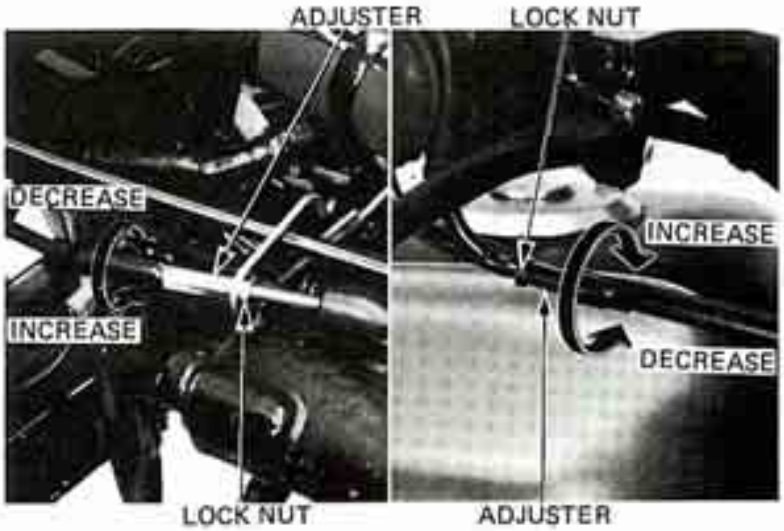
Check for smooth throttle grip rotation from fully closed to fully open in all steering positions and that it automatically returns to "fully closed" when released.
Adjust if necessary.



Major adjustments are made at the middle adjuster.
Remove the fuel tank.
To adjust, loosen the grip play adjuster lock nut and turn the adjuster.
Tighten the lock nut.

Minor adjustments are performed at the upper adjuster.

Recheck throttle operation.



CARBURETOR SYNCHRONIZATION

NOTE

Perform carburetor synchronization with engine at normal operating temperature, transmission in neutral and motorcycle on the center stand.

Remove the legshield.
Remove the seat and air cleaner inlet duct.
Turn the fuel valve OFF and remove the fuel tube and fuel tank.
Prepare a longer fuel tube and reconnect it to the fuel tank and carburetor.

Position the fuel tank higher than its normal position.
Remove plugs from the carburetor intake parts (except No. 3 carburetor) and install long adapters to inner carburetors and short adapters to outer carburetors.
Connect vacuum gauges.

Start the engine and adjust the idle speed to 900 ± 100 rpm. Clip the vacuum tube for the fuel auto cock and disconnect the vacuum tube from the plug.
Remove the plug from carburetor 3 and install the long adapter, then connect the vacuum gauge.
Make sure that the maximum difference in vacuum readings is 40 mmHg (1.6 inHg) or less.

VACUUM GAUGE 07404–0020000 or M937B–021–XXXXX (USA only)

Date of Issue: May, 1981

ADJUSTMENT

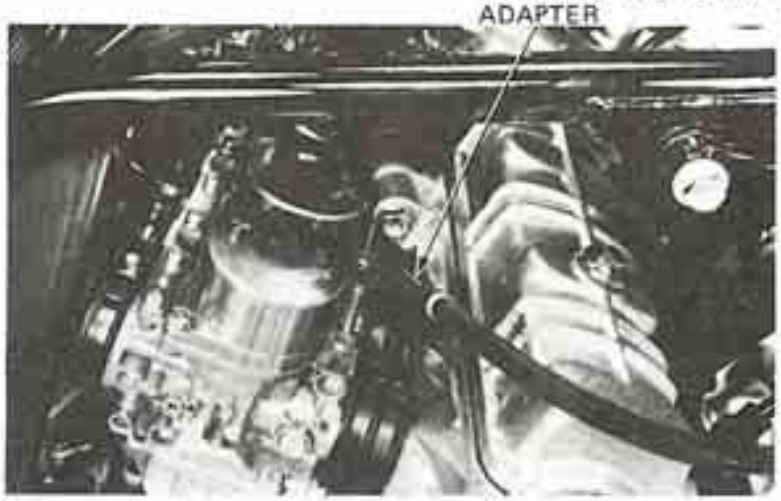
NOTE

The No.4 carburetor cannot be adjusted; it is the base carburetor.

Start the engine and adjust the idle speed.

IDLE SPEED: 900 ± 100 rpm

Make sure that the maximum difference in vacuum readings does not exceed 40 mm Hg (1.6 in Hg).



Adjust by loosening the locknuts and turning the adjusting screws with the special tool Carburetor Throttle Wrench. Adjust to a maximum difference in vacuum readings between carburetors of less than 40 mm Hg (1.6 in Hg).

Adjust in the following order:

CARBURETOR

No. 5→No. 6→
No. 3→No. 2→No. 1

NOTE

Use carb. throttle wrench (07908-4600000) to adjust the No. 5 and No. 6 carburetors.

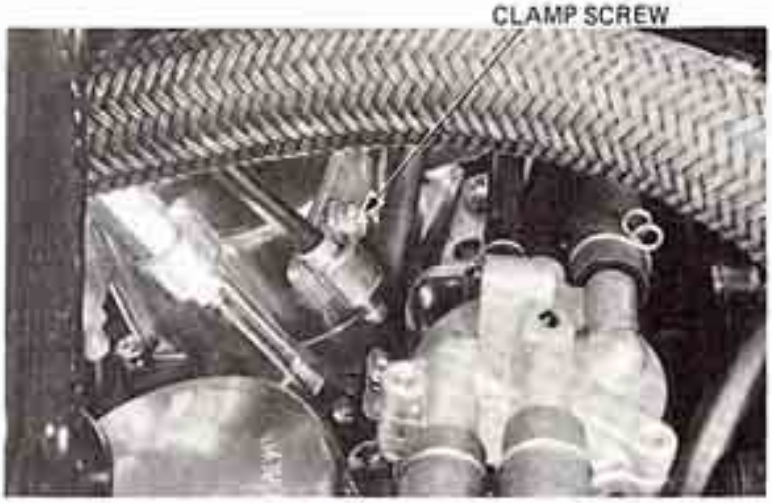
Hold the adjusting screws and tighten the lock nuts.

Recheck the idle speed and synchronization.

Install the removed parts in the reverse order of disassembly.

CHOKE MECHANISM

Operate the choke lever and check for smooth operation.
Pull the choke to "fully close" and make sure that the choke lever fully closed at the carburetors.
Adjust by loosening the choke cable clamp and moving the choke cable casing.
Retighten the clamp, holding the choke lever fully closed.
Push the choke lever down all the way to fully open. Make sure the choke valve is fully open by checking for free play in the cable between the lever and the cable casing.



IDLE SPEED

NOTE

Adjust idle speed after synchronizing carburetors. 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: 900 ± 100 rpm

NOTE

Pilot screws are factory pre-set. Do not adjust the pilot screw unless the carburetors are overhauled.

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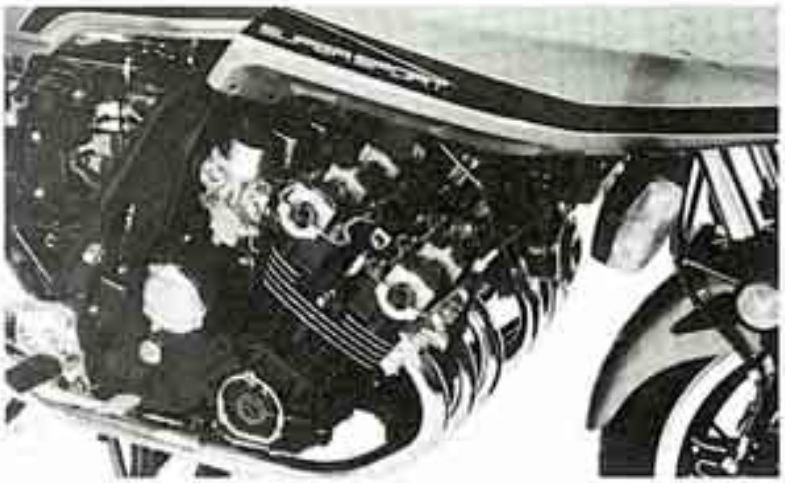
VALVE CLEARANCE

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.

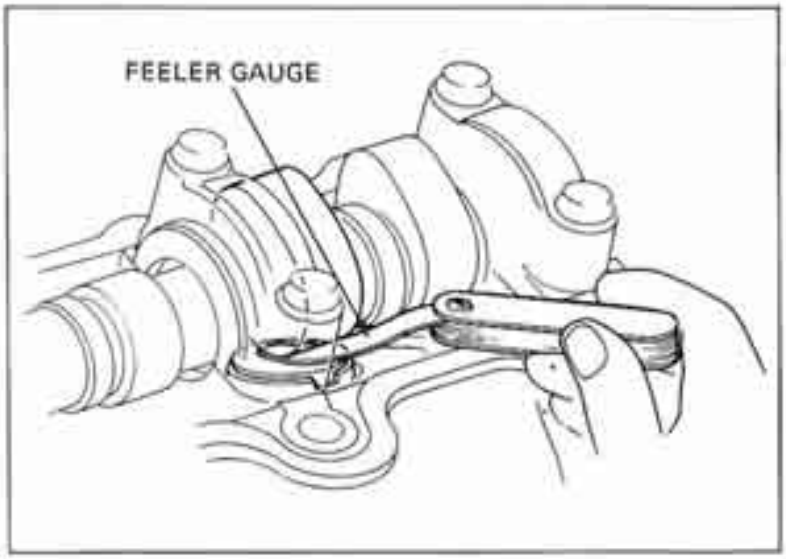


Remove the seat and leg shield.
Turn the fuel valve OFF and remove the fuel tube and fuel tank.
Remove the No. 1 and No. 6 spark plugs.
Remove the cylinder head brackets.
Remove the tachometer cable.

Remove the tachometer gear cap and tachometer driven gear.

CAUTION

The tachometer driven gear must be removed to prevent No. 4 camshaft holder breakage when the camshafts are rotated. Camshaft holder breakage necessitates cylinder head assembly replacement.



Remove the four cylinder head side covers.
Remove the eight cylinder head cover mounting bolts and cylinder head cover.

NOTE

- Do not allow engine oil to enter the combustion chambers when the cylinder head cover is removed.
- Make sure the torque of the camshaft holder mounting bolts (32 bolts) is 12–14 N·m (1.2–1.4 kg-m, 104–122 in-lb).

Remove the right crank cap.

INSPECTION

Measure intake and exhaust valve clearances by inserting a feeler gauge between the camshaft and valve lifter shim.

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

Rotate the crankshaft clockwise and measure the valve clearances in the following sequence:

Open No. 2 Ex. Valves to maximum and Measure No. 2 In., No. 1 Ex., No. 3 Ex. clearance
Open No. 4 Ex. Valves to maximum and Measure No. 4 In., No. 5 Ex., No. 6 Ex. clearance
Open No. 2 In. Valves to maximum and Measure No. 1 In., No. 3 In., No. 5 In. clearance
Open No. 5 Ex. Valves to maximum and Measure No. 6 In., No. 2 Ex., No. 4 Ex. clearance

Record the valve clearances.

ADJUSTMENT

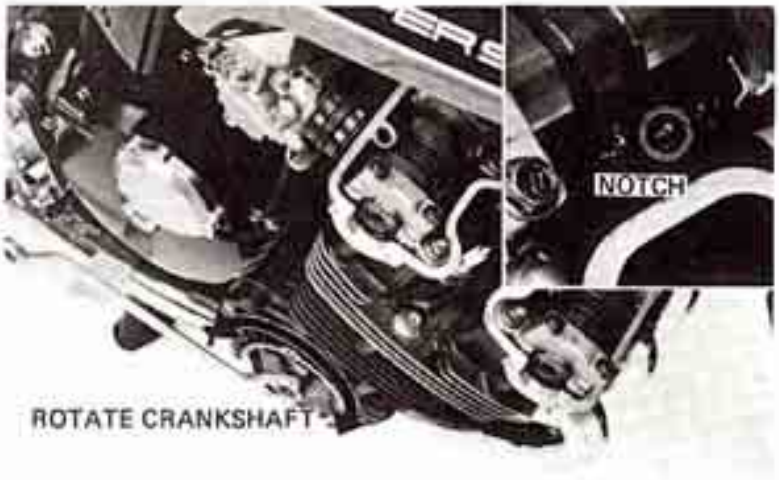
NOTE

Adjustment shims are available in 0.05 mm increments, from 2.30 to 3.50 mm.

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

Turn the valve lifter notch toward the spark plug hole.

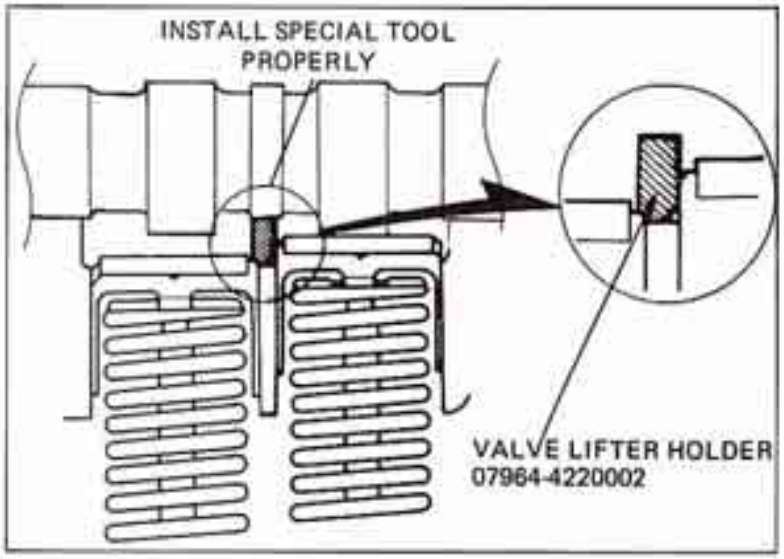
Rotate the crankshaft so that the valve being adjusted is at maximum lift.



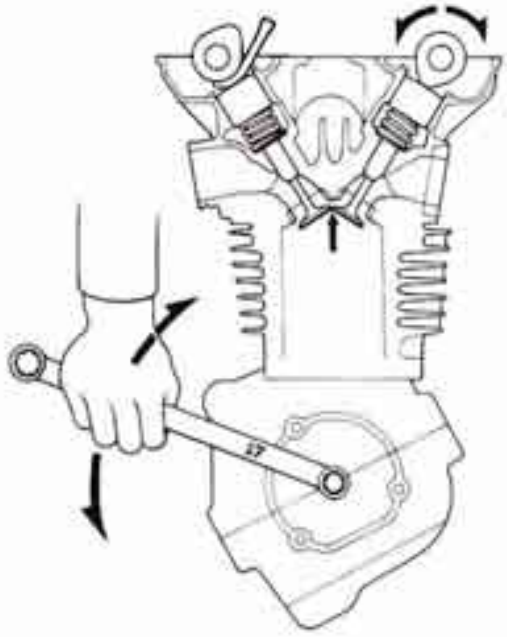
Insert the special tool (Valve Lifter Holder) between the camshaft and adjacent lifter.

CAUTION

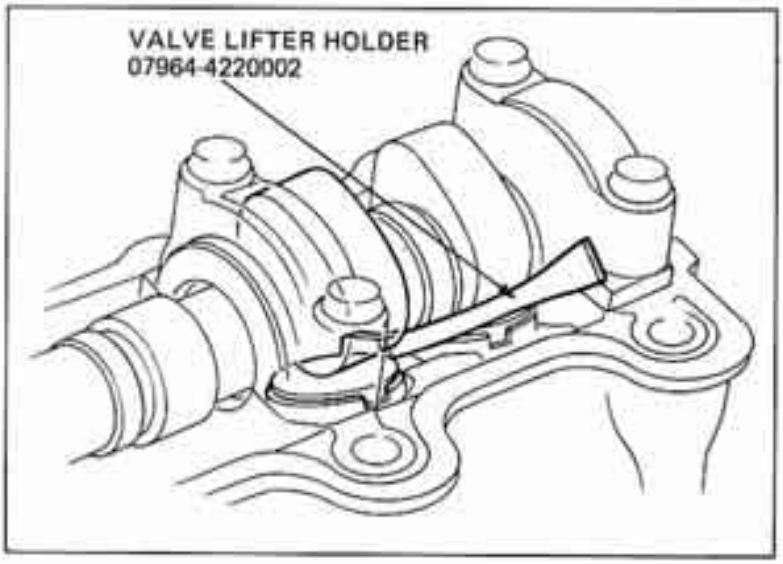
Do not rotate the crankshaft too far or in the wrong direction when the Valve Lifter Holder is depressing a pair of Valves. To do so will cause the intake and exhaust valves to strike and damage each other.



VALVE LIFTER HOLDER
07964-4220002



Rotate the crankshaft clockwise until there is enough clearance to remove the shim.



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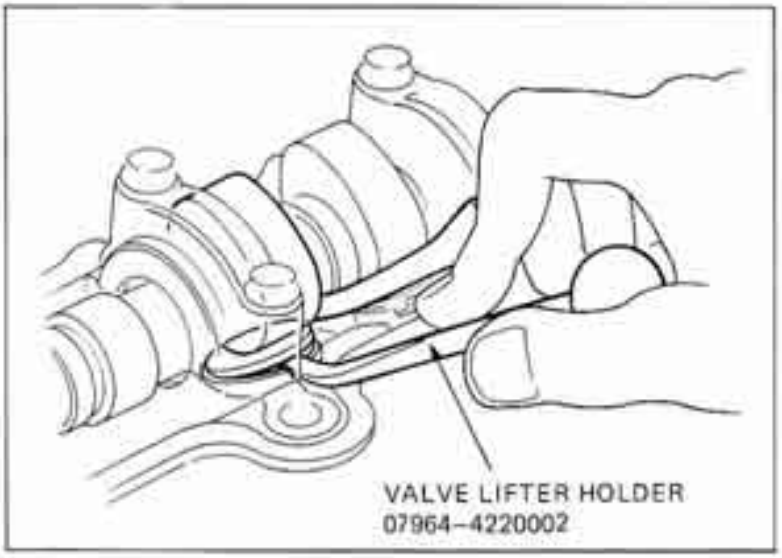
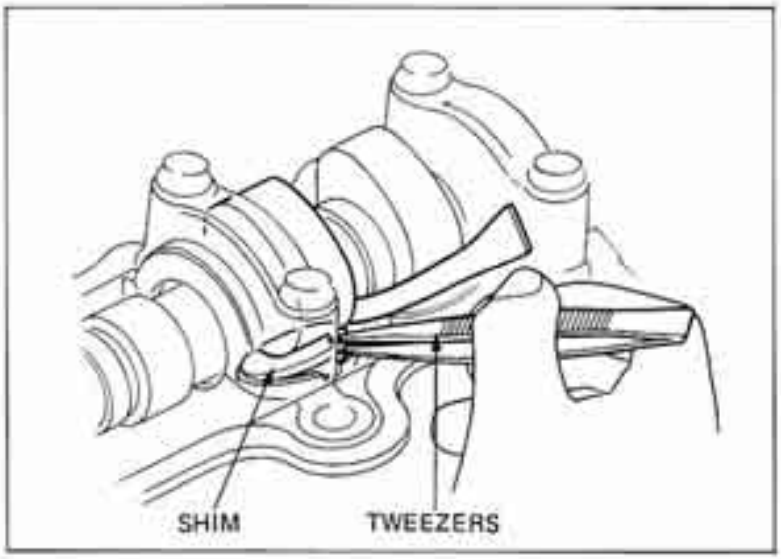
Begin removal of the shim by prying it off with the valve lifter.



Then remove the shim with tweezers.

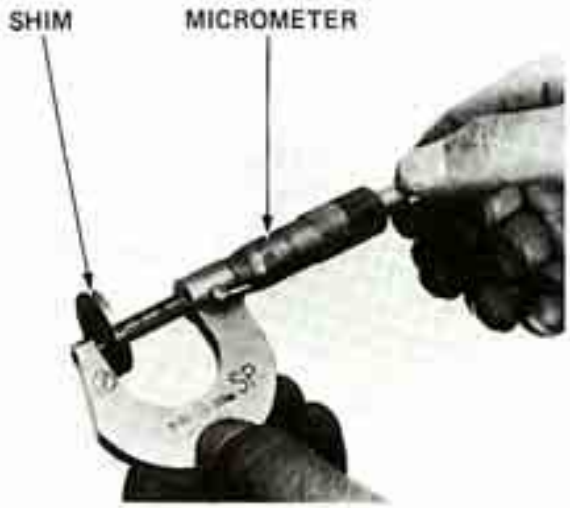


Measure the thickness of the used shim with a micrometer.
Select a replacement shim using the chart on Page 3-13.

Insert the replacement shim.

CAUTION

Make sure the opposite pair of valves does not open. The valves could be bent or damaged if the crankshaft is rotated incorrectly.



Rotate the crankshaft in the correct direction until the valves being adjusted are at maximum lift.
Remove the special tool "Valve Lifter Holder".
Rotate the crankshaft 2-3 revolutions to fully seat the replacement shim.
Recheck the valve clearance.
Install the removed parts in the reverse order of disassembly.

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

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	2.60	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					
0.37–0.41		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															
0.87–0.91		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.
(2) For shim replacement, see page 3–12.
(3) Measure old and new shims with a micrometer.
(4) The chart is for reference purpose only. After installing new shims, recheck the valve clearance.
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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HONDA

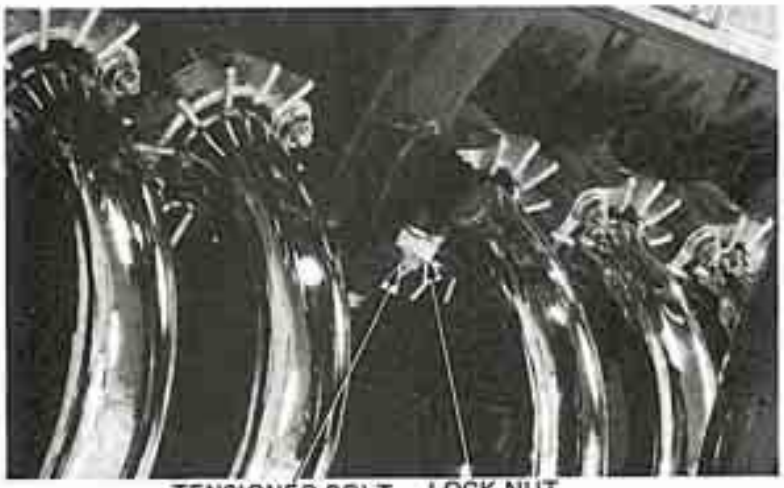
CAM CHAIN

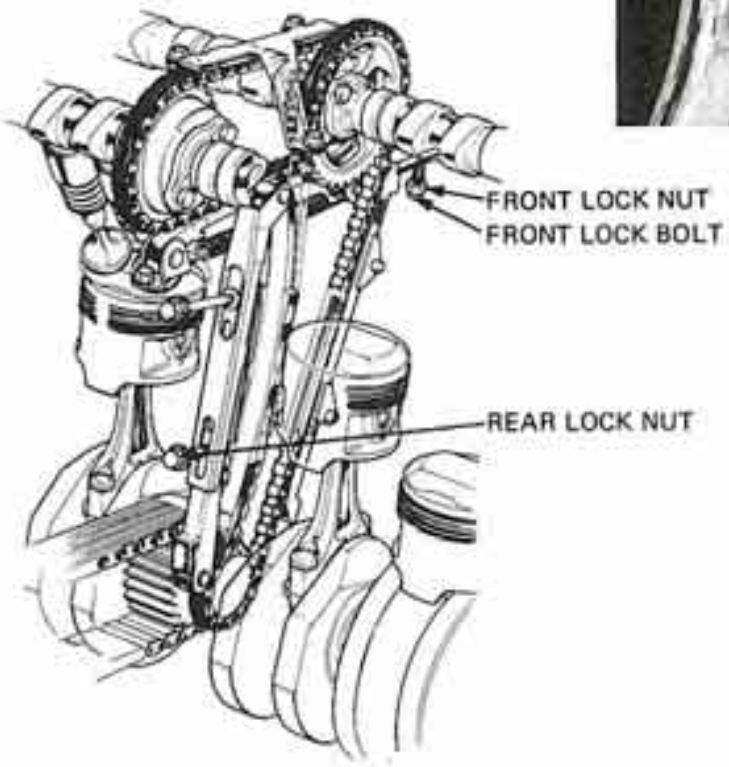
Start the engine and allow it to idle.
Loosen the rear cam chain tensioner lock nut and bolt at the rear of the cylinder head.
Tighten the bolt and lock nut.

Loosen, then tighten, the front cam chain tensioner lock nut and bolt at the front of the cylinder.

NOTE

With engine running at idle, the tensioner will automatically position itself to provide the correct tension.





COMPRESSION TEST

NOTE

The battery must be fully charged for this test.

Warm up the engine.
Remove all spark plugs.
Insert the compression gauge.
Open the choke and throttle valves fully.
Crank the engine with the starter motor.

NOTE

Crank the engine until the gauge reading stops rising. The maximum reading is usually reached in several seconds.

COMPRESSION PRESSURE:
1200 ± 100 kPa (12 ±1 kg/cm^2, 170 ± 14 psi)

If compression is low, check the following:

- Leaky valves
- Improper valve clearance
- Leaking cylinder head gasket
- Worn piston/rings/cylinder

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

COMPRESSION GAUGE

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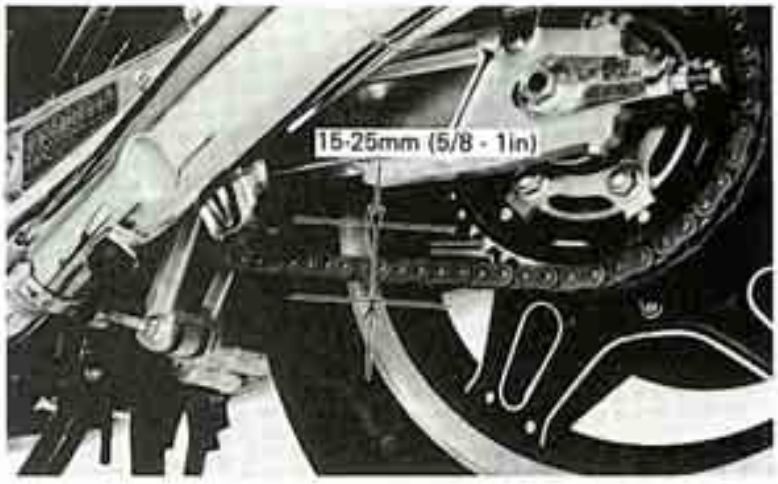
DRIVE CHAIN

NOTE

Perform the following with the ignition switch "OFF".

Place the vehicle on its center stand and shift the transmission into neutral.
Inspect the drive chain midway between the sprockets on the lower chain run.

FREE PLAY: 15–25 mm (5/8–1 in)
SERVICE LIMIT: 40 mm (1.5 in)



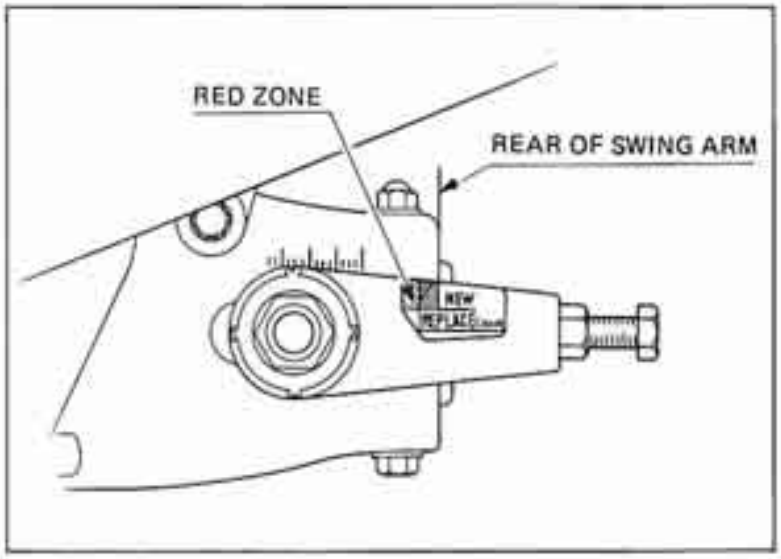
Adjust as follows:
Remove the rear axle cotter pin and loosen the nut.
Loosen the adjuster bolt lock nuts.
Turn the adjuster bolts an equal number of turns to obtain the specified free play.

CAUTION

Be sure that the index mark aligns with the same graduation of the scale on both sides.

Tighten the adjuster bolt lock nuts.
Tighten the axle nut securely.
Recheck free play and free wheel rotation.
Lubricate the drive chain (Page 2-5).

AXLE NUT TORQUE:
85-105 N-m, (8.5-10.5 kg-m, 61-76 ft-lb)



Replace the drive chain when the red zone on the label aligns with the rear of the swing arm with a chain free play of 20 mm (3/4 in).

Replacement chain: DID 50ZL, RK 50LO

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

NOTE

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

BATTERY

Remove the right and left side covers.
Disconnect the ground cable at the battery terminal.
Disconnect the positive cable at the magnetic switch terminal.
Remove 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.

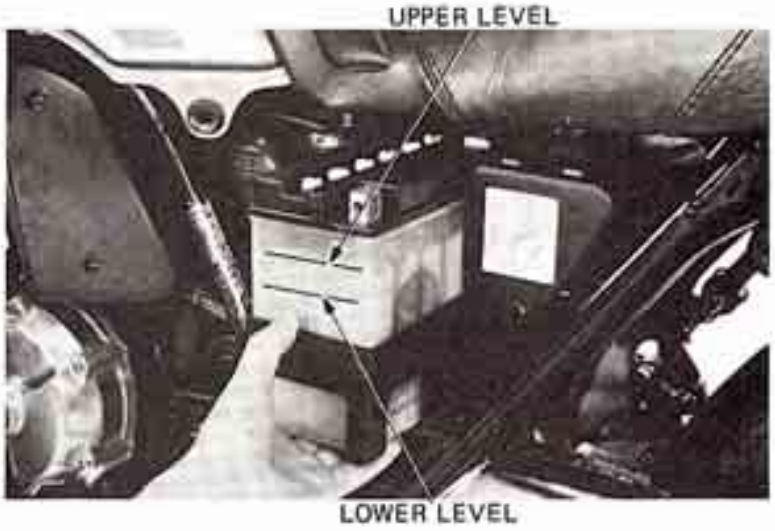
WARNING

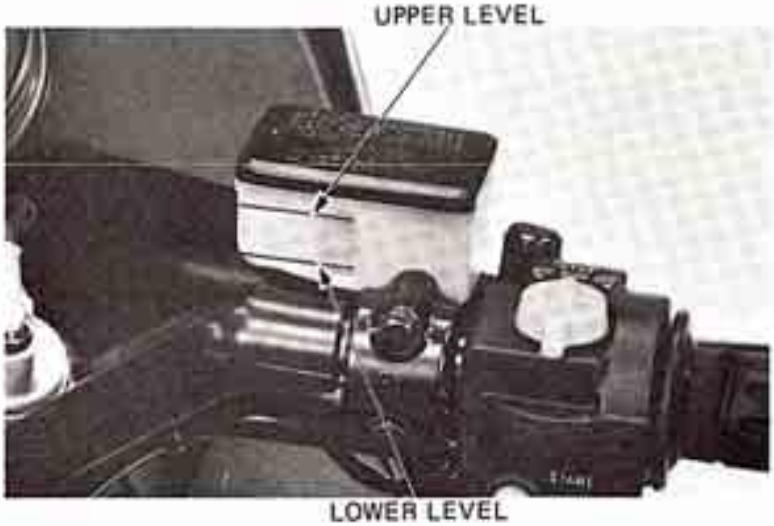
The battery electrolyte contains sulfuric acid. Protect your eyes, skin and clothing. In case of contact, flush thoroughly with water and call a doctor if electrolyte gets in your eyes.

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

CAUTION

- *To prevent damage to the battery, do not tap it with a hammer during installation.*
- *Do not grease the battery.*





BRAKE FLUID

Check that the front and rear brake fluid reservoirs are filled to the upper level mark.
If the level nears the lower level mark, fill the reservoir with DOT–3 BRAKE FLUID to the upper level mark.
Check the entire system for leaks, if the level is low.

CAUTION

- *Do not mix different brands of fluid as they may not be compatible.*
- *Do not remove the cap until the handlebar has been turned full right so that the reservoir is level.*
- *Avoid operating the brake lever with the removed.*
  Brake fluid will squirt out if the lever is pulled.

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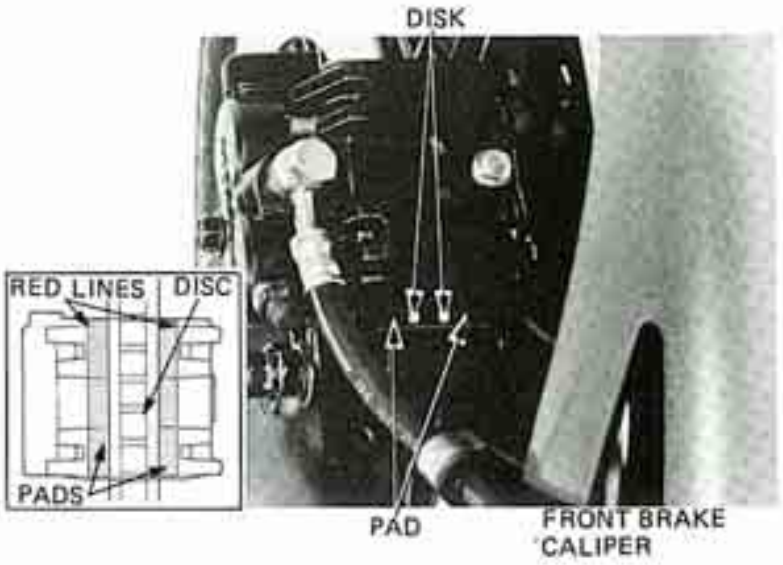
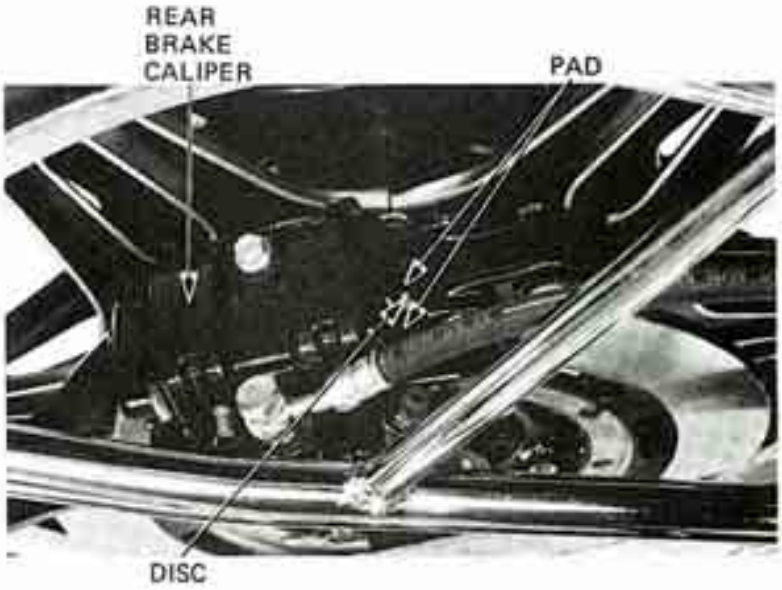
BRAKE PAD WEAR

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

CAUTION

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





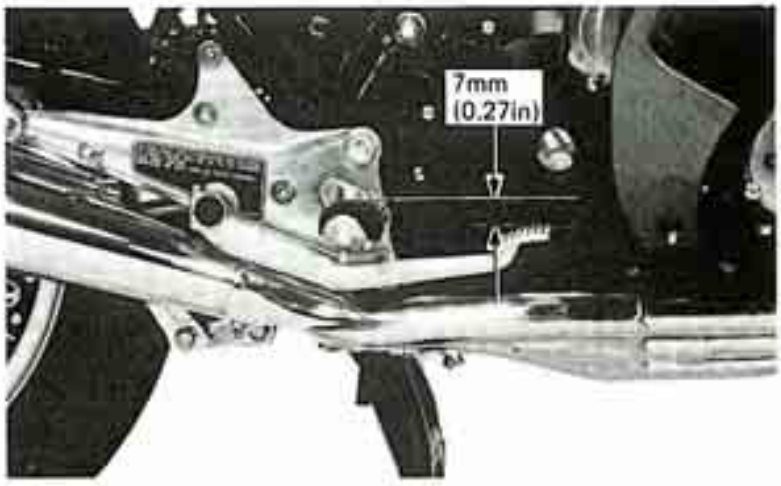
BRAKE SYSTEM

REAR BRAKE PEDAL HEIGHT

Adjust the pedal height so that the distance between the pedal and upper face of the footpeg is 7 mm (0.27 in).

CAUTION

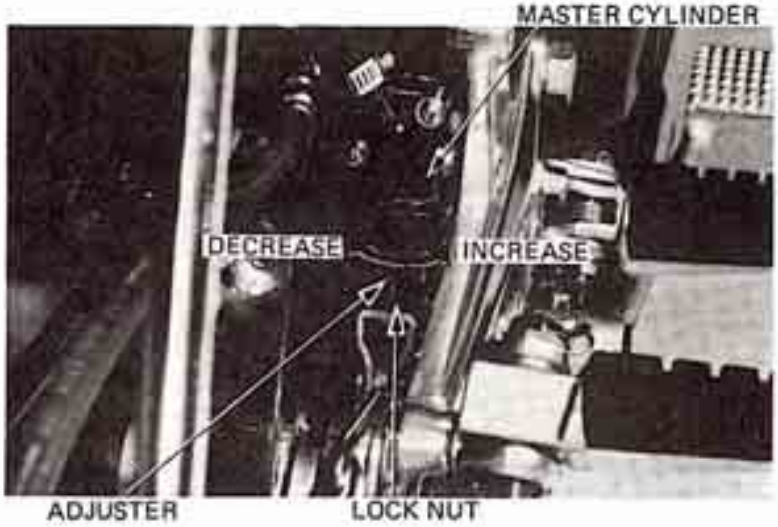
Improper brake pedal height adjustment can cause brake drag.



Adjust as follows:
Loosen the lock nut.
Turn the adjuster until the correct pedal height is obtained.
Tighten the lock nut securely.

NOTE

After adjusting pedal height, adjust the brakelight switch.



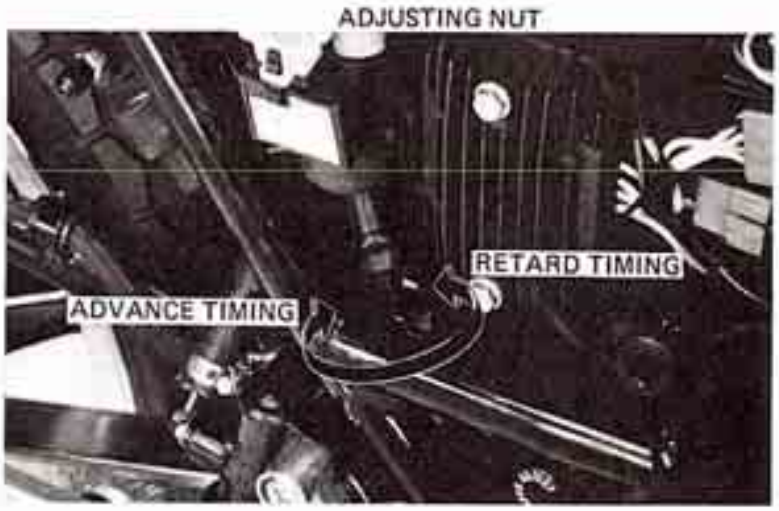
BRAKELIGHT SWITCH

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

Adjust by turning the switch adjusting nut as shown.

NOTE

- Do not turn the switch body.
- The front brakelight switch does not require adjustment.



HEADLIGHT AIM

VERTICAL BEAM

The headlight beam can be raised or lowered by turning the vertical beam adjusting knob.

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HORIZONTAL BEAM

Remove the headlight cover from the rubber seal in the fairing.
Adjust horizontally by turning the adjusting screw on the headlight rim.
Turn the adjusting screw clockwise to direct the beam toward the right side of the rider.

NOTE

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

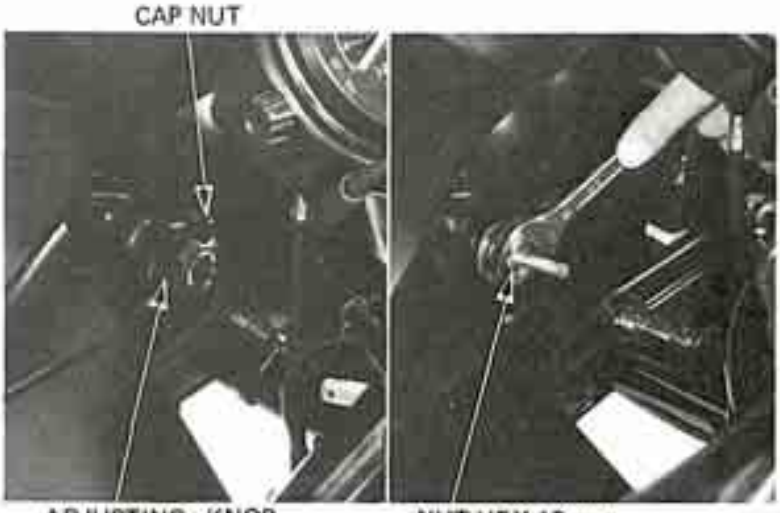
WARNING

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

HEADLIGHT BULB REPLACEMENT

Loosen the screw attached to the headlight adjusting knob.

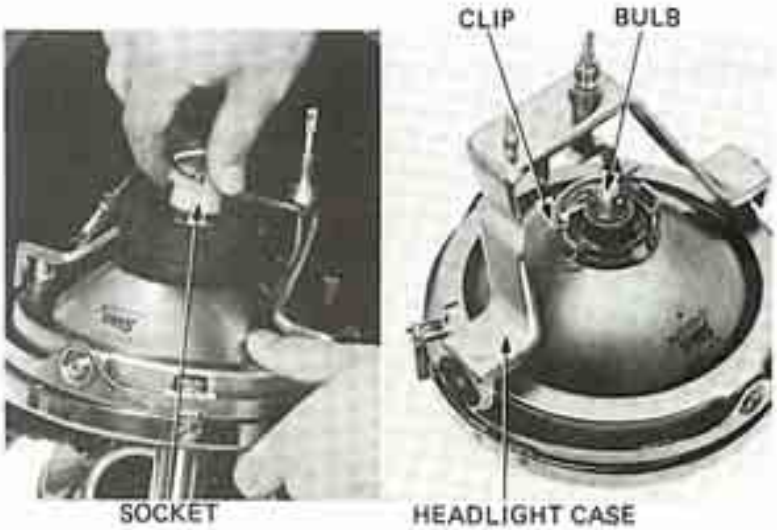
Remove the adjusting knob, nut and washers.
Remove the crown nut.



Remove the headlight cover from the fairing.
Pull out the headlight case and replace the bulb.
Reinstall the bulb clip.

CAUTION

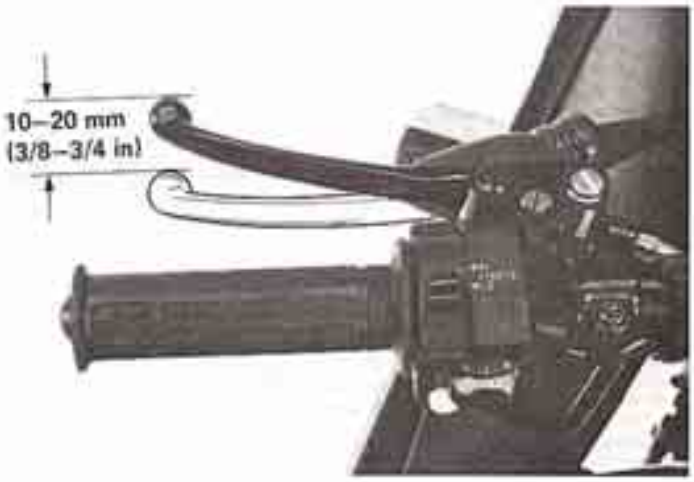
- *Do not touch the glass of a halogen bulb, or early bulb failure will occur.*
- *If you do touch the bulb, wipe it clean with a cloth moistened with alcohol.*



CLUTCH FREE PLAY

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

FREE PLAY: 10–20 mm (3/8–3/4 in)



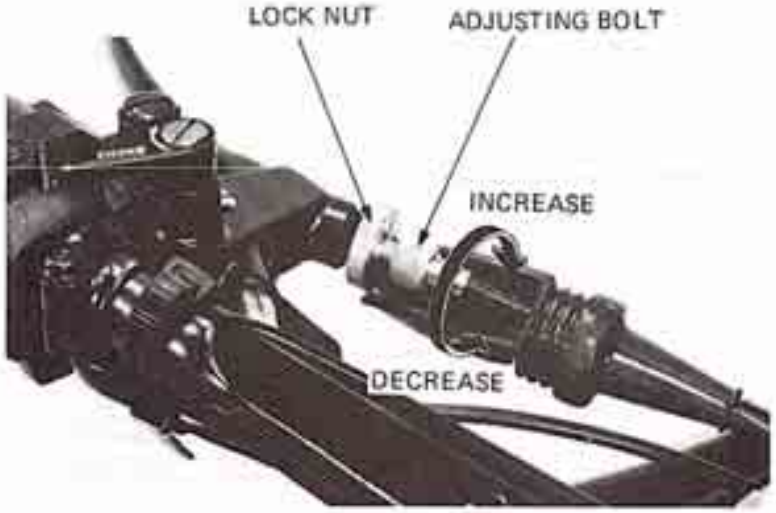
ADJUSTMENT

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

Tighten the lock nut.

NOTE

Do not expose the adjusting bolt threads more than 8 mm (3/4 in).



If adjustment cannot be made with the clutch lever adjusting bolt, screw the adjusting bolt all the way in. Adjustment must be made at the clutch housing.

Loosen the lower clutch cable adjusting lock nut and turn the adjusting nut all the way in.

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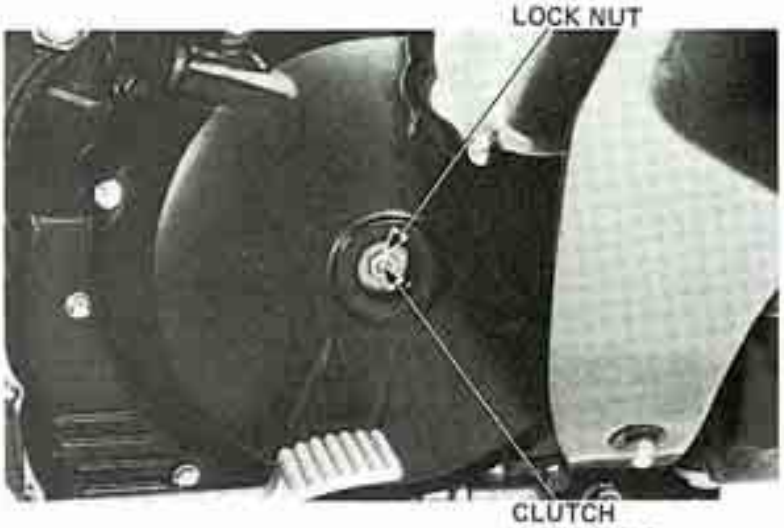
Remove the clutch lifter cap and loosen the clutch lifter lock nut. Turn the adjusting screw in until a slight resistance is felt. From this position, turn the clutch adjusting screw counterclockwise 1 turn, and tighten the lock nut.

Turn the clutch cable 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.
Any minor adjustment can be obtained with the adjusting bolt and lock nut at the clutch lever.

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

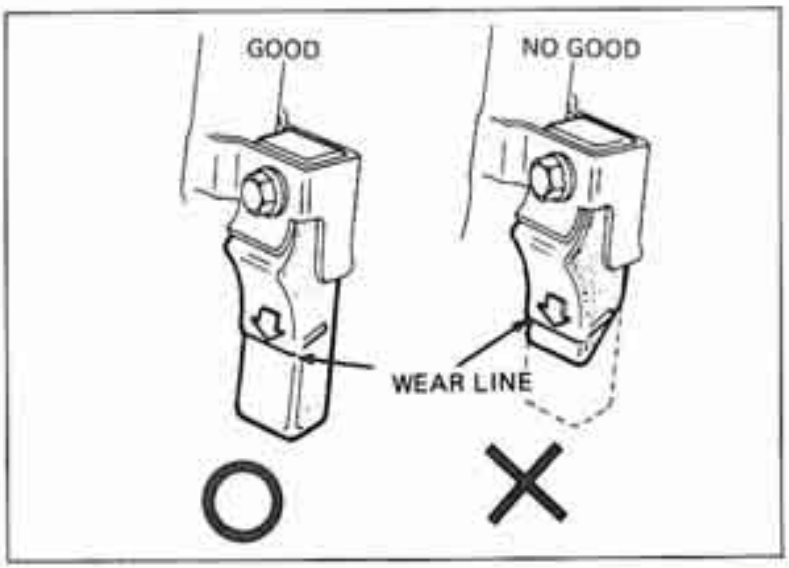


SIDE STAND

Check the rubber pad for deterioration or wear.
Replace if any wear extends 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 rider control.

FRONT

With the front brake applied, pump the front forks up and down several times.
Place the motorcycle on the center stand.

Measure the air pressure.

STANDARD:
70 ± 20 kPa (0.7 ± 0.2 kg/cm², 10 ± 3 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/cm², 43 psi). Do not exceed this or fork tube component damage may occur.*

Check the entire fork assembly for leaks or damage.
Replace any components which cannot be repaired.
Tighten all nuts and bolts.

REAR

Place the motorcycle on its center stand.
Move the rear wheel sideways forcefully to see if the swing arm bushings are worn.
Replace if excessively worn.
Check the entire suspension assembly to see if it is securely mounted, and not damaged or distorted.
Tighten all nuts and bolts.
Lubricate the swing arm bushings.

Measure the air pressure.

STANDARD:
200–400 kPa (2.0–4.0 kg/cm², 28–57 psi)

Adjust the rebound damping according to the following chart.

Recommended Rear Suspension Adjustment:

Rear Air Pressure	Rider/ Load	REBOUND DAMPING ADJUSTER	RIDING CONDITIONS
200 kPa (2.0 kg/cm², 28 psi) ↓ 400 kPa (4.0 kg/cm², 57 psi)	One ↕ Up to vehicle capacity load	1	General or around town riding.
		2	Highway or winding road riding
		3	Rough road riding

Rebound damping adjuster

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WHEELS

TIRE PRESSURE

NOTE

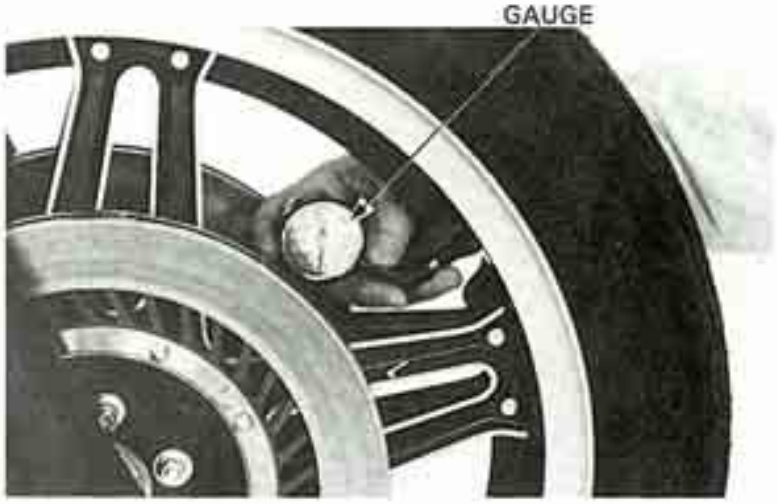
Tire pressure should be checked when tires are **COLD.**

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

Recommended tire pressure and tire size:

Cold tire pressure kPa (kg/cm^2, psi)	Front Rear Max load	250 (2.5, 36) 250 (2.5, 36) 290 (2.9, 41)
Vehicle capacity load limit	175 kg (385 lbs)	
Tire size	Front Rear	3.50V19–4PR 130/90 V18
Tire brand Tubeless only	Front	GOLD SEAL F11 (DUNLOP) MaG. MOPUS-706 (BRIDGESTONE)
	Rear	GOLD SEAL K127 (DUNLOP) MaG. MOPUS-G508 (BRIDGESTONE)

Check the front and rear wheels for trueness (page 14-5).

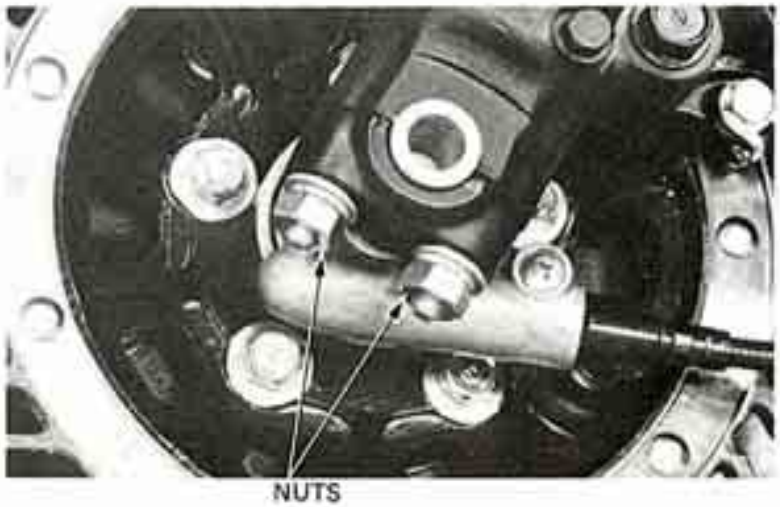


STEERING HEAD BEARINGS

NOTE

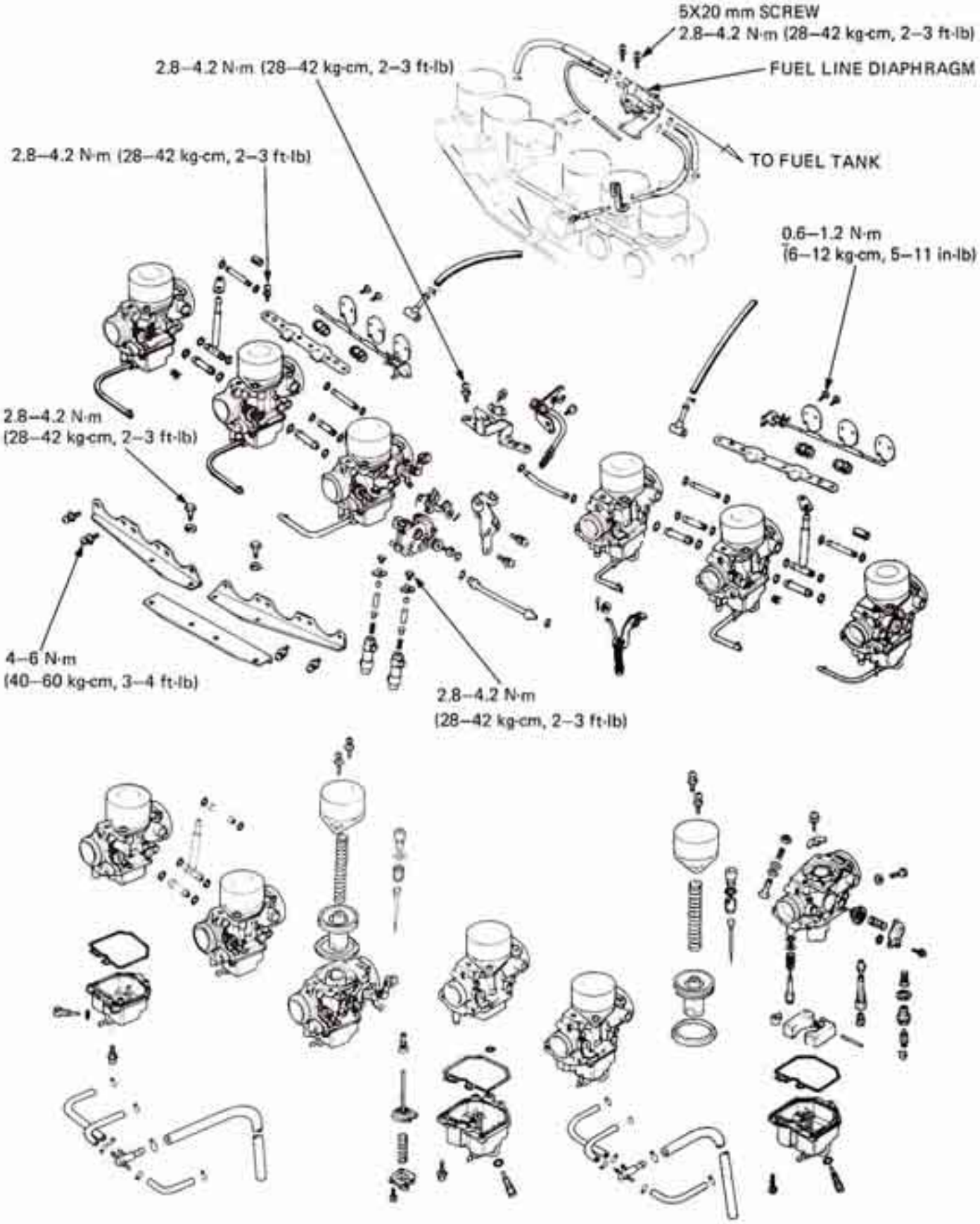
Check that the control cables do not interfere with the handlebar rotation.

Raise the front wheel off the ground.
Check that the handlebar rotates freely.
If the handlebar moves unevenly, binds, or has vertical movement, adjust the steering head bearing by turning the steering head adjusting nut with a pin spanner. (page 13-27).



NUTS, BOLTS, FASTENERS

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



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GENERAL INFORMATION

GENERAL INSTRUCTIONS

- 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 with new ones on re-assembly.
- 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 screw is factory pre-set and should not be removed unless the carburetor is overhauled.

TOOLS

Common	
Float level gauge	07401–0010000
Special	
Carburetor Throttle Wrench	07908–4220100 (for No. 1, 2, 3 and 4) 07908–4600000 (for No. 5 and 6)
Carburetor Pilot Screw Wrench	07908–4220200 or 07908–4220201

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, 5–11 in-lb)
Front and rear brackets between three carburetors	2.8–4.2 N·m (28–42 kg-cm, 24–36 in-lb)
Throttle joint holding nut	2.8–4.2 N·m (28–42 kg-cm, 24–36 in-lb)

SPECIFICATIONS

Venturi dia.	28 mm (1.1 in)
Setting mark	V864A
Float level	15.5 mm (0.61 in)
Main jet	#105
Idle speed	900 ± 100 rpm
Throttle grip free play	2–6 mm (0.08–0.24 in)
Fast idle	2,000 ± 500 rpm after break-in
Pilot screw	See page 4-28

TROUBLESHOOTING

Engine Cranks but Won't Start
1. No fuel in tank
2. No fuel to carburetor
   - Fuel line diaphragm vent tube clogged
   - Fuel line diaphragm vacuum tube clogged
   - Clogged fuel line diaphragm
   - Clogged fuel line diaphragm check valve
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 or accelerator pump

Backfiring
1. Ignition malfunction
2. Carburetor malfunction
3. Faulty air cutoff valve or accelerator pump

Poor Performance (Driveability) and Poor Fuel Economy
1. Fuel system clogged
2. Ignition malfungtion
3. Faulty accelerator pump

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 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. Choke stuck closed
5. Stuck closed air cutoff valve
6. Clogged air cleaner

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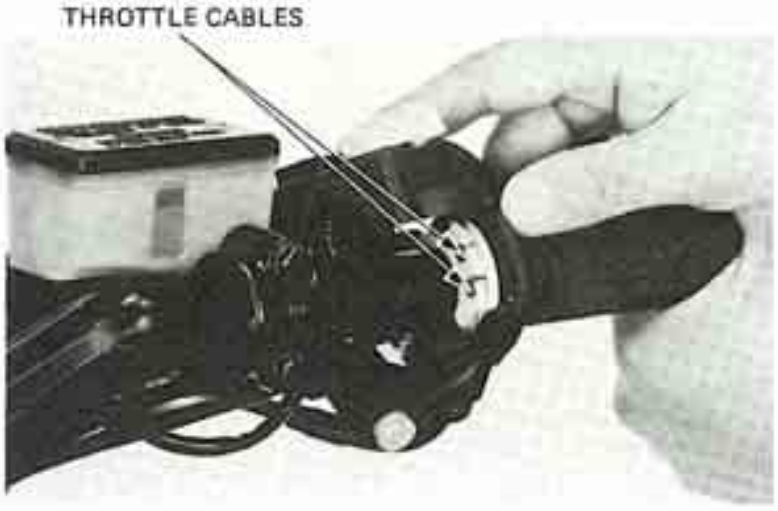
CARBURETOR REMOVAL

NOTE

To remove the carburetors, the engine must be tilted.
Refer to Section 5 "ENGINE REMOVAL AND INSTALLATION".

Remove the front fairing and leg shields.
Disconnect the throttle cables at the throttle housing before tilting the engine.
Remove the choke cable at the left handlebar switch housing.



Loosen the carburetor manifold bands.
Remove the carburetor assembly with the chamber.

NOTE

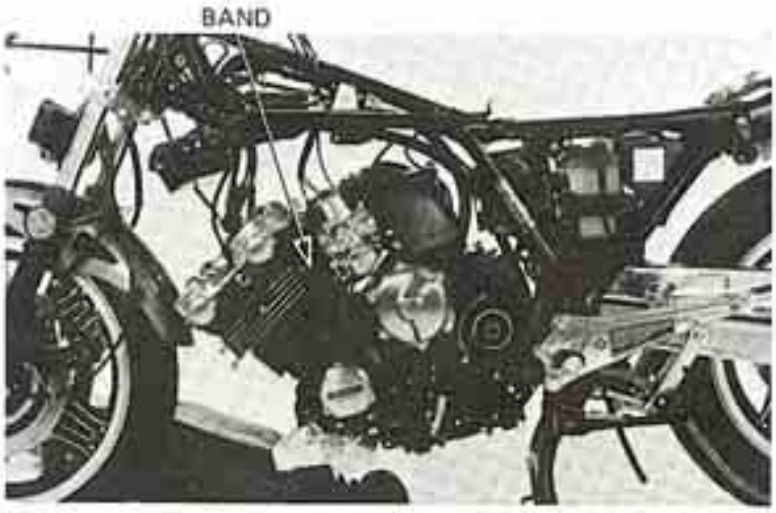
For easy removal, loosen the cylinder head side bands.

CAUTION

Apply equal force to each carburetor.

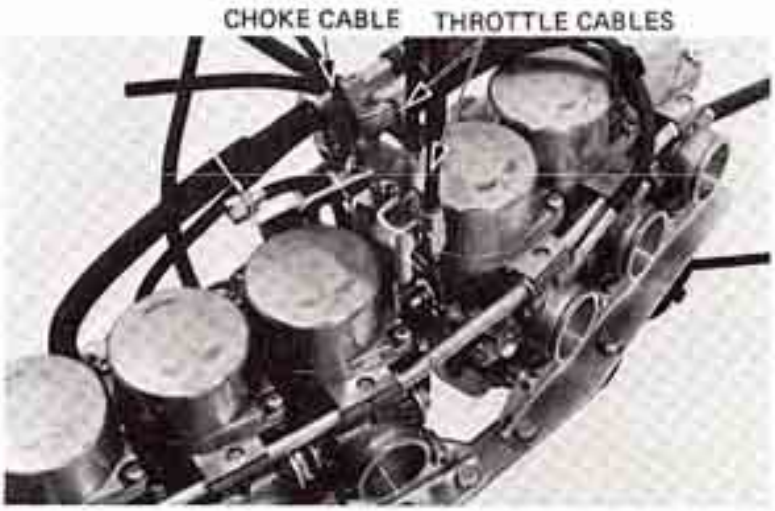
Loosen the air cleaner connecting band.
(For more information, refer to Section 5).

Tilt the engine.

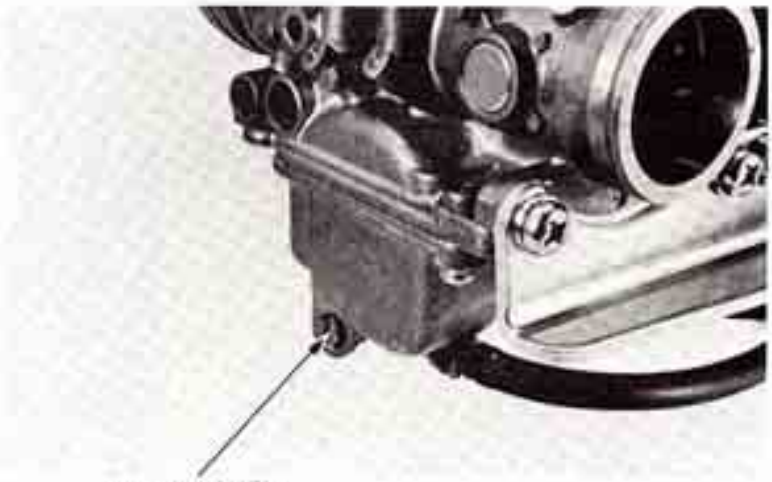


Remove the air chamber from the carburetor.

Disconnect the throttle and choke cables.



Drain the fuel by loosening each drain screw.



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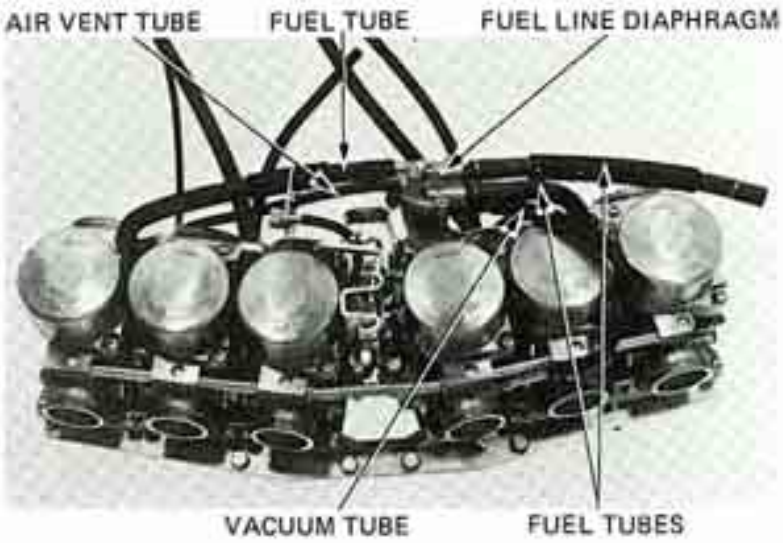
FUEL LINE DIAPHRAGM

Disconnect the fuel tubes, vacuum tubes 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 tube from the diaphragm, and connect a longer tube to the fuel tank.

Place a suitable drainage container under the outlet fuel tubes.

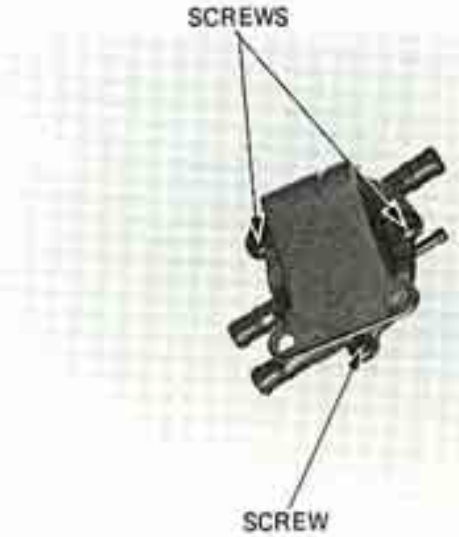
Turn the fuel valve on. Fuel should not flow from the outlet tubes.

Connect a vacuum 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, check the diaphragm for clogged fuel or air passages and the diaphragm itself for tears.

DISASSEMBLY

Disassemble the upper body, spacer, spring and lower body by removing the screws shown.

Disassemble the spacer, being careful not to damage the diaphragm.

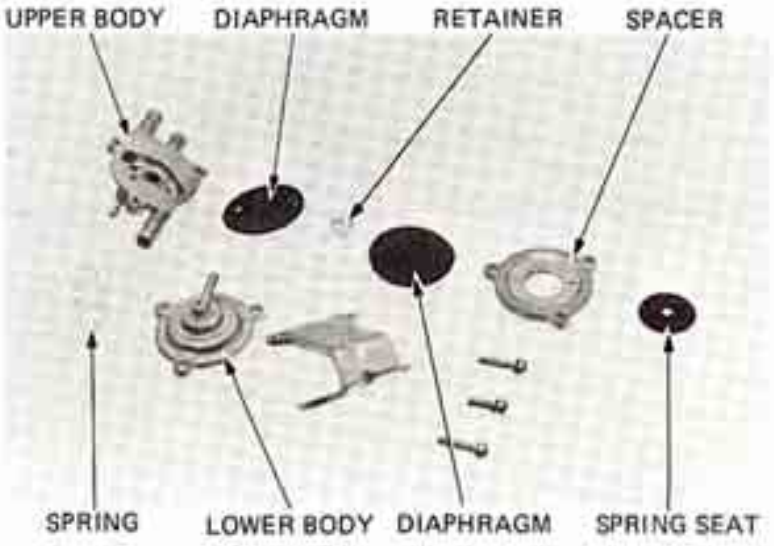


Check the upper and lower bodies for signs of damage to the diaphragm contacting faces.

Check the diaphragms for damage, cracks or other faults.
Check the bodies and spacer for clogged vent holes.

Check the diaphragm seal for damage.

Check for clogged fuel or air passages.



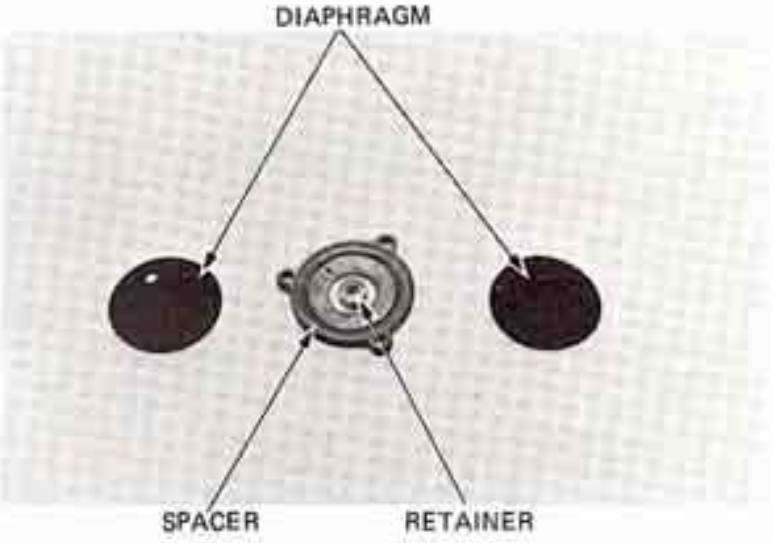
ASSEMBLY

Clean all the disassembled parts in solvent and allow to dry.

Install the spacer and diaphragm retainer.
Install the spring seat.

NOTE

Check that the diaphragm is installed in the retainer properly.

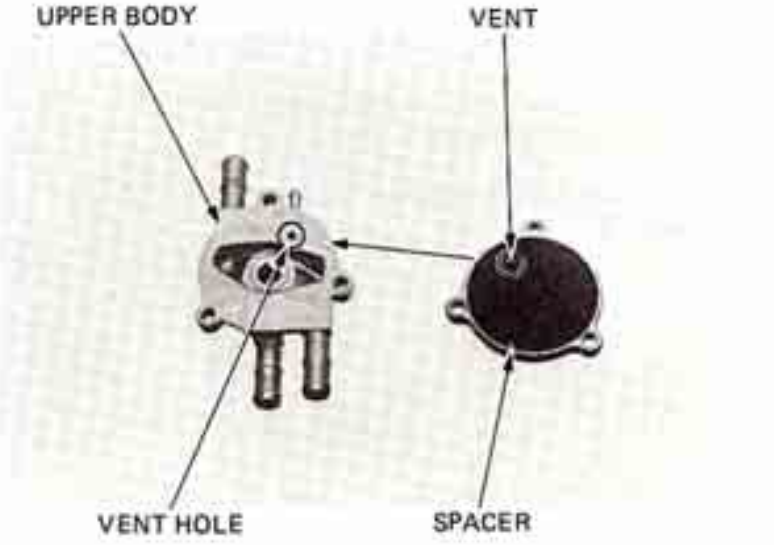


Install the spacer on the upper body.

NOTE

Align the air vent hole in the body with the air passage in the spacer.

Install the diaphragm spring and lower body.
Install the bracket and tighten the screws.



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VACUUM CYLINDER DISASSEMBLY

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

NOTE

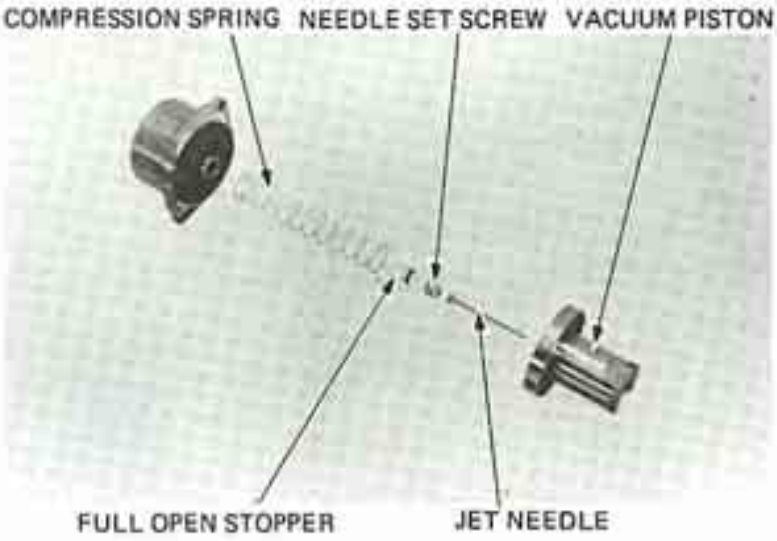
Inspect the vacuum piston and cylinder for wear, nicks, scratches or other damage. Make sure that the piston and jet needle move up and down freely in the cylinder.

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

NOTE

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

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



Blow open the primary main air jet, secondary main air jet and slow air jet with compressed air.

NOTE

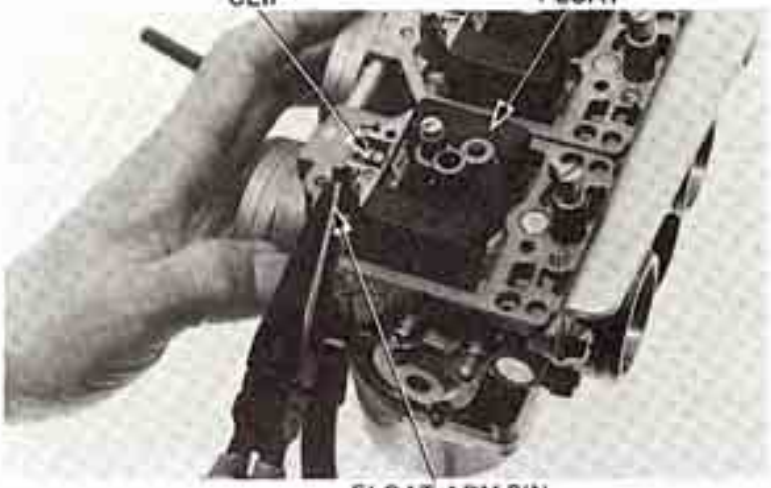
Never clean carburetor jets with wire or drills. This will enlarge the openings and result in excessive fuel consumption.

FLOAT CHAMBER DISASSEMBLY

Remove the float chamber body.
Remove the float arm pin.
Remove the float and float valve.

NOTE

Remember the direction of the clip to ensure correct reassembly.

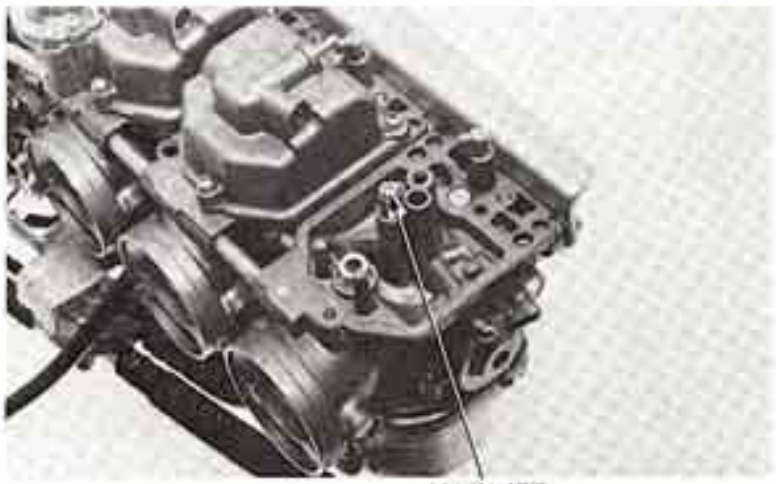


Inspect the float valve and seat for grooves, nicks or deposits.
Inspect the float valve for operation.

Remove the secondary main jet.
Remove the primary main jet.
Remove the slow jet plug.

NOTE

The slow jet is a press fit. It cannot be removed.



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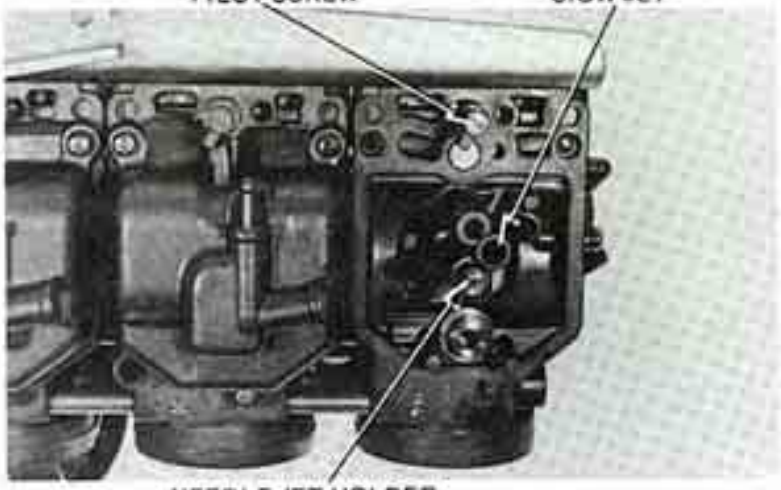
Remove the needle jet holder.
Tilt the carburetor to remove the needle jet.
Blow all jets and body passages with compressed air.

NOTE

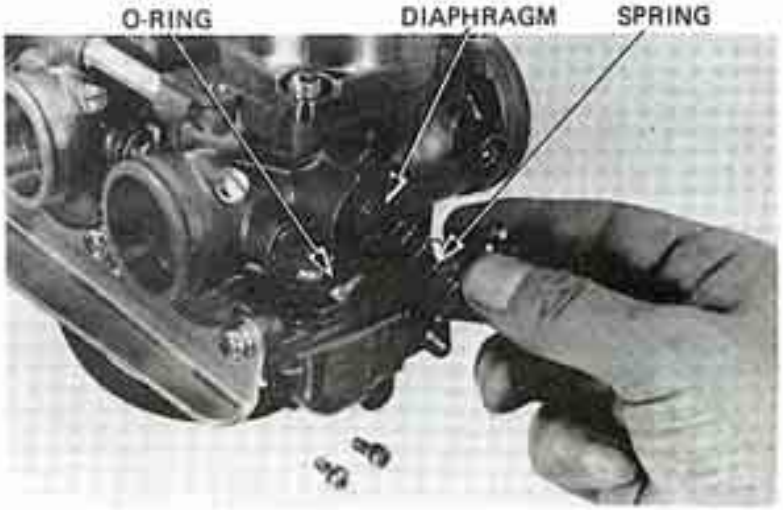
- If the needle jet is difficult to remove, carefully press the needle jet from the cylinder side with a wooden stick.
- Before removing the pilot screw, record the number of turns until it seats. Do not damage the pilot screw threads when removing the plain washer and O-ring.



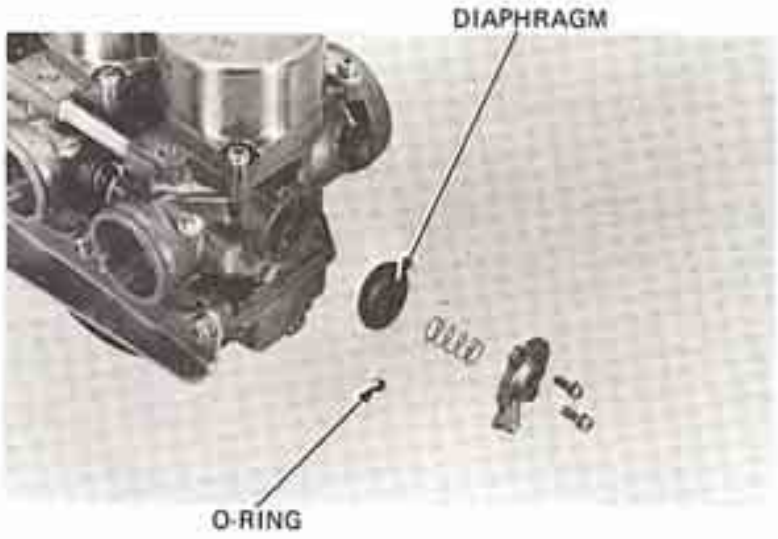
AIR CUTOFF VALVE DISASSEMBLY

Remove the air cutoff valve cover and spring.

Remove the diaphragm and O-ring.



Inspect the diaphragm and valve for cracks and brittleness.



ACCELERATOR PUMP DISASSEMBLY

Remove the accelerator pump cover and spring.

Remove the diaphragm.
Inspect the diaphragm for cracks and brittleness.

NOTE

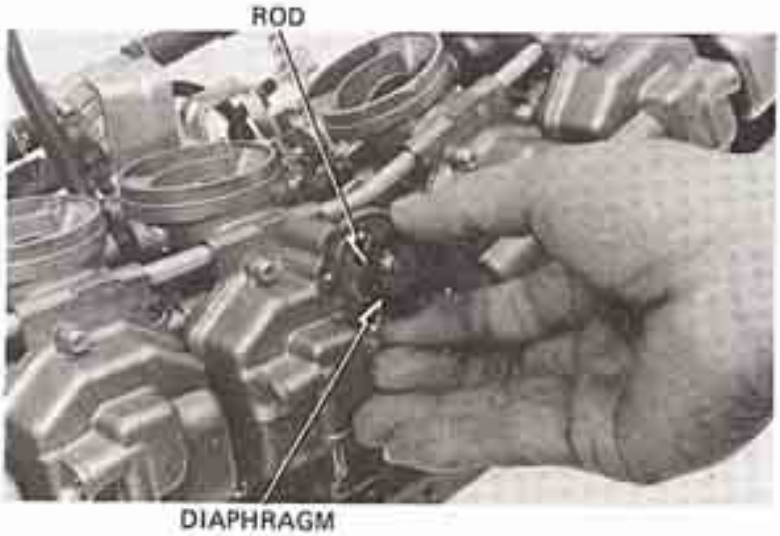
Be sure the rod is not bent.

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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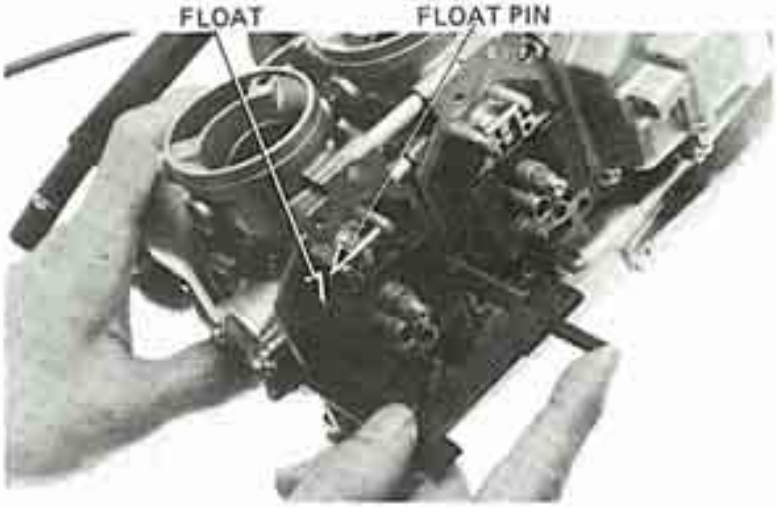
FLOAT LEVEL ADJUSTMENT

Adjust the float level by bending the float arm carefully until the float tip just contacts the float valve.

FLOAT LEVEL: 15.5 mm (0.61 in)

NOTE

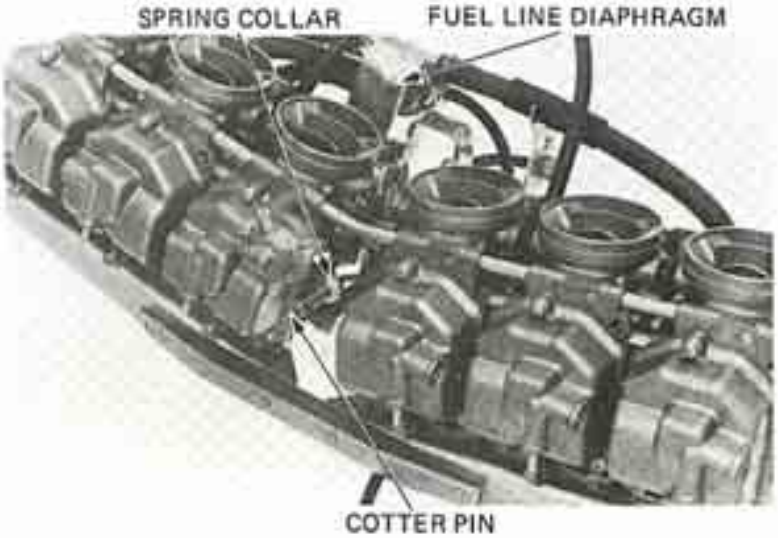
Before adjusting, remove the adjacent chambers.



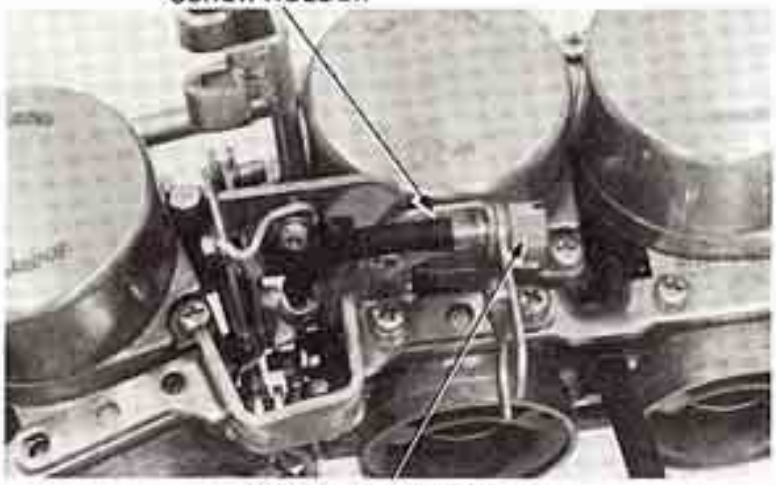
CARBURETOR SEPARATION

Disconnect the overflow tubes from the float chambers.

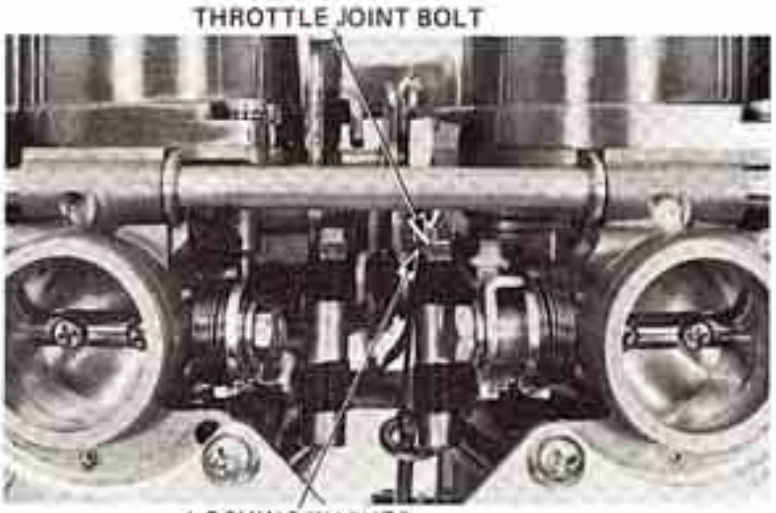
Remove the cotter pin from the accelerator pump rod.
Remove the plain washer, spring and spring collar.
Remove the fuel line diaphragm (page 4-5).



Remove the throttle stop screw holder.
Turn the throttle stop screw out.



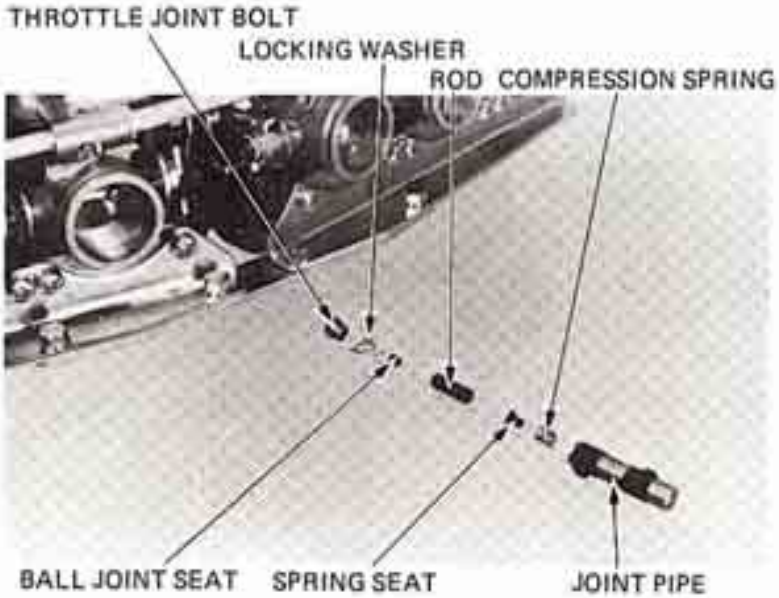
Straighten the throttle joint bolt locking washer tabs.



Loosen the throttle joint bolt.
Remove the locking washer and ball joint seat.
Disconnect the ball joint of the throttle link from the throttle joint pipe.
Remove the rod.
Disconnect the throttle joint pipe from the No. 3 carburetor throttle linkage.
Note each parts location to insure original assembly.

NOTE

For easy removal, hold the joint pipe and turn the throttle link.



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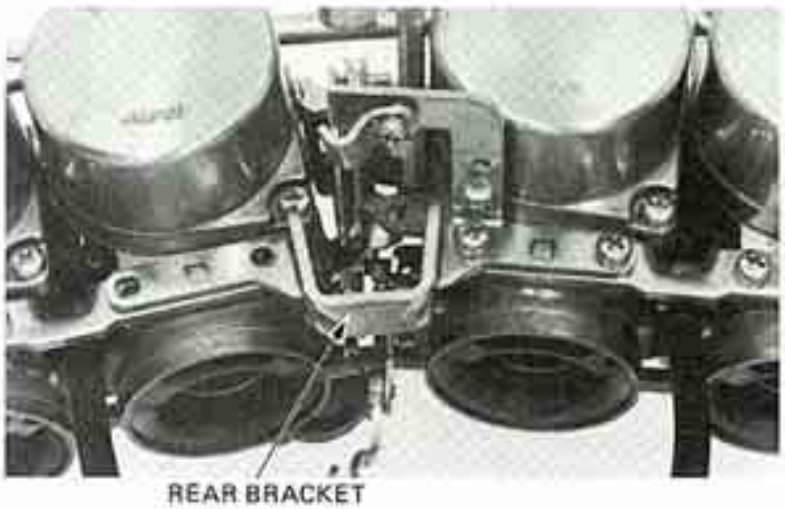
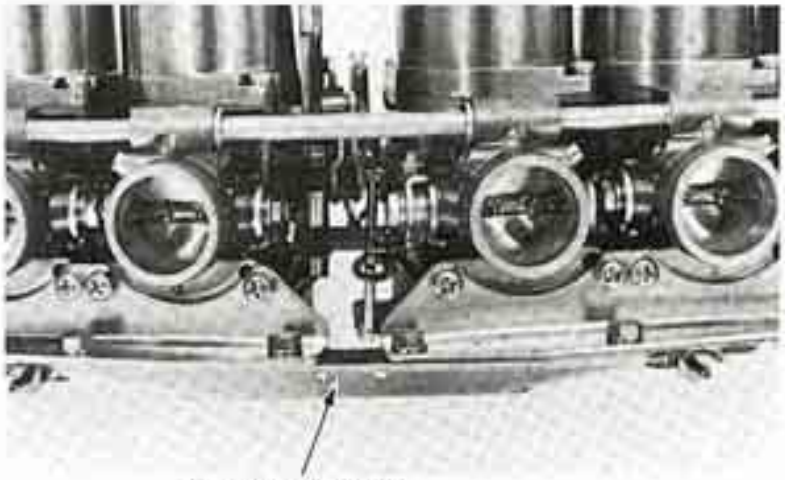
Remove the rear bracket.



REAR BRACKET

Remove the front bracket.

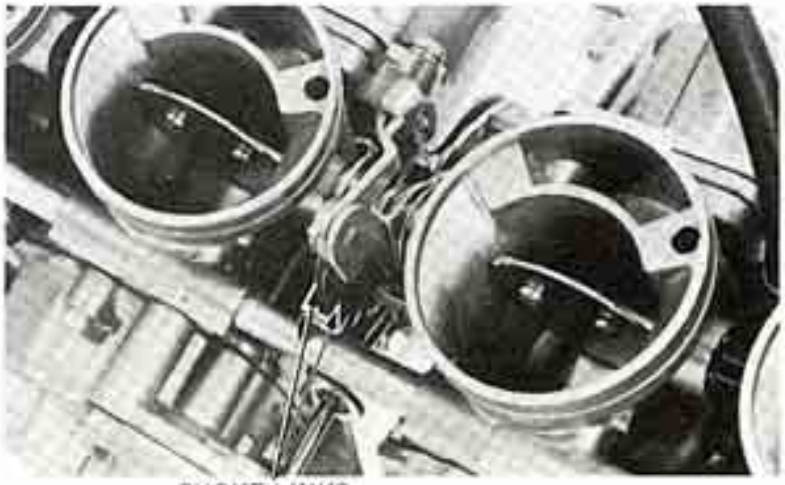


FRONT BRACKET

Carefully separate the carburetors.

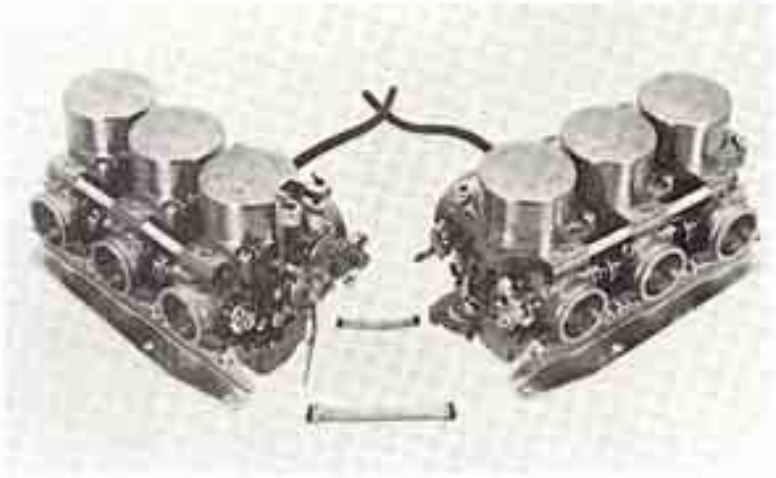
CAUTION

- *Separate the carburetor horizontally to prevent damage to the fuel and air joint pipes and choke link. Then, tilt the right carburetor assembly to clear the accelerator pump rod.*
- *Do not bend the accelerator pump rod.*



CHOKE LINKS

Blow the air and fuel passages with compressed air.



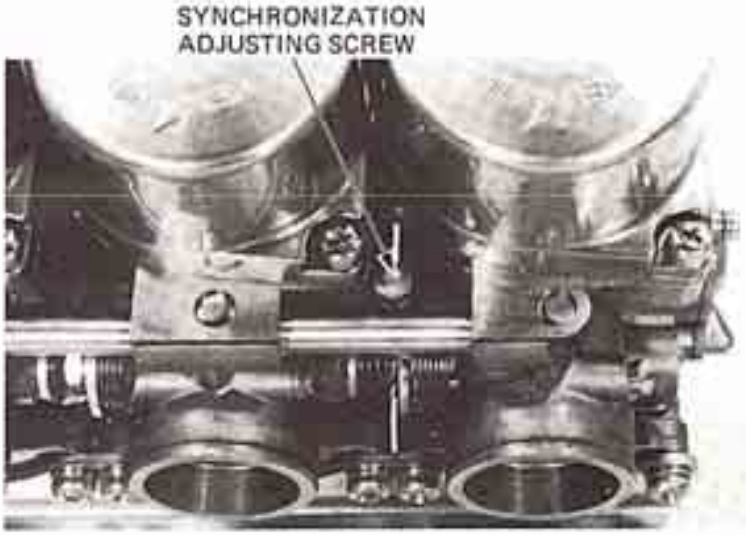
NOTE

The separation of the No. 1, 2 and 3 carburetors is given here. The procedure is similar for No. 4, 5 and 6 carburetors.

Loosen the synchronization adjusting screw lock nuts and adjusting screw with the carburetor throttle wrench until there is no tension.

NOTE

Turn the synchronization screws in until they seat and note the number of turns to ensure correct repositioning.



Cut off the staked ends of the choke valve screws. Remove the choke valves.

NOTE

Do not allow filings to enter the carburetors.

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

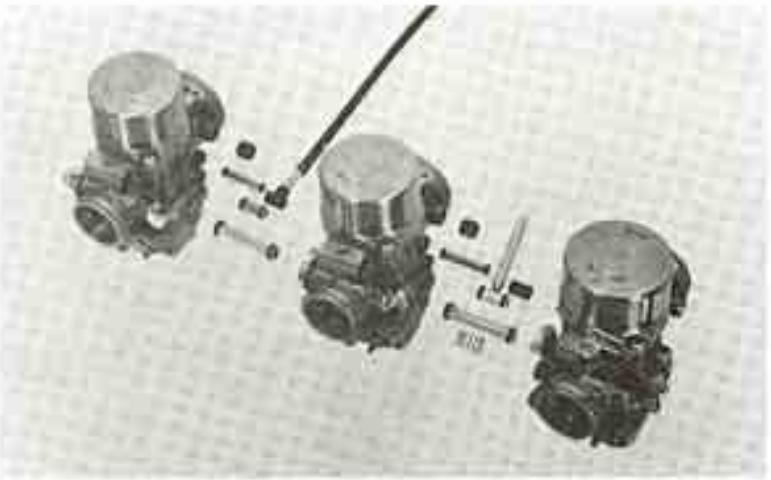
CAUTION

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

RELIEF SPRING

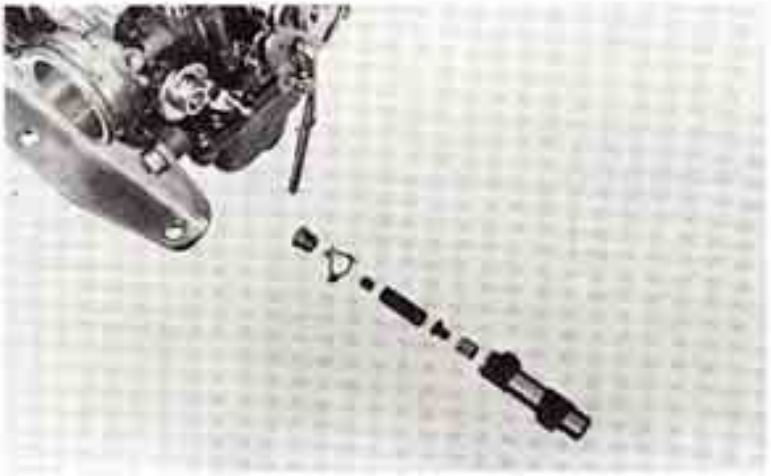
Remove the rear and front brackets.

Carefully separate the carburetors.
Blow the air and fuel joint pipes with compressed air.



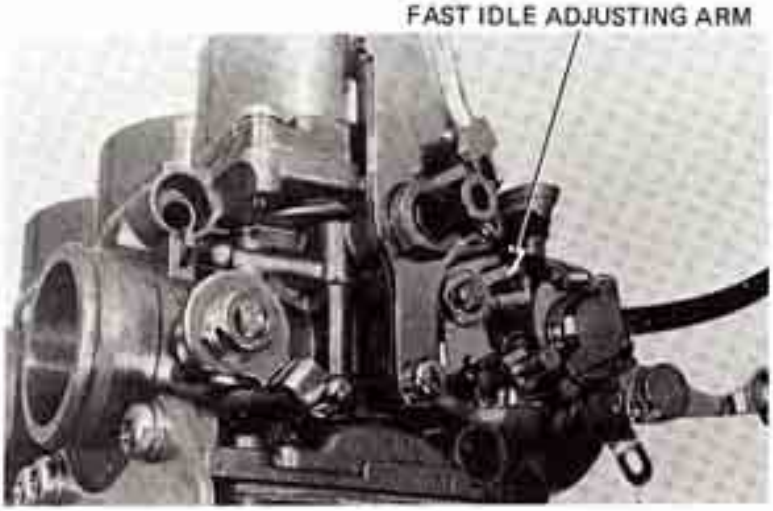
LINKAGE DISASSEMBLY

Remove the right throttle joint, using the same procedure as for the left throttle joint.



Remove the throttle link bolt.
Remove the throttle link.

Remove the fast idle adjusting arm cotter pin.
Remove the fast idle adjusting arm.



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CARBURETOR ASSEMBLY

NOTE

- Assemble one set of three carburetors at a time.
- No. 1, 2 and 3 carburetor assembly is shown here. The procedure is similar for the No. 4, 5 and 6 carburetors.

Install new O-rings on the air and fuel joint pipes securely.
Install the air cutoff valve joint, fuel joint, accelerator pump joint and air vent pipes on the No. 3 carburetor.
Install the choke dust tube.

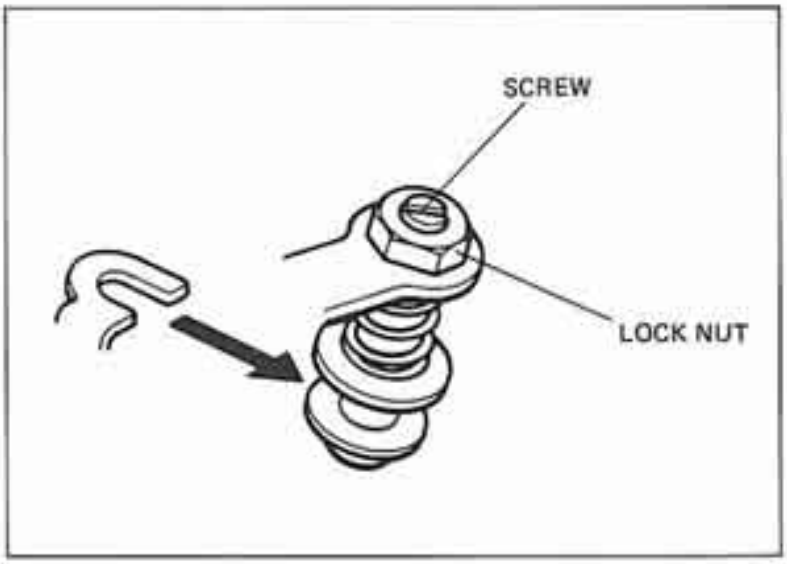
NOTE

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

Loosen the synchronization adjusting screw until there is no tension.
Insert the No. 3 carburetor throttle link between the plain washers.
Assemble the No. 2 and No. 3 carburetors, pressing them together carefully.

NOTE

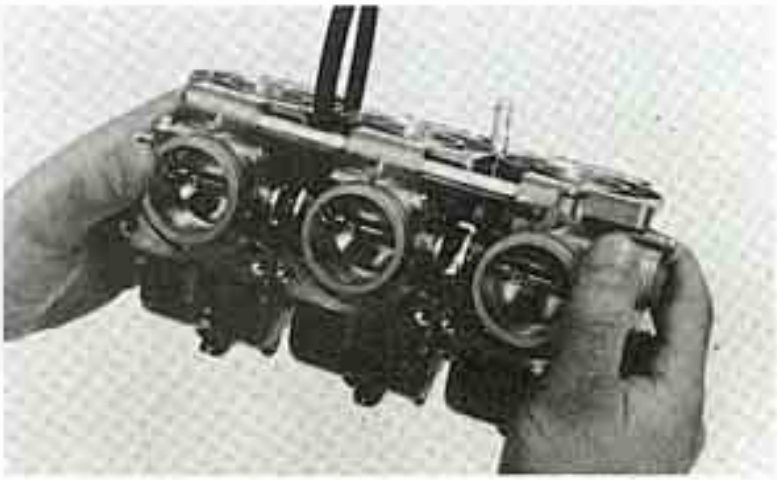
The large washer should be positioned on the spring side.



Attach the No. 1 carburetor to the No. 2 carburetor, pressing them together carefully.

NOTE

Check the condition of the O-rings and choke dust tubes.

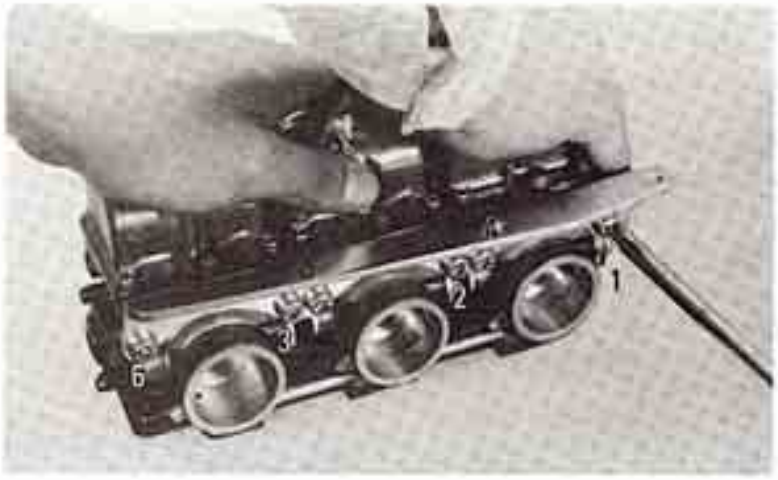


Install the front bracket loosely.
Place the carburetors on a flat surface with the float chamber up.
Press the carburetors together equally and tighten the screws in the sequence shown in two or more steps to prevent carburetor misalignment.

TORQUE: 4–6 N·m (40–60 kg-cm, 35–52 in-lb)

NOTE

Insert the choke shaft to ensure correct carburetor alignment before tightening screws. Check that the choke shaft operation is smooth. If it is not, recheck the carburetor alignment.

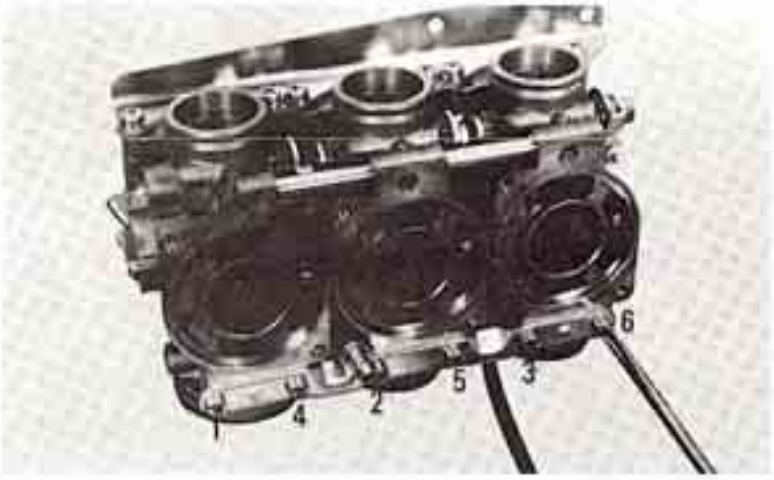


Install the rear bracket using the same procedure as for the front bracket.

TORQUE: 2.8–4.2 N·m (28–42 kg-cm, 24–36 in-lb)

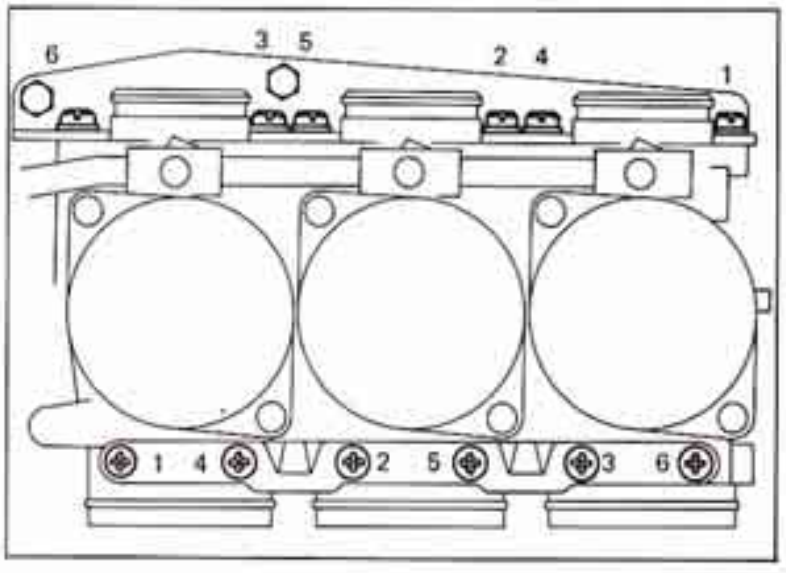
NOTE

No. 3 and No. 4 carburetors require 5 x 16 mm screws. The other carburetors require 5 x 12 mm screws.



NOTE

Right carburetor screw tightening sequence is shown here.



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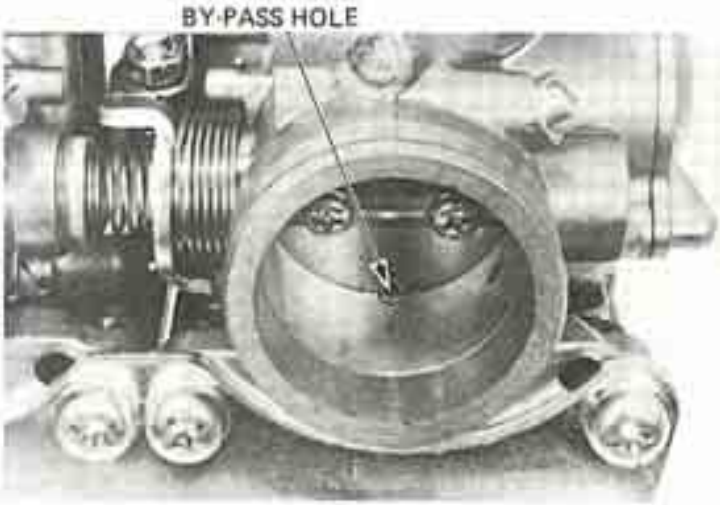
Install the thrust spring between the No. 1 and No. 2 carburetor throttle valve links.

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

NOTE

Make each distance between the by-pass hole in the carburetor body and throttle valve equal when assembling new carburetors.



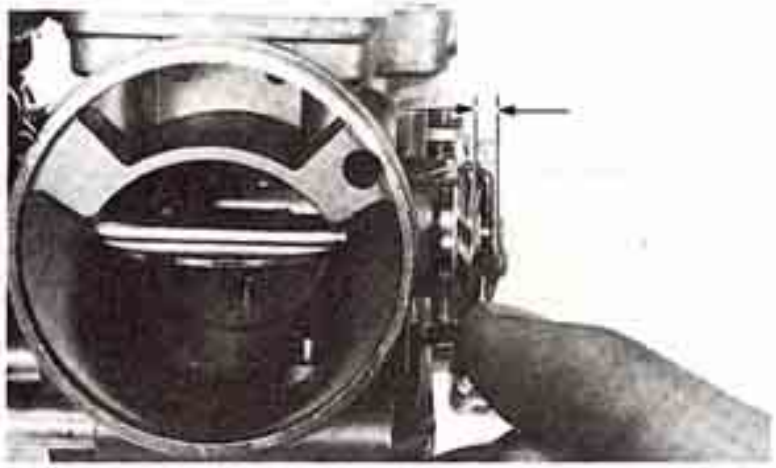
Inspect throttle operation as described below:

- Open the throttle slightly by pressing the No. 3 carburetor ball joint. Then release the throttle.
- Make sure that it returns smoothly.
- Make sure that there is no drag when opening and closing the throttle.

Install a new choke shaft.

Check that choke shaft operation is smooth and it does not bind during installation. If it binds, the carburetors may not be properly aligned or the shaft may be bent.

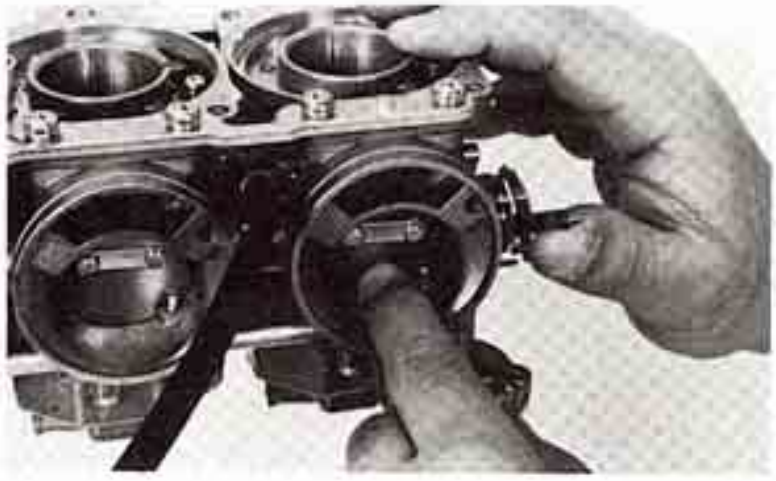
Slide the choke relief spring over the choke shaft.
Install the choke shaft.
Install the choke valve, but do not tighten the bolts.
Make sure that the clearance between the choke shaft lever and carburetor body is approximately 1 mm (0.04 in).



Attach the choke relief spring to the choke link and choke shaft lever.

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

Close the choke valve by turning the choke link.
Hold the choke link.
Press the choke valve end to the fully opened position.
Release the choke valve, then make sure that it returns smoothly.



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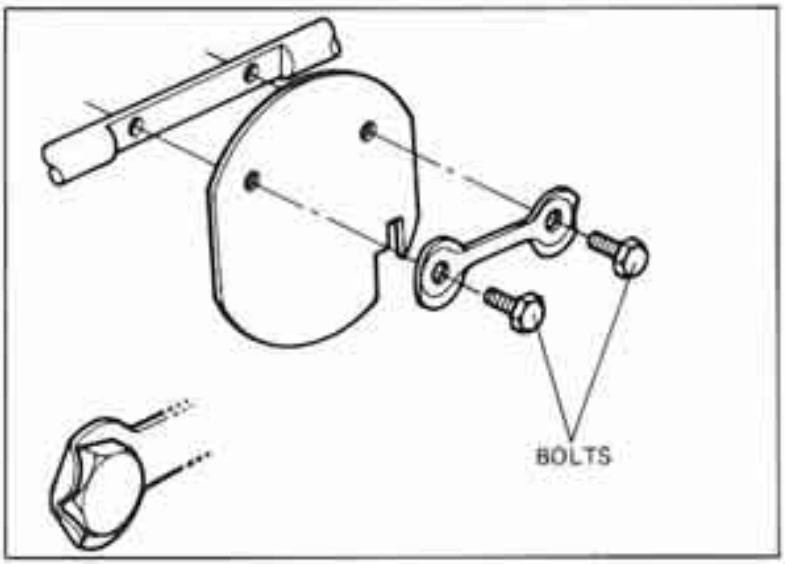
Tighten the choke valve bolts.
TROUBLE: 0.6–1.2 N·m (6–12 kg-cm, 5–11 in-lb)

Fold the tabs of the lock washer up.
Recheck the throttle and choke operation.

NOTE

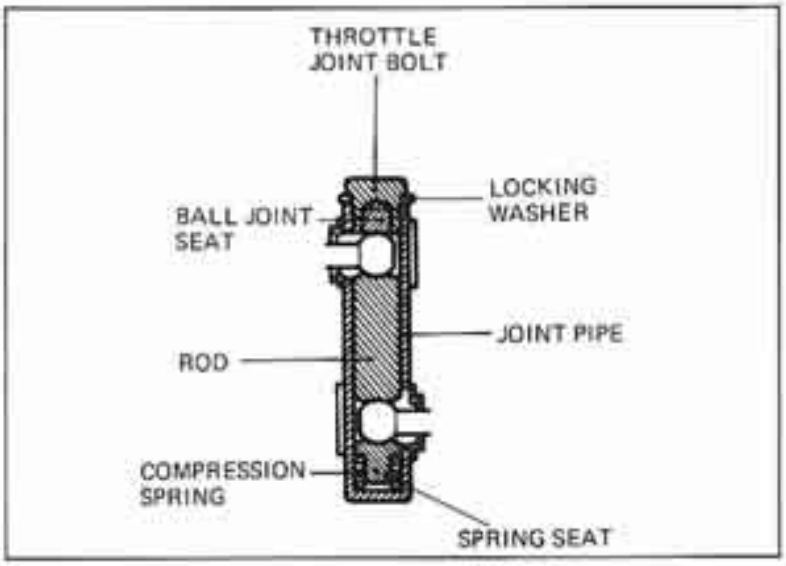
The choke valve bolts and lock washer are for rebuilding assembly only. The original assembly uses staked screws.



Loosen the No. 3 and No. 4 carburetor rear bracket screws.
Connect the throttle joint to the throttle link.

CAUTION

- *Do not damage the ball joints and rubber grommets.*
- *Do not allow dust in the throttle joint pipe.*
- *Use a new locking washer.*

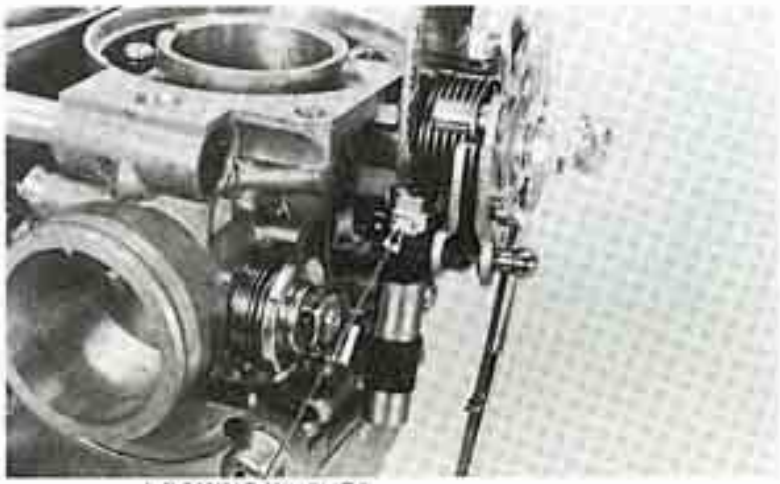


Tighten the throttle joint bolt.
TORQUE: 2.8–4.2 N·m (28–42 kg-cm, 24–36 in-lb)

Secure the bolt by bending the tabs of the locking washer.

NOTE

- Bend the two small tabs up against the bolt head.
- Bend the center tab over the throttle joint flat.



LOCKING WASHER

FAST IDLE ADJUSTMENT

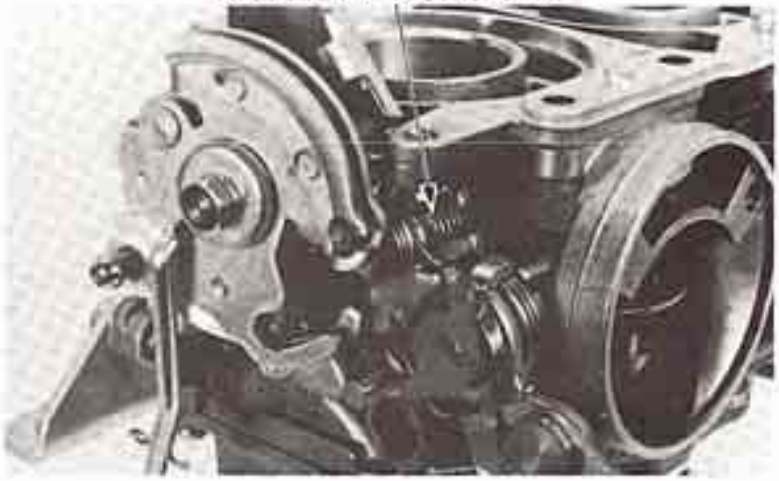
FAST IDLE: 2000 ± 500 rpm (after break-in)

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

SPECIFIED CLEARANCE:
0.7–1.0 mm (0.003–0.04 in)

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

FAST IDLE ADJUSTING ARM



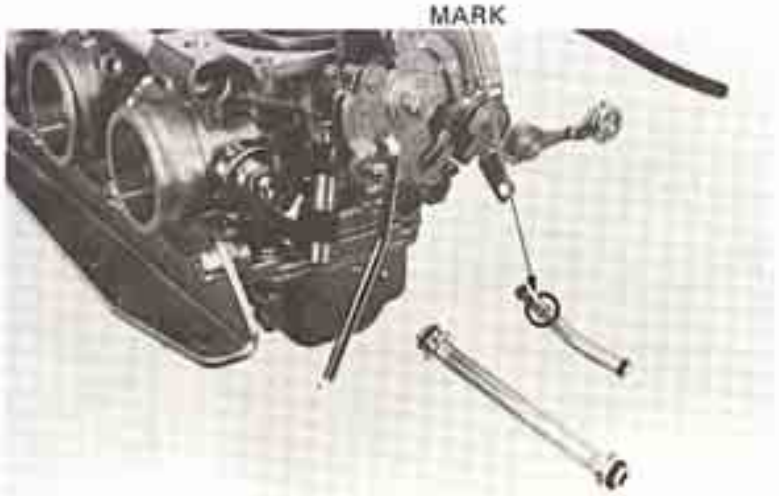
INSTALLATION

Install new O-rings on the air and fuel joint pipes. Install the air cutoff valve joint pipe and accelerator pump joint pipe on the No. 4 carburetor.

NOTE

- Apply a thin coating of oil to the O-rings.
- Install the accelerator pump joint pipe with the mark toward the No. 4 carburetor.

MARK



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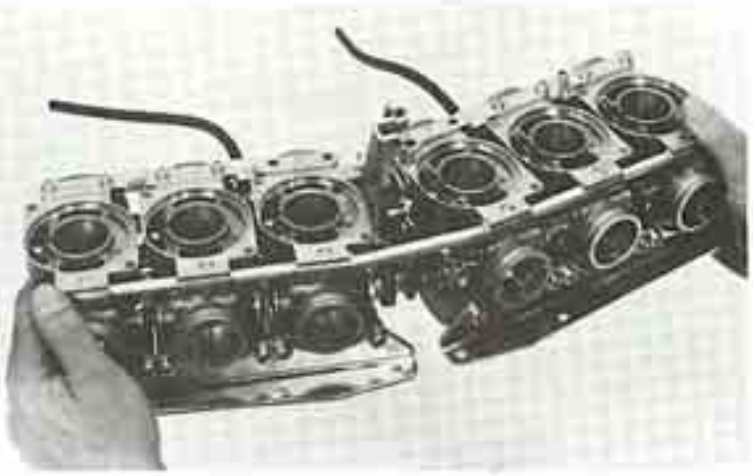
Insert the accelerator pump rod.
Position the right and left carburetor assemblies properly, aligning the pipes and choke link.

Press the assemblies together carefully.



Install the diaphragm bracket, front and rear brackets loosely.

Connect the other throttle joint to the throttle link.
Tighten the throttle joint bolt.
Secure the bolt by bending the tabs of the locking washer as for the previous throttle joint.

