

IMPORTANT SAFETY NOTICE

⚠ WARNING

Indicates a strong possibility of severe personal injury or death if instructions are not followed.

CAUTION

Indicates a possibility of equipment damage if instructions are not followed.

NOTE

Gives helpful information.

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

Type Codes

- Throughout this manual, the following abbreviations are used to identify individual type.
- The asterisk (*) indicates that this manual is applicable for the corresponding area type.

Code	Available	Area type
ED	*	European direct sales
E	*	U.K.
F	*	France
IIG	*	Germany
U		Australia
SA		South Africa
ND		North Europe
SW		Switzerland
SD		Sweden
FI		Finland
N		Norway
IT		Italy
SP		Spain
B		Belgium
H		Netherlands
AR		Austria
D (DK, DM)		General export (km/h, mph)
II PO		Portugal

HOW TO USE THIS MANUAL

This service manual describes the service procedures for the CLR 125.

Follow the Maintenance Schedule (Section 3) recommendations to ensure that the vehicle is in peak operating condition.

Performing the first scheduled maintenance is very important. It compensates for the initial wear that occurs during the break-in period.

Sections 1 and 3 apply to the whole scooter. Section 2 describes procedures for removal/installation of components that may be required to perform service described in the following sections.

Sections 4 through 18 describe parts of the scooter, grouped according to location.

Find the section you want on this page, then turn to the table of contents on the first page of the 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 don't know the source of the trouble, go to section 20, Troubleshooting.

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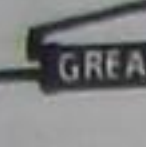
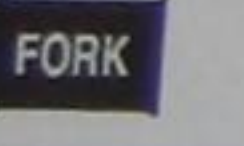
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SERVICE PUBLICATIONS OFFICE

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Symbols

The symbols used throughout this manual show specific service procedures. If supplementary information is required pertaining to these symbols, it would be explained specifically in the next without the use of the symbols.

	Replace the part(s) with new one(s) before assembly.
	Use recommended engine oil, unless otherwise specified.
	Use molybdenum oil solution (mixture of the engine oil and molybdenum grease in a ratio of 1:1).
	Use multi-purpose grease (Lithium based multi-purpose grease NLGI # 2 or equivalent).
	Use molybdenum disulfide grease (containing more than 3% molybdenum disulfide, NLGI # 2 or equivalent). Example: Molykote - BR-2 plus manufactured by Down Corning, U.S.A. Multi-purpose M-2 manufactured by Mitsubishi Oil, Japan.
	Use molybdenum disulfide paste (containing more than 40% molybdenum disulfide, NLGI # 2 or equivalent). Example: Molykote - G-n paste, manufactured by Down Corning, U.S.A. Honda Moly 60 (U.S.A. only) Rocol ASP manufactured by Rocol Limited, U.K. Rocol Paste manufactured by Sumico Lubricant, Japan.
	Use silicone grease.
	Apply a locking agent. Use a middle strength locking agent unless otherwise specified.
	Apply sealant.
	Use DOT 4 brake fluid. Use the recommended brake fluid unless otherwise specified.
	Use Fork or Suspension Fluid.

1. General Information

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General Safety

Carbon Monoxide

In the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area.

WARNING

- The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and may lead to death.

Run the engine in an open area or with an exhaust evacuation system in an enclosed area.

Gasoline

Work in a well ventilated area. Keep cigarettes, flames or sparks away from the work area or where gasoline is stored.

WARNING

- Gasoline is extremely flammable and is explosive under certain conditions. KEEP OUT OF REACH OF CHILDREN.

Hot Components

WARNING

- Engine and exhaust system parts become very hot and remain hot for some time after the engine is run. Wear insulated gloves or wait until the engine and exhaust system have cooled before handling these parts.

Used Engine Oil

WARNING

- Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil. KEEP OUT OF REACH OF CHILDREN.

Brake Dust

Never use an air hose or dry brush to clean brake assemblies. Use a vacuum cleaner or alternate method to minimize the hazard caused by air borne asbestos fibers.

WARNING

- Inhaled asbestos fibers have been found to cause respiratory disease and cancer.

Brake Fluid

CAUTION

- Spilling fluid on painted, plastic or rubber parts will damage them. Place a clean shop towel over these parts whenever the system is serviced. KEEP OUT OF REACH OF CHILDREN.

Battery Hydrogen Gas & Electrolyte

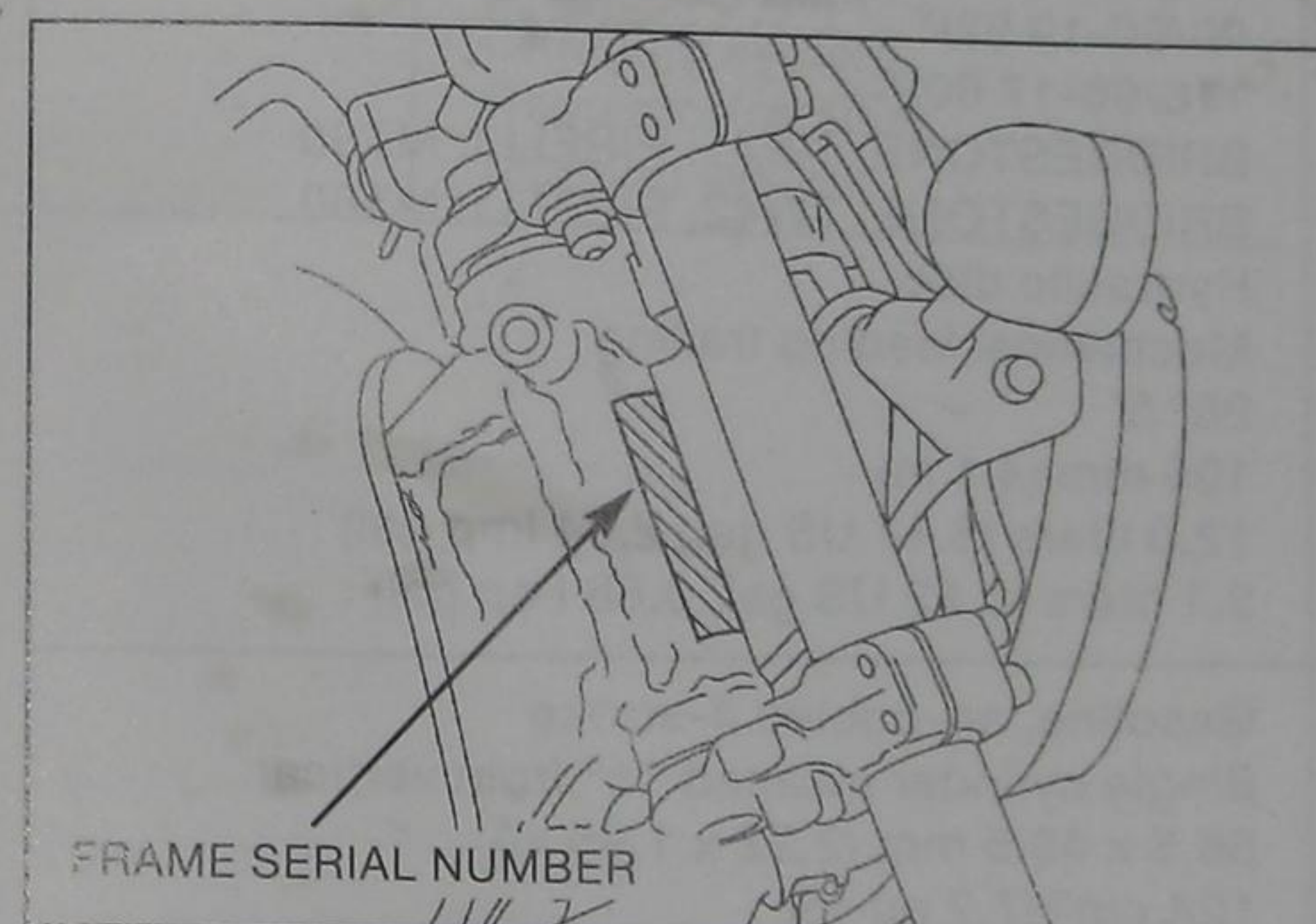
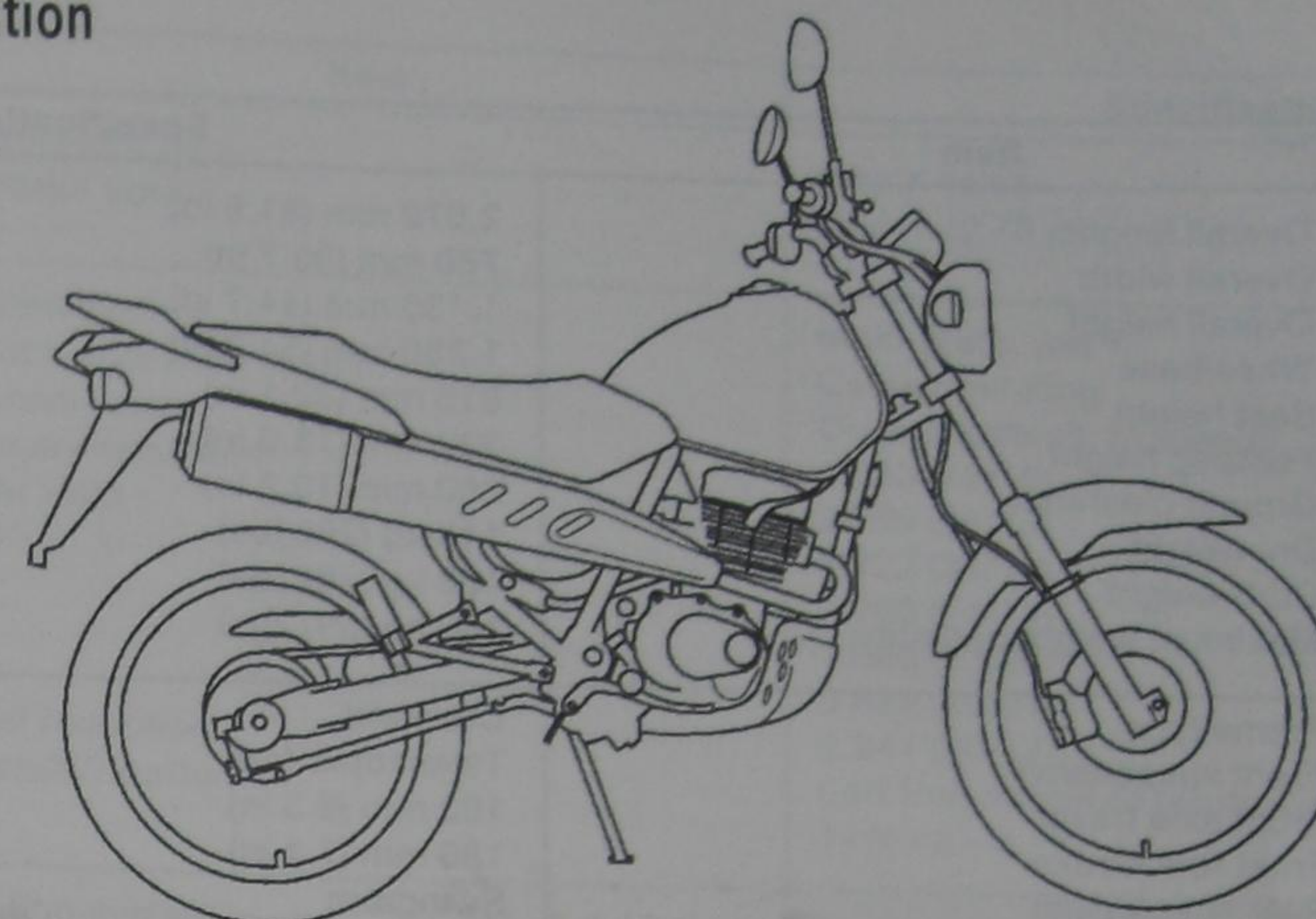
WARNING

- The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging or using the battery in an enclosed space.
- The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.
 - If electrolyte gets on your skin, flush with water.
 - If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.
- Electrolyte is poisonous.
 - If swallowed, drink large quantities of water or milk and follow with milk of magnesia or vegetable oil and call a physician. KEEP OUT OF REACH OF CHILDREN.

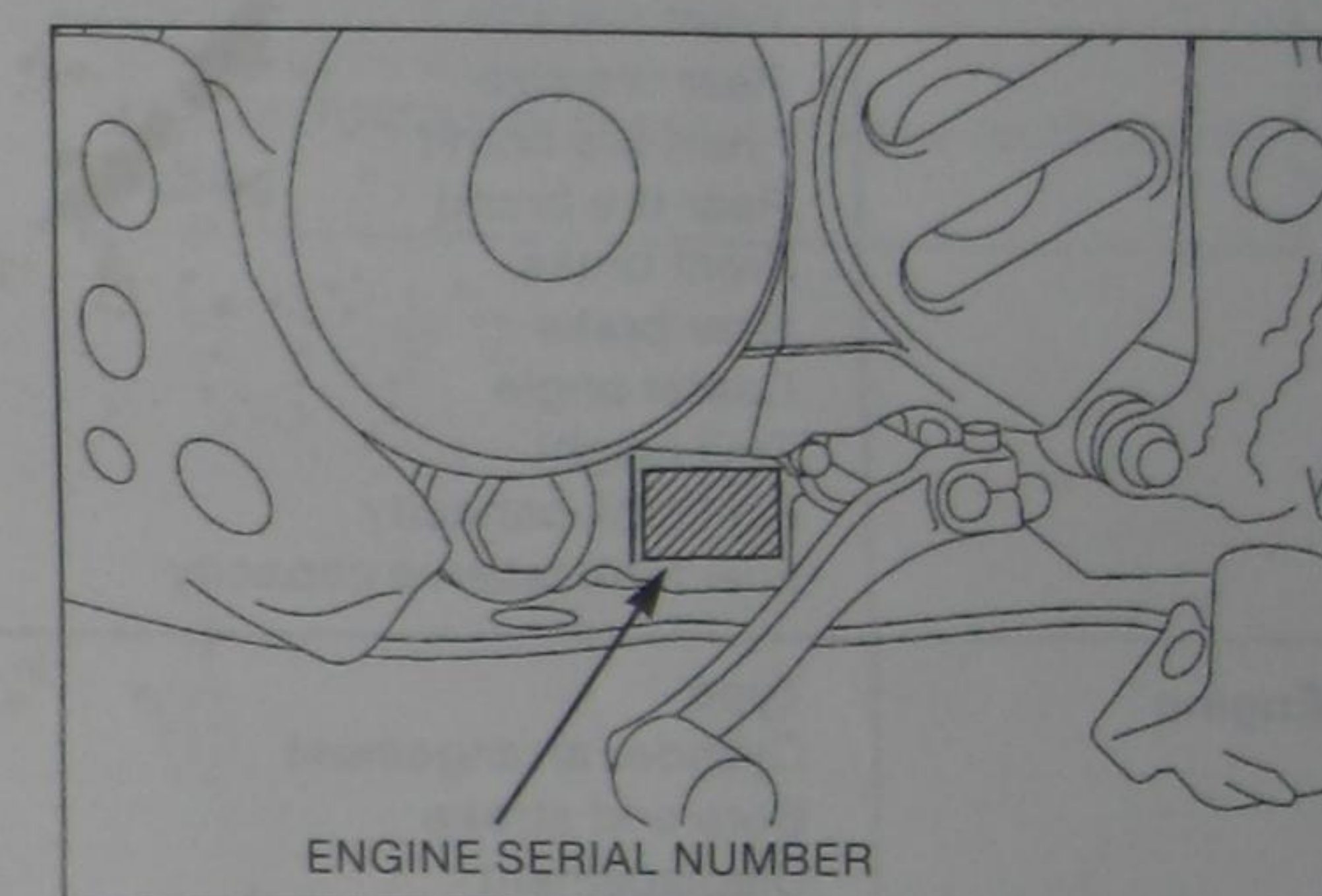
Service Rules

1. Use genuine HONDA or HONDA-recommended parts and lubricants or their equivalents. Parts that don't meet HONDA'S design specifications may cause damage to the motorcycle.
2. Use the special tools designed for this product to avoid damage and incorrect assembly.
3. Use only metric tools when servicing the motorcycle. Metric bolts, nuts and screws are not interchangeable with English fasteners.
4. Install new gaskets, O-rings, cotter pins, and lock plates when reassembling.
5. When tightening bolts or nuts, begin with the larger diameter or inner bolt first. Then tighten to the specified torque diagonally in incremental steps unless a particular sequence is specified.
6. Clean parts in cleaning solvent upon disassembly. Lubricate any sliding surfaces before reassembly.
7. After reassembly, check all parts for proper installation and operation.
8. Route all electrical wires as shown on pages 1-16 through 1-20, Cable & Harness routing.

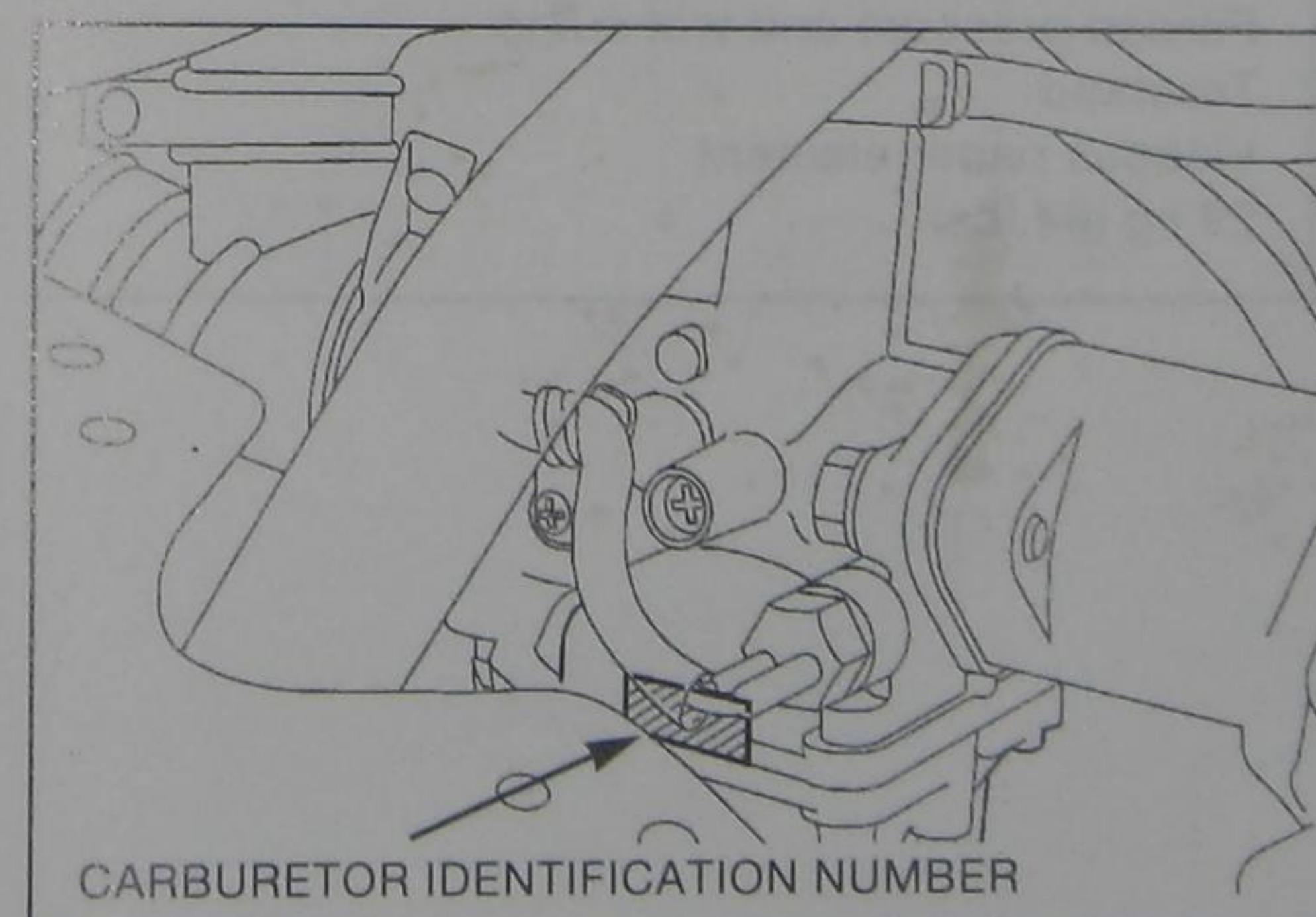
Model Identification



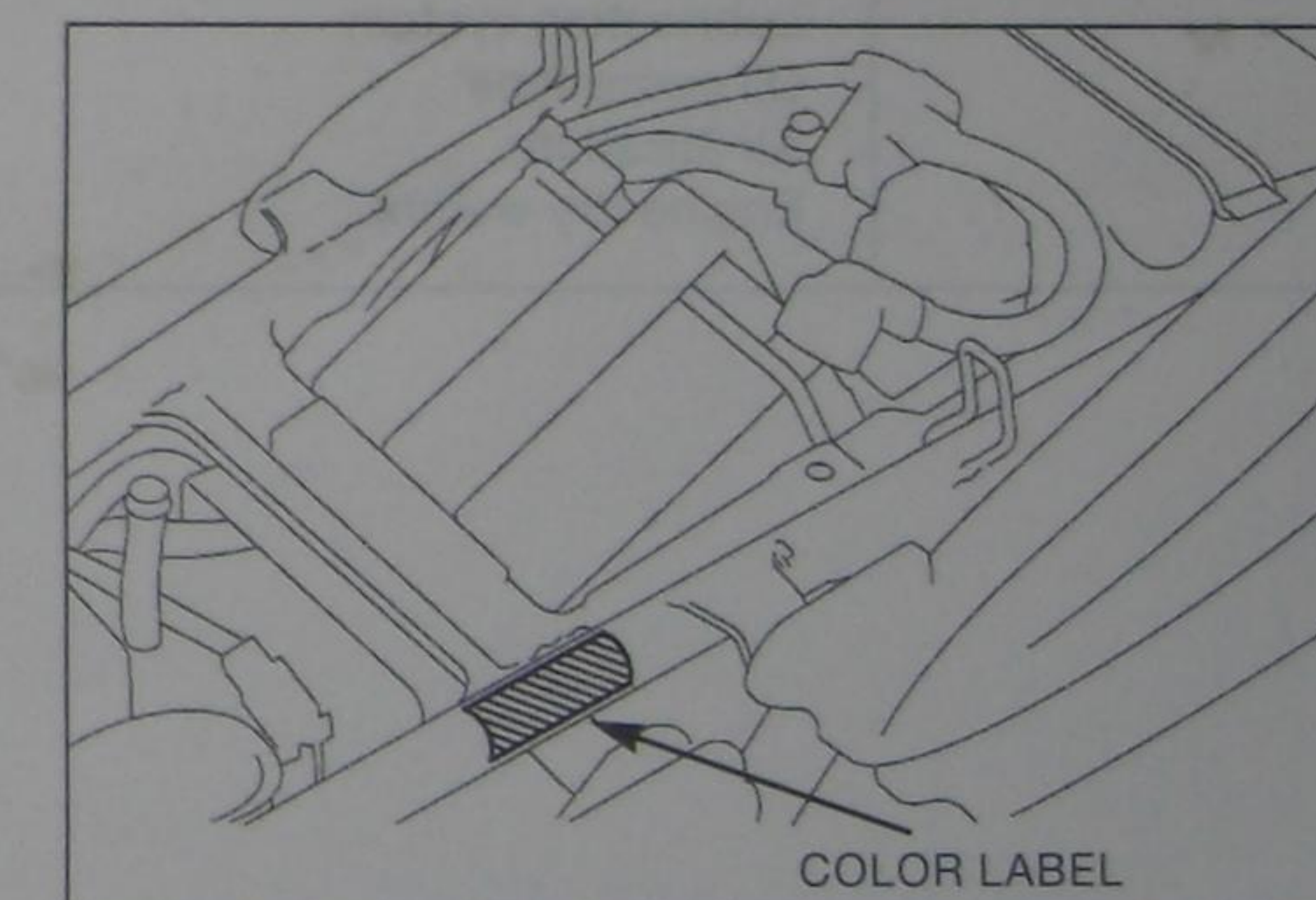
The frame serial number is stamped on the right side of the steering head.



The engine serial number is stamped on the lower left side of the crankcase.



The carburetor identification number is stamped on the right side of the carburetor body.



The color label is attached on the frame tube under the seat. When ordering color-coded parts, always specify the designated color code.

GENERAL INFORMATION

Specifications

Unit: mm (in)

General		Item	Specifications
Dimensions	Overall length		2,070 mm (81.5 in)
	Overall width		780 mm (30.7 in)
	Overall height		1,135 mm (44.7 in)
	Wheelbase		1,380 mm (54.3 in)
	Seat height		815 mm (32.1 in)
	Footpeg height		330 mm (13.0 in)
	Ground clearance		260 mm (10.2 in)
	Dry weight		118 kg (260 lbs)
	Curb weight		128 kg (282 lbs)
	Maximum weight capacity		180 kg (397 lbs)
Frame	Frame type		Diamond
	Front suspension		Telescopic fork
	Front axle travel		162 mm (6.3 in)
	Front fork stroke		180 mm (7.1 in)
	Rear suspension		Swingarm
	Rear axle travel		128 mm (5.0 in)
	Front tire size		90/90-19 52P
	Rear tire size		110/90-17 60P
	Front tire brand		BRIDGESTONE: TW41, PIRELLI: MT60
	Rear tire brand		BRIDGESTONE: TW42, PIRELLI: MT60
	Front brake		Hydraulic disc
	Rear brake		Mechanical leading trailing
	Caster angle		28° 5'
	Trail length		105 mm (4.1 in)
	Fuel tank capacity		12.0 liters (3.17 US gal, 2.64 Imp gal)
	Fuel tank reserve capacity		3.1 liters (0.82 US gal, 0.68 Imp gal)
Engine	Type		Gasoline, air-cooled 4-stroke
	Cylinder arrangement		Single cylinder inclined 15° from vertical
	Bore and stroke		56.5 x 49.5 mm (2.22 x 1.95 in)
	Displacement		124 cm³ (7.7 cu-in)
	Compression ratio		9.2 : 1
	Valve train		Chain driven, SOHC
	Intake valve	opens	15° BTDC (At 1 mm lift)
		closes	20° ABDC (At 1 mm lift)
	Exhaust valve	opens	35° BBDC (At 1 mm lift)
		closes	0° ATDC (At 1 mm lift)
	Lubrication system		Forced pressure and wet sump
	Oil pump type		Trochoid
	Air filtration		Viscous paper element
	Engine dry weight		29 kg (64 lbs)

GENERAL INFORMATION

General (Cont'd)

Unit: mm (in)

General		Item	Specifications
Carburetor	Carburetor type		Piston valve
	Throttle bore		20 mm (0.78 in)
Drive Train	Clutch system		Multi-plate, wet
	Clutch operation system		Cable operating
	Transmission		Constant mesh, 5-speeds
	Primary reduction		4.055 (73/18)
	Gear ratio	1st	2.769 (36/13)
		2nd	1.722 (31/18)
		3rd	1.263 (24/19)
		4th	1.000 (22/22)
		5th	0.838 (26/31)
	Final reduction		2.941 (50/17)
	Gearshift pattern		Left foot operated return system, 1 - N - 2 - 3 - 4 - 5
Electrical	Ignition system		DC-CDI
	Starting system		Electric starter motor
	Charging system		Triple phase alternator
	Regulator/rectifier		SCR shorted/triple phase, full wave rectification
	Lighting system		Battery

GENERAL INFORMATION

Unit: mm (in)

Lubrication System		Standard	Service Limit
Item			
Engine oil capacity	At draining	1.0 liter (1.06 US qt, 0.88 Imp qt)	—
	At disassembly	1.2 liters (1.27 US qt, 1.06 Imp qt)	—
Recommended engine oil		Honda 4-stroke oil or equivalent motor oil API service classification: SE Viscosity: SAE 10W-30	—
Oil pump	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15-0.21 (0.006-0.008)	0.35 (0.014)
	Side clearance	0.03-0.12 (0.001-0.005)	0.15 (0.006)

Fuel System		Specifications
Item		
Identification number		PDC5B
Venturi diameter		22 mm (87 in)
Main jet		#100
Slow jet		#38 x #38
Jet needle clip position		3rd groove
Float level		14 mm (0.55 in)
Pilot screw initial opening		1 — 1/2 turns out
Idle speed		1,400 ± 100 min ⁻¹ (rpm)
Throttle grip free play		2-6 mm (1/12-1/4 in)

Cylinder Head/Valves				Standard	Service Limit
Item					
Cylinder compression				1,373 ± 98 kPa (14.0 ± 1.0 kgf/cm ² , 199 ± 14 psi) at 600 min ⁻¹ (rpm)	
Valve clearance		IN		0.10 ± 0.02 (0.004 ± 0.001)	
		EX		0.10 ± 0.02 (0.004 ± 0.001)	
Camshaft	Cam lobe height	IN		31.402-31.582 (1.2363-1.2434)	31.10 (1.224)
		EX		31.082-31.262 (1.2237-1.2308)	30.70 (1.209)
	Runout			—	0.03 (0.002)
Cylinder head warpage				—	0.10 (0.004)
Rocker arm	I.D			12.000-12.018 (0.4724-0.4731)	12.06 (0.474)
	Shaft O.D			11.966-11.984 (0.4711-0.4718)	11.93 (0.470)
	Rocker arm-to-shaft clearance			0.016-0.052 (0.0006-0.0020)	0.08 (0.003)
Valve	Stem O.D	IN		5.450-5.465 (0.2146-0.2052)	5.42 (0.213)
		EX		5.430-5.445 (0.2138-0.2144)	5.40 (0.213)
	Guide I.D	IN		5.475-5.485 (0.2156-0.2159)	5.50 (0.217)
		EX		5.475-5.485 (0.2156-0.2159)	5.50 (0.217)
	Stem-to guide clearance	IN		0.010-0.035 (0.0004-0.0014)	0.08 (0.003)
		EX		0.030-0.055 (0.0012-0.0022)	0.10 (0.004)
	Spring free length	Outer		44.9 (1.77)	43.5 (1.71)
		Inner		39.2 (1.54)	38.0 (1.50)
Valve seat width				1.1-1.3 (0.04-0.05)	1.5 (0.06)

GENERAL INFORMATION

Unit: mm (in)

Cylinder/Piston			Unit: mm (in)	
Item			Standard	Service Limit
Cylinder	I.D.			
	Out of round		56.500-56.510 (2.2244-2.2248)	56.60 (2.228)
	Taper		—	0.08 (0.003)
	Warpage		—	0.05 (0.002)
Piston, piston ring, piston pin	Piston O.D.		—	0.05 (0.002)
	Piston pin hole I.D.		56.470-56.490 (2.4988-2.4996)	56.42 (2.221)
	Piston pin O.D.		15.002-15.008 (0.5906-0.5909)	15.04 (0.592)
	Piston-to-piston pin clearance		14.994-15.000 (0.5903-0.5906)	14.96 (0.589)
	Piston ring-to-groove clearance	Top	0.002-0.014 (0.0001-0.0006)	0.07 (0.003)
		Second	0.015-0.045 (0.0006-0.0018)	0.10 (0.004)
	Piston ring end gap	Top	0.015-0.045 (0.0006-0.0018)	0.10 (0.004)
		Second	0.05-0.20 (0.002-0.008)	0.05 (0.02)
		Oil (side rail)	0.05-0.20 (0.002-0.008)	0.05 (0.02)
	Cylinder-to-piston clearance		0.20-0.70 (0.008-0.028)	0.09 (0.04)
Connecting rod small end I.D.		0.010-0.040 (0.0004-0.0016)	0.15 (0.006)	
Connecting rod-to-piston pin clearance.		15.010-15.028 (0.5909-0.5917)	15.06 (0.593)	
		0.010-0.034 (0.0004-0.0013)	0.10 (0.004)	

Clutch/Gearshift Linkage				Unit: mm (in)	
Item				Standard	Service Limit
Clutch	Lever free play			10-20 (3/8-3/4)	—
	Spring free length			34.7 (1.37)	31.7 (1.25)
	Disc thickness			2.90-3.00 (0.114-0.118)	2.6 (0.10)
	Plate warpage			—	0.20 (0.008)
	Outer I.D.			28.000-28.021 (1.1024-1.1032)	28.04 (1.104)
	Outer guide	O.D.		27.959-27.980 (1.1007-1.1015)	27.93 (1.100)
		I.D.		19.983-19.996 (0.7867-0.7872)	20.02 (0.788)
Mainshaft O.D. at clutch outer guide.				19.967-19.980 (0.7861-0.7866)	19.92 (0.784)

GENERAL INFORMATION

Unit: mm (in)

Crankcase/Transmission/Crankshaft			Standard	Service Limit
Item				
Shift fork	I.D.		12.000-12.018 (0.4724-0.4731)	12.05 (0.474)
	Claw thickness		4.93-5.00 (0.194-0.197)	4.70 (0.185)
	Shaft O.D.		11.976-11.994 (0.4715-0.4722)	11.90 (0.469)
Transmission	Gear I.D.	M3, C4	20.020-20.041 (0.7882-0.7890)	20.07 (0.790)
		M5, C2	23.020-23.041 (0.9063-0.9071)	23.07 (0.908)
		C1	19.520-19.541 (0.7685-0.7693)	19.57 (0.770)
	Bushing O.D.	M5	22.984-23.005 (0.9049-0.9057)	22.93 (0.903)
		C1	19.479-19.500 (0.7667-0.7677)	19.43 (0.765)
		C2	22.979-23.000 (0.9047-0.9055)	22.93 (0.903)
	Bushing I.D.	M5	20.020-20.041 (0.7882-0.7890)	20.10 (0.791)
		C1	16.516-16.534 (0.6502-0.6509)	16.60 (0.654)
		C2	20.000-20.021 (0.7874-0.7882)	20.10 (0.791)
	Gear-to-bushing clearance	M5	0.015-0.057 (0.0006-0.0022)	0.10 (0.004)
		C1, C2	0.020-0.062 (0.0008-0.0024)	0.10 (0.004)
	Mainshaft O.D.	At M3, M5	19.959-19.980 (0.7875-0.7866)	19.91 (0.784)
	Countershaft O.D.	At C1 bushing	16.466-16.484 (0.6483-0.6490)	16.41 (0.646)
		At C2 bushing	19.974-19.987 (0.7864-0.7869)	19.91 (0.784)
		At C4 gear	19.959-19.980 (0.7875-0.7866)	19.91 (0.784)
	Gear-to-shaft clearance	M3, C4	0.040-0.082 (0.0016-0.0032)	0.111 (0.0044)
	Bushing-to-shaft clearance	M5	0.040-0.082 (0.0016-0.0032)	0.111 (0.0044)
C1		0.032-0.068 (0.0013-0.0027)	0.096 (0.0038)	
C2		0.013-0.047 (0.0005-0.0019)	0.10 (0.004)	
Crankshaft	Runout		—	0.10 (0.004)
	Big end side clearance		0.05-0.30 (0.002-0.012)	0.5 (0.02)
	Big end radial clearance		0-0.008 (0-0.0003)	0.05 (0.002)

GENERAL INFORMATION

Unit: mm (in)

Front Wheel/Suspension/Sttering			Unit: mm (in)	
Item		Standard	Service Limit	
Minimum tire tread depth				
Cold tire pressure	Driver only	—	3.0 (0.12)	
	Driver and passenger	175 kPa (1.75 kgf/cm ² , 25 psi)	—	
Front axle runout		175 kPa (1.75 kgf/cm ² , 25 psi)	—	
Front wheel rim runout	Radial	—	0.20 (0.008)	
	Axial	—	2.0 (0.08)	
Fork spring free length		—	2.0 (0.08)	
Fork tube runout		587.6 (23.13)	579.3 (22.81)	
Fork fluid capacity		—	0.20 (0.008)	
Fork fluid level		384 cm ³ (12.9 US oz, 13.5 Imp oz)	—	
		140 (5.5)	—	

Unit: mm (in)

Rear Wheel/Brake/Suspension			Unit: mm (in)	
Item		Standard	Service Limit	
Minimum tire tread depth		—	3.0 (0.12)	
Cold tire pressure	Driver only	175 kPa (1.75 kgf/cm ² , 25 psi)	—	
	Driver and passenger	200 kPa (2.00 kgf/cm ² , 29 psi)	—	
Rear axle runout		—	0.20 (0.008)	
Rear wheel rim runout	Radial	—	2.0 (0.08)	
	Axial	—	2.0 (0.08)	
Rear brake drum I.D.		130 (5.1)	131 (5.2)	
Rear brake lining thickness		4.0 (0.16)	2.0 (0.08)	
Rear brake pedal free play		20-30 (3/4 — 1-1/4)	—	
Drive chain slack		25-35 (1—1-3/8)	—	

Unit: mm (in)

Hydraulic Disc Brake			Standard	Service Limit
Item				
Specified brake fluid			DOT 4	—
Brake disc thickness			3.8-4.2 (0.15-0.17)	3.5 (0.14)
Brake disc runout			—	0.30 (0.012)
Master cylinder I.D.			12.700-12.743 (0.500-0.5017)	12.75 (0.502)
Master cylinder piston O.D.			12.657-12.684 (0.4983-0.4994)	12.65 (0.498)
Caliper cylinder I.D.			25.020-25.050 (0.9850-0.9862)	25.06 (0.987)
Caliper piston O.D.			24.960-24.980 (0.9827-0.9835)	24.95 (0.982)

GENERAL INFORMATION

Battery/Charging System			Specifications
Item			
Battery	Capacity		12 V - 4 Ah
	Voltage at 20°C (68°F)	Fully charged	Above 12.8 V
		Needs charging	Below 12.3 V
	Charging rate	Normal	0.5 A/5-10 h
		Quick	5 A/0.5 h
	Current leakage		1 mA max.
Regulator/rectifier regulated voltage			14.0-14.8 V/5,000 min ⁻¹ (rpm)
Alternator	Capacity		200 W/5,000 min ⁻¹ (rpm)
	Charging coil at 20°C (68°F)		0.1 - 1.0 Ω

Ignition System			Specifications
Item			
Spark plug	NGK		DPR8EA-9
	DENSO		X24EPR-U9
Spark plug gap			0.8-0.9 mm (0.031-0.035 in)
Ignition coil peak voltage			100 V minimum
Ignition pulse generator peak voltage			0.7 V minimum
Ignition timing ("F" mark)			15° BTDC at idle

Unit: mm (in)

Electric Starter			
Item		Standard	Service Limit
Starter motor brush length		12.5-13.5 (0.49-0.51)	8.5 (0.33)

Lights/Meters/Switches			
Item			Specifications
Bulb	Headlight high/low beam	E type	12 V - 35/35 W
		Except E type	12 V - 60/55 W
	Position light		12 V - 5 W
	Brake/taillight		12 V - 21/5 W
	Turn signal light		12 V - 10 W x 4
	Meter light		12 V - 1.7 W
	High beam indicator		12 V - 1.7 W
	Neutral indicator		12 V - 1.7 W
	Turn signal indicator		12 V - 1.7 W
			12 V - 1.7 W
Fuse	Main fuse		20 A
	Sub fuse		10 A x 2, 15 A

GENERAL INFORMATION

Torque Values

Standard			
Fastener Type	Torque N·m (kgf-m, lbf-ft)	Fastener Type	Torque N·m (kgf-m, lbf-ft)
5 mm bolt and nut	5 (0.5, 3.6)	5 mm screw	4 (0.4, 2.9)
6 mm bolt and nut	10 (1.0, 7)	6 mm screw	9 (0.9, 6.5)
8 mm bolt and nut	22 (2.2, 16)	6 mm flange bolt (8 mm head, small flange)	10 (1.0, 7)
10 mm bolt and nut	34 (3.5, 25)	(8 mm head, large flange)	12 (1.2, 9)
12 mm bolt and nut	54 (5.5, 40)	6 mm flange bolt and nut (10 mm head)	12 (1.2, 9)
		8 mm flange bolt and nut	26 (2.7, 20)
		10 mm flange bolt and nut	39 (4.0, 29)

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

- Notes:
1. Apply oil to the threads and seating surface.
 2. Apply locking agent to the threads.
 3. U-nut.
 4. ALOC bolt: replace with a new one.
 5. One-way bolt: replace with a new one.

Engine				
Item	Q'Ty	Thread Dia. (mm)	Torque N·m (kgf-m, lbf-ft)	Remarks
MAINTENANCE:				
Spark plug	1	12	18 (1.8, 13)	NOTE 1
Valve adjusting hole cap	2	36	15 (1.5, 11)	
Valve adjusting lock nut	2	6	14 (1.4, 10)	
Crankshaft hole cap	1	30	8 (0.8, 5.8)	
Timing hole cap	1	14	10 (1.0, 7)	
Oil strainer screen cap	1	36	15 (1.5, 11)	
LUBRICATION SYSTEM:				
Oil filter rotor cover screw	3	5	5 (0.5, 3.6)	
Pump plate attaching screw	2	4	3 (0.3, 2.2)	
Oil pump mounting screw	2	6	10 (1.0, 7)	
FUEL SYSTEM:				
Carburetor heater	1	—	8 (0.8, 5.8)	
ENGINE REMOVAL/INSTALLATION:				
Drive sprocket bolt (IIG type)	2	6	11 (1.1, 8)	NOTE 5
CYLINDER HEAD/VALVE:				
Cam chain tensioner slider pivot bolt	1	8	10 (1.0, 7)	NOTE 1
Cam sprocket bolt	2	6	12 (1.2, 9)	
Cylinder head cover cap nut	4	8	26 (2.7, 20)	
Cylinder head socket bolt	1	6	10 (1.0, 7)	
Cam chain tensioner mounting bolt	2	6	12 (1.2, 9)	
Cam chain tensioner sealing screw	1	6	4 (0.4, 2.9)	
CLUTCH/GEARSHIFT LINKAGE:				
Oil filter rotor lock nut	1	16	83 (8.5, 61)	NOTE 1
Clutch center lock nut	1	16	83 (8.5, 61)	NOTE 1
Gearshift drum stopper arm bolt	1	—	12 (1.2, 9)	
Clutch lifter plate bolt	4	6	12 (1.2, 9)	
Gearshift pedal bolt	1	6	12 (1.2, 9)	
ALTERNATOR/STARTER CLUTCH:				
Ignition pulse generator mounting bolt	2	5	5 (0.5, 3.6)	NOTE 2
Stator bolt	3	6	10 (1.0, 7)	
Starter clutch bolt	6	6	16 (1.6, 12)	NOTE 2
Flywheel bolt	1	10	74 (7.5, 54)	NOTE 1
CRANKCASE/TRANSMISSION/CRANKSHAFT:				
Mainshaft bearing setting plate bolt	2	6	12 (1.2, 9)	NOTE 2

GENERAL INFORMATION

Frame	Item	Q'Ty	Thread Dia. (mm)	Torque N·m (kgf-m, lbf-ft)	Remarks
FRAME/BODY PANELS/EXHAUST SYSTEM:					
	Exhaust pipe joint nut	2	6	10 (1.0, 7)	
	Muffler mounting bolt	2	8	32 (3.3, 24)	
	Muffler band bolt	1	8	20 (2.0, 14)	
	Exhaust pipe cover bolt	3	6	12 (1.2, 9)	
	Muffler cover screw	1	5	4 (0.4, 2.9)	
	Fuel valve	1	18	26 (2.7, 20)	
MAINTENANCE:					
	Headlight case mounting bolt	2	8	22 (2.2, 16)	
	Air cleaner housing cover screw	4	5	1 (0.1, 0.7)	
ENGINE REMOVAL/INSTALLATION:					
	Front engine hanger nut (engine side)	2	8	34 (3.5, 25)	
	(frame side upper)	1	8	34 (3.5, 25)	
	(frame side lower)	1	10	34 (3.5, 25)	
	Upper engine hanger nut	3	8	34 (3.5, 25)	
	Rear upper engine mounting nut	1	10	49 (5.0, 36)	
	Rear lower engine mounting nut	1	10	59 (6.0, 43)	
FRONT WHEEL/SUSPENSION/STEERING:					
	Brake disc bolt	6	6	20 (2.0, 14)	NOTE 4
	Front axle	1	12	64 (6.5, 47)	
	Front axle holder nut	4	6	12 (1.2, 9)	NOTE 3
	Spoke nipple	36	BC 3.2	4 (0.4, 2.9)	NOTE 2
	Fork socket bolt	2	8	20 (2.0, 14)	
	Fork cap	2	34	23 (2.3, 17)	
	Fork top bridge pinch bolt	4	8	27 (2.8, 20)	
	Fork bottom bridge pinch bolt	4	8	32 (3.3, 24)	
	Steering top thread	1	26	5 (0.5, 3.6)	Page 12-20
	Steering stem nut	1	24	103 (10.5, 76)	
	Handle holder bolt	2	8	18-25 (1.8-2.5, 13-18)	
REAR WHEEL/BRAKE/SUSPENSION:					
	Final driven sprocket nut	4	4	44 (4.5, 33)	NOTE 3
	Rear brake panel stopper arm nut	2	8	22 (2.2, 16)	
	Rear axle nut	1	14	88 (9.0, 65)	NOTE 3
	Spoke nipple	36	BC 3.5	4 (0.4, 2.9)	
	Rear brake arm pinch bolt	1	6	10 (1.0, 7)	
	Rear shock absorber mounting nut	2	10	44 (4.5, 33)	NOTE 3
	Shock arm-to-swing arm nut	1	12	103 (10.5, 76)	NOTE 3
	Shock link-to-shock arm nut	1	10	44 (4.5, 33)	NOTE 3
	Shock link-to-frame nut	1	10	44 (4.5, 33)	NOTE 3
	Swingarm pivot nut	1	14	88 (9.0, 65)	NOTE 3
HYDRAULIC DISC BRAKE:					
	Brake caliper bleed valve	1	6	6 (0.6, 4.3)	
	Master cylinder reservoir cap screw	2	4	0.2 (2, 1.4)	
	Brake caliper mounting bolt	2	8	30 (3.1, 22)	NOTE 4
	Pad pin retainer plate bolt	1	6	10 (1.0, 7)	
	Brake hose oil bolt	2	10	29 (3.0, 22)	
	Brake lever pivot bolt	1	6	10 (1.0, 7)	
	nut	1	6	10 (1.0, 7)	
	Front brake light switch screw	1	4	1 (0.1, 0.7)	
	Brake caliper pin bolt	1	8	23 (2.3, 17)	NOTE 2
	Brake caliper pin bolt nut	1	8	23 (2.3, 17)	NOTE 2
	Brake caliper assembly bolt	2	10	54 (5.5, 40)	
	Master cylinder holder bolt	2	6	8-12 (0.8-1.2, 5.6-8.4)	
BATTERY/CHARGING SYSTEM:					
	Battery holder plate screw	1	6	3 (0.3, 2.2)	
LIGHT/METERS/SWITCHES:					
	Ignition switch mounting bolt	2	8	26 (2.7, 20)	NOTE 4
OTHERS:					
	Side stand pivot bolt	1	10	10 (1.0, 7)	
	nut	1	10	39 (4.0, 29)	

GENERAL INFORMATION

Tools

Description	Tool Number	Ref. Section
Float level gauge	07401-0010000	5
Spoke wrench, 5.8 x 6.1 mm	07701-0020300	3, 12, 13
Valve adjusting wrench, 8 x 9 mm	07708-0030100	3
Lock nut wrench, 20 x 24 mm	07716-0020100	9
Gear holder	07724-0010200	9
Flywheel holder	07725-0040000	10
Rotor puller	07733-0020001	10
Valve guide driver, 5.5 mm	07742-0010100	7
Pin driver, 3 mm	07744-0010200	9
Attachment, 32 x 35 mm	07746-0010100	9, 11, 12, 13
Attachment, 42 x 47 mm	07746-0010300	11, 12, 13
Attachment, 52 x 55 mm	07746-0010400	11
Attachment, 72 x 75 mm	07746-0010600	11
Attachment, 22 x 24 mm	07746-0010800	13
Pilot, 15 mm	07746-0040300	11, 12, 13
Pilot, 17 mm	07746-0040400	9, 13
Pilot, 20 mm	07746-0040500	11
Pilot, 28 mm	07746-0041100	11
Bearing remover shaft	07746-0050100	12, 13
Bearing remover head, 15 mm	07746-0050400	12, 13
Driver	07749-0010000	9, 11, 12, 13
Valve spring compressor	07757-0010000	7
Seat cutter, 27.5 mm (45° EX)	07780-0010200	7
Seat cutter, 33 mm (45° IN)	07780-0010800	7
Flat cutter, 30 mm (32° EX)	07780-0012200	7
Flat cutter, 33 mm (32° IN)	07780-0012900	7
Interior cutter, 30 mm (60° IN/EX)	07780-0014000	7
Cutter holder, 5.5 mm	07781-0010101	7
Pilot screw wrench	07908-4220201	5
Snap ring pliers	07914-SA50001	14
Steering stem socket	07916-KA50100	12
Bearing remover set, 15 mm	07936-KC10000	11
- remover shaft	07936-KC10100	11
- remover head	07936-KC10200	11
- sliding weight	07741-0010201	11
Steering stem driver	07946-4300101	12
Driver shaft	07946-MJ00100	13
Driver head	07946-MJ00200	13
Fork seal driver	07947-4630100	12
Ball race remover	07953-MJ10000	12
- remover attachment	07953-MJ10100	12
- remover handle	07953-MJ10200	12
Valve adjusting screw	07980-GE00100	3
Valve guide reamer	07984-0980001	7
Clutch center holder	07GMB-KT70101	9
Peak voltage adaptor	07HGJ-0020100	16
Bushing driver	07HMF-MM90200	13

GENERAL INFORMATION

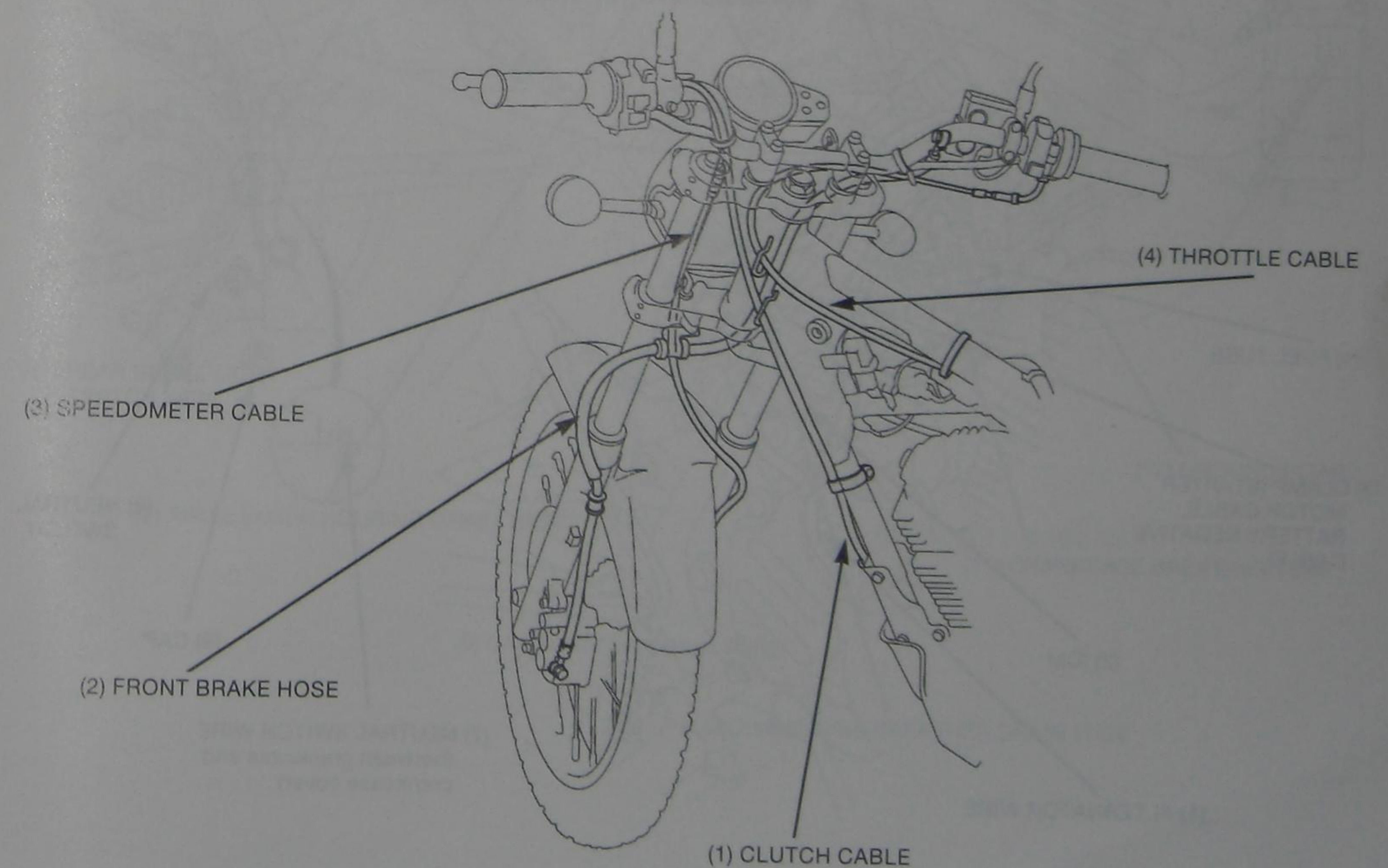
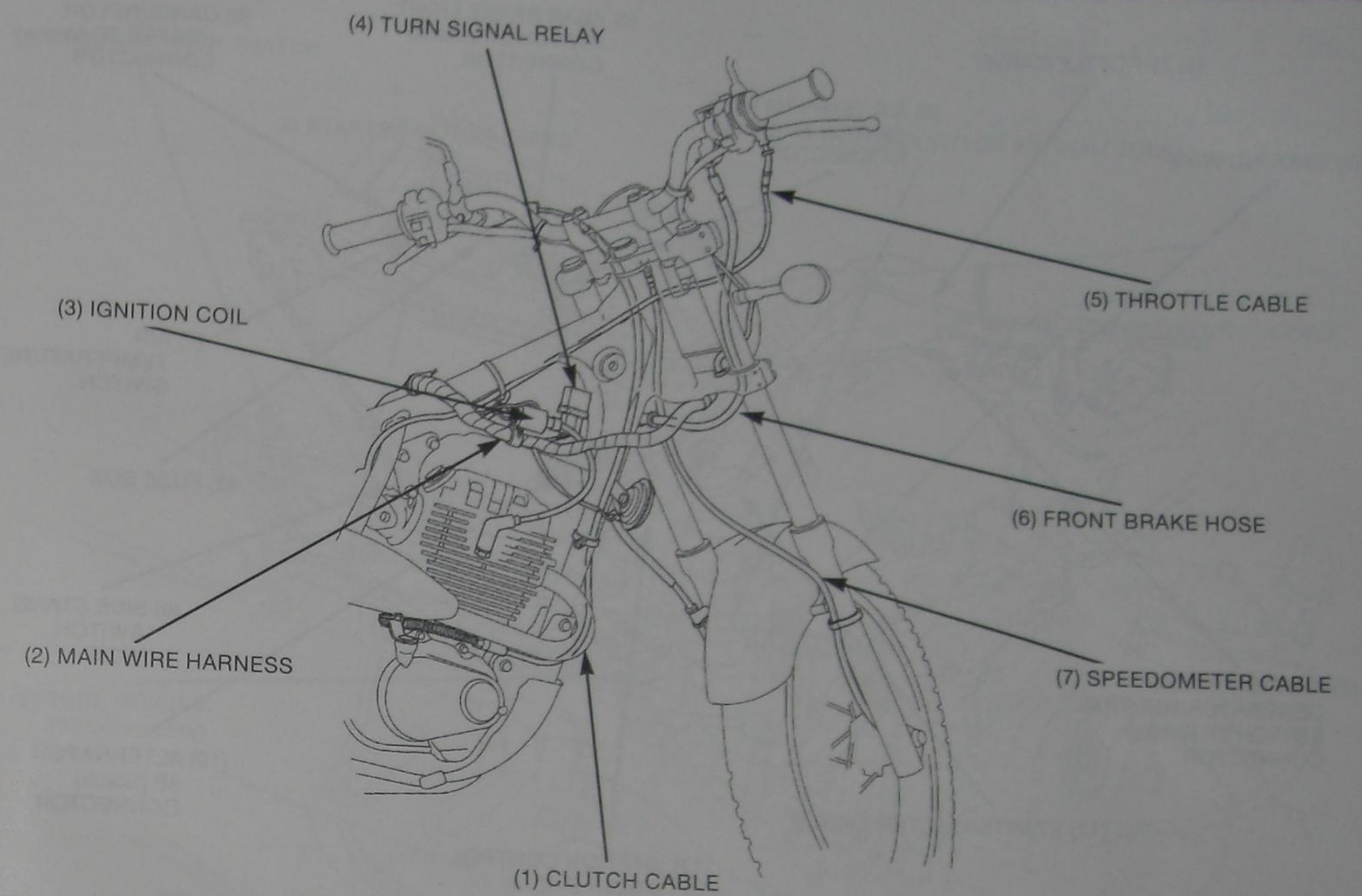
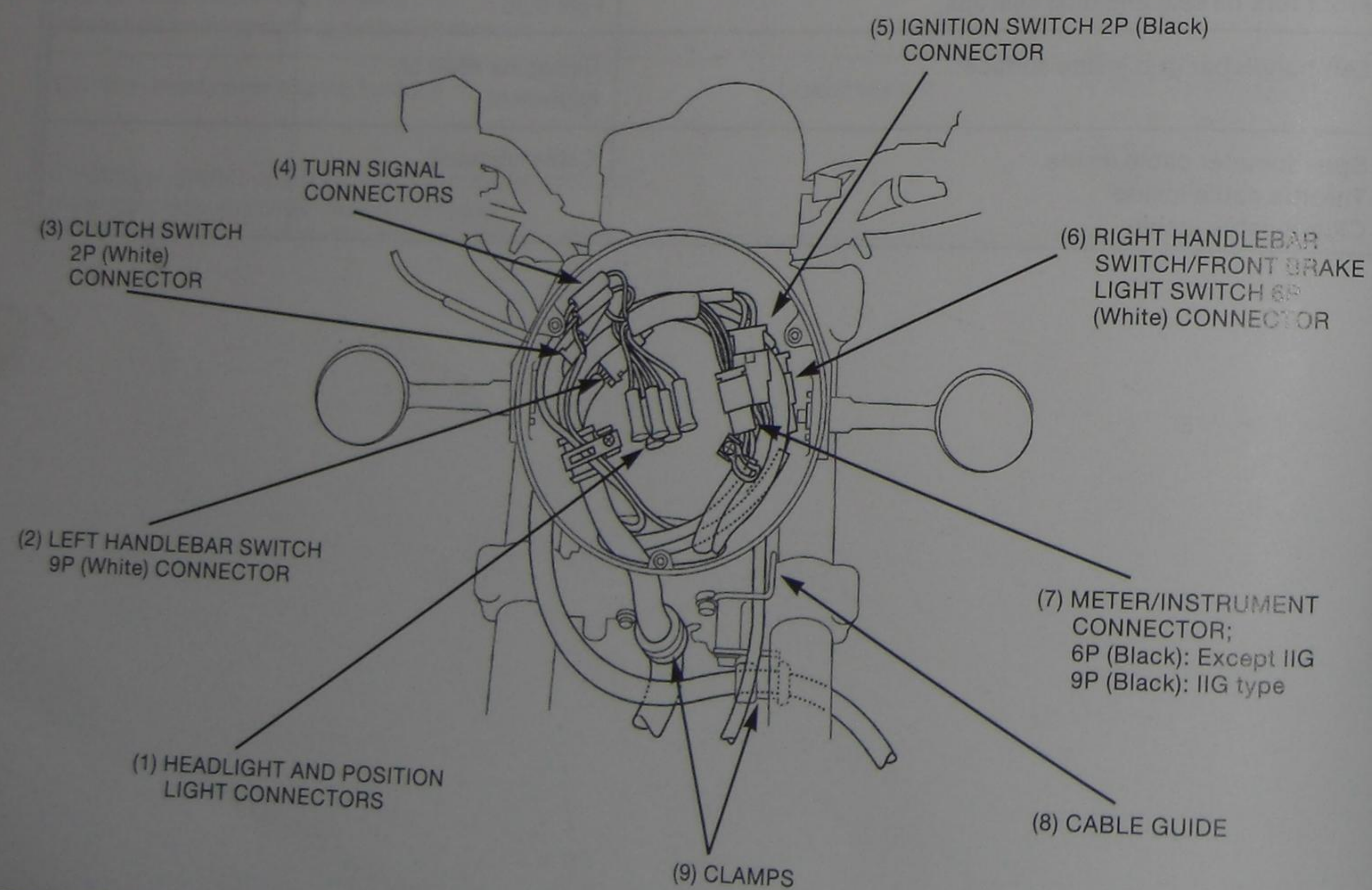
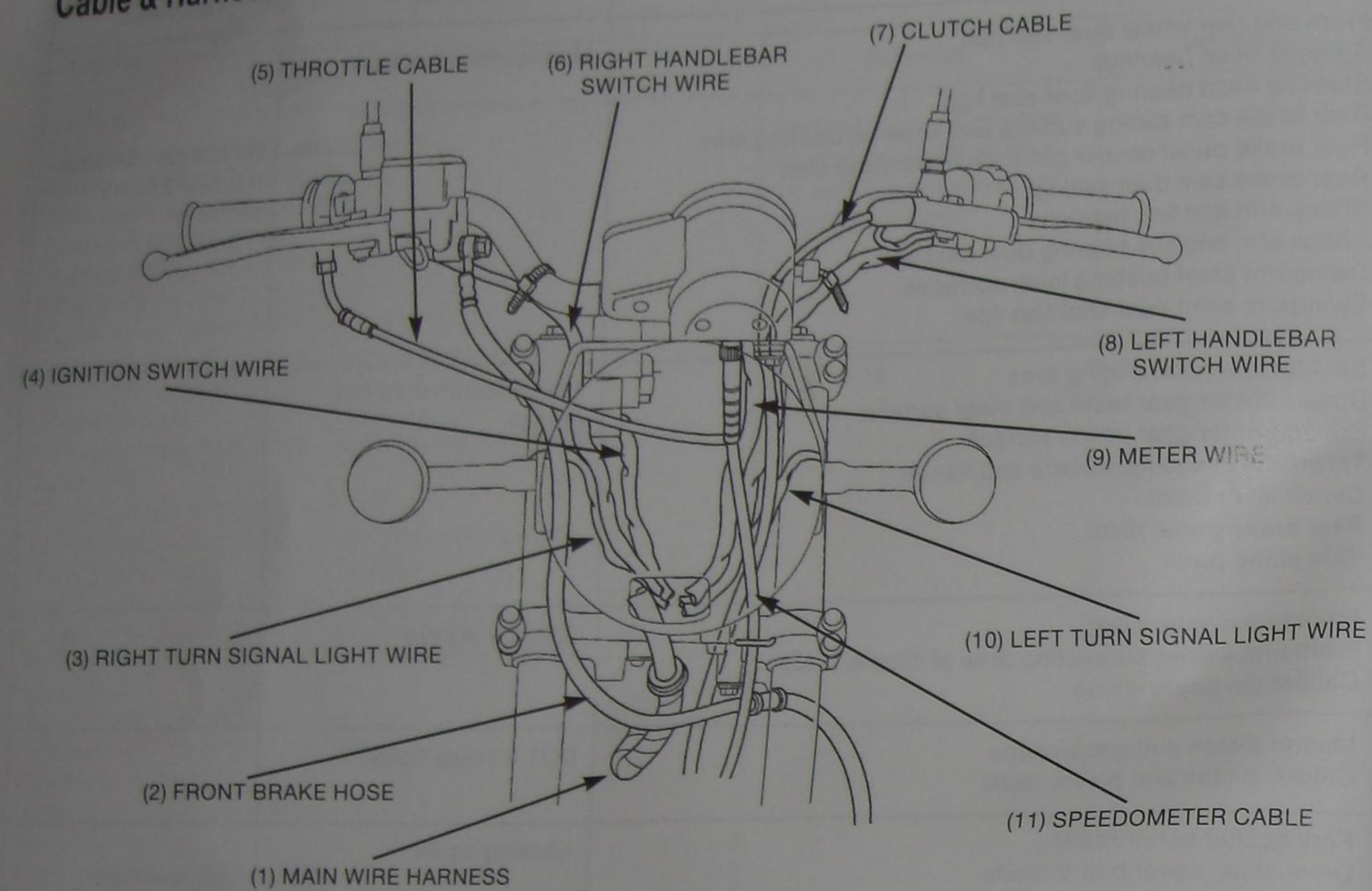
Lubrication & Seal Points

Engine	Location	Material	Remarks
Camshaft bearings and cam lobes Rocker arm shaft whole surfaces Valve valve stem sliding surfaces Piston pin outer surface Clutch outer guide whole surface M3 and M5 gear inner surfaces C1, C2 and C4 gear inner surfaces		Molybdenum oil solution (a mixture of 1/2 engine oil and 1/2 molybdenum disulfide grease)	
	Oil through pipe sliding surface Oil pump rotors Valve adjusting lock nut threads and seating surfaces Cam chain Cylinder head cover cap nut threads Valve adjusting lock nut threads and seating surfaces Piston outer surface and piston rings Clutch disc whole surfaces Clutch center lock nut threads and seating surface Oil filter rotor lock nut threads and seating surface Sprag clutch sliding surfaces Starter driven gear inner surface Flywheel bolt threads and seating surface Starter idle gear shaft Starter reduction gear shaft Each oil seal lip Each bearing rotating surface Each O-ring whole surface	Engine oil	
Ignition pulse generator bolt threads Starter clutch outer bolt threads Mainshaft bearing setting plate bolt threads		Locking agent	
	Cylinder head cover mating surface	Liquid sealant	Avoid getting into oil passage. (page 7-17) (page 8-6)
Crankcase gasket upper cut end (crankcase-cylinder) Alternator wire grommet seating surface			

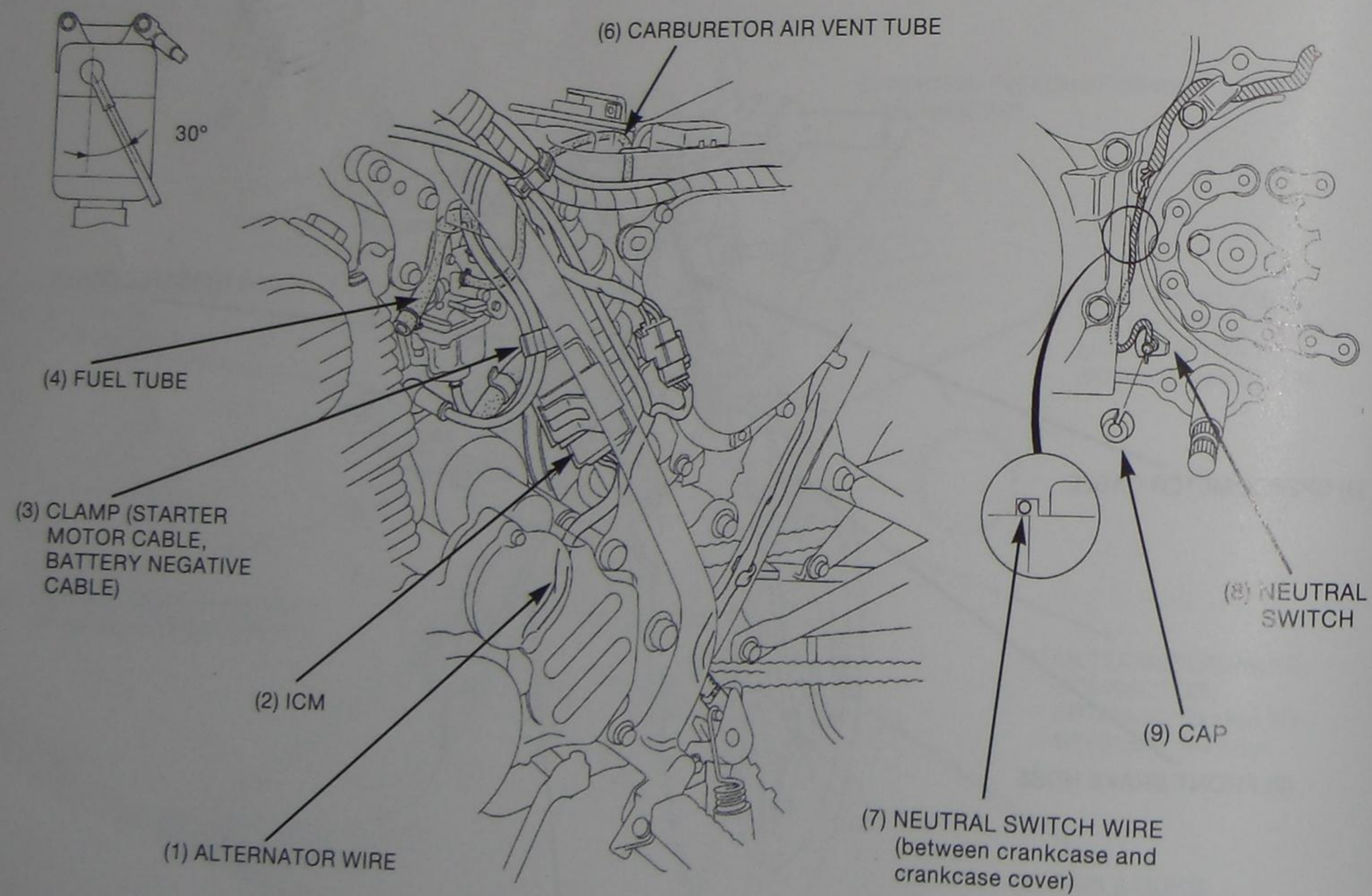
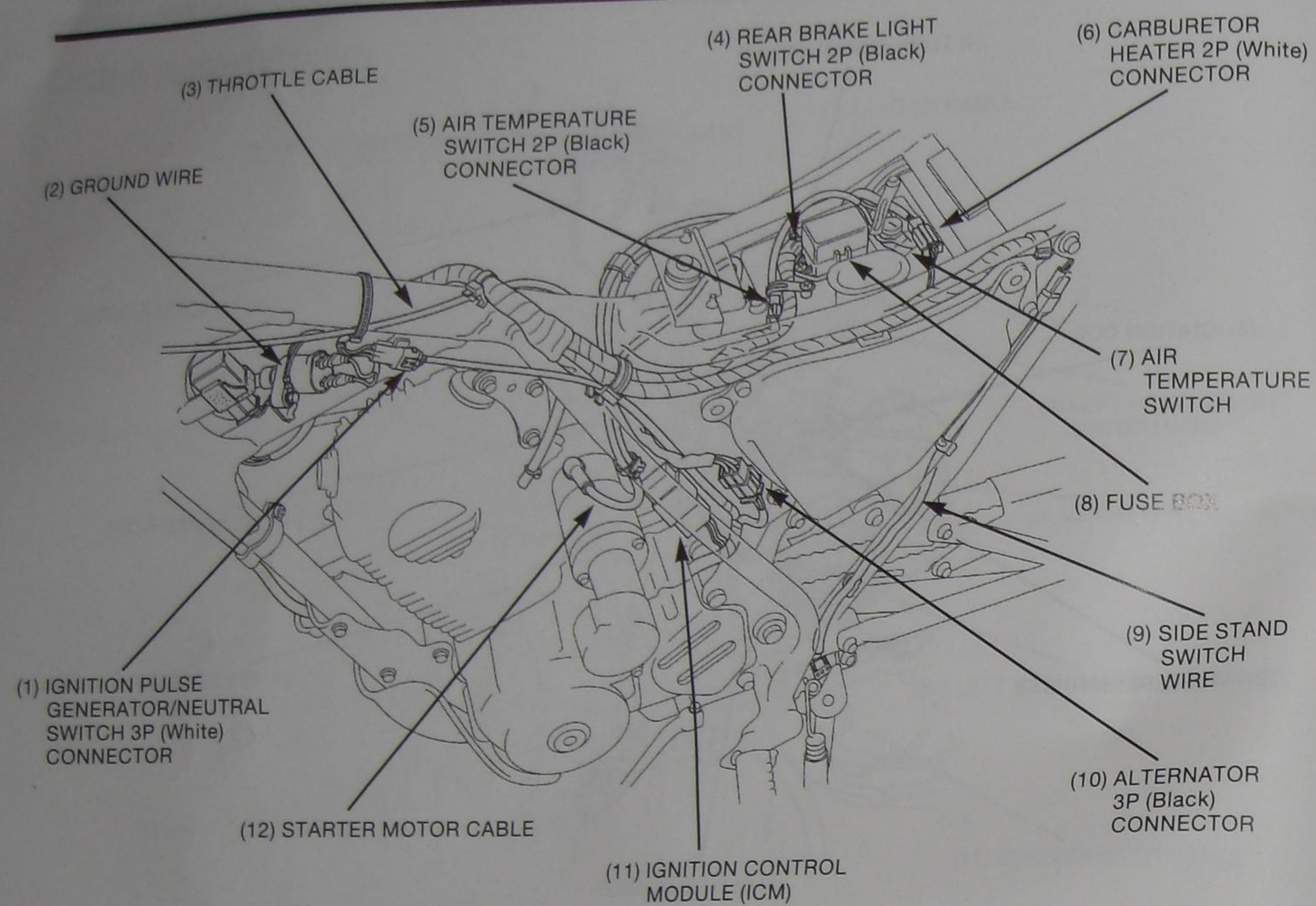
GENERAL INFORMATION

Frame	Location	Material	Remarks
Front and rear wheel dust seal lips Steering head bearings Steering head bearing dust seal lips Rear brake cam sliding surface and shoe contacting area Rear brake panel anchor pin shoe contacting area Rear brake cam dust seal lip Shock arm and link bearings Shock arm and link bearing dust seal lips Swingarm pivot bushing inner surfaces Swingarm pivot dust seal cap lips		Multi-purpose grease	Do not contaminate the brake lining surfaces
	Seat lock bracket sliding area Speedometer gear teeth and inner surface Speedometer gear inside surface Throttle grip sliding surface and flange Clutch lever pivot Rear brake pedal pivot Side stand pivot	Molybdenum disulfide grease	
Front brake lever pivot Front brake lever contacting area of master piston Caliper pin boots inside		Silicone grease	
	Master piston and piston cups Caliper piston and piston seals	DOT 4 brake fluid	
Fork socket bolt threads Drive chain cover bolt threads Caliper pin bolt threads		Locking agent	Only one bolt (page 13-17)
	Front fork oil seal and dust seal lips	Fork fluid	
Left handlebar grip inside surface		Cemedine #540 or equivalent	
	Speedometer cable inside Throttle cable inside Clutch cable inside	Cable lubricant	

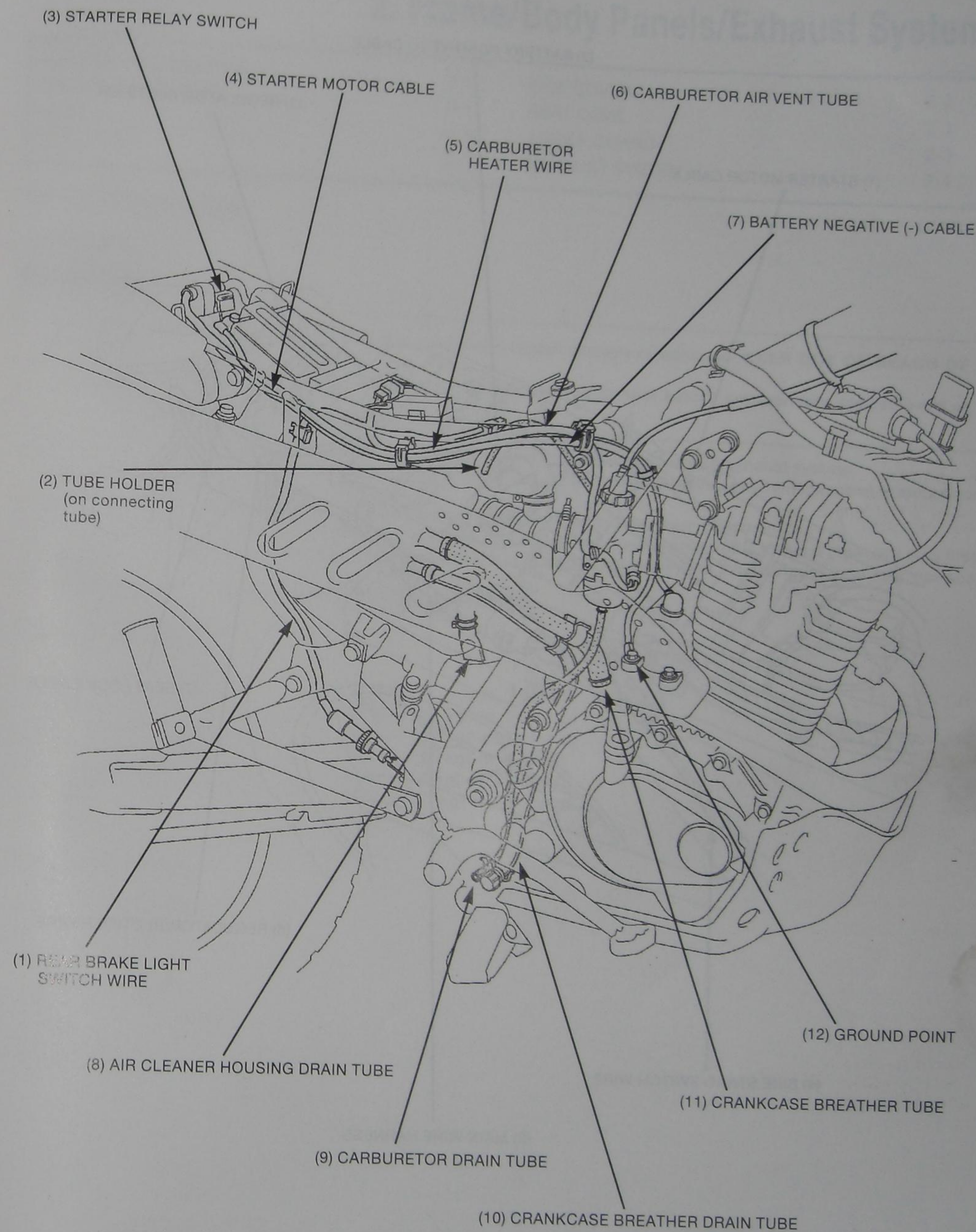
Cable & Harness Routing

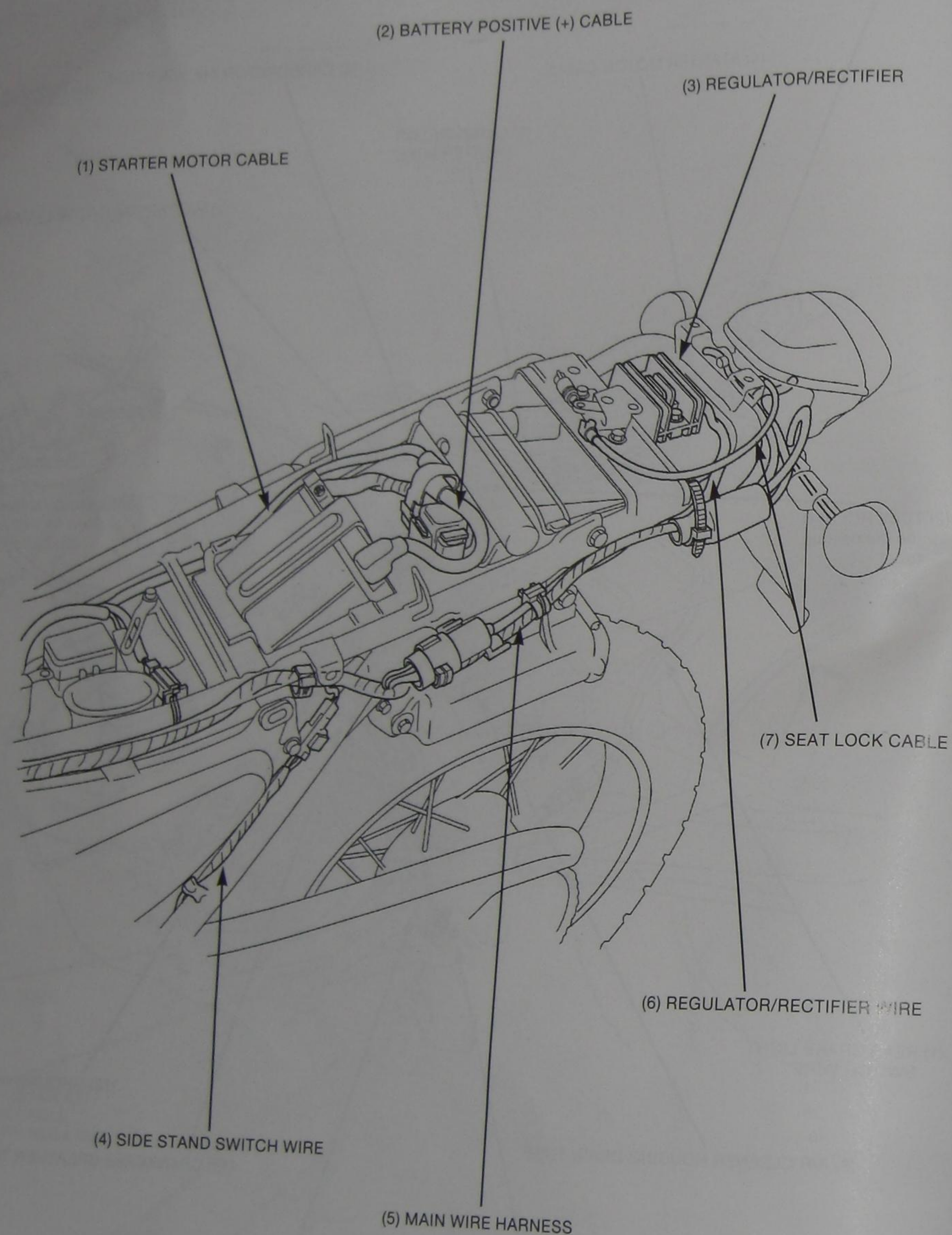


GENERAL INFORMATION



GENERAL INFORMATION





2. Frame/Body Panels/Exhaust System

SERVICE INFORMATION	2-1	SIDE COVER	2-3
TROUBLESHOOTING	2-1	SEAT COWL	2-3
SEAT	2-2	UNDER GUARD	2-3
FUEL TANK	2-2	EXHAUST SYSTEM	2-4

Service Information

GENERAL

⚠ WARNING

- Gasoline is extremely flammable and is explosive under certain conditions. KEEP OUT OF REACH OF CHILDREN.
- Serious burns may result if the exhaust system is not allowed to cool before components are removed or serviced.

- This section covers removal and installation of the frame body panels, fuel tank and exhaust system.
- Work in a well ventilated area. Smoking or allow flames or sparks in the working area or where gasoline is stored can cause a fire or explosion.
- Always replace the exhaust pipe gasket when removing the exhaust system from the engine.
- When installing the exhaust system, loosely install all of the fasteners. Always tighten the exhaust pipe joint nuts first, then tighten the mounting fasteners. If you tighten the mounting fasteners first, the exhaust pipe may not seat properly.
- Always inspect the exhaust system for leaks after installation.

TORQUE VALUES

Exhaust pipe joint nut	10 N·m (1.0 kgf-m, 7 lbf-ft)
Muffler mounting bolt	32 N·m (3.3 kgf-m, 24 lbf-ft)
Muffler band bolt	20 N·m (2.0 kgf-m, 14 lbf-ft)
Exhaust pipe cover bolt	12 N·m (1.2 kgf-m, 9 lbf-ft)
Muffler cover screw	4 N·m (0.4 kgf-m, 2.9 lbf-ft)
Fuel valve	26 N·m (2.7 kgf-m, 20 lbf-ft)

Troubleshooting

Excessive exhaust noise

- Broken exhaust system
- Exhaust gas leaks

Poor performance

- Deformed exhaust system
- Exhaust gas leaks
- Clogged muffler

FRAME/BODY PANELS/EXHAUST SYSTEM

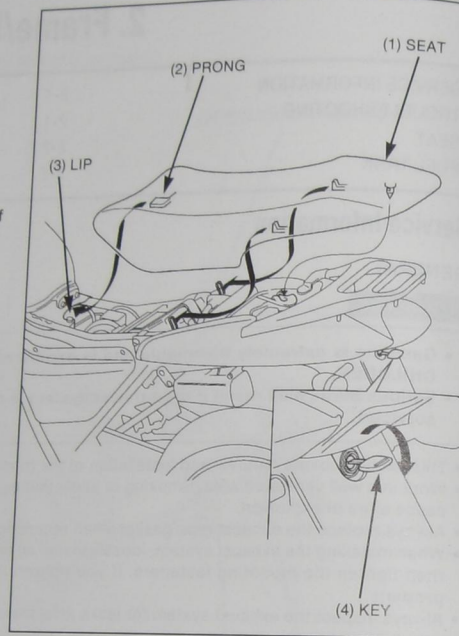
Seat

REMOVAL

Unhook the seat with the ignition key.
Pull the seat back and remove it.

INSTALLATION

Install the seat, inserting the prong under the raised lip of the frame cross member.
Push the seat forward, then down to lock it.



Fuel Tank

REMOVAL/INSTALLATION

WARNING

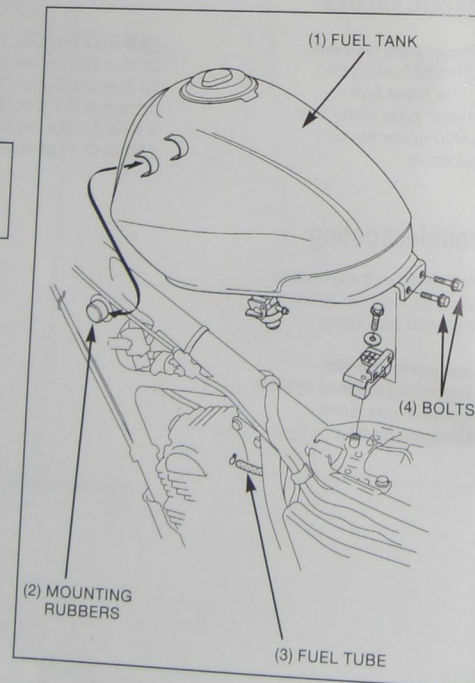
- Gasoline is extremely flammable and is explosive under certain condition. KEEP OUT OF REACH OF CHILDREN.

Remove the seat.

Disconnect the fuel tube from the fuel tank.
Remove the fuel tank mounting bolts.
Remove the fuel tank from the mounting rubbers.

Installation is in the reverse order of removal.

After installation, turn the fuel valve ON and check the fuel line for leakage.



Side Cover

CAUTION

- Be careful not to break the side cover bosses.

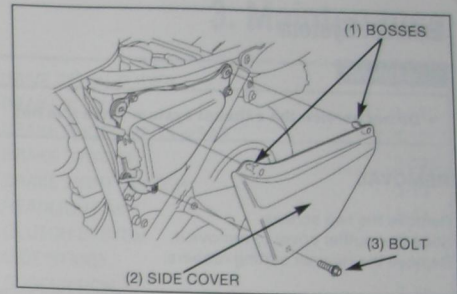
REMOVAL/INSTALLATION

Remove the side cover bolt.
Release the side cover bosses from the grommets and remove the side cover.

Installation is in the reverse order of removal.

NOTE:

- Be careful not to dislodge the grommets in the air cleaner housing.



Seat Cowl

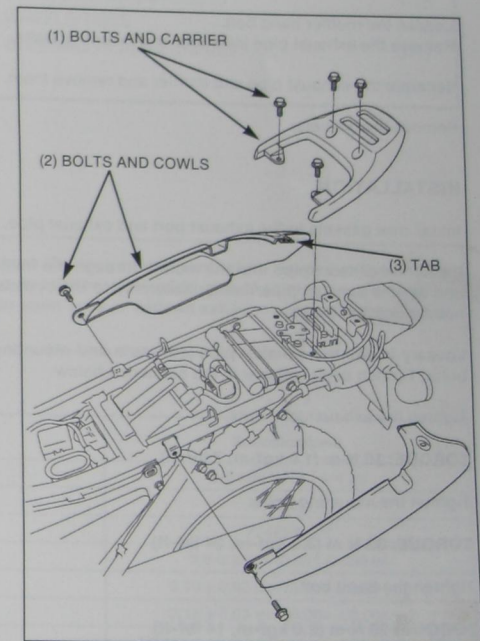
REMOVAL/INSTALLATION

Remove the seat (page 2-2).

Remove the four bolts and the rear carrier.

Remove the two bolts.
Carefully release the tab of the right cowl to separate the cowls and remove them.

Installation is in the reverse order of removal.

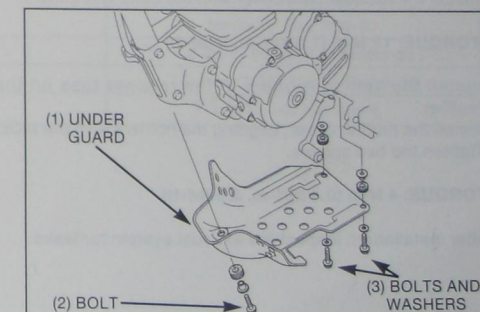


Under Guard

REMOVAL/INSTALLATION

Remove the two 6 mm bolts, washers and 8 mm bolt and the under guard.

Installation is in the reverse order of removal.



Exhaust System

WARNING

- Do not service the exhaust system while it is hot.

REMOVAL

- Remove the two screws.
- Slide the muffler cover to remove it.
- Remove the retainer setting rubbers.
- Remove the three bolts, collars and the exhaust pipe cover.
- Loosen the muffler band bolt.
- Remove the exhaust pipe joint nuts and mounting bolts.
- Separate the exhaust pipe and muffler and remove them.
- Remove the gaskets.

INSTALLATION

- Install new gaskets to the exhaust port and exhaust pipe.
- Install the exhaust pipe into the muffler through the frame and set the exhaust pipe/muffler assembly to the cylinder head studs and frame.

Loosely install the exhaust pipe joint nuts and mounting bolts. Tighten each fastener in the sequence below.

Tighten the exhaust joint nuts.

TORQUE: 10 N·m (1.0 kgf-m, 7 lbf-ft)

Tighten the mounting bolts.

TORQUE: 32 N·m (3.3 kgf-m, 24 lbf-ft)

Tighten the band bolt.

TORQUE: 20 N·m (2.0 kgf-m, 14 lbf-ft)

Install the exhaust pipe cover with the bolts and collars.

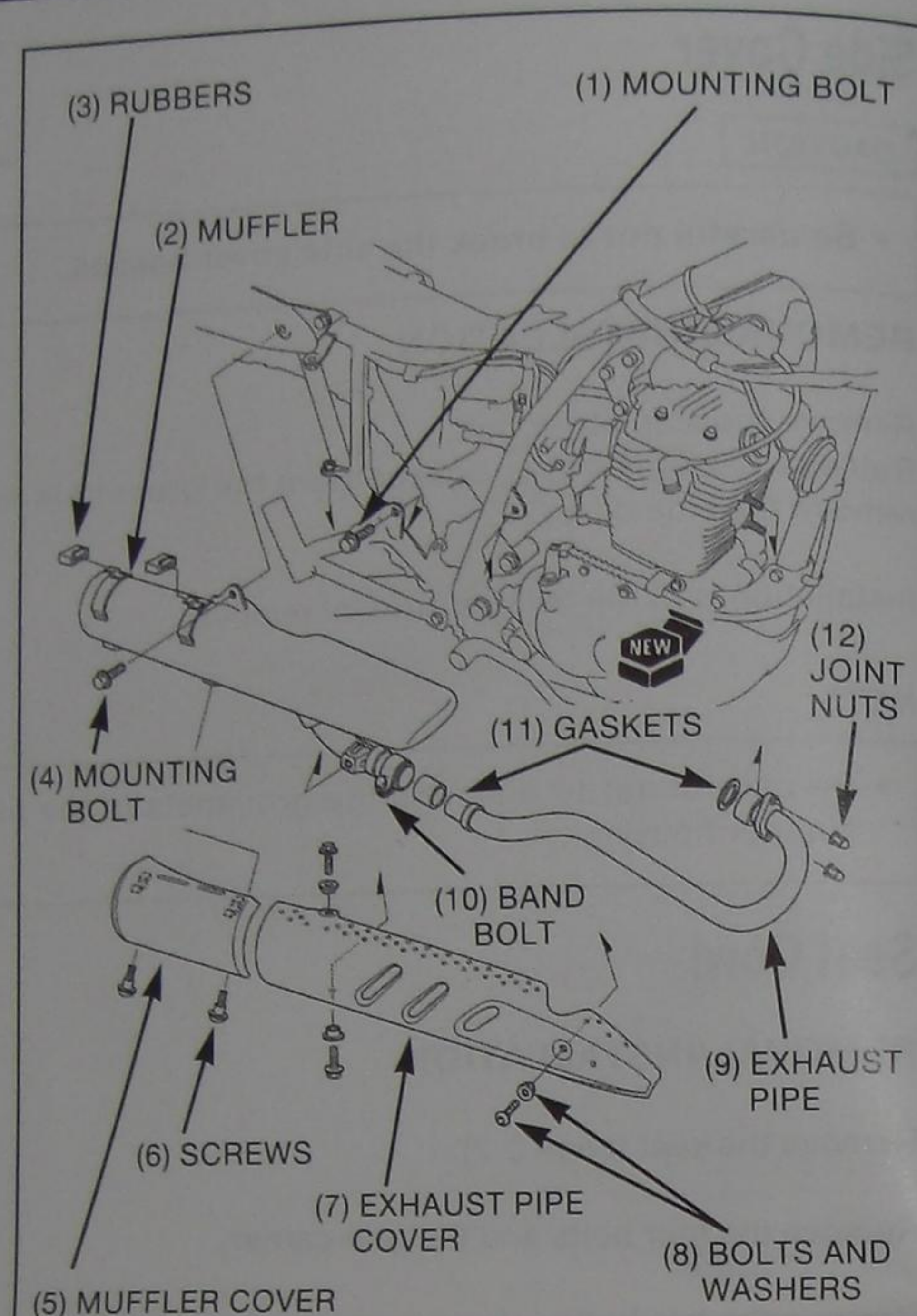
TORQUE: 12 N·m (1.2 kgf-m, 9 lbf-ft)

Install the setting rubbers to the retainer tabs on the muffler.

Install the muffler cover, aligning the holders with the tabs. Tighten the two screws.

TORQUE: 4 N·m (0.4 kgf-m, 2.9 lbf-ft)

After installation, inspect the exhaust system for leaks.



3. Maintenance

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FUEL STRAINER SCREEN	3-4	BRAKE SYSTEM	3-12
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AIR CLEANER	3-5	HEADLIGHT AIM	3-14
CRANKCASE BREATHER	3-6	CLUTCH SYSTEM	3-14
SPARK PLUG	3-6	SIDE STAND	3-15
VALVE CLEARANCE	3-6	SUSPENSION	3-15
ENGINE OIL	3-8	NUTS, BOLTS, FASTENERS	3-16
ENGINE OIL STRAINER SCREEN	3-9	WHEELS/TIRES	3-16
ENGINE IDLE SPEED	3-9	STEERING HEAD BEARINGS	3-17
DRIVE CHAIN	3-10		

Service Information

GENERAL

WARNING

- If the engine must be running to do some work, make sure the area is well ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.

SPECIFICATIONS

Item		Specifications
Throttle grip free play		2-6 mm (1/12 - 1/4 in)
Spark plug	NGK	DPR8EA-9
	DENSO	X24EPR-U9
Spark plug gap		0.8-0.9 mm (0.031-0.035 in)
Valve clearance	Intake	0.10 ± 0.02 mm (0.004 ± 0.001 in)
	Exhaust	0.10 ± 0.02 mm (0.004 ± 0.001 in)
Recommended engine oil		Honda 4-stroke oil or equivalent motor oil API service classification: SE Viscosity: SAE 10W-30
Engine oil capacity	At draining	1.0 liter (1.06 US qt, 0.88 Imp qt)
	At disassembly	1.2 liters (1.27 US qt, 1.06 Imp qt)
Engine idle speed		1,400 ± 100 min ⁻¹ (rpm)

Item			Specifications
Drive chain slack			25-35 mm (1 — 1-3/8 in)
Specified brake fluid			DOT 4 brake fluid
Brake pedal free play			20-30 mm (3/4-1—1/4 in)
Clutch lever free plays			10-20 mm (3/8-3/4 in)
Cold tire pressure	Driver only	Front	175 kPa (1.75 kgf/cm ² , 25 psi)
		Rear	175 kPa (1.75 kgf/cm ² , 25 psi)
	Driver and passenger	Front	175 kPa (1.75 kgf/cm ² , 25 psi)
		Rear	200 kPa (2.00 kgf/cm ² , 29 psi)
Tire size	Front		90/90-19 52P
	Rear		110/90-17 60P
Minimum tread depth	Front		3.0 mm (0.12 in)
	Rear		3.0 mm (0.12 in)

TORQUE VALUES

Spark plug	18 N·m (1.8 kgf-m, 13 lbf-ft)
Valve adjusting hole cap	15 N·m (1.5 kgf-m, 11 lbf-ft)
Valve adjusting lock nut	14 N·m (1.4 kgf-m, 10 lbf-ft)
Crankshaft hole cap	8 N·m (0.8 kgf-m, 5.8 lbf-ft)
Timing hole cap	10 N·m (1.0 kgf-m, 7 lbf-ft)
Oil strainer screen cap	15 N·m (1.5 kgf-m, 11 lbf-ft)
Air cleaner housing cover screw	1 N·m (0.1 kgf-m, 0.7 lbf-ft)
Rear axle nut	88 N·m (9.0 kgf-m, 65 lbf-ft) U-nut
Master cylinder reservoir cap screw	2 N·m (0.2 kgf-m, 1.4 lbf-ft)
Headlight case mounting bolt	22 N·m (2.2 kgf-m, 16 lbf-ft)
Front spoke nipple	4 N·m (0.4 kgf-m, 2.9 lbf-ft)
Rear spoke nipple	4 N·m (0.4 kgf-m, 2.9 lbf-ft)

TOOLS

Valve adjusting wrench, 8 x 9 mm	07708-0030100
Valve adjusting screw	07980-GE00100
Spoke wrench, 5.8 x 6.1 mm	07701-0020300

Maintenance Schedule

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

The following items require some mechanical knowledge. Certain items (particularly those marked * and **) may require more technical information and tools. Consult your Honda dealer.

ITEM	FREQUENCY	WHICHEVER COMES FIRST NOTE	ODOMETER READING [(NOTE (1))]					Refer to page
			X 1,000 km	1	4	8	12	
			X 1,000 mi	0.6	2.5	5	7.5	
* FUEL LINE			MONTHS		6	12	18	
* FUEL STRAINER SCREEN					I	I	I	3-4
* THROTTLE OPERATION					C	C	C	3-4
AIR CLEANER					I	I	I	3-4
CRANKCASE BREATHER		NOTE 2					R	3-5
SPARK PLUG		NOTE 3			C	C	C	3-6
* VALVE CLEARANCE					I	R	I	3-6
ENGINE OIL				I	I	I	I	3-6
* ENGINE OIL STRAINER SCREEN				R	Every 1,250 km (2,000 mi) R			3-8
** ENGINE OIL CENTRIFUGAL FILTER							C	3-9
* ENGINE IDLE SPEED							C	4-2
DRIVE CHAIN		NOTE 4		I	I	I	I	3-9
DRIVE CHAIN SLIDER					Every 1,000 km (600 mi) I, L			3-10
BRAKE FLUID					I	I	I	3-11
BRAKE SHOES/PADS WEAR		NOTE 5			I	I	I	3-11
BRAKE SYSTEM					I	I	I	3-12
* BRAKE LIGHT SWITCH				I	I	I	I	3-12
* HEADLIGHT AIM					I	I	I	3-13
CLUTCH SYSTEM					I	I	I	3-14
SIDE STAND				I	I	I	I	3-14
* SUSPENSION					I	I	I	3-15
* NUTS, BOLTS, FASTENERS					I	I	I	3-15
** WHEELS/TIRES		NOTE 4		I		I		3-16
** STEERING HEAD BEARINGS		NOTE 4		I	I	I	I	3-16
				I			I	3-17

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

Honda recommends that your Honda dealer should road test your motorcycle after each periodic maintenance is carried out.

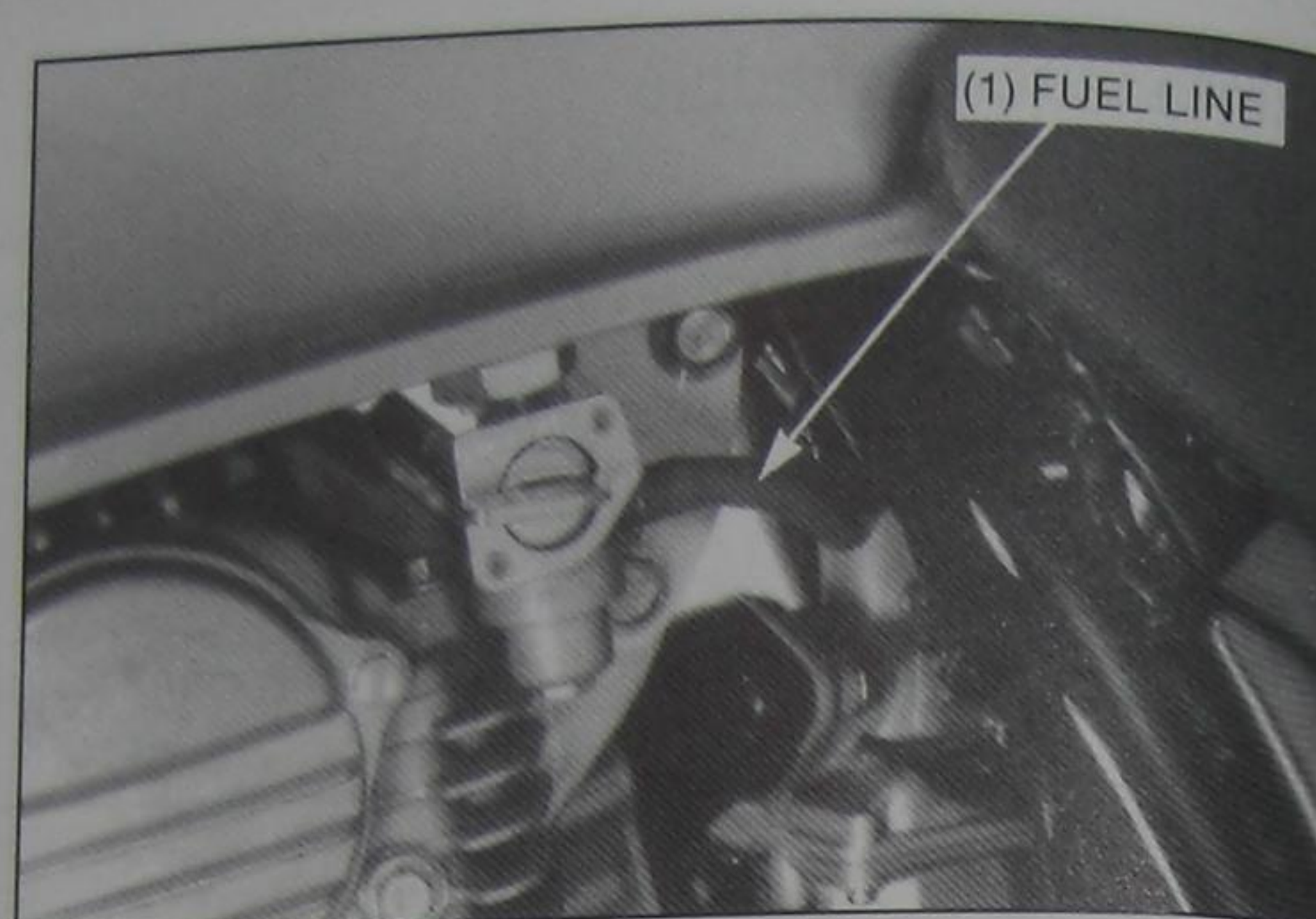
- NOTES: 1. At higher odometer reading, repeat at the frequency interval established here.
2. Service more frequently when riding in unusually wet or dusty areas.
3. Service more frequently when riding in rain or at full throttle.
4. Service more frequently when riding OFF-ROAD.
5. Replace every 2 years. Replacement requires mechanical skill.

Fuel Line

Check the fuel line for deterioration, damage or leakage.
Replace the fuel line if necessary.

Also check the fuel line clip for loose or improperly positioned.

Replace any defective parts.



Fuel Strainer Screen

WARNING

- Gasoline is extremely flammable and is explosive under certain condition. **KEEP OUT OF REACH OF CHILDREN.**

Turn the fuel valve OFF.

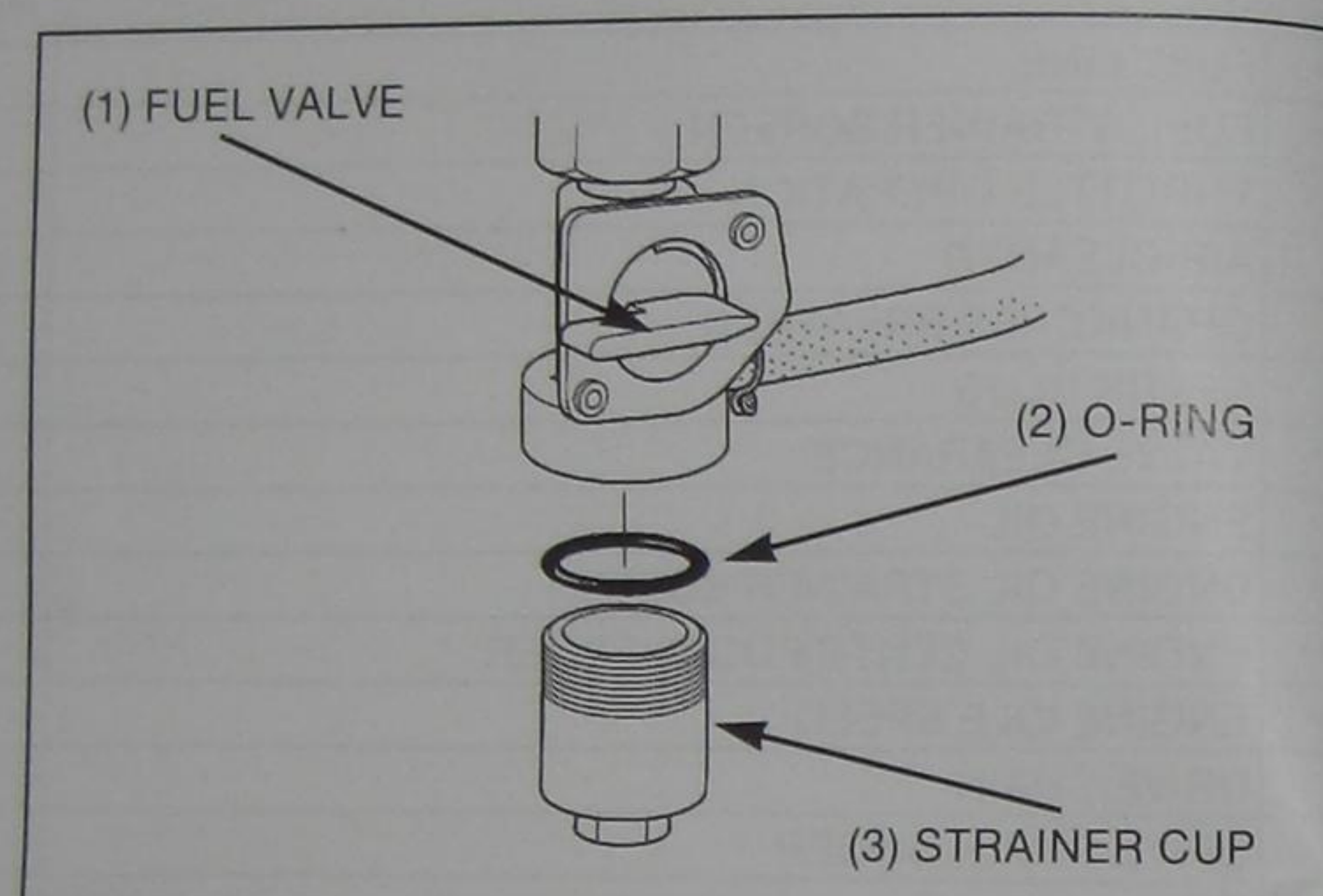
Remove the fuel strainer cup and O-ring, and pour the contents of the cup into a suitable container.

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

Check that the O-ring is in good condition and replace it with a new one if necessary.

Reinstall the O-ring and fuel strainer cup in the fuel valve body, making sure that the O-ring is in place.

Hand-tighten the fuel-strainer cup and then tighten it with a wrench.



NOTE:

- Do not overtighten the fuel strainer cup.

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

Throttle Operation

Check for any deterioration or damage to the throttle cable. Check that the throttle grip for smooth operation. Check that the throttle opens and automatically closes in all steering positions.

If the throttle grip does not return properly, lubricate the throttle cable and overhaul and lubricate the throttle housing.

For cable lubrication: Disconnect the throttle cable at its upper end. Thoroughly lubricate the cable and its pivot point with a commercially available cable lubricant or a light weight oil.

If the throttle grip still does not return properly, replace the throttle cable.

WARNING

- Reusing a damaged or abnormally bent or kinked throttle cable can prevent proper throttle slide operation and may lead to a loss of throttle control while riding.

With the engine idling, turn the handlebar all the way to the right and left to ensure that the idle speed does not change. If idle speed increases, check the throttle grip free play and the throttle cable connection.

Measure the throttle grip free play at the throttle grip flange.

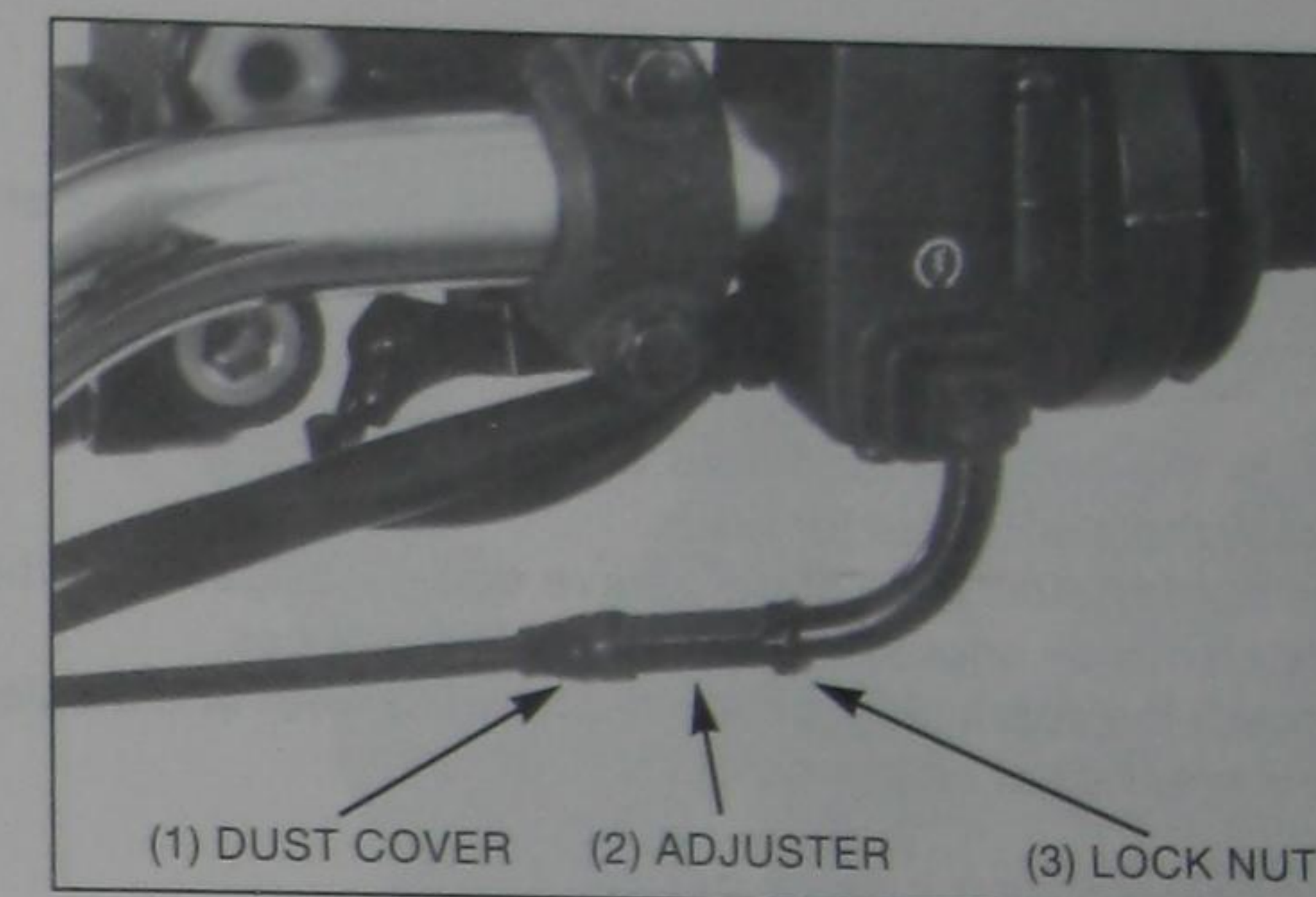
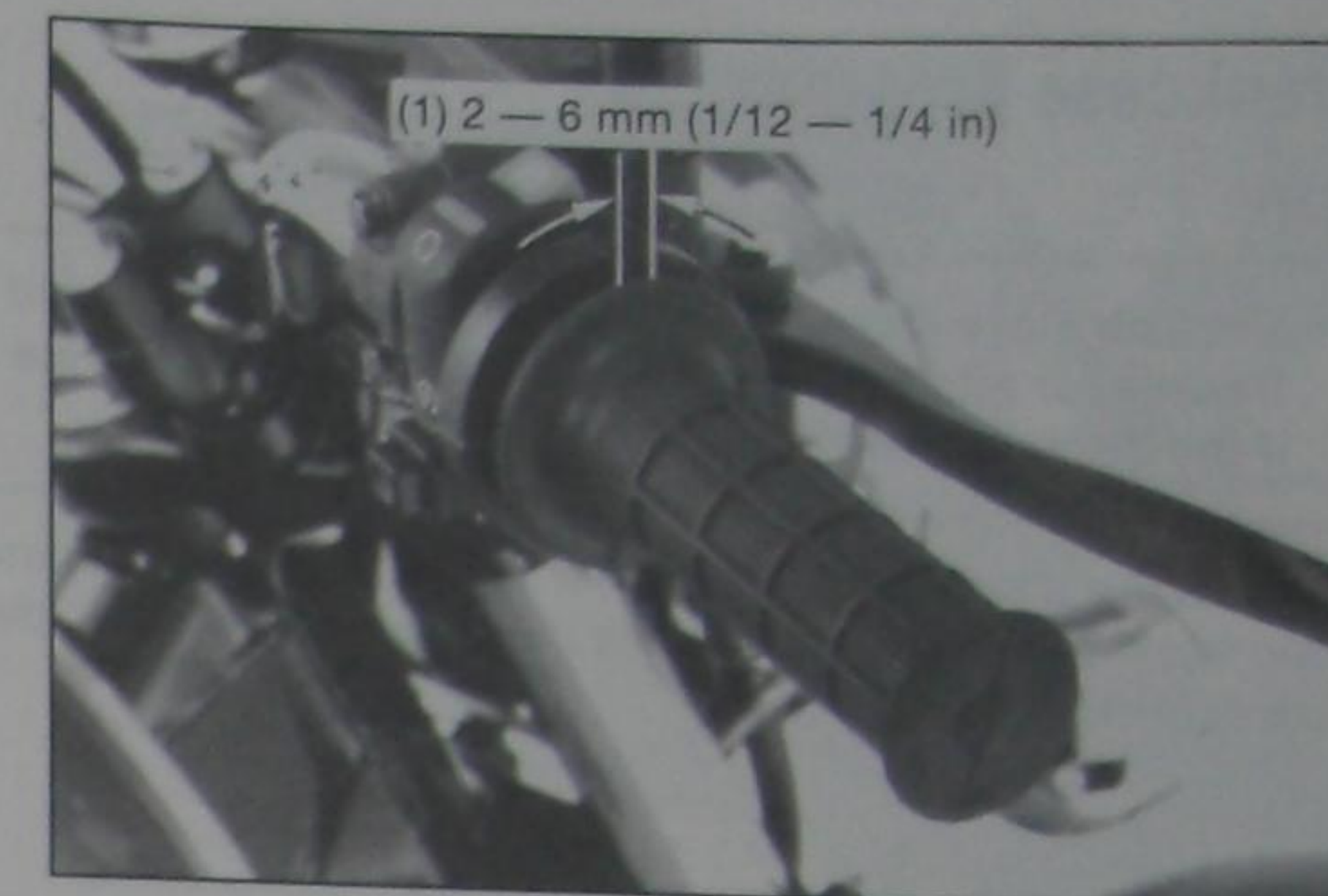
THROTTLE GRIP FREE PLAY: 2 — 6 mm (1/12 — 1/4 in)

Throttle grip free play can be adjusted using the adjuster at the throttle housing.

Slide the dust cover off the adjuster, loosen the lock nut and turn the adjuster as required.

After adjustment, tighten the lock nut and reposition the dust cover.

Recheck the throttle operation in all steering positions.



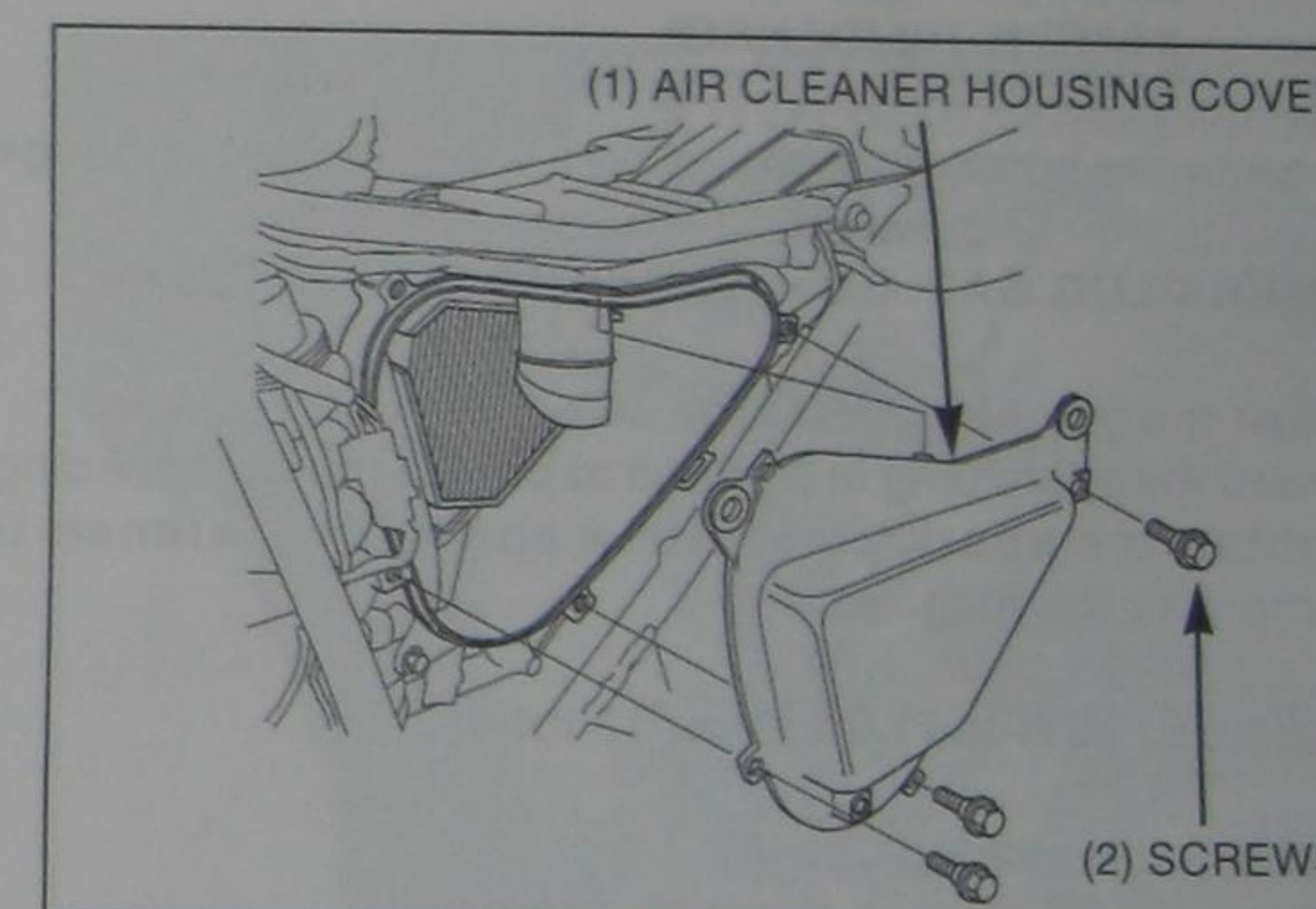
Air Cleaner

NOTE:

- The viscous paper element type air cleaner cannot be cleaned because the element contains a dust adhesive.
- If the motorcycle is used in wet or dusty areas, more frequent inspections are required.

Remove the left side cover (page 2-3)

Remove the four screws and the air cleaner housing cover.



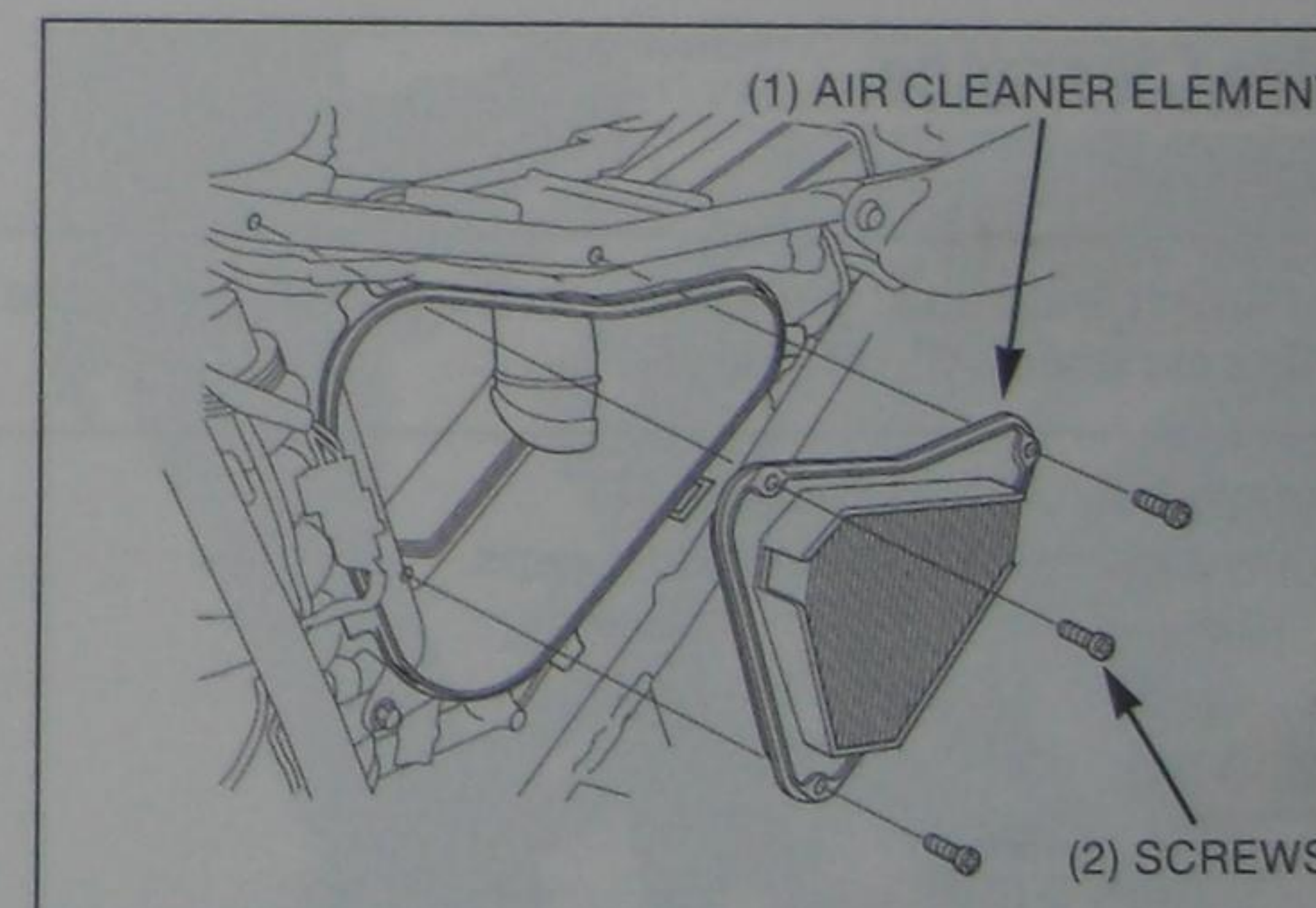
Remove the three screws and the air cleaner element from the air cleaner housing.

Remove the element in accordance with the maintenance schedule or any time it is excessively dirty or damaged.

Install the removed parts in the reverse order of removal.

TORQUE:

Housing cover screws: 1 N·m (0.7 kgf·m, 0.7 lbf·ft)

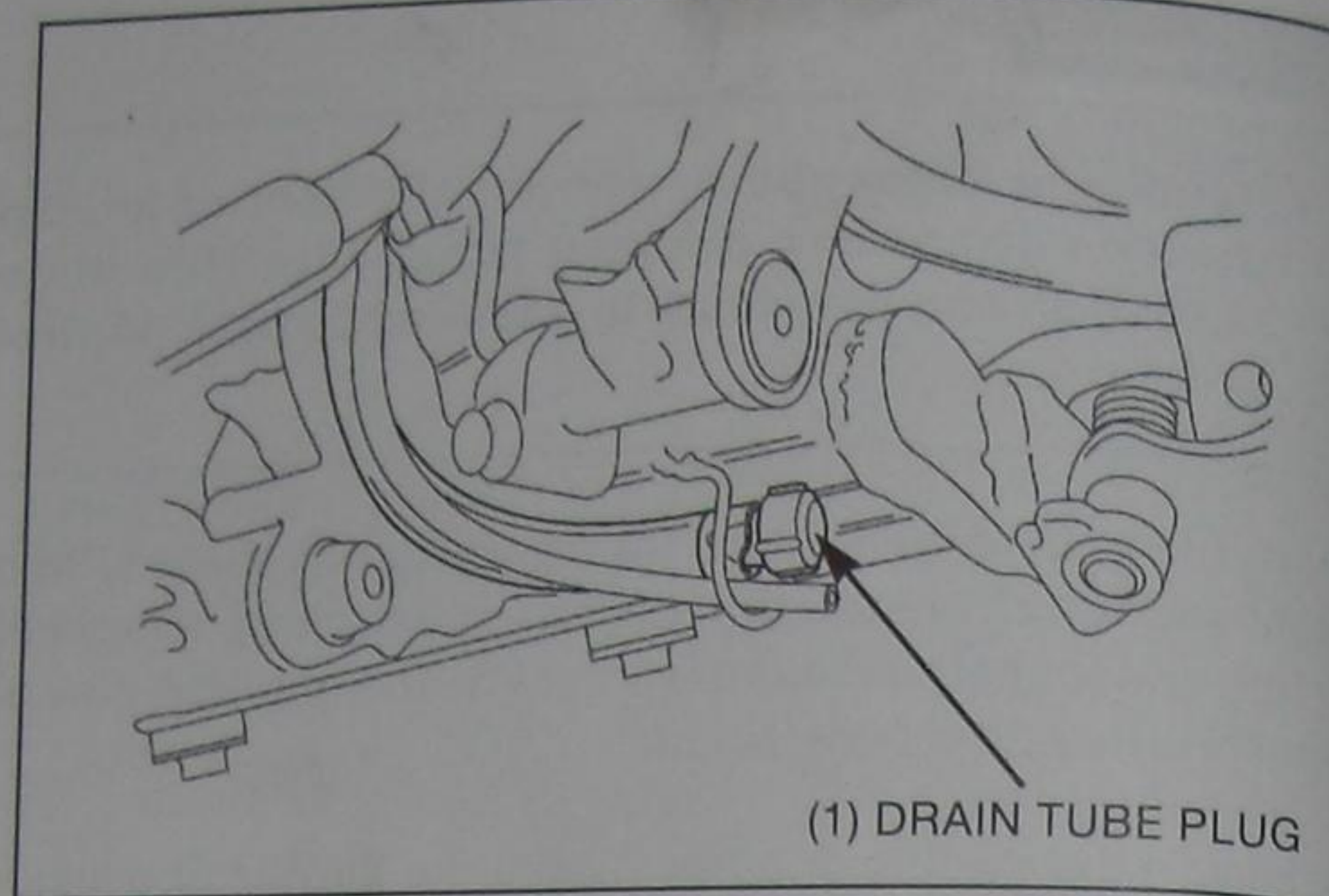


Crankcase Breather

NOTE:

- Service more frequently when ridden in rain, at full throttle, or after the motorcycle is overturned. Service if the deposits level can be seen in the drain tube.

Remove the plug from the breather tank drain tube end and drain the deposits into a suitable container, then install the plug securely.



Spark Plug

Disconnect the spark plug cap and clean around the spark plug base with compressed air. Remove the spark plug.

Check the insulator for cracks or damage. Check the electrodes for wear. The center electrode should have square edges and the side electrode should have a constant thickness. Discard the spark plug if there is apparent wear or if insulator is cracked or chipped.

RECOMMENDED SPARK PLUG:

DPR8EA-9 (NGK)
X24EPR-U9 (DENSO)

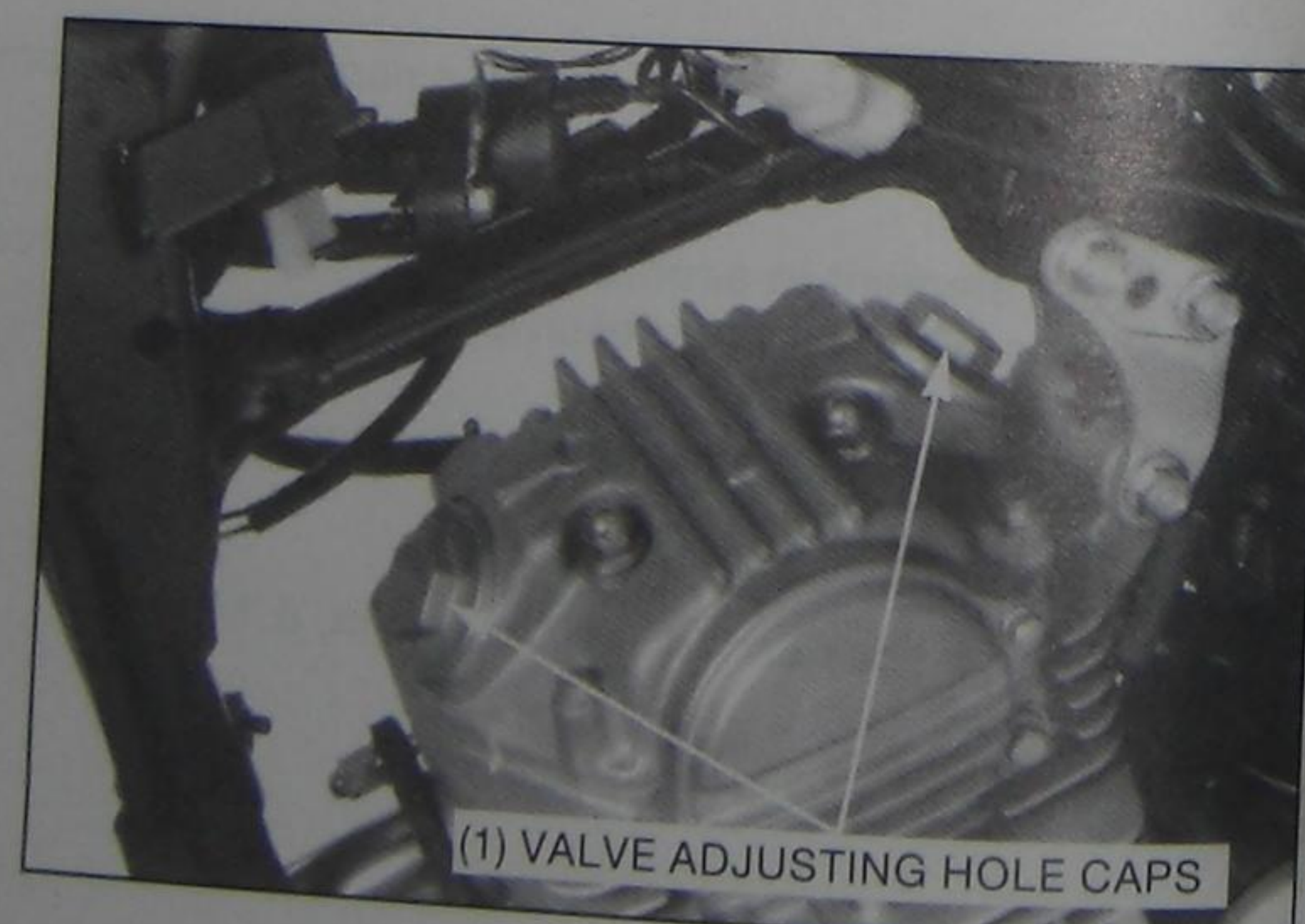
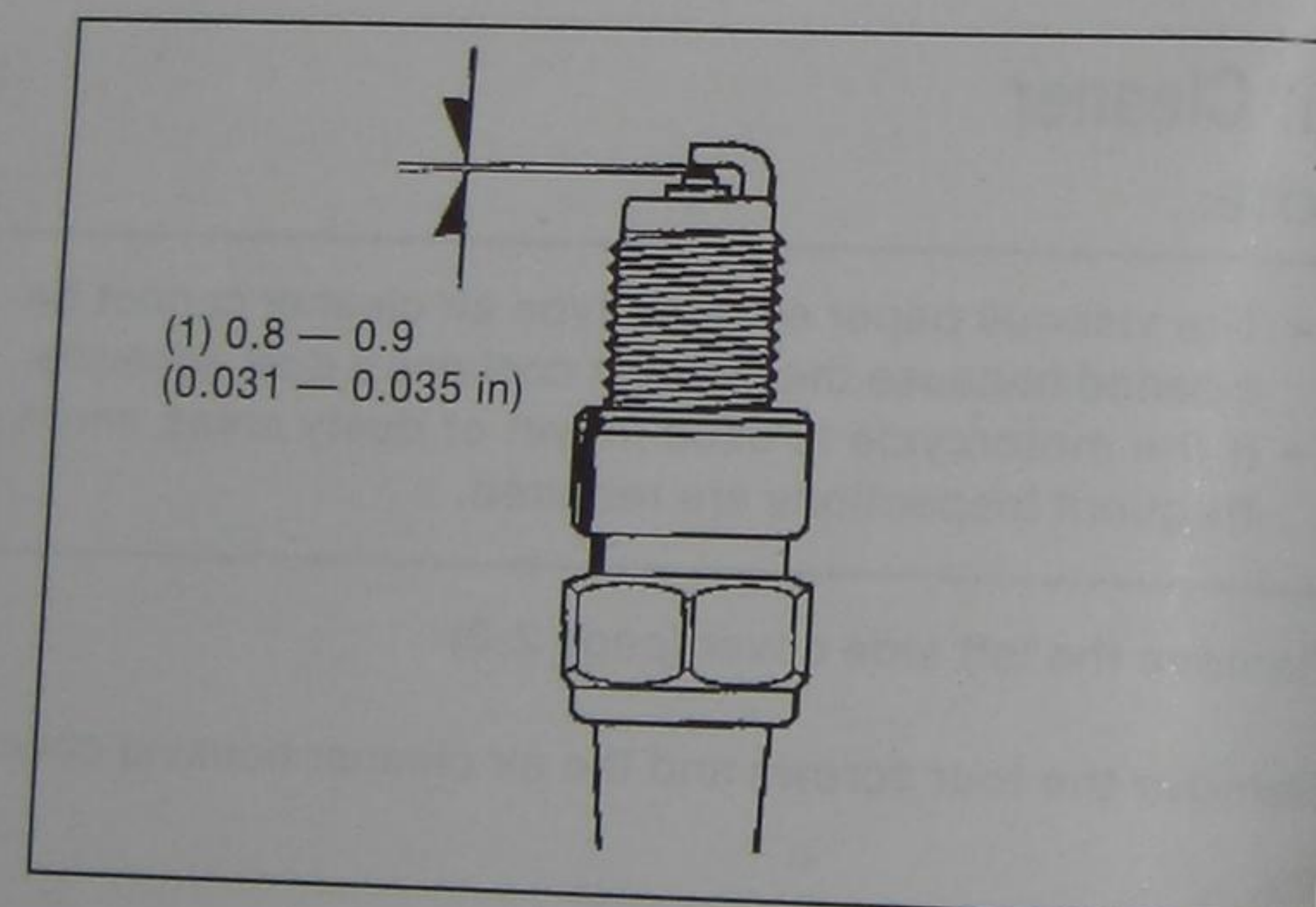
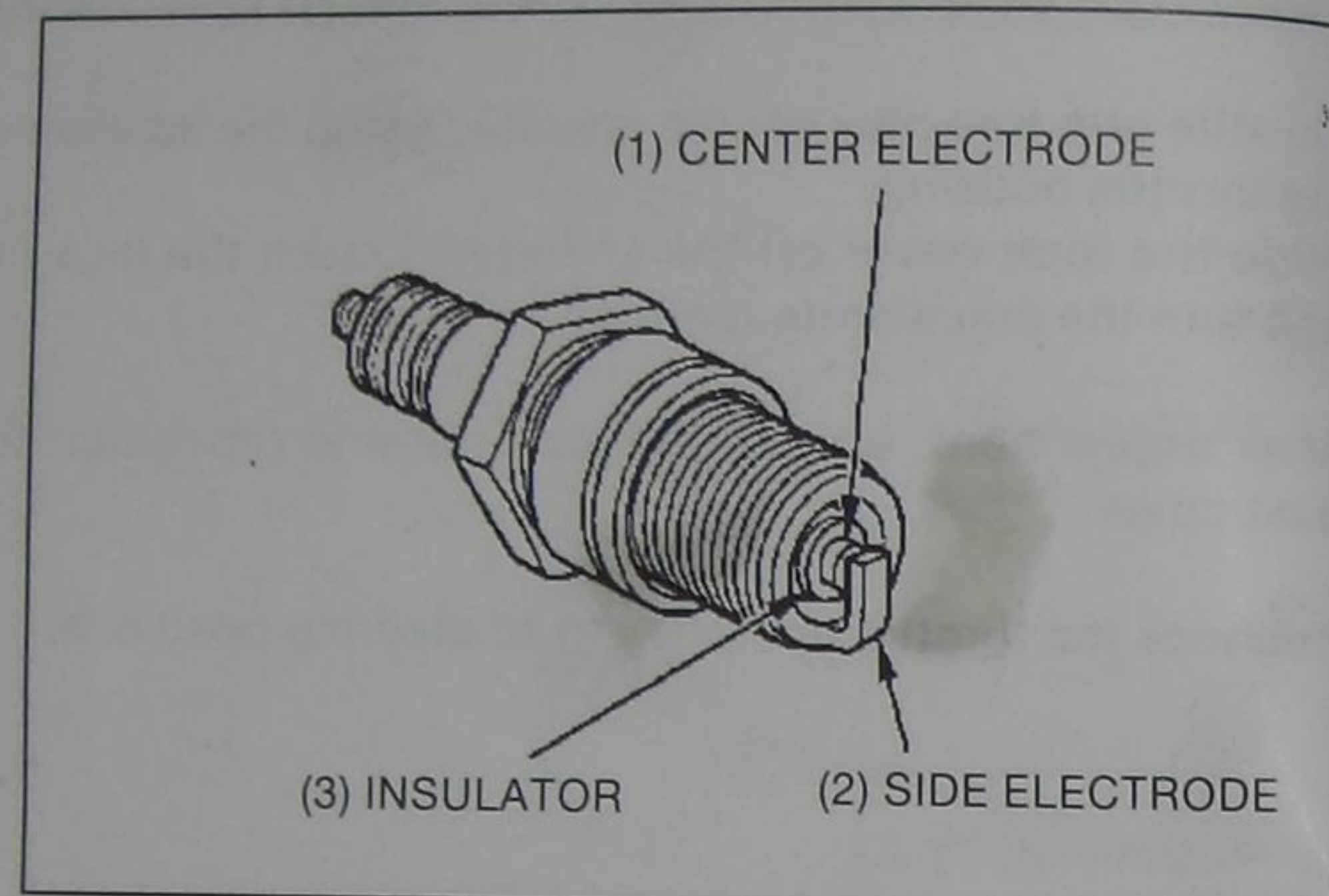
Measure the spark plug gap using a wire-type feeler gauge.

SPARK PLUG GAP: 0.8 — 0.9 mm (0.031 — 0.035 in)

Adjust the gap by bending the side electrode carefully. Thread the spark plug in by hand to prevent cross-threading. Tighten the spark plug with a spark plug wrench to compress the plug washer.

TORQUE: 18 N·m (1.8 kgf-m, 13 lbf-ft)

Connect the spark plug cap.



Valve Clearance

NOTE:

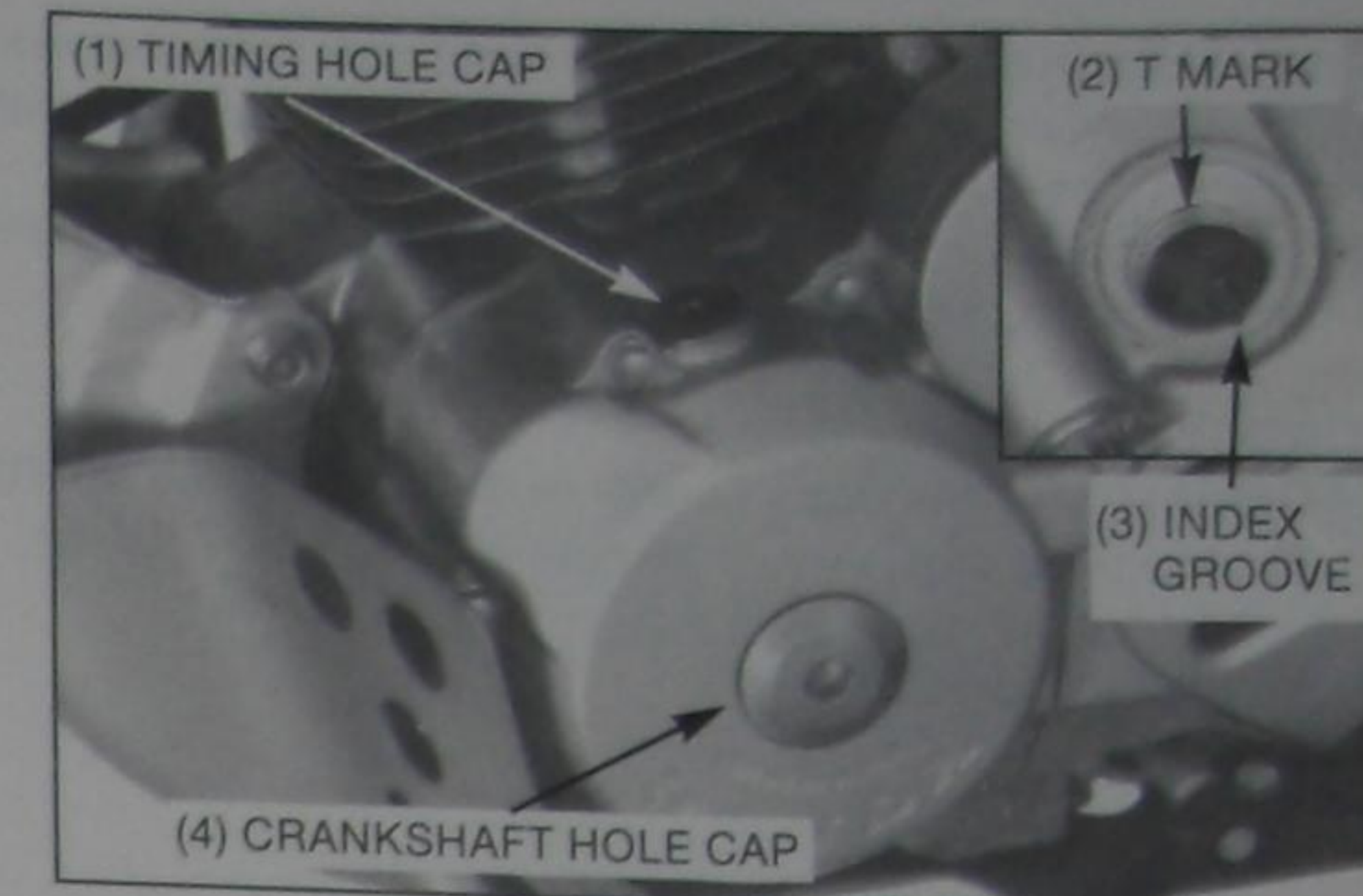
- Inspect and adjust the valve clearance when the engine is cold (below 35° C / 95° F).

Remove the fuel tank (page 2-2)
Remove the valve adjusting hole caps.

Remove the crankshaft hole cap and timing hole cap.

Rotate the crankshaft counterclockwise and align the T mark on the flywheel with the index groove in the left crankcase cover.

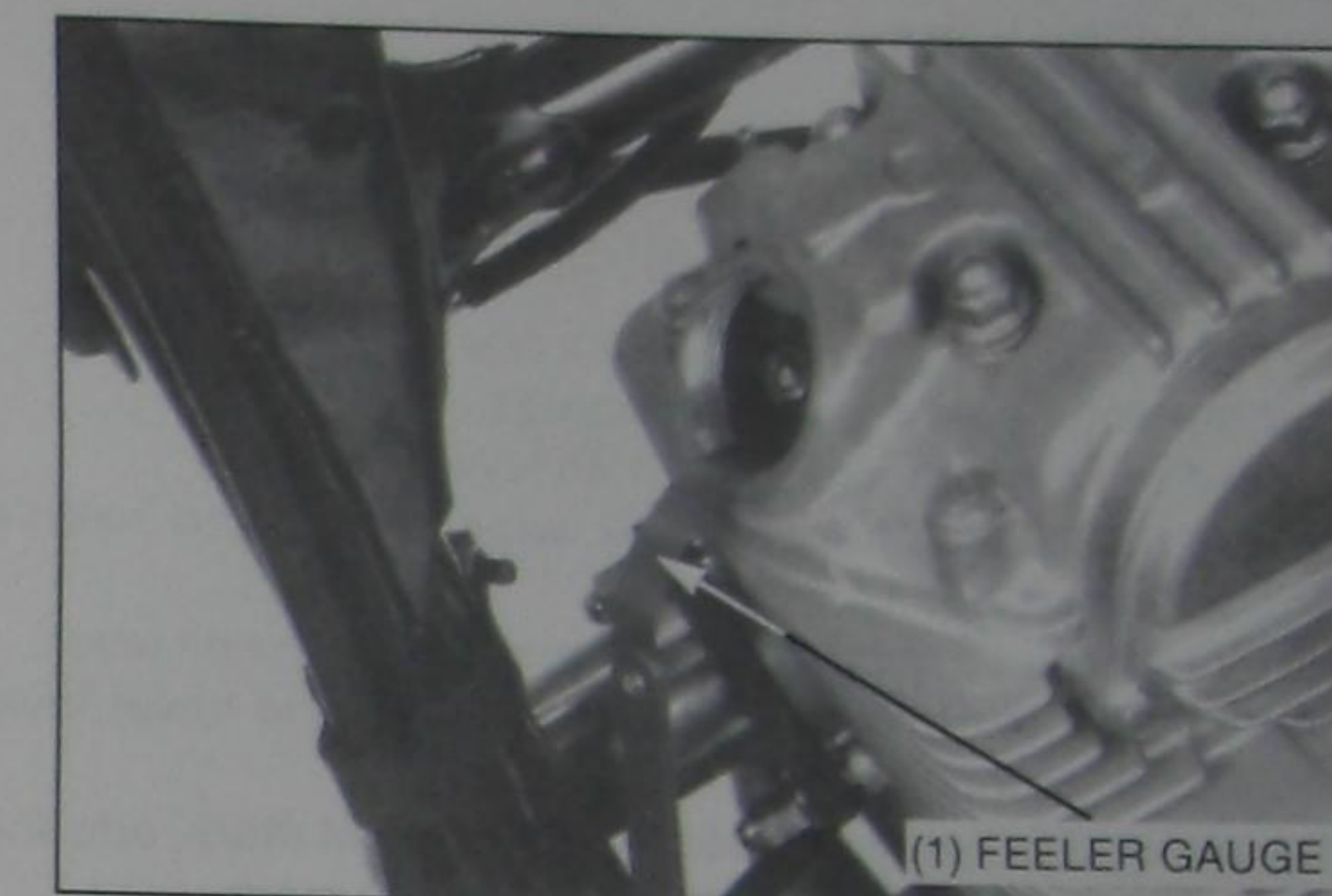
Make sure that the piston is at TDC (Top Dead Center) on the compression stroke. (The rocker arms should be loose.) If the rocker arms are tight, rotate the crankshaft counterclockwise 360° (1 full turn) and realign the T mark with the index groove.



Check the valve clearance by inserting the feeler gauge between the valve adjusting screw and the valve stem.

VALVE CLEARANCE:

Intake: 0.10 ± 0.02 mm (0.004 ± 0.001 in)
Exhaust: 0.10 ± 0.02 mm (0.004 ± 0.001 in)



Adjust the valve clearance by loosening the lock nut and turning the adjusting screw until there is slight drag on the feeler gauge.

Hold the adjusting screw and tighten the lock nut.

TORQUE: 14 N·m (1.4 kgf-m, 10 lbf-ft)

TOOLS:

Valve adjusting wrench, 8 x 9 mm
Valve adjusting screw

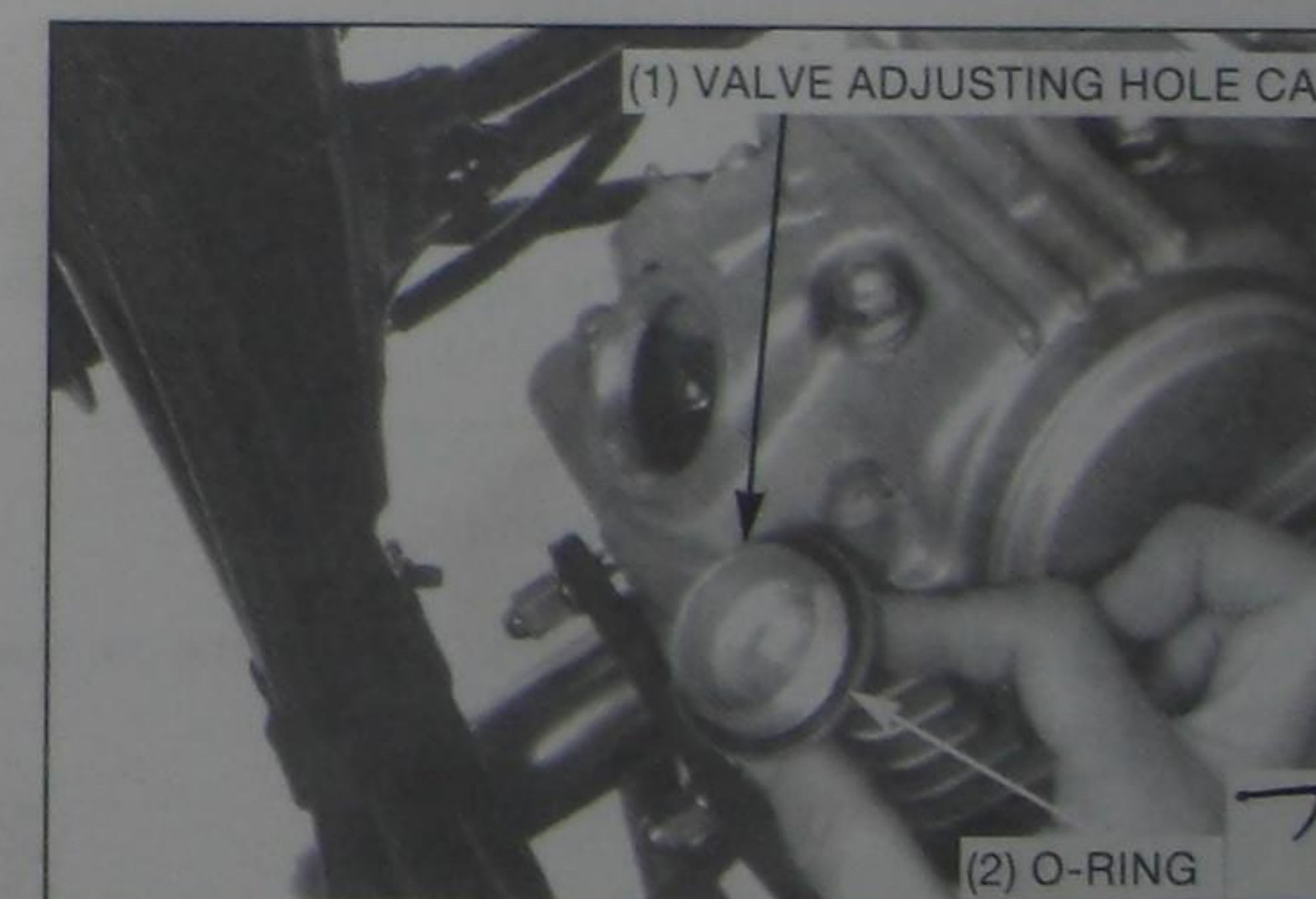
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Recheck the valve clearances.



Check that the O-rings on the valve adjusting hole caps are in good condition and replace them with new ones if necessary. Apply oil to the O-rings, install the valve adjusting hole caps and tighten them.

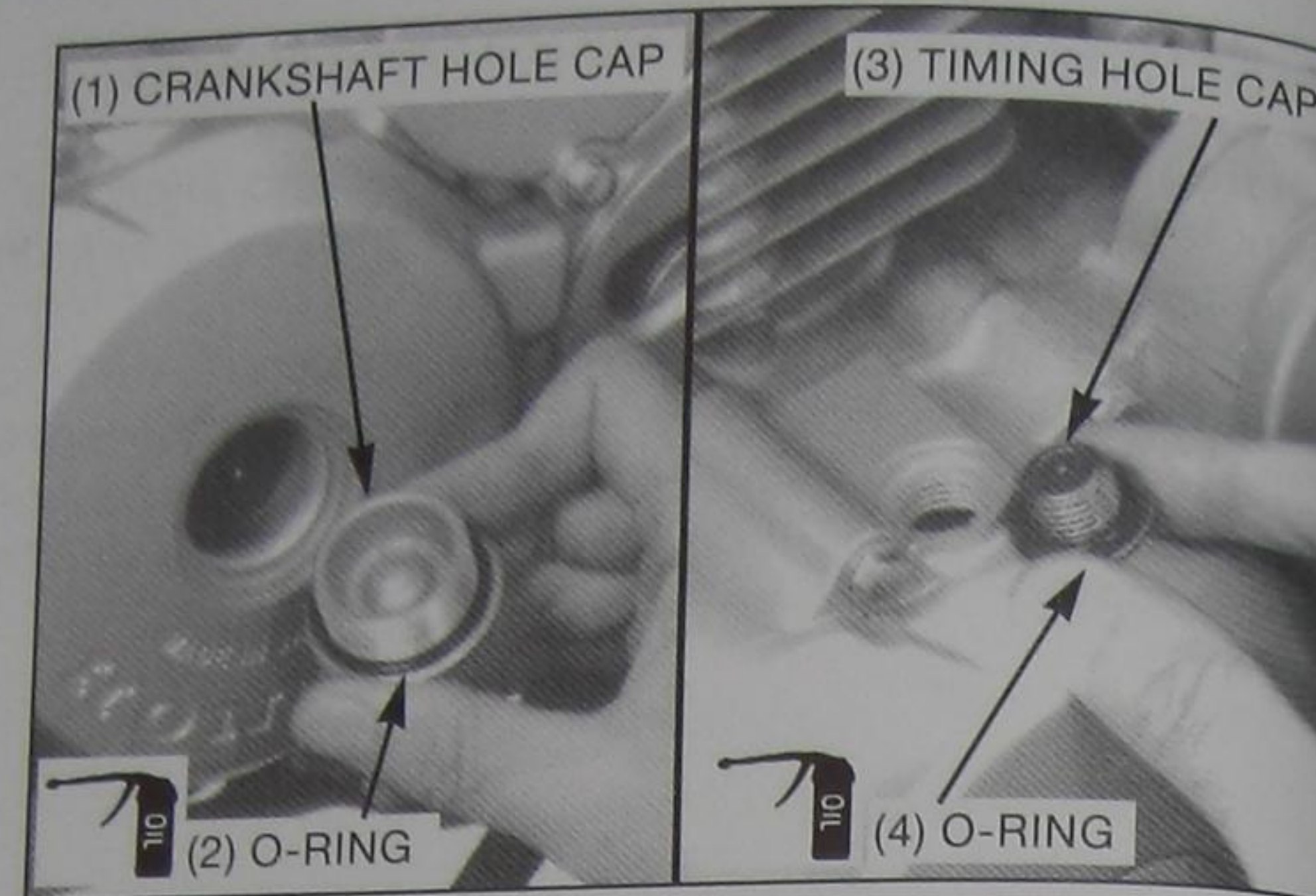
TORQUE: 15 N·m (1.5 kgf-m, 11 lbf-ft)



Check that the O-rings on the crankshaft hole cap and timing hole cap are in good condition and replace them with new ones if necessary.
Apply oil to the O-rings, install the crankshaft hole cap and timing hole cap, and tighten them.

TORQUE:
Crankshaft hole cap: 8 N·m (0.8 kgf-m, 5.8 lbf-ft)
Timing hole cap: 10 N·m (1.0 kgf-m, 7 lbf-ft)

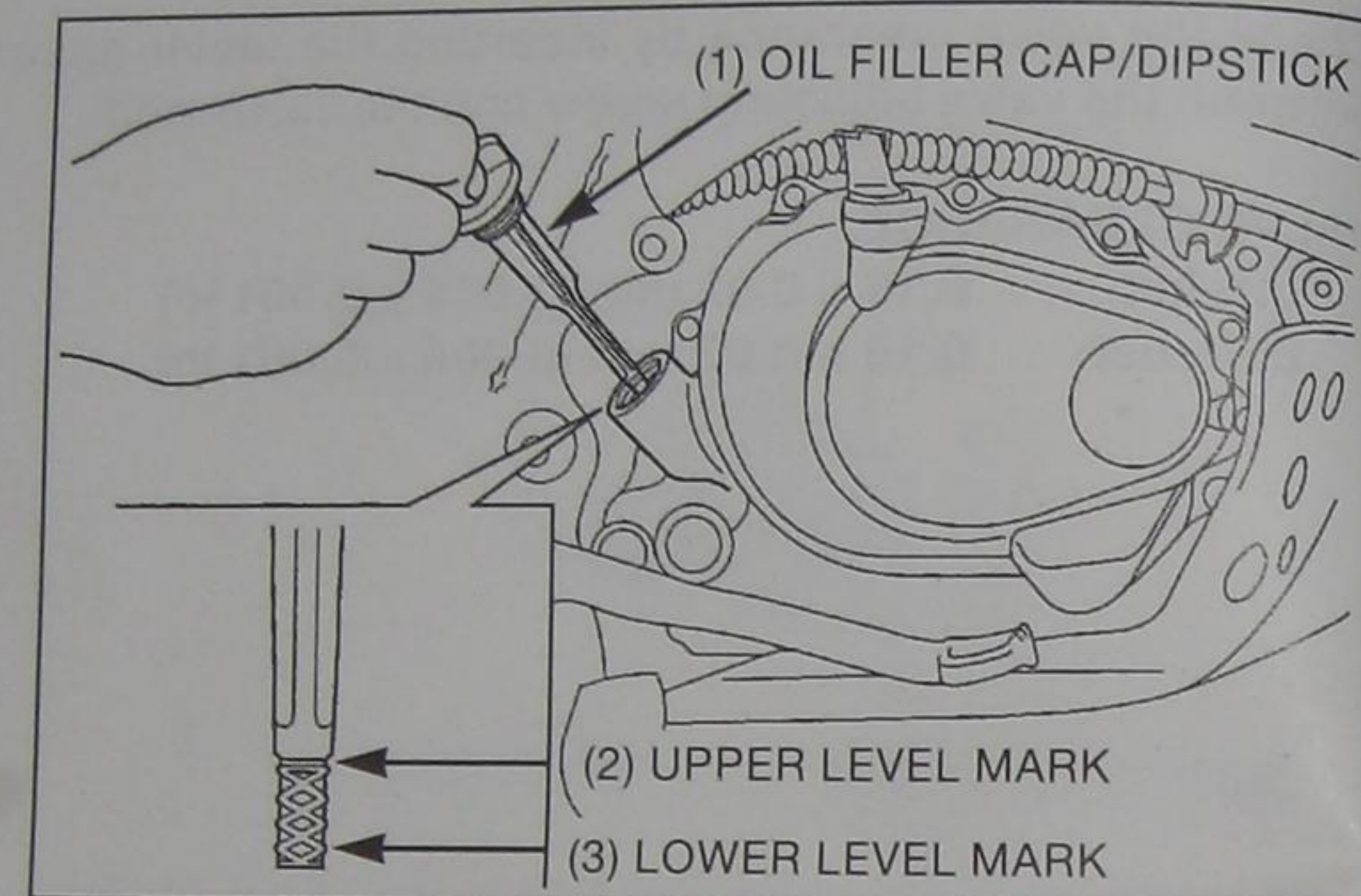
Install the fuel tank (page 2-2)



Engine Oil

OIL LEVEL CHECK

Start the engine and let it idle for a few minutes.
Stop the engine and wait 2-3 minutes.
Support the motorcycle upright on level ground.
Remove the oil filler cap/dipstick, wipe it clean and insert it without screwing it in.
Remove the oil filler cap/dipstick and check the oil level.
The oil level should be between the upper and lower level marks on the dipstick.
If the oil level is below or near the lower level mark, add the recommended engine oil to the upper level mark.



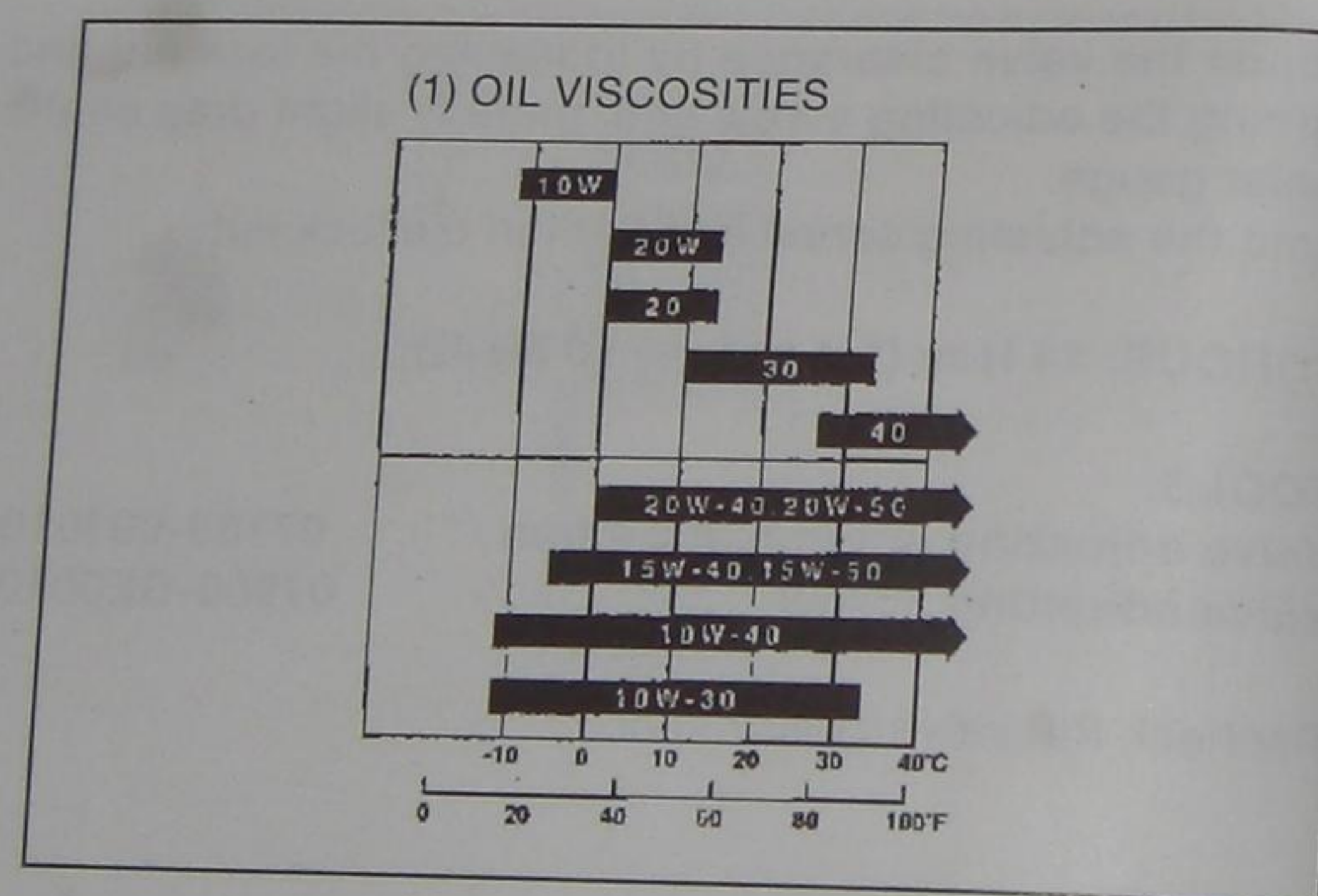
RECOMMENDED ENGINE OIL:

Honda 4-stroke oil or equivalent motor oil
API service classification: SE
Viscosity: SAE 10W-30

NOTE:

- Other viscosities shown in the chart may be used when the average temperature in your riding area is within the indicated range.

Reinstall the filler cap/dipstick.

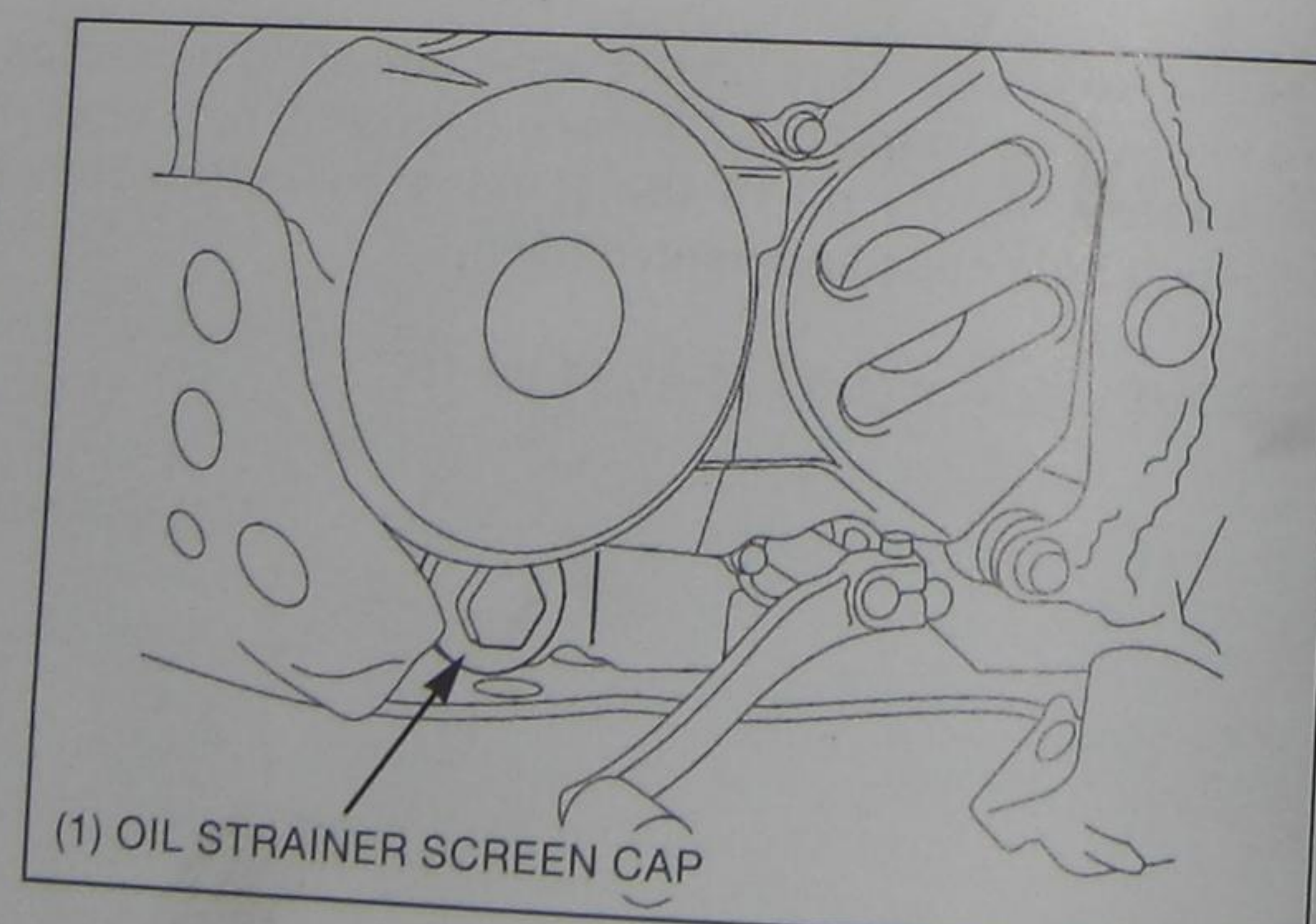


OIL CHANGE

NOTE:

- Drain the engine oil while the engine is warm. This ensures complete and rapid draining.

Place the motorcycle on its side stand.
Remove the oil filler cap/dipstick.
Place an oil drain pan under the engine to catch the oil, then remove the oil strainer screen cap.



WARNING

- Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil in a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil. **KEEP OUT OF REACH OF CHILDREN.**

NOTE:

- If the maintenance for the engine oil strainer screen cap is in good condition and replace it with a new one if necessary.

Check that the O-ring on the oil strainer screen cap is in good condition and replace it with a new one if necessary. Install the oil strainer screen cap and tighten it.

TORQUE: 15 N·m (1.5 kgf-m, 11 lbf-ft)

Fill the crankcase with the recommended engine oil (page 3-8).

ENGINE OIL CAPACITY:

1.0 liter (1.06 US qt, 0.88 Imp qt) at oil change
1.2 liters (1.27 US qt, 1.06 Imp qt) at disassembly

Install the oil filler cap/dipstick.
Check the oil level (page 3-7).

Make sure that there are no oil leaks.

Engine Oil Strainer Screen

Drain the engine oil.

Remove the spring and oil strainer screen.
Clean the oil strainer screen thoroughly.
Check the screen for damage and the sealing rubber for damage or deterioration and replace the oil strainer screen if necessary.

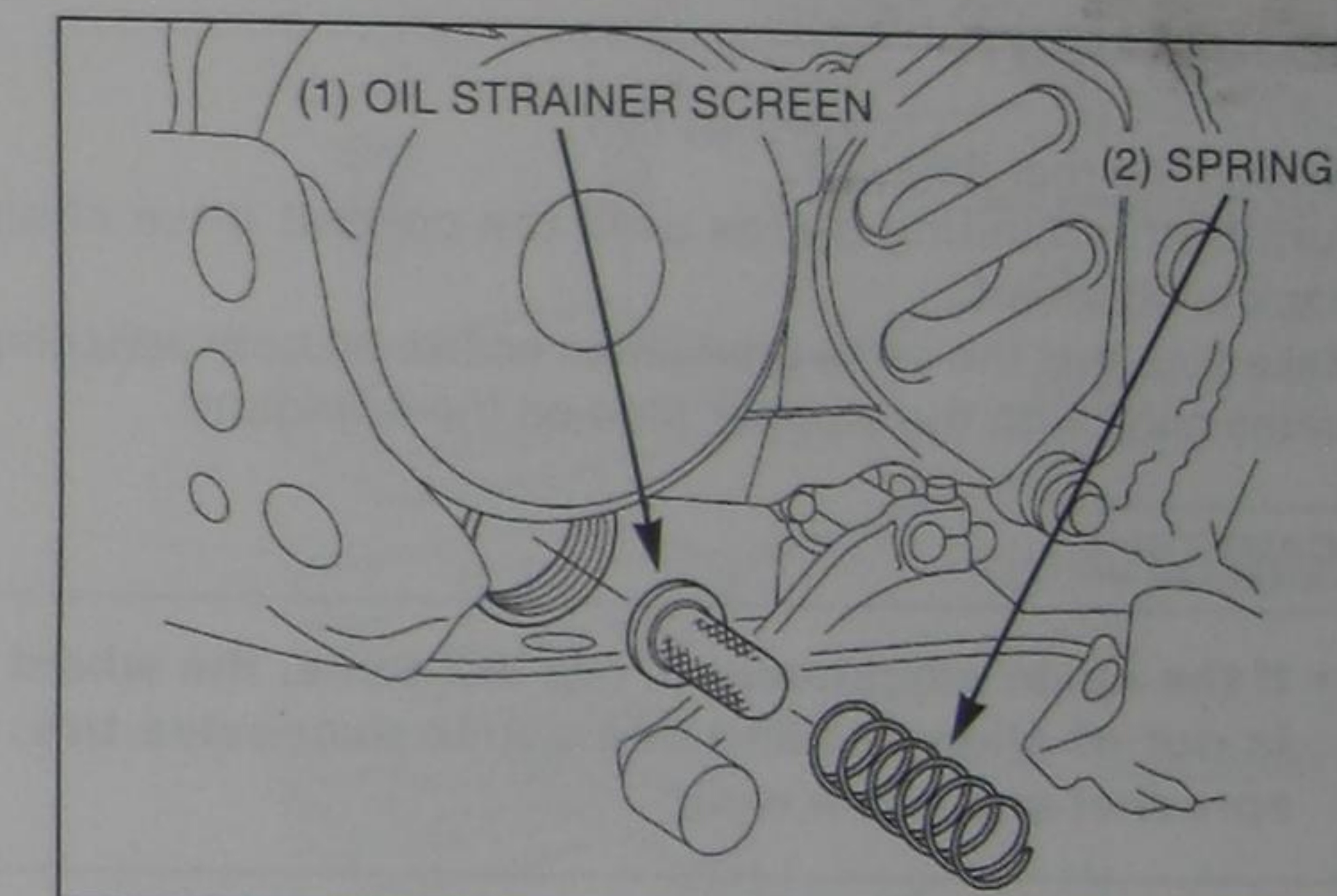
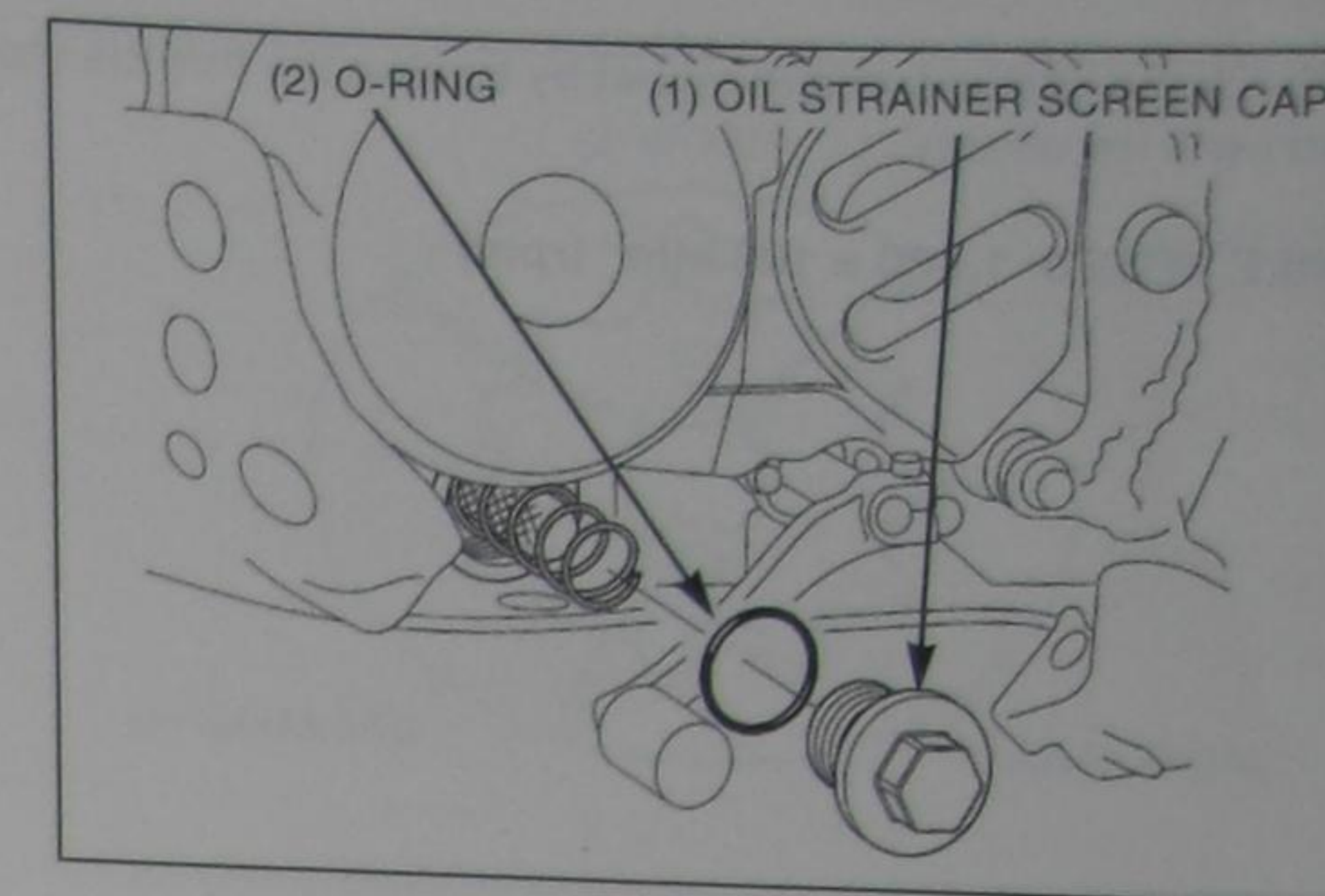
Install the oil strainer screen cap and fill the crankcase with recommended engine oil (see above).

Engine Idle Speed

NOTE:

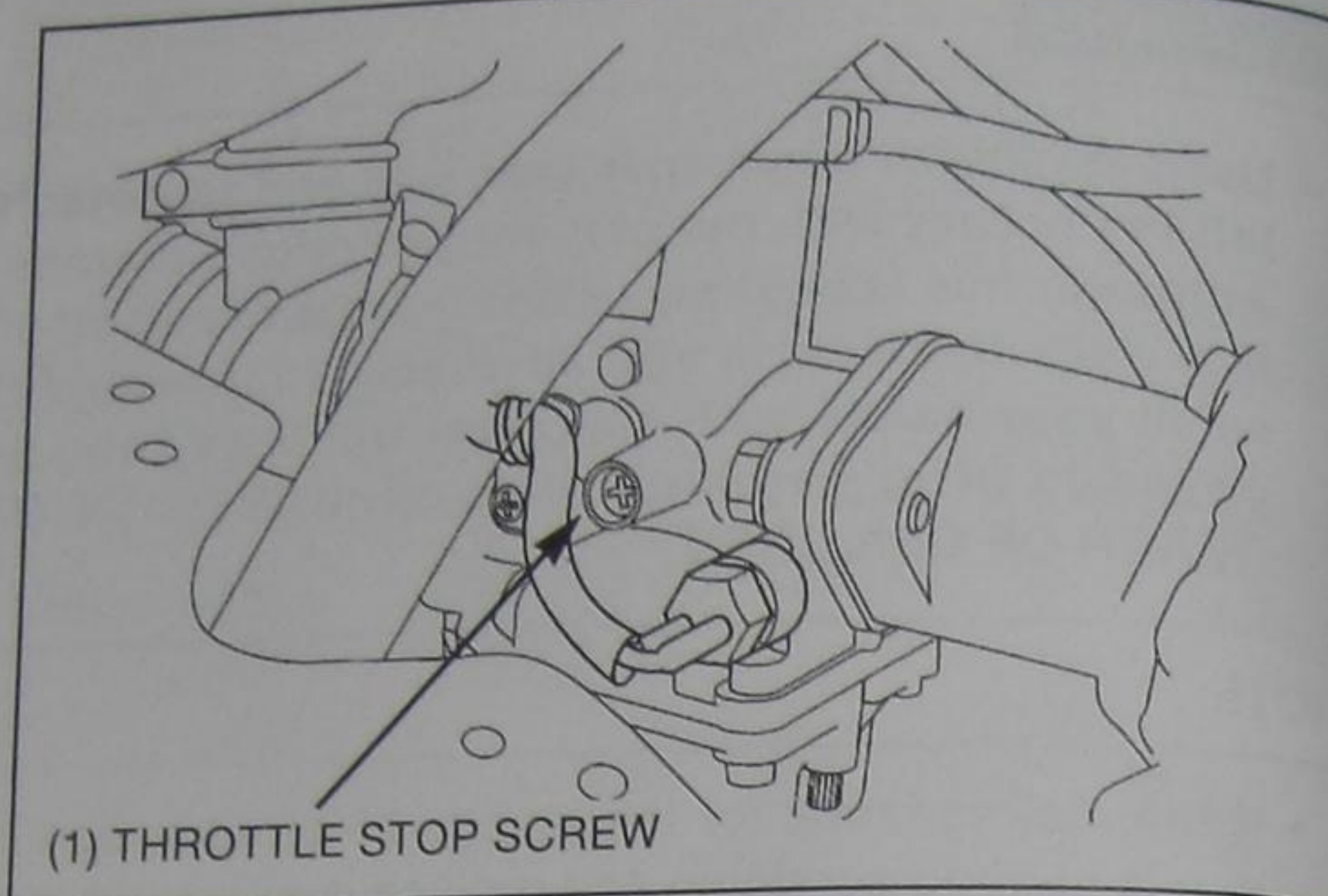
- Inspect and adjust the idle speed after all other engine adjustments are within specifications.
- The engine must be warm for accurate inspection and adjustment.

Warm up the engine to normal operating temperature.
Place the motorcycle on its side stand on level ground and shift the transmission into neutral.



Check the idle speed and adjust by turning the throttle stop screw if necessary.

IDLE SPEED: 1,400 ± 100 min⁻¹ (rpm)



Drive Chain

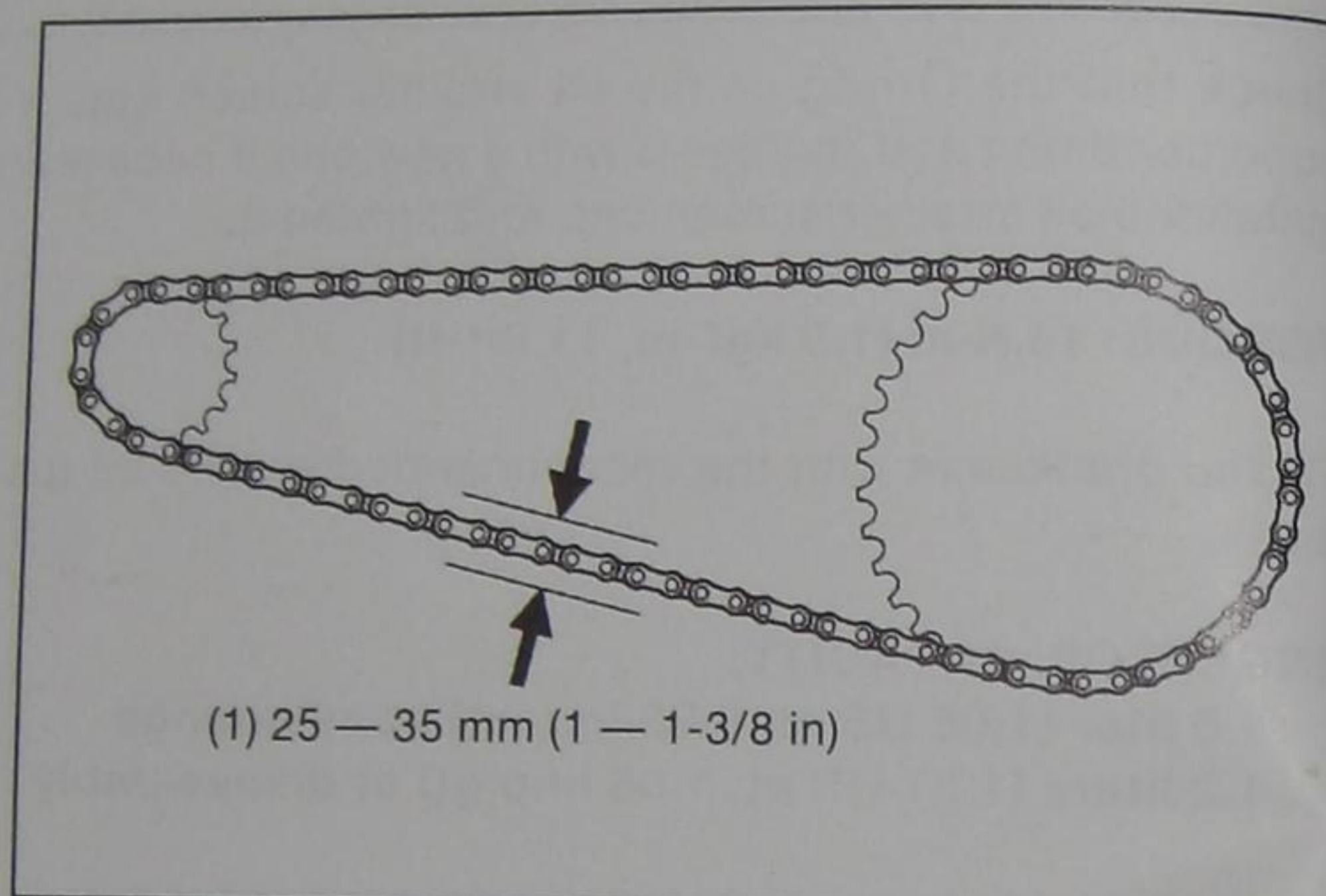
WARNING

- Never inspect and adjust the drive chain while the engine is running.

INSPECTION

With the engine stopped, place the motorcycle on its side stand and shift the transmission into neutral. Measure the drive chain slack in the lower drive chain run midway between the sprockets.

DRIVE CHAIN SLACK: 25 - 35 mm (1 — 1-3/8 in)

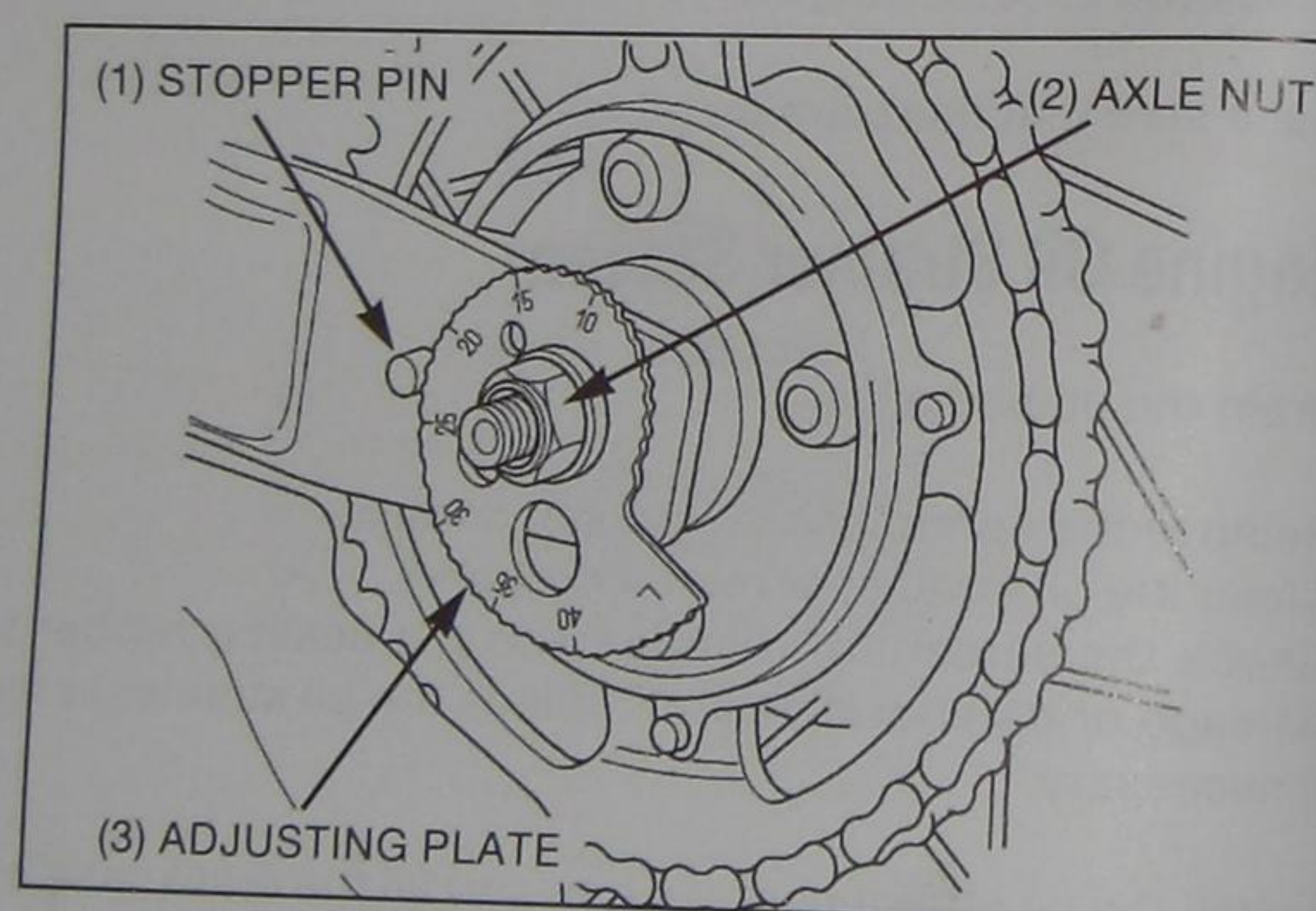


ADJUSTMENT

Loosen the rear axle nut. Turn both adjusting plates until the correct drive chain slack is obtained. Make sure that the same graduation scales on both adjusting plates align with the stopper pins on the swingarm.

CAUTION

- If the chain adjustment is not the same, the wheel is out of alignment and can cause excessive tire, sprocket and chain wear.



Tighten the rear axle nut.

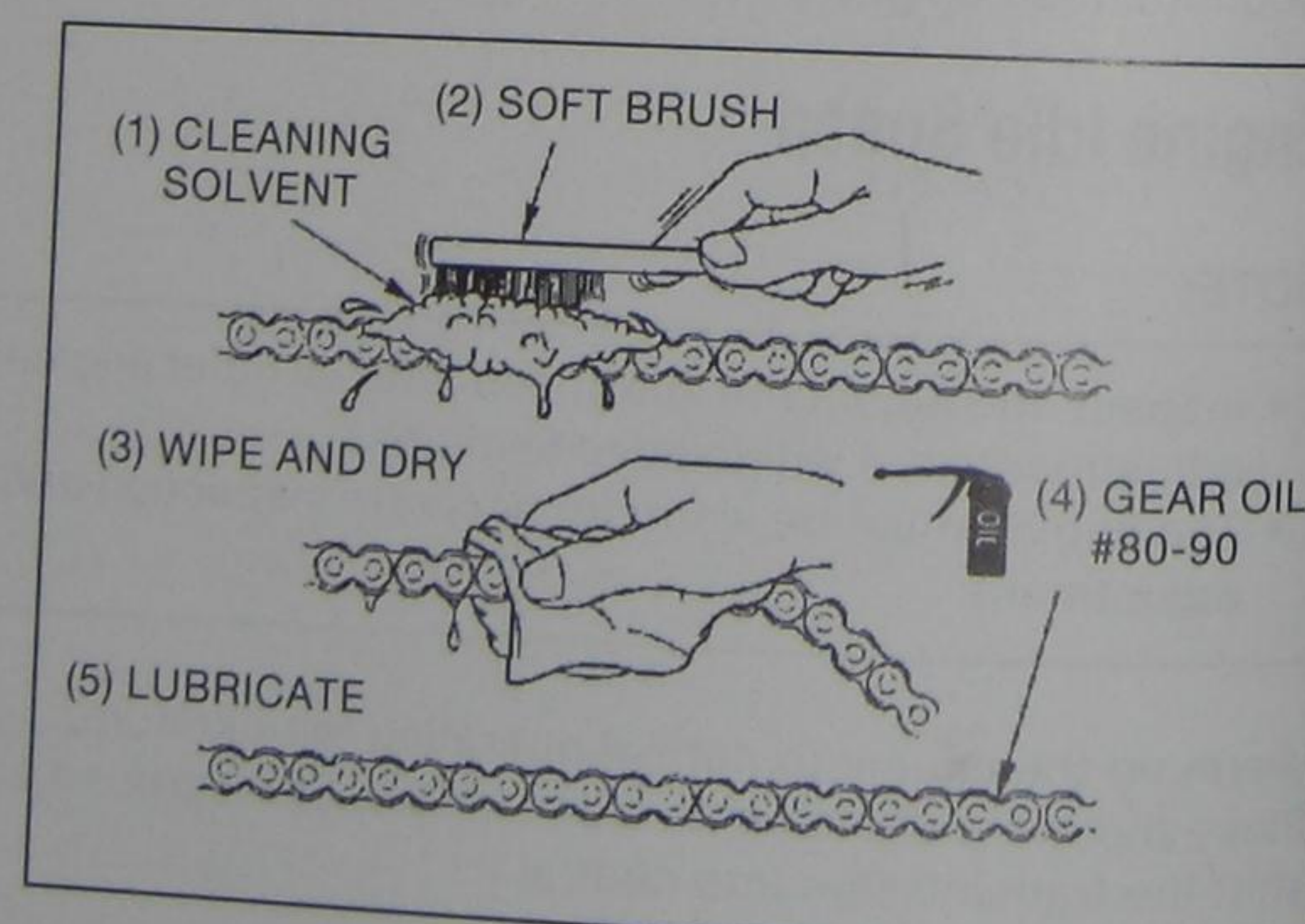
TORQUE: 88 N·m (9.0 kgf-m, 65 lbf-ft)

Recheck the drive chain slack and free wheel rotation.

CLEANING/LUBRICATION

Clean the chain with non-flammable or high flash point solvent and wipe it dry. Be sure the chain has dried completely before lubricating. Inspect the drive chain for wear or damage. Replace the drive chain if it is worn excessively or damaged.

Lubricate the drive chain with #80-90 gear oil drive chain lubricant. Wipe off the excess oil or chain lubricant.



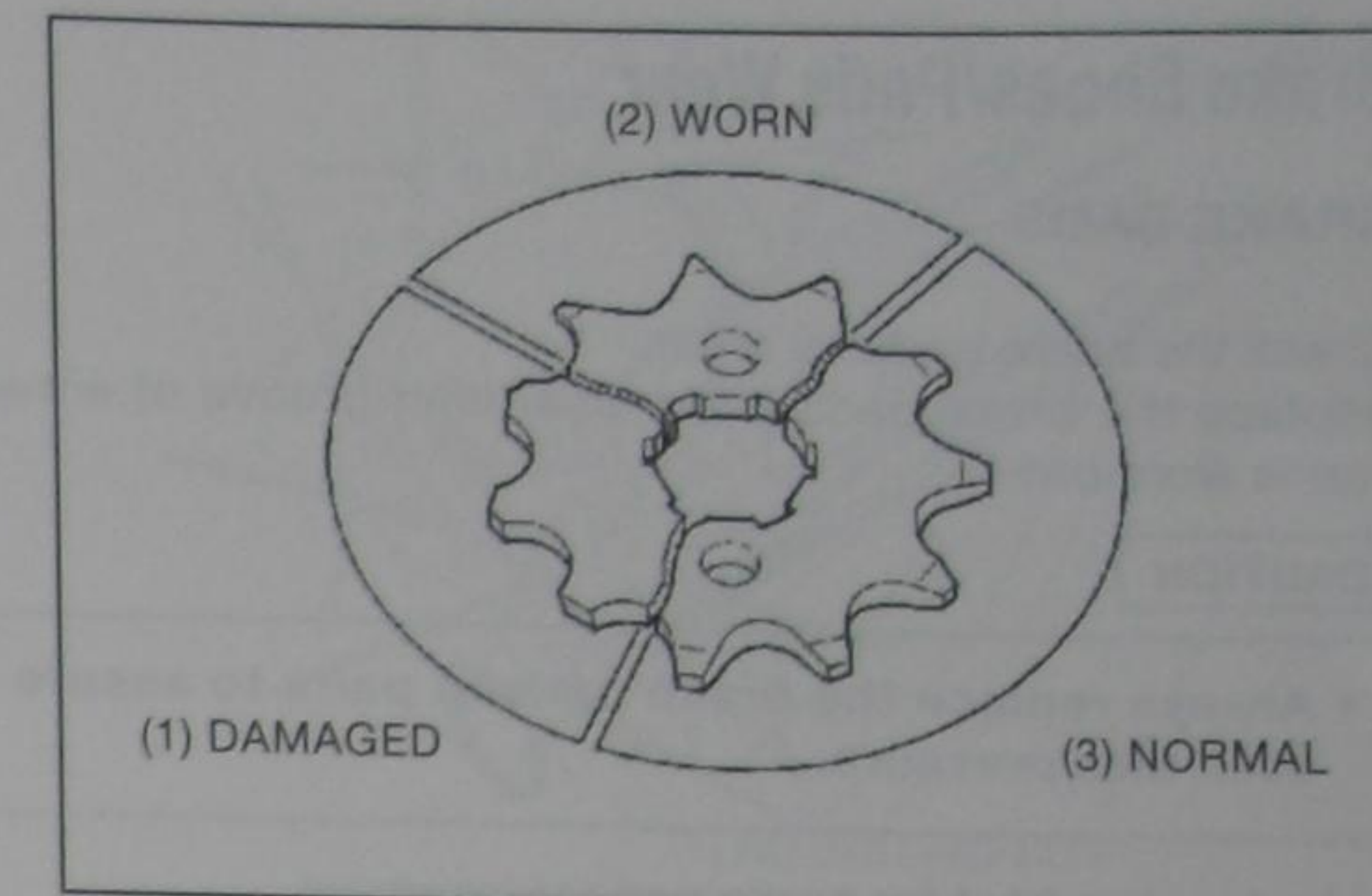
SPROCKET INSPECTION

Inspect the drive and driven sprocket teeth for 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 new replacement chain or sprockets will wear rapidly.

Check the attaching bolts and nuts on the drive and driven sprockets. If any are loose, torque them.



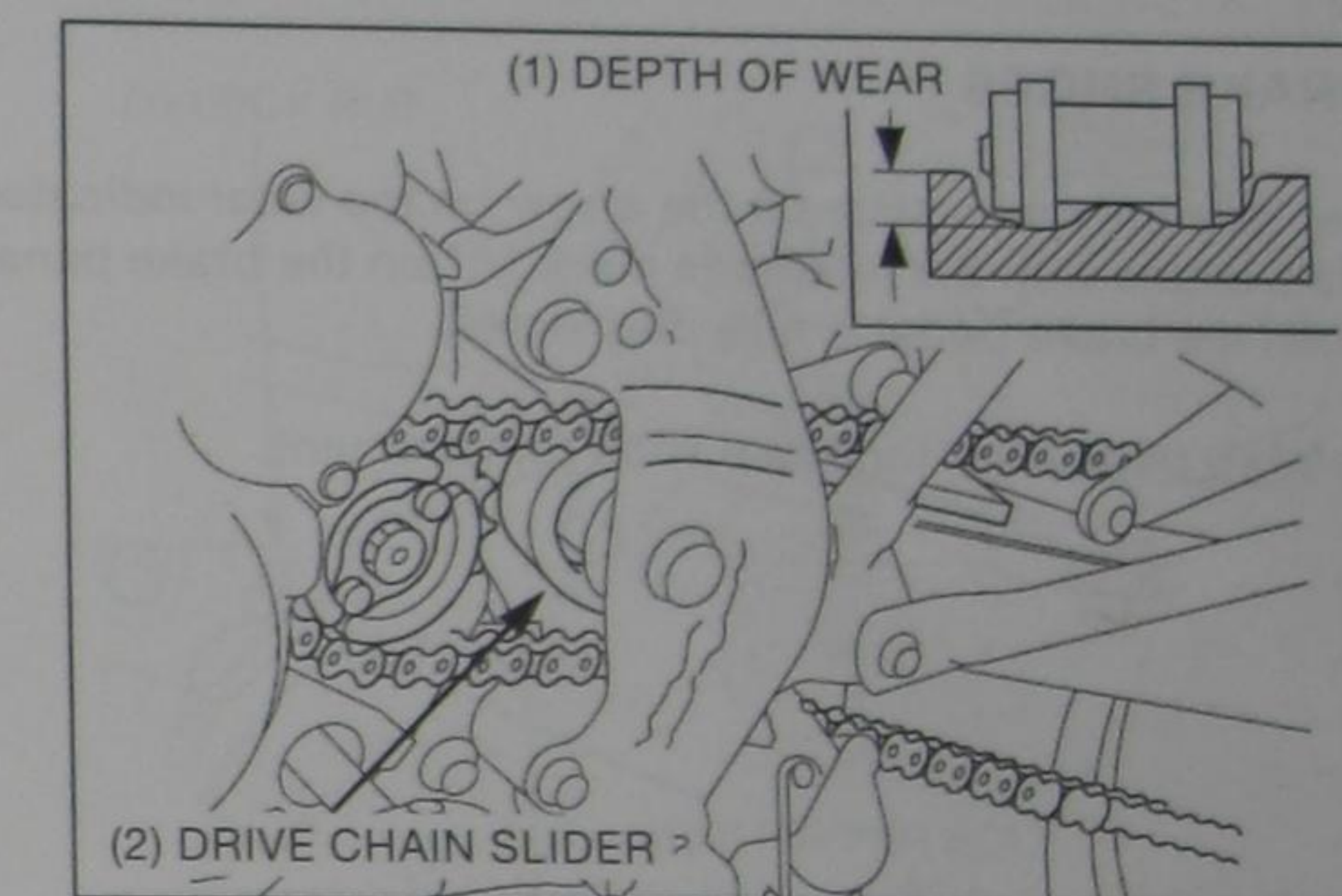
Drive Chain Slider

Remove the drive sprocket cover (page 6-2).

Check the drive chain slider for depth of wear.

SERVICE LIMIT: 2 mm (0.1 in)

Refer to section 14 for drive chain slider replacement.



Brake Fluid

CAUTION

- Do not mix different types of fluid, as they are not compatible with each other.
- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.

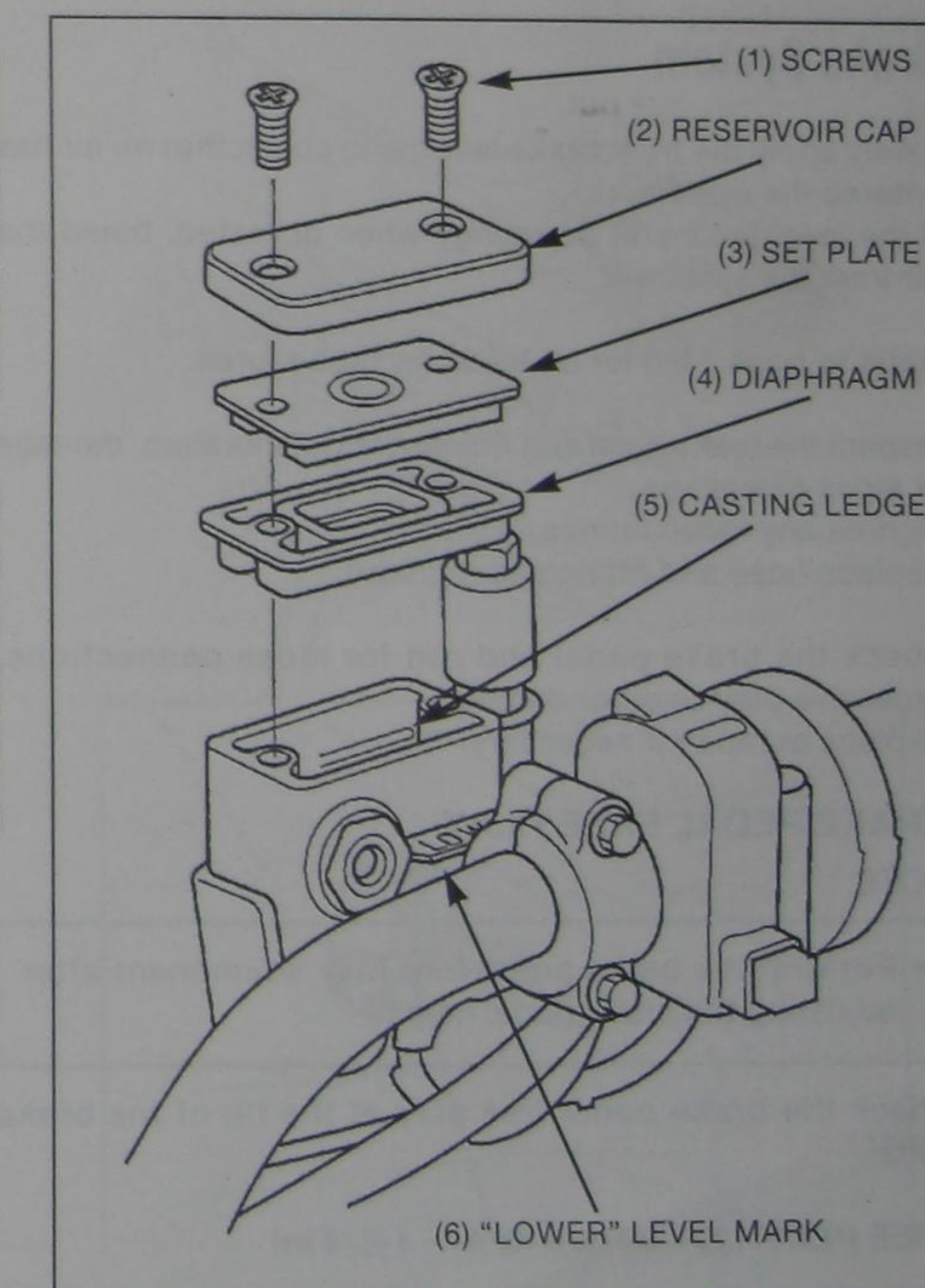
NOTE:

- When the fluid level is low, check the brake pads for wear (page 3-12). A low fluid level may be due to wear of the brake pads. If the brake pads are worn, the caliper pistons are pushed out, and this accounts for a low reservoir level.
- If the brake pads are not worn and the fluid level is low, check entire system for leaks (page 3-12).

Turn the handlebar so that the reservoir is level and check the brake fluid level through the sight glass. If the fluid level nears the "LOWER" level mark, remove the two screws, reservoir cap, set plate and diaphragm. Fill the reservoir to the casting ledge with DOT 4 brake fluid from a sealed container.

Install the diaphragm, set plate and reservoir cap, and tighten the two screws.

TORQUE: 2 N·m (0.2 kgf-m, 1.4 lbf-ft)



Brake Shoes/Pads Wear

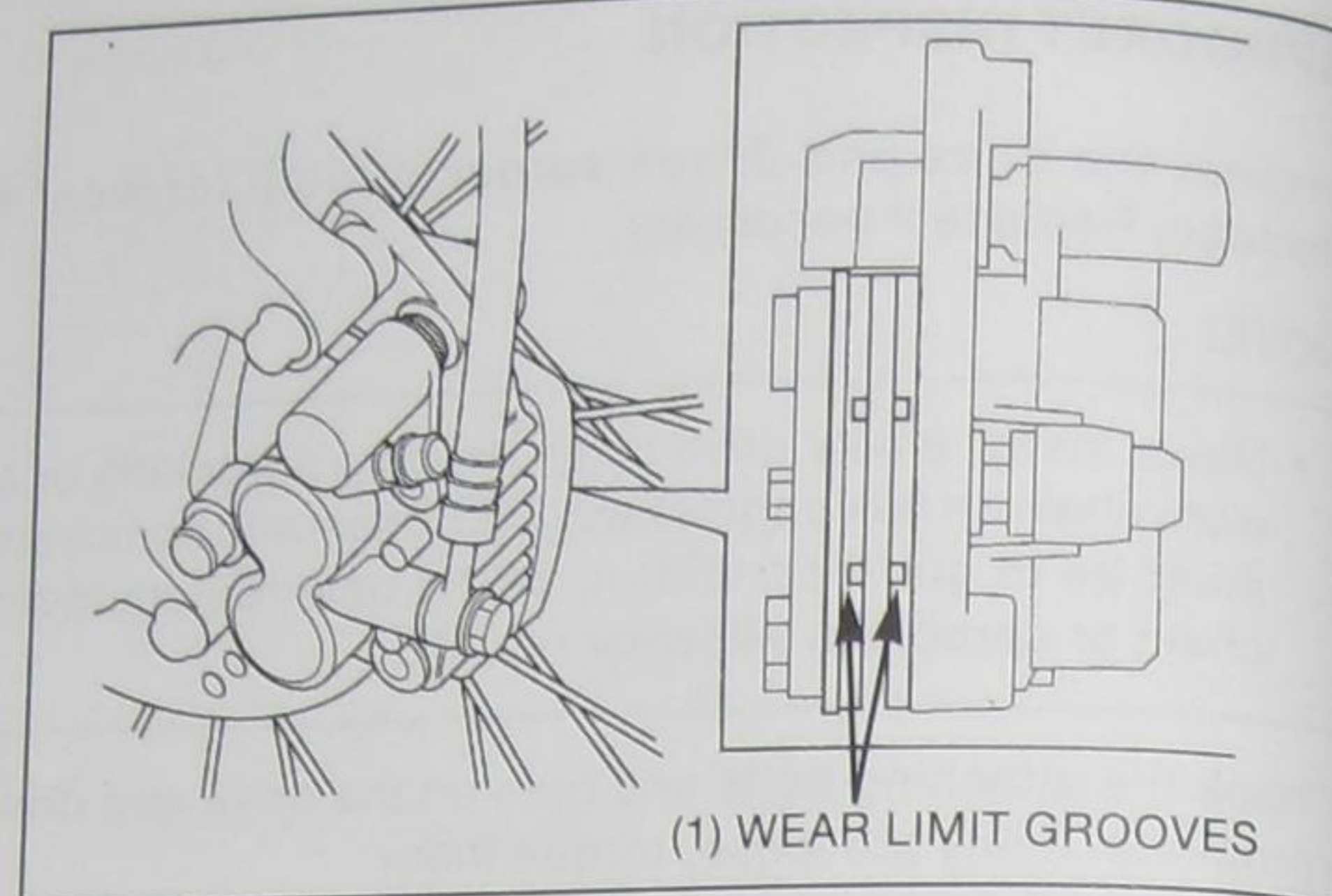
BRAKE PADS

Check the brake pads for wear. Replace the brake pads if the wear limit groove of either pad is worn out.

CAUTION

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

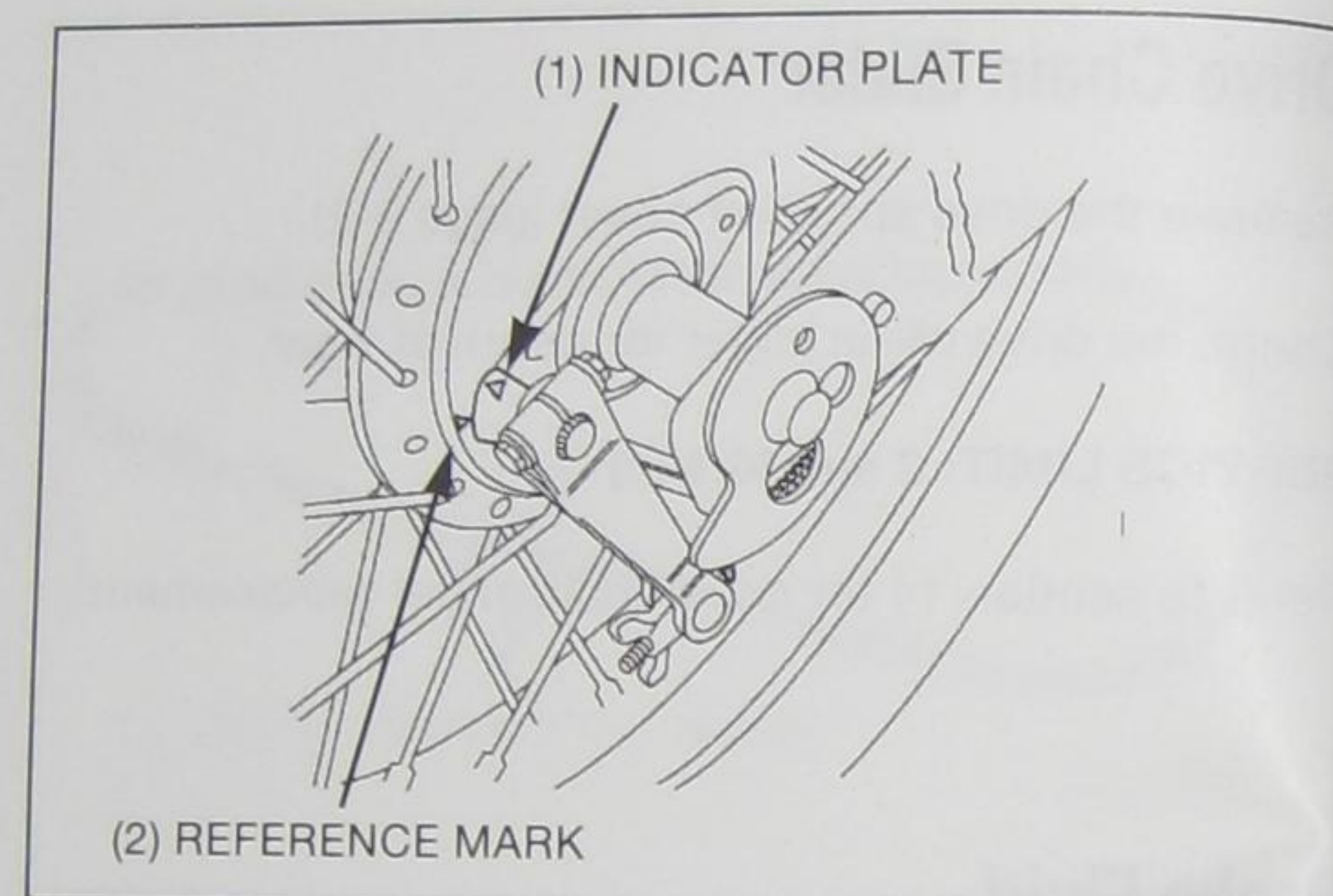
Refer to page 14-4 for brake pad replacement.



BRAKE SHOES

Replace the brake shoes if the arrow on the wear indicator plate aligns with the reference mark "Δ" on the brake panel when the brake pedal is fully depressed.

Refer to page 13-7 for brake shoe replacement.



Brake System

Firmly apply the front brake lever, and check that no air has entered the system. If the lever feels soft or spongy when operated, bleed the air from the system.

Refer to page 14-3 for air bleeding procedures.

Inspect the brake hose and fittings for deterioration, damage or signs of leakage. Tighten any loose fittings. Replace hose and fittings as required.

Check the brake pedal and rod for loose connections, excessive play or other damage. Replace or repair if necessary.

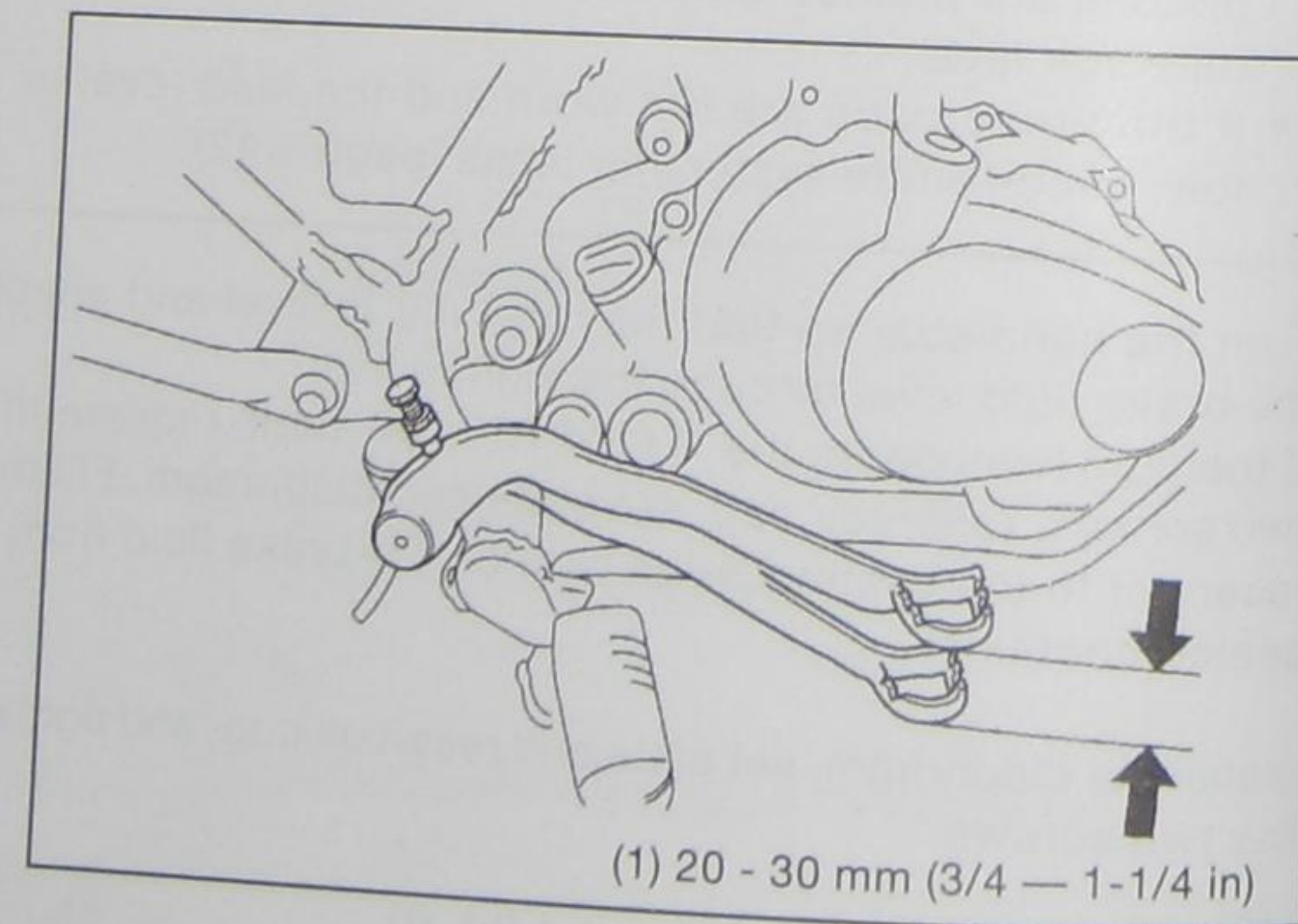
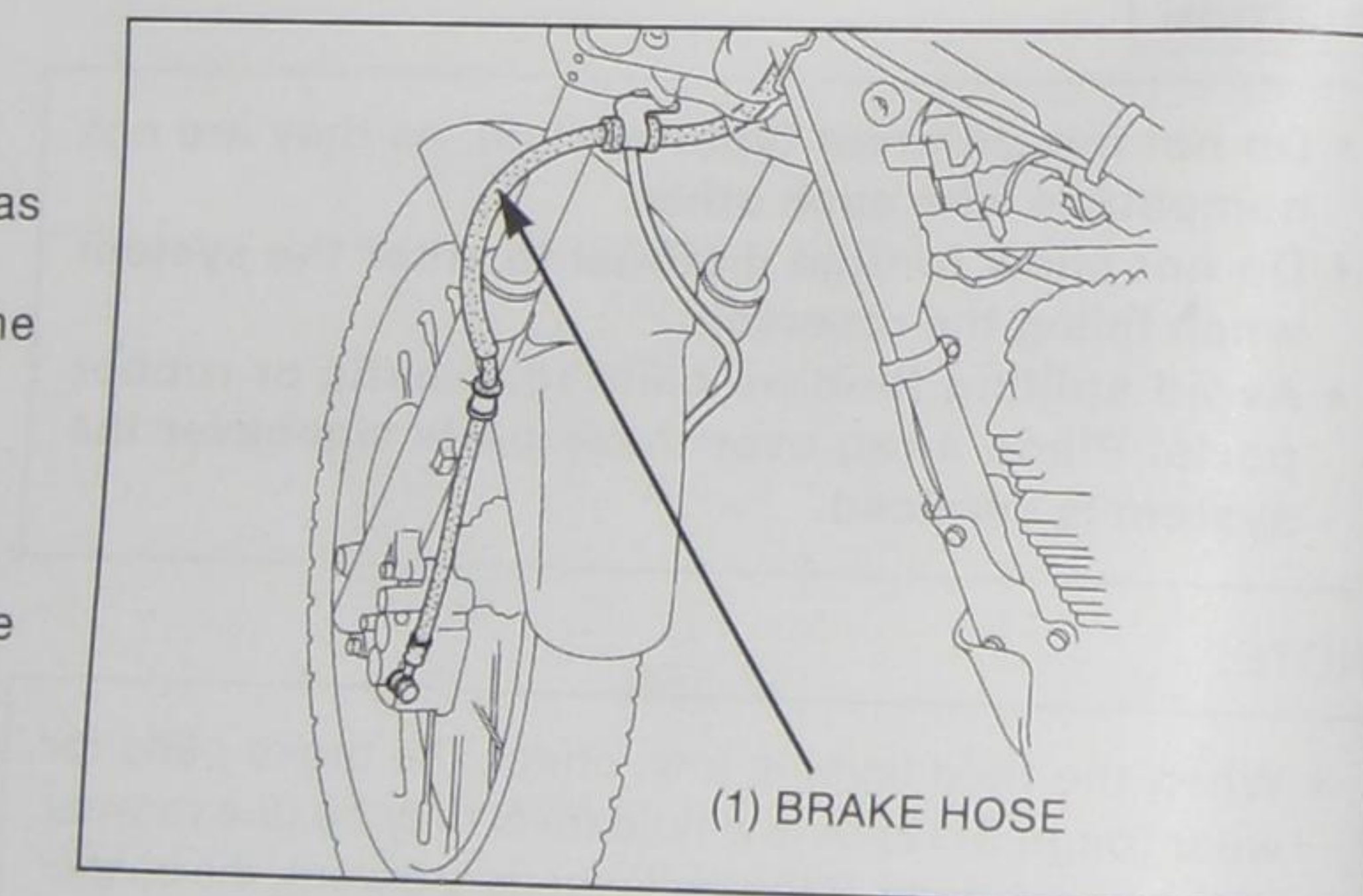
BRAKE PEDAL FREE PLAY

NOTE:

- Perform the brake pedal free play adjustment after adjusting the brake pedal height.

Check the brake pedal free play at the tip of the brake pedal.

FREE PLAY: 20 - 30 mm (3/4 — 1-1/4 in)

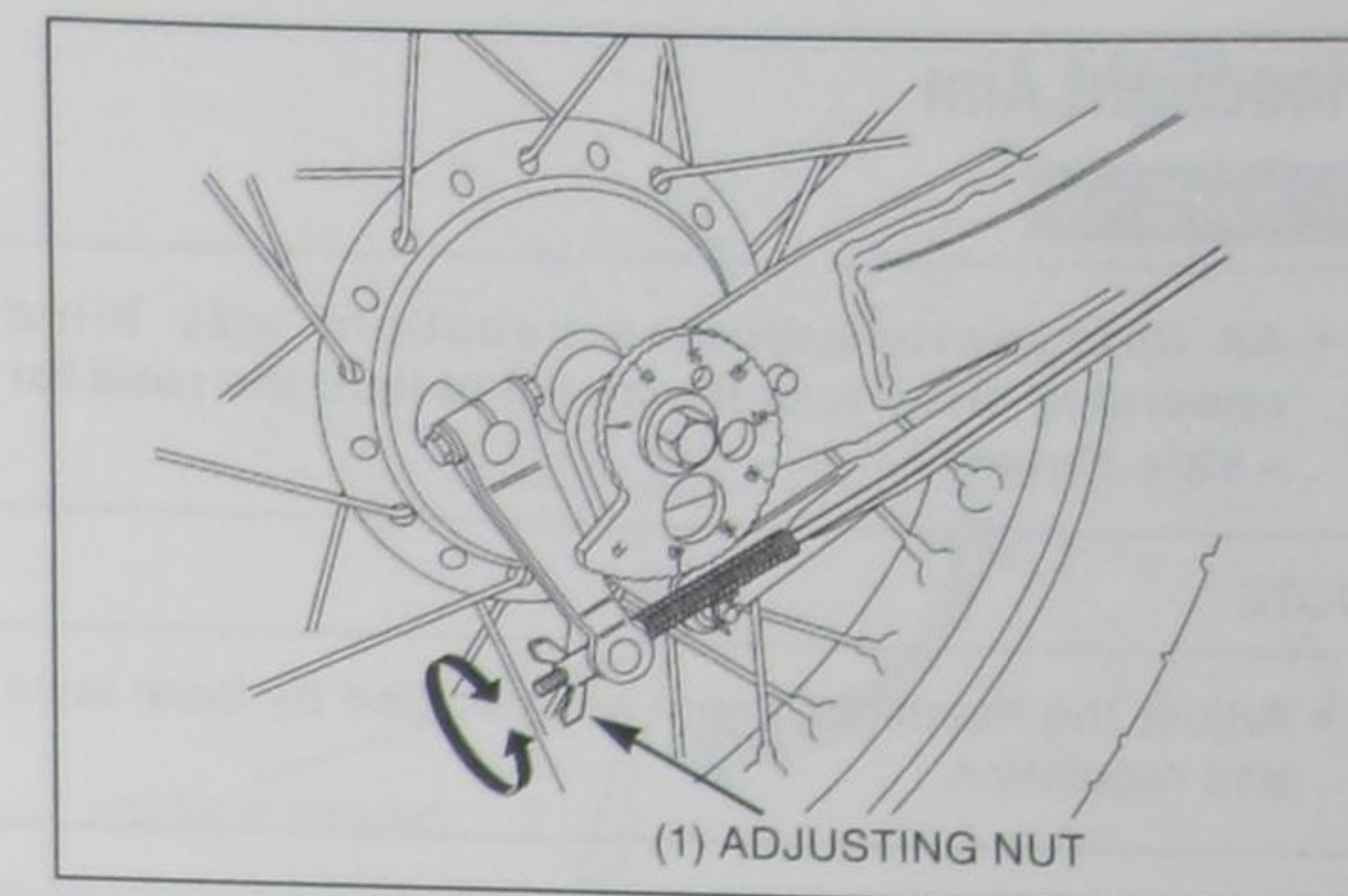


Adjust the brake pedal free play by turning the adjusting nut.

NOTE:

- Make sure that the cutout in the adjusting nut is seated on the brake arm joint.

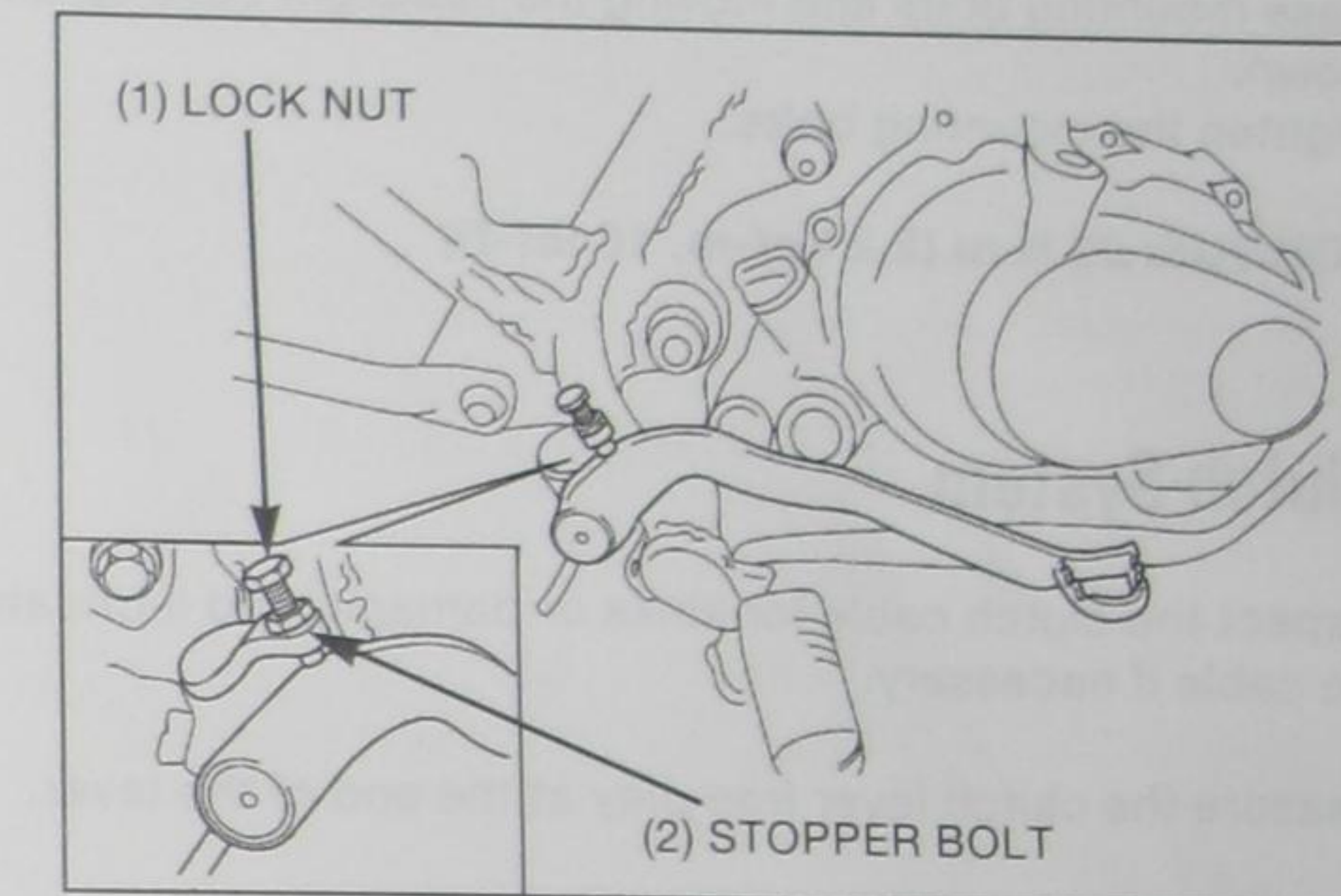
After adjusting the brake pedal free play, check the rear brake light switch operation and adjust if necessary.



BRAKE PEDAL HEIGHT

The brake pedal height can be adjusted by loosening the lock nut and turning the stopper bolt.

After adjusting the brake pedal height, check the brake pedal free play and rear brake light switch operation and adjust if necessary.



Brake Light Switch

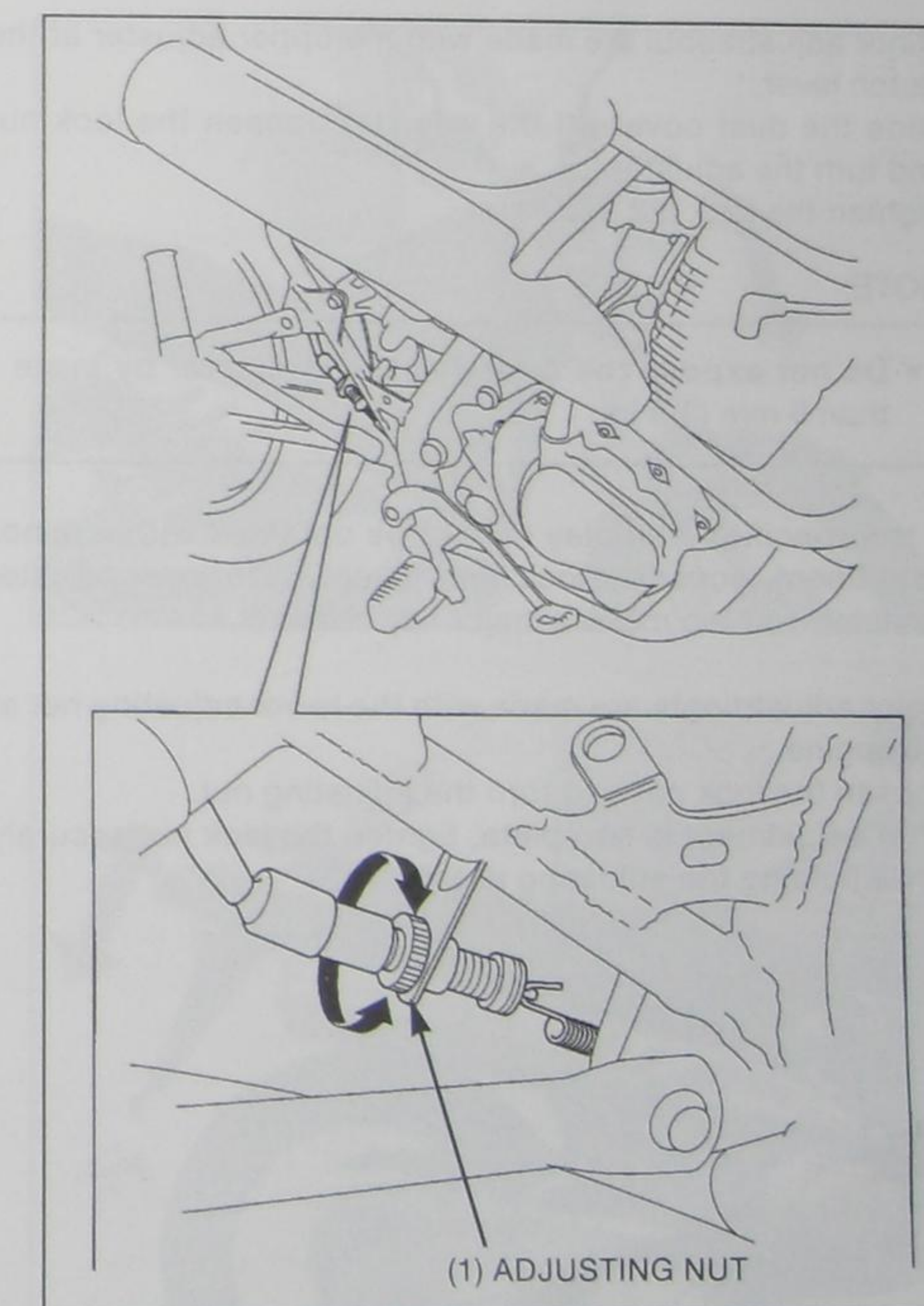
NOTE:

- Perform brake light switch adjustment after adjusting the brake pedal height and free play.
- The front brake light switch cannot be adjusted. If the front brake light switch actuation and brake engagement are off, either replace the switch unit or the malfunctioning parts of the system.

Check that the brake light comes on when the brake pedal is depressed and the brake engagement begins. To adjust, hold the switch body and turn the adjusting nut.

CAUTION

- Do not turn the brake light switch body.



Headlight Aim

WARNING

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

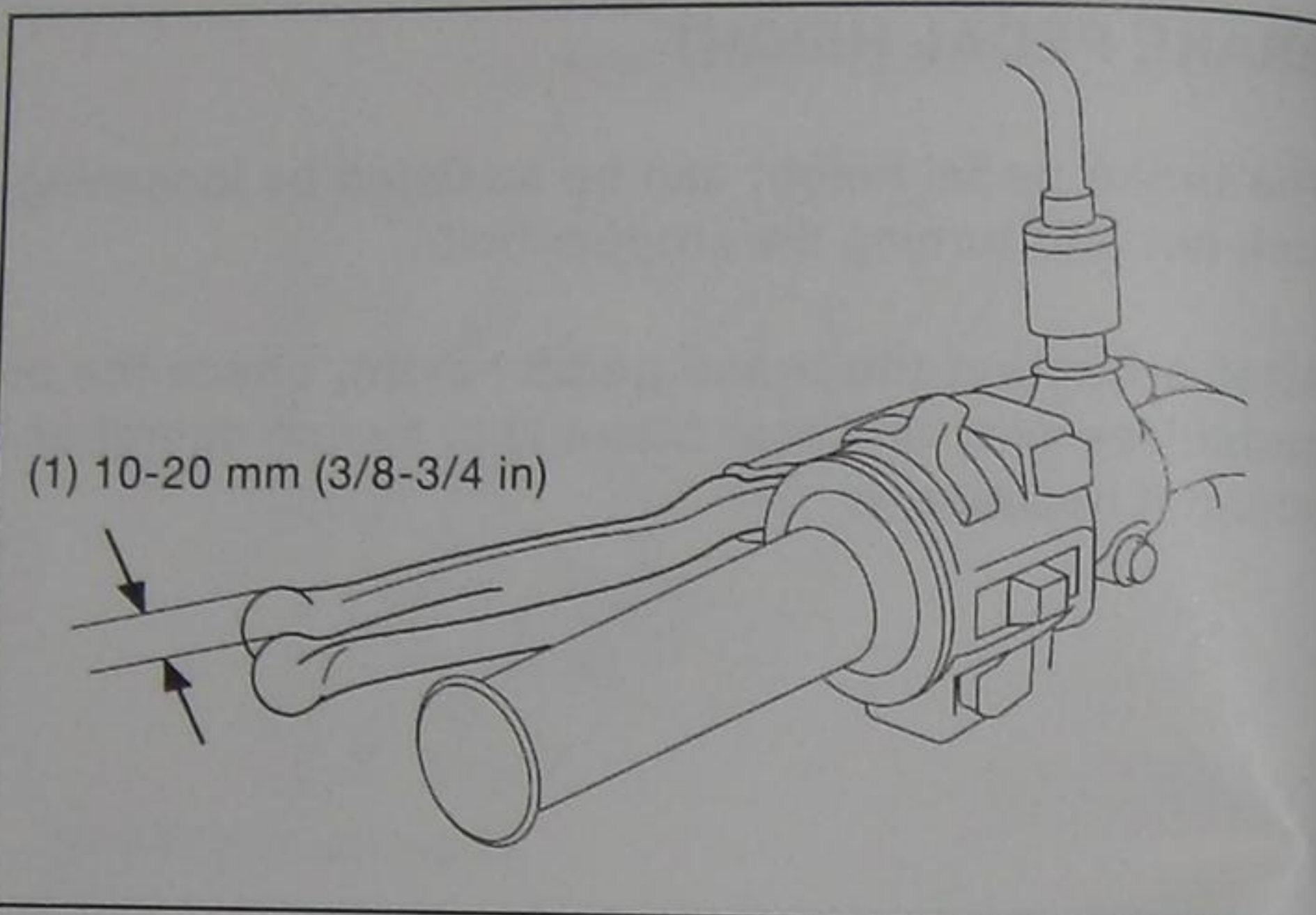
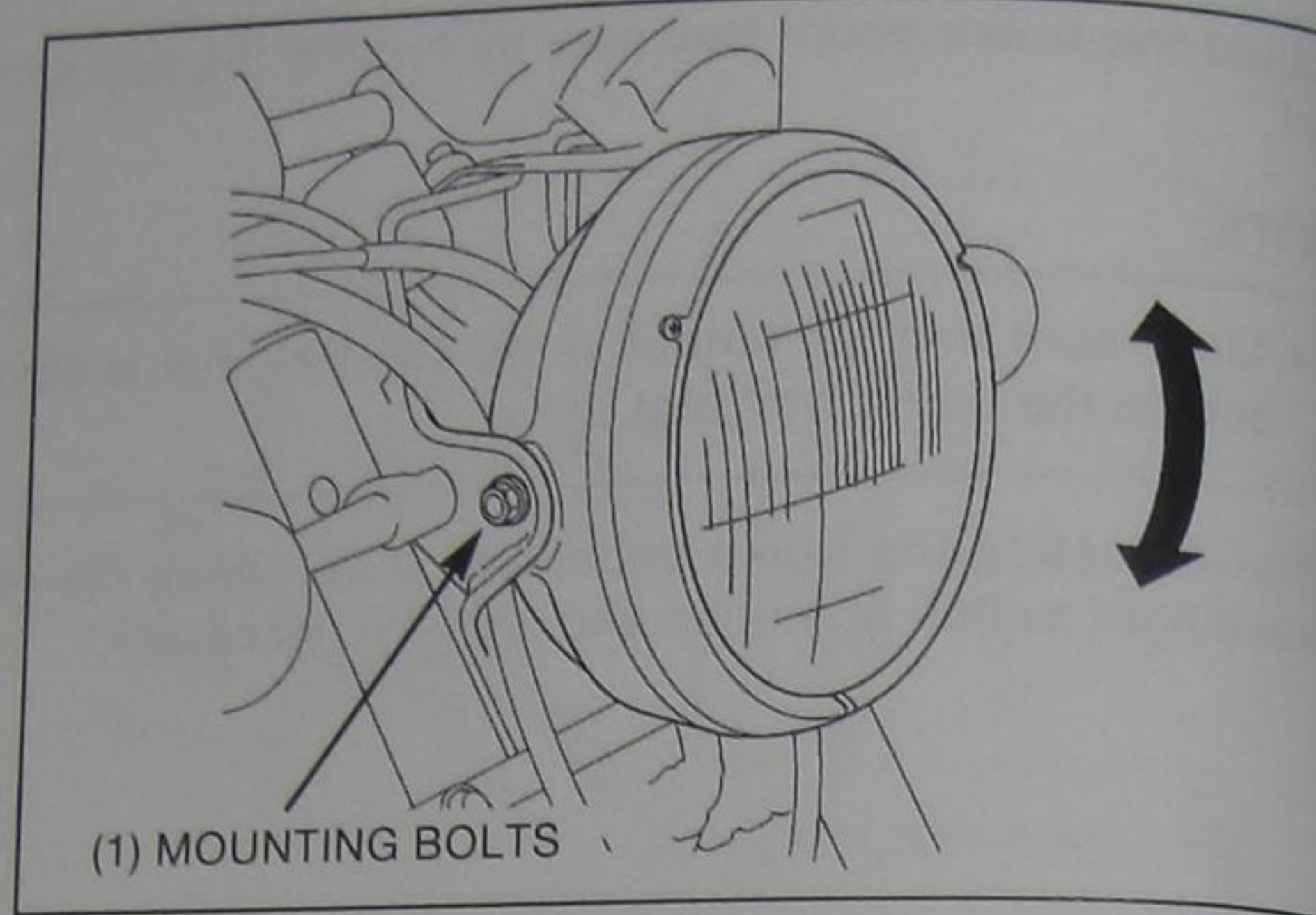
NOTE:

- Adjust the headlight beam as specified by local laws and regulation.

Adjust the headlight beam vertically by loosening the headlight case mounting bolts and moving the headlight case up and down.

Tighten the mounting bolts.

TORQUE: 22 N·m (2.2 kgf-m, 16 lbf-ft)



Clutch System

Inspect the clutch cable for kinks or damage, and lubricate the cable if necessary.

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

FREE PLAY: 10-20 mm (3/8-3/4 in)

Minor adjustments are made with the upper adjuster at the clutch lever.

Slide the dust cover off the adjuster, loosen the lock nut and turn the adjuster.

Tighten the lock nut securely.

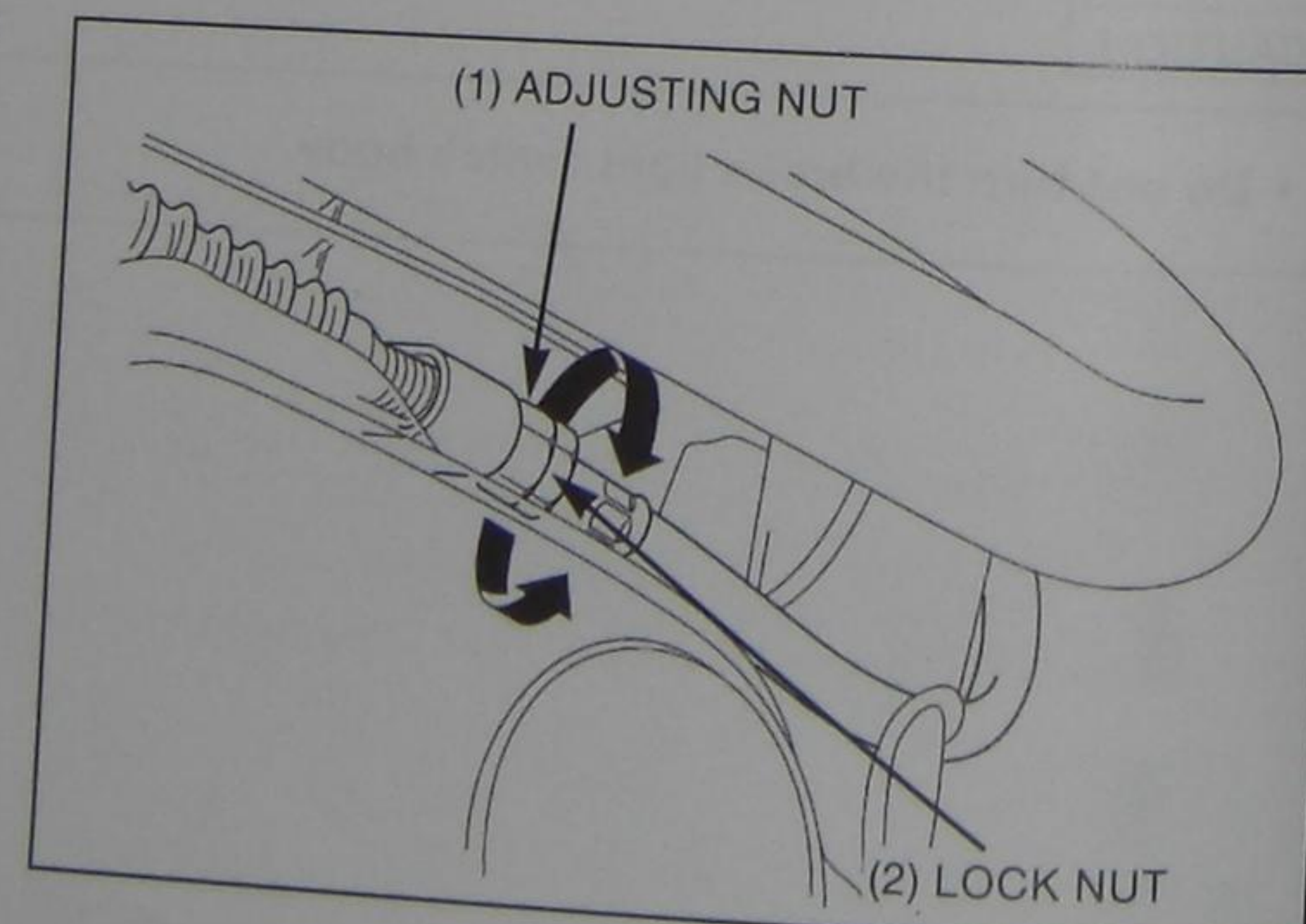
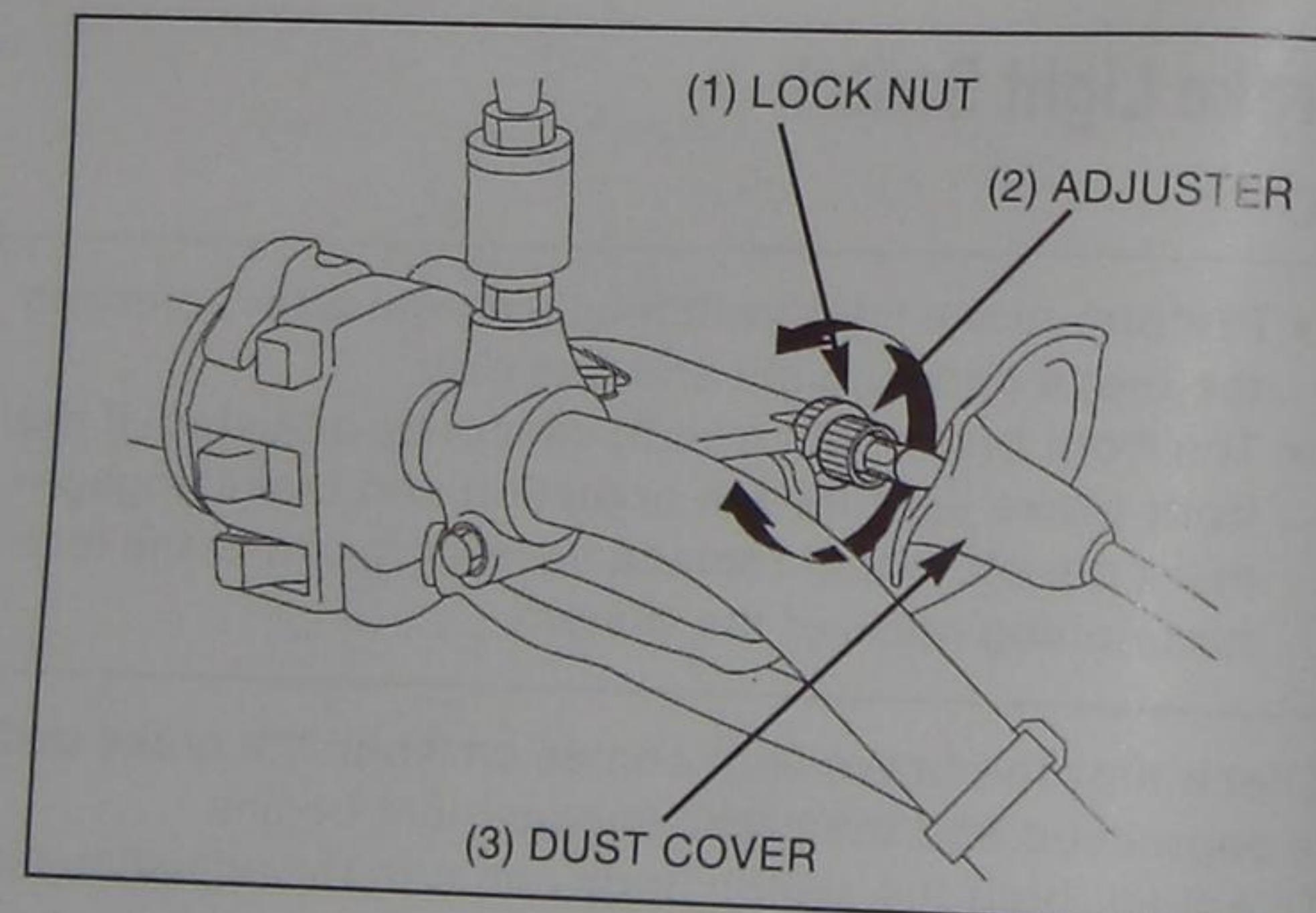
NOTE:

- Do not expose the threads of the adjuster by more than 8 mm (3.8 in).

If the specified free play cannot be obtained with a minor adjustment, loosen the lock nut and turn in the upper adjuster completely; then make a major adjustment.

Major adjustments are made with the lower adjusting nut at the engine.

Loosen the lock nut and turn the adjusting nut. After adjustment is complete, tighten the lock nut securely while holding the adjusting nut.



Side Stand

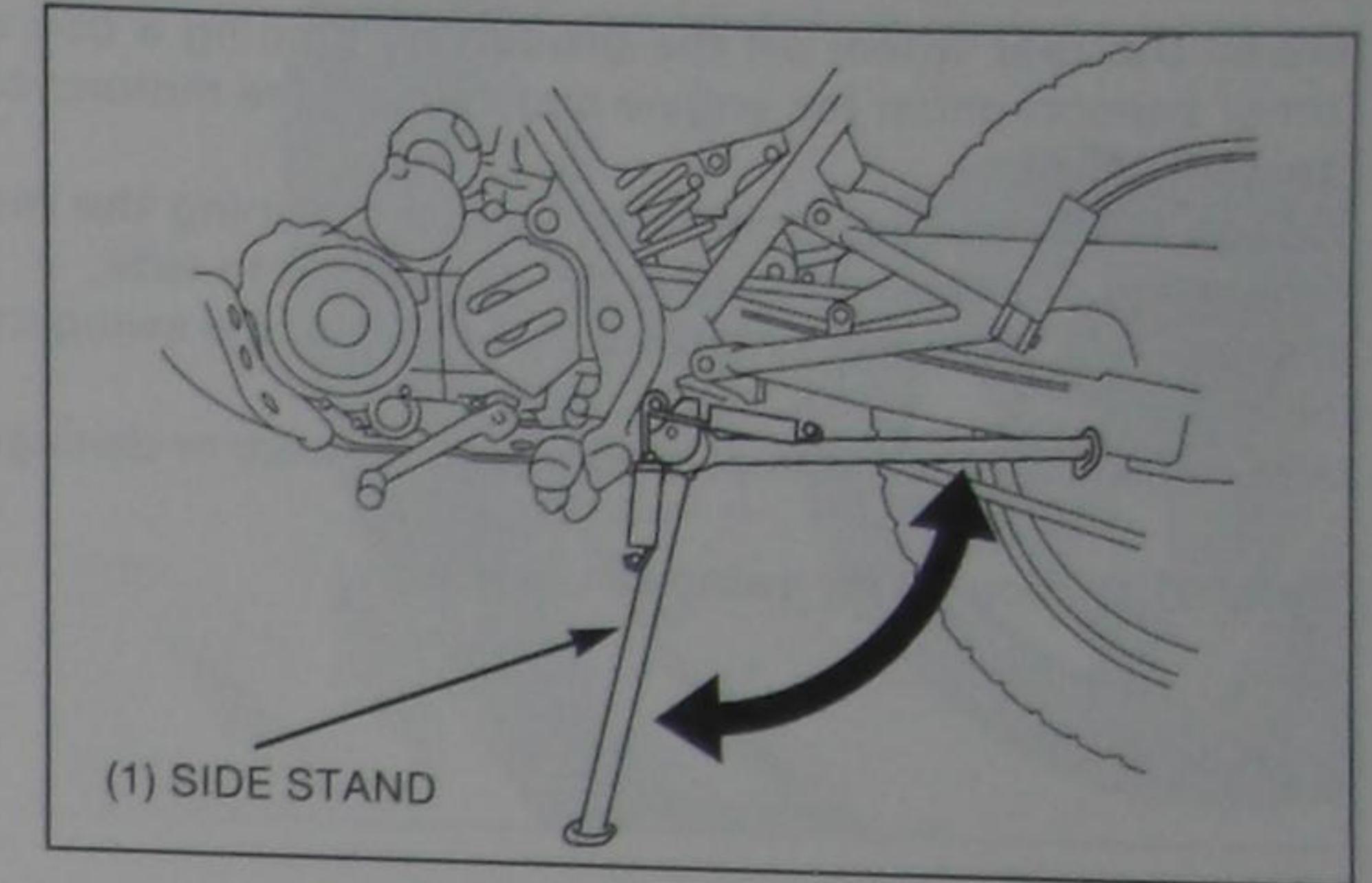
Support the motorcycle on a level surface.

Check the side stand spring for damage or loss of tension. Check the side stand assembly for freedom of movement and lubricate the side stand pivot if necessary.

Check the side stand ignition cut-off system:

- Sit astride the motorcycle and raise the side stand.
- Start the engine with the transmission in neutral, then shift the transmission into gear, while squeezing the clutch lever.
- Fully lower the side stand.
- The engine should stop as the side stand is lowered.

If there is a problem with the system, check the side stand switch (page 18-6).



Suspension

WARNING

- Loose, worn or damaged suspension parts impair motorcycle stability and control. Repair or replace any damaged components before riding. Riding a motorcycle with faulty suspension increases your risk of an accident and possible injury.

FRONT SUSPENSION

Check the action of the front suspension by applying the front brake and compressing the forks several times.

Check the entire assembly for signs of leaks, damage or loose fasteners.

Replace damaged components which cannot be repaired. Tighten all nuts and bolts.

Refer to section 12 for fork service.

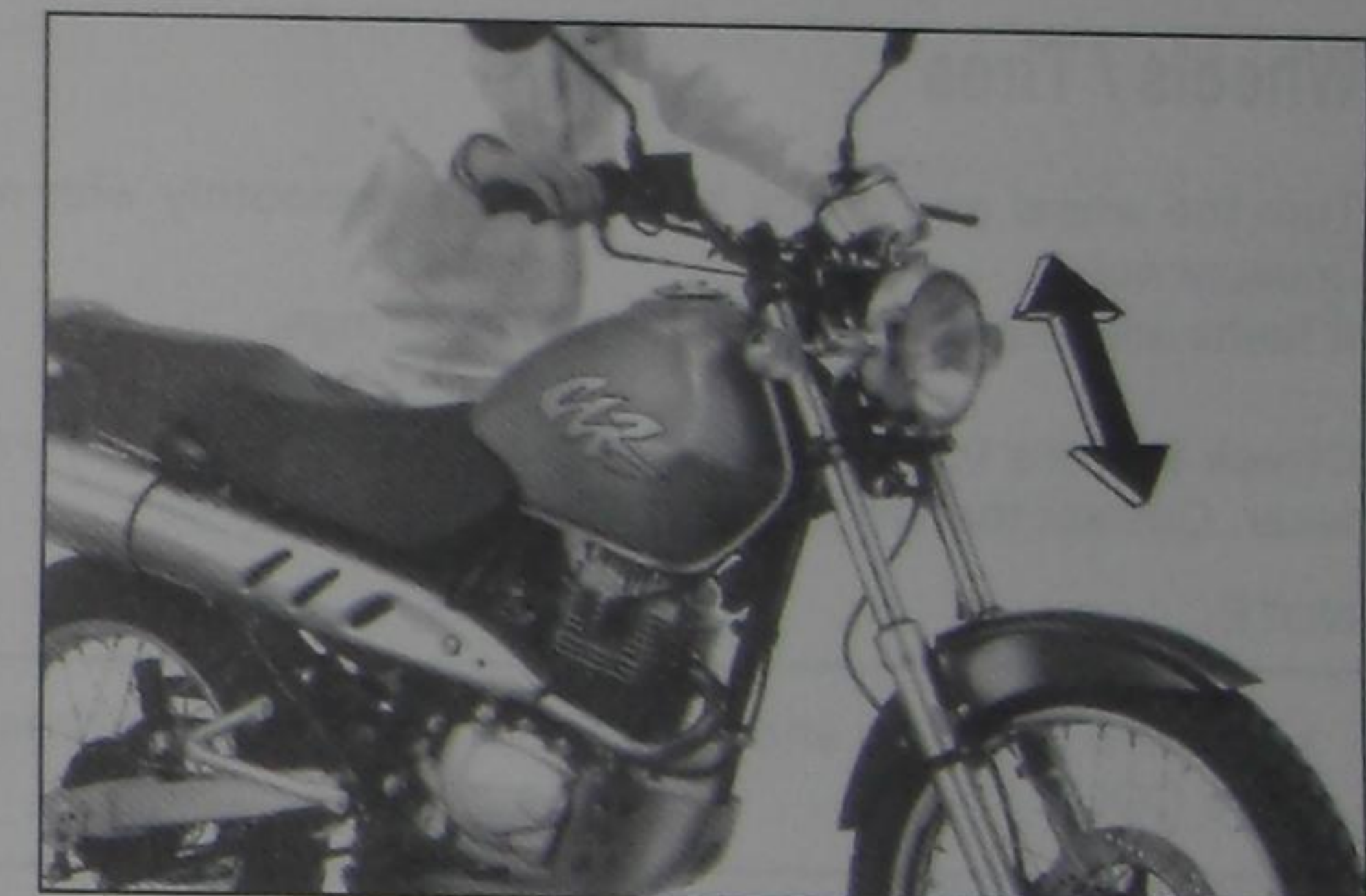
REAR SUSPENSION

Check the action of the shock absorber by compressing it several times.

Check the entire shock absorber assembly for signs of leaks, damage or loose fasteners.

Replace damaged components which cannot be repaired. Tighten all nuts and bolts.

Refer to section 13 for shock absorber and linkage service.



Raise the rear wheel off the ground by placing a box or other support under the engine and support the motorcycle securely.
Check for worn swingarm bushings by grabbing the rear wheel and attempting to move the wheel side to side.
If any play is detected, check for looseness of the swingarm pivot bolt.
Also, check the swingarm pivot bushings for wear or damage.

Refer to section 13 for swingarm service.



Nuts, Bolts, Fasteners

Check that all chassis nuts and bolts are tightened to correct torque values (page 1-11).
Check that all cotter pin, safety clips, hose clamps and cable stays are in place and properly secured.

Wheels / Tires

Turn the wheel and check that it rotates smoothly with no unusual noise.
If faults are found, inspect the wheel bearings.

Check the tire for cuts, embedded objects or excessive wear. Correct the tire pressure.

NOTE:

- The tire pressure should be checked when the tires are COLD.

RECOMMENDED TIRE PRESSURE:

Driver only:

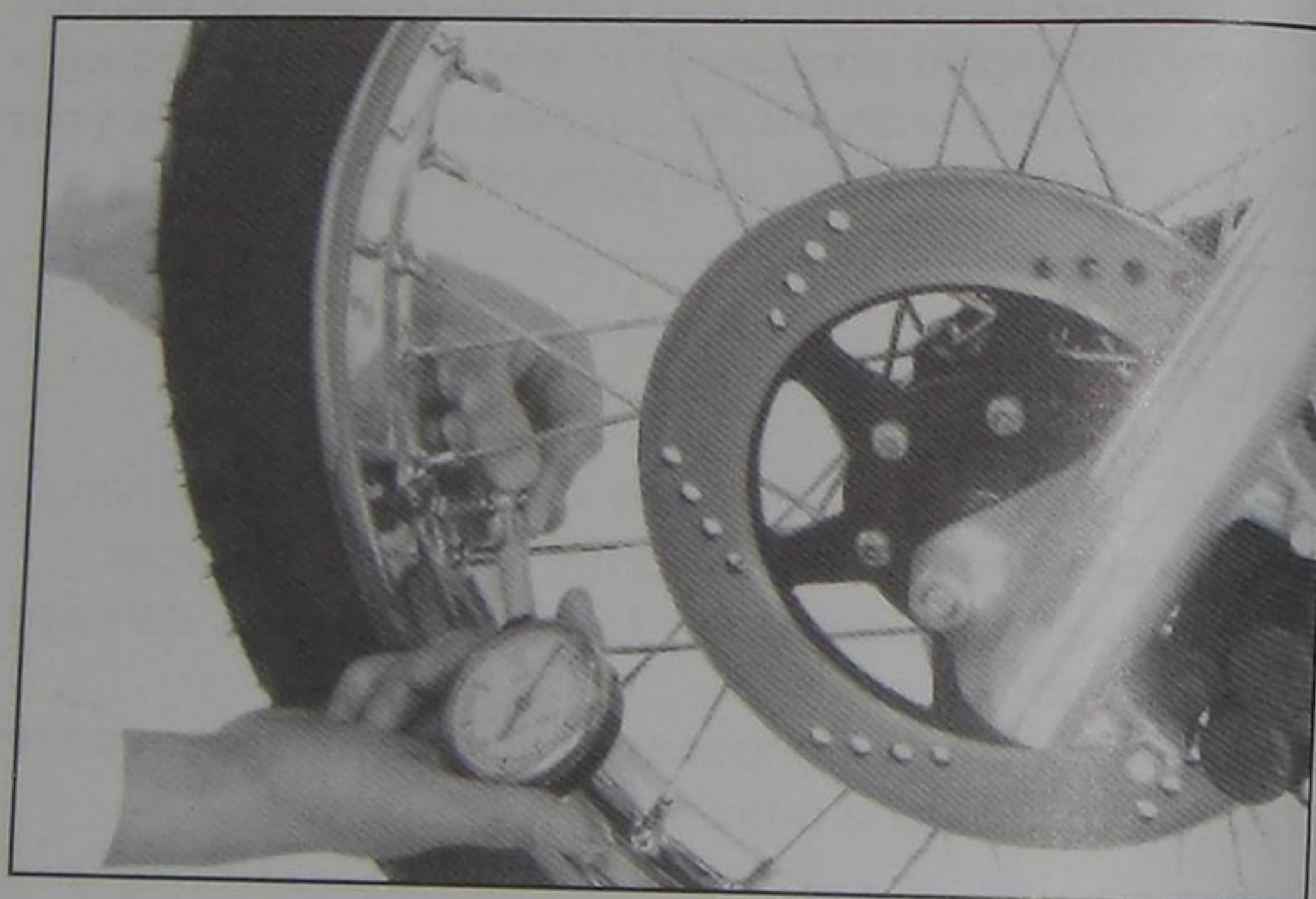
Front: 175 kPa (1.75 kg/cm², 25 psi)
Rear: 175 kPa (1.75 kg/cm², 25 psi)

Driver and passenger:

Front: 175 kPa (1.75 kg/cm², 25 psi)
Rear: 200 kPa (2.00 kg/cm², 29 psi)

Measure the tread depth at the center of tire.
Replace the tire when the tread depth reaches the following limits:

MINIMUM TREAD DEPTH: Front: 3.0 mm (1.2 in)
Rear: 3.0 mm (1.2 in)



Inspect the spokes for looseness by tapping them with a screwdriver.
If a spoke does not sound clearly, or if it sounds different from the other spokes, tighten it.

TORQUE: Front spoke: 4 N·m (0.4 kgf-m, 2.9 lbf-ft)
Rear spoke: 4 N·m (0.4 kgf-m, 2.9 lbf-ft)

NOTE:

- The spoke nipples are made of soft material. Be sure to tighten the spokes with the proper size spoke wrench. After tightening, check the rim for runout.

TOOLS:

Spoke wrench, 5.8 x 6.1 mm

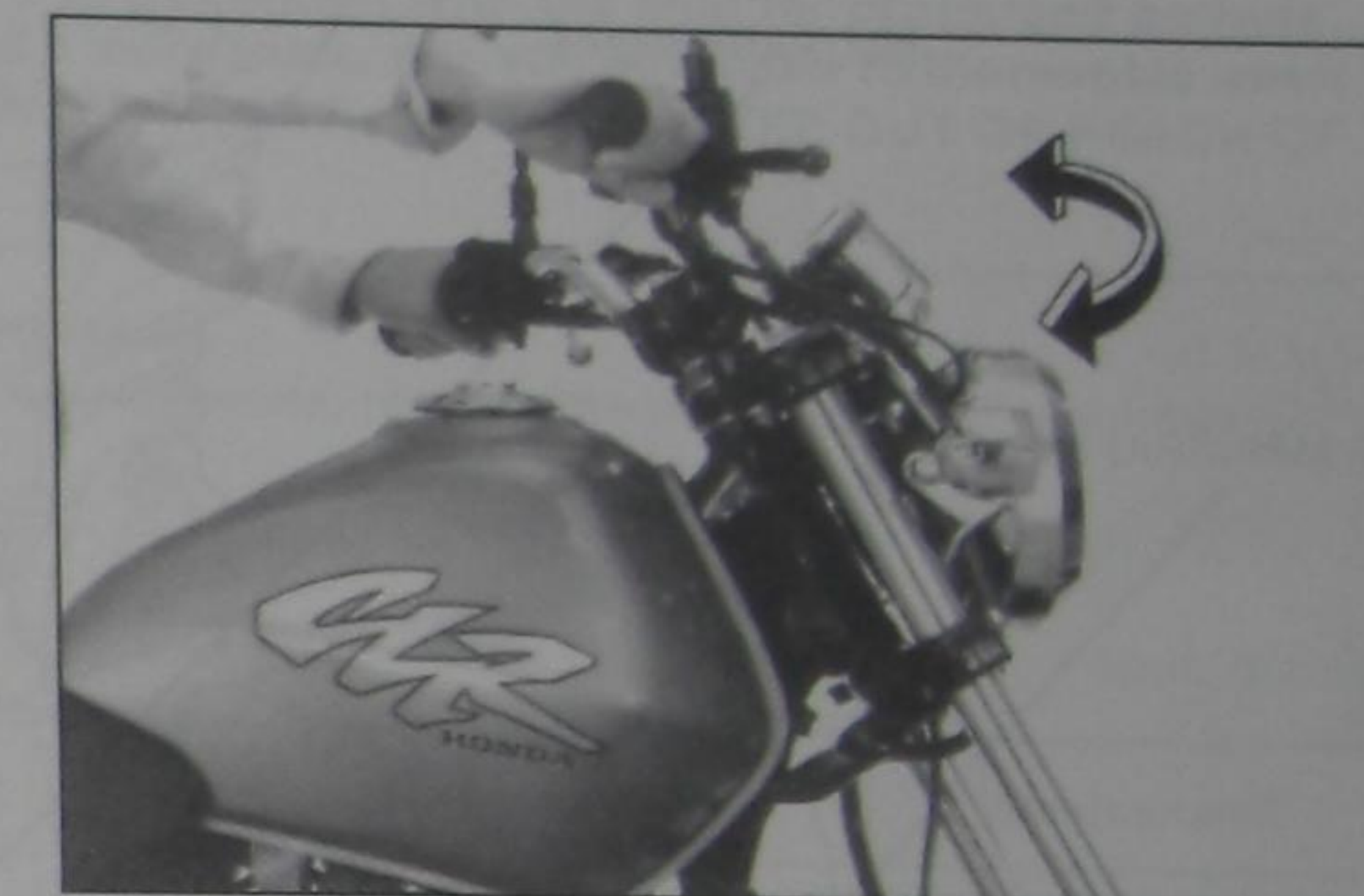
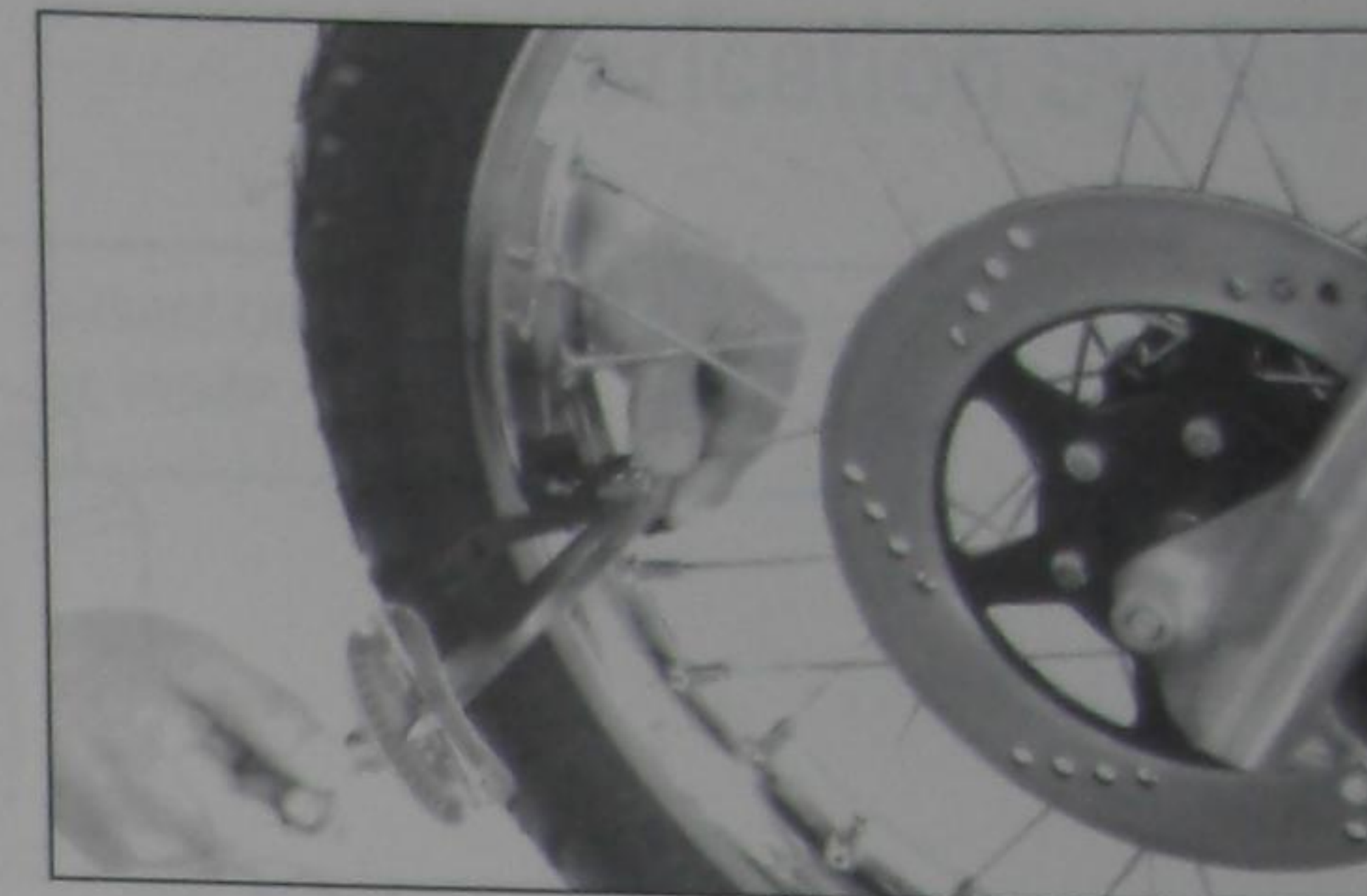
07701-0020300

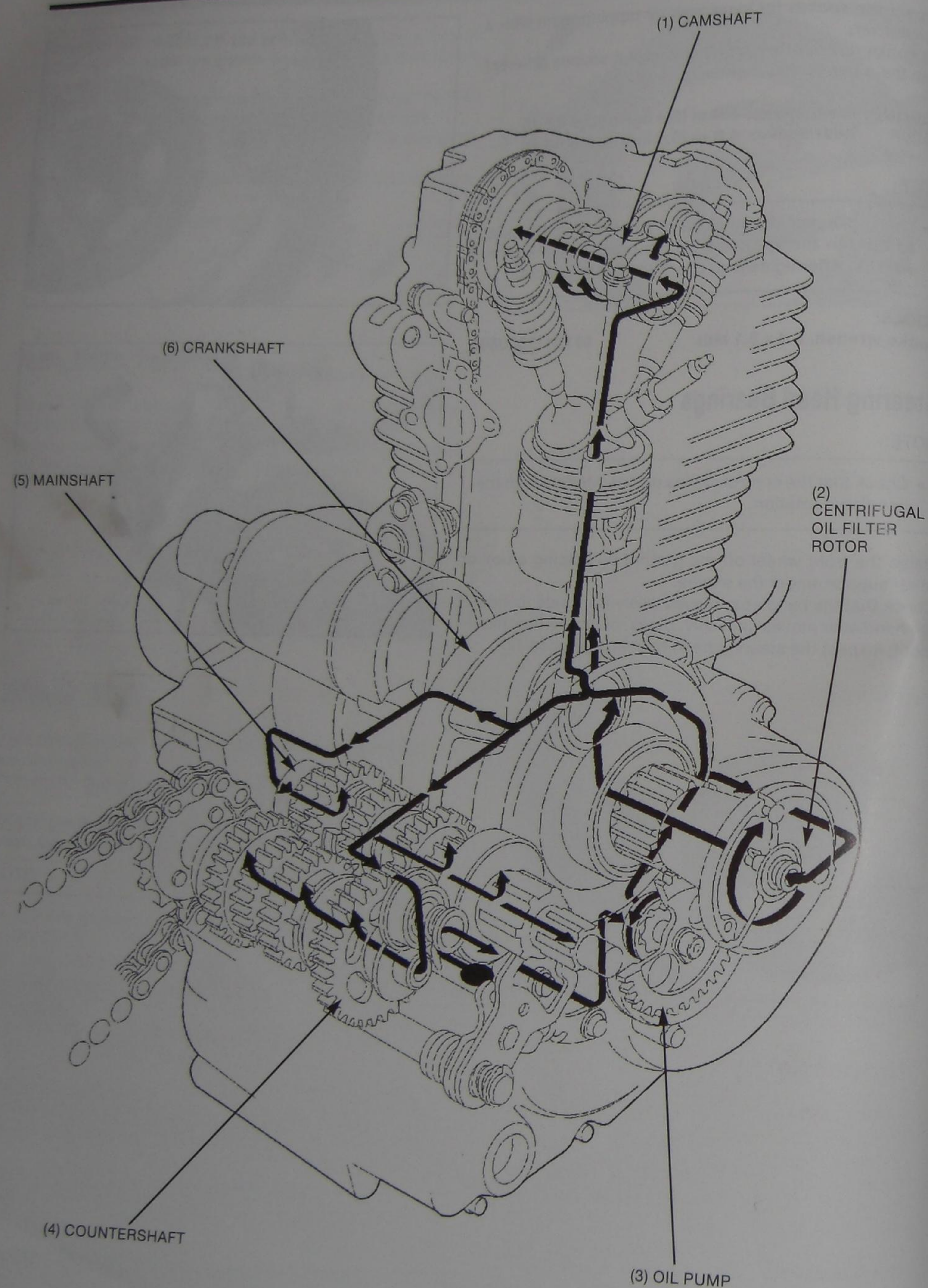
Steering Head Bearings

NOTE:

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

Raise the front wheel off the ground by placing a box or other support under the engine.
Check that the handlebar moves freely from side to side. If the handlebar moves unevenly, binds, or has vertical movement, inspect the steering head bearings (section 12).





4. Lubrication System

SERVICE INFORMATION TROUBLESHOOTING

4-1
4-1ENGINE OIL CENTRIFUGAL FILTER
OIL PUMP4-2
4-2

Service Information

GENERAL

⚠ WARNING

- Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil. **KEEP OUT OF REACH OF CHILDREN.**

- The oil pump can be serviced with the engine installed in the frame.
- If any portion of the oil pump is worn beyond the specified service limits, replace the oil pump as an assembly.
- For engine oil level check, see page 3-8.
- For engine oil strainer screen clearing, see page 3-9.

SPECIFICATIONS

Unit: mm (in)

Item		Standard	Service Limit
Engine oil capacity	At draining	1.0 liter (1.06 US qt, 0.88 Imp qt)	—
	At disassembly	1.2 liters (1.27 US qt, 1.06 Imp qt)	—
Recommended engine oil		Honda 4-stroke oil or equivalent motor oil API service classification: SE Viscosity: SAE 10W-30	—
Oil pump	Tip clearance	0.15 (0.006)	0.20 (0.008)
	Body clearance	0.15-0.21 (0.006-0.008)	0.35 (0.014)
	Side clearance	0.03-0.12 (0.001-0.005)	0.15 (0.006)

TORQUE VALUES

Oil filter rotor cover screw	5 N·m (0.5 kgf-m, 3.6 lbf-ft)
Pump plate attaching screw	3 N·m (0.3 kgf-m, 2.2 lbf-ft)
Oil pump mounting screw	10 N·m (1.0 kgf-m, 7 lbf-ft)

Troubleshooting

Oil level too low

- Normal oil consumption
- External oil leaks
- Worn valve guide or seal
- Worn piston rings or incorrect piston ring installation
- Worn cylinder.

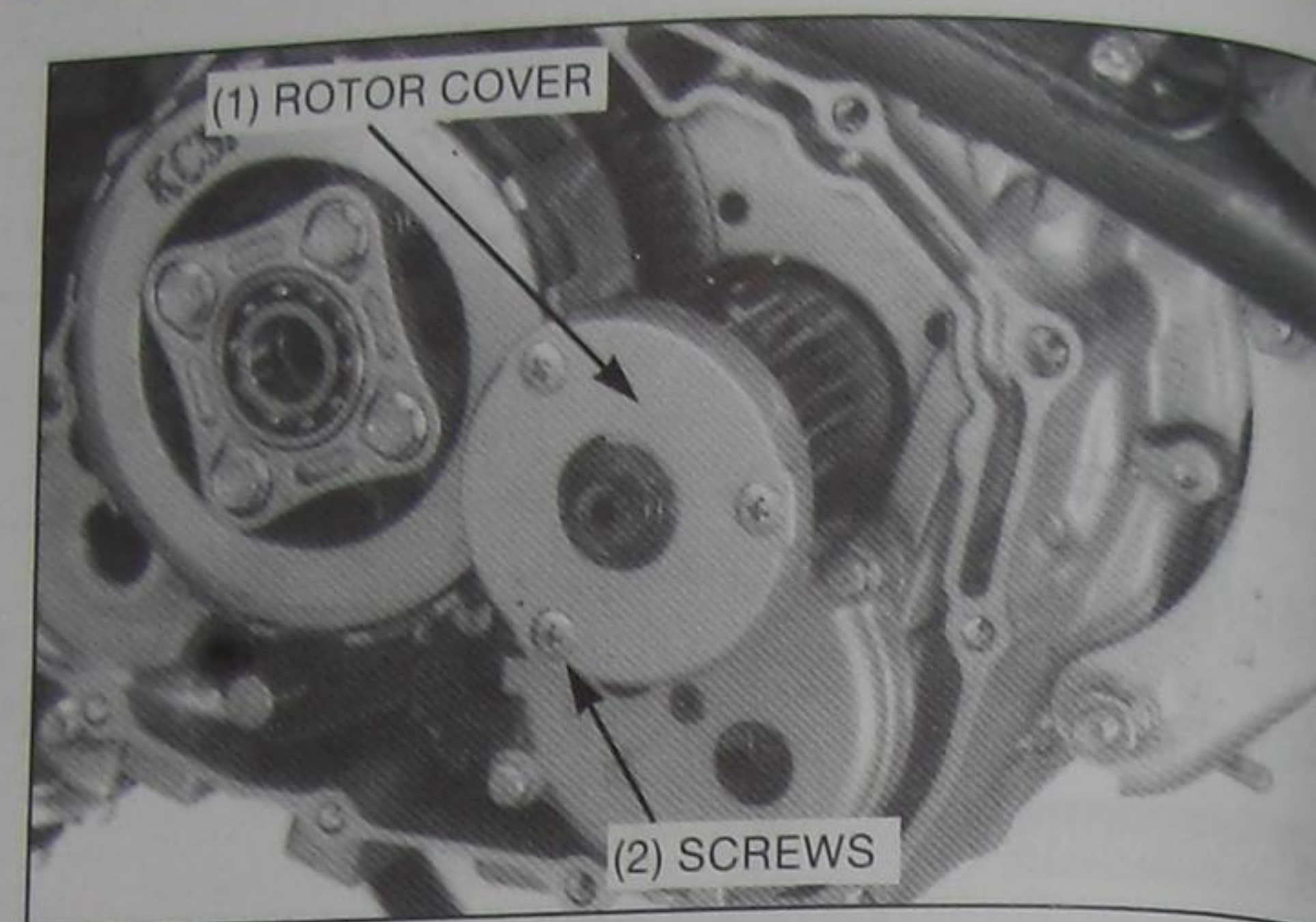
Oil contamination

- Oil not changed often enough
- Faulty cylinder head gasket
- Worn piston rings.

Engine Oil Centrifugal Filter

CLEANING

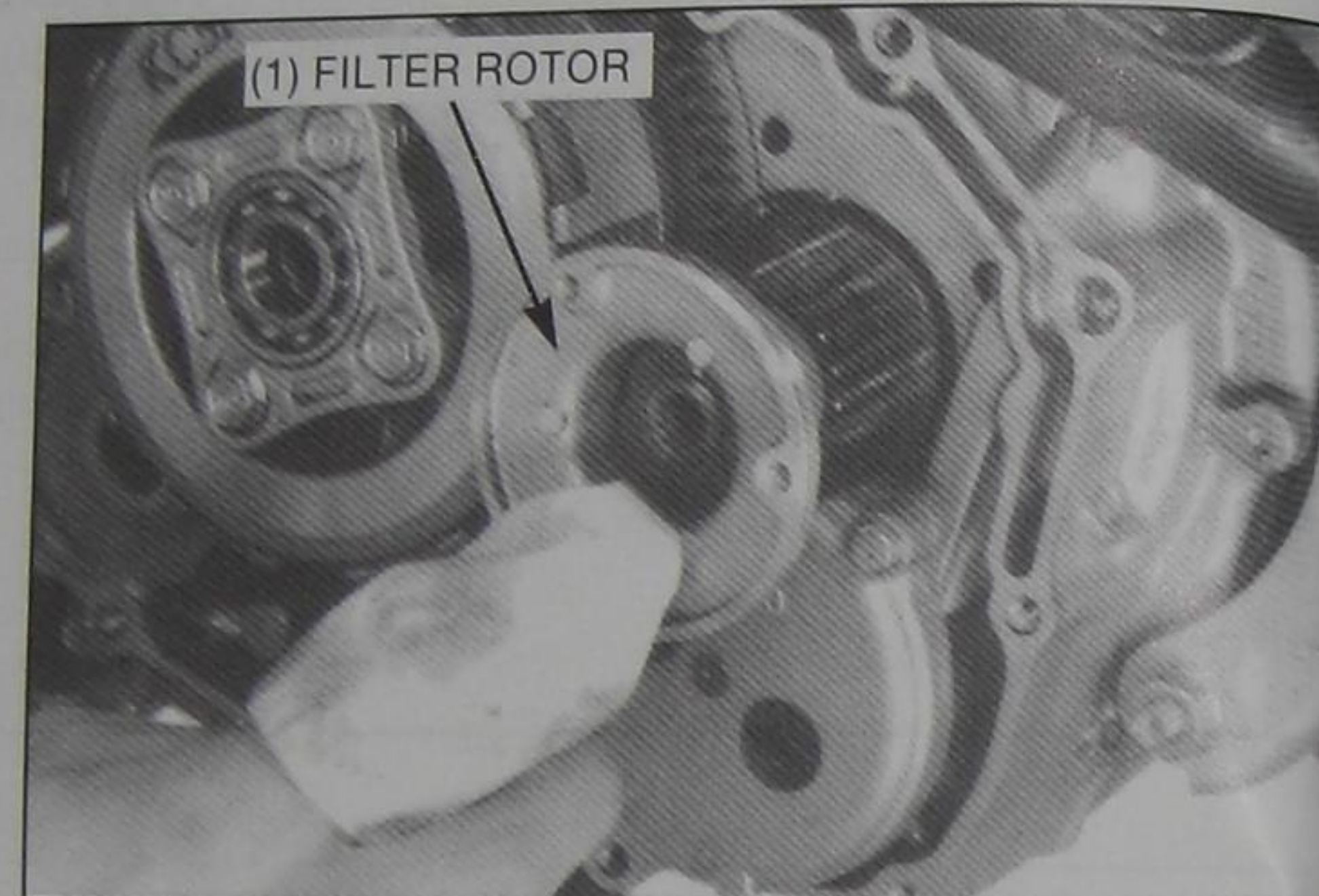
Remove the right crankcase cover (page 9-3).
Remove the three screws and the oil filter rotor cover.



Clean the oil filter rotor cover and the inside of the oil filter rotor using a clean lint-free cloth.

CAUTION

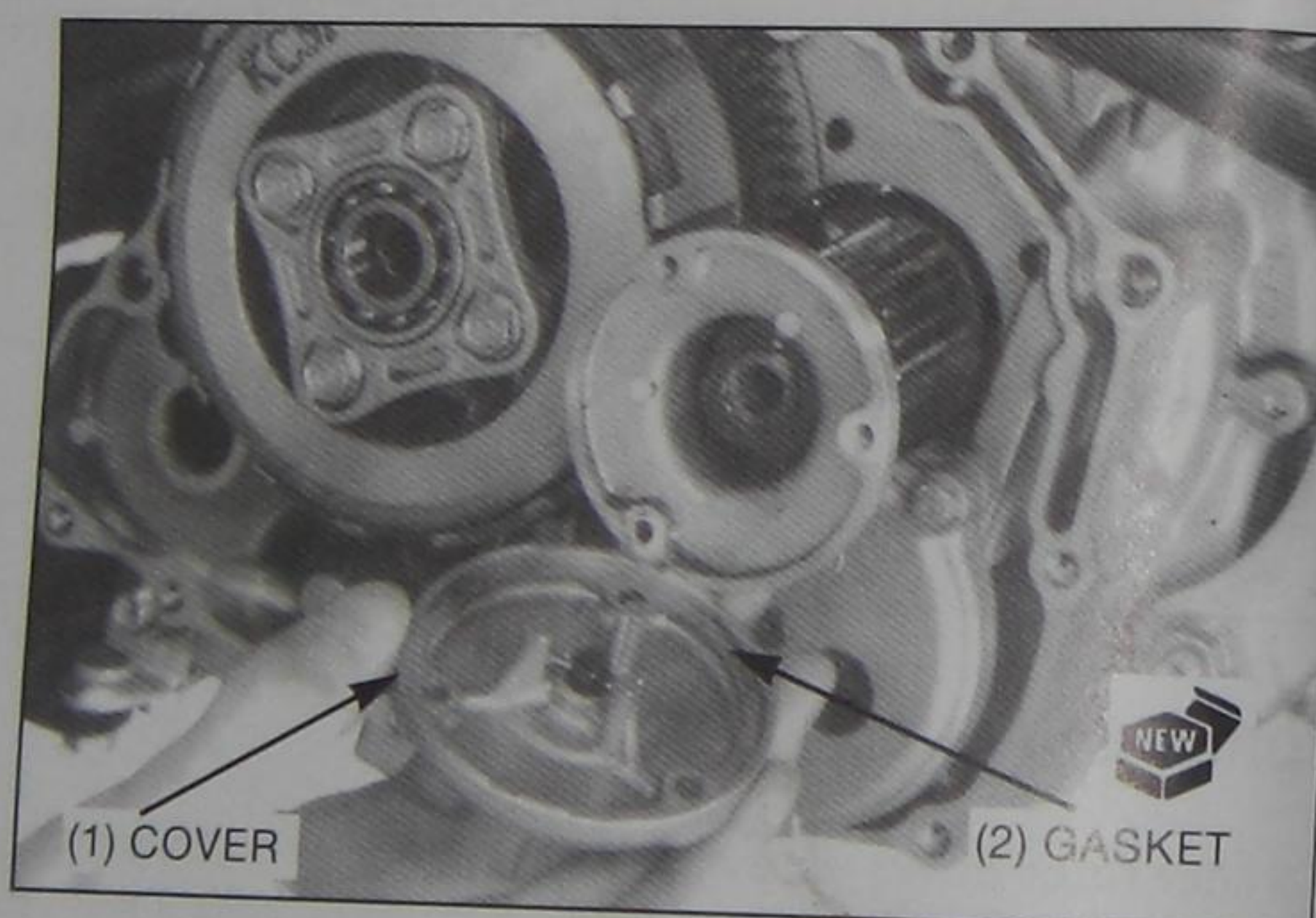
- Do not allow dust or dirt to enter the crankshaft oil passage.
- Do not use compressed air to clean the filter rotor.



Install the oil filter rotor cover with a new gasket, aligning the screw holes in the cover and gasket.
Install the three screws and tighten them.

TORQUE: 5 N·m (0.5 kgf-m, 3.6 lbf-ft)

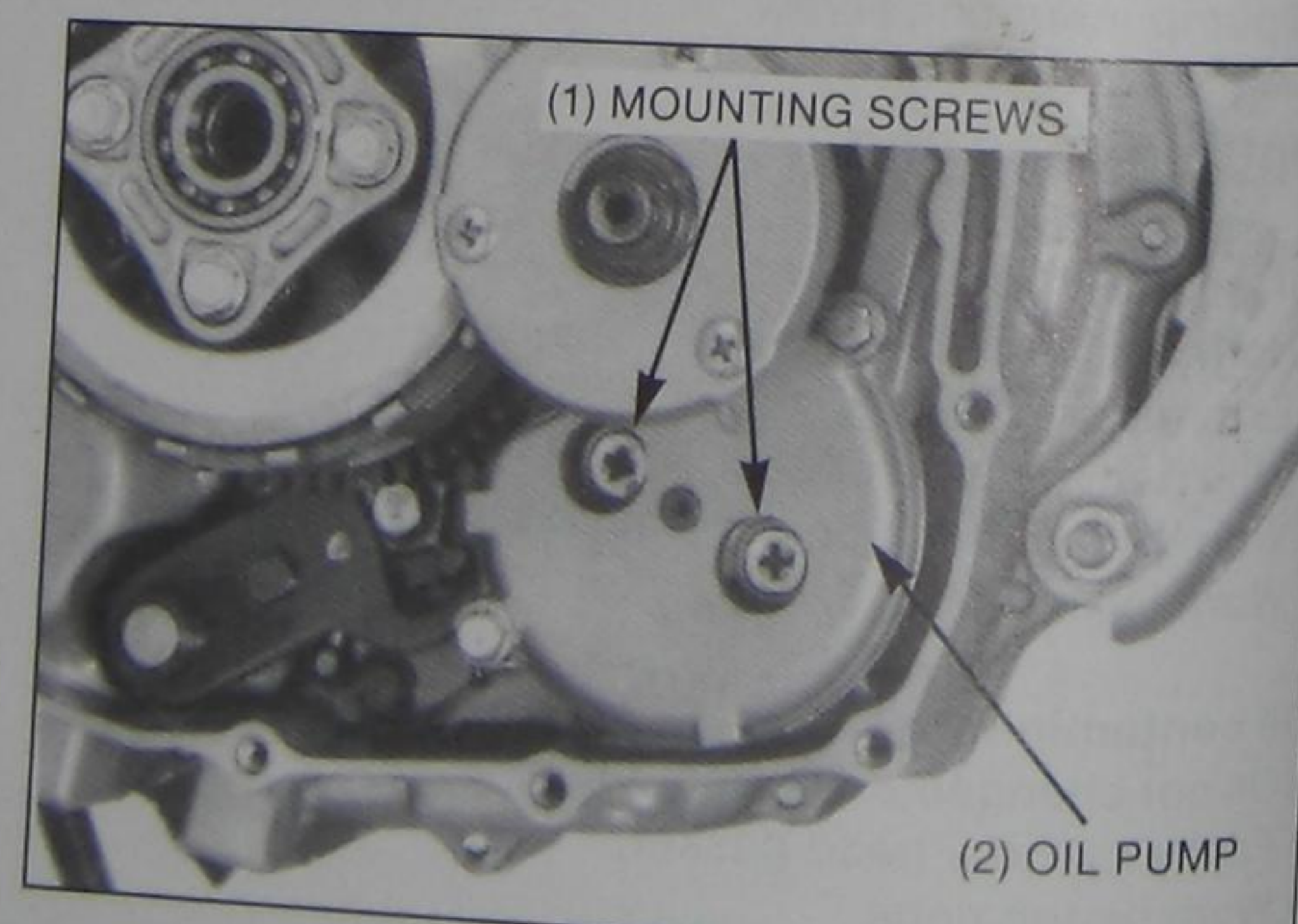
Install the right crankcase cover (page 9-12).



Oil Pump

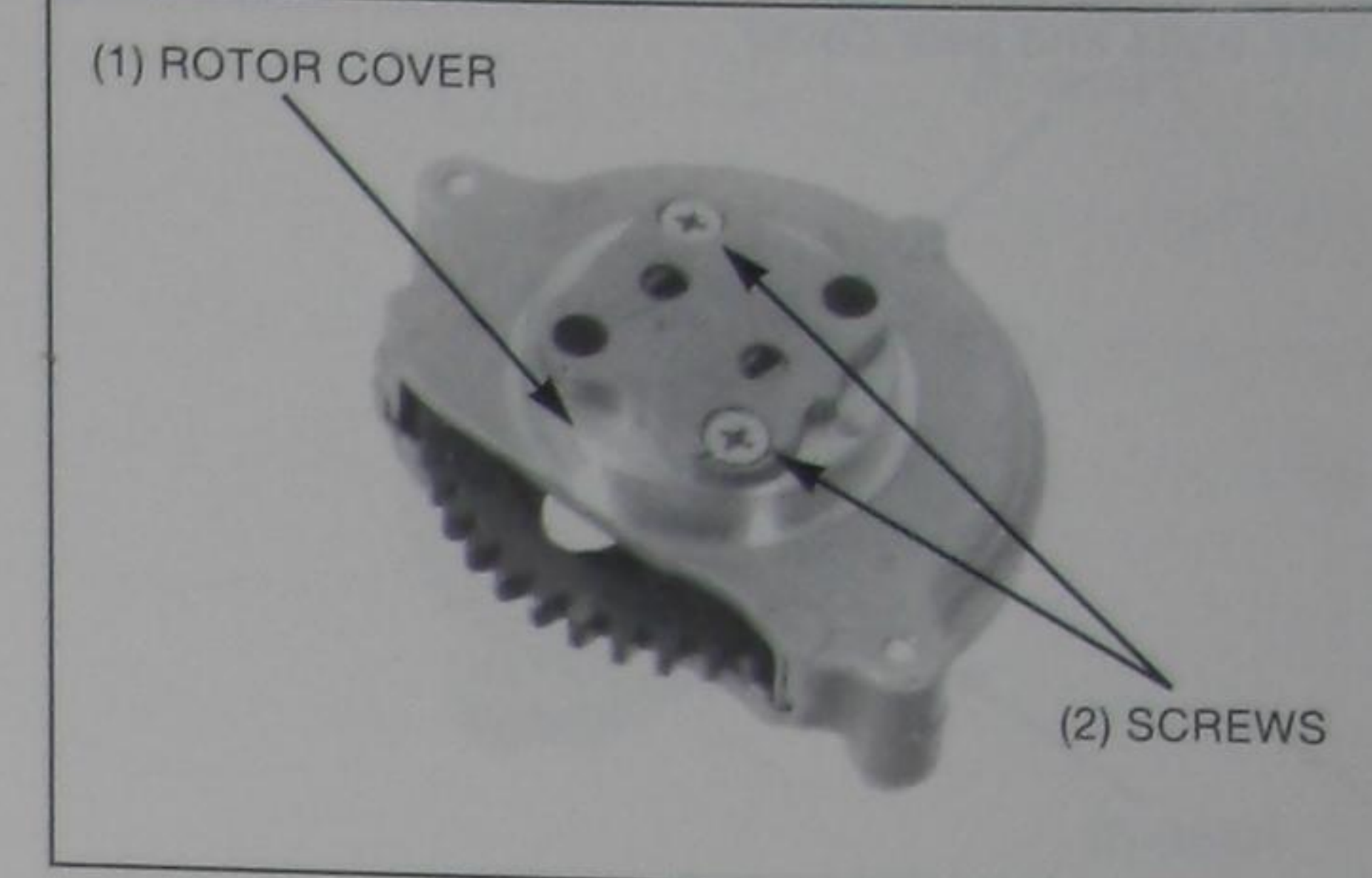
REMOVAL

Remove the right crankcase cover (page 9-3).
Rotate the crankshaft clockwise until the pump mounting screws and accessible through the pump gear.
Remove the two mounting screws and the oil pump.



INSPECTION

Remove the two screws and the rotor cover.

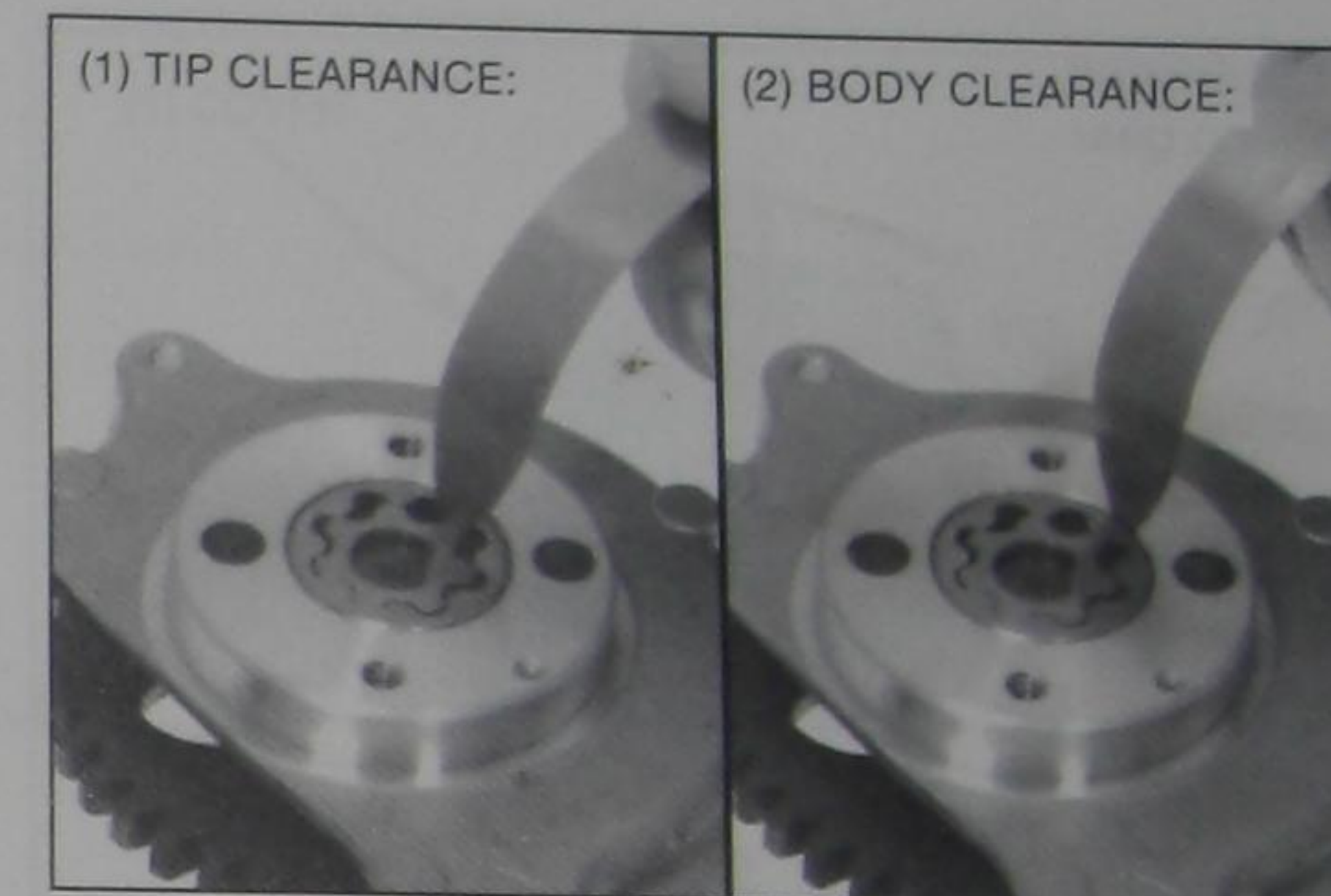


Measure the rotor tip clearance.

SERVICE LIMIT: 0.20 mm (0.008 in)

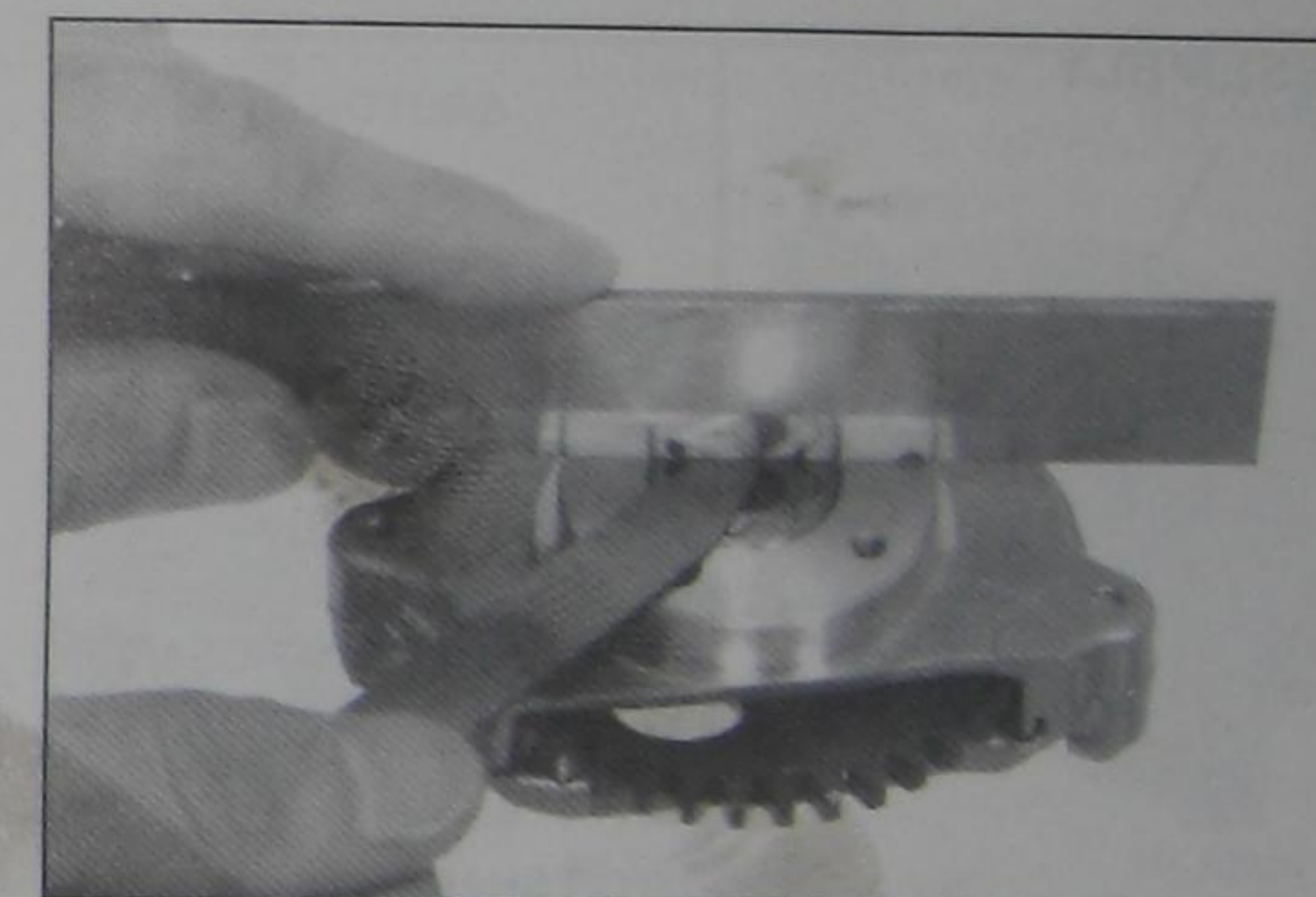
Measure the pump body clearance

SERVICE LIMIT: 0.35 mm (0.014 in)



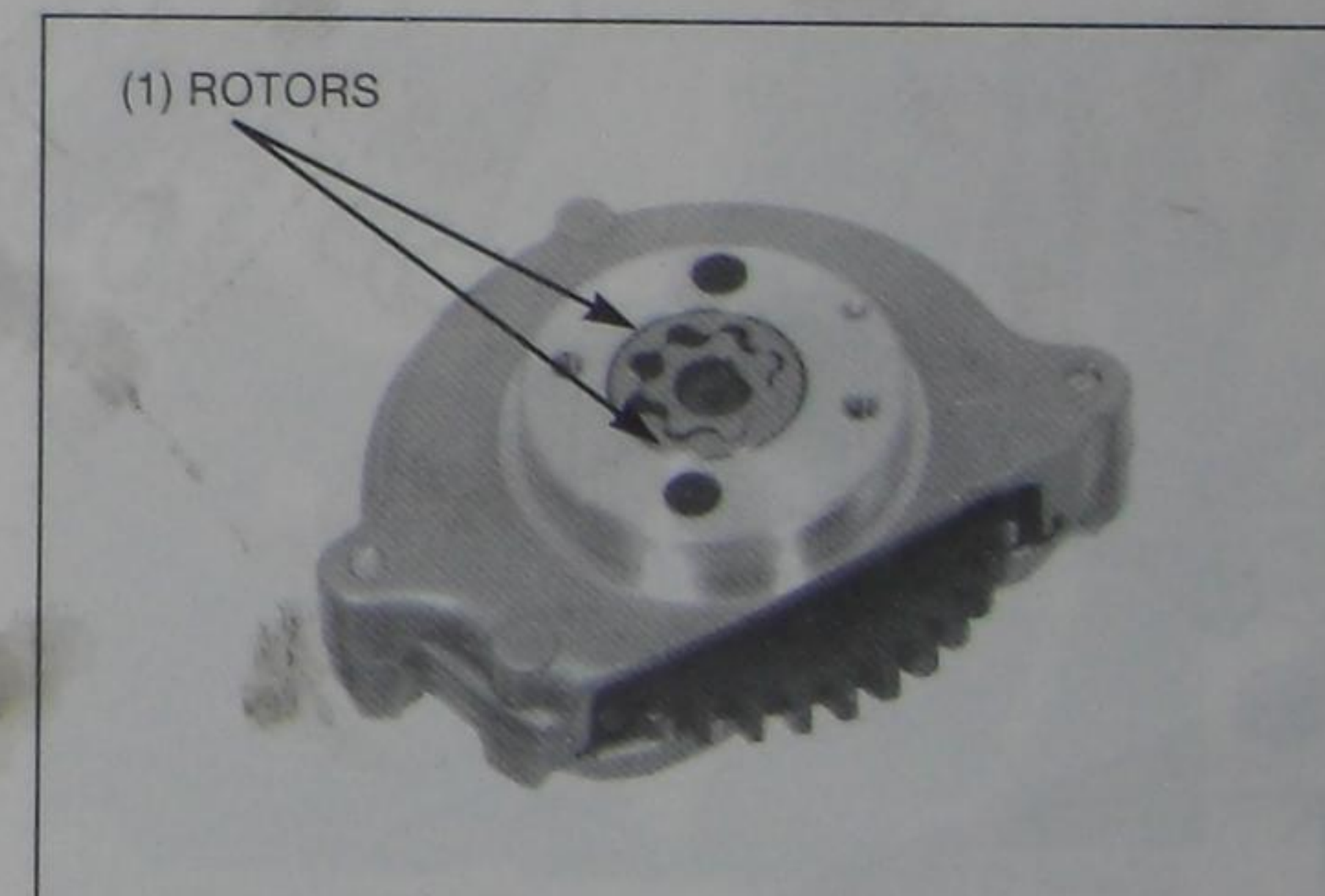
Measure the pump side clearance.

SERVICE LIMIT: 0.15 mm (0.006 in)

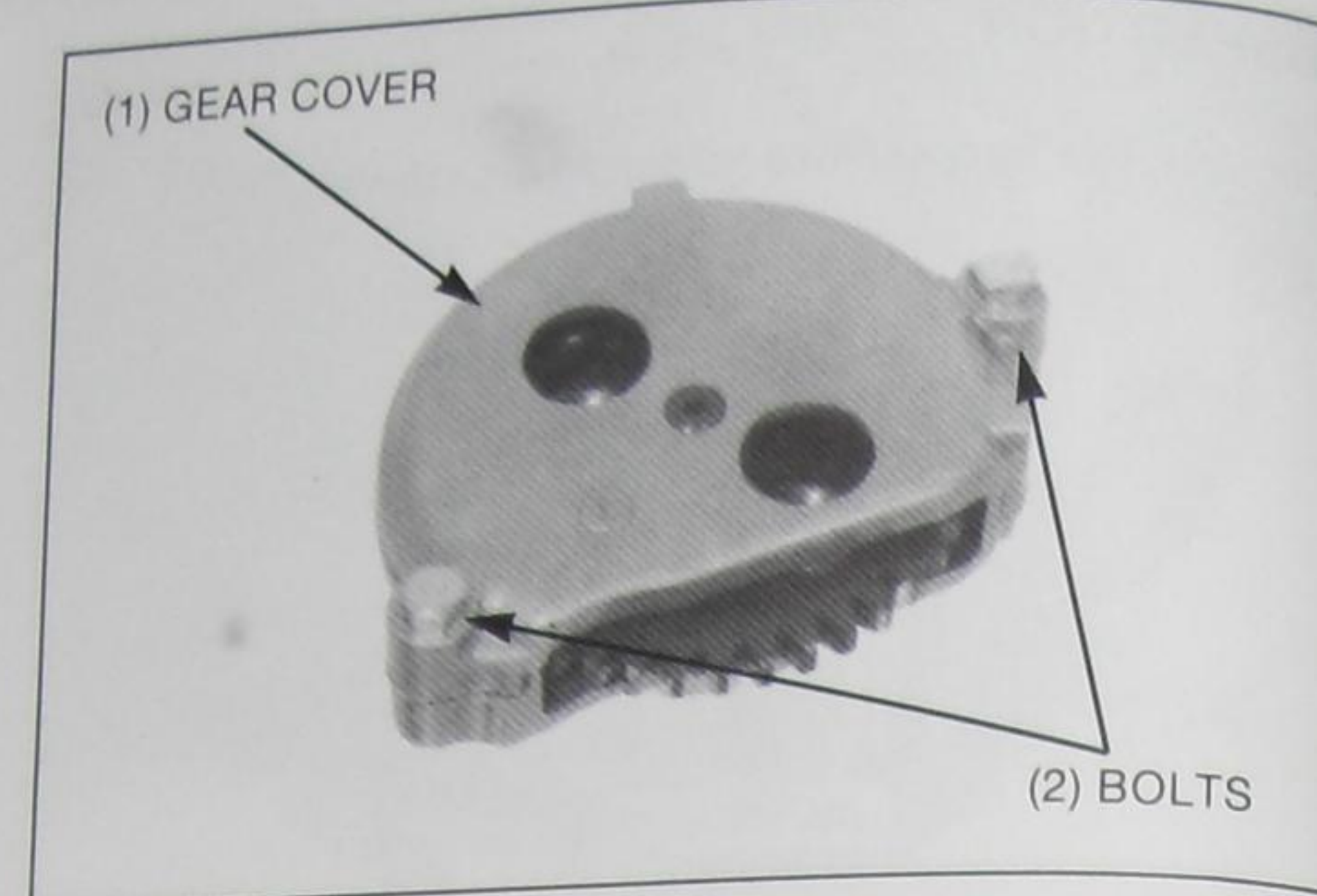


DISASSEMBLY

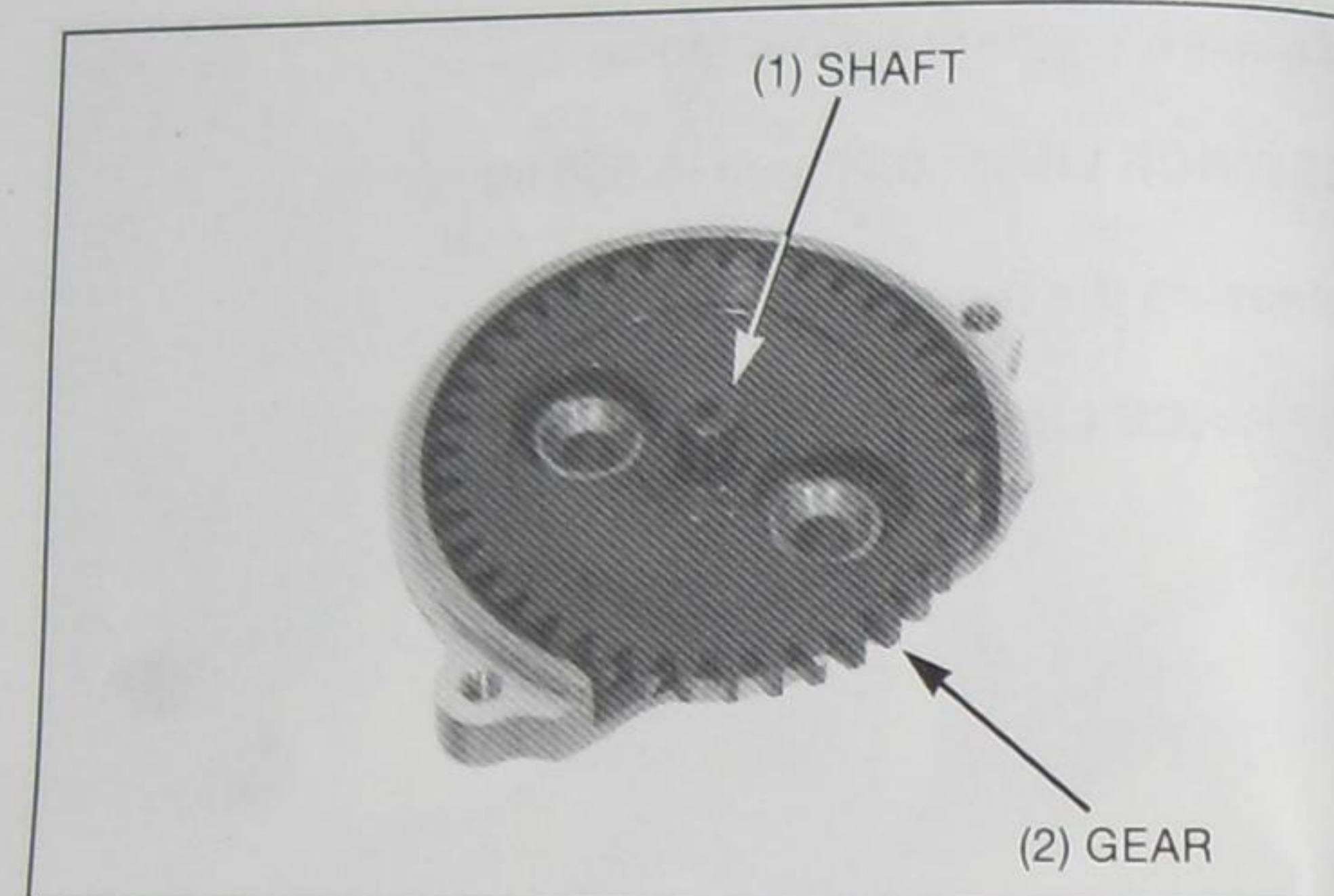
Remove the following:
- Two screws and rotor cover
- Inner and outer rotors



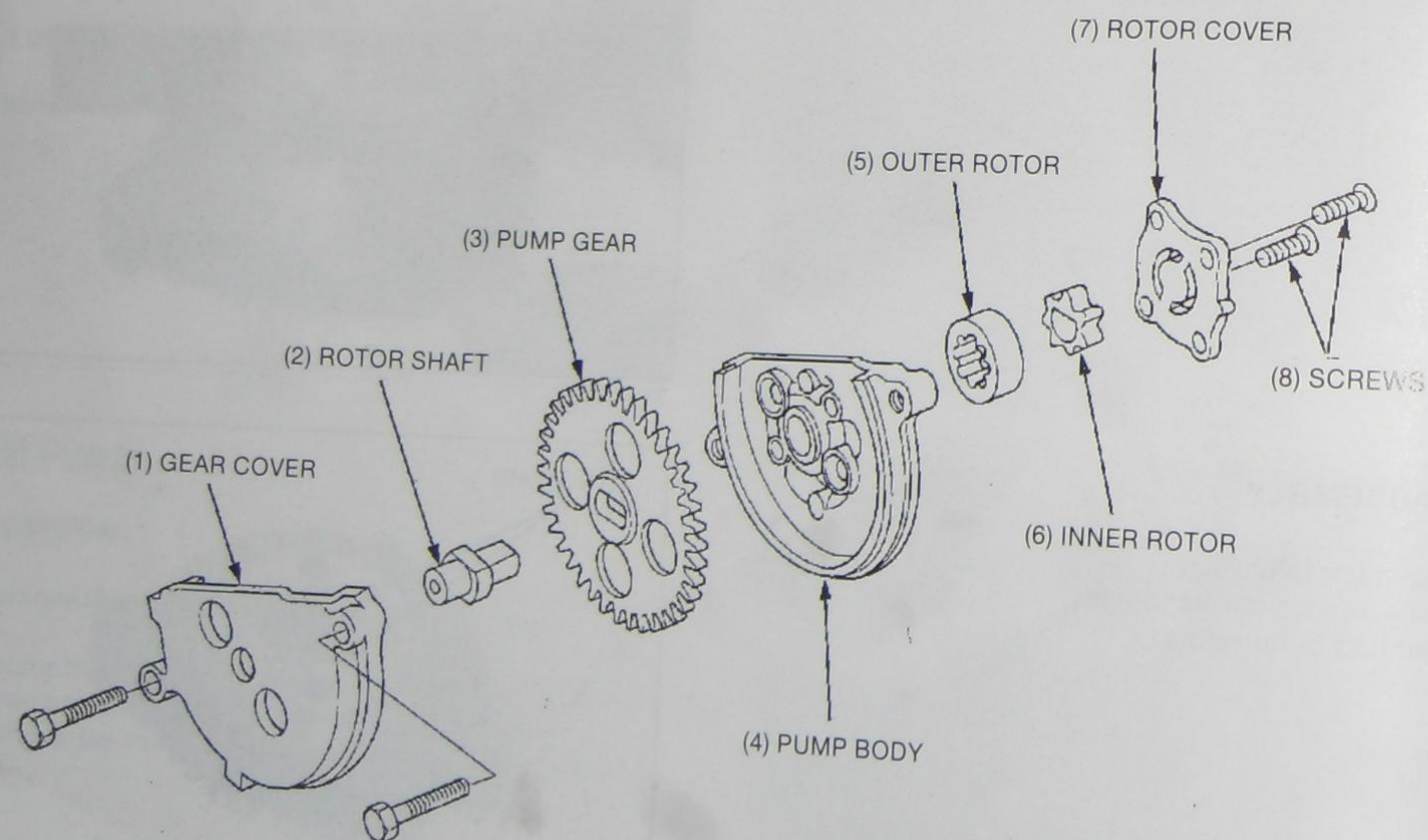
- Two bolts and gear cover



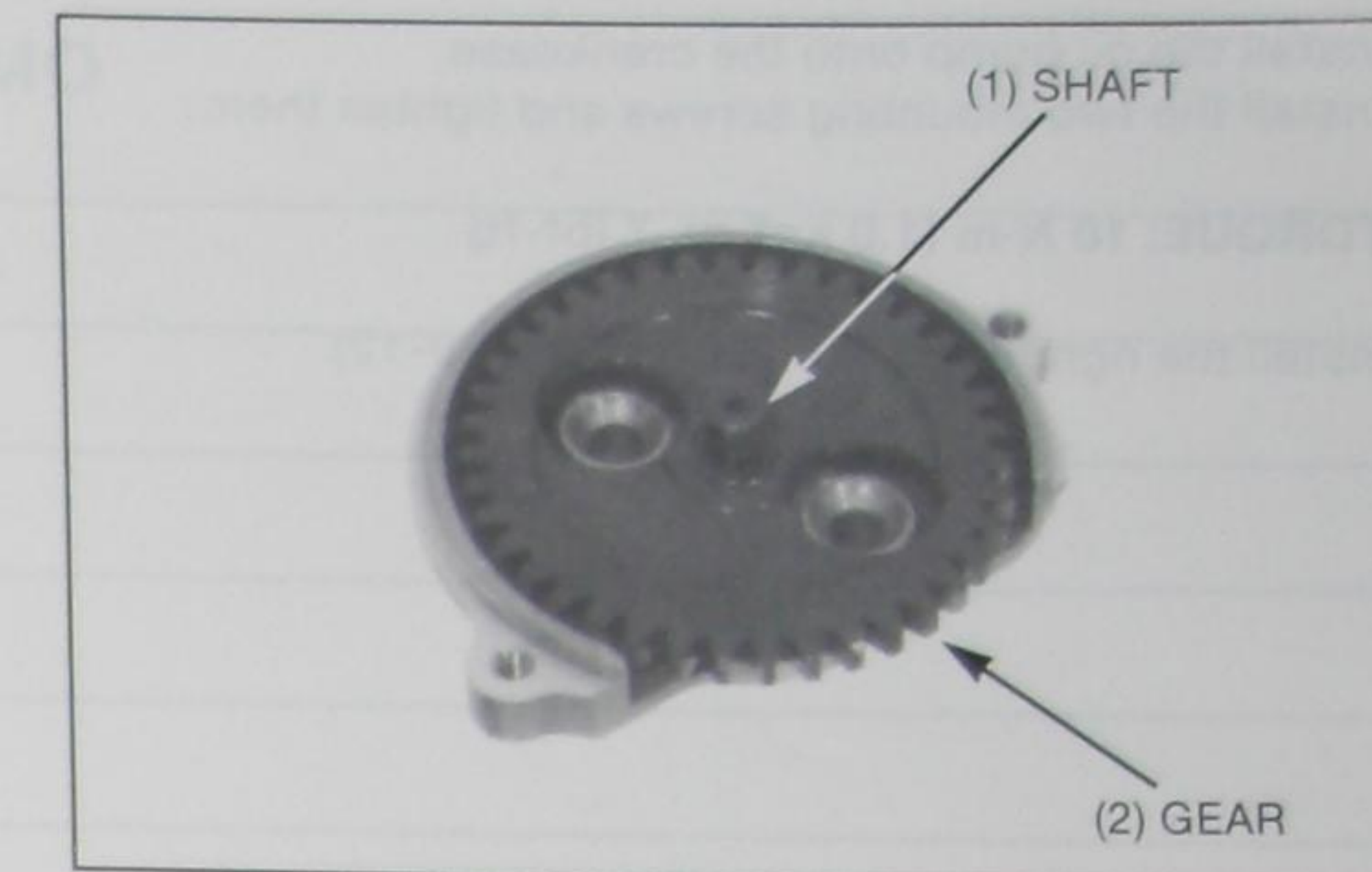
- Rotor shaft
- Pump gear



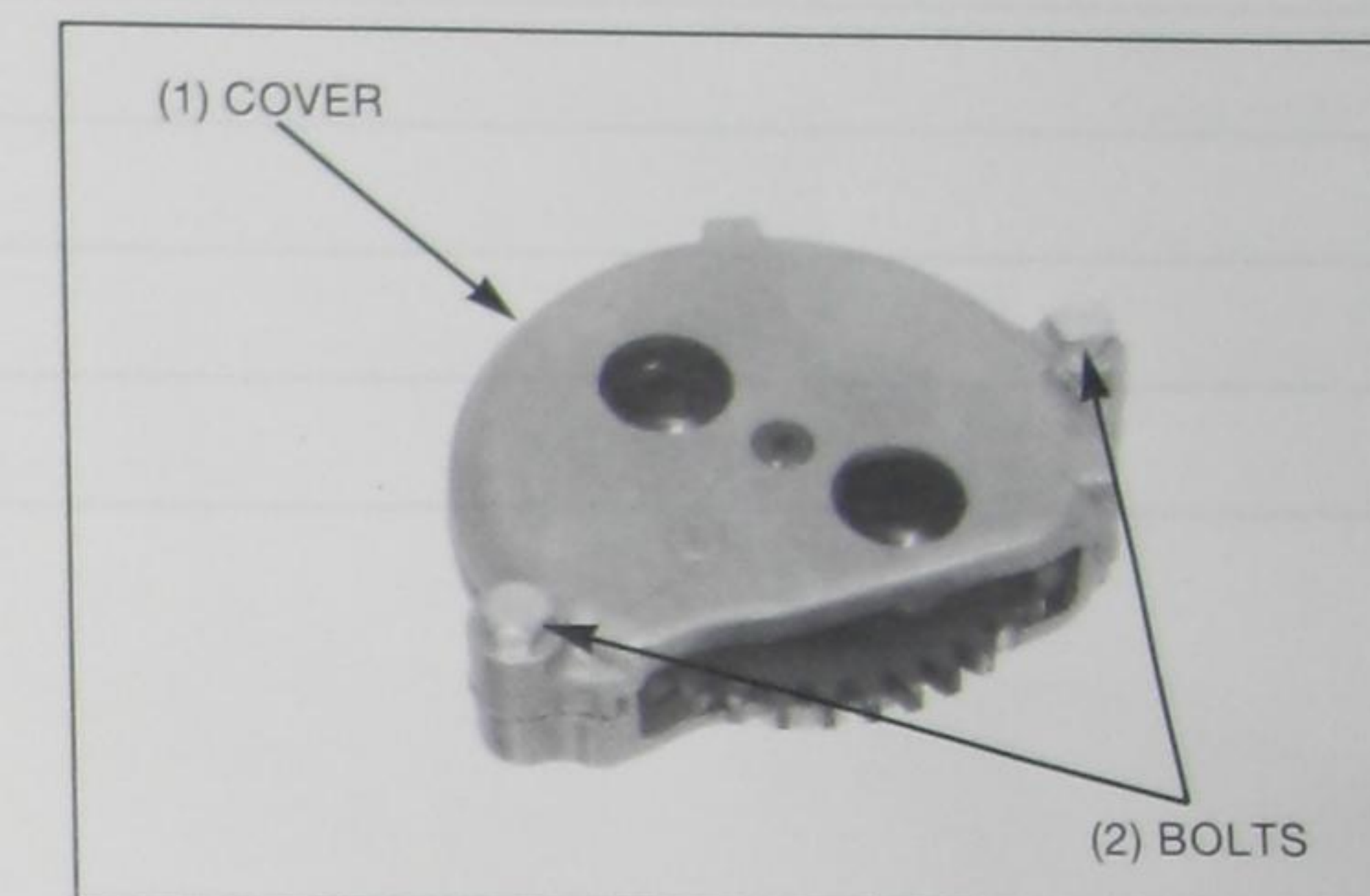
ASSEMBLY



Install the rotor shaft and pump gear into the pump body as shown.



Install the gear cover and tighten the bolts.

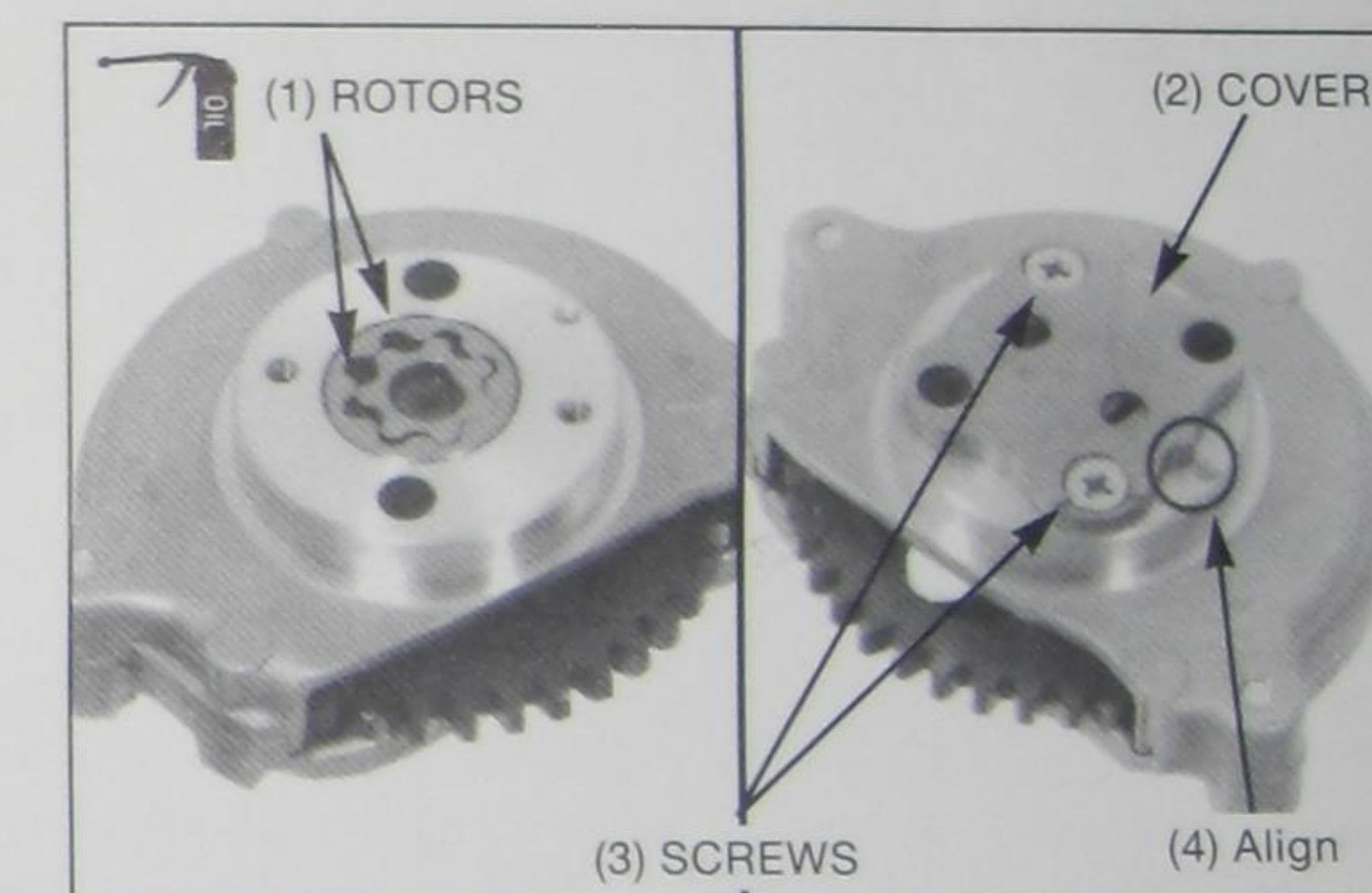


Apply oil to outer and inner rotors and install them.

Install the rotor cover, aligning its boss with the dent in the pump body.
Install the cover attaching screws and tighten them.

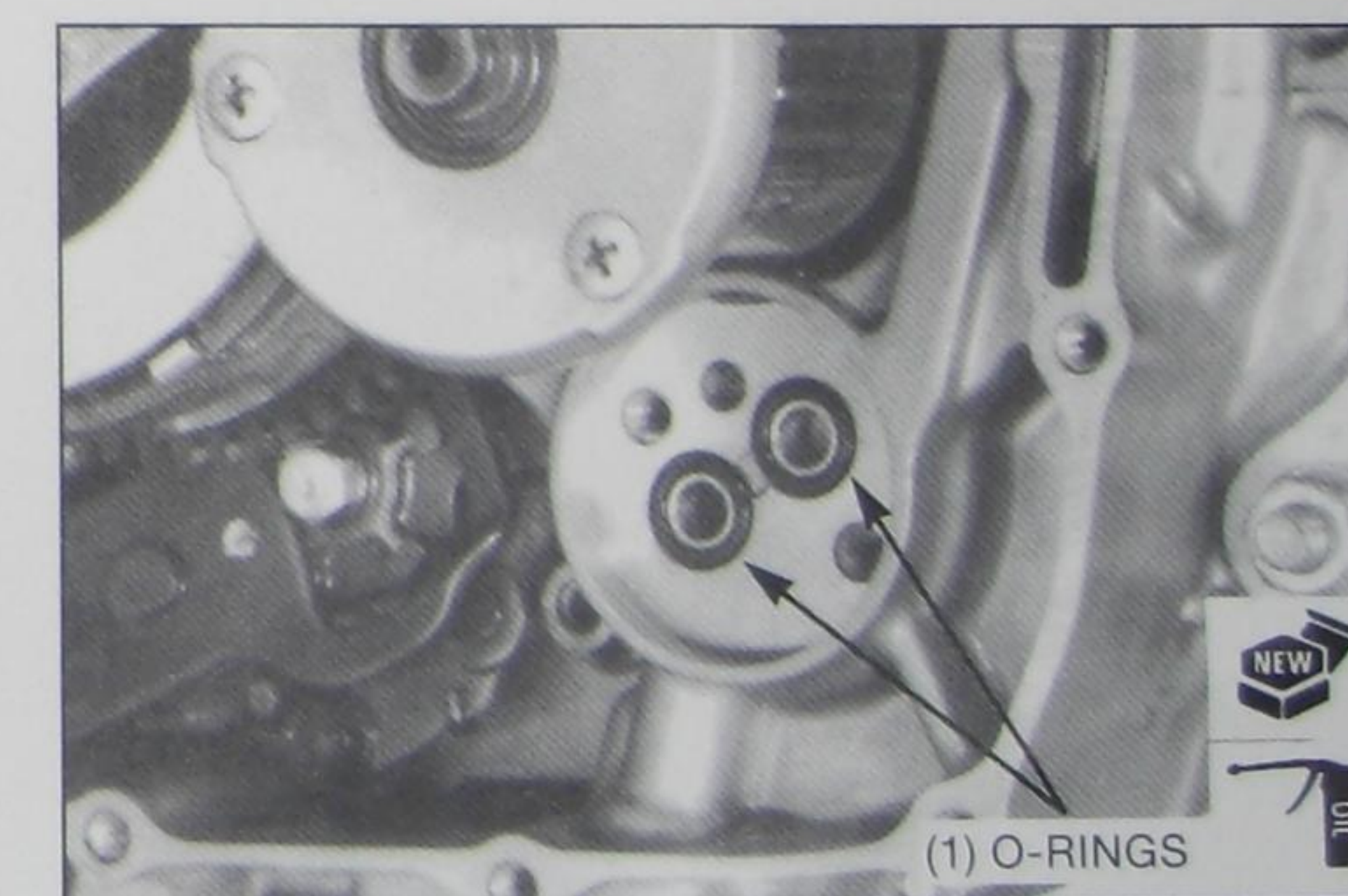
TORQUE: 3 N·m (0.3 kgf-m, 2.2 lbf-ft)

Check that the oil pump rotates smoothly.



INSTALLATION

Coat new O-rings with oil install them into the crankcase grooves.

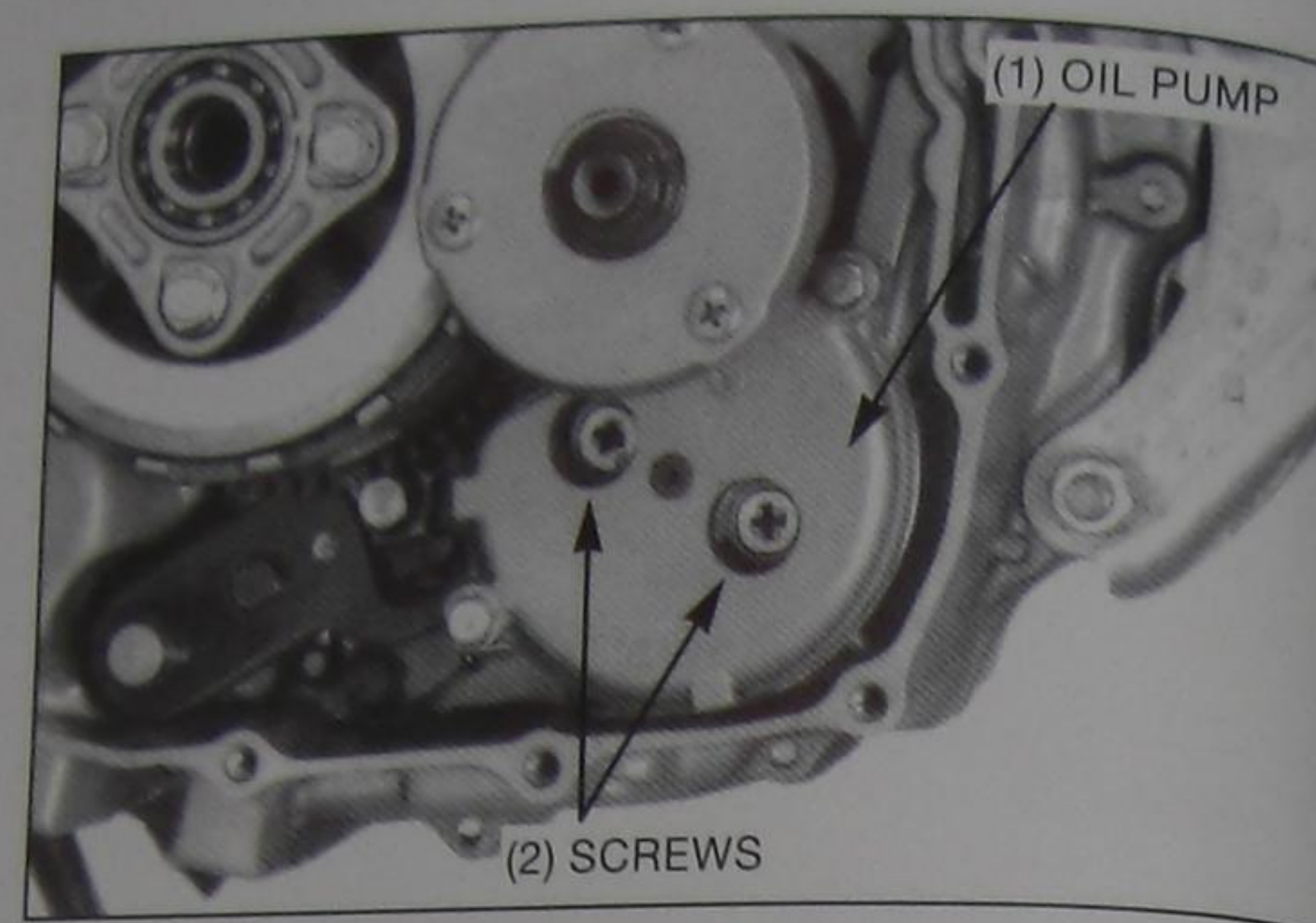


LUBRICATION SYSTEM

Install the oil pump onto the crankcase.
Install the two mounting screws and tighten them.

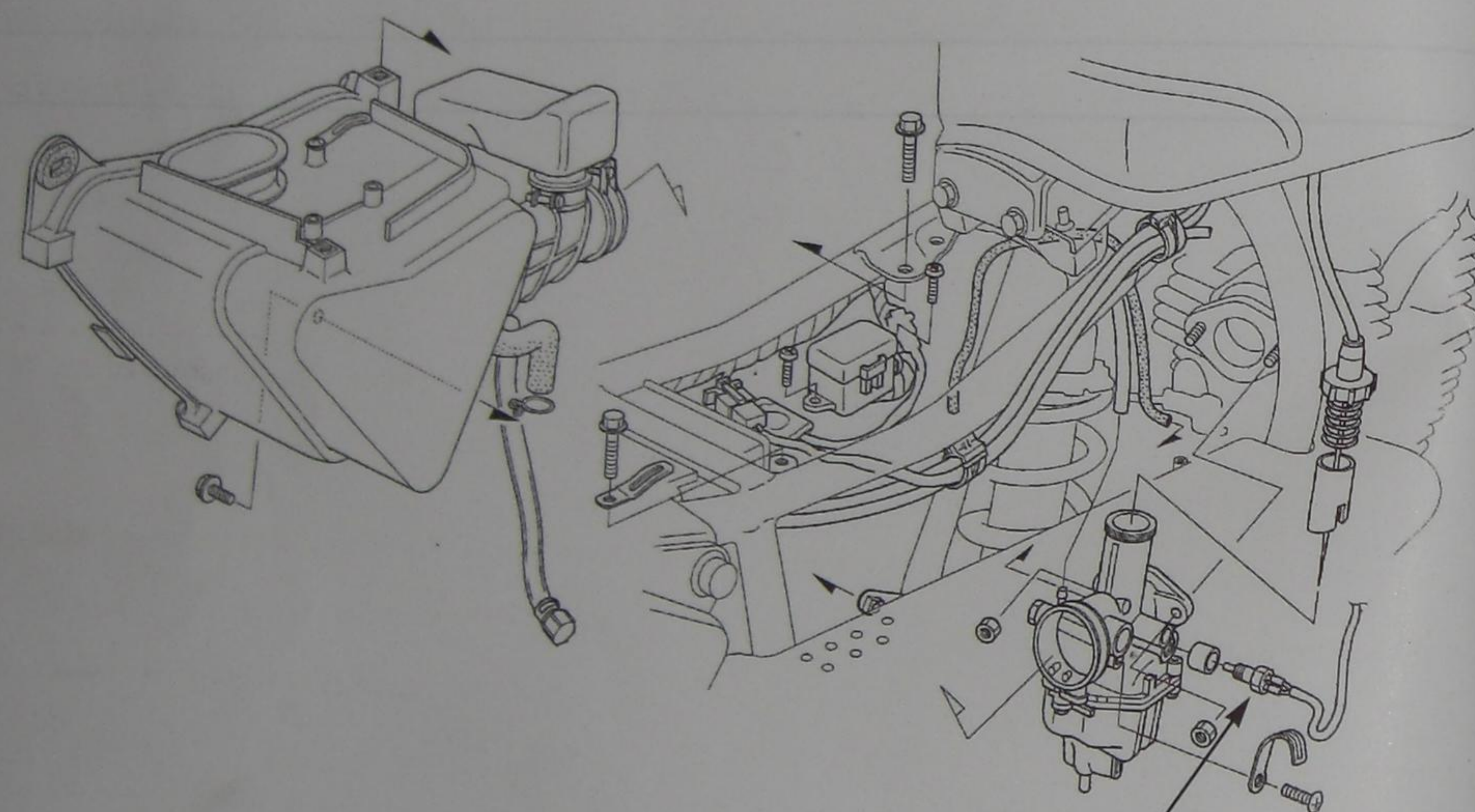
TORQUE: 10 N·m (1.0 kgf-m, 7 lbf-ft)

Install the right crankcase cover (page 9-12).



MEMO

5. Fuel System



8 N·m (0.8 kgf-m, 5.8 lbf-ft)

5. Fuel System

SERVICE INFORMATION	5-1	CARBURETOR ASSEMBLY	5-6
TROUBLESHOOTING	5-2	CARBURETOR INSTALLATION	5-8
CARBURETOR REMOVAL	5-3	PILOT SCREW ADJUSTMENT	5-9
CARBURETOR DISASSEMBLY/INSPECTION	5-3	AIR CLEANER HOUSING	5-10

Service Information

GENERAL

⚠ WARNING

- Gasoline is extremely flammable and is explosive under certain conditions. **KEEP OUT OF REACH OF CHILDREN.**
- If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.
- Bending or twisting the control cable will impair smooth operation and could cause the cable to stick or bind, resulting in loss of vehicle control.

- Work in a well ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.

CAUTION

- Be sure to remove the diaphragms before cleaning air and fuel passages with compressed air. The diaphragms might be damaged.
- Refer to section 2 for fuel tank removal and installation.
- Refer to section 18 for carburetor heater inspection.
- After removing the carburetor, cover the intake ports of the cylinder heads with shop towels to prevent any foreign material from dropping into the engine.
- Before disassembling the carburetors, place an approved fuel container under the carburetors, loosen the drain screw and drain the carburetor.
- When disassembling the fuel system parts, note the locations of the O-rings. Replace them with new ones on reassembly.

NOTE:

- If the vehicle is to be stored for more than one month, drain the float bowl. Fuel left in the float bowl may cause clogged jets, resulting in hard starting or poor driveability.

SPECIFICATIONS

Item	Specifications
Identification number	PDC5B
Venturi diameter	22 mm (87 in)
Main jet	#100
Slow jet	#38 x #38
Jet needle clip position	3rd groove
Float level	14 mm (0.55 in)
Pilot screw initial opening	1 — 1/2 turns out
Idle speed	1,400 ± 100 min ⁻¹ (rpm)
Throttle grip free play	2-8 mm (1/12-1/4 in)

TORQUE VALUES

Carburetor heater	8 N-m (0.8 kgf-m, 5.8 lbf-ft)
-------------------	-------------------------------

TOOL

Float level gauge	07401-0010000
Pilot screw wrench	07908-4220201

Troubleshooting

Engine cranks but won't start.

- No fuel in tank
- No fuel to carburetor
 - Clogged fuel strainer
 - Clogged fuel line
 - Clogged fuel tank breather
- Too much fuel getting to the engine
 - Clogged air cleaner
 - Flooded carburetor
- Intake air leak
- Contaminated/deteriorated fuel
- Improper choke operation
- Improper throttle operation
- No spark at plug (faulty ignition system section 16)

Lean mixture

- Clogged fuel jets
- Faulty float valve
- Float level too low
- Restricted fuel line
- Clogged carburetor air vent tube
- Clogged fuel tank breather
- Intake air leak

Rich mixture

- Choke valve closed
- Clogged air jets
- Faulty float valve
- Float level too high
- Dirty air cleaner

Engine stalls, hard to start, rough idling

- Restricted fuel line
- Fuel mixture too lean/rich
- Contaminated/deteriorated fuel
- Intake air leak
- Misadjusted idle speed
- Misadjusted pilot screw
- Clogged fuel tank breather
- Clogged air cleaner
- Clogged slow circuit
- Faulty ignition system (section 16)

Afterburn when engine braking is used

- Lean mixture in slow circuit
- Faulty ignition system (section 16)

Backfiring or misfiring during acceleration

- Fuel mixture too lean
- Faulty ignition system (section 16)

Pool performance (driveability) and poor fuel economy

- Clogged fuel system
- Faulty ignition system (section 16)

Carburetor Removal

Turn the fuel valve OFF

Loosen the drain screw and drain the fuel from the float chamber into the approved gasoline container.

Remove the seat (page 2-2).

Loosen and remove the carburetor top.

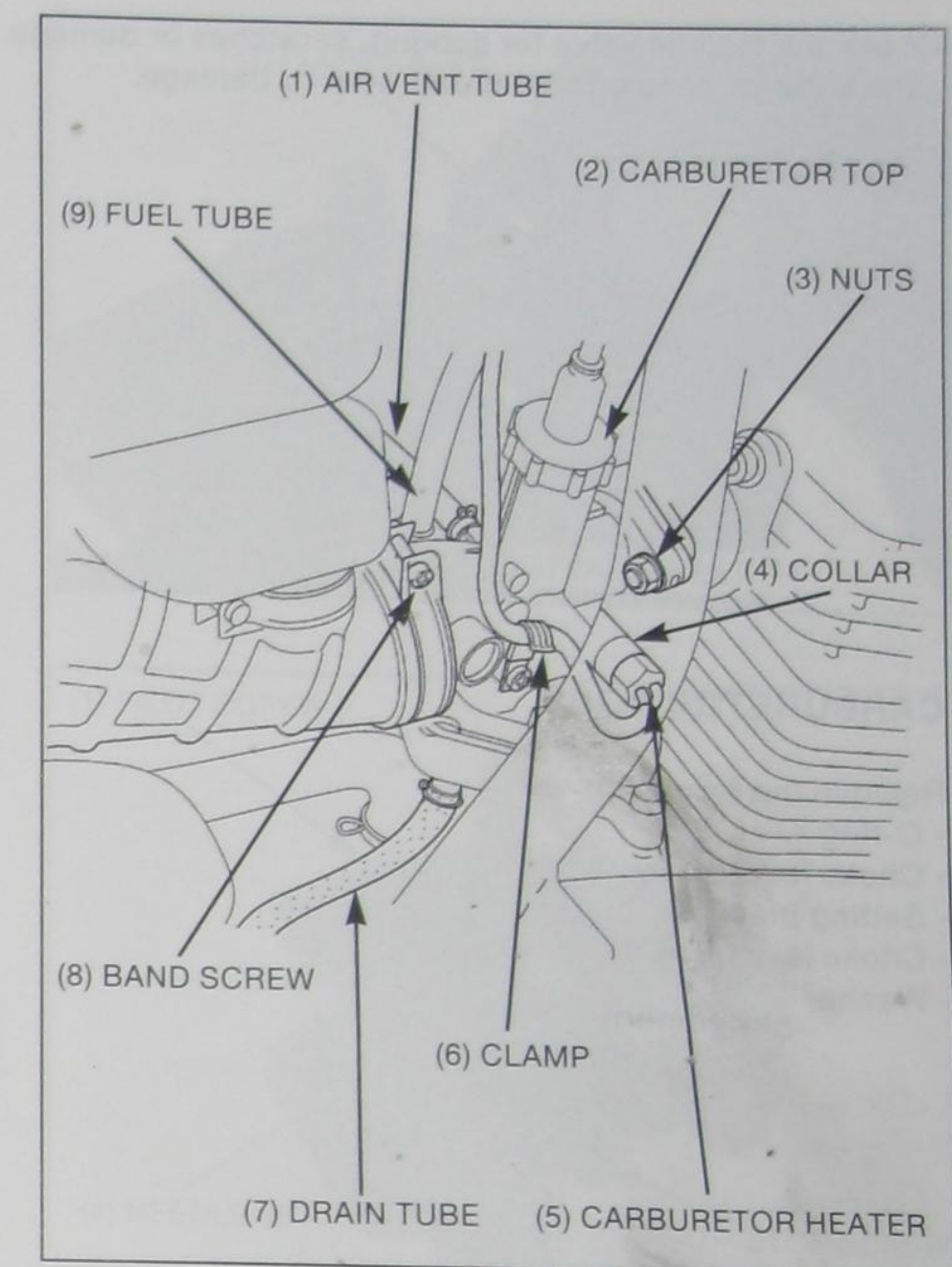
Remove the throttle valve from the carburetor body, being careful not to damage the jet needle.

Disconnect the fuel tube, air vent tube and drain tube from the carburetor body.

Release the carburetor heater wire from the clamp.

Remove the carburetor heater and collar from the carburetor body by turn it counterclockwise, being careful not to damage the heater wire.

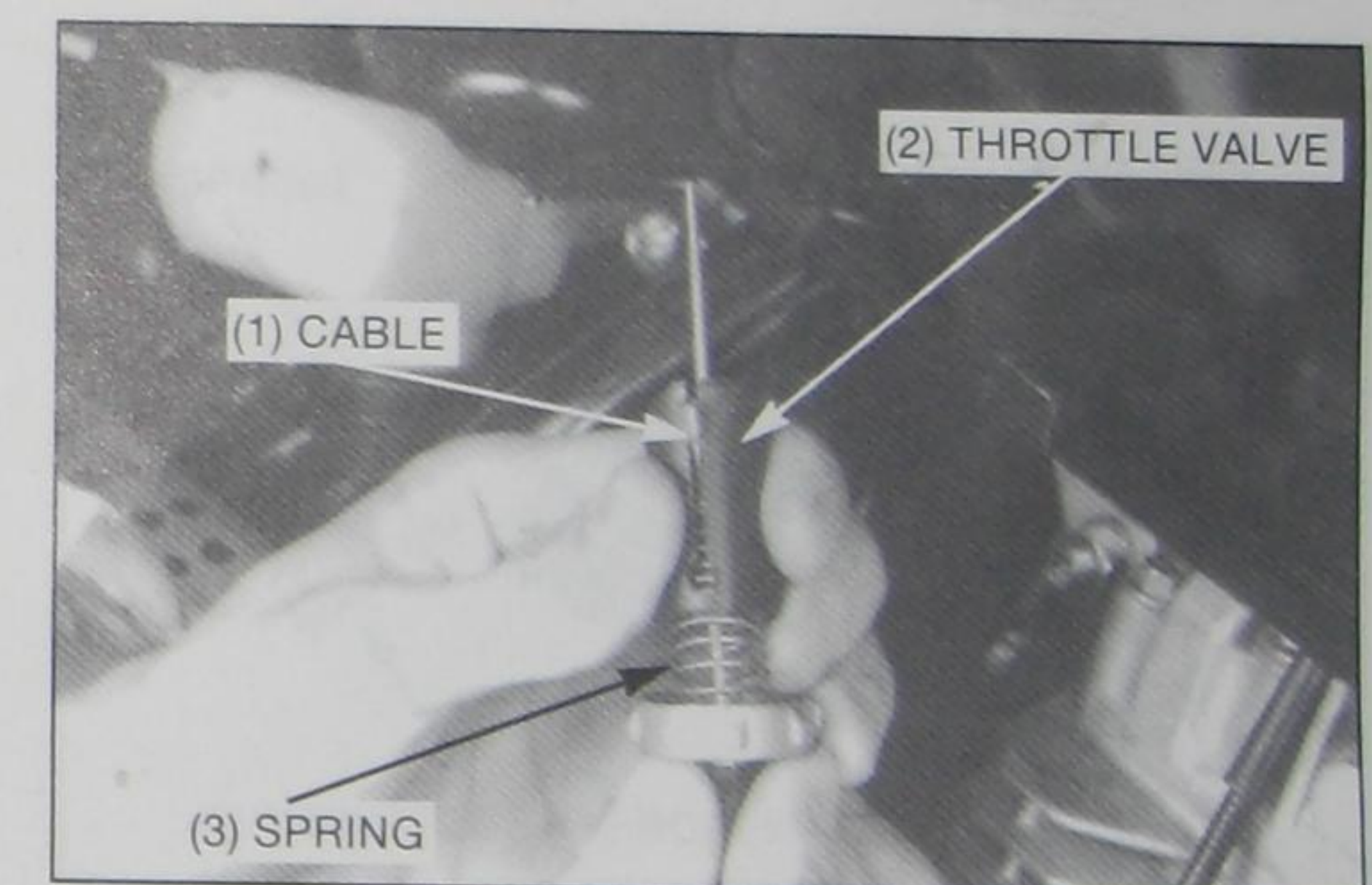
Loosen the connecting tube band screw.
Remove the mounting nuts.
Remove the carburetor assembly.



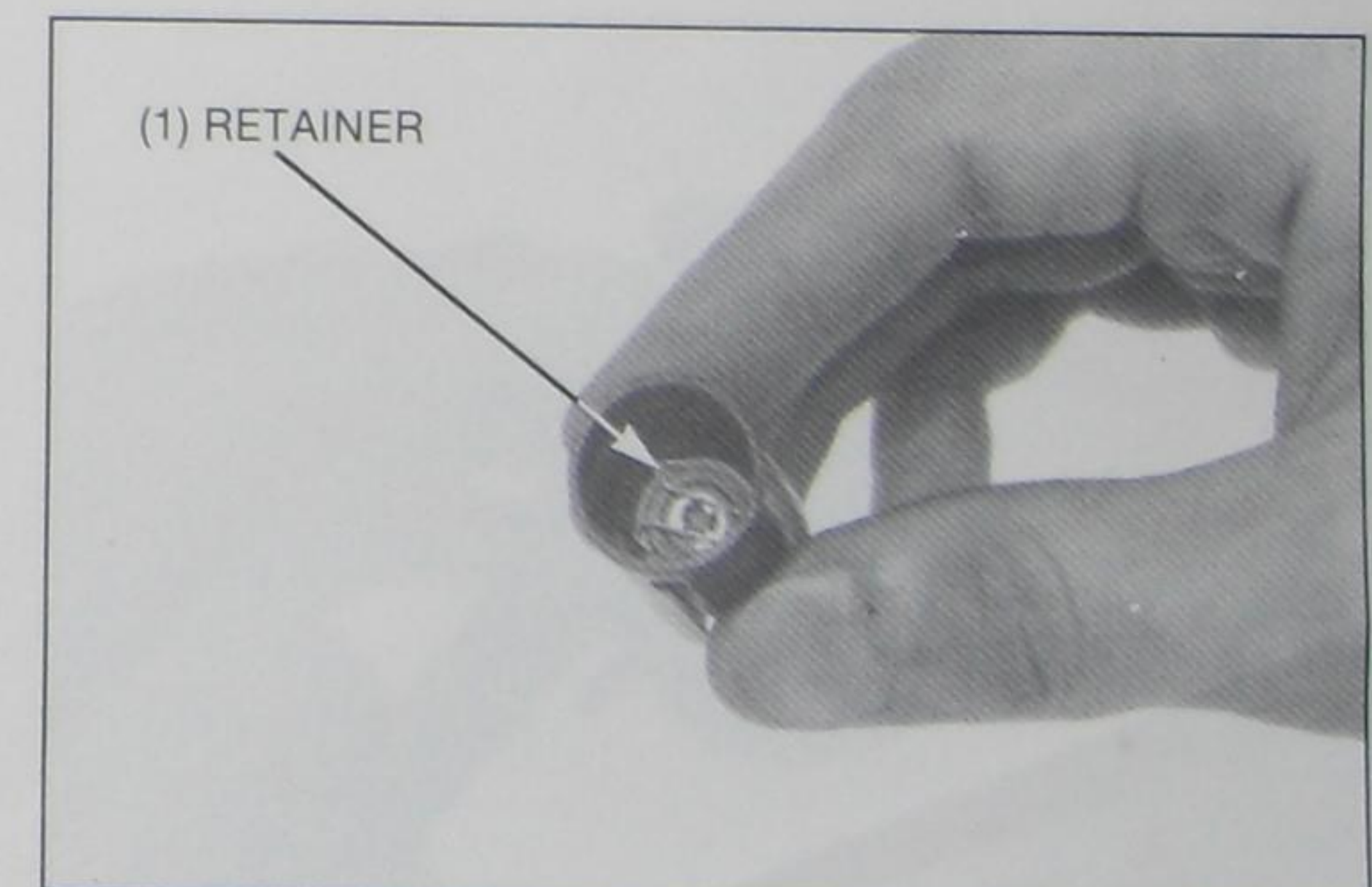
Carburetor Disassembly/Inspection

THROTTLE VALVE

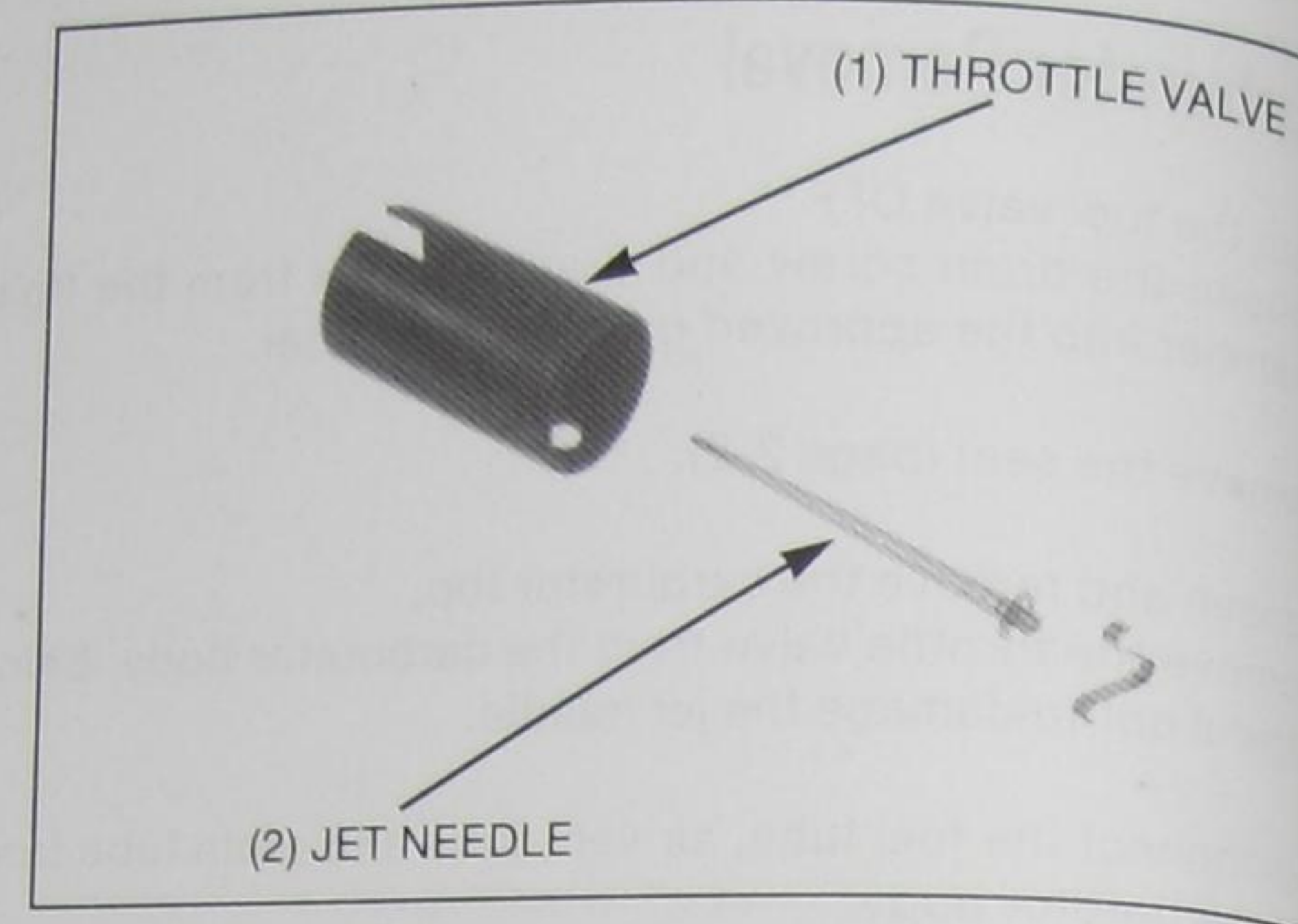
Disconnect the throttle cable from the throttle valve by compressing the throttle valve spring and remove the throttle valve and valve spring.



Remove the jet needle retainer and jet needle.



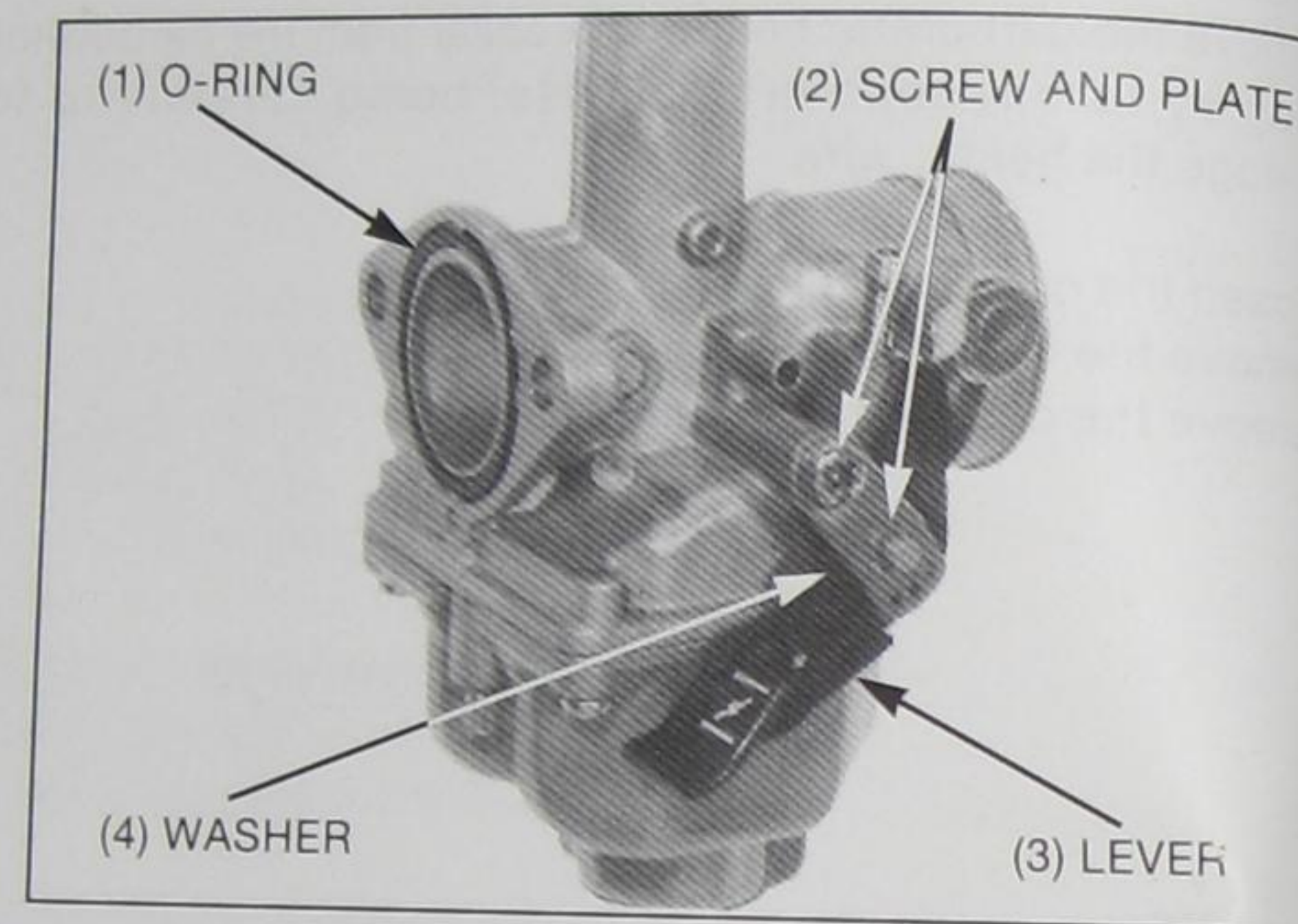
Check the throttle valve for scoring, scratches or damage.
Check the jet needle for stepped wear or damage.



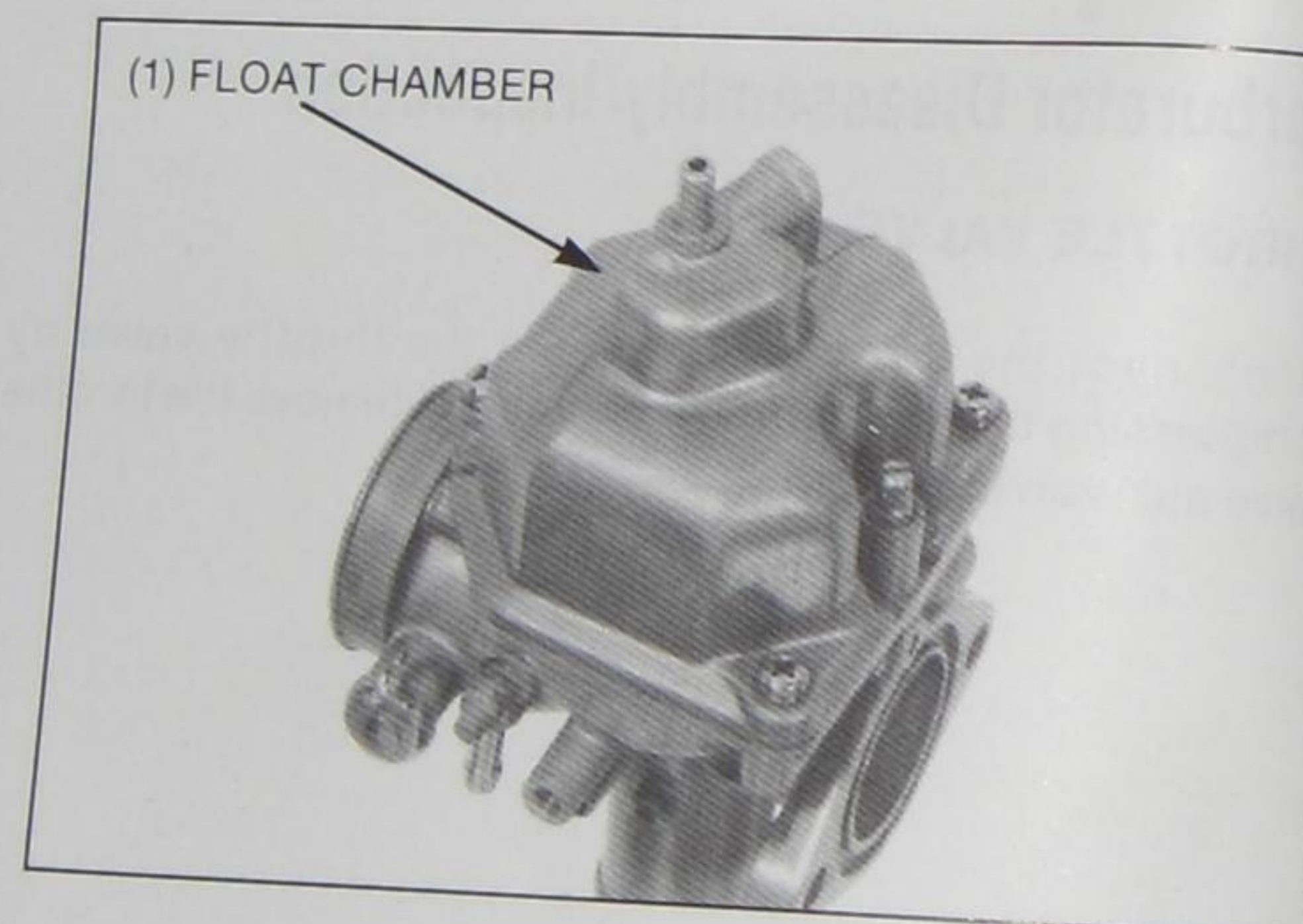
CARBURETOR BODY

Remove the following:

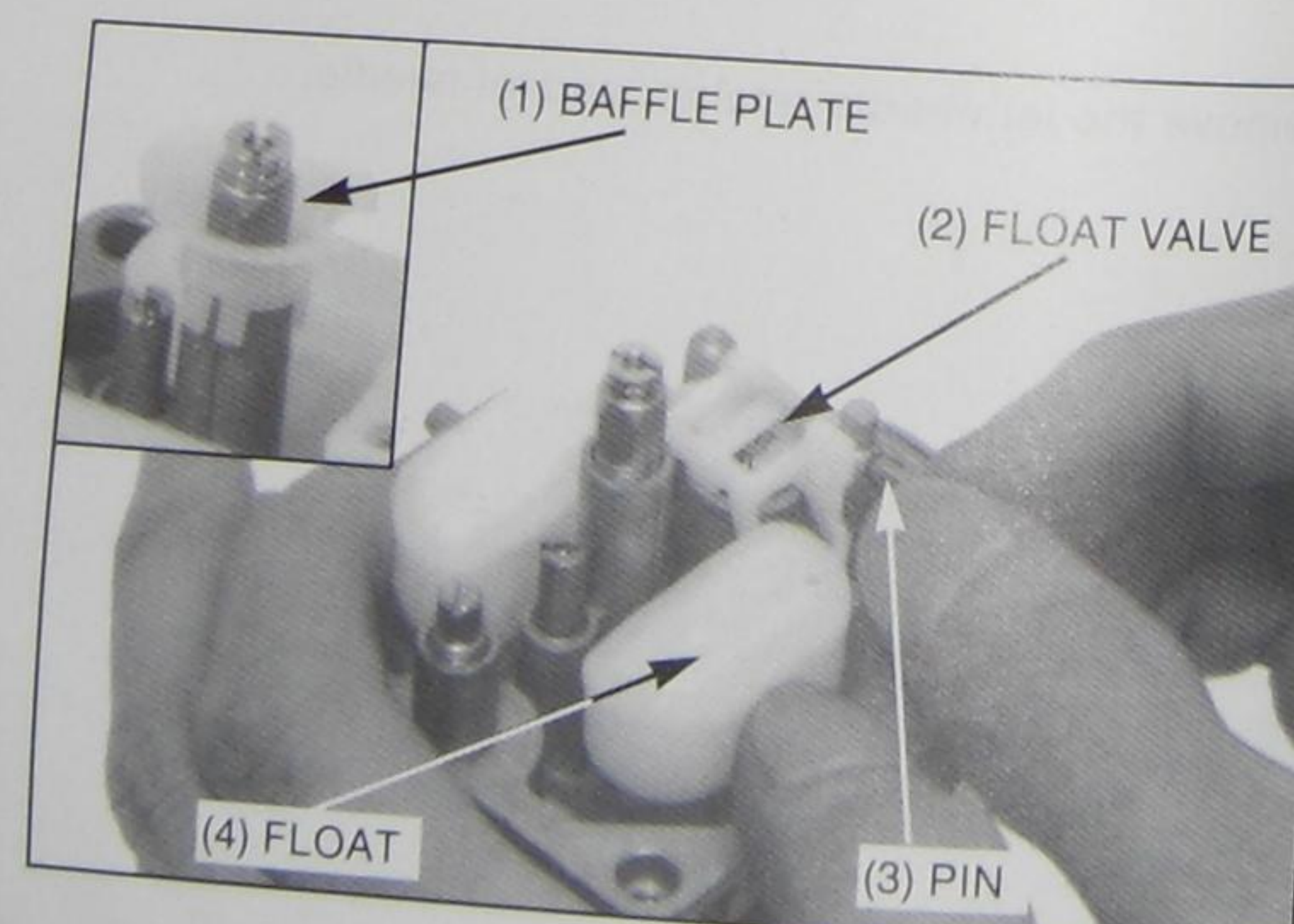
- O-ring
- Choke lever screw
- Setting plate
- Choke lever
- Washer



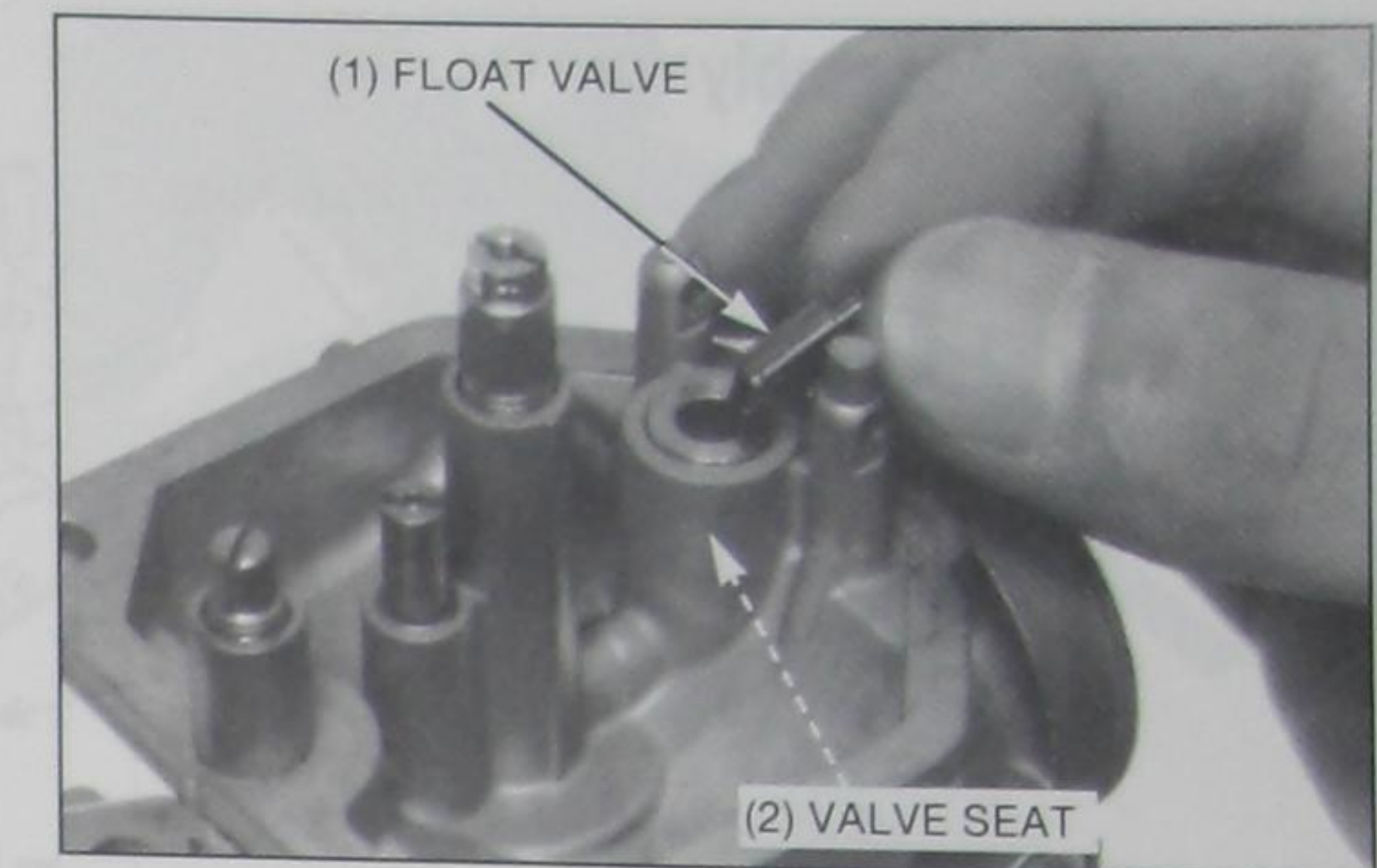
- Three screws and float chamber



- Baffle plate
- Float pin
- Float
- Float valve



Check the float valve and valve seat for scoring, scratches, clogging or damage.
Check the tip of the float valve, where it contacts the valve seat, for stepped wear or contamination.
Check the operation of the float valve.



Remove the following:

- Main jet
- Needle jet holder
- Needle jet
- Slow jet
- Throttle stop screw and spring

CAUTION

- Handle the jets with care. They can easily be scored or scratched.

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

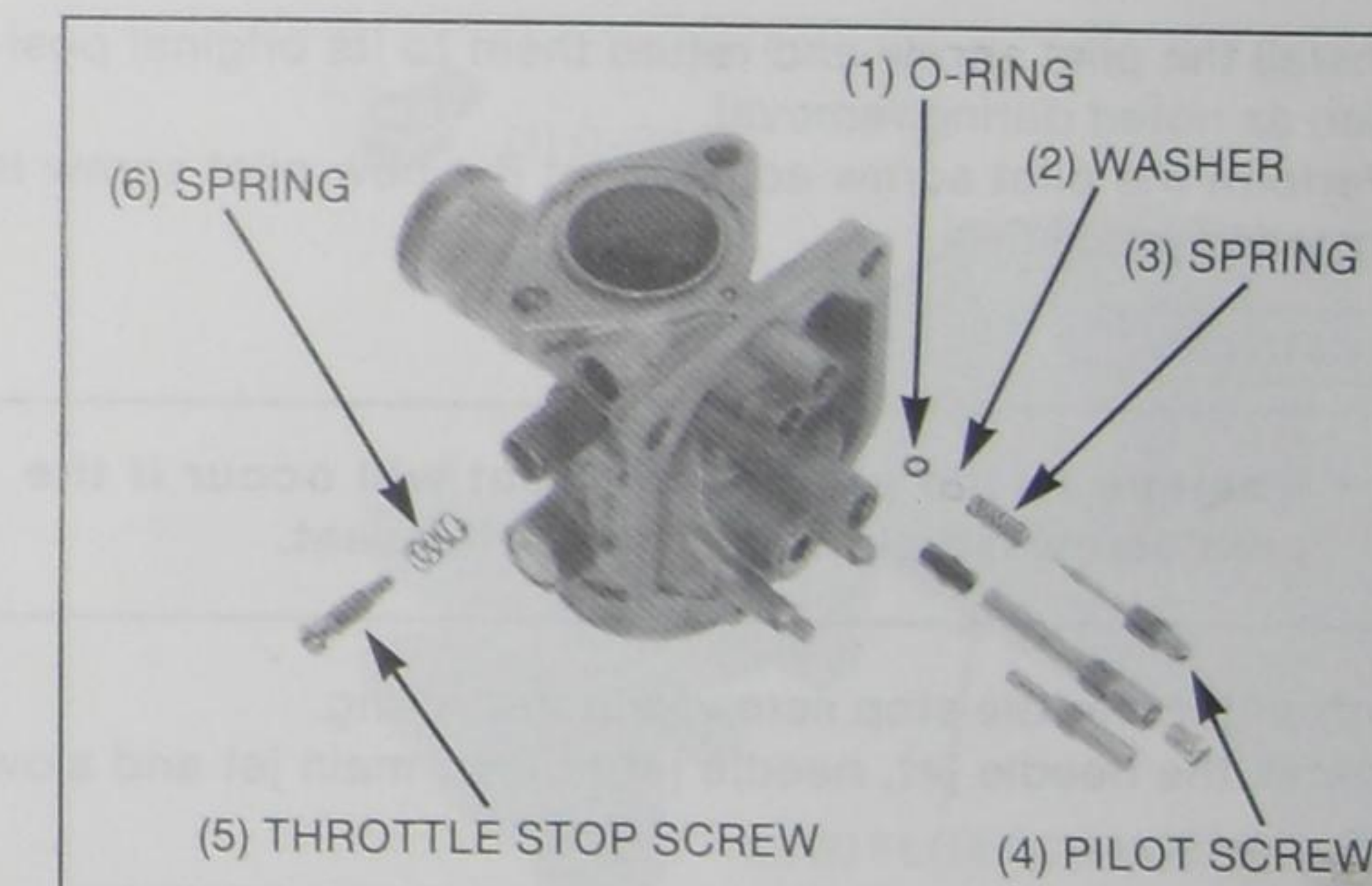
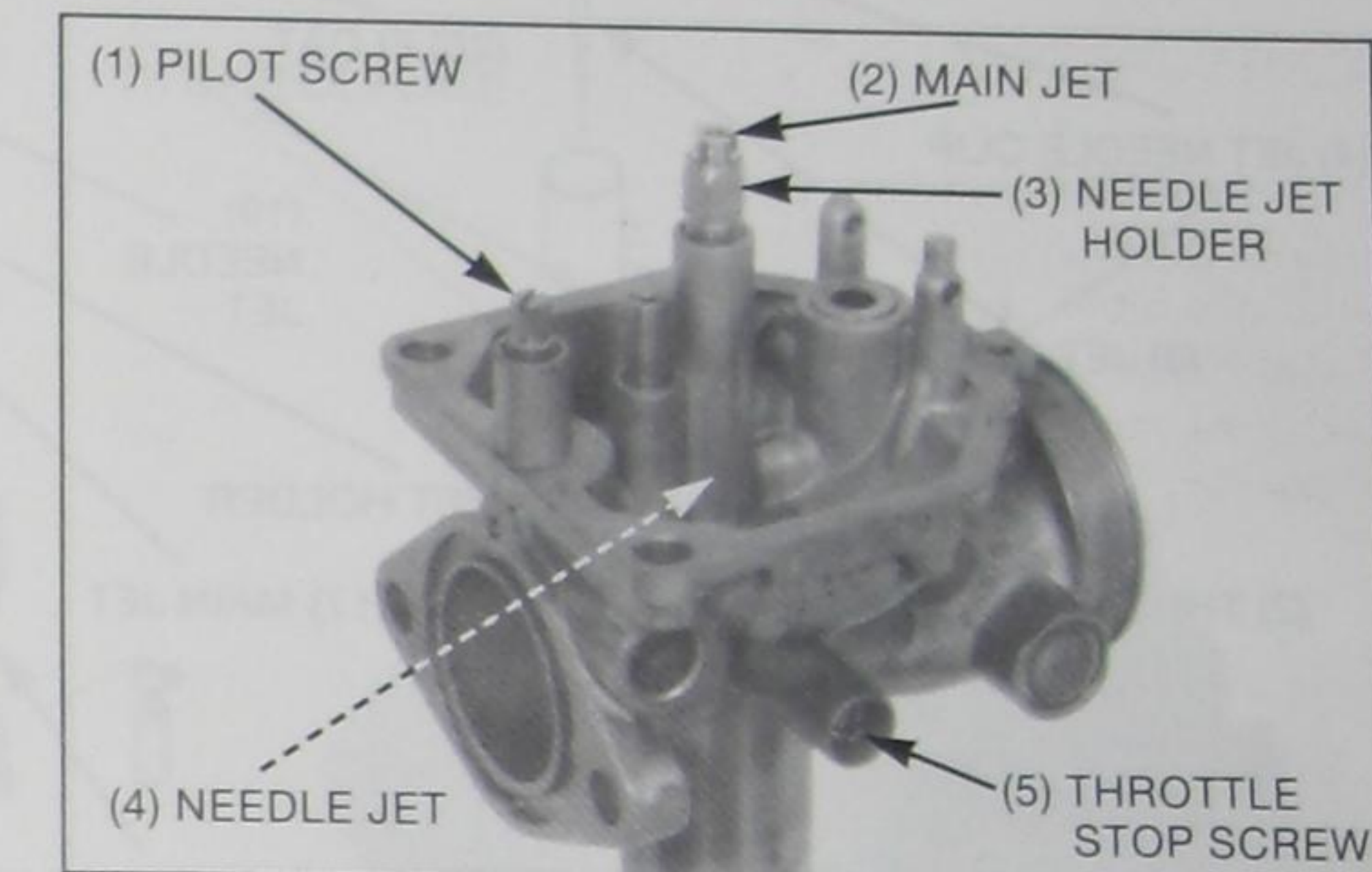
CAUTION

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

Remove the pilot screw, spring, washer and O-ring.

Check each jet for wear or damage.
Check the pilot screw for wear or damage.

Clean the jets with cleaning solvent and blow open with compressed air.



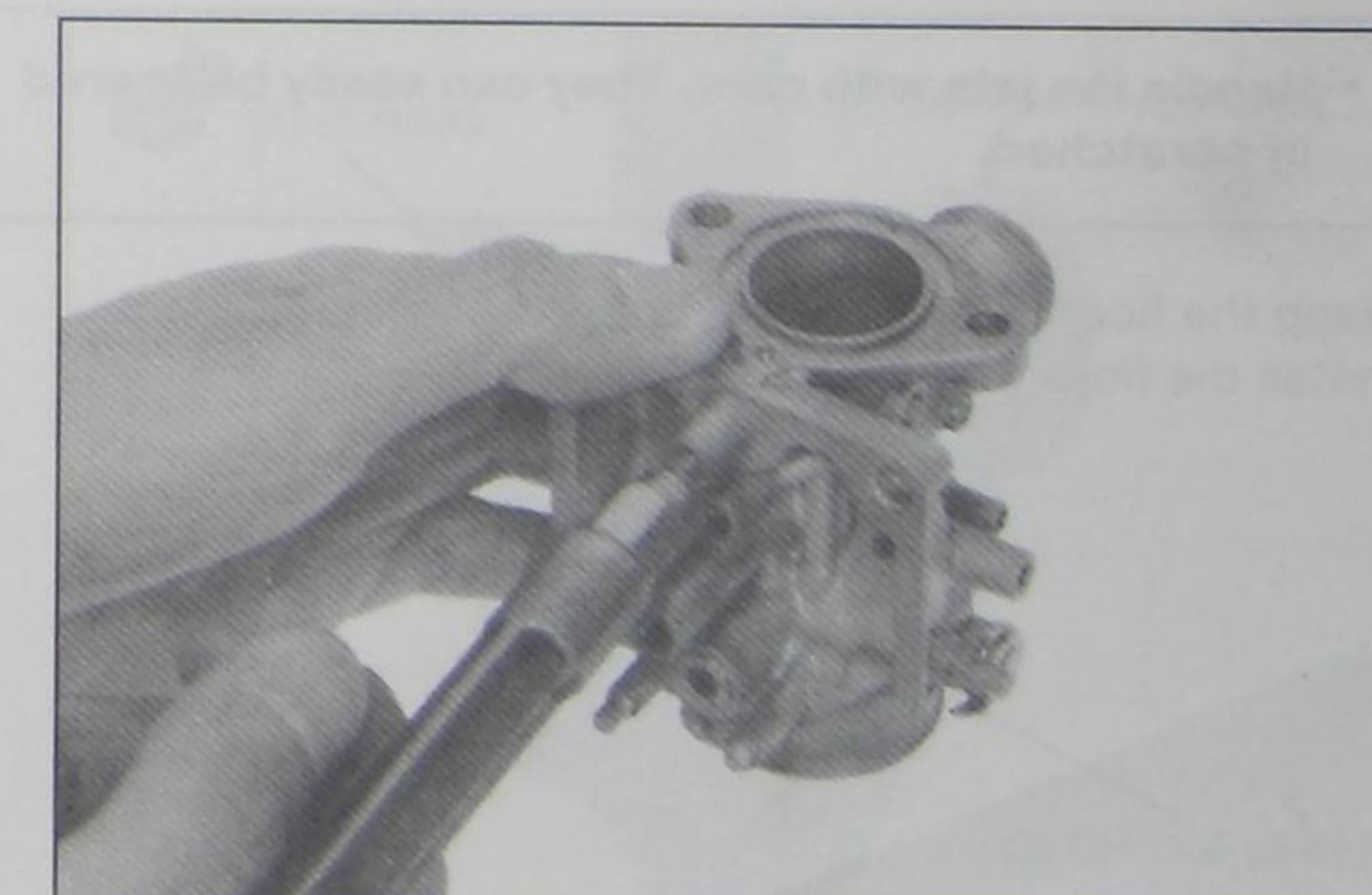
CARBURETOR CLEANING

Remove all parts from the carburetor as mentioned above.

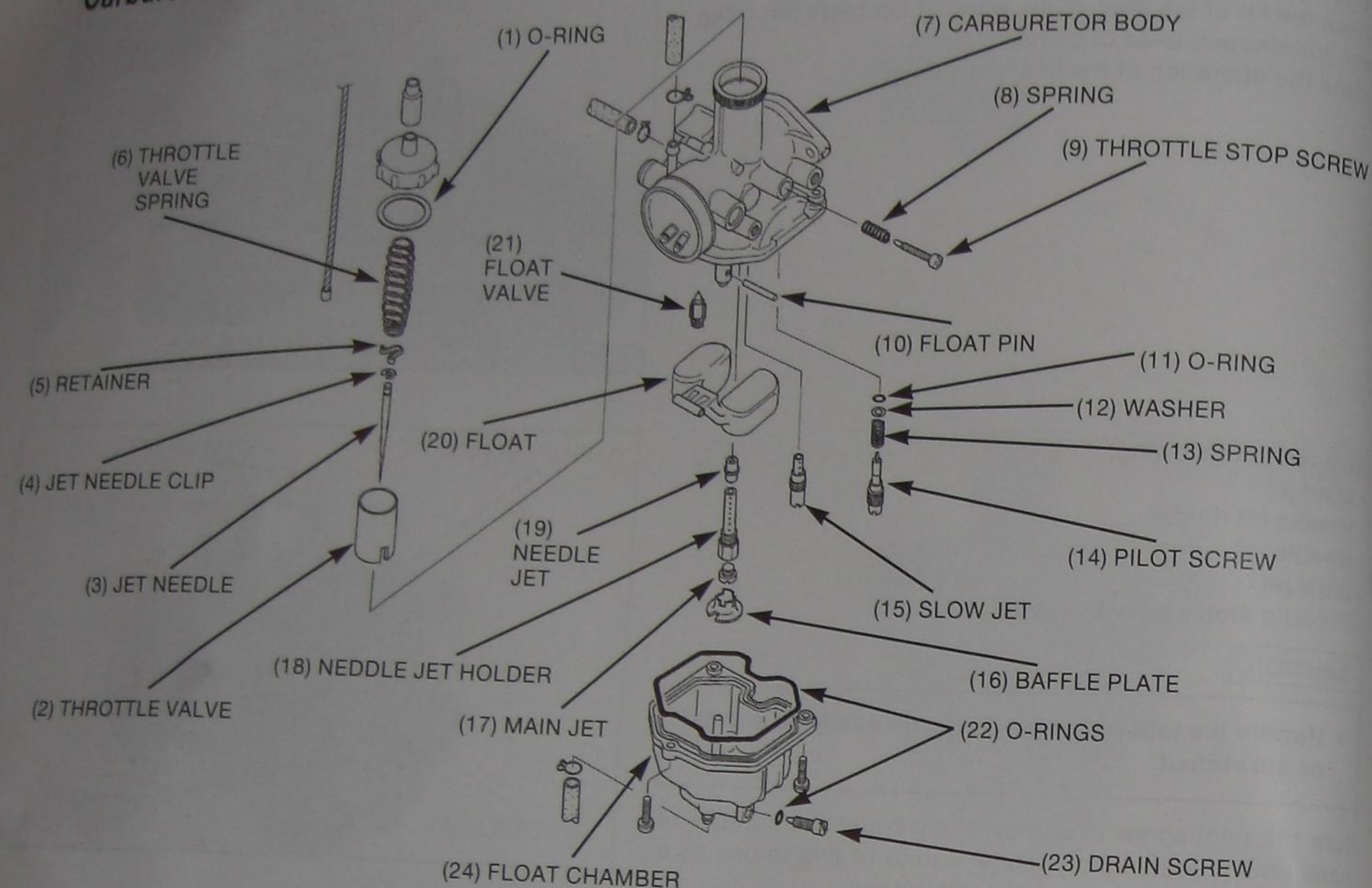
CAUTION

- Cleaning the air and fuel passages with a piece of wire will damage the carburetor body.

Blow open all air and fuel passages in the carburetor body with compressed air.



Carburetor Assembly



Install the pilot screw and return them to its original position as noted during removal. Perform the pilot screw adjustment if a new pilot screw is installed (page 5-9).

CAUTION

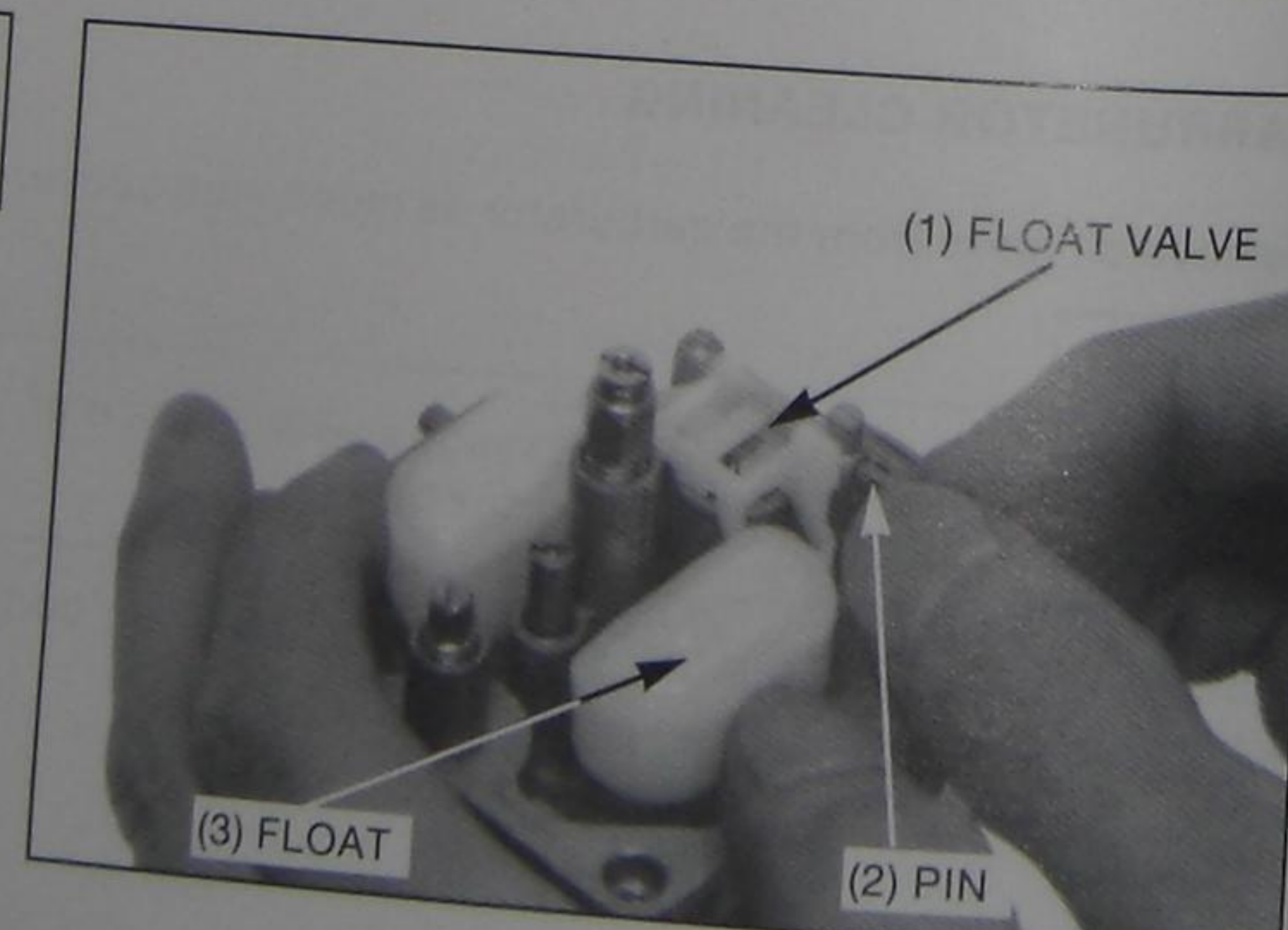
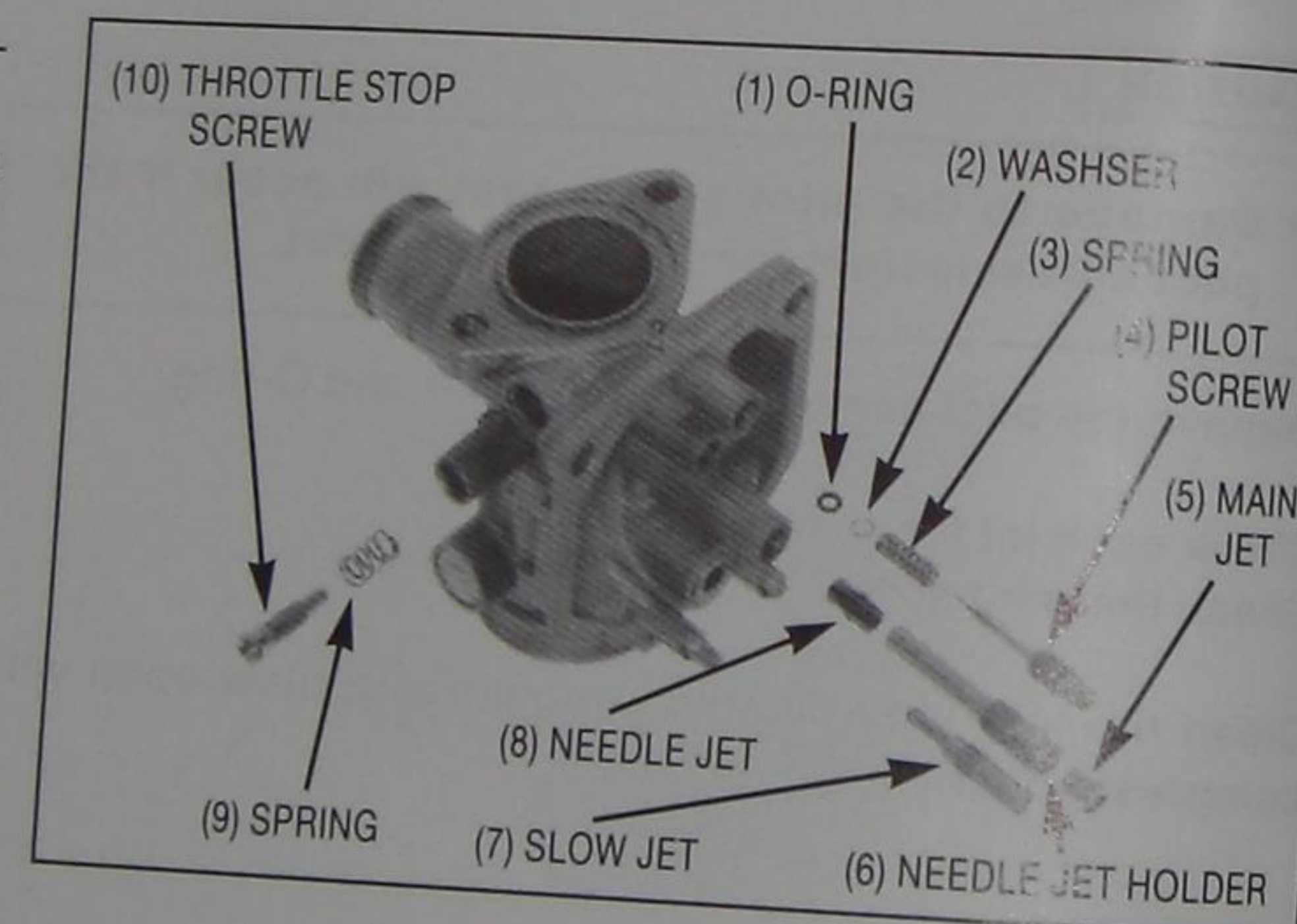
- Damage to the pilot screw seat will occur if the pilot screw is tightened against the seat.

Install the throttle stop screw with the spring. Install the needle jet, needle jet holder, main jet and slow jet.

CAUTION

- Handle the jets with care. They can easily be scored or scratched.

Hang the float valve onto the float arm lip. Install the float valve, float and float pin.



FLOAT LEVEL INSPECTION

With the float valve seated and the float arm just touching the valve, measure the float level gauge.

NOTE:

- Set the float level gauge so that is perpendicular to the float chamber face and inline with the main jet.

TOOL:

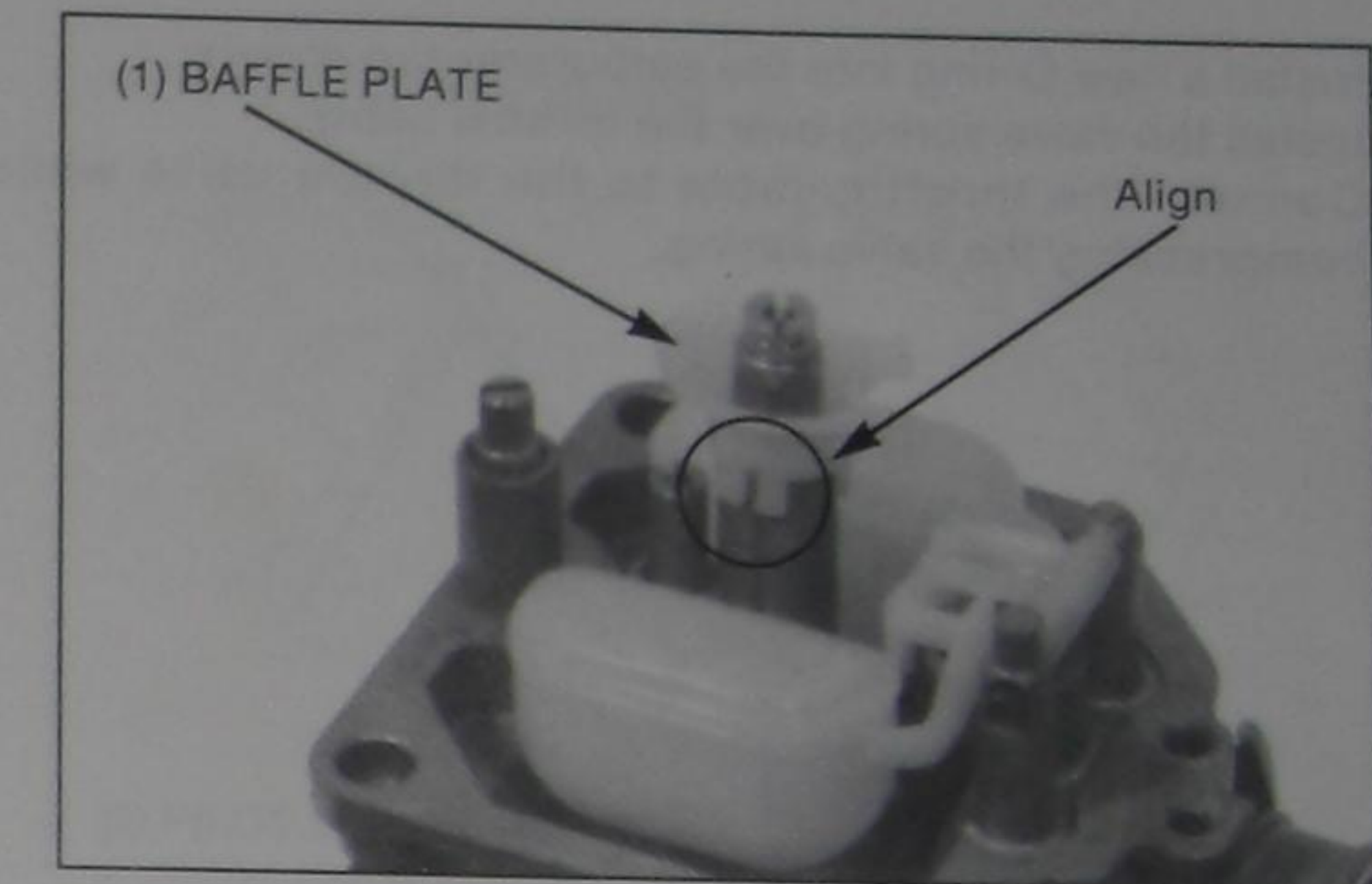
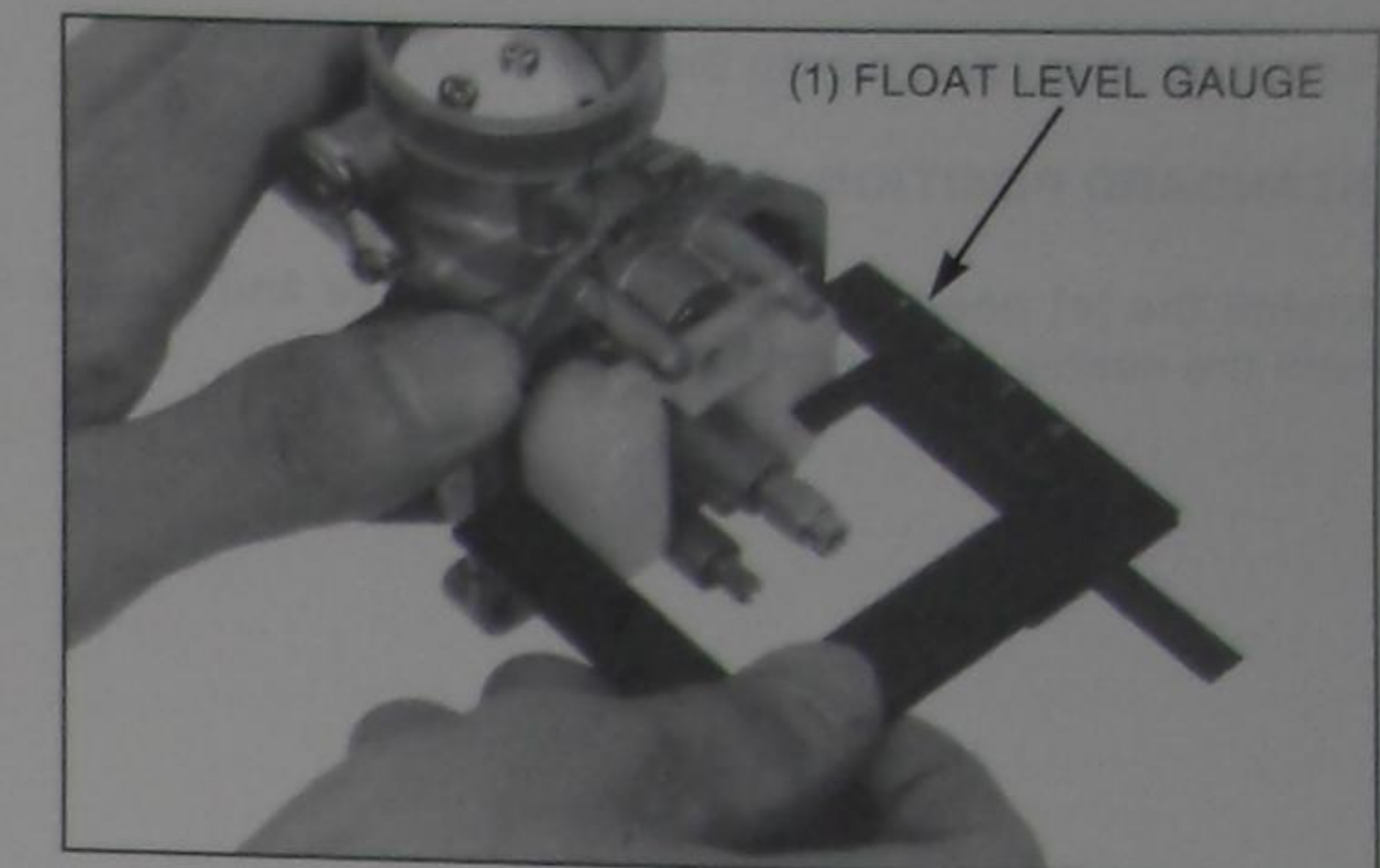
Float level gauge

07401-0010000

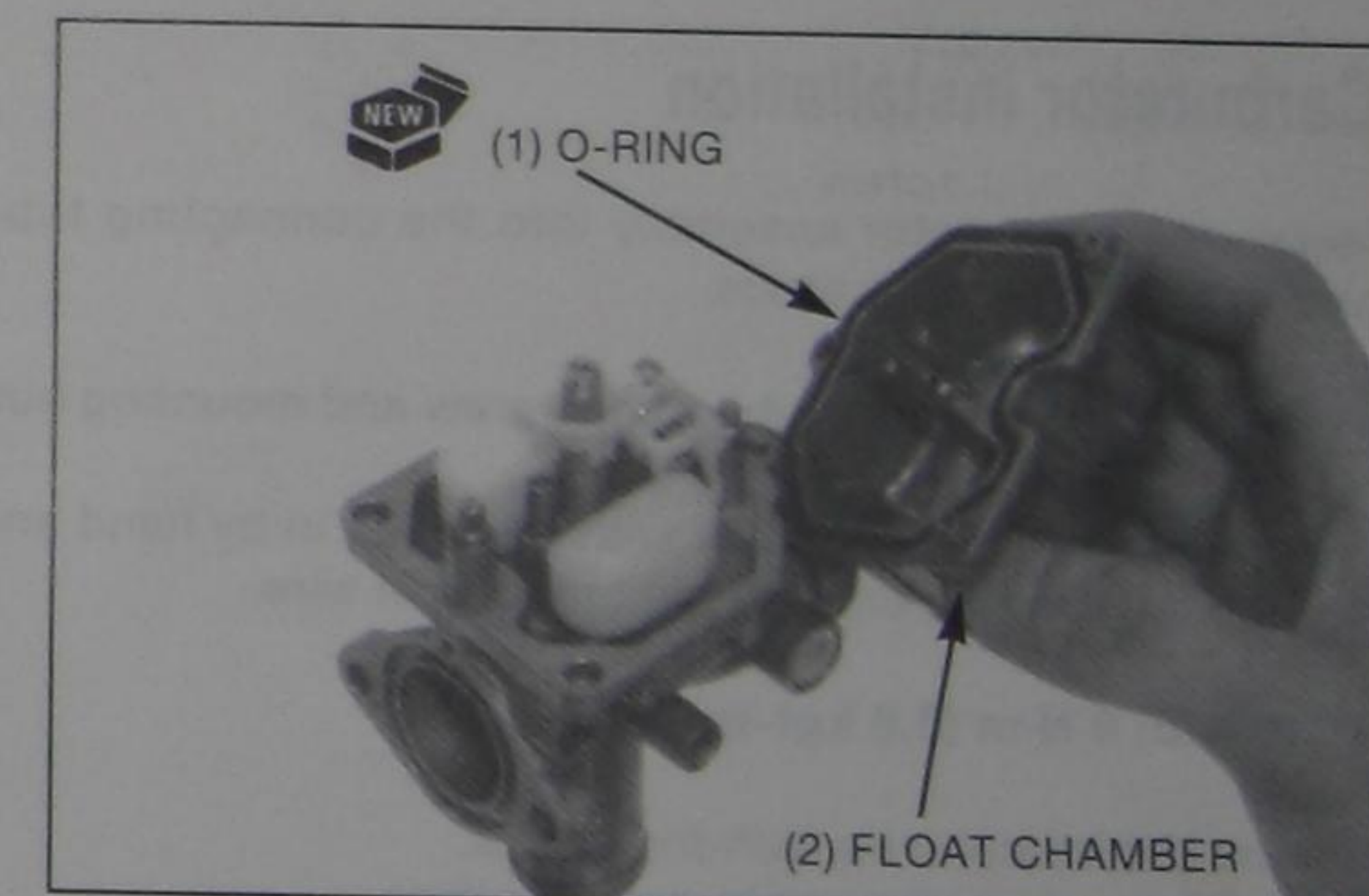
FLOAT LEVEL: 14 mm (0.55 in)

The float level cannot be adjusted. Replace the float assembly if the float level is out of specification.

Install the baffle plate, aligning the its groove with the lug on the carburetor body.

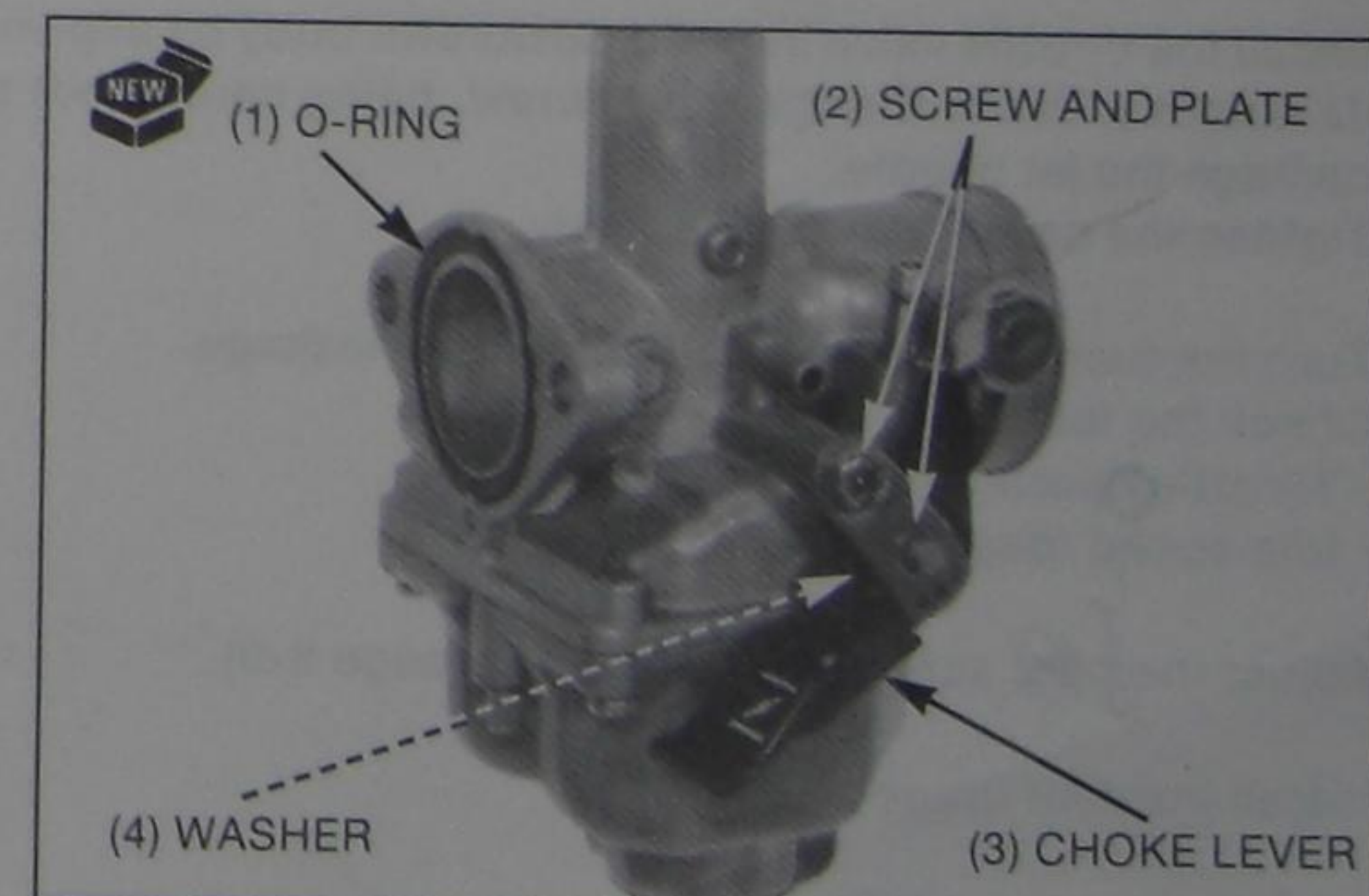


Install a new O-ring into the float chamber groove. Install the float chamber and tighten the three screws.



Install the washer (between the carburetor body and lever) and choke lever onto the pivot boss and secure it with the setting plate and screw as shown.

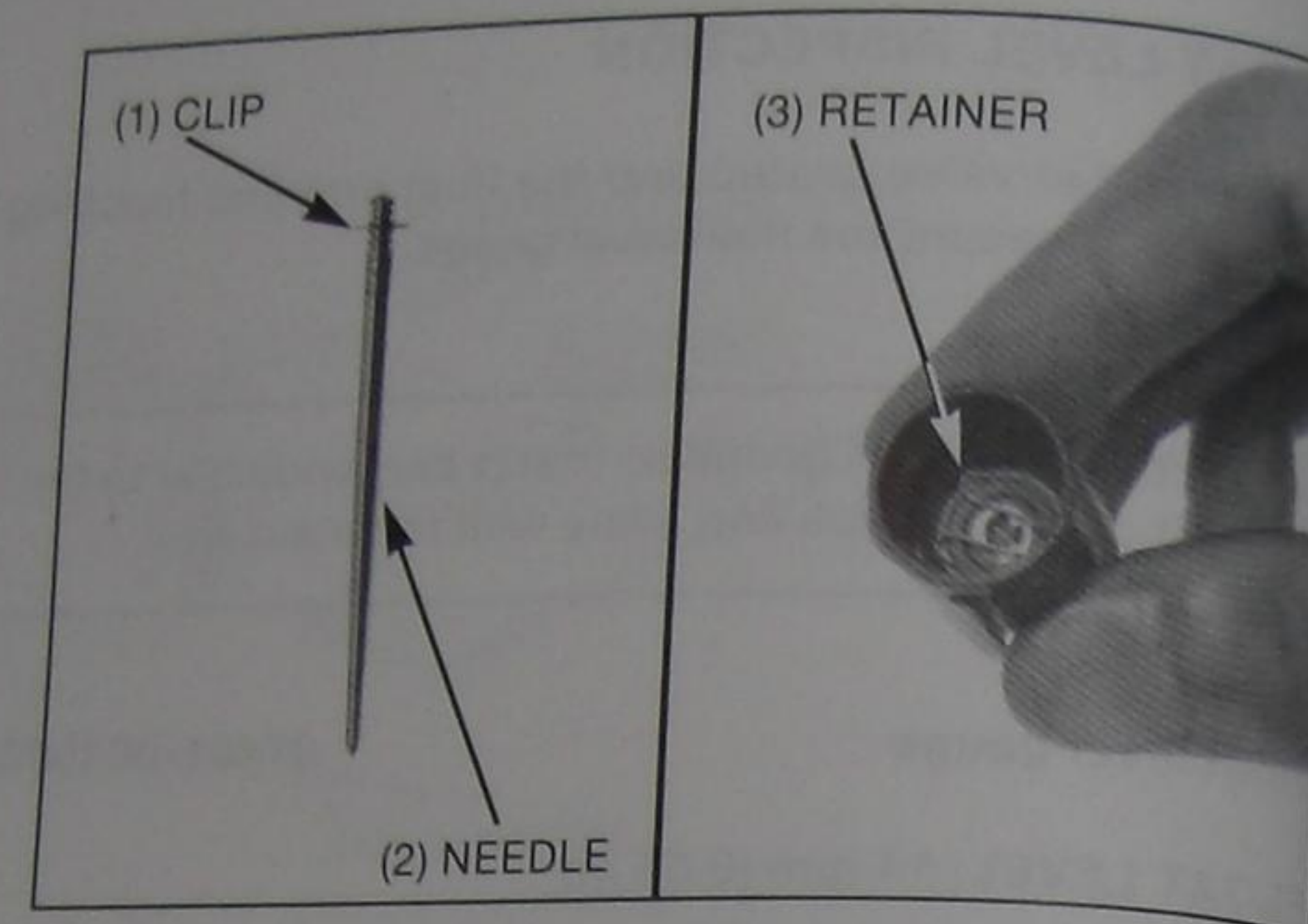
Coat a new O-ring with oil and install it into the carburetor groove.



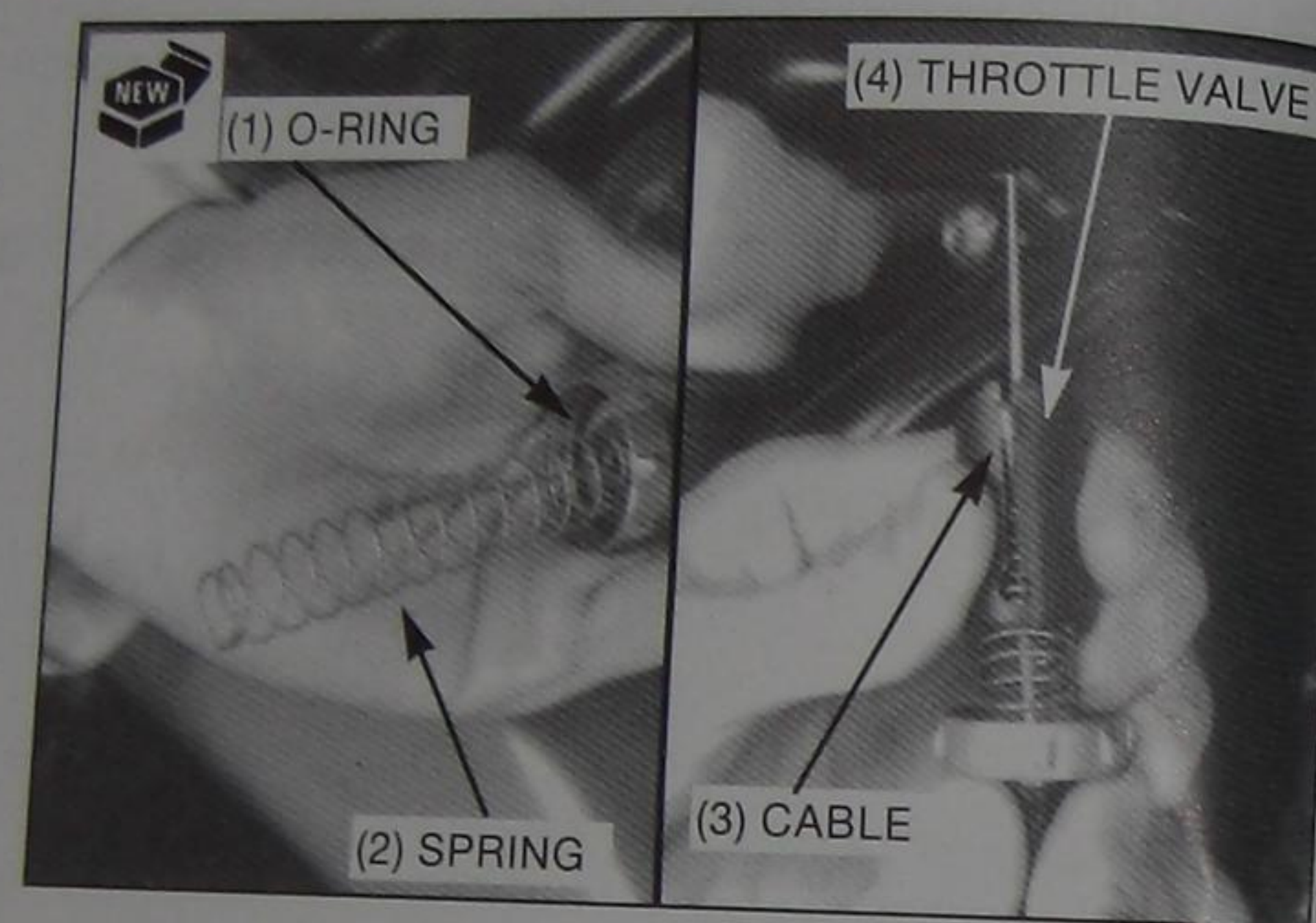
Install the needle clip onto the jet needle.

STANDARD POSITION: 3rd groove from top

Install the jet needle into the throttle valve and secure it with the needle retainer securely.



Install a new O-ring into the carburetor top groove. Install the valve spring over the throttle cable. Connect the throttle cable to the throttle valve while compressing the valve spring.



Carburetor Installation

Install the carburetor assembly into the connecting tube and onto the insulator studs.

Tighten the connecting tube band screw and mounting nut.

Thread the carburetor heater with the collar in by hand and tighten it, being careful not to damage the wire.

TORQUE: 8 N·m (0.8 kgf-m, 5.8 lbf-ft)

Secure the heater wire with the clamp. Connect the fuel, air vent and drain tubes.

Install the throttle valve into the carburetor body by aligning its cutout with the throttle stop screw, being careful not to damage the jet needle.

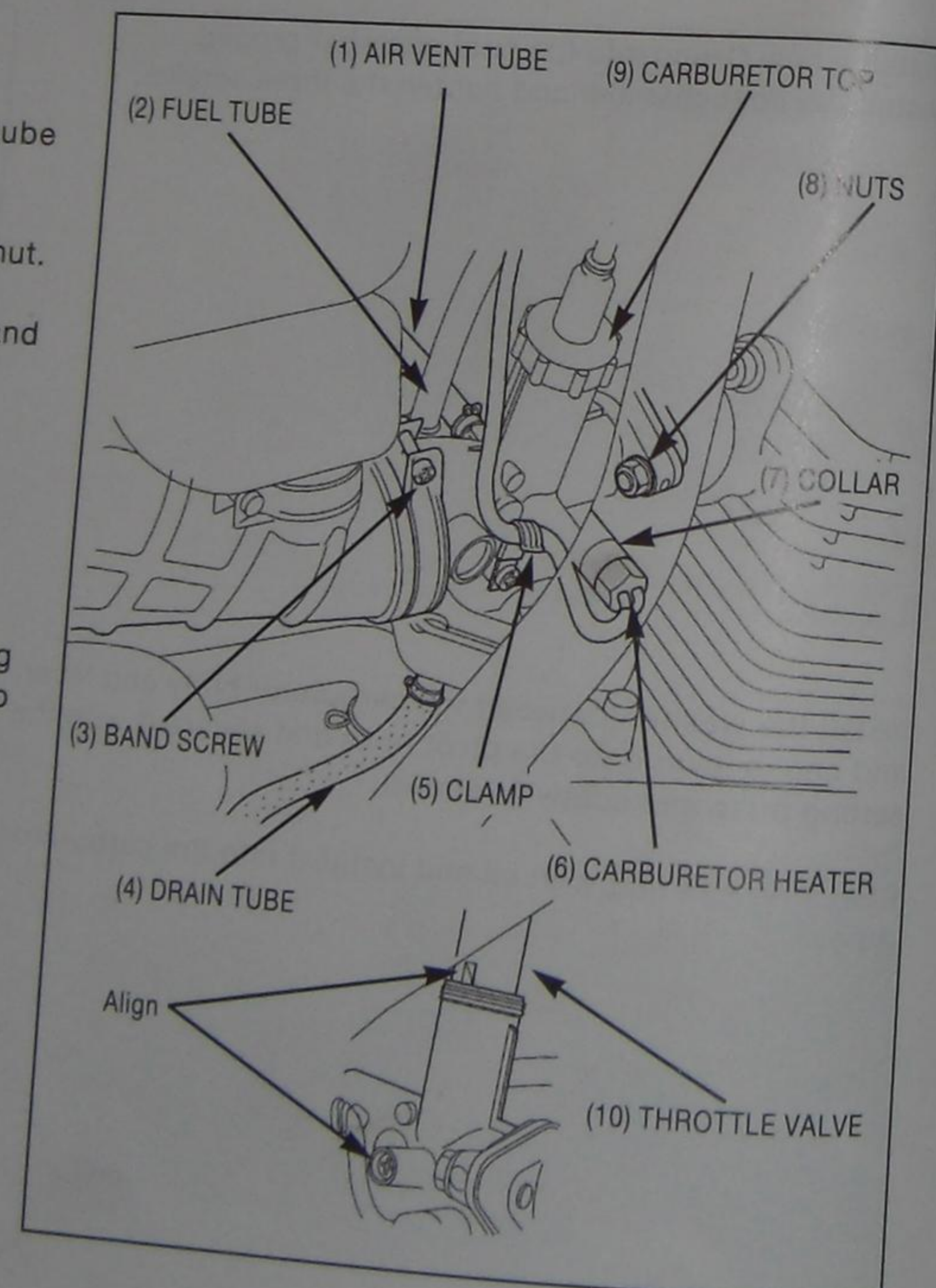
Tighten the carburetor top securely.

Turn the fuel valve ON and check for fuel leakage. Check the following:

- Throttle operation (page 3-4)
- Idle speed (page 3-9)

Adjust the pilot screw if it is replaced (page 5-9).

Install the seat (page 2-2).



Pilot Screw Adjustment

NOTE:

- The pilot screw is factory pre-set. Adjustment is not necessary unless the carburetor is overhauled or a new pilot screw is installed.

CAUTION

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

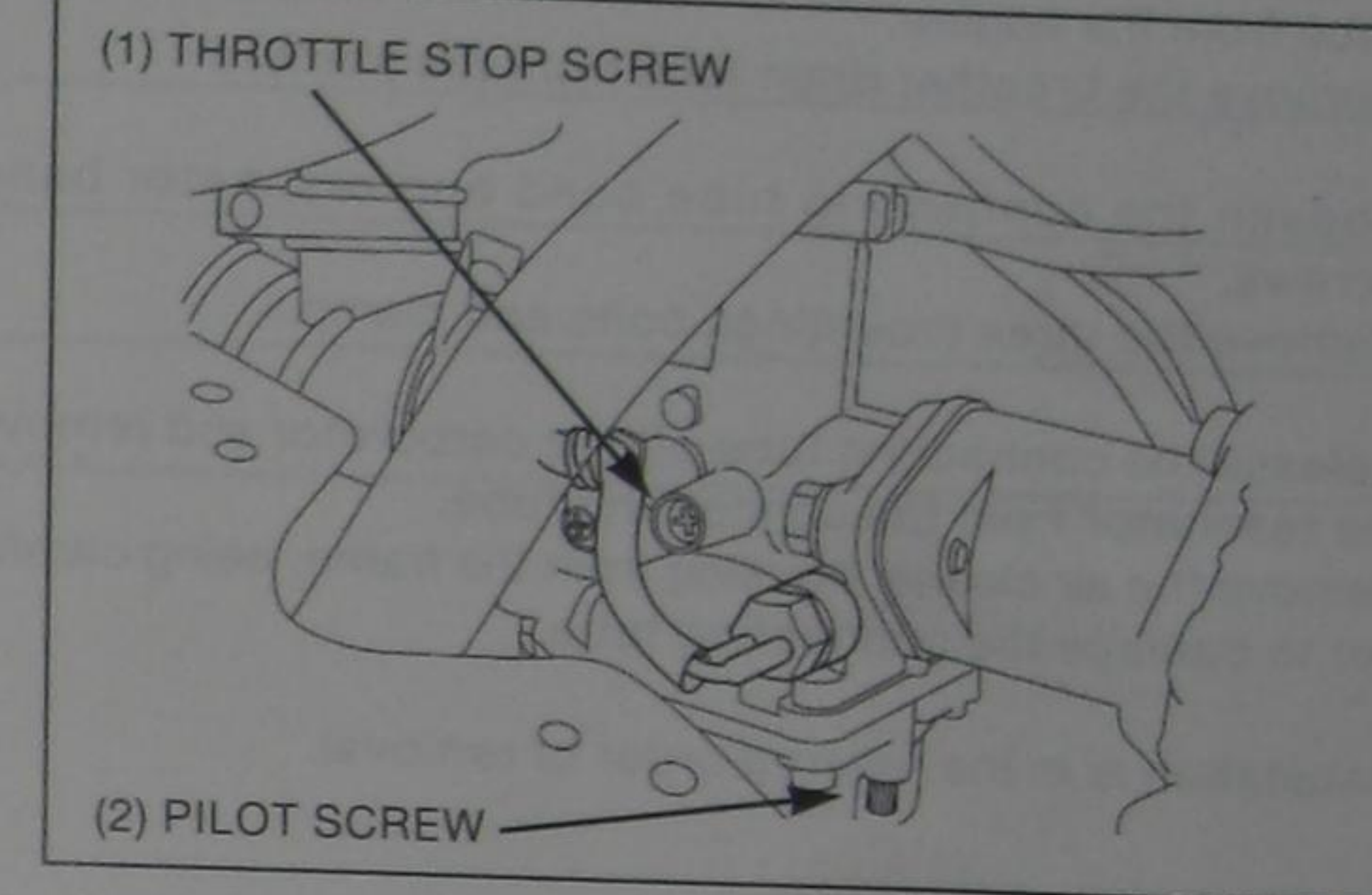
1. Turn the pilot screw clockwise until it seats lightly and then back it out to the specification.

PILOT SCREW INITIAL OPENING: 1 — 1/2 turns out

2. Warm up the engine to the normal operating temperature. Stop and go riding for 10 minutes is sufficient.
3. Stop the engine and attach the tachometer according to the tachometer manufacturer's instructions.
4. Start the engine and adjust the idle speed to specified rpm with the throttle stop screw.

IDLE SPEED: 1,400 ± 100 min⁻¹ (rpm)

5. Turn the pilot screw in or out slowly to obtain the highest engine speed.
6. Readjust the idle speed to the specified value with the throttle stop screw.
7. Make sure that the engine does not miss or run erratically. Repeat steps 5 and 6 until engine speed increases smoothly.



Air Cleaner Housing

REMOVAL/INSTALLATION

Remove the following:

- Seat (page 2-2)
- Side cover (page 2-3).

Release the wires from the clamps on the air cleaner housing.

Remove the two screws and the fuse box.

Remove the air temperature switch from the stud on the air cleaner housing.

Remove the tube clip and disconnect the crankcase breather tube from the engine.

Remove the breather drain tube from the frame.

Loosen the connecting tube band and resonator band screws.

Remove the three mountings bolts and clamp.

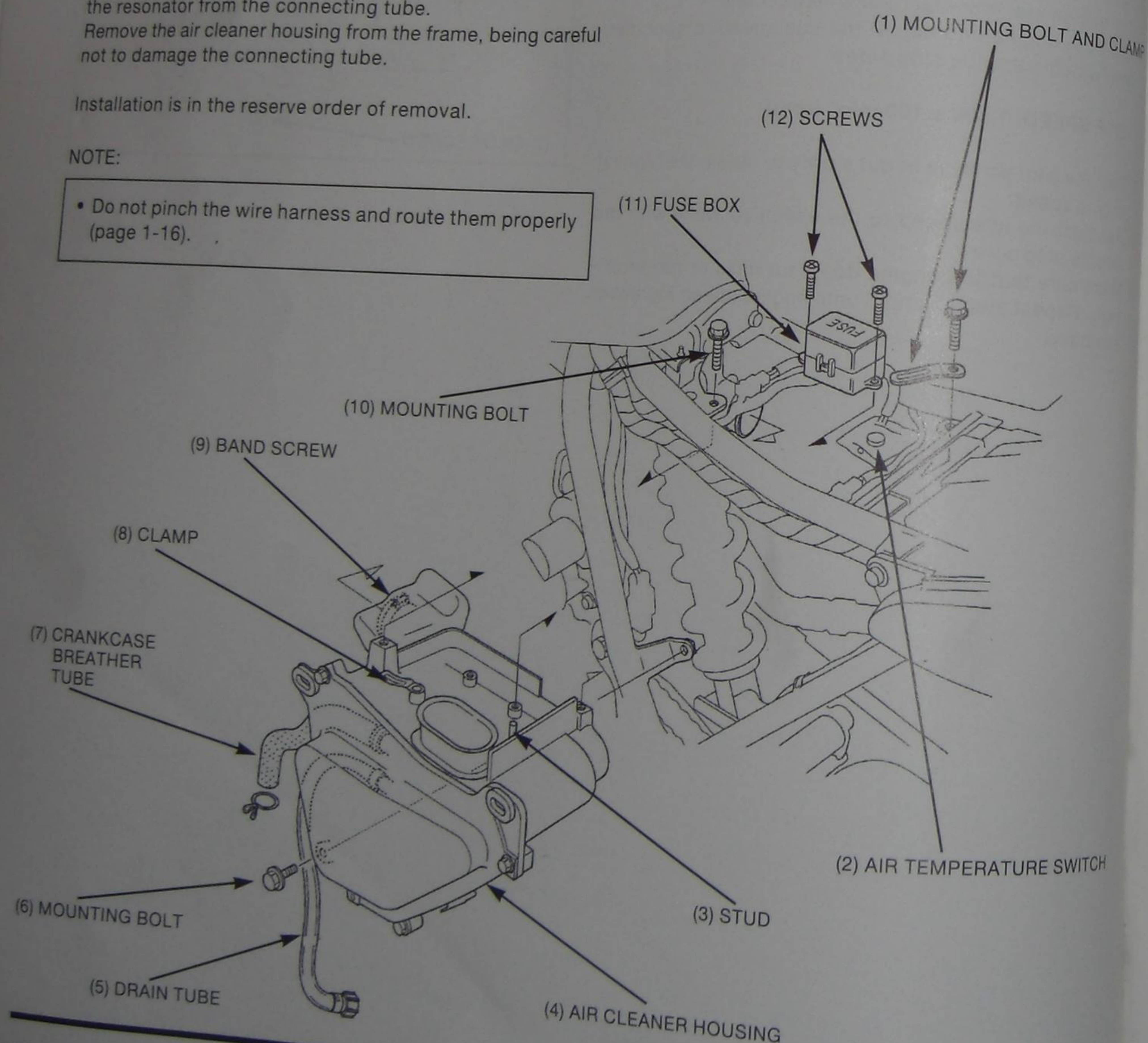
Release the connecting tube off the carburetor and remove the resonator from the connecting tube.

Remove the air cleaner housing from the frame, being careful not to damage the connecting tube.

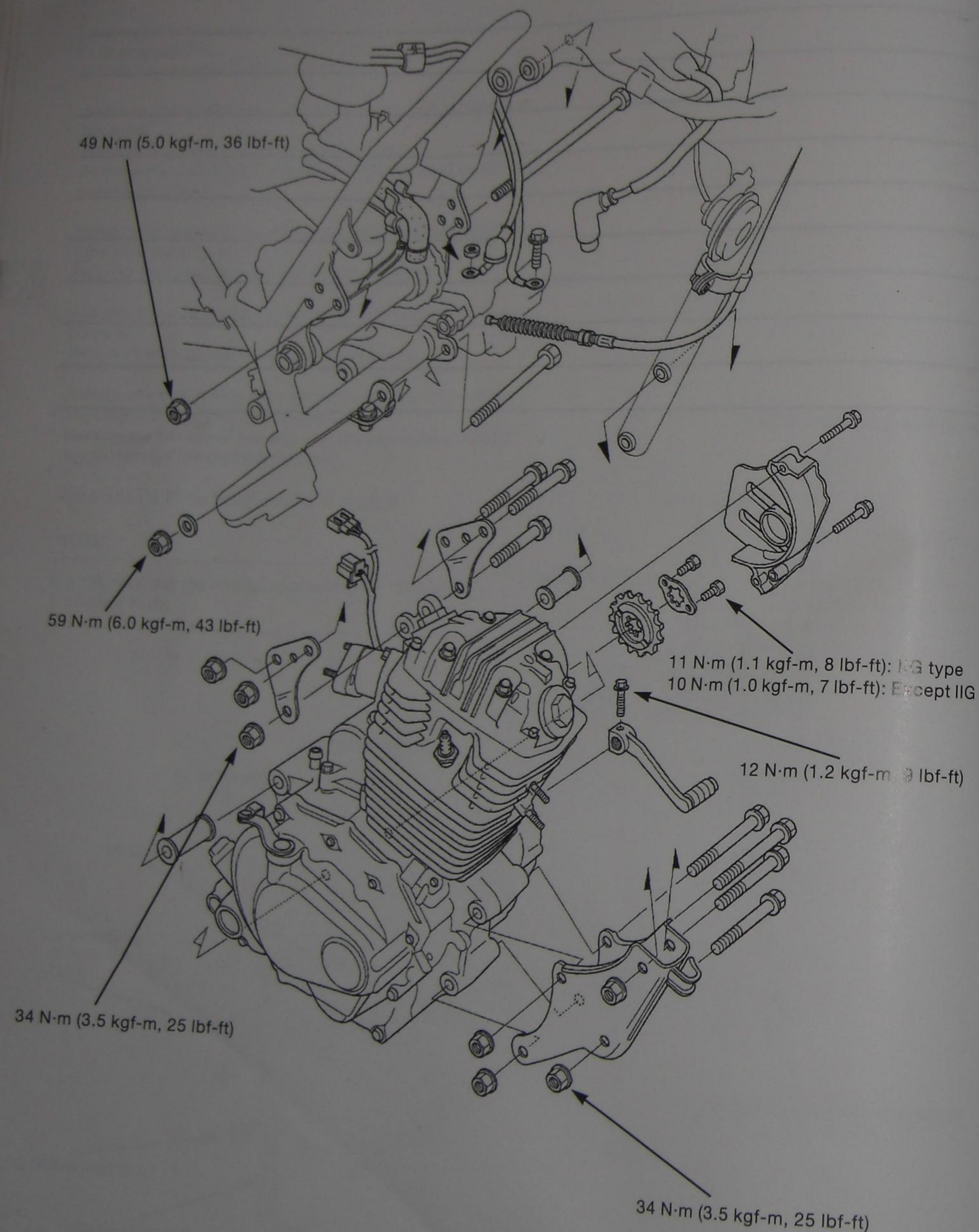
Installation is in the reserve order of removal.

NOTE:

- Do not pinch the wire harness and route them properly (page 1-16).



MEMO



6. Engine Removal/Installation

SERVICE INFORMATION
ENGINE REMOVAL6-1
6-2

ENGINE INSTALLATION

6-4

Service Information

GENERAL

- Tape the frame around the engine beforehand for frame protection.
- A safety stand or equivalent is required to support the motorcycle when removing and installing the engine.
- A floor jack or other adjustable support is required to support and maneuver the engine.
- The following components require engine removal for service:
 - Cylinder head /valve (section 7)
 - Cylinder/piston (section 8)
 - Crankcase/transmission/crankshaft (section 11)

SPECIFICATIONS

Item		Specifications
Engine dry weight		29 kg (64 lbs)
Engine oil capacity	At draining	10 liter (1.06 US qt, 0.88 Imp qt)
	At disassembly	1.2 liters (1.27 US qt, 1.06 Imp qt)

TORQUE VALUES

Front engine hanger nut	34 N·m (3.5 kgf-m, 25 lbf-ft)
Upper engine hanger nut	34 N·m (3.5 kgf-m, 25 lbf-ft)
Rear upper engine mounting nut	49 N·m (5.0 kgf-m, 36 lbf-ft)
Rear lower engine mounting nut	59 N·m (6.0 kgf-m, 43 lbf-ft)
Drive sprocket bolt (IIG type)	11 N·m (1.1 kgf-m, 8 lbf-ft)
Gearshift pedal bolt	12 N·m (1.2 kgf-m, 9 lbf-ft)

One-way bolt: replace with a new one

Engine Removal

Drain the engine oil (page 3-8).

Remove the following:

- Fuel tank (page 2-2)
- Side cover (page 2-3)
- Under guard (page 2-3)
- Exhaust system (page 2-4)
- Carburetor assembly (page 5-3)
- Brake pedal (page 13-10)

Loosen the rear axle nut and turn the chain adjusters to loosen the drive chain (page 13-3).

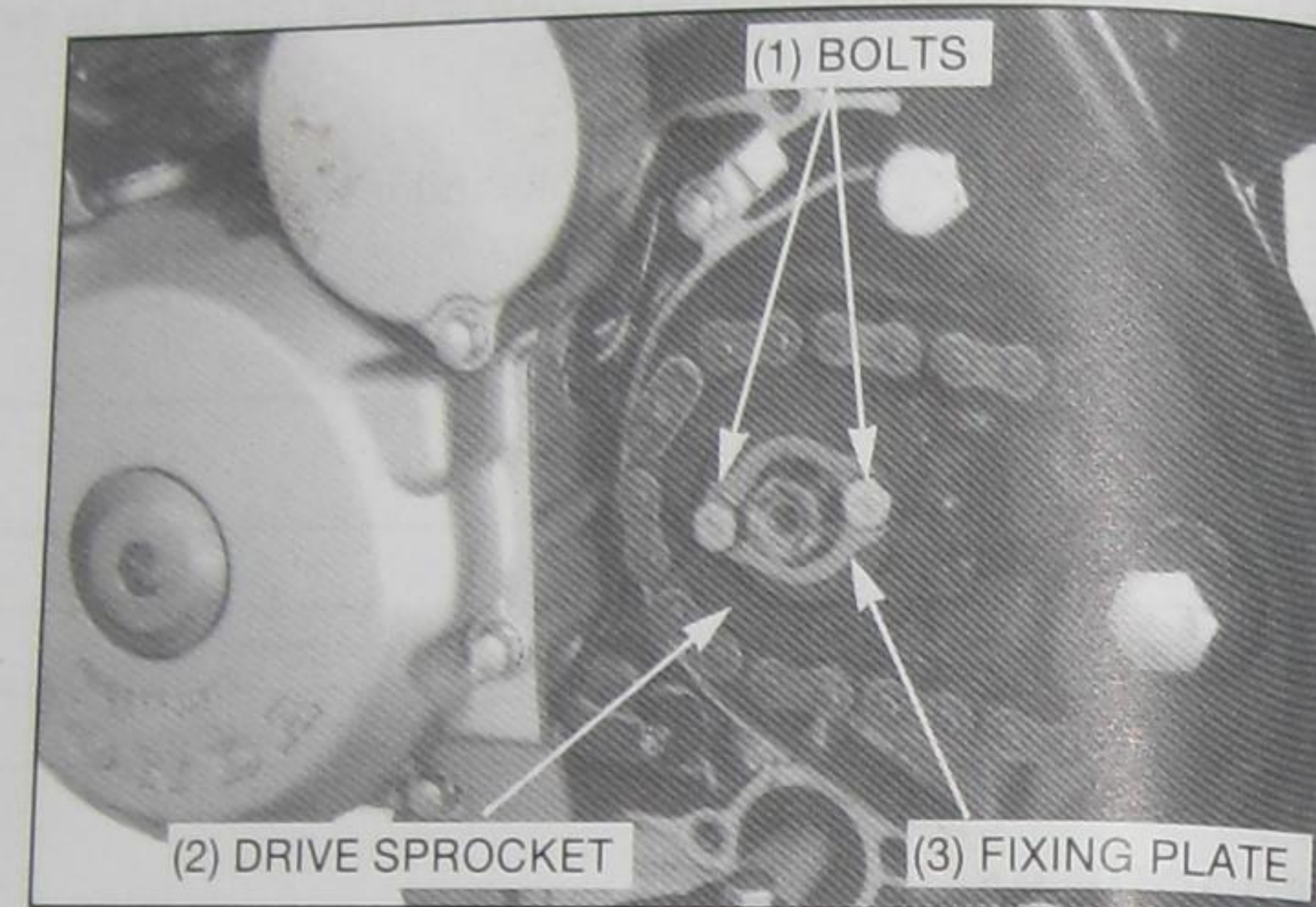
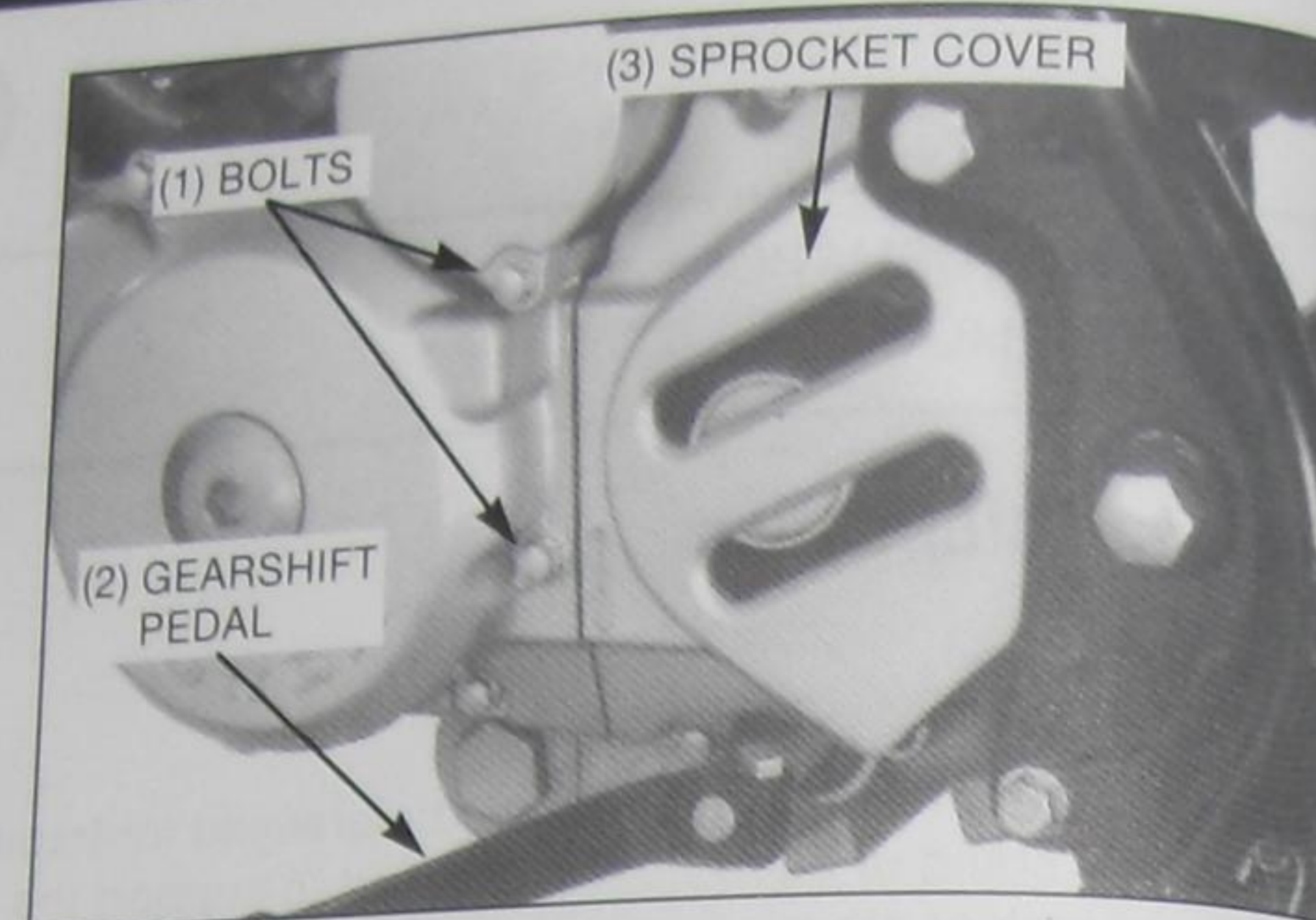
Remove the two bolts and the drive sprocket cover.

Remove the two fixing plate bolts.

Remove the fixing plate by aligning the splines of the plate and counter shaft.

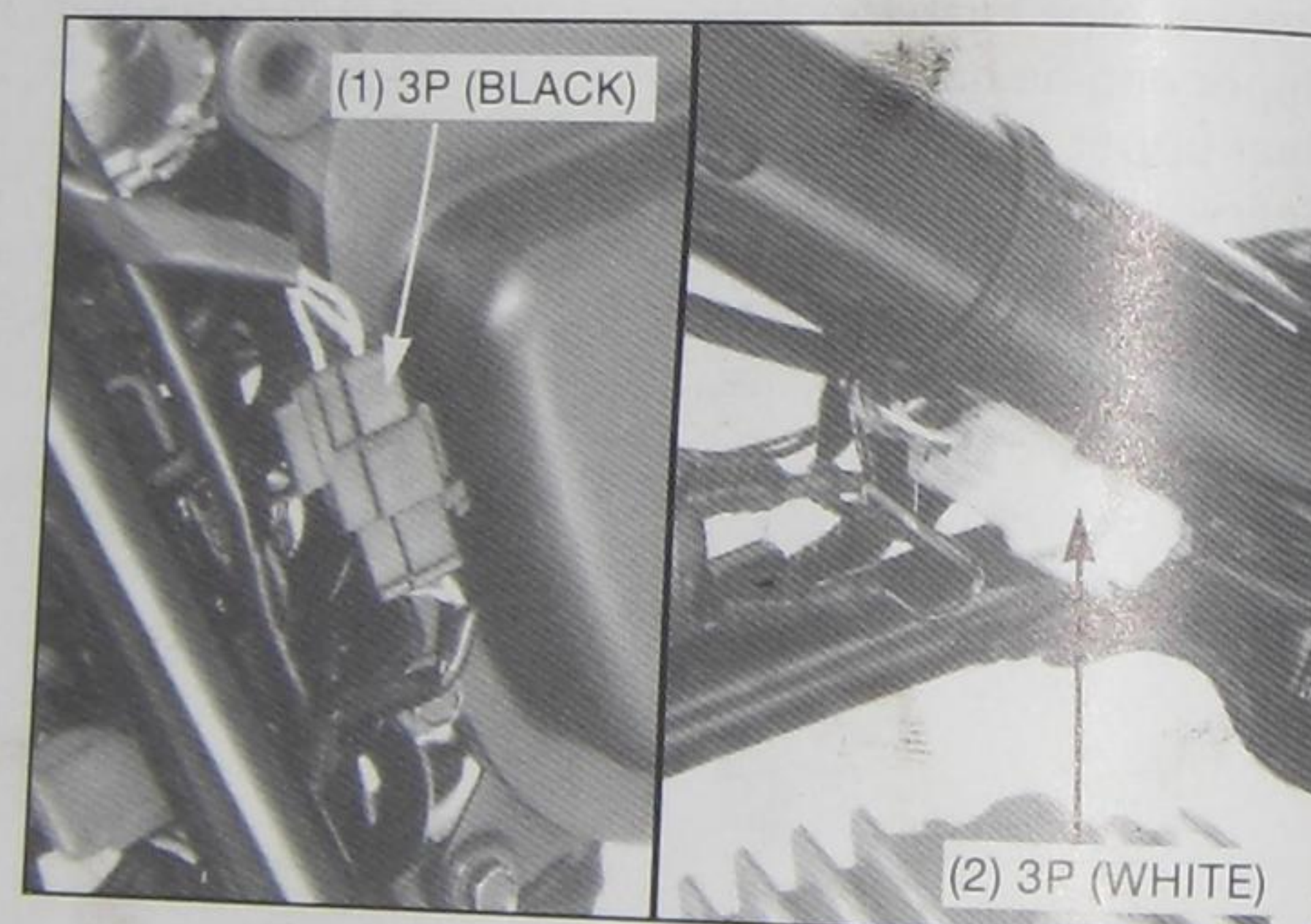
Pull the drive sprocket off the countershaft and remove it from the drive chain.

Remove the pinch bolt and the gearshift pedal.

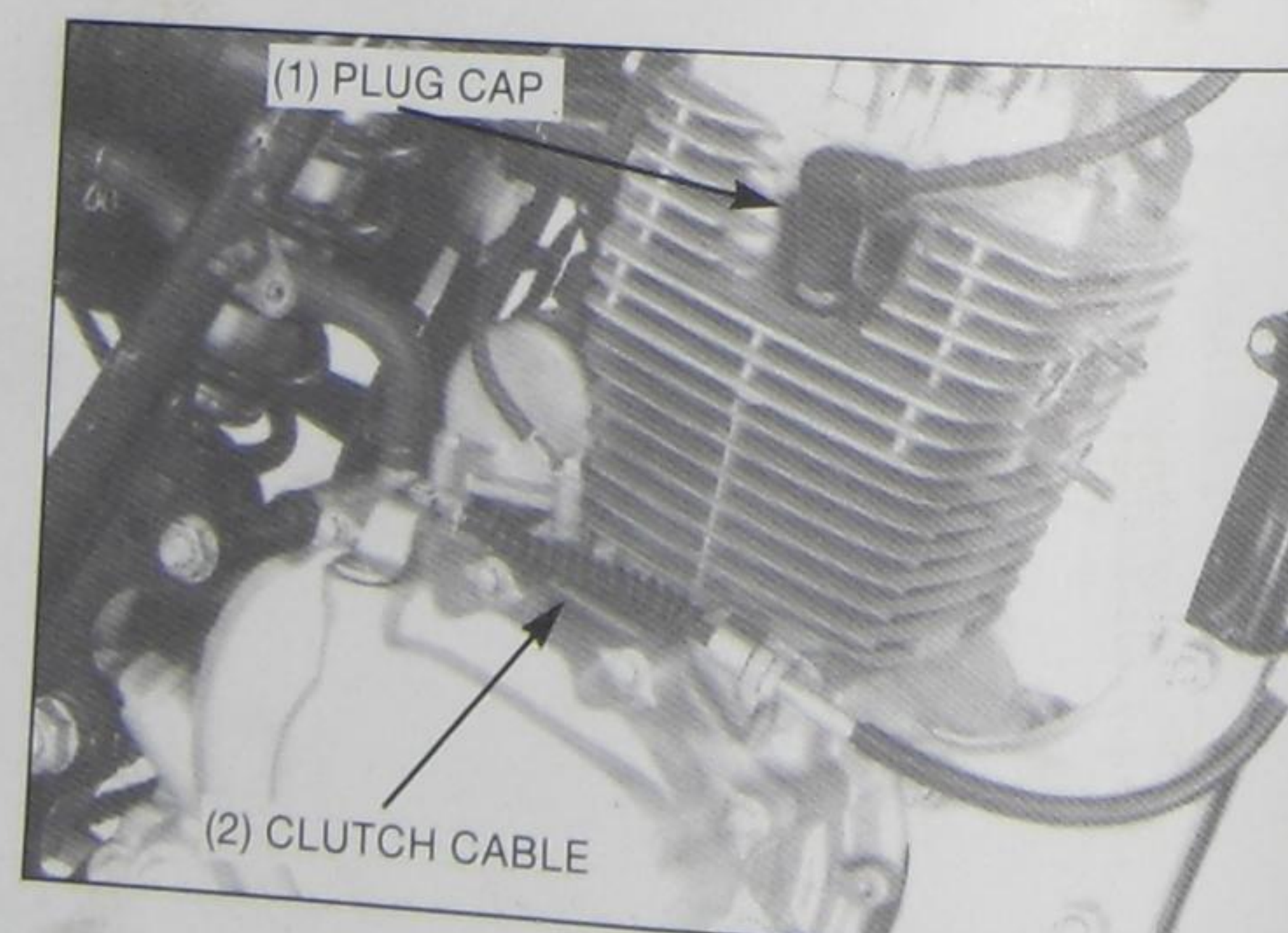


Disconnect the following:

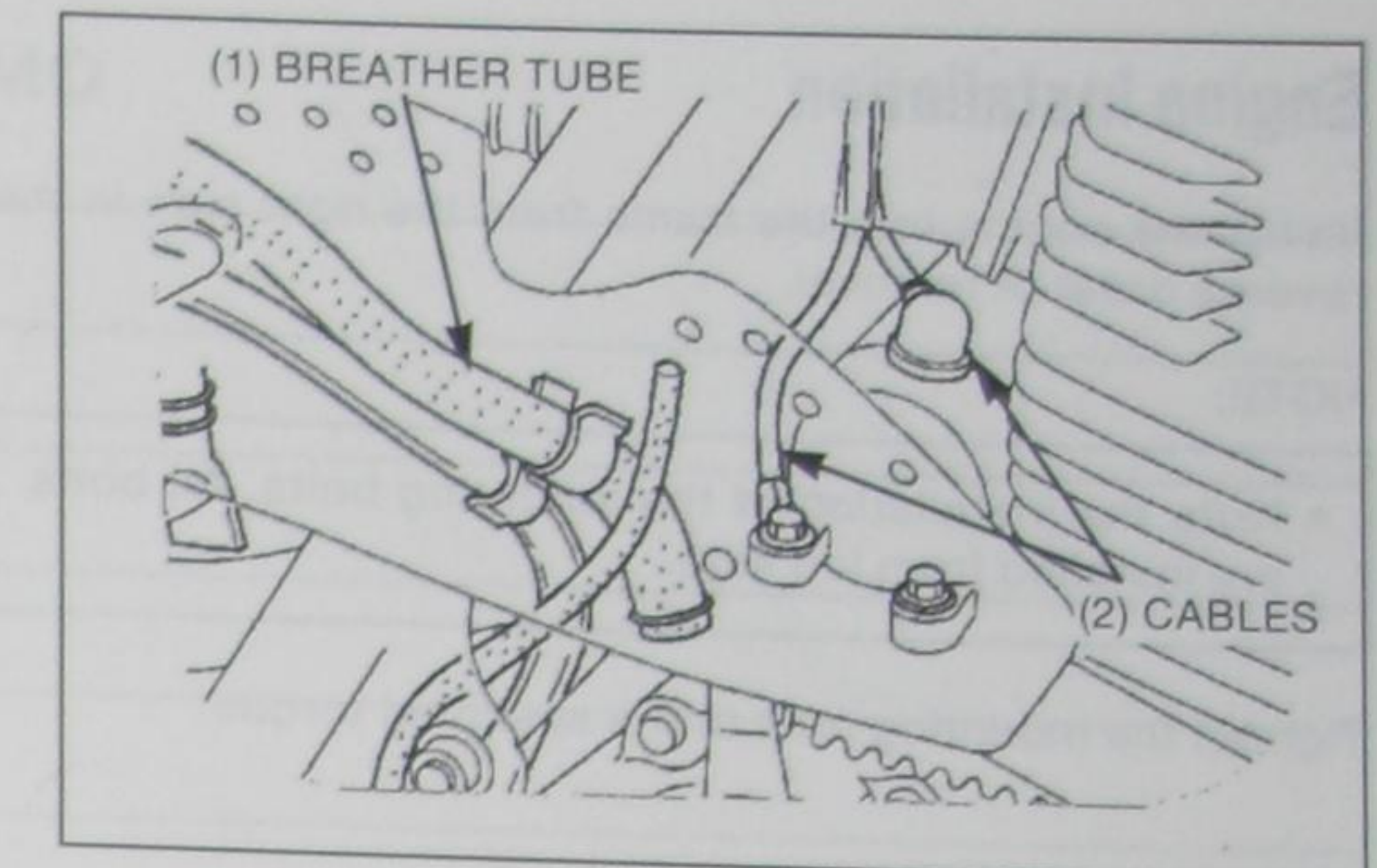
- Alternator 3P (Black) connector
- Ignition pulse generator/neutral switch 3P (White) connector



- Spark plug cap
- Clutch cable



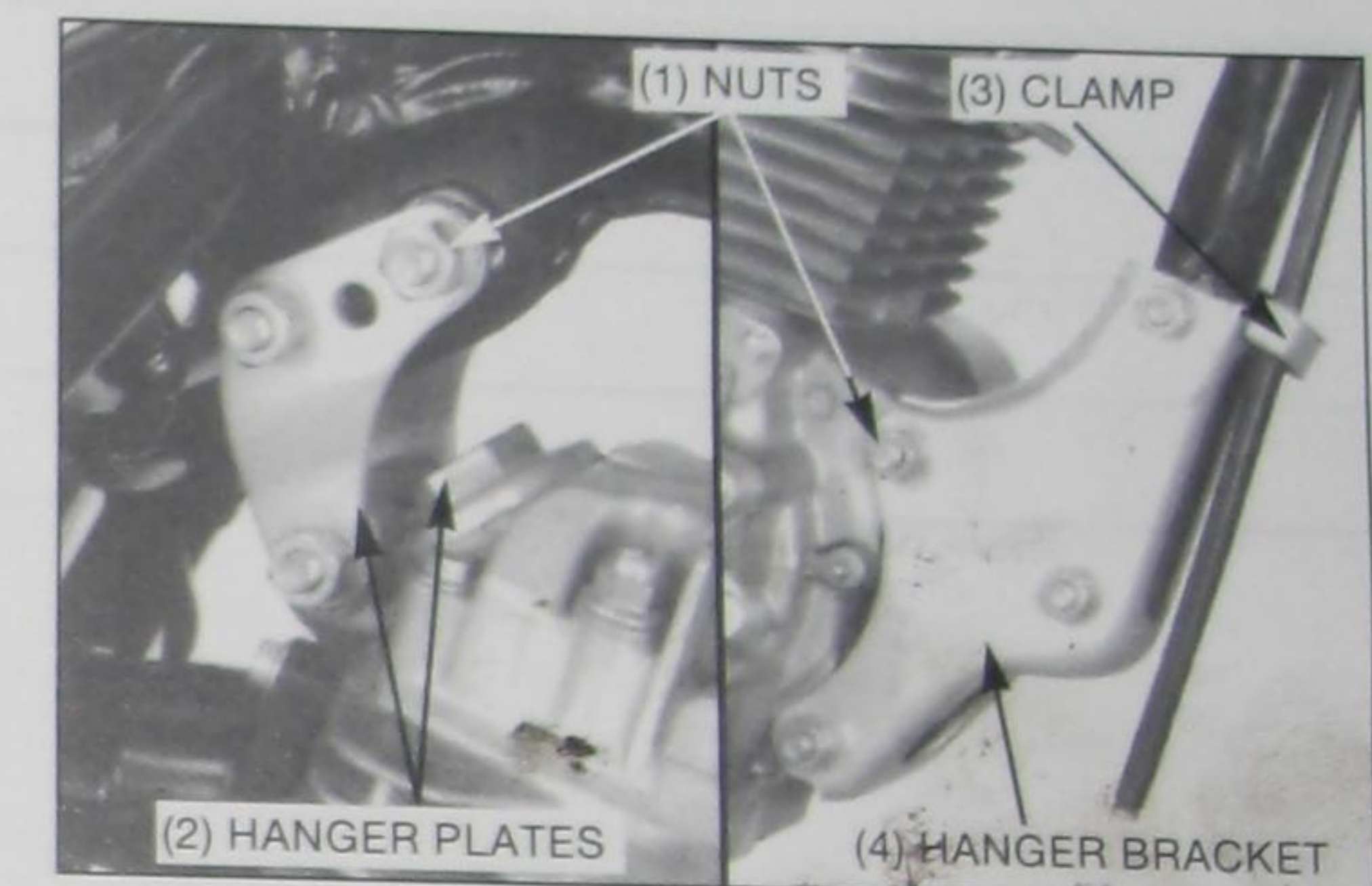
- Crankcase breather tube
- Starter motor cable and ground cable



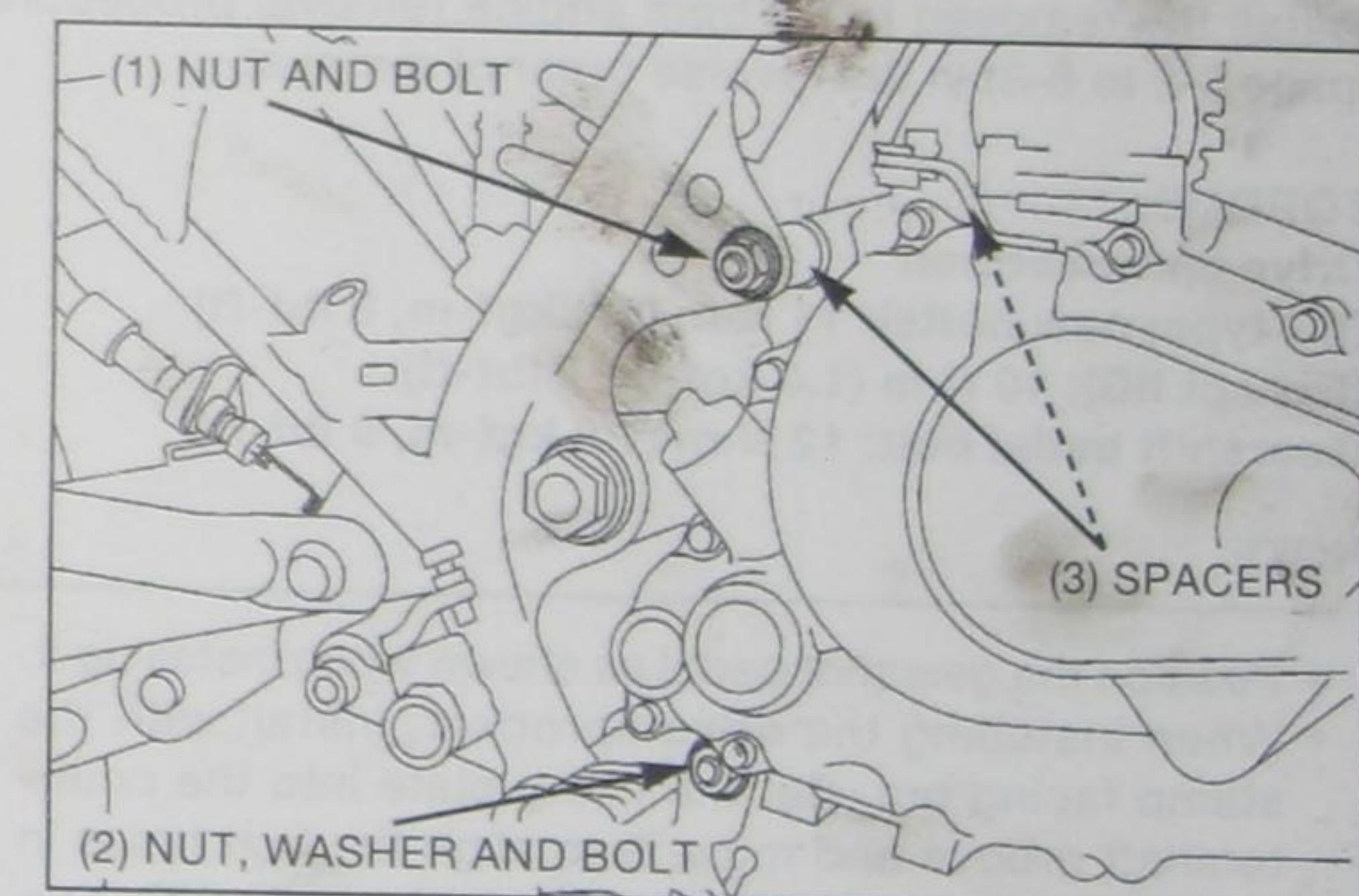
Support the engine with a floor jack or other adjustable support.

Remove the following:

- Upper mounting nuts, bolts and hanger plates.
- Front mounting nuts, bolts and hanger bracket.
- Clutch cable from clamp



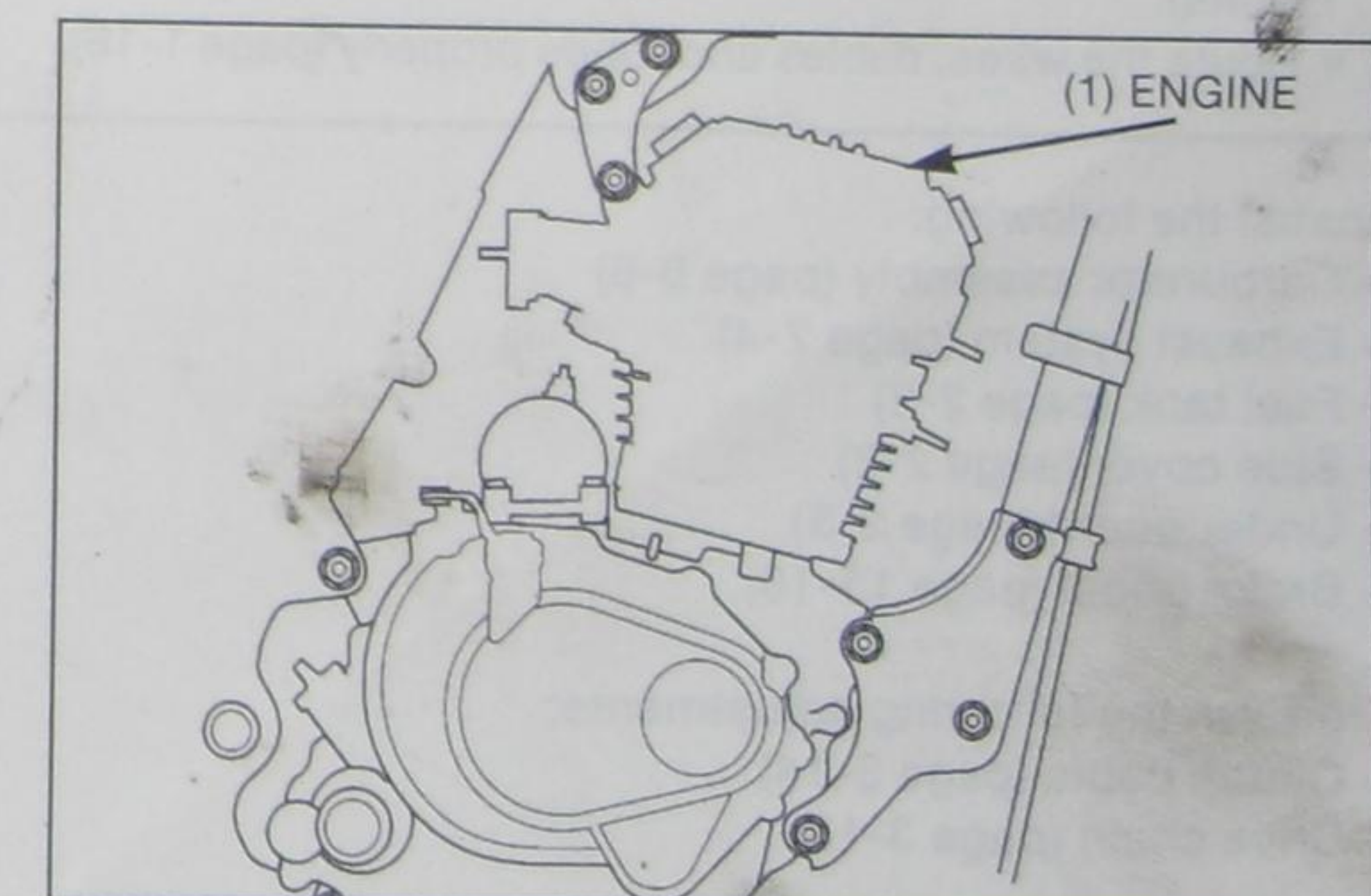
- Rear upper mounting nut, bolt and spacers (left: short/ right: long)
- Rear lower mounting nut, washer and bolt.



CAUTION

- During engine assembly removal, hold the engine securely and be careful not to damage the frame and engine.

Remove the engine out of the frame to the right.



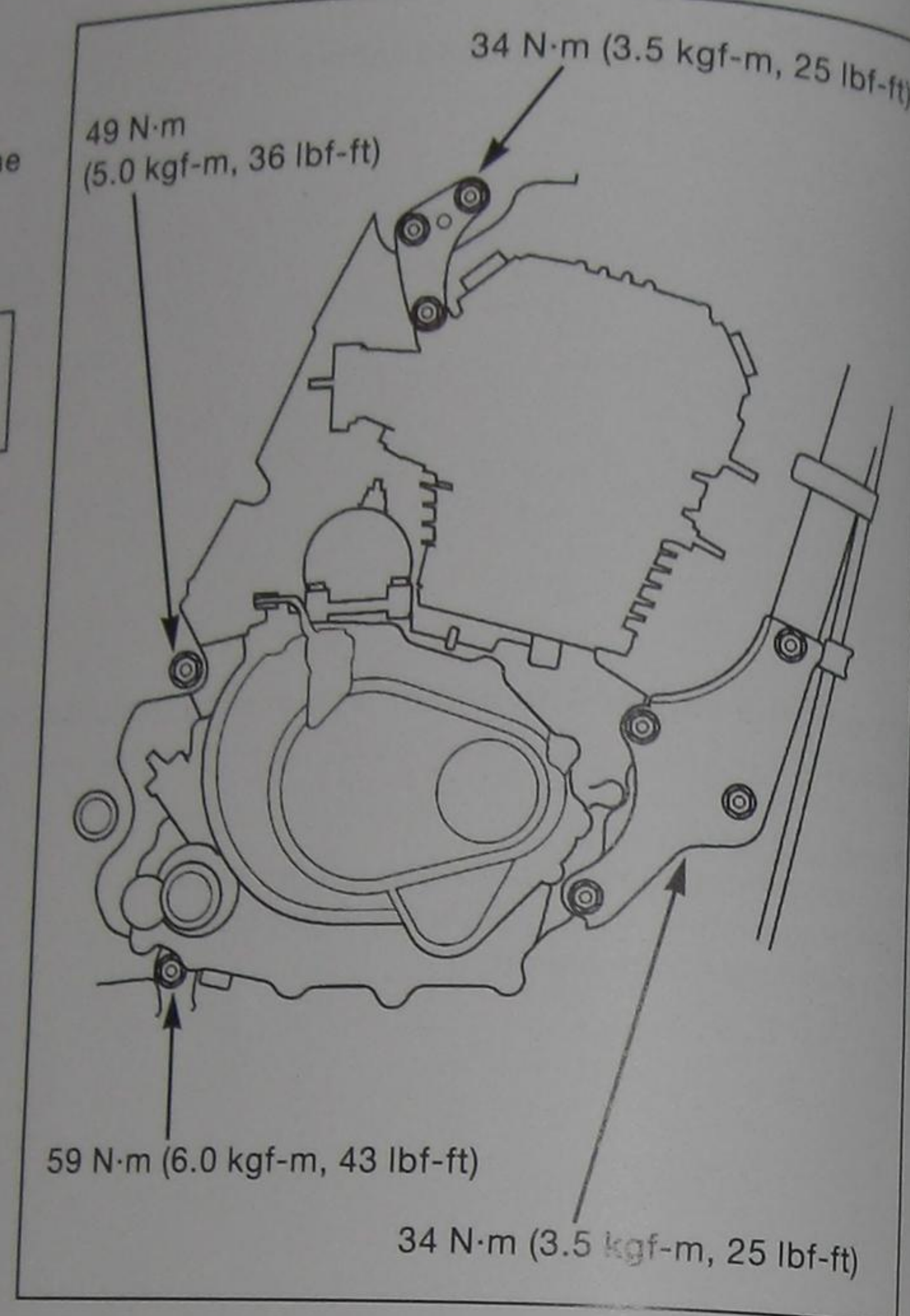
Engine Installation

Install the engine into the frame from the right side in the reverse order of removal.

NOTE:

- Note the installation of the mounting bolts. All bolts are installed from left side.

Tighten the mounting nuts to the specified torque.



Install the removed parts from engine removal procedure (page 6-2 to 6-3) in the reverse order of removal.

TORQUE:

Drive sprocket bolt

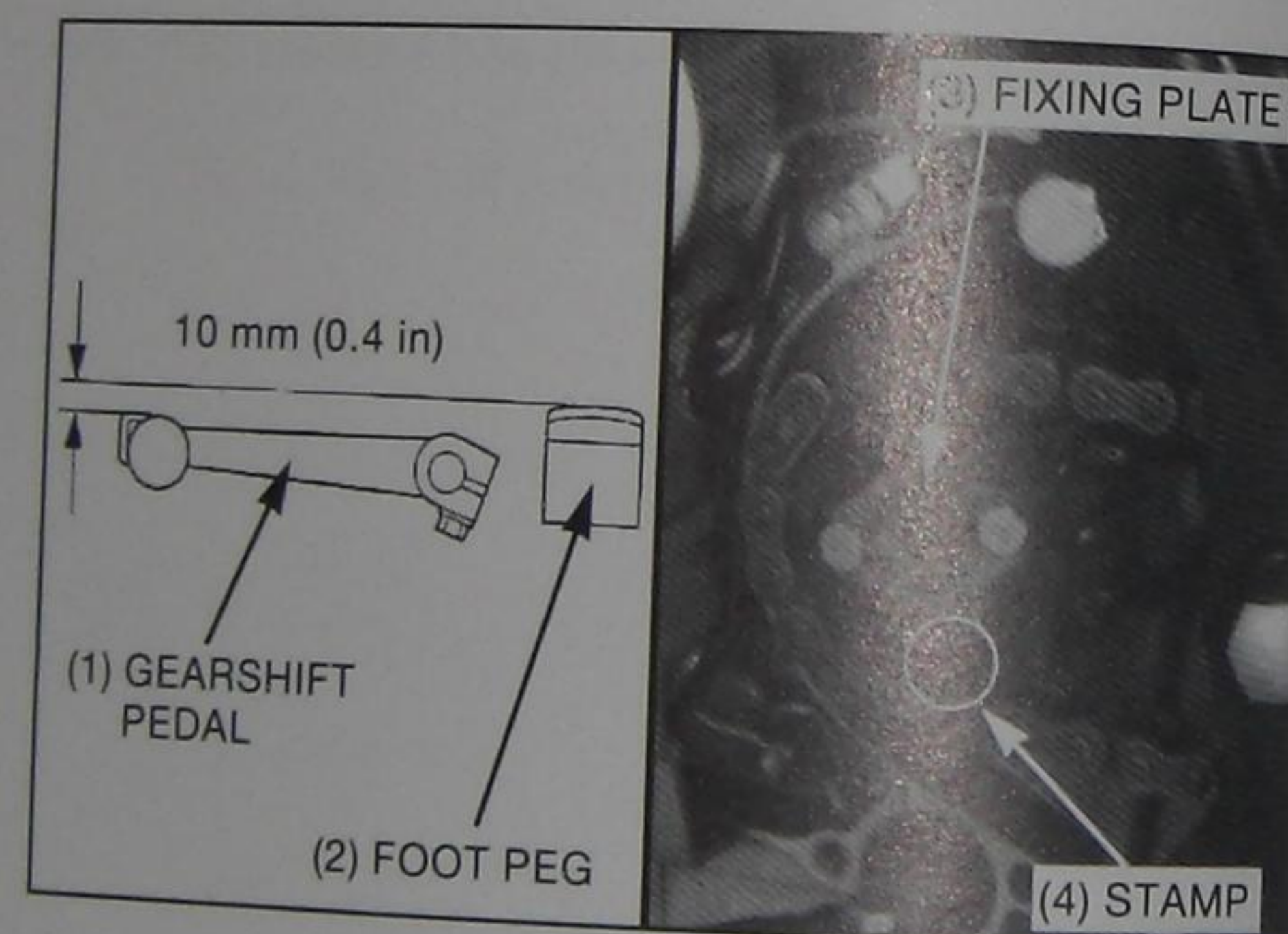
(IIG type; new bolts): 11 N·m (1.1 kgf-m, 8 lbf-ft)

(Except IIG): 10 N·m (1.0 kgf-m, 7 lbf-ft)

Gearshift pedal bolt: 12 N·m (1.2 kgf-m, 9 lbf-ft)

NOTE:

- Position the gearshift pedal as shown when installing it.
- When installing the drive sprocket, install with the stamp facing out. Set the fixing plate into the countershaft groove and move it to align the bolt holes in the plate and sprocket, then tighten the bolts (IIG: new bolts).
- Route the wires, cables and tubes properly (page 1-16).



MEMO

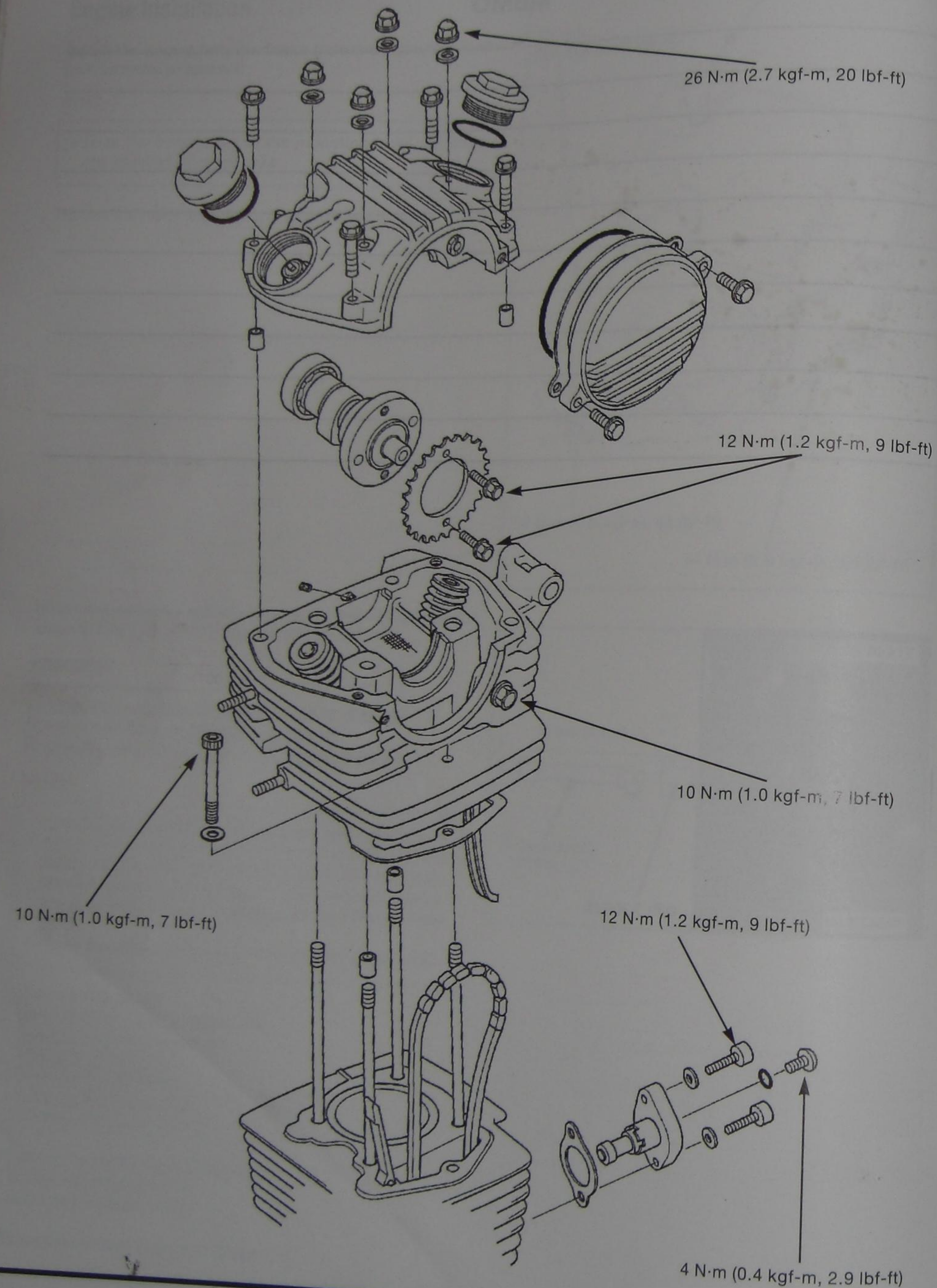
Install the following:

- Carburetor assembly (page 5-8)
- Exhaust system (page 2-4)
- Fuel tank (page 2-2)
- Side cover (page 2-3)
- Under guard (page 2-3)
- Brake pedal (page 13-10).

Perform the following adjustments:

- Clutch cable (page 3-14)
- Drive chain (page 3-10).

Fill recommended engine oil (page 3-8).



7-0

7. Cylinder Head/Valve

SERVICE INFORMATION			
TROUBLESHOOTING	7-1	VALVE GUIDE REPLACEMENT	7-9
CYLINDER COMPRESSION	7-2	VALVE SEAT INSPECTION/REFACING	7-10
CYLINDER HEAD COVER/CAMSHAFT REMOVAL	7-3	CYLINDER HEAD ASSEMBLY	7-13
CYLINDER HEAD REMOVAL	7-3	CYLINDER HEAD INSTALLATION	7-14
CYLINDER HEAD DISASSEMBLY	7-6	CYLINDER HEAD COVER/CAMSHAFT INSTALLATION	7-15
	7-7		

Service Information

GENERAL

- This section covers service of the camshaft, rocker arms, cylinder head and valves. To service these parts, the engine must be removed from the frame.
- When disassembling, mark and store the disassembled parts to ensure that they are reinstalled in their original locations.
- Clean all disassembled parts with cleaning solvent and dry them by blowing them off with compressed air before inspection.
- Camshaft and rocker arm lubricating oil is fed through oil passages in the cylinder head. Clean the oil passages before assembling cylinder head.
- Be careful not to damage the mating surfaces of the cylinder head cover and cylinder head.

SPECIFICATIONS

Unit: mm (in)

Item			Standard	Service Limit
Cylinder compression			1,373 ± 98 kPa (14.0 ± 1.0 kgf/cm ² , 199 ± 14 psi) at 600 min ⁻¹ (rpm)	—
Valve clearance			0.10 ± 0.02 (0.004 ± 0.001)	—
Camshaft	Cam lobe height	IN	0.10 ± 0.02 (0.004 ± 0.001)	—
		EX	0.10 ± 0.02 (0.004 ± 0.001)	—
	Runout	IN	31.402-31.582 (1.2363-1.2434)	31.10 (1.224)
		EX	31.082-31.262 (1.2237-1.2308)	30.70 (1.209)
Cylinder head warpage			—	0.05 (0.002)
Rocker arm	I.D		—	0.10 (0.004)
	Shaft O.D		12.000-12.018 (0.4724-0.4731)	12.05 (0.474)
	Rocker arm-to-shaft clearance		11.966-11.984 (0.4711-0.4718)	11.93 (0.470)
Valve	Stem O.D	IN	0.016-0.052 (0.0006-0.0020)	0.08 (0.003)
		EX	5.450-5.465 (0.2146-0.2052)	5.42 (0.213)
	Guide I.D	IN	5.430-5.445 (0.2138-0.2144)	5.40 (0.213)
		EX	5.475-5.485 (0.2156-0.2159)	5.50 (0.217)
	Stem-to guide clearance	IN	5.475-5.485 (0.2156-0.2159)	5.50 (0.217)
		EX	0.010-0.035 (0.0004-0.0014)	0.08 (0.003)
	Spring free length	Outer	0.030-0.055 (0.0012-0.0022)	0.10 (0.004)
		Inner	44.9 (1.77)	43.5 (1.71)
Valve seat width			39.2 (1.54)	38.0 (1.50)
			1.1-1.3 (0.04-0.05)	1.5 (0.06)

7-1

TORQUE VALUES

Cam chain tensioner slider pivot bolt	10 N·m (1.0 kgf-m, 7 lbf-ft)	Apply oil to the threads and seating surface.
Cam sprocket bolt	12 N·m (1.2 kgf-m, 9 lbf-ft)	
Cylinder head cover cap nut	26 N·m (2.7 kgf-m, 20 lbf-ft)	
Cylinder head socket bolt	10 N·m (1.0 kgf-m, 7 lbf-ft)	
Cam chain tensioner mounting bolt	12 N·m (1.2 kgf-m, 9 lbf-ft)	
Cam chain tensioner sealing screw	4 N·m (0.4 kgf-m, 2.9 lbf-ft)	

TOOLS

Valve spring compressor	07757-0010000
Valve guide driver, 5.5 mm	07742-0010100
Valve guide reamer	07984-0980001
Seat cutter, 33 mm (45° IN)	07780-0010800
Seat cutter, 27.5 mm (45° EX)	07780-0010200
Flat cutter, 33 mm (32° IN)	07780-0012900
Flat cutter, 30 mm (32° EX)	07780-0012200
Interior cutter, 30mm (60° IN/EX)	07780-0014000
Cutter holder, 5.5 mm	07781-0010101

Troubleshooting

Engine top-end problems usually affect engine performance. These can be diagnosed by a compression test, or by tracing top-end noises with a sounding rod or stethoscope.

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

- Valves
 - Incorrect valve clearance
 - Burned or bent valve
 - Incorrect valve timing
 - Broken valve spring
 - Uneven valve seating
- Cylinder head
 - Leaking or damaged cylinder head gasket
 - Warped or cracked cylinder head
 - Loose spark plug
- Cylinder/piston (section 8)

Compression too high

- Excessive carbon built-up on piston or combustion chamber.

Excessive smoke

- Worn valve stem or valve guide
- Damaged stem seal
- Cylinder/piston problem (section 8)

Excessive noise

- Incorrect valve clearance
- Sticking valve or broken valve spring
- Worn or damaged camshaft
- Worn or damaged rocker arm and/or shaft
- Worn or damaged cam sprocket teeth
- Worn cam chain
- Worn or damaged cam chain tensioner
- Worn cam sprocket teeth
- Cylinder/piston problem (section 8)

Rough idle

- Low cylinder compression

Cylinder Compression

Warm up the engine to normal operating temperature. Stop the engine and remove the spark plug cap and park plug.

Install the compression gauge into the spark plug hole. Shift the transmission in neutral and open the choke lever (OFF). Open the throttle all the way and crank the engine with the starter motor until the gauge reading stops rising. The maximum reading is usually reached within 4-7 seconds.

COMPRESSION PRESSURE:

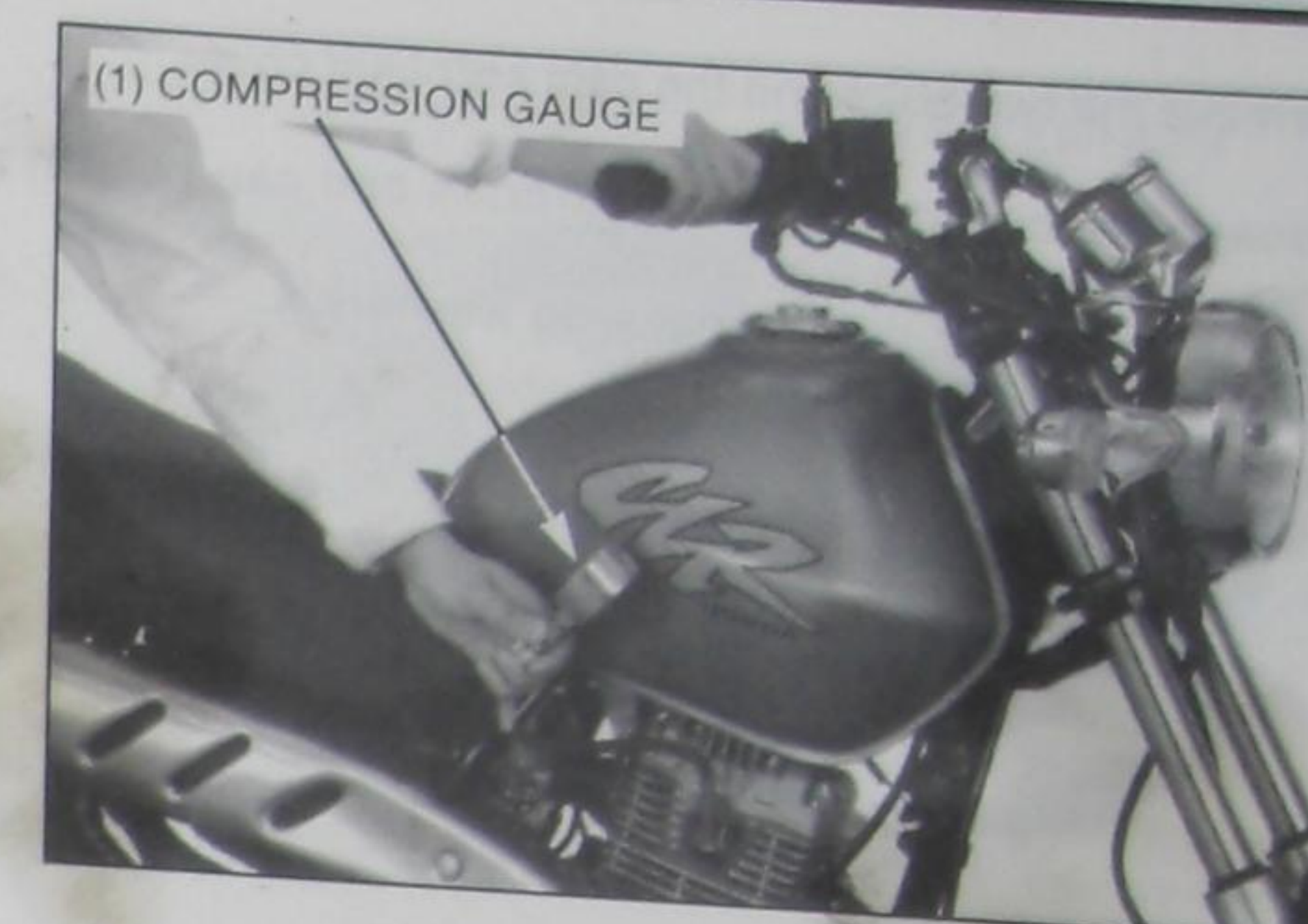
1,373 ± 98 kPa (14.0 ± 1.0 kgf/cm², 199 ± 14 psi) at 600 min⁻¹ (rpm)

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

If compression is low, pour 3-5 cm³ (0.1-0.2 oz) of clean engine oil into the cylinder through the spark plug hole and recheck the compression.

If the compression increases from the previous value, check the cylinder, piston and piston ring.

If compression is the same as the previous value, check the valves and cylinder head for leakage.



Cylinder Head Cover/Camshaft Removal

HEAD COVER REMOVAL

Remove the engine from the frame (section 7).

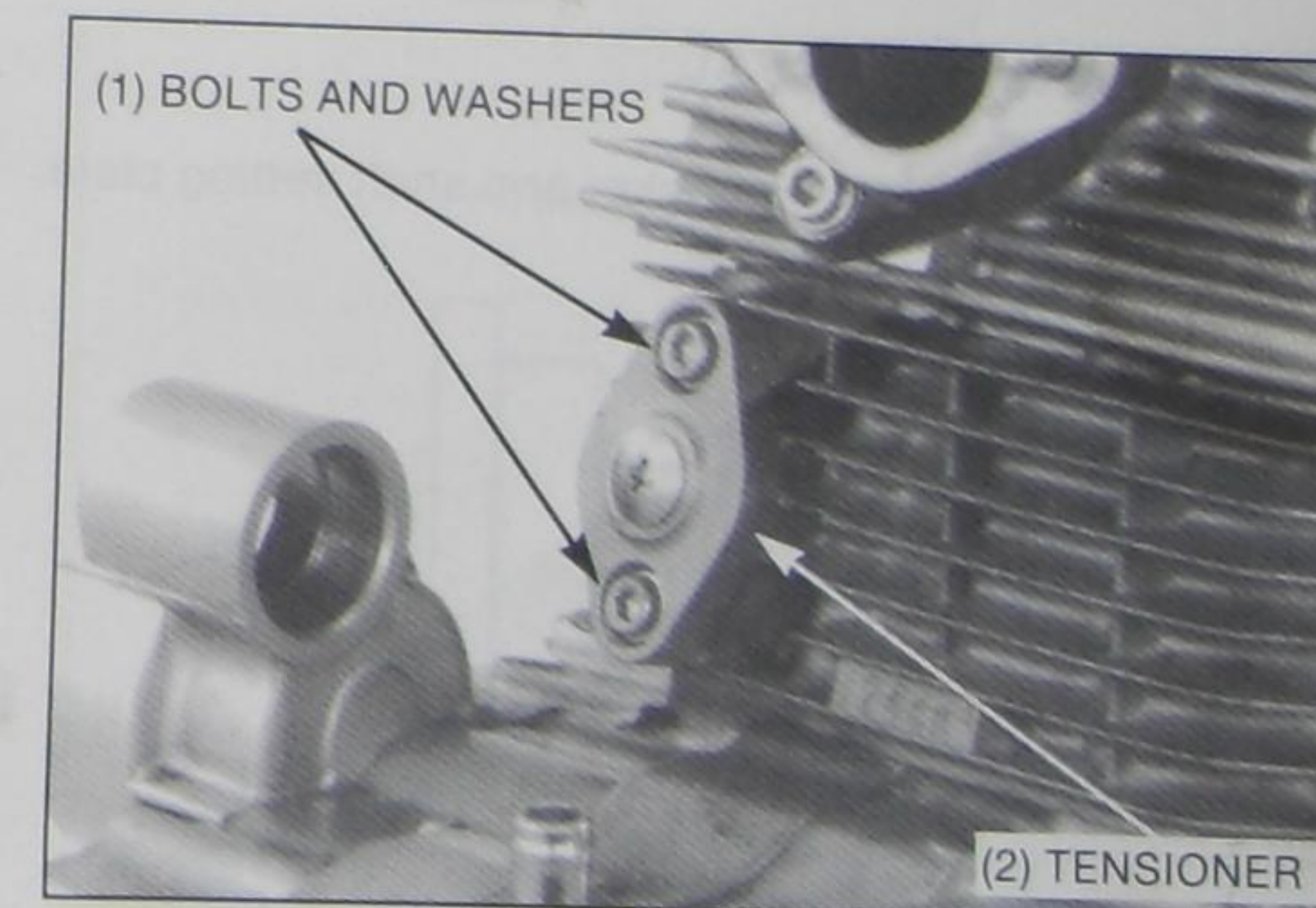
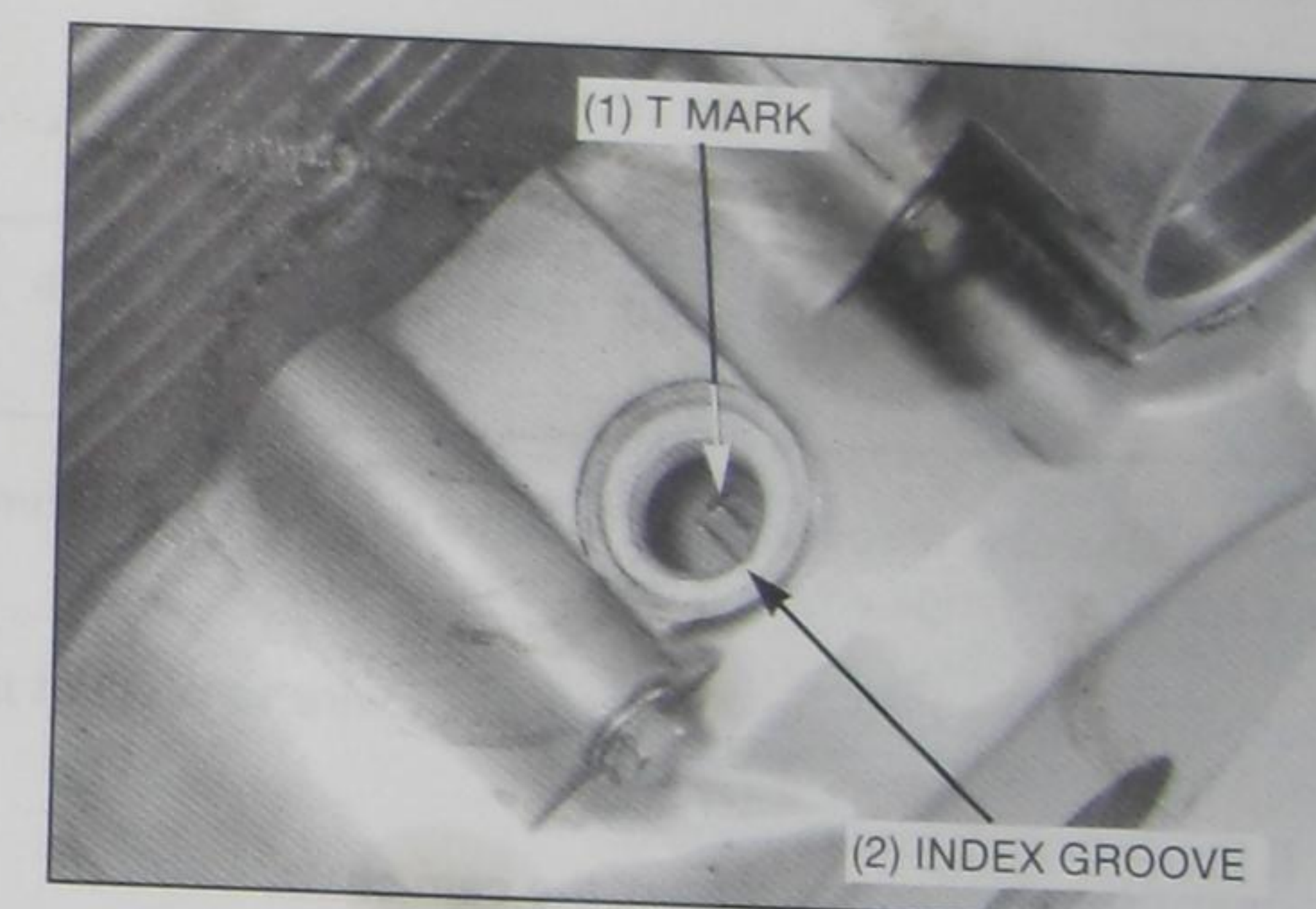
Remove the starter motor (page 17-4).

Remove the timing hole and crankshaft hole caps. Rotate the crankshaft counterclockwise to align the T mark on the flywheel with the index groove in the crankcase cover.

Remove the valve hole cap. Make sure the piston is at TDC (Top Dead Center) on the compression stroke.

This position can be obtained by confirming that there is slack in the rocker arm. If there is no slack, it is because the piston is moving through the exhaust stroke to TDC. Rotate the crankshaft one full turn counterclockwise and match up the T mark again.

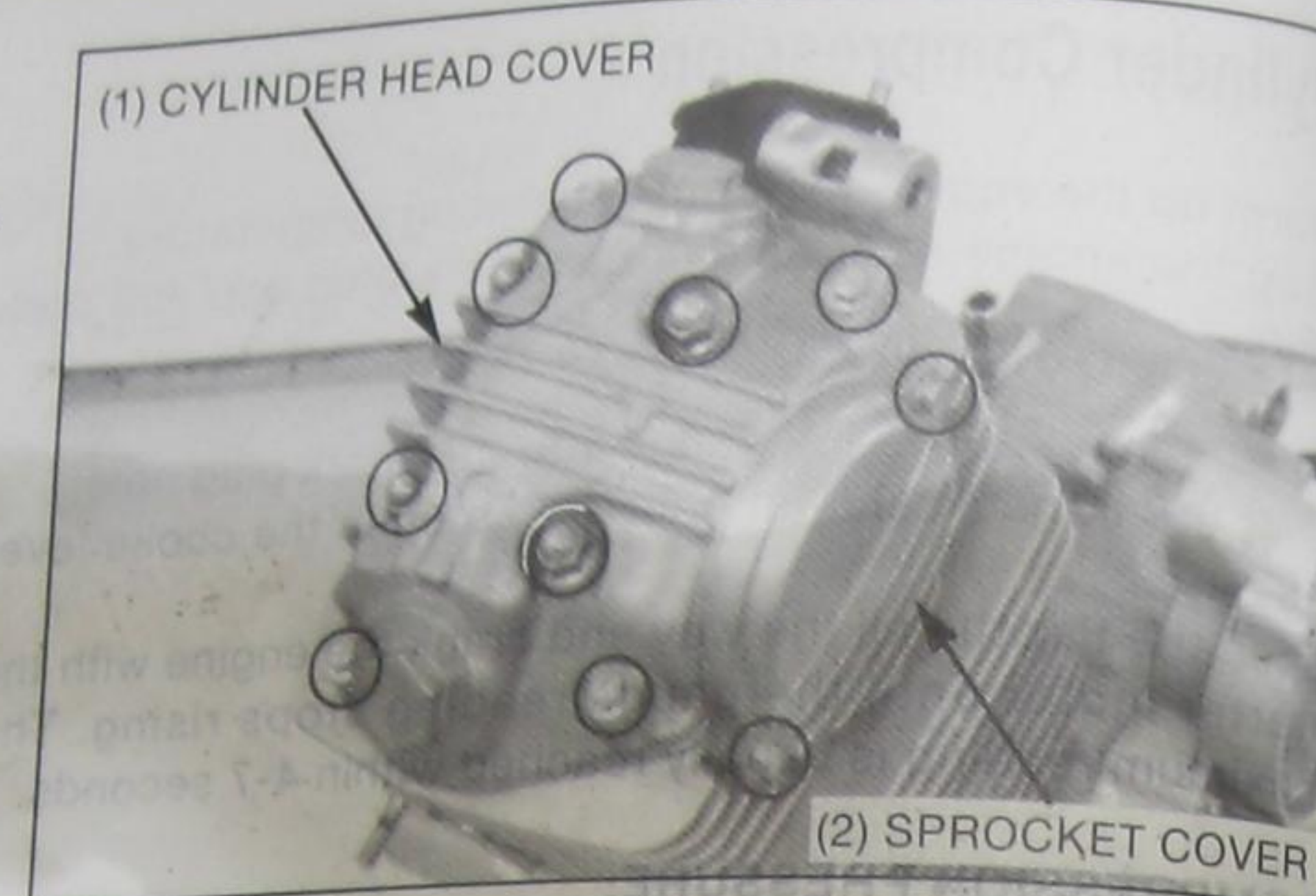
Remove the cam chain tensioner by loosening the two bolts alternately.



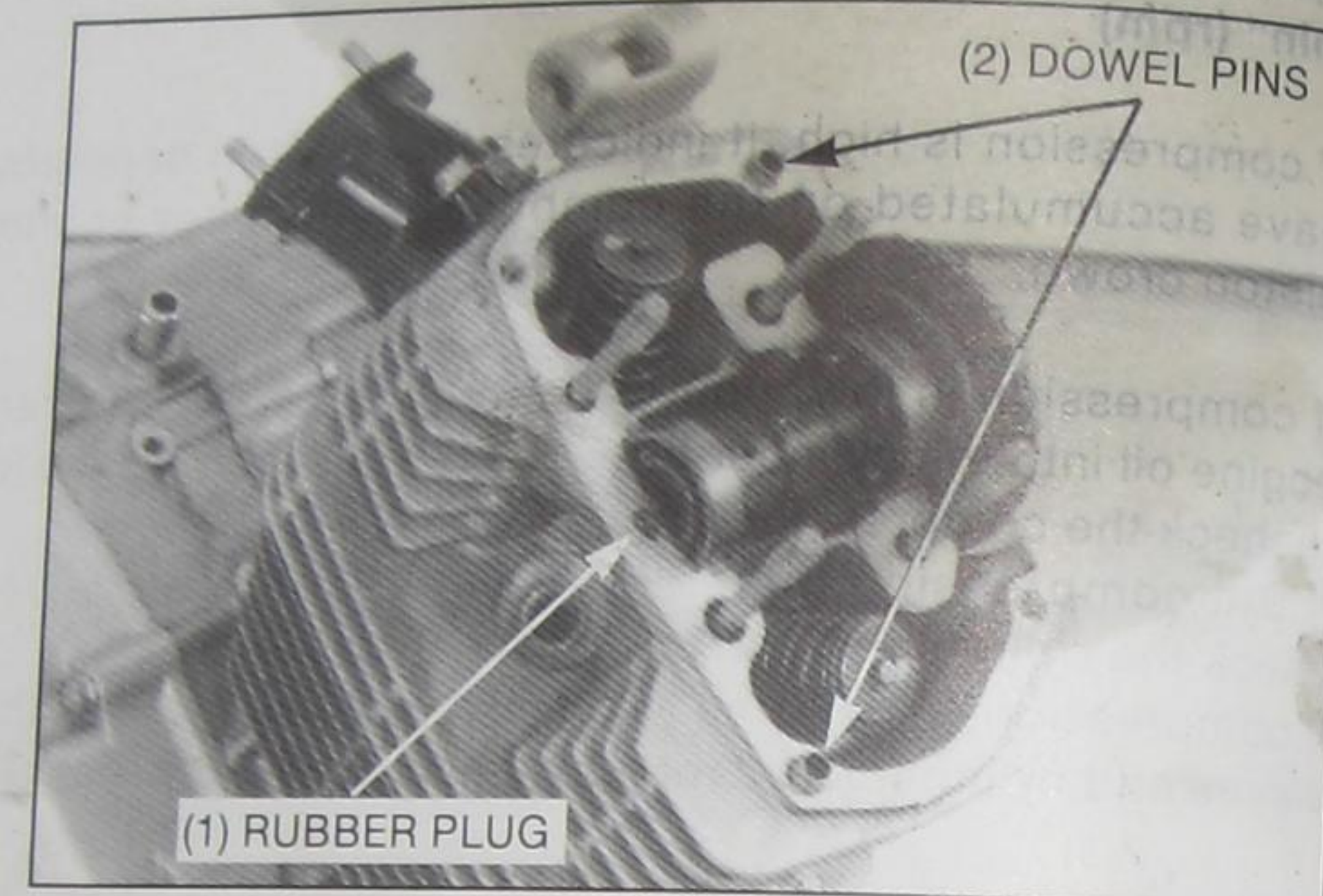
CYLINDER HEAD/VALVE

Remove the two bolts and the cam sprocket cover.

Loosen the cylinder head cover bolts and cap nuts in a crisscross pattern in 2 or 3 steps.
Remove the bolts, nuts and sealing washers.
Remove the cylinder head cover.



Remove the rubber plug and dowel pins.



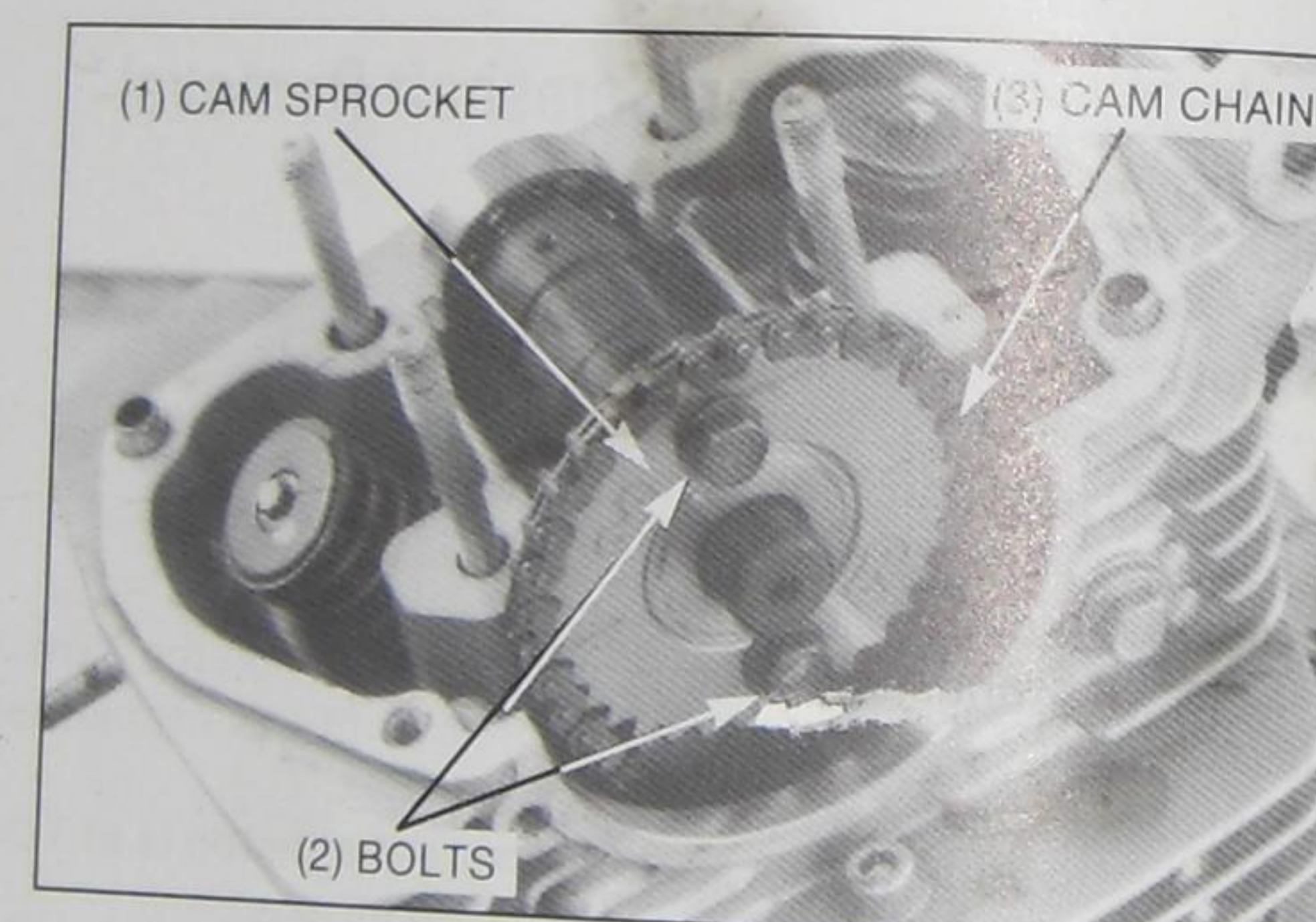
CAMSHAFT REMOVAL

NOTE:

- Be careful not to let the sprocket bolts fall into the crankcase.

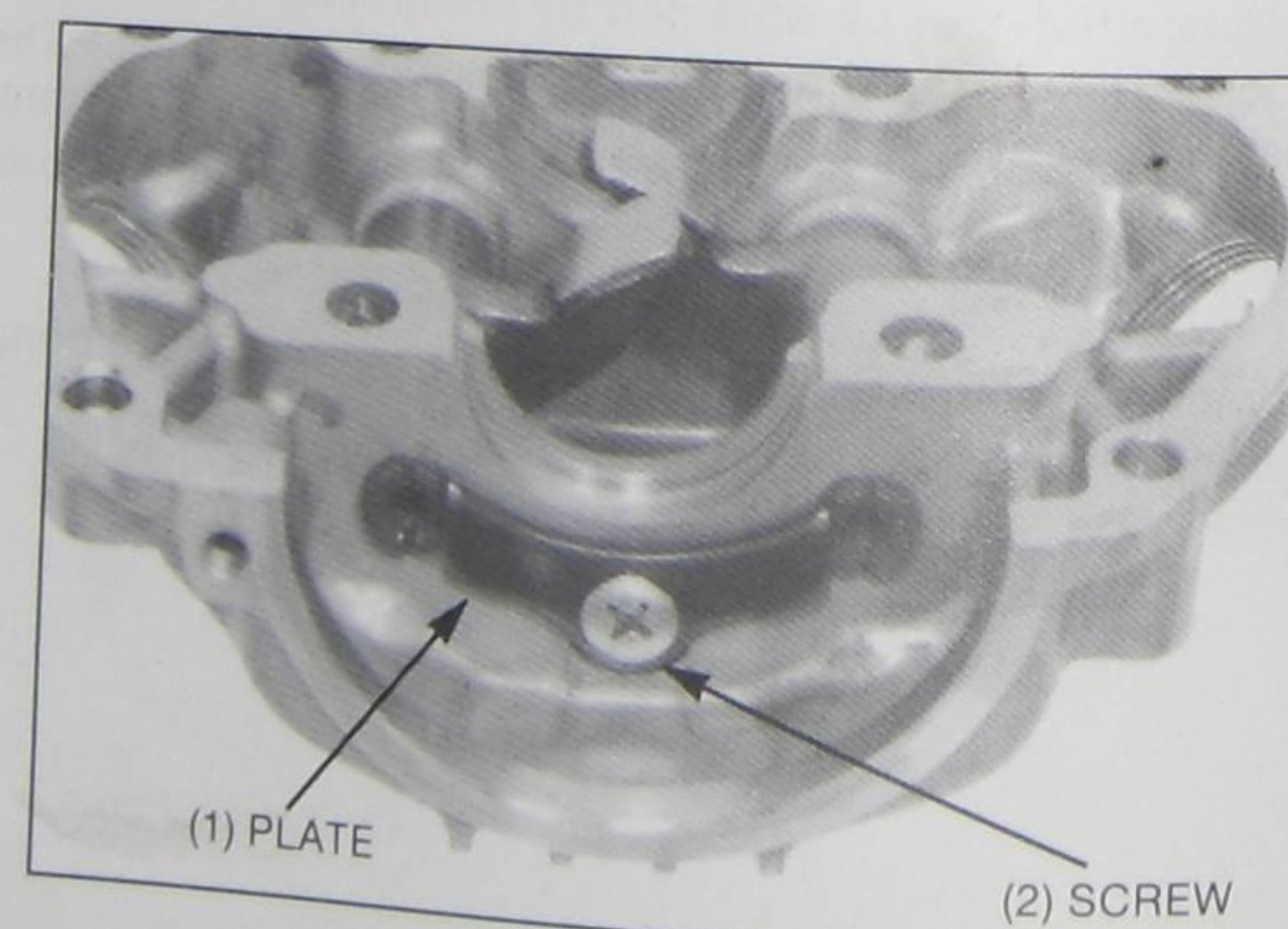
Remove the cam sprocket bolts and the cam sprocket from the camshaft flange with the cam chain.

Suspend the cam chain with a piece of wire to prevent it from falling into the crankcase.
Lift the camshaft and remove it.
Remove the cam sprocket from the cam chain.



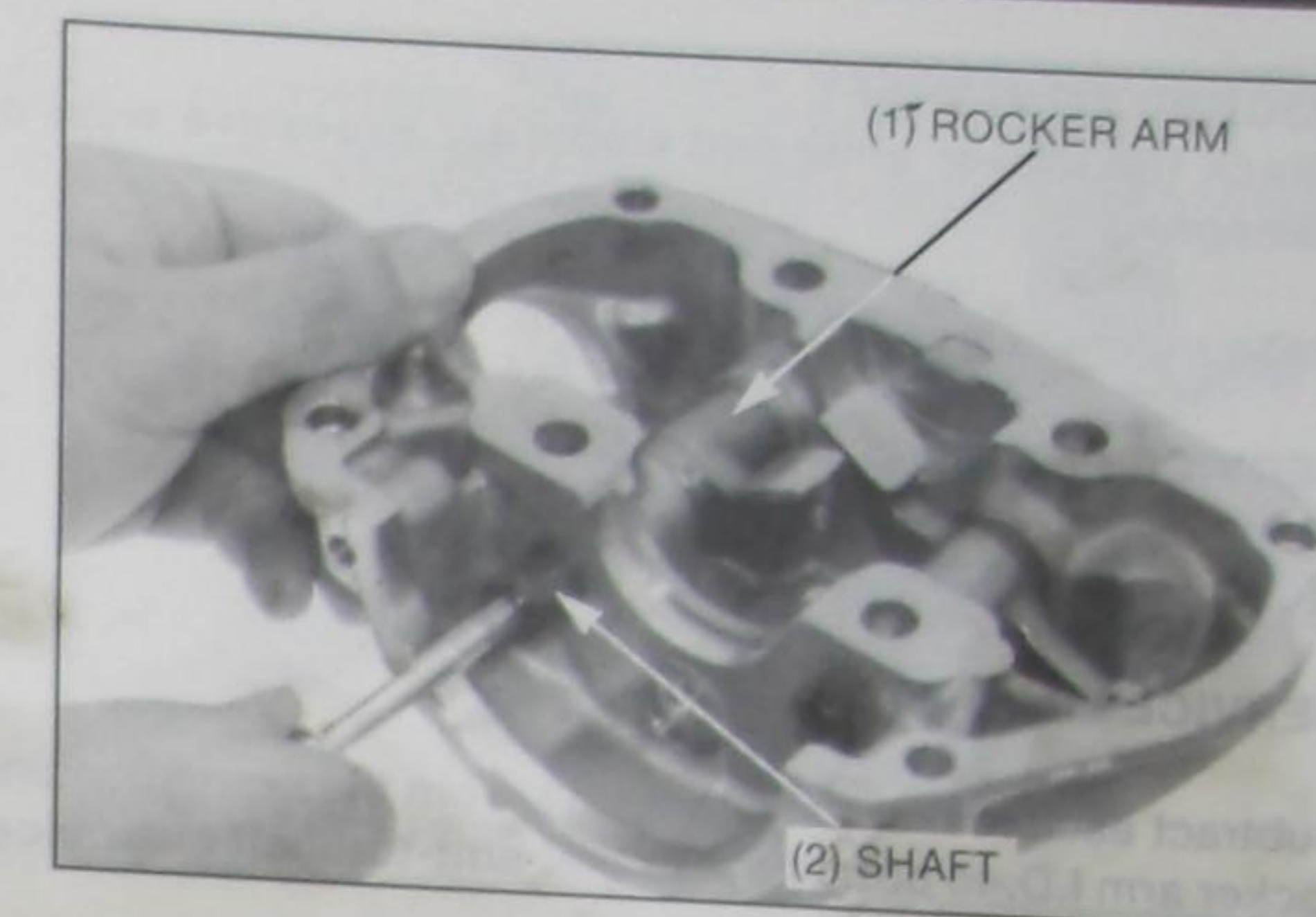
ROCKER ARM REMOVAL

Remove the screw and the rocker arm shaft setting plate.



CYLINDER HEAD/VALVE

Thread a 6 mm bolt into the rocker arm shaft, and pull it out and remove the rocker arm shaft and rocker arm.



INSPECTION

CAMSHAFT

Turn the outer race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing inner race fits tightly on the camshaft.

Check the cam and journal surfaces on the camshaft for scoring, scratches or evidence of insufficient lubrication. Check the oil holes in the camshaft for clogging.



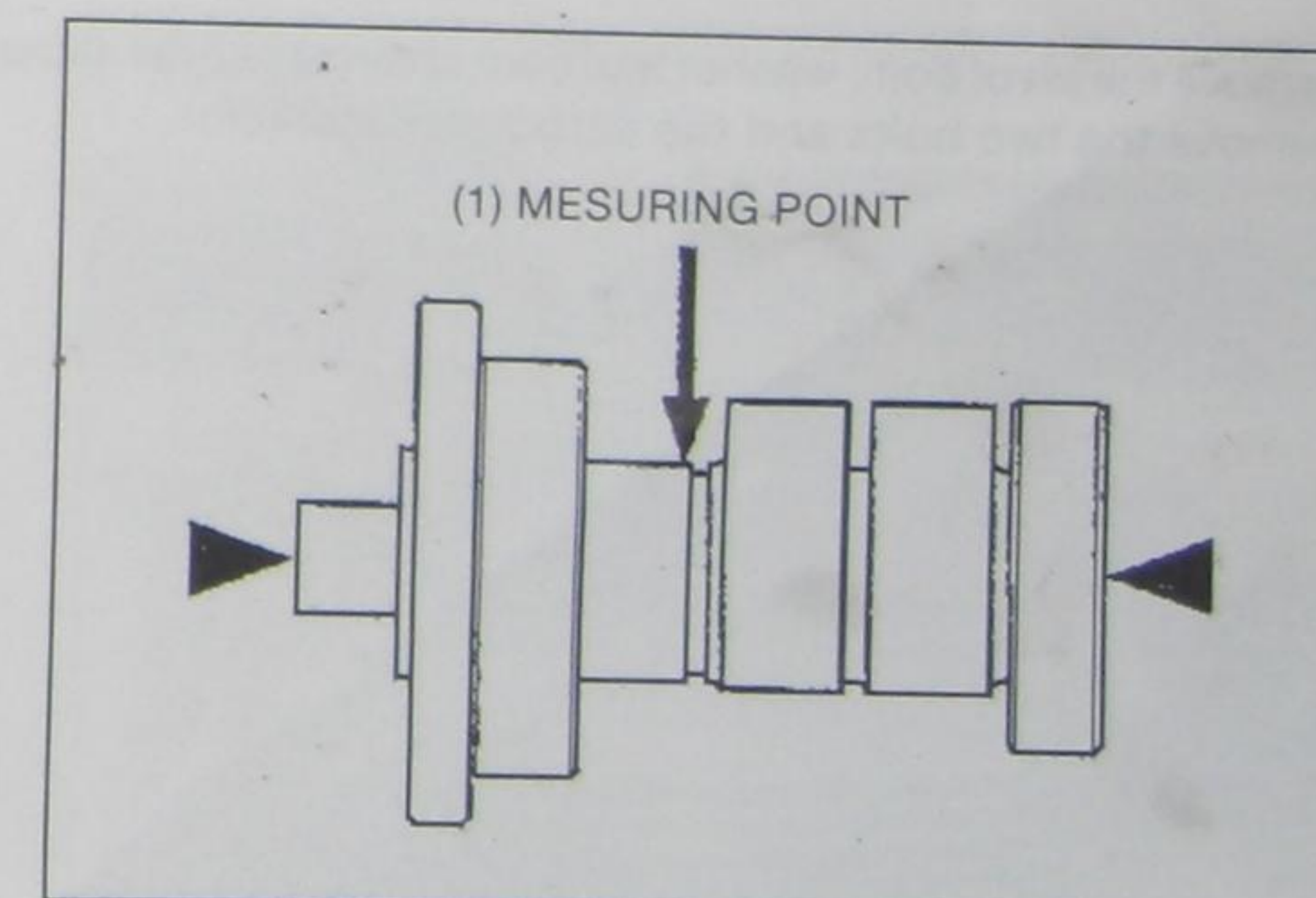
Measure each cam lobe height using a micrometer.

SERVICE LIMITS: IN: 31.10 mm (1.224 in)
EX: 30.70 mm (1.209 in)



Measure the camshaft runout using a dial indicator. Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.05 mm (0.002 in)



ROCKER ARM/SHAFT

Check the rocker arms and shafts for excessive wear or damage.

Measure the I.D. of each rocker arm.

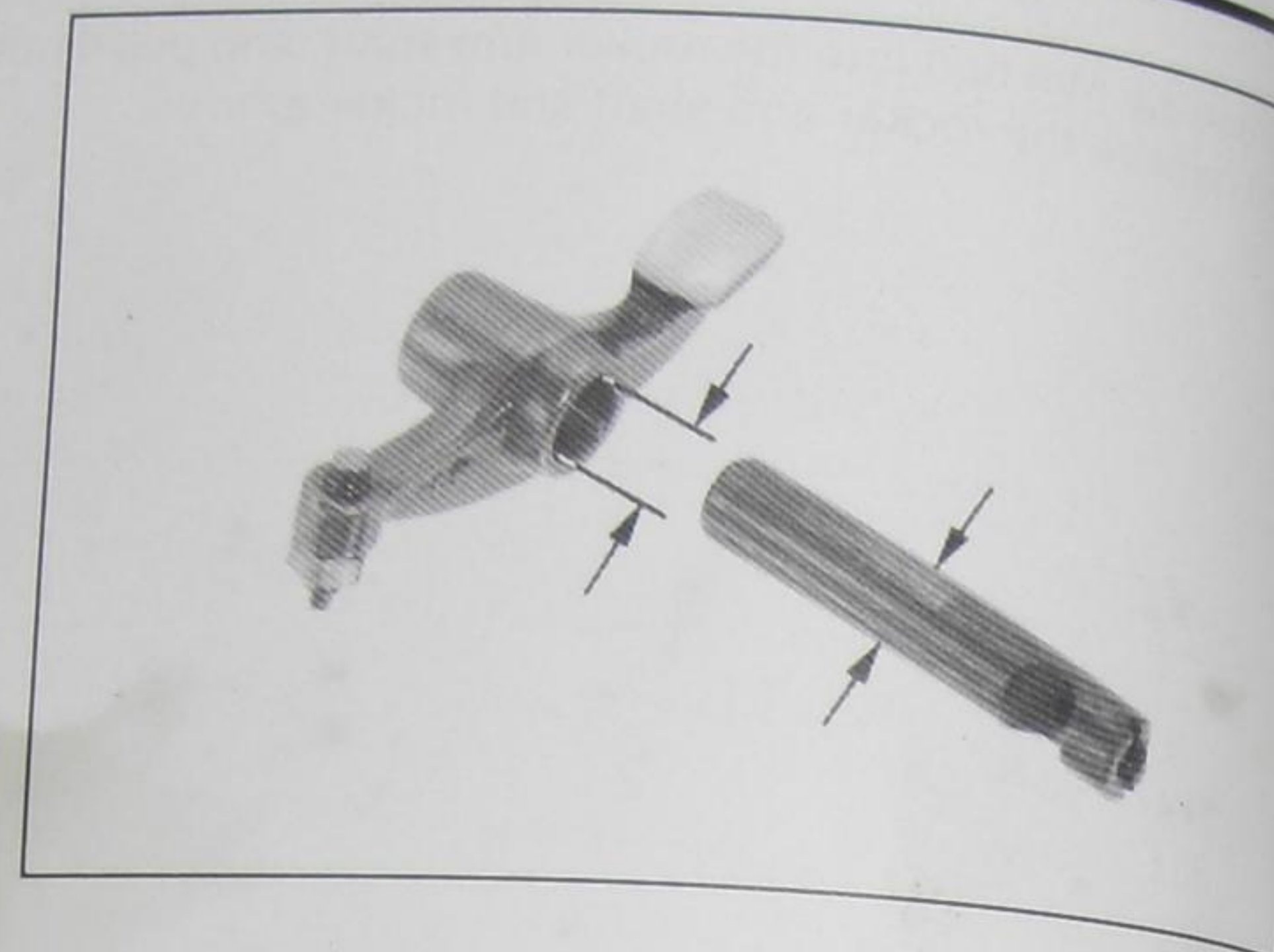
SERVICE LIMIT: 12.05 mm (0.474 in)

Measure the O.D. of each rocker arm shaft.

SERVICE LIMIT: 11.93 mm (0.470 in)

Subtract each rocker arm shaft O.D. from the corresponding rocker arm I.D. to obtain the rocker arm-to-shaft clearance.

SERVICE LIMIT: 0.08 mm (0.003 in)

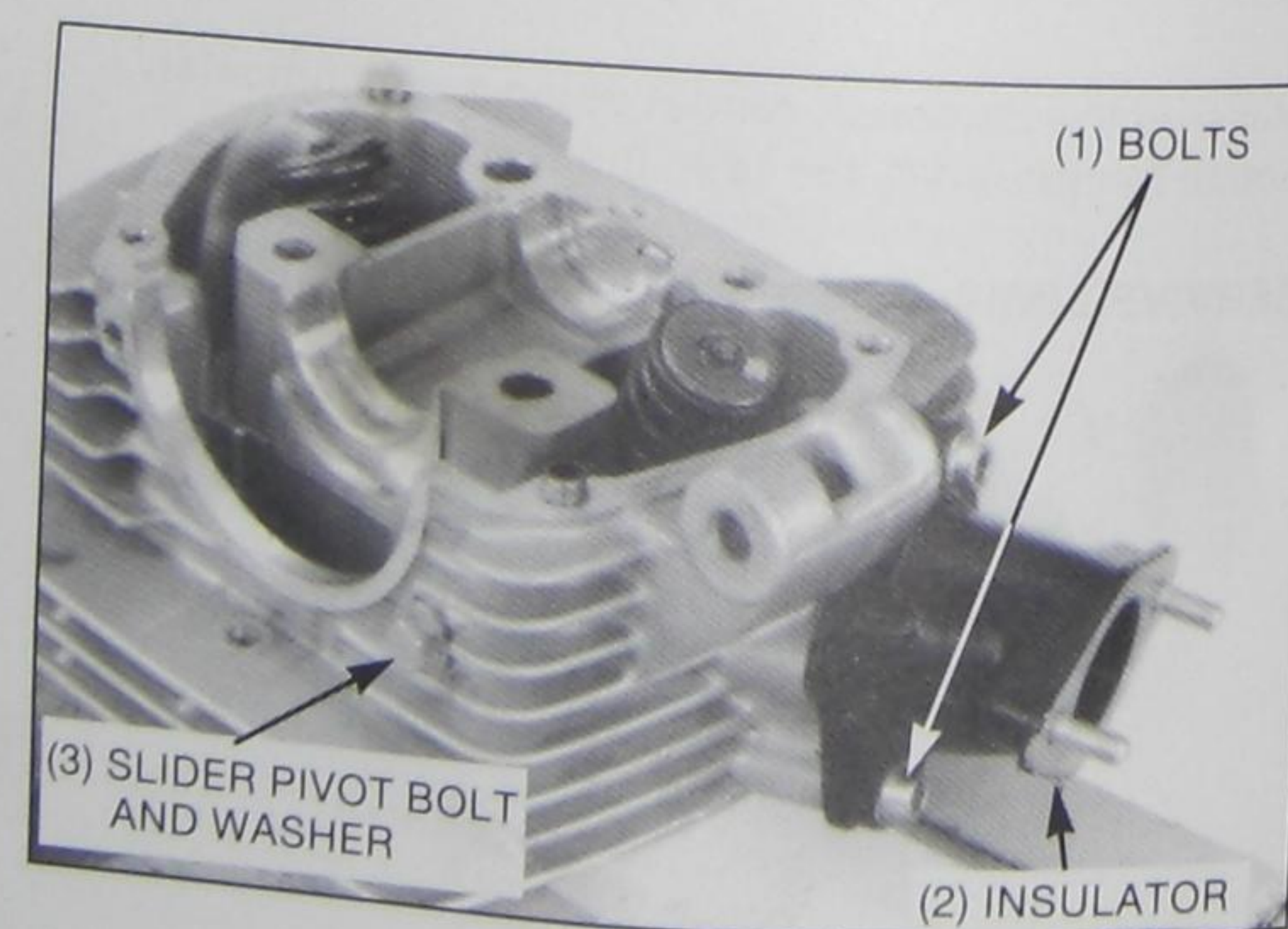
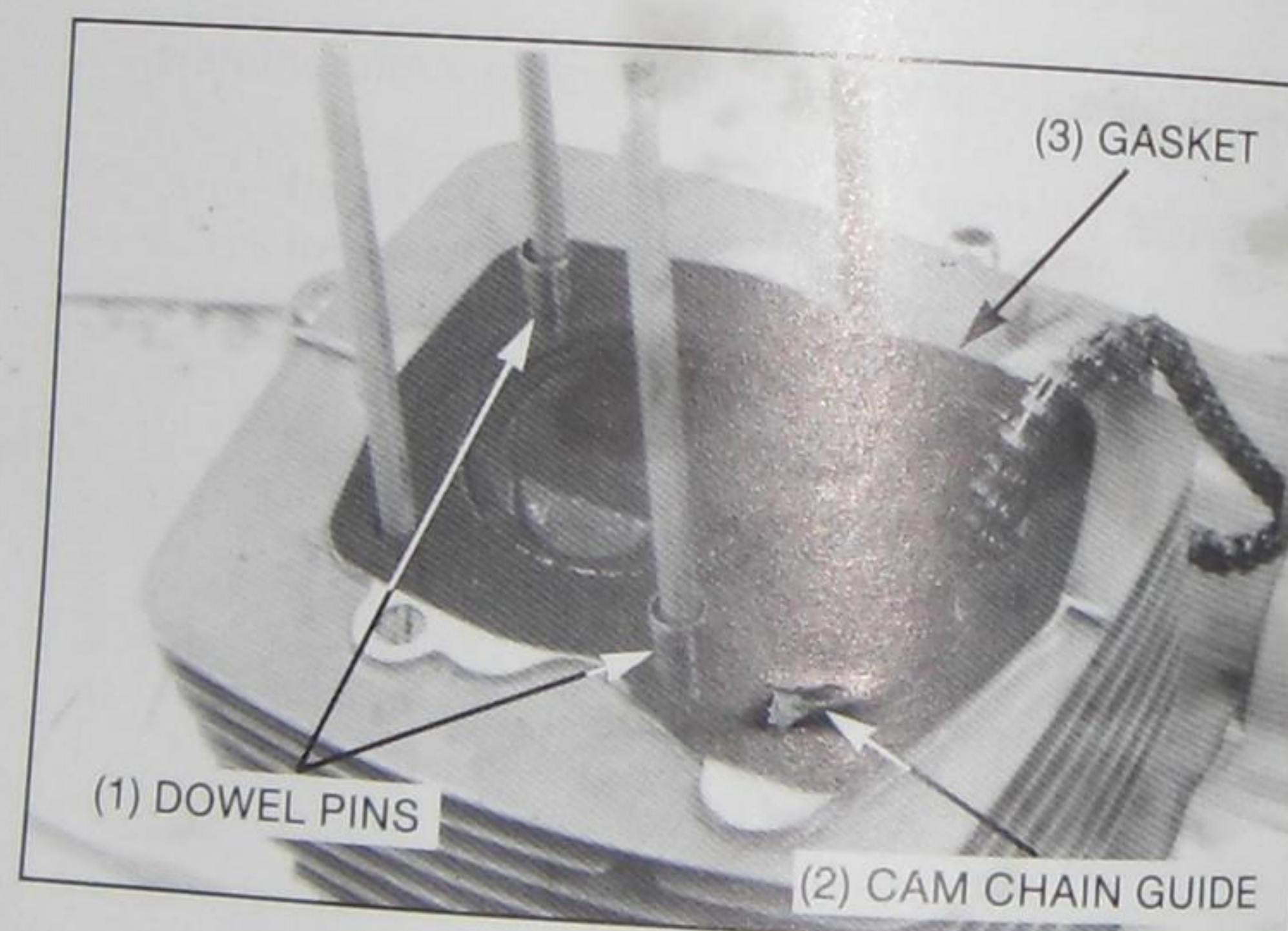
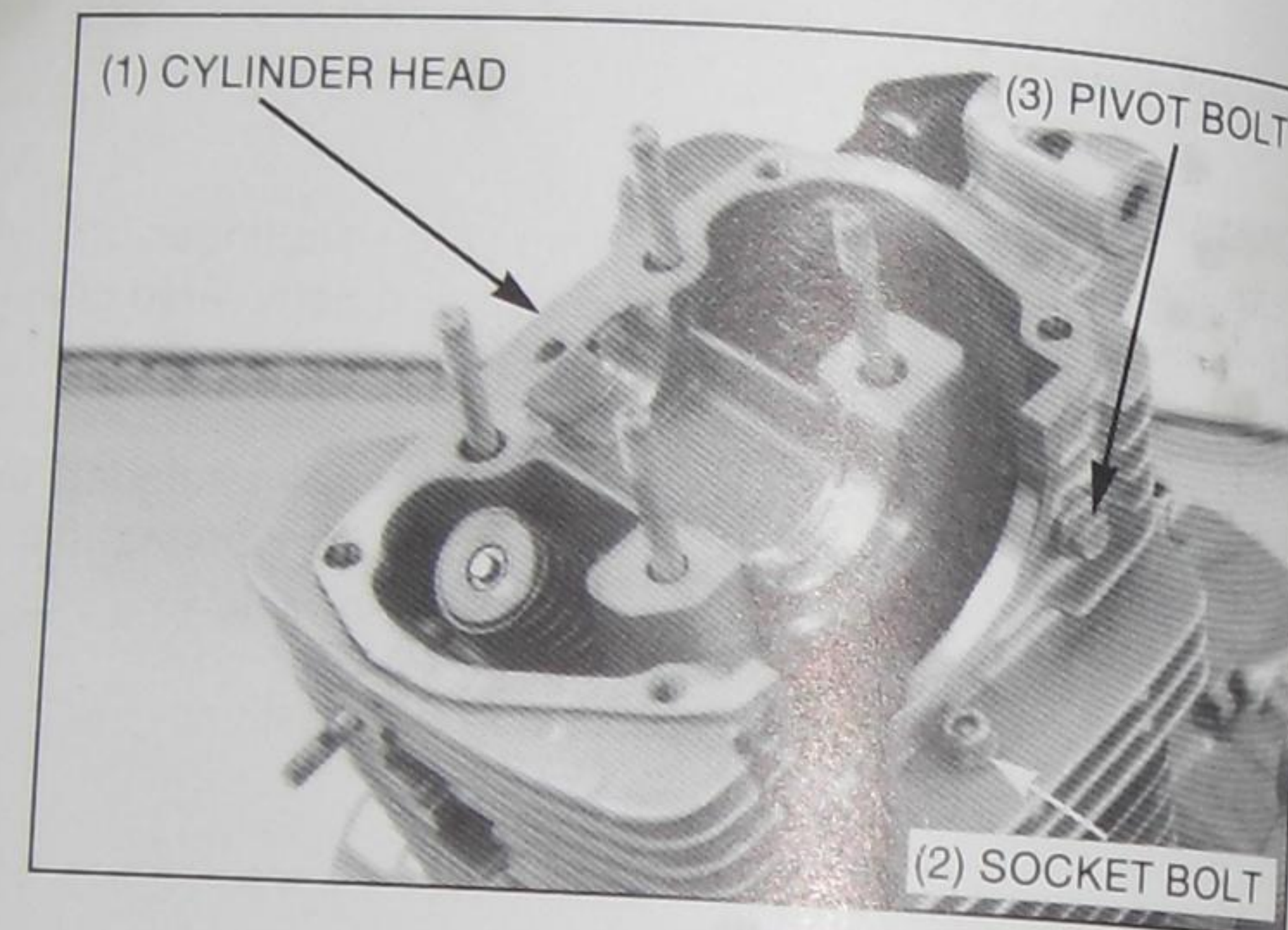


Cylinder Head Removal

Remove the spark plug.
Loosen the cam chain tensioner slider pivot bolt.
Remove the cylinder head socket bolt.

Remove the cylinder head.
Do not strike the cylinder head too hard and not damage the mating surfaces by using the screwdriver.

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



Cylinder Head Disassembly

NOTE:

- Mark all parts during disassembly so they can be placed back in their original locations.

CAUTION

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

Remove the valve spring cotters using the valve spring compressor.