TORQUE
2.8–4.2 N·m (28–42 kg-cm, 24–36 in-lb)

LOCKING WASHER

Tighten the front and rear brackets in the sequence shown.

TORQUE:
2.8–4.2 N·m (28–42 kg-cm, 24–36 in-lb)

SYNCHRONIZATION ADJUSTING SCREW

Turn the synchronization adjusting screw on the No. 3 carburetor so that all throttle valve positions are equal.

Move the throttle link to check throttle operation.

Move the choke link to check choke operation and synchronization.

THROTTLE STOP SCREW

Install the accelerator pump rod spring, washer, collar and cotter pin.
Install the throttle stop screw.
Install the vacuum cylinder components.
Install the overflow tubes.
Remove the diaphragm bracket and assemble the fuel line diaphragm.
Reinstall the fuel line diaphragm.

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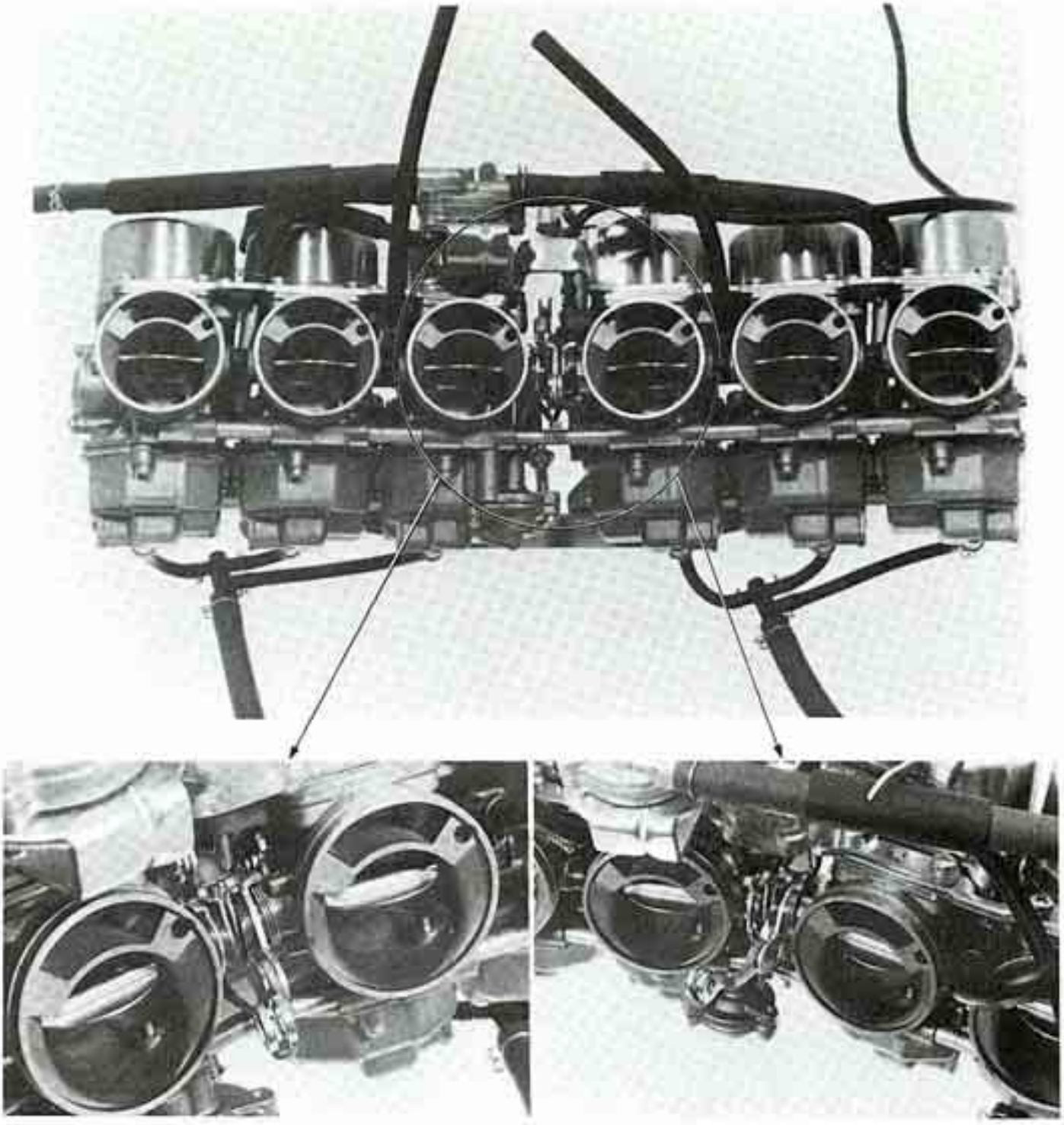
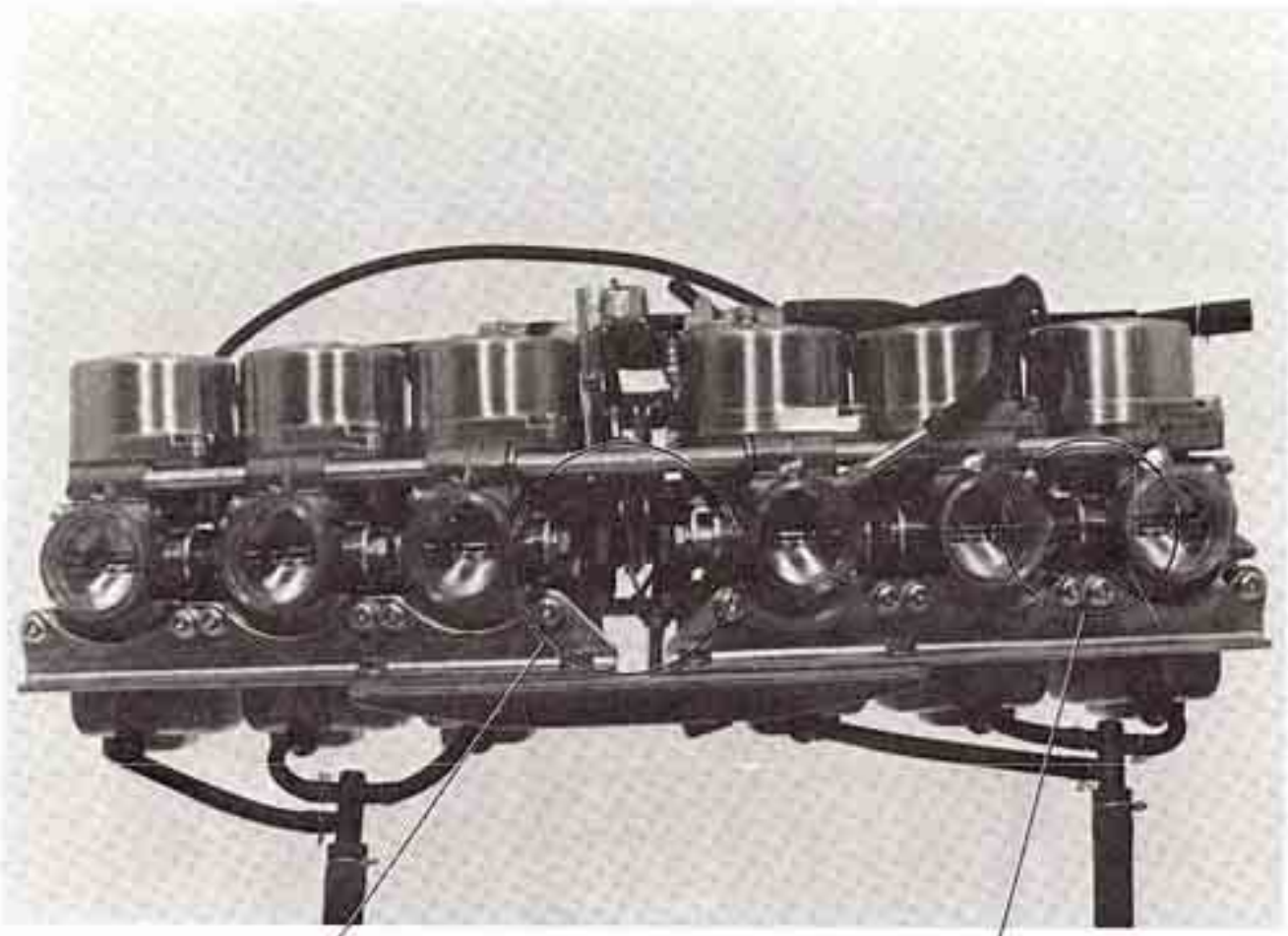


These photographs here and on the nex page show the details of the carburetor linkage.



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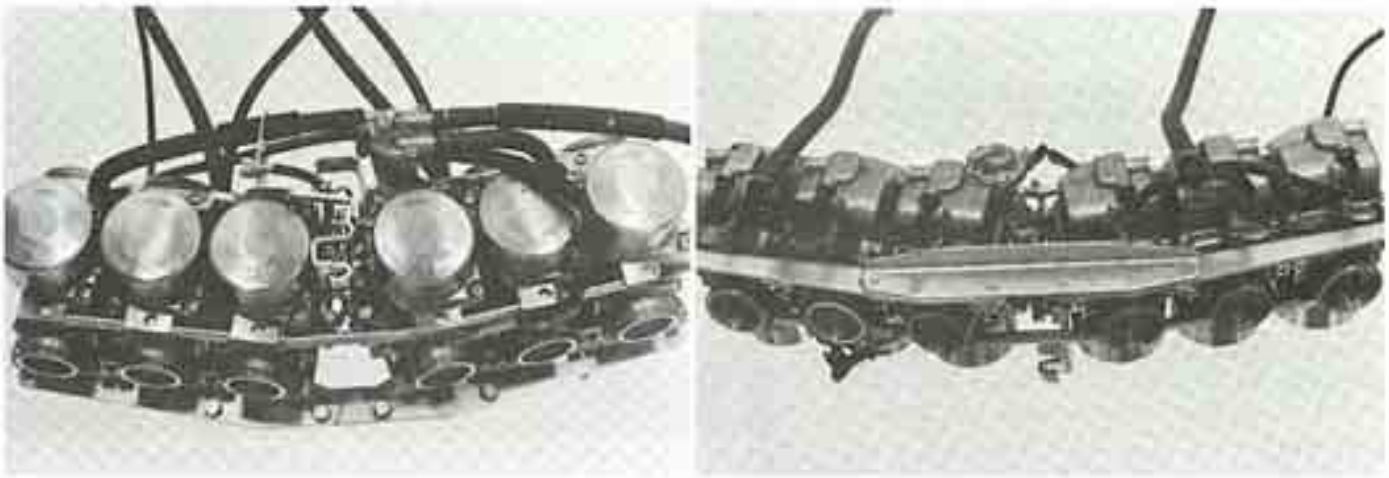
TUBE ROUTING

Route the carburetor tubes as shown.



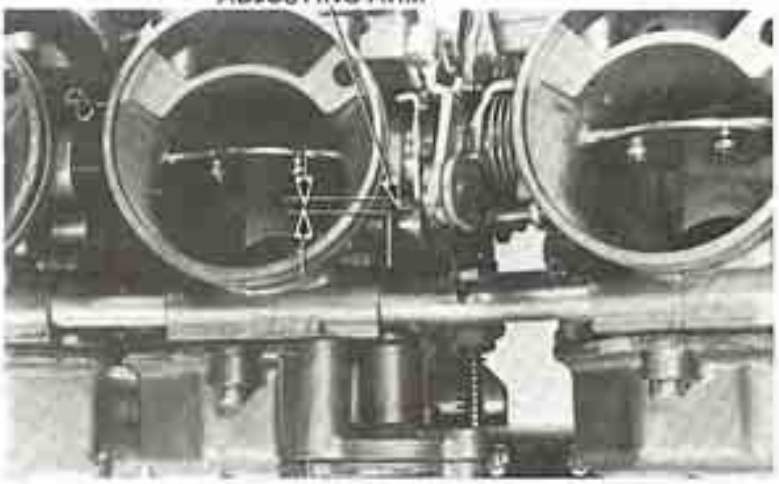
ACCELERATOR PUMP ADJUSTMENT

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

CLEARANCE: 0–0.04 mm (0–0.0016 in)

Adjust by bending the adjusting arm.

ADJUSTING ARM



Measure the clearance between the adjusting arm and stopper on the carburetor body.

CLEARANCE: 3.1–3.3 mm (0.12–0.13 in)

Adjust by bending the adjusting arm.

ADJUSTING ARM

PILOT SCREW ADJUSTMENT

PILOT SCREW REMOVAL

NOTE

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

Remove the carburetors. (Page 4-3).

Remove the float chambers (Page 4-6).

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.

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 (below).

NOTE

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

PILOT SCREW WITH LIMITER CAP

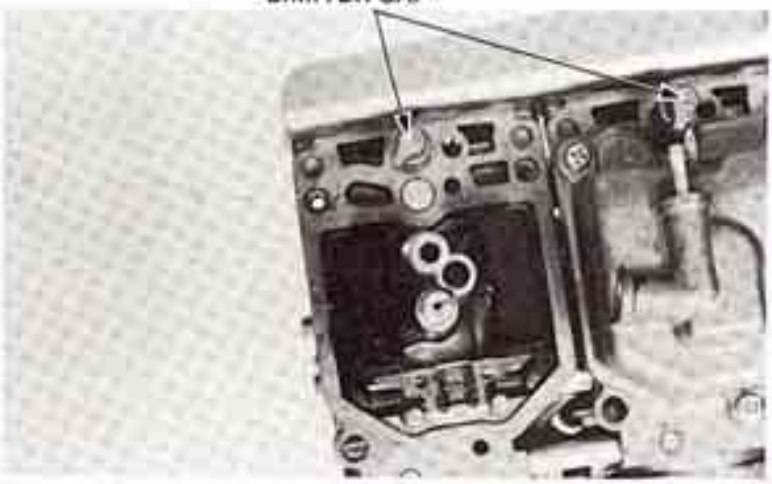
PILOT SCREW ADJUSTMENT

NOTE

- The pilot screws are factory pre-set and no adjustment is necessary unless the pilot screw is replaced (See removal above).
- Use a tachometer with graduations of 50 rpm or smaller and 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: 1-1/4 turns out

PILOT SCREW WITH LIMITER CAP



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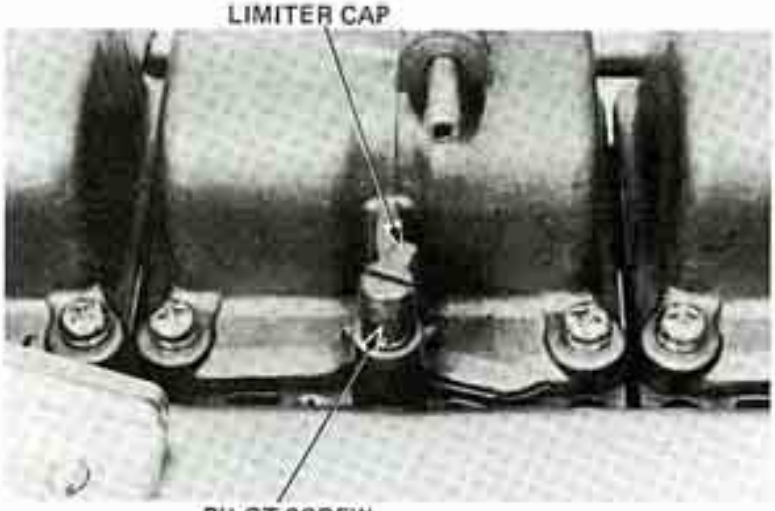
CAUTION

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: 900 rpm
5. Turn each pilot screw in or out to obtain the highest engine speed with a carburetor pilot screw wrench.
6. Adjust the idle speed with the throttle stop screw.
7. Turn the No. 1 carburetor pilot screw in until it seats lightly and record the number of turns.
8. Turn the No. 2 carburetor pilot screw in until the engine speed drops 50 rpm.
9. Turn the No. 2 carburetor pilot screw 1/2 turn out from the position obtained in Step 8.
10. Perform Steps 8 and 9 for the No. 3, 4, 5 and 6 carburetor pilot screws.
11. Turn the No. 1 pilot screw the number of turns recorded in step 7.
12. Turn the No. 6 pilot screw in until it seats lightly, recording the number of turns.
13. Perform Steps 8 and 9 for the No. 1 carburetor pilot screw.
14. Turn the No. 6 pilot screw out the number of turns recorded in Step 12.
15. Adjust the idle speed with the throttle stop screw.



LIMITER CAP INSTALLATION

If the pilot screw is replaced, a new limiter cap must be installed after pilot screw adjustment is completed.

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

A pilot screw limiter cap must be installed. It prevents misadjustment that could cause poor performance and increase exhaust emissions.

HIGH ALTITUDE ADJUSTMENT (USA only)

When the vehicle is to be operated continuously above 2,000 m (6,500 feet) the carburetor must be readjusted as follows to improve driveability.

Warm up the engine to operating temperature. Stop and go driving for 10 minutes is sufficient.
Turn each pilot screw clockwise 1/2 turn.
Adjust the idle speed to 900 ± 100 rpm with the throttle stop screw.

NOTE

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

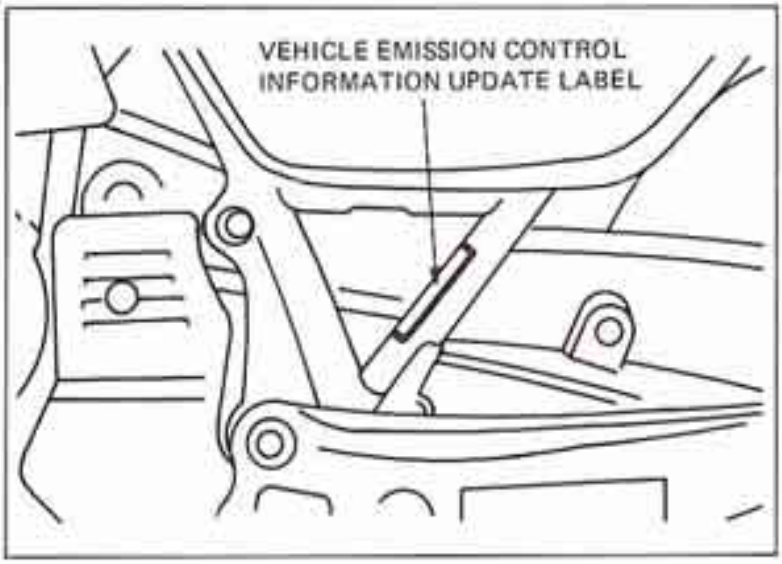
Attach the Vehicle Emission Control Information Update label onto the left frame as shown (see Service Letter No. 132).

NOTE

Do not attach the label to any part that can be easily removed from the vehicle.

WARNING

Operation at an altitude lower than 1,500 m (5,000 feet) 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 1,500 m (5,000 feet), turn each pilot screw counterclockwise to its stop and adjust the idle speed to 900 ± 100 rpm. Be sure to do these adjustments at low altitude.



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FUEL TANK

WARNING

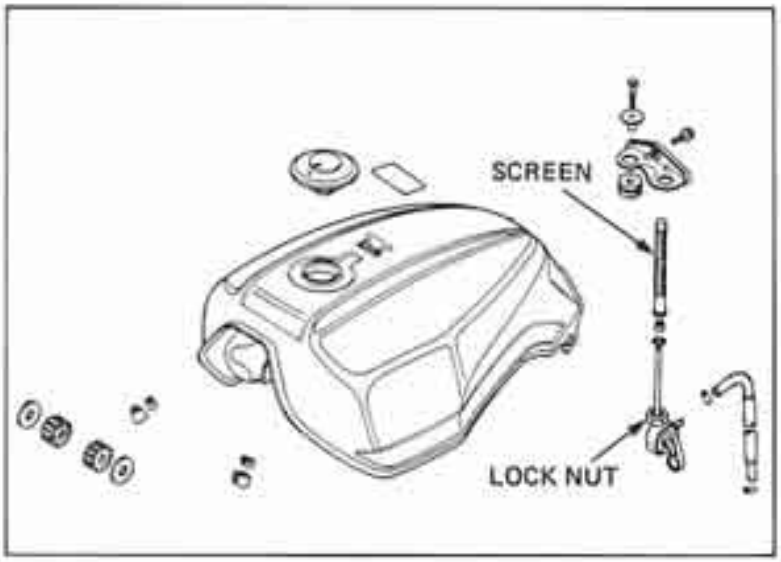
Do not allow flames or sparks near gasoline. Wipe up spilled gasoline at once.

Check the vent hole of the filler cap for blockage. Check that fuel is flowing out of the fuel valve freely.
If the fuel flow is restricted, clean the fuel strainer.

NOTE

Do not overtighten the fuel valve lock nut.

Make sure there are no fuel leaks.



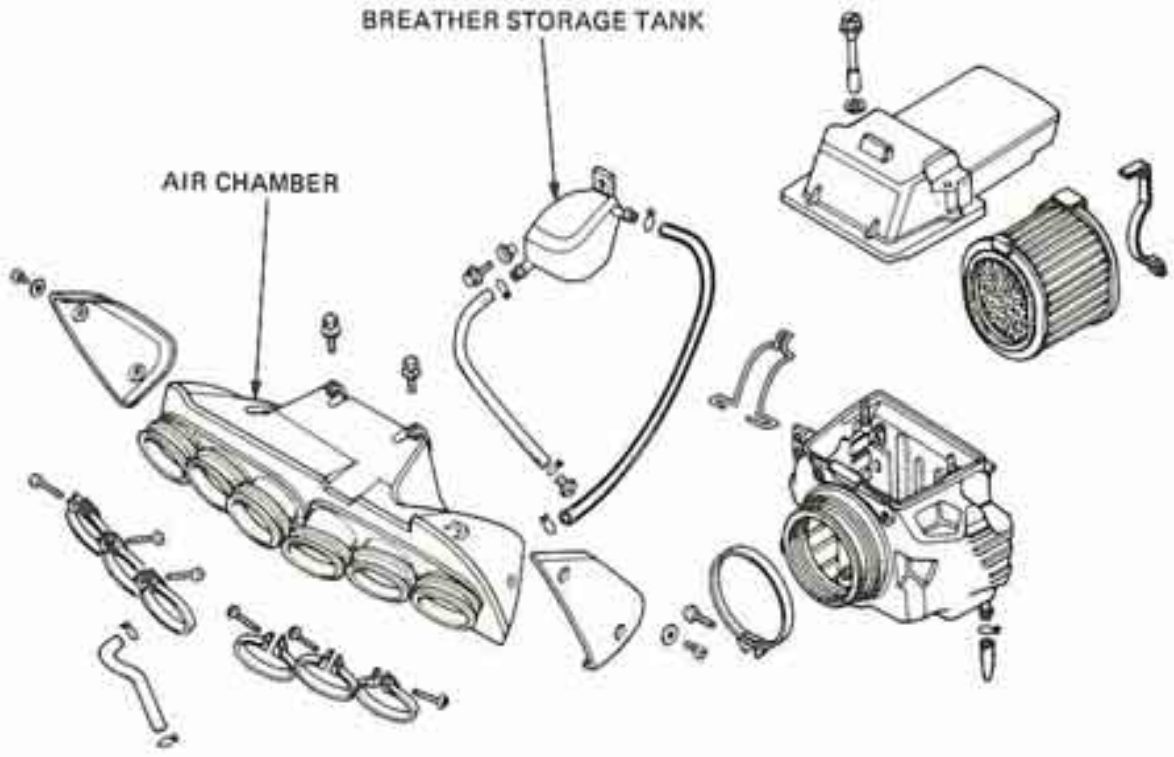
AIR CLEANER CASE

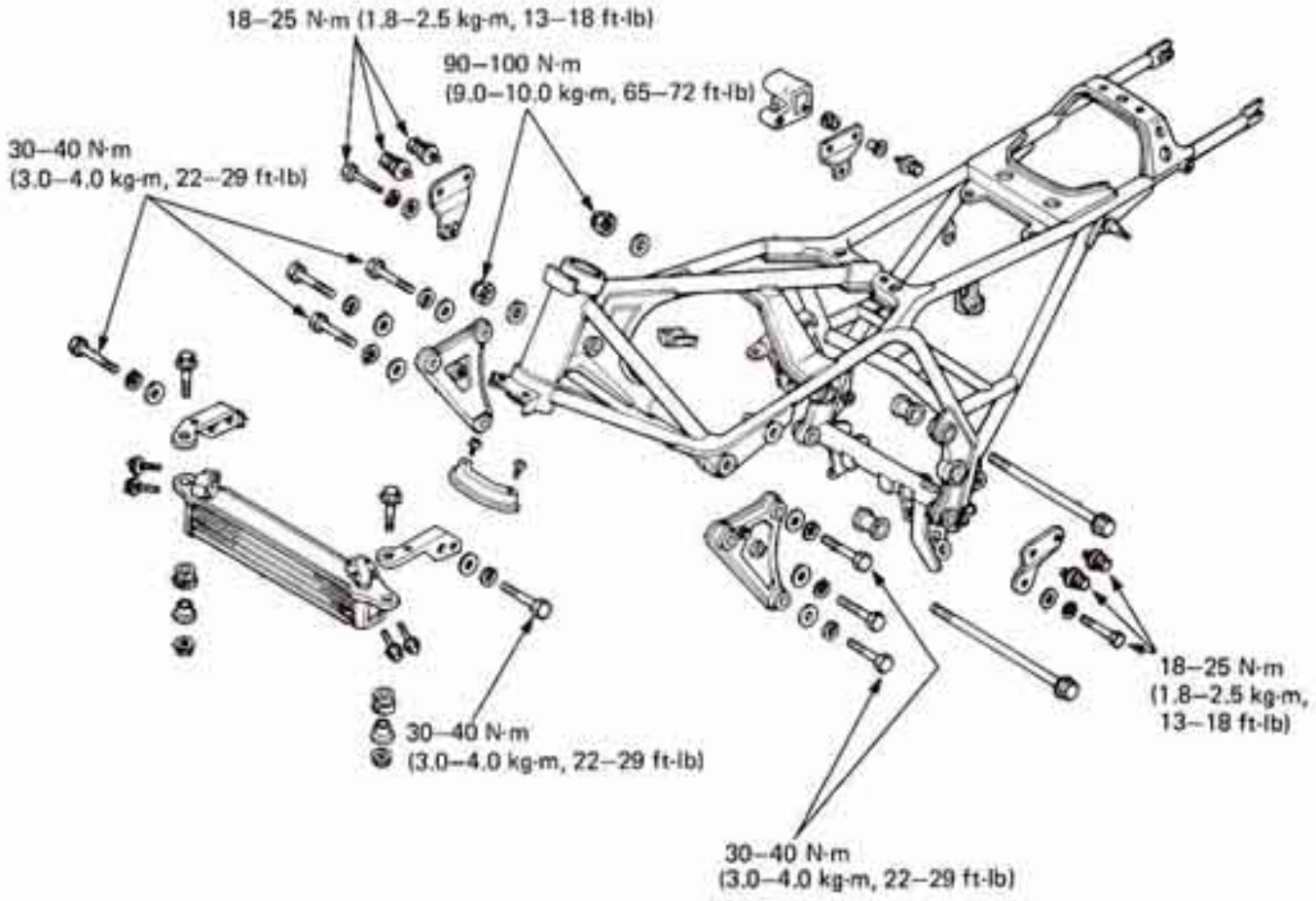
AIR CLEANER CASE/CHAMBER

Check the air cleaner case and chamber for cracking or deterioration.

CRANKCASE VENTILATION SYSTEM

Check that the breather tube is not restricted.





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SERVICE INFORMATION

GENERAL INSTRUCTION

- The following parts or components can be serviced with the engine installed in the frame:
  - Clutch
  - Shift linkage
  - Camshaft
  - A.C. generator
  - Starter motor
- The following parts or components can be serviced with the engine tilted forward in the frame:

NOTE

The engine can be pivoted on the rear lower hanger bolt after removing the front engine hangers, upper engine hangers and three hanger bolts.

- Carburetor
- Cylinder
- Cylinder head
- Piston

SPECIFICATIONS

Engine dry weight	108 kg (238 lb)
Oil capacity	5.5 lit (5.8 U.S. qt) at engine assembly 4.0 lit (4.2 U.S. qt) at draining

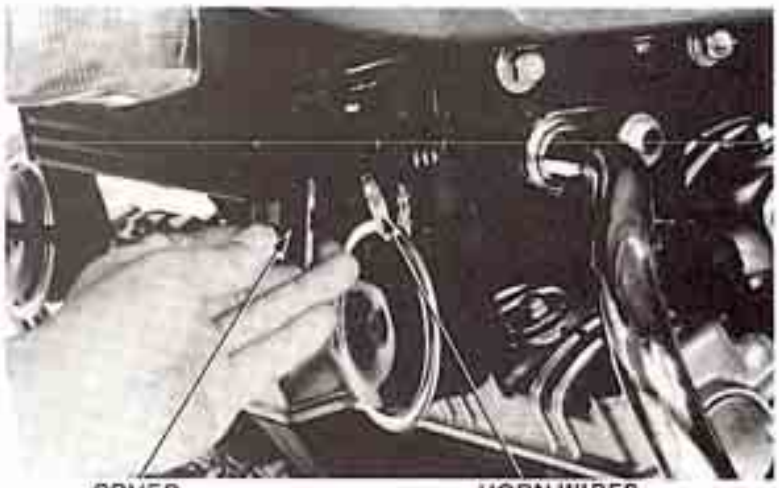
TORQUE VALUES

8mm bolt	18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)
10 mm bolt	30–40 N·m (3.0–4.0 kg-m, 22–29 ft-lb)
14 mm bolt	90–100 N·m (9.0–10.0 kg-m, 65–72 ft-lb)
Rear axle nut	85–105 N·m (8.5–10.5 kg-m, 62–76 ft-lb)
Drive sprocket	50–54 N·m (5.0–5.4 kg-m, 36–39 ft-lb)
Spark plug	12–16 N·m (1.2–1.6 kg-m, 9–12 ft-lb)

TILTING ENGINE

Remove the left and right leg shields and engine guard.

Remove the left and right horns by removing the wire connecter covers and disconnecting the horn wire terminals.



Disconnect the fairing wire connecter and remove the fairing.
(Fairing Removal page 13-18)

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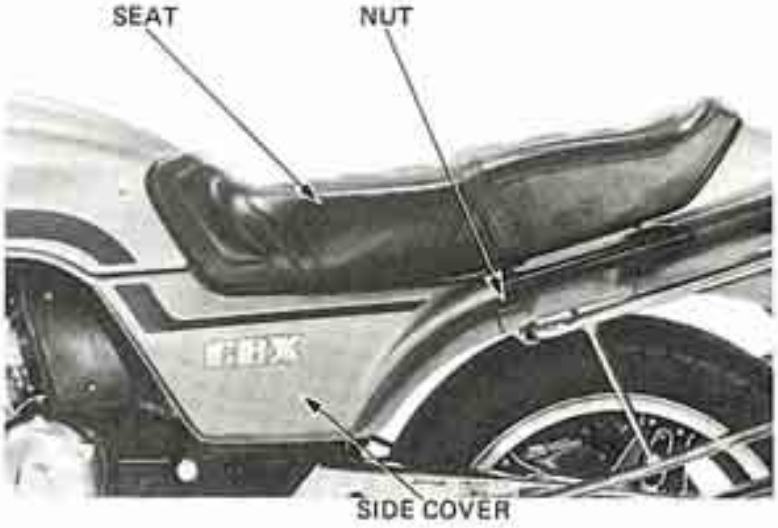
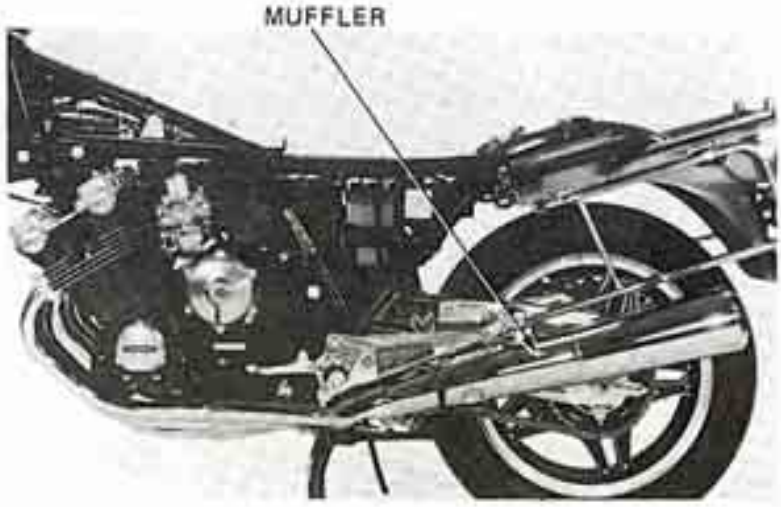
Remove the left and right side covers.
Remove the seat mounting nuts.
Pull the seat back and remove it.



Remove the air cleaner cover.
Remove the fuel tank.

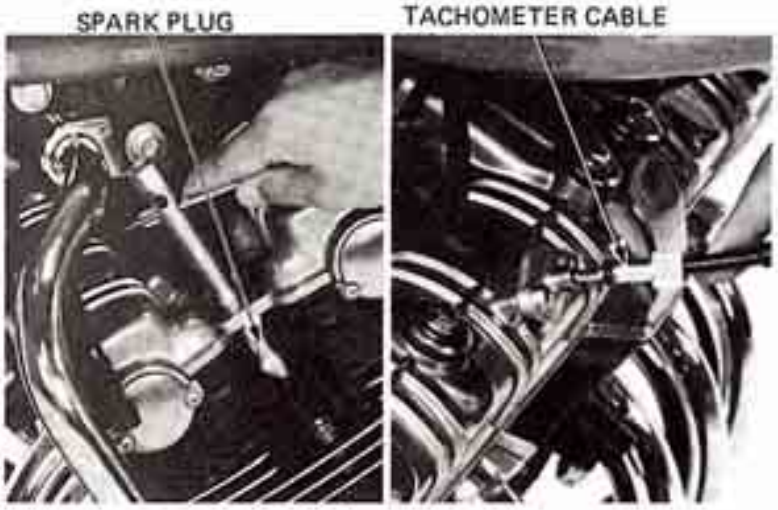
Remove the exhaust system.



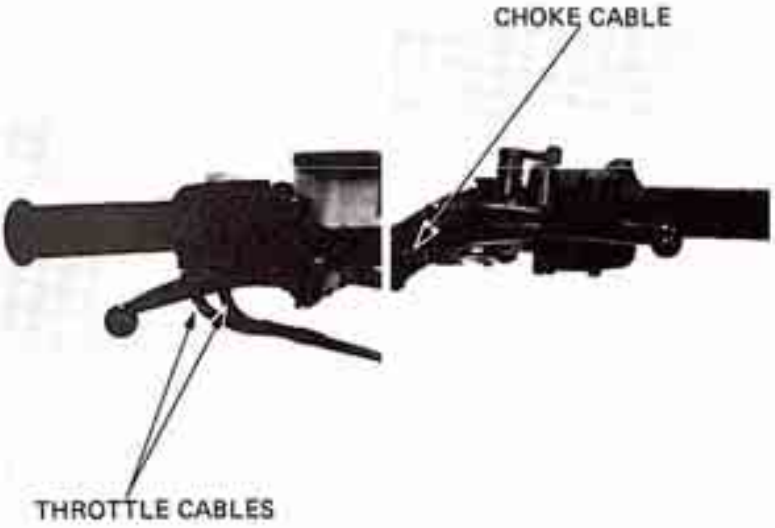
Remove the tachometer cable from the cylinder head cover.
Remove all spark plug caps and the No. 1 and 6 spark plugs.

NOTE

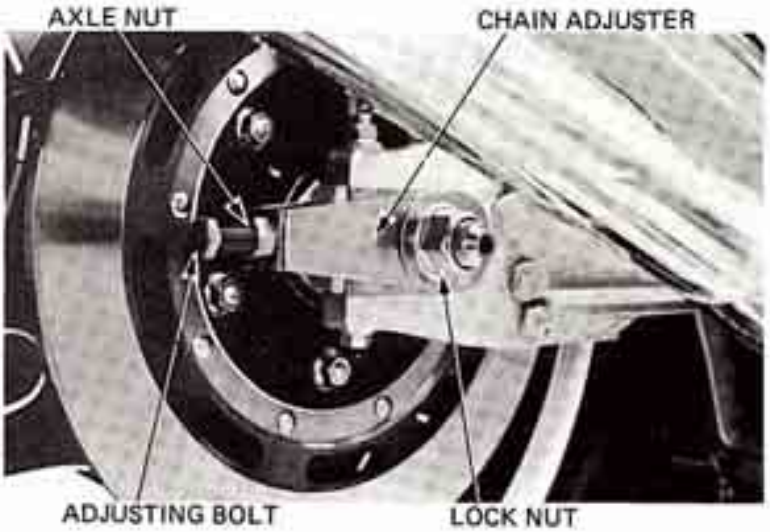
Do not allow anything to fall into the cylinders through the spark plug holes.



Remove the choke cable from the choke lever.
Remove the throttle cables from the right handlebar switch.



Loosen the rear axle nut and drive chain adjusting bolt.
Slide the chain adjusters down. Push the rear wheel forward.



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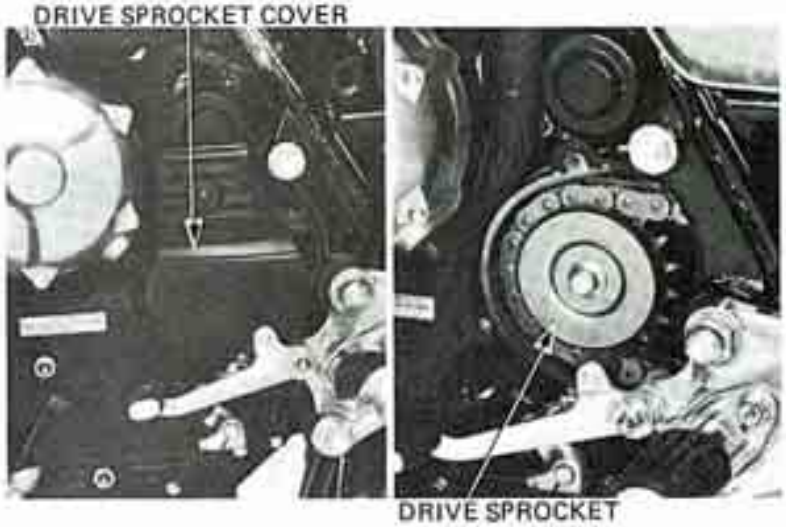
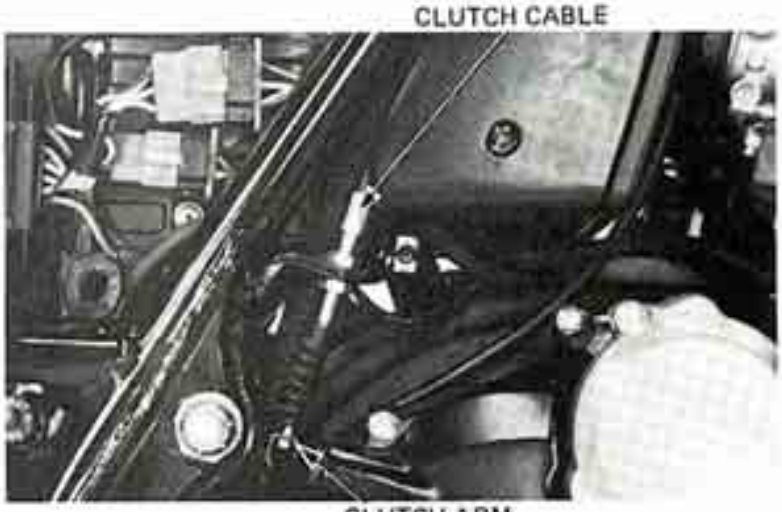
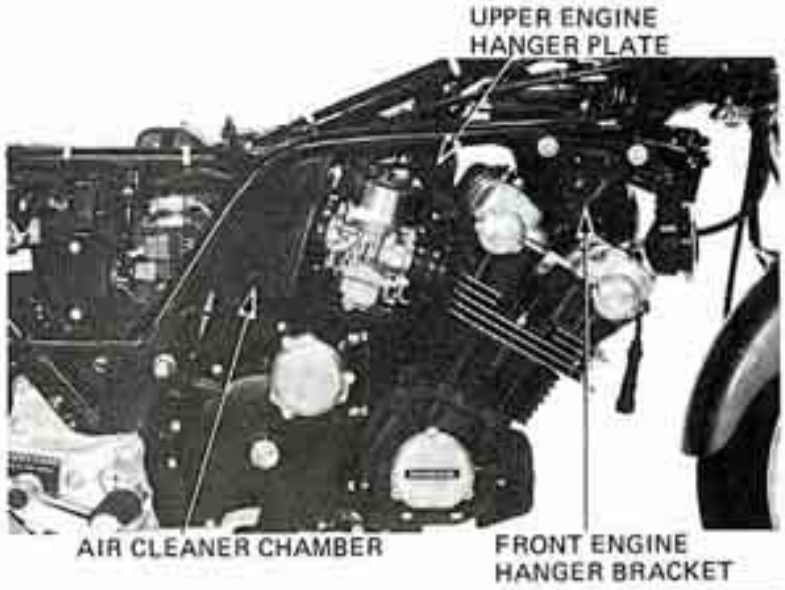
Remove the drive sprocket cover.
Remove the drive sprocket bolt and disengage the drive chain from the drive sprocket by removing the drive sprocket.
Remove the gear change pedal.



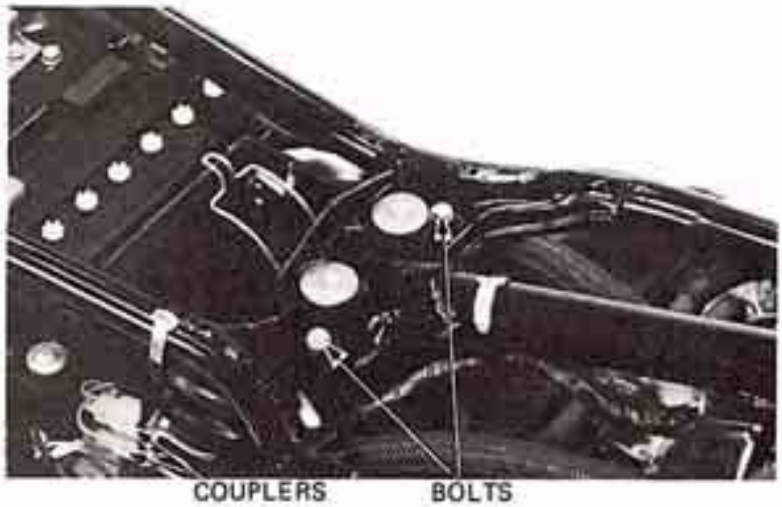
Remove the clutch cable from the clutch arm.



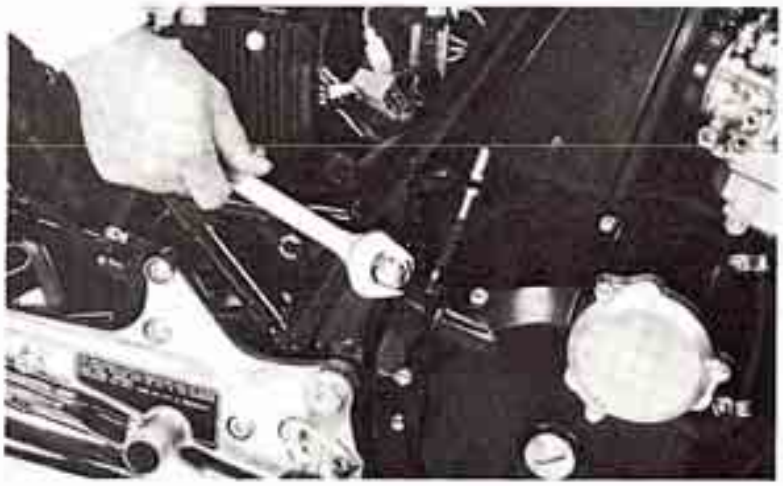
Place a jack under the engine.
Remove the left and right front engine hanger brackets and upper engine hanger plates.
Loosen the air chamber connecting tube band screw.



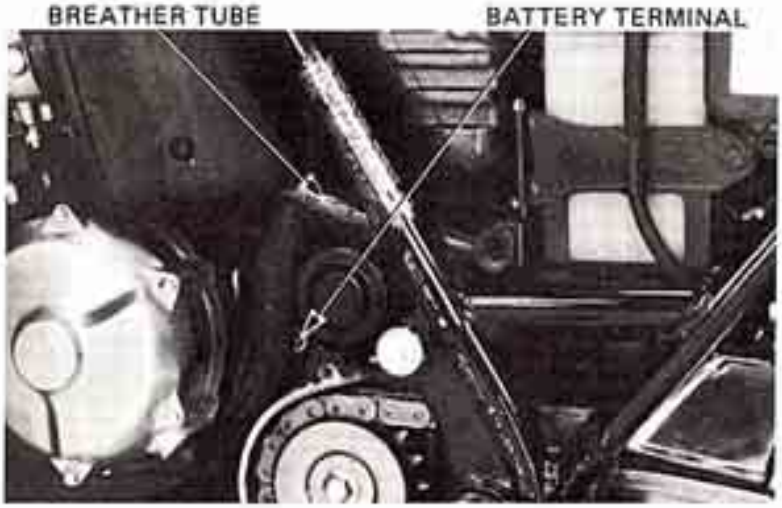
Remove the two bolts holding the air chamber.
Disconnect the three couplers.



Remove the rear upper engine hanger bolt.



Remove the battery negative terminal at the starter motor.
Disconnect the breather tube.
Loosen the rear engine hanger bolt.
Tilt the engine forward on the rear lower hanger bolt by lowering the jack.



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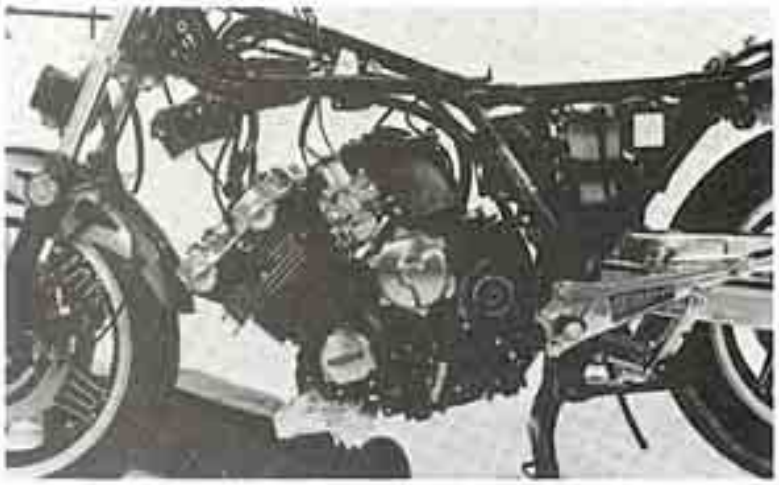
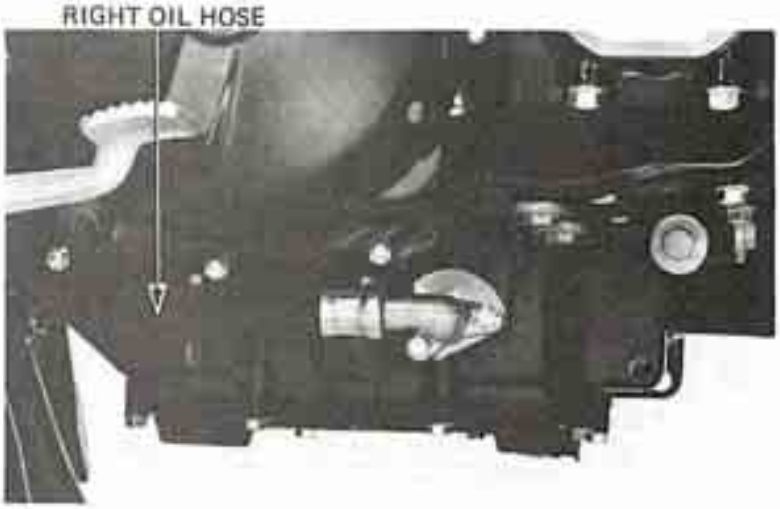
ENGINE REMOVAL

Drain oil from the engine.
Perform tilting engine procedures (page 5-2).
Disconnect the throttle cables and choke cable from the carburetor.



Remove the right oil hose cover and remove the oil hose.
Remove the brake pedal.



Remove the left oil hose and remove the oil hose.

Remove the rear engine mounting bolt.
Lower the jack and remove the engine.

NOTE

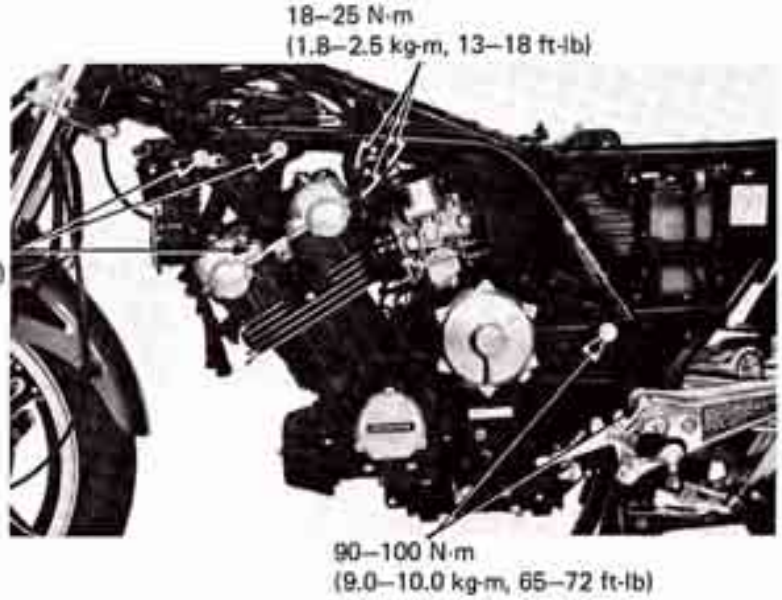
Jack height must be continuously adjusted during engine removal and installation to prevent damage to mounting bolt threads, wire harnesses and cables.

ENGINE INSTALLATION

The installation sequence is essentially the reverse of removal.

NOTE

- Do not damage parts during installation.
- Route the wires and cables properly (Page 1-8).
- Fill the crankcase to the proper level (Page 2-1).
- Perform the following inspection and adjustments: Throttle cable free play (Page 3-19).
  Clutch lever free play (Page 3-6).
  Drive chain tension (Page 3-15).
  Choke cable free play (Page 3-9).



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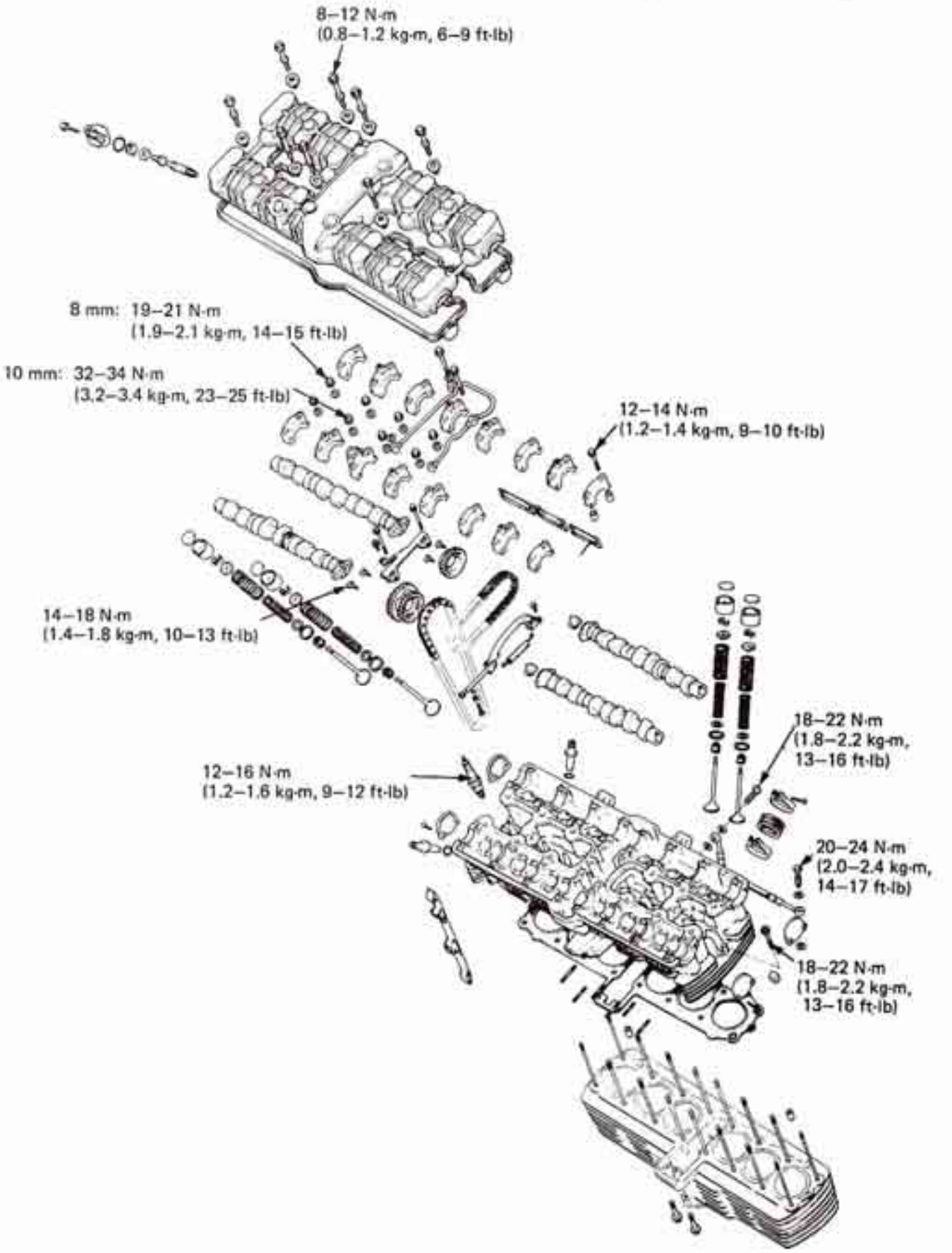

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SERVICE INFORMATION

GENERAL INSTRUCTIONS

- All cylinder head maintenance and inspection can be accomplished with the engine installed.
- Camshaft lubricating oil is fed through the oil hose. Be sure the holes in the oil hose bolt are 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.
- To remove the cylinder head, the engine should be tilted. The camshafts and valve lifters can be serviced without engine tilting.
- Marks 1 thru 16 on the camshaft holders mean position of holders to be installed; 1 to 8 are for EXHAUST side and 9 to 16 for INTAKE side from left to right respectively. When installing, be sure the mark ⇧ faces forward.

TOOLS

Special

Valve Guide Reamer	07984–2000000
Valve Lifter Hole Protector	07999–4220000

Common

Valve Guide Remover (5.5 mm)	07742–0010100
Valve Spring Compressor	07757–0010000

TORQUE VALUES

Cylinder head cover		8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)
Camshaft holder		12–16 N·m (1.2–1.6 kg-m, 9–12 ft-lb)
Cylinder head cap nut	10 mm	33–35 N·m (3.3–3.5 kg-m, 24–25 ft-lb)
	8 mm	19–21 N·m (1.9–2.1 kg-m, 14–15 ft-lb)
Cylinder head 6 mm bolt		19–21 N·m (1.9–2.1 kg-m, 14–15 ft-lb)
Cam sprocket		14–18 N·m (1.4–1.8 kg-m, 10–13 ft-lb)
Spark plug		12–16 N·m (1.2–1.6 kg-m, 9–12 ft-lb)
Oil hose Upper		18–22 N·m (1.8–2.2 kg-m, 13–16 ft-lb)
Lower		20–24 N·m (2.0–2.4 kg-m, 14–17 ft-lb)

SPECIFICATIONS

			STANDARD	SERVICE LIMIT
Compression pressure			1177 ± 98 kPa (12 ± 1 kg/cm², 171 ± 14 psi)	———
Camshaft	Cam height	IN.	37.000–37.160 mm (1.4567–1.4630 in)	36.9 mm (1.45 in)
		EX.	37.500–37.660 mm (1.4763–1.4826 in)	37.4 mm (1.47 in)
	Oil clearance	No. 1 and 9	0.040–0.082 mm (0.0016–0.0032 in)	0.12 mm (0.005 in)
		No. 2 and 10	0.063–0.105 mm (0.0025–0.0041 in)	0.14 mm (0.006 in)
		No. 3 and 11	0.063–0.105 mm (0.0025–0.0041 in)	0.14 mm (0.006 in)
		No. 4 and 12	0.040–0.082 mm (0.0016–0.0032 in)	0.12 mm (0.005 in)
		No. 5 and 13	0.040–0.082 mm (0.0016–0.0032 in)	0.12 mm (0.005 in)
		No. 6 and 14	0.063–0.105 mm (0.0025–0.0041 in)	0.14 mm (0.006 in)
		No. 7 and 15	0.063–0.105 mm (0.0025–0.0041 in)	0.14 mm (0.006 in)
		No. 8 and 16	0.040–0.082 mm (0.0016–0.0032 in)	0.12 mm (0.005 in)
	Run out		———	0.03 mm (0.001 in)

			STANDARD	SERVICE LIMIT
Valve lifter	Valve lifter O.D.	Mark B	27.982–27.993 mm (1.1017–1.1021 in)	27.98 mm (1.102 in)
		Mark A	27.972–27.982 mm (1.1013–1.1017 in)	27.97 mm (1.101 in)
	Cylinder head I.D.	Mark A	28.000–28.011 mm (1.1024–1.1028 in)	28.02 mm (1.103 in)
		Mark B	28.011–28.021 mm (1.1028–1.1032 in)	28.03 mm (1.104 in)
	Lifter to cylinder head clearance		———	0.07 mm (0.003 in)
Valve spring	Free length	IN. Outer	43.9 mm (1.73 in)	42.5 mm (1.67 in)
		In. Inner	40.7 mm (1.60 in)	39.8 mm (1.57 in)
		Ex. Outer	43.9 mm (1.73 in)	42.5 mm (1.67 in)
		EX. Inner	40.7 mm (1.60 in)	39.8 mm (1.57 in)
	Preload/length	IN. Outer	12.6–14.6 kg/37.5 mm (27.78–32.19 lbs/1.48 in)	12.0 kg/37.5 mm (26.46 lbs/1.48 in)
		IN. Inner	6.39–7.81 kg/34.5 mm (14.087–17.218 lbs/1.36 in)	6.0 kg/34.5 mm (13.23 lbs/1.36 in)
		EX. Outer	12.6–14.6 kg/37.5 mm (27.78–32.19 lbs/1.48 in)	12.0 kg/37.5 mm (26.46 lbs/1.48 in)
		EX. Inner	6.39–7.81 kg/34.5 mm (14.087–17.218 lbs/1.36 in)	6.0 kg/34.5 mm (13.23 lbs/1.36 in)
Valve guide	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)	5.45 mm (0.215 in)
	Valve guide I.D.	IN.	5.500–5.512 mm (0.2165–0.2170 in)	5.54 mm (0.218 in)
		EX.	5.500–5.512 mm (0.2165–0.2170 in)	5.54 mm (0.218 in)
	Stem-to-guide clearance	IN.	———	0.07 mm (0.003 in)
		EX.	———	0.09 mm (0.004 in)
	Valve seat width		0.90–1.10 mm (0.035–0.043 in)	1.5 mm (0.06 in)
Cylinder head	Warpage		———	0.10 mm (0.004 in)
Cam chain	Length		169.70–169.92 mm (6.681–6.690 in)	170.7 mm (6.72 in)

TROUBLESHOOTING

Engine top-end problems are usually performance-related and can be diagnosed by a compression test, or are engine noise 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 spring
2. Cylinder head
   - Leaking or damaged head gasket
   - Warped or cracked cylinder head
3. Cylinder and piston (Refer to Section 7)

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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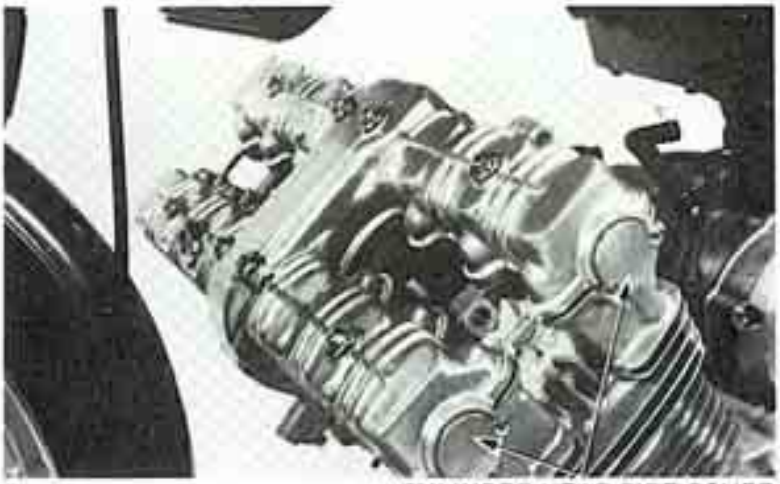
CAMSHAFT REMOVAL

Remove the left and right leg shields (page 13-18).
Remove the fairing and engine guards (page 13-18).
Disconnect the tachometer cable and remove the tachometer drive gear.
Disconnect the spark plug caps.
Remove the No. 1 and 6 spark plugs.
Remove the front engine hanger brackets.
Remove the cylinder head side covers.

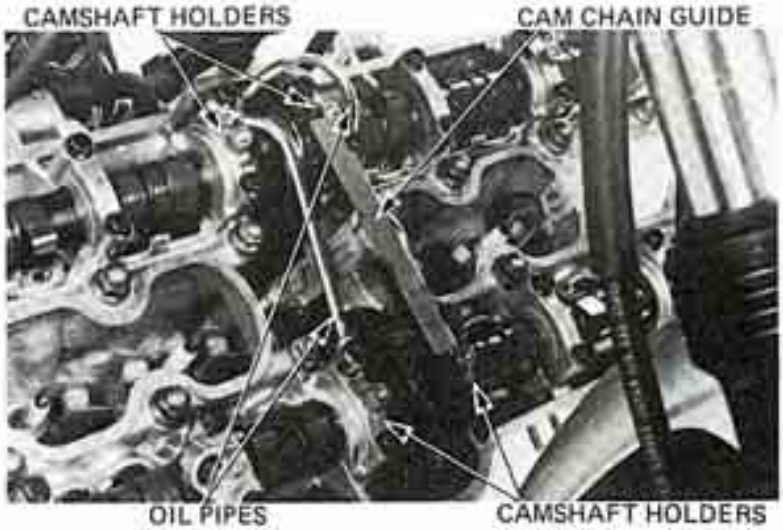
CAUTION

The tachometer driven gear must be removed to prevent No. 4 camshaft holder breakage when the camshafts are rotated. Camshaft holder breakage necessitates cylinder head assembly replacement.

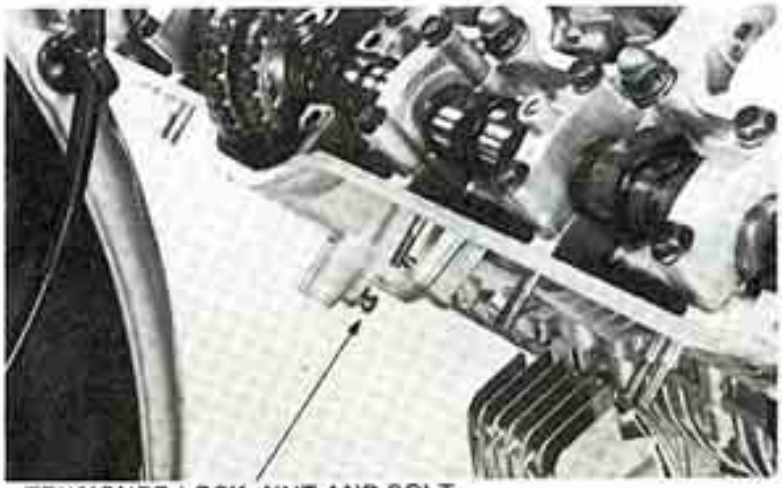


CYLINDER HEAD SIDE COVER

Remove the cylinder head cover bolts and the cylinder head cover.
Remove the oil pool plates.
Remove the oil pipes and cam chain guide.
Remove the No. 4, No. 5, No. 12 and No. 13 camshaft holders.
Remove the dowel pins.



Loosen the front cam chain tensioner lock nut and bolt.



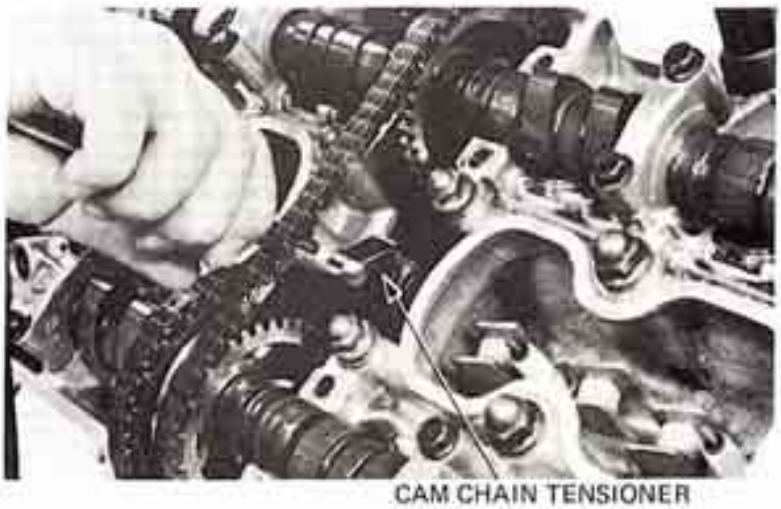
TENSIONER LOCK NUT AND BOLT

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

Loosen the rear cam chain tensioner lock nut.

LOCK NUT

Pull the cam chain tensioner up to reduce chain tension and tighten the bolt and lock nut.



CAM CHAIN TENSIONER

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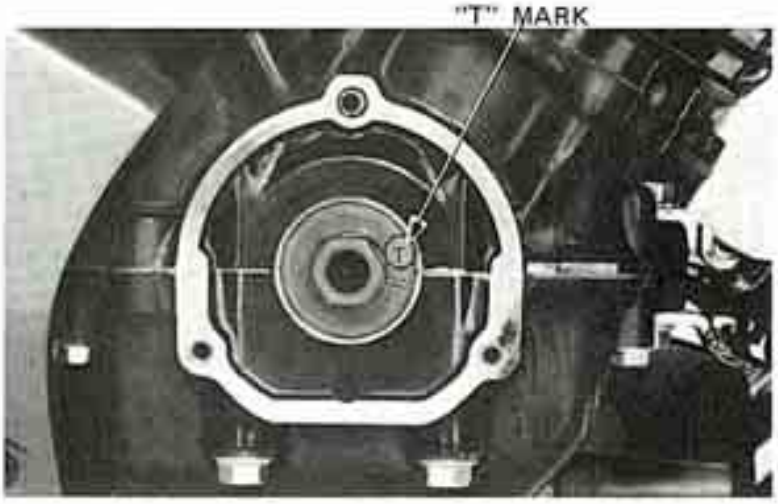
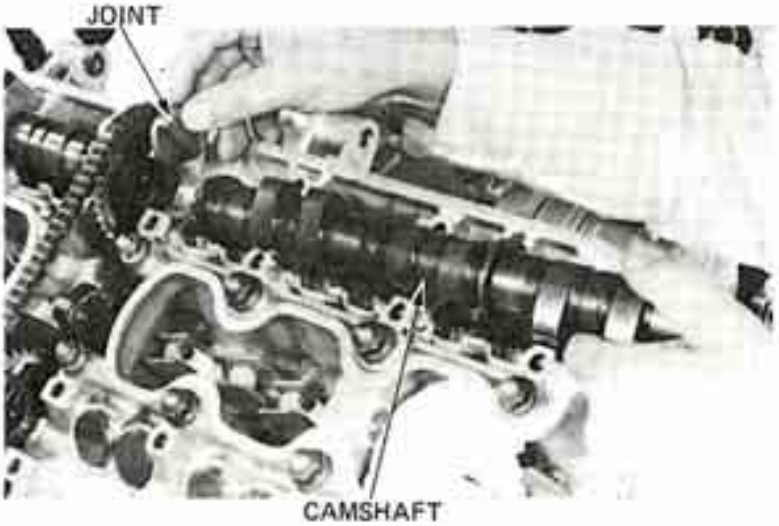
Remove the right crankshaft side cover.
Turn the crankshaft clockwise until the "T" mark on the crankshaft end aligns with the forward crankcase mating surface.



Make sure the No. 1 cylinder intake and exhaust cam lobes face the spark plug.
If they do not, turn the crankshaft 360 degrees clockwise and realign the "T" mark.
Remove the No. 2 and 10 camshaft holders.
Remove the No. 1, 9, 3 and 11 holders.
Remove the dowel pins.

Remove the left camshafts and joints.



Turn the crankshaft 360 degrees clockwise and realign the "T" mark with the crankcase mating surfaces.
The No. 6 intake and exhaust cam lobes face the spark plug.
Remove the No. 15 camshaft holder.
Then remove the No. 16 and 14 camshaft holders.
Remove the dowel pins.

Remove the right intake camshaft with the cam sprocket.
Loosen the cam sprocket bolt.

Turn the crankshaft clockwise until cam lift is minimal and the other cam sprocket bolt can be removed.
Remove the cam sprocket with the cam chain.

NOTE

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

Remove the No. 7 camshaft holder, then remove the No. 8 and 6 camshaft holders.
Remove the right exhaust camshaft.

NOTE

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

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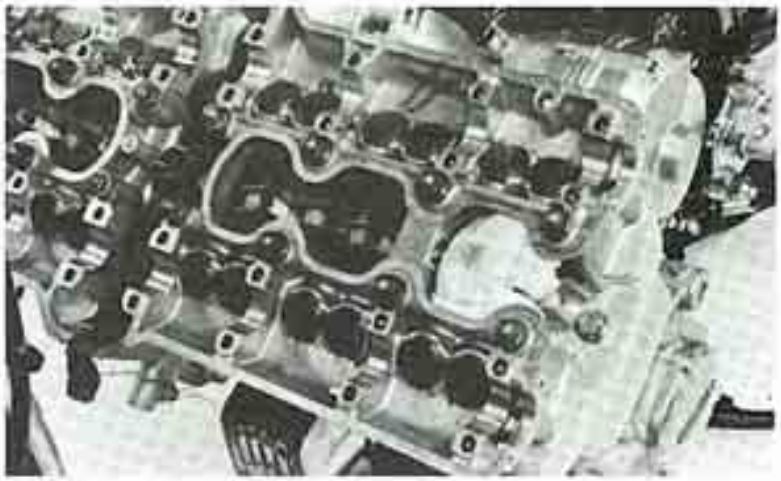
CAM BEARING SURFACE INSPECTION

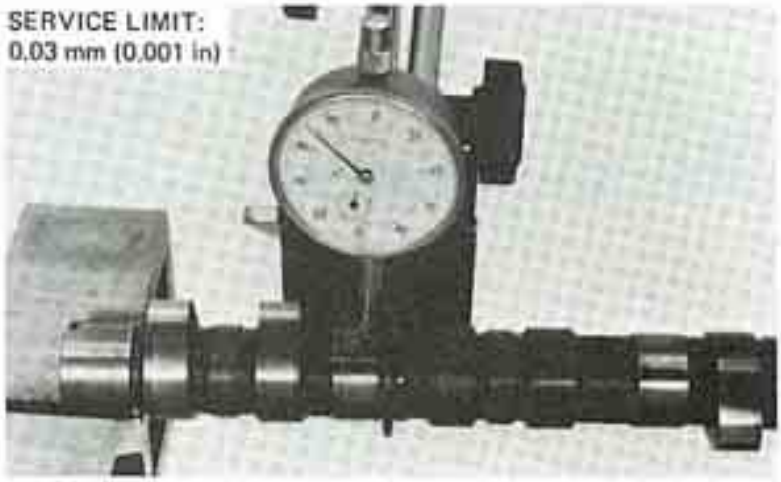
Inspect the cam bearing surfaces for scoring, scratches, or evidence of insufficient lubrication. Inspect the bearing surface of the camshaft holders.



CAMSHAFT RUNOUT

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

SERVICE LIMIT:
0.03 mm (0.001 in)



CAM LOBE INSPECTION

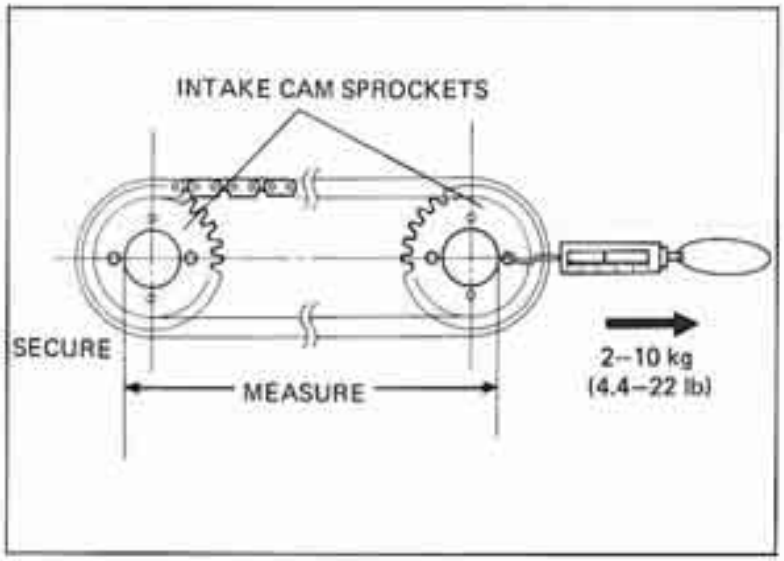
Measure the height of each cam lobe.
Inspect the cam lobes for wear or damage.

SERVICE LIMTI:
IN: 36.9 mm (1.45 in)
EX: 37.4 mm (1.47 in)

CAM CHAIN LENGTH MEASUREMENT

Place the cam chain over the intake camshaft sprockets. Secure one sprocket and apply 2–10 kg (4.4–22 lb) of tension with a spring scale. Measure the distance between the points as shown.

SERVICE LIMIT: 170.7 mm (6.72 in)



CAM CHAIN GUIDE INSPECTION

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

CAMSHAFT OIL CLEARANCE

Remove the adjusting shims and the valve lifters.

NOTE

Mark each part to ensure correct reassembly.

Wipe any oil from the journals.
Lay a strip of plastigauge lengthwise on top of each camshaft journal.

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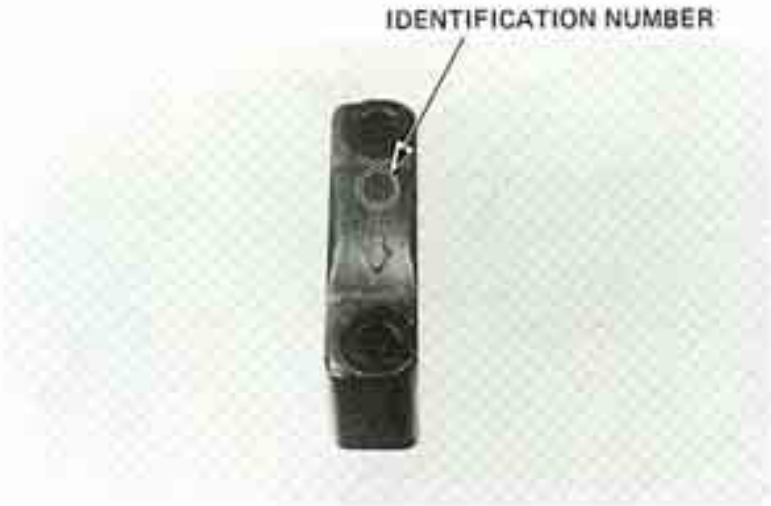
Determine the camshaft holder identification number before installing.

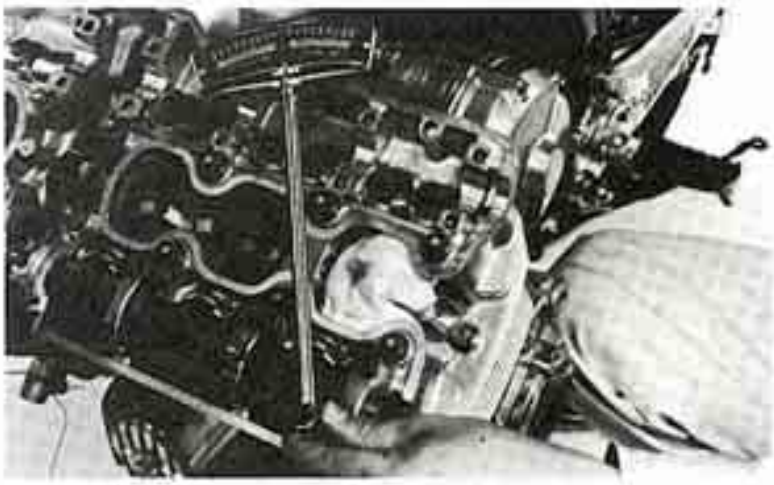


Install the camshaft holders and tighten to the specified torque in a crisscross pattern.

NOTE

Do not rotate the camshaft when using plastigauge.

TORQUE:
12–14 N-m (1.2–1.4 kg-m, 9–10 ft-lb)



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

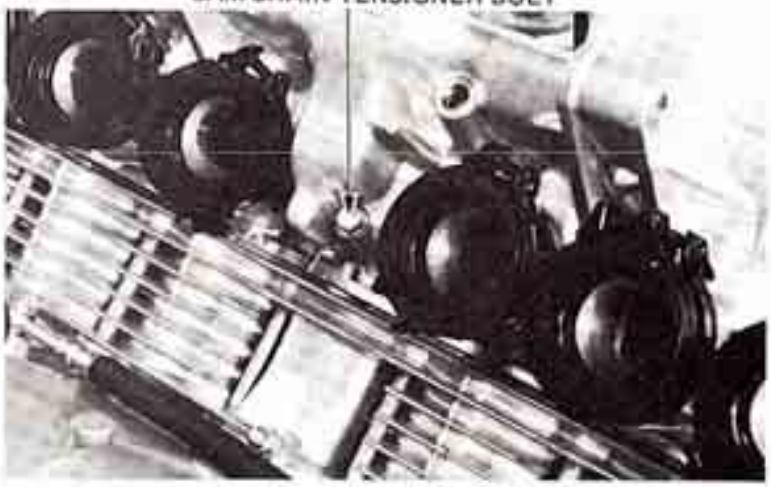
SERVICE LIMITS:
No. 1, 4, 5, 8, 9, 12, 13 and 16:
0.12 mm (0.005 in)
No. 2, 3, 6, 7, 10, 11, 14 and 15:
0.14 mm (0.006 in)

When the service limits are exceeded, replace the camshaft and recheck the oil clearance.
Replace the cylinder head and camshaft holders if the clearance still exceeds service limits.

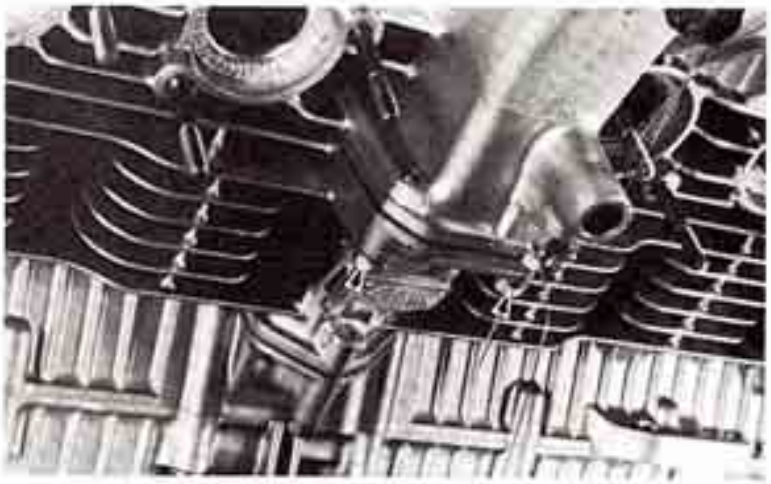
CYLINDER HEAD REMOVAL

Place the motorcycle on its side stand for 2-3 minutes to allow oil to drain from the cylinder head to the sump.
Then, place the motorcycle on its center stand.
Tilt the engine (Section 5).
Remove the cylinder head cover and remove the camshaft (Page 6-3).
Remove the carburetor and exhaust system.
Remove the oil hose bolt.

Remove the rear cam chain tensioner bolt.



Remove the two cam chain housing bolts.



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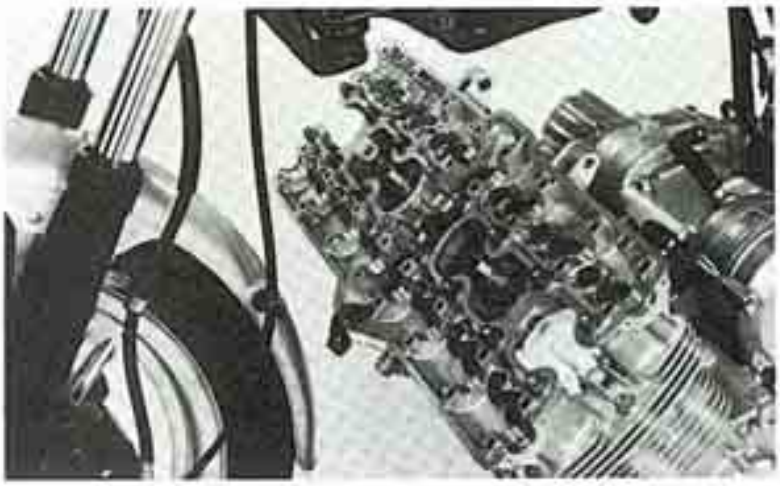
Remove the 16 cap nuts and two bolts.

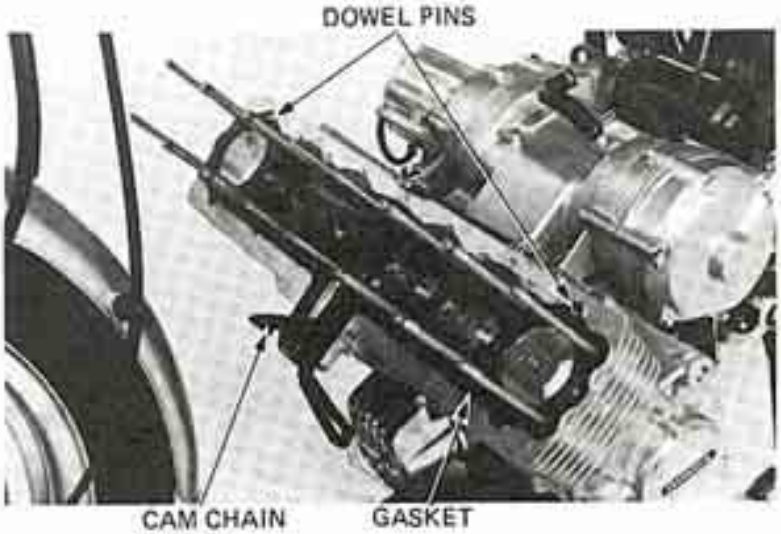
NOTE

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

Remove the cylinder head.



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

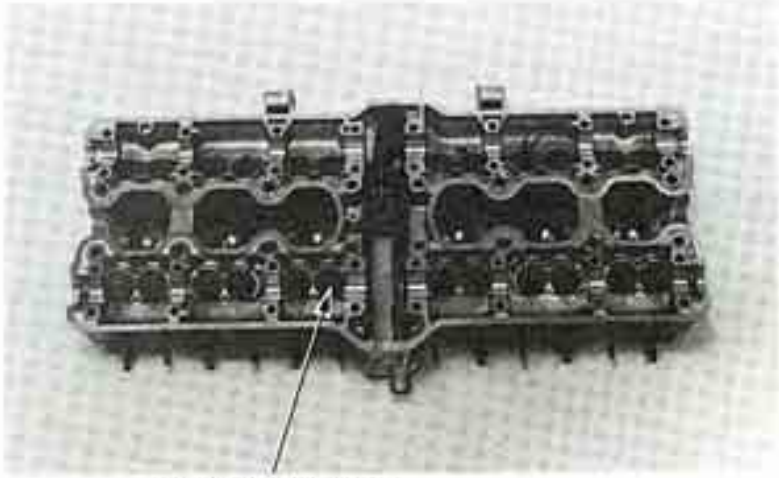


CYLINDER HEAD DISASSEMBLY

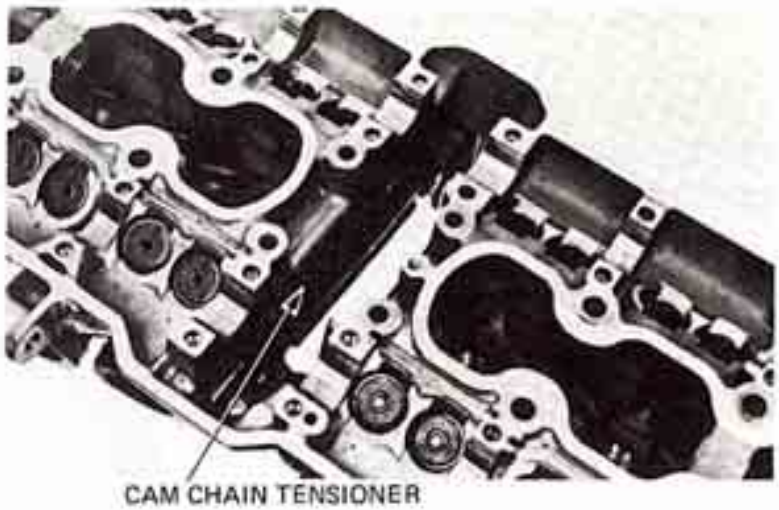
Remove the carburetor insulators.
Remove the valve shims.
Remove the valve lifters.

NOTE

Mark all disassembled parts to ensure original assembly.



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



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

CAUTION

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

NOTE

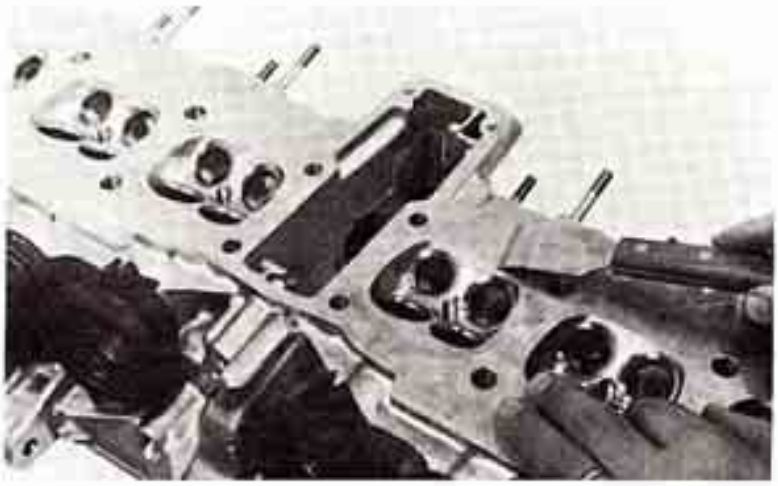
- Avoid damaging the lifter sliding surface.
- Mark all disassembled parts to ensure original assembly.

Remove the valve stem seals.

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

NOTE

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



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VALVE LIFTER O.D. MEASUREMENT

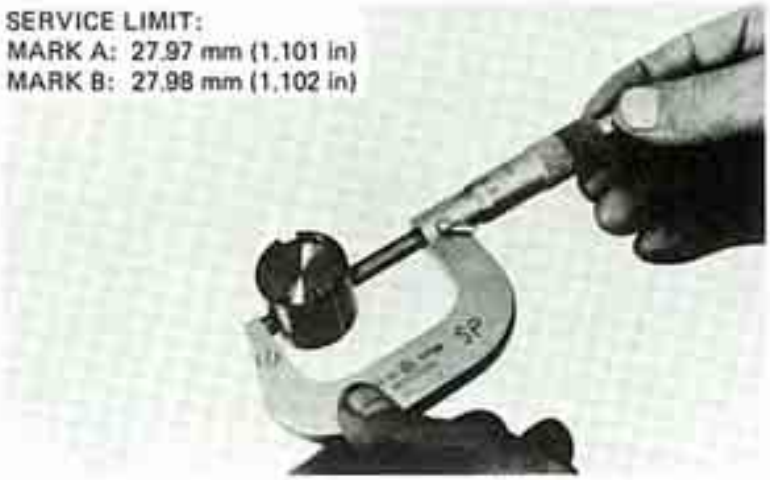
Measure the valve lifter O.D.,

STANDARD:

MARK A: 27.972–27.982 mm (1.1013–1.1017 in)

MARK B: 27.982–27.993 mm (1.1017–1.1021 in)

SERVICE LIMIT:
MARK A: 27.97 mm (1.101 in)
MARK B: 27.98 mm (1.102 in)



CYLINDER HEAD I.D. MEASUREMENT

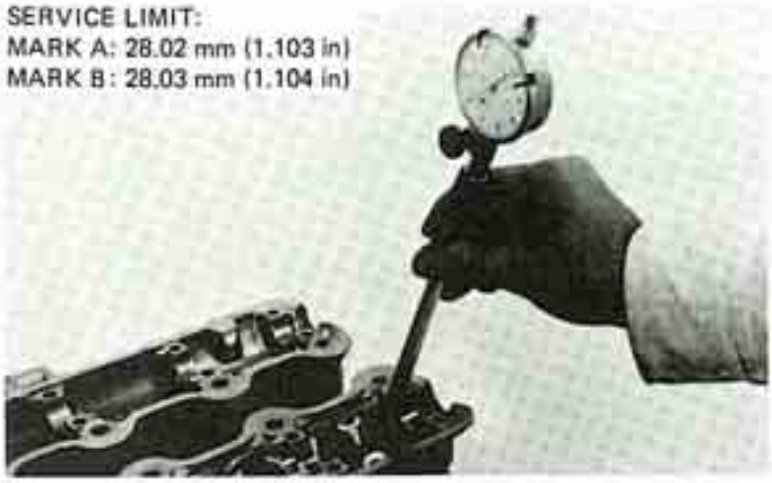
Measure the cylinder head I.D.

STANDARD:

MARK A: 28.000–28.011 mm (1.1024–1.1028 in)

MARK B: 28.011–28.021 mm (1.1028–1.1032 in)

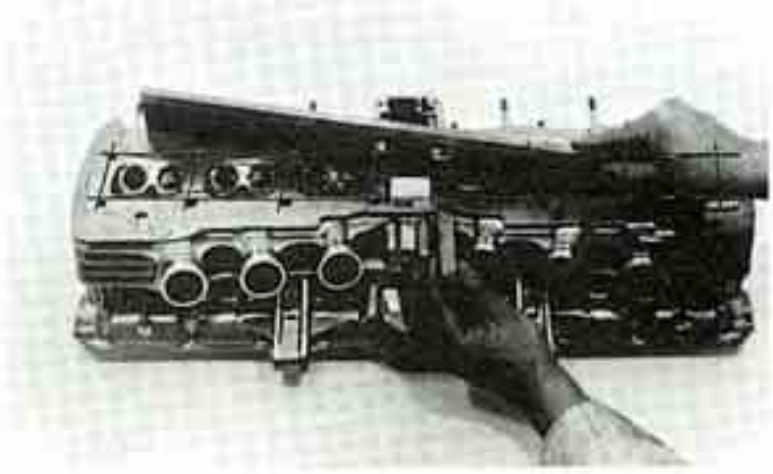
SERVICE LIMIT:
MARK A: 28.02 mm (1.103 in)
MARK B: 28.03 mm (1.104 in)



CYLINDER HEAD INSPECTION

Inspect the sliding surfaces 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.

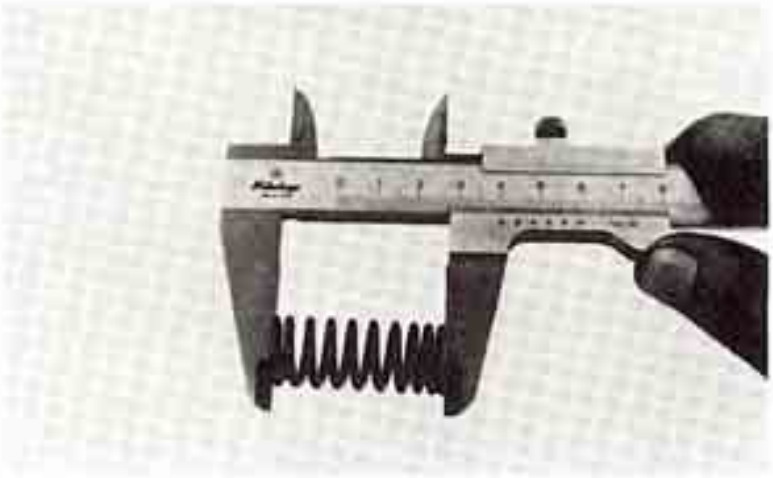


VALVE SPRING FREE LENGTH INSPECTION

Measure the length of the inner and outer valve springs.

SERVICE LIMITS:

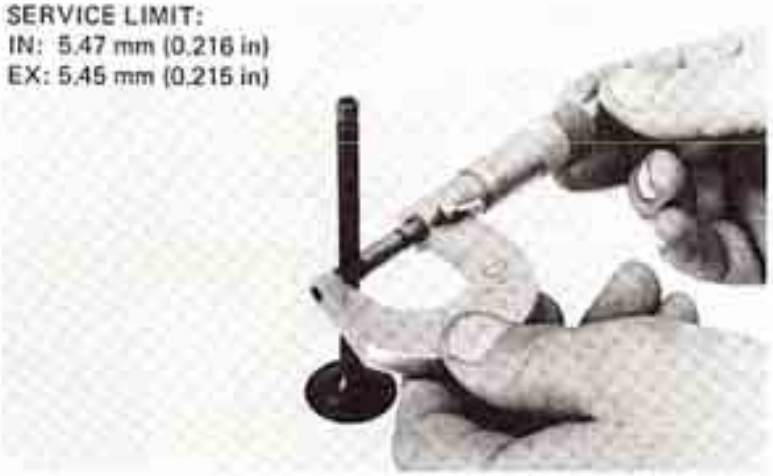
Inner:	**IN.**	**39.8 mm (1.57 in)**
	EX.	**39.8 mm (1.57 in)**
Outer:	**IN.**	**42.5 mm (1.67 in)**
	EX.	**42.5 mm (1.67 in)**



VALVE STEM-TO-GUIDE CLEARANCE

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

SERVICE LIMIT:
IN: 5.47 mm (0.216 in)
EX: 5.45 mm (0.215 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 LIMITS:

IN. 5.54 mm (0.215 in)
EX. 5.54 mm (0.215 in)

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

SERVICE LIMITS:

IN. 0.07 mm (0.003 in)
EX. 0.09 mm (0.004 in)

VALVE GUIDE REAMER (5.5mm)
07984-2000000

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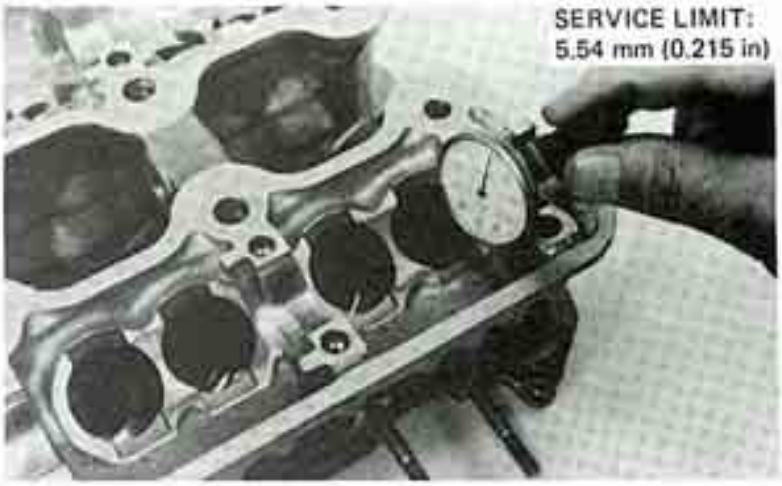
NOTE:

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

NOTE

Reface the valve seats whenever the valve guides are replaced.



CAM CHAIN GUIDE AND CAM CHAIN TENSIONER INSPECTION

Inspect the cam chain guide for damage or excessive wear.

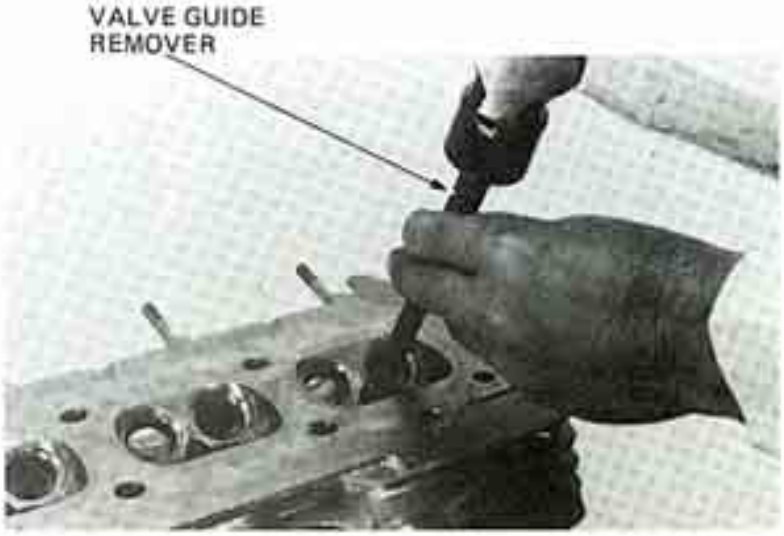
Inspect the cam chain tensioner slipper for damage or excessive wear.
Inspect the tension spring for weakness.

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.

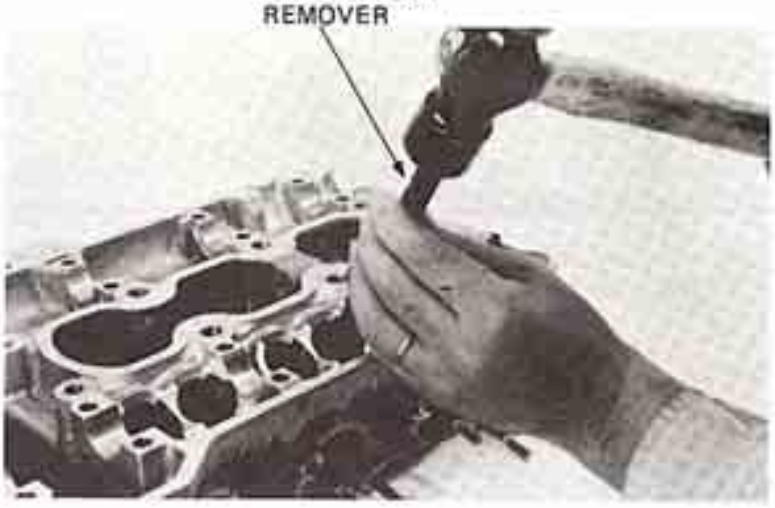


Install a new oversize valve guide from the top of the head.

NOTE

For best results, heat the cylinder head to 150°C (300°F) before installing new oversize guides.

VALVE GUIDE REMOVER

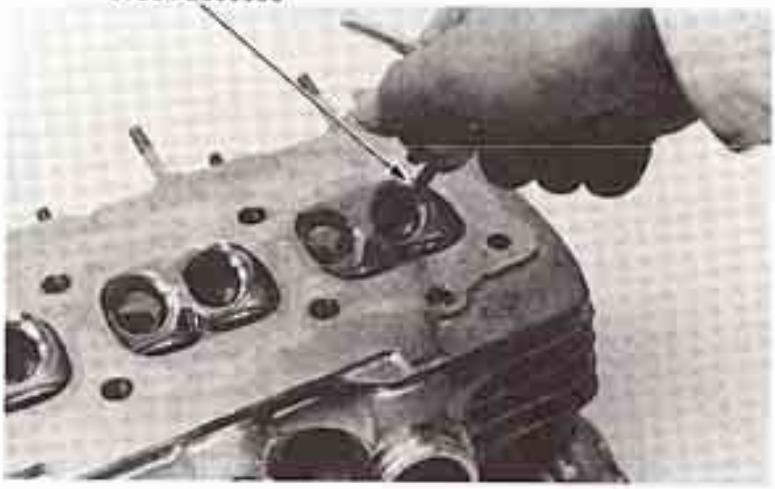


Ream the new valve guide after installation.

NOTE

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

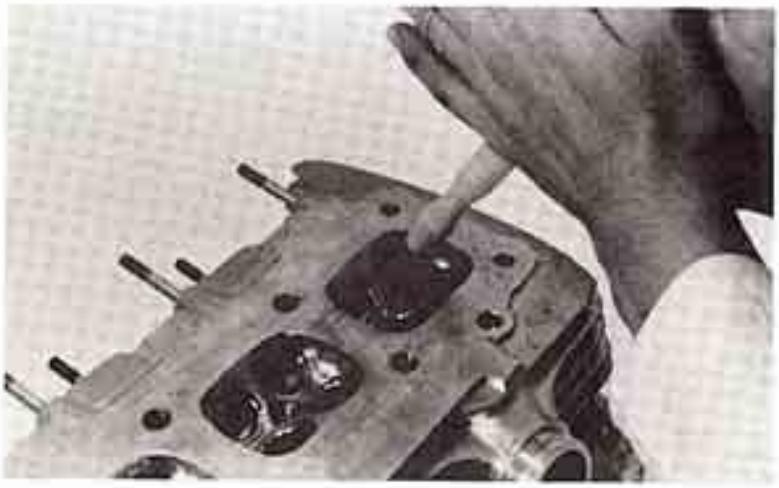
VALVE GUIDE REAMER (5.5 mm)
07984-2000000



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

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.



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Remove the valve and inspect the face.

CAUTION

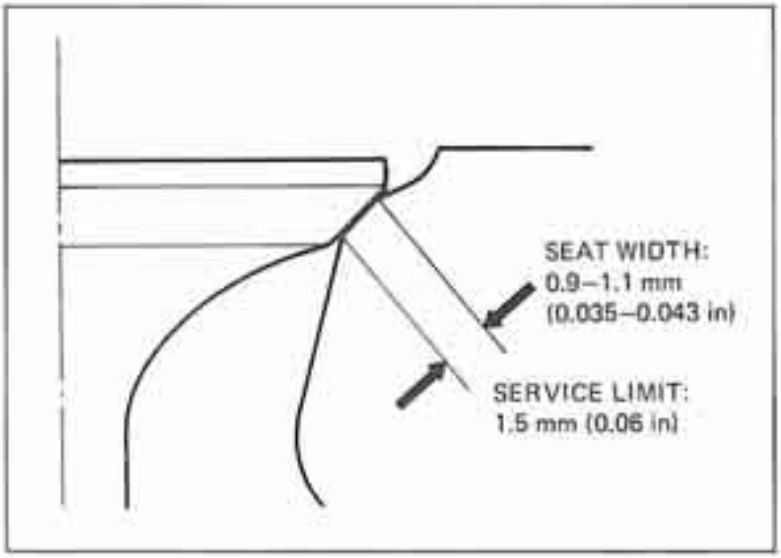
The valves cannot be ground. If the valve face is rough, worn unevenly, or contacts the seat improperly, the valve must be replaced.

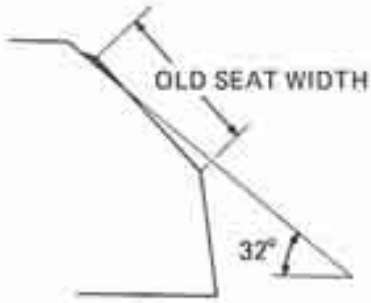
Inspect the valve seat.

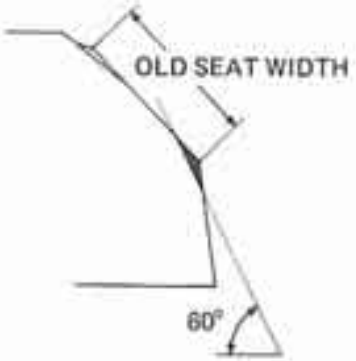
If the seat is too wide, too narrow, or has low spots, the seat must be ground.

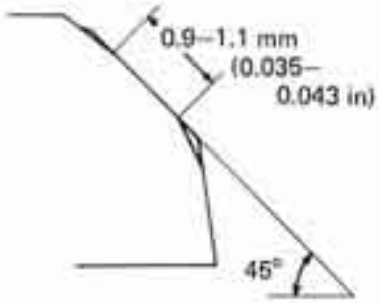
NOTE

Follow the refacer manufacturer's operating instructions.

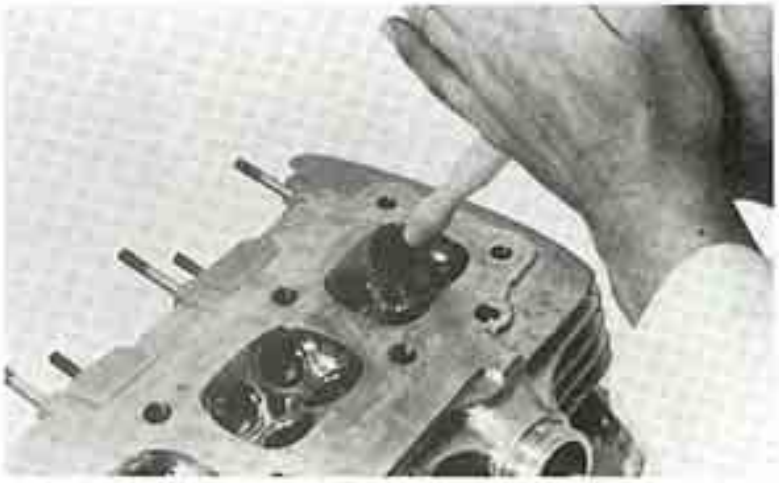








After cutting the seat, apply lapping compound to valve face, and lap the valve using light pressure. After lapping, wash any residual compound off the cylinder head and valve.



CYLINDER HEAD ASSEMBLY

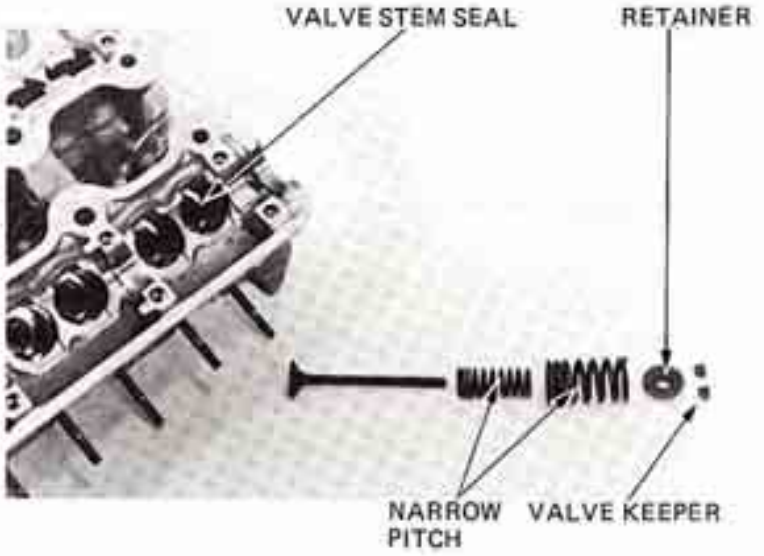
NOTE

Install new valve stem seals when reassembling.

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

NOTE

To avoid damage to the stem seal, turn the vavle slowly when inserting.



Install the valve springs and retainers.

NOTE

Install the valve springs with the tightly wound coils facing the cylinder head.

Install the valve keepers.

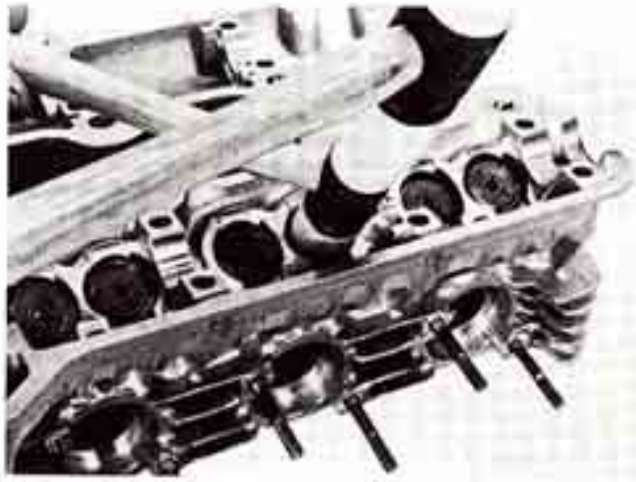
CAUTION

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

Tap the valve stems gently with a soft hammer to firmly seat the keepers.

NOTE

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



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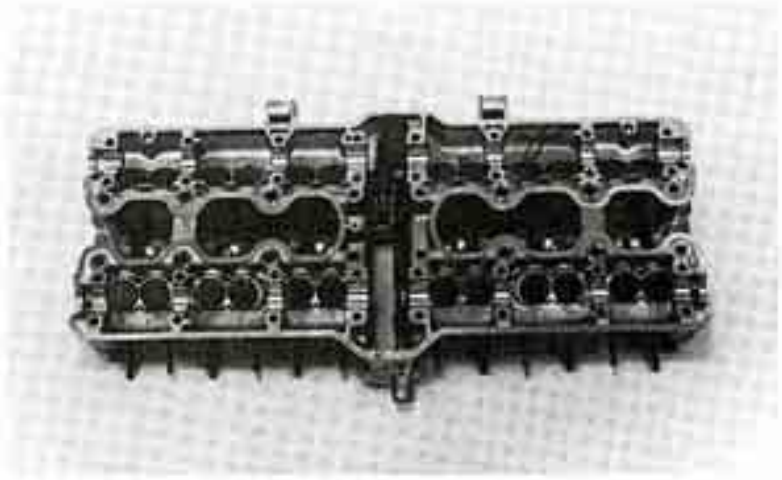
Install the cam chain tensioner.
Push the chain tensioner and tighten the lock nut.

Install the valve lifters and adjustment shims.

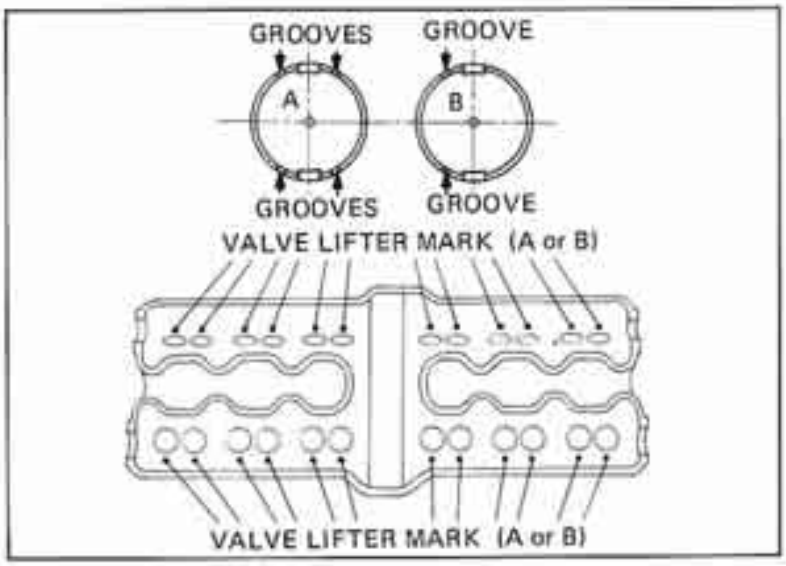
NOTE

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



NOTE

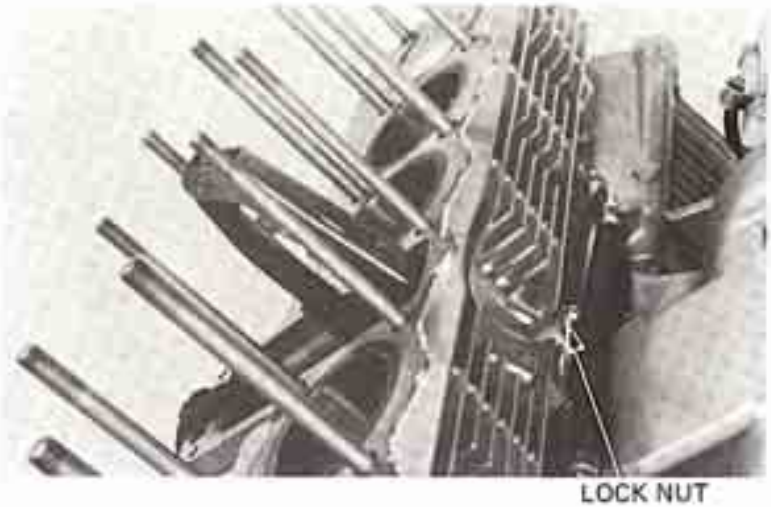
Valve lifters are available in two sizes.
When installing new valve lifters, use lifters with the letter code that coresponds the code stamped on the cylinder head. Use 'A' with 'A', 'B' with 'B'.



CYLINDER HEAD INSTALLATION

Clean the cylinder head gasket surfaces of any gasket material.

Loosen the cam chain tensioner lock nut and pull the tensioner up.
Retighten the lock nut.
Install the dowel pins, a new gasket and cam chain guide.



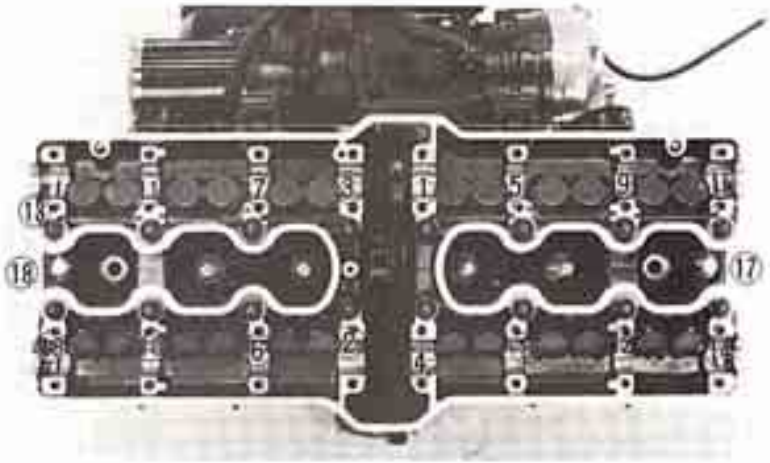
LOCK NUT

Install the cylinder head assembly.
Tighten the cap nuts in the sequence shown.
Tighten the two bolts.
Tighten the two bolts at the cam chain housing.

NOTE

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

TORQUE VALUES:
10 mm cap nut:
32–34 N·m (3.2–3.4 kg-m, 23–25 ft-lb)
8 mm cap nut:
19–21 N·m (1.9–2.1 kg-m, 14–15 ft-lb)
8 mm bolt:
18–22 N·m (1.8–2.2 kg-m, 13–16 ft-lb)



Tighten the cam chain tensioner bolt.
TORQUE:
10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)

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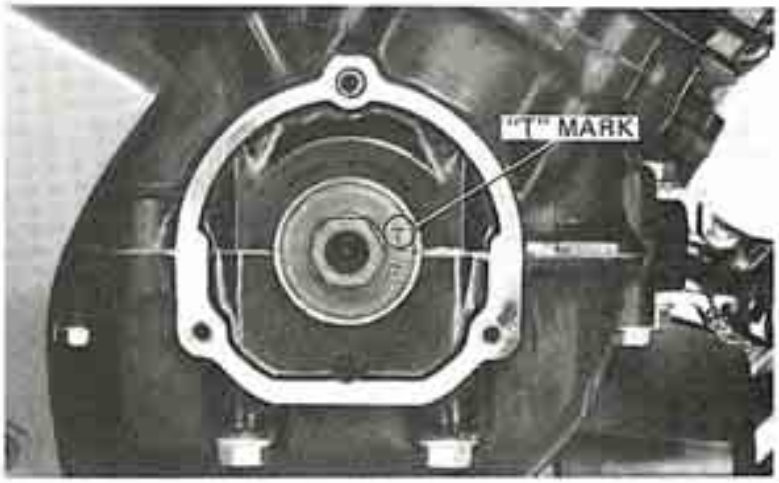
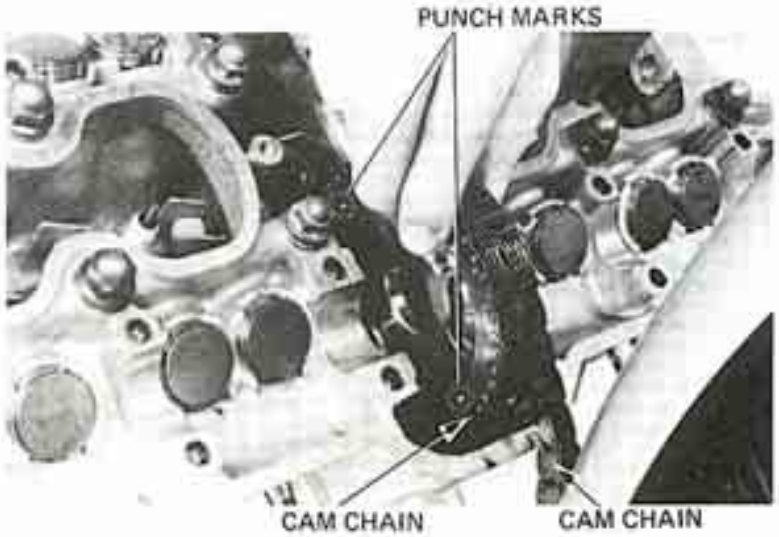
CAMSHAFT INSTALLATION

Lubricate the camshaft bearings with molybdenum disulfide grease.

Turn the crankshaft clockwise until the "T" mark is toward the front of the engine and is aligned with the crankcase mating surfaces as shown.



Place the cam chains over the exhaust camshaft sprocket, aligning the sprocket punch marks with the cylinder head surface.
Install the right exhaust camshaft, positioning the cam lobes for the No. 6 cylinder toward the spark plug. Install a camshaft sprocket bolt, but do not tighten yet.



Loosely install the No. 6 and No. 8 camshaft holders. Install the No. 7 holder, positioning the camshaft so its flange fits into the slot in the No. 7 holder.

NOTE

Install camshaft holders with directional arrows pointing toward the front of the engine.

Tighten the camshaft holder bolts in a crisscross pattern.

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

Turn the crankshaft clockwise 360° to obtain access for installing the other camshaft sprocket bolt. Install the sprocket bolt and tighten to the specified torque.

TORQUE:
14–18 N·m (1.4–1.8 kg·m, 10–13 ft·lb)

Turn the crankshaft another 360° and tighten the sprocket bolt which was installed earlier.
Adjust the cam chain (page 3-14).

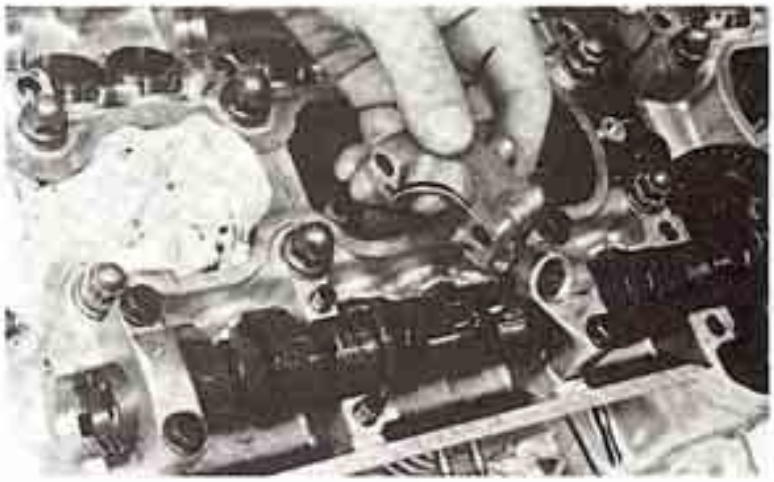
Position the crankshaft so the "T" mark is again aligned with the crankshaft mating surfaces as shown on page 6-21. Recheck the position of the exhaust camshaft sprocket; the punch marks must align with the cylinder head surface. Place the cam chain over the intake camshaft sprocket, aligning the sprocket punch marks with the cylinder head surface.
Install the right intake camshaft, positioning the cam lobes for the No. 6 cylinder toward the spark plugs. Install a camshaft sprocket bolt, but do not tighten yet.

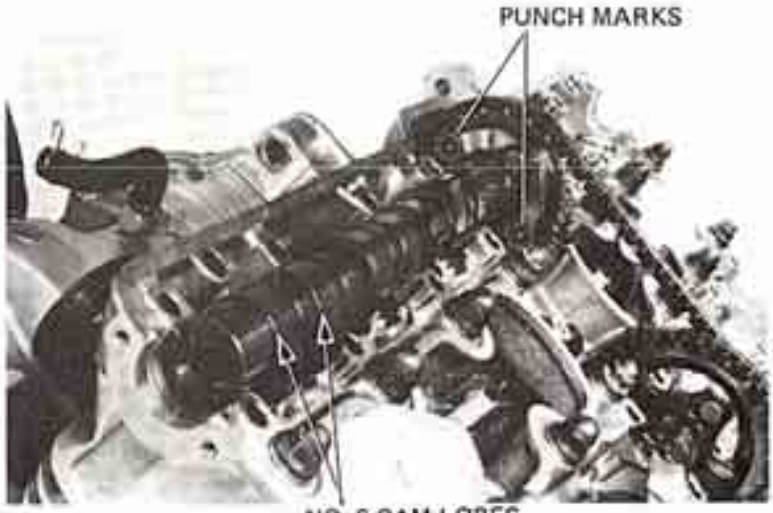
NOTE

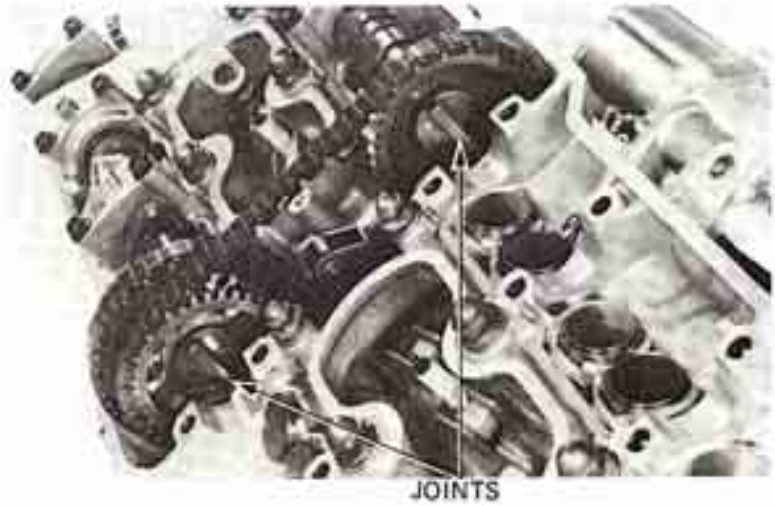
If the sprocket was not removed from the camshaft during disassembly, then reinstall as an assembled set.

Loosely install the No. 14 and No. 16 camshaft holders. Install the No. 15 holder, positioning the camshaft so its flange fits into the slot in the No. 15 holder.
Tighten the camshaft holder bolts, then tighten the camshaft sprocket bolt, following the same procedure described for exhaust camshaft installation.

Turn the crankshaft clockwise 360° until the "T" mark is aligned with the crankcase mating surface. Make sure the cam lobes for the No. 6 cylinder are toward outside.
Install and tighten the camshaft sprocket bolt. Adjust the cam chain tensioner (page 3-14). Recheck the crankshaft and camshaft sprocket alignment.
Insert the camshaft joints into the camshaft ends.