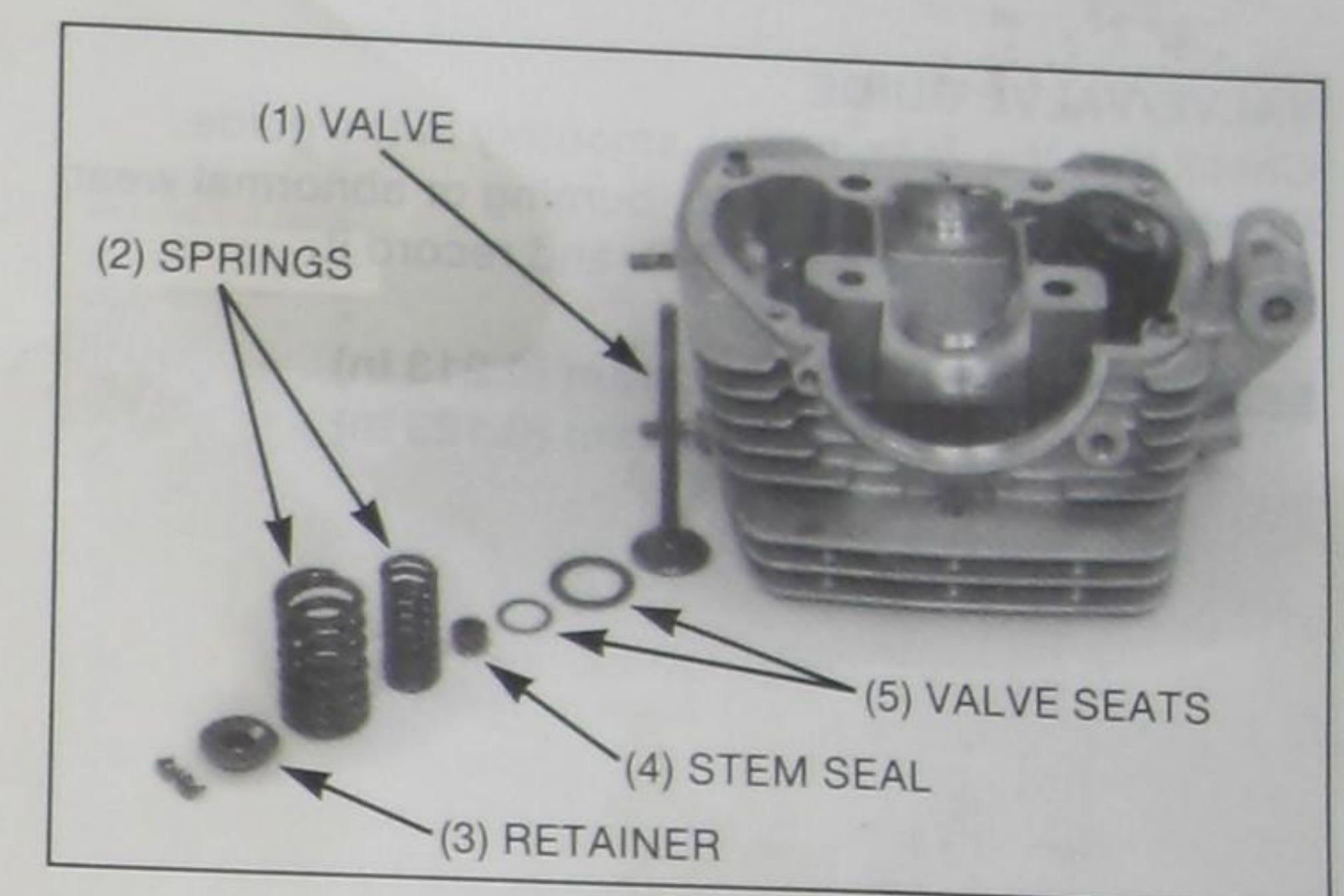
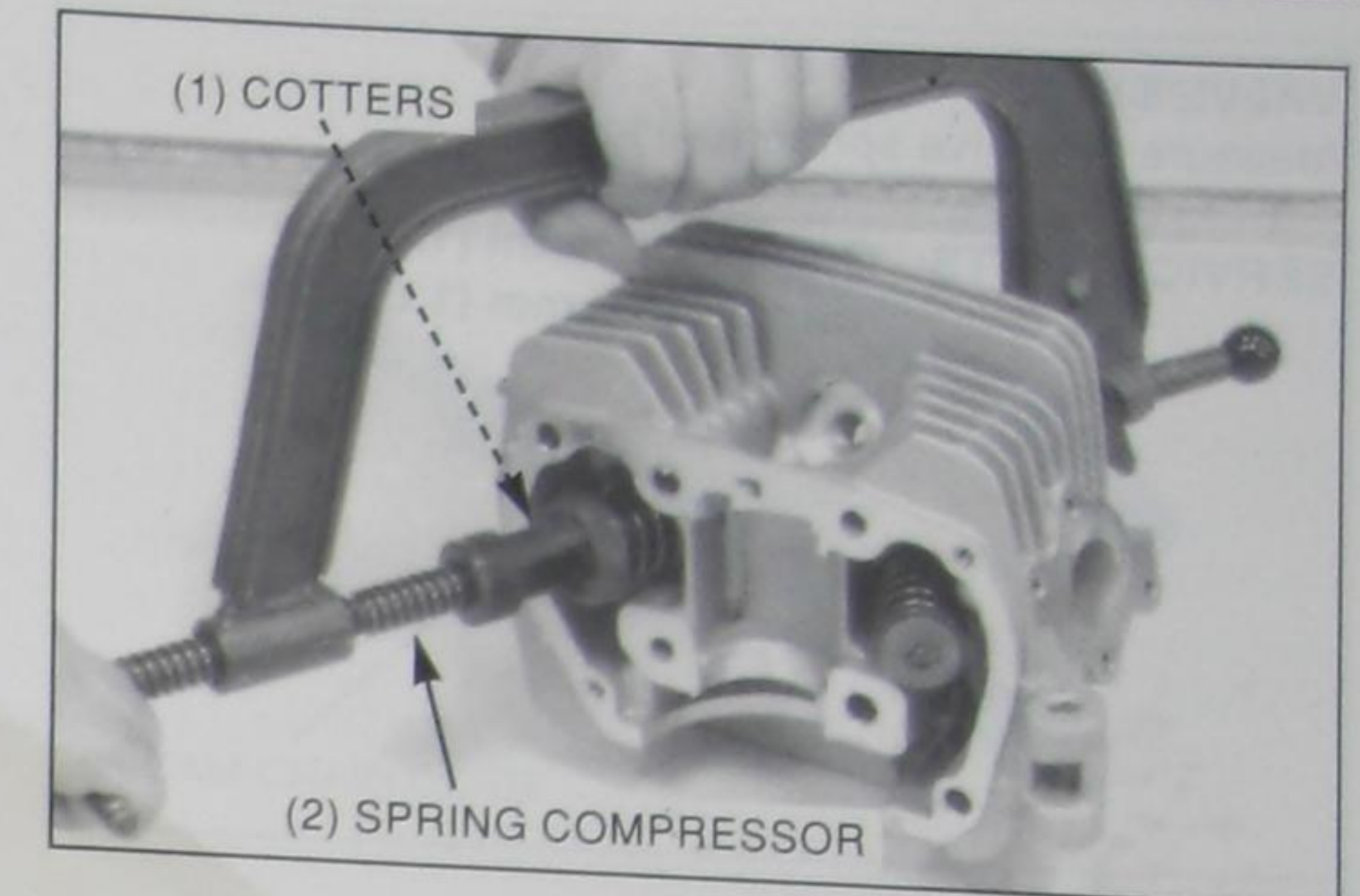
TOOL:

Valve spring compressor

07757-0010000

Remove the following:

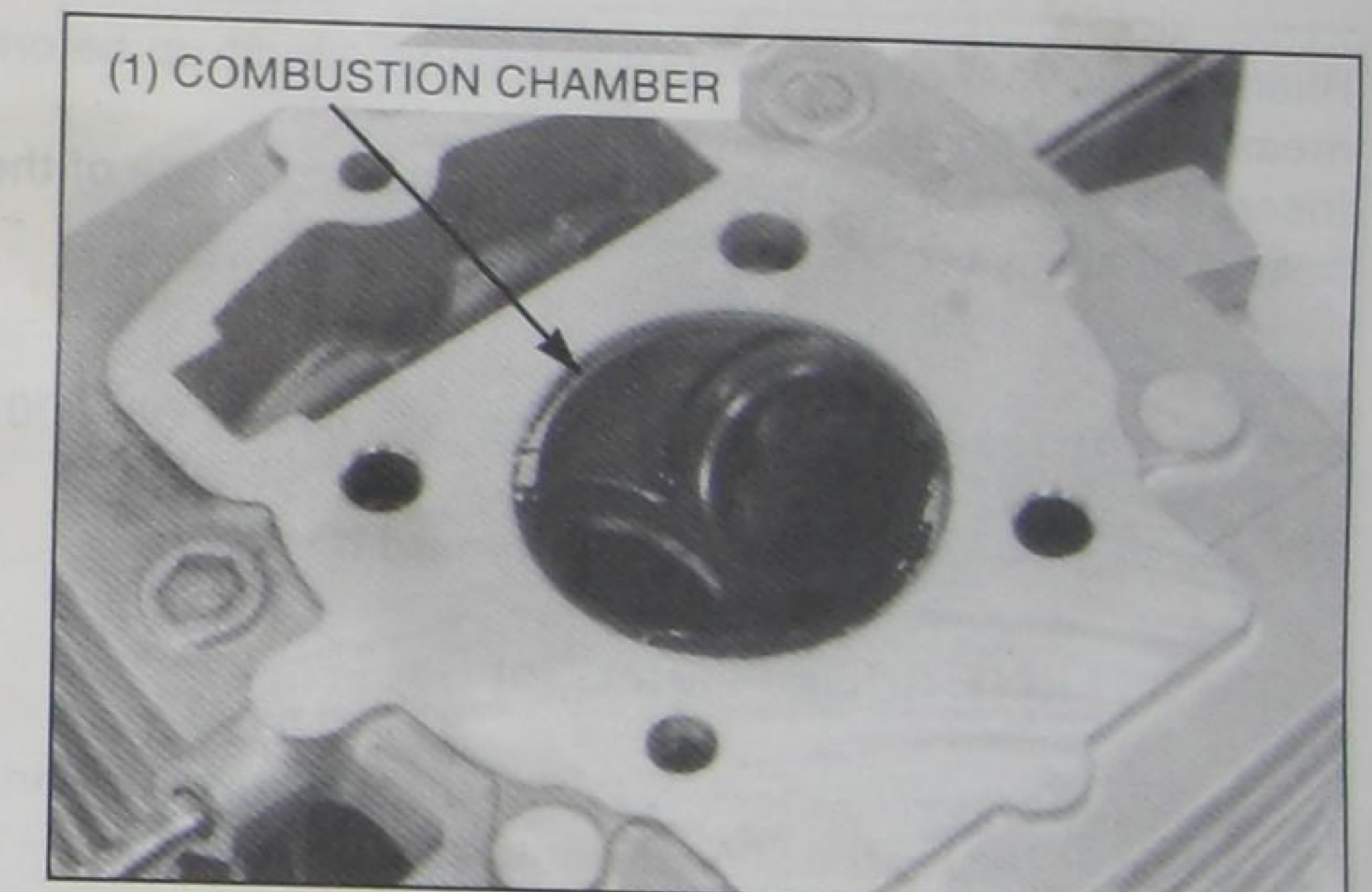
- Spring retainer
- Inner and outer valve springs
- Valve
- Stem seal
- Inner and outer spring seats.



INSPECTION

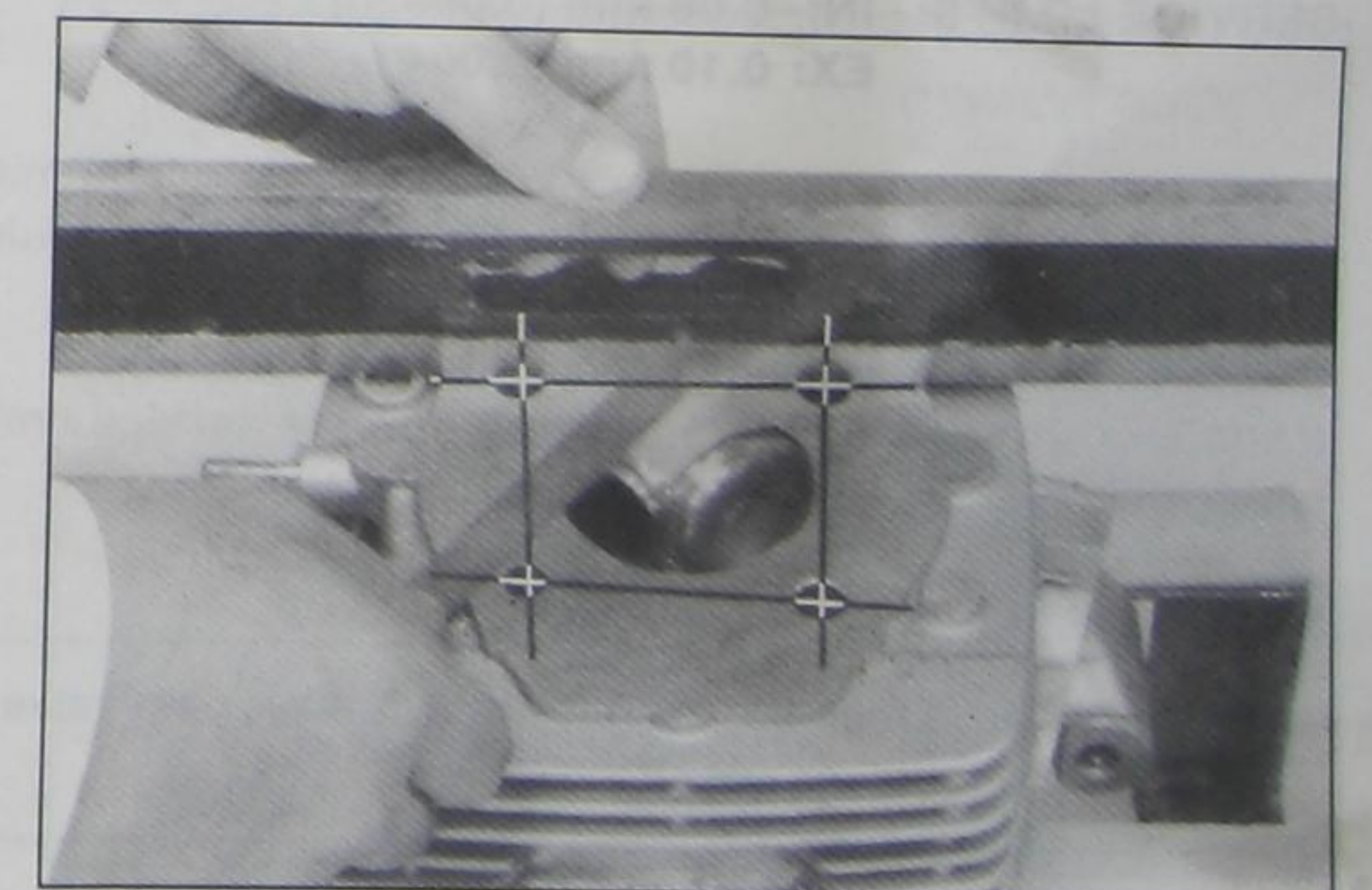
CYLINDER HEAD

Remove the carbon deposits from the combustion chamber, being careful not to damage the gasket surface.
Check the spark plug hole and valve areas for cracks.



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

SERVICE LIMIT: 0.10 mm (0.004 in)

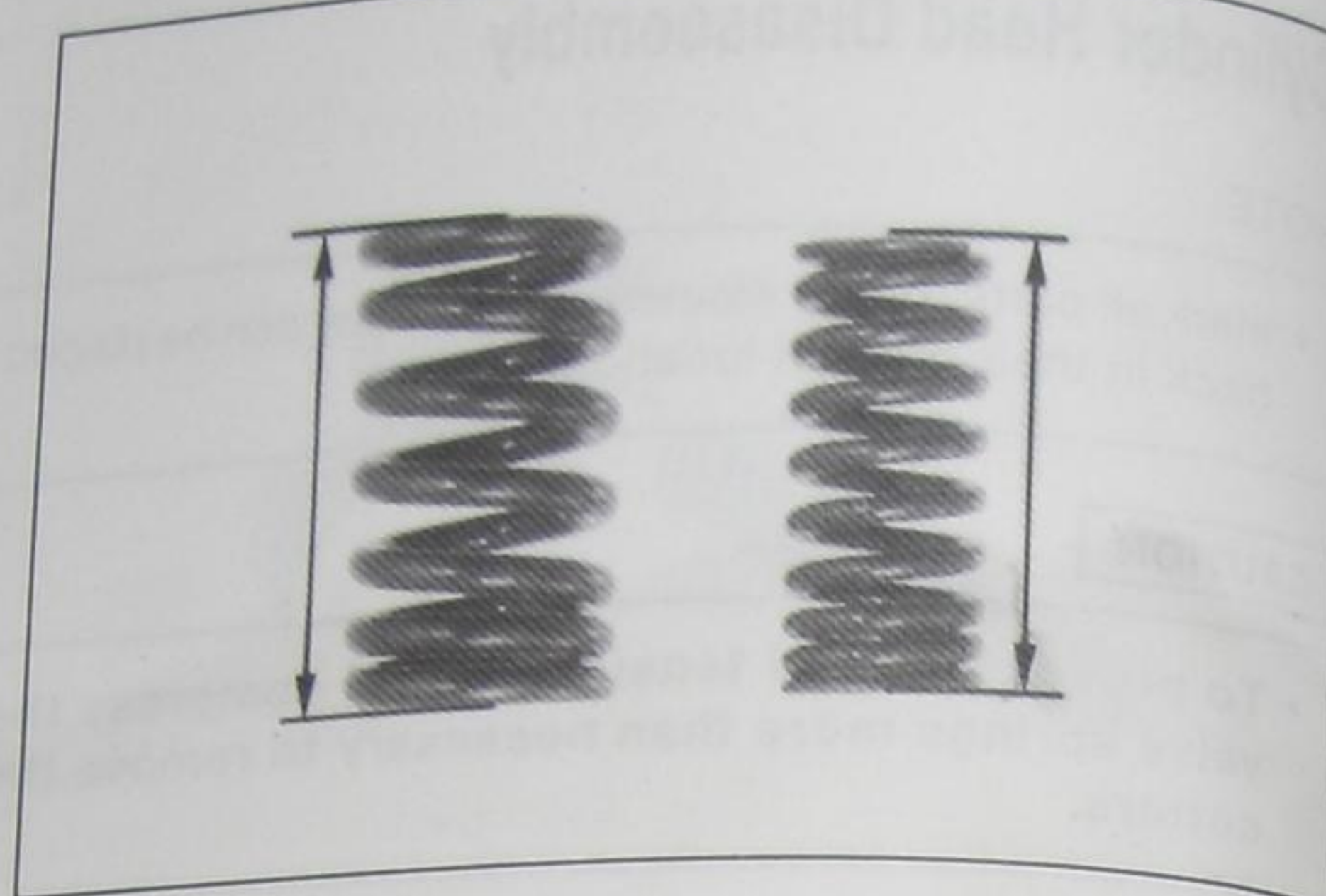


CYLINDER HEAD/VALVE

VALVE SPRING

Measure the valve spring free length.

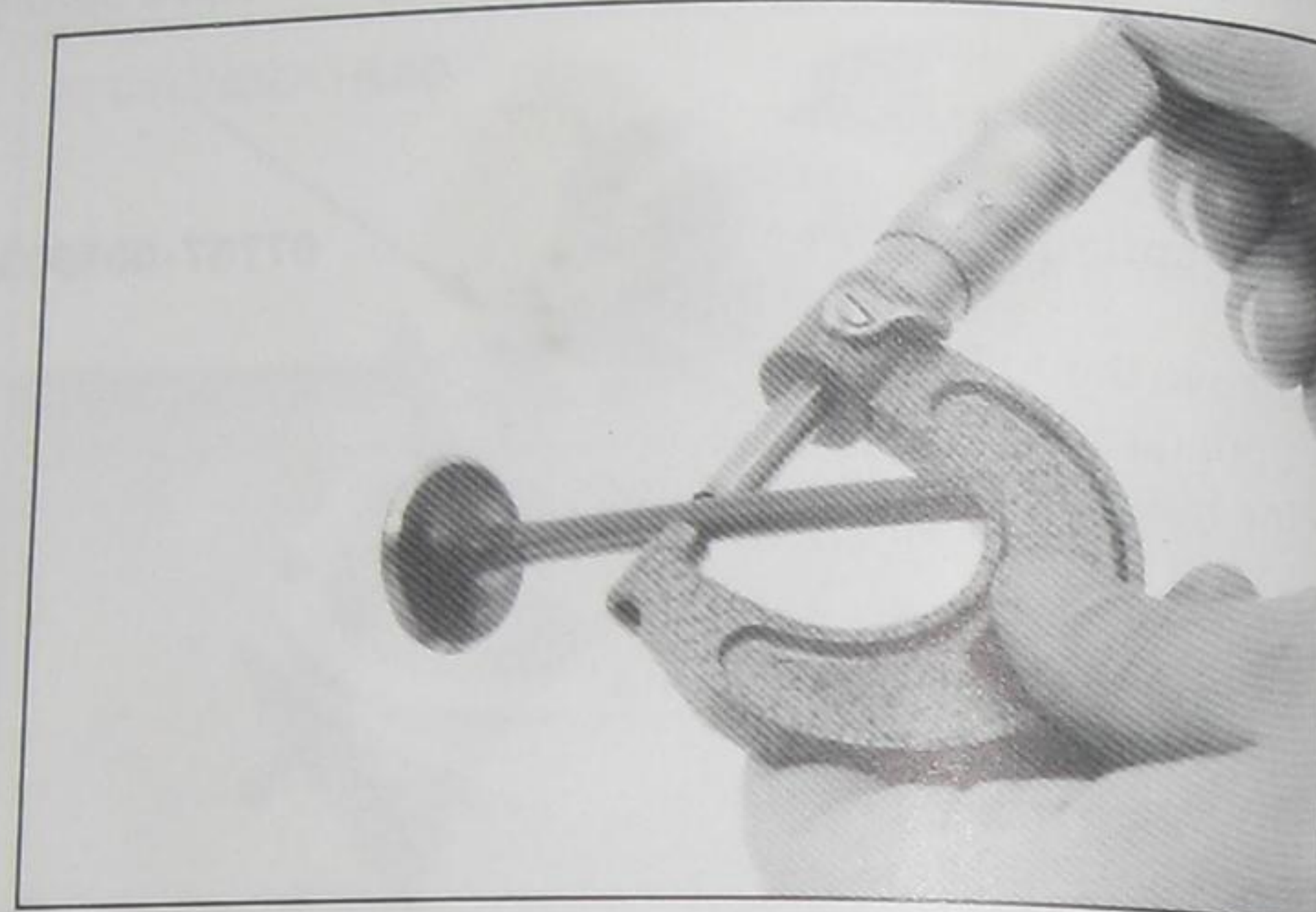
SERVICE LIMITS: Outer: 43.5 mm (1.71 in)
Inner: 38.0 mm (1.50 in)



VALVE/VALVE GUIDE

Check that the valve moves smoothly in the guide.
Check the valve for bending, burning or abnormal wear.
Measure each valve stem O.D. and record it.

SERVICE LIMITS: IN: 5.42 mm (0.213 in)
EX: 5.40 mm (0.123 in)



Ream the valve guide to remove any carbon built-up before measuring the guide.
Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.

TOOL:

Valve guide reamer 07984-0980001

Measure each valve guide I.D. and record it.

SERVICE LIMIT: 5.50 mm (0.217 in)

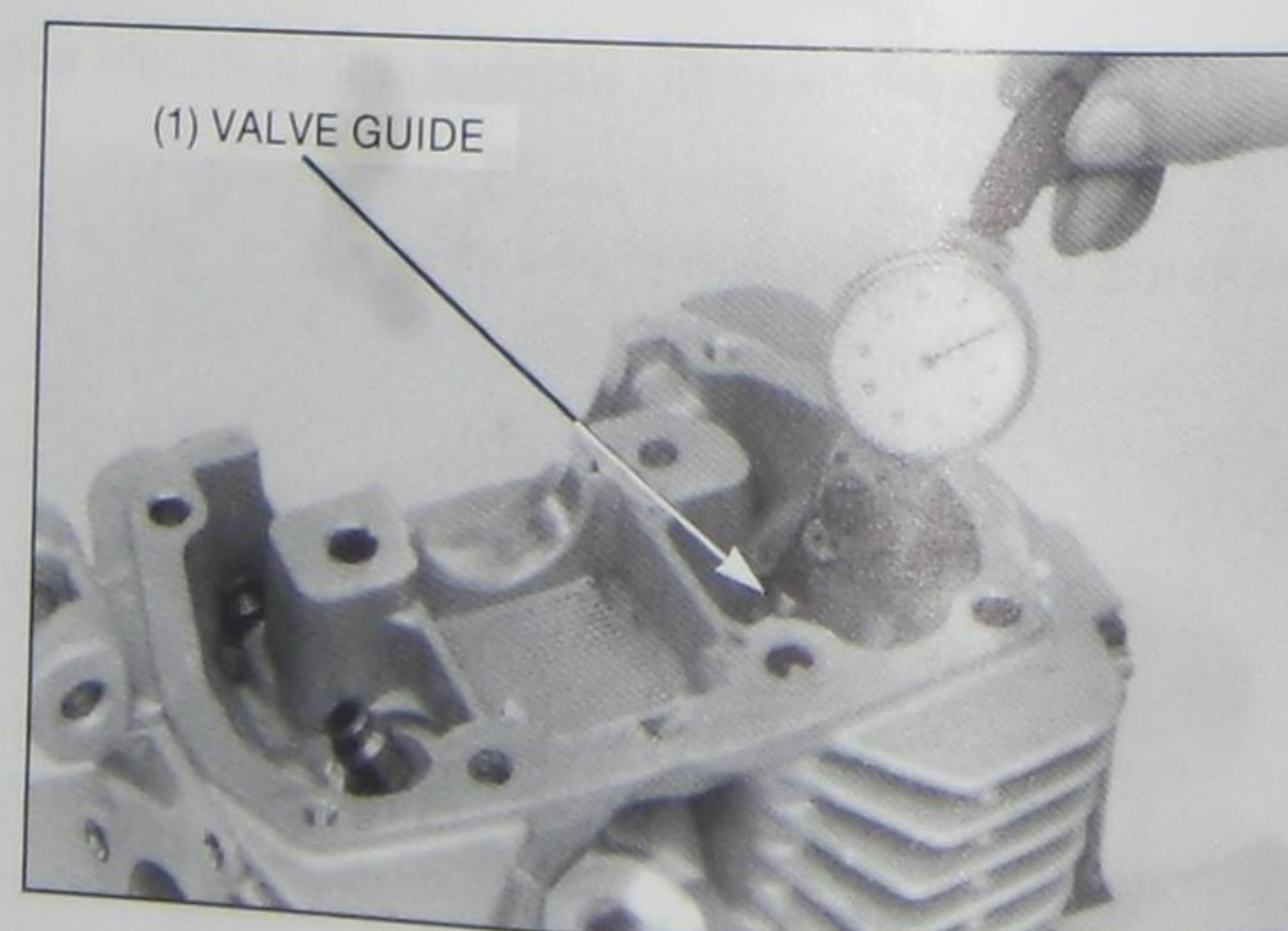
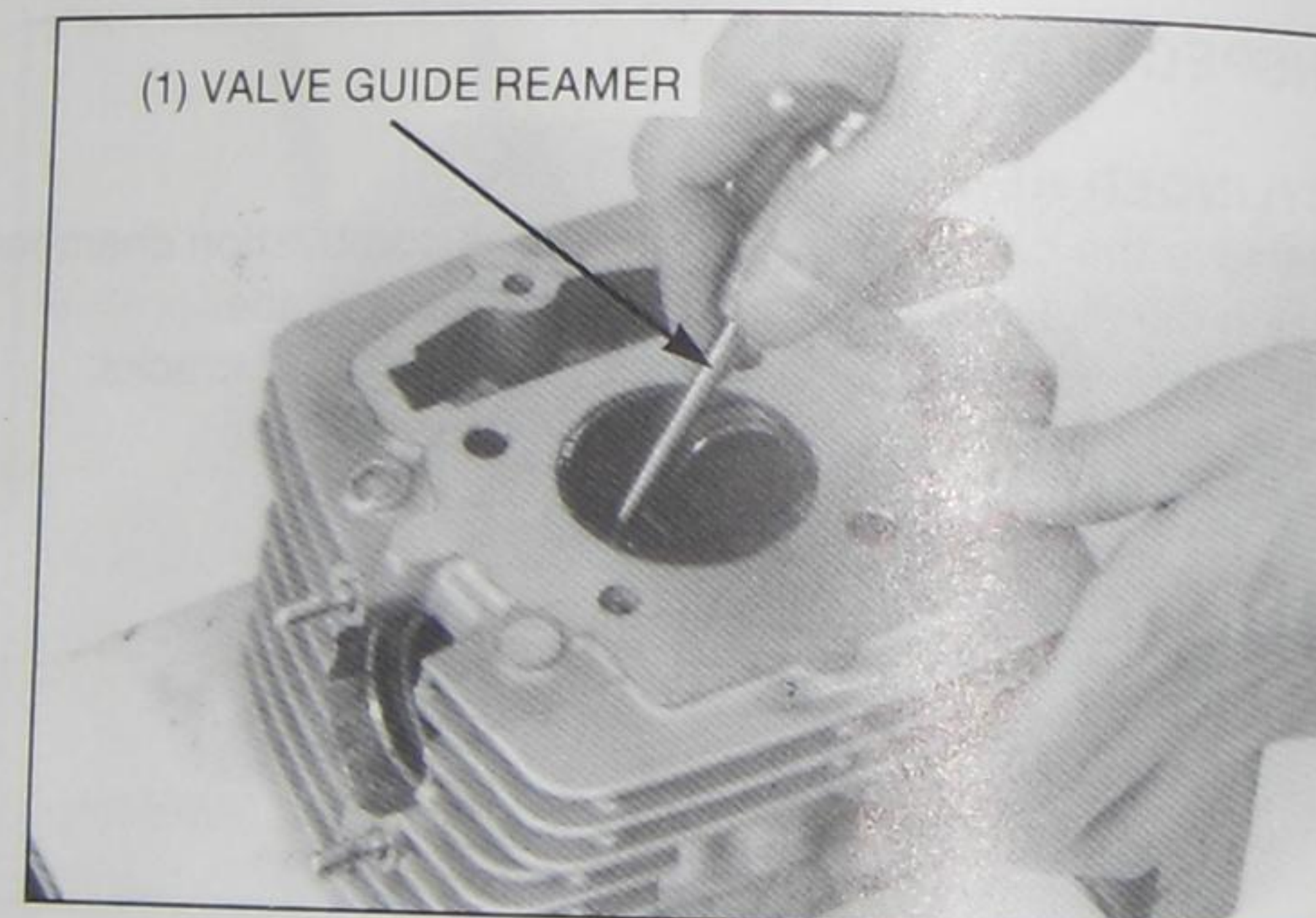
Subtract each valve stem O.D. from the corresponding guide I.D. to obtain the stem-to-guide clearance.

SERVICE LIMITS: IN: 0.08 mm (0.003 in)
EX: 0.10 mm (0.004 in)

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

NOTE:

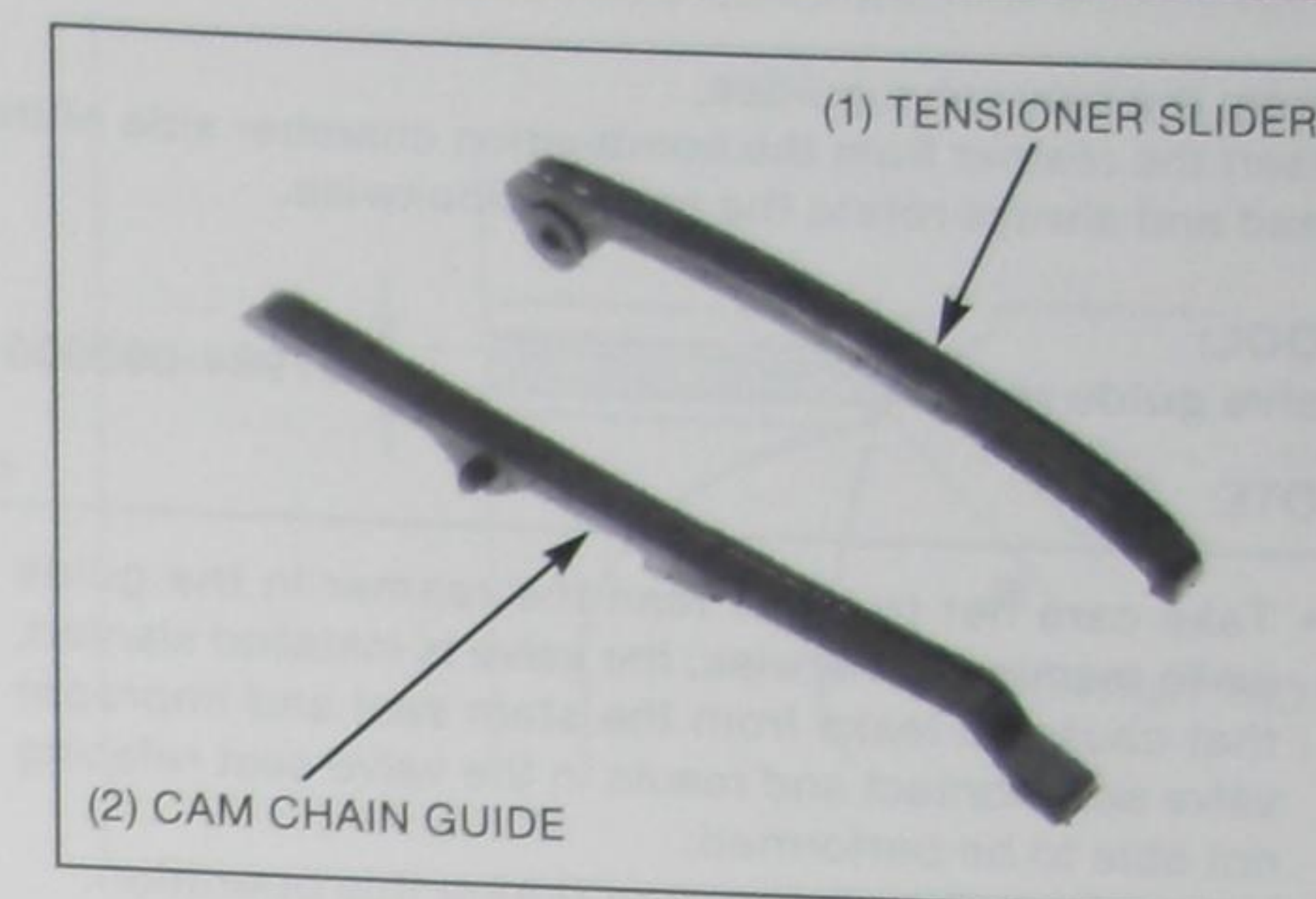
- Inspect and reface the valve seats whenever the valve guides are replaced (page 7-10).



CYLINDER HEAD/VALVE

CAM CHAIN GUIDE/TENSIONER SLIDER

Check the cam chain guide and tensioner slider for excessive wear or damage and replace them if necessary.



Valve Guide Replacement

Chill new valve guides in the freezer section of a refrigerator for about an hour.

Heat the cylinder head to 130-140°C (275-290°F) with a hot plate or oven.

WARNING

- Wear heavy gloves to avoid burns when handling the heated cylinder head.

CAUTION

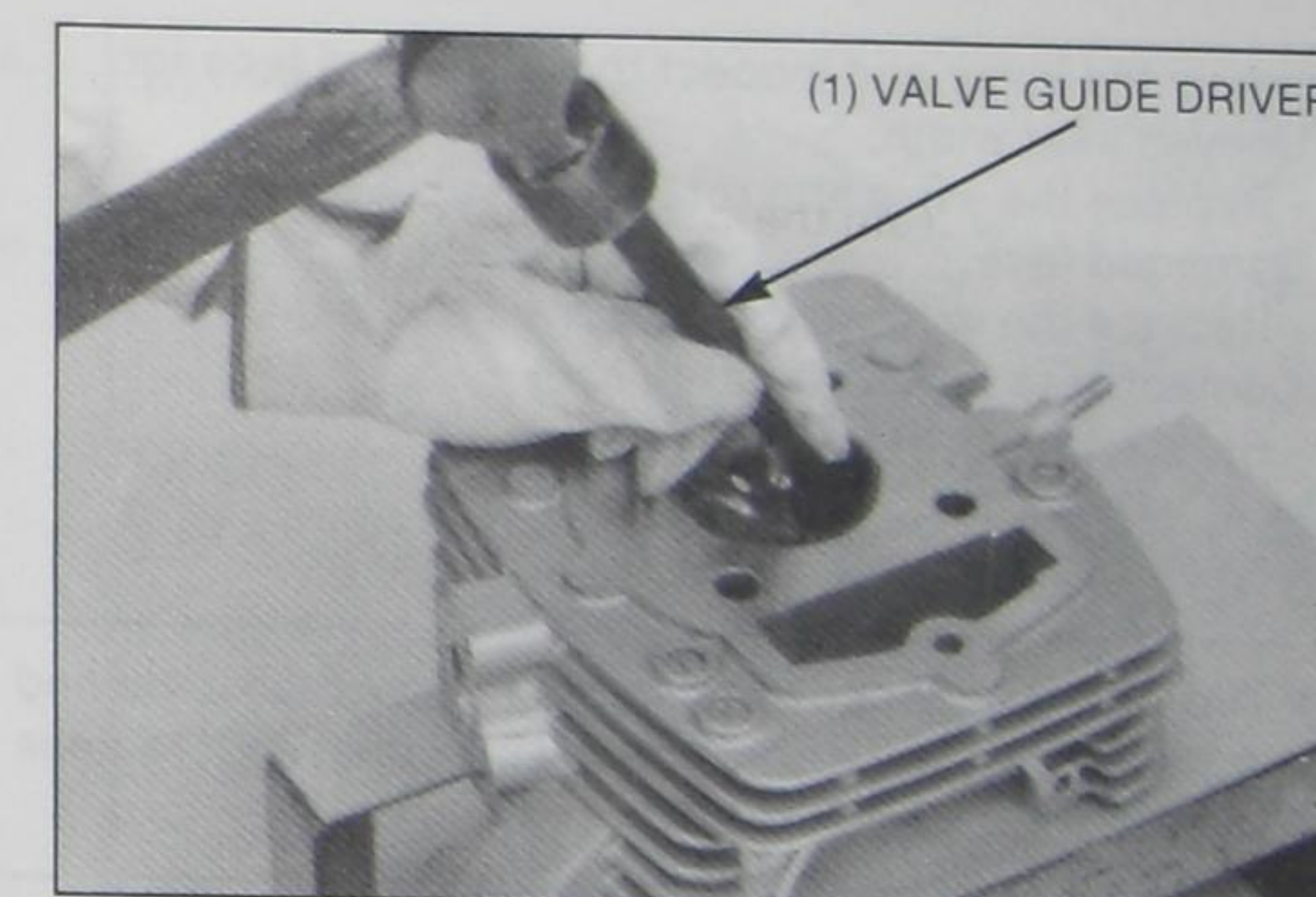
- Using a torch to heat the cylinder head may cause warpage.

Support the cylinder head and drive the valve guides out of the cylinder head from the combustion chamber side.

TOOL:

Valve guide driver, 5.5 mm

07742-0010100



Coat new O-rings with oil and install them onto new valve guides.

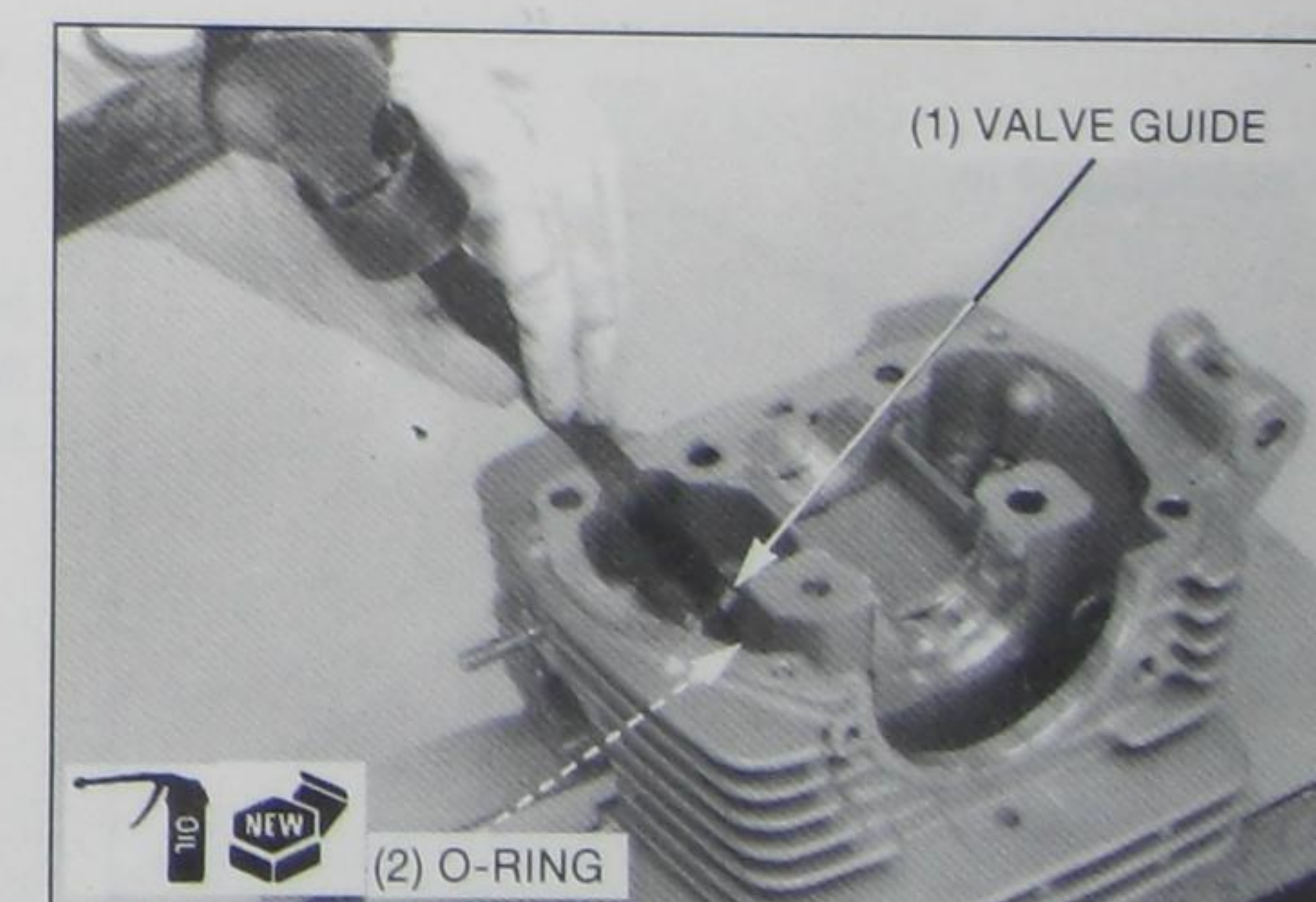
Drive new valve guides in the cylinder head from the camshaft side until they are fully seated while the cylinder head is still heated.

TOOL:

Valve guide driver, 5.5 mm

07742-0010100

Let the cylinder head cool to room temperature.



Ream the new valve guides.
Insert the reamer from the combustion chamber side of the head and always rotate the reamer clockwise.

TOOL:
Valve guide reamer

07984-0980001

NOTE:

- Take care not to tilt or lean the reamer in the guide while reaming. Otherwise, the valve is installed slanted, that cause oil leaks from the stem seal and improper valve seat contact and results in the valve seat refacing not able to be performed.
- Use cutting oil on the reamer during this operation.

Clean the cylinder head thoroughly to remove any metal particles after reaming and reface the valve seat.

Valve Seat Inspection/Refacing**INSPECTION**

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

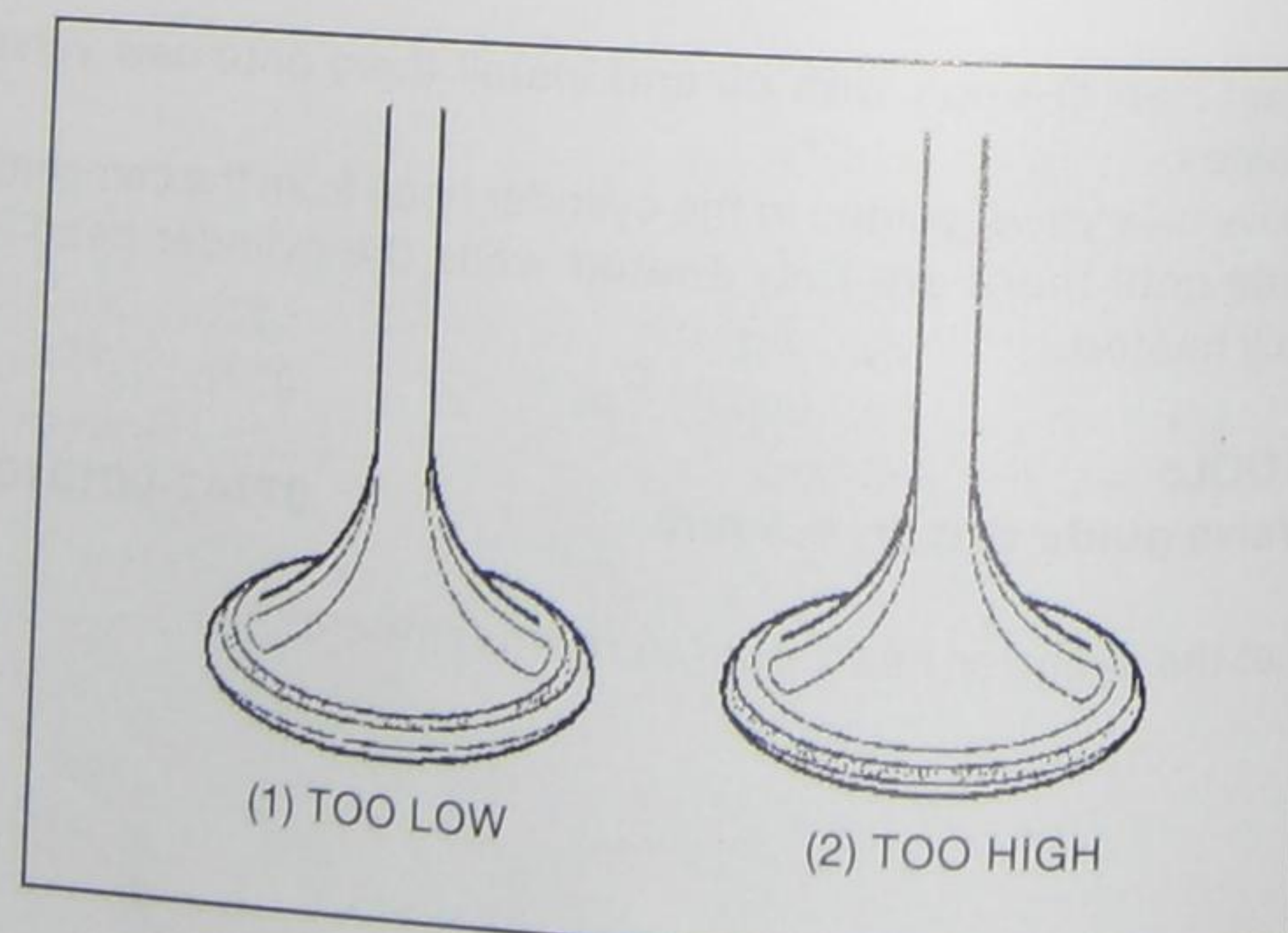
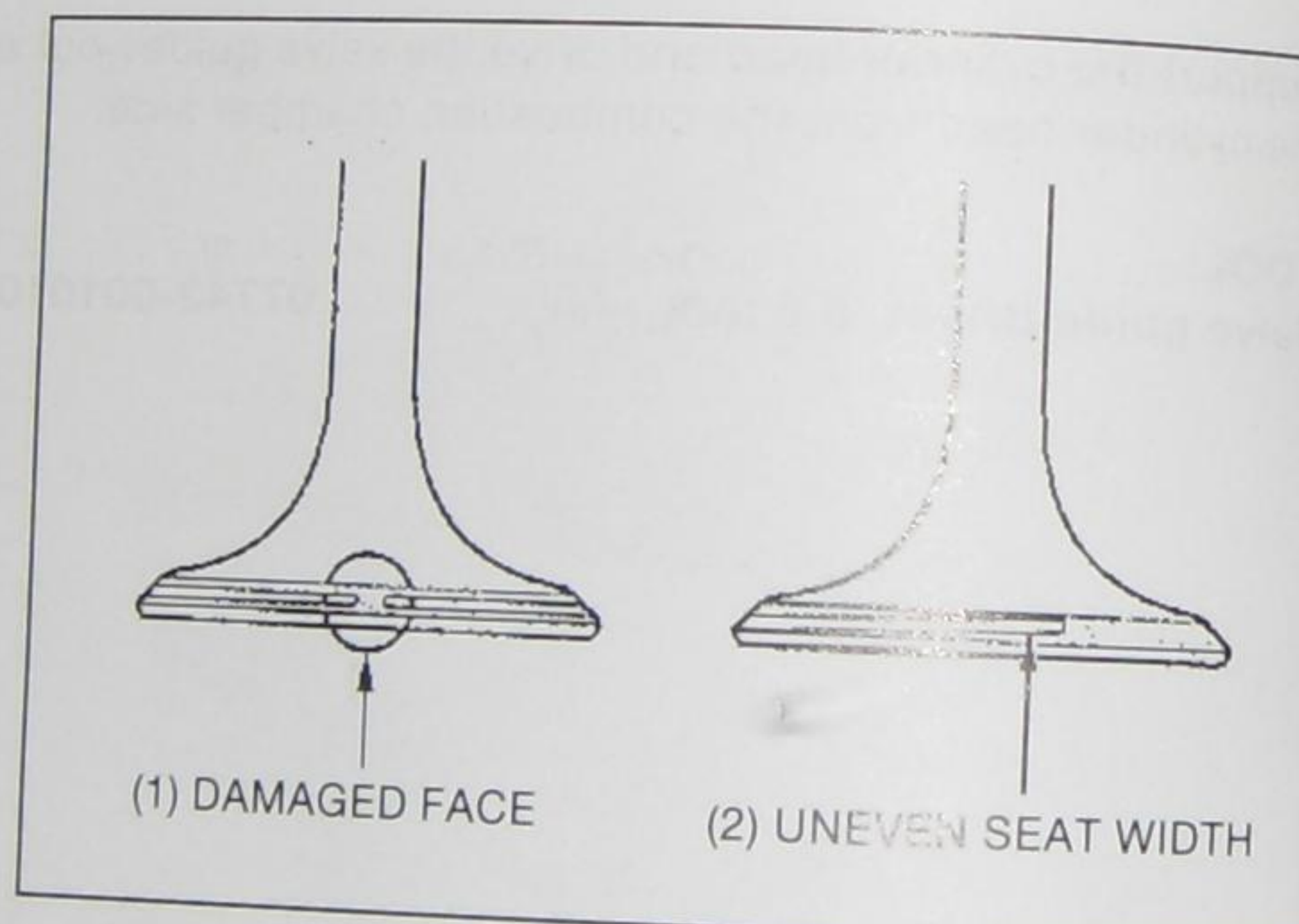
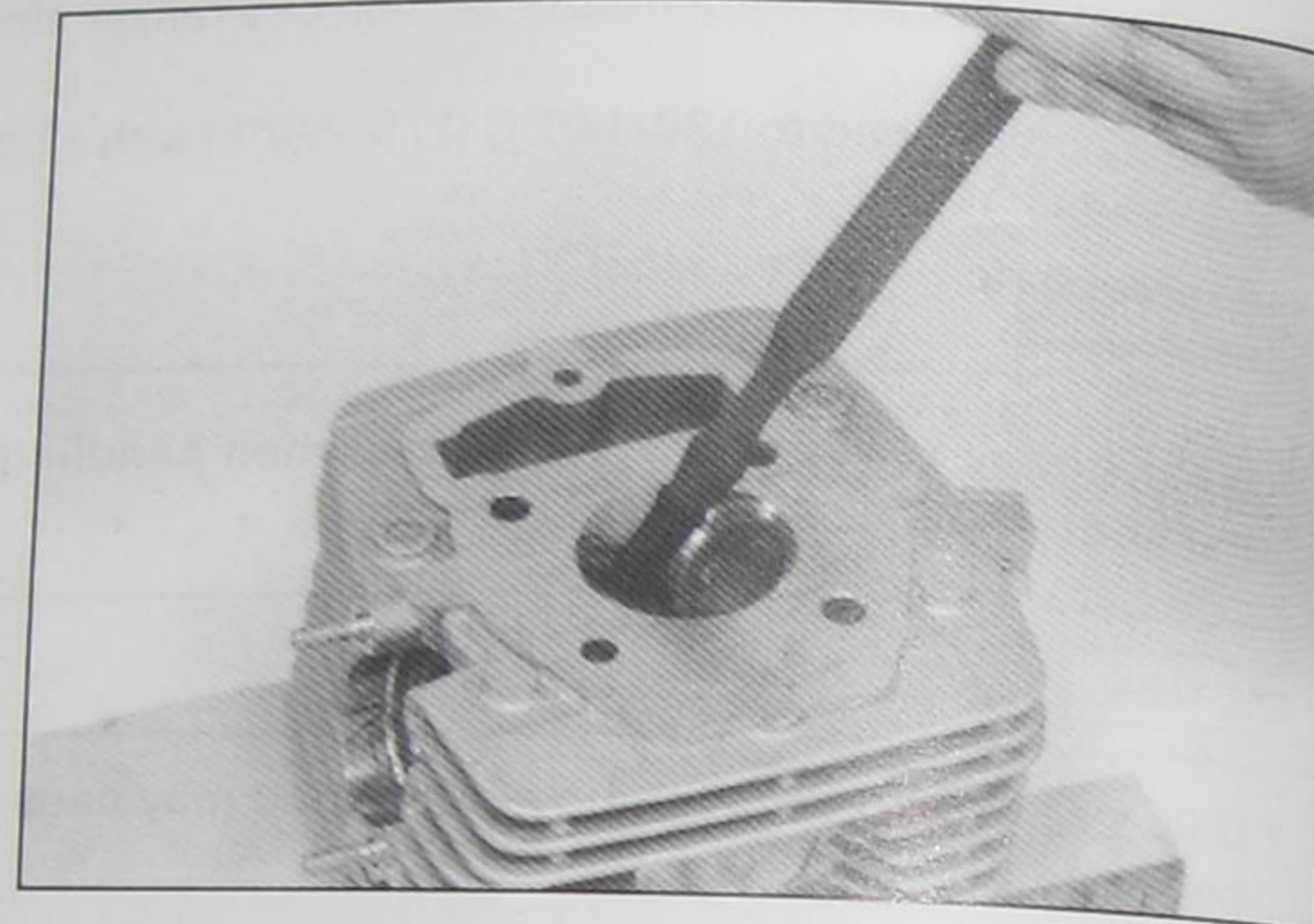
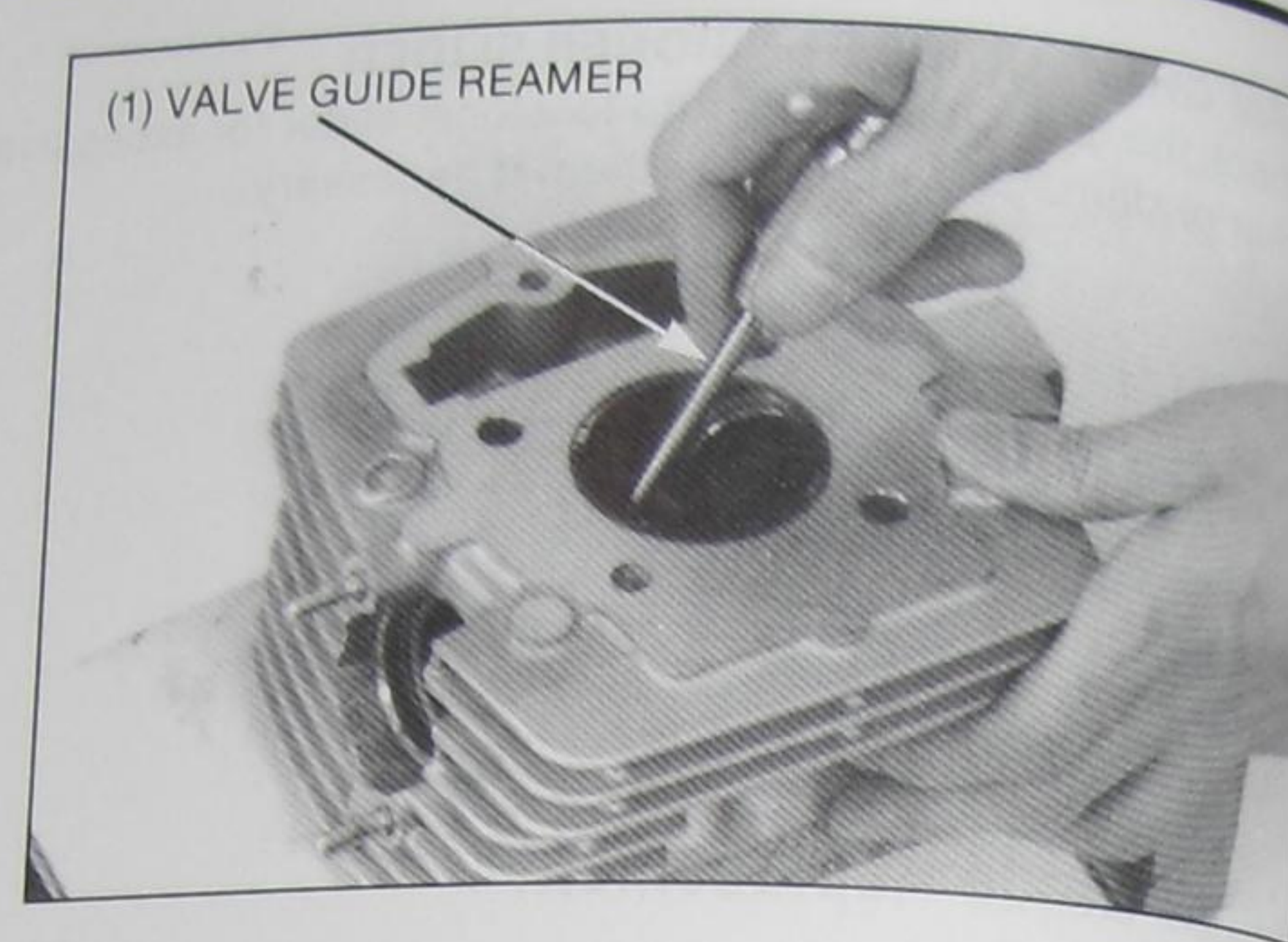
Apply a light coating of Prussian blue to each valve seat. Tap the valve against the valve seat several times without rotating the valve, to check for proper valve seat contact.

Remove the valve and inspect the valve seat face for:

- Uneven seat width:
 - Replace the valve and reface the valve seat.
- Damaged face:
 - Replace the valve and reface the valve seat
- Contact area (too high or too low)
 - Reface the valve seat

NOTE:

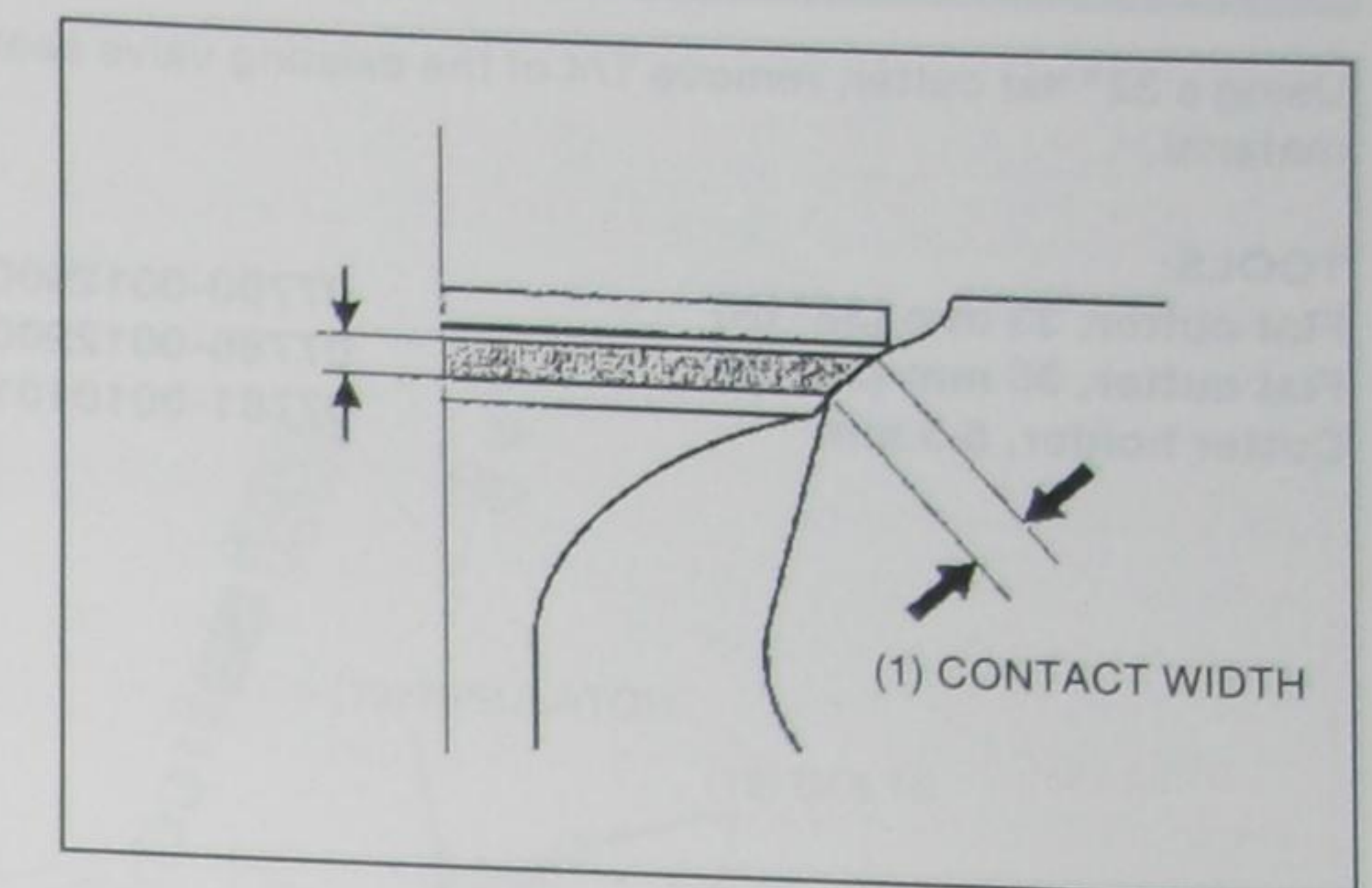
- The valve cannot be ground. If the valve face is burned or badly worn or if it contacts the seat unevenly, replace the valve.



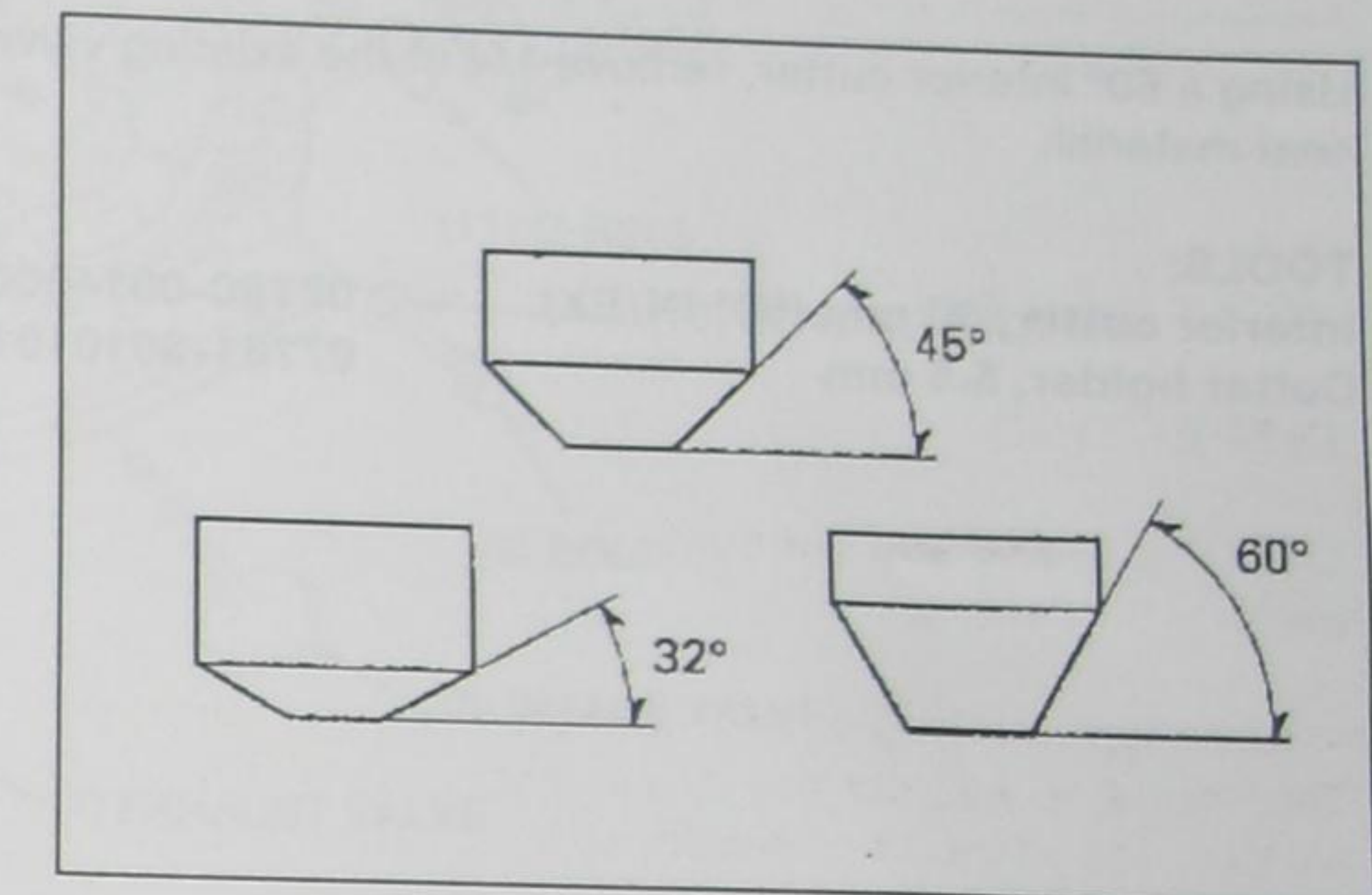
Inspect the width of valve seat.
The valve seat contact should be within the specified width and even all around the circumference.

STANDARDS: IN/EX: 1.1-1.3 mm (0.04-0.05 in)
SERVICE LIMITS: IN/EX: 1.5 mm (0.06 in)

If the valve seat width is not within specification, reface the valve seat (see below).

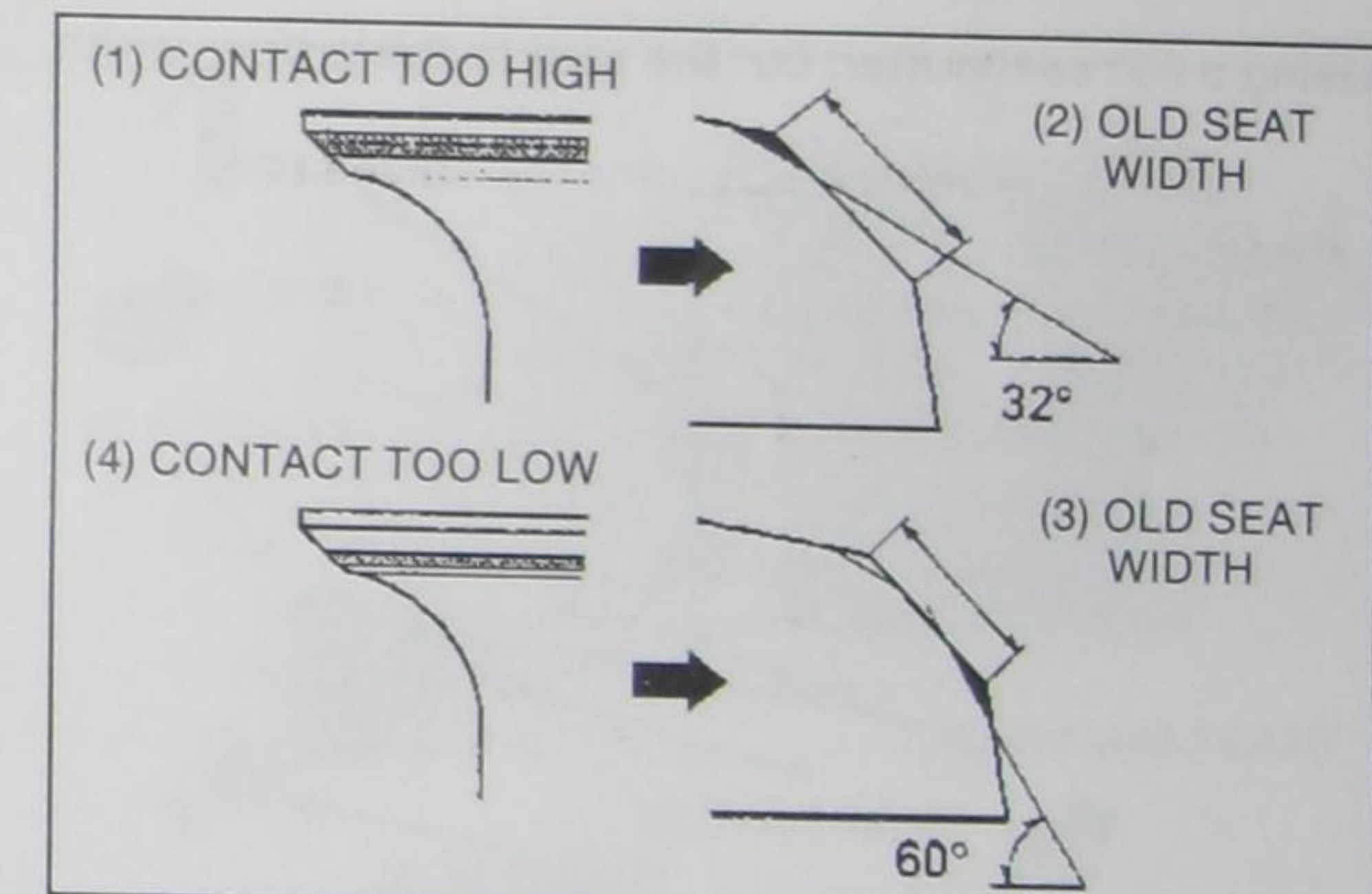
**REFACING****NOTE:**

- Follow the refacing manufacturer's operating instructions.
- Be careful not to grind the seat more than necessary.



If the contact area is too high on the valve, the seat must be lowered using a 32° flat cutter.

If the contact area is too low on the valve, the seat must be raised using a 60° interior cutter.

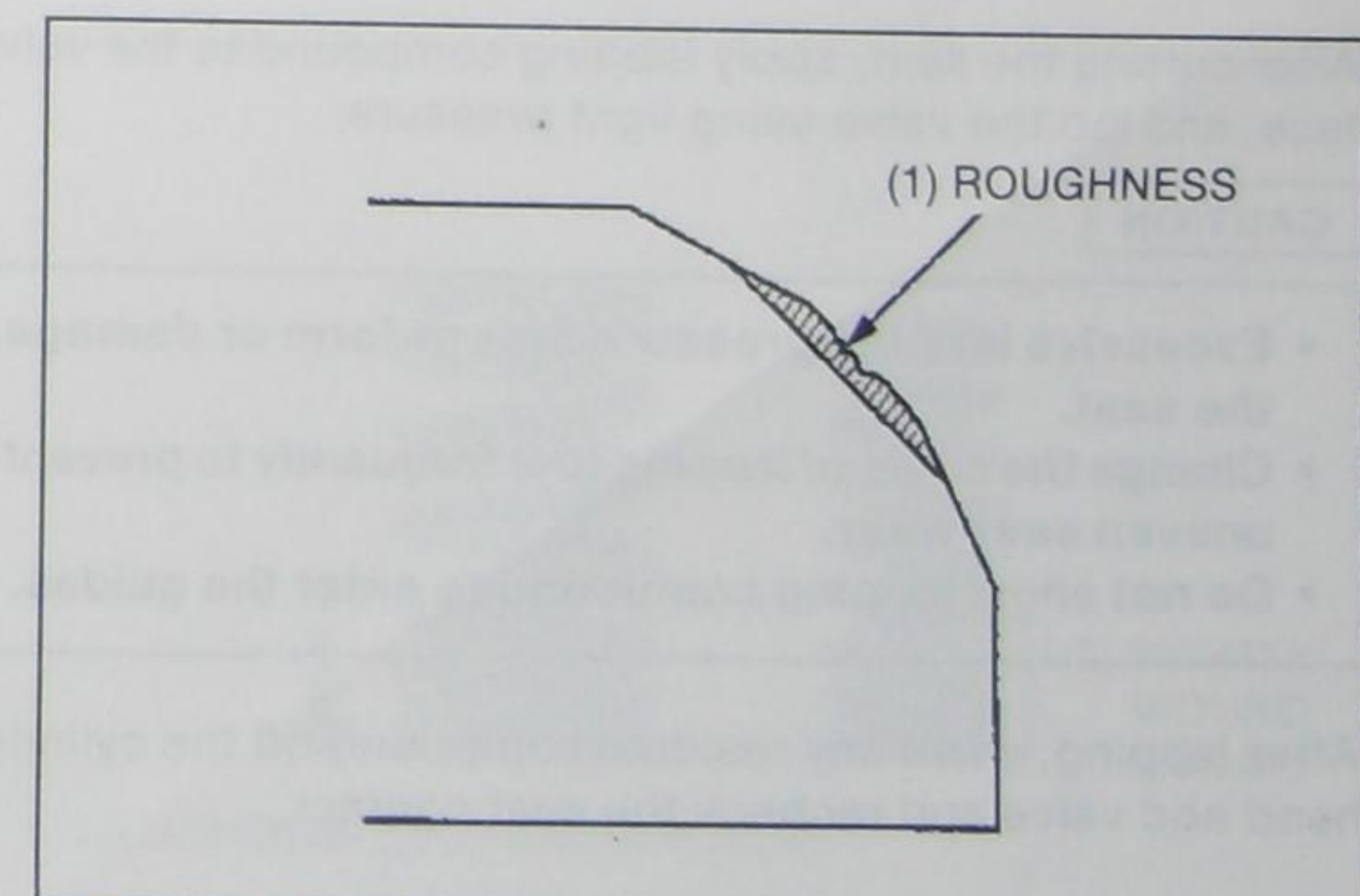


Using a 45° seat cutter, remove any roughness or irregularities from the seat.

TOOLS:

Seat cutter, 33 mm (45° IN)
Seat cutter, 27.5 mm (45° EX)
Cutter holder, 5.5 mm

07780-0010800
07780-0010200
07781-0010101



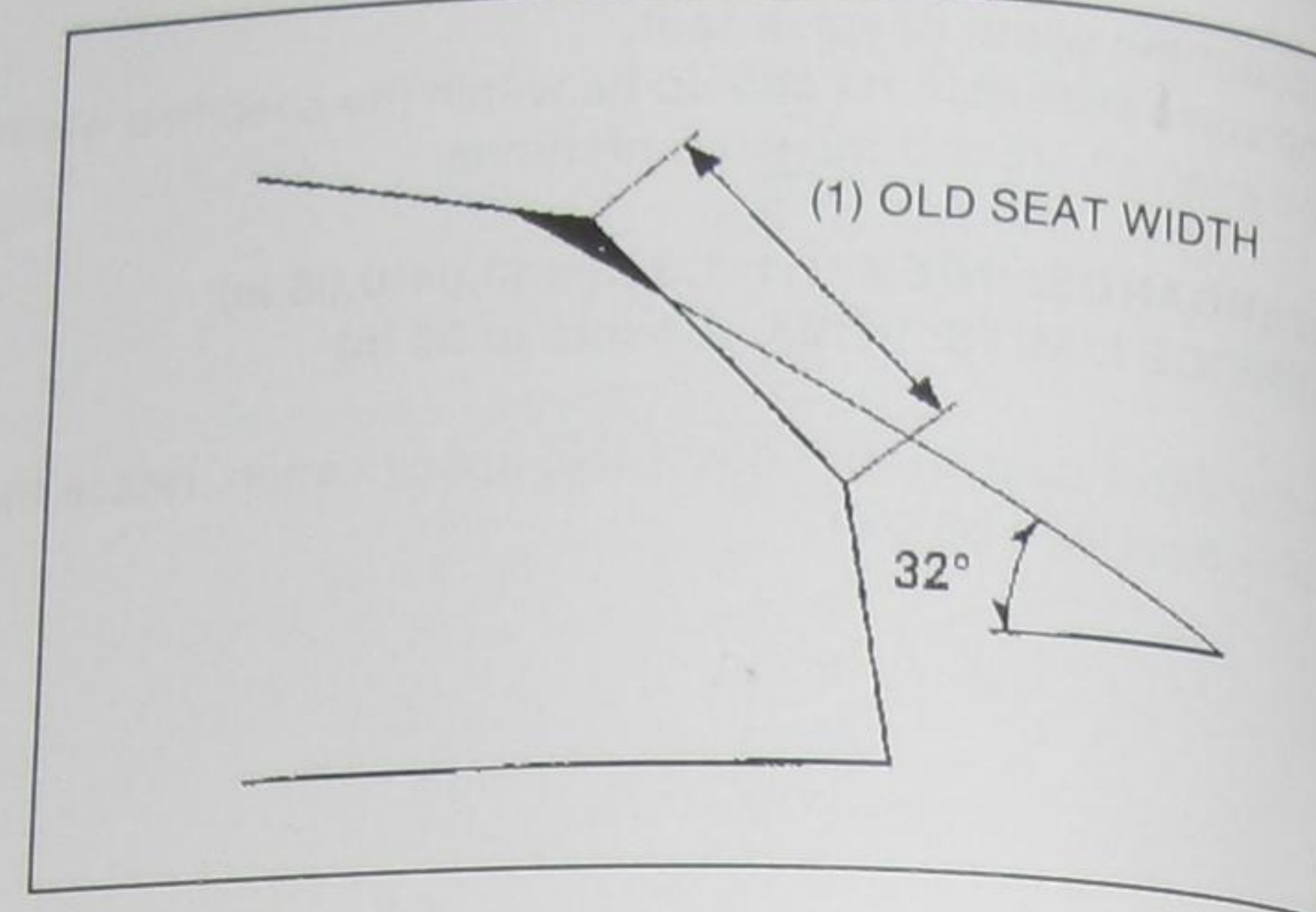
CYLINDER HEAD/VALVE

Using a 32° flat cutter, remove 1/4 of the existing valve seat material.

TOOLS:

Flat cutter, 33 mm (32° IN)
Flat cutter, 30 mm (32° EX)
Cutter holder, 5.5 mm

07780-0012900
07780-0012200
07781-0010101

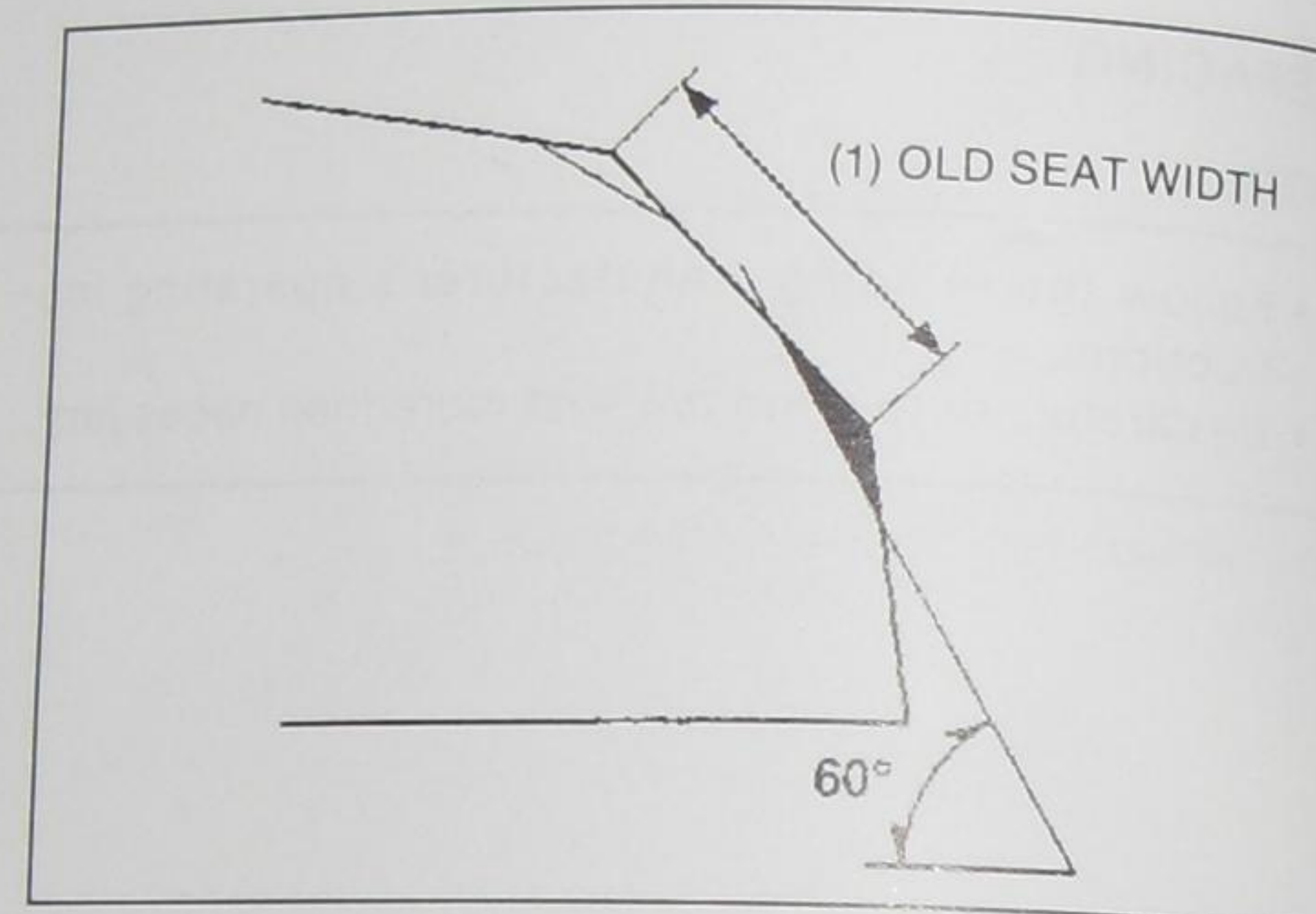


Using a 60° interior cutter, remove 1/4 of the existing valve seat material.

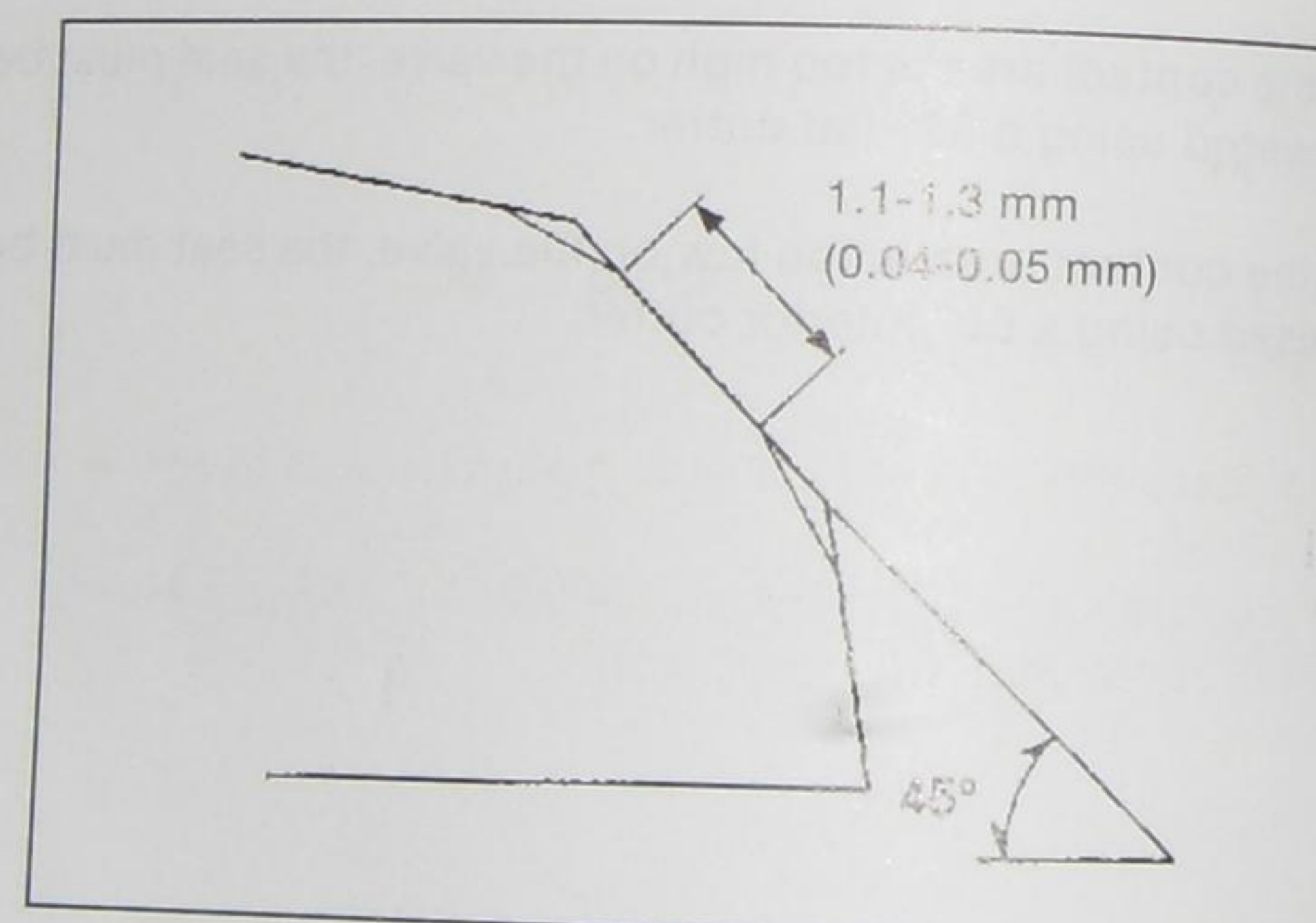
TOOLS:

Interior cutter, 30 mm (60° IN/EX)
Cutter holder, 5.5 mm

07780-0014000
07781-0010101



Using a 45° seat cutter, cut the seat to the proper width.

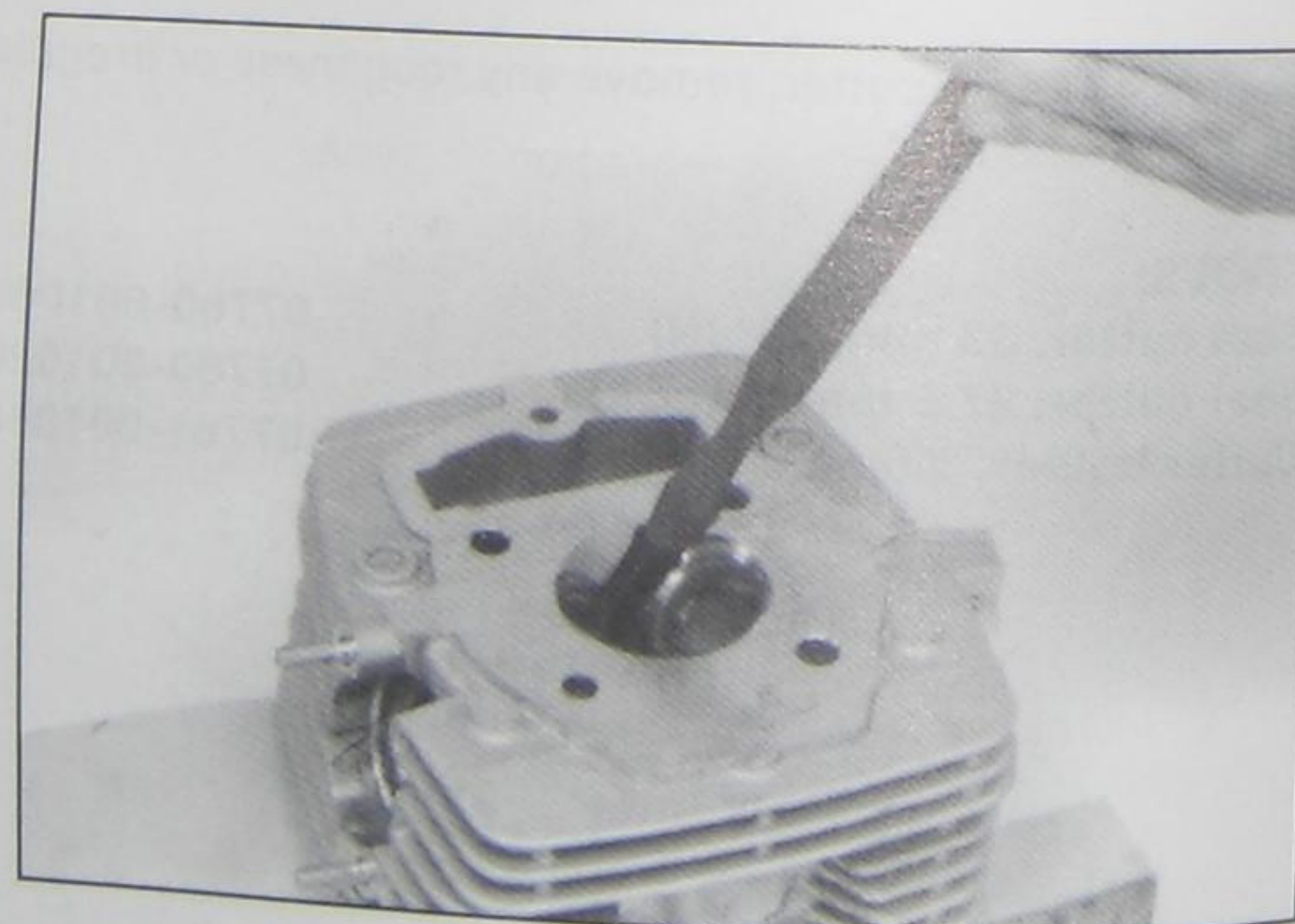


After cutting the seat, apply lapping compound to the valve face, and lap the valve using light pressure.

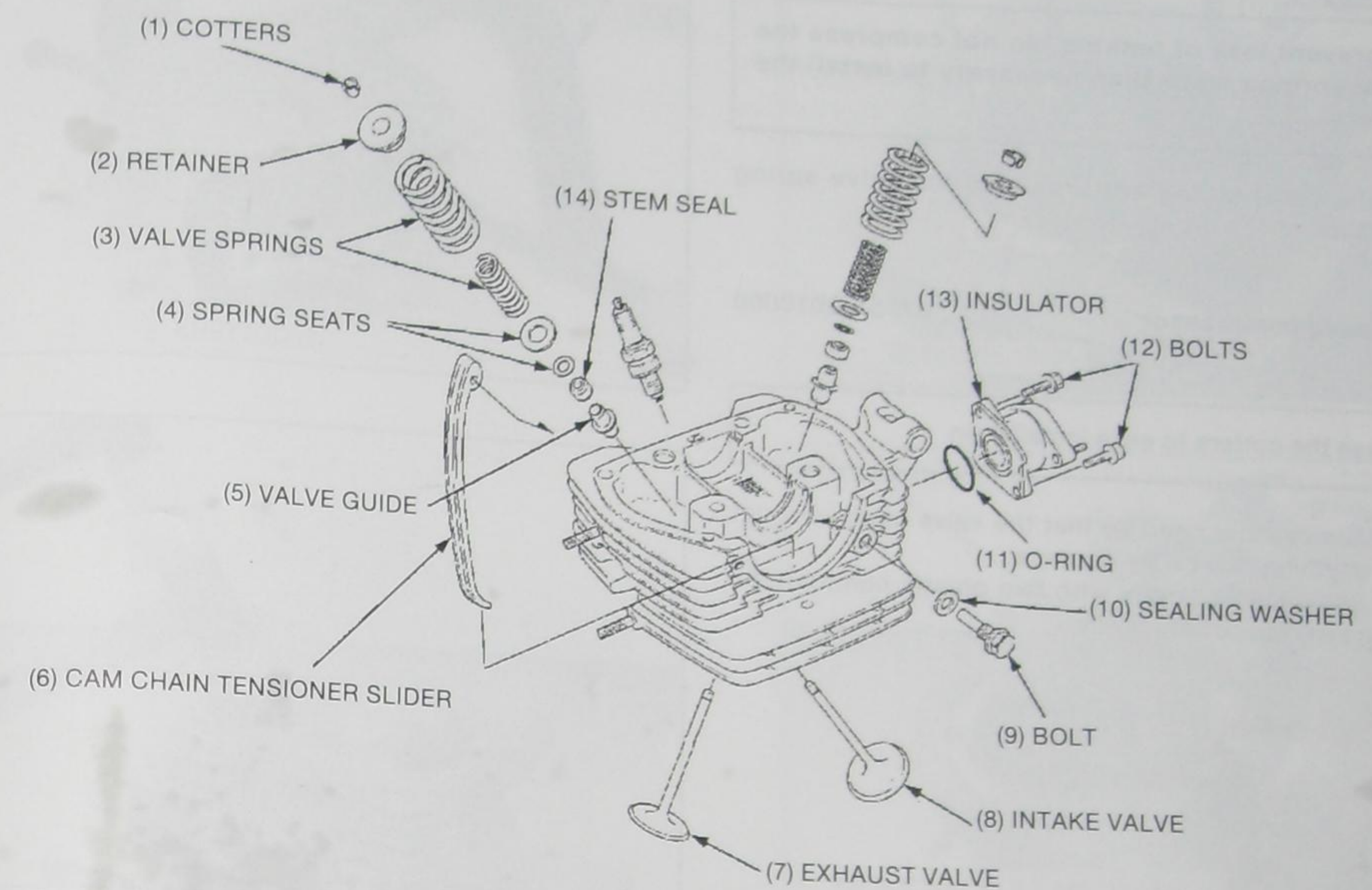
CAUTION

- Excessive lapping pressure may deform or damage the seat.
- Change the angle of lapping tool frequently to prevent uneven seat wear.
- Do not allow lapping compound to enter the guides.

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



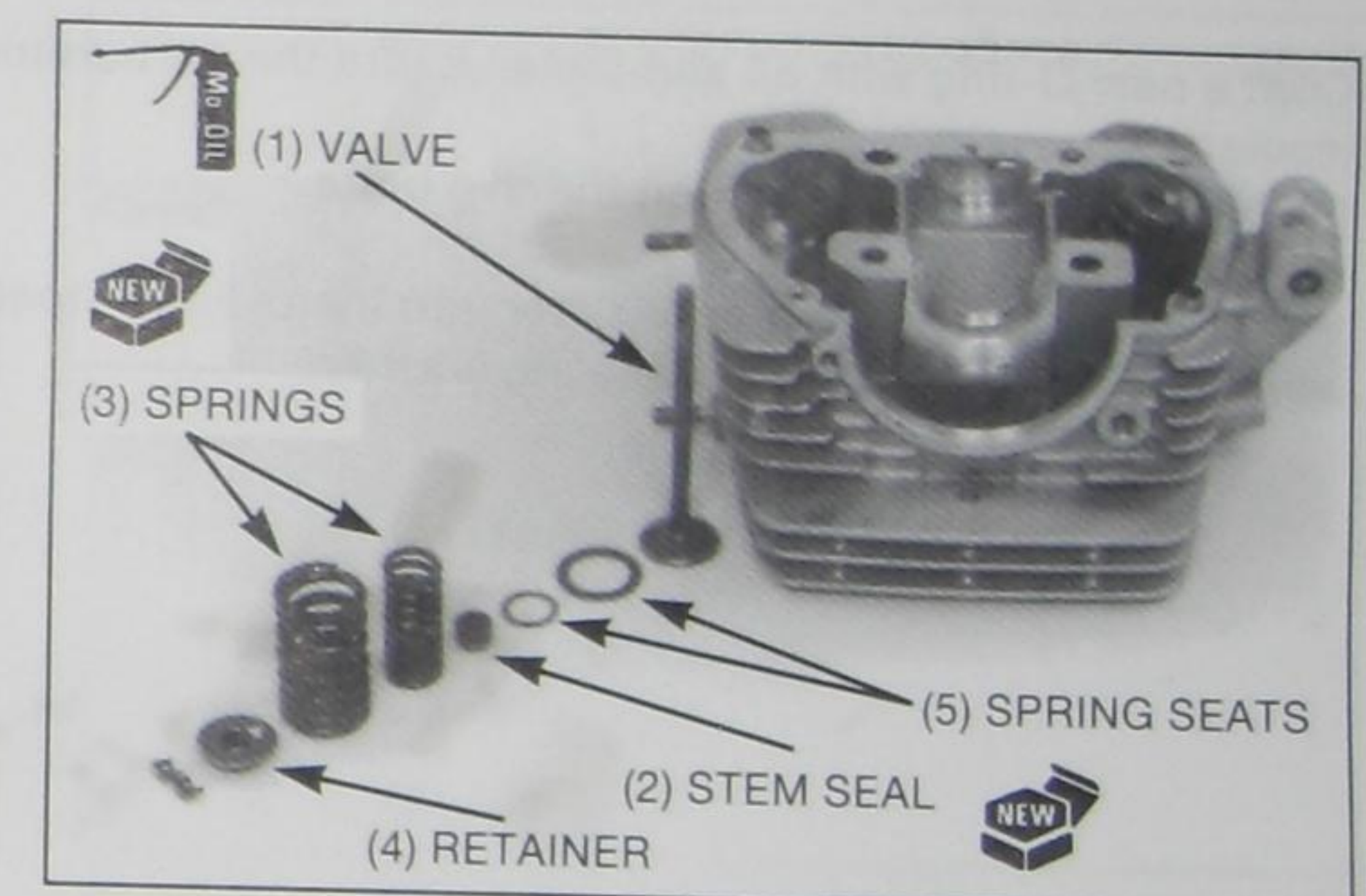
Cylinder Head Assembly



Blow through all oil passages in the cylinder head with compressed air.

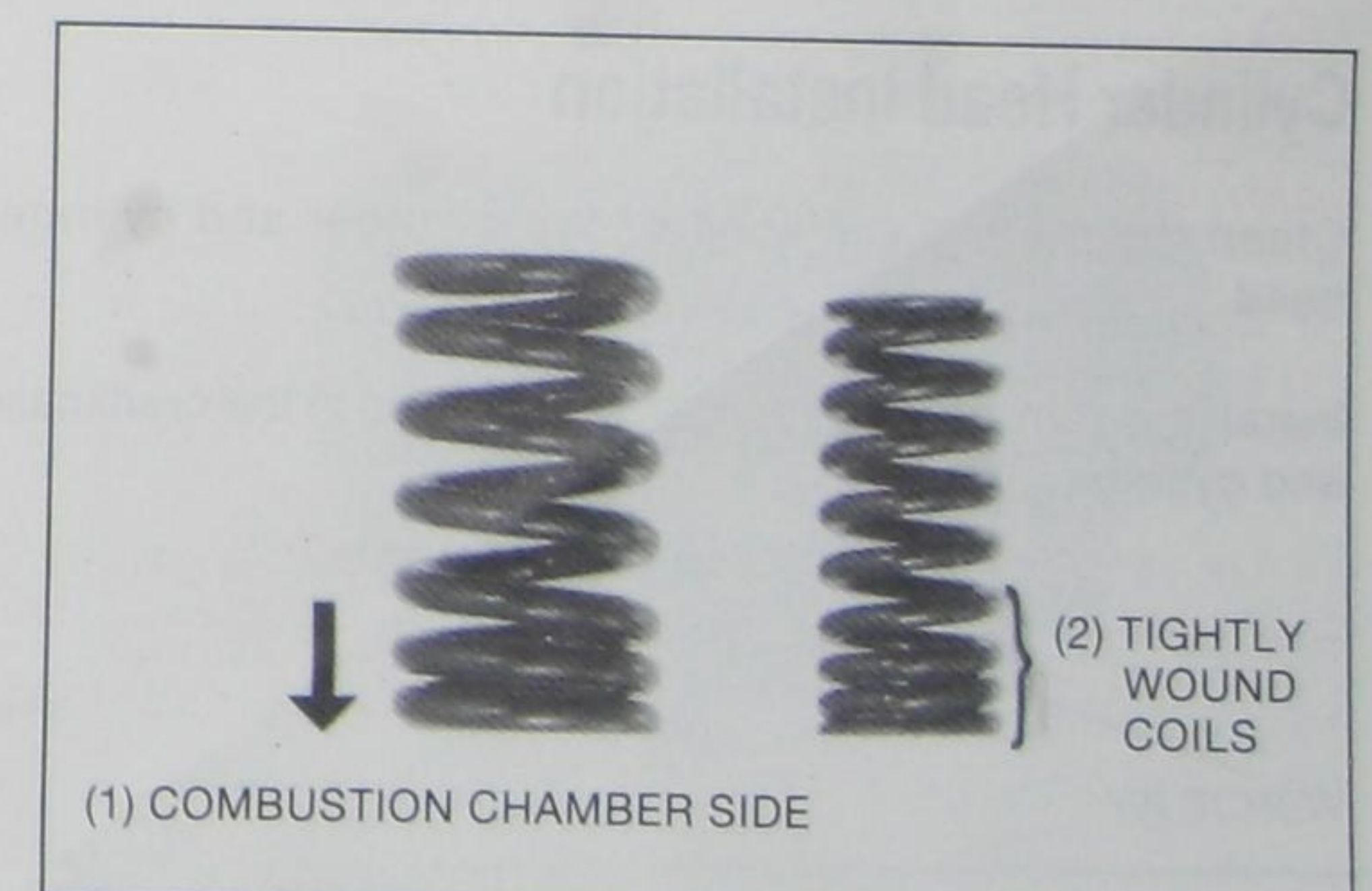
Install the inner and outer spring seats.
Install new stem seals.

Lubricate the valve stem sliding surface with molybdenum oil solution.
Insert the valve into the guide while turning it slowly to avoid damage to the stem seal.



Install the inner and outer valve springs with the tightly wound coils facing the combustion chamber.

Install the spring retainer.



CYLINDER HEAD/VALVE

CAUTION

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

Install the valve spring cotters using the valve spring compressor.

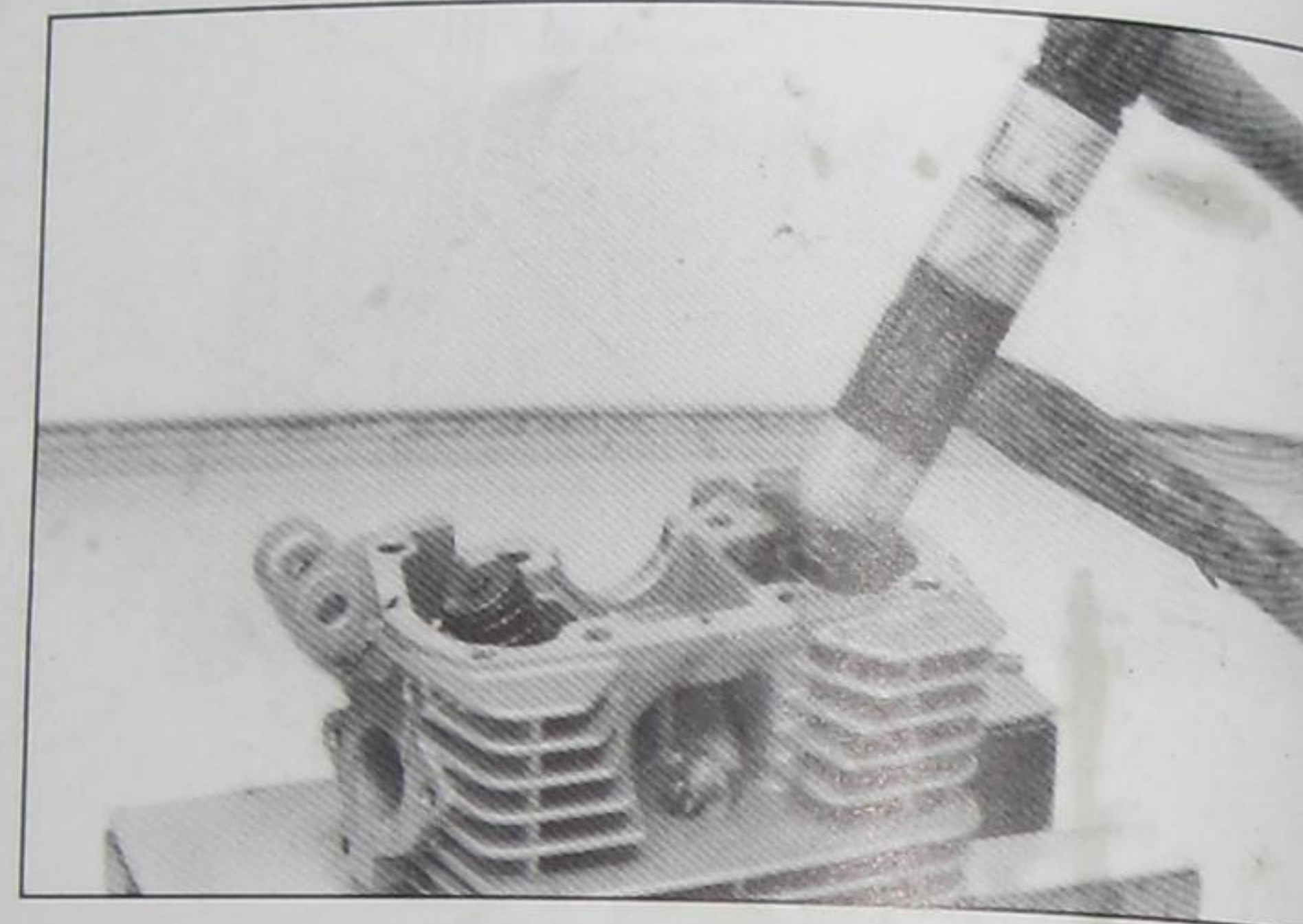
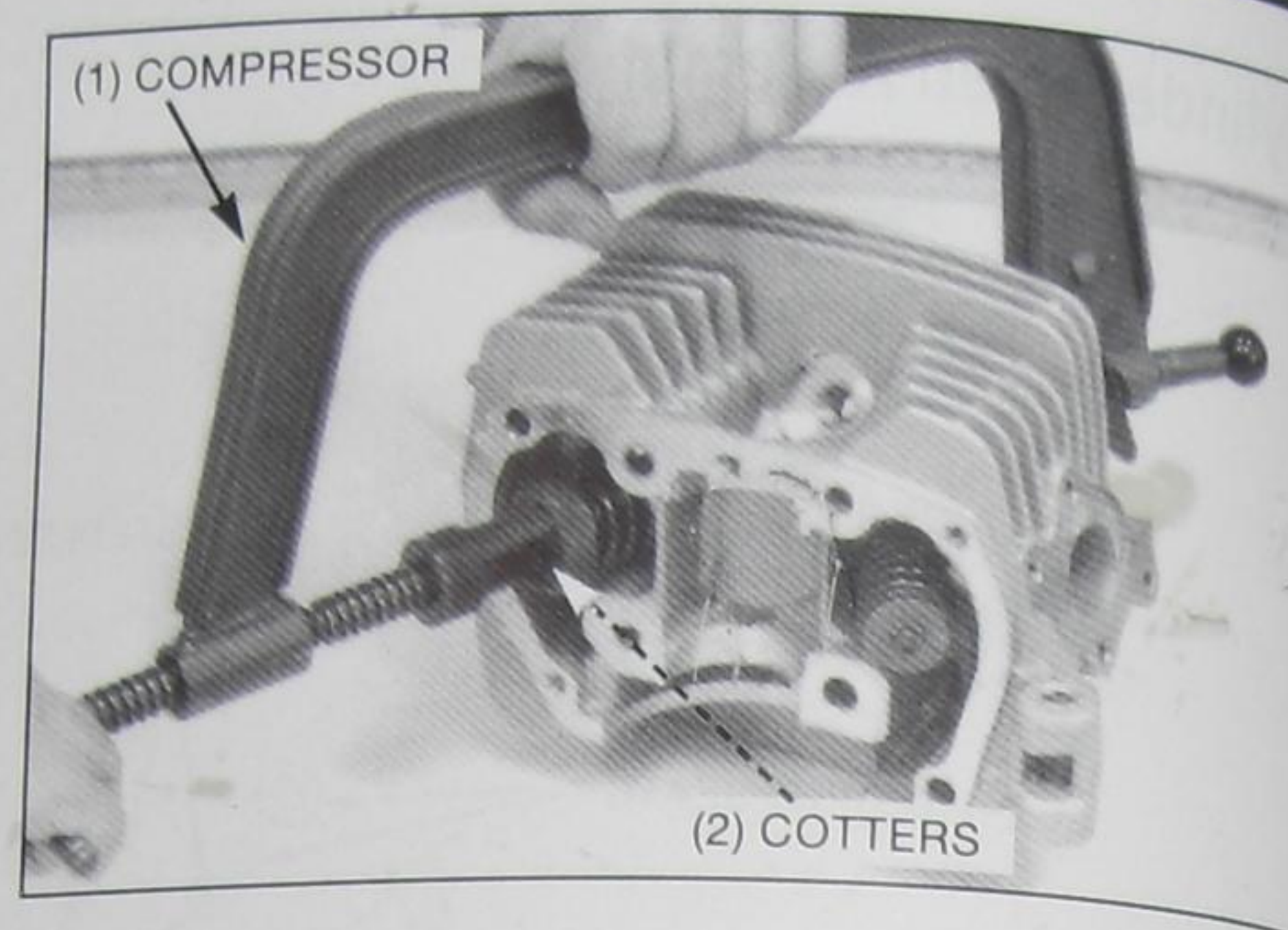
TOOL:
Valve spring compressor

07757-0010000

NOTE:

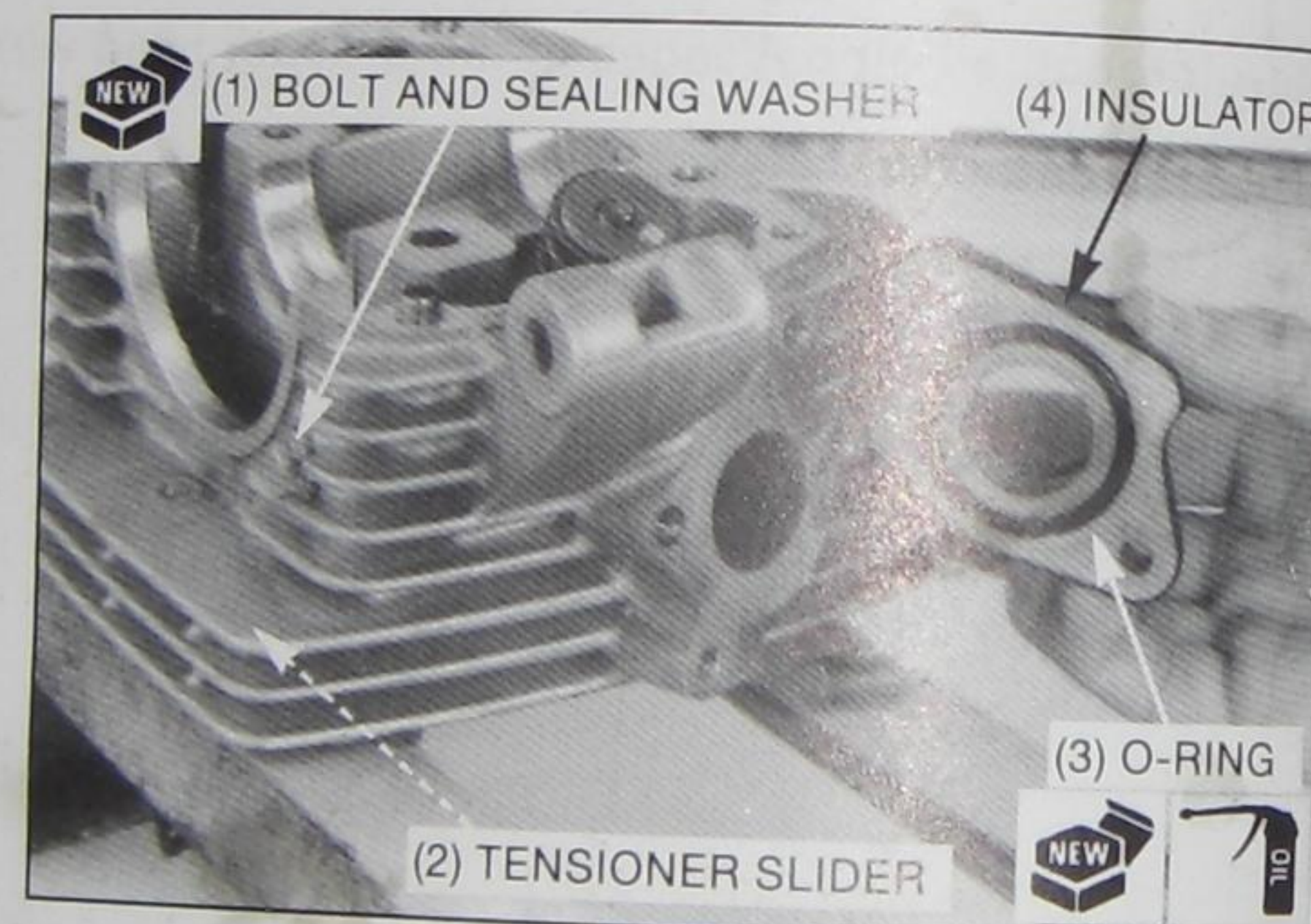
- Grease the cotters to ease installation.

Support the cylinder head so that the valve heads will not contact anything that cause damage.
Tap the valve stems gently with two plastic hammers as shown to seat the cotters firmly



Coat a new O-ring with oil and install it into the carburetor insulator groove.
Install the insulator and tighten the two bolts.

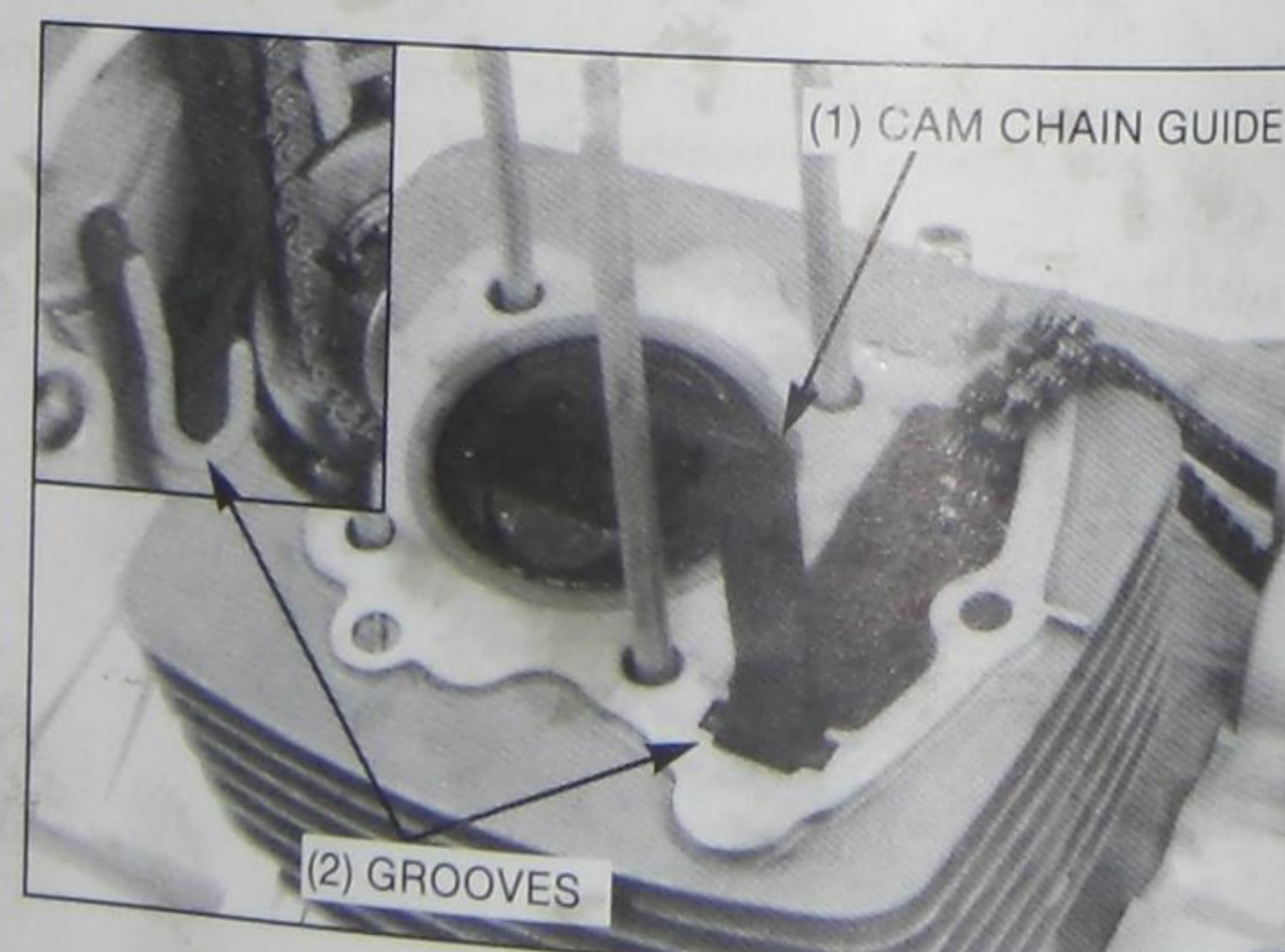
Install the cam chain tensioner slider into the cylinder head with the pivot bolt and a new sealing washer.



Cylinder Head Installation

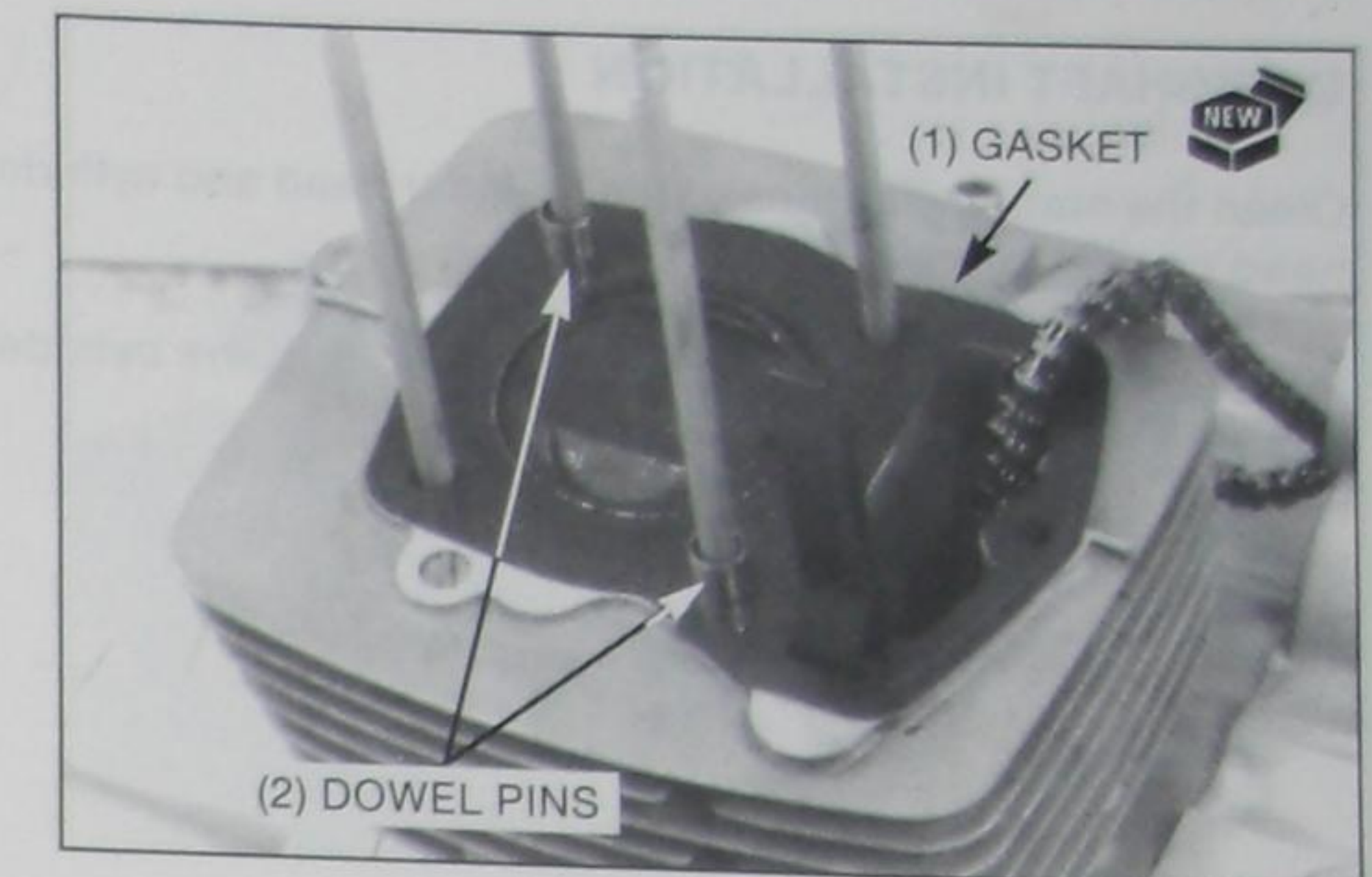
Clean the mating surfaces of the cylinder and cylinder head.

Install the cam chain guide into the grooves in the crankcase and cylinder.

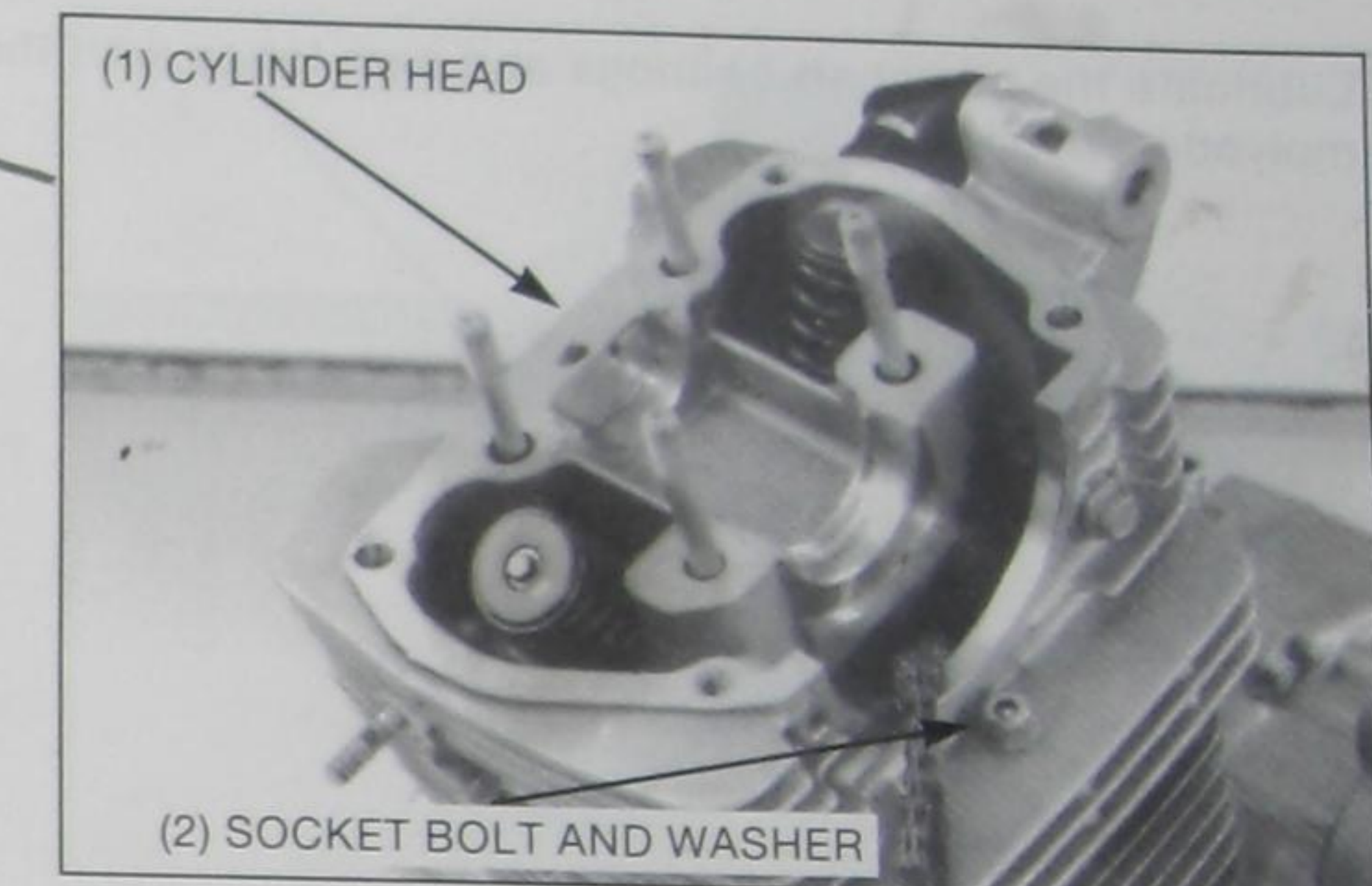


CYLINDER HEAD/VALVE

Install the dowel pins and a new gasket.



Install the cylinder head onto the cylinder.
Install the socket bolt with the washer.

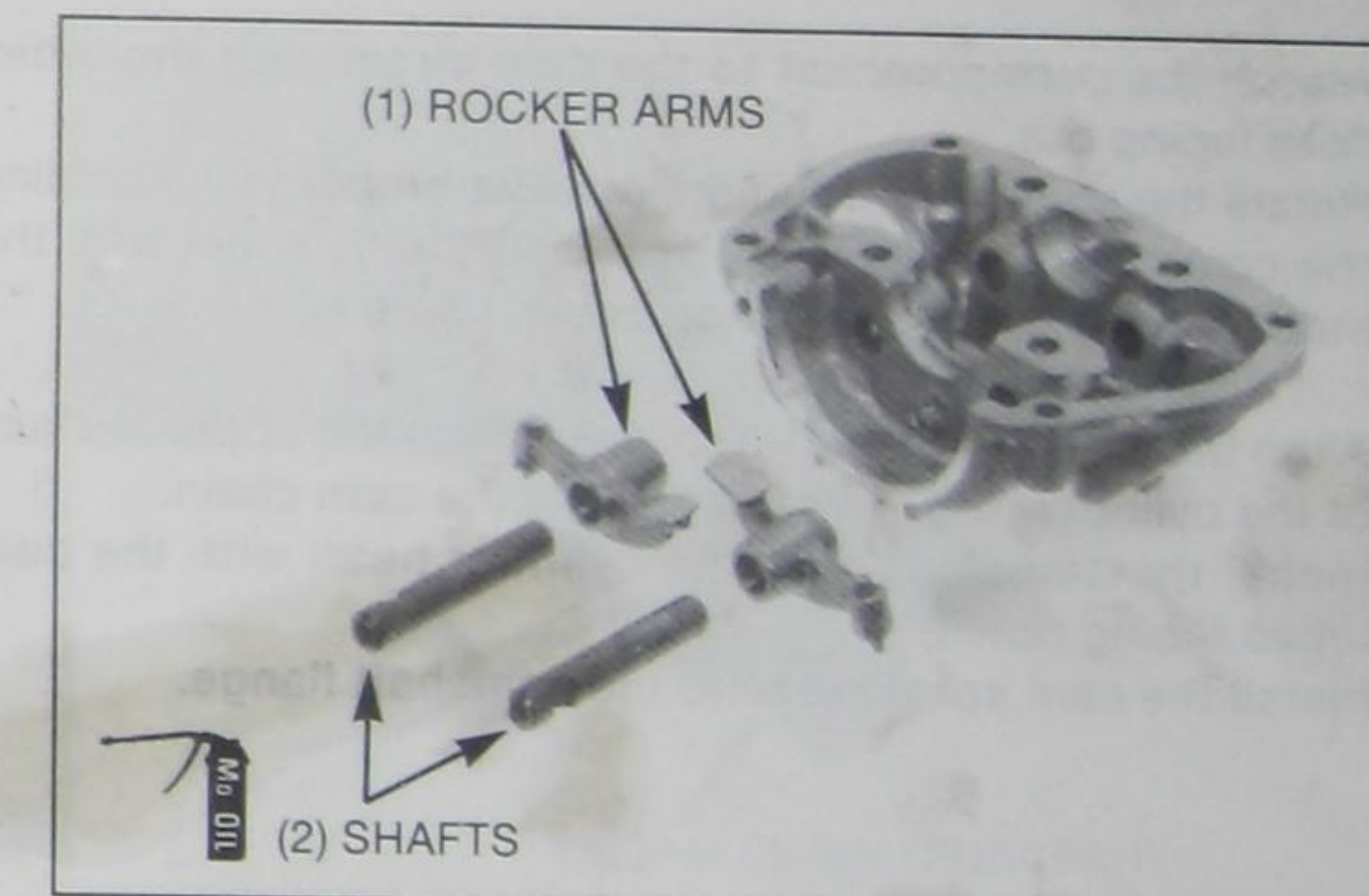


Cylinder Head Cover/Camshaft Installation

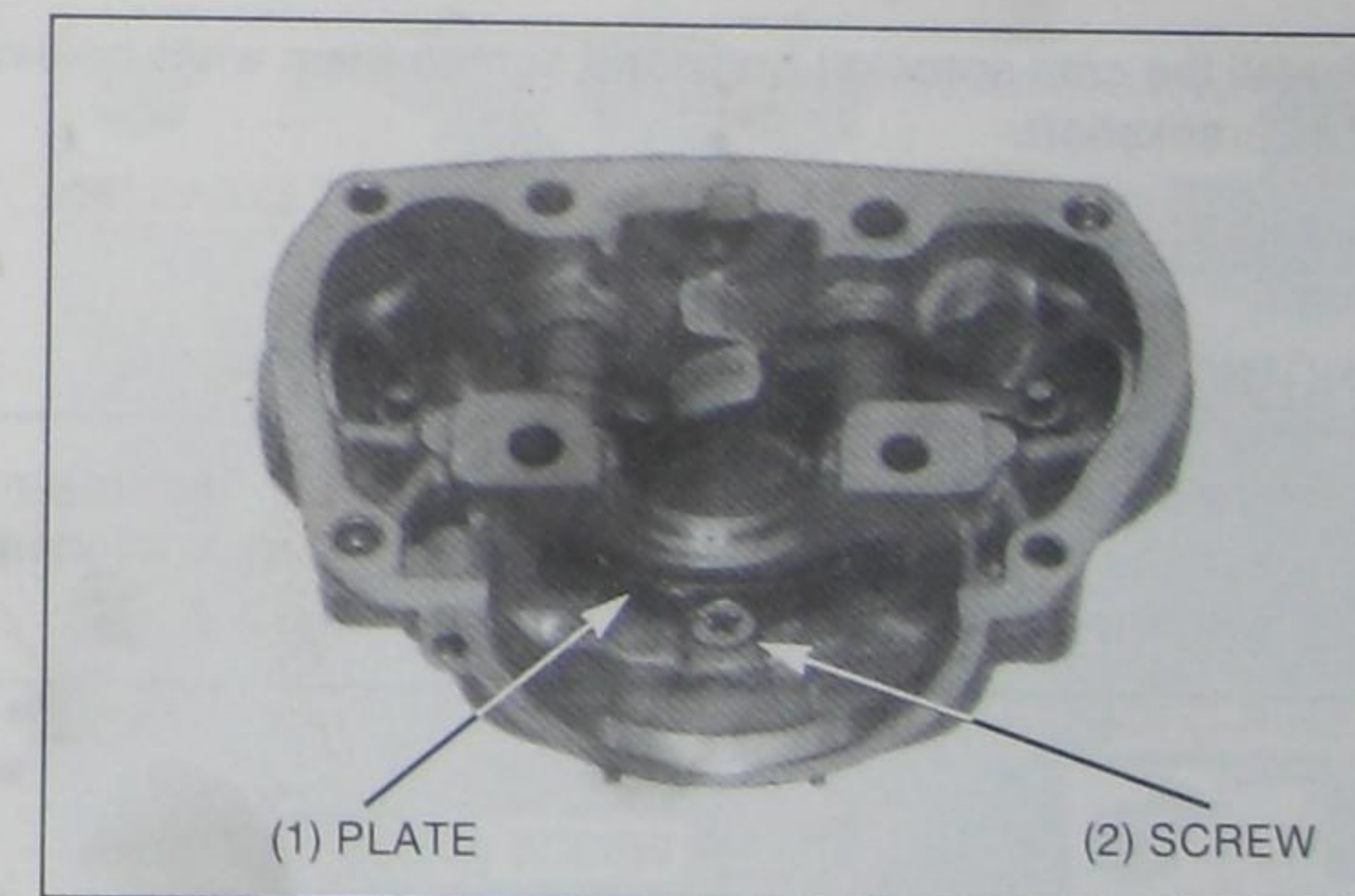
ROCKER ARM INSTALLATION

Apply molybdenum oil solution to the rocker arm shaft sliding surfaces.

Set the rocker arm into the cylinder head cover and install the rocker arm shaft through the rocker arm.



Install the setting plate so that it ends aligned with the cutouts of the rocker arm shafts.
Install the attaching screw and tighten it securely.

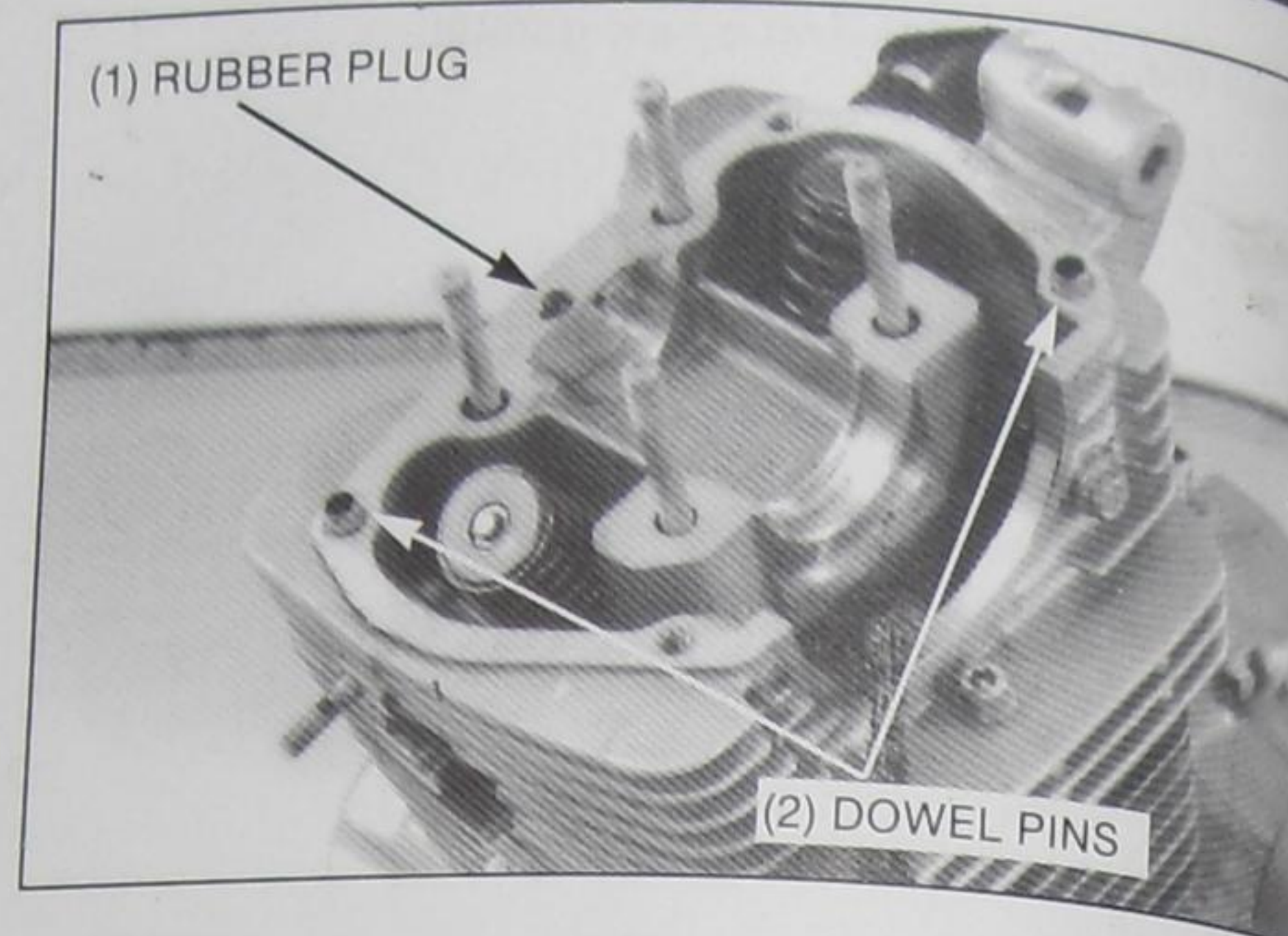


CYLINDER HEAD/VALVE

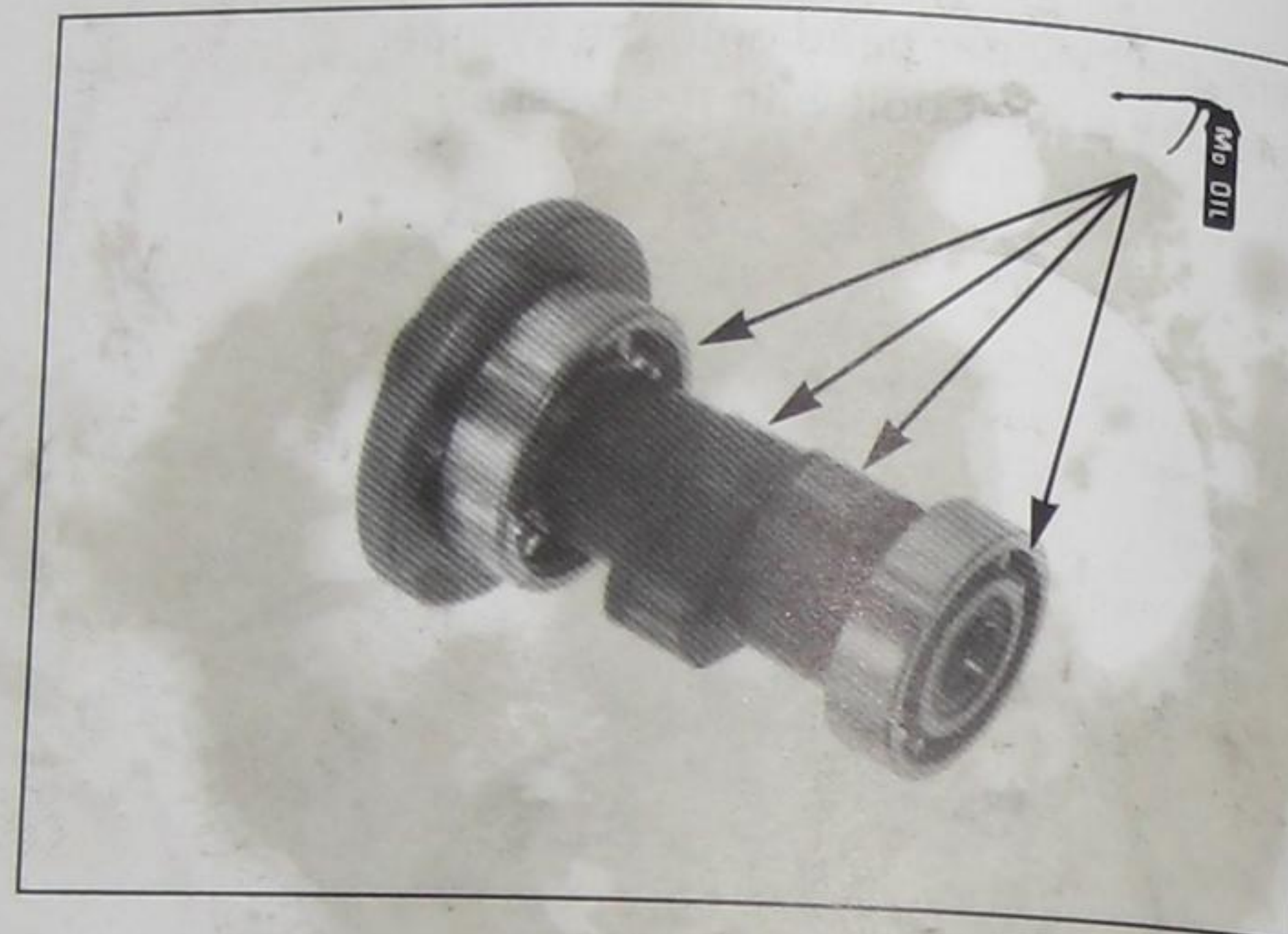
CAMSHAFT INSTALLATION

Clean the mating surfaces of the cylinder head and cylinder head cover.

Install the dowel pins and the rubber plug into the cylinder head.



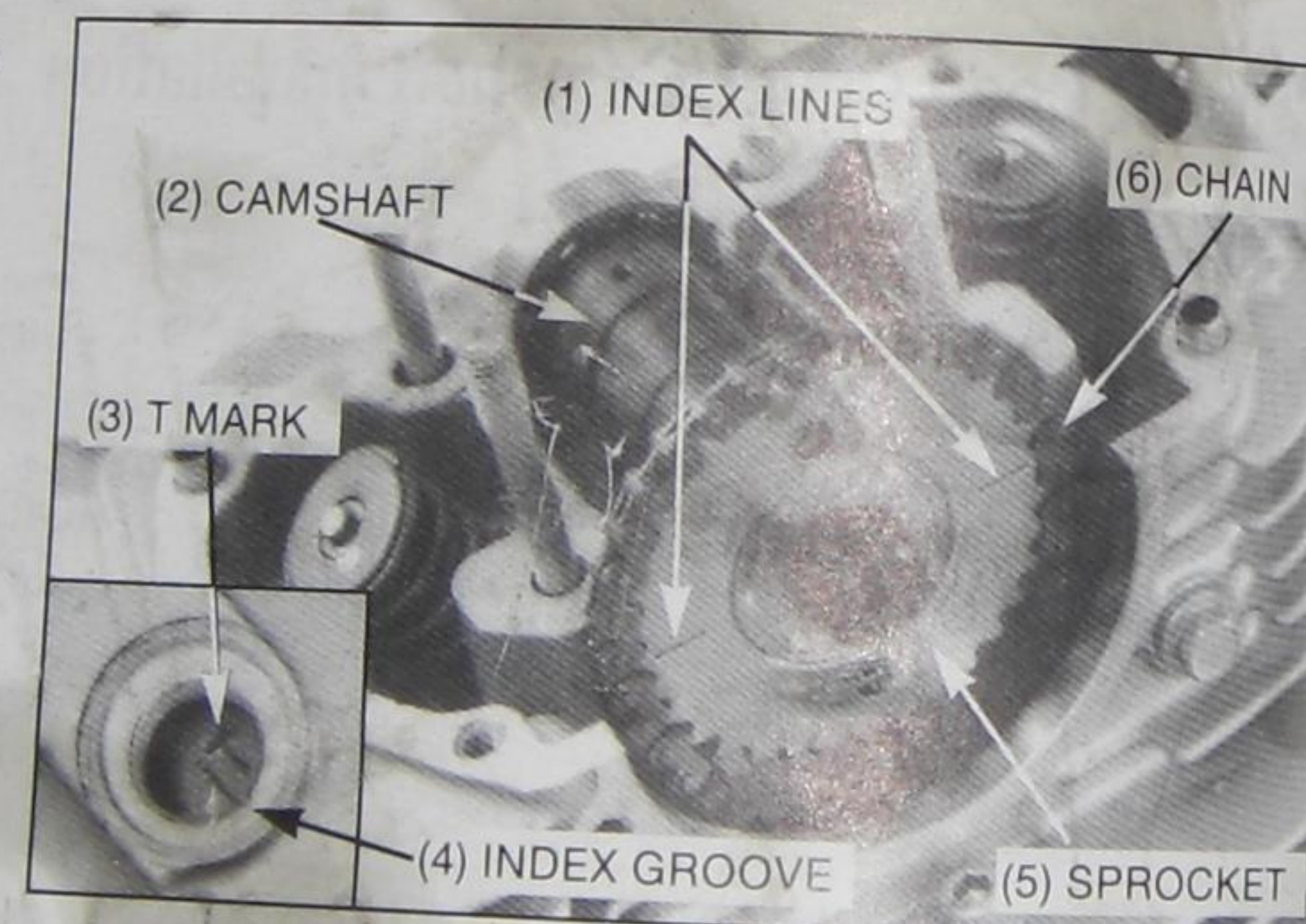
Lubricate the camshaft bearings and cam lobes with the molybdenum oil solution.



Attach the cam sprocket to the cam chain with the index lines facing out.

Rotate the crankshaft counterclockwise slowly while holding the cam chain to align the T mark on the flywheel with the index groove in the crankcase cover.

Align the index lines on the sprocket with the upper surface of the cylinder head without moving the cam chain.
Install the camshaft onto the cylinder head with the cam lobes facing down.
Install the cam sprocket onto the camshaft flange.

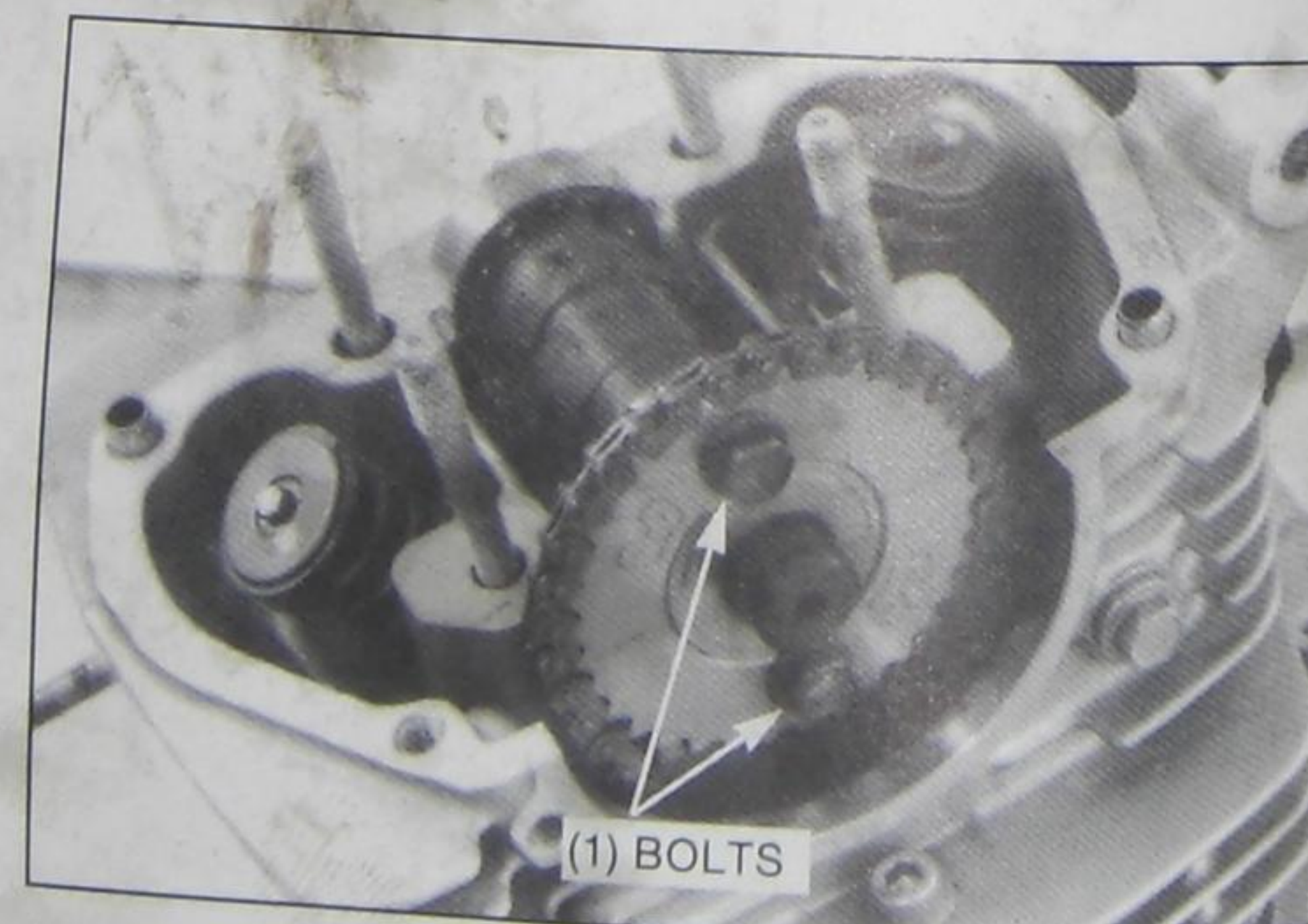


Install the cam sprocket bolts and tighten them while holding the crankshaft.

TORQUE: 12 N·m (1.2 kgf-m, 9 lbf-ft)

NOTE:

- Make sure that the index lines align with the upper surface of the cylinder head when the T mark is aligned with the index groove.



CYLINDER HEAD/VALVE

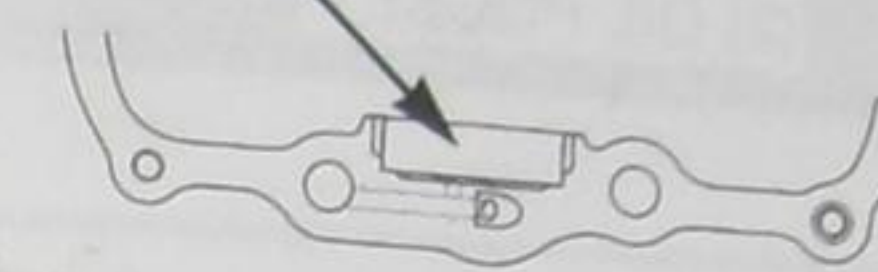
CYLINDER HEAD COVER INSTALLATION

Apply liquid sealant to the mating surface of the cylinder head cover.

NOTE:

- Do not get sealant into the oil passages. Sealant in these locations could cause lubrication failure.

Avoid getting sealant



Pour engine oil into the oil pocket in the cylinder head.

Install the cylinder head cover onto the cylinder head.
Apply oil to the head cover cap nut threads and seating surfaces.

Install the head cover bolts and cap nuts with a new sealing washers.

Tighten the nuts and bolts in a crisscross pattern in 2-3 steps.

TORQUE:

Head cover cap nut: 26 N·m (2.7 kgf-m, 20 lbf-ft)

Head cover bolt: 12 N·m (1.2 kgf-m, 9 lbf-ft)

Cylinder head socket bolt: 10 N·m (1.0 kgf-m, 7 lbf-ft)

Tighten the tensioner slider pivot bolt.

TORQUE: 10 N·m (1.0 kgf-m, 7 lbf-ft)

Remove the tensioner sealing screw.

Before installing the cam chain tensioner, check the following:

- The tensioner shaft should not go into the body when it is pushed.
- When it is turned clockwise with a screwdriver, the tensioner shaft should be pulled into the body. The shaft spring out of the body as soon as the screwdriver is released.

Turn the tensioner shaft clockwise with a screwdriver to retract the tensioner until it is locked.

Install the cam chain tensioner into the cylinder with a new gasket.

Install the two mounting bolts with new sealing washers and tighten them.

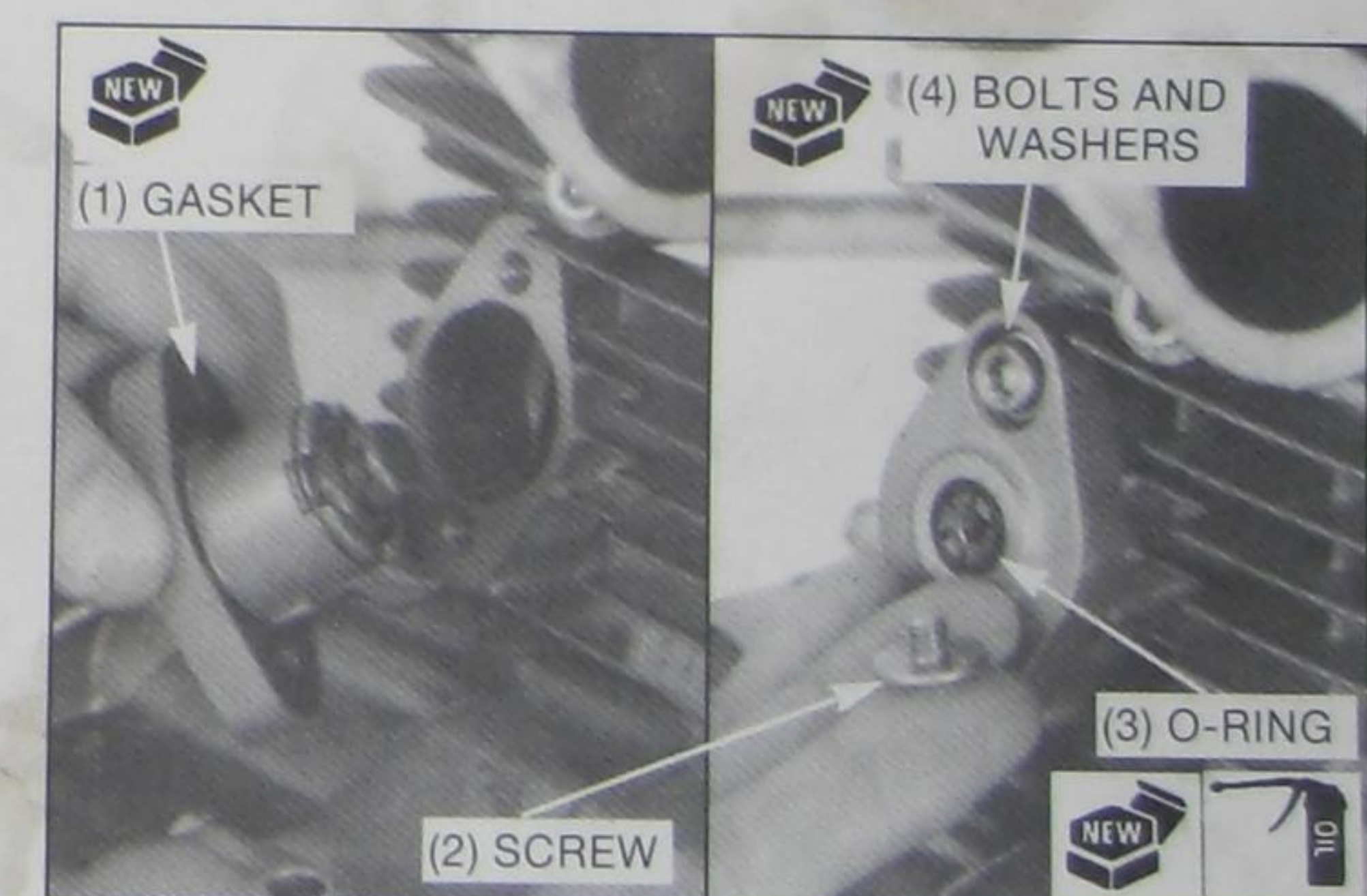
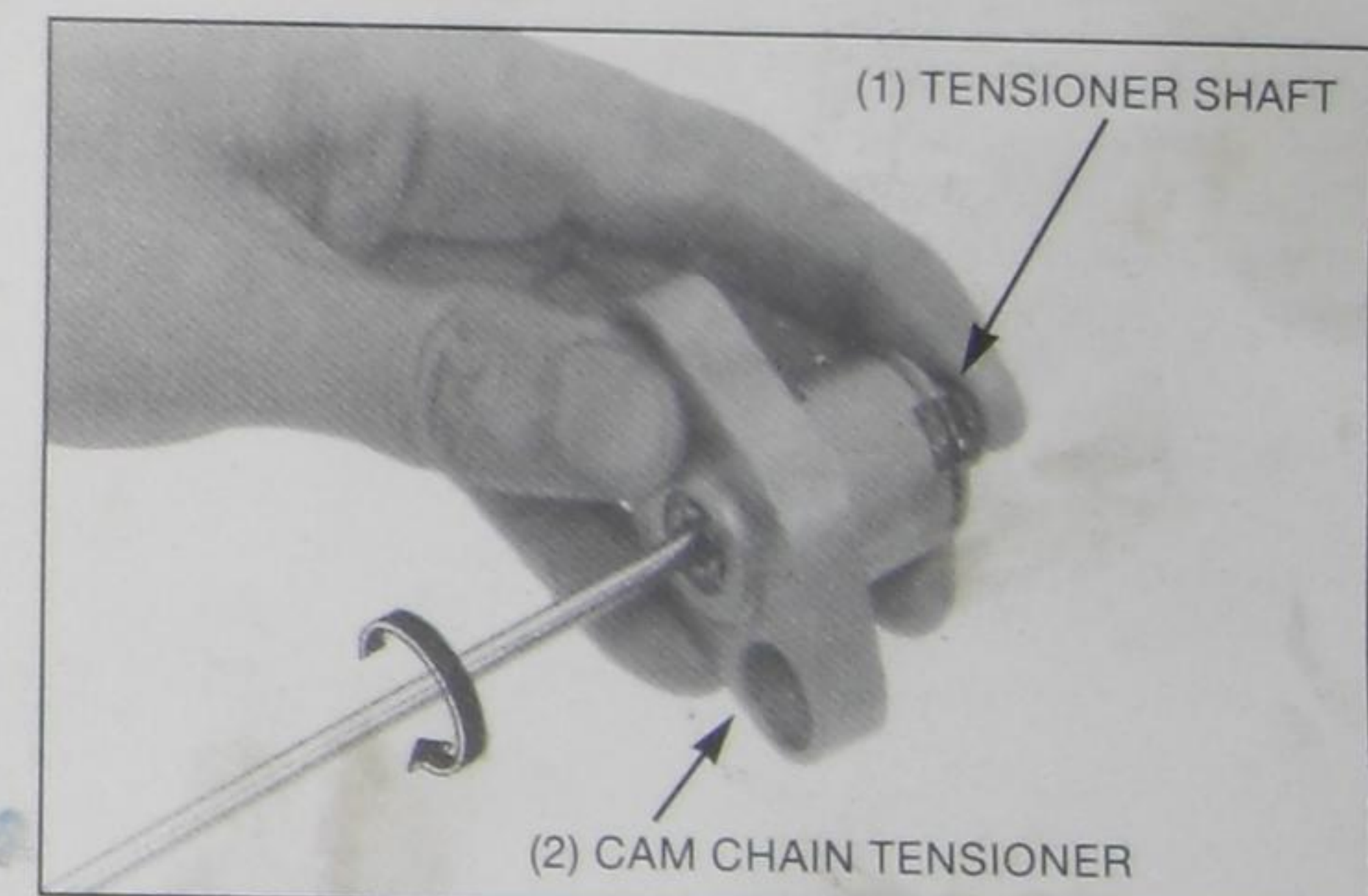
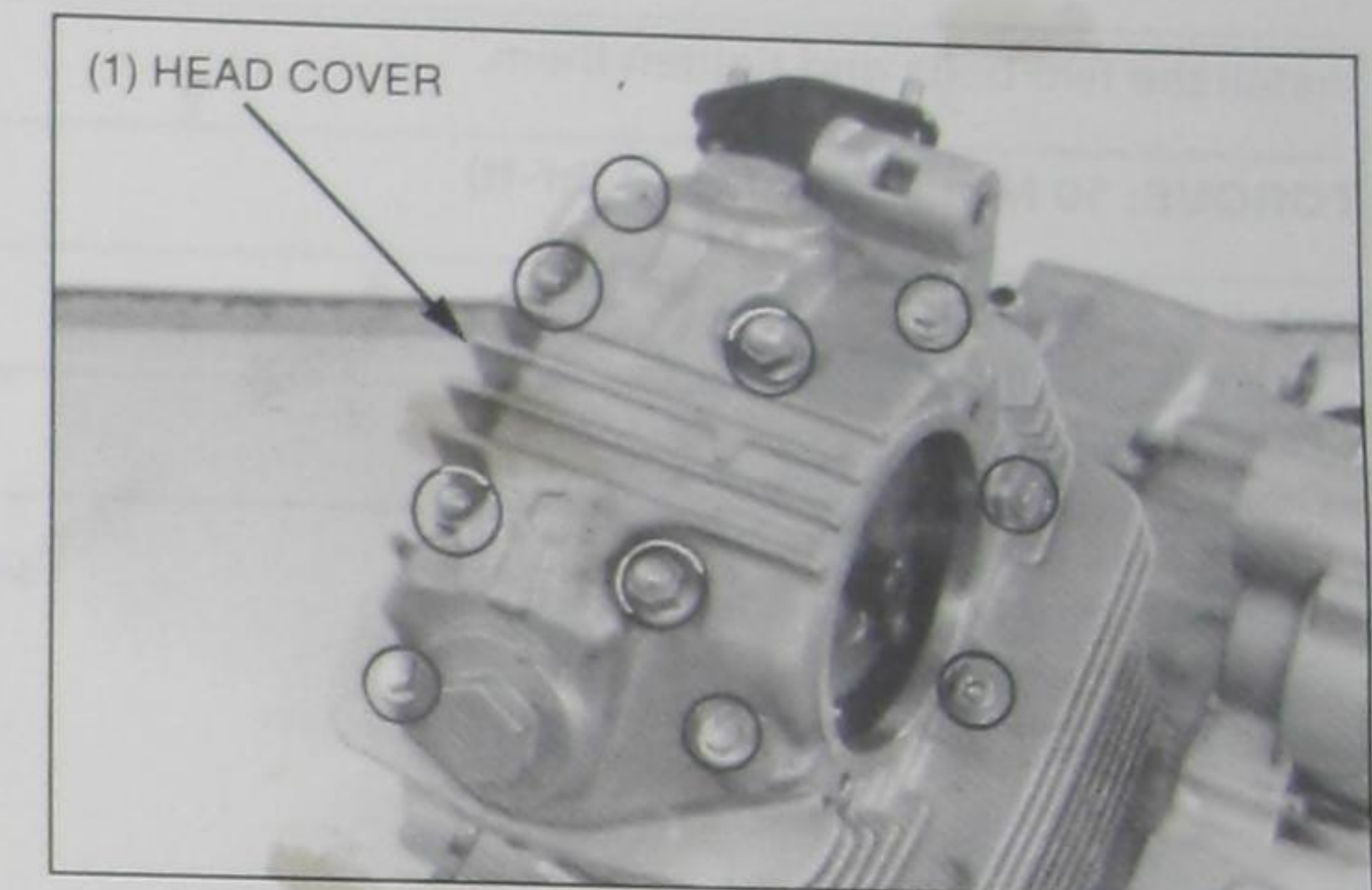
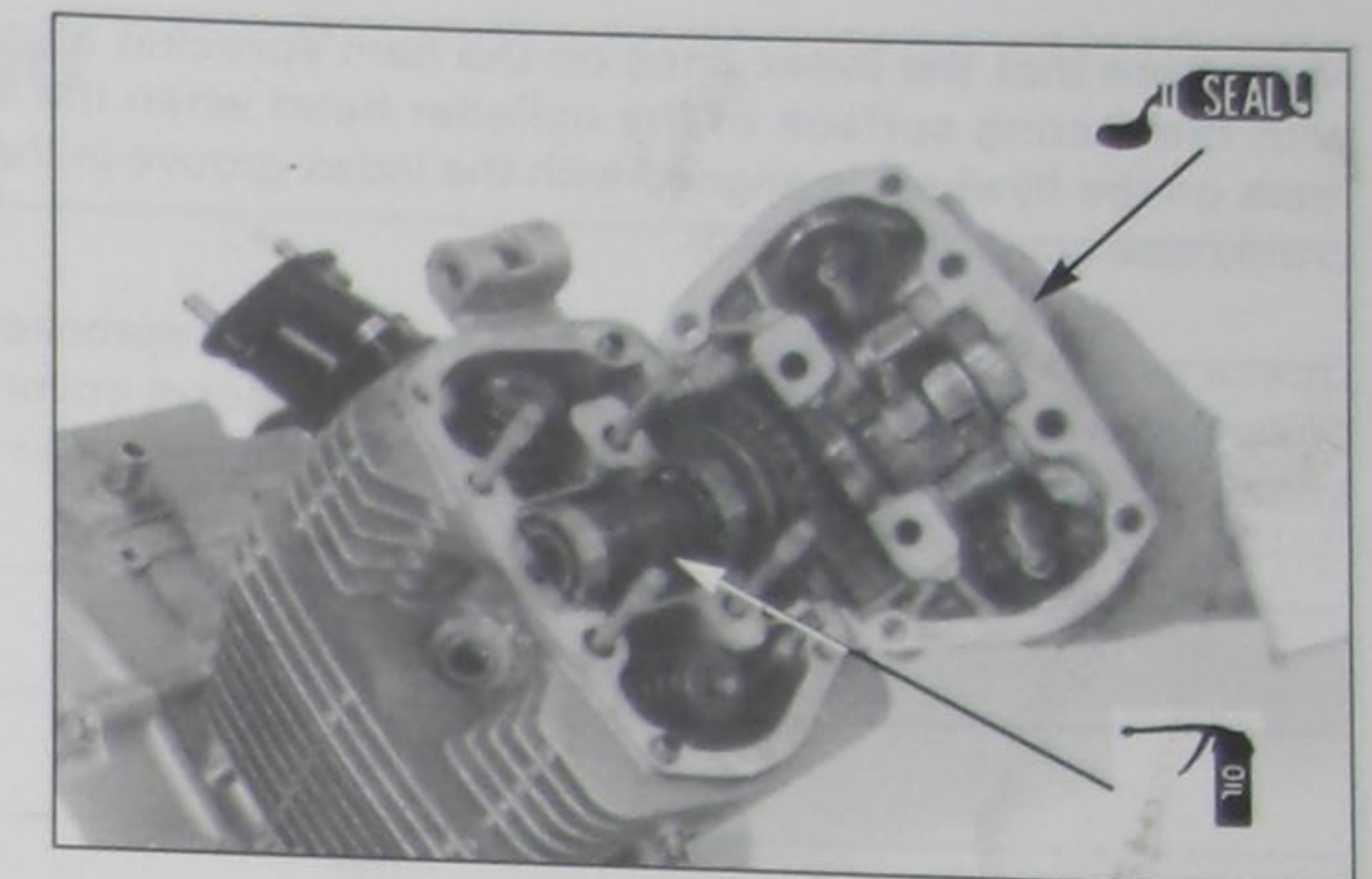
TORQUE: 12 N·m (1.2 kgf-m, 9 lbf-ft)

Turn the tensioner shaft counterclockwise slightly to release the tensioner.

Coat a new O-ring with oil and install it into the tensioner groove.

Install the sealing screw and tighten it.

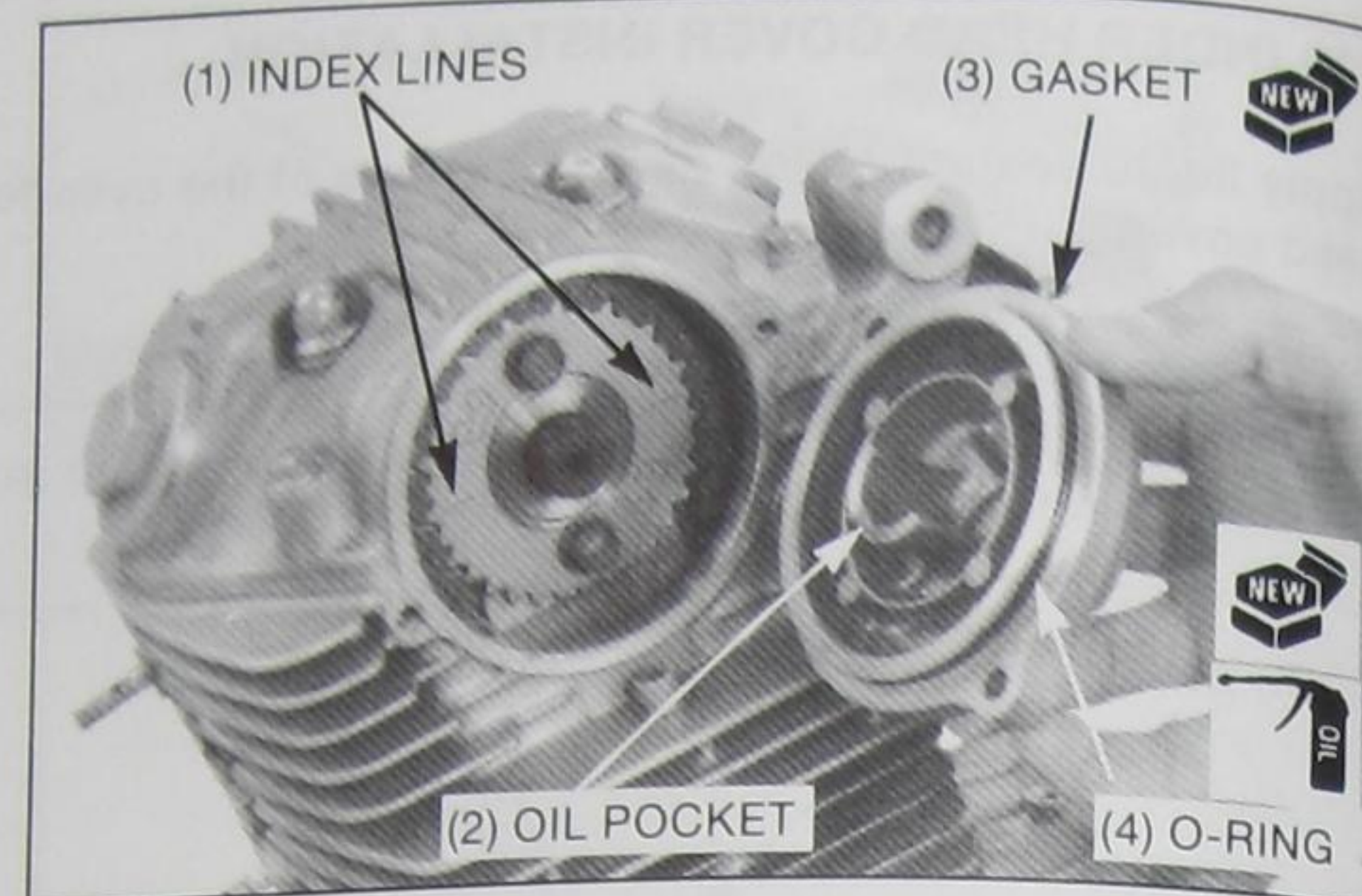
TORQUE: 4 N·m (0.4 kgf-m, 2.9 lbf-ft)



CYLINDER HEAD/VALVE

Make sure that the index lines on the cam sprocket align with the mating surface of the cylinder head when the T mark on the flywheel is aligned with the index groove in the crankcase cover (page 7-16).

Coat a new O-ring with oil and install it into the cam sprocket cover groove. Install a new gasket onto the sprocket cover. Install the sprocket cover with its oil pocket facing down.



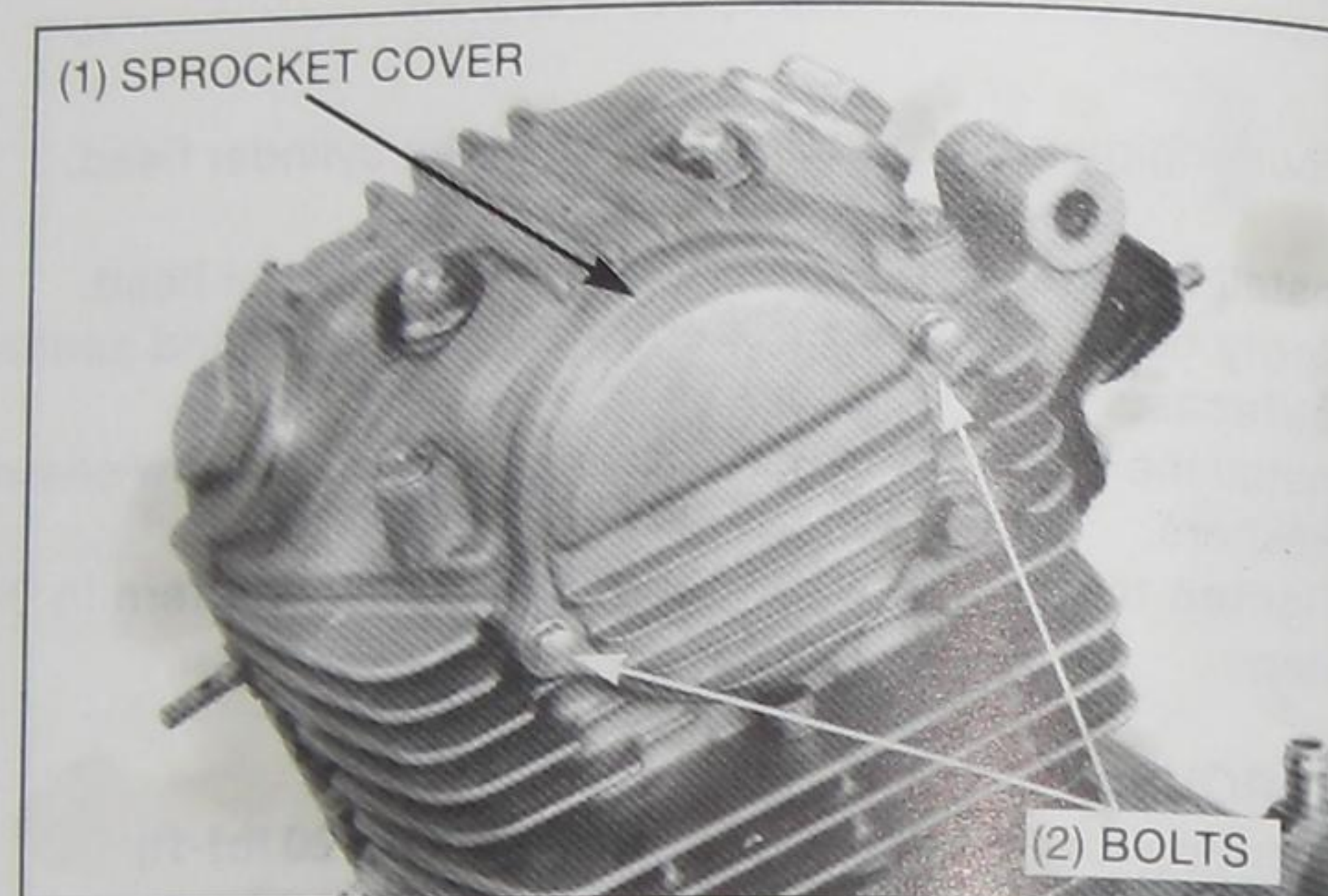
Install the two bolts and tighten them.

TORQUE: 10 N·m (1.0 kgf·m, 7 lbf·ft)

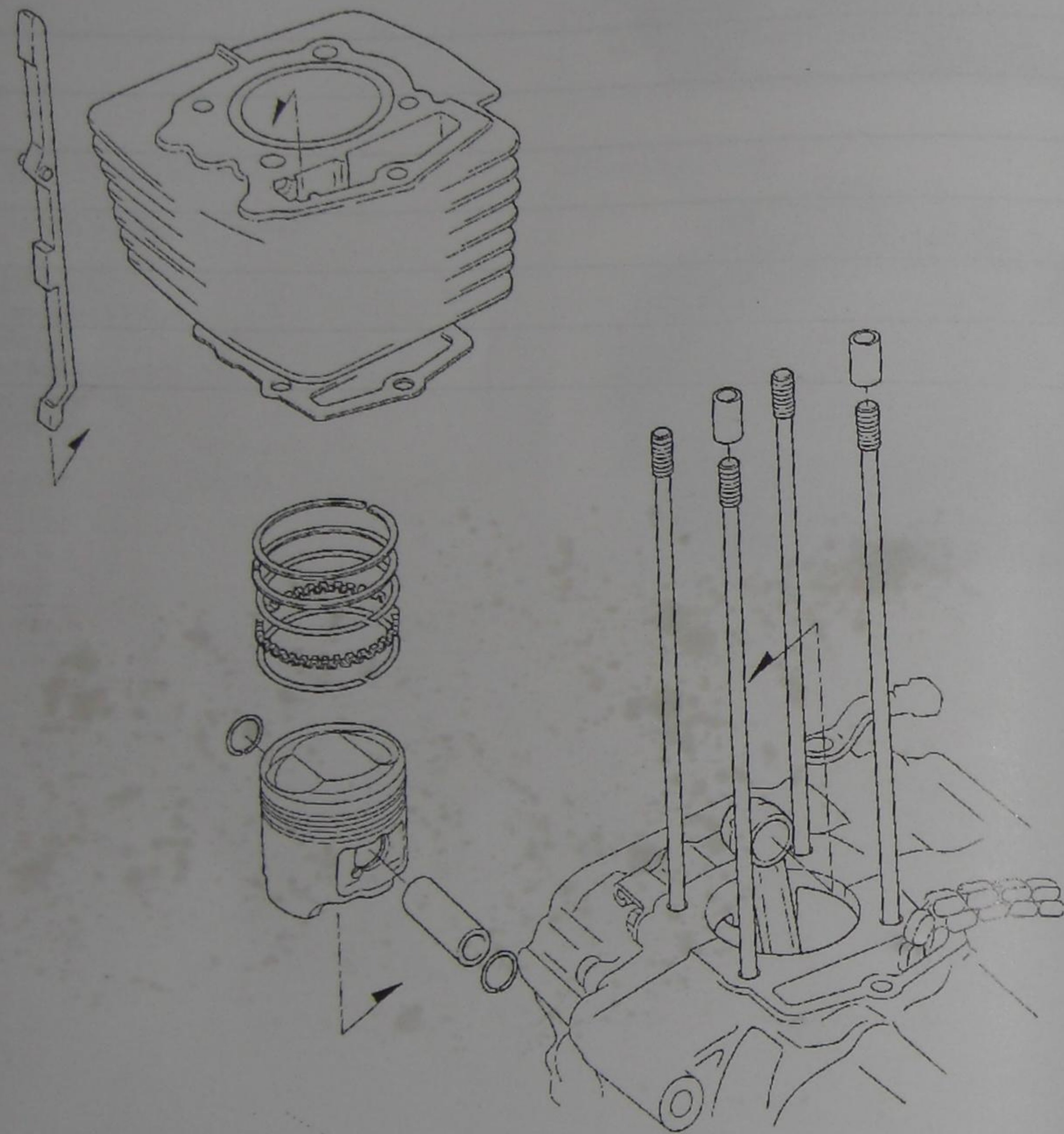
Install the following:

- Valve adjusting hole caps
- Timing hole cap
- Crankshaft hole cap (page 3-6)
- Spark plug (page 3-6)
- Starter motor (page 17-9).

Install the engine in the frame (section 6).



MEMO



8. Cylinder/Piston

SERVICE INFORMATION
TROUBLESHOOTING

8-1

8-1

CYLINDER/PISTON REMOVAL

CYLINDER/PISTON INSTALLATION

8-2

8-5

Service Information

GENERAL

- The engine must be removed from the frame to service the cylinder and piston.
- Do not damage mating surfaces by using a screwdriver when removing the cylinder.
- Take care not to damage the cylinder wall and piston.
- Camshaft lubricating oil is fed through the oil passage in the cylinder. Clean the oil passage before installing the cylinder.

SPECIFICATIONS

Unit: mm (in)

Item		Standard	Service Limit
Cylinder	I.D.	56.500-56.510 (2.2244-2.2248)	56.60 (2.228)
	Out of round	—	0.08 (0.003)
	Taper	—	0.05 (0.002)
	Warpage	—	0.05 (0.002)
Piston, piston ring, piston pin	Piston O.D.	56.470-56.490 (2.4988-2.4996)	56.42 (2.221)
	Piston pin hole I.D.	15.002-15.008 (0.5906-0.5909)	15.04 (0.592)
	Piston pin O.D.	14.994-15.000 (0.5903-0.5906)	14.96 (0.589)
	Piston-to-piston pin clearance	0.002-0.014 (0.0001-0.0006)	0.07 (0.003)
	Piston ring-to-groove clearance	Top	0.015-0.045 (0.0006-0.0018)
		Second	0.015-0.045 (0.0006-0.0018)
	Piston ring end gap	Top	0.05-0.20 (0.002-0.008)
		Second	0.05-0.20 (0.002-0.008)
		Oil (side rail)	0.020-0.70 (0.008-0.028)
	Cylinder-to-piston clearance	0.010-0.040 (0.0004-0.0016)	0.15 (0.006)
Connecting rod small end I.D.		15.010-15.028 (0.5909-0.5917)	15.06 (0.593)
Connecting rod-to-piston pin clearance		0.010-0.034 (0.0004-0.0013)	0.10 (0.004)

Troubleshooting

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

- Worn, stuck or broken piston ring
- Worn or damaged cylinder or piston

Excessive smoke

- Worn cylinder, piston or piston rings
- Improper installation of piston rings
- Scored or scratched piston or cylinder wall

Abnormal noise

- Worn piston pin or piston pin hole
- Worn cylinder, piston or piston rings
- Worn connecting rod small end

Cylinder/Piston Removal

Remove the cylinder head (page 7-3).

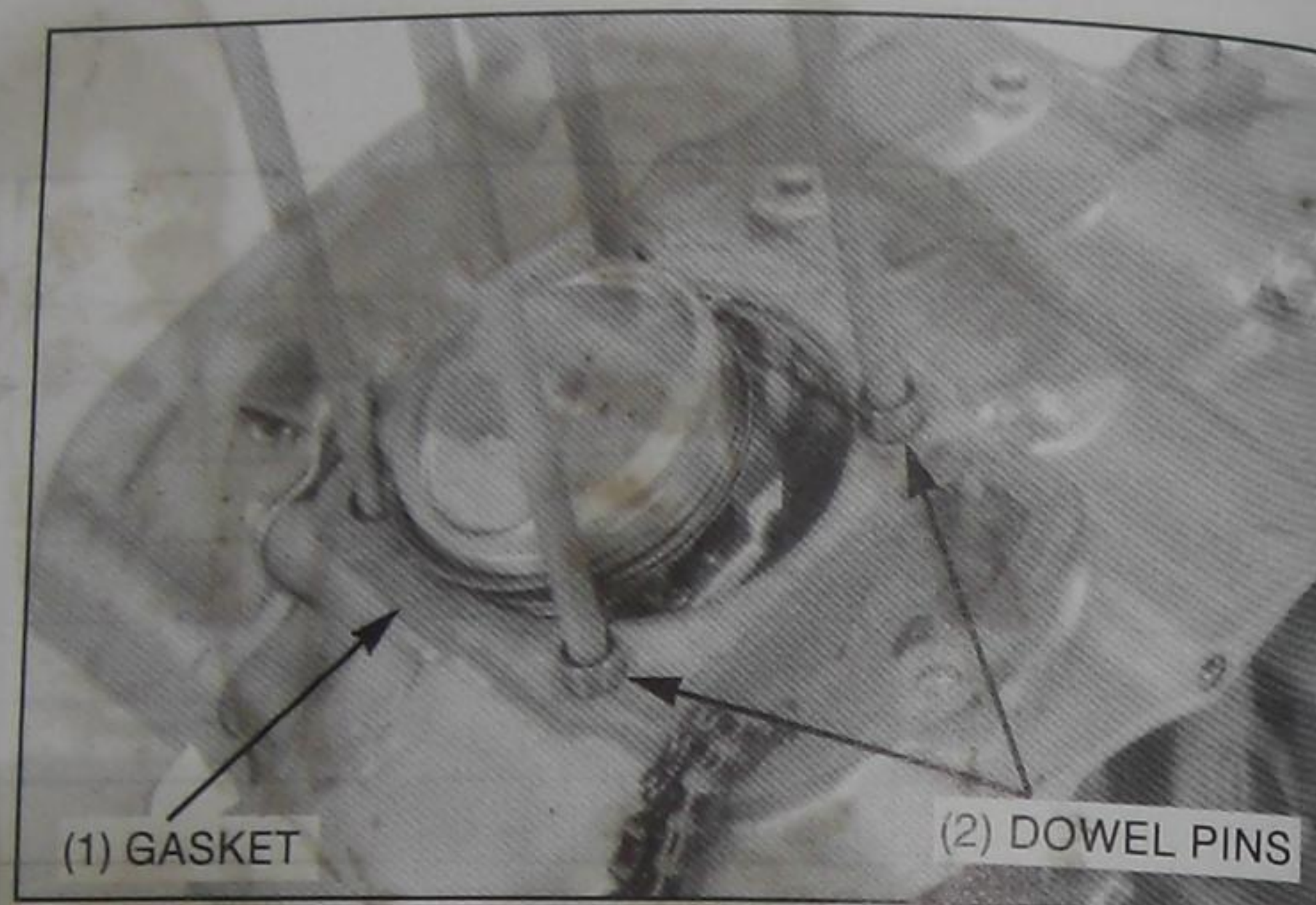
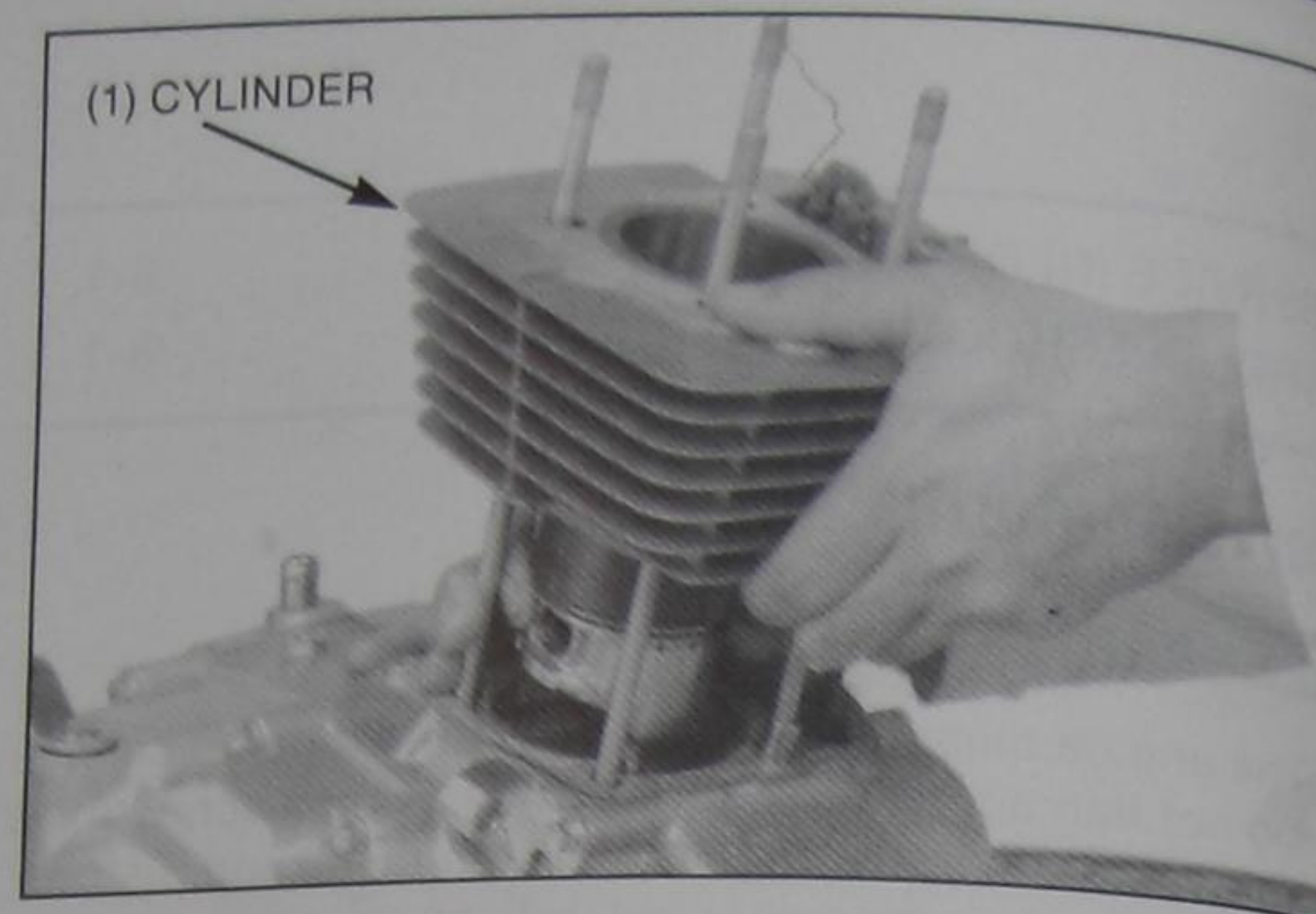
Remove the cylinder.

Remove the gasket and dowel pins.

CAUTION

- Be careful not to damage the mating surface.

Clean the cylinder.

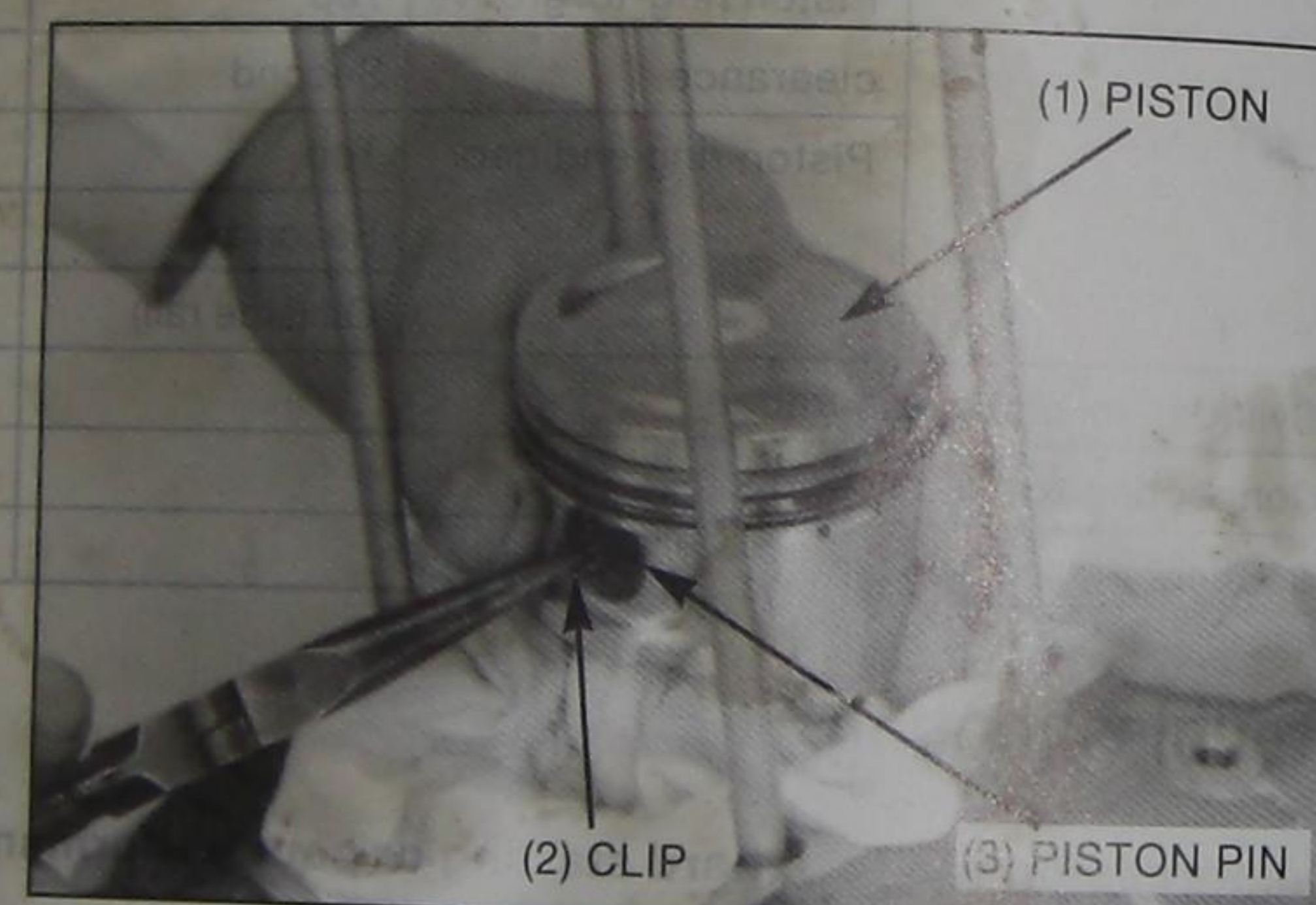


Place a clean shop towel over the crankcase to prevent the clip from falling into the crankcase.

Remove the piston pin clips with a pliers. Push the piston pin out of the piston and connecting rod, and remove the piston.

CAUTION

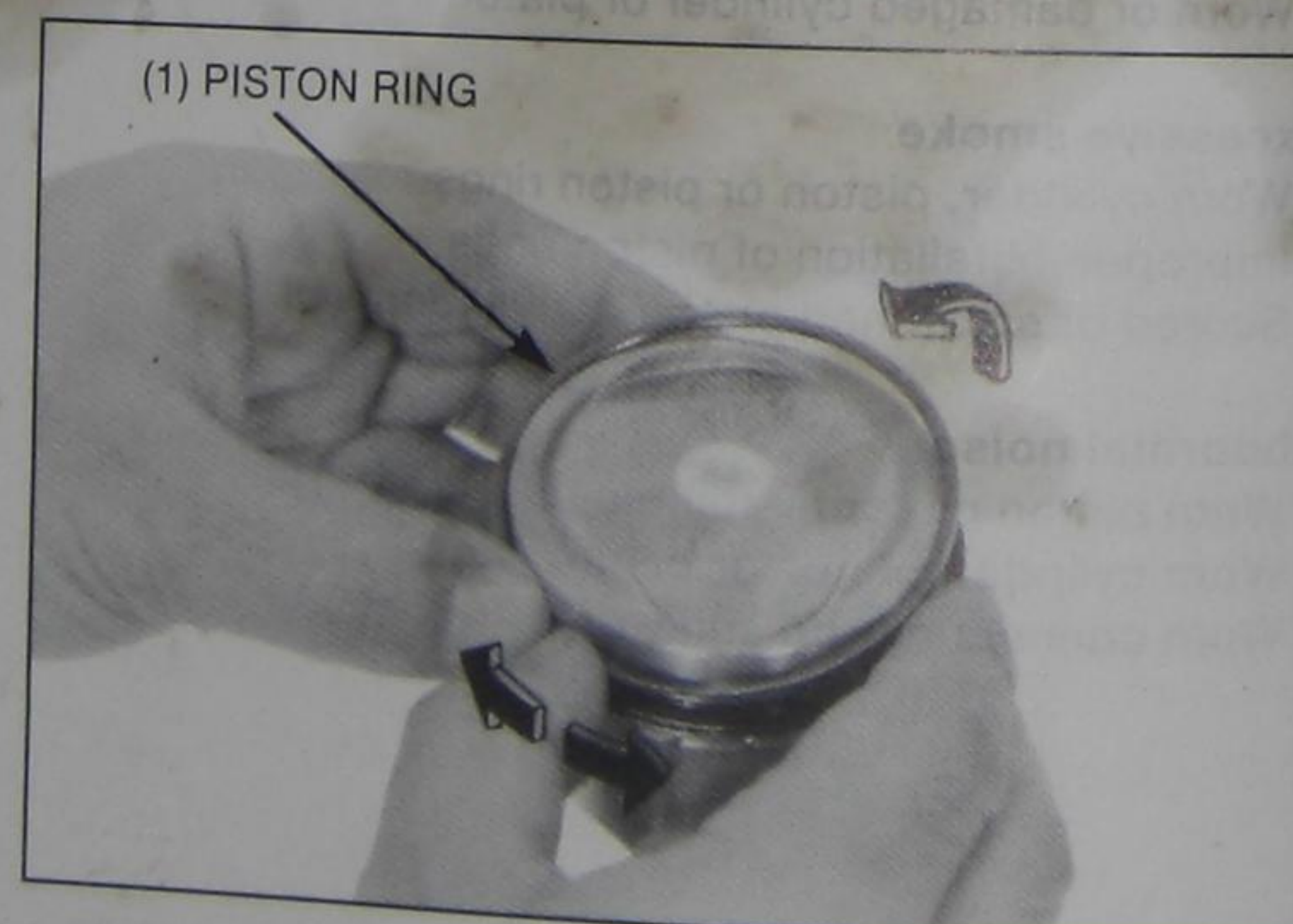
- Be careful not to damage or scratch the piston sliding surface.
- Do not apply side force to the connecting rod.



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

CAUTION

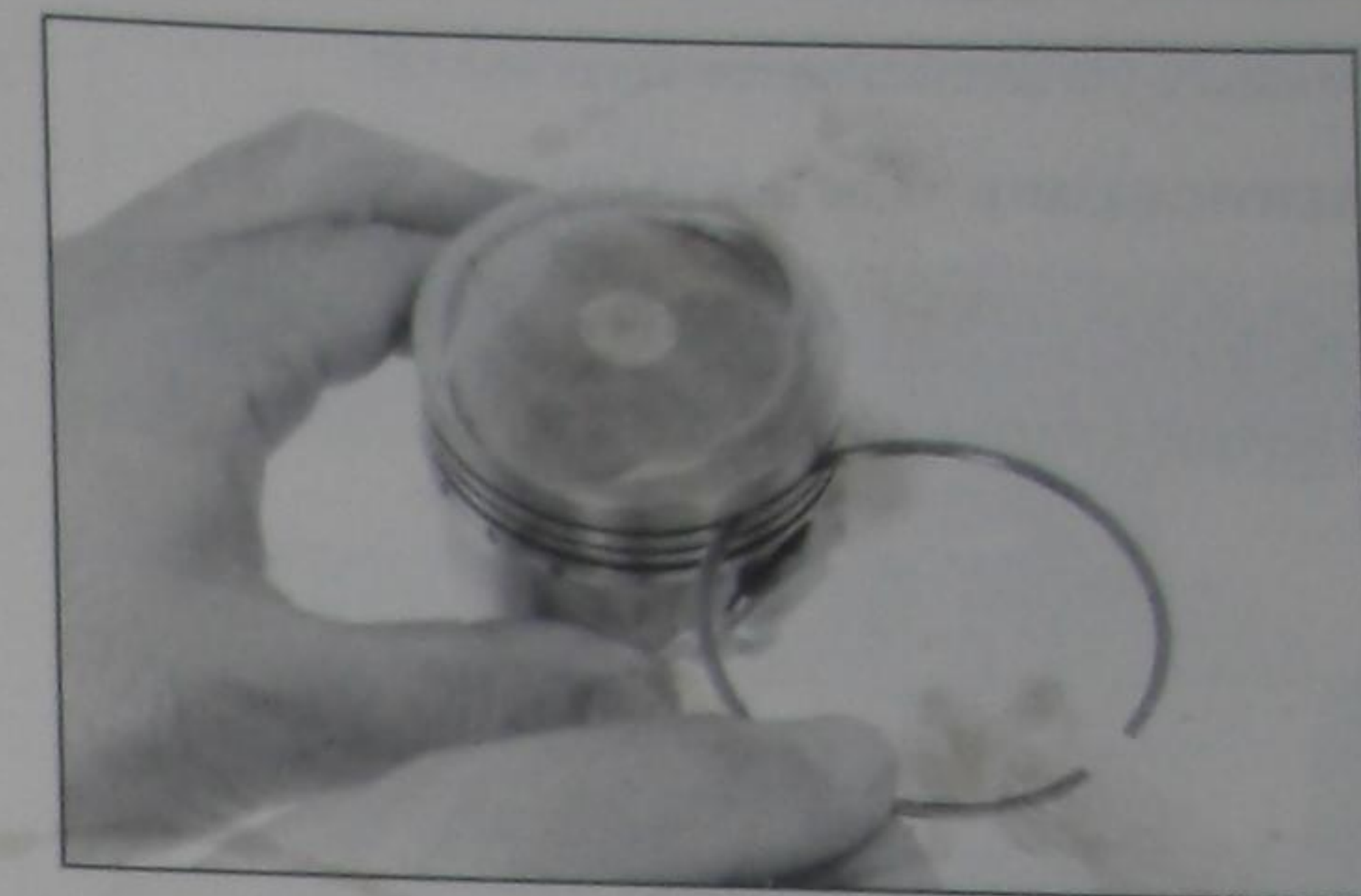
- Do not damage the piston ring by spreading the ends too far.



Clean carbon deposits from the piston.

CAUTION

- Clean carbon deposits from the ring grooves with a ring that will be discarded. Never use a wire brush; it will scratch the groove.



PISTON INSPECTION

Inspect the piston rings for movement by rotating the rings. The rings should be able to move in their grooves without catching.

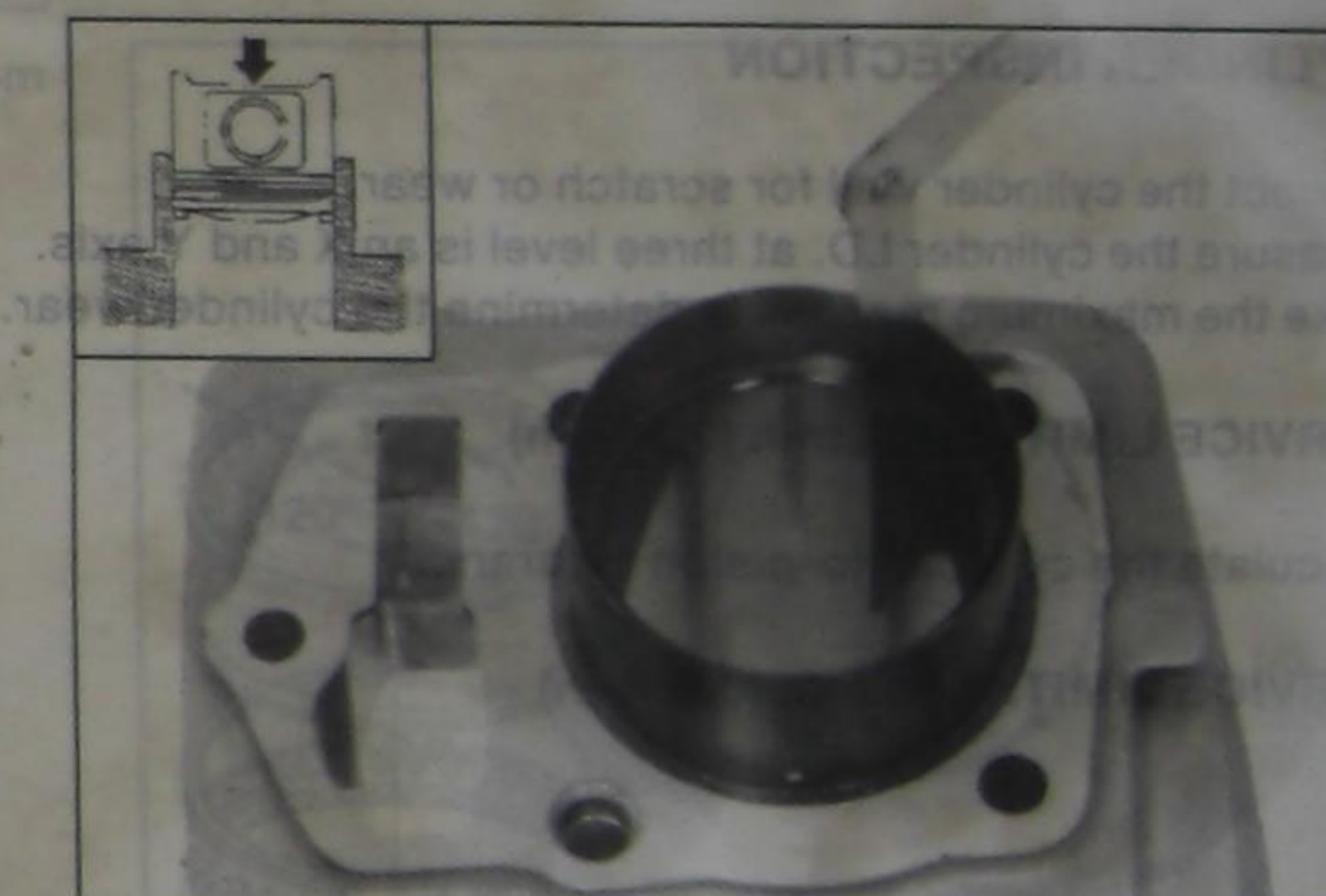
Push the ring until the outer surface of the piston ring is nearly flush with the piston and measure the ring-to-ring groove clearance.

SERVICE LIMITS: Top/Second: 0.10 mm (0.004 in)



Insert each piston ring into the bottom of the cylinder squarely using the piston. Measure the ring end gap.

SERVICE LIMIT: Oil (side rail): 0.9 mm (0.04 in)



Measure the piston pin O.D. at piston and connecting rod sliding areas.

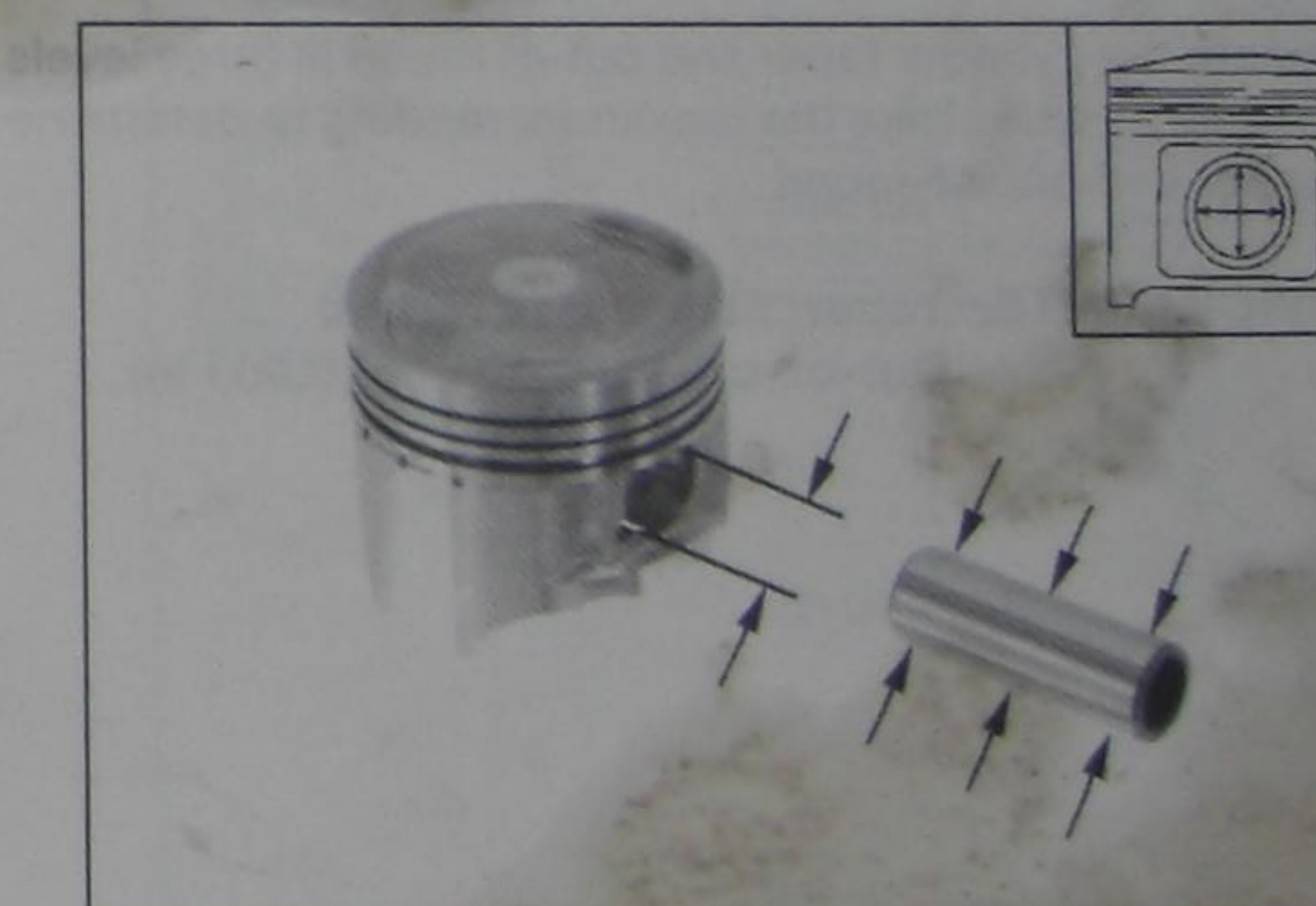
SERVICE LIMIT: 14.96 mm (0.589 in)

Measure the piston pin hole I.D.

SERVICE LIMIT: 15.04 mm (0.592 in)

Calculate the piston-to-piston pin clearance.

SERVICE LIMIT: 0.07 mm (0.003 in)



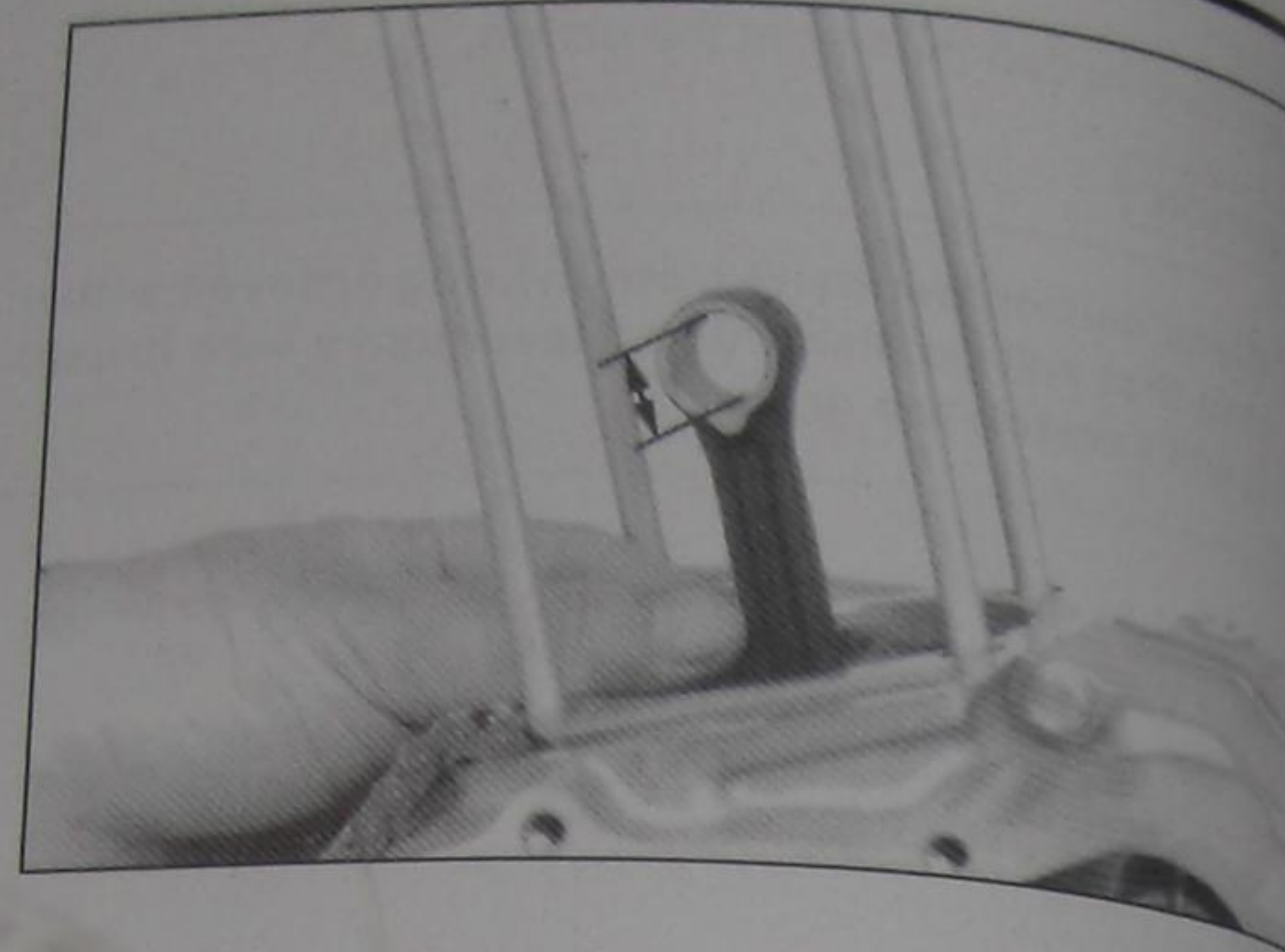
CYLINDER/PISTON

Measure the connecting rod small end I.D.

SERVICE LIMIT: 15.06 mm (0.593 in)

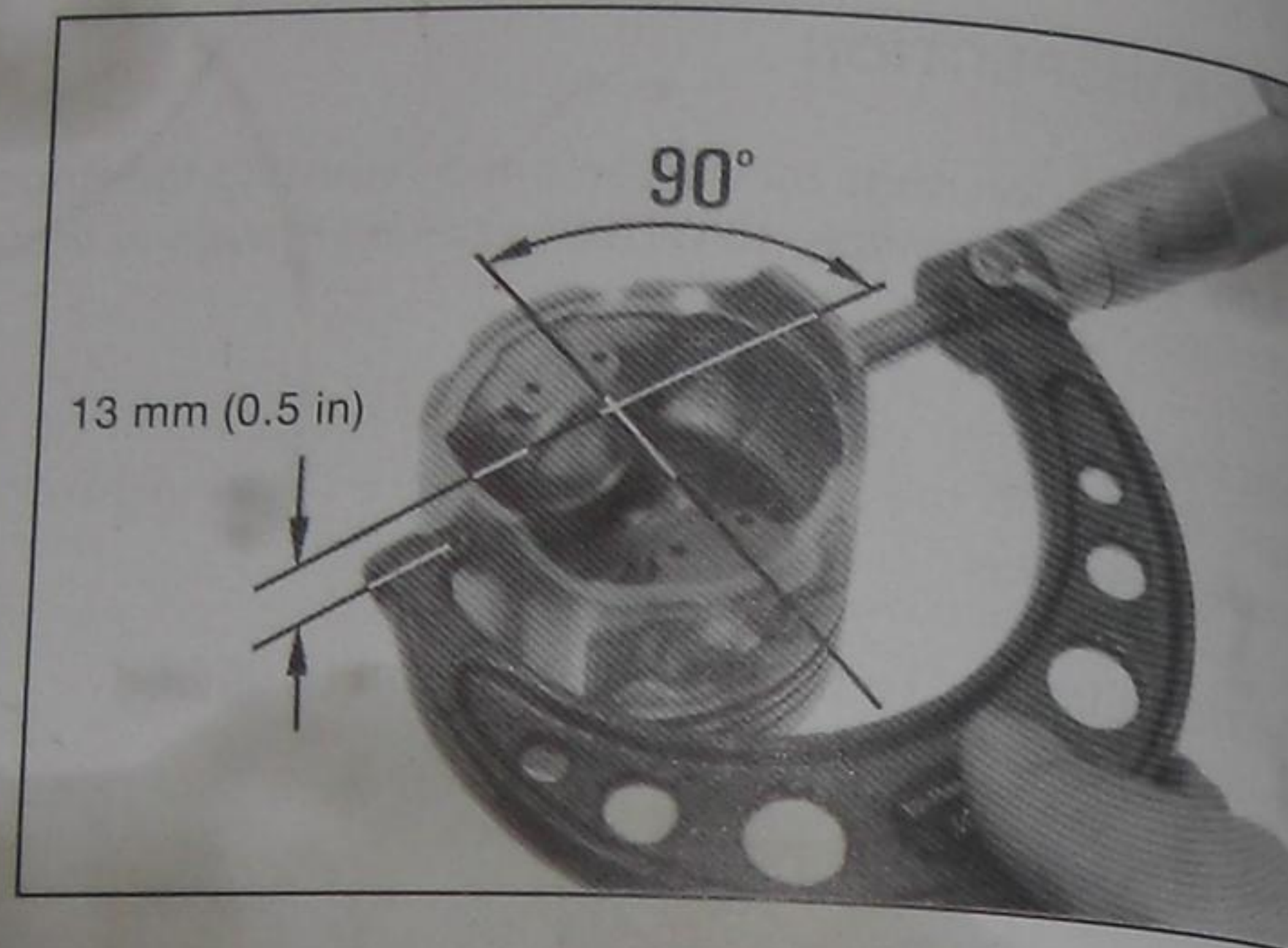
Calculate the connecting rod-to-piston pin clearance.

SERVICE LIMIT: 0.10 mm (0.004 in)



Measure the piston O.D. at a point 13 mm (0.5 in) from the bottom and 90° to the piston pin hole.

SERVICE LIMIT: 56.42 mm (2.221 in)



CYLINDER INSPECTION

Inspect the cylinder wall for scratch or wear.
Measure the cylinder I.D. at three levels in an X and Y axis.
Take the maximum reading to determine the cylinder wear.

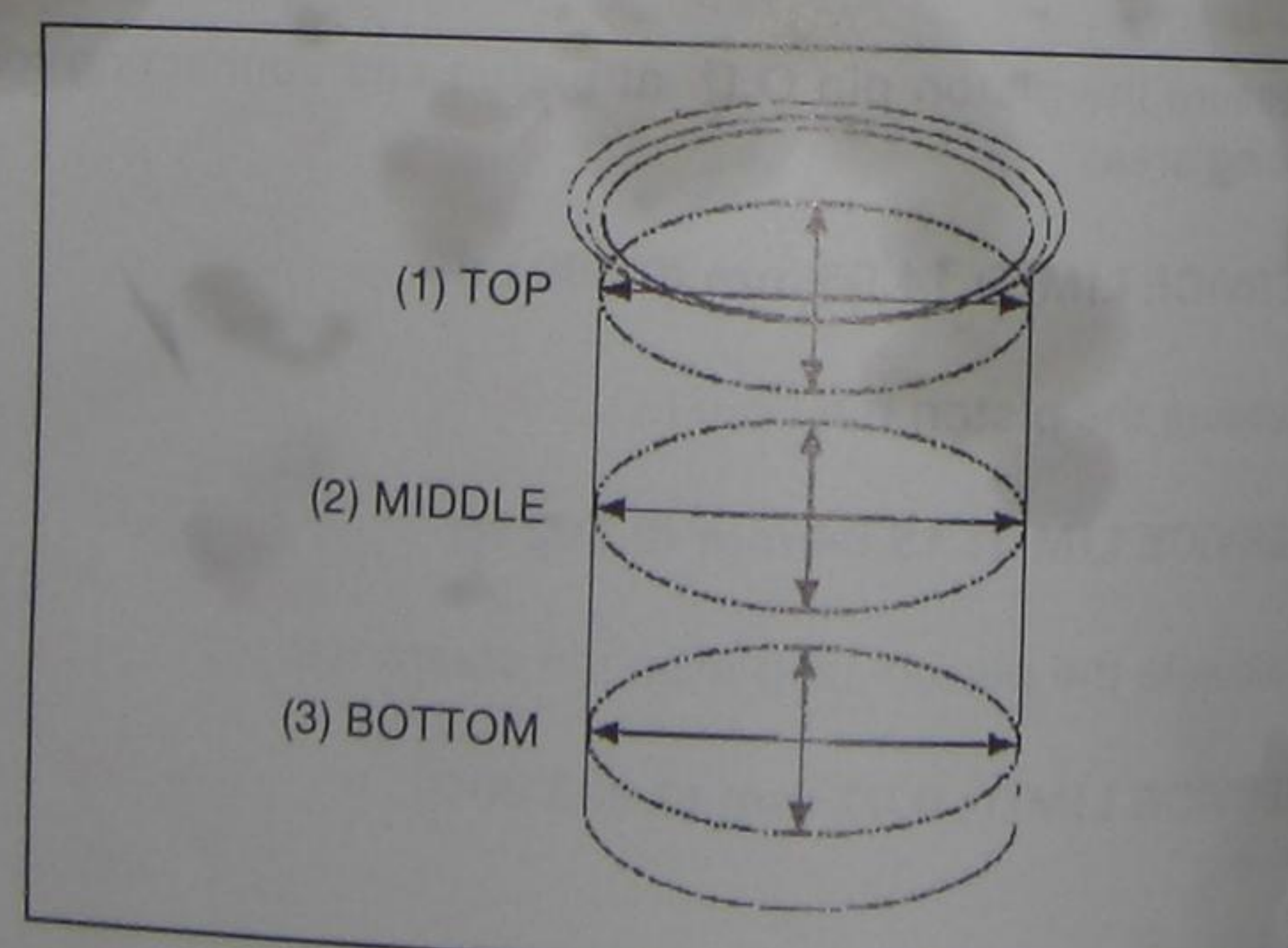
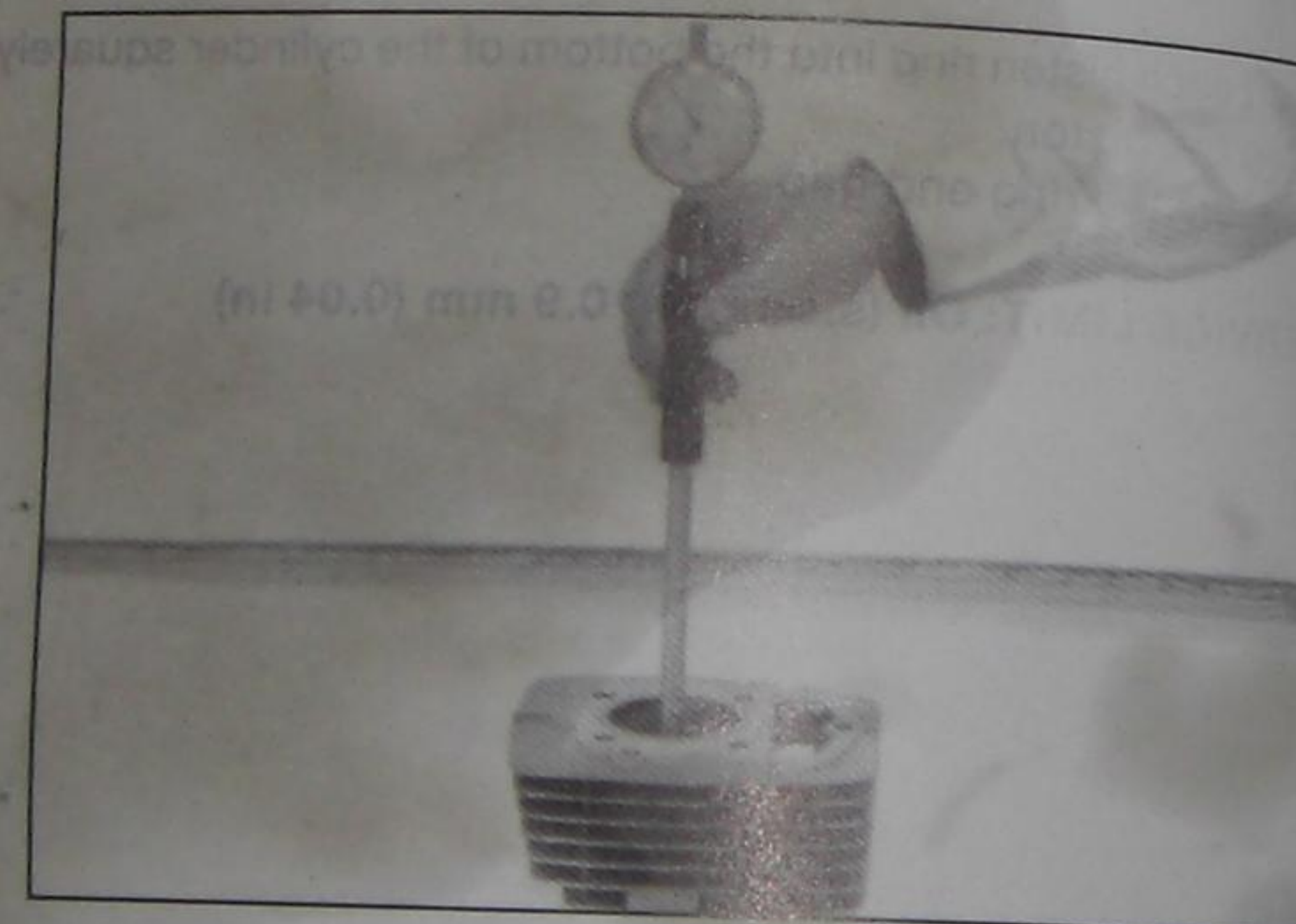
SERVICE LIMIT: 56.60 mm (2.228 in)

Calculate the cylinder-to-piston clearance.

SERVICE LIMIT: 0.15 mm (0.006 in)

Calculate the cylinder taper and out-of-round at three levels in an X and Y axis. Take the maximum reading to determine the taper and out-of-round.

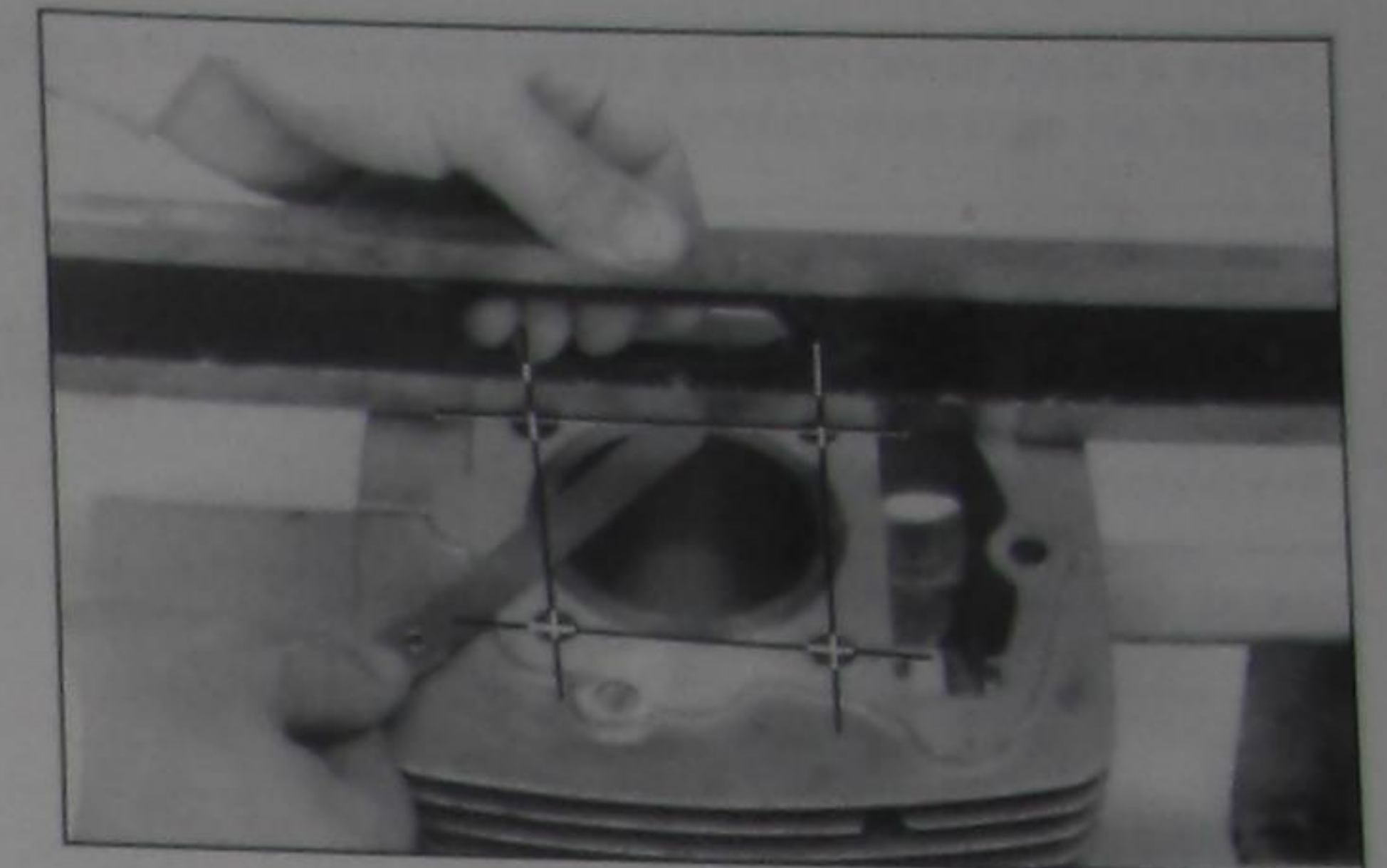
SERVICE LIMITS: Taper: 0.05 mm (0.002 in)
Out-of-round: 0.08 mm (0.003 in)



CYLINDER/PISTON

Check the top of the cylinder for warpage with a straight edge and feeler gauge.

SERVICE LIMIT: 0.05mm (0.002 in)



Cylinder/Piston Installation

Carefully install the piston rings into the piston ring grooves with the markings facing up.

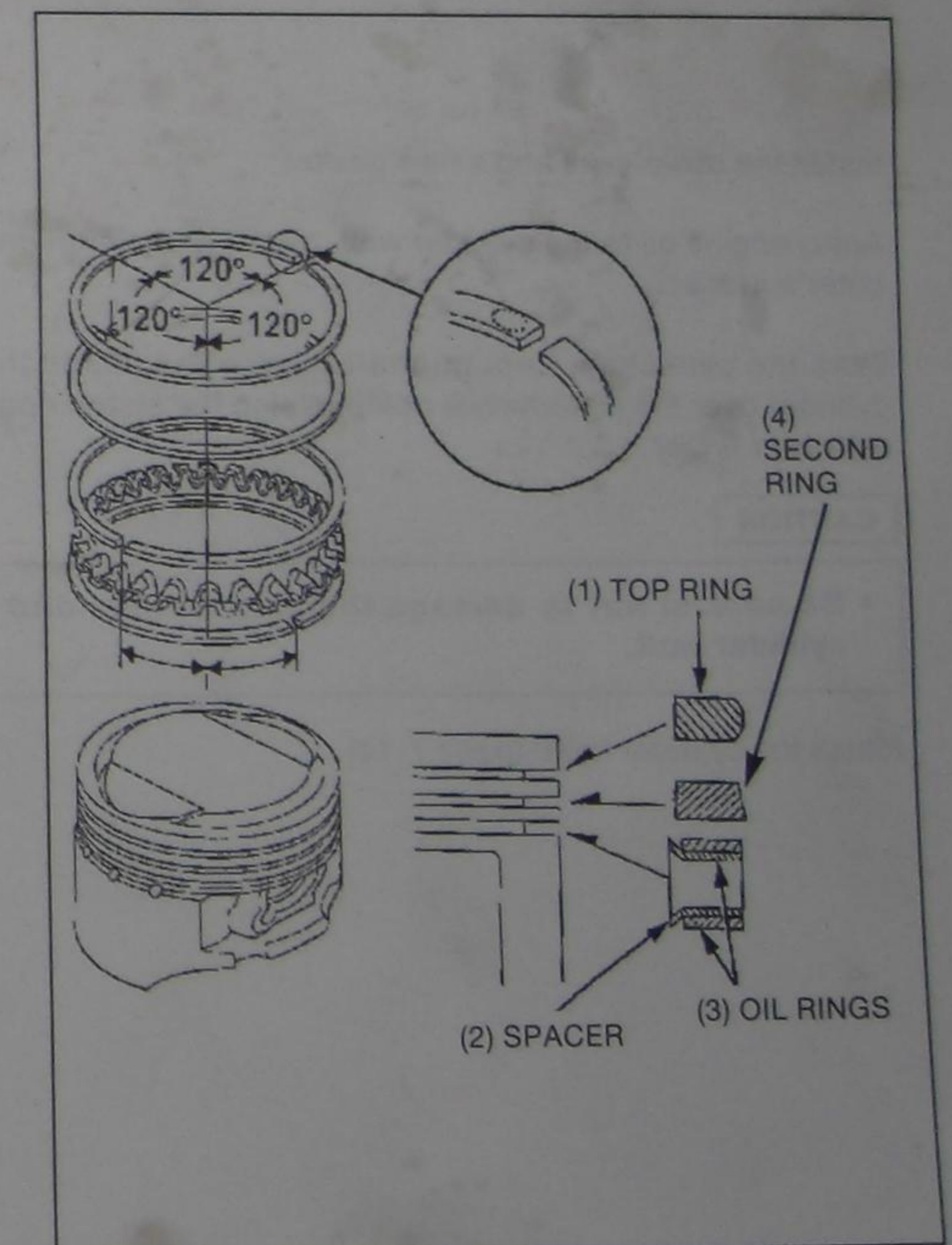
CAUTION

- Be careful not to damage the piston and rings during installation.

NOTE:

- To install the oil ring, install the spacer first, then install the side rails.

Stagger the piston ring end gaps 120 degrees apart from each other.
Stagger the side rail end gaps as shown.



CYLINDER/PISTON

Place a shop towel over the crankcase opening to prevent piston pin clips from falling into the crankcase.

Apply molybdenum oil solution to the piston pin outer surface.

Set the piston over the connecting rod with the "IN" mark facing toward the intake side and install the piston pin into the piston and connecting rod.

Install new piston pin clips into the grooves in the piston pin hole.

NOTE:

- Make sure that the piston pin clips are seated securely.
- Do not align the piston pin clip end gap with the piston cutout.

Clean the mating surface of the crankcase thoroughly, being careful not to damage it and not to allow gasket material into the crankcase.

Apply sealant to the mating surface of the crankcase as shown.



Install the dowel pins and a new gasket

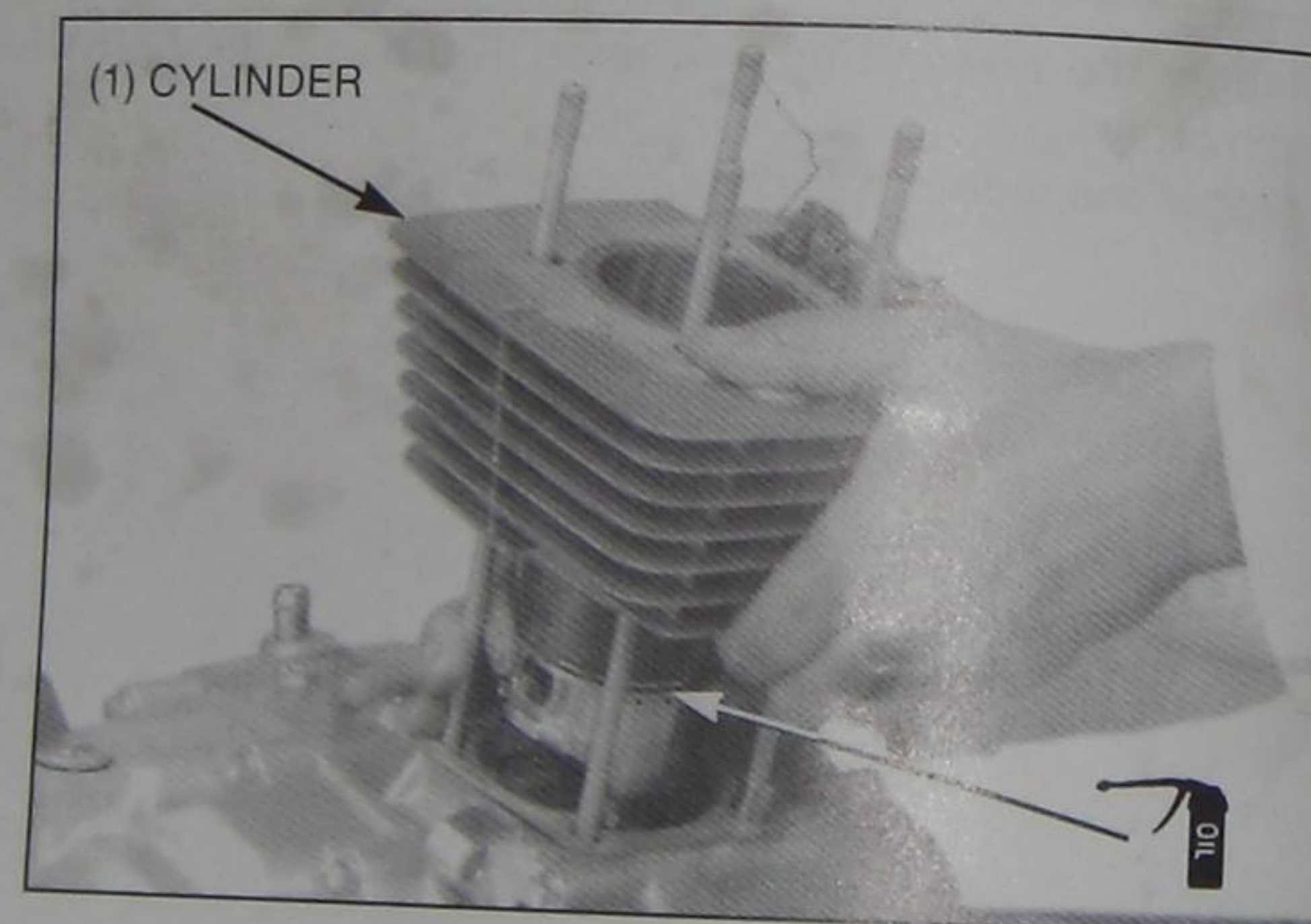
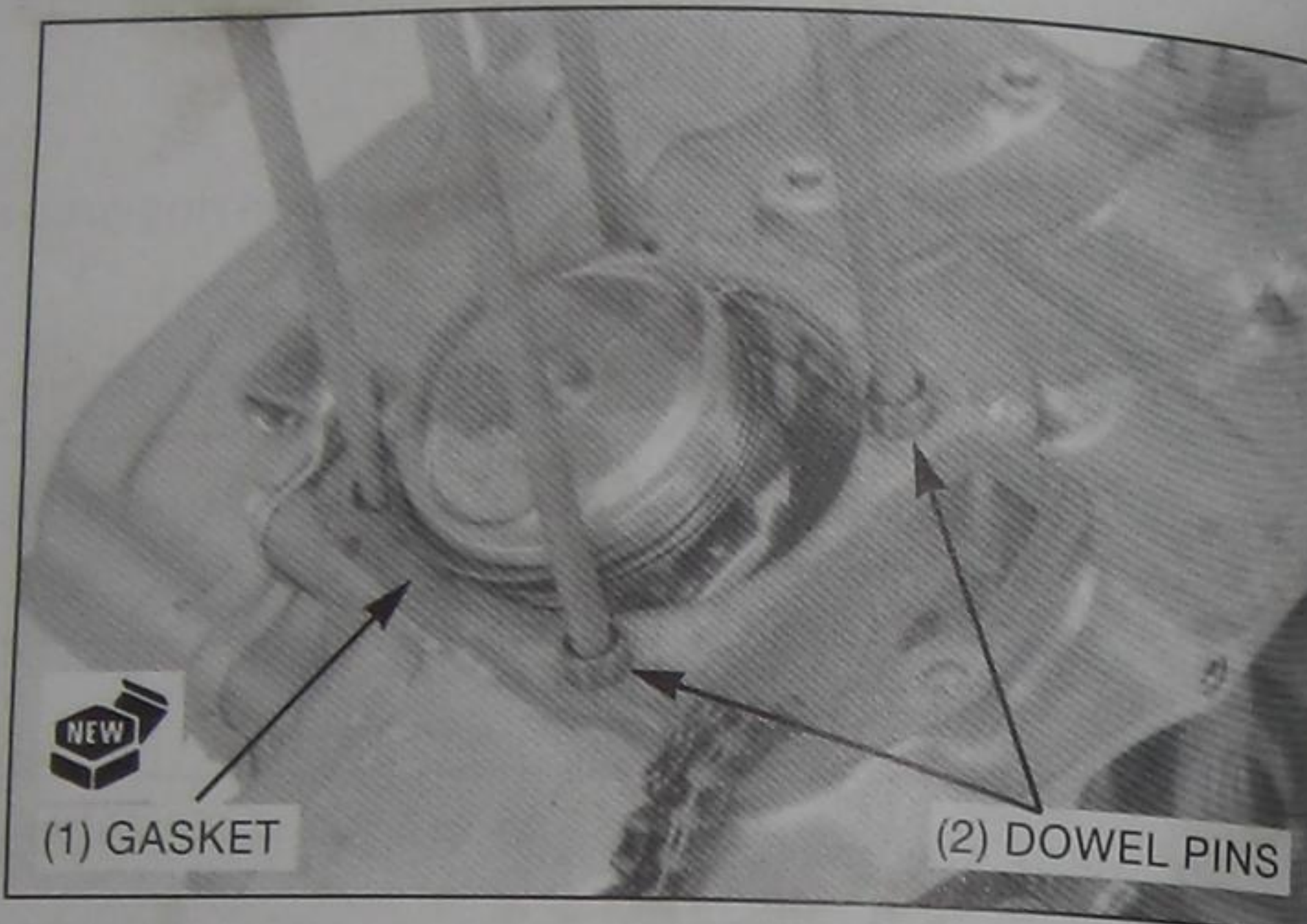
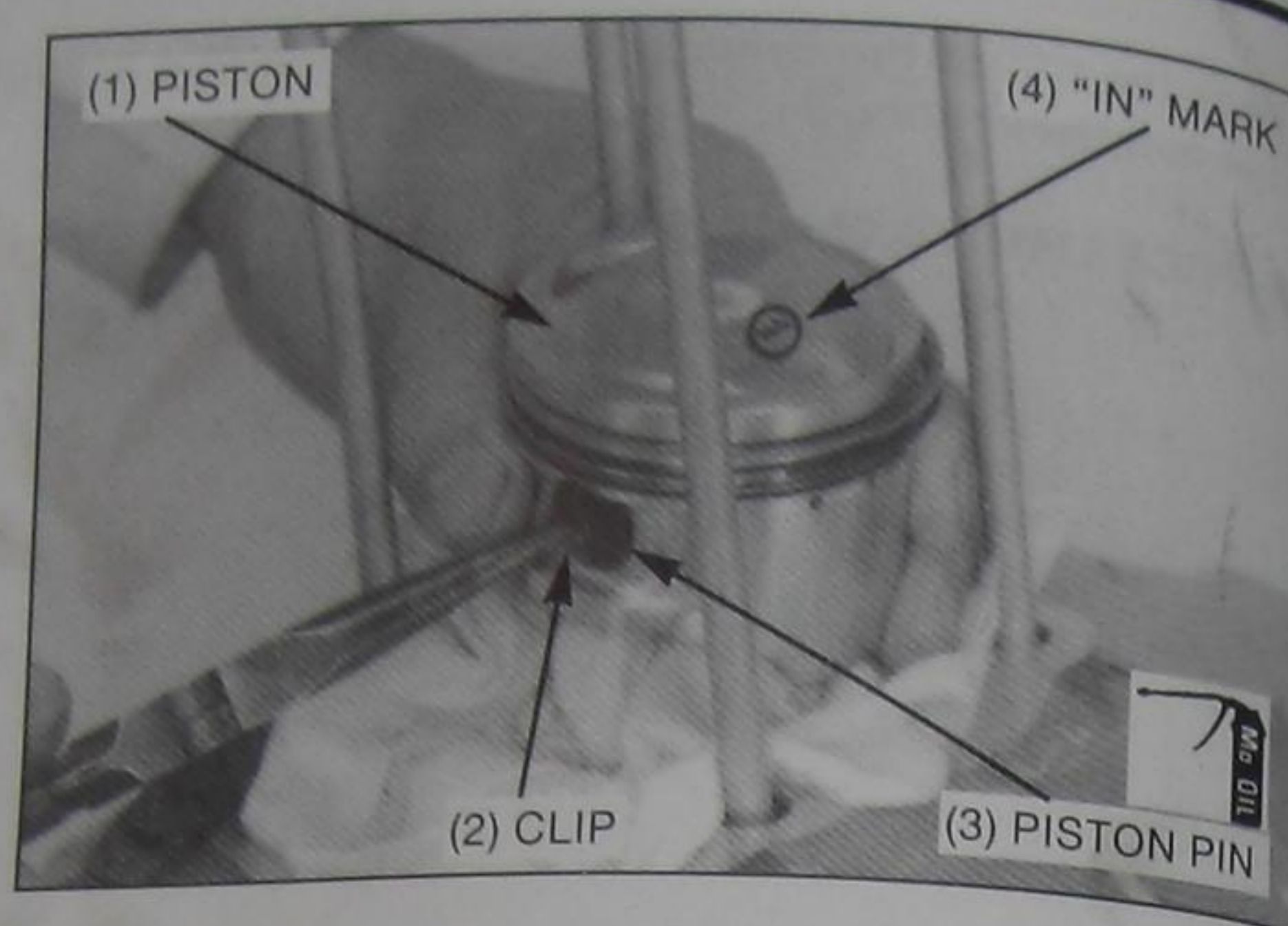
Apply engine oil to the cylinder wall, piston and piston ring outer surfaces.

Pass the cam chain through the cylinder and install the cylinder over the piston while compressing the piston rings with your finger.

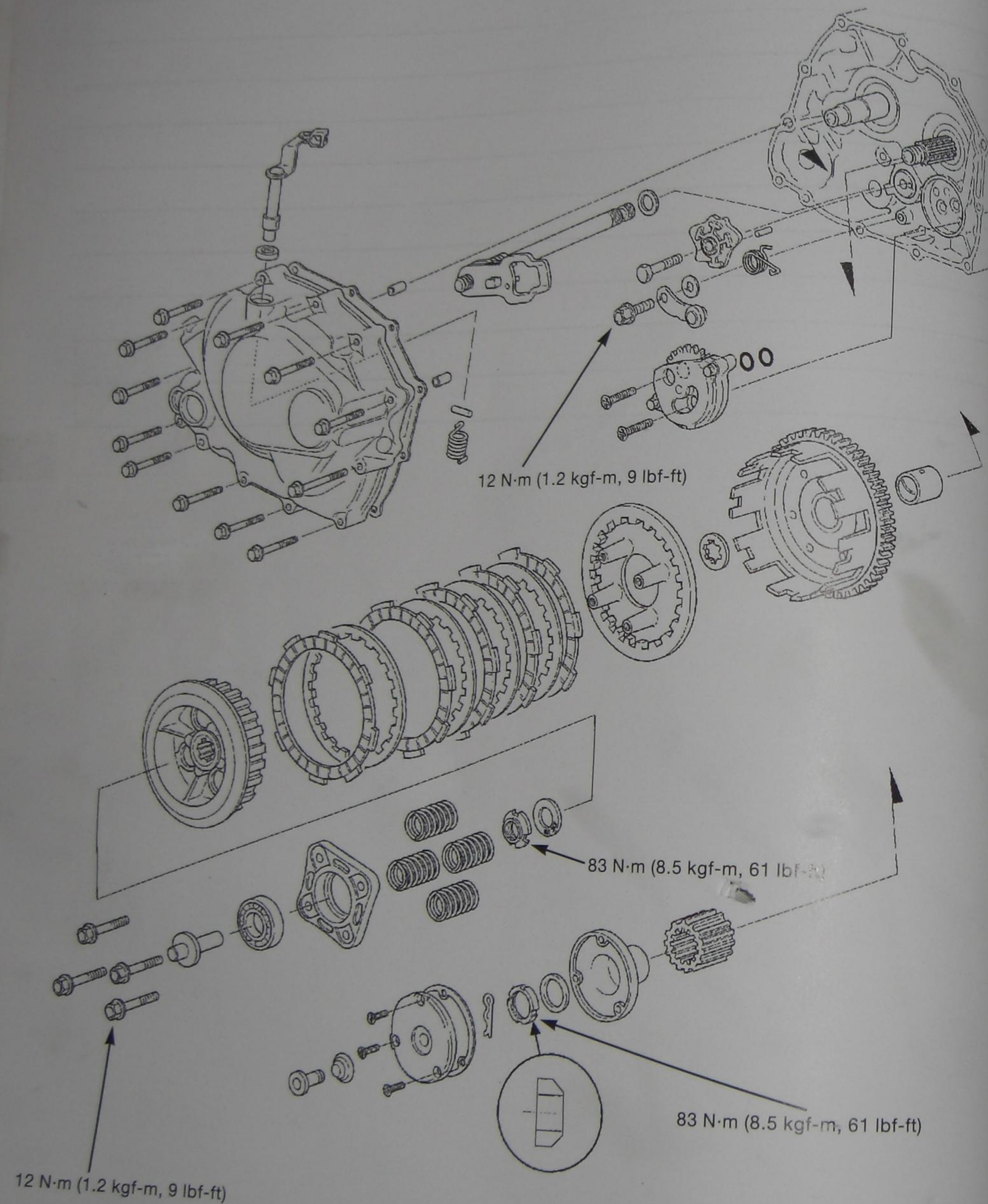
CAUTION

- Be careful not to damage the piston rings and cylinder wall.

Install the cylinder head (page 7-14)



MEMO



9. Clutch/Gearshift Linkage

SERVICE INFORMATION	9-1	CLUTCH	9-3
TROUBLESHOOTING	9-2	GEARSHIFT LINKAGE	9-10
RIGHT CRANKCASE COVER REMOVAL	9-3	RIGHT CRANKCASE COVER INSTALLATION	9-12

Service Information

GENERAL

- The clutch and gearshift linkage can be serviced with the engine installed in the frame.
- Engine oil viscosity and level have an effect on clutch operation. When the clutch does not disengage or the motorcycle creeps with the clutch disengaged, inspect the engine oil and oil level before servicing the clutch system.
- The crankcase must be separated when the transmission, shift drum and shift forks require service (section 11).

SPECIFICATIONS

Unit: mm (in)

Unit: mm (in)

Item			Standard	Service Limit
Clutch	Lever free play		10-20 (3/8-3/4)	—
	Spring free length		34.7 (1.37)	31.7 (1.25)
	Disc thickness		2.90-3.00 (0.114-0.118)	2.6 (0.10)
	Plate warpage		—	0.20 (0.008)
	Outer I.D.		28.000-28.021 (1.1024-1.1032)	28.04 (1.104)
	Outer guide	O.D.	27.959-27.980 (1.1007-1.1015)	27.93 (1.100)
		I.D.	19.983-19.996 (0.7867-0.7872)	20.02 (0.788)
Mainshaft O.D. at clutch outer guide.			19.967-19.980 (0.7861-0.7866)	19.92 (0.784)

TORQUE VALUES

Oil filter rotor lock nut	83 N·m (8.5 kgf-m, 61 lbf-ft)	Apply oil to the threads and seating surface.
Clutch center lock nut	83 N·m (8.5 kgf-m, 61 lbf-ft)	Apply oil to the threads and seating surface. Stake.
Clutch lifter plate bolt	12 N·m (1.2 kgf-m, 9 lbf-ft)	
Gearshift drum stopper arm bolt	12 N·m (1.2 kgf-m, 9 lbf-ft)	
Gearshift pedal bolt	12 N·m (1.2 kgf-m, 9 lbf-ft)	

TOOLS

Driver	07749-0010000
Attachment, 32 x 35 mm	07746-0010100
Pilot, 17 mm	07746-0040400
Clutch center holder	07GMB-KT70101
Pin driver, 5 mm	07744-0010200
Lock nut wrench, 20 x 24 mm	07716-0020100
Gear holder	07724-0010200

Troubleshooting

Clutch lever too hard

- Damaged, kinked or dirty clutch cable
- Improperly routed clutch cable
- Damaged clutch lifter mechanism
- Faulty clutch lifter plate bearing

Clutch will not disengage or motorcycle creeps with clutch disengaged

- Too much clutch lever free play
- Warped clutch plates
- Faulty clutch lifter
- Oil level too high, improper oil viscosity or oil additive used

Clutch slips

- No clutch lever free play
- Worn clutch discs
- Weak clutch springs
- Clutch lifter sticking
- Oil level too low or oil additive used

Hard to shift

- Incorrect clutch adjustment
- Bent or damaged gearshift spindle
- Damaged gearshift cam
- Bent fork shaft or damaged shift forks (section 11)

Transmission jumps out of gear

- Weak or broken shift linkage returns springs
- Broken shift drum stopper arm
- Worn or damaged gearshift cam
- Bent fork shaft or worn shift forks (section 11)
- Worn gear dogs or slots (section 11)

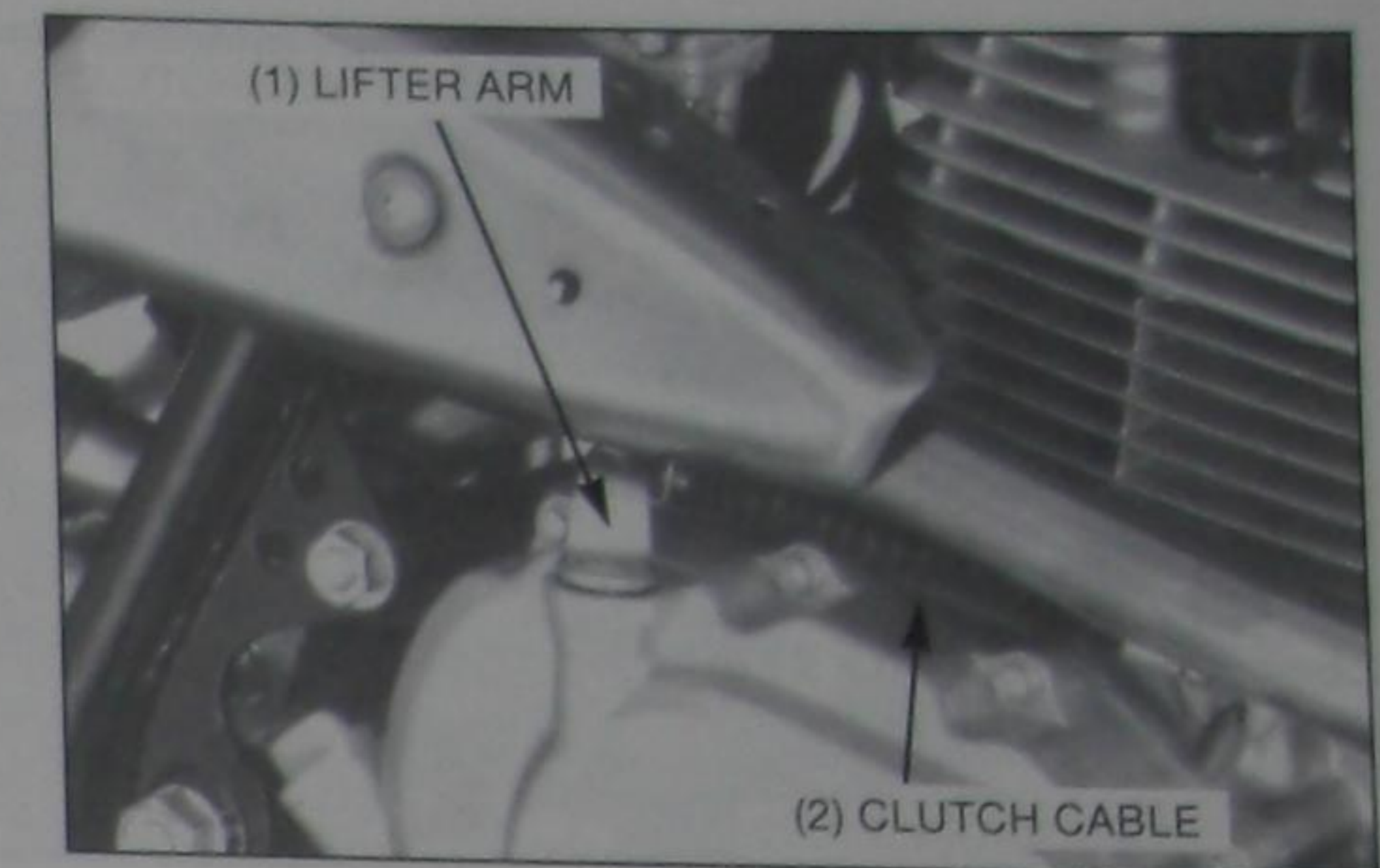
Right Crankcase Cover Removal

Remove the following:

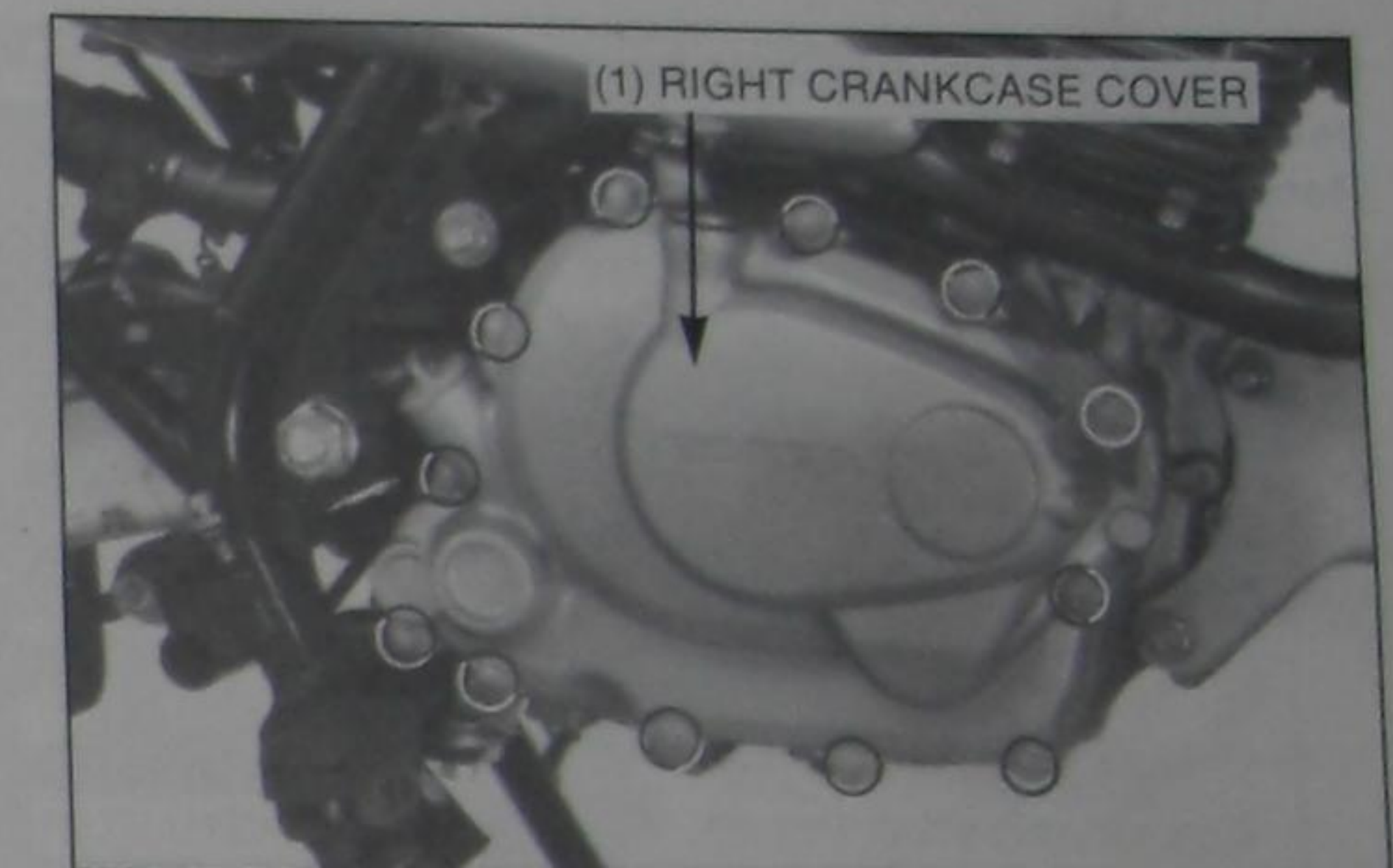
- Brake pedal (page 13-10)
- Under guard (page 2-3).

Drain the engine oil (page 3-8).

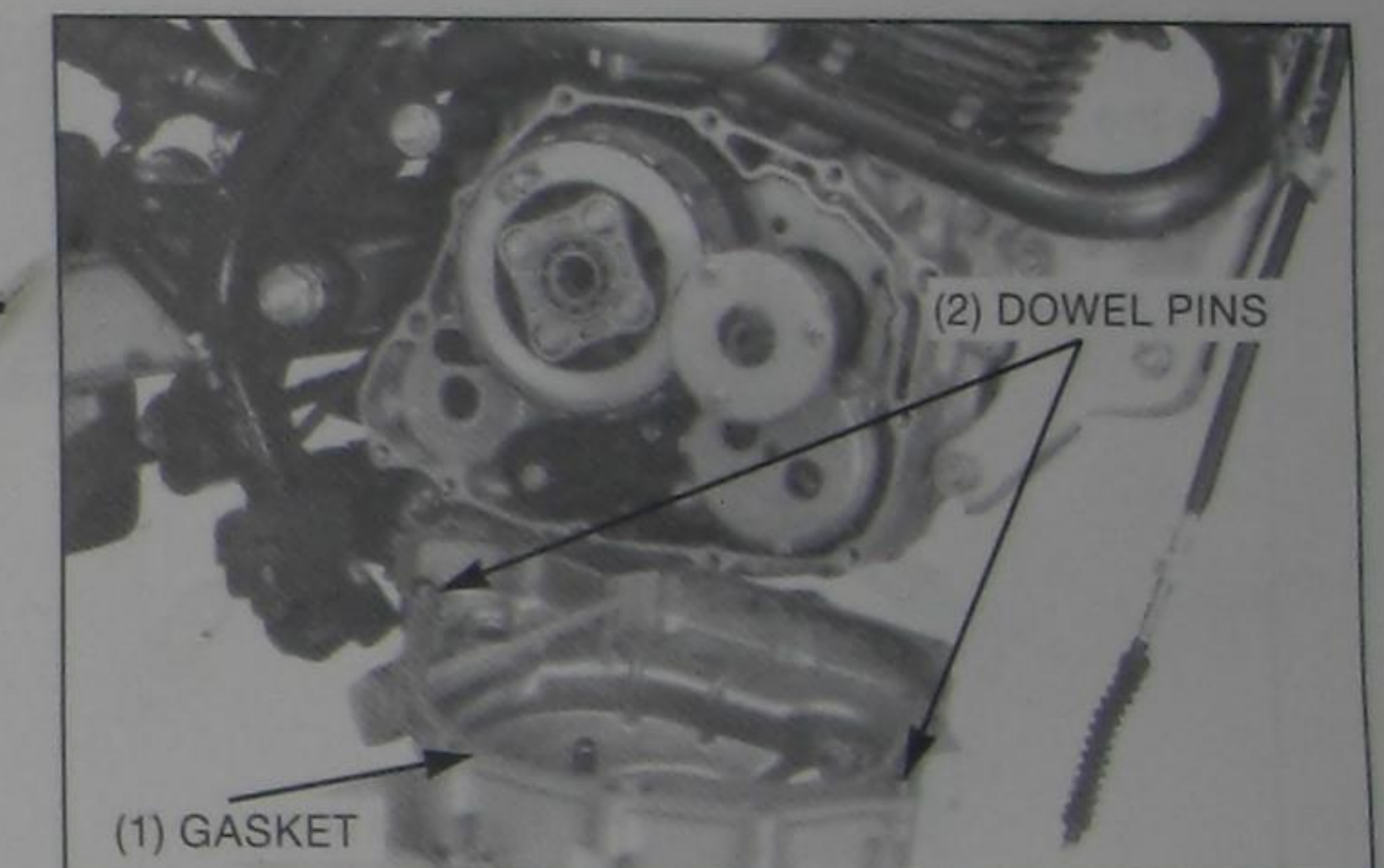
Loosen the clutch cable lock and adjusting nuts and disconnect the clutch cable from the clutch lifter arm.



Remove the twelve cover bolts.
Remove the right crankcase cover.



Remove the dowel pins and gasket.



Clutch

LIFTER ARM DISASSEMBLY

Remove the right crankcase cover.

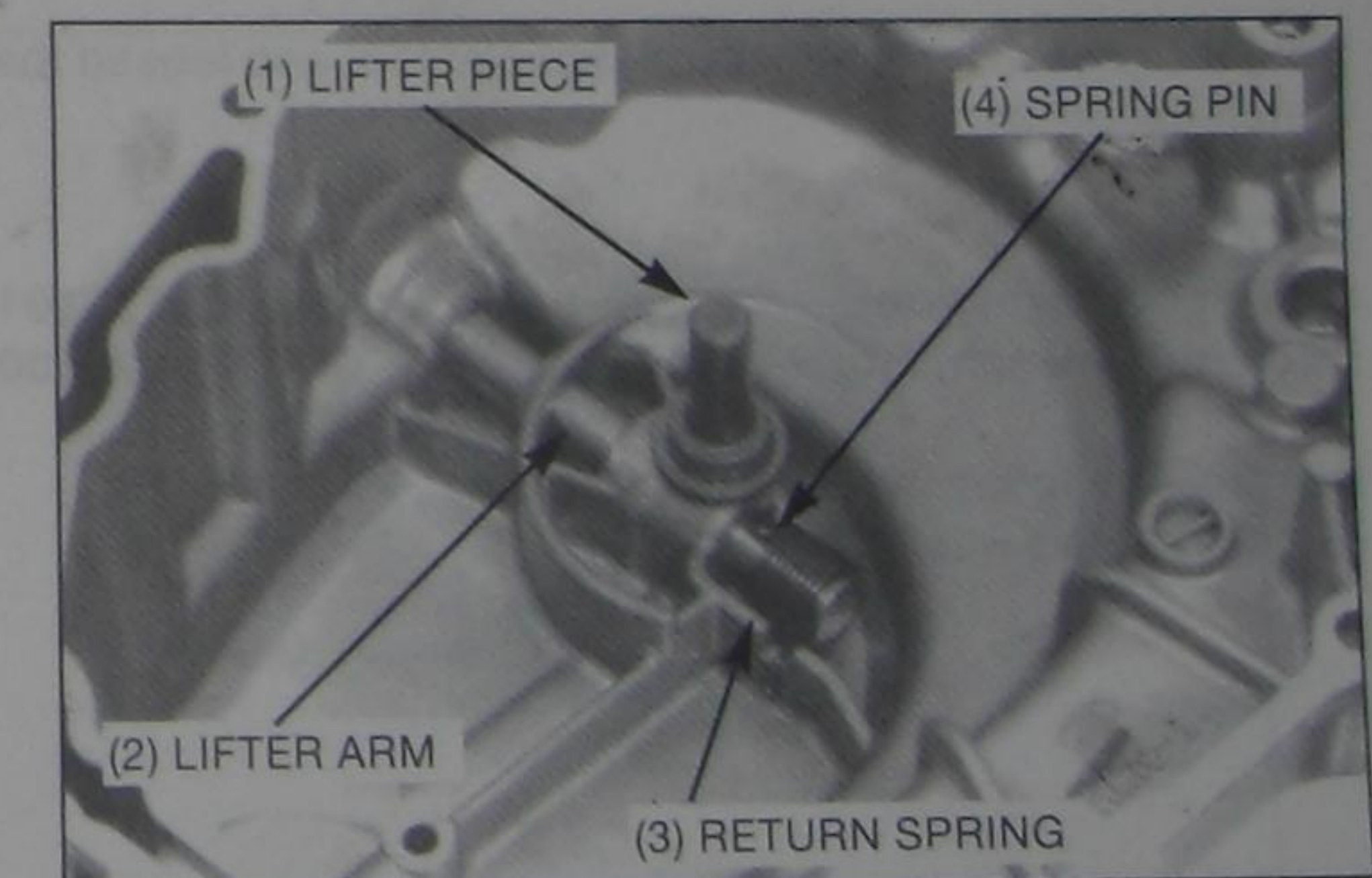
Remove the lifter piece by turning the lifter arm clockwise.

Record the projection of the spring pin.
Drive the spring pin into the lifter arm spindle until it is flush with the pin hole edge.

TOOL:
Pin driver, 3 mm

07744-0010200

Remove the lifter arm and the spring.



CLUTCH/GEARSHIFT LINKAGE

CLUTCH DISASSEMBLY

Remove the oil filter rotor cover (page 4-2).

Install the special tool between the primary drive and driven gears as shown, loosen the oil filter rotor lock nut. Remove the lock nut, washer and oil filter rotor.

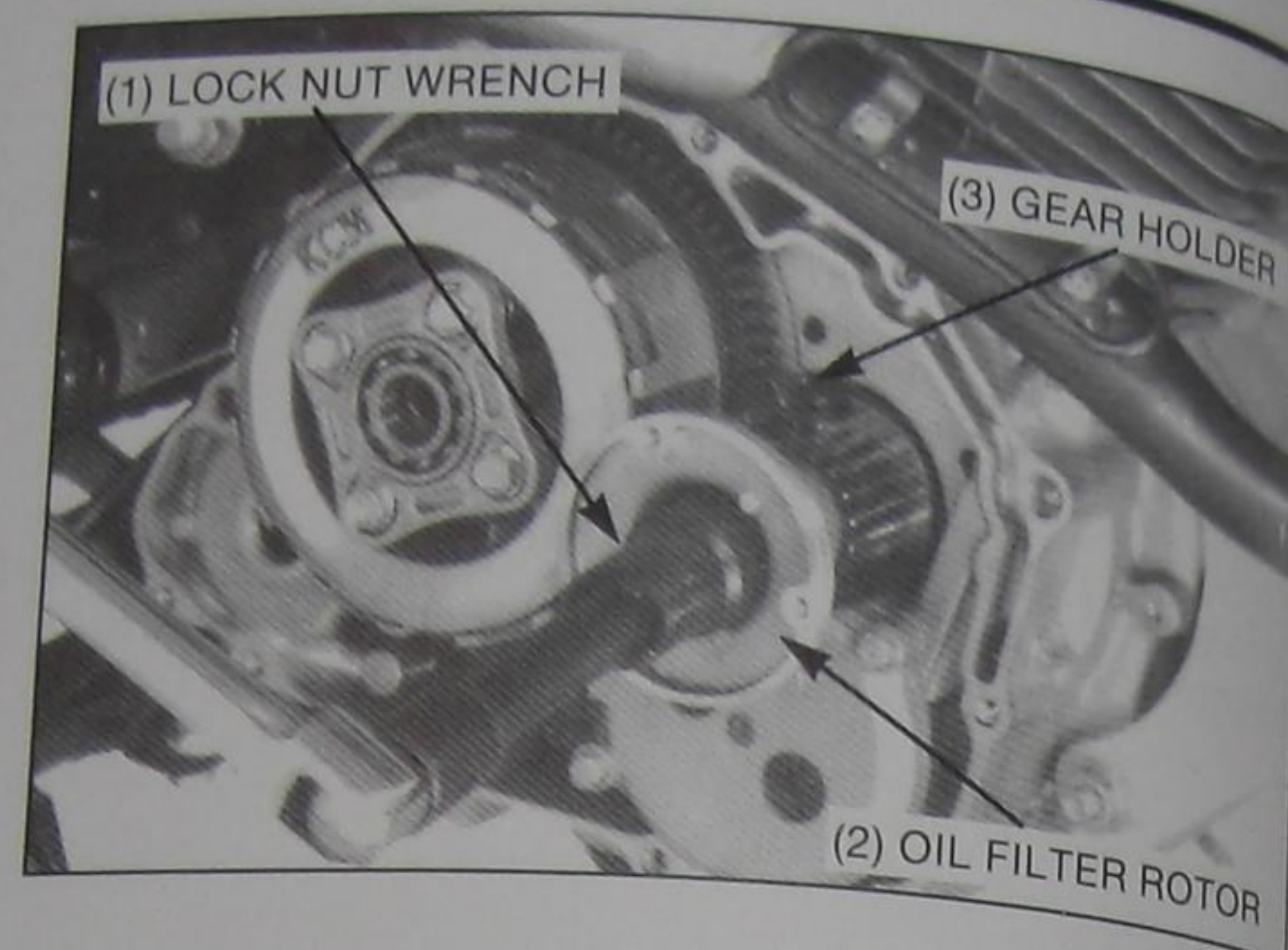
TOOLS:

Gear holder:

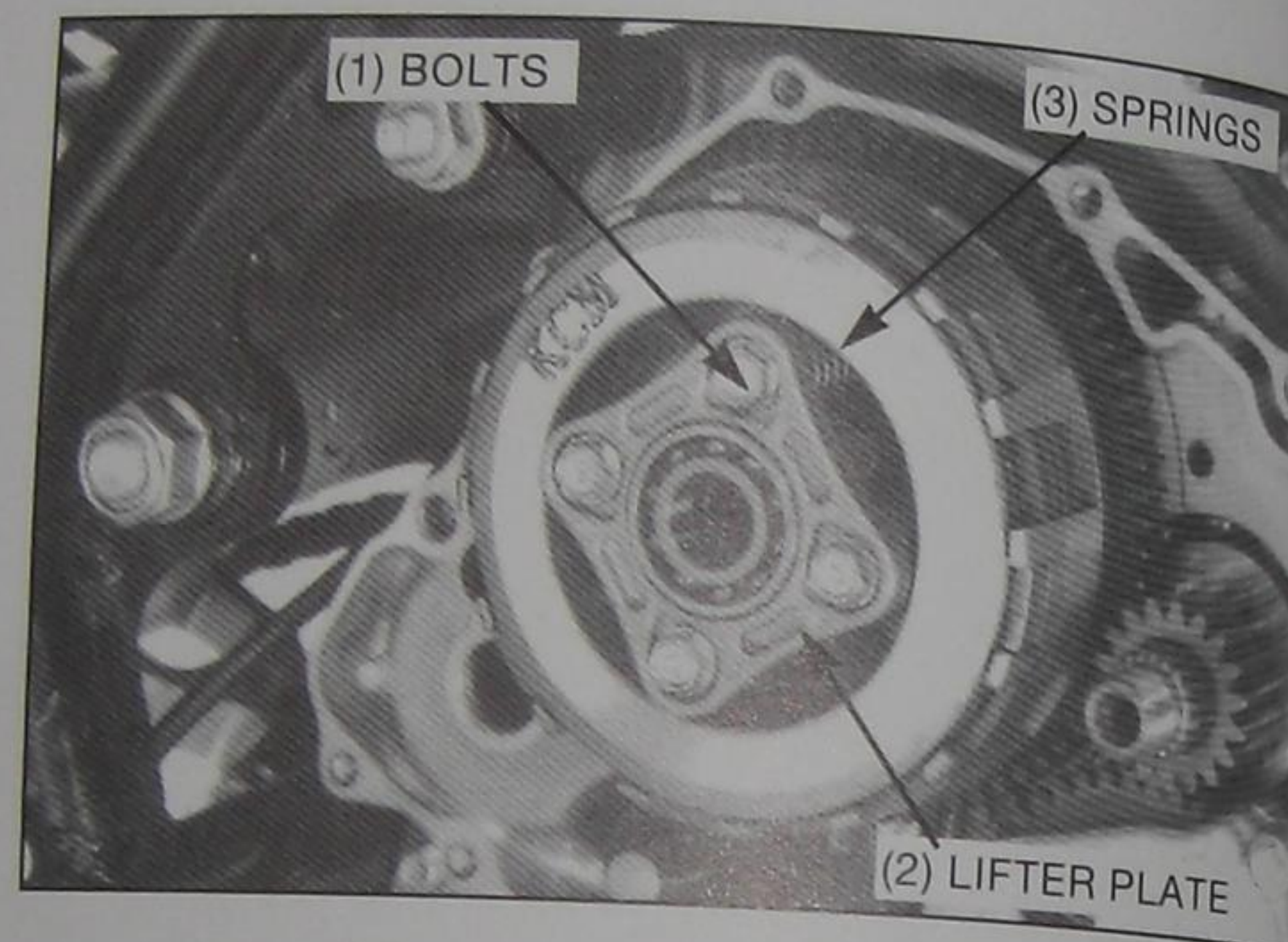
Lock nut wrench, 20 x 24 mm

07724-0010200

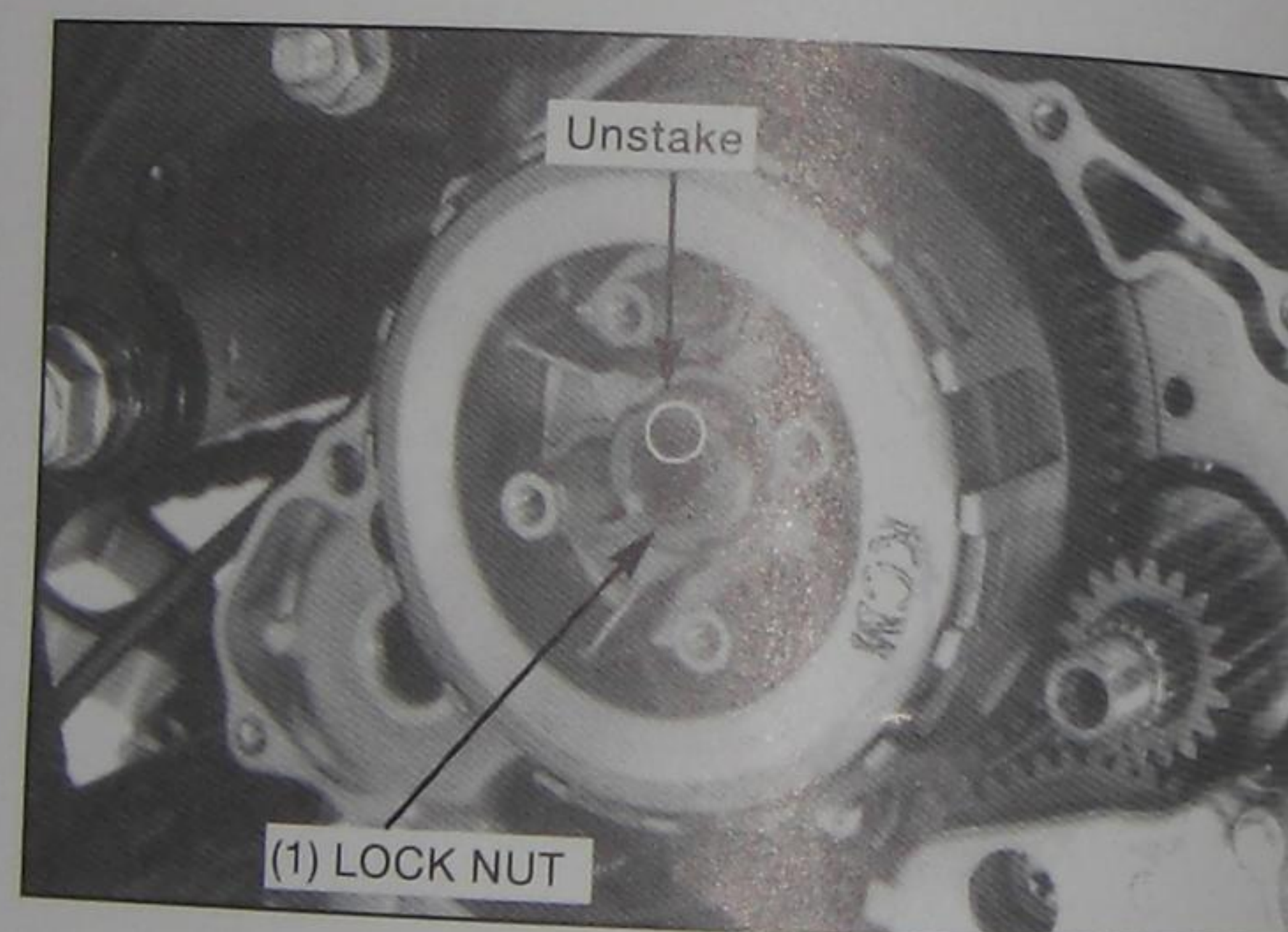
07716-0020100



Loosen the clutch lifter plate bolts in a crisscross pattern in several steps.
Remove the bolts, lifter plate and clutch springs.



Unstake the clutch center lock nut, being careful not to damage the mainshaft threads.



Hold the pressure plate with the special tool and loosen the clutch center lock nut.

TOOL:

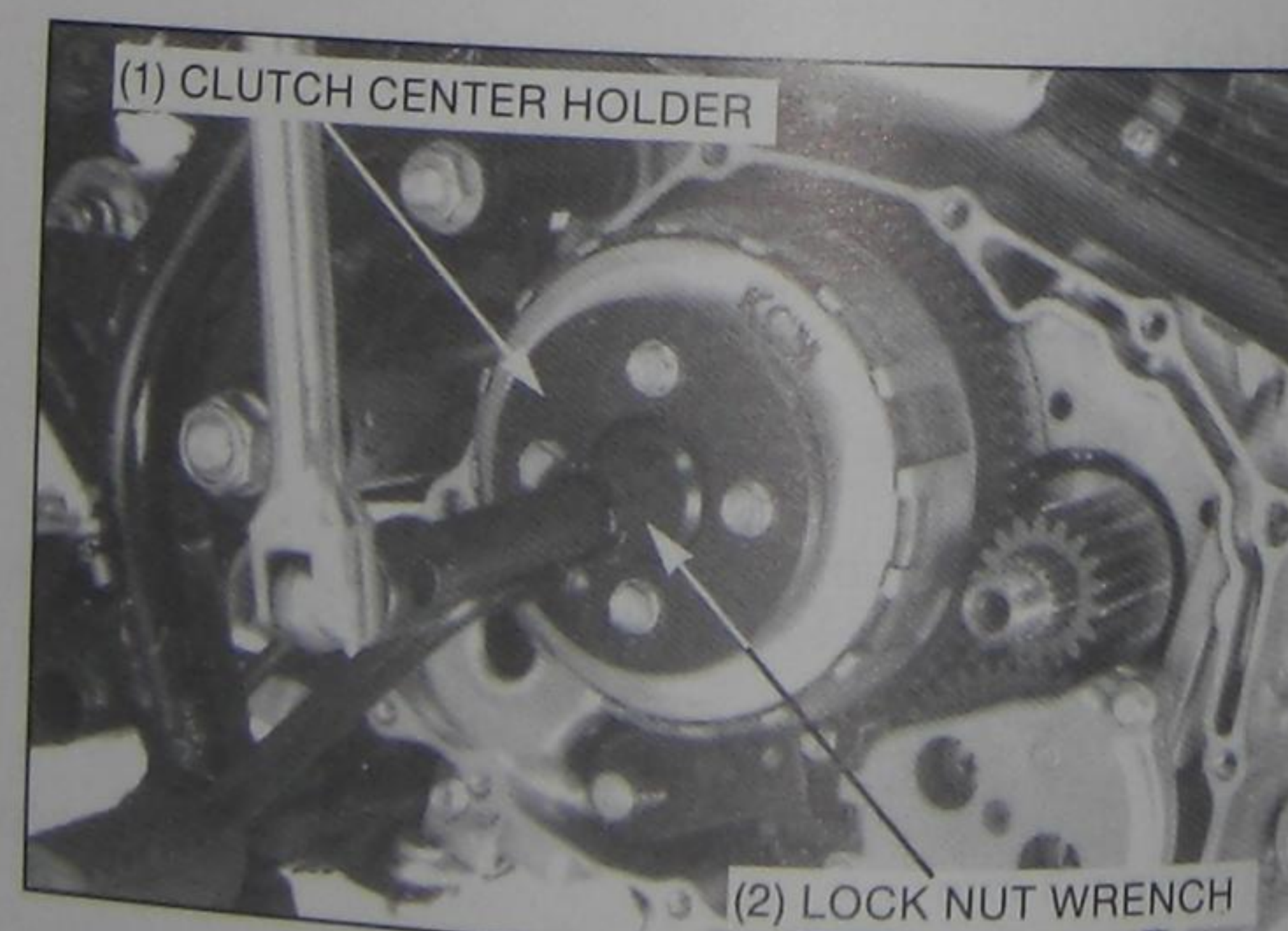
Clutch center holder

Lock nut wrench, 20 x 24 mm

07GMB-KT70101

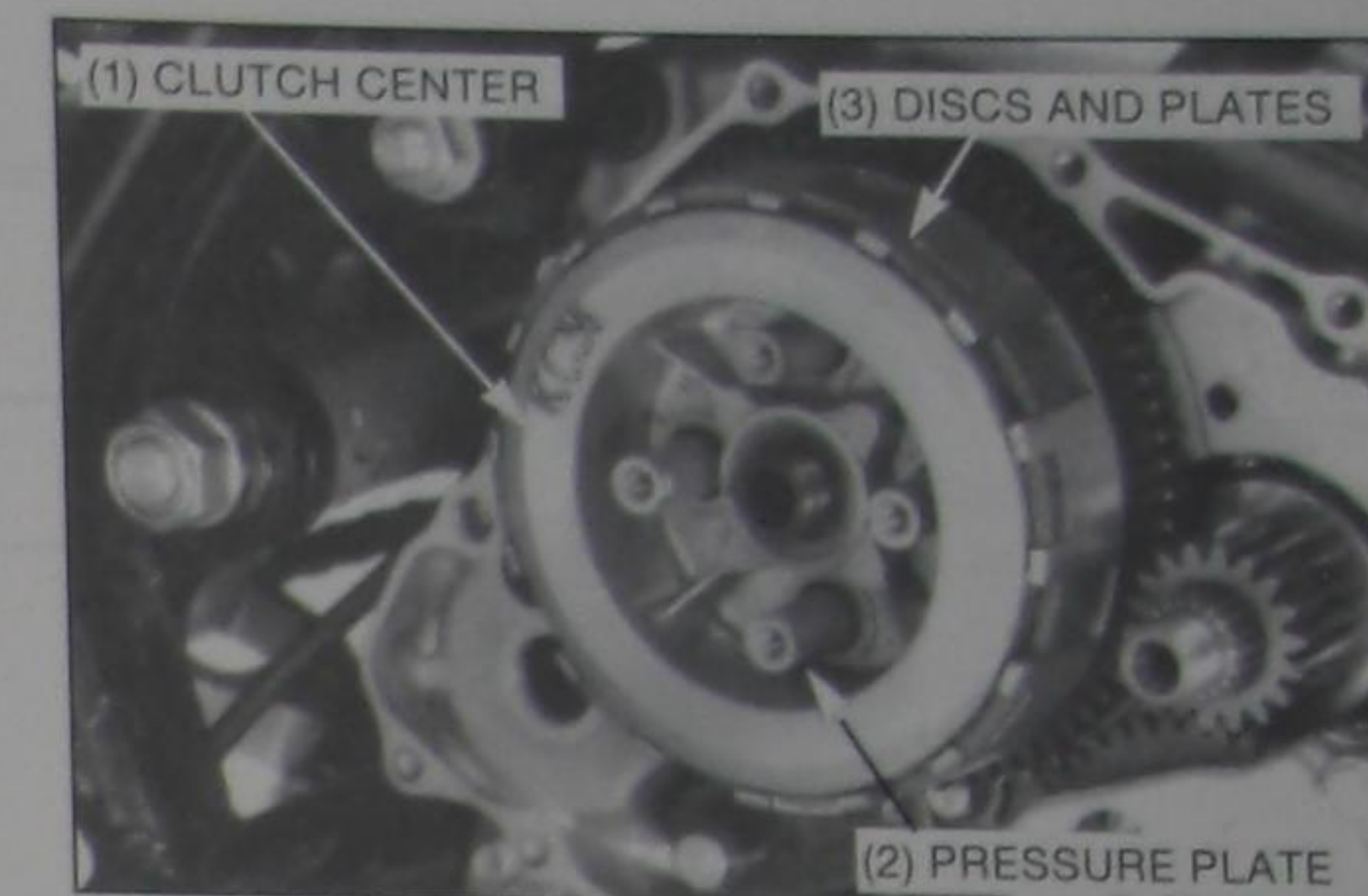
07716-0020100

Remove the following:
- Lock nut and washer

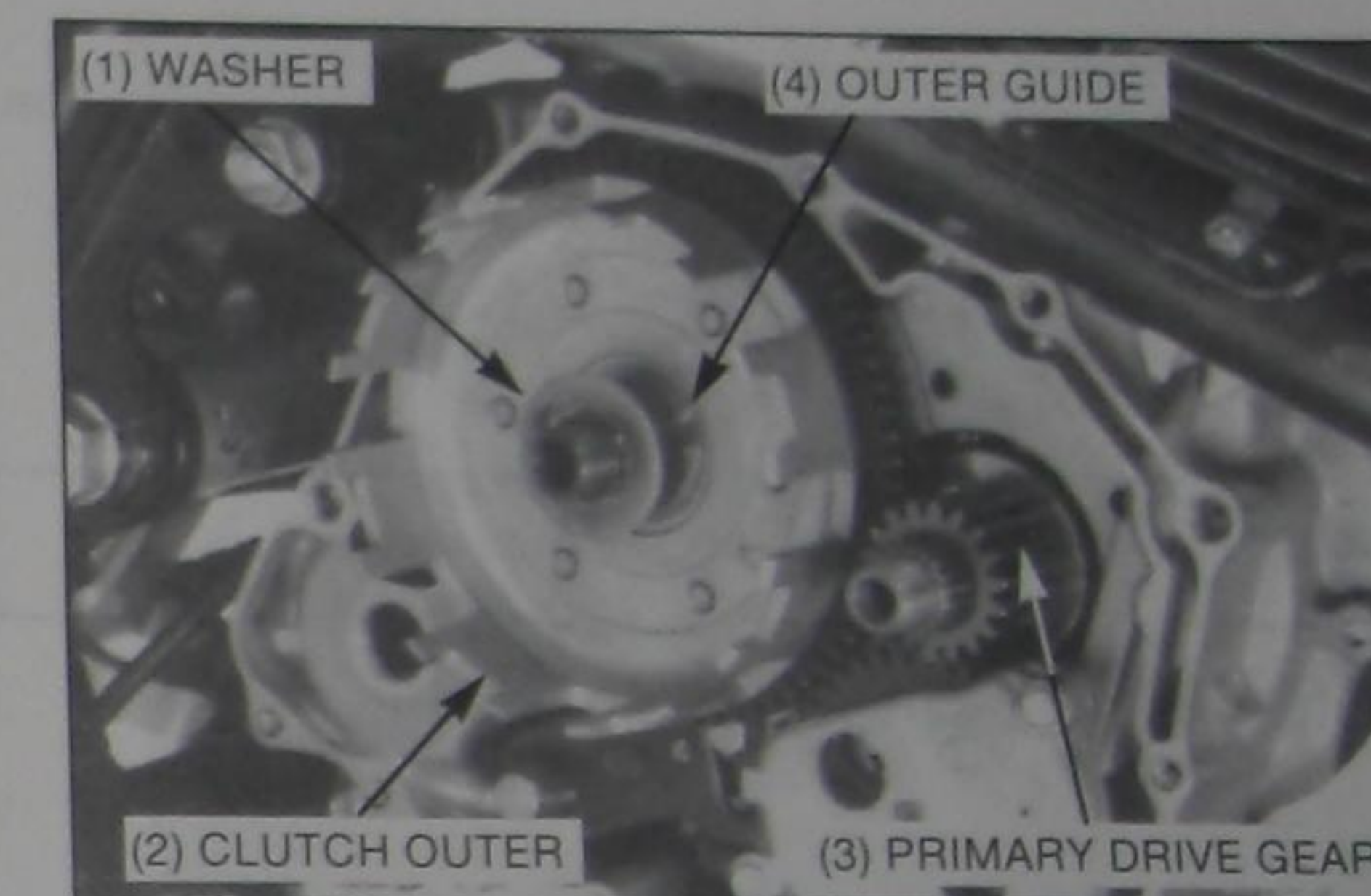


CLUTCH/GEARSHIFT LINKAGE

- Clutch center
- Clutch discs and plates
- Pressure plate



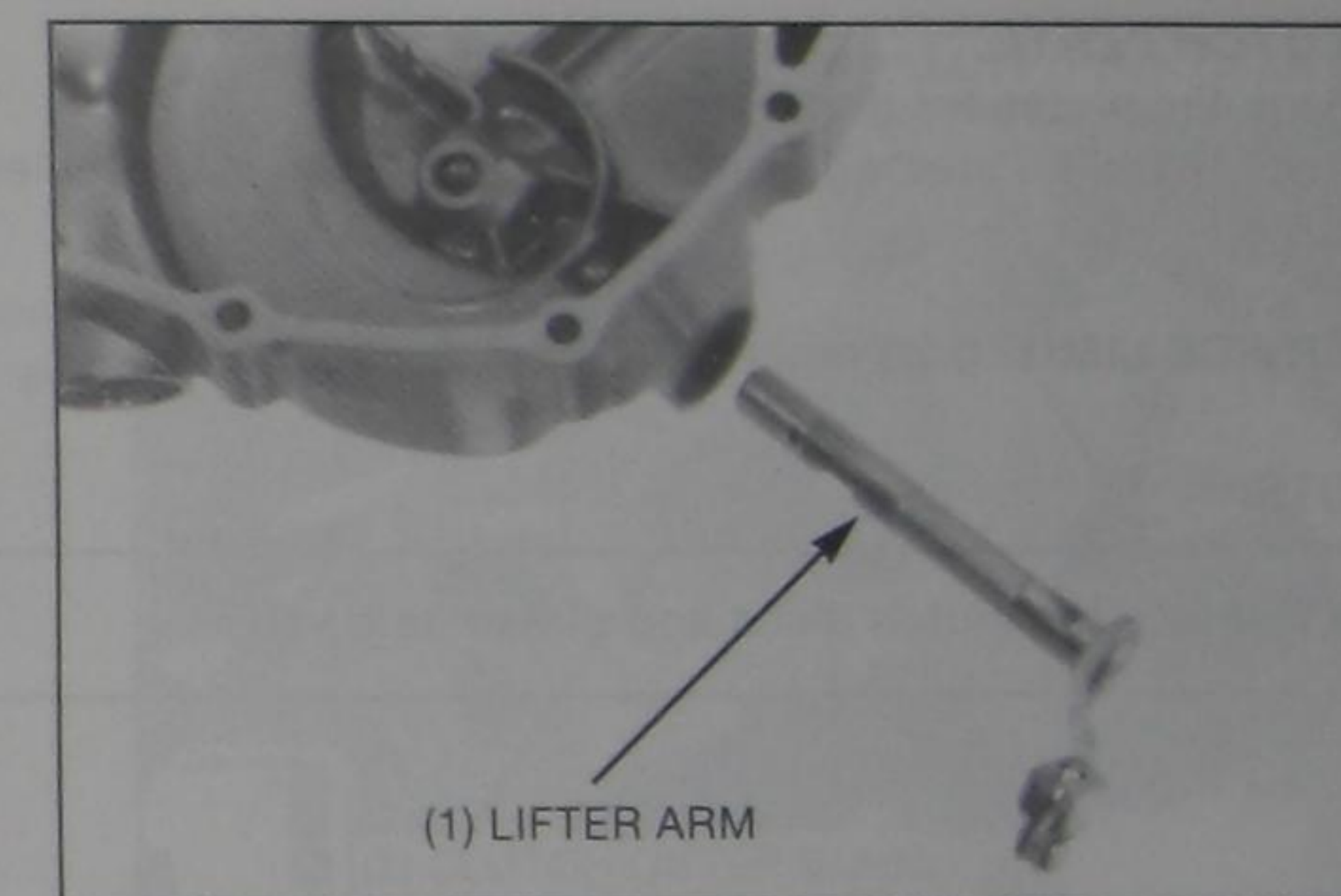
- Thrust washer (aligning spline teeth)
- Clutch outer
- Outer guide
- Primary drive gear



INSPECTION

LIFTER ARM

Check the lifter arm spindle and dust seal for wear or damage.
Check the return spring for fatigue or damage.



LIFTER BEARING

Turn the inner race of the lifter bearing with your finger. The bearing should turn smoothly and quietly. Also check that the outer race of the bearing fits tightly in the lifter plate. Replace the bearing if the inner race does not turn smoothly, quietly, or if the outer race fit loosely in the lifter plate.

Drive the bearing out of the lifter plate.

Drive a new bearing into the plate with its mark side facing out.

TOOLS:

Driver

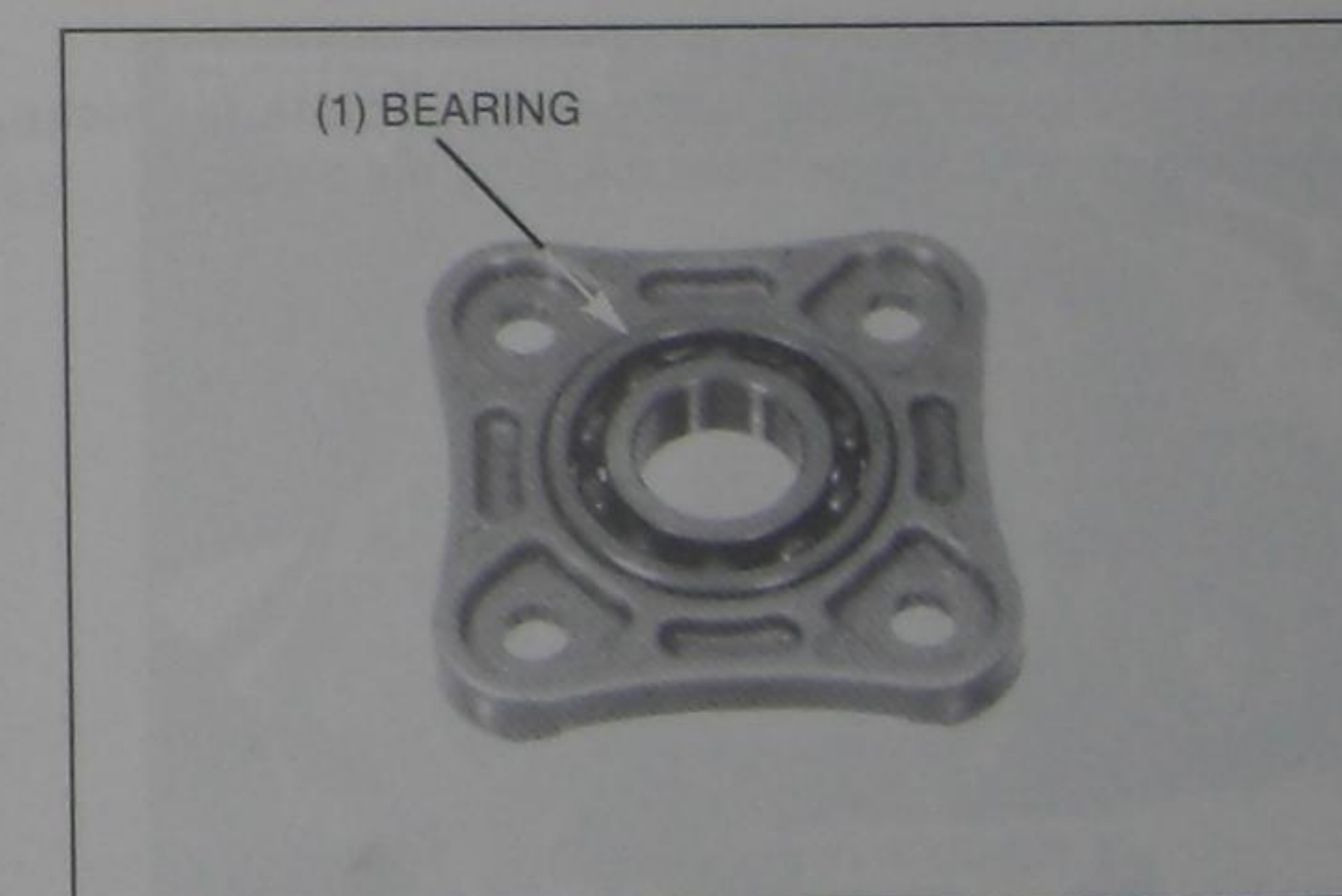
Attachment, 32 x 35 mm

Pilot, 17 mm

07749-0010000

07746-0010100

07746-0040400



CLUTCH/GEARSHIFT LINKAGE

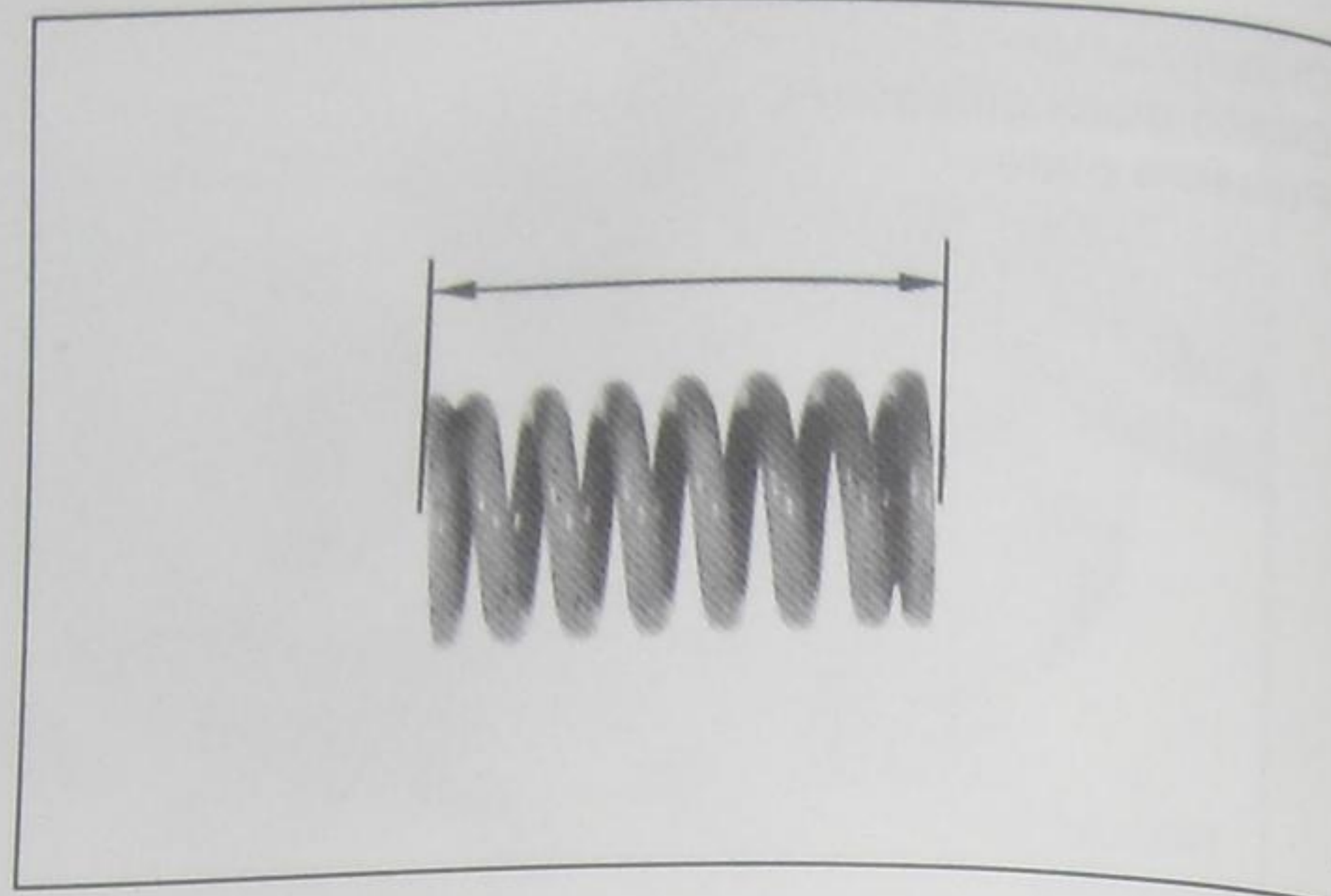
CLUTCH SPRING

Measure the clutch spring free length.

SERVICE LIMIT: 31.7 mm (1.25 in)

NOTE:

- Replace the clutch springs as a set.



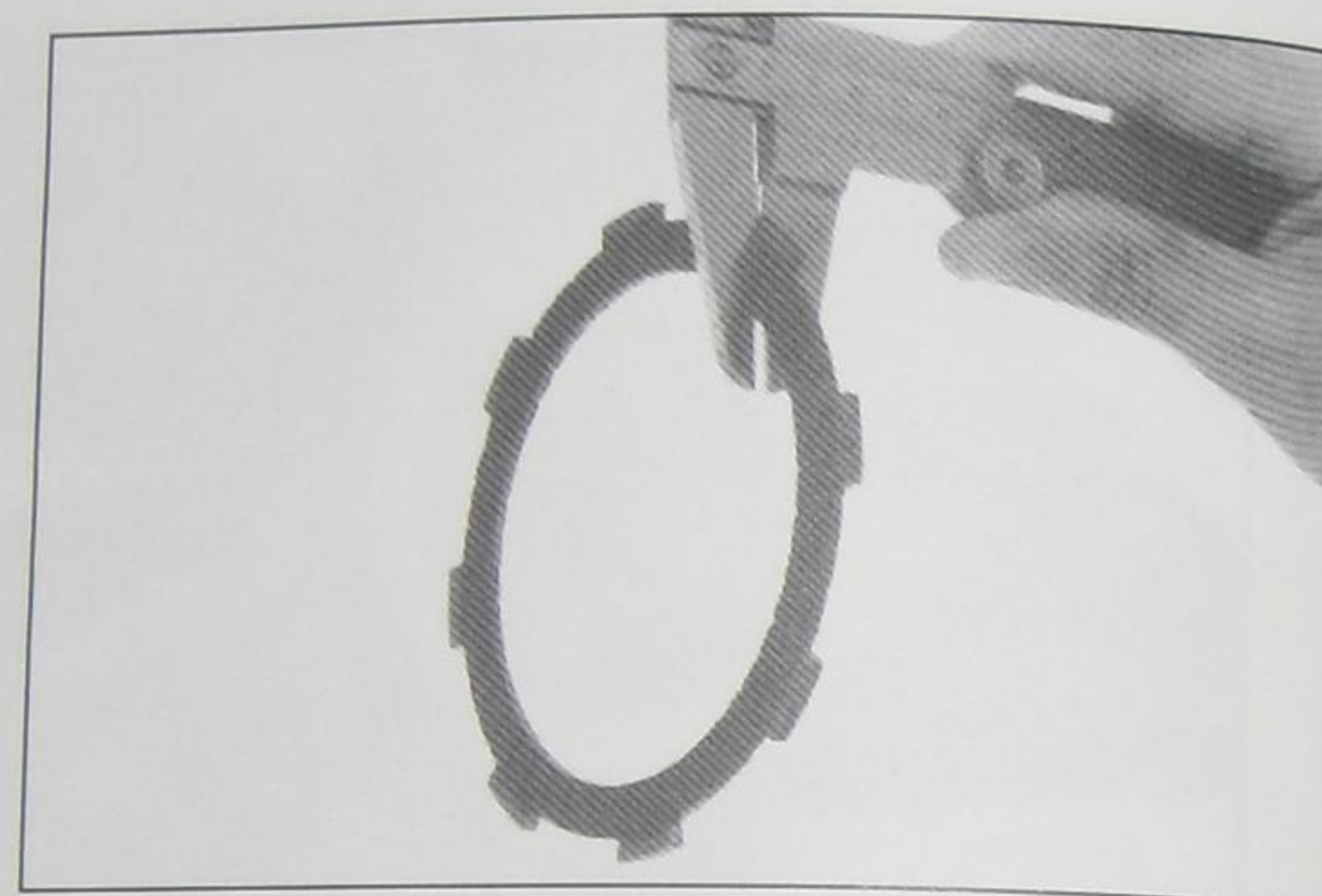
CLUTCH DISC

Check the clutch discs for signs of scoring or discoloration. Measure the clutch disc thickness.

SERVICE LIMIT: 2.6 mm (0.10 in)

NOTE:

- Replace the clutch discs and plates as a set.



CLUTCH PLATE

Check the plates for discoloration. Check the plate warpage on a surface plate using a feeler gauge.

SERVICE LIMIT: 0.20 mm (0.008 in)

NOTE:

- Replace the clutch discs and plates as a set.



CLUTCH CENTER

Check the clutch center and pressure plate for nicks, indentations or abnormal wear made by the plates.



CLUTCH/GEARSHIFT LINKAGE

CLUTCH OUTER/OUTER GUIDE

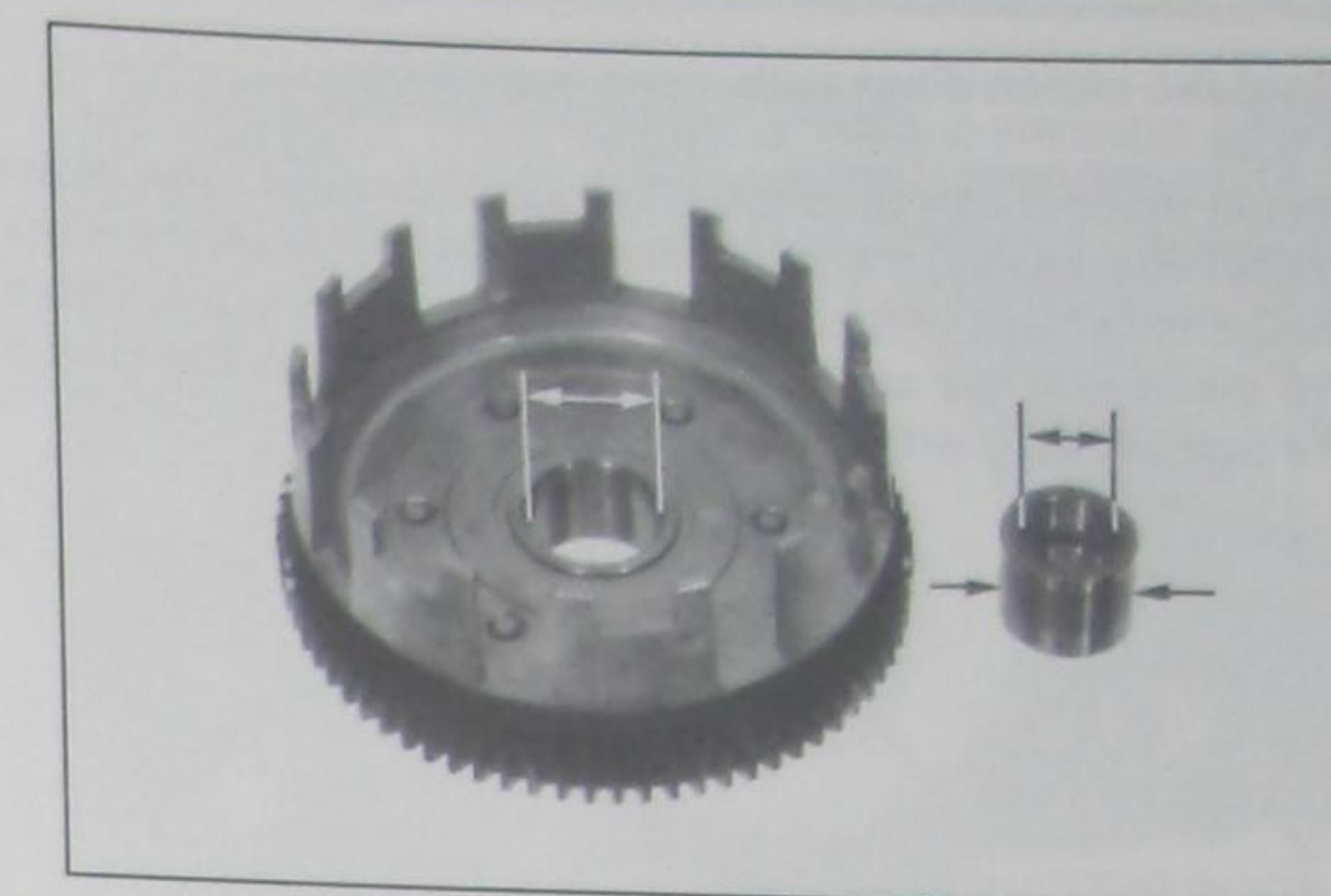
Check the primary driven gear teeth for wear or damage. Check the slots in the clutch outer for nicks, indentation or abnormal wear made by the clutch discs.

Measure the clutch outer I.D.

SERVICE LIMIT: 28.04 mm (1.104 in)

Measure the outer guide O.D. and I.D.

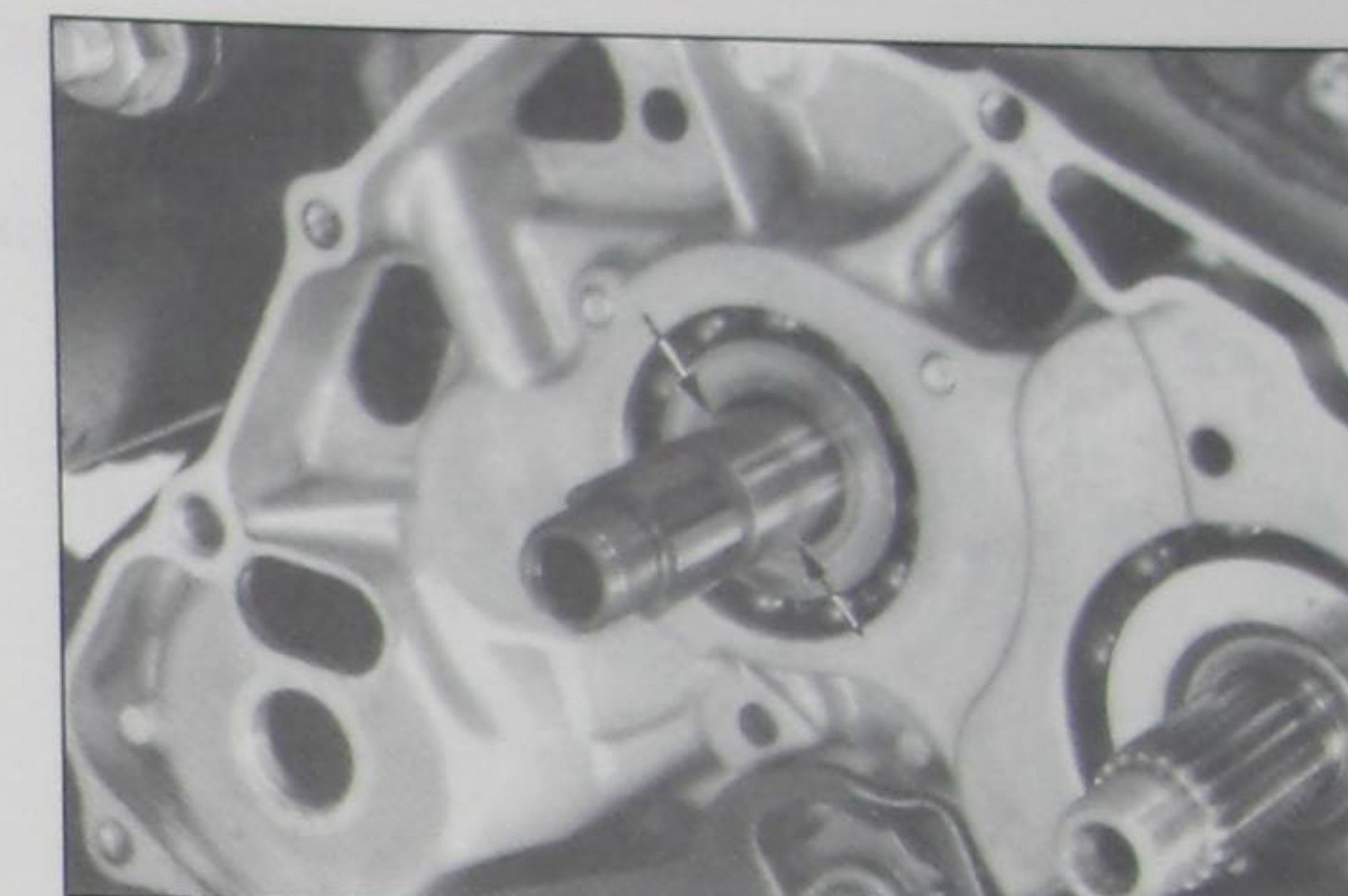
**SERVICE LIMITS: I.D.: 20.02 mm (0.788 in)
O.D.: 27.93 mm (1.100 in)**



MAINSHAFT

Measure the mainshaft O.D. at clutch outer guide.

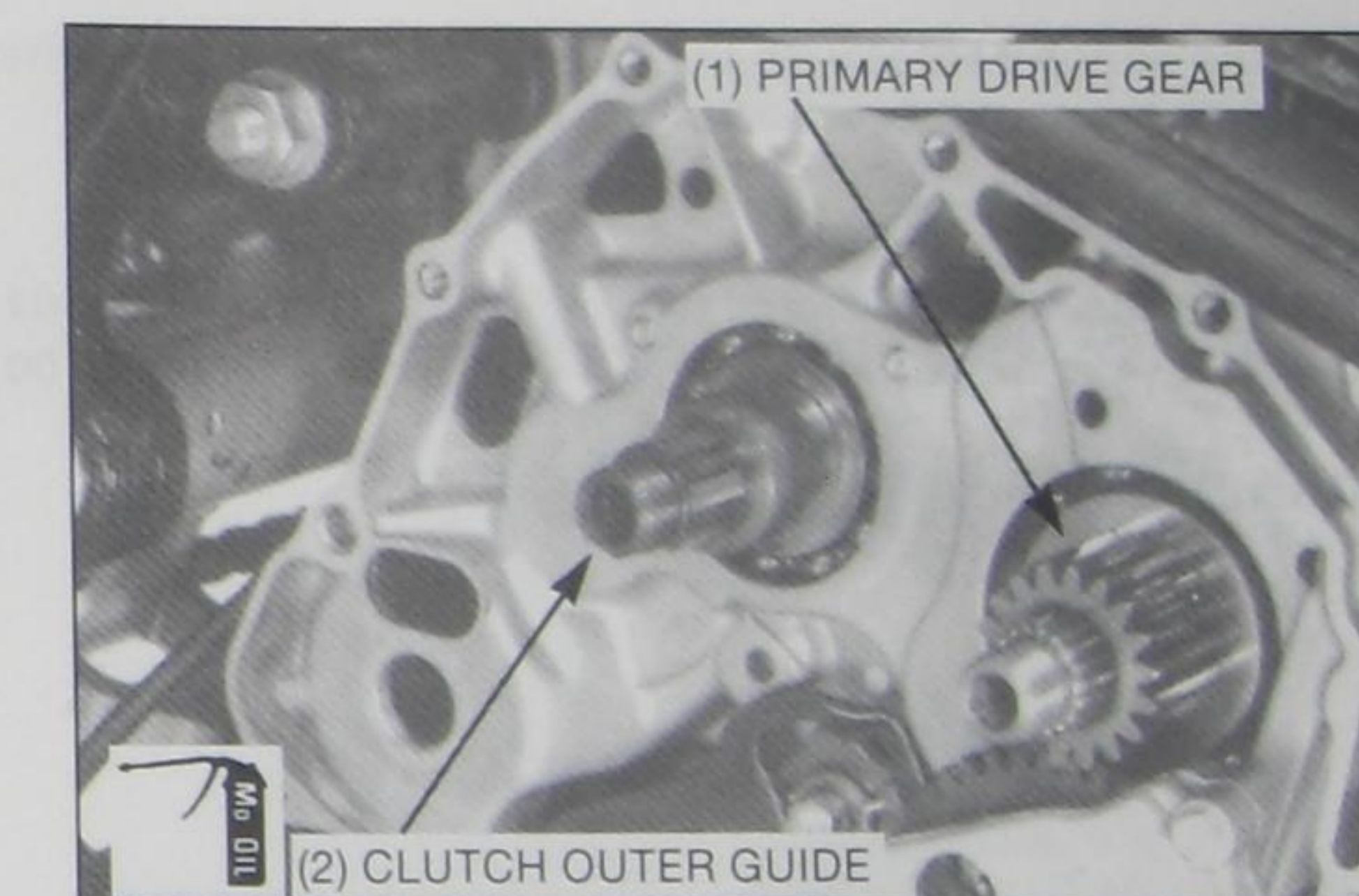
SERVICE LIMIT: 19.92 mm (0.784 in)



CLUTCH ASSEMBLY

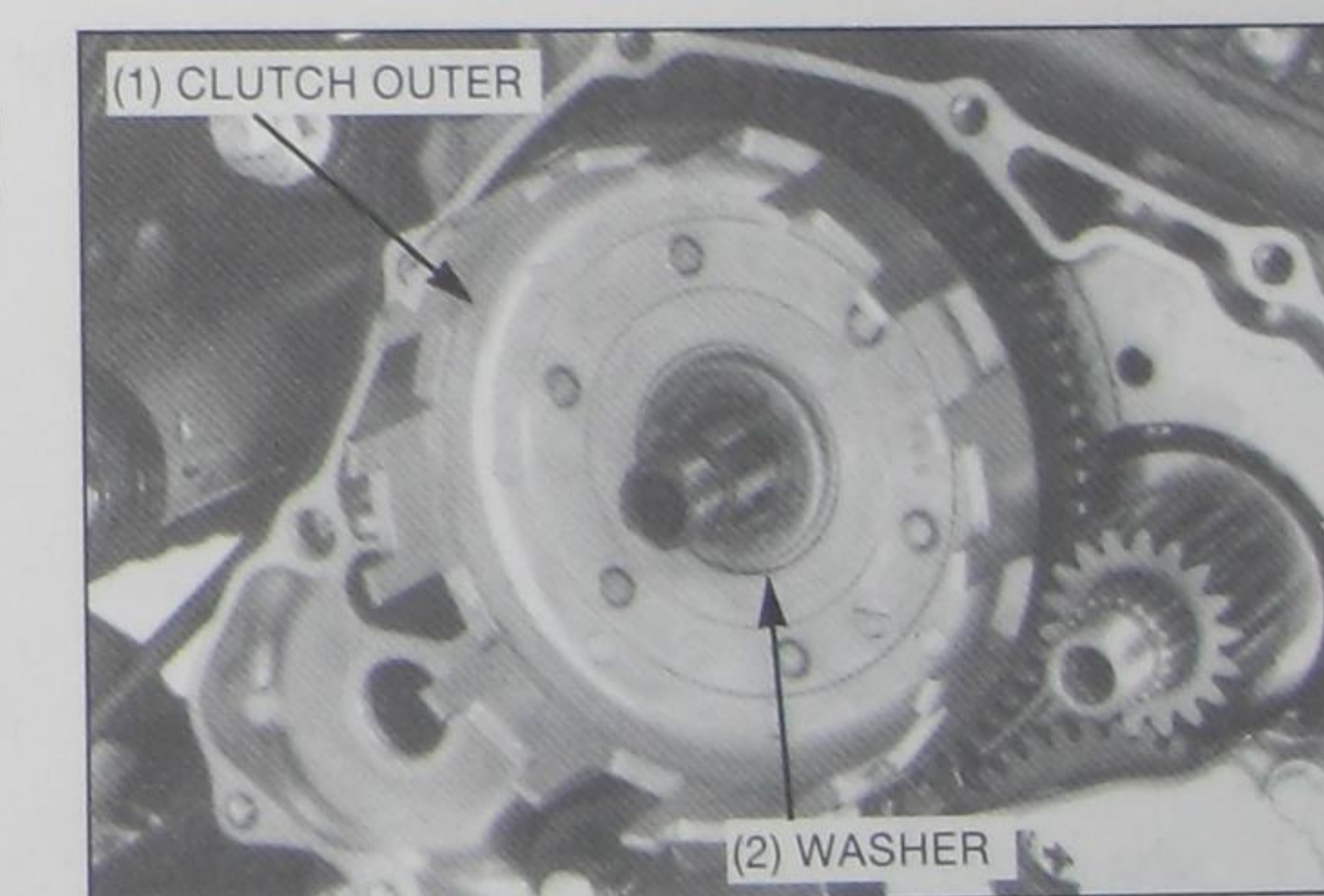
Install the primary drive gear onto the crankshaft.

Apply molybdenum oil solution to the inner and outer surfaces of the clutch outer guide and install it onto the mainshaft.



Install the clutch outer onto the outer guide.

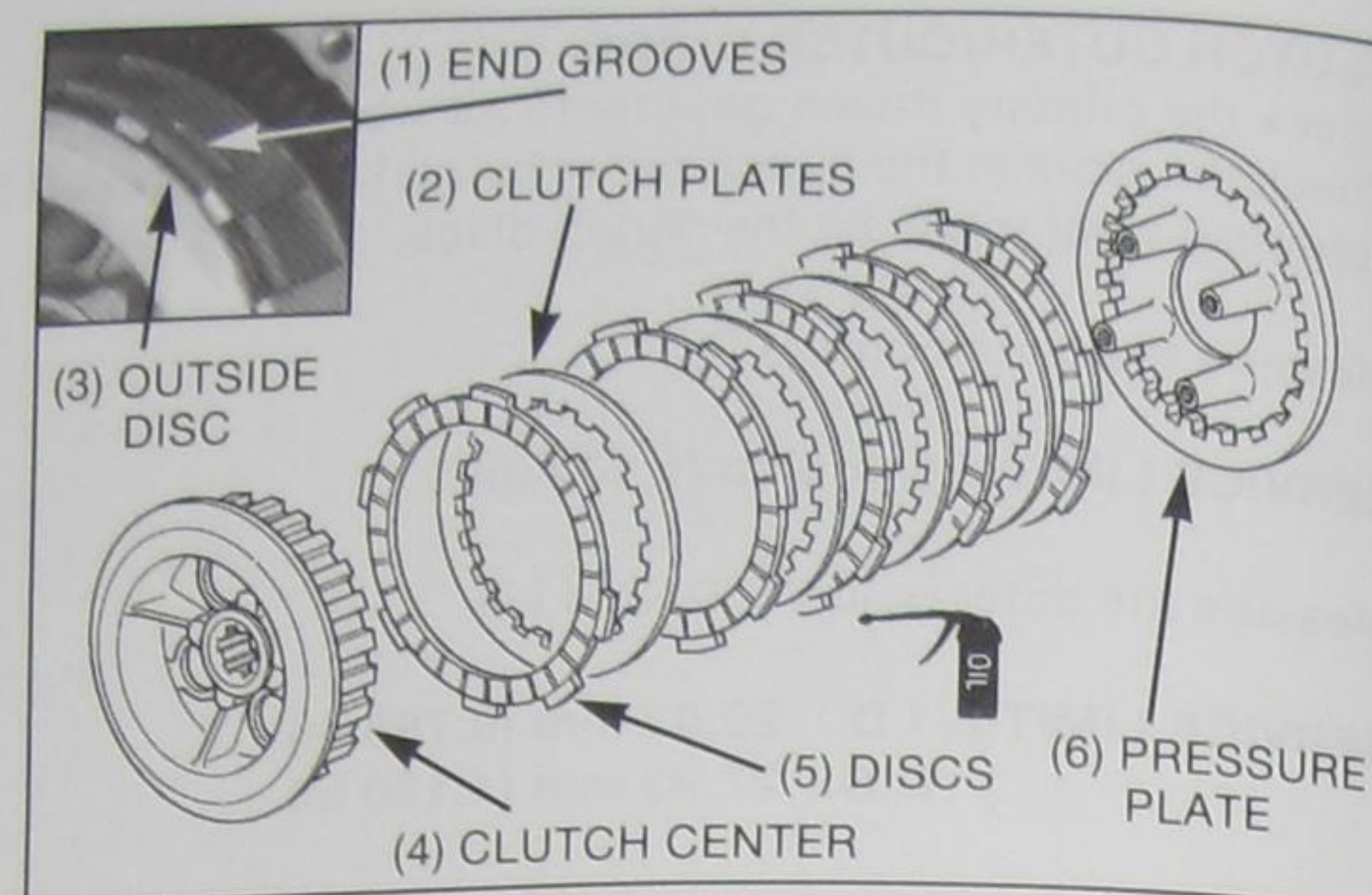
Install the thrust washer onto the mainshaft groove and align the spline teeth of the washer and mainshaft as shown.



CLUTCH/GEARSHIFT LINKAGE

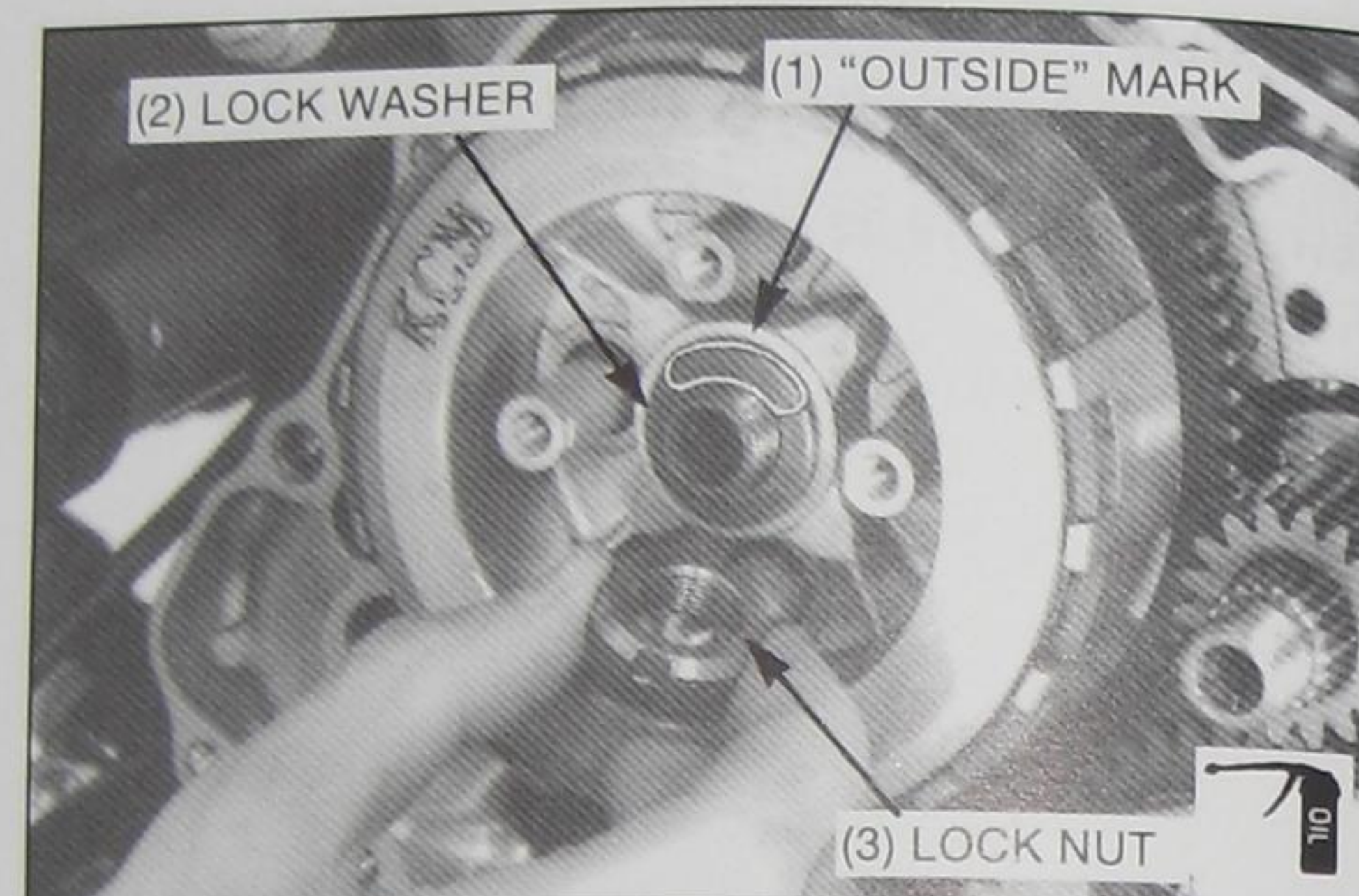
Coat the clutch discs with clean engine oil.

Install the five clutch discs and four plates onto the clutch center alternately, starting a disc. Install the pressure plate. Install the clutch center assembly while aligning the tabs of the discs with the slots in the clutch outer and the tabs of the outside disc with the end grooves.



Install the lock washer onto the mainshaft with the "OUTSIDE" mark facing out.

Apply oil to the threads and seating surface of a new lock nut and install it.



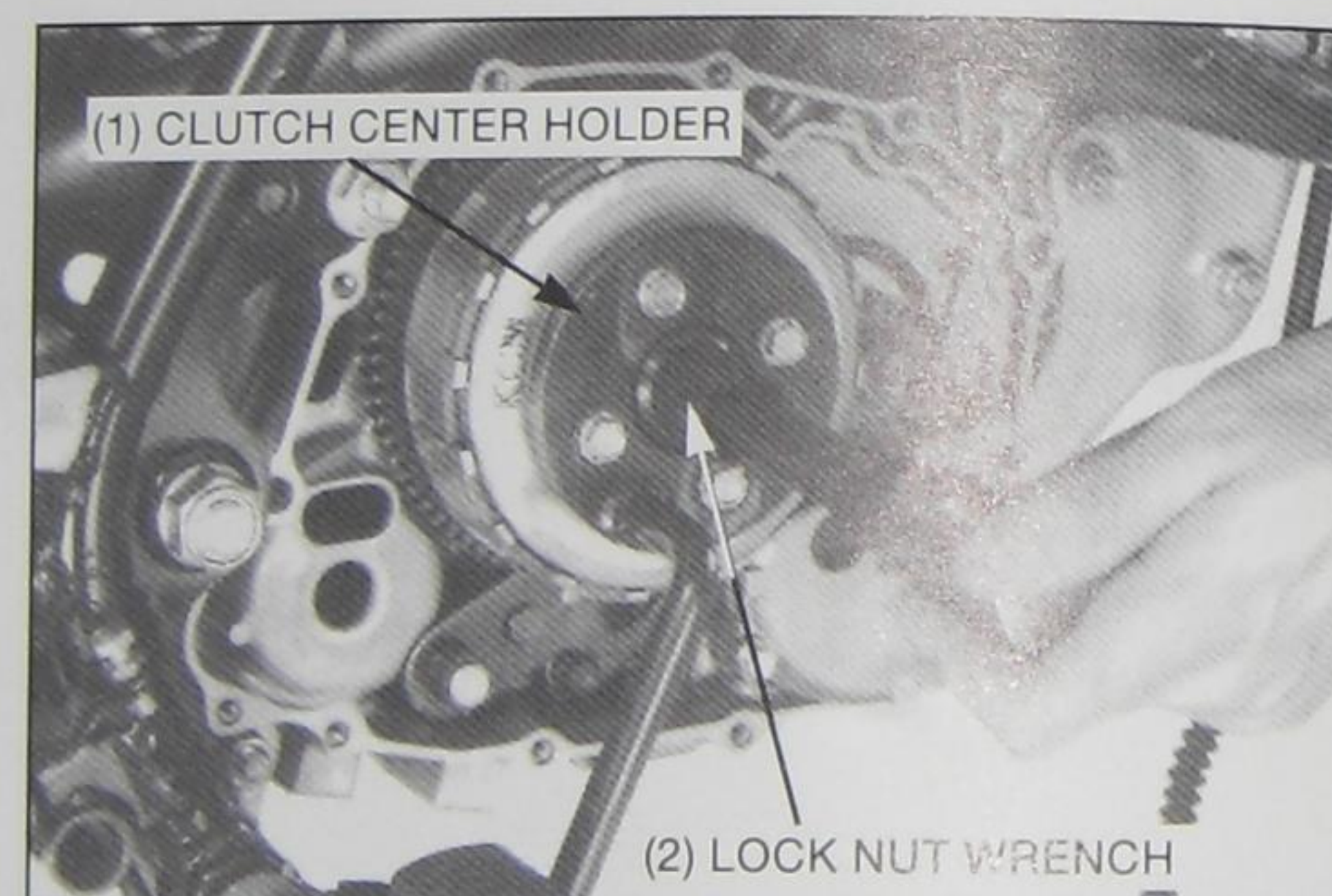
Hold the clutch center with the special tool and tighten the lock nut.

TOOLS:

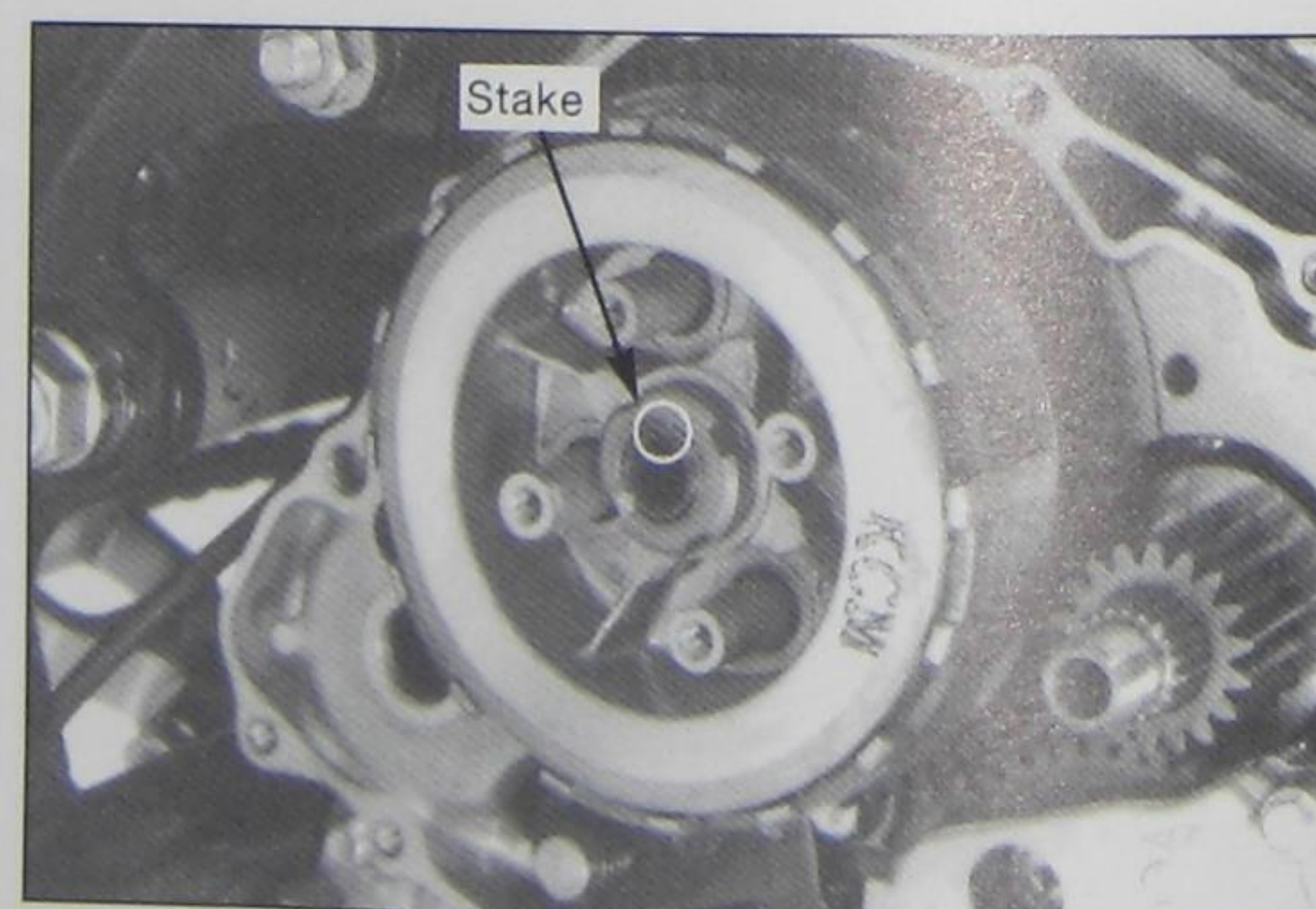
Clutch center holder
Lock nut wrench, 20 x 24 mm

07GMB-KT70101
07716-0020100

TORQUE: 83 N·m (8.5 kgf-m, 61 lbf-ft)



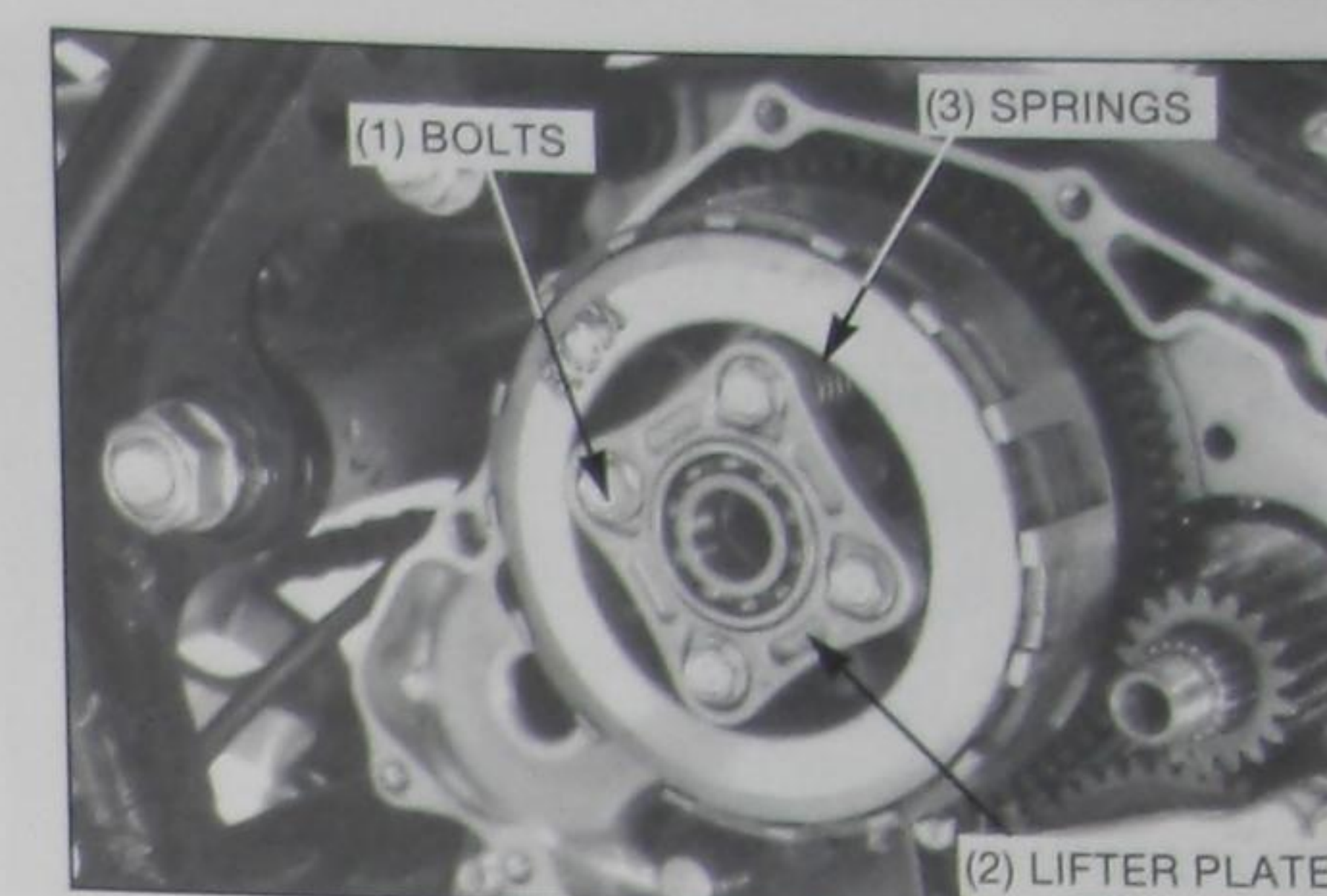
Stake the lock nut into the mainshaft groove, being careful not to damage the mainshaft threads.



CLUTCH/GEARSHIFT LINKAGE

Install the clutch springs, lifter plate and bolts. Tighten the bolts in a crisscross pattern in several steps.

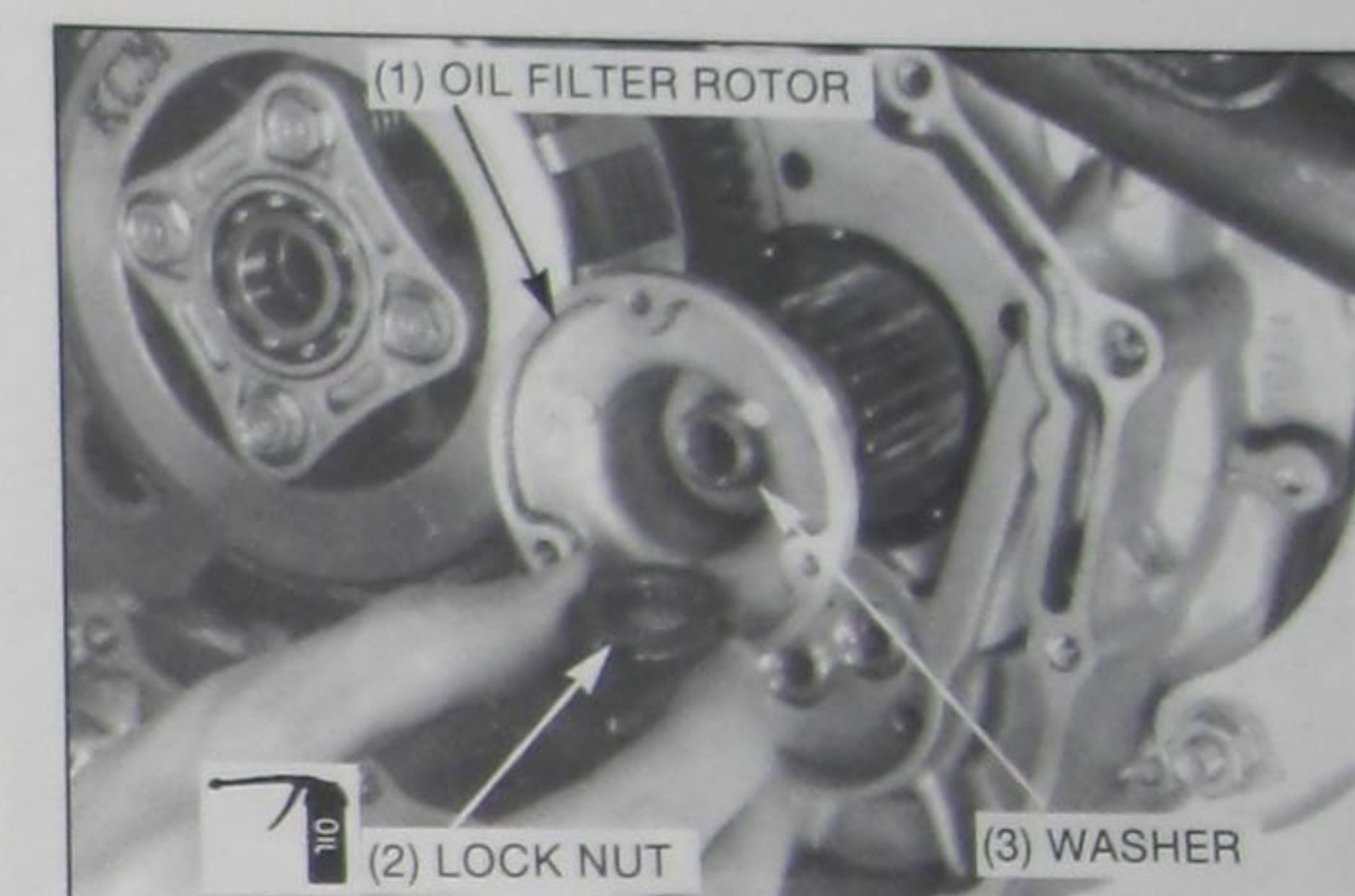
TORQUE: 12 N·m (1.2 kgf-m, 9 lbf-ft)



Remove the oil pump (page 4-2).

Install the oil filter rotor and washer onto the crankshaft. Apply oil to the threads and seating surface of the oil filter rotor lock nut.

Install the lock nut with the chamfered side facing inside.



Install the special tool between the primary drive and driven gears as shown and tighten the lock bolt.

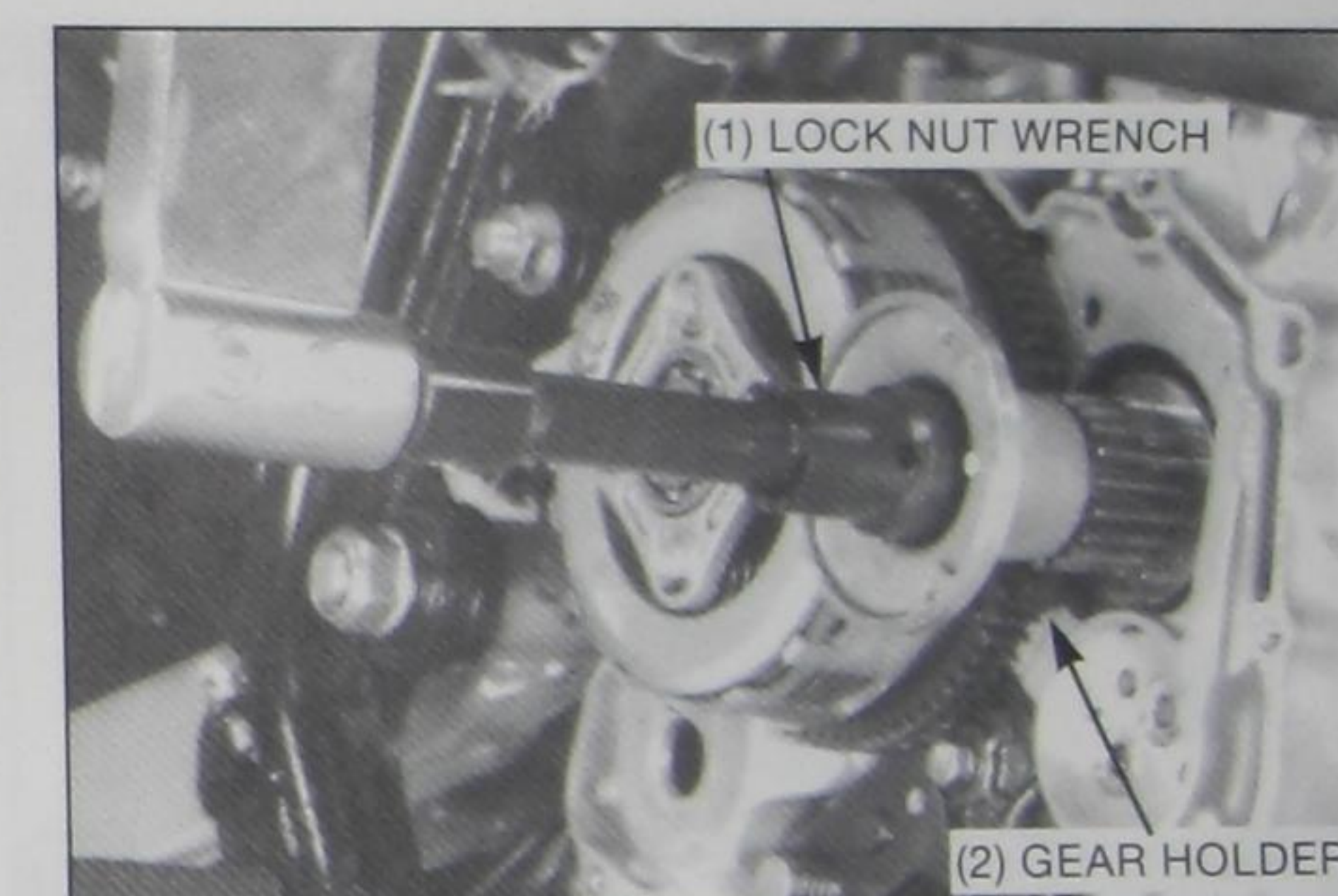
TOOL:

Gear holder
Lock nut wrench, 20 x 24 mm

07724-0010200
07716-0020100

TORQUE: 83 N·m (8.5 kgf-m, 61 lbf-ft)

Install the oil pump (page 4-5).



CLUTCH LIFTER ASSEMBLY

Apply oil to a new dust seal lip and install it into the crankcase cover.

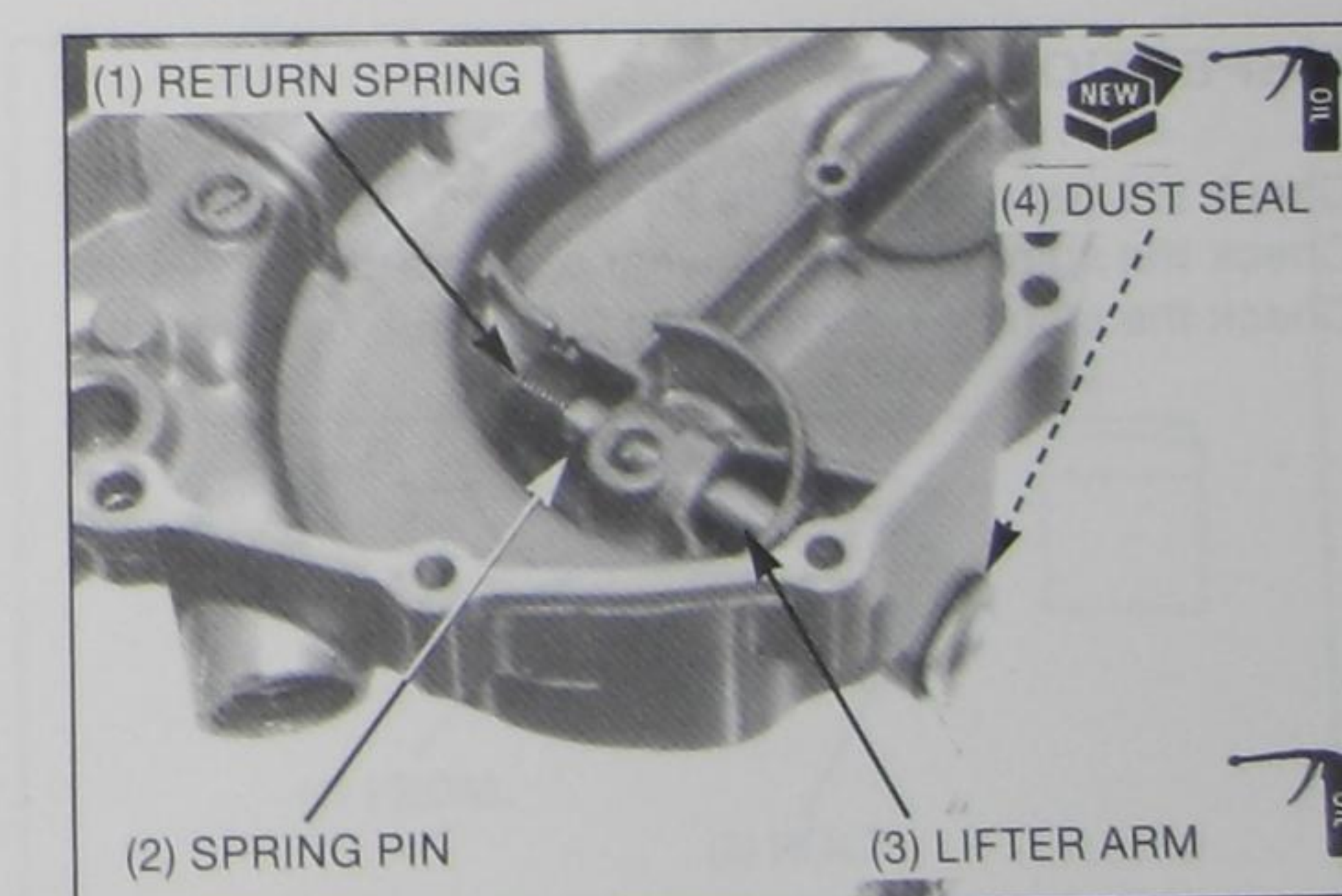
Apply oil to the clutch lifter arm spindle and install it. Drive the spring pin from the opposite side of the arm to project it as recorded when disassembling.

TOOL:

Pin driver, 3 mm

07744-0010200

Install the return spring as shown.

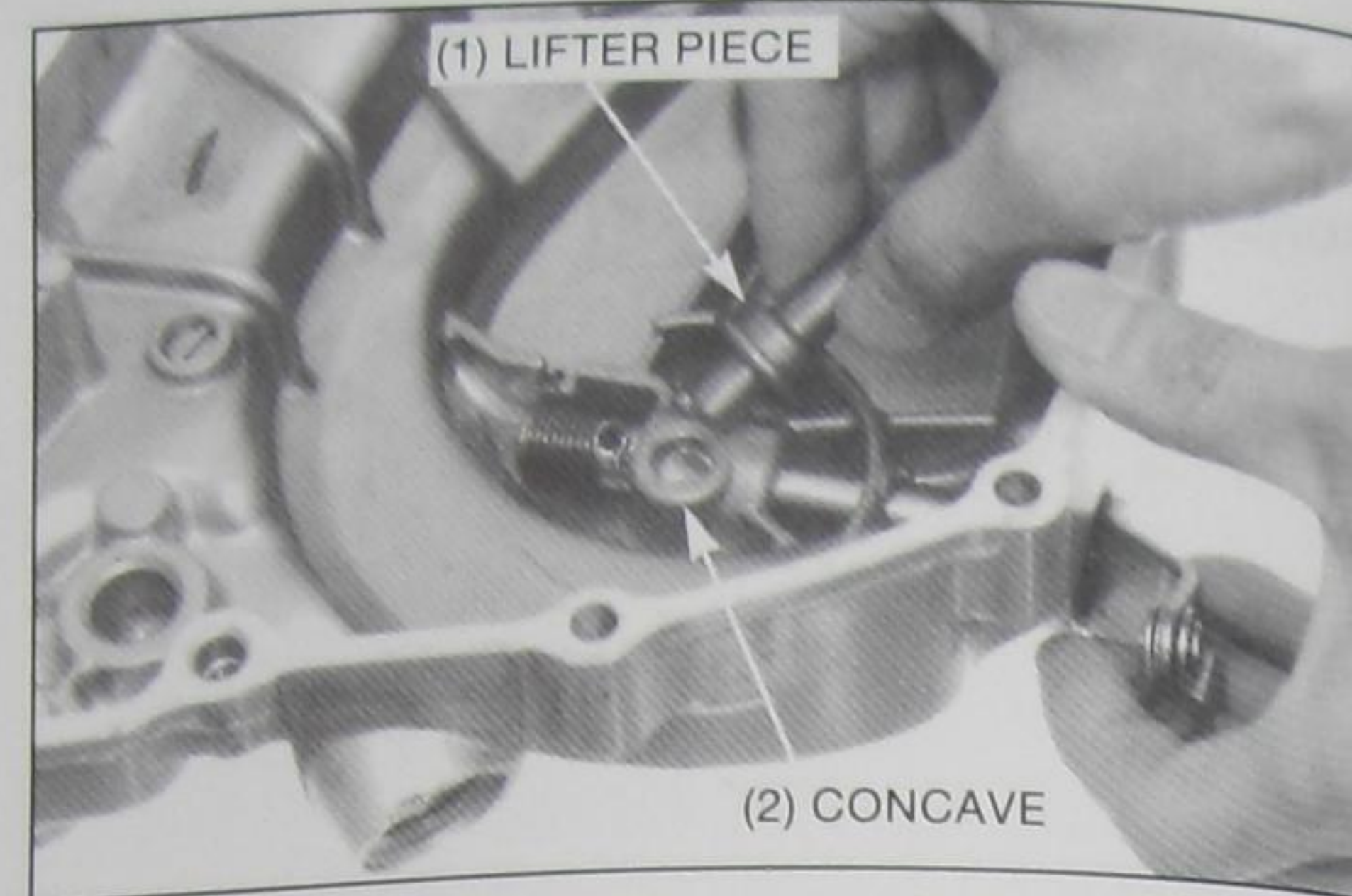


CLUTCH/GEARSHIFT LINKAGE

Install the lifter piece into the spindle concave while aligning the concave with the lifter piece hole.

After installing, check for smooth operation.

Install the right crankcase cover (page 9-12).



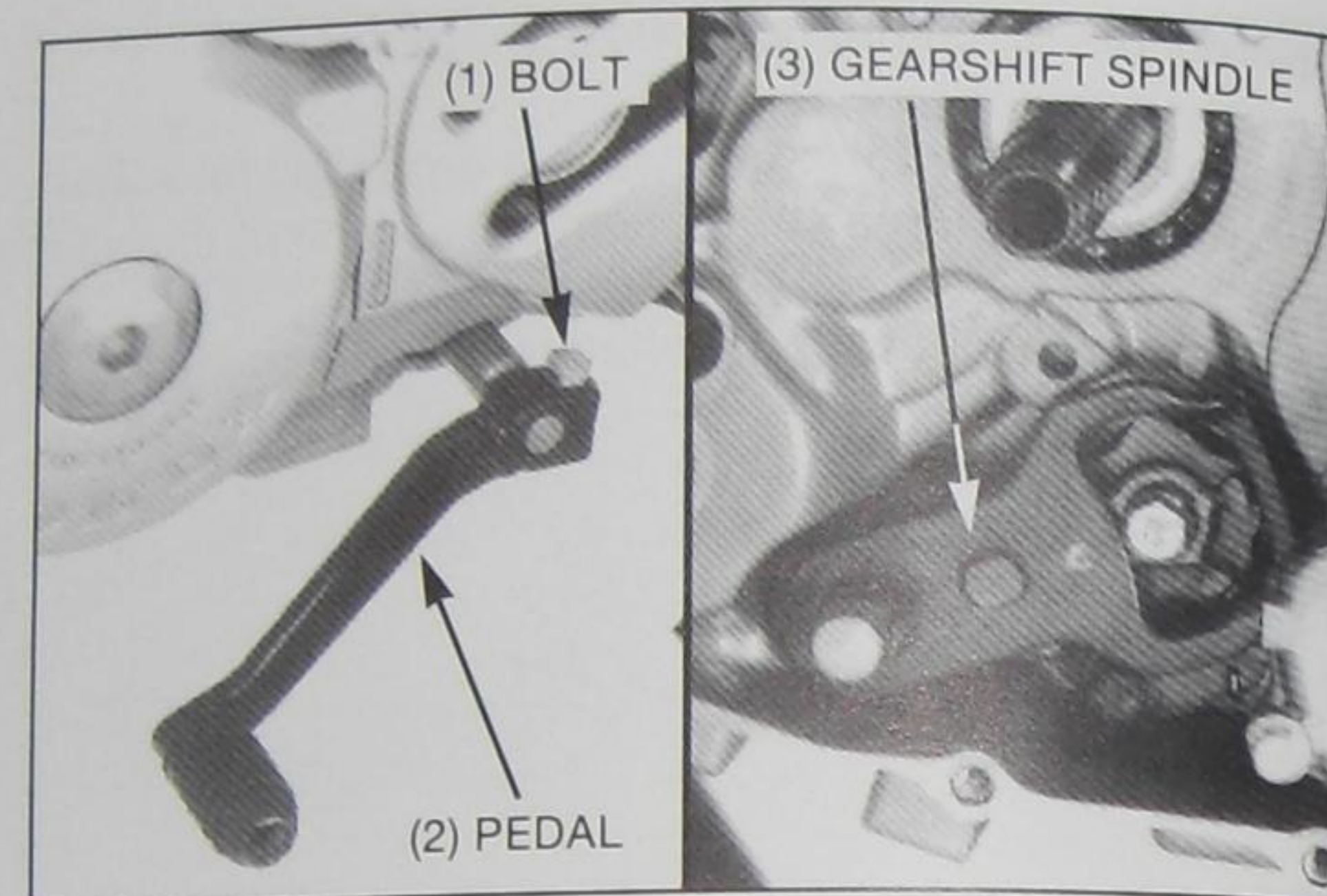
Gearshift Linkage

REMOVAL

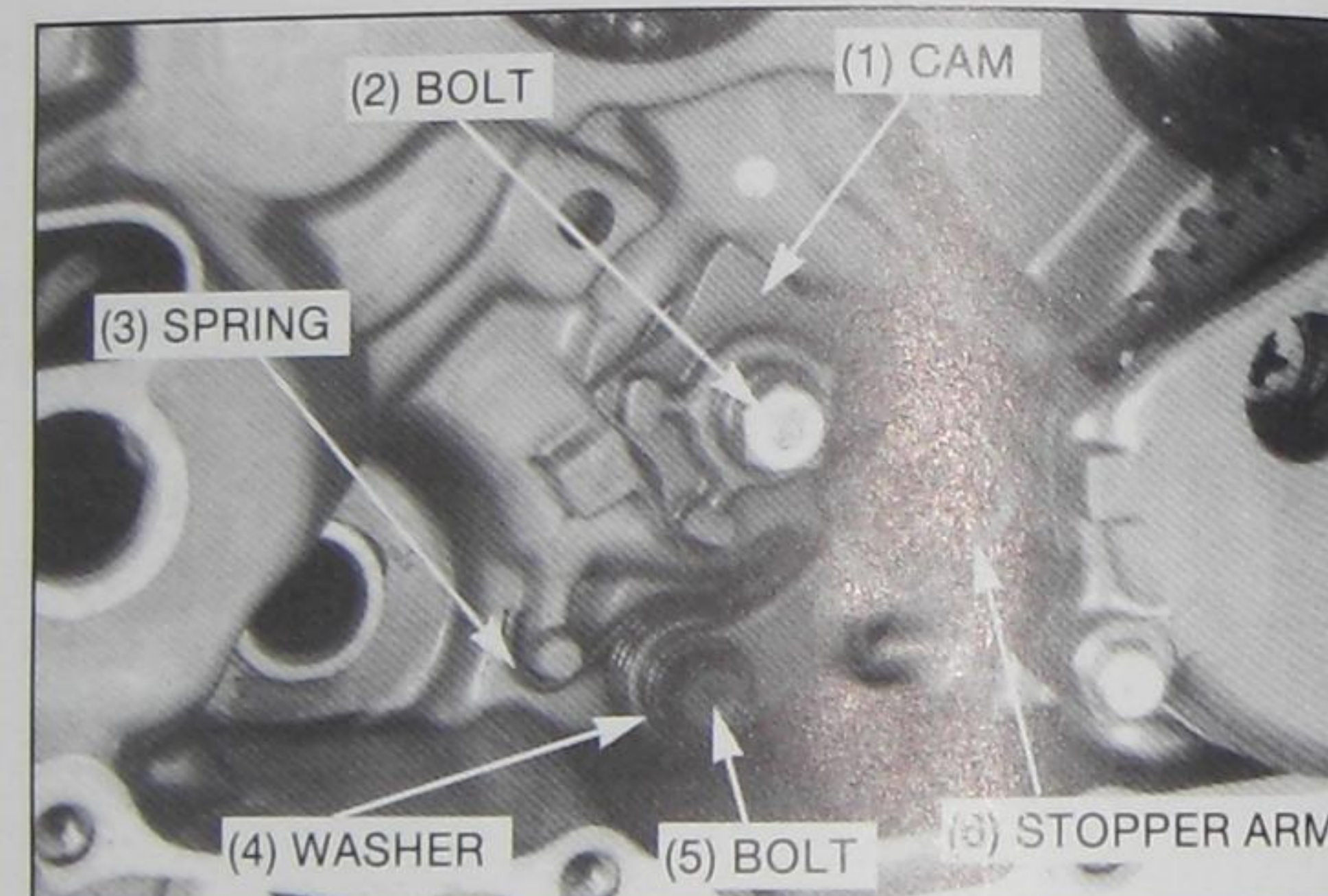
Disassemble the clutch to the clutch outer (page 9-3).

Remove the bolt and the gearshift pedal.

Remove the gearshift spindle assembly and thrust washer.



Remove the gearshift cam bolt and gearshift cam.
Remove the dowel pin from the shift drum.
Remove the stopper arm bolt, arm, washer and return spring.



INSPECTION

Check the gearshift spindle for bending.
Check the spindle plate for wear or damage.
Check the spindle return spring for fatigue or damage.



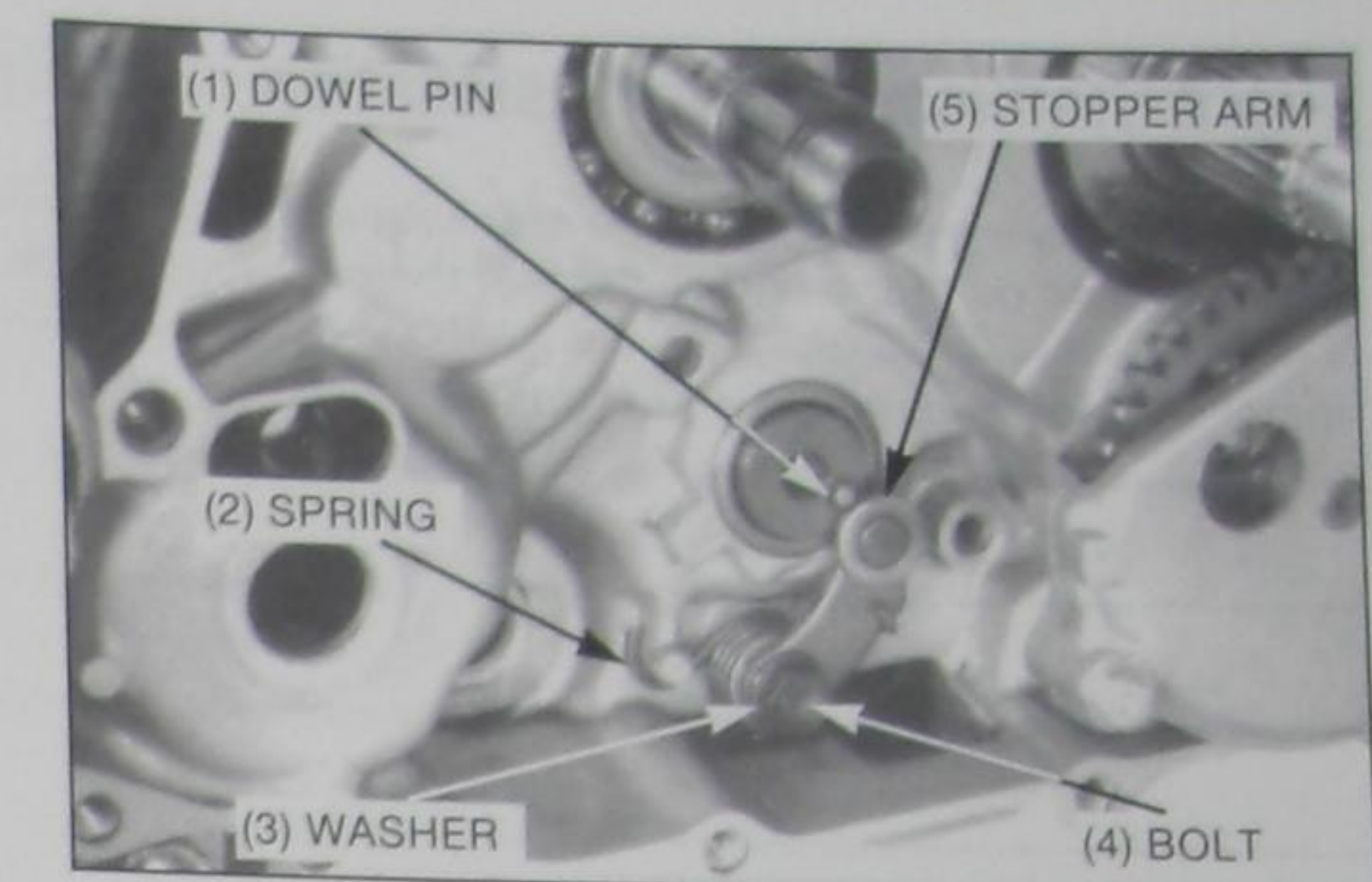
CLUTCH/GEARSHIFT LINKAGE

INSTALLATION

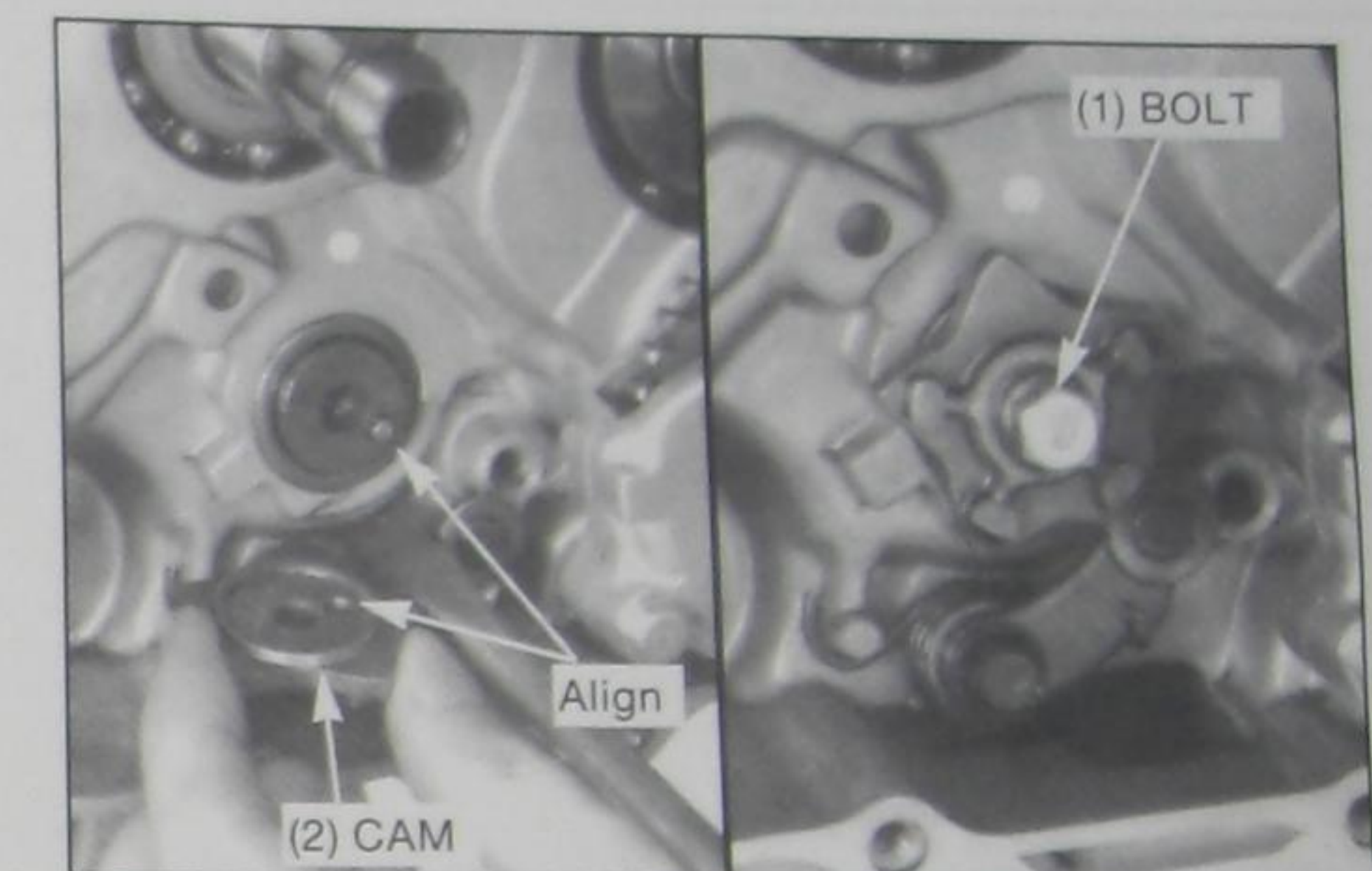
Install the stopper arm, washer (between the spring and arm), spring and bolt, and tighten the bolt.

TORQUE: 12 N·m (1.2 kgf-m, 9 lbf-ft)

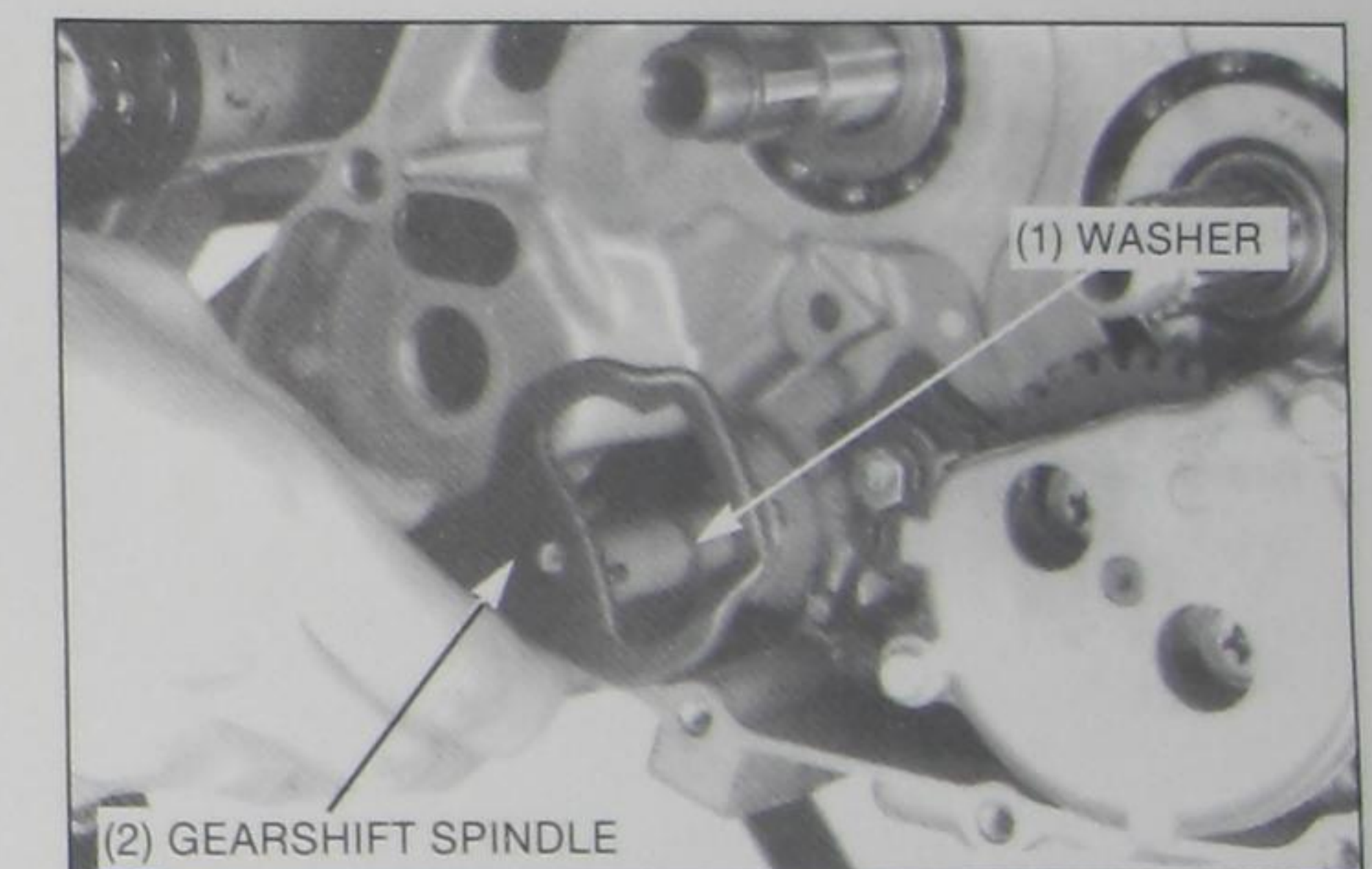
Install the dowel pin into the shift drum.



Hold the stopper arm with a screwdriver and install the gearshift cam by aligning the pin hole with the dowel pin.
Install the cam bolt and tighten it.



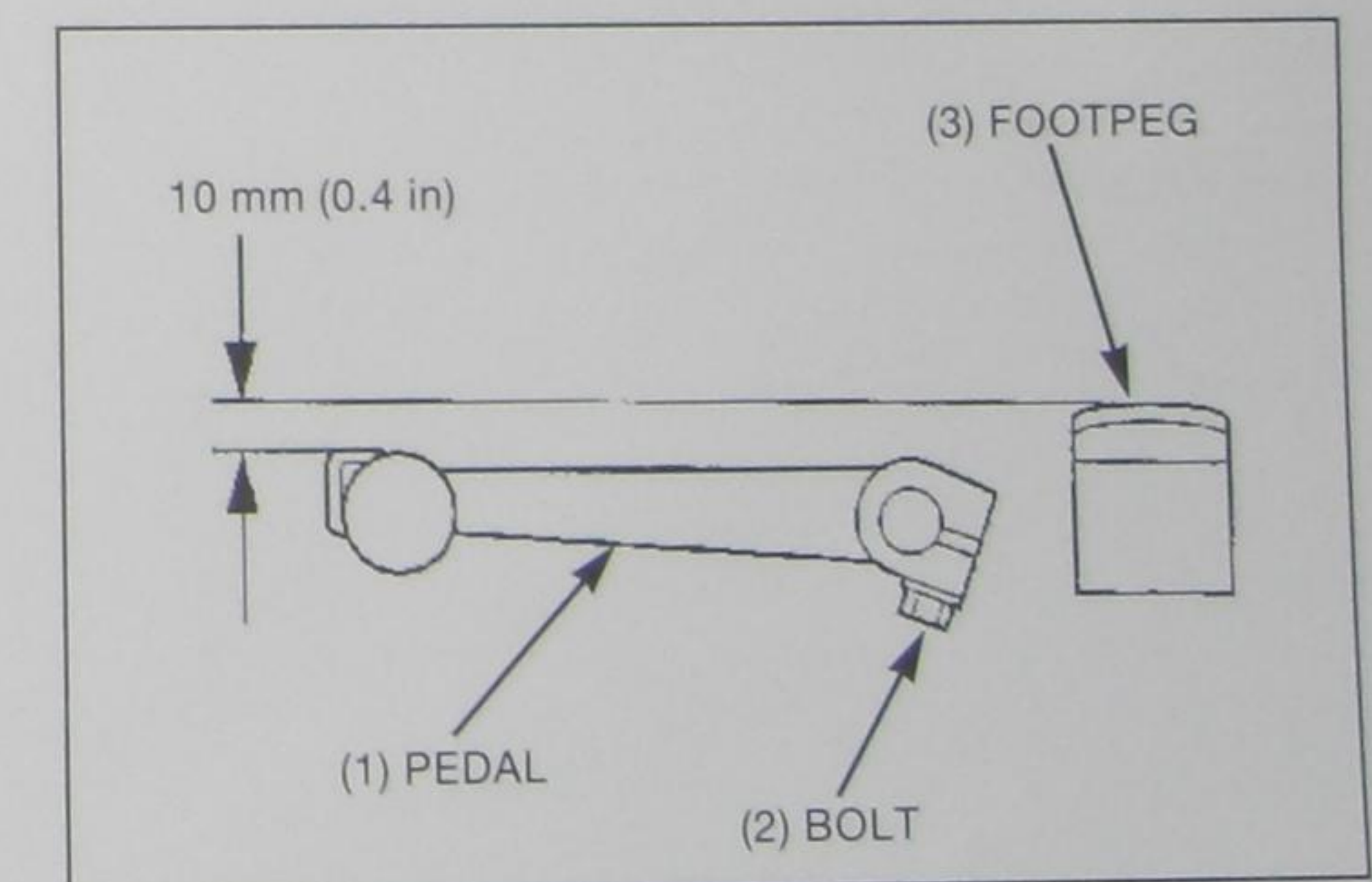
Install the thrust washer onto the gearshift spindle, and insert the spindle into the crankcase, aligning the return spring ends with the lug.



Install the gearshift pedal as shown.
Install the pedal bolt and tighten it.

TORQUE: 12 N·m (1.2 kgf-m, 9 lbf-ft)

Assemble the clutch (page 9-7).

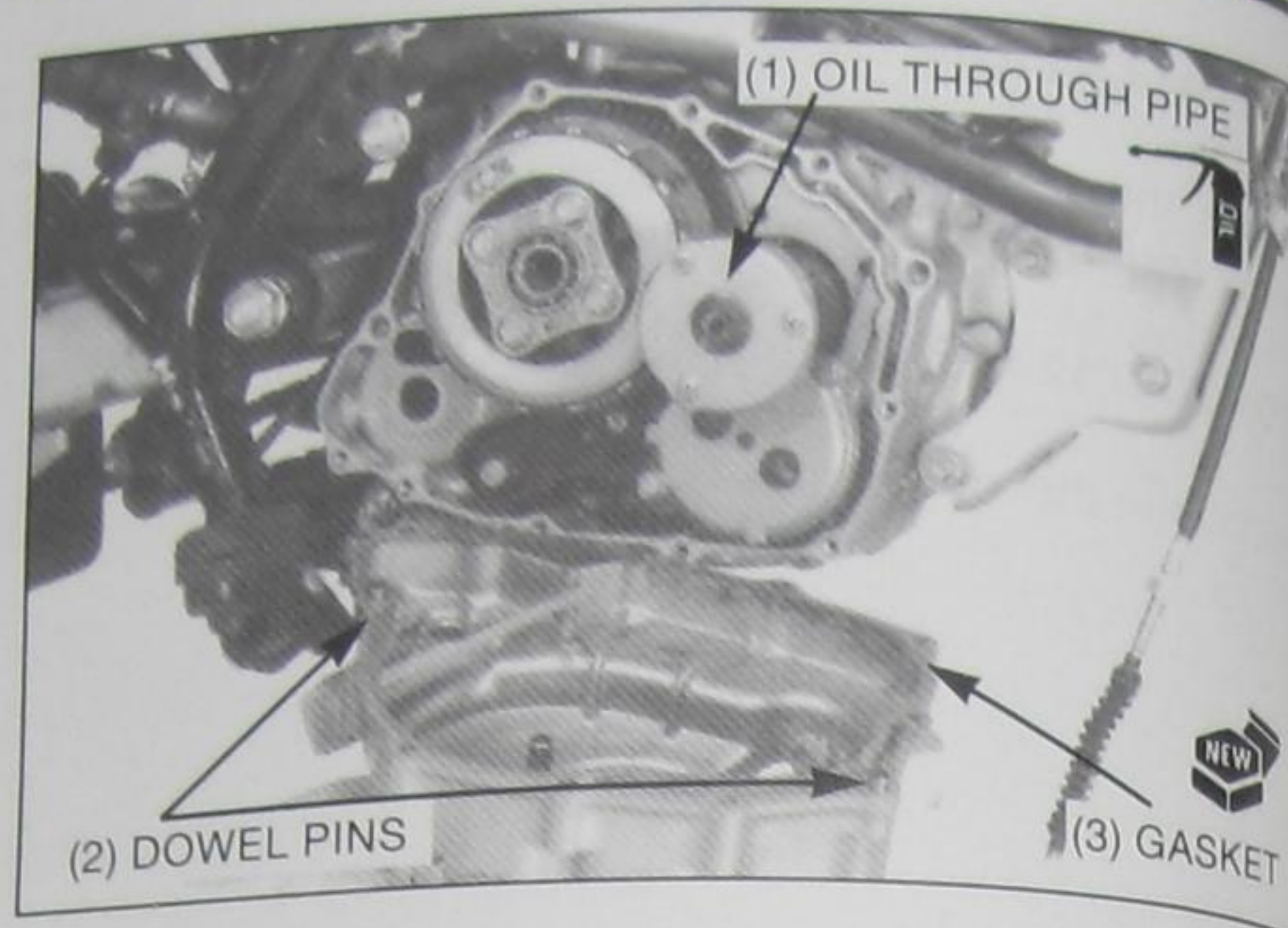


CLUTCH/GEARSHIFT LINKAGE

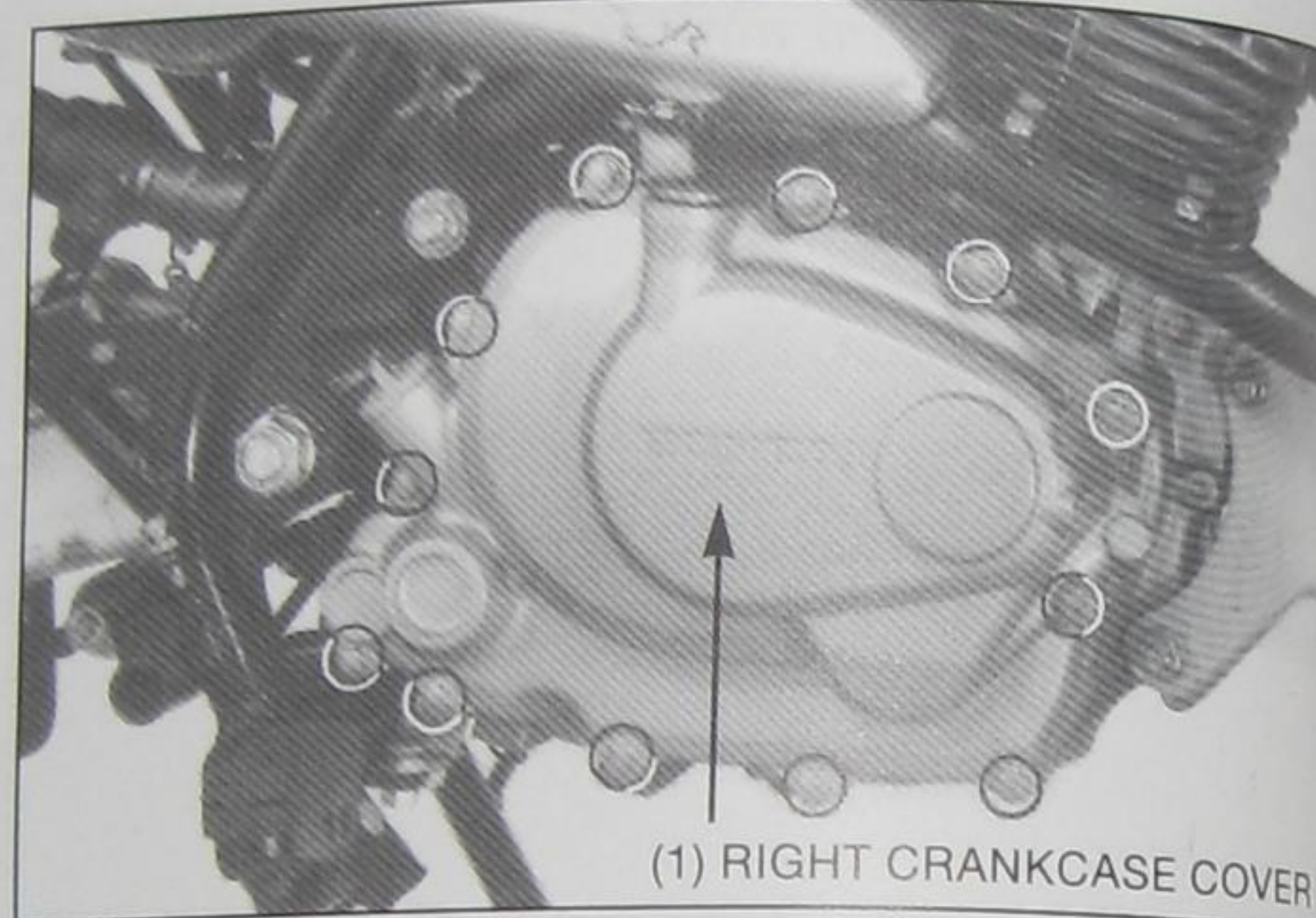
Right Crankcase Cover Installation

Clean the mating surfaces of the crankcase and cover.
Apply engine oil to the end surface of the oil through pipe.

Install the dowel pins and a new gasket.



Install the crankcase cover with the twelve bolts.
Tighten the bolts in a crisscross pattern in several steps.

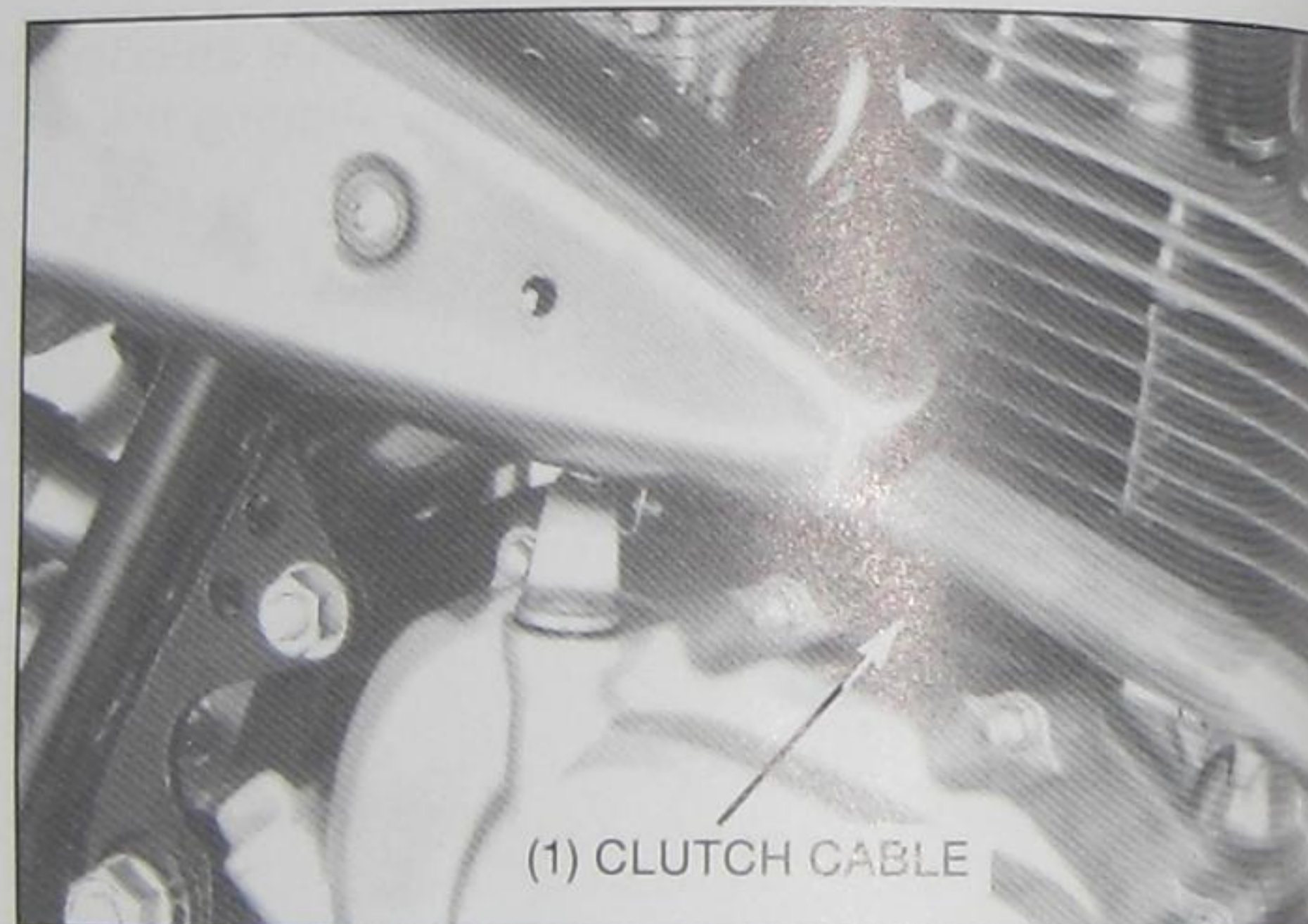


Connect the clutch cable to the clutch lifter arm

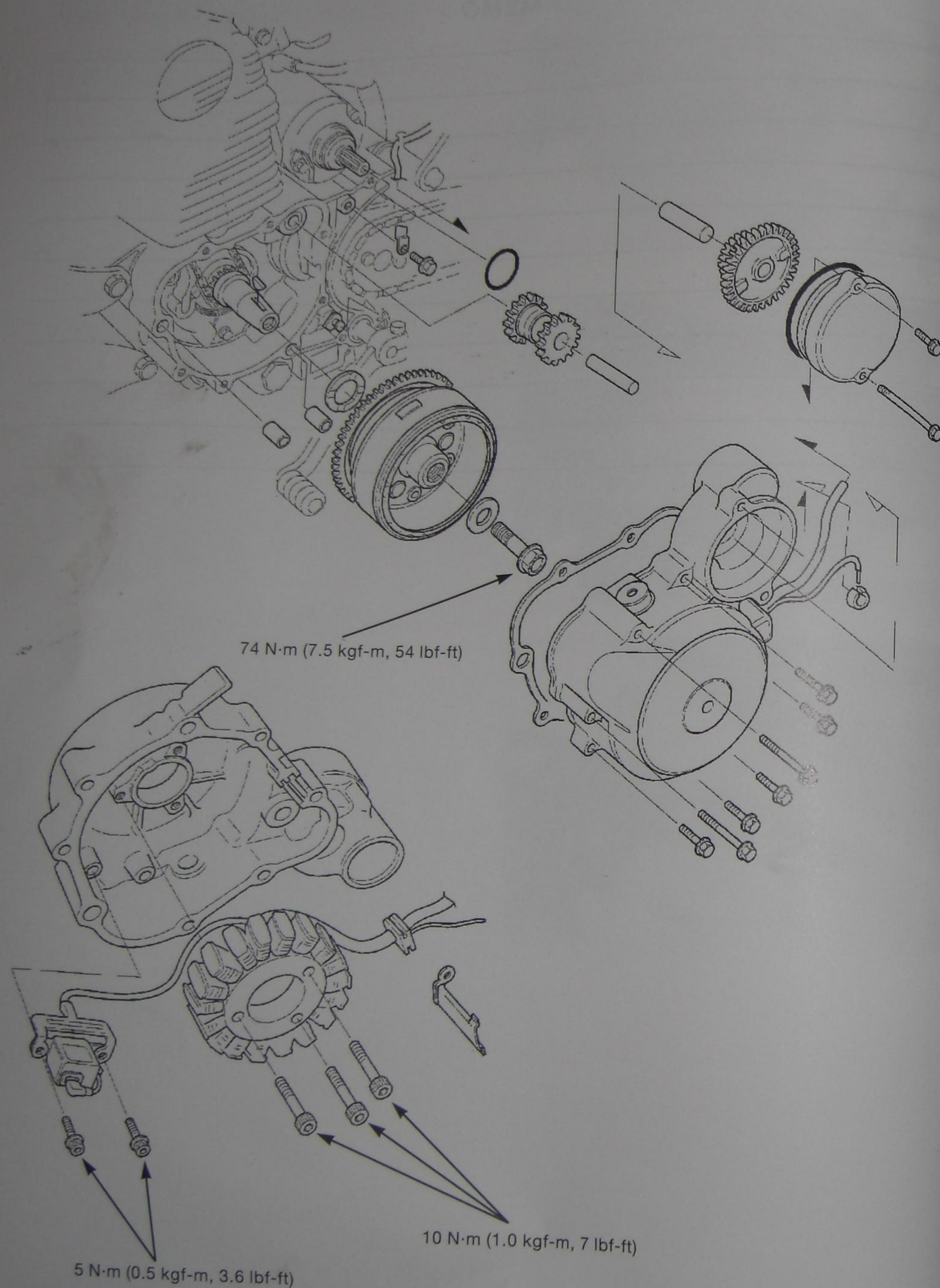
Perform the clutch adjustment (page 3-14).
Fill the crankcase with engine oil (page 3-8).

Install the following:

- Under guard (page 2-3).
- Brake pedal (page 13-10).



MEMO



10. Alternator/Starter Clutch

SERVICE INFORMATION	10-1	FLYWHEEL REMOVAL	10-5
TROUBLESHOOTING	10-1	STARTER CLUTCH	10-6
ALTERNATOR STATOR	10-2	FLYWHEEL INSTALLATION	10-8

Service Information

GENERAL

- This section covers service of the alternator stator, flywheel and starter clutch. These parts can be removed with the engine installed in the frame.
- Refer to section 15 for alternator stator inspection.
- Refer to section 17 for starter motor servicing.

TORQUE VALUES

Ignition pulse generator mounting bolt	5 N·m (0.5 kgf-m, 3.6 lbf-ft)	Apply locking agent to the threads.
Stator bolt	10 N·m (1.0 kgf-m, 7 lbf-ft)	
Starter clutch bolt	16 N·m (1.6 kgf-m, 12 lbf-ft)	Apply locking agent to the threads.
Flywheel bolt	74 N·m (7.5 kgf-m, 54 lbf-ft)	Apply oil to the threads and seating surface.

TOOLS

Flywheel holder	07725-0040000
Rotor puller	07733-0020001

Troubleshooting

Engine does not turn

- Faulty starter clutch
- Damaged starter gears

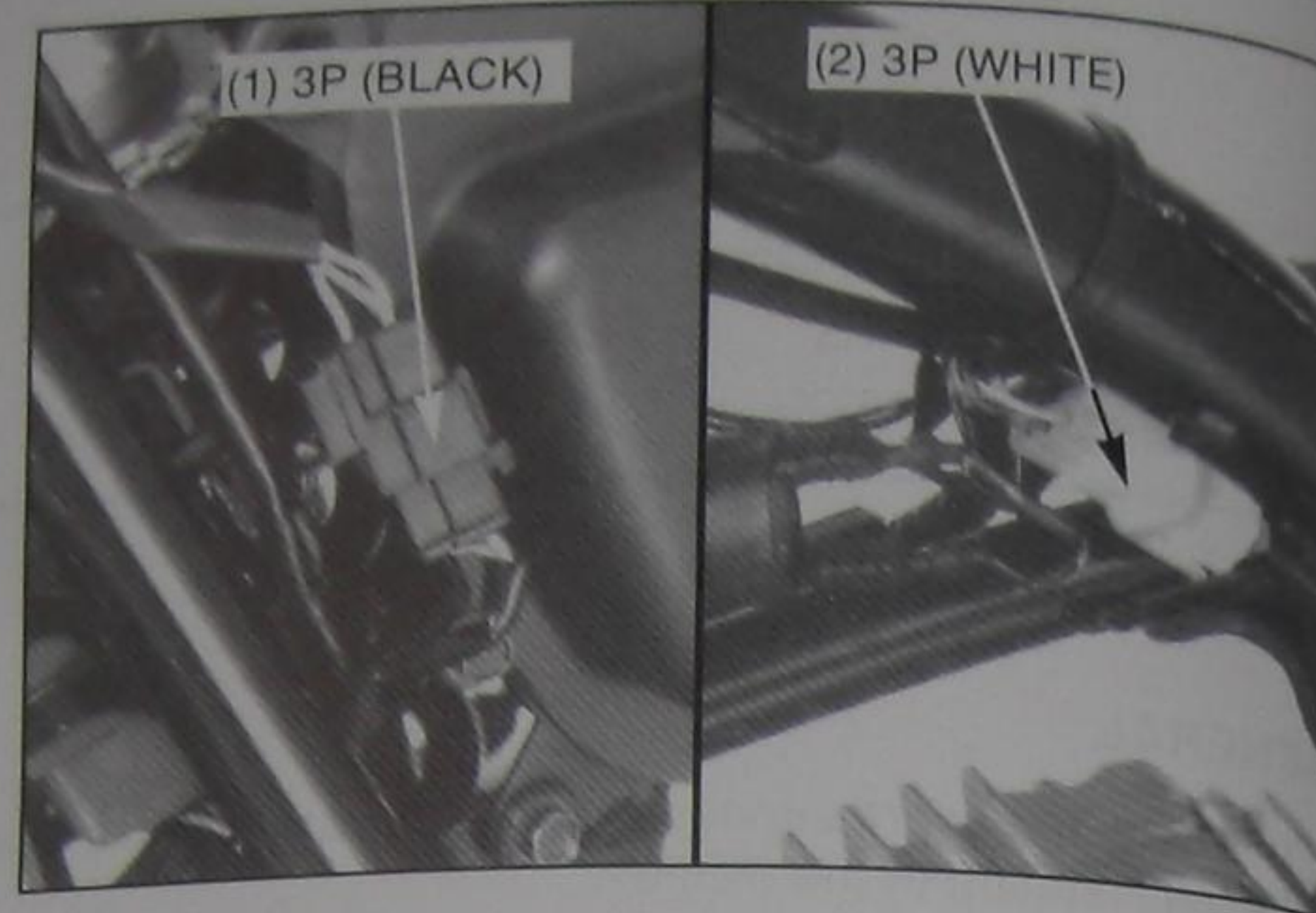
ALTERNATOR/STARTER CLUTCH

Alternator Stator

LEFT CRANKCASE COVER REMOVAL

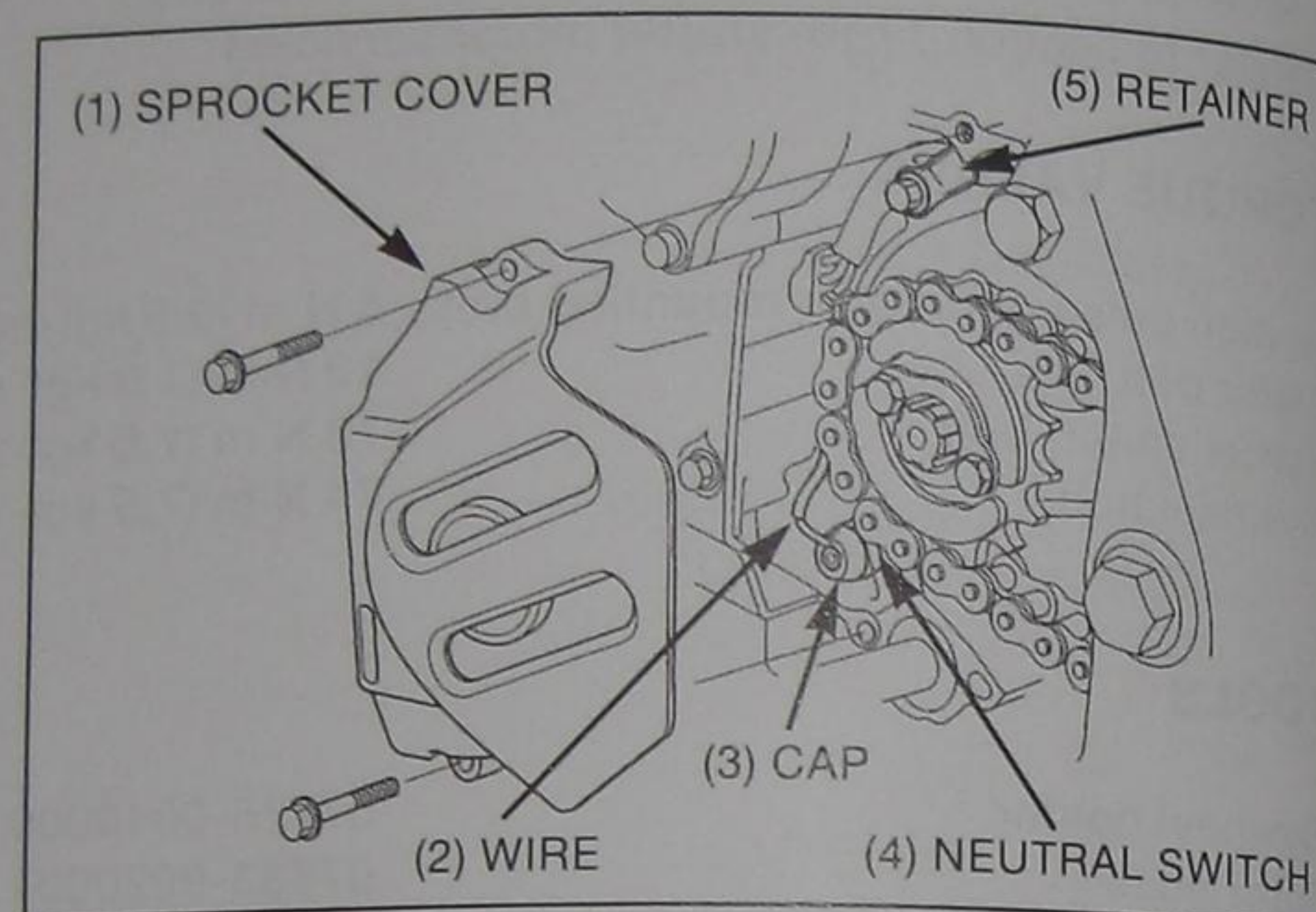
Remove the under guard (page 2-3).
Drain the engine oil (page 3-8).

Remove the side cover (page 2-3).
Remove the fuel tank (page 2-2).
Disconnect the alternator 3P (Black) and ignition pulse generator/neutral switch 3P (White) connectors.



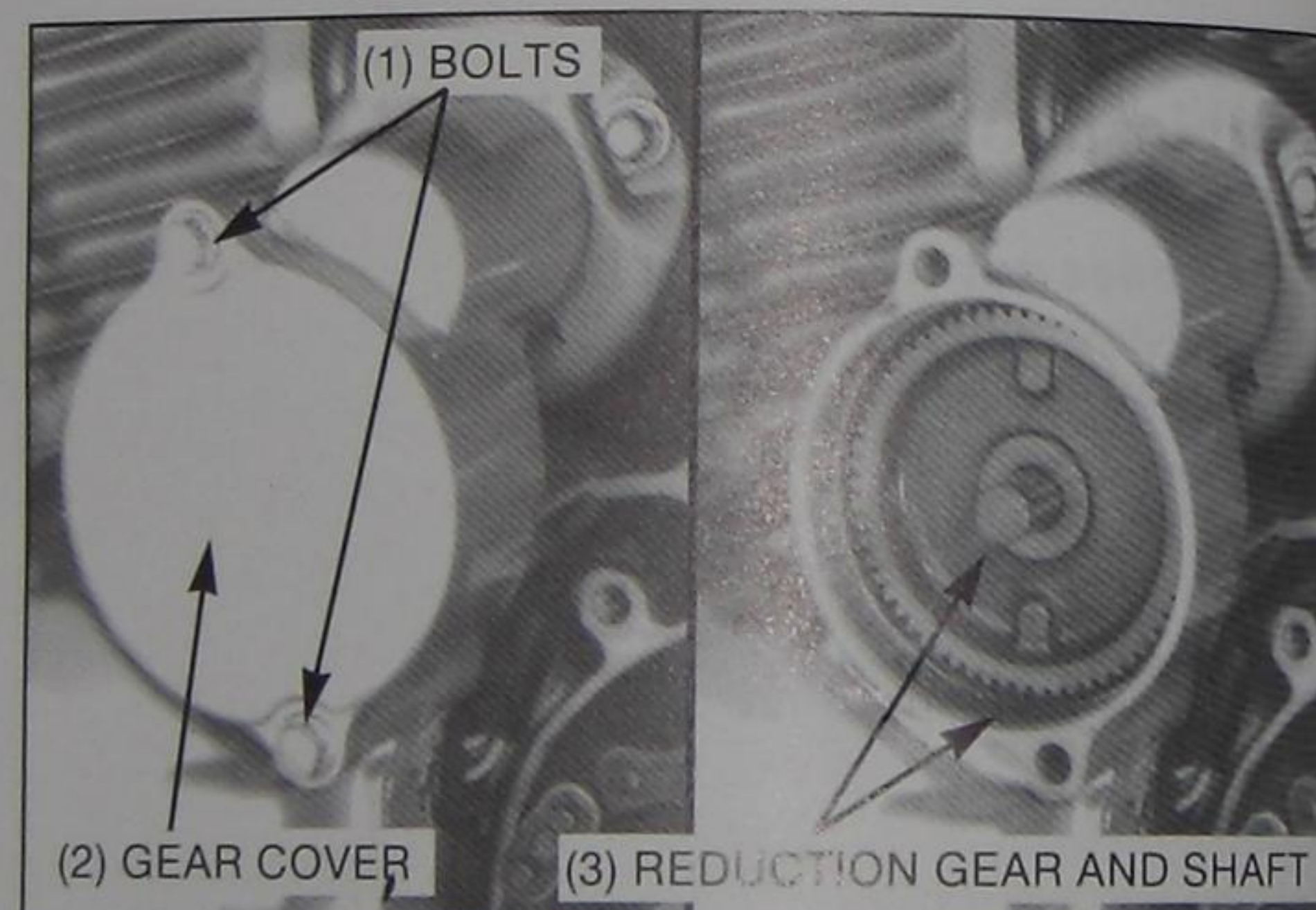
Remove the two bolts and the drive sprocket cover.

Remove the bolt and wire retainer.
Remove the cap from the neutral switch and disconnect the wire by pushing the terminal flange.

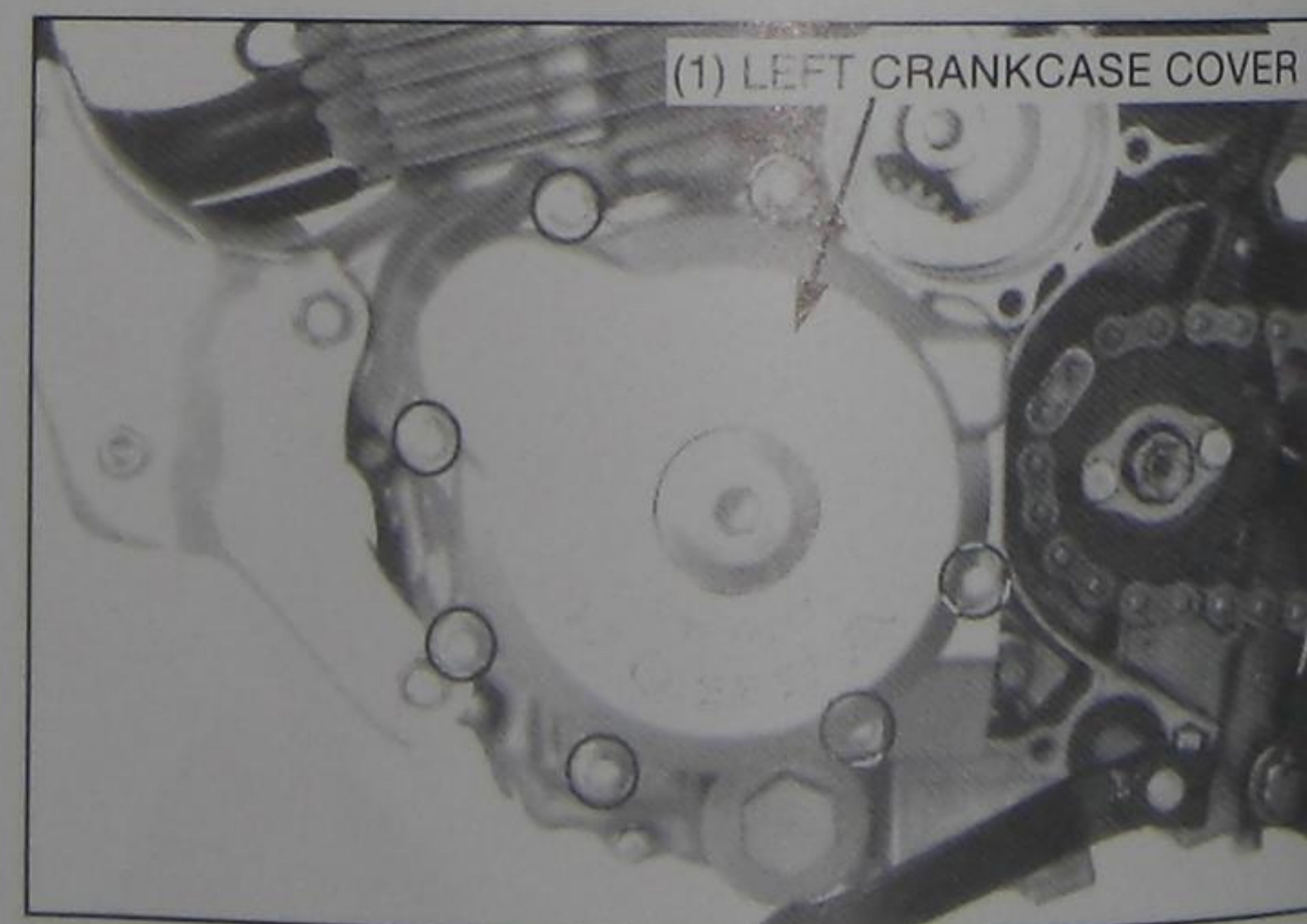


Remove the two bolts and the reduction gear cover.

Pull the reduction gear shaft and remove the reduction gear.



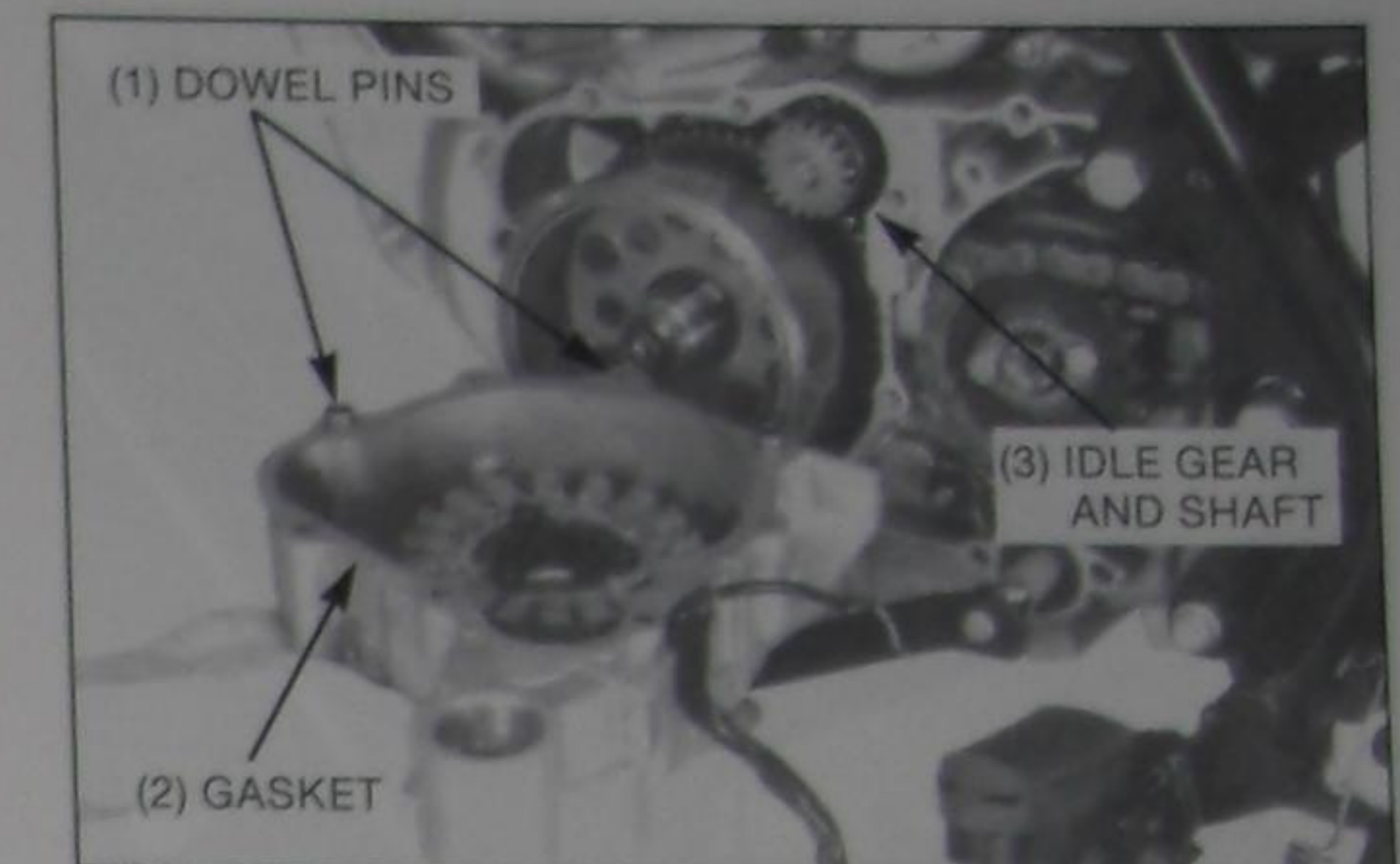
Remove the seven crankcase cover bolts.
Remove the left crankcase cover.



ALTERNATOR/STARTER CLUTCH

Remove the reduction idle gear and shaft.

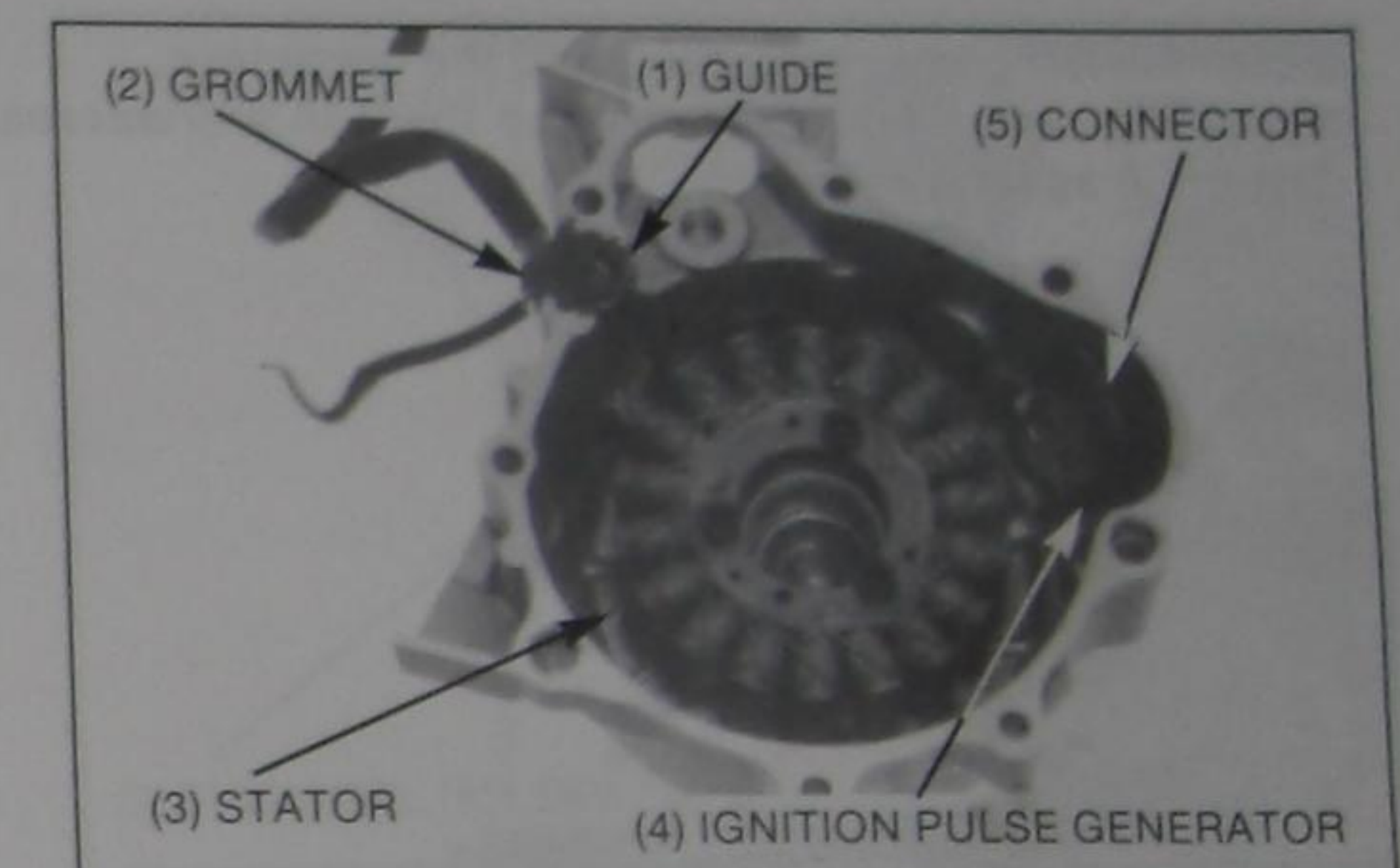
Remove the dowel pins and gasket.



STATOR/IGNITION PULSE GENERATOR REPLACEMENT

Disconnect the connector from the ignition pulse generator.
Remove the two bolts, wire retainer and ignition pulse generator from the crankcase cover.

Pull the wire guide out of the crankcase cover.
Remove the wire grommet.
Remove the three bolts and stator.



Install a new stator onto the crankcase cover with the three bolts.

Apply sealant to the grommet seating surface and install it into the cover groove properly.
Install the wire guide, aligning its hole with the case pin until it is fully seated.
Tighten the three bolts.

TORQUE: 10 N·m (1.0 kgf-m, 7 lbf-ft)

Apply locking agent to the pulse generator bolt threads.
Install the ignition pulse generator with the two bolts and wire retainer.
Tighten the two bolts.

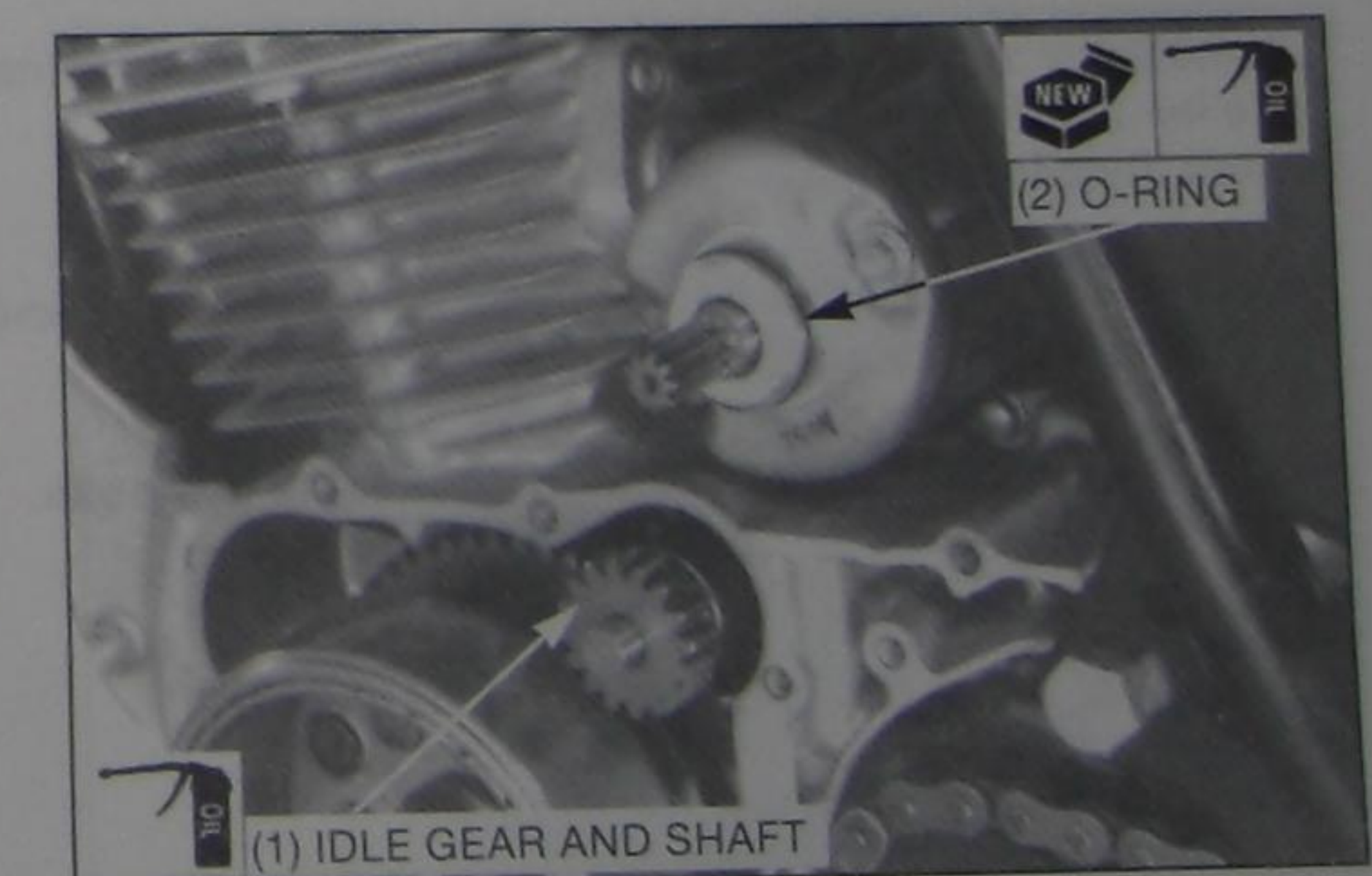
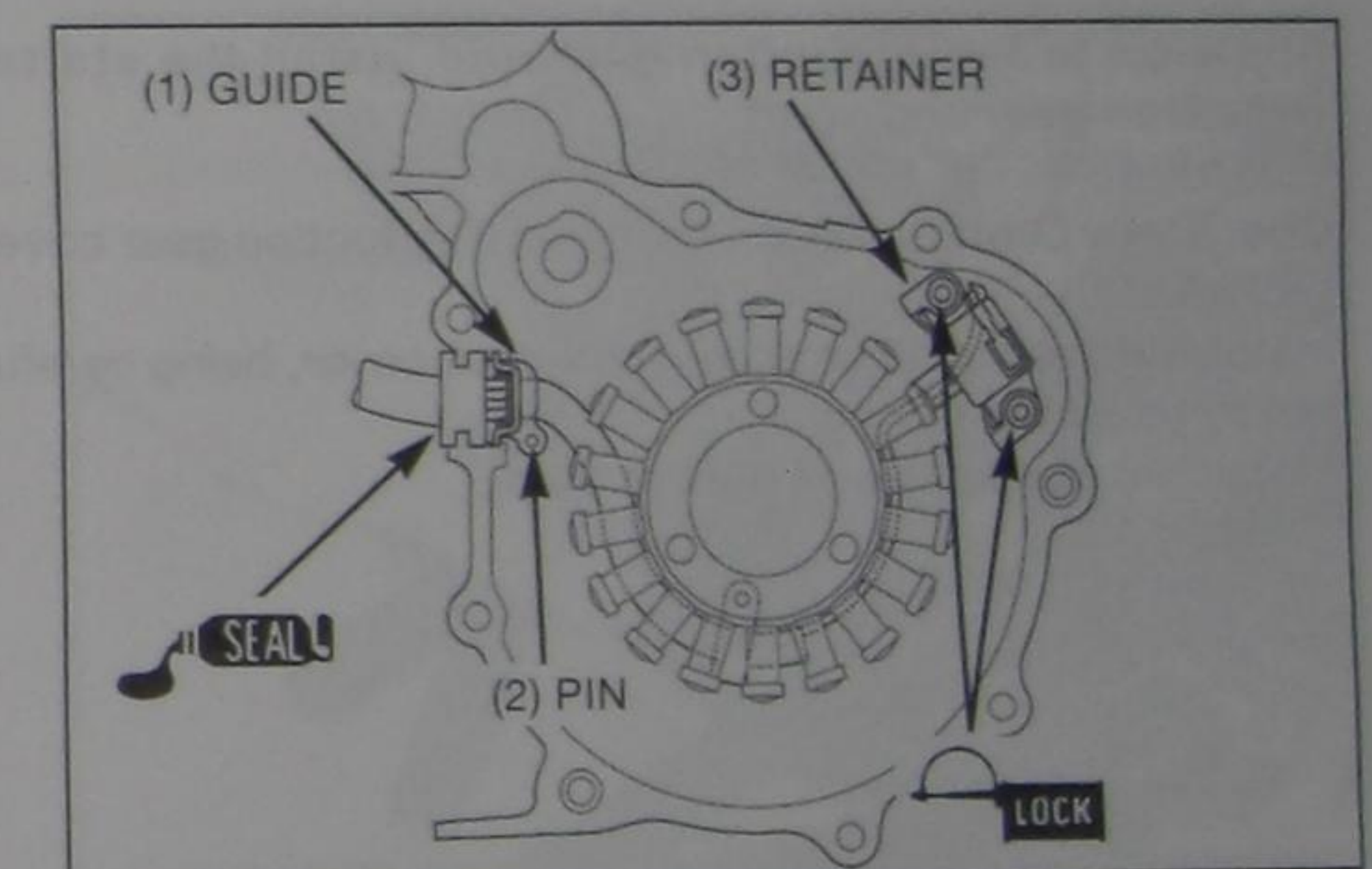
TORQUE: 5 N·m (0.5 kgf-m, 3.6 lbf-ft)

LEFT CRANKCASE COVER INSTALLATION

Clean the mating surfaces of the crankcase and cover.

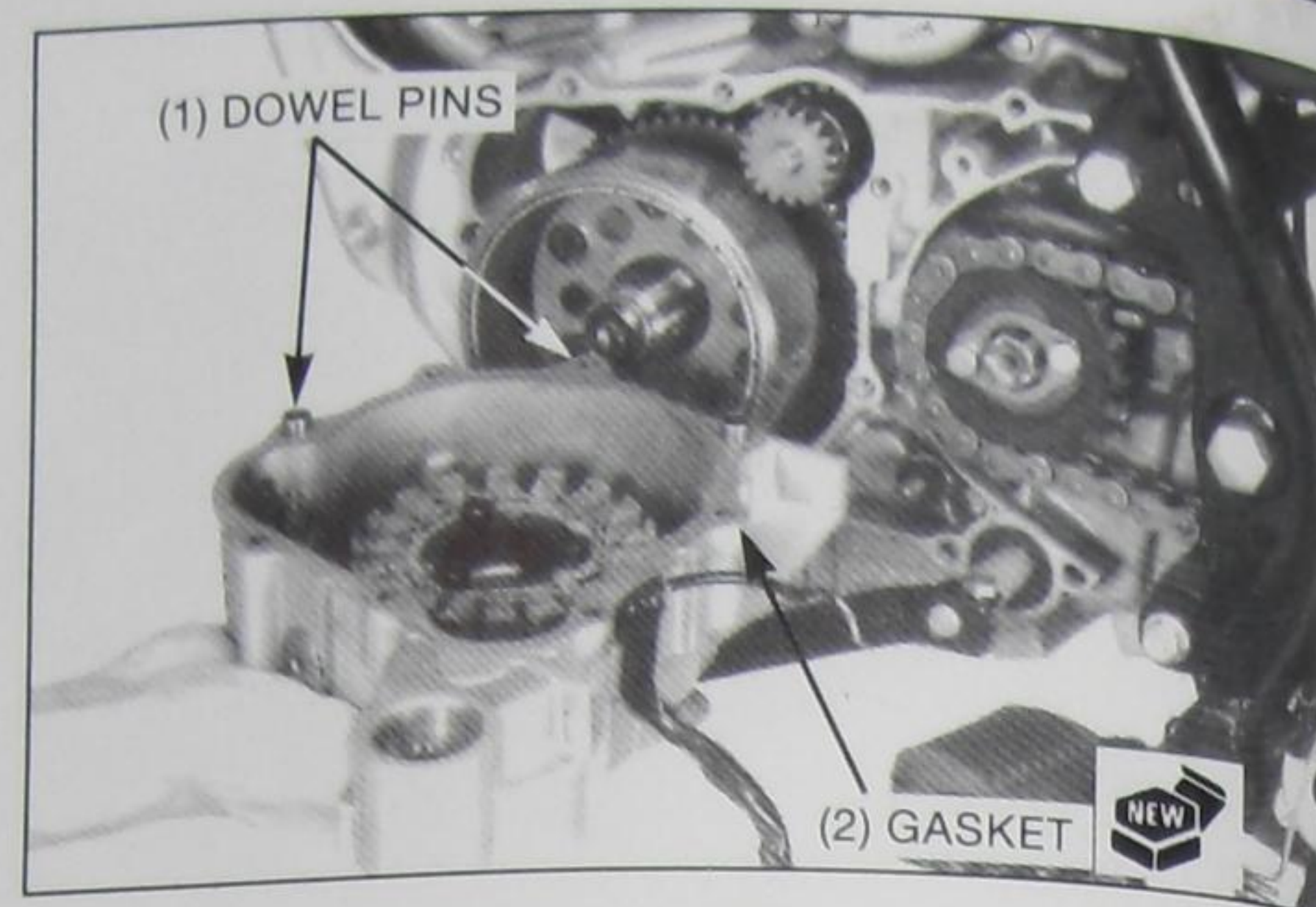
Apply oil to the idle gear shaft and install the idle gear and shaft.

Coat a new O-ring with oil and install it into the starter motor groove.

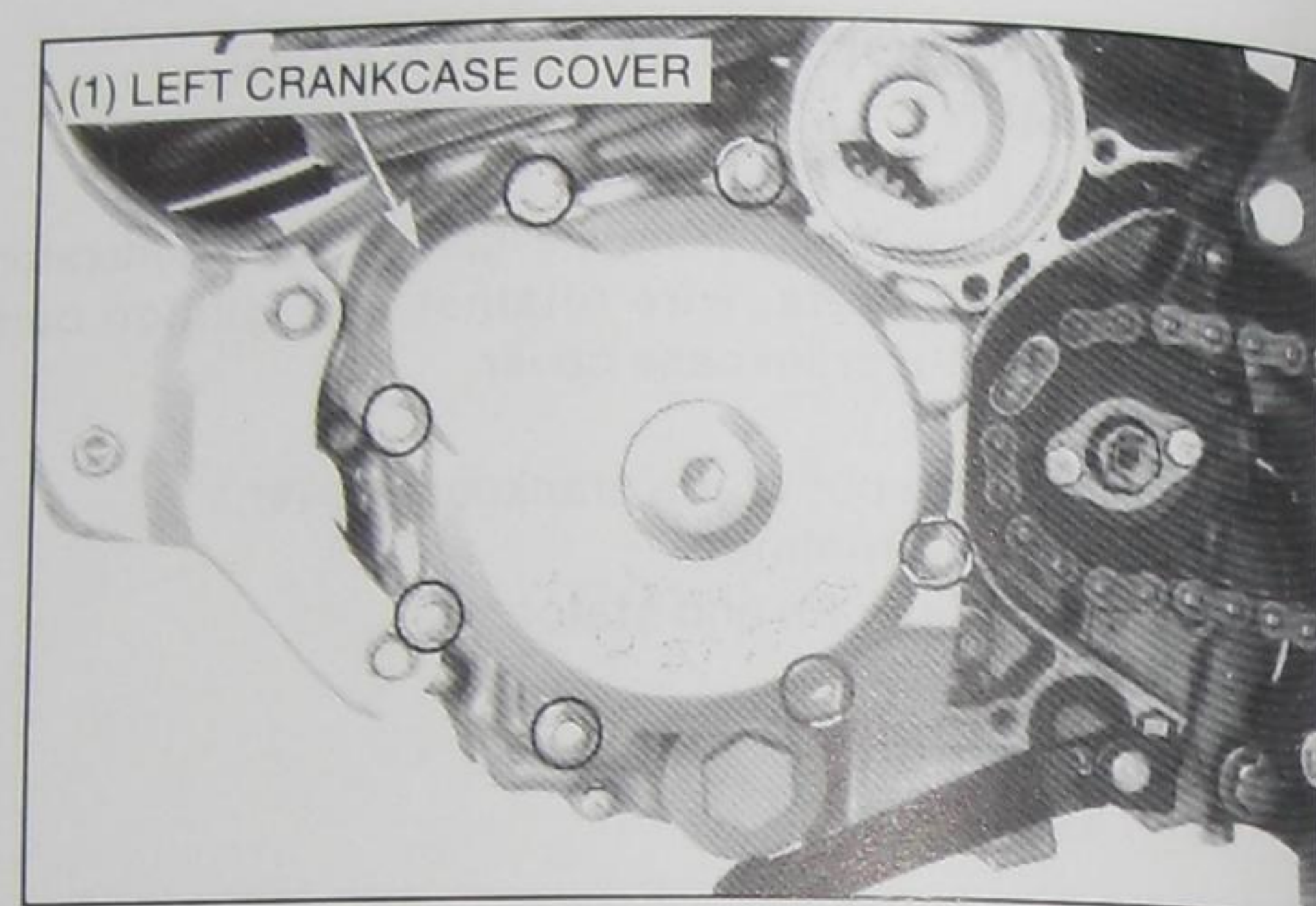


ALTERNATOR/STARTER CLUTCH

Install the dowel pins and a new gasket.

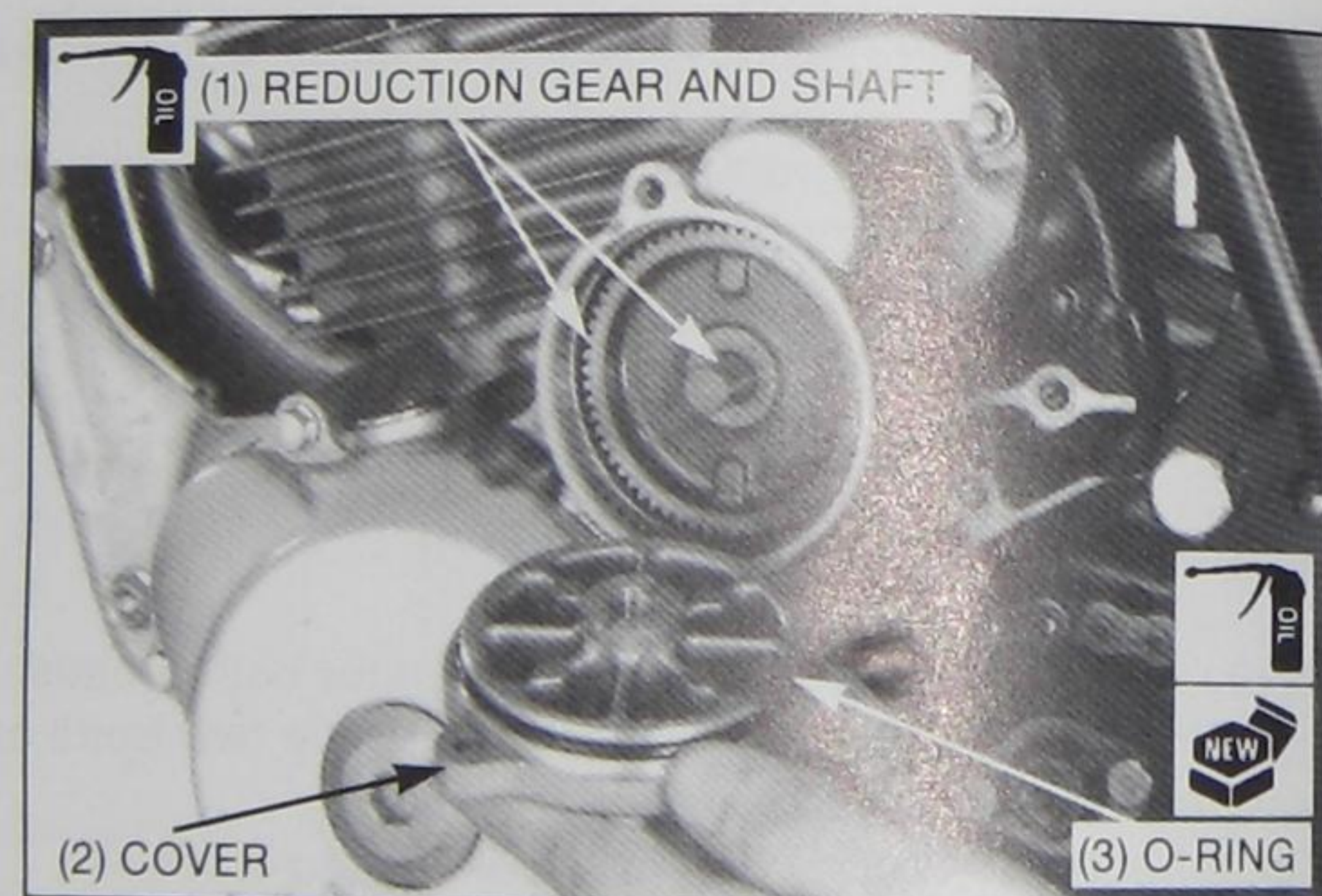


Install the left crankcase cover onto the crankcase.
Install the seven bolts and tighten them in a crisscross pattern in several steps.



Apply oil to the reduction gear and install the starter reduction gear and shaft.

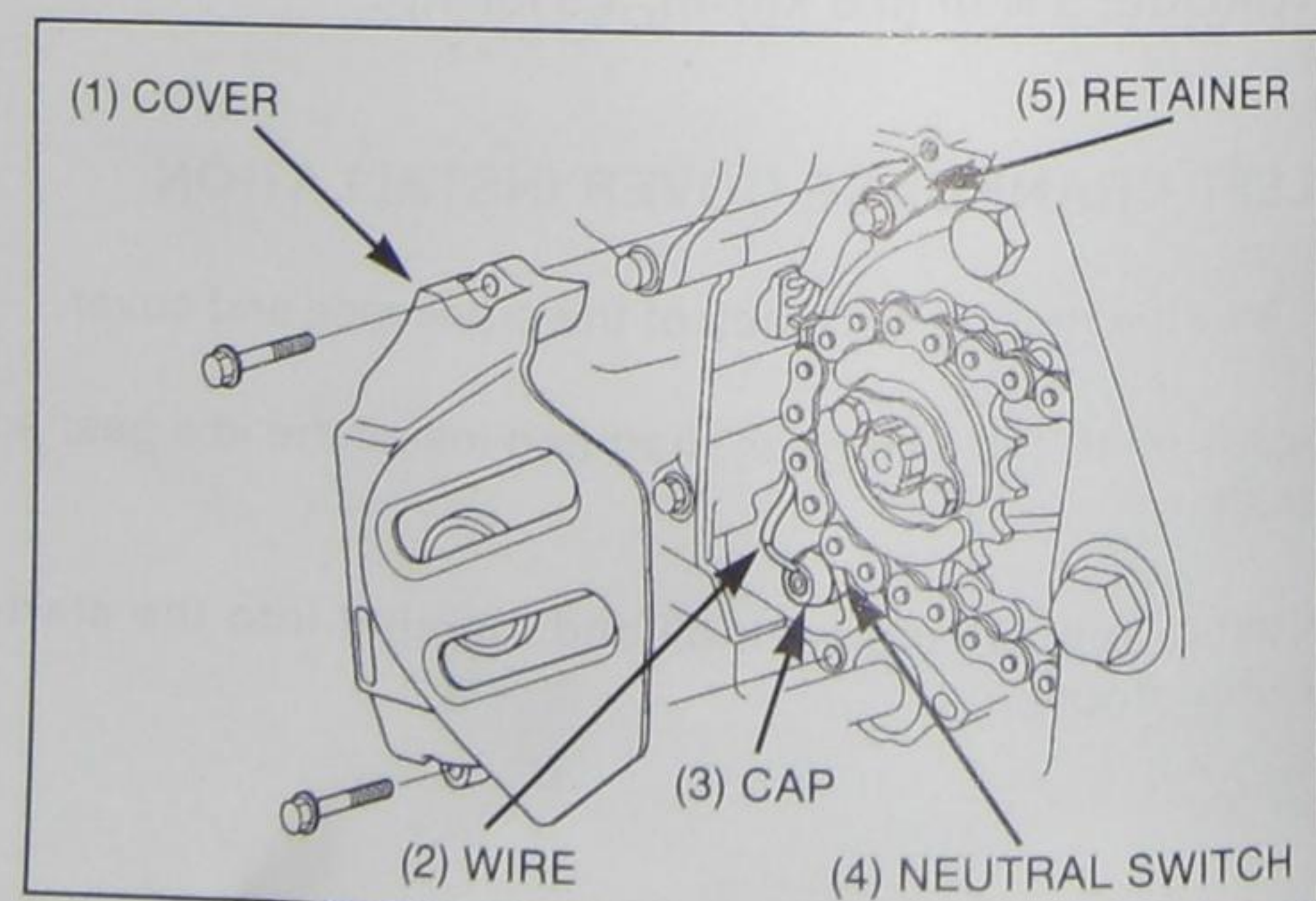
Coat a new O-ring with oil and install it reduction gear cover groove.
Install the gear cover onto the crankcase cover, being careful not to pinch the O-ring.
Install the two bolts and tighten them.



Connect the wire to the neutral switch through the terminal hole by pushing the terminal flange.
Install the cap onto the switch securely.

Route the wire harness into the crankcase properly and install the wire retainer with the bolt (page 1-16).

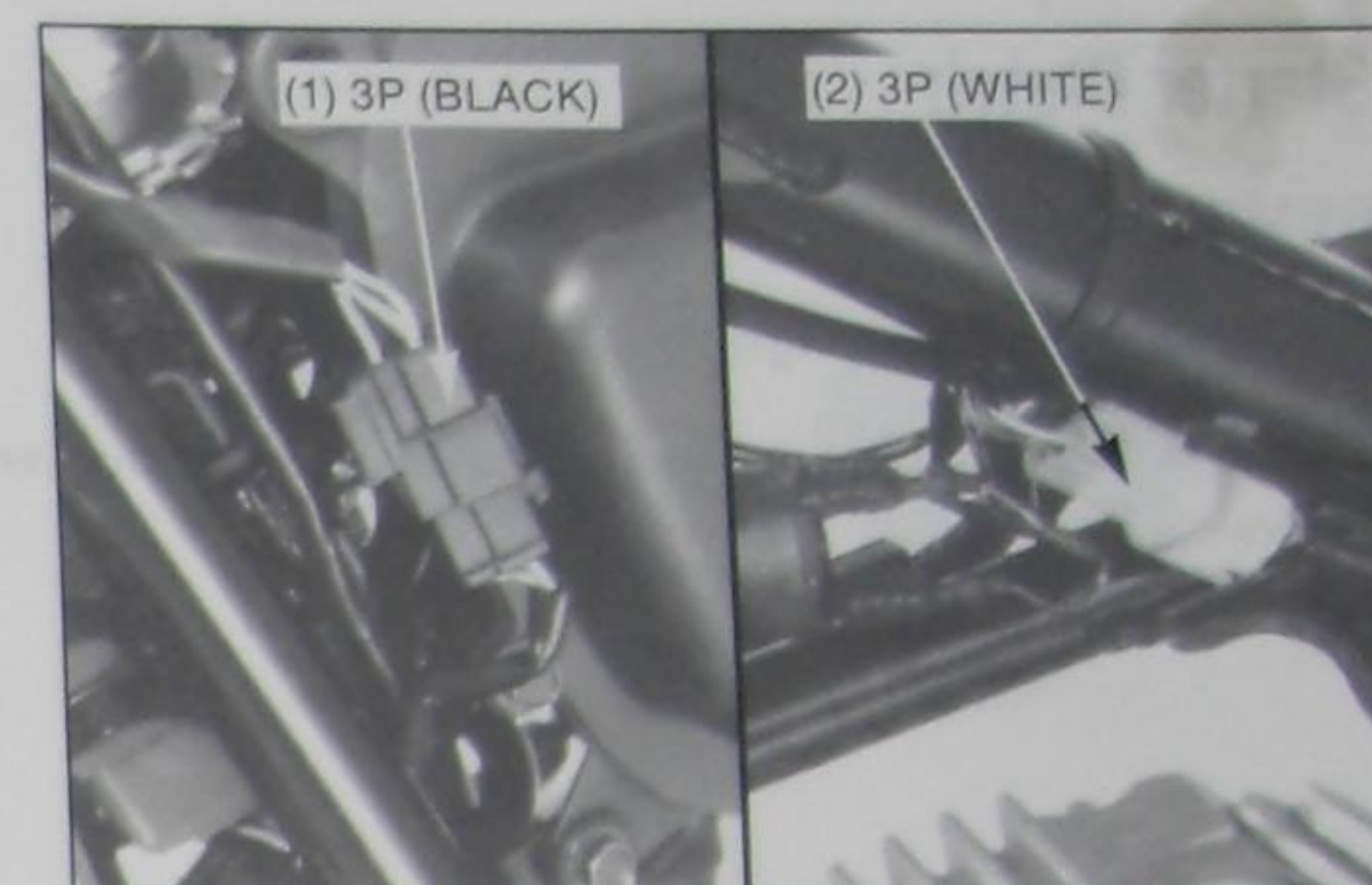
Install the drive sprocket cover and tighten the two bolts.



Connect the alternator 3P (Black) and ignition pulse generator/neutral switch 3P (White) connectors.

Install the following:
- Fuel tank (page 2-3)
- Under guard (page 2-3)
- Side cover (page 2-3)

Fill the crankcase with engine oil (page 3-8).



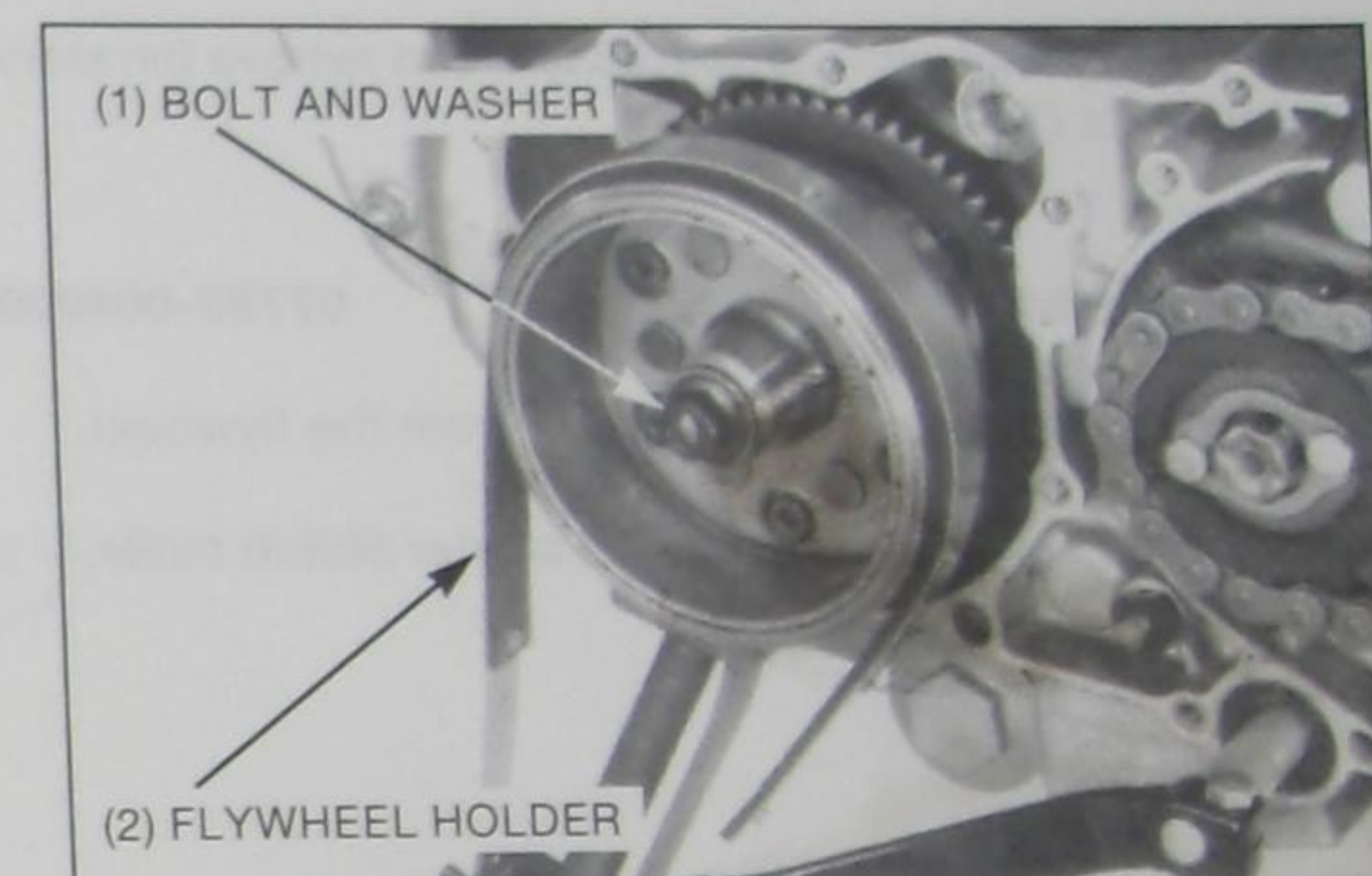
Flywheel Removal

Remove the left crankcase cover (page 10-2).

Hold the flywheel with the special tool and loosen the flywheel bolt.

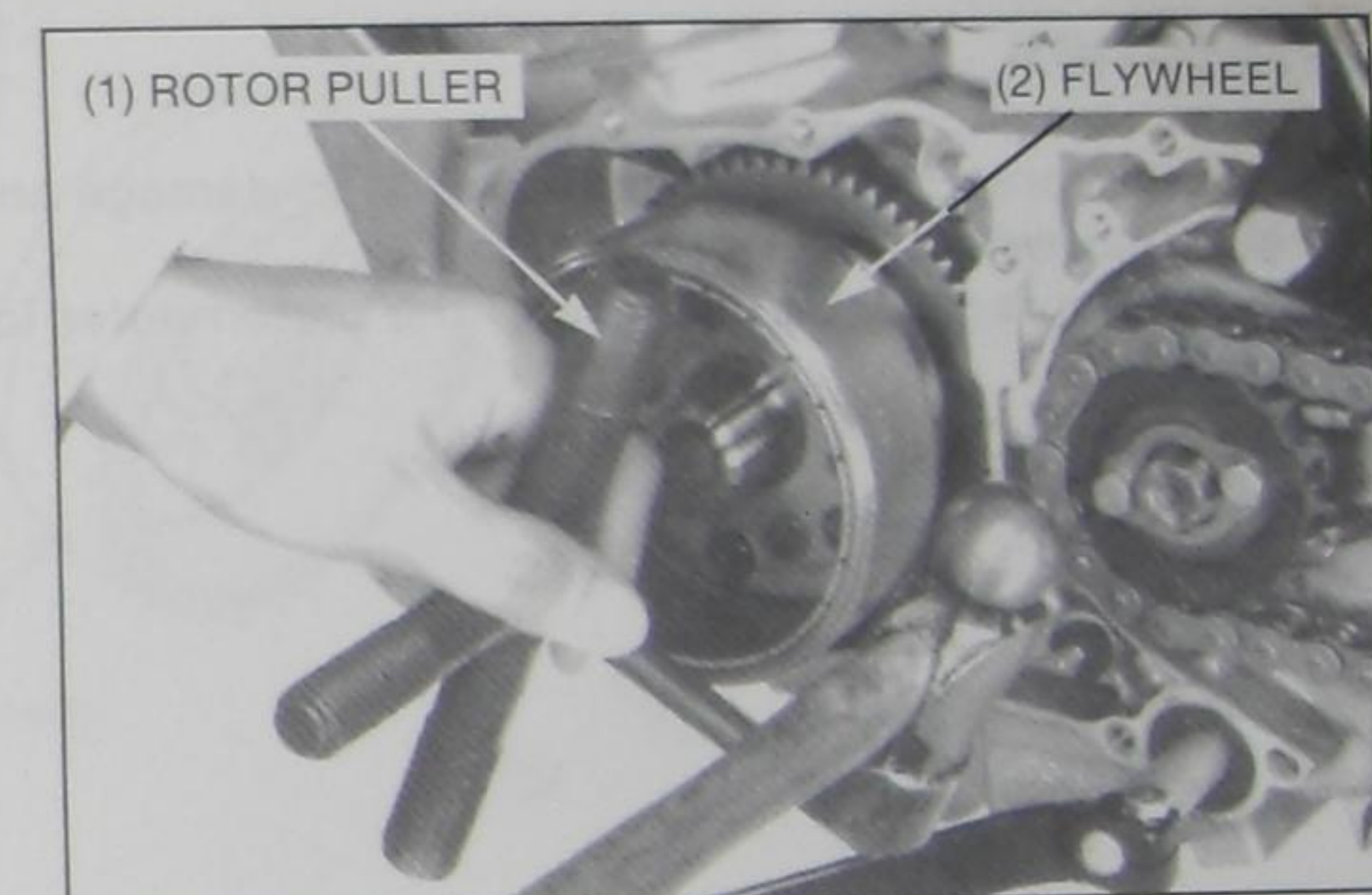
TOOL:
Flywheel holder 07725-0040000

Remove the flywheel bolt and washer.

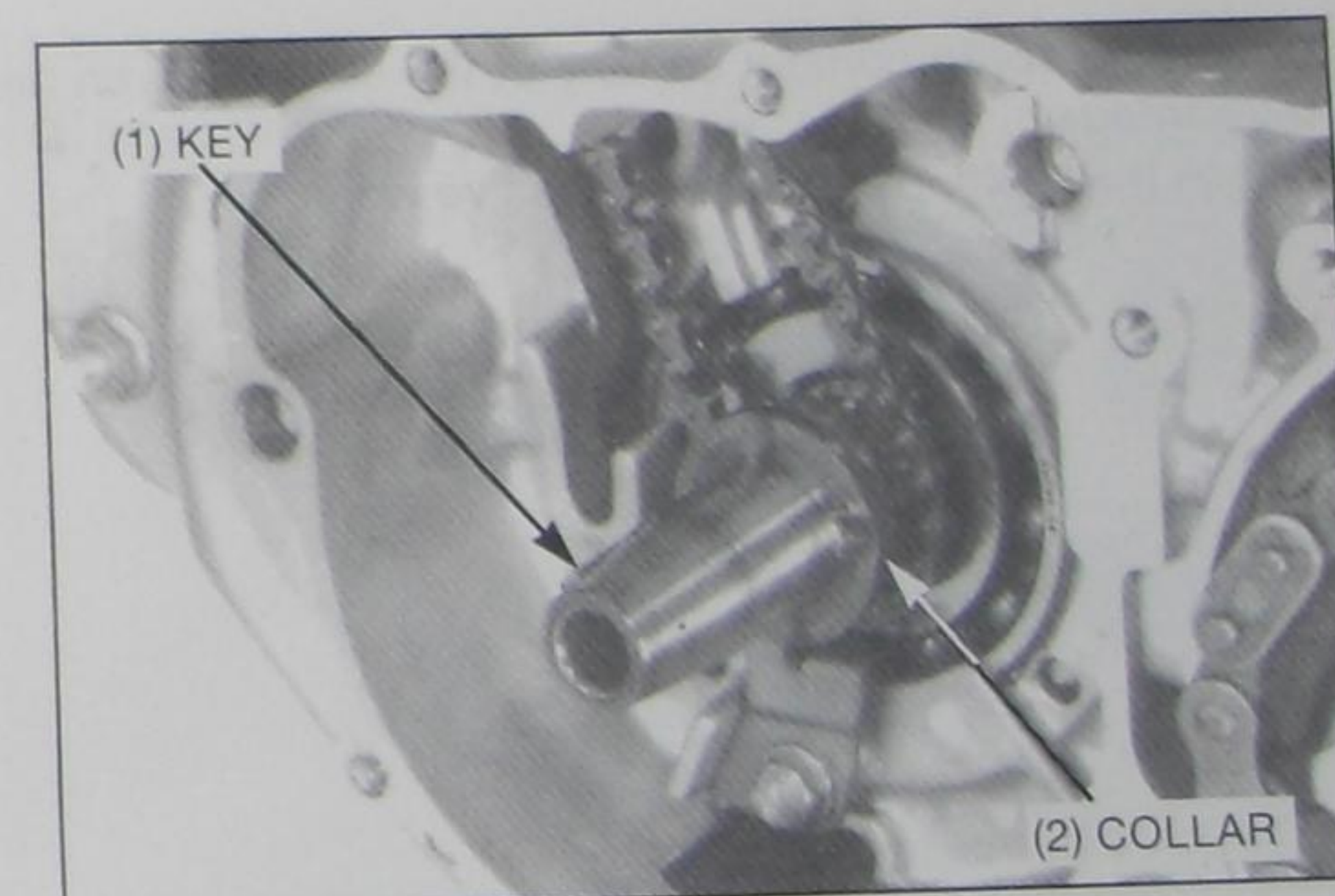


Remove the flywheel using the special tool.

TOOL:
Rotor puller 07733-0020001



Remove the collar and the woodruff key from the crankshaft.

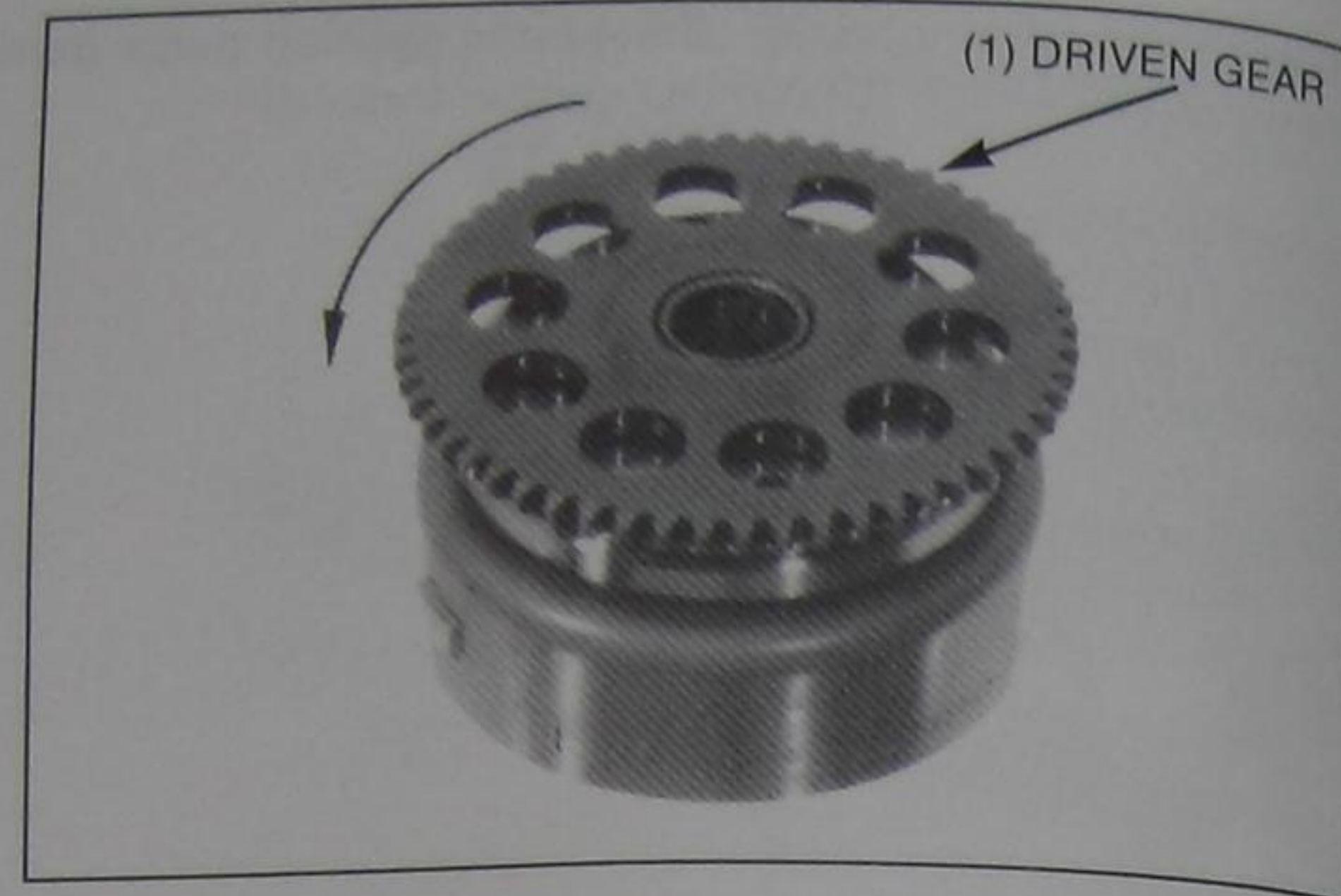


Starter Clutch

REMOVAL

Remove the flywheel (page 10-5).

Remove the starter driven gear while turning it counter-clockwise.



Hold the flywheel with the special tool and remove the starter clutch bolts (T30).

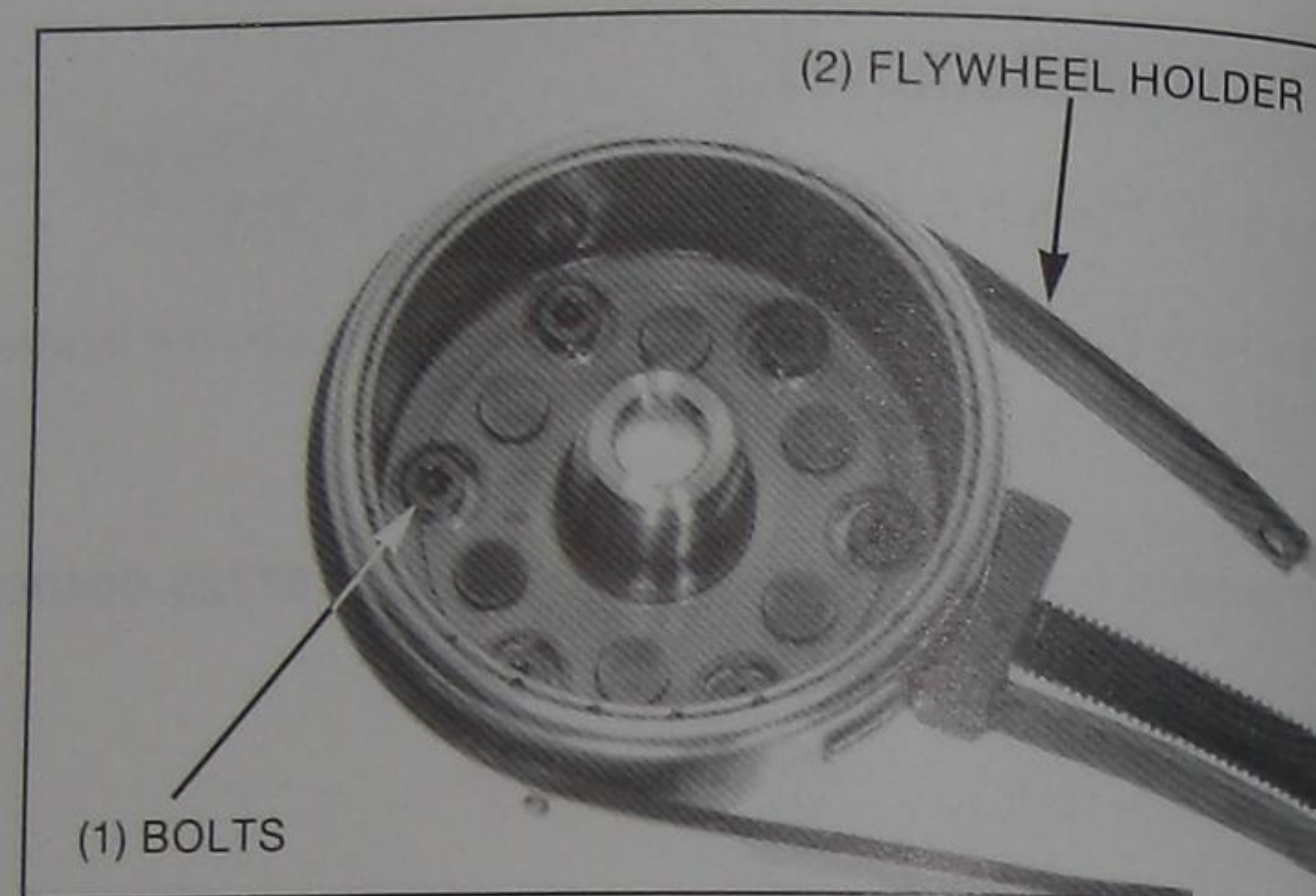
TOOL:

Flywheel holder

07725-0040000

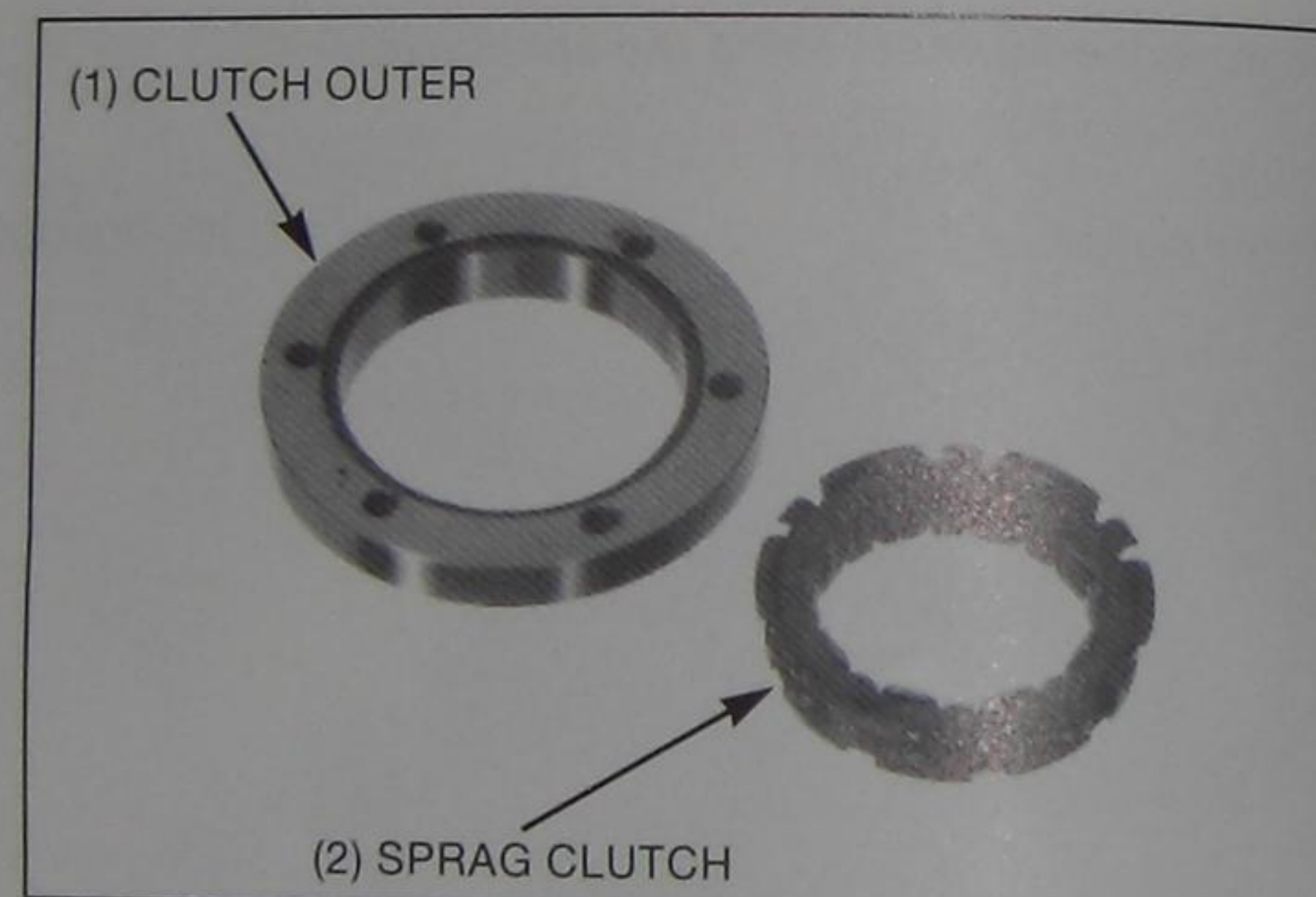
Remove the starter clutch assembly from the flywheel.

Remove the sprag clutch from the starter clutch outer.



INSPECTION

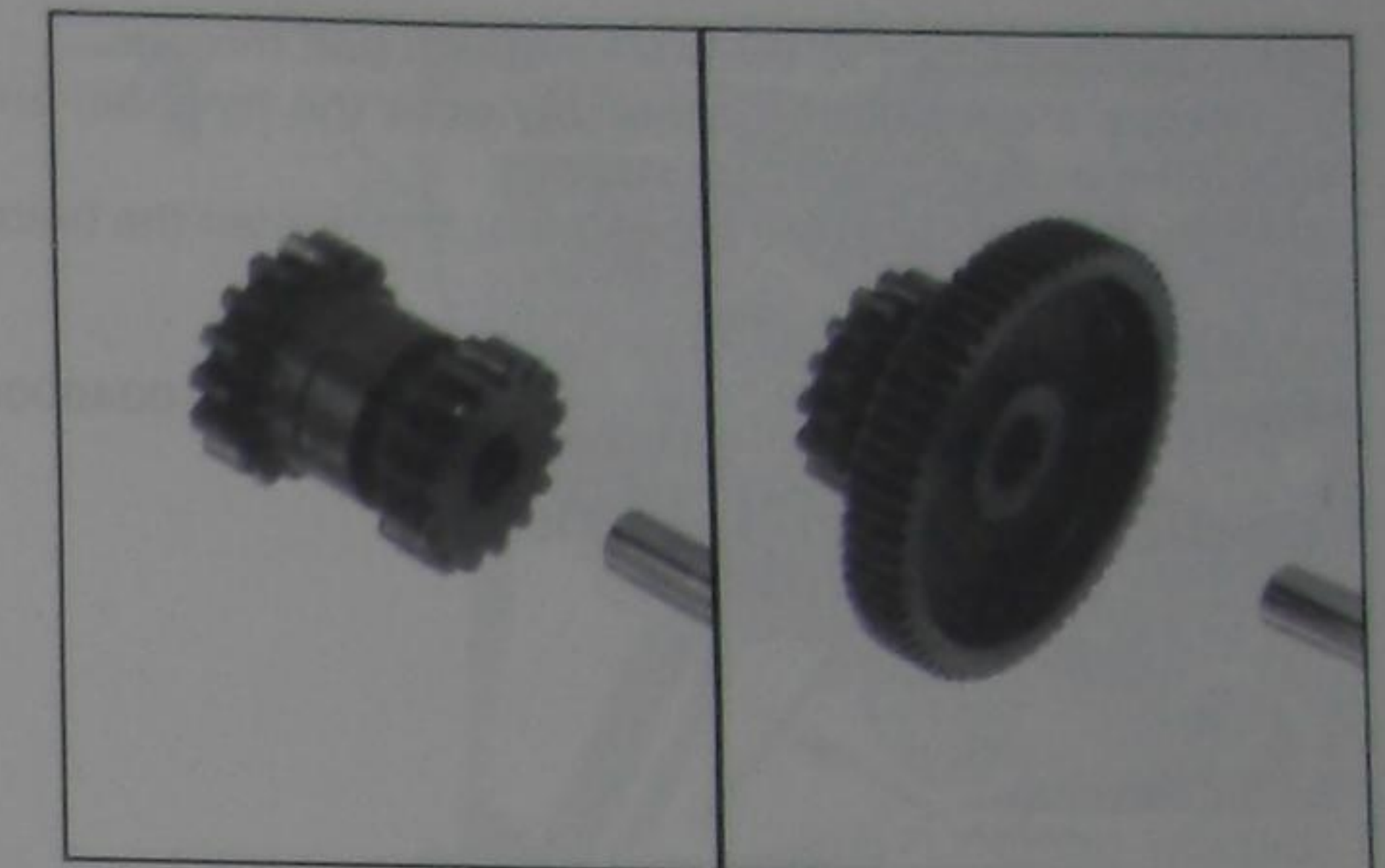
Check the sprag clutch for abnormal wear, damage and irregular movement.
Check the sprag contact surface of the clutch outer for damage.



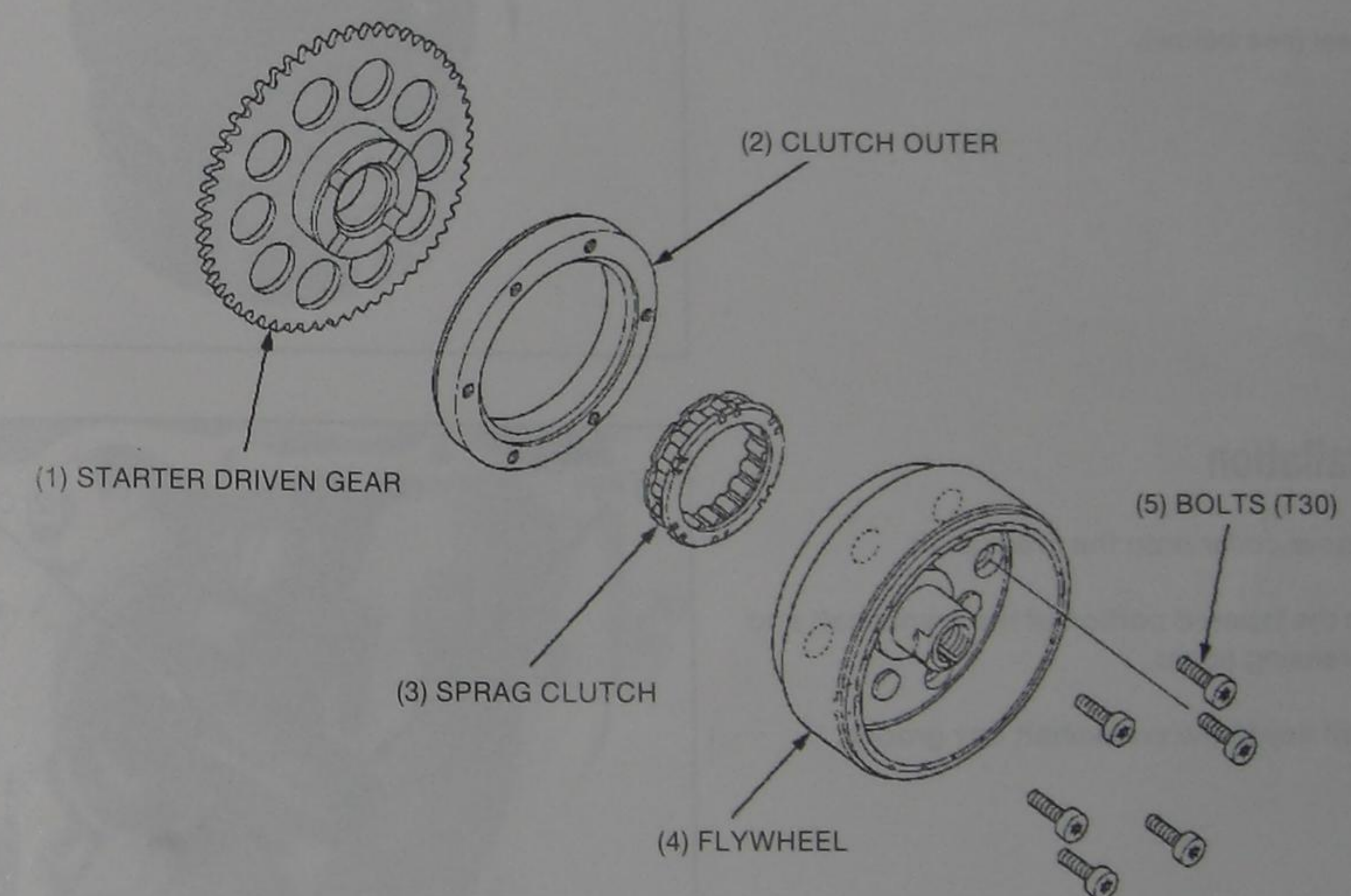
Check the sprag contact surface of the starter driven gear for damage.
Check the teeth for damage excessive wear.



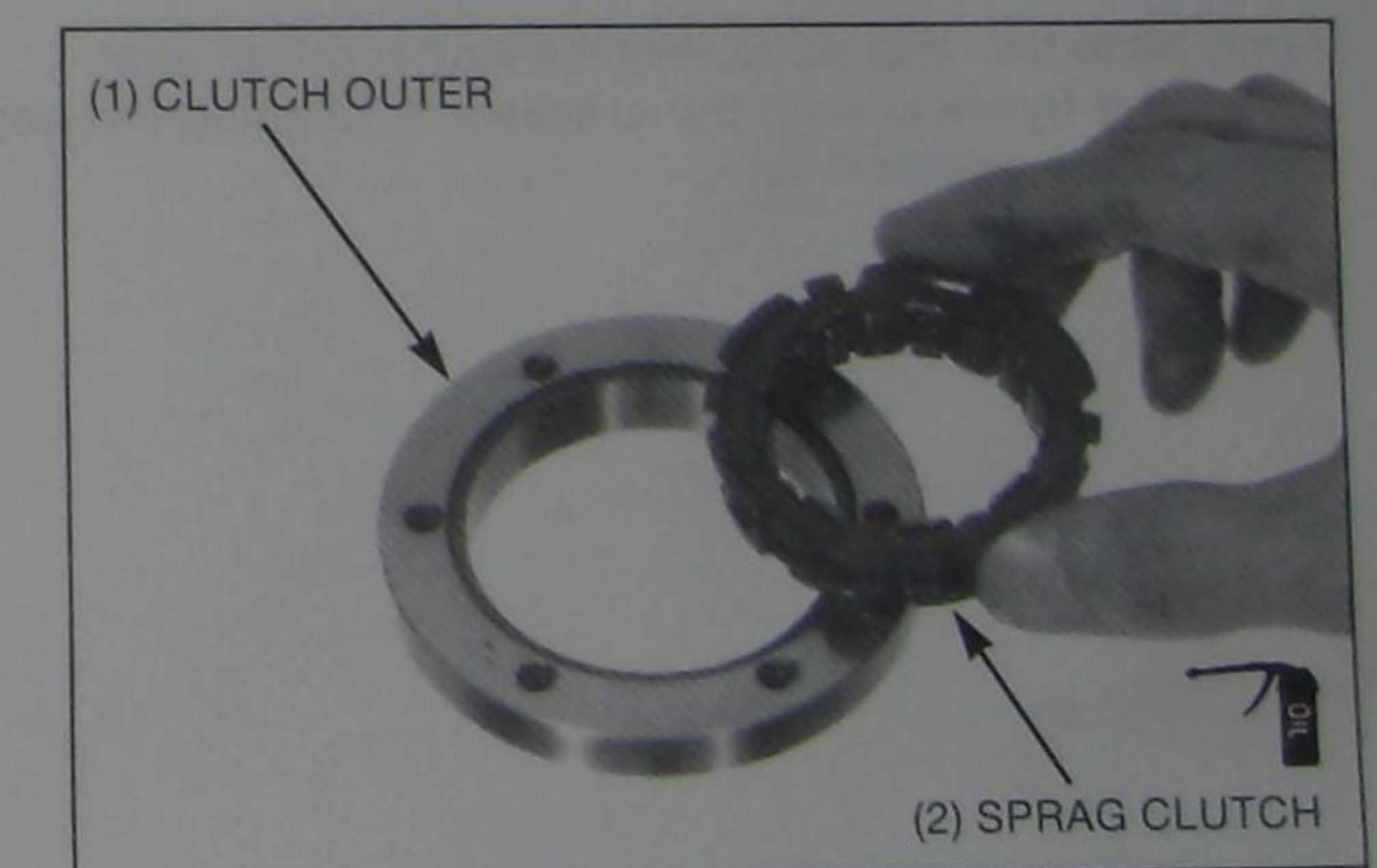
Check the idle and reduction gears for damage excessive wear.



INSTALLATION



Apply oil to the sprag and install the sprag clutch into the clutch outer as shown.

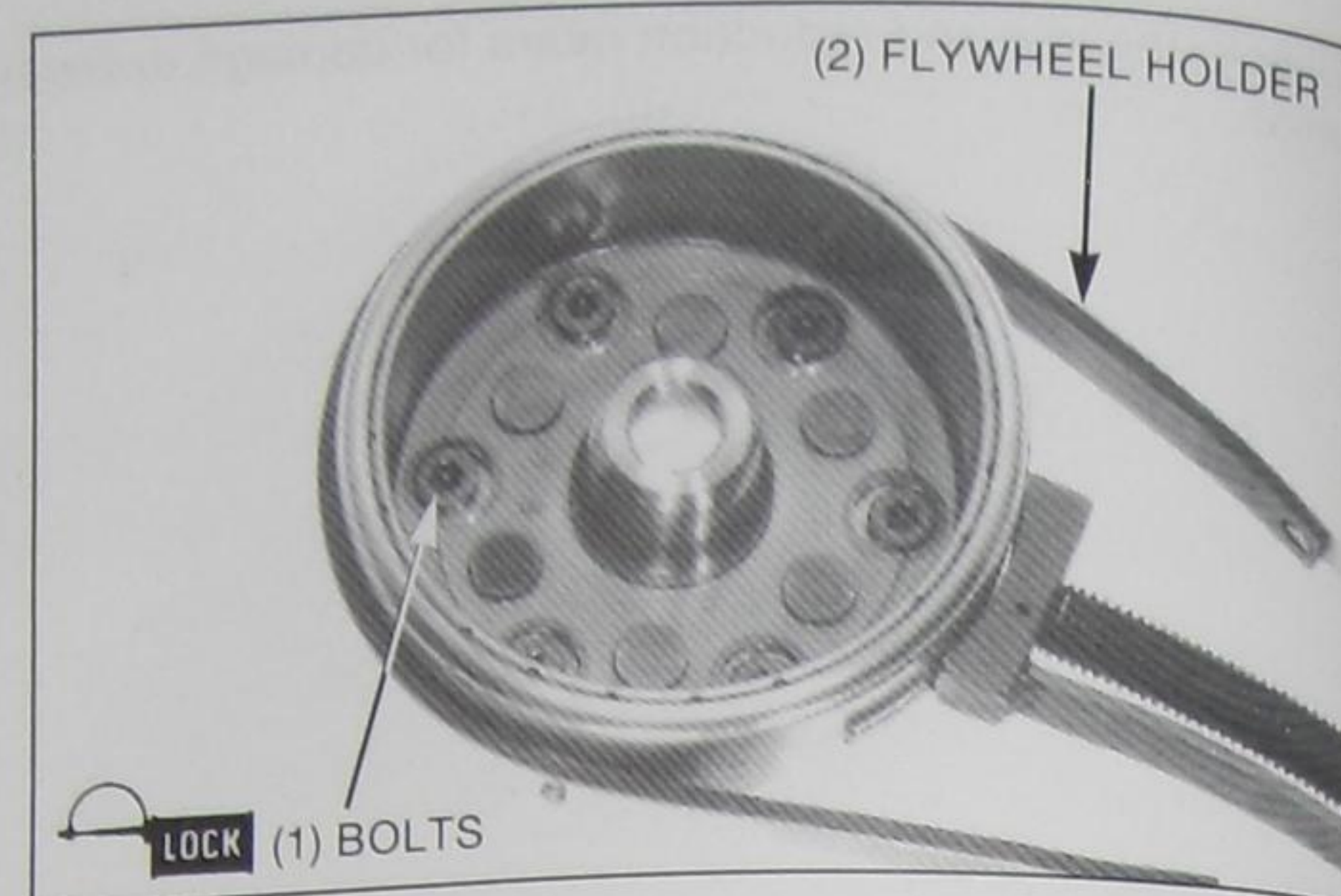


ALTERNATOR/STARTER CLUTCH

Apply locking agent to the starter clutch bolt threads.
Install the starter clutch assembly onto the flywheel and install the bolts.
Hold the flywheel with the special tool and tighten the bolts.

TOOL:
Flywheel holder 07725-0040000

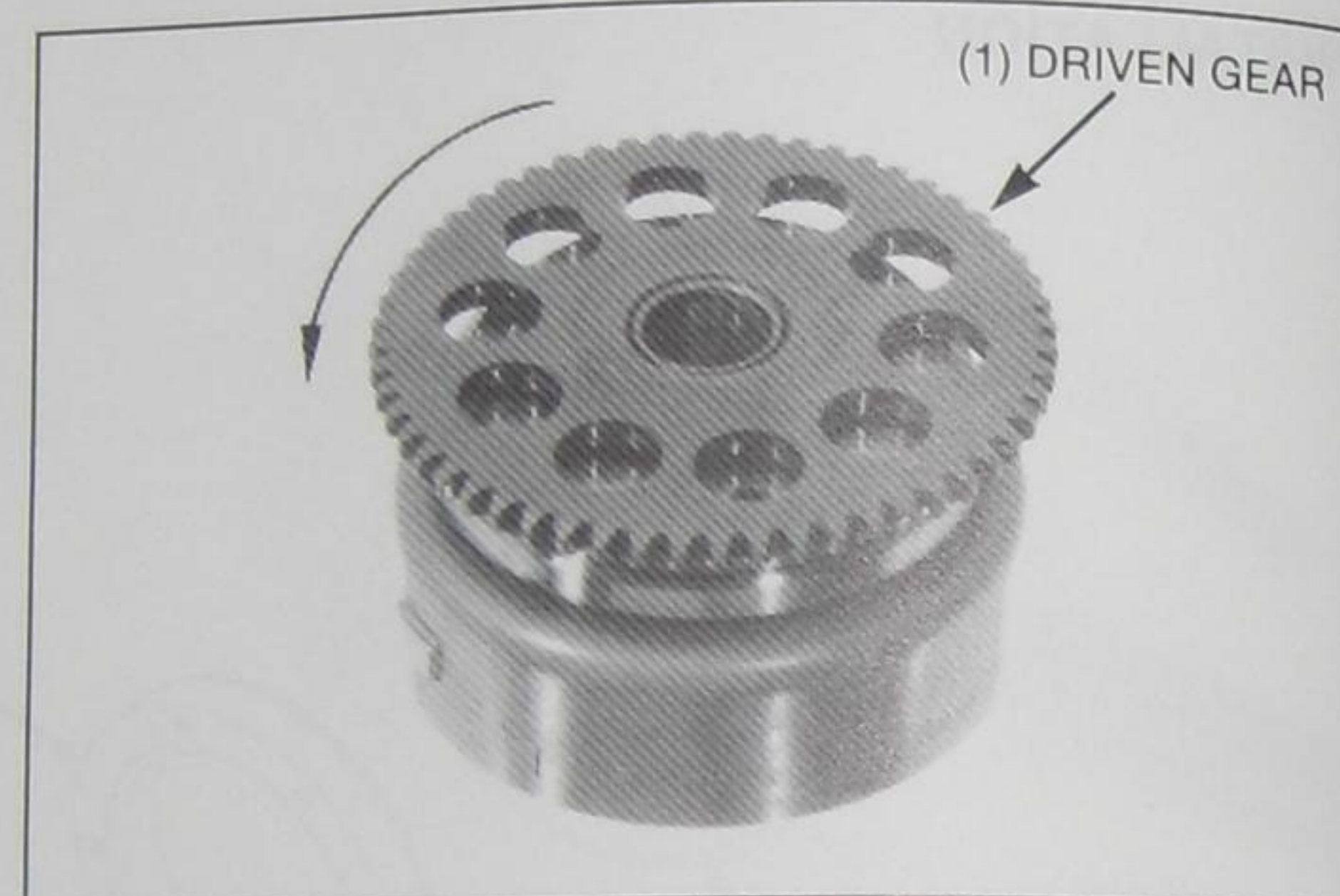
TORQUE: 16 N·m (1.6 kgf-m, 12 lbf-ft)



Install the starter driven gear while turning it counterclockwise.

Make sure that the starter driven gear turns counterclockwise smoothly and does not turn clockwise.

Install the flywheel (see below).

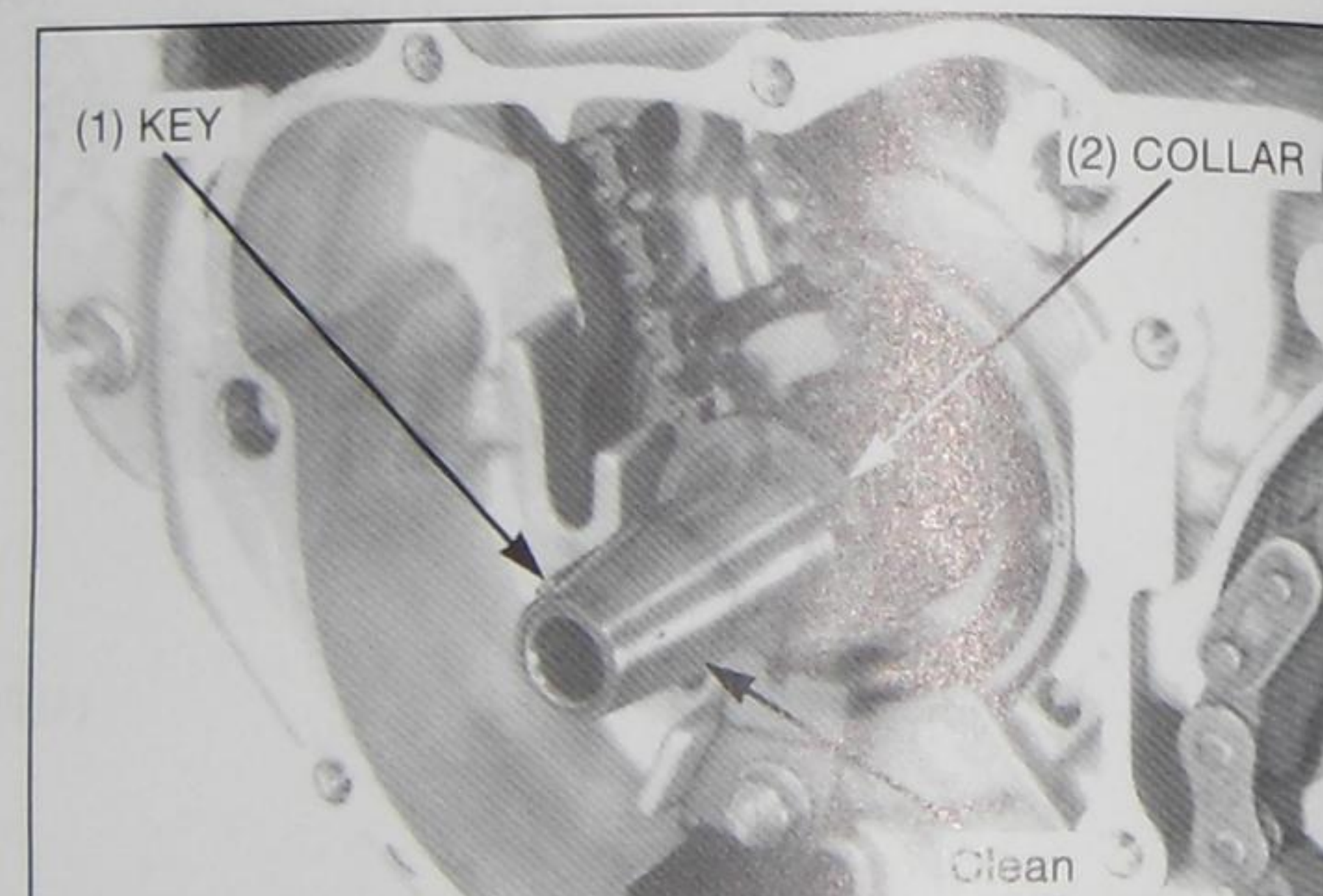


Flywheel Installation

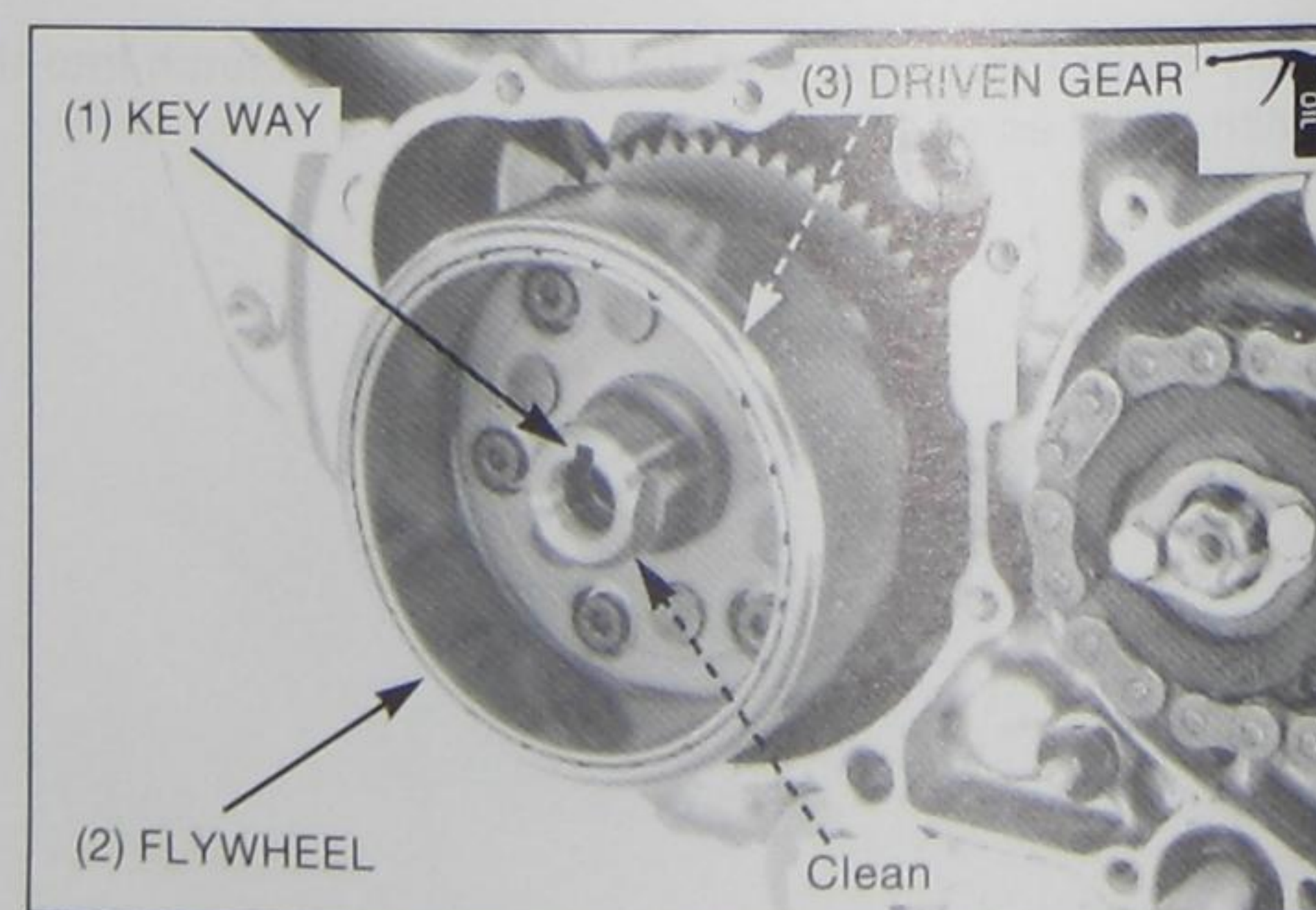
Install the driven gear collar onto the crankshaft.

Clean any oil from the tapered portion of the crankshaft and flywheel with degreasing agent.

Install the woodruff key in the crankshaft key groove.



Apply oil to the inner surface of the starter driven gear.
Install the flywheel onto the crankshaft, aligning the key way with the woodruff key.



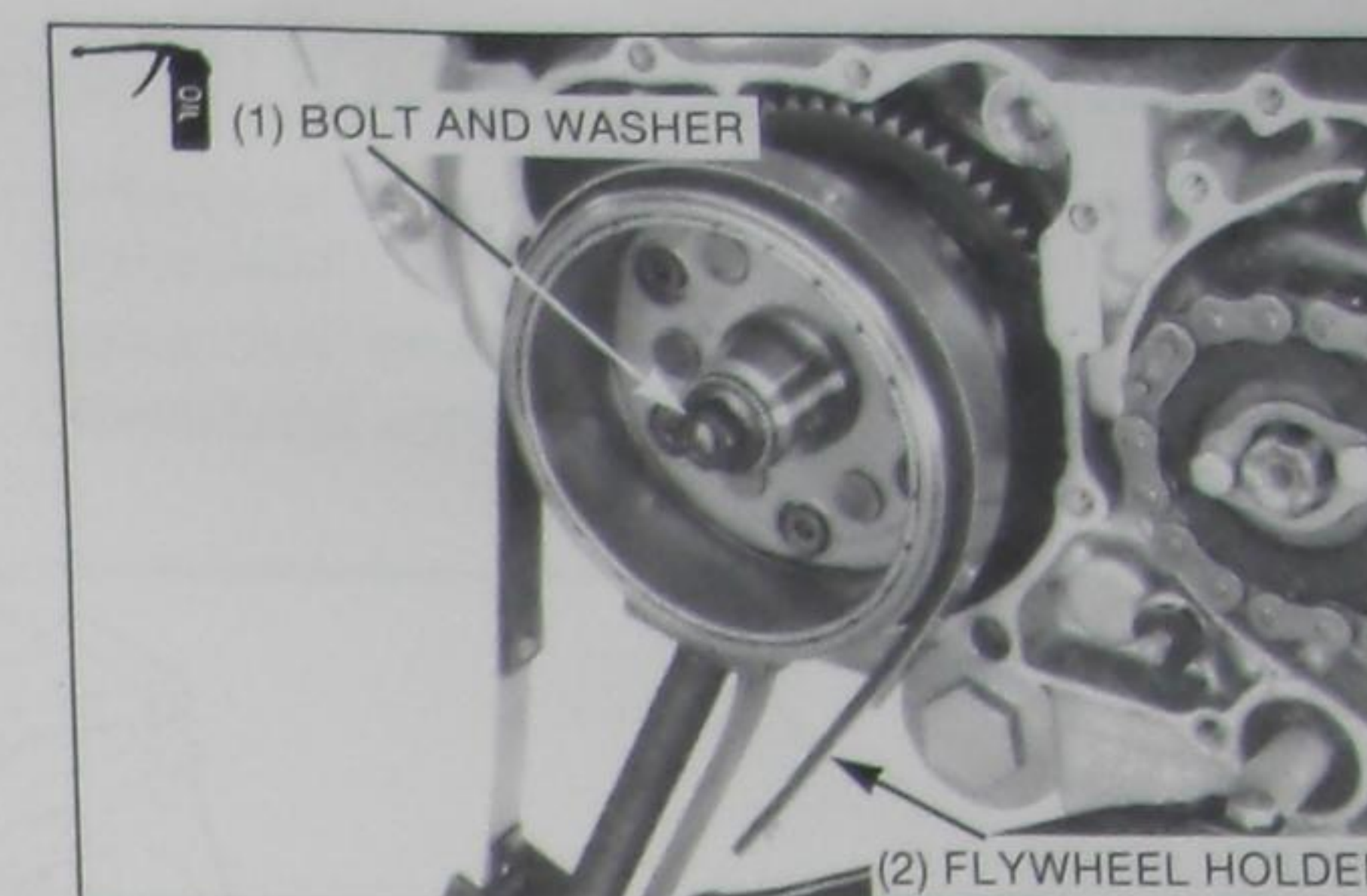
ALTERNATOR/STARTER CLUTCH

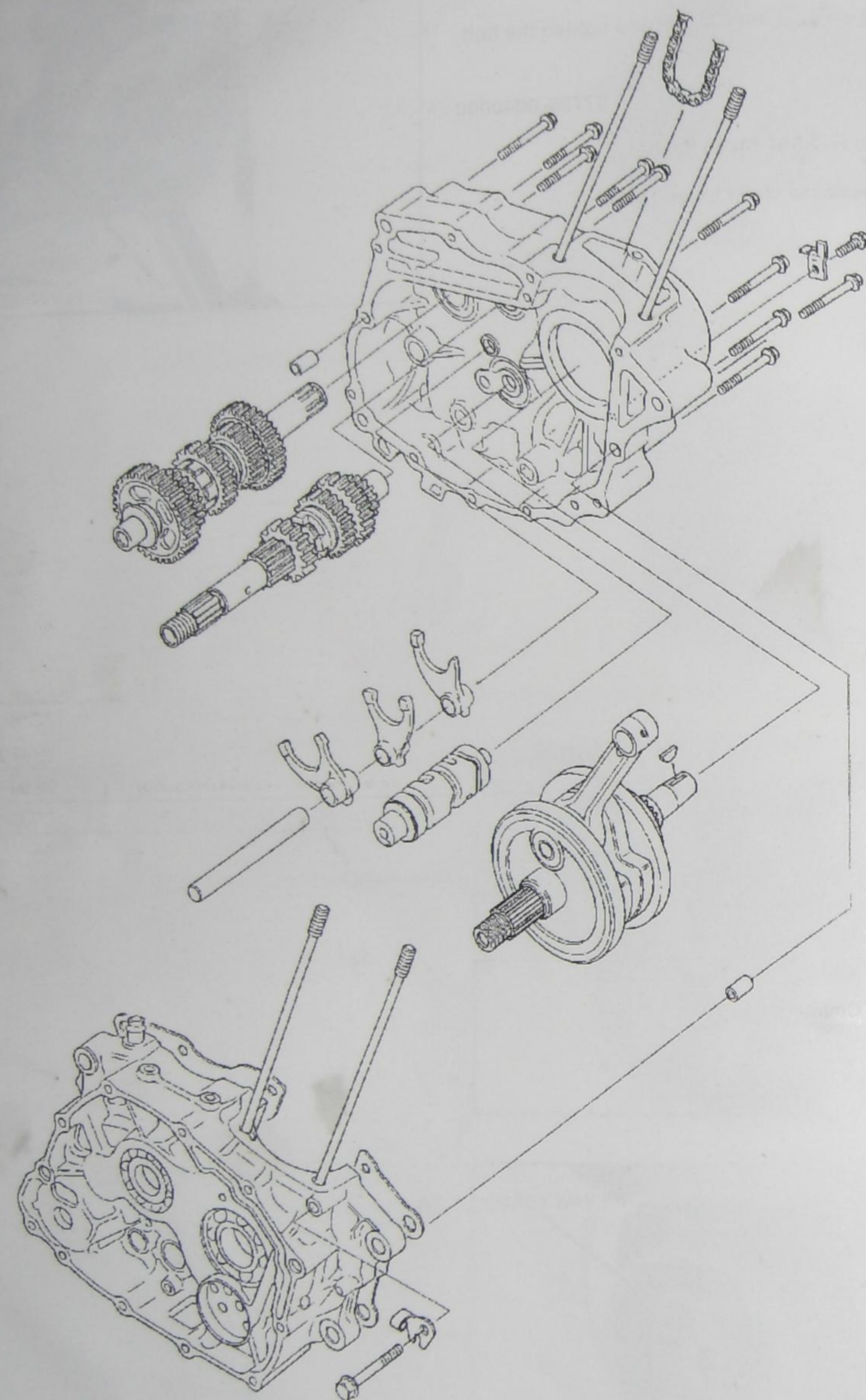
Apply oil to the flywheel bolt threads and seating surface.
Install the bolt and washer with the chamfered side of the washer facing out.
Hold the flywheel with the special tool and tighten the bolt.

TOOL:
Flywheel holder 07725-0040000

TORQUE: 74 N·m (7.5 kgf-m, 54 lbf-ft)

Install the left crankcase cover (page 10-3).





11. Crankcase/Transmission/Crankshaft

SERVICE INFORMATION	11-1	CRANKSHAFT	11-8
TROUBLESHOOTING	11-2	CRANKCASE BEARING REPLACEMENT	11-9
CRANKCASE SEPARATION	11-3	CRANKCASE ASSEMBLY	11-11
TRANSMISSION	11-4		

Service Information

GENERAL

- The crankcase halves must be separated to service the transmission and crankshaft. To service these parts, the engine must be removed from the frame (section 6).
- Be careful not to damage the crankcase mating surfaces when servicing.

SPECIFICATIONS

Unit: mm (in)

Item			Standard	Service Limit
Shift fork	I.D.		12.000-12.018 (0.4724-0.4731)	12.05 (0.474)
	Claw thickness		4.93-5.00 (0.194-0.197)	4.70 (0.185)
	Shaft O.D.		11.976-11.994 (0.4715-0.4722)	11.90 (0.469)
Transmission	Gear I.D.	M3, C4	20.020-20.041 (0.7882-0.7890)	20.07 (0.790)
		M5, C2	23.020-23.041 (0.9063-0.9071)	23.07 (0.908)
		C1	19.520-19.541 (0.7685-0.7693)	19.57 (0.770)
	Bushing O.D.	M5	22.984-23.005 (0.9049-0.9057)	22.93 (0.903)
		C1	19.479-19.500 (0.7667-0.7677)	19.43 (0.765)
		C2	22.979-23.000 (0.9047-0.9055)	22.93 (0.903)
	Bushing I.D.	M5	20.020-20.041 (0.7882-0.7890)	20.10 (0.791)
		C1	16.516-16.534 (0.6502-0.6509)	16.60 (0.654)
		C2	20.000-20.021 (0.7874-0.7882)	20.10 (0.791)
	Gear-to-bushing clearance	M5	0.015-0.057 (0.0006-0.0022)	0.10 (0.004)
		C1, C2	0.020-0.062 (0.0008-0.0024)	0.10 (0.004)
	Mainshaft O.D.	At M3, M5	19.959-19.980 (0.7875-0.7866)	19.91 (0.784)
	Countershaft O.D.	At C1 bushing	16.466-16.484 (0.6483-0.6490)	16.41 (0.646)
		At C2 bushing	19.974-19.987 (0.7864-0.7869)	19.91 (0.784)
		At C4 gear	19.959-19.980 (0.7875-0.7866)	19.91 (0.784)
Crankshaft	Runout		—	0.10 (0.004)
	Big end side clearance		0.05-0.30 (0.002-0.012)	0.5 (0.02)
	Big end radial clearance		0-0.008 (0-0.0003)	0.05 (0.002)
	Gear-to-shaft clearance	M3, C4	0.040-0.082 (0.0016-0.0032)	0.111 (0.0044)
		M5	0.040-0.082 (0.0016-0.0032)	0.111 (0.0044)
	Bushing-to-shaft clearance	C1	0.032-0.068 (0.0013-0.0027)	0.096 (0.0038)
		C2	0.013-0.047 (0.0005-0.0019)	0.10 (0.004)

TORQUE VALUES

Mainshaft bearing setting plate bolt 12 N·m (1.2 kgf-m, 9 lbf-ft) Apply locking agent to the threads.

TOOLS

Driver	07749-0010000
Attachment, 32 x 35 mm	07746-0010100
Attachment, 42 x 47 mm	07746-0010300
Attachment, 52 x 55 mm	07746-0010400
Attachment, 72 x 75 mm	07746-0010600
Pilot, 15 mm	07746-0040300
Pilot, 20 mm	07746-0040500
Pilot, 28 mm	07746-0041100
Bearing remover set, 15 mm	07936-KC10000
- Remover shaft	07936-KC10100
- Remover head	07936-KC10200
- Sliding weight	07741-0010201

Troubleshooting

Excessive engine noise

- Worn connecting rod big end bearing
- Worn crankshaft main journal bearing
- Worn or damaged transmission gears
- Worn or damaged transmission bearing

Transmission jumps out of gear

- Worn gear dogs or dog holes
- Worn shift drum guide groove
- Worn shift for guide pin
- Worn gear shifter groove
- Worn shift fork
- Bent shift fork shaft

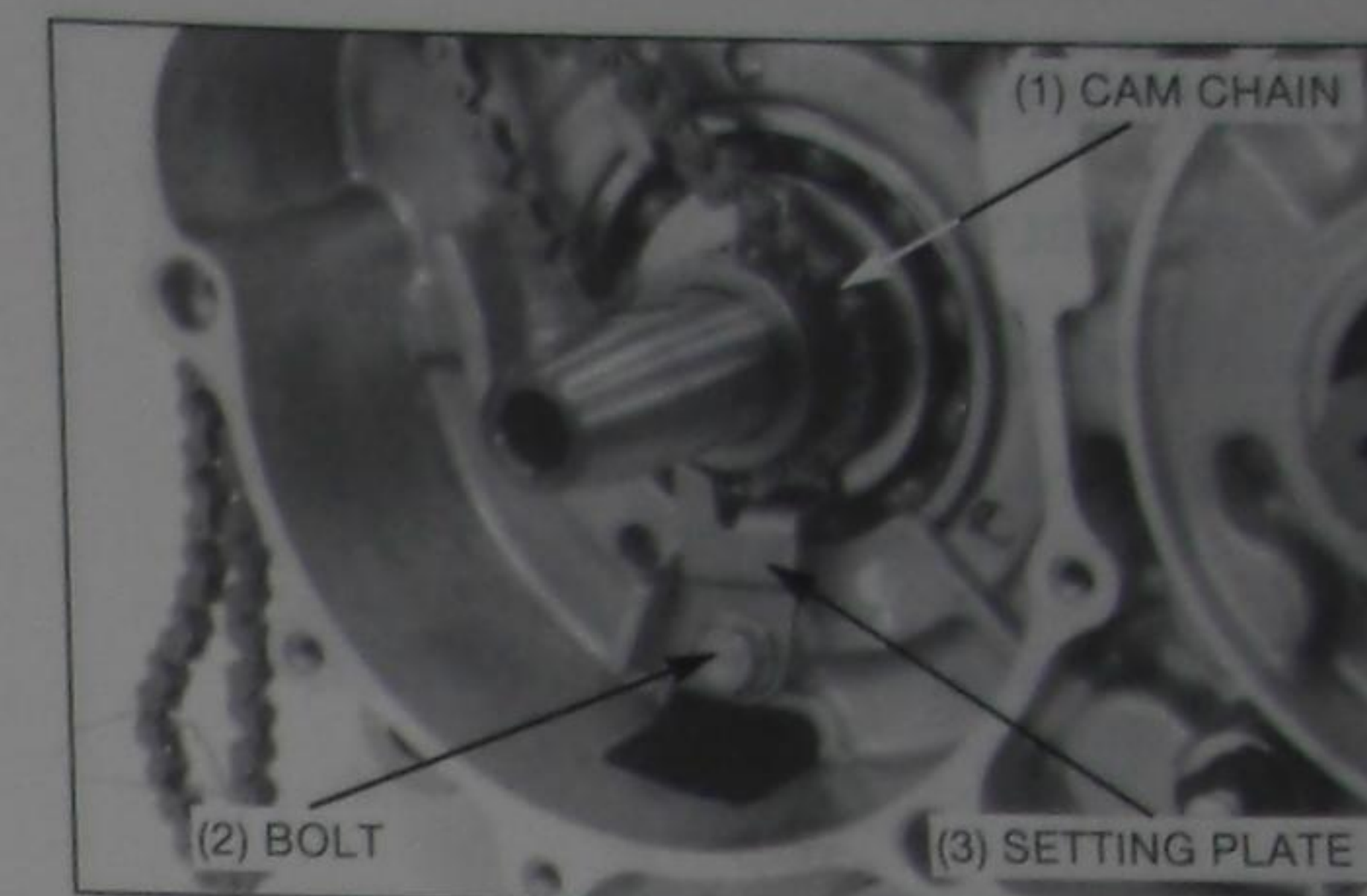
Hard to shift

- Damaged shift fork
- Bent shift fork shaft
- Damaged shift fork guide pin
- Damaged shift drum guide groove

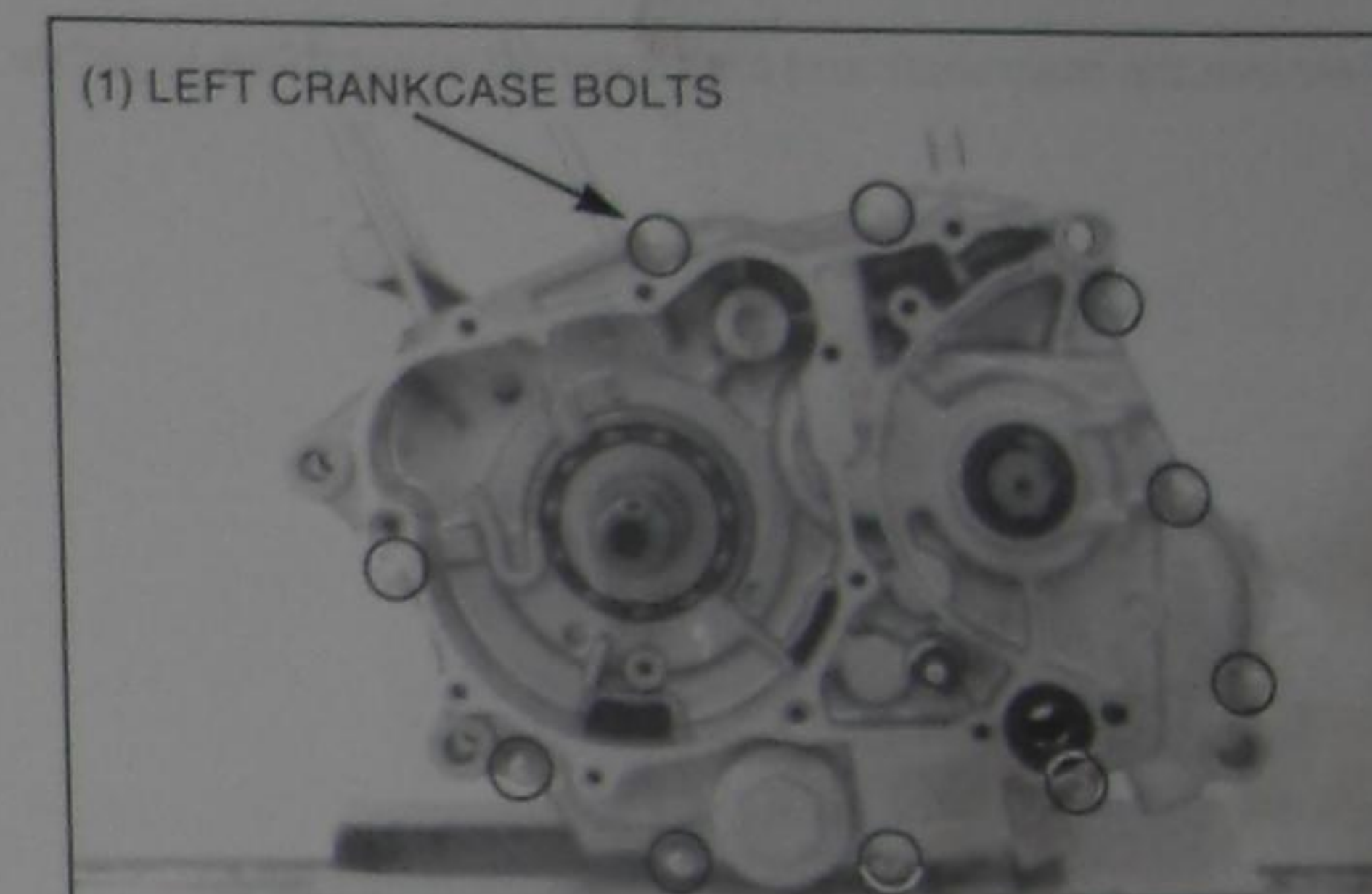
Crankcase Separation

Remove the following

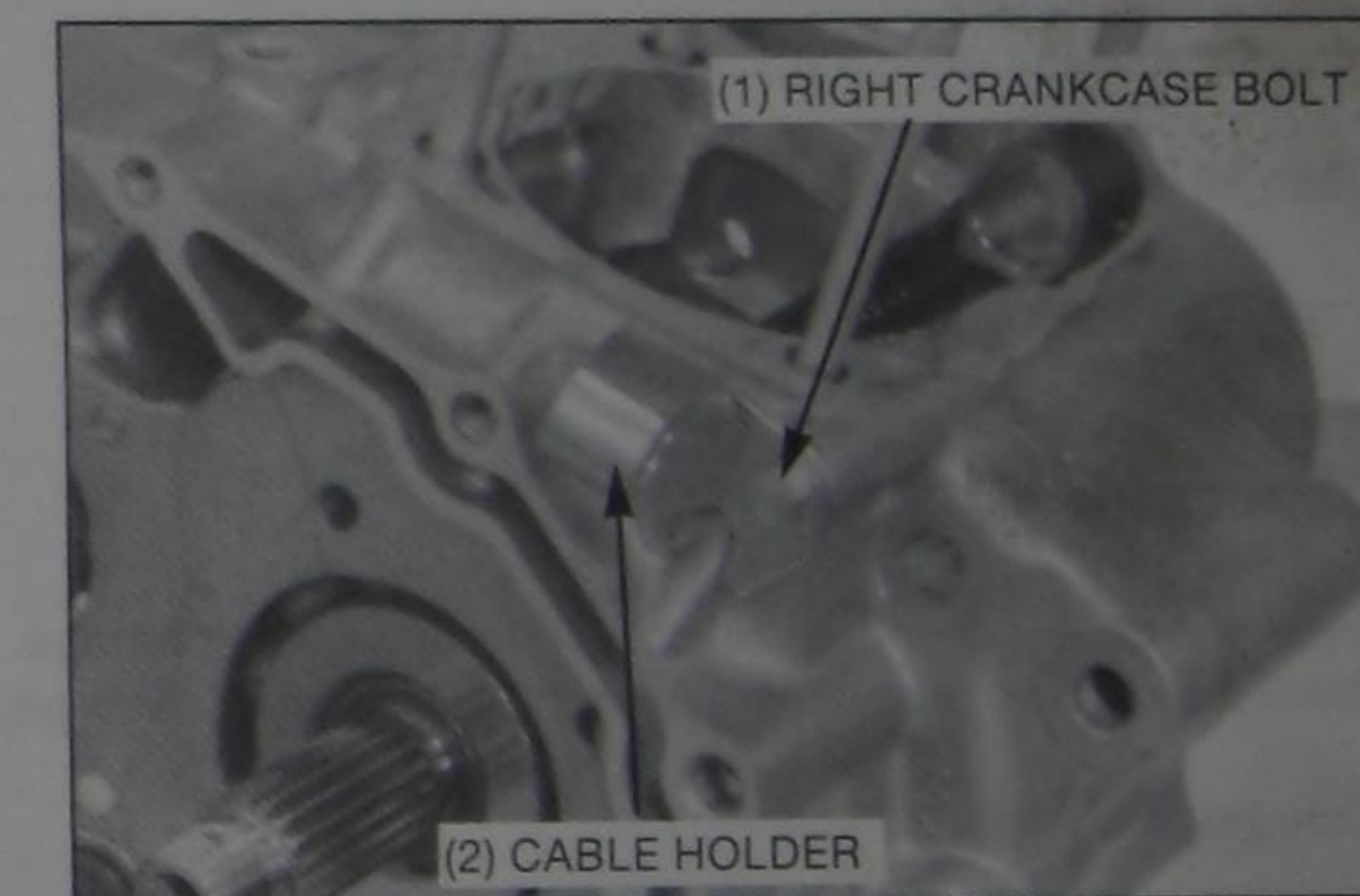
- Engine (section 6)
- Starter motor (section 17)
- Cylinder head (section 7)
- Cylinder, piston (section 8)
- Clutch, gearshift linkage (section 9)
- Oil pump (section 4)
- Flywheel (section 10)
- Bolt and cam chain setting plate
- Cam chain



Loosen the ten left crankcase bolts and remove them.

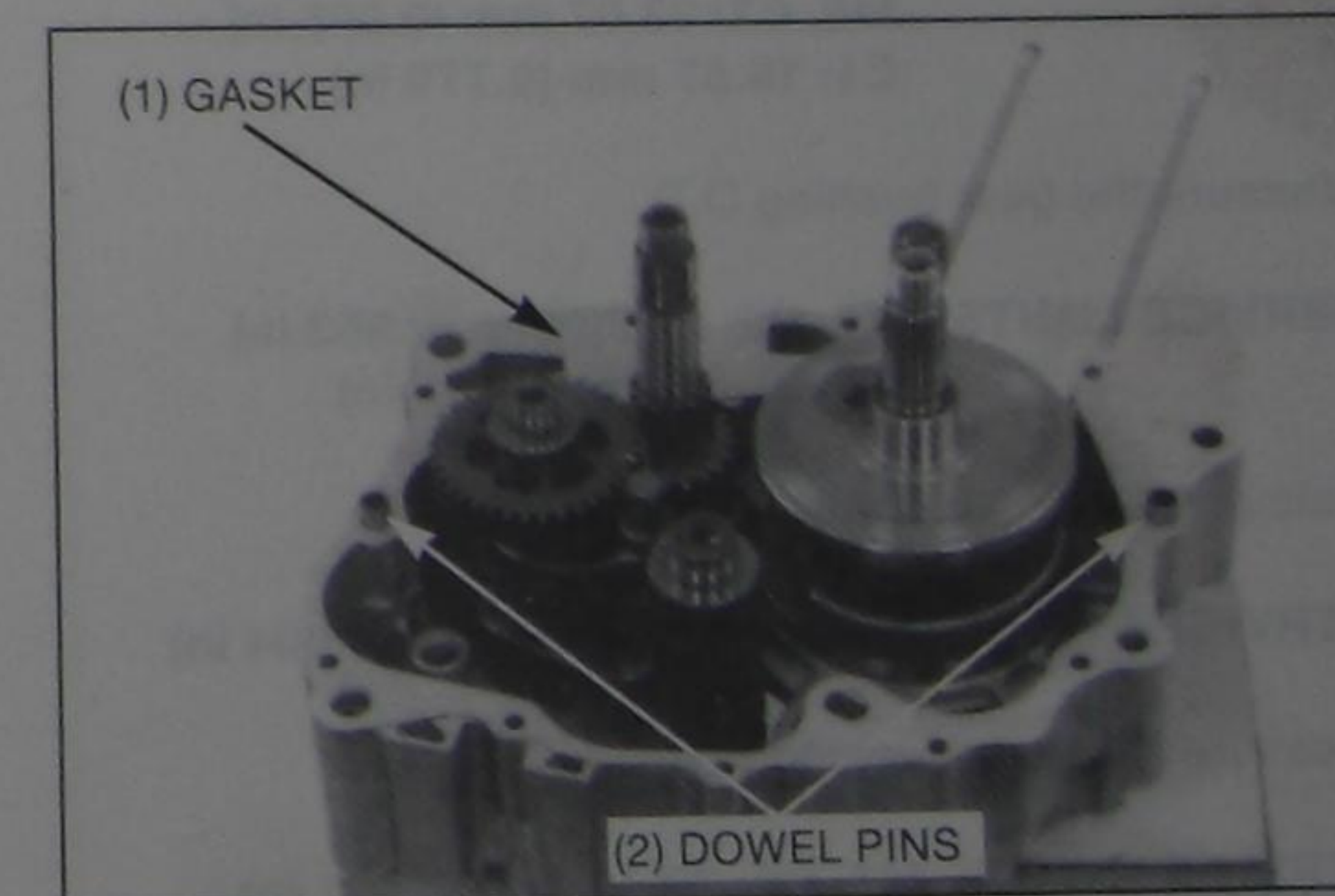


Remove the right crankcase bolt with the clutch cable holder.



Place the crankcase assembly with the left side down. Carefully separate the right crankcase from the left crankcase.

Remove the dowel pins and gasket.

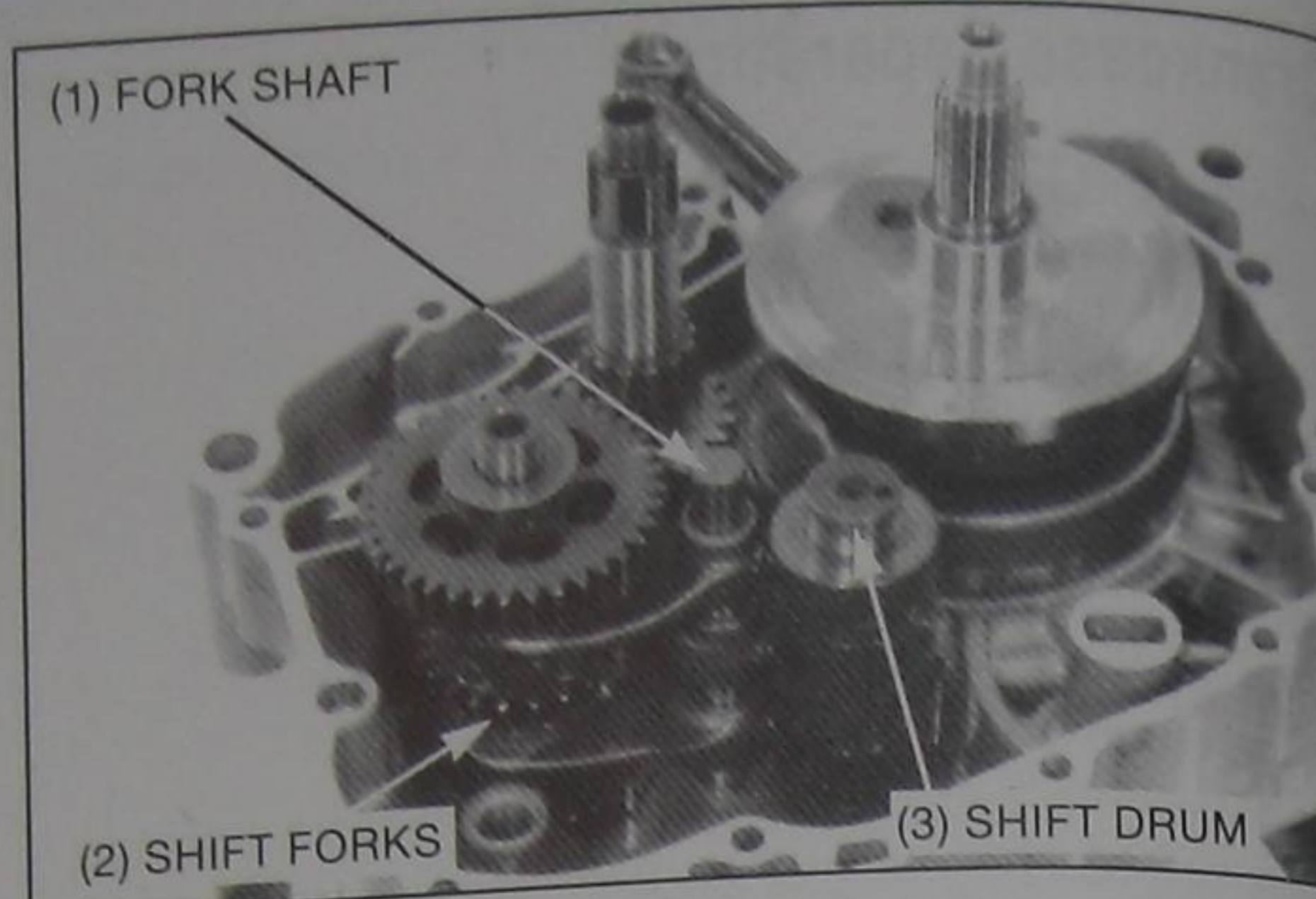


Transmission

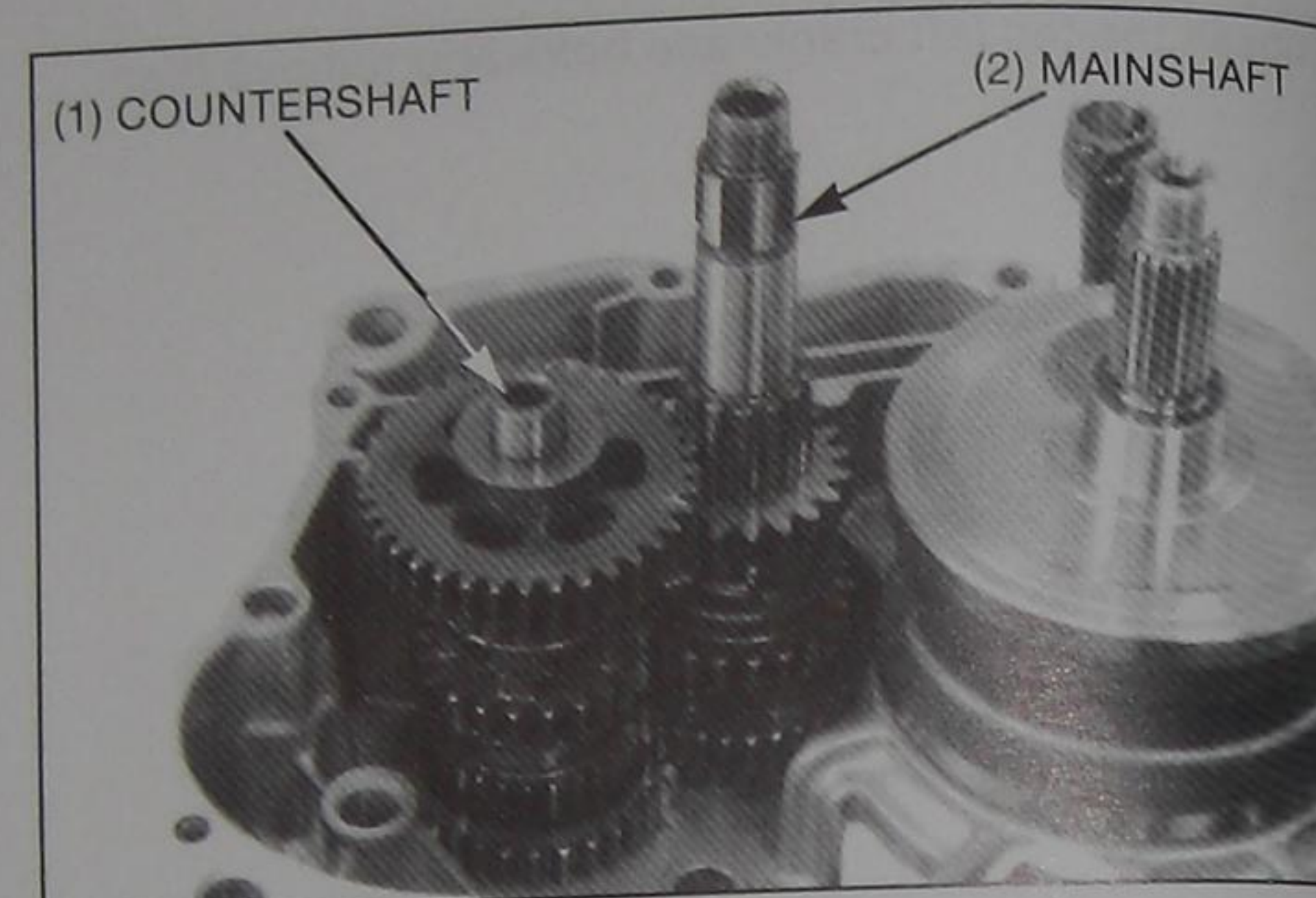
DISASSEMBLY

Separate the crankcase (page 11-3).

Pull the fork shaft and remove it from the shift forks.
Remove the shift drum and the shift forks.



Remove the mainshaft and countershaft assemblies together.



Disassemble the mainshaft and countershaft.

Clean all disassembled parts in solvent thoroughly.

INSPECTION

Check the gear shifter groove for abnormal wear or damage.
Check the gear dogs and teeth for abnormal wear or damage.

Measure the gear I.D.

SERVICE LIMITS: M3, C4: 20.07 mm (0.790 in)
M5, C2: 23.07 mm (0.908 in)
C1: 19.57 mm (0.770 in)

Measure the gear bushing O.D.

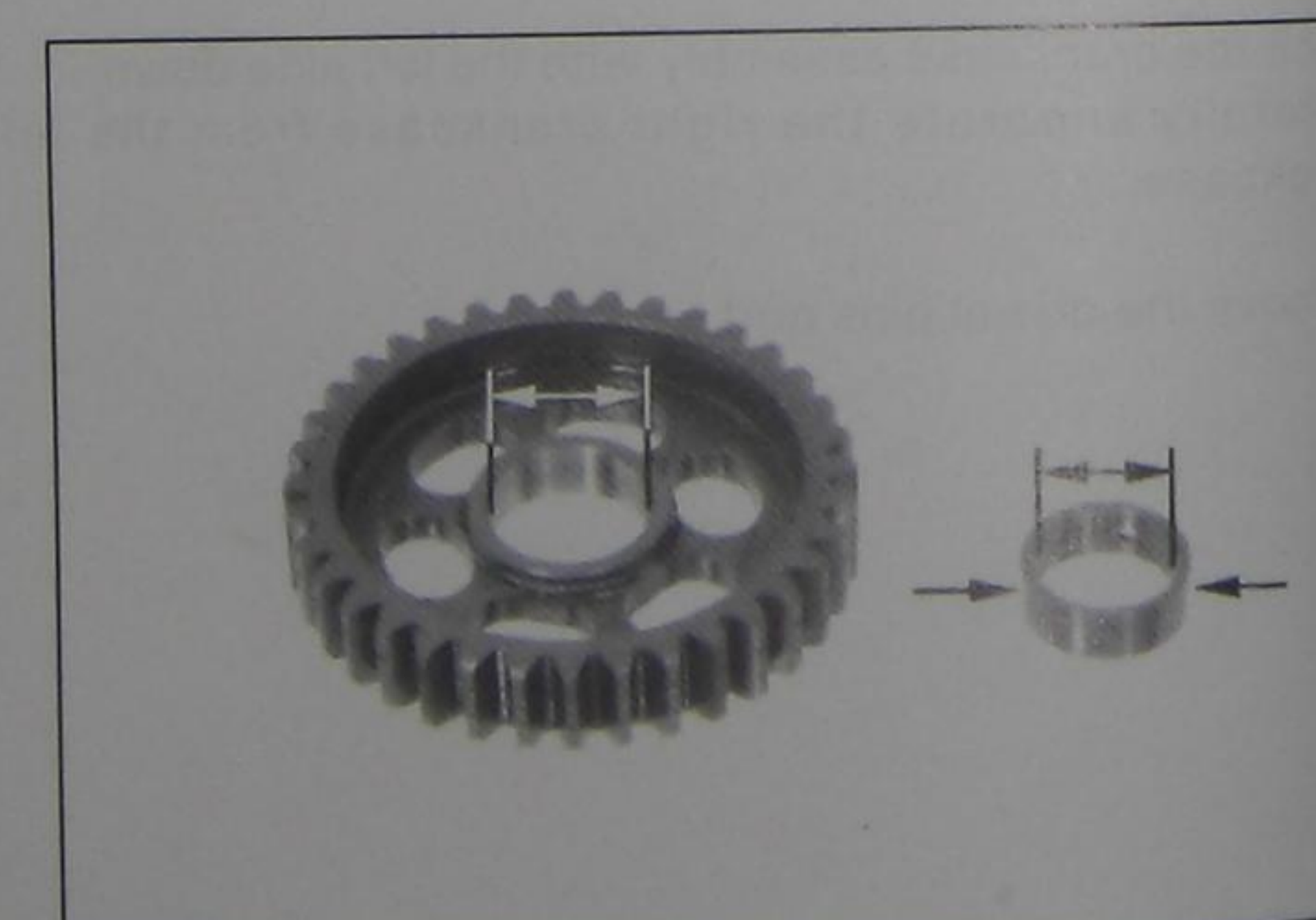
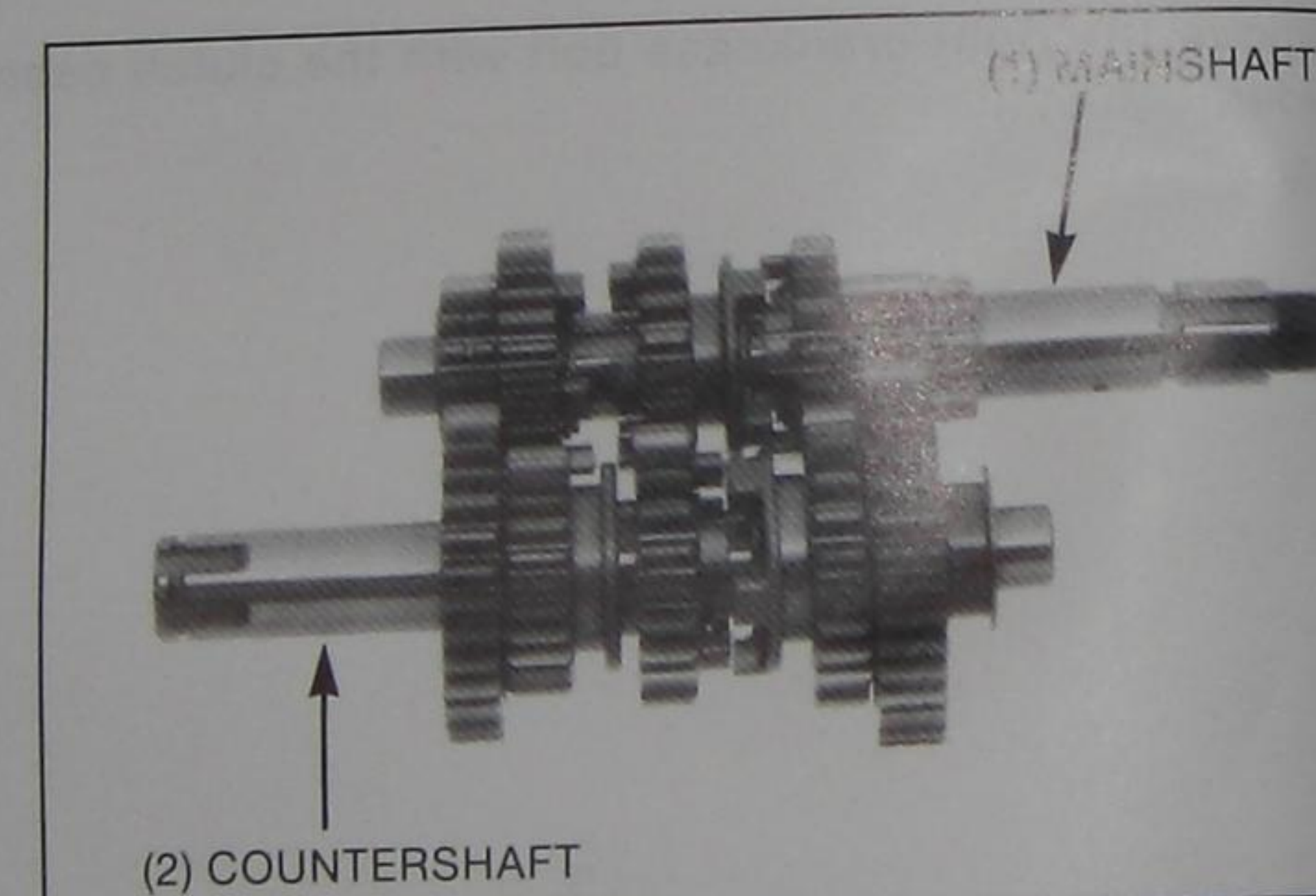
SERVICE LIMITS: M5, C2: 22.93 mm (0.903 in)
C1: 19.43 mm (0.765 in)

Calculate the gear-to-bushing clearance.

SERVICE LIMITS: M5, C1, C2: 0.10 mm (0.004 in)

Measure the gear bushing I.D.

SERVICE LIMITS: M5, C2: 20.10 mm (0.791 in)
C1: 16.60 mm (0.654 in)



Check the mainshaft and countershaft for abnormal wear or damage.

Measure the mainshaft O.D. at the M3 and M5 gears.

SERVICE LIMIT: M3, M5: 19.91 mm (0.784 in)

Measure the countershaft O.D. at the C1, C2 and C4 gears.

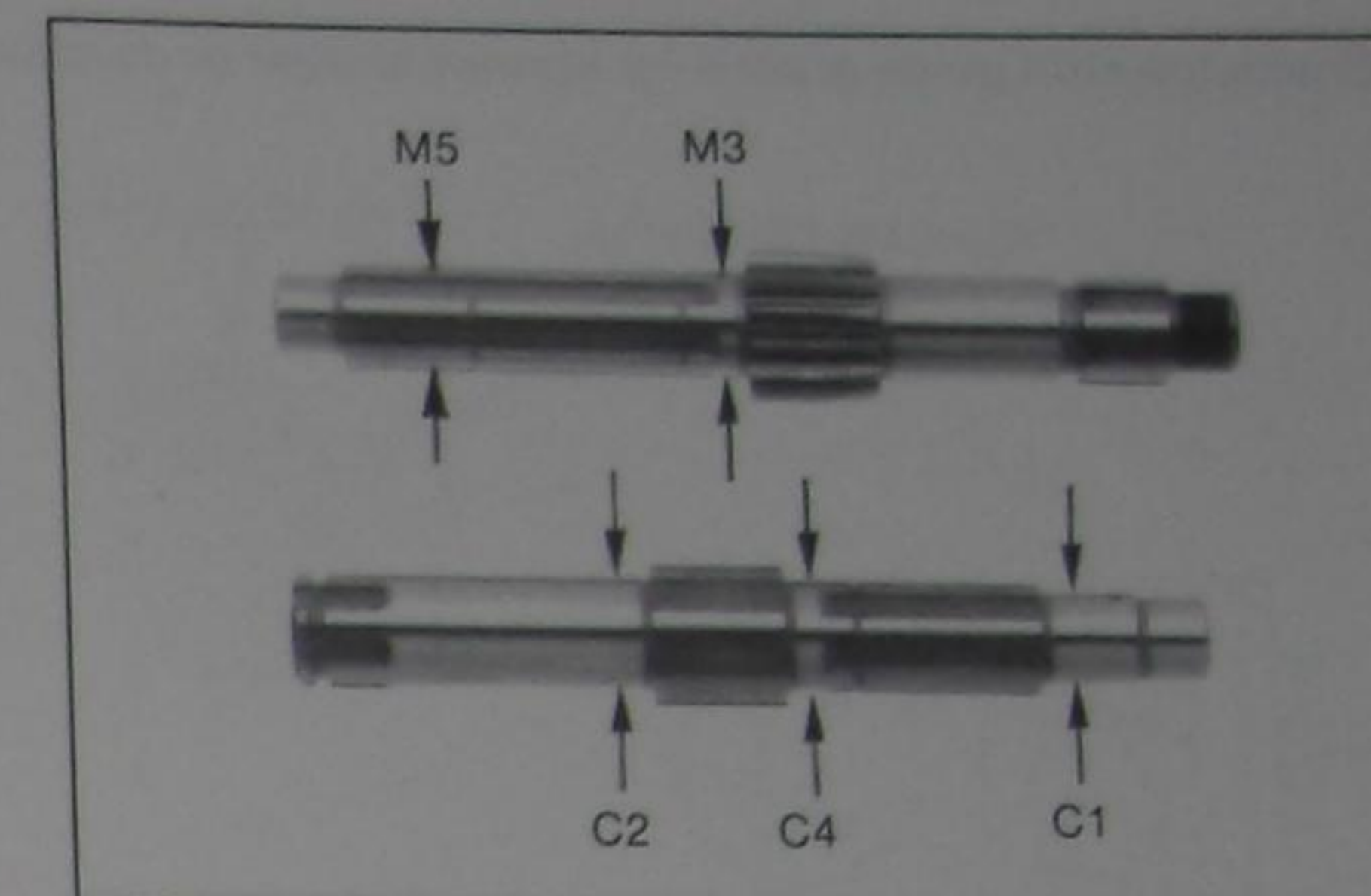
SERVICE LIMITS: C1: 16.41 mm (0.646 in)
C2, C4: 19.91 mm (0.784 in)

Calculate the gear bushing-to-shaft clearance.

SERVICE LIMITS: M5: 0.111 mm (0.0044 in)
C1: 0.096 mm (0.0038 in)
C2: 0.10 mm (0.004 in)

Calculate the gear-to-shaft clearance.

SERVICE LIMIT: M3, C4: 0.111 mm (0.0044 in)



Check the shift fork guide pins for abnormal wear or damage.
Check the fork claw for deformation or abnormal wear.
Measure the shift fork I.D.