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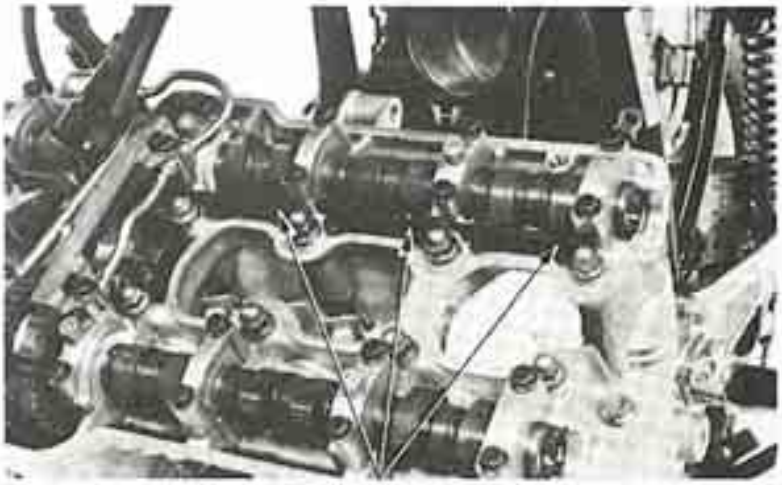
Connect the left camshafts to the joints with No. 1 cam lobes toward the spark plug.
Install No. 1, No. 3 and No. 9 and 11 holders loosely.
Install the No. 2 and No. 10 holders.
Tighten the bolts to the specified torque in a crisscross pattern.

NO. 1 CAM LOBES
ALSO, NO. 1 EX. CAM LOBES
TOWARD SPARK PLUG.

Install the oil pipes and cam chain guide with the No. 4, 5, 12 and 13 holders.
Tighten in a crisscross pattern to the specified torque.



OIL POOL PLATES

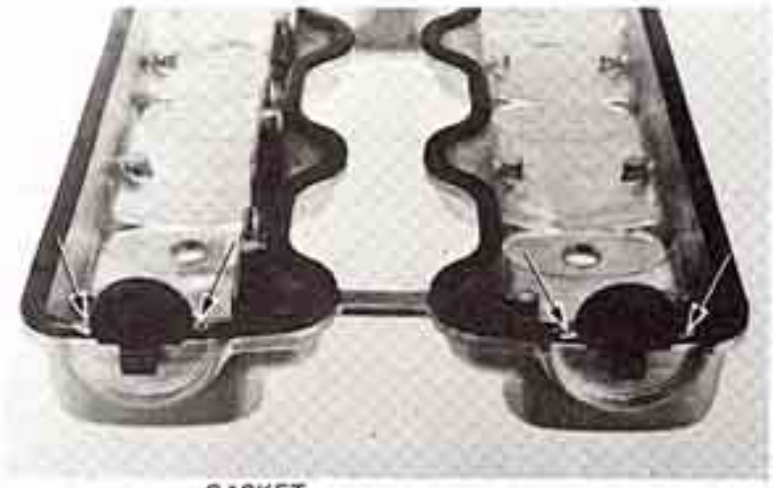
Install the engine.
Fill the oil pockets in the head with oil so that the cam lobes are submerged.

Adjust valve tappet clearance (Section 3).

Inspect the cylinder head cover gasket for damage or deterioration.
Apply a sealant on the cylinder gasket as shown, adjacent to each side cover.

NOTE

Before applying sealant, clean the gasket.



GASKET

Install the cylinder head cover and cylinder head side covers.

Insert the tachometer drive gear.
Install the tachometer gear cover.
Connect the tachometer cable.

TACHOMETER DRIVE GEAR

Install the right crankshaft side cover and gasket with bead printed surface toward the crankcase.
Install a new O-ring on the upper screw only.
Adjust the cam chain (page 3-14).

O-RING

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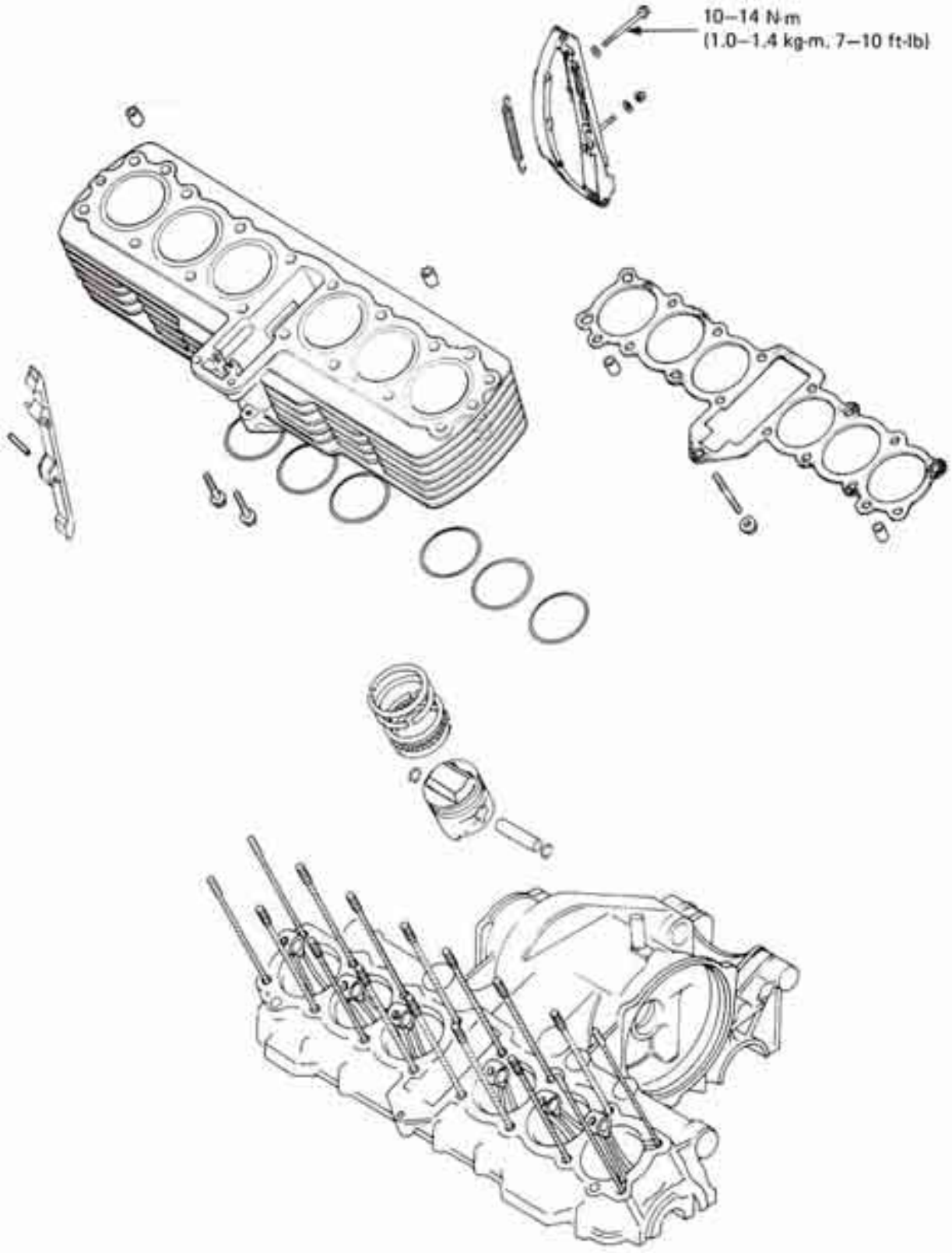

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SERVICE INFORMATION

GENERAL INSTRUCTION

All cylinder/piston maintenance and inspection can be accomplished with the engine in the frame.

TOOLS

Special

Piston Base (4 required)	07958–2500000
Piston Ring Compressor (4 required)	07954–4220000

TORQUE VALUE

Cam chain tensioner rear bolt: 10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)

SPECIFICATIONS

			STANDARD	SERVICE LIMIT
Cylinder	I.D.		64.500–64.510 mm (2.5394–2.5398 in)	64.60 mm (2.543 in)
	Warpage		———	0.10 mm (0.004 in)
Piston, piston rings and piston pin	Piston ring-to ring groove clearance	TOP	0.015–0.045 mm (0.0006–0.0018 in)	0.09 mm (0.004 in)
		SECOND	0.015–0.045 mm (0.0006–0.0018 in)	0.09 mm (0.004 in)
	Ring end gap	TOP	0.15–0.30 mm (0.006–0.012 in)	0.5 mm (0.02 in)
		SECOND	0.15–0.30 mm (0.006–0.012 in)	0.5 mm (0.02 in)
		OIL (SIDE RAIL)	0.30–0.90 mm (0.012–0.035 in)	1.1 mm (0.04 in)
	Piston O.D.		64.47–64.49 mm (2.538–2.539 in)	64.40 mm (2.535 in)
	Piston pin bore		15.002–15.008 mm (0.5906–0.5909 in)	15.04 mm (0.592 in)
	Connecting rod small end I.D.		15.016–15.034 mm (0.5912–0.5919 in)	15.05 mm (0.592 in)
	Piston pin O.D.		14.994–15.000 mm (0.5903–0.5906 in)	14.98 mm (0.590 in)
	Piston-to-piston pin clearance		———	0.04 mm (0.002 in)
	Cylinder-to-piston clearance		———	0.10 mm (0.004 in)

TROUBLESHOOTING

Compression Too Low or Unstable
1. Worn cylinder or piston rings

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

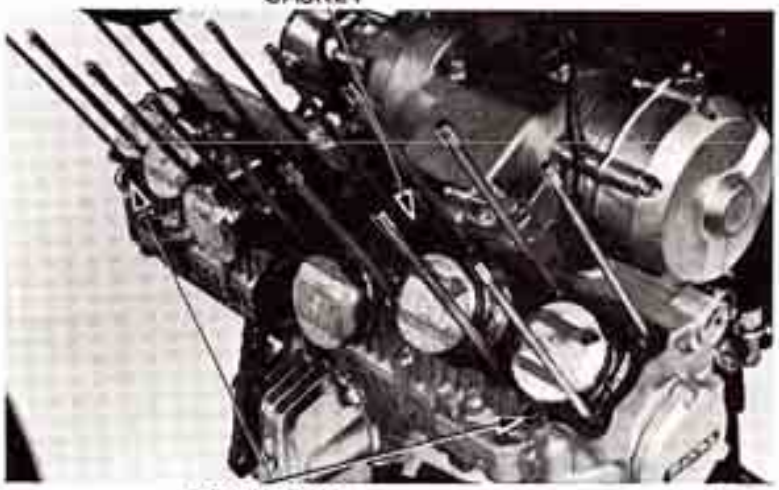
Overheating
1. Excessive carbon build-up on the piston or combustion chamber.

Knocking or Abnormal Noise
1. Worn piston and cylinder
2. Excessive carbon build-up

CYLINDER REMOVAL

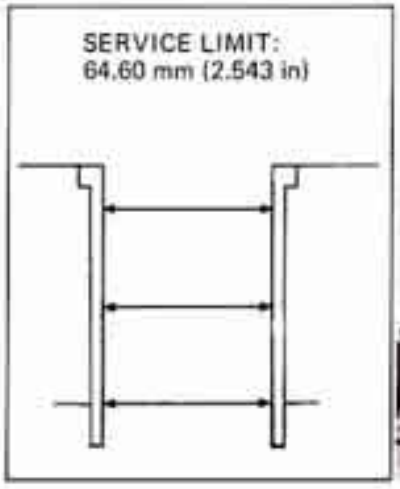
Remove the cylinder head (Section 6).
Place clean shop towels into the crankcase openings to keep objects from falling in.
Remove the nut at the lower front cylinder base.
Remove the cylinder.
Remove the cam chain tensioner.

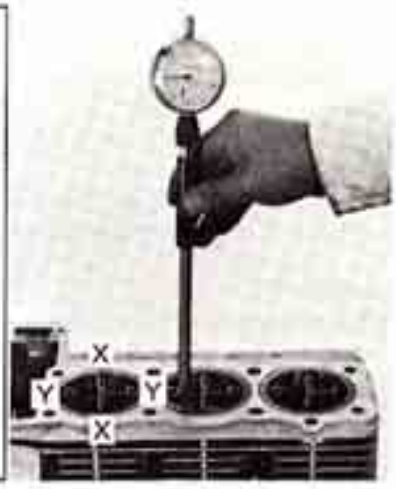
Remove the cylinder gasket and dowel pins.
Remove the cam chain guide pin.



CYLINDER INSPECTION

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





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

WARP SERVICE LIMIT
0.10 mm (0.004 in)

CAM CHAIN TENSIONER INSPECTION

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

PISTON REMOVAL

Remove and discard each piston pin clip with pliers.

NOTE

- Do not allow clips to fall into the crankcase.
- Never re-use the clips.

Press the piston pin out of the piston.

NOTE

Mark the pistons to indicate the cylinder positions.

PISTON/PISTON RING INSPECTION

Inspect the piston ring-to-groove clearacne.
Remove the piston rings.

NOTE

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

Inspect the pistons for damage and cracks.
Check ring grooves for wear.

SERVICE LIMIT:
TOP: 0.09 mm (0.004 in)
SECOND:0.09 mm (0.004 in)

Insert each piston ring into the cylinder and inspect 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 (0.04 in)**

STANDARD END GAPS:

TOP	**0.15–0.30 mm (0.006–0.012 in)**
SECOND:	**0.15–0.30 mm (0.006–0.012 in)**
OIL (Side rail):	**0.3–0.9 mm (0.012–0.035 in)**

Measure the piston O.D. at the skirt 90° from the piston pin hole.

NOTE

Measurements should be taken 10 mm (0.4 in) from the bottom.

Calculate the cylinder-to-piston clearance.
SERVICE LIMIT: 0.10 mm (0.004 in)

SERVICE LIMIT:
64.40 mm (2.535 in)

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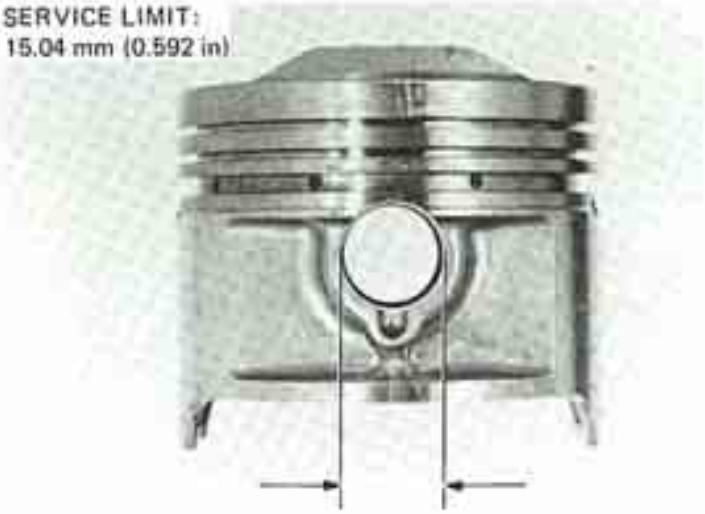
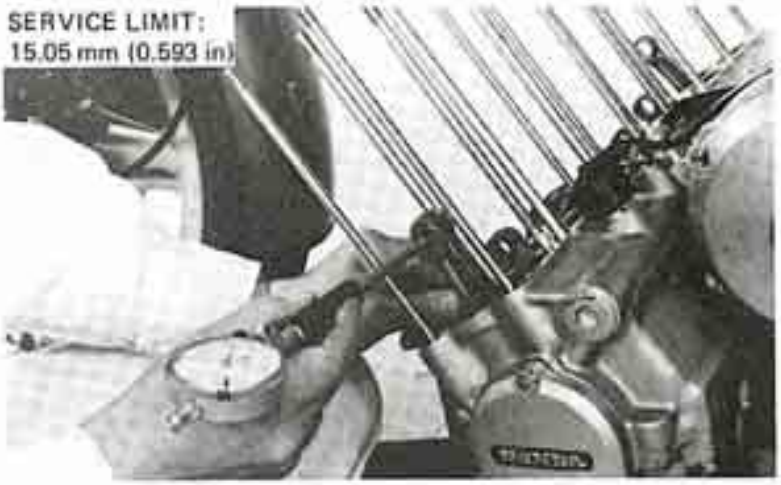
Measure the piston pin hole I.D..

SERVICE LIMIT:
15.04 mm (0.592 in)



Measure the connecting rod small end I.D..
(See Section 12 for replacement procedure)

SERVICE LIMIT:
15.05 mm (0.593 in)



Measure the piston pin O. D..

Determine the piston-to-piston pin clearance.
SERVICE LIMIT: 0.04 mm (0.002 in)

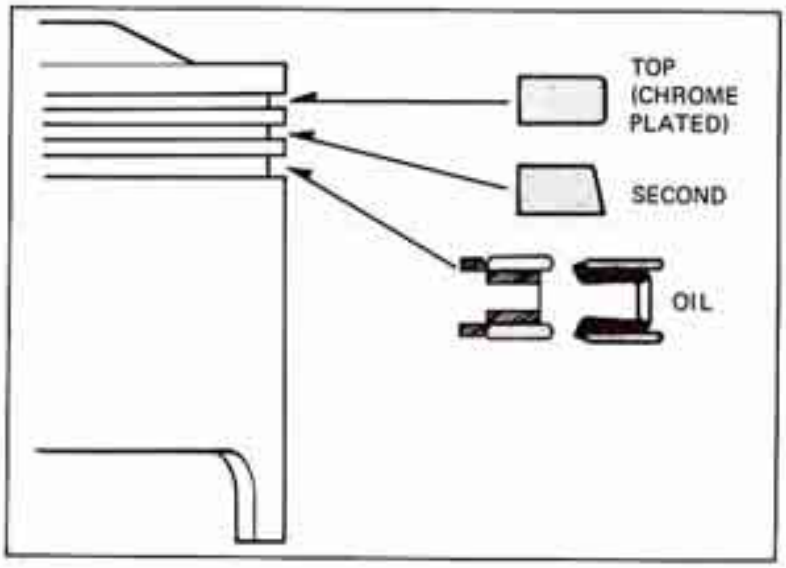
SERVICE LIMIT:
14.98 mm (0.590 in)

PISTON RING INSTALLATION

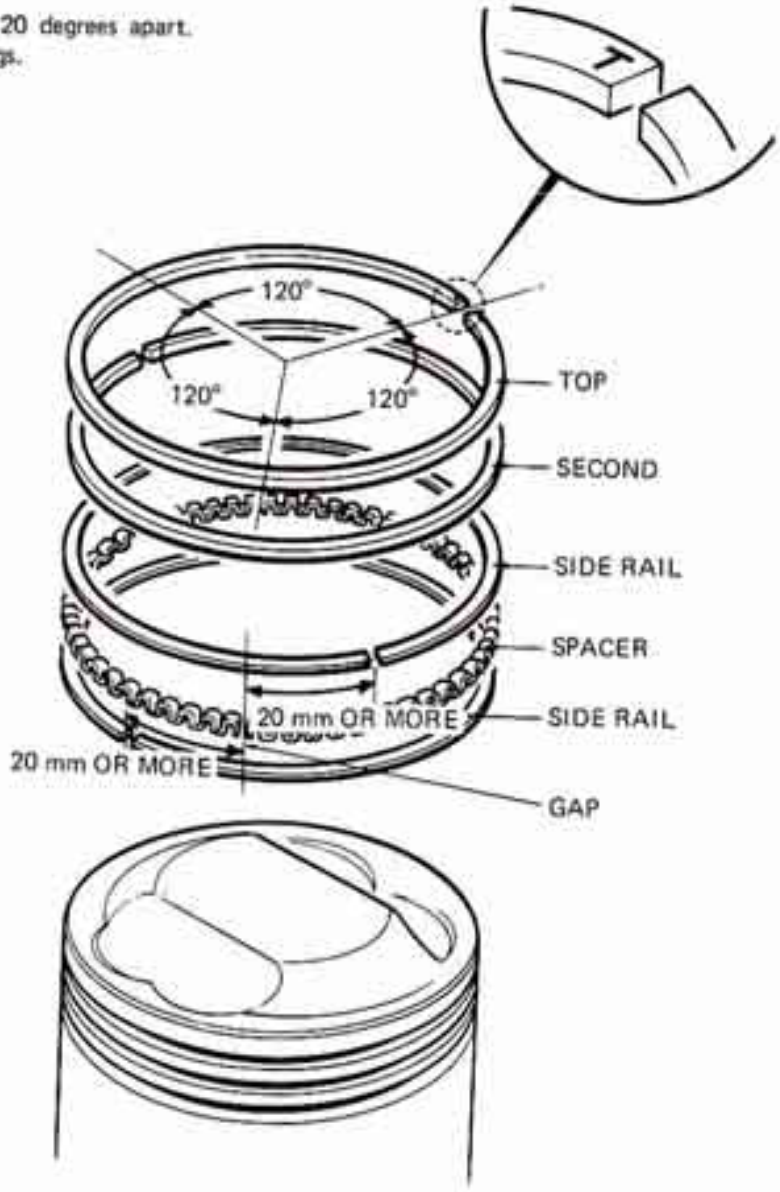
Install the piston rings.

NOTE

- Avoid piston and piston ring damage during installation.
- All rings should be installed 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.



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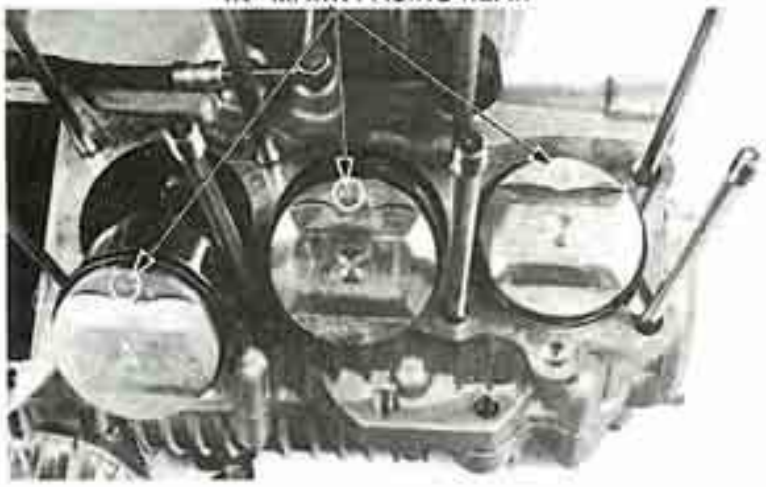
PISTON INSTALLATION

Apply molybdenum disulfide grease to the connecting rod small ends.
Install the pistons, piston pins and new clips.

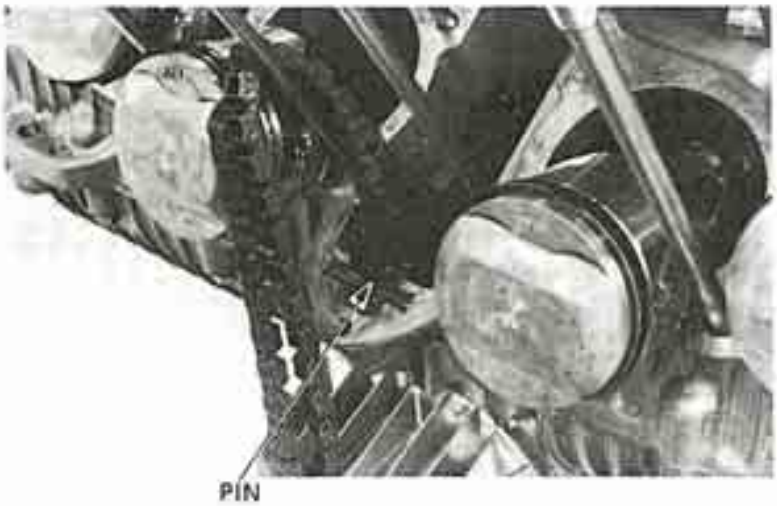
NOTE

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

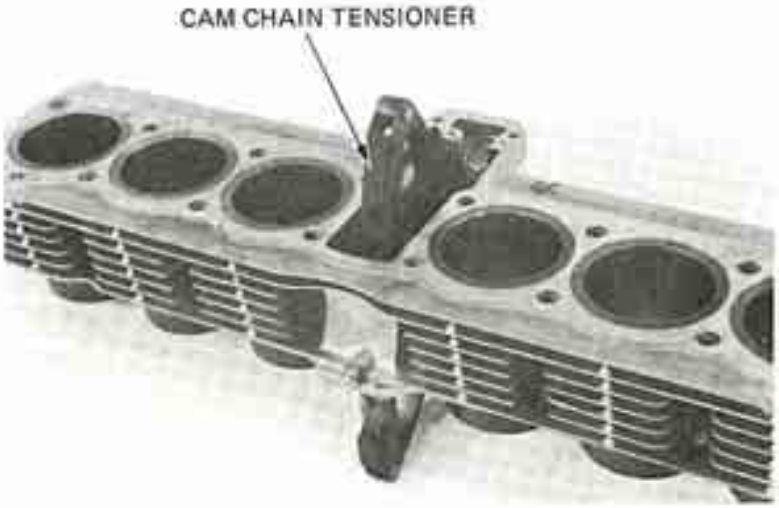


CYLINDER INSTALLATION

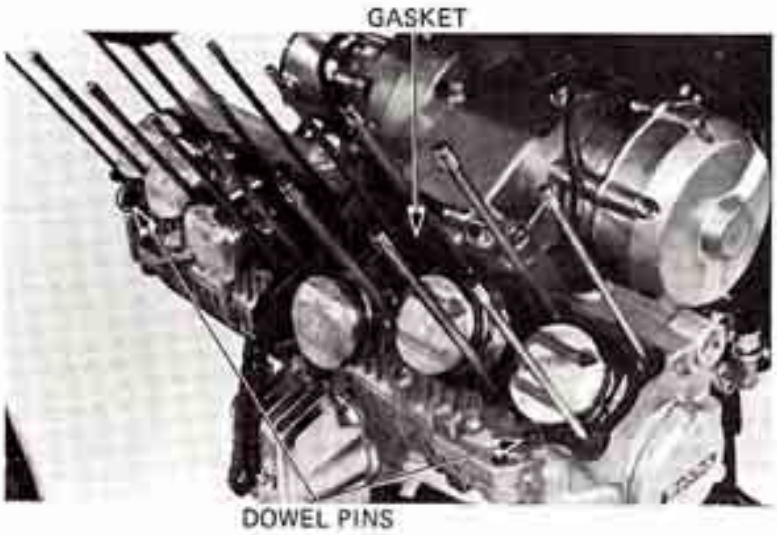
Install the cam chain guide pin.



Install the cam chain tensioner.



Install the dowel pins and cylinder gasket.



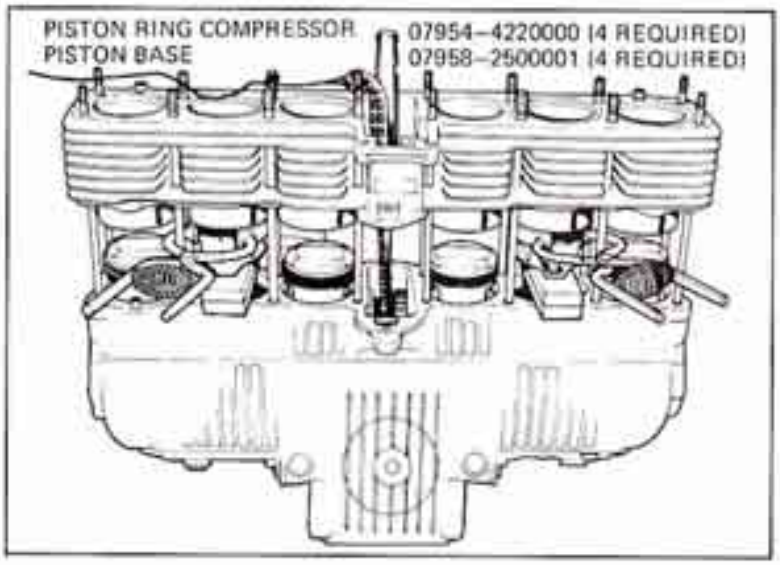
Install the cylinder.

CAUTION

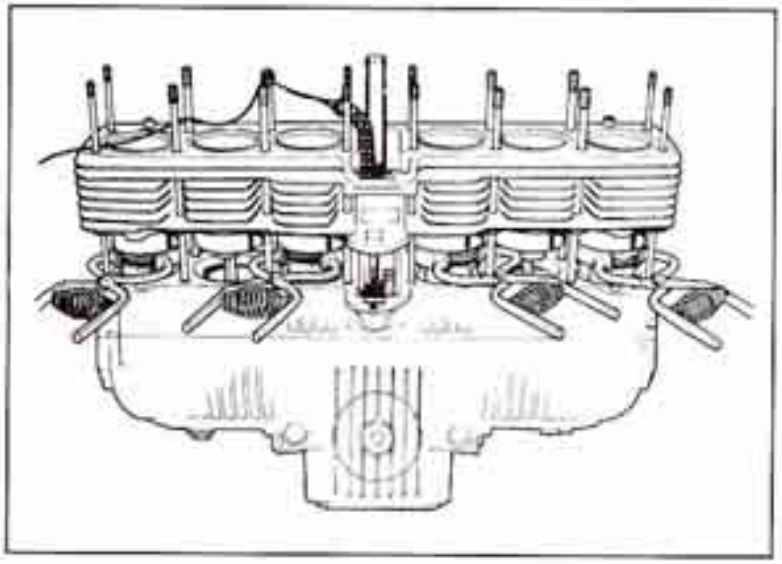
Avoid damaging the pistons and piston rings when installing the cylinder.

NOTE

Before using the special tools, position the No. 2 and No. 5 pistons at T. D. C. (Top Dead Center).



Tighten the cylinder base nut securely after installation.



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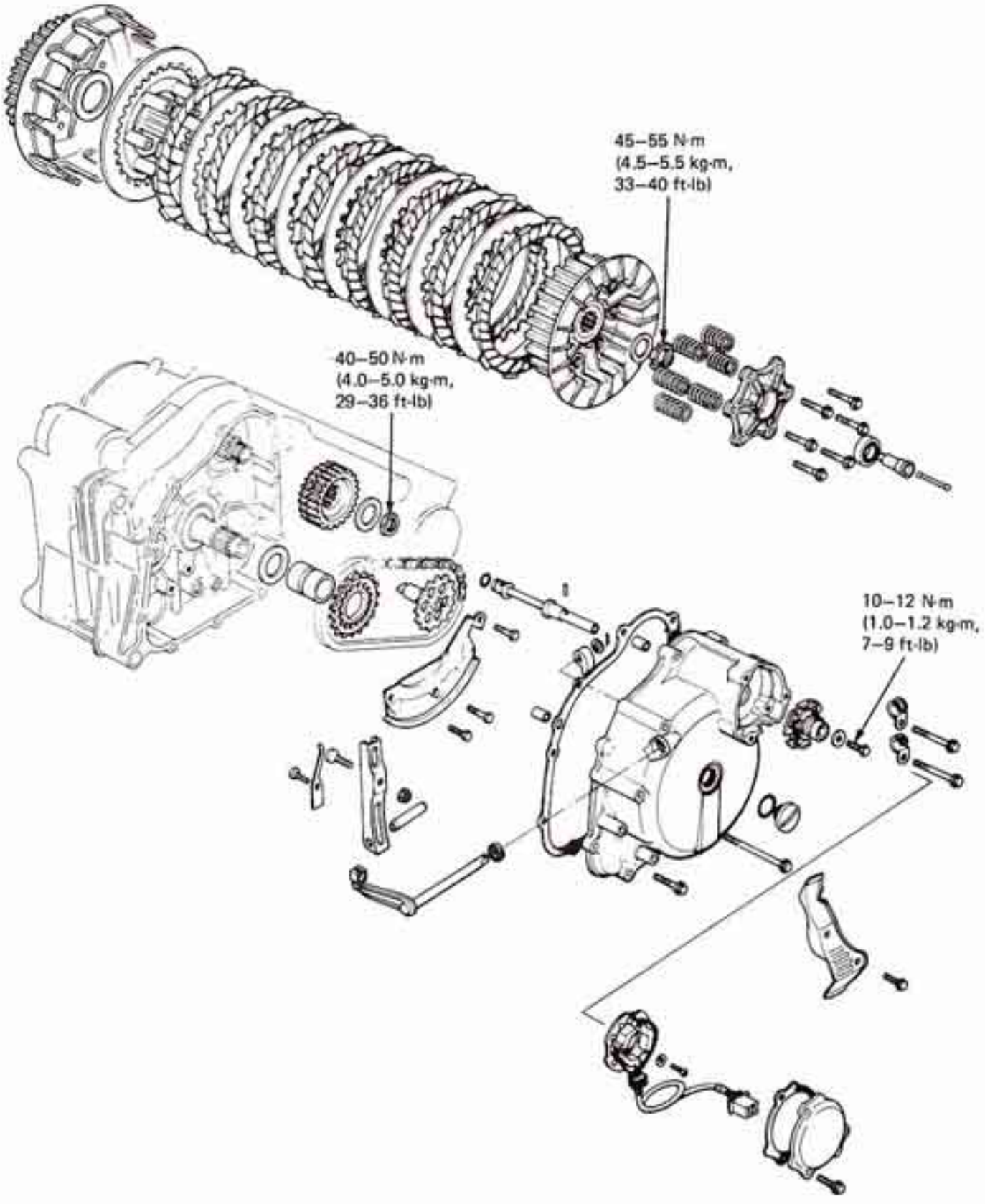

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SERVICE INFORMATION

GENERAL INSTRUCTIONS

- This section covers removal and installation of the clutch, pulse generator and advancer, starting with the clutch cover.
- This operation can be accomplished with the engine in the frame.

TOOLS

Common
- Universal Holder 07725-0030000

Special
- Lock Nut Wrench 07916-4220000
- Primary Gear Holder 07924-4250000

TORQUE VALUES

Clutch lock nut	45–55 N·m (4.5–5.5 kg-m, 33–40 ft-lb)
Primary drive gear lock nut	40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)
Spark advancer	10–12 N·m (1.0–1.2 kg-m, 7–9 ft-lb)

SPECIFICATIONS

			STANDARD	SERVICE LIMIT
Clutch	Lever free play (at lever end)		10–20 mm (3/8–3/4 in)	———
	Spring free length		35.1 mm (1.38 in)	33.6 mm (1.32 in)
	Spring preload/length		18.3–20.1 kg/24.4–25.6 mm (40.34–44.31 lbs/0.96–1.01 in)	17.0 kg/24.4–35.6 mm (37.48 lbs/0.96–1.01 in)
	Disc thickness	A	3.42–3.58 mm (0.135–0.141 in)	3.1 mm (0.12 in)
		B	3.42–3.58 mm (0.135–0.141 in)	3.1 mm (0.12 in)
	Plate warpage		———	0.2 mm (0.01 in)
	Clutch outer I.D.		37.000–37.025 mm (1.4567–1.4577 in)	37.06 mm (1.459 in)
	Clutch outer guide O.D.		36.950–36.975 mm (1.457–1.4557 in)	36.93 mm (1.454 in)
Oil pump drive system	Drive sprocket I.D.		37.000–37.021 mm (1.4567–1.4575 in)	37.1 mm (1.46 in)
	Driven sprocket shaft O.D.		12.966–12.984 mm (0.5105–0.5112 in)	12.9 mm (0.51 in)
Ignition timing	Refer to Section 3.			

TROUBLESHOOTING

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

Clutch Slips When Accelerating
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

CLUTCH COVER REMOVAL

Remove the right leg shield.
Remove the exhaust pipes.
Remove the oil hose cover.

OIL HOSE COVER

NOTE

The clutch cover can be removed without removing the pulse generator and advancer. The pulse generator and advancer removal is shown here. If removal is unnecessary, the clutch cover can be removed by removing the cover bolts.

Remove the pulse generator cover.
Loosen the center bolt and three screws.
Then, remove the pulse generator.

Remove the spark advancer unit.

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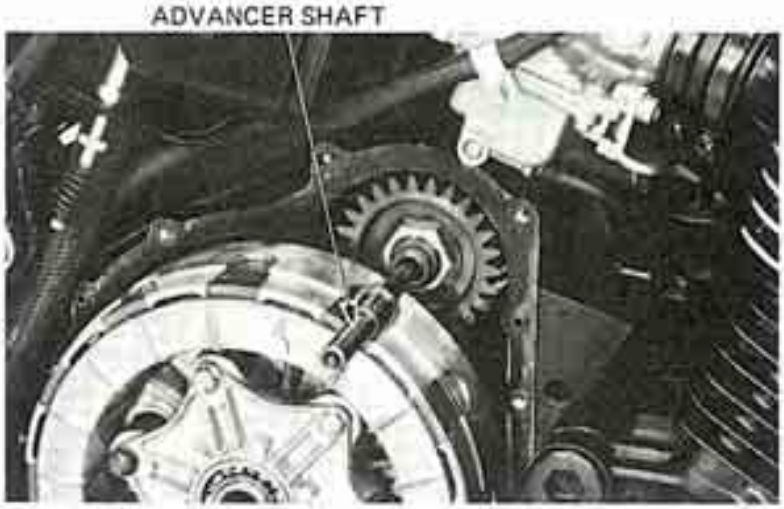
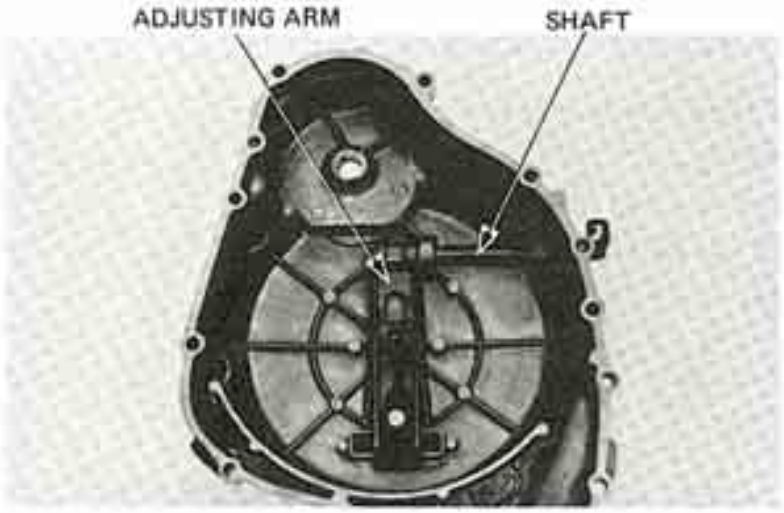
Remove the clutch cover.
Remove the advancer shaft.
Remove the gasket and dowel pins.



CLUTCH REMOVAL

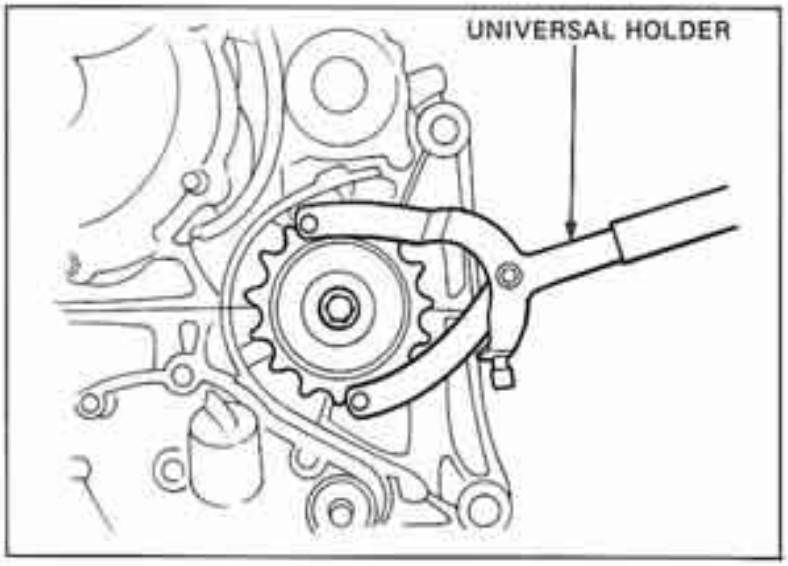
CLUTCH LIFTER REMOVAL

Remove the clutch lifter shaft and adjusting arm.



CLUTCH REMOVAL

Use the universal holder if the drive chain is removed.
Shift the transmission into gear to lock the countershaft and mainshaft.
Lock the drive sprocket to prevent it from turning.

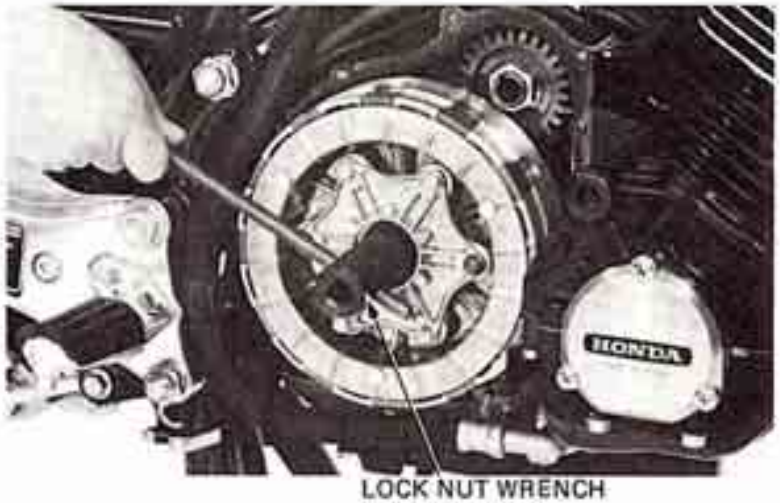


When servicing the clutch with the engine in the frame, shift the transmission into gear and press the brake pedal to lock the transmission.

Remove the clutch lifter guide.
Remove the release bearing.

Attach the lock nut wrench.
Remove the lock nut and washer.
The clutch can now be removed as a unit.

Remove the clutch disc assembly and thrust washer from the clutch outer.



LOCK NUT WRENCH
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CLUTCH LIFTER PLATE REMOVAL

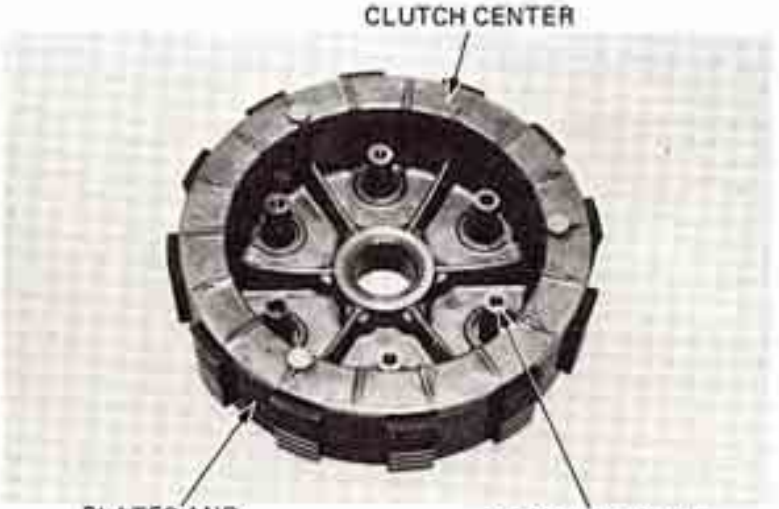
Remove the bolts, lifter plate and clutch springs.

NOTE

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

CLUTCH CENTER, PLATE AND DISC REMOVAL

Remove the clutch center.
Remove discs A and B and plate A.
Remove the pressure plate.



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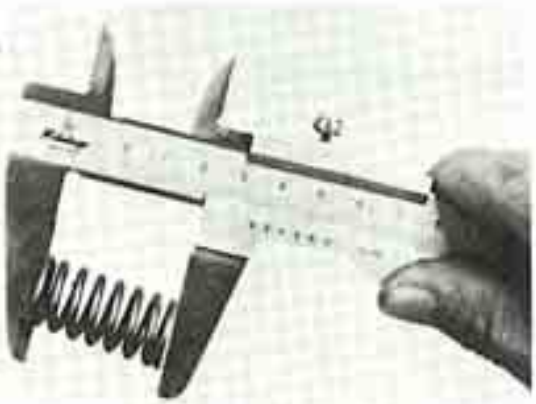
CLUTCH SPRING INSPECTION

Measure the clutch spring free length.

SERVICE LIMIT:
33.6 mm (1.32 in)



CLUTCH DISC INSPECTION

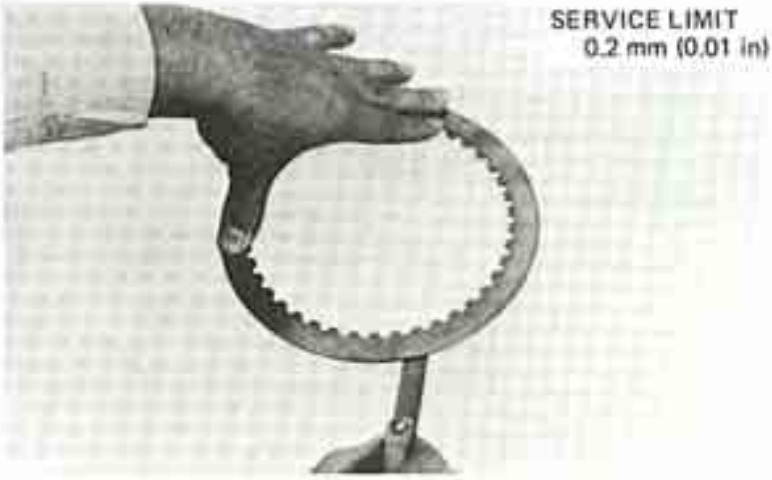
Replace the clutch discs if they show signs of scoring or discoloration.
Measure disc thickness.

SERVICE LIMIT:
3.1 mm (0.12 in)

PLATE INSPECTION

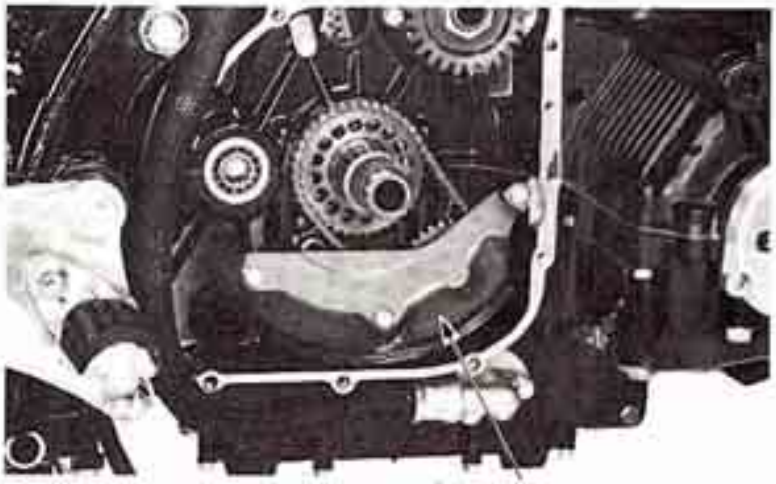
Check for plate warpage on a surface plate.

SERVICE LIMIT
0.2 mm (0.01 in)



OIL GUIDE PLATE REMOVAL

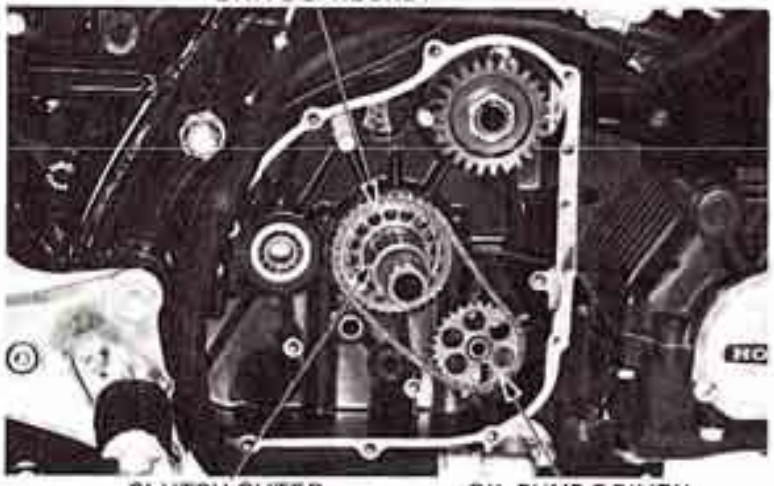
Remove the oil guide plate.



OIL GUIDE PLATE

OIL PUMP SPROCKETS AND CLUTCH OUTER GUIDE REMOVAL

Remove the oil pump drive and driven sprockets and clutch outer guide.



OIL PUMP DRIVE SPROCKET

CLUTCH OUTER GUIDE

OIL PUMP DRIVEN SPROCKET

CLUTCH OUTER AND OUTER GUIDE INSPECTION

Check the slots in the outer drum for nicks, cuts or indentations made by the friction discs.
Measure the I.D. of the clutch outer and the O.D. of the outer guide.

SERVICE LIMIT:
OUTER I.D. : 37.06 mm (1.459 in)
GUIDE O.D. : 36.93 mm (1.454 in)

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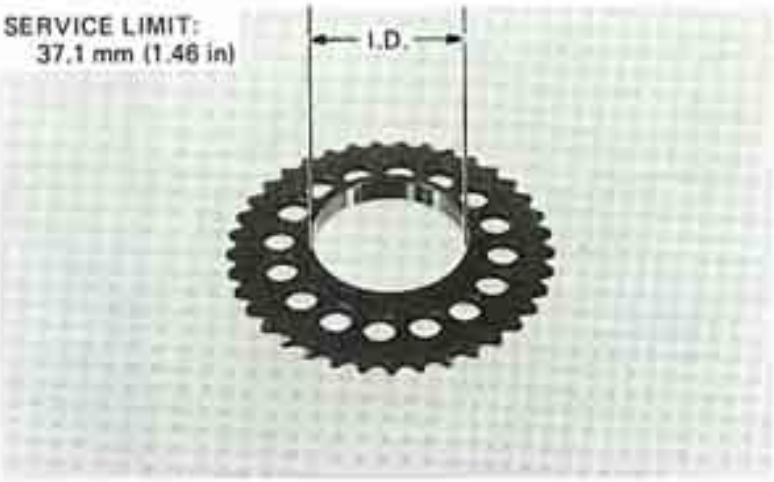
OIL PUMP DRIVE SPROCKET AND DRIVEN SPROCKET MEASUREMENT

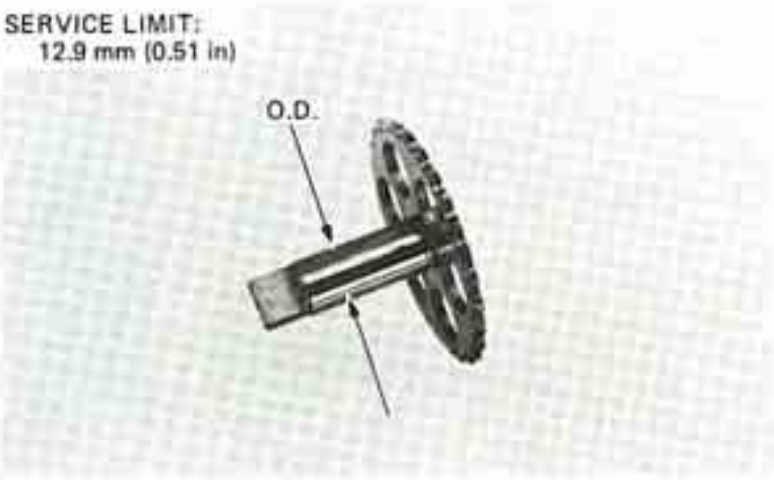
Measure the oil pump drive sprocket I.D.

SERVICE LIMIT:
37.1 mm (1.46 in)



Measure the oil pump driven sprocket shaft O.D..

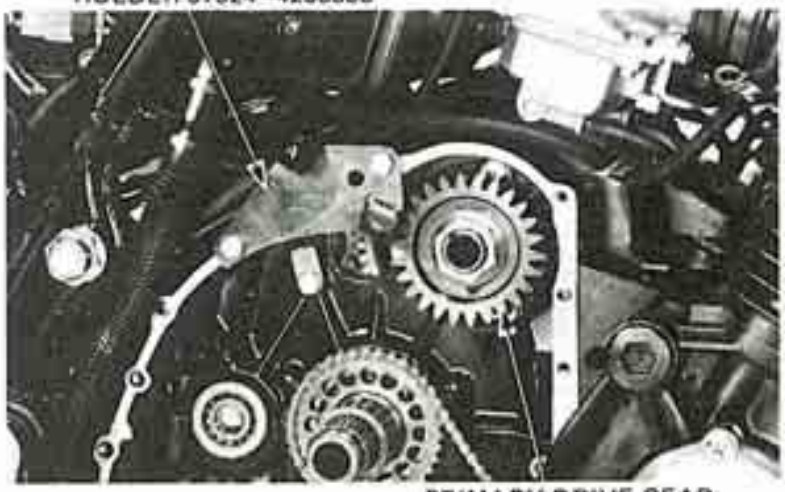
SERVICE LIMIT:
12.9 mm (0.51 in)



PRIMARY DRIVE GEAR REMOVAL

Hold the primary drive gear with the primary gear holder as shown.
Loosen the lock nut.

PRIMARY GEAR
HOLDER 07924–4250000



PRIMARY DRIVE GEAR

CLUTCH INSTALLATION

Install the primary drive gear.

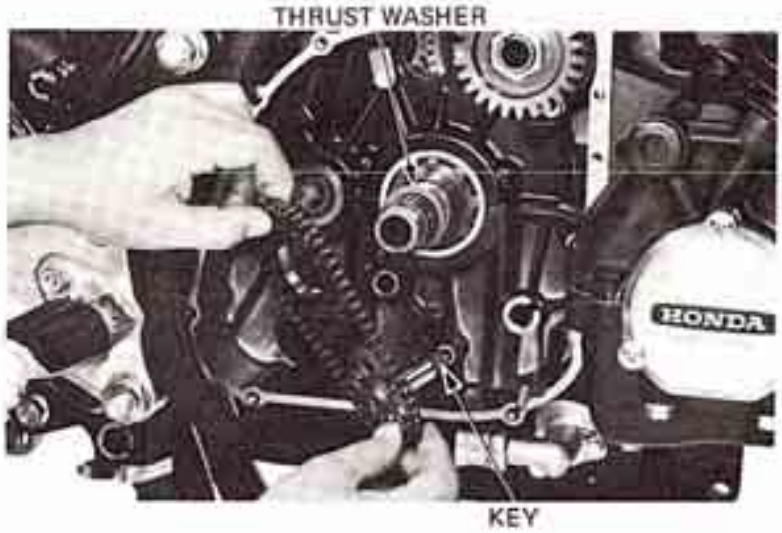
NOTE

- Position the drive gear with the large gear facing out.
- Position the mark "OUTSIDE" on the lock washer on the outside.

Tighten the lock nut to the specified torque.

TORQUE:
40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)

Install the thrust washer and clutch outer guide on the transmission mainshaft.
Install the oil pump drive sprocket, driven sprocket and drive chain.
Align the driven sprocket key with the oil pump shaft slot.
Install the oil guide plate.



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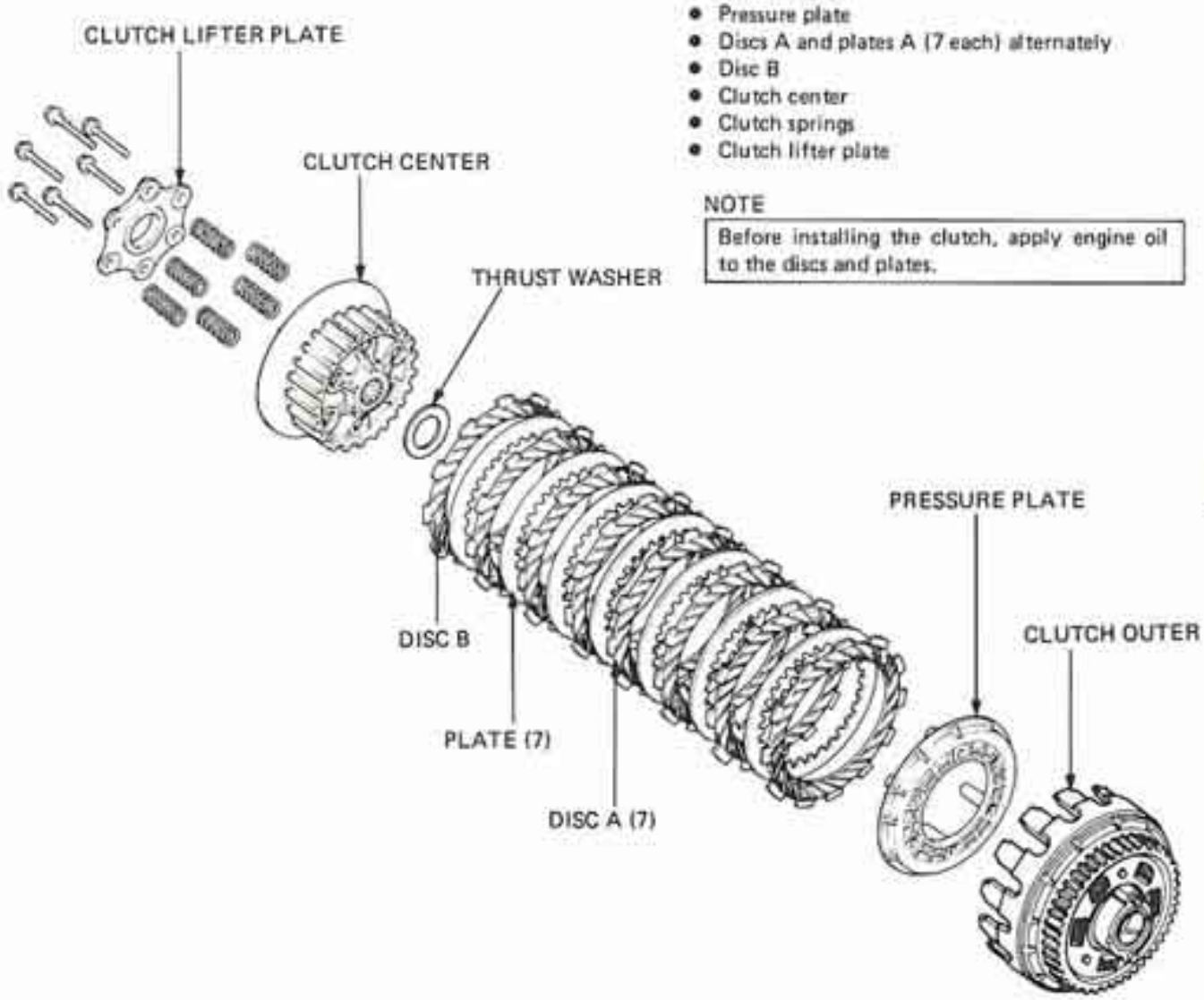
Install the following parts in the clutch outer in the order listed.

- Pressure plate
- Discs A and plates A (7 each) alternately
- Disc B
- Clutch center
- Clutch springs
- Clutch lifter plate

NOTE

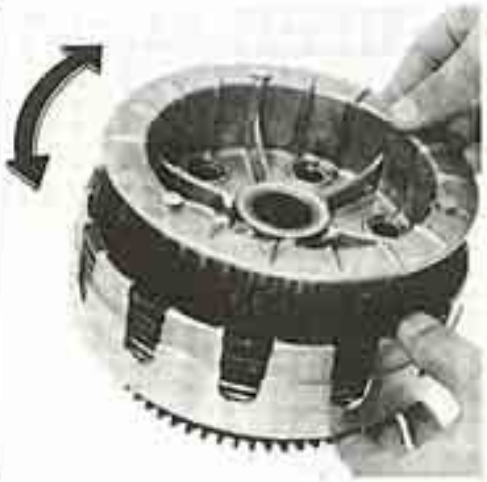
Before installing the clutch, apply engine oil to the discs and plates.



Install the discs with the grooves facing in the direction shown.
Align the splines by rotating the clutch center. Install the clutch springs, lifter plate and lifter plate bolts.

NOTE

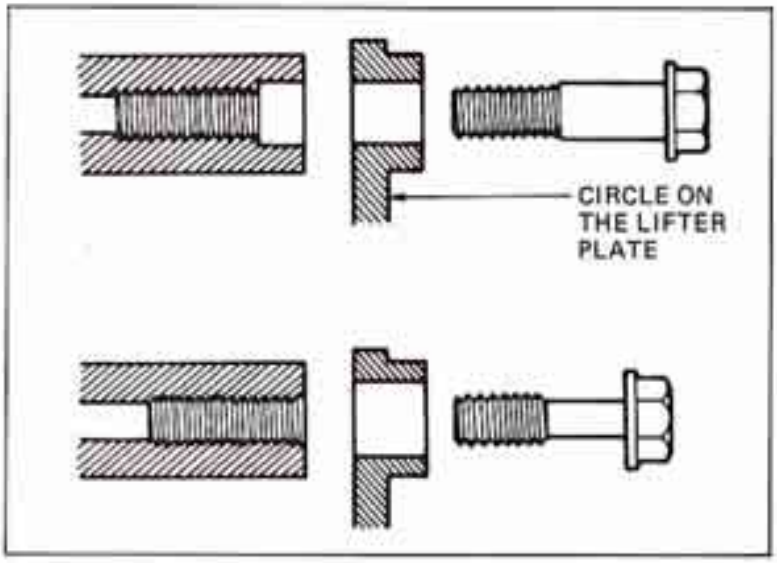
Tighten the bolts in two or more steps and in a crisscross pattern.



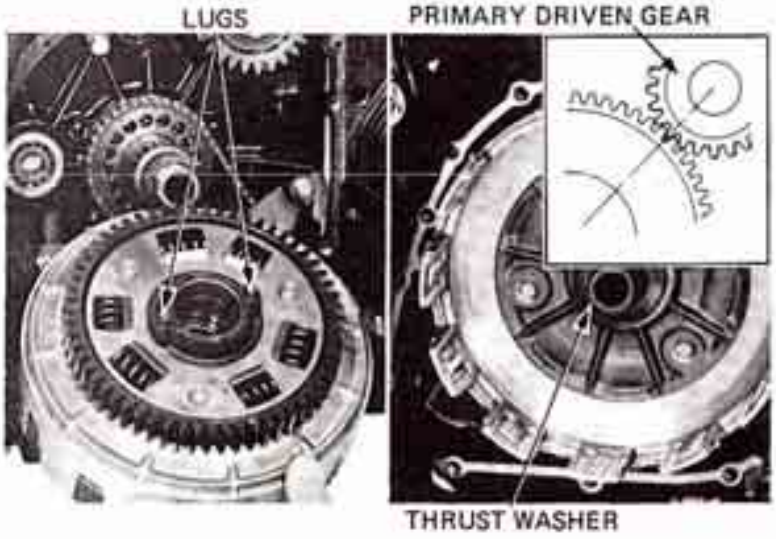
Tighten the lifter plate bolts.

NOTE

The lifter plate bolts are in two types. Tighten the pin-bolts first, then the 6 mm bolts.



Turning the primary drive gear, find a pair of outer and inner gear teeth which are aligned.
Assemble the clutch outer gear so it meshes with the aligned teeth and connect the clutch outer to the oil pump drive sprocket by putting the lugs into the holes.
Install the thrust washer on the mainshaft after the clutch outer is installed.
Install the clutch disc assembly.



Install the lock washer with the mark "OUT SIDE" facing out and install the lock nut.

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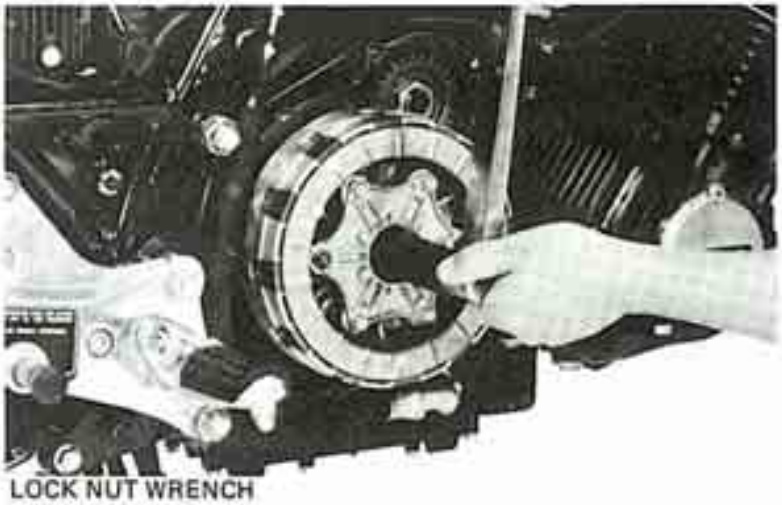
Tighten the lock nut to the specified torque.

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

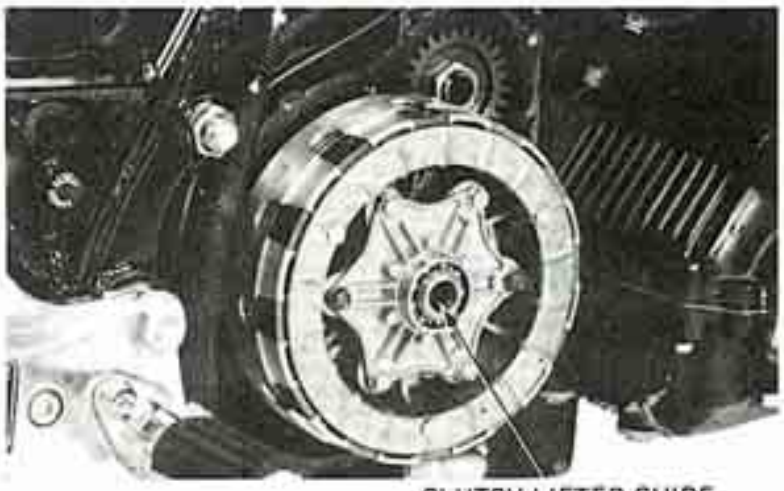
NOTE

With the transmission engaged, depress the rear brake pedal to lock the transmission or lock the drive sprocket with a universal holder.



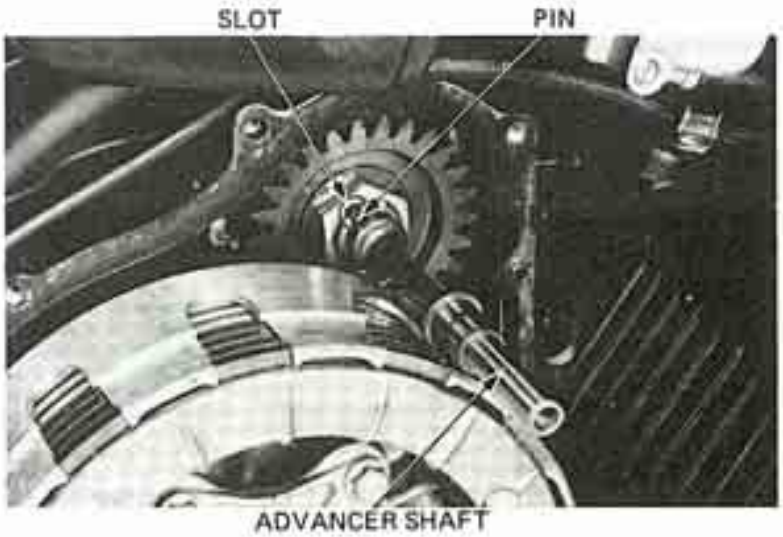
LOCK NUT WRENCH
07916–4220000

Install the release bearing in the lifter plate.
Insert the clutch lifter guide.
Install the clutch lifter pin.



CLUTCH LIFTER GUIDE

Install the advancer shaft.
Make sure that the pin on the shaft is aligned with the slot in the primary shaft.



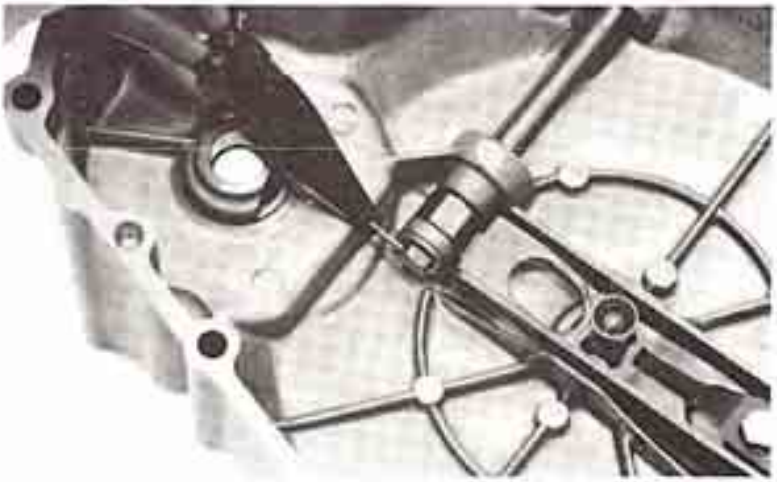
ADVANCER SHAFT

CLUTCH COVER INSTALLATION

Coat the advancer shaft oil seal with oil.
Drive the oil seal with the proper rod until the top of the oil seal is flush with the advancer side surface of the clutch cover.

Install the clutch lifter cam and shaft.
Insert the cotter pin and spread the ends.

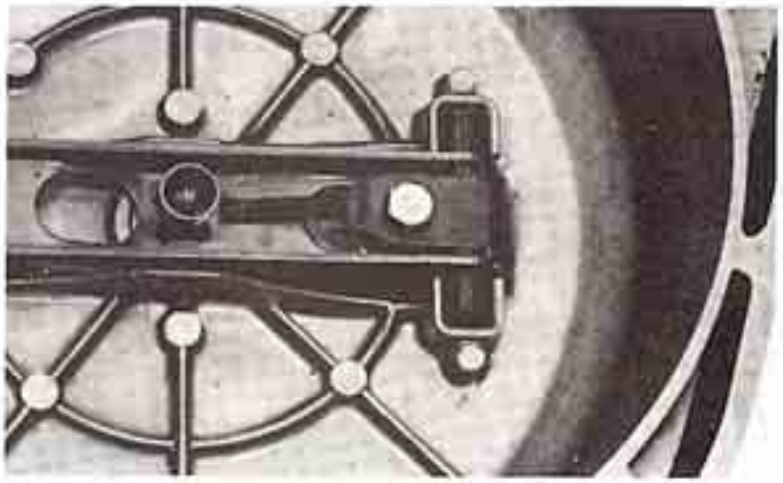
Apply molybdenum disulfide grease to the advancer shaft hole of the clutch cover.



Install the clutch adjusting arm and spring.
Install the dowel pins and gasket.
Install the clutch cover.

Adjust the clutch free play (Section 3).

Apply molybdenum disulfide grease to the clutch adjusting hole cap.



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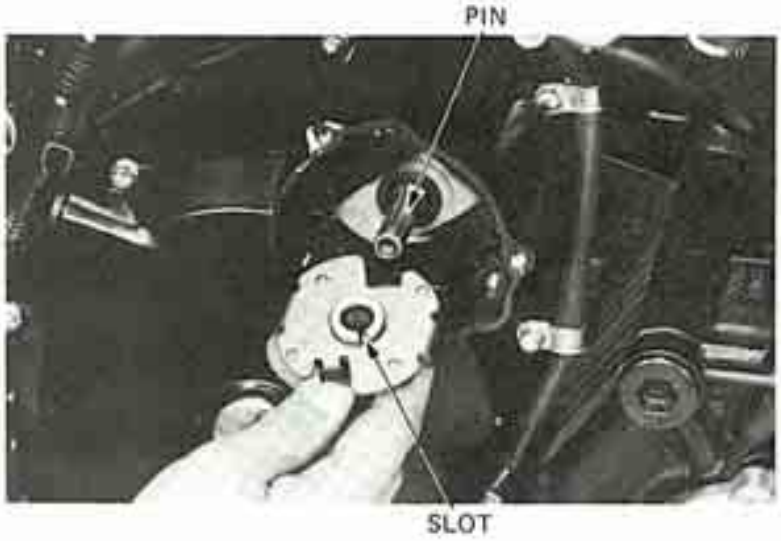
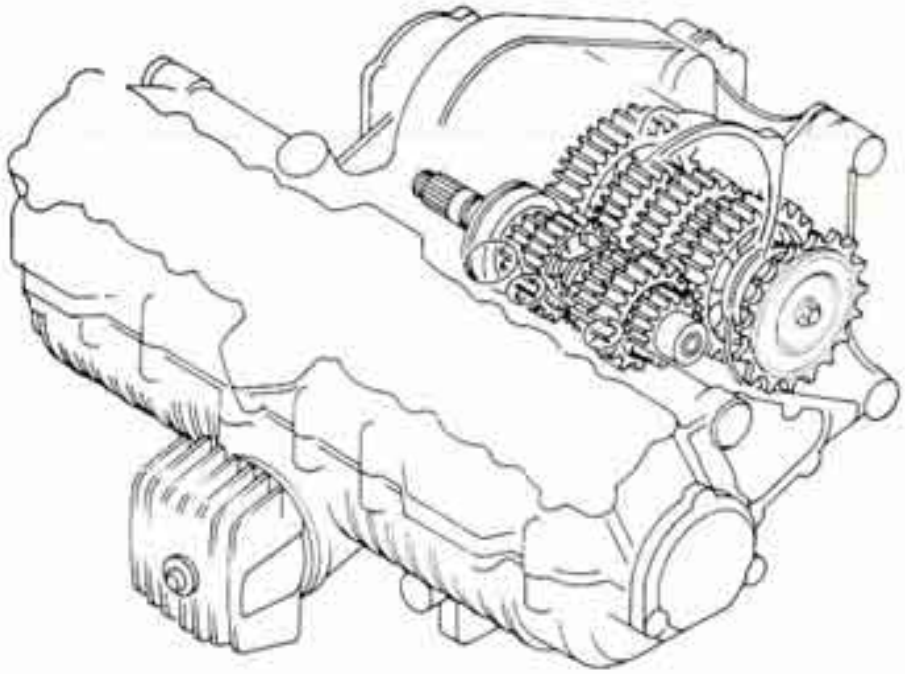
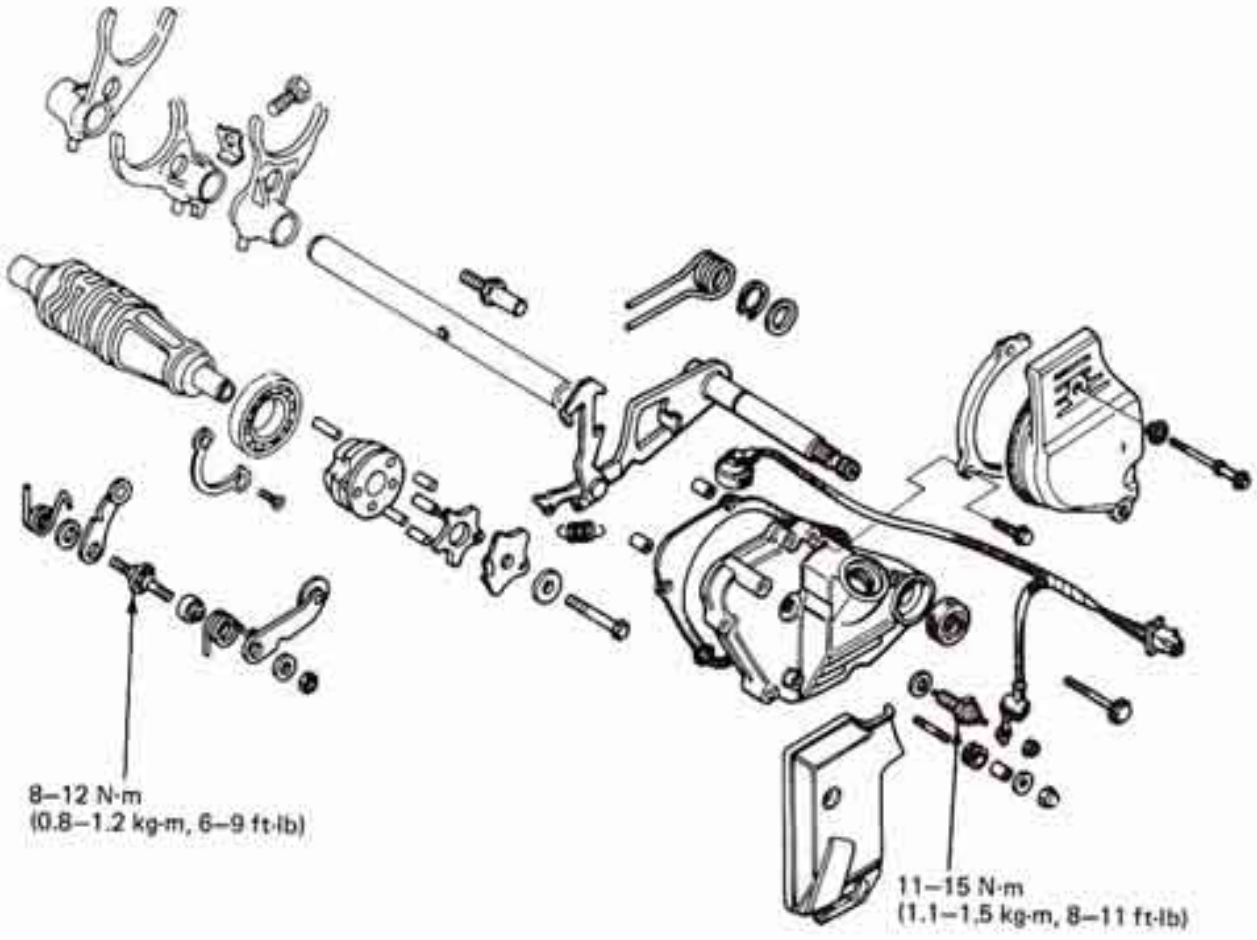
Install the advancer.
Align the slot on the spark advancer unit with the pin on the advancer shaft.
Tighten the advancer bolt.



Install the pulse generator.
Adjust the ignition timing, if necessary (Section 3).





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SERVICE INFORMATION

GENERAL INSTRUCTIONS

- The gearshift spindle and stopper arms can be serviced with the engine in the frame.
- The outline of the shift forks and drum can be inspected by removing the oil pan. If the shift forks, drum or transmission require servicing, remove the engine and separate the crankcases.

TORQUE VALUES

Stopper arm shaft	8–12 N·m (0.8–1.2 kg-m, 6– 9 ft-lb)
Neutral switch	11–15 N·m (1.1–1.5 kg-m, 8–11 ft-lb)
Oil drain bolt	28–32 N·m (2.8–3.2 kg-m, 20–23 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

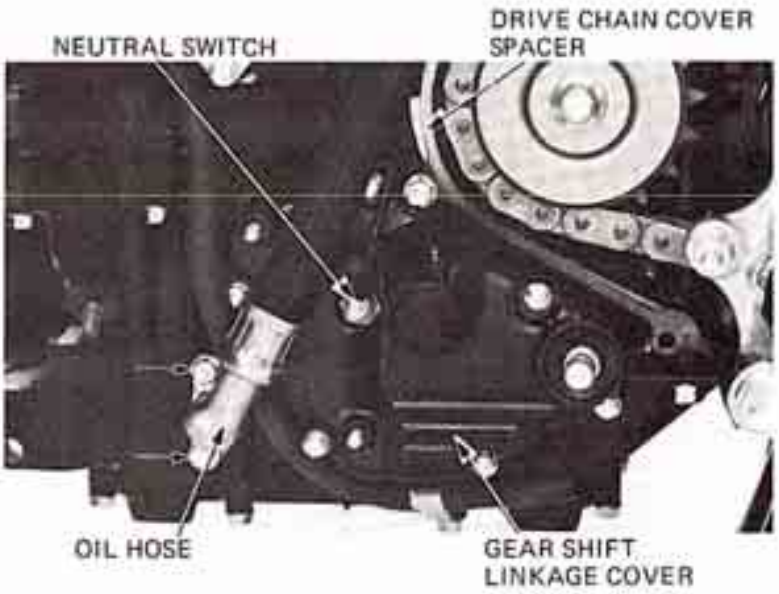
Transmission Jumps Out of Gear
1. Gear dogs worn
2. Shift shaft bent
3. Shift drum stopper broken
4. Shift forks bent

GEARSHIFT PEDAL AND LINKAGE REMOVAL

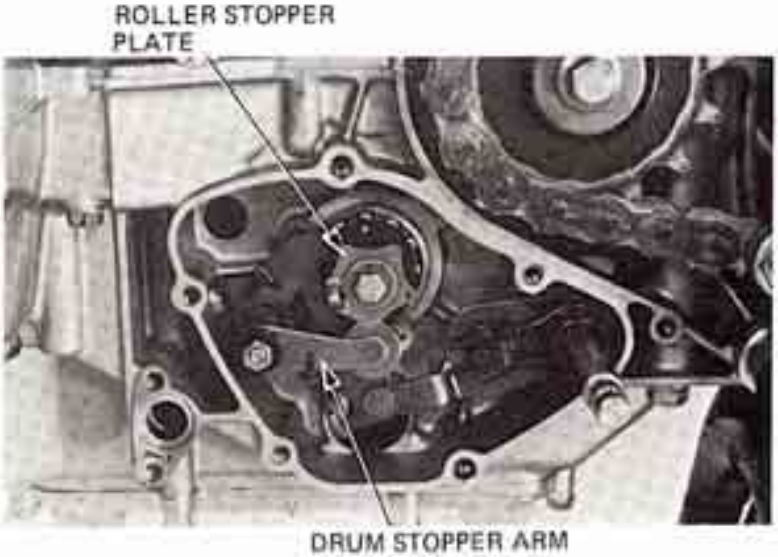
Drain engine oil.

Remove the left exhaust pipes.
Remove the oil hose cover.
Remove the gear shift pedal.
Remove the drive sprocket cover.

Remove the oil hose.
Disconnect the neutral switch lead.
Remove the drive sprocket and gear shift linkage covers.
Remove the gasket and dowel pins.
Remove the drive chain cover spacer.



Remove the roller stopper plate bolt and plate.
Remove the drum stopper arm nut, arm and spring.



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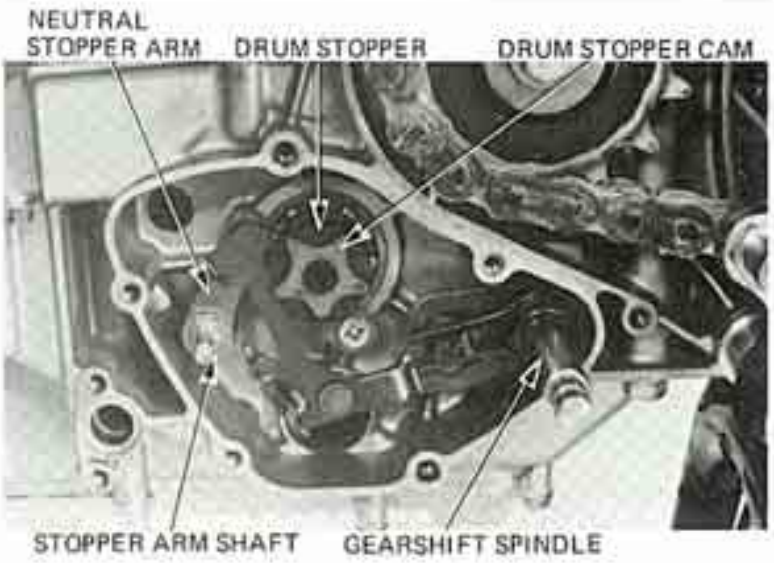
Remove the gearshift spindle assembly.
Remove the drum stopper cam and drum stopper.
Loosen the stopper arm shaft.
Remove the neutral stopper arm and spring.

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



NEUTRAL SWITCH INSPECTION

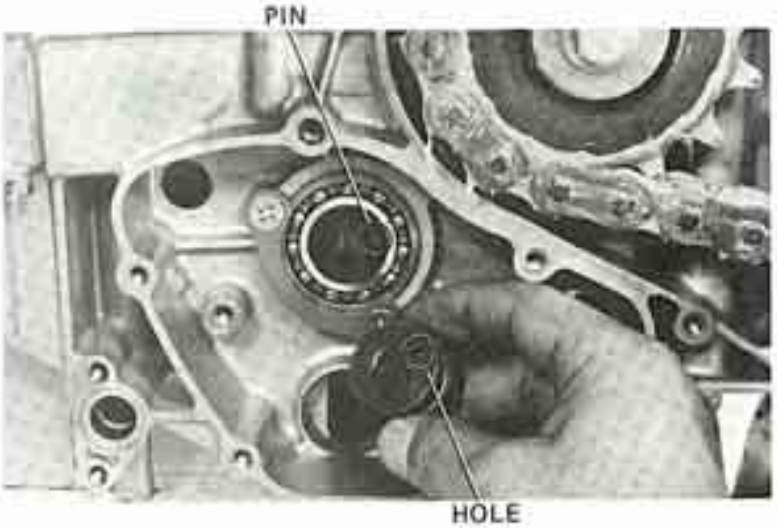
Check the switch operation.
Check the neutral switch for continuity between the top and bottom terminals, when pressing the end terminal.
The switch is normal if there is continuity. Also check for shorts between the top terminal and any ground.
Replace the switch if there is continuity.

GEARSHIFT LINKAGE INSTALLATION

Align the hole in the drum stopper with the pin on the shift drum.

NOTE

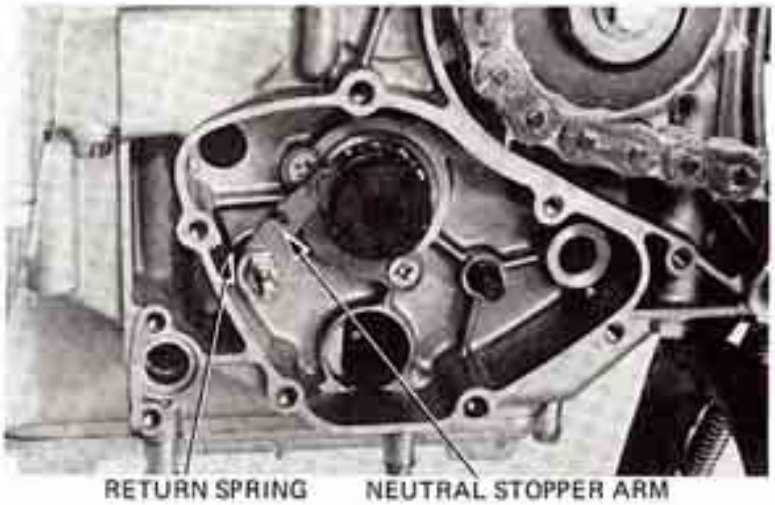
If bearing replacement is necessary, apply locking agent to the threads of the screws.



Install the stopper arm shaft, neutral stopper arm and return spring.

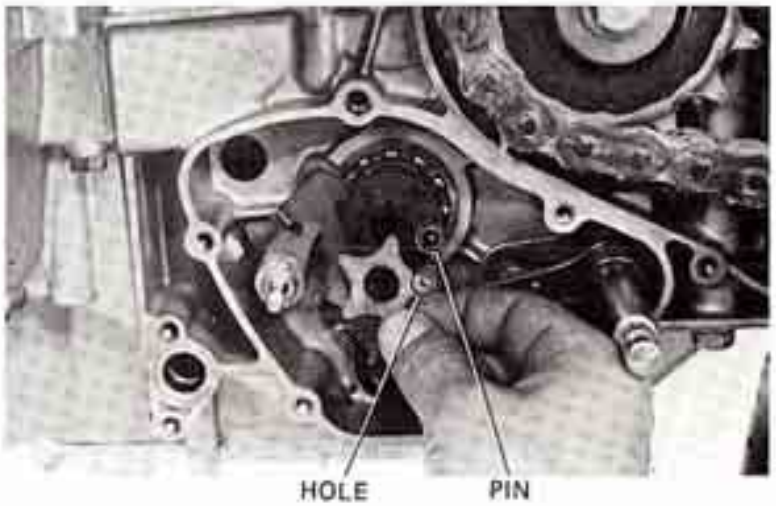
TORQUE:
8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)

Make sure that the roller on the neutral stopper arm is positioned correctly in the groove of the drum stopper.



Assemble the gearshift spindle, return spring and snap ring.
Install as shown.

Align the hole in the drum stopper cam with the pin on the drum stopper.



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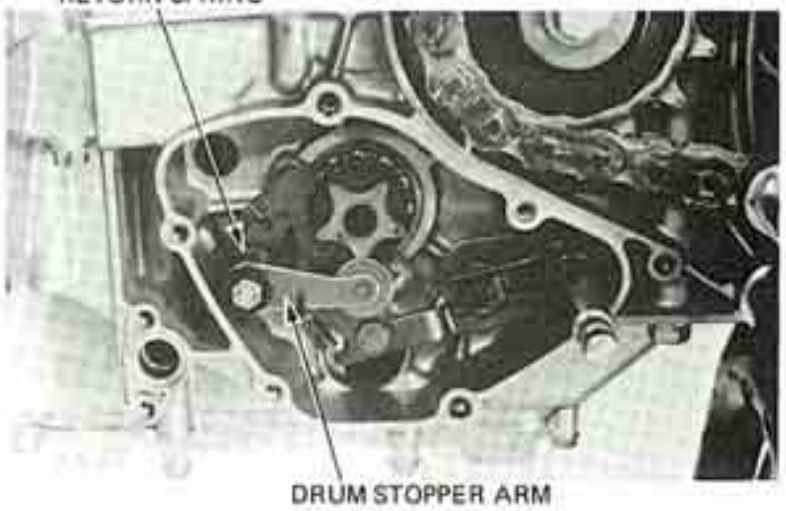
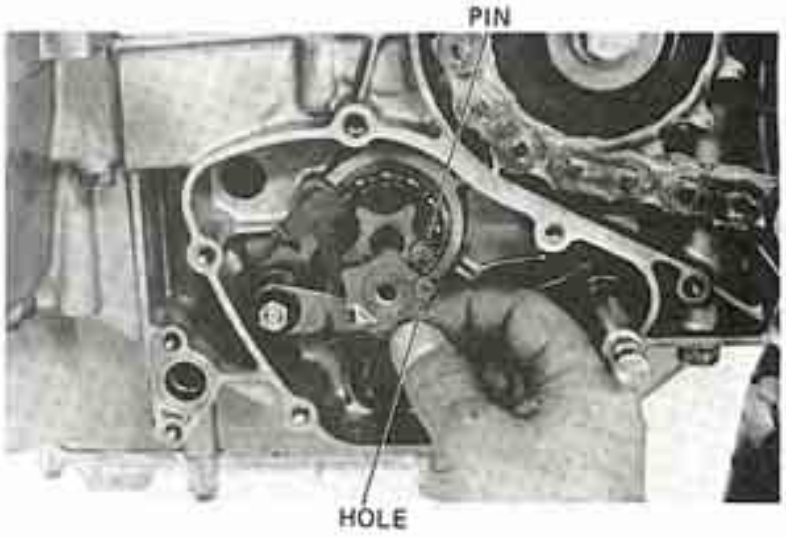
Install the drum stopper arm and return spring.



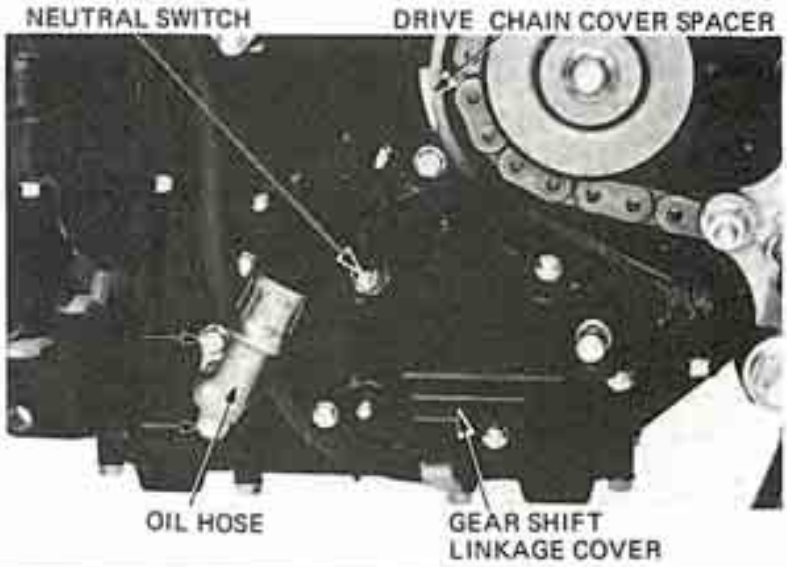
Align the hole in the roller stopper plate with the pin on the drum stopper cam.

Apply a locking agent to the bolt.
Tighten the stopper plate bolt securely.

Check the linkage for smooth operation by rotating the gearshift spindle.

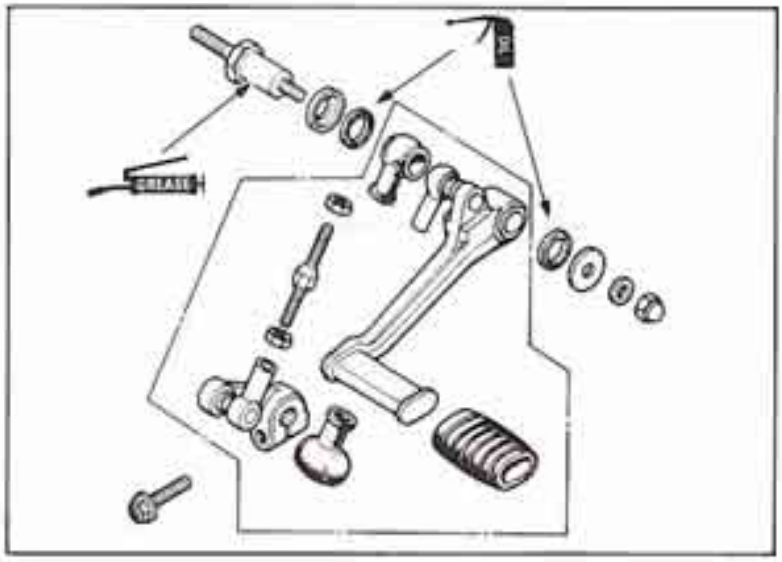


Install the gearshift linkage cover.
Install the drive sprocket cover spacer.
Connect the neutral switch lead.
Apply grease or oil to the O-ring and install it on the oil hose.
Connect the oil hose.
Install the oil hose and drive sprocket covers.



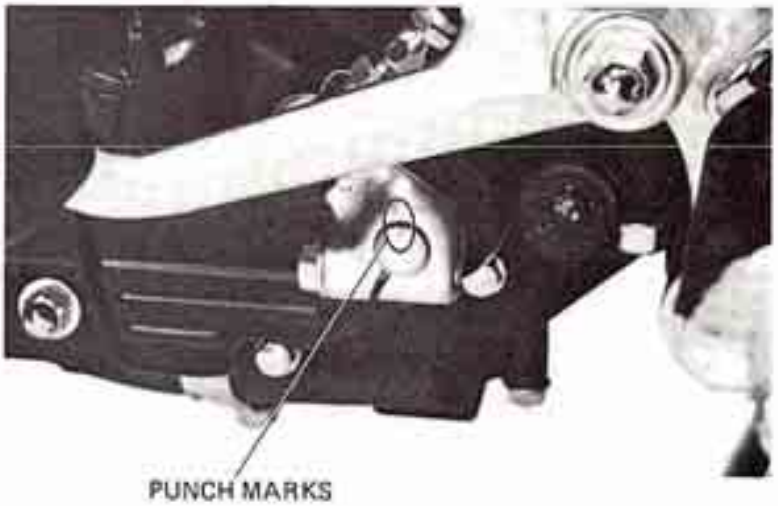
GEARSHIFT PEDAL INSTALLATION

Install the gear shift pedal as shown.



NOTE

- Coat the dust seal with oil.
- Align the punch mark on the joint arm with the punch mark on the gear shift spindle.
- Tighten the bolt and nut securely.



PUNCH MARKS

Adjust by turning the adjuster after loosening the lock nuts.
Tighten the lock nuts.

LOCK NUTS

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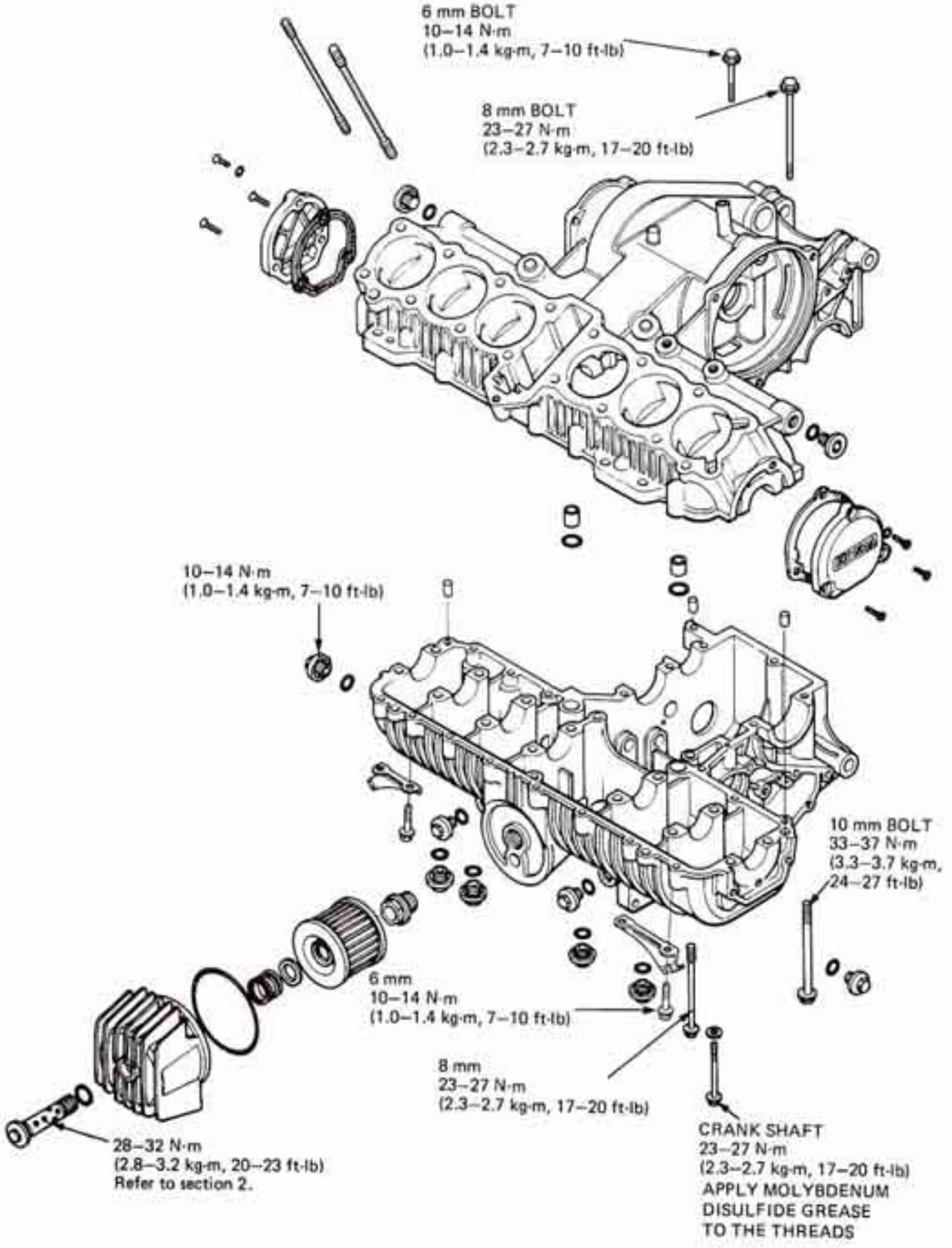

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SERVICE INFORMATION

GENERAL INSTRUCTIONS

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

Item to be serviced	Items to be removed
Crankshaft and connecting rod	Cylinder head, cylinder, pistons and primary shaft assembly
Primary shaft	A.C. generator and lock nut (inside the clutch)
Transmission	Clutch, oil pump drive chain and gear shift linkage

TORQUE VALUES

8 mm bolt (crankshaft)	23–27 N·m (2.3–2.7 kg-m, 17–20 ft-lb) Apply molybdenum disulfide grease to the threads and underside of the bolt head.
8 mm bolt (crankcase)	23–27 N·m (2.3–2.7 kg-m, 17–20 ft-lb)
6 mm bolt	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
10 mm bolt	33–37 N·m (3.3–3.7 kg-m, 24–27 ft-lb)
Oil pass cap	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
Oil filter center bolt	28–32 N·m (2.8–3.2 kg-m, 20–23 ft-lb)

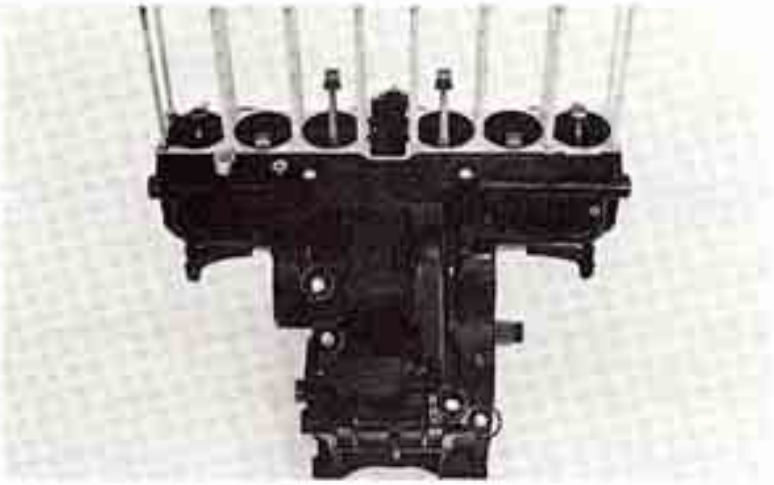
CRANKCASE DISASSEMBLY

Remove the cylinder head, cylinder, pistons and oil filter (Sections 6 and 7).

Remove the clutch, clutch related parts, A. C. generator, gear shift linkage and starter motor (Sections 8, 9, 16 and 18).

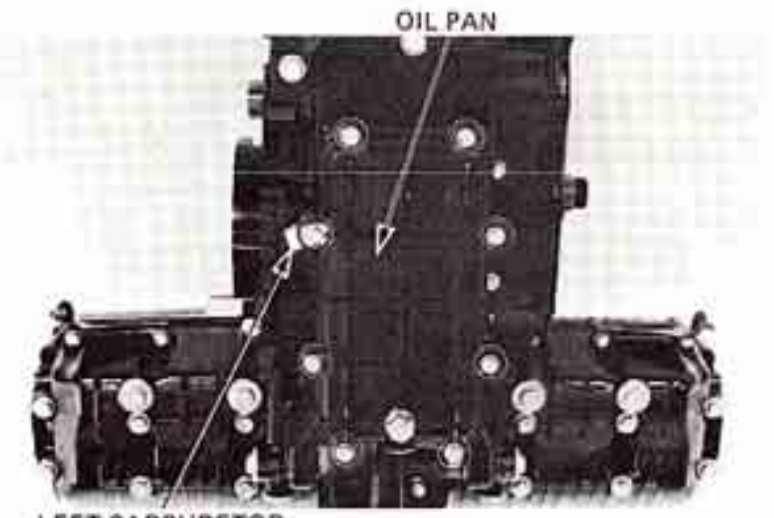
NOTE

The crankcase can be separated without removing the clutch, clutch related parts, A. C. generator, gearshift mechanism and starting motor.
However, removal of those parts is recommended because the transmission gears may be dropped when separating the crankcase if they are not removed.



Remove the upper crankcase bolts.

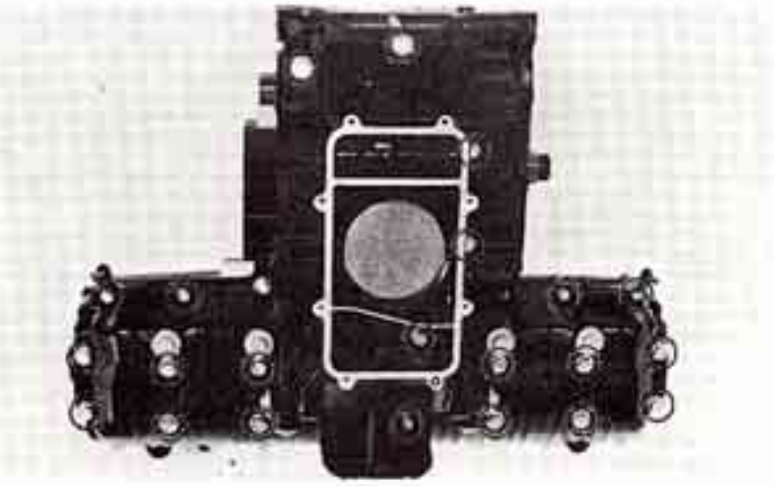
Turn the engine upside down.
Remove the oil pan.



Remove the lower crankcase bolts.

NOTE

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



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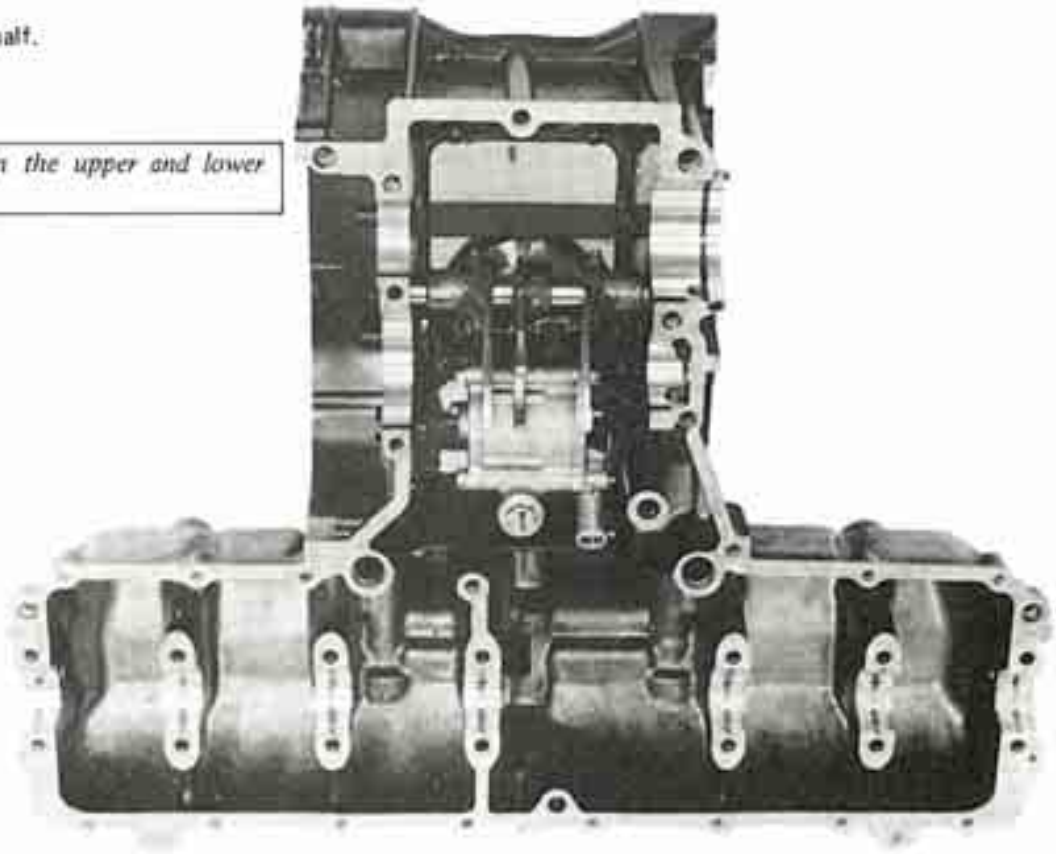
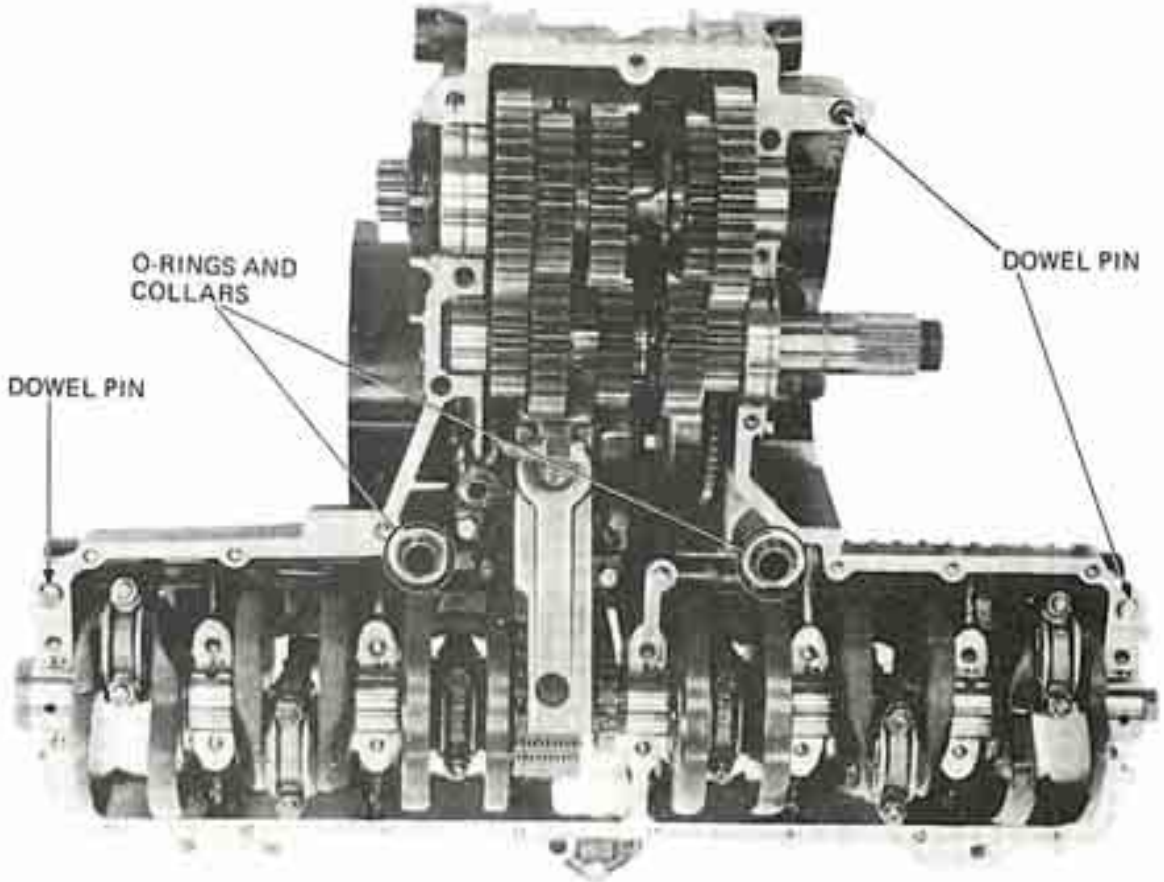
Separate the lower case half.

CAUTION:

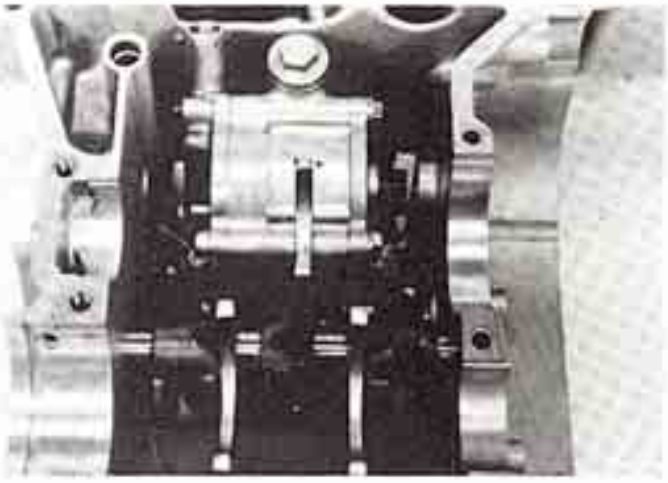
Do not pry between the upper and lower cases.





CRANKCASE ASSEMBLY

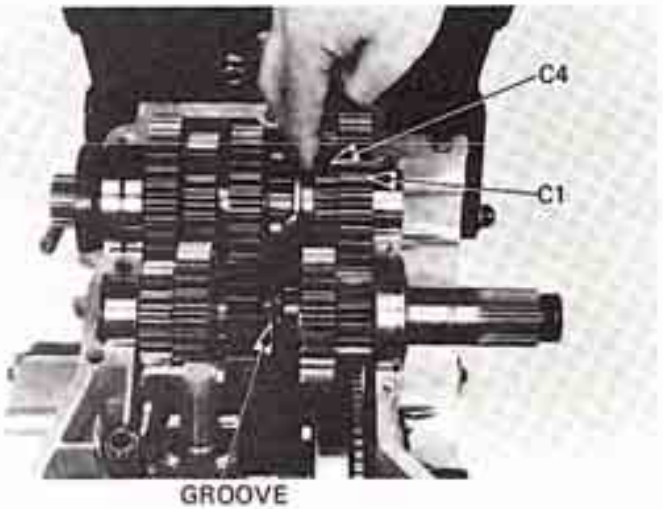
If the gearshift linkage, shift fork and shift drum are installed in the lower crankcase, shift the gearshift linkage into 1st gear for easier assembly.



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

Apply molybdenum disulfide grease to the groove of the M3 gear.

Apply molybdenum disulfide grease to the crankshaft main bearings.

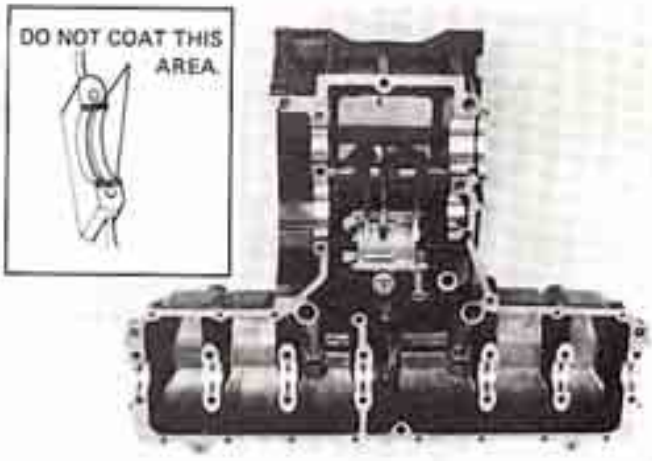


GROOVE

Clean the crankcase mating surfaces.
Apply liquid sealant to the mating surface of the lower crankcase.

CAUTION

Do not apply sealant to the portion near the main bearing.



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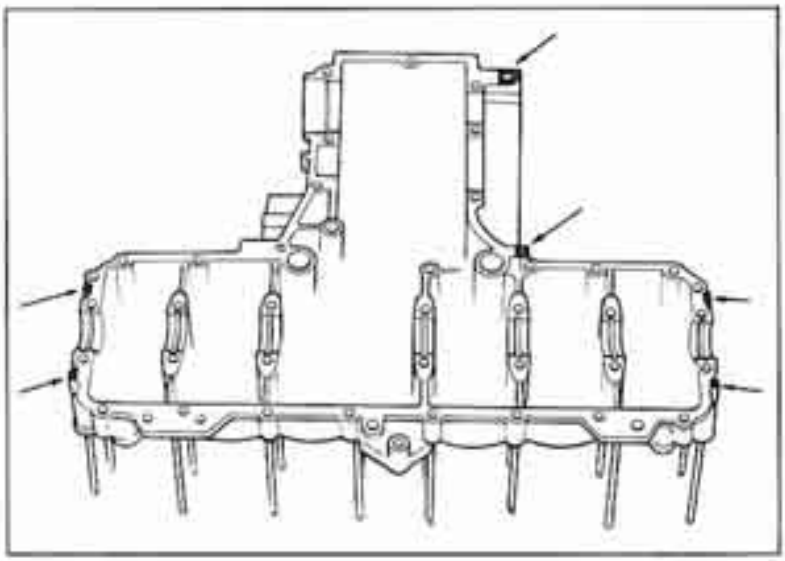
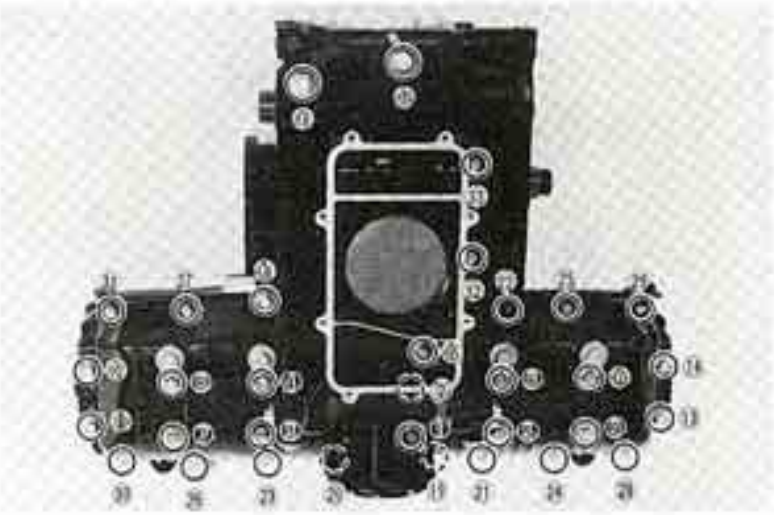
For the upper crankcase, apply sealant only where shown.



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

TORQUE SPECIFICATIONS:
8 mm bolt (Crankshaft)
23–27N·m (2.3–2.7 kg-m, 17–20 ft-lb
8 mm bolt (Crankcase)
23–27N·m (2.3–2.7 kg-m, 17–20 ft-lb)
6 mm bolt
10–14N·m (1.0–1.4 kg-m, 7–10 ft-lb)
10 mm bolt
33–37N·m (3.3–3.7 kg-m, 24–27 ft-lb)



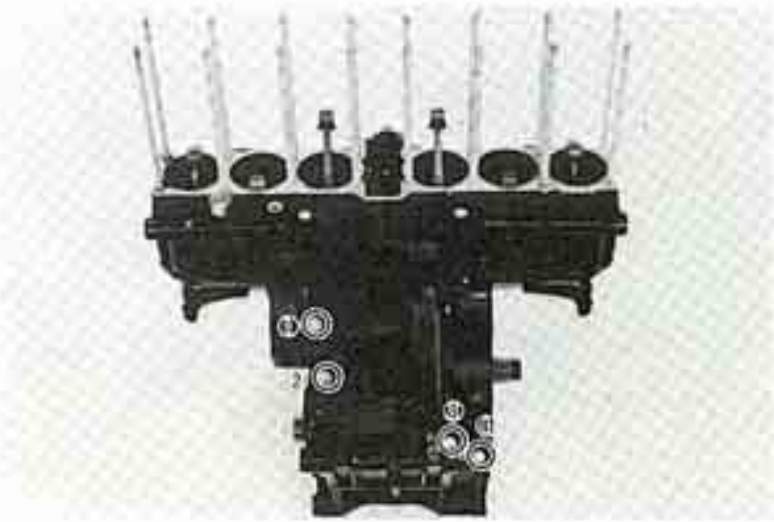
NOTE

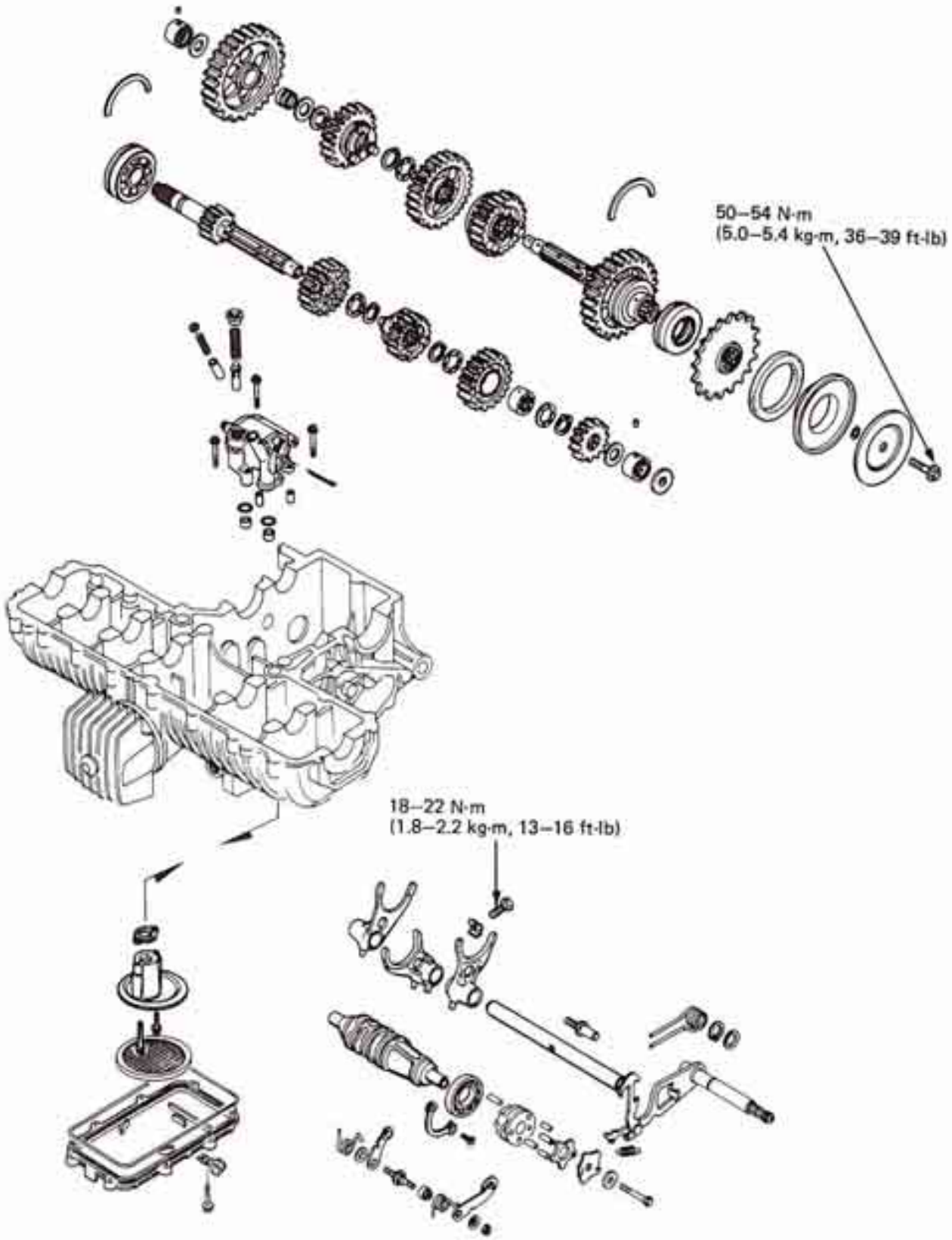
- Make sure that the plain washers are under the crakshaft bearing bolts.
- Apply molybdenum disulfide grease to the threads and heads of the fourteen crankshaft holding bolts.

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

NOTE

If the oil path cap is removed, apply molybdenum disulfide grease to the threads when reinstalling.





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SERVICE INFORMATION

GENERAL INSTRUCTION

The gear shift linkage can be serviced with engine in the frame. For internal transmission repairs, the crankcase must be separated (Refer to Section 10).

TOOLS

Common

Driver	07746–0030100
Attachment 30 mm	07746–0030300

TORQUE VALUES

Drive sprocket	50–54 N·m (5.0–5.4 kg-m, 36–39 ft-lb)
Shift fork shaft	18–22 N·m (1.8–2.2 kg-m, 13–16 ft-lb)

SPECIFICATIONS

			STANDARD	SERVICE LIMIT
Transmission	Backlash		0.024–0.074 mm (0.0009–0.0029 in)	0.12 mm (0.005 in)
	Gear I.D.	M4 gear	28.020–28.041 mm (1.1031–1.1040 in)	28.06 mm (1.105 in)
		M5 gear	31.000–31.025 mm (1.2205–1.2215 in)	31.04 mm (1.222 in)
		C1 gear	28.000–28.021 mm (1.1024–1.1032 in)	28.04 mm (1.1.04 in)
		C3 gear	28.020–28.041 mm (1.1031–1.1040 in)	28.06 mm (1.105 in)
	Gear bushing	M5 O.D.	30.950–30.975 mm (1.2185–1.2195 in)	30.93 mm (1.218 in)
		C1 O.D.	27.959–27.980 mm (1.1007–1.1-16 in)	27.94 mm (1.100 in)
		C1 I.D.	24.007–24.028 mm (0.9452–0.9460 in)	24.05 mm (0.947 in)
	Mainshaft O.D	at M4	27.959–27.980 mm (1.1007–1.1016 in)	27.94 mm (1.100 in)
	Countershaft O.D.	at C1 bushing	23.9935-24.0065mm (0.9446-0.9451 in)	23.97 mm (0.944 in)
		at C3	27.959–27.980 mm (1.1007–1.1016 in)	27.94 mm (1.100 in)
	Gear-to-bushing or shaft clearance	M4-to-shaft	———	0.10 mm (0.004 in)
		M5-to-M5 bushing	———	0.10 mm (0.004 in)
		C1-to-C1 bushing	———	0.10 mm (0.004 in)
		C1 bushing-to-shaft	———	0.10 mm (0.004 in)
		C3-to-shaft	———	0.10 mm (0.004 in)

			STANDARD	SERVICE LIMIT
Shift fork	Claw thickness		6.43–6.50 mm (0.253–0.256 in)	6.1 mm (0.24 in)
	I.D.	Center	16.009–16.012 mm (0.6303–0.6304 in)	———
		Left and right	16.000–16.021 mm (0.6299–0.6307 in)	16.55 mm (0.652 in)
Fork shaft	O.D.		15.966–15.984 mm (0.6286–0.6293 in)	15.95 mm (0.628 in)
Oil pump	Pressure	Left pump	50–100 kPa (0.5–1.0 kg/cm², 7.1–14.2 psi)	———
		Right pump	40–530 kPa (4.0–5.3 kg/cm², 75.4 psi)	———
	Left pump clearances	Tip clearance	0.08–0.12 mm (0.003–0.005 in)	0.15 mm (0.006 in)
		Body clearance	0.15–0.21 mm (0.006–0.008 in)	0.35 mm (0.014 in)
		End clearance	0.02–0.07 mm (0.001–0.003 in)	0.10 mm (0.004 in)
	Right pump clearances	Tip clearance	0.08–0.12 mm (0.003–0.005 in)	0.15 mm (0.006 in)
		Body clearance	0.15–0.21 mm (0.006–0.008 in)	0.35 mm (0.014 in)
		End clearance	0.02–0.07 mm (0.001–0.003 in)	0.10 mm (0.004 in)

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

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

High Oil Pressure
1. Pressure relief valve stuck closed
2. Plugged oil filter, gallery, or mating orifice
3. Incorrect oil being used

No Oil Pressure
1. Oil level low
2. Oil pump drive chain broken
3. Oil pump faulty
4. Internal oil leakage

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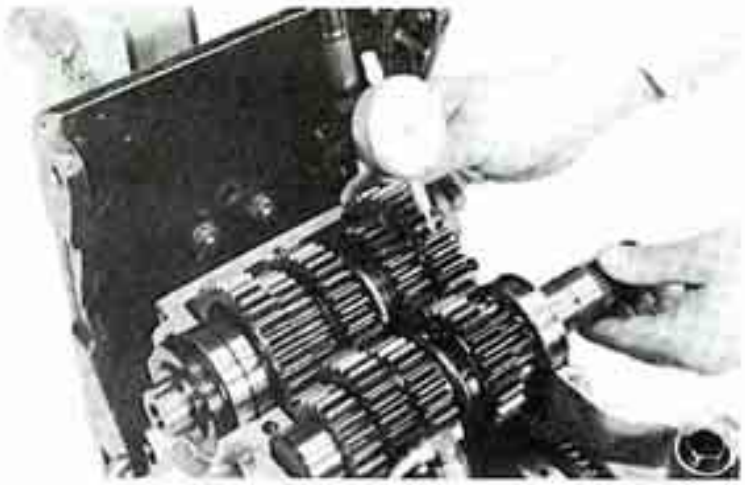
For servicing of the gearshift linkage, see Section 9.

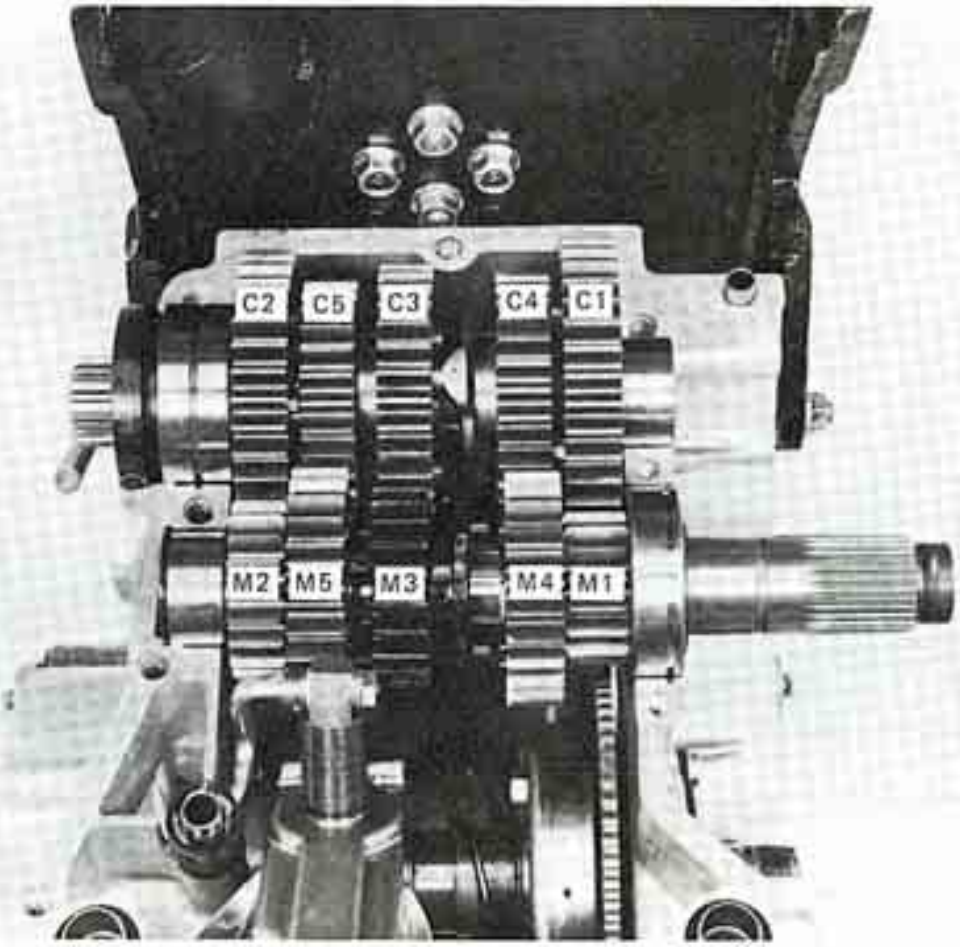
TRANSMISSION DISASSEMBLY

Separate the crankcase (Section 10).
Inspect each gear for backlash.

SERVICE LIMIT: 0.12 mm (0.005 in)



Remove the main and countershafts.
Remove the dowel pins from the crankcase.



TRANSMISSION INSPECTION

Check gear dogs, dog holes and teeth for excessive or abnormal wear, or evidence of insufficient lubrication.
Measure the I. D. of each gear.

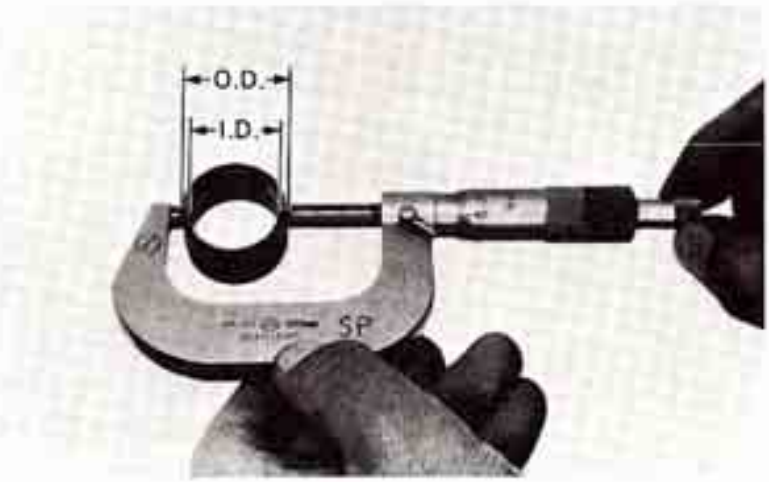
SERVICE LIMITS:

M4 gear:	**28.06 mm (1.105 in)**
M5 gear:	**31.04 mm (1.222 in)**
C1 gear:	**28.04 mm (1.104 in)**
C3 gear:	**28.06 mm (1.105 in)**

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

SERVICE LIMITS:

M5 O.D.:	**30.93 mm (1.218 in)**
C1 O.D.:	**27.94 mm (1.100 in)**
C1 I.D.:	**24.05 mm (0.947 in)**



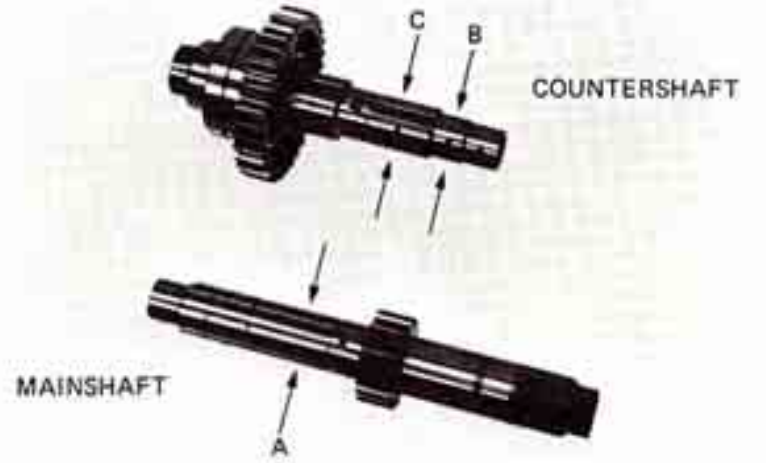
Measure the O.D. of the mainshaft and countershaft.

SERVICE LIMITS:

A (at M4):	**27.94 mm (1.100 in)**
B (at C1 bushing):	**23.97 mm (0.944 in)**
C (at C3):	**27.94 mm (1.100 in)**

Calculate the clearance between the gear and gear shaft or bushing.

SERVICE LIMIT: 0.10 mm (0.004 in)



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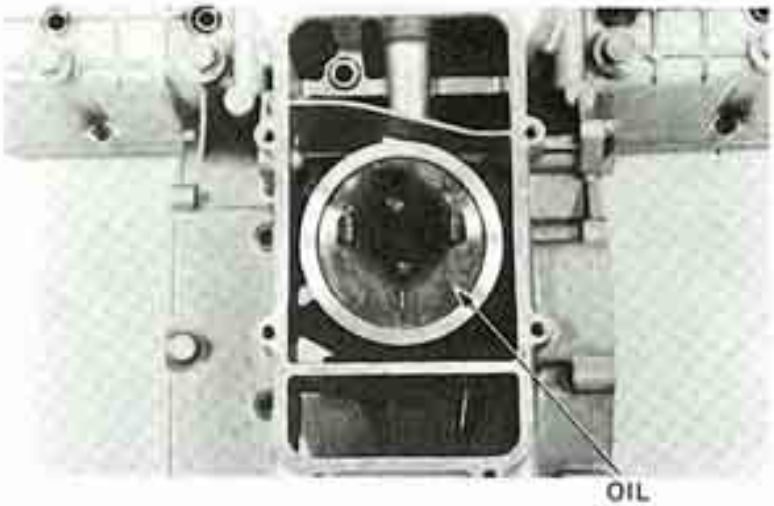
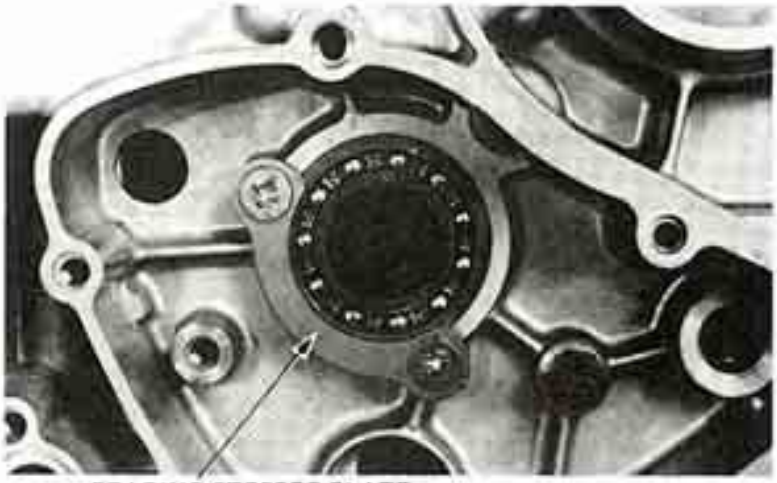
SHIFT FORK, SHIFT DRUM AND OIL PUMP REMOVAL

Remove the oil strainer.


OIL STRAINER

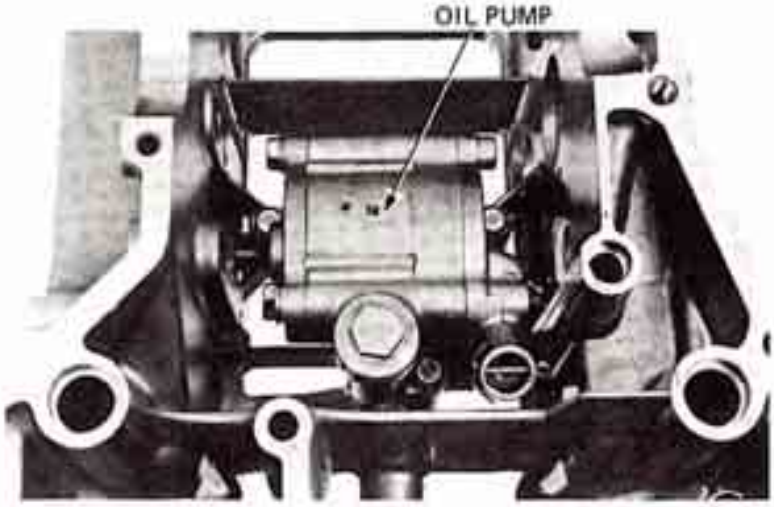
Remove the bearing stopper plate.
Remove the bearing.


BEARING STOPPER PLATE

Bend the tabs of the lock washer at the center shift fork.
Loosen the bolt.
Remove the shift forks, shaft and shift drum.


LOCK WASHER

Remove the oil pump.



GEAR SHIFT DRUM AND SHIFT FORK INSPECTION

Inspect the shift drum end for scoring, scratches, or evidence of insufficient lubrication.
Check the shift grooves for damage.

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

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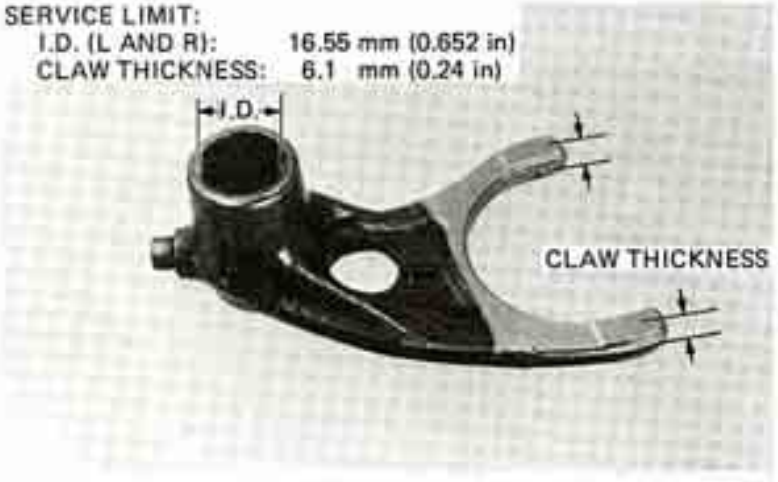
Measure the shift fork shaft O.D.
Check for scratches, scoring, or evidence of insufficient lubrication.

SERVICE LIMIT:
15.95 mm (0.628 in)

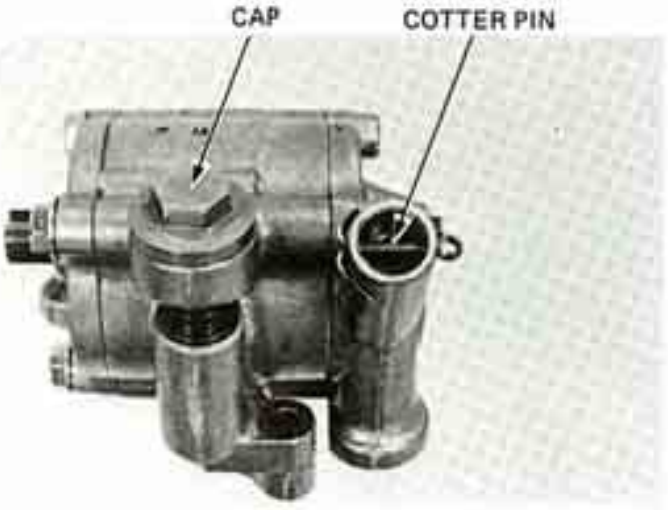
Measure the shift fork I.D. and claw thickness.

SERVICE LIMIT:
I.D. (L AND R): 16.55 mm (0.652 in)
CLAW THICKNESS: 6.1 mm (0.24 in)



OIL PUMP DISASSEMBLY

Remove the relief valve cap and cotter pin.



Remove the oil pump side covers.

OIL PUMP INSPECTION

Measure the left pump tip clearance.

SERVICE LIMIT:
0.15 mm (0.006 in)

Measure the left pump body clearance.

SERVICE LIMIT:
0.35 mm (0.014 in)

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Measure the left pump end clearance.

SERVICE LIMIT:
0.10 mm (0.004 in)

Measure the right pump tip clearance.

SERVICE LIMIT:
0.15 mm (0.006 in)

Measure the right pump body clearance.

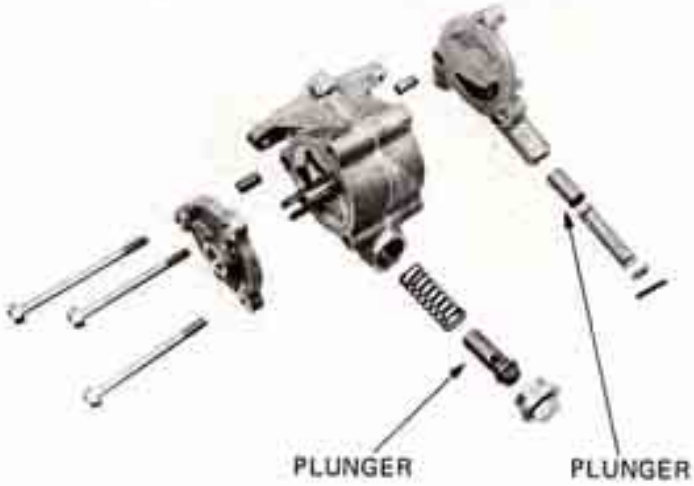
SERVICE LIMIT:
0.35 mm (0.014 in)

Measure the right pump end clearance.

SERVICE LIMIT:
0.10 mm (0.004 in)

RELIEF VALVE INSPECTION

Check that the plungers operate smoothly and that the springs are not damaged or weak.
Replace the relief valve as a unit if the spring must be replaced.



OIL PUMP ASSEMBLY

Install the left outer rotor.
Insert the drive pin into the shaft.
Align the slot in the left inner rotor with the drive pin.

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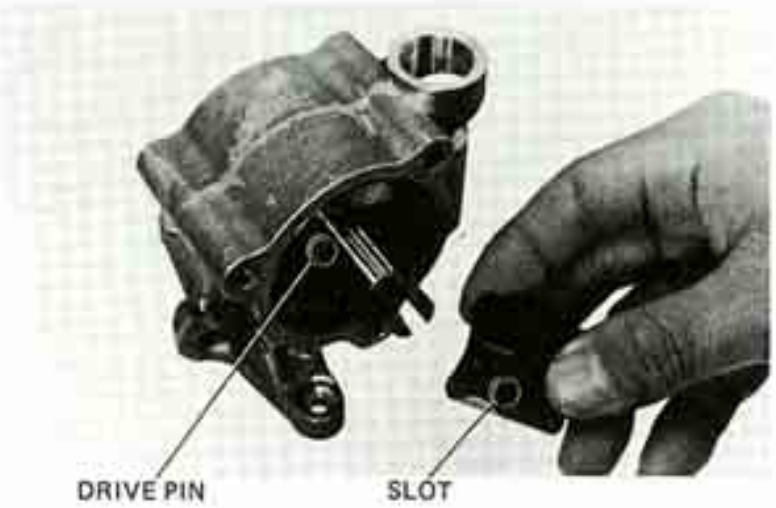
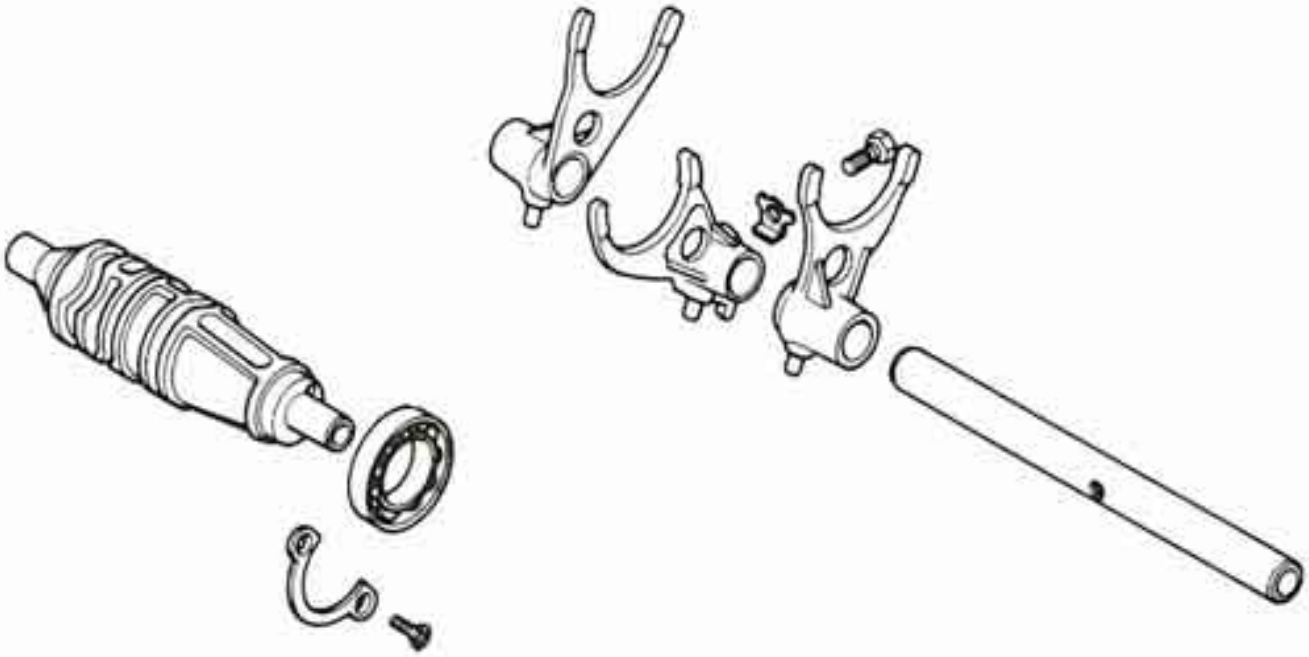
Install the right outer rotor.
Insert the drive pin into the shaft.
Align the slot in the inner rotor with the drive pin.

Install the side covers.
Install the relief valves.

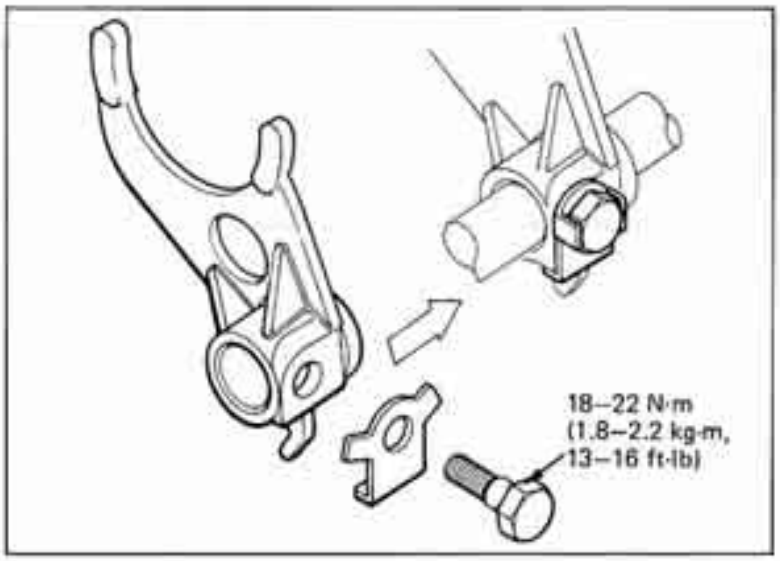


OIL PUMP, SHIFT DRUM AND SHIFT FORK INSTALLATION

To install the oil pump, shift drum and shift fork, reverse the removal procedure.
Key points are shown here.



After tightening the center shift fork secure the bolt by bending the lock washer tabs against the bolt head.



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

CAUTION

The oil strainer bolts are different lengths. Use the bolts correctly when installing the oil strainer. If the bolts are used incorrectly, the shift drum may lock.

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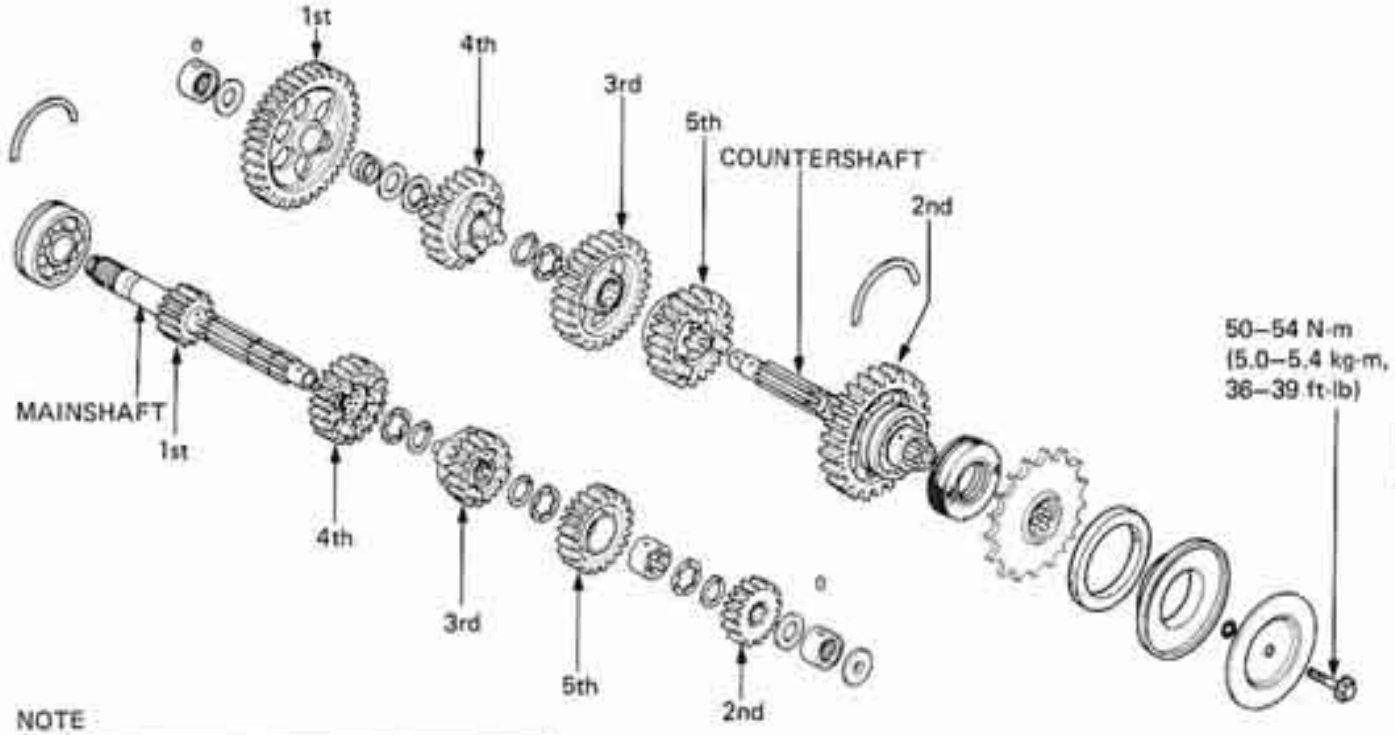
TRANSMISSION ASSEMBLY

Assemble the mainshaft and countershaft.

CAUTION

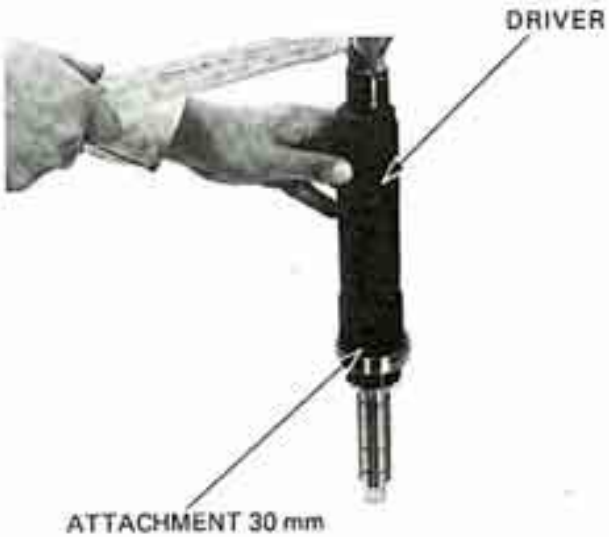
Note the installation direction of the C3 gear. The 8.5 mm recess should face the C5 gear. The 4.0 mm recess should face the C4 gear. If installed incorrectly, proper gear engagement will not occur.



NOTE

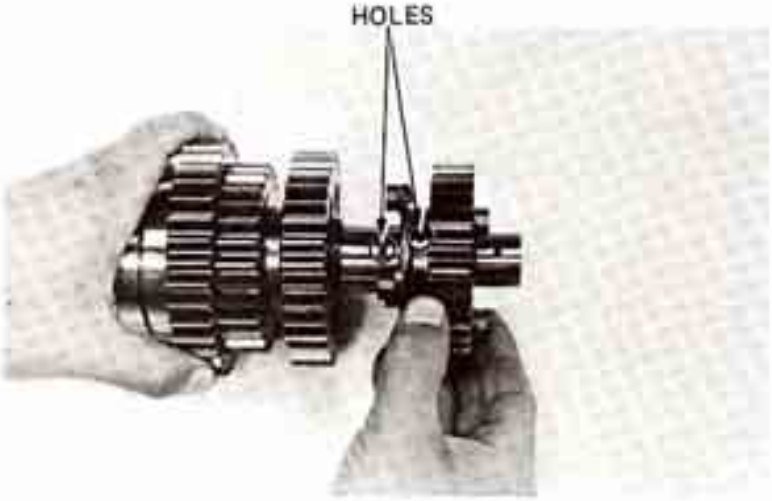
- Check the gears for freedom of movement or rotation on the shaft.
- Check that the snap rings are seated in the grooves.

Install the mainshaft bearing.

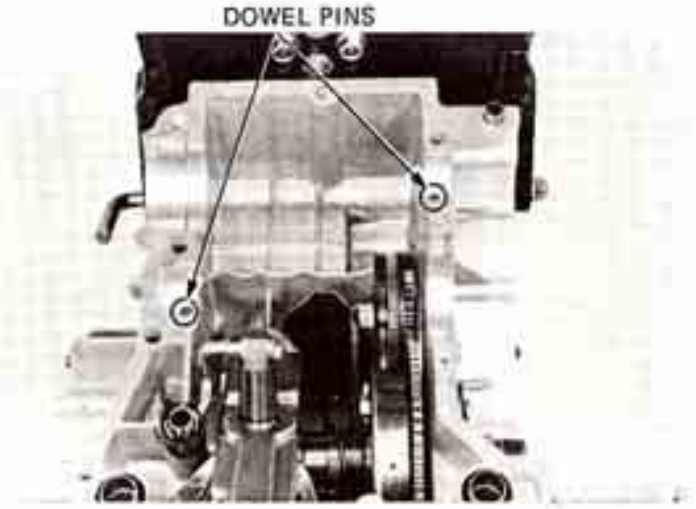


Align the hole in the M5 gear bushing with the hole in the mainshaft.

Align the hole in the C5 gear with the hole in the countershaft.



Insert the dowel pins.



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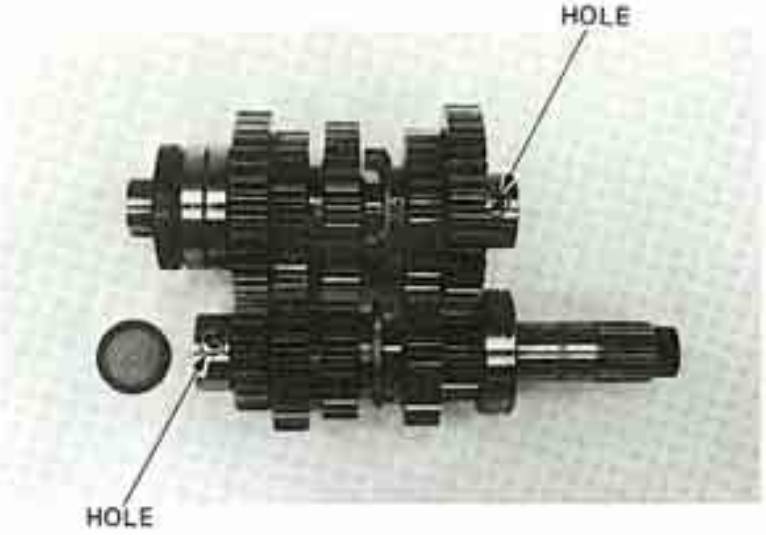
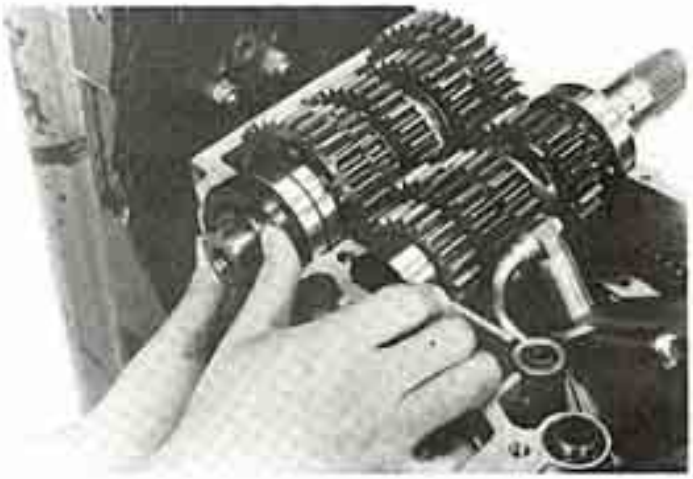
Align the holes in the mainshaft bearing and countershaft bearing with the dowel pins.



NOTE

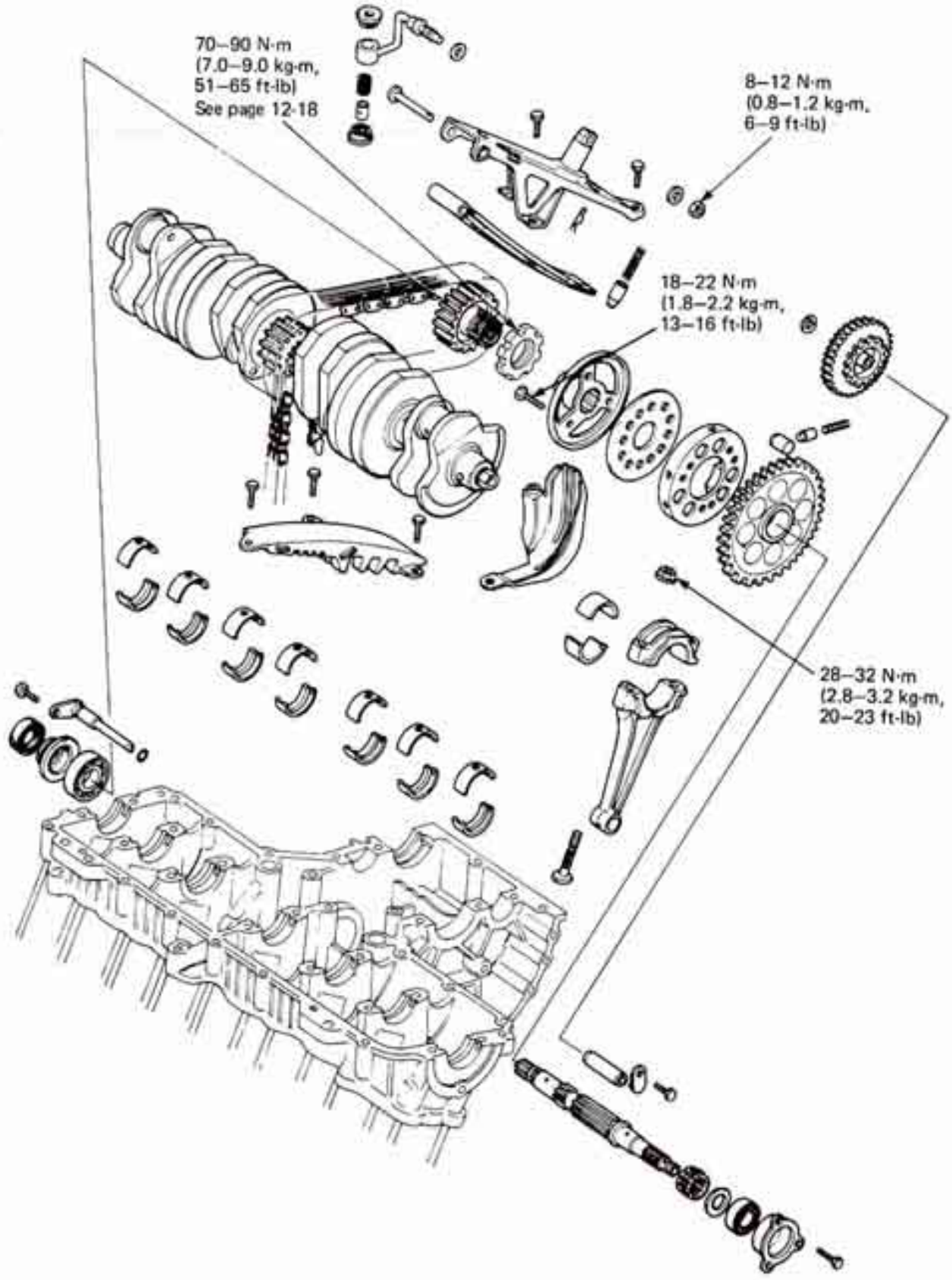
- Install the countershaft oil seal carefully so that the oil seal lip is seated completely on the bearing before assembling the lower crankcase.
  Apply molybdenum disulfide grease to the shift fork groove of M-3 gear.



Install the lower crankcase (Refer to Section 10).

NOTE

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



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SERVICE INFORMATION

GENERAL INSTRUCTIONS

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

TOOLS

Common

Driver	07749–0010000
Pilot 25 mm	07746–0040600
Attachment 37 x 40 mm	07746–0010200
Attachment 52 x 55 mm	07746–0010400
Driver	07746–0030100
Attachment 25 mm	07746–0030200

Special

Primary shaft holder	07924–6340300 or 07923–6890101
Pin spanner 55 mm	07902–4220000

TORQUE VALUES

Crankpin	28–32 N·m (2.8–3.2 kg-m, 20–23 ft-lb)
Starter clutch	18–22 N·m (1.8–2.2 kg-m, 13–16 ft-lb)
Primary chain tensioner nut	8–12 N·m (0.8–1.2 kg-m, 6– 9 ft-lb)
Primary driven sprocket	70–90 N·m (7.0–9.0 kg-m, 51–65 ft-lb) (See page 12-18)

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.	9.972–9.987 mm (0.3926–0.3932 in)	9.95 mm (0.392 in)
	Idle gear-to-shaft clearance	—	0.1 mm (0.004 in)
Crankshaft	Connecting rod big end side clearance	0.05–0.20 mm (0.002–0.008 in)	0.3 mm (0.001 in)
	Runout	—	0.05 mm (0.002 in)
	Crankpin oil clearance	0.020–0.060 mm (0.0008–0.0024 in)	0.08 mm (0.003 in)
	Main journal oil clearance	0.020–0.060 mm (0.0008–0.0024 in)	0.08 mm (0.003 in)
Cam chain	Length	260.35–260.57 mm (10.250–10.259 in)	261.8 mm (10.31 in)
Primary chain	Length	194.65–194.92 mm (7.663–7.674 in)	195.8 mm (7.71 in)

TROUBLESHOOTING

Excessive Noise

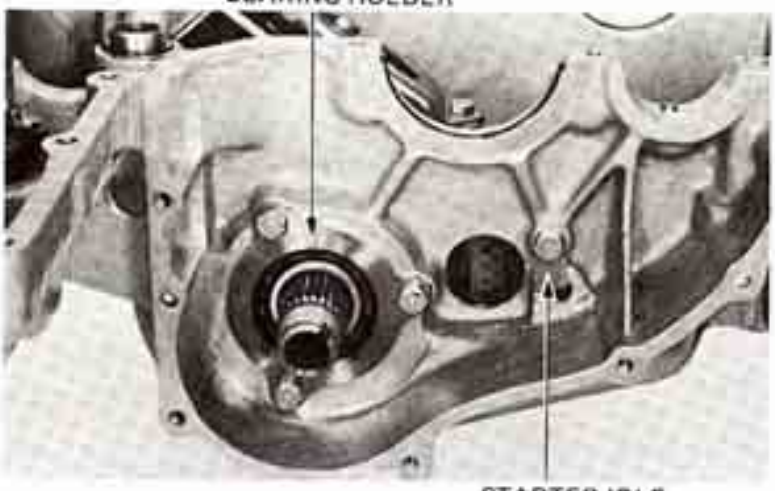
– Worn main journal bearing

– Worn crank pin bearing

PRIMARY SHAFT/STARTER CLUTCH REMOVAL

Disassemble the crankcase (Section 10).
Remove the primary shaft drive gear (Section 8).
Remove the starter motor (Section 18).
Remove the transmission assembly (Section 11).
Remove the A. C. generator (Section 16).

Remove the starter idle gear shaft holder.
Loosen the primary shaft bearing holder bolts.



Remove the starter idle gear shaft.
Remove the starter idle gear and wave washer.
Remove the primary chain tensioner.

Remove the oil supply nozzle.

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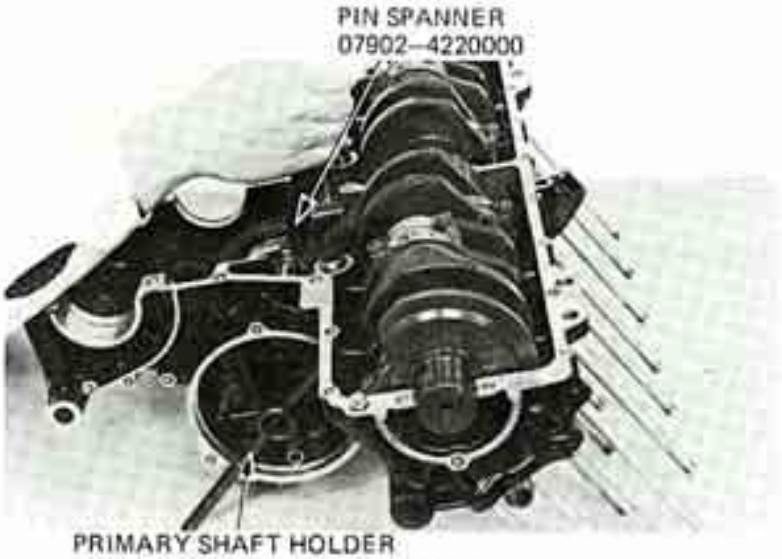
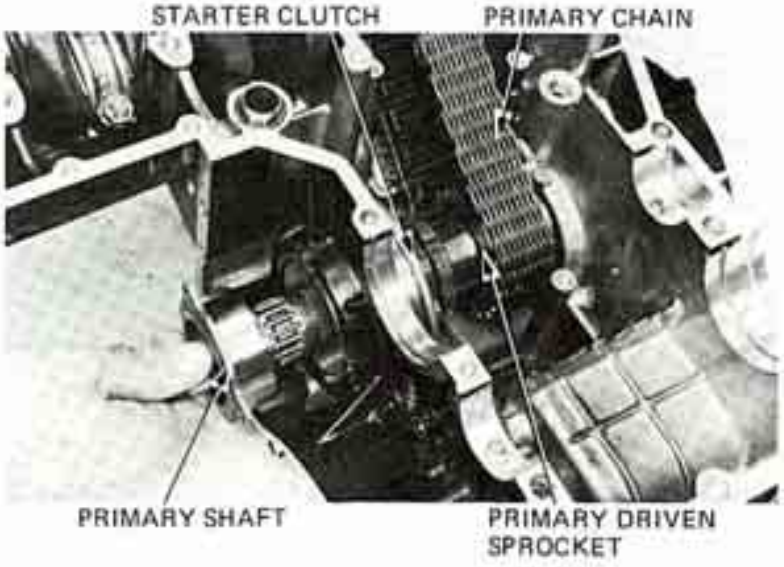
Hold the shaft with the special "PRIMARY SHAFT HOLDER" tool.
Loosen the primary driven sprocket collet ring nut with the special tool "PIN SPANNER".

NOTE

The ring nut has left-hand threads.

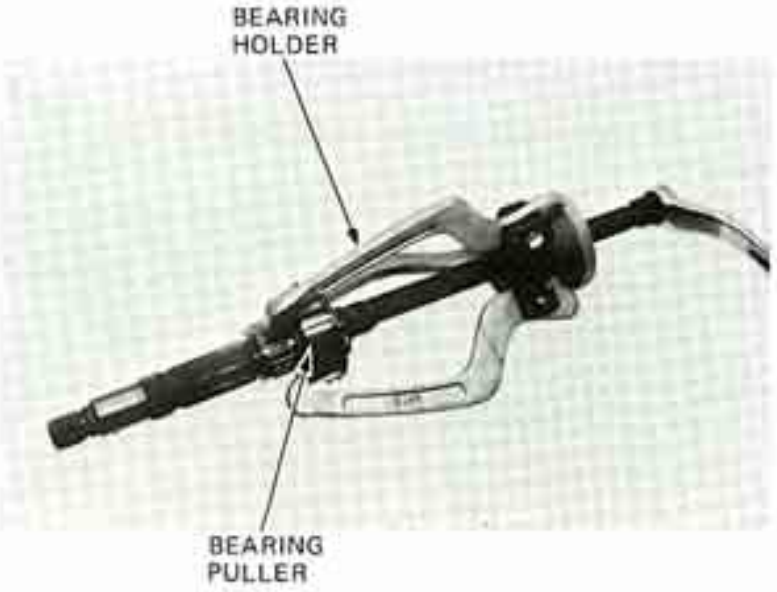


Remove the primary shaft.
Lift the primary driven sprocket and starter clutch and remove the primary chain.
Remove the primary driven sprocket, ring nut and starter clutch.



PRIMARY SHAFT DISASSEMBLY

Remove the bearing holder.
Remove the bearing from the holder.



PRIMARY SHAFT INSPECTION

Check for scoring, wear or other damage.

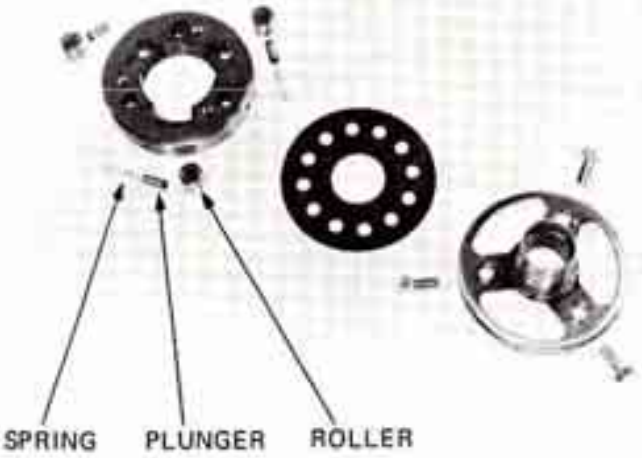
BEARING INSPECTION

Check for damage.

STARTER CLUTCH DISASSEMBLY

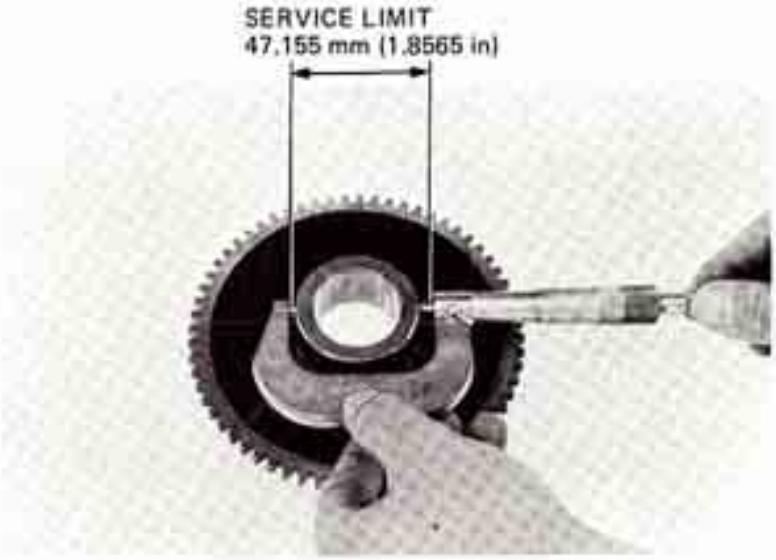
STARTER CLUTCH INSPECTION

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 DRIVE GEAR INSPECTION

Inspect the starter drive gear for damage or excessive wear.
Measure the O. D..



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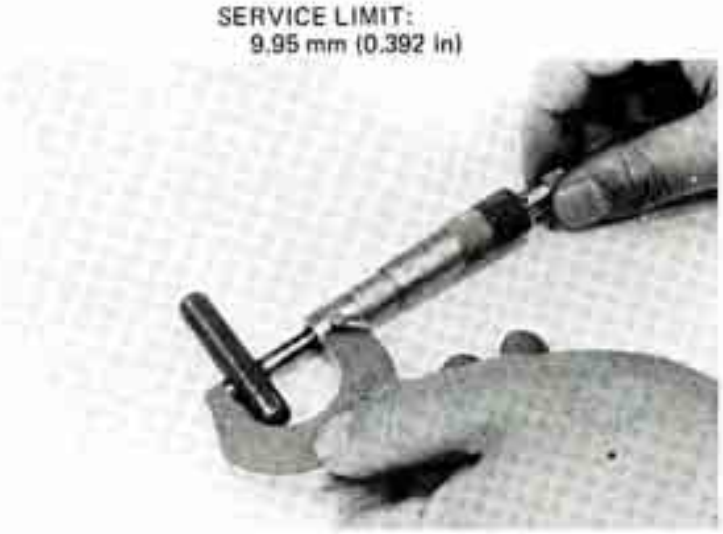
STARTER IDLE GEAR INSPECTION

Inspect the idle gear for tooth damage.
Measure the idle gear I.D..

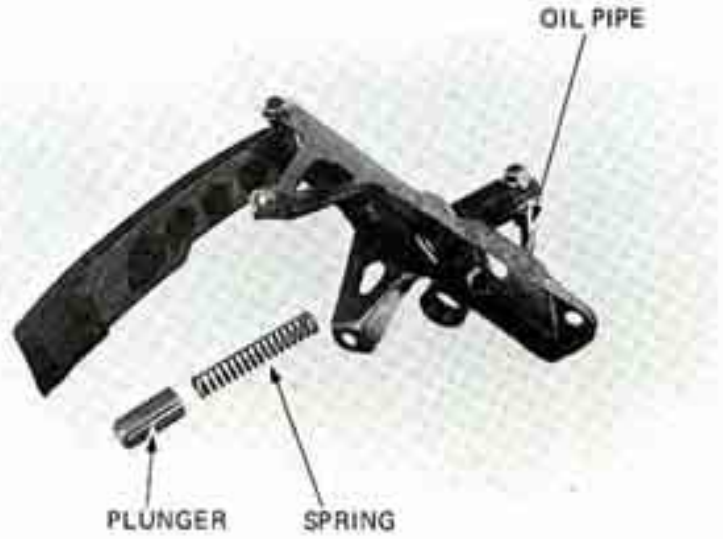
Measure the idle gear shaft O. D..
Measure the idle gear-to-shaft clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)



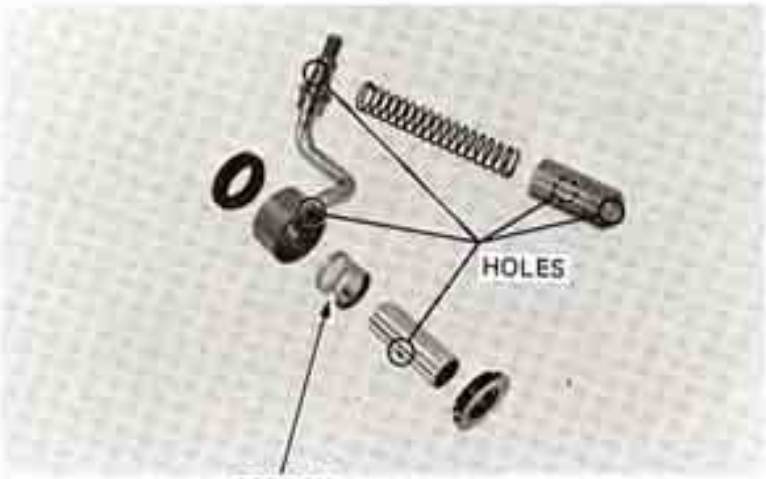
PRIMARY CHAIN TENSIONER DISASSEMBLY

Remove the inner oil pipe and screen.
Remove the spring and plunger.
Remove the lock pin and slipper.
Remove the nut and oil pipe.



INSPECTION

Check the holes in the oil pipes and plunger for blockage.
Clean all parts with non-flammable or high flashpoint solvent.

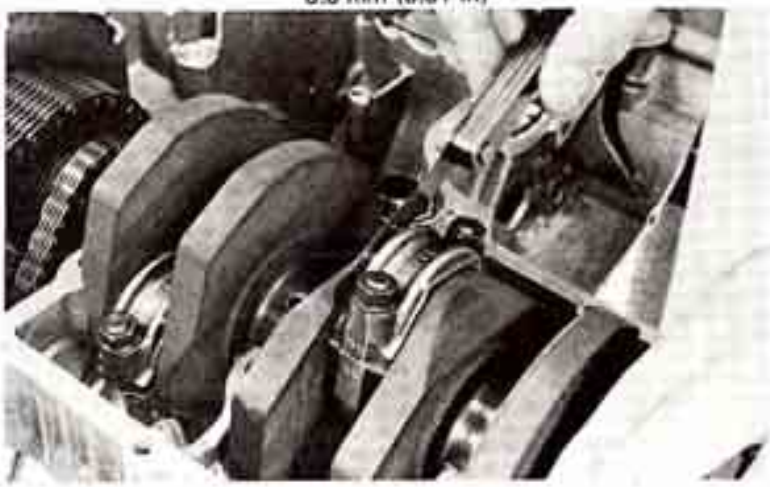


Inspect the slipper for damage or excessive wear.

CONNECTING ROD REMOVAL

Check the connecting rod side clearance.

SERVICE LIMIT:
0.3 mm (0.01 in)



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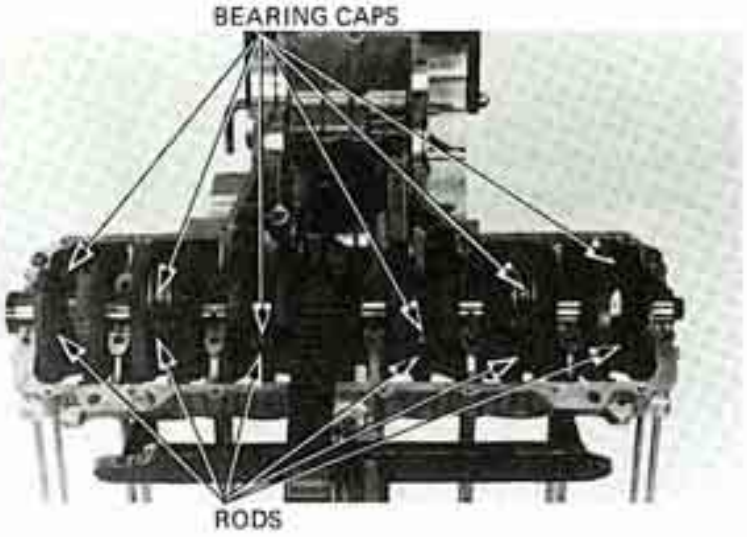
Remove the bearing caps and rods.



NOTE

Mark the rods, bearings and bearing caps to indicate cylinder position.

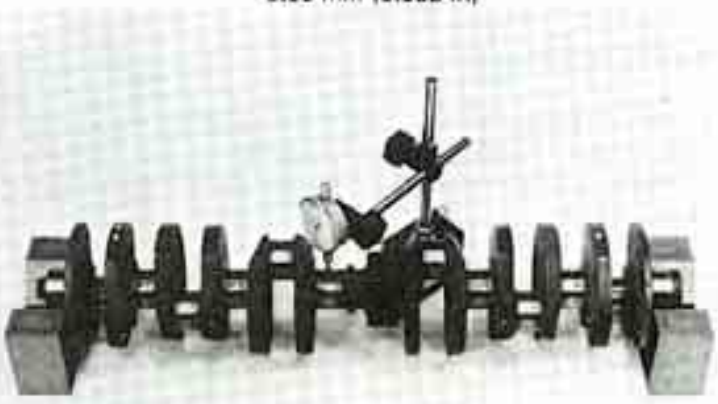
CRANKSHAFT INSPECTION

Remove the cam chain and primary chain.

Set the crankshaft on a stand or V blocks.
Set a dial gauge into the center main journal.
Rotate the crankshaft two revolutions and read runout at the center journal.

Actual runout is 1/2 of total indicator reading.

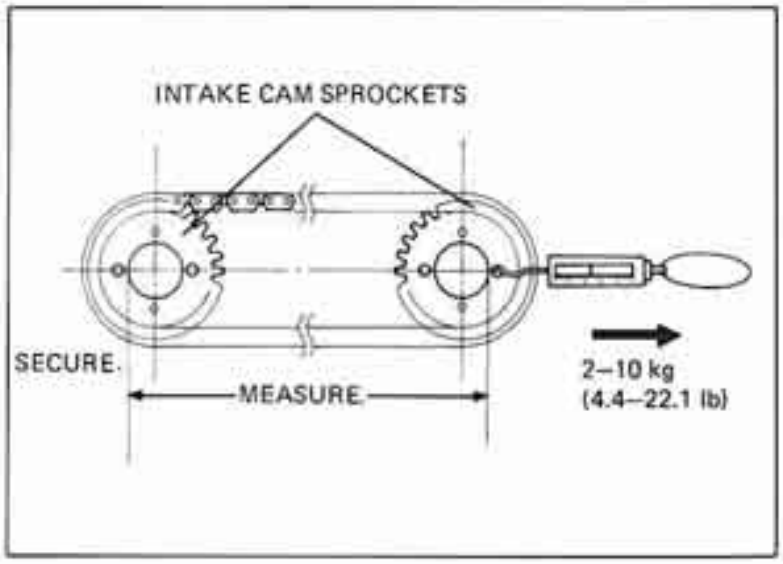
SERVICE LIMIT:
0.05 mm (0.002 in)



CAM CHAIN LENGTH MEASUREMENT

Place the cam chain over the intake cam sprockets. Secure one sprocket. Apply 2–10 kg (4.4–22.1 lb) of tension with a spring scale to the other sprocket. Measure the chain length as shown.

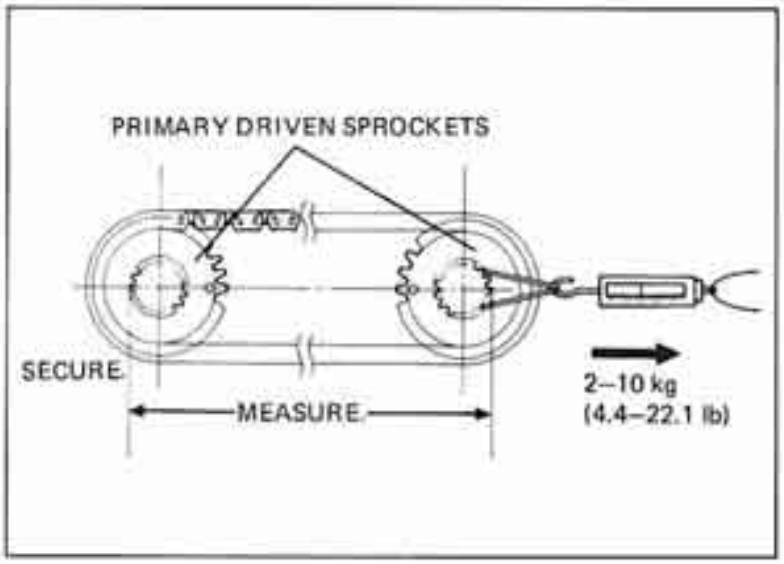
SERVICE LIMIT: 261.8 mm (10.31 in)



PRIMARY CHAIN LENGTH MEASUREMENT

Place the primary chain over the primary driven sprockets. Secure one sprocket.
Apply 2–10 kg (4.4–22.1 lb) of tension with a spring scale to the other sprocket. Measure the chain length as shown.

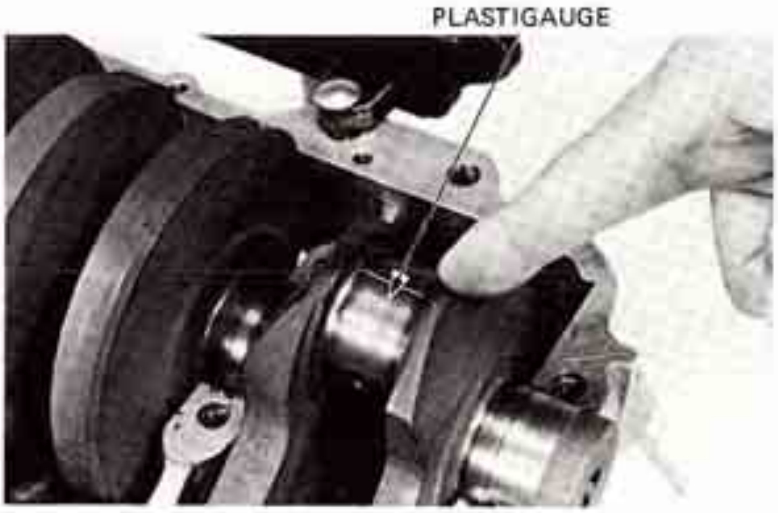
SERVICE LIMIT: 195.8 mm (7.71 in)



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 hole.



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

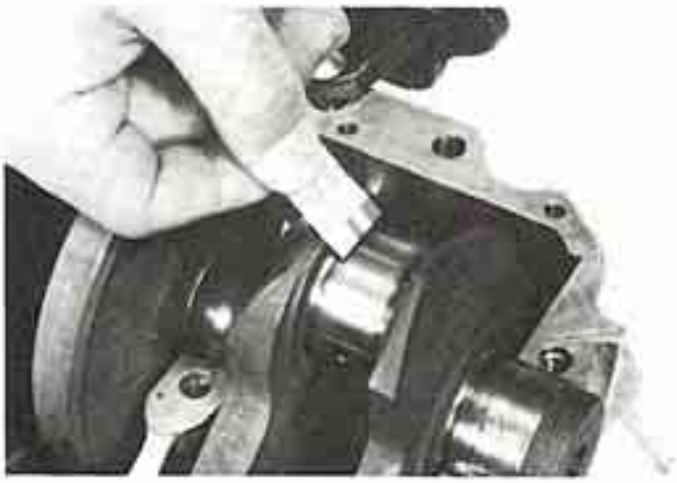
TORQUE: 28–32 N·m (2.8–3.2 kg-m, 20–23 ft-lb)

NOTE

Do not rotate the crankshaft during inspection.

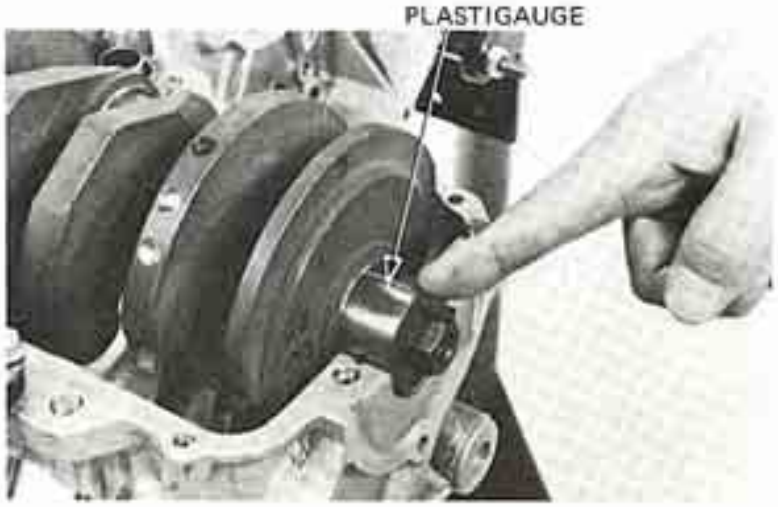
Remove the caps and measure the compressed plastigauge on each crankpin.

OIL CLEARANCE SERVICE LIMIT: 0.08 mm (0.003 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.



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.

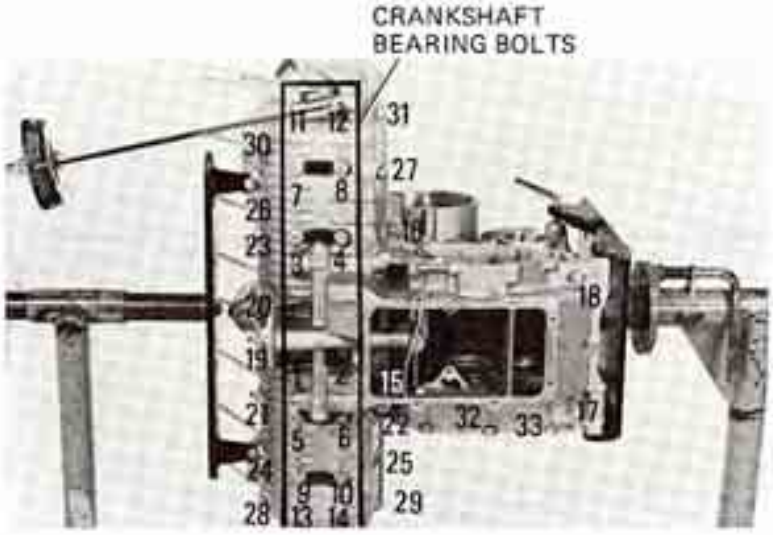
TORQUES:

8 mm bolt:	23–27 N·m (2.3–2.7 kg-m, 17–20 ft-lb)
6 mm bolt:	10–14 N·m (1.0–1.4 kg-m, 7–10 ft-lb)
10 mm bolt:	33–37 N·m (3.3–3.7 kg-m, 24–27 ft-lb)

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

NOTE

Do not rotate the crankshaft during inspection.



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

OIL CLEARANCE SERVICE LIMIT:
0.08 mm (0.003 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.

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

NOTE

The six letters "Ⓟ L–BBCBBB" on the crank weight indicate the code numbers for the crankpin O.D. from left to right; e.g. O.D. code number for the second crankpin from left is B.

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

			CRANKPIN O.D. CODE NO.		
			A	B	C
			35.992–36.000 mm	35.984–35.992 mm	35.976–35.984 mm
CONNECTING ROD I.D. CODE NO.	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:

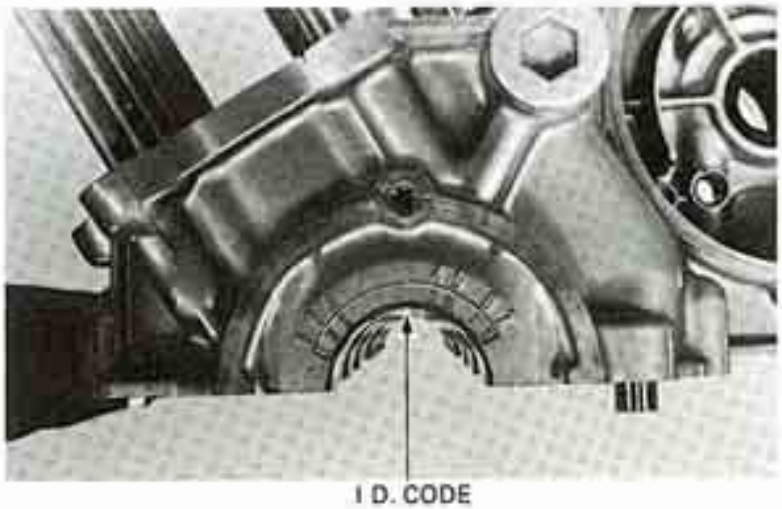
A (Blue) : 1.502–1.506 mm (0.0591–0.0593 in)
B (Black) : 1.498–1.502 mm (0.0590–0.0591 in)
C (Brown): 1.494–1.498 mm (0.0588–0.0590 in)
D (Green) : 1.490–1.494 mm (0.0587–0.0588 in)
E (Yellow): 1.486–1.490 mm (0.0585–0.0587 in)

MAIN BEARING

Determine and record crankcase I.D. code numbers.

NOTE

The seven numbers "I III II II III I II" on the upper left crankcase indicate the code numbers for the main journal I.D. from left to right; e.g. I.D. code number for the fifth Main journal from left to right is III.



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

NOTE

The seven numbers "Ⓙ L–3322232" on the crank weight indicate the code numbers for the main journal O.D. from left to right; e.g. O.D. code number for the third main journal from left to right is 2.

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

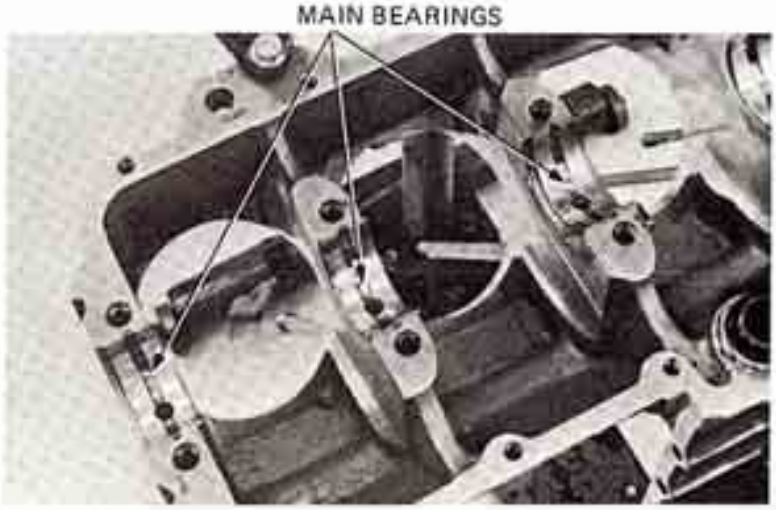
			MAIN JOURNAL O.D. CODE NO.		
			1	2	3
			35.992–36.000 mm	35.984–35.992 mm	35.976–35.984 mm
CASE I.D. CODE NO.	I	39.000–39.008 mm	D (Yellow)	C (Green)	B (Brown)
	II	39.008–39.016 mm	C (Green)	B (Brown)	A (Black)
	III	39.016–39.024 mm	B (Brown)	A (Black)	AA (Blue)

MAIN BEARING INSERT THICKNESS:

AA (Blue) : 1.502–1.506 mm (0.0591–0.0593 in)
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)

CONNECTING ROD INSTALLATION

Install the main bearings into the upper crankcase. Apply molybdenum disulfide grease to the upper and lower main bearings.
Install the crankshaft with the cam chain and primary chain.



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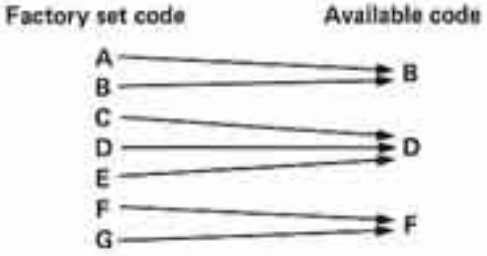
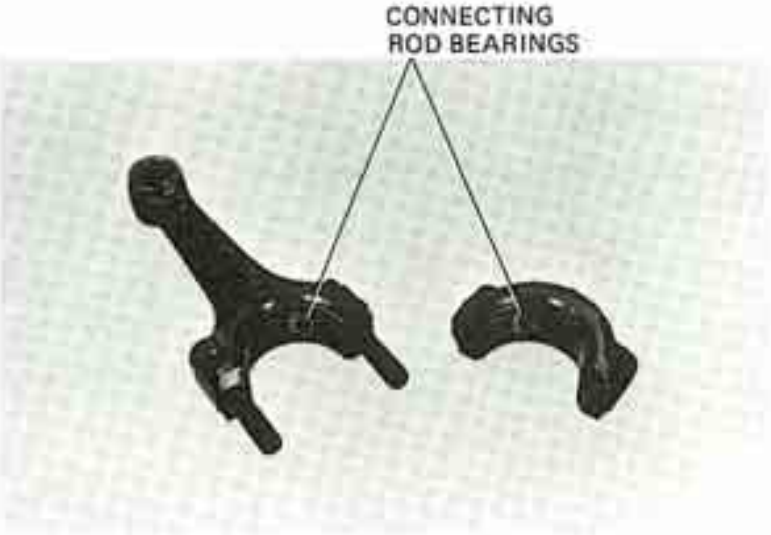
Before installing the connecting rods, make sure that the weight code combination is correct:



Align the hole in the bearing insert with the hole in the connecting rod.

Install the connecting rod and cap bearing inserts. Apply molybdenum disulfide 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 to insure corect reassenbly.

Torque the connecting rod bearing cap bolts.

TORQUE: 28–32 N·m
(2.8–3.2 kg-m, 20–23 ft-lb)

NOTE

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

OIL SEAL AND BEARING INSTALLATION

Install the 25 x 38 mm oil seal with special tools.
Install the 25 x 52 mm oil seal.

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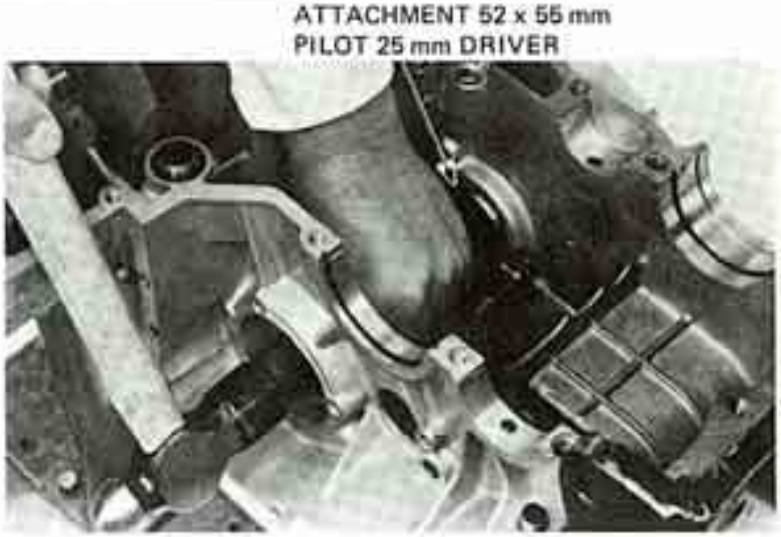
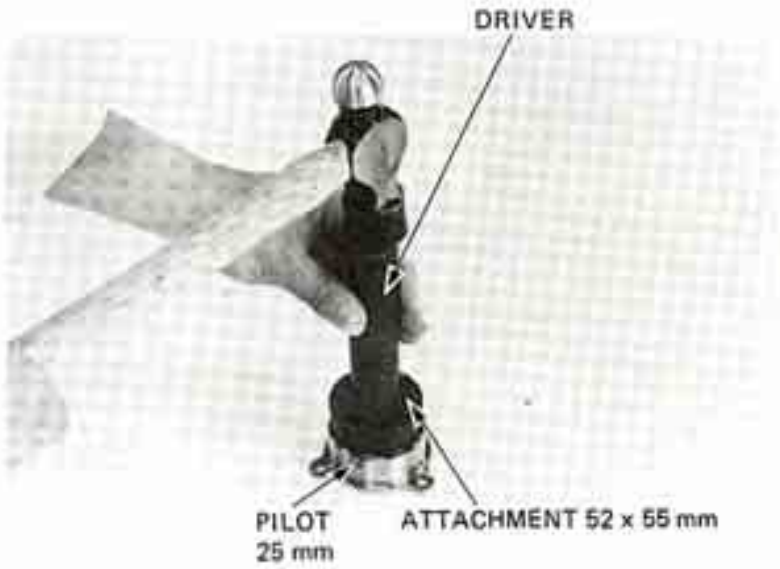
Install the bearing with special tools.



PRIMARY SHAFT ASSEMBLY

Insert the primary shaft bearing into the bearing holder.

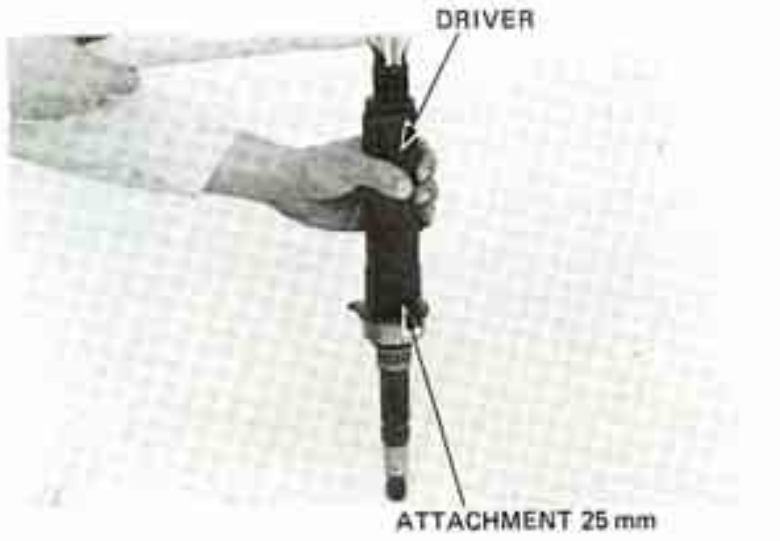


Slide the needle bearing and washer onto the shaft.

NOTE

Install the washer with the chamfered edge facing the spark advancer side.

Install the bearing over the shaft.



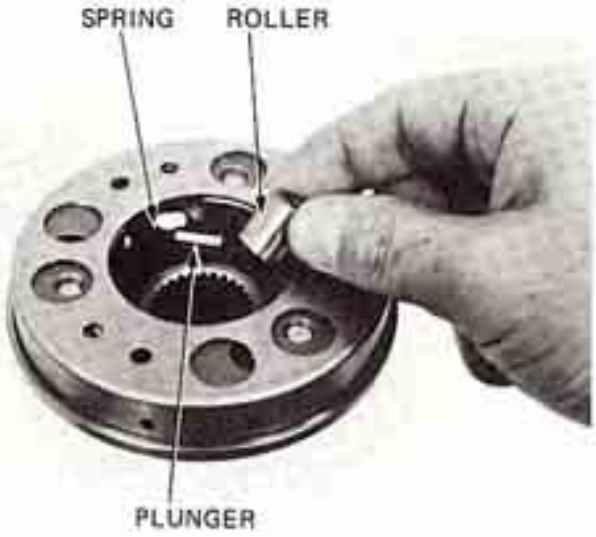
STARTER CLUTCH ASSEMBLY

Install the springs plungers and rollers.

NOTE

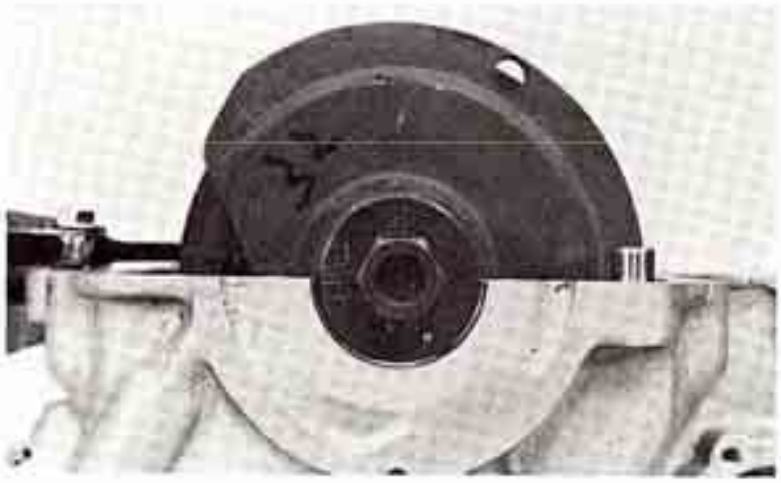
Apply a locking agent to the threads of the locking bolts.

Install the starter clutch outer and side plate.
Install the springs, plungers and rollers.
Install the starter drive gear.



PRIMARY SHAFT INSTALLATION

Align the crankshaft "T" mark with the forward crankcase mating surface.

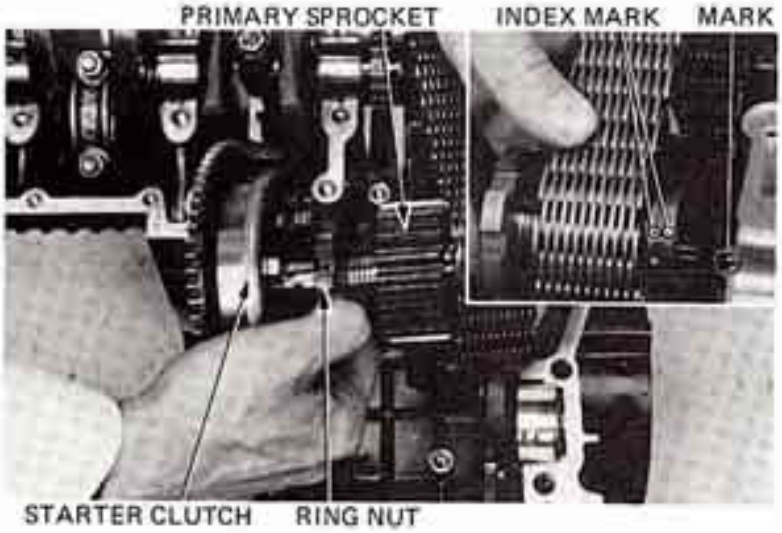


Install the ring nut on the primary driven sprocket.
Install the starter clutch assembly on the primary driven sprocket by aligning the slots.

Install the primary chain over the primary driven sprocket.
Make sure that the driven sprocket index mark aligns with the bearing boss mark as shown.

NOTE

One primary driven sprocket slot aligns with an index mark on the sprocket's other side. This slot can also be used as a reference.



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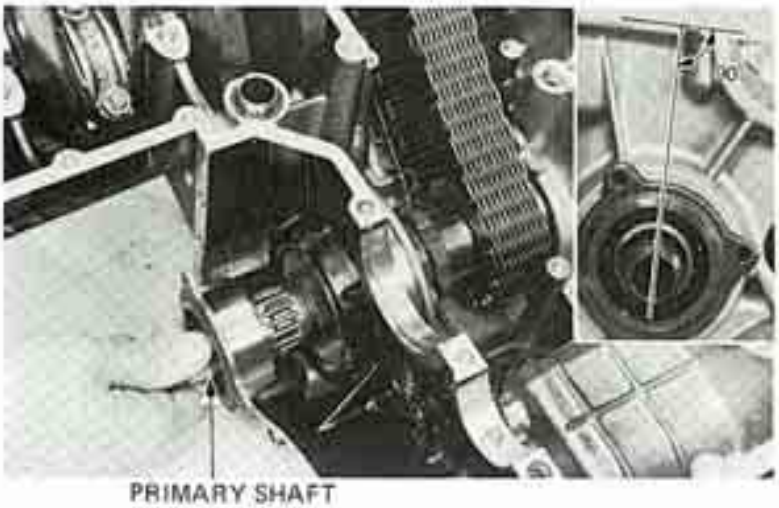
Install the primary shaft assembly. Make sure that the recess in the primary shaft is positioned 90° from the crankcase mating surface, and the bearing holder is in position.

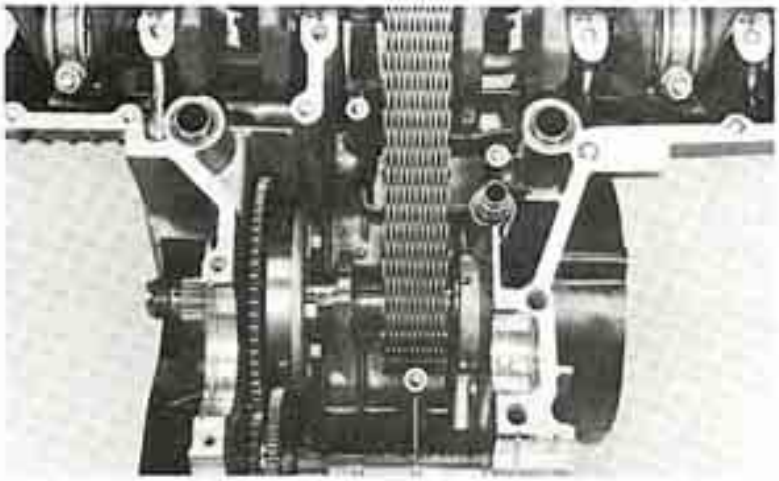
CAUTION

Do not damage the oil seals when installing the primary shaft.

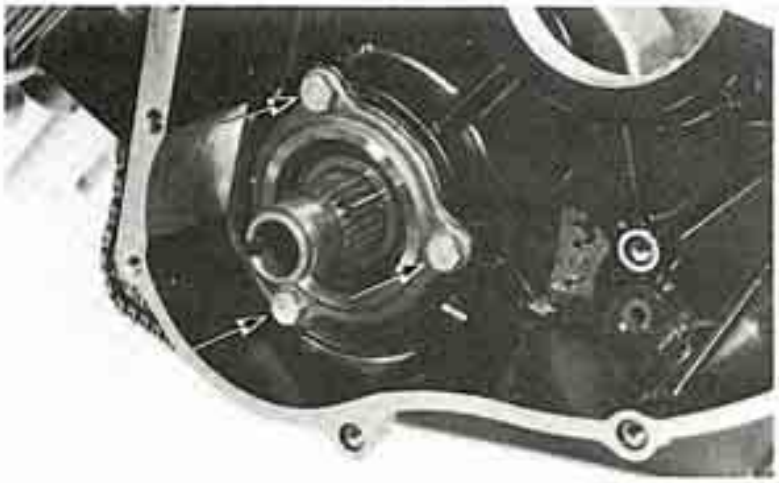


PRIMARY SHAFT

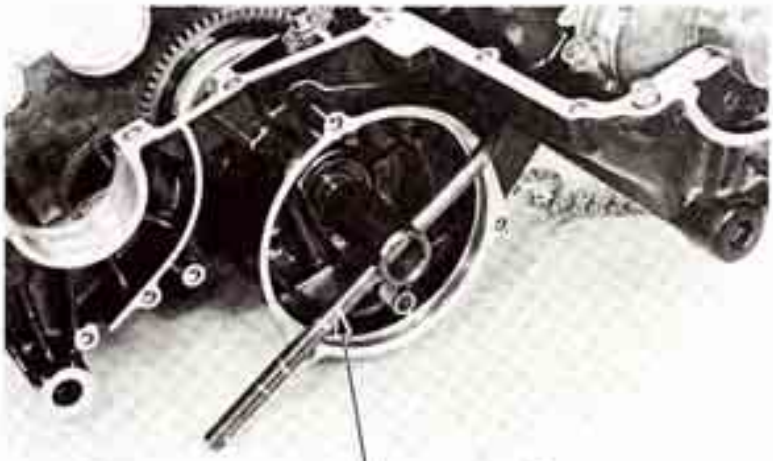
Make certain that the primary shaft recess aligns with the sprocket index mark and corresponding slot. The shaft recess, and sprocket slot/mark should align with the bearing boss mark as shown.



Tighten the primary shaft bearing holder bolts securely.



Hold the primary shaft with the special tool.



PRIMARY SHAFT HOLDER
07924–6340300

Tighten the collet ring nut.

TORQUE:
70–90 N·m (7.0–9.0 kg-m, 51–65 ft·lb)

Attach the pin spanner to a torque wrench. Tighten the collet ring nut to obtain a torque wrench reading of 70–80N·m (7.0–8.0 kg-m, 51–59 ft·lb). This will give you the specified torque valve.

NOTE

- The ring nut has left-hand threads.
- Be certain the sprocket and nut threads do not have any burrs.
- Lightly oil the threads before tightening the nut.

PIN SPANNER 55 mm 07902–4220000

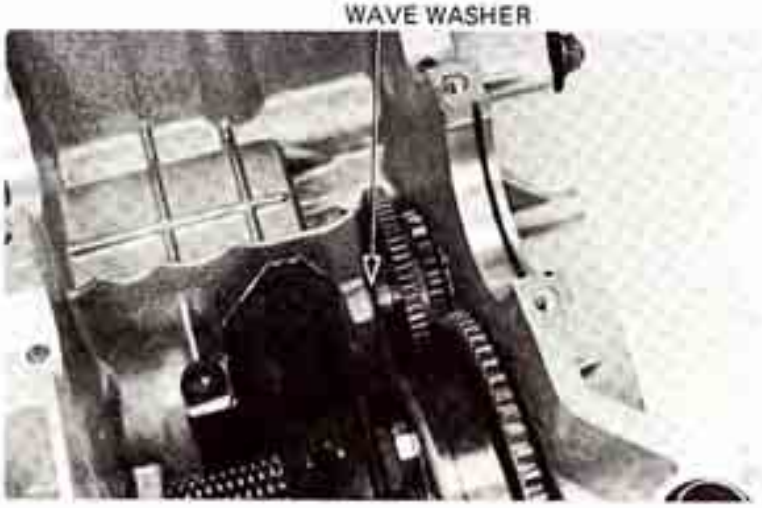
STARTER IDLE GEAR INSTALLATION

Install the starter idle gear as shown.

NOTE

Be sure to install the wave washer.

Install the idle gear shaft holder.



WAVE WASHER

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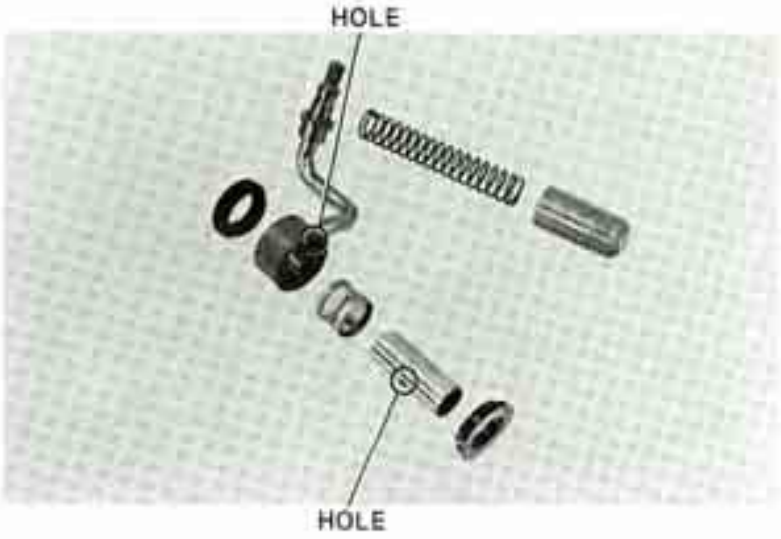
PRIMARY CHAIN TENSIONER ASSEMBLY

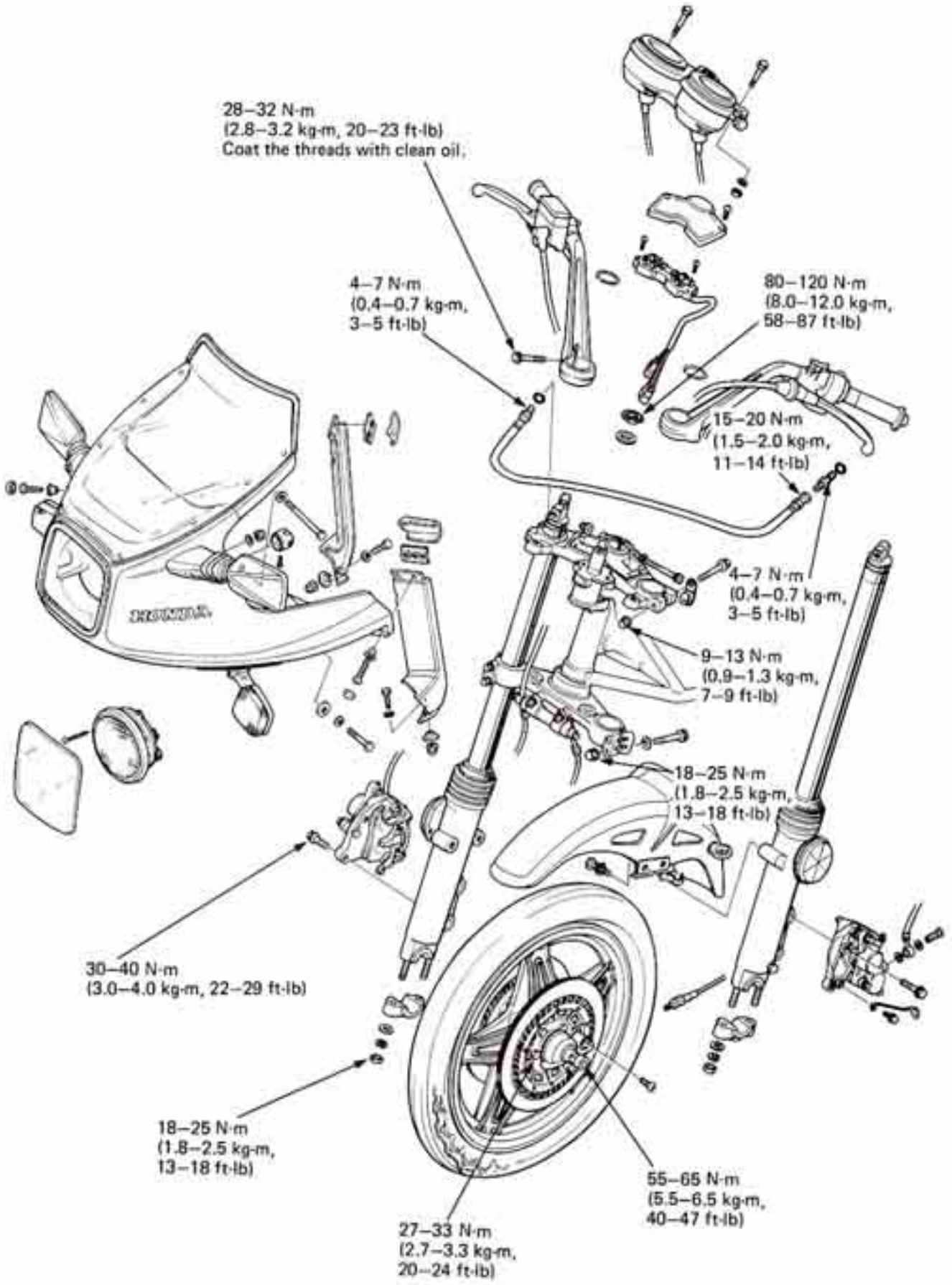
Before installing the oil pipe, check the holes for blockage.



Assemble the primary chain tensioner as shown.
Tighten the nut loosely.

Insert the oil pipe into the oil opening.
Tighten the nut securely.

Install the oil supply nozzle.
Install the transmission (Section 11).
Assemble the crankcase (Section 10).



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SERVICE INFORMATION

GENERAL INSTRUCTIONS

- The front wheel uses a tubeless tire. For tubeless tire repairs, refer to the TUBELESS TIRE MANUAL, code No. 6141550. (In U.S.A., H/C 068216)
- Do not remove rivets, nut and pins from the rim, spoke plate and hub.
- Never ride on the rim or try to bend the wheel.
- Avoid damaging the aluminum alloy rim.
- The front suspension uses an air assisted fork front suspension. The front fork preload can be changed by adjusting the amount of air pressure in each fork.
- The fairing is designed for the CBX'81 model only. Do not try to install it on any other motorcycle.

TORQUE VALUES

Front brake disc	27–33 N·m (2.7–3.3 kg-m, 20–24 ft-lb)	
Front axle nut	55–65 N·m (5.5–6.5 kg-m, 40–47 ft-lb)	
Front caliper bracket	30–40 N·m (3.0–4.0 kg-m, 22–29 ft-lb)	
Front caliper	15–20 N·m (1.5–2.0 kg-m, 11–14 ft-lb)	
Front axle holder nut	18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)	
Front fork cap bolt	15–30 N·m (1.5–3.0 kg-m, 11–22 ft-lb)	
Air valve	4– 7 N·m (0.4–0.7 kg-m, 3– 5 ft-lb)	
Air hose connecter	4– 7 N·m (0.4–0.7 kg-m, 3– 5 ft-lb)	
Front fork socket bolt	15–25 N·m (1.5–2.5 kg-m, 11–18 ft-lb)	
Handlebar mounting bolt	28–32 N·m (2.8–3.2 kg-m, 20–23 ft-lb)	Apply clean oil to the thread.
Steering stem bolt	18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)	
Fork bridge	9–13 N·m (0.9–1.3 kg-m, 7– 9 ft-lb)	
Steering stem nut	80–120 N·m (8.0–12.0 kg-m, 58–87 ft-lb)	
Steering stem adjusting nut	11–13 N·m (1.1–1.3 kg-m, 8– 9 ft-lb)	Apply clean oil to the thread.
Air hose right	15–20 N·m (1.5–2.0 kg-m, 11–14 ft-lb)	
Air hose left	4– 7 N·m (0.4–0.7 kg-m, 3– 5 ft-lb)	

TOOLS

Special		
Steering stem socket	07916–3710100	
Hollow set wrench 6 mm	07917–3230000	or commercially available tool.
Bearing race remover	07946–371050	
Steering stem driver	07946–3710600	
Bearing driver attachment	07946–3710700	
Bearing race remover	07953–4250001	
Common		
Retainer wrench attachment	07710–0010200	or 07910–3230101
Retainer wrench body	07710–0010401	
Attachment 42 x 47 mm	07746–0010300	or 07946–9350200
Pilot 15 mm	07746–0040300	
Front fork seal driver body	07747–0010100	or 07947–4630100
Fork seal driver attachment E	07747–0010600	
Lock nut wrench socket 30 x 32 mm	07716–0020400	or commercially available tool.
Driver A	07749–0010000	or 07949–6110000
Extension bar	07716–0020500	or commercially available tool.

SPECIFICATION

		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)
Forke spring free length	Spring	569.4 mm (22.42 in)	559.3 mm (22.02 in)
Fork tube runout		———	0.2 mm (0.01 in)
Fork slider bushing O.D.		39.95–39.98 mm (1.573–1.574 in)	39.86 mm (1.569 in)
Fork guide bushing I.D.		38.98–39.11 mm (1.535–1.540 in)	39.23 mm (1.544 in)
Fork tube O.D.		38.950–38.975 mm (1.5335–1.5344 in)	38.90 mm (1.531 in)
Fork slider I.D.		40.04–40.08 mm (1.576–1.578 in)	40.2 mm (1.58 in)
Front fork fluid capacity	(after draining)	345 cc (11.7 oz)	———
	(after disassembly	305 cc (10.3 oz)	———
Front fork air pressure		50–90 kPa (0.5–0.9 kg/cm^2, 7–13 psi)	———

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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

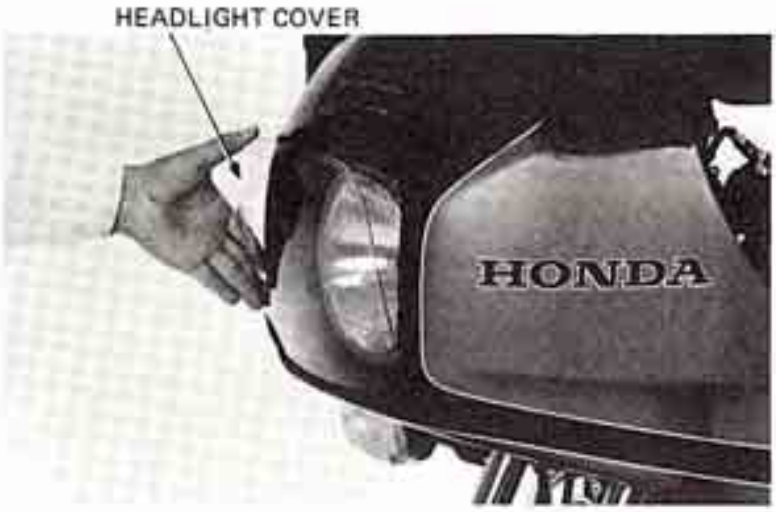
Head suspension
1. Incorrect fluid weight in front forks
2. Fork air pressure incorrect

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

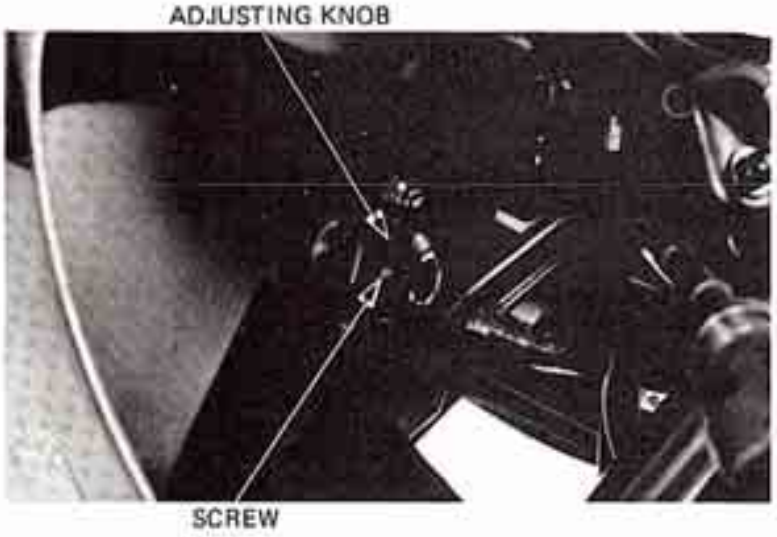
HEADLIGHT

HEADLIGHT REMOVAL

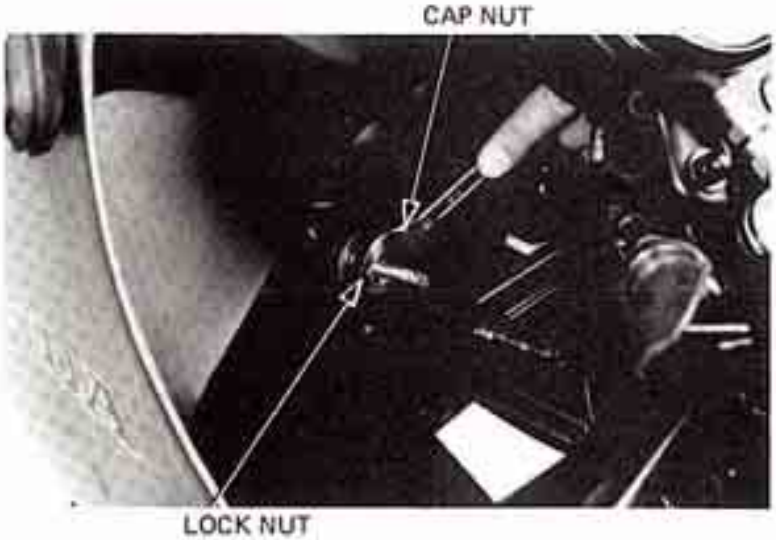
Remove the front fairing headlight cover.



Remove the headlight aim adjusting knob by removing the attaching screw.



Remove the lock nut and cap nut.



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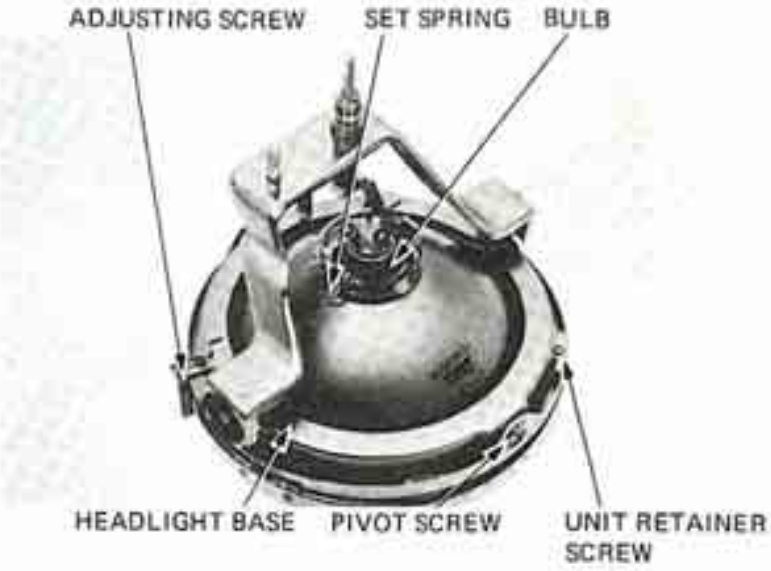
Pull the headlight out and disconnect the receptacle.

Remove the bulb cover.
Remove the set spring and bulb.
Remove the horizontal adjustment pivot screws.
Remove the horizontal adjusting screw.
Remove the headlight unit retaining screws and headlight unit.
Remove the headlight base.

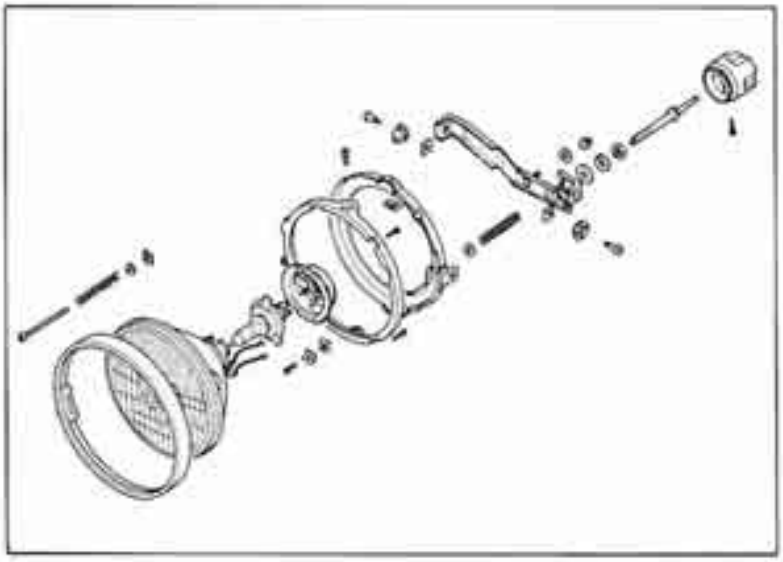


Assembly is essentially the reverse of disassembly.

After assembly, adjust headlight beam (Page 3-19).

NOTE

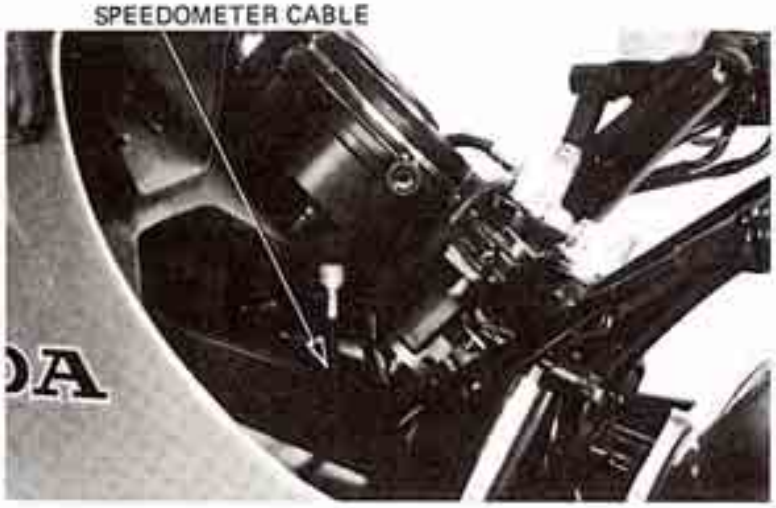
Wear clean gloves when installing the halogen bulb. If you touch the bulb with your bare hands, clean it with a clean cloth moistened with alcohol to prevent its early failure.



INSTRUMENTS

CLUSTER DISASSEMBLY

Disconnect the speedometer and tachometer cables.



Remove the instrument mounting bolts.

Disconnect the couplers from the instrument cluster.

Remove the instrument cluster.

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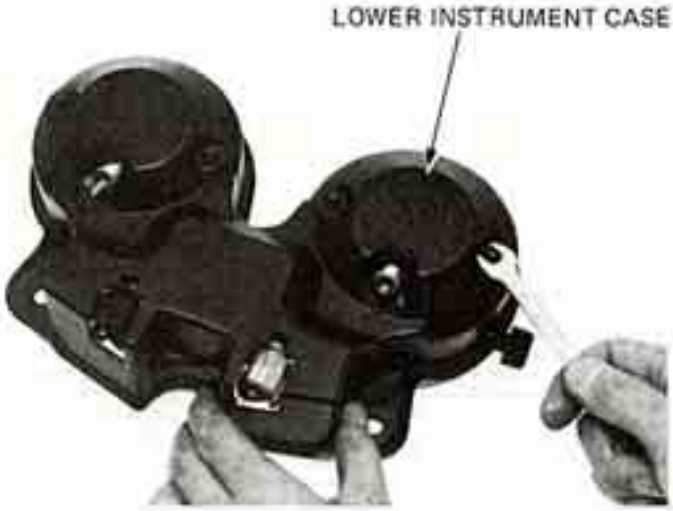
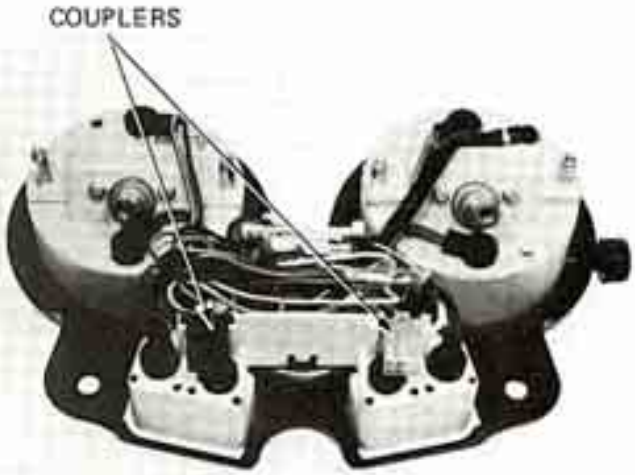
Remove the lower instrument case by removing four cap nuts.

CAUTION

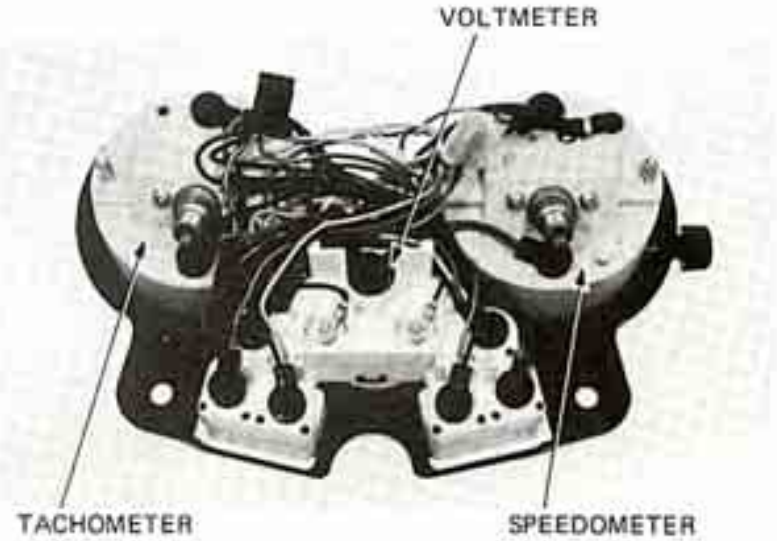
Do not leave the instruments upside down for a long time or damping fluid will leak onto the lens.



Remove the couplers from the holder on the indicator lamp case.



Remove the volt meter.
Rmove the bulbs and speedmeter and tachometer by pushing them out.
Check the meters if the needle swings abnormally.



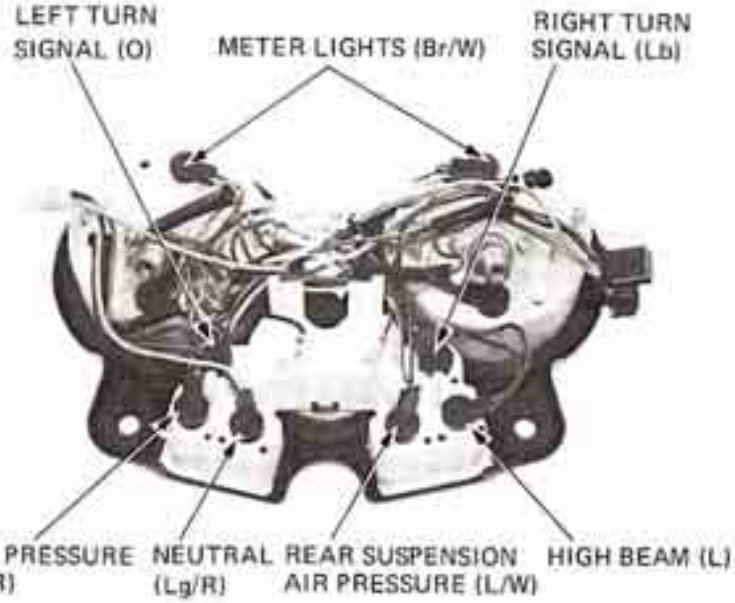
CLUSTER ASSEMBLY

Install the indicator and meter bulbs.

Connect the wires color-to-color.

NOTE

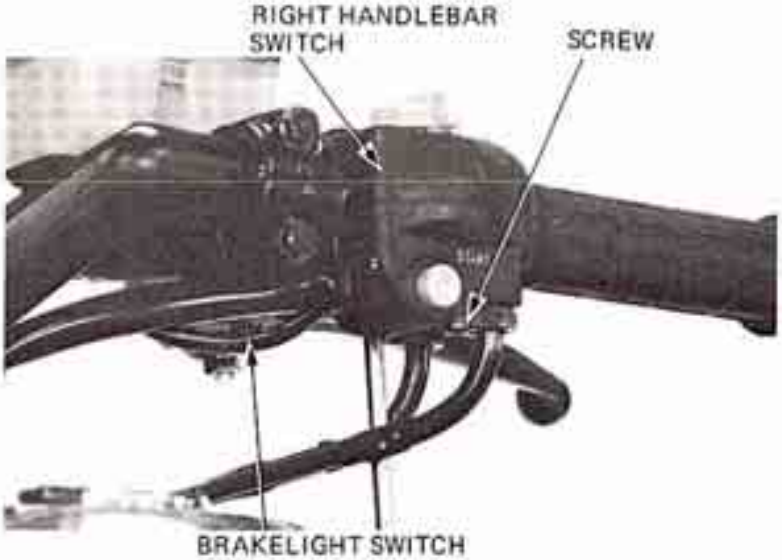
After installing new bulbs, inspect the wiring for open or short circuits if the bulbs do not light.



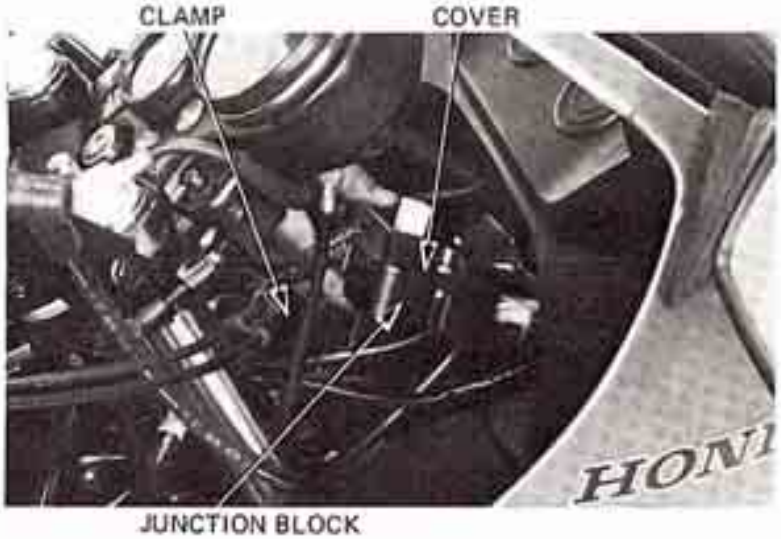
HANDLEBAR SWITCH/HANDLEBAR

RIGHT HANDLEBAR SWITCH REPLACMENT

Remove the fuel tank.
Remove the screws holding the upper and lower switch housing.
Disconnect the throttle cables from the throttle grip. Remove the throttle cables.
Disconnect the front brakelight switch wires from the switch.



Remove the clamps.
Disconnect the fairing wire connecter.
Remove the junction block cover and disconnect the right handlebar switch couplers.



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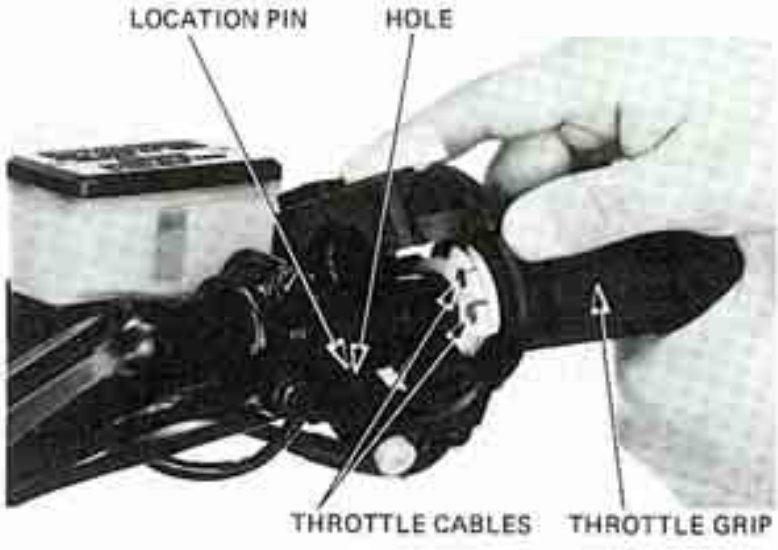
Install a new handlebar switch, alining the location pin of the switch lower housing with the hole in the handlebar.
Reinstall the throttle cables. Install the throttle grip and connect the throttle cables.
Tighten the forward screw first, then tighten the rearward screw.
Check the switch operation.

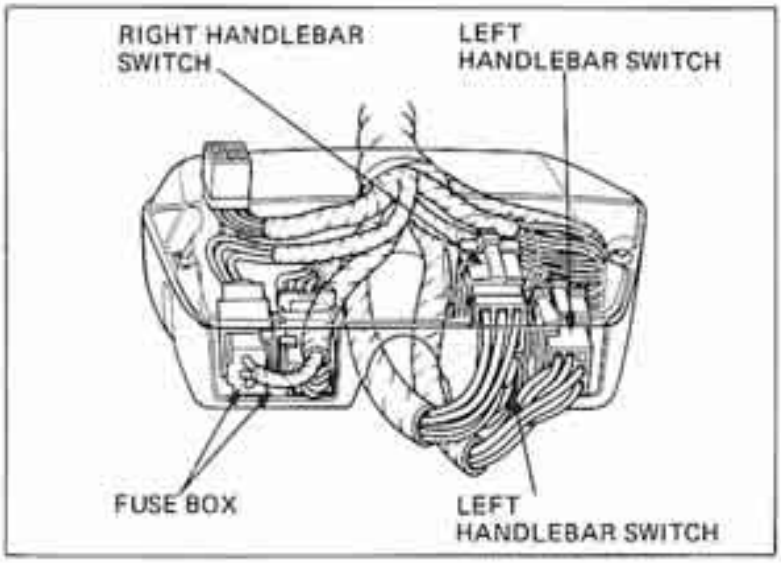
NOTE

- Before tightening the throttle cable lock nut, turn the handlebar all the way to the right and pull the throttle cables to the right.
- Make sure there is clearance between the switch housing and throttle grip.

After installing, adjust throttle cable free play. (Page 3-6)



Install the couplers in the junction block as shown.
Install the junction block cover and screws.
Connect the fairing wire connecter and install the wire band.



LEFT HANDLEBAR SWITCH REPLACEMENT

Remove the screws holding the upper and lower switch housings.
Disconnect the clutch switch wires.
Remove the wire band. Remove the junction block cover and disconnect the switch couplers.
Replace the left handlebar switch.

RIGHT HANDLEBAR REMOVAL

Remove the right handlebar switch (page 13–8).
Remove the front brake master cylinder (page 15–7).
Disconnect the front fork air hose at the left fork connecter, after releasing the air pressure from the front forks.
Remove the air hose from the right fork.
Remove the set ring.

Loosen the handlebar setting bolt and remove the right handlebar.

RIGHT HANDLEBAR INSTALLATION

Install the right handlebar on the right fork tube, inserting the location lug into the cutout of the fork bridge.
Apply clean oil to the thread of the handlebar setting bolt and install it.
Push the handlebar forward and tighten the bolt to the specified torque.

TORQUE:
28–32 N·m (2.8–3.2 kg-m, 20–23 ft-lb)

Coat the throttle grip area of the handlebar with grease.
Install the throttle grip and right handlebar switch.

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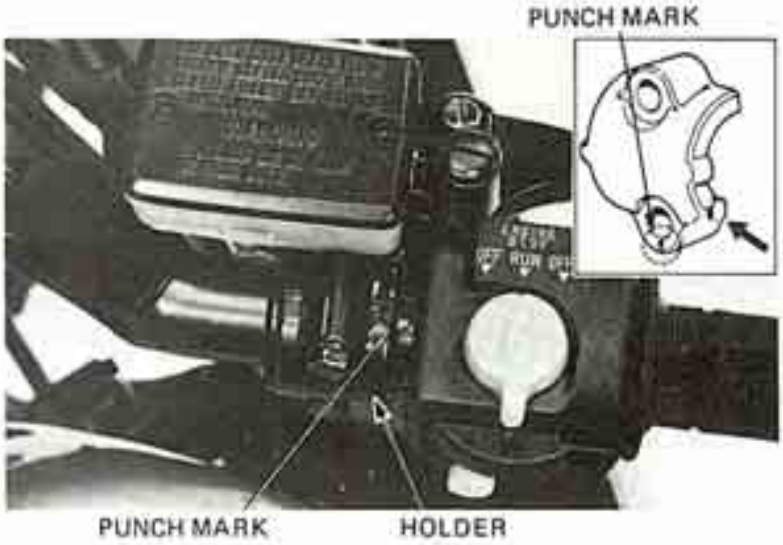
Install the front brake master cylinder on the handlebar with the end of the holder aligned with the punch mark and wire relief facing down.
Tighten the upper bolt first then tighten the lower bolt.
After assembly, check that the brake lever does not touch the switch housing when it is pulled in.
Install the set ring on the fork tube groove.



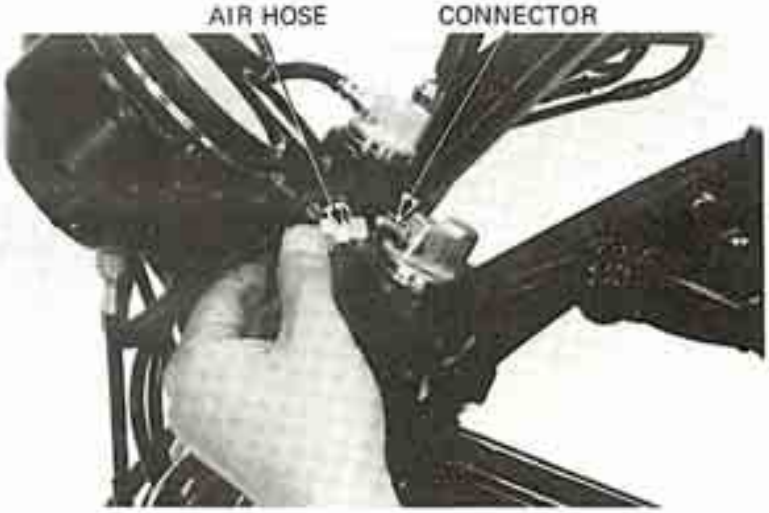
Apply grease to a new o-ring and install it on the air hose joint.
Connect the air hose to the right fork and tighten it to specified torque.