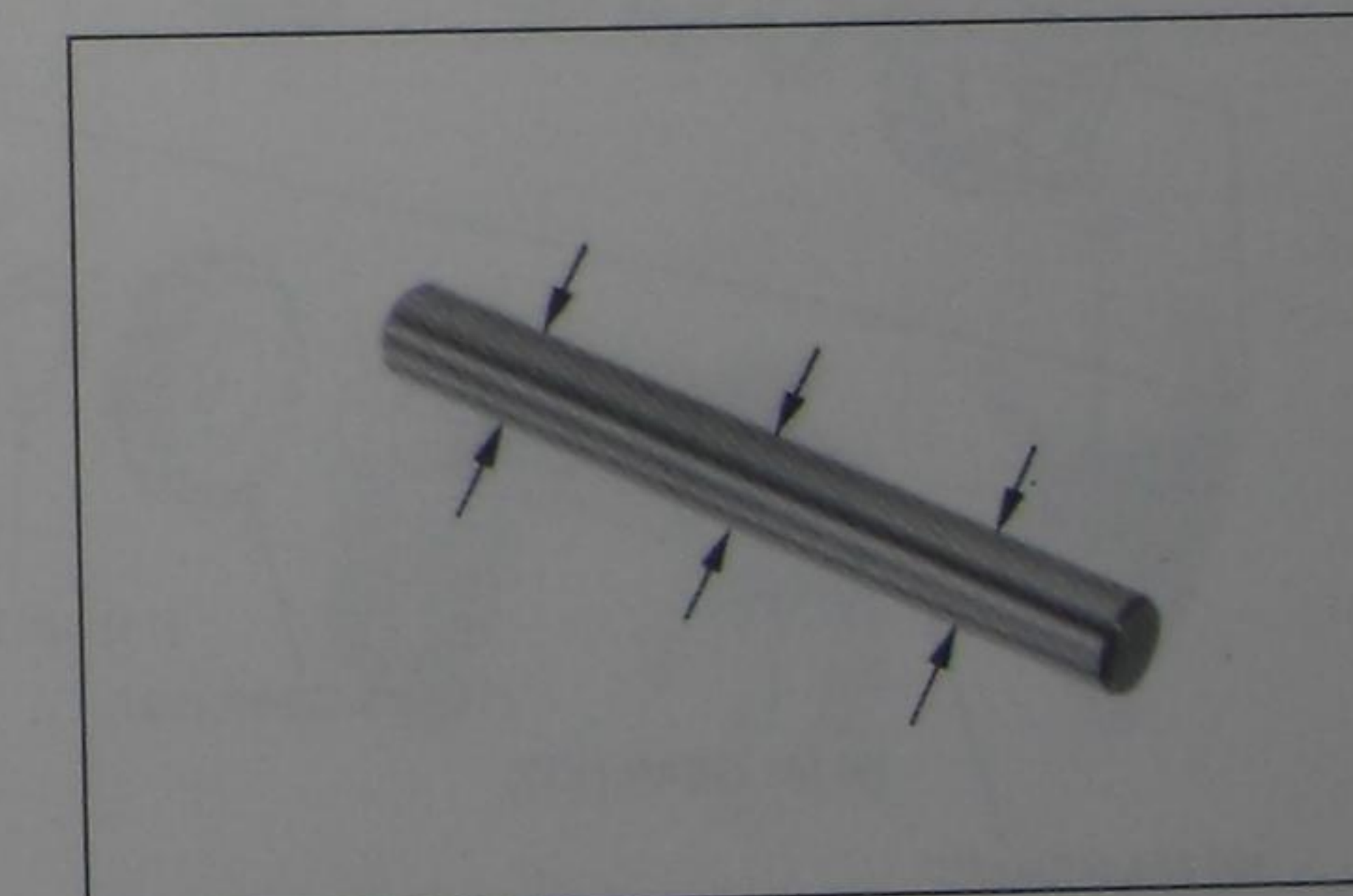
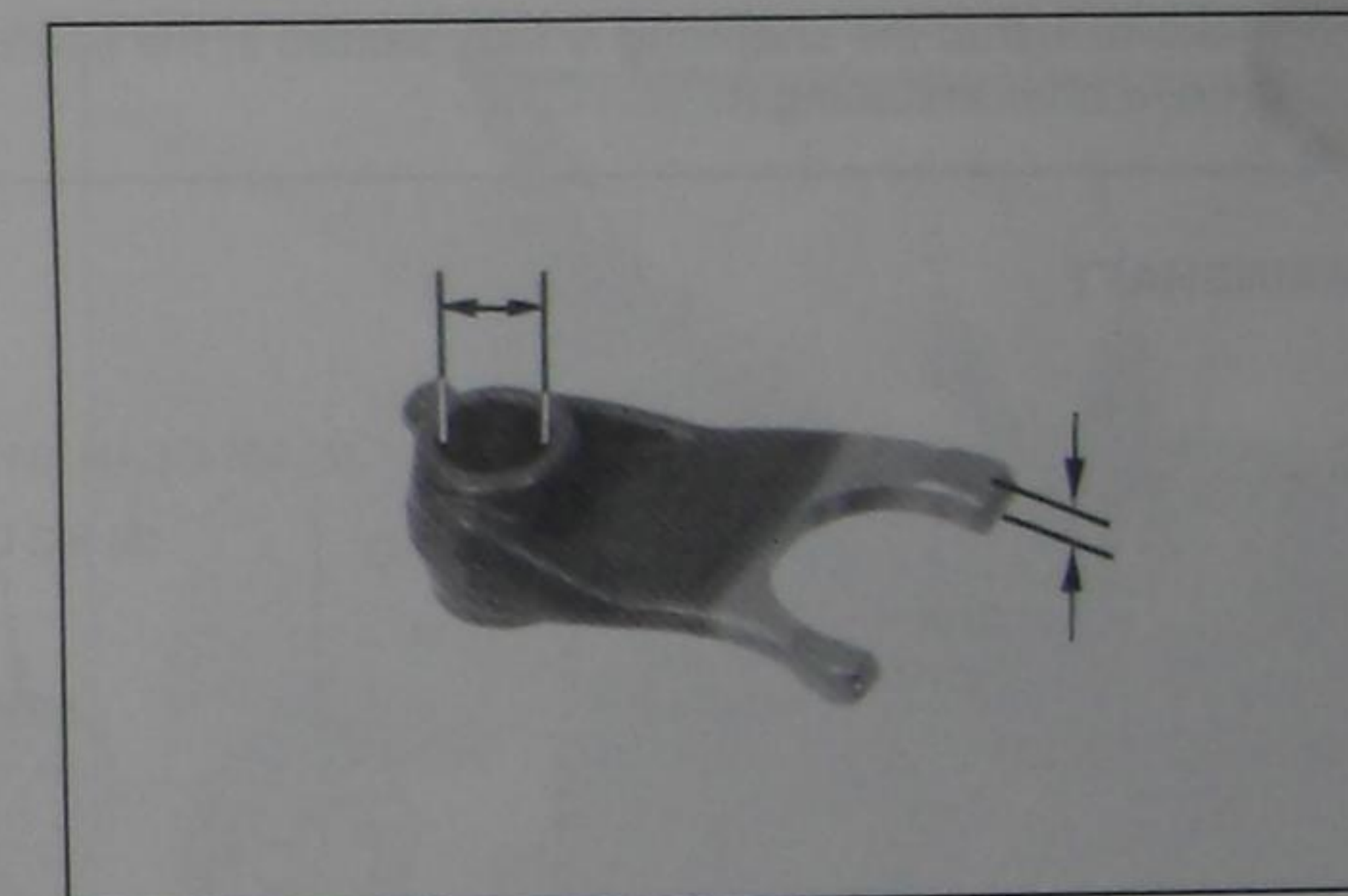
SERVICE LIMIT: 12.05 mm (0.474 in)

Measure the claw thickness.

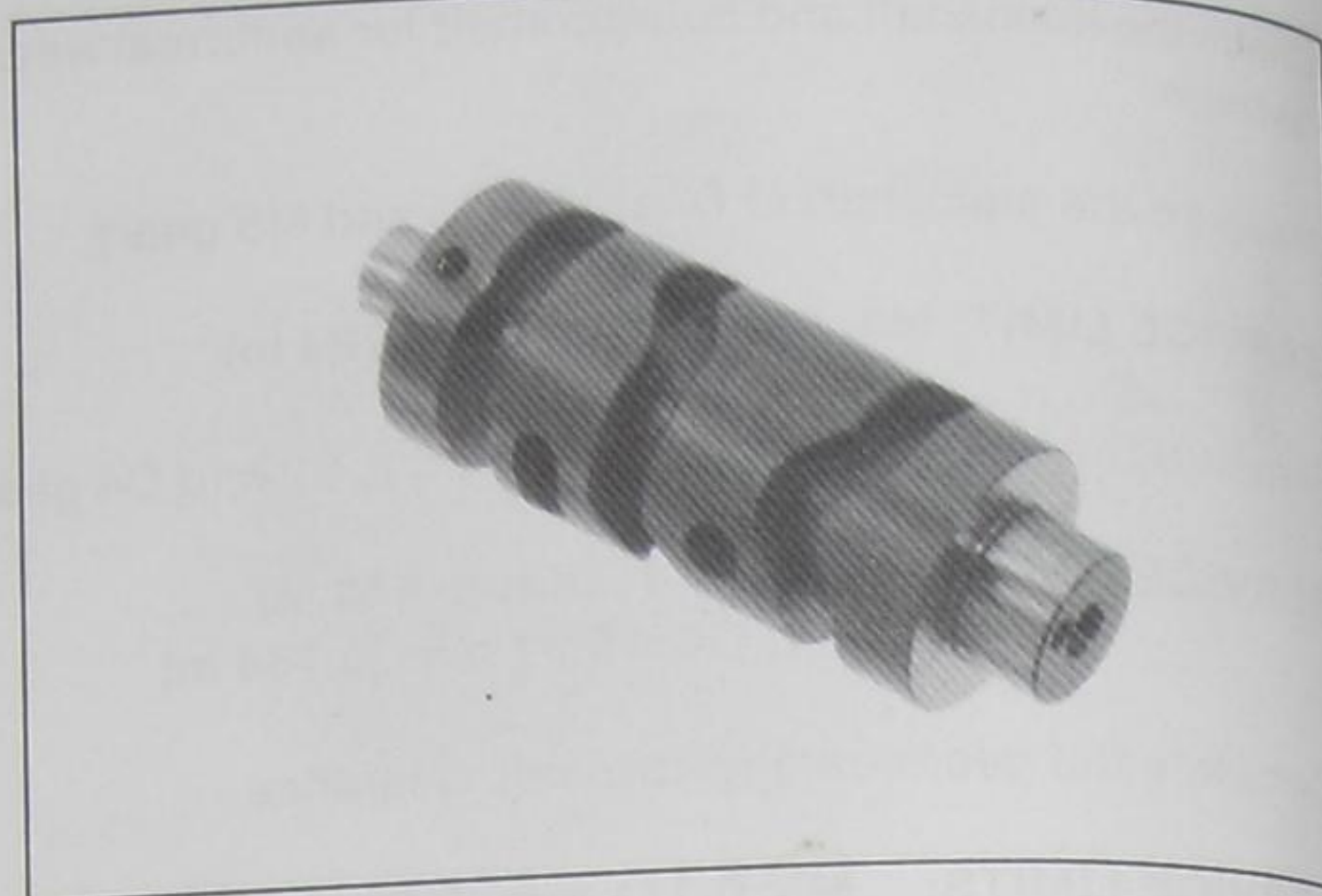
SERVICE LIMIT: 4.70 mm (0.185 in)

Check the shift fork shaft for abnormal wear or damage.
Measure the fork shaft O.D.

SERVICE LIMIT: 11.90 mm (0.469 in)



Check the shift guide groove for abnormal wear or damage.



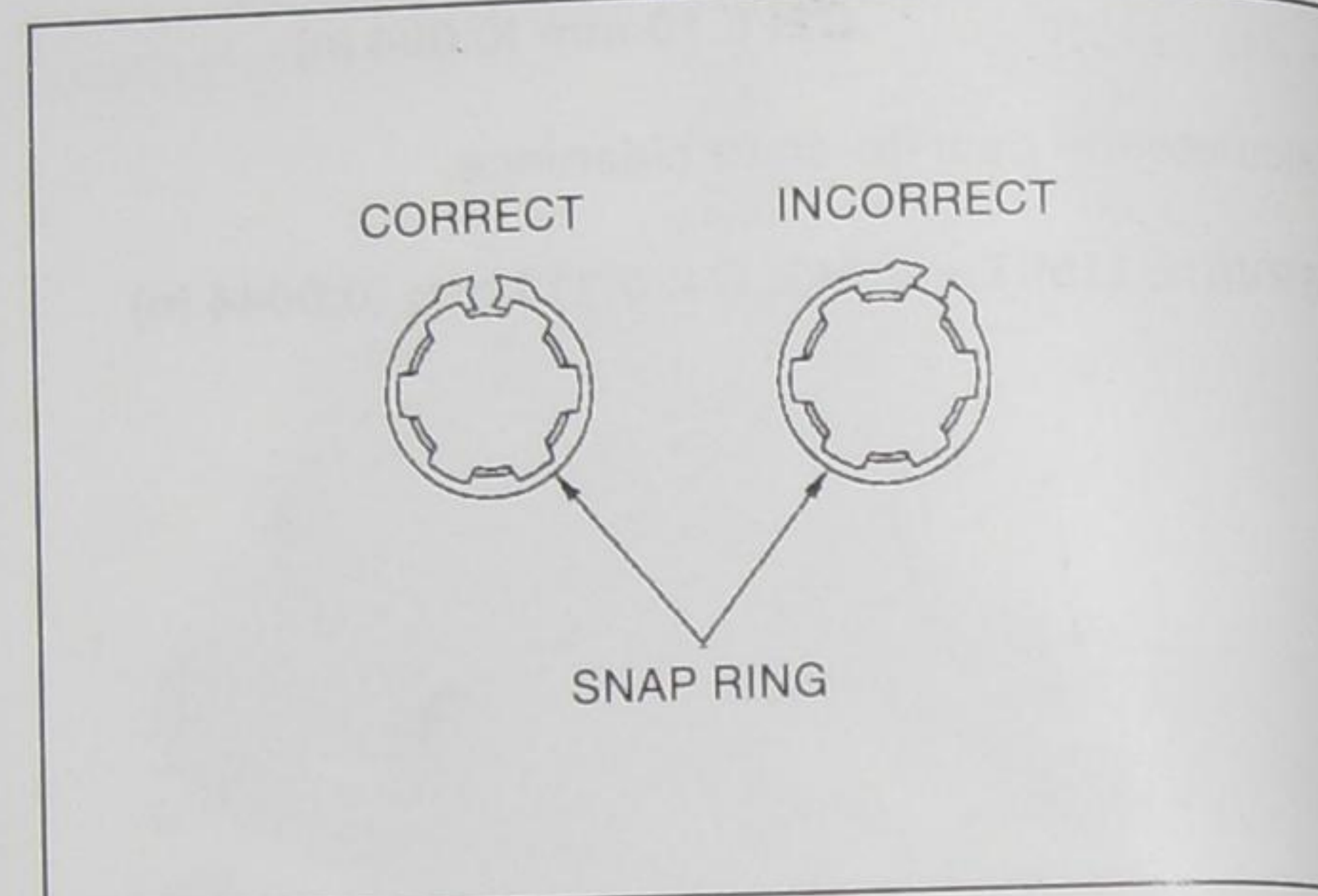
ASSEMBLY

Apply molybdenum oil solution to the inner rotating surface of the transmission gears.

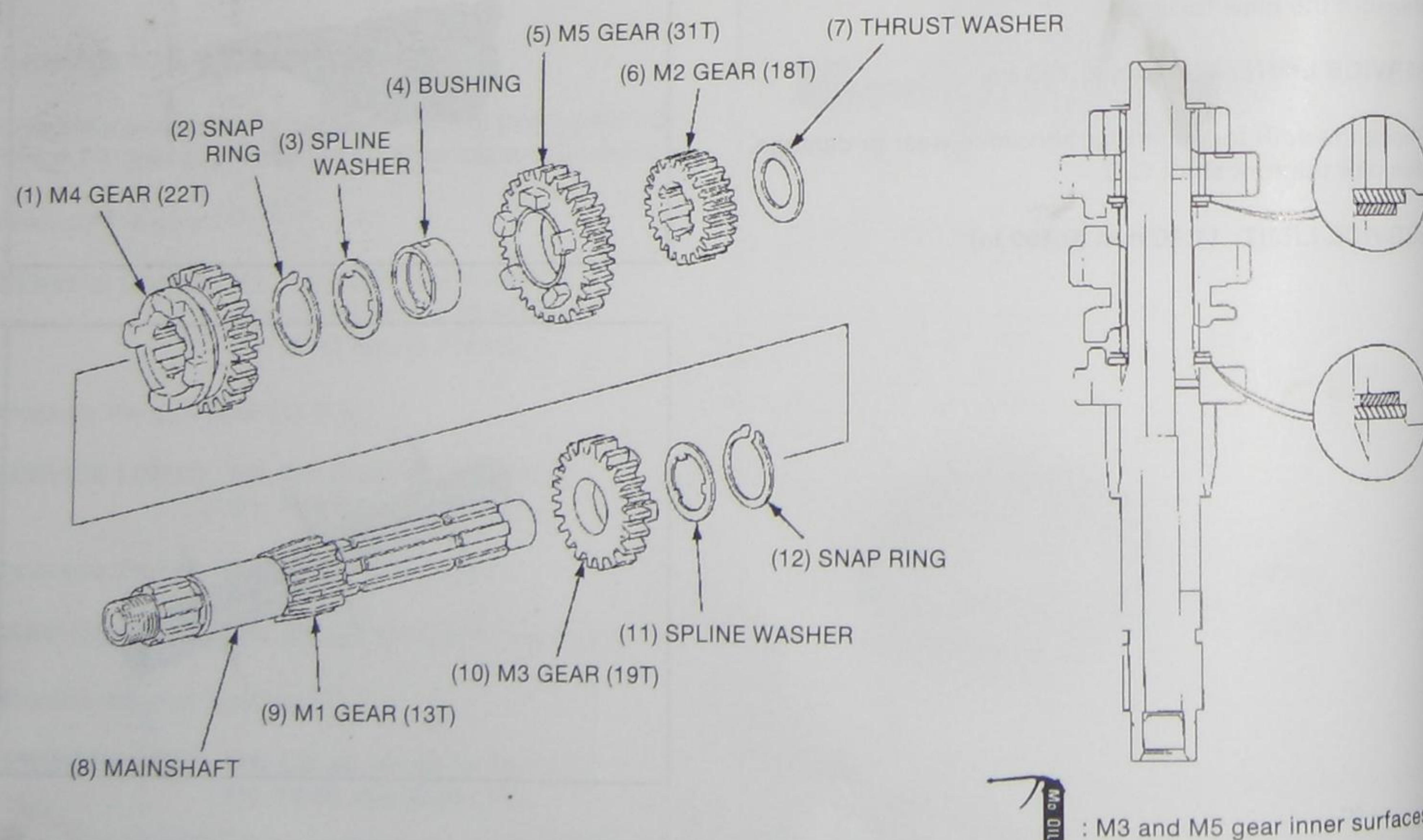
Assemble the mainshaft and countershaft.

NOTE:

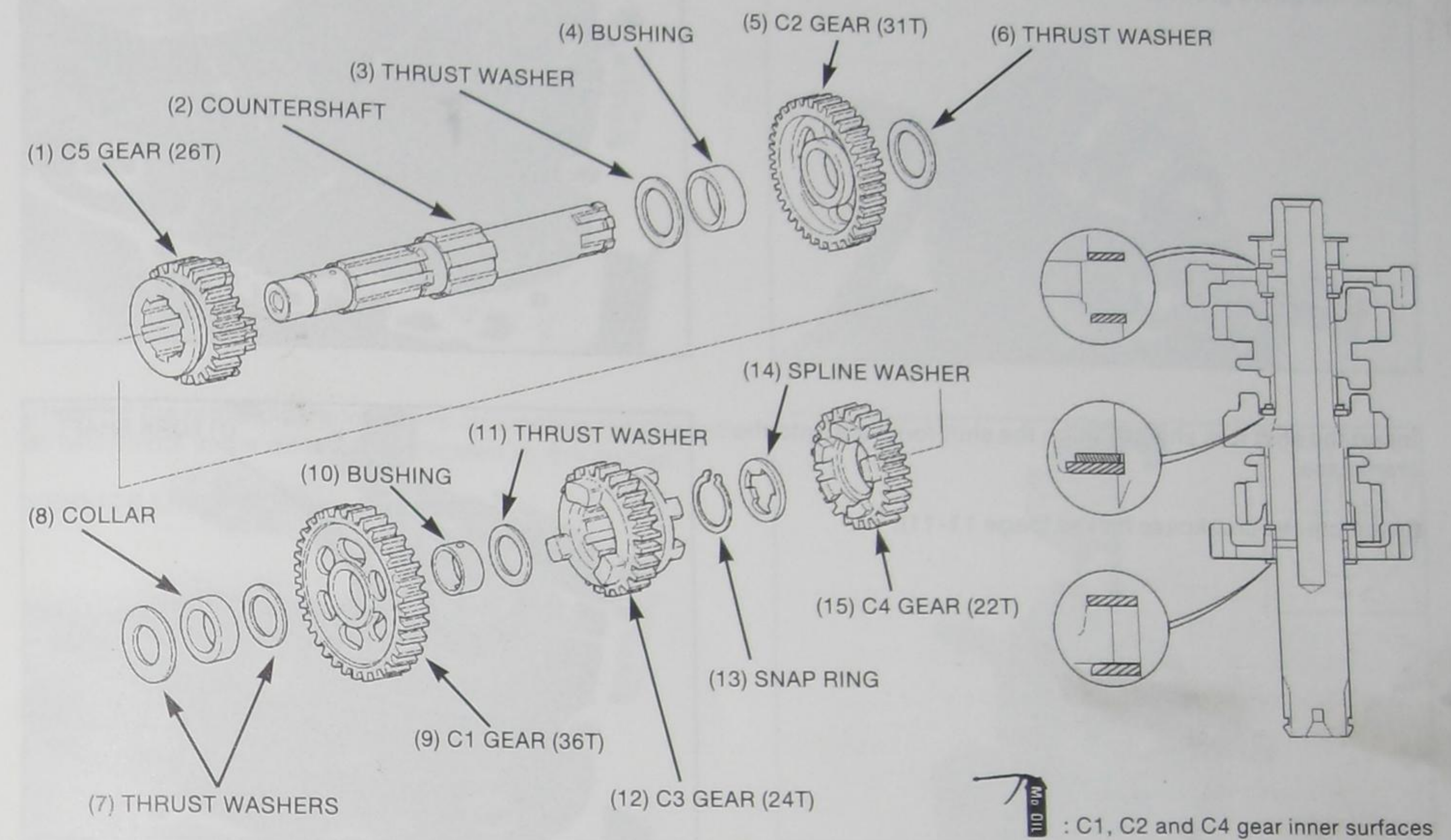
- Always install the washer and snap ring with the chamfered (rolled) edge facing away from the thrust load.
- Do not reuse worn snap ring which could easily spin in the groove.
- Install the snap ring so that its end gap aligns with the groove in the splines.
- Make sure that the snap ring is fully seated in the shaft groove after installing it.



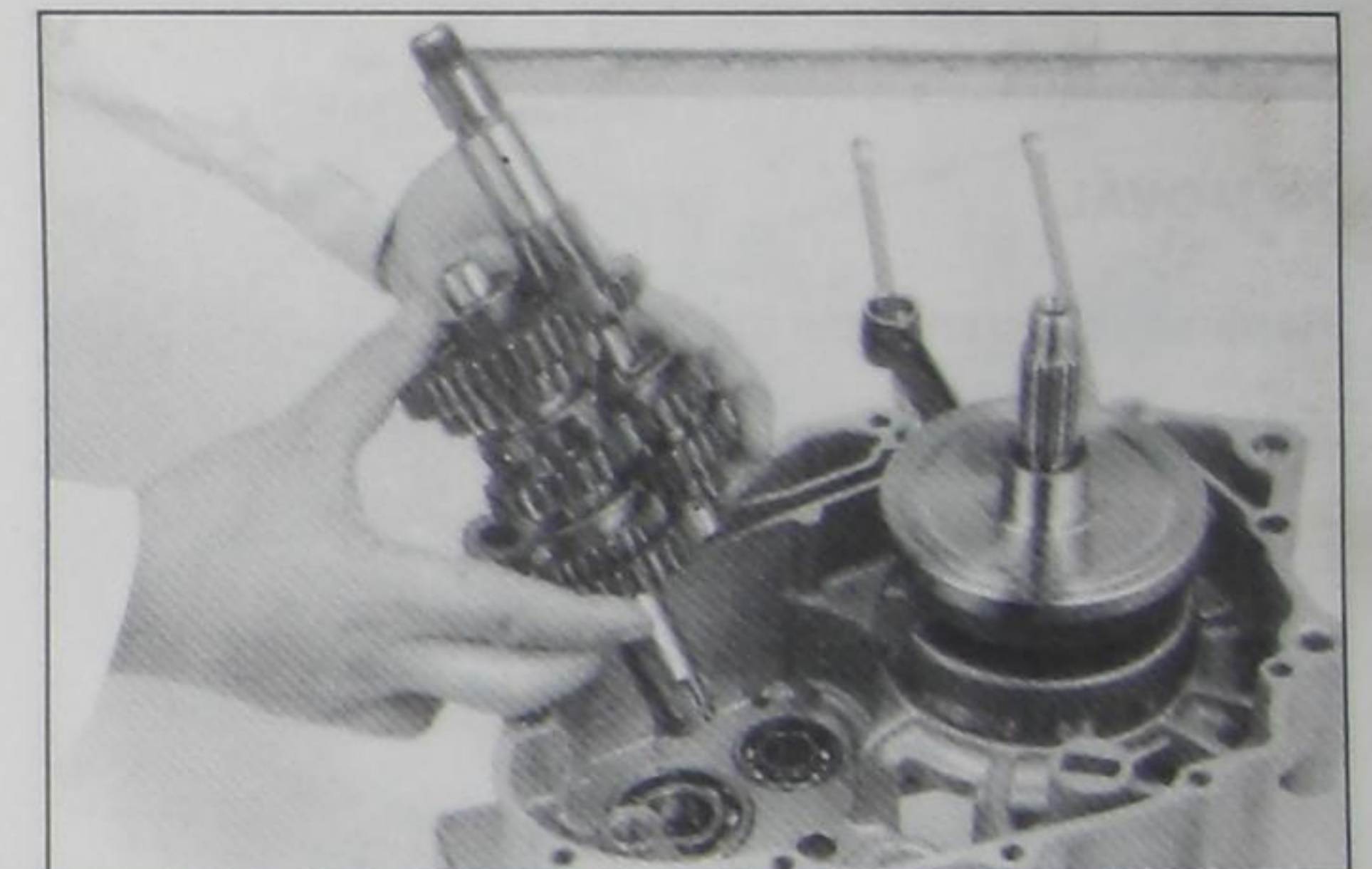
MAINSHAFT



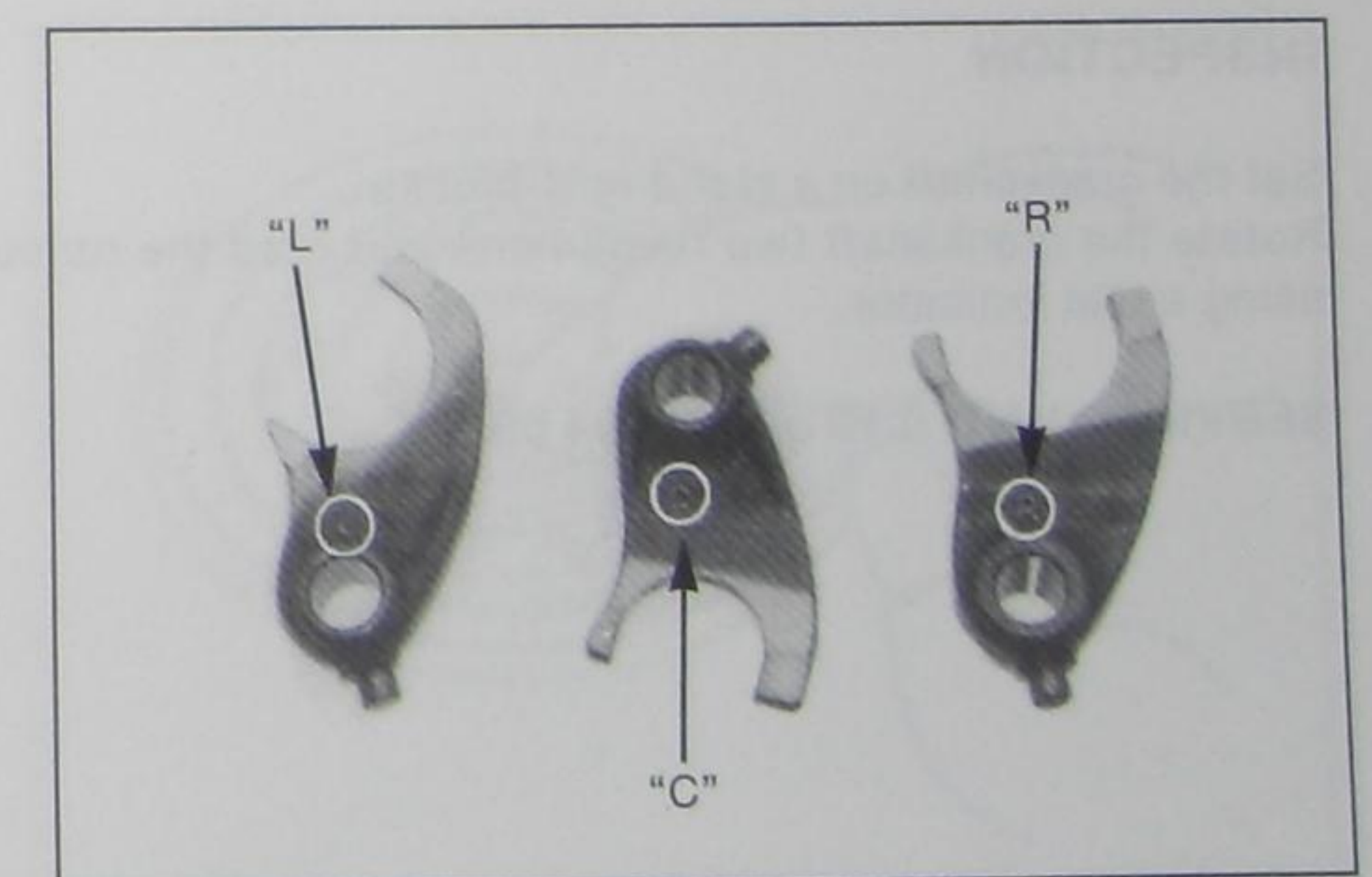
COUNTERSHAFT



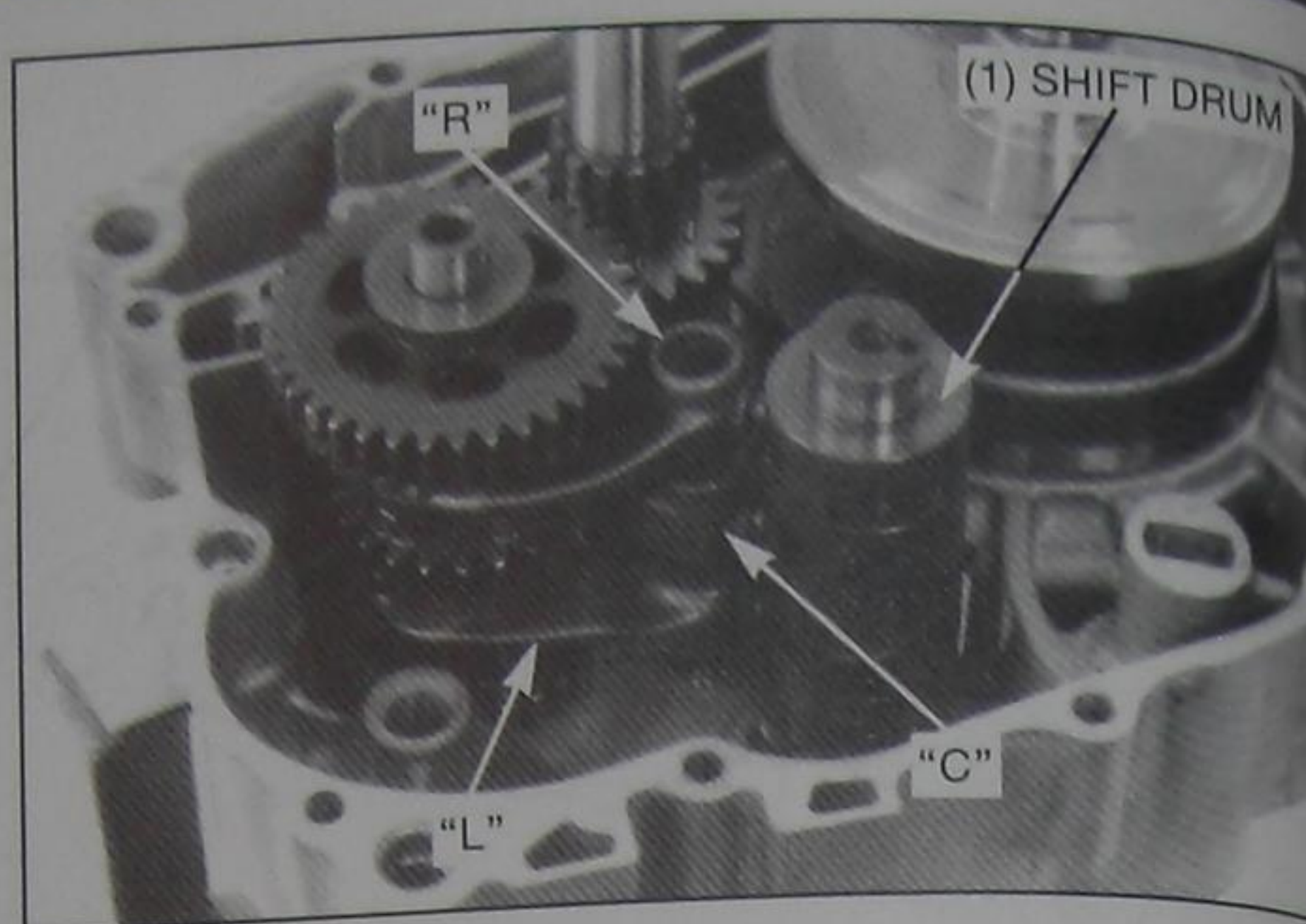
Install the mainshaft and countershaft assemblies into the left crankcase.



Each shift fork has an identification marks; "L" (Left), "C" (Center), "R" (Right). Install the shift forks into the shifter gear grooves with the marks facing down (left crankcase side).

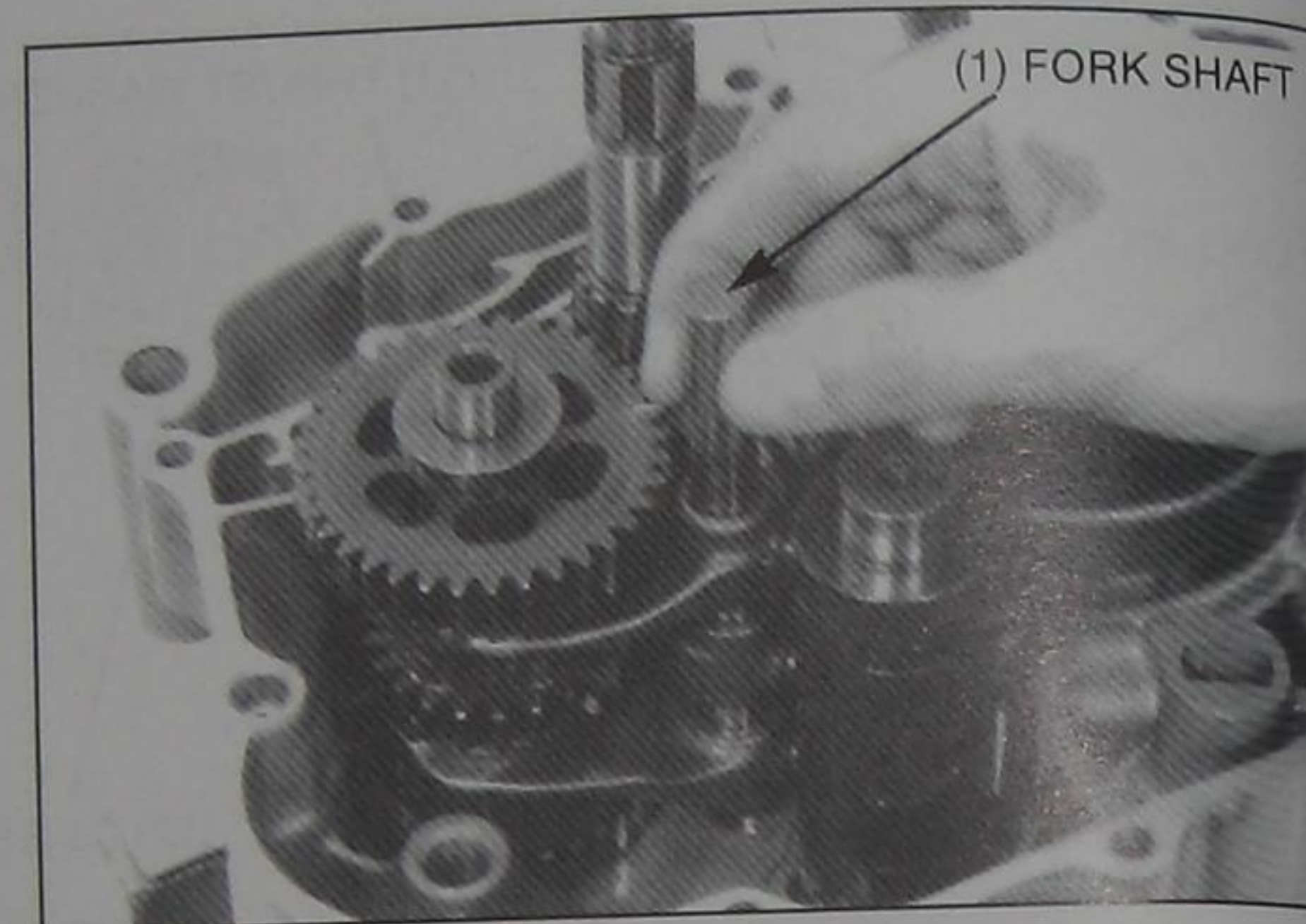


Install the shift drum by aligning the shift fork guide pins with the guide groove.



Insert the shift fork shaft through the shift forks and into the crankcase.

Assemble the crankcase halves (page 11-11).

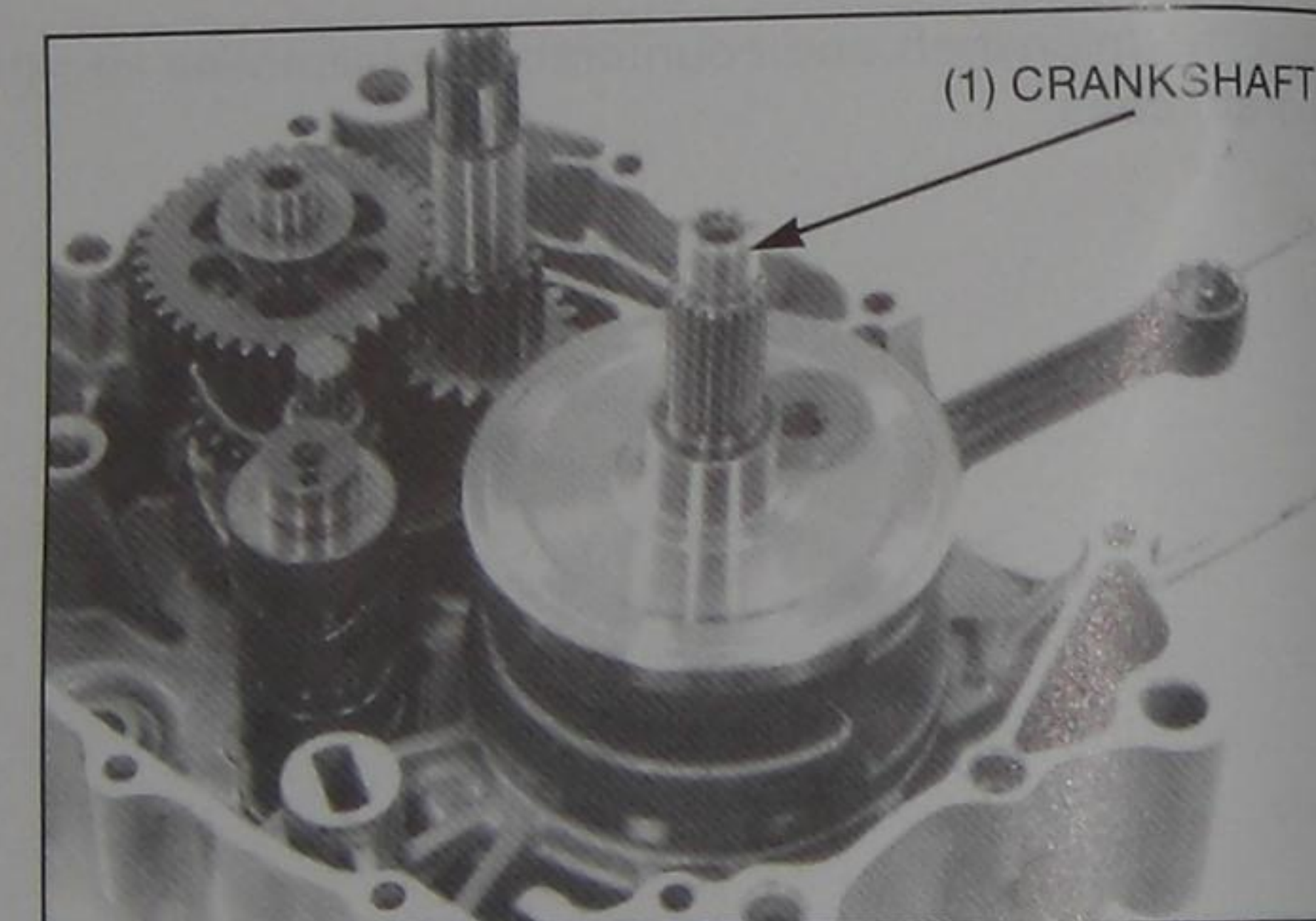


Crankshaft

REMOVAL

Separate the crankcase (page 11-3).

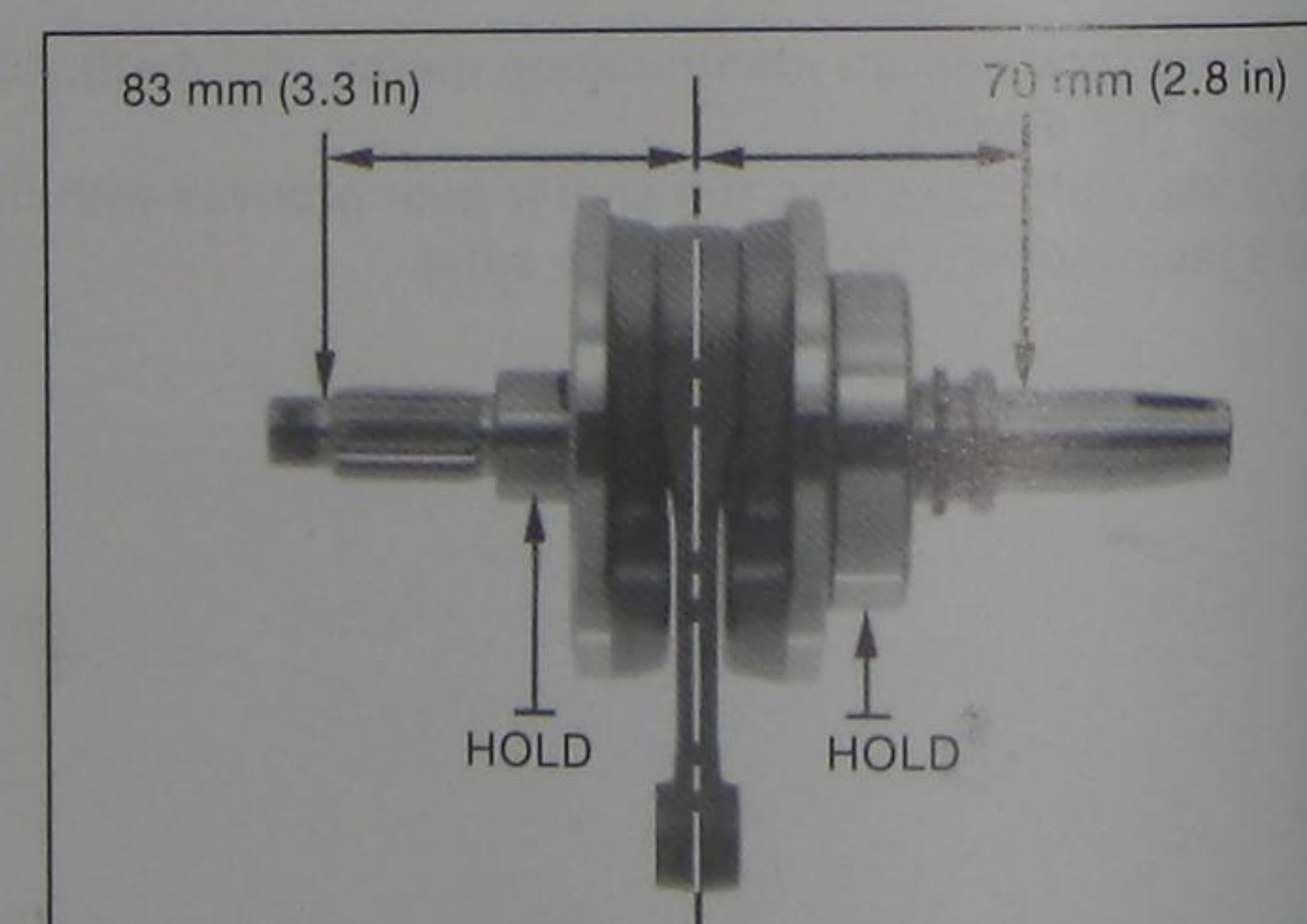
Remove the crankshaft.



INSPECTION

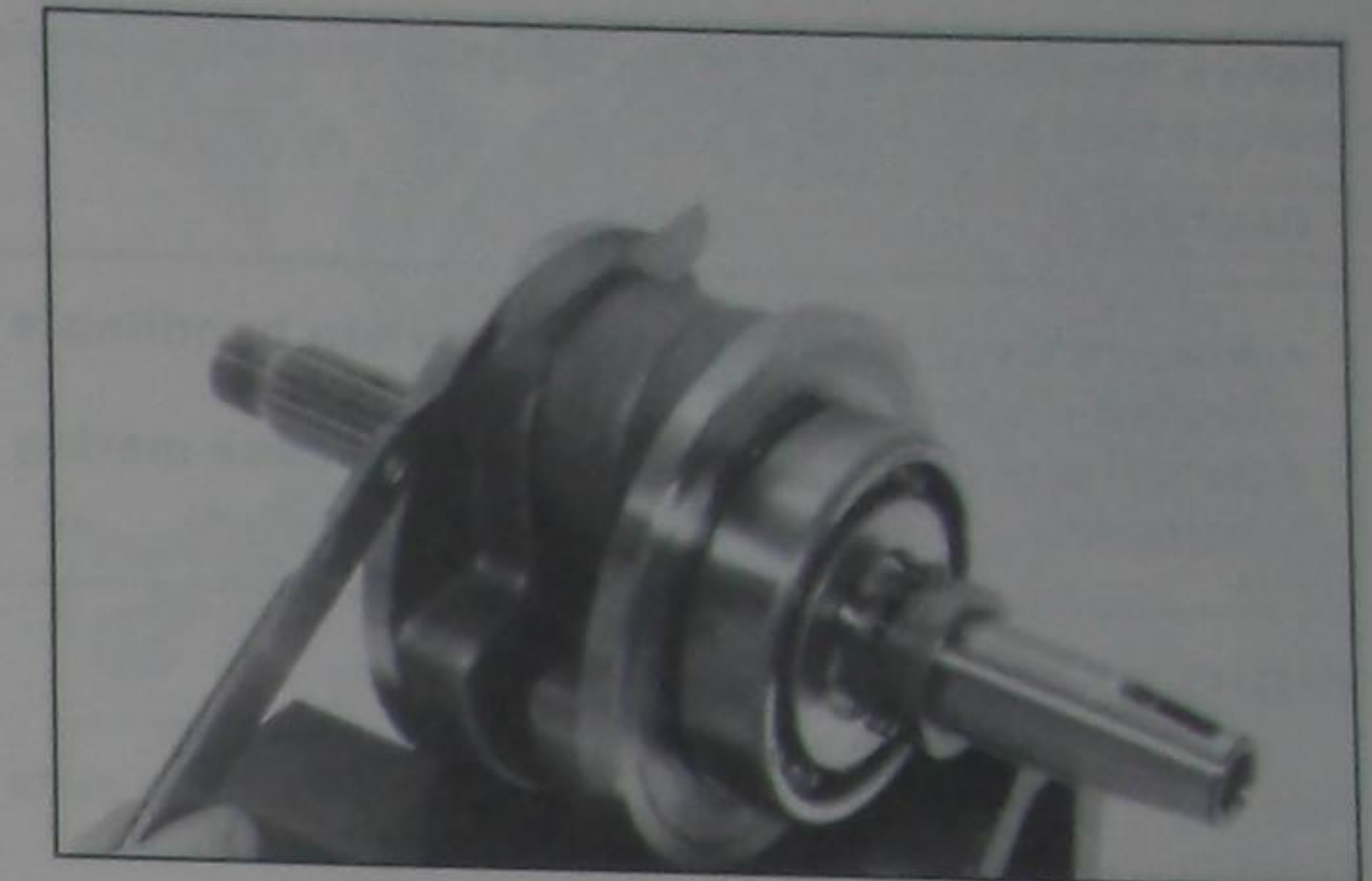
Set the crankshaft on a stand or V-blocks. Rotate the crankshaft two revolutions and read the runout using a dial indicator.

SERVICE LIMIT: 0.10 mm (0.004 in)



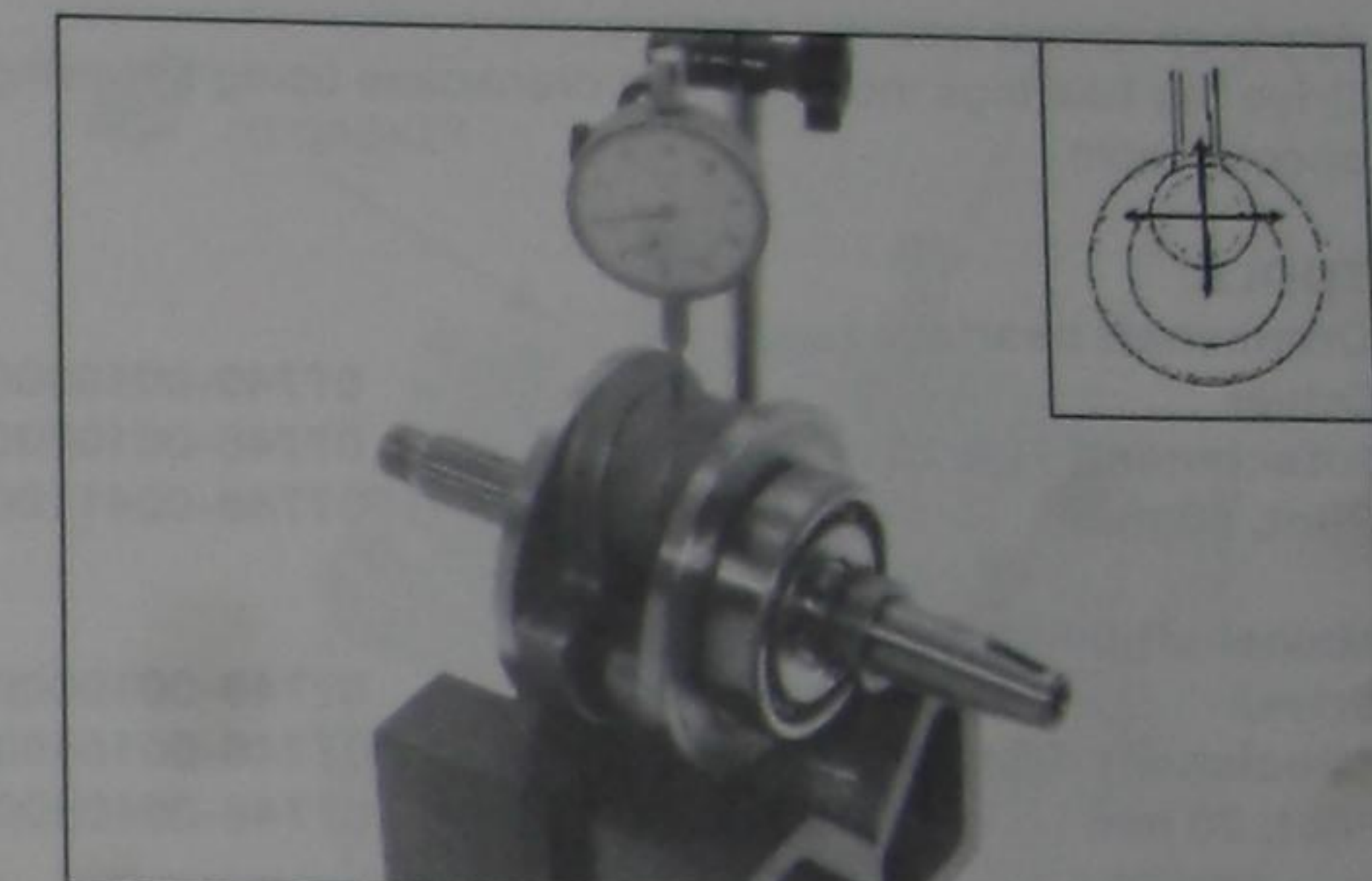
Measure the side clearance of the connecting rod big end with a feeler gauge.

SERVICE LIMIT: 0.5 mm (0.02 in)



Measure the radial clearance of the connecting rod big end at two points in the directions indicated by the arrows.

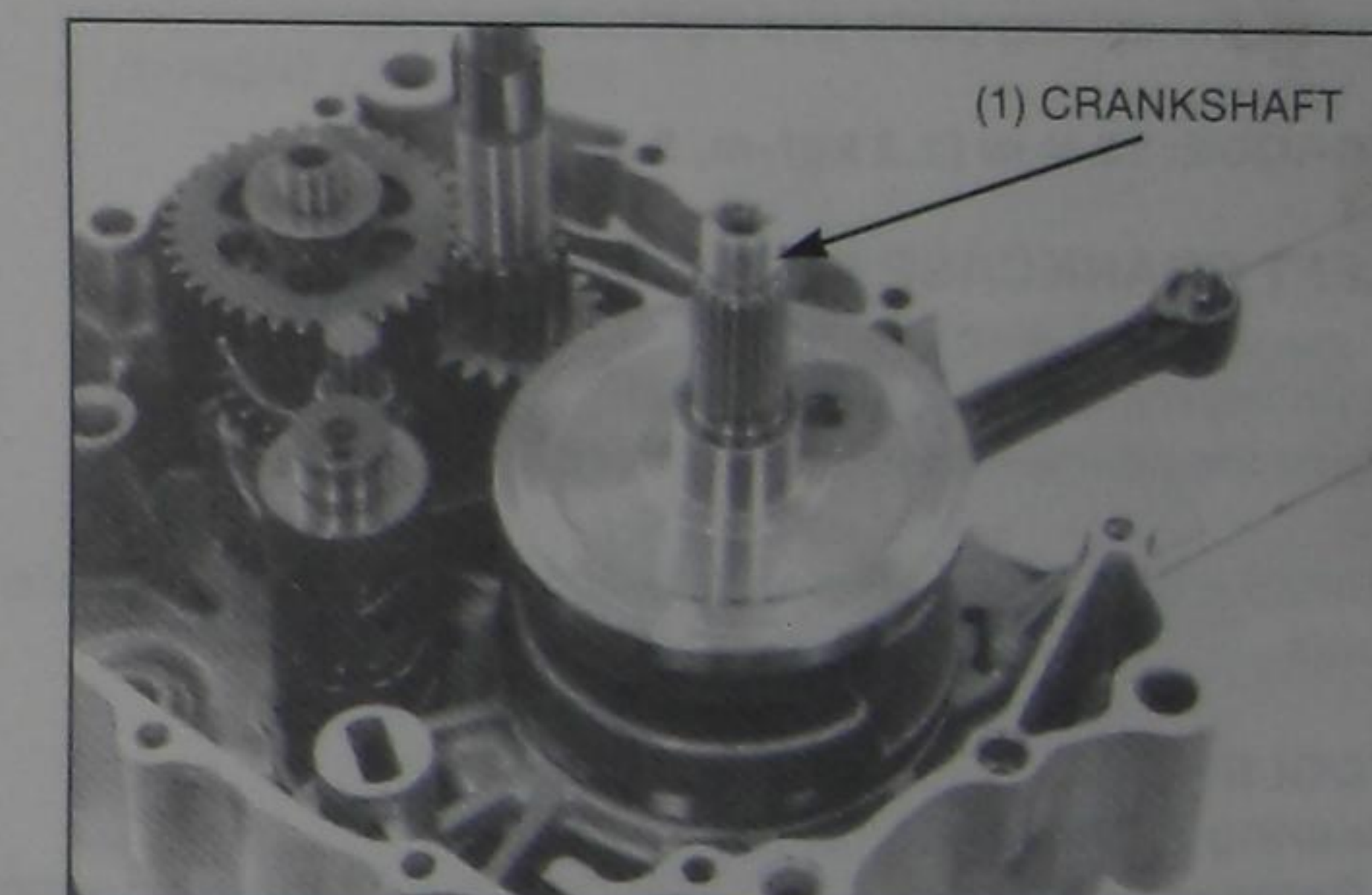
SERVICE LIMIT: 0.05 mm (0.002 in)



INSTALLATION

Install the crankshaft into the left crankcase.

Assemble the crankcase halves (page 11-11).



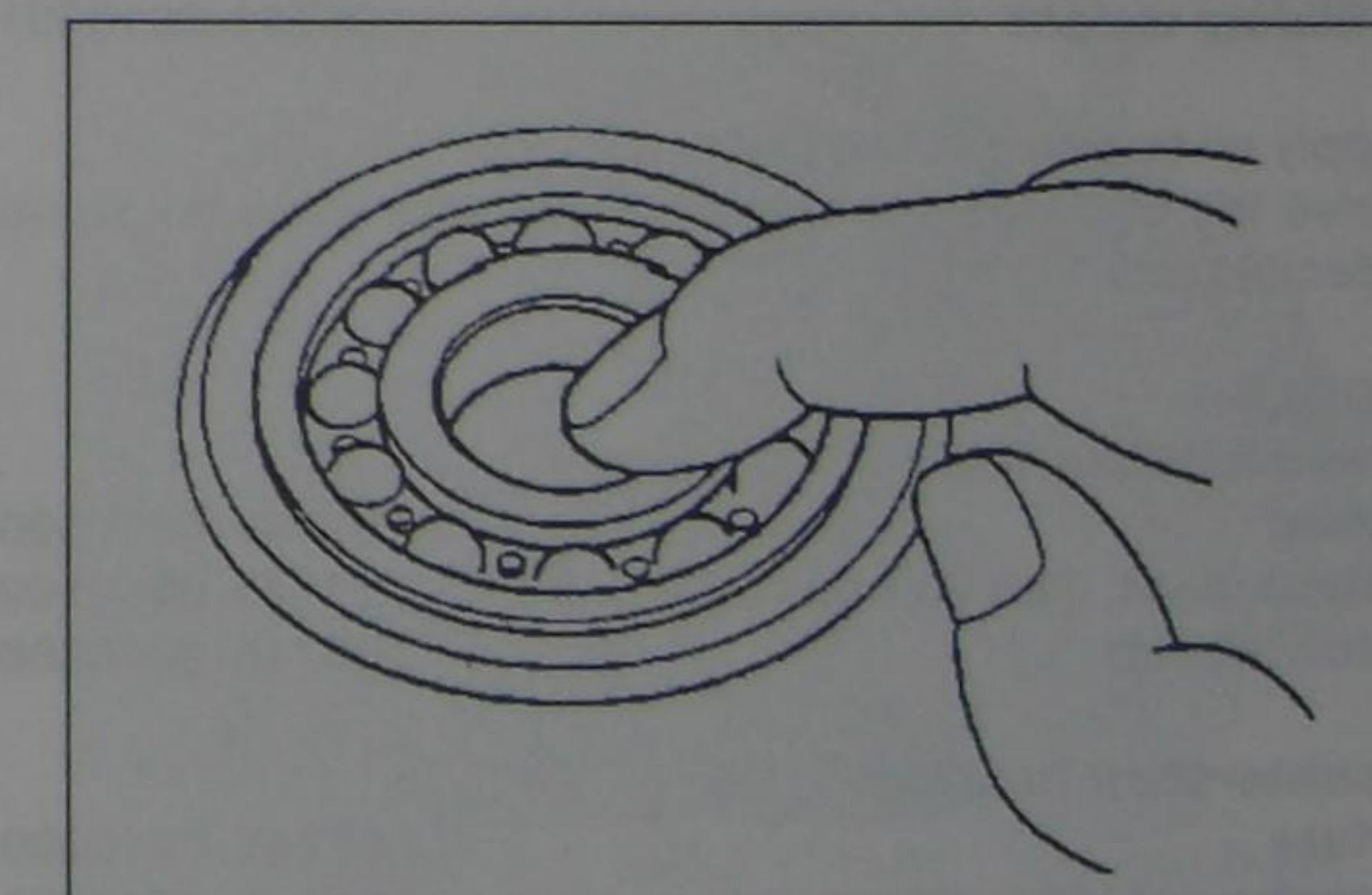
Crankcase Bearing Replacement

Remove the following

- Transmission (page 11-4)
- Crankshaft (page 11-8)

Turn the inner race of each transmission bearing with your finger. The bearing should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the crankcase.

Replace the bearing if the inner race does not turn smoothly, quietly, or if the outer race fit loosely in the crankcase.



CRANKCASE/TRANSMISSION/CRANKSHAFT

Before removing the bearings, heat the crankcase evenly using a heat gun.

CAUTION

- Always wear insulated gloves when handling a heated crankcase.
- Be careful not to damage the crankcase mating surfaces.

RIGHT CRANKCASE BEARINGS

Remove the two bolts and mainshaft bearing setting plate. Drive the bearings out of the right crankcase.

Apply oil to new bearing cavities. Drive the bearings into the right crankcase using following special tools.

TOOLS:

Crankshaft bearing:
Driver 07749-0010000
Attachment, 72 x 75 mm 07746-0010600
Pilot, 28 mm 07746-0041100

Mainshaft bearing:
Driver 07749-0010000
Attachment, 52 x 55 mm 07746-0010400
Pilot, 20 mm 07746-0040500

Apply locking agent to the bearing setting plate bolt threads. Install the setting plate and tighten the bolts.

TORQUE: 12 N·m (1.2 kgf-m, 9 lbf-ft)

LEFT CRANKCASE BEARINGS

Remove the countershaft oil seal. Drive the countershaft bearing out of the left crankcase.

Remove the mainshaft bearing with the following special tools.

TOOLS:

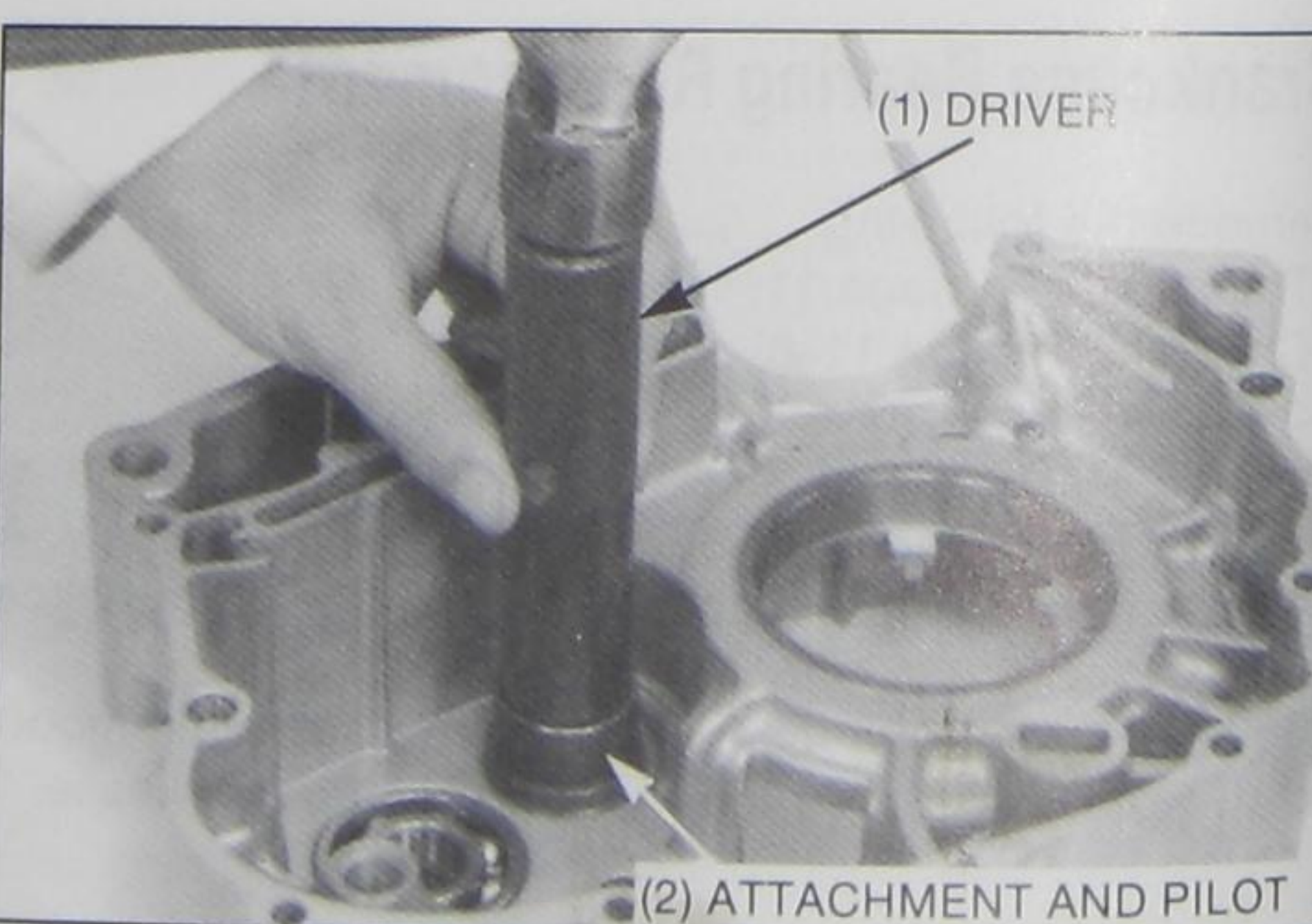
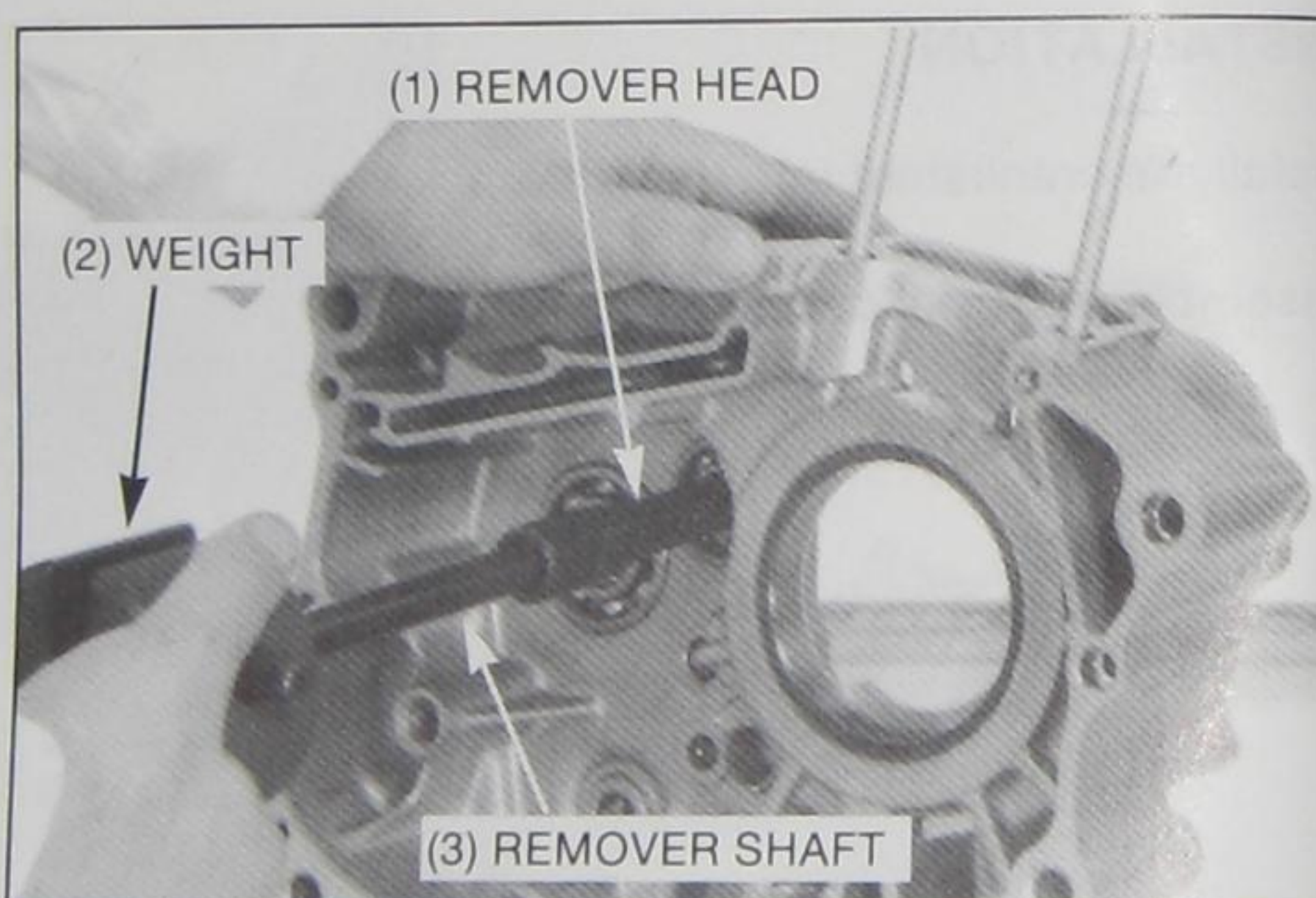
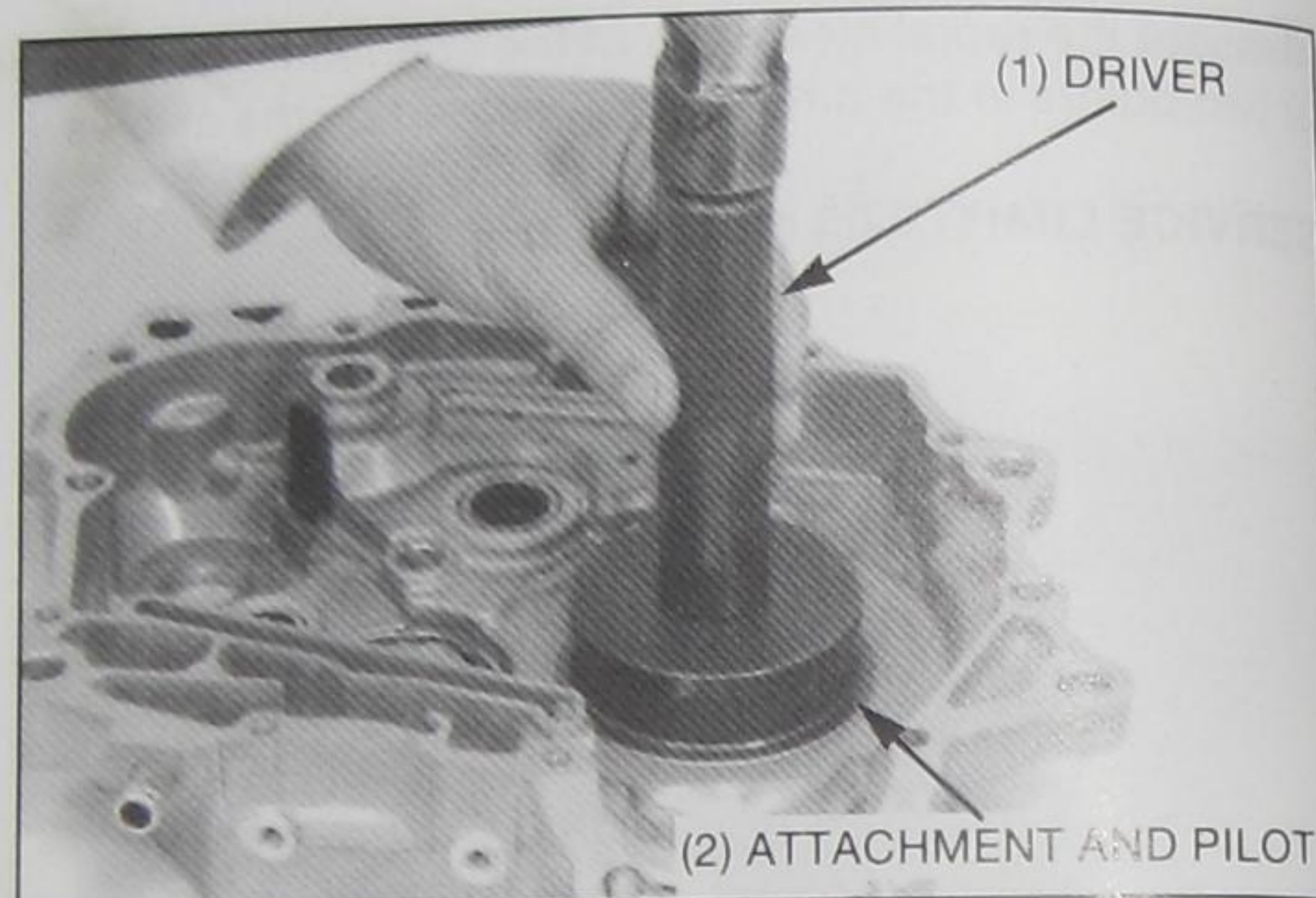
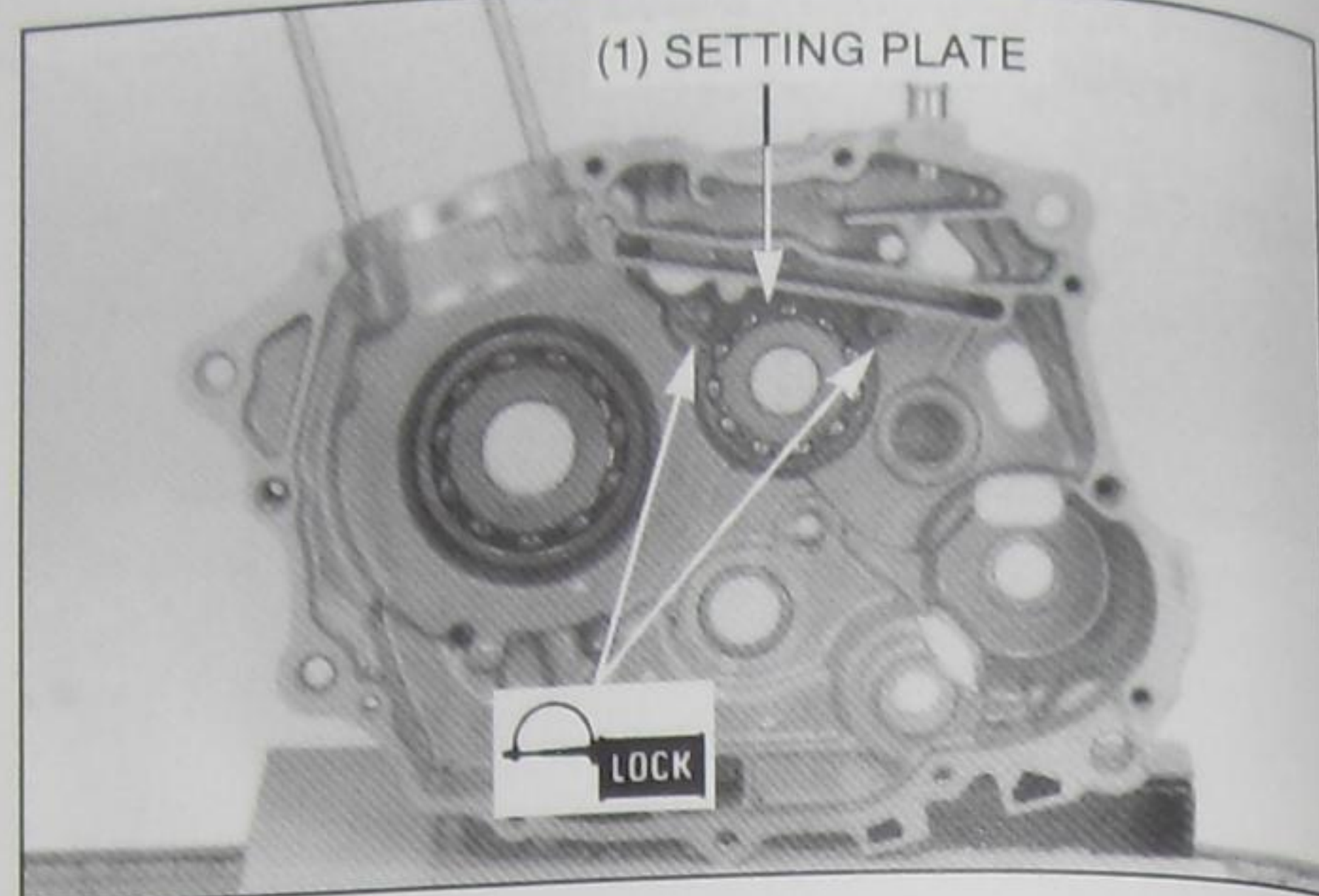
Bearing remover set, 15 mm
- Remover shaft 07936-KC10100
- Remover head 07936-KC10200
- Sliding weight 07741-0010201

Apply oil to new bearing cavities. Drive the bearings into the left crankcase using following special tools.

TOOLS:

Mainshaft bearing:
Driver 07749-0010000
Attachment, 32 x 35 mm 07746-0010100
Pilot, 15 mm 07746-0040300

Countershaft bearing:
Driver 07749-0010000
Attachment, 42 x 47 mm 07746-0010300
Pilot, 20 mm 07746-0040500



CRANKCASE/TRANSMISSION/CRANKSHAFT

Apply oil to a new countershaft oil seal. Install the oil seal until it is flush with the crankcase surface.

Install the following:
- Transmission (page 11-6)
- Crankshaft (page 11-9).

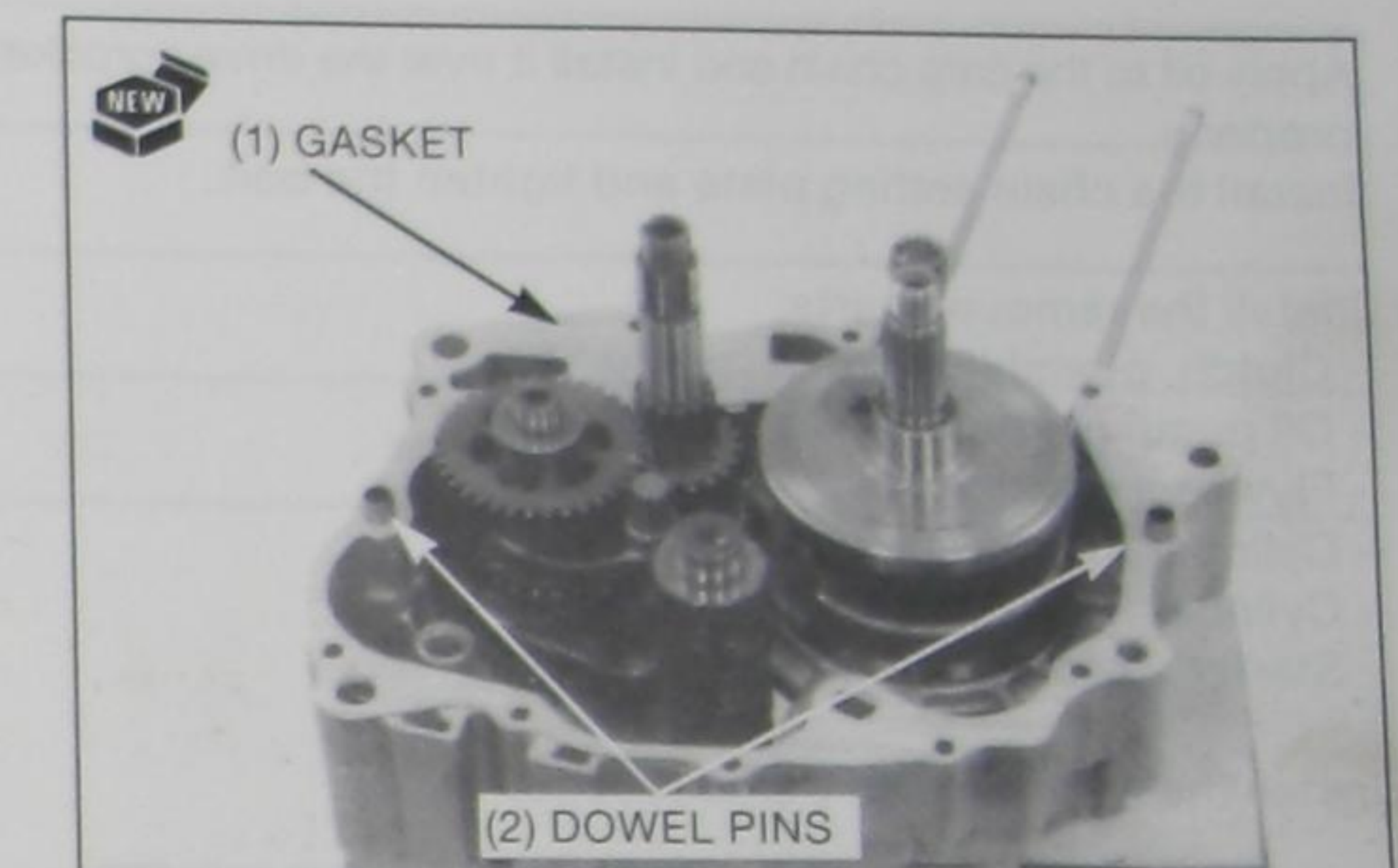


Crankcase Assembly

Clean the crankcase mating surfaces thoroughly, being careful not to damage them. Dress any roughness or irregularities with an oil stone.

Make sure all parts are installed in the left crankcase.

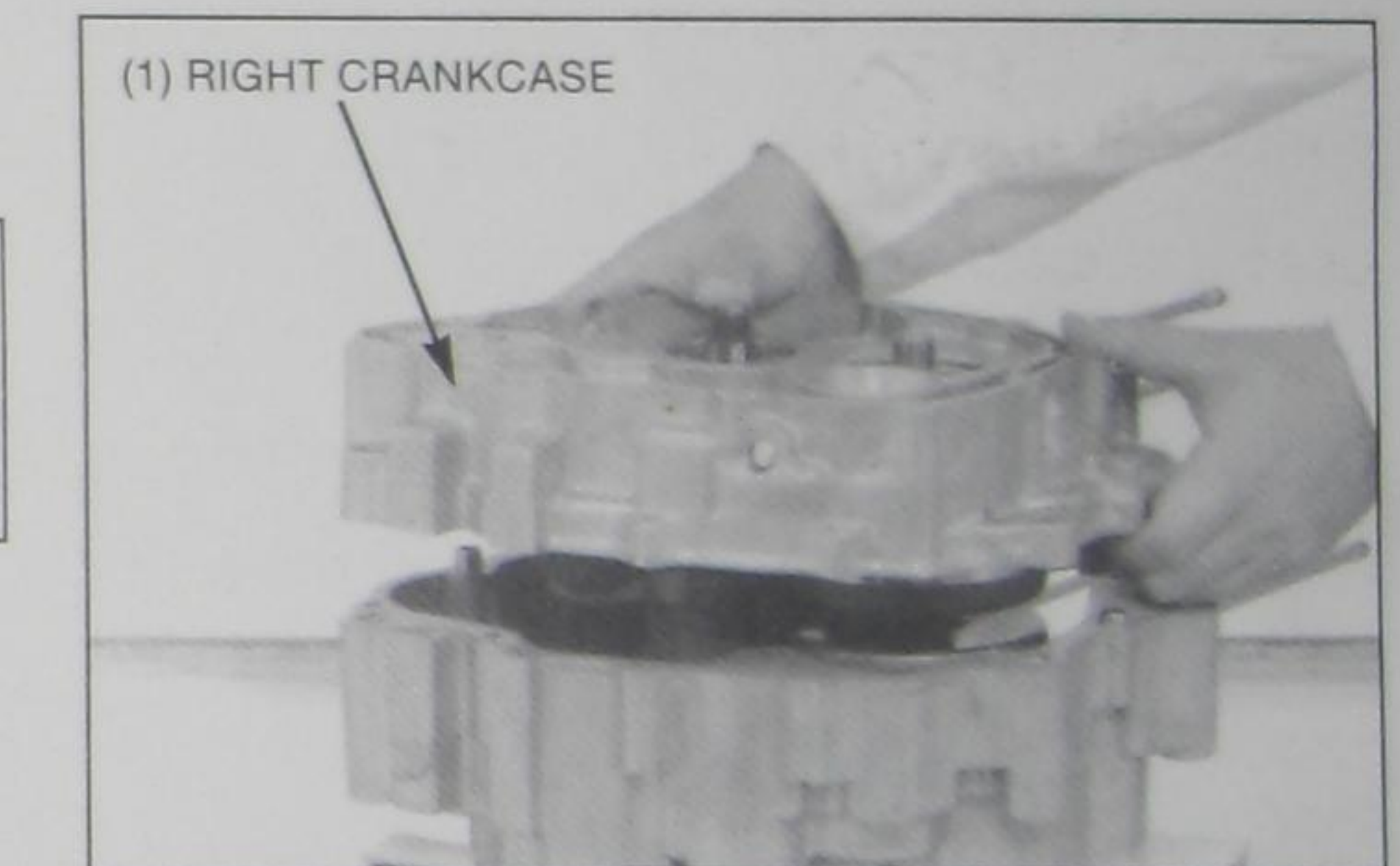
Install the dowel pins and a new gasket onto the left crankcase.



Install the right crankcase over the left crankcase.

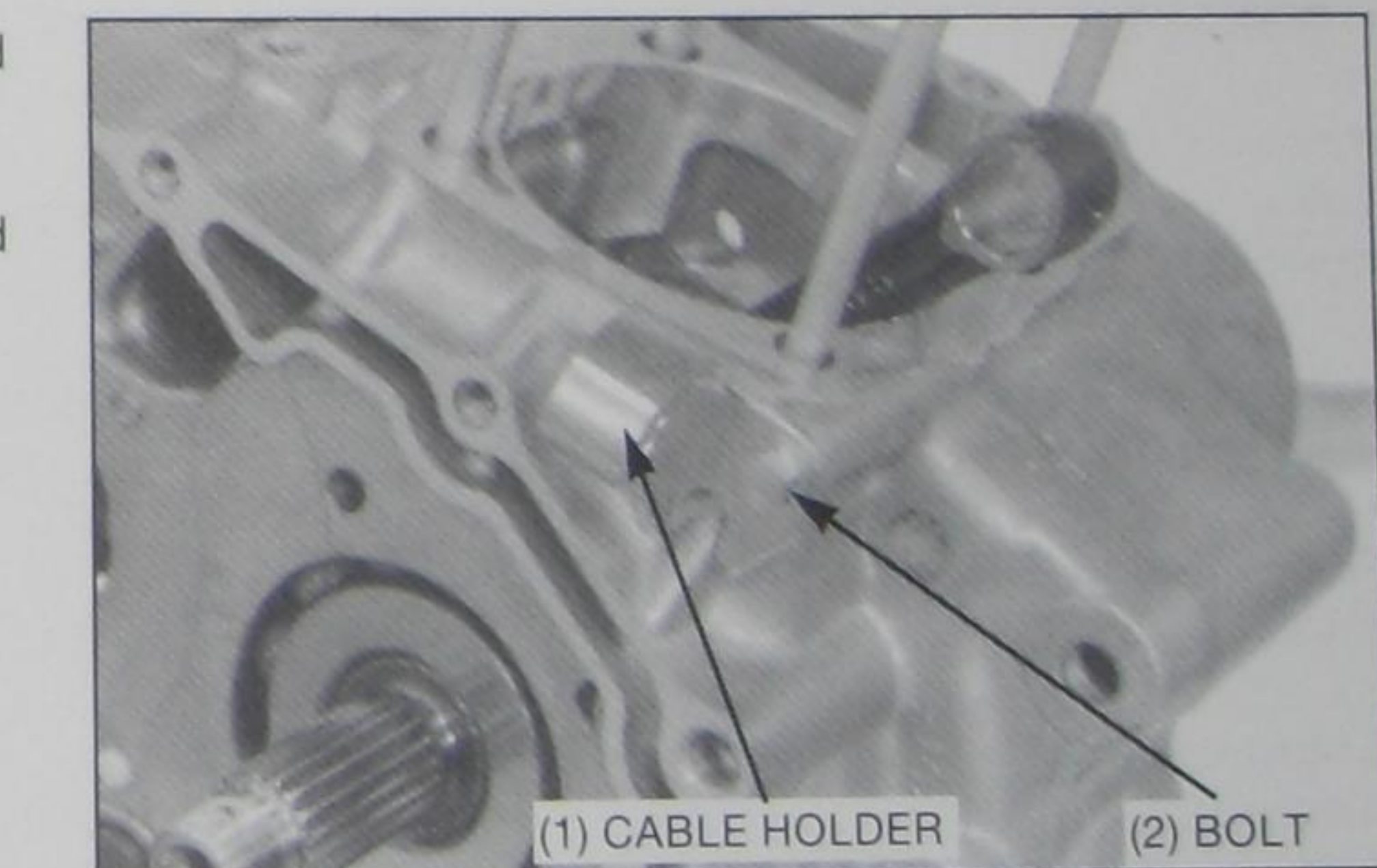
CAUTION

- Do not force the crankcase halves together; if there is excessive force required, something is wrong. Remove the right crankcase and check for misaligned parts.



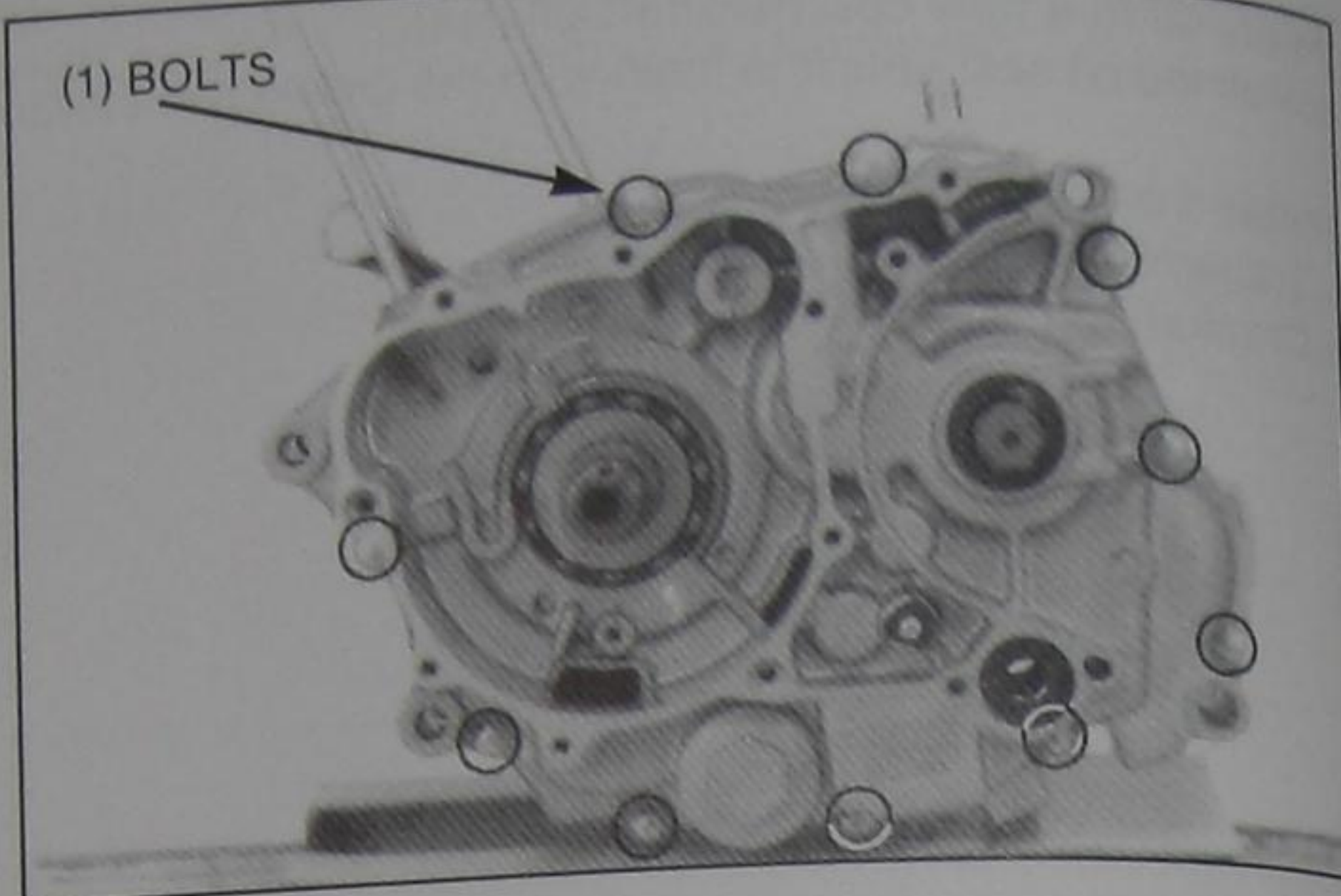
Make sure that the crankcase mating surfaces are touched evenly.

Install the right crankcase bolt with clutch cable holder and tighten it.



CRANKCASE/TRANSMISSION/CRANKSHAFT

Install the ten left crankcase bolts and tighten them in a crisscross pattern in several steps.

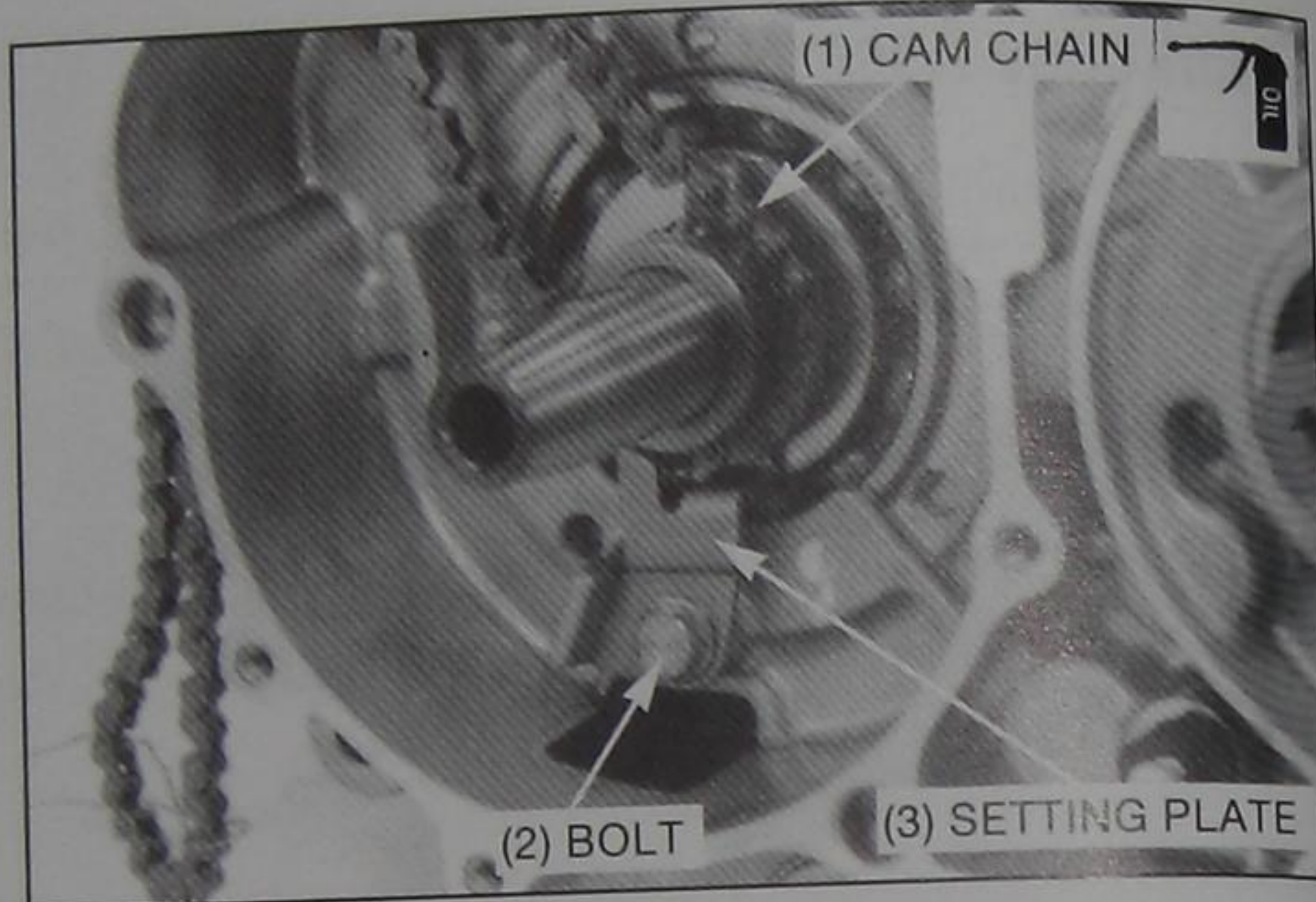


Apply oil to the cam chain and install it over the drive sprocket properly.
Install the chain setting plate and tighten the bolt.

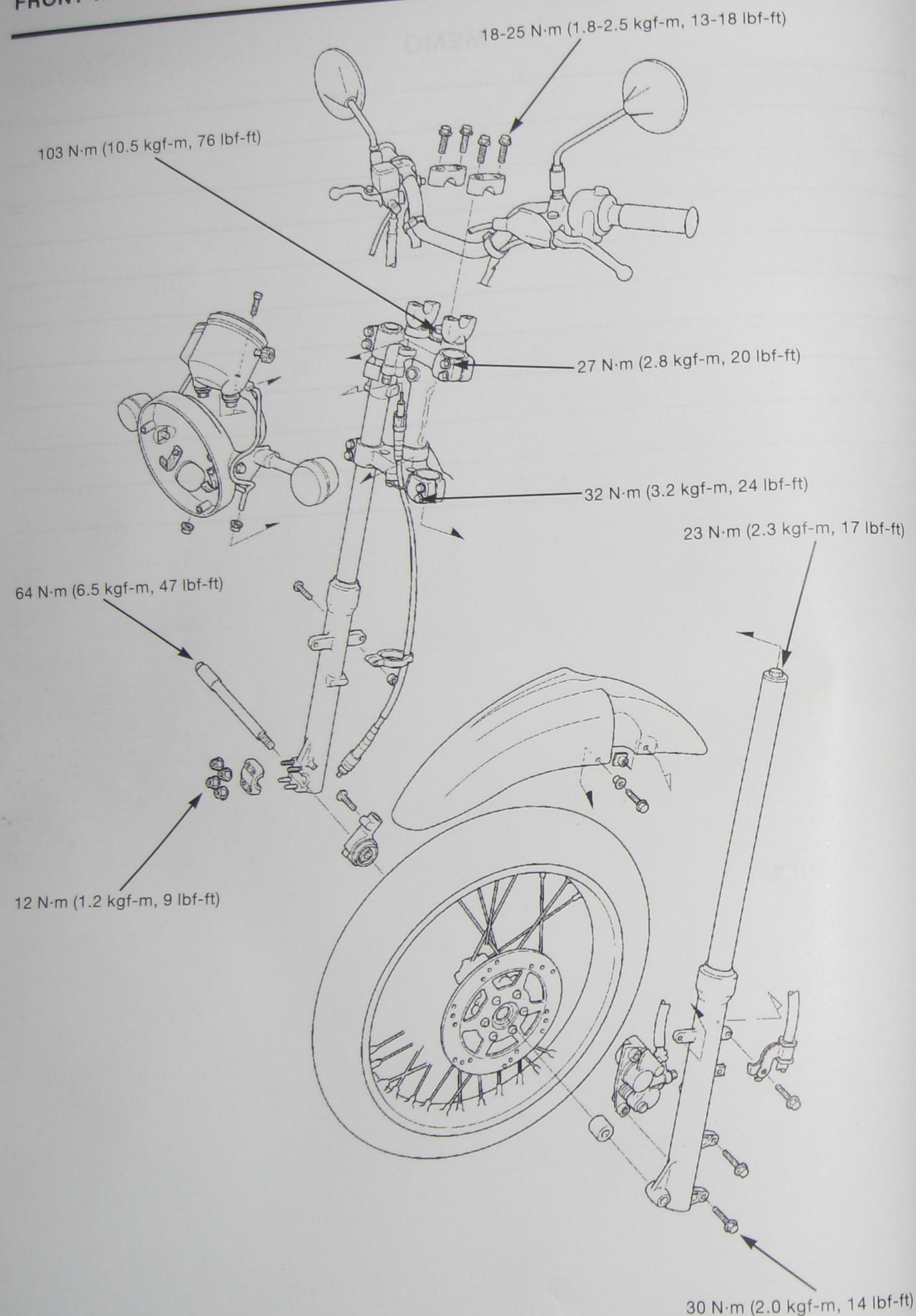
Install the removed parts:

- Clutch, gearshift linkage (section 9)
- Oil pump (section 4)
- Flywheel (section 10)
- Cylinder, piston (section 8)
- Cylinder head (section 7)
- Starter motor (section 17)

Install the engine in the frame (section 6).



MEMO



12. Front Wheel/Suspension/Steering

SERVICE INFORMATION	12-1	FORK	12-7
TROUBLESHOOTING	12-2	HANDLEBAR	12-14
FRONT WHEEL	12-3	STEERING STEM	12-17

Service Information

GENERAL

WARNING

- Riding on damaged rim or spokes impairs safe operation of the vehicle.
- A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.

- A hoist or equivalent is required to support the motorcycle when servicing the front wheel, fork and steering stem.
- Refer to section 14 for hydraulic brake system service.
- Refer to section 18 for light, meter and switch service.

SPECIFICATIONS

Unit: mm (in)

Item		Standard	Service Limit
Minimum tire tread depth		—	3.0 (0.12)
Cold tire pressure	Driver only	175 kPa (1.75 kgf/cm ² , 25 psi)	—
	Driver and passenger	175 kPa (1.75 kgf/cm ² , 25 psi)	—
Front axle runout		—	0.20 (0.008)
Front wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Fork spring free length		587.6 (23.13)	579.3 (22.81)
Fork tube runout		—	0.20 (0.008)
Fork fluid capacity		384 cm ³ (12.9 US oz, 13.5 Imp oz)	—
Fork fluid level		140 (5.5)	—

TORQUE VALUES

Brake disc bolt	20 N·m (3.1 kgf-m, 22 lbf-ft)	ALOC bolt: replace with a new one
Front axle	64 N·m (6.5 kgf-m, 47 lbf-ft)	
Front axle holder nut	12 N·m (1.2 kgf-m, 9 lbf-ft)	U-nut
Spoke nipple	4 N·m (0.4 kgf-m, 2.9 lbf-ft)	
Fork socket bolt	20 N·m (2.0 kgf-m, 14 lbf-ft)	Apply locking agent to the threads
Fork cap	23 N·m (2.3 kgf-m, 17 lbf-ft)	
Fork top bridge pinch bolt	27 N·m (2.8 kgf-m, 20 lbf-ft)	
Fork bottom bridge pinch bolt	32 N·m (3.2 kgf-m, 24 lbf-ft)	
Brake caliper mounting bolt	30 N·m (2.0 kgf-m, 14 lbf-ft)	ALOC bolt: replace with a new one
Steering top thread	5 N·m (0.5 kgf-m, 3.6 lbf-ft)	page 12-20
Steering stem nut	103 N·m (10.5 kgf-m, 76 lbf-ft)	
Handle holder bolt	18-25 N·m (1.8-2.5 kgf-m, 13-18 lbf-ft)	

TOOLS

Bearing remover shaft	07746-0050100
Bearing remover head, 15 mm	07746-0050400
Driver	07749-0010000
Attachment, 32 x 35 mm	07746-0010100
Attachment, 42 x 47 mm	07746-0010300
Pilot, 15 mm	07746-0040300
Fork seal driver	07947-4630100
Steering stem socket	07916-KA50100
Ball race remover	07953-MJ10000
- Remover attachment	07953-MJ10100
- Remover handle	07953-MJ10200
Steering stem driver	07946-4300101
Spoke wrench C, 5.8 x 6.1 mm	07701-0020300

Troubleshooting

Hard steering

- Steering top thread too tight
- Worn or damaged steering head bearings
- Bent steering stem
- Insufficient tire pressure
- Faulty front tire

Steers one side or does not track straight

- Damaged or loose steering head bearings
- Bent forks
- Bent axle
- Wheel installed incorrectly
- Bent frame
- Worn or damaged wheel bearings
- Faulty front tire

Front wheel wobbling

- Bent rim
- Worn or damaged front wheel bearings
- Loose or broken spokes
- Faulty front tire
- Unbalanced front tire and wheel
- Wheel installed incorrectly

Front wheel turns hard

- Faulty front wheel bearings
- Bent front axle
- Front brake drag

Soft suspension

- Insufficient fluid in fork
- Incorrect fork fluid weight
- Deteriorated fork fluid
- Weak fork springs
- Insufficient tire pressure

Hard suspension

- Bent fork tubes
- Too much fluid in fork
- Incorrect fork fluid weight
- Clogged fork fluid passage

Front suspension noise

- Insufficient fluid in fork
- Loose fork fasteners

Front Wheel

REMOVAL

Remove the speedometer set screw and disconnect the speedometer cable.

Loosen the axle holder nuts.
Loosen the front axle.

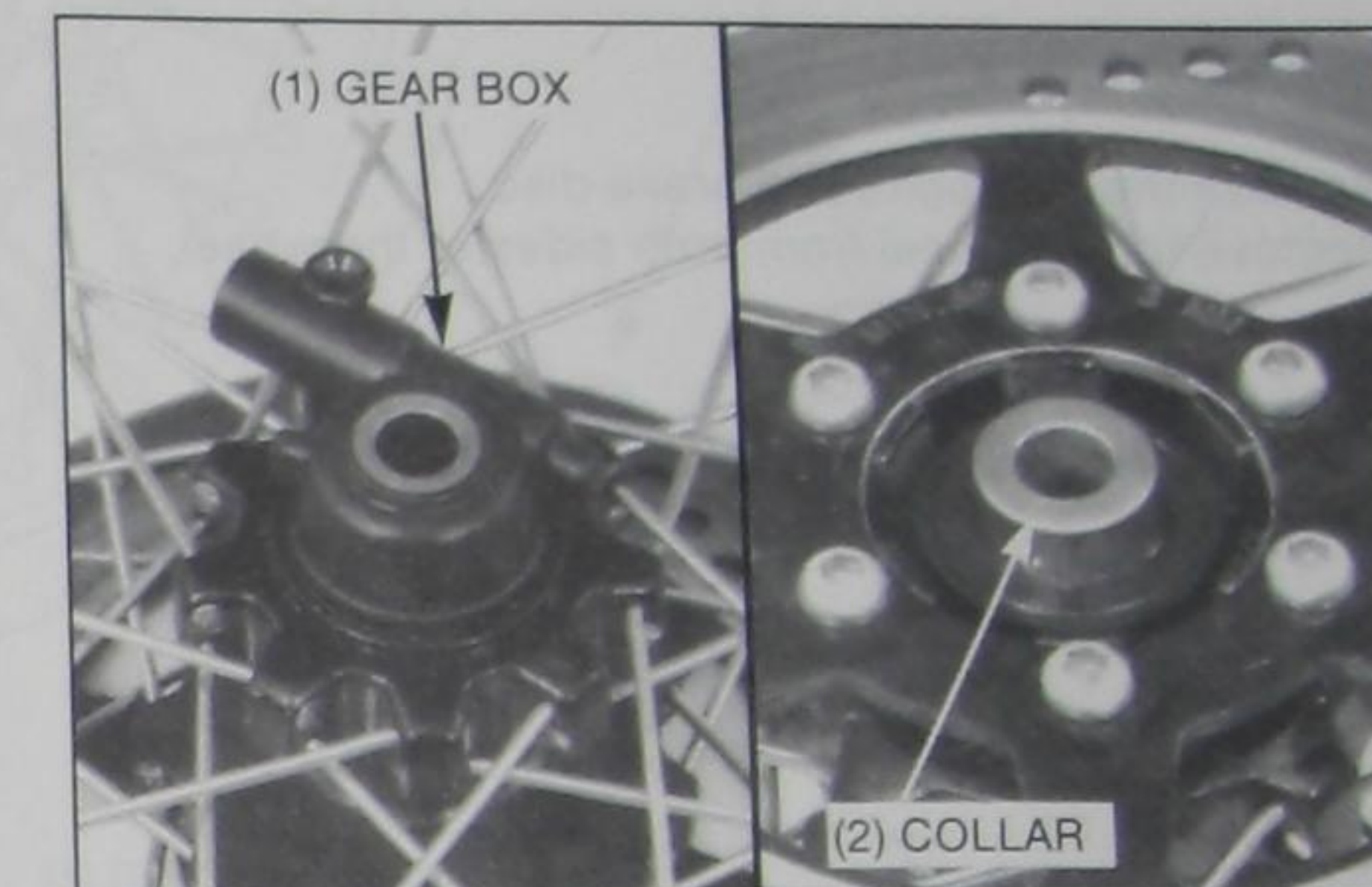
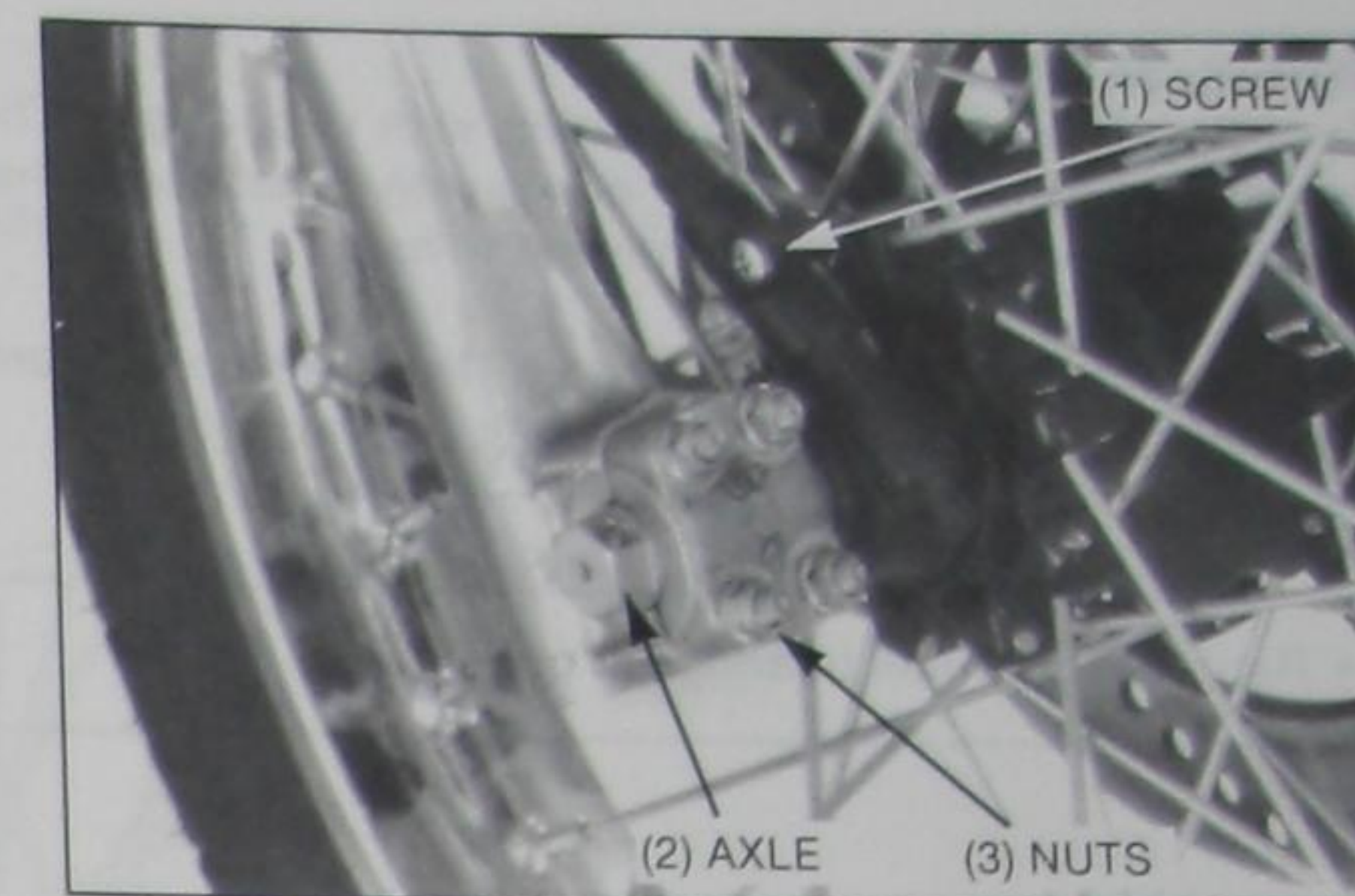
Support the motorcycle securely using a hoist or equivalent and raise the front wheel off the ground.

Remove the axle and the front wheel.

NOTE:

- Do not operate the brake lever after removing the wheel.

Remove the speedometer gear box and side collar.



INSPECTION

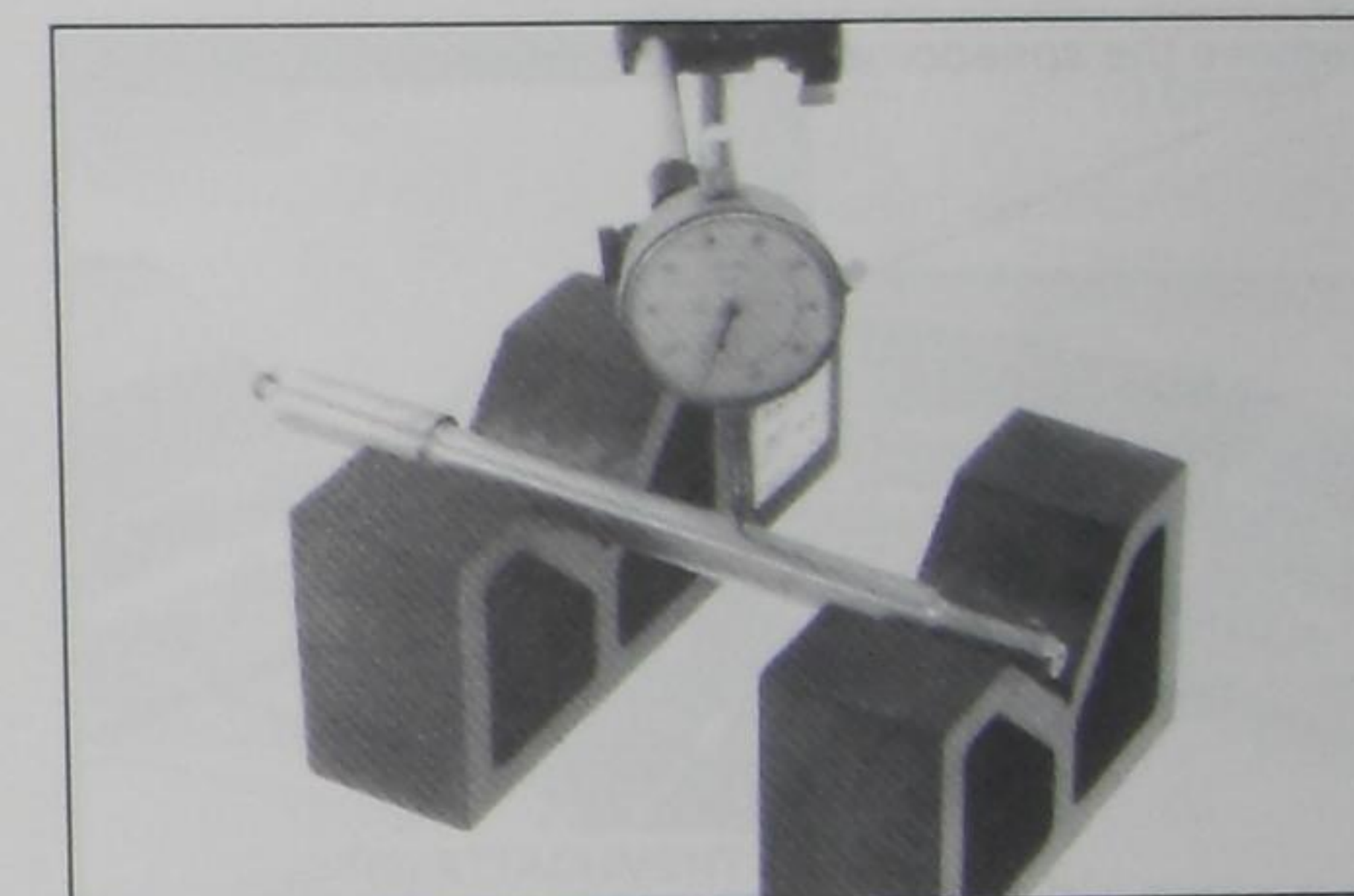
AXLE

Set the front axle in V-blocks.

Turn the front axle and measure the runout using a dial indicator.

Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.20 mm (0.008 in)

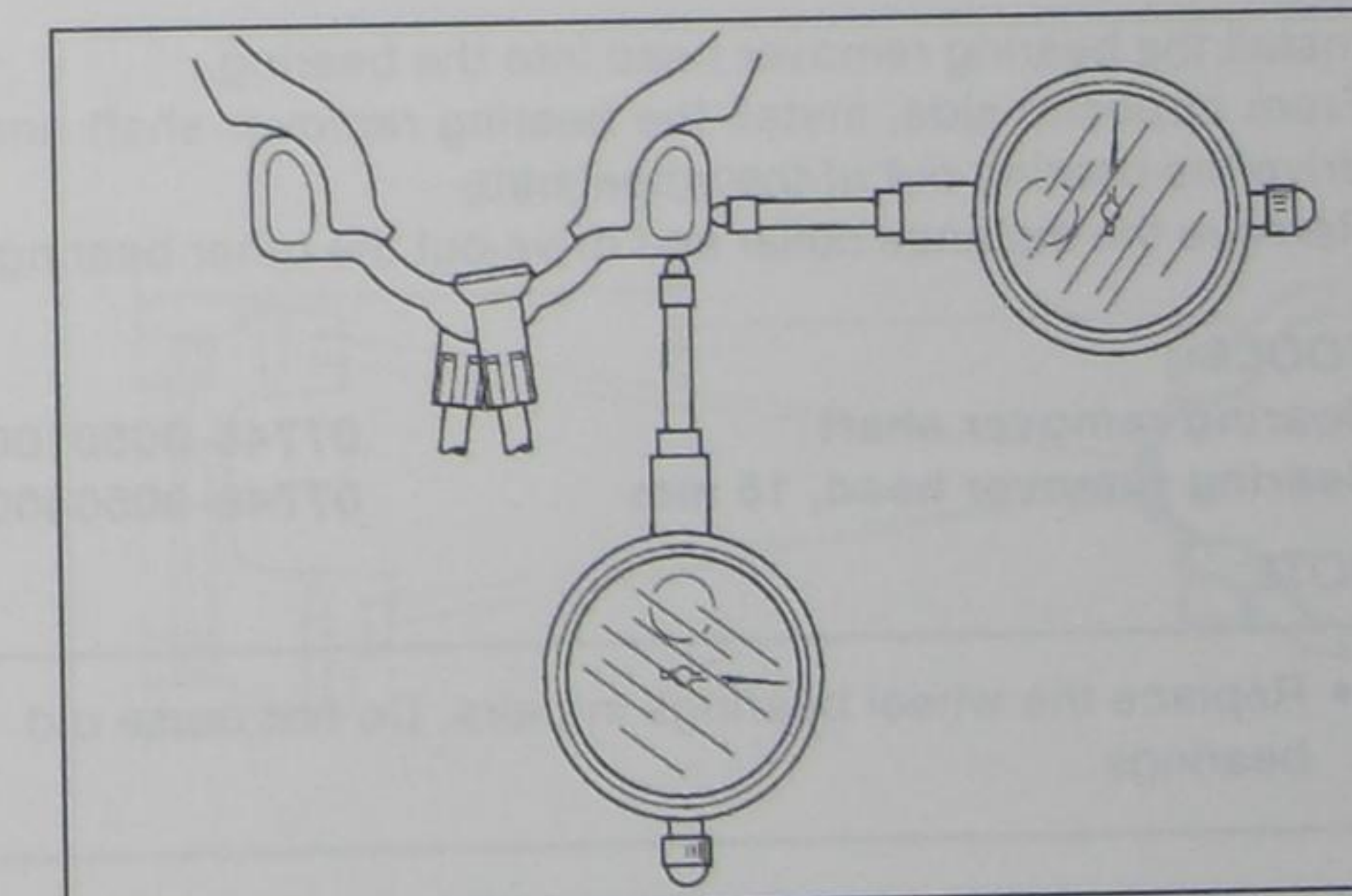


WHEEL RIM

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

Actual runout is 1/2 the total indicator reading.

**SERVICE LIMITS: Radial: 2.0 mm (0.08 in)
Axial: 2.0 mm (0.08 in)**



FRONT WHEEL/SUSPENSION/STEERING

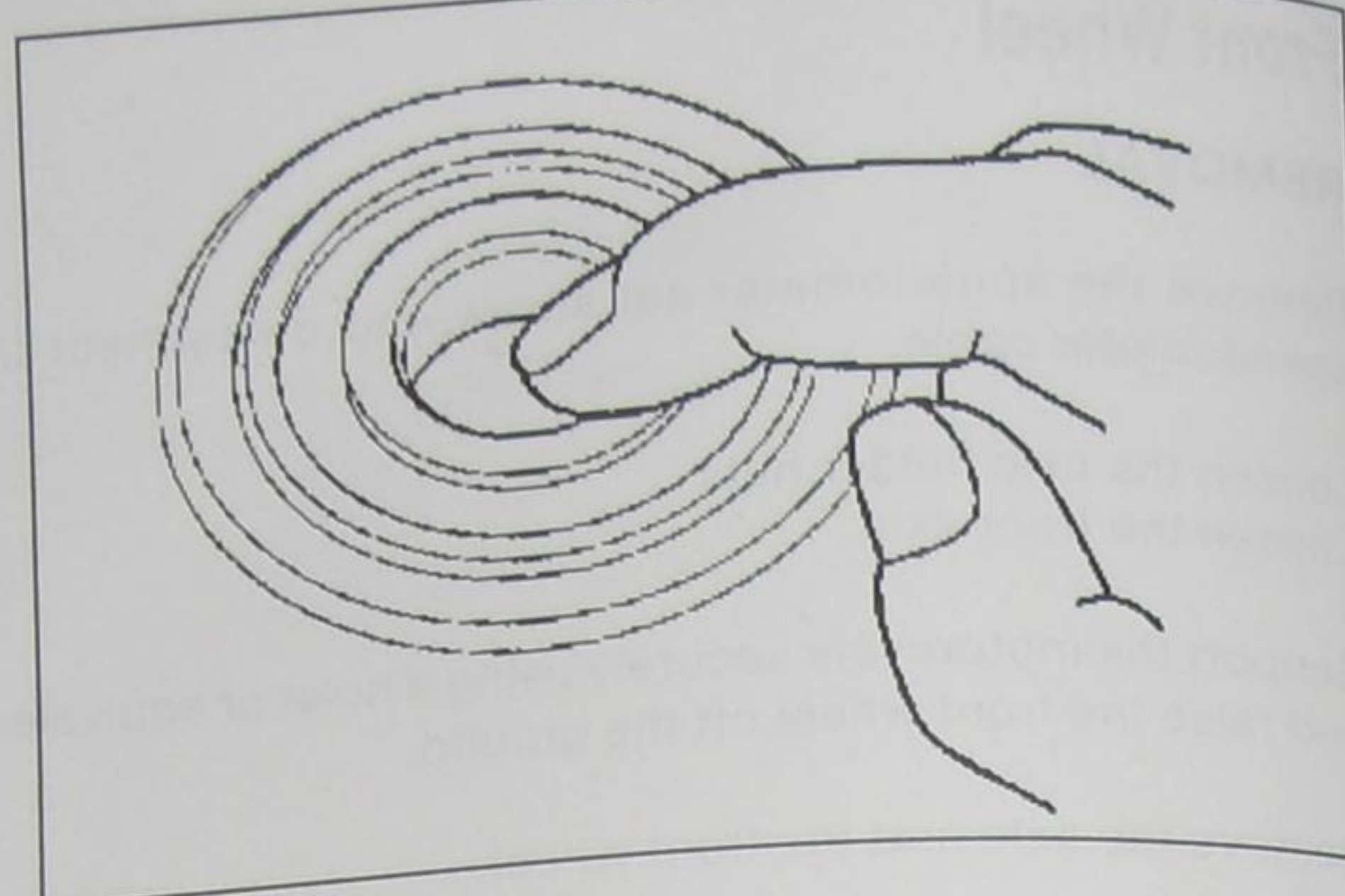
WHEEL BEARING

Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

Remove and discard the bearings if the races do not turn smoothly and quietly, if they fit loosely in the hub.

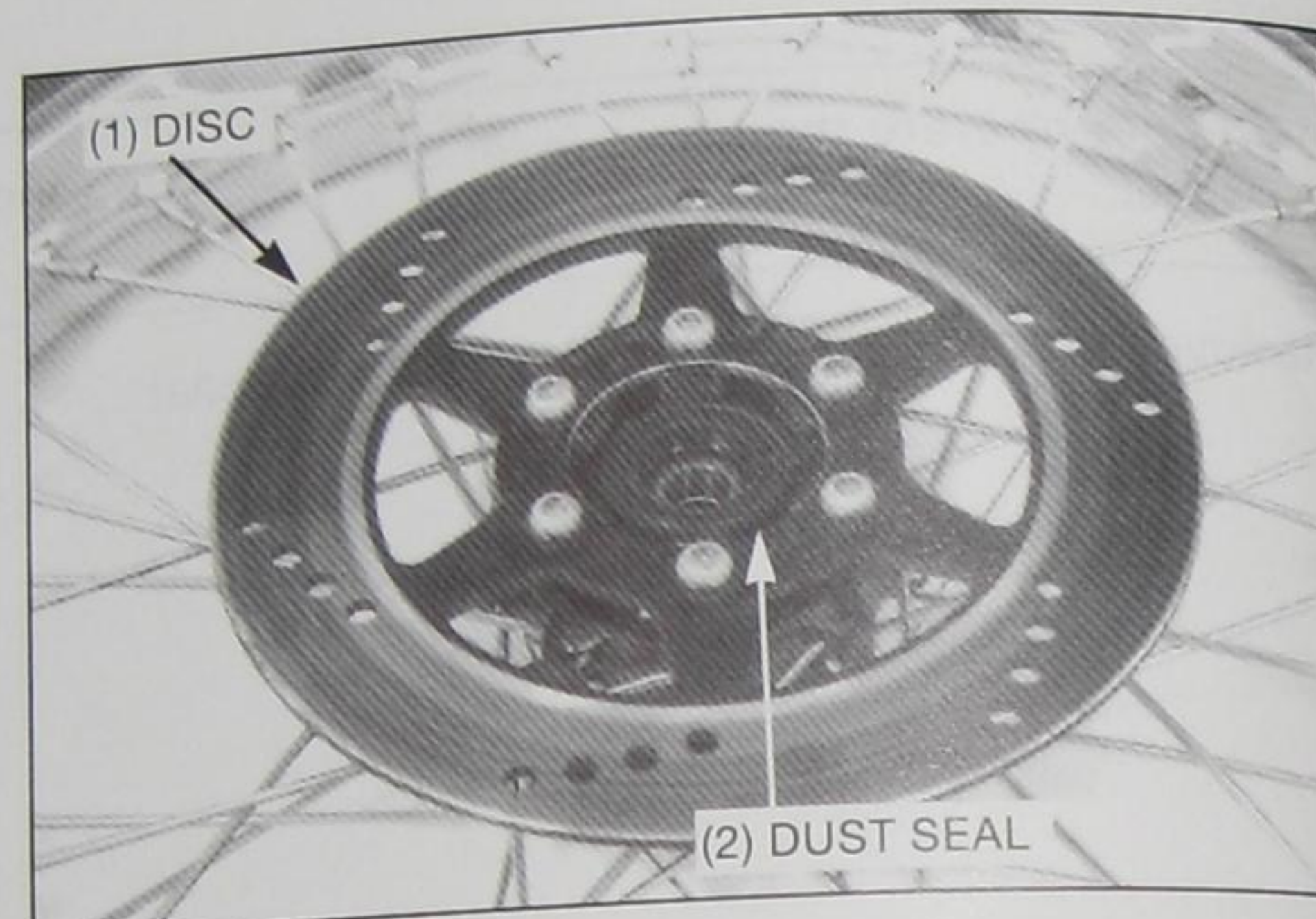
NOTE:

- Replace the wheel bearings in pairs.

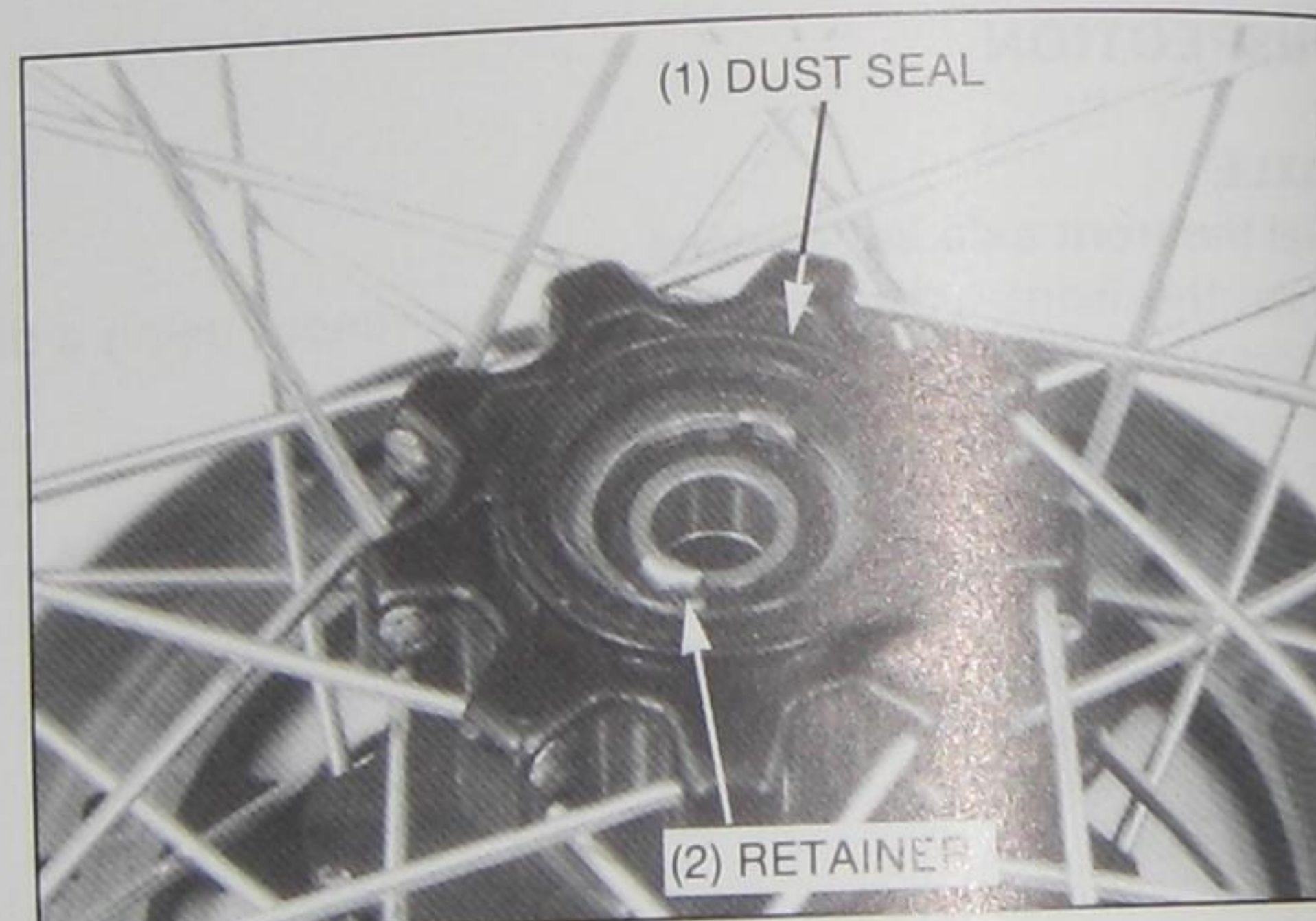


DISASSEMBLY

Remove the disc bolts and brake disc.
Remove the dust seal from both sides of the wheel.



Remove the speedometer gear retainer.



Install the bearing remover head into the bearing.
From opposite side, install the bearing remover shaft and drive the bearing out of the wheel hub.
Remove the distance collar and drive out the other bearing.

TOOLS:

Bearing remover shaft 07746-0050100
Bearing remover head, 15 mm 07746-0050400

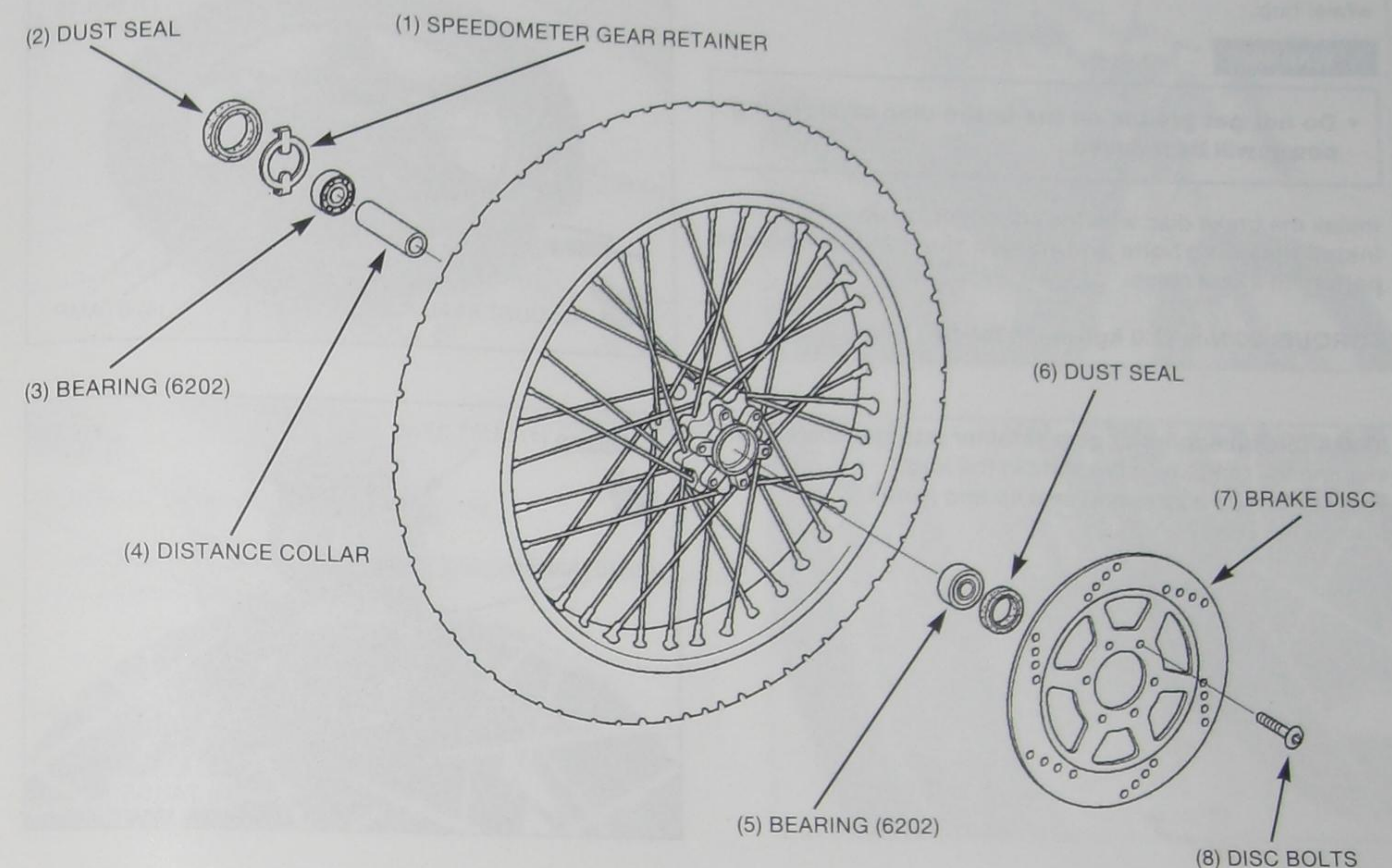
NOTE:

- Replace the wheel bearings in pairs. Do not reuse old bearings.



FRONT WHEEL/SUSPENSION/STEERING

ASSEMBLY

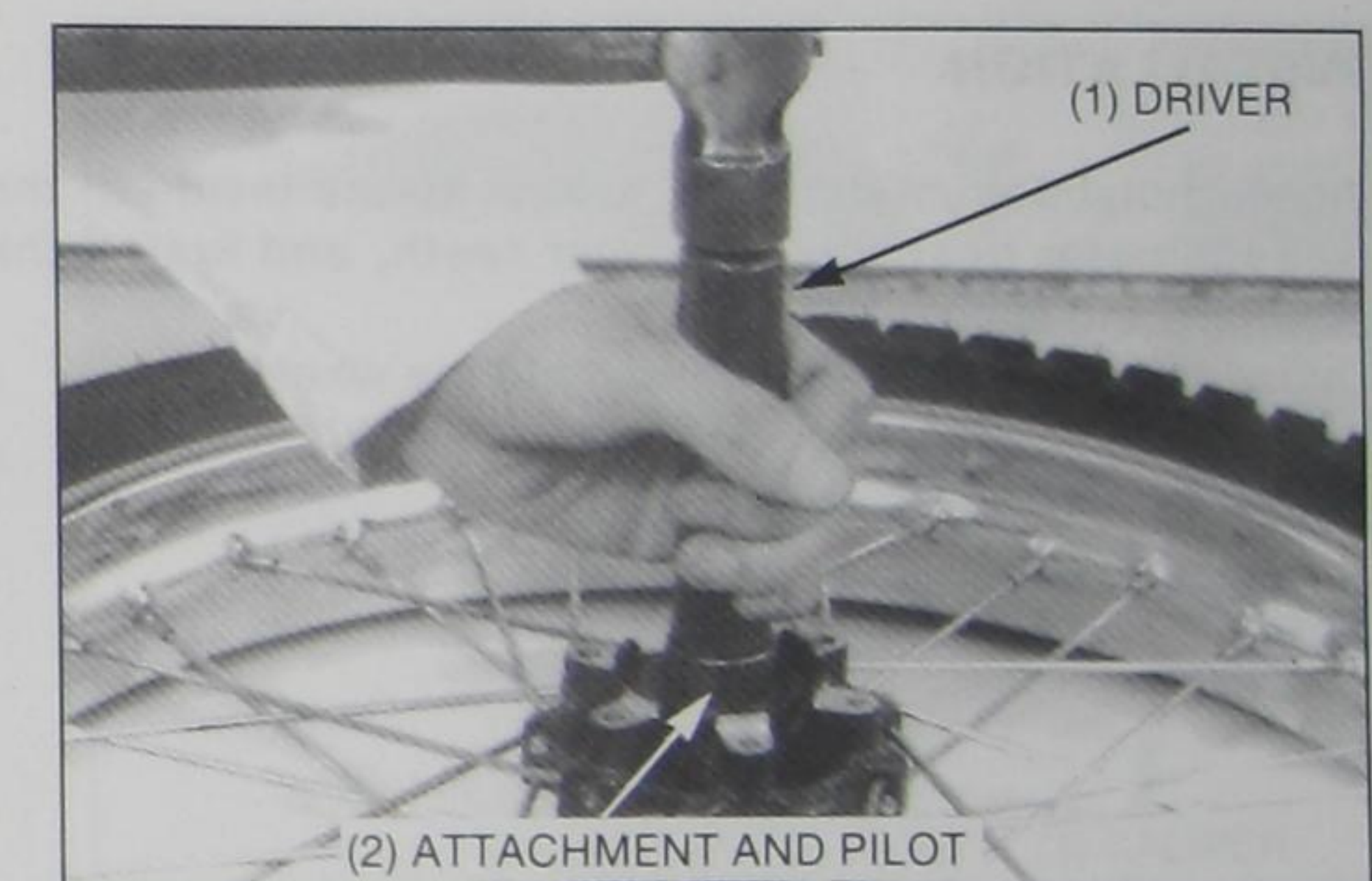


Pack new bearing cavities with grease.
Drive in the right bearing squarely with the sealed side facing up until it is fully seated.
Install the distance collar.
Drive in the left bearing squarely with the sealed side facing up until it is fully seated.

TOOLS:

Driver
Attachment, 32 x 35 mm
Pilot, 15 mm

07749-0010000
07746-0010100
07746-0040300



When new spokes are installed, perform as follows:
Place the rim on the work bench.
Place the hub with the left side down and begin lacing with new spokes.
Adjust the hub position so that the distance from the hub right end surface to the rim right side is 6.5 mm (0.26 in) as shown. Tighten the spokes in 2 or 3 progressive steps.

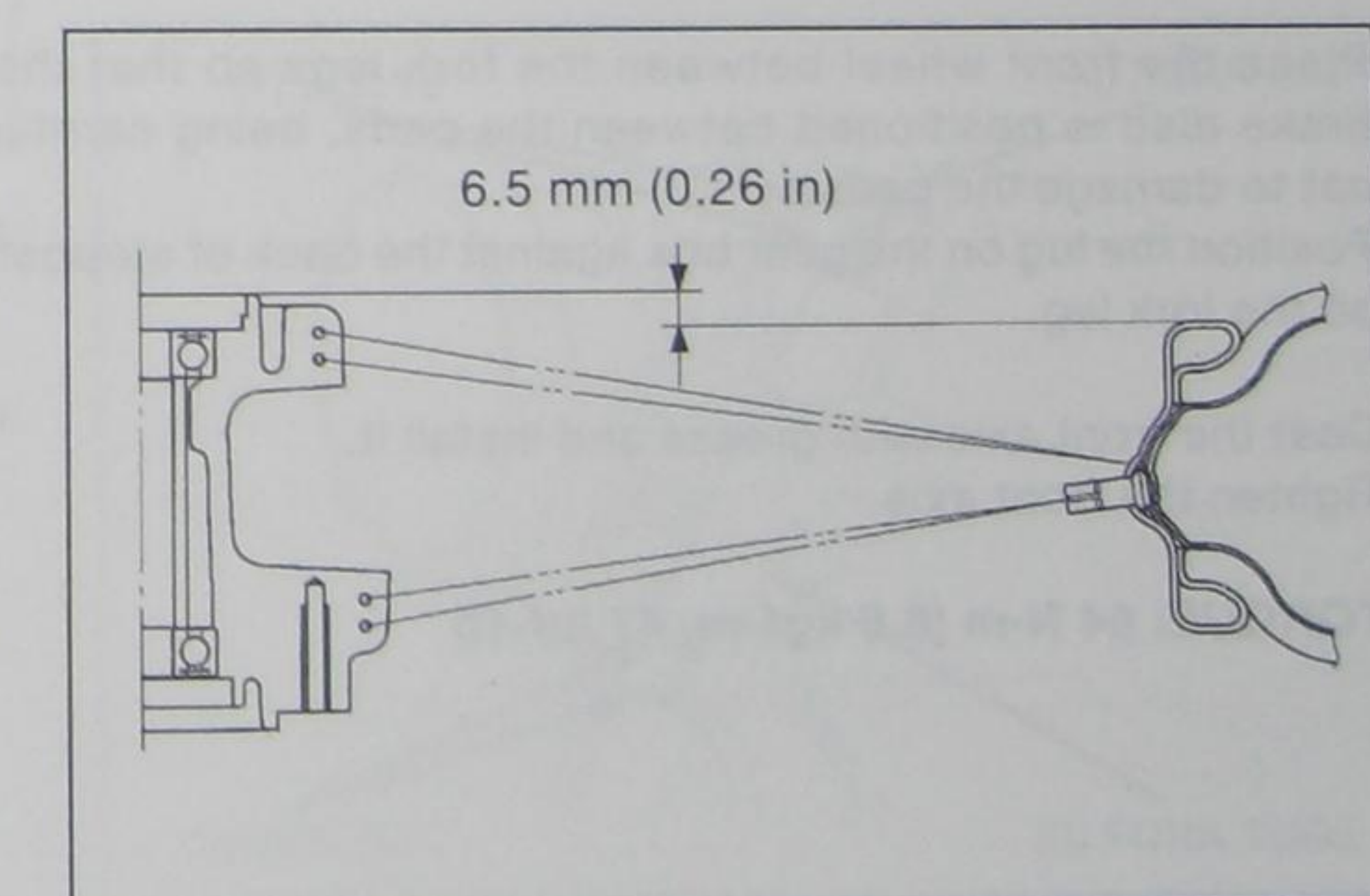
TOOL:

Spoke wrench, 5.8 x 6.1 mm

07701-0020300

TORQUE: 4 N·m (0.4 kgf-m, 2.9 lbf-ft)

Check the rim runout (page 12-3).



FRONT WHEEL/SUSPENSION/STEERING

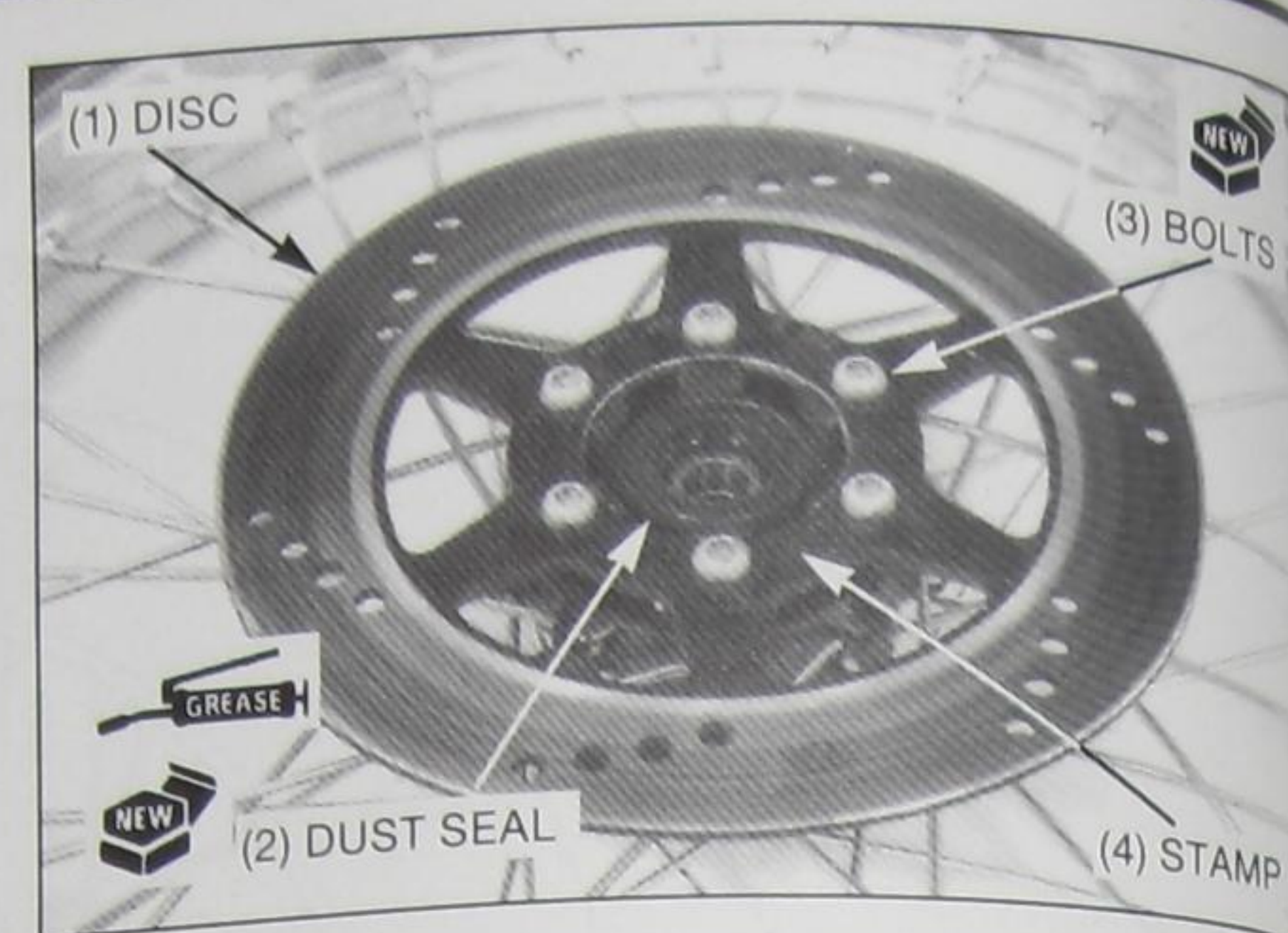
Apply grease to a new dust seal lip and install it into the wheel hub.

WARNING

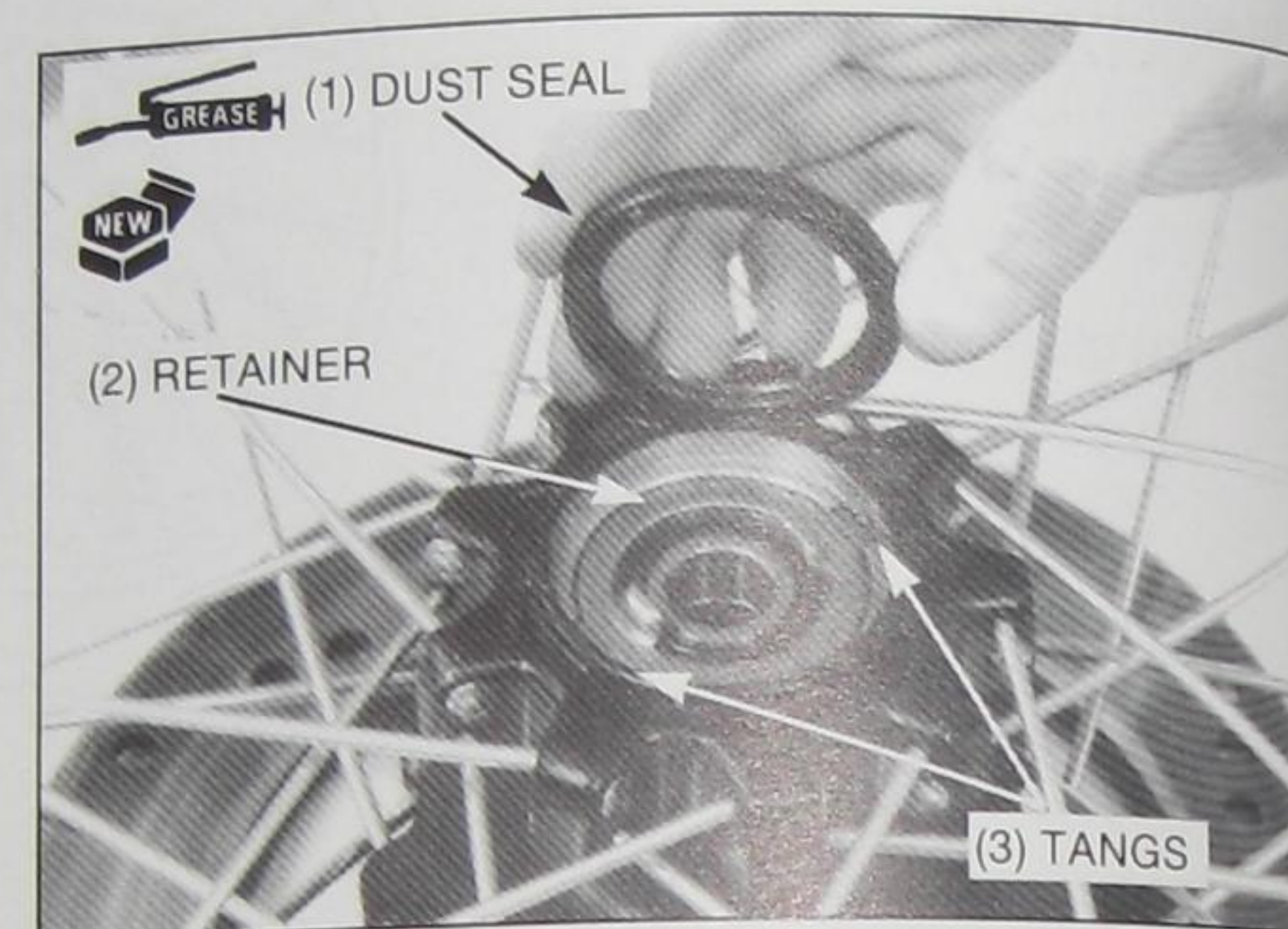
- Do not get grease on the brake disc or stopping power will be reduced.

Install the brake disc with the stamp facing up. Install new disc bolts and tighten them in a crisscross pattern in 2 or 3 steps.

TORQUE: 20 N·m (2.0 kgf-m, 14 lbf-ft)



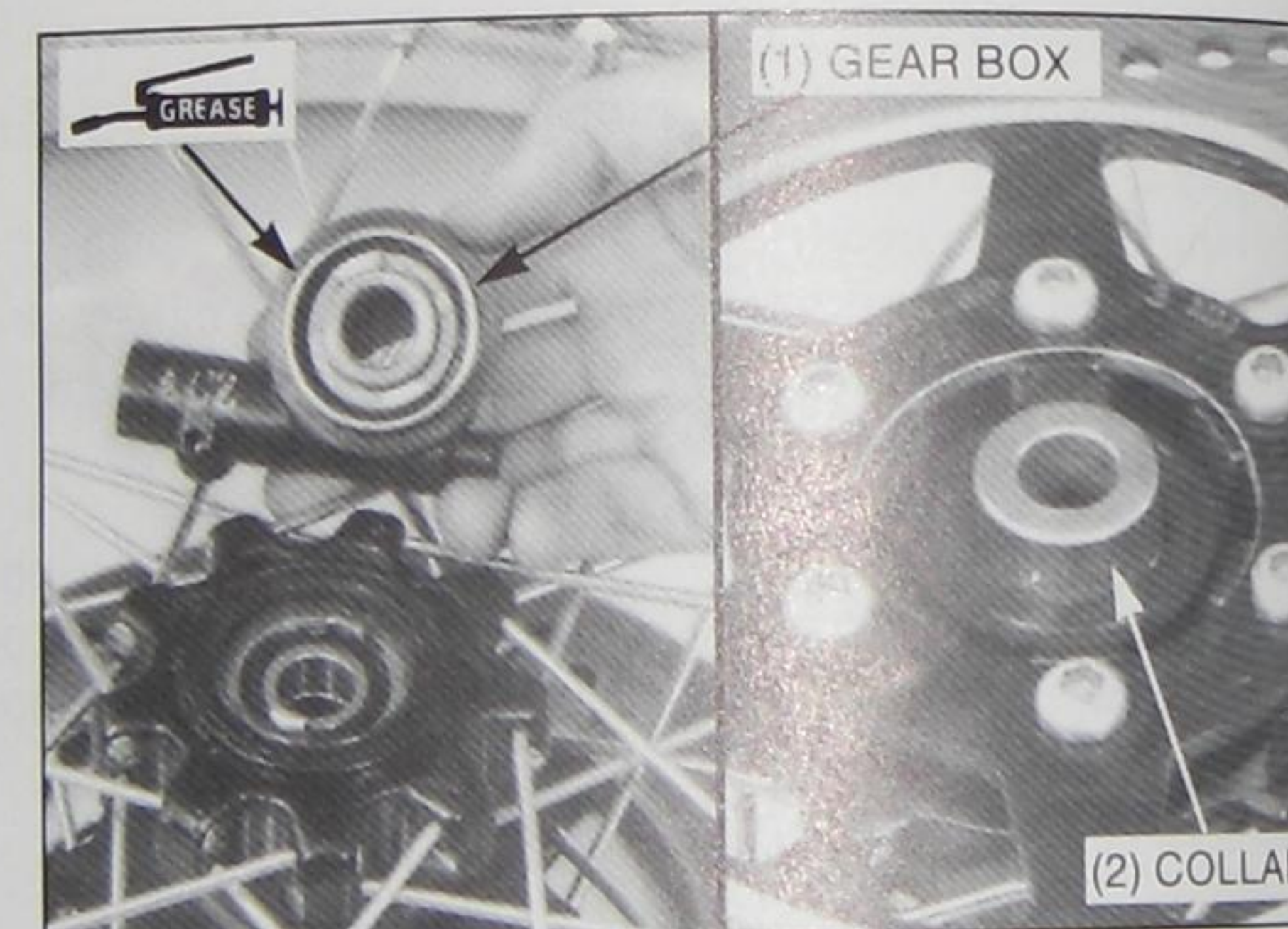
Install the speedometer gear retainer into the wheel hub, aligning the tangs with the slots in the hub. Apply grease to a new dust seal lip and install it.



INSTALLATION

Apply molybdenum disulfide grease to the inside of the speedometer gear box and gear teeth, and install the washers and speedometer gear. Install the speedometer gear box into the wheel hub.

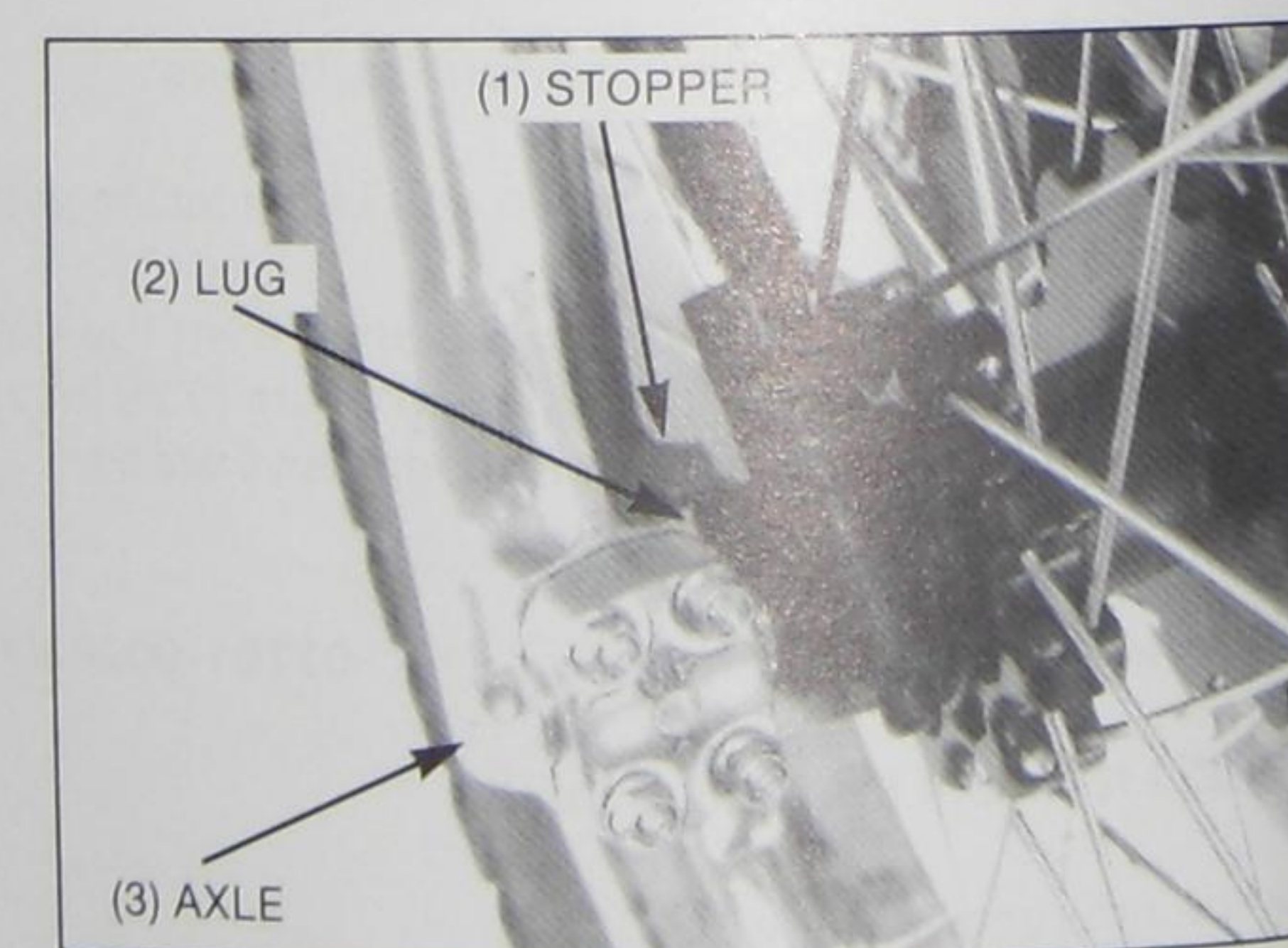
Install the side collar.



Place the front wheel between the fork legs so that the brake disc is positioned between the pads, being careful not to damage the pads. Position the lug on the gear box against the back of stopper on the fork leg.

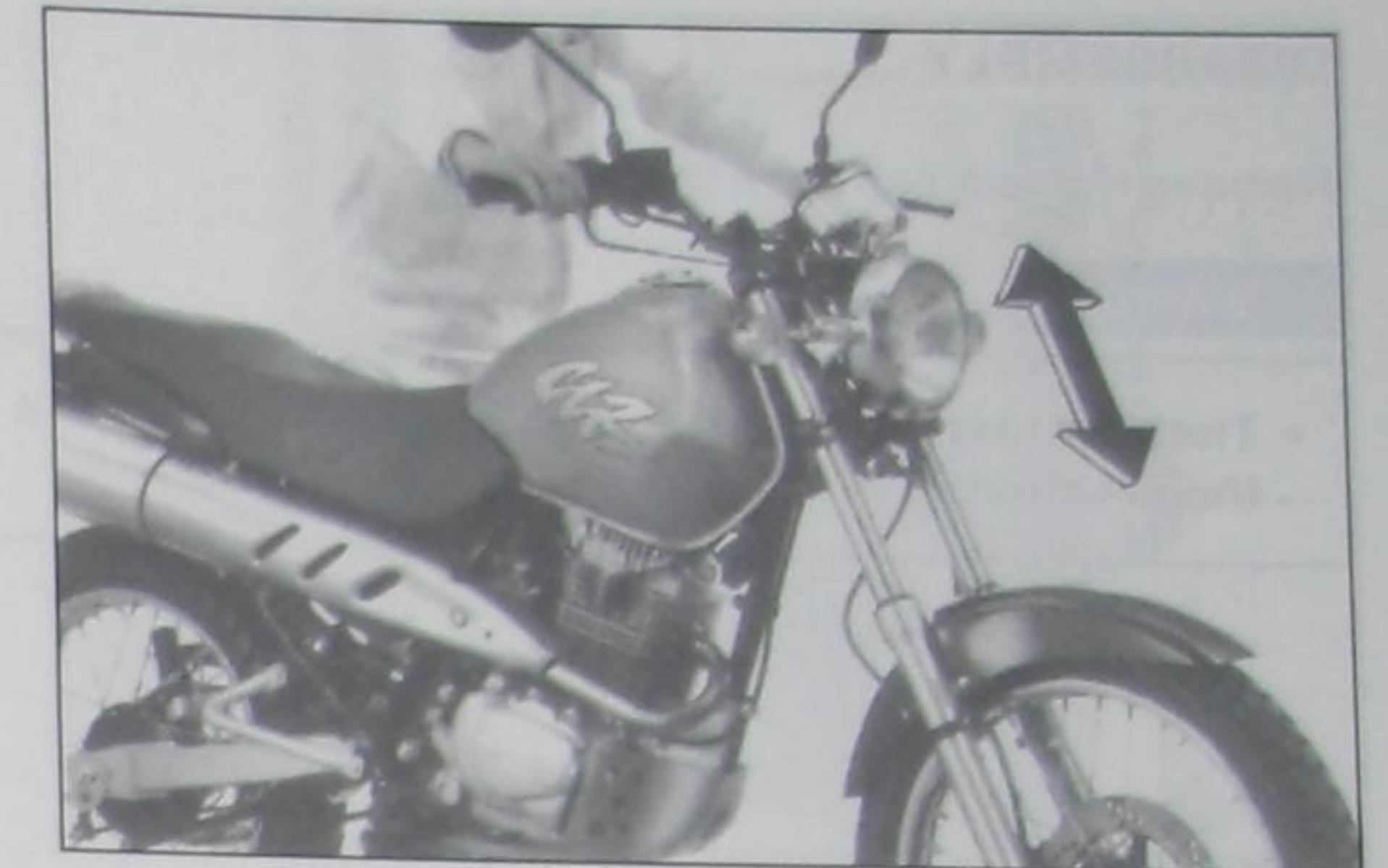
Coat the front axle with grease and install it. Tighten the front axle.

TORQUE: 64 N·m (6.5 kgf-m, 47 lbf-ft)



FRONT WHEEL/SUSPENSION/STEERING

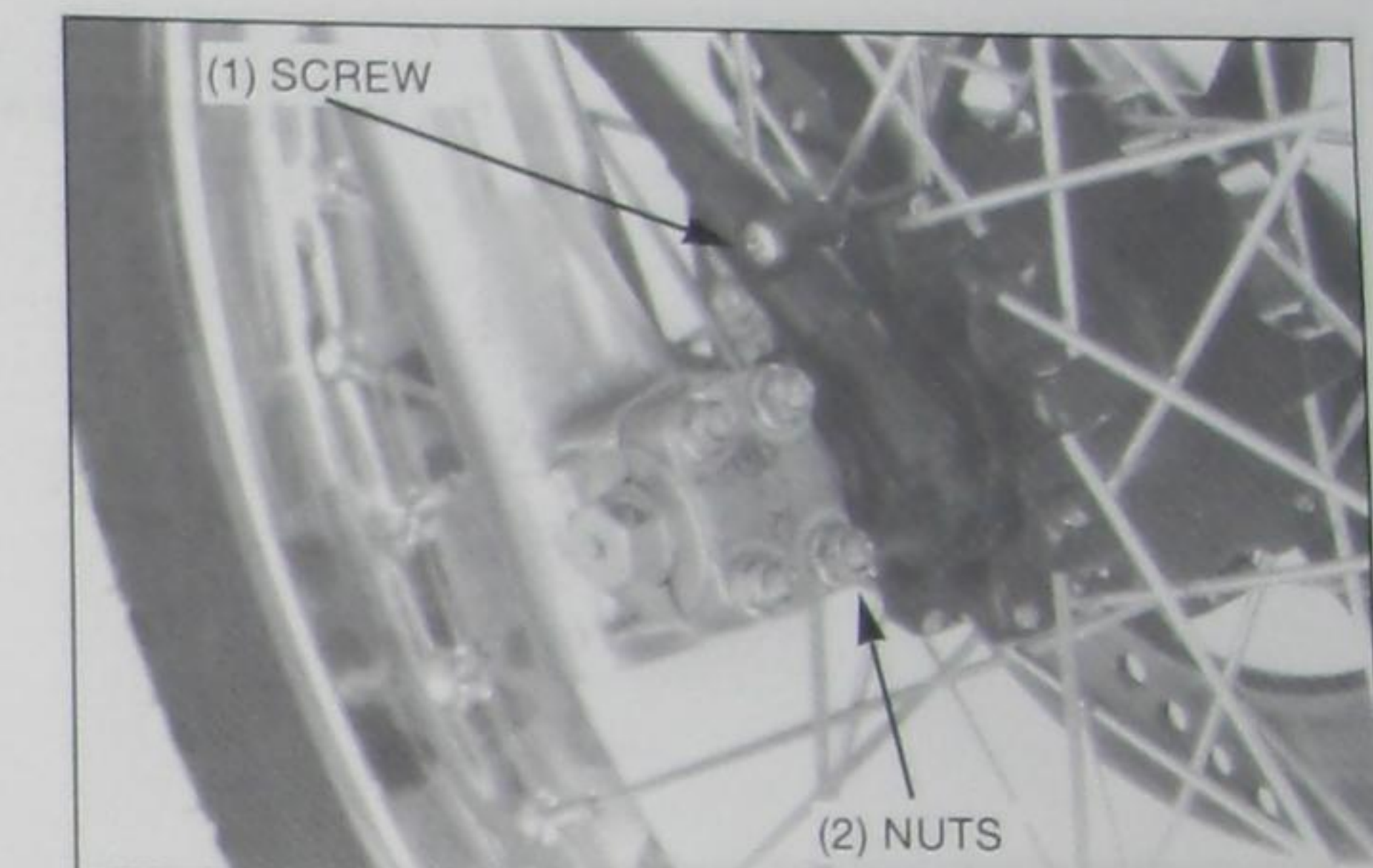
With the front brake applied, pump the forks up and down several times to seat the axle and check brake operation.



While keeping the fork parallel, tighten the upper holder nuts first, then tighten the lower nuts.

TORQUE: 12 N·m (1.2 kgf-m, 9 lbf-ft)

Connect the speedometer cable to the gear box and secure it with the set screw.



Fork

REMOVAL

Remove the front wheel (page 12-3).

Remove the four bolts with the brake hose clamp and the front fender from the fork legs.

Remove the screw, nut and speedometer clamp.

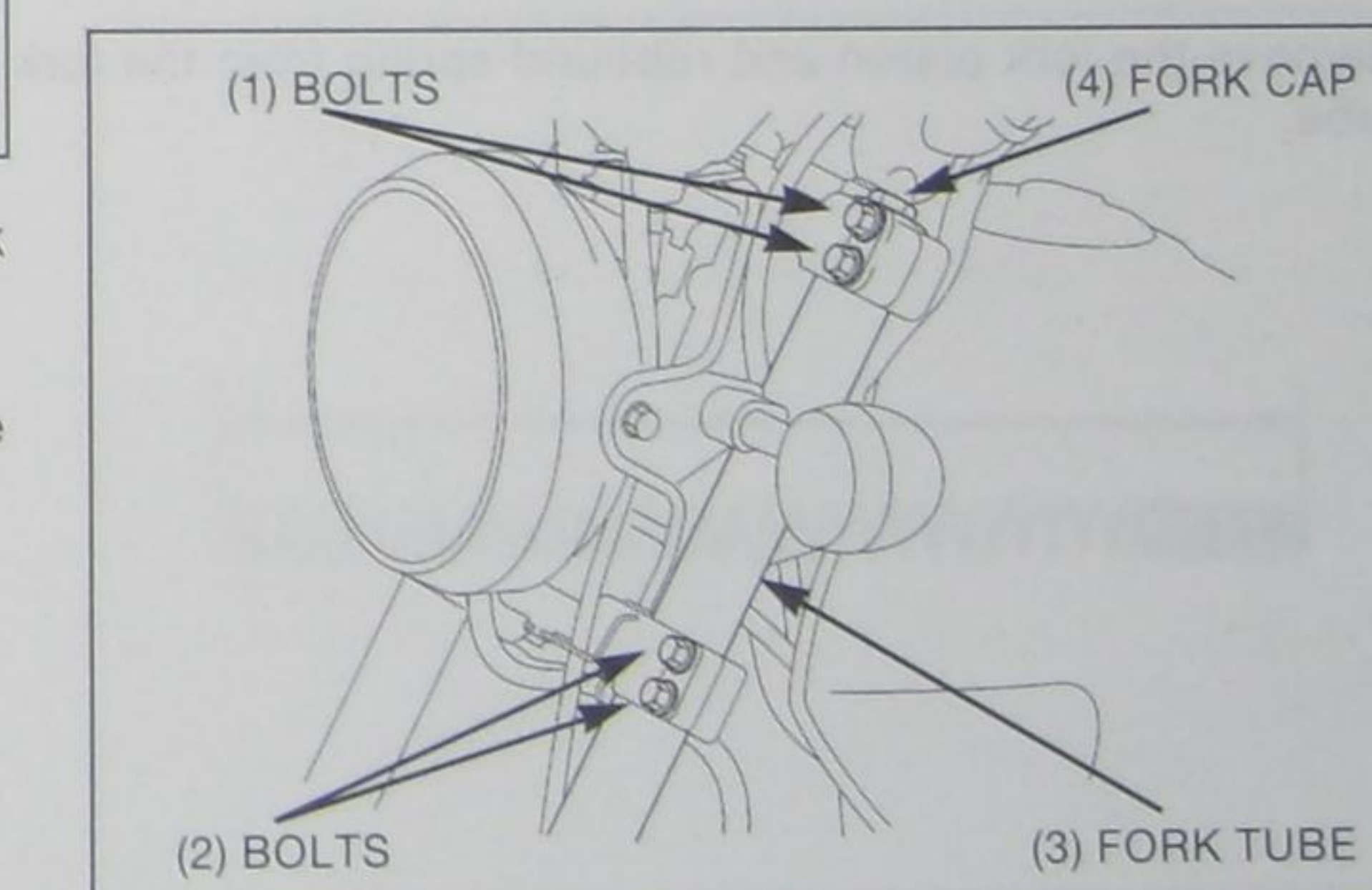
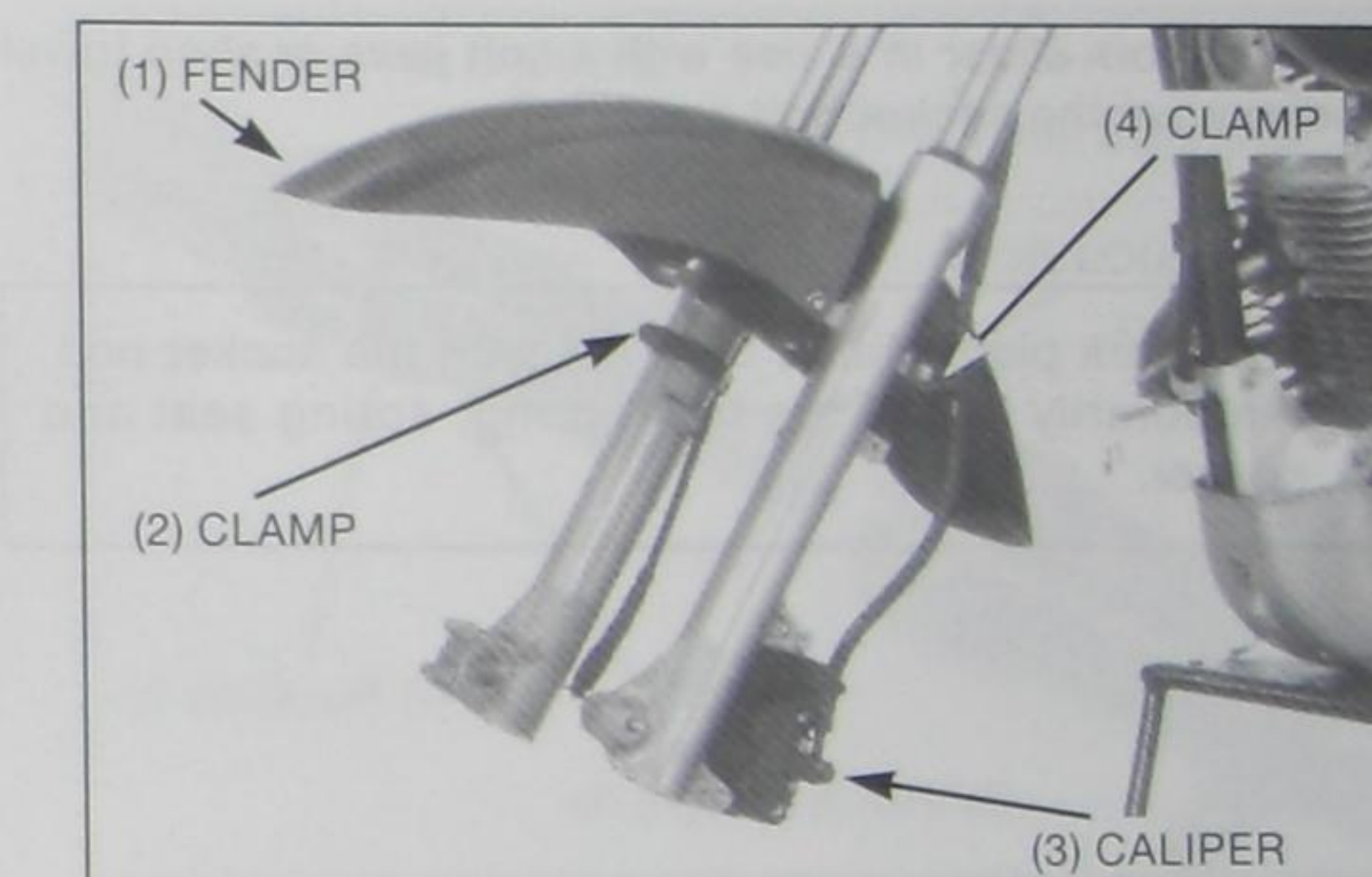
Remove the two mounting bolts and the brake caliper.

CAUTION

- Support the brake caliper so that it does not hang from the brake hose. Do not twist the brake hose.

When the fork is ready to be disassembled, loosen the fork cap, but do not remove it.

Loosen the fork top and bottom pinch bolts, and remove the fork tube from the fork bridges.

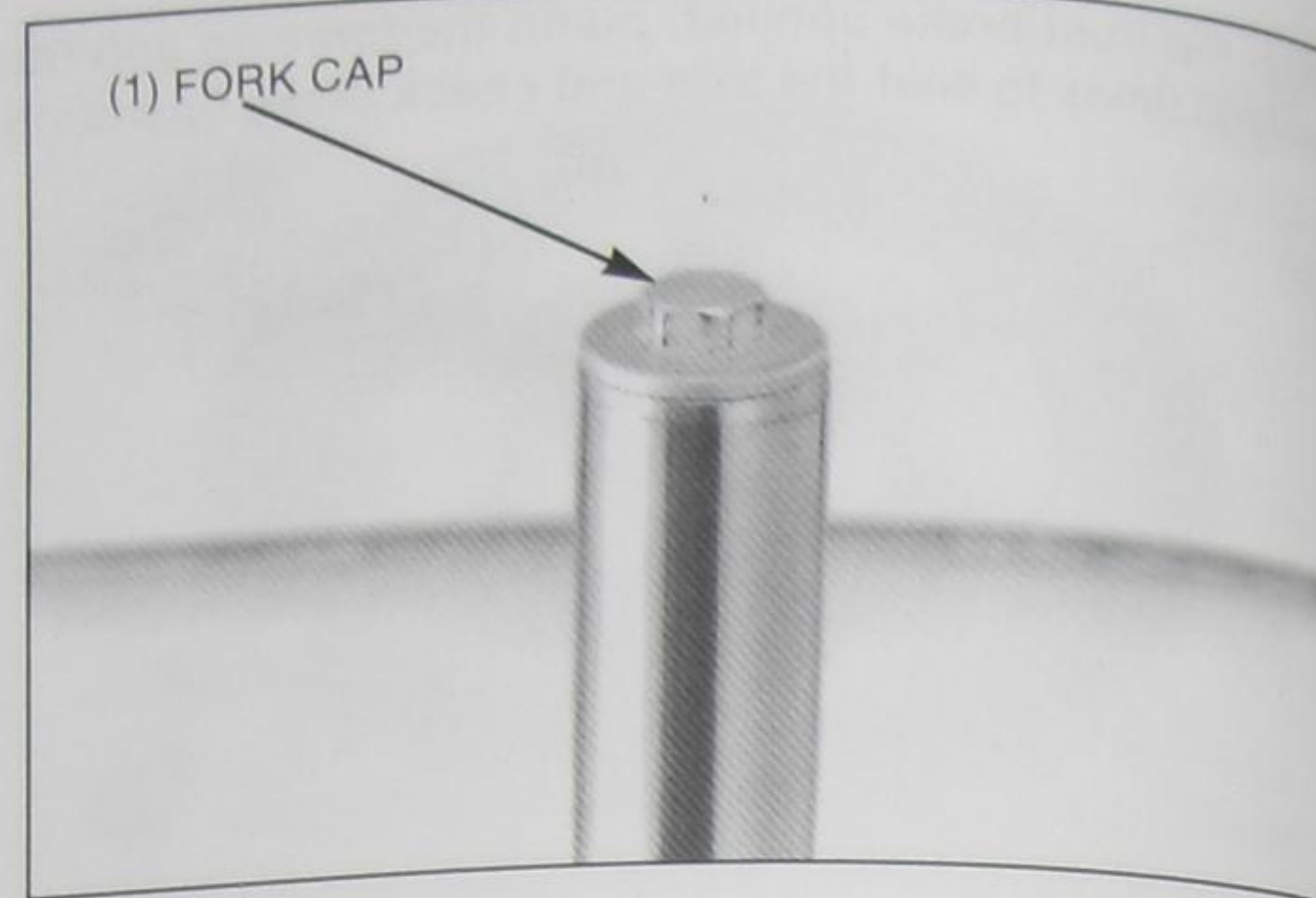


DISASSEMBLY

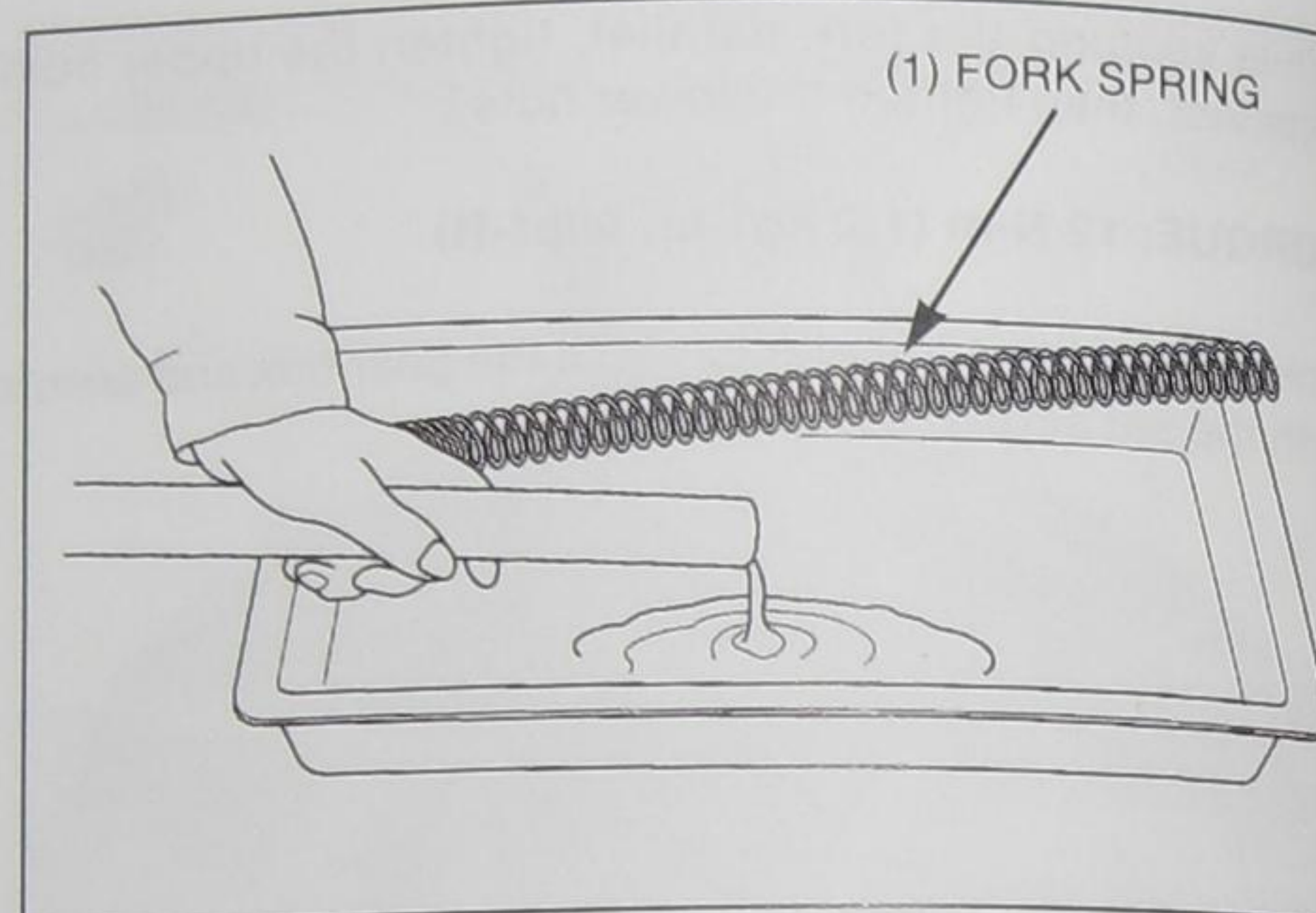
Remove the fork cap from the fork tube.

WARNING

- The fork cap is under spring pressure. Use care then removing it.



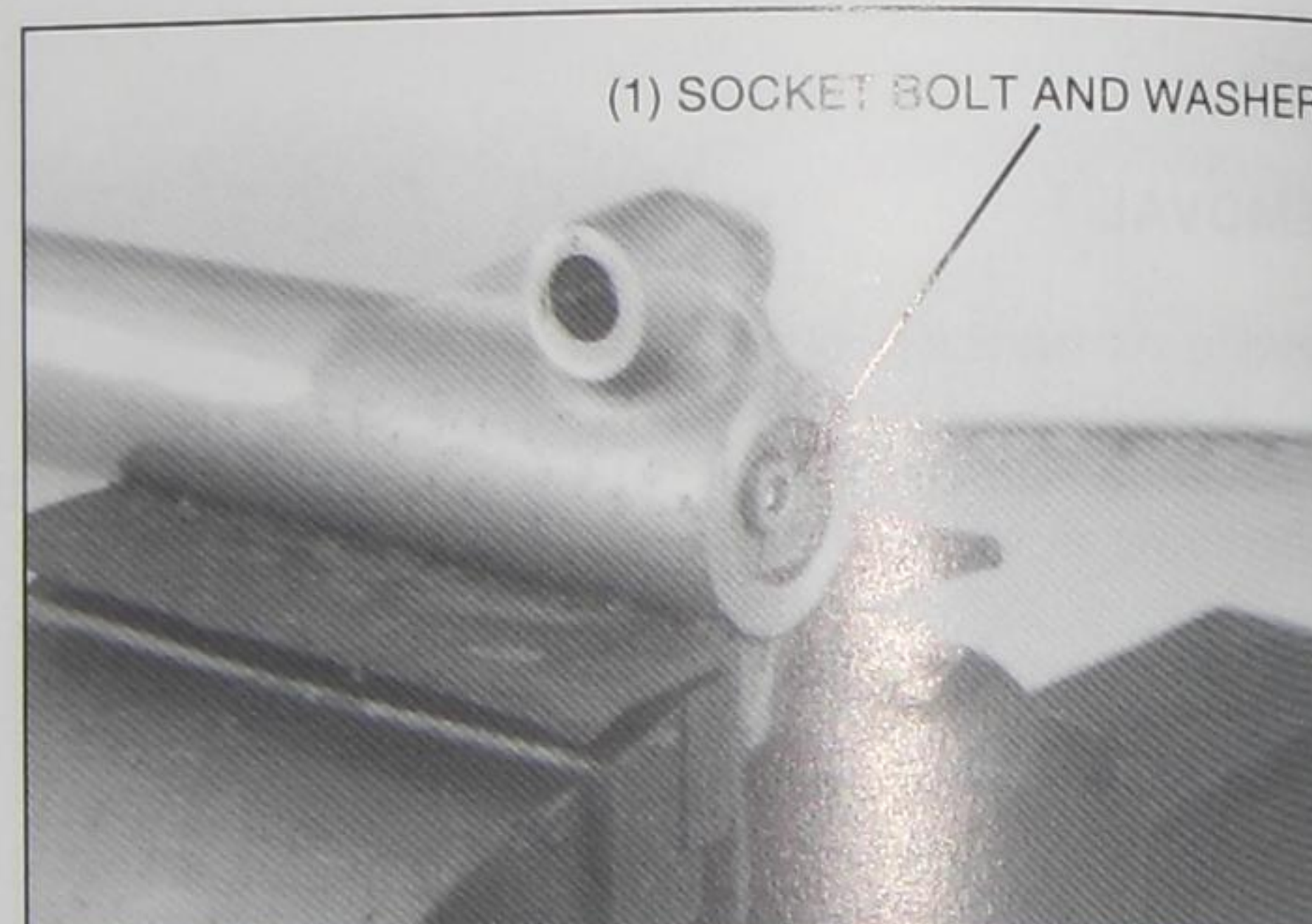
Remove the fork spring. Pour out the fork fluid by pumping the fork tube several times.



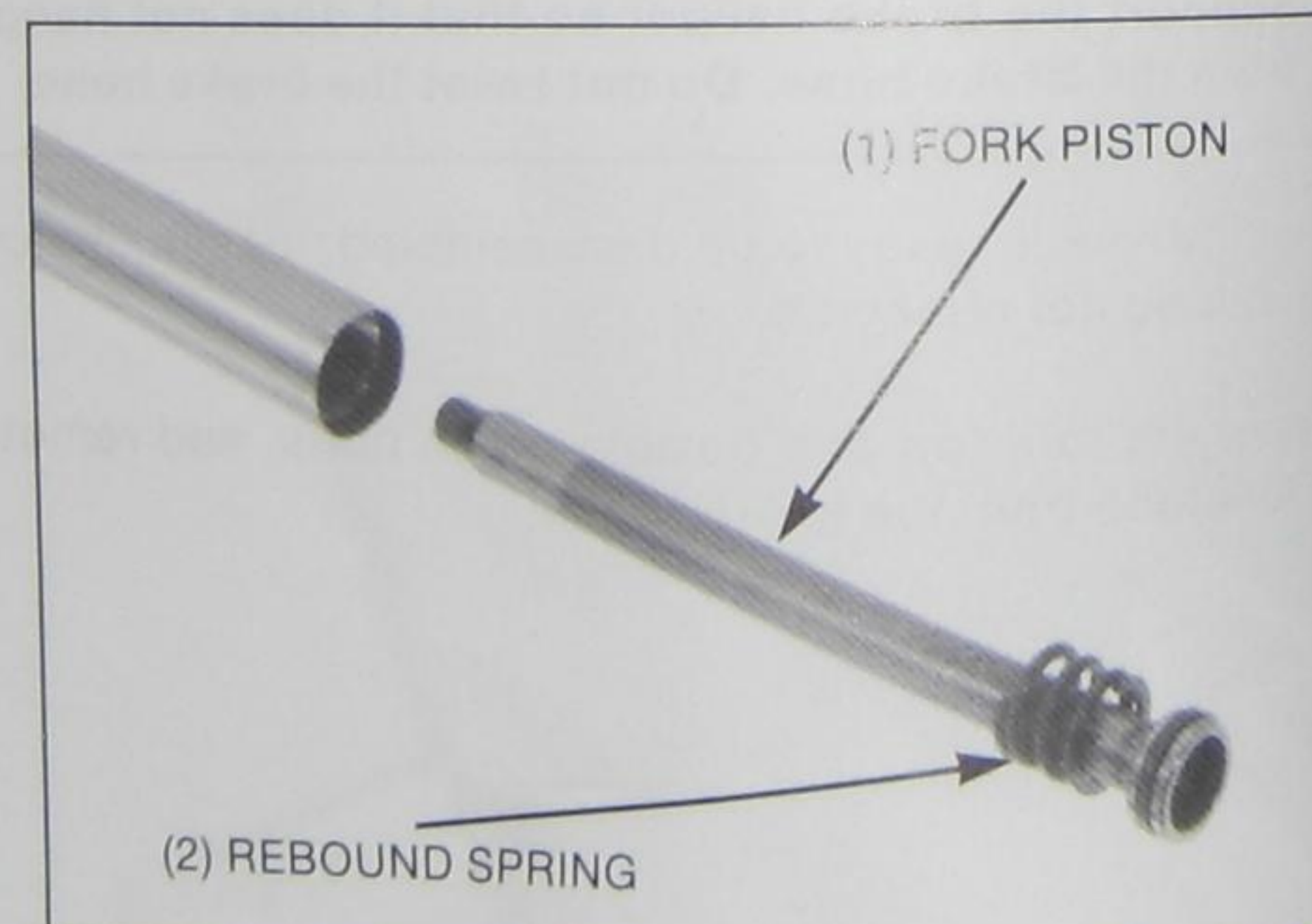
Hold the fork slider in a vise with a soft jaws or shop towel and remove the socket bolt and washer.

NOTE:

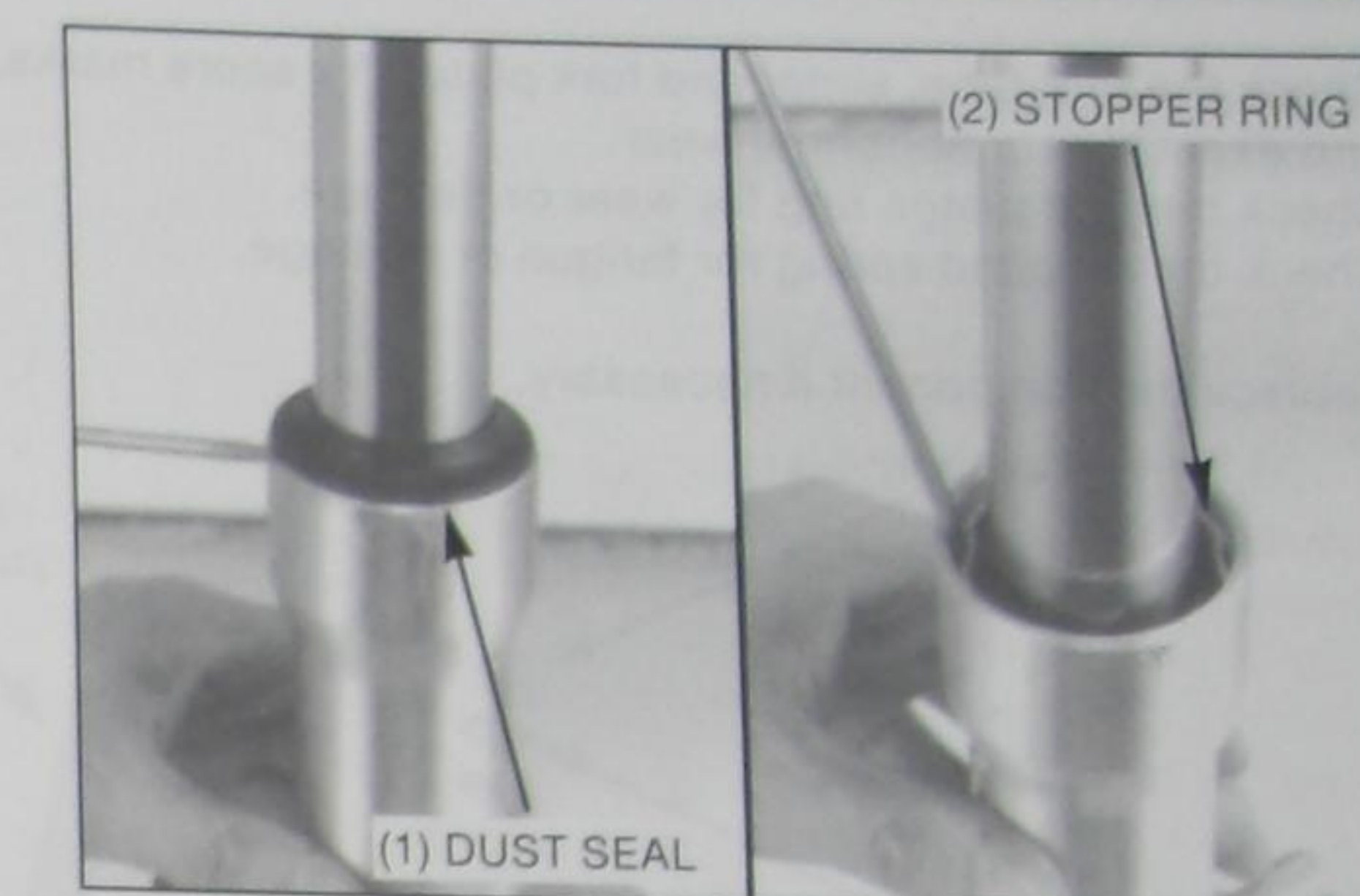
- If the fork piston turns together with the socket bolt, temporarily install the fork spring, spring seat and spacer.



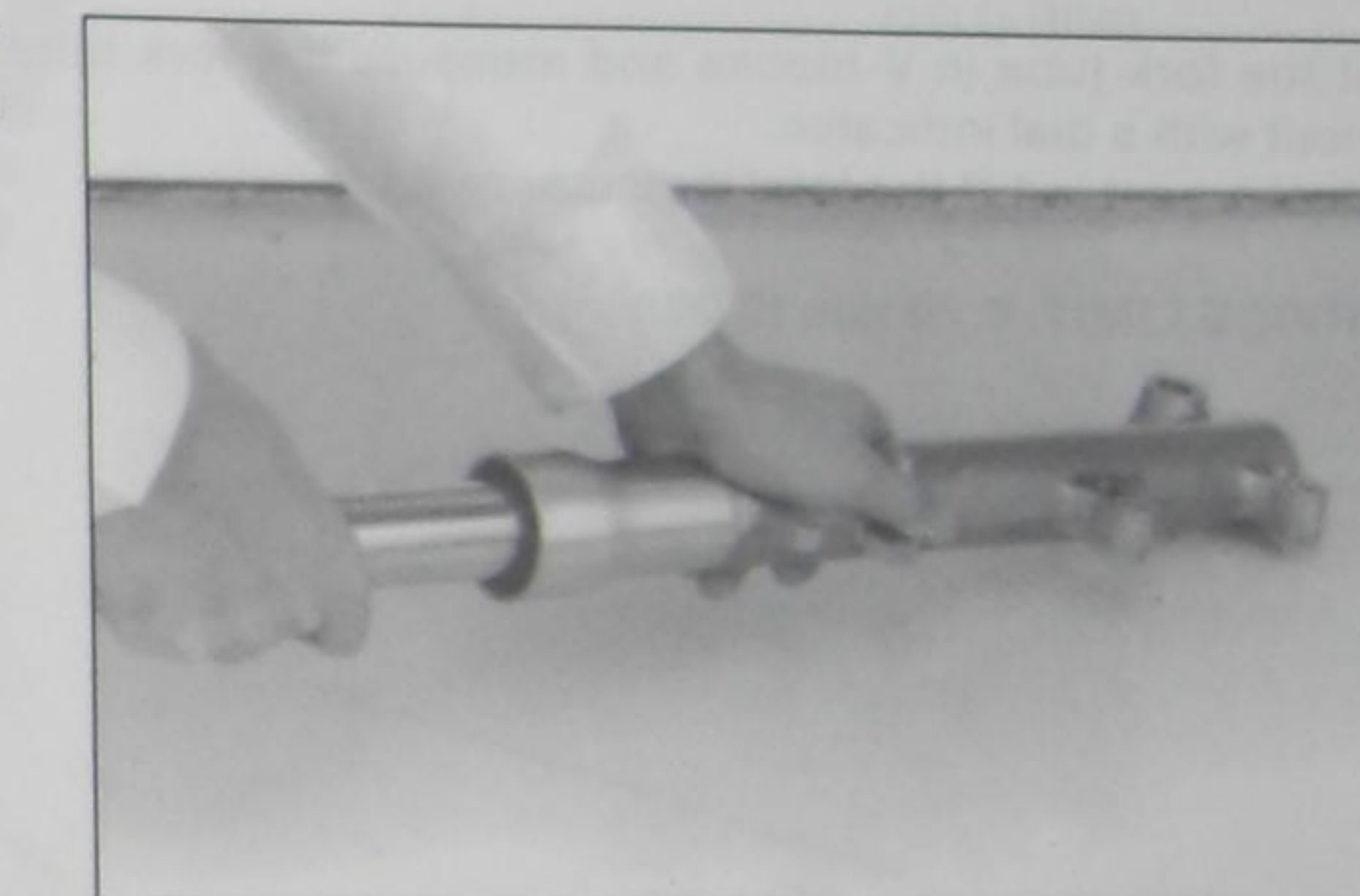
Remove the fork piston and rebound spring from the fork tube.



Remove the dust seal and the stopper ring, being careful not to scratch the fork tube sliding surface.



Using quick successive motions, pull the fork tube out of the fork slider. The slider bushing will be forced out by the fork tube bushing.



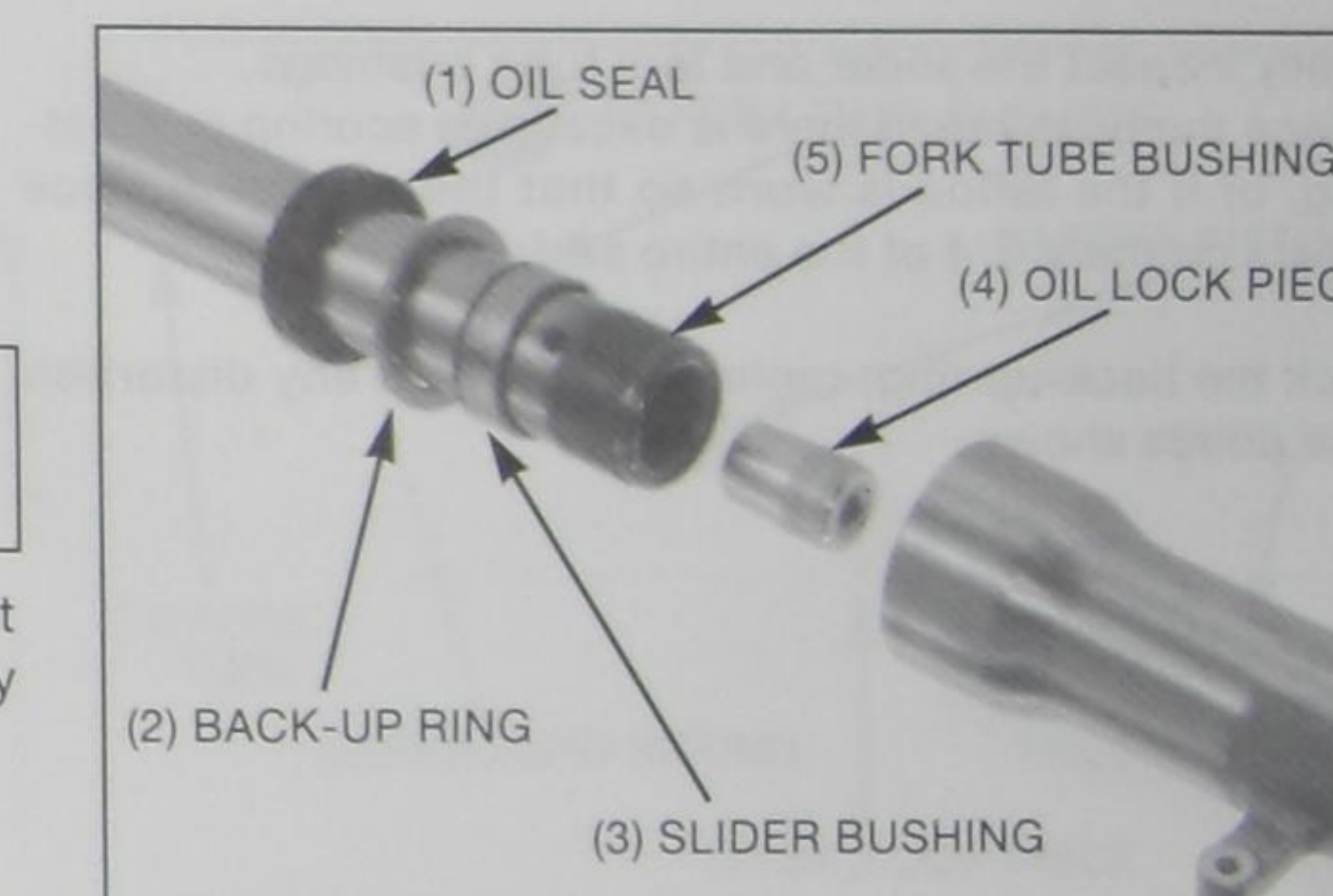
Remove the oil lock piece.

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

NOTE:

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

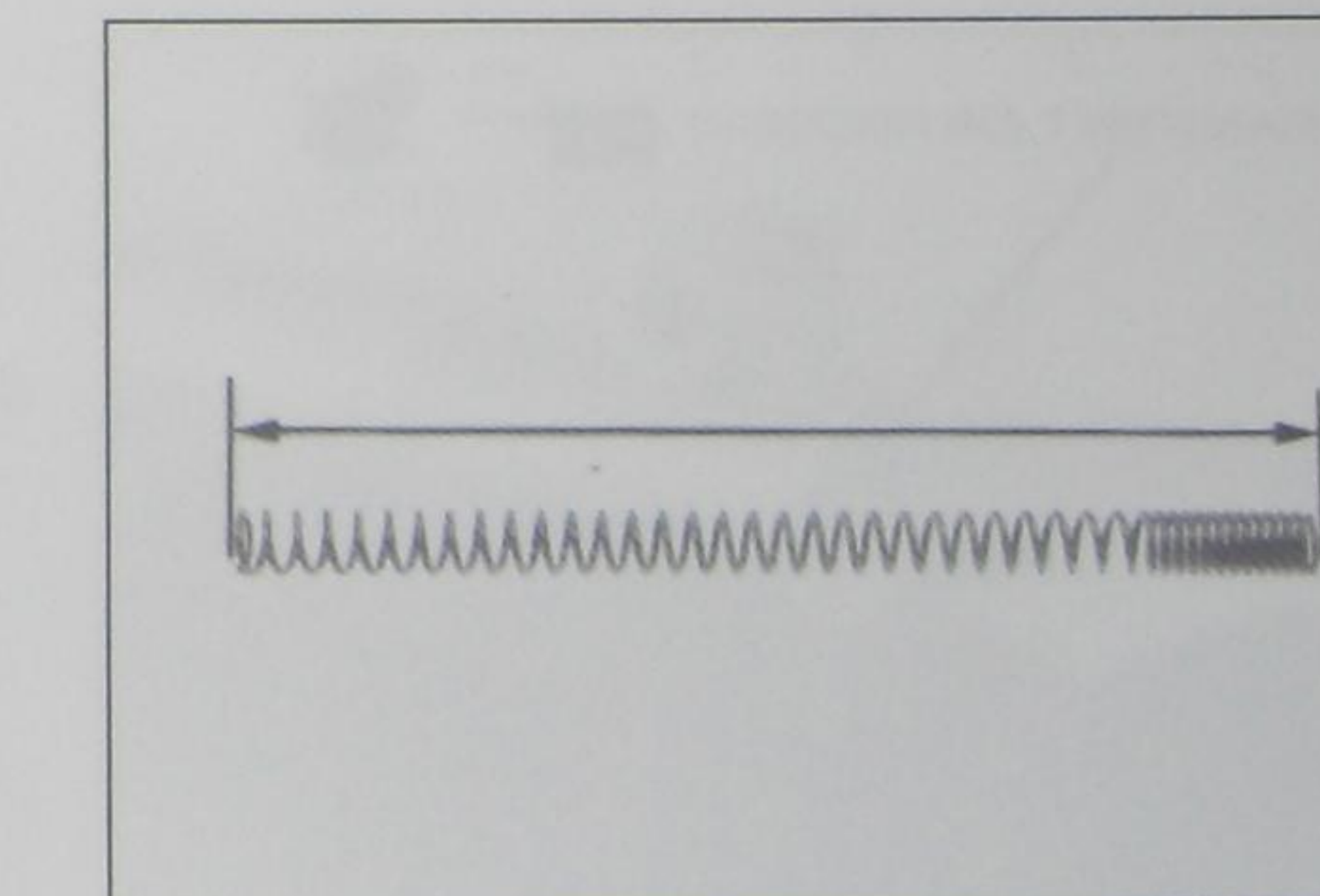
Carefully remove the fork tube bushing by prying the slot with a screwdriver until the bushing can be pulled off by hand.



INSPECTION

Measure the fork spring free length.

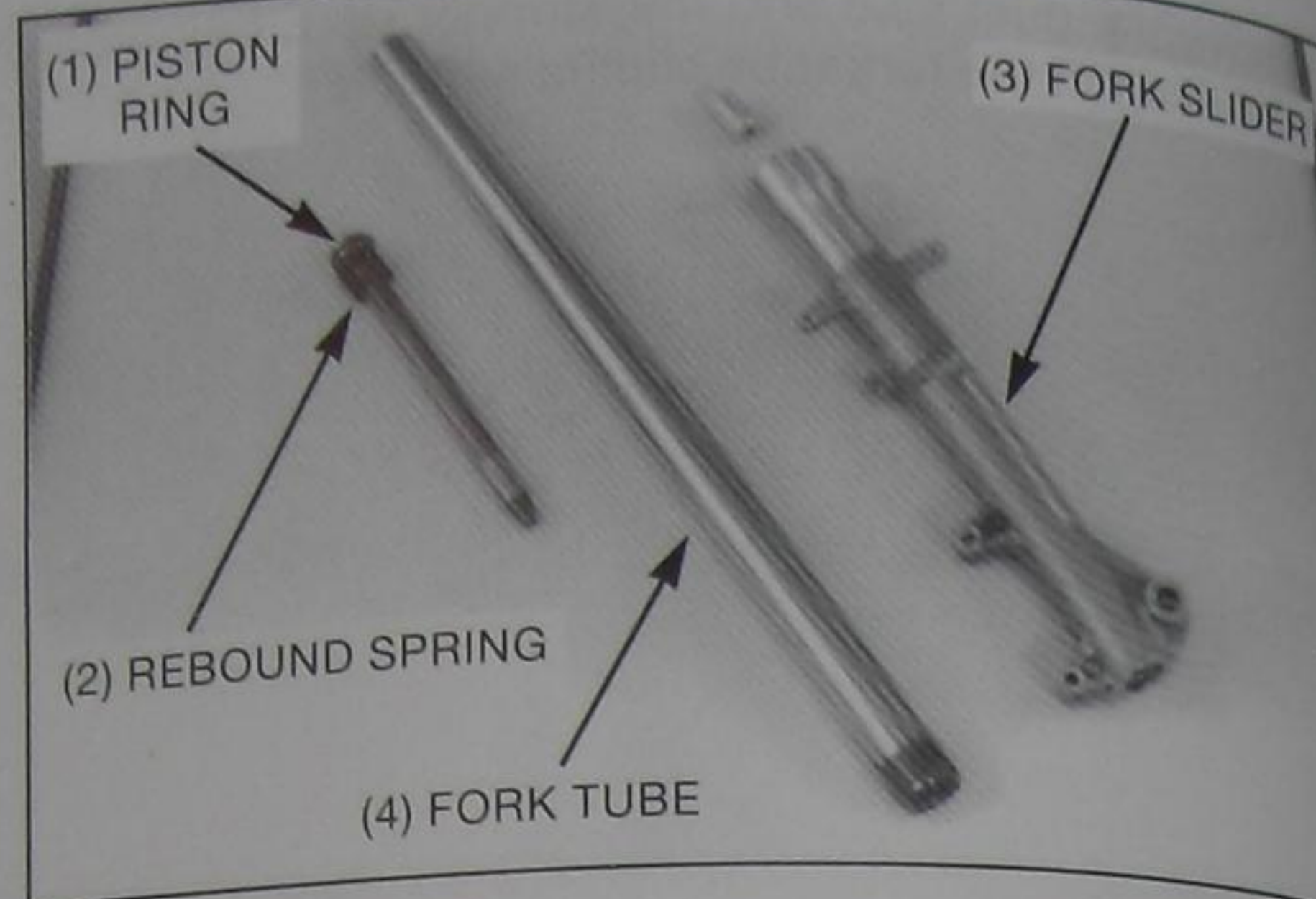
SERVICE LIMIT: 579.3 mm (22.81 in)



FRONT WHEEL/SUSPENSION/STEERING

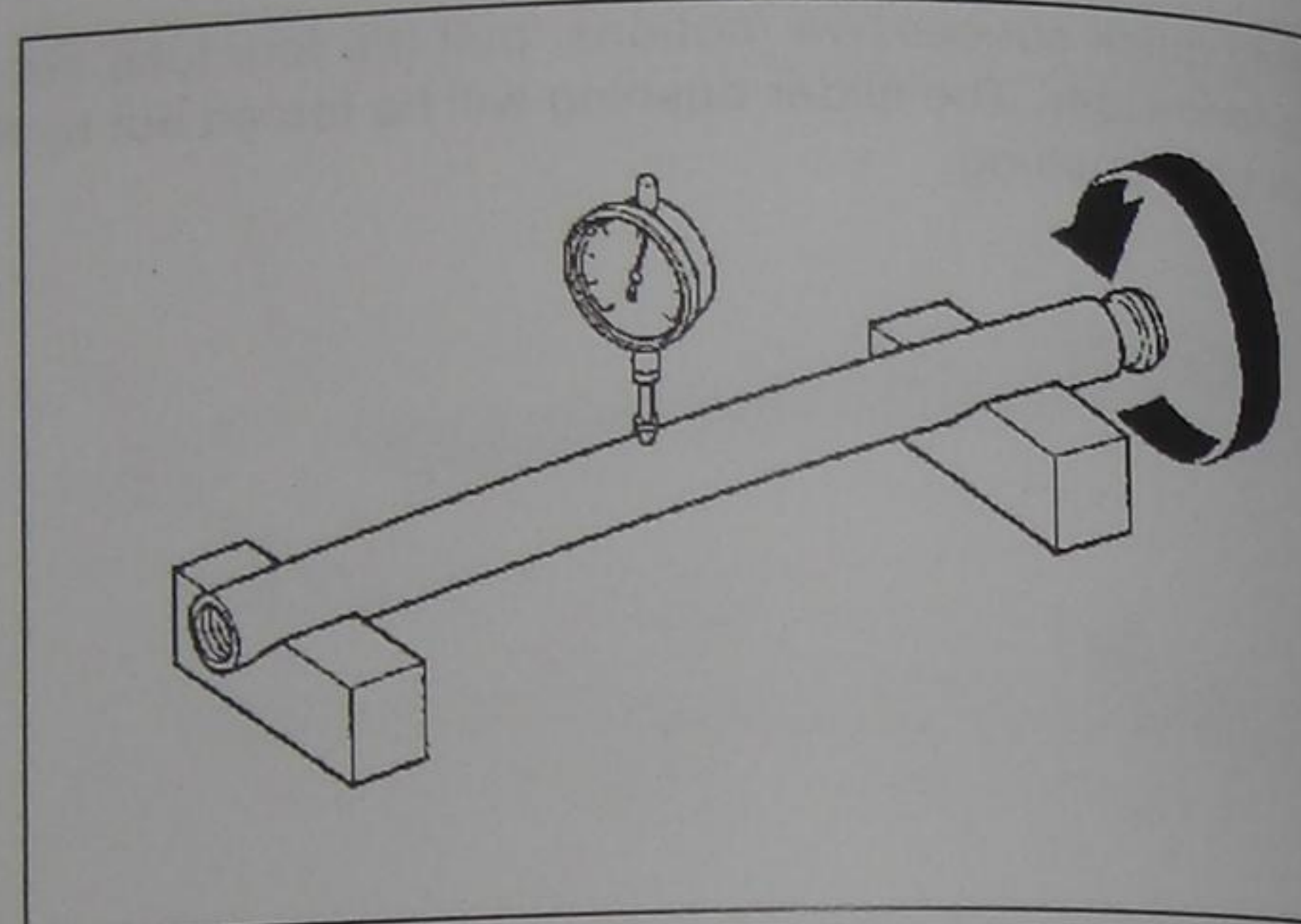
Check the fork tube, slider and fork piston for score marks, and excessive or abnormal wear.
Check the fork piston ring for wear or damage.
Check the rebound spring for fatigue or damage.

Replace the component if necessary.



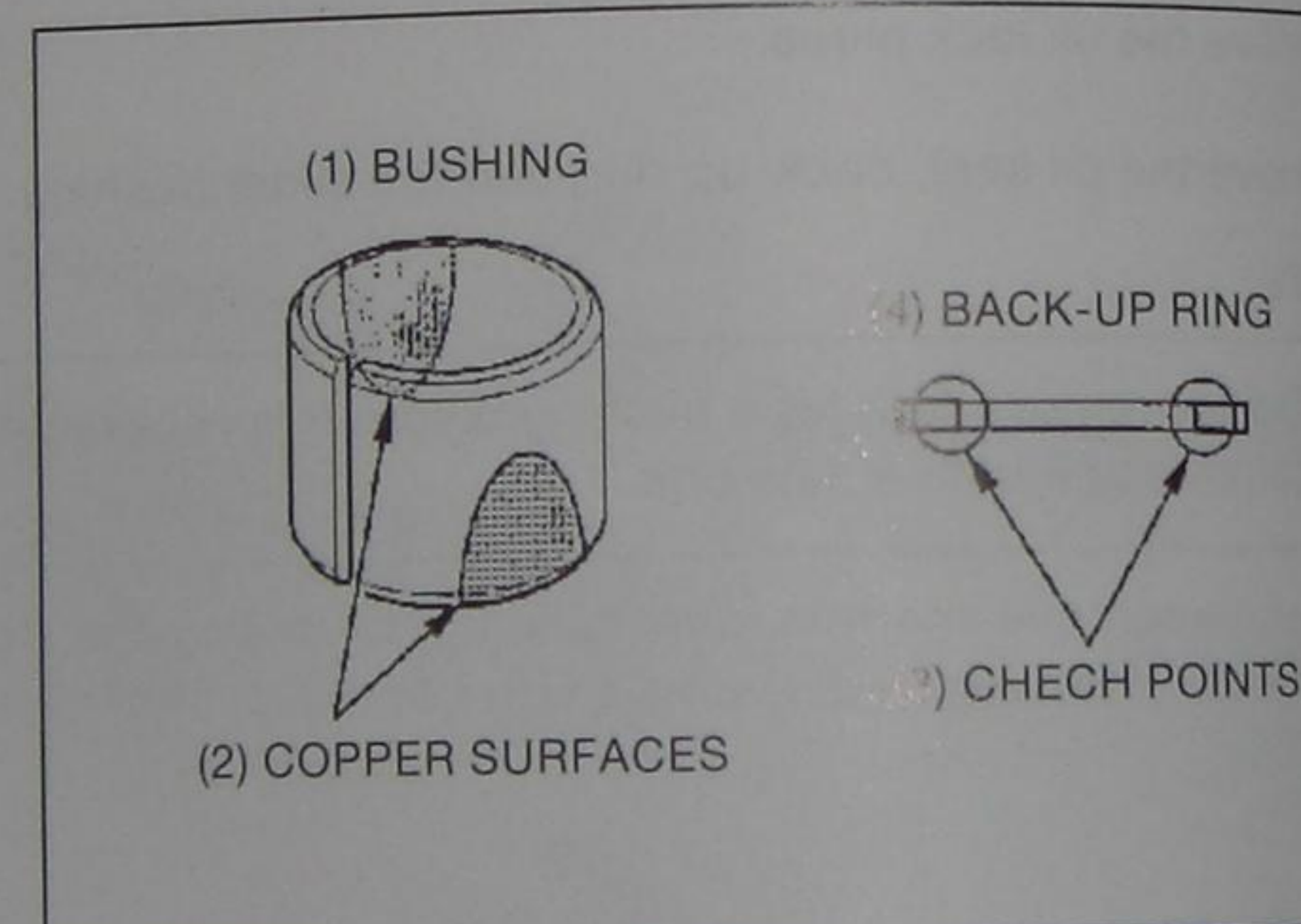
Set the fork tube in V-blocks and measure the fork tube runout with a dial indicator.
Actual runout is 1/2 the total indicator reading.

SERVICE LIMIT: 0.20 mm (0.008 in)



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

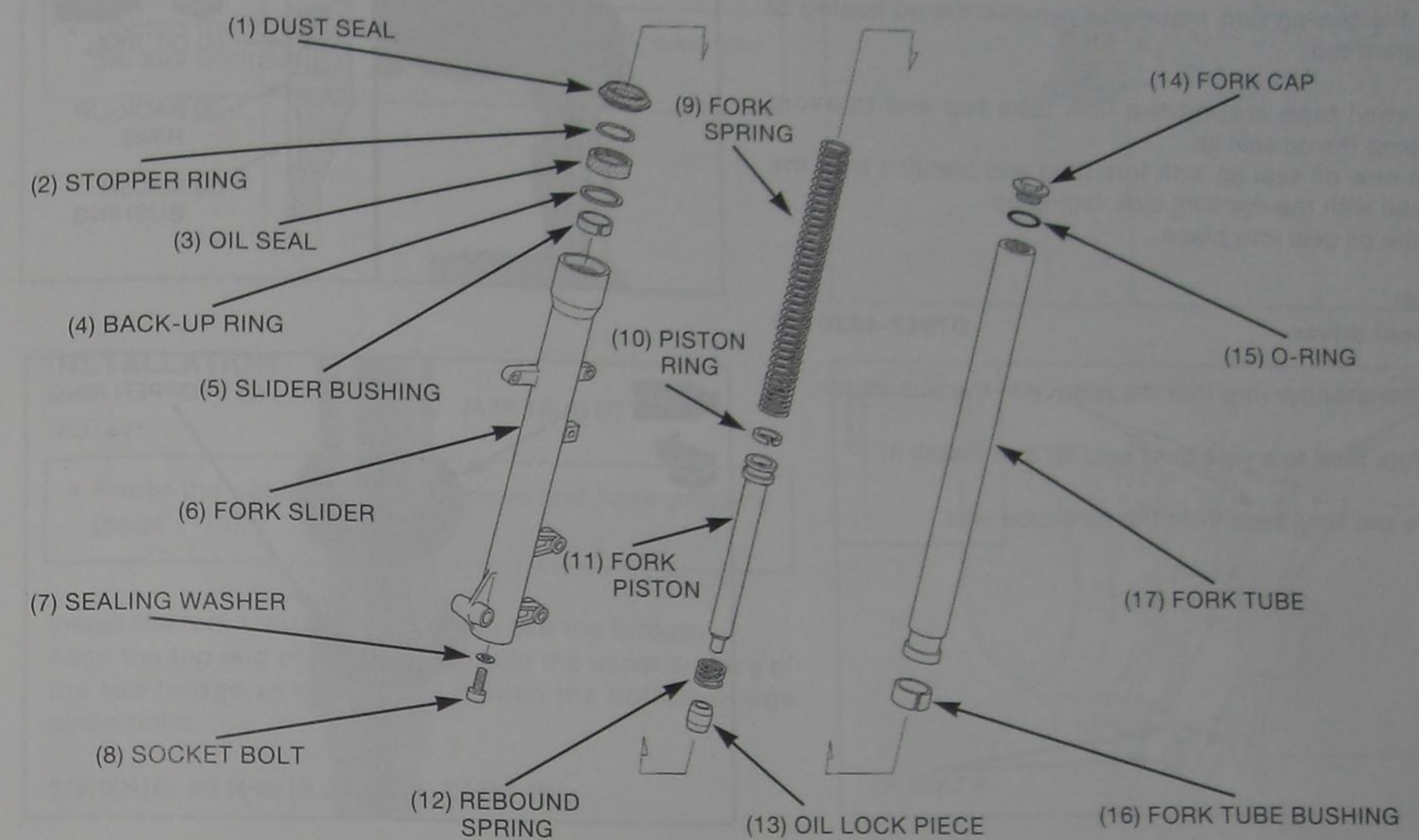
Check the back-up ring; replace it if there is any distortion at the points shown.



FRONT WHEEL/SUSPENSION/STEERING

ASSEMBLY

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



Install a new fork tube bushing if it has been removed.

CAUTION

- Be careful not to damage the coating of the bushing.
- Do not open the bushing more than necessary.

NOTE:

- Remove the burrs from the bushing mating surface, being careful not to peel off the coating.

Install the rebound spring onto the fork piston.
Install the fork piston into the fork tube.
Install the oil lock piece onto the fork piston end.

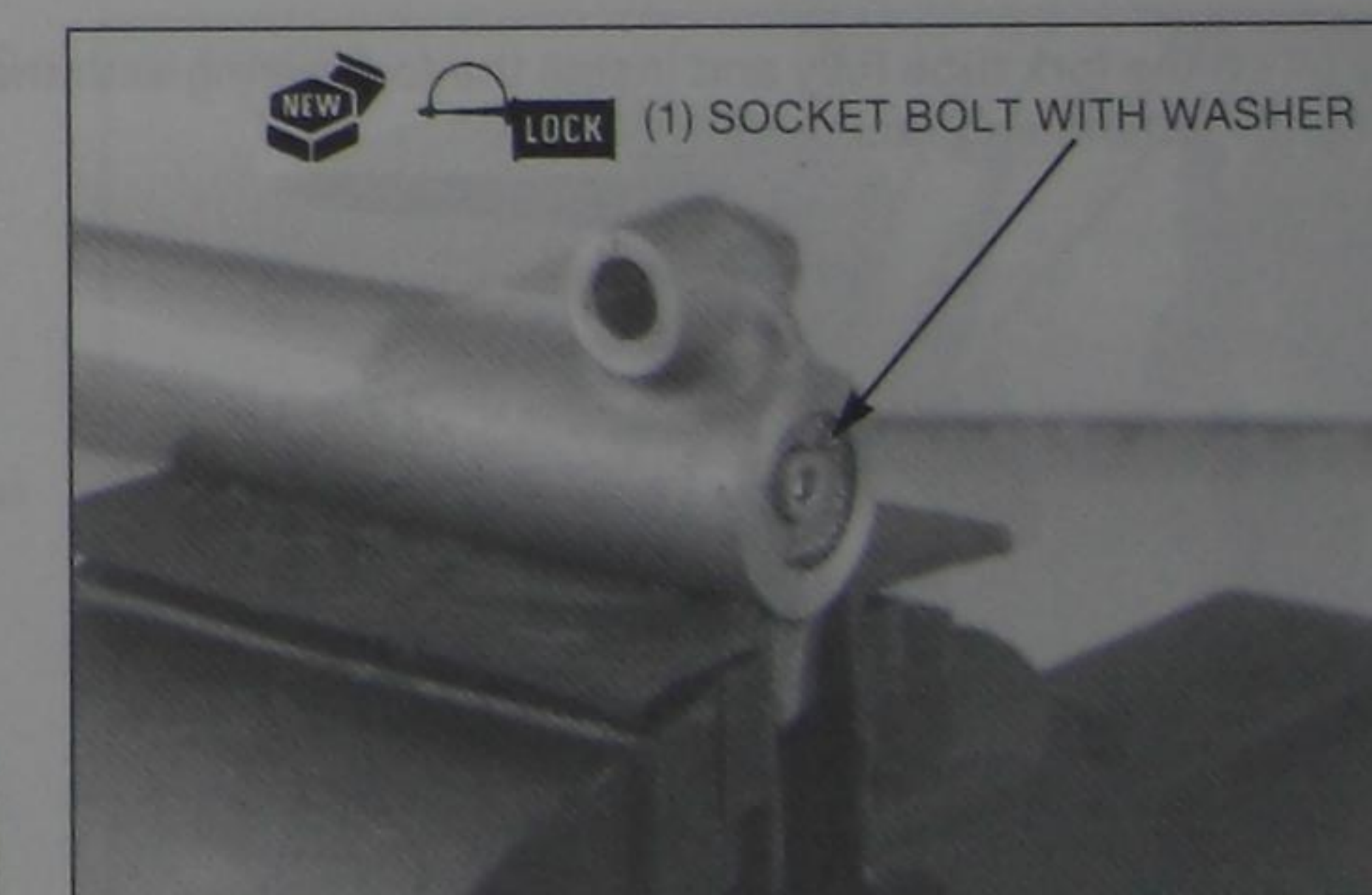
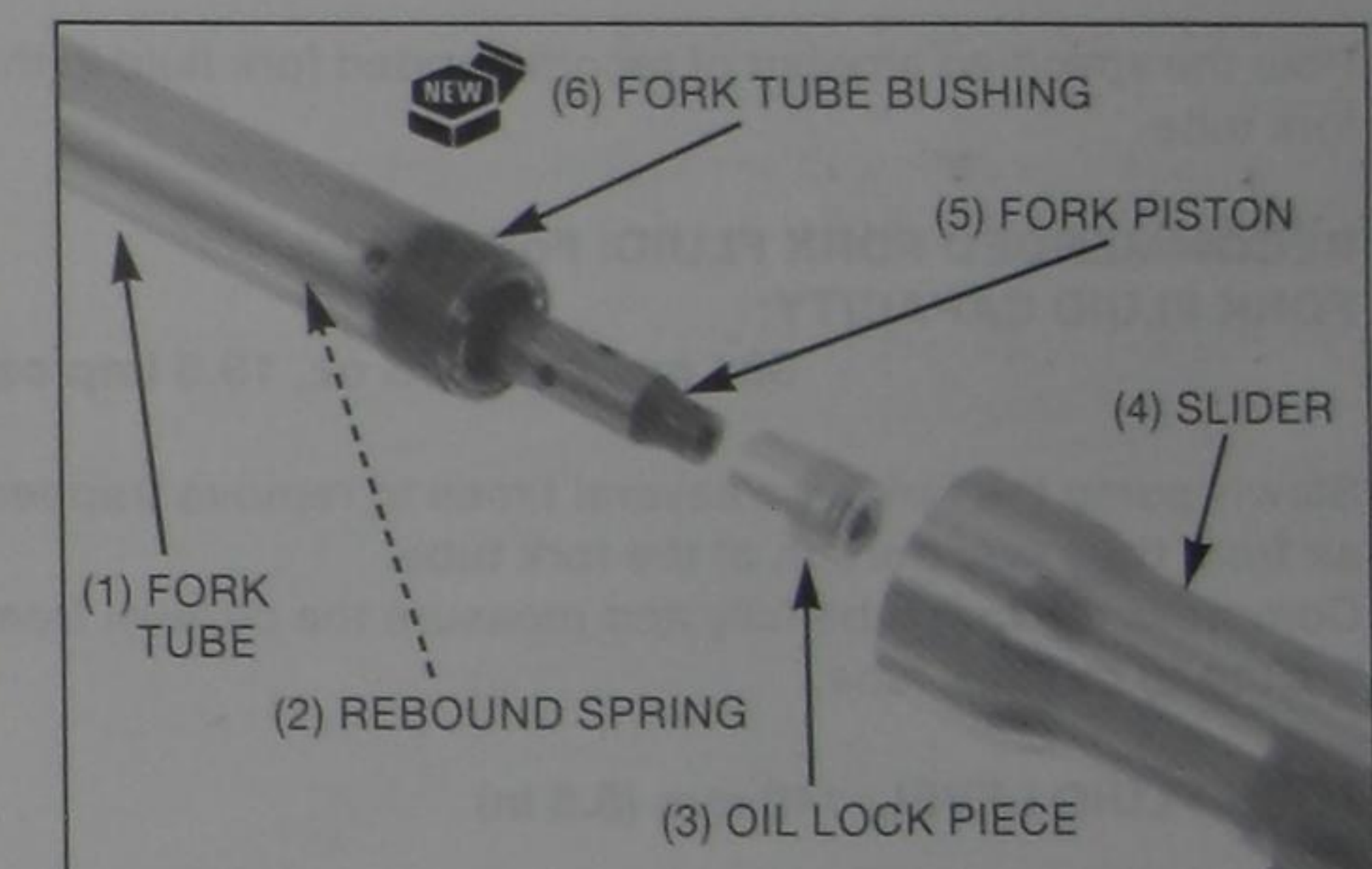
Install the fork tube into the fork slider.

Hold the fork slider in a vise with a soft jaws or shop towel.
Apply locking agent to the socket bolt threads.
Install the socket bolt with a new sealing washer and tighten it.

TORQUE: 20 N·m (2.0 kgf-m, 14 lbf-ft)

NOTE:

- If the fork piston turns together with the socket bolt, temporarily install the fork spring, spring seat and spacer.



FRONT WHEEL/SUSPENSION/STEERING

Place the slider bushing over the fork tube and rest it on the slider. Put the back-up ring with the chamfered side facing down and an old busing or equivalent tool on the top of the slider bushing. Drive the busing into place and remove the oil busing or equivalent tool.

Wrap vinyl tape around the fork tube top end to avoid damaging the oil seal lip. Coat a new oil seal lip with fork fluid and install it over the fork tube with the marking side facing up. Drive the oil seal into place.

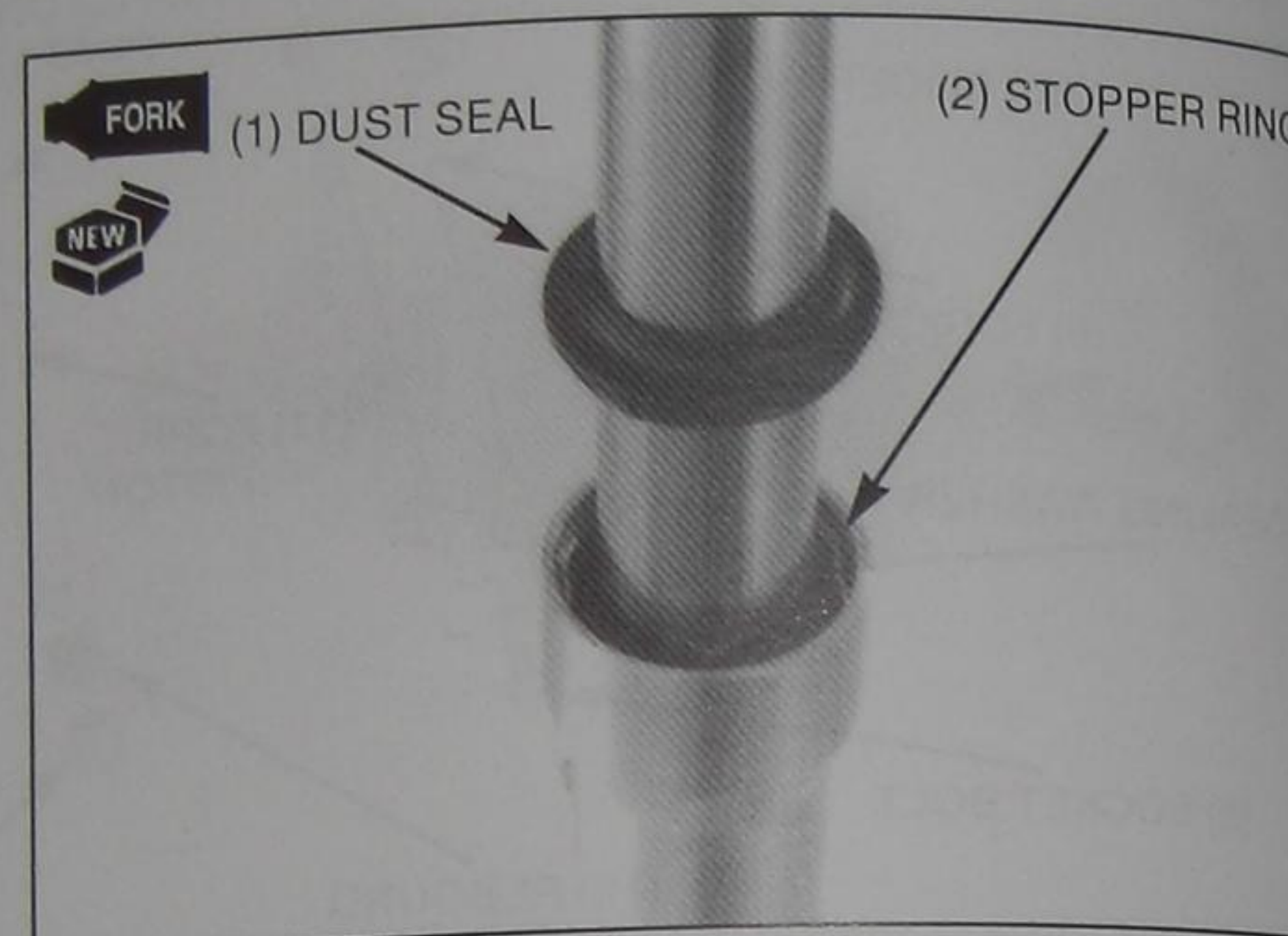
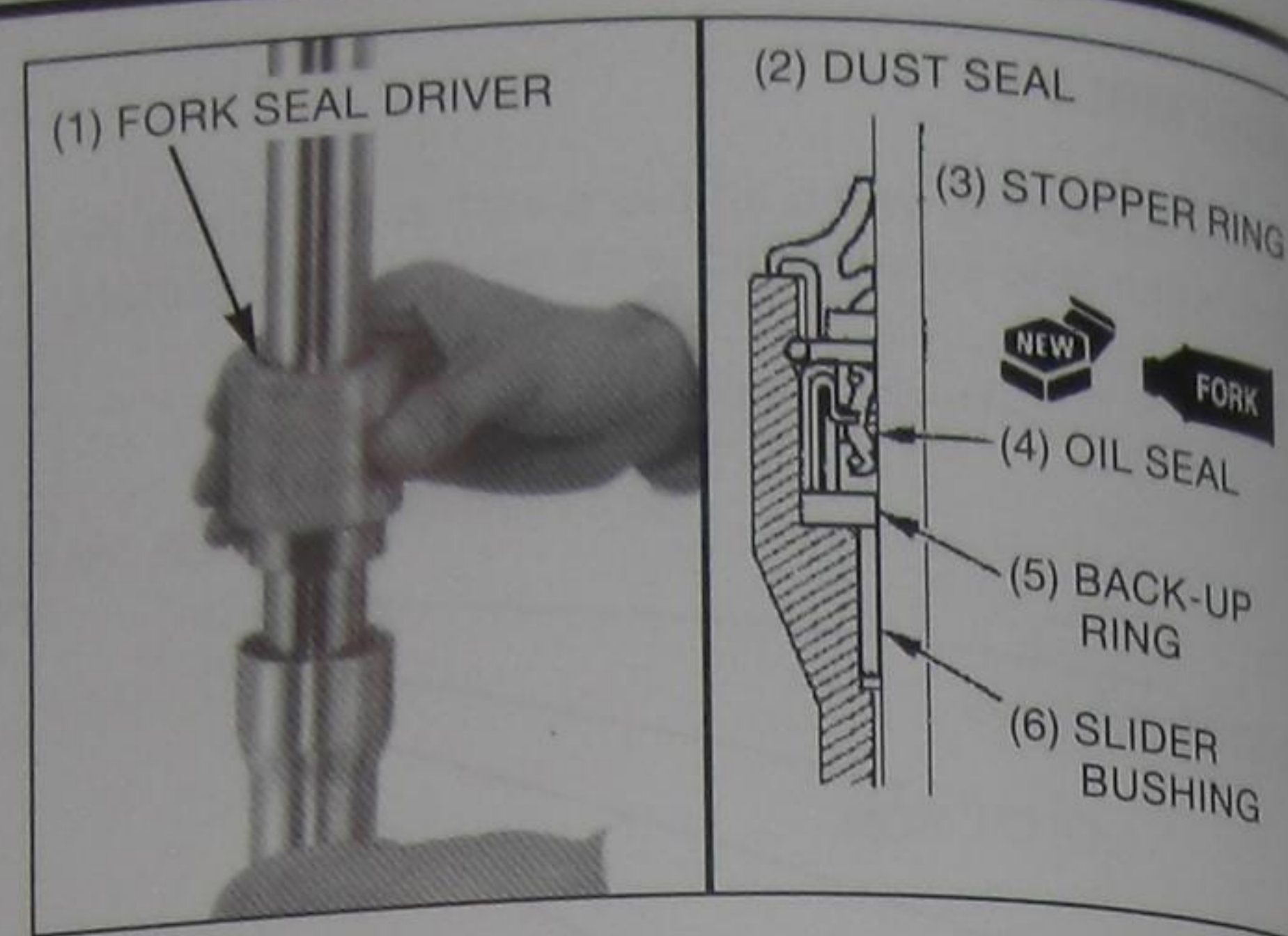
TOOLS:
Fork seal driver

07947-4630100

Install the stopper ring into the groove in the fork slider.

Apply fork fluid to a new dust seal lip and install it.

Remove the vinyl tape from the fork tube end.

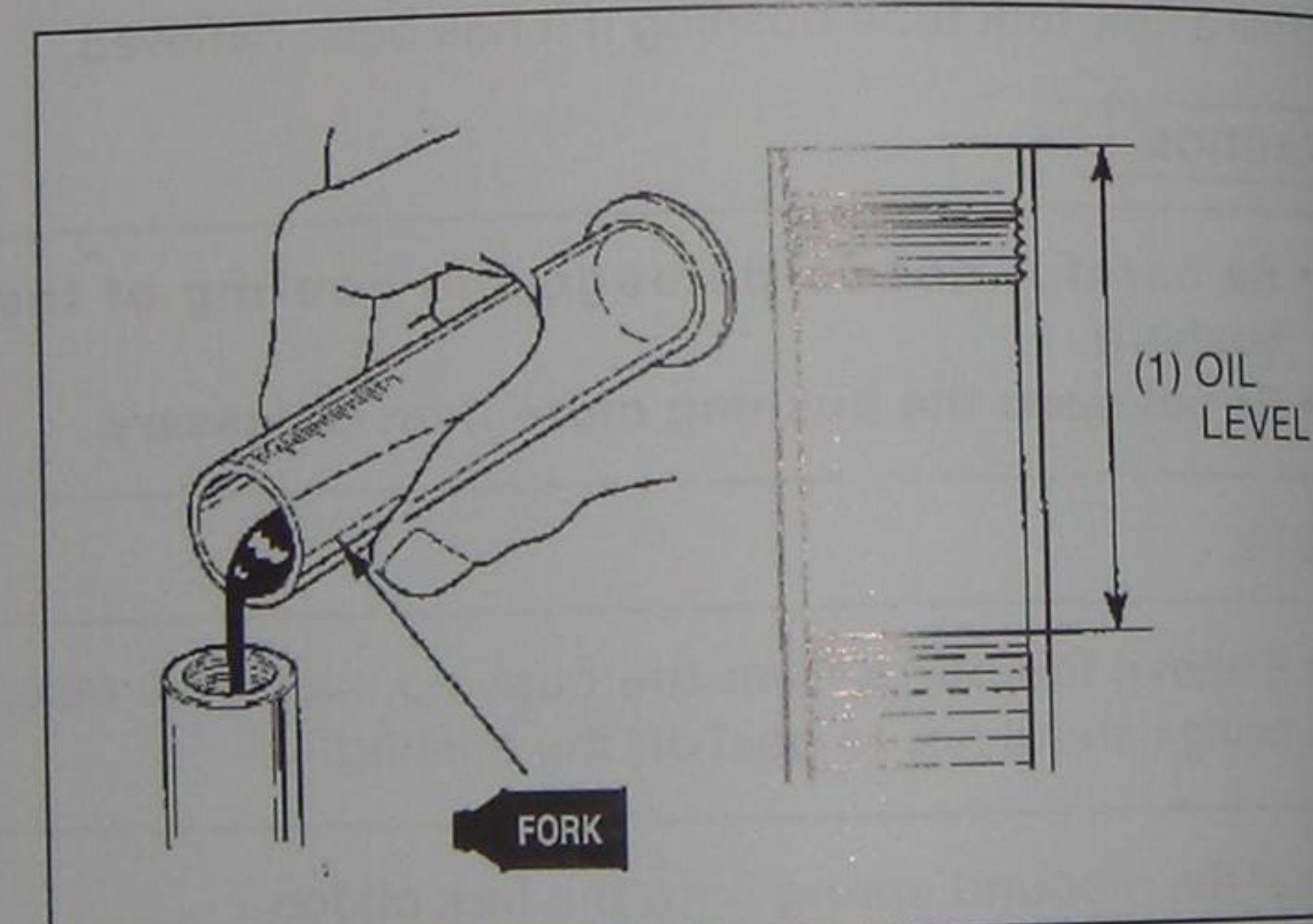


Pour the specified amount of recommended fork fluid in the fork tube.

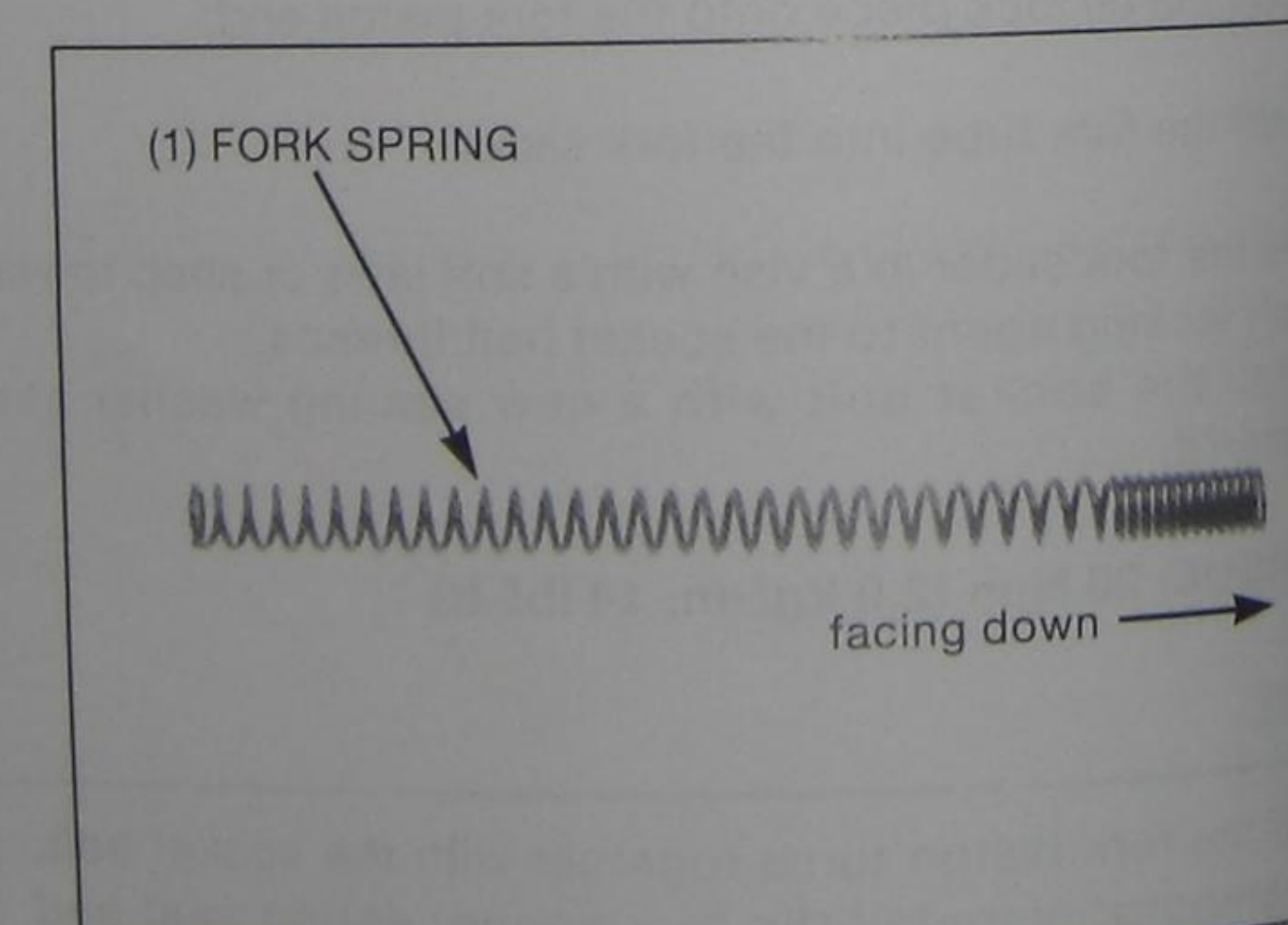
RECOMMENDED FORK FLUID: Fork fluid
FORK FLUID CAPACITY:
384 cm³ (12.9 US oz, 13.5 Imp oz)

Slowly pump the fork tube several times to remove trapped air from the lower portion of the fork tube. Compress the fork tube fully and measure the oil level from the top of the fork tube.

FORK FLUID LEVEL: 140 mm (5.5 in)



Pull up the fork tube fully and install the fork spring with the tightly wound end facing down.

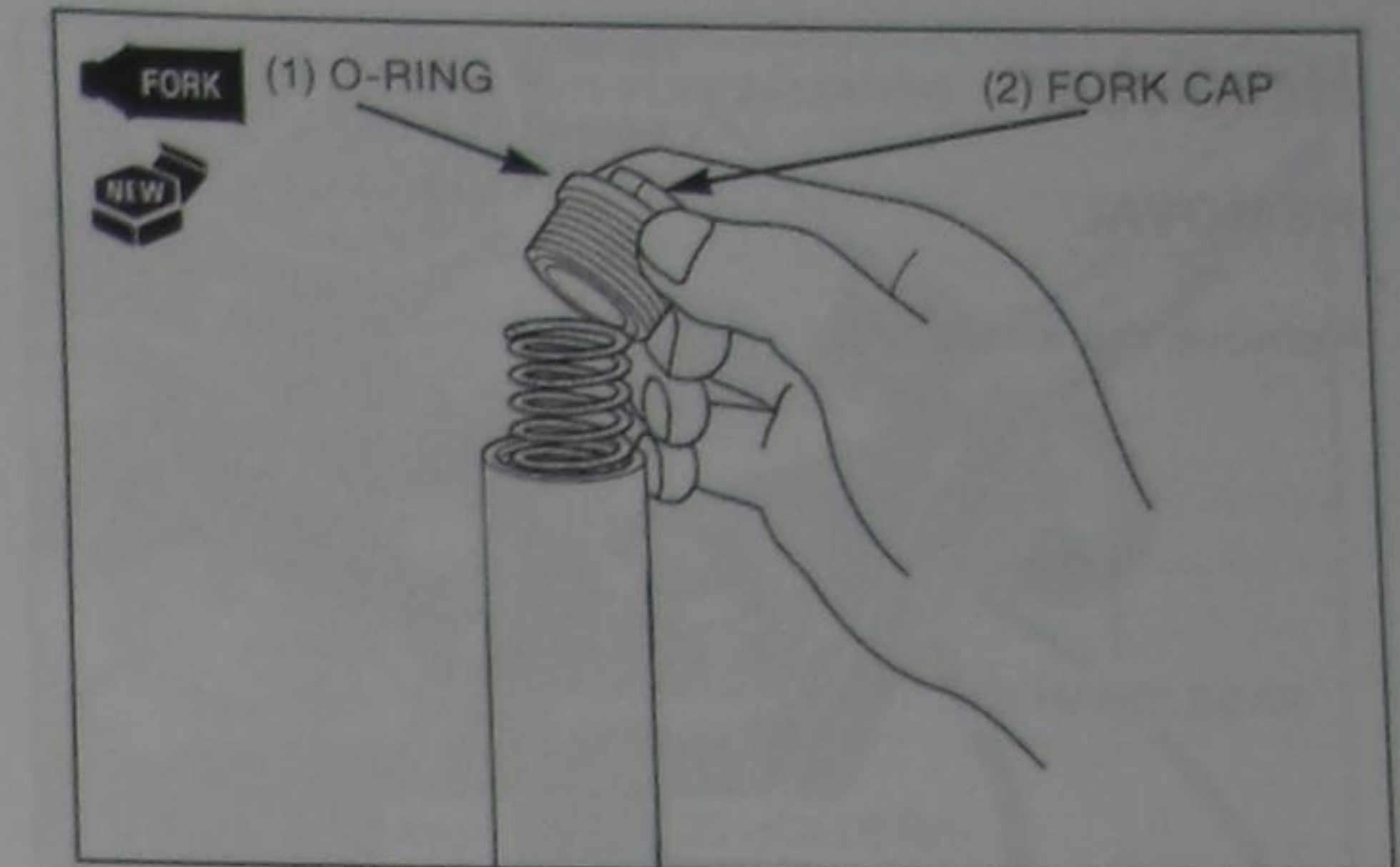


FRONT WHEEL/SUSPENSION/STEERING

Coat a new O-ring with fork fluid and install it into the fork cap groove. Install the fork cap.

NOTE:

- Tighten the fork cap after installing the fork tube into the fork bridges.



INSTALLATION

NOTE:

- Route the cables, wire harnesses and hose properly (page 1-16).

Install the fork tube into the bottom and top bridges. Align the top end of the fork tube with the upper surface of the top bridge as shown and tighten the bottom bridge pinch bolts.

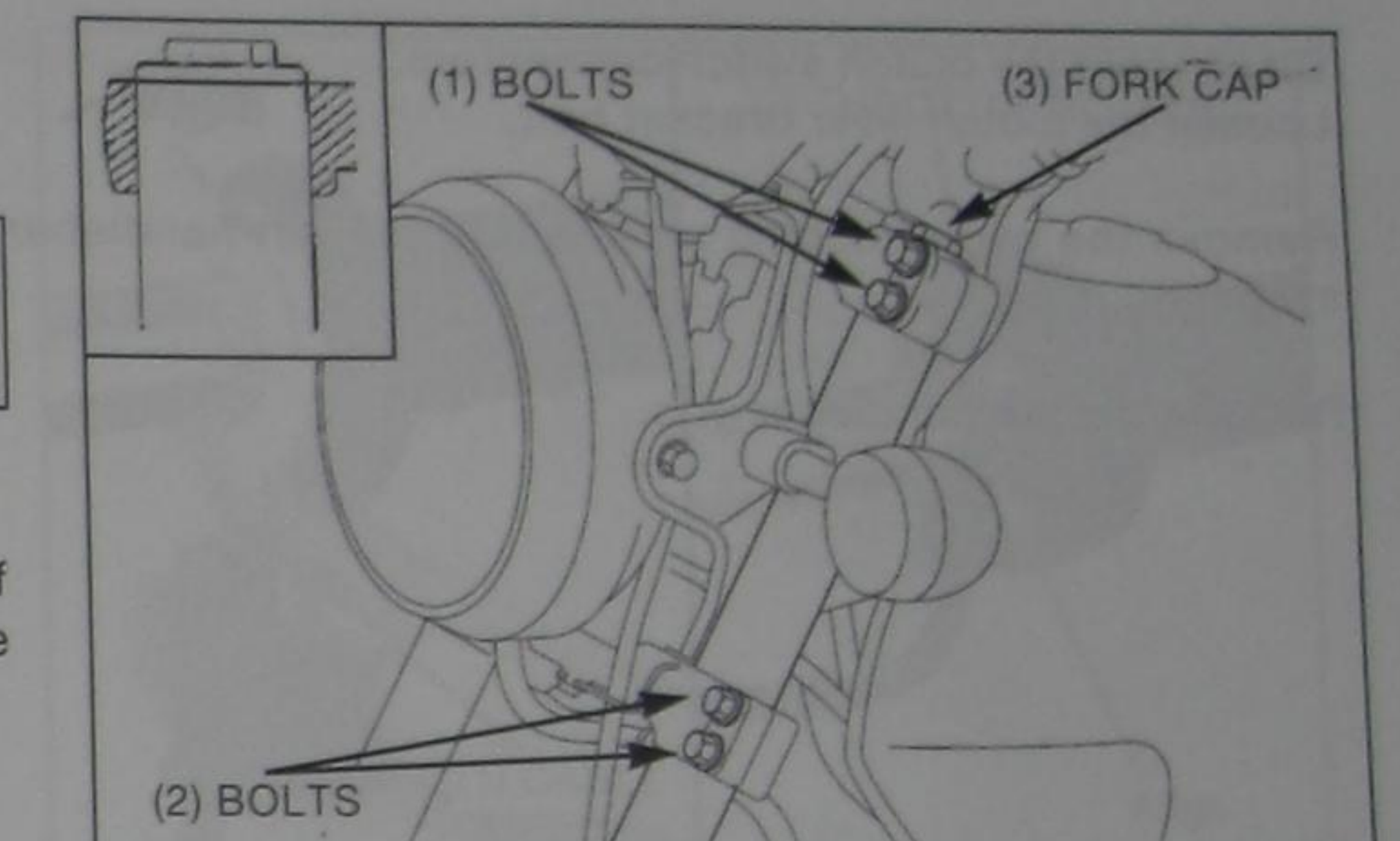
TORQUE: 32 N·m (3.3 kgf-m, 24 lbf-ft)

Tighten the fork cap if it was removed.

TORQUE: 23 N·m (2.3 kgf-m, 17 lbf-ft)

Tighten the top bridge pinch bolts.

TORQUE: 27 N·m (2.8 kgf-m, 20 lbf-ft)



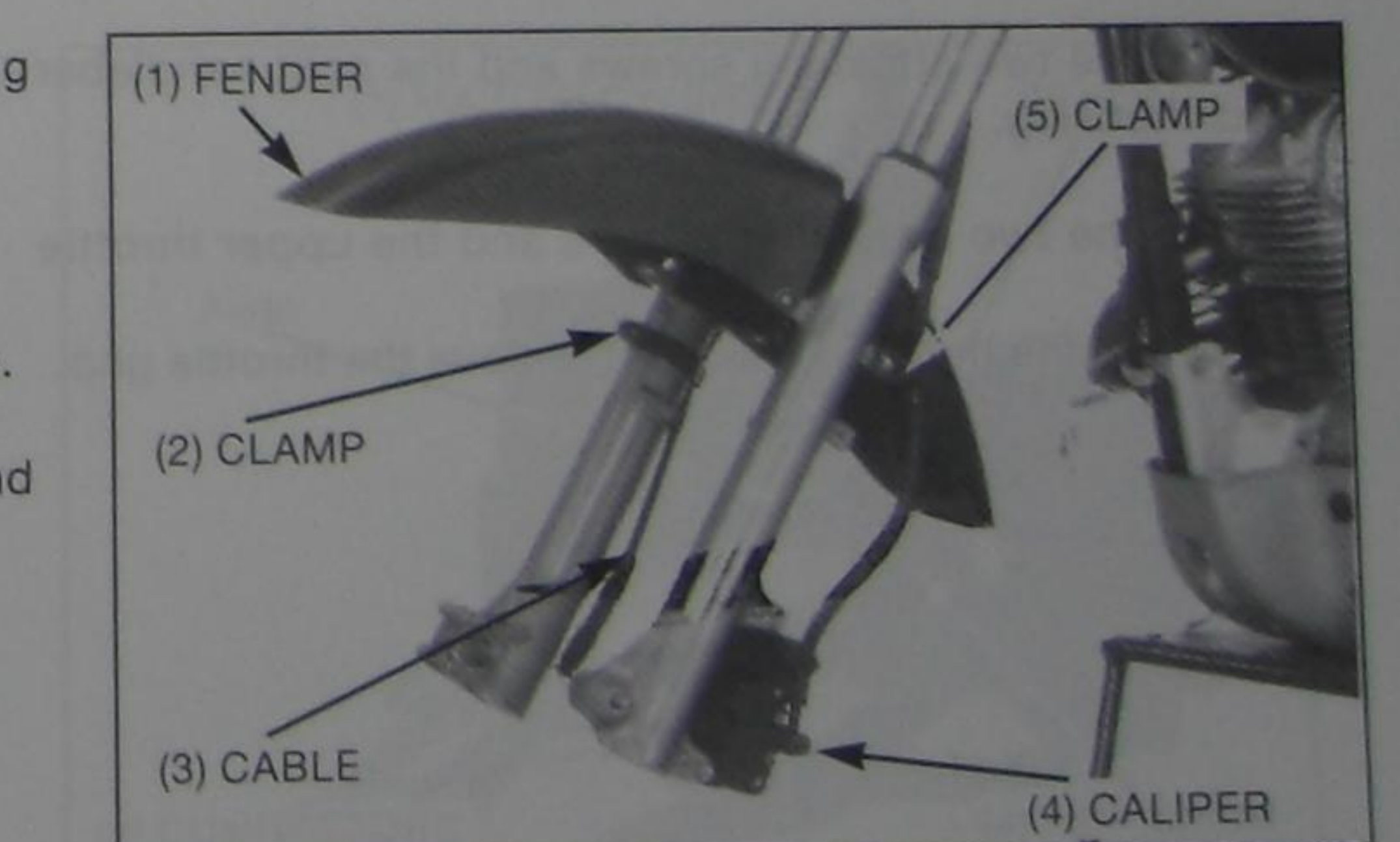
Install the brake caliper onto the fork leg with new mounting bolts.

TORQUE: 30 N·m (3.1 kgf-m, 22 lbf-ft)

Install the front fender with the hose clamp and four bolts.

Install the speedometer cable with the cable clamp, nut and screw.

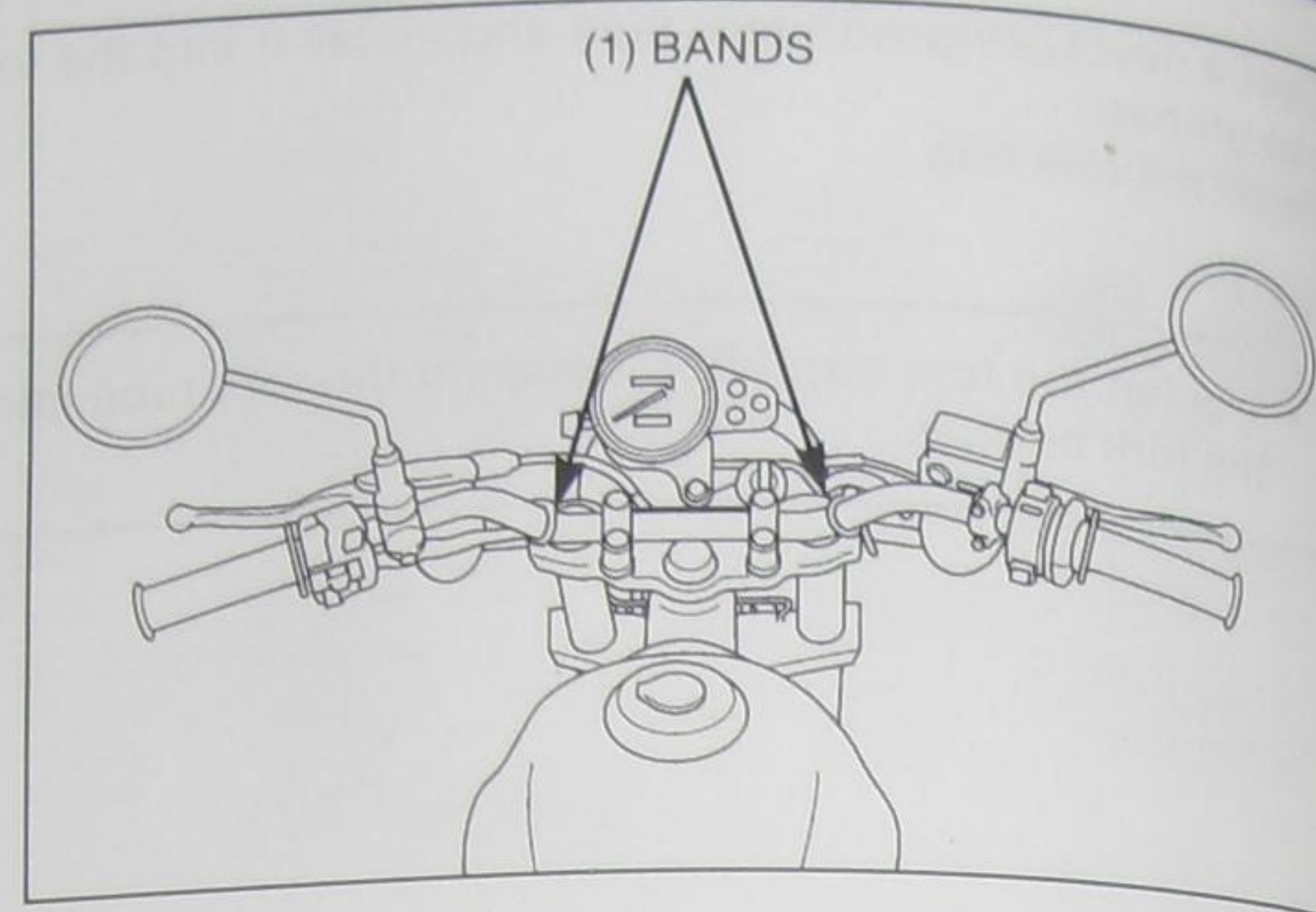
Install the front wheel (page 12-6).



Handlebar

REMOVAL

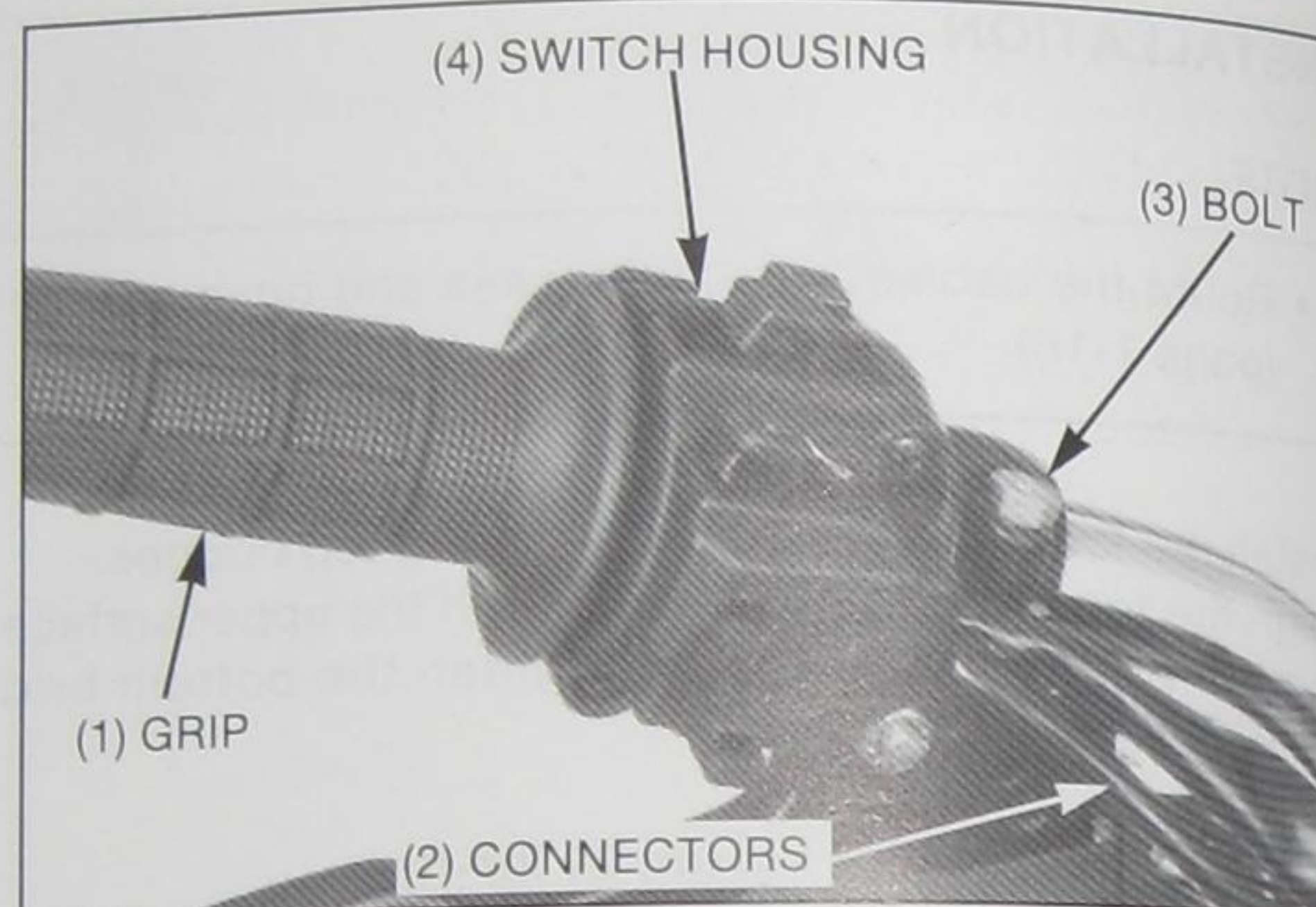
Remove the wire bands.



Disconnect the clutch switch connectors.
Loosen the clutch lever bracket bolt.

Remove the two attaching screws and the left handlebar switch housing.

Remove the left handlebar grip.

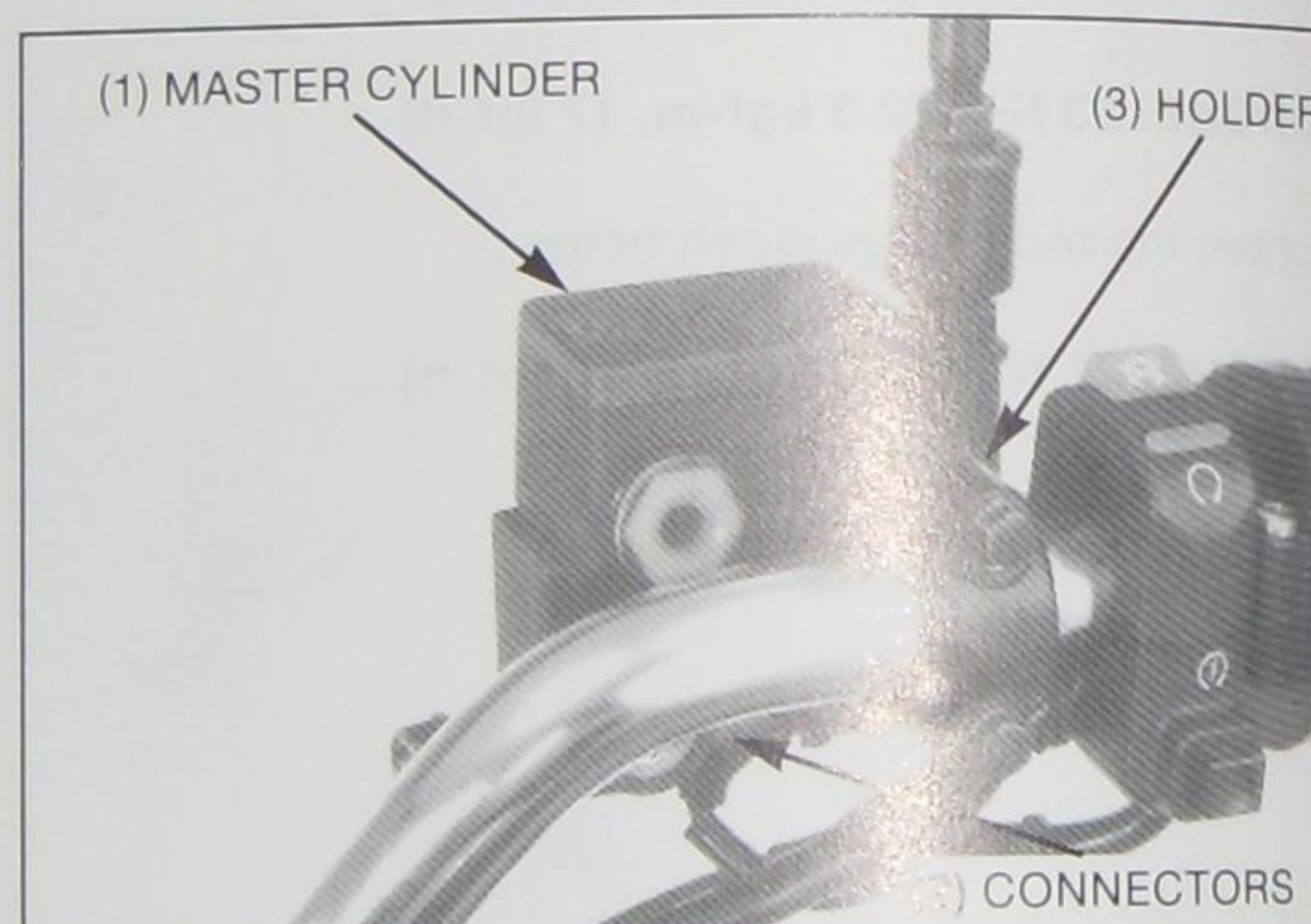


Disconnect the brake light switch connectors.

Remove the two bolts, holder and the master cylinder.

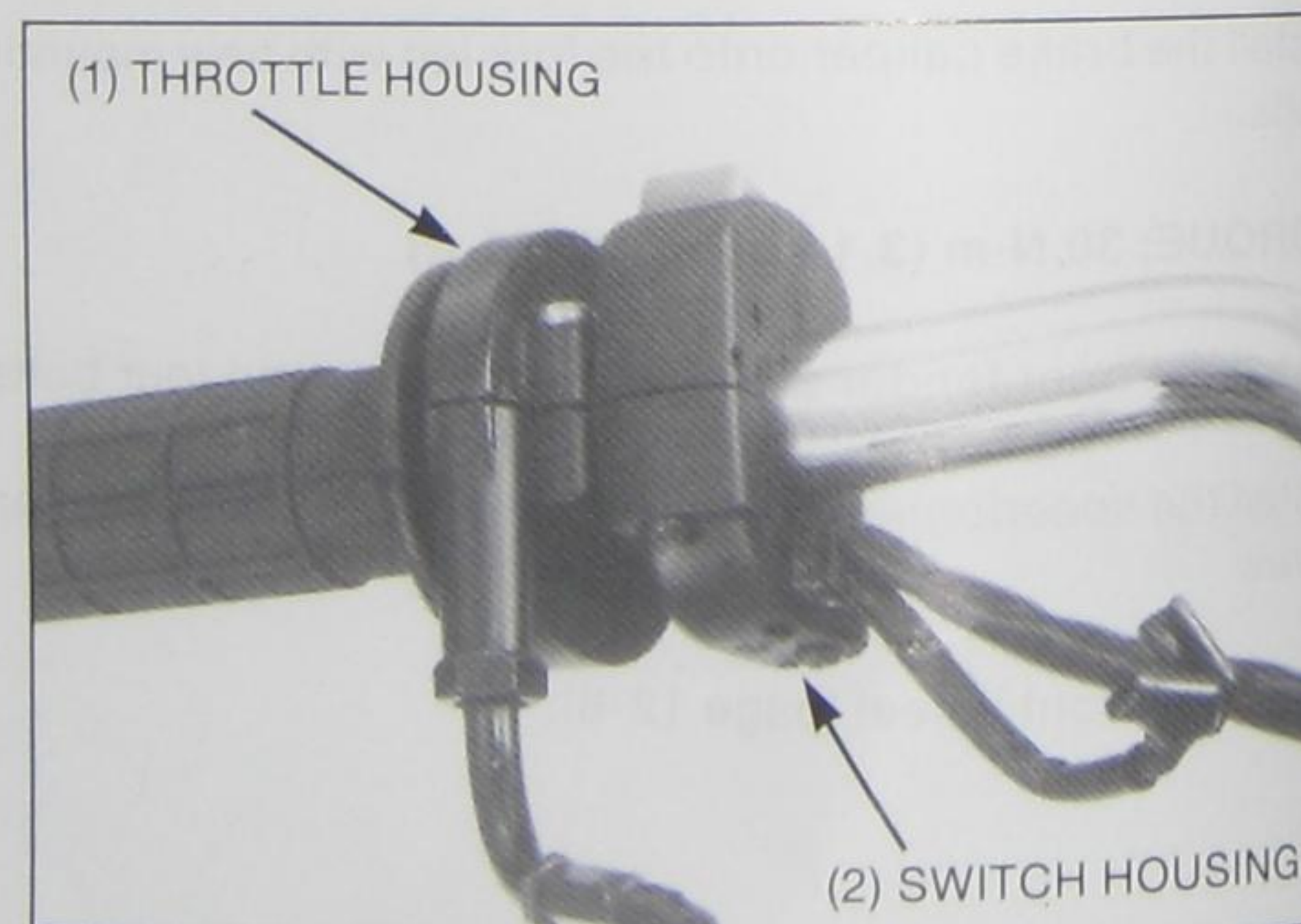
NOTE:

- Keep the master cylinder upright to prevent air from entering the hydraulic system.



Remove the two attaching screws and the right handlebar switch housing.

Remove the two attaching screws and the upper throttle housing.
Disconnect the throttle cable and remove the throttle grip.



Remove the four bolts and the upper holders.
Remove the handlebar from the lower holders.

Remove the clutch lever bracket.