TORQUE: 4–7 N·m (0.4–0.7 kg-m, 3–5 ft-lb)

Route the air hose properly and connect the air hose to the left fork hose connecter and tighten to specified torque.

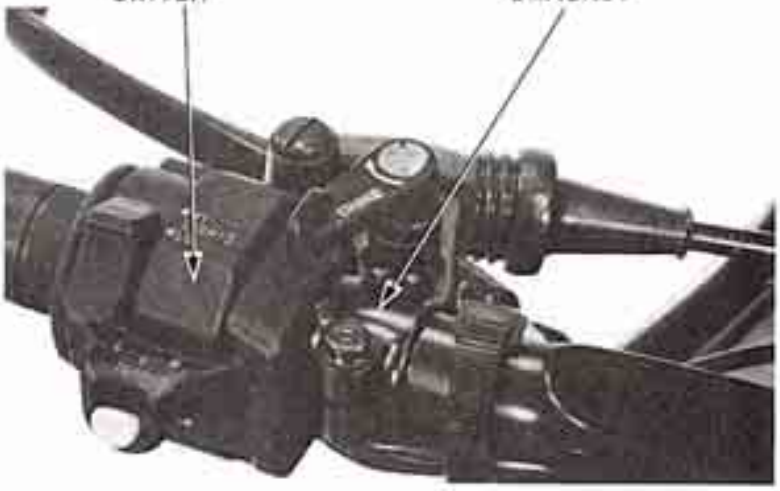
TORQUE:
15–20 N·m (1.5–2.0 kg-m, 11–14 ft-lb)

Fill the fork tube with air to the specified pressure.

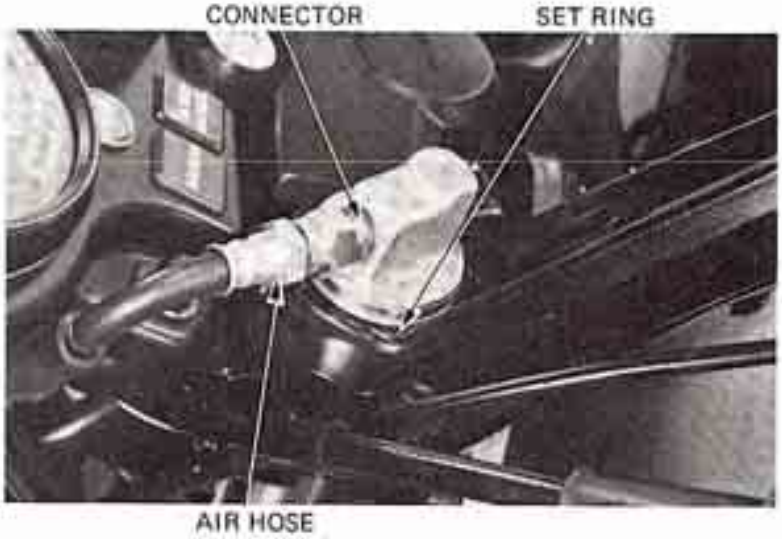


LEFT HANDLEBAR REMOVAL

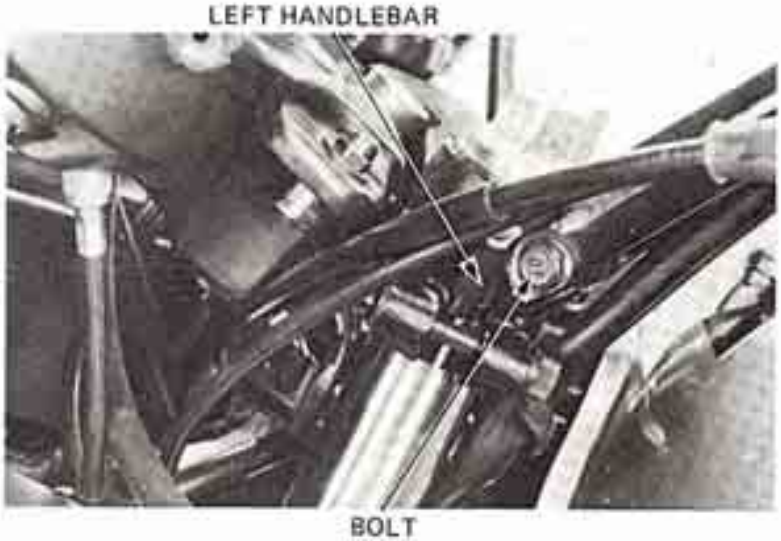
Remove the left handlebar switch (page 13–9).
Remove the left grip.
Loosen the clutch lever bracket bolt.



Depress the air pressure of the front forks.
Disconnect the air hose from the left fork.
Remove the air hose connecter.
Remove the set ring.



Loosen the handlebar setting bolt and remove the left handlebar.
Remove the clutch lever bracket.



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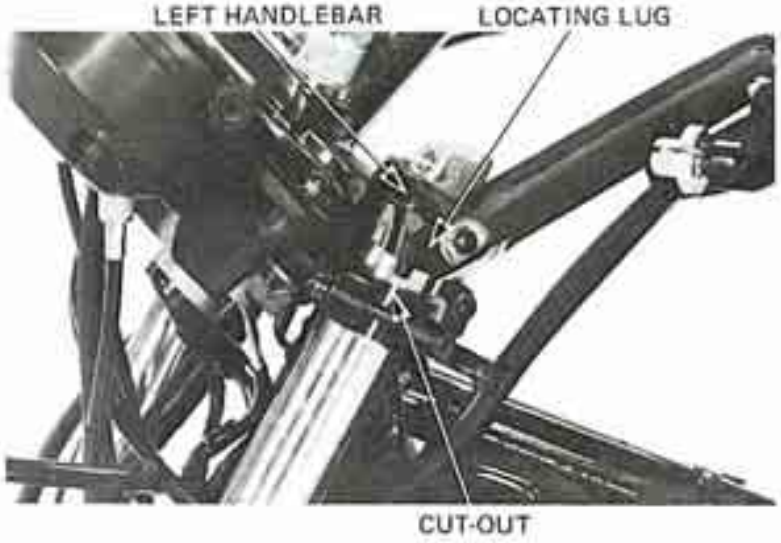
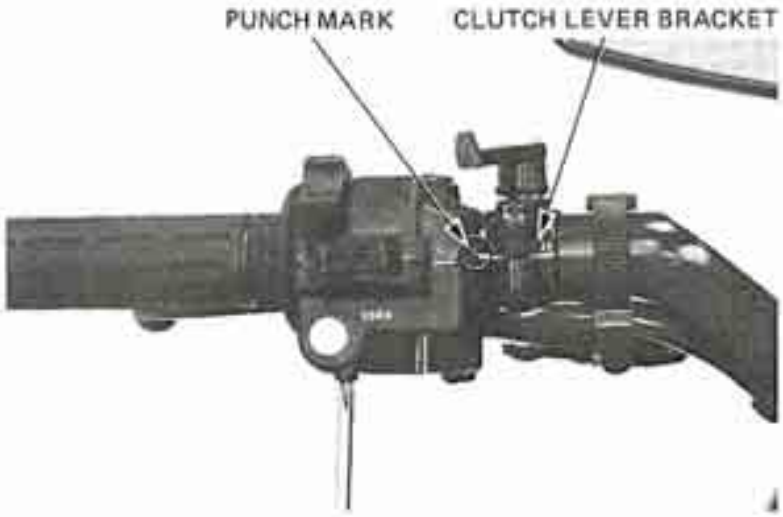
LEFT HANDLEBAR INSTALLATION

Attach the left handlebar to the left fork tube, installing the locating lug into the cutout of the fork bridge.
Coat clean oil to the thread of the handlebar setting bolt and install it.
Tighten the handlebar setting bolt to the specified torque while pushing the handlebar forward.

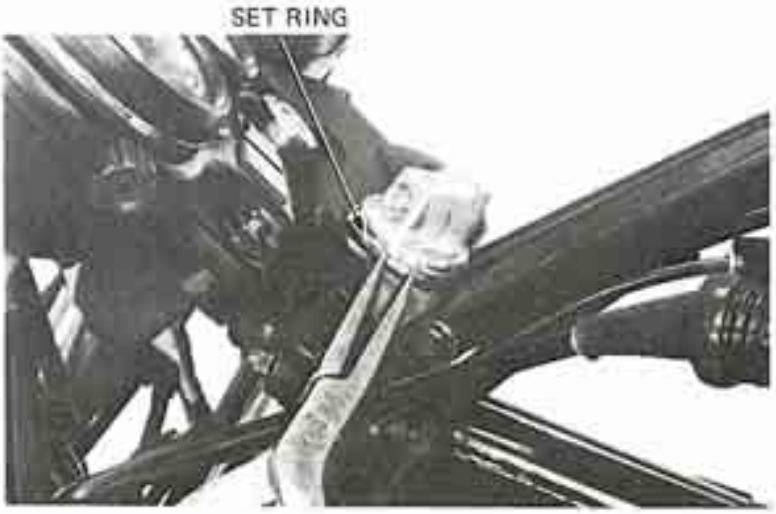
TORQUE:
28–32 N·m (2.8–3.2 kg-m, 20–23 ft-lb)



Install the clutch lever bracket with the split aligned with the punch mark on the handlebar.
Install the left handlebar switch and grip.



Install the set ring.



Apply grease to a new o-ring and install it on the connecter.
Tighten the connecter to specified torque.

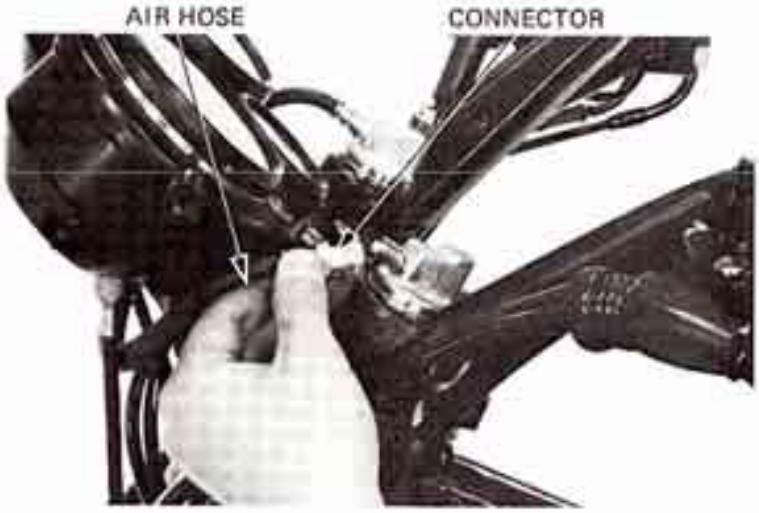
TORQUE: 4–7N·m (0.4–0.7 kg·m, 3–5 ft·lb)

Connect the air hose to the left fork and tighten it to the specified torque.

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

Fill the front forks with air to the specified pressure.

PRESSURE:
50–90 kPa (0.5–0.9 kg/cm², 7–13 psi)



Install the air valve cap on the right fork cap bolt.

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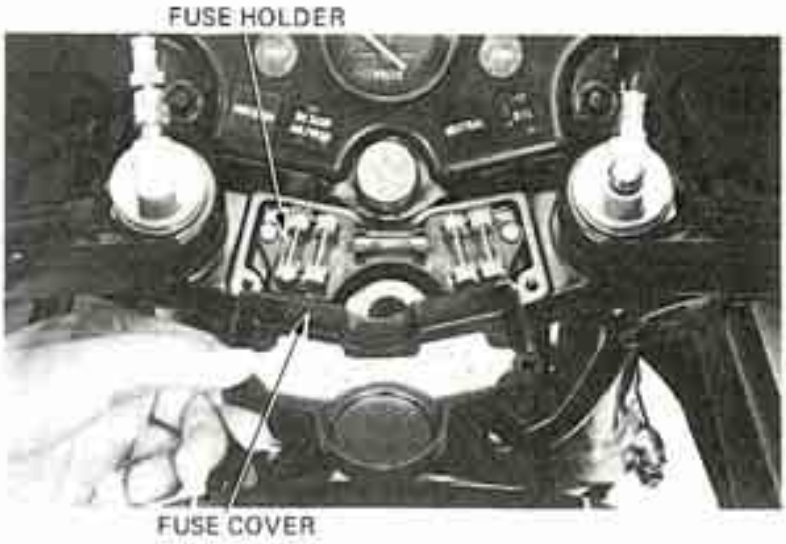
FUSE HOLDER REPLACEMENT

Remove the fuse cover.
Unscrew the screws holding the fuse holder.



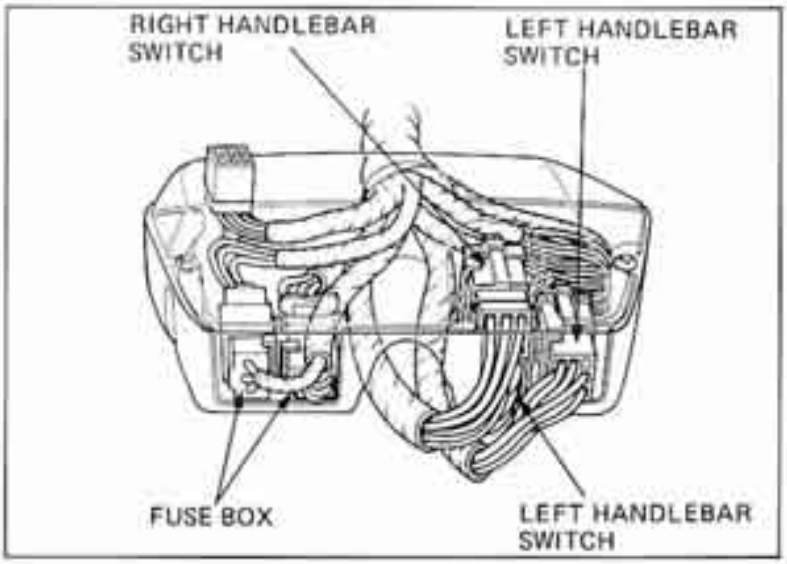
Remove the wire band and junction block cover.

Disconnect the wire coupler.
Remove the fuse holder.

NOTE

Route the fuse holder wires as shown.

Install a new fuse holder in the reverse of removal.



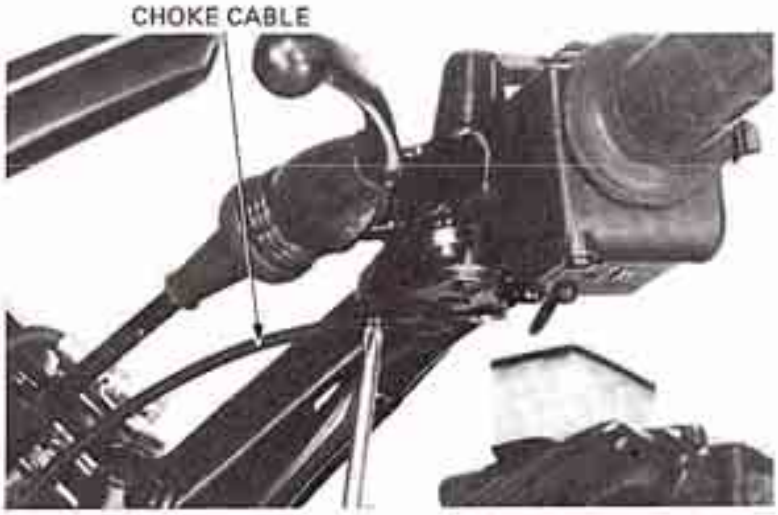
CHOKE CABLE REPLACEMENT

Remove the fuel tank.
Disconnect the choke cable from the lower choke cable clamp.
Remove the cable end from the choke lever.

Remove the choke cable from the choke lever on the handlebar.

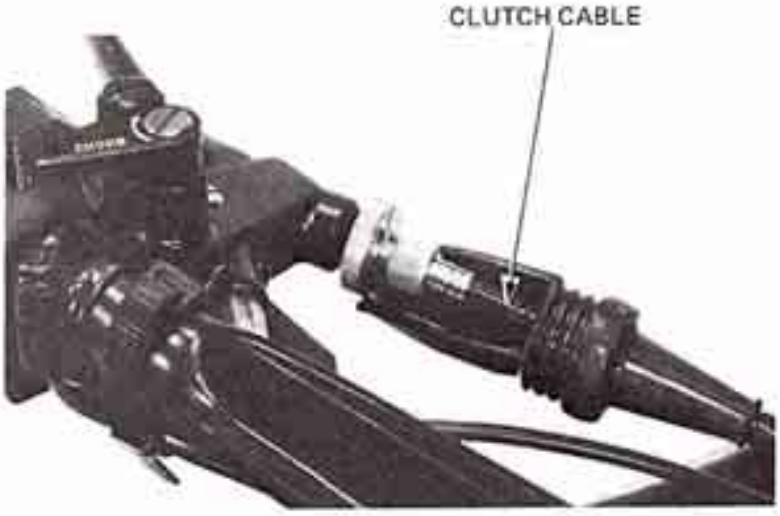
NOTE

Before removing the cable, tie a string to the cable end. This string can be used as a draw cord when installing a new choke cable.



CLUTCH CABLE REPLACEMENT

Remove the fuel tank.
Remove the clutch cable from the lever.



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Loosen the lock nut on the engine and remove the clutch cable from the clutch lever.

NOTE

Before removing the clutch cable, connect a string to the end of the cable so that a new cable can be installed easily by using this string as a draw cord.

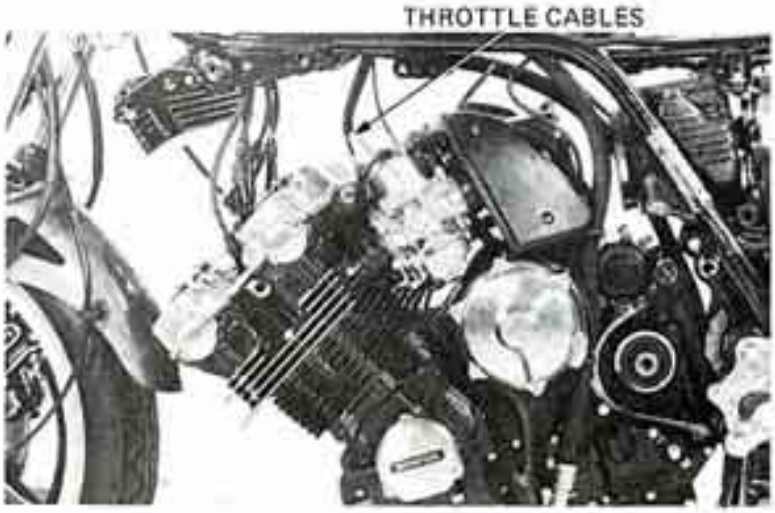
Adjust the clutch cable after replacement (Page 3-19).

THROTTLE CABLE REPLACEMENT

Remove the fuel tank.
Remove the right handlebar switch/throttle housing.
Remove the throttle cables from the throttle housing.

Tilt the engine forward (Page 5-1).
Remove the throttle cables from the carburetors.

Adjust throttle cable free play (Page 3-6)



FAIRING

FAIRING REMOVAL

Remove the left and right leg shields.

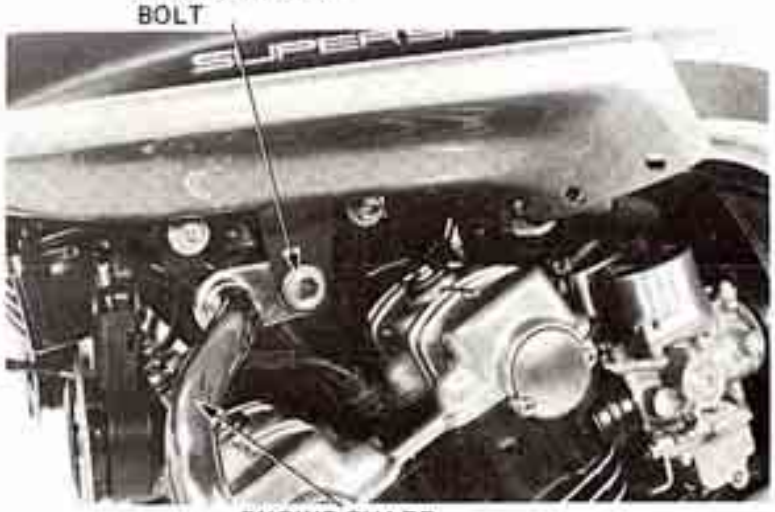
LEG SHIELD

Disconnect the fairing wire connecter.
Remove the fairing mount bolt.
Remove the wire band.
Disengage the wires form the fairing bracket.

CONNECTER

Remove the fairing side mount bolts.
Remove the fairing.
Remove the engine guards.

FAIRING MOUNT BOLT



ENGINE GUARD

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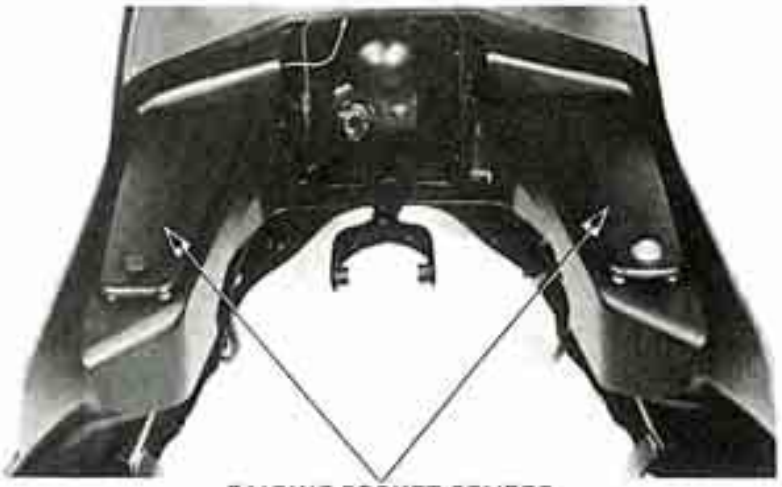
FAIRING DISASSEMBLY

Remove the fairing (Page 13-18).
Remove the headlight (Page 13-4) and turn signals (Page 13-22).
Remove the windshield (Page 13-22).
Remove the left and right fairing pocket covers.



FAIRING POCKET COVERS

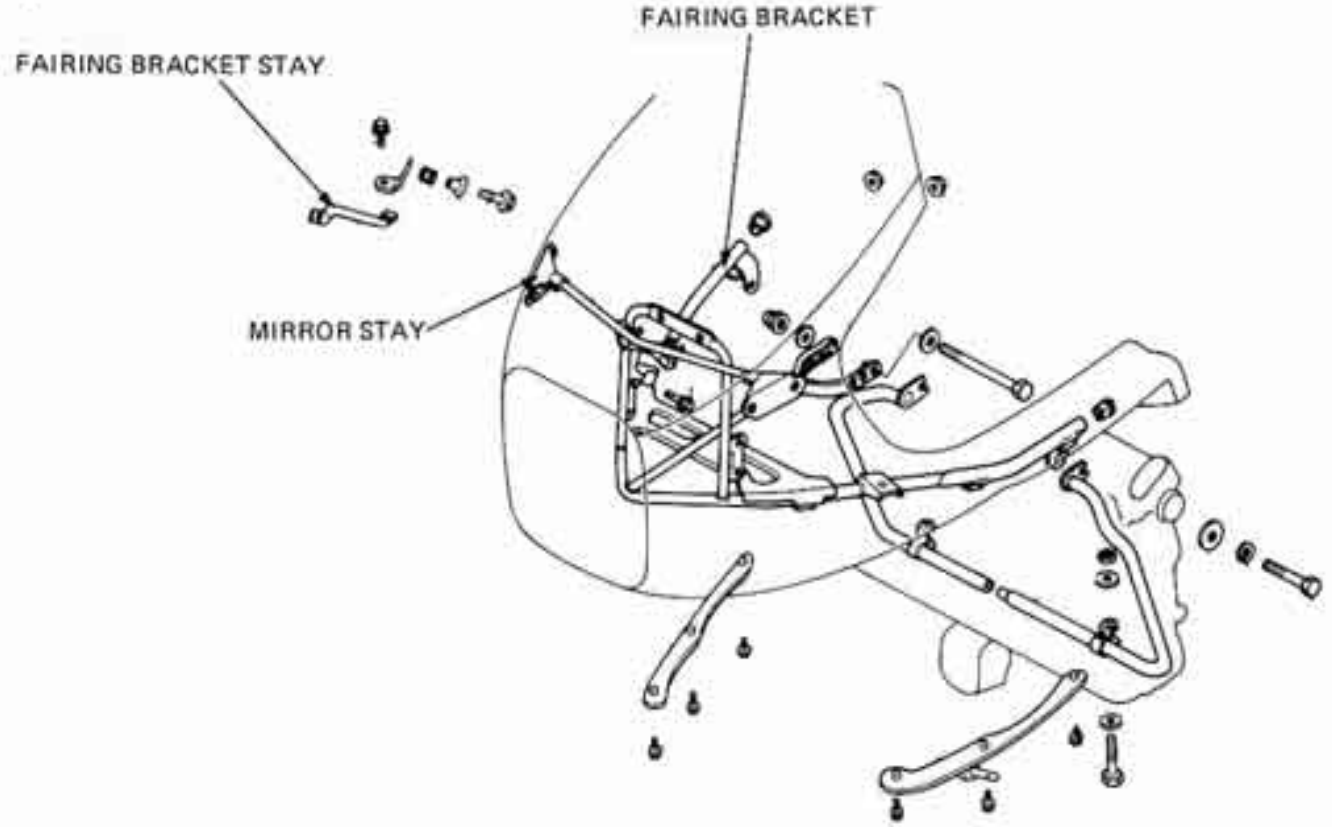
Remove the fuse holder from the right fairing pocket.
Remove the left and right fairing pockets.

FAIRING POCKETS

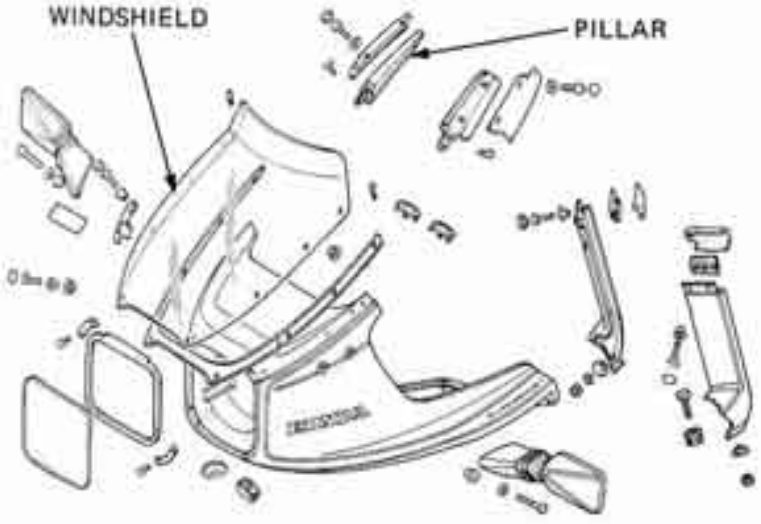
Remove the left and right rear view mirrors.

REAR VIEW MIRROR

Remove the mirror stay mounting cap nuts.
Remove the fairing bracket stays.
Remove the mirror bracket setting screws.
Remove the mirror bracket.
Remove the fairing bracket from the fairing assembly.



Disassemble the fairing as shown if necessary.



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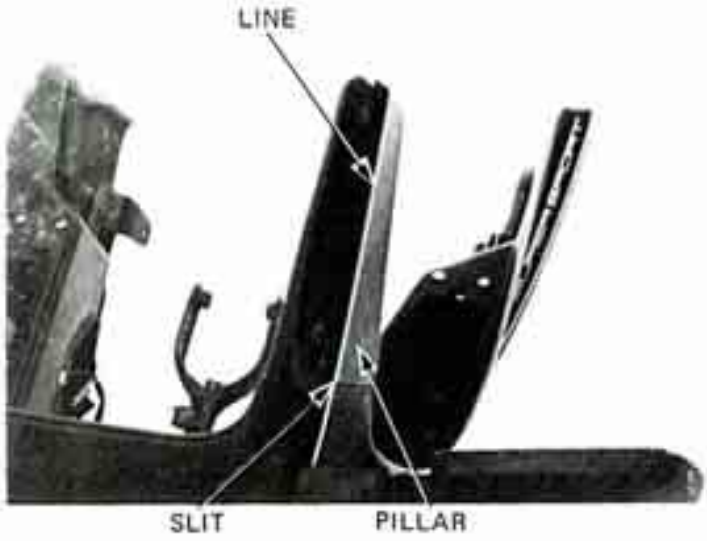
FAIRING ASSEMBLY

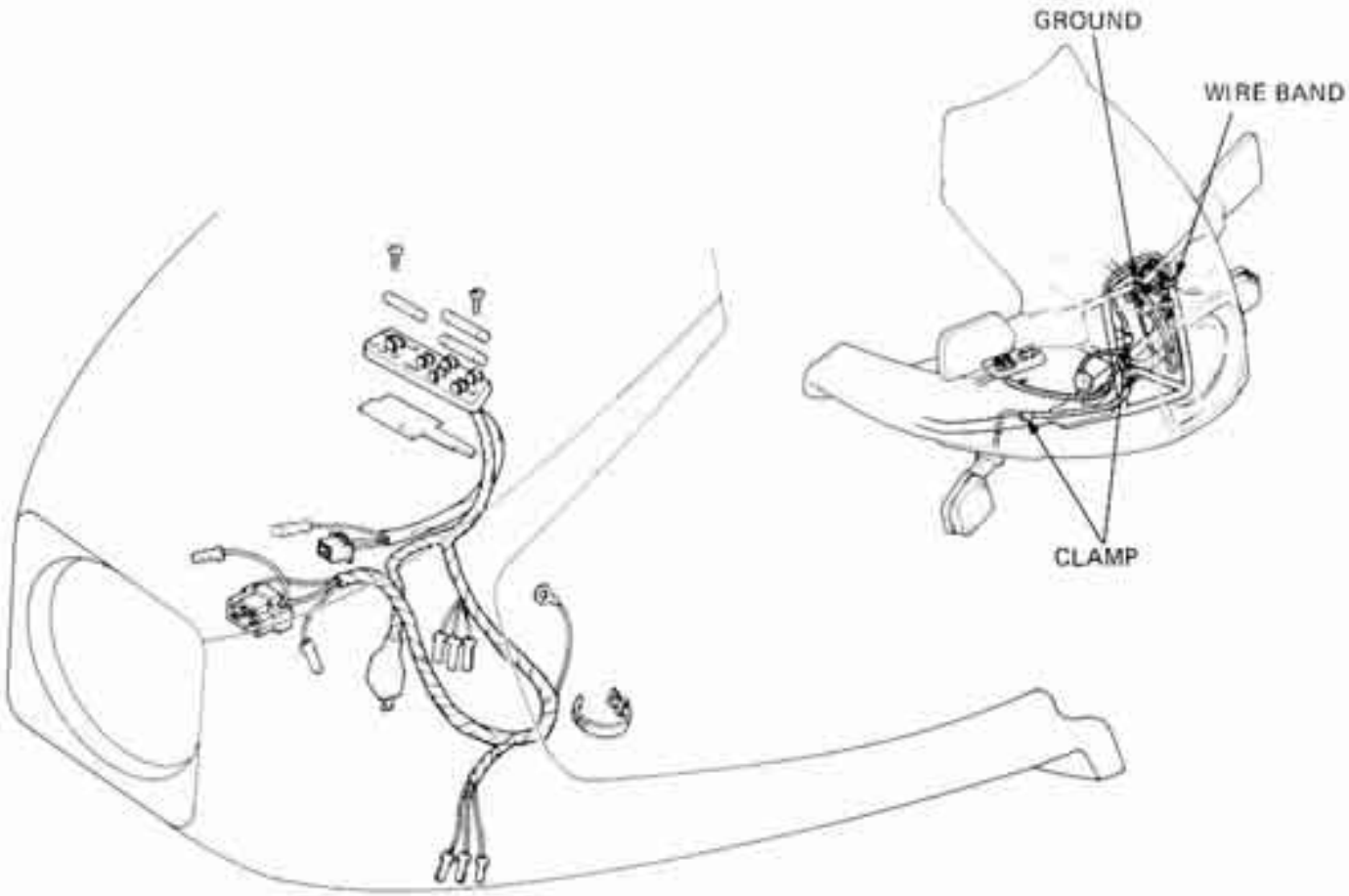
Assemble the fairing in the reverse order of disassembly.

NOTE

Tighten the pillars by aligning the line of pillar and slit of pillar.



Route the fairing wire harness as shown.



TURN SIGNAL REMOVAL

Disconnect the turn signal wire connecters.
Remove the turn sinagals by removing the turn signal mounting bolts.

NOTE

The left turn signal has an orange tube wire, and the right turn signal has a light-blue tube wire.

TURN SIGNAL

WINDSHIELD REPLACEMENT

Remove the windshield screw caps.
Remove the left and right fairing pockets.

SCREW CAP

Remove the screws.
Remove the windshield.

NOTE

Do not let the nuts and nut plates fall when removing the two lower right and left screws.

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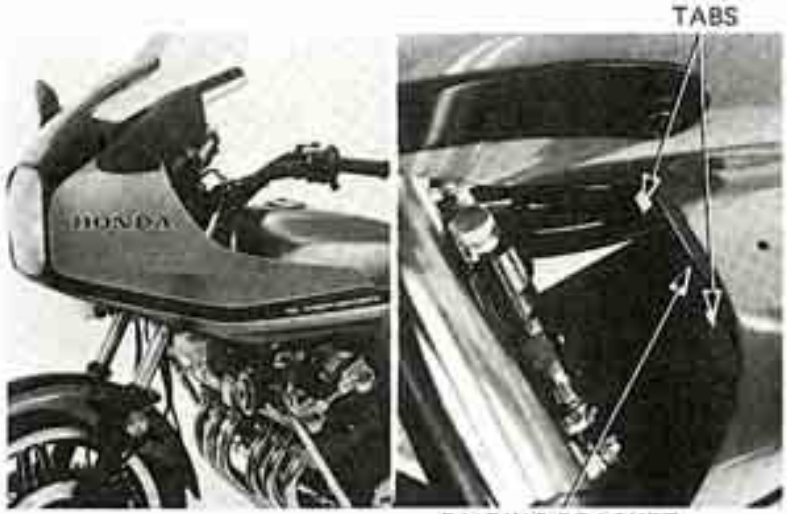
Install the weatherstrips on the fairing by aligning the screw holes.
Install the windshield.
Tighten the windshield screws in the sequence shown.

FAIRING INSTALLATION

In stall the fairing in the reverse order of removal.

NOTE

Set the tabs of the junction block to the fairing bracket as shown.



FRONT WHEEL

REMOVAL

Remove the speedometer cable set screw and speedometer cable.

Remove the left and right calipers.

NOTE

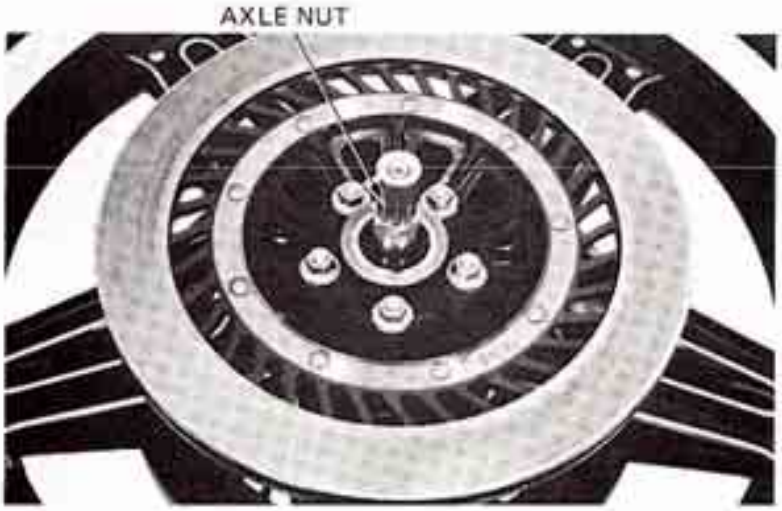
Do not operate the front brake lever after removing the front wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.

Remove the left and right axle holders.

Place a jack under the engine and jack up the engine untill the forks clear the front axle and remove the front wheel.

DISASSEMBLY

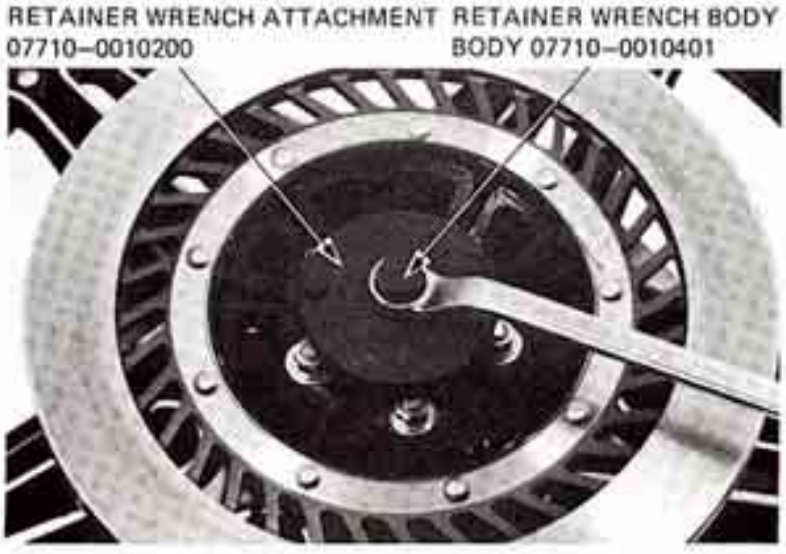
Remove the axle nut, speedometer gear box, axle and collar.



Remove the retainer.
Remove the bearings and the distance collar from the hub.

NOTE

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



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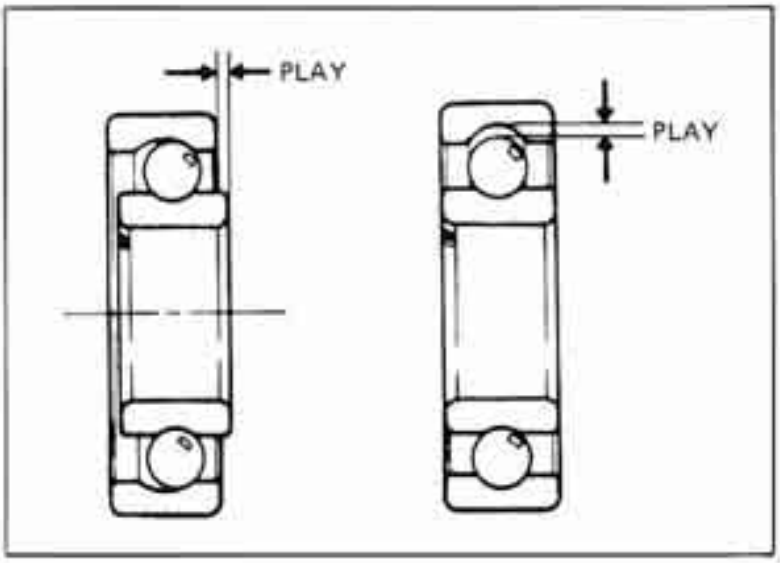
INSPECTION

WHEEL BEARING

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

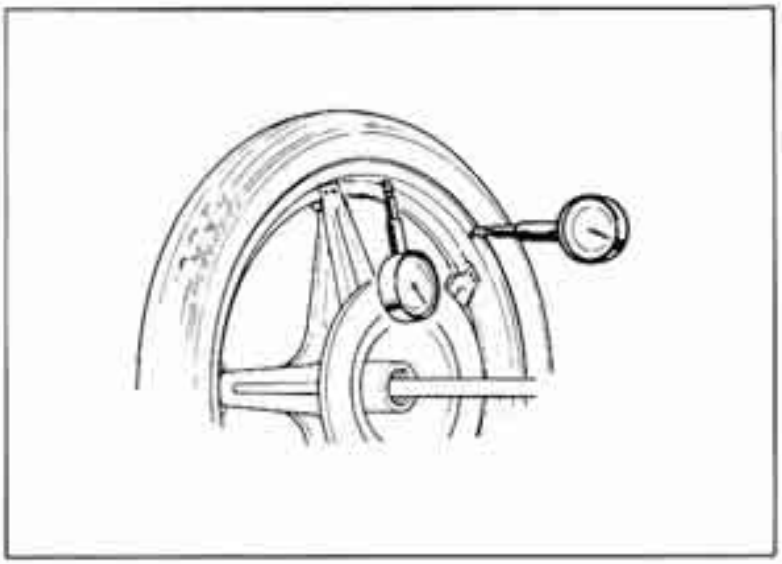


WHEEL

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

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

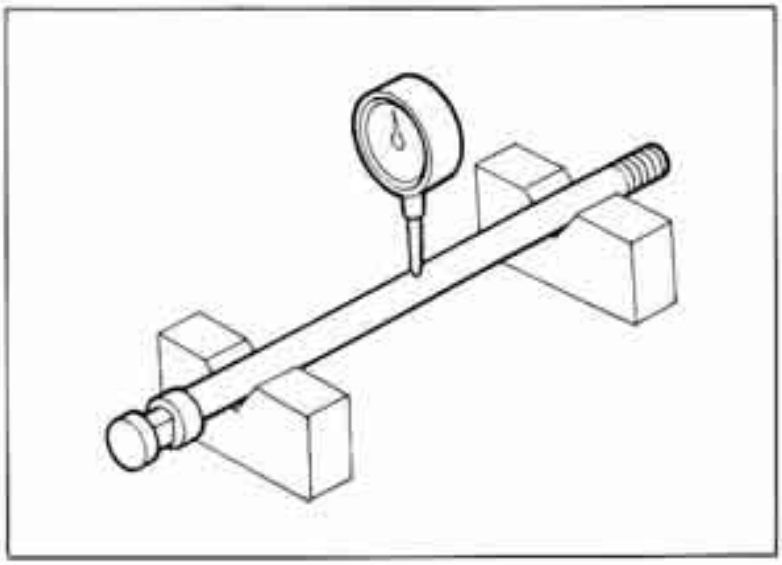
The COMSTAR TM WHEEL cannot be repaired and must be replaces with a new one if the service limits are exceeded.



AXLE INSPECTION

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

SERVICE LIMIT: 0.20 mm (0.008 in)



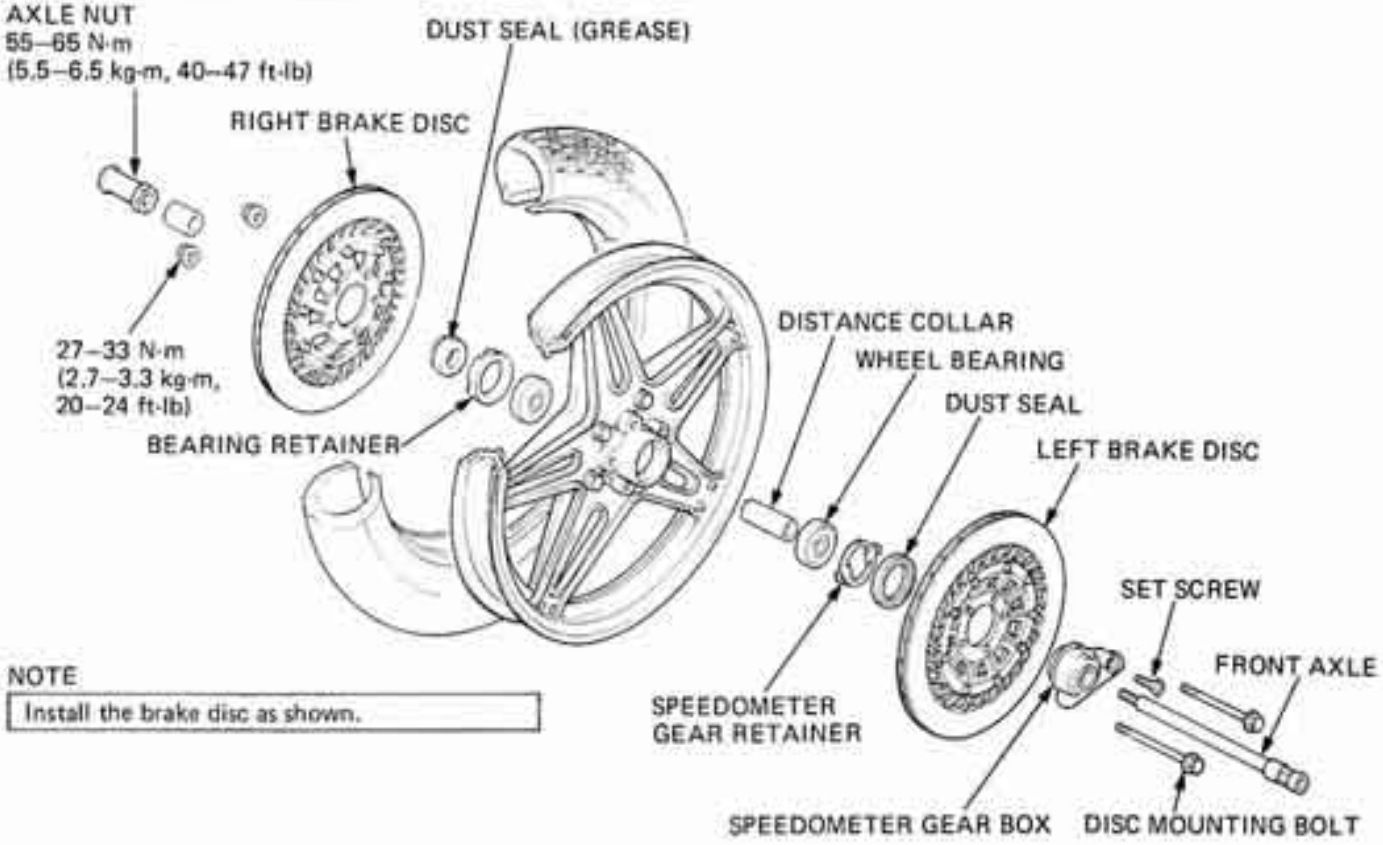
ASSEMBLY

NOTE

- The COMSTAR TM WHEEL has no rim band.
- The front wheel uses a tubeless tire. For tubeless tire repair, refer to the TUBELESS TIRE MANUAL (Code No. 6141500, H/C 068216 in U.S.A.).

WARNING

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



NOTE

Install the brake disc as shown.

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

NOTE

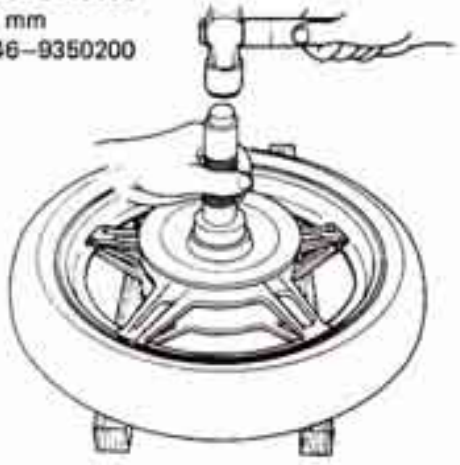
Be certain the distance collar is in position before installing the bearings.

Drive in the left bearing.

NOTE

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

DRIVER
07749–0010000 or 07949–6110000
ATTACHMENT 42 X 47 mm
07746–0010300 or 07946–9350200
PILOT 15 mm
07746–0040300



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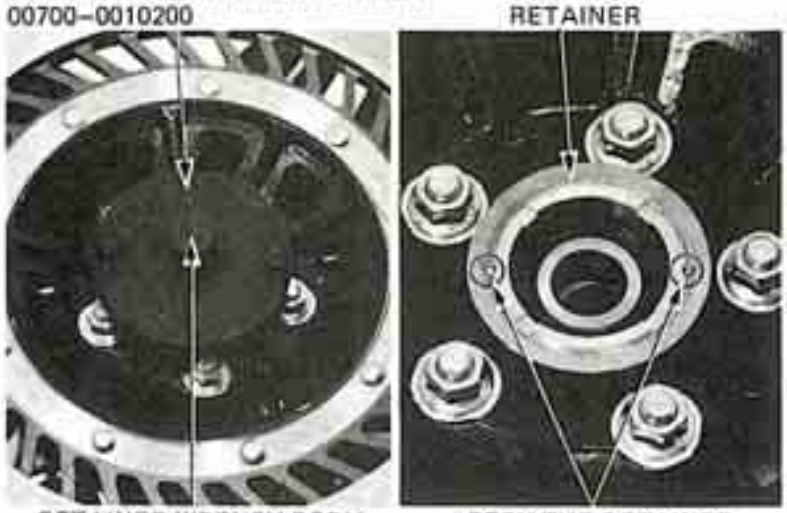
Install the bearing retainer with the tool used to remove it.

NOTE

Inspect the retainer. If the threads are damaged, it should be replaced.

Install the seal and the bearing retainer and peen the edge of the retainer.



NOTE

The spoke plate bolts and nuts require no retightening since they are secured with lock pins. Do not remove the pins.

Install the speedometer gear retainer.
Lubricate the inside of the oil seal and install it.

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

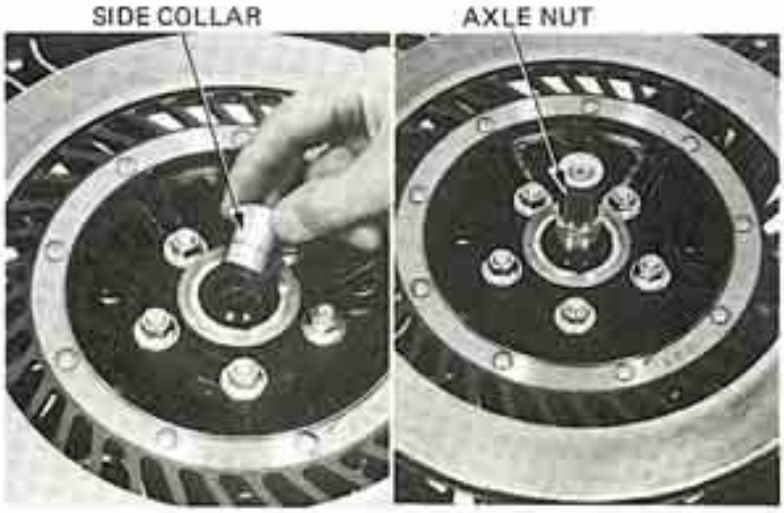
Install the left and right discs.

TORQUE:
27–33 N·m (2.7–3.3 kg·m, 20–24 ft·lb)

Install the left side collar and axle.
Install the 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

Fit the calipers over the discs, taking care not to damage the brake pads. Install the caliper mounting bolts.

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

Install the axle holders with the "F" arrow forward. Tighten the forward axle holder nuts lightly.

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

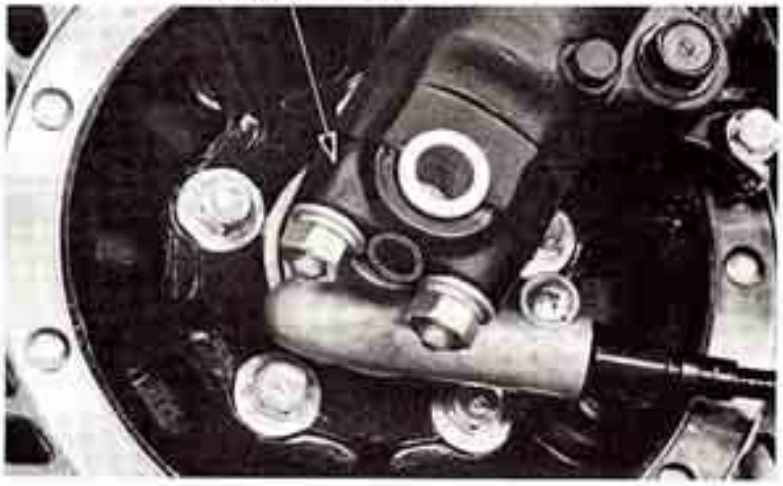
TORQUE:
18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)

Measure the outside surface of the left brake disc and the rear of the left caliper holder with a 0.7 mm (0.028 in) feeler gauge.
If the gauge cannot be inserted, pull the left fork out until the gauge can be inserted.
Tighten the left holder nuts.
There should be at least 0.7 mm (0.028 in) clearance between the caliper holder and disc.

CAUTION

After installing the wheel, apply the brakes several times and recheck the clearance on both sides. Failure to provide clearance will damage the brake discs and affect braking efficiency.

AXLE HOLDER



FRONT FORK

REMOVAL

Remove the front wheel (page 13-26).
Remove the brake calipers.

NOTE

Do not loosen the brake hose unless necessary.

Remove the front fender.

FRONT FENDER

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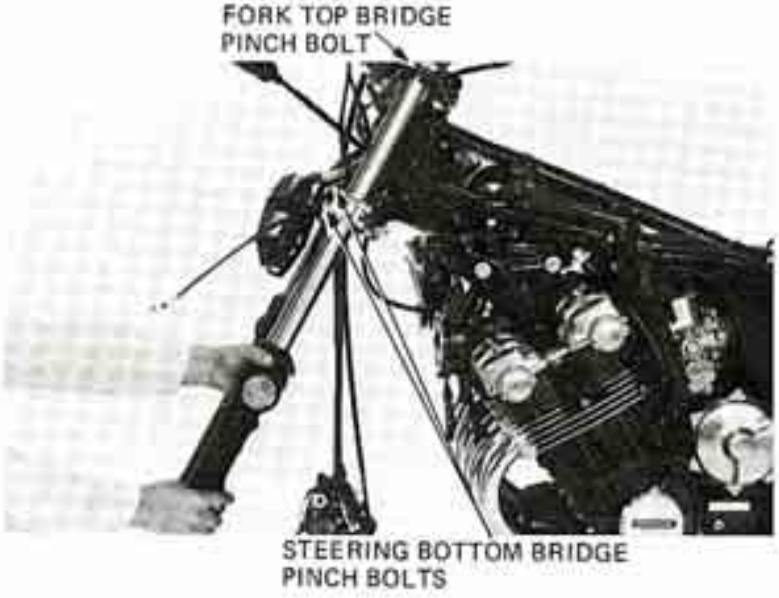
Remove the fairing (page 13-18).

Remove the handlebar (Page 13-10).
Loosen the fork bridge and steering stem pinch bolts.
Remove the front fork by rotating the fork tube.
Before removing the front forks, loosen the fork cap bolts to ease front fork disassembly.



DISASSEMBLY

Fork Seal Removal

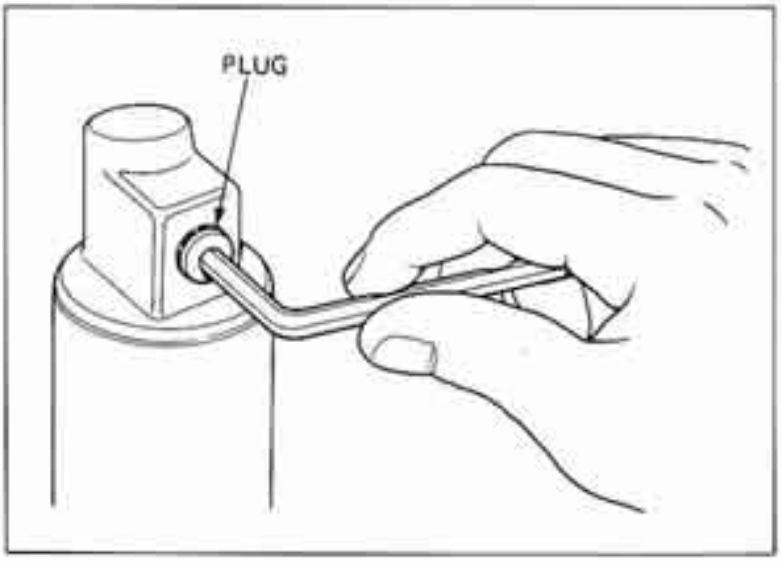
WARNING

The fork tube caps are under spring pressure. Care must be used when removing the fork tube caps to prevent them from becoming projectles.
Wear eye and face protection.

NOTE

- Fork seal replacement does not require inner fork tube and slider separation.
- This procedure is for air assisted forks only.

Remove the air valve from the right fork cap bolt. Install a special plug into the fork cap bolt. (See service Bulletin 900 # 2, 1100 # 3).

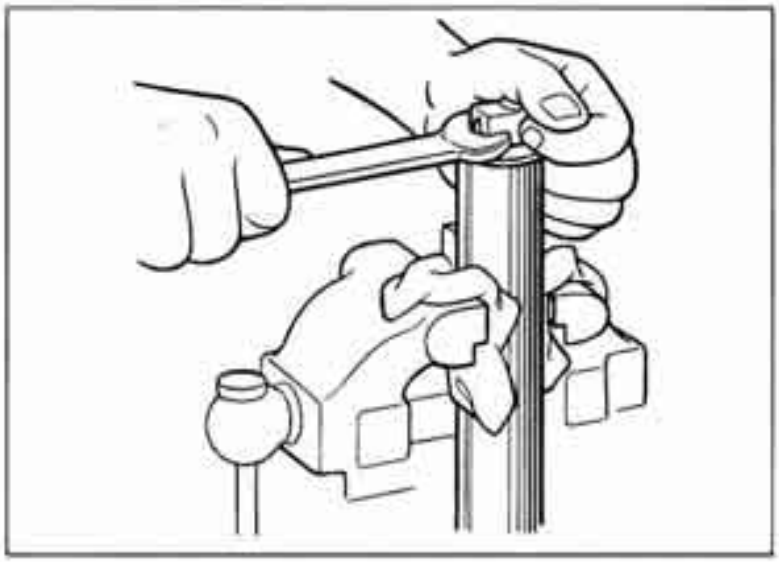


Place the fork tube into a vise with soft jaws or a shop towel. Loosen the fork cap bolt.

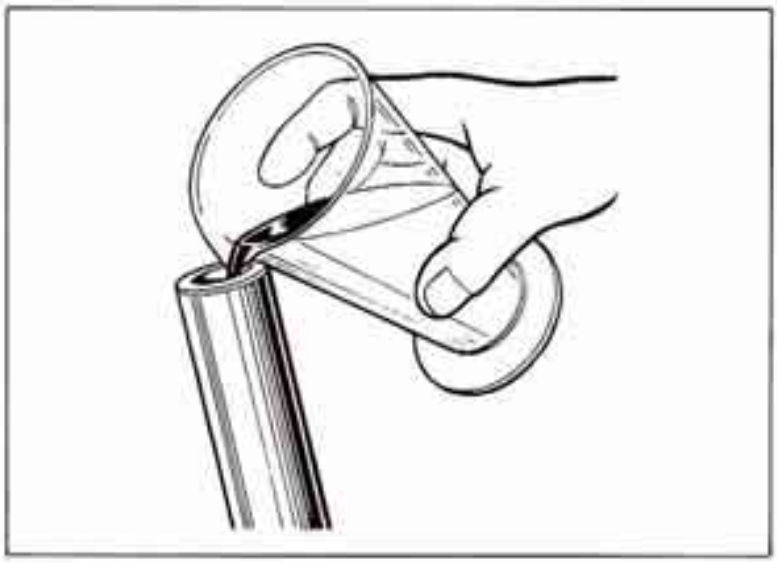
NOTE

Avoid damaging the sliding surface of the fork tube.

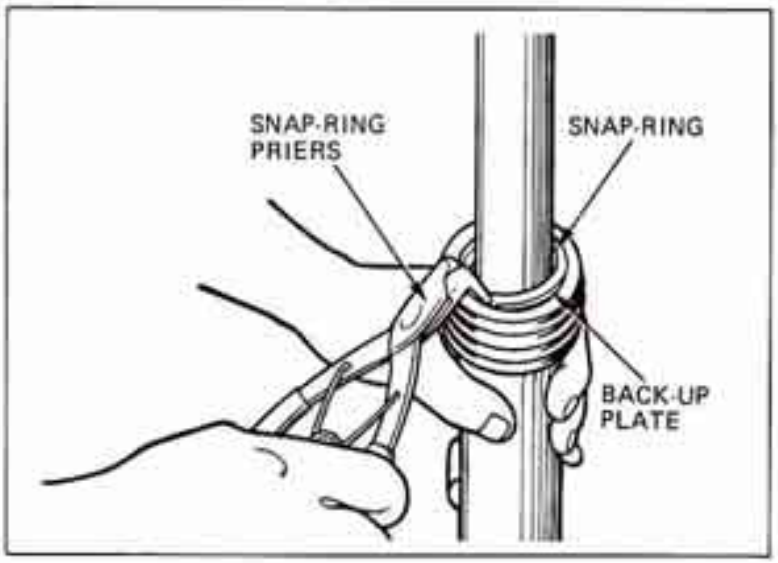
Remove the fork cap bolt.



Extend the fork tube.
Pour ATF into the fork tube up to the bottom of the cap threads.
Install the fork cap bolt.



Remove the dust cover and circlip.
Remove the back-up plate with a magnet.



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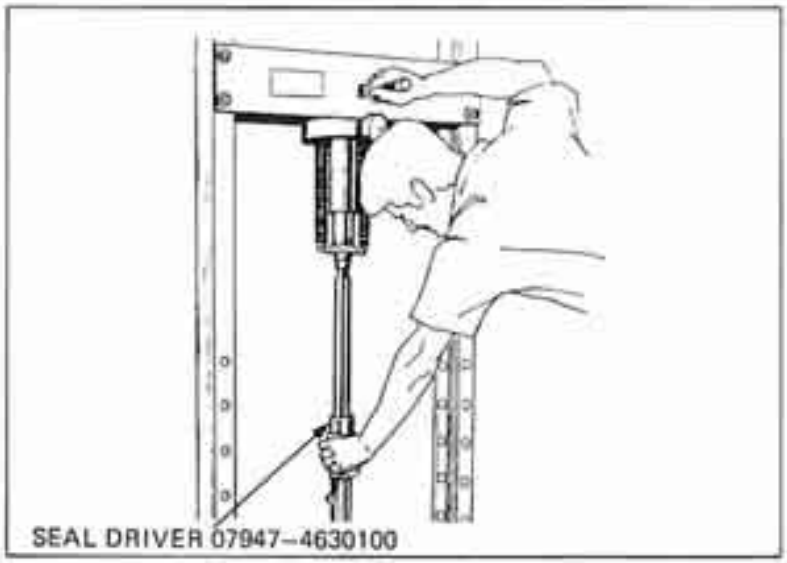
Place the seal driver over the fork tube.
Wrap a shop towel around the seal area.
Compress the fork tube with a hydraulic press until the fork seal is forced out.
Hold the driver against the seal during removal to keep the seal from tilting.
Remove the fork cap bolt, tool and seal and pour the fork oil out.
Remove the back-up ring with a magnet.

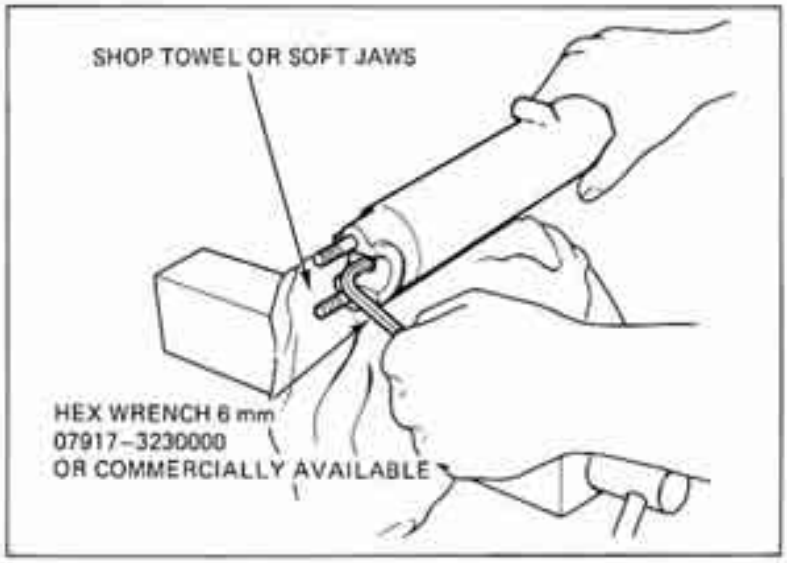


Fork Tube and Slider Separation.

Hold the fork slider in a vise with soft jaws or a shop towel.
Remove the socket bolt with a hex wrench and pump the remaining ATF out through the socket bolt hole.

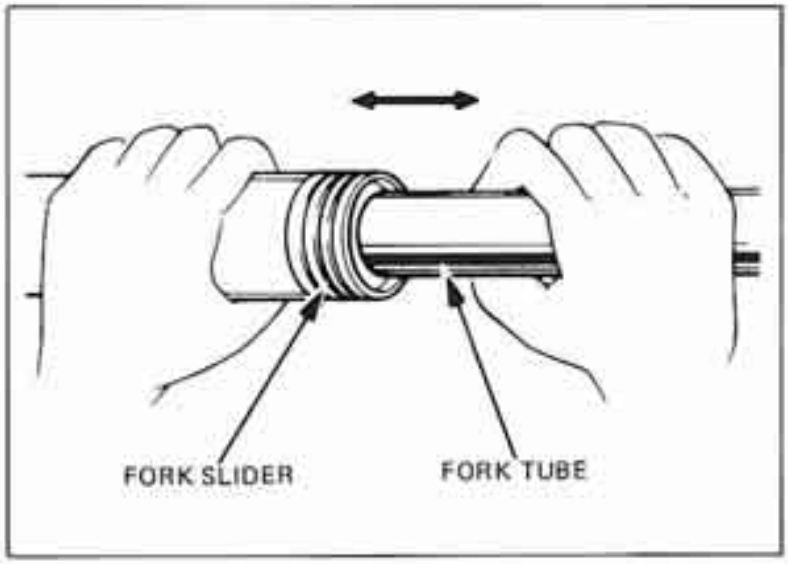
CAUTION

Do not distort the slider in the vise.



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.

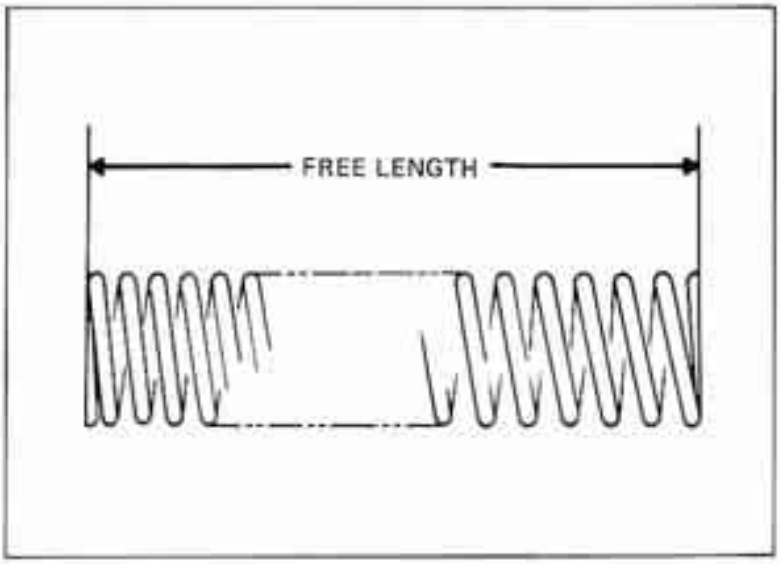
Remove and discard the oil seal.
Do not remove the fork tube bushing unless required after inspection (Page 13–32).
Remove the slider bushing from the fork tube.



INSPECTION

Check the fork spring free lengths and replace the springs if shorter than the service limit.

SERVICE LIMIT:
559.3 mm (22.02 in)

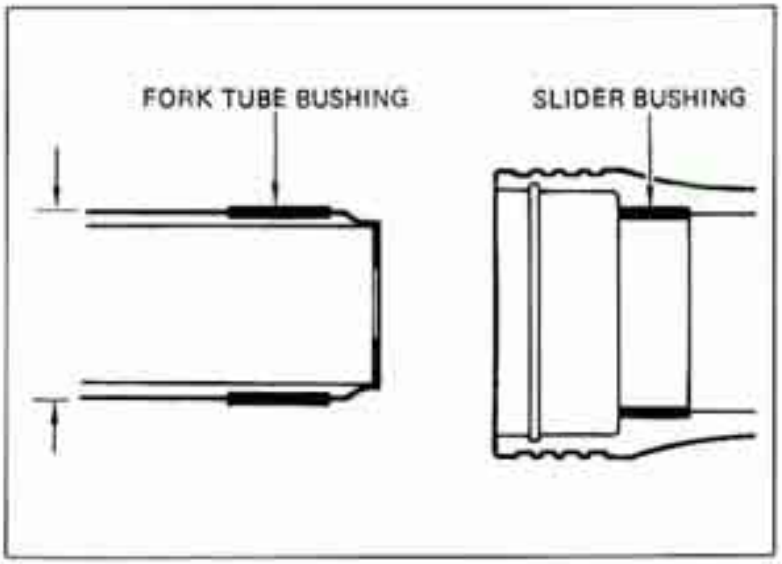


Check the fork tubes, fork sliders and pistons for score marks, scratches, excessive or abnormal wear. Replace those which cannot be reused.
Measure the outside diameter of the fork tube and bushing.

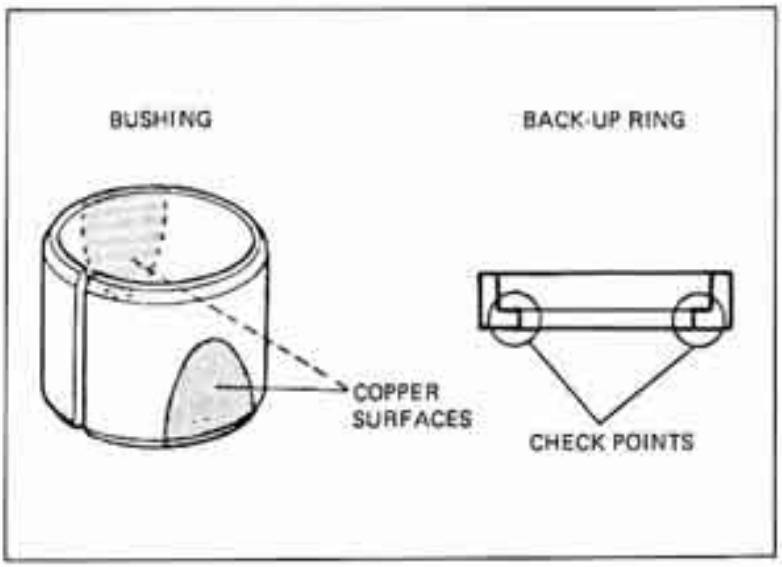
SERVICE LIMIT:
FORK TUBE O.D. : 38.90 mm (1.531 in)
SLIDER BUSHING O.D. : 39.86 mm (1.569 in)

Measure the inside of the slider and bushing.

SERVICE LIMIT:
FORK SLIDER I.D. : 40.2 mm (1.58 in)
GUIDE BUSHING I.D. : 39.23 mm (1.544 in)



Visually inspect the slider and fork tube bushings. Replace if there are excessive scores or scratches, or worn so that copper appears over more than 3/4 of the total surface.
Replace the back-up ring if there is distortion at the points shown.



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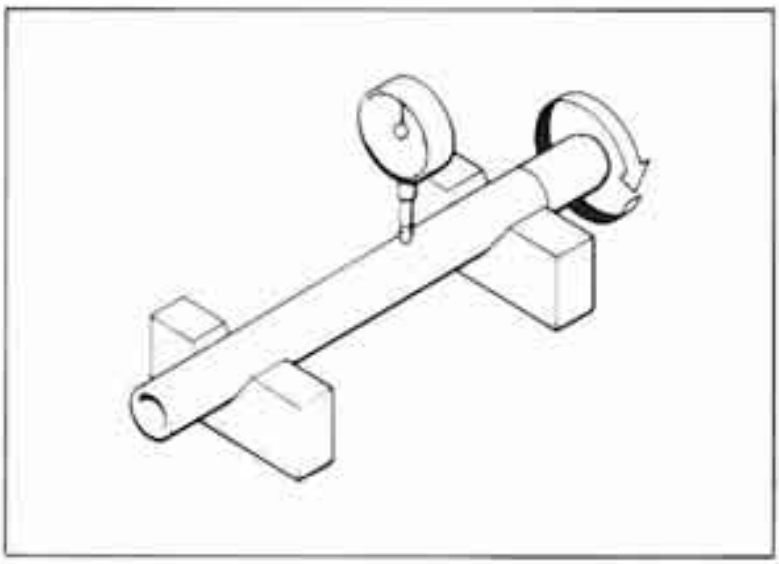
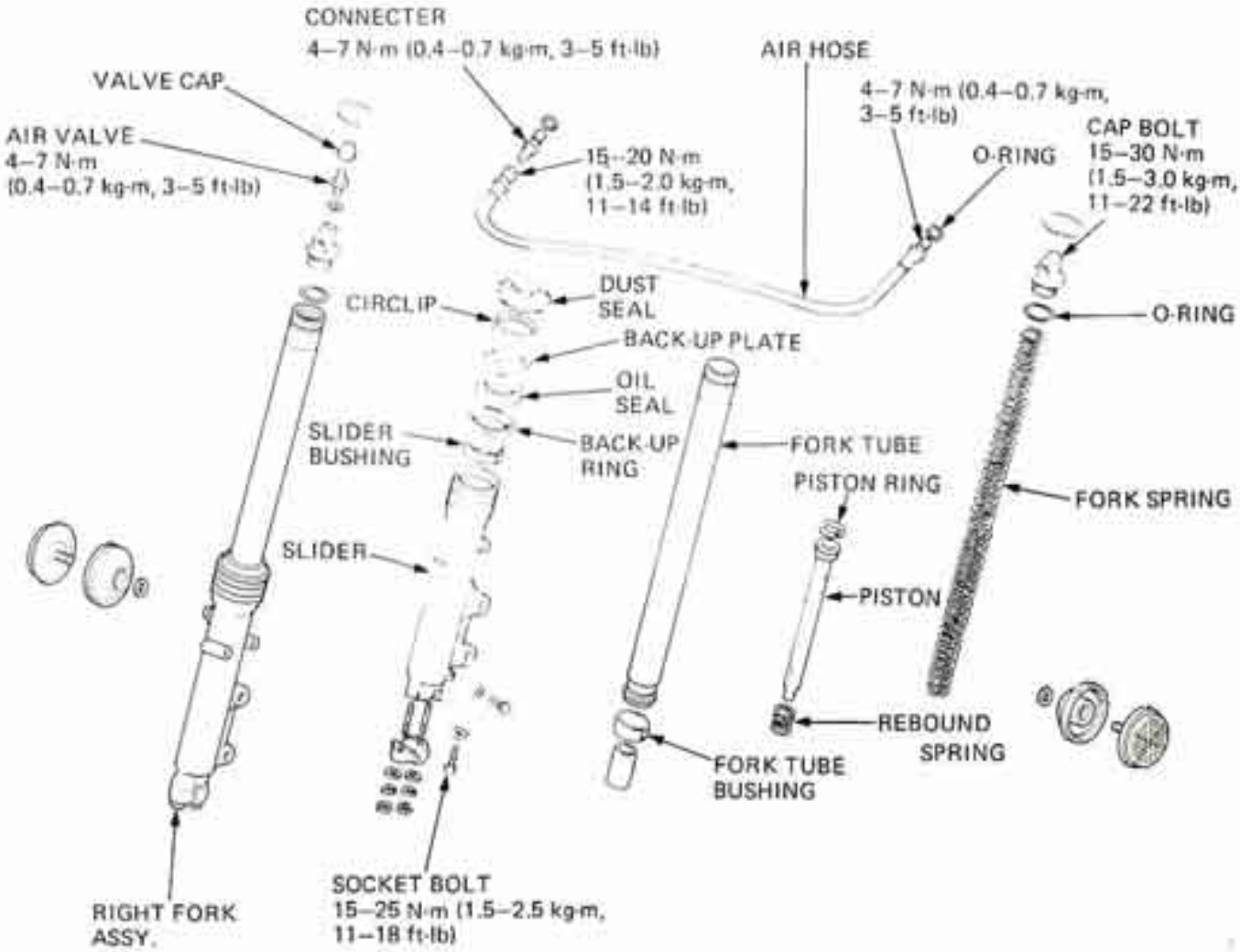
Set the fork tube in V blocks and measure the runout. The actual runout is 1/2 of total indicator reading.

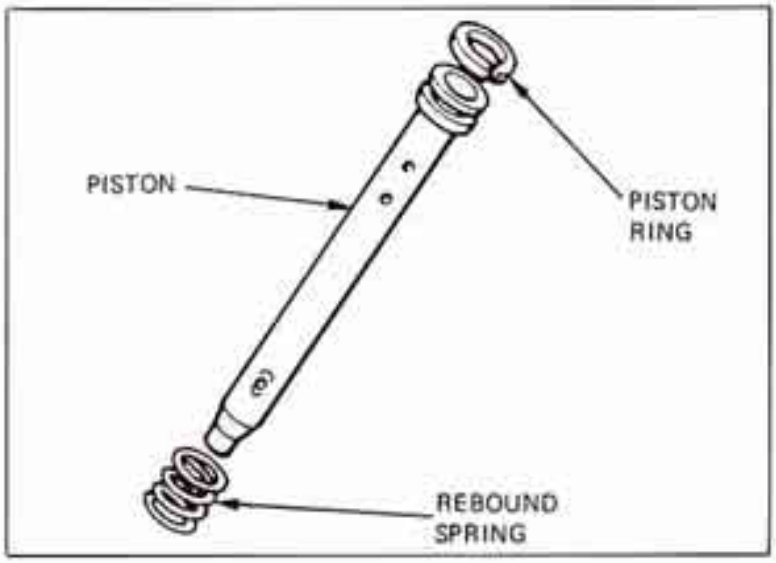
RUN OUT SERVICE LIMIT: 0.2 mm (0.01 in)



FRONT FORK ASSEMBLY



Clean all disassembled parts.
Install a new bushing onto the fork tube if necessary. Install the rebound spring and piston into the fork tube.
Place the oil lock piece over the piston end and insert the fork tube into the slider.
Install the fork spring. Install the fork cap bolt loosely.



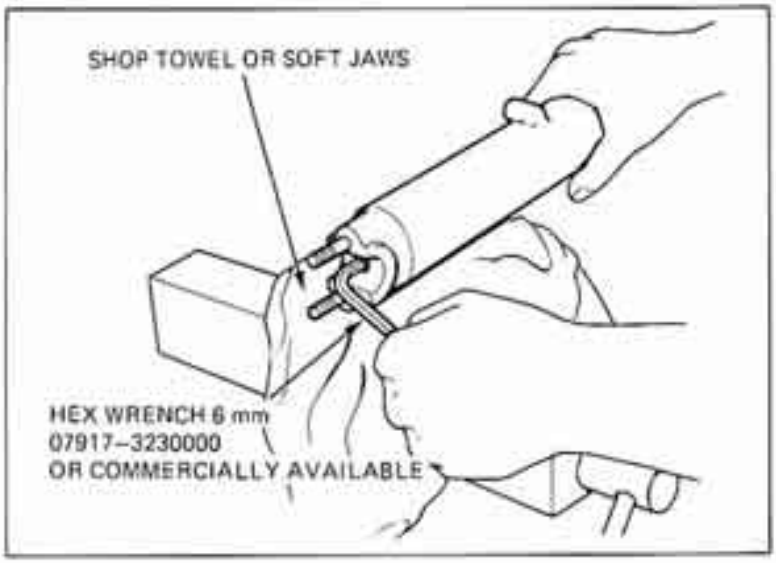
Place the fork slider in a vise with soft jaws or a shop towel.

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

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

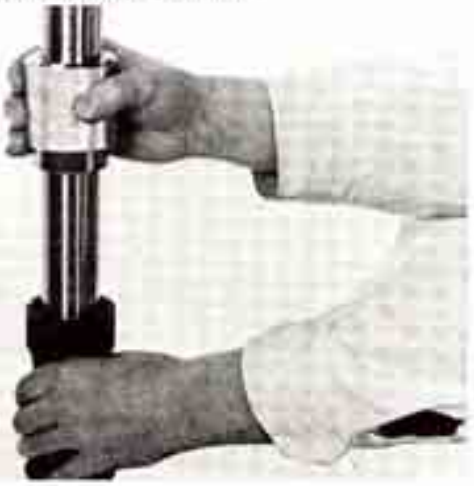
CAUTION

Do not distort the slider in the vise.



Place a new slider bushing over the fork tube and rest it on the slider. Put the back-up ring and old bushing or equivalent tool on top. Drive the new bushing into place with the seal driver. Remove the old bushing.

SEAL DRIVER 07947–4630100



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SEAL INSTALLATION

Wrap a piece of tape around the grooves at the top of the fork tube.
This will prevent the oil seal from being damaged when it is installed.

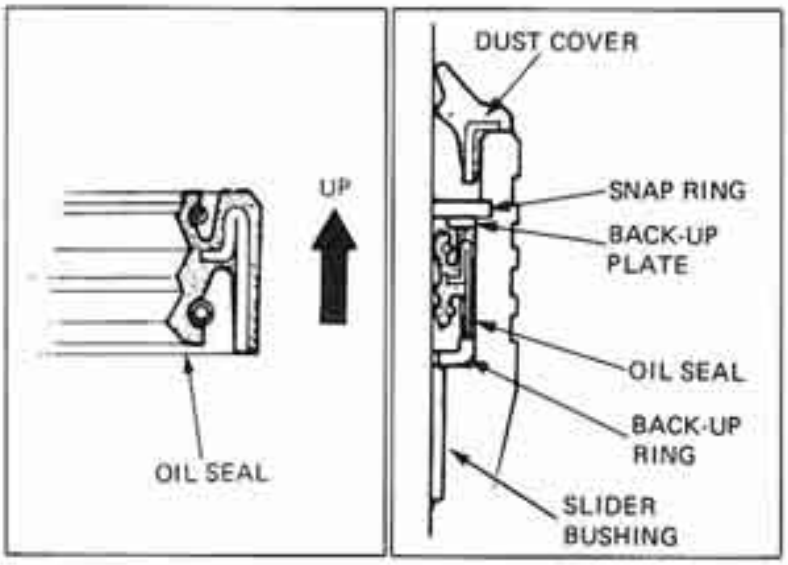
Coat the oil seal with ATF and slide the seal over the fork tube.

Drive the seal in with the seal driver until the tool bottoms against the slider.

Install the back-up plate, snap ring and dust cover.

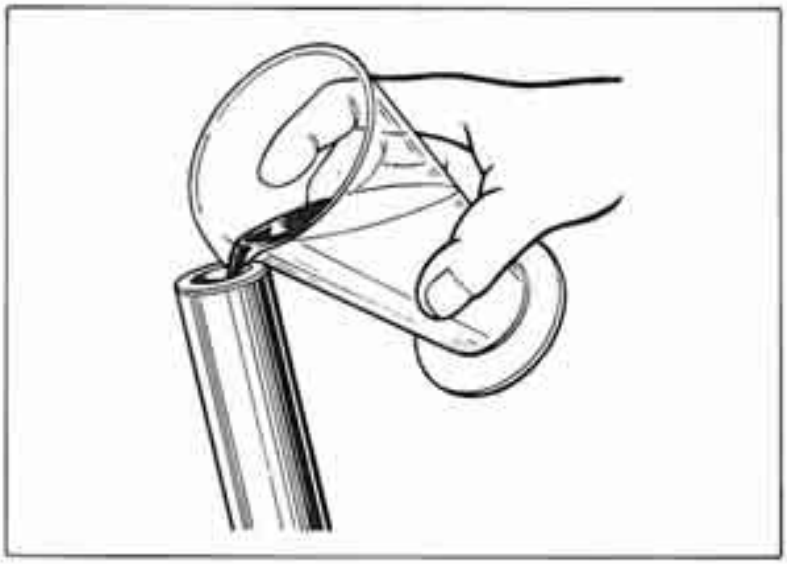
NOTE:

Install the snap ring with its radiused edge facing down.



Remove the fork tube cap and pour the specified amount of ATF into the fork tube.

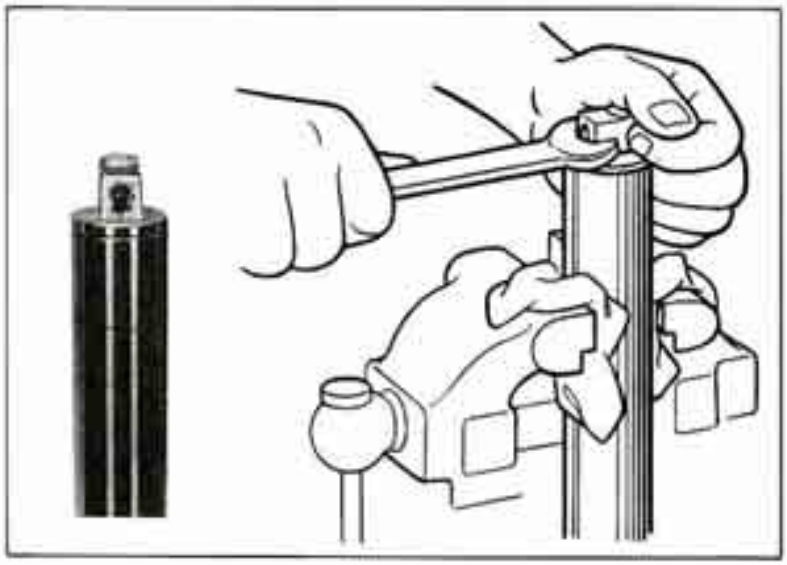
CAPACITY:
345 cc (11.7 oz) (Reassembly)
305 cc (10.3 oz) (after draining)



Remove the special plugs from cap bolts.
Install a new o-ring on the cap bolt.
Install the fork tube cap.

NOTE

Place the fork tube in a vise with soft jaws or a shop towel to avoid damaging the sliding surface.



Tighten the fork cap bolt to the specified torque.

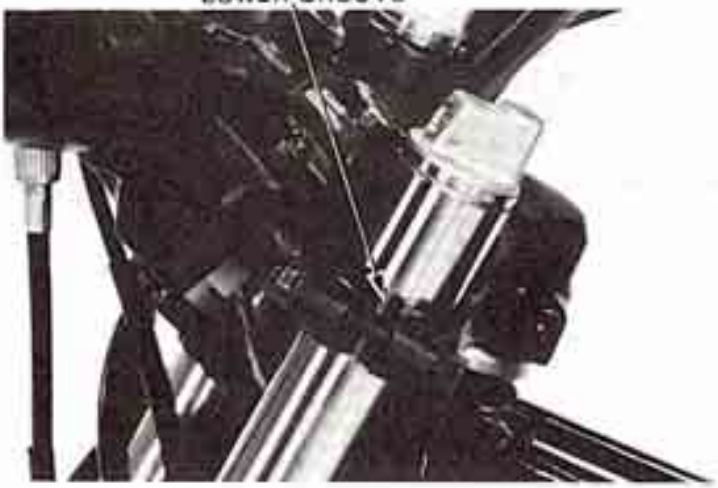
TORQUE:
15–30 N·m (1.5–3.0 kg-m, 11–22 ft-lb)

Install the air valve into the right fork cap bolt.

TORQUE:
4–7N·m (0.4–0.7 kg-m, 3–5 ft-lb)

INSTALLATION

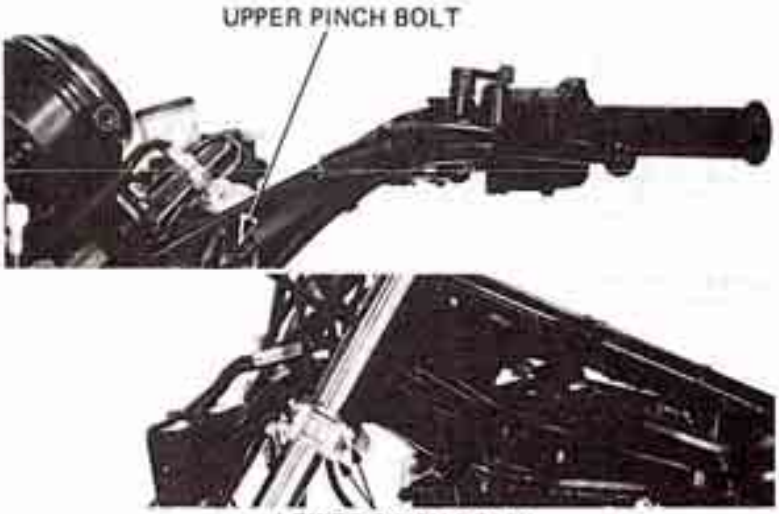
Slide the front forks into the fork bridge with the air fitting hole facing foward.
Loosely tighten the bridge pinch bolts.
Align the lower groove with the top surface of the fork top bridge.



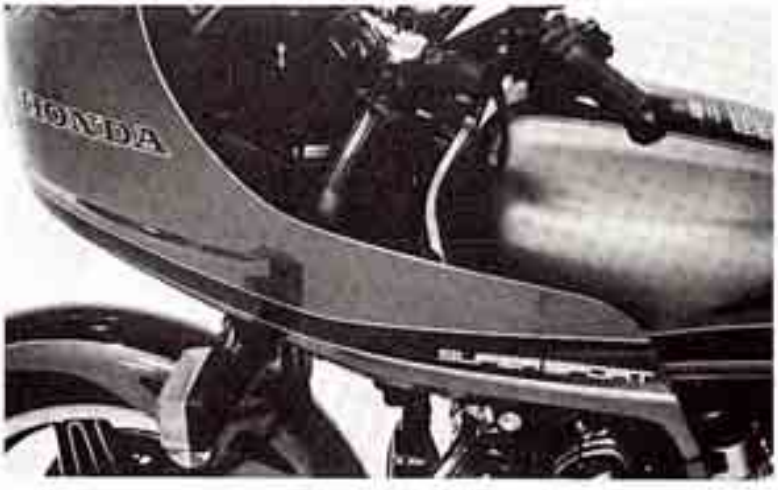
Install the left and right handlebars (Page 13-10).
Install the set rings onto the fork tubes.
Loosen the bridge pinch bolts and align the set ring with the top of the handlebars.
Tighten the bridge and steering stem pinch bolts to specified torque.

TORQUE:
Bridge: 9–13N·m (0.9–1.3 kg·m, 7–9 ft·lb)
Steering stem:
18–25N·m (1.8–2.5 kg·m, 13–18 ft·lb)

Install the front fender.



Install the front fender.
Install the fairing and front wheel (Page 13-20 and 13-22).



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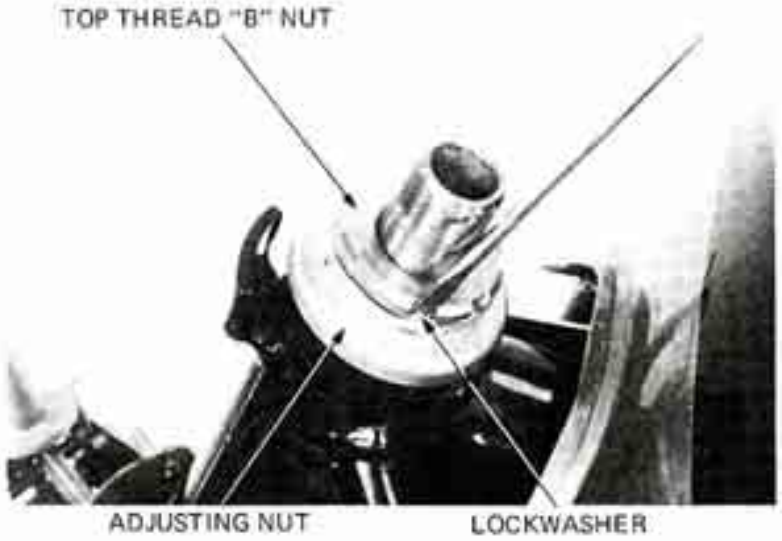
STEERING STEM

STEM REMOVAL

Remove the fairing (Page 13-18), left and right handlebars (Page 13-10) and instruments (Page 13-6).
Loosen the fork bridge pinch bolts.
Remove the steering stem nut.
Remove the front wheel (Page 13-22) and front forks (Page 13-27).

LOCK NUT WRENCH 26 x 30 mm

Remove the top thread "B" nut, lockwasher and stem bearing adjusting nut.
Remove the steering stem and bearings.
Check the steering stem bearing for damage or wear.



BEARING REPLACEMENT

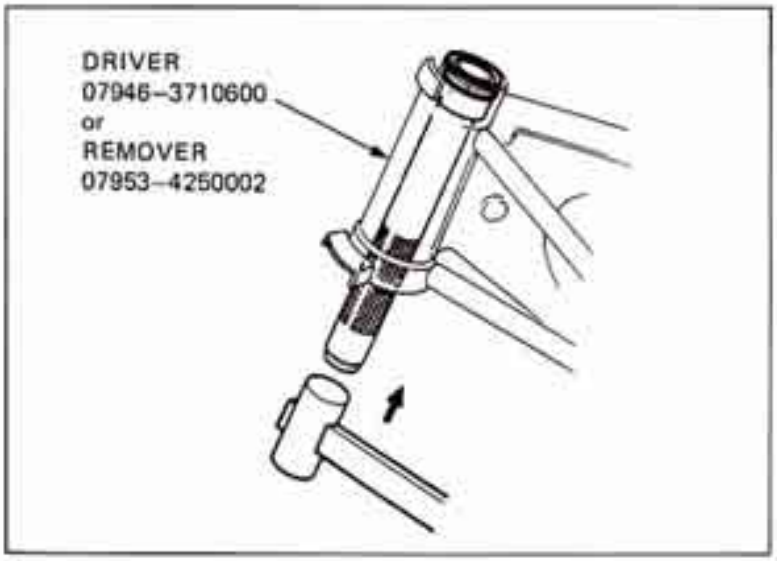
Remove the bearing if necessary.

NOTE

Replace the bearing and bearing race as a set.

Install the dust seal on the steering stem and drive the lower bearing inner race over the stem.

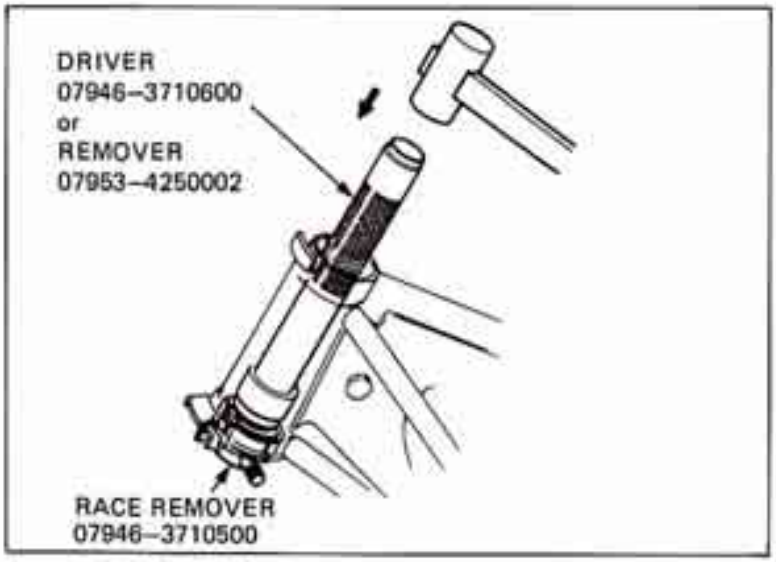
Remove the upper bearing outer race.



Remove the lower bearing outer race.

NOTE

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



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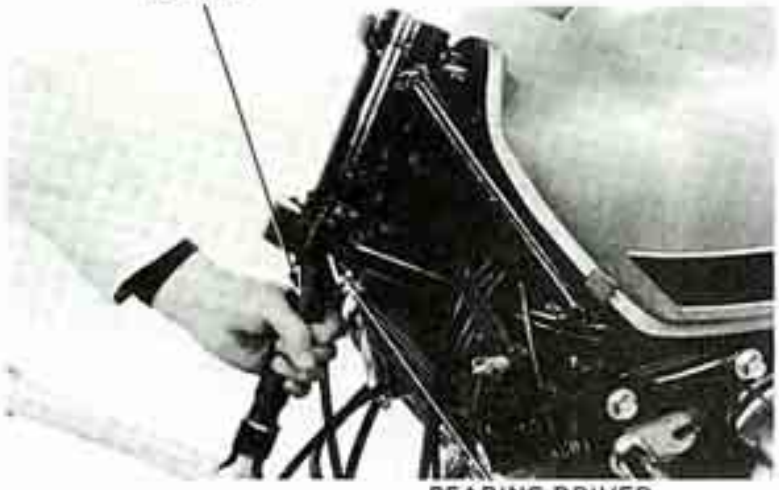
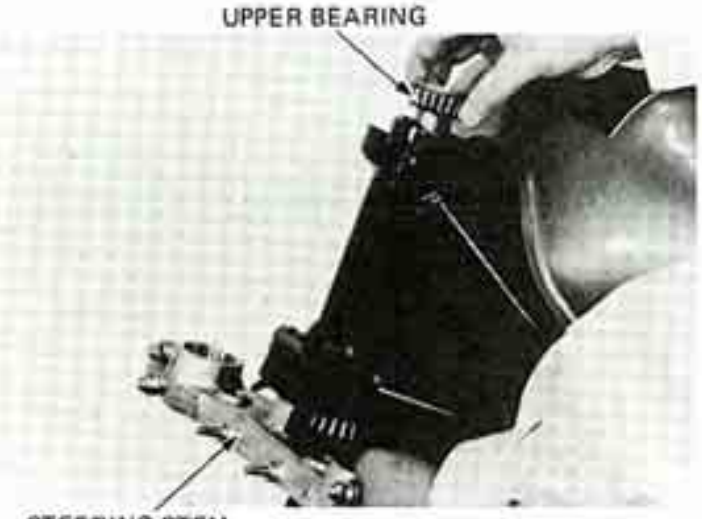
Drive the upper bearing outer race into the head pipe.
Drive the lower bearing outer race into the head pipe.



BEARING DRIVER ATTACHMENT 07946–3710700

INSTALLATION

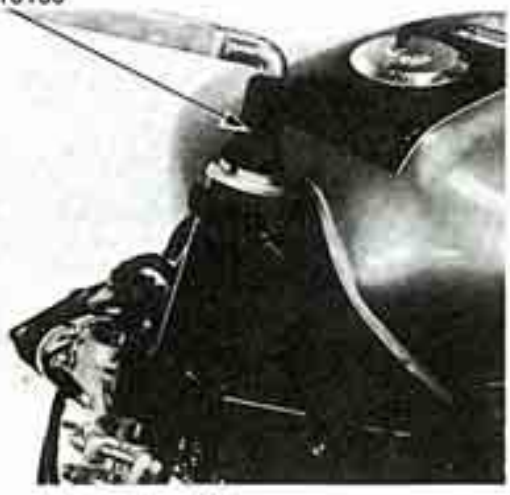
Pack the bearing cavities with bearing grease.
Install the steering stem into the head pipe.
Install the grease plate on the stem pipe.
Install the upper bearing outer race on the steering stem.



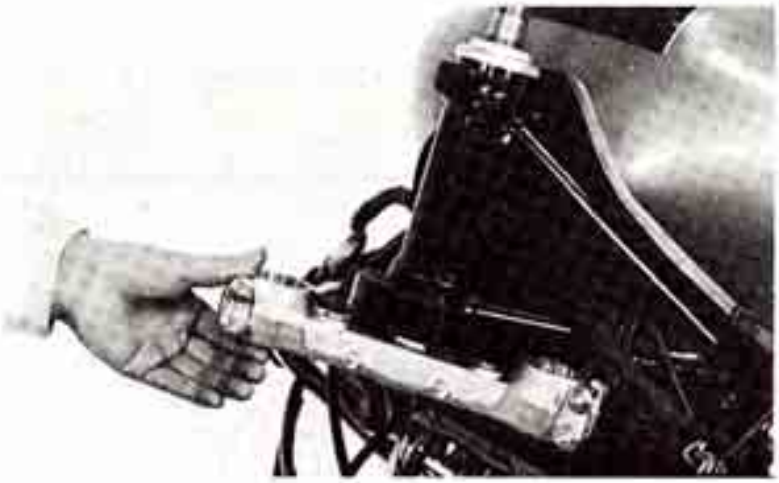
Install and tighten the adjusting nut.

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

STEERING STEM SOCKET 07916–3710100



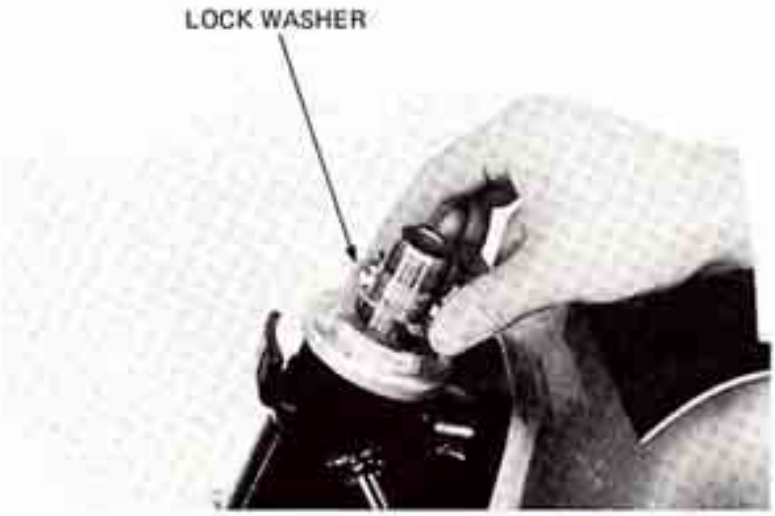
Turn the steering stem left lock-to-right lock 5 times to seat the bearings.
Install the front forks and front wheel and lower the front wheel to ground.
Repeat the bearing tightening and steering stem turning sequence twice.
If the nut does not tighten after turning the steering stem the first or second 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 grooves in the nut.

NOTE

DO NOT install a used bearing adjstment nut lock washer.

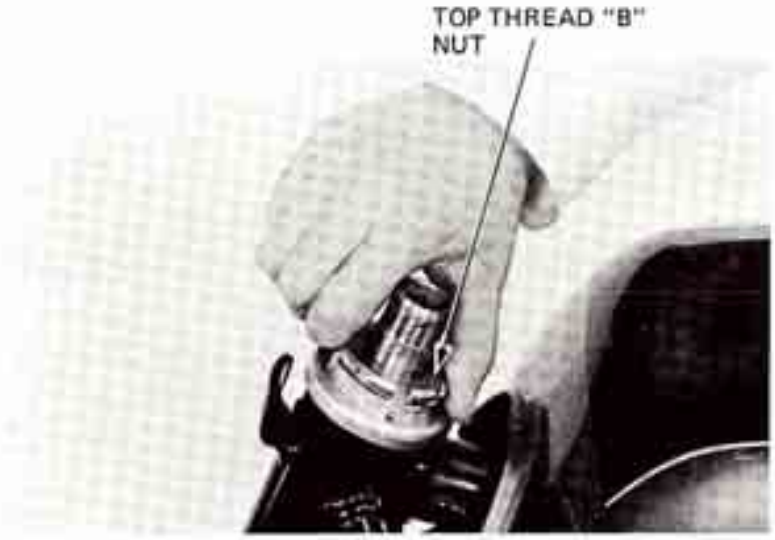


Hand tighten the top thread "B" nut. Hold the adjustment nut and further tighten the "B" nut only to align its grooves with the lock washer tabs.

NOTE

If the top thread "B" 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 top thread "B" nut grooves.



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Install the front forks (Page 13-35) and bridge. Tighten the steering stem nut.

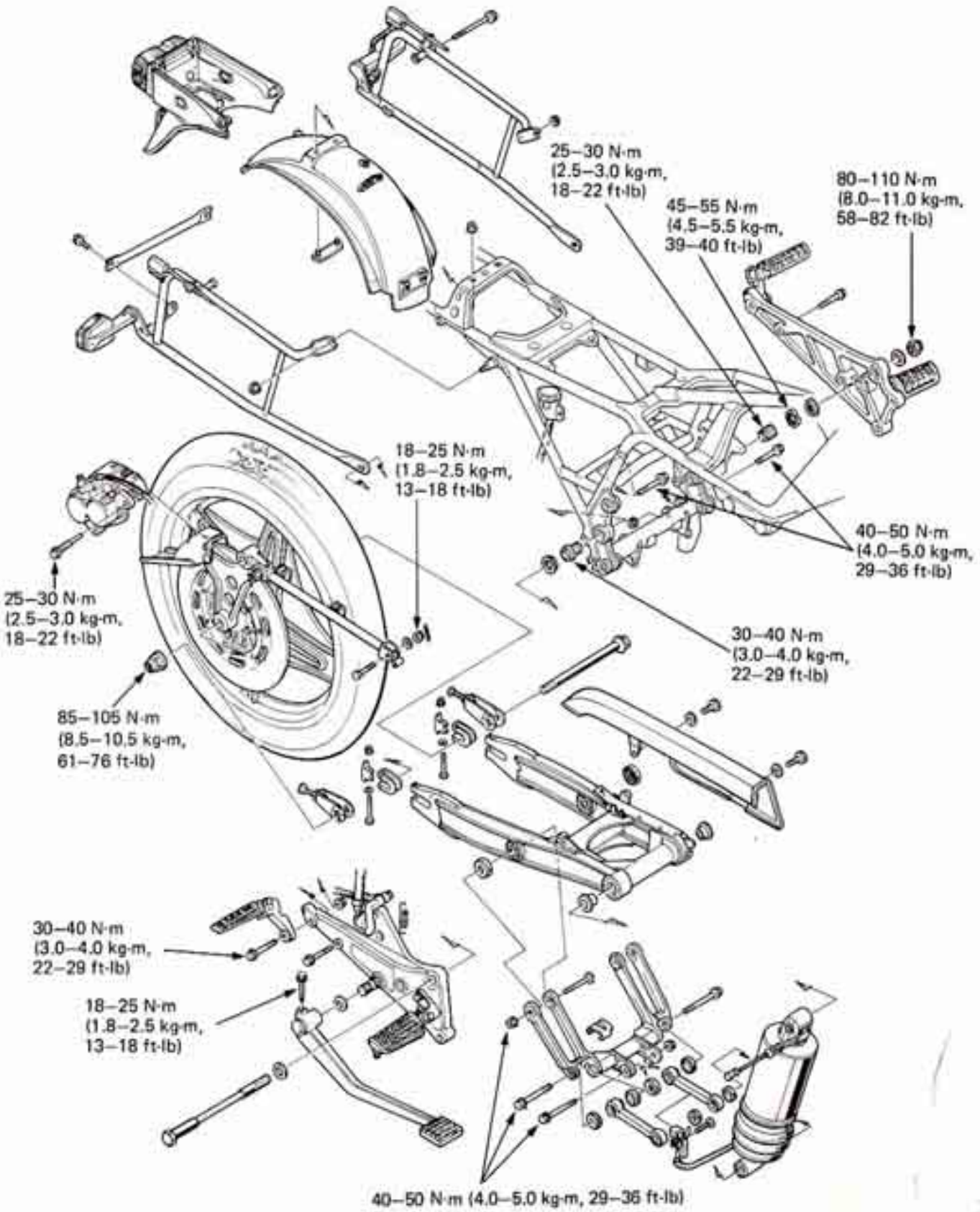
TORQUE:
80–120 N·m (8.0–12.0 kg·m, 58–87 ft·lb)

Tighten the bridge pinch bolts.

TORQUE:
7 mm bolt: 9–13 N·m (0.9–1.3 kg·m, 7–9 ft·lb)
8 mm bolt: 30–40 N·m (3.0–4.0 kg·m, 22–29 ft·lb)

LOCKNUT WRENCH 26 x 30 mm

8 mm BOLT 7 mm BOLT



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SERVICE INFORMATION

GENERAL INSTRUCTIONS

- The rear wheel uses a tubeless tire. For tubeless tire repairs, refer to the TUBELESS TIRE MANUAL (Part No. 6141550, H/C 068216 in USA)
- Do not remove rivets, nuts and pins from the rim, spoke plate and hub.
- Never ride on the rim or try to bend the wheel.
- Avoid damaging the aluninum alloy rim.
- The rear suspension uses an air-asisted shock absorber with a damping adjustment. The rear suspension preload acn be changed by adjusting air pressure.
- The rear suspension has a low-pressure warning system (section 18)
- The saddle bags are designed for the CBX'81 model only. Do not install them on any other motorcycle.

TORQUE

Rear axle nut		85–105 N·m (8.5–10.5 kg-m, 62–76 ft-lb)
Rear brake disc		27– 33 N·m (2.7–3.3 kg-m, 20–24 ft-lb)
Driven sprocket		80–100 N·m (8.0–10.0 kg-m, 58–72 ft-lb)
Swingarm pivot bolt		80–110 N·m (8.0–11.0 kg-m, 58–80 ft-lb)
Rear brake torque link		18– 25 N·m (1.8– 2.5 kg-m, 13–18 ft-lb)
Swingarm pivot collar	Right	30– 40 N·m (3.0– 4.0 kg-m, 22–29 ft-lb)
	Left	25– 30 N·m (2.5–3.0 kg-m, 18–22 ft-lb)
Left pivot piece lock nut		45– 55 N·m (4.5– 5.5 kg-m, 30–40 ft-lb)
Shock absorber	Upper	40– 50 N·m (4.0– 5.0 kg-m, 29–36 ft-lb)
	Lower	40– 50 N·m (4.0– 5.0 kg-m, 29–36 ft-lb)
Suspension arm		40– 50 N·m (4.0– 5.0 kg-m, 29–36 ft-lb)
Suspension rod		40– 50 N·m (4.0– 5.0 kg-m, 29–36 ft-lb)

TOOLS

Common		
Driver	07749–0010000 or 07949–6110000	
Attachment 62 x 68 mm	07746–0010500 or 07946–3600000	
Attachment 52 x 55 mm	07746–0010400 or 07946–3290000	
Pilot 20 mm	07746–0040500	
Pilot 25 mm	07746–0040600	
Retainr wrench body	07610–0010400	or 07910–2830000, 07910–3290000, 07910–3230101
Retainer wrench attachment	07710–0010100	
Special		
Retainer wrench	07910–4690100 or K3–HBA–08–469 (USA only)	
Bearing driver handle	07949–3710000	
Attachment	07946–4690100 or 7946–3710300	
Attachment	07946–4690200	
Lock nut wrench	07908–4690001	
Oil seal driver	07965–MA10100	
Driver attachment	07965–MA10200	
Bearing remover	M9310–277–91774 (USA only)	

SPECIFICATIONS

		STANDARD	SERVICE LIMIT
Rear axle runout		———	0.2 mm (0.01 in)
Rear wheel rim runout	Radial	———	2.0 mm (0.08 in)
	Axial	———	2.0 mm (0.08 in)
Suspension arm bushing I.D.		14.966–14.984 mm (0.5892–0.5926 in)	14.958 mm (0.5889 in)
Suspension arm collar O.D.		15.000–15.052 mm (0.5906–0.5926 in)	15.158 mm (0.5968 in)
Suspension rod bushing I.D.		14.966–14.984 mm (0.5892–0.5899 in)	14.958 mm (0.5889 in)
Suspension rod collar O.D.		15.000–15.052 mm (0.5906–0.5926 in)	15.158 mm (0.5968 in)
Rear shock absorber oil capacity (gross)		618 cc (20.9 oz)	———
Rear shock absorber air pressure		200–400 kPa (2.0–4.0 kg/cm², 28–57 psi)	———

TROUBLESHOOTING

Wobble or Vibration in Motorcycle
1. Bent rim
2. Loosen wheel bearing
3. Loose or distorted spokes
4. Faulty tire
5. Loose axle
6. Tire pressure incorrect
7. Swing arm bearings worn

Soft Suspension
1. Broken shock absorber spring
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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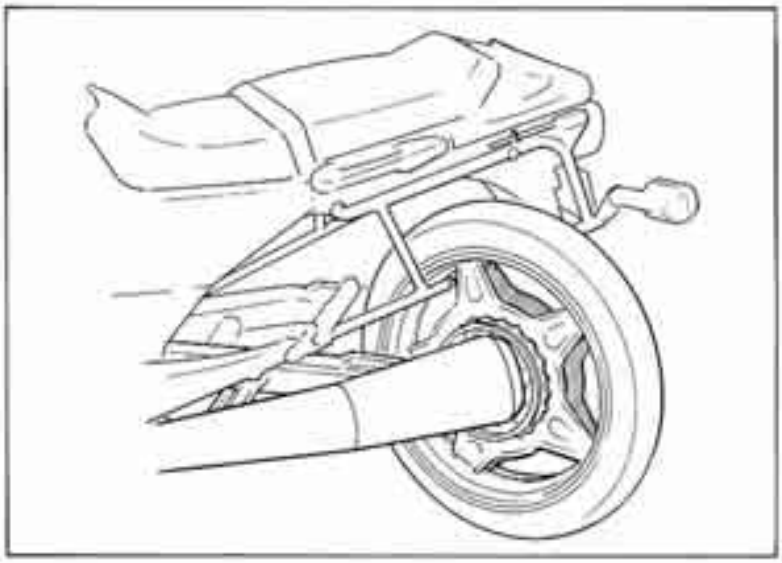
REAR WHEEL

REMOVAL

Place the motorcycle on its center stand.
Remove the left saddle bag and stay rod.
Loosen the drive chain adjuster.
Remove the rear axle nut.
Place a wooden block under the rear wheel.
Remove the rear axle, push the wheel forward and disengage the drive chain.

Remove the rear wheel through the space left by removal of the left saddle bag stay.

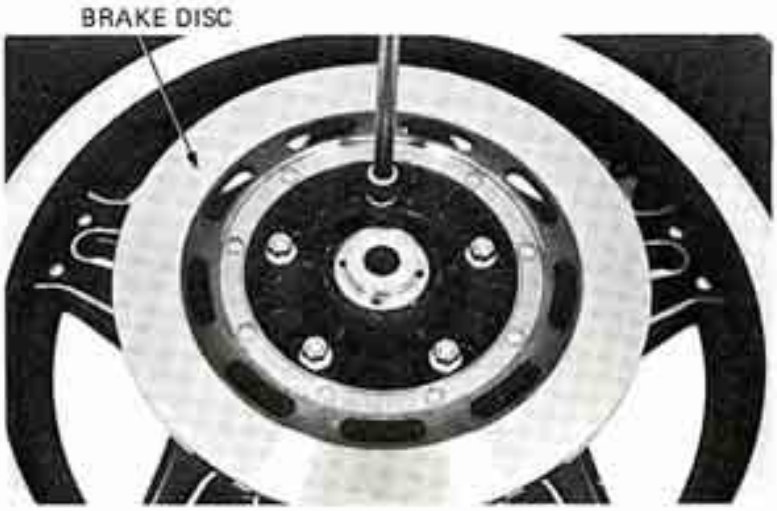


NOTE

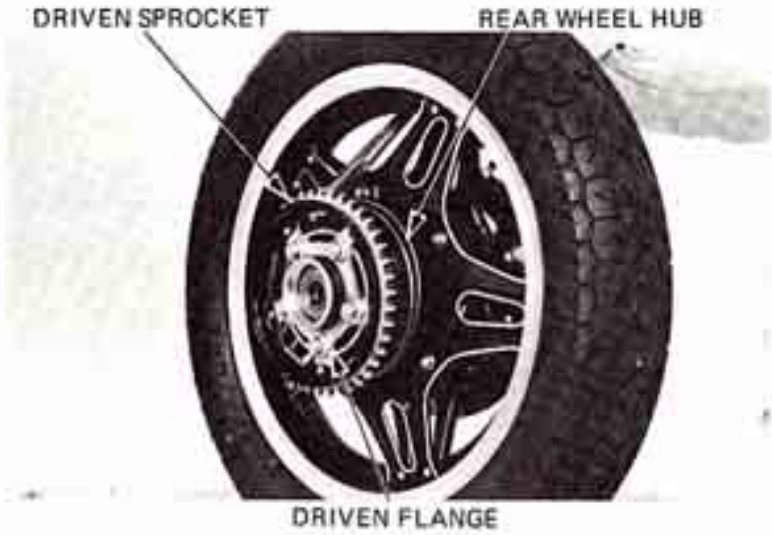
Do not operate the rear brake pedal after removing the rear wheel. To do so will cause difficulty in refitting the brake disc between the brake pads.

DISASSEMBLY

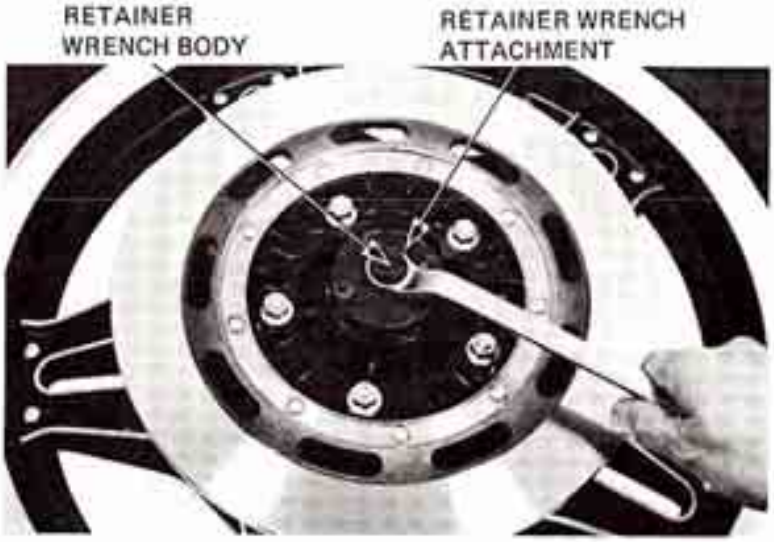
Remove the rear brake disc.



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



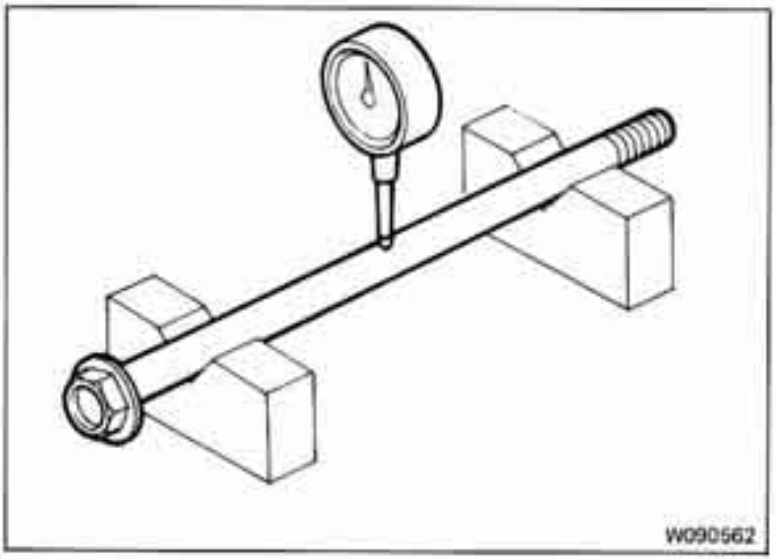
Remove the bearing retainer.



AXLE INSPECTION

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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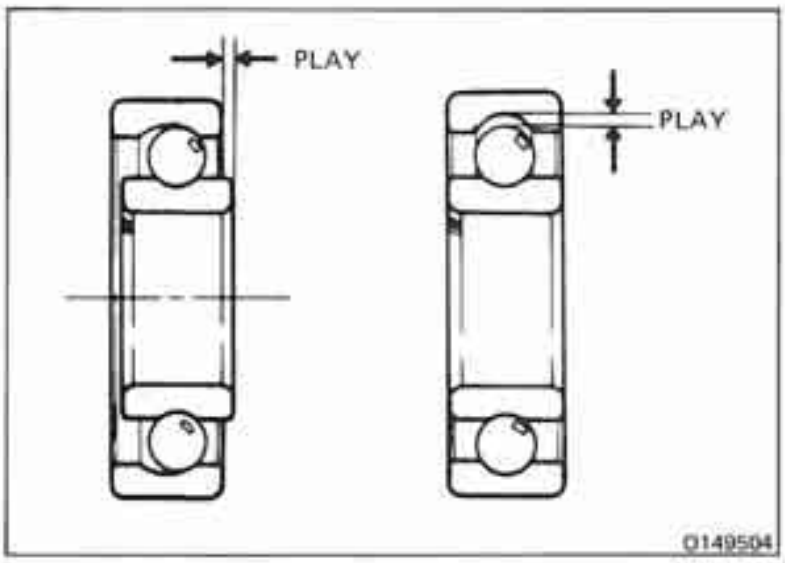
REAR WHEEL BEARING PLAY INSPECTION

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



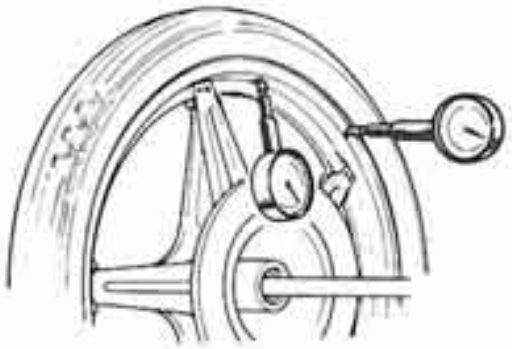
REAR WHEEL RIM RUNOUT INSPECTION

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.

NOTE

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

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

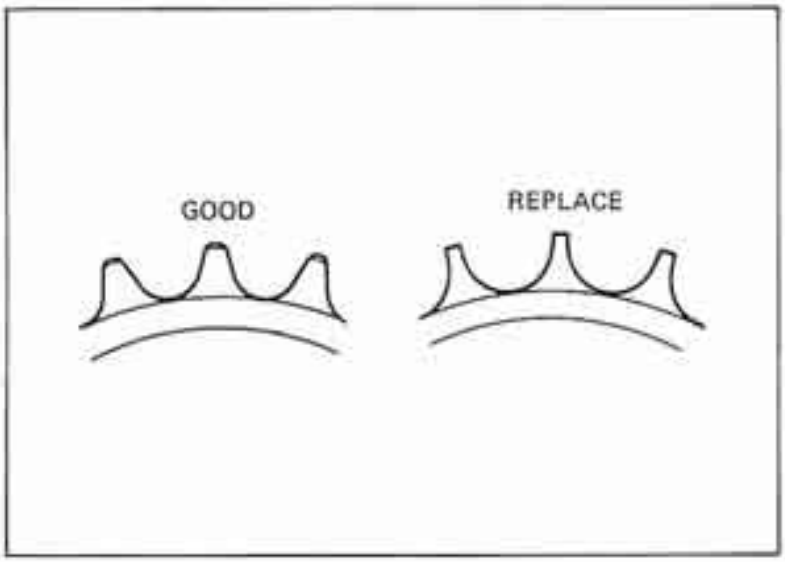


FINAL DRIVEN SPROCKET INSEPCTION

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 (See 3–16).



DAMPER RUBBER INSPECTION

Replace the damper rubbers if they are damaged or deteriorated.

DAMPER RUBBER

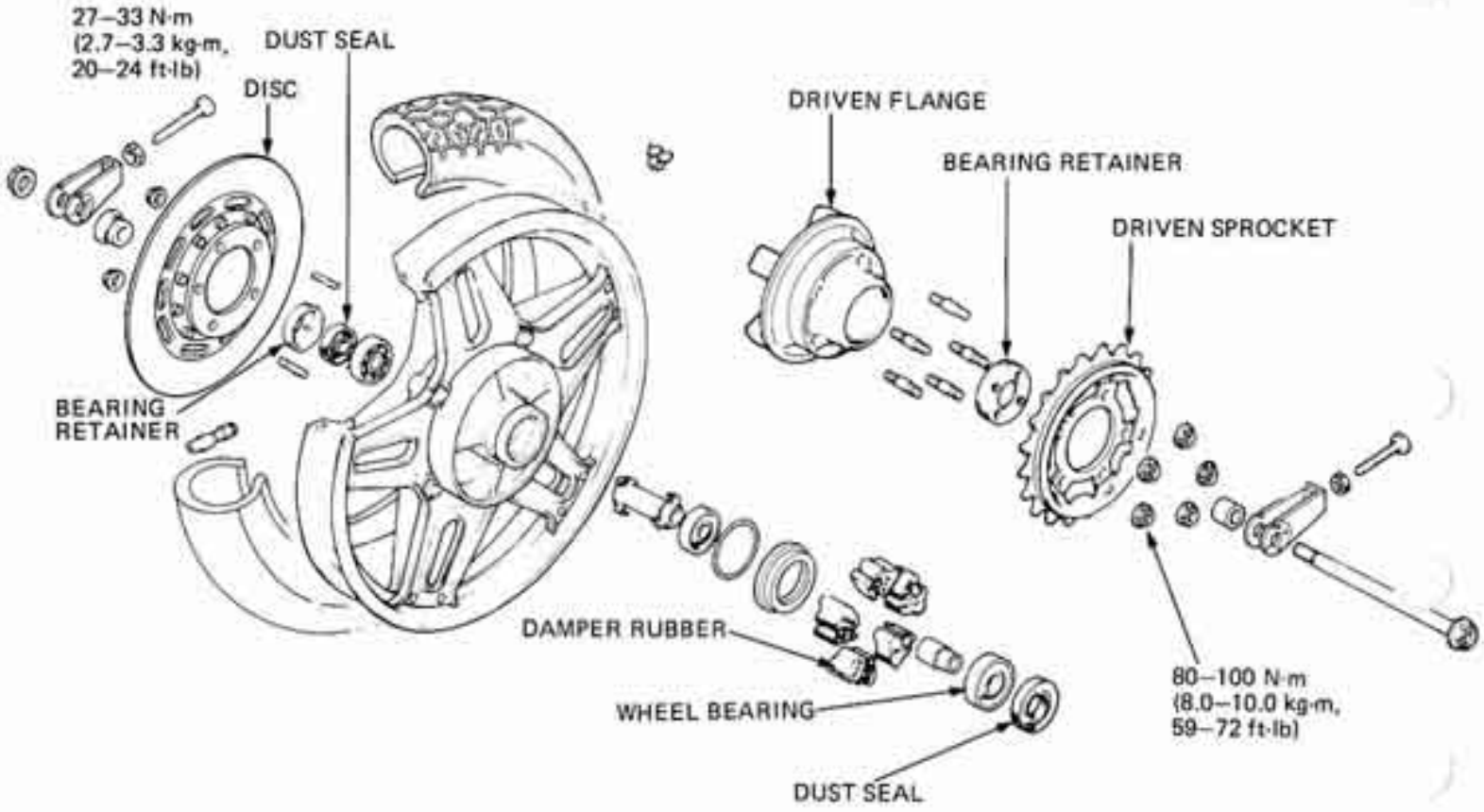
ASSEMBLY

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 stopping power will be reduced.



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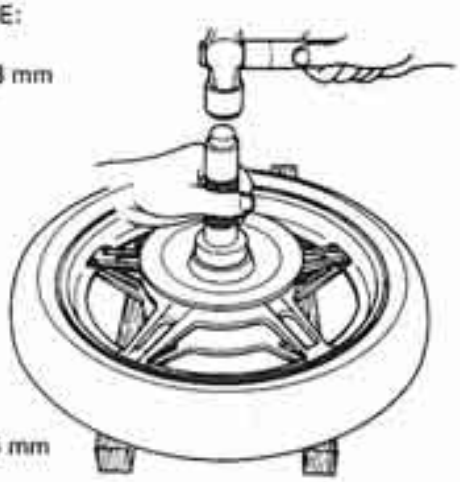
Pack all bearing cavities with grease.
Press the distance collar into place from the left side.
Drive the right ball bearing first, then the left ball bearing.

NOTE

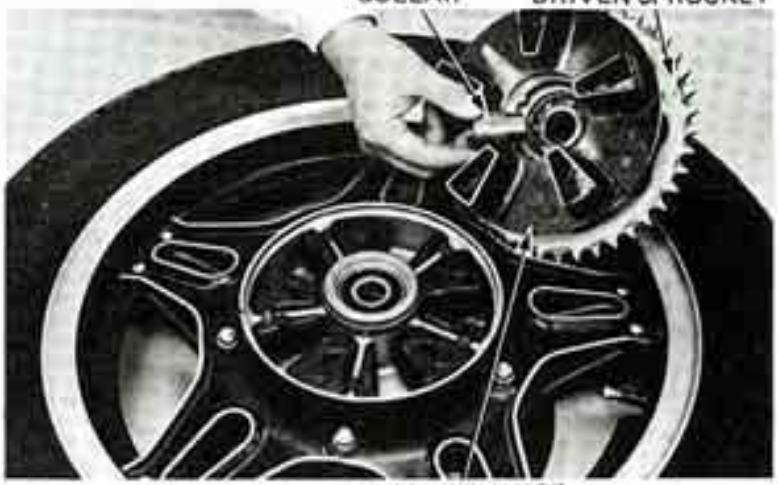
Drive the bearings squarely and install them with the sealed end facing out, making sure they are fully seated.

DRIVEN FLANGE SIDE:
DRIVER
ATTACHMENT 62 x 68 mm
PILOT 25 mm



WHEEL HUB SIDE:
ATTACHMENT 52 x 55 mm
PILOT 20 mm

Install the driven sprocket onto the driven flange.
Install the driven flange collar into the driven flange.
Install the driven flange onto the rear wheel hub.



NOTE

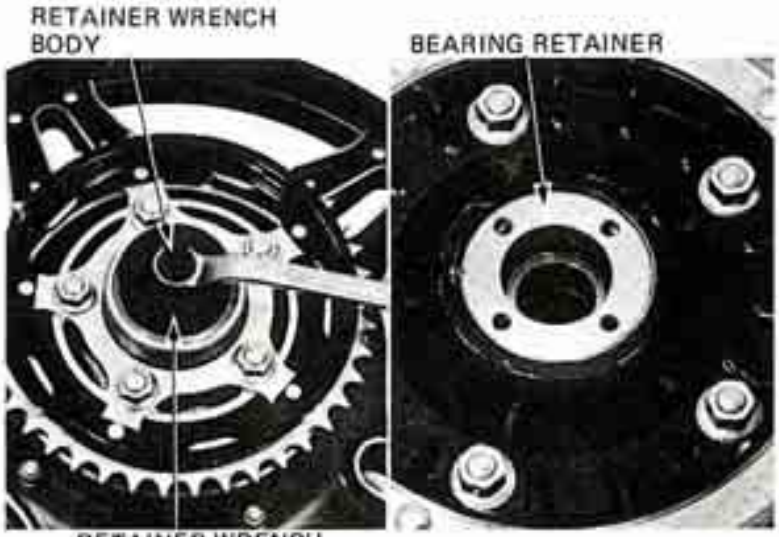
Check the condition of the bearing retainer.
If the threads are damaged, the retainer should be replaced.

Install the bearing retainer with the same tool that was used to remove it. Peen it to the hub.
Install the rear brake disc and nuts.

TORQUE:
27–33 N·m (2.7–3.3 kg-m, 20–24 ft-lb)

Clean the brake disc with a high quality degreasing agent.
Tighten the drive sprocket nuts.

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



INSTALLATION

Install the rear wheel in the reverse order of removal.

NOTE

- When installing the wheel, fit the brake disc between the brake pads carefully.
- After installing the wheel, apply the brakes several times and then check if the wheel rotates freely. Recheck the wheel if the brake drags or if the wheel does not rotate freely.

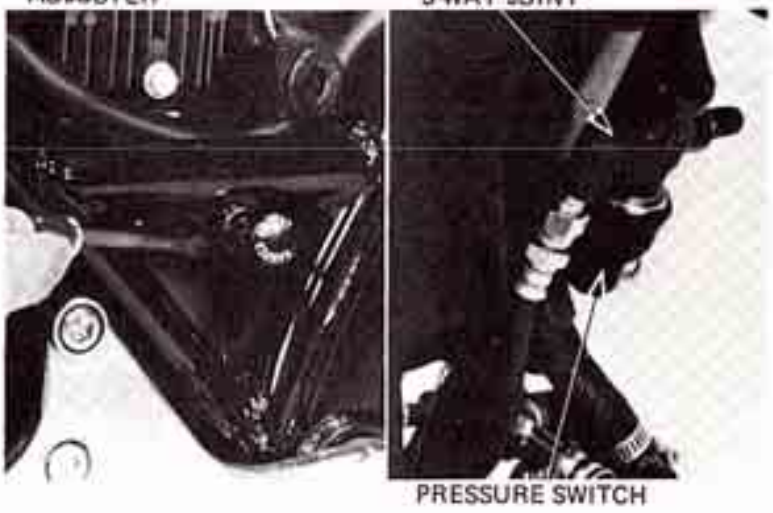
Adjust the drive chain slack (Page 3-16).

TORQUE:
REAR AXLE NUT
85–105 N·m (8.5–10.5 kg-m, 62–76 ft-lb)

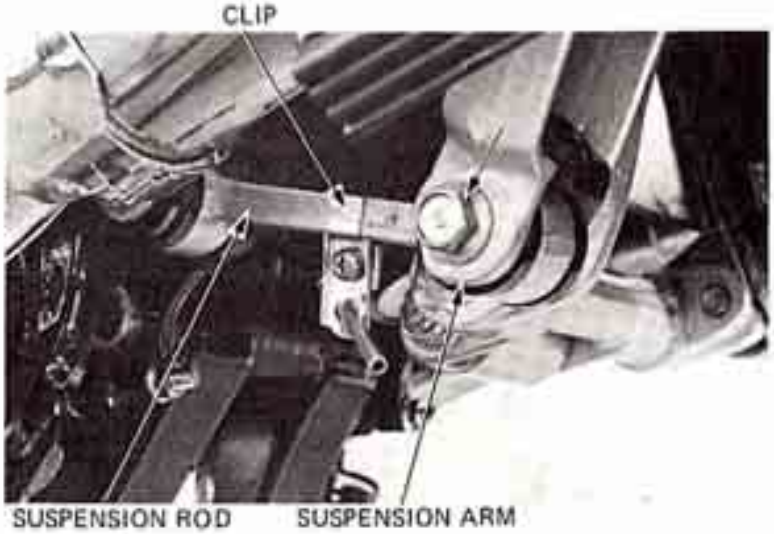
SHOCK ABSOBER

REMOVAL

Place the motorcycle on it center stand.
Remove the left and right side covers.
Disengage the damper adjuster holder from the frame.
Disconnect the air prssure switch wire.
Remove the 3-way joint.



Remove the boot breather tube clip.
Place a wooden block under the rear wheel.
Remove the rear shock absorber mounting bolt and suspension rod bolts.



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Remove the crankcase breather storage tank mounting bolt.
Remove the upper shock mount bolt and rear shock absorber.


STORAGE TANK

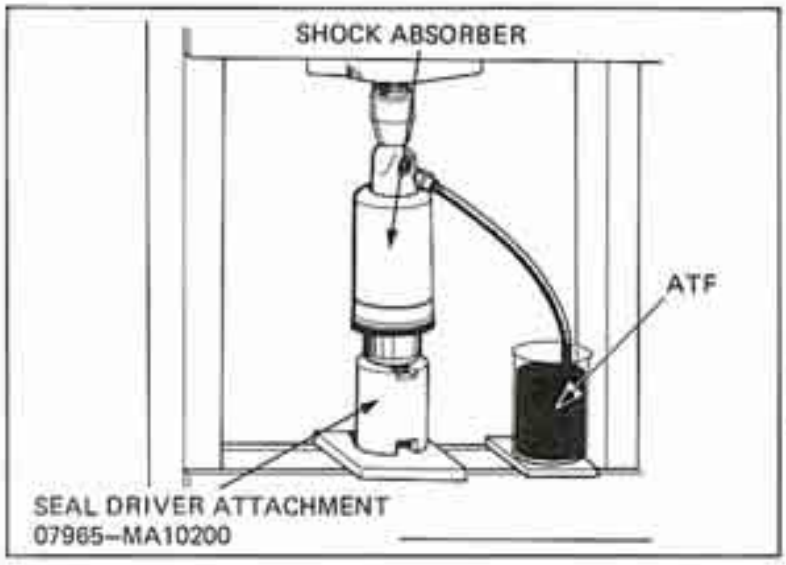
DISASSEMBLY

Oil Seal Replacement

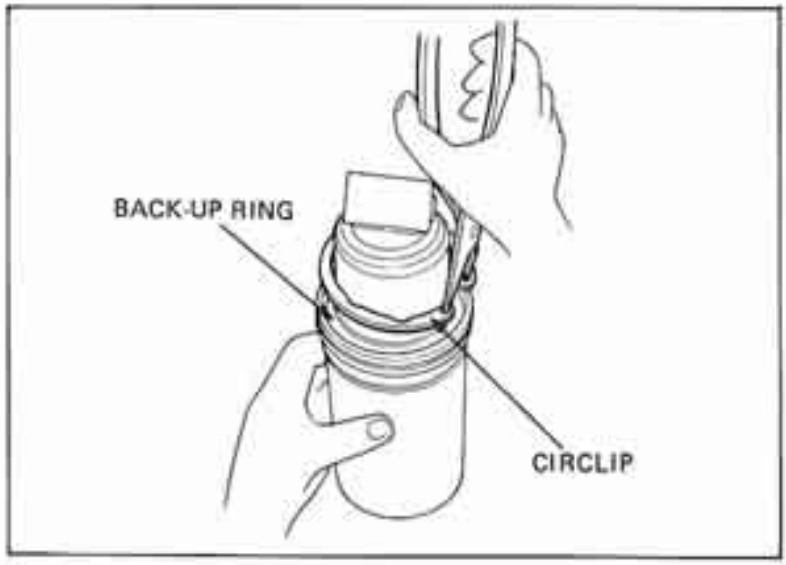
Remove the boot band and adjusting rod.
Disconnect the air hose from the 3-way joint.
Prepare about 300 cm^3 (10.1 US ozs, 8.4 Imp ozs) of ATF in a clean container.
Set the shock absorber into the hydraulic press with the oil seal driver attachment positioned as shown.
Pump the absorber several times until the damper is filled with ATF (stroke about 20 mm/0.8 in).

NOTE

Set the shock absorber noting the seal driver attachment direction.



Reconnect the air hose to the 3-way joint.
Remove the shock absorber from the hydraulic press.
Remove the circlip and back-up ring.



Wrap a shop towel around the oil seal area and place the seal driver over the oil seal.

Press the oil seal out by compressing the shock absorber with the oil seal driver attachment in the hydraulic press.

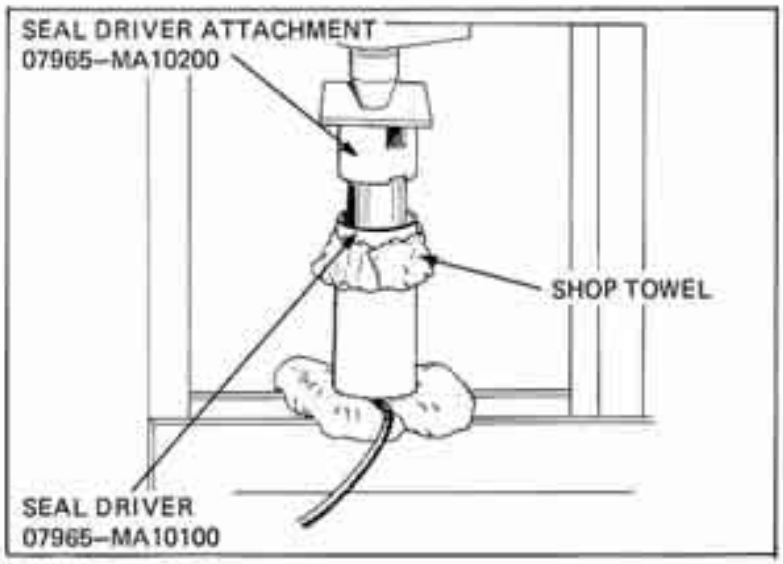
NOTE

Use the oil seal driver as a guide to keep the oil seal from tilting.

Remove the shock from the press.
Remove the guide bushing and check for wear or damage.

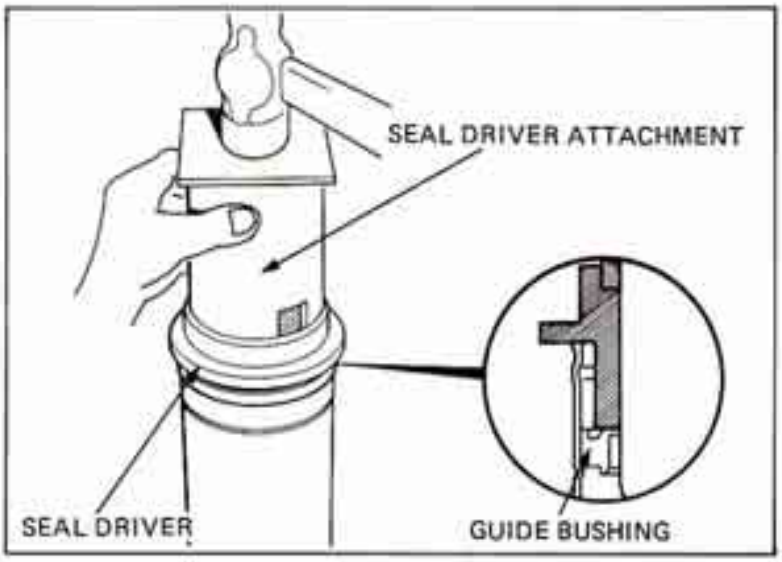
CAUTION

Do not reuse ATF.



Disconnect the air hose from the 3-way joint.
Drive the guide bushing in.

Spill as little ATF as possible to prevent air from entering the shock.
Air in the shock will cause the shock damping to be too soft.



Wrap a piece of tape around the groove at the end of the shock absorber.
Dip the oil seal in ATF and place it on the damper.

CAUTION

Be careful not to damage the oil seal during installation.

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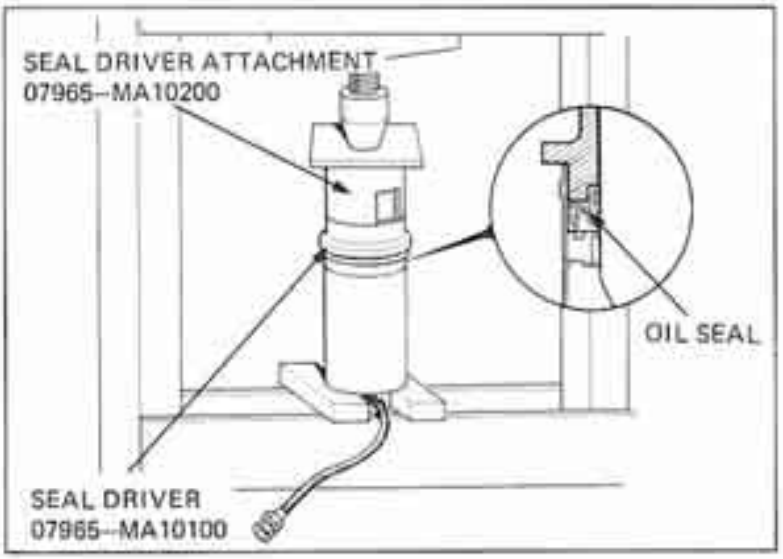
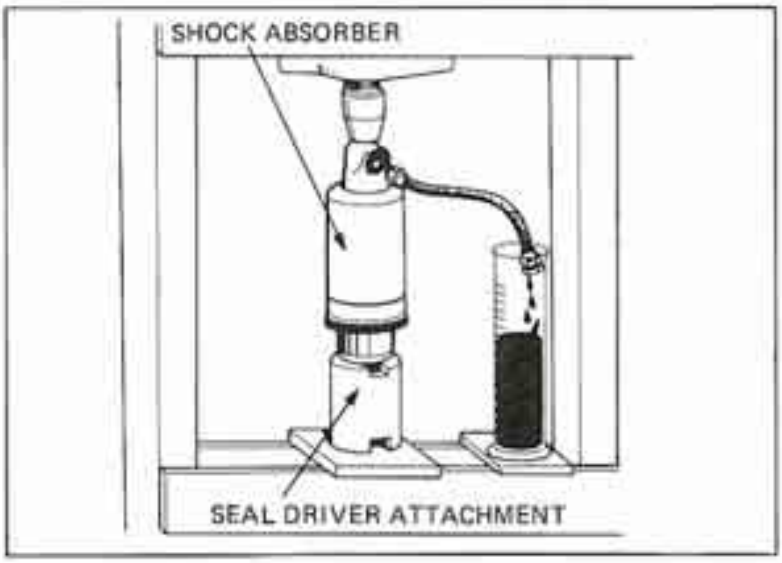
Press the oil seal in the shock absorber with a hydraulic press until the oil seal driver stops at the edge of the outer case.

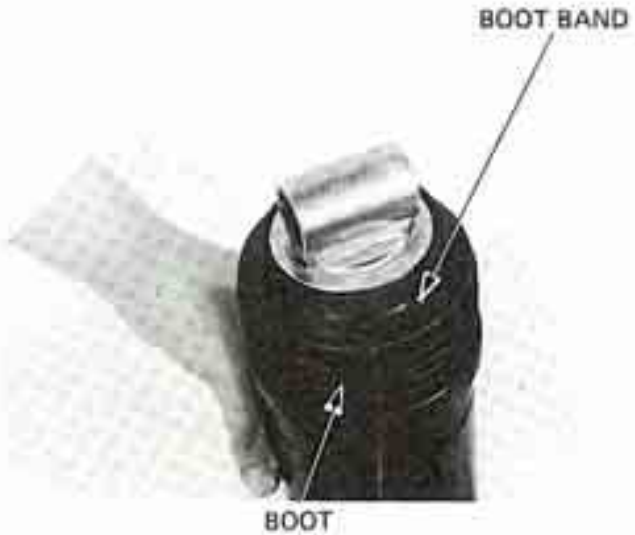


Install the back-up ring and circlip.
Fill the damper with ATF using the same procedure as for oil seal removal.
Be sure no air remains in the shock.
Compress the shock absorber slowly about 33 mm (1.3 in) to drain 210 cm^3 (7.1 US ozs, 5.9 Im ozs) of ATF from the shock absorber.

ATF that remains 618 cm^3
(20.9 U.S. 02, 17.41 m ozs)
Air in air chamber: 210 cc (12.81 cu. in)



Install the boot and boot band.



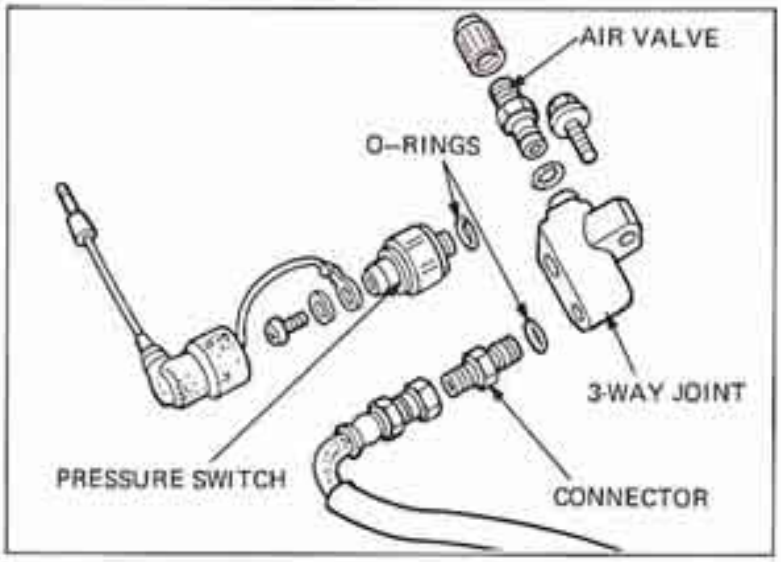
Install the damper adjuster by aligning the groove of the adjuster guide with the center tooth of the adjuster.
Apply a locking agent to the screw thread and tighten then.

3-WAY JOINT DISASSEMBLY/ ASSEMBLY

Apply grease to new O-rings and install them onto the connector, air valve and pressure switch.
Install the connector, pressure switch and air valve.

TORQUE VALUES:

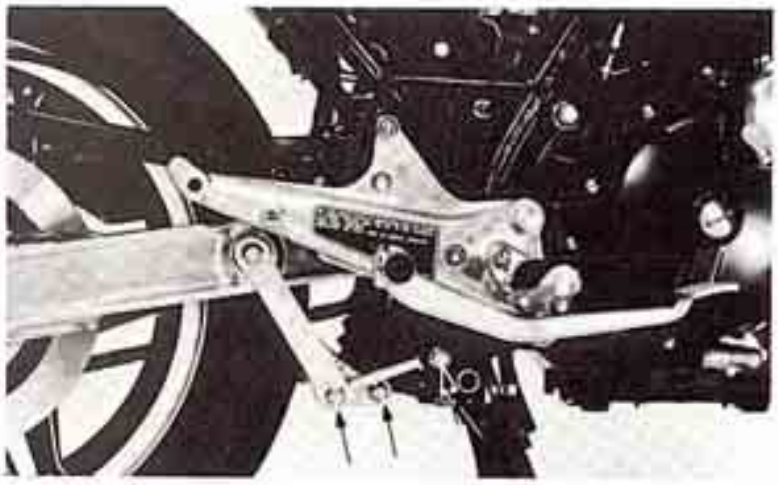
PRESSURE SWITCH:	**8–12 N·m (0.8–1.2 kg-m, 6–9 lb-ft)**
CONNECTOR:	**4–7 N·m (0.4–0.7 kg-m, 3–5 ft-lb)**
AIR VALVE:	**4–7 N·m (0.4–0.7 kg-m, 3–5 ft-lb)**
AIR HOSE:	**15–20 N·m (1.5–2.0 kg-m, 11–14 ft-lb)**



INSTALLATION

Installation is the reverse order of removal.

TORQUE:
SHOCK ABSORBER MOUNTING BOLTS:
40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)
SUSPENSION ROD BOLTS:
40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)



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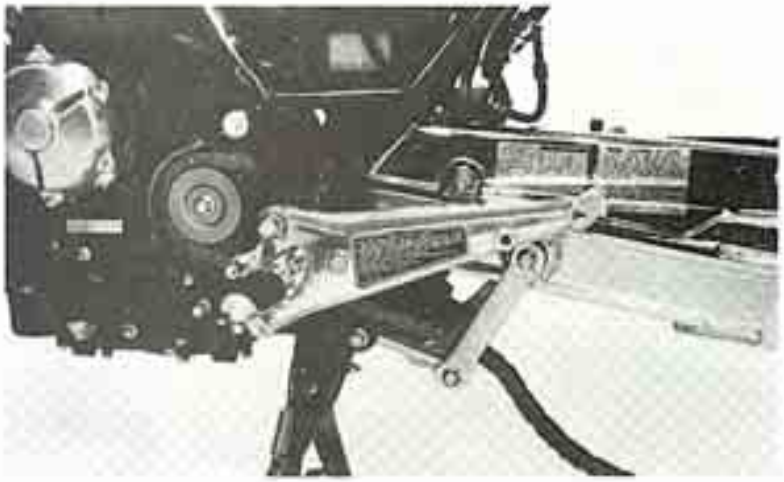
SWINGARM

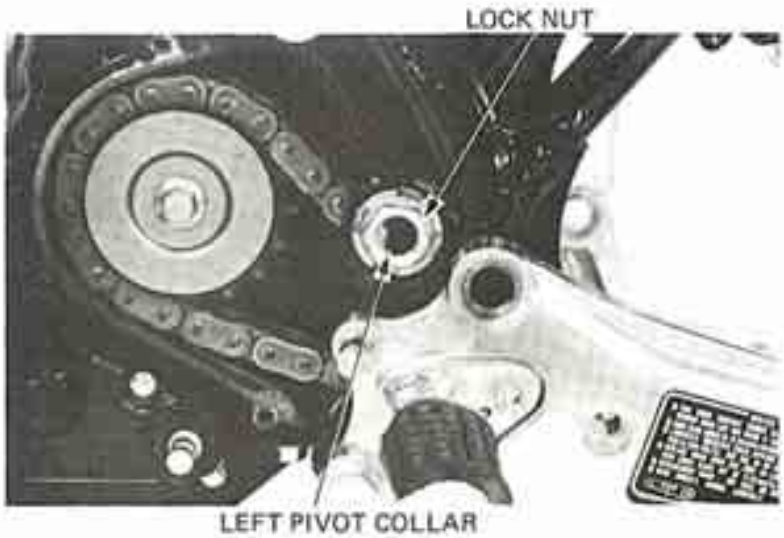
REMOVAL

Remove the following:
Left and right mufflers.
Left and right foot pegs
Gearshift pedal.
Rear brake master cylinder and pedal.
Rear wheel and chain cover.
Rear shock absorber and saddle bag stays.



Loosen the rear engine hanger lower bolt.
and remove the pivot cap.
Move the footpeg brackets and remove the pivot caps.

Move the left footpeg bracket out of the way and remove the pivot cap.
Remove the lock nut and pivot collar.



Remove the right pivot collar.
Remove the swingarm.


RIGHT PIVOT COLLAR

DISASSEMBLY

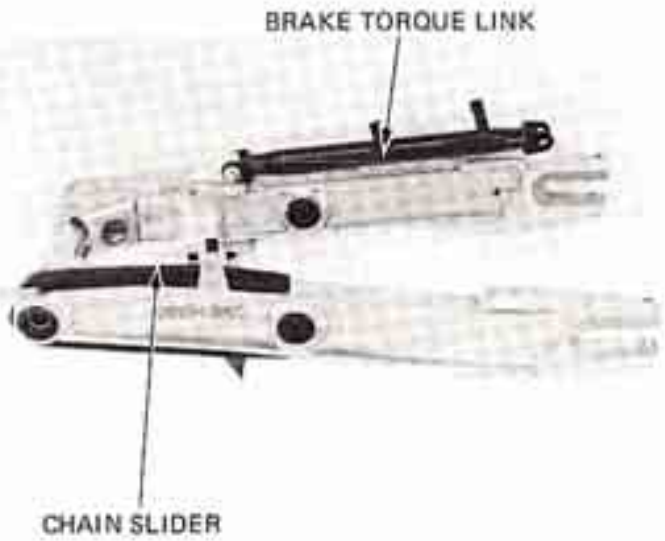
Remove the suspension arm and rods.
Remove the brake torque link.
Remove the chain slider.
Remove the dust seals and collars.
Measure the suspension arm bushing I.D. and collar O.D.

STANDARD:

Bushing	**I.D.: 14.966–14.984 mm (0.5892–0.5899 in)**
Collar	**O.D.: 15.000–15.052 mm (0.5906–0.5926 in)**

SERVICE LIMIT:

Bushing	**I.D.: 14.958 mm (0.5889 in)**
Collar	**O.D.: 15.158 mm (0.5968 in)**



Remove the dust seals from the suspension rods.
Inspect the collar and bushing for wear or damage.
Measure the bushing I.D. and collar O.D.

STANDARD:

Bushing	**I.D.: 14.966–14.984 mm (0.5892–0.5899 in)**
Collar	**O.D.: 15.000–15.052 mm (0.5906–0.5926 in)**

SERVICE LIMIT:

Bushing	**I.D.: 14.958 mm (0.5889 in)**
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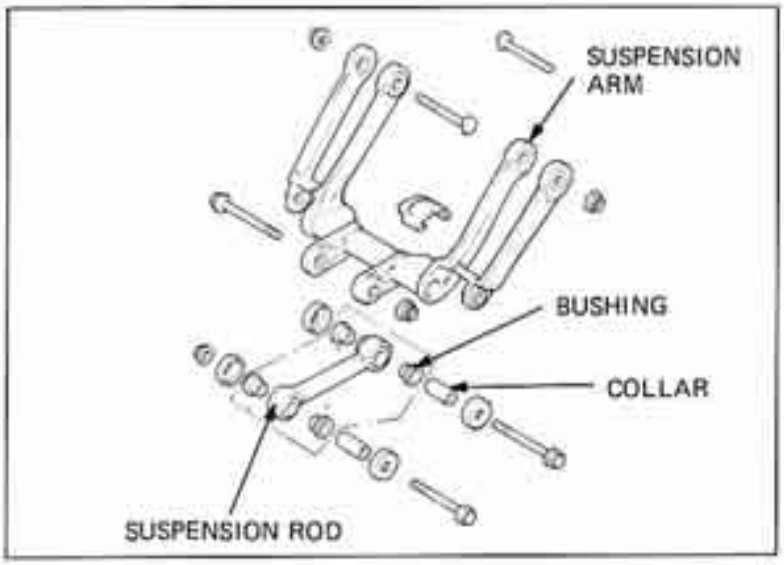

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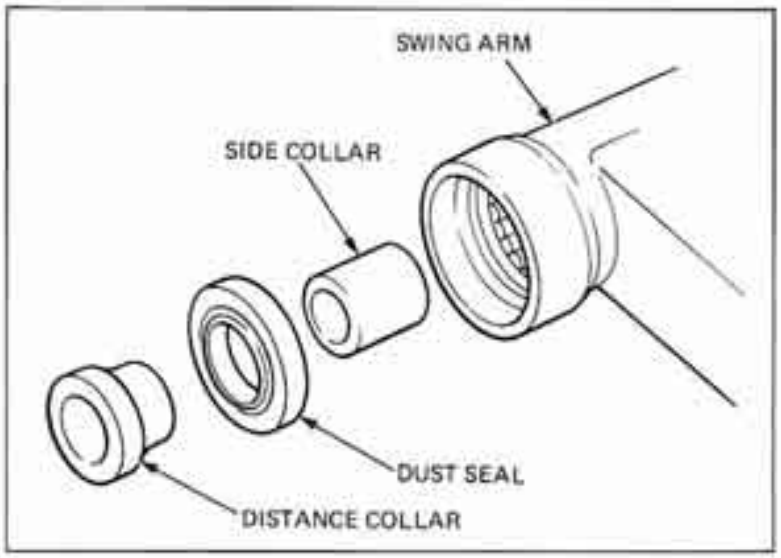
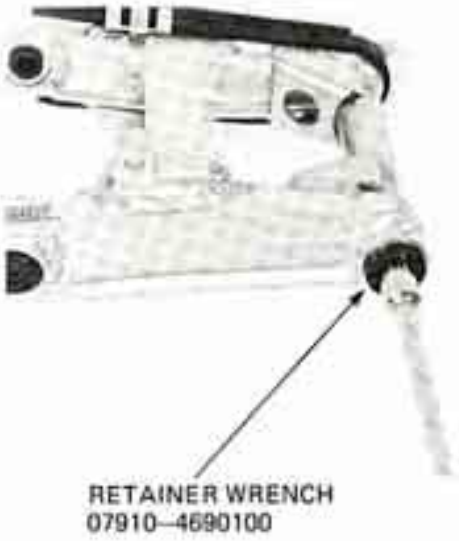
Remove the distance collar.
Remove the left dust seal and side collar.



Remove the bearing retainer.

Remove the dust seal from the bearing retainer if necessary.

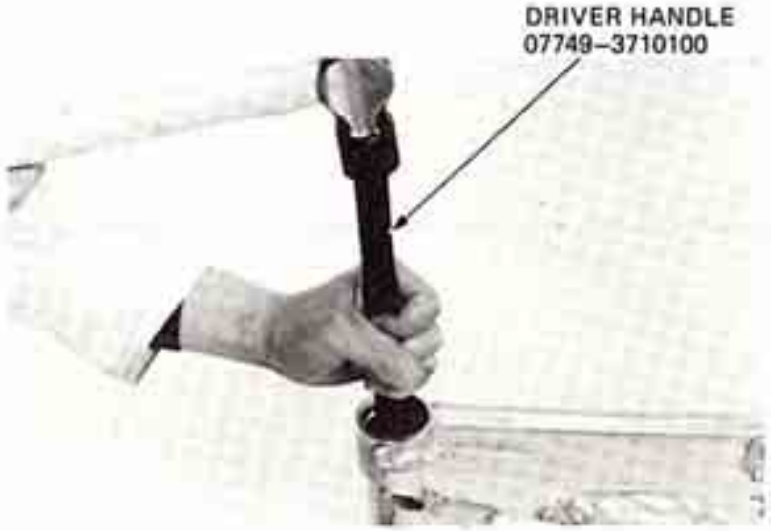


Drive out the center collar and right ball bearing as a set.

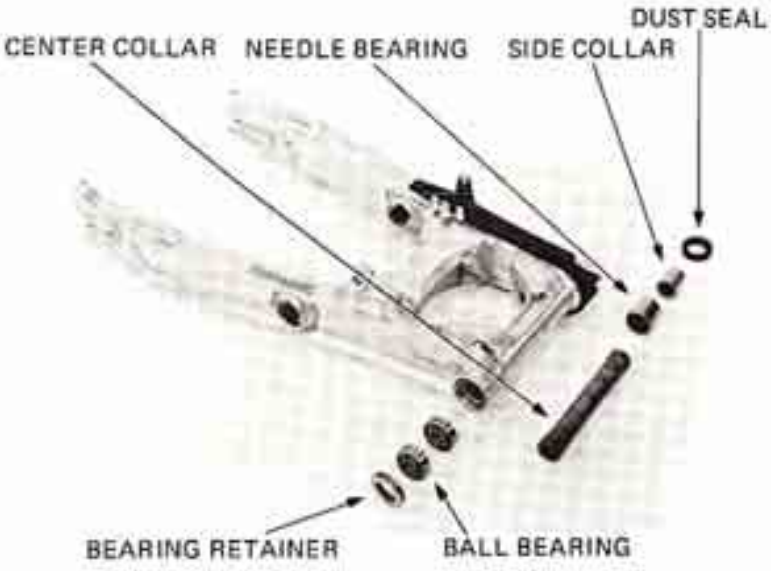
Inspect the needle bearing. Remove the needle bearing if necessary use bearing remover M9310–277–91774 (USA only).
Install the center collar.
Drive out the center collar and needle bearing.

NOTE

Replace the needle bearing with a new one whenever disassembled.



Clean all the disassembled parts and check for wear or damage. Parts which show excessive wear or damage must be replaced.

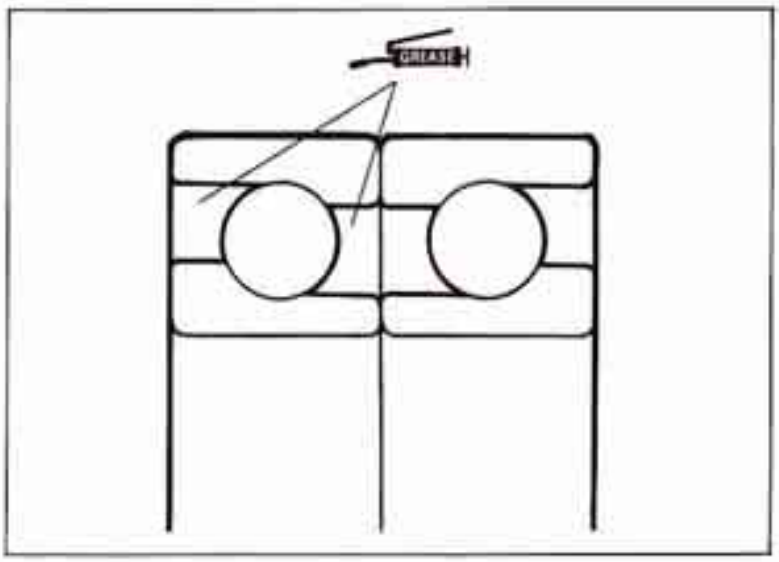


ASSEMBLY

Clean all the disassembled parts.
Pack the right bearing cavities with MULTIPURPOSE NLGI No. 2 Grease (MoS2-additive).

NOTE

Use lithium-based MULTIPURPOSE grease with MoS2-additive as follows:
- MOLYKOTE BR2-S manufactured by Dow Corning, U.S.A.
- MULTIPURPOSE M-2 manufactured by Mitsubishi Oil, Japan
- Other lubricants of equivalent quality.



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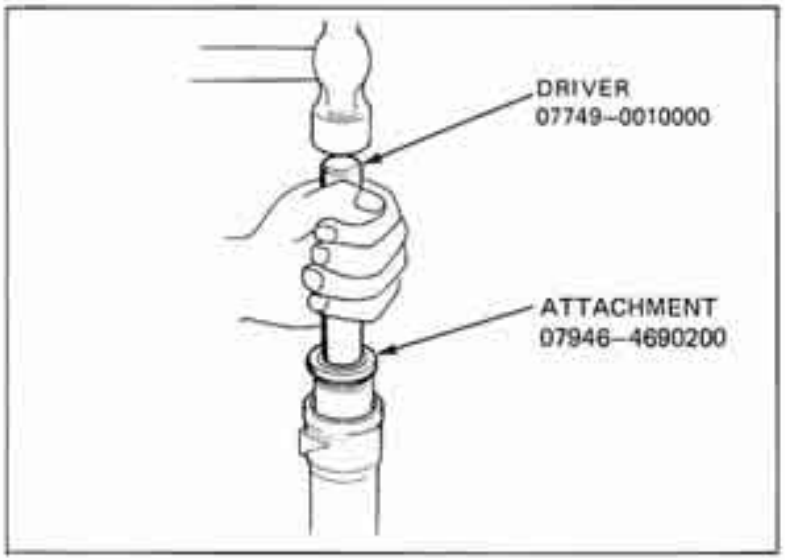
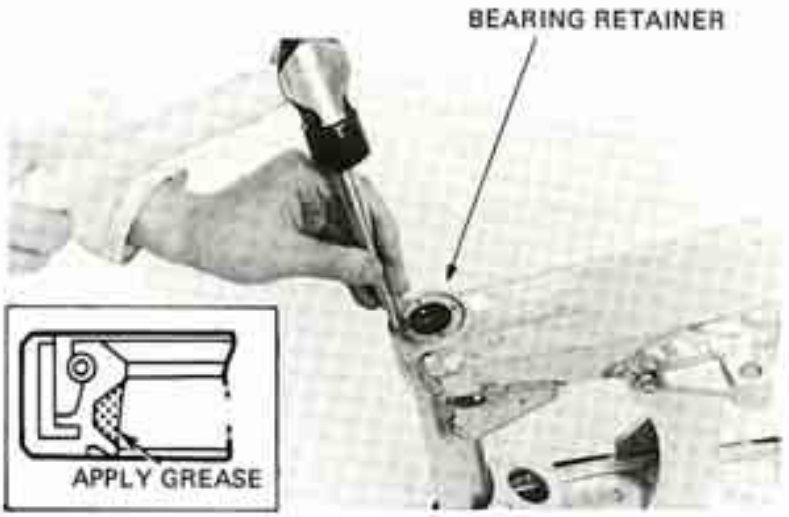
Drive one ball bearing into place with the numbers facing toward the swing arm center.
Install the second ball bearing with its numbers facing out.



Install the dust seal onto the retainer and apply MULTIPURPOSE NLGI No. 2 grease (MoS_2-additive) to the inside lip.
Tighten the retainer.

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

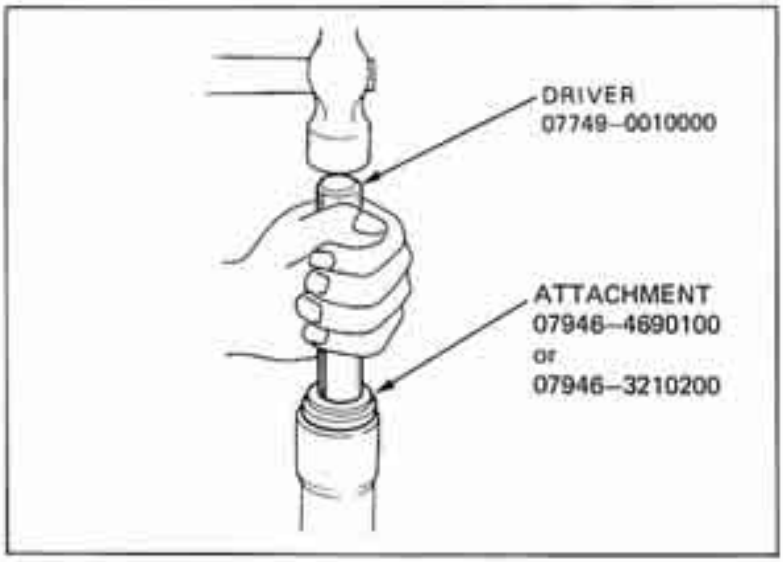
Peen the retainer over the swing arm using a hammer and drift.



NOTE

Use lithium-based MULTIPURPOSE grease with MoS_2-additive as follows:
- MOLYKOTE BR2-S manufactured by Dow Corning, U.S.A.
- MULTIPURPOSE M-2 manufactured by Mitsubishi Oil Japan
- Other lubricants of equivalent quality.

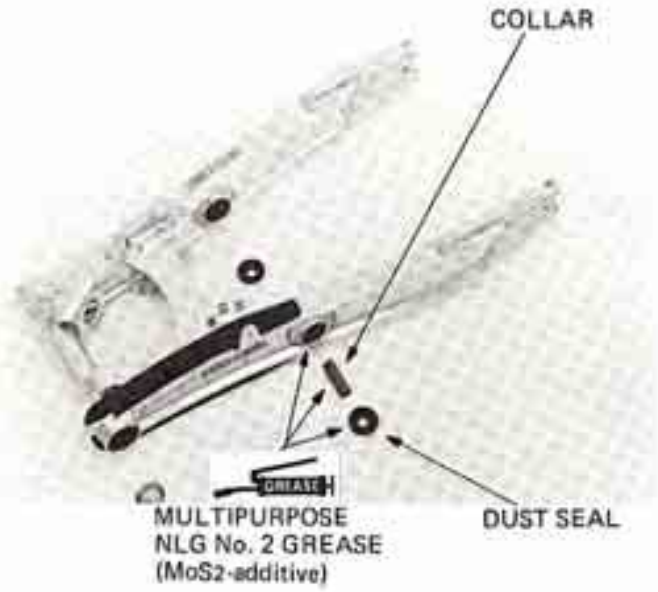
Apply MULTIPURPOSE NLGI No. 2 grease (MoS_2-additive) to the center collar and slide it into place.
Pack the needle bearing with grease.
Drive the needle bearing into place with its numbers facing out.



Apply MULTIPURPOSE NLGI No.2 grease (MoS2-additive) to the suspension arm collars and dust seals and install them onto the swingarm.

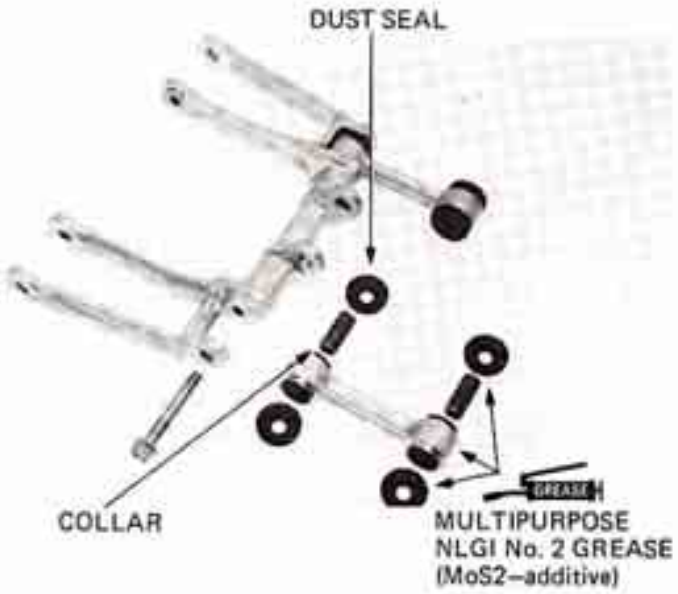
NOTE

Use lithium-based MULTIPURPOSE grease with MoS2-additive as follows:
- MOLYKOTE BR2-S manufactured by Dow Corning, U.S.A.
- MULTIPURPOSE M-2 manufactured by Mitsubishi Oil, Japan.
- Other lubricants of equivalent quality.



Apply MULTIPURPOSE NLGI No.2 grease (MoS2-additive) to the suspension rod collar and dust seal.
Install the collars and dust seals.
Tighten the suspension rod pivot bolts.

TORQUE:
40–50 N·m (4.0–5.0 kg-m, 29–36 ft-lb)

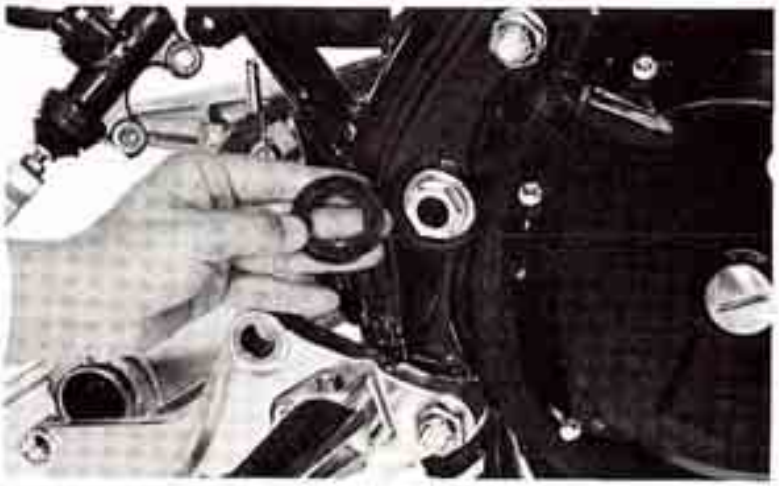


INSTALLATION

Tighten the right pivot collar.

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

Install the pivot cap and right foot peg bracket.



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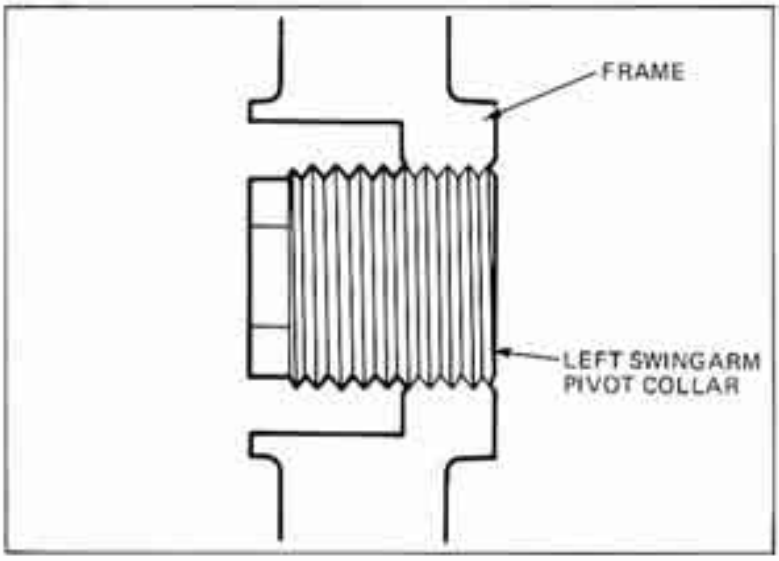
Install the distance collar onto the swingarm.
Install the left pivot collar loosely.

NOTE

Make sure that the end of the pivot collar does not extend past the frame.



Install the swingarm and insert the pivot bolt to hold the swingarm.
Tighten the left pivot collar.

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

Install the suspension rodsand arm assembly to the swing arm.

TORQUE:
40–50 N·m (4.0–5.0 kg·m, 29–36 ft·lb)

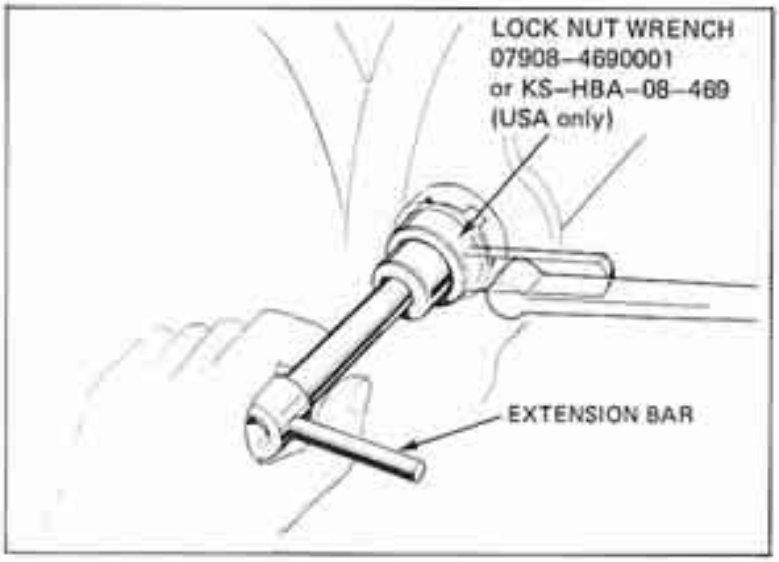
Hold the pivot collar and tighten the lock nut.

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

Install the pivot cap and left footpeg bracket.
Tighten the swingarm pivot bolt.

TORQUE:
70–80N·m (7.0–8.0 kg-m, 51–58 ft·lb)

Install the removed parts in the reverse order of removal.



REAR FENDER REMOVAL

Remove the following.
Left and right side covers.
The seat and the rear cowl.
The cowl protecter from the rear cowl.

Remove the left and right saddle bags.
Disconnect the rear turn signal wires.
Remove the rear hand-rail.
Remove the saddle bag stays.

Disconnect the taillight wire connecters.
Remove the rear fender A and B by removing the three connecters of the spark unit.

Remove the taillight from the rear fender A.
Remove the rear fender stay.

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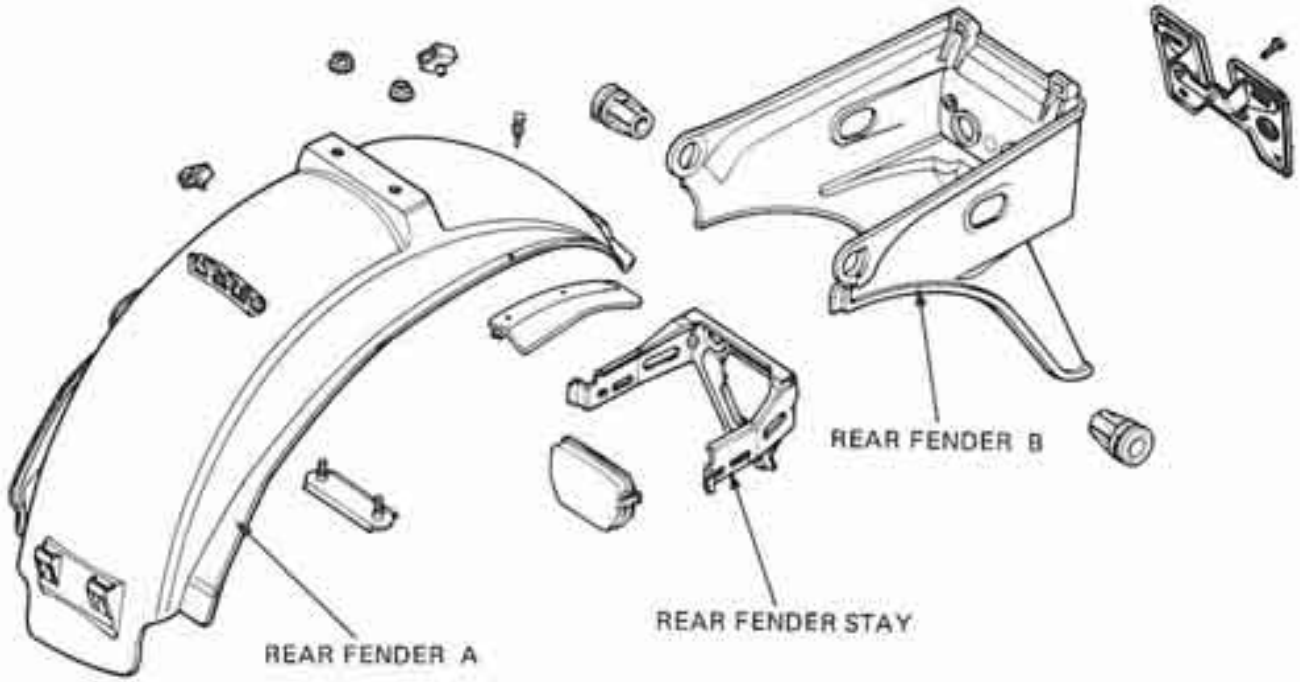
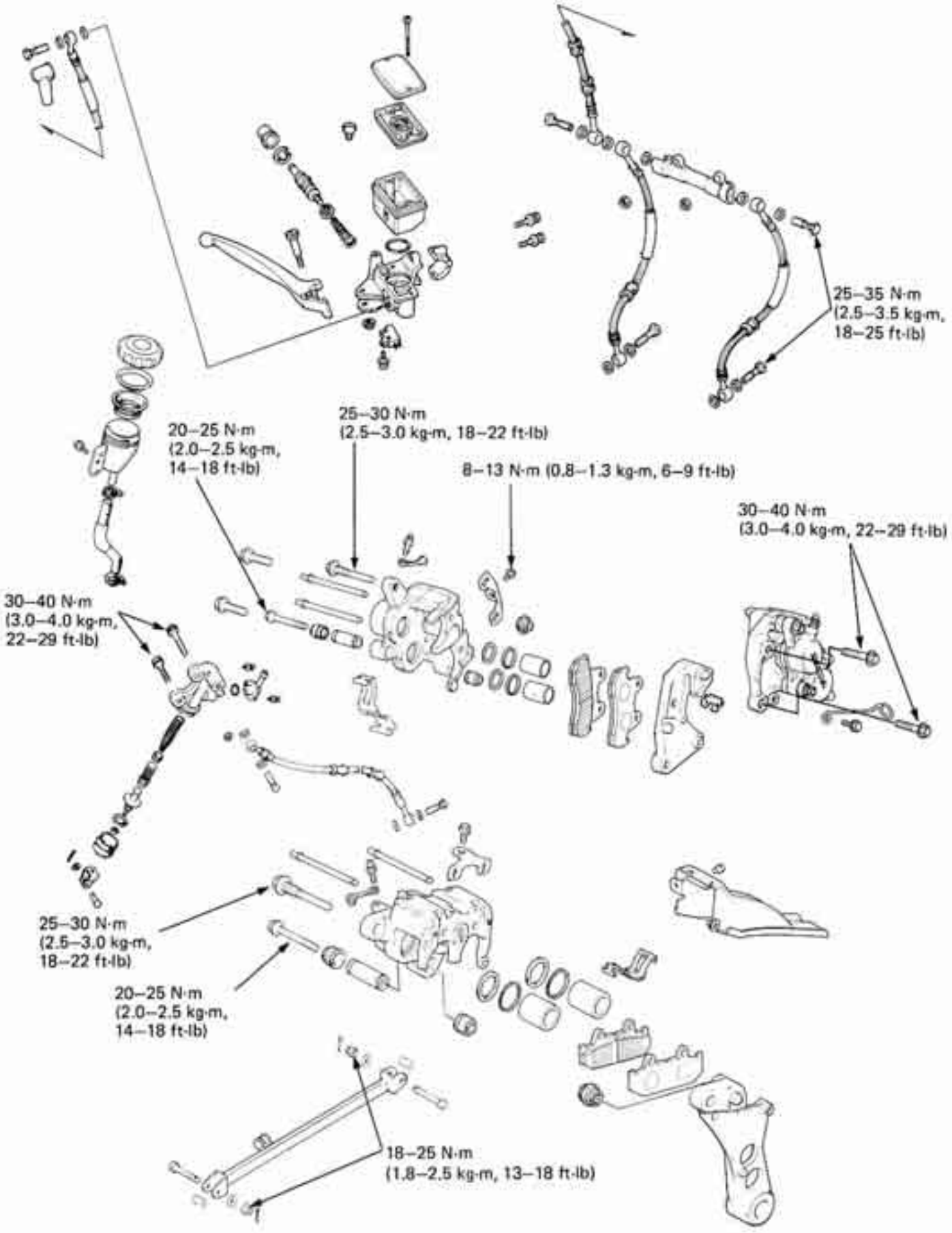
INSTALLATION

Assemble and install the rear fender in the reverse order of removal.





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SERVICE INFORMATION

GENERAL INSTRUCTIONS

- 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 reservoir.
- Avoid spilling brake fluid on painted surfaces or instrument lenses, as severe damage will result.
- Always check brake operation before riding the motorcycle.

TOOL

Common

Snap ring pliers	07914–3230001

TORQUE VALUES

Brake hose bolt	25–35 N·m (2.5–3.5 kg-m, 18–25 ft-lb)
Front brake caliper bracket	30–40 N·m (3.0–4.0 kg-m, 22–29 ft-lb)
Rear brake caliper	15–25 N·m (1.5–2.5 kg-m, 11–18 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	85–105 N·m (8.5–10.5 kg-m, 61–76 ft-lb)
Caliper shaft	25–30 N·m (2.5–3.0 kg-m, 18–22 ft-lb)
Caliper bolt	20–25 N·m (2.0–2.5 kg-m, 14–18 ft-lb)

SPECIFICATIONS

	STANDARD	SERVICE LIMIT
Front disc thickness	13.9–14.1 mm (0.55–0.56 in)	13 mm (0.5 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)	30.14 mm (1.187 in)
Front caliper cylinder I.D.	30.230–30.280 mm (1.19041–1.1921 in)	30.29 mm (1.193 in)
Rear master cylinder I.D.	14.000–14.043 mm (0.5512–0.5529 in)	14.06 mm (0.553 in)
Rear caliper cylinder I.D.	30.230–30.280 mm (1.1901–1.19021 in)	30.29 mm (1.193 in)
Rear caliper piston O.D.	30.148–34..128 mm (1.1869–1.1889 in)	30.14 mm (1.187 in)
Rear disc thickness	6.8–7.2 mm (0.27–0.28 in)	6.0 mm (0.24 in)
Rear disc runout	———	0.30 mm (0.012 in)

TROUBLSHOOTING

Brake Lever/Pedal Soft or Spongy
1. Air bubbles in hydraulic system
2. Low fluid 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. Fault in one side of front brake
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

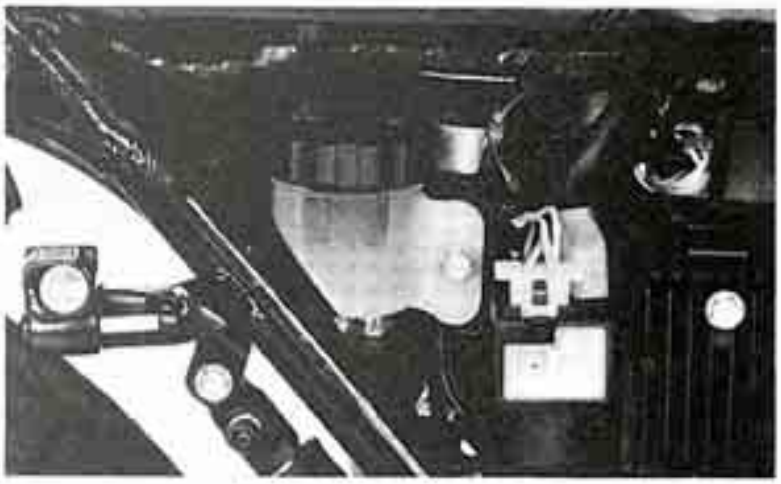
Check the fluid level with the fluid reservoir parallel to the ground.

CAUTION

- *Install the diaphragm on the reservoir when operating the brake lever/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.*

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.

BRAKE FLUID FILLING

NOTE

Do not mix different brands of brake fluid since they may not be 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 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.

AIR BLEEDING

NOTE

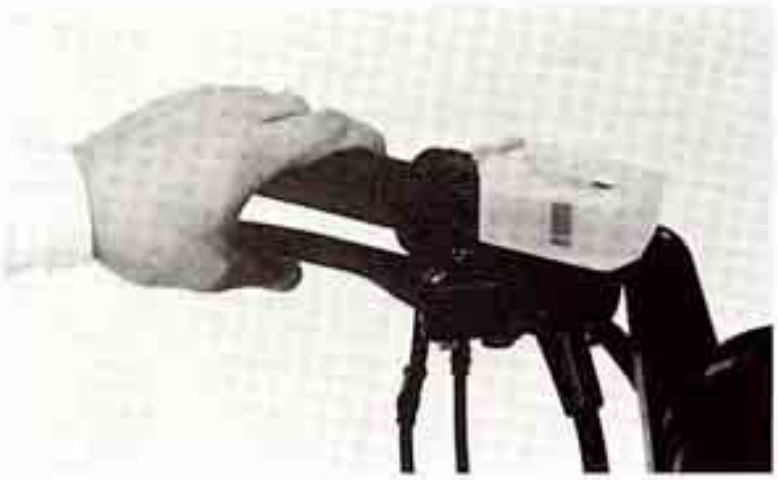
Use this procedure for the front and rear brakes.

NOTE

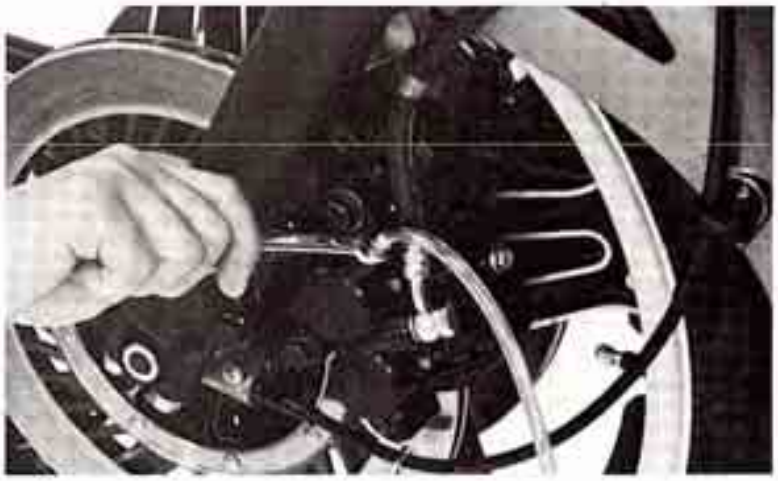
Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.

NOTE

- Use only **DOT 3 brake fluid** from a sealed container.
- Do not mix brake fluid brands 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) Squeeze the brake lever (or depress the brake pedal), open the bleeder valve 1/2 turn then close the valve.



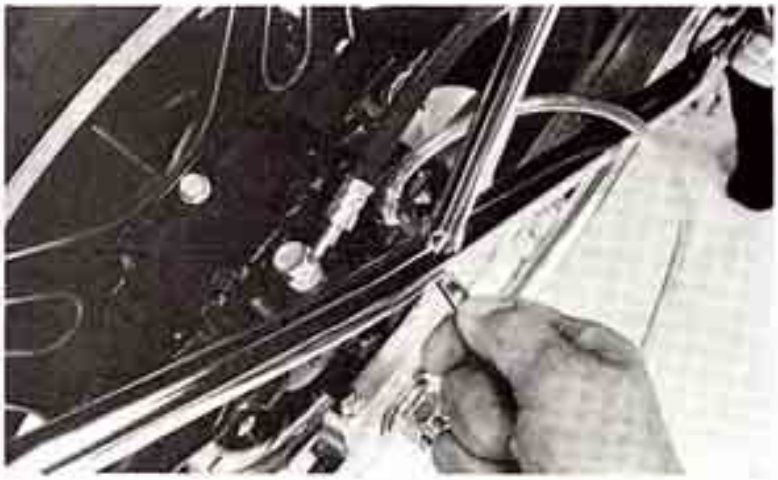
NOTE

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

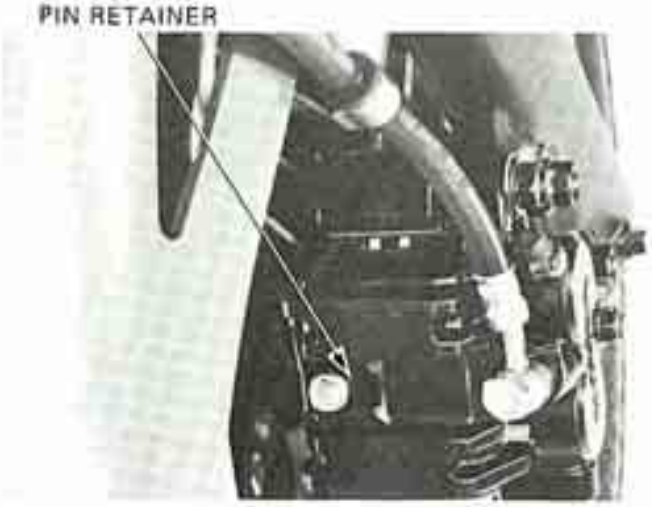
FRONT BRAKE PAD REPLACMENT

Replace the brake pads if the wear line on the pads reaches the edge of the brake disc. (Refer to Page 3-18).

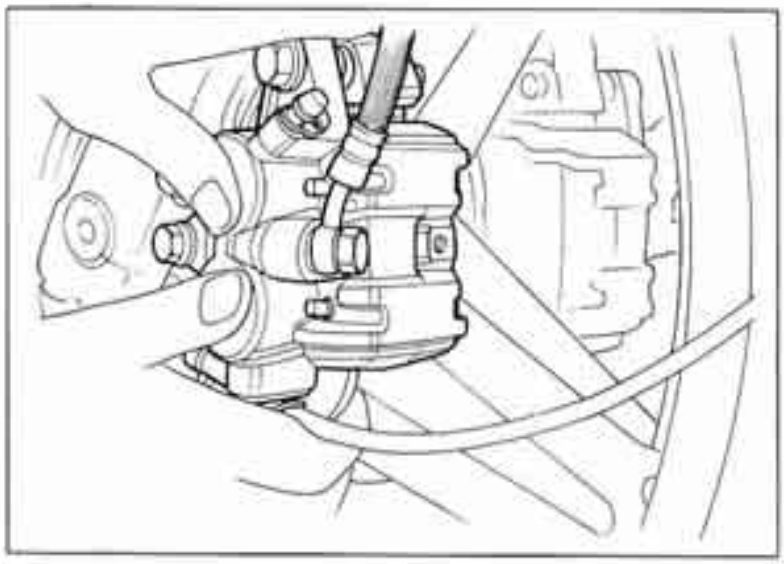
CAUTION

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

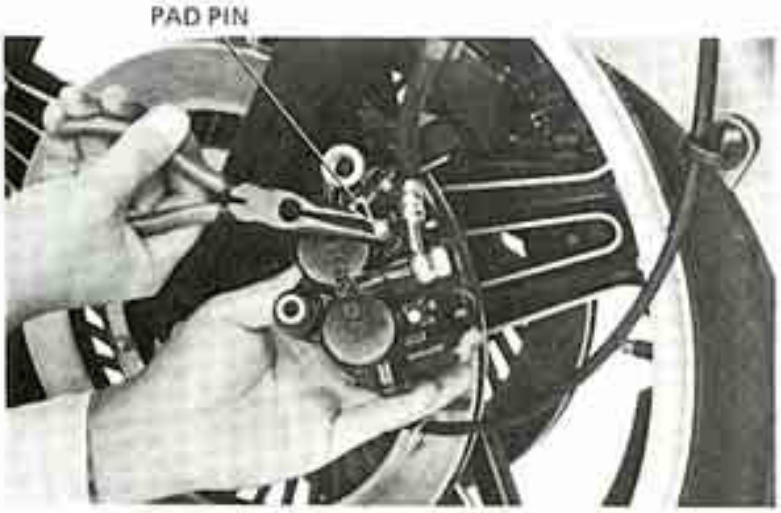
Remove the brake pad pin retainer.



Push the caliper against the disc to push the pistons all the way in to facilitate new brake pad installation.

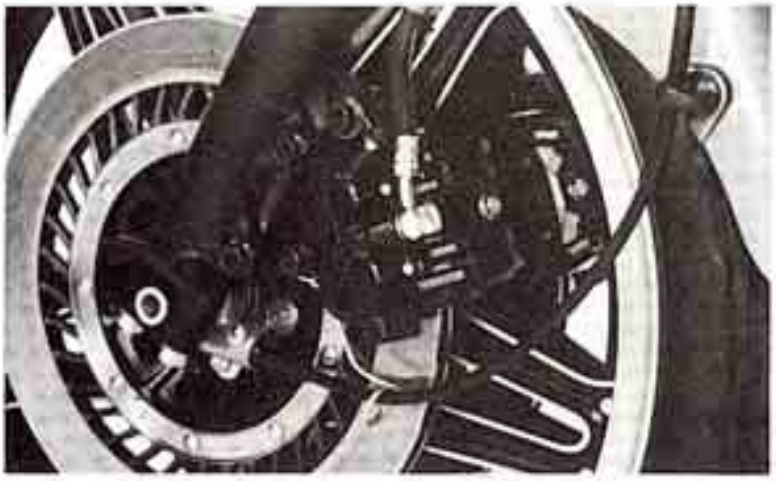


Remove the caliper mount bolt and caliper shaft.
Remove the brake caliper.
Remove the pad pins.



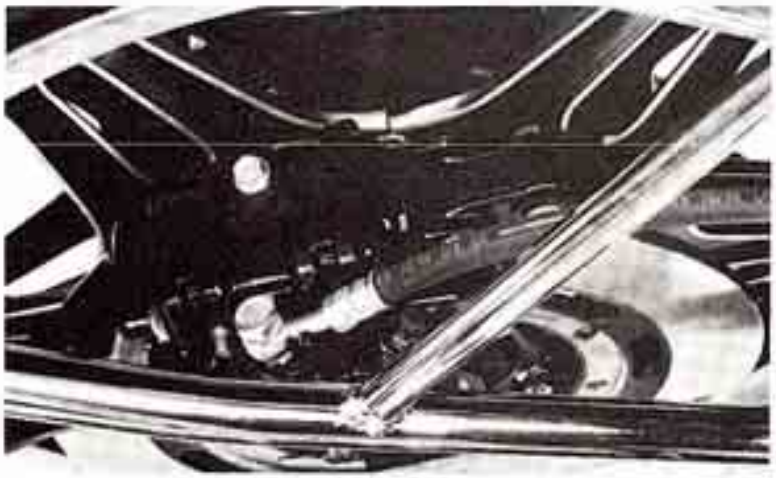
Install new brake pads and insert the pad pins.
Install the pad pin retainer.
Install the front brake caliper on the front fork.

TORQUE VALUES:
PIN RETAINER BOLT:
8–13 N·m (0.8–1.3 kg-m, 69 ft-lb)
CALIPER MOUNT BOLT:
20–25 N·m (2.0–2.5 kg-m, 14–18 ft-lb)
CALIPER SHAFT:
25–30 N·m (2.5–3.0 kg-m, 18–22 ft-lb)



REAR BRAKE PAD REPLACMENT

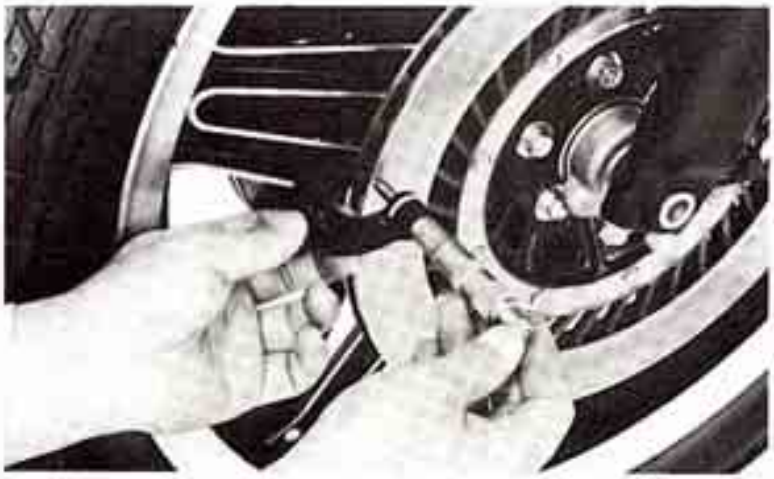
Refer to Front Brake Pad Replacement. (Page 15-5)



BRAKE DISC THICKNESS

Measure the disc thickness.
SERVICE LIMITS:

Front:	**13 mm (0.5 in)**
Rear:	**6 mm (0.2 in)**



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BRAKE DISC WARPAGE

Measure brake disc warpage.

SERVICE LIMIT: 0.30 mm (0.012 in)

FRONT MASTER CYLINDER

DISASSEMBLY

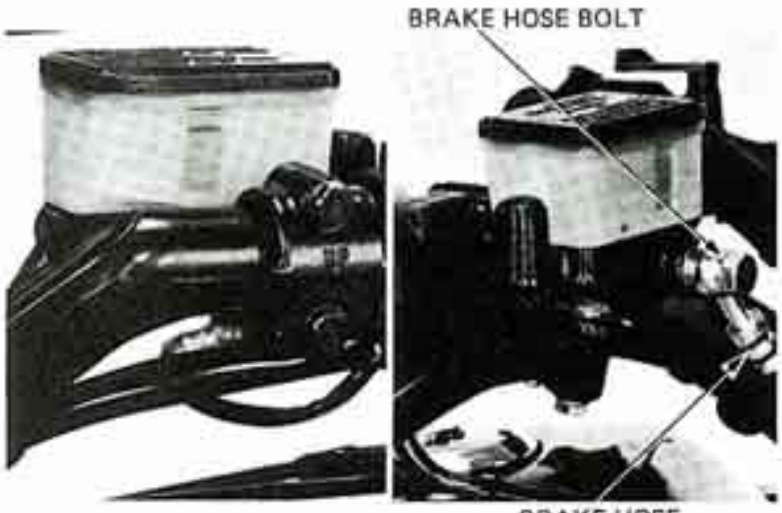
Drain brake fluid from the hydraulic system.
Remove the brake lever from the master cylinder.
Disconnect the brake hose.

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 to secure the hose.



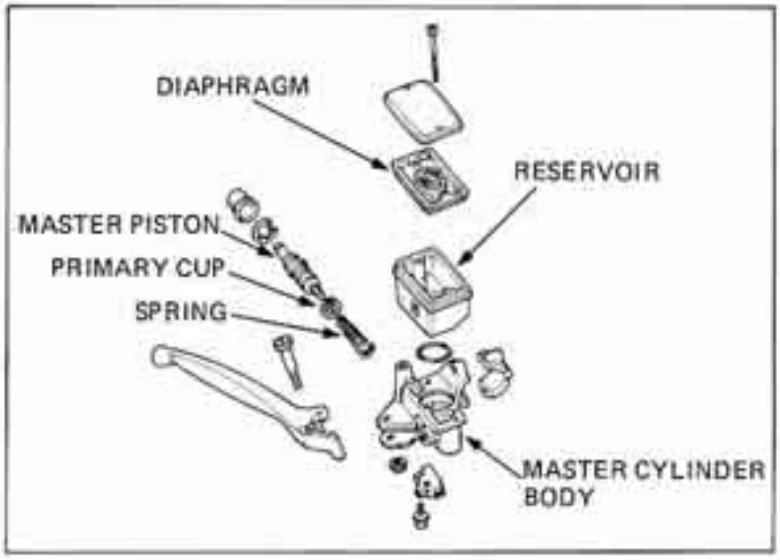
Remove the master cylinder.

Remove the boot.
Remove the circlip from the master cylinder body.

Remove the master piston.
Then remove the primary cup and spring.

Remove the brake fluid reservoir from the master cylinder body.

Clean the inside of the master cylinder and reservoir with brake fluid.



INSPECTION

CYLINDER I.D.

Measure the master cylinder I.D.
Check the master cylinder for scoring, scratches or nicks.

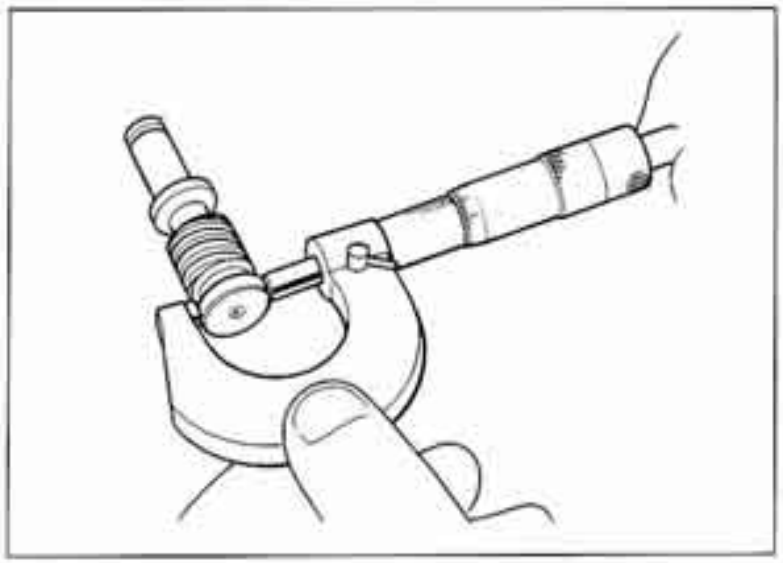
SERVICE LIMIT: 15.925 mm (0.6270 in)

PISTON O.D.

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 set.

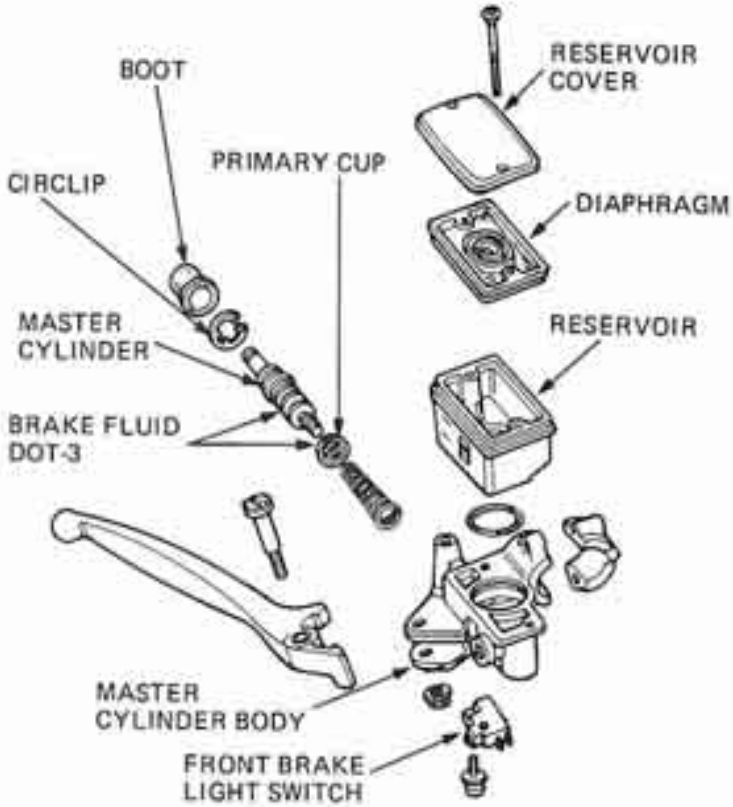
Assemble the master cylinder. Coat all parts with clean brake fluid before assembly.
Install the spring and valve together.

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 firmly in the groove.

Install the circlip and boot.
Install the reservoir on the master cylinder making sure that the O-ring is in good condition.



INSTALLATION

Place the master cylinder on the handlebar and install the holder and the two mounting bolts. Torque the top bolt first. Install the oil hose with the bolt and its two sealing washers.
Install the brake lever.
Fill the reservoir to the upper level and bleed the brake system according to page 15-3.

FRONT BRAKE CALIPER

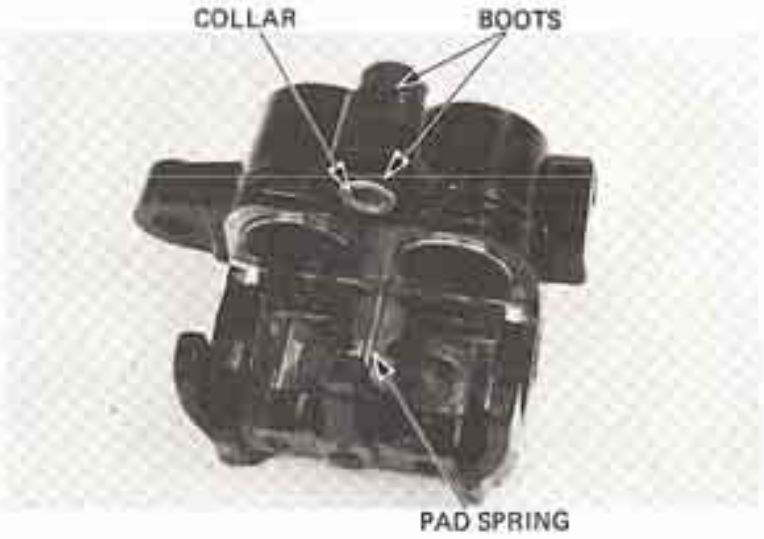
DISASSEMBLY

Drain the brake hydraulic system.
Disconnect the brake hose.
Remove the brake pads (see page 26-22).

NOTE:
Avoid spilling brake fluid on painted surfaces.

Remove the caliper mounting bolt.

Remove the boots and collar.
Remove the pad spring.



Position the caliper with the piston down and apply small spurts 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.

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Push the oil seals in and then lift them out.
Clean the caliper grooves with brake fluid.

CAUTION

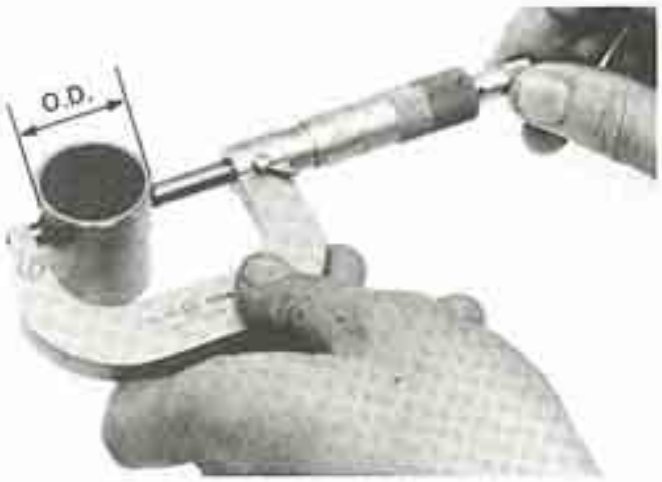
Do not damage the piston sliding surface.

OIL SEALS

CALIPER PISTON INSPECTION

Check the piston for scoring, scratches or other faults. Measure the piston diameter with a micrometer.

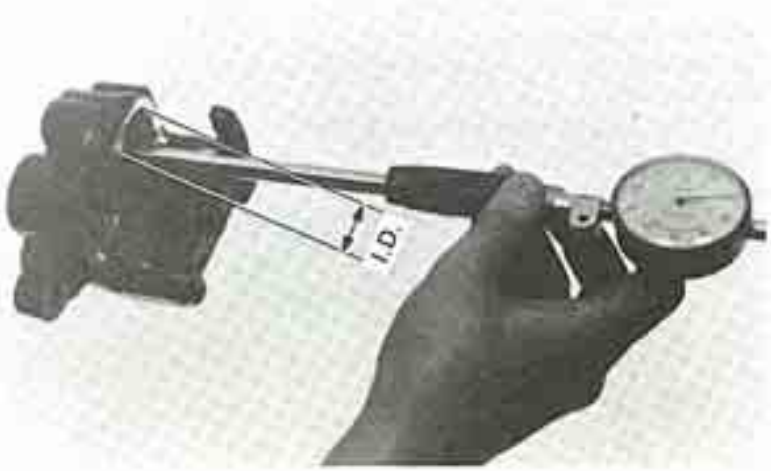
SERVICE LIMIT: 30.14 mm (1.187 in)



CALIPER CYLINDER INSPECTION

Check the caliper cylinder for scoring, scratches or other faults. Measure the caliper I.D.

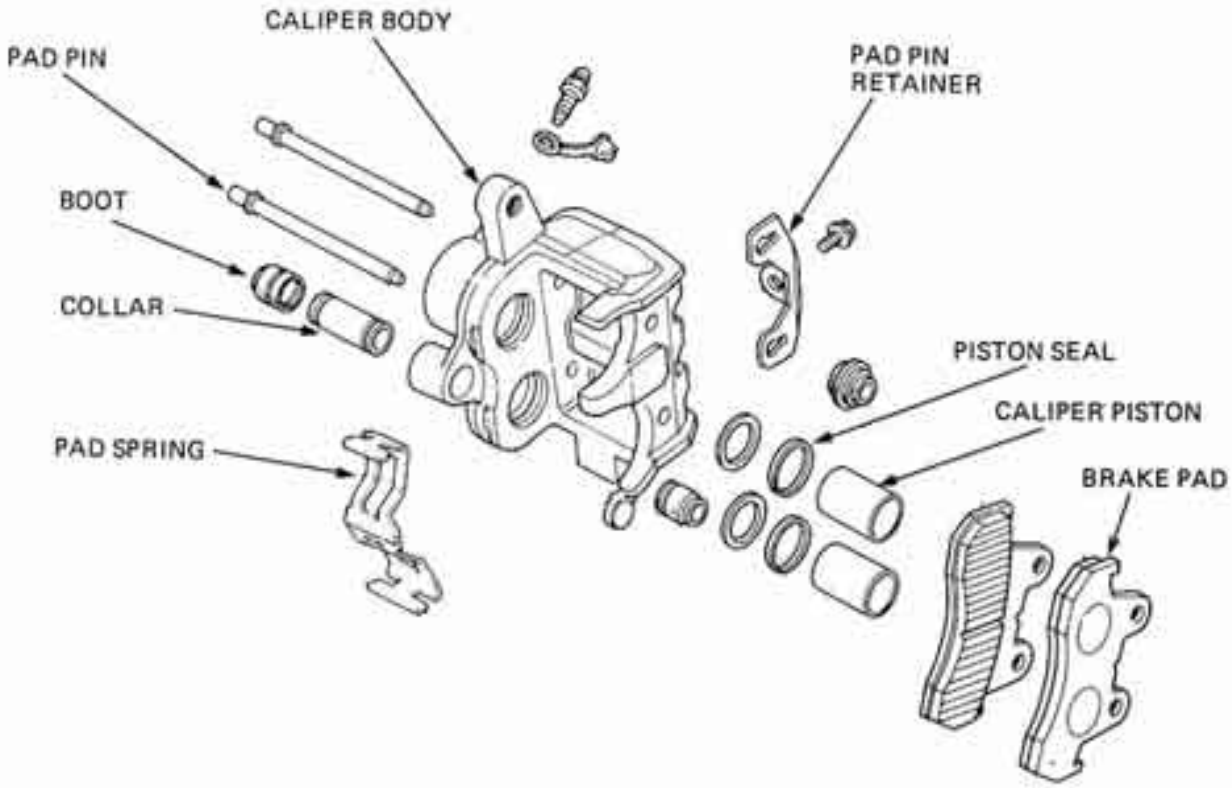
SERVICE LIMIT: 30.29 mm (1.193 in)



ASSEMBLY

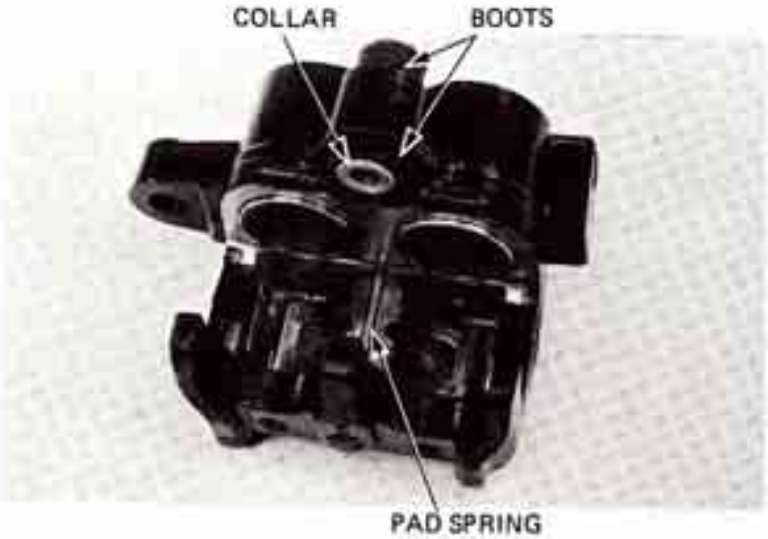
WARNING

A contaminated brake disc or pad reduces stopping power. Do not allow grease on the brake pads.



The oil seals must be replaced with new ones whenever disassembled.
Coat the oil seals with silicon grease or brake fluid before assembly.
Install the pistons with the dished ends on the brake pad side.

Install the boots and collar making sure that the boots are seated in the collar grooves properly.
Install the brake pad spring.



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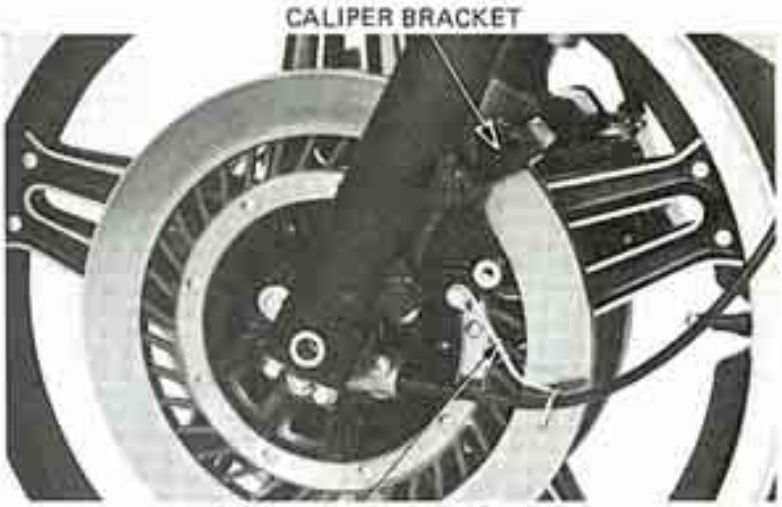
FRONT CALIPER BRACKET DISASSEMBLY

Remove the speedometer clamp.
Remove the caliper bracket.
Remove the caliper shaft boot.



FRONT CALIPER BRACKET ASSEMBLY

Coat the boot with silicone grease or brake fluid and install it in the groove of the carrier.
Install the caliper carrier.

NOTE

Install the caliper shim on the caliper bracket with cement.

Install the caliper bracket on the fork slider.

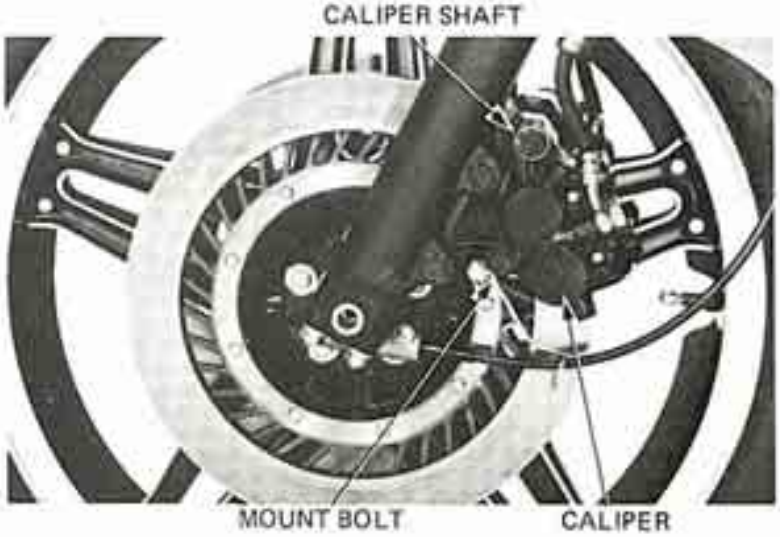
TORQUE:
30–40N·m (3.0–4.0 kg·m, 22–29 ft·lb)

CALIPER INSTALLATION

Apply silicon grease or brake fluid to the caliper shaft.
Install the caliper onto the front fork.

TORQUE:
CALIPER SHAFT:
25–30 N·m (2.5–3.0 kg·m, 18–22 ft·lb)
CALIPER MOUNT BOLT:
20–25 N·m (2.0–2.5 kg·m, 14–18 ft·lb)

Make sure that the caliper shaft boot is seated in the shaft groove properly.
Install the brake pads.
Connect the brake hose.
Bleed the brake system.



REAR MASTER CYLINDER

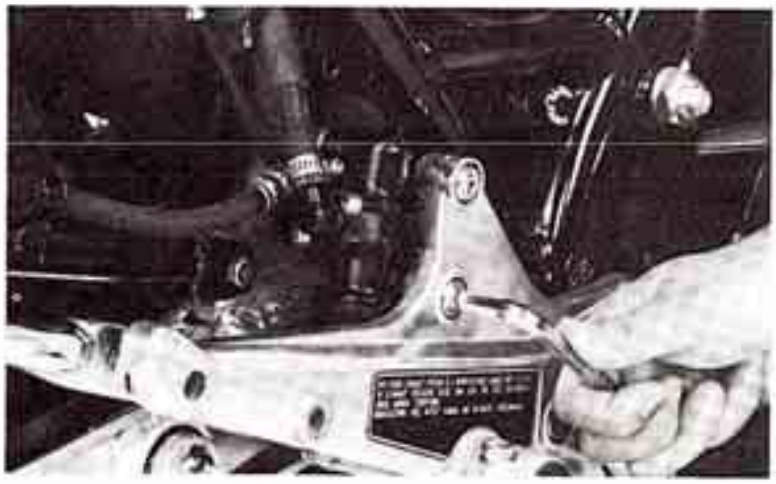
DISASSEMBLY

Remove the right side cover.
Place a clean drip pan under the brake line.
Disconnect the brake line on the back of the master cylinder.

CAUTION

Avoid spilling brake fluid on painted surfaces.

Remove the pin from the rod ege and remove the two allen head bolts.

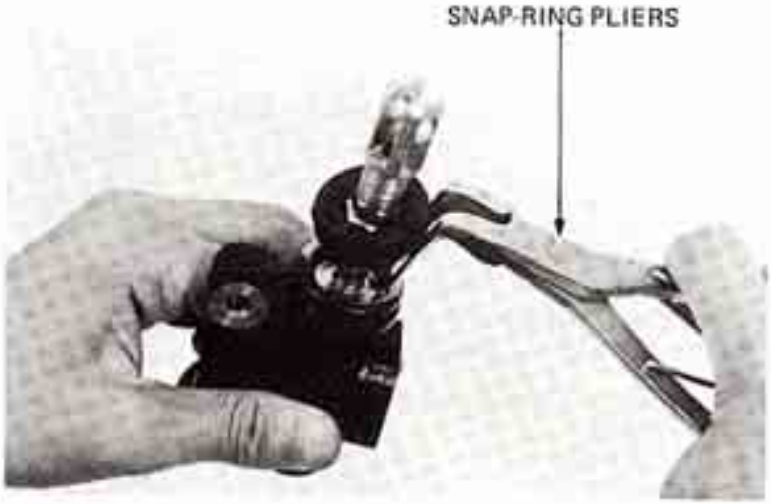


Remove the rubber cover.
Remove the circlip and push rod from the master cylinder body.

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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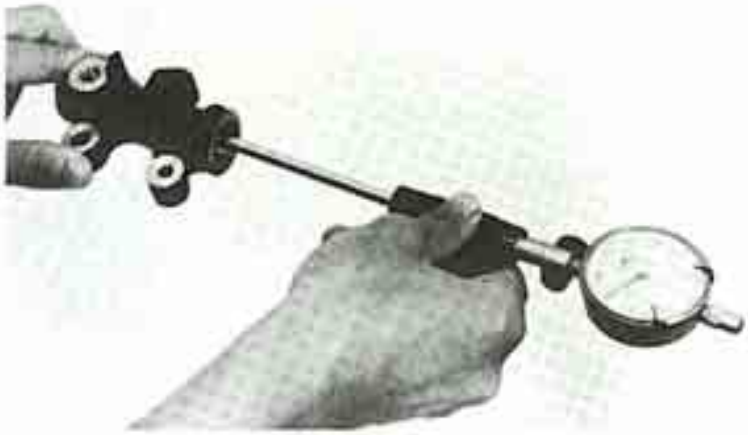
INSPECTION

CYLINDER I.D.

Measure the inside diameter of the master cylinder bore.

SERVICE LIMIT: 14.06 mm (0.554 in)

Check for scores, scratches or nicks.



PISTON O.D.

Measure the master piston O.D.

SERVICE LIMIT: 13.945 mm (0.5490 in)

Check the primary cup and secondary cup for damages before assembly.

ASSEMBLY

CAUTION

Handle the master cylinder piston, cylinder and spring as set.

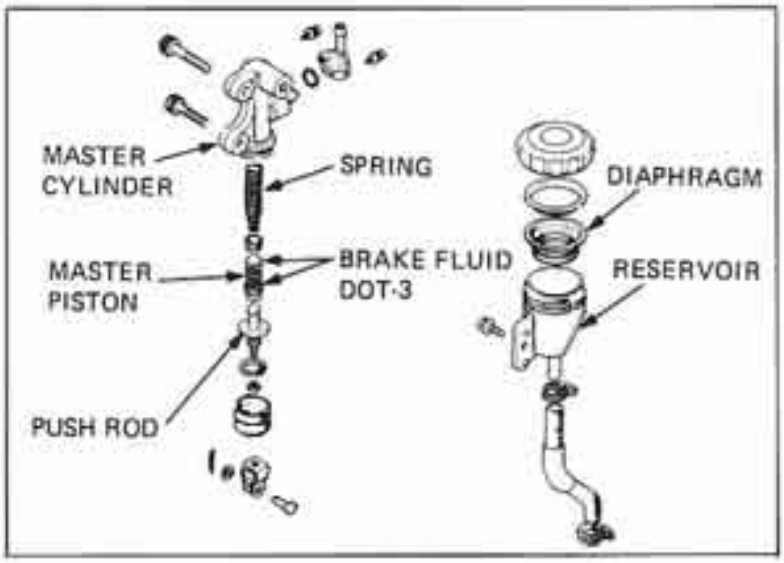
Assemble the master cylinder.
Coat all parts with clean brake fluid.

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 spring.
Install the primary cup and piston.
Install the push rod and circlip.
Install the boot, nut and rod eye.

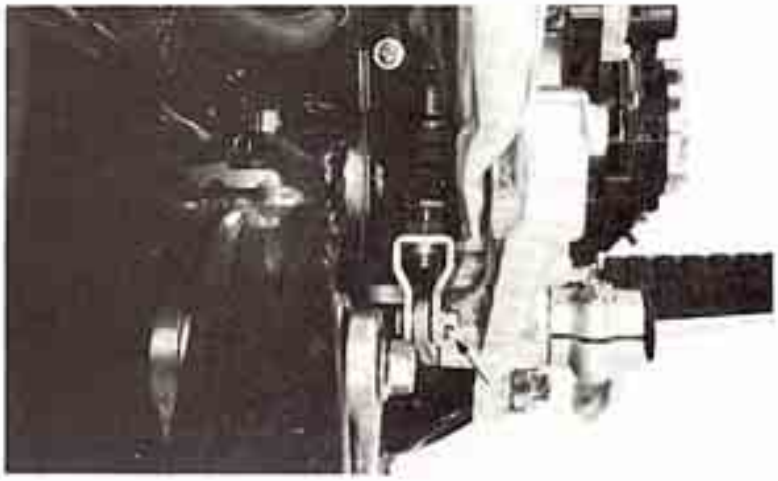


Install the master cylinder on the master cylinder bracket.

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

Connect the brake hose and brake rod.

Bleed the brake hydraulic system after assembly. (Page 15-14)



REAR CALIPER

REMOVAL

Remove the right saddle bag.
Drain the hydraulic system and disconnect the brake hose.

CAUTION

Avoid spilling brake fluid on painted surfaces to prevent damage to the paint.

Remove the brake caliper by removing the caliper mount bolts.

DISASSEMBLY

Refer to Front Brake Caliper (Page 15-10).

INSPECTION

REAR BRAKE CALIPER

Check the piston for scoring or scratches.
Measure the piston O.D.

SERVICE LIMIT: 30.14 mm (1.187 in)

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REAR BRAKE CALIPER CYLINDER

Check the caliper cylinder for scoring or scratches. Measure the inside diameter of the caliper cylinder bore.

SERVICE LIMIT: 30.29 mm (1.193 in)

ASSEMBLY

Refer to Front Brake Caliper (Page 15-12).

REAR CALIPER BRACKET DISASSEMBLY

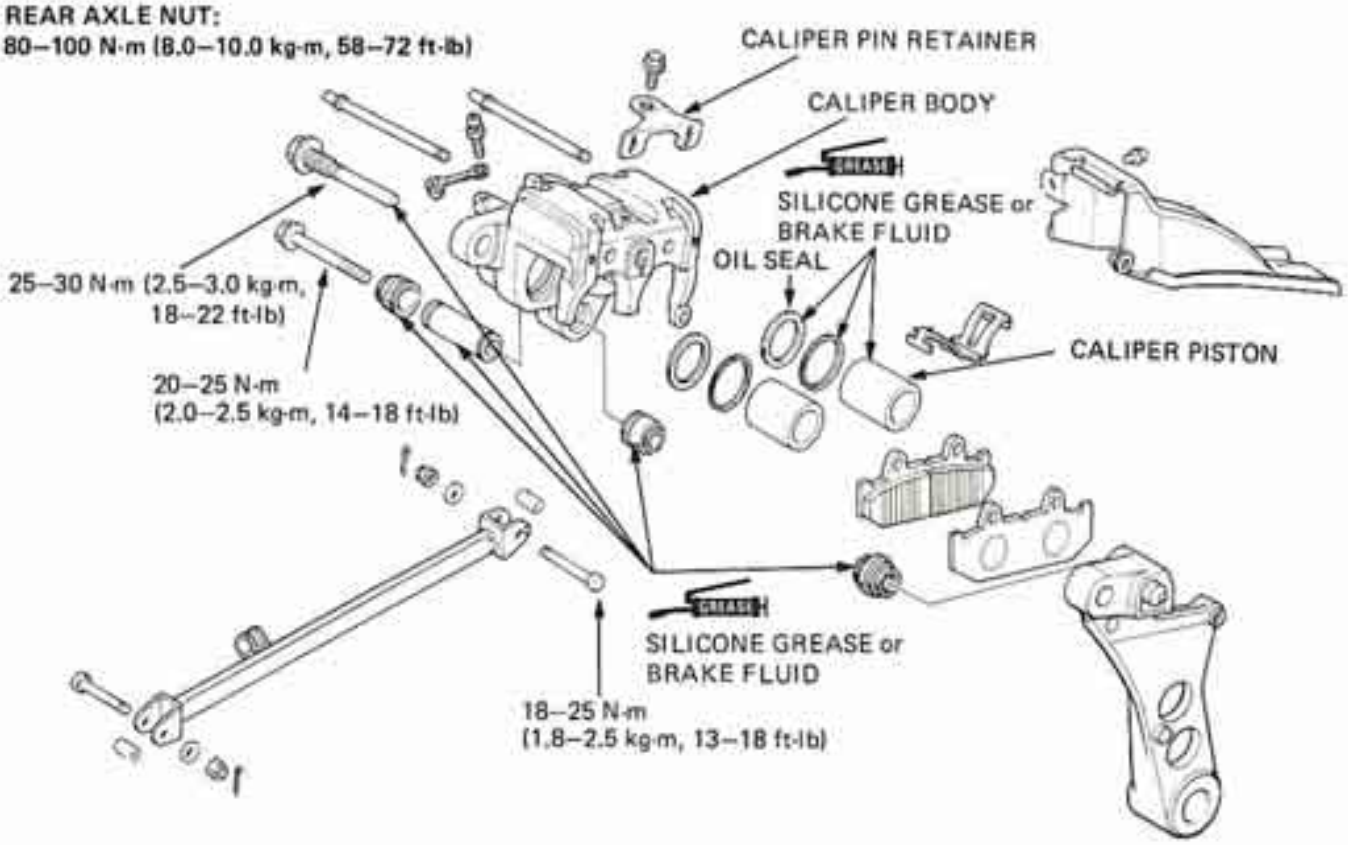
Remove the rear wheel.
Remove the rear brake caliper.
Remove the rear brake torque link.
Remove the rear brake caliper bracket.
Remove the caliper shaft boot.

REAR CALIPER BRACKET ASSEMBLY

Installation is the reverse order of removal.

Coat the boot with silicon grease or brake fluid.
Install the boot in the groove of the bracket with cement as shown.

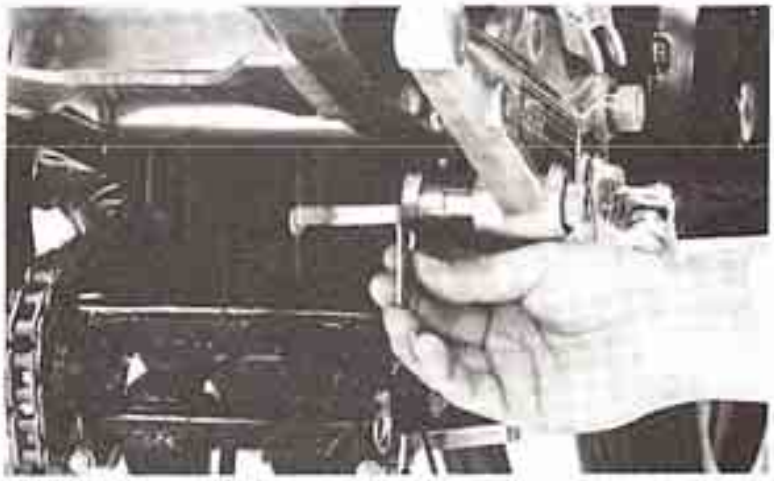
TORQUE:
REAR AXLE NUT:
80–100 N·m (8.0–10.0 kg-m, 58–72 ft-lb)



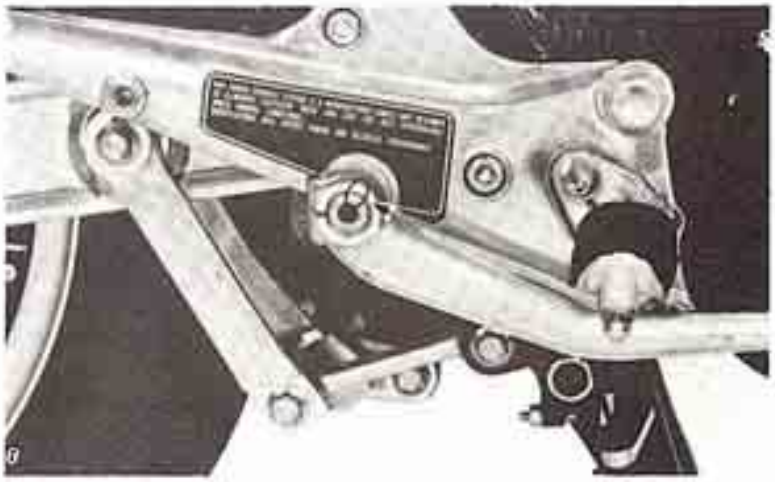
Remove the brake pedal.
Remove the rear brake master cylinder.
Remove the rear brake stoplight switch spring and brake pedal shaft.

INSTALLATION

Install the brake pedal shaft.
Install the return spring.



Install the thrust washer on the brake shaft.
Install the brake pedal by aligning the punch mark on the brake shaft with the punch mark on the brake pedal.



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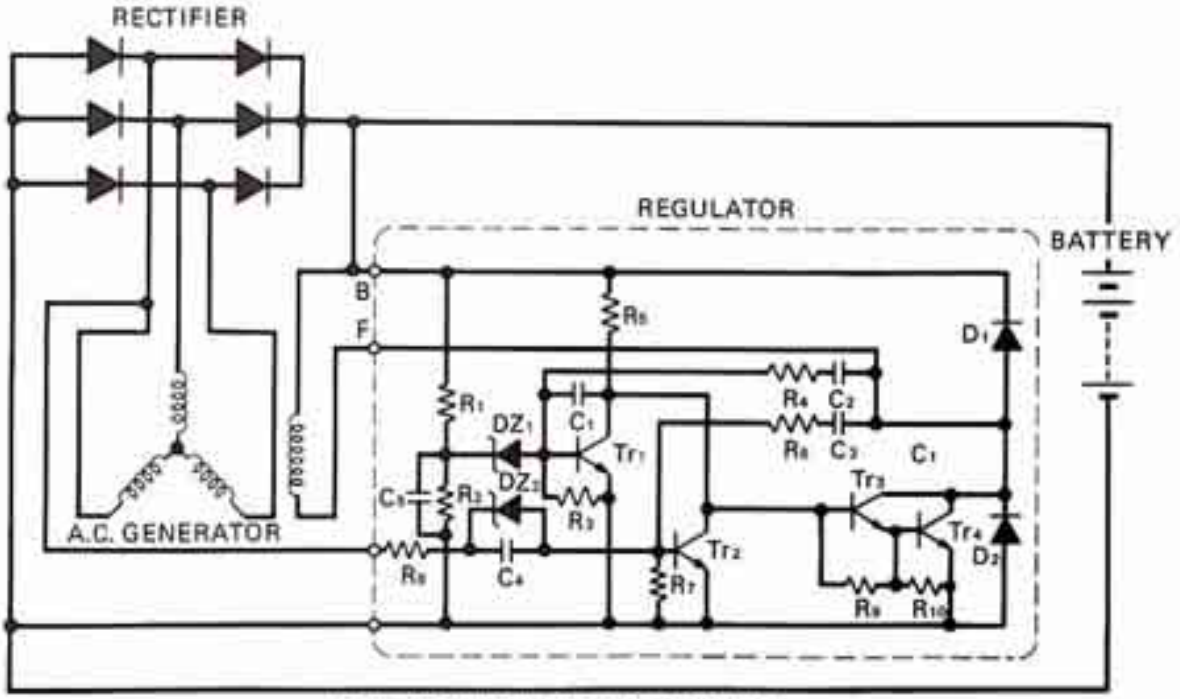
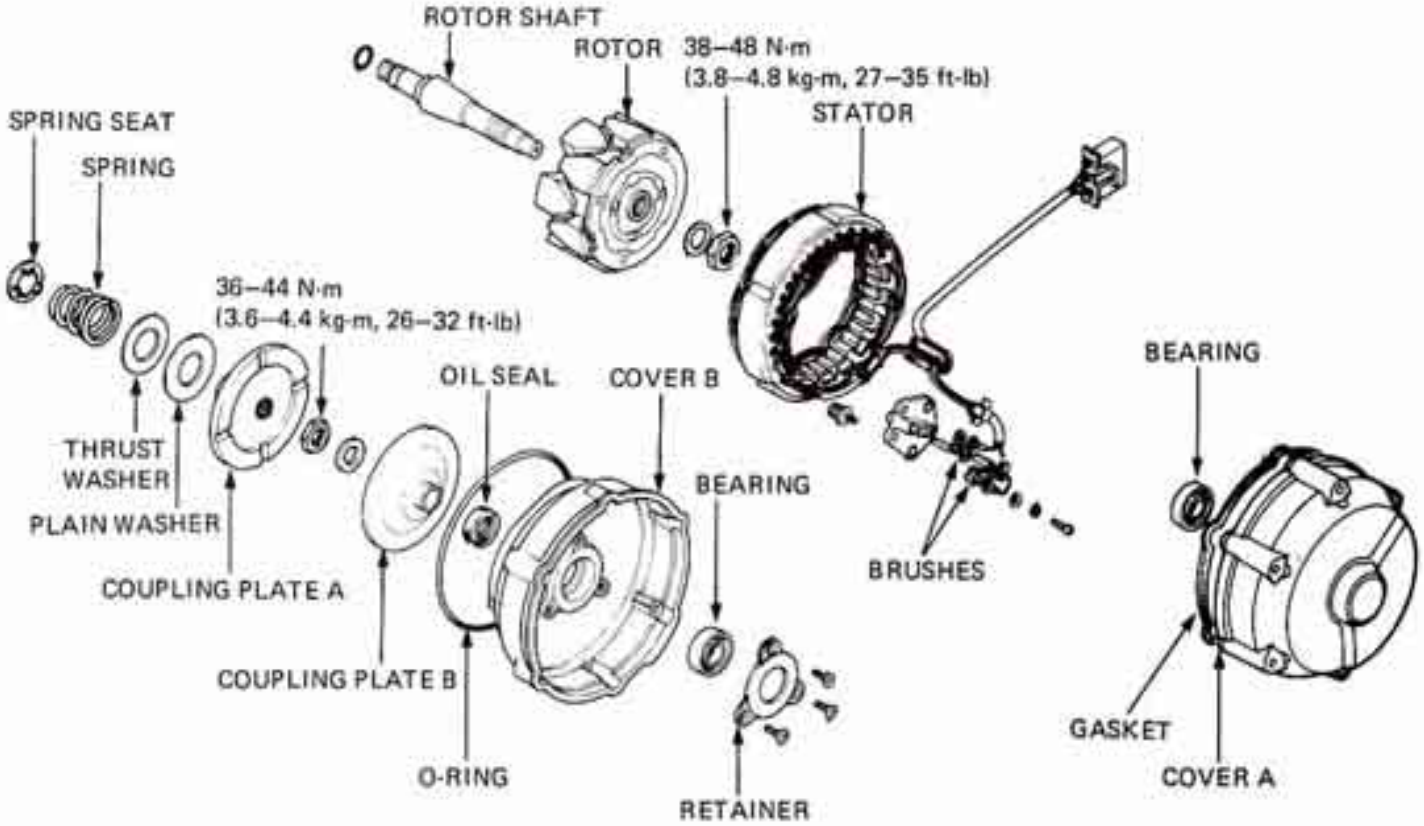


BATTERY/CHARGING SYSTEM



A.C. GENERATOR

Date of Issue: May, 1981

SERVICE INFORMATION

GENERAL INSTRUCTIONS

- Battery fluid level should be checked regularly and topped up with distilled water when necessary.
- When charging the battery, quick-charging should only be done in an emergency; slow-charging is preferred.
- Remove the battery from the motorcycle for charging. If battery must be charged on the motorcycle, disconnect the battery cables.
- Keep flames or sparks away from a charging battery because it produces explosive hydrogen gas.
- All charging system components can be tested on the motorcycle.

TOOLS

Common

Driver	07749–0010000
Attachment 32 x 35 mm	07746–0010100
Attachment 37 x 40 mm	07746–0010200

SPECIFICATIONS

Battery	Capacity	12V 18AH		
	Specific gravity	1.28/20°C (68°F)		
	Charging rate	1.8 amperes maximum		
A.C. generator output		1000 rpm	1500 rpm	5000 rpm
		5A min.	12A min.	24A min.
Voltage regulator		Transistorized non-adjustable		

TORQUE

Rotor lock nut	38–48 N·m (3.8–4.8 kg-m, 27–35 ft-lb)
Coupling lock nut	36–44 N·m (3.6–4.4 kg-m, 26–32 ft-lb)

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 underchaged
   – 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
3. Faulty silicon rectifier
4. Faulty alternator

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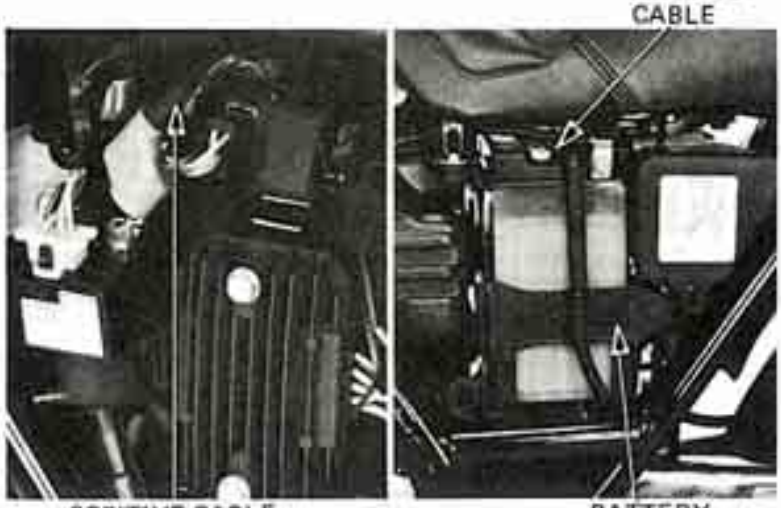
BATTERY

REMOVAL

Remove the right and left side covers.
Disconnect the ground cable at the battery terminal.
Disconnect the positive cable at the starter relay switch terminal.
Remove the battery holder.



TESTING SPECIFIC GRAVITY

Test each cell with a hydrometer.

SPECIFIC GRAVITY:
(20°C, 68°F)

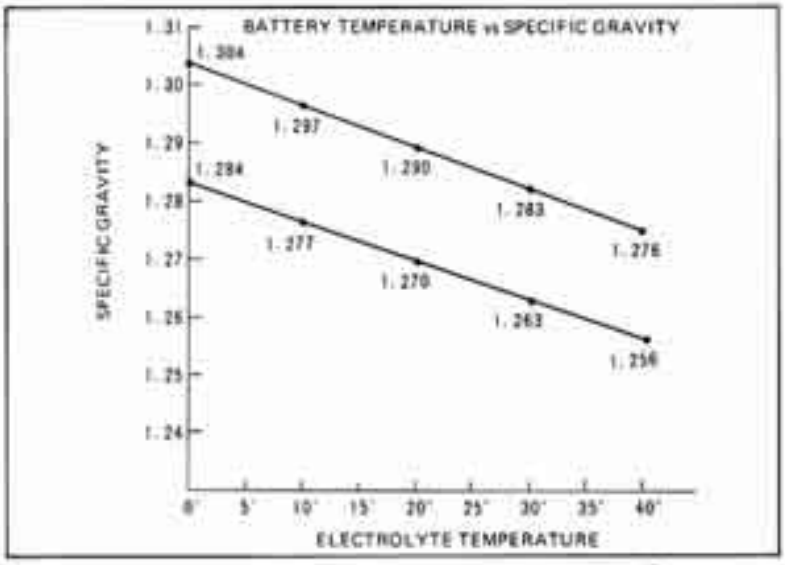
1.27–1.29	**Fully charged**
Below 1.26	**Undercharged**

NOTE

- The battery must be recharged if the specific gravity is below 1.23.
- The specific gravity varies with the temperature as shown in the accompanying table.
- Replace the battery if sulfation is evident.
- The battery must be replaced if there are deposits on the bottom of each cell.

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.

BATTERY CHARGING

Connect the charger positive (+) cable to the battery positive (+) terminal.
Connect the charger negative (–) cable to the battery negative (–) terminal.

Charging current:
1.8 amperes max.

Charging:
Charge the battery until specific gravity is 1.27–1.29 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.

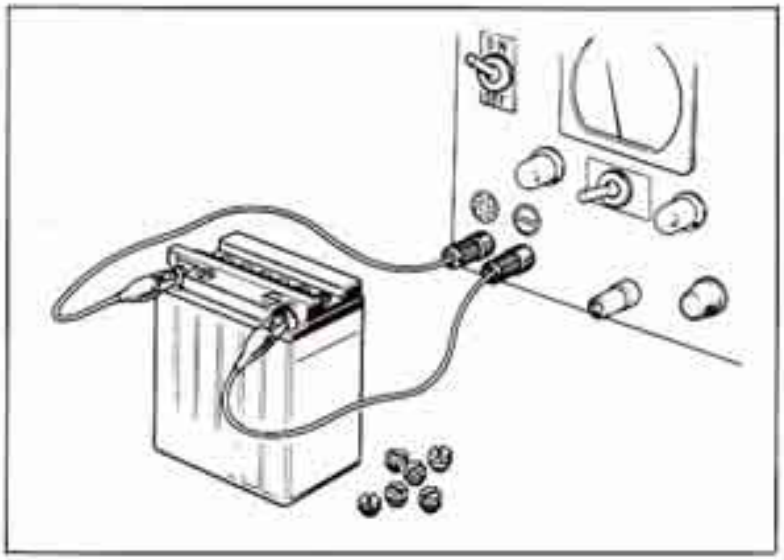
After installing the battery, coat the terminals with clean grease.

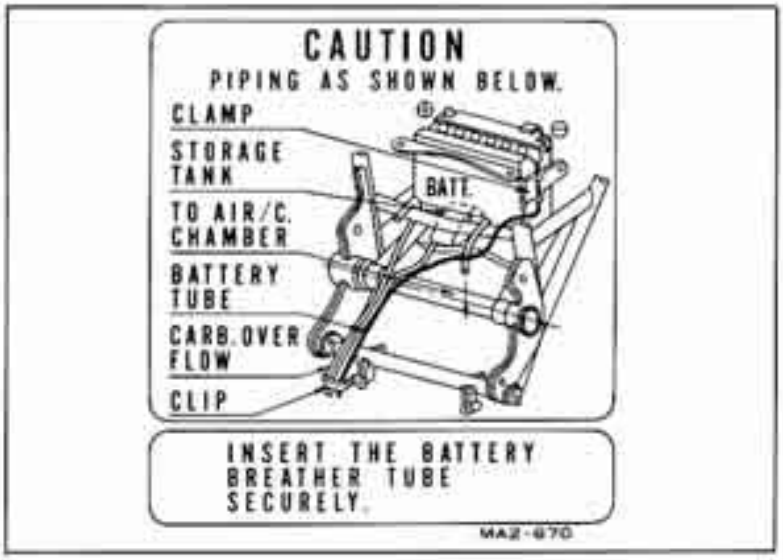
WARNING

Do not allow battery electrolyte to touch the drive chain. This would weaken the chain.