INSTALLATION

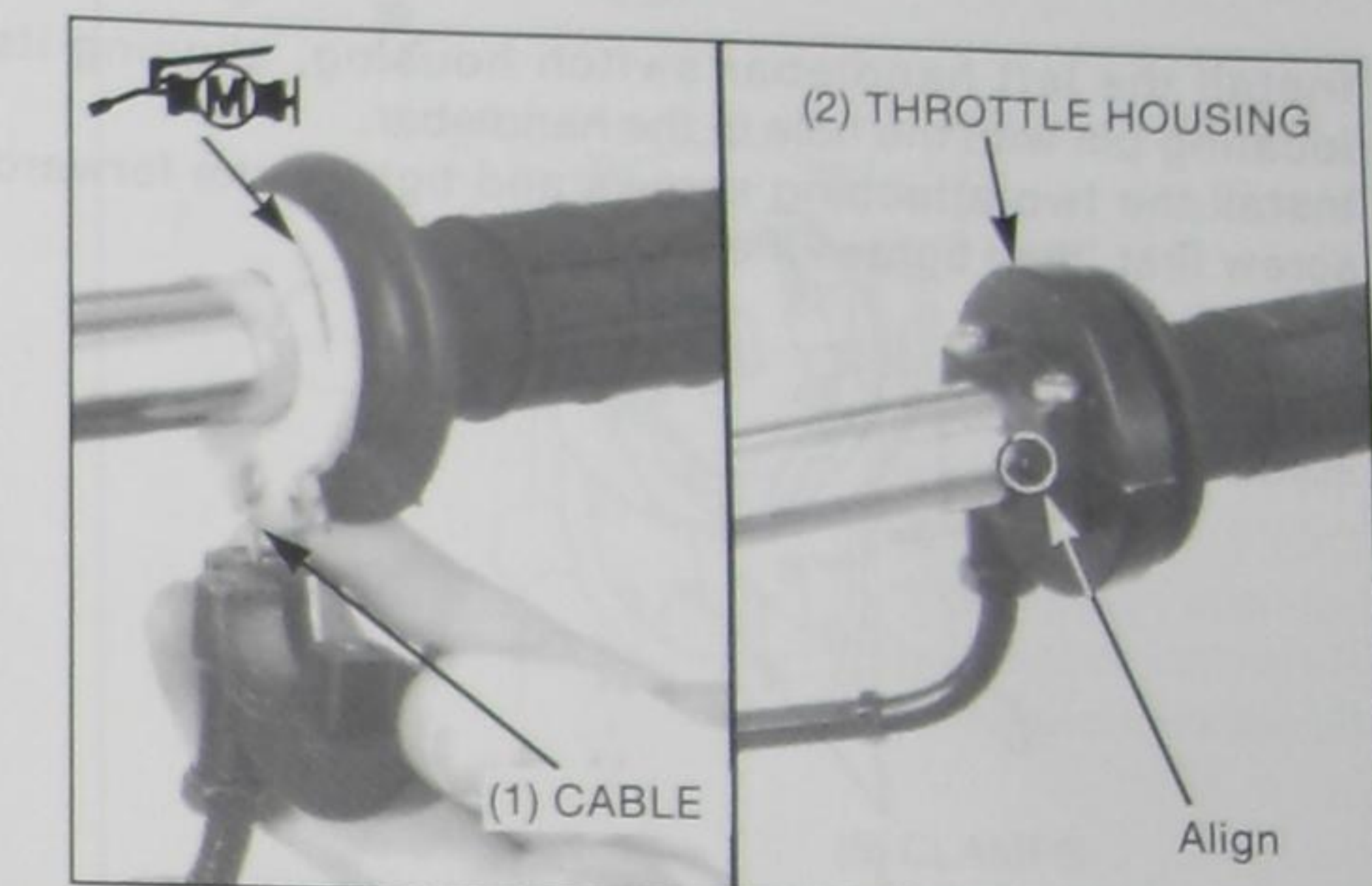
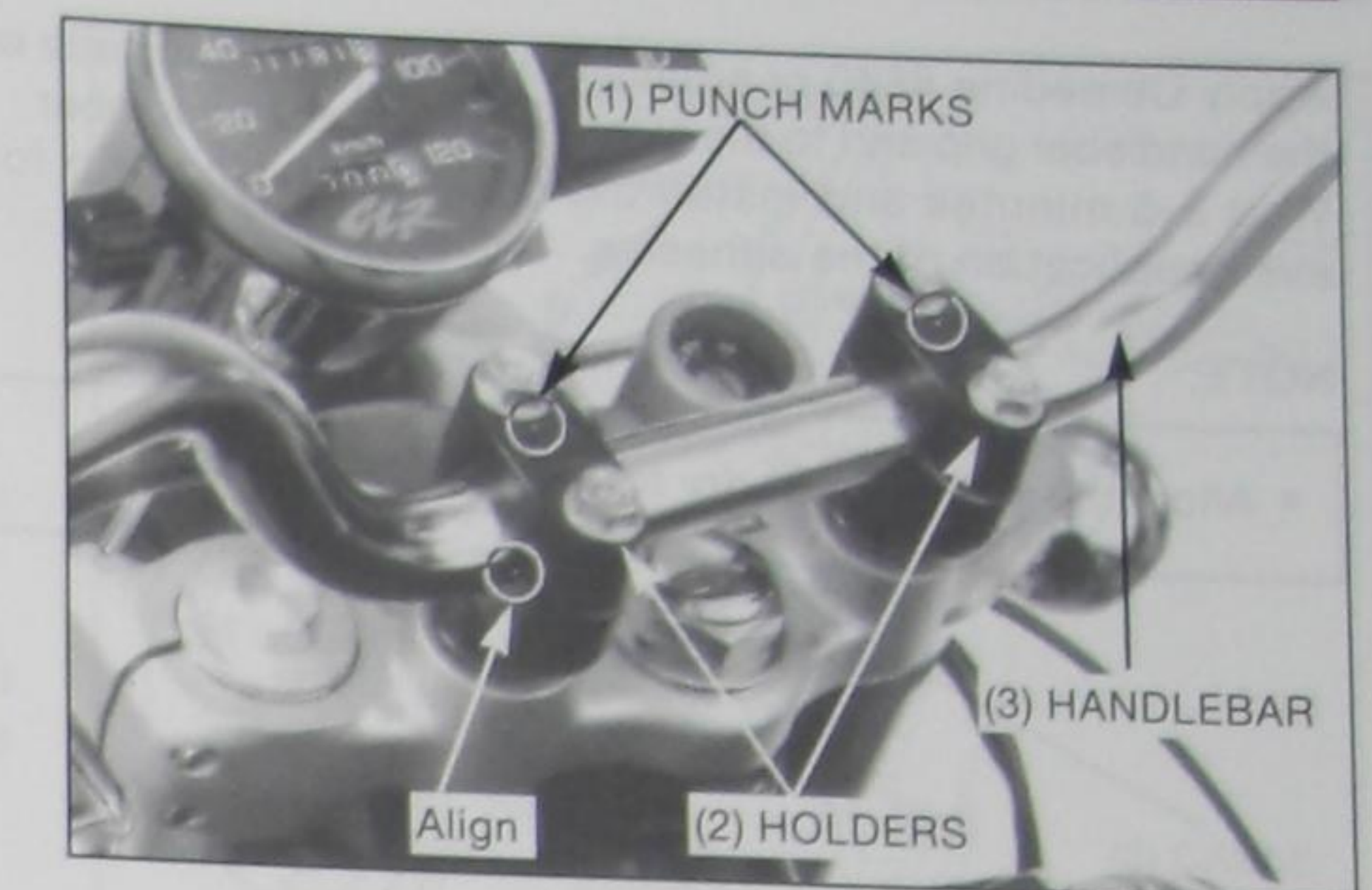
Install the clutch lever bracket onto the handlebar.

Place the handlebar onto the lower holders and align the punch mark on the handlebar with the top of the lower holder. Install the upper holders with the punch marks facing forward. Install the four bolts and tighten the rear bolts first, then tighten the rear bolts.

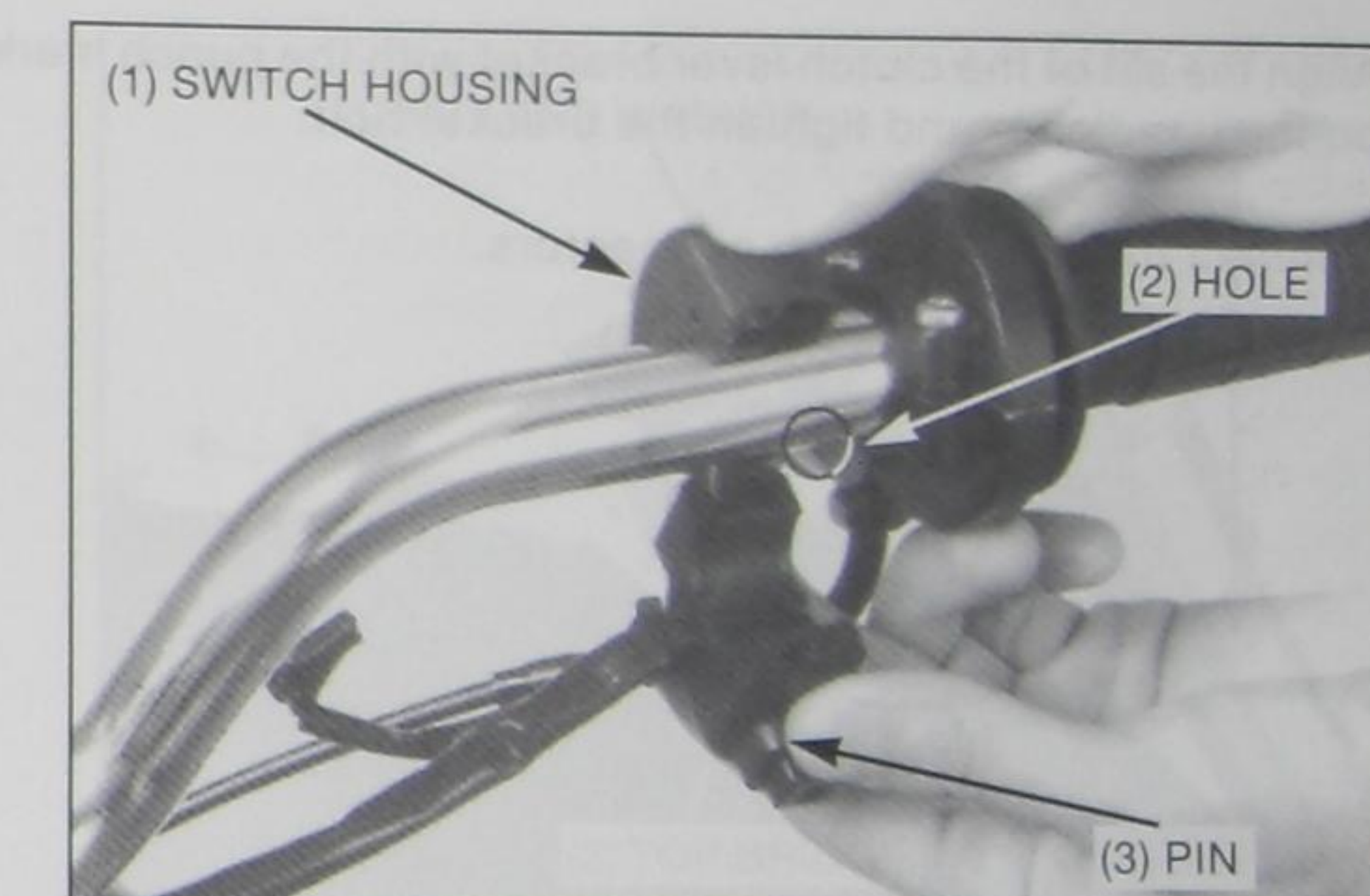
Apply molybdenum disulfide grease to the throttle grip flange groove and sliding surface.

Install the throttle grip onto the handlebar and connect the throttle cable to the throttle grip flange.

Install the upper throttle housing with the two screws. Align the slit if the throttle housing with the punch mark on the handlebar, and tighten the forward screw first, then tighten the rear screw.

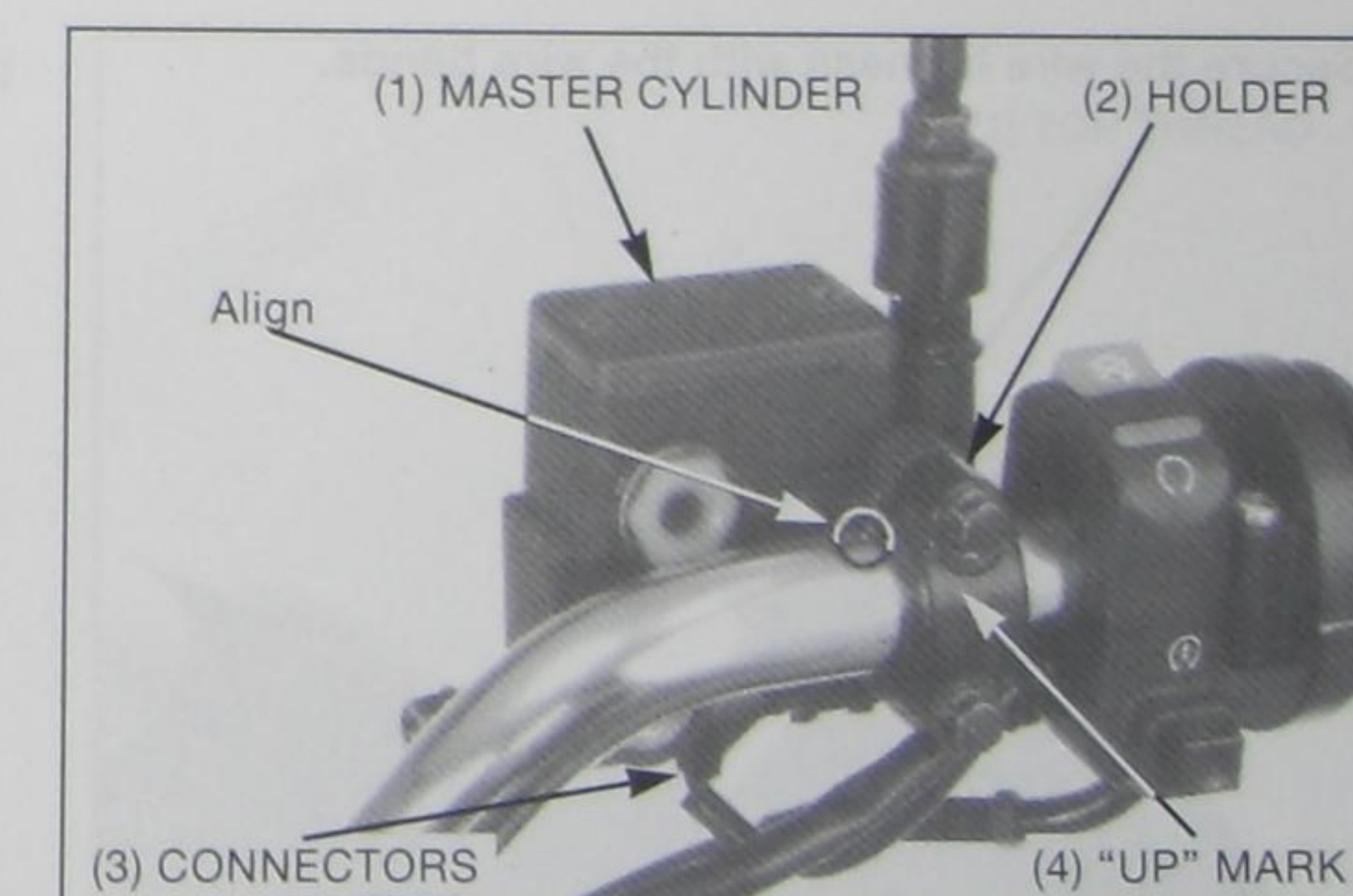


Install the right handlebar switch housing, aligning its locating pin with the hole in the handlebar.
Install the two attaching screws and tighten the forward screw first, then tighten the rear screw.



Install the master cylinder and holder with the "UP" mark facing up.
Align the slit of the master cylinder with the punch mark on the handlebar, and tighten the upper bolt first, then lower bolt.

Connect the brake light switch connectors.

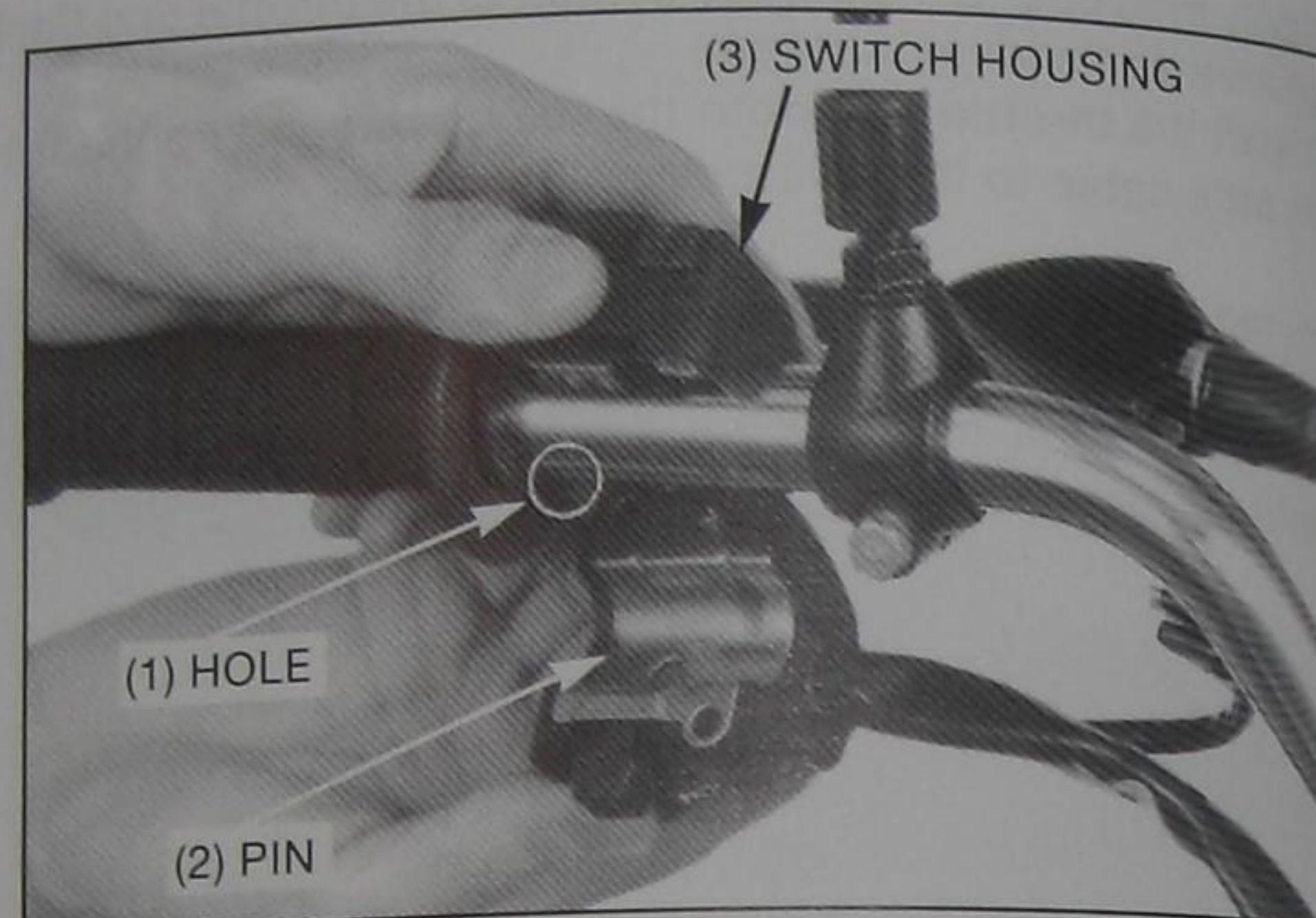
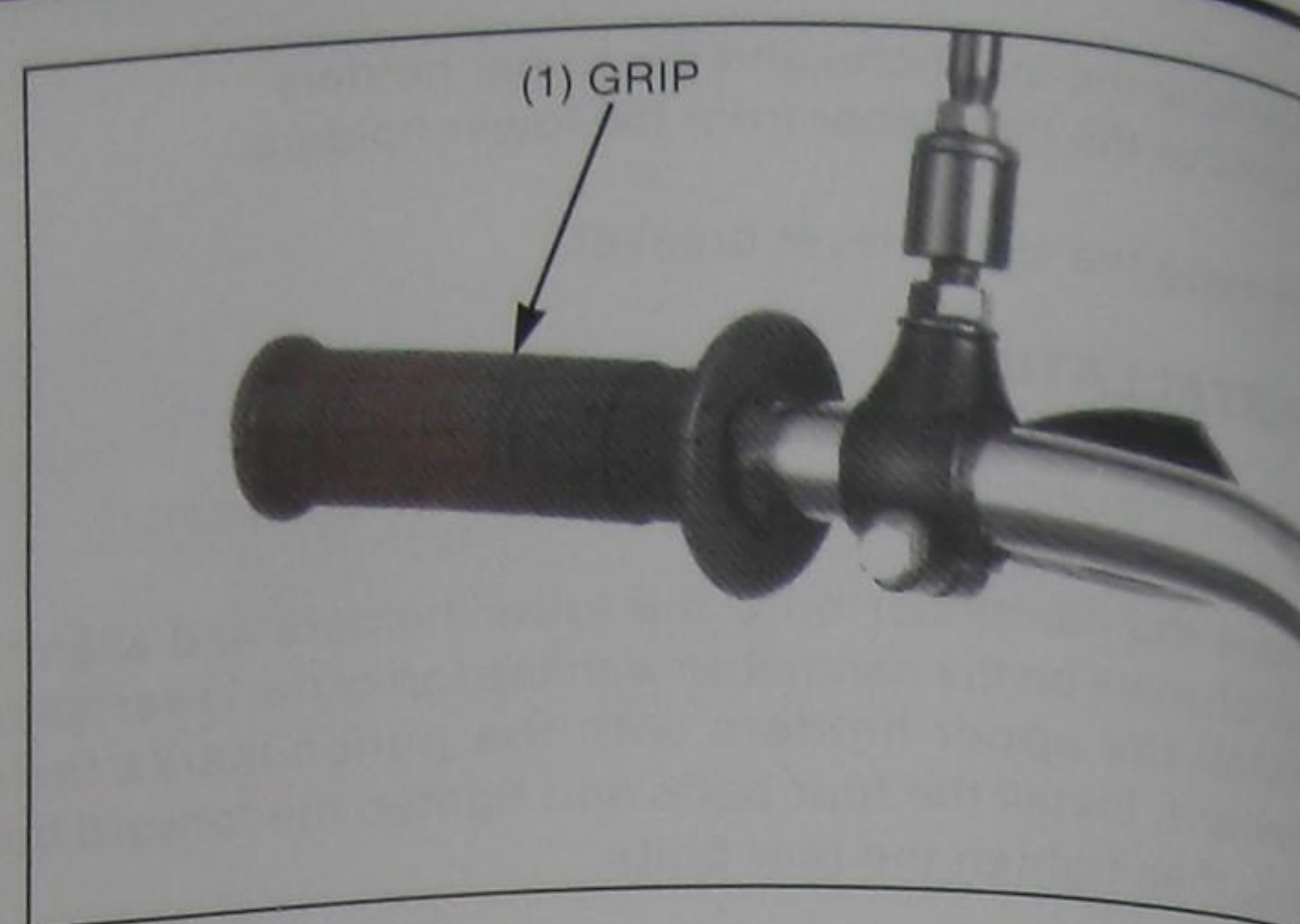


Apply Cemedine #540 or equivalent to the inside surface of the handlebar grip and to the clean surface of the handlebar. Wait 3-5 minutes and install the grip. Rotate the grip for even application of the adhesive.

NOTE:

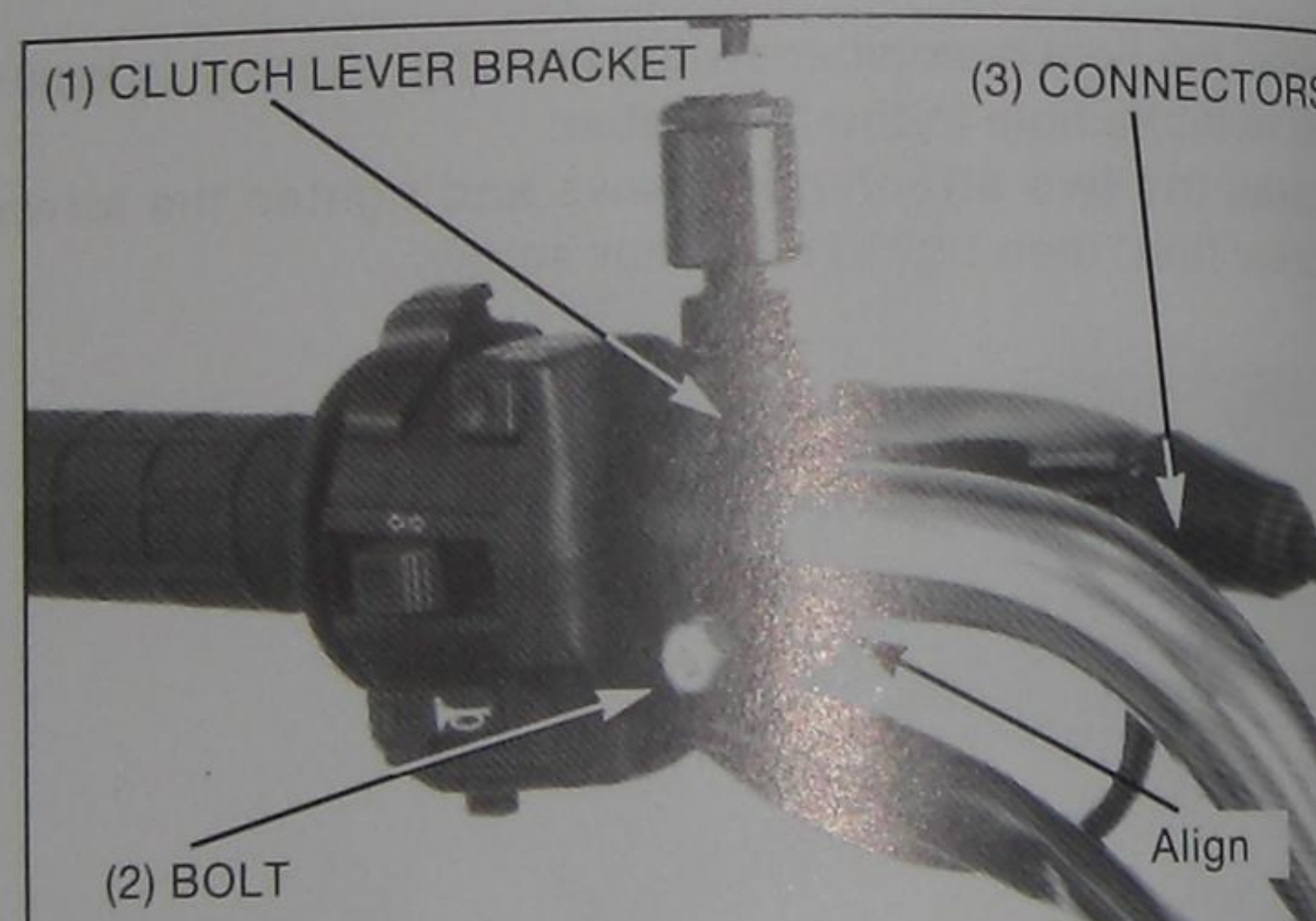
- Allow the adhesive to dry for an hour before using.

Install the left handlebar switch housing, aligning its locating pin with the hole in the handlebar. Install the two attaching screws and tighten the forward screw first, then tighten the rear screw.

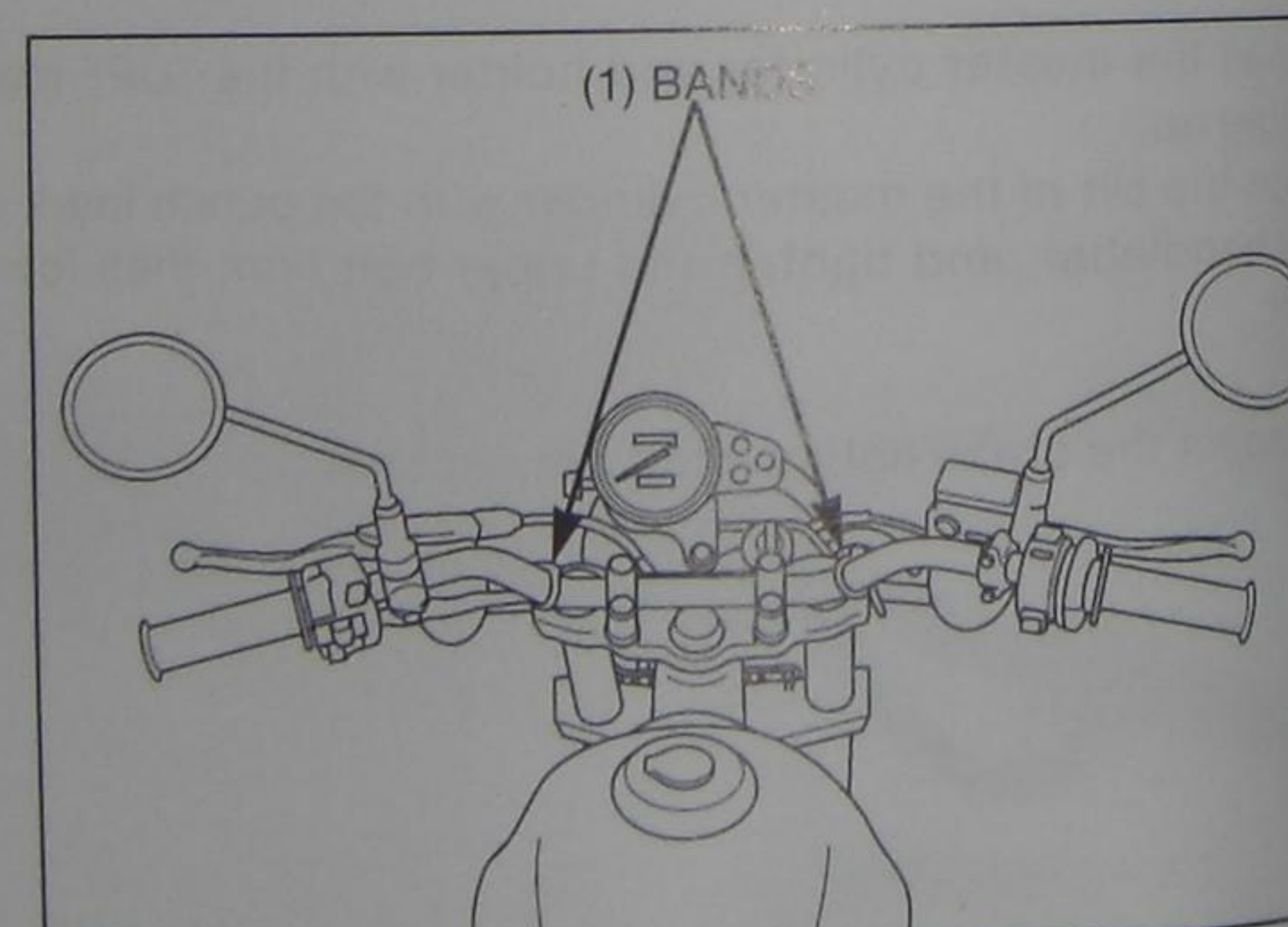


Align the slit of the clutch lever bracket with the punch mark on the handlebar and tighten the bracket bolt.

Connect the clutch switch connectors.



Secure the wire harness with the wire bands.



Steering Stem

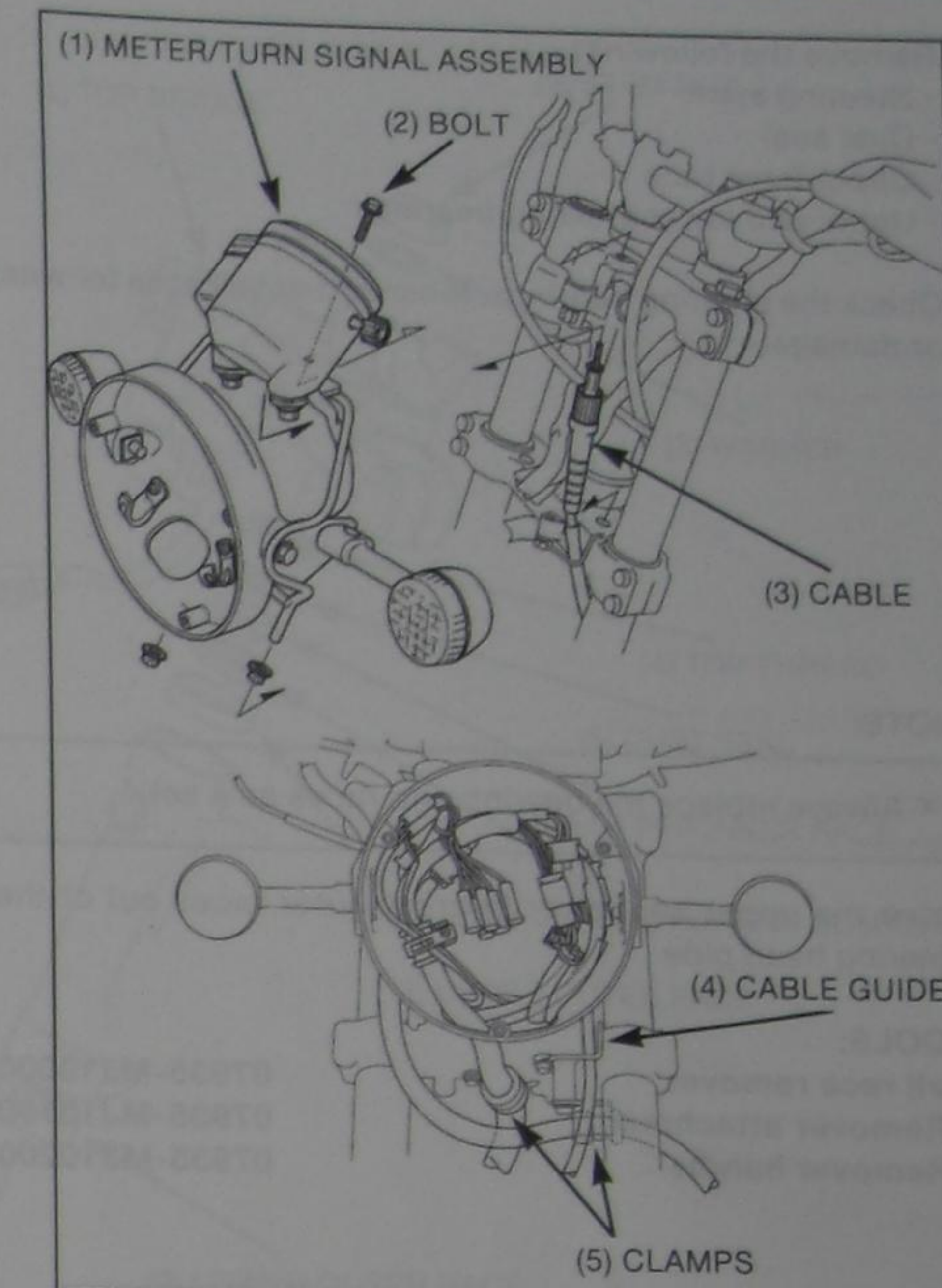
REMOVAL

Remove the headlight (page 18-2). Disconnect the connectors inside the headlight case. Disconnect the speedometer cable from the speedometer. Remove the bolt and the meter/turn signal assembly from the fork bottom bridge.

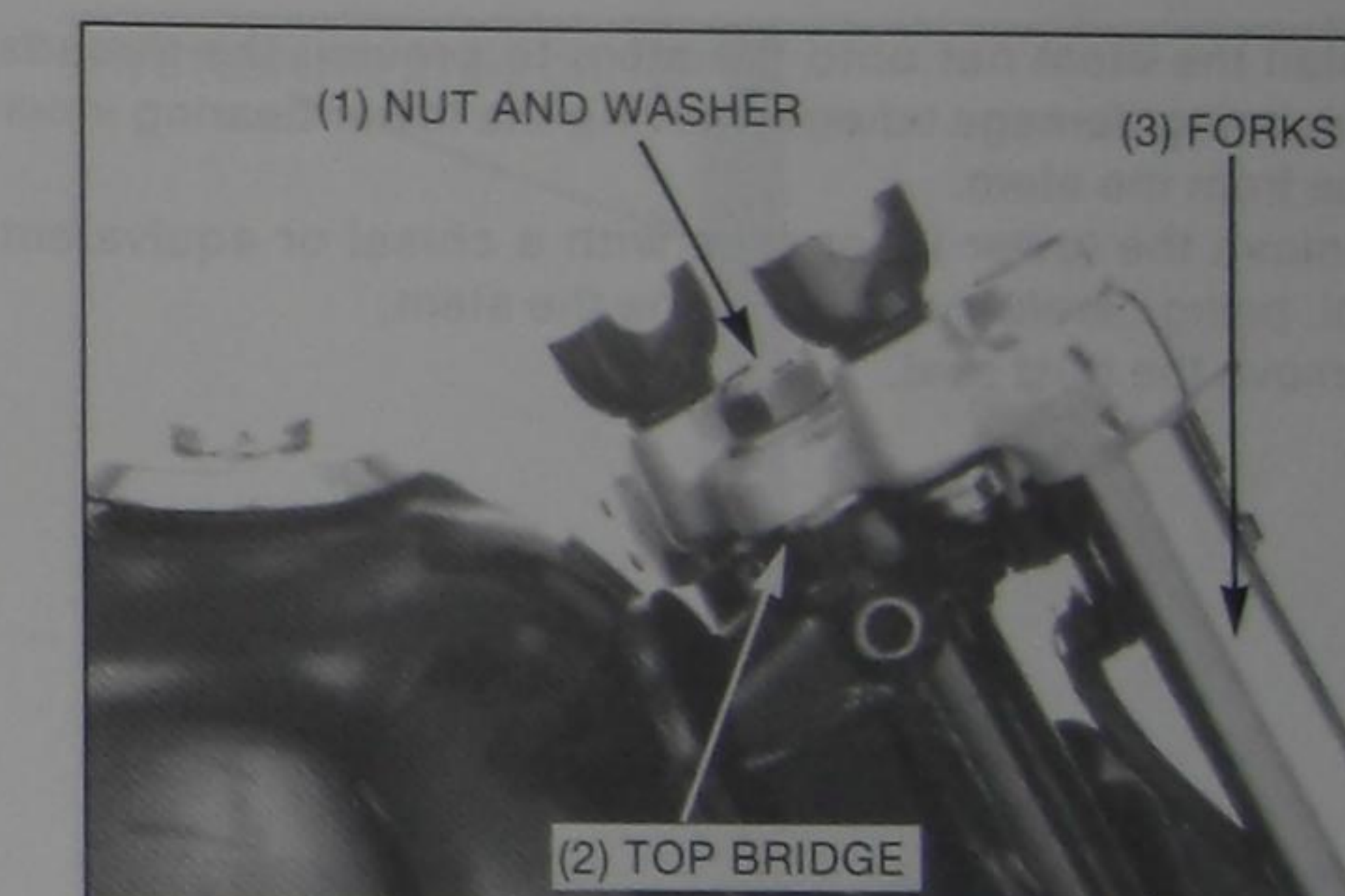
Remove the wire harness clamp, brake hose clamp and speedometer cable guide by removing the bolts from the bottom bridge.

Remove the following:

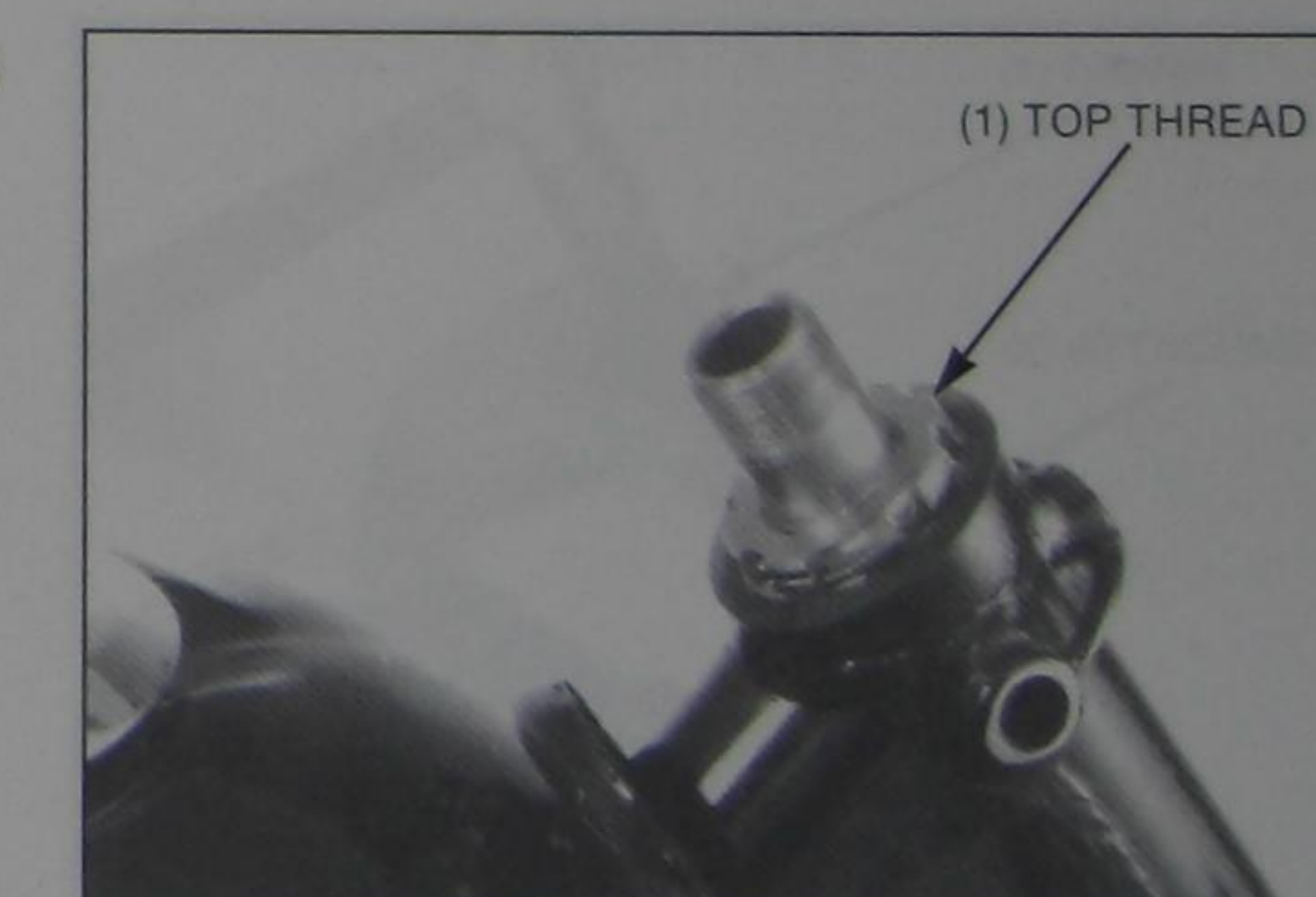
- Handlebar (page 12-14)
- Left and right forks (page 12-7).



Temporarily install the forks into the fork bridges. Loosen the steering stem nut. Remove the forks, stem nut, washer and fork top bridge.



Loosen the steering top thread while holding the steering stem and remove the top thread.

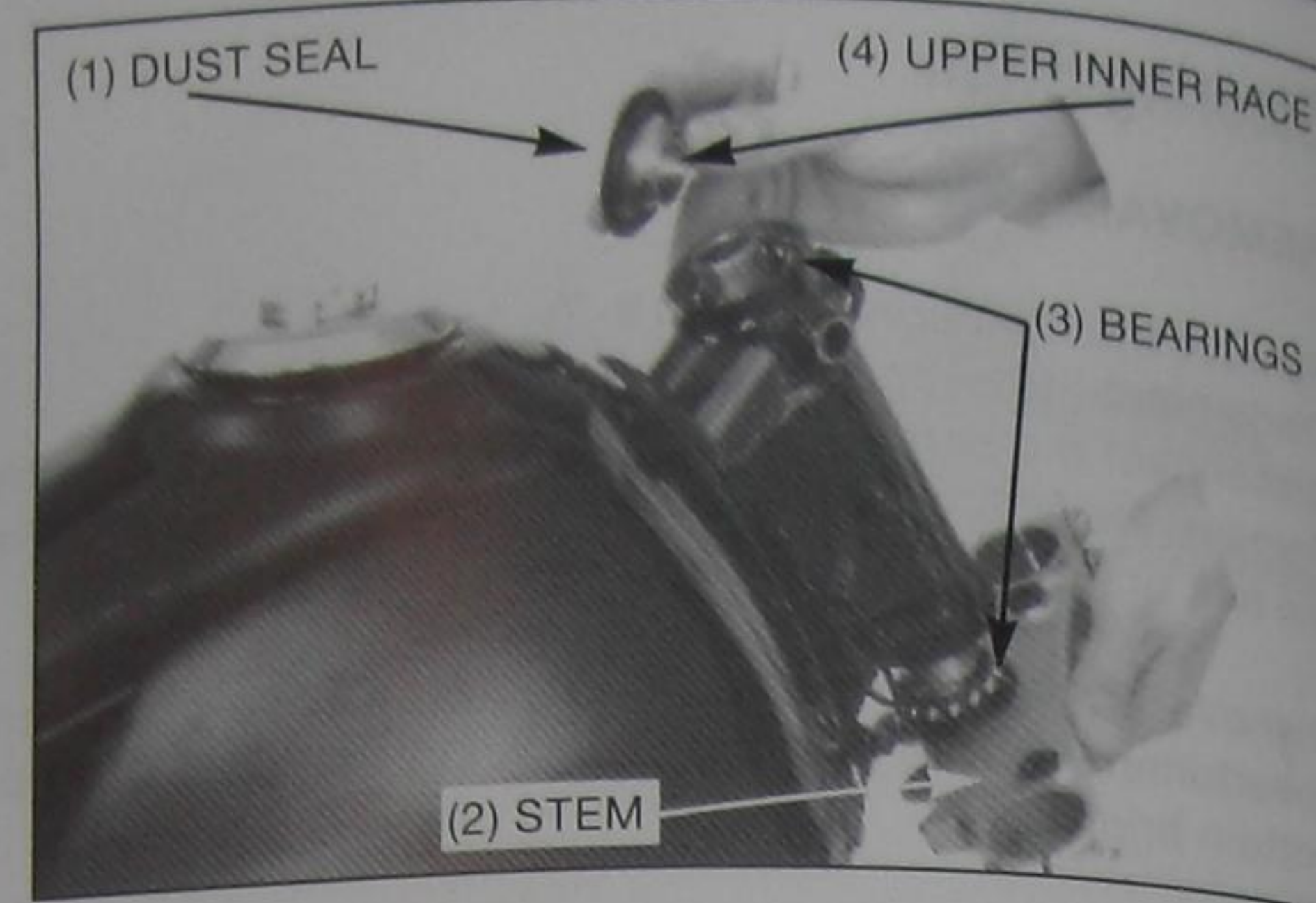


FRONT WHEEL/SUSPENSION/STEERING

Remove the following:

- Steering stem
- Dust seal
- Upper inner race
- Upper and lower steering bearings.

Check the steering bearings, inner and outer races for wear or damage.



NOTE:

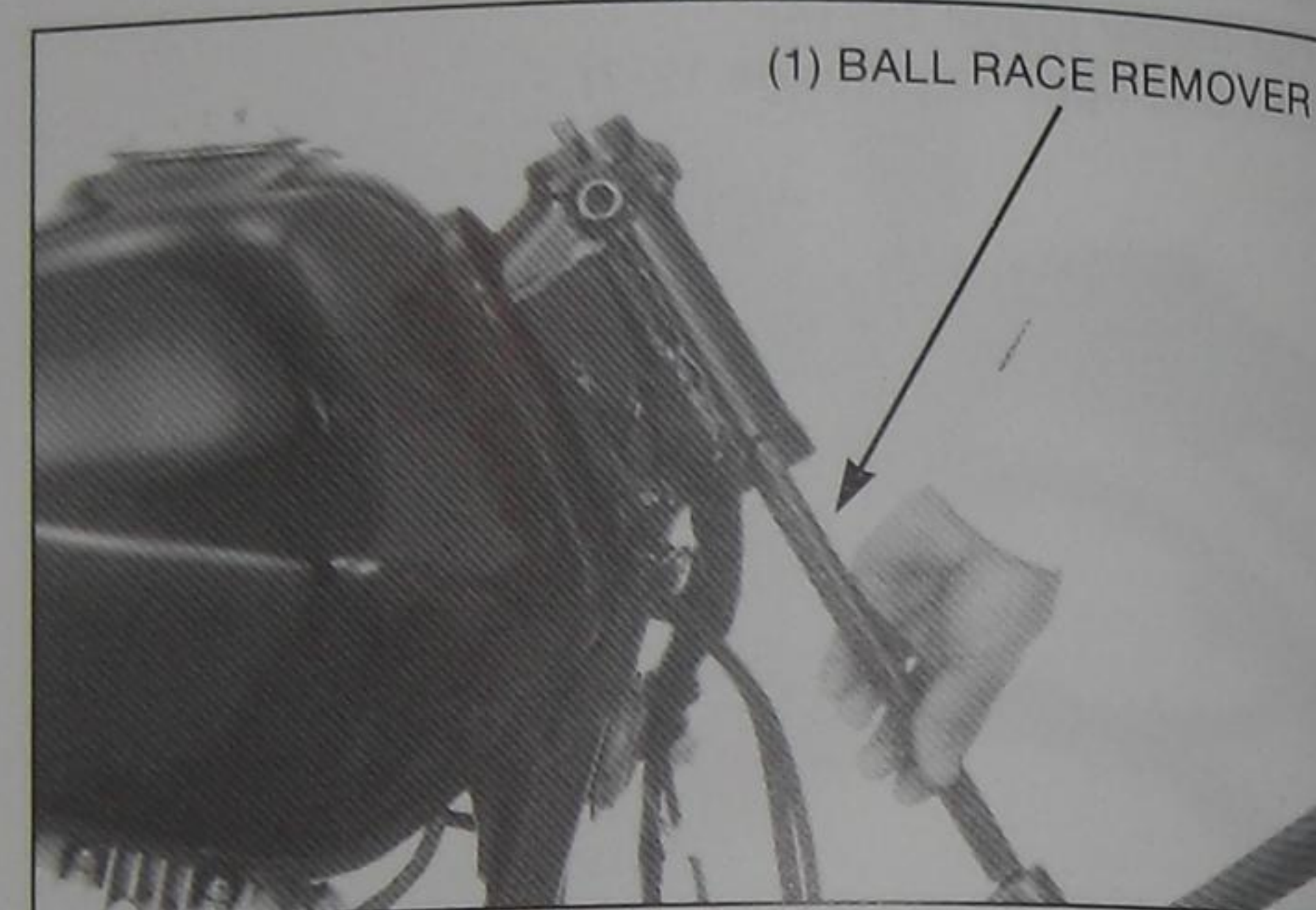
- Always replace the bearing and races as a set.

Drive the upper and lower bearing outer races out of the steering head pipe.

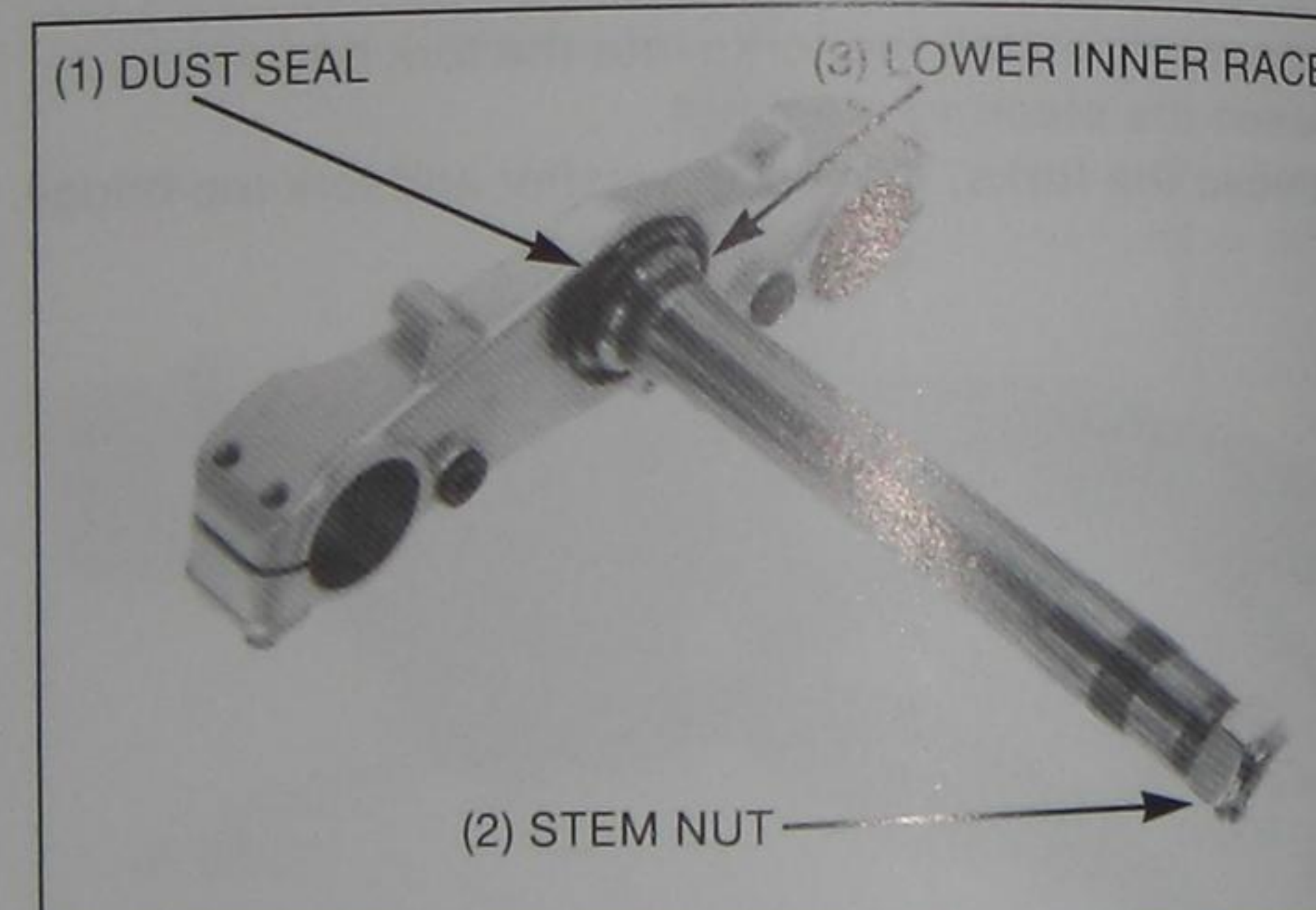
TOOLS:

- Ball race remover
- Remover attachment
- Remover handle

07935-MJ10000
07935-MJ10100
07935-MJ10200

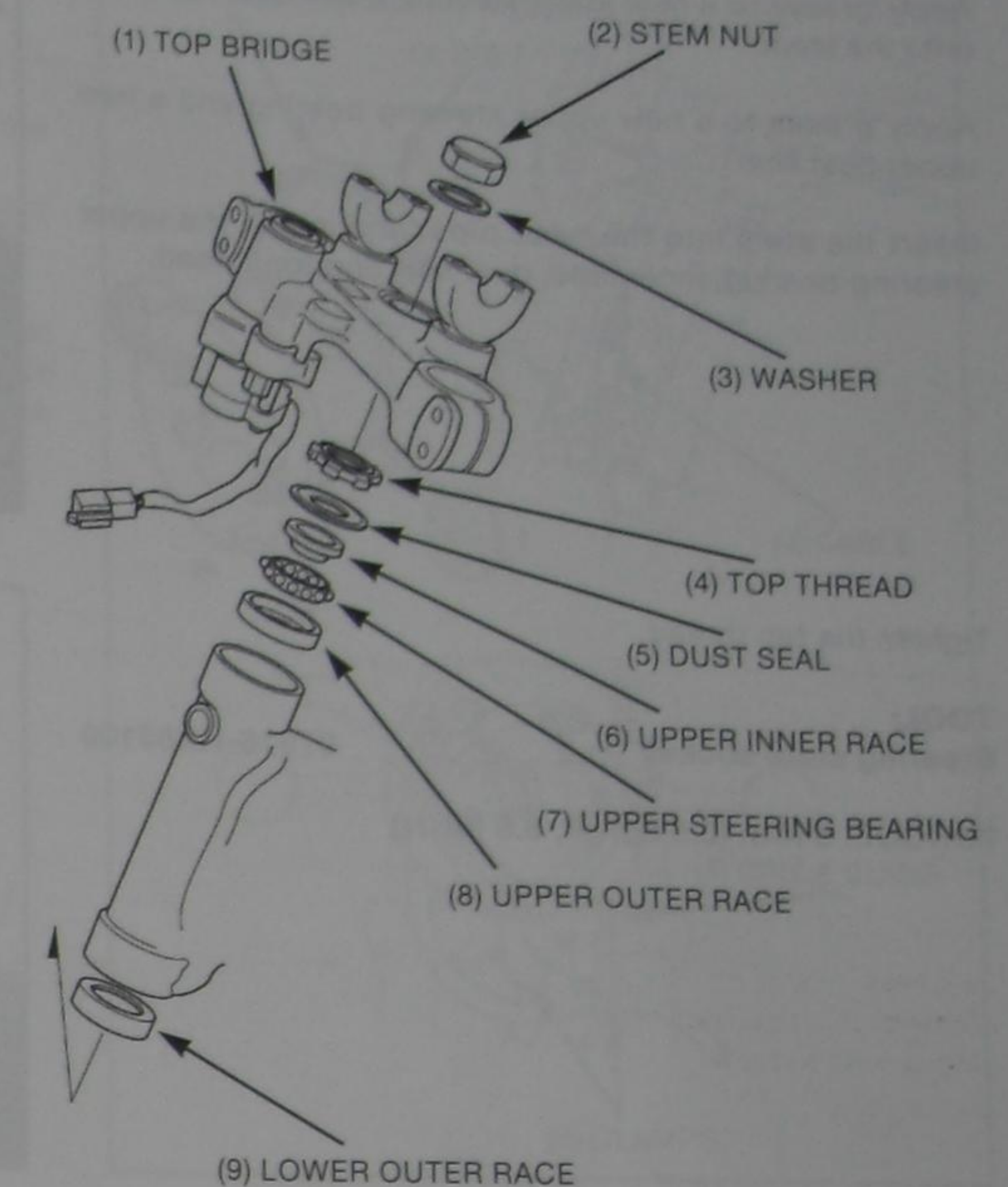
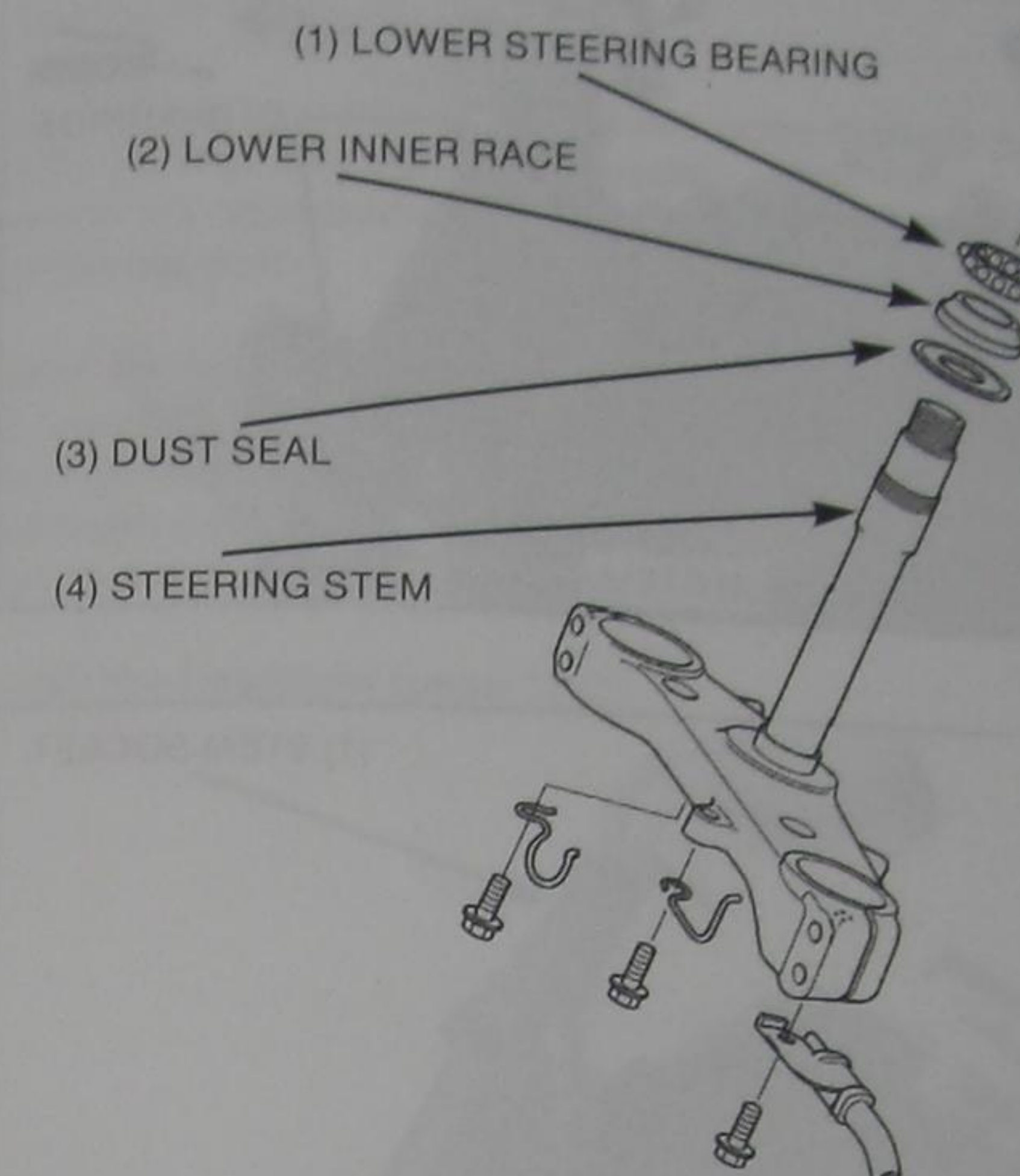


Install the stem nut onto the stem to prevent the threads from being damaged when removing the lower bearing inner race from the stem.
Remove the lower inner race with a chisel or equivalent tool, being careful not to damage the stem.
Remove the dust seal.



FRONT WHEEL/SUSPENSION/STEERING

INSTALLATION

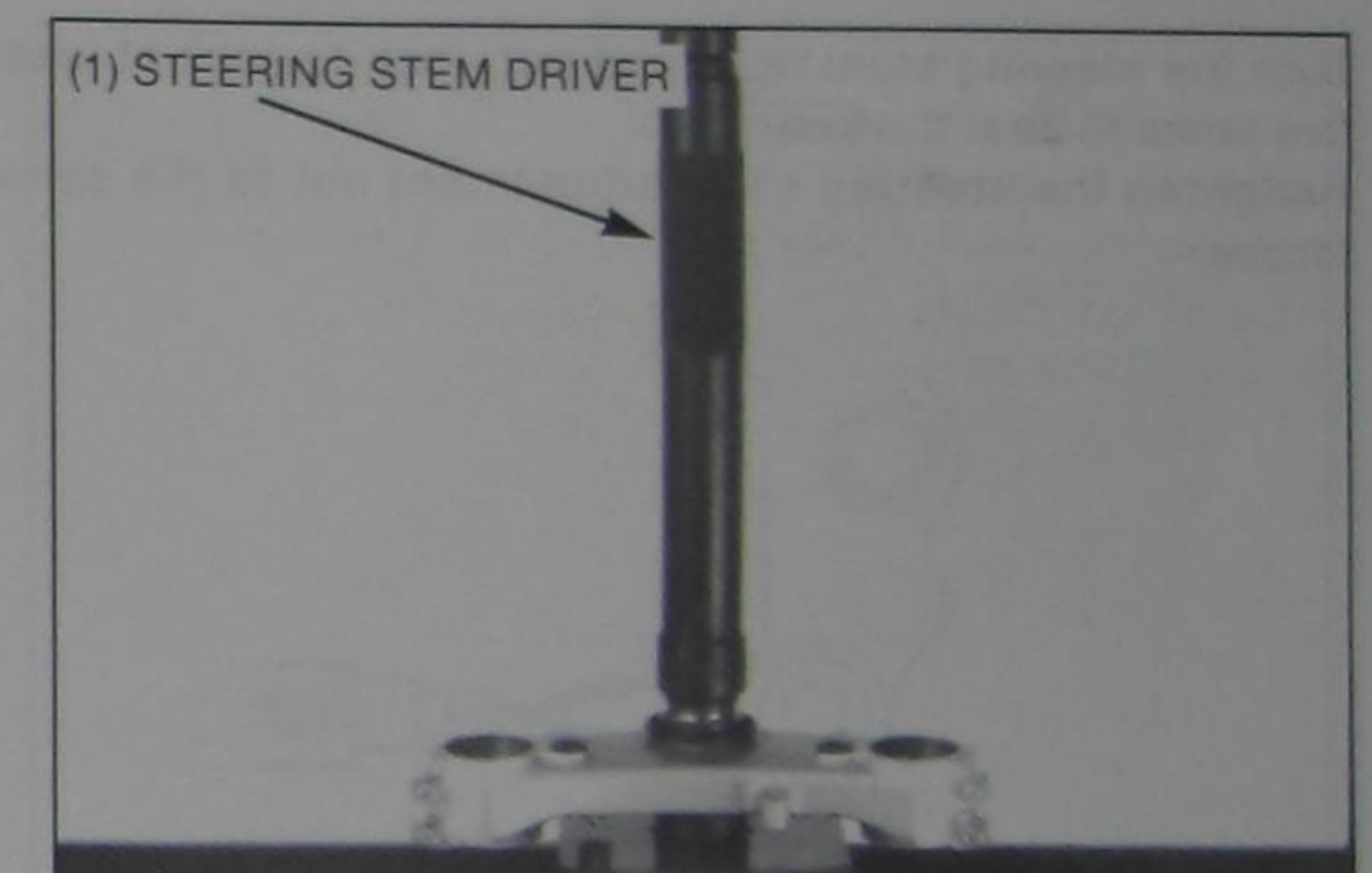


Apply grease to a new lower dust seal lip and install it onto the steering stem.
Press a new lower inner race onto the steering stem using the special tool.

TOOL:

Steering stem driver

07946-4300101

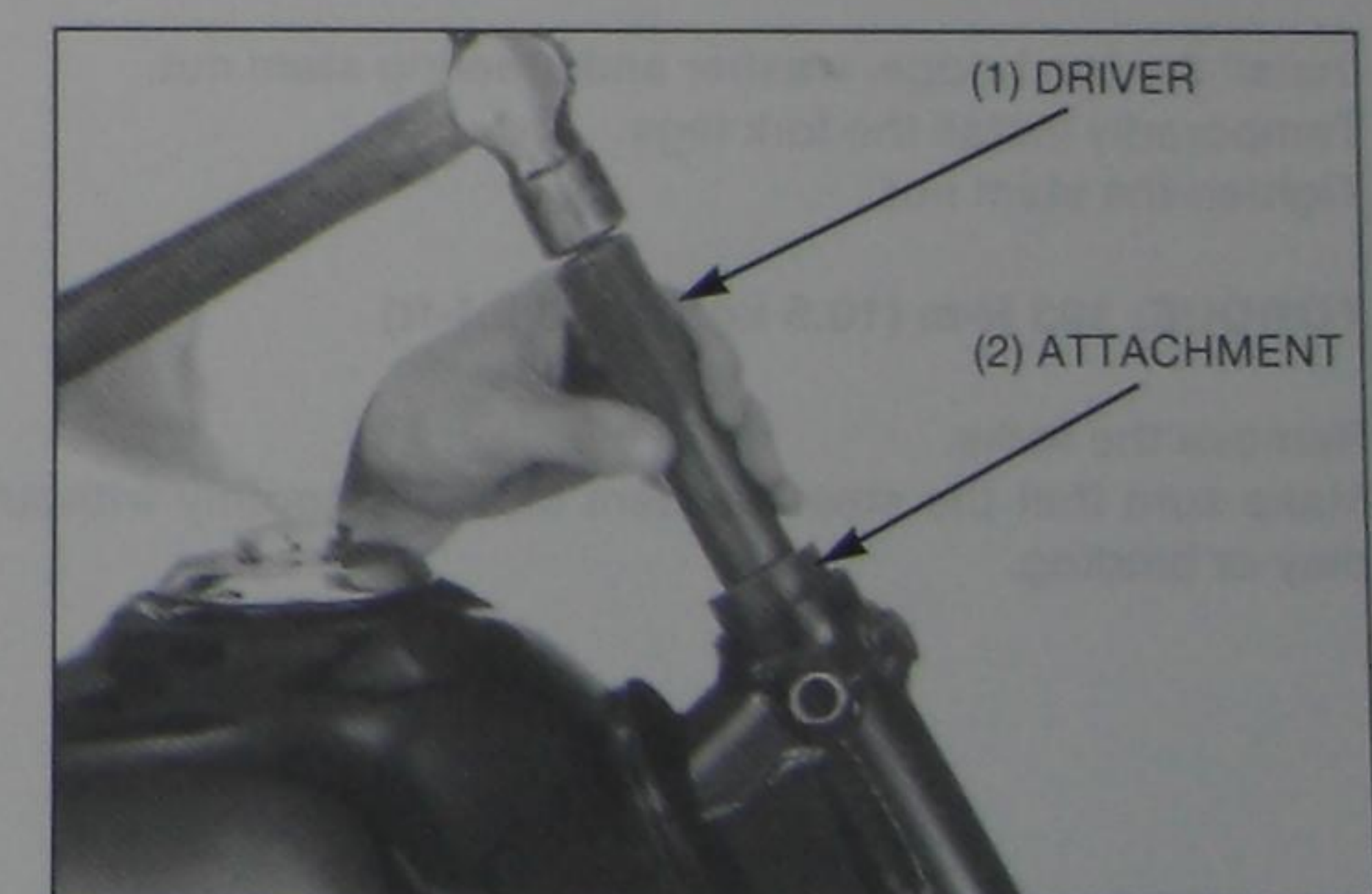


Drive new upper and lower outer races into the steering head pipe.

TOOLS:

Driver
Attachment, 42 x 47 mm

07749-0010000
07746-0010300

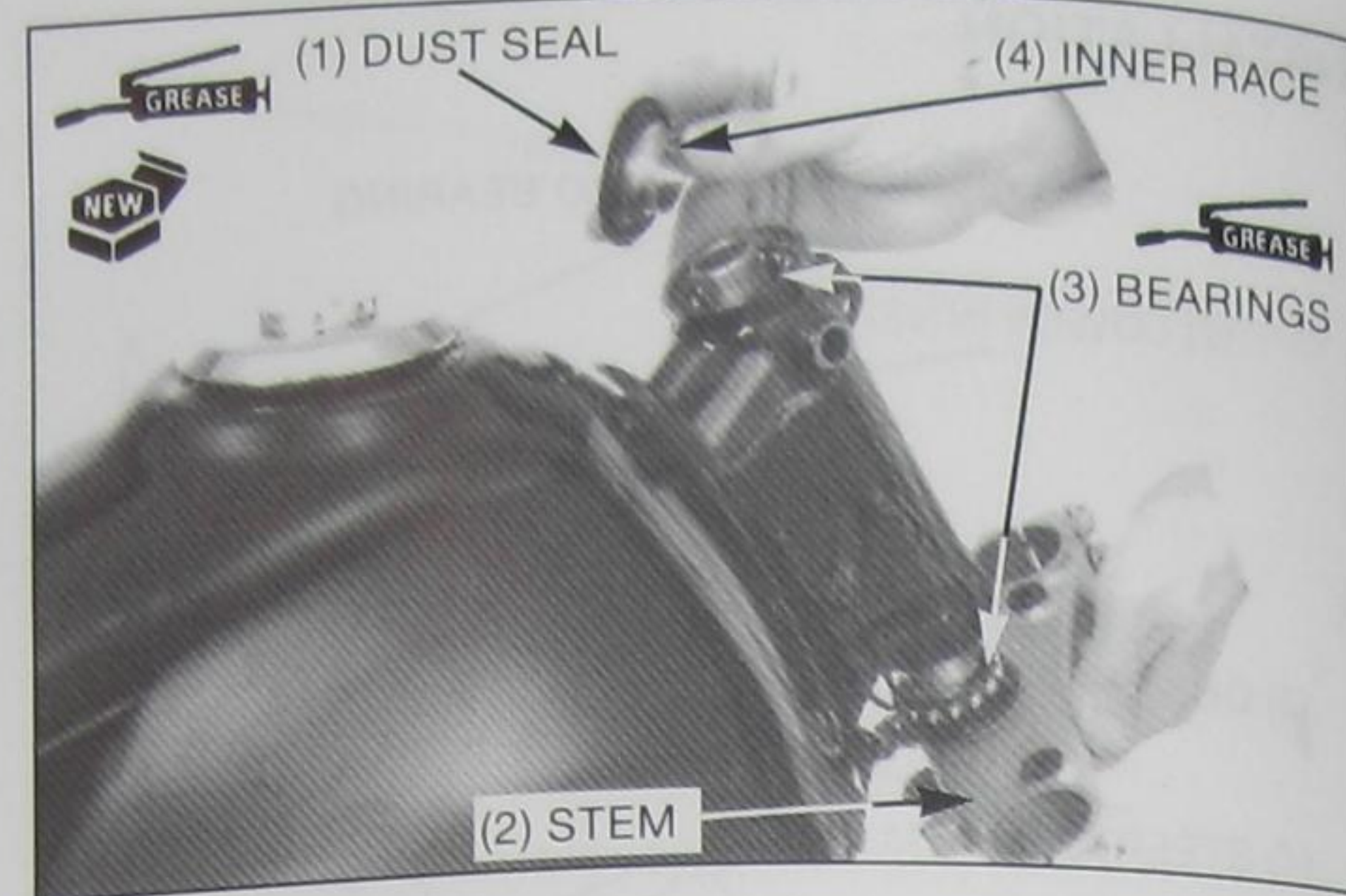


FRONT WHEEL/SUSPENSION/STEERING

Apply grease to a new lower steering bearing and install it onto the stem.

Apply grease to a new upper steering bearing and a new upper dust seal.

Insert the stem into the head pipe, and install the upper steering bearing, inner race, dust seal and top thread.

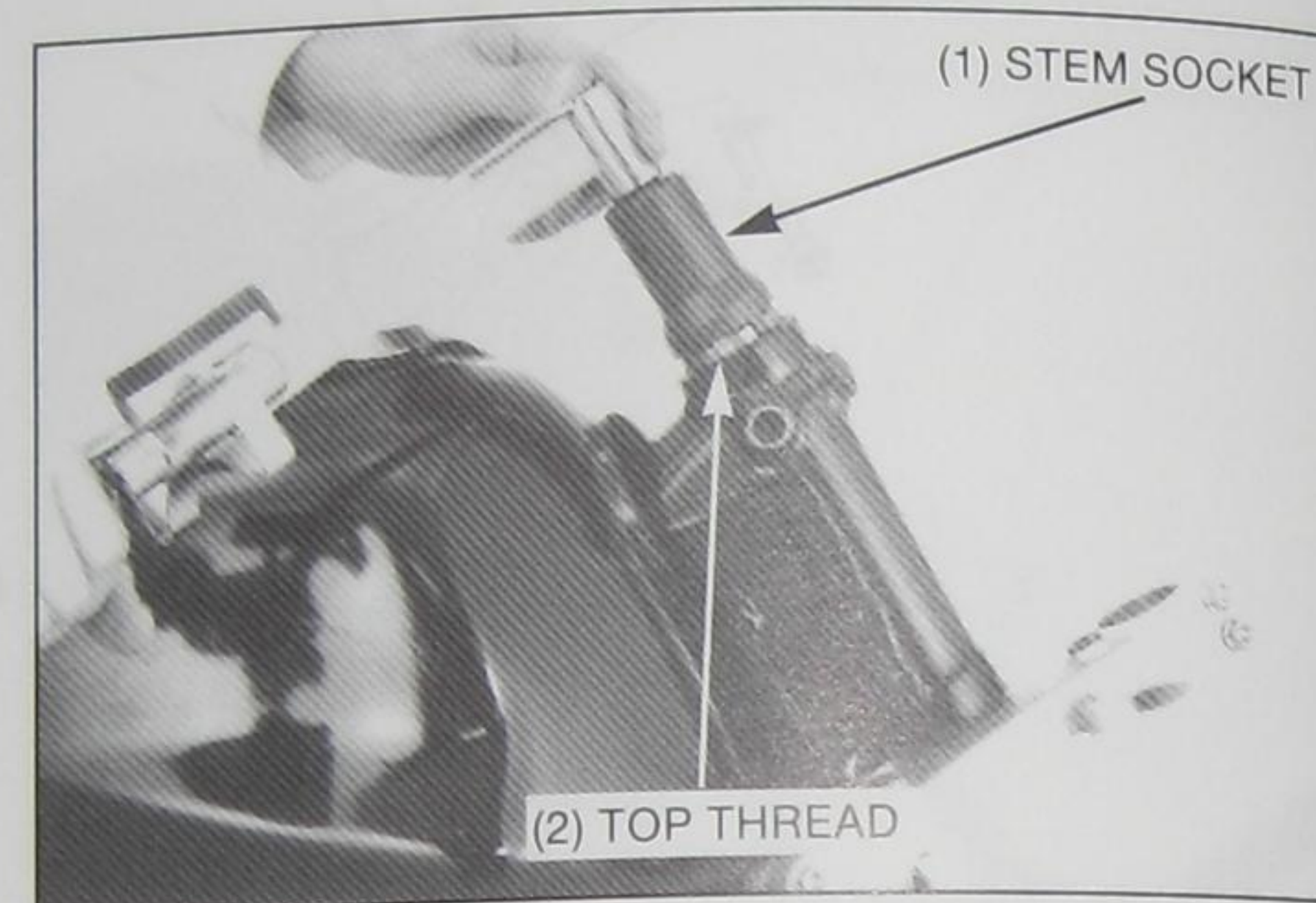


Tighten the top thread.

TOOL:
Steering stem socket

07916-KA50100

TORQUE: 5 N·m (0.5 kgf-m, 3.6 lbf-ft)



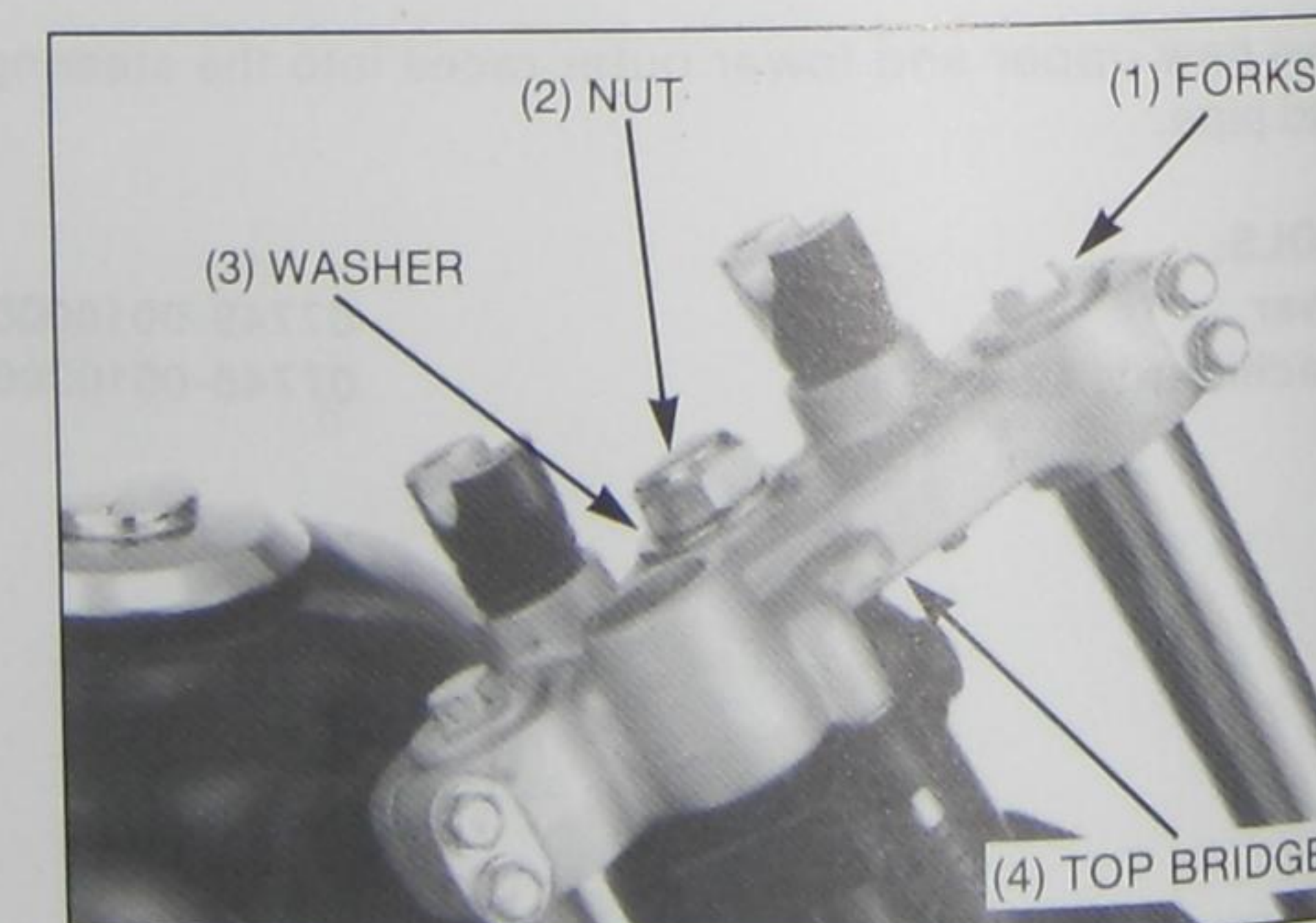
Turn the steering stem right and left, lock-to-lock at least five times to seat the bearings.
Retighten the steering stem adjustment nut to the same torque.



Install the top bridge, washer and steering stem nut.
Temporarily install the fork legs.
Tighten the stem nut.

TORQUE: 103 N·m (10.5 kgf-m, 76 lbf-ft)

Remove the forks.
Make sure that the steering stem moves smoothly without play or binding.



FRONT WHEEL/SUSPENSION/STEERING

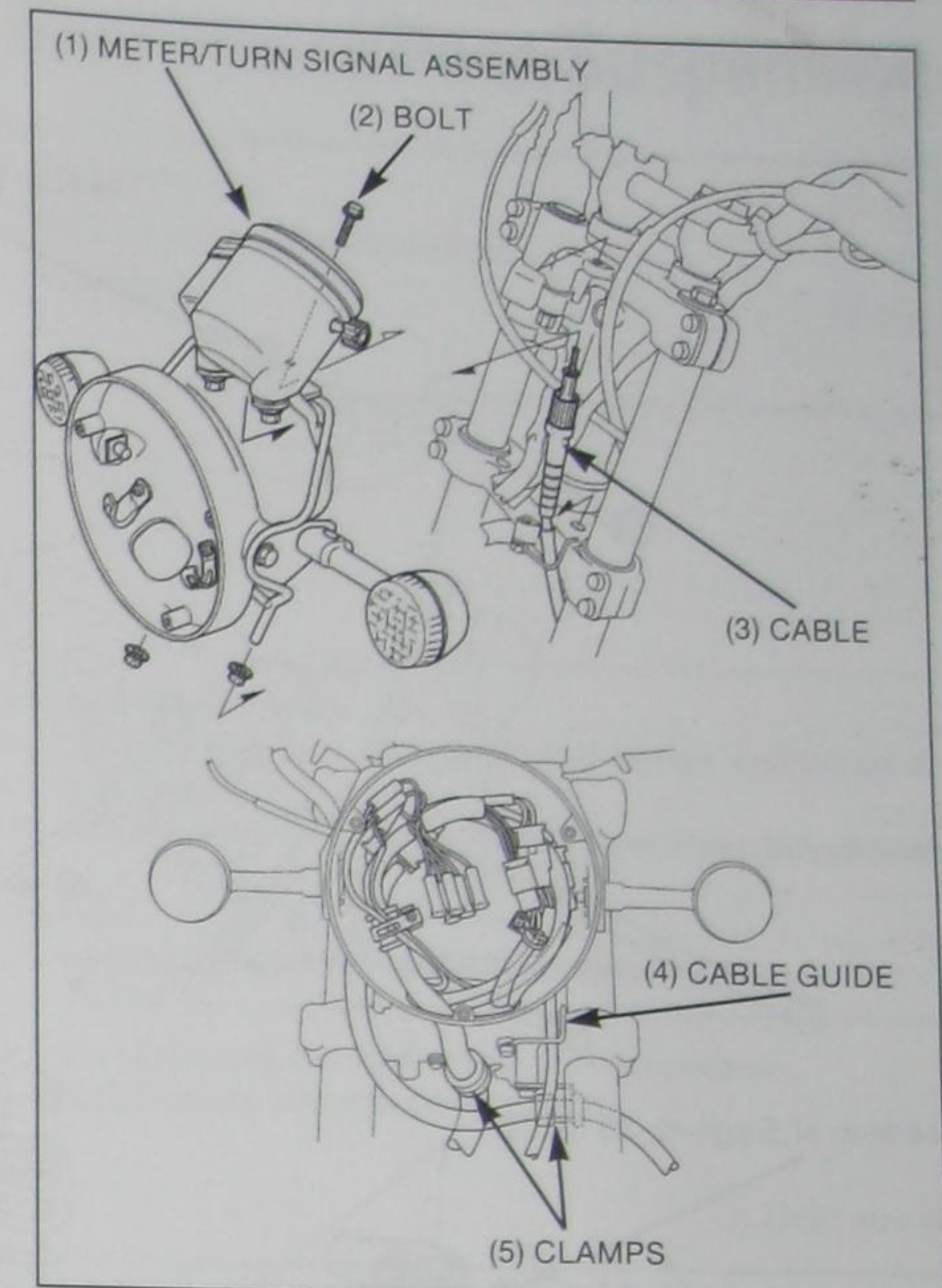
Install the following:

- Left and right forks (page 12-13)
- Handlebar (page 12-15).

Install the wire harness and brake hose clamps onto the bottom bridge and tighten the bolts.
Secure the speedometer cable with the cable guide and tighten the bolt.

Install the meter/turn signal assembly onto the fork bridges by inserting the wire harnesses through the headlight case and tighten the bolt. Connect the connectors inside the headlight case (page 1-16).
Connect the speedometer cable to the speedometer.

Install the headlight (page 18-2).



STEERING BEARING PRELOAD

Support the motorcycle securely using safety stands or a hoist and raise the front wheel off the ground.
Position the steering stem to the straight ahead position.
Hook a spring scale to the fork tube between the fork top and bottom bridges.

Make sure that there is no cable, wire harness or hose interference.

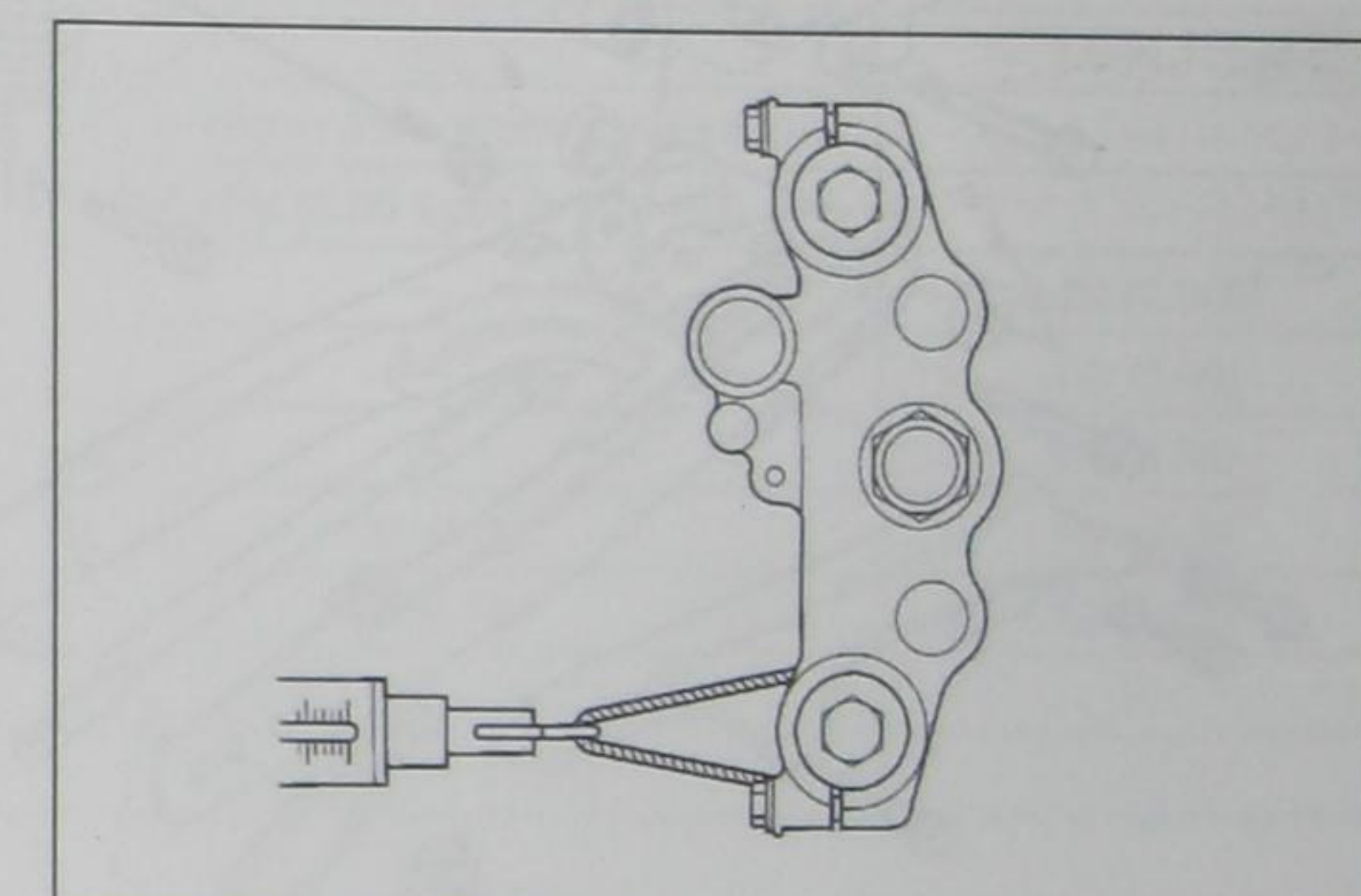
Pull the spring scale keeping it right angle to the steering stem.

Read the scale at the point where the steering stem just starts to move.

STEERING BEARING PRELOAD:

11-17 N (1.1-1.7 kgf, 2.4-3.7 lbf)

If the readings do not fall within the limits, readjust the steering top thread.



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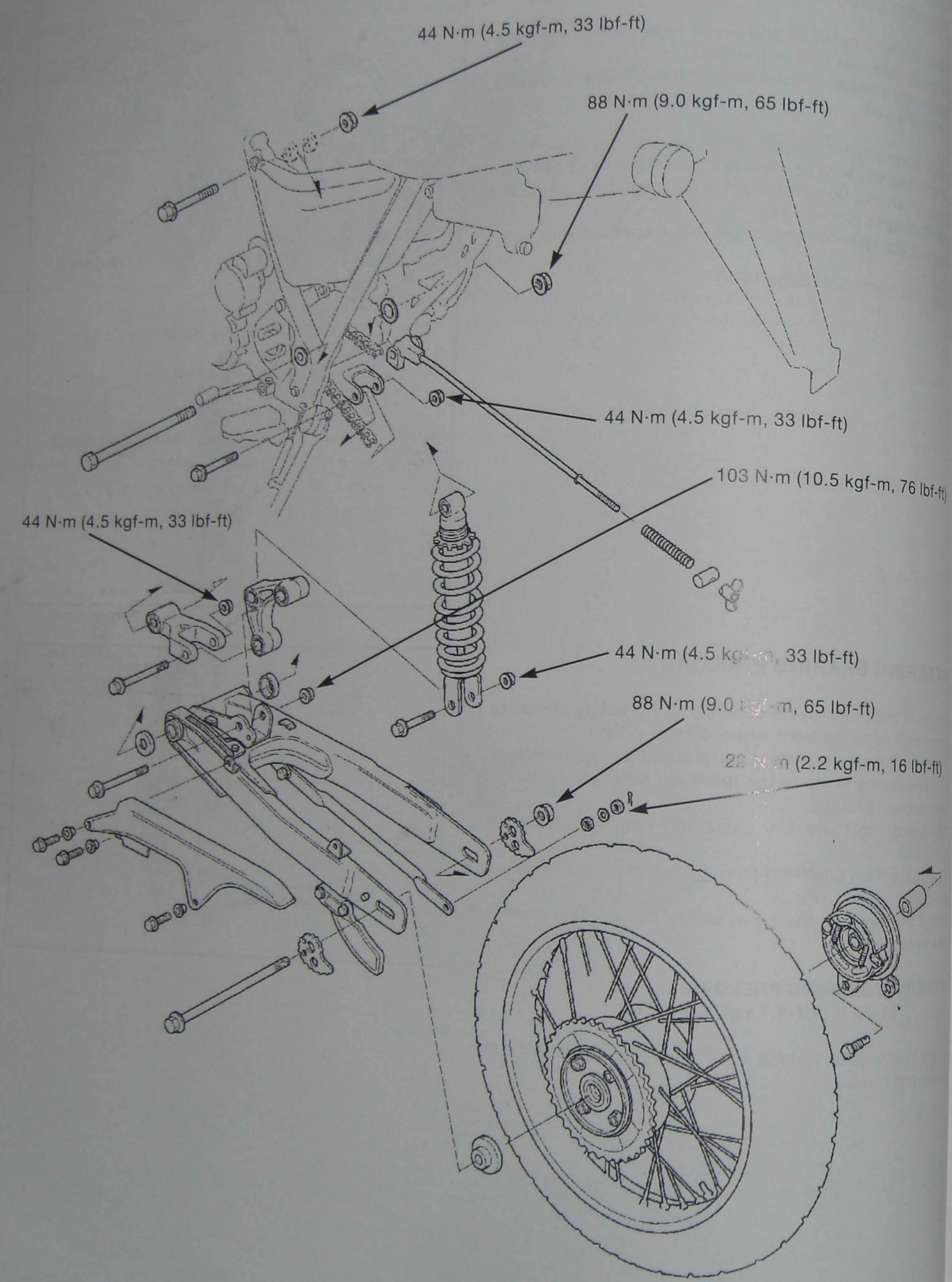
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13. Rear Wheel/Rear/Suspension

SERVICE INFORMATION	13-1	BRAKE PEDAL	13-10
TROUBLESHOOTING	13-2	SHOCK ABSORBER/LINKAGE	13-11
REAR WHEEL	13-3	SWINGARM	13-15
REAR BRAKE	13-7		

Service Information

GENERAL

WARNING

- Riding on damaged rim or spokes impairs safe operation of the vehicle.
- A contaminated brake drum or shoe reduces stopping power. Discard contaminated shoes and clean a contaminated drum with a high quality brake degreasing agent.
- The shock absorber contains nitrogen gas under high pressure. Do not allow fire or heat near the shock absorber.
- Before disposal of the shock absorber, release the nitrogen.
- The damper unit is filled with nitrogen gas under high pressure, do not try to disassemble.

- A hoist or equivalent is required to support the motorcycle when servicing the rear wheel and suspension.
- Use genuine Honda replacement bolts and nuts for all suspension pivots and mounting points.

SPECIFICATIONS

Unit: mm (in)

Item		Standard	Service Limit
Minimum tire tread depth		—	3.0 (0.12)
Cold tire pressure	Driver only	175 kPa (1.75 kgf/cm ² , 25 psi)	—
	Driver and passenger	200 kPa (2.00 kgf/cm ² , 29 psi)	—
Rear axle runout		—	0.20 (0.008)
Rear wheel rim runout	Radial	—	2.0 (0.08)
	Axial	—	2.0 (0.08)
Rear brake drum I.D.		130 (5.1)	131 (5.2)
Rear brake lining thickness		4.0 (0.16)	2.0 (0.08)
Rear brake pedal free play		20-30 (3/4 — 1-1/4)	—
Drive chain slack		25-35 (1 — 1-3/8)	—

TORQUE VALUES

Final driven sprocket nut	44 N·m (4.5 kgf-m, 33 lbf-ft)	U-nut
Rear brake panel stopper arm nut	22 N·m (2.2 kgf-m, 16 lbf-ft)	
Rear axle nut	88 N·m (9.0 kgf-m, 65 lbf-ft)	U-nut
Spoke nipple	4 N·m (0.4 kgf-m, 2.9 lbf-ft)	
Rear brake arm pinch bolt	10 N·m (1.0 kgf-m, 7 lbf-ft)	
Rear shock absorber mounting nut	44 N·m (4.5 kgf-m, 33 lbf-ft)	U-nut
Shock arm-to-swingarm nut	103 N·m (10.5 kgf-m, 76 lbf-ft)	U-nut
Shock link-to-shock arm nut	44 N·m (4.5 kgf-m, 33 lbf-ft)	U-nut
Shock link-to-frame nut	44 N·m (4.5 kgf-m, 33 lbf-ft)	U-nut
Swingarm pivot nut	88 N·m (9.0 kgf-m, 65 lbf-ft)	U-nut

TOOLS

Bearing remover shaft	07746-0050100
Bearing remover head, 15 mm	07746-0050400
Driver	07749-0010000
Attachment, 22 x 24 mm	07746-0010800
Attachment, 32 x 35 mm	07746-0010100
Attachment, 42 x 47 mm	07746-0010300
Pilot, 15 mm	07746-0040300
Pilot, 17 mm	07746-0040400
Driver shaft	07946-MJ00100
Driver head	07946-MJ00200
Bushing driver	07HMF-MM90200
Spoke wrench C, 5.8 x 6.1 mm	07701-0020300

Troubleshooting

Soft suspension

- Weak shock absorber spring
- Oil leakage from damper unit
- Insufficient tire pressure
- Incorrect suspension adjustment

Hard suspension

- Damaged rear suspension pivot bearings
- Bent damper rod
- Tire pressure too high
- Incorrect suspension adjustment

Rear wheel wobbling

- Bent rim
- Worn or damaged rear wheel bearings
- Loose or broken spokes
- Faulty rear tire
- Unbalanced rear tire and wheel
- Wheel installed incorrectly
- Bent frame or swingarm

Rear wheel turns hard

- Faulty rear wheel bearings
- Bent rear axle
- Rear brake drag
- Drive chain too tight

Rear suspension noise

- Faulty rear shock absorber
- Loose rear suspension fasteners
- Worn rear suspension pivot bearings

Steers to one side or does not track straight

- Wheel installed incorrectly
- Bend rear axle
- Bent frame or swingarm

Poor brake performance

- Improperly adjusted brake
- Worn brake linings
- Worn brake drum
- Worn brake cam
- Improperly installed brake linings
- Contaminated brake linings
- Contaminated brake drum
- Worn brake shoe at cam contact areas

Brake squeaks

- Worn brake linings
- Worn brake drum
- Contaminated brake linings
- Contaminated brake drum

Rear Wheel

REMOVAL

Loosen the rear axle nut.

Raise the rear wheel off the ground and support the motorcycle securely with a hoist or equivalent.

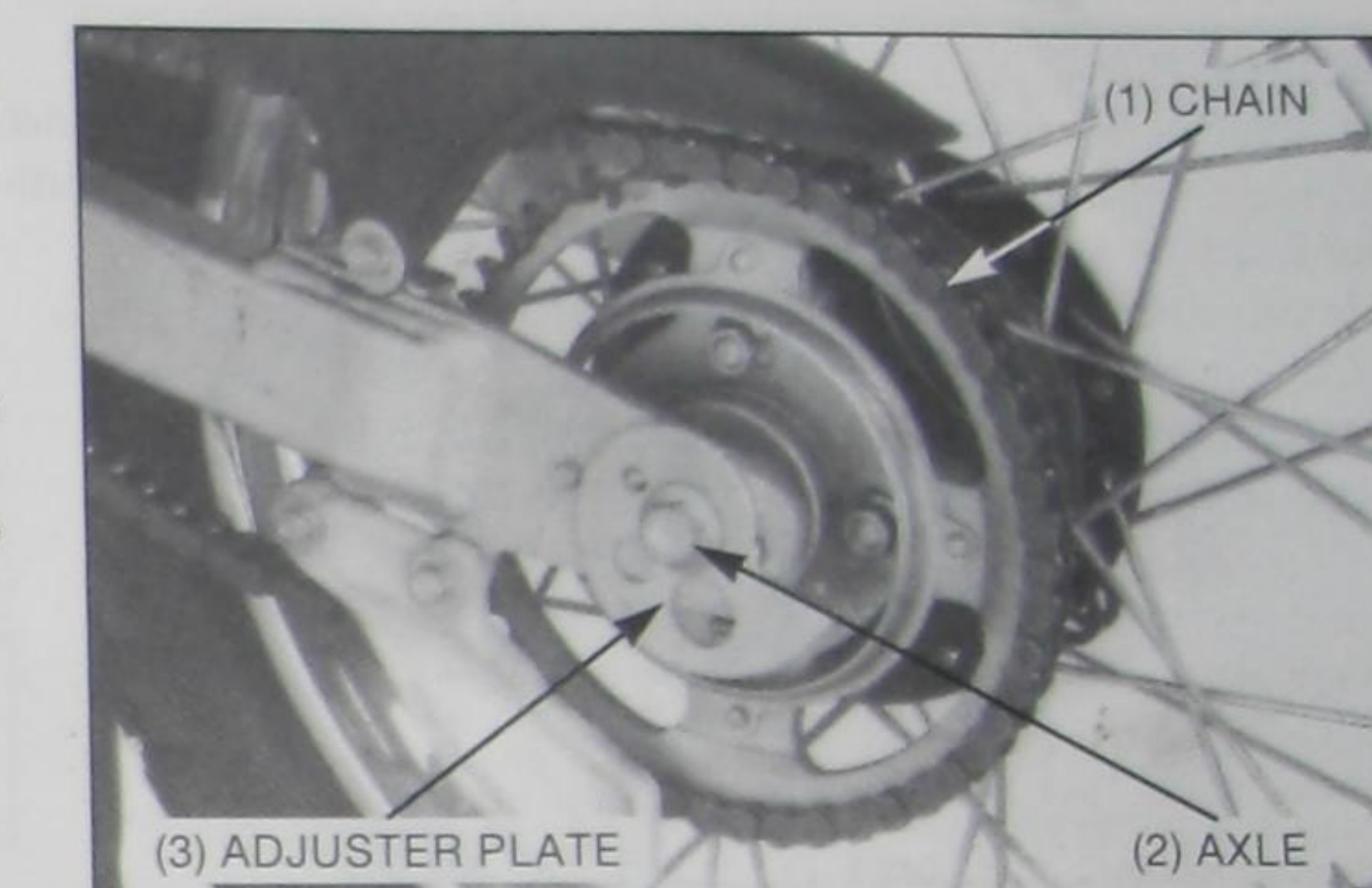
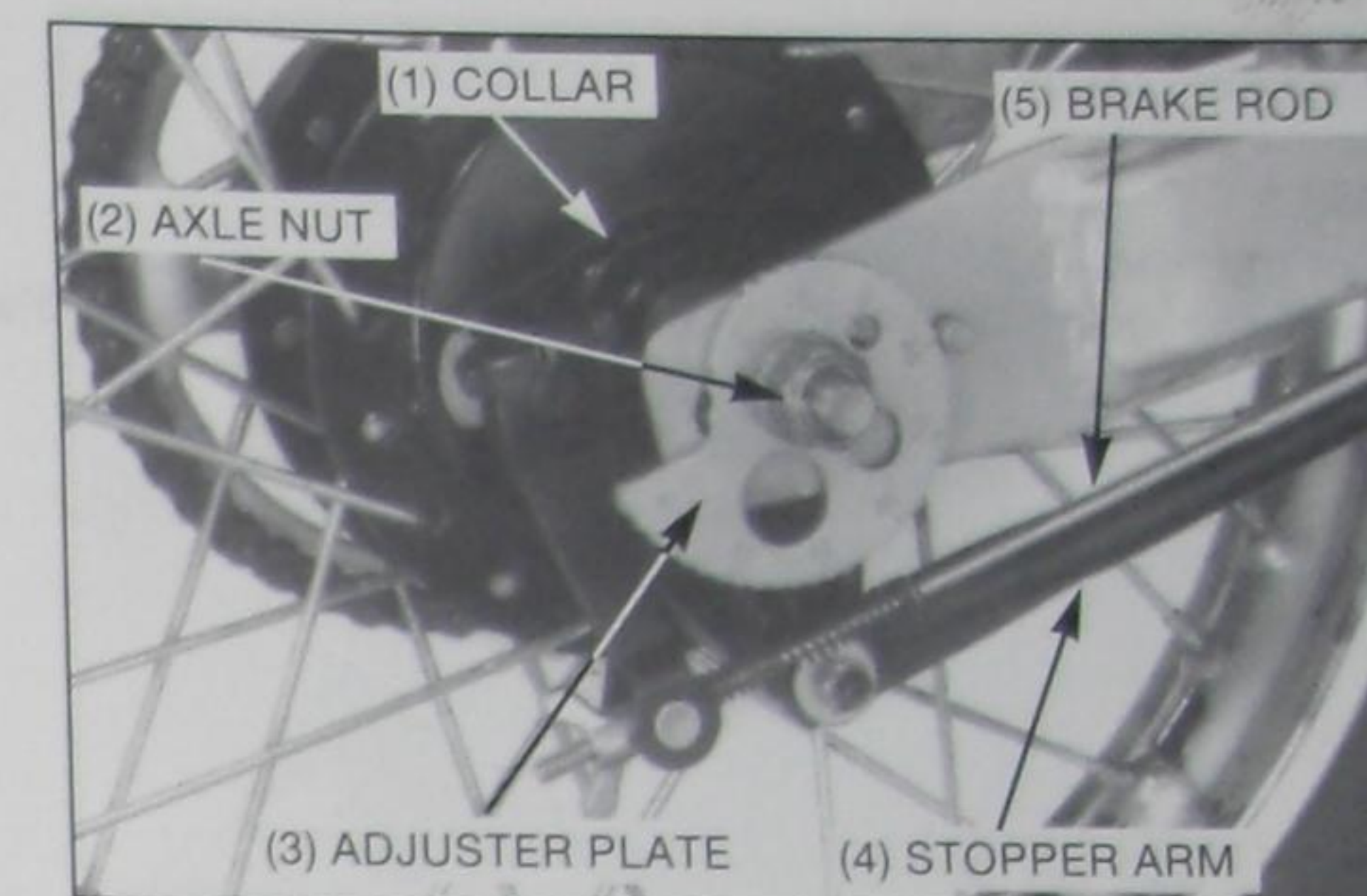
Disconnect the brake stopper arm by removing the following:

- Cotter pin
- Nut
- Washer
- Seat rubber
- Bolt.

Remove the adjusting nut and disconnect the brake rod from the brake arm.

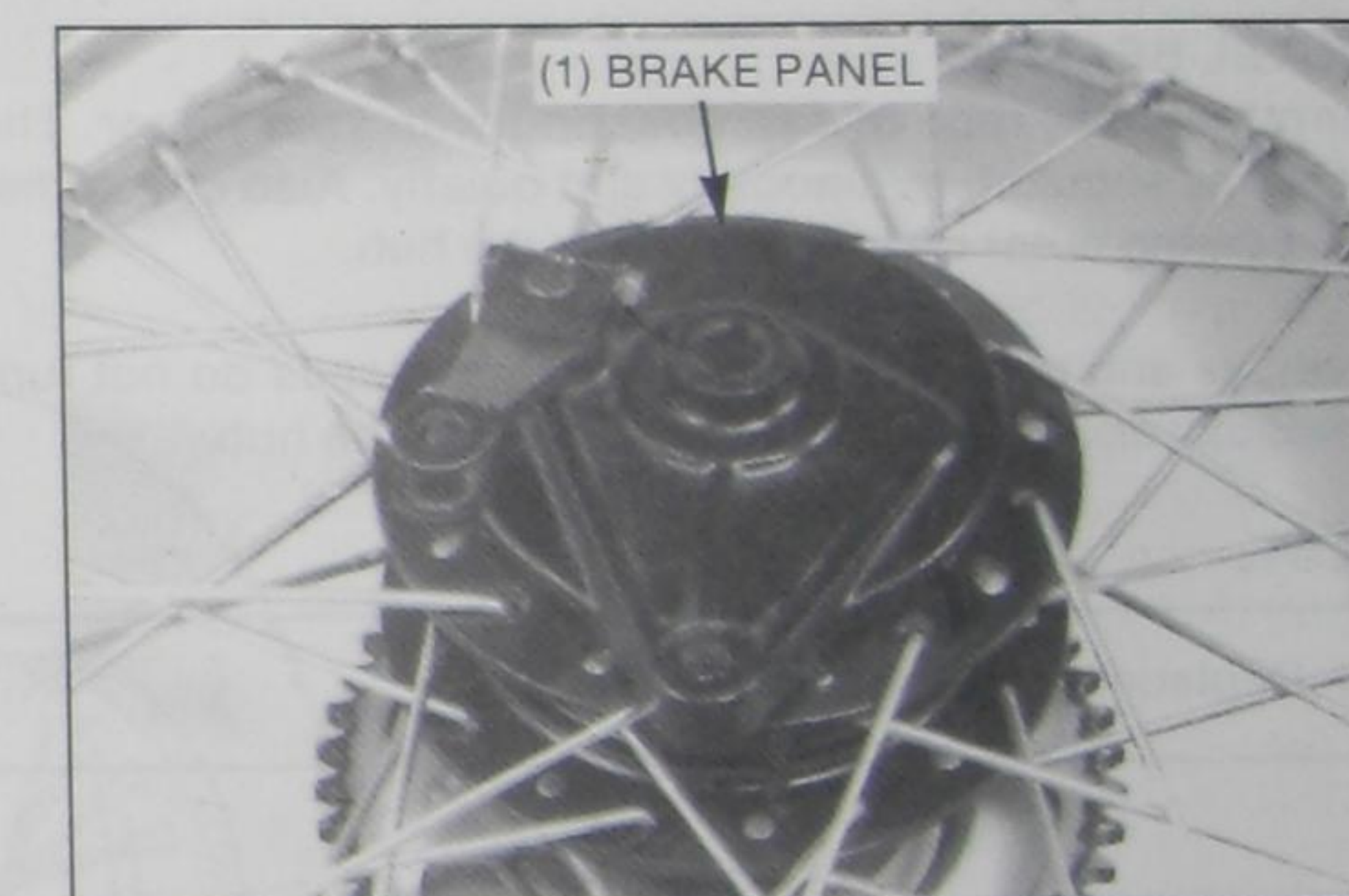
Remove the joint pin and spring.

Remove the rear axle nut, washer and right adjuster plate. Move the rear wheel forward for maximum drive chain slack and remove the drive chain from the final driven sprocket. Pull the axle out, then remove the right side collar and the rear wheel.

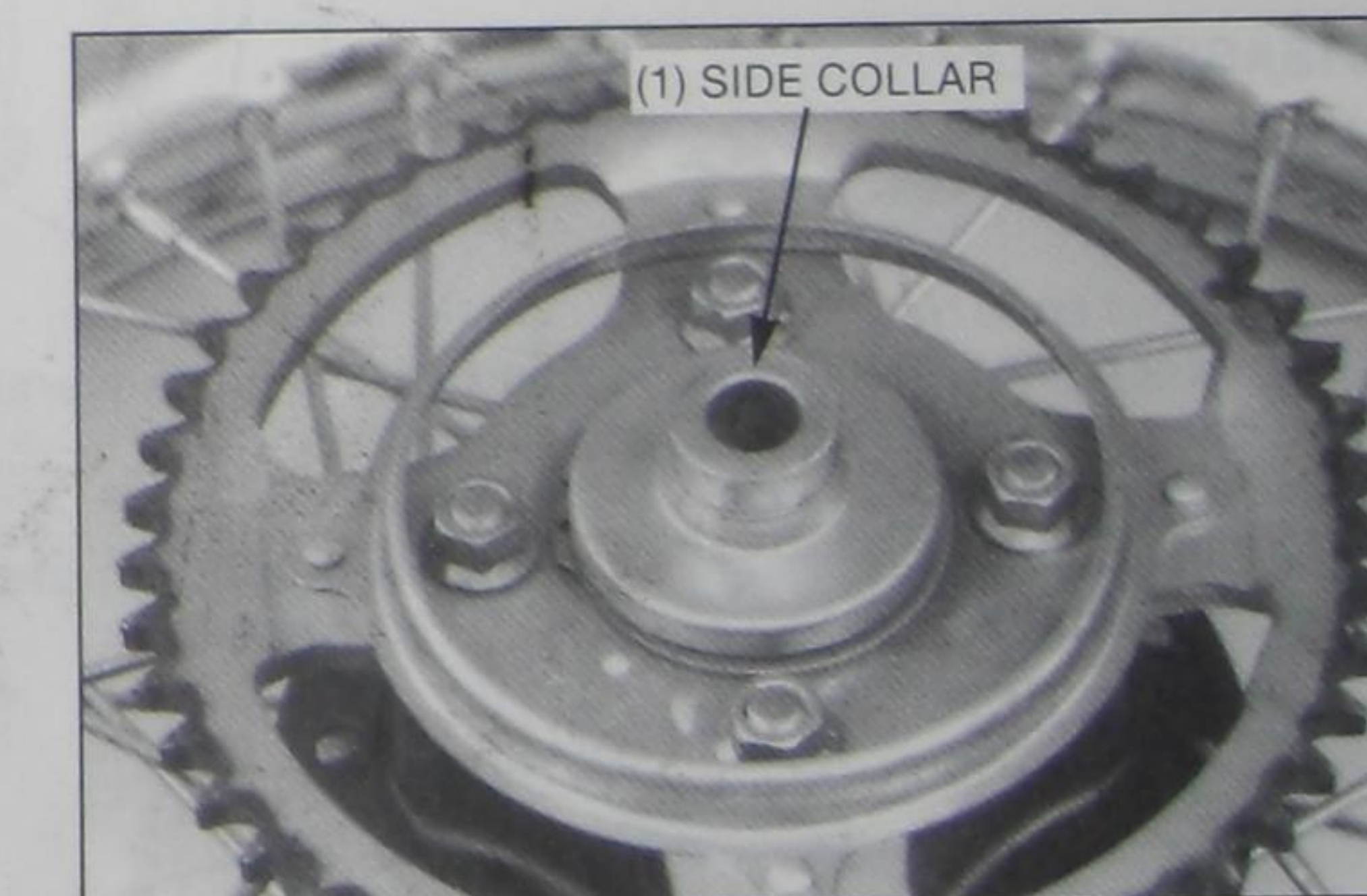


Remove the brake panel from the wheel hub.

For rear brake service, refer to page 13-7.



Remove the left side collar.



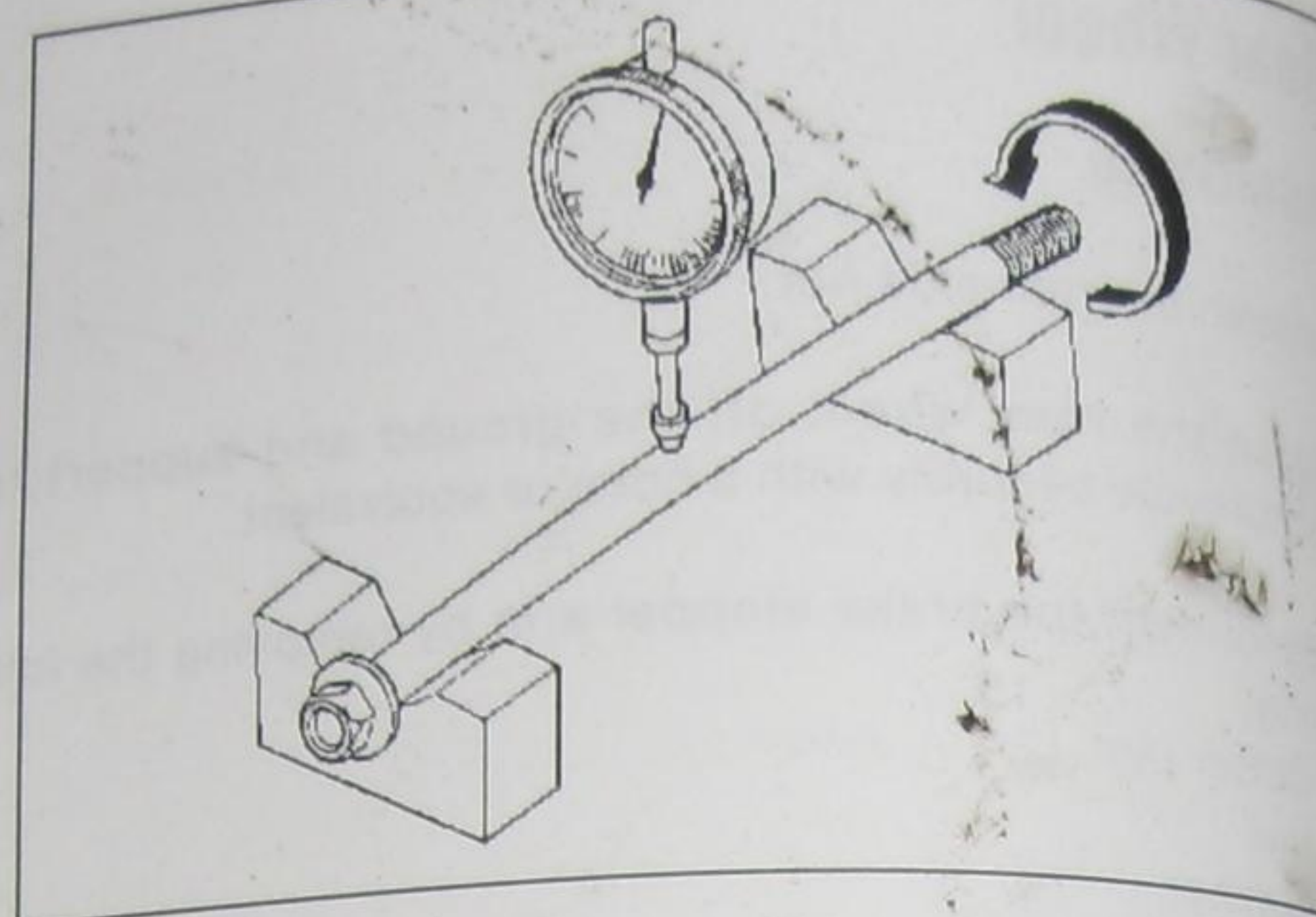
REAR WHEEL/BRAKE/SUSPENSION

INSPECTION

AXLE

Set the front axle in V-blocks.
Turn the front axle and measure the runout using a dial indicator.
Actual runout is 1/2 the total indicator reading.

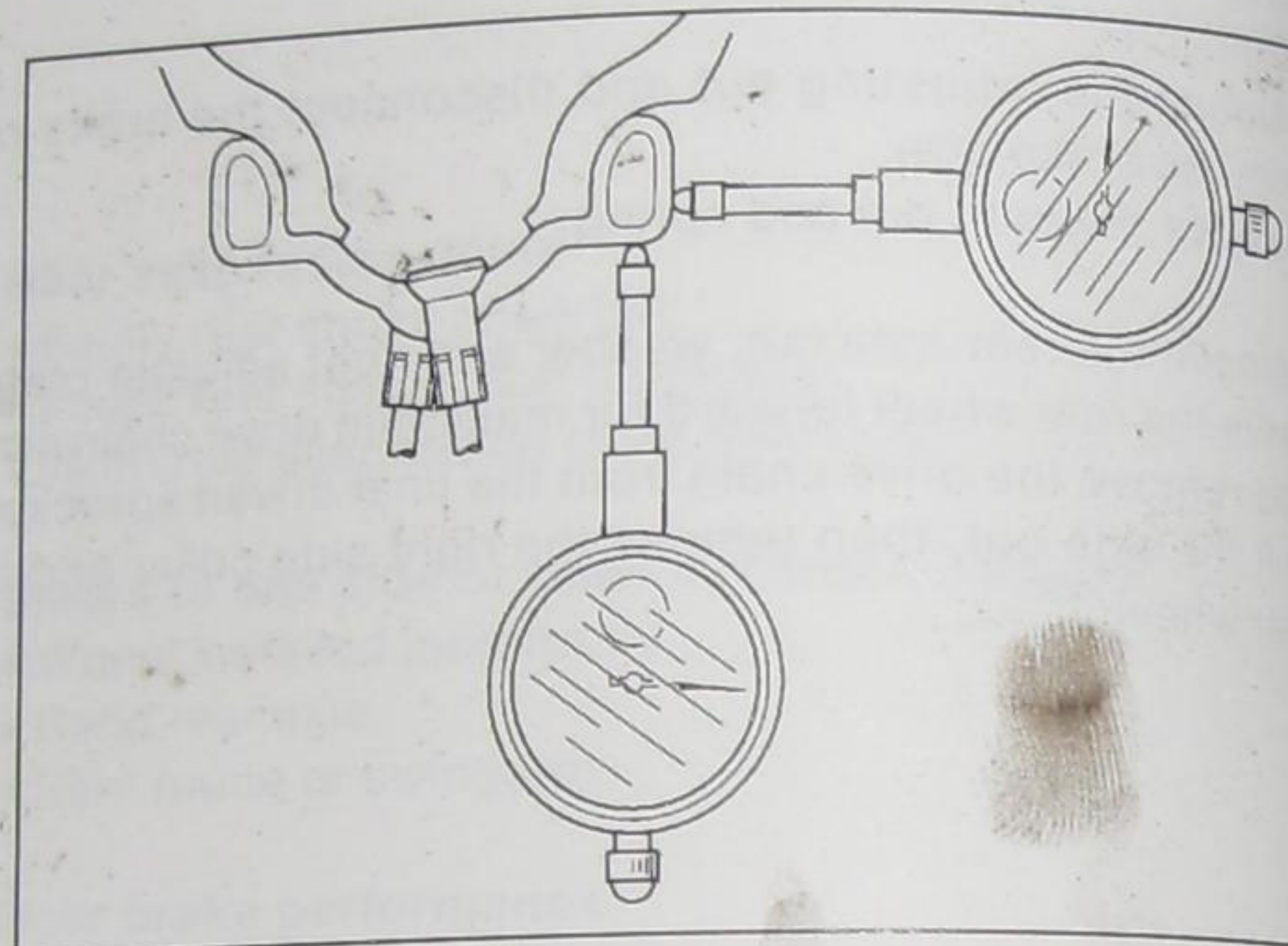
SERVICE LIMIT: 0.20 mm (0.008 in)



WHEEL RIM

Check the rim runout by placing the wheel in a truing stand.
Spin the wheel slowly and read the runout using a dial indicator.
Actual runout is 1/2 the total indicator reading.

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



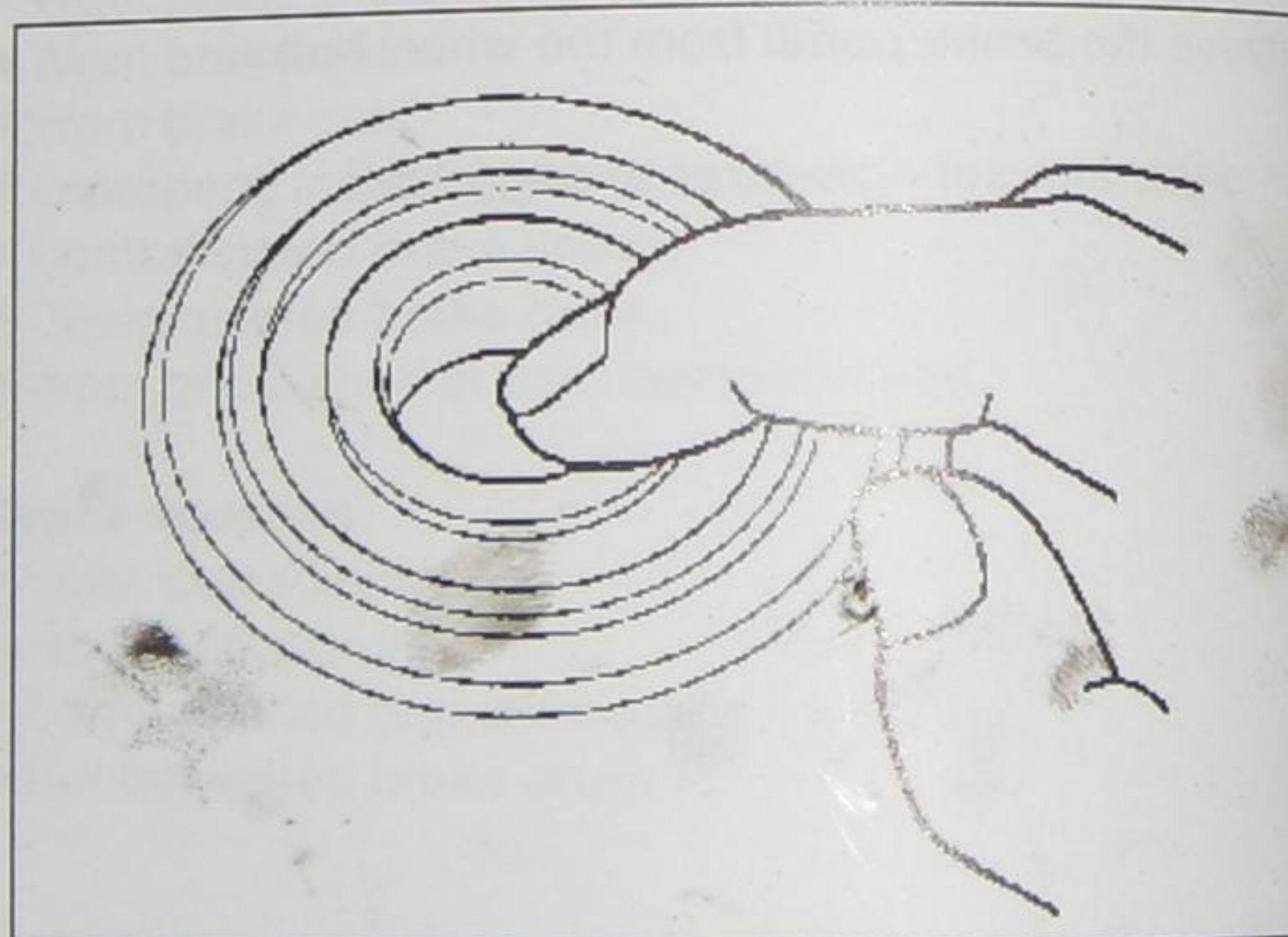
WHEEL BEARING

Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Also check that the bearing outer race fits tightly in the hub.

Remove and discard the bearings if the races do not turn smoothly and quietly, if they fit loosely in the hub.

NOTE:

- Replace the wheel bearings in pairs.



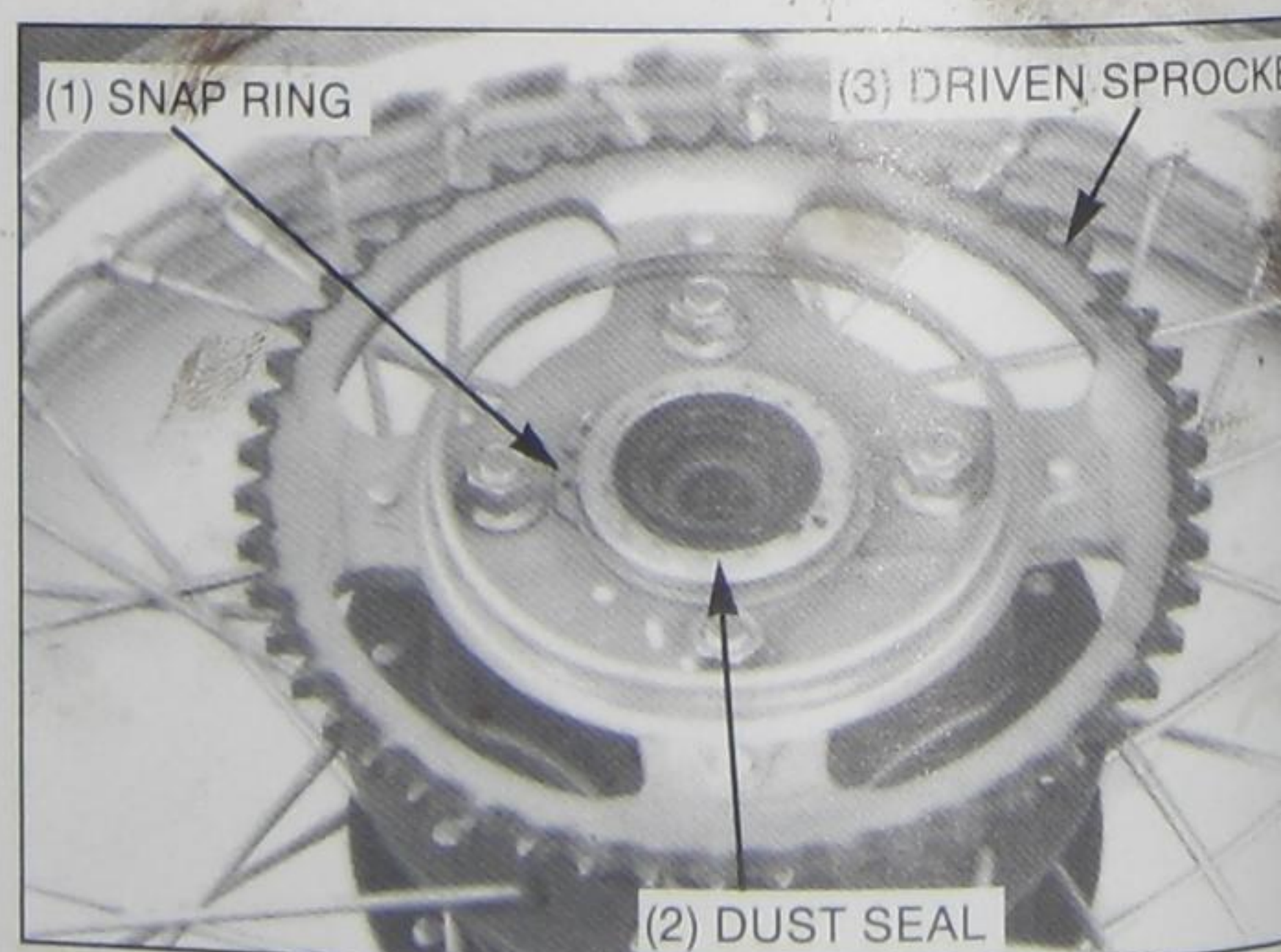
DISASSEMBLY

Remove the dust seal.

Remove the snap ring.

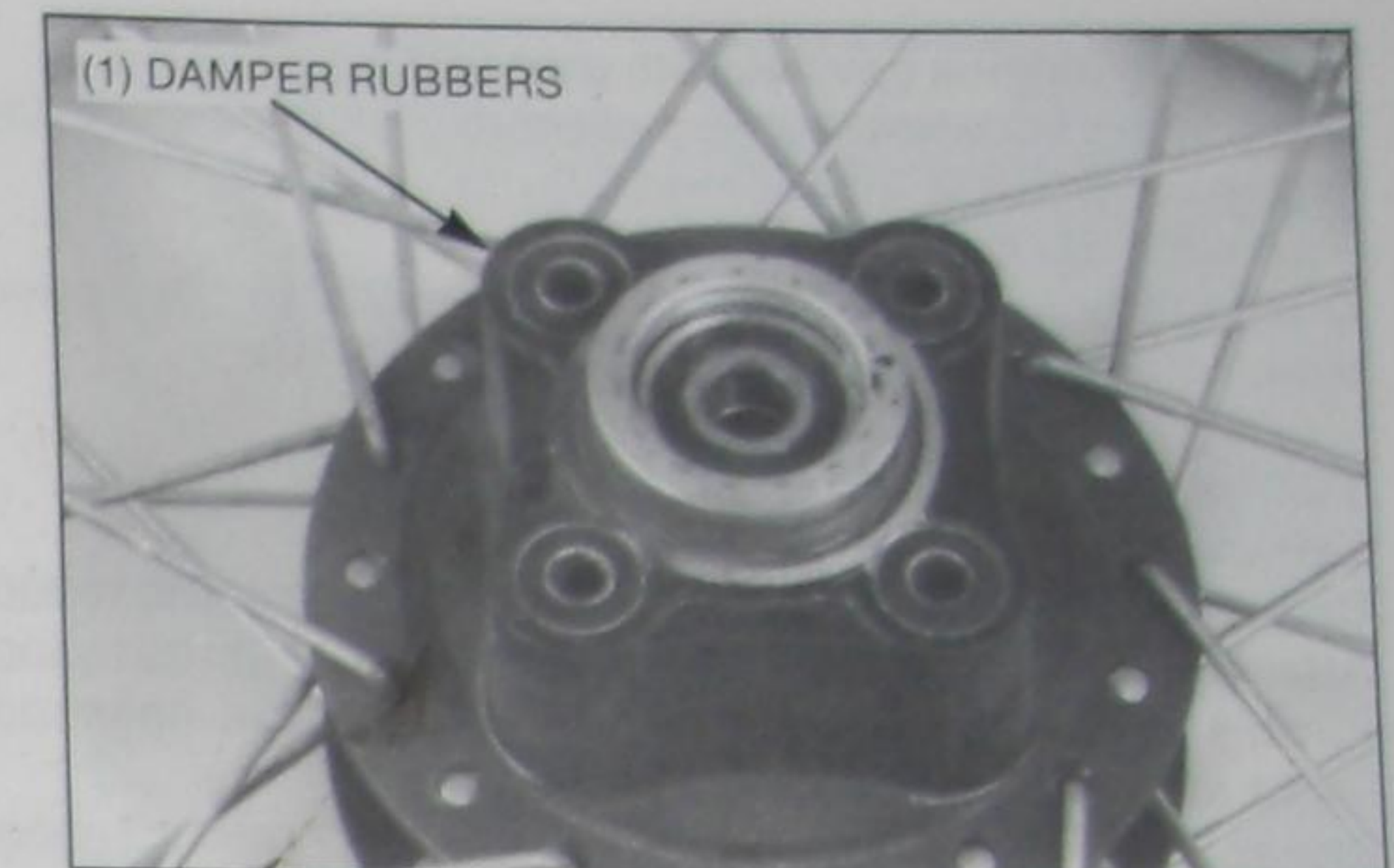
Remove the final driven sprocket by tapping it in several locations with a piece of wood or a soft hammer.

If the final driven sprocket requires replacement, remove the nuts and bolt.



REAR WHEEL/BRAKE/SUSPENSION

Check the damper rubbers for deterioration or damage.
Replace the wheel hub if necessary.



Install the bearing remover head into the bearing.
From opposite side, install the bearing remover shaft and drive the bearing out of the wheel hub.
Remove the distance collar and drive out the other bearing.

TOOLS:

Bearing remover shaft

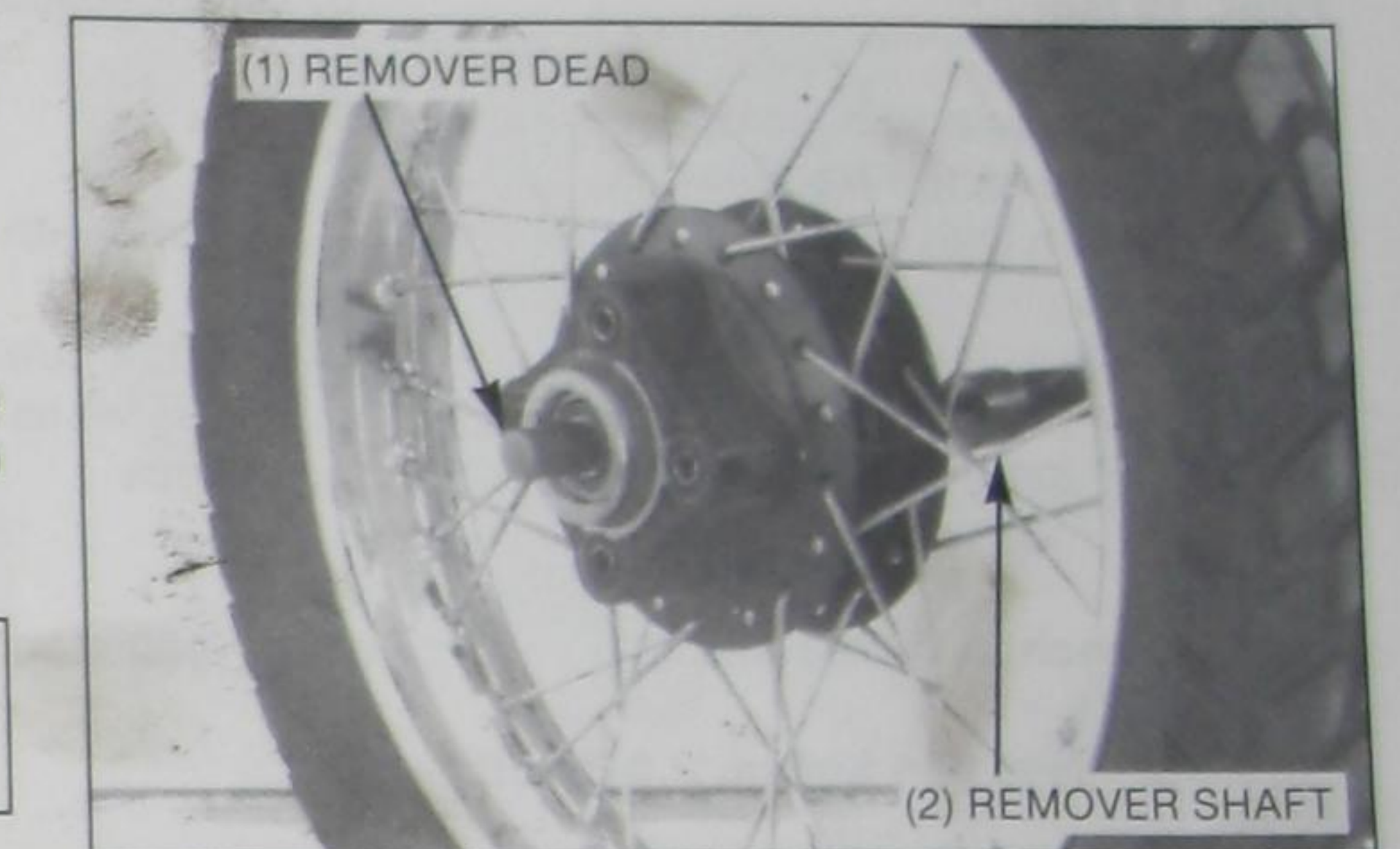
07746-0050100

Bearing remover head, 15 mm

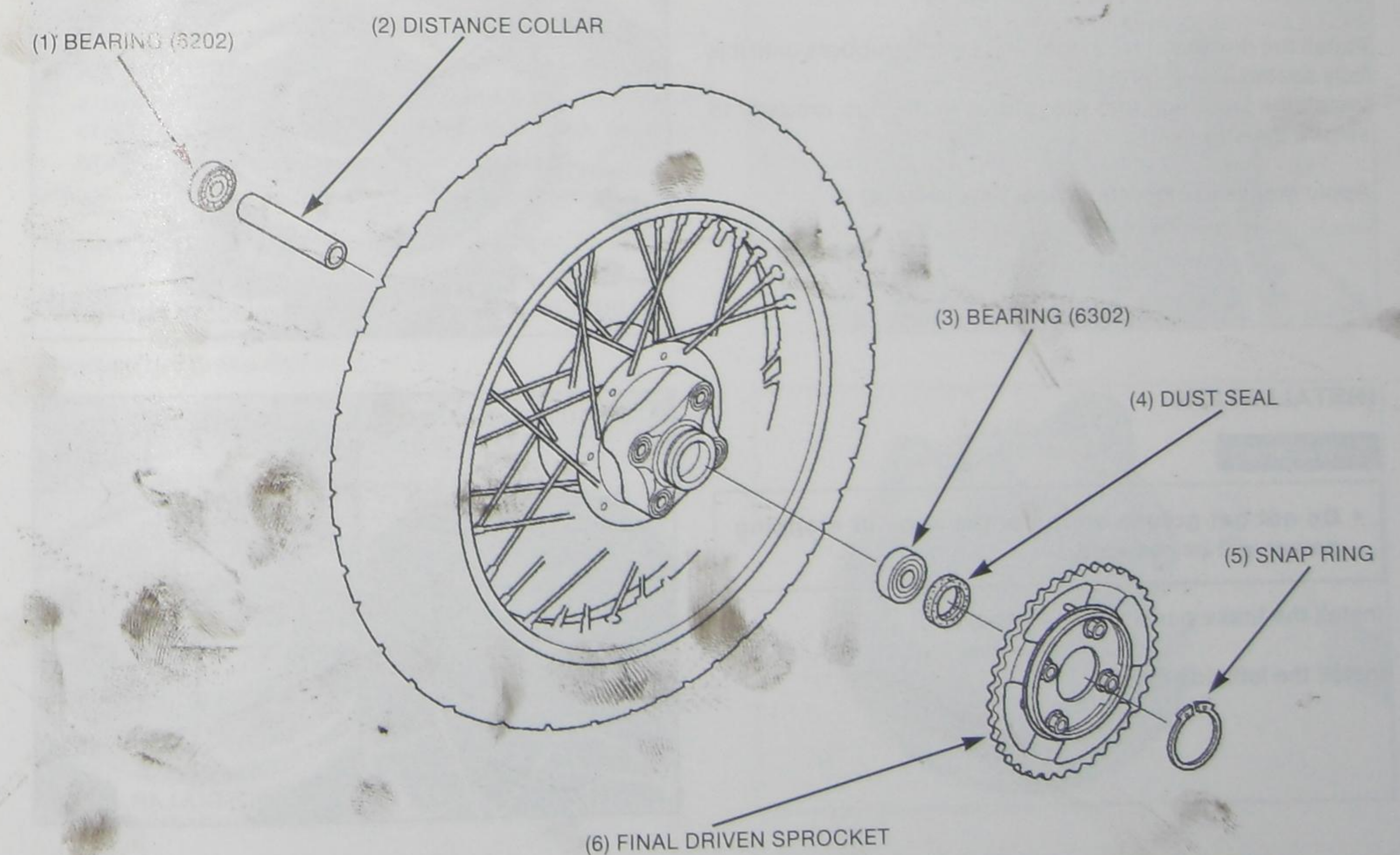
07746-0050400

NOTE:

- Replace the wheel bearings in pairs. Do not reuse old bearings.



ASSEMBLY



REAR WHEEL/BRAKE/SUSPENSION

Pack new bearing cavities with grease.
Drive in the left wheel bearing squarely with the sealed side facing up until it is fully seated.
Install the distance collar.
Drive in the right wheel bearing squarely with the sealed side facing up until it is fully seated.

TOOLS:

Left side:

Driver

Attachment, 42 x 47 mm

Pilot, 15 mm

Right side:

Driver

Attachment, 32 x 35 mm

Pilot, 15 mm

07749-0010000

07746-0010300

07746-0040300

07749-0010000

07746-0010100

07746-0040300

When new spokes are installed, perform as follows:
Place the rim on the work bench.

Place the hub with the left side down and begin lacing with new spokes.

Adjust the hub position so that the distance from the hub right end surface to the rim right side is 1 mm (0.04 in) as shown. Tighten the spokes in 2 or 3 progressive steps.

TOOL:

Spoke wrench, 5.8 x 6.1 mm

07701-0020300

TORQUE: 4 N·m (0.4 kgf-m, 2.9 lbf-ft)

Check the rim runout (page 13-4).

Install the sprocket bolts and nuts and tighten them.

TORQUE: 44 N·m (4.5 kgf-m, 33 lbf-ft)

Install the driven sprocket into the damper rubbers until it is fully seated.

Install the snap ring into the groove in the hub properly to secure the sprocket.

Apply grease to a new dust seal lip and install it.

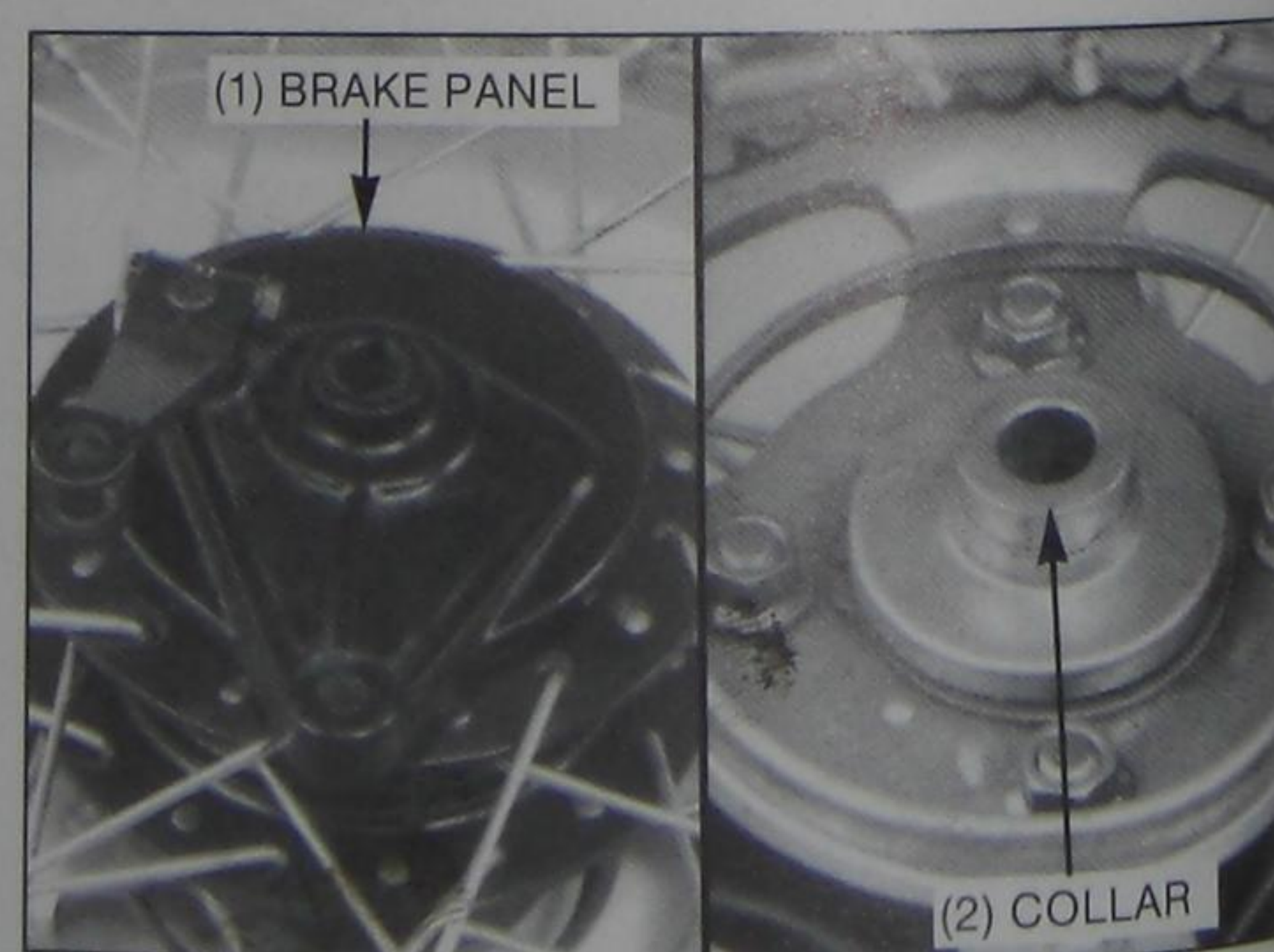
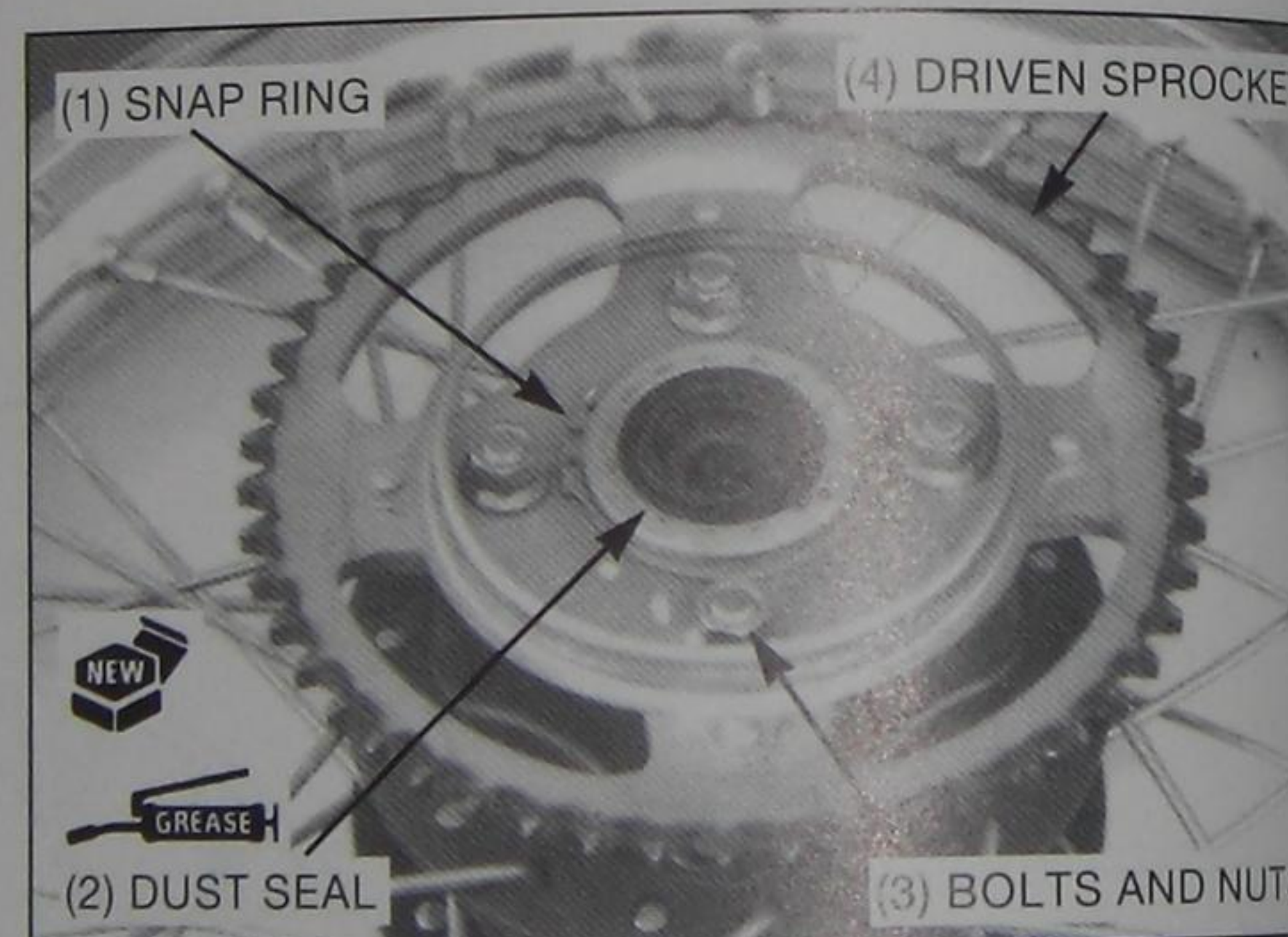
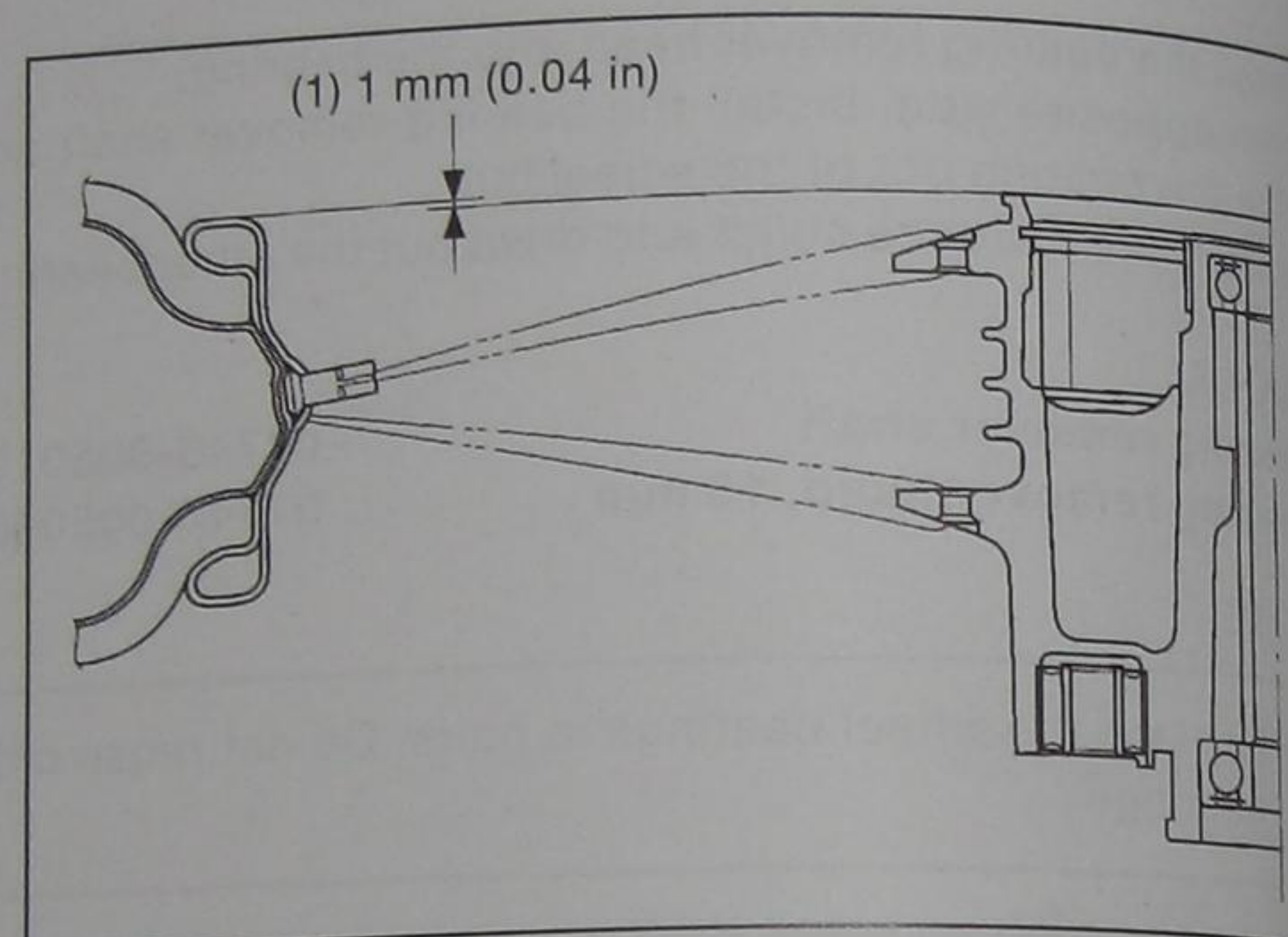
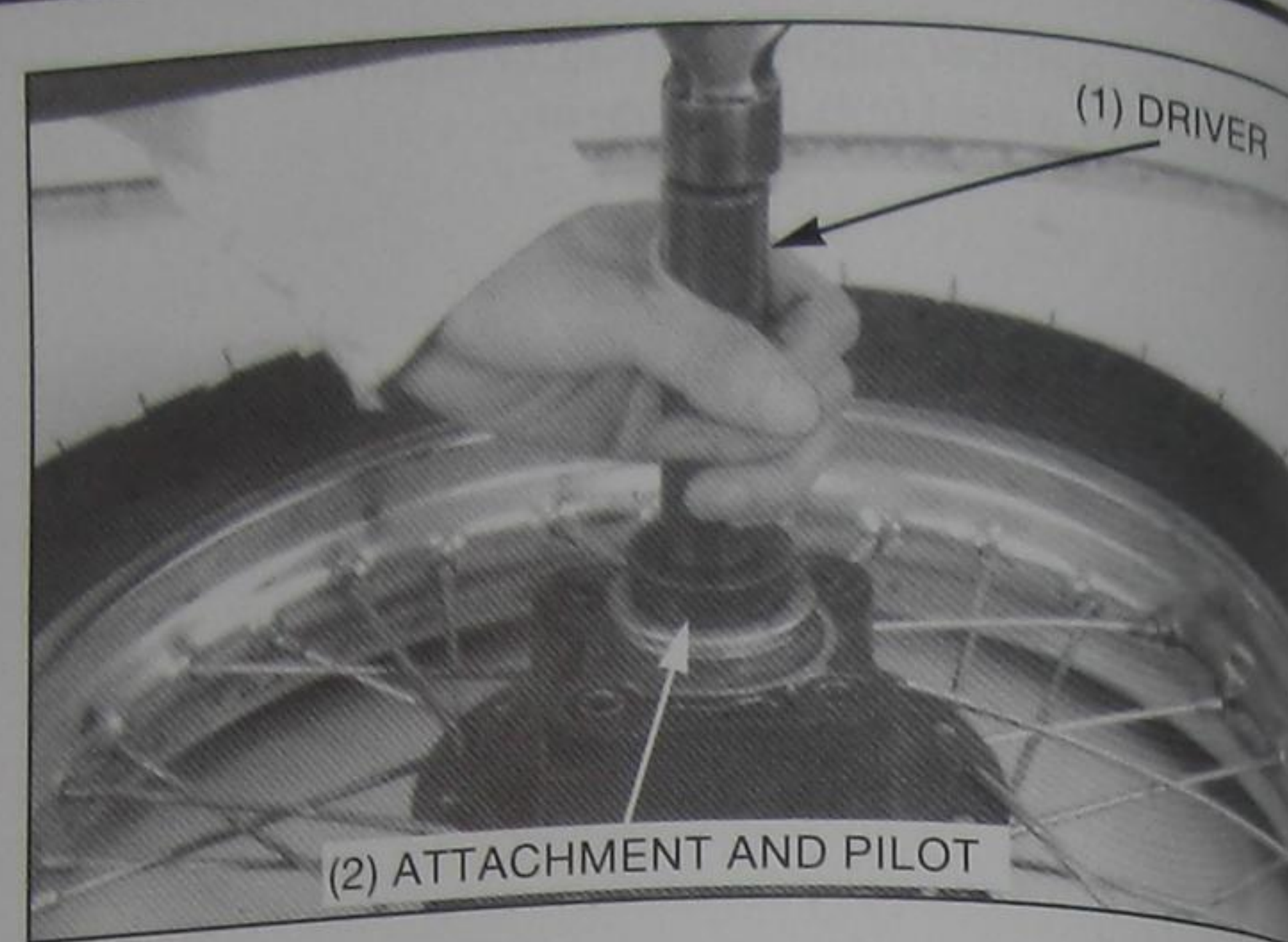
INSTALLATION

⚠ WARNING

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

Install the brake panel into the wheel hub.

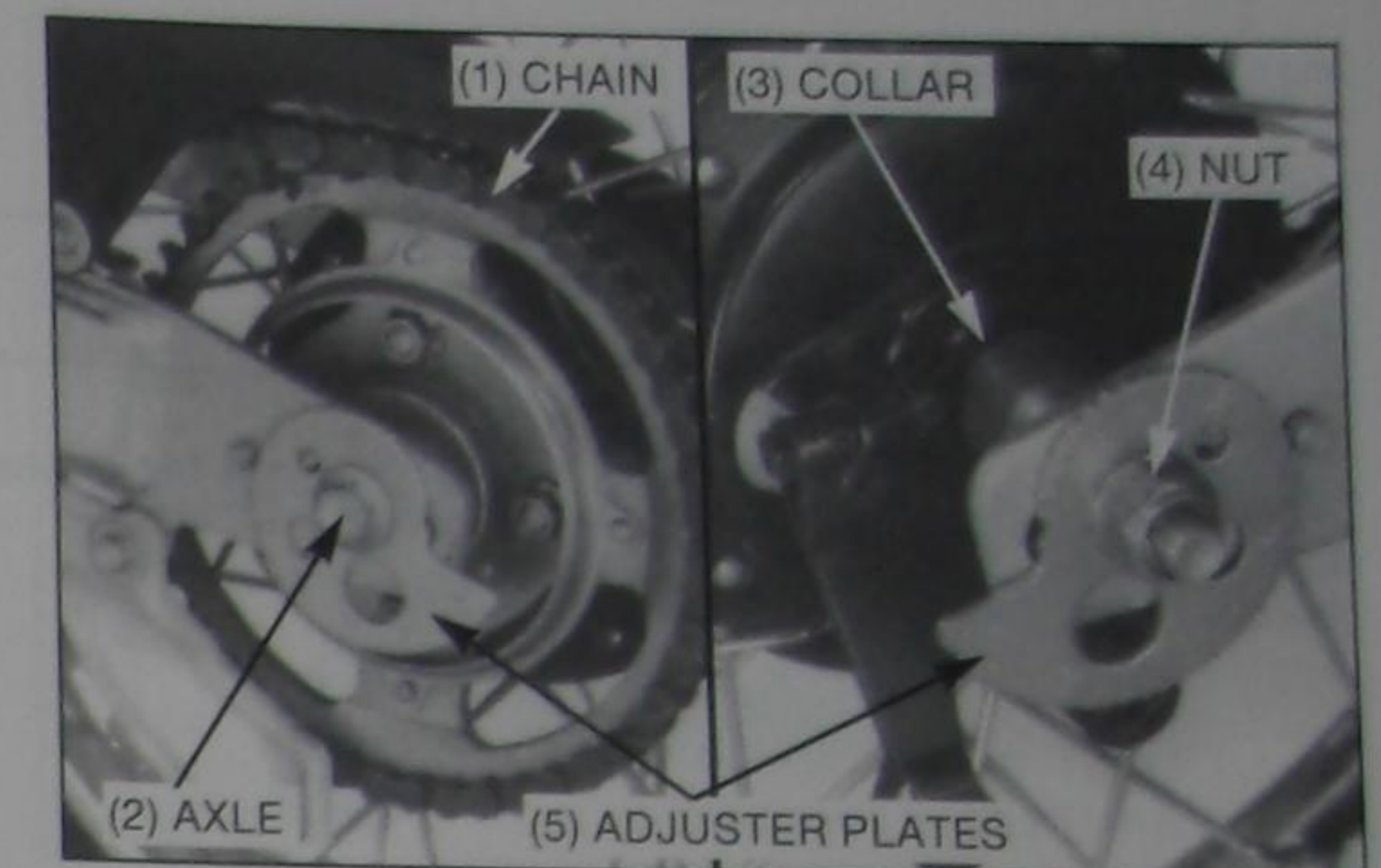
Install the left side collar.



REAR WHEEL/BRAKE/SUSPENSION

Place the rear wheel between the swingarm legs and install the drive chain onto the final driven sprocket.
Insert the axle with the left adjuster plate from the left side, then install the right side collar.

Install the right adjuster plate and axle nut but do not tighten it.



Connect the stopper arm to the brake panel with the stopper bolt. Install the seat rubber, washer and nut and tighten it.

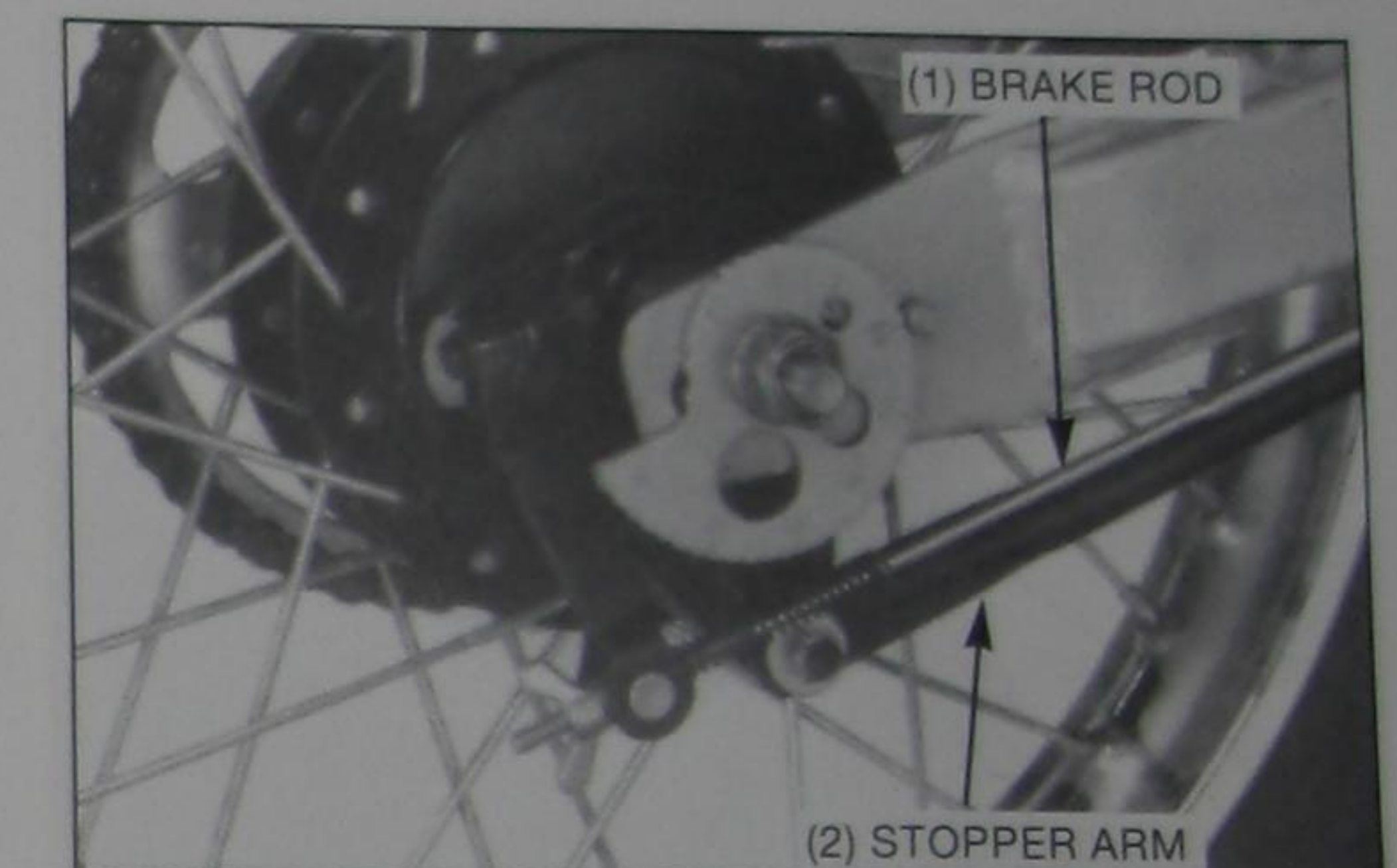
TORQUE: 22 N·m (2.2 kgf-m, 16 lbf-ft)

Install a new cotter pin into the stopper bolt.

Install the spring onto the brake rod and the joint pin into the brake arm. Connect the brake rod to the brake arm and install the adjusting nut.

Adjust the following:

- Drive chain (page 3-10)
- Brake pedal free play (page 3-12).



Rear Brake

⚠ WARNING

- A contaminated brake drum or shoe reduces stopping power. Discard contaminated shoes and clean a contaminated drum with a high quality brake degreasing agent.

Remove the brake panel from the wheel (page 13-3).

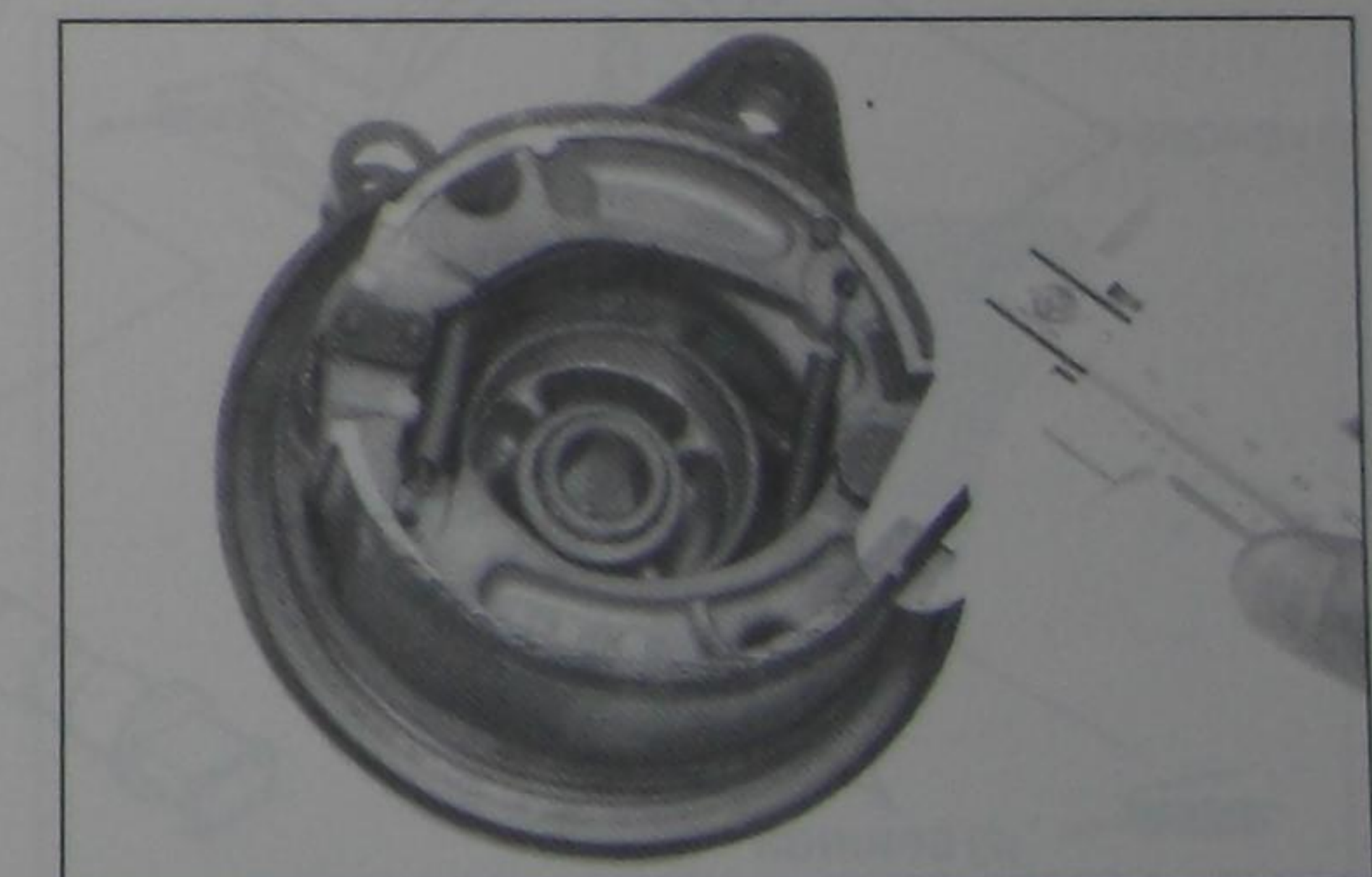
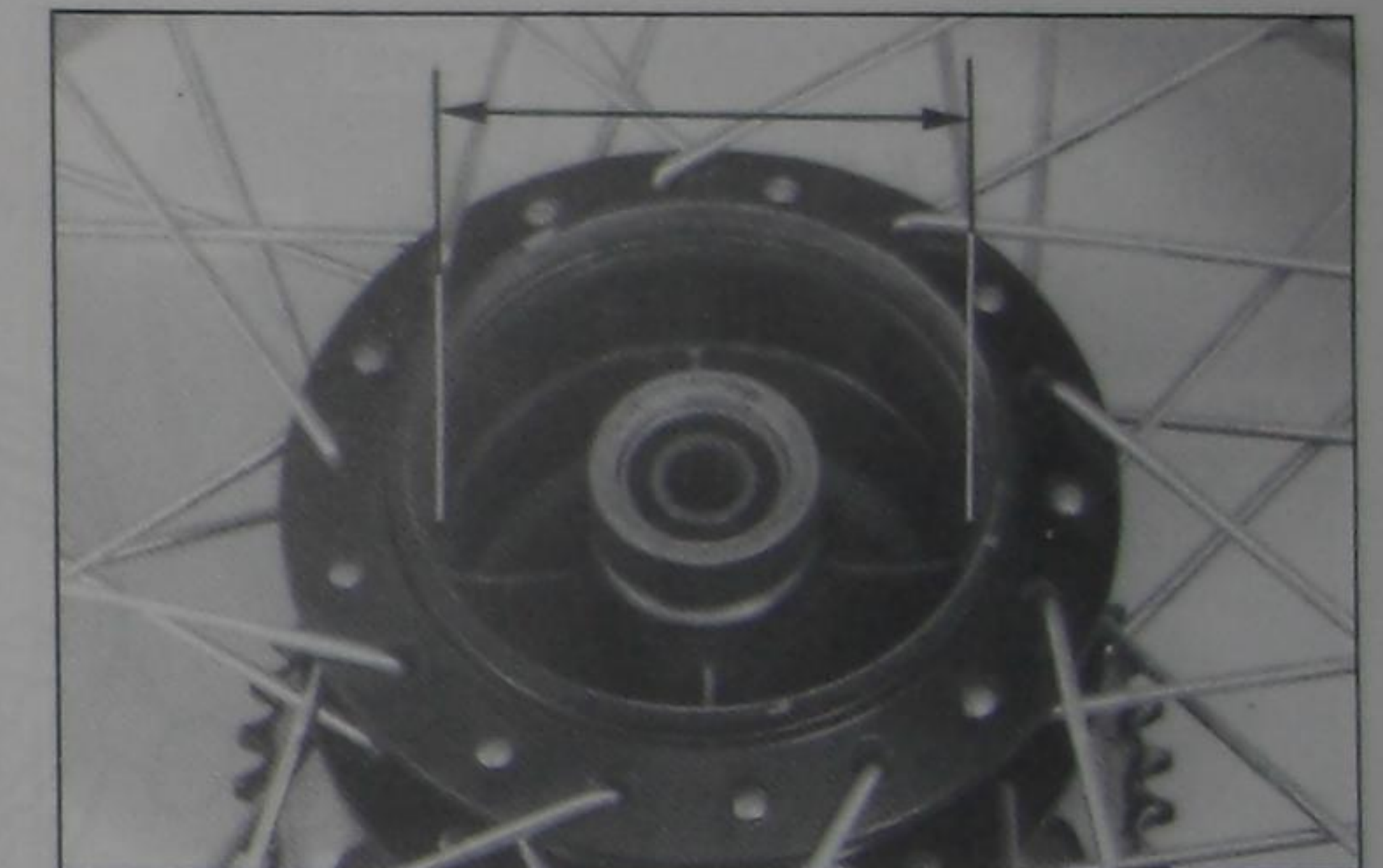
INSPECTION

Measure the brake drum I.D.

SERVICE LIMIT: 131 mm (5.2 in)

Measure the brake lining thickness.

SERVICE LIMIT: 2.0 mm (0.08 in)



REAR WHEEL/BRAKE/SUSPENSION

DISASSEMBLY

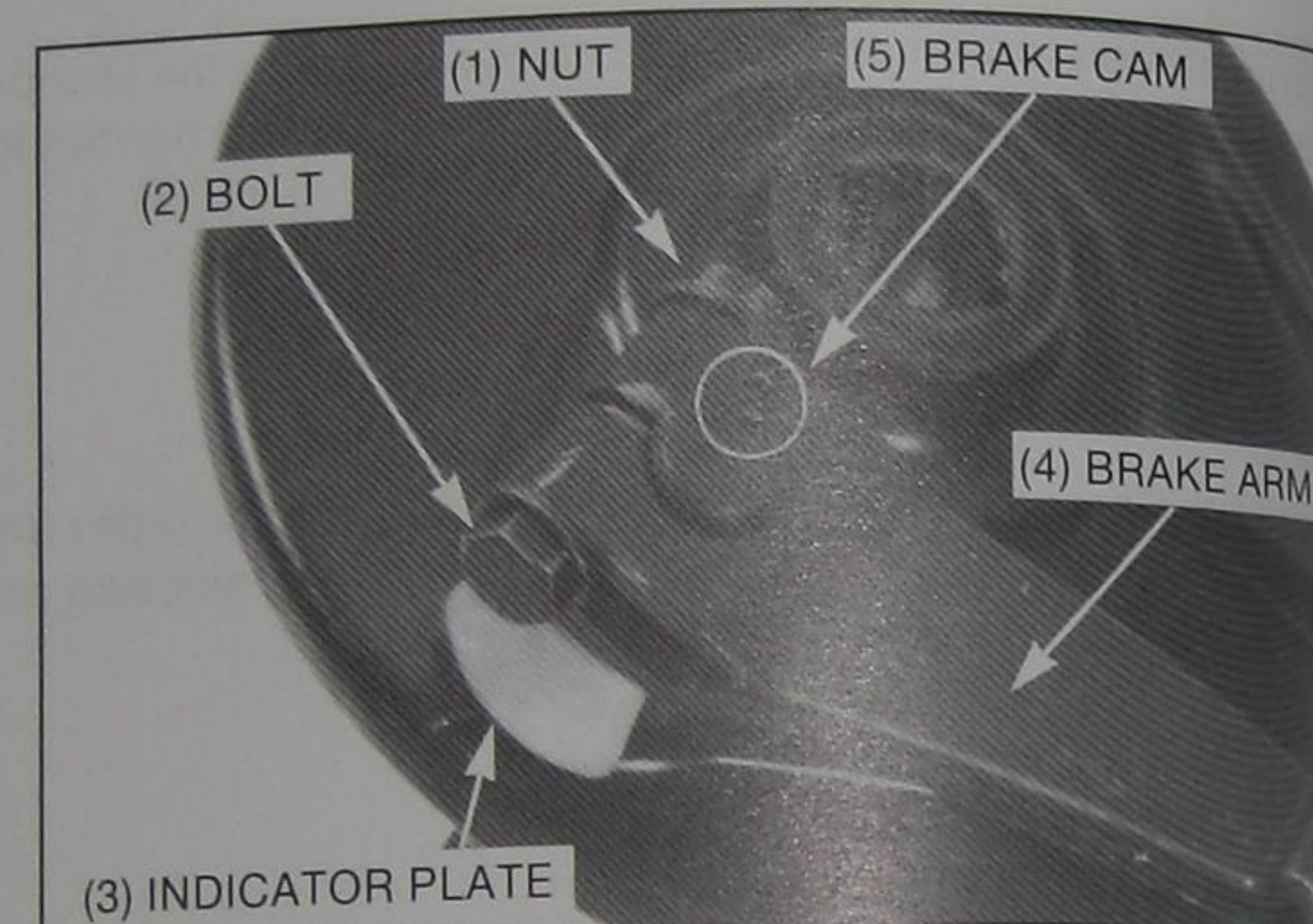
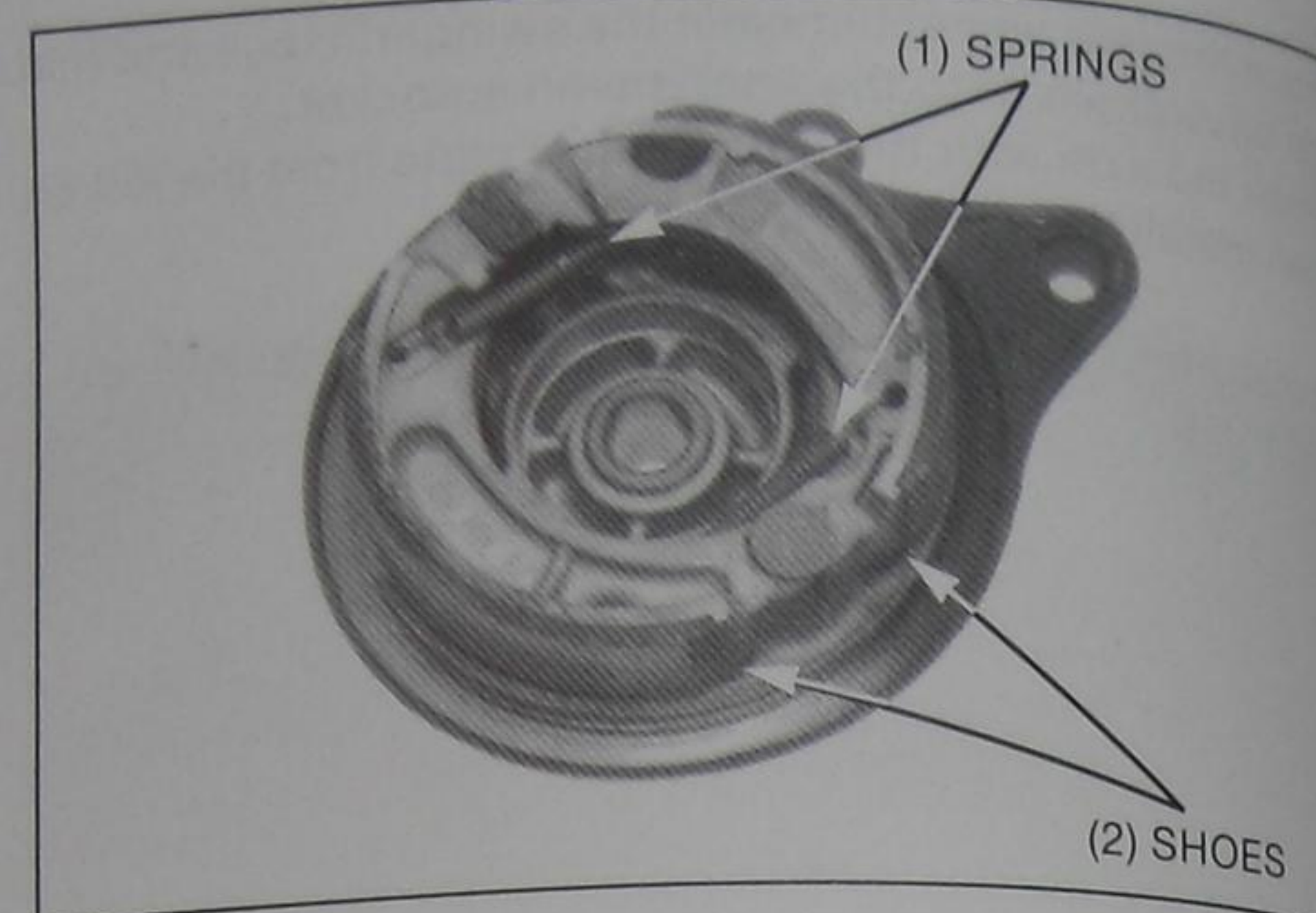
NOTE:

- Always replace the brake shoes in pairs.

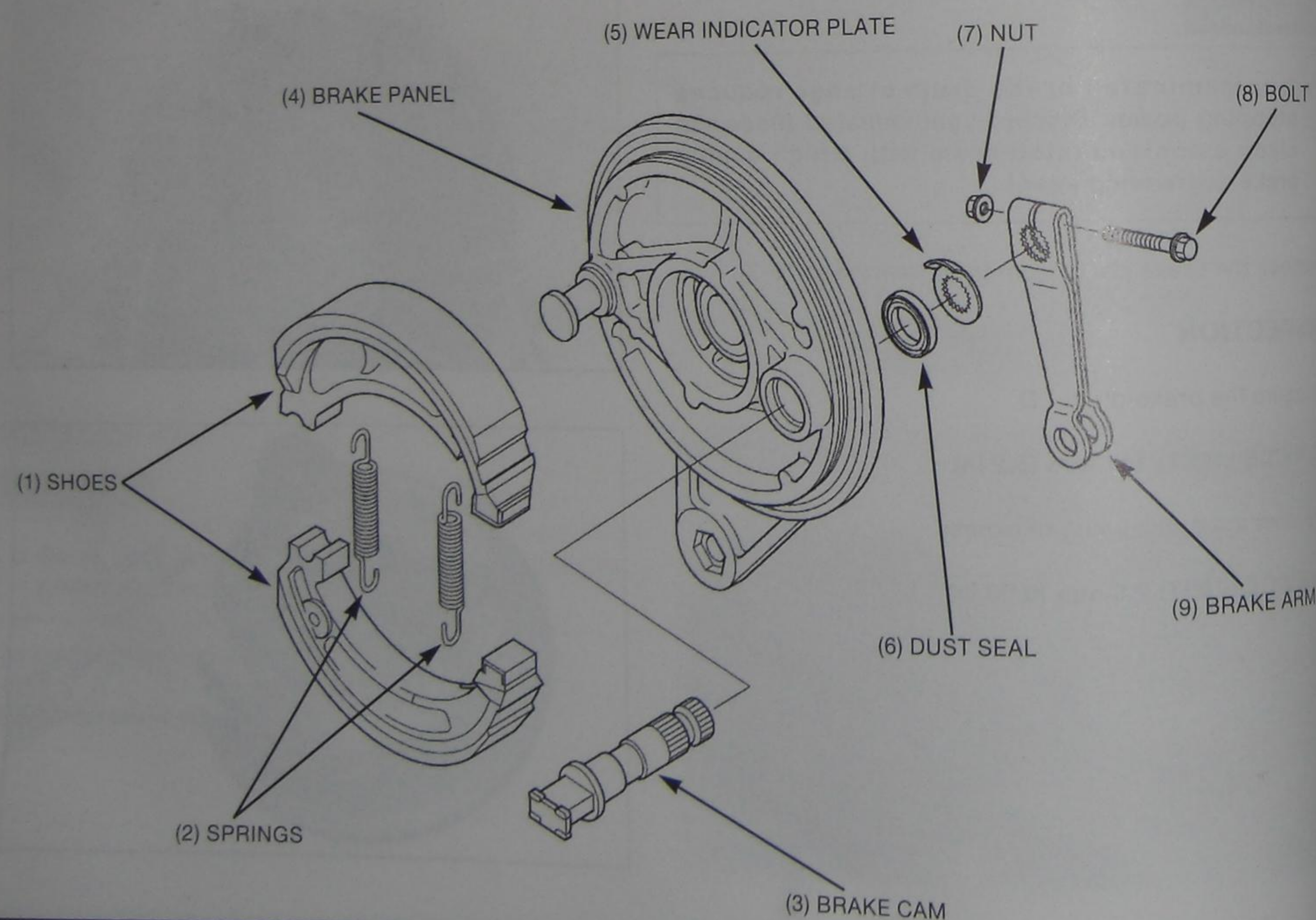
Expand the brake shoes and remove them from the brake cam and anchor pin.
Remove the shoe springs from the shoes.

Remove the following:

- Brake arm nut and bolt
- Brake arm
- Indicator plate
- Brake cam
- Dust seal

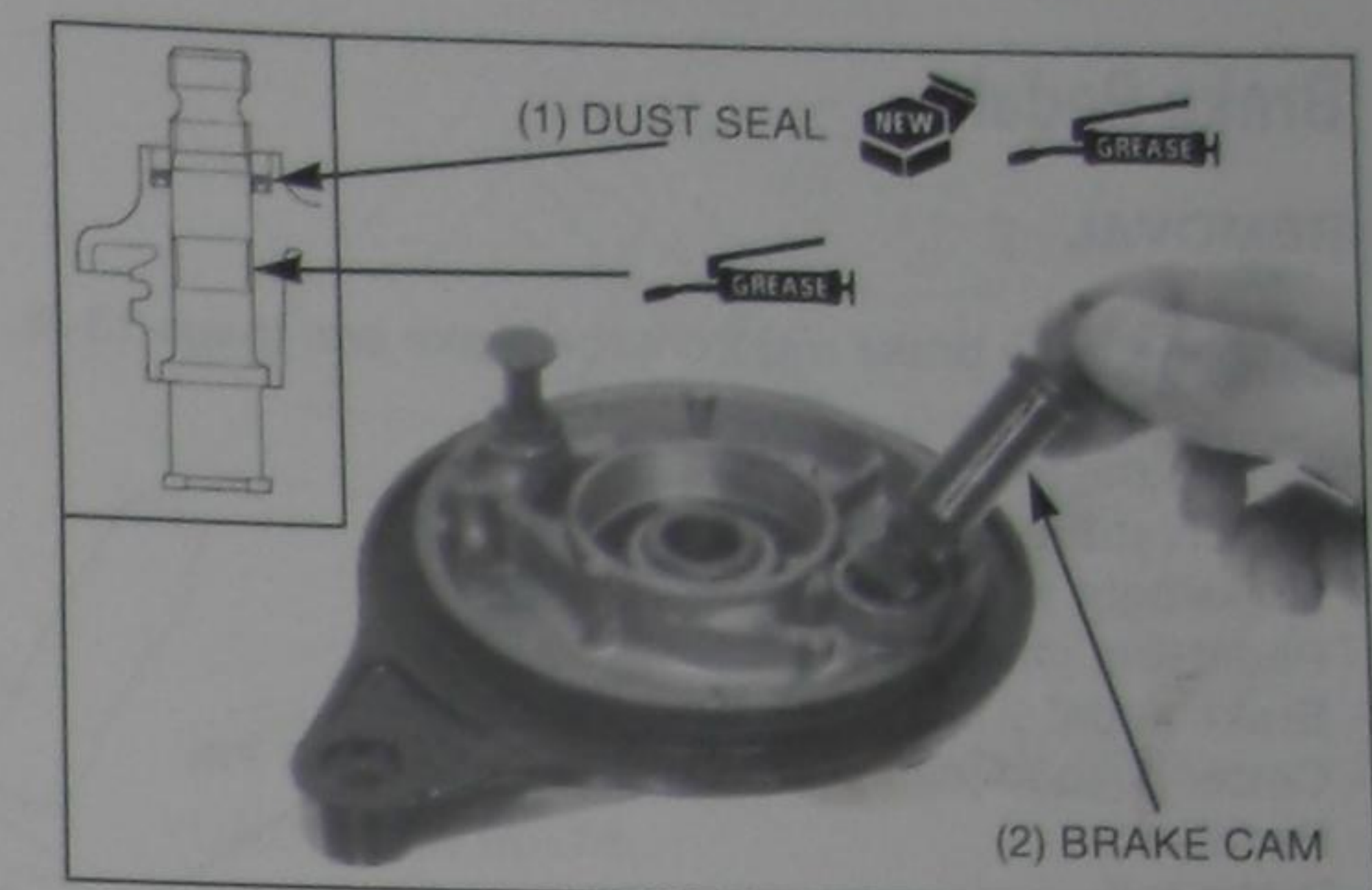


ASSEMBLY

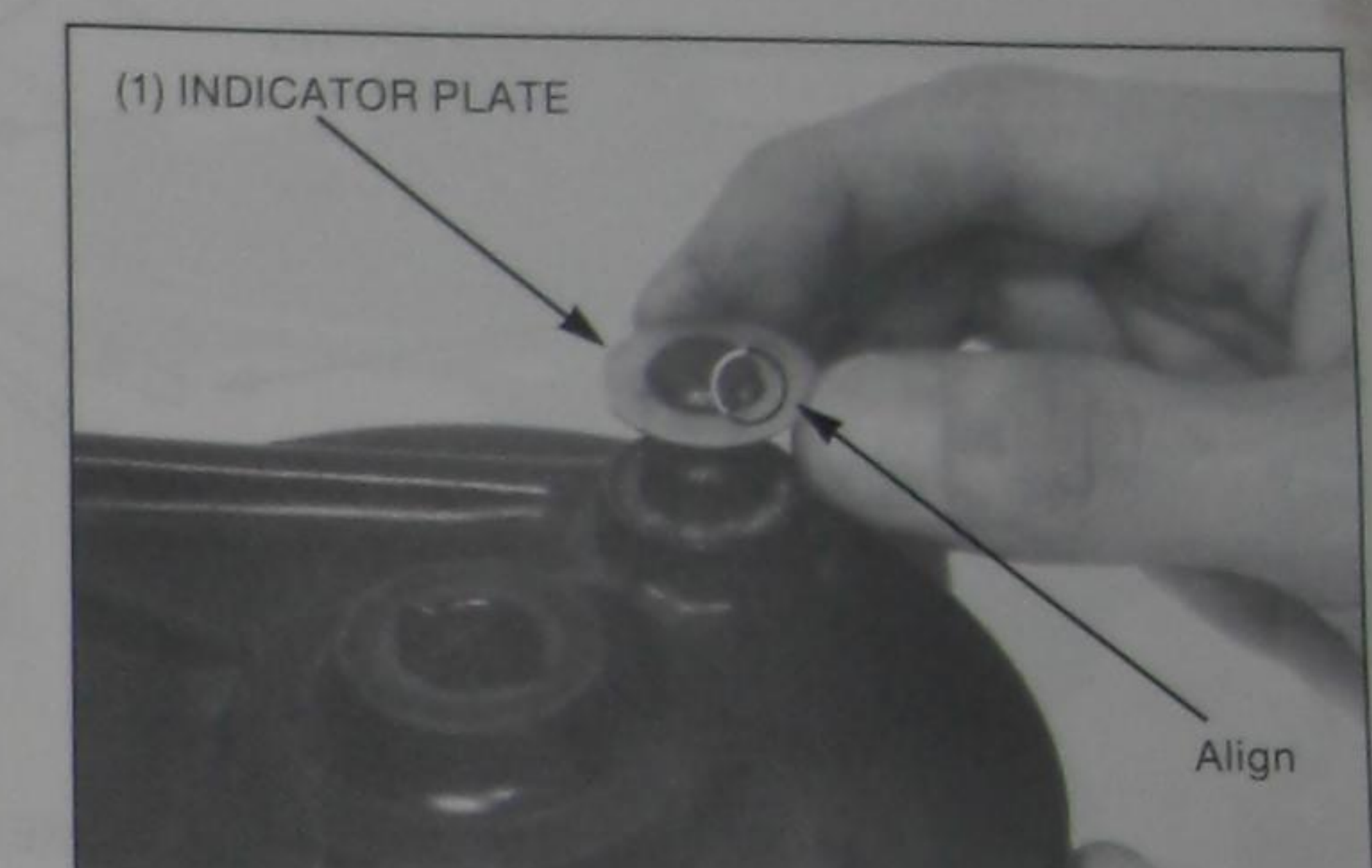


REAR WHEEL/BRAKE/SUSPENSION

Pack a new dust seal lip with grease and install it into the brake panel until it is fully seated.
Apply grease to the brake cam spindle and install it, being careful not to damage the seal lip by the its spline.



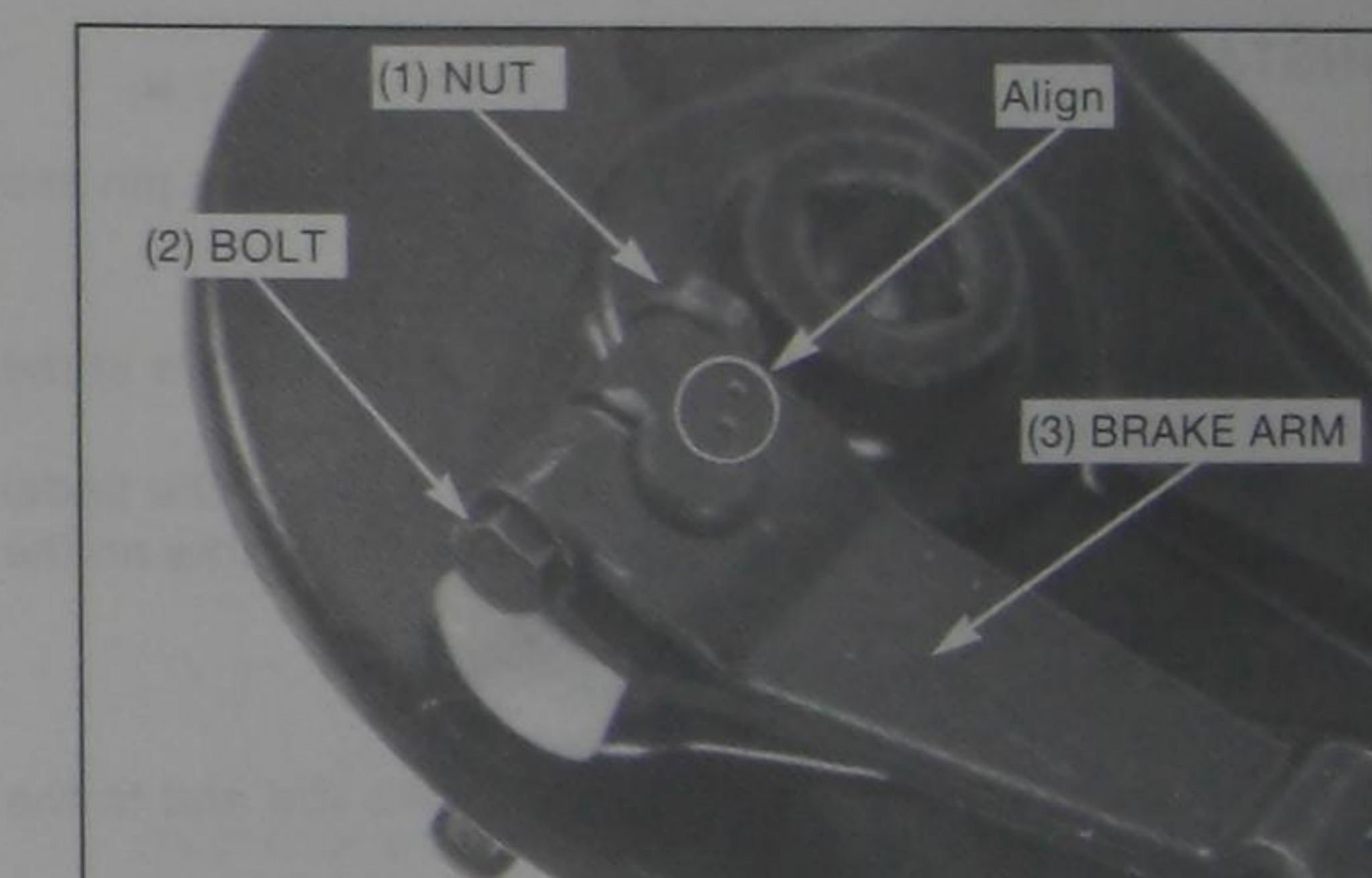
Install the wear indicator by aligning the wide tooth with the wide groove in the brake cam.



Install the brake arm by aligning the punch marks on the brake arm and cam.

Install the brake arm bolt and nut and tighten the it.

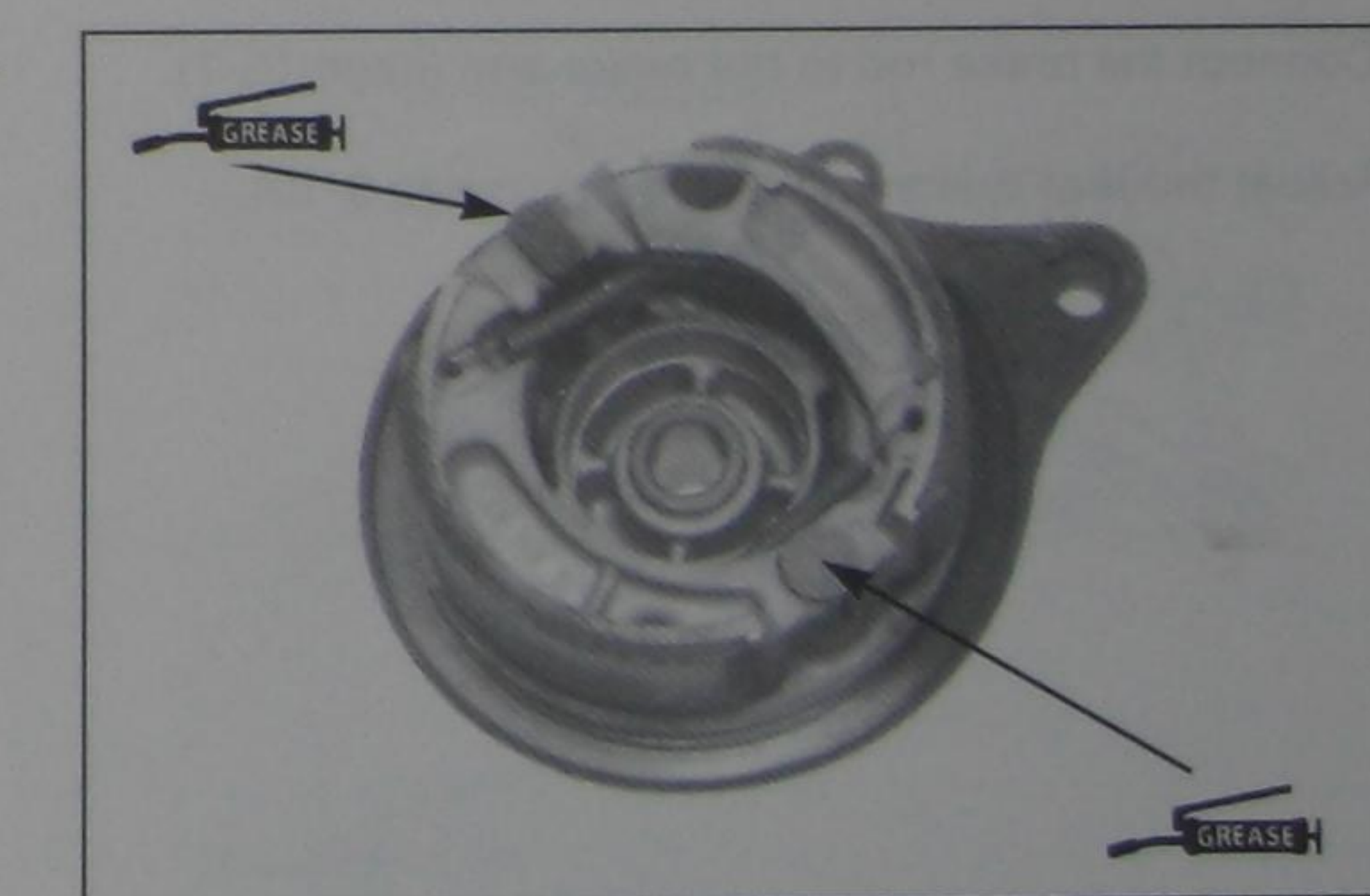
TORQUE: 10 N·m (1.0 kgf-m, 7 lbf-ft)



Apply grease to the anchor pin and brake cam sliding surfaces.

Assemble the brake shoes and springs as shown.
Install the shoe assembly onto the brake panel.
Wipe any excess grease of the brake cam and anchor pin.

Install the rear wheel (page 13-6).

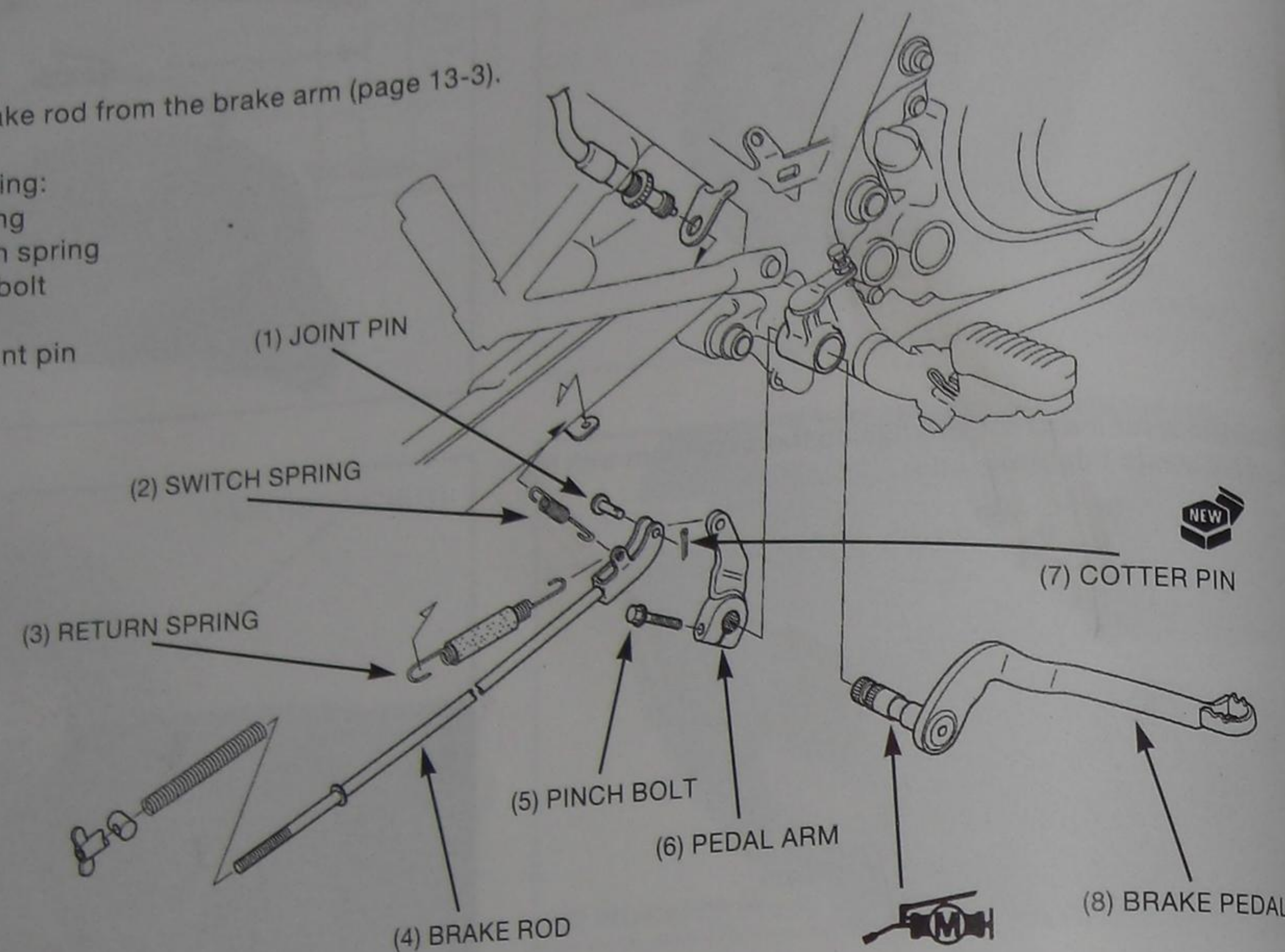


Brake Pedal

REMOVAL

Disconnect the brake rod from the brake arm (page 13-3).

- Remove the following:
- Pedal return spring
 - Brake light switch spring
 - Pedal arm pinch bolt
 - Brake pedal
 - Cotter pin and joint pin
 - Pedal arm
 - Brake rod.



INSTALLATION

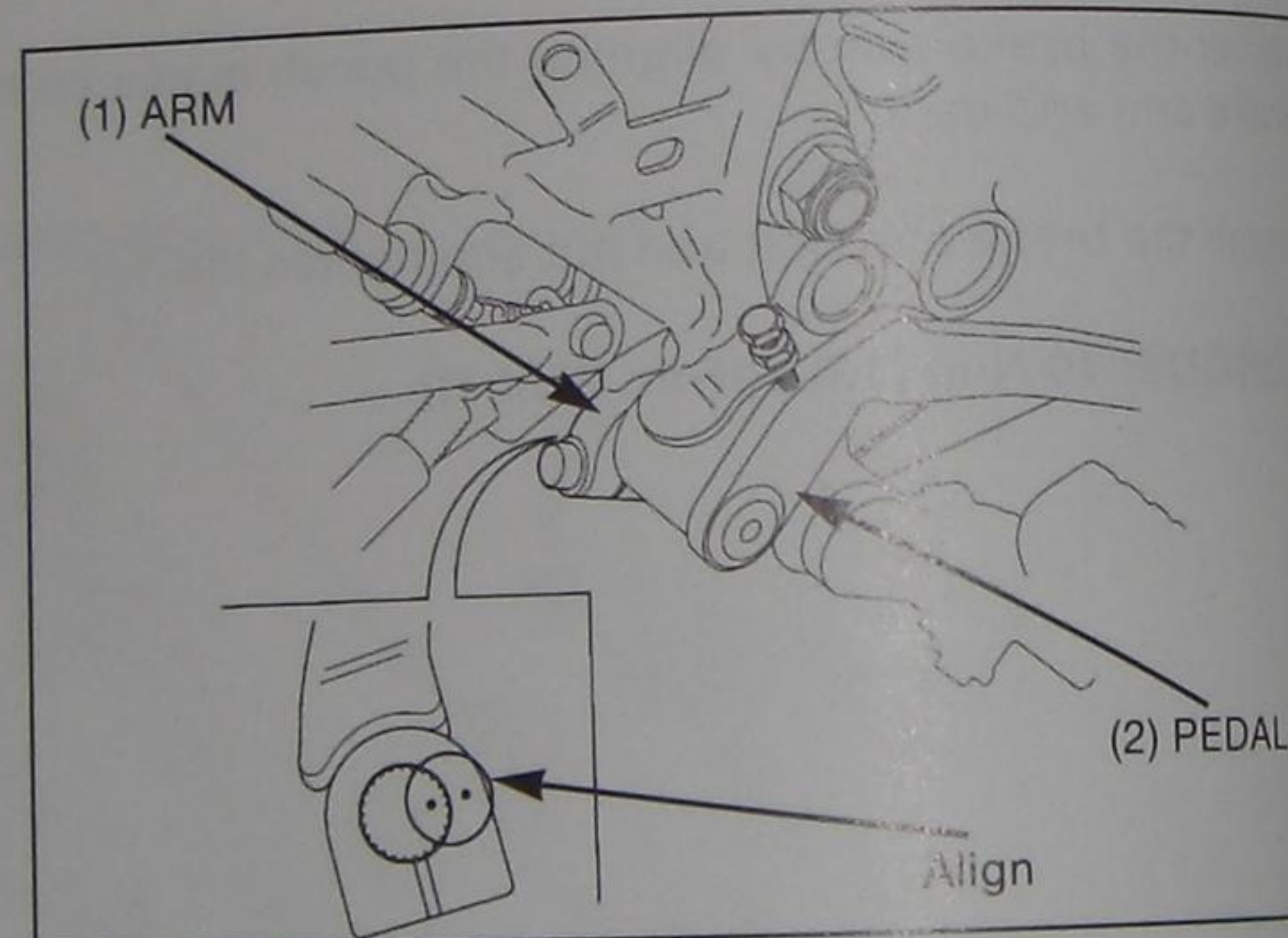
Install the brake rod to the brake arm with the joint pin and cotter pin.

Apply molybdenum disulfide grease into the groove in the brake pedal pivot. Insert the brake pedal into the frame and install the pedal arm onto the pedal pivot, aligning the punch marks on the brake pedal and arm. Install the pinch bolt and tighten it.

Install the pedal return spring to the brake rod and to the swingarm as shown. Install the switch spring to the brake rod as shown.

Connect the brake rod to the brake arm (page 13-7).

Adjust the rear brake pedal free play (page 3-12).



Shock Absorber/Linkage

CAUTION

- Be careful not to damage the frame, swingarm and linkage when removing and installing.

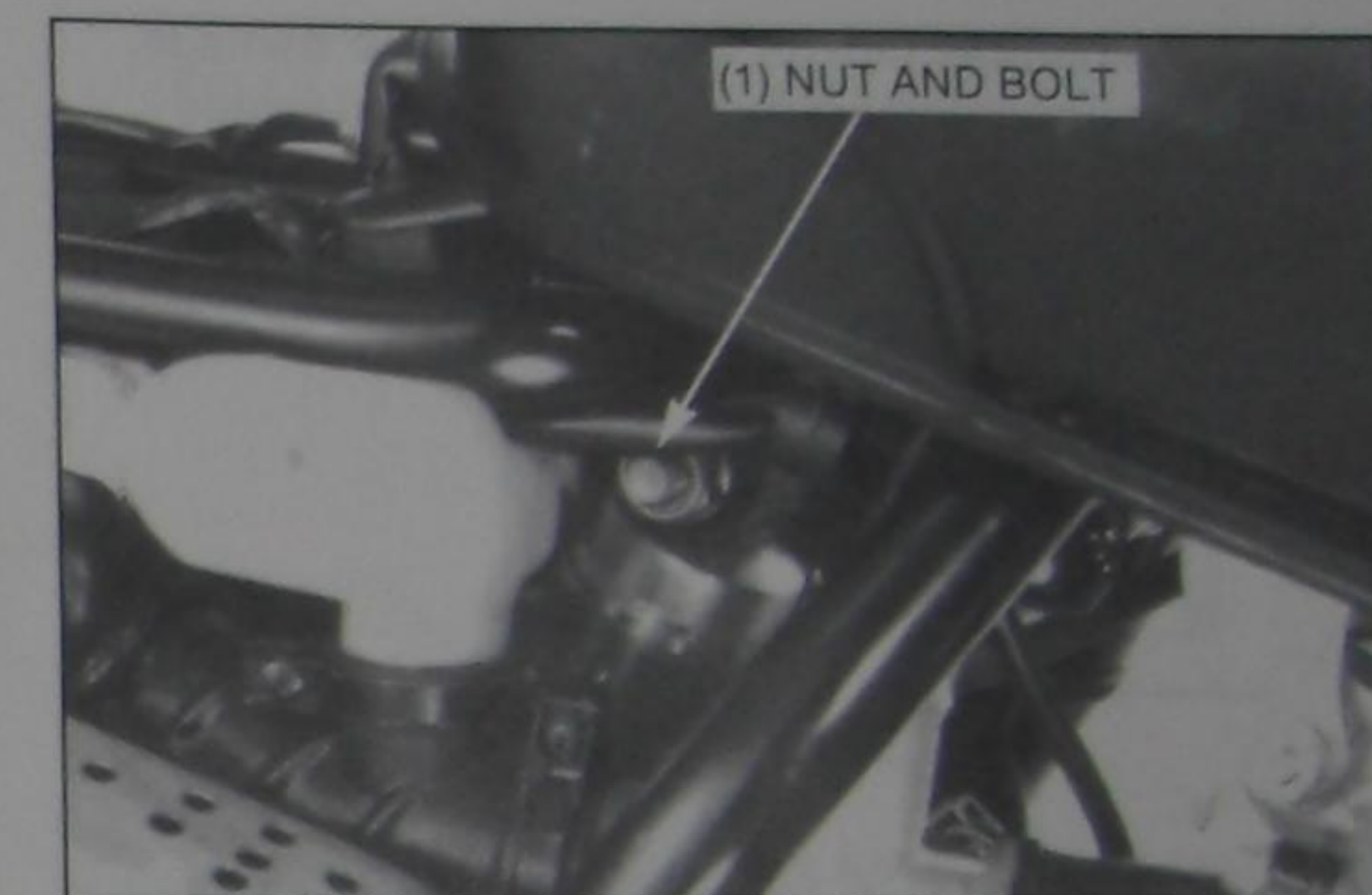
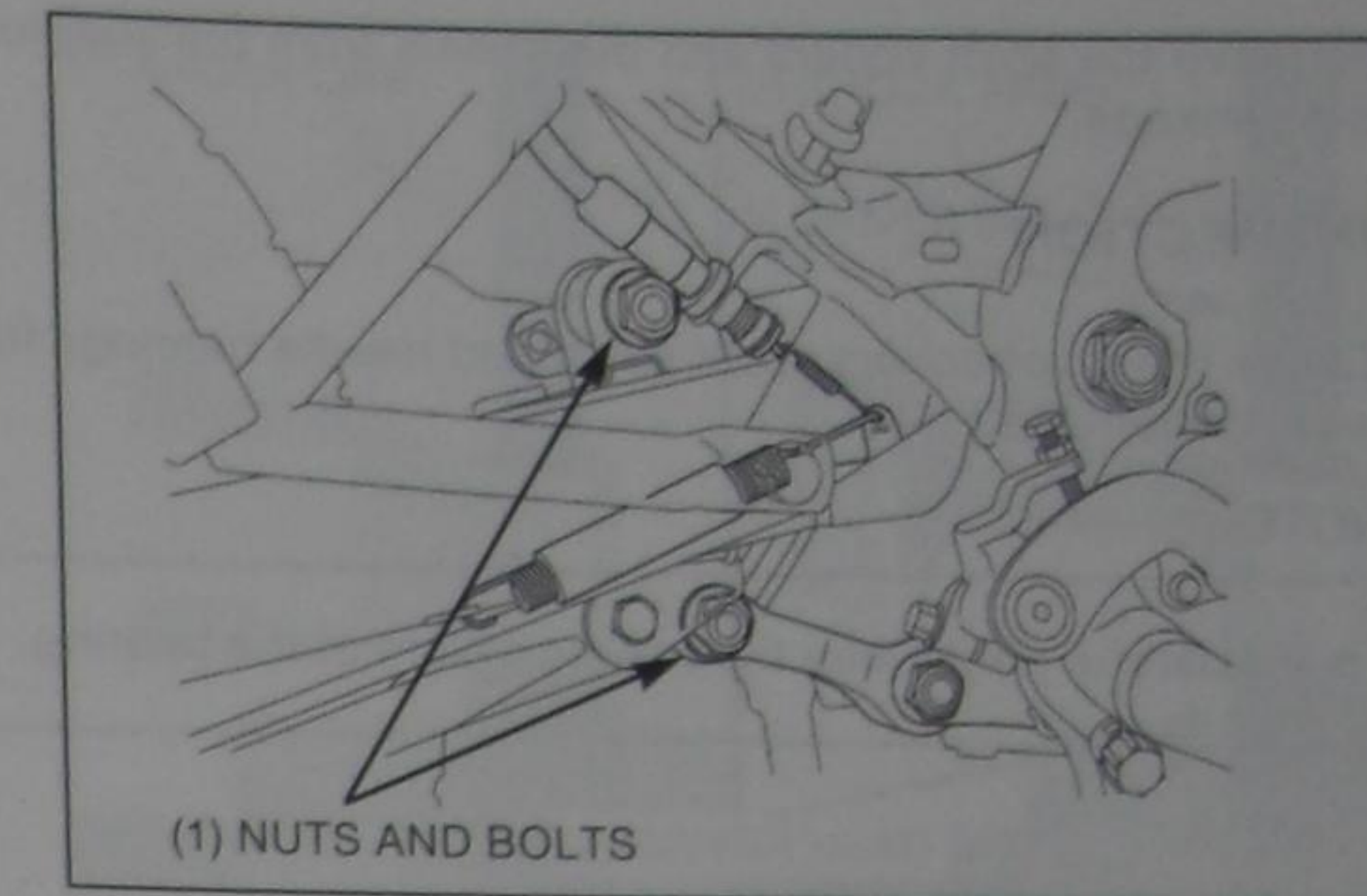
REMOVAL

Raise the rear wheel off the ground and support the motorcycle securely with a hoist or equivalent, and hold the swingarm.

Remove the seat (page 2-2).

Remove the following fasteners:

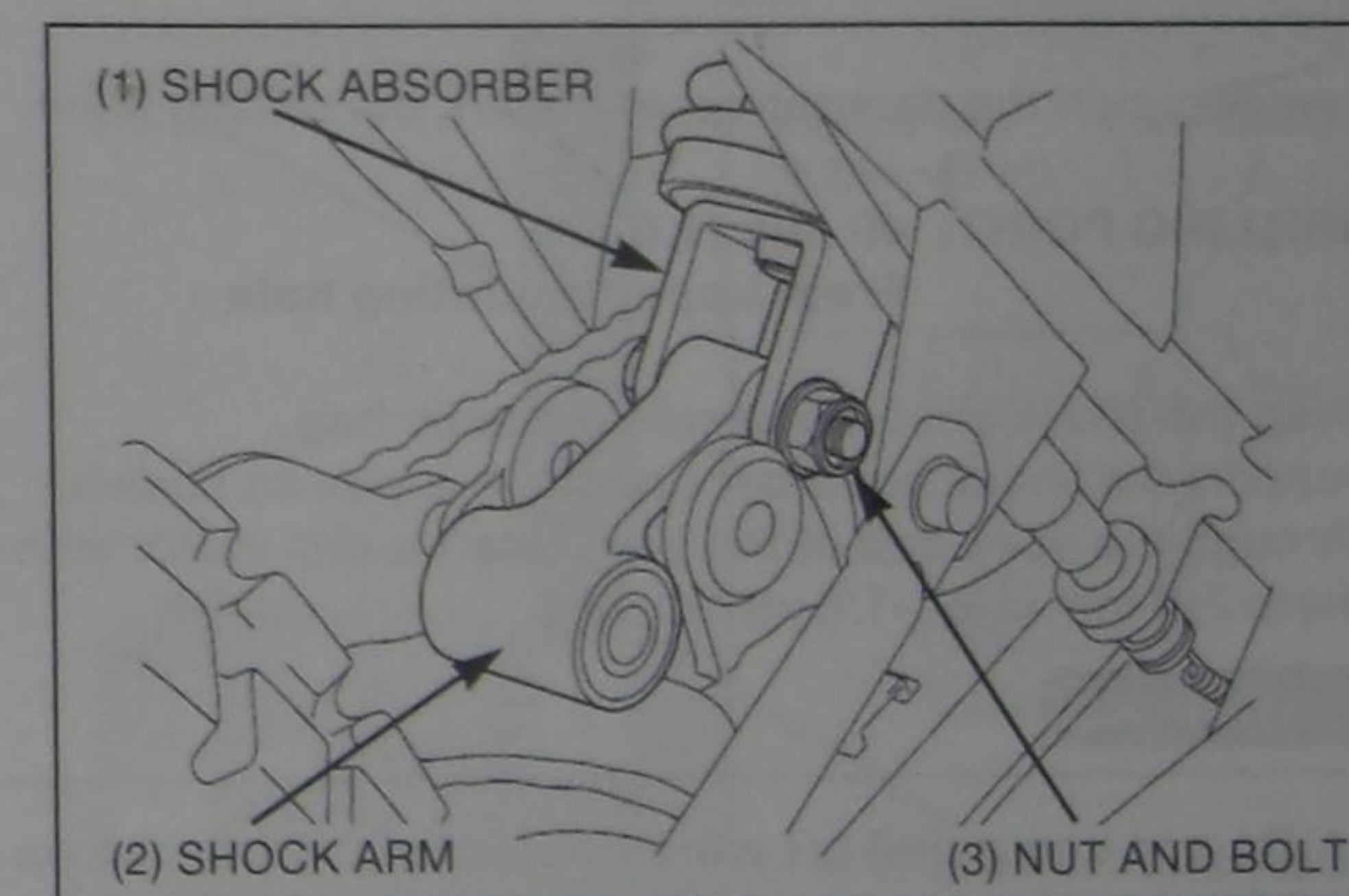
- Shock arm-to-swingarm nut and bolt
- Shock link-to-shock arm nut and bolt
- Shock absorber upper mounting nut and bolt.



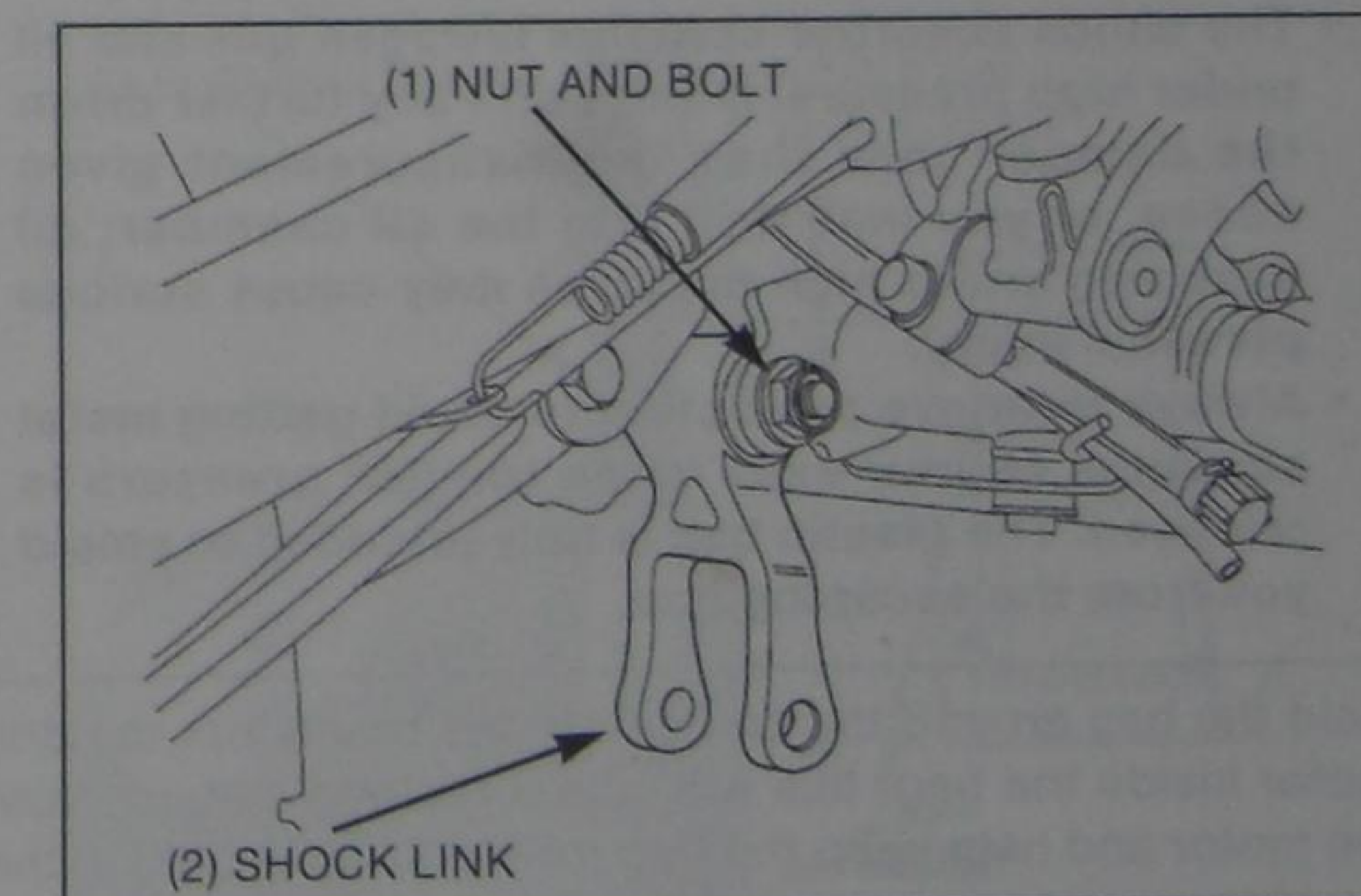
Lower the swingarm while sliding the shock arm rearward until the shock absorber lower mounting nut and bolt can be removed.

Remove the following:

- Shock absorber lower mounting nut and bolt
- Shock absorber and shock arm



- Shock link-to-frame nut, bolt and shock link.



REAR WHEEL/BRAKE/SUSPENSION

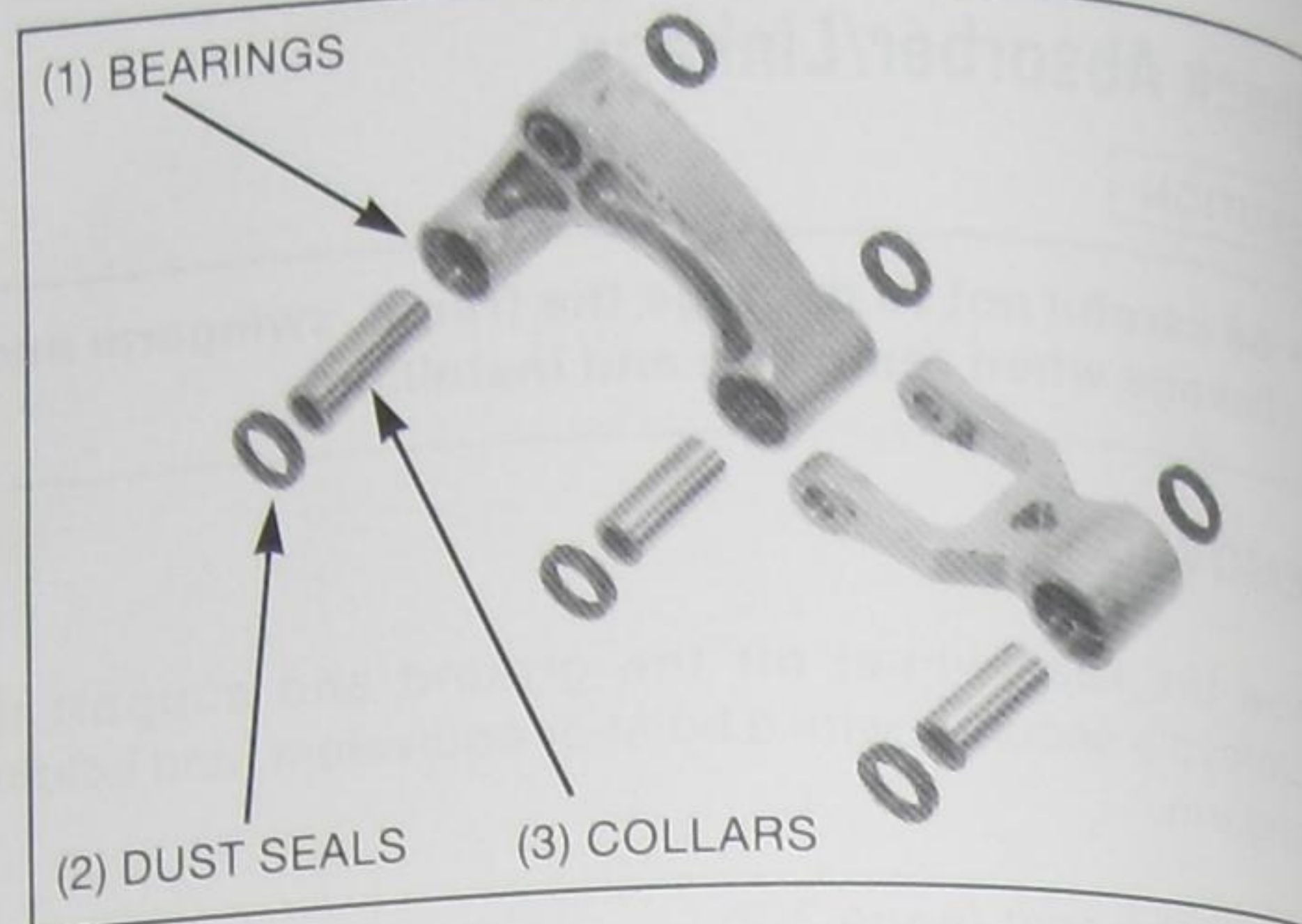
Remove the pivot collars and dust seals from the suspension linkage.

INSPECTION

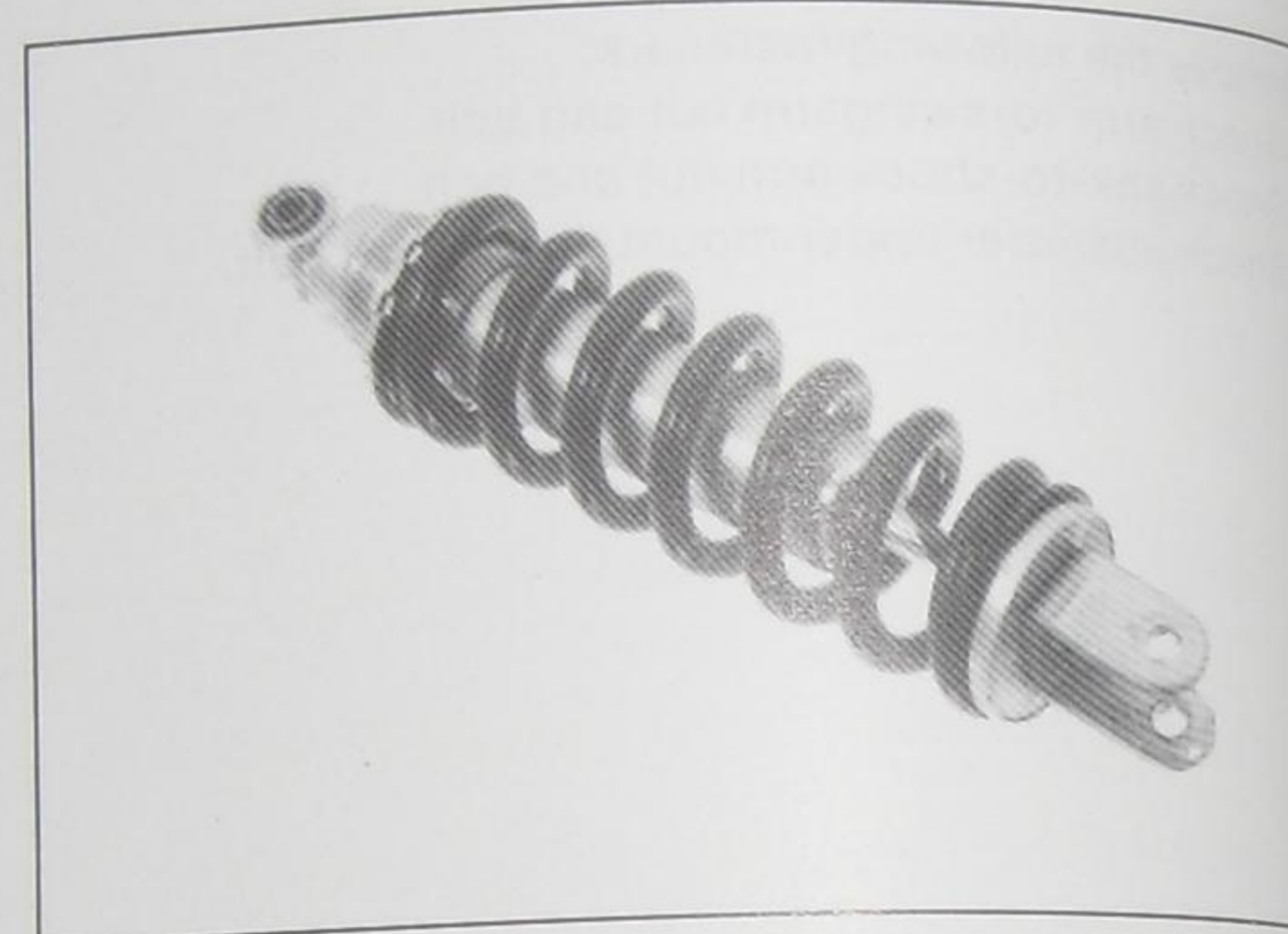
Check the pivot collars, dust seals and needle bearings for wear or damage.

NOTE:

- Be careful not to lose the needle rollers of the bearing.



Check the damper unit for leakage or other damage.
Check the upper joint bushing for wear or damage.
Replace the shock absorber assembly if necessary.



SHOCK ABSORBER DISPOSAL

Center punch the damper case to mark the drilling point.

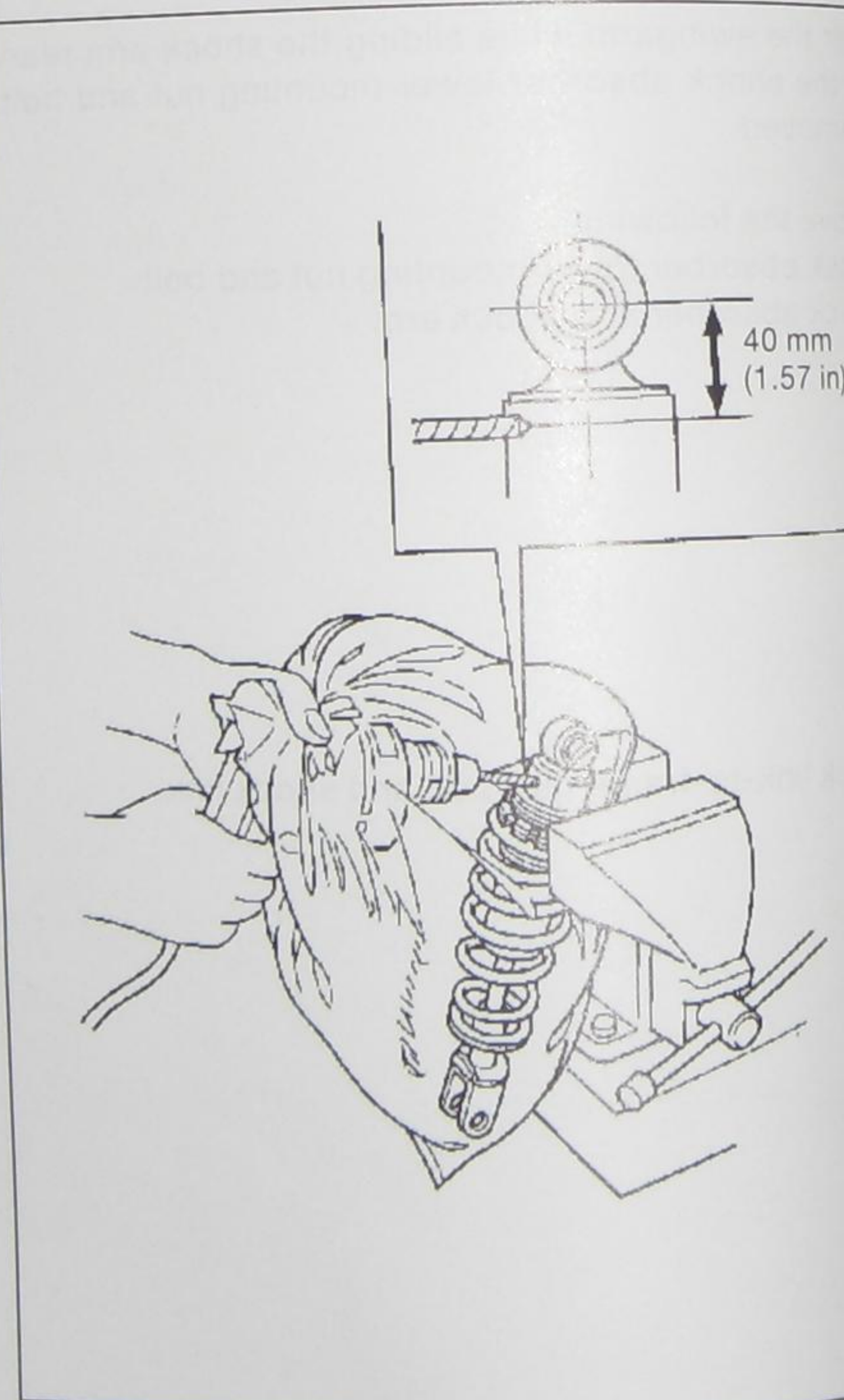
DRILLING POINT: 40 mm (1.57 in)
From upper mounting hole

Wrap the shock absorber inside a plastic bag.
Support the shock absorber upright in a vise as shown.
Through the open end of the bag, insert a drill motor with a sharp 2-3 mm (5/64-1/8 in) drill bit.

WARNING

- Do not use a dull bit which could cause a build-up of excessive heat and pressure inside the damper, leading to explosion and severe personal injury.
- The shock absorber contains nitrogen gas and oil under high pressure. Do not drill any further down the damper case than the measurement given above, or you may drill into the oil chamber; oil escaping under high pressure may cause serious personal injury.
- Always wear eye protection to avoid getting metal shavings in your eyes when the gas pressure is released. The plastic bag is only intended to shield you from the escaping gas.

Hold the bag around the drill motor and briefly run the drill motor inside the bag; this will inflate the bag with air from the motor and help keep the bag from getting caught in the bit when you start.



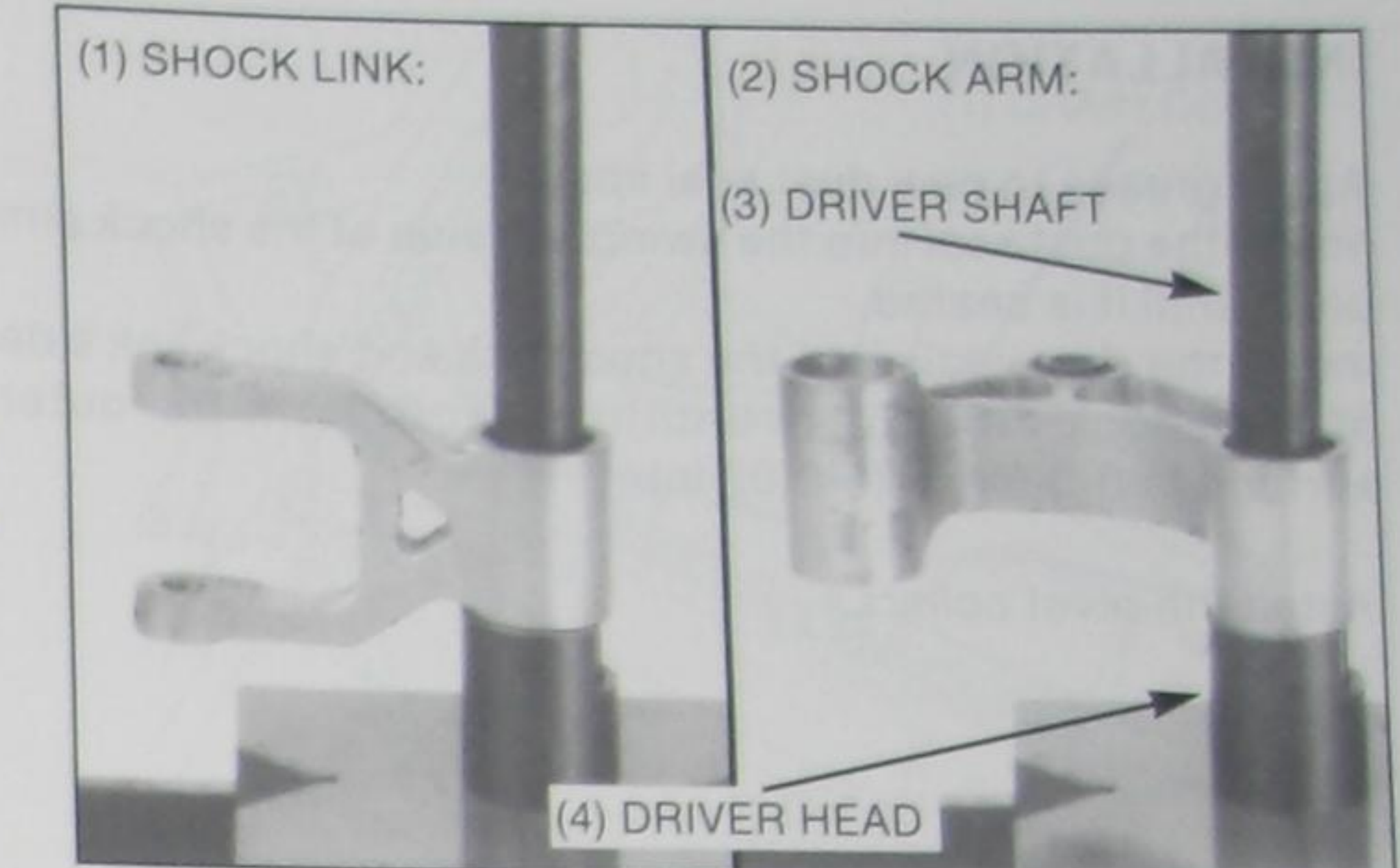
REAR WHEEL/BRAKE/SUSPENSION

SUSPENSION LINKAGE PIVOT BEARING REPLACEMENT

Press each needle bearing out of the shock link and shock arm pivots using the special tools.

TOOLS:
Driver shaft
Driver head

07946-MJ00100
07946-MJ00200



SHOCK LINK AND SHOCK ARM (Shock link side)

Apply grease to the needle rollers of new bearings.
Carefully press each needle bearing in the pivots until the depth from the outer surface is 6.2-6.8 mm (0.24-0.27 in), using the special tools.

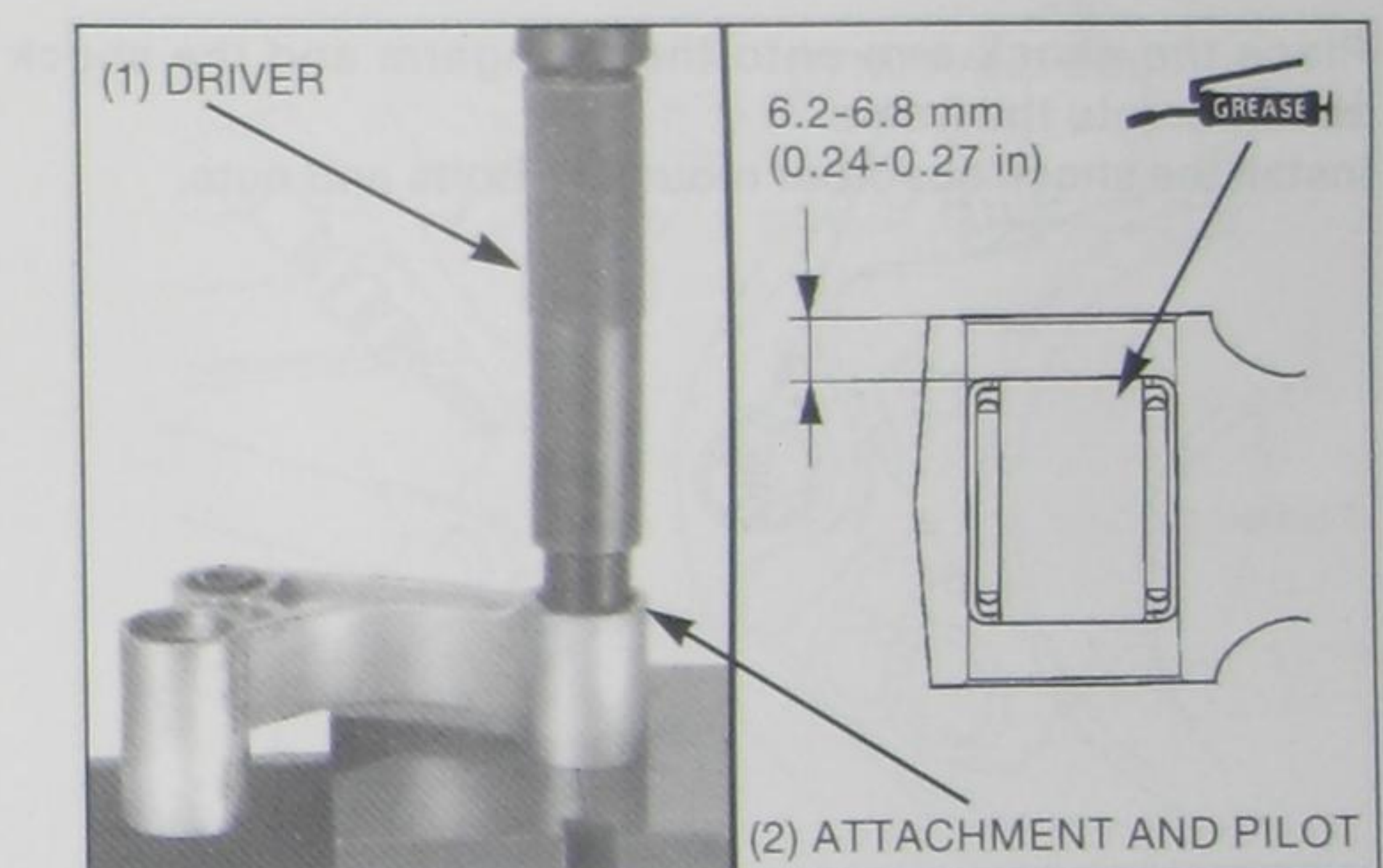
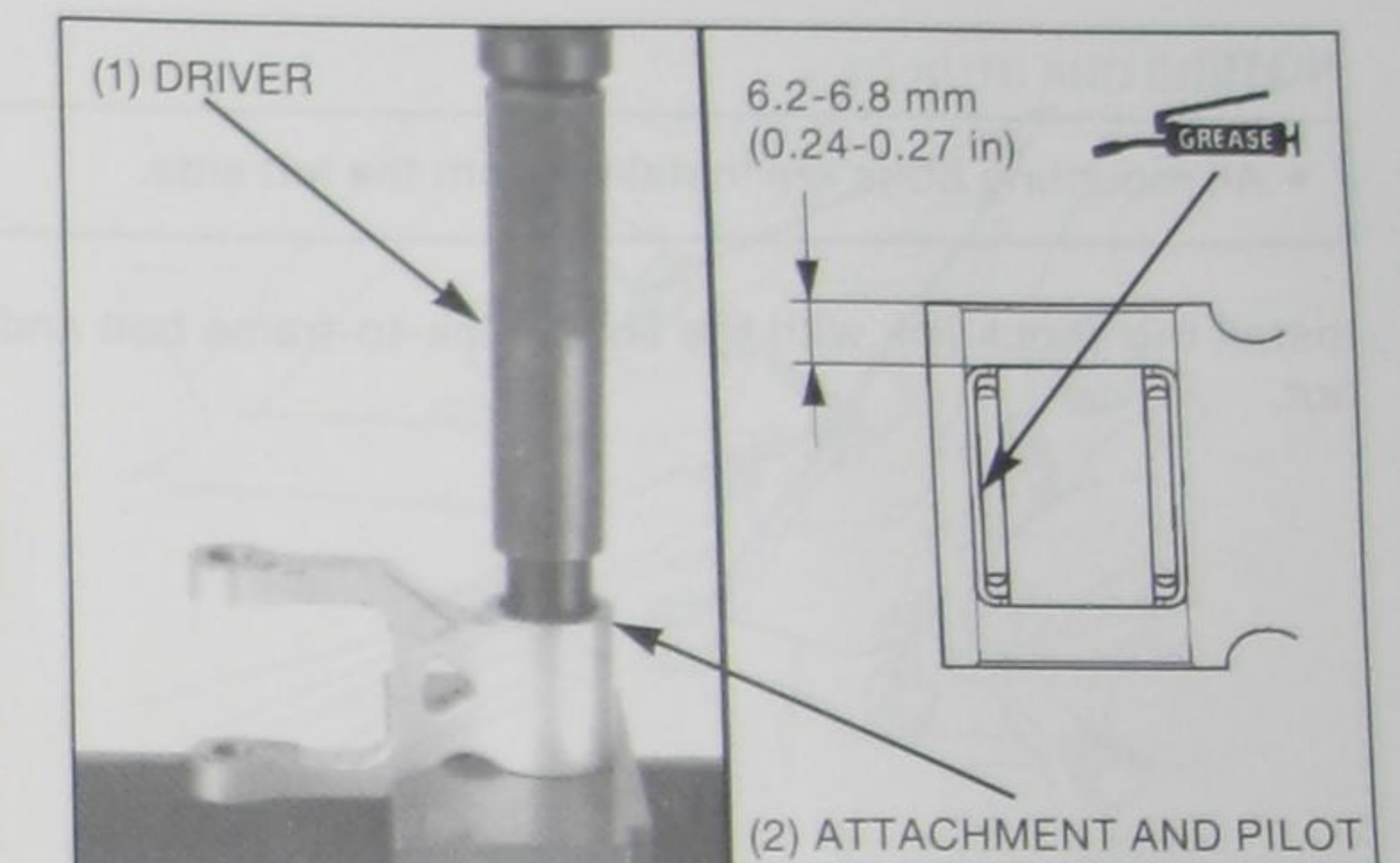
NOTE:

- Press in the bearing with the marking side facing up.

TOOLS:

Driver
Attachment, 22 x 24 mm
Pilot, 17 mm

07749-0010000
07746-0010800
07746-0040400



SHOCK ARM (Swingarm side)

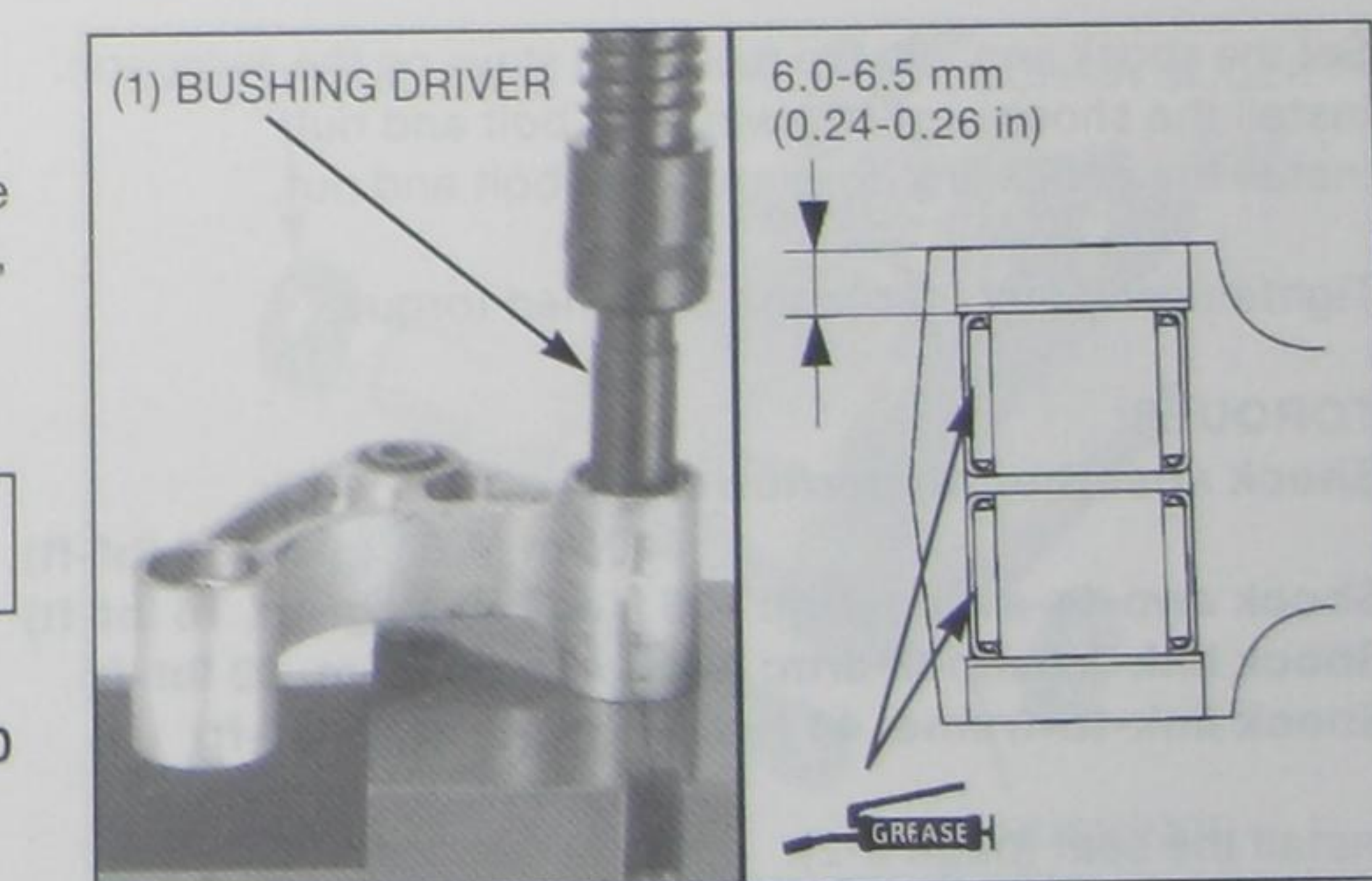
Apply grease to the needle rollers of a new bearing.
Carefully press each needle bearing in the pivot until the depth from the outer surface is 6.0-6.5 mm (0.24-0.26 in), using the special tool.

NOTE:

- Press in the bearing with the marking side facing up.

TOOL:
Bushing driver

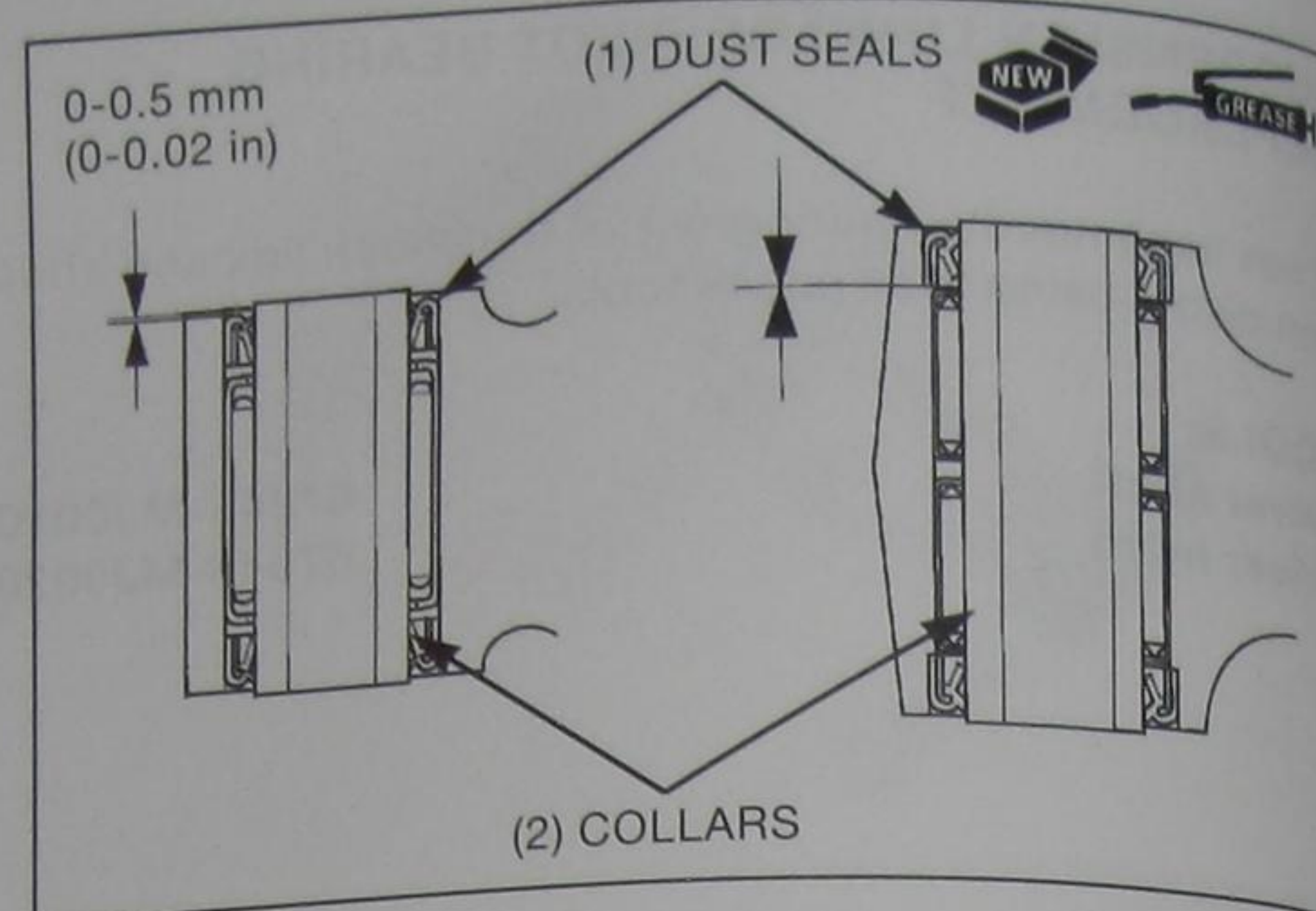
07HMF-MM90200



INSTALLATION

Apply grease to new dust seal lips.
Install the dust seal into the swingarm side of the shock arm pivot until it is seated.
Install the dust seals into the shock link and shock link side of the shock arm pivots until the depth from the outer surface is 0-0.5 mm (0-0.02 in).

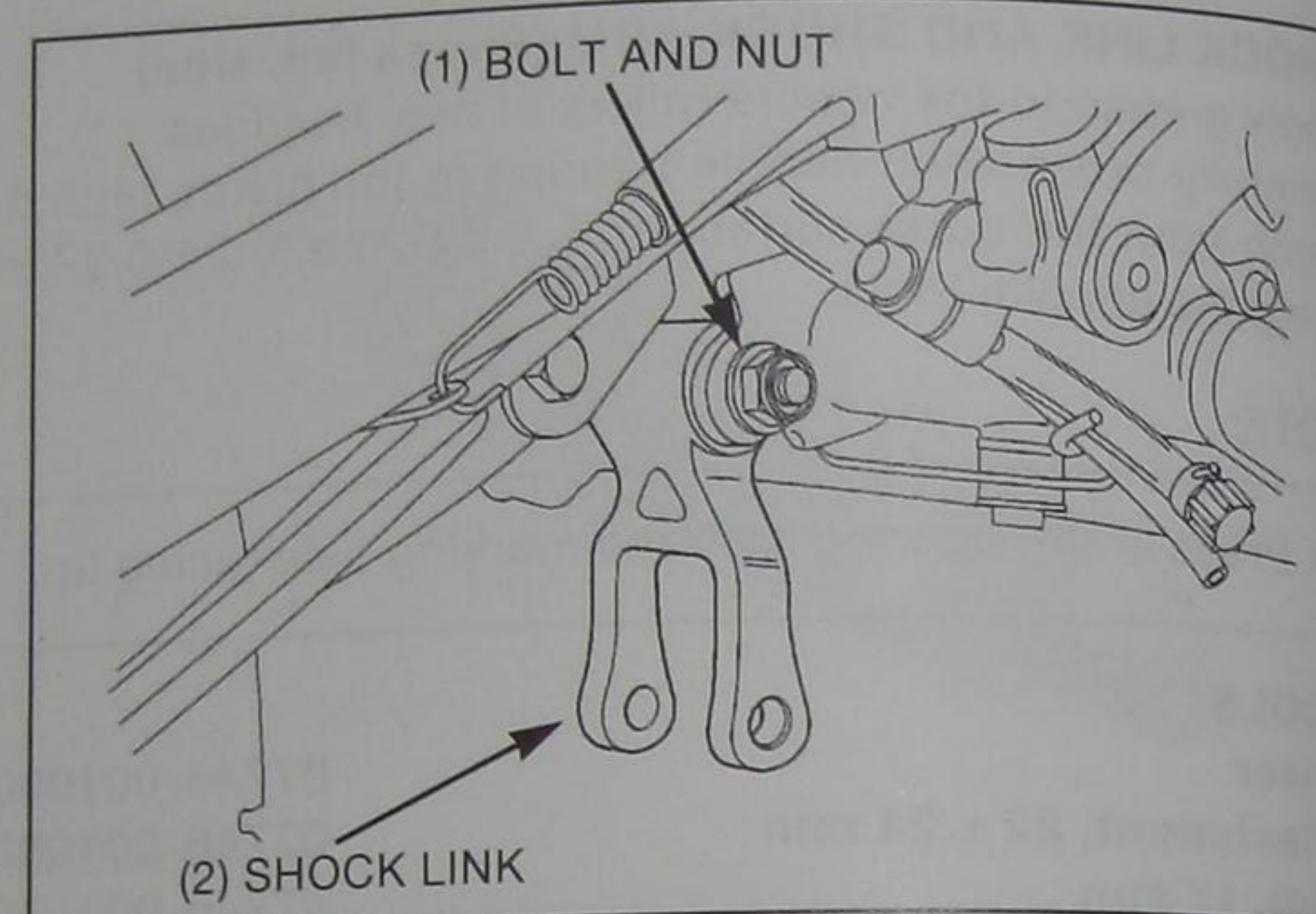
Install the pivot collars.



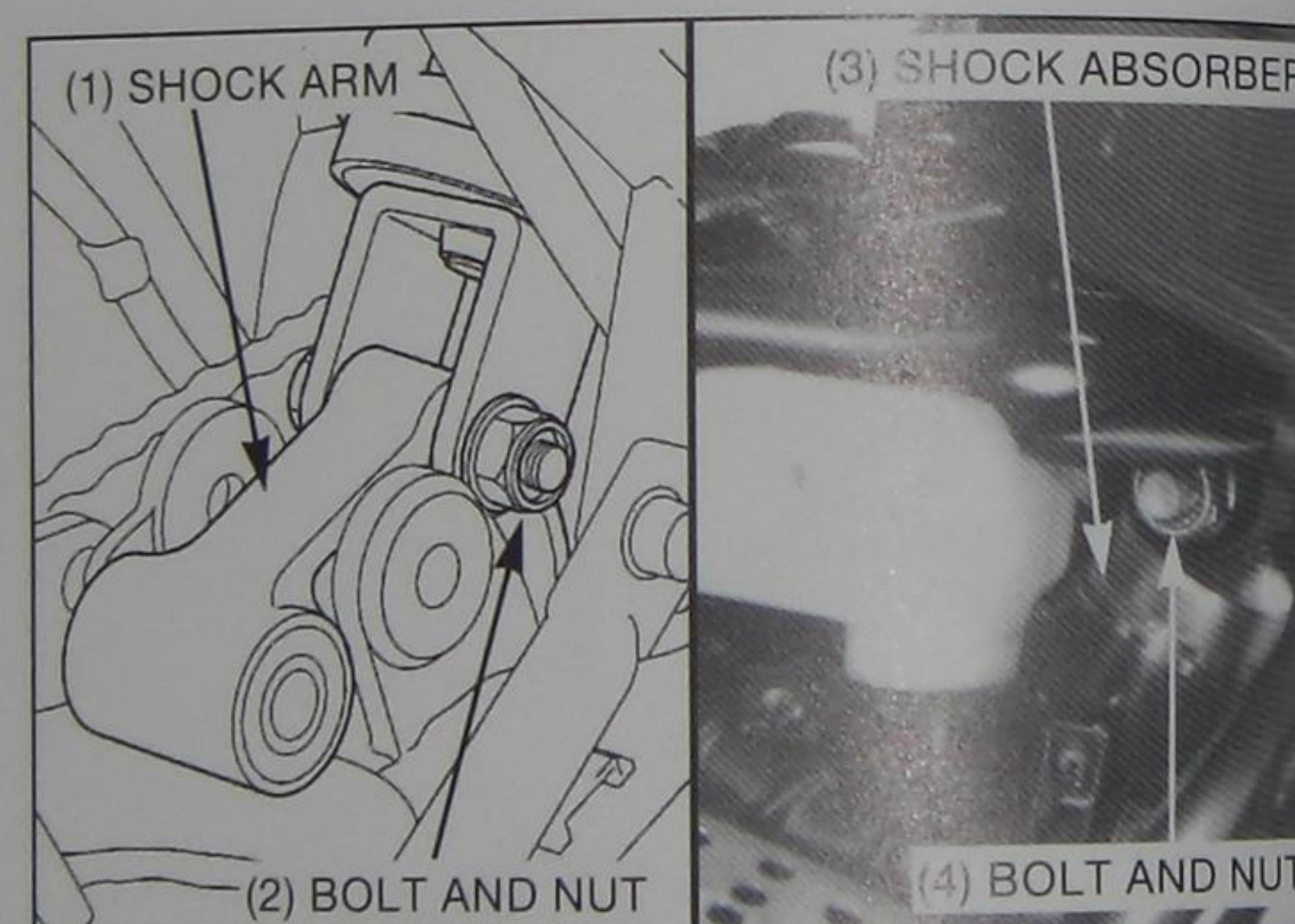
NOTE:

- All mounting bolts are installed from the left side.

Install the shock link with the shock link-to-frame bolt and nut.



Place the shock arm onto the swingarm and the shock absorber into the frame.
Install the shock absorber mounting bolts and nuts.



Set the shock arm into the mounting stays on the swingarm.
Install the shock arm-to-swingarm bolt and nut.
Install the shock link-to-shock arm bolt and nut.

Tighten each fastener to the specified torque.

TORQUES:

Shock absorber (upper/lower):

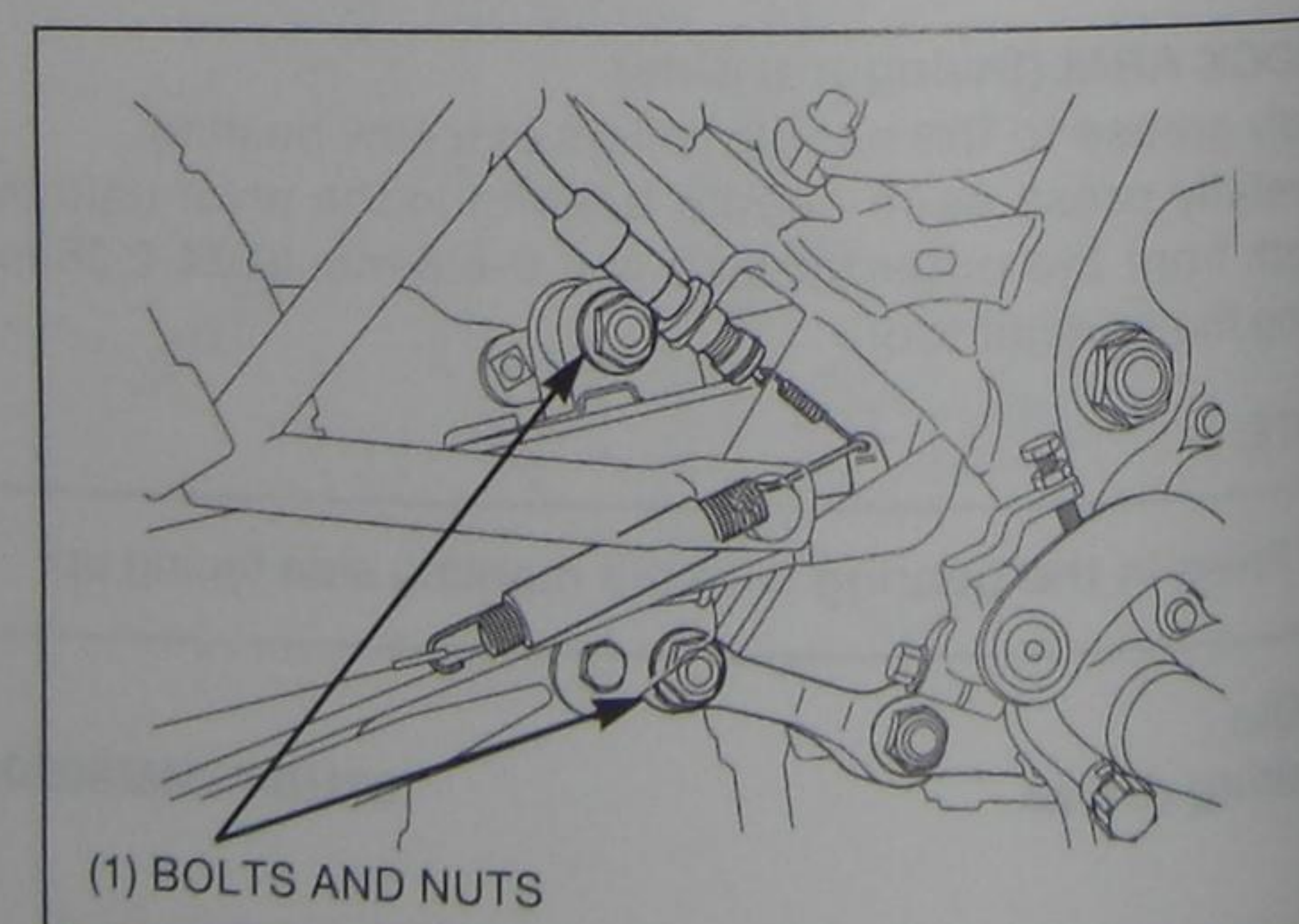
44 N·m (4.5 kgf-m, 33 lbf-ft)

Shock arm-to-swing arm: 103 N·m (10.5 kgf-m, 76 lbf-ft)

Shock link-to-shock arm: 44 N·m (4.5 kgf-m, 33 lbf-ft)

Shock link-to-frame: 44 N·m (4.5 kgf-m, 33 lbf-ft)

Install the seat (page 2-2).



Swingarm

REMOVAL

Remove the following:

- Rear wheel (page 13-3)
- Bolts and collars
- Drive chain cover

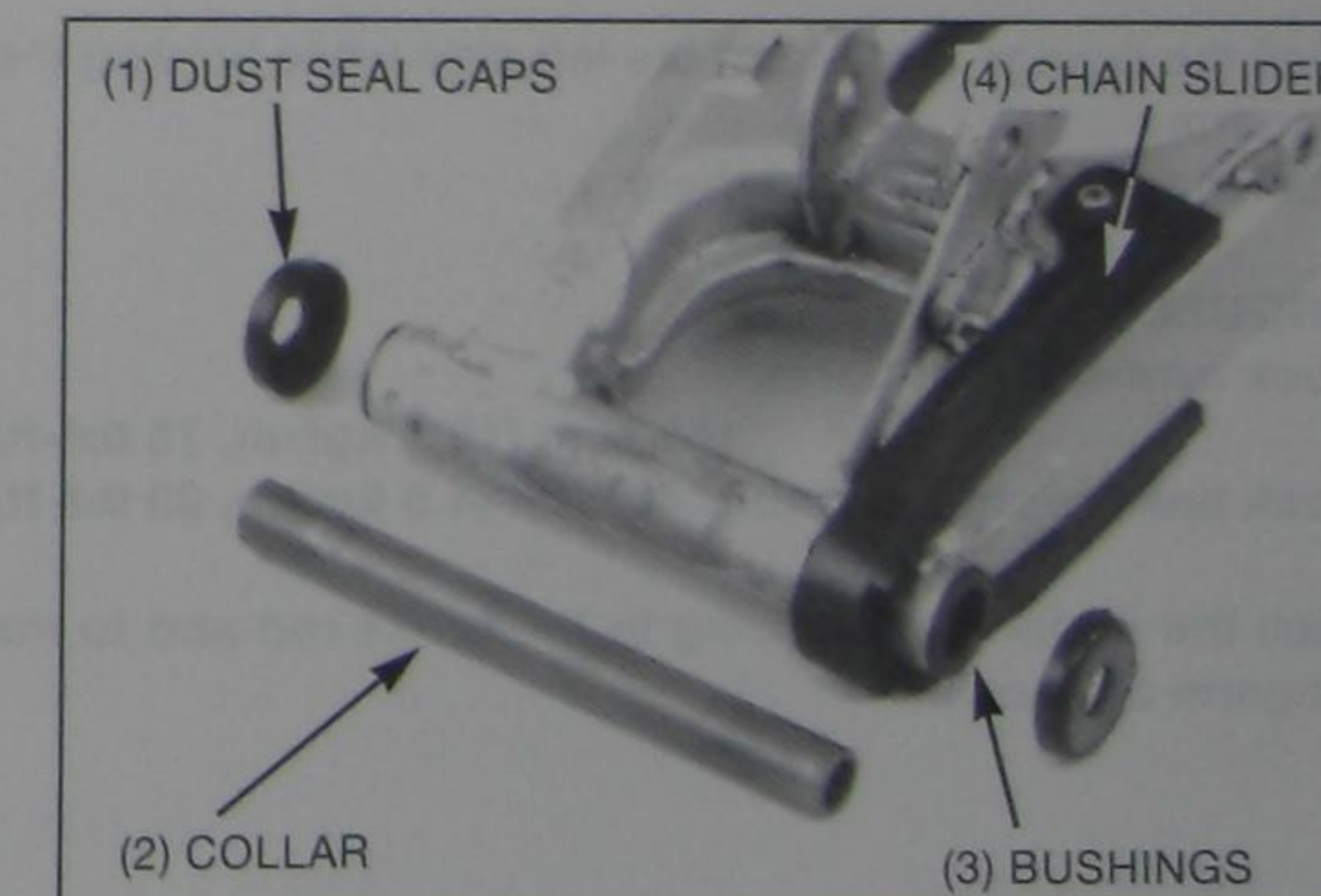
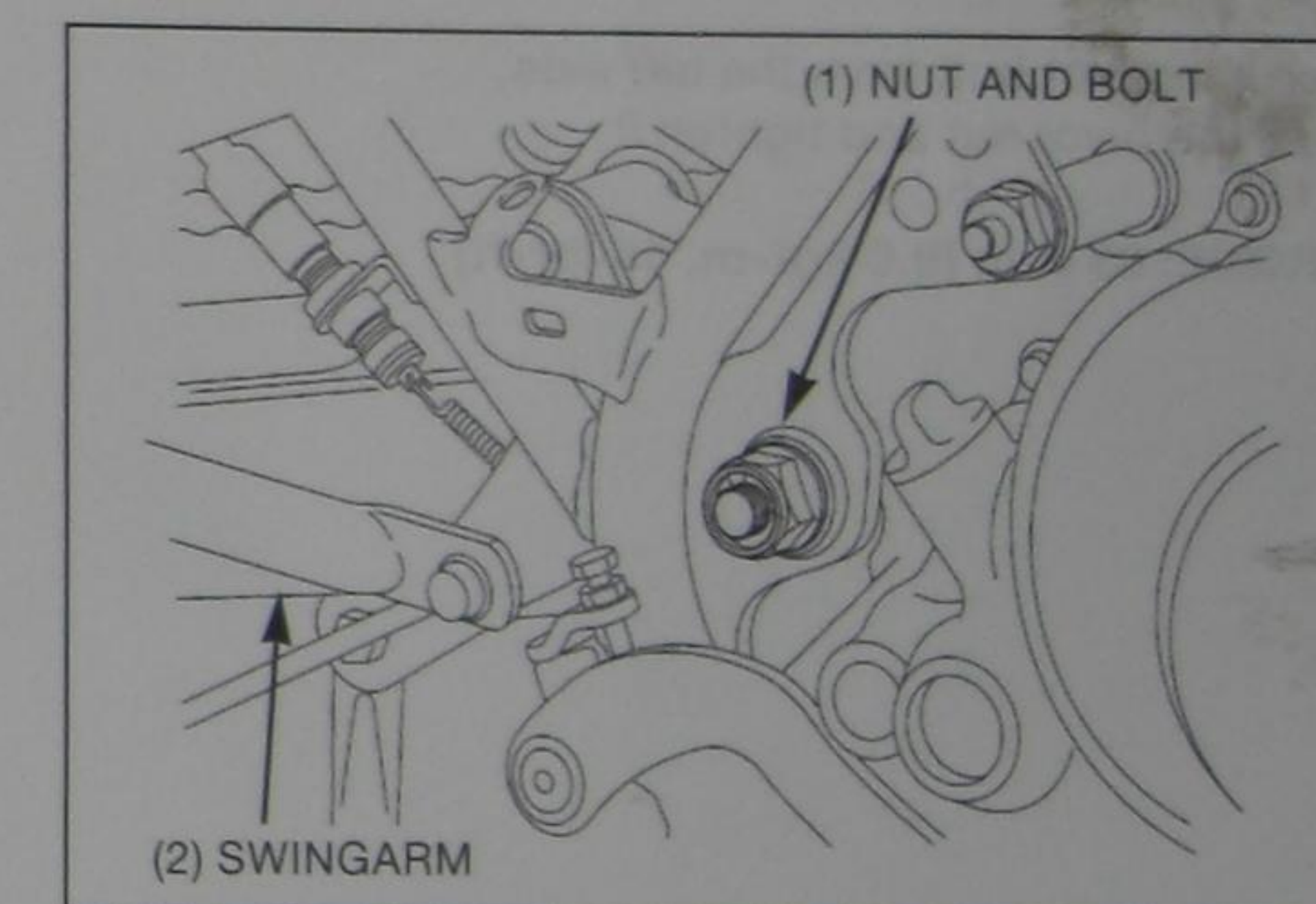
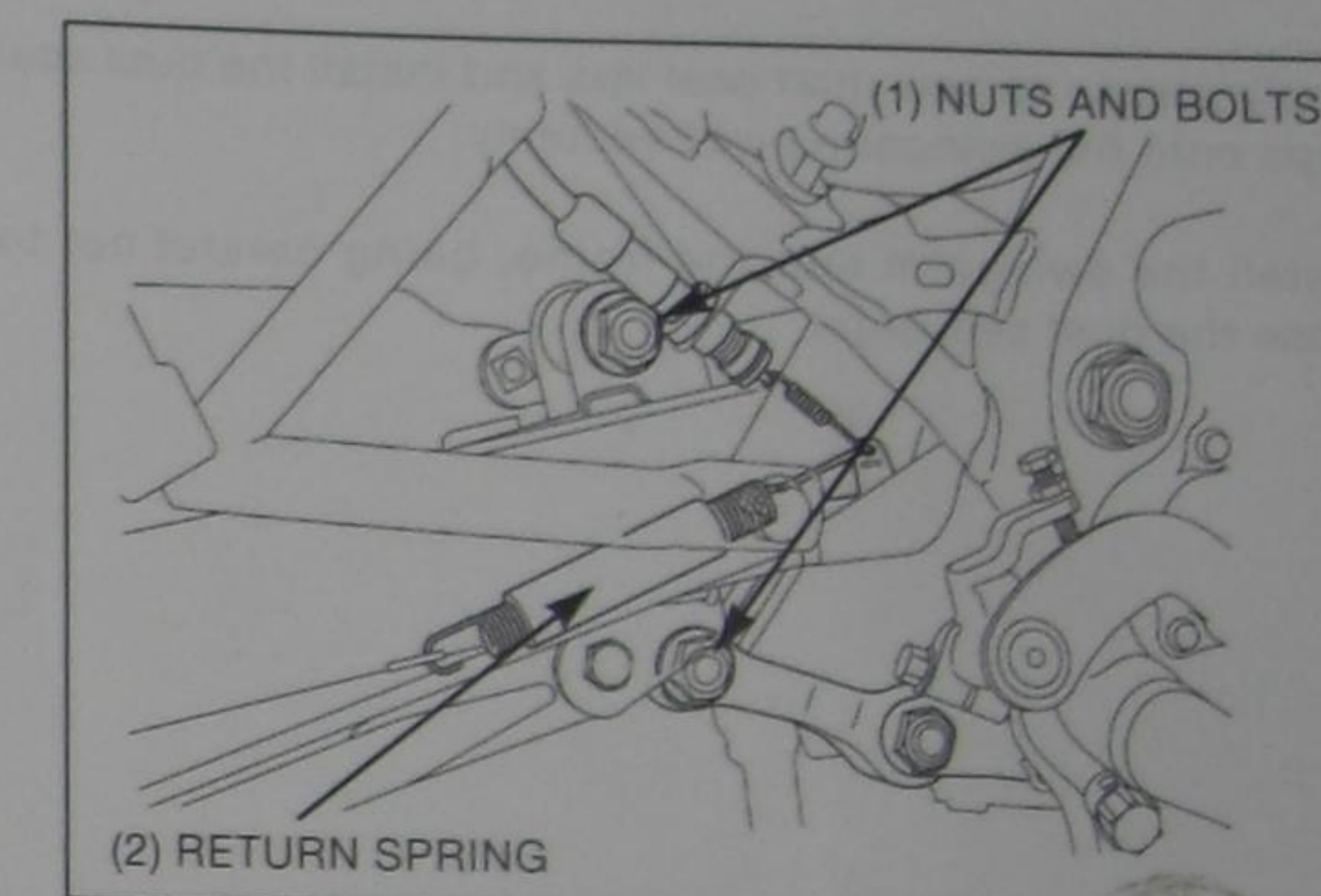
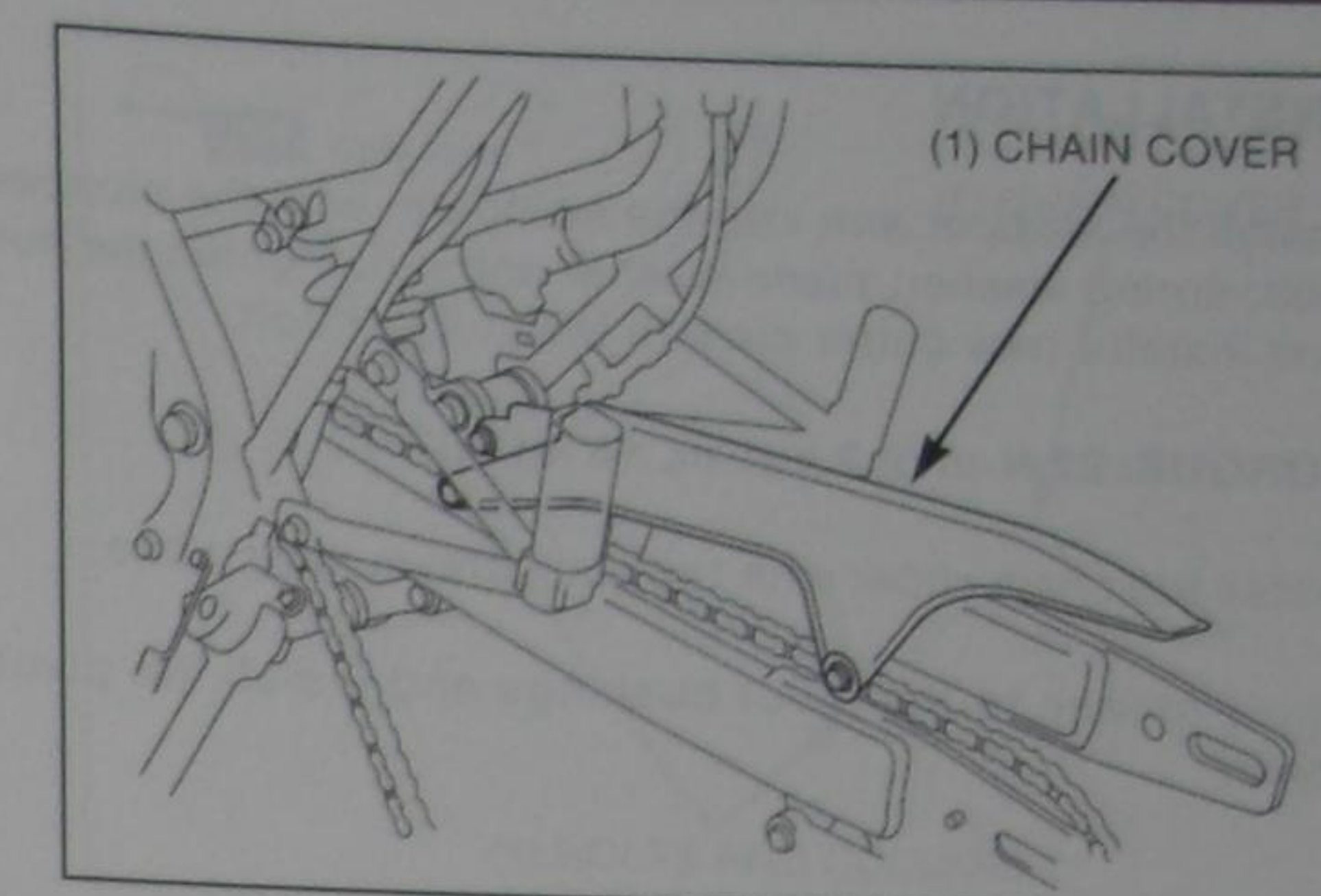
- Brake pedal return spring
- Shock arm-to-swingarm nut and bolt
- Shock link-to-shock arm nut and bolt

- Swingarm pivot nut and bolt
- Swingarm

- Dust seal caps
- Pivot collar
- Two screws, collars and drive chain slider
- Cotter pin, plane washer, spring washer, bolt and stopper arm.

INSPECTION

Check the swingarm for cracks or other damage.
Check the pivot bushings and collar for wear or damage.



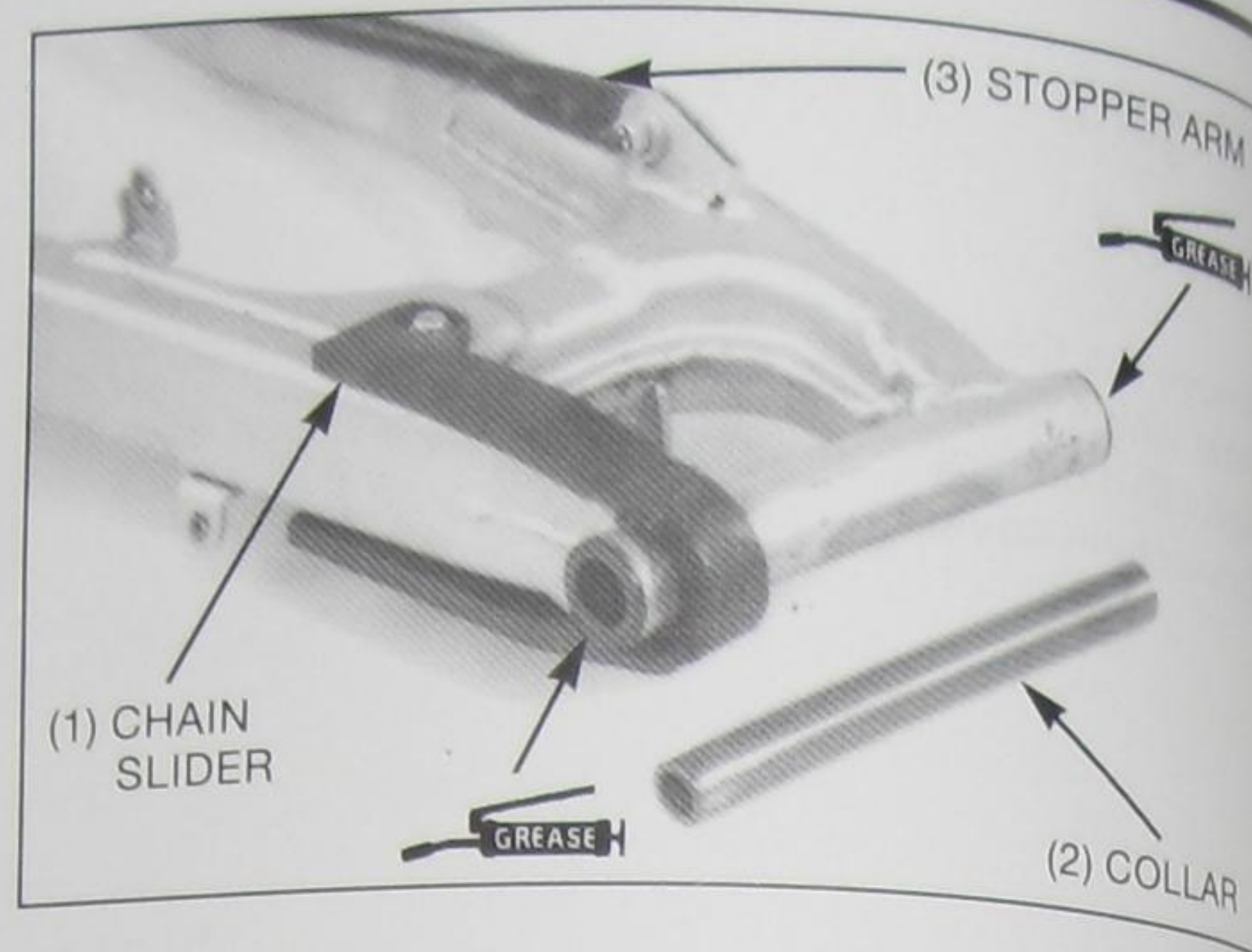
INSTALLATION

Install the stopper arm into the swingarm with the stopper bolt, spring washer, plane washer and nut. Tighten the nut and install a new cotter pin into the stopper bolt.

TORQUE: 22 N·m (2.2 kgf-m, 16 lbf-ft)

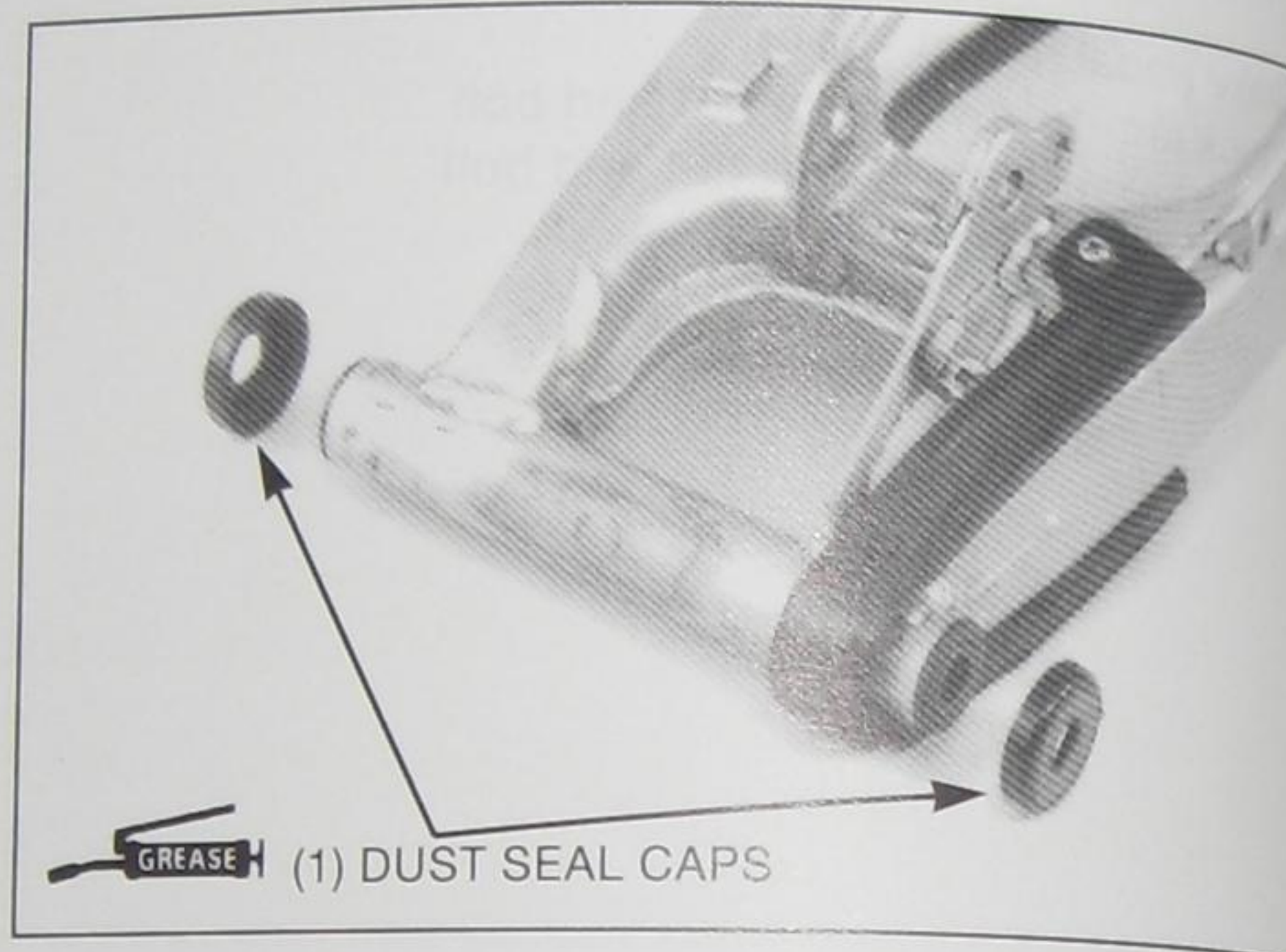
Install the chain slider with the two screws and collars.

Apply grease to the pivot bushings and install the pivot collar.



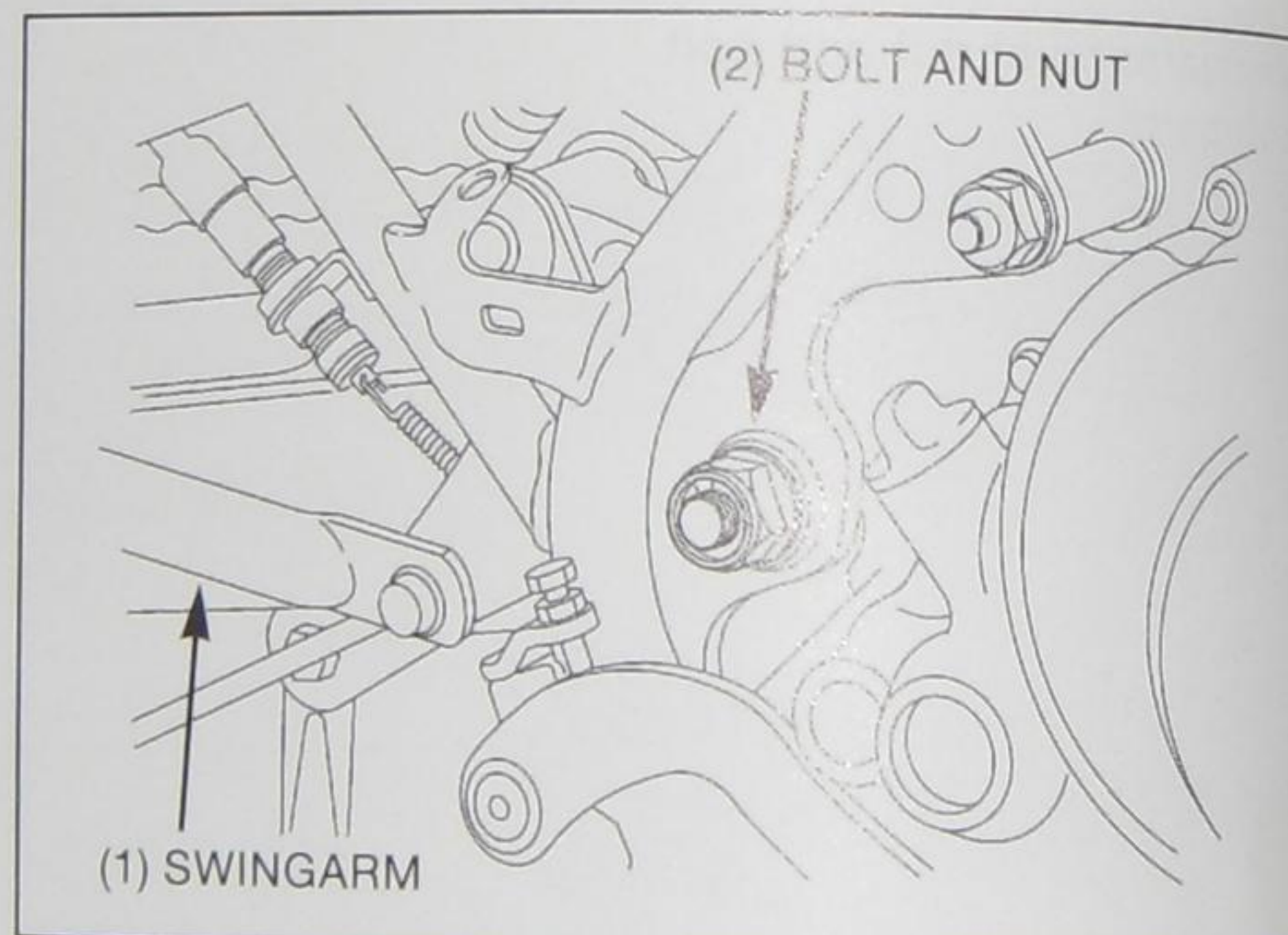
Apply grease to new dust seal lips and install the dust seal caps onto the swingarm pivot securely.

Install the swingarm into the frame, being careful not to lose the dust seal caps.



Insert the pivot bolt from the left side. Install the pivot nut and tighten it.

TORQUE: 88 N·m (9.0 kgf-m, 65 lbf-ft)



Install the linkage bolts from the left side while holding the swingarm. Install the nuts and tighten them.

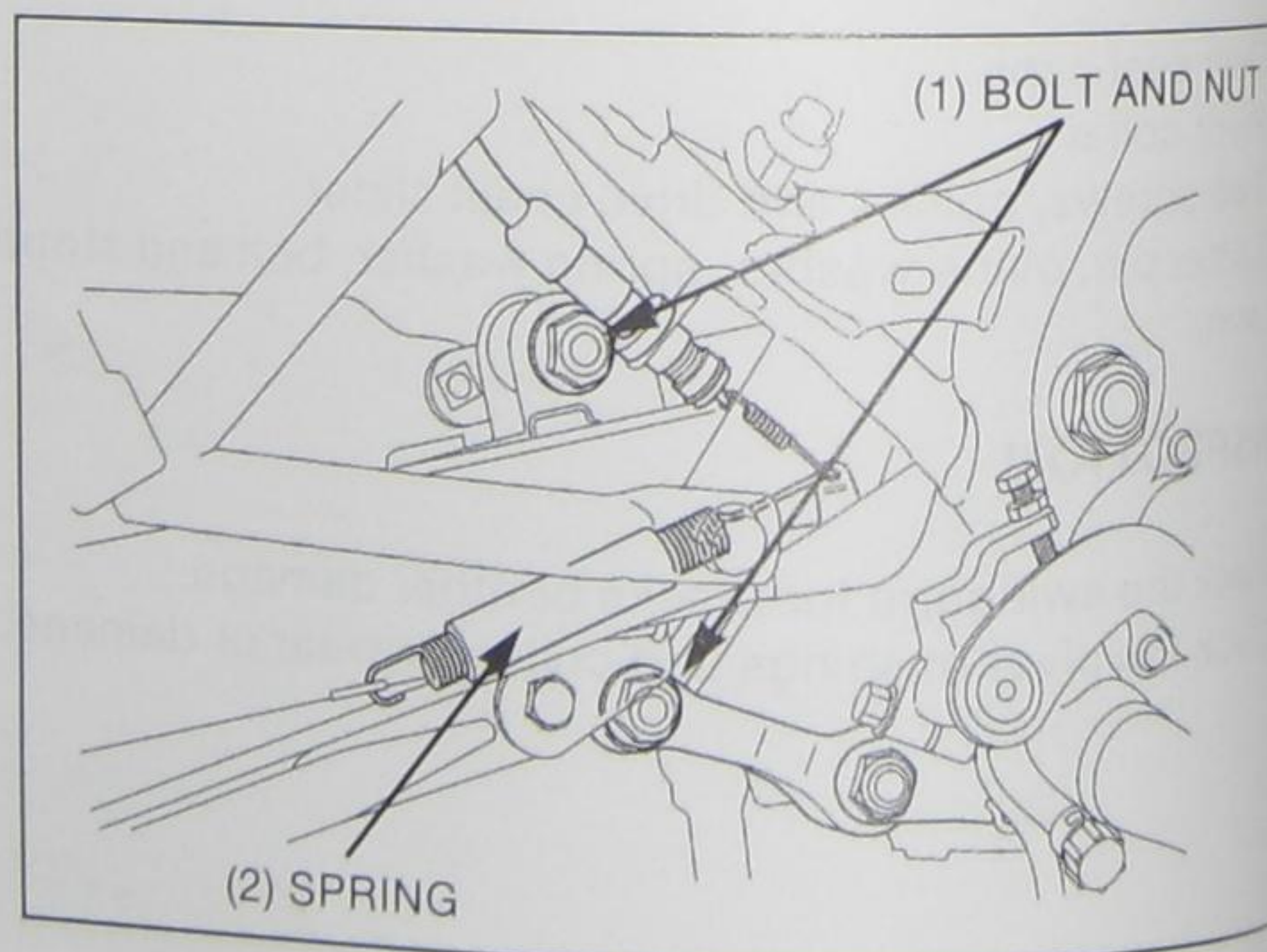
TORQUES:

Shock arm-to-swing arm:

103 N·m (10.5 kgf-m, 76 lbf-ft)

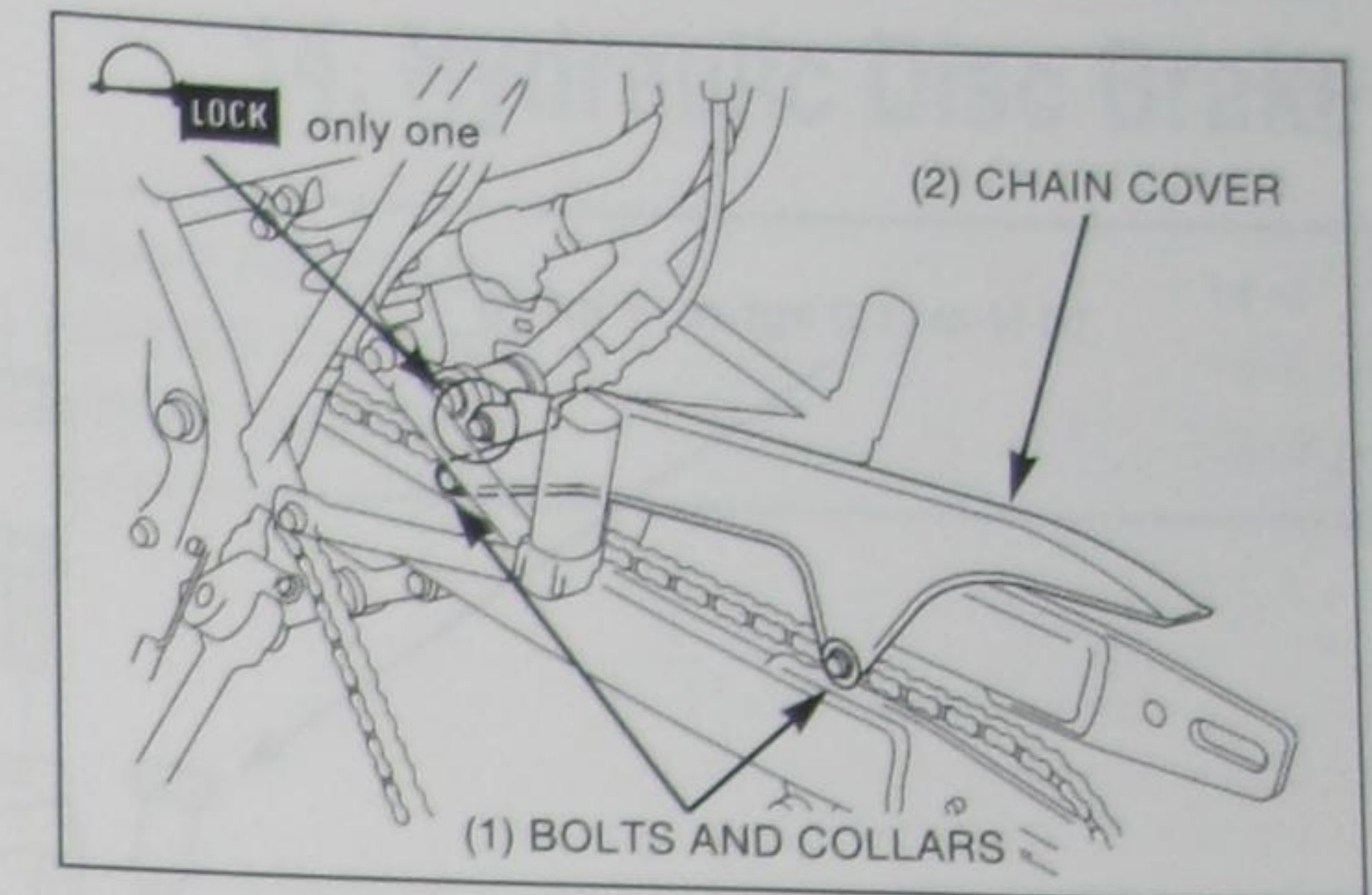
Shock link-to-shock arm: 44 N·m (4.5 kgf-m, 33 lbf-ft)

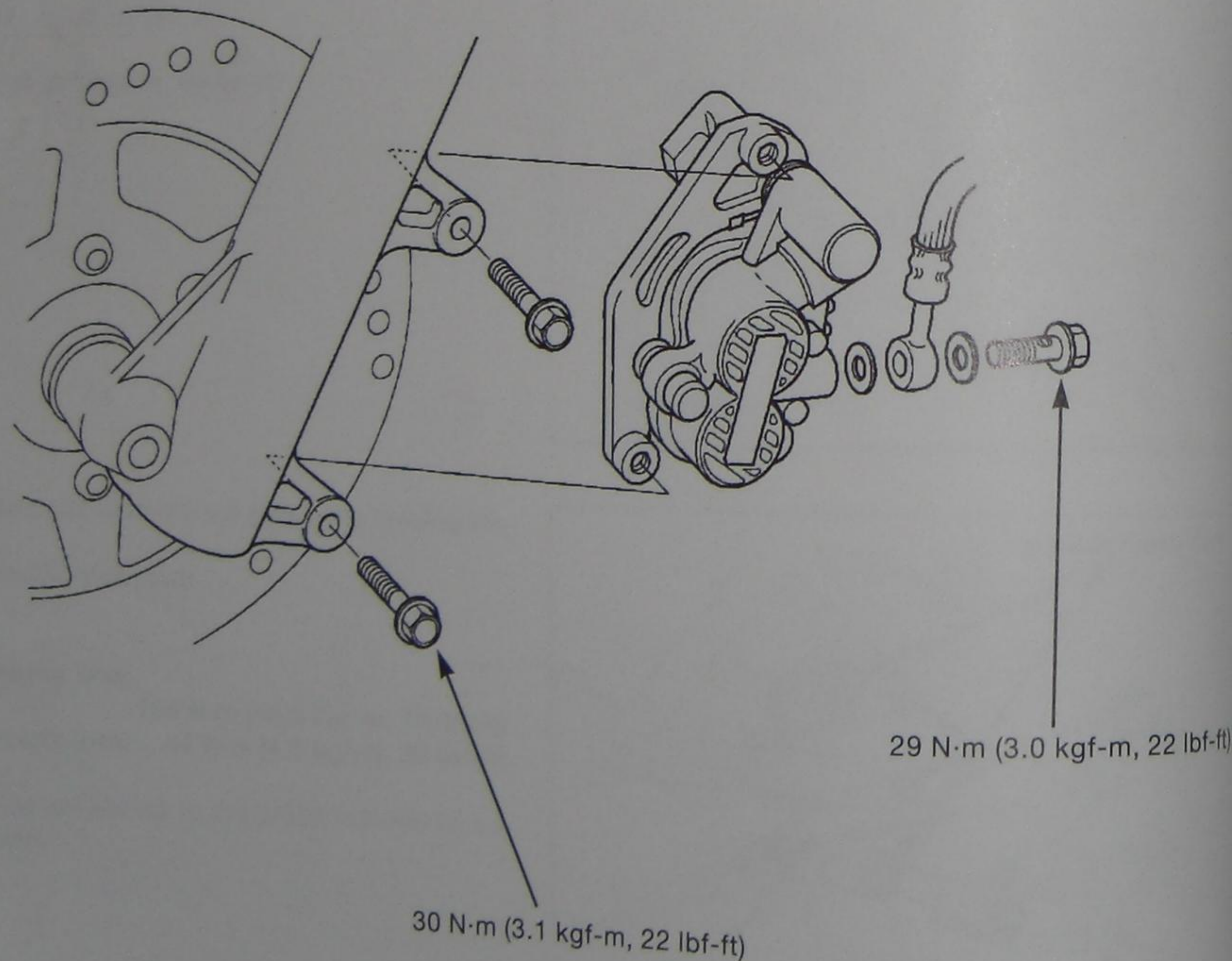
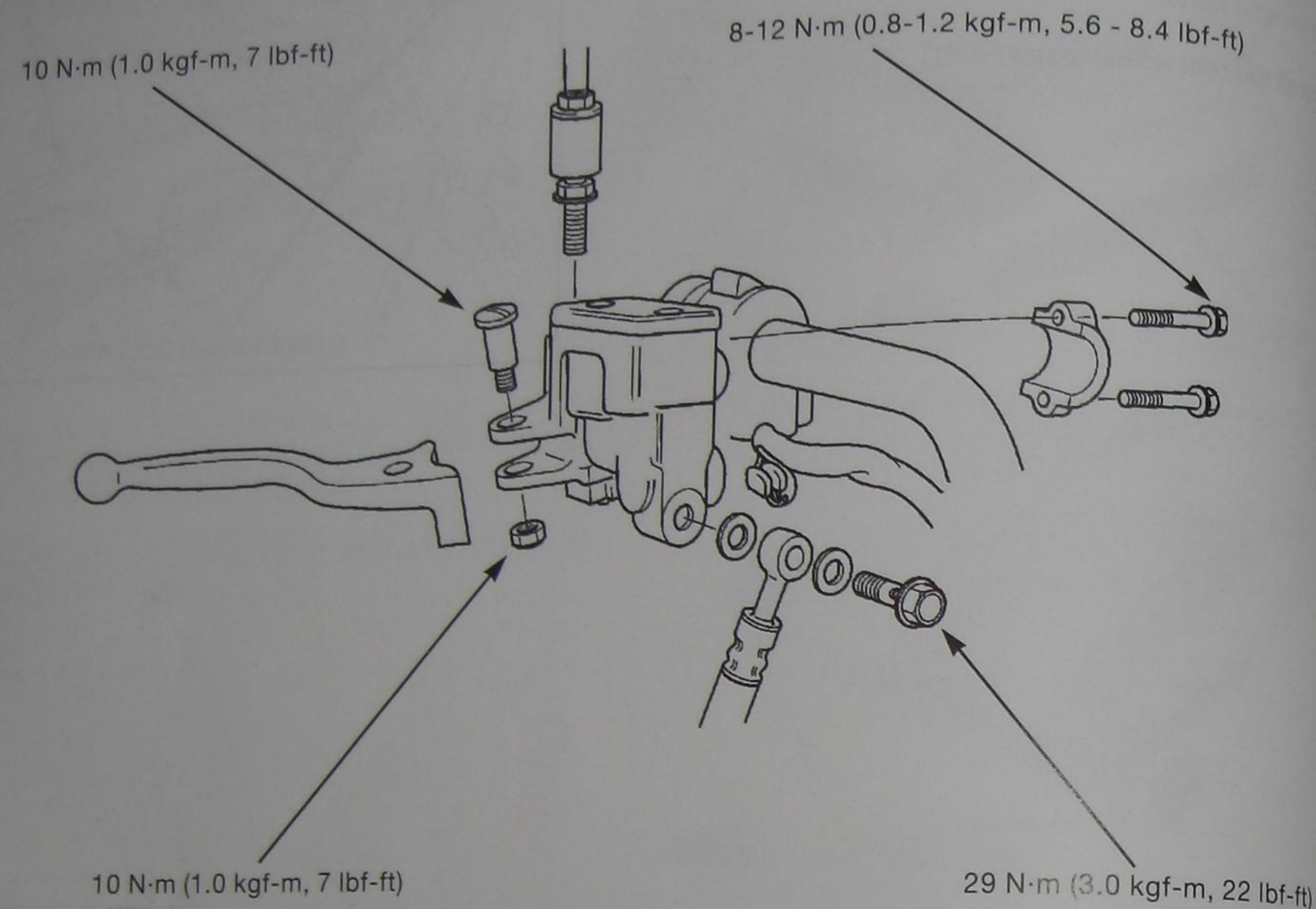
Install the pedal return spring to the brake rod and to the swingarm as shown.



Apply locking agent to the chain cover bolt threads as shown. Install the drive chain cover onto the swingarm with the collar and bolts.

Install the rear wheel (page 13-6).





14. Hydraulic Disc Brake

SERVICE INFORMATION	14-1	BRAKE PAD/DISC	14-4
TROUBLESHOOTING	14-2	MASTER CYLINDER	14-6
BRAKE FLUID REPLACEMENT/AIR BLEEDING	14-3	BRAKE CALIPER	14-9

Service Information

GENERAL

⚠ 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.

- Spilled brake fluid will severely damage the plastic parts and painted surfaces. It is also harmful to some rubber parts. Be careful whenever you remove the reservoir cap; make sure the reservoir is horizontal first.
- Never allow contaminants (dirt, water, etc.) to get into an open reservoir.
- Once the hydraulic system has been opened, or if the brake feels spongy, the system must be bled.
- Always use fresh DOT 4 brake fluid from a sealed container when servicing the system. Do not mix different types of fluid as they may not be compatible.
- Always check brake operation before riding the motorcycle.

SPECIFICATIONS

Unit: mm (in)

Item	Standard	Service Limit
Specified brake fluid	DOT 4	—
Brake disc thickness	3.8-4.2 (0.15-0.17)	3.5 (0.14)
Brake disc runout	—	0.30 (0.012)
Master cylinder I.D.	12.700-12.743 (0.5000-0.5017)	12.75 (0.502)
Master cylinder piston O.D.	12.657-12.684 (0.4983-0.4994)	12.65 (0.498)
Caliper cylinder I.D.	25.020-25.050 (0.9851-0.9862)	25.06 (0.987)
Caliper piston O.D.	24.960-24.980 (0.9827-0.9835)	24.95 (0.982)

TORQUE VALUES

Brake caliper bleed valve	6 N·m (0.6 kgf-m, 4.3 lbf-ft)
Master cylinder reservoir cap screw	2 N·m (0.2 kgf-m, 1.4 lbf-ft)
Brake caliper mounting bolt	30 N·m (3.1 kgf-m, 22 lbf-ft) ALOC bolt: replace with a new one
Pad pin retainer plate bolt	10 N·m (1.0 kgf-m, 7 lbf-ft)
Brake hose oil bolt	29 N·m (3.0 kgf-m, 22 lbf-ft)
Front brake lever pivot nut	10 N·m (1.0 kgf-m, 7 lbf-ft)
bolt	10 N·m (1.0 kgf-m, 7 lbf-ft)
Front brake light switch screw	1 N·m (0.1 kgf-m, 0.7 lbf-ft)
Brake caliper pin bolt	23 N·m (2.3 kgf-m, 17 lbf-ft) Apply locking agent to the threads
Brake caliper pin bolt nut	23 N·m (2.3 kgf-m, 17 lbf-ft) Apply locking agent to the threads
Brake caliper assembly bolt	54 N·m (5.5 kgf-m, 40 lbf-ft)
Master cylinder holder bolt	8-12 N·m (0.8 - 1.2 kgf-m, 5.6 - 8.4 lbf-ft)

TOOL

Snap ring pliers	07914-SA50001
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Troubleshooting

Brake lever soft or spongy

- Air in hydraulic system
- Leaking hydraulic system
- Contaminated brake pad/disc
- Worn caliper piston seals
- Worn master cylinder piston cups
- Worn brake pad/disc
- Contaminated caliper
- Contaminated master cylinder
- Caliper not sliding properly
- Low brake fluid level
- Clogged fluid passage
- Warped/deformed brake disc
- Sticking/worn caliper piston
- Sticking/worn master piston
- Bent brake lever

Brake lever hard

- Clogged/restricted hydraulic system
- Sticking/worn caliper piston
- Sticking/worn master piston
- Caliper not sliding properly
- Bent brake lever

Brake drag

- Contaminated brake pad/disc
- Misaligned wheel
- Badly worn brake pad/disc
- Warped/deformed brake disc
- Caliper not sliding properly
- Clogged/restricted fluid passage
- Sticking caliper piston

Brake Fluid Replacement/Air Bleeding

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.

CAUTION

- Do not allow foreign material to enter the system when filling the reservoir.
- Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.
- Use only DOT 4 brake fluid from a sealed container.
- Do not mix different types of fluid. They are not compatible.

BRAKE FLUID DRAINING

Turn the handlebar so that the reservoir is level and remove the two screws, reservoir cap, set plate and diaphragm.

Connect the bleed hose to the bleed valve. Loosen the bleed valve and pump the brake lever until no more fluid flows out of the bleed valve.

BRAKE FLUID FILLING/BLEEDING

Close the bleed valve.

Fill the reservoir with DOT 4 brake fluid from a sealed container.

Connect a commercially available brake bleeder to the bleed valve.

Pump the brake bleeder and loosen the bleed valve.

Add brake fluid when the fluid level in the reservoir is low.

NOTE:

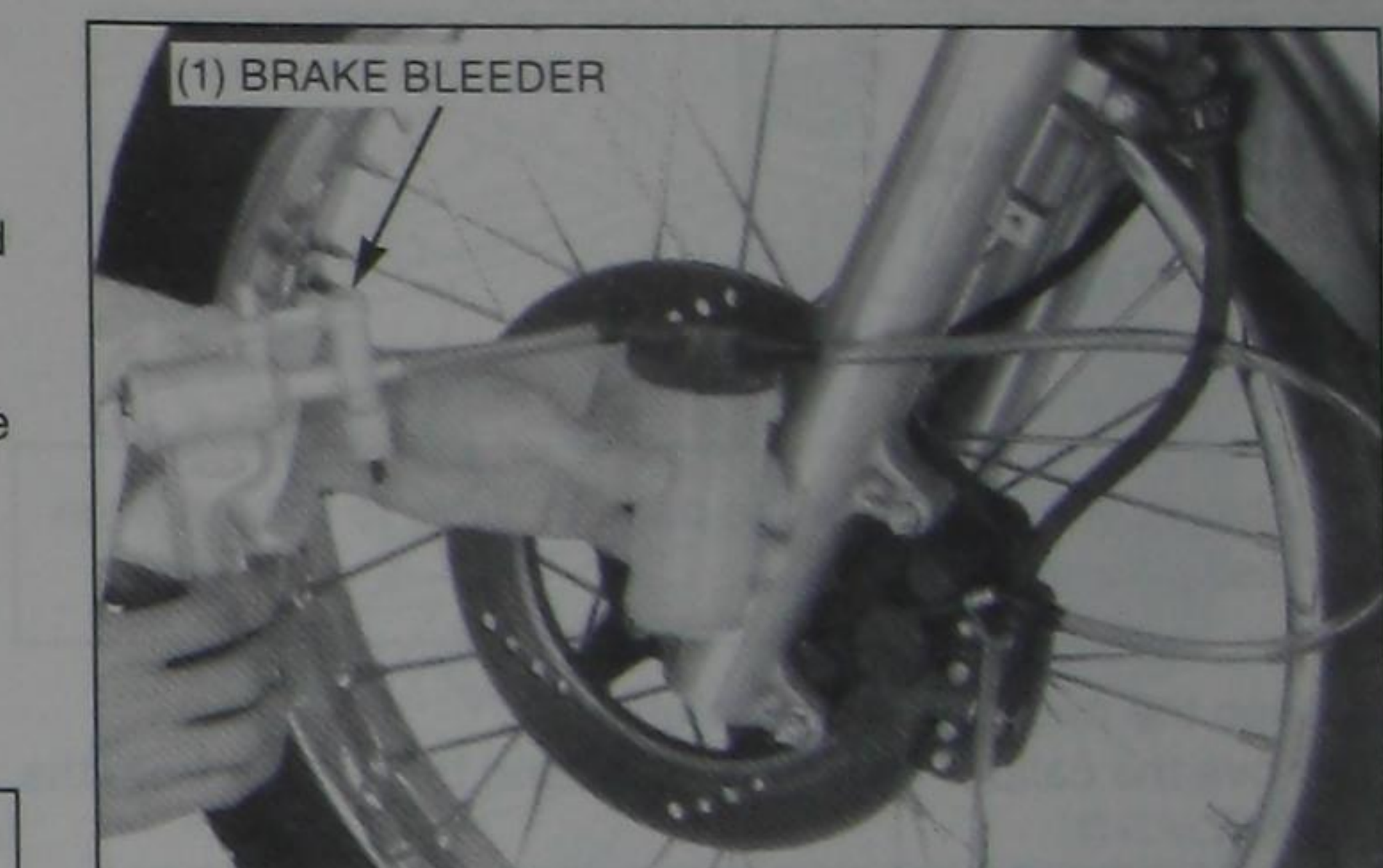
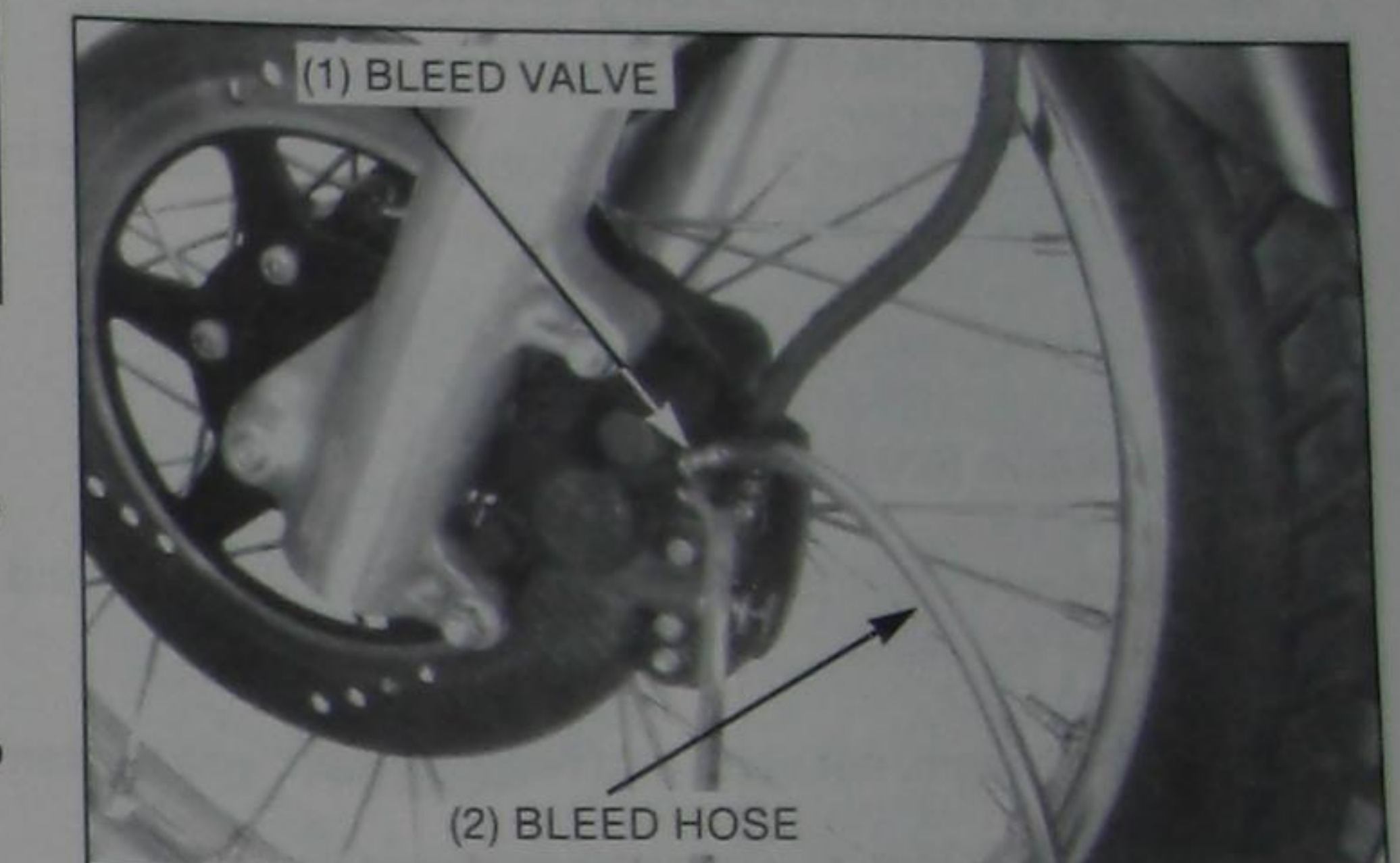
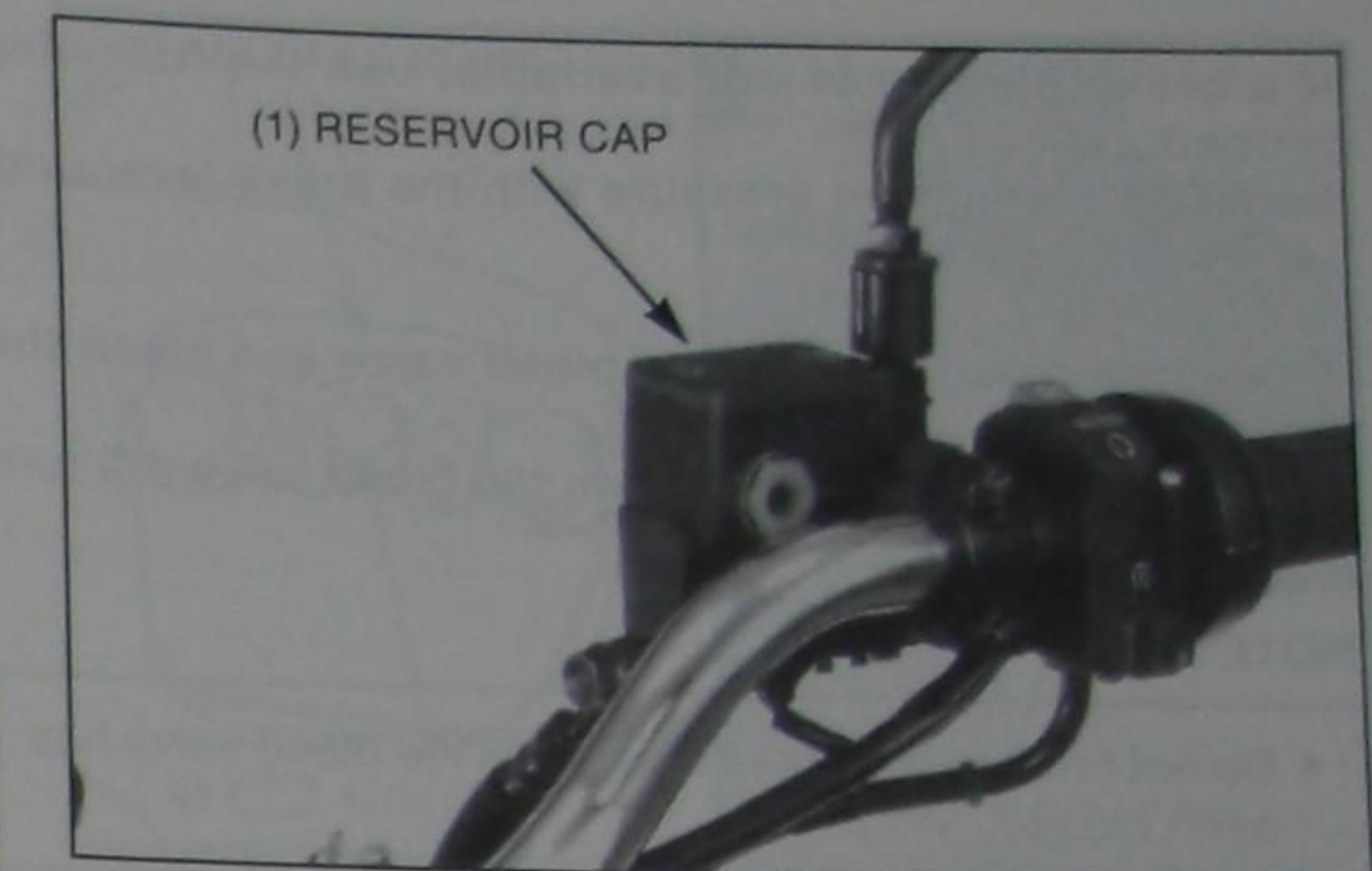
- Check the fluid level often while bleeding the brake to prevent air from being pumped into the system.
- When using a brake bleeding tool, follow the manufacturer's operating instruction.

Repeat the above procedures until air bubbles do not appear in the plastic hose.

NOTE:

- If air is entering the bleeder from around the bleed valve threads, seal the threads with teflon tape.

Close the bleed valve and operate the brake lever. If it still feels spongy, bleed the system again.



HYDRAULIC DISC BRAKE

If a brake bleeder is not available, use the following procedure:
Pump up the system pressure with the brake lever until lever resistance is felt.

Connect a bleed hose to the bleed valve and bleed the system as follows:

1. Squeeze the brake lever, open the bleed valve 1/2 turn and then close it.

NOTE:

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

2. Release the brake lever slowly and wait several seconds after it reaches the end of its travel.

Repeat the steps 1 and 2 until air bubbles do not appear in the bleed hose.

Tighten the bleed valve.

TORQUE: 6 N·m (0.6 kgf-m, 4.3 lbf-ft)

Fill the reservoir to the casting ledge with DOT 4 brake fluid from a sealed container.

Install the diaphragm, set plate and reservoir cap, and tighten the two screws.

TORQUE: 2 N·m (0.2 kgf-m, 1.4 lbf-ft)

Brake Pad/Disc

BRAKE PAD REPLACEMENT

NOTE:

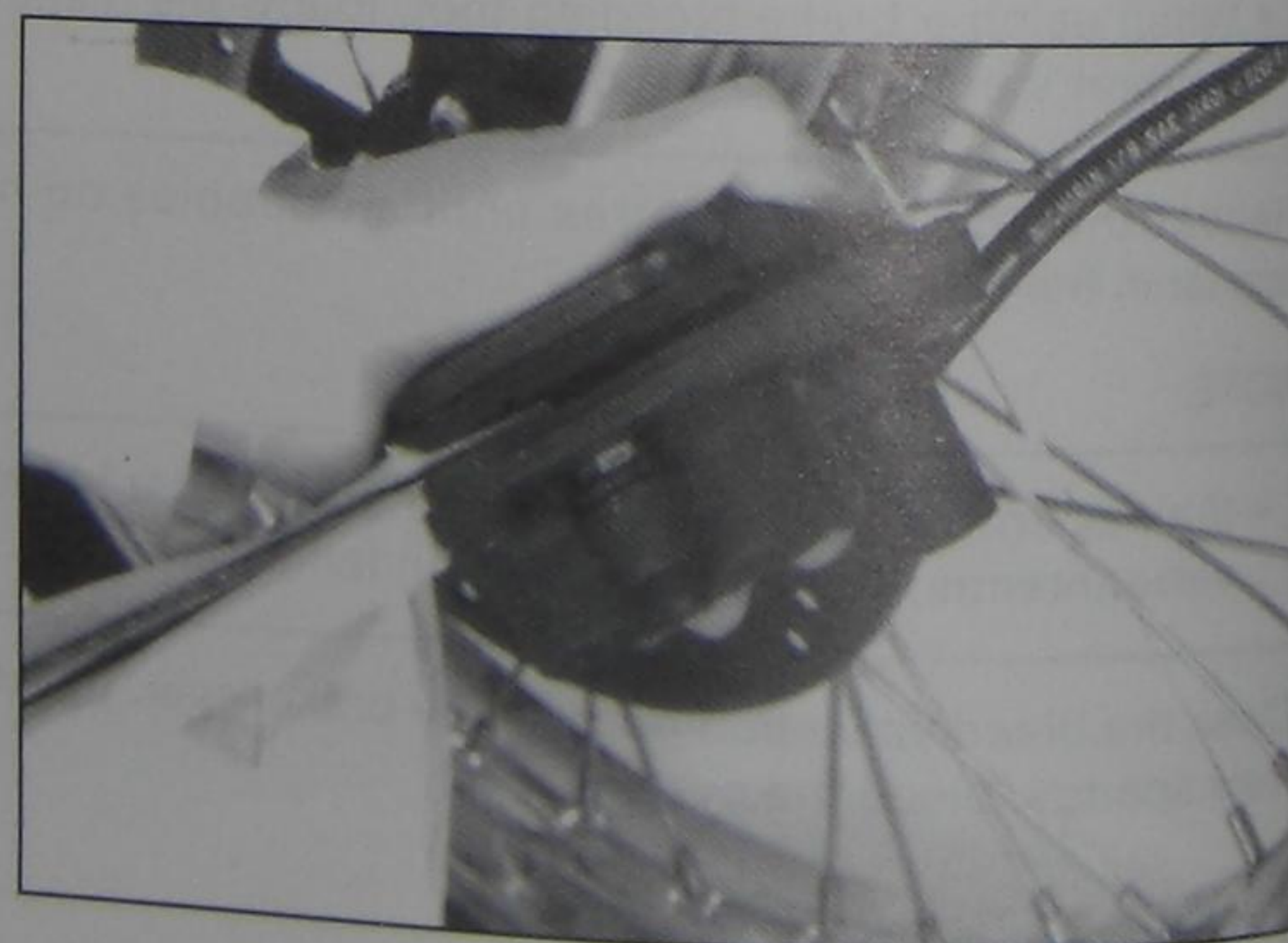
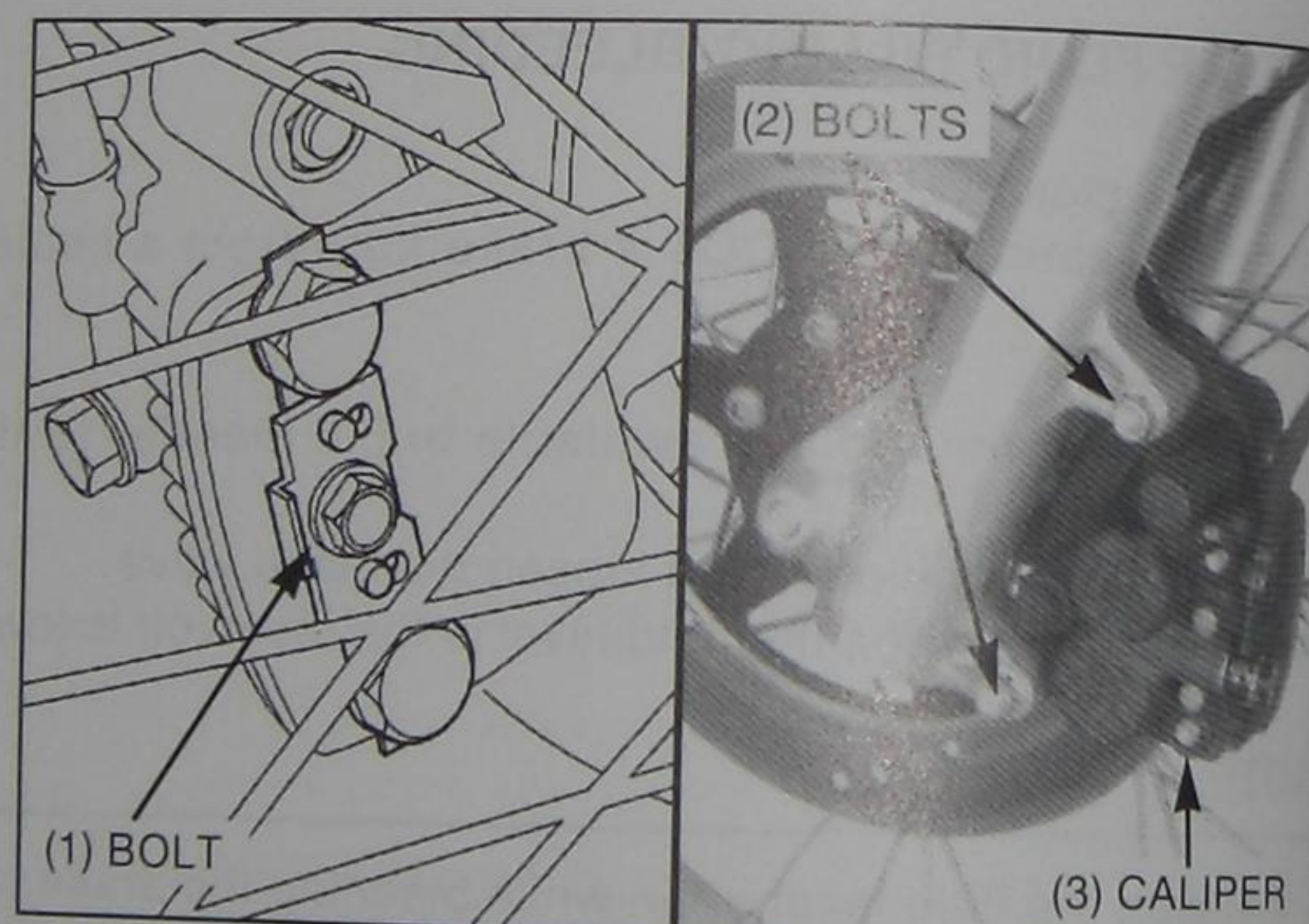
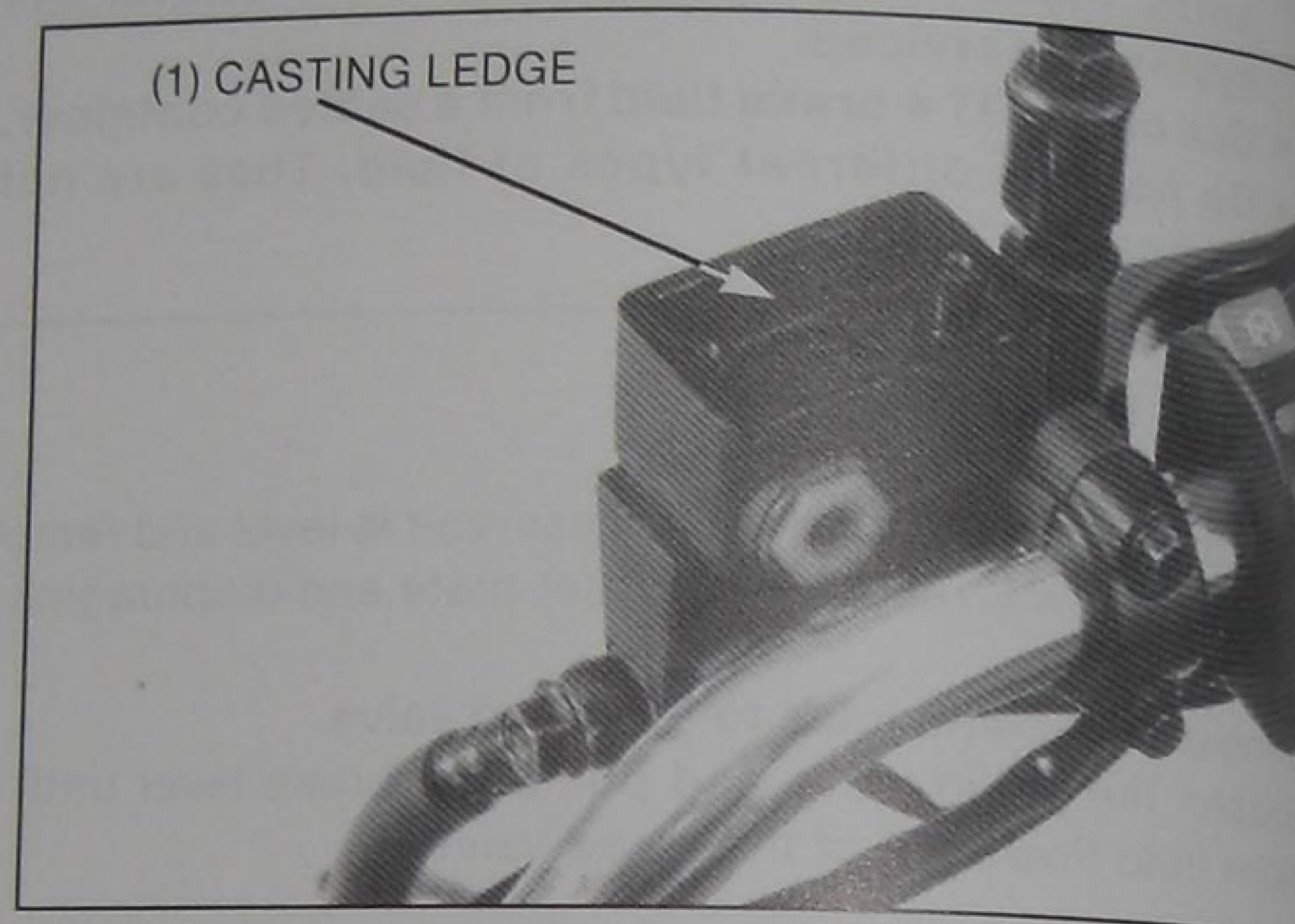
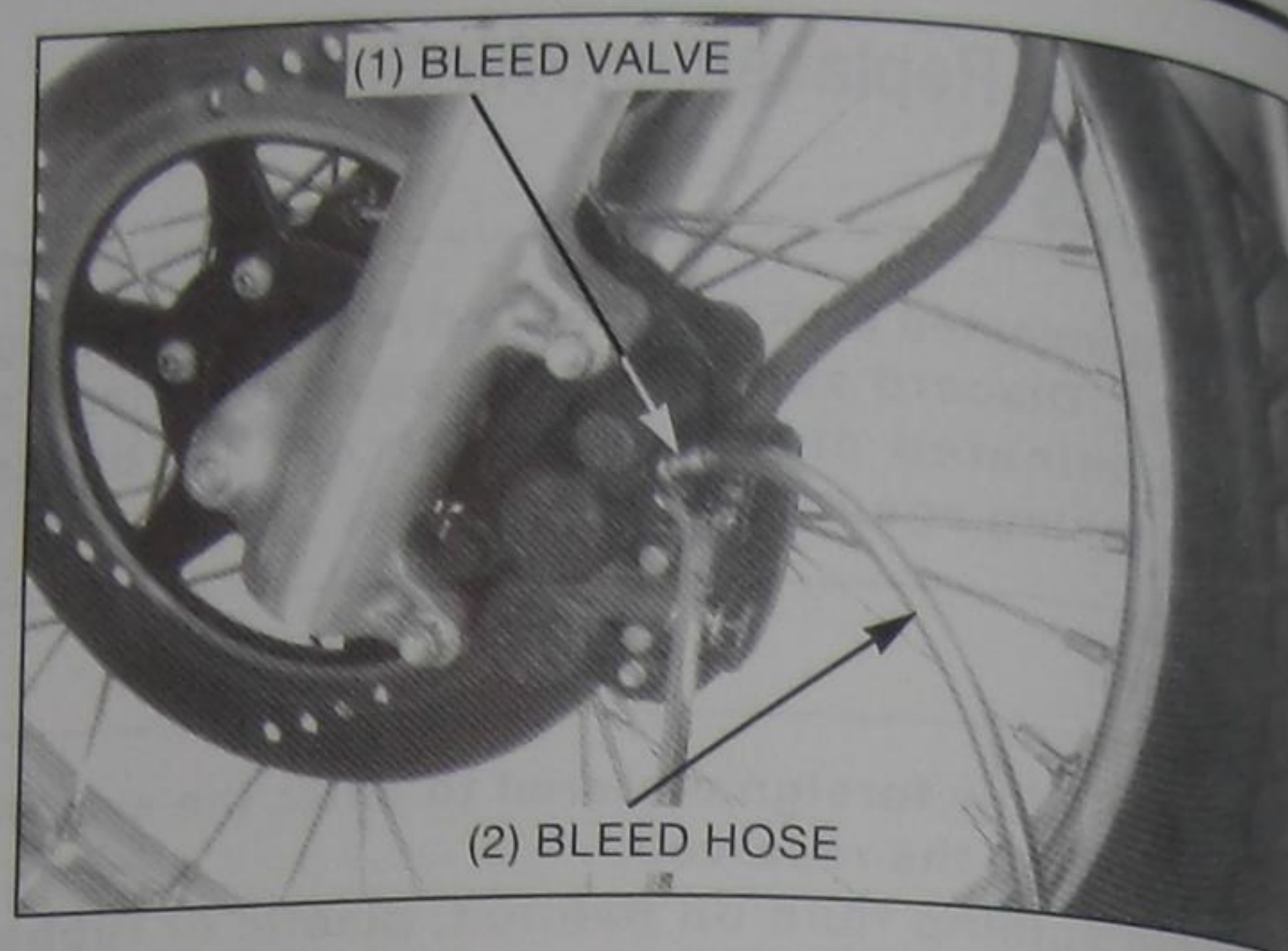
- Always replace the brake pads in pairs to ensure even disc pressure.

Loosen the pad pin retainer plate bolt.
Remove the caliper mounting bolts and the caliper from the fork leg.

Push the caliper pistons all the way in to allow installation of new brake pads.

NOTE:

- Check the brake fluid level in the brake reservoir as this operation causes the level to rise.



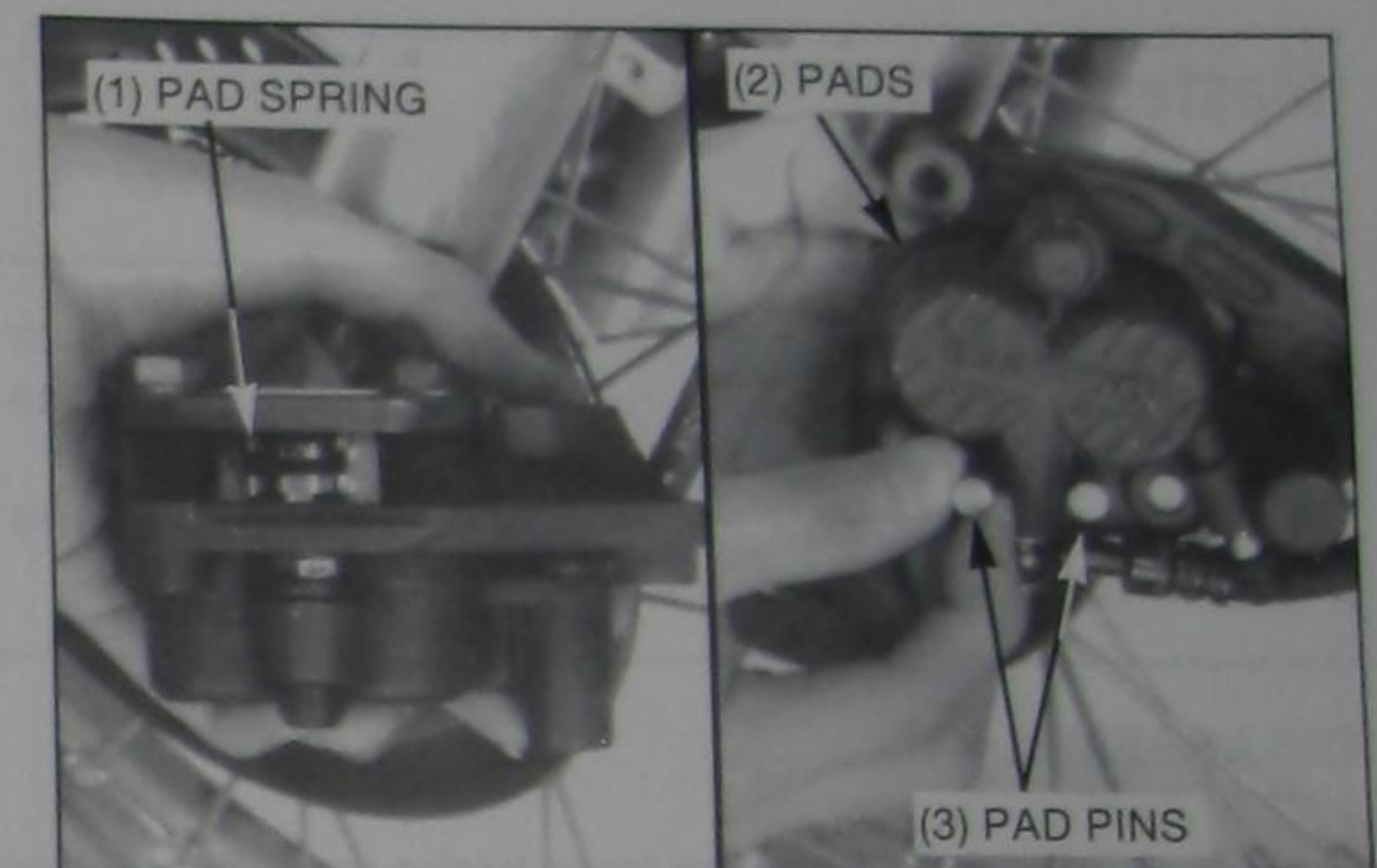
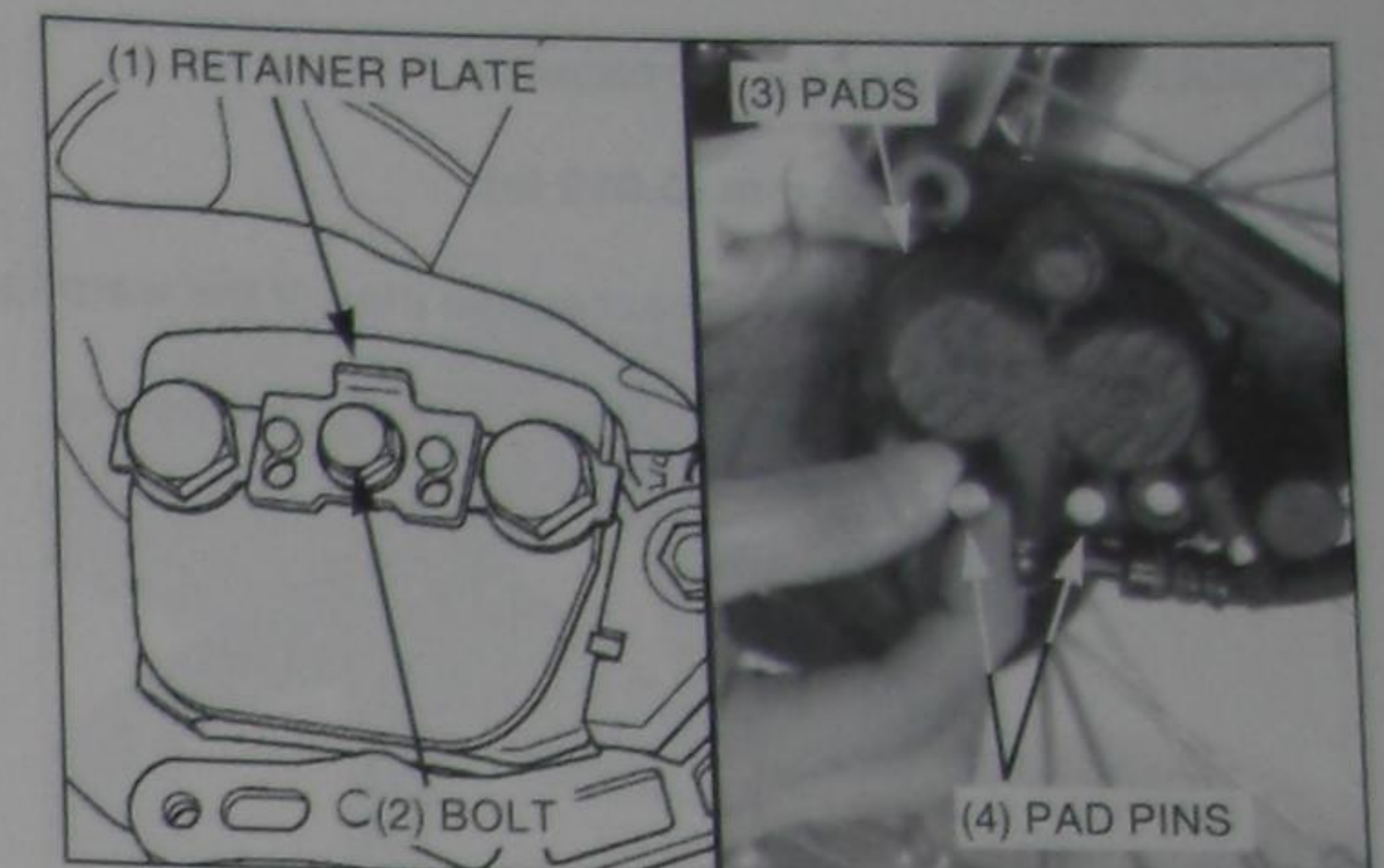
HYDRAULIC DISC BRAKE

Remove the retainer plate bolt.
Slide the retainer plate to remove it from the pad pins.

Pull the pad pins out of the caliper body while pushing in the pads against the pad spring.
Remove the brake pads.

Clean the caliper body.

Make sure that the pad spring is in position as shown.
Install new brake pads into the caliper body.
Install the pad pins by pushing in the pads against the pad spring to align the pad pin holes in the pads and caliper body.



Set the retainer plate to the pad pin grooves with the tab facing rearward and install the plate bolt.

Install the brake caliper onto the fork leg with new mounting bolts.
Tighten the mounting bolts.

TORQUE: 30 N·m (3.1 kgf-m, 22 lbf-ft)

Tighten the retainer plate bolt.

TORQUE: 10 N·m (1.0 kgf-m, 7 lbf-ft)

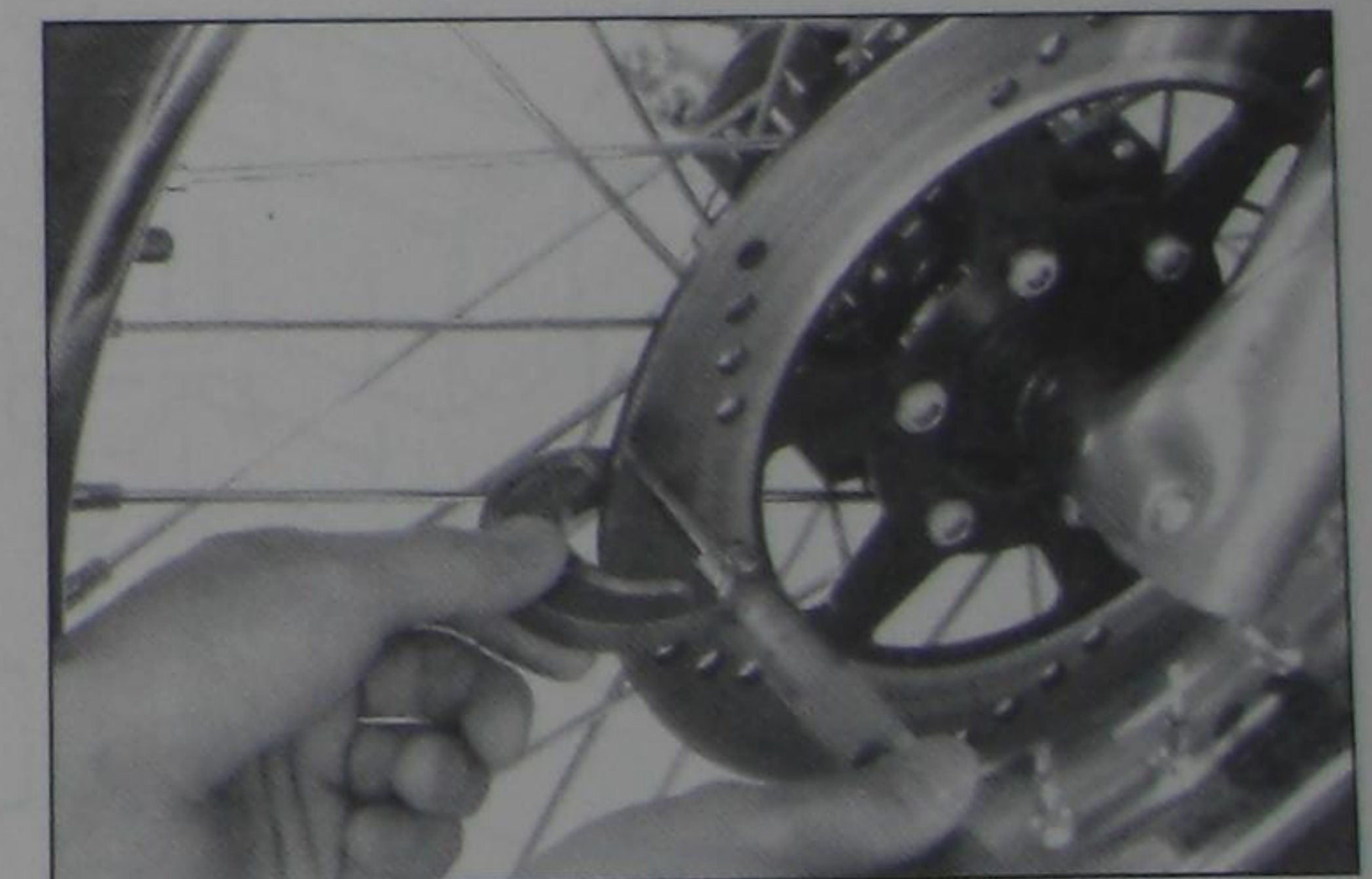
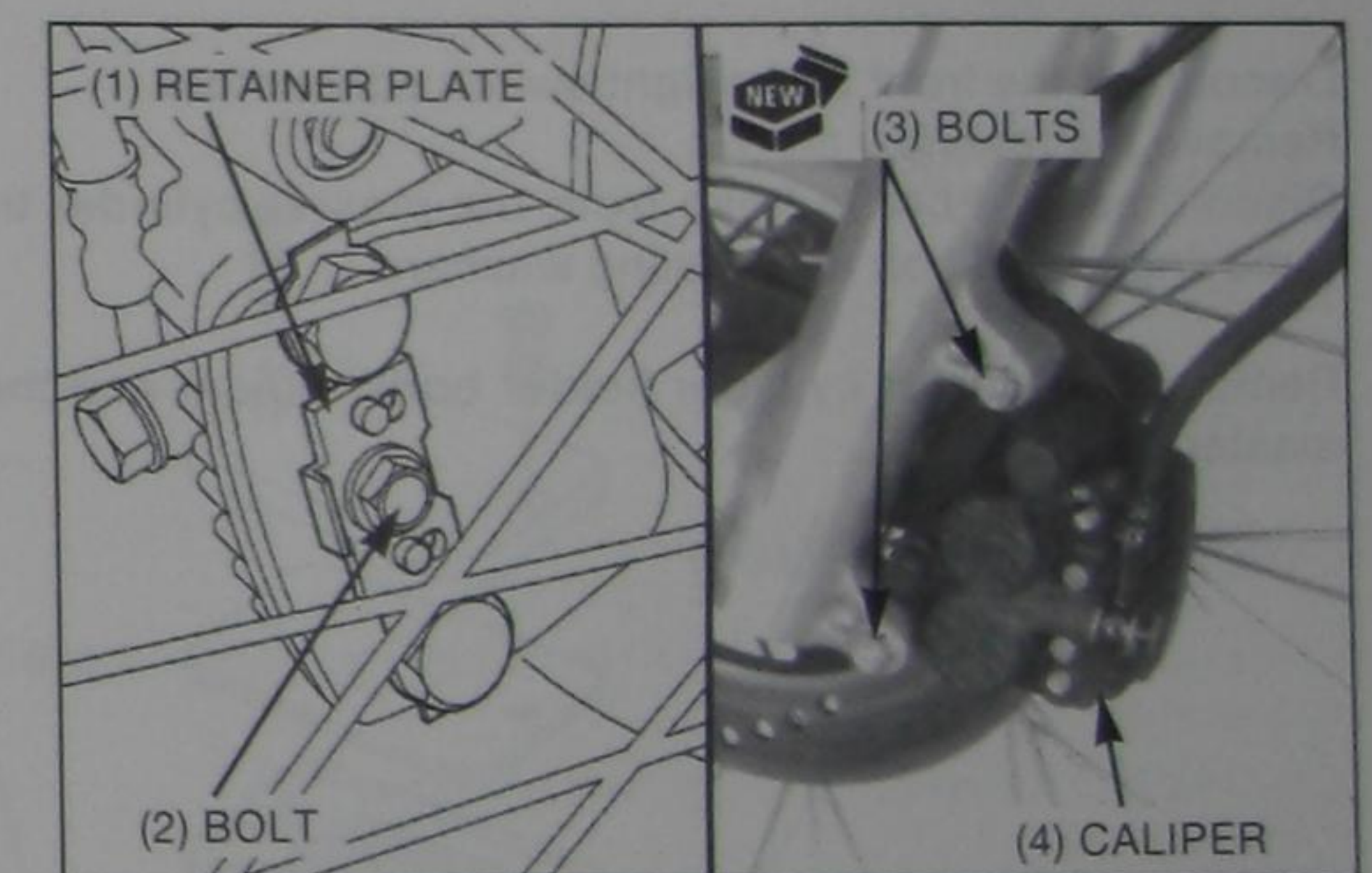
Operate the brake lever to seat the caliper pistons against the pads.

BRAKE DISC INSPECTION

Visually inspect the disc for damage or cracks.
Measure the brake disc thickness at several points.

SERVICE LIMIT: 3.5 mm (0.14 in)

Replace the brake disc if the smallest measurement is less than the service limit.

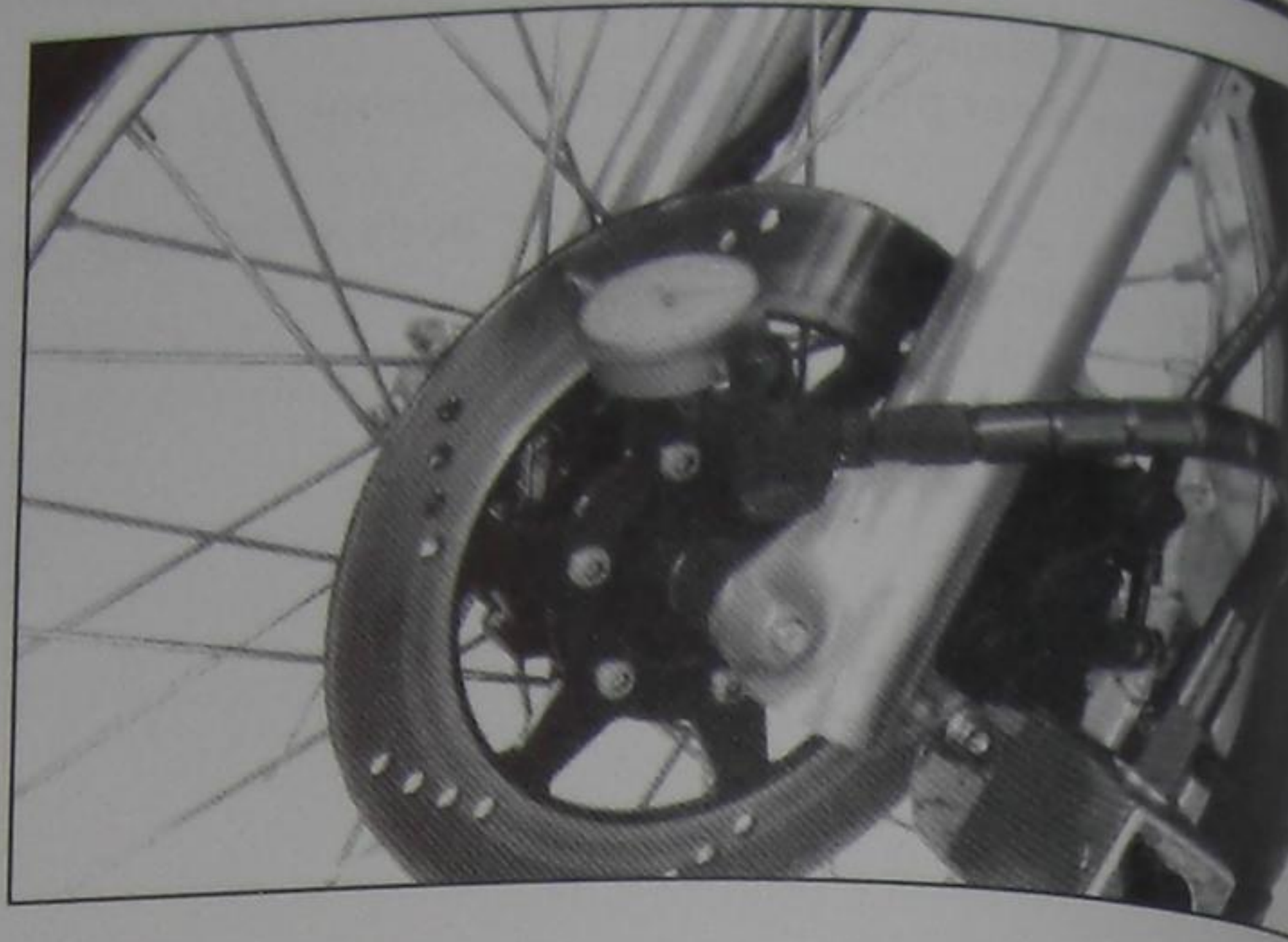


HYDRAULIC DISC BRAKE

Check the brake disc for warpage.

SERVICE LIMIT: 0.30 mm (0.012 in)

Check the wheel bearing for excessive play, if the warpage exceeds the service limit.
Replace the brake disc if the wheel bearings are normal.



Master Cylinder

CAUTION

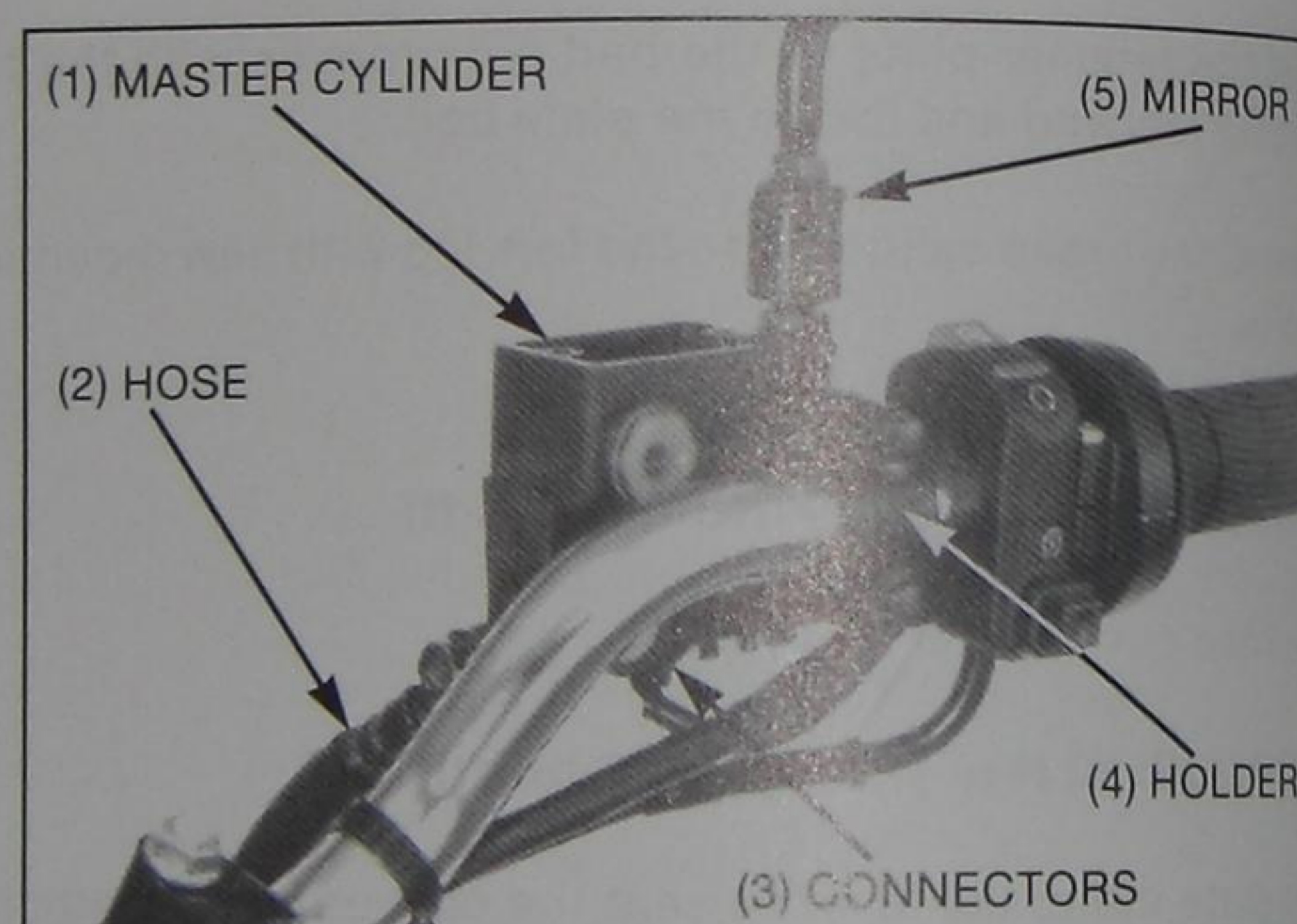
- Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.
- When removing the oil bolt, cover the end of the hose to prevent contamination.

DISASSEMBLY

Drain the brake fluid from the front brake hydraulic system (page 14-3).

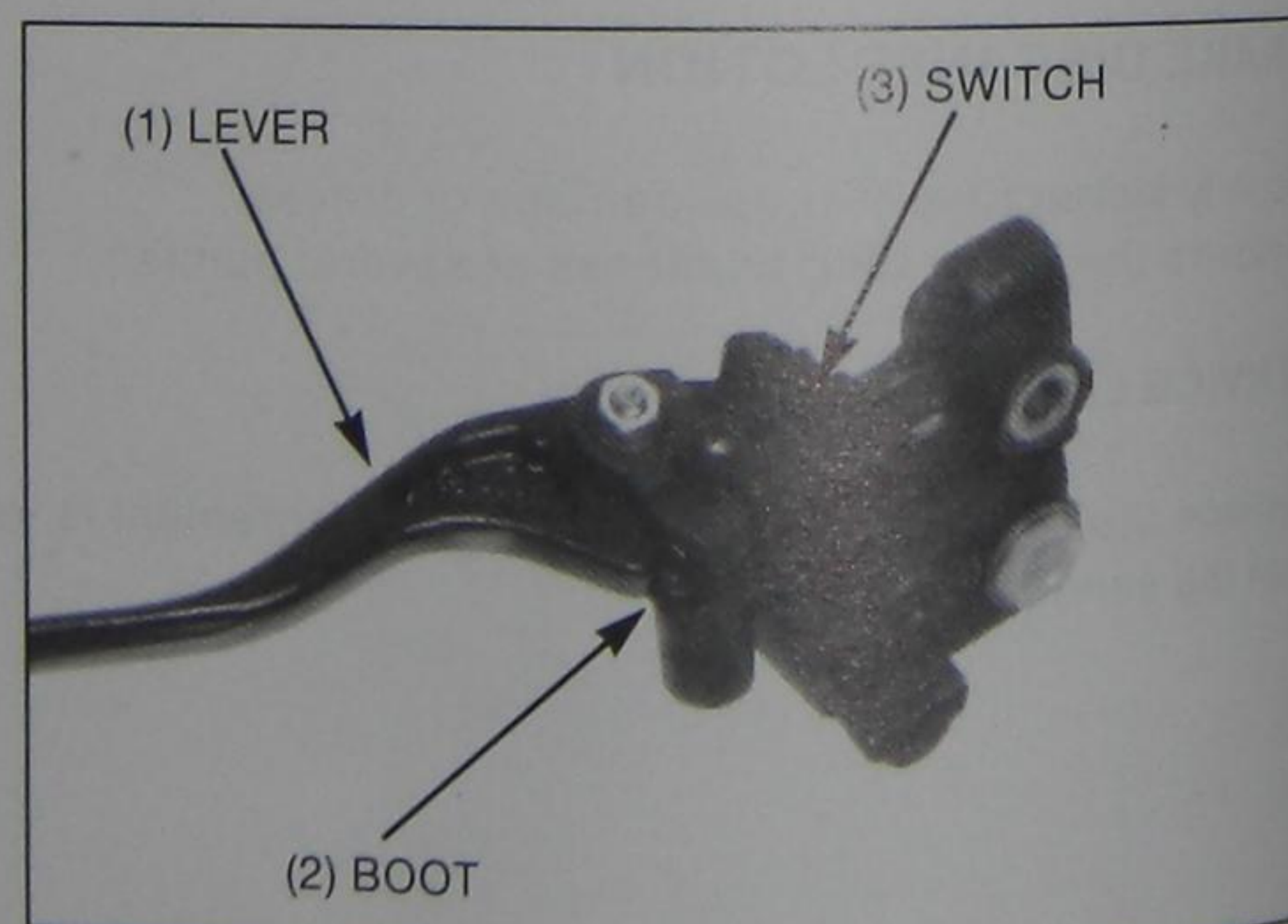
Disconnect the front brake light switch connectors.
Remove the rearview mirror.
Disconnect the brake hose from the master cylinder by removing the oil bolt and sealing washers.

Remove the master cylinder holder bolts, holder and the master cylinder.



Remove the following:

- Screw and brake light switch
- Pivot bolt, nut and brake lever
- Piston boot



HYDRAULIC DISC BRAKE

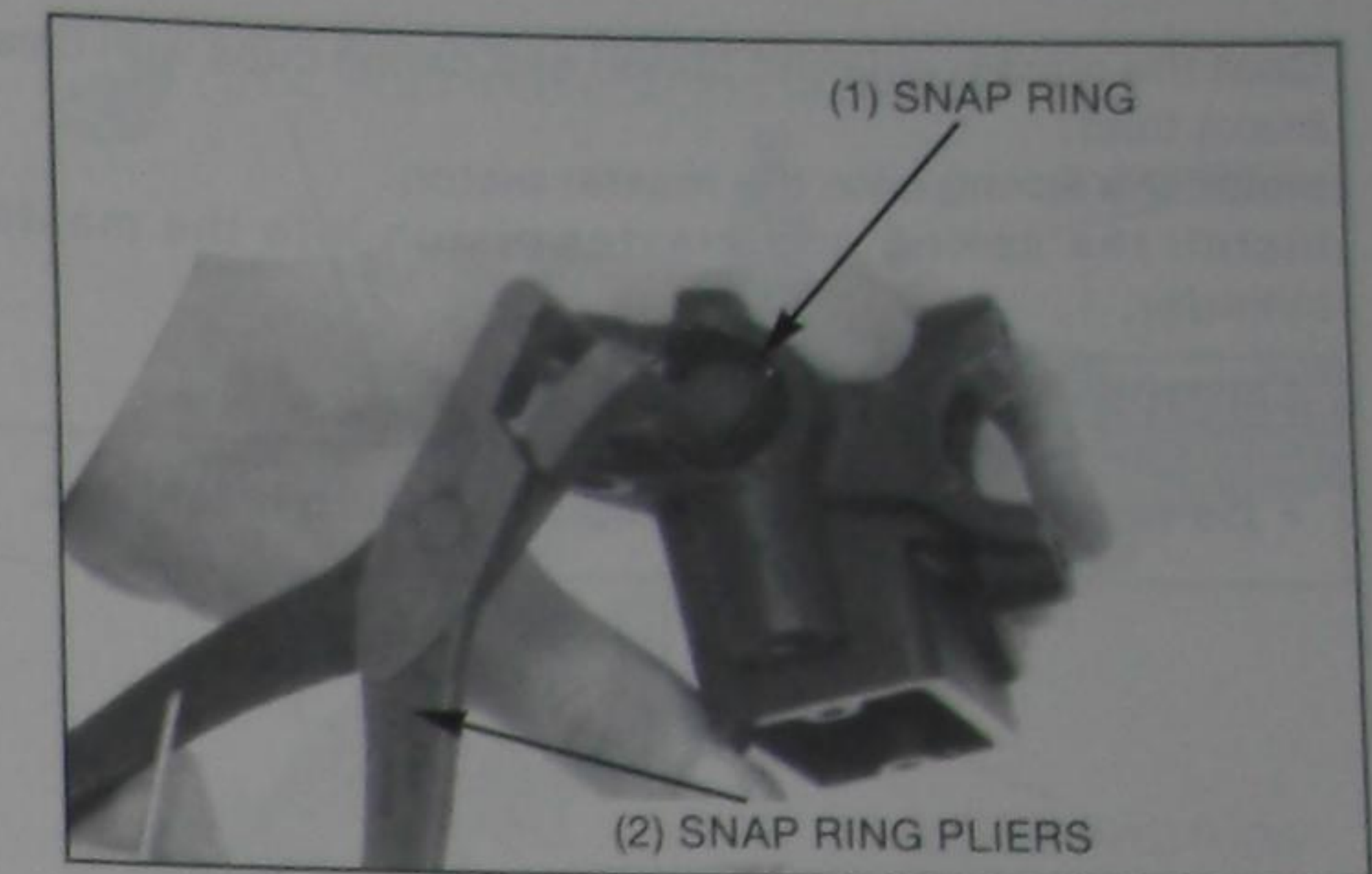
- Snap ring

TOOL:
Snap ring pliers

07914-SA50001

- Master piston
- Spring

Clean the master cylinder, reservoir and master piston in clean brake fluid.



INSPECTION

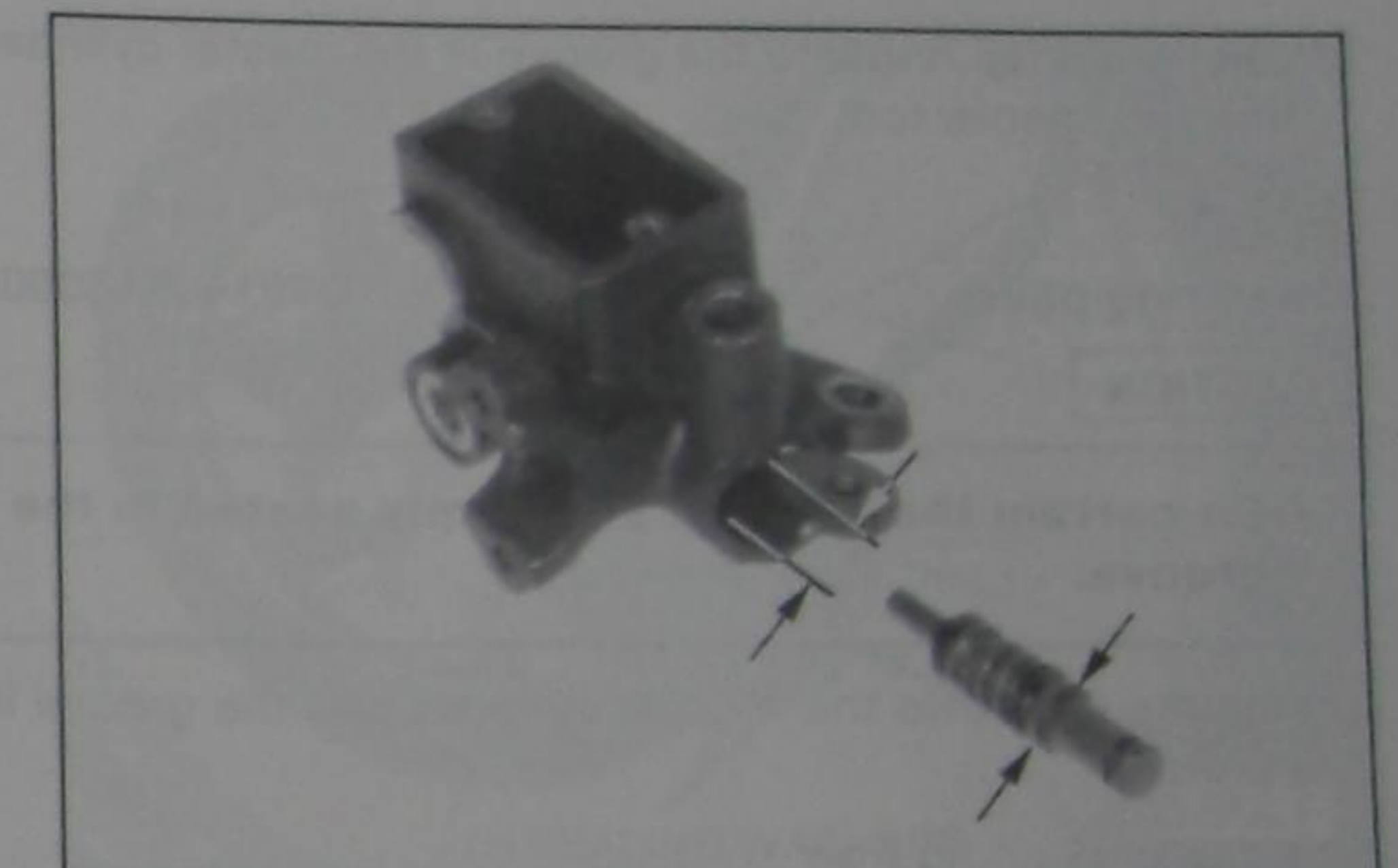
Check the piston cups for wear, deterioration or damage.
Check the spring for damage.
Check the master cylinder and piston for scoring, scratches or damage.

Measure the master cylinder I.D.

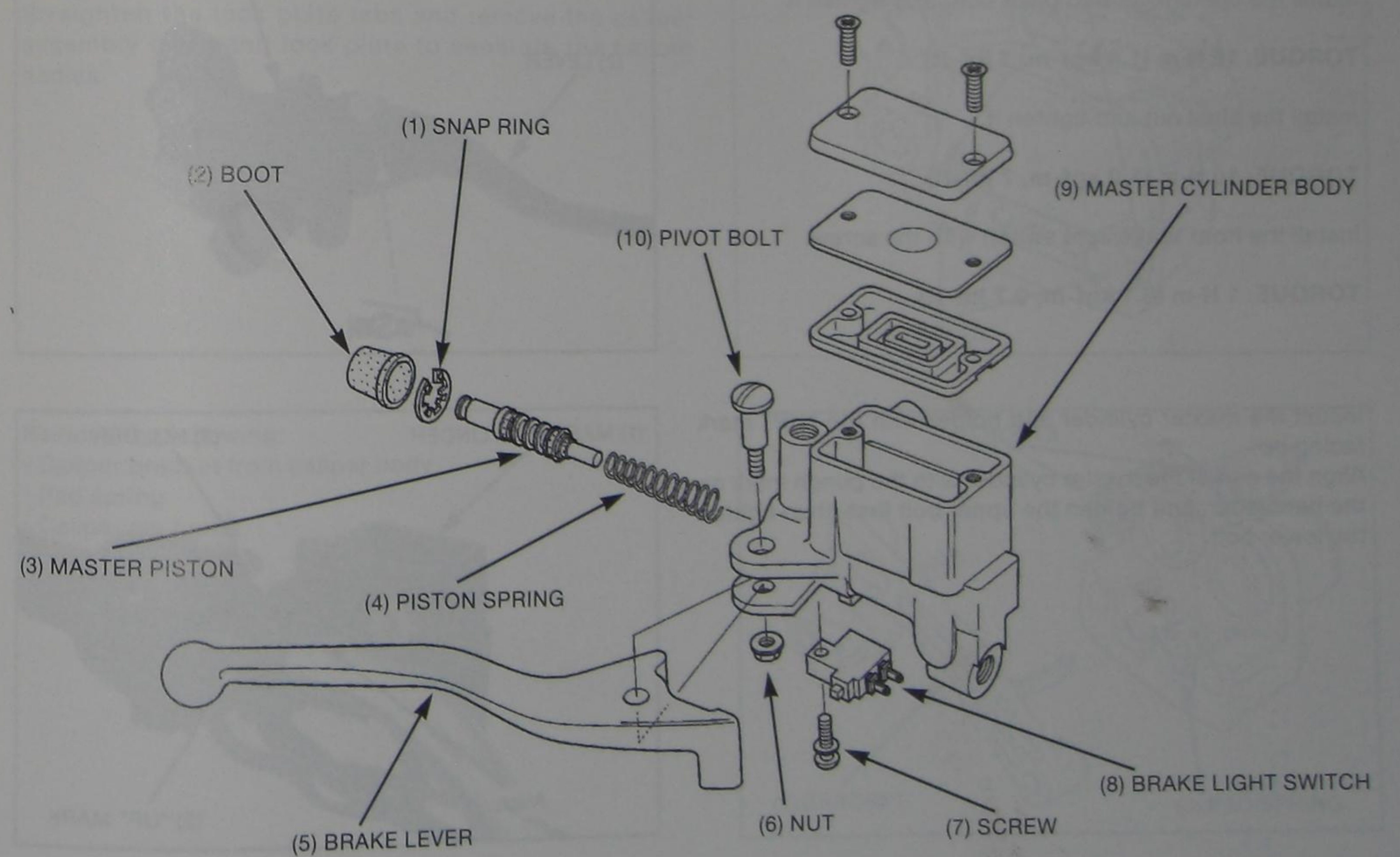
SERVICE LIMIT: 12.75 mm (0.502 in)

Measure the master piston O.D.

SERVICE LIMIT: 12.65 mm (0.498 in)



ASSEMBLY

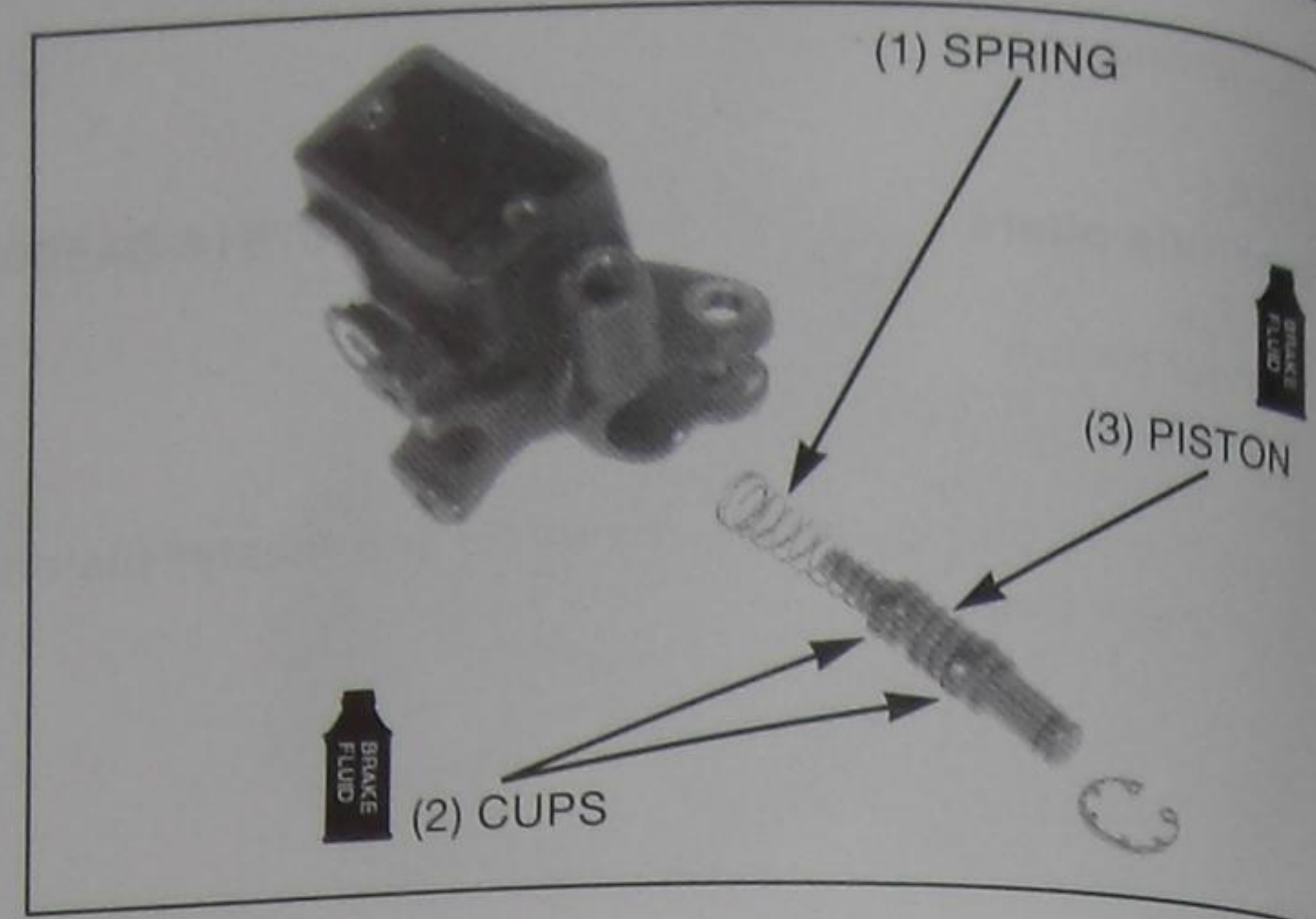


HYDRAULIC DISC BRAKE

Coat the master cylinder piston and piston cups with clean brake fluid.
Install the spring onto the master piston.
Install the spring and master piston into the master cylinder.

CAUTION

- Do not allow the piston cup lips to turn inside out.



Install the snap ring into the groove in the master cylinder, using the special tool.

TOOL:
Snap ring pliers

07914-SA50001

CAUTION

- Be certain the snap ring is firmly seated in the groove.

Install the boot into the master cylinder and the groove in the piston.

Apply silicone grease to the brake lever contacting surface of the piston.

Apply silicone grease to the brake lever pivot.
Install the brake lever and pivot bolt, and tighten it.

TORQUE: 10 N·m (1.0 kgf-m, 7 lbf-ft)

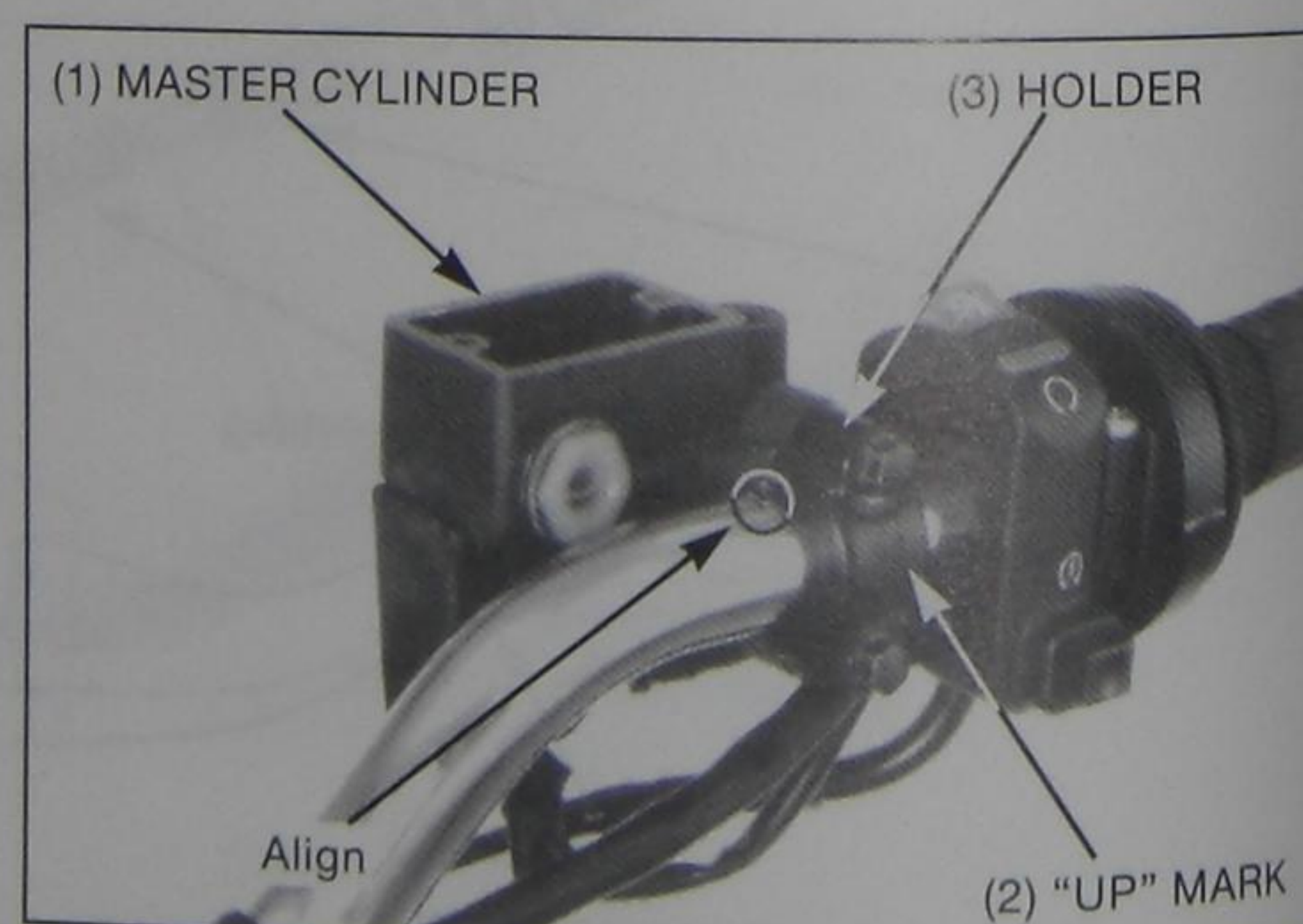
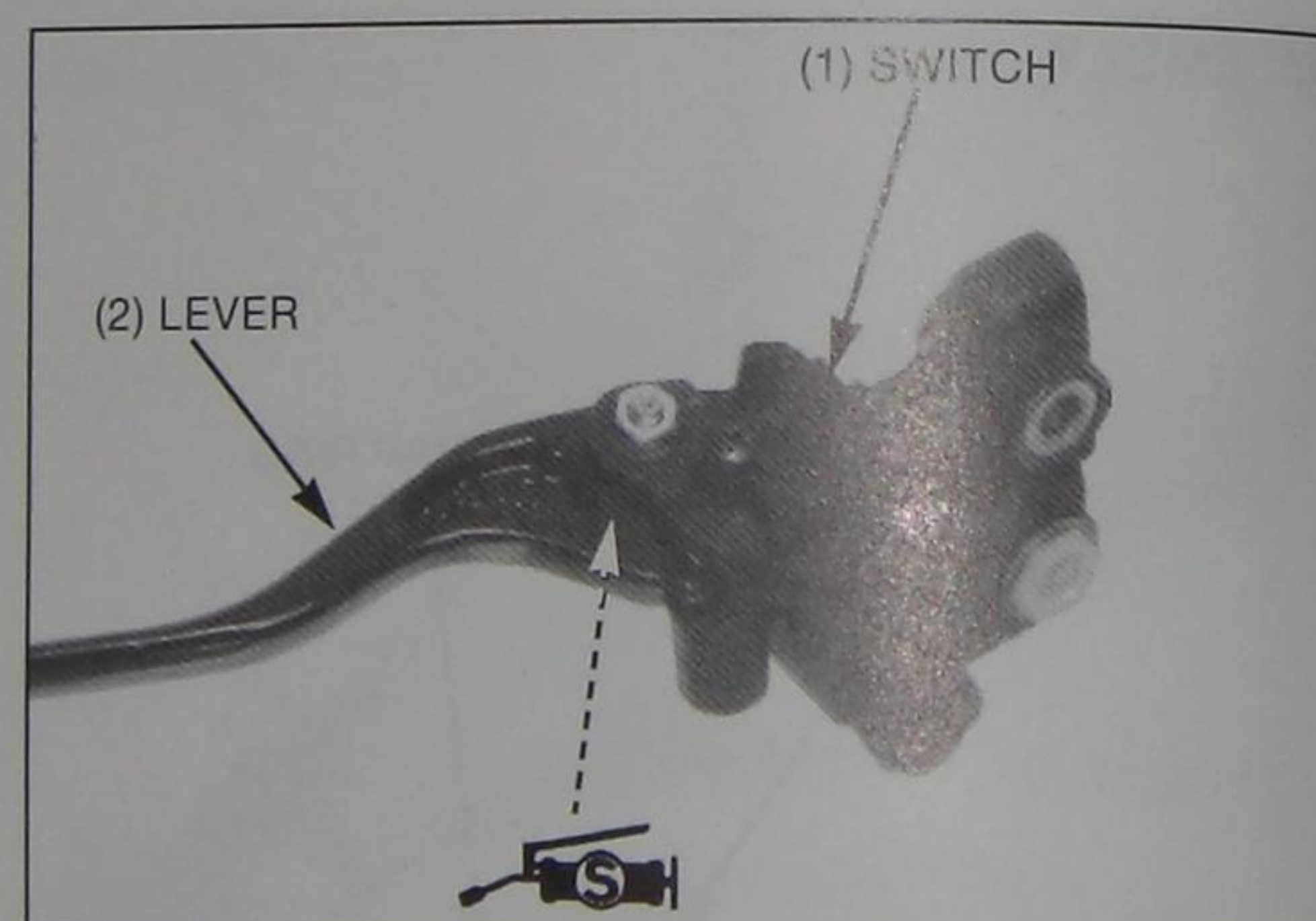
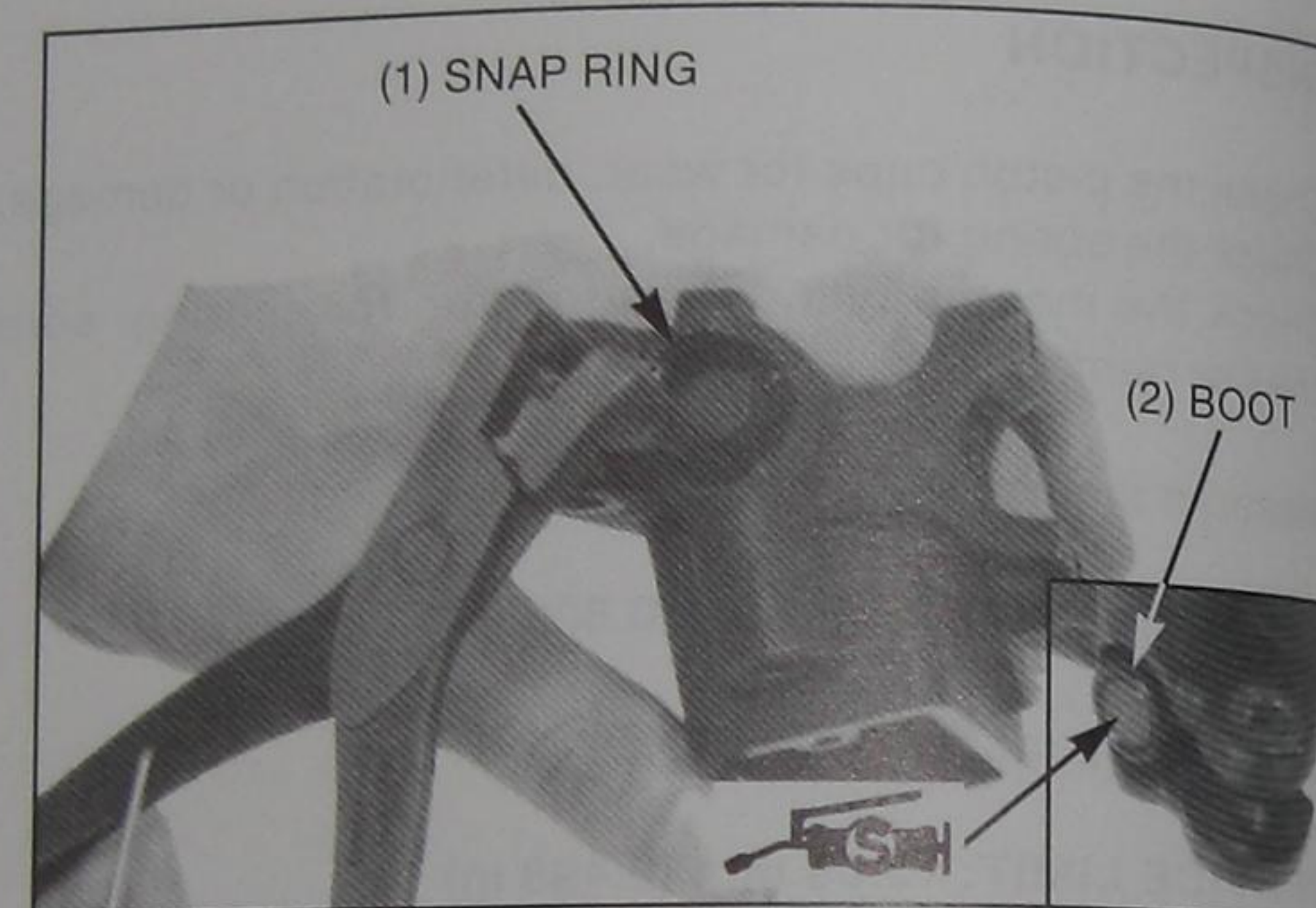
Install the pivot nut and tighten it.

TORQUE: 10 N·m (1.0 kgf-m, 7 lbf-ft)

Install the front brake light switch with the screw.

TORQUE: 1 N·m (0.1 kgf-m, 0.7 lbf-ft)

Install the master cylinder and holder with the "UP" mark facing up.
Align the end of the master cylinder with the punch mark on the handlebar, and tighten the upper bolt first, then tighten the lower bolt.



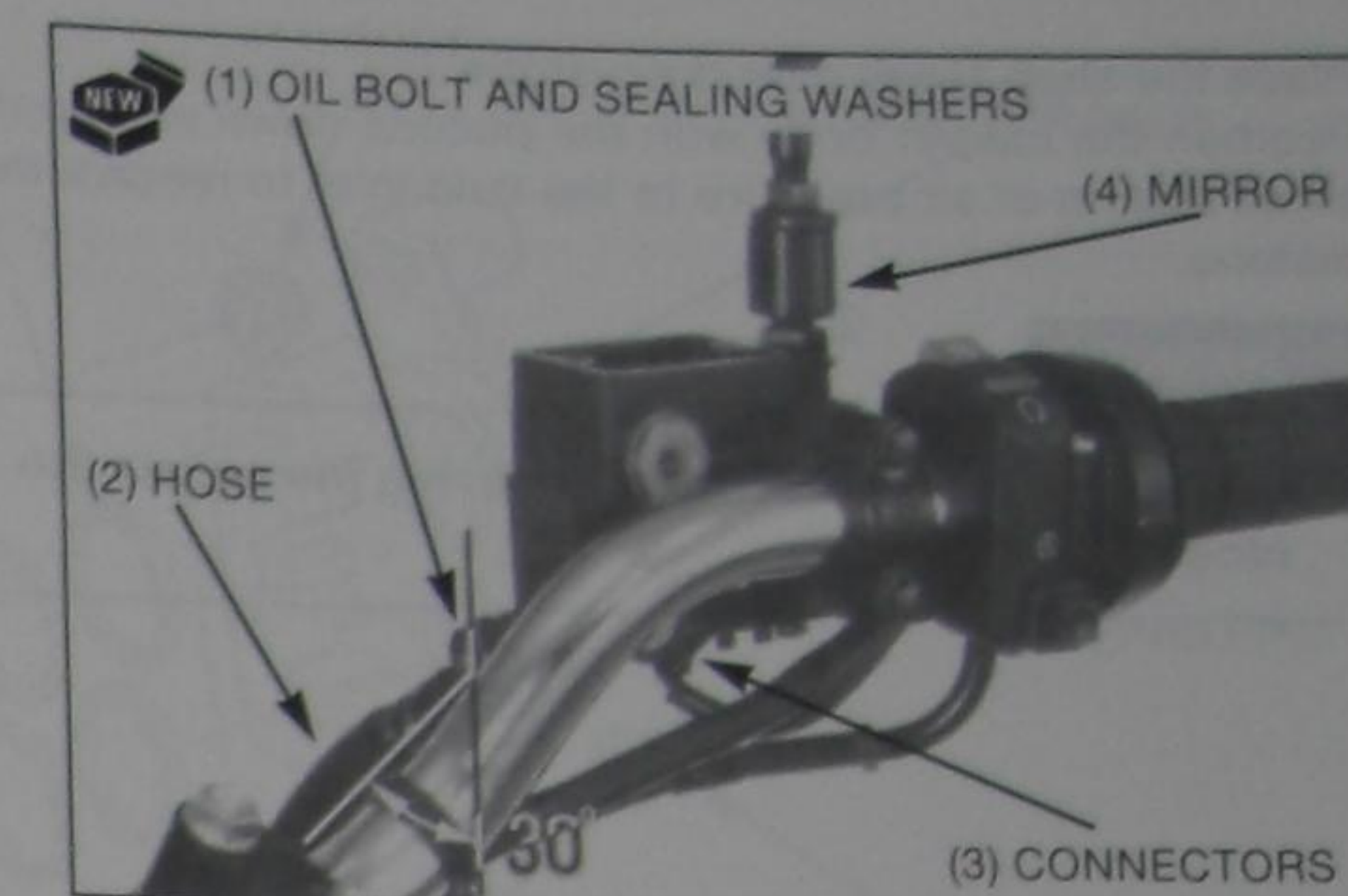
HYDRAULIC DISC BRAKE

Connect the brake hose to the master cylinder with the oil bolt and new sealing washers, and tighten the oil bolt at an angle of the hose as shown.

TORQUE: 29 N·m (3.0 kgf-m, 22 lbf-ft)

Install the rearview mirror.
Connect the brake light switch connectors.

Fill and bleed the front brake hydraulic system (page 14-3).



Brake Caliper

CAUTION

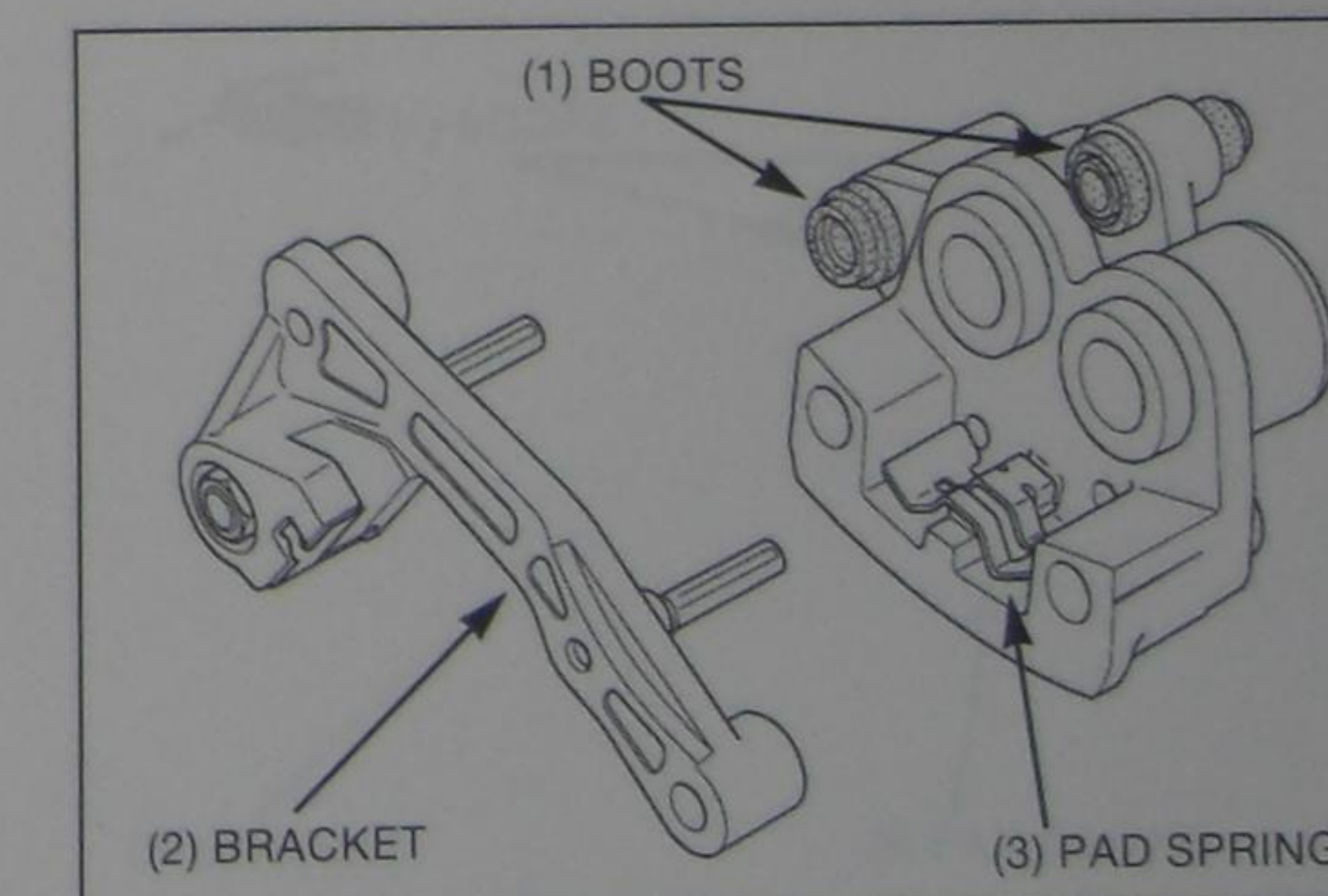
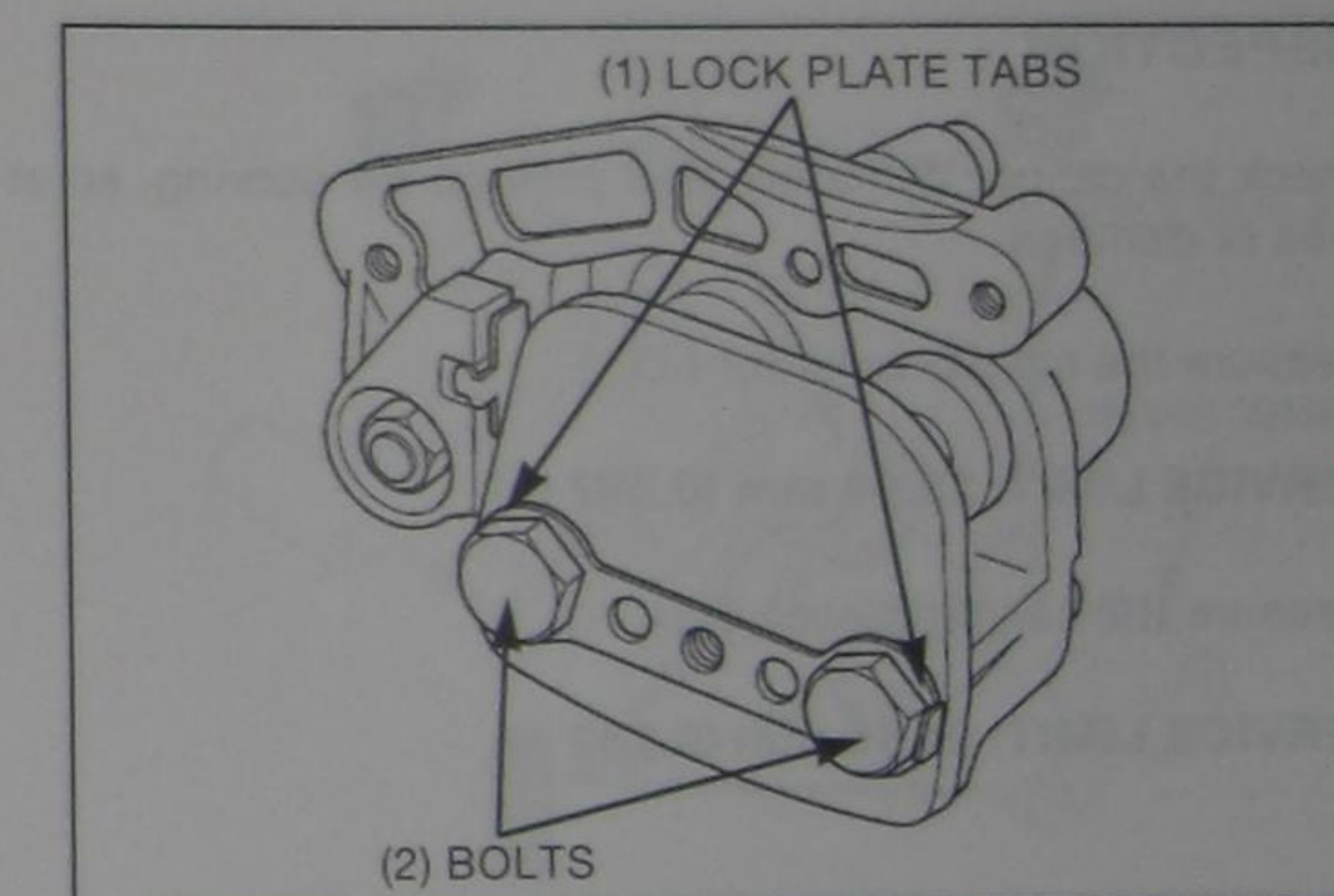
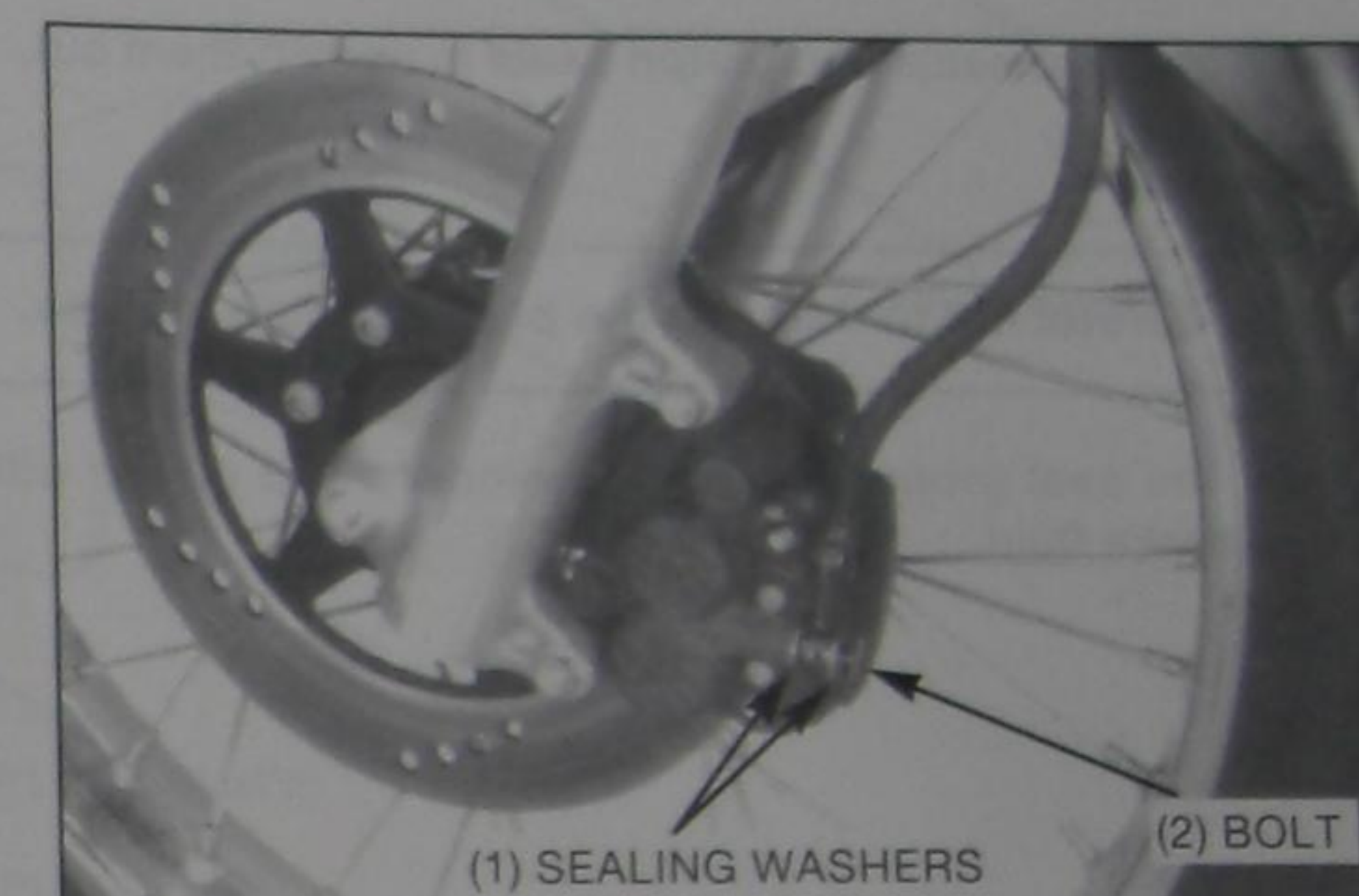
- Avoid spilling fluid on painted, plastic or rubber parts. Place a rag over these parts whenever the system is serviced.

DISASSEMBLY

Drain the brake fluid from the front brake hydraulic system (page 14-3).

Disconnect the brake hose from the brake caliper by removing the oil bolt and sealing washers.
Remove the front brake pads (page 14-4).

Straighten the lock plate tabs and remove the caliper assembly bolts and lock plate to separate the caliper bodies.



Remove the following:

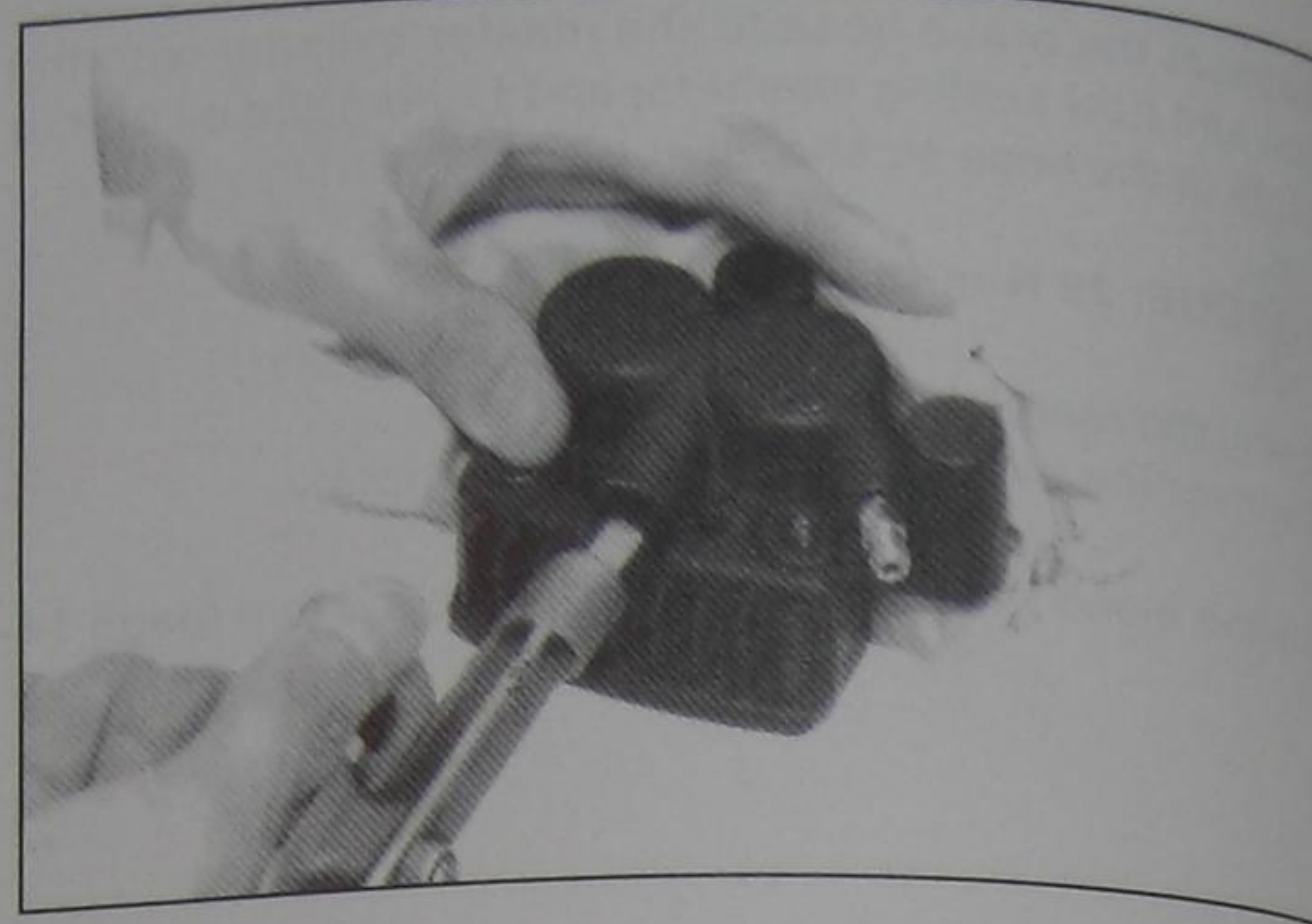
- Caliper bracket from caliper body
- Pad spring
- Caliper pin boots.

HYDRAULIC DISC BRAKE

Place the shop towel over the pistons.
Position the caliper body with the pistons down and apply small squirts of air pressure to the fluid inlet to remove the pistons.

WARNING

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



Push the dust seals and piston seals in and lift them out.

CAUTION

- Be careful not to damage the piston sliding surface.

Clean the seal grooves, caliper cylinders and piston with clean brake fluid.



INSPECTION

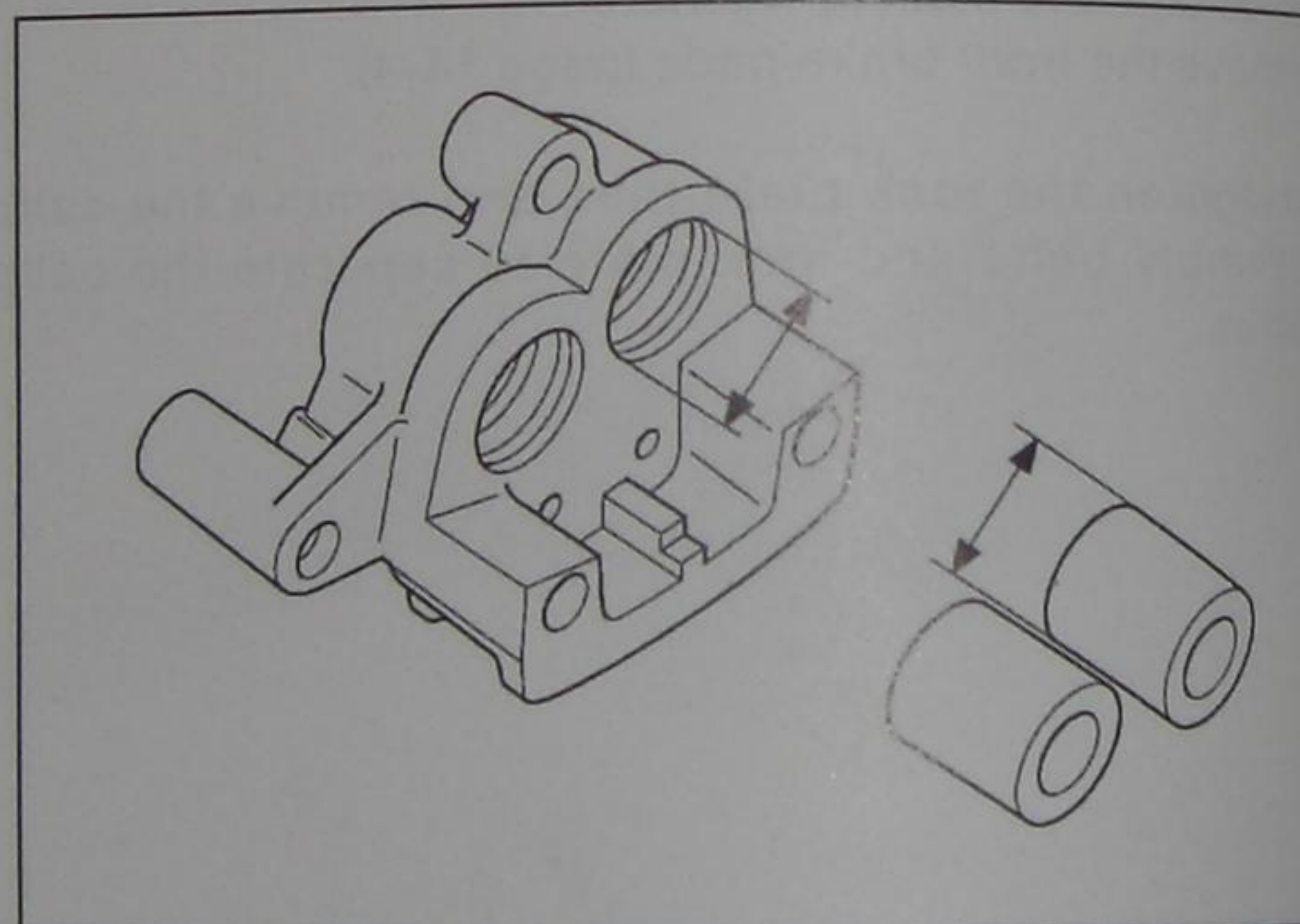
Check the caliper cylinders and pistons for scoring, scratches or damage.

Measure the caliper cylinder I.D.

SERVICE LIMIT: 25.06 mm (0.987 in)

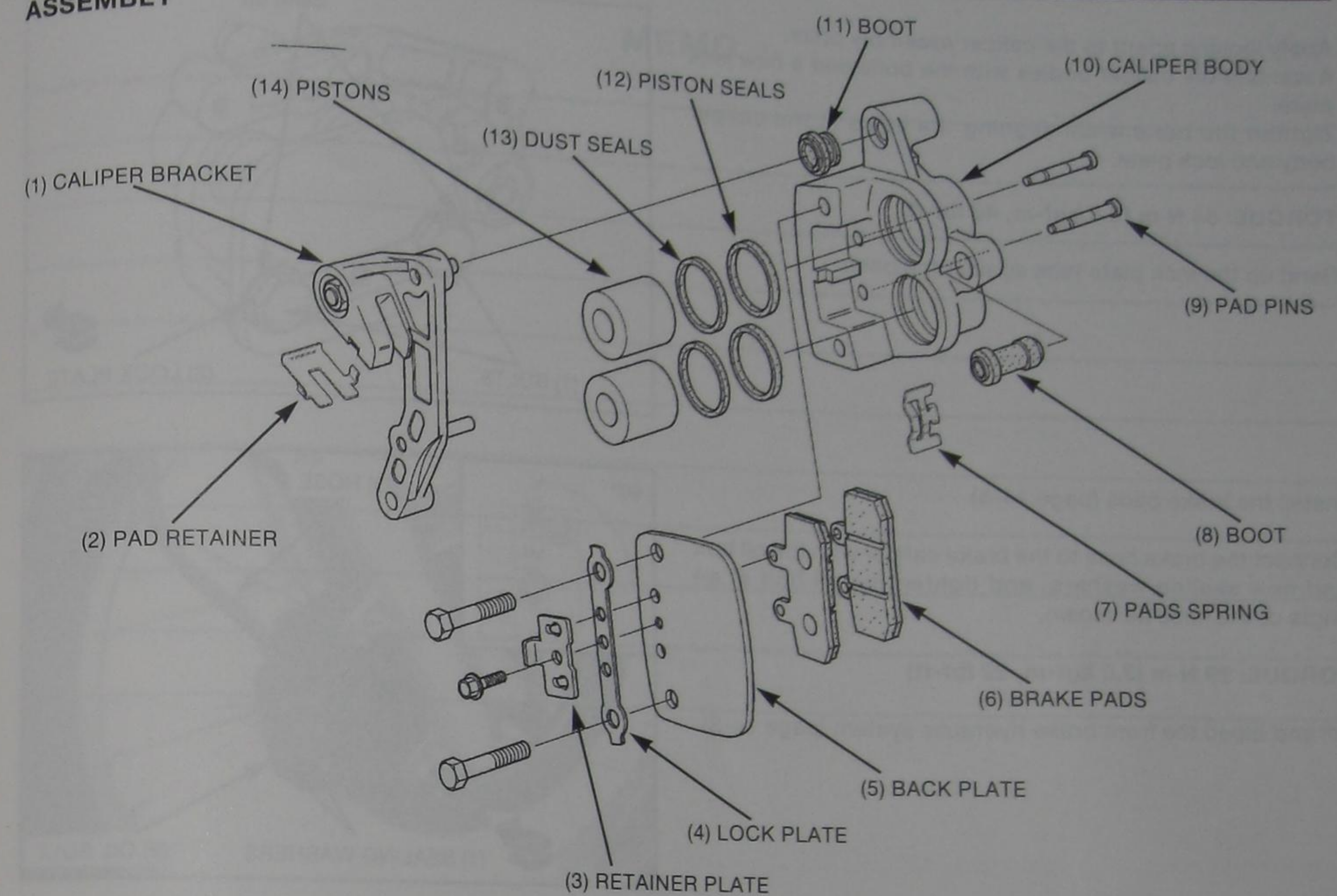
Measure the caliper piston O.D.

SERVICE LIMIT: 24.95 mm (0.982 in)



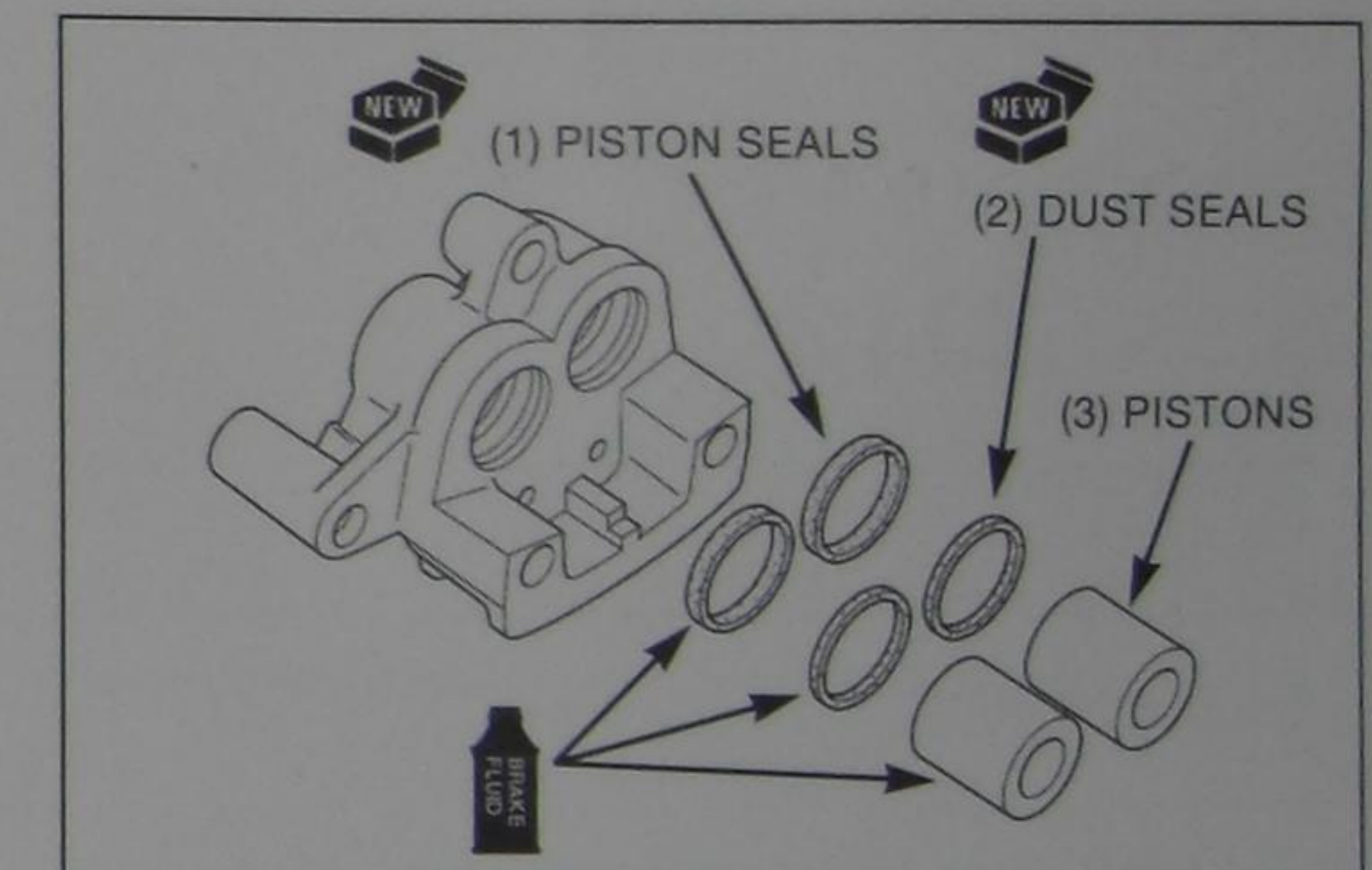
HYDRAULIC DISC BRAKE

ASSEMBLY



Coat new piston and dust seals with clean brake fluid and install them in the seal grooves in the caliper.

Coat the caliper pistons with clean brake fluid and install them into the caliper cylinders with the opening toward the pads.

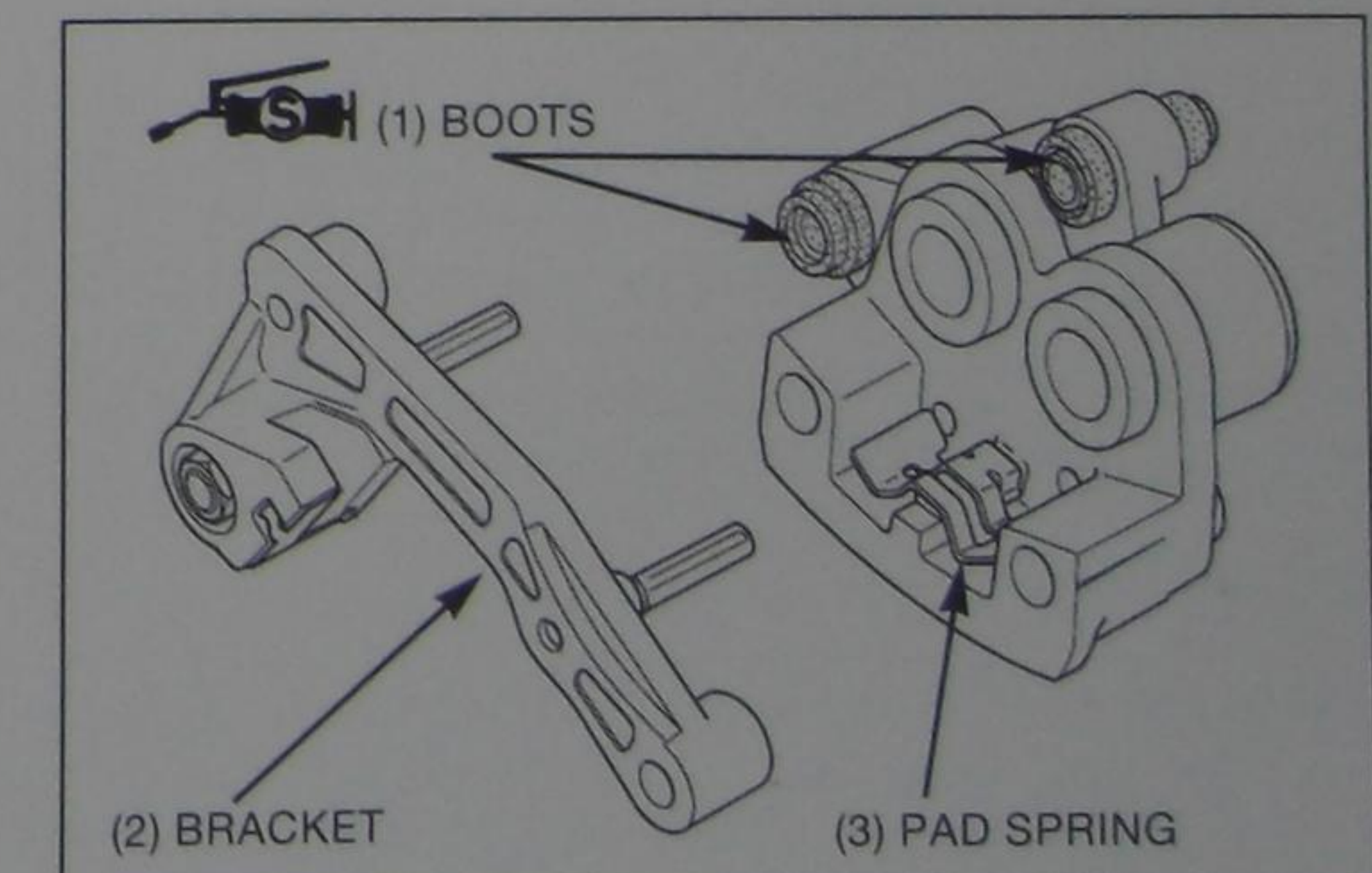


If the pin boots are hard or deteriorated, replace them with new ones.

Install the pin boots into the caliper body and pack silicone grease to the inside of the boots.

Install the pad spring as shown.

Install the caliper bracket over the caliper body. Make sure that the boots are seated securely into the pin grooves.

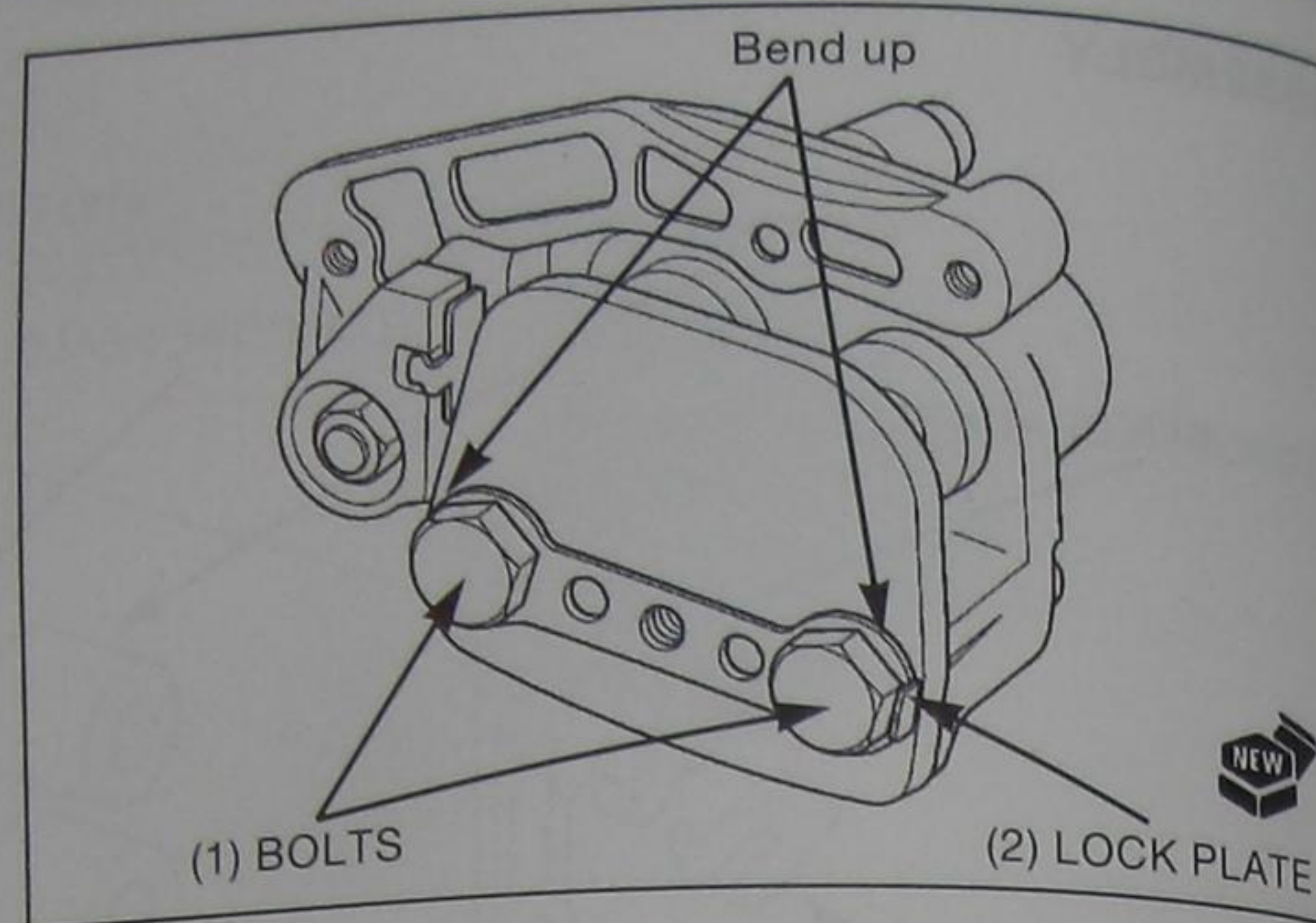


HYDRAULIC DISC BRAKE

Apply locking agent to the caliper assembly bolts.
Assemble the caliper bodies with the bolts and a new lock plate.
Tighten the bolts while aligning the holes in the caliper body and lock plate.

TORQUE: 54 N·m (5.5 kgf-m, 40 lbf-ft)

Bend up the lock plate tabs against the bolts.

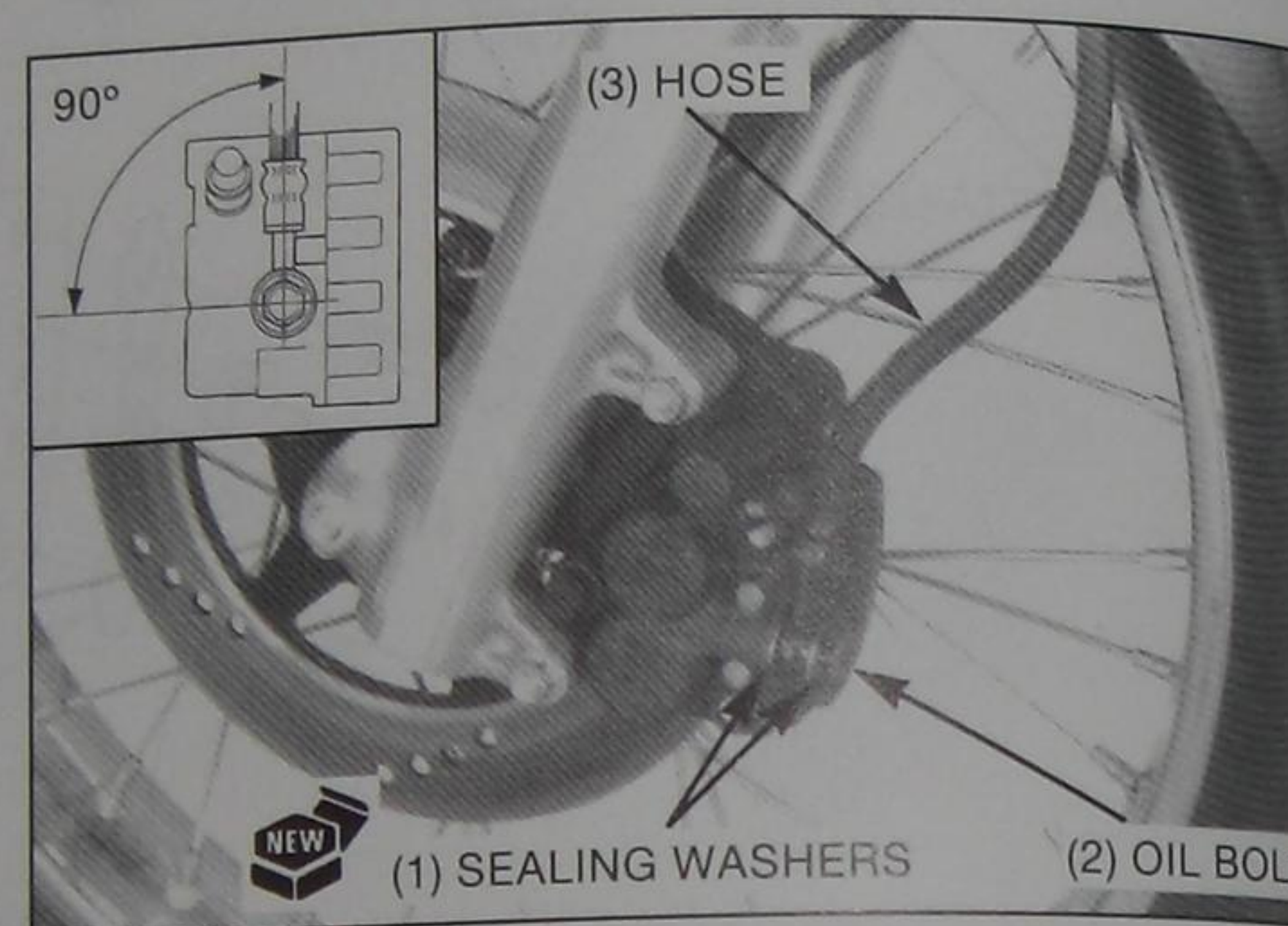


Install the brake pads (page 14-5).

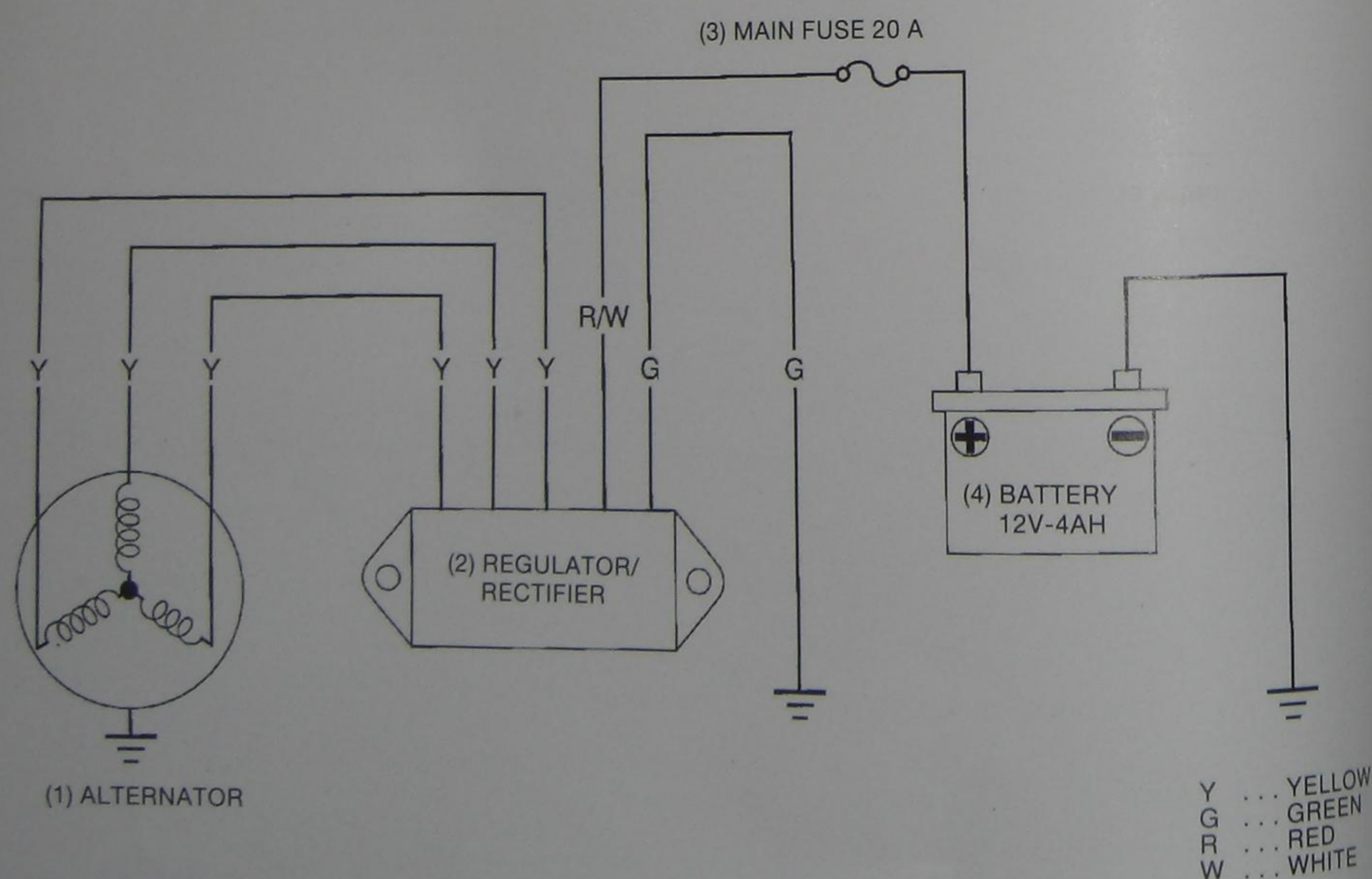
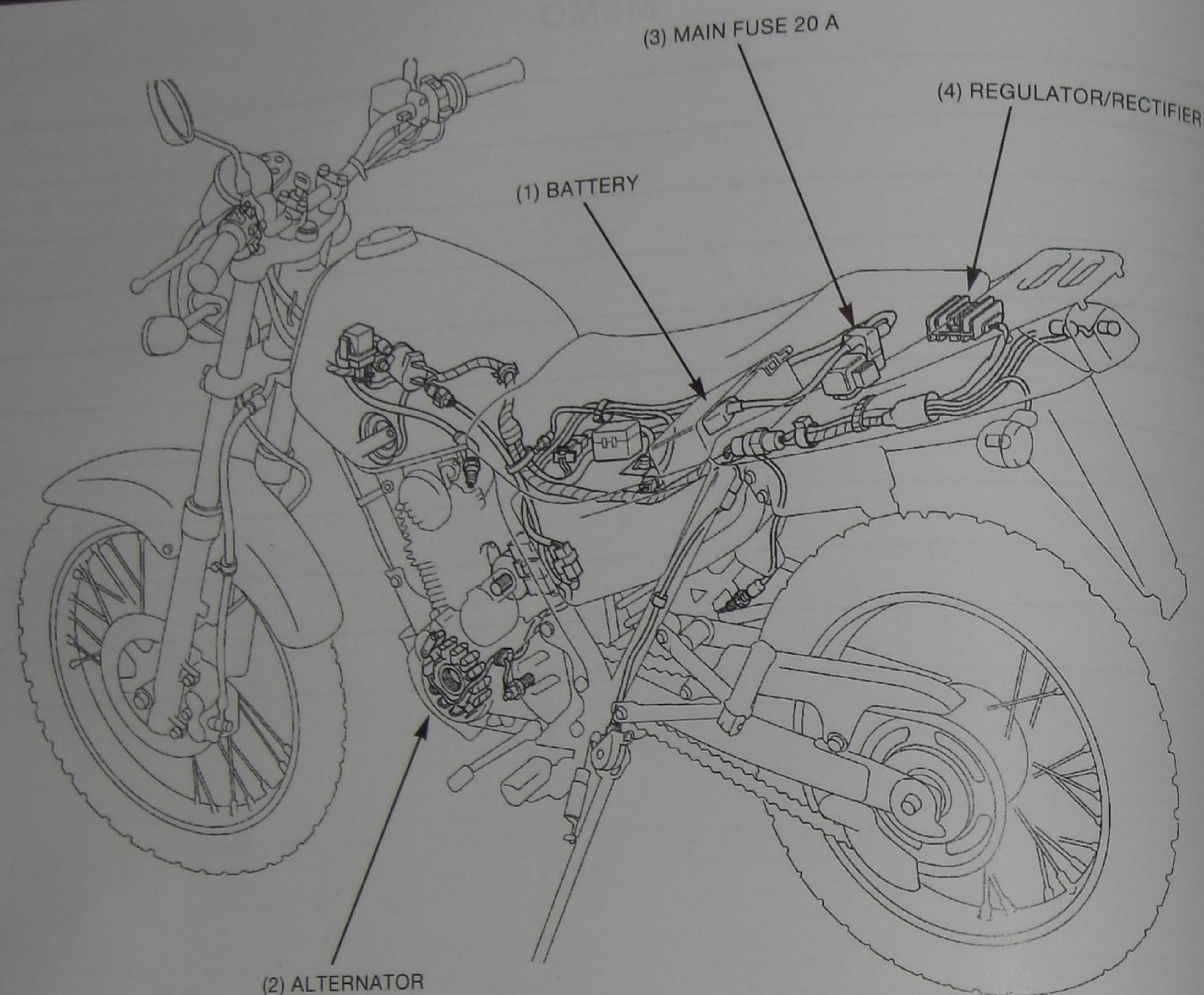
Connect the brake hose to the brake caliper with the oil bolt and new sealing washers, and tighten the oil bolt at an angle of the hose as shown.

TORQUE: 29 N·m (3.0 kgf-m, 22 lbf-ft)

Fill and bleed the front brake hydraulic system (page 14-3).



MEMO



15. Battery/Charging System

SERVICE INFORMATION

15-1	CHARGING SYSTEM INSPECTION	15-6
15-3	REGULATOR/RECTIFIER	15-8
15-5	ALTERNATOR CHARGING COIL	15-8

Service Information

GENERAL

WARNING

- The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.
- The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.
 - If electrolyte gets on your skin, flush with water.
 - If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.
- Electrolyte is poisonous.
 - If swallowed, drink large quantities of water or milk and follow with milk of magnesia or vegetable oil and call a physician. KEEP OUT OF REACH OF CHILDREN.

- Always turn off the ignition switch before disconnecting any electrical component.

CAUTION

- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is ON and current is present.

- For extended storage, remove the battery, give it a full charge, and store it in a cold, dry place.
- For a battery remaining in a stored motorcycle, disconnect the negative battery cable from the battery.

NOTE:

- The maintenance free battery must be replaced when it reaches the end of its service life.

CAUTION

- The battery caps should not be removed. Attempting to remove the sealing caps from the cells may damage the battery.

- The battery can be damaged if overcharged or undercharged, or if left to discharge for long period. These same conditions contribute to shortening the "life span" of the battery. Even under normal use, the performance of the battery deteriorates after 2-3 years.
- Battery voltage may recover after battery charging, but under heavy load, the battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharging symptom. If one of the battery cells is shorted and battery voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the electrolyte level goes down quickly.
- Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under heavy load, such as having the headlight and taillight ON for long periods of time without riding the motorcycle.
- The battery will self-discharge when the motorcycle is not in use. For this reason, charge the battery every two weeks to prevent sulfation from occurring.
- Filling a new battery electrolyte will produce some voltage, but in order to achieve its maximum performance, always charge the battery. also, the battery life is lengthened when it is initially charged.
- When checking the charging system, always follow the steps in the troubleshooting flow chart (page 15-3).
- For alternator service, refer to section 10.

BATTERY/CHARGING SYSTEM

- This model comes with a maintenance free (MF) battery. Remember the following about MF batteries.
 - Use only the electrolyte that comes with the battery.
 - Use all of the electrolyte.
 - Seal the battery properly.
 - Never open the seals again.

CAUTION

- For battery charging, do not exceed the charging current and time specified on the battery. Using excessive current or extending the charging time may damage the battery.

SPECIFICATIONS

Item			Specifications
Battery	Capacity		12 V - 4 Ah
	Voltage at 20°C (68°F)	Fully charged	Above 12.8 V
		Needs charging	Below 12.3 V
	Charging rate	Normal	0.5 A/5-10 h
		Quick	5 A/0.5 h
	Current leakage		1 mA max.
Regulator/rectifier regulated voltage			14.0-14.8 V/5,000 min ⁻¹ (rpm)
Alternator	Capacity		200 W/5,000 min ⁻¹ (rpm)
	Charging coil at 20°C (68°F)		0.1 - 1.0 Ω

TORQUE VALUES

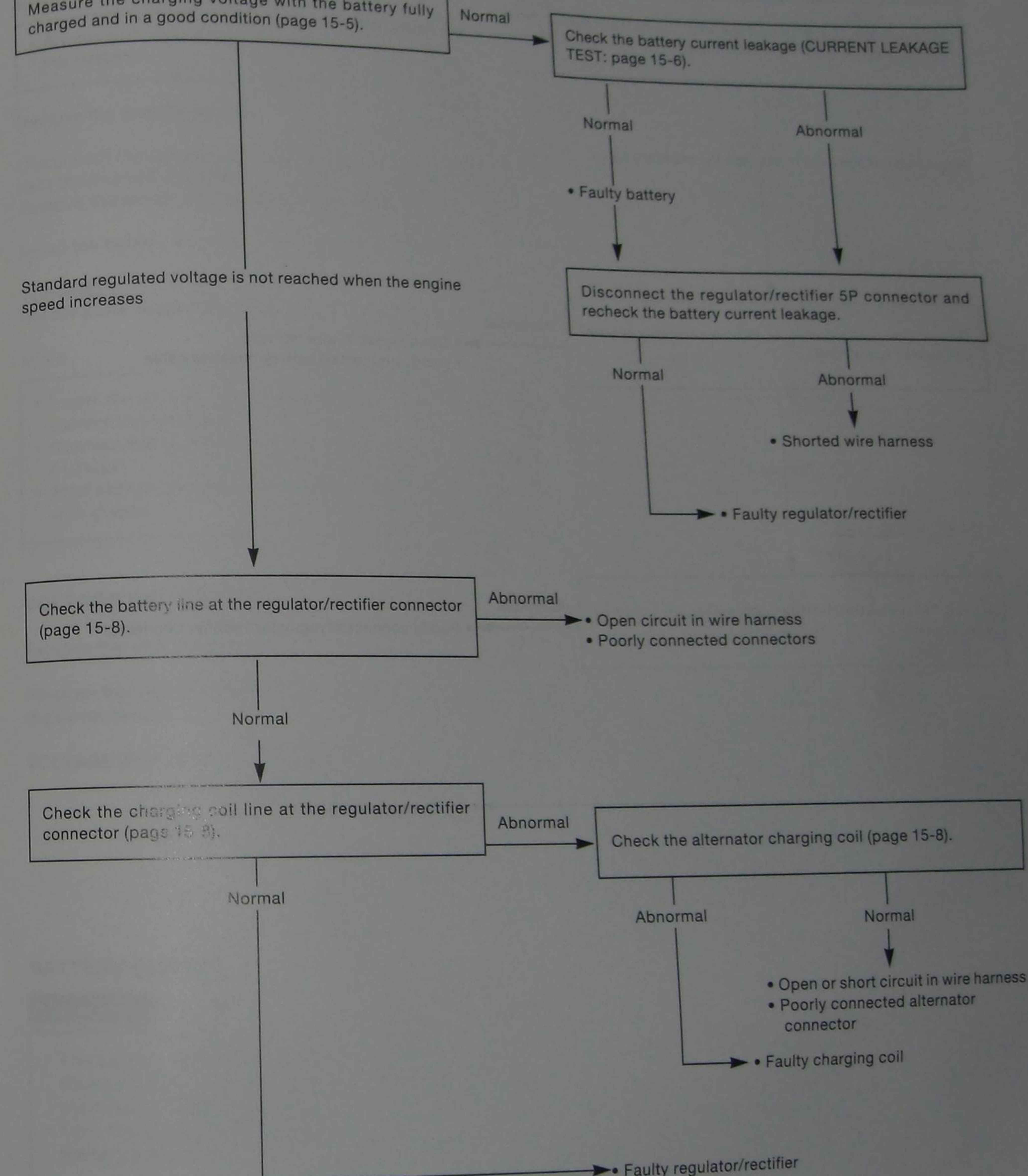
Battery holder plate screw 3 N·m (0.3 kgf-m, 2.2 lbf-ft)

BATTERY/CHARGING SYSTEM

Troubleshooting

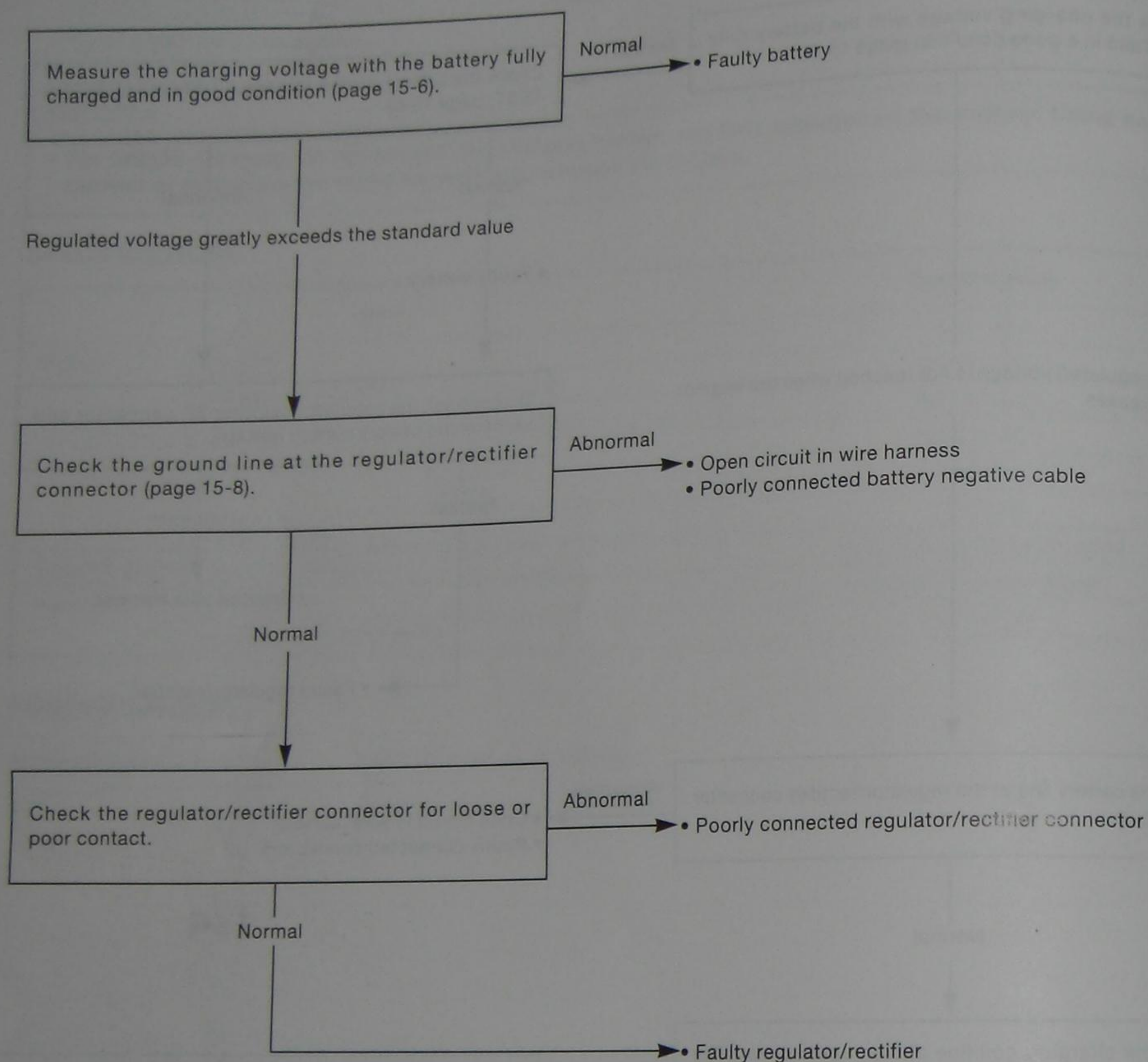
Battery undercharging (voltage not raised to regulated voltage)

Measure the charging voltage with the battery fully charged and in a good condition (page 15-5).



BATTERY/CHARGING SYSTEM

Battery overcharging (regulated voltage too high)



BATTERY/CHARGING SYSTEM

Battery

REMOVAL/INSTALLATION

NOTE:

- Always turn the ignition switch OFF before removing the battery.

Remove the seat (page 2-2).

Disconnect the battery negative (-) cable first, then disconnect the positive (+) cable.
Remove the screw, holder plate and the battery.

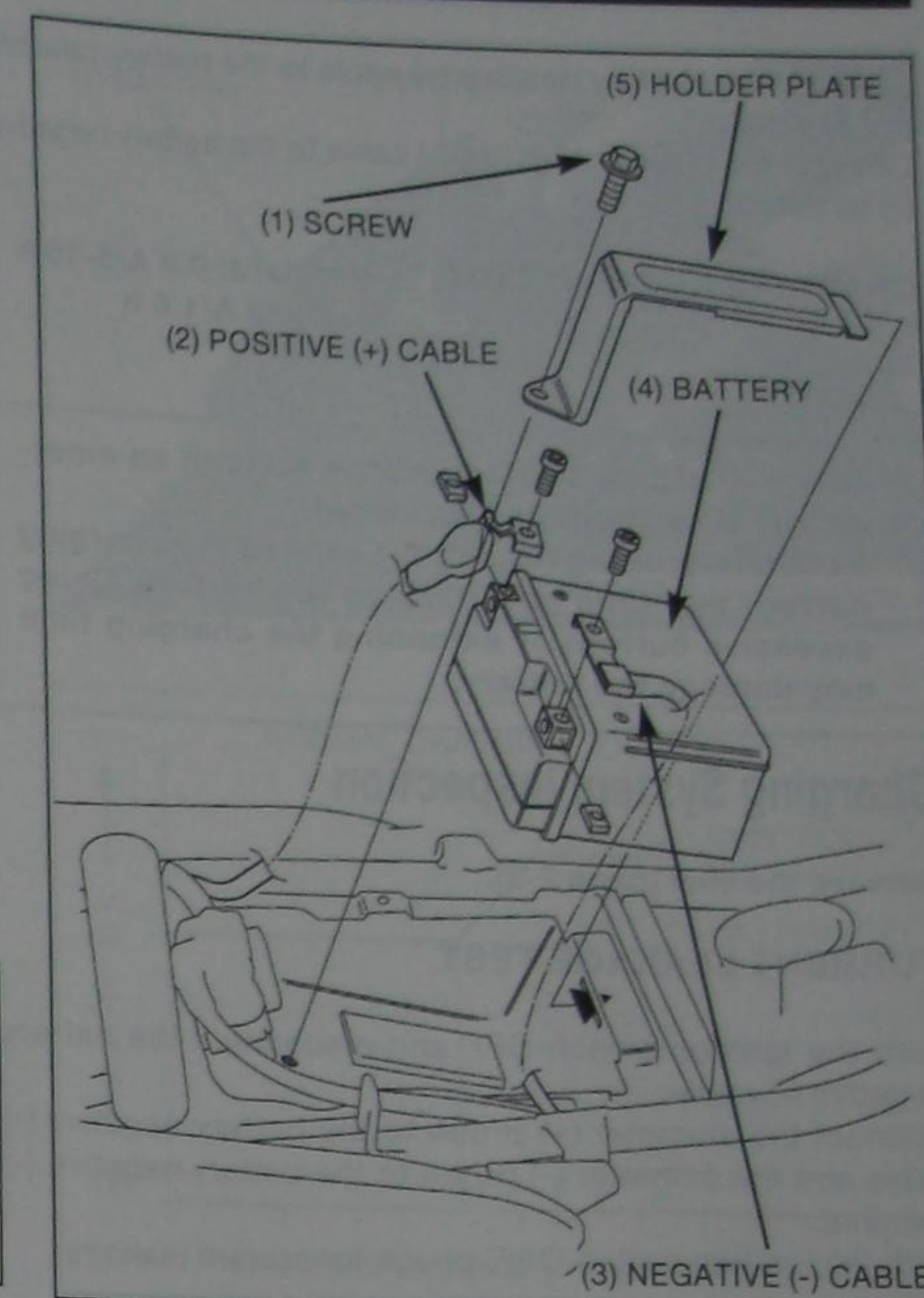
Install the battery in the reverse order of removal.

TORQUE:

Holder plate screw: 3 N·m (0.3 kgf-m, 2.2 lbf-ft)

NOTE:

- Insert the end of the holder plate into the slit in the battery tray properly.
- Connect the positive (+) cable first, then the negative (-) cable.
- After connecting the battery cables, coat the terminals with grease.

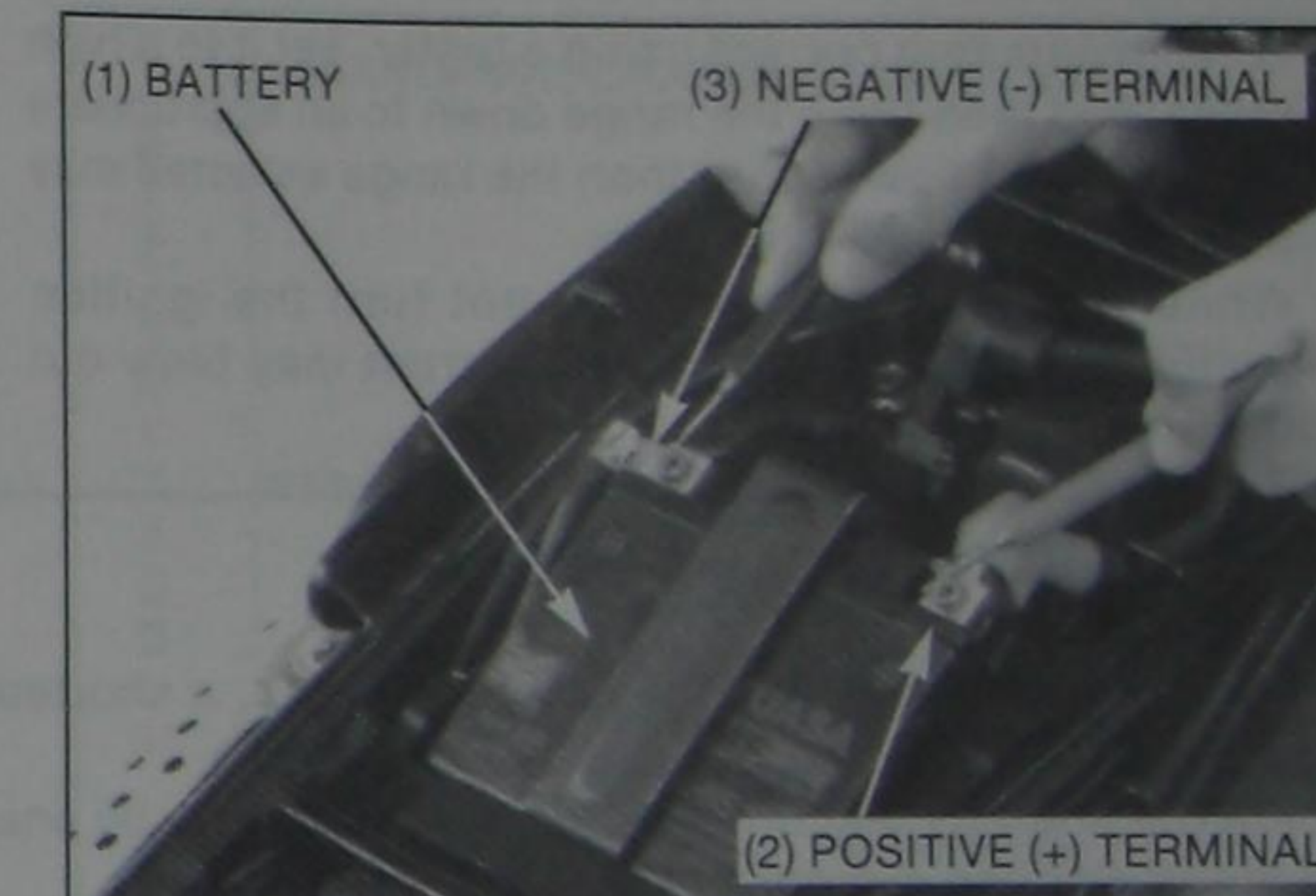


VOLTAGE INSPECTION

Remove the seat (page 2-2).

Measure the battery voltage using a commercially available digital multimeter.

VOLTAGE (20°C/68°F): Fully charged: Above 12.8 V
Under charged: Below 12.3 V



BATTERY CHARGING

⚠ WARNING

- The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.
- Turn the power ON/OFF at the charger, not at the battery terminals.

Remove the battery.

BATTERY/CHARGING SYSTEM

Connect the charger positive (+) cable to the battery positive (+) terminal.
Connect the charger negative (-) cable to the battery negative (-) terminal.

CHARGING CURRENT/TIME: Standard: 0.5 A/5-10 h
Quick: 5 A/1.0 h

CAUTION

- Quick charging should only be done in an emergency; slow charging is preferred.
- For battery charging, do not exceed the charging current and time specified on the battery. Using excessive current or extending the charging time may damage the battery.

Charging System Inspection

Remove the seat (page 2-2).

CURRENT LEAKAGE TEST

Turn the ignition switch OFF and disconnect the battery negative (-) cable.

Connect the ammeter (+) probe to the battery negative (-) cable and the ammeter (-) probe to the battery negative (-) terminal.

With the ignition switch OFF, check for current leakage.

NOTE:

- When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level. Current flow higher than the range selected may blow out the fuse in the tester.
- While measuring current, do not turn the ignition switch ON. A sudden surge of current may blow out the fuse in the tester.

CURRENT LEAKAGE: 0.1 mA maximum

If current leakage exceeds the specified value, a shorted circuit is likely.

Locate the short by disconnecting connections one by one and measuring the current.

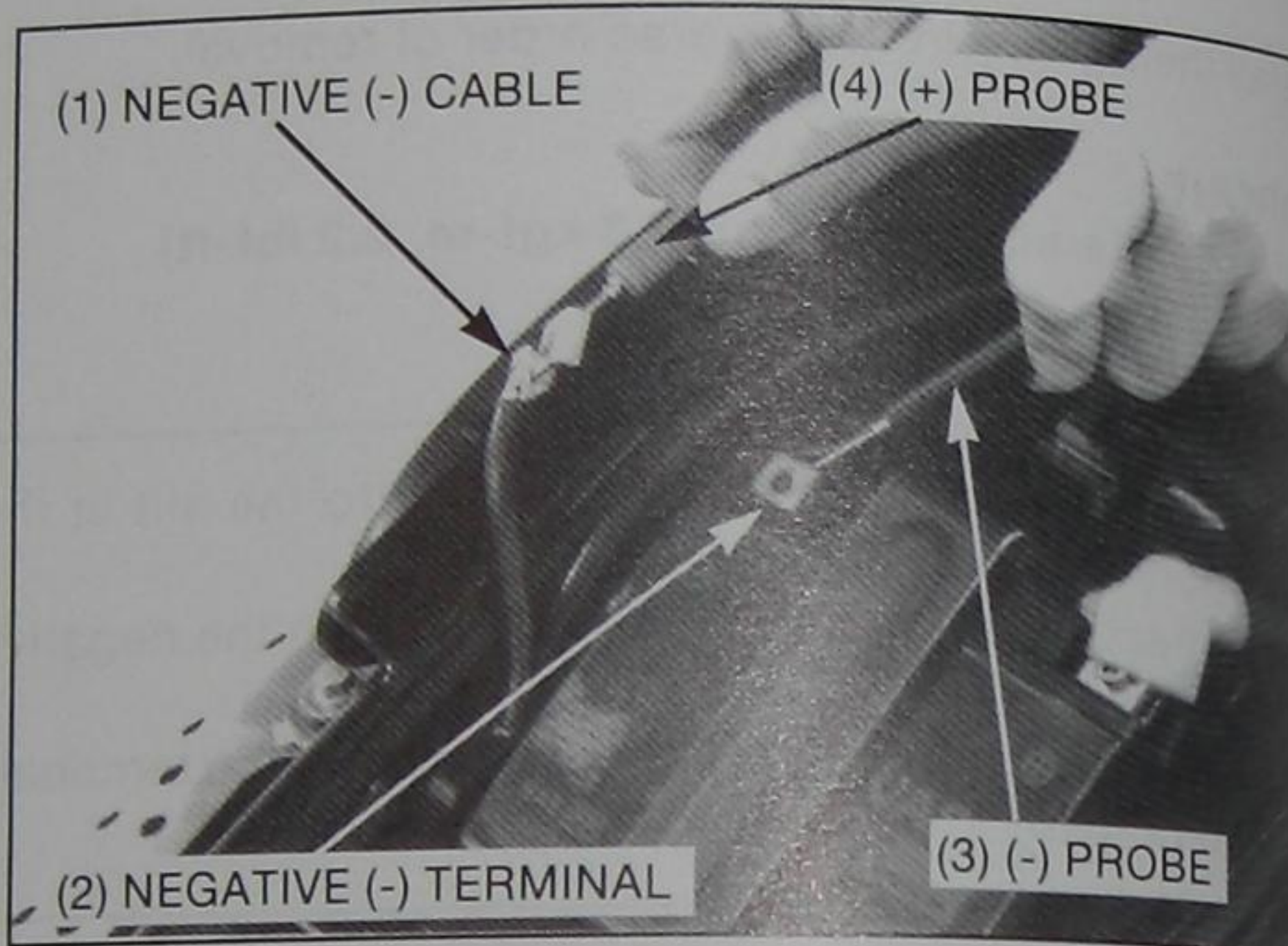
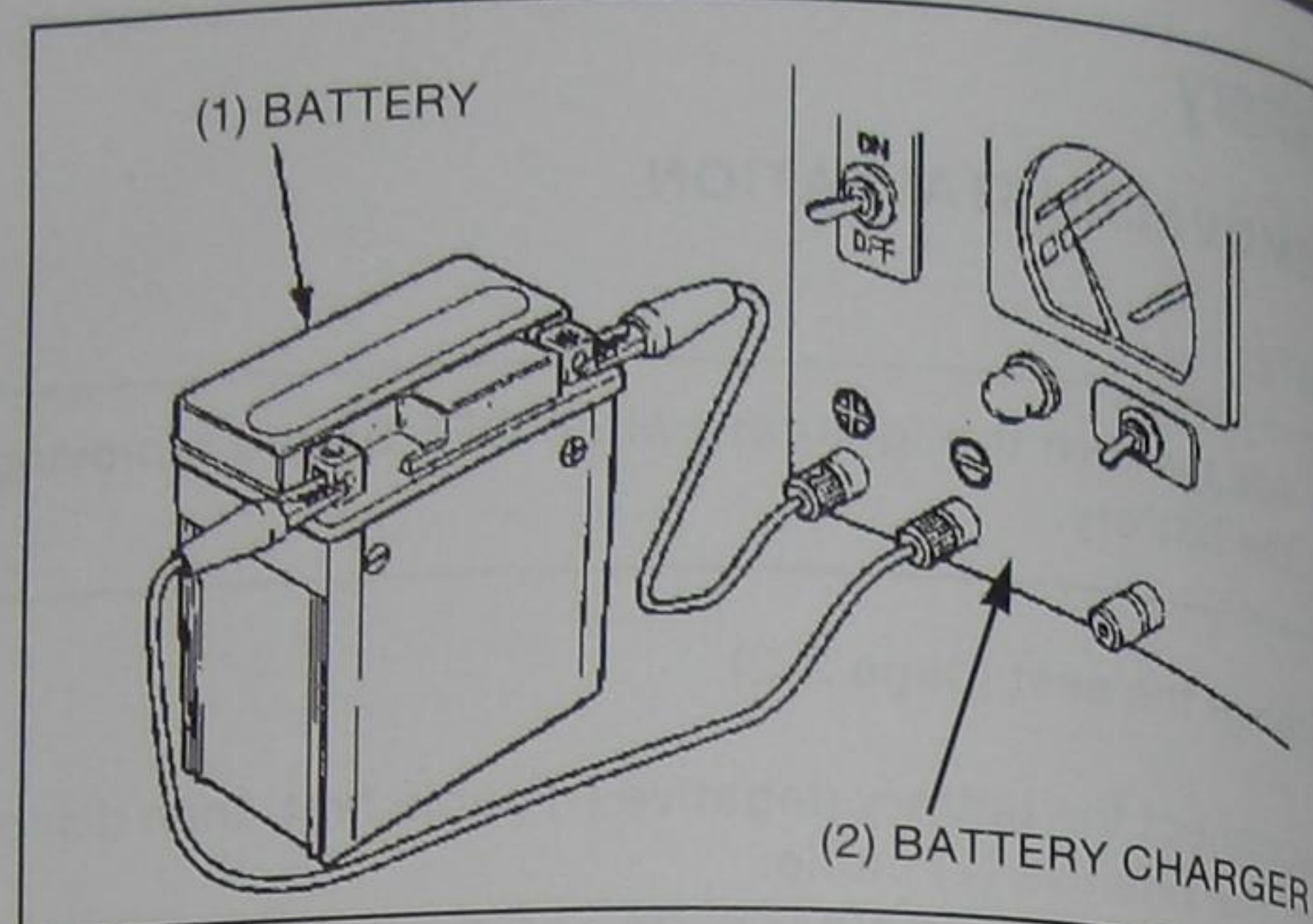
REGULATED VOLTAGE INSPECTION

NOTE:

- Be sure that the battery is in good condition before performing this test.

WARNING

- If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.



Start the engine and warm it up to the operating temperature; stop the engine.
Connect the multimeter between the positive and negative terminals of the battery.

CAUTION

- To prevent short, make absolutely certain which are the positive and negative terminals or cable.
- Do not disconnect the battery or any cable in the charging system without first switching off the ignition switch. Failure to follow this precaution can damage the tester or electrical components.

With the headlight high beam, restart the engine. Measure the voltage on the multimeter when the engine runs at 5,000 min⁻¹ (rpm).

REGULATED VOLTAGE: 14.0-14.8 V/5,000 min⁻¹ (rpm)

The charging system is normal if the voltage reads the regulated voltage on the tester.

NOTE:

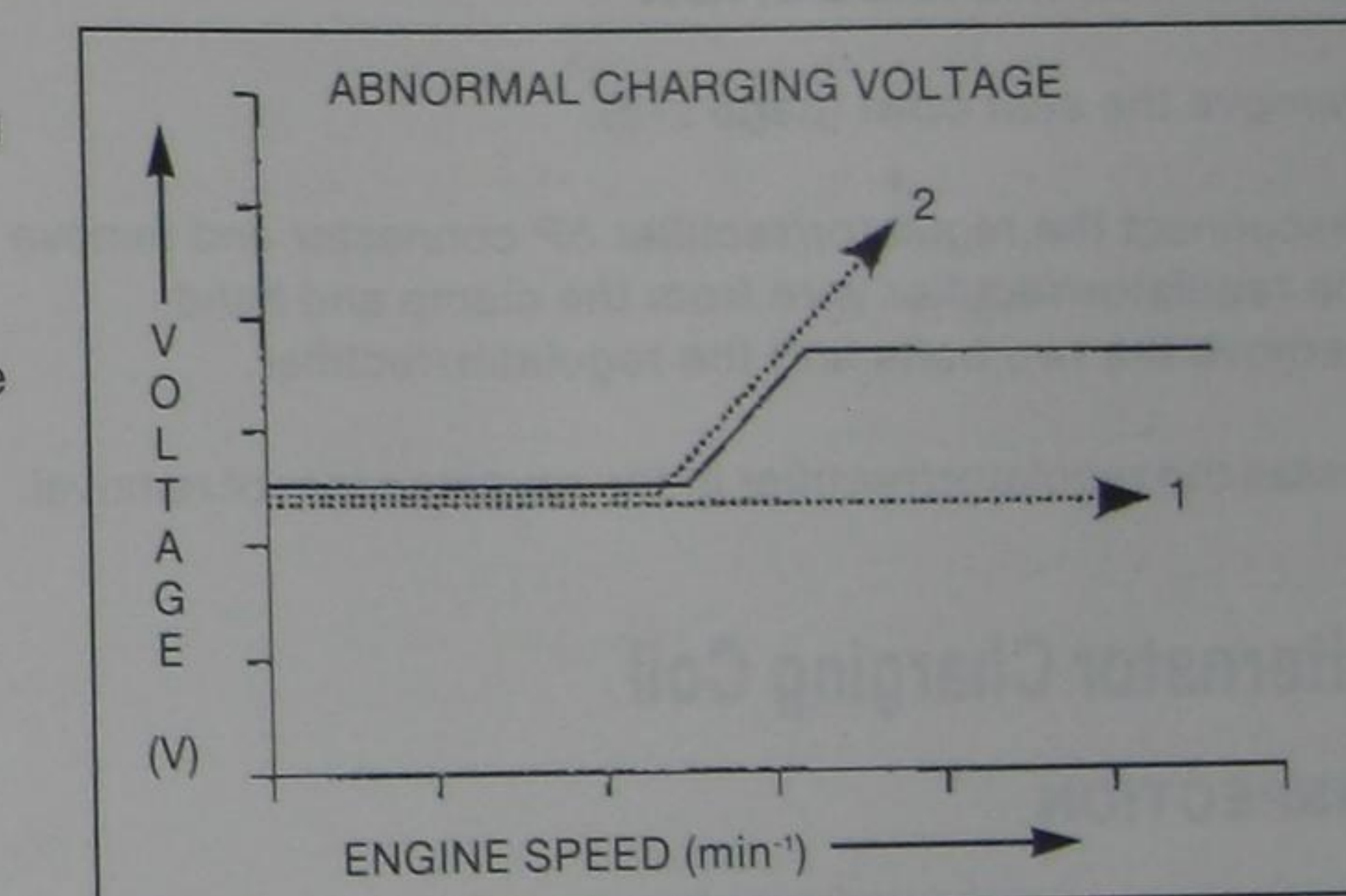
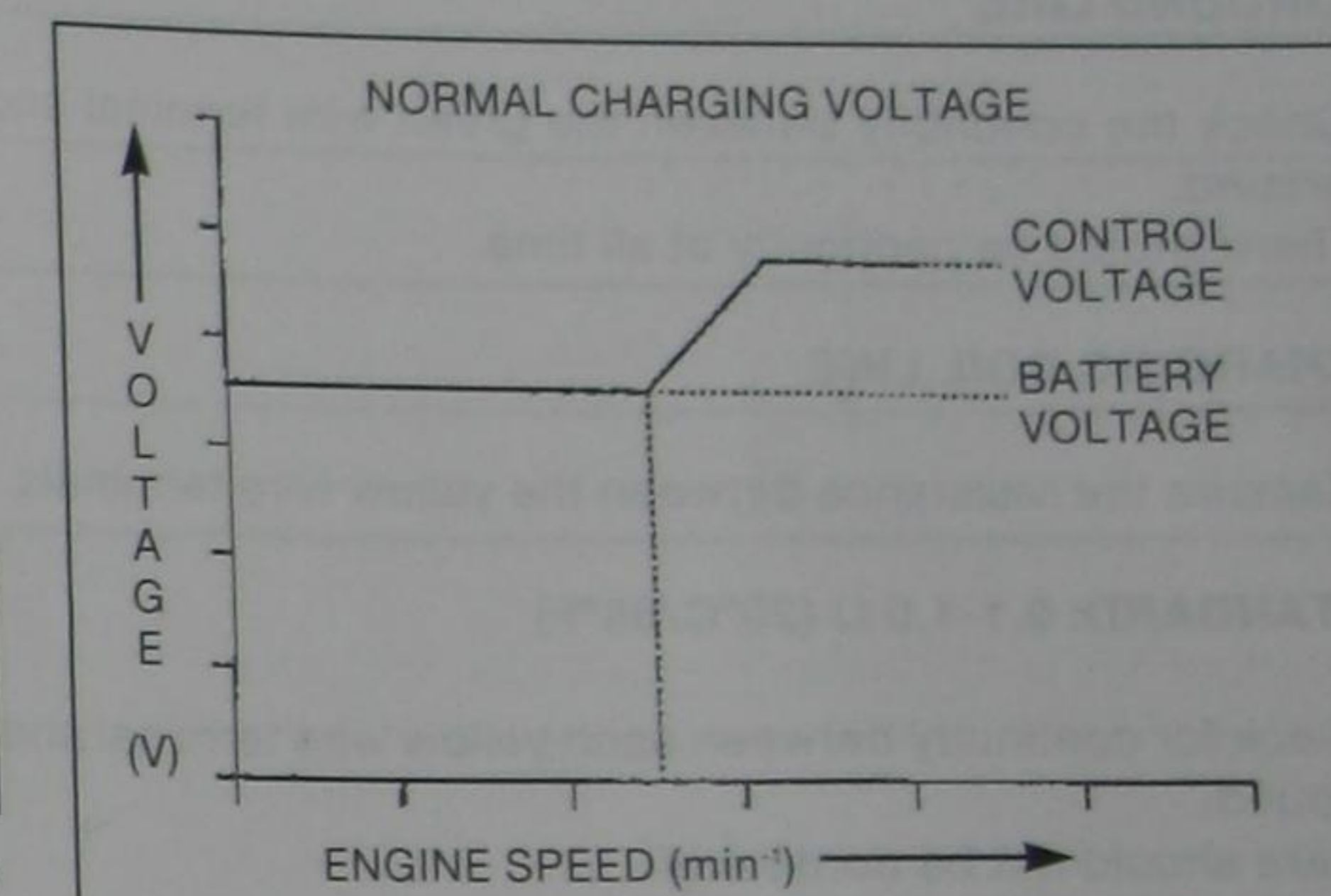
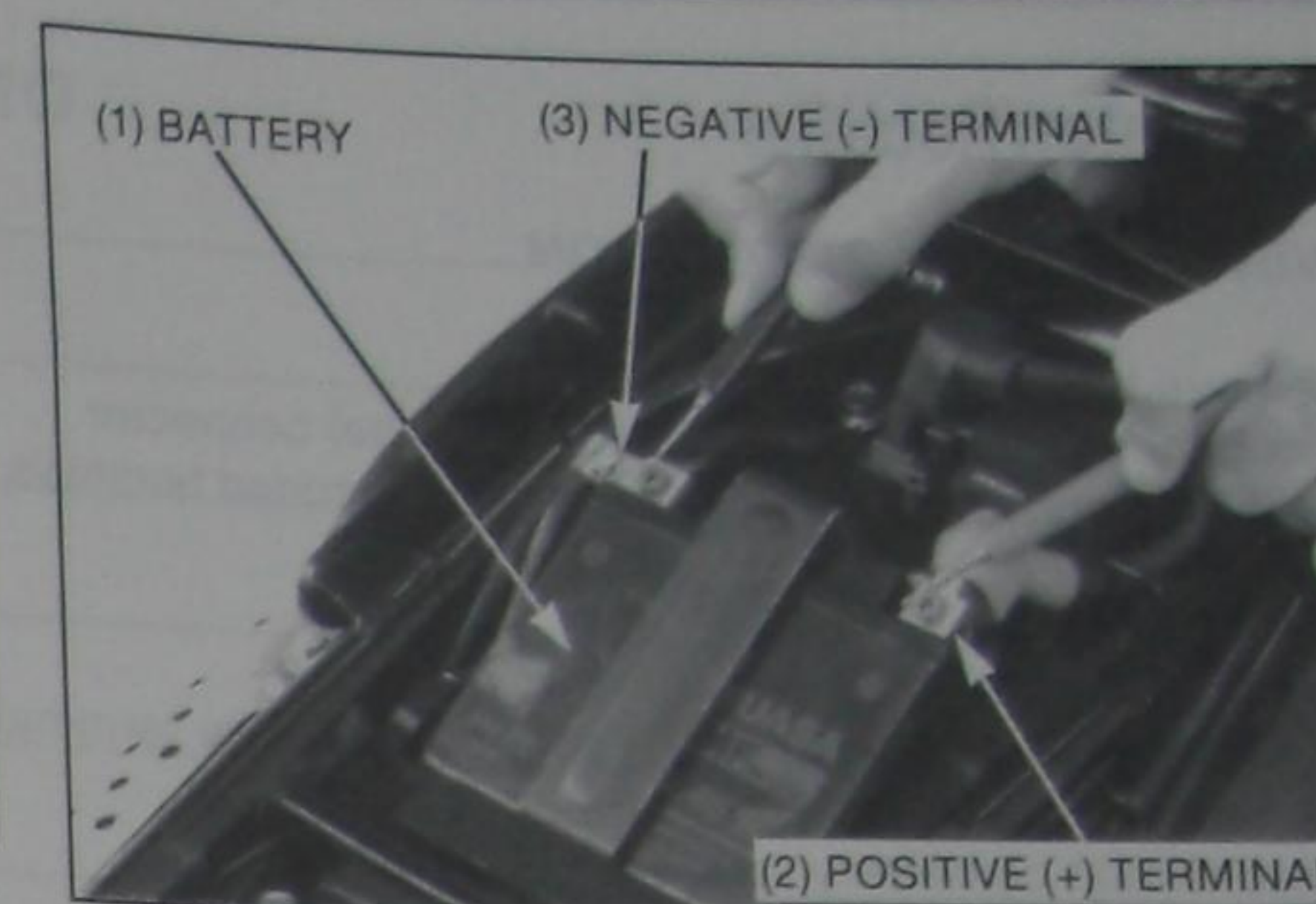
- The speed at which voltage starts to rise cannot be checked as it varies with the temperature and loads on the alternator.

A frequently discharged battery is an indication that it is deteriorated even if it proves normal in the regulated voltage inspection.

The charging circuit may be abnormal if any of the following symptoms is encountered:

1. Voltage not raised to regulated voltage (page 15-3)
 - Open or short circuit in the charging system wire harness or poorly connected connector
 - Open or shorted alternator
 - Faulty regulator/rectifier
2. Regulated voltage too high (page 15-4)
 - Poorly grounded regulator/rectifier
 - Faulty battery
 - Faulty regulator/rectifier

BATTERY/CHARGING SYSTEM



BATTERY/CHARGING SYSTEM

Regulator/Rectifier

WIRE HARNESS INSPECTION

Remove the seat cowl (page 2-3).
Disconnect the regulator/rectifier 5P (white) connector.
Check the connector for loose contact or corroded terminals.

BATTERY LINE

Measure the voltage between the red/white wire terminal and ground.
There should be battery voltage at all time.

GROUND LINE

Check the continuity between the green wire terminal and ground.
There should be continuity at all time.

CHARGING COIL LINE

Measure the resistance between the yellow wire terminals.

STANDARD: 0.1-1.0 Ω (20°C/68°F)

Check for continuity between each yellow wire terminal and ground.
There should not be continuity.

REMOVAL/INSTALLATION

Remove the seat cowl (page 2-3).

Disconnect the regulator/rectifier 5P connector and remove the regulator/rectifier wire from the clamp and band.
Remove the two bolts and the regulator/rectifier.

Install the regulator/rectifier in the reverse order of removal.

Alternator Charging Coil

INSPECTION

Remove the left side cover (page 2-3).

Disconnect the alternator 3P (black) connector.

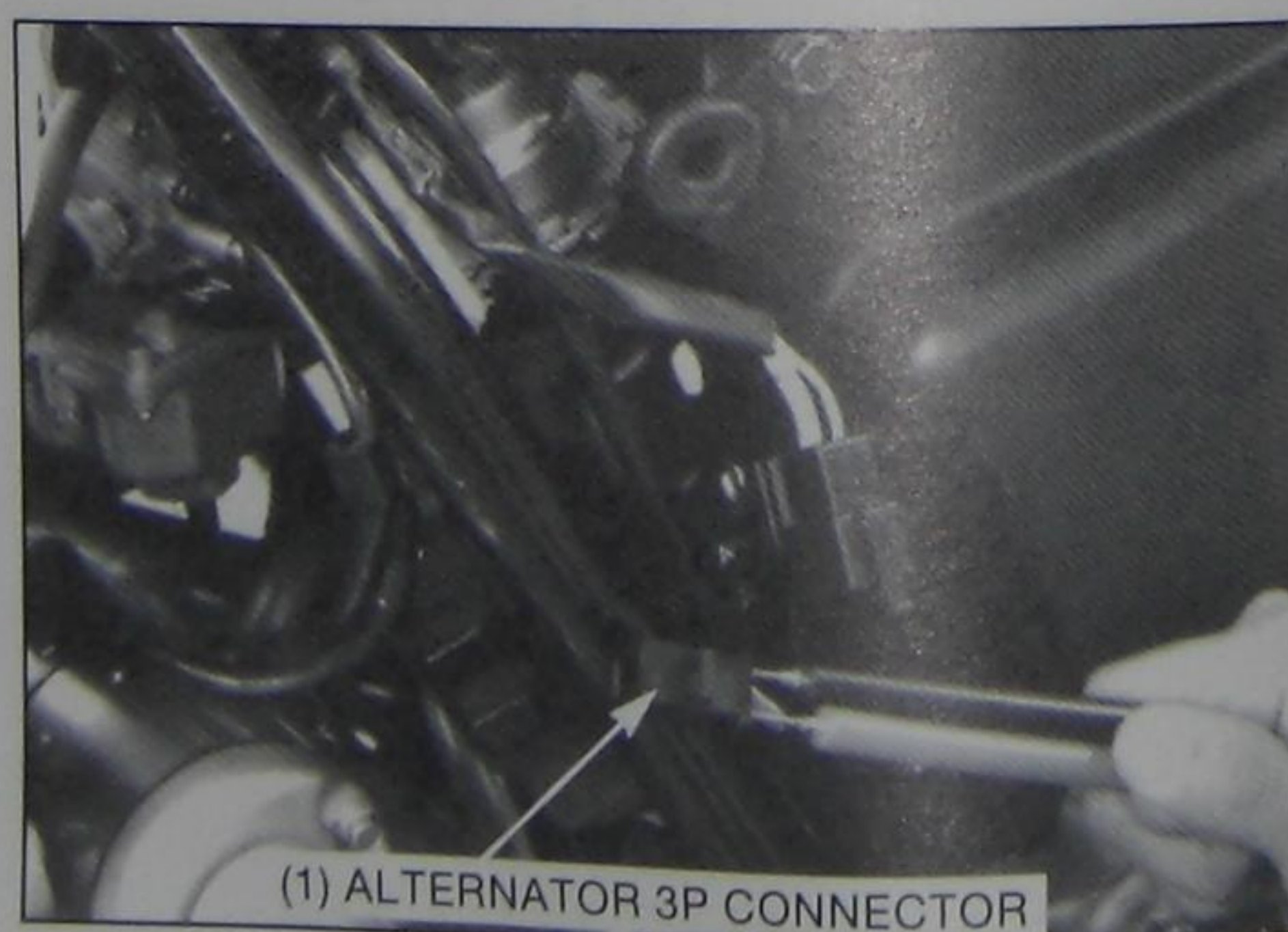
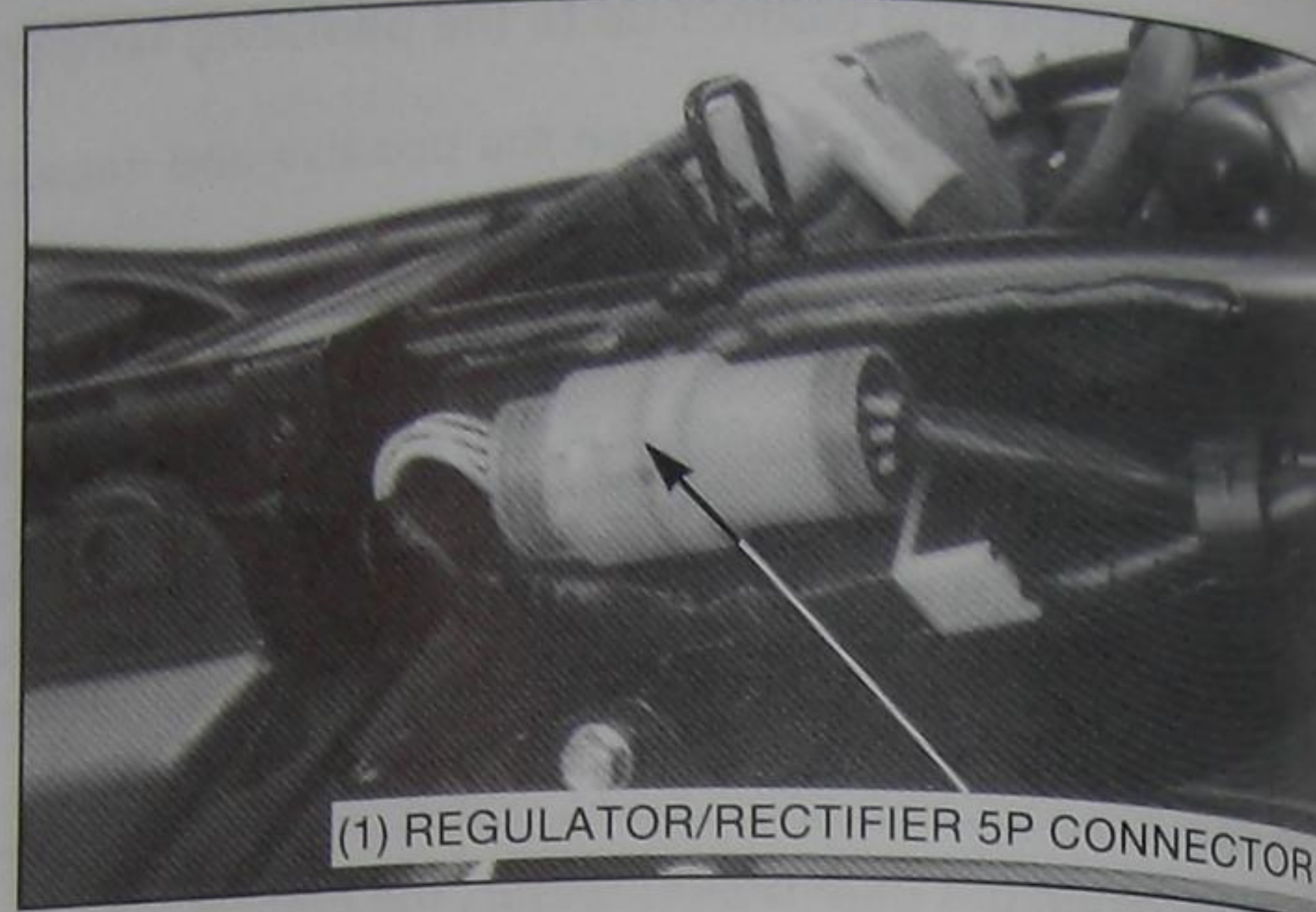
Measure the resistance between the wire terminals of the alternator side connector.

STANDARD: 0.1-1.0 Ω (20°C/68°F)

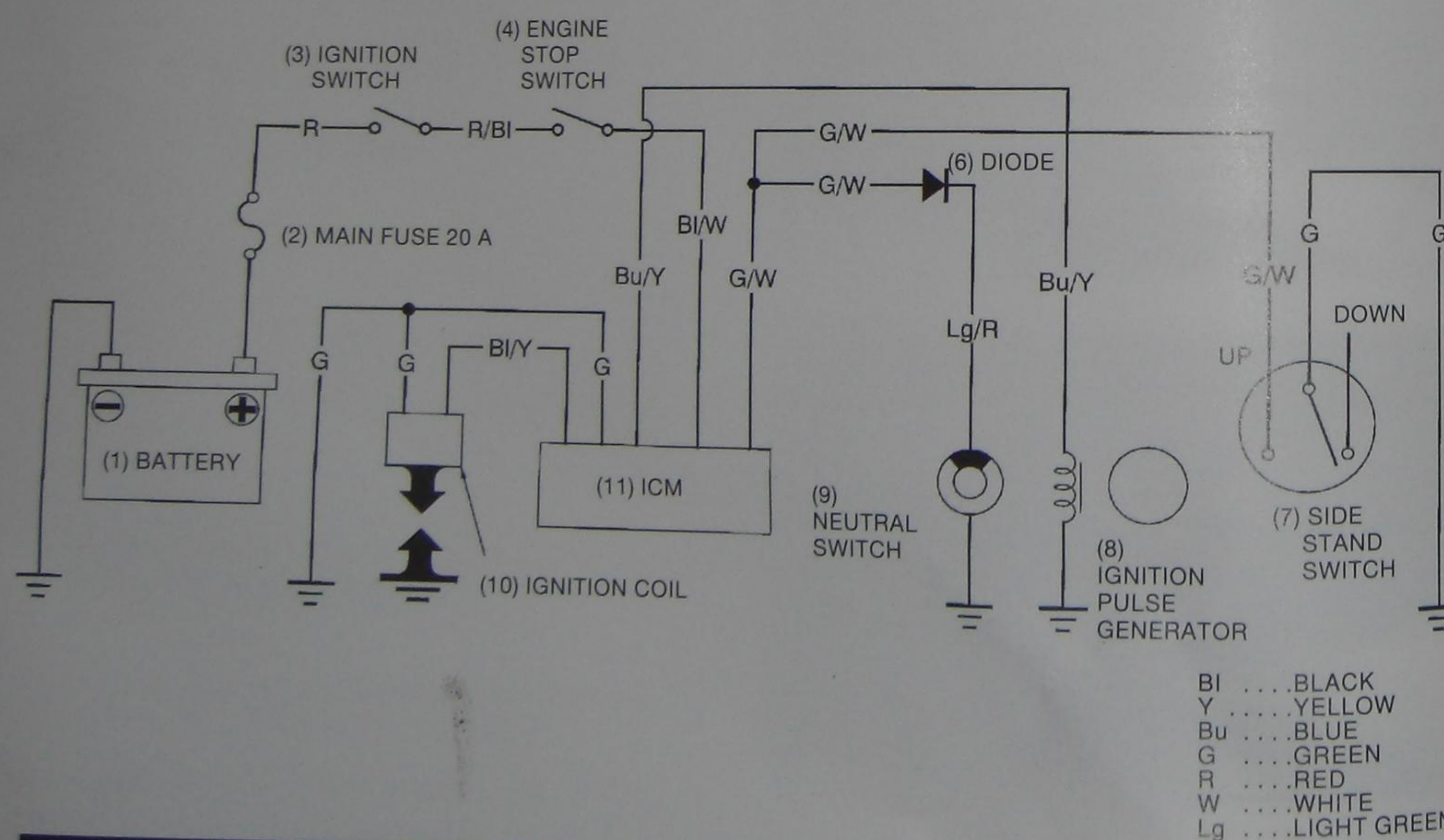
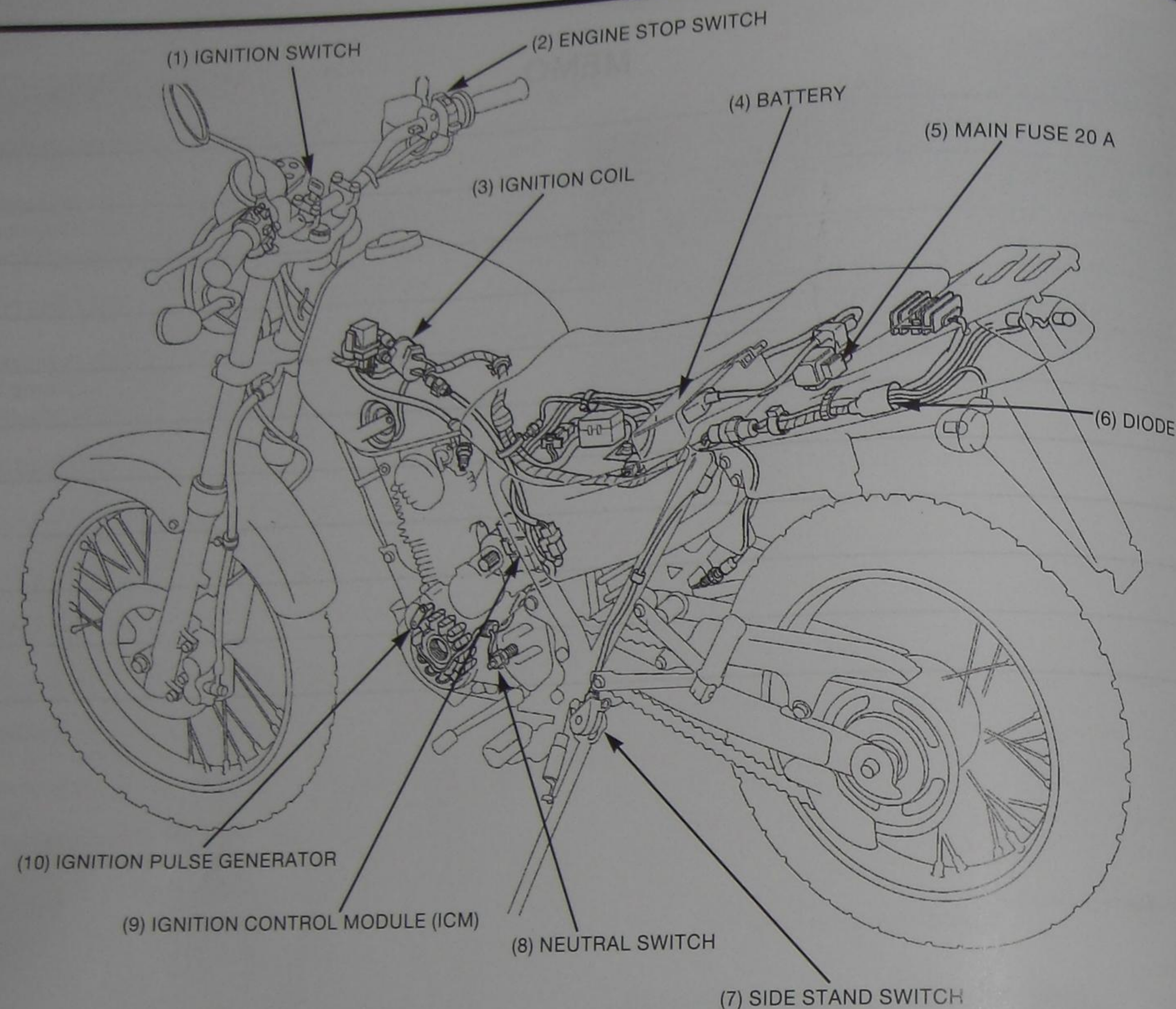
Check for continuity between each wire terminal of the alternator side connector and ground.
There should be no continuity.

Replace the alternator stator if resistance is out of specification, or if any wire has continuity to ground.

Refer to section 10 for alternator stator replacement.



MEMO



16. Ignition System

SERVICE INFORMATION

16-1	IGNITION TIMING	16-4
16-2	IGNITION COIL	16-5
16-3	IGNITION CONTROL MODULE (ICM)	16-5

Service Information

GENERAL

CAUTION

- Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is On and current is present.

- When servicing the ignition system, always follow the steps in the troubleshooting on page 16-2.
- The ignition timing does not normally need to be adjusted since the ignition control module (ICM) is factory preset.
- The ICM may be damaged if dropped. Also, if the connector is disconnected when current is flowing, the excessive voltage may damage the ICM. Always turn off the ignition switch before servicing.
- A faulty ignition system is often related to poor connections. Check those connections before proceeding.
- Make sure the battery is adequately charged. Using the starter motor with a weak battery results in a slower engine cranking speed as well as no spark at the spark plugs.
- Use a spark plug of the correct heat range. Using spark plug with an incorrect heat range can damage the engine.
- For spark plug inspection, see section 3.
- For ignition pulse generator (alternator stator) removal/installation, see section 10.
- See section 18 for following components:
 - Ignition switch
 - Engine stop switch
 - Neutral switch
 - Side stand switch

SPECIFICATIONS

Item		Specifications
Spark plug	NGK	DPR8EA-9
	DENSO	X24EPR-U9
Spark plug gap		0.8-0.9 mm (0.031-0.035 in)
Ignition coil peak voltage		100 V minimum
Ignition pulse generator peak voltage		0.7 V minimum
Ignition timing ("F" mark)		15° BTDC at idle

TORQUE VALUE

Timing hole cap	10 N·m (1.0 kgf-m, 7lbf-ft)
-----------------	-----------------------------

TOOLS

Imrie diagnostic tester (model 625) or Peak voltage adaptor	07HGJ-0020100 with commercially available digital multimeter (impedance 10 MΩ/DCV minimum)
---	--

Troubleshooting

Inspect the following before diagnosing the system.

- Faulty spark plug
- Loose spark plug cap or spark plug wire connections
- Water got into the spark plug cap (Leaking the ignition coil secondary voltage)

No spark at spark plug

Unusual condition		Probable cause (Check in numerical order)
Ignition coil primary voltage	Low peak voltage	1. Incorrect peak voltage adaptor connections. (System is normal if measured voltage is over the specifications with reverse connections.) 2. The multimeter impedance is too low; below 10MΩ/DCV. 3. Cranking speed is too low. (Battery is undercharged.) 4. The sampling timing of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.) 5. Poorly connected connectors or an open circuit in ignition system. 6. Faulty side stand switch or neutral switch. 7. An open circuit or loose connection in No. 6 related circuit. • Side stand switch line: green/white wire • Neutral switch line: light green/red wire 8. Faulty ignition coil. 9. Faulty ignition control module (ICM). (In case when above No. 1 thru. 8 are normal.)
	No peak voltage	1. Incorrect peak voltage adaptor connections. (System is normal if measured voltage is over the specifications with reverse connections.) 2. Battery is undercharged. (Voltage drops largely when the engine is started.) 3. Faulty ignition switch or engine stop switch. 4. Loose or poorly connected ICM connector. 5. No voltage at the black/white wire of the ICM. 6. Open circuit or poor connection in ground (green) wire of the ICM. 7. Faulty side stand switch or neutral switch. 8. An open circuit or loose connection in No. 6 related circuit. • Side stand switch line: green/white wire • Neutral switch line: light green/red wire 9. Faulty peak voltage adaptor. 10. Faulty ignition pulse generator. (Measure peak voltage.) 11. Faulty ICM. (In case when above No. 1 thru. 10 are normal.)
	Peak voltage is normal, but no spark jumps at plug	1. Faulty spark plug or leaking ignition coil secondary current ampere. 2. Faulty ignition coil.
Ignition pulse generator	No peak voltage	1. The multimeter impedance is too low; 10MΩ/DCV. 2. Cranking speed is too slow. (Battery is undercharged.) 3. The sampling timing of the tester and measured pulse were not synchronized. (System is normal if measured voltage is over the standard voltage at least once.) 4. Faulty ignition pulse generator. (In case when above No. 1 thru. 3 are normal.)
	Low peak voltage	1. Faulty peak voltage adaptor. 2. Faulty ignition pulse generator.

Ignition System Inspection

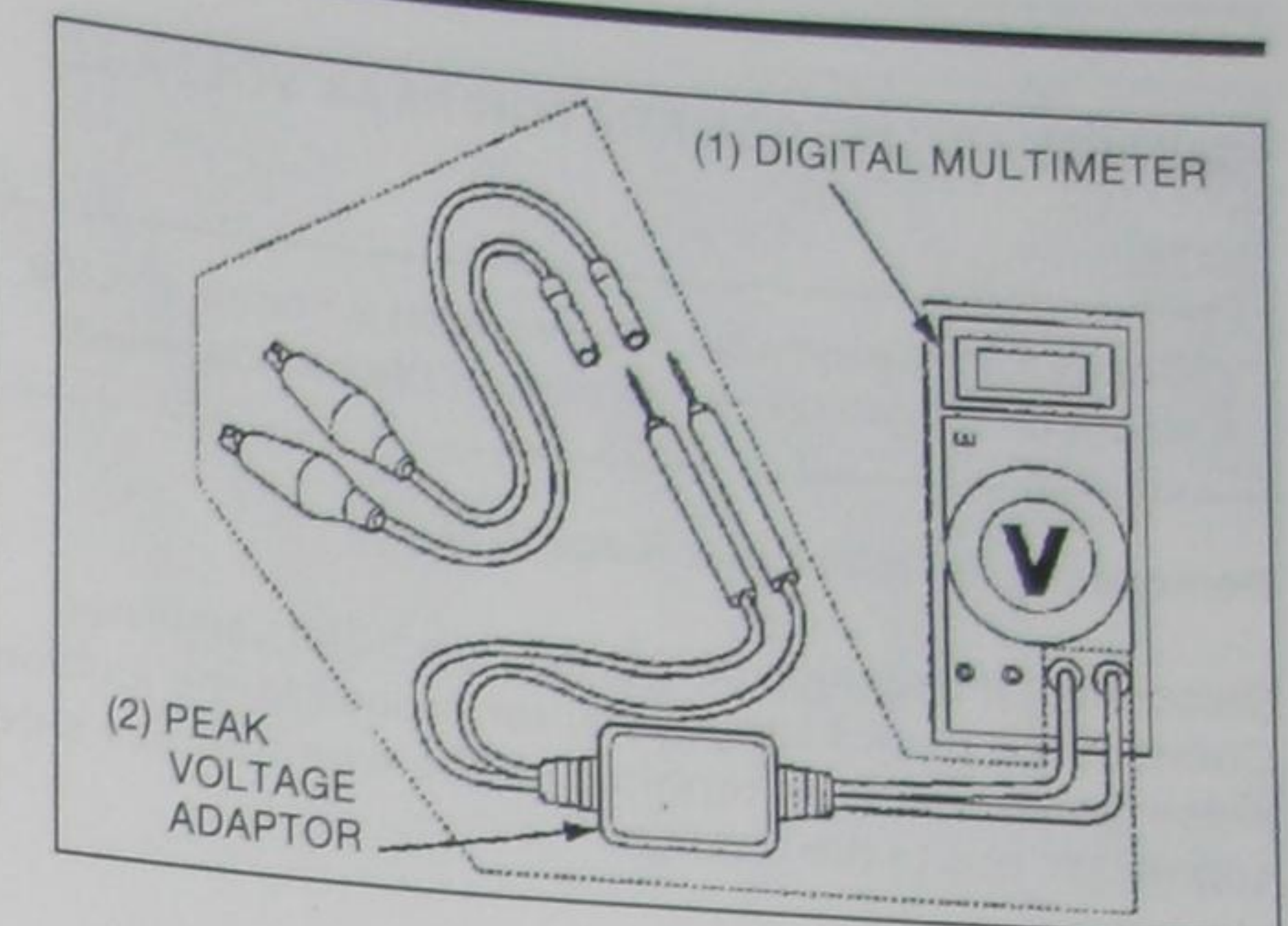
NOTE:

- If no spark jumps at the plug, check all connections for loose or poor contact before measuring each peak voltage.
- Use a commercially available digital multimeter (impedance 10 MΩ/DCV minimum).
- The display value differs depending upon the internal impedance of the multimeter.
- If the Imrie diagnostic tester (model 625) is used, follow the manufacturer's instructions.

Connect the peak voltage adaptor to the digital multimeter.

TOOL:

Imrie diagnostic tester (model 625) or
Peak voltage adaptor 07HGJ-0020100
with commercially available digital multimeter
(impedance 10 MΩ/DCV minimum)



IGNITION PRIMARY PEAK VOLTAGE

NOTE:

- Check all system connections before this inspection. Poor connected connectors can cause incorrect readings.
- Check that the cylinder compression is normal and check that the spark plug is installed correctly in the cylinder head.

Remove the fuel tank (page 2-2).

Disconnect the spark plug cap from the spark plug. Connect a good known spark plug to the spark plug cap and ground it to the cylinder head as done in a spark test.

With the connector connected, connect the peak voltage adaptor probes to the ignition coil primary terminal and ground.

Connection:

Black/yellow wire terminal (-) — ground (+)

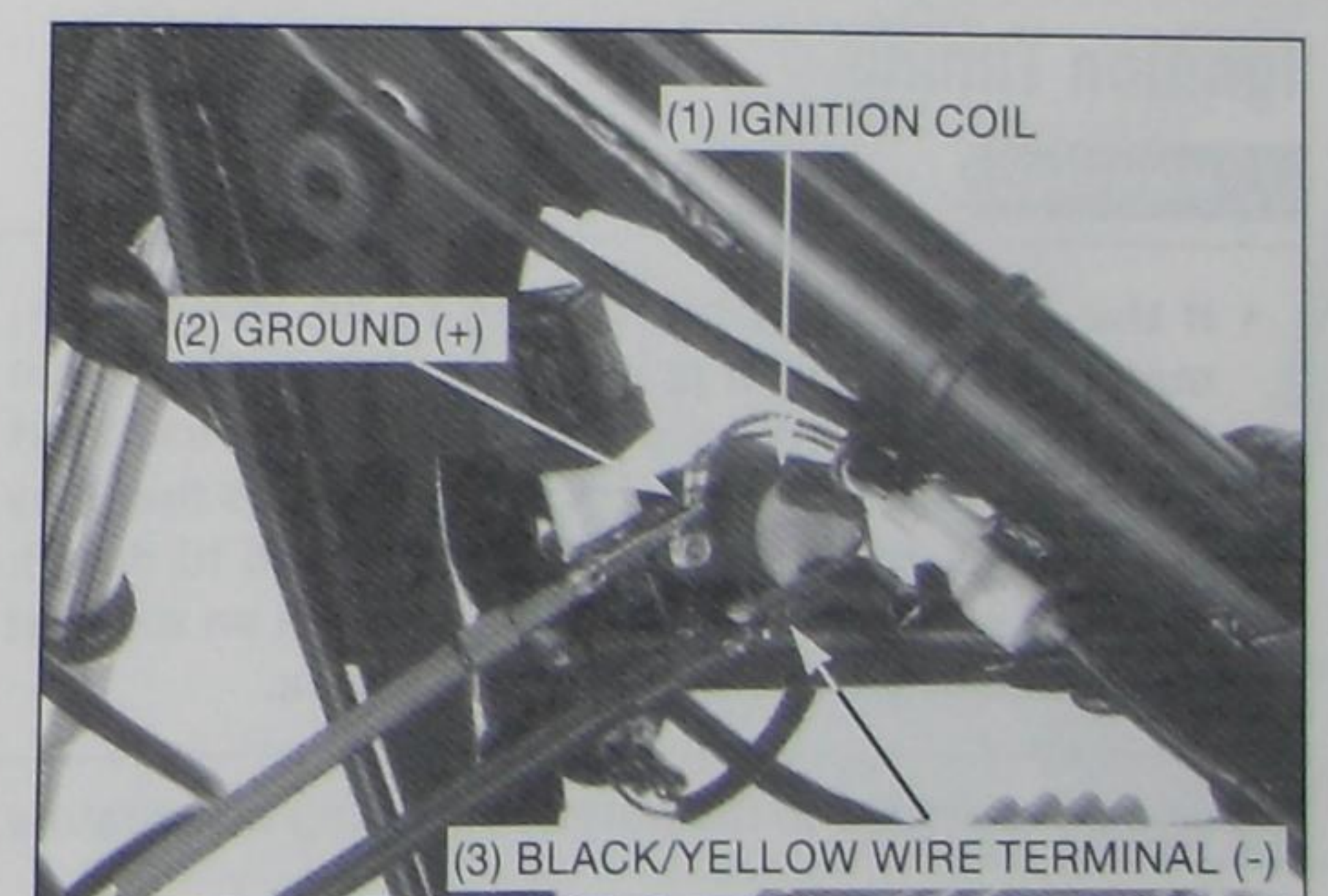
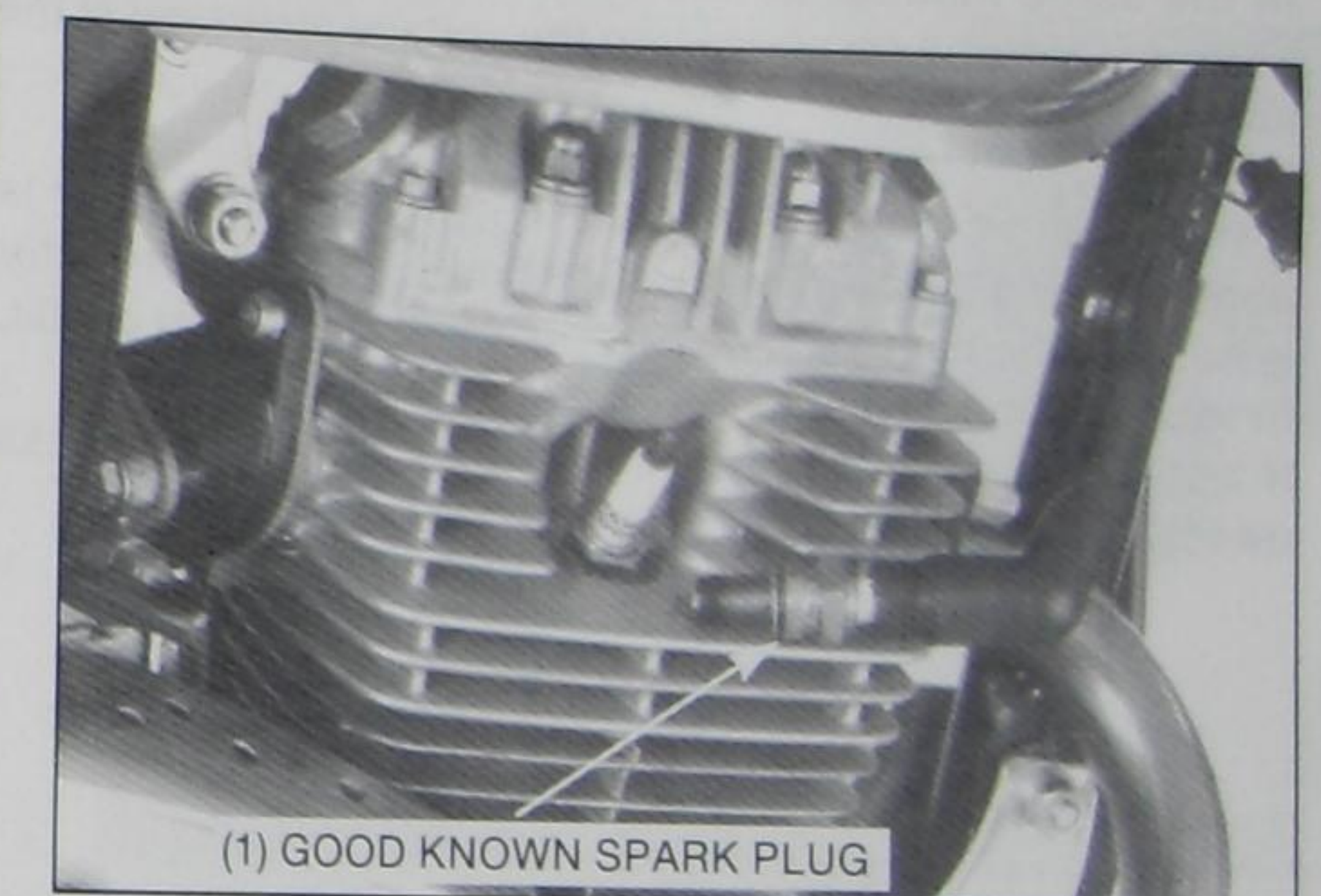
Turn the ignition switch ON and engine stop switch to RUN. Shift the transmission into neutral. Crank the engine with the starter motor and read the ignition coil primary voltage.

PEAK VOLTAGE: 100 V minimum

WARNING

- Avoid touching the spark plug and tester probes to prevent electric shock.

If the peak voltage is lower than the standard value, follow the checks described in the troubleshooting on page 16-2.



IGNITION SYSTEM

IGNITION PULSE GENERATOR PEAK VOLTAGE

NOTE:

- Check that the cylinder compression is normal and the spark plug is installed correctly in the cylinder head.

Remove the left side cover (page 2-3).

Disconnect the ignition control module (ICM) connector. Connect the peak voltage adaptor probes to the ignition pulse generator wire terminal of the wire harness side connector and to the ground.

CONNECTION:

Blue/yellow wire terminal (+) — ground (-)

Turn the ignition switch ON and engine stop switch to RUN. Crank the engine with the starter motor and read the peak voltage.

PEAK VOLTAGE: 0.7 V minimum

If the peak voltage measured at the ICM connector is abnormal, disconnect the ignition pulse generator 3P (white) connector and connect the adaptor probes to the ignition pulse generator wire terminal of the ignition pulse generator side connector and to the ground. In the same manner as the ICM connector, measure the peak voltage and compare it to the voltage measured at the ICM connector.

If the peak voltage measured at the ICM connector is abnormal and the one measured at the alternator connector is normal, the blue/yellow wire has an open or short circuit, or loose connections.

If both peak voltages are abnormal, follow the checks described in the troubleshooting on page 16-2.

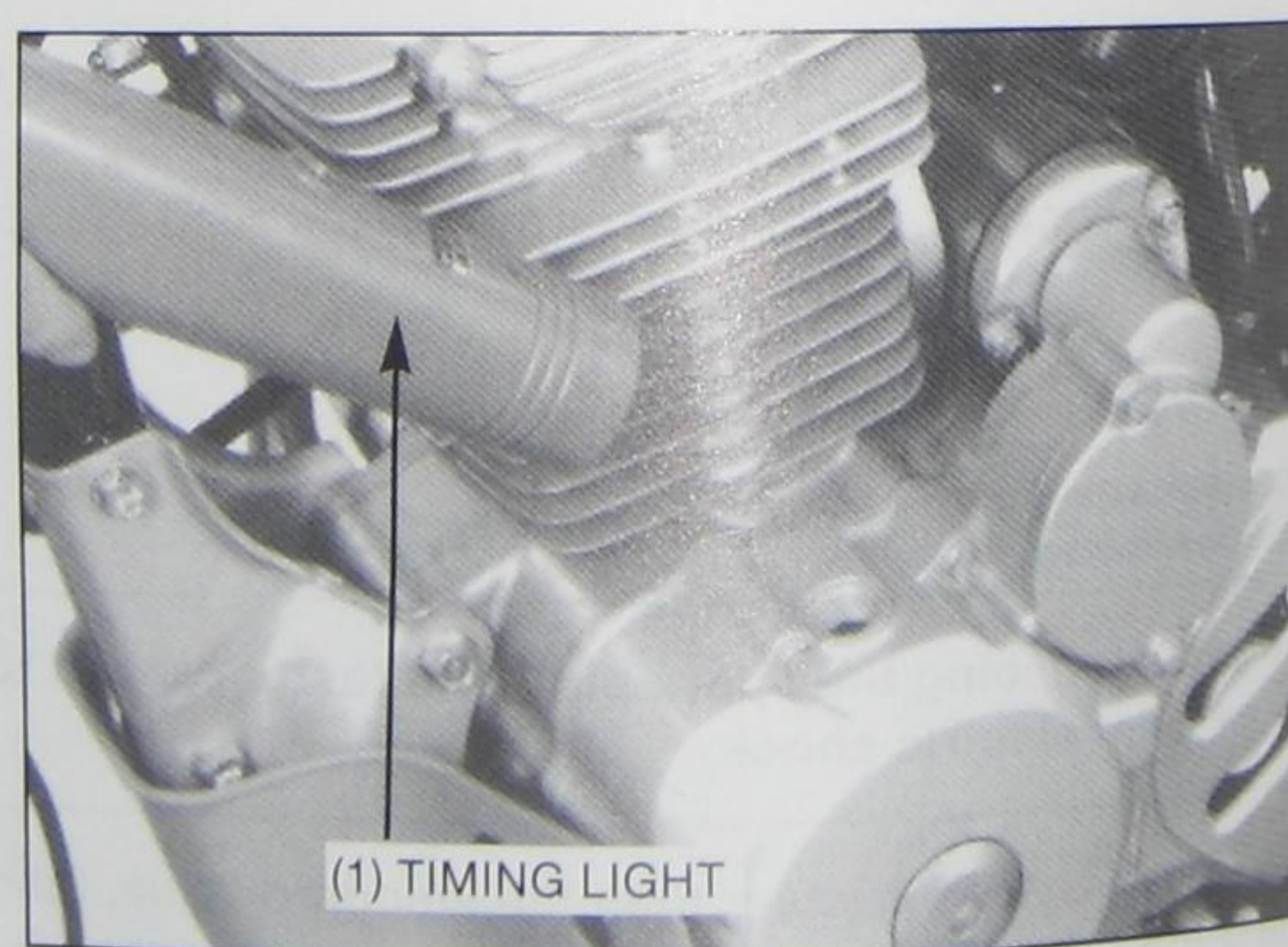
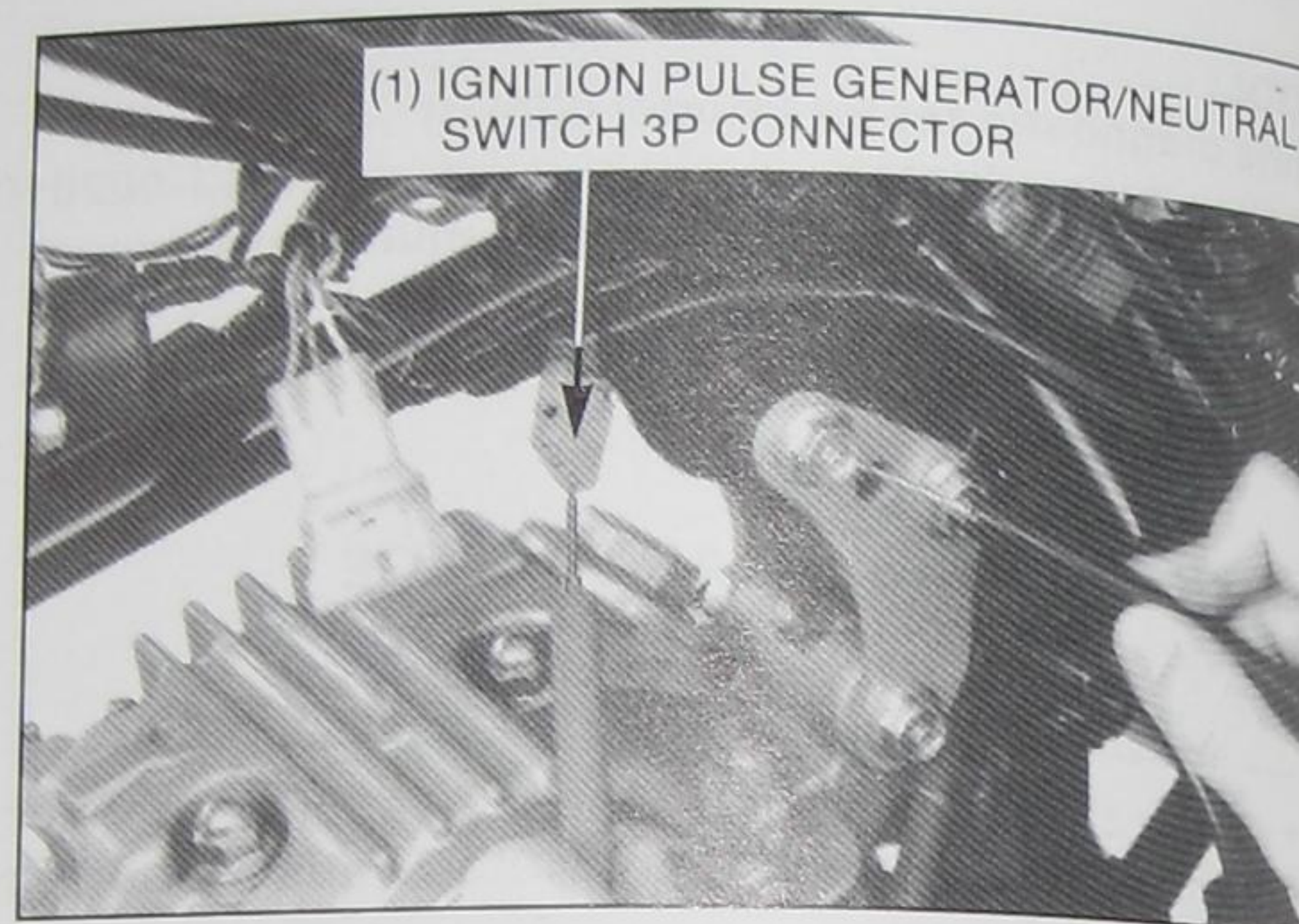
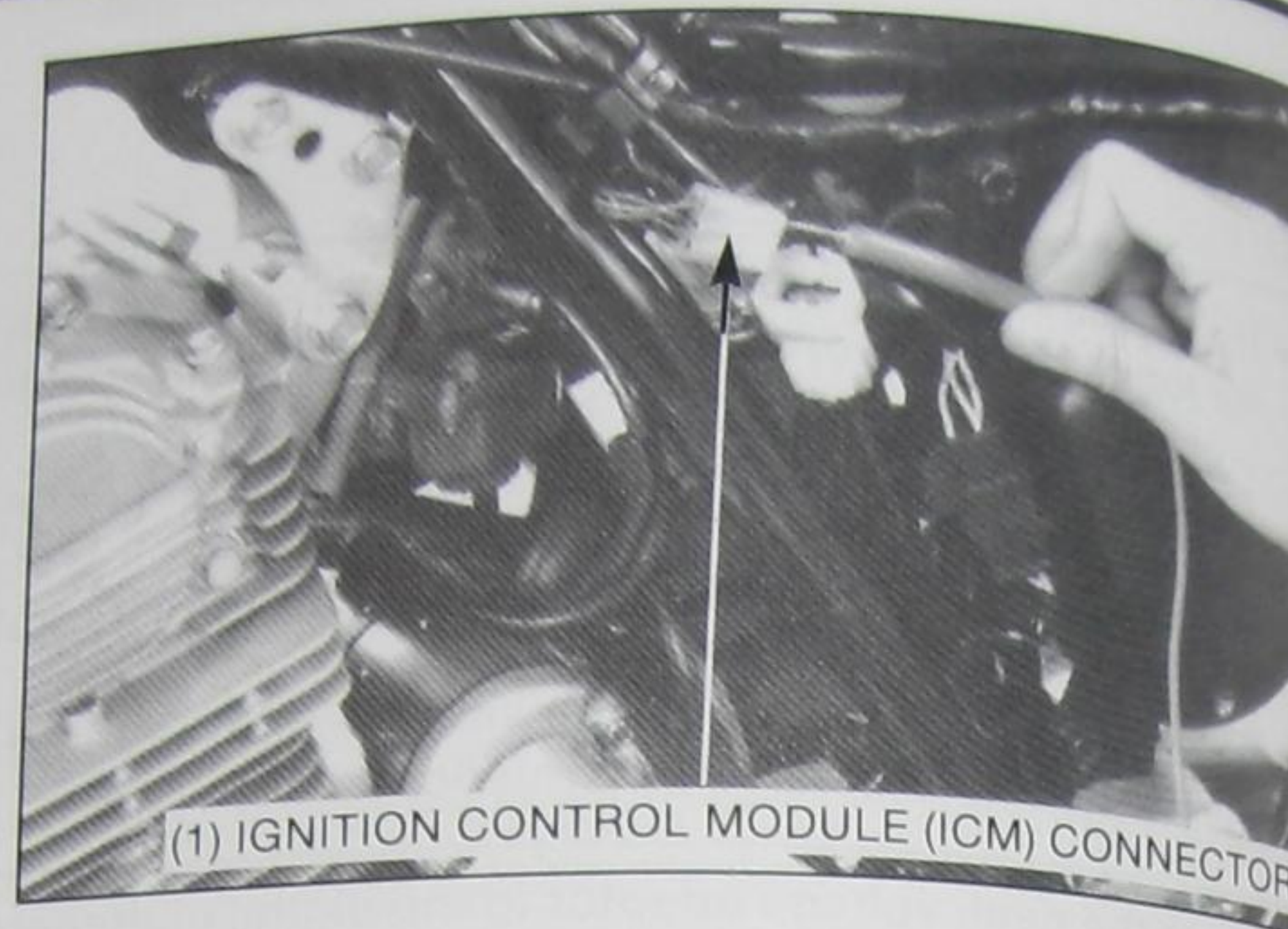
Ignition Timing

WARNING

- If the engine must be running to do some work, make sure the area is well-ventilated. Never run the engine in an enclosed area. The exhaust contain poisonous carbon monoxide gas that may cause loss of consciousness and lead to death. Run the engine in an open area or with an exhaust evacuation system in an enclosed area.

Warm up the engine to the normal operating temperature,

Remove the timing hole cap.



IGNITION SYSTEM

Connect a timing light and a tachometer.

NOTE:

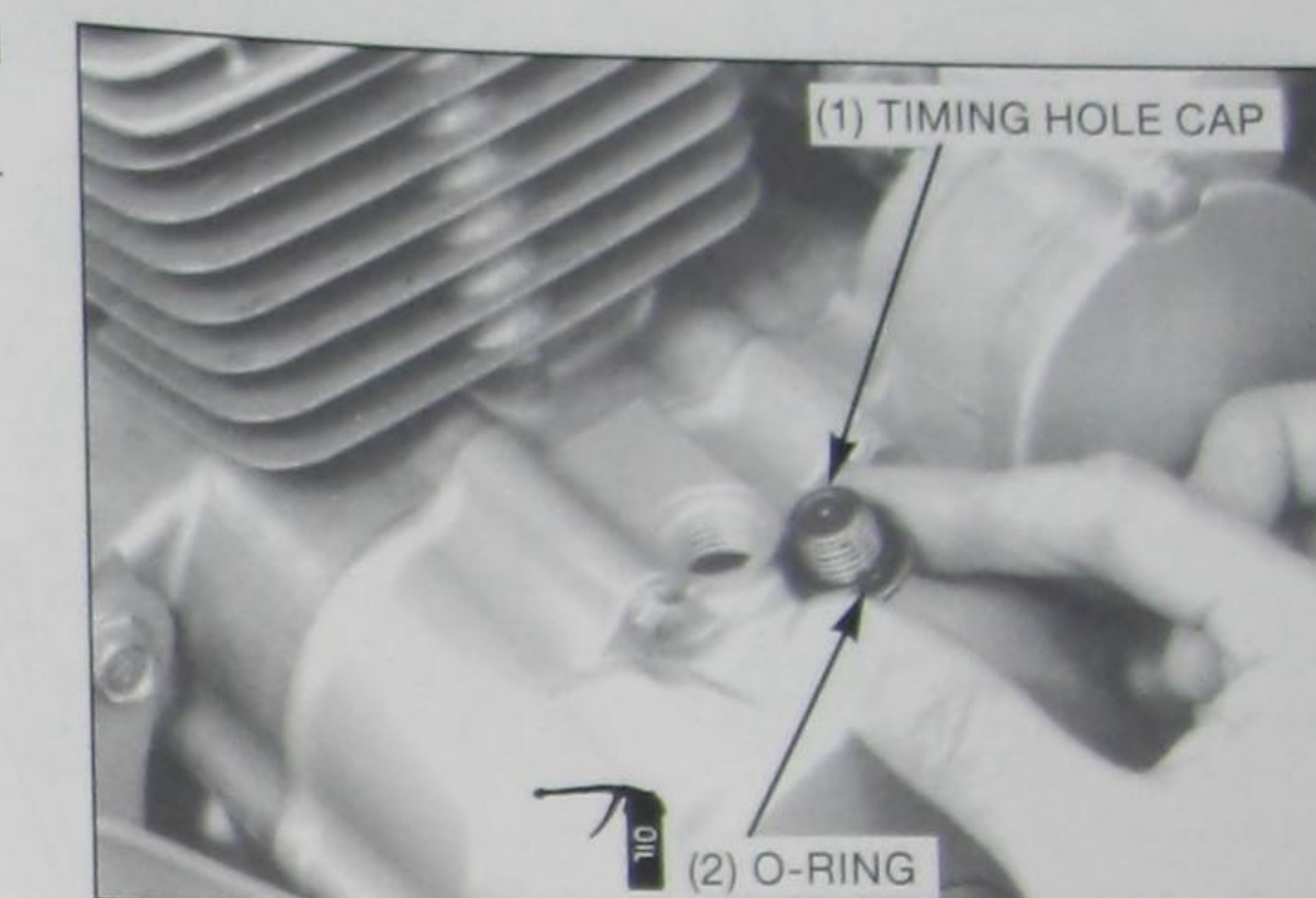
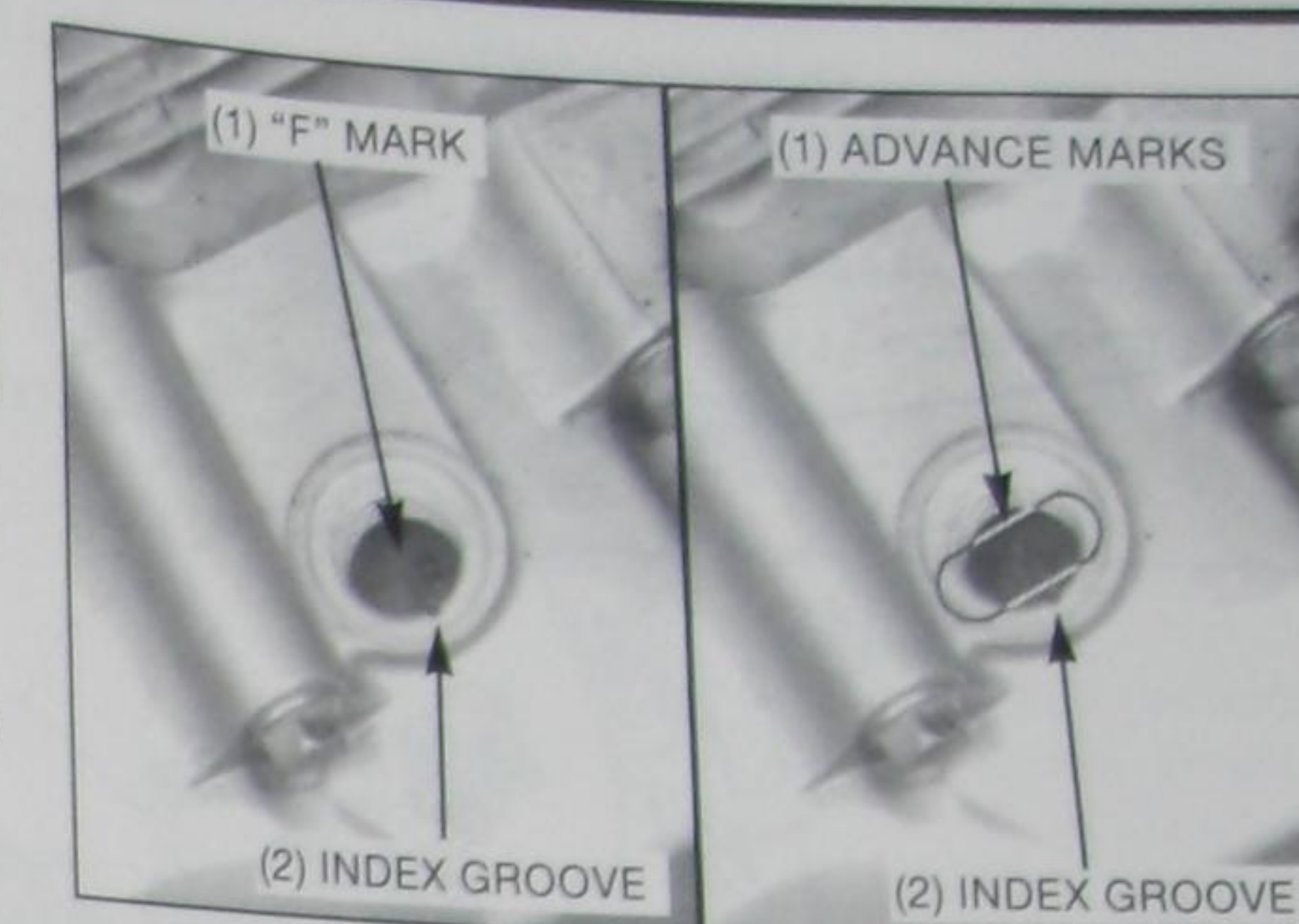
- Read the manufacturer's instructions for the timing light and tachometer.

The ignition timing is correct if the F mark on the flywheel aligns with the index groove on the left crankcase cover at idle.

Increase the engine speed and check the ignition timing at full advance. The index groove should be between the advance marks.

Make sure that the O-ring on the timing hole cap is in good condition. Apply oil to the O-ring, install the timing hole cap and tighten it.

TORQUE: 10 N·m (1.0 kgf-m, 7 lbf-ft)



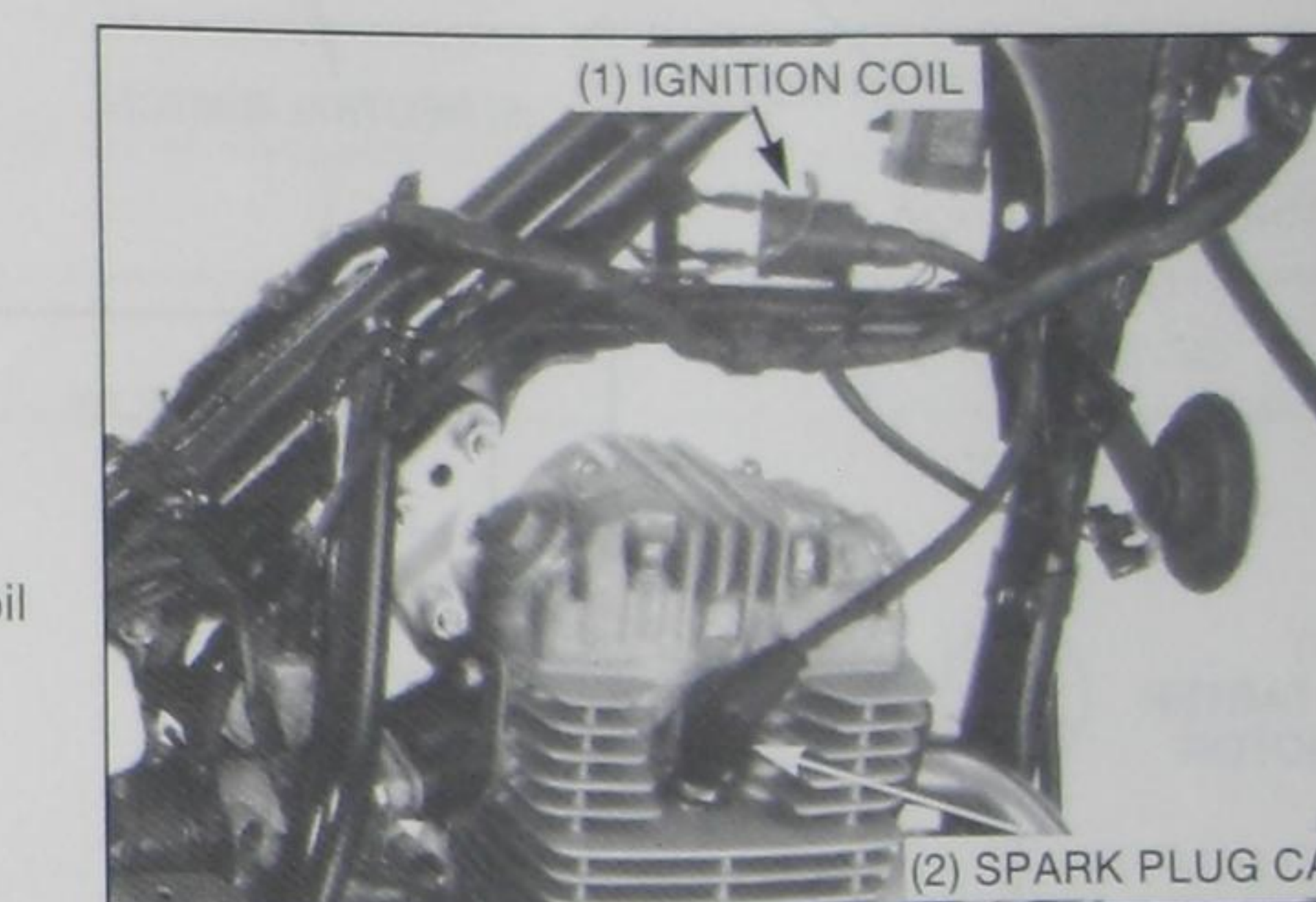
Ignition Coil

REMOVAL/INSTALLATION

Remove the fuel tank (page 2-2).