CAUTION

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





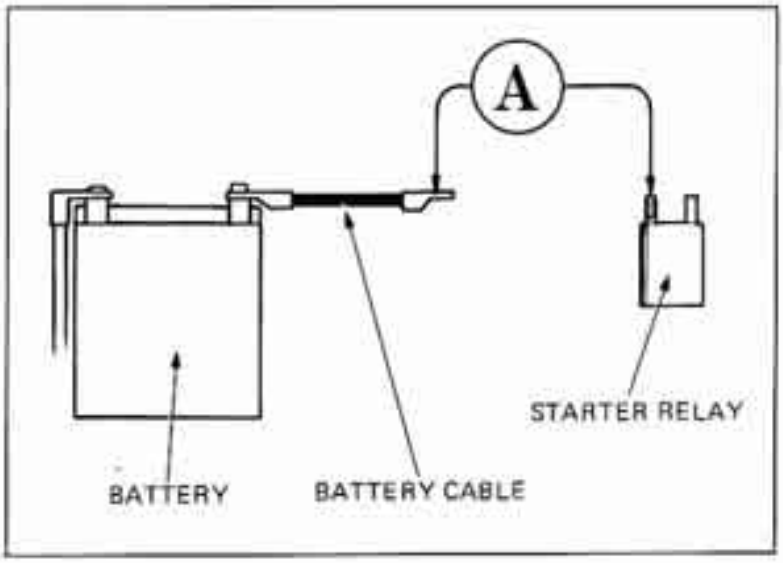
CHARGING SYSTEM

Current Test

NOTE

Be sure the battery is good condition before performing this test.

Warm up the engine.
Remove the frame left side cover.
Turn headlight high beam on.
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 1050 rpm and should be a minimum of 14 amperes at 5,000 rpm.
Check the stator (page 16-9 or 16-11) and then the regulator/rectifier (page 16-12), if the charging specifications are not met.



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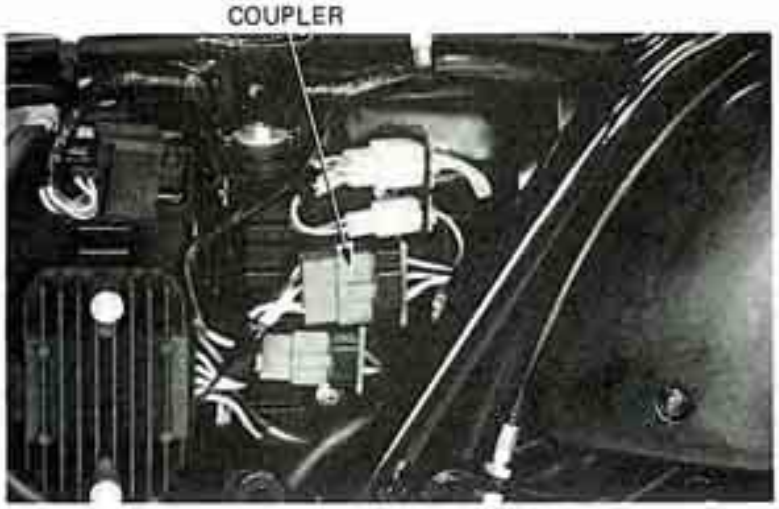
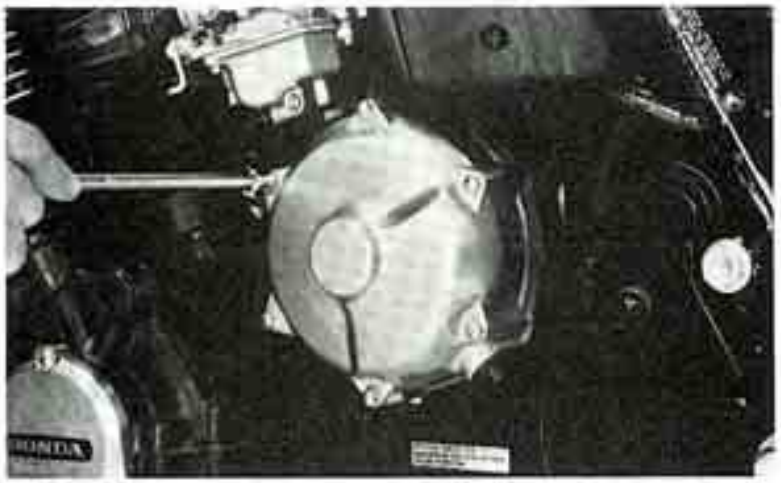
ALTERNATOR REMOVAL/ INSTALLATION

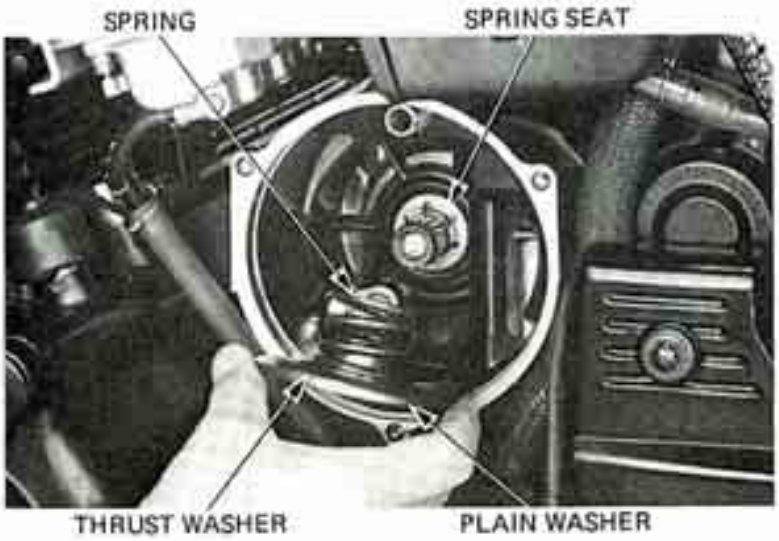
Remove the left leg shield.
Remove the right side cover and disconnect the alternator couplers.



Remove the alternator by loosening the three bolts shown.
Loosen the screws in a crisscross pattern 2 to 3 turns at a time.



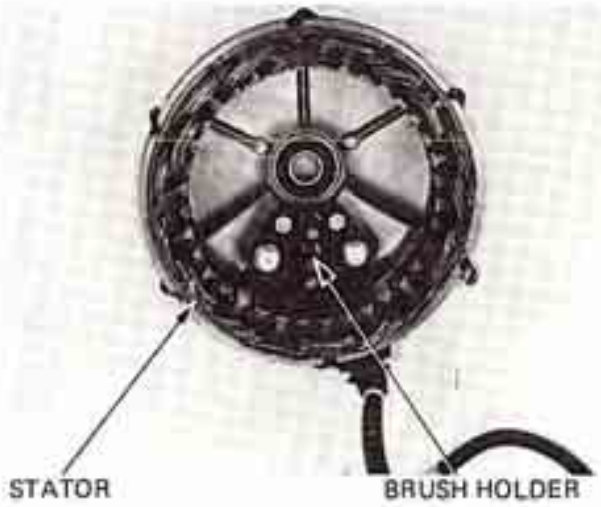
Remove the alternator clutch spring and washer.



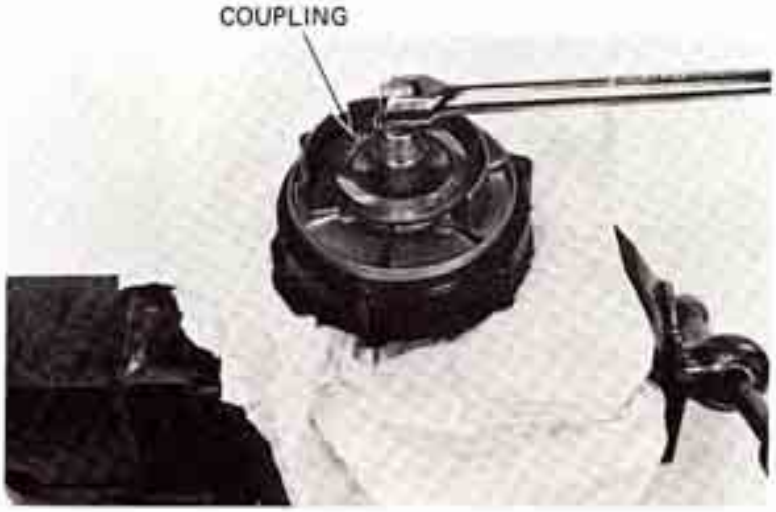
ALTERNATOR DISASSEMBLY

Remove the alternator.
Remove the generator housing mount bolts.

Remove the bolts and brush holder.
Remove the stator coil and brush holder.



Hold the rotor in a vise with soft jaws, or shop towels being careful not to overtighten.
Remove the coupling lock nut and washer.
Remove the coupling.



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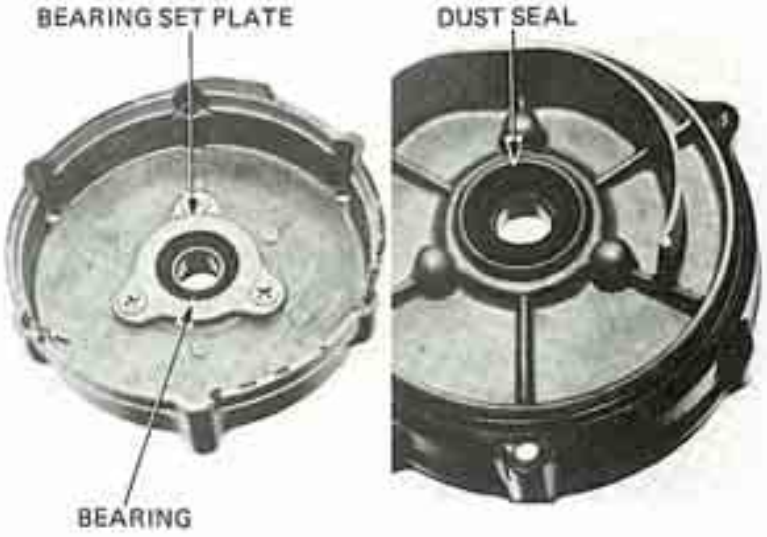
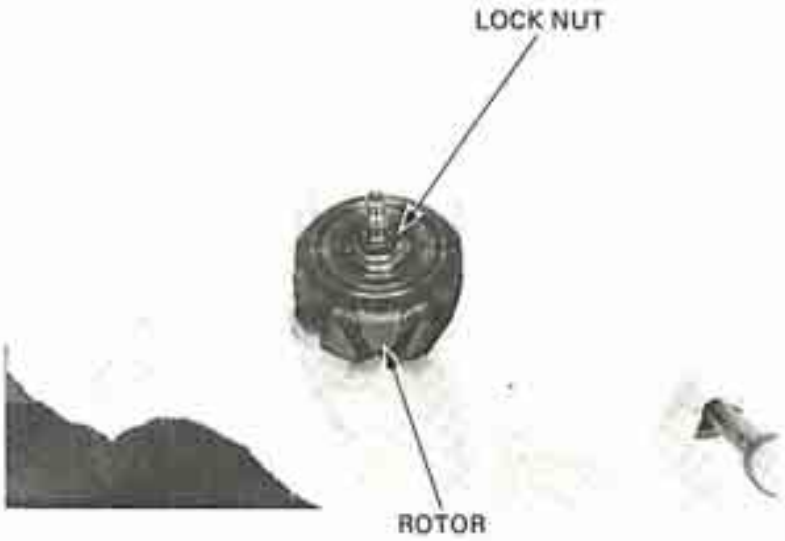
Remove the rotor shaft from the rotor housing.
Remove the bearing set plate and bearing.
Remove the dust seal.



Remove the rotor lock nut.
Remove the rotor shaft from the rotor.



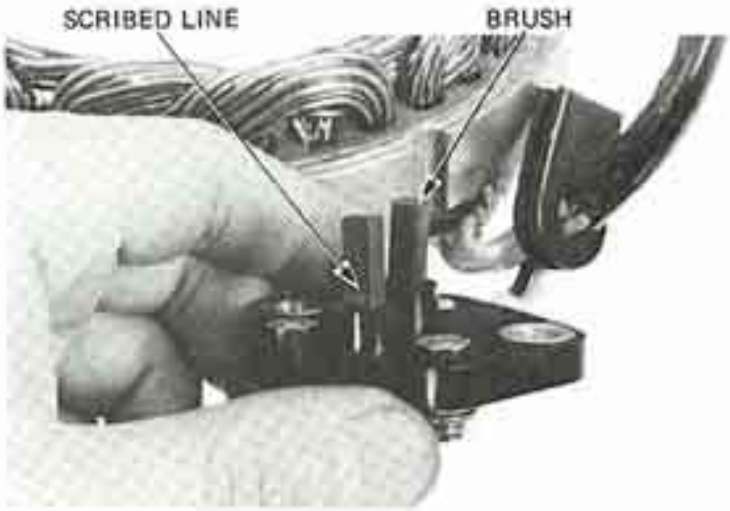
INSPECTION

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

SERVICE LIMIT: Scribed line

NOTE

Replace the brushes in pairs.



STATOR COIL CONTINUITY TEST

NOTE

It is not necessary to remove the stator to make this test.

Check the yellow leads to the alternator stator for continuity with each other. Replace the stator if any yellow lead is not continuous with the others, or if any lead has continuity to ground.

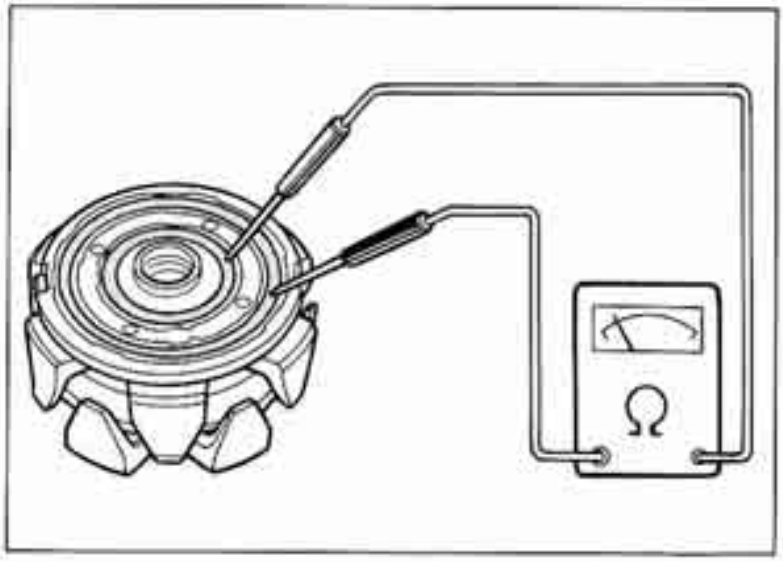
RESISTANCE: 0.32–0.40Ω

ROTOR CONTINUITY TEST

Check the resistance between the two rotor slip rings.

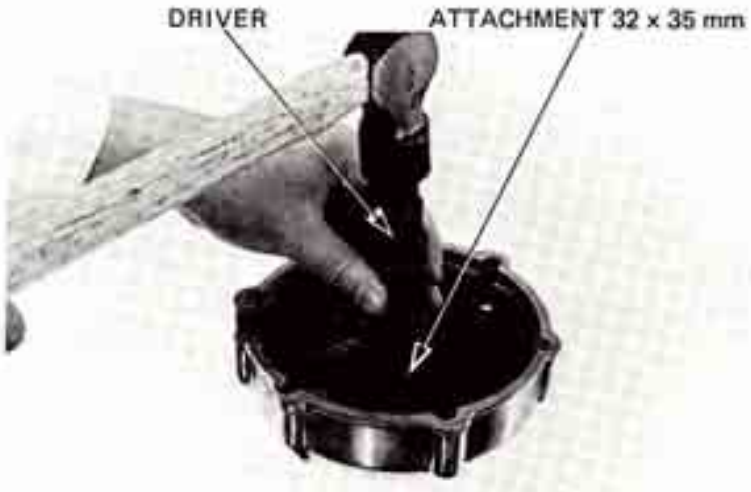
SLIP RING - TO - SLIP RING: 3.5–4.8Ω

Replace the rotor, if not within specifications.



ALTERNATOR ASSEMBLY

Pack the bearing cavities with grease.
Install the bearing into the generator cover.



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Install the dust seal.
Apply grease to the inside of the dust seal.

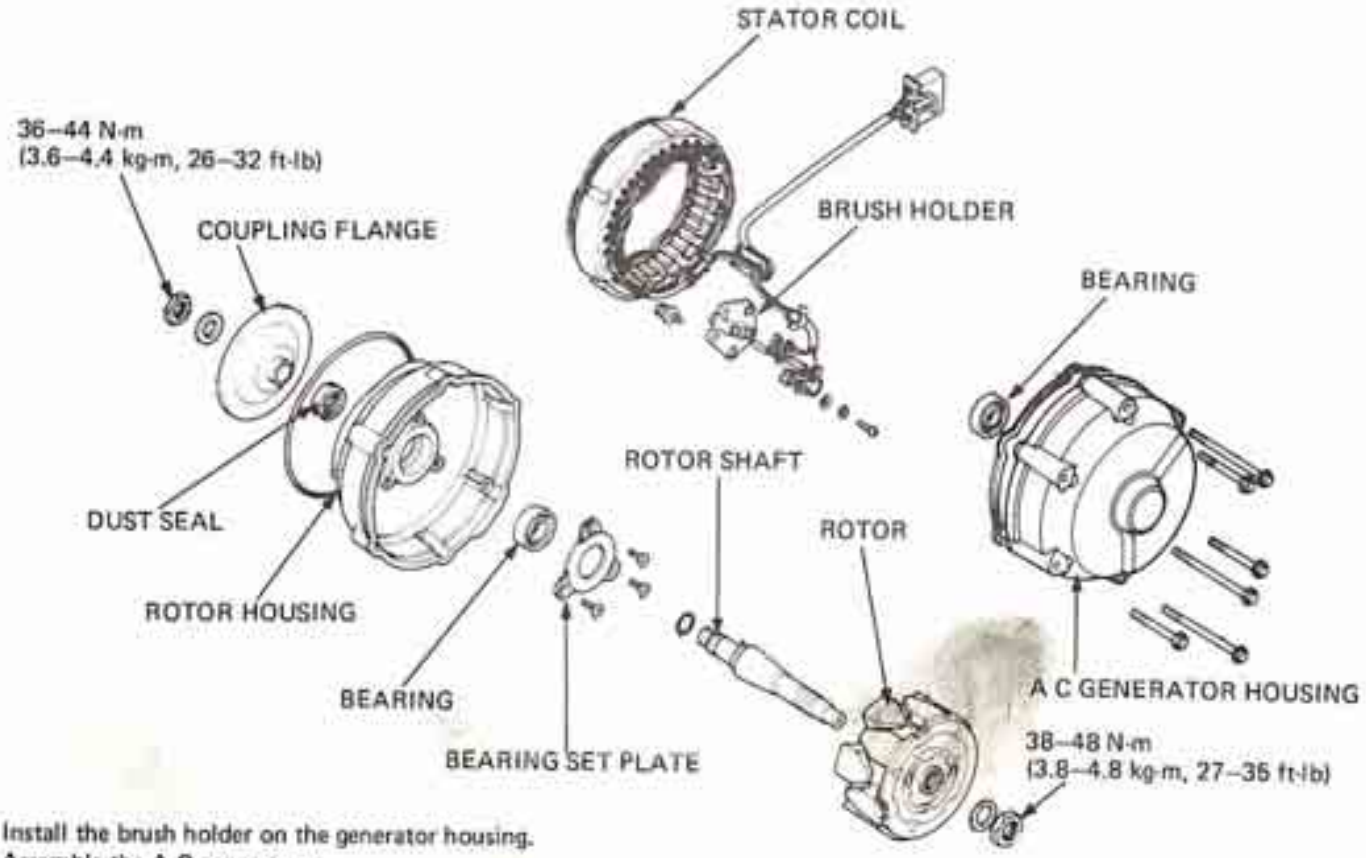
Pack the bearing cavities with grease.
Drive the bearing into the rotor housing.
Install the bearing setting plate.

Apply grease to a new o-ring.
Install the o-ring on the rotor shaft.
Clean the rotor shaft and rotor matching surfaces.
Install the rotor shaft into the rotor.
Tighten the lock nut.

TORQUE:
38–48 N·m (3.8–4.8 kg-m, 27–35 ft-lb)

Install the rotor shaft into the rotor housing.
Install the coupling on the rotor shaft and tighten the lock nut.

TORQUE:
36–44 N·m (3.6–4.4 kg-m, 26–32 ft-lb)



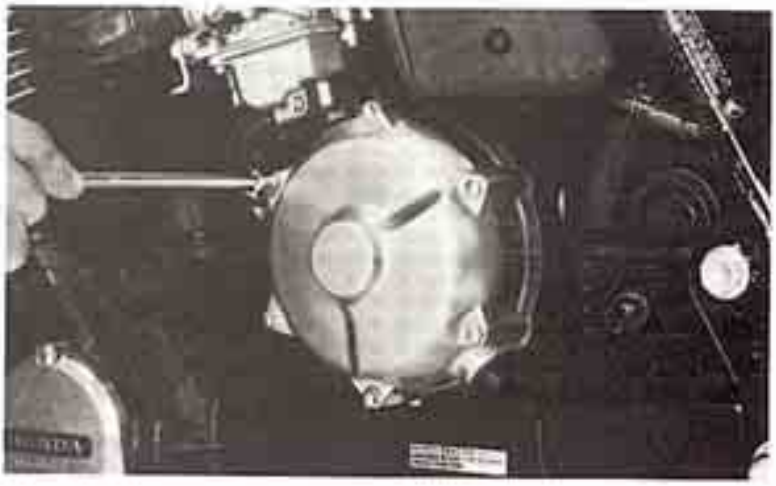
Install the brush holder on the generator housing.
Assemble the A C generator.

ALTERNATOR INSTALLATION

Install the alternator in the reverse order of removal.

CAUTION

When installing the alternator apply molybdenum disulfide grease to sliding surface of the couplings of the alternator.



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STATOR

INSPECTION

Remove the frame left side cover.
Turn the ignition switch on.
Measure battery voltage.
Connect a DC voltmeter to regulator red/white wire and ground. 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 8–10 volts. Check the wire and battery cable connections (photo), if battery voltage is not equal.
Disconnect the DC voltmeter.
Warm up the engine.

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.

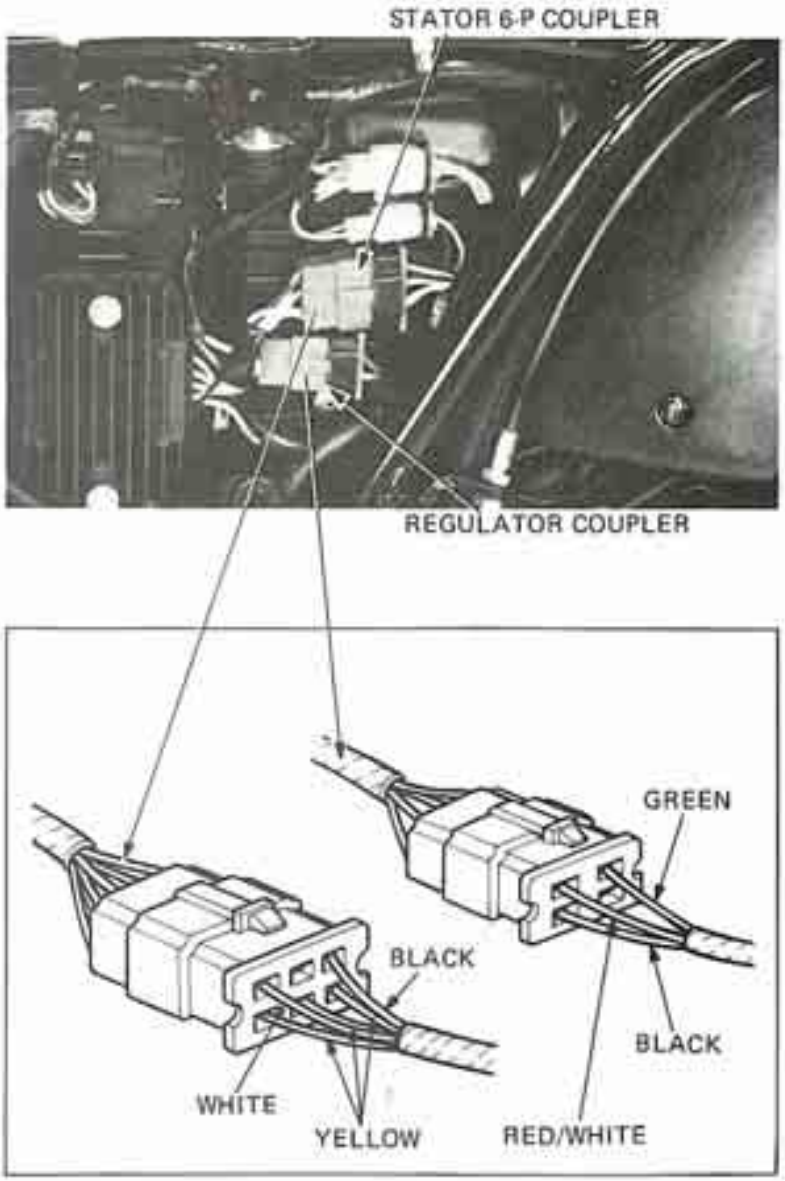
STATOR CONTINUITY TEST

Warm up the engine.
Stop the engine.
Remove the frame right side cover.
Disconnect the startor 6 - P coupler.
Check the resistance of the stator six pole connector wires.

Use the R x 1 ohmmeter scale.

Black-White:	10-12Ω
Yellow-Yellow:	0.4-0.5Ω
Yellow-ground:	∞

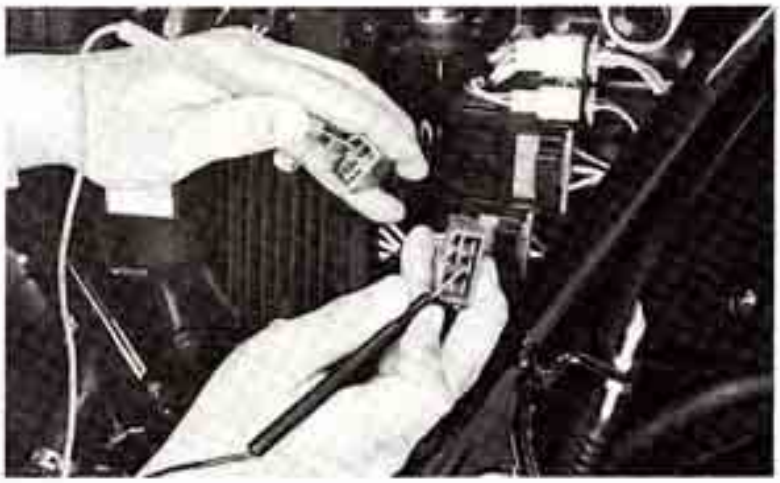
Replace the stator if not within specifications.



VOLTAGE REGULATOR/RECTIFIER

INSPECTION

Disconnect the regulator/rectifier couplers.
Check the resistance between the leads.
Replace the regulator/rectifier unit if the readings do not fall within the limits shown in the charts.



NOTE

- For accurate testing, it is necessary to use a high quality electrical tester. Use of an improper tester or measurements in improper range may give false readings.
- Use SANWA ELECTRICAL TESTER (P/N 07308-0020000).
- The resistances shown in the table indicate those to be read on the tester, not of specific circuits or parts.

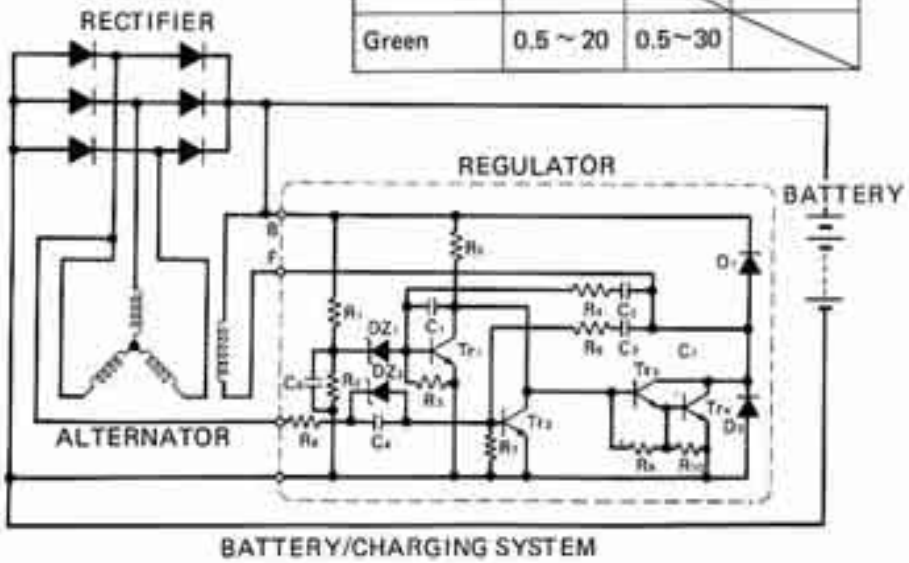
MEASURING RANGE:
SANWA SP-10D : XKΩ
KOWA TH-5H : X100Ω

RECTIFIER UNIT : kΩ

Probe (+) / Probe (−)	Red/White	Green	Yellow 1	Yellow 2	Yellow 3
Red/White		∞	∞	∞	∞
Green	0.5 ~ 50		0.5 ~ 50	0.5 ~ 50	0.5 ~ 50
Yellow 1	0.5 ~ 50	∞		∞	∞
Yellow 2	0.5 ~ 50	∞	∞		∞
Yellow 3	0.5 ~ 50	∞	∞	∞	

REGULATOR UNIT : kΩ

Probe (+) / Probe (−)	Black	White	Green
Black		1 ~ 30	0.5 ~ 20
White	0.5 ~ 30		1 ~ 50
Green	0.5 ~ 20	0.5~30	



BATTERY/CHARGING SYSTEM

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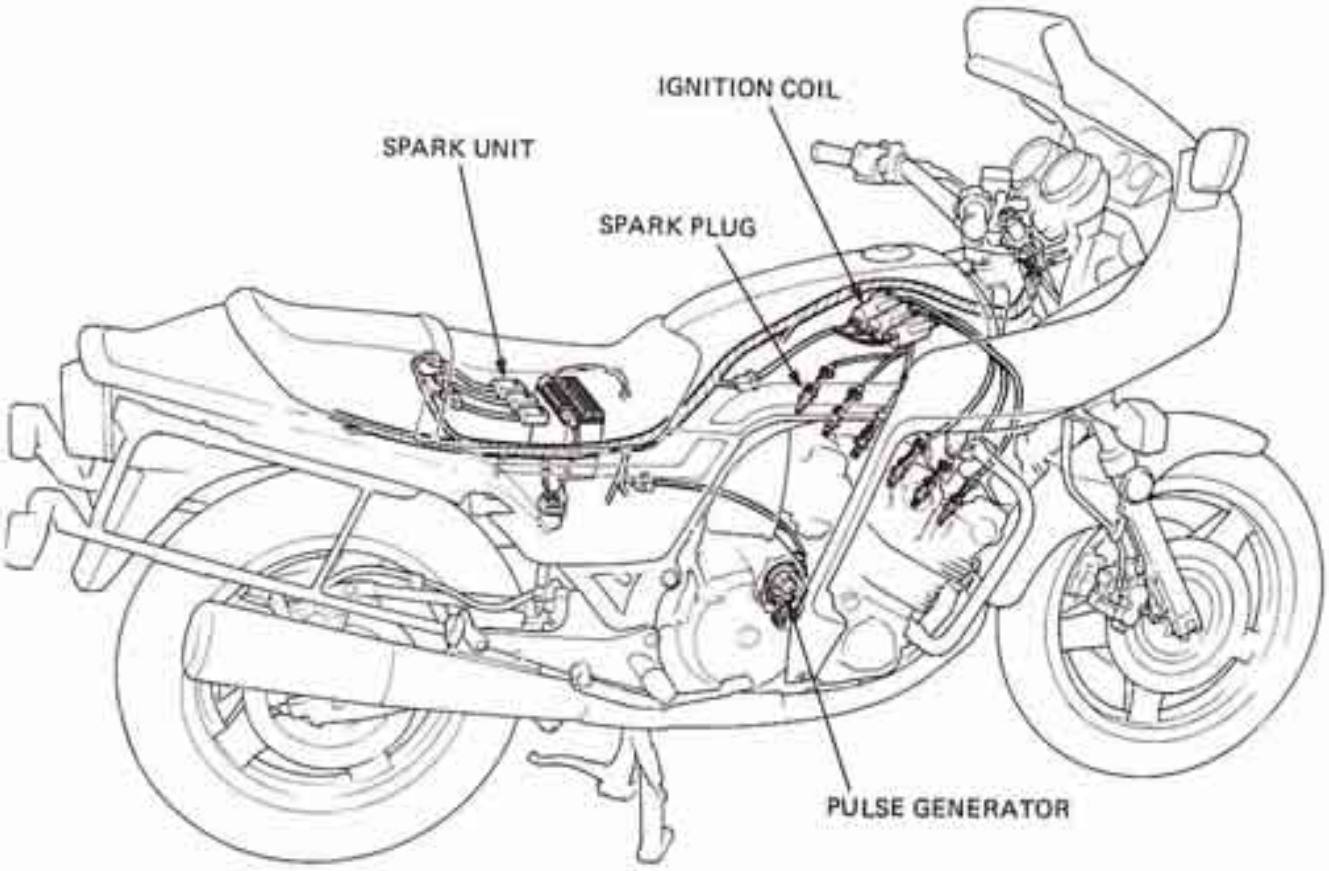

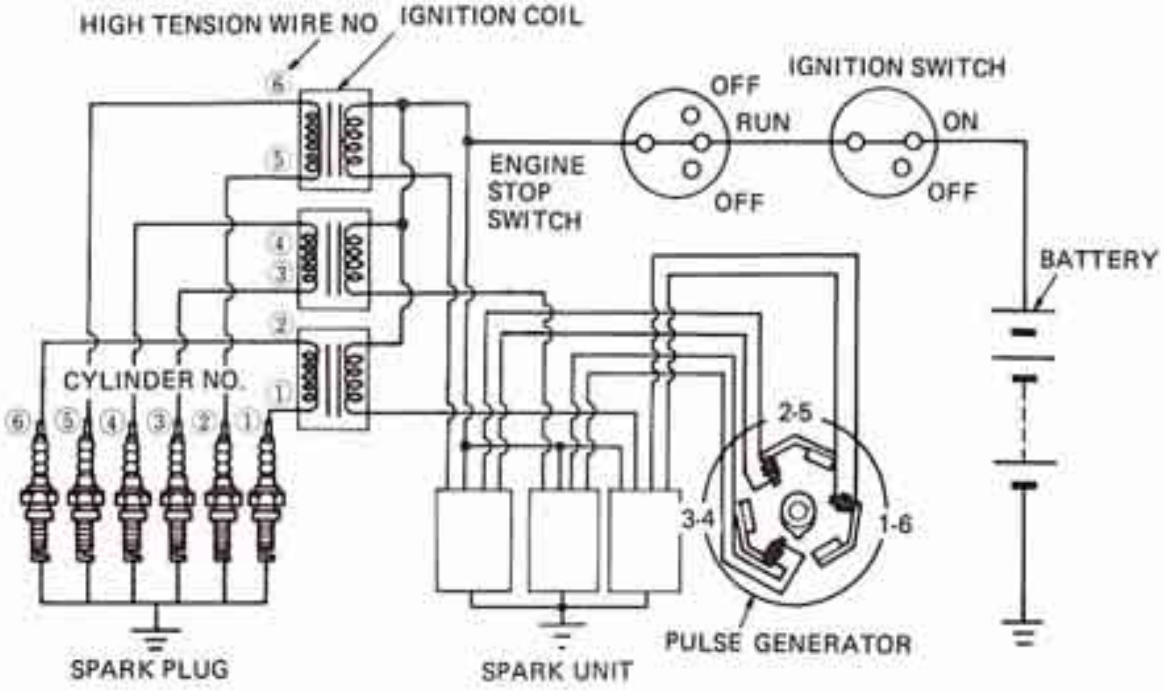

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SERVICE INFORMATION

GENERAL INSTRUCTIONS

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. 6 cylinder must be adjusted. For spark plug information, see page 3-4.

SPECIFICATION

Spark plug		For cold climate (below 5°C)	Standard	For extended high speed riding
U.S.A. model (optional)	ND NGK	X22ES-U (X22ESR-U) D7EA (DR7ES)	X24ES-U (X24ESR-U) D8EA (DR8ES-L)	X27ES-U (X27ESR-U) D9EA (DR8ES)
Canada model	ND NGK	X22ESR-U DR7ES	X24ESR-U DR8ES-L	X27ESR-U DR8ES
Spark plug gap	0.6 – 0.7 mm (0.024 – 0.028 in)			
Ignition timing	At idle Partial advance/rpm Full advance/rpm		10° (BTDC) 23.5° (BTDC)/2500 rpm 31° (BTDC)/8000 rpm	
Ignition coil	3-point gap		6 mm (0.24 in) min.	
Firing order	1–5–3–6–2–4			

TROUBLESHOOTING

NOTE

The ignition system is broken down into three sub-systems; one for No. 1 and No. 6 cylinders, one for No. 2 and No. 5 cylinders and one for No. 3 and No. 4 cylinders. First localize the trouble to one of these sub-systems, then proceed to the more detailed tests as described below.

Engine cranks but will not start
- Engine stop switch OFF.
- No spark at plugs
- Faulty transistorized spark unit
- Faulty pulse generator

No spark at plug
- Engine stop switch OFF
- 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
- Faulty ignition coil
- Faulty ignition switch
- Faulty spark unit
- Faulty pulse generator

Engine starts but runs poorly
- Ignition primary circuit
  - Faulty ignition coil
  - Loose or bare wire
  - Intermittent short circuit
- Secondary circuit
  - Faulty plug
  - Faulty high tension cord

Timing advance incorrect
- Centrifugal advancer faulty

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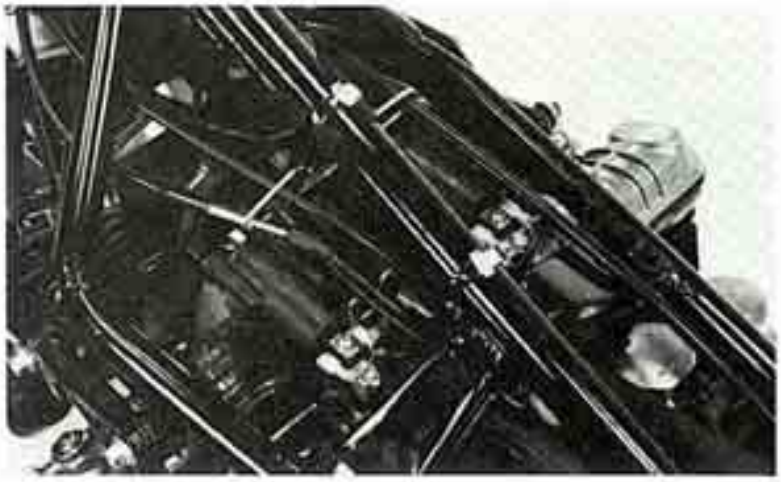
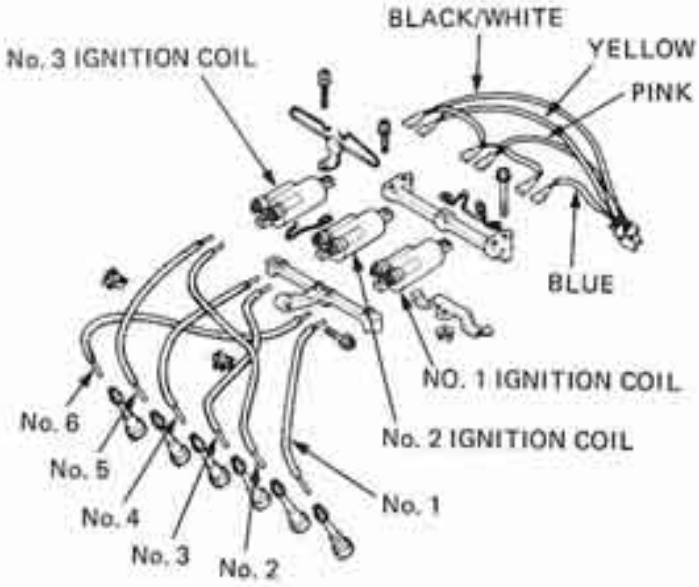
IGNITION COIL

REMOVAL

Remove the fuel tank.
Disconnect the wire leads.
Remove the coils by removing the attaching bolts.





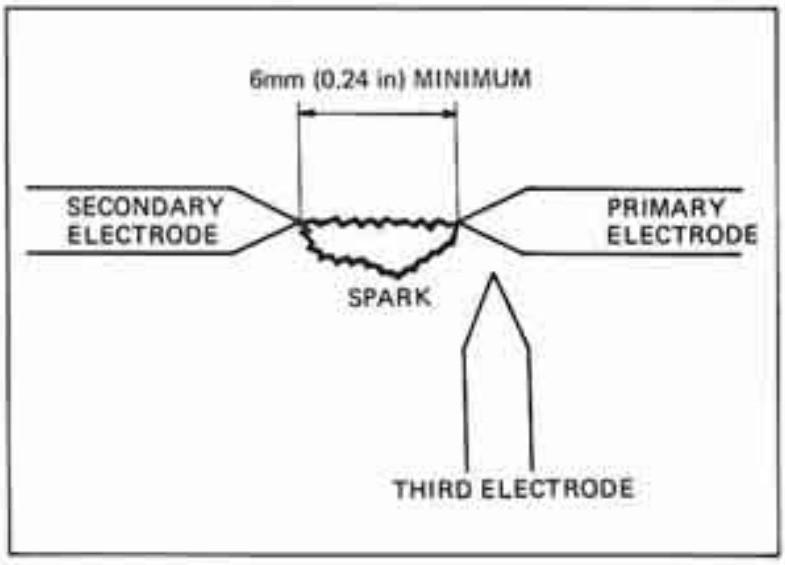
PERFORMANCE TEST

Perform the 3-point spark test with a coil tester.

SERVICE LIMIT: 6 mm (0.24 in) min

NOTE

For wire connection, follow the instructions supplied with the coil tester.



TRANSISTORIZED IGNITION SYSTEM

INSPECTION

System

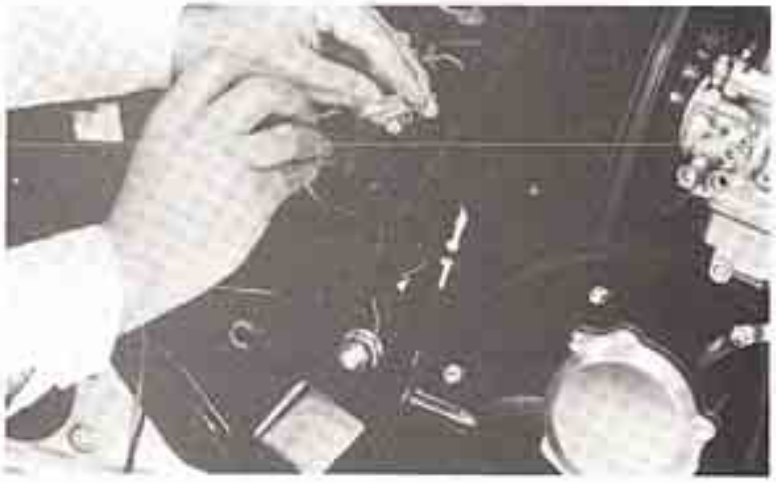
Disconnect the No. 4,5 and 6 spark plugs.
Hold each plug against any convenient engine ground.
Turn the ignition switch on.
Remove the pulse generator cover.
Touch the end of a screwdriver to the rotor and one pulse generator steel core.
Repeat this operation several times.
A good spark to the plug means that the ignition system for that cylinder is in good shape.
Repeat the above for the other two pulse generators.

Pulse generator

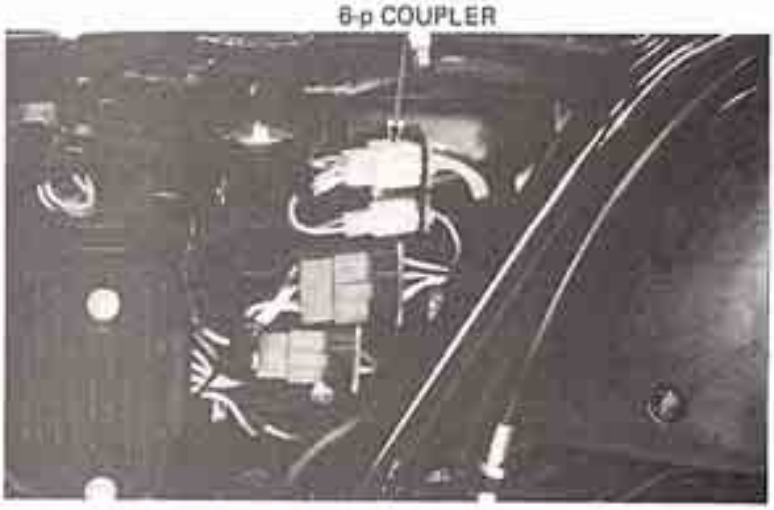
Measure the coil resistance.

COIL RESISTANCE: 530 ± 50Ω (20°C, 68°F)

Between pink leads (3,4 cylinders)
Between yellow leads (2,5 cylinders)
Between blue leads (1,6 cylinders)



6-p COUPLER



Spark unit

Disconnect the 6-P (red pulse generator) coupler.
Turn the ignition switch ON. Set the voltmeter to the 0-25V DC.

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Touch the positive lead of the voltmeter to the blue/yellow wire of the 1-6 spark unit coupler.
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 of the spark unit 6-P coupler. Voltage should drop to 0-2 VDC.

Move the positive voltmeter lead to the pink wire of the 3-4 spark unit coupler. Voltage should be 12V.

Move the jump wire lead from blue wire to pink wire of the 3-4 spark unit coupler. Voltage should drop to 0-2 V DC.

Move the voltmeter lead from the pink wire to the yellow wire of the 2-5 spark unit coupler.
Move the jump wire lead from the pink wire to the yellow/blue wire.
Voltage should change from 12 V to 0–2V.

Replace the spark units if they are faulty.

SPARK UNITS

PULSE GENERATOR REPLACEMENT

If pulse generator replacement is necessary, loosen the two pulser base plate screws.
Replace the pulse generator assembly.
Adjust the ignition timing (Page 3-4).

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 properly.

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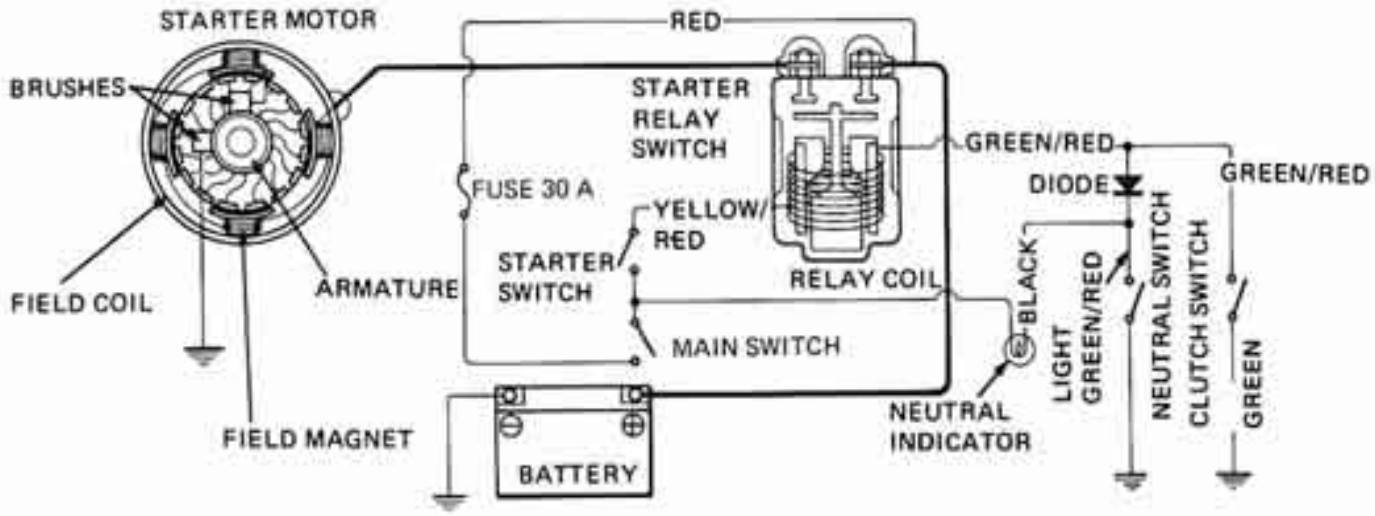
SERVICE INFORMATION

GENERAL INSTRUCTION

The starter motor can be removed with the engine in the frame.

SPECIFICATION

		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)



TROUBLESHOOTING

Starter Motor Will Not Turn:
- Battery discharged
- Faulty ignition switch
- Faulty start switch
- Faulty neutral switch
- Faulty starter magnetic switch
- Loosen 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 problems

STARTER MOTOR

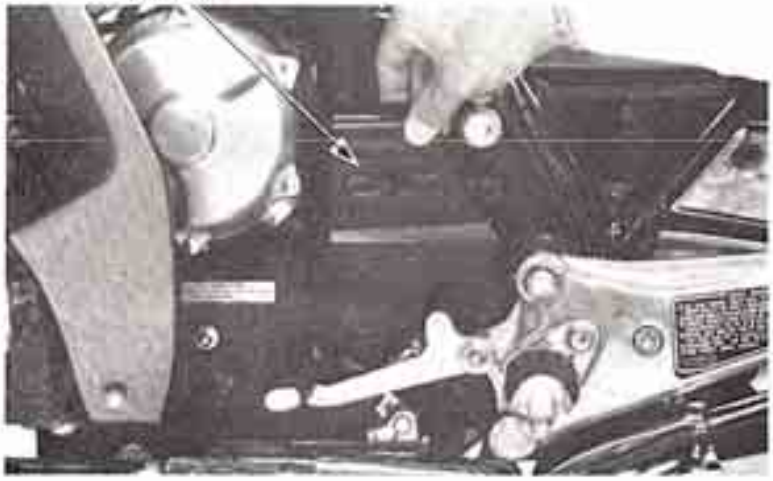
REMOVAL

WARNING

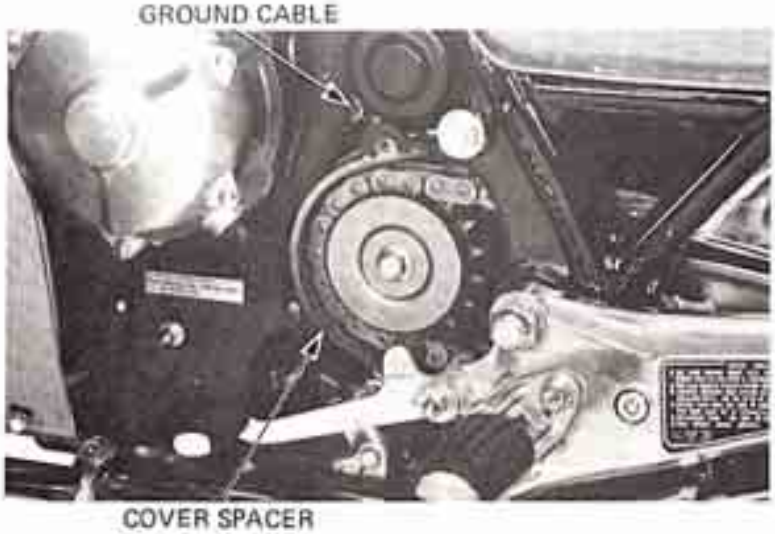
With the ignition switch OFF, remove the negative cable at the battery before servicing the starter motor.

Loosen the drive sprocket cover mounting bolts.

Remove the drive sprocket cover, and pull back and to the right.



Remove the starter motor ground cable and the drive sprocket cover spacer.



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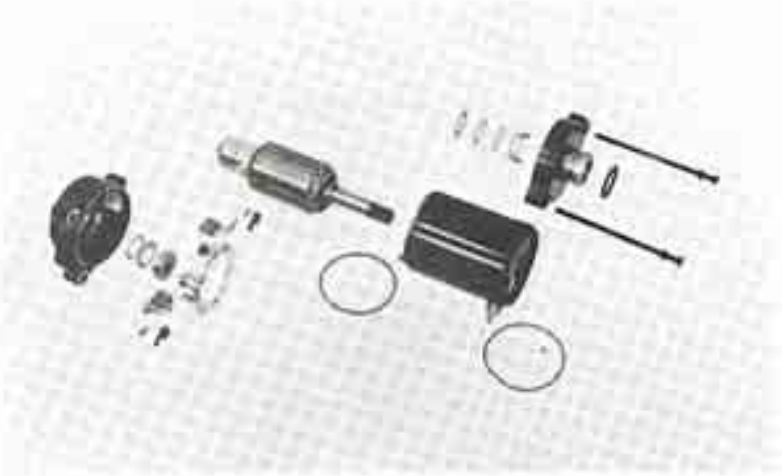
Remove the right side cover and disconnect the starter cable at the relay switch.
Remove the starter motor.

STARTER CABLE

STARTER RELAY SWITCH

STARTER MOTOR DISASSEMBLY

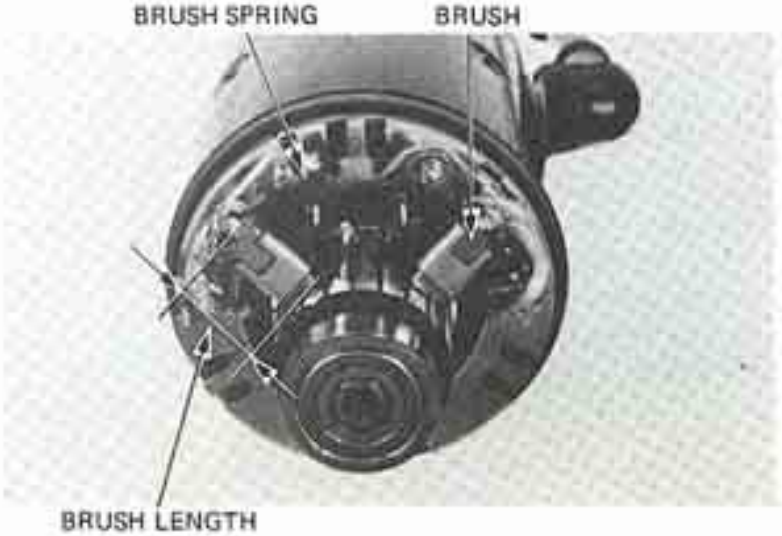
Remove the set bolts and disassemble the motor.



BRUSH INSPECTION

Remove the set bolts.
Remove the rear bracket.
Inspect the brushes and measure the brush length.
Measure the brush spring tension with a spring scale.

SERVICE LIMIT:
BRUSH LENGTH: 7.5 mm (0.30 in)
BRUSH SPRING TENSION: 560 g (19.75 oz)



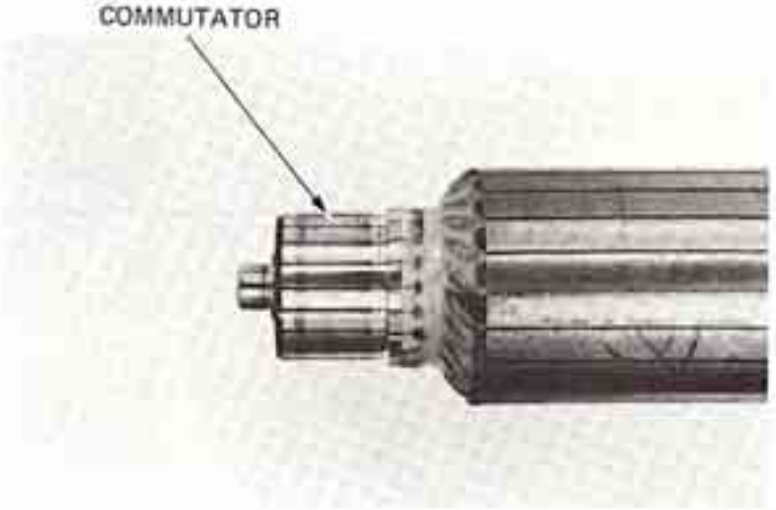
COMMUTATOR INSPECTION

Remove the starter motor case.

NOTE

Record the location and number of the 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.

Check for continuity between pairs of commutator bars, and also between commutator bars and armature shaft.
Replace the starter motor if armature coils are open, or shorted to the armature shaft.

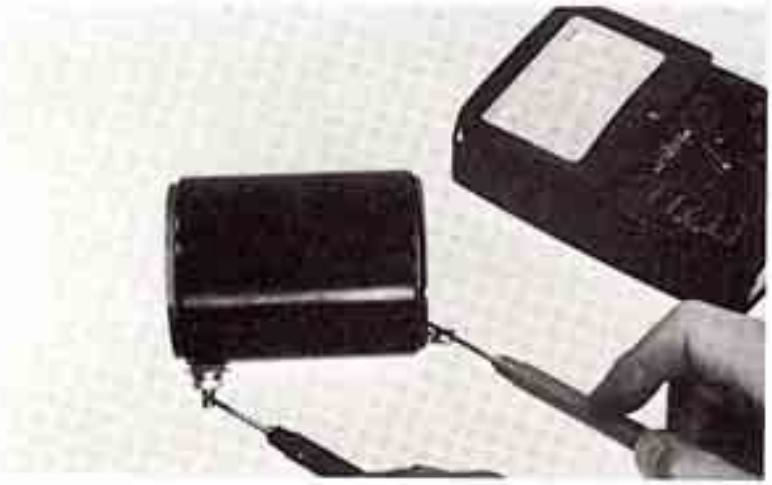
COMMUTATOR BAR PAIRS: continuity
COMMUTATOR-ARMATURE: No continuity
COMMUTATOR-SHAFT: No continuity

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

CABLE TERMINAL-BRUSH TERMINAL: Continuity



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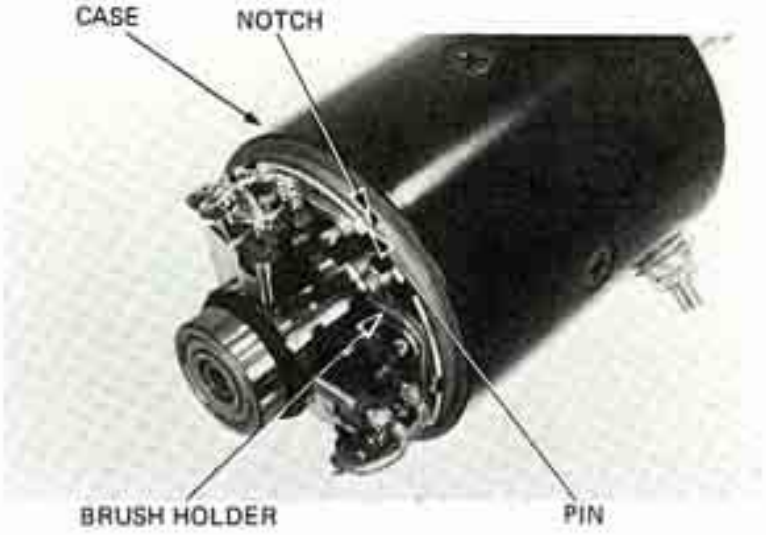
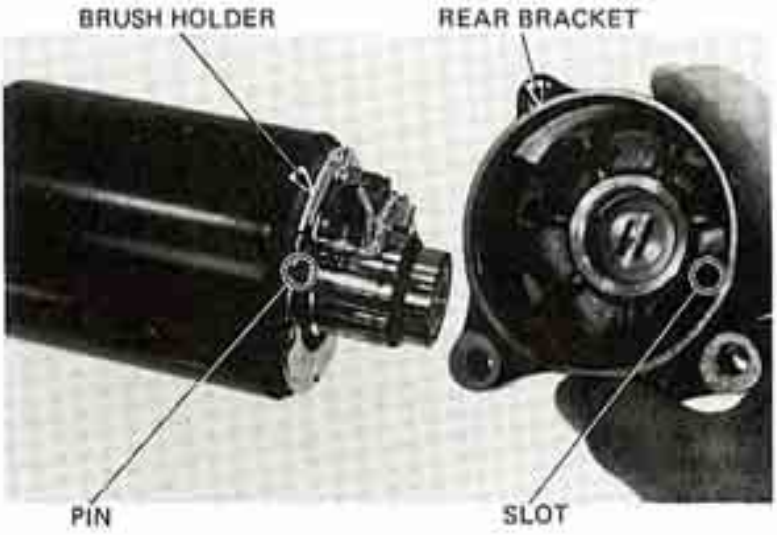
ASSEMBLY/INSTALLATION

Assemble the starter motor.
Align the case notch with the brush holder pin.



Install the rear bracket, aligning its slot with the brush holder pin.

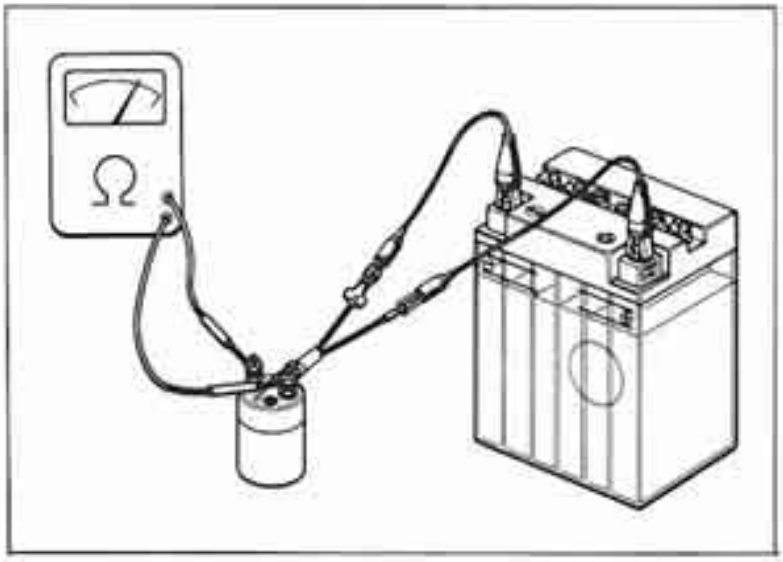


STARTER RELAY SWITCH

INSPECTION

Depress the starter switch button with the ignition ON.
The coil is normal if the magnetic switch clicks.

Connect an ohmmeter to the magnetic switch terminals.
Connect a 12 V battery to the switch cable terminals.
The switch is normal if there if there is continuity.



SERVICE INFORMATION

GENERAL INSTRUCTIONS

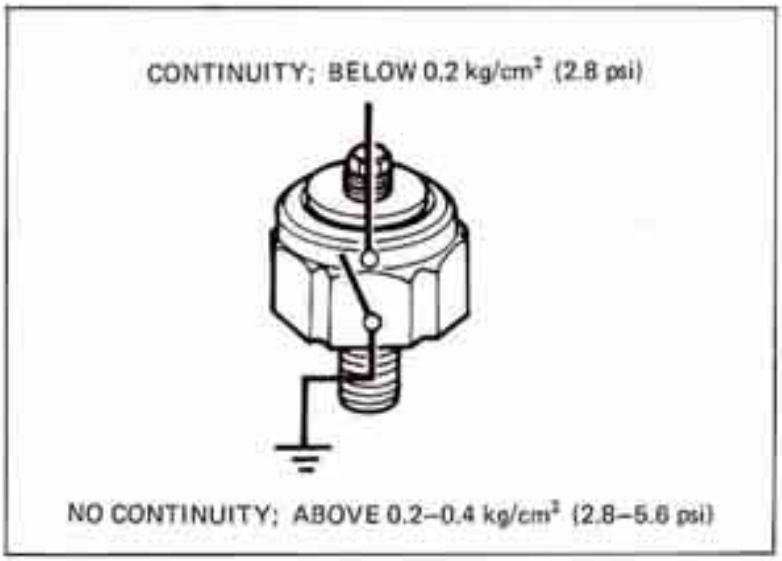
- All electrical wires and connectors are color-coded. When two or more different colored wires are connected, a colored tube that matches the significant color appears on the other wire near the connector. Observe the color codes before disconnecting any wires.
- All plastic plugs have locking tabs 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	=	Black	Br	=	Brown
Y	=	Yellow	O	=	Orange
L	=	Blue	Lb	=	Light Blue
G	=	Green	Lg	=	Light Green
R	=	Red	P	=	Pink
W	=	White	Gr	=	Gray

- In order 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 – by simply disconnecting the wires and connecting a continuity tester or volt-ohmmeter to the terminals or connections.
- A continuity tester is useful when checking to find out whether or not there is an electrical connection between the two points. If the quality of the circuit is important, as when there is a specific coil resistance involved, or when checking for high resistance caused by corroded connections, an ohmmeter is needed.

OIL PRESSURE WARNING SWITCH

Check for continuity while applying pressure to the switch.
Replace the switch if necessary.

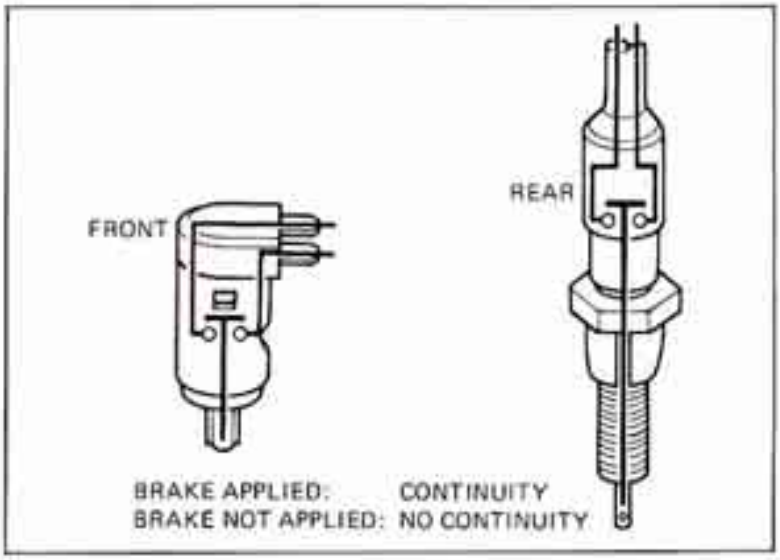


BRAKE SWITCHES

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.



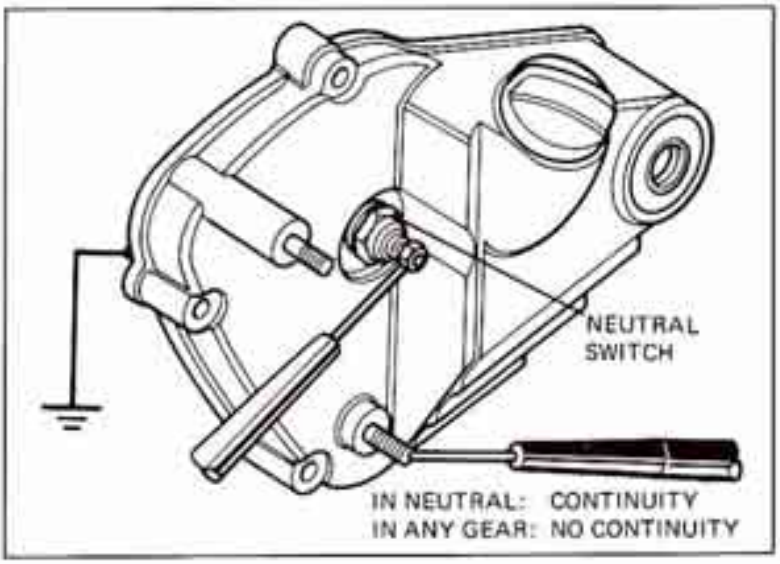
NEUTRAL SWITCH

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.

NOTE

To replace the neutral switch, remove the left muffler and oil hose cover.

Replace the neutral switch if necessary.



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HANDLEBAR SWITCHES

The handlebar cluster switches (lights, turn signals, horn, start and stop) 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

LO: L/W to W
MIDDLE (N): L/W to L to W
HI: L/W to L

Headlight Hi-Low Switch

	HI	Lo	Hi
Lo	○	○	
(N)	○	○	○
Hi	○		○
Code color	L/W	W	L

TURN SIGNAL SWITCH

RIGHT: Gr to Lb, Br/W to O/W
OFF: Br/W to O/W to Lb/W
LEFT: Gr to O, Br/W to Lb/W

Turn Signal Switch

	W	R	L	P	PR	PL
RIGHT	○	○		○		○
OFF				○	○	○
LEFT	○		○	○	○	
Code color	Gr	Lb	O	Br/W	Lb/W	O/W

HORN BUTTON

Lg to G with button depressed
No continuity with button released

B/R to L/W with button released
B to Y/R with button depressed

Horn Button

	Ho	E
FREE		
PUSH	○	○
Code color	Lg	G

Starter Button

	HL1	HL2	1G	ST
FREE	○	○		
START			○	○
Code color	B/R	L/W	B	Y/R

ENGINE STOP SWITCH

RUN: B to B/W
OFF: No continuity

Engine Stop Switch

	KB	KW
OFF		
RUN	○	○
OFF		
Code color	B	B/W

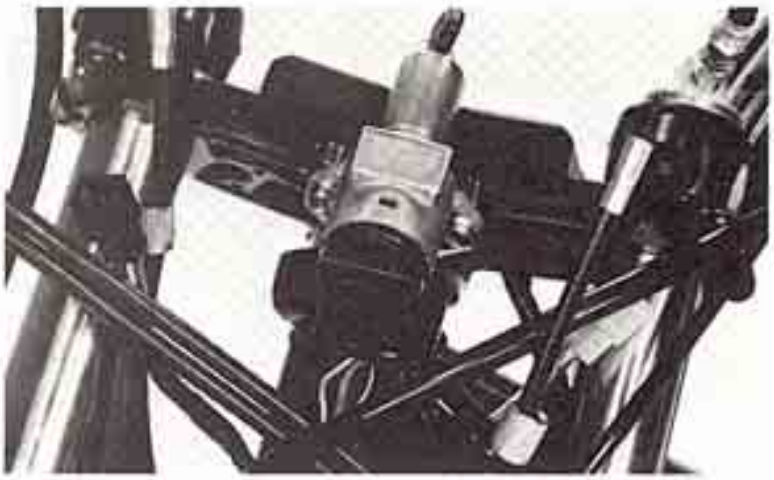
IGNITION SWITCH

Remove the instrument cluster and disconnect the plug.
Remove the ignition switch.

NOTE

Identify the wire colors at the connector. There are no colors on the switch.

Check continuity of terminals on the ignition switch in each switch position.

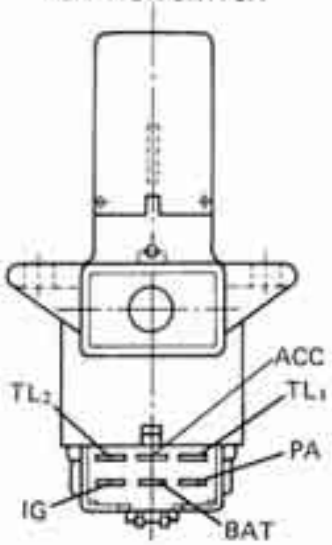


SWITCH POSITION

LOCK: No continuity
OFF: No continuity
ON: BAT to 1G to ACC, TL1 to TL2
PARK: BAT to ACC to P

Position \ Terminal	BAT	1G	ACC	TL1	TL2	P
LOCK						
OFF						
ACC	○		○			
ON	○	○	○	○	○	
PARK	○		○			○

IGNITION SWITCH



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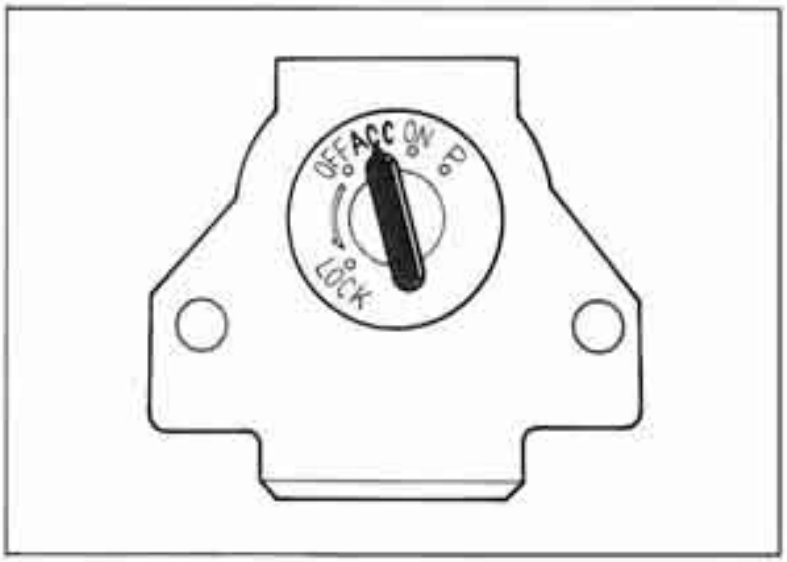
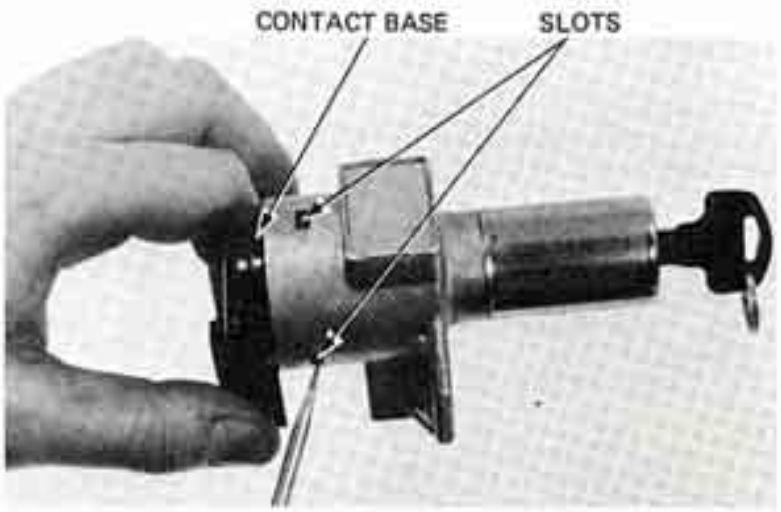
IGNITION SWITCH CONTACT BASE REPLACEMENT

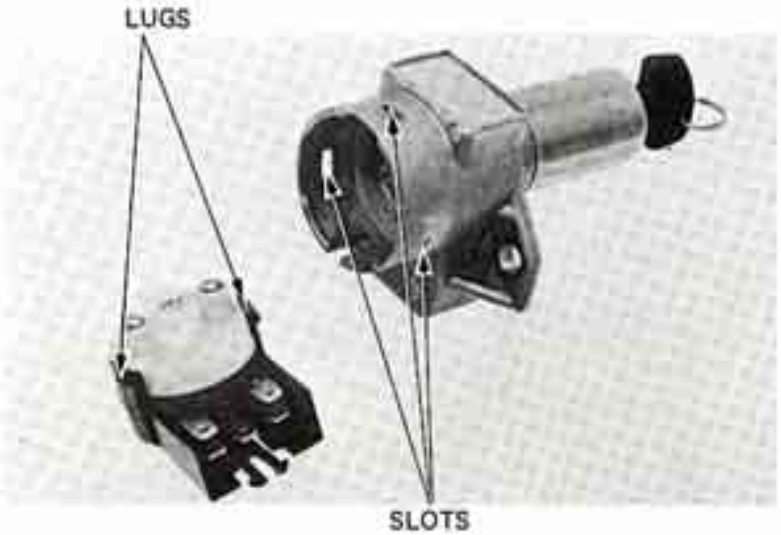
Remove the ignition switch, see page 19-4.
Insert the key and turn it the ACC positions.



Push the lugs from the slots and remove the contact base.



Assembly is the reverse of removal.



CLUTCH SWITCH

Check continuity of the clutch lever (safety) switch with the clutch released and applied.
Replace if necessary.

CLUTCH SWITCH

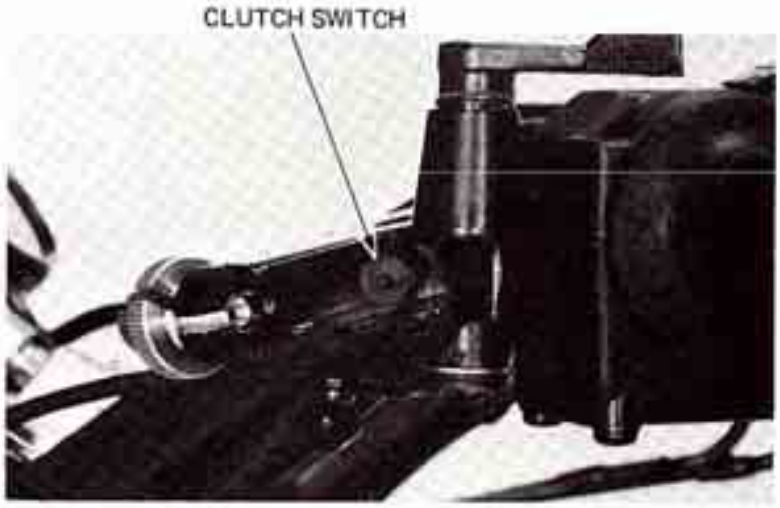
CLUTCH APPLIED: CONTINUITY
CLUTCH RELEASED: NO CONTINUITY

REMOVAL

Unplug the wires.
Remove the clutch lever and cable.
Remove the switch.

NOTE

The switch case has a small protrusion that must point toward the handlebar when installed.



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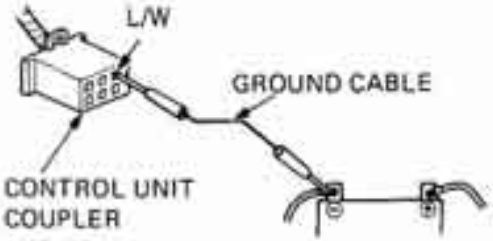
REAR SUSPENSION WARNING SYSTEM

TROUBLESHOOTING

The rear suspension air pressure warning light will light during running if there are certain abnormalities in the system. If this happens, observe the following:

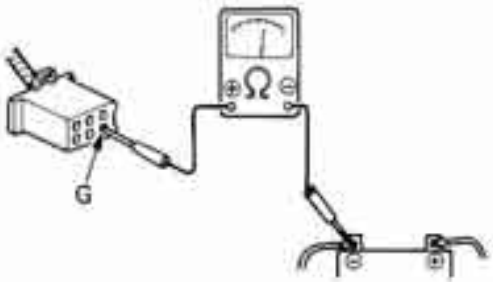
Stop the motorcycle, support it on the side stand and turn the ignition switch OFF.
Again turn the ignition switch ON to see if the warning lamp will light.

→A. If warning lamp still remains OFF, disconnect coupler from control unit and connect L/W terminal to battery negative (–) terminal with a ground cable.



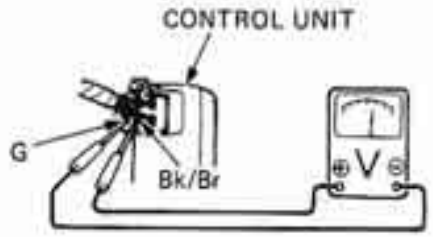
→**If lamp fails to come ON:**
- Blown bulb
- Blown fuse
- Loose or damaged connector
- Open circuit in wire harness (between coupler and bulb, and fuse and bulb)

If lamp comes ON: Check continuity between terminal G and battery negative (–) terminal.



→**No Continuity:**
- Loose or damaged connector
- Open circuit in wire harness (between terminal G and battery negative (–) terminal)

Continuity: Connect coupler to control unit and check voltage across terminal G and Bk/Br terminal.



→**Below 8V:**
- Loose or damaged connector
- Open circuit in wire harness (between B/Br and fuse)

Over 8V: Replace control unit.

→B. If lamp lights, but goes OUT within 3 seconds, replace control unit.

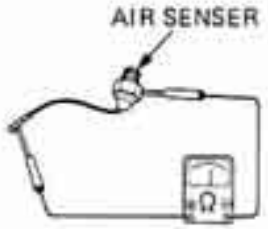
C.D.

→C. If lamp lights, but goes OUT after 3-7 seconds:

Support motorcycle on main stand and check air pressure in rear shock absorbers.

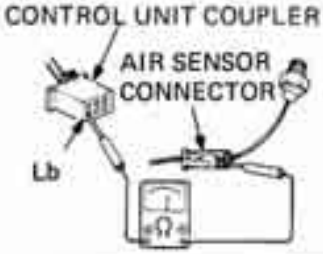
→ **Compression is Low**
- Leaky air hoses or connectors.
- Faulty shock absorber.

AIR PRESSURE: 2.0–4.5 kg/cm² (28–64 psi)
Disconnect air sensor connector, adjust air pressure and check switch operation. Replace if faulty.



→ **Below 2.0 (28 psi):**
Continuity
Above 3.2 (45 psi):
No continuity
- Faulty air pressure sensor

Below 2.0 kg/cm² (28 psi): No continuity
Above 3.2 kg/cm² (45 psi): Continuity
Disconnect coupler from control unit and check for continuity between Lb terminal and air sensor terminal.



→ **No continuity:**
- Loose or damaged connector
- Open circuit in wire harness (between terminal Lb and air sensor)

If there is continuity: Disconnect P wire connector at back of speedometer.
Disconnect air sensor Lb terminal wire.
Ground Lb terminal wire to frame ground.
Measure time required for lamp to come on after disconnecting ground.

→ Replace control unit if lamp comes ON within 4 seconds.

Replace air sensor if lamp comes ON after 4-8 seconds.

D

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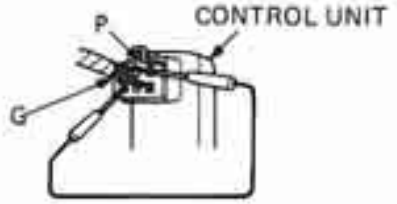
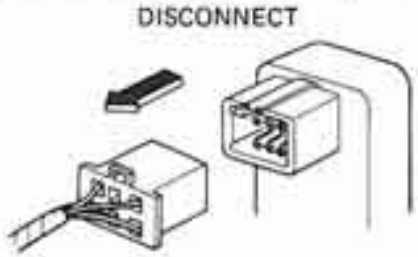
D. If lamp is kept ON:

Connect control unit coupler P and G terminals with a jumper cable.



If lamp remains ON: Disconnect control unit coupler.



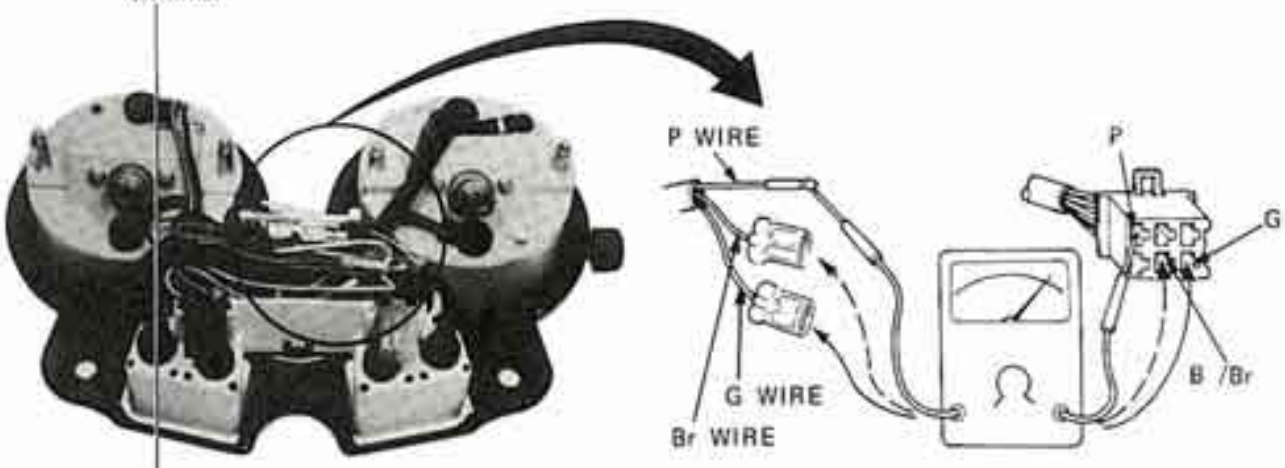
Lamp OFF: Replace control unit;

Lamp ON: Open circuit in wire harness (between lamp and B/W terminal)

Lamp goes OUT within 8 seconds:
Remove cover from back of meter cluster and disconnect P, B/Br and G wire connectors from speedometer, and check for continuity between terminals:
Control unit coupler P terminal and meter harness P terminal

Control unit coupler B/Br terminal and meter harness B/Br terminal

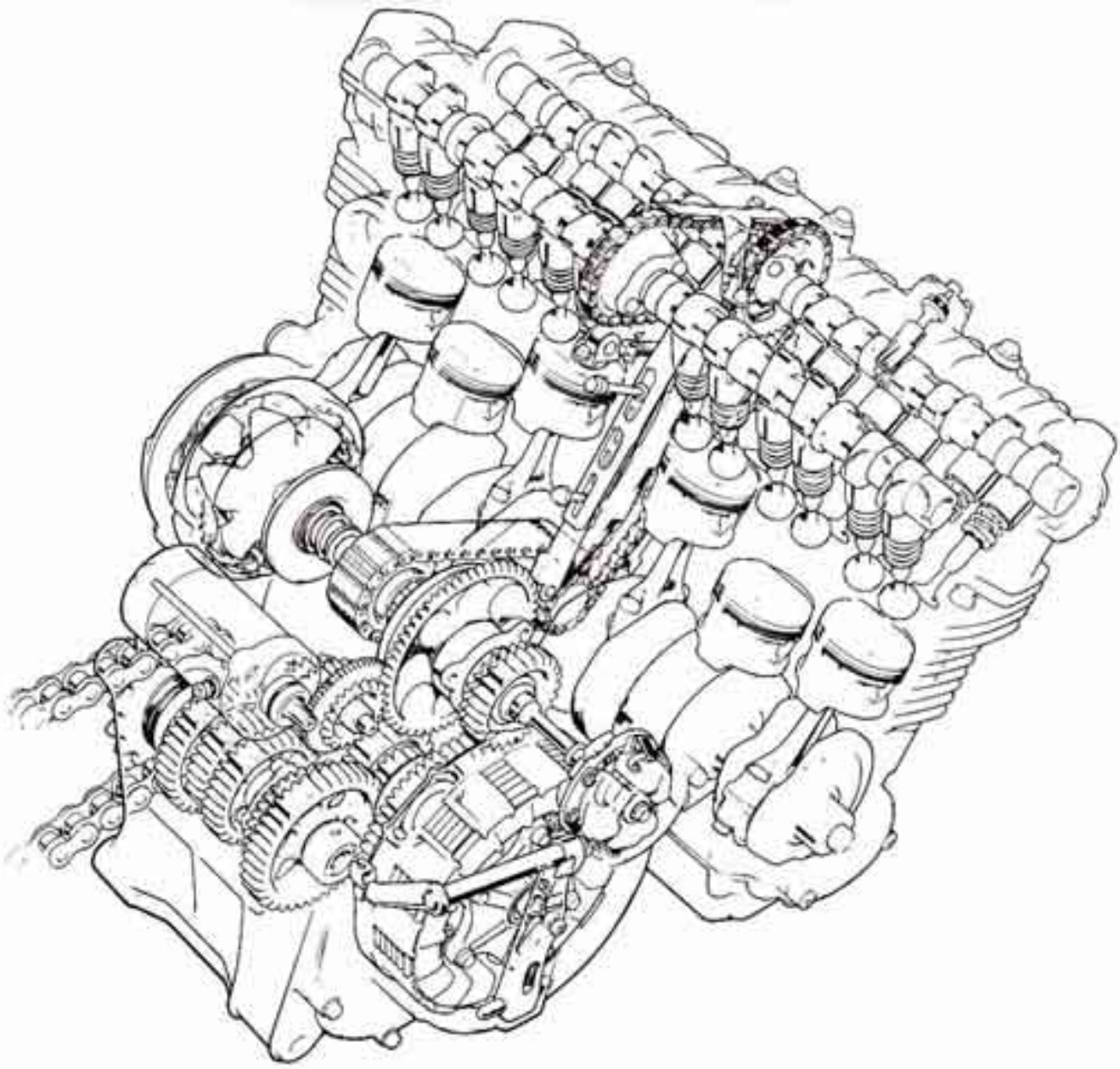
Control unit coupler G terminal and meter harness G terminal



No continuity:
- Loose or damaged connector
- Open circuit

Continuity: Replace speedometer

ENGINE CONSTRUCTION



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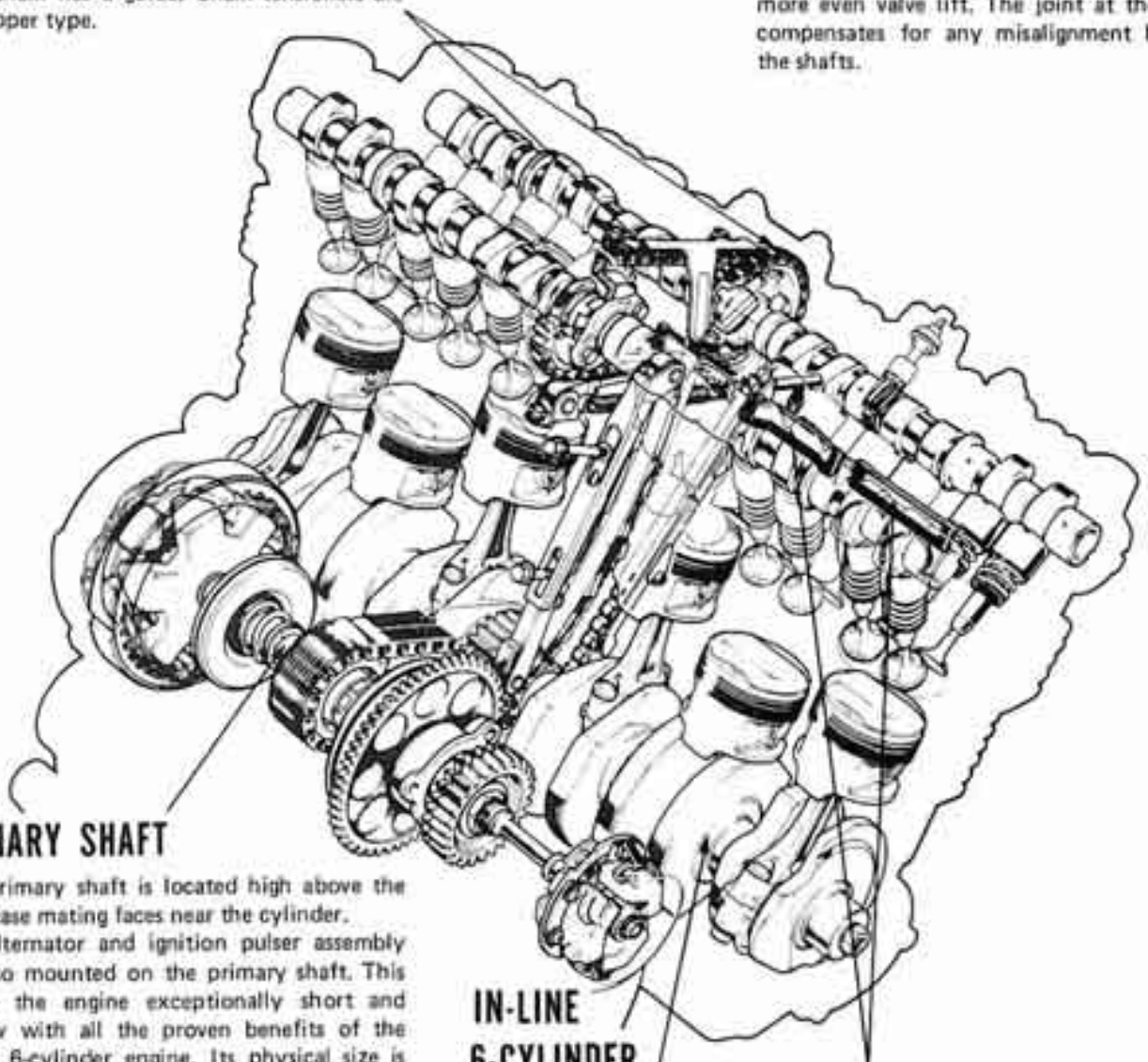
DUAL CAM CHAINS

Dual cam chains drive the camshafts. Drive is transmitted from the crankshaft to the exhaust camshafts and from there to the intake camshafts. This eliminates a diagonal chain path through the rear of the engine, reducing the distance between the carburetors and cylinders.
The narrow air cleaner and canted carburetors eliminate interference with the rider's legs.
The cam chains are durable silent type.
Each chain has a guide. Chain tensioners are the slipper type.

24 VALVES, SEPARATED CAMSHAFTS

Each cylinder has two intake and two exhaust valves. The arrangement insures effective breathing at high speed without valve float. Four valves instead of two allow a large overall port area with a low reciprocating weight for each valve spring.
The camshafts are of a two-piece forging. The separated shafts provide rigidity with more even valve lift. The joint at the center compensates for any misalignment between the shafts.



PRIMARY SHAFT

The primary shaft is located high above the crankcase mating faces near the cylinder.
The alternator and ignition pulser assembly are also mounted on the primary shaft. This makes the engine exceptionally short and narrow with all the proven benefits of the in-line 6-cylinder engine. Its physical size is equal to the standard in-line 4-cylinder motorcycles in its cc class.

IN-LINE 6-CYLINDER ARRANGEMENT

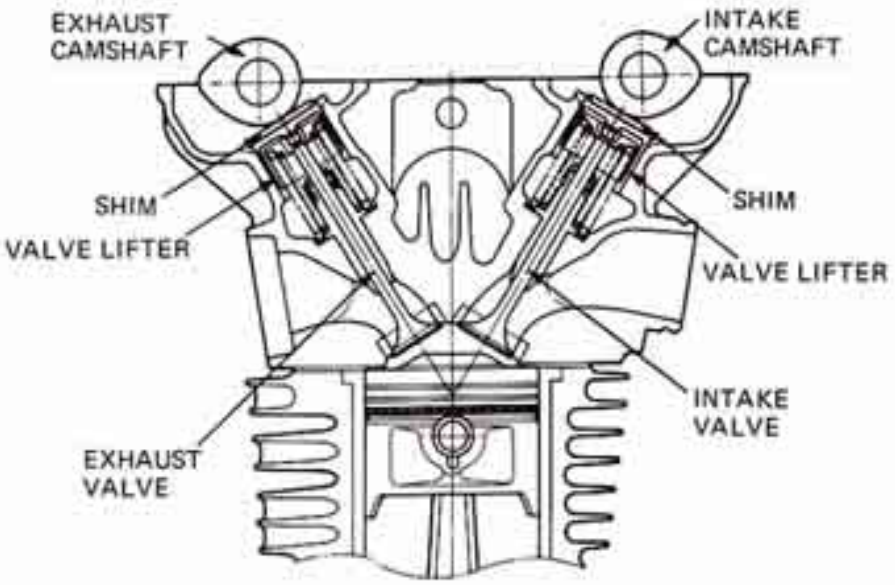
The in-line ultra short 53.4 mm stroke 6-cylinder arrangement reduces the vehicle's height. It also reduces piston speed and minimizes wear.

CAMSHAFT OIL POOL PLATES

The engine oil is collected in the camshaft troughs by oil pool plates for positive lubrication of the valve lifters and cams.
The plates also contribute to quieter valve operation.

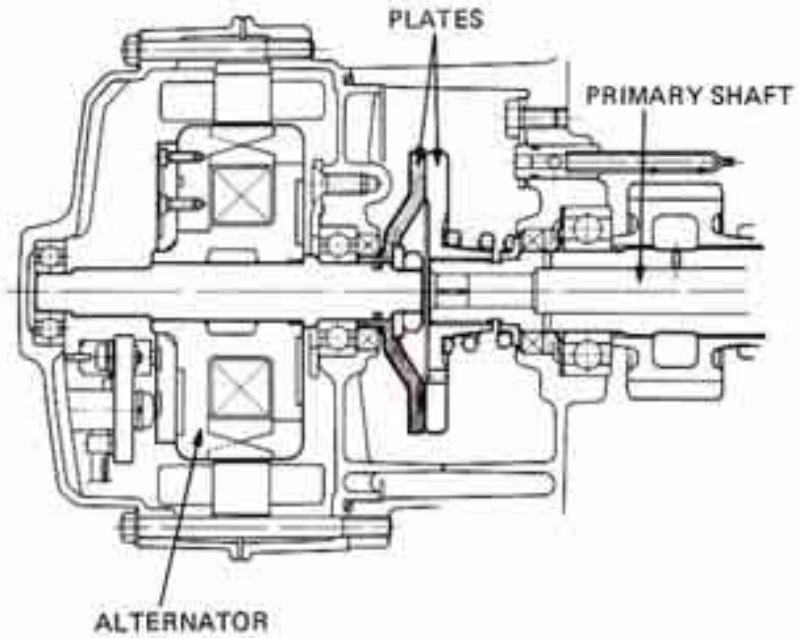
VALVE MECHANISM

The valves are operated by the cams through the valve lifters. The shims can be removed and installed easily without removing the camshafts by pushing down on the lifters with a special tool.



ALTERNATOR COUPLING

Power from the primary shaft is transmitted to the alternator through a frictional coupling. The coupling consists of two steel discs pressed against each other by a spring. Relative movement between the discs prevents excessive inertia from being transmitted directly from the alternator to the primary chain when snapping the throttle.



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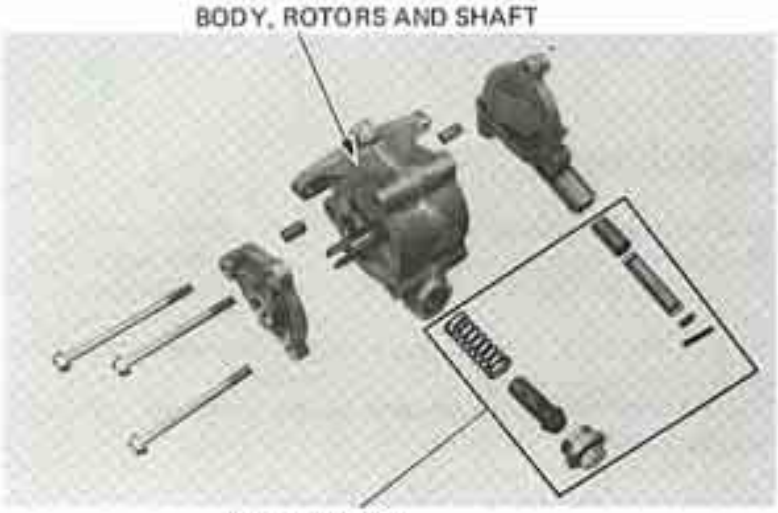
OIL COOLER, OIL PUMP

The lubricating system uses a wet sump with the sump at the crankcase bottom. The oil is cooled by an oil cooler.

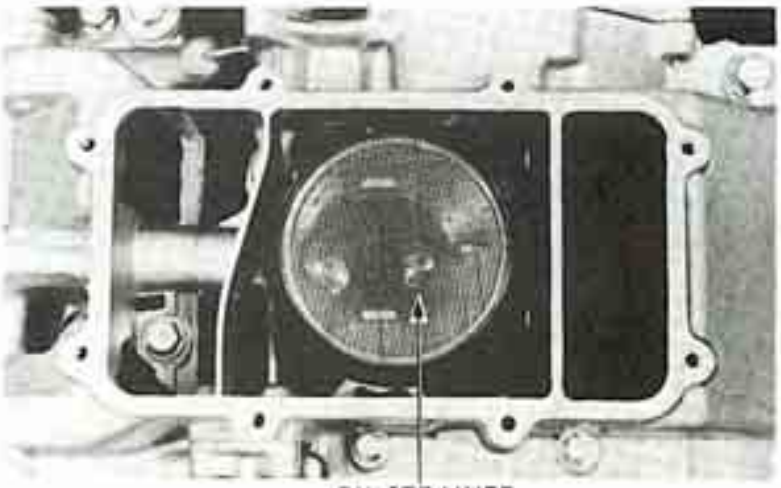
OIL COOLER

A tandem trocoid pump supplies oil to the bearings and other moving parts of the engine. Oil from the oil sump is forced by the main pump into the crankshaft and cylinder head.
The auxiliary pump feeds oil to the primary shaft and transmission. The oil cooler is in the auxiliary pump circuit and cools the oil drawn from the sump by the auxiliary pump. The oil damper in the primary chain receives oil from this pump circuit.



OIL PRESSURE
RELIEF VALVES

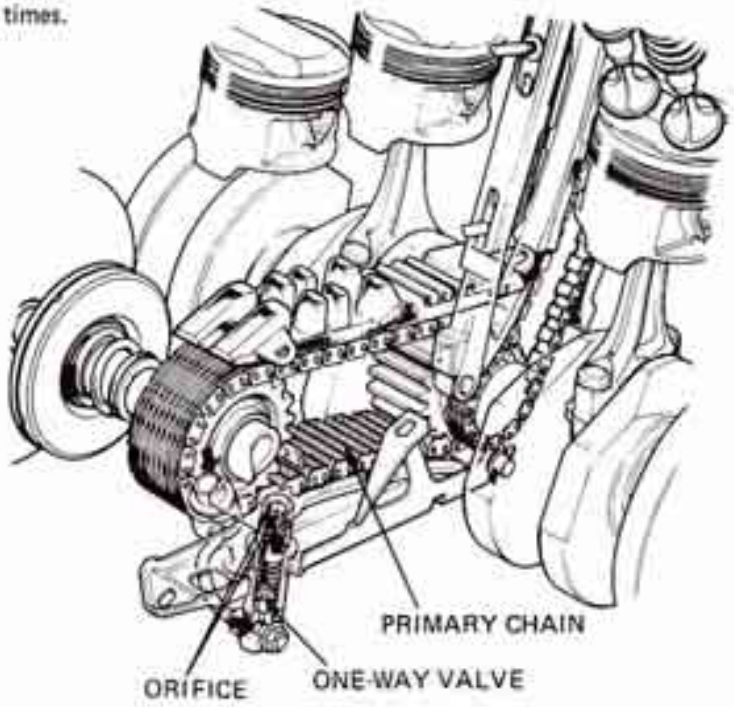
Oil from the sump must pass through a strainer before it enters the pumps.



OIL STRAINER

OIL DAMPER TYPE PRIMARY CHAIN TENSIONER

Primary chain tension is controlled by an oil dampened chain tensioner. It consists of a one-way check valve using a steel ball, a spring and a tension bar. The bar has an oil chamber with small orifices at its end. Oil in the chamber compensates for cavitation, assuring positive damper action at all times.

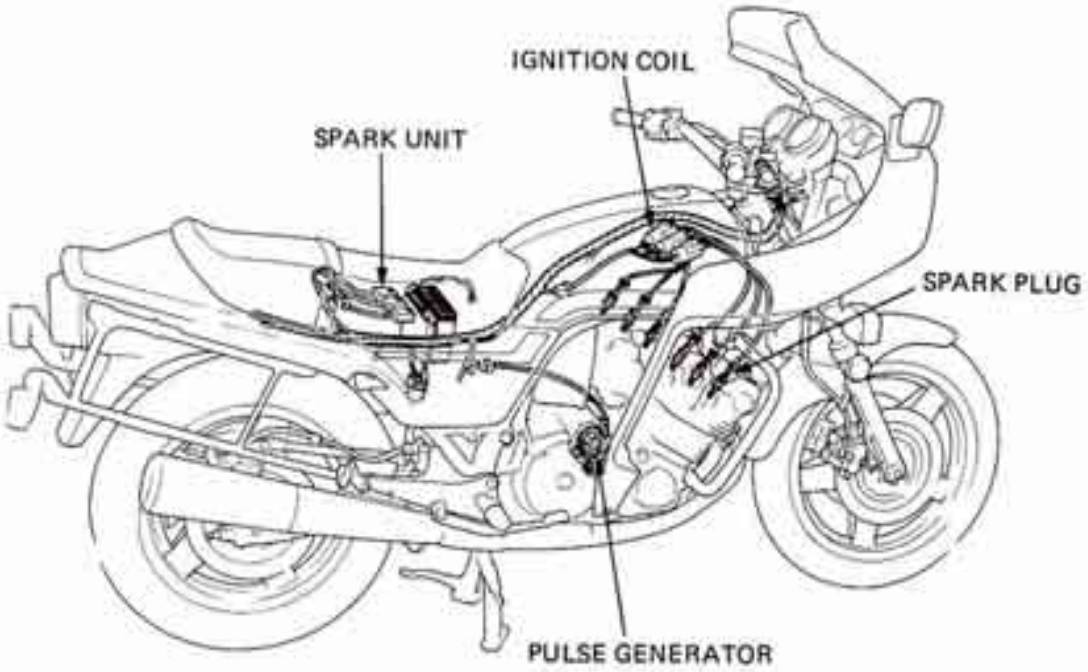


TRANSISTORIZED IGNITION

The engine uses a transistorized ignition. A pulse generator and transistorized spark unit supply current to the primary circuit. The system is free from problems that occur in mechanical breaker systems. It produces stable secondary energy and eliminates periodic adjustments and maintenance services. There are three independent systems; one for 1 & 6, 2 & 5, and 3 & 4 cylinders.

The generator rotor is connected to the primary shaft so they turn as a unit as the shaft rotates. Three generating coils are spaced evenly on the base plate, 120 degrees apart.

When the rotor turns, pulses are generated as it passes over the coils. Adjusting timing for 1 & 6 cylinders automatically adjusts the other cylinders.



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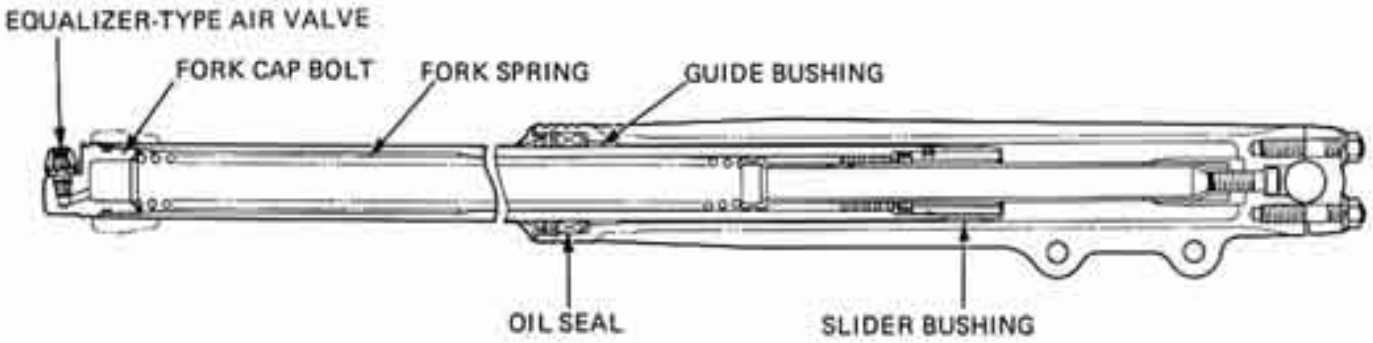
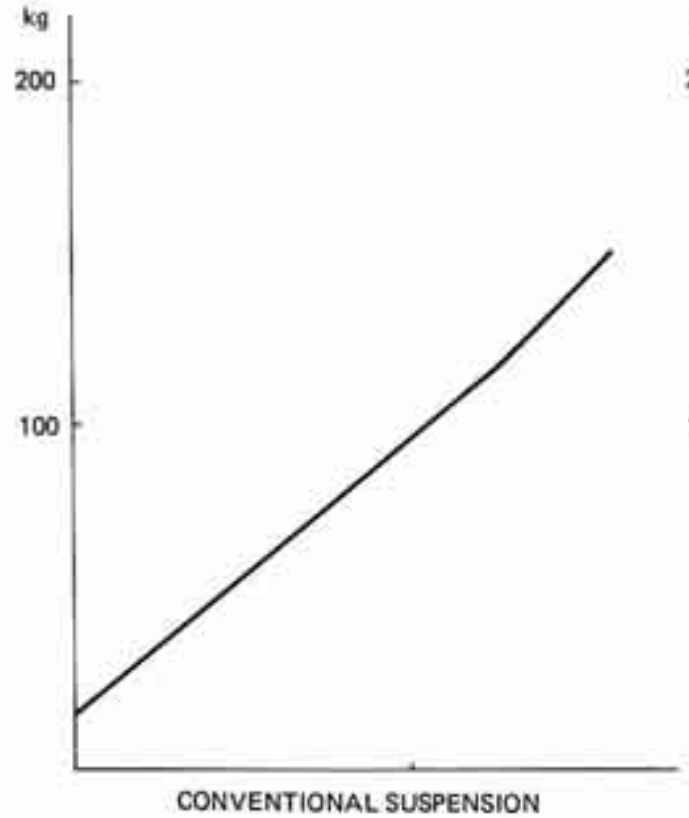
FRONT AIR FORKS

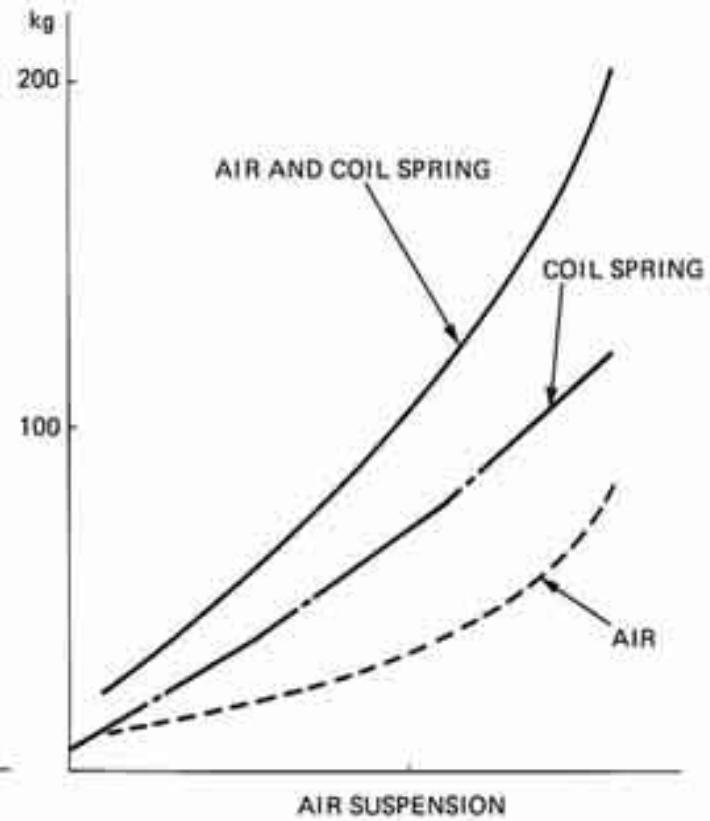
The front forks uses air and a coil spring. The air chamber is inside each fork tube connected with equalizer tube to an air valve at the fork cap bolt.



When adjusted correctly, the air fork system provides a more progressive compression than a conventional fork. The air fork system can be adjusted to each individual's preference to compensate for load and riding conditions.



CONVENTIONAL SUSPENSION

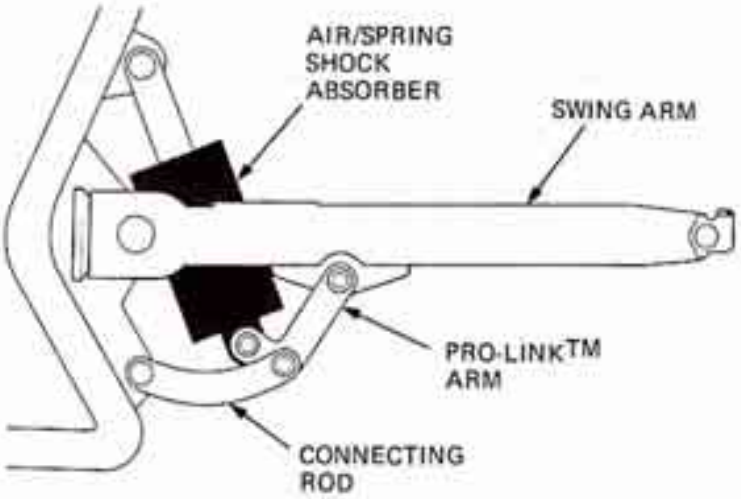


AIR SUSPENSION

PRO-LINK (PROGRESSIVE LINKAGE) STREET REAR SUSPENSION

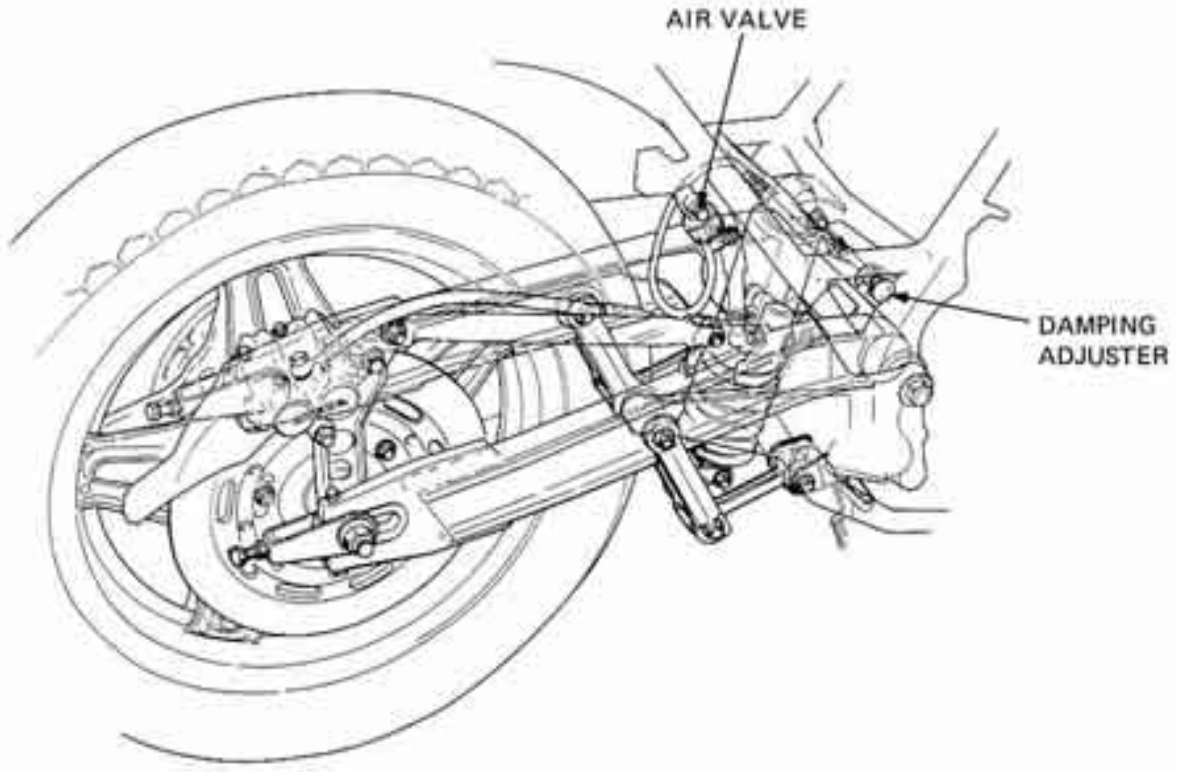
INTRODUCTION

This motorcycle has the Pro-Link Street Rear Suspension System with a two-way adjustable air/spring shock absorber to provide the desired ride under various road conditions and rider/cargo combinations. This system gives good bottoming resistance and at the same time, provides acceptably soft initial travel for smaller bumps.
Low air pressure settings provide a softer ride and are for light loads and smooth road conditions. High air pressure settings provide a firmer ride and are for heavy loads and rough road conditions.



The action of the street system is not as progressive as that of the competition system. Also, the shock absorber position in the street version is considerably lower than in the dirt system, in order to keep the center of gravity of the motorcycle as low as possible, and to allow room above the shock absorber for the battery and other electrical components.

Shock absorbers used in the street Pro-Link™ systems are of the air/spring type: this gives good bottoming resistance, and at the same time, provides acceptably soft initial travel for smaller bumps.



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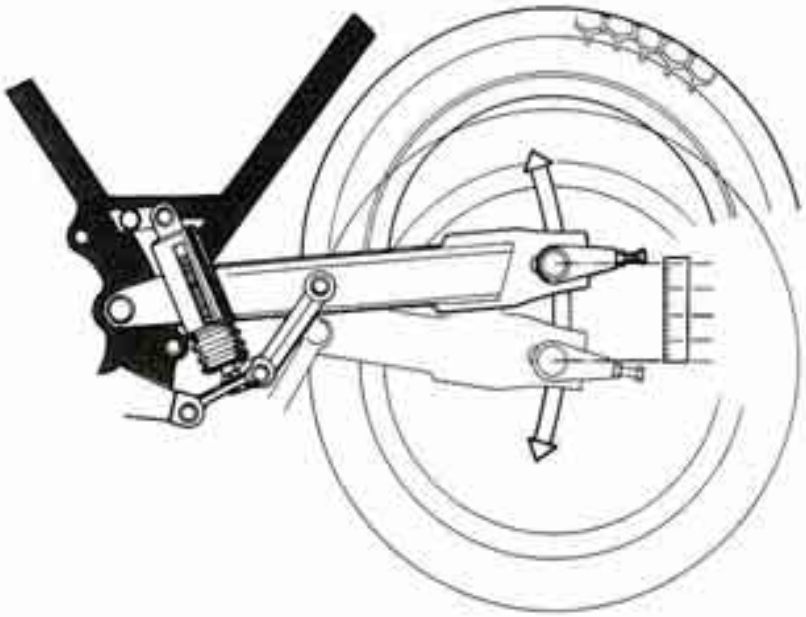
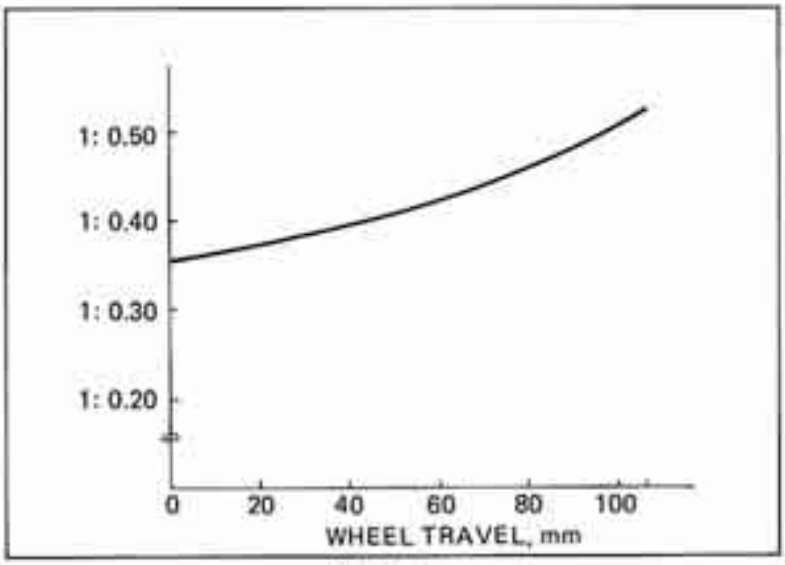
OPERATION

As the wheel and swingarm are driven up by bumps, the shock absorber is compressed by the shock arm which is held in a precise arc by the shock link. As wheel travel increases the shock arm rises above the swingarm proportionately, increasing absorber compression.
This provides the required progressive rise rate; the shock absorber moves only about one-fourth of wheel travel at the beginning and moves about one-third of wheel travel near the end.

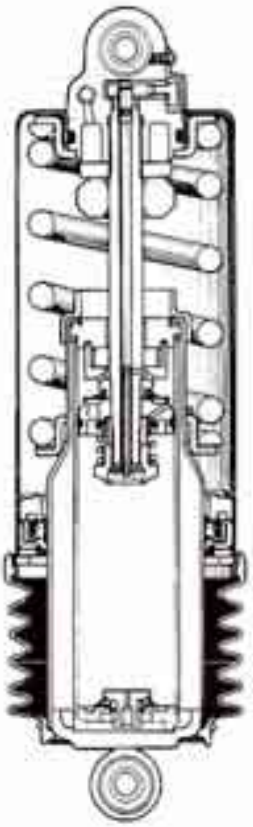


This graph shows the wheel travel/shock travel ratio through the entire stroke of a CBX Pro-Link system.

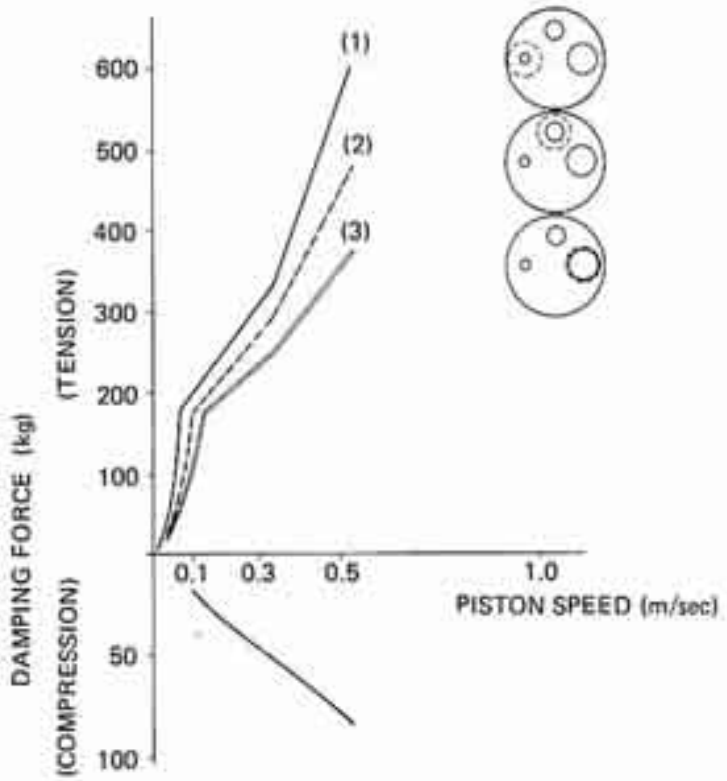
WHEEL TRAVEL/SHOCK TRAVEL RATIO



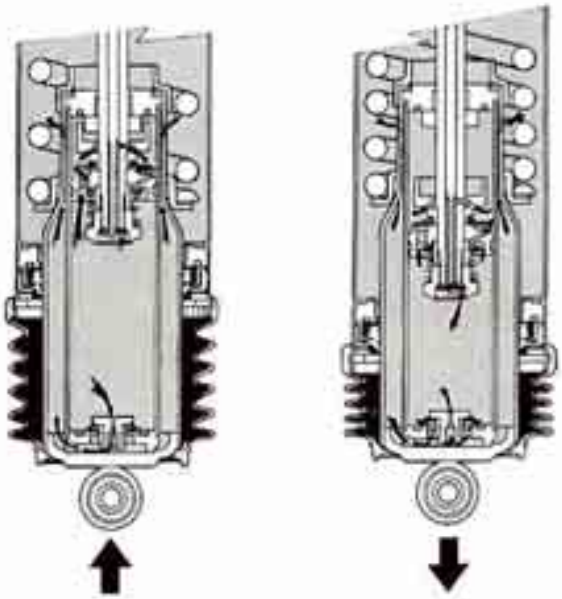
The CBX shock absorber has provision for three stages of damping adjustment:



DAMPING FORCE CHARACTERISTICS



OIL FLOW CHART



COMPRESSION REBOUND

(1) Recommended Rear Suspension Adjustment:

Rear Air Pressure	Rider/ Load	REBOUND DAMPING ADJUSTER	RIDING CONDITIONS
200 kPa (2.0 kg/cm², 28 psi) ↕ 400 kPa (4.0 kg/cm², 57 psi)	One ↕ Up to vehicle capacity load	1	General or around town riding
		2	Highway or winding road riding
		3	Rough road riding

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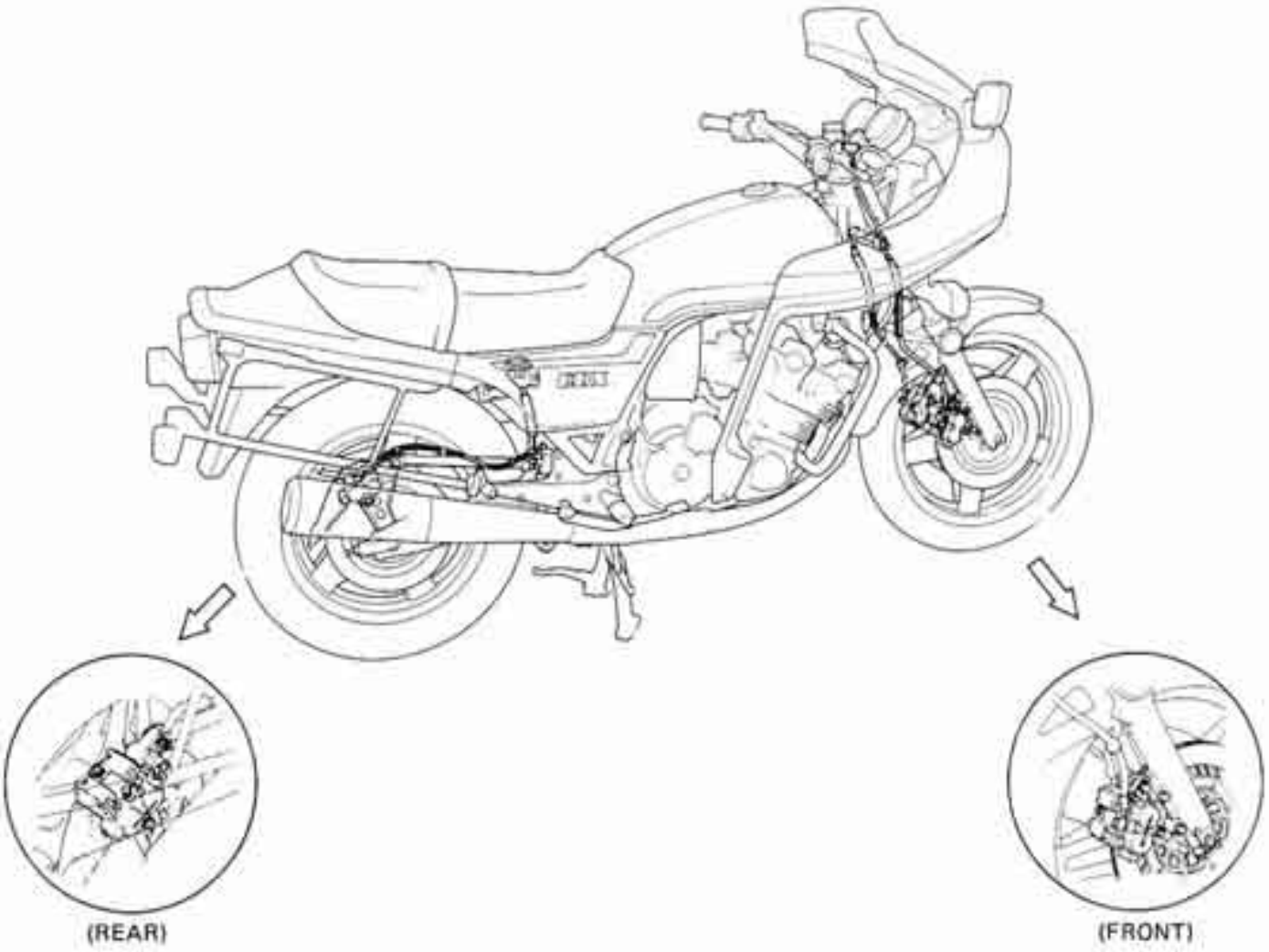
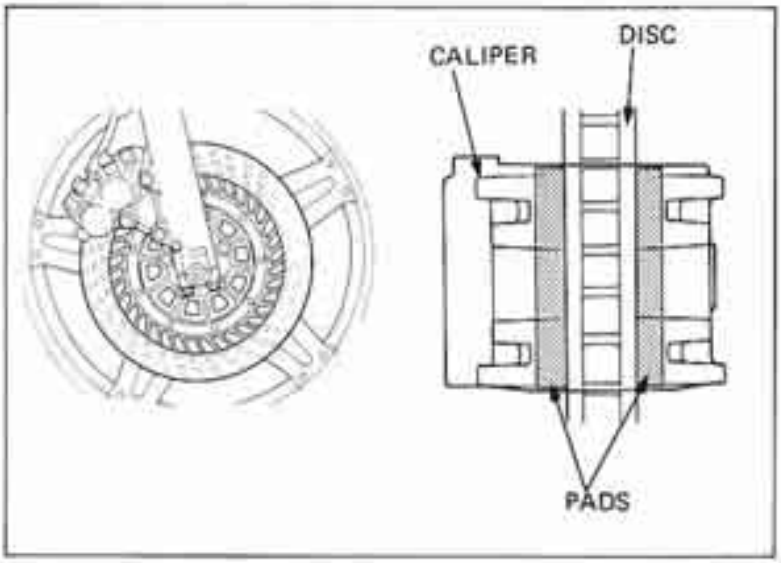
TRIPLE DISC BRAKE SYSTEM

The CBX uses a triple hydraulic brake system: a ventilated dual disc brake for the front and a single disc brake for the rear. Each brake caliper contains two pistons to force the brake pads against the disc.

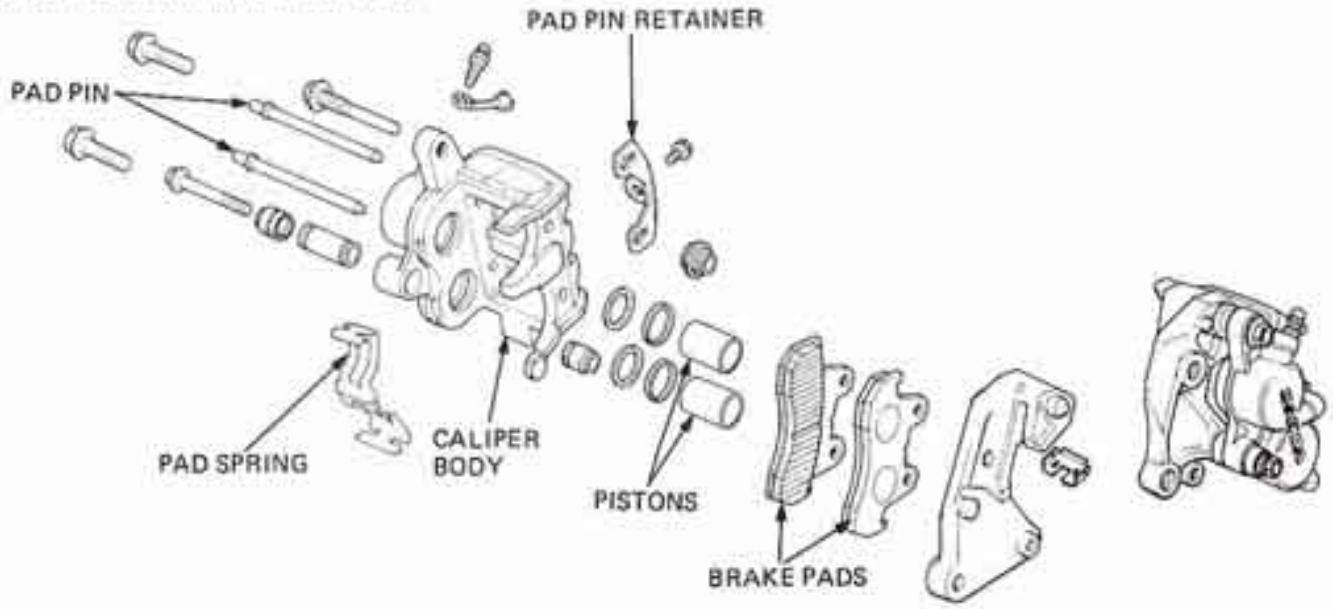


VENTILATED FRONT BRAKE DISCS

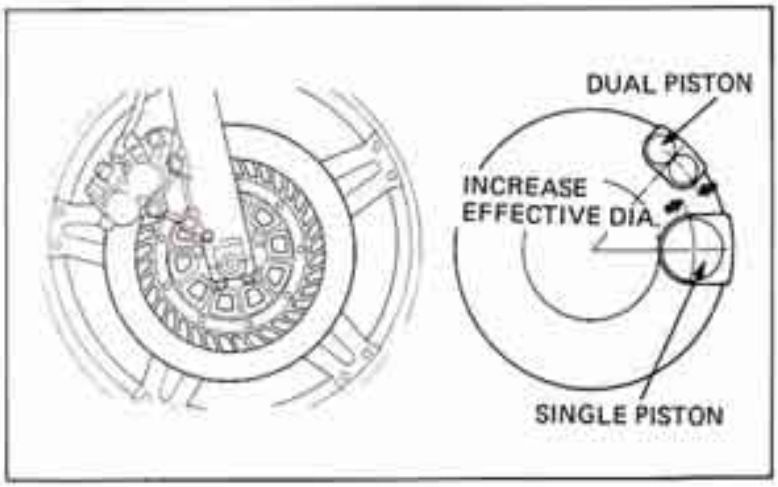
The hollow construction allows more heat to be dissipated to the air when the brake is applied, ensuring safer, faster stopping with the least possible fading.



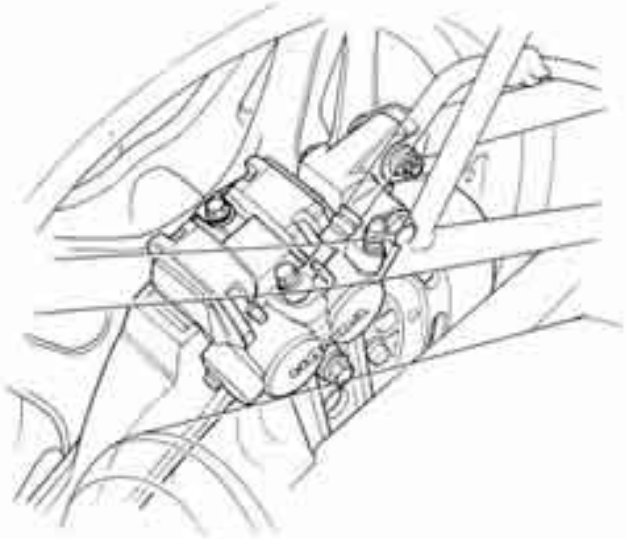
DUAL PISTON BRAKE CALIPER



The advantages inherent in the use of two pistons in a single caliper can be added to the long list of many features built into the CBX.
Among the advantages is greater stopping power, and locating the pistons nearer the edge of the disc allows the same pad pressure with up to 30% less lever effort.
Another result of this design is a lighter, stronger caliper to withstand a greater load encountered by the caliper when the brake is applied.



[REAR]

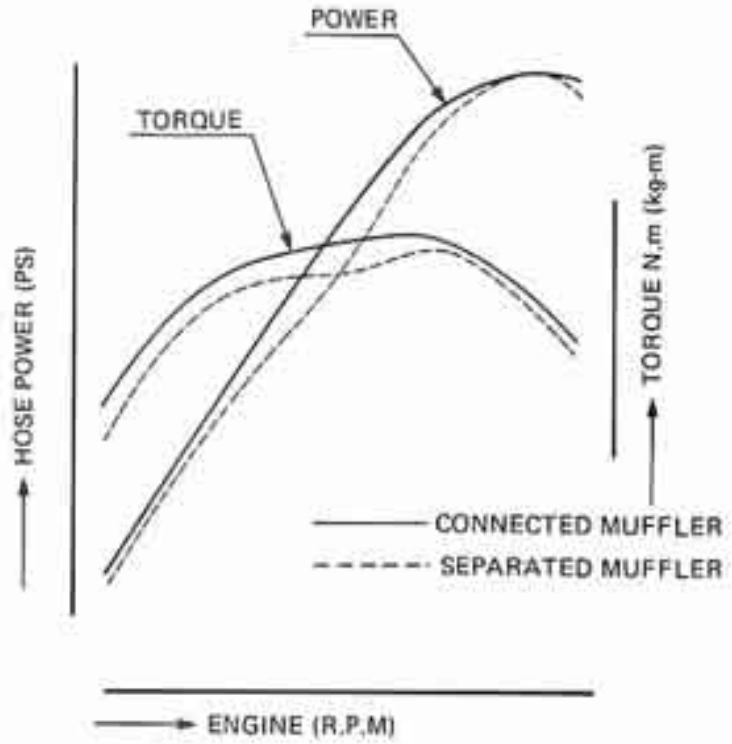


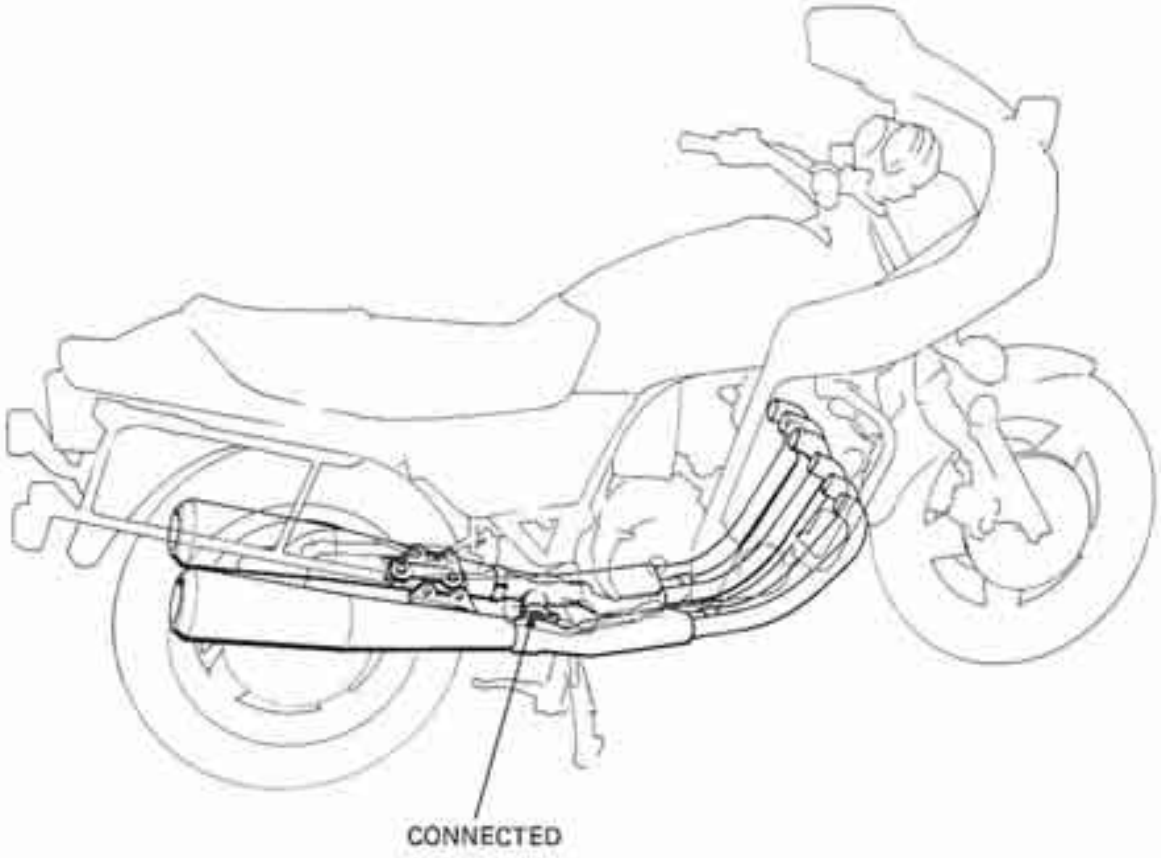
[FRONT]

Date of Issue: May, 1981

EXHAUST MUFFLERS

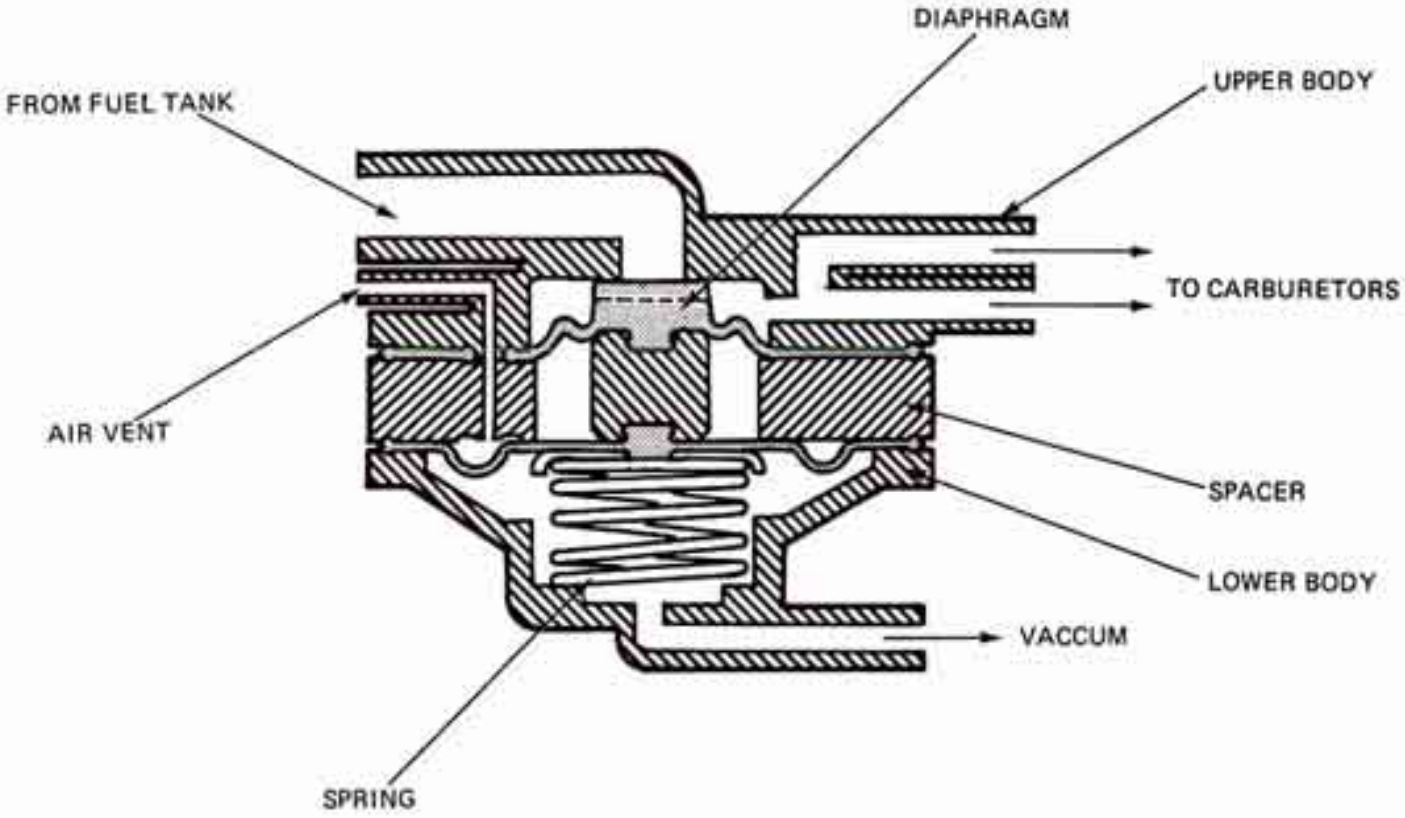
The right and left mufflers are internally connected to give a desired acoustic properties and still offer low resistance to gas flow for more output per liter of fuel consumed.





FUEL LINE DIAPHRAGM

The fuel line diaphragm depends upon a negative crankcase pressure and a spring loaded diaphragm, allowing fuel to flow from fuel tank to the carburetor to the engine only when the engine is operating.
With the engine off the diaphragm is held against the fuel outlet within the diaphragm body; no fuel can flow through the fuel tank to the carburetor.
As the engine is cranked, negative vacuum pressure pulls the diaphragm down against diaphragm spring tension. This opens the fuel outlet allowing fuel to flow to the carburetor.
When the engine is stopped, the diaphragm is pushed back against the fuel outlet to block the fuel flow.



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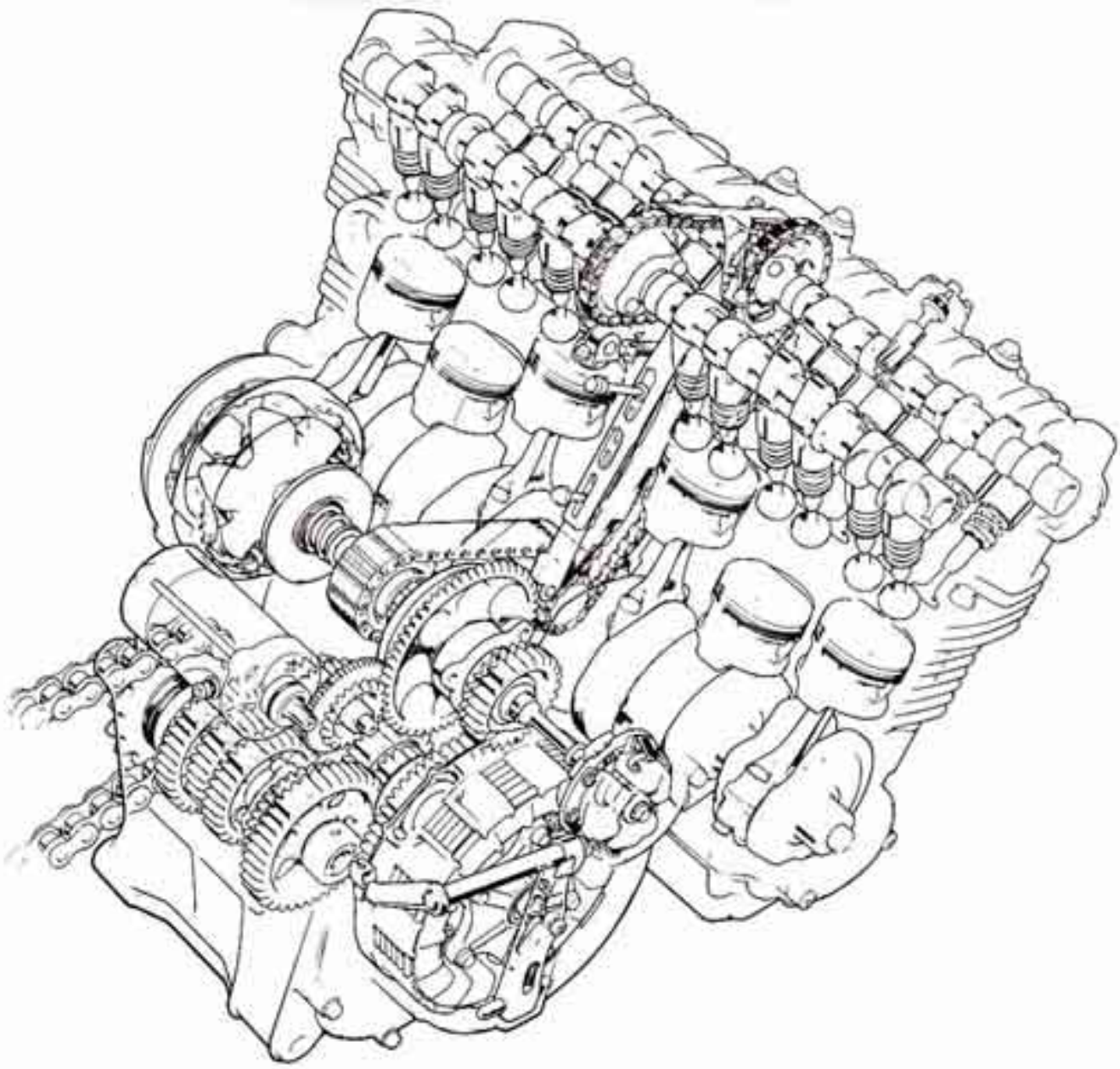
ENGINE CONSTRUCTION



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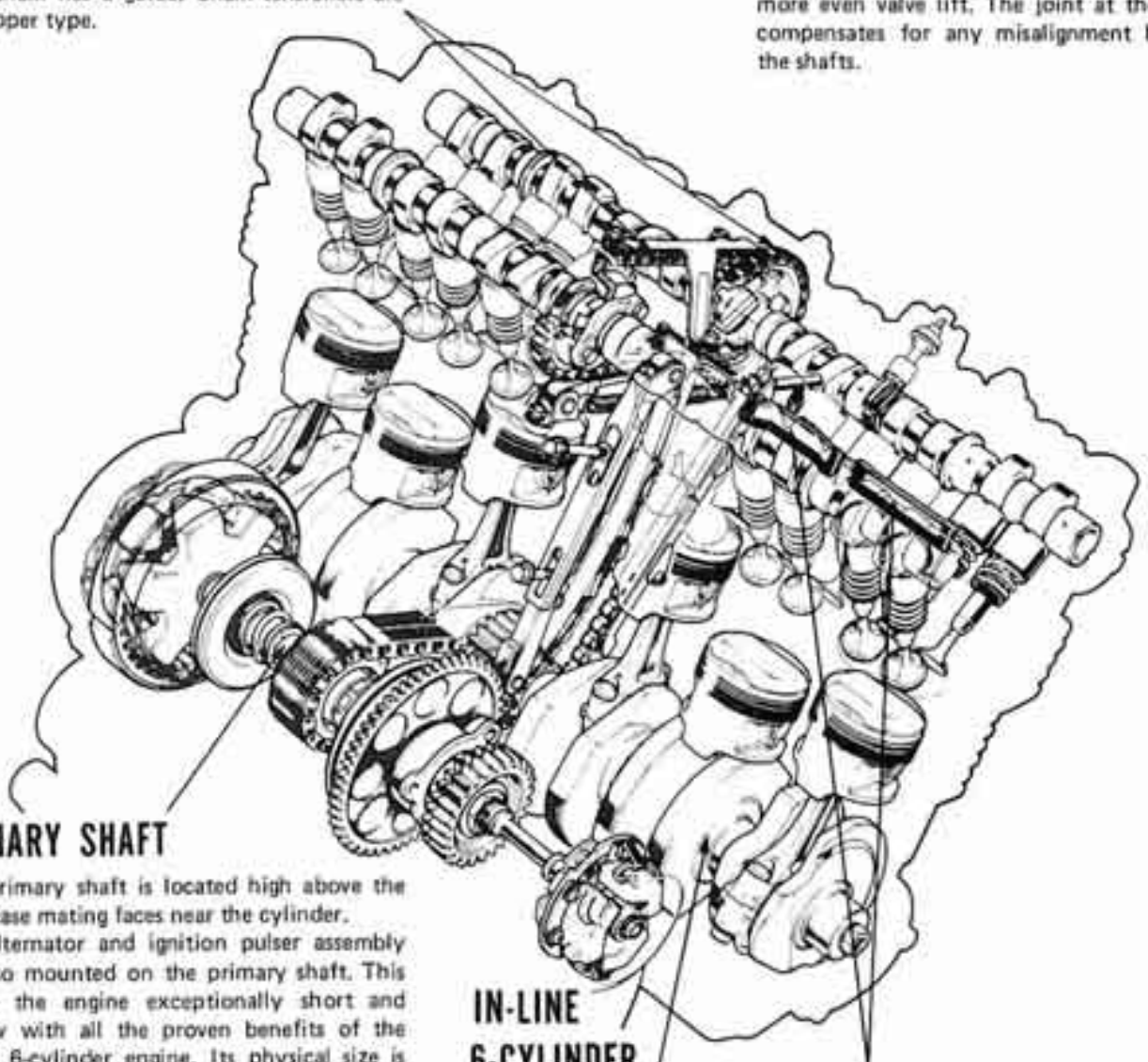
DUAL CAM CHAINS

Dual cam chains drive the camshafts. Drive is transmitted from the crankshaft to the exhaust camshafts and from there to the intake camshafts. This eliminates a diagonal chain path through the rear of the engine, reducing the distance between the carburetors and cylinders.
The narrow air cleaner and canted carburetors eliminate interference with the rider's legs.
The cam chains are durable silent type.
Each chain has a guide. Chain tensioners are the slipper type.

24 VALVES, SEPARATED CAMSHAFTS

Each cylinder has two intake and two exhaust valves. The arrangement insures effective breathing at high speed without valve float. Four valves instead of two allow a large overall port area with a low reciprocating weight for each valve spring.
The camshafts are of a two-piece forging. The separated shafts provide rigidity with more even valve lift. The joint at the center compensates for any misalignment between the shafts.



PRIMARY SHAFT

The primary shaft is located high above the crankcase mating faces near the cylinder.
The alternator and ignition pulser assembly are also mounted on the primary shaft. This makes the engine exceptionally short and narrow with all the proven benefits of the in-line 6-cylinder engine. Its physical size is equal to the standard in-line 4-cylinder motorcycles in its cc class.

IN-LINE 6-CYLINDER ARRANGEMENT

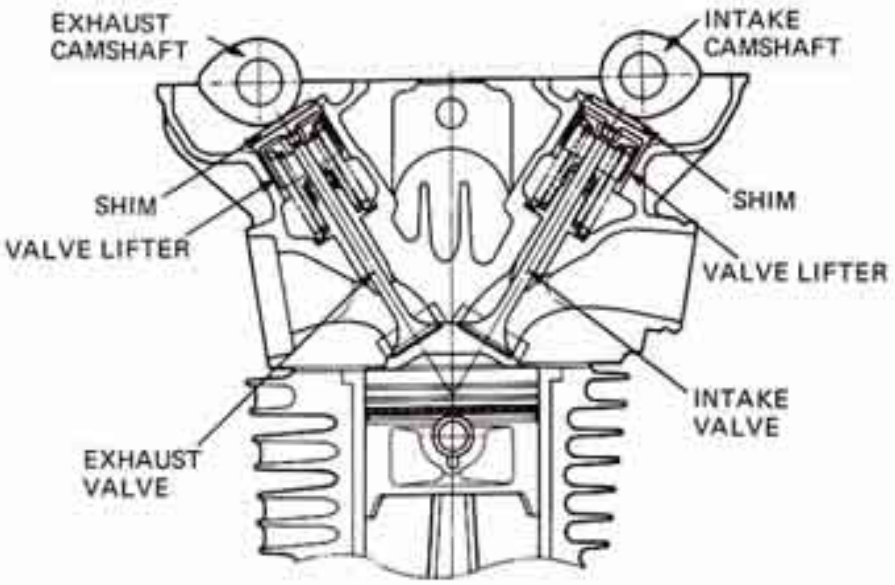
The in-line ultra short 53.4 mm stroke 6-cylinder arrangement reduces the vehicle's height. It also reduces piston speed and minimizes wear.

CAMSHAFT OIL POOL PLATES

The engine oil is collected in the camshaft troughs by oil pool plates for positive lubrication of the valve lifters and cams.
The plates also contribute to quieter valve operation.

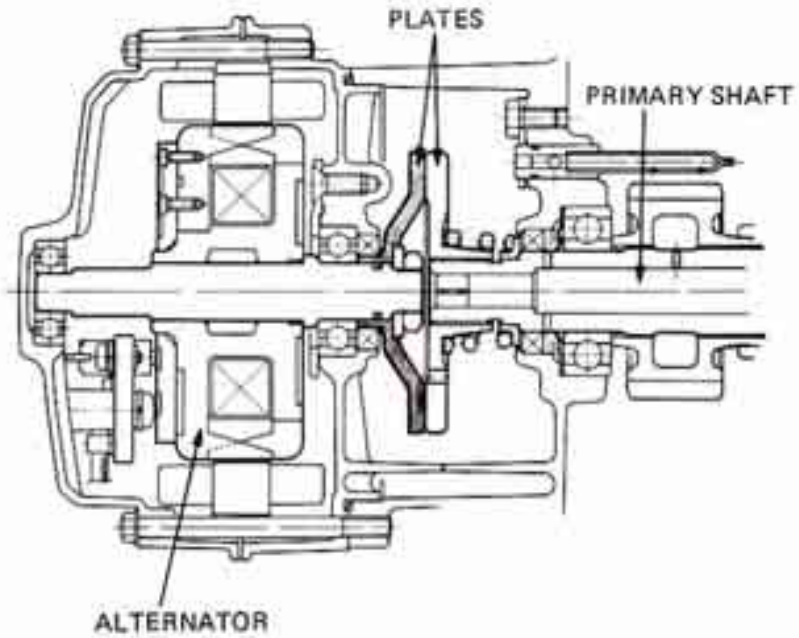
VALVE MECHANISM

The valves are operated by the cams through the valve lifters. The shims can be removed and installed easily without removing the camshafts by pushing down on the lifters with a special tool.



ALTERNATOR COUPLING

Power from the primary shaft is transmitted to the alternator through a frictional coupling. The coupling consists of two steel discs pressed against each other by a spring. Relative movement between the discs prevents excessive inertia from being transmitted directly from the alternator to the primary chain when snapping the throttle.



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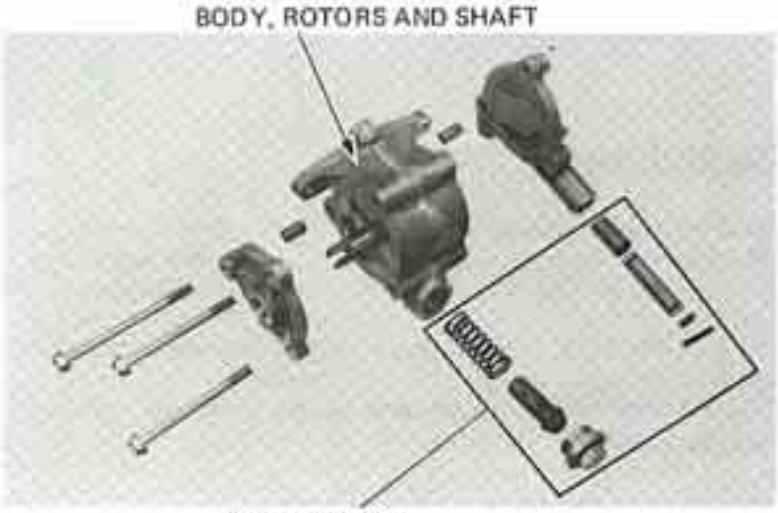
OIL COOLER, OIL PUMP

The lubricating system uses a wet sump with the sump at the crankcase bottom. The oil is cooled by an oil cooler.

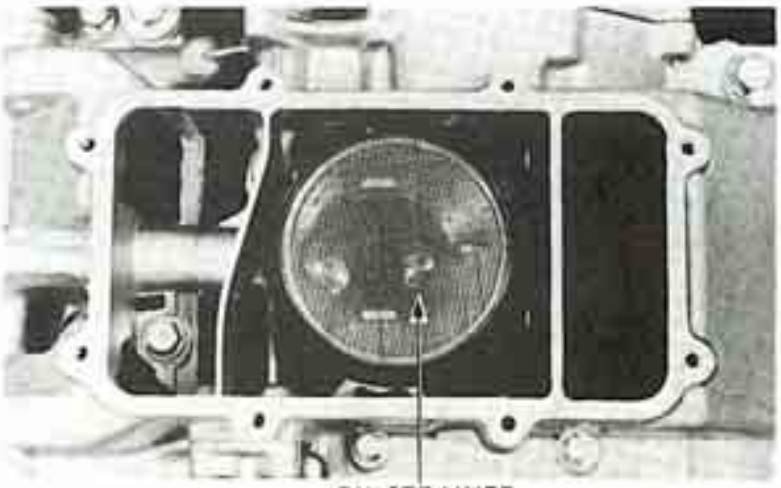
OIL COOLER

A tandem trocoid pump supplies oil to the bearings and other moving parts of the engine. Oil from the oil sump is forced by the main pump into the crankshaft and cylinder head.
The auxiliary pump feeds oil to the primary shaft and transmission. The oil cooler is in the auxiliary pump circuit and cools the oil drawn from the sump by the auxiliary pump. The oil damper in the primary chain receives oil from this pump circuit.



OIL PRESSURE
RELIEF VALVES

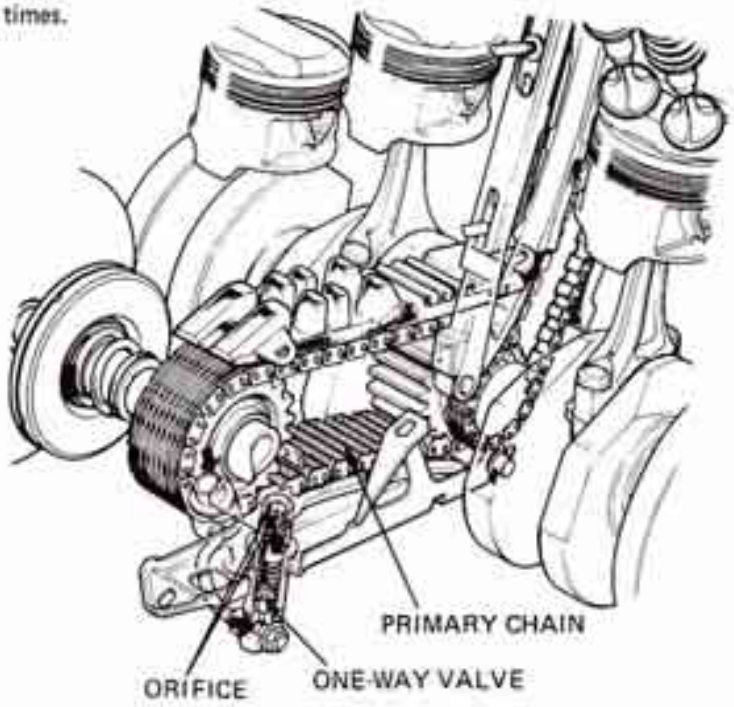
Oil from the sump must pass through a strainer before it enters the pumps.



OIL STRAINER

OIL DAMPER TYPE PRIMARY CHAIN TENSIONER

Primary chain tension is controlled by an oil dampened chain tensioner. It consists of a one-way check valve using a steel ball, a spring and a tension bar. The bar has an oil chamber with small orifices at its end. Oil in the chamber compensates for cavitation, assuring positive damper action at all times.

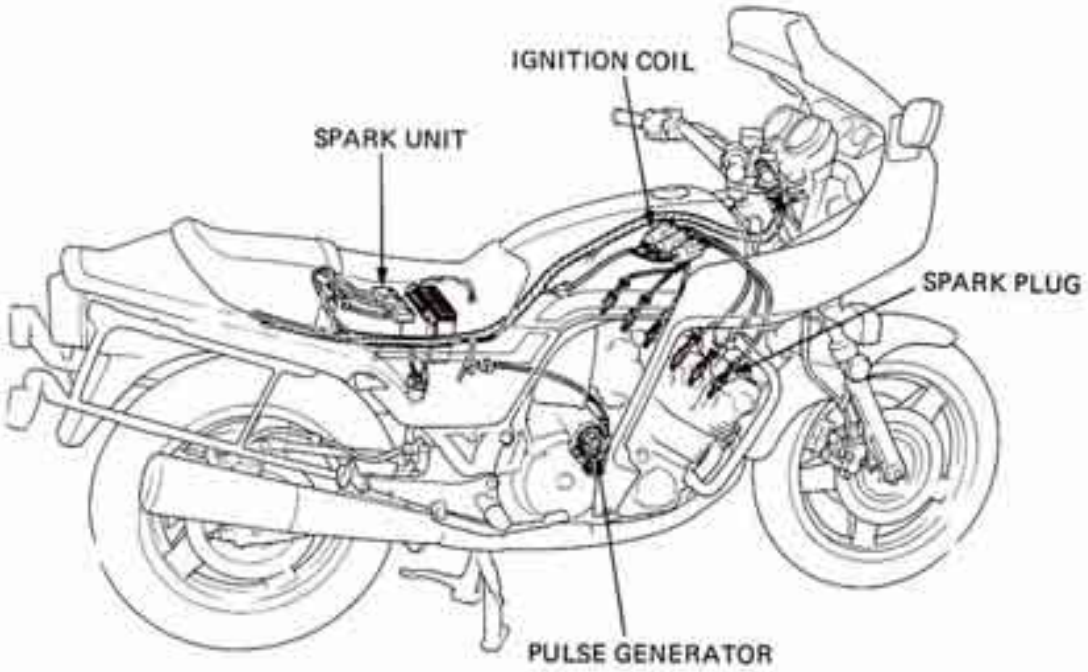


TRANSISTORIZED IGNITION

The engine uses a transistorized ignition. A pulse generator and transistorized spark unit supply current to the primary circuit. The system is free from problems that occur in mechanical breaker systems. It produces stable secondary energy and eliminates periodic adjustments and maintenance services. There are three independent systems; one for 1 & 6, 2 & 5, and 3 & 4 cylinders.

The generator rotor is connected to the primary shaft so they turn as a unit as the shaft rotates. Three generating coils are spaced evenly on the base plate, 120 degrees apart.

When the rotor turns, pulses are generated as it passes over the coils. Adjusting timing for 1 & 6 cylinders automatically adjusts the other cylinders.



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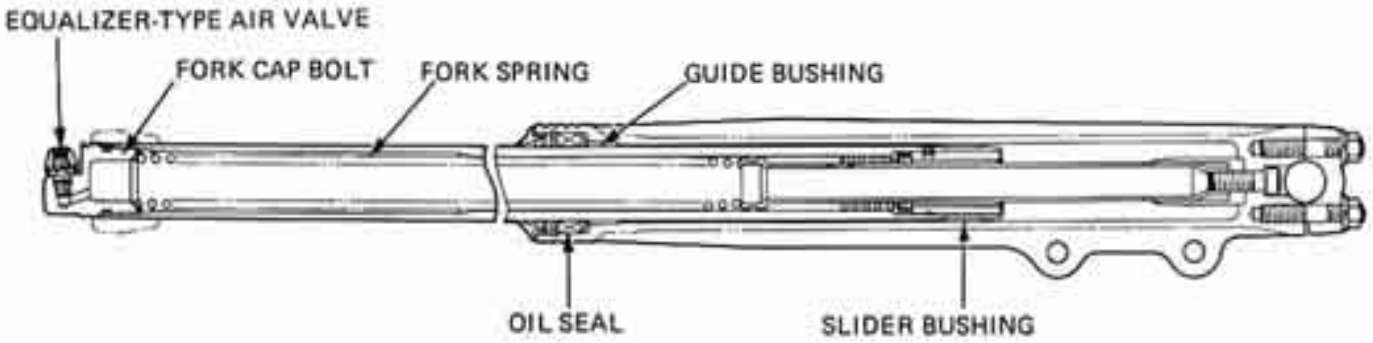
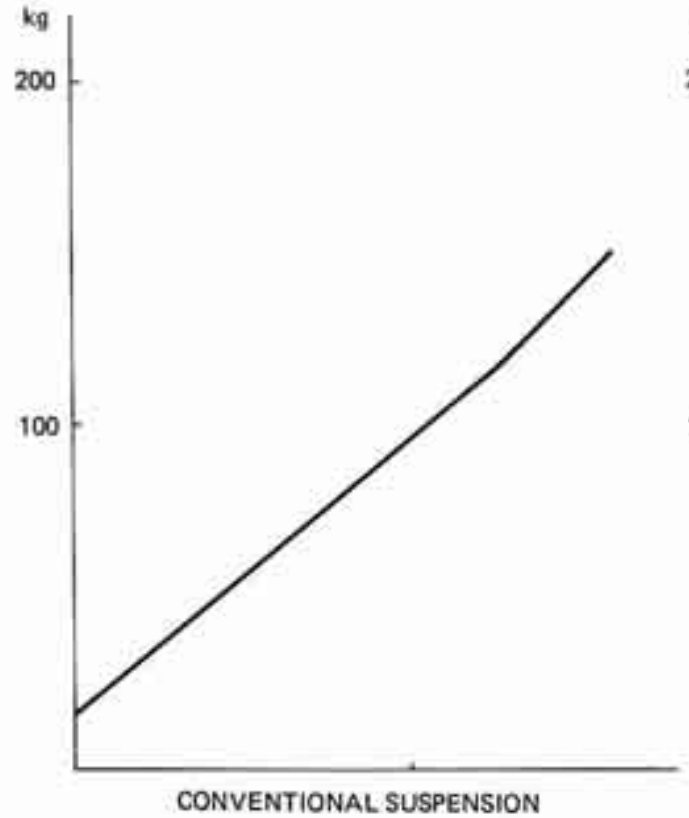
FRONT AIR FORKS

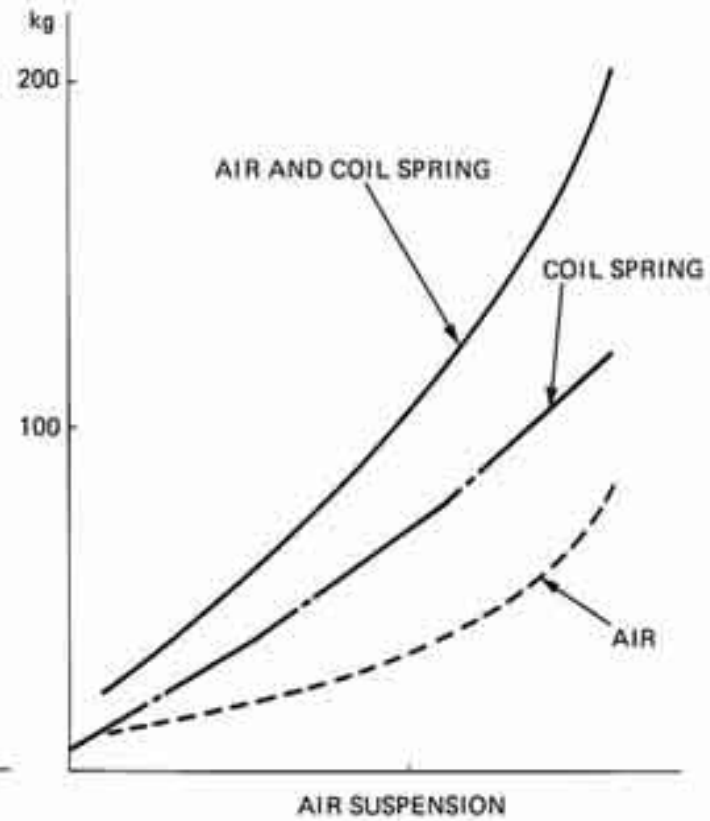
The front forks uses air and a coil spring. The air chamber is inside each fork tube connected with equalizer tube to an air valve at the fork cap bolt.



When adjusted correctly, the air fork system provides a more progressive compression than a conventional fork. The air fork system can be adjusted to each individual's preference to compensate for load and riding conditions.



CONVENTIONAL SUSPENSION

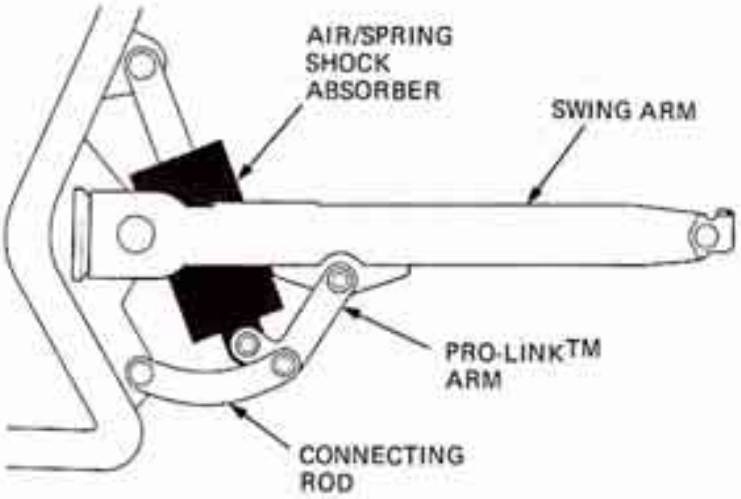


AIR SUSPENSION

PRO-LINK (PROGRESSIVE LINKAGE) STREET REAR SUSPENSION

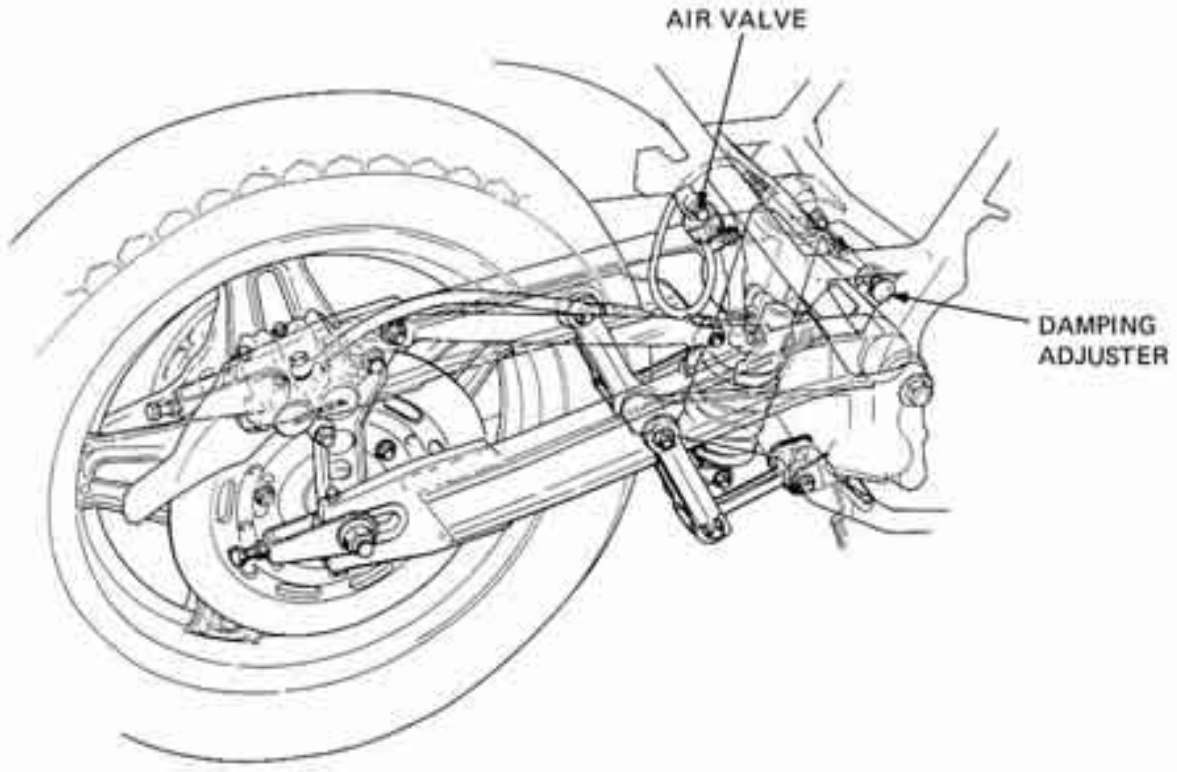
INTRODUCTION

This motorcycle has the Pro-Link Street Rear Suspension System with a two-way adjustable air/spring shock absorber to provide the desired ride under various road conditions and rider/cargo combinations. This system gives good bottoming resistance and at the same time, provides acceptably soft initial travel for smaller bumps.
Low air pressure settings provide a softer ride and are for light loads and smooth road conditions. High air pressure settings provide a firmer ride and are for heavy loads and rough road conditions.



The action of the street system is not as progressive as that of the competition system. Also, the shock absorber position in the street version is considerably lower than in the dirt system, in order to keep the center of gravity of the motorcycle as low as possible, and to allow room above the shock absorber for the battery and other electrical components.

Shock absorbers used in the street Pro-Link™ systems are of the air/spring type: this gives good bottoming resistance, and at the same time, provides acceptably soft initial travel for smaller bumps.



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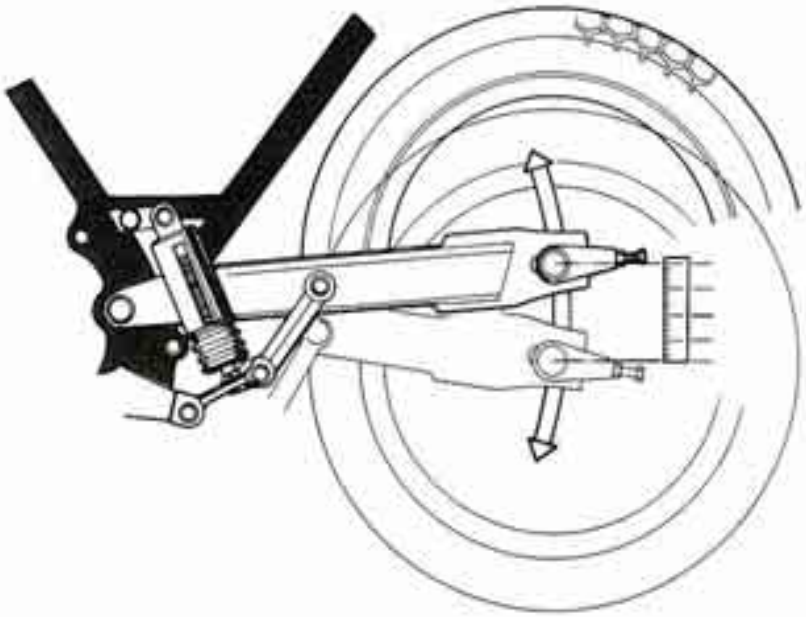
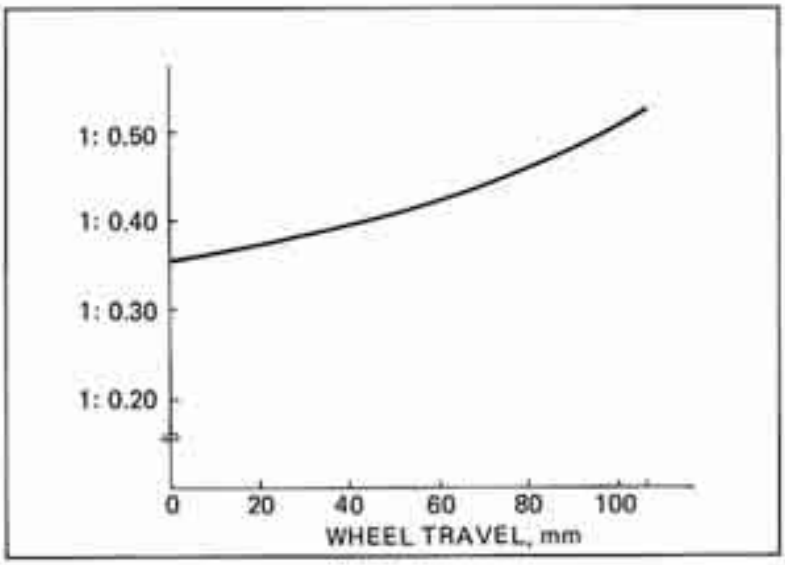
OPERATION

As the wheel and swingarm are driven up by bumps, the shock absorber is compressed by the shock arm which is held in a precise arc by the shock link. As wheel travel increases the shock arm rises above the swingarm proportionately, increasing absorber compression.
This provides the required progressive rise rate; the shock absorber moves only about one-fourth of wheel travel at the beginning and moves about one-third of wheel travel near the end.

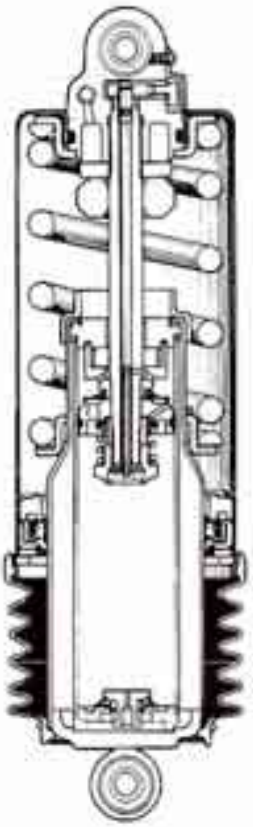


This graph shows the wheel travel/shock travel ratio through the entire stroke of a CBX Pro-Link system.

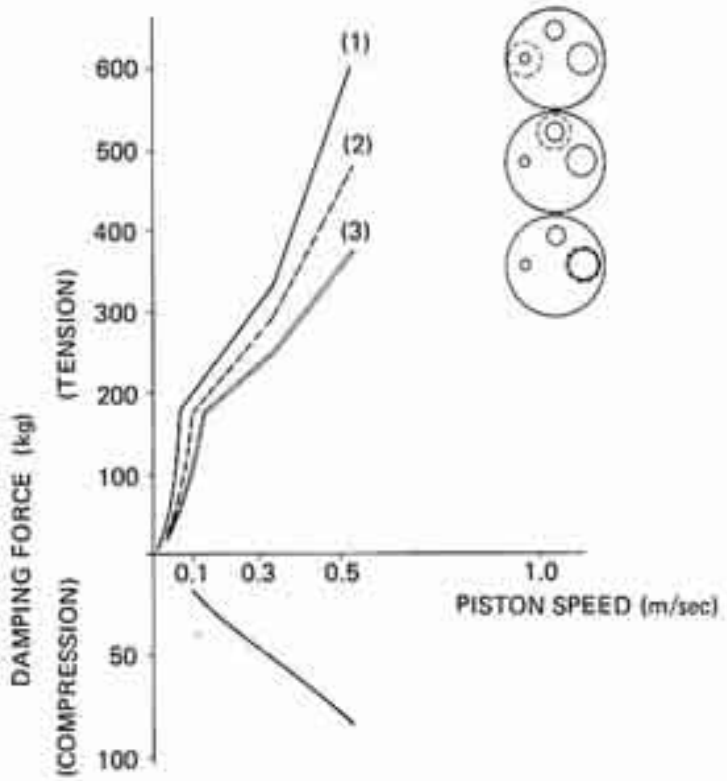
WHEEL TRAVEL/SHOCK TRAVEL RATIO



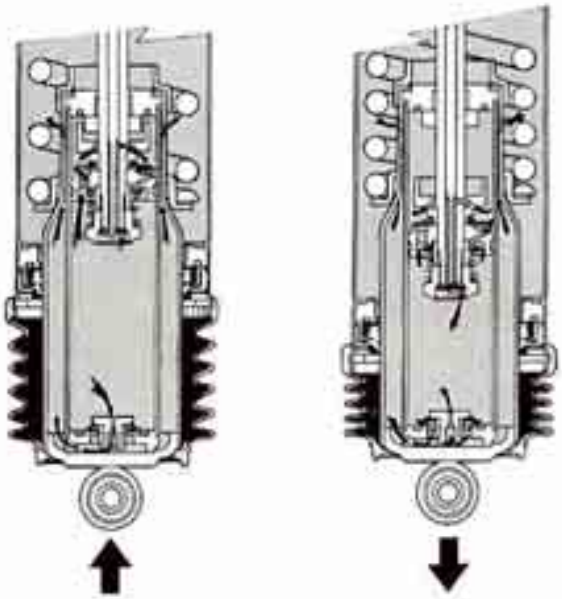
The CBX shock absorber has provision for three stages of damping adjustment:



DAMPING FORCE CHARACTERISTICS



OIL FLOW CHART



COMPRESSION REBOUND

(1) Recommended Rear Suspension Adjustment:

Rear Air Pressure	Rider/ Load	REBOUND DAMPING ADJUSTER	RIDING CONDITIONS
200 kPa (2.0 kg/cm², 28 psi) ↕ 400 kPa (4.0 kg/cm², 57 psi)	One ↕ Up to vehicle capacity load	1	General or around town riding
		2	Highway or winding road riding
		3	Rough road riding

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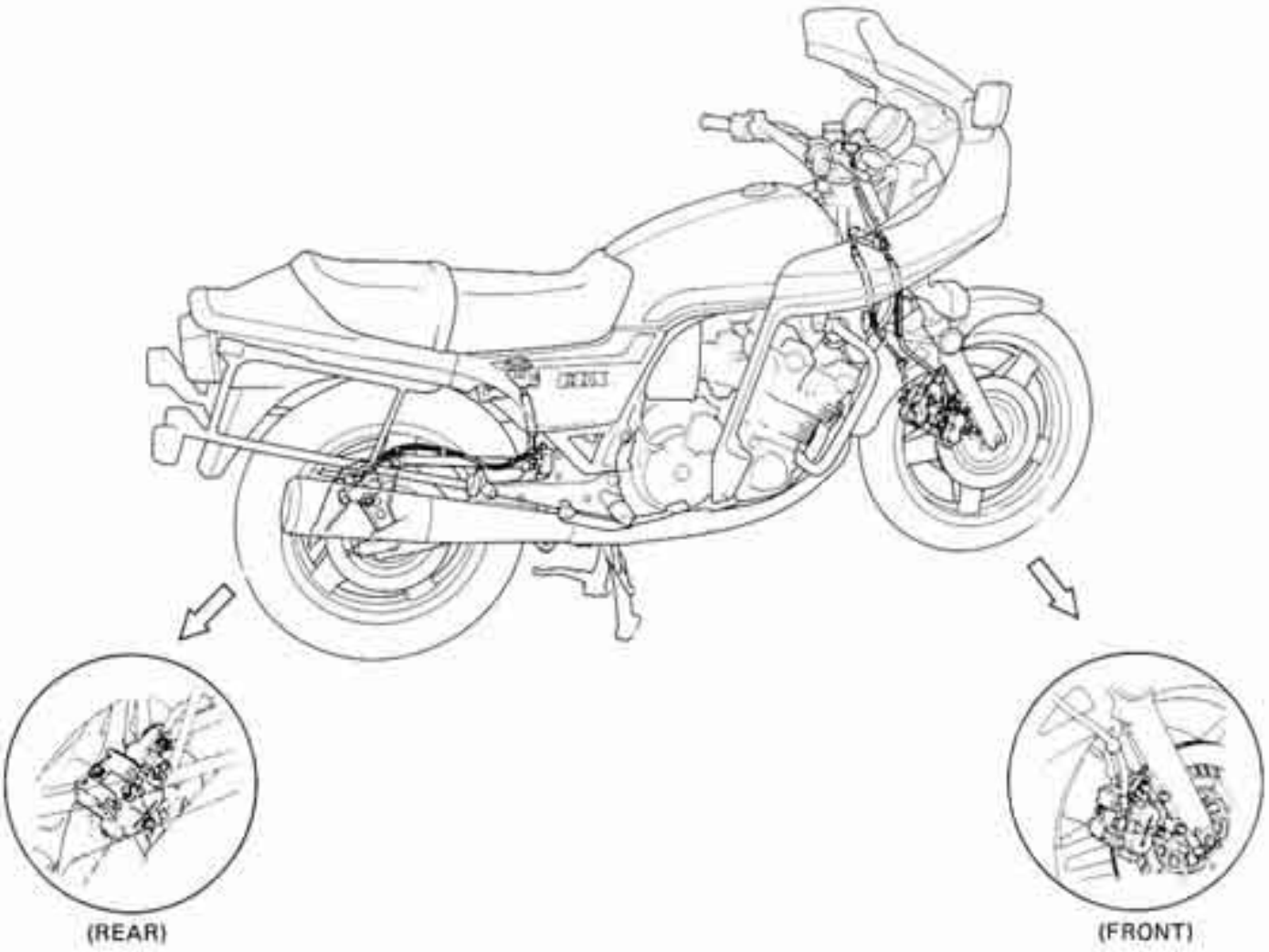
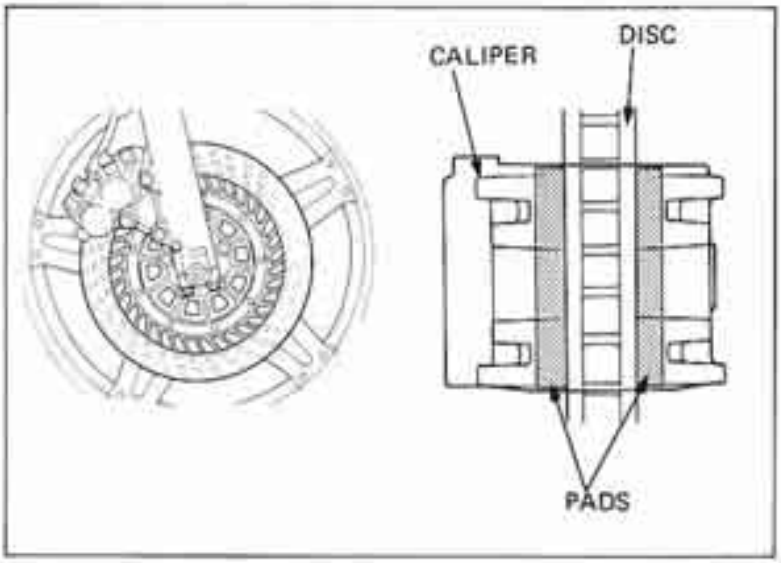
TRIPLE DISC BRAKE SYSTEM

The CBX uses a triple hydraulic brake system: a ventilated dual disc brake for the front and a single disc brake for the rear. Each brake caliper contains two pistons to force the brake pads against the disc.

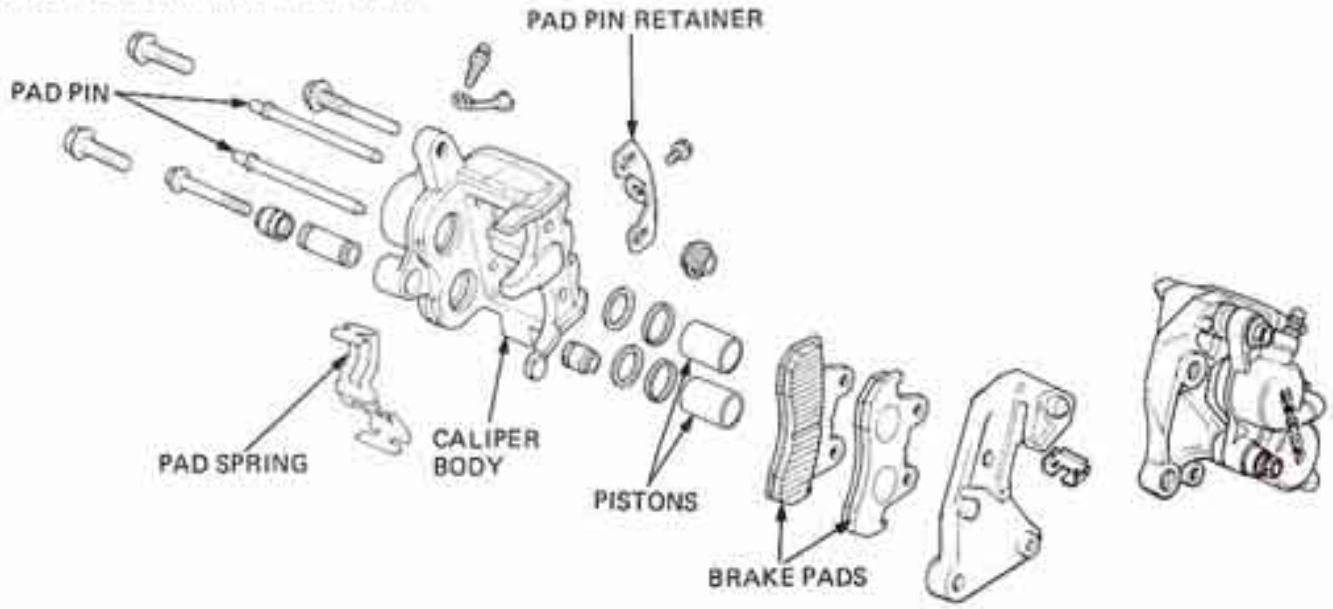


VENTILATED FRONT BRAKE DISCS

The hollow construction allows more heat to be dissipated to the air when the brake is applied, ensuring safer, faster stopping with the least possible fading.



DUAL PISTON BRAKE CALIPER



The advantages inherent in the use of two pistons in a single caliper can be added to the long list of many features built into the CBX.
Among the advantages is greater stopping power, and locating the pistons nearer the edge of the disc allows the same pad pressure with up to 30% less lever effort.
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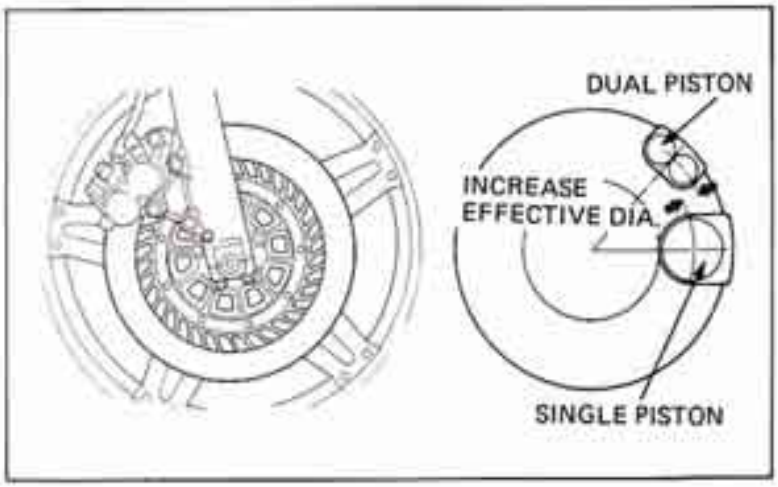

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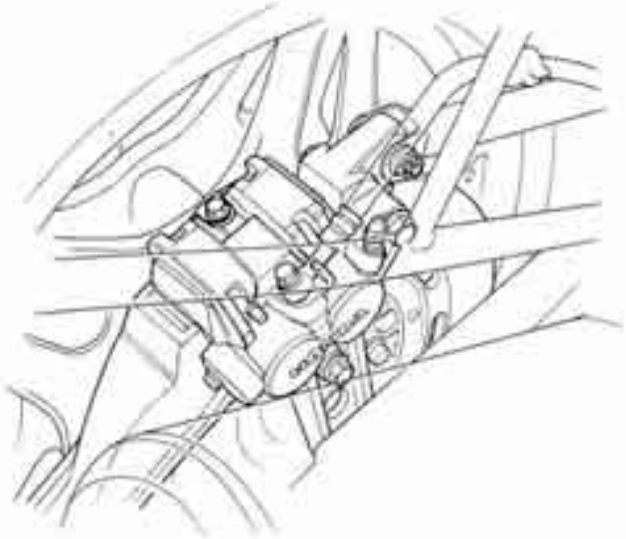

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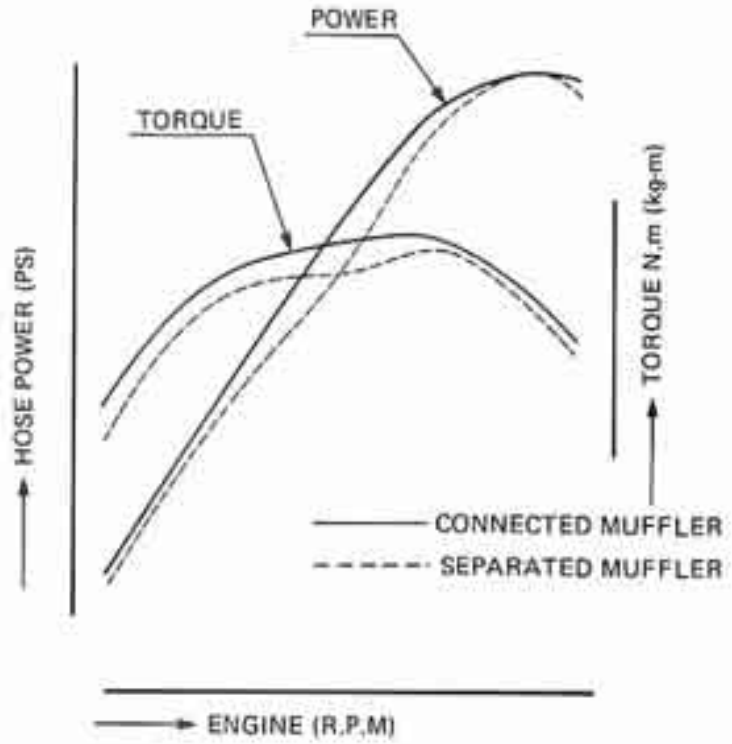

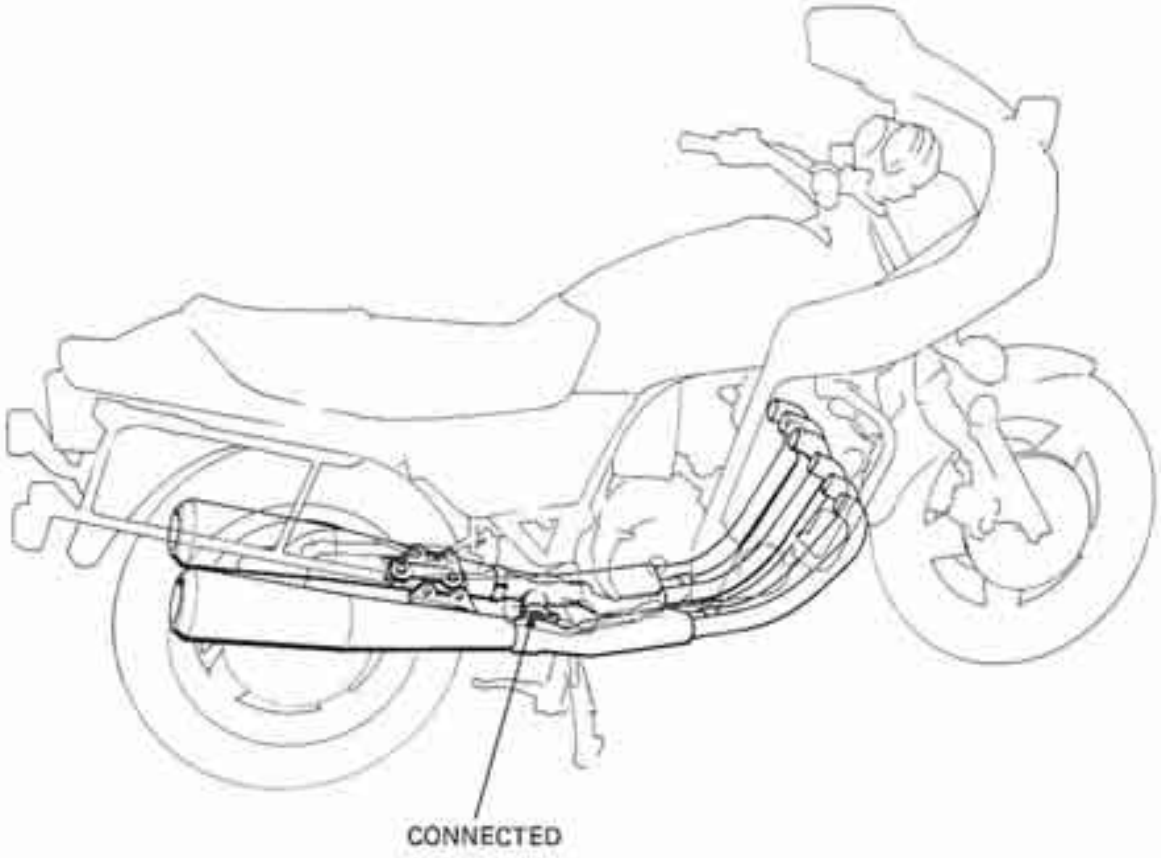

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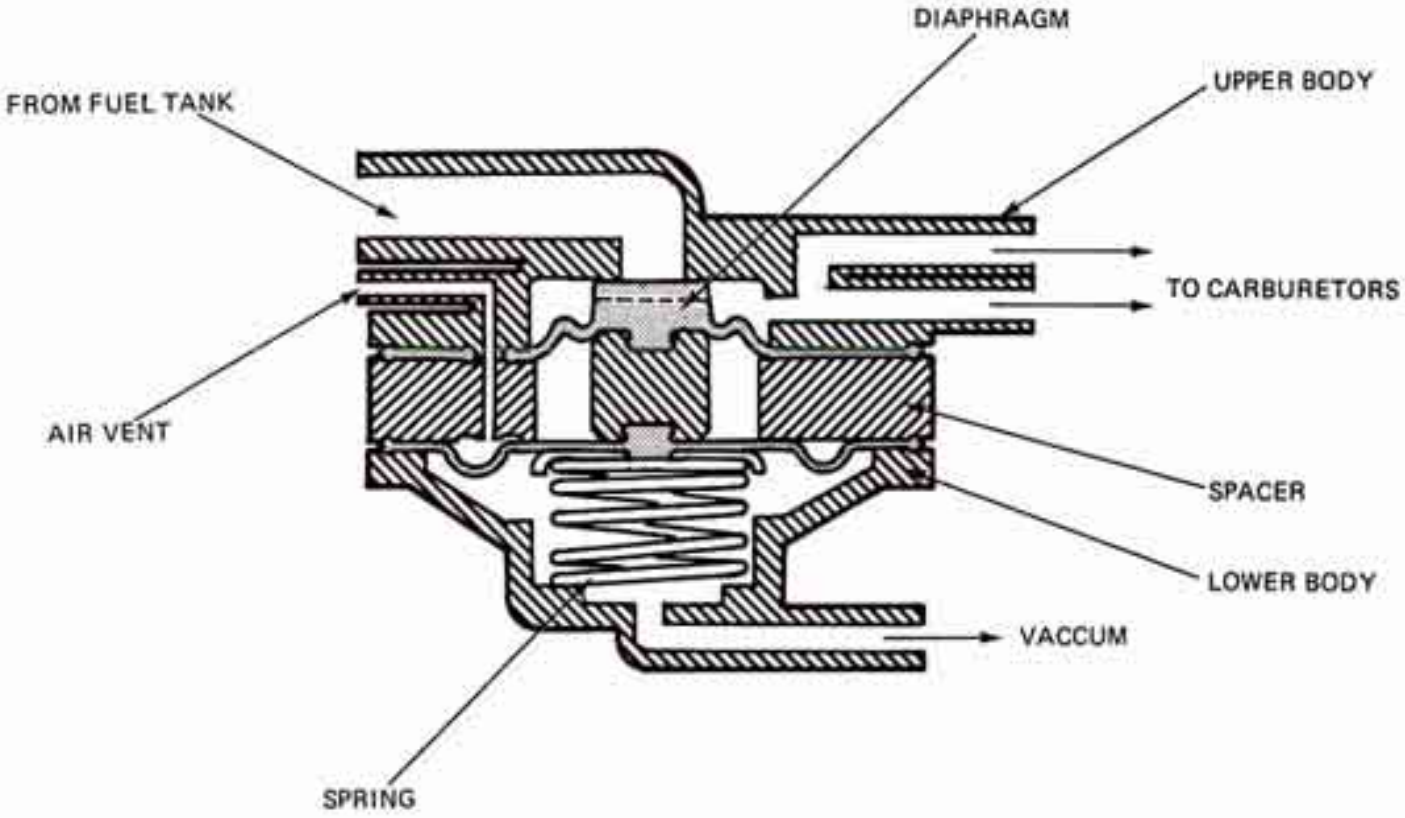

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ENGINE DOES NOT START OR IS HARD TO START

1. Check fuel flow to carburetor
   - NOT REACHING CARBURETOR →
     - (1) Fuel tank empty
     - (2) Clogged fuel tube or fuel filter
     - (3) Vacuum not reaching fuel line diaphragm
     - (4) Faulty fuel line diaphragm
     - (5) Sticking float valve
     - (6) Clogged fuel tank cap breather hole
   - REACHING CARBURETOR ↓

2. Perform spark test
   - WEAK OR NO SPARK →
     - (1) Faulty spark plugs
     - (2) Fouled spark plugs
     - (4) 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) Manifold leaking
     - (4) Improper ignition timing (Spark unit or pulse generator)
     - (5) Incorrect fast idle
     - (6) Fuel contaminated
   - ENGINE DOES NOT FIRE ↓

5. Remove and inspect spark puig
   - WET PLUG →
     - (1) Carburetor flooded
     - (2) Choke closed
     - (3) Throttle valve open
     - (4) Air cleaner dirty

ENGINE LACKS POWER

		POSSIBLE CAUSE
1. Raise wheels off ground and spin by hand	WHEELS DO NOT SPIN FREELY →	(1) Brake dragging (2) Worn or damaged wheel bearing (3) Wheel bearing needs lubrication (4) Drive chain too tight
WHEEL SPINS FREELY		
2. Check tire pressure	PRESSURE LOW →	(1) Punctured tire (2) Faulty tire valve
PRESSURE NORMAL		
3. Accelerator rapid from low to second	ENGINE SPEED CHANGED WHEN CLUTCH IS RELEASED →	(1) Clutch slipping (2) Worn clutch disc/plate (3) Warped clutch disc/plate
ENGINE SPEED LOWERED WHEN CLUTCH IS RELEASED		
4. Accelerate lightly	ENGINE SPEED DOES NOT INCREASE →	(1) Carburetor choke closed (2) Clogged air cleaner (3) Restricted fuel flow vent (4) Clogged fuel tank cap (5) Vacuum not reaching fuel line diaphragm (6) Fuel line diaphragm faulty (7) Clogged muffler
ENGINE SPEED INCREASE		
5. Check ignition timing	INCORRECT →	(1) Faulty spark unit (2) Faulty pulse generator (3) Faulty ignition advancer
CORRECT		
6. Check valve clearance	INCORRECT →	(1) Improper valve adjustment (2) Worn valve seat
CORRECT		
7. Test cylinder compression	TOO LOW →	(1) Valve stuck open (2) Worn cylinder and piston rings (3) Leaking head gasket (4) Improper valve timing
NORMAL		
8. Check carburetor for clogging	CLOGGED →	(1) Carburetor not serviced frequently enough
NOT CLOGGED		
9. Remove spark plug	FOULED OR DISCOLORED →	(1) Plugs not serviced frequently enough (2) Spark plug with incorrect heat range
NOT FOULED OR DISCOLORED		
10. Check oil level and condition	INCORRECT →	(1) Oil level too high (2) Oil level too low (3) Contaminated oil
CORRECT		
11. Remove cylinder head cover and inspect lubrication	VALVE TRAIN NOT LUBRICATED PROPERLY →	(1) Clogged oil passage (2) Clogged oil control orifice
VALVE TRAIN LUBRICATED PROPERLY		
12. Check for engine overheating	OVERHEATING →	(1) Excessive carbon build-up in combustion chamber (2) Use of poor quality fuel (3) Clutch slipping (4) Fuel-air mixture too lean
NOT OVERHEATING		
13. Accelerate or run at high speed	ENGINE KNOCKS →	(1) Worn piston and cylinder (2) Fuel-air mixture too lean (3) Wrong type of fuel (4) Excessive carbon build-up in combustion chamber (5) Ignition timing too advanced (Faulty spark unit or advancer)
ENGINE DOES NOT KNOCK		

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POOR PERFORMANCE AT LOW AND IDLE SPEEDS

			POSSIBLE CAUSE
1. Check ignition timing and valve clearance	INCORRECT →	(1)	Improper valve clearance
		(2)	Improper ignition timing (Faulty spark unit or spark advancer)
CORRECT			
2. Check carburetor pilot screw adjustment	INCORRECT	See Fuel System Section	
CORRECT			
3. Check for leaking manifold	LEAKING →	(1)	Deteriorated insulator O-ring
		(2)	Loose carburetor
NO LEAK			
4. Perform spark test	WEAK OR INTERMITTENT SPARK →	(1)	Faulty, carbon or wet fouled spark plug
GOOD SPARK		(2)	Faulty spark unit
		(3)	Alternator faulty
		(4)	Faulty ignition coil
		(5)	Faulty spark advancer

POOR PERFORMANCE AT HIGH SPEED

1. Check ignition timing and valve clearance	INCORRECT →	(1)	Improper valve clearance
		(2)	Faulty spark unit
		(3)	Faulty pulse generator
CORRECT		(4)	Faulty spark advancer
2. Disconnect fuel tube	FUEL FLOW RESTRICTED →	(1)	Lack of fuel in tank
		(2)	Clogged fuel line
FUEL FLOWS FREELY		(3)	Clogged fuel tank breather hole
		(4)	Clogged fuel valve
		(5)	Vacuum not reaching fuel line diaphragm
		(6)	Fuel line diaphragm faulty
3. Remove carburetor and check for clogged jet	CLOGGED →	(1)	Clean
NO CLOGGING			
4. Check valve timing	INCORRECT →	(1)	Cam sprocket not installed properly
CORRECT			
5. Check valve spring tention	WEAK →	(1)	Faulty spring
NOT WEAKENED			

POOR HANDLING → Check tire and suspension pressure

1. If steering is heavy	(1)	Steering top thread nut too tight
	(2)	Damaged steering head bearings
2. If either wheel is wobbling →	(1)	Excessive wheel bearing play
	(2)	Distorted rim
	(3)	Improperly installed wheel hub
	(4)	Swing arm pivot bushing excessively worn
	(5)	Distorted frame
	(6)	Improper drive chain tension or adjustment
3. If the motorcycle pulls to one side →	(1)	Improperly adjusted shock absorber
	(2)	Front and rear wheels not aligned
	(3)	Bent front fork
	(4)	Bent swing arm

INTRODUCTION

This Addendum contains information for the 1982 CBX. Refer to the base shop manual for service information not included in this addendum.

HONDA MOTOR CO., LTD.
Service Publications Office

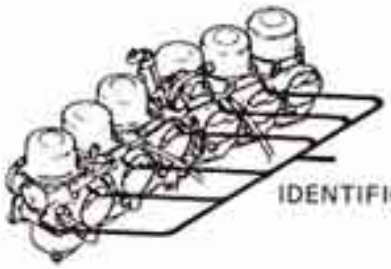
CONTENTS

MODEL IDENTIFICATION

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

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

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



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

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I. SPECIFICATIONS

ITEM			
DIMENSIONS	Overall length		2365 mm (93.1 in)
	Overall width		780 mm (30.7 in)
	Overall height		1360 mm (53.5 in)
	Wheelbase		1535 mm (60.4 in)
	Seat height		810 mm (31.9 in)
	Foot peg height		335 mm (13.2 in)
	Ground clearance		155 mm (6.1 in)
	Dry weight		287 kg (633 lb)
FRAME	Type		Diamond
	Front suspension, travel		Telescopic air forks 160 mm (6.3 in)
	Rear suspension, travel		Swingarm 105 mm (4.1 in)
	Front tire size		3.50V19 (4PR)
	Rear tire size		130/90V18
	Cold tire pressures	Up to 90 kg (200 lbs) load	Front : 250 kPa (2.5 kg/cm², 36 psi) Rear : 250 kPa (2.5 kg/cm², 36 psi)
		Up to vehicle capacity load	Front : 250 kPa (2.5 kg/cm², 36 psi) Rear : 290 kPa (2.9 kg/cm², 41 psi)
	F. brake, lining swept area		Double disc brake, 22 cm² x 4 (3.4 sqin x 4)
	R. brake, lining swept area		Single disc brake, 22 cm² x 2 (3.4 sqin x 2)
	Fuel capacity		22.0 liters (5.8 US gal)
	Fuel reserve capacity		3.0 liters (0.8 US gal)
	Caster angle		62°30'
	Trail		120 mm (4.7 in)
	Front fork oil capacity		345 cc (11.7 ozs)
	Front fork air pressure		70 ± 20 kPa (0.7 ± 0.2 kg/cm², 10 ± 3 psi)
	Rear suspension oil capacity		618 cc (20.9 ozs) at disassembly
	Rear suspension air pressure		200–400 kPa (2.0–4.0 kg/cm², 28–57 psi)
ENGINE	Type		Air cooled 4-stroke
	Cylinder arrangement		Vertical parallel six
	Bore and stroke		64.5 x 53.4 mm (2.54 x 2.10 in)
	Displacement		1047 cc (63.89 cu in)
	Compression ratio		9.3 : 1
	Valve train		Chain driven DOHC 4 valve/cylinder
	Maximum horsepower		100 BHP/9,000 rpm
	Maximum torque		8.5 kg-m (60.8 ft-lb)/7,500 rpm
	Oil capacity		5.5 liters (5.8 US qt) after disassembly 4.0 liters (4.2 US qt) after draining
	Lubrication system		Wet sump dual pump with oil cooler
	Air filtration		Paper
	Cylinder compression		12.0 ± 1.0 kg/cm² (170 ± 14 psi)
	Intake valve	Opens	5° (BTDC) at 1 mm lift, 78° (BTDC) at 0 lift
		Closes	35° (ABDC) at 1 mm lift, 110° (ABDC) at 0 lift
	Exhaust valve	Opens	40° (BBDC) at 1 mm lift, 94° (BBDC) at 0 lift
		Closes	5° (ATDC) at 1 mm lift, 71° (ATDC) at 0 lift
	Valve overlap		149°
	Valve clearance (Cold)		IN: / EX: 0.06–0.13 mm (0.002–0.005 in)
	Engine weight		108 kg (238.1 lb)
	Idle speed		900 ± 100 rpm

ITEM		
CARBURETION	Carburetor type	VB 28 mm (1.1 in) venturi bore
	Identification number	VB64A
	Pilot screw	Refer to page 4-28
	Float level	15.5 mm (0.61 in)
DRIVE TRAIN	Clutch	Wet, multi-plate
	Transmission	5-speed constant-mesh
	Primary reduction	2.269
	Gear ratio I	2.438
	Gear ratio II	1.750
	Gear ratio III	1.391
	Gear ratio IV	1.200
	Gear ratio V	1.037
	Final reduction	2.333 (18/42)
	Gear shift pattern	Left foot operated return system 1–N–2–3–4–5
ELECTRICAL	Ignition	Transistorized
	Ignition timing "F" mark	10° BTDC static
	Full advance	41° BTDC at 8,000 rpm
	Firing order	1–5–3–6–2–4
	Starting system	Electric starter
	Alternator	Three phase Alternator 350 W/5,000 rpm
	Battery capacity	12V – 18AH
NEW	Spark plug	For cold climate below 5°C, 41°F: ND X22ESR-U / NGK DR7ES; Standard: ND X24ESR-U / NGK DR8ES-L; For extended high speed riding: ND X27ESR-U / NGK DR8ES
	Spark plug gap	0.6–0.7 mm (0.024–0.028 in)
LIGHTS	Headlight (high/low beam)	60/55W H4 BULB (Philips 12342/99, or equivalent)
	Tail/stoplight	8/27W, 3/32 cp SAE NO. 1157
	Turn signal Front	8/23W, 3/32 cp SAE NO. 1034
	Rear	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
	Rear suspension air pressure warning light	3,4W, 2 cp SAE NO. 57
	Running light	8W, 3 cp SAE NO. 1034

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II. MAINTENANCE SCHEDULE

Perform the PRE-RIDE INSPECTION in the Owner's Manual at each scheduled maintenance.
I: INSPECT AND CLEAN, ADJUST, LUBRICATE, OR REPLACE IF NECESSARY.
C: CLEAN A: ADJUST
R: REPLACE L: LUBRICATE

		ITEM \ FREQUENCY	WHICHEVER COMES FIRST / EVERY	ODOMETER READING (NOTE 3) 800 mi. (1,600 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	
EMISSION RELATED ITEMS	*	FUEL LINES			I	I	I	I	I	Page 3-4	
	*	FUEL STRAINER		C	C	C	C	C	C	Page 22-6	NEW
	*	THROTTLE OPERATION		I	I	I	I	I	I	Page 3-7	
	*	CARBURETOR CHOKE			I	I	I	I	I	Page 3-10	
		AIR CLEANER	NOTE 1			R		R		Page 3-3	
		CRANKCASE BREATHER	NOTE 2		C	C	C	C	C	Page 3-4	
		SPARK PLUGS			R	R	R	R	R	Page 22-6	NEW
	*	VALVE CLEARANCE		I	I	I	I	I	I	Page 3-11	
	*	IGNITION TIMING		I	I	I	I	I	I	Page 3-5	
		ENGINE OIL	YEAR	R	R	R	R	R	R	Page 2-2, 3-8, 22-6	NEW
		ENGINE OIL FILTER	YEAR	R	R	R	R	R	R	Page 2-2	
	*	ENGINE OIL SCREEN					C			Page 2-3	
	*	CAM CHAIN TENSION		A	A	A	A	A	A	Page 3-15	
	*	CARBURETOR-SYNCHRONIZE		I	I	I	I	I	I	Page 3-8	
	*	CARBURETOR-IDLE SPEED		I	I	I	I	I	I	Page 3-10	
NON-EMISSION RELATED ITEMS		DRIVE CHAIN		I, L EVERY 300 mi. (500 km)						Pages 2-5, 3-17	
		BATTERY	MONTH	I	I	I	I	I	I	Page 3-18	
		BRAKE FLUID	MONTH I 2 YEARS *R	I	I	I	*R	I	I	Page 3-18	
		BRAKE PAD WEAR			I	I	I	I	I	Page 3-19	
		BRAKE SYSTEM		I	I	I	I	I	I	Page 3-19	
	*	BRAKE LIGHT SWITCH		I	I	I	I	I	I	Page 3-20	
	*	HEADLIGHT AIM		I	I	I	I	I	I	Page 3-20	
		CLUTCH		I	I	I	I	I	I	Page 3-22	
		SIDE STAND			I	I	I	I	I	Page 3-23	
	*	SUSPENSION		I	I	I	I	I	I	Page 3-24	
	*	NUTS, BOLTS, FASTENERS		I	I	I	I	I	I	Page 3-25	
	**	WHEELS		I	I	I	I	I	I	Page 3-25	
	**	STEERING HEAD BEARING		I		I		I		Page 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 (USA ONLY).
3. FOR HIGHER ODOMETER READINGS, REPEAT AT THE FREQUENCY INTERVAL ESTABLISHED HERE.

III. MAINTENANCE

SPARK PLUGS

RECOMMENDED SPARK PLUG

NEW

For cold climate below 5°C (41°F)		Standard		For extending high speed riding	
ND	NGK	ND	NGK	ND	NGK
X22ESR -U	DR7ES	X24ESR -U	DR8ES -L	X27ESR -U	DR8ES

Disconnect the spark plug caps.
Clean any dirt from around the spark plug bases.
Remove and diseard the spark plugs.

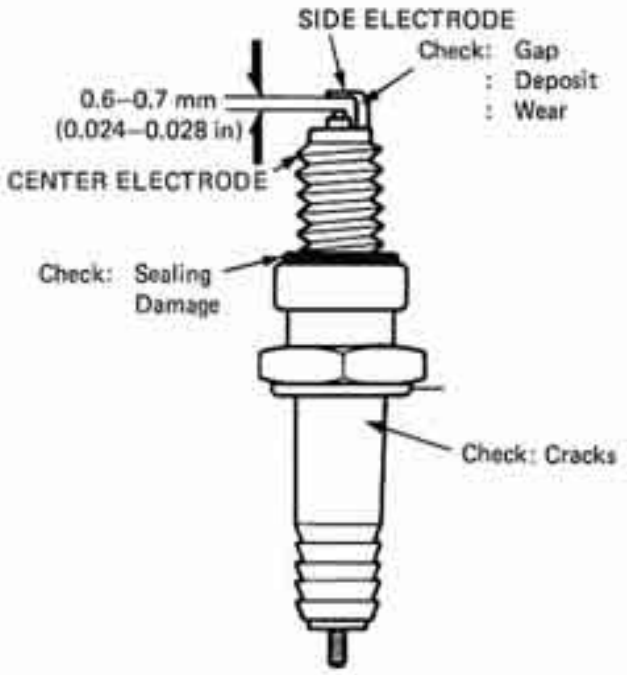
Measure the new spark plug gaps using a wire-type feeler gauge.

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

Adjust by bending the side electrode carefully.

With the plug washer attached, thread the new spark plugs in by hand to prevent cross-threading.

Tighten the spark plugs another 1/2 turn with a spark plug wrench to compress the plug washer.



NEW

Reinstall the spark plug caps.

CAUTION

- *The spark plug must be securely tightened. An improperly tightened plug can become very hot and possibly damage the engine.*
- *Never use a spark plug with an improper heat range.*

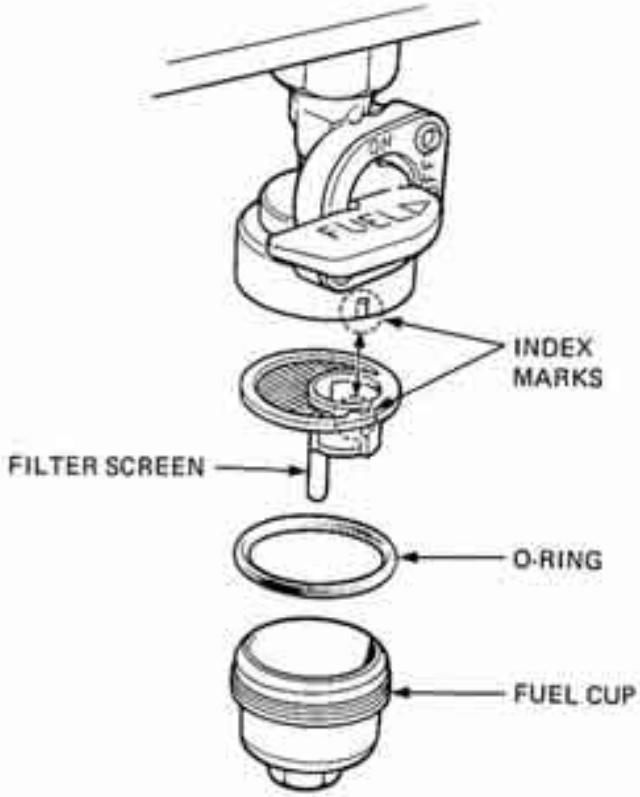
FUEL STRAINER

NEW

Turn the fuel valve OFF.
Remove the fuel cup, O-ring and filter screen, 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 securely, 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 cup and then torque it to specification.

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

NOTE

Do not overtighten the fuel cup.

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

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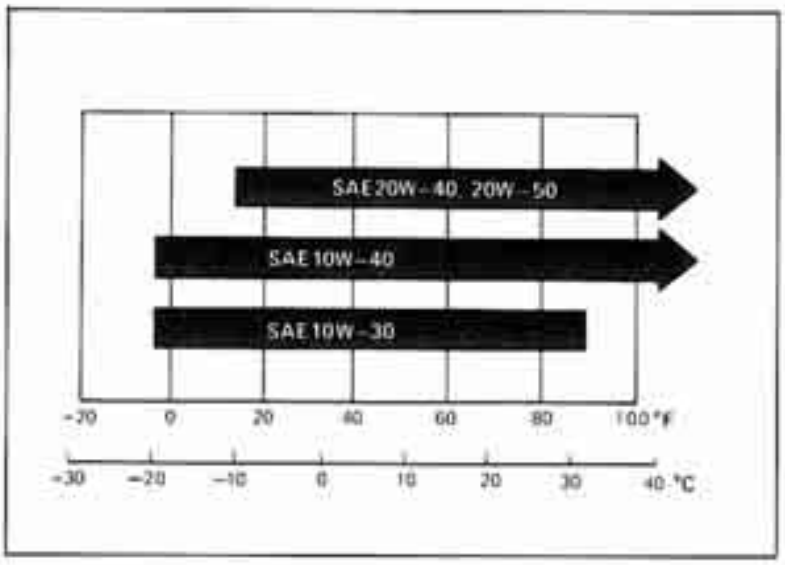
ENGINE OIL

Recommended oil:

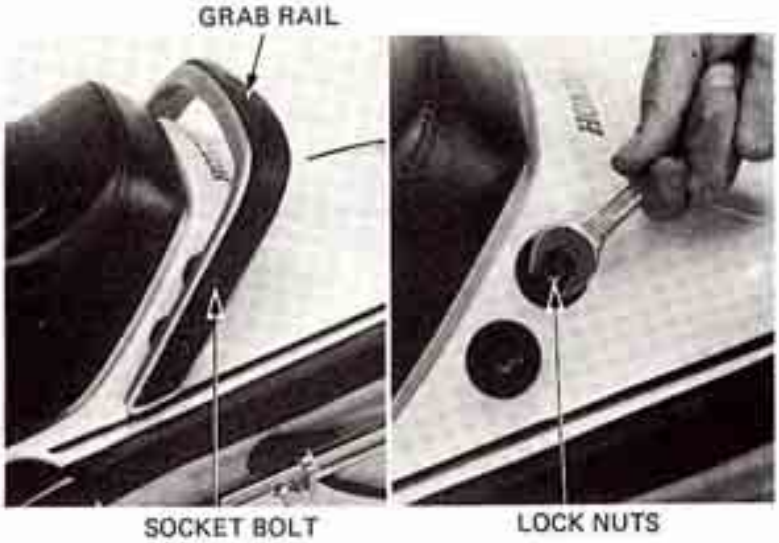
NEW
- Use HONDA 4-STROKE OIL or equivalent.
- API service classification – SE or SF.
- Viscosity – SAE 10W-40.
- Other oil viscosities may be used when the average temperature in your riding area is within the indicated range.



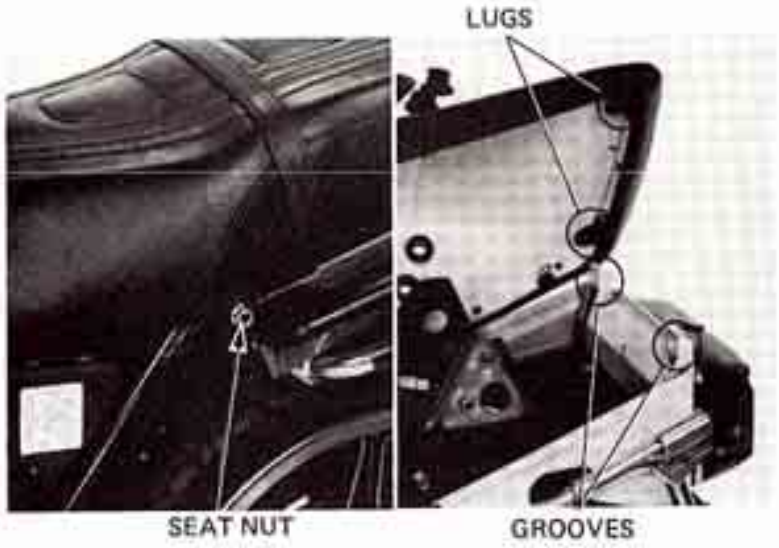
VI. FRAME

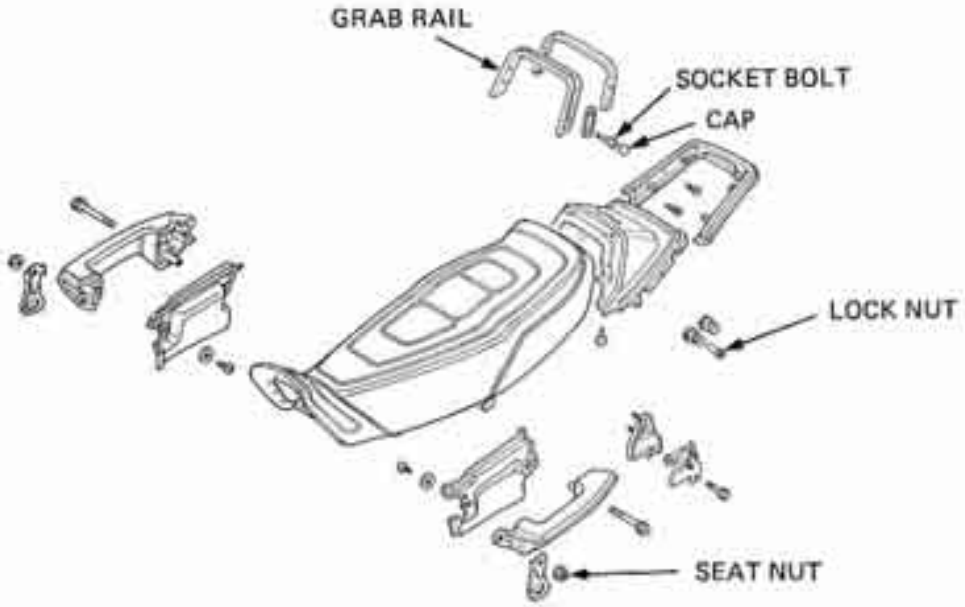
SEAT REMOVAL

Remove the socket bolt caps.
Remove the four socket bolts from the grab rail.
Remove the grab rail.
Remove the grab rail lock nuts.
Remove the seat nuts and pull the seat backwards to remove it.



When reinstalling the seat, align the grooves with the lugs and push the seat firmly into place.
Reinstall the locknuts, the grab rail and the socket bolts and caps. Lift the seat to make sure the latches are secure.





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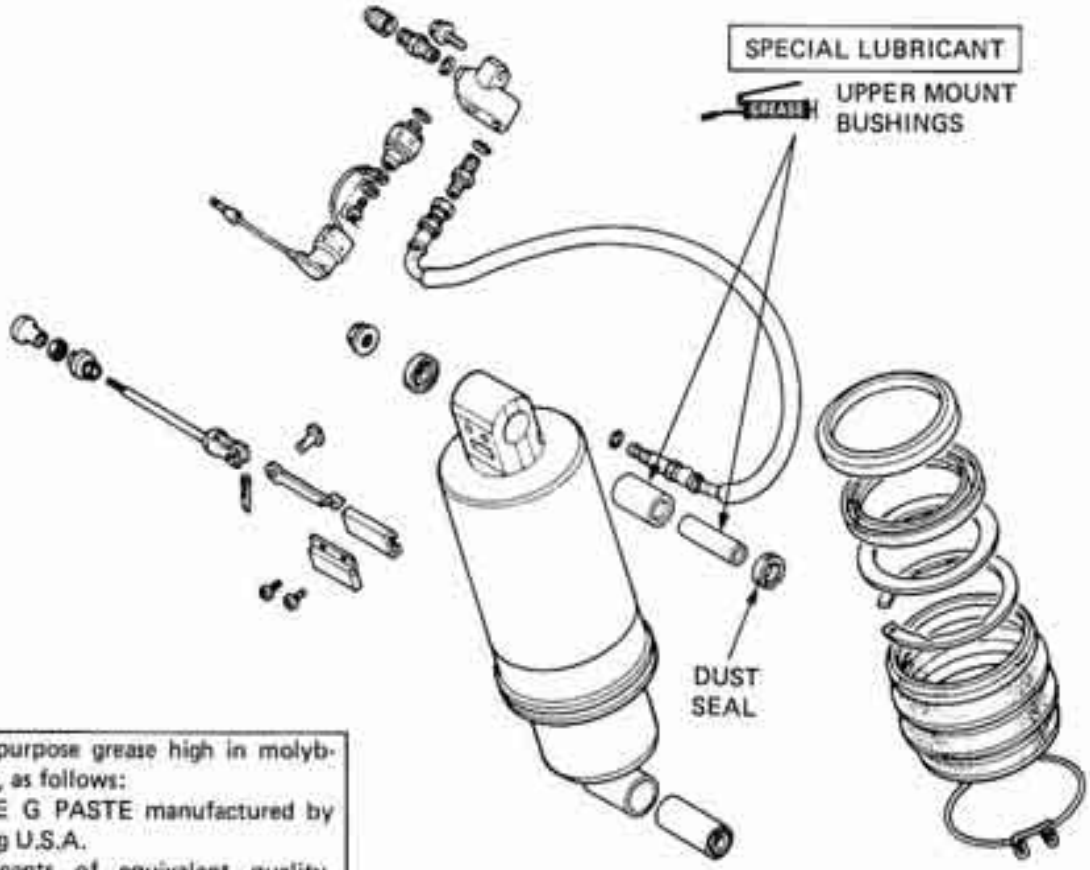
REAR SUSPENSION

SHOCK ABSORBER ASSEMBLY

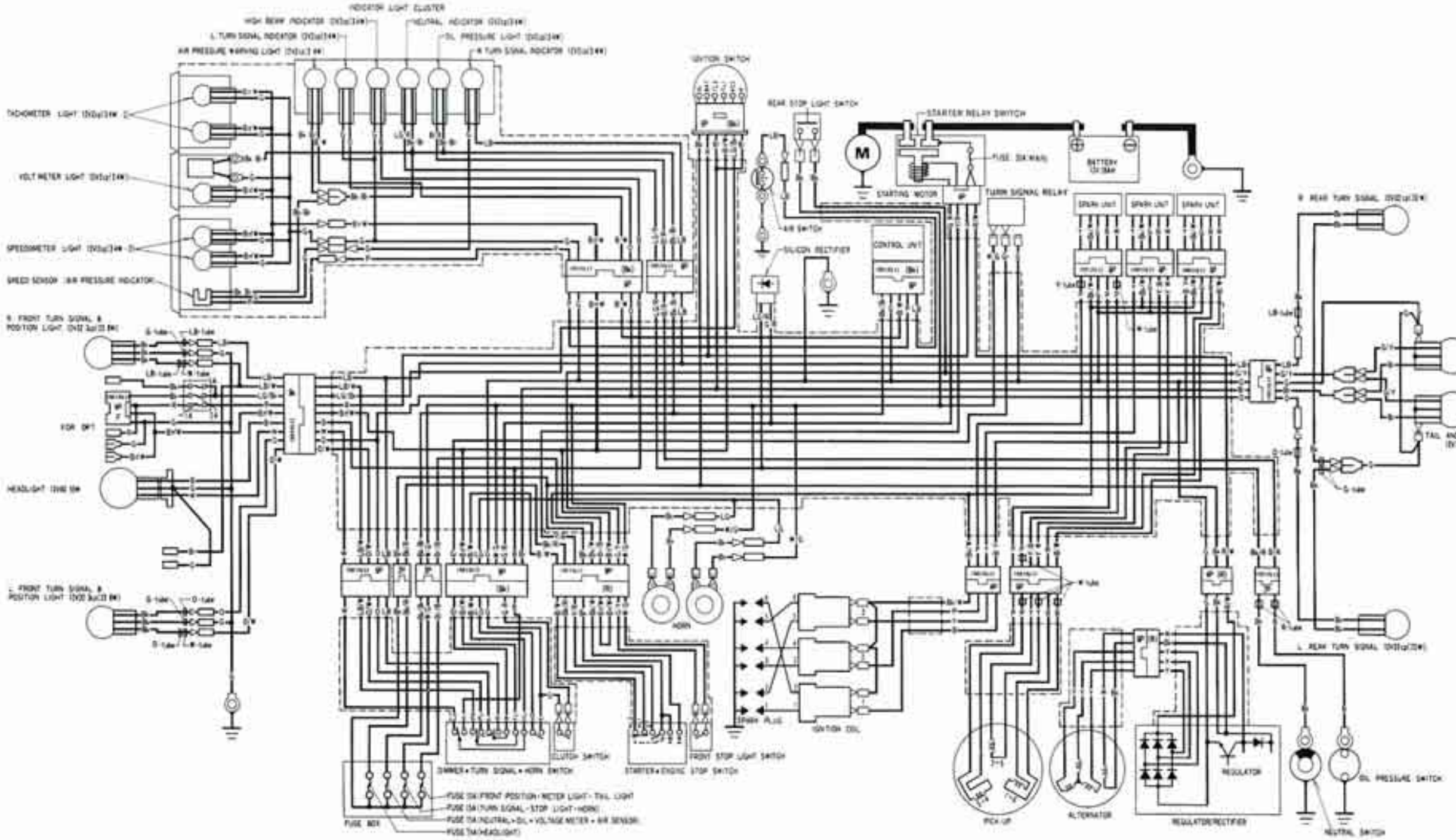


NOTE

Apply a multipurpose grease high in molybdenum content, as follows:

- MOLYKOTE G PASTE manufactured by Dow Corning U.S.A.
- Other lubricants of equivalent quality.

WIRING DIAGRAM



SWITCH CONTINUITY

IGNITION SWITCH

	BAT	IG	ACC	TL1	TL2	P
OFF						
ACC			○			
ON			○	○		
P						○
COLOR	L	Bk	LG/Bk	B/W	B/W	G

STARTER SWITCH

	HL1	HL2	IG	ST
FREE	○			
PUSH				○
COLOR	Bu/R	B/W	Bu	Y/G

ENGINE STOP SWITCH

	KB	KA
OFF		
RUN	○	
OFF		
COLOR	Bu	Bu/W

TURN SIGNAL SWITCH

	R	R	L	P	HR	HL
R	○			○		
N						
L		○	○			
COLOR	Gr	LB	G	B/W	LB/W	O/W

DIMMER SWITCH

	HL	LO	HI
LO		○	
N			
HI	○		○
COLOR	B/W	W	R

HORN SWITCH

	HO	E
FREE		
PUSH	○	○
COLOR	LG	G

W	White	Y	Yellow
Bk	Black	B	Blue
R	Red	Gr	Grey
LG	Light Green	LB	Light Blue
R	Red	O	Orange
G	Green	P	Pink

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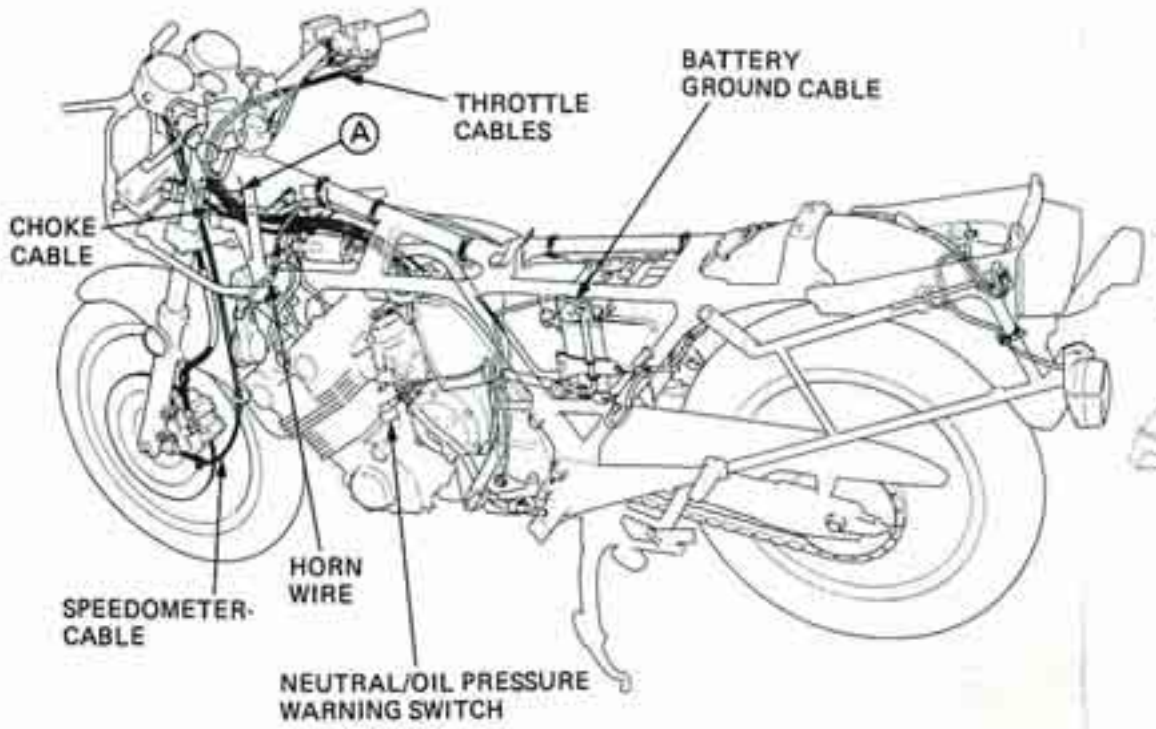
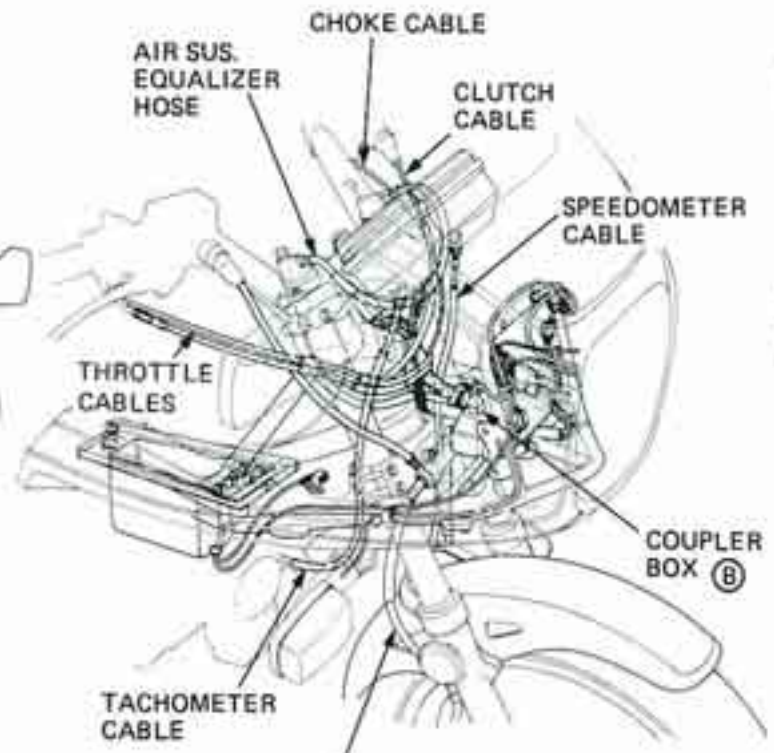
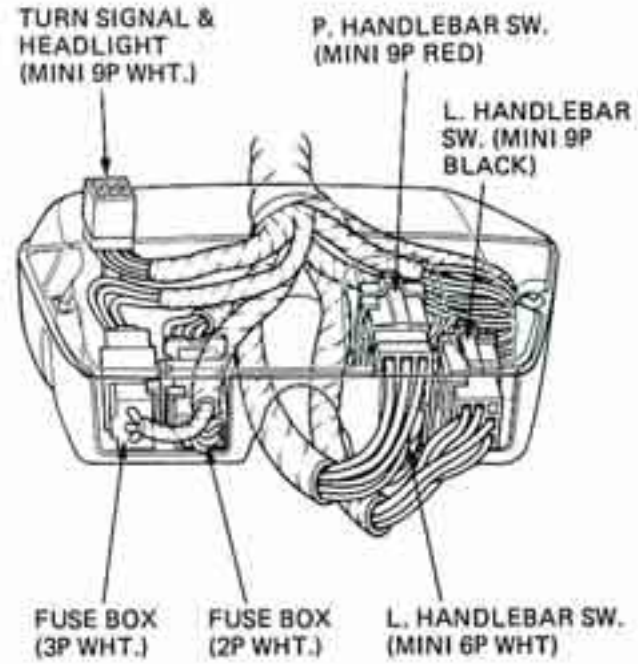
CABLE & HARNESS ROUTING

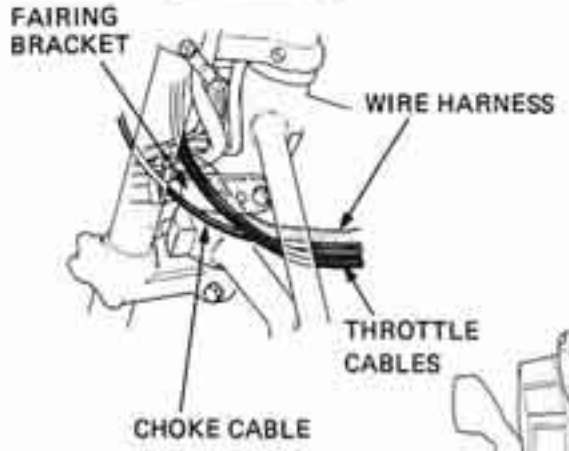


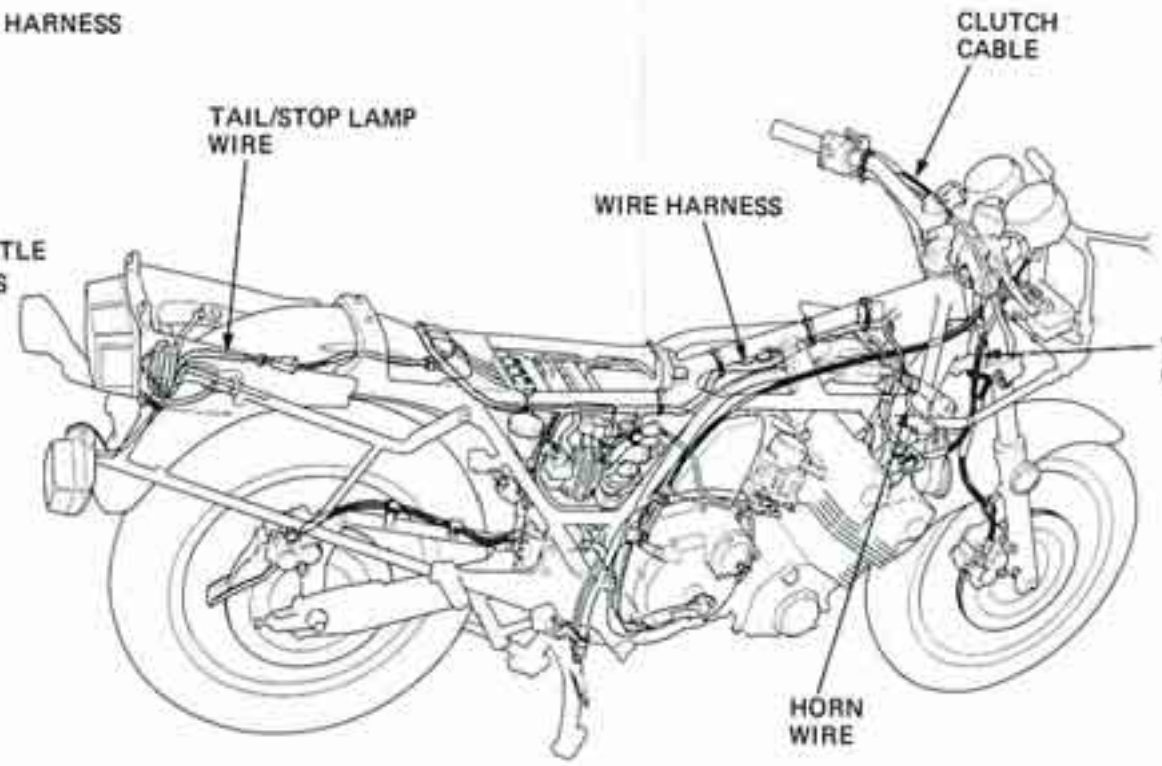


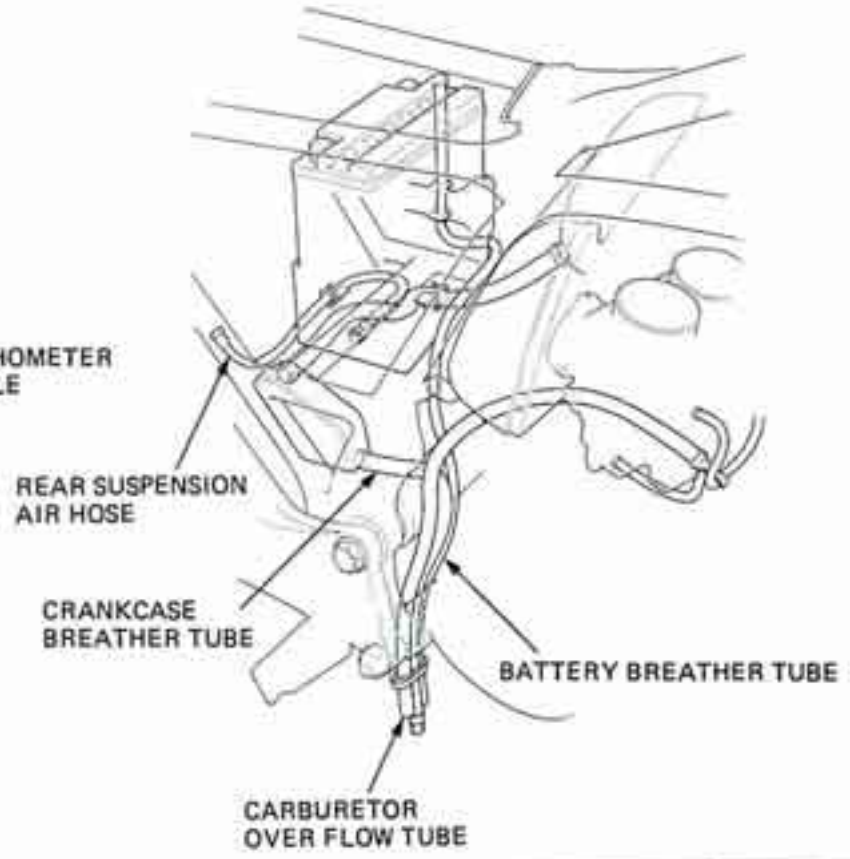
DETAIL B



DETAIL A







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