Remove the spark plug cap from the spark plug. Disconnect the ignition coil primary wire connectors. Remove the mounting bolt, ground wire and the ignition coil from the frame.

Install the ignition coil in the reverse order of removal.



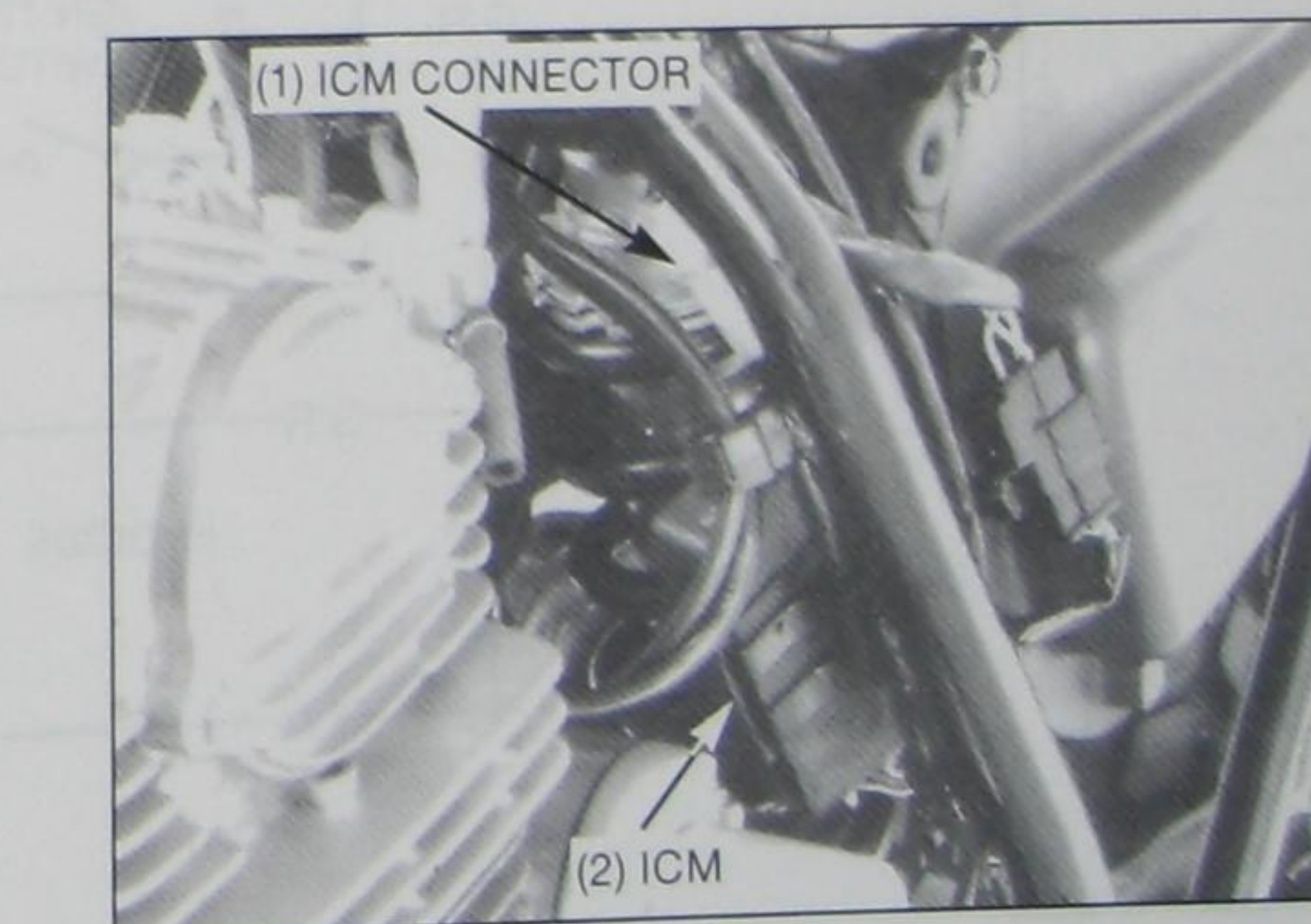
Ignition Control Module (ICM)

REMOVAL/INSTALLATION

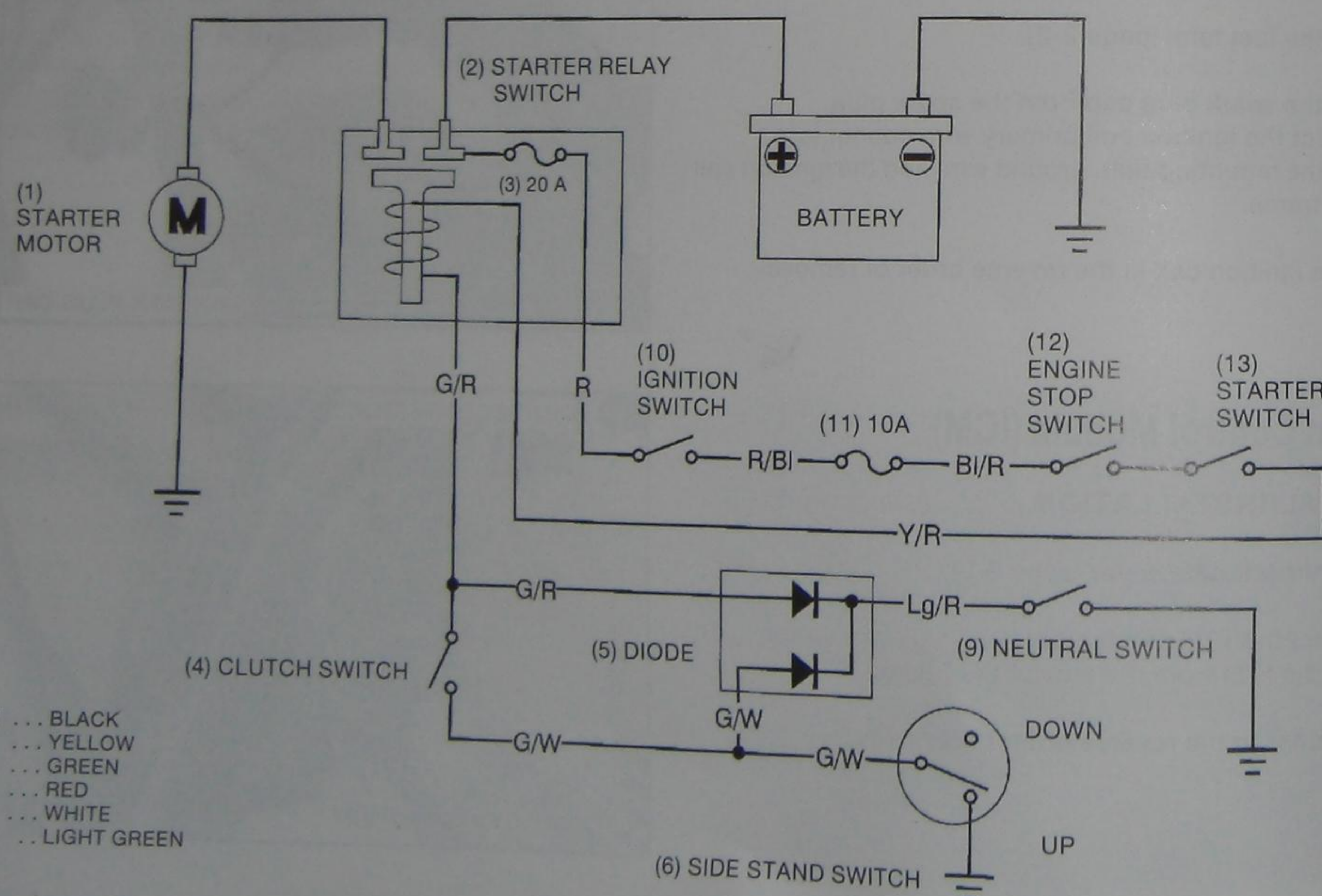
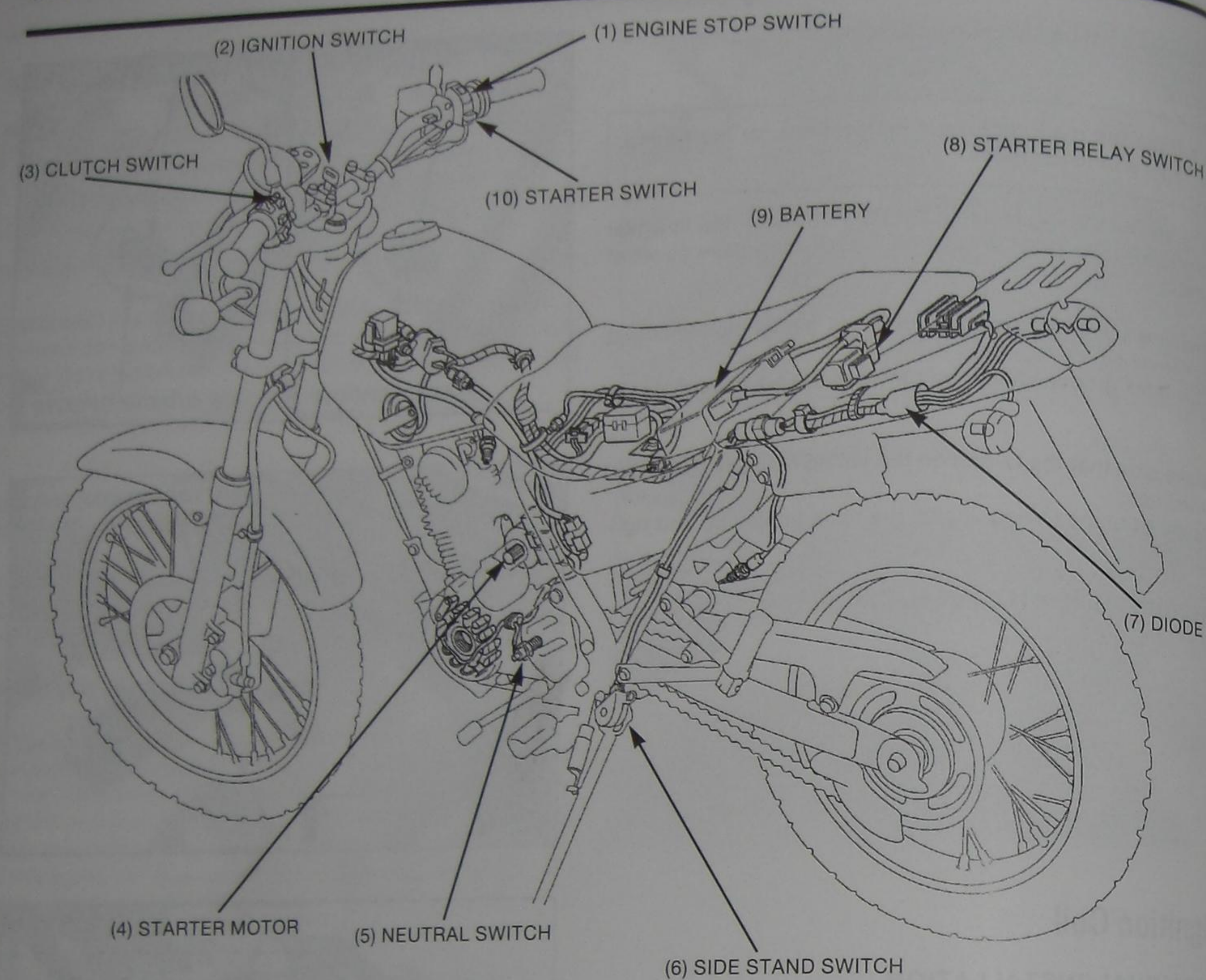
Remove the left side cover (page 2-3).

Disconnect the ICM connectors. Remove the ICM from the stay of the frame.

Installation is in the reverse order of removal.



ELECTRIC STARTER



17. Electric Starter

SERVICE INFORMATION

17-1	STARTER RELAY SWITCH	17-9
17-2	CLUTCH DIODE	17-10
17-4		

Service Information

GENERAL

WARNING

- Always turn the ignition switch OFF before servicing the starter motor. The motor could suddenly start, causing serious injury.

- The starter motor can be serviced with the engine in the frame.
- When checking the starter system, always follow the steps in the troubleshooting flow chart (page 17-2).
- A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current. If the current is kept flowing though the starter motor to turn it while the engine is not cranking over, the starter motor may be damaged.
- See section 10 for starter clutch servicing.
- See section 18 for following components:
 - Ignition switch
 - Engine stop switch
 - Starter switch
 - Neutral switch
 - Side stand switch
 - Clutch switch

SPECIFICATIONS

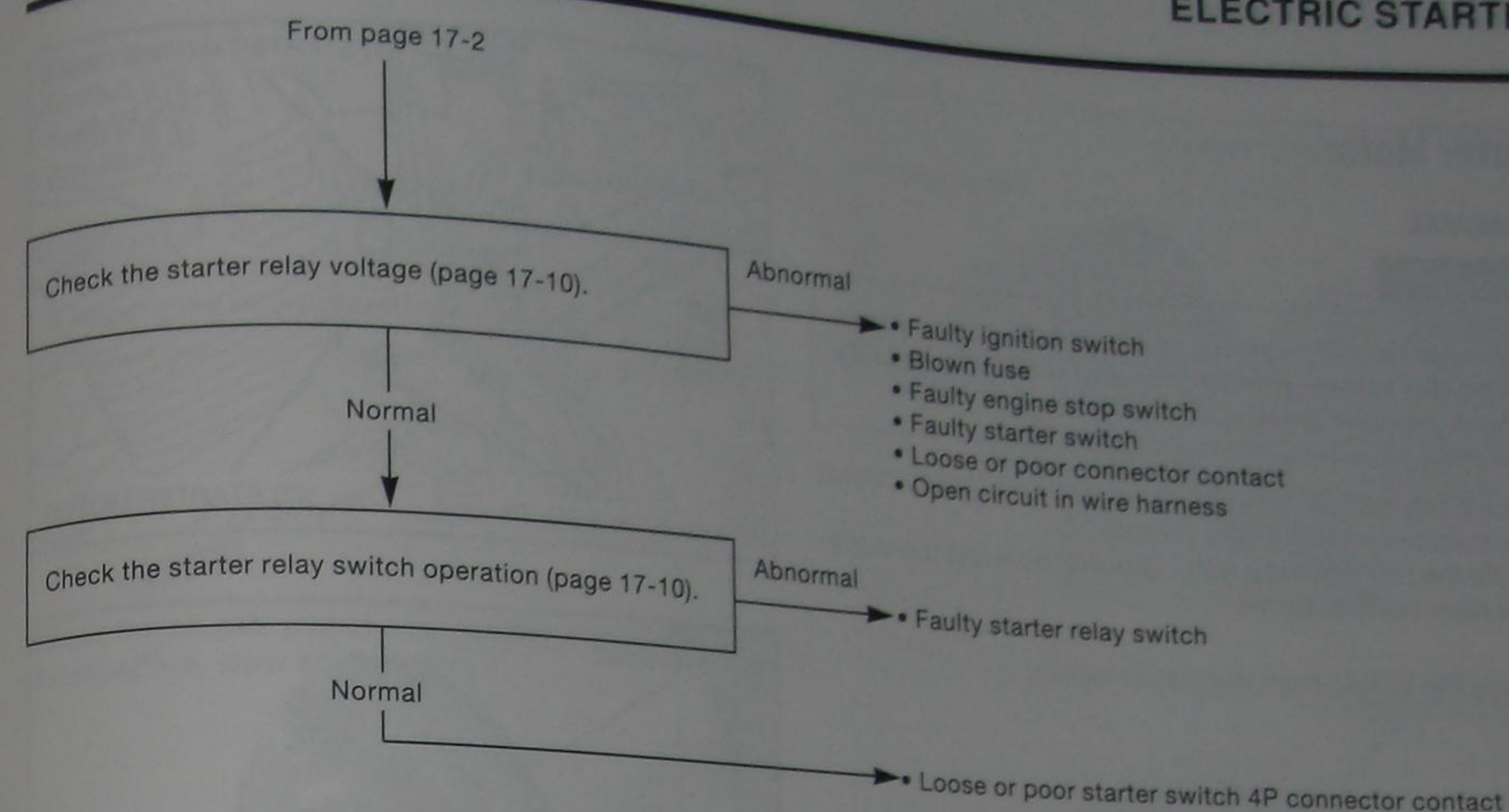
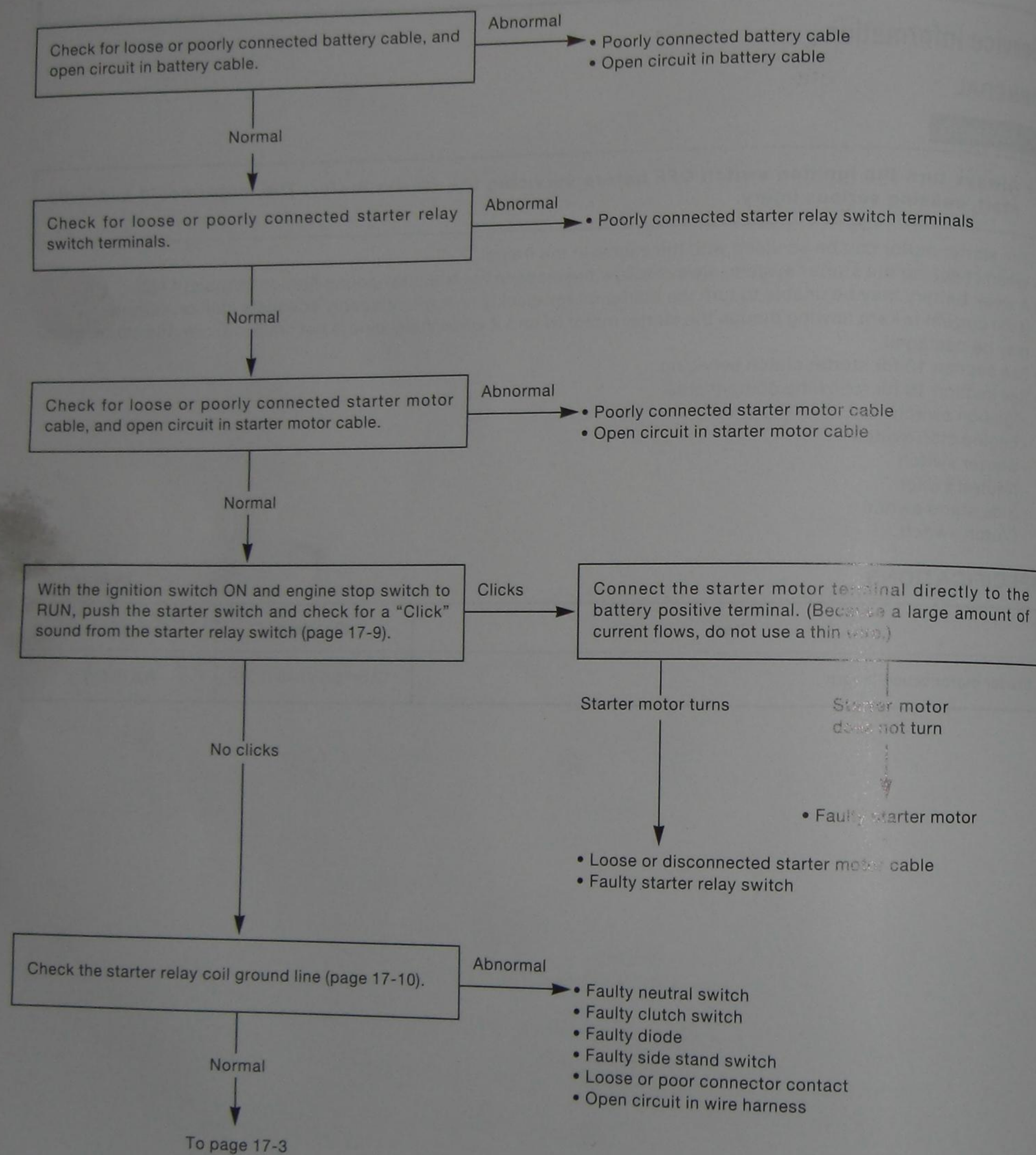
Unit: mm (in)

Item	Standard	Service Limit
Starter motor brush length	12.5-13.5 (0.49-0.51)	8.5 (0.33)

Troubleshooting

Starter motor will not turn

- Check for a blown main fuse (20 A) or sub-fuse (10 A)
- Check that the battery is fully charged and in good condition

**Starter motor turns slowly**

- Weak battery
- Poorly connected battery cable
- Poorly connected starter motor cable
- Faulty starter motor

Starter motor turns, but engine does not turn

- Faulty starter clutch (section 10)

Starter relay switch "clicks", but engine does not turn over

- Crankshaft does not turn due engine problem
- Faulty starter clutch (section 10)
- Faulty starter reduction gear (section 10)

Starter Motor

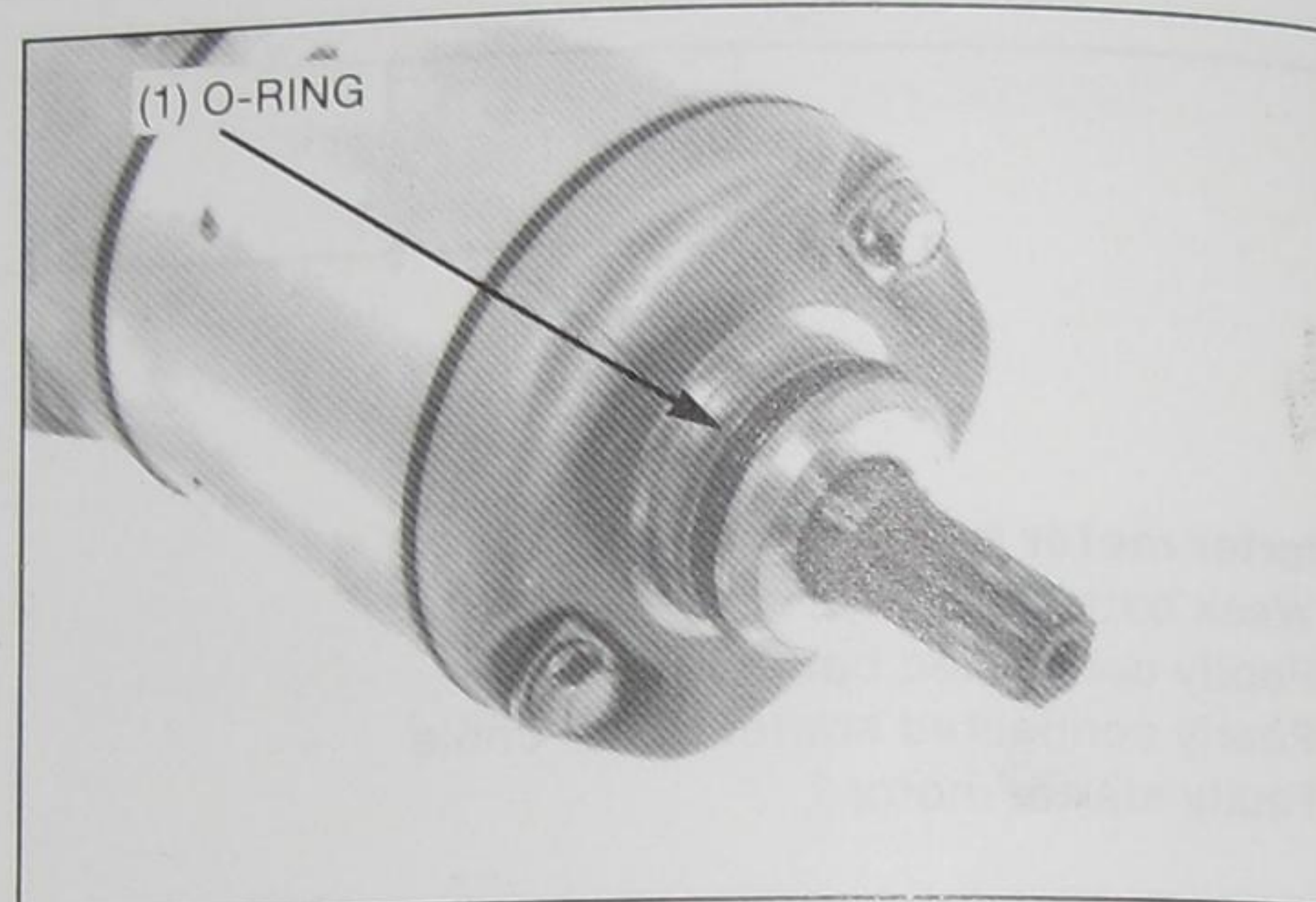
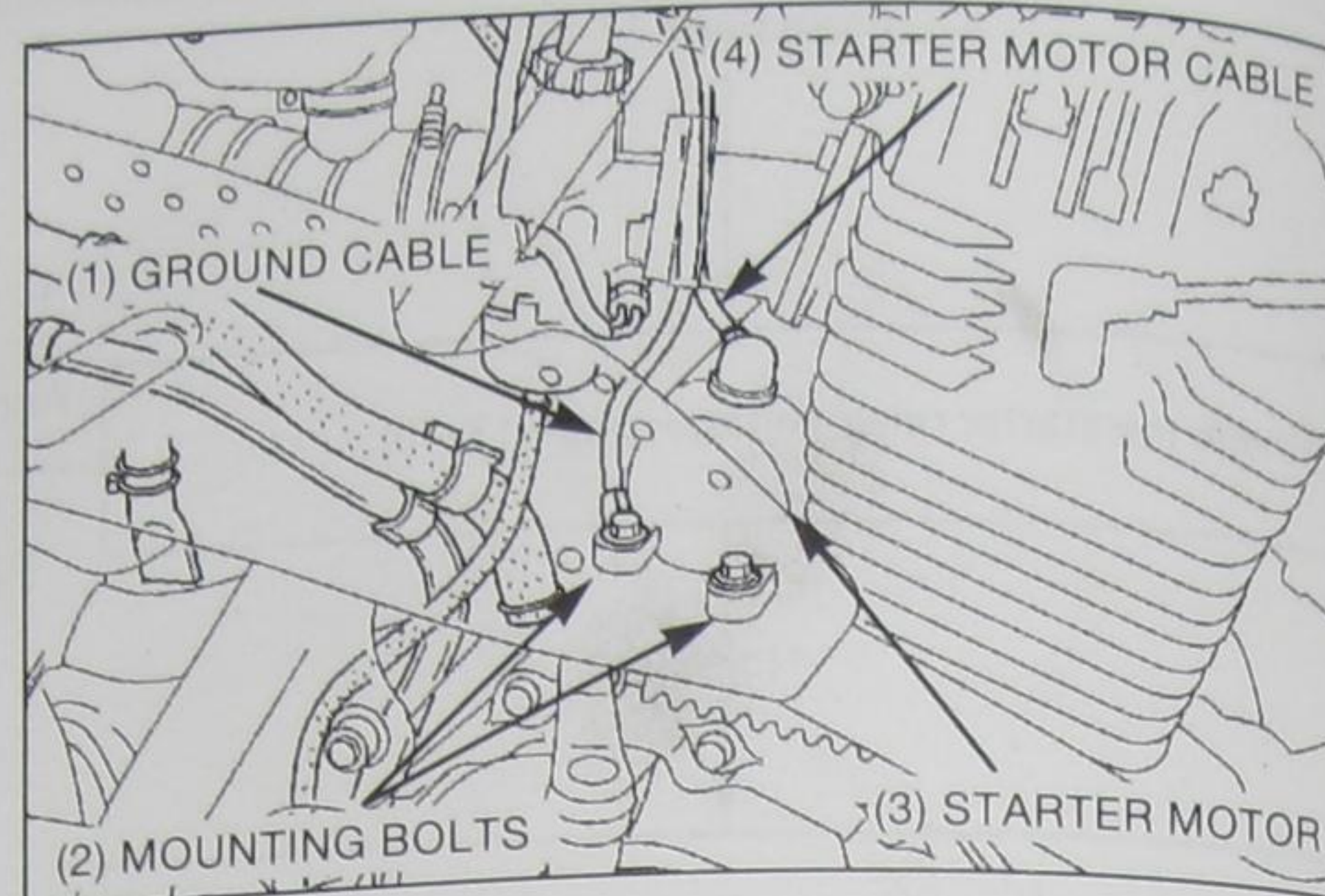
REMOVAL

⚠ WARNING

- Always turn the ignition switch **OFF** before servicing the starter motor. The motor could suddenly start, causing serious injury.

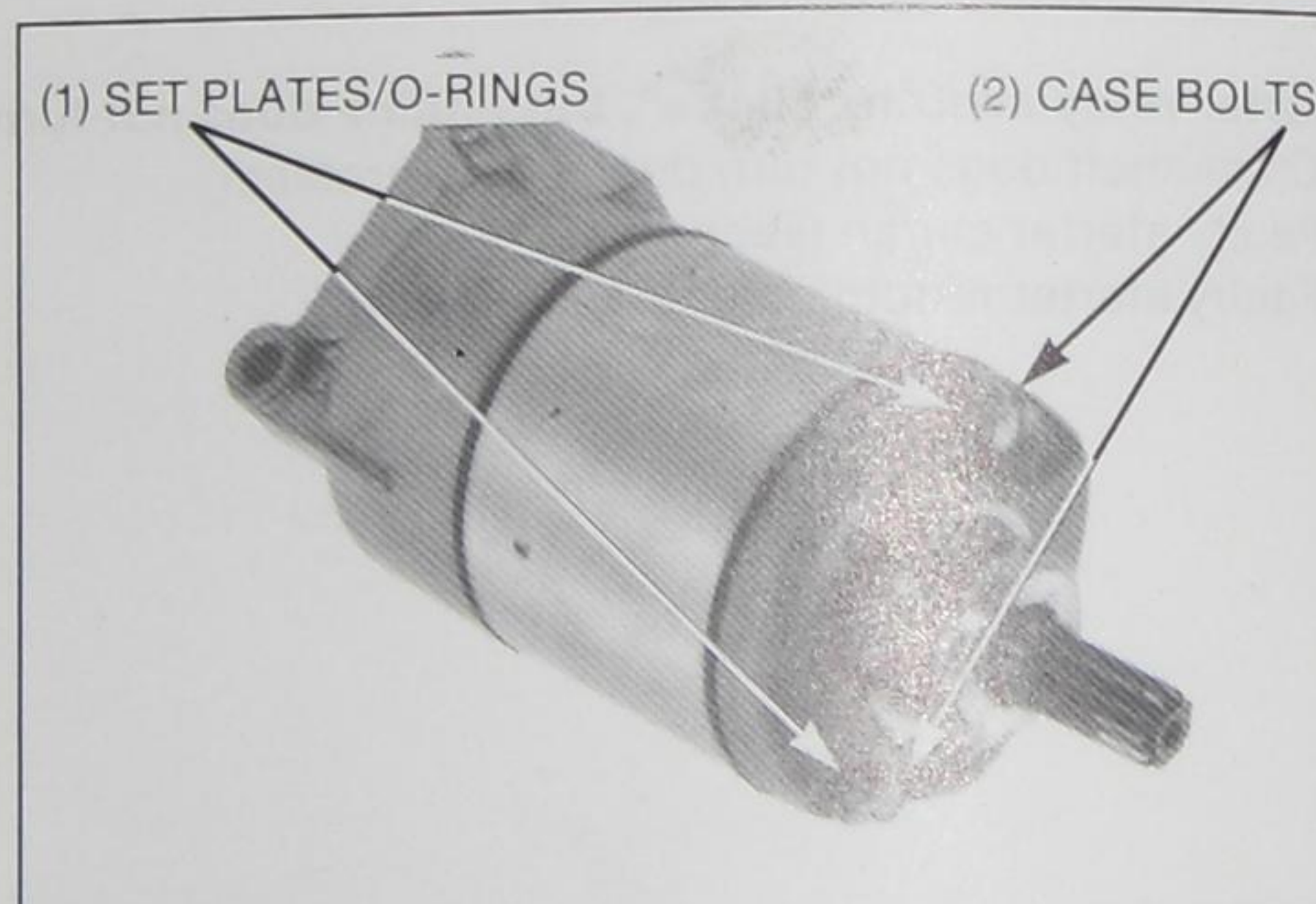
Remove the rubber cap, terminal nut and starter motor cable from the starter motor terminal.
Remove the two mounting bolts, ground cable and the starter motor from the crankcase.

Remove the O-ring from the starter motor.



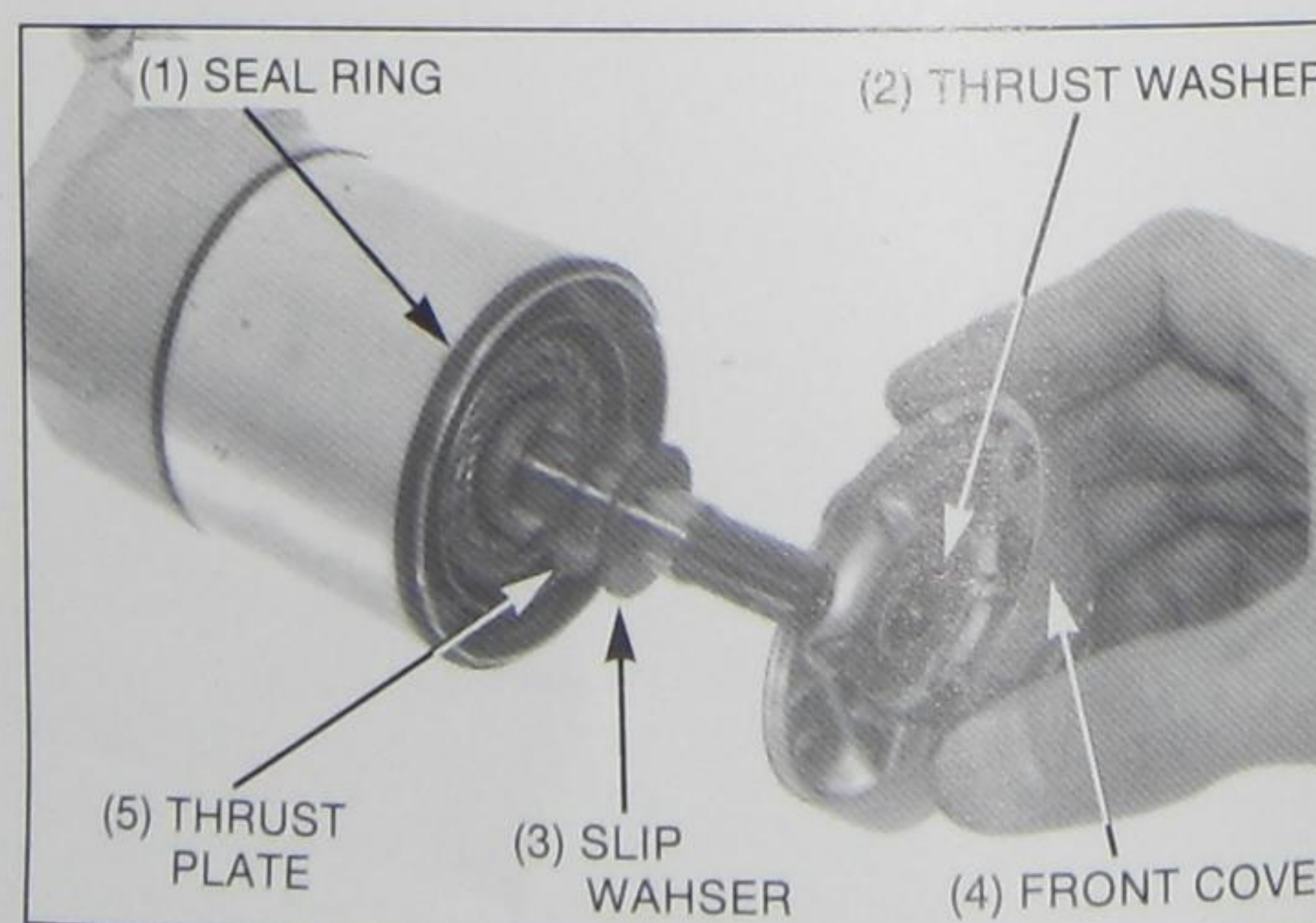
DISASSEMBLY/INSPECTION

Remove the two starter motor case bolts, set plates and O-rings.



Remove the following:

- Front cover
- Thrust plate
- Slip washer
- Thrust washer
- Seal ring

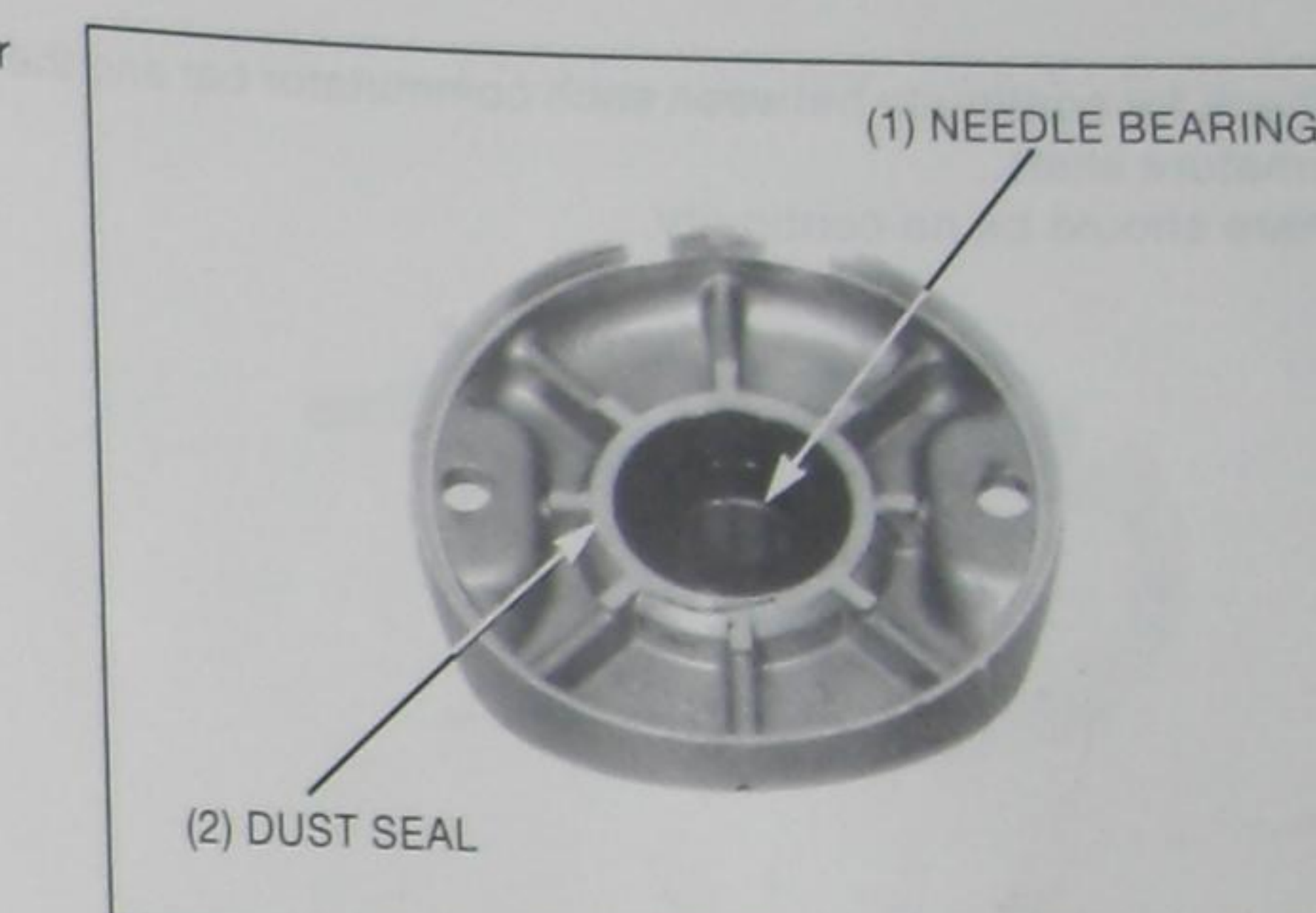
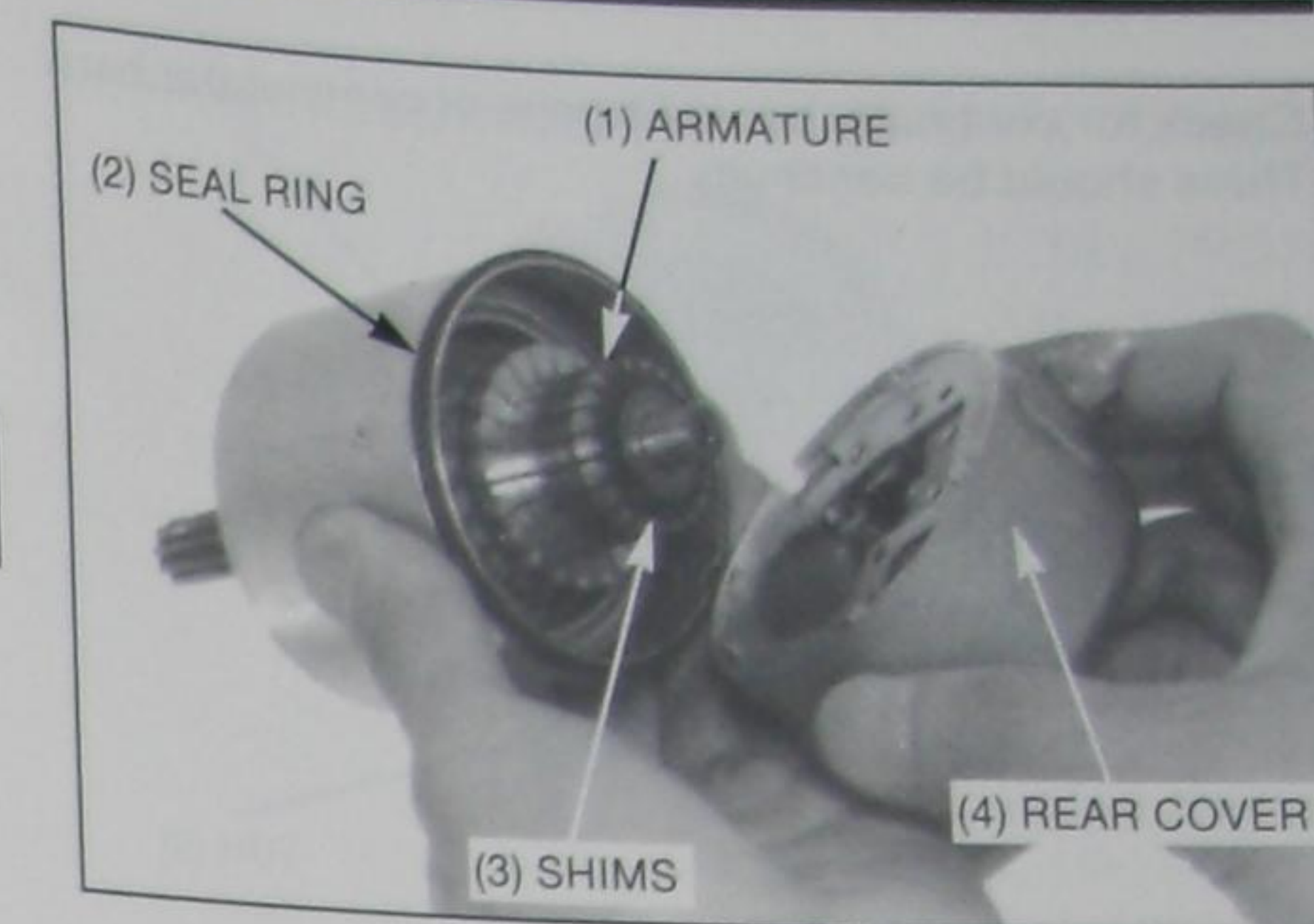


- Rear cover
- Shims
- Seal ring
- Armature

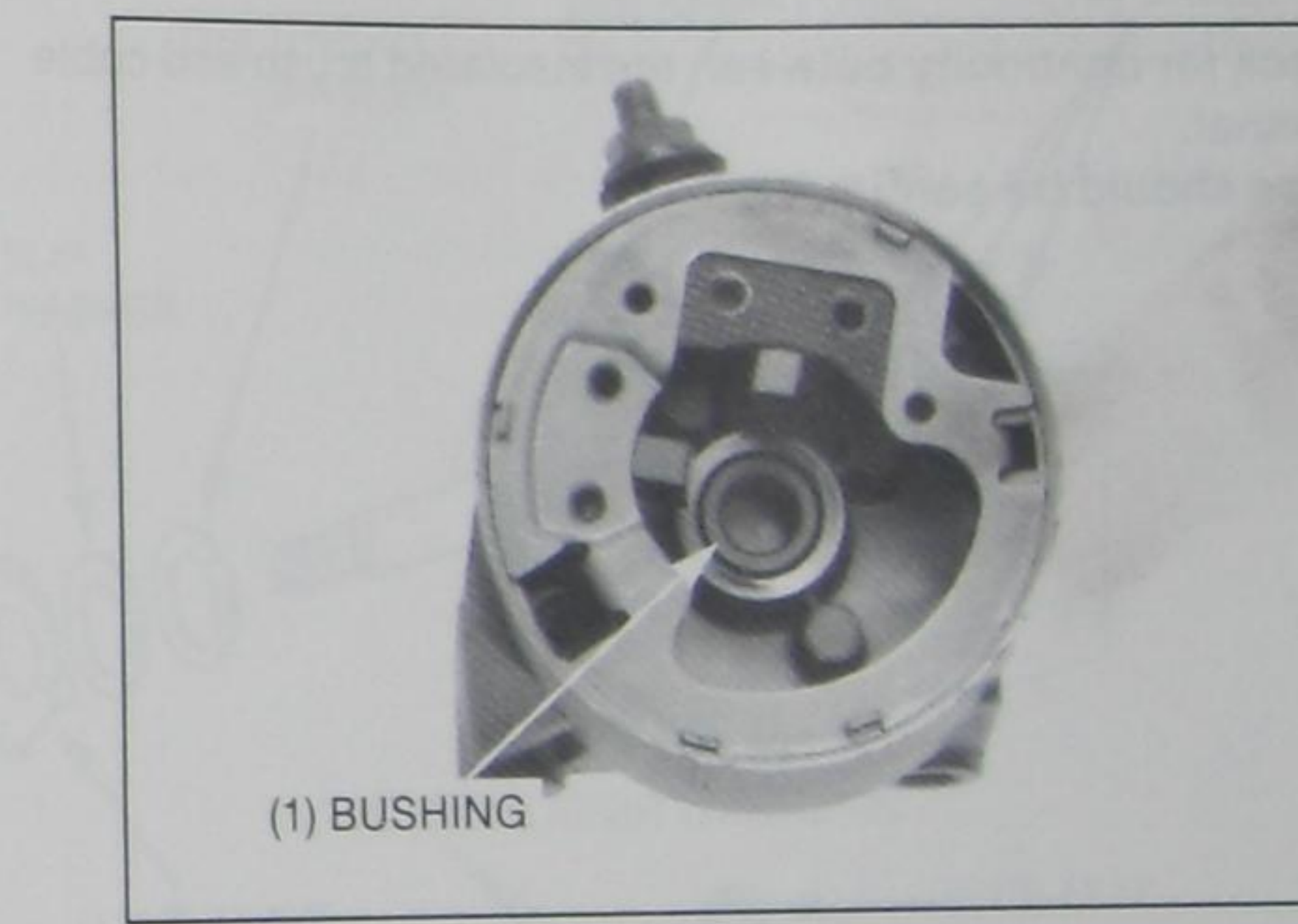
NOTE:

- Record the location and number of the shims.

Check the oil seal and needle bearing in the front cover for deterioration, wear or damage.



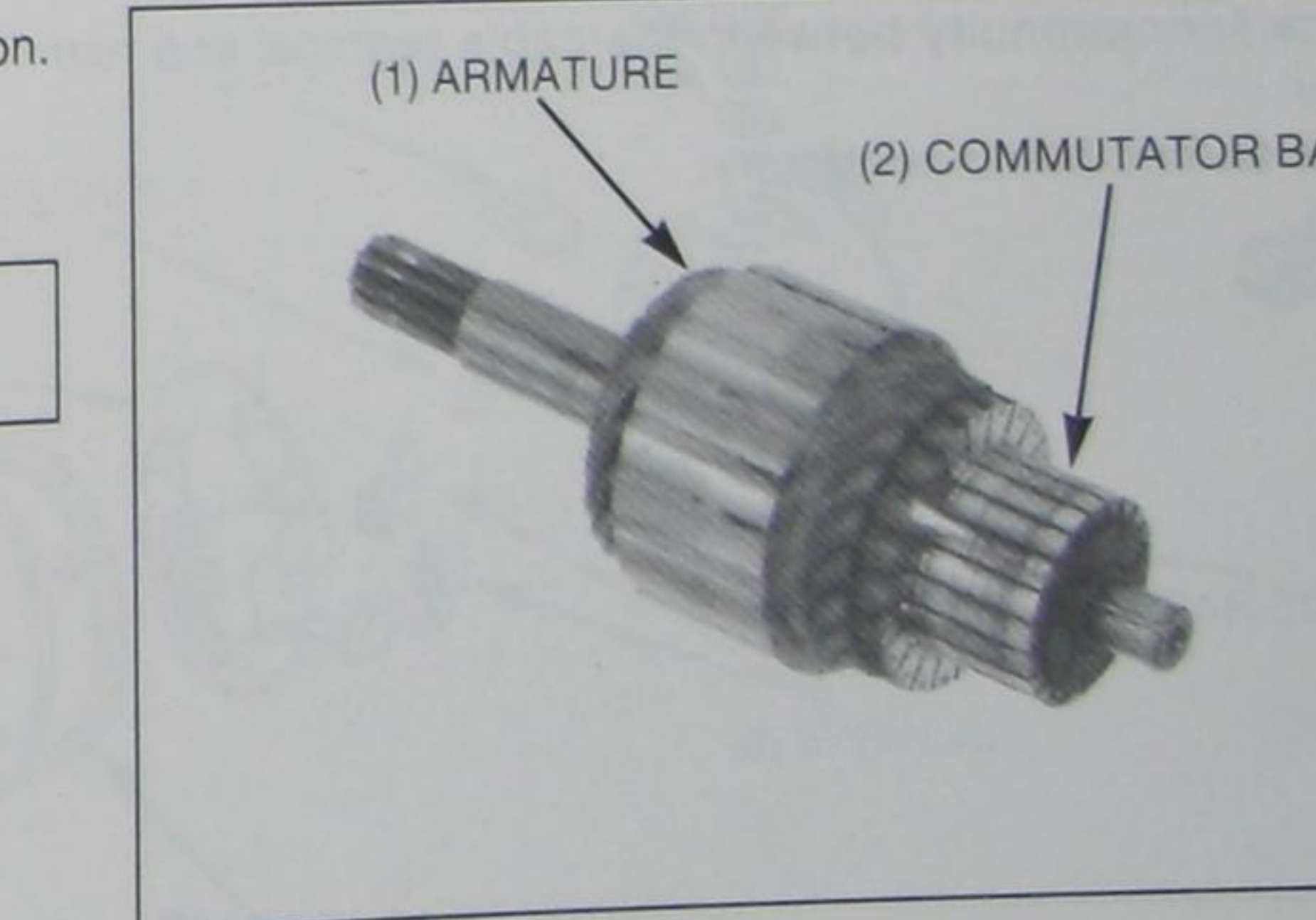
Check the bushing in the rear cover for wear or damage.



Check the commutator bars of the armature for discoloration.

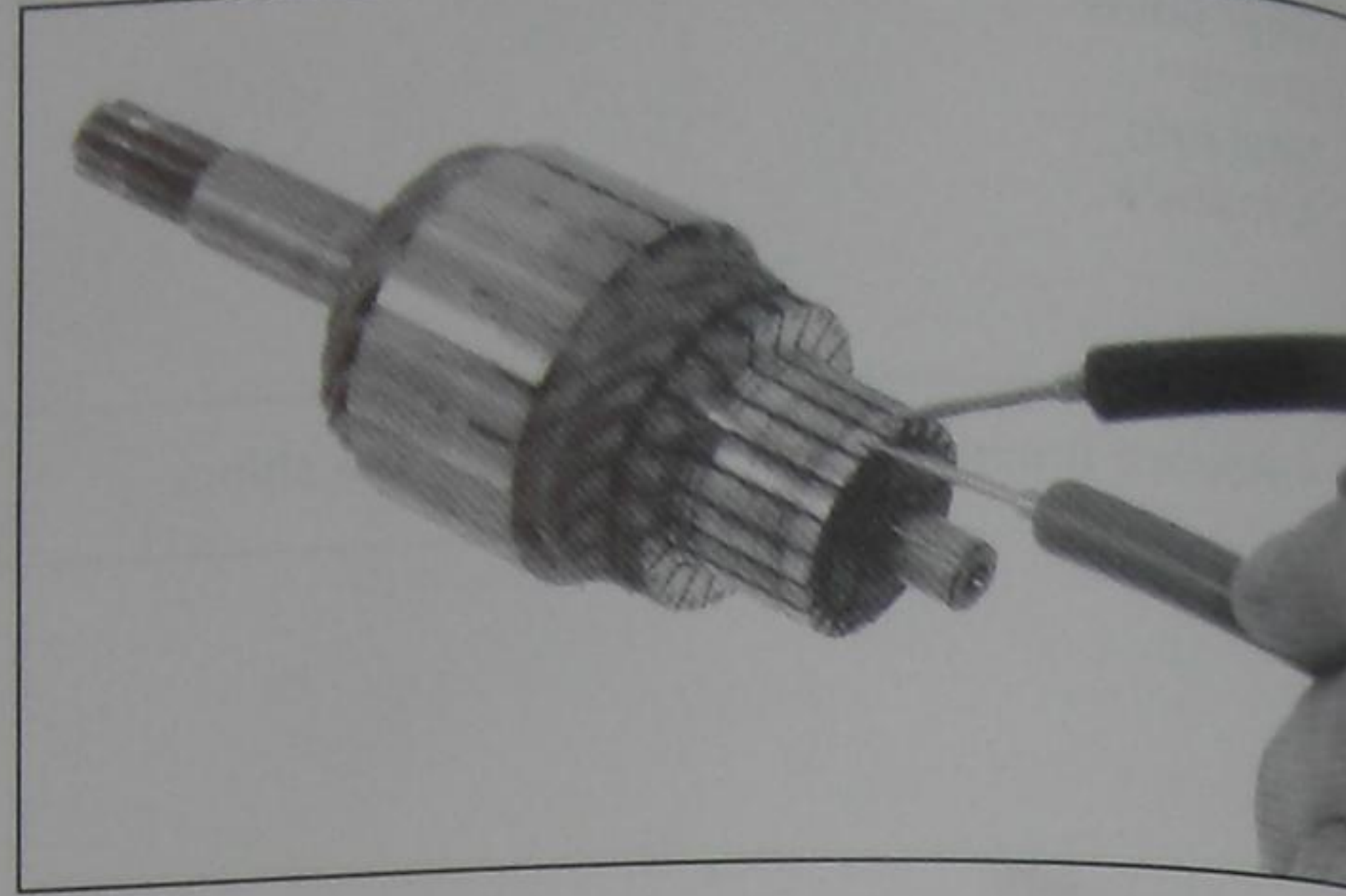
NOTE:

- Do not use emery or sand paper on the commutator.

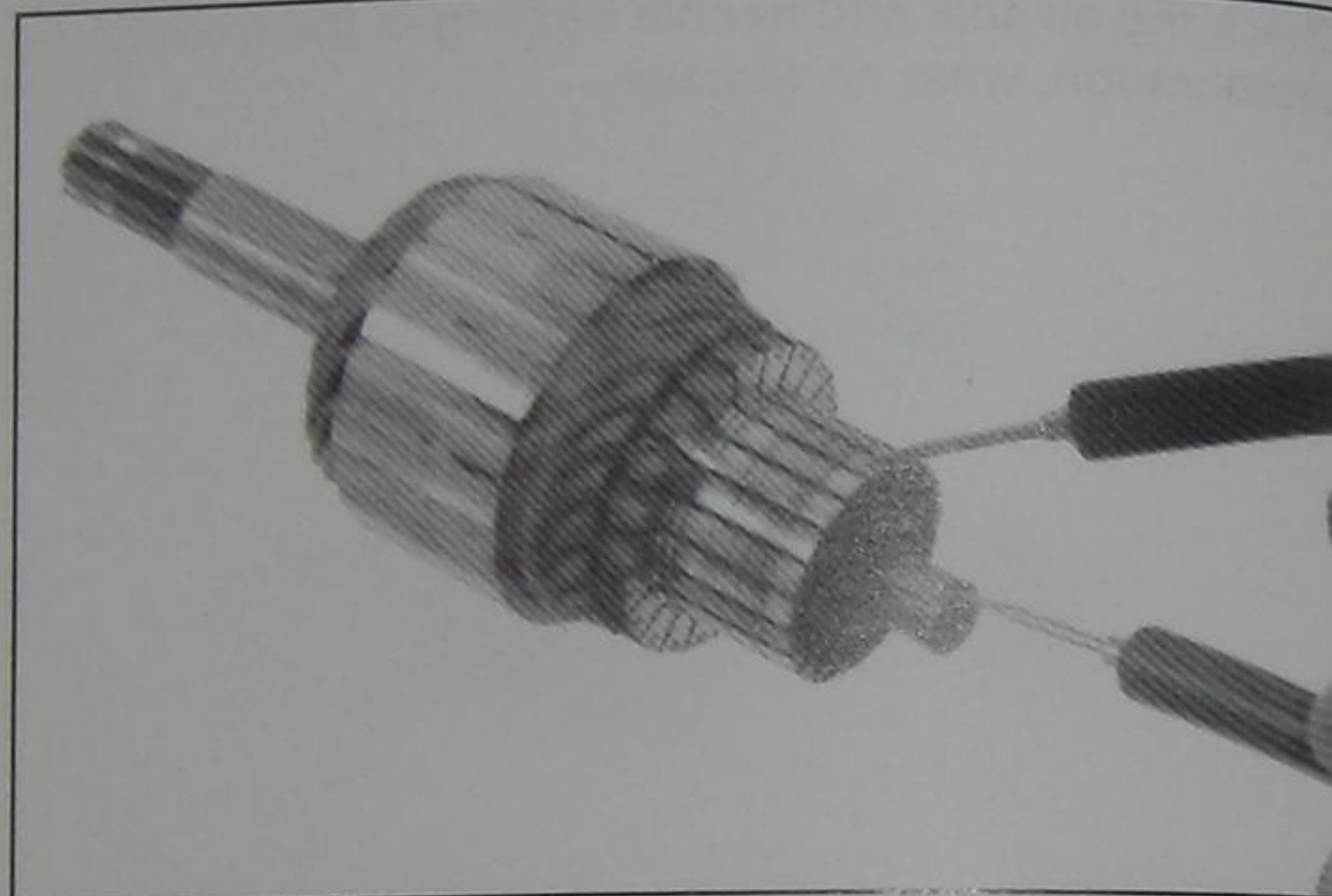


ELECTRIC STARTER

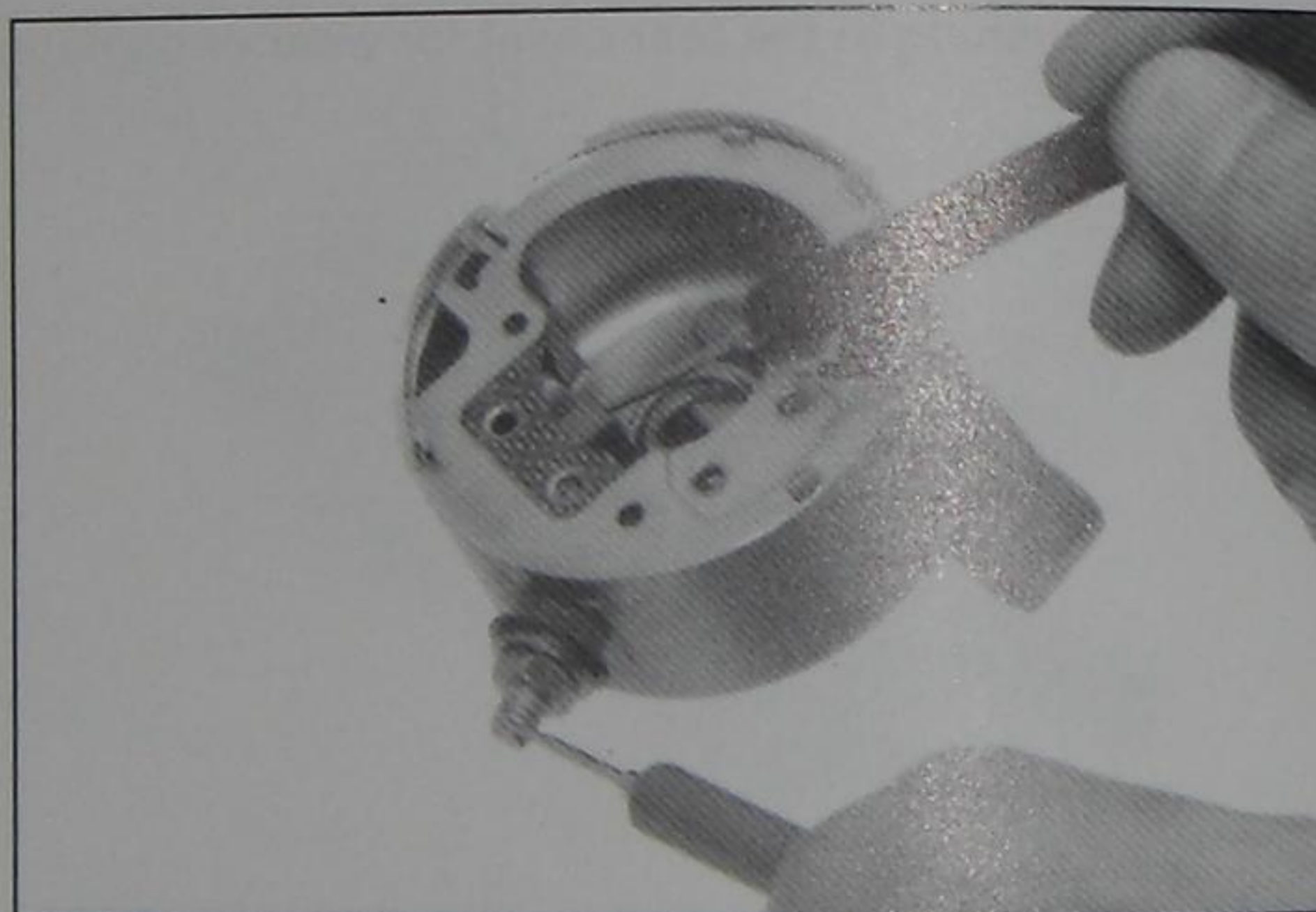
Check for continuity between pairs of commutator bars.
There should be continuity.



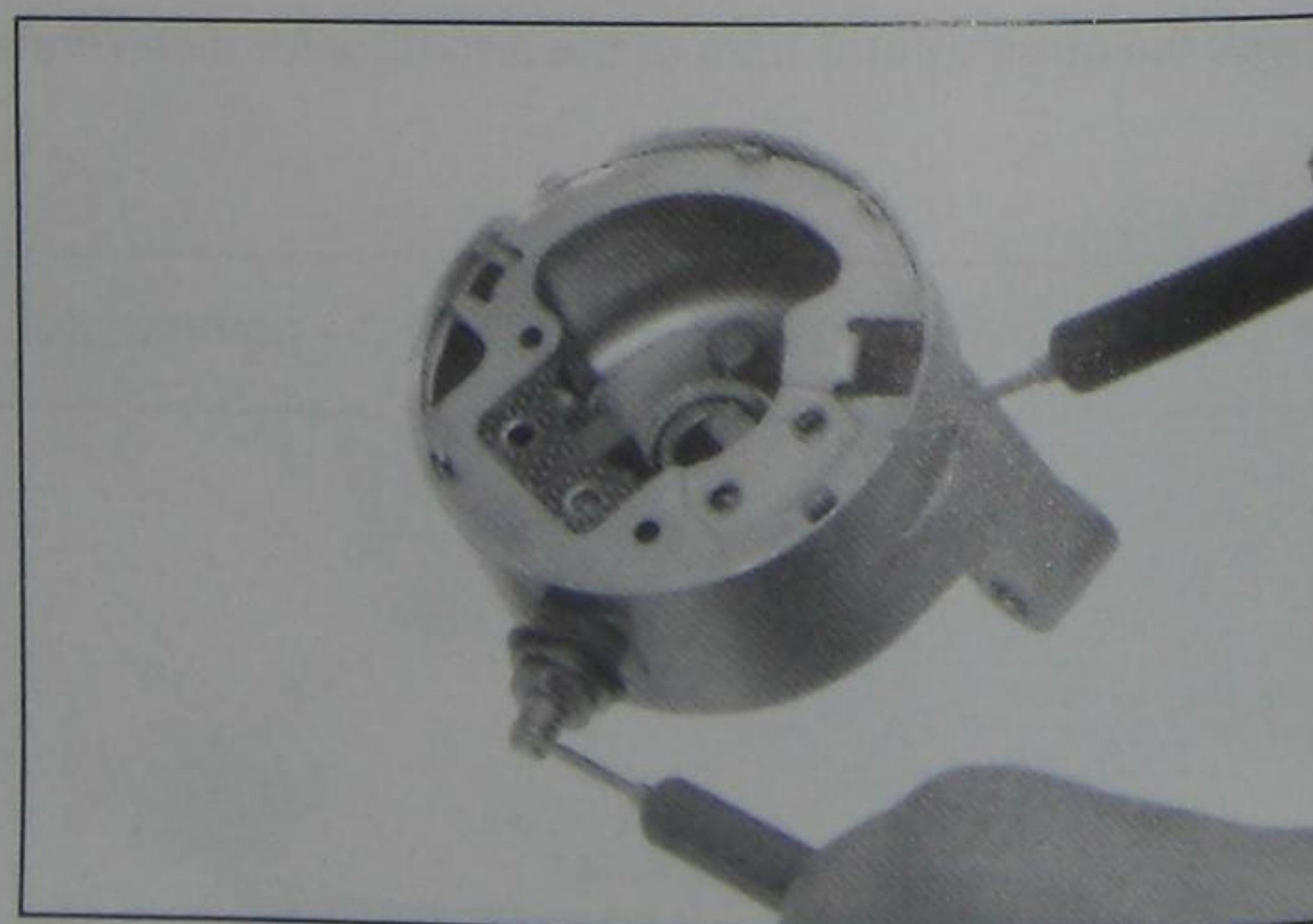
Check for continuity between each commutator bar and the armature shaft.
There should be no continuity.



Check for continuity between the insulated brush and cable terminal.
There should be continuity.

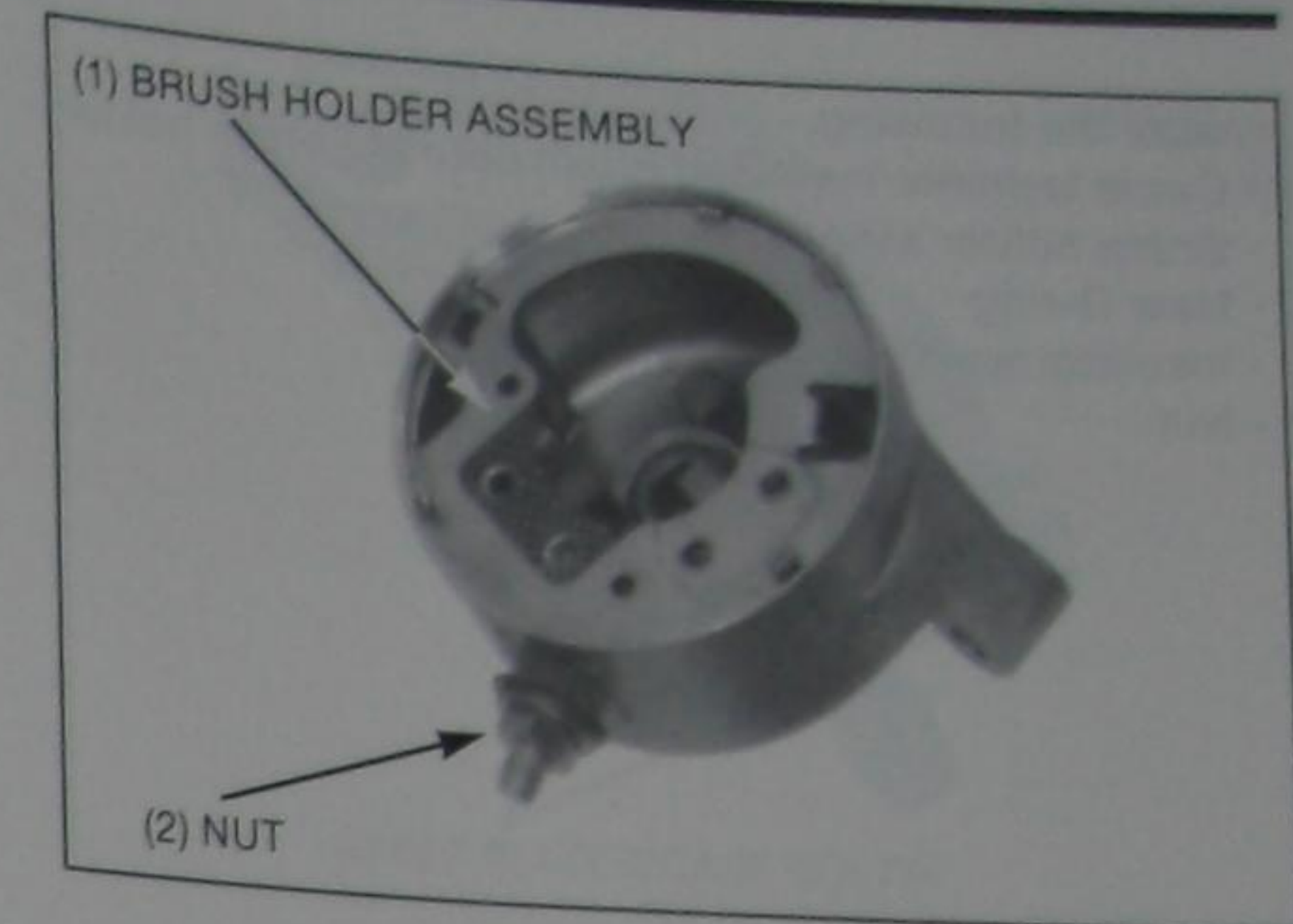


Check for continuity between the cable terminal and rear cover.
There should be no continuity.



ELECTRIC STARTER

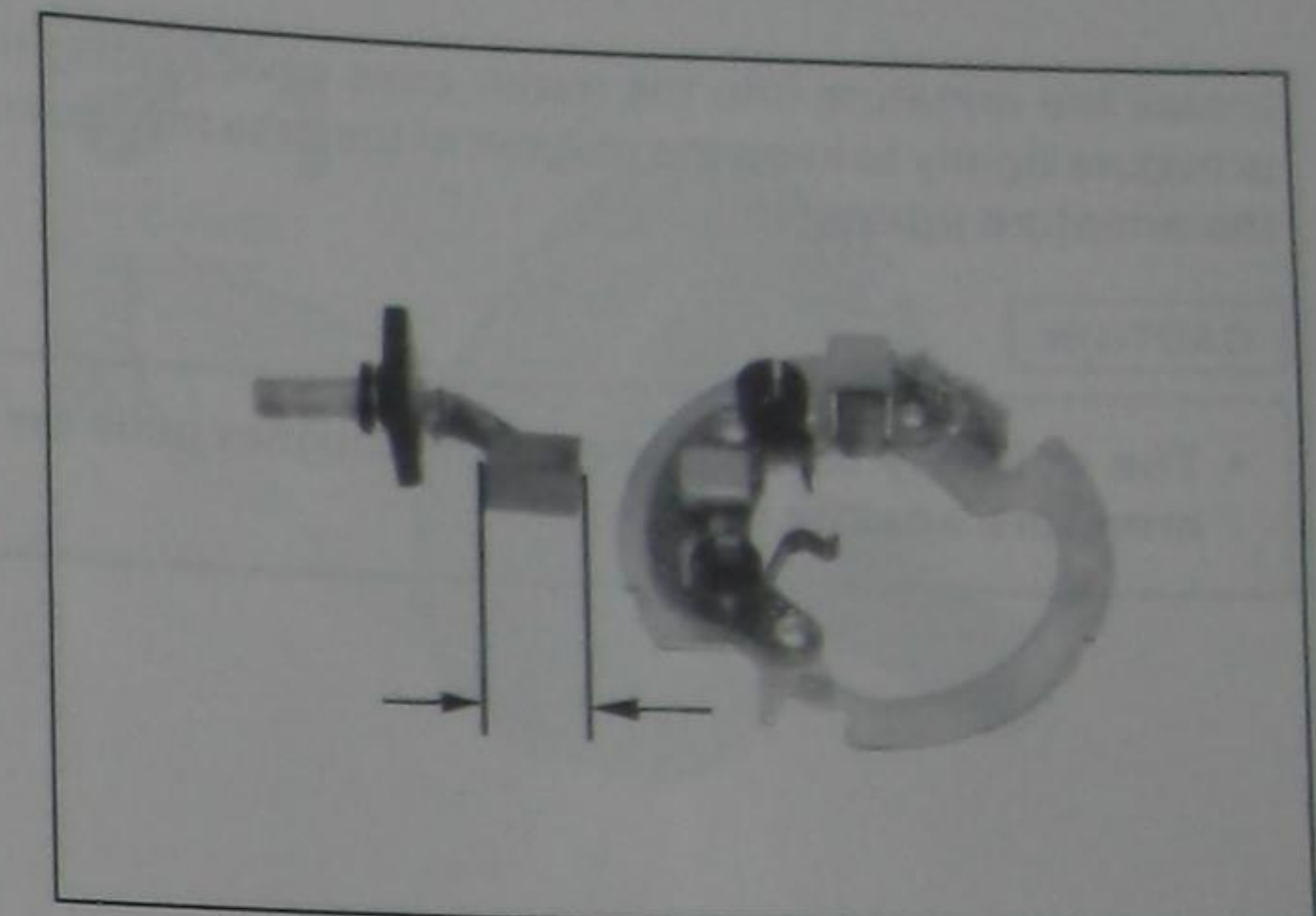
Remove the following:
- Nut
- Washer
- Insulator washers
- O-ring
- Brush holder assembly



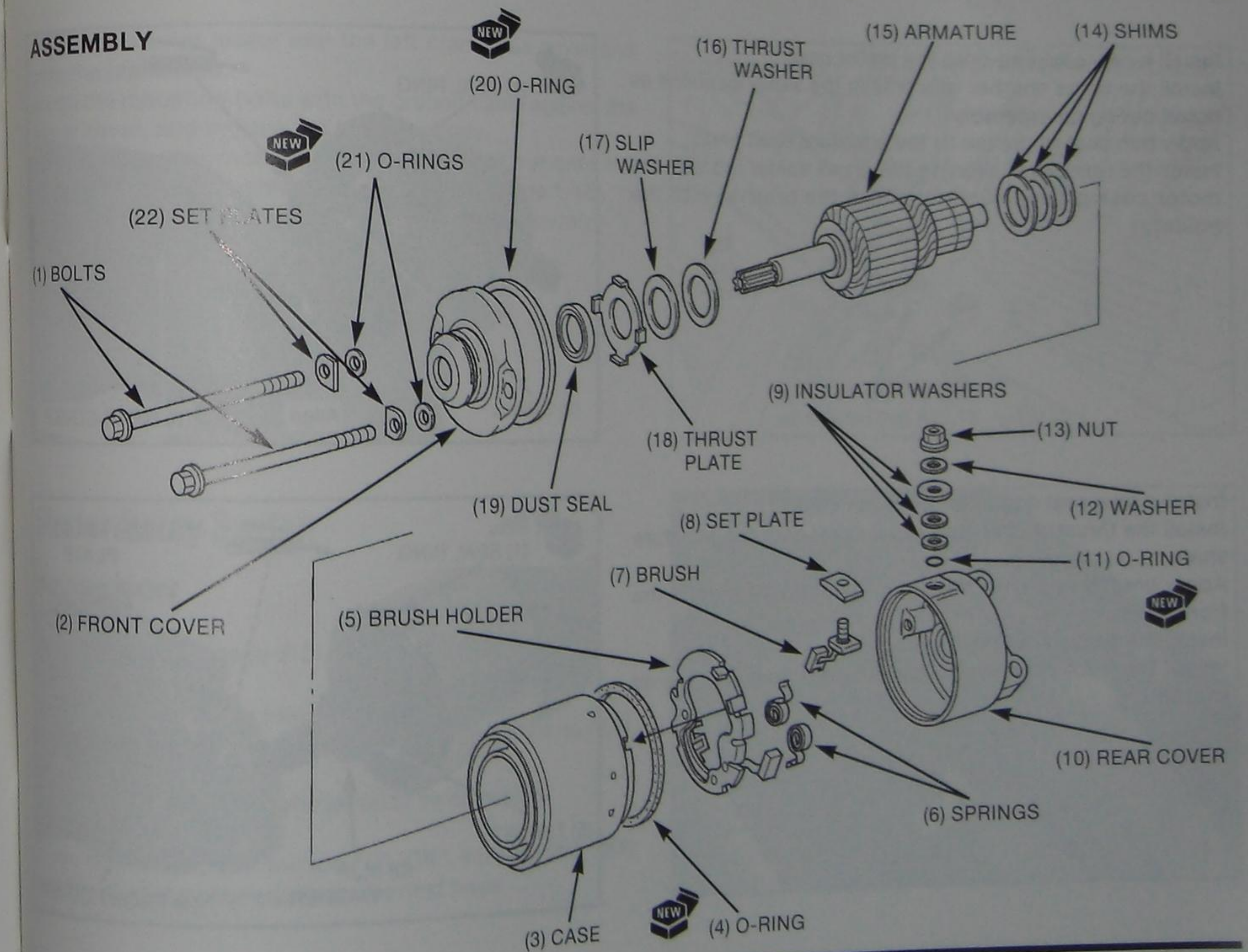
Remove the cable terminal/insulated brush from the brush holder.

Measure the brush length.

SERVICE LIMIT: 8.5 mm (0.33 in)



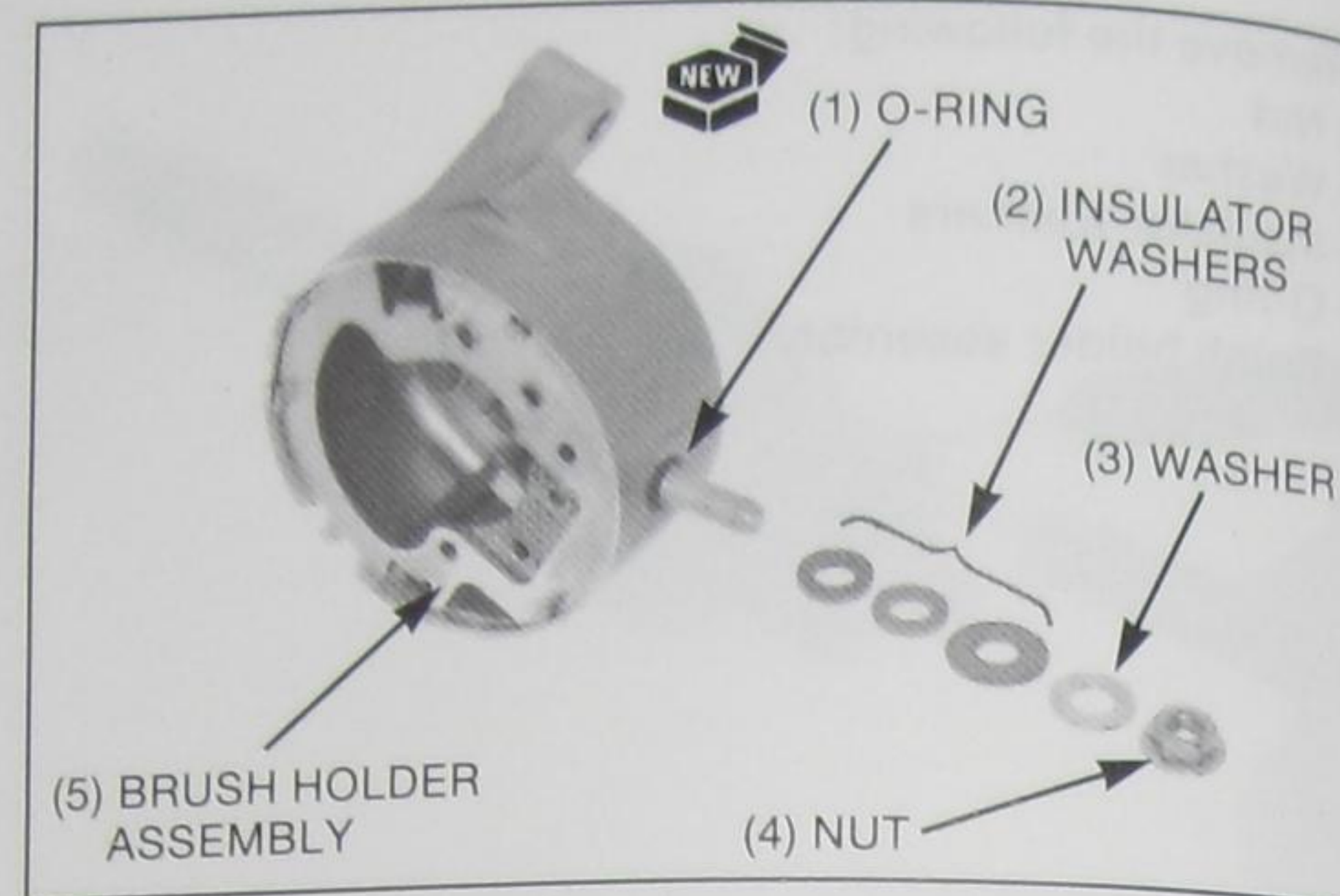
ASSEMBLY



ELECTRIC STARTER

Install the following:

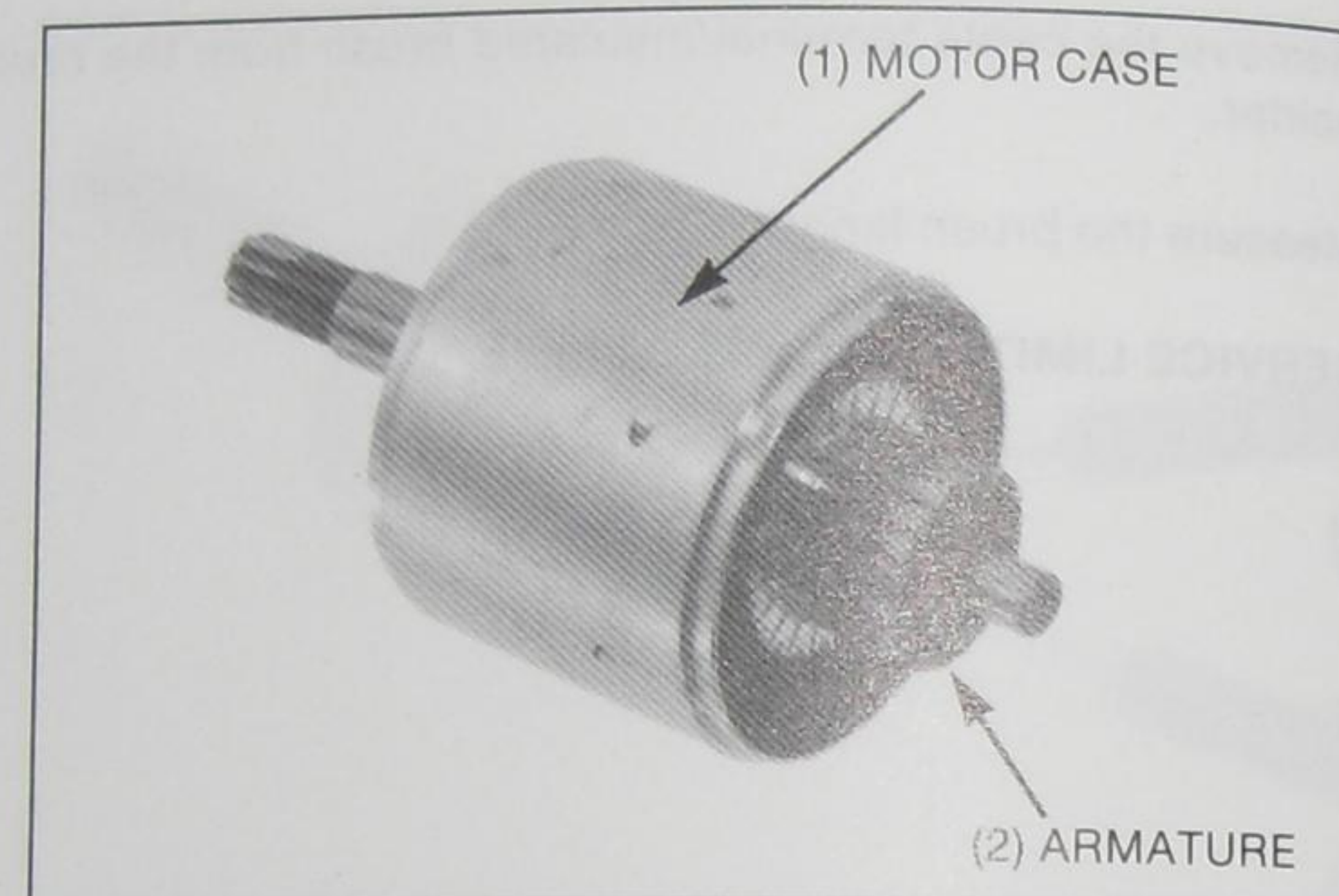
- Cable terminal/insulated brush onto the brush holder
- Brush holder assembly
- New O-ring
- Insulator washers
- Nut



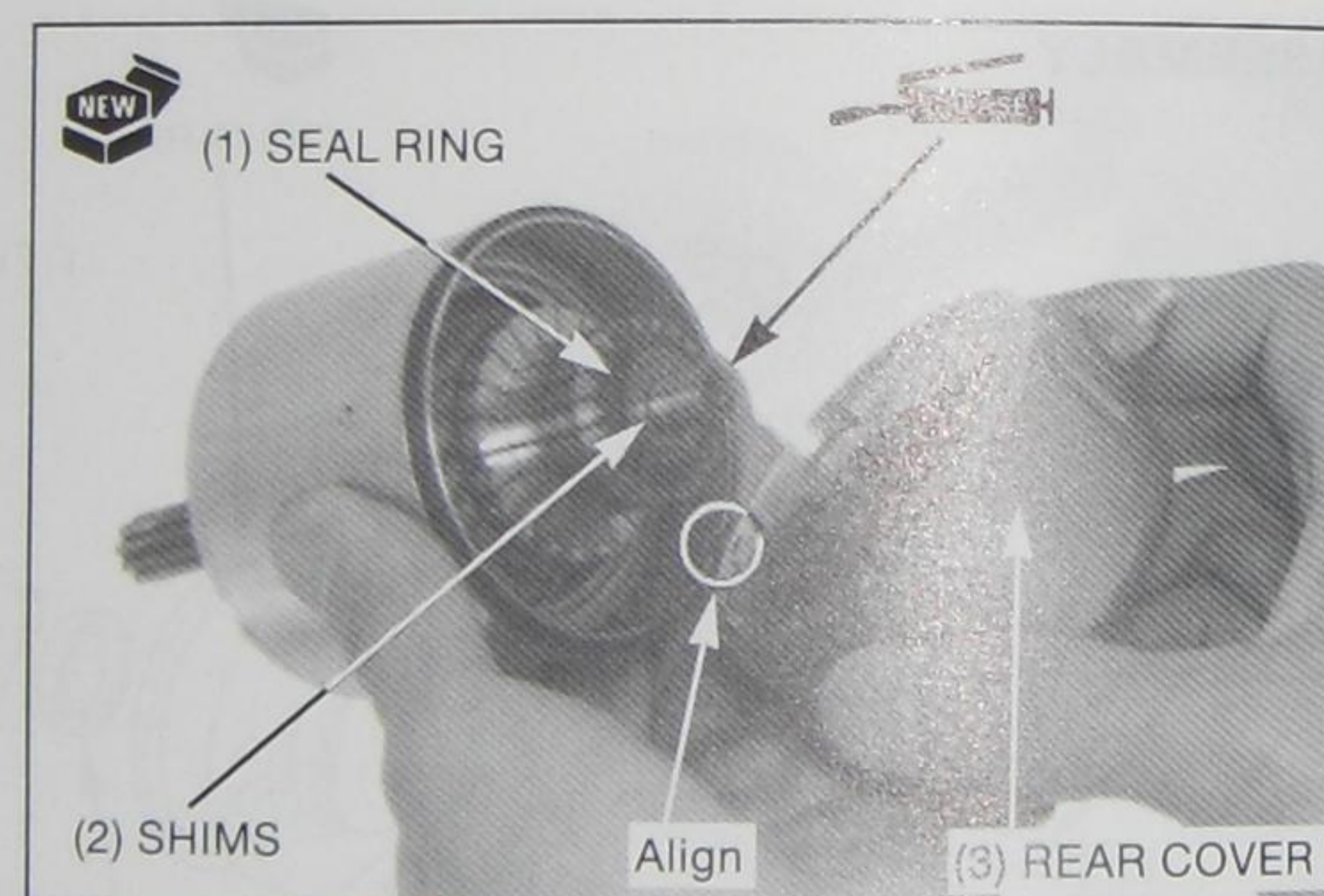
Install the armature into the motor case while holding the armature tightly to keep the magnet of the case from pulling the armature against it.

CAUTION

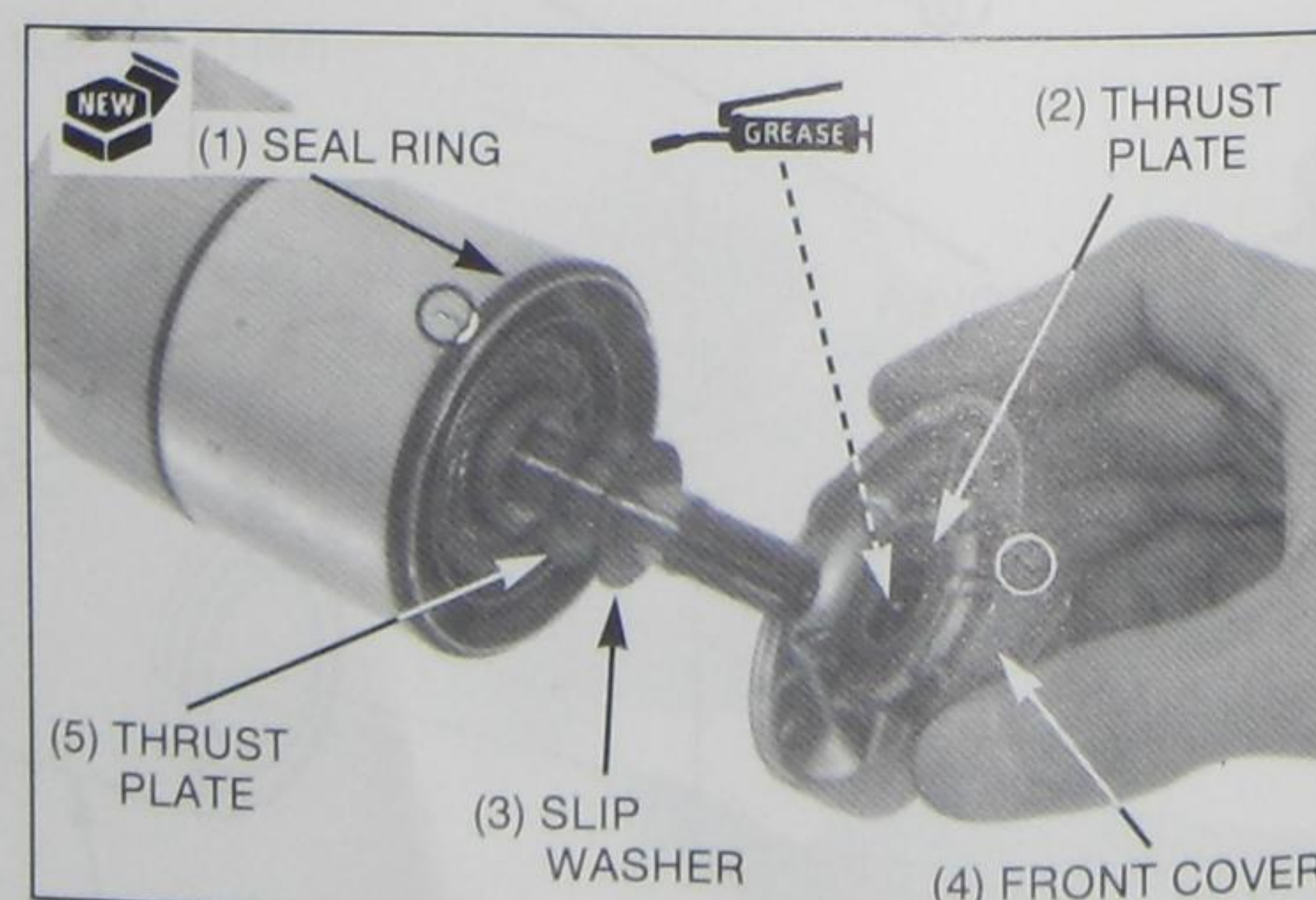
- The coil may be damaged if the magnet pulls the armature against the case.



Install a new seal ring onto the motor case.
Install the same number of shims in the same locations as noted during disassembly.
Apply thin coat of grease to the armature shaft end.
Install the rear cover aligning the brush holder tab with the motor case groove, while pushing the brushes into the holder.

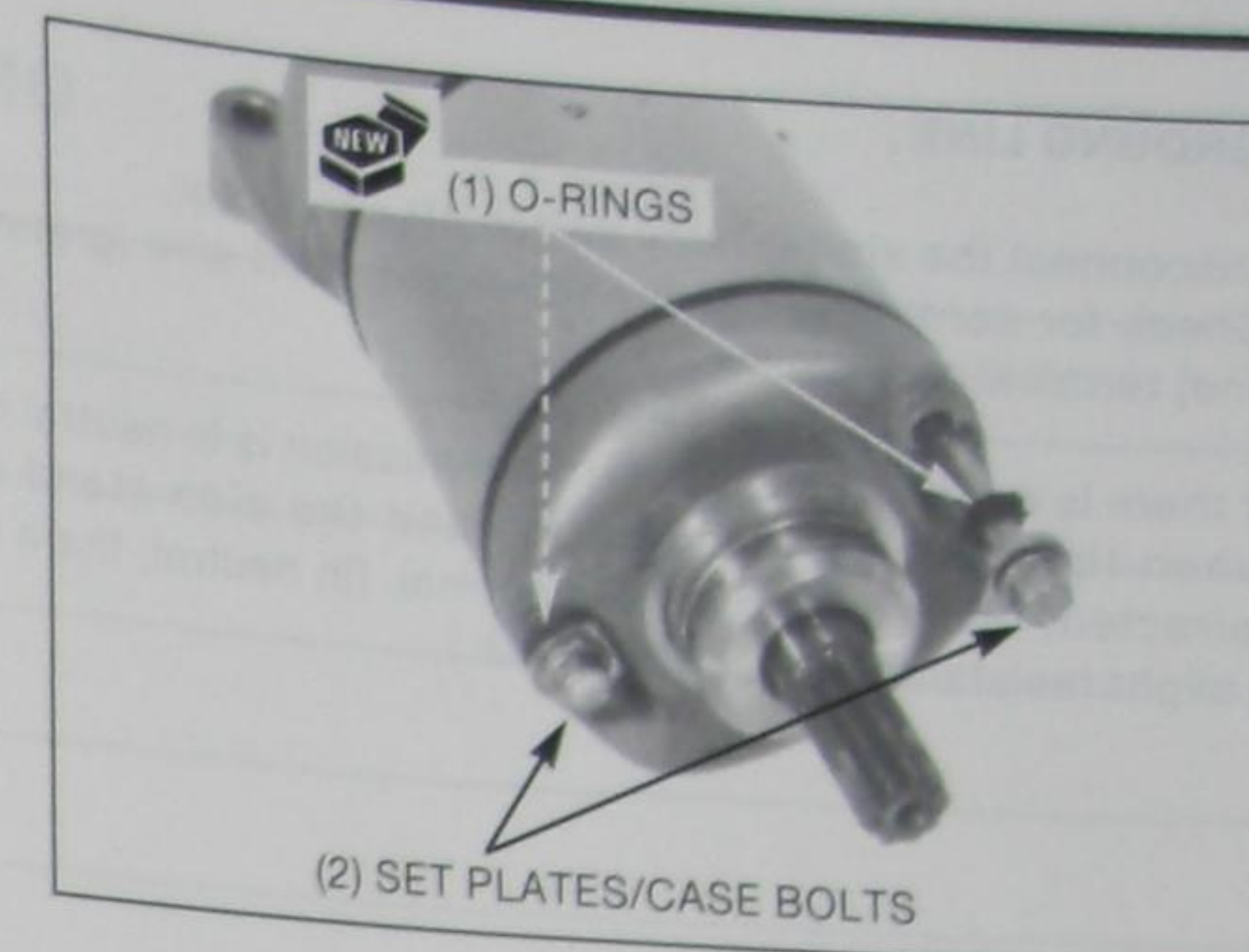


Install a new seal ring onto the motor case.
Install the thrust washer and slip washer onto the armature shaft.
Apply grease to the oil seal lip and needle bearing in the front cover.
Install the thrust onto the front cover.
Install the front cover being careful not to damage the oil seal lip.



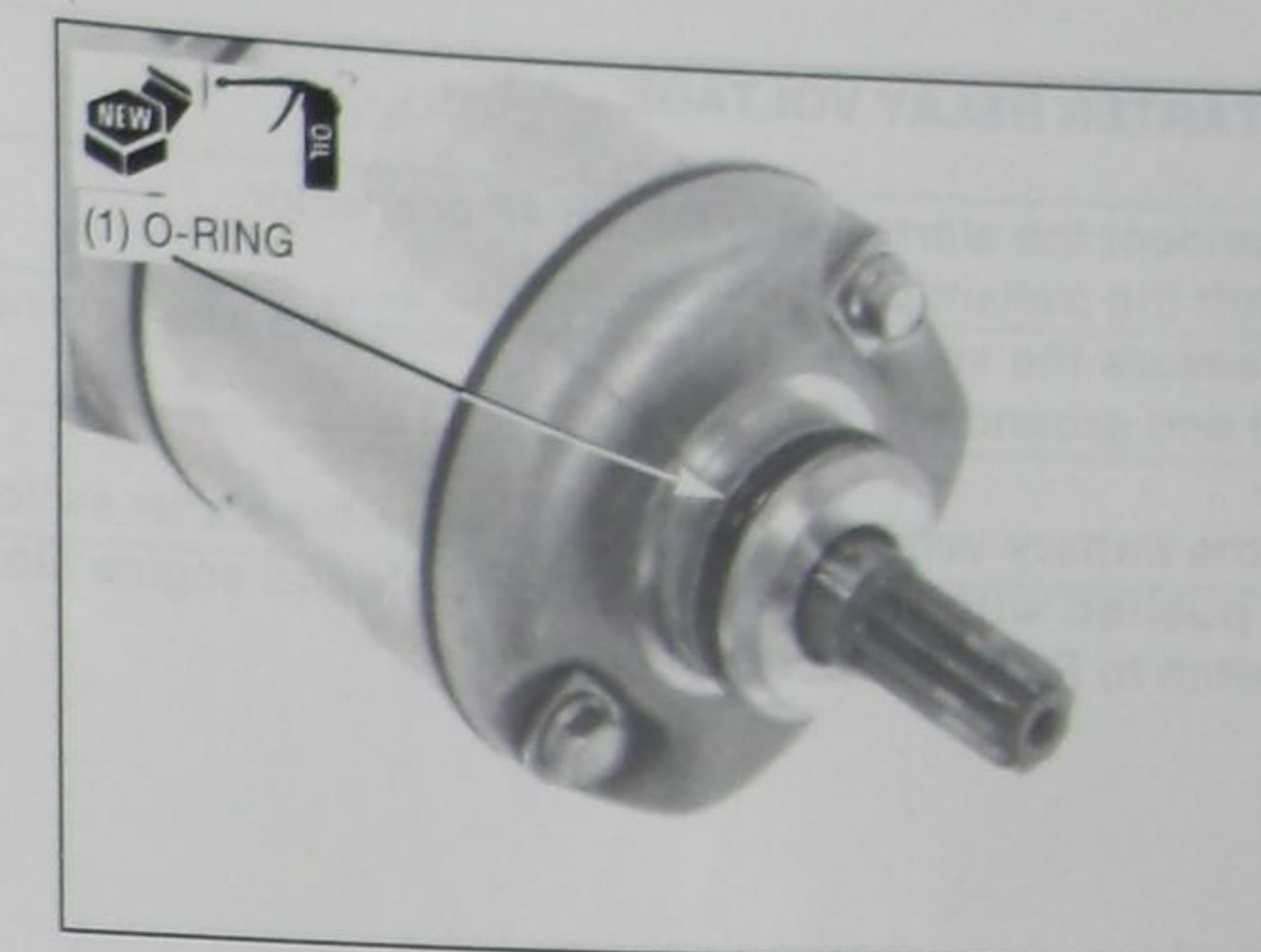
Install the set plates and new O-rings onto the motor case bolts.
Install and tighten the motor case bolts.

ELECTRIC STARTER

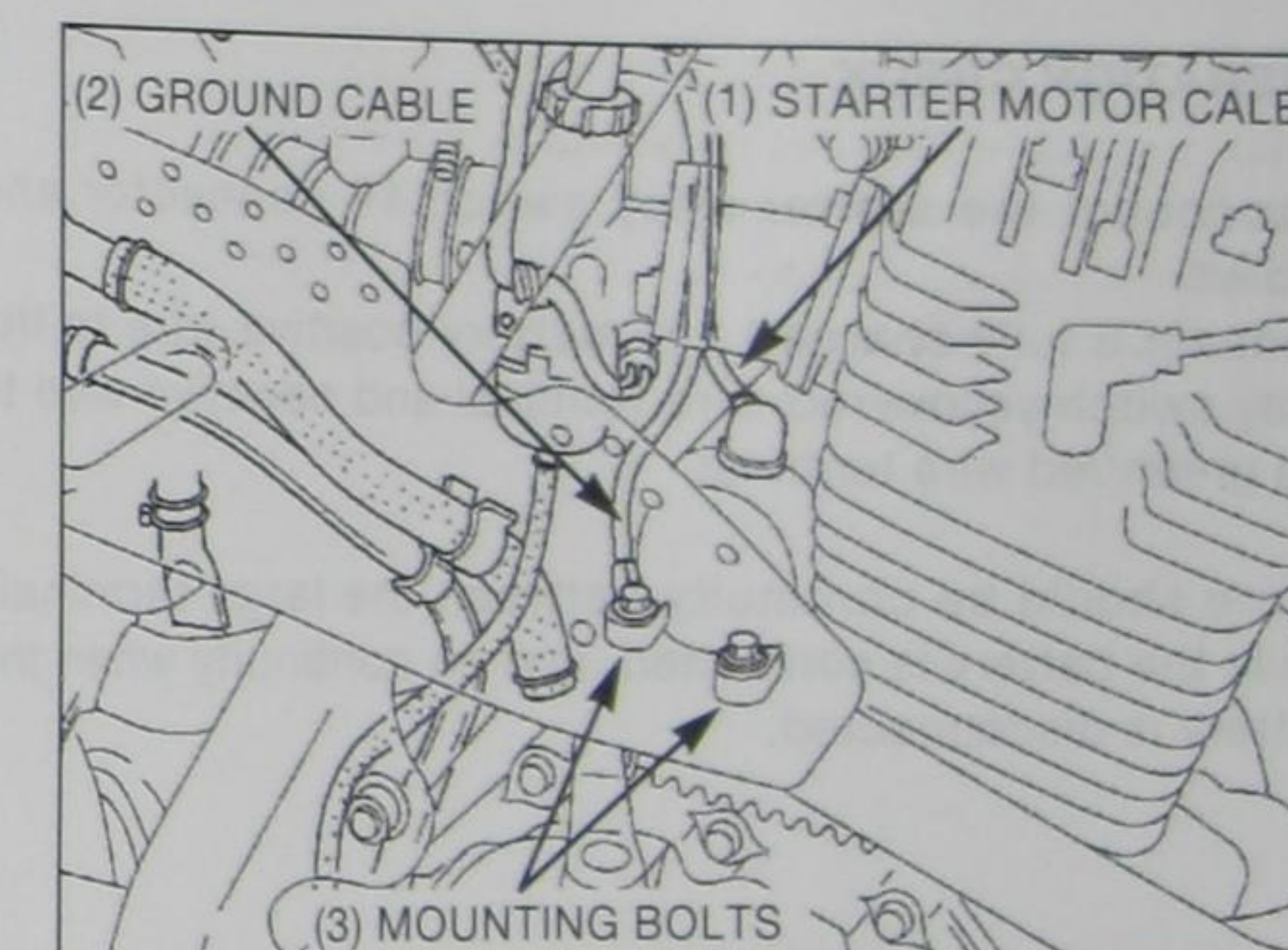


INSTALLATION

Coat a new O-ring with oil and install it into the starter motor groove.



Install the starter motor into the left crankcase cover and onto the crankcase.
Install the mounting bolts with the ground cable against the motor cover, and tighten the bolts securely.
Install the starter motor cable and terminal nut onto the motor terminal and tighten the nut securely (page 1-18).
Install the rubber cap over the motor terminal securely.



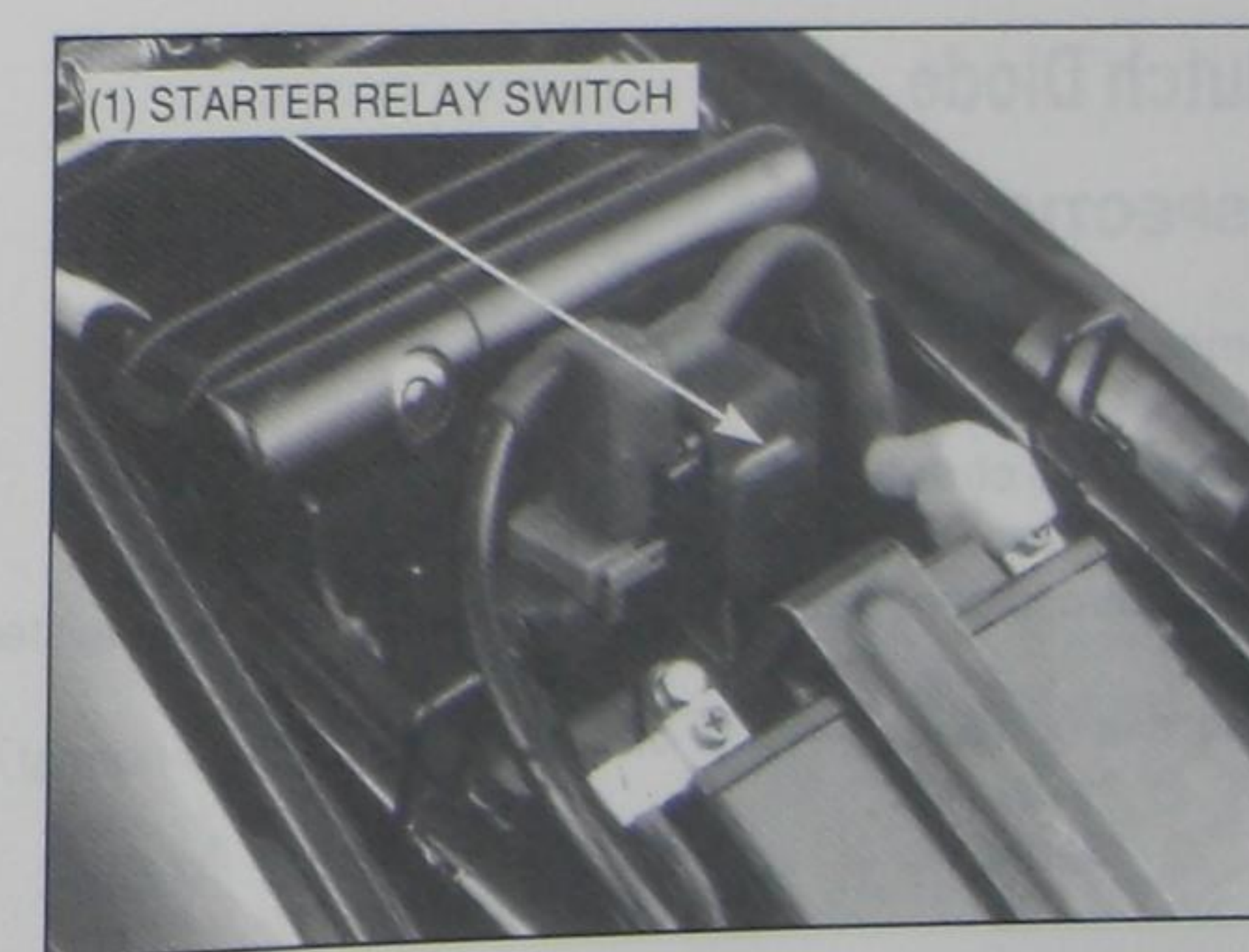
Starter Relay Switch

INSPECTION

Remove the seat (page 2-2).

Shift the transmission into neutral.
Turn the ignition switch ON and engine stop switch to RUN.
Push the starter switch.
The coil is normal if the starter relay switch clicks.

If you don't hear the switch "CLICK", inspect the relay switch using the procedure on the next page.

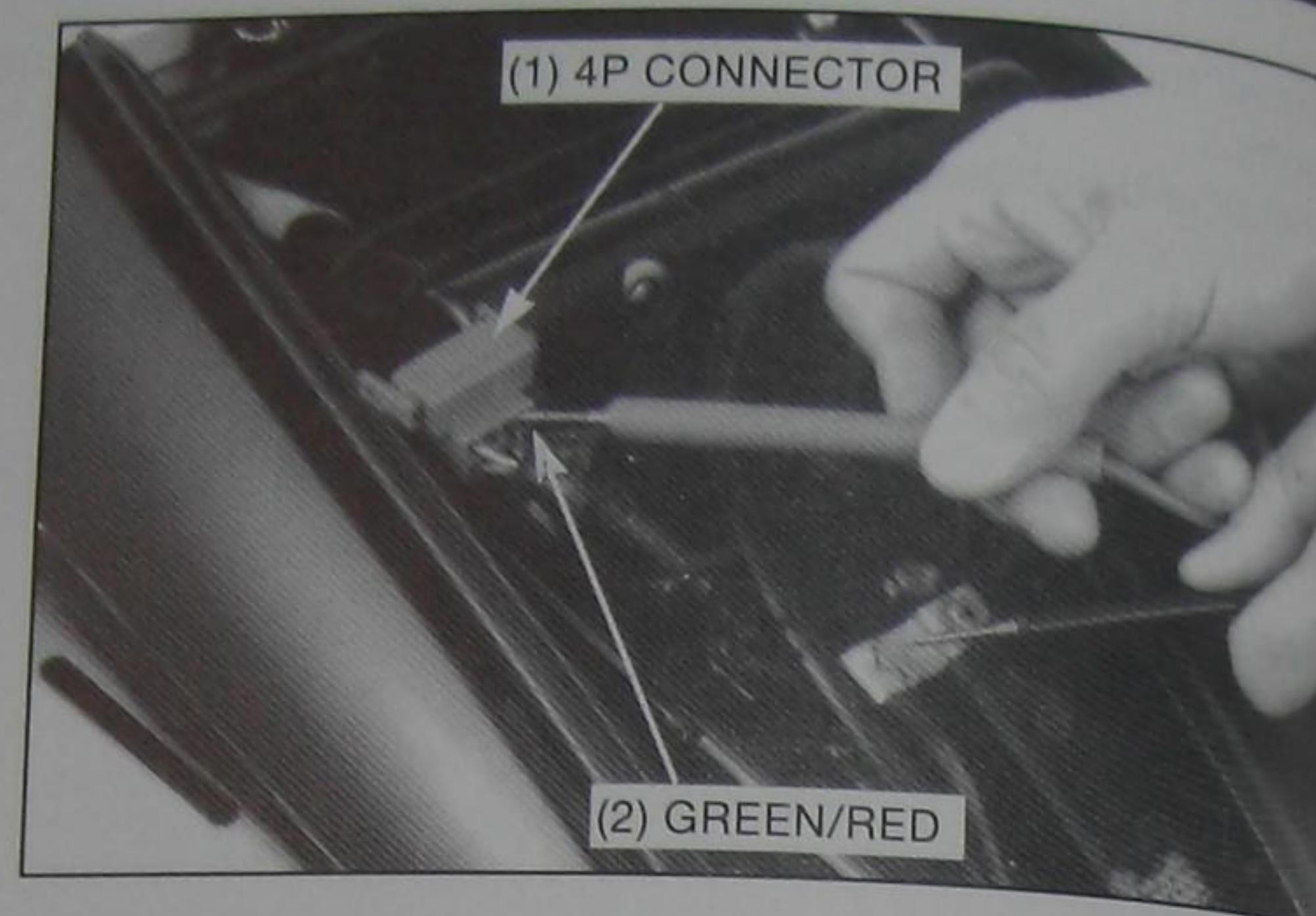


ELECTRIC STARTER

GROUND LINE

Disconnect the starter relay switch 4P connector.
Check for continuity between the green/red wire (ground line) terminal and ground.

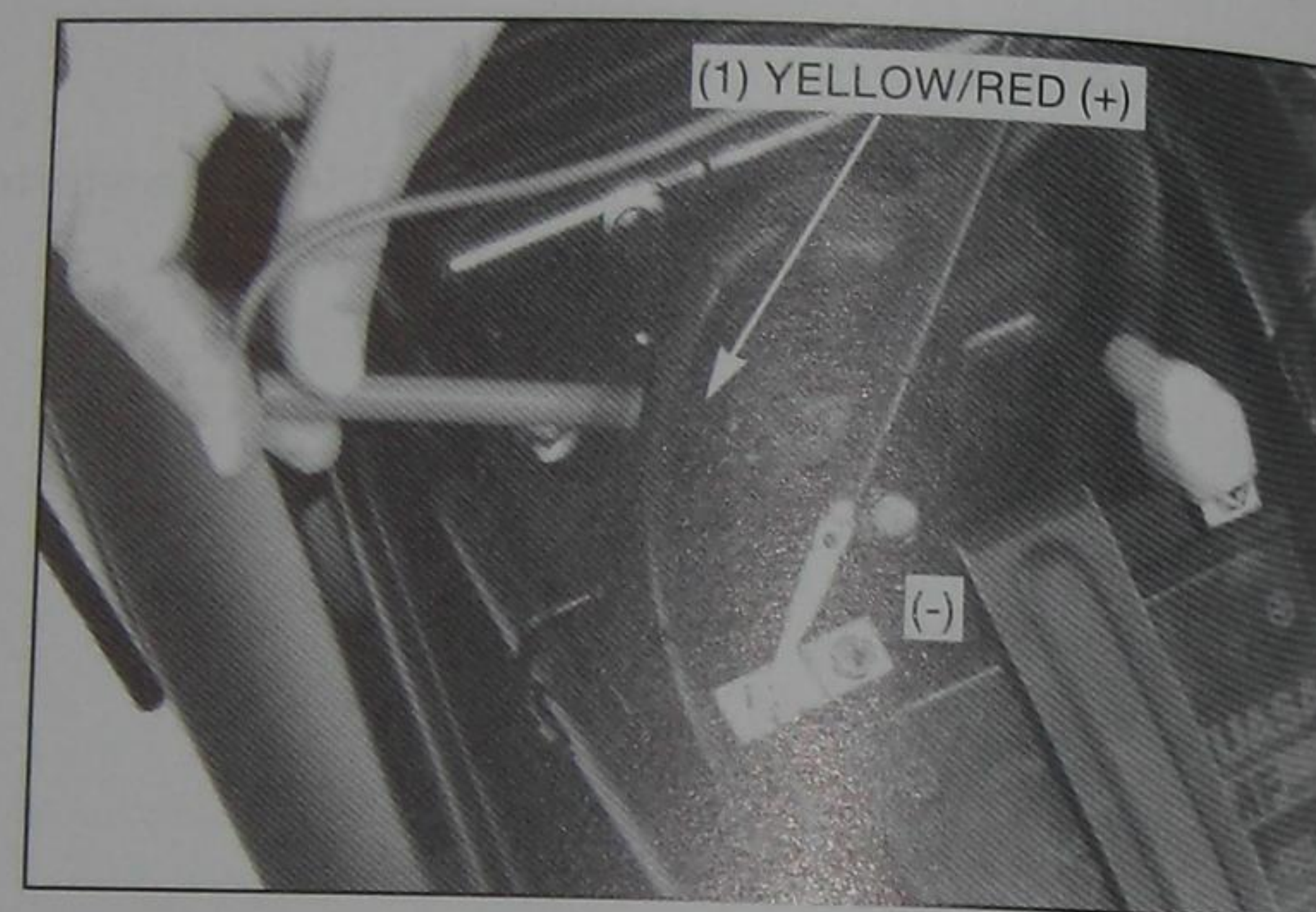
If there is continuity when the transmission is in neutral or when the clutch is disengaged and the side stand is retracted, the ground circuit is normal. (In neutral, there is a slight resistance due to the diode.)



STARTER RELAY VOLTAGE

Connect the starter relay switch 4P connector.
Shift the transmission into neutral.
Measure the voltage between the yellow/red wire terminal (+) and ground (-).

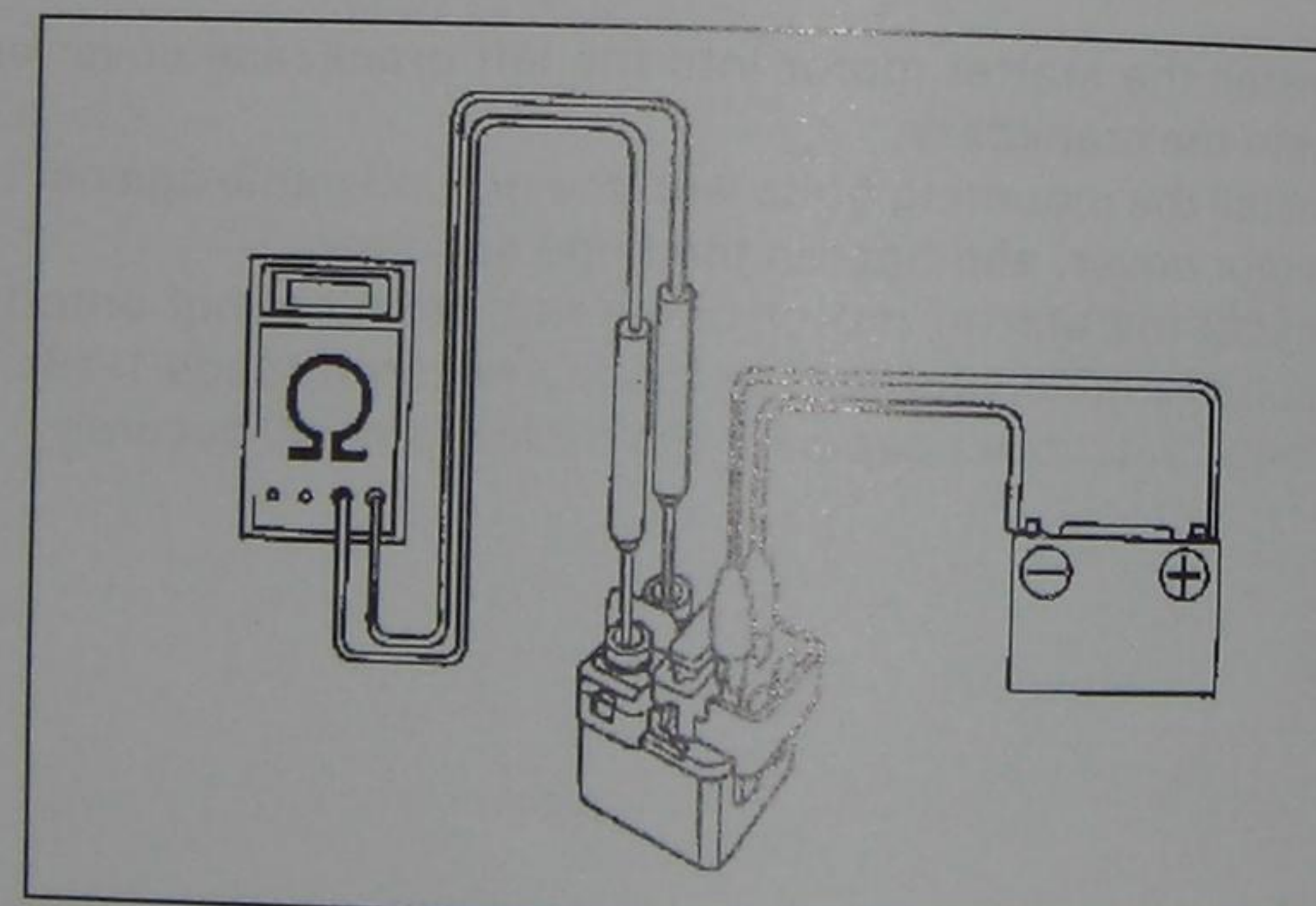
If the battery voltage appears only when the starter switch is pushed with the ignition switch ON and engine stop switch to RUN, it is normal.



OPERATION CHECK

Disconnect the starter relay switch 4P connector and cables.
Connect a fully charged 12V battery positive wire to the relay switch yellow/red wire terminal and negative wire to the green/red wire terminal.

There should be continuity between the large terminals while the battery is connected, and no continuity when the battery is disconnected.



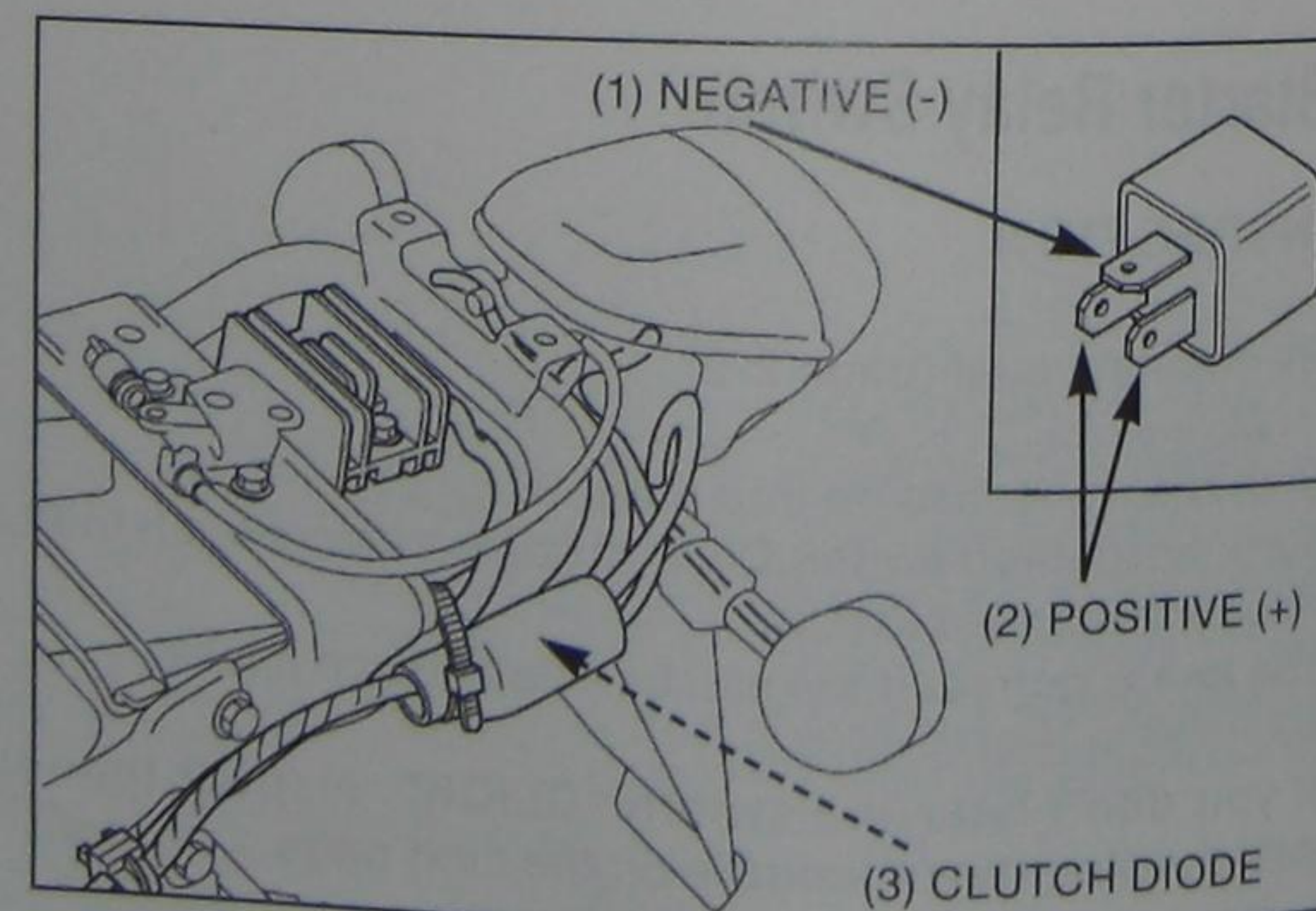
Clutch Diode

INSPECTION

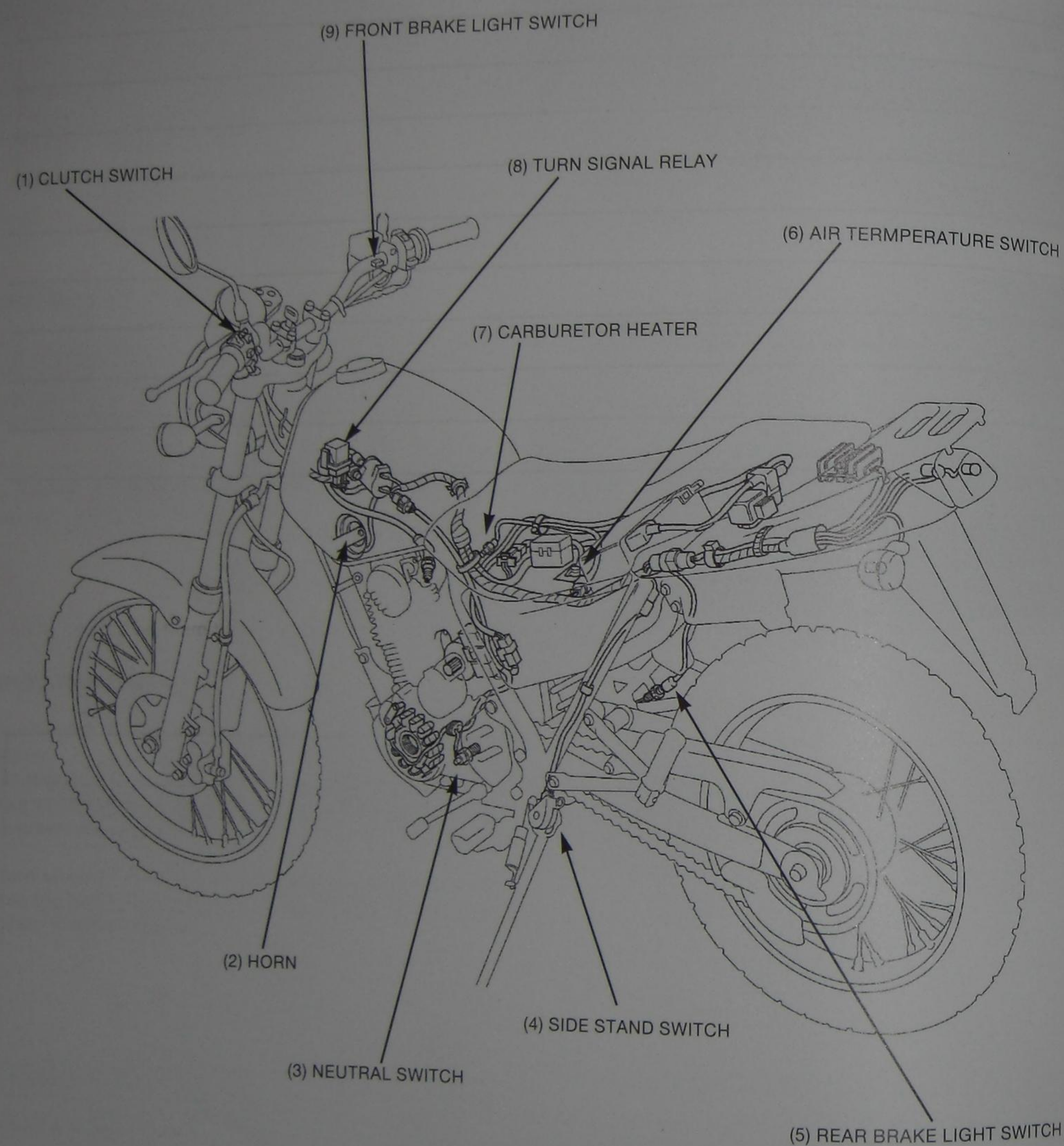
Remove the seat cowl (page 2-3).

Remove the clutch diode.
Check for continuity between the diode terminals.
When there is continuity, a small resistance value will register.

If there is continuity in one direction, the diode is normal.



MEMO



18. Lights/Meters/Switches

SEVICE INFORMATION	18-1	SIDE STAND SWITCH	18-6
BULB REPLACEMENT	18-2	NEUTRAL SWITCH	18-7
SPEEDOMETER/INSTRUMENT	18-4	HANDLEBAR SWITCH	18-8
BRAKE LIGHT SWITCH	18-5	CARBURETOR HEATER	18-9
CLUTCH SWITCH	18-6	HORN	18-9
IGNITION SWITCH	18-6	TURN SIGNAL RELAY	18-10

Service Information

GENERAL

WARNING

- A halogen headlight bulb becomes very hot while the headlight is ON, and remains hot for a while after it is turned OFF. Be sure to let it cool down before servicing.

- Note the following when replacing the halogen headlight bulb.
 - Wear clean gloves while replacing the bulb. Do not put finger prints on the headlight bulb, as they may create hot spots on the bulb and cause it to fail.
 - If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.
 - Be sure to install the dust cover after replacing the bulb.
- Check the battery condition before performing any inspection that requires proper battery voltage.
- A continuity test can be made with the switches installed on the motorcycle.
- All plastic connectors have locking tabs that must be released before disconnecting, and must be aligned when reconnecting.

SPECIFICATIONS

Item			Specifications
Bulb	Headlight high/low beam	E type	12 V - 35/35 W
		Except E type	12 V - 60/55 W
	Position light		12 V - 5 W
	Brake/taillight		12 V - 21/5 W
	Turn signal light		12 V - 10 W x 4
	Meter light		12 V - 1.7 W
	High beam indicator		12 V - 1.7 W
	Neutral indicator		12 V - 1.7 W
	Turn signal indicator		20 A
Fuse	Main fuse		10 A x 2, 15 A
	Sub fuse		

TORQUE VALUE

- Ignition switch mounting bolt 26 N·m (2.7 kgf-m, 20 lbf-ft) ALOC bolt: replace with a new one

Bulb Replacement

HEADLIGHT AND POSITION LIGHT

WARNING

- A halogen headlight bulb becomes very hot while the headlight is ON, and will remain hot for a while after it is turned OFF. Be sure to let it cool down before servicing.

Remove the three screws and the headlight from the case. Remove the dust cover from the headlight tabs. Pull the socket out of the headlight and disconnect the headlight connector (s) to remove the headlight assembly.

POSITION LIGHT BULB

Pull the bulb out of the socket and replace it with a new one.

HEADLIGHT BULB

Except E type:

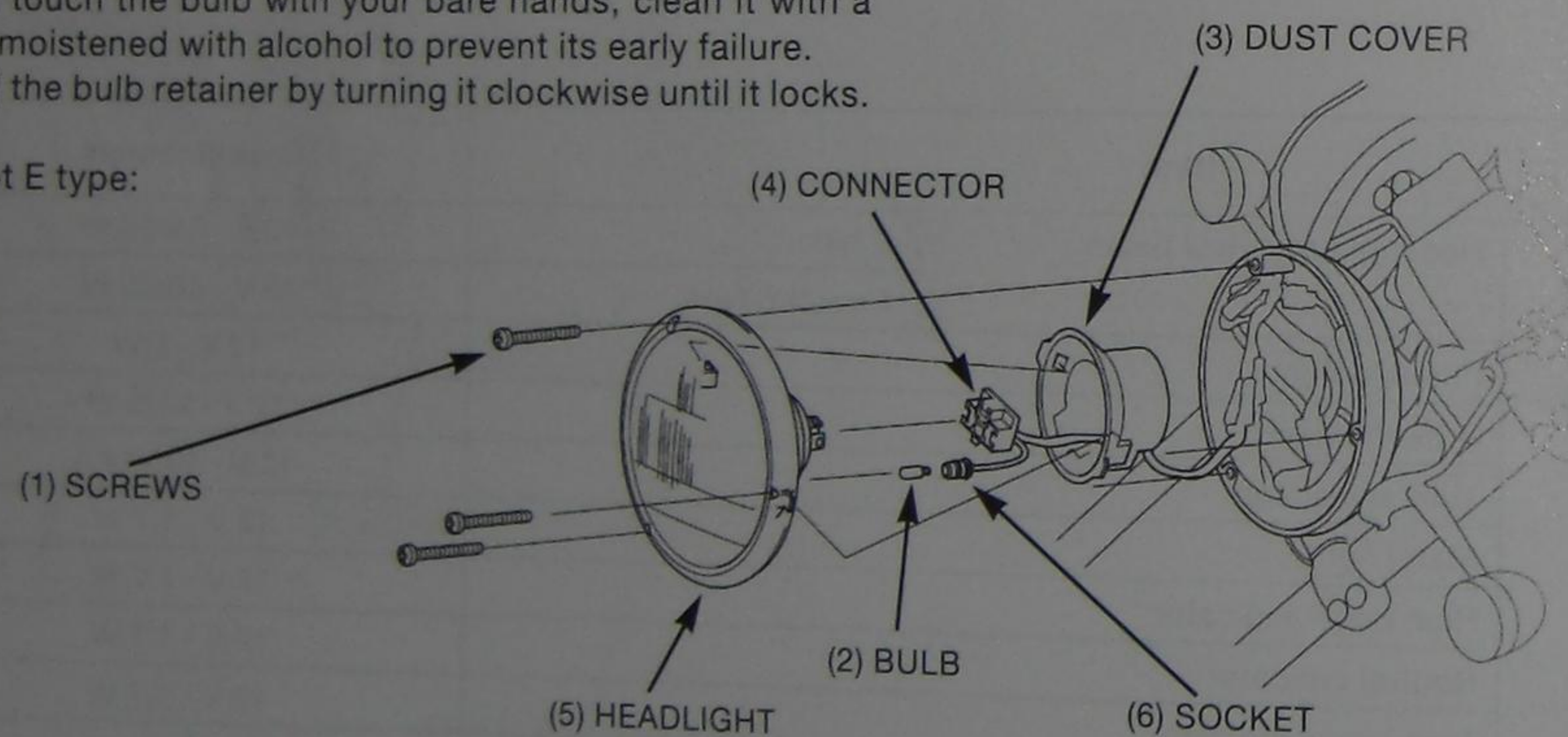
Remove the headlight bulb retainer by turning counterclockwise and replace the headlight bulb with a new one.

CAUTION

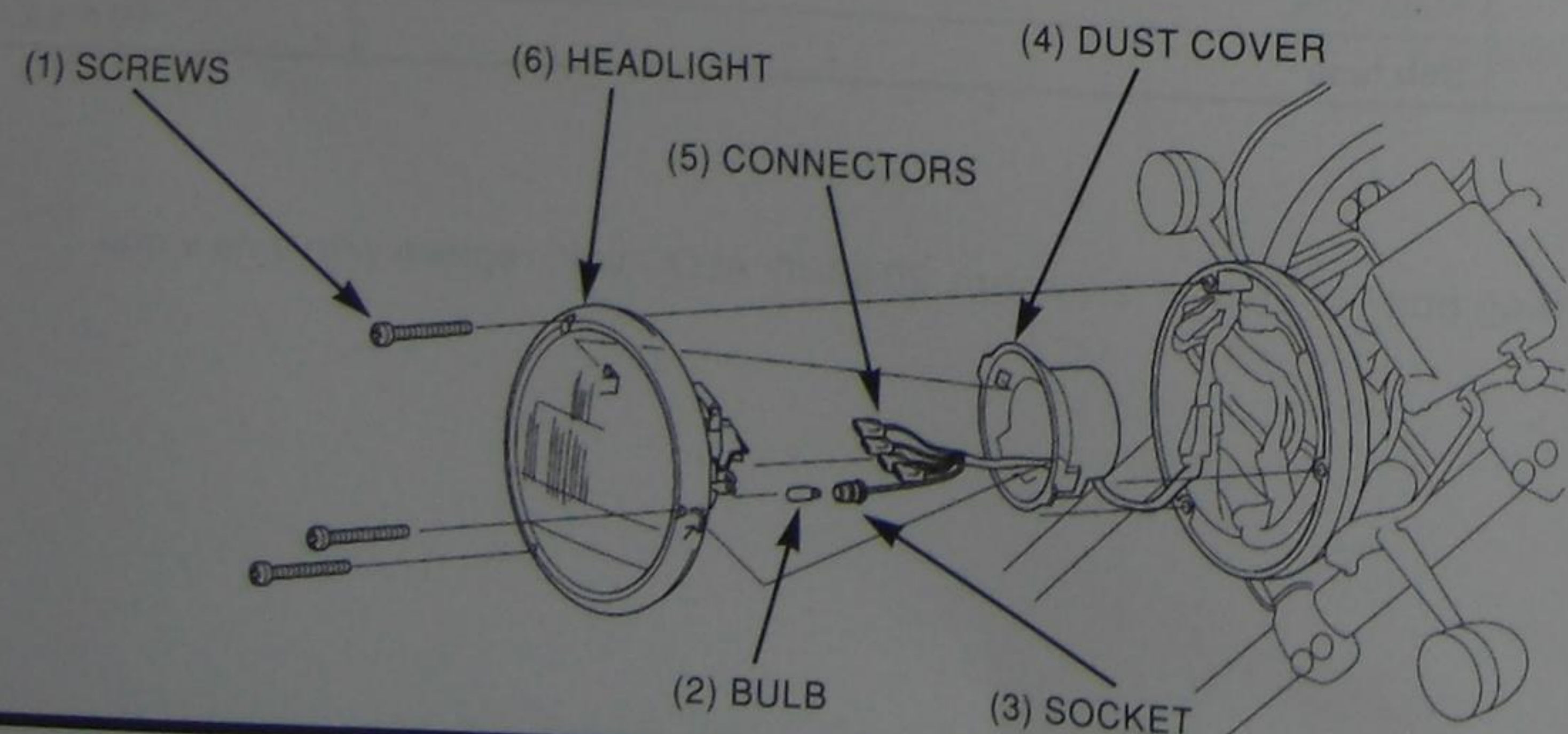
- Avoid touching halogen headlight bulb. Finger prints can create hot spots that cause a bulb to break.

If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure. Install the bulb retainer by turning it clockwise until it locks.

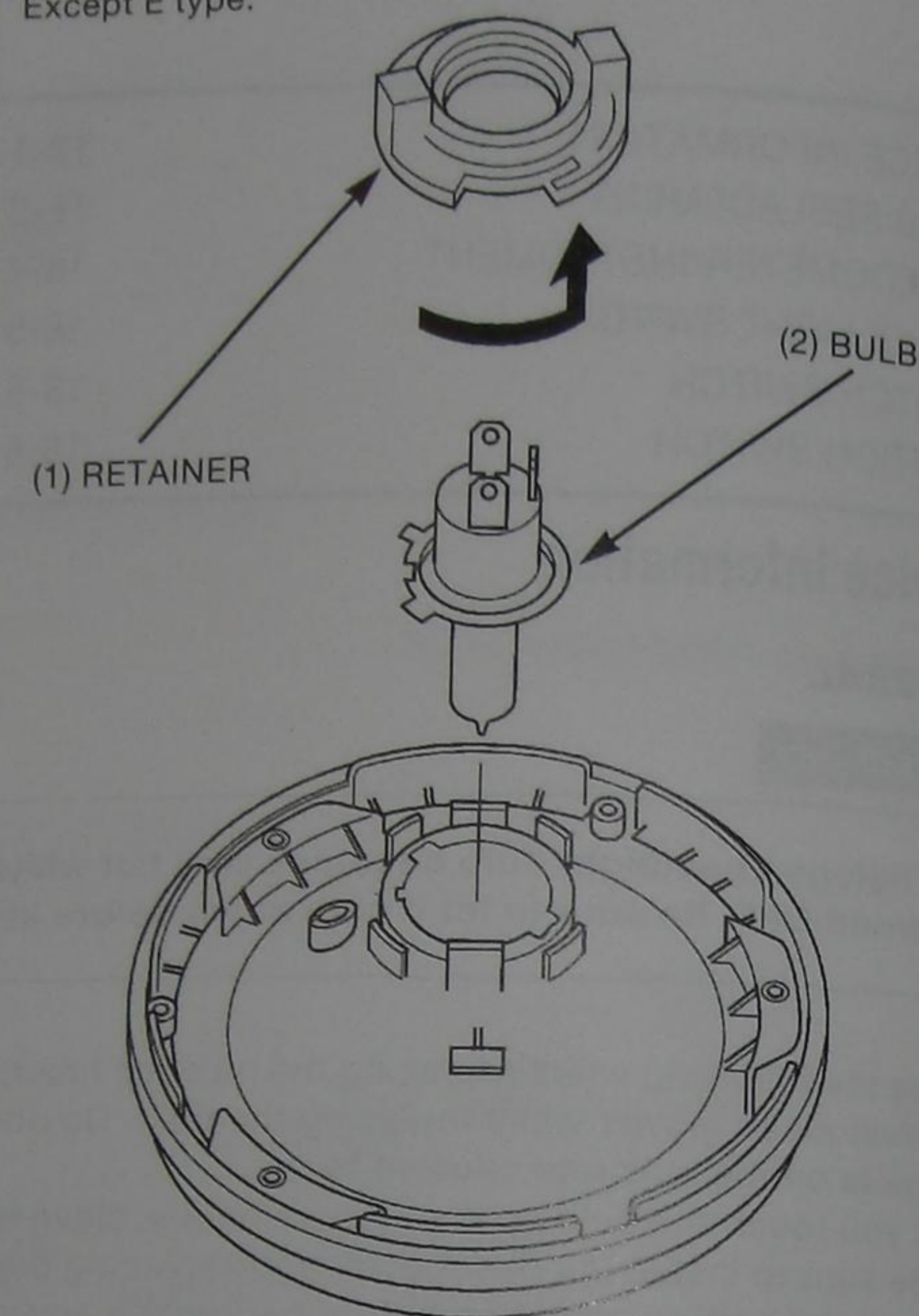
Except E type:



E type:



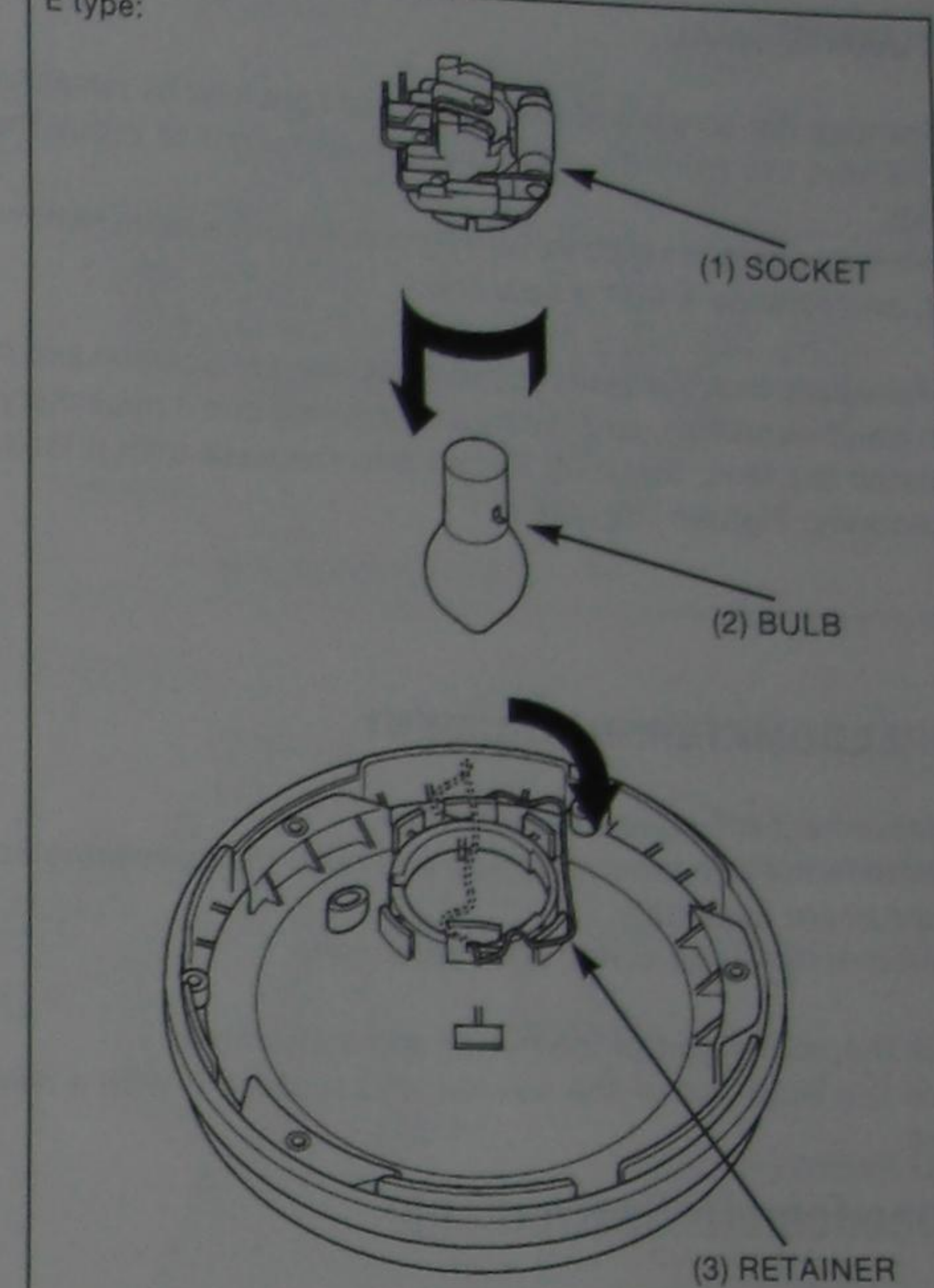
Except E type:



E type:

Unhook the bulb retainer and remove the socket. While pushing the bulb in, turn it counterclockwise to remove it, and replace it with a new one. Install the socket and hook the bulb retainer properly.

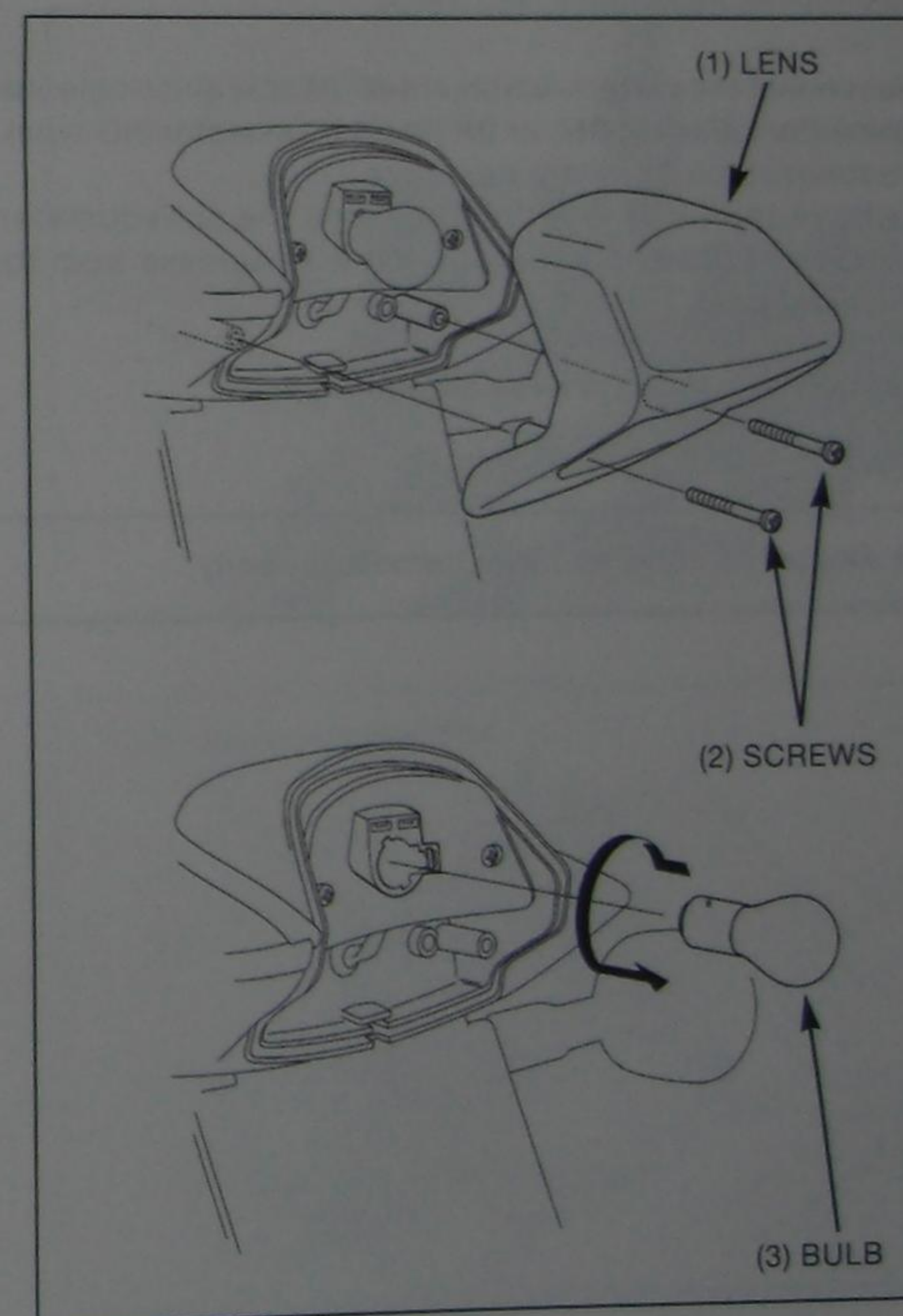
E type:



BRAKE/TAILLIGHT

Remove the two screws and turn brake/taillight lens. While pushing the bulb in, turn in counterclockwise to remove it, and replace it with a new one.

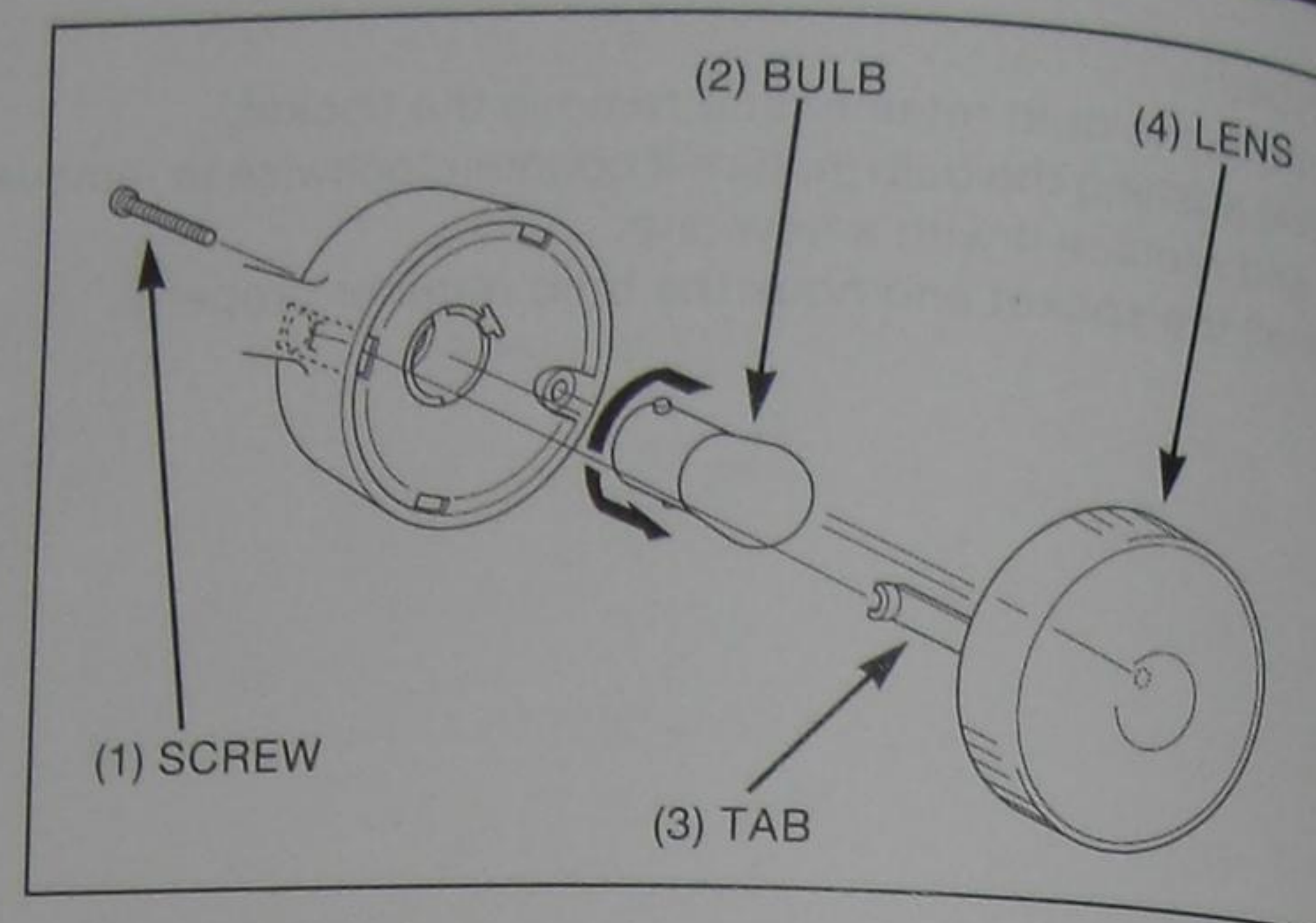
Make sure that the seal rubber is installed in position and is in good condition, and replace it with new one if necessary. Install the lens and tighten the two screws.



TURN SIGNAL

Remove the screw and the turn signal light lens by releasing the lens tab from the case, being careful not to break the tab. While pushing the bulb in, turn it counterclockwise to remove it, and replace it with a new one.

Make sure that the seal rubber is installed in position and is in good condition, and replace it with new one if necessary. Install the lens, inserting its tab into the case until it locks securely. Tighten the screw.



SPEEDOMETER/INSTRUMENT

Disconnect the speedometer cable. Remove the two mounting nuts and raise the speedometer/instrument assembly. Remove the three screws and meter case.

Pull the socket out of the meter and instrument. Pull the bulb out of the socket and replace it with a new one.

Speedometer/Instrument

REMOVAL/INSTALLATION

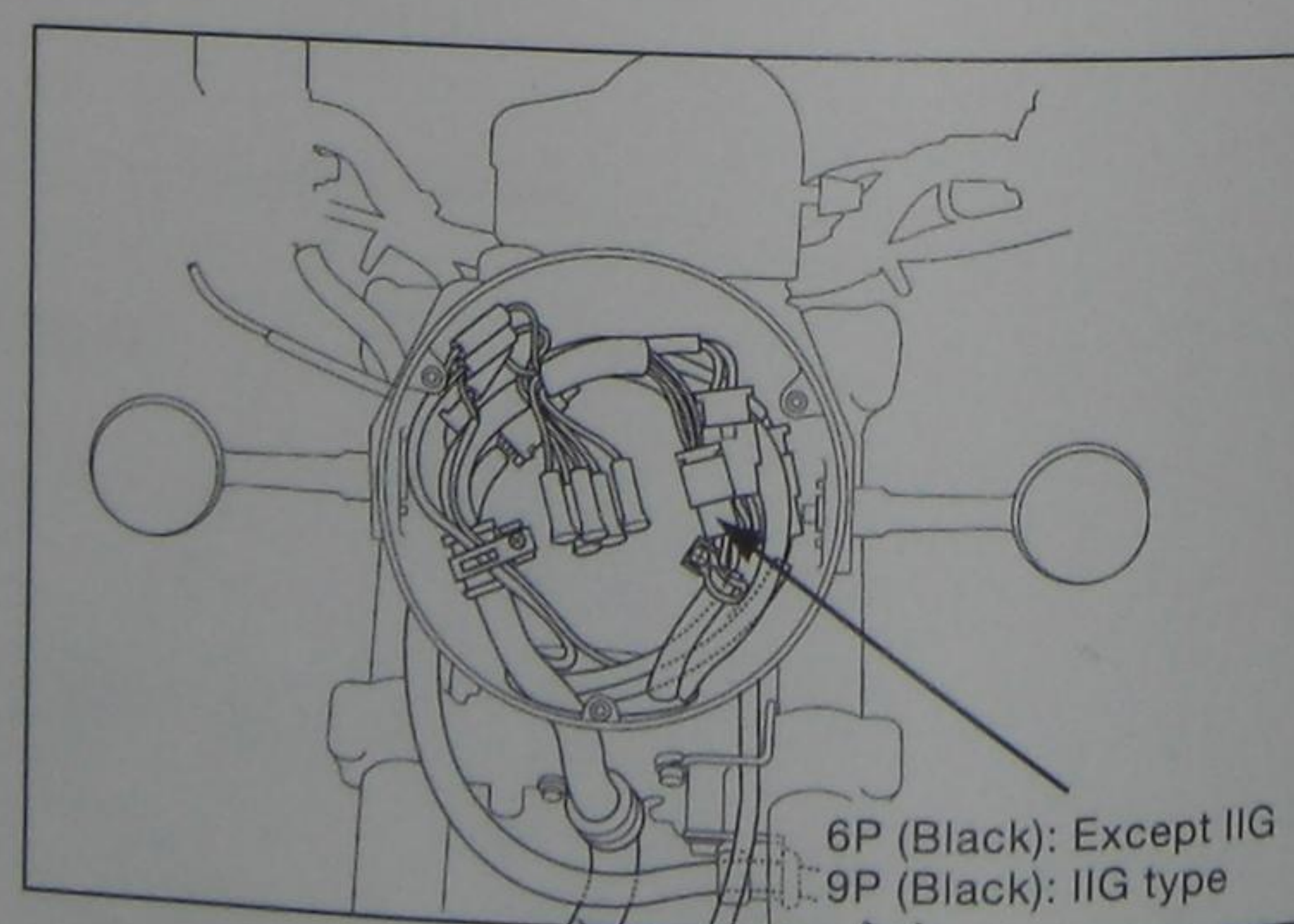
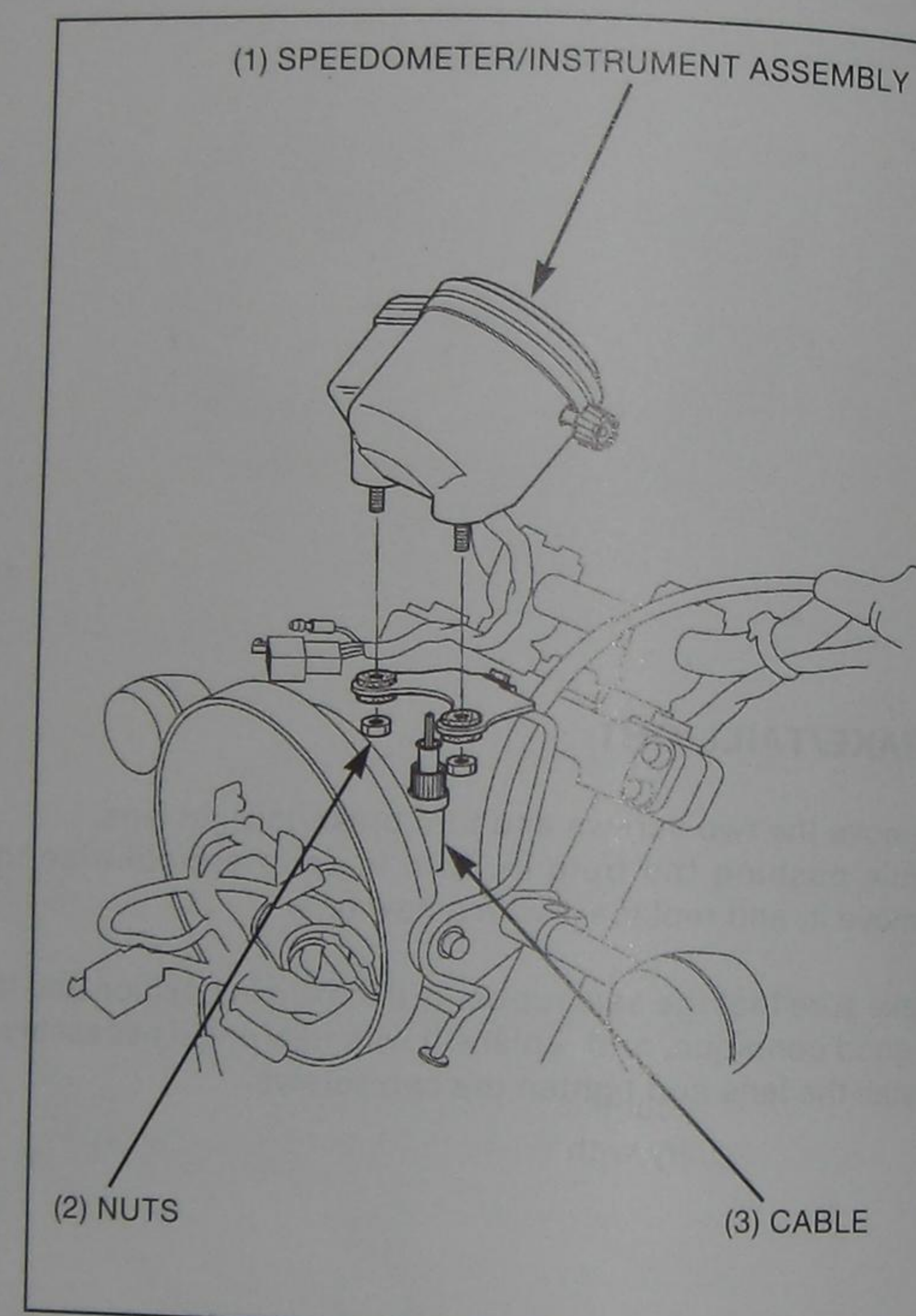
Remove the headlight (page 18-2).

Disconnect the meter/instrument 6P (Black) and single lead connectors (Except IIG) or 9P (Black) connector (IIG type). Disconnect the speedometer cable. Remove the two mounting nuts and the speedometer/instrument assembly through the wire harness from the headlight case.

Installation is in the reverse order of removal.

NOTE:

- Route the cable and wire harness properly.



DISASSEMBLY/ASSEMBLY

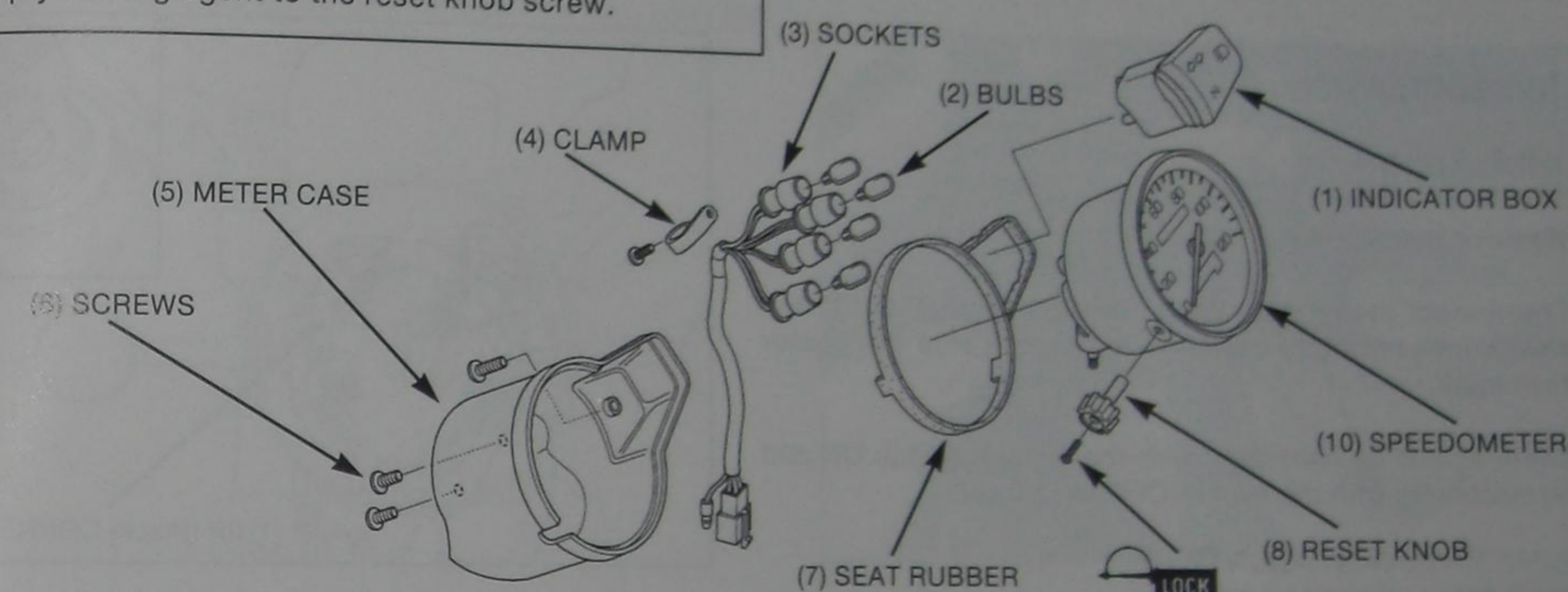
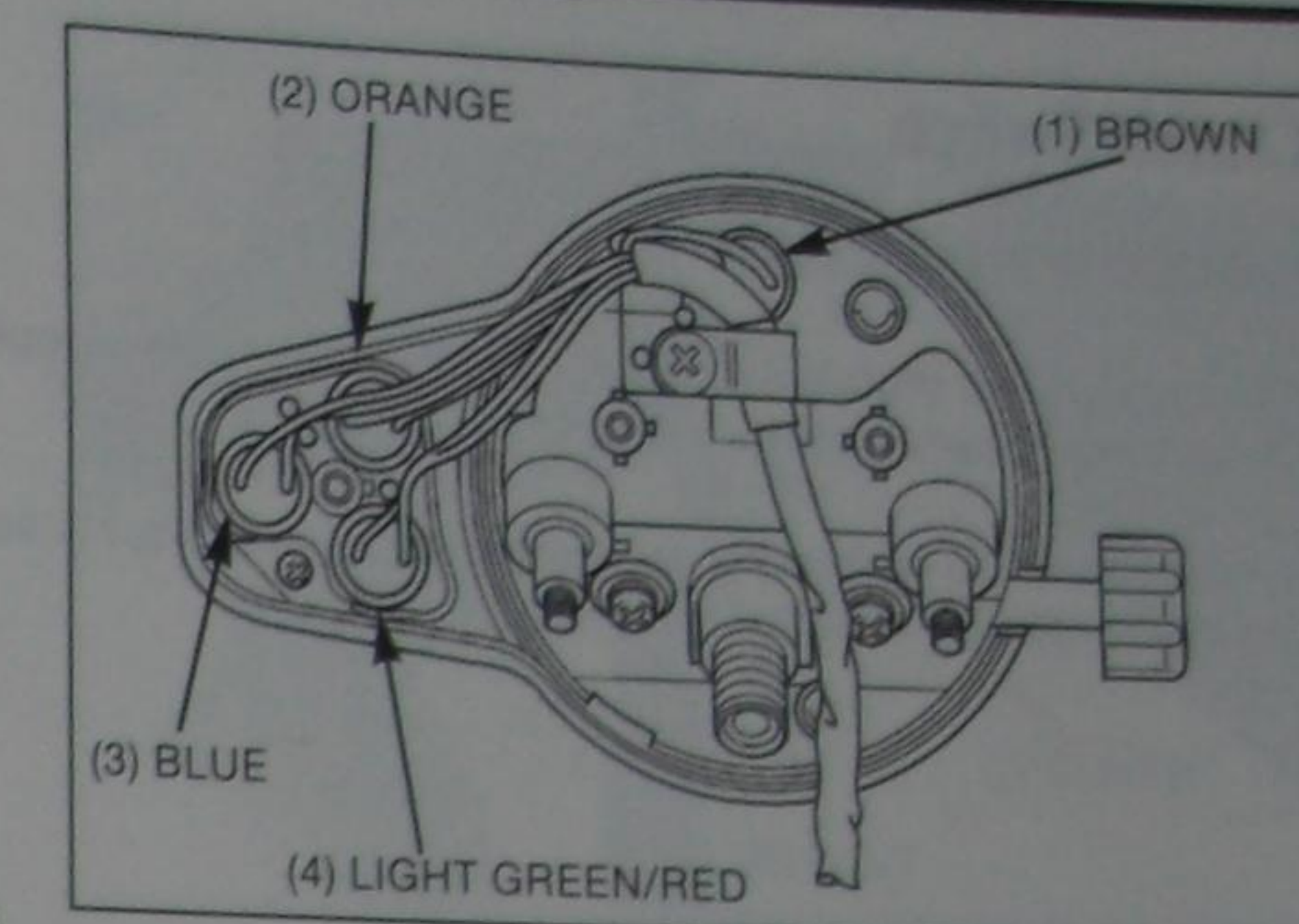
Remove the following:

- Three screws
- Meter case
- Speedometer and indicator box
- Seat rubber
- Clamp screw and harness clamp
- Bulb sockets
- Screw and tripmeter reset knob

Assembly is in the reverse order of disassembly.

NOTE:

- Apply locking agent to the reset knob screw.



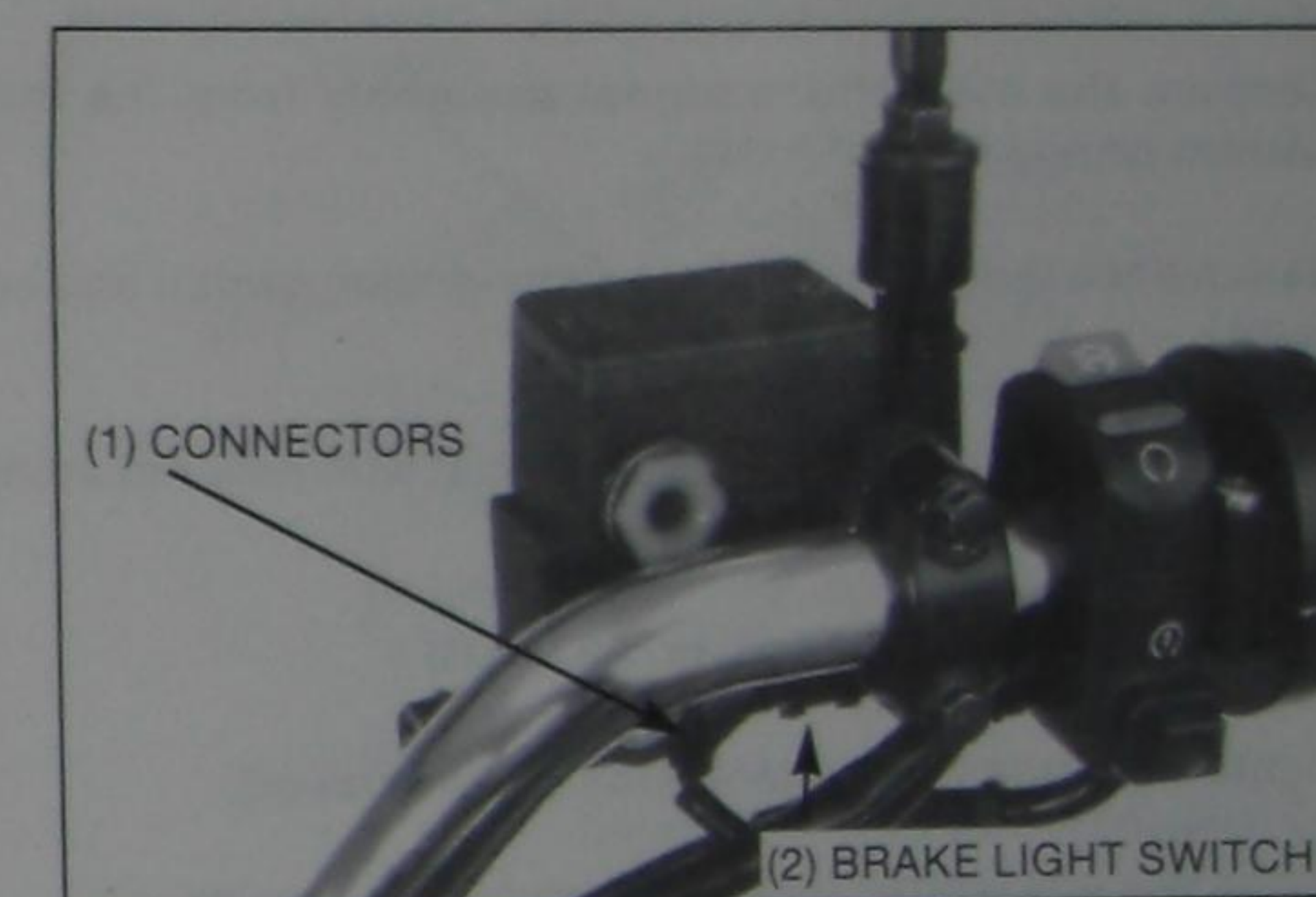
Brake Light Switch

INSPECTION

FRONT

Disconnect the front brake light switch wire connectors and check for continuity between the switch terminals.

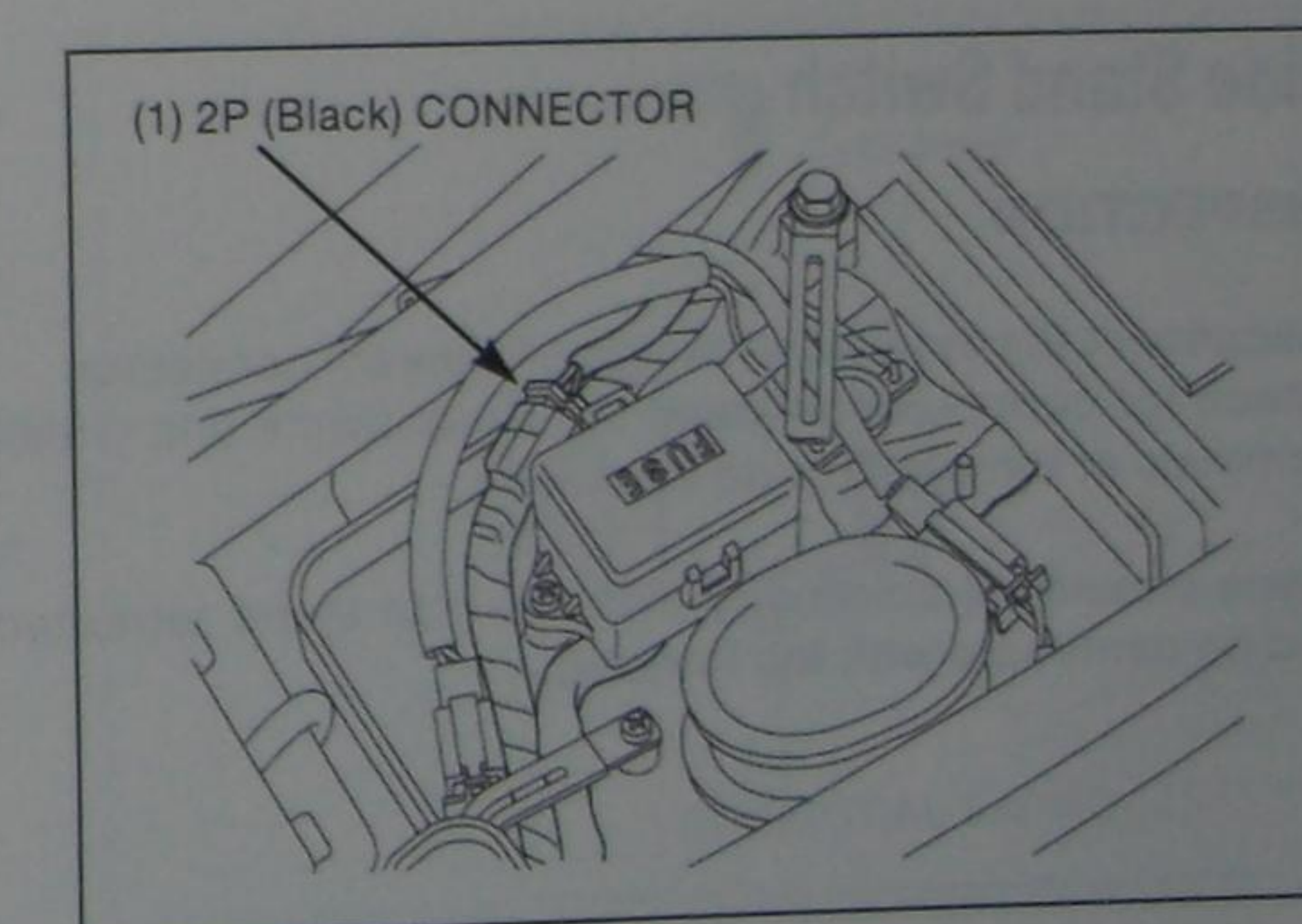
There should be continuity with the front brake lever squeezed and no continuity with the lever released.



REAR

Remove the seat (page 2-2). Disconnect the rear brake light switch 2P (Black) connector and check for continuity between the switch side connector terminals.

There should be continuity with the rear brake pedal depressed and no continuity with the pedal released.

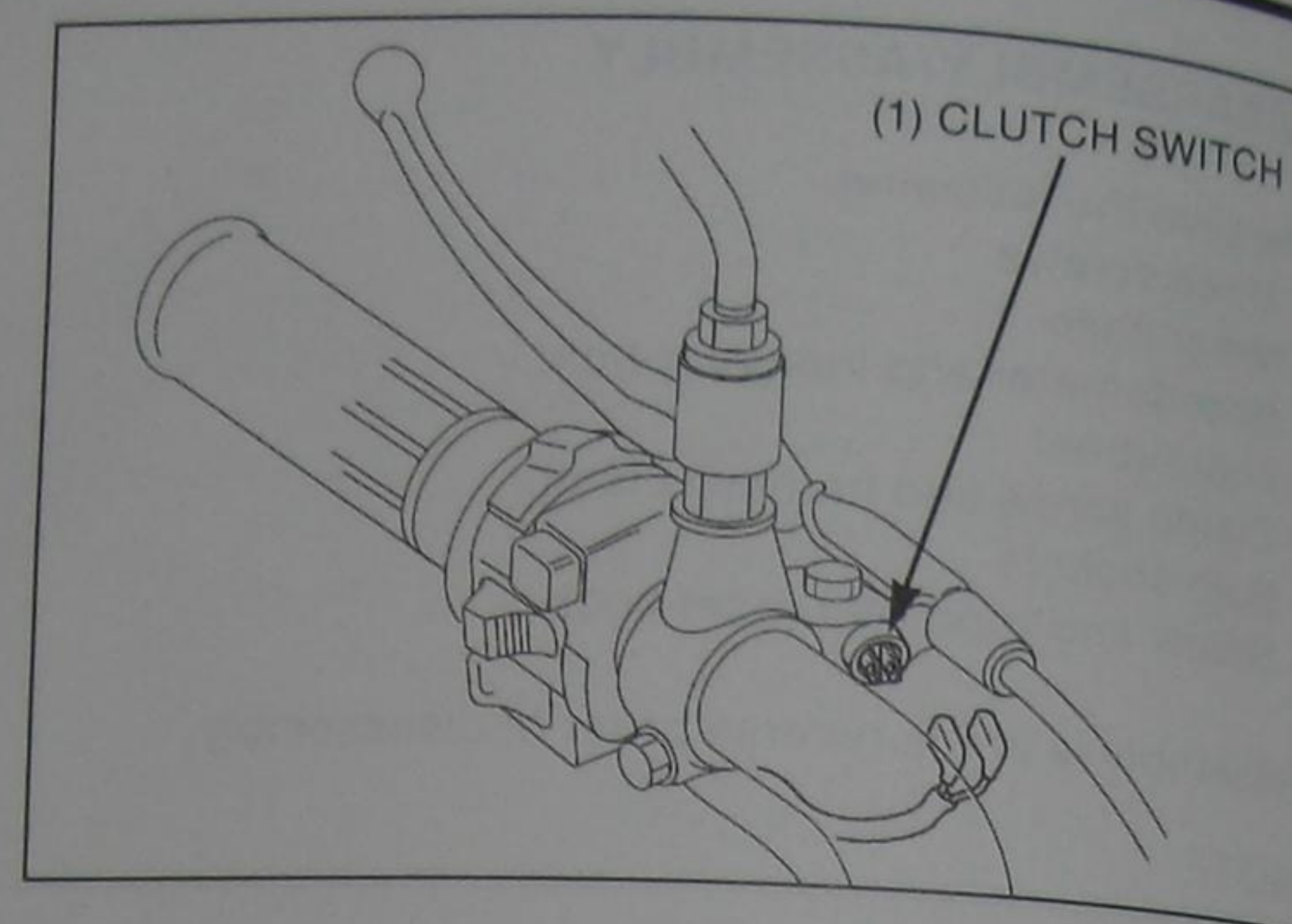


Clutch Switch

INSPECTION

Disconnect the clutch switch wire connectors and check for continuity between the switch terminals.

There should be continuity with the clutch lever squeezed and no continuity with the lever released.



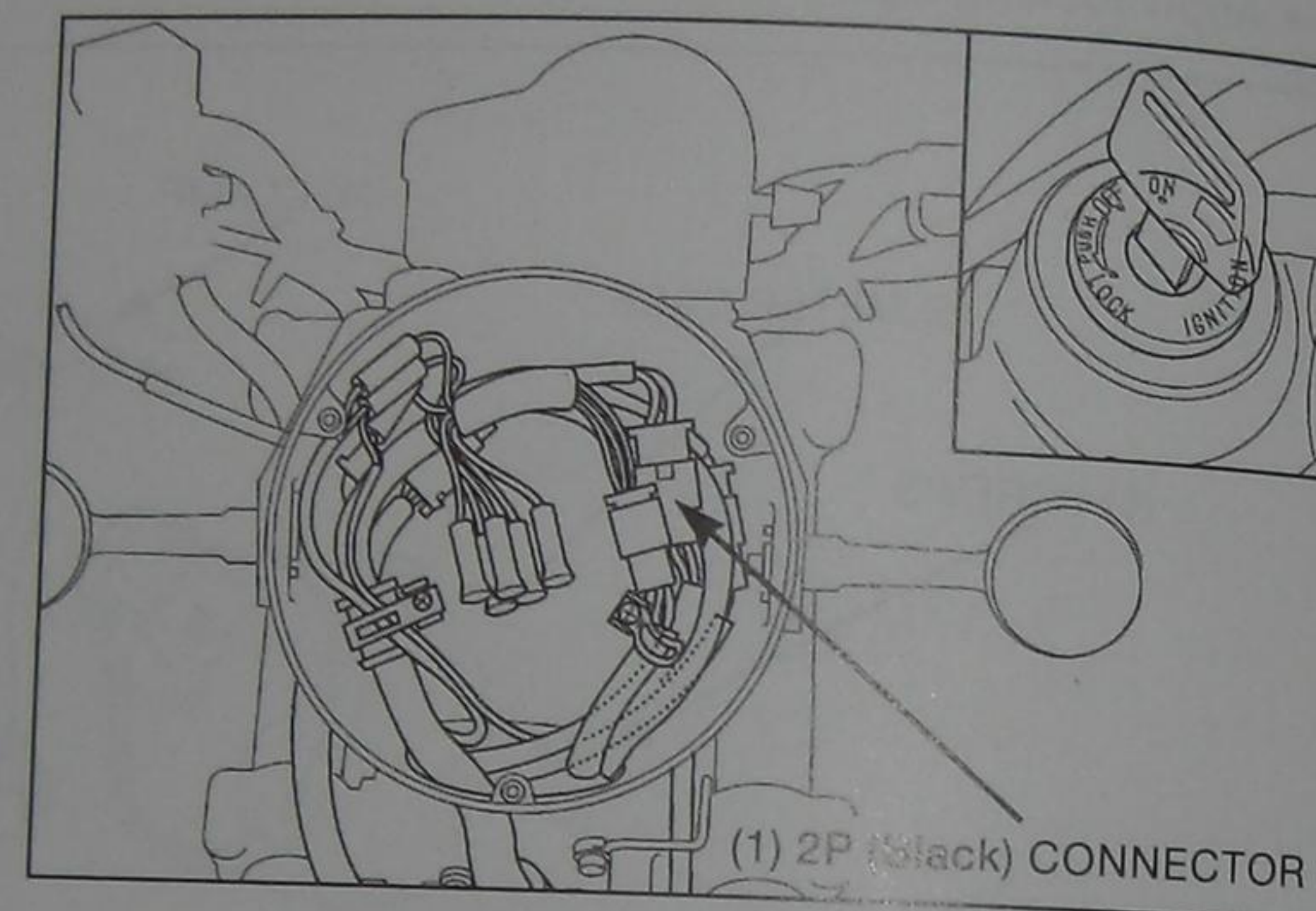
Ignition Switch

INSPECTION

Remove the headlight (page 18-2).

Disconnect the ignition switch 2P (Black) connector and check for continuity between the switch side connector terminals.

There should be continuity with the ignition switch ON and no continuity with the switch OFF and LOCK.



REMOVAL/INSTALLATION

Remove the meter/turn signal assembly from the fork bottom bridge (page 12-17).

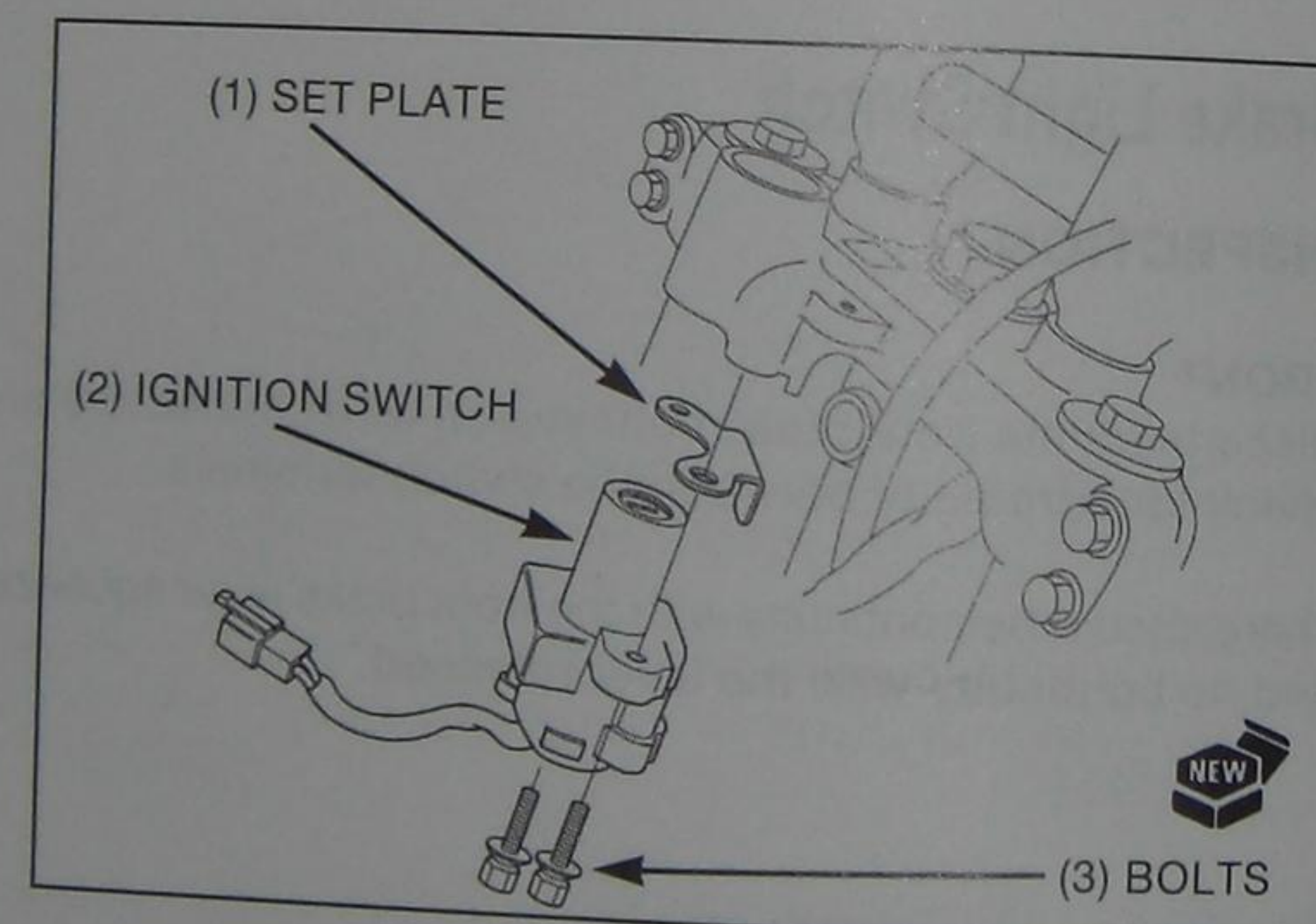
Remove the mounting bolts and the ignition switch and set plate.

Install the set plate and ignition switch with new mounting bolts.

TORQUE: 26 N·m (2.7 kgf-m, 20 lbf-ft)

Tighten the bolts until their ends are broken off.

Install the meter/turn signal assembly (page 12-21).

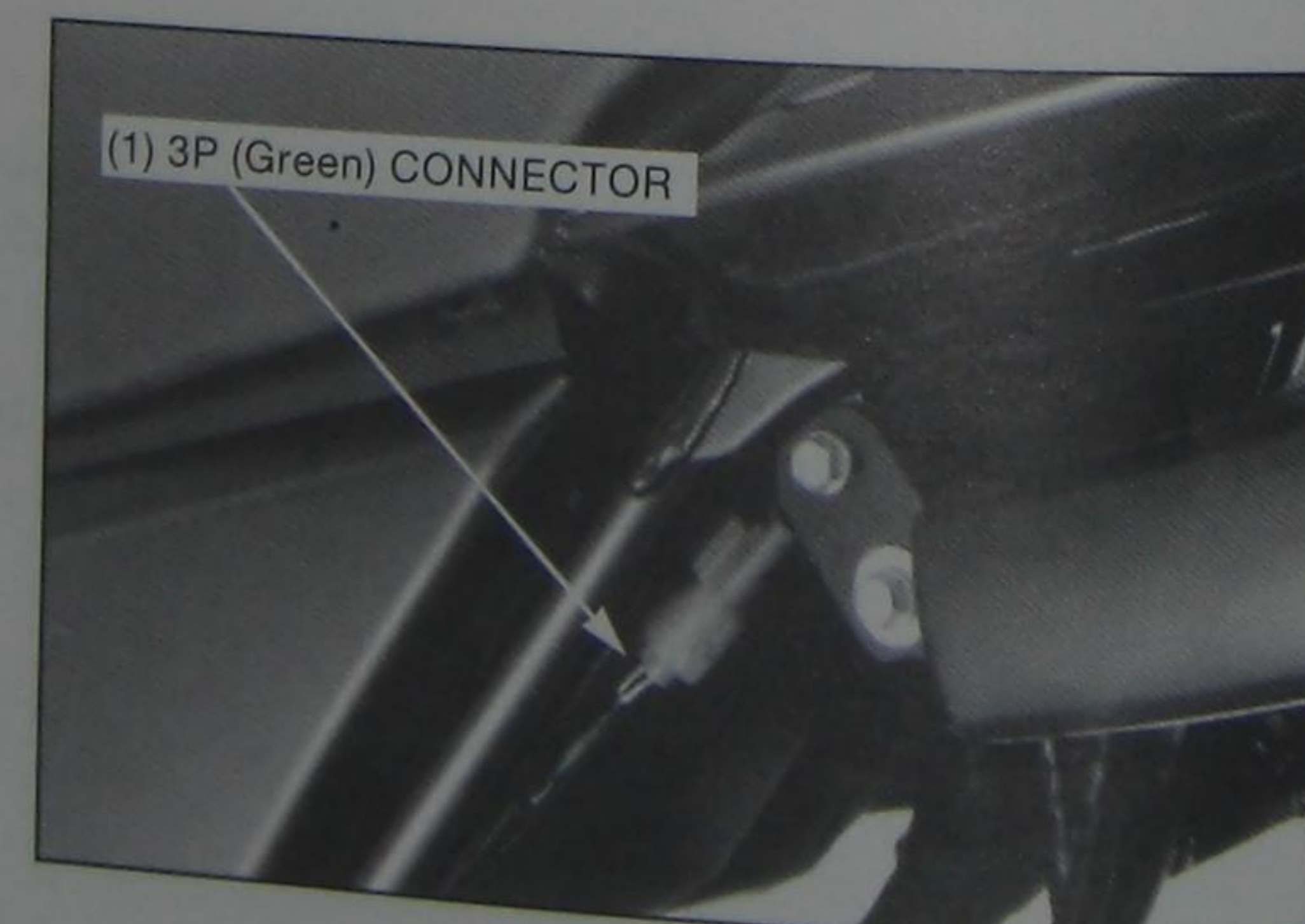


Side Stand Switch

INSPECTION

Disconnect the side stand switch 3P (Green) connector. Check for continuity between the Green/white and Green terminals at the switch side connector.

There should be continuity with the side stand retracted and no continuity with the lowered.



REMOVAL

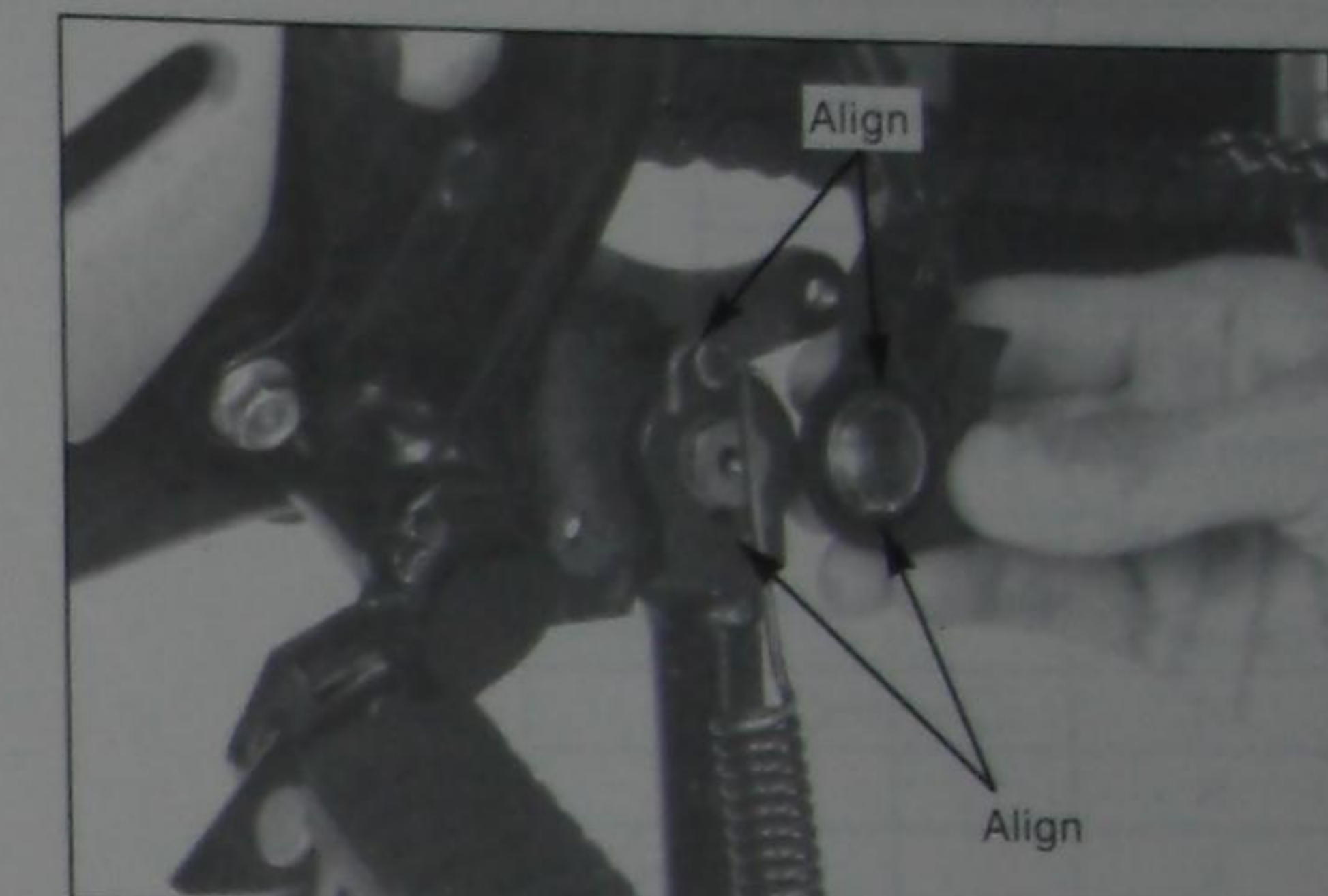
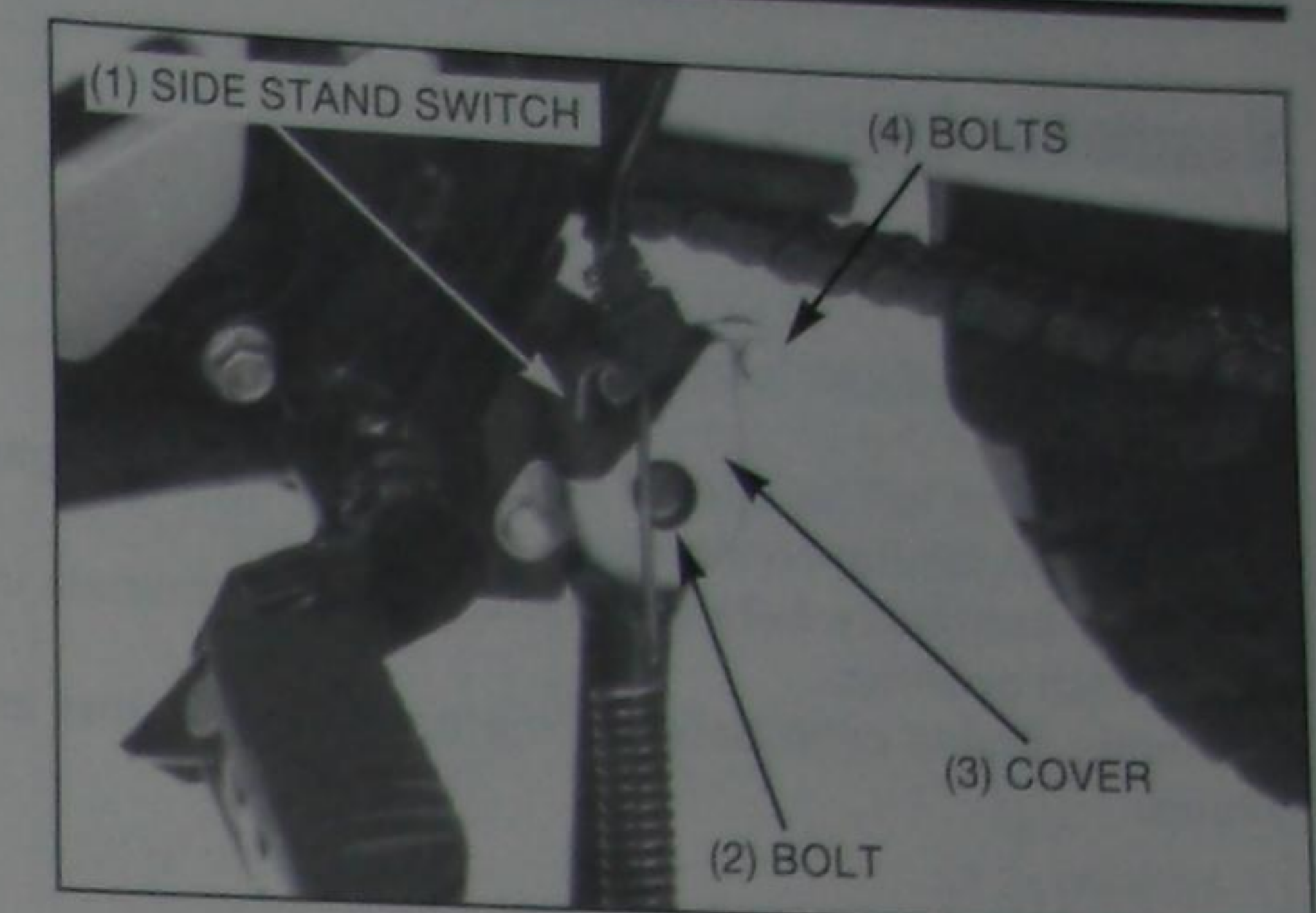
Disconnect the side stand switch 3P connector and release the switch wire from the frame clamps. Remove the cover bolts and switch cover. Remove the switch bolt and side stand switch.

INSTALLATION

Install the side stand switch by aligning the switch pin with the side stand hole and the switch groove with the spring holding pin.

Install the switch bolt and tighten it.

Install the switch cover and tighten the cover bolts. Connect the 3P connector and secure the wire with the frame clamps.



Neutral Switch

INSPECTION

Remove the two bolts and the drive sprocket cover. Remove the cap from the neutral switch and disconnect the wire by pushing the terminal flange. Check for continuity between the switch terminal and engine ground.

There should be continuity with the transmission in neutral, and no continuity with the transmission in gear except neutral.

REMOVAL/INSTALLATION

Disconnect the wire from the neutral switch (see above). Pull the neutral switch out of the crankcase, being careful not to damage the terminal flange.

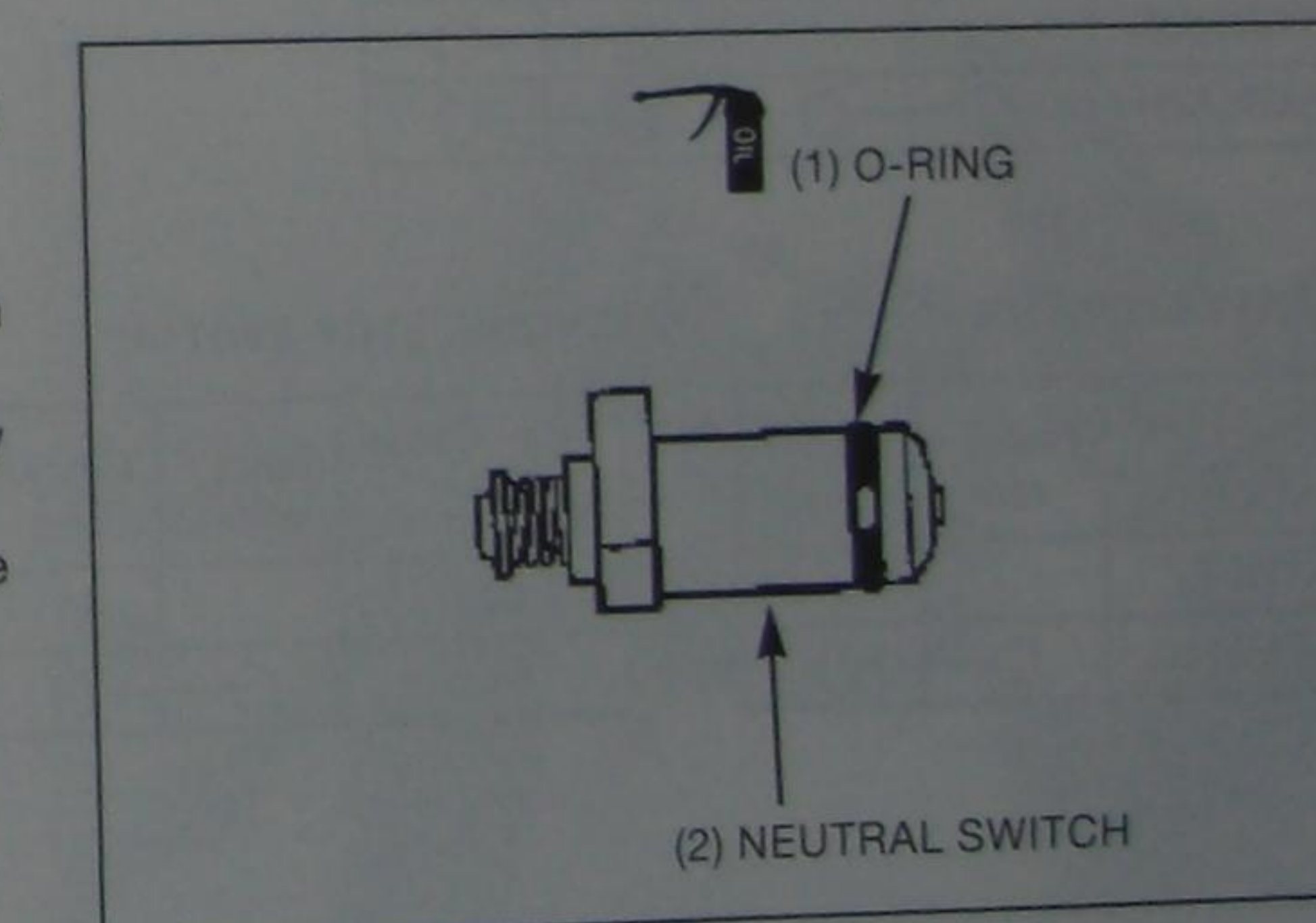
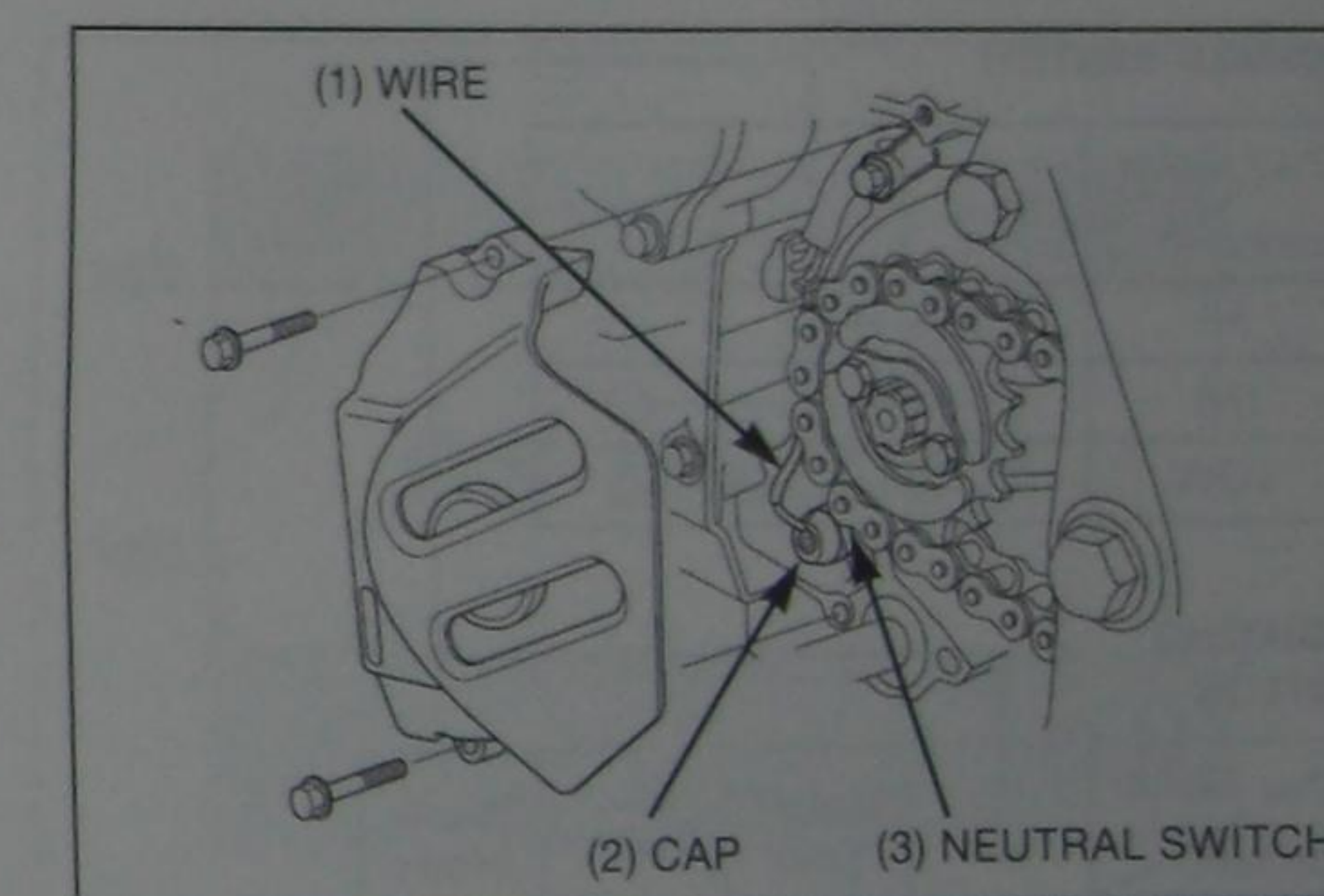
Coat a new O-ring with oil and install it into the switch groove.

Install the neutral switch into the crankcase until it is fully seated.

Connect the wire through the terminal hole by pushing the terminal flange.

Install the cap onto the switch securely.

Install the drive sprocket cover and tighten the two bolts.



Handlebar Switch

INSPECTION

Remove the headlight (page 19-2).

Disconnect the left handlebar switch 9P (White) and right handlebar 6P (White) connectors.
Check for continuity between the connector terminals in each switch position.
Continuity should exist between the color coded wires as follows:

HORN SWITCH

Color Position	Light green	Black/ brown
FREE		
PUSH	○	○

TURN SIGNAL SWITCH

Color Position	Orange	Gray	Light/ blue
R	○	○	
N			
L		○	○

DIMMER SWITCH

Color Position	Blue	White
HI	○	○
(N)	○	○
LOW		○

LIGHTING SWITCH

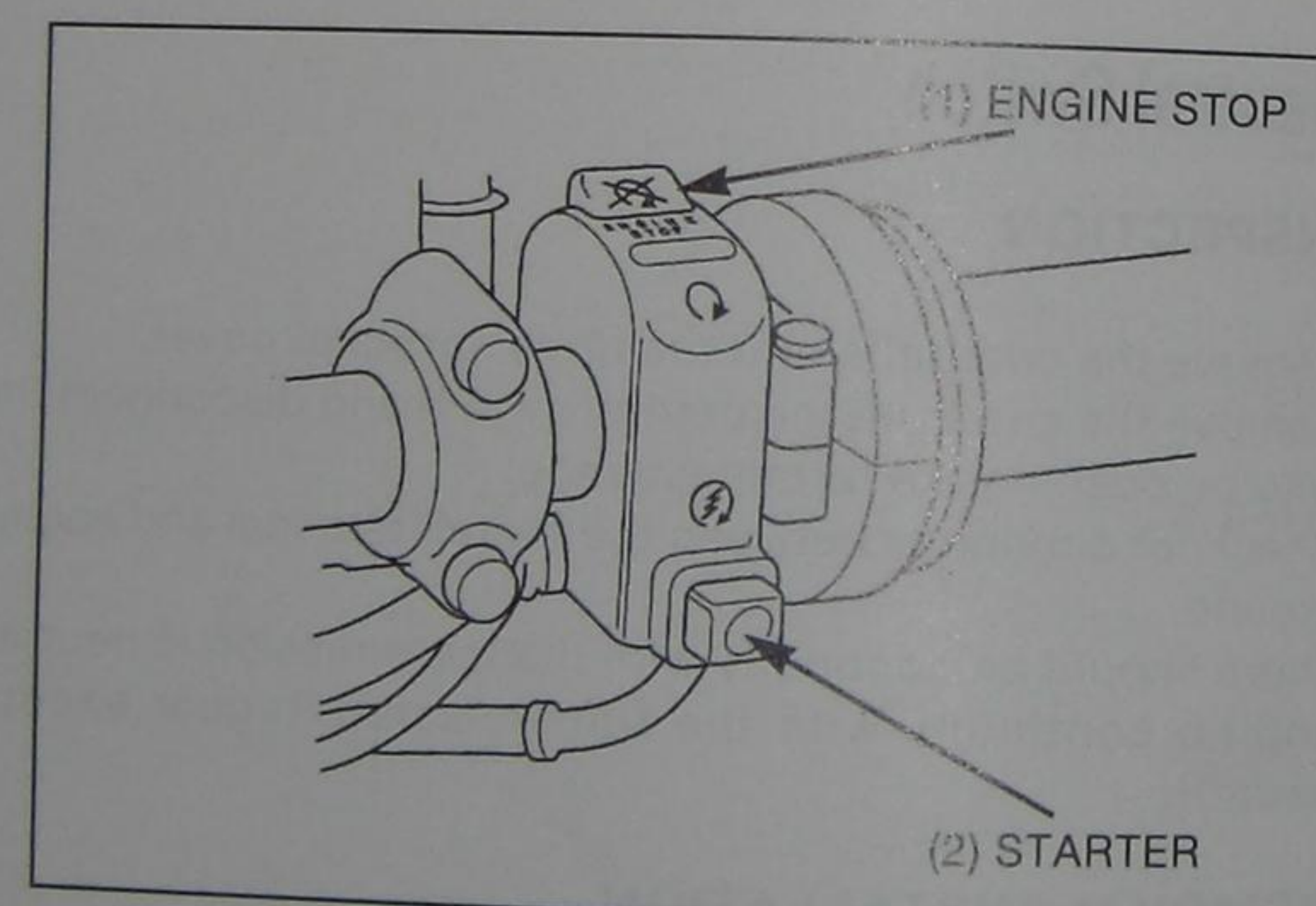
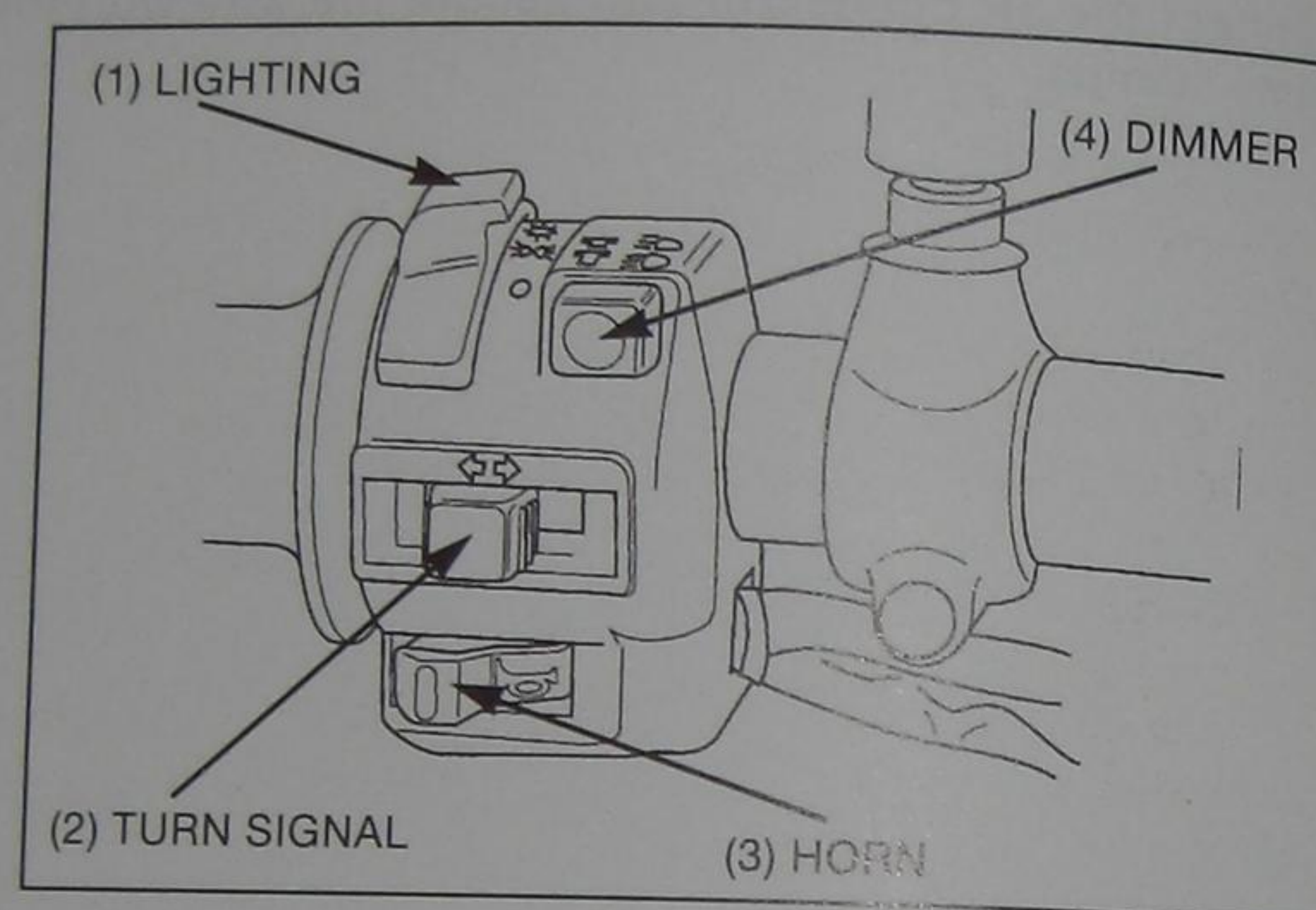
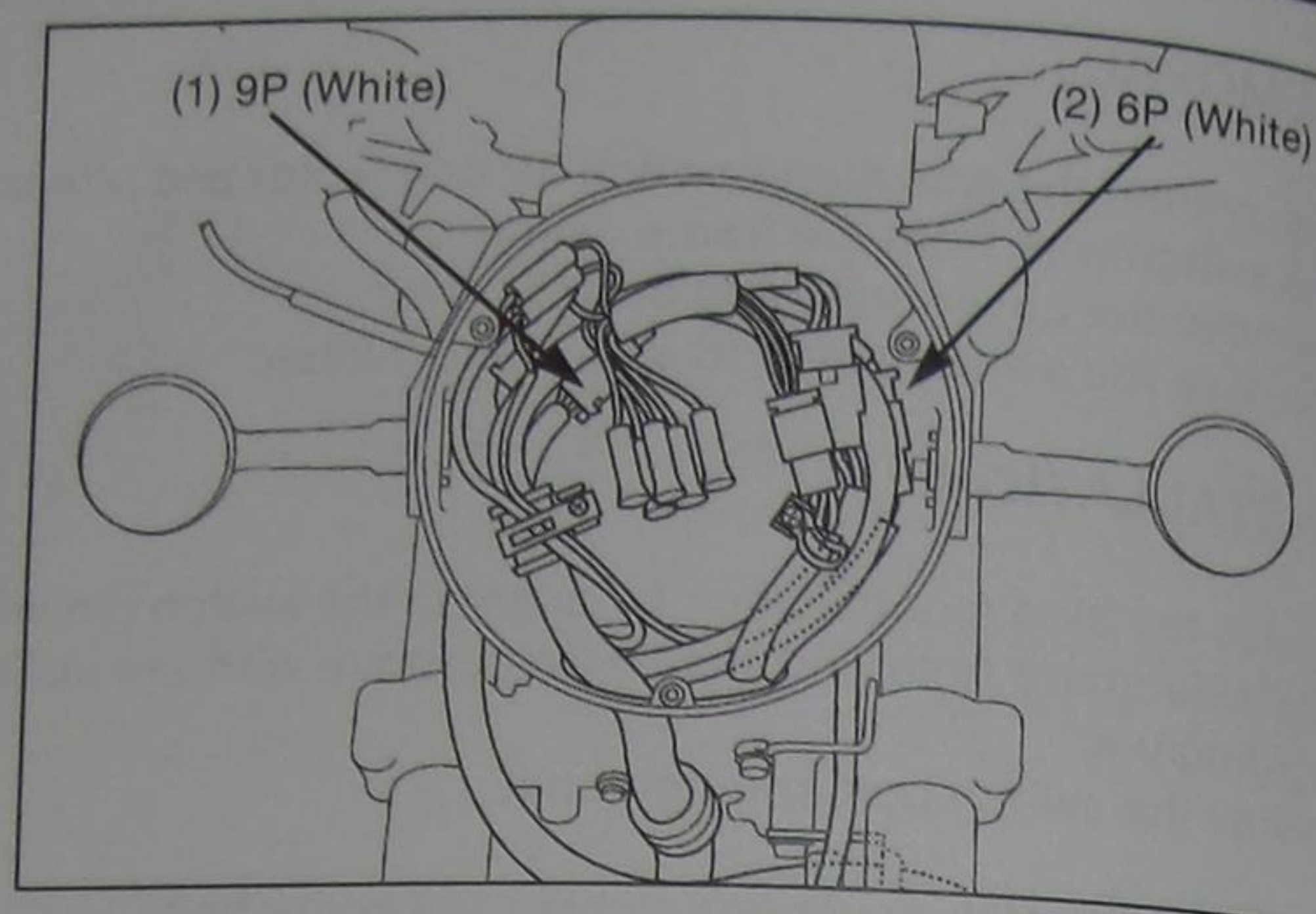
Color Position	Black/ blue	Brown	Black/ brown
OFF			
POSITION		○	○
HEADLIGHT	○	○	○

STARTER SWITCH

Color Position	Yellow/ red	Black/ white
FREE		
PUSH	○	○

ENGINE STOP SWITCH

Color Position	Black/ white	Black/ red
OFF		
RUN	○	○



Carburetor Heater

SYSTEM INSPECTION

Remove the seat (page 2-2).

Disconnect the heater 2P (White) and air temperature switch 2P (Black) connectors.
Check for continuity between the Brown/blue terminals at the harness side connectors. There should be continuity.
If there is no continuity, check for open circuit in Brown/blue wire.

Measure the voltage between the Black/brown (+) and Green (-) wire terminals at the harness side connectors with the ignition switch ON.
There should be battery voltage.
If there is no voltage, check for open circuit in Black/brown and Green wires.

If the wires are OK, check as follows:

Measure the resistance between the heater side connector terminals of the 2P (White) connector.

STANDARD: 4-10 Ω (20°C/68°F)

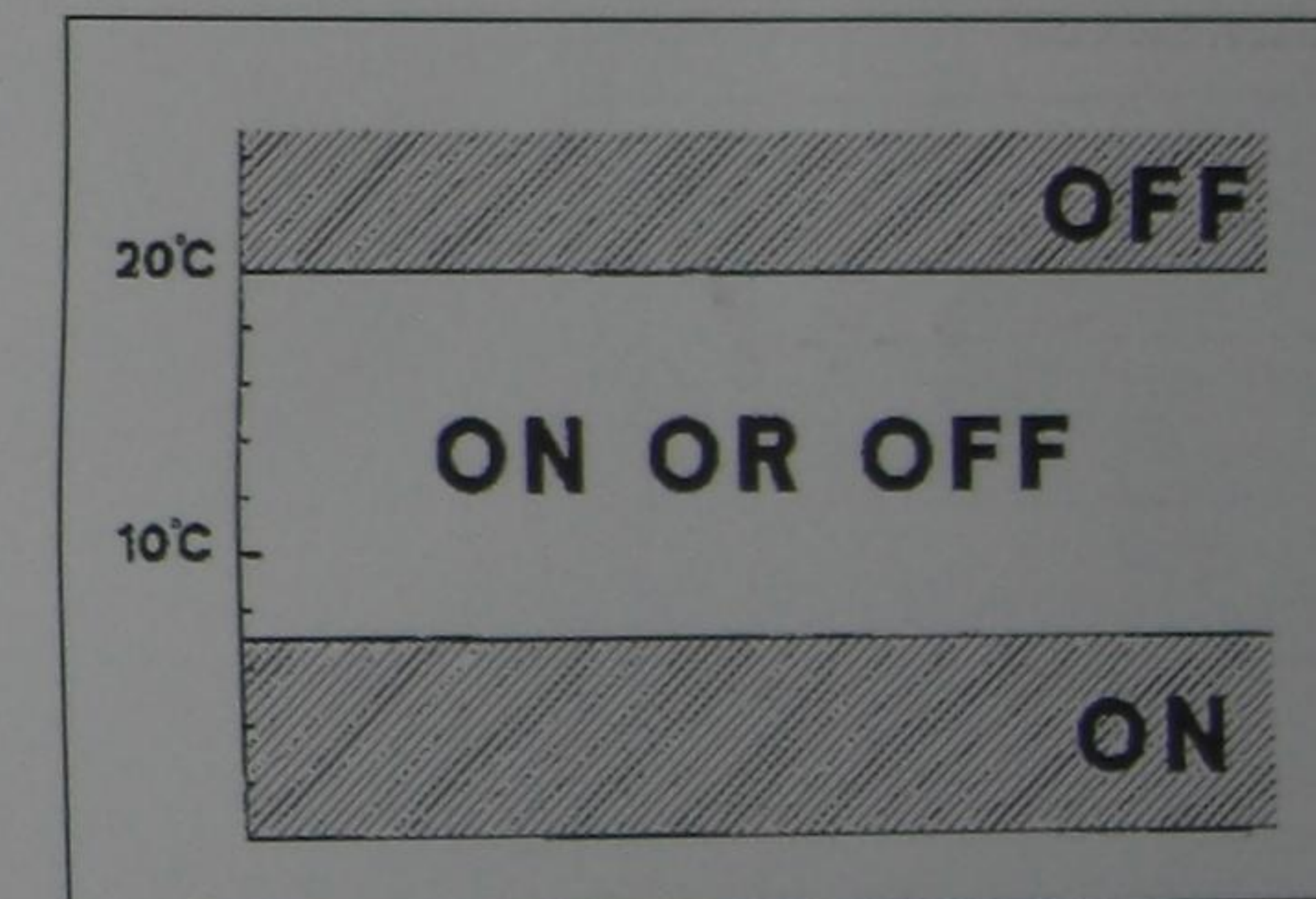
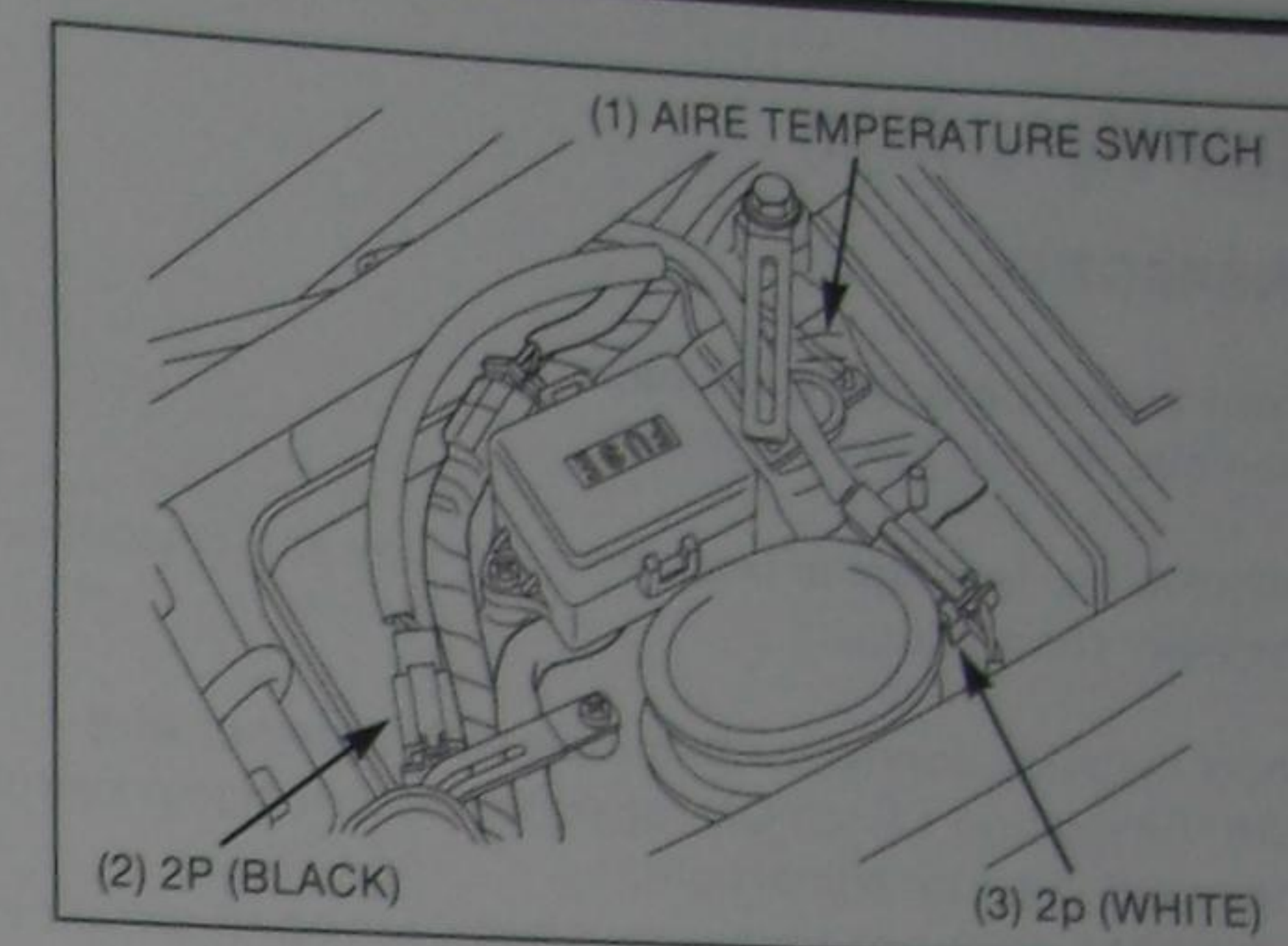
If the resistance is out of above ranges, replace the carburetor heater.

If the carburetor heater resistance is normal, check for continuity between the air temperature switch side connector terminals of the 2P (Black) connector.

Above: 20°C (68°F): No continuity

Below: 7°C (45°F): Continuity

If there is abnormal, replace the air temperature switch.

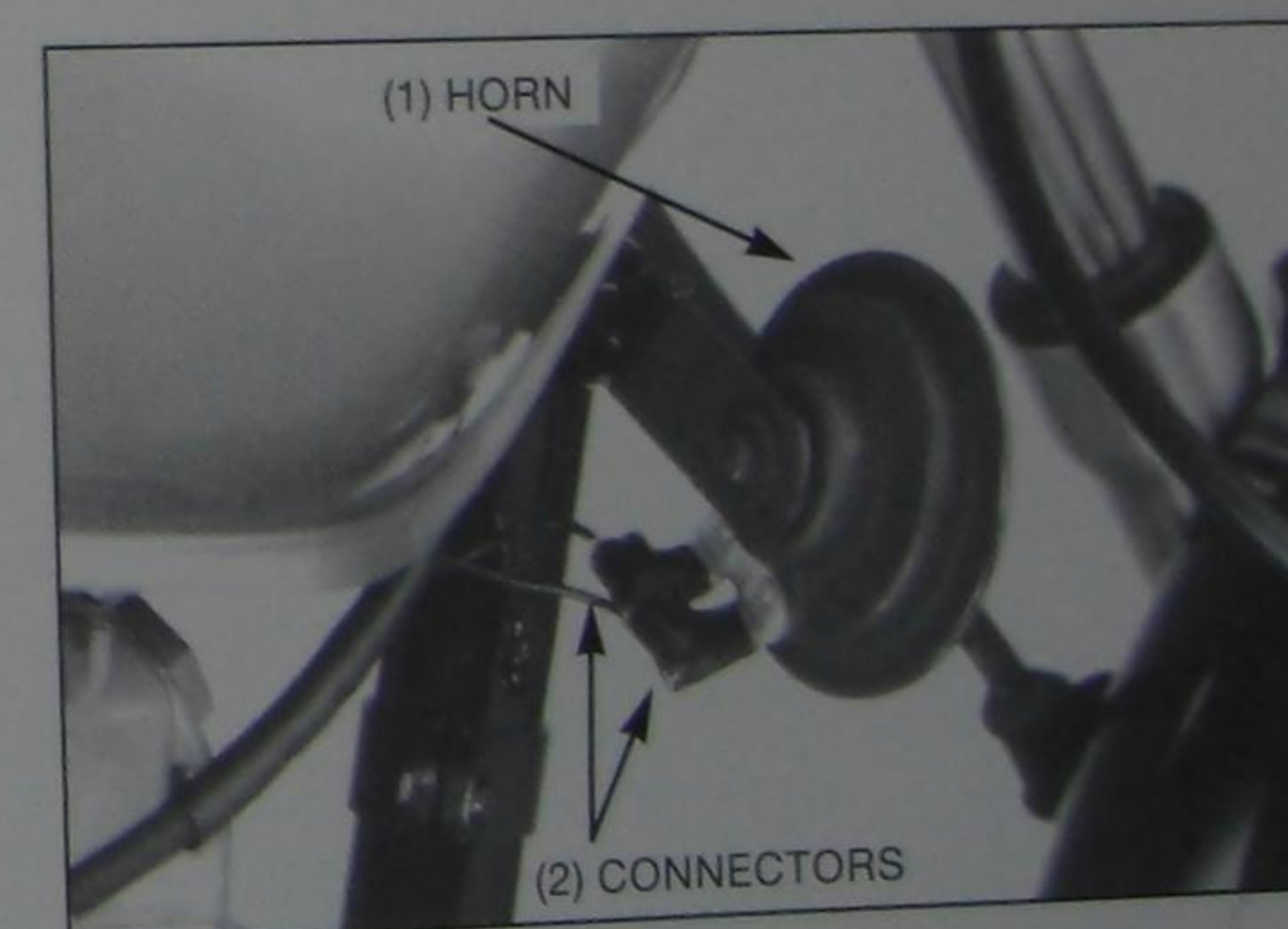


Horn

INSPECTION

Disconnect the wire connectors from the horn.
Connect a 12 V battery to the horn terminals.

The horn is normal if it sounds when the 12 V battery is connected across the horn terminals.



Turn Signal Relay

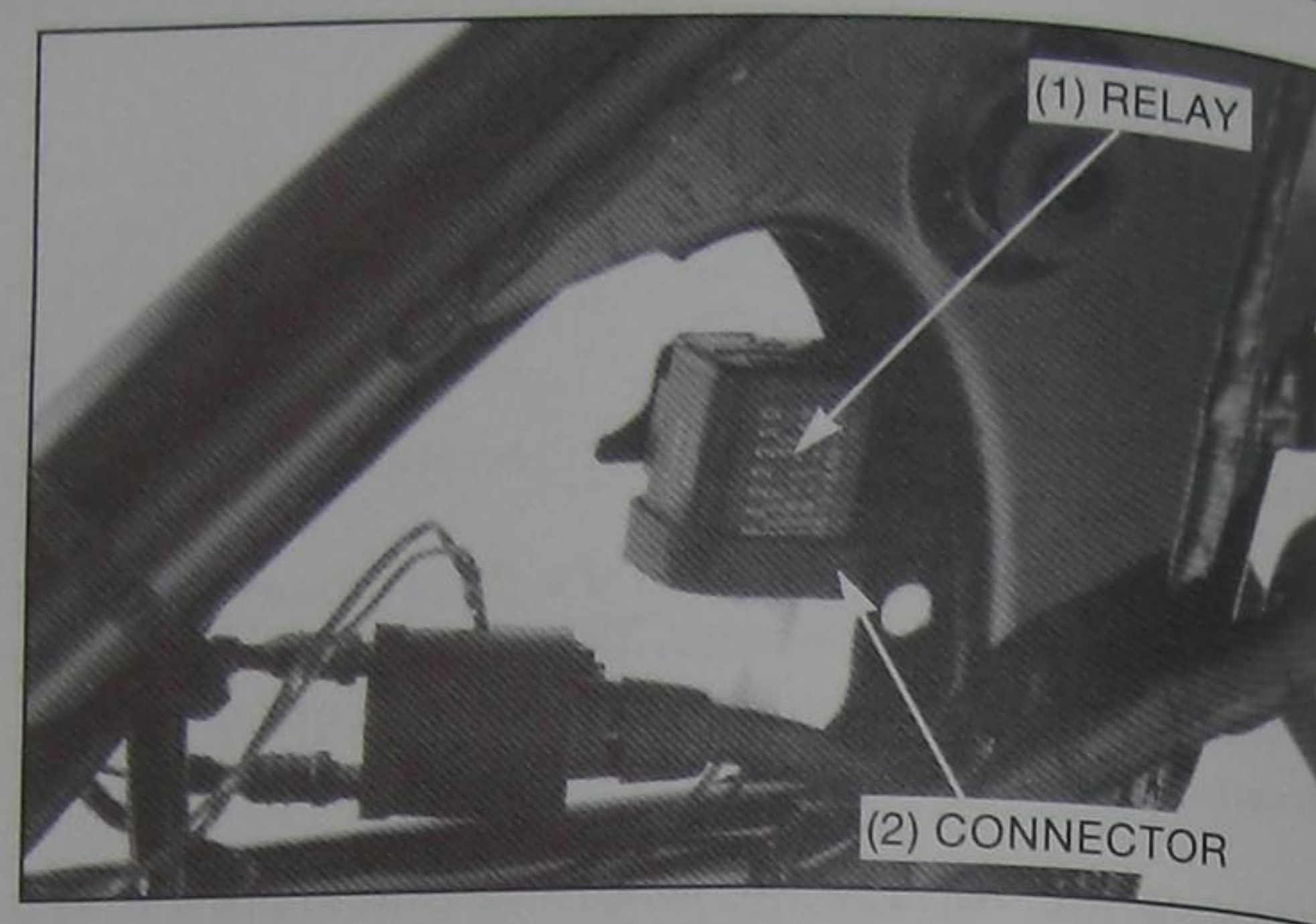
INSPECTION

Turn signal light does not blink
Remove the fuel tank (page 2-2).

Remove the turn signal relay from the stay and disconnect the relay connector.

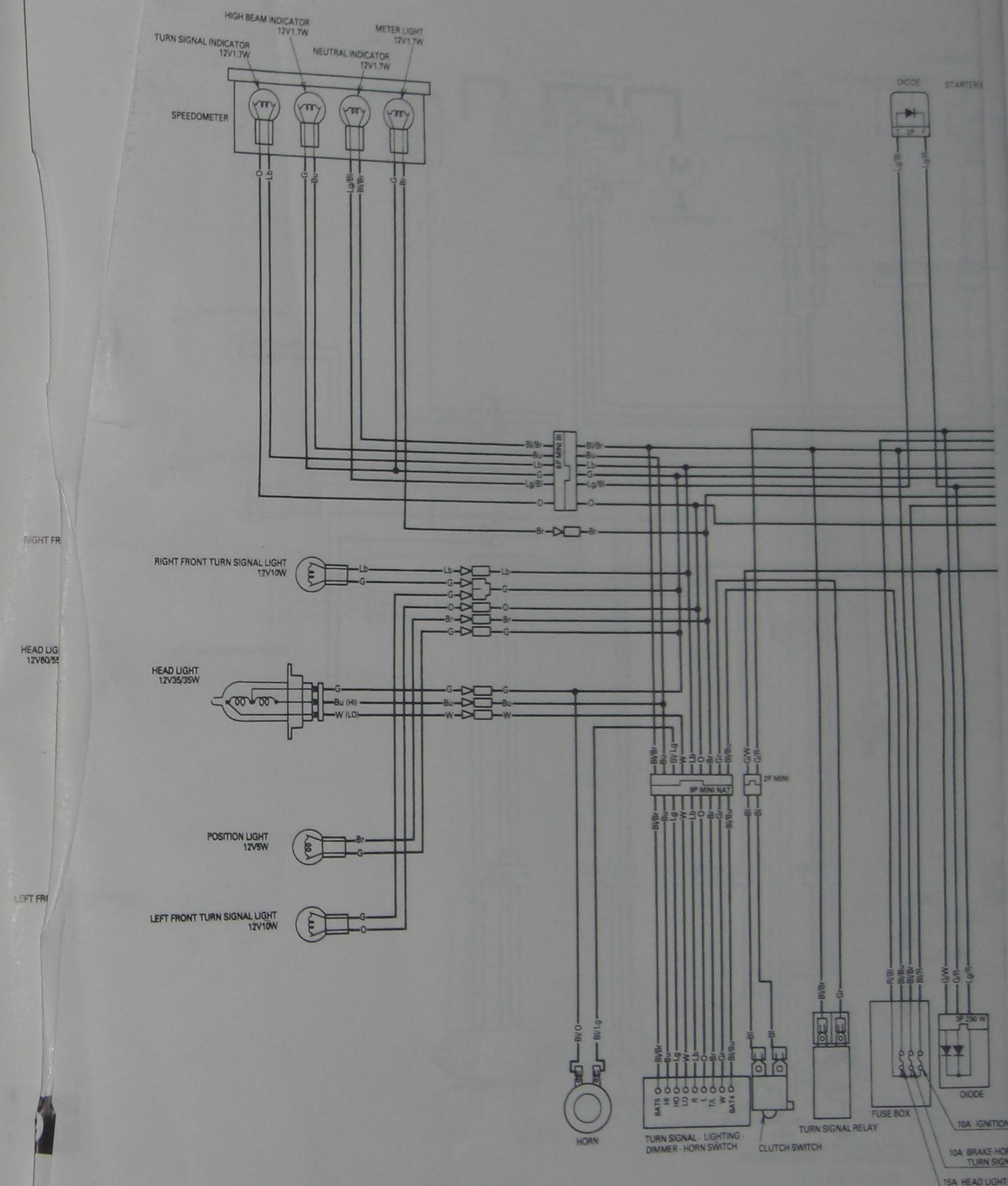
Short the relay connector terminals with a jumper wire. Turn the ignition switch ON, operate the turn signal switch and check the turn signal light. If the light does not come on, check for open circuit in wires.

If the light comes on, check the connector terminals for loose or poor contact.
If the connector terminals are OK, replace the turn signal relay.



WIRING DIAGRAM

E type:



SWITCH CONTINUITY

STARTER SWITCH			ENGINE STOP SWITCH		IGNITION SWITCH		LIGHTING SWITCH			DIMMER SWITCH			TURN SIGNAL SWITCH			HORN SWITCH				
ST	IG		IG	BAT7	BAT1	BAT2	(HL)	BAT4	TL	BAT5	HI	(HL)	LO	L	W	R	HO	BAT6		
FREE			OFF		ON												FREE			
PUSH			RUN		OFF						(NI)			(NI)			PUSH			
CORD COLOR	Y/R	B/W	CORD COLOR	B/W	B/R	CORD COLOR	R	B/B	Br	B/R	CORD COLOR	Bu	W	CORD COLOR	O	Gr	Lb	CORD COLOR	Lg	B/B

(1) RELAY

(2) CONNECTOR

19

STARTER SWITCH		
	ST	IG
FREE		
PUSH		
CORD COLOR	Y/R	B/W

ENGINE		STOP SWITCH	
	IG	BAT7	
	OFF		
	RUN		
CORD COLOR	B/W	B/R	

KNOX SWITCH	
	BAT1 BAT2
ON	
OFF	
LOCK	
CORD COLOR	R R/B

LIGHTING SWITCH				
	(HL)	BAT4	TL	BAT5
				
				
				

DIMMER SWITCH		
	HL	(HL)
HL		
(HL)		
HL		

TURN SIGNAL SWITCH			
	L	W	R
←	●—●		
(N)			
→			●—●

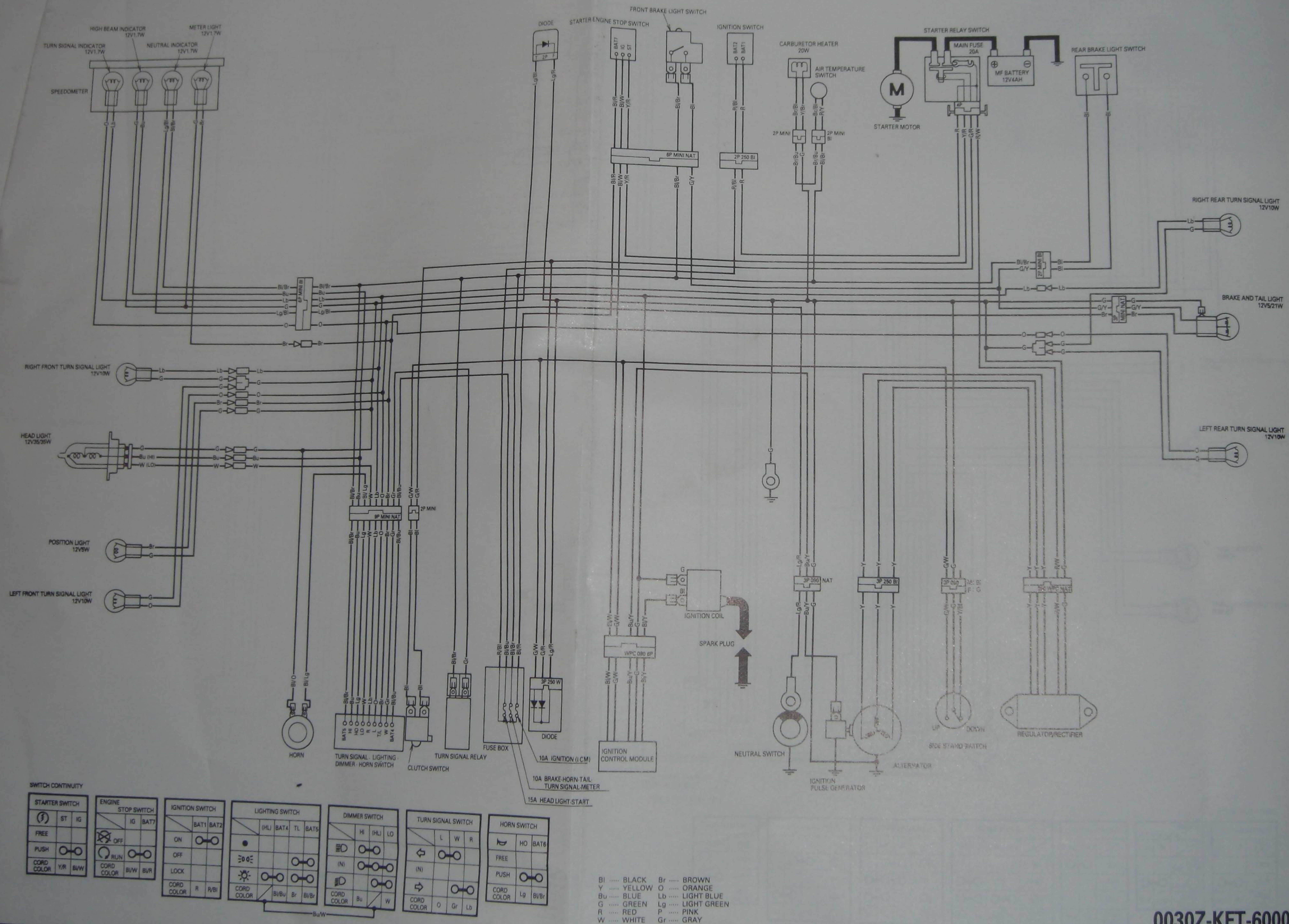
HORN SWITCH		
	HO	BAT8
FREE		
PUSH		
CORD COLOR	Lg	BvBr

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

0030Z-KFT-6200

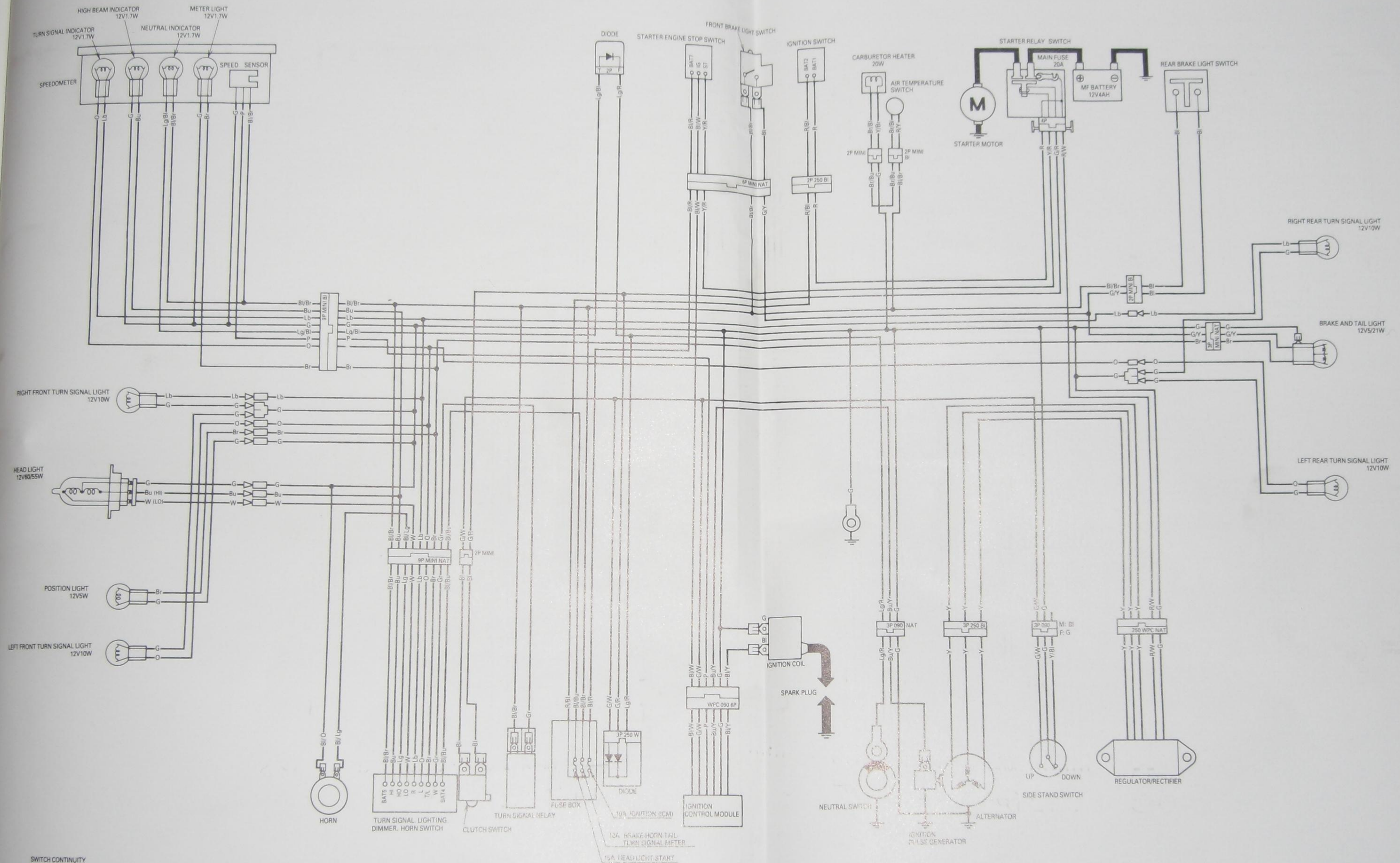
WIRING DIAGRAM

E type:



0030Z-KFT-6000

11G type:



SWITCH CONTINUITY

STARTER SWITCH	ENGINE STOP SWITCH	IGNITION SWITCH	LIGHTING SWITCH	DIMMER SWITCH	TURN SIGNAL SWITCH	HORN SWITCH
ST IG FREE PUSH CORD COLOR Y/R B/W	IG BAT1 BAT2 OFF RUN CORD COLOR B/W B/R	BAT1 BAT2 ON OFF LOCK CORD COLOR R R/B	(HL) BAT4 TL BAT5 CORD COLOR Bu/Bu Br Bu/Br	HI (HL) LO CORD COL Bu W	L W R (N) CORD COLOR O Gr Lb	FR HO BAT6 FREE PUSH CORD COLOR Lg B/B

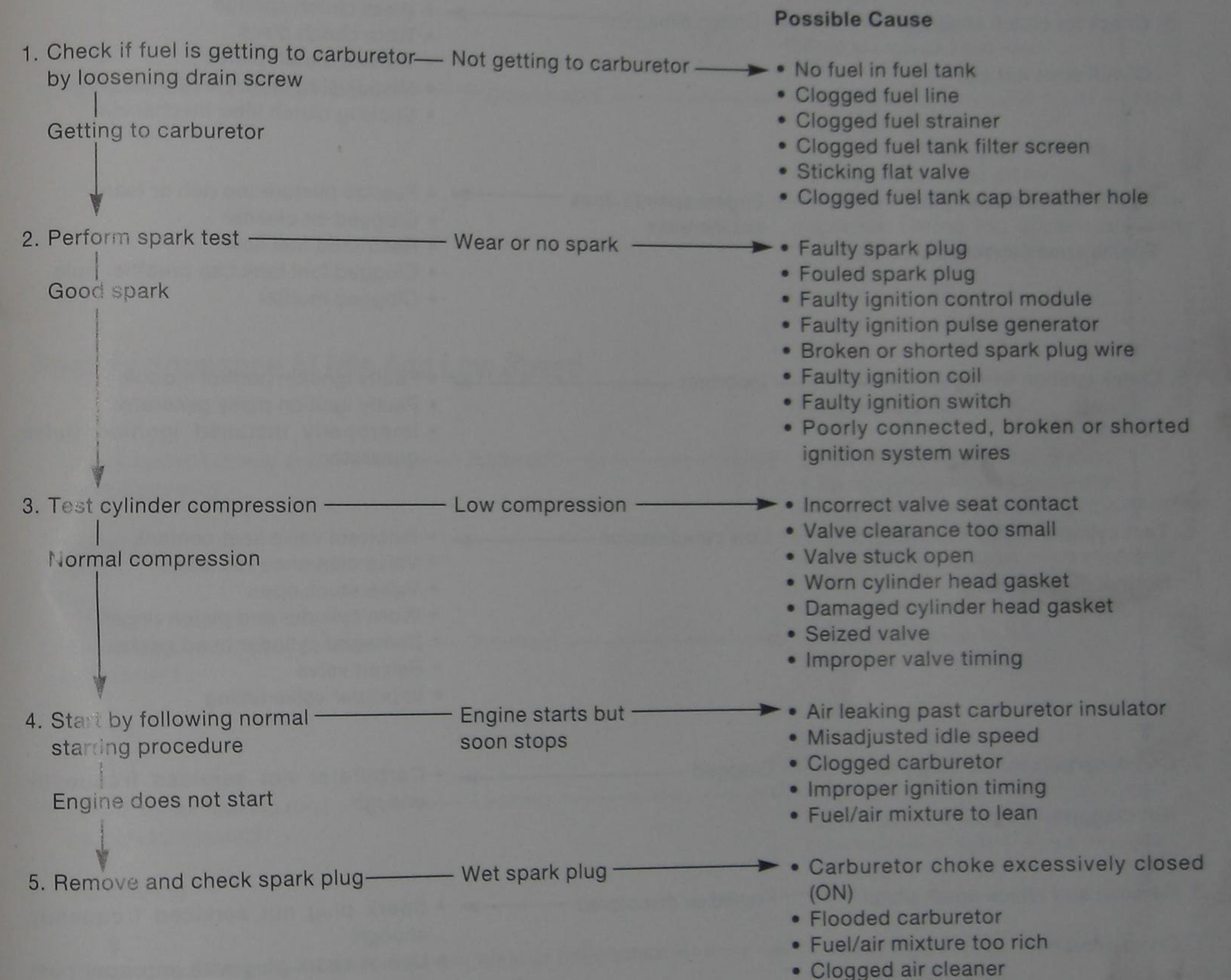
BI BLACK Br BROWN
 Y YELLOW O ORANGE
 Bu BLUE Lb LIGHT BLUE
 G GREEN Lg LIGHT GREEN
 R RED P PINK
 W WHITE Gr GRAY

0030Z-KFT-9400

20. Troubleshooting

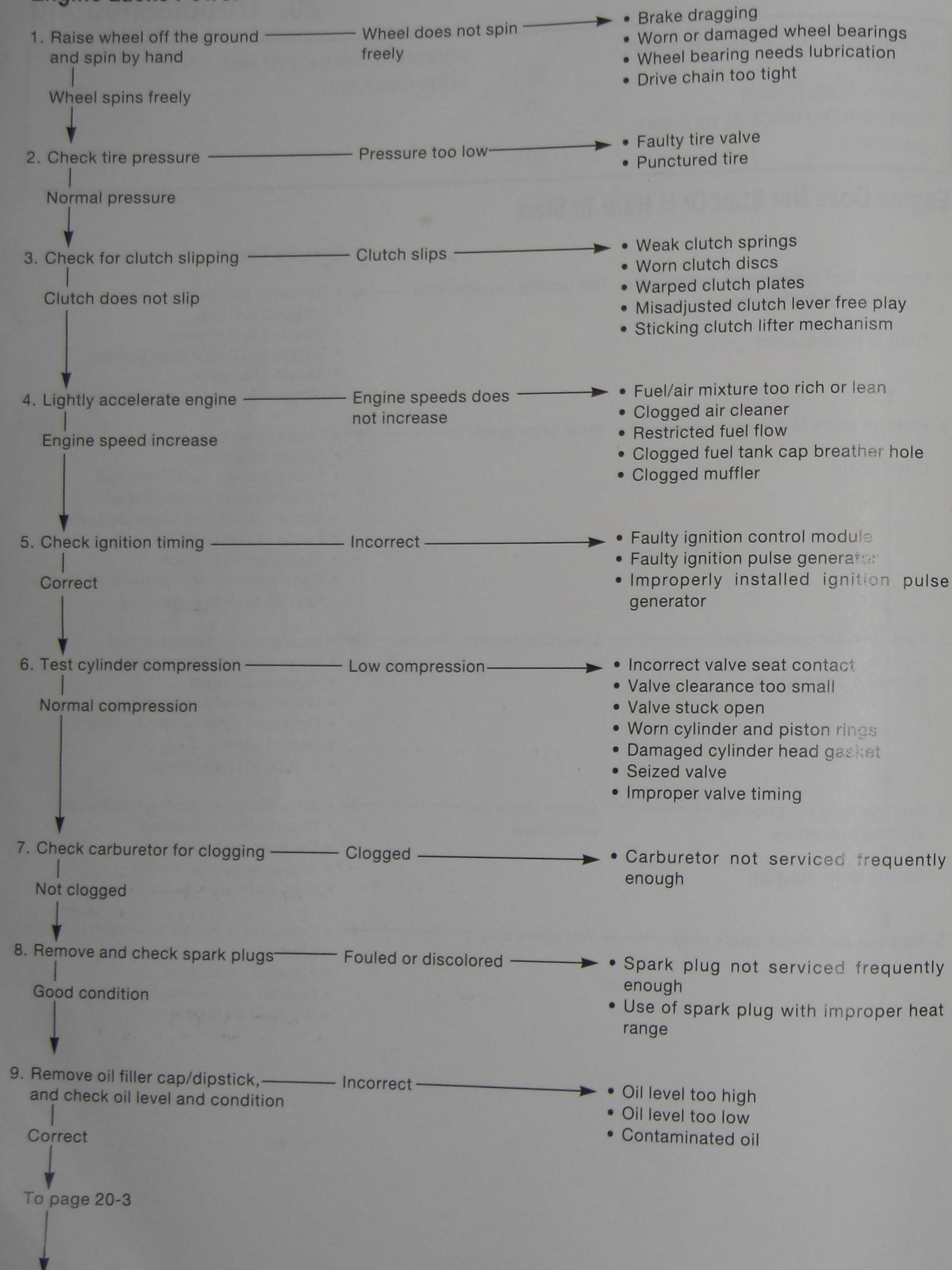
ENGINE DOES NOT START OR IS HARD TO START		POOR PERFORMANCE AT HIGH SPEED	20-4
ENGINE LACKS POWER	20-1	POOR HANDLING	20-4
POOR PERFORMANCE AT IDLE AND LOW SPEED	20-2		
	20-3		

Engine Does Not Start Or Is Hard To Start

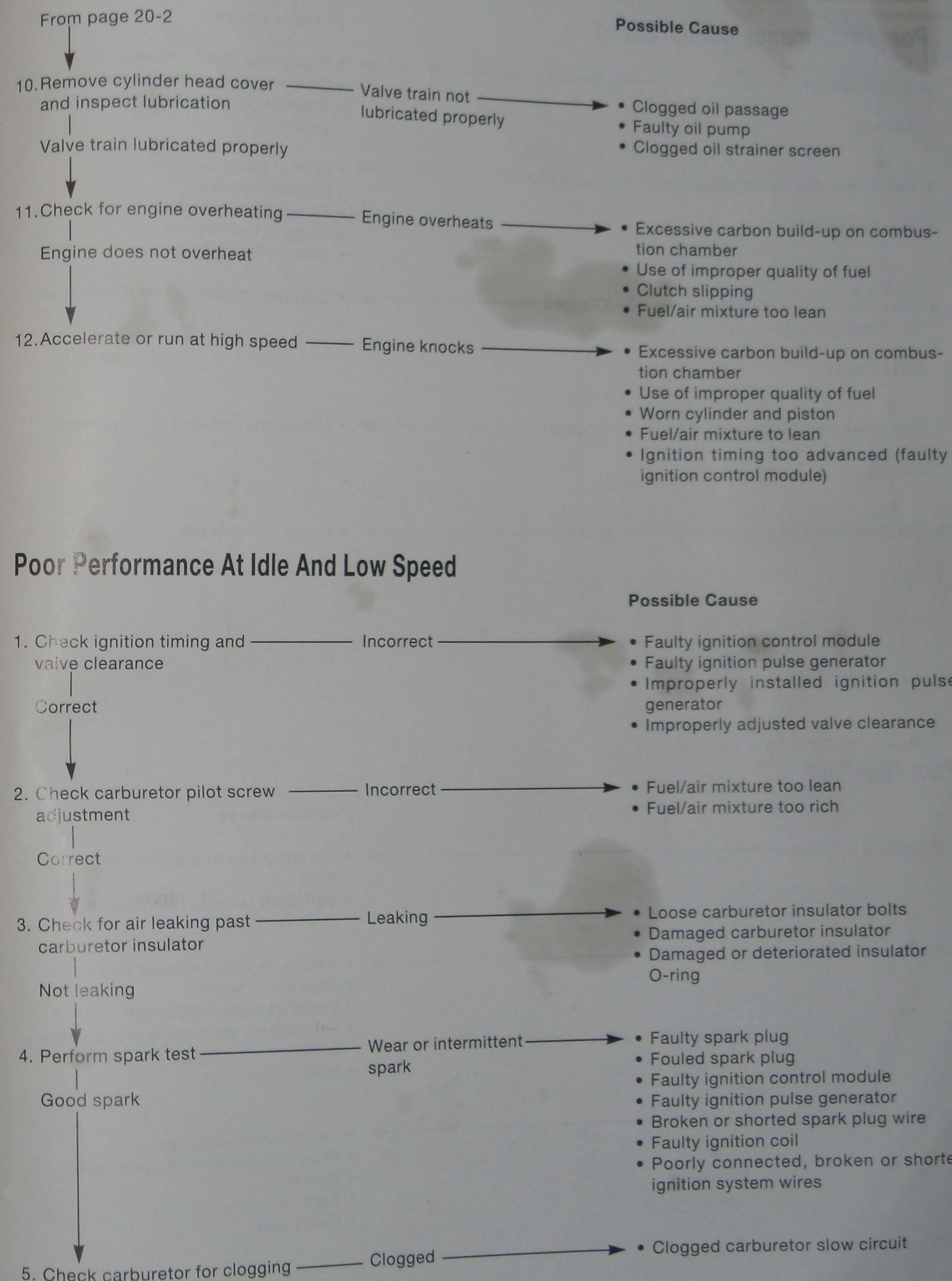


Engine Lacks Power

Possible Cause

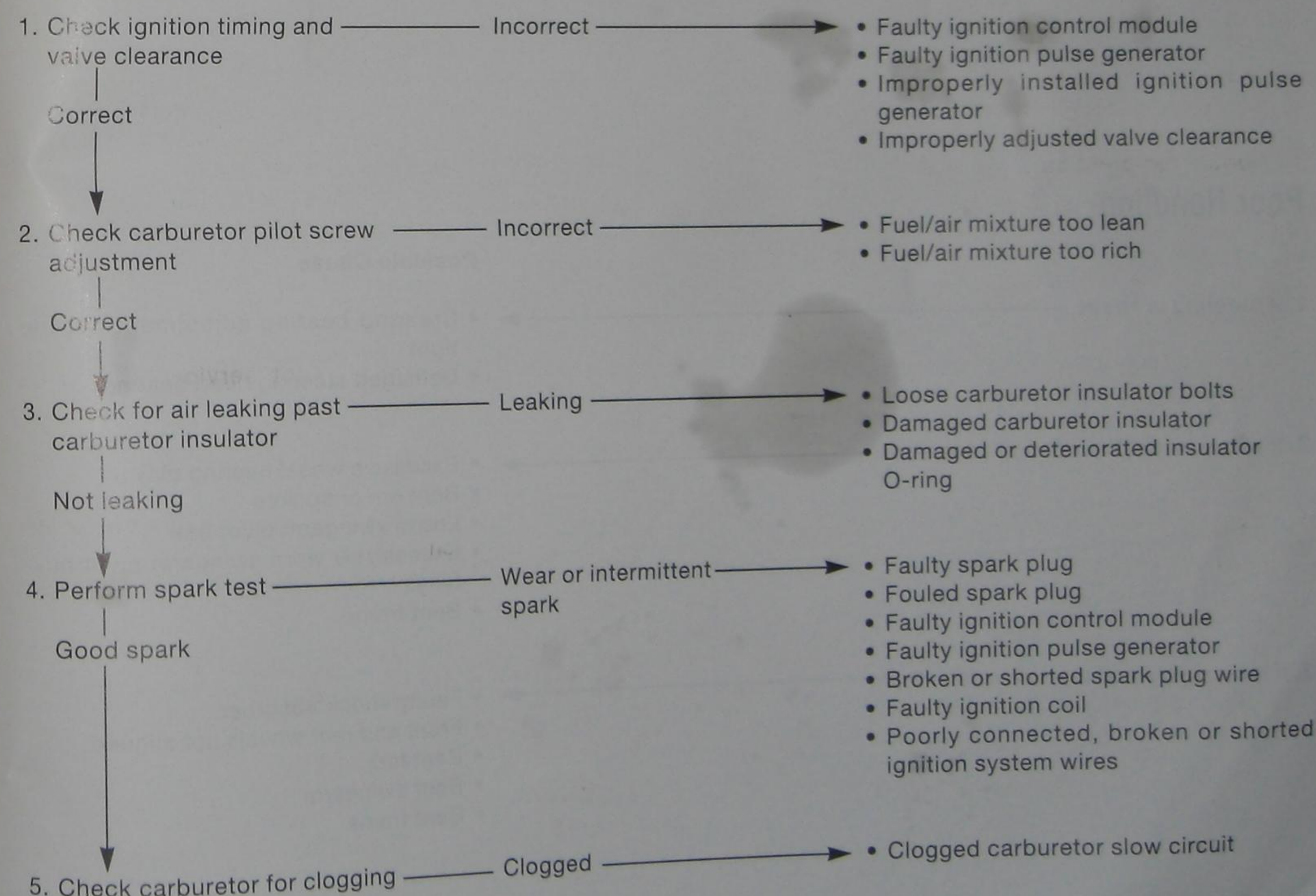


Possible Cause

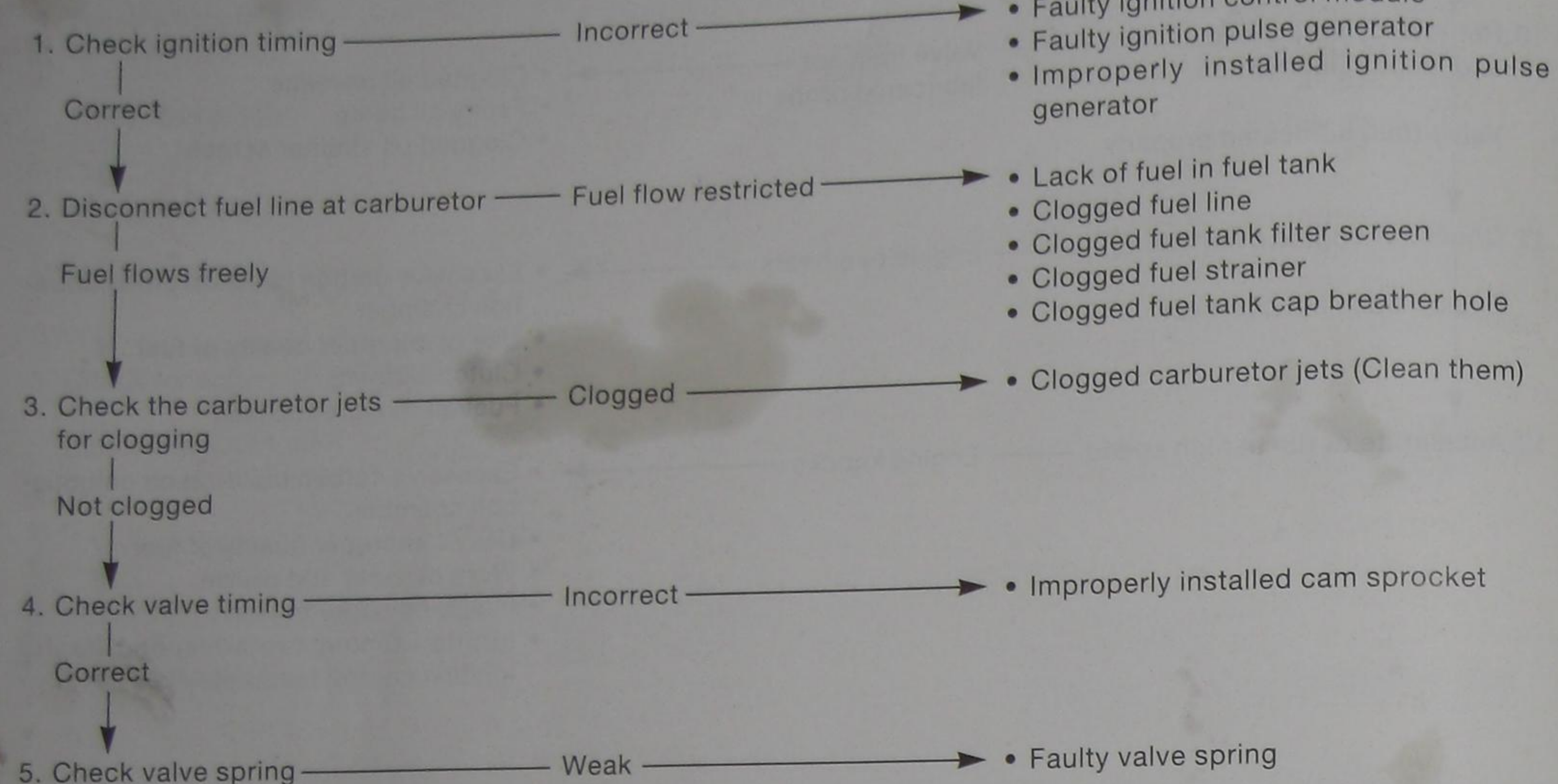


Poor Performance At Idle And Low Speed

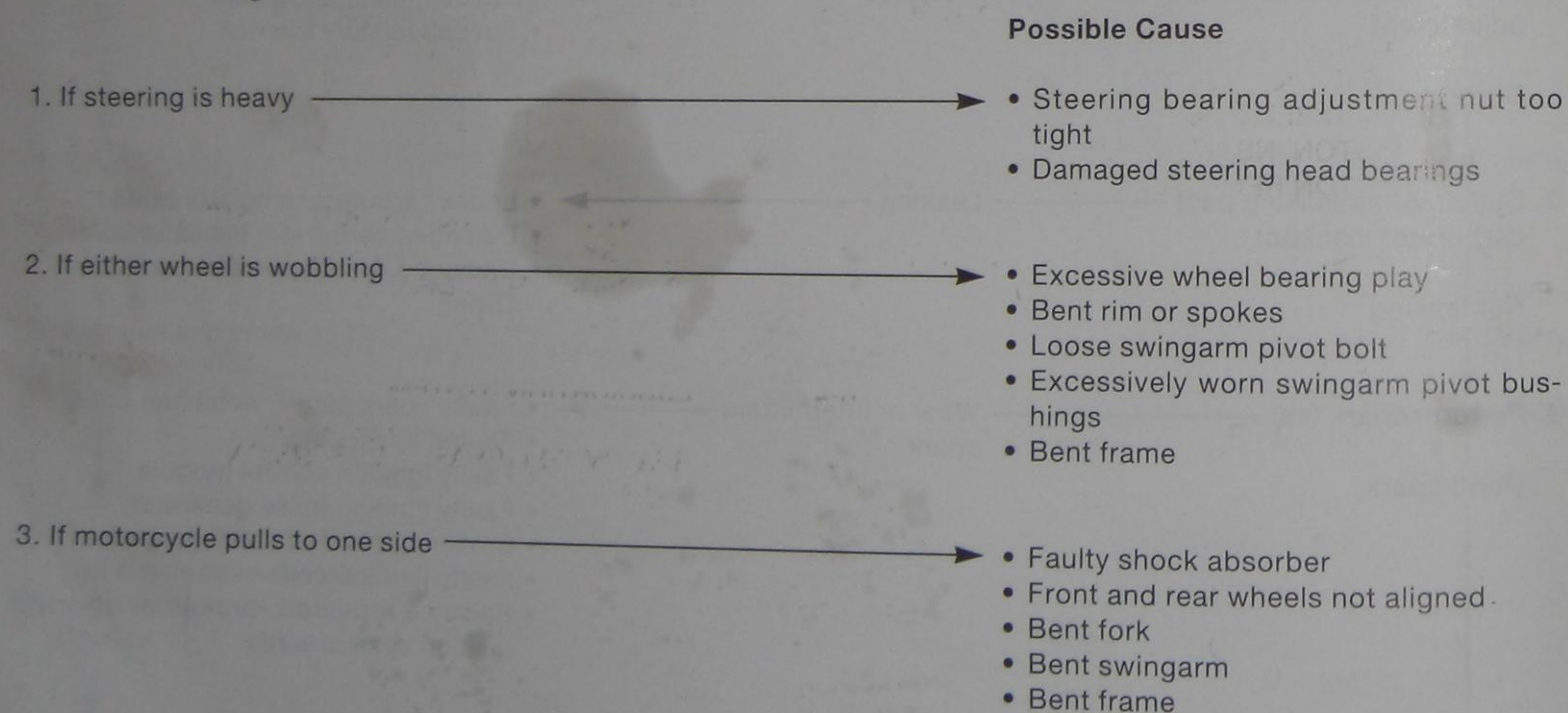
Possible Cause



Poor Performance At High Speed



Poor Handling



